Hytera

SERVICE MANUAL

DMR MOBILE RADIO
数字车载对讲机



DMR
DIGITAL MOBILE RADIO ASSOCIATION

Preface

This manual describes information related with product repair. To repair the product properly, please read this manual carefully.

This manual is applicable to the following model:

MD78X (X may indicate 2, 5, 6 or 8)

MD78XG (X may indicate 2, 5, 6 or 8)

Note: The description related to GPS is applicable to MD78XG only.

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1. Revision History

Version	Date	Description
R2.0	09-2010	Initial Release
R3.5	05-2011	Add descriptions on VHF, UHF2 and UHF3.

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U.S. Patent No: #6,912,495 B2, #6,199,037 B1, #5,870,405, #5,826,222, #5,754,974, #5,701,390, #5,715,365, #5,649,050, #5,630,011, #5,581,656, #5,517,511, #5,491,772, #5,247,579, #5,226,084 and #5,195,166.

3. Disclaimer

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If you have any suggestions or would like to learn more details, please visit our website at: http://www.hytera.com.

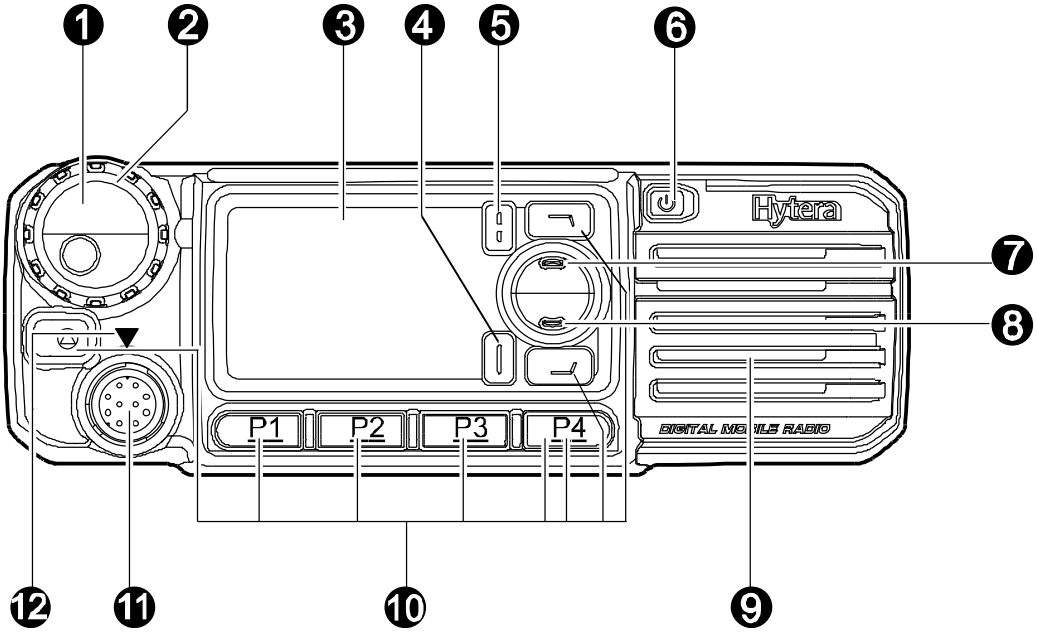
4. Product Overview

Intended User

This manual is intended for use by qualified technicians only.

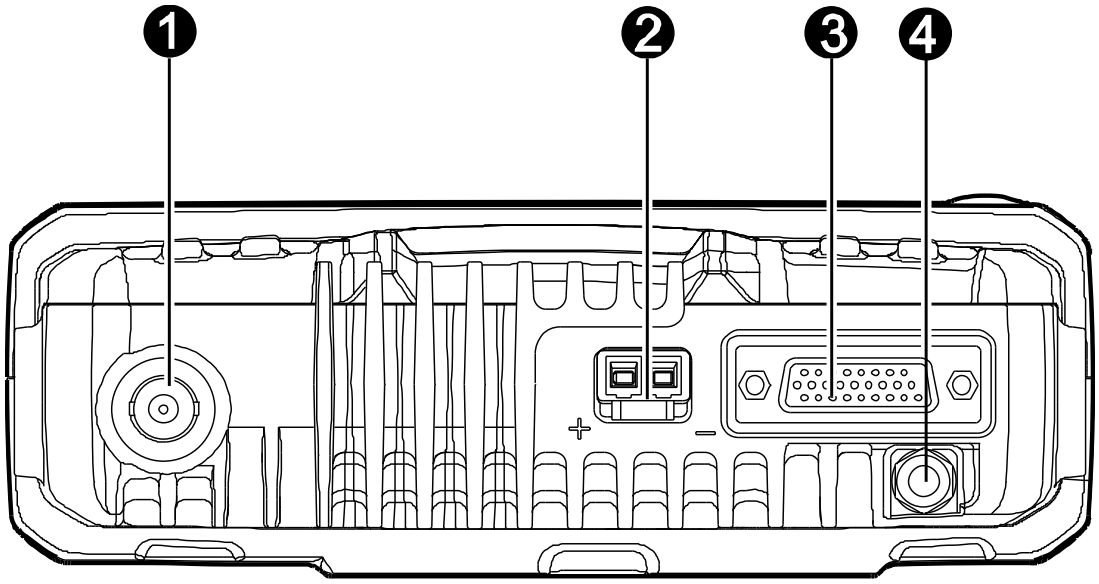
5. Product Controls

Front Panel



No.	Part Name	No.	Part Name
①	Volume Control / Channel Selector Knob	②	LED Indicator
③	LCD Display	④	OK/Menu Key
⑤	Back Key	⑥	Power On/Off Key
⑦	Up Key	⑧	Down Key
⑨	Speaker	⑩	Programmable Keys
⑪	Microphone Jack	⑫	Microphone Installation Index

Rear Panel



No.	Part Name	No.	Part Name
①	RF Antenna Connector	②	Power Inlet
③	Accessory Jack	④	GPS Antenna Connector

Note: The GPS Antenna Connector is only available for MD78XG.

6. Front Panel

The front panel contains the speaker, keys, power switch, volume control knob, LCD display and other parts. The block diagram is shown as the figure below.

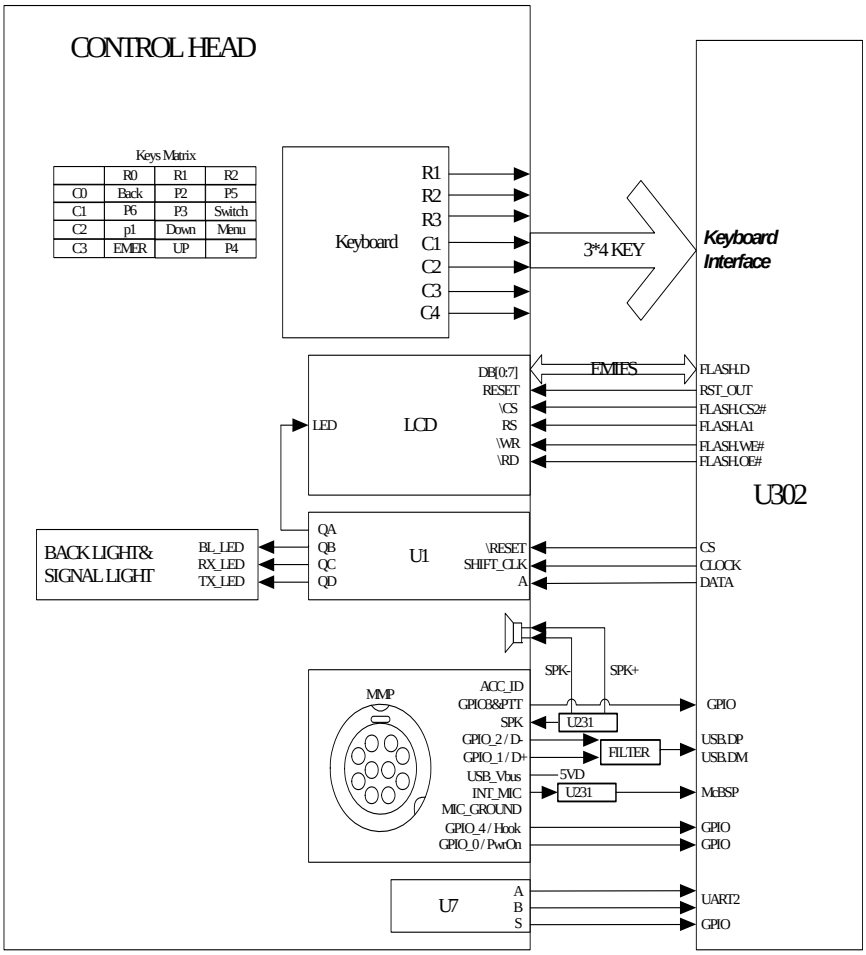


Figure 6-1 Diagram of Front Panel

1) Power Supply

The main board supplies power to the front panel via U902, so that the LED, backlight and USB devices can be powered up. Then the power is further fed to U5, so as to supply LCD and U1 (serial-to-parallel converter IC).

2) Keys

The front panel has ten keys: programmable keys (S2, S3, S7, S8, S9, S10 and S12), Up/Down key (S5, S11), OK/Menu key (S4), Back key (S6), and Power On/Off key (S1).

The operation of each key is identified by a 3X4 matrix keyboard.

3) LCD Display

The TFT LCD transfers data via the bus EMIFS of U302. The control signals contain write/read enable, memory chip select, LCD chip select and reset signal, each of which is pulled up by R36, R35, R34, R33

and R6 respectively. The 5V voltage is converted to 3.3V by U5, in order to supply the LCD module.

4) LEDs and Backlight

The LED enable signal is fed to the serial-to-parallel converter IC, and then is output by U302. RX status is indicated by green LED, and TX status by red LED. Backlight is activated upon key press.

The LEDs (red and green) in series are supplied by a 5V voltage (U902) and controlled by Q2 and Q3.

The backlight is also supplied by a 5V voltage and controlled by Q1. Control signals are output via U1.

5) MMC

For details, please refer to *Interface Definition*.

6) Audio output

The front panel provides two audio outputs: Handset_audio and SPK±. Handset_audio is the output of received audio via MMC, and SPK± is the output by the audio PA (U201) as audio signal for the front panel speaker.

7） Volume Control

The volume control is facilitated by the encoder switch (U7), which generates signals to be fed to U302 by GPIO17 and GPIO18.

7. Baseband Section

7.1 Power Section

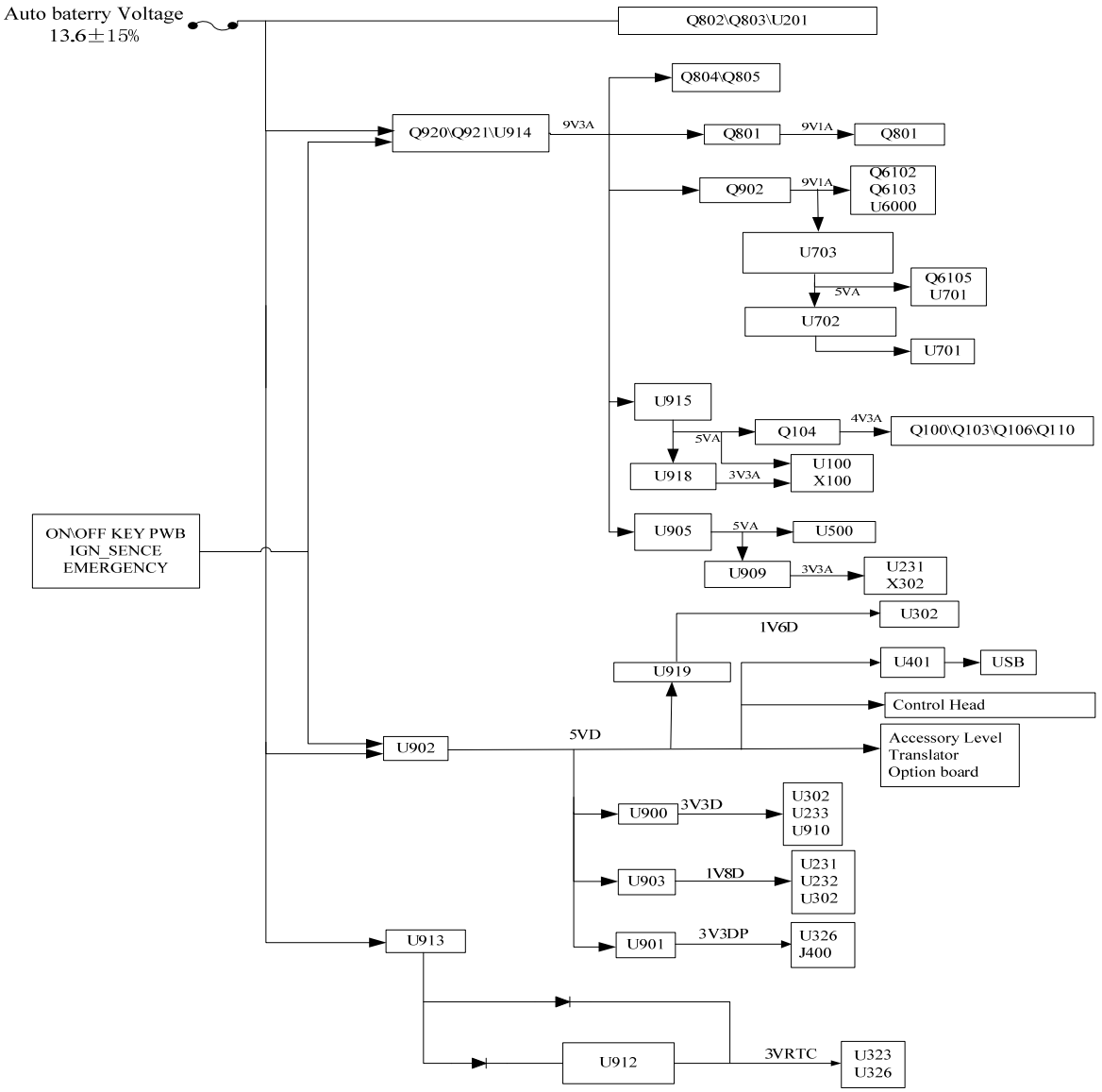


Figure 7-1 Diagram of Power Distribution

Both the baseband control IC and the RF section can convert the supplied voltage to an appropriate one via the voltage converter.

- Supply for RF: U914, Q920 and Q921 supply power for the RF section by high current PNP transistor and comparator, which can work as LDO (Low Dropout Regulator).
- Supply for FGU: U918 and U915 supply 3.3V and 5V respectively to U100.
- Supply for Baseband: The processor U302 is supplied by 3.3V (U900), 1.8V (U903) and 1.6V (U919); the memory is supplied by 3.3V (U900) and 1.8V (U903) respectively; the audio processor IC is supplied by 3.3V (U900&U909) and 1.8V (U903); the DAC is supplied by 5V (U905) and 3.3V (U900).
- EXT_SWB+: Q909.

7.2 Power On/Off

The mobile radio can be powered on/off through any of the following methods:

1) Power On/Off key
2) Ignition Signal
3) Emergency

7.2.1 Power On/Off Key

Power on the radio: As the Power On/Off Key is pressed, R944 becomes grounded and Q910 is on. Then Q905 outputs high-level signal, causing U902 and Q920 to start working. Afterwards the processor U302 executes user routines to maintain a high-level power control signal (PWR_CTR). In this case, the radio starts to work properly after the Power On/Off Key is released. Power off the radio: As the Power On/Off Key is pressed, LQ910 is on and a low-level signal (PWB) to turn off the radio is detected by U302, which then controls PWR_CTRL to output low level. Afterwards, the radio becomes off.

7.2.2 Ignition Signal

When the voltage of ignition signal exceeds 7V, Q1 will be turned on by C933, R955 and R956. As a result, the PNP transistor of Q905 will be further turned on to supply power. Meanwhile, Q401 will also be turned on, and U302 will identify ignition signals by detecting the signal from Q401; afterwards, the level PWR_CTRL is generated by the processor.

7.2.3 Emergency

When the emergency alarm pin is at low level, R940 is grounded, and Q906 is turned on to supply power. Meanwhile, Q908 is also turned on. When low level is detected from Q908 but the radio is powered off, U302 will output the level PWR_CTRL and send emergency signal. If the radio is powered on then, U302 will only output emergency signal.

7.2.4 Power-up Sequence

1) Power on the radio using one of the three methods (Power On/Off key, Ignition Signal, or Emergency);
2) U917 generates reset signal and remains low level for 1.25 seconds, allowing the processor to start;
3) Power-on signal will be sent to the processor;
4) After receiving the signal, the processor generates the level of PWR_CTRL. Then the power-up

procedures are completed.

7.3 Clock

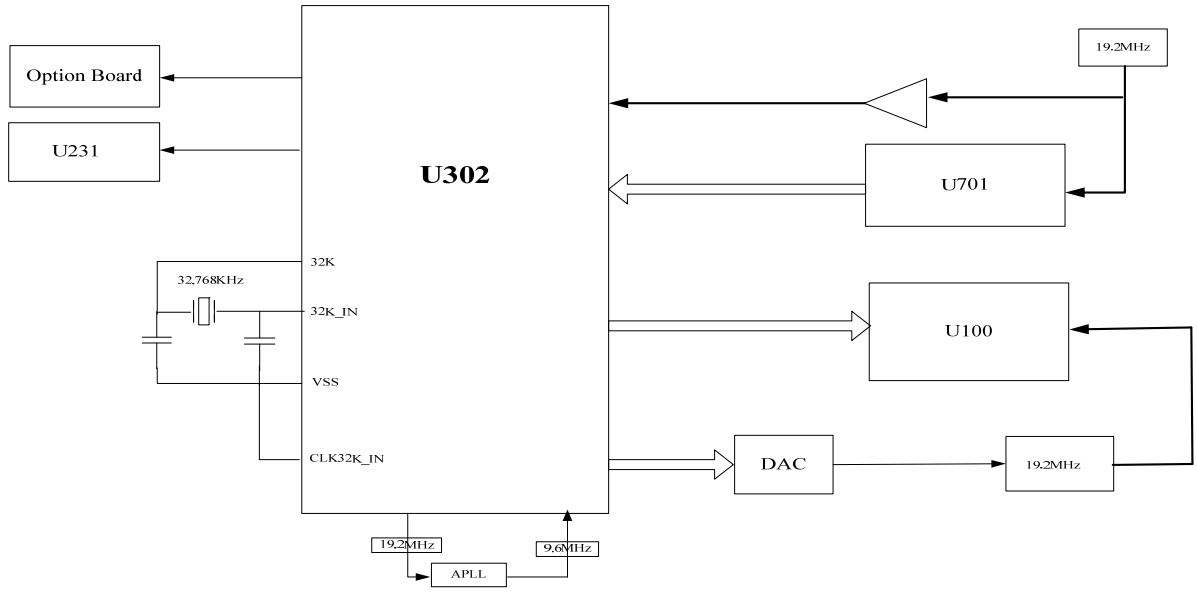


Figure 7-2 Diagram of Clock Distribution

7.3.1 Input Clock

The 32K clock provided by X375 is mainly used for timing and sleeping of the system. Its frequency (32.768 kHz) is divided by U302 (32768 times in all) to 1Hz for counting seconds. The system clock (19.2MHz) is generated by an external crystal oscillator.

7.3.2 Output Clock

The baseband outputs 3 clock signals fed to U231, U100 and Option Board respectively.

7.4 Interface Distribution

7.4.1 Serial Peripheral Interface (SPI)

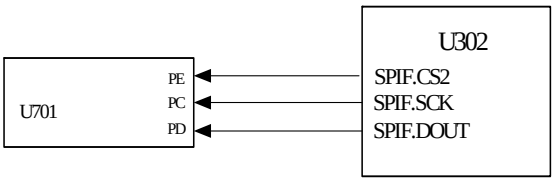


Figure 7-3 Diagram of SPI Interface

SPI of U302 operates in Master Mode, and is controlled by MPU or DMA. In this case, U302 can provide 4 chip select signals, of which CS2 is used to control the IF processor U701.

7.4.2 MCSI Interface

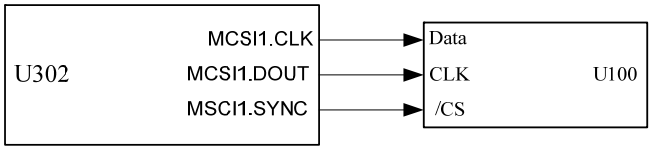


Figure 7-4 Diagram of MCSI Interface

When U302 is communicating with U100, it works in Master Mode with clock frequency of up to 9.6MHz. U100 uses MCSI synchronization as chip select signal and MCSI1.DOUT as data cable to configure its register.

7.4.3 MICROWIRE Interface

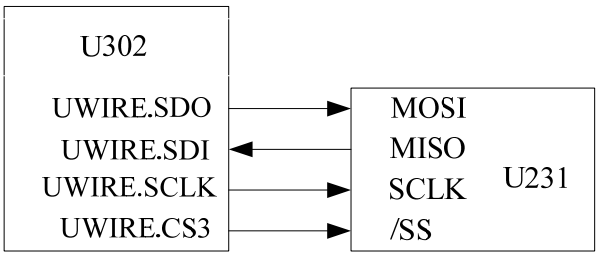


Figure 7-5 Diagram of MICROWIRE Interface

The MICROWIRE interface can accommodate 4 external devices at most, generally transmitting control and status messages of external devices, and reading data from ROM. Its maximum clock frequency is a quarter of system clock frequency. In this case, MICROWIRE is used to configure or read from the audio processor. It requires chip select signal CS3.

7.4.4 Serial Synchronous Interface (SSI)

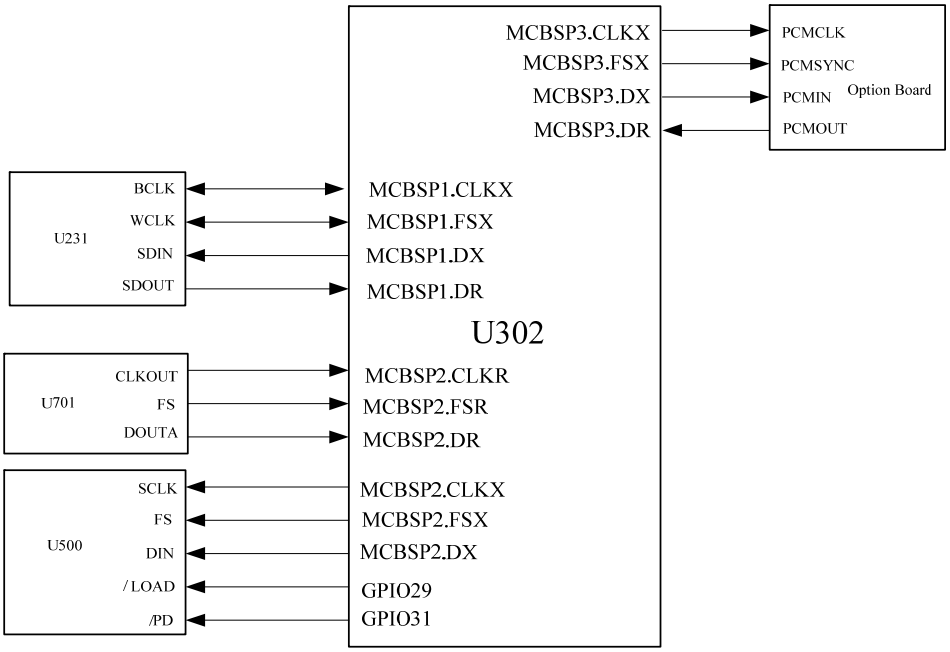


Figure 7-6 Diagram of SSI Interface

U302 has a total of three McBSP interfaces: McBSP1, McBSP2 and McBSP3, compatible with various interfaces. McBSP1 is connected with I2C of the audio processor, to realize two-way transmission of digital voice and data. McBSP2 uses independent clock and frame synchronization for transmitting and receiving. The SSI of the receiver processor is connected with the RX end of McBSP2, and U500 with the TX end of McBSP2. U302 works in Master Mode. McBSP3 is connected with the Option Board interface for both voice and data transmission.

7.4.5 USB Interface

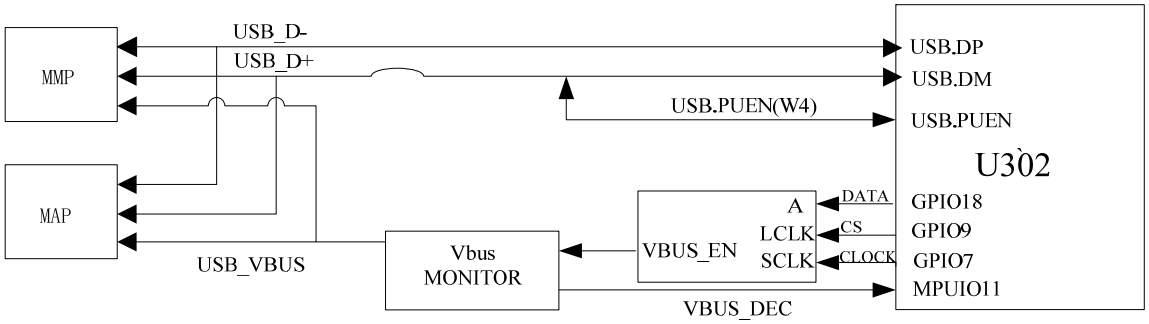


Figure 7-7 Diagram of USB Interface

The radio has two USB interfaces, which are connected to the same USB signal port of the processor. REF CLOCK is the reference frequency in specified mode. It should be 12MHz in high rate mode or 1.5MHz in low rate mode.

7.4.6 UART Interface

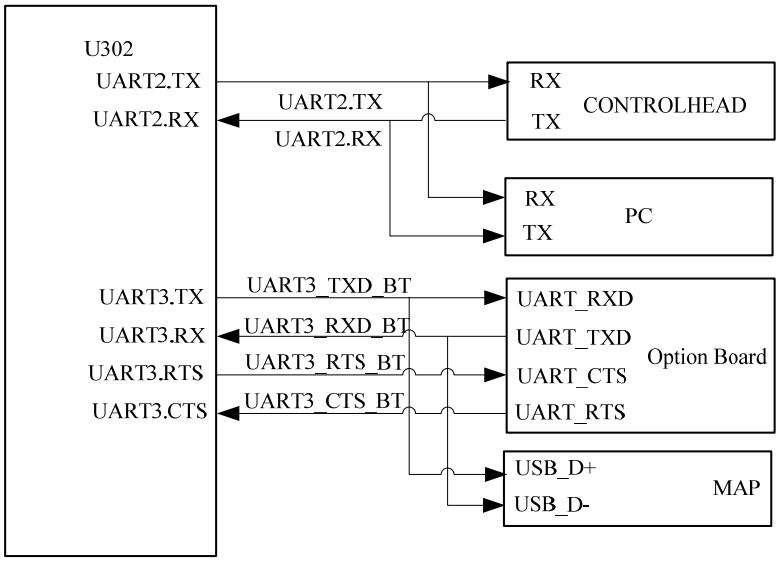


Figure 7-8 Diagram of UART Interface

U302 has a total of three UART interfaces, which are utilized to communicate with different external devices. UART2 is used for communication with front panel and serial port on PC, while UART3 with Option Board and accessory jack (USB).

7.4.7 Mobile Accessory Connector (MAC)

Mobile accessory connector contains audio interface, programmable I/O port, serial port, USB port, accessory identifier port and etc, which are applied for further development. For details, please refer for the section *Interface Definition*.

7.4.8 Option Board Interface

J400, an option board interface, is used to achieve specific function by connecting with the designated option board. The definition of each pin is listed as below:

Pin No.	Signal	Function	I/O Relative to Option Board	Voltage (VDD=3.3V)	Remarks
1 3 5 7 9	GPIO1 GPIO2 GPIO3 GPIO4 GPIO5	GPIO GPIO GPIO GPIO RESET-OUT	I/O I/O I/O O O	VIH MIN=0.7VDD VIL MAX=0. 3VDD VOH MIN=0.8VDD VOL MAX=0.22VDD	GPIO5: output signal of the option board (reset); GPIO4 and GPIO5: uni-directional output interfaces. They require their input resistance is above or equal to 47KΩ.
11 13 15 17	UART-TX UART-RX UART-CTS UART-RTS	UART	O I I O		UART
2 4	I2C –SDA I2C -SCL	I2C	I/O O		I2C
6 8 10 12	MCBSP-DR MCBSP-WCLK MCBSP-DX MCBSP-FSX	MCBSP	I I/O O I/O		McBSP: Multichannel Buffered Serial Port
14	AGND	AGND			
16	AF OB TO MB	AF	I	80mv (standard output from the option board to the main board)	MAX:700mV
18	AF MB TO OB	AF	O	80mv (standard output from the main board to the option board)	MAX:700mV
19	DGND	DGND			
20	3V6 or 5V	Power	O	Power supply: 5.0V	

7.5 Audio Section

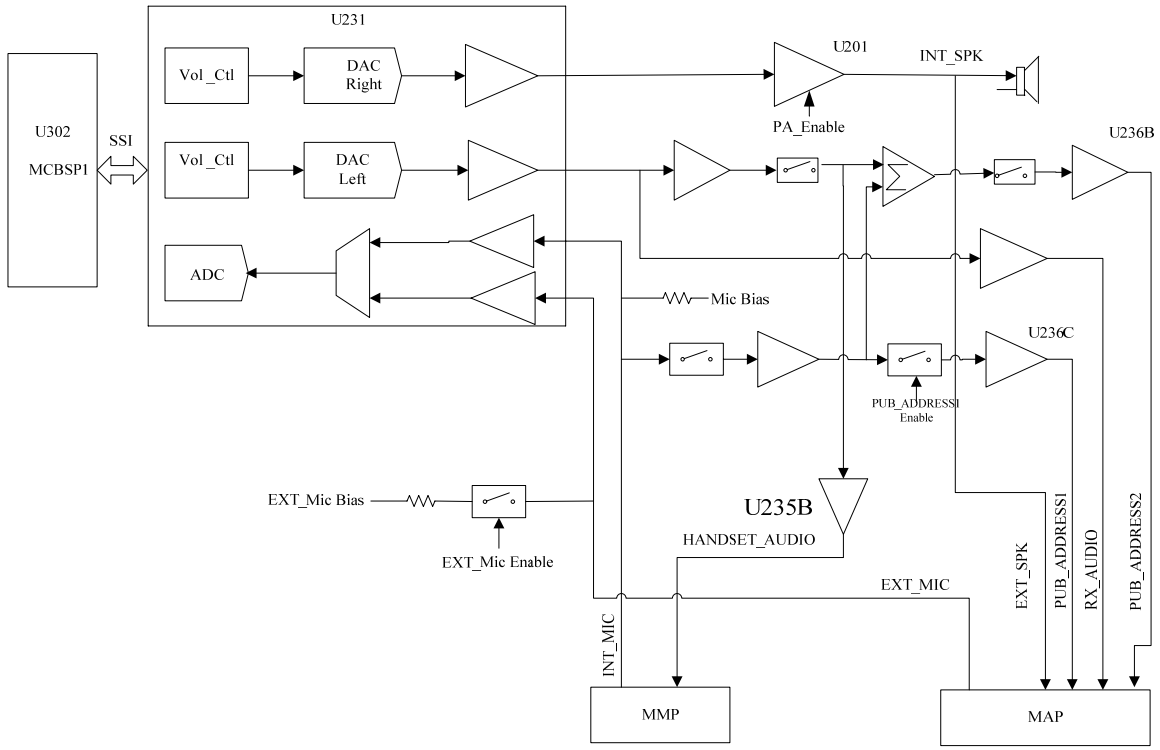


Figure 7-9 Diagram of Audio Section

7.5.1 RX Audio Circuit

U302 sends digital audio to the audio processor codec via the SSI bus of MCBSP1. This bus is composed of CLKX, FSX, DX and DR. It sends the demodulated PCM audio signal to the codec, and adjusts the signal to appropriate amplitude according to the volume (RMS should be 80mv when frequency is 1 KHz and deviation is 3 KHz). Then the codec converts PCM data into analog audio data via DAC. U231 provides two outputs: SPK1 and SPK2. SPK1 is amplified by U238 and then is fed to the PA U201, to derive two outputs of received audio, which will be applied to the front panel speaker and further development interface respectively. SPK2 is amplified and divided into the four paths of signal HANDSET_AUDIO, RX_AUDIO, PUB_ADDESS1 and PUB_ADDESS2. The first two paths are amplified by U235, and the last two paths are amplified by U236. Output of HANDSET_AUDIO, PUB_ADDESS1 and PUB_ADDESS2 are controlled by Q231, Q235 and Q233 respectively.

7.5.2 TX Audio Circuit

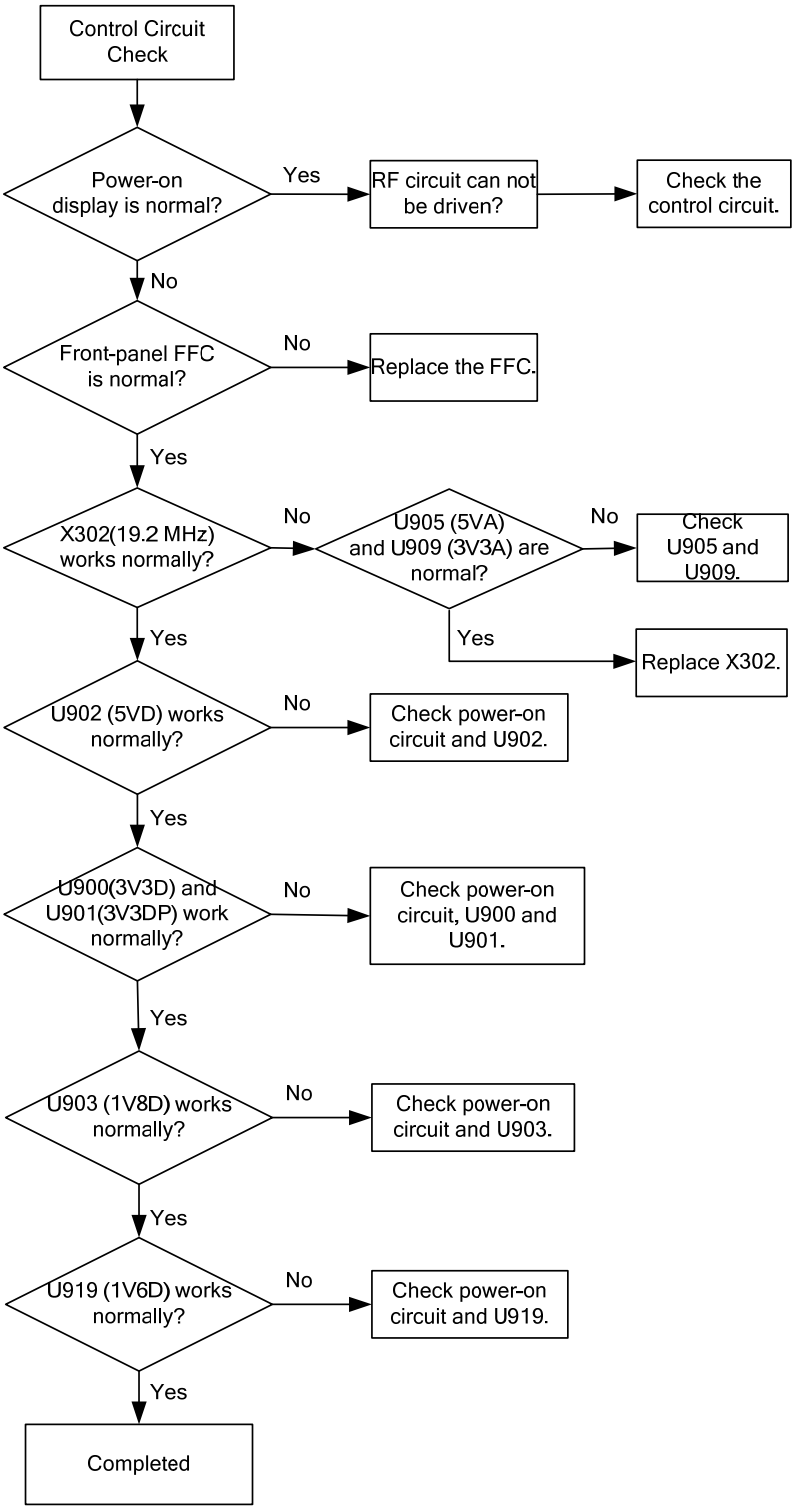
The audio processor U231 has two MIC inputs: the internal MIC and external MIC. The internal MIC is connected to the MICIN_HND of U231, and is combined with AUX1 to provide differential input. After 9.3V is divided by R255 and R264, a bias voltage of about 7V is provided to the front panel MIC. The

external MIC is connected to the MIC_HED of the codec as a unit-directional input. Both MICs are controlled by Q232. When the internal MIC is active, EXT_MIC_EN is at low level, bias voltage of external MIC is disconnected, and the ADC in U231 senses voltage at the MICIN_HND. When the external MIC is active, EXT_MIC_EN is at high level, Q232 is turned on, bias voltage is connected, and the ADC in U231 senses only audio data at MICIN_HED.

Audio signals input from the MMP interface or the accessory jack, are fed to the codec (gain of codec is programmable via the CPS) and then are converted by the ADC into 16-bit PCM digital audio, which will be fed to U302 via the SSI interface.

When the radio is set to operate in loudspeaker mode, audio signal is generated by the internal MIC, and then feeds to U231, and finally is output via SPK2. The output audio signal is amplified, and then is output as the two paths of audio PUB_ADDRESS1 and PUB_ADDRESS2.

7.5.3 Troubleshooting Flow Chart for Control Circuit



7.6 PCB Difference

The UHF1 PCB has three versions: D, F and H.

The watchdog circuit (in the figure below) is added in version F.

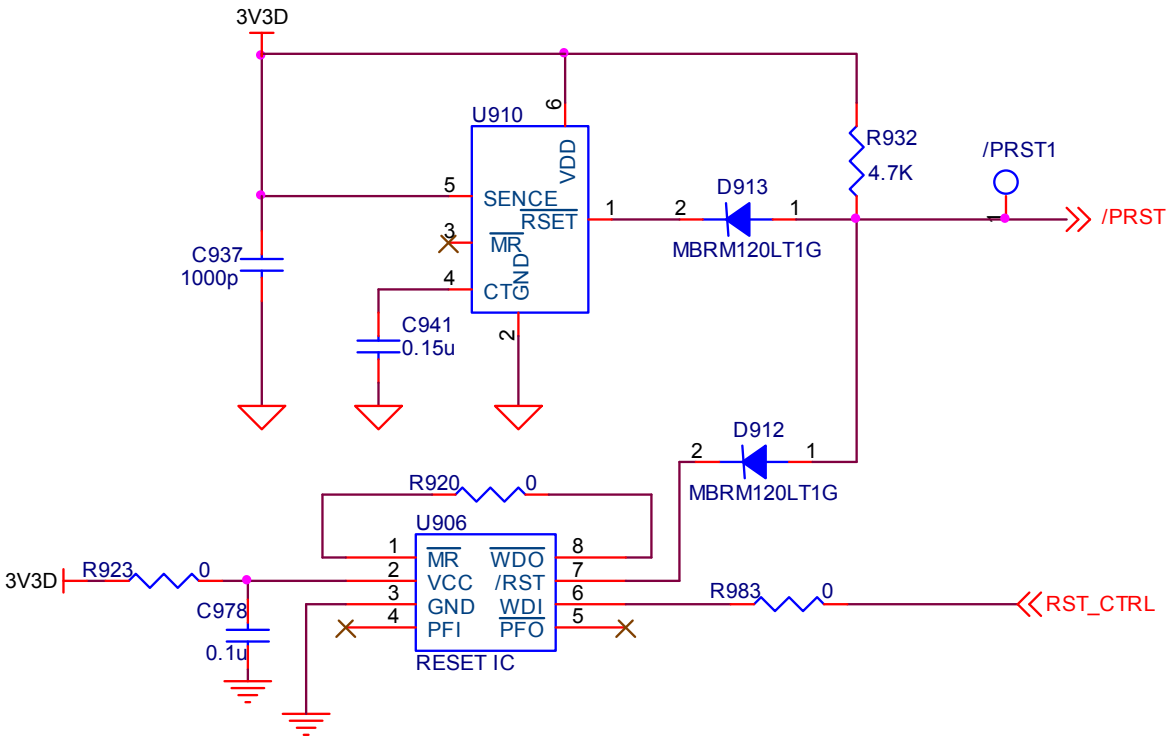


Figure 7-10 Watchdog Circuit

Watchdog circuit

The watchdog circuit is used to prevent the radio from damage due to OMAP malfunction. If the program works properly, U302 feeds pulse signal (25ms) to the watchdog circuit through RST_CTRL. Otherwise, this pulse signal will be terminated and delayed for more than 1.6s so that U906 generates the reset signal to reset OMAP.

Compared with version D & F, the difference in version G lies with the audio amplifier, which applies TDA7297SA instead of TDA7297D.

8. GPS Circuit

8.1 Circuit Description

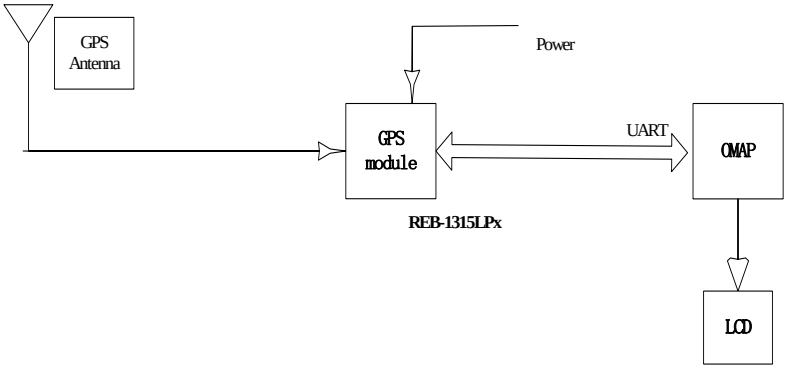


Figure 8-1 Diagram of GPS Circuit

GPS positioning information can be acquired via the programmed GPS key on the front panel. The GPS function is realized via REB-1315LPx module, which integrates GPS baseband processor circuits.

The GPS signal (1.57542GHz), received via the GPS active antenna (with a built-in LNA), goes to the GPS module for processing, and then enters U302 via the UART port. Meanwhile, U302 sends control command to the GPS module and forwards processed GPS information to the LCD.

8.2 Schematic Diagram

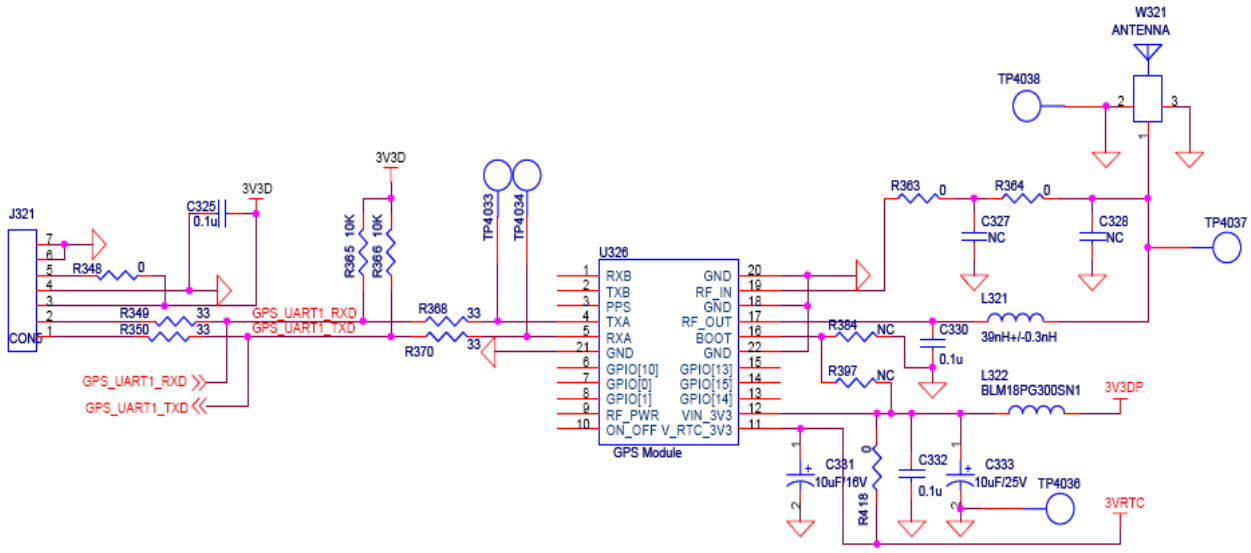
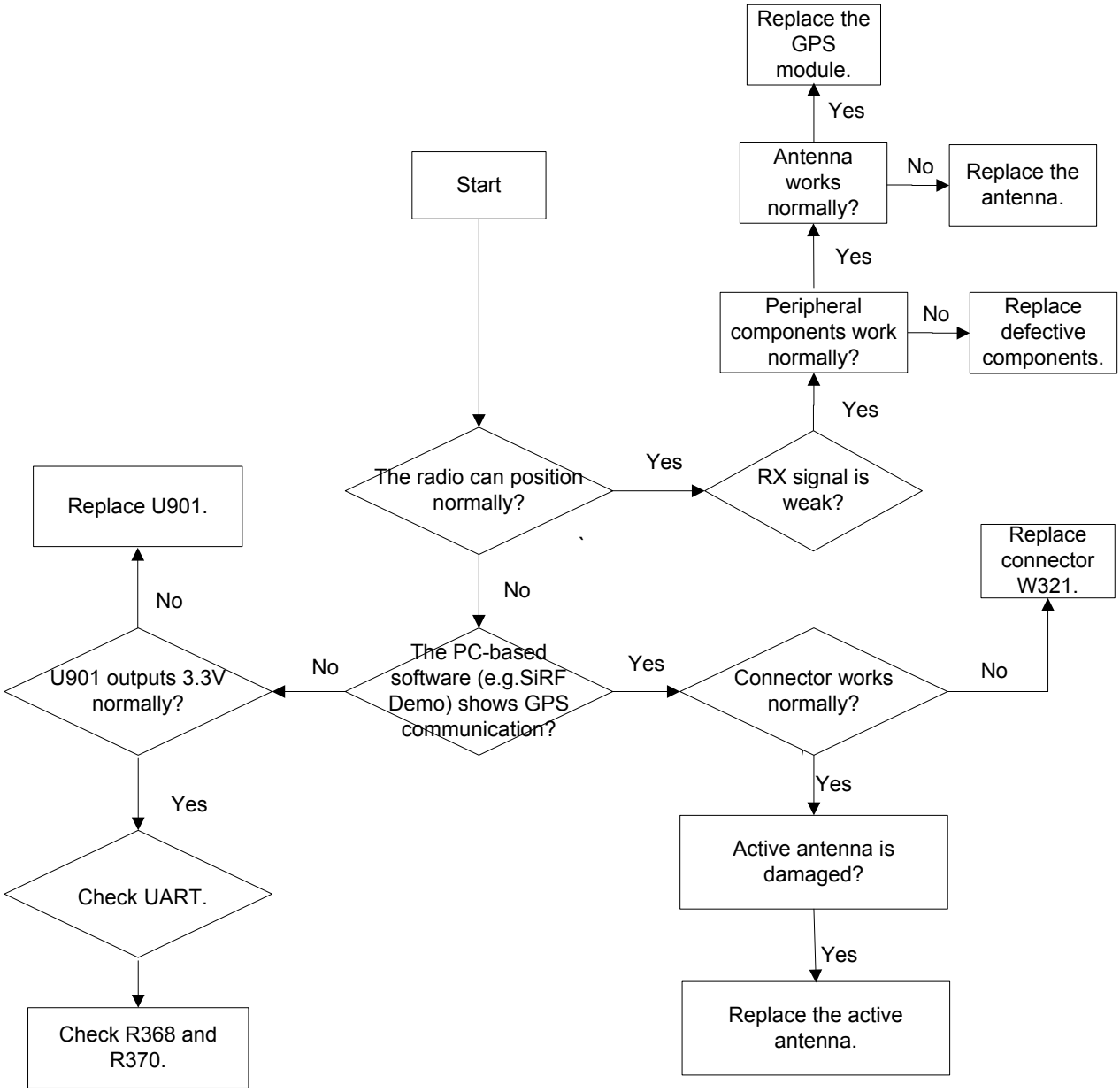


Figure 8-2 GPS Schematic Diagram

8.3 Parts List

No.	Ref.No	Part Number	Description
1	R348	3001050000000	0Ω
2	R349	3001053300010	33Ω
3	R350	3001053300010	33Ω
4	R365	3001051030000	10KΩ
5	R366	3001051030000	10KΩ
6	C325	3101051040010	0.1UF
7	U326	3625999000030	GPS module
8	W321	4411100002000	IPX RF connector
9	R364	3001050000000	0Ω
10	R363	3001050000000	0Ω
11	L321	3212106390000	39nH
12	C330	3101051040010	0.1UF
13	L322	3221506300000	Ferrite bead
14	C333	3101081060010	10UF
15	C332	3101051040010	0.1UF
16	C331	3101081060010	10UF
17	R418	3001060000000	0Ω
18	R368	3001053300010	33Ω
19	R370	3001053300010	33Ω

8.4 Troubleshooting Flow Chart



9. Tuning Description

For details about radio tuning, please refer to the help file of DMR Tuner Software supplied by the Company.

10. Interface Definition

J404: to front panel jack

Pin No.	Name	Function
1	INT_MIC	Audio input
2	MIC_GROUND	Audio input ground
3	ACC_IO1	Accessory identifier pin 1
4	USB_VBUS	USB power supply
5	HOOK	HOOK
6	PTT	PTT
7	USB_D-	USB data cable D-
8	USB_D+	USB data cable D+
9	ACC_IO2	Accessory identifier pin 2
10	UART2_RXD_A	Volume control port
11	UART2_TXD_B	
12	HANDSET_AUDIO	Audio signal output by accessory
13	SPKR1+	Speaker audio signal cable+
14	SPKR1-	Speaker audio signal cable-
15	5VD	Power supply
16	PRST	Reset signal
17	KB_C0	Matrix keyboard
18	KB_C1	
19	KB_C2	
20	KB_C3	
21	KB_R0	
22	KB_R1	
23	KB_R2	
24	CSLED	Backlight control IC chip select
25	CLOCK	Backlight control IC clock
26	DATA	Backlight control IC data
27	OE_LCD	LCD read enable
28	WE_LCD	LCD write enable
29	CS2_LCD	LCD chip select
30	F_A1_LCD	LCD register enable
31	F_D7	LCD data bus
32	F_D6	
33	F_D5	
34	F_D4	
35	F_D3	
36	F_D2	
37	F_D1	LCD data bus
38	F_D0	
39	GND	Ground

40	PWB_IN	Power-on/ power-off signal

J4: to aviation jack of front panel

Pin No.	Name	Function
1	ACC_IO1	Digital input
2	PTT_IN	Digital input
3	Handset_Audio	Analog output
4	USB_D-	USB data cable
5	GND	Ground
6	USB_VBUS	Power supply
7	MIC_IN	Analog input
8	USB_D+	USB data cable
9	HOOK	Hook signal input
10	ACC_IO2	Digital input

J2: to LCD display jack

Pin No.	Name	Function
1	GND	Ground
2	VCI	2.5V-3.3V adjustable port
3	VCI	2.5V-3.3V adjustable port
4	IOVCC	1.65V-3.3V adjustable; input/output port
5	FLM	Synchronization signal control pin
6	CS	Chip select signal
7	RS	Register select
8	WR	Write signal
9	RD	Read signal
10	DB0	Data bus
11	DB1	
12	DB2	
13	DB3	
14	DB4	
15	DB5	
16	DB6	
17	DB7	
18	DB8	
19	DB9	
20	DB10	
21	DB11	
22	DB12	
23	DB13	
24	DB14	
25	DB15	
26	DB16	
27	DB17	

28	RESET	Reset signal
29	IM3	Select data cable
30	IM0	
31	LEDA	LED positive
32	LED_K1	LED negative
33	LED_K2	
34	LED_K3	

J403: to accessory pin jack

Pin No.	Name	Function
1	Vbus USB	Power supply (+5V)
2	Ground	Ground
3	GP5_3	Digital input/output
4	SW B+ sense	Power supply
5	External Alarm	Analog voltage output
6	Power Ground	Power supply ground
7	Tx Audio	Analog input
8	RX Audio	Analog output
9	Spkr-	Analog output
10	D+ USB	USB data cable +
11	USB_GROUDN	Ground
12	GP5_2	Digital input/output
13	ACC_IO2	Digital input
14	Emerg Sw	Digital input
15	ACC_IO3	Digital input
16	PRGM_IN_PTT	Digital input
17	Audio Ground	Audio ground
18	Spkr+	Analog output
19	D- USB	USB data cable -
20	GP5_8	Input/output
21	Ground	Ground
22	GP5_7	Input/output
23	GP5_6	Digital input/output
24	AUX Audio Out 1	Analog output
25	AUX Audio Out 2	Analog output
26	Ign Sense	Analog voltage input

11.UHF1 (400-470MHz 25W) Information

11.1 Transmitter Circuit

The transmitter circuit is composed of power amplifier circuit and power control circuit. The former is used to amplify the VCO signal to the desired output power level, while the latter can keep the output power at the desired level, so as to protect the power amplifier from damage caused by over heat, antenna mismatch, and out-of-range voltage (over voltage or under voltage may result in damage to Q801, Q805, Q804, Q802 and Q803).

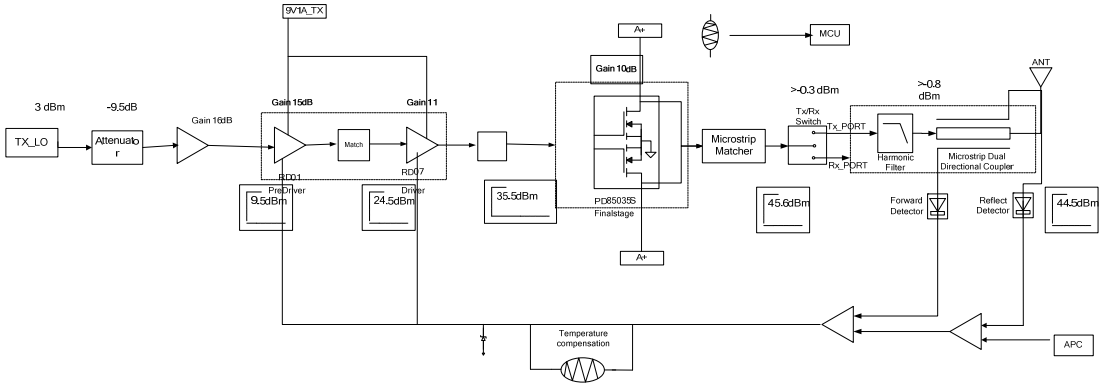


Figure 11-1 Diagram of Transmitter Circuit

11.1.1 Power Amplifier

The 4-stage power amplifier amplifies the signal output from VCO to the required output power level. The first stage is a buffer amplifier circuit with fixed gain; the second stage is a pre-driver power amplifier circuit with variable gain (formed by Q805); the third stage is a driver power amplifier circuit with variable gain (formed by Q804); and the final stage is the final power amplifier circuit with fixed gain (formed by Q802 and Q803). In addition, this power amplifier contains a TX/RX switch and a low-pass filter.

Note: only a final power amplifier (Q803) is available in later versions (including version H).

11.1.2 TX Buffer Amplifier

The first stage (Q801) provides about 16dB power gain, and adjusts its bias circuit to get a quiescent bias current of 28mA (for Q801). Power supply for the switching transistor Q810 is controlled by TX signal (enabled by antenna switch) so as to further control the power supply for the whole circuit.

11.1.3 Pre-driver Power Amplifier

The pre-driver power amplifier is formed by Q805, with variable gain controlled by voltage VGG. The input matching circuit is composed of C826, L826, L814, C843 and R824.

11.1.4 Driver Power Amplifier

The driver power amplifier is formed by Q804, with variable gain controlled by voltage VGG. The maximum output power is 38.5dBm, and the maximum variable gain is 11dB.

11.1.5 Final Power Amplifier

The final power amplifier comprises Q802 and Q803, with the maximum output power of 48.5dBm, and the maximum variable gain of 10dB. The input matching circuit is composed of C815, C839, R804, R806, R807, R813, R818 and R861, while the power combining circuit is composed of C820, C8330, C831, C819, C812, C841 and C842.

11.1.6 Antenna Switch

The antenna switch is used to switch between the transmitter circuit and the receiver circuit.

In TX mode, TX signal controls the switching transistor Q810, to further control the power supply 9V 3A for the PIN diodes D801 and D802. Quiescent bias current of the PIN diode is controlled by the resistors R821 and R825. In this mode, D801 and D802 are turned on; RF signals are applied to the low-pass filter (composed of C871, C816, C836, C837, C838, L809, L813, and L810) and then transmitted via the antenna port.

In RX mode, TX signal controls the switching transistor Q810, to further control the power supply for the PIN diodes D801 and D802, which are not applied with DC bias current. When the two PIN diodes are turned off, signals feed into the RX path through the low-pass filter (composed of L871, C852 and C862).

11.1.7 Low-pass Filter

A low-pass filter that consists of inductors L809, L813 and L810, and capacitors C836, C837, C830, is used to attenuate harmonic energy from the transmitter.

11.1.8 Directional Coupler

A directional coupler that consists of microstrip directional coupler, D803, D804 and etc, is used to detect both forward and reverse directed power of the transmitter. The forward power is coupled to the diode D803, and the voltage is applied to the power control circuit (U801). Then the voltage VGG is output to control the gate voltage of pre-driver and driver PA, ensuring a constant power output.

The directional coupler can adjust the TX power and detect the VSWR load. The reverse power is coupled to D804. The voltage is applied to U802 and then feeds into U302 for detection

11.1.9 Output Power Control

The TX power is controlled by U801. The forward power is applied to the directional coupler, to output a voltage that can represent the forward power. The voltage together with the preset voltage feeds to U801 to output a voltage VGG, which can control both gate voltage and gain of Q804 and Q805, ensuring a constant power output.

11.1.10 Thermal and Over-voltage Protections

The circuit consists of thermistor RT804 and resistor R884. The output voltage is proportional to the detected temperature. Both the voltage used for temperature detection and the threshold voltage are fed into the operational amplifier U803, to output a voltage signal that is in proportion to the detected temperature. Afterwards, the voltage is applied to software for judgment, and then the preset voltage will be subsequently changed to reduce the TX power, and to protect the PA from over-heating.

11.1.11 Pressure Pad Switch

The power control circuit includes a pressure pad switch SW1, which is controlled by the conductive rubber part mounted on the top cover. If the switch is turned off, VGG will become low, and no power will be output from PA. Otherwise, PA will work normally.

11.2 Receiver Circuit

The receiver utilizes double conversion superheterodyne technique. The first IF is 73.35MHz and the second IF is 2.25MHz. The first local oscillator signal is from the PLL circuit U100, and the second local oscillator signal (71.1MHz) from the PLL circuit U701. The major units are BPF, LNA, mixer, IF filter, IF amplifier and IF processor.

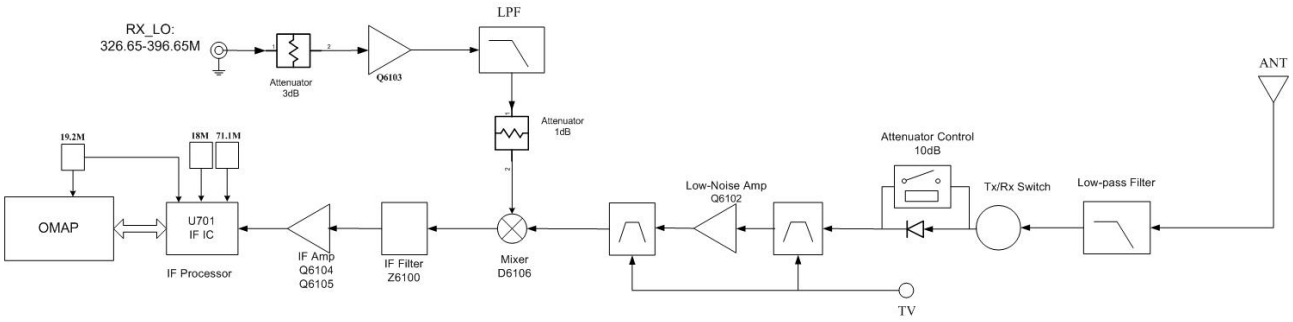


Figure 11-2 Diagram of Receiver Circuit

11.2.1 Receiver Front-end

RF signals feed to the low-pass filter to remove out-of-band signals, and are applied to the two-stage

electrically tunable band-pass filter to get useful signals. After passing through the RF band-pass filter and LNA (Q6102), the RF signals together with the first LO signal feed to the mixer for the first frequency conversion, to generate the first IF signal (73.35MHz). The mixer that employs the passive diode can ensure good dynamic range and port isolation. The LO signal (3-5dBm) from the VCO feeds to Q6103 to get a gain (17dB). The first LO signals (73.35MHz) pass through the crystal filter (Z6100) to remove out-of-band spurious signals, and then feed to the two-stage IF amplifier circuit (composed of Q6133 and Q6134) for amplification. Finally the amplified signals go to the IF IC for processing

11.2.2 Receiver Back-end

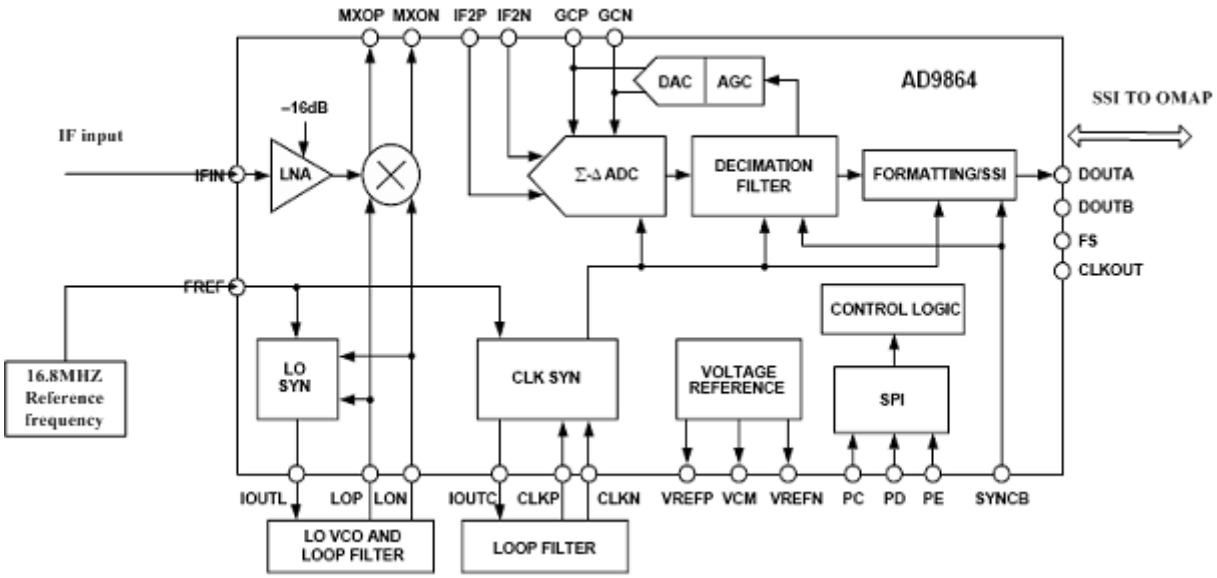


Figure 11-3 Diagram of IF Processor

The first IF signal (73.35MHz) output by the IF amplifier goes into IF IC via Pin 47, where the signal is converted to the second IF signal (2.25MHz). Then the un-demodulated digital I/Q signal output from the SSI interface is sent to U302 for demodulation. IF IC employs a reference frequency of 19.2MHz and shares the crystal with U302. The second LO VCO consists of the external transistor, varactor and some other components, to provide the second LO signal. The 18MHz clock frequency is generated by the LC resonance loop (D702, L715 and C745).

DSP (U302) gets the audio signal from IF IC (U701). Then this signal goes through U302 to output data signal, which is sent to U231 and PIN44 (SSI_DI) for digital-to-analog conversion. Finally, the output analog audio signal will be subjected to gain control, and then fed to the speaker.

11.3 Frequency Generation Unit (FGU)

11.3.1 PLL Synthesizer

The PLL synthesizer that consists of the reference oscillator (X100), PLL IC (U100) and VCO, is utilized to supply excitation signal source to the transmitter, and local oscillator signal to the receiver.

11.3.2 Reference Oscillator

X100 is a 19.2MHz TCXO, and its reference frequency is calibrated by the digital-to-analog converter (U500) for accuracy.

11.3.3 PLL IC

The PLL IC (U100) is a fractional frequency divider. The logic IC U101 and U102 work with the PLL IC (U100) to achieve locking.

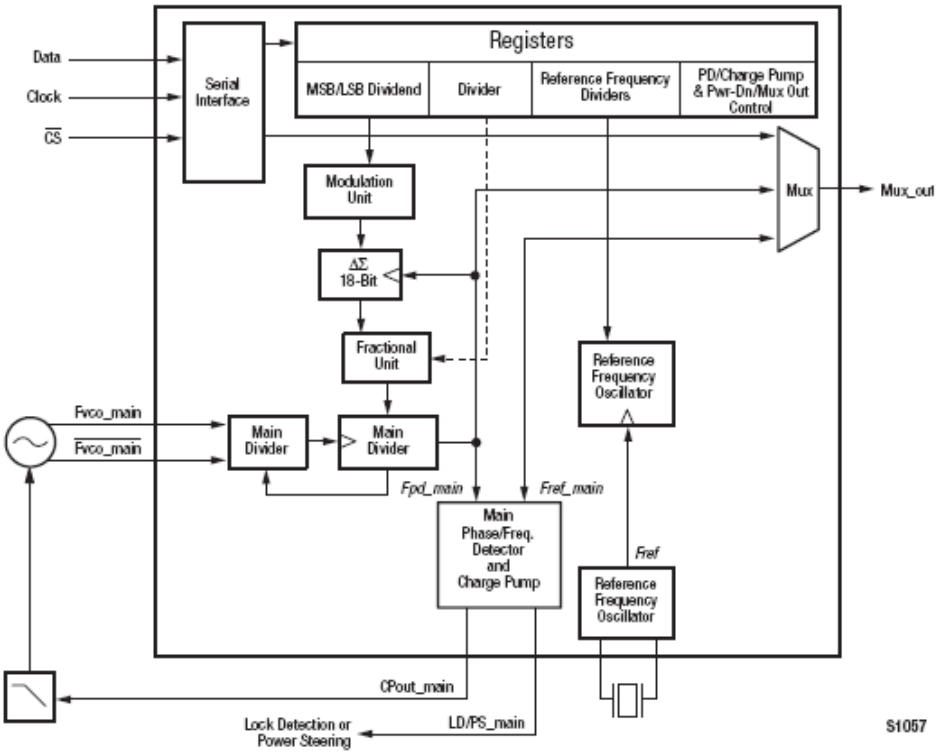


Figure 11-4 Diagram of PLL IC

The 19.2MHz frequency generated by the reference oscillator goes into the PLL IC for division, generating the reference frequency. Meanwhile, the frequency generated by VCO goes into PLL IC (U100) for frequency division. The resulting frequency will be compared with the reference frequency in terms of phase difference in the phase detector. After comparison, the resulting frequency is converted to CV voltage via the loop filter, to control and lock the frequency.

11.3.4 VCO

The VCO is composed of transistors (Q100, Q103, Q106 and Q110), varactors and four Colpitts

oscillators. There are four VCOs in all: two VCOs (Q100 and Q103) used to transmit excitation signals and the other two VCOs (Q106 and Q110) to receive LO signals. U302 controls the operating frequency of the VCO. Q102 and Q107 constitute the buffer amplifiers for the transmitter circuit, while Q111 and Q109 for the receiver circuit. The digital-to-analog converter (U500) modulates the TX oscillator signal.

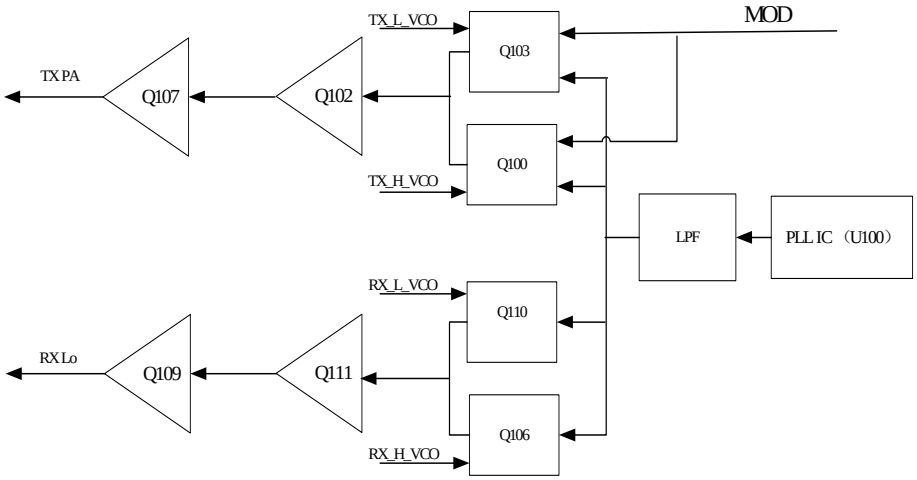
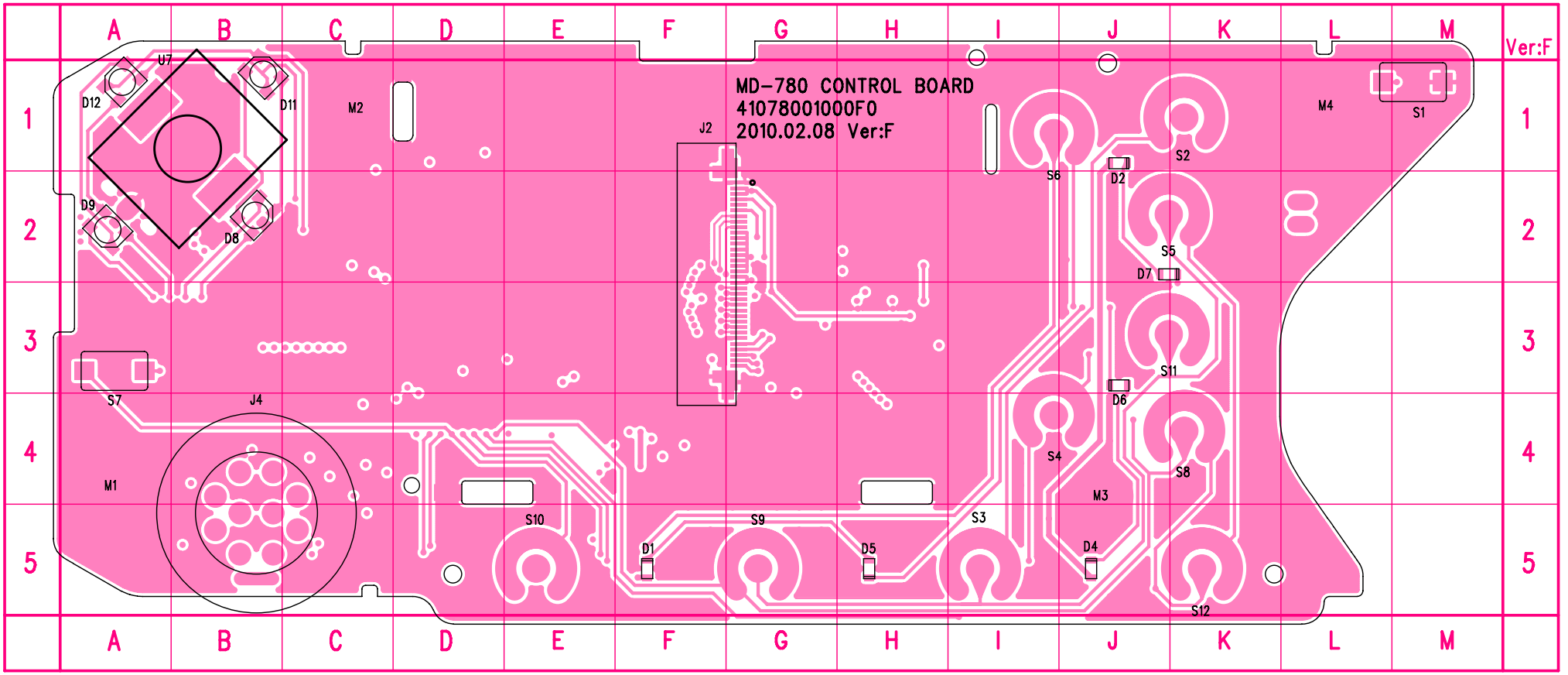


Figure 11-5 Diagram of VCO

11.4 PCB View

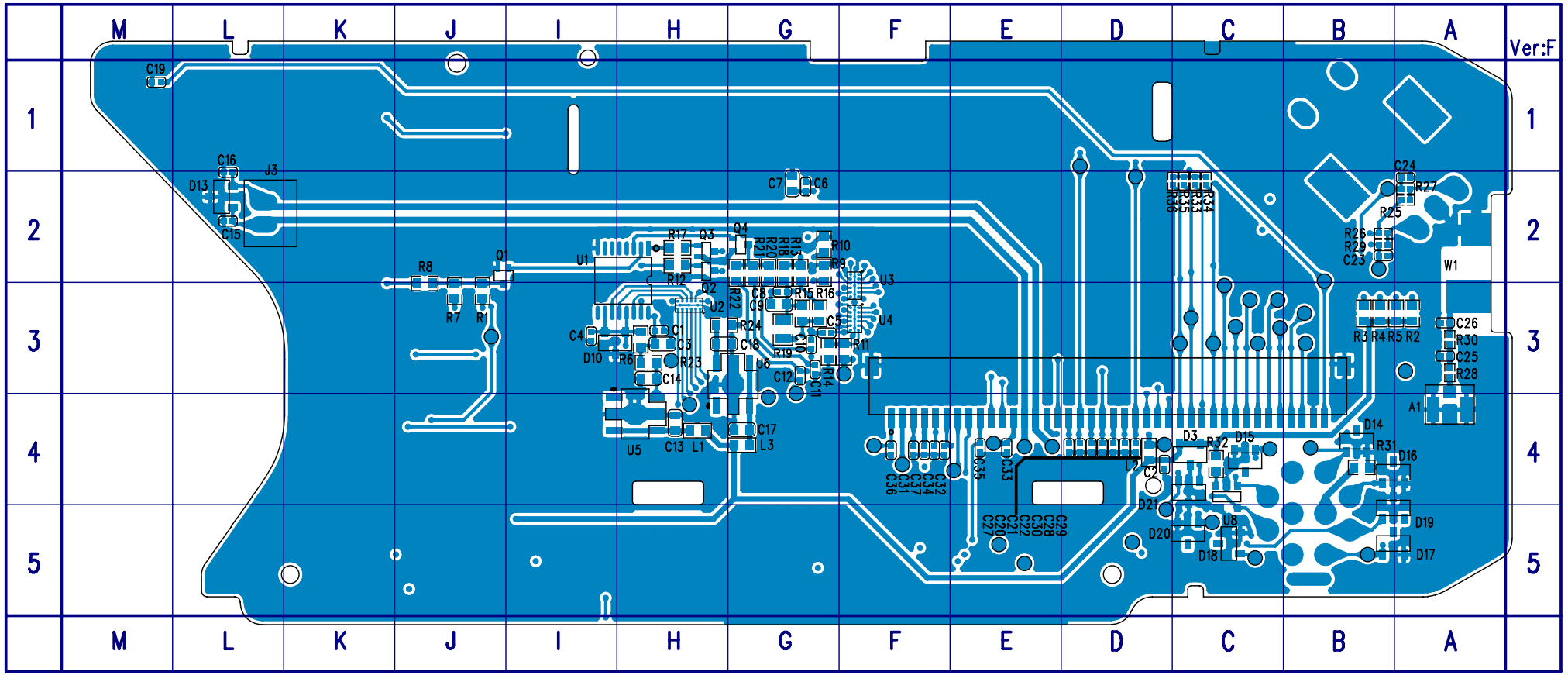
MD78X/MD78XG PCB View (Front Panel)

Top Layer

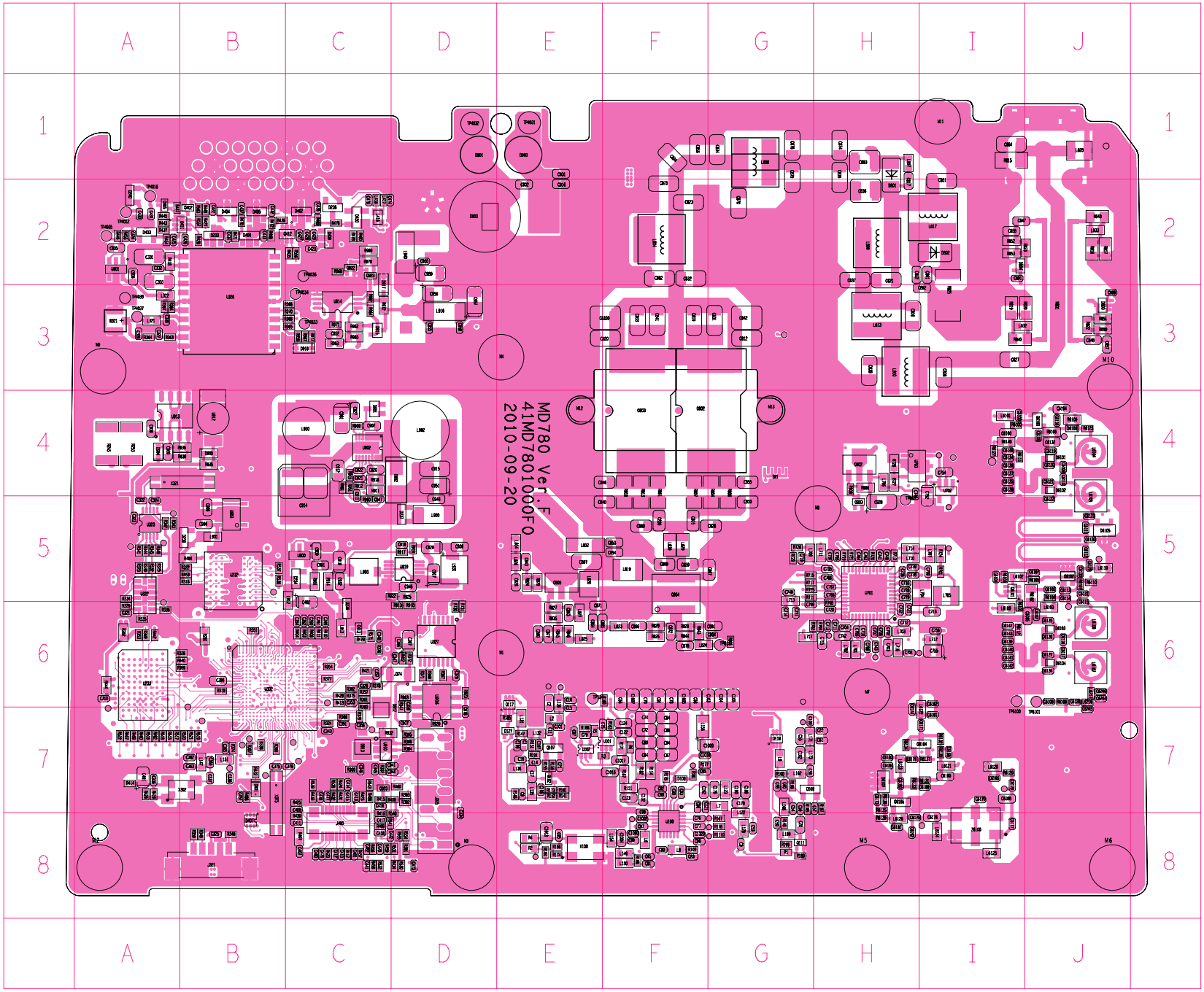


MD78X/MD78XG PCB View (Front Panel)

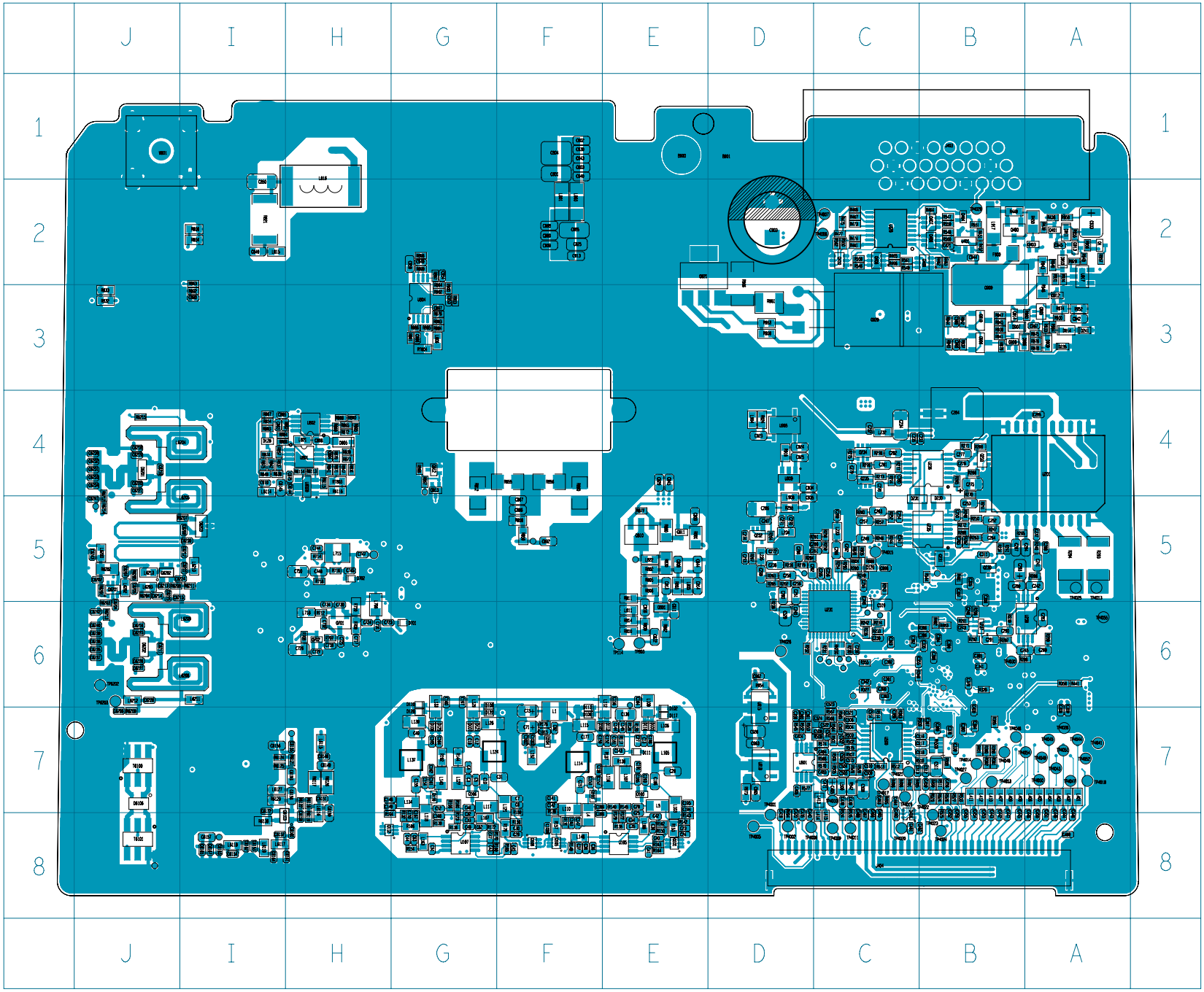
Bottom Layer



MD78X/MD78XG PCB View (Main Board)
Top Layer

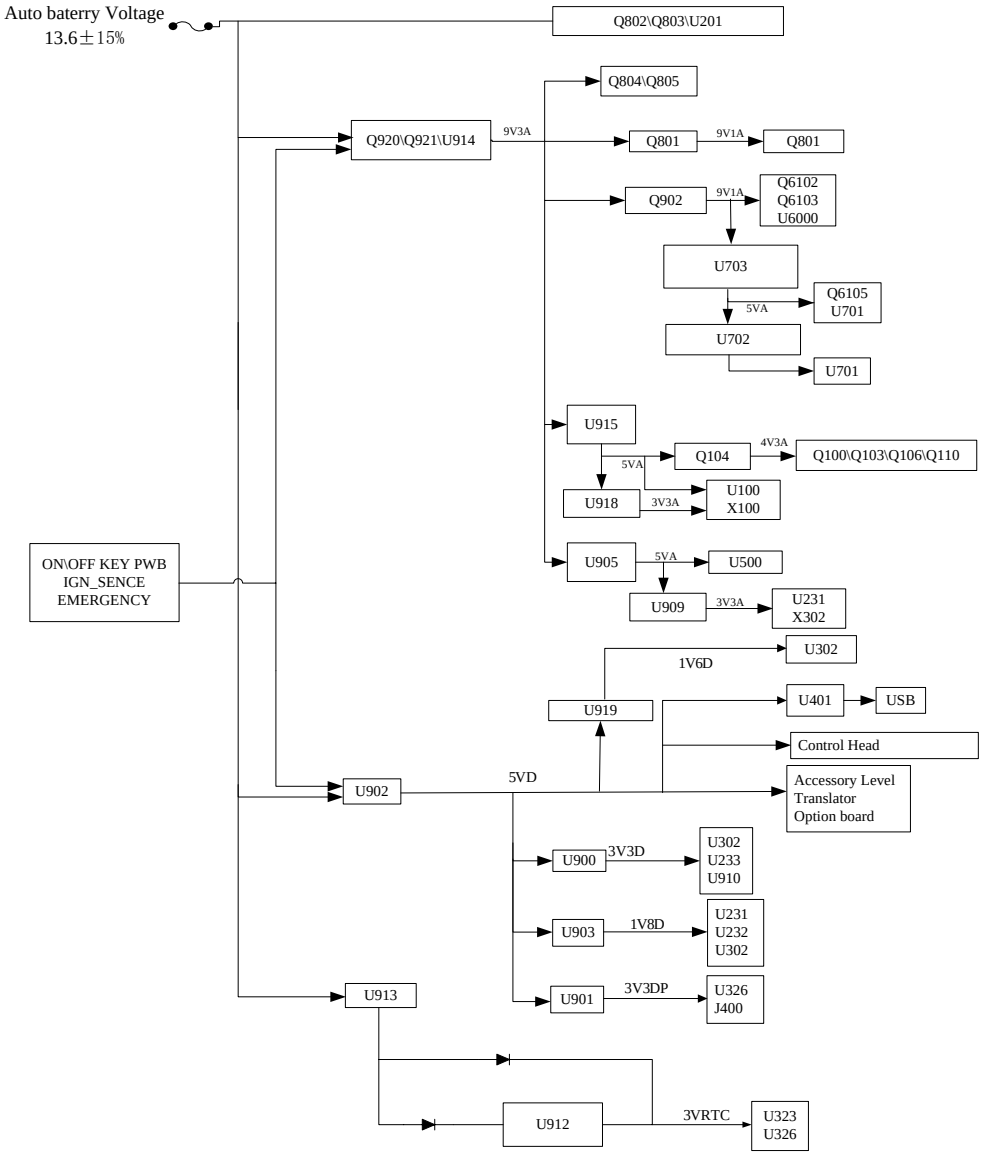


MD78X/MD78XG PCB View (Main Board)
Bottom Laver

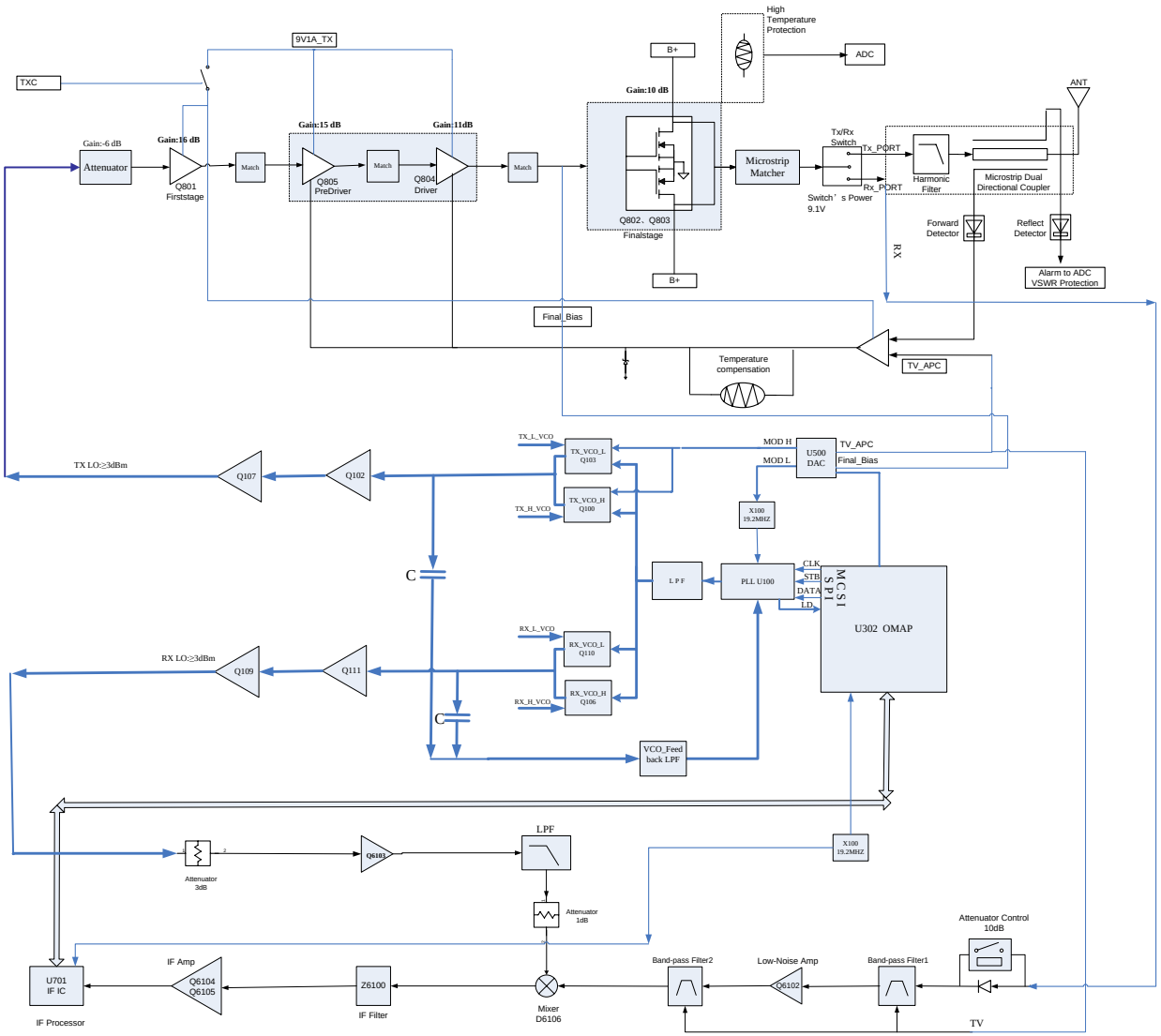


11.5 Block Diagram

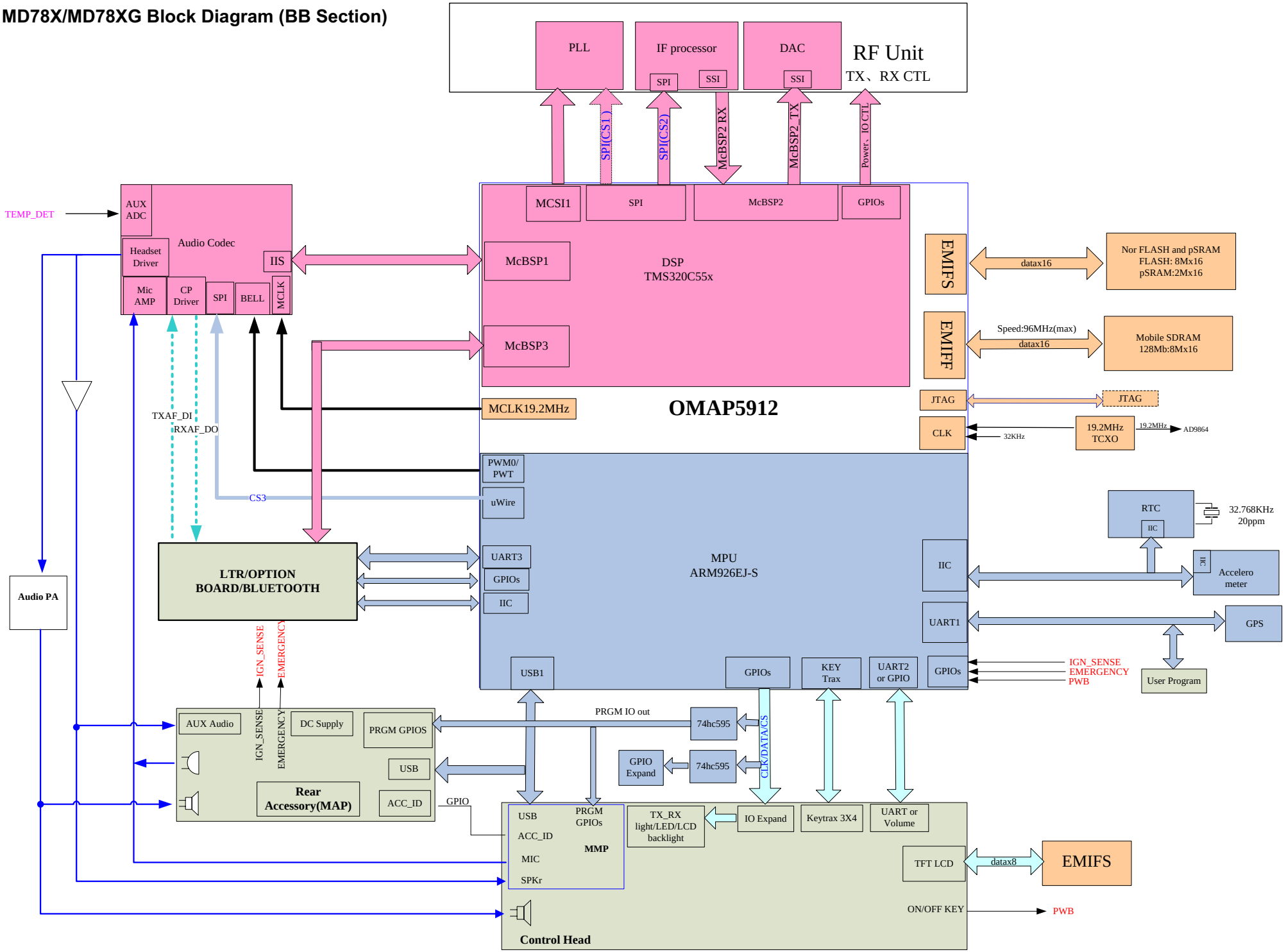
MD78X/MD78XG Block Diagram (Power Section)



MD78X/MD78XG Block Diagram (RF Section)

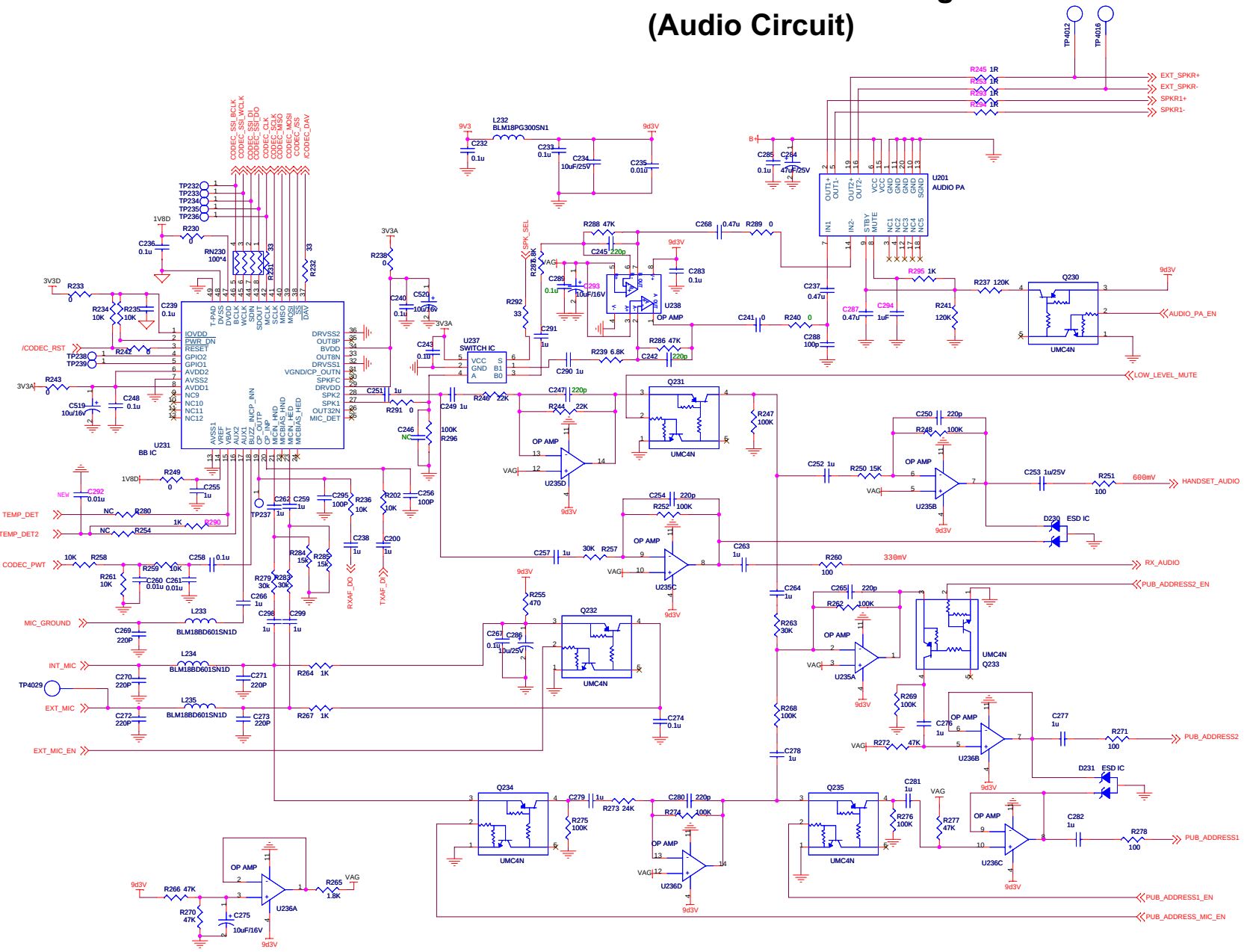


MD78X/MD78XG Block Diagram (BB Section)

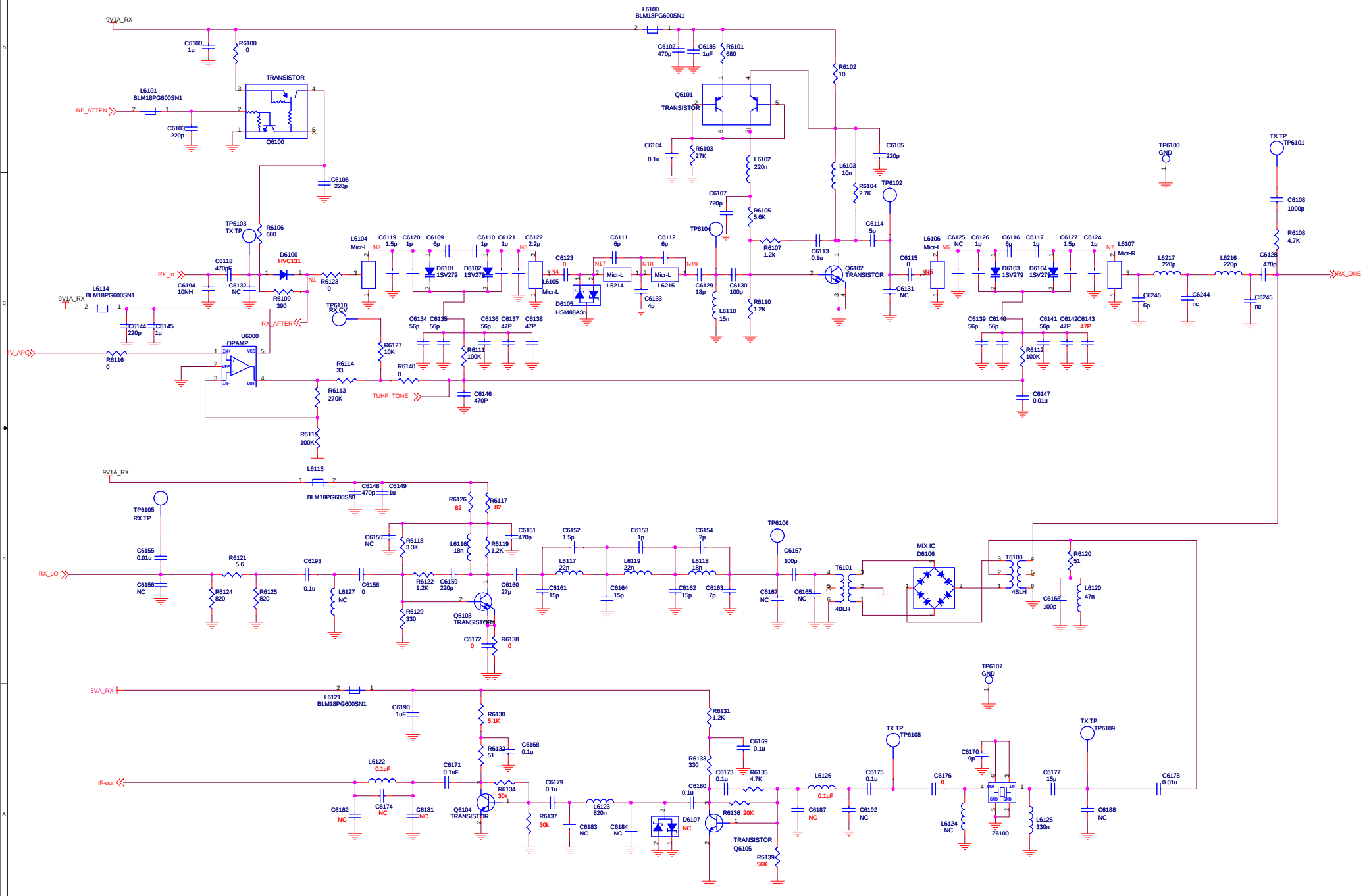


11.6 Schematic Diagram

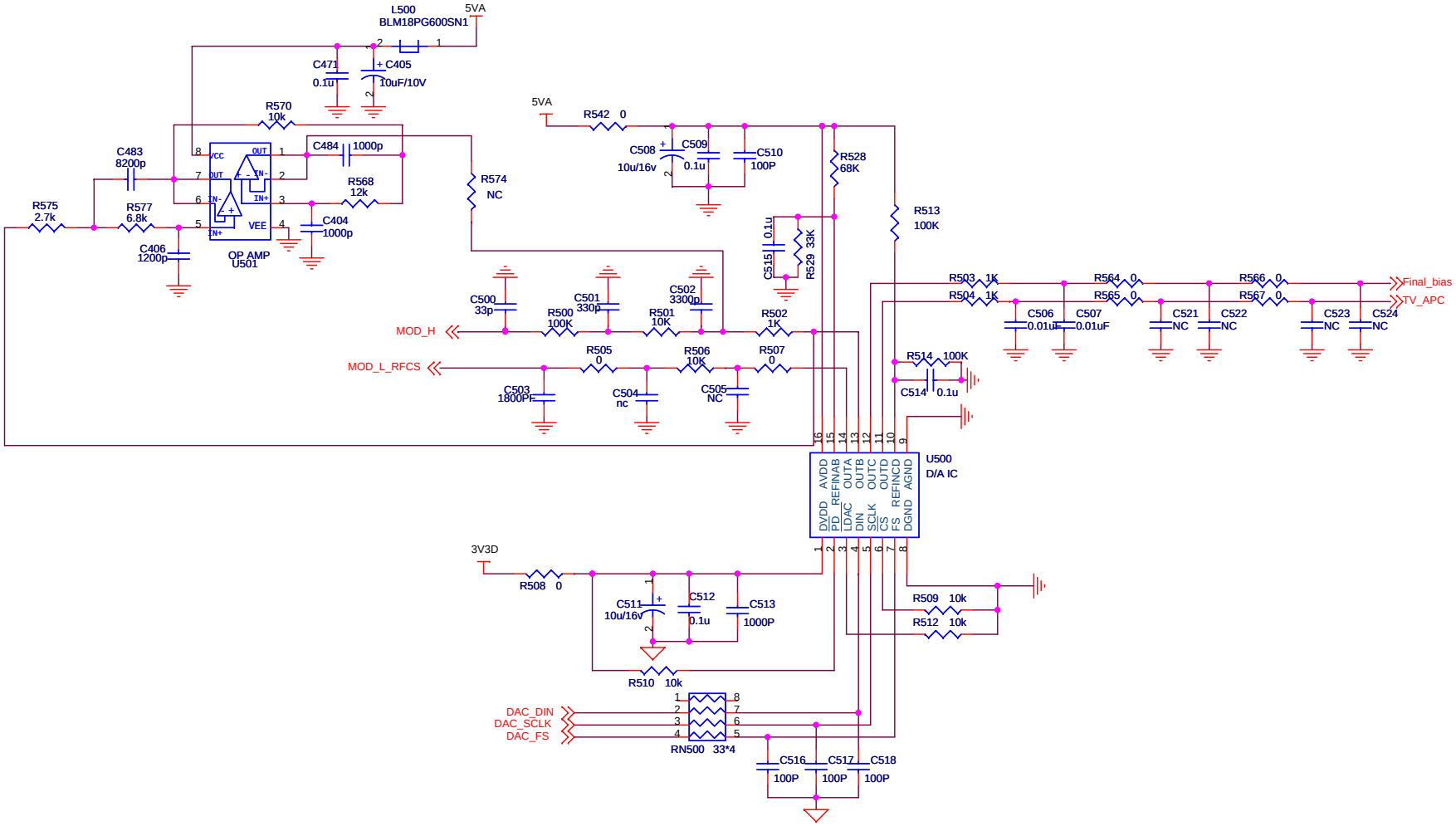
MD78X/MD78XG Schematic Diagram (Audio Circuit)



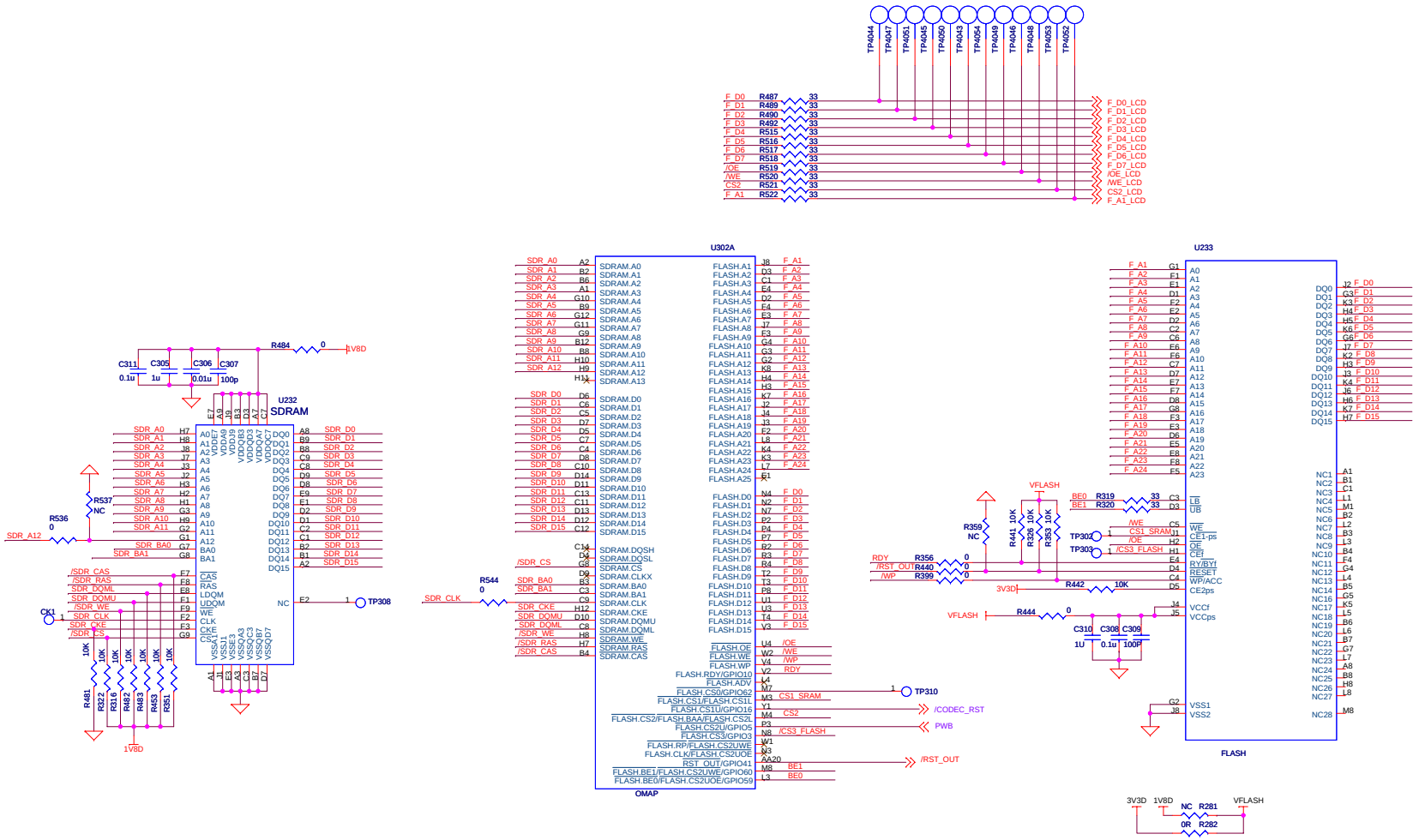
MD78X/MD78XG Schematic Diagram
(RX Circuit)



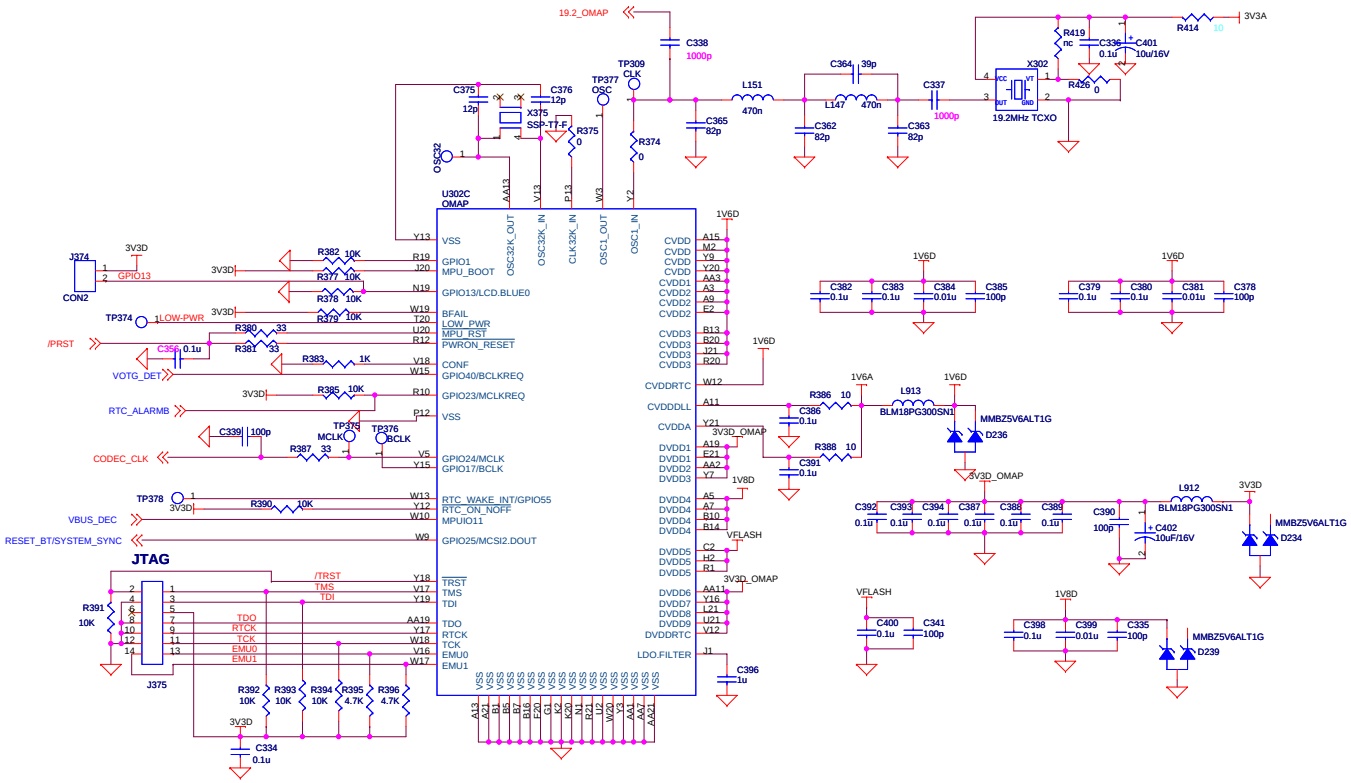
MD78X/MD78XG Schematic Diagram
(DAC Circuit)



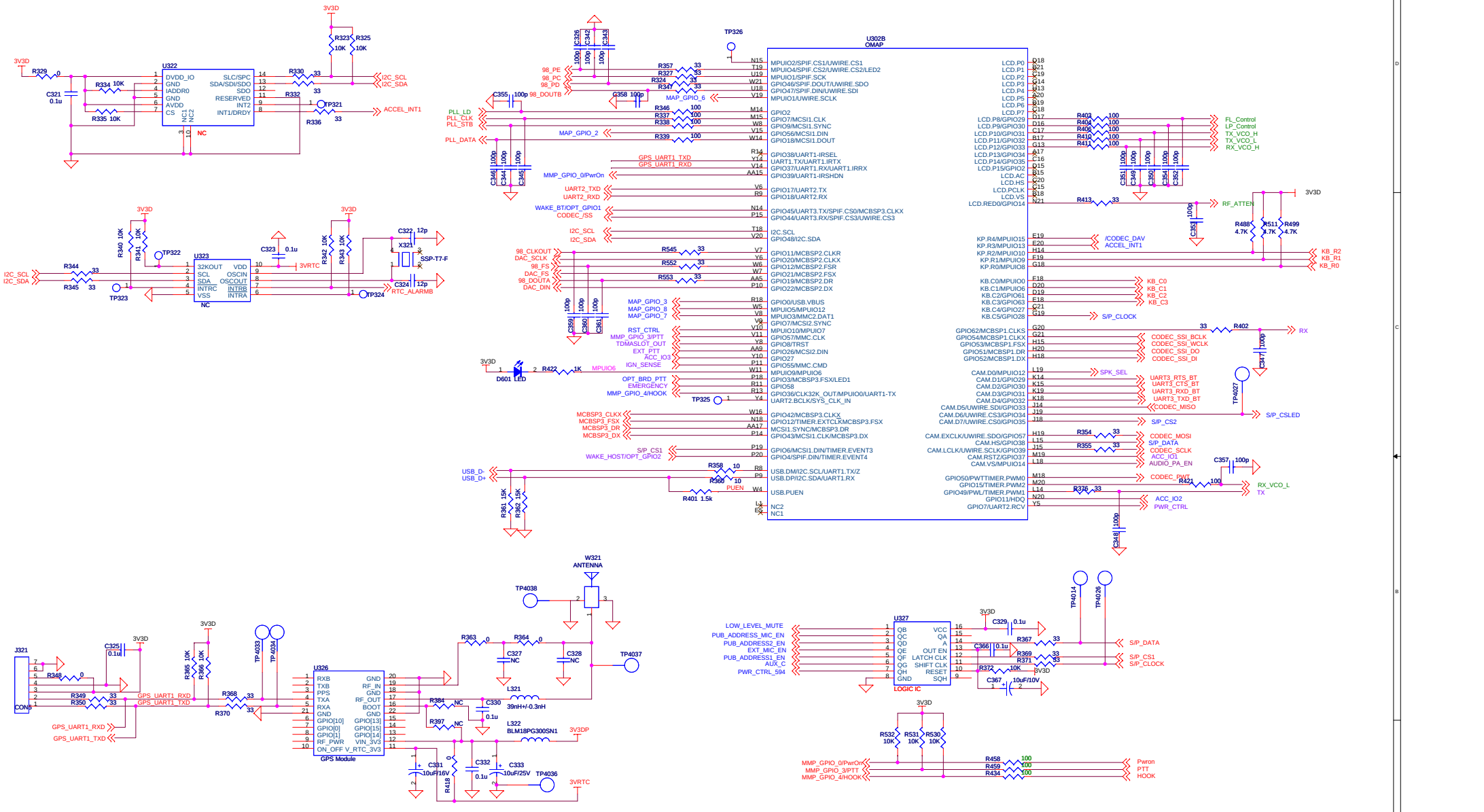
MD78X/MD78XG Schematic Diagram
(Memory Circuit)



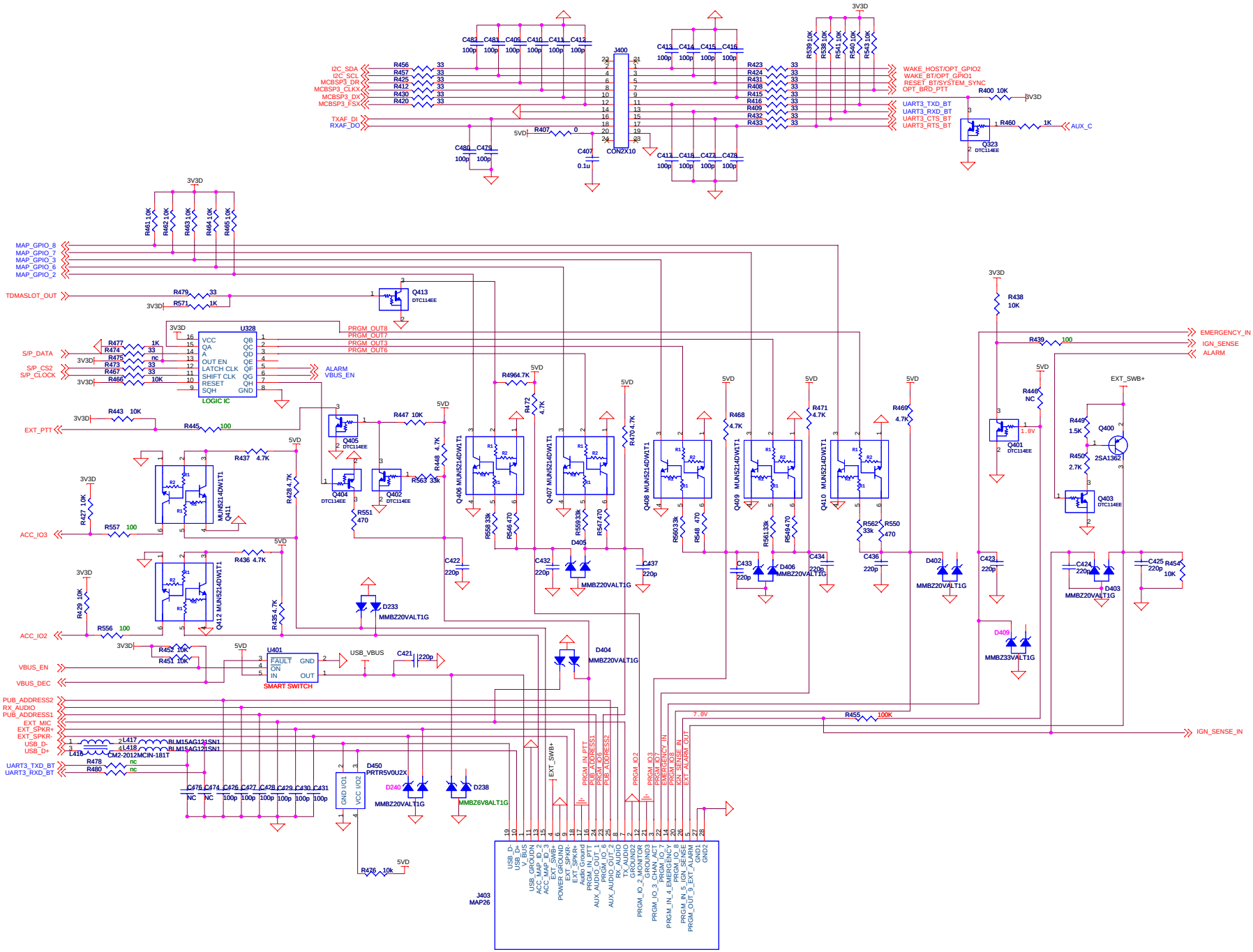
MD78X/MD78XG Schematic Diagram
(OMAP Circuit)



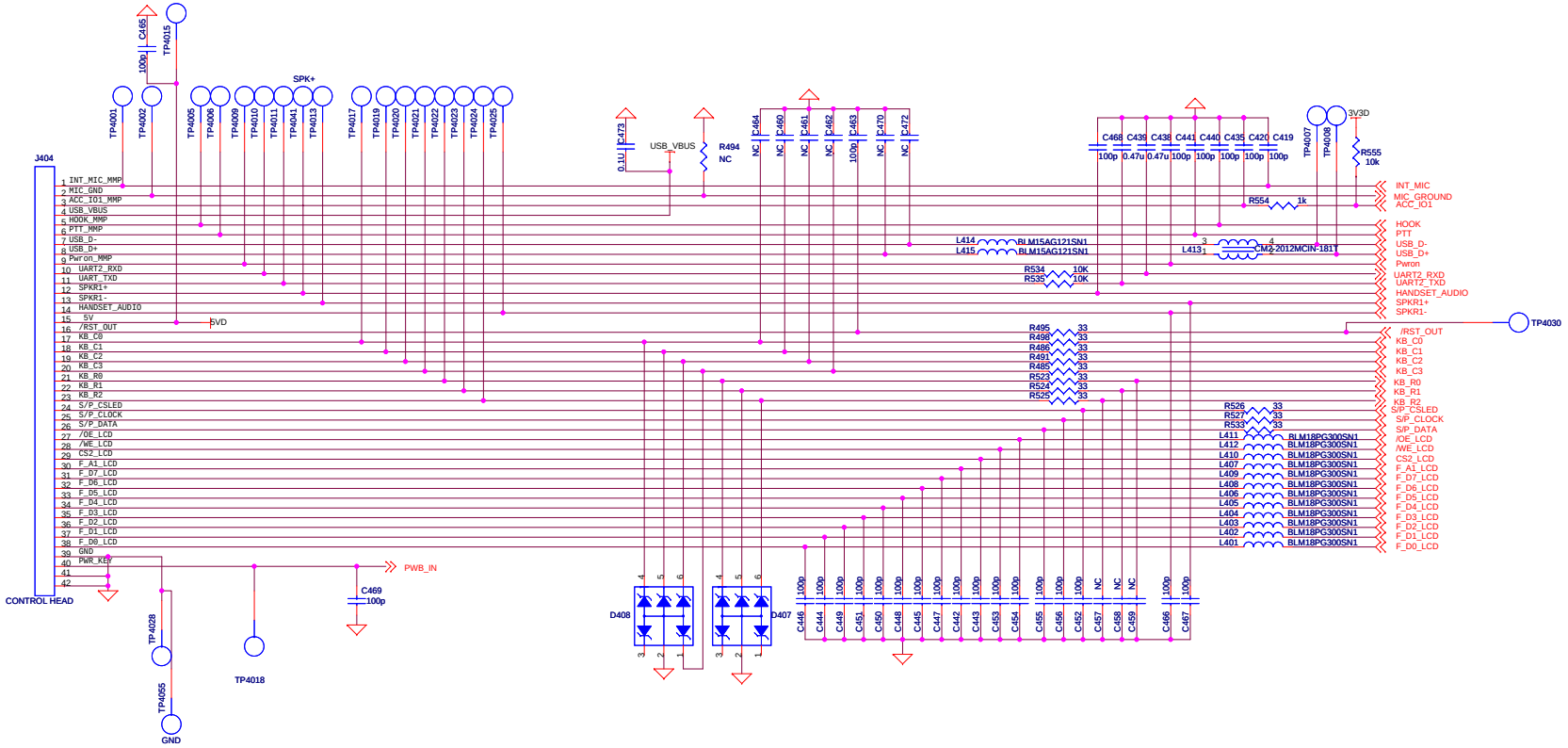
MD78X/MD78XG Schematic Diagram
(OMAP & GPS Circuit)



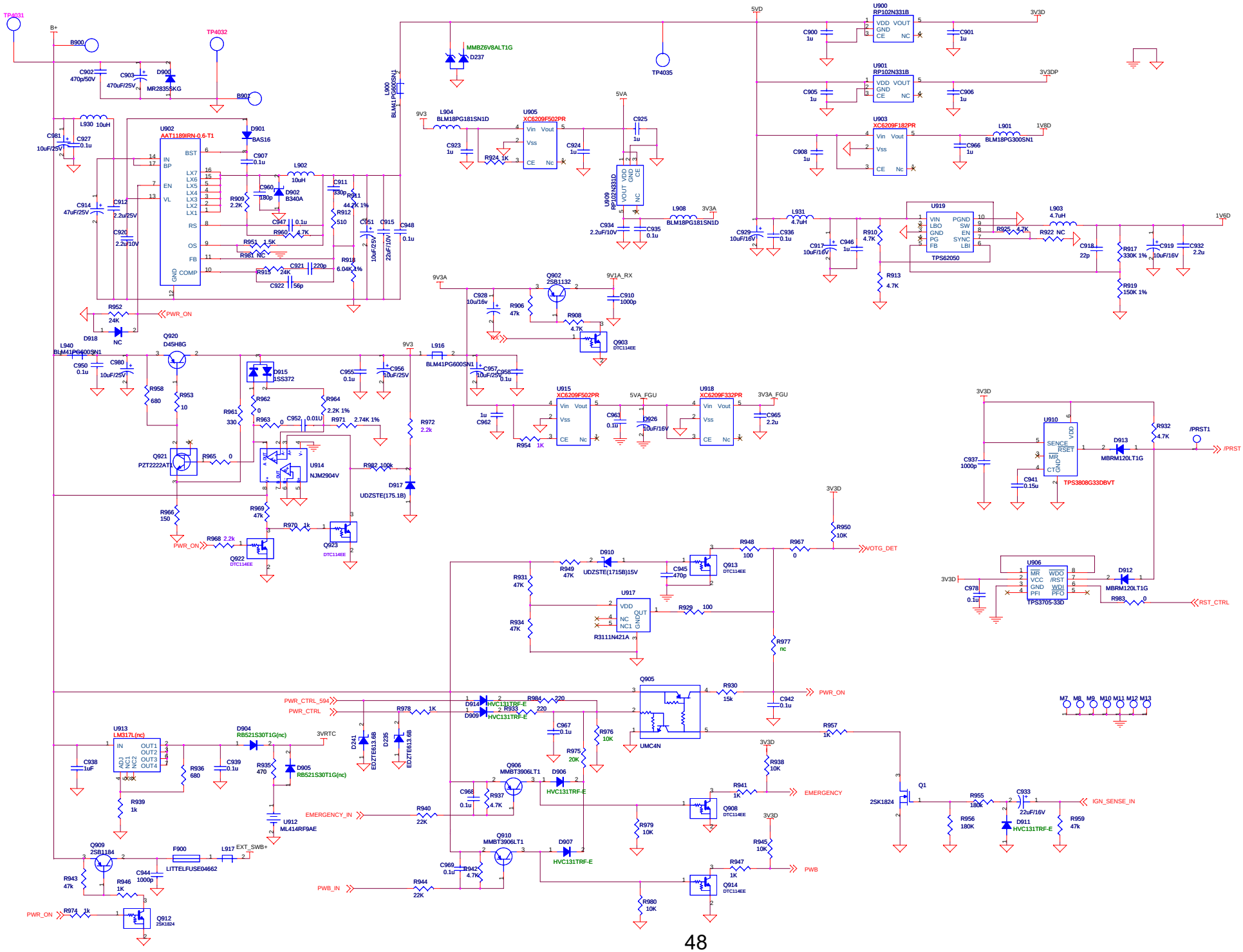
MD78X/MD78XG Schematic Diagram (Peripheral Interface Circuit)



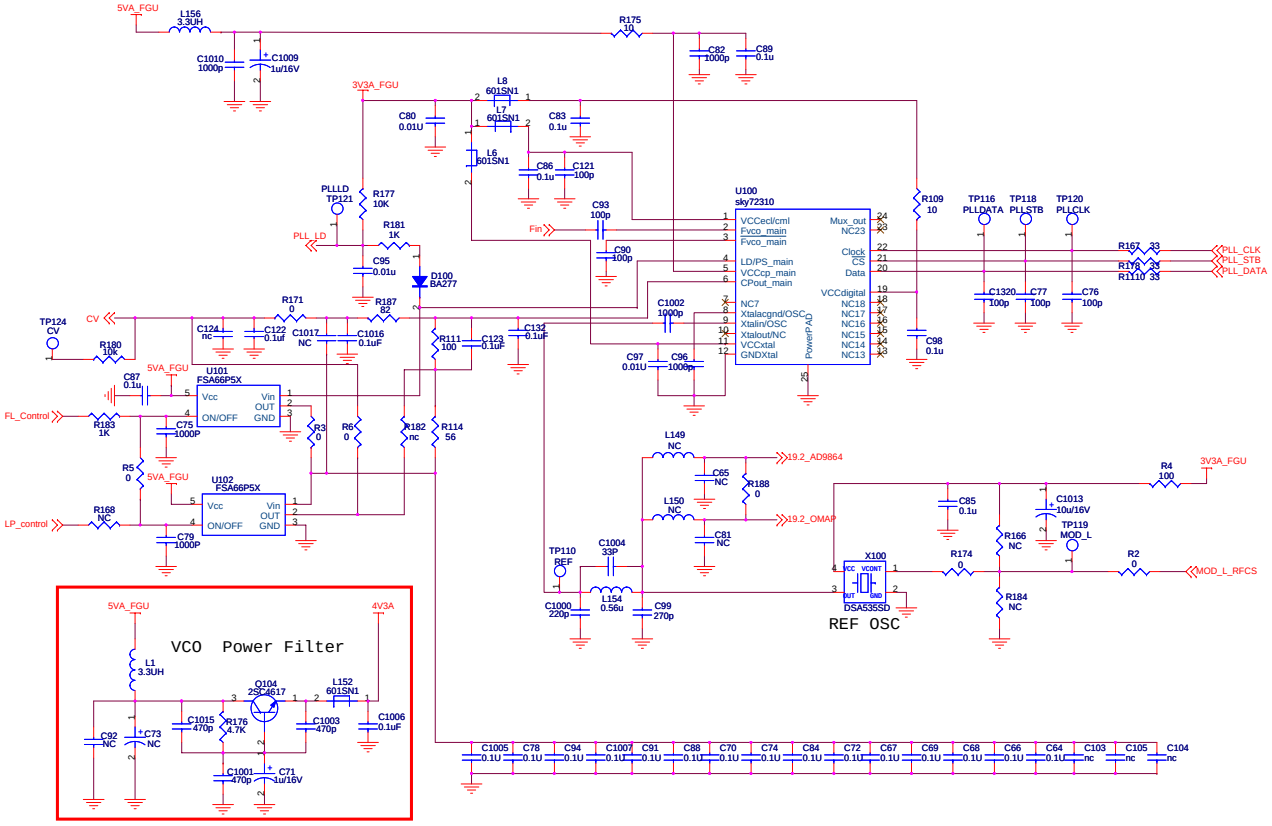
MD78X/MD78XG Schematic Diagram
(40-Pin Interface Circuit)



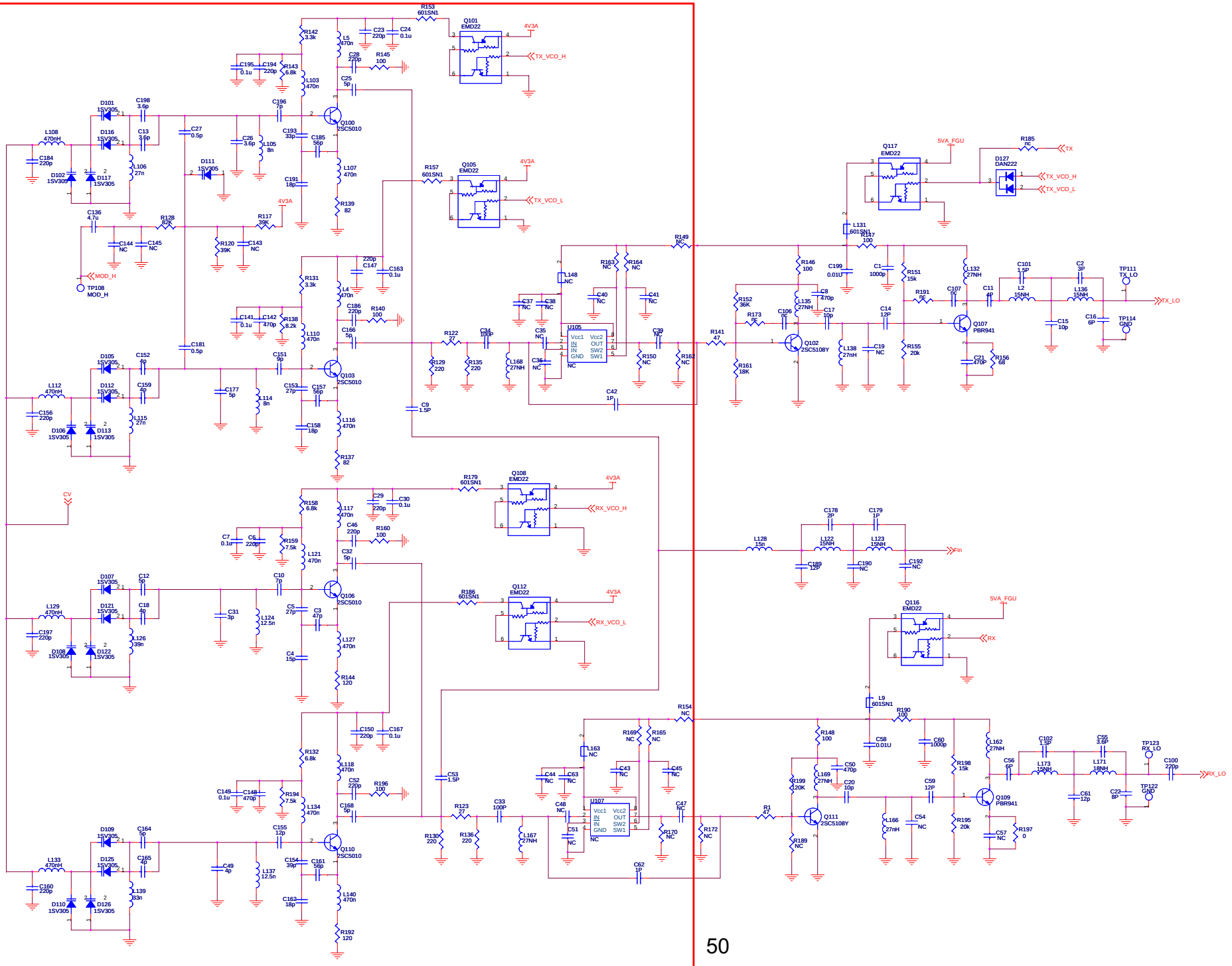
MD78X/MD78XG Schematic Diagram (Power Circuit)



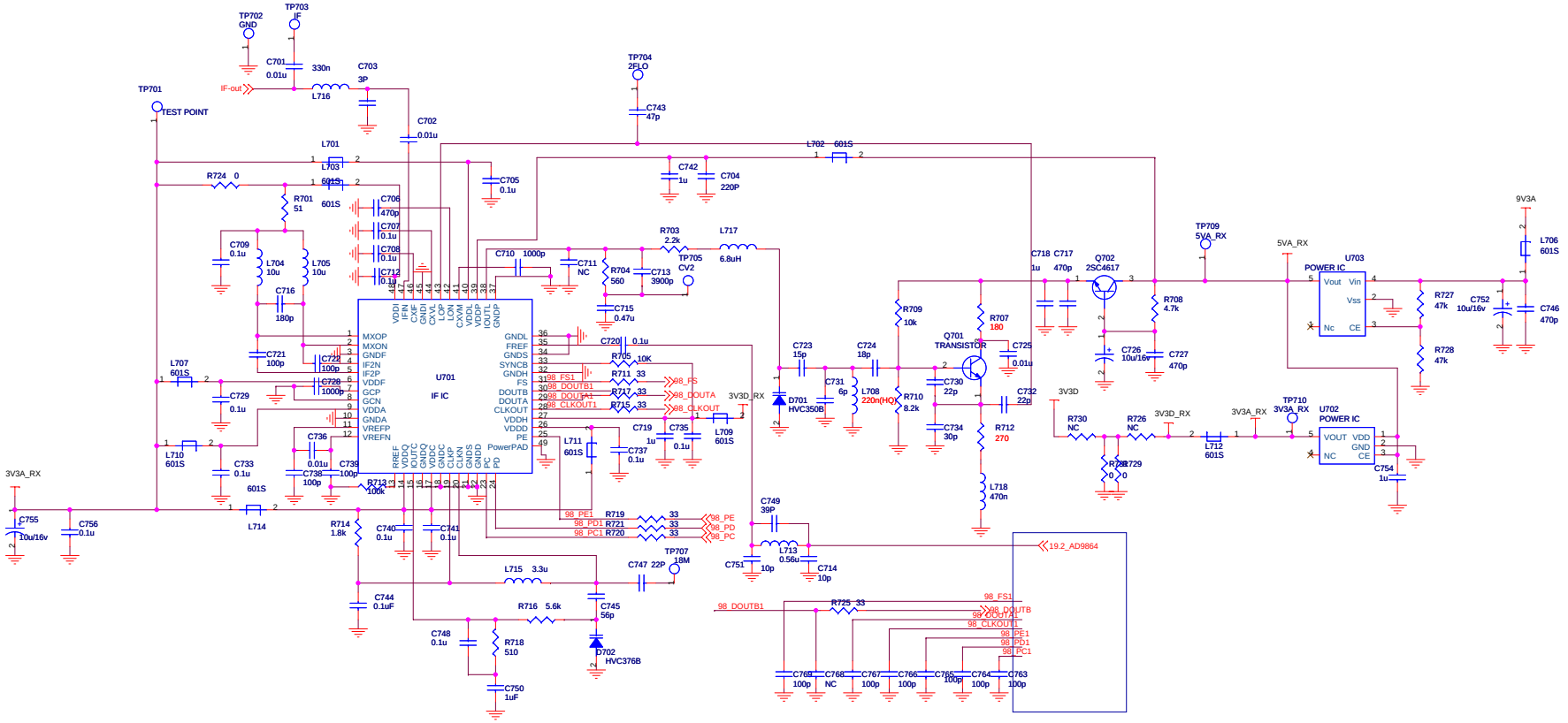
MD78X/MD78XG Schematic Diagram
(PLL Circuit)



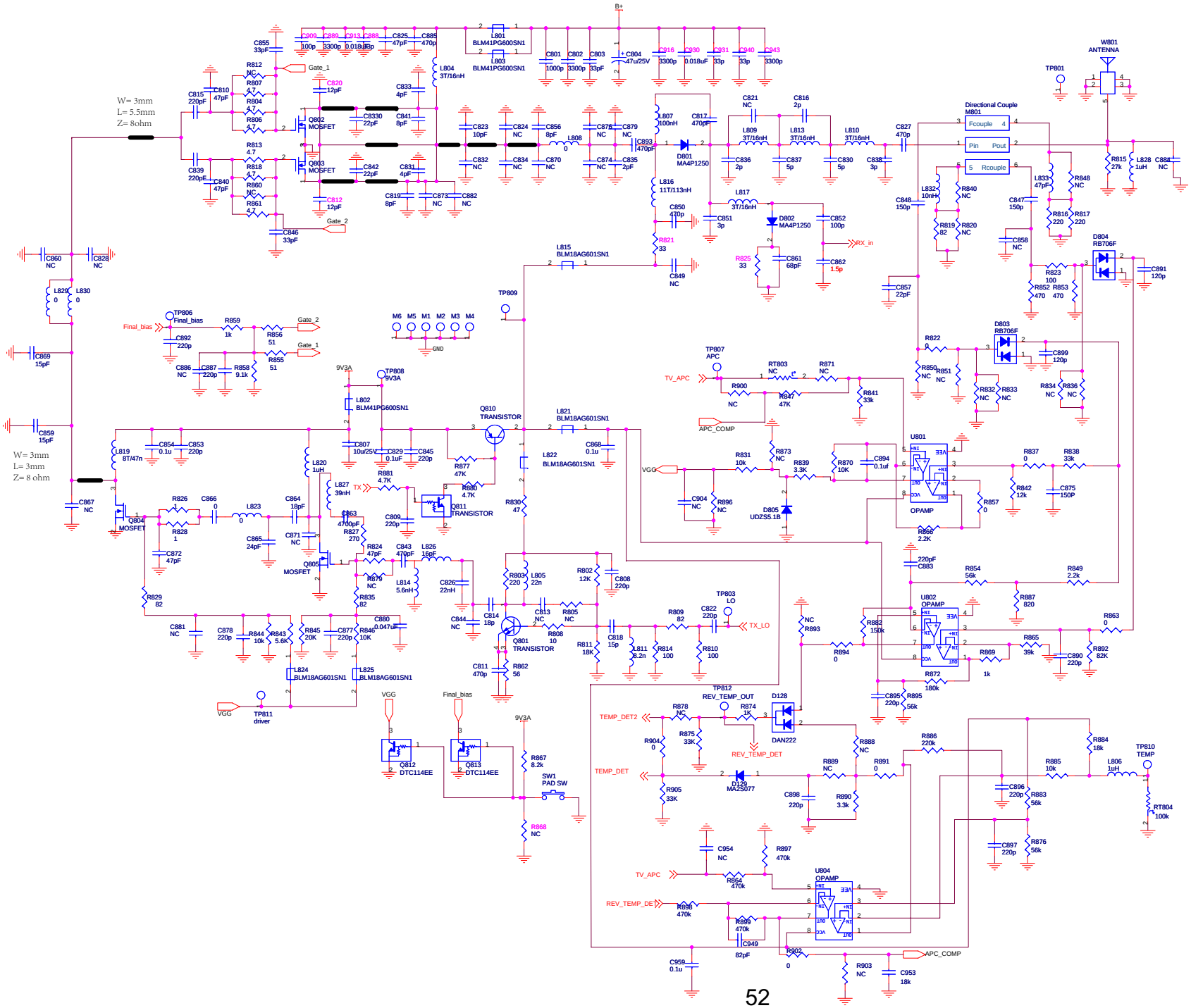
MD78X/MD78XG Schematic Diagram (VCO Circuit)



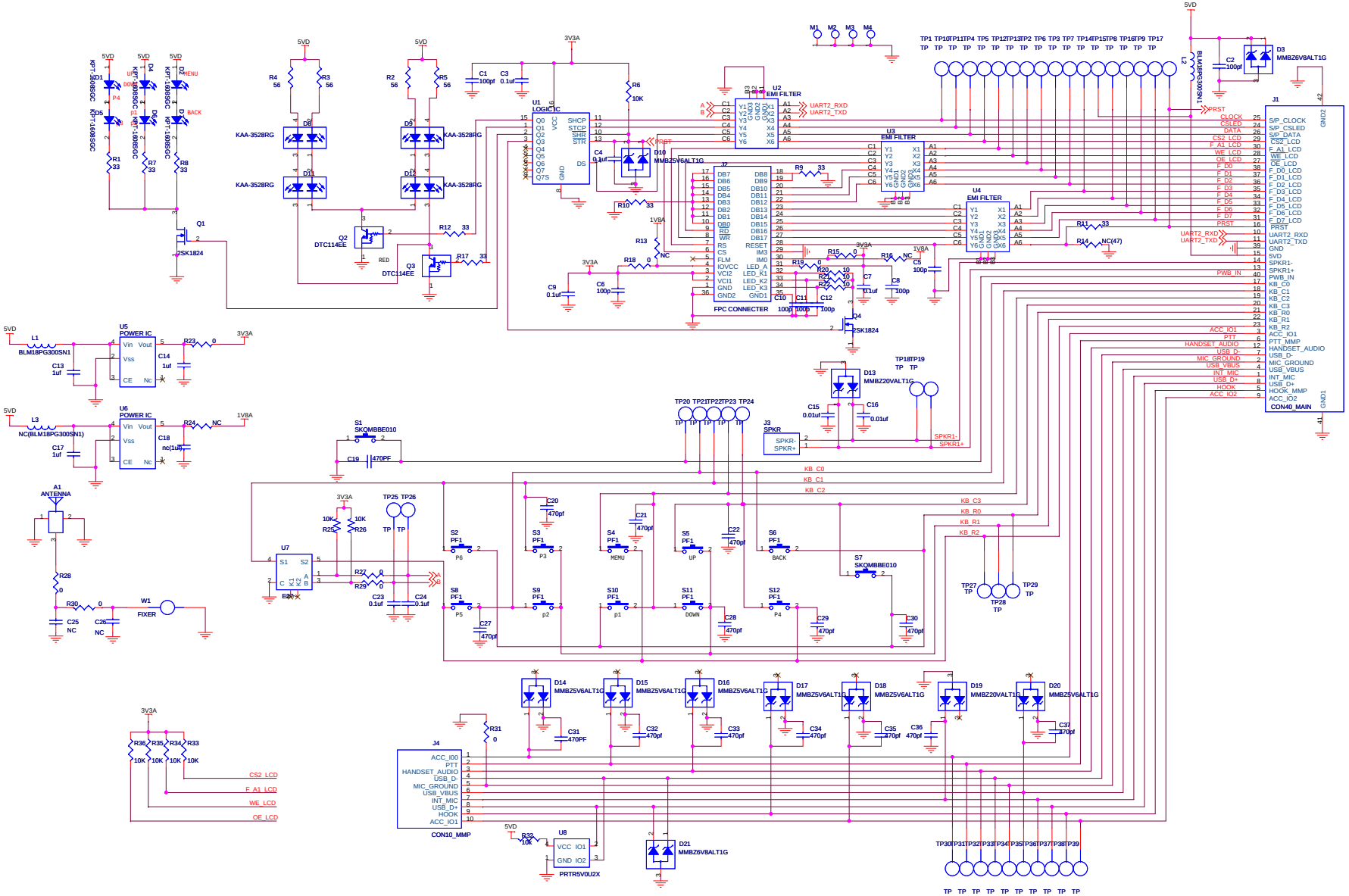
MD78X/MD78XG Schematic Diagram
(IF Circuit)



MD78X/MD78XG Schematic Diagram (TX Circuit)



MD78X/MD78XG Schematic Diagram
(Front Panel)



V1.0

11.7 Parts List

Main Board *for MD78X/MD78XG*

No.	Ref. No.	Part No.	Description
1	C6115	3001050000000	0Ω
2	C6123	3001050000000	0Ω
3	C6172	3001050000000	0Ω
4	R127	3001050000000	0Ω
5	R174	3001050000000	0Ω
6	R188	3001050000000	0Ω
7	R197	3001050000000	0Ω
8	R230	3001050000000	0Ω
9	R233	3001050000000	0Ω
10	R238	3001050000000	0Ω
11	R240	3001050000000	0Ω
12	R242	3001050000000	0Ω
13	R243	3001050000000	0Ω
14	R249	3001050000000	0Ω
15	R289	3001050000000	0Ω
16	R329	3001050000000	0Ω
17	R356	3001050000000	0Ω
18	R374	3001050000000	0Ω
19	R375	3001050000000	0Ω
20	R399	3001050000000	0Ω
21	R426	3001050000000	0Ω
22	R440	3001050000000	0Ω
23	R493	3001050000000	0Ω
24	R497	3001050000000	0Ω
25	R5	3001050000000	0Ω
26	R505	3001050000000	0Ω
27	R507	3001050000000	0Ω
28	R508	3001050000000	0Ω
29	R536	3001050000000	0Ω
30	R544	3001050000000	0Ω
31	R564	3001050000000	0Ω
32	R565	3001050000000	0Ω
33	R566	3001050000000	0Ω
34	R567	3001050000000	0Ω
35	R6123	3001050000000	0Ω
36	R729	3001050000000	0Ω
37	R731	3001050000000	0Ω
38	R837	3001050000000	0Ω
39	R857	3001050000000	0Ω
40	R863	3001050000000	0Ω
41	R888	3001050000000	0Ω

No.	Ref. No.	Part No.	Description
41	R888	3001050000000	0Ω
42	R891	3001050000000	0Ω
43	R894	3001050000000	0Ω
44	R967	3001050000000	0Ω
45	C241	3001060000000	0Ω
46	C6158	3001060000000	0Ω
47	C6176	3001060000000	0Ω
48	C866	3001060000000	0Ω
49	L823	3001060000000	0Ω
50	R171	3001060000000	0Ω
51	R2	3001060000000	0Ω
52	R282	3001060000000	0Ω
53	R405	3001060000000	0Ω
54	R444	3001060000000	0Ω
55	R484	3001060000000	0Ω
56	R542	3001060000000	0Ω
57	R6116	3001060000000	0Ω
58	R6138	3001060000000	0Ω
59	R6140	3001060000000	0Ω
60	R724	3001060000000	0Ω
61	R822	3001060000000	0Ω
62	R901	3001060000000	0Ω
63	R914	3001060000000	0Ω
64	R916	3001060000000	0Ω
65	R962	3001060000000	0Ω
66	R963	3001060000000	0Ω
67	R965	3001060000000	0Ω
68	R973	3001060000000	0Ω
69	L829	3001070000000	0Ω
70	L830	3001070000000	0Ω
71	L808	3001080000000	0Ω
72	R245	3001160100000	1Ω
73	R253	3001160100000	1Ω
74	R293	3001160100000	1Ω
75	R294	3001160100000	1Ω
76	R826	3001060100000	1Ω
77	R828	3001060100000	1Ω
78	R804	3001084790000	4.7Ω
79	R806	3001084790000	4.7Ω
80	R807	3001084790000	4.7Ω
81	R813	3001084790000	4.7Ω
82	R818	3001084790000	4.7Ω
83	R861	3001084790000	4.7Ω
84	R109	3001051000000	10Ω

No.	Ref. No.	Part No.	Description
85	R175	3001051000000	10Ω
86	R358	3001051000000	10Ω
87	R360	3001051000000	10Ω
88	R386	3001051000000	10Ω
89	R388	3001051000000	10Ω
90	R414	3001051000000	10Ω
91	R456	3001051000000	10Ω
92	R457	3001051000000	10Ω
93	R808	3001061000000	10Ω
94	R953	3001061000000	10Ω
95	R6102	3001071000000	10Ω
96	R878	3001081000000	10Ω
97	R122	3001052700010	27Ω
98	R123	3001052700010	27Ω
99	R1110	3001053300010	33Ω
100	R167	3001053300010	33Ω
101	R178	3001053300010	33Ω
102	R231	3001053300010	33Ω
103	R232	3001053300010	33Ω
104	R292	3001053300010	33Ω
105	R319	3001053300010	33Ω
106	R320	3001053300010	33Ω
107	R324	3001053300010	33Ω
108	R327	3001053300010	33Ω
109	R330	3001053300010	33Ω
110	R332	3001053300010	33Ω
111	R336	3001053300010	33Ω
112	R344	3001053300010	33Ω
113	R345	3001053300010	33Ω
114	R347	3001053300010	33Ω
115	R354	3001053300010	33Ω
116	R355	3001053300010	33Ω
117	R357	3001053300010	33Ω
118	R367	3001053300010	33Ω
119	R369	3001053300010	33Ω
120	R371	3001053300010	33Ω
121	R376	3001053300010	33Ω
122	R380	3001053300010	33Ω
123	R381	3001053300010	33Ω
124	R387	3001053300010	33Ω
125	R389	3001053300010	33Ω
126	R400	3001053300010	33Ω
127	R402	3001053300010	33Ω
128	R407	3001053300010	33Ω

No.	Ref. No.	Part No.	Description
129	R408	3001053300010	33Ω
130	R409	3001053300010	33Ω
131	R412	3001053300010	33Ω
132	R413	3001053300010	33Ω
133	R420	3001053300010	33Ω
134	R423	3001053300010	33Ω
135	R424	3001053300010	33Ω
136	R425	3001053300010	33Ω
137	R430	3001053300010	33Ω
138	R431	3001053300010	33Ω
139	R432	3001053300010	33Ω
140	R433	3001053300010	33Ω
141	R467	3001053300010	33Ω
142	R473	3001053300010	33Ω
143	R474	3001053300010	33Ω
144	R479	3001053300010	33Ω
145	R485	3001053300010	33Ω
146	R486	3001053300010	33Ω
147	R487	3001053300010	33Ω
148	R489	3001053300010	33Ω
149	R490	3001053300010	33Ω
150	R491	3001053300010	33Ω
151	R492	3001053300010	33Ω
152	R495	3001053300010	33Ω
153	R498	3001053300010	33Ω
154	R515	3001053300010	33Ω
155	R516	3001053300010	33Ω
156	R517	3001053300010	33Ω
157	R518	3001053300010	33Ω
158	R519	3001053300010	33Ω
159	R520	3001053300010	33Ω
160	R521	3001053300010	33Ω
161	R522	3001053300010	33Ω
162	R523	3001053300010	33Ω
163	R524	3001053300010	33Ω
164	R525	3001053300010	33Ω
165	R526	3001053300010	33Ω
166	R527	3001053300010	33Ω
167	R533	3001053300010	33Ω
168	R545	3001053300010	33Ω
169	R552	3001053300010	33Ω
170	R553	3001053300010	33Ω
171	R6114	3001053300010	33Ω
172	R711	3001053300010	33Ω

No.	Ref. No.	Part No.	Description
173	R715	3001053300010	33Ω
174	R717	3001053300010	33Ω
175	R719	3001053300010	33Ω
176	R720	3001053300010	33Ω
177	R721	3001053300010	33Ω
178	R725	3001053300010	33Ω
179	R821	3001113300000	33Ω
180	R825	3001113300000	33Ω
181	R6117	3001063900000	39Ω
182	R1	3001054700000	47Ω
183	R141	3001054700000	47Ω
184	R830	3001074700000	47Ω
185	R6120	3001055100010	51Ω
186	R6132	3001055100010	51Ω
187	R701	3001055100010	51Ω
188	R114	3001065600000	56Ω
189	R862	3001065600000	56Ω
190	R156	3001056800000	68Ω
191	R137	3001068200000	82Ω
192	R139	3001068200000	82Ω
193	R187	3001068200000	82Ω
194	R809	3001068200000	82Ω
195	R829	3001068200000	82Ω
196	R835	3001068200000	82Ω
197	R819	3001078200000	82Ω
198	R140	3001051010040	100Ω
199	R145	3001051010040	100Ω
200	R146	3001051010040	100Ω
201	R147	3001051010040	100Ω
202	R148	3001051010040	100Ω
203	R160	3001051010040	100Ω
204	R190	3001051010040	100Ω
205	R196	3001051010040	100Ω
206	R251	3001051010040	100Ω
207	R260	3001051010040	100Ω
208	R271	3001051010040	100Ω
209	R278	3001051010040	100Ω
210	R337	3001051010040	100Ω
211	R338	3001051010040	100Ω
212	R339	3001051010040	100Ω
213	R346	3001051010040	100Ω
214	R403	3001051010040	100Ω
215	R404	3001051010040	100Ω
216	R406	3001051010040	100Ω

No.	Ref. No.	Part No.	Description
217	R410	3001051010040	100Ω
218	R411	3001051010040	100Ω
219	R421	3001051010040	100Ω
220	R434	3001051010040	100Ω
221	R439	3001051010040	100Ω
222	R445	3001051010040	100Ω
223	R458	3001051010040	100Ω
224	R459	3001051010040	100Ω
225	R556	3001051010040	100Ω
226	R557	3001051010040	100Ω
227	R929	3001051010040	100Ω
228	R948	3001051010040	100Ω
229	R111	3001061010000	100Ω
230	R4	3001061010000	100Ω
231	R810	3001061010000	100Ω
232	R814	3001061010000	100Ω
233	R823	3001061010000	100Ω
234	R855	3001061010000	100Ω
235	R856	3001061010000	100Ω
236	R144	3001061210000	120Ω
237	R192	3001061210000	120Ω
238	R966	3001161510010	150Ω
239	R707	3001051810010	180Ω
240	R129	3001052210000	220Ω
241	R130	3001052210000	220Ω
242	R135	3001052210000	220Ω
243	R136	3001052210000	220Ω
244	R933	3001052210000	220Ω
245	R803	3001062210000	220Ω
246	R816	3001072210000	220Ω
247	R817	3001072210000	220Ω
248	R712	3001052710010	270Ω
249	R827	3001062710000	270Ω
250	R6133	3001053310010	330Ω
251	R6129	3001063310010	330Ω
252	R961	3001083310010	330Ω
253	R6109	3001063910000	390Ω
254	R546	3001054710000	470Ω
255	R547	3001054710000	470Ω
256	R548	3001054710000	470Ω
257	R549	3001054710000	470Ω
258	R550	3001054710000	470Ω
259	R551	3001054710000	470Ω
260	R255	3001064710000	470Ω

No.	Ref. No.	Part No.	Description
261	R852	3001064710000	470Ω
262	R853	3001064710000	470Ω
263	R935	3001064710000	470Ω
264	R6100	3001055110000	510Ω
265	R718	3001055110000	510Ω
266	R912	3001055110000	510Ω
267	R704	3001055610010	560Ω
268	R6101	3001056810000	680Ω
269	R6106	3001066810000	680Ω
270	R936	3001066810000	680Ω
271	R958	3001066810000	680Ω
272	R887	3001058210000	820Ω
273	R181	3001051020000	1KΩ
274	R183	3001051020000	1KΩ
275	R264	3001051020000	1KΩ
276	R267	3001051020000	1KΩ
277	R290	3001051020000	1KΩ
278	R295	3001051020000	1KΩ
279	R383	3001051020000	1KΩ
280	R416	3001051020000	1KΩ
281	R417	3001051020000	1KΩ
282	R422	3001051020000	1KΩ
283	R460	3001051020000	1KΩ
284	R477	3001051020000	1KΩ
285	R502	3001051020000	1KΩ
286	R503	3001051020000	1KΩ
287	R504	3001051020000	1KΩ
288	R554	3001051020000	1KΩ
289	R831	3001051020000	1KΩ
290	R869	3001051020000	1KΩ
291	R874	3001051020000	1KΩ
292	R941	3001051020000	1KΩ
293	R947	3001051020000	1KΩ
294	R957	3001051020000	1KΩ
295	R978	3001051020000	1KΩ
296	R859	3001061020010	1KΩ
297	R924	3001061020010	1KΩ
298	R939	3001061020010	1KΩ
299	R954	3001061020010	1KΩ
300	R970	3001061020010	1KΩ
301	R974	3001061020010	1KΩ
302	R946	3001071020010	1KΩ
303	R291	3001051220000	1.2K
304	R6107	3001051220000	1.2K

No.	Ref. No.	Part No.	Description
305	R6110	3001051220000	1.2K
306	R6119	3001051220000	1.2K
307	R6122	3001051220000	1.2K
308	R6131	3001051220000	1.2K
309	R401	3001051520010	1.5K
310	R951	3001051520010	1.5K
311	R449	3001061520000	1.5K
312	R265	3001051820000	1.8K
313	R714	3001051820000	1.8K
314	R703	3001052220010	2.2K
315	R849	3001052220010	2.2K
316	R866	3001052220010	2.2K
317	R909	3001052220010	2.2K
318	R964	3001052220010	2.2K
319	R968	3001052220010	2.2K
320	R972	3001062220000	2.2K
321	R6104	3001052720000	2.7K
322	R450	3001072720010	2.7K
323	R971	3099052741000	2.74Ω
324	R131	3001053320000	3.3K
325	R142	3001053320000	3.3K
326	R6118	3001053320000	3.3K
327	R890	3001053320000	3.3K
328	R960	3001054790010	4.7K
329	R176	3001054720000	4.7K
330	R395	3001054720000	4.7K
331	R396	3001054720000	4.7K
332	R428	3001054720000	4.7K
333	R435	3001054720000	4.7K
334	R436	3001054720000	4.7K
335	R437	3001054720000	4.7K
336	R448	3001054720000	4.7K
337	R468	3001054720000	4.7K
338	R469	3001054720000	4.7K
339	R470	3001054720000	4.7K
340	R471	3001054720000	4.7K
341	R472	3001054720000	4.7K
342	R488	3001054720000	4.7K
343	R496	3001054720000	4.7K
344	R499	3001054720000	4.7K
345	R511	3001054720000	4.7K
346	R6108	3001054720000	4.7K
347	R6135	3001054720000	4.7K
348	R708	3001054720000	4.7K

No.	Ref. No.	Part No.	Description
349	R908	3001054720000	4.7K
350	R910	3001054720000	4.7K
351	R913	3001054720000	4.7K
352	R937	3001054720000	4.7K
353	R942	3001054720000	4.7K
354	R925	3001064720000	4.7K
355	R932	3001064720000	4.7K
356	R880	3001074720010	4.7K
357	R881	3001074720010	4.7K
358	R6130	3001055120030	5.1K
359	R839	3001053320000	5.6K
360	R239	3001055620000	5.6K
361	R287	3001055620000	5.6K
362	R6105	3001055620000	5.6K
363	R716	3001055620000	5.6K
364	R843	3001065620000	5.6K
365	R918	3099066041010	6K
366	R132	3001056820000	6.8K
367	R143	3001056820000	6.8K
368	R158	3001056820000	6.8K
369	R159	3001057520000	7.5K
370	R194	3001057520000	7.5K
371	R138	3001058220000	8.2K
372	R710	3001058220000	8.2K
373	R867	3001058220000	8.2K
374	R858	3001069120000	9.1K
375	R3	3001050000000	10KΩ
376	R6	3001050000000	10KΩ
377	R177	3001051030000	10KΩ
378	R180	3001051030000	10KΩ
379	R234	3001051030000	10KΩ
380	R235	3001051030000	10KΩ
381	R236	3001051030000	10KΩ
382	R256	3001051030000	10KΩ
383	R258	3001051030000	10KΩ
384	R259	3001051030000	10KΩ
385	R261	3001051030000	10KΩ
386	R316	3001051030000	10KΩ
387	R322	3001051030000	10KΩ
388	R323	3001051030000	10KΩ
389	R325	3001051030000	10KΩ
390	R326	3001051030000	10KΩ
391	R334	3001051030000	10KΩ
392	R335	3001051030000	10KΩ

No.	Ref. No.	Part No.	Description
393	R340	3001051030000	10KΩ
394	R341	3001051030000	10KΩ
395	R342	3001051030000	10KΩ
396	R343	3001051030000	10KΩ
397	R351	3001051030000	10KΩ
398	R353	3001051030000	10KΩ
399	R372	3001051030000	10KΩ
400	R373	3001051030000	10KΩ
401	R377	3001051030000	10KΩ
402	R378	3001051030000	10KΩ
403	R379	3001051030000	10KΩ
404	R382	3001051030000	10KΩ
405	R385	3001051030000	10KΩ
406	R390	3001051030000	10KΩ
407	R391	3001051030000	10KΩ
408	R392	3001051030000	10KΩ
409	R393	3001051030000	10KΩ
410	R394	3001051030000	10KΩ
411	R398	3001051030000	10KΩ
412	R427	3001051030000	10KΩ
413	R429	3001051030000	10KΩ
414	R438	3001051030000	10KΩ
415	R441	3001051030000	10KΩ
416	R442	3001051030000	10KΩ
417	R443	3001051030000	10KΩ
418	R447	3001051030000	10KΩ
419	R451	3001051030000	10KΩ
420	R452	3001051030000	10KΩ
421	R453	3001051030000	10KΩ
422	R454	3001051030000	10KΩ
423	R461	3001051030000	10KΩ
424	R462	3001051030000	10KΩ
425	R463	3001051030000	10KΩ
426	R464	3001051030000	10KΩ
427	R465	3001051030000	10KΩ
428	R466	3001051030000	10KΩ
429	R476	3001051030000	10KΩ
430	R481	3001051030000	10KΩ
431	R482	3001051030000	10KΩ
432	R483	3001051030000	10KΩ
433	R501	3001051030000	10KΩ
434	R506	3001051030000	10KΩ
435	R509	3001051030000	10KΩ
436	R510	3001051030000	10KΩ

No.	Ref. No.	Part No.	Description
437	R512	3001051030000	10KΩ
438	R530	3001051030000	10KΩ
439	R531	3001051030000	10KΩ
440	R532	3001051030000	10KΩ
441	R534	3001051030000	10KΩ
442	R535	3001051030000	10KΩ
443	R538	3001051030000	10KΩ
444	R539	3001051030000	10KΩ
445	R540	3001051030000	10KΩ
446	R541	3001051030000	10KΩ
447	R543	3001051030000	10KΩ
448	R555	3001051030000	10KΩ
449	R705	3001051030000	10KΩ
450	R709	3001051030000	10KΩ
451	R885	3001051030000	10KΩ
452	R938	3001051030000	10KΩ
453	R945	3001051030000	10KΩ
454	R950	3001051030000	10KΩ
455	R976	3001051030000	10KΩ
456	R979	3001051030000	10KΩ
457	R980	3001051030000	10KΩ
458	R844	3001051030000	10KΩ
459	R846	3001051030000	10KΩ
460	R842	3001051030000	10KΩ
461	R870	3001051030000	10KΩ
462	R802	3001051030000	10KΩ
463	R151	3001051030000	10KΩ
464	R198	3001051030000	10KΩ
465	R250	3001051030000	10KΩ
466	R284	3001051030000	10KΩ
467	R285	3001051030000	10KΩ
468	R361	3001051030000	10KΩ
469	R362	3001051030000	10KΩ
470	R884	3001051030000	10KΩ
471	R930	3001051030000	10KΩ
472	R161	3001051830000	18KΩ
473	R811	3001061830010	18KΩ
474	R155	3001052030000	20KΩ
475	R195	3001052030000	20KΩ
476	R6136	3001052030000	20KΩ
477	R975	3001052030000	20KΩ
478	R845	3001062030000	20KΩ
479	R244	3001052230010	22KΩ
480	R246	3001052230010	22KΩ

No.	Ref. No.	Part No.	Description
481	R940	3001052230010	22KΩ
482	R944	3001052230010	22KΩ
483	R273	3001052430010	24KΩ
484	R915	3001052430010	24KΩ
485	R952	3001062430000	24KΩ
486	R6103	3001052730010	27KΩ
487	R815	3001082730000	27KΩ
488	R257	3001053030000	30KΩ
489	R263	3001053030000	30KΩ
490	R279	3001053030000	30KΩ
491	R283	3001053030000	30KΩ
492	R6134	3001053030000	30KΩ
493	R6137	3001053030000	30KΩ
494	R529	3001053330000	33KΩ
495	R558	3001053330000	33KΩ
496	R559	3001053330000	33KΩ
497	R560	3001053330000	33KΩ
498	R561	3001053330000	33KΩ
499	R562	3001053330000	33KΩ
500	R563	3001053330000	33KΩ
501	R838	3001053330000	33KΩ
502	R841	3001053330000	33KΩ
503	R875	3001053330000	33KΩ
504	R152	3001053630000	36KΩ
505	R117	3001053930000	39KΩ
506	R120	3001053930000	39KΩ
507	R865	3001053930000	39KΩ
508	R911	3099064422010	44KΩ
509	R266	3001054730000	47KΩ
510	R270	3001054730000	47KΩ
511	R272	3001054730000	47KΩ
512	R277	3001054730000	47KΩ
513	R286	3001054730000	47KΩ
514	R288	3001054730000	47KΩ
515	R847	3001054730000	47KΩ
516	R877	3001054730000	47KΩ
517	R931	3001054730000	47KΩ
518	R949	3001054730000	47KΩ
519	R959	3001054730000	47KΩ
520	R727	3001064730000	47KΩ
521	R728	3001064730000	47KΩ
522	R906	3001064730000	47KΩ
523	R943	3001064730000	47KΩ
524	R969	3001064730000	47KΩ

No.	Ref. No.	Part No.	Description
525	R934	3001055130010	51KΩ
526	R237	3001055630000	56KΩ
527	R241	3001055630000	56KΩ
528	R6139	3001055630000	56KΩ
529	R854	3001055630000	56KΩ
530	R876	3001055630000	56KΩ
531	R883	3001055630000	56KΩ
532	R895	3001055630000	56KΩ
533	R528	3001056830000	68KΩ
534	R128	3001058230000	82KΩ
535	R892	3001058230000	82KΩ
536	R247	3001051040000	100K
537	R248	3001051040000	100K
538	R252	3001051040000	100K
539	R262	3001051040000	100K
540	R268	3001051040000	100K
541	R269	3001051040000	100K
542	R274	3001051040000	100K
543	R275	3001051040000	100K
544	R276	3001051040000	100K
545	R296	3001051040000	100K
546	R455	3001051040000	100K
547	R500	3001051040000	100K
548	R513	3001051040000	100K
549	R514	3001051040000	100K
550	R6111	3001051040000	100K
551	R6112	3001051040000	100K
552	R6115	3001051040000	100K
553	R713	3001051040000	100K
554	R982	3001051040000	100K
555	RT804	3003061040000	Thermistor 100KΩ
556	R199	3001051240000	120K
557	R882	3001051540000	150K
558	R919	3001051540000	150K
559	R872	3001051840000	180K
560	R955	3001051840000	180K
561	R956	3001051840000	180K
562	R886	3001052240000	220K
563	R6113	3001052740000	270K
564	R917	3001053340010	330K
565	RN230	3005051010010	100Ω
566	RN500	3005051010010	100Ω
567	C181	3101050590010	0.5PF
568	C27	3101050590010	0.5PF

No.	Ref. No.	Part No.	Description
569	C42	3101050100030	1PF
570	C6117	3101050100030	1PF
571	C6120	3101050100030	1PF
572	C6121	3101050100030	1PF
573	C6124	3101050100030	1PF
574	C6126	3101050100030	1PF
575	C6153	3101050100030	1PF
576	C62	3101050100030	1PF
577	C179	3101060100010	1PF
578	C821	3101080100010	1PF
579	C832	3101080100010	1PF
580	C101	3101051590000	1.5PF
581	C53	3101051590000	1.5PF
582	C6110	3101051590000	1.5PF
583	C6119	3101051590000	1.5PF
584	C6122	3101051590000	1.5PF
585	C6127	3101051590000	1.5PF
586	C6152	3101051590000	1.5PF
587	C9	3101051590000	1.5PF
588	C102	3101061590010	1.5PF
589	C6154	3101050200010	2PF
590	C178	3101060200010	2PF
591	C862	3101060200010	2PF
592	C816	3101080200010	2p
593	C835	3101080200010	2p
594	C836	3101080200010	2p
595	C2	3101060300010	3PF
596	C31	3101060300010	3PF
597	C703	3101060300010	3PF
598	C838	3101080300010	3p
599	C851	3101080300010	3p
600	C13	3101053690030	3.6P
601	C198	3101053690030	3.6P
602	C26	3101063690000	3.6P
603	C55	3101063690000	3.6P
604	C11	3101050400010	4P
605	C165	3101050400010	4P
606	C6133	3101050400010	4P
607	C152	3101054090010	4P
608	C159	3101054090010	4P
609	C18	3101054090010	4P
610	C49	3101060400010	4P
611	C831	3101080400010	4p
612	C833	3101080400010	4p

No.	Ref. No.	Part No.	Description
613	C166	3101050500010	5PF
614	C168	3101050500010	5PF
615	C25	3101050500010	5PF
616	C32	3101050500010	5PF
617	C6114	3101050500010	5PF
618	C12	3101050500030	5PF
619	C164	3101050500030	5PF
620	C177	3101060500010	5PF
621	C830	3101080500010	5PF
622	C837	3101080500010	5PF
623	C16	3101050600010	6PF
624	C56	3101050600010	6PF
625	C6109	3101050600010	6PF
626	C6111	3101050600010	6PF
627	C6112	3101050600010	6PF
628	C6116	3101050600010	6PF
629	C731	3101050600010	6PF
630	L6111	3101060600010	6PF
631	C6163	3101050700010	7PF
632	C10	3101060700020	7PF
633	C196	3101060700020	7PF
634	C22	3101050800000	8PF
635	C819	3101080800010	8PF
636	C841	3101080800010	8PF
637	C856	3101080800010	8PF
638	C6170	3101050900000	9PF
639	C151	3101060900010	9PF
640	C15	3101051000020	10PF
641	C714	3101051000020	10PF
642	C751	3101051000020	10PF
643	C17	3101061000000	10PF
644	C20	3101061000000	10PF
645	C823	3101081000010	10pF
646	C14	3101051200020	12PF
647	C322	3101051200020	12PF
648	C324	3101051200020	12PF
649	C375	3101051200020	12PF
650	C376	3101051200020	12PF
651	C59	3101051200020	12PF
652	C61	3101051200020	12PF
653	C155	3101061200000	12PF
654	C189	3101061200000	12PF
655	C812	3101081200010	12PF
656	C820	3101081200010	12PF

No.	Ref. No.	Part No.	Description
657	C6161	3101051500020	15PF
658	C6162	3101051500020	15PF
659	C6164	3101051500020	15PF
660	C6177	3101051500020	15PF
661	C723	3101051500020	15PF
662	C4	3101051500080	15PF
663	C818	3101061500010	15PF
664	L826	3101061600000	16PF
665	C6129	3101051800010	18PF
666	C724	3101051800010	18PF
667	C158	3101051800070	18PF
668	C162	3101051800070	18PF
669	C191	3101051800070	18PF
670	C6128	3101061800000	18PF
671	C814	3101061800000	18PF
672	C864	3101061800000	18PF
673	C730	3101052200010	22PF
674	C732	3101052200010	22PF
675	C747	3101052200010	22PF
676	C918	3101052200010	22PF
677	C857	3101062200010	22PF
678	C8330	3101372200000	22PF
679	C842	3101372200000	22PF
680	C865	3101062400010	24PF
681	C153	3101052700000	27PF
682	C5	3101052700000	27PF
683	C6160	3101052700000	27PF
684	C734	3101053000010	30PF
685	C193	3101053300000	33PF
686	C500	3101053300000	33PF
687	C1004	3101063300000	33PF
688	C803	3101063300000	33PF
689	C888	3101063300000	33PF
690	C931	3101063300000	33PF
691	C940	3101063300000	33PF
692	C846	3101073300000	33PF
693	C855	3101073300000	33PF
694	C154	3101053900000	39PF
695	C364	3101053900000	39PF
696	C749	3101053900000	39PF
697	C3	3101054700010	47PF
698	C6137	3101054700010	47PF
699	C6138	3101054700010	47PF
700	C6142	3101054700010	47PF

No.	Ref. No.	Part No.	Description
701	C6143	3101054700010	47PF
702	C743	3101054700010	47PF
703	C872	3101064700000	47PF
704	C902	3101064700000	47PF
705	L833	3101064700000	47PF
706	R824	3101064700000	47PF
707	C810	3101074700000	47PF
708	C825	3101074700000	47PF
709	C840	3101074700000	47PF
710	C157	3101055600000	56PF
711	C161	3101055600000	56PF
712	C185	3101055600000	56PF
713	C6134	3101055600000	56PF
714	C6135	3101055600000	56PF
715	C6136	3101055600000	56PF
716	C6139	3101055600000	56PF
717	C6140	3101055600000	56PF
718	C6141	3101055600000	56PF
719	C745	3101055600000	56PF
720	C922	3101055600000	56PF
721	C861	3101066800000	68PF
722	C362	3101058200000	82PF
723	C363	3101058200000	82PF
724	C365	3101058200000	82PF
725	C121	3101051010030	100PF
726	C1320	3101051010030	100PF
727	C288	3101051010030	100PF
728	C307	3101051010030	100PF
729	C309	3101051010030	100PF
730	C326	3101051010030	100PF
731	C33	3101051010030	100PF
732	C335	3101051010030	100PF
733	C339	3101051010030	100PF
734	C34	3101051010030	100PF
735	C340	3101051010030	100PF
736	C341	3101051010030	100PF
737	C342	3101051010030	100PF
738	C343	3101051010030	100PF
739	C344	3101051010030	100PF
740	C345	3101051010030	100PF
741	C346	3101051010030	100PF
742	C347	3101051010030	100PF
743	C348	3101051010030	100PF
744	C349	3101051010030	100PF

No.	Ref. No.	Part No.	Description
745	C350	3101051010030	100PF
746	C351	3101051010030	100PF
747	C352	3101051010030	100PF
748	C353	3101051010030	100PF
749	C354	3101051010030	100PF
750	C355	3101051010030	100PF
751	C357	3101051010030	100PF
752	C358	3101051010030	100PF
753	C359	3101051010030	100PF
754	C360	3101051010030	100PF
755	C361	3101051010030	100PF
756	C378	3101051010030	100PF
757	C385	3101051010030	100PF
758	C390	3101051010030	100PF
759	C409	3101051010030	100PF
760	C410	3101051010030	100PF
761	C411	3101051010030	100PF
762	C412	3101051010030	100PF
763	C413	3101051010030	100PF
764	C414	3101051010030	100PF
765	C415	3101051010030	100PF
766	C416	3101051010030	100PF
767	C417	3101051010030	100PF
768	C418	3101051010030	100PF
769	C419	3101051010030	100PF
770	C420	3101051010030	100PF
771	C426	3101051010030	100PF
772	C427	3101051010030	100PF
773	C428	3101051010030	100PF
774	C429	3101051010030	100PF
775	C430	3101051010030	100PF
776	C431	3101051010030	100PF
777	C435	3101051010030	100PF
778	C440	3101051010030	100PF
779	C441	3101051010030	100PF
780	C442	3101051010030	100PF
781	C443	3101051010030	100PF
782	C444	3101051010030	100PF
783	C445	3101051010030	100PF
784	C446	3101051010030	100PF
785	C447	3101051010030	100PF
786	C448	3101051010030	100PF
787	C449	3101051010030	100PF
788	C450	3101051010030	100PF

No.	Ref. No.	Part No.	Description
789	C451	3101051010030	100PF
790	C452	3101051010030	100PF
791	C453	3101051010030	100PF
792	C454	3101051010030	100PF
793	C455	3101051010030	100PF
794	C456	3101051010030	100PF
795	C463	3101051010030	100PF
796	C465	3101051010030	100PF
797	C466	3101051010030	100PF
798	C467	3101051010030	100PF
799	C468	3101051010030	100PF
800	C469	3101051010030	100PF
801	C470	3101051010030	100PF
802	C472	3101051010030	100PF
803	C510	3101051010030	100PF
804	C516	3101051010030	100PF
805	C517	3101051010030	100PF
806	C518	3101051010030	100PF
807	C6130	3101051010030	100PF
808	C6166	3101051010030	100PF
809	C721	3101051010030	100PF
810	C722	3101051010030	100PF
811	C738	3101051010030	100PF
812	C739	3101051010030	100PF
813	C76	3101051010030	100PF
814	C763	3101051010030	100PF
815	C764	3101051010030	100PF
816	C765	3101051010030	100PF
817	C766	3101051010030	100PF
818	C767	3101051010030	100PF
819	C769	3101051010030	100PF
820	C77	3101051010030	100PF
821	C90	3101051010030	100PF
822	C93	3101051010030	100PF
823	C6157	3101061010010	100PF
824	C852	3101061010010	100PF
825	C909	3101061010010	100PF
826	C891	3101051210000	120PF
827	C899	3101051210000	120PF
828	C875	3101051510000	150PF
829	C847	3101061510000	150PF
830	C848	3101061510000	150PF
831	C716	3101061810010	180PF
832	C100	3101052210010	220PF

No.	Ref. No.	Part No.	Description
833	C1000	3101052210010	220PF
834	C147	3101052210010	220PF
835	C150	3101052210010	220PF
836	C156	3101052210010	220PF
837	C160	3101052210010	220PF
838	C184	3101052210010	220PF
839	C186	3101052210010	220PF
840	C194	3101052210010	220PF
841	C197	3101052210010	220PF
842	C23	3101052210010	220PF
843	C247	3101052210010	220PF
844	C250	3101052210010	220PF
845	C254	3101052210010	220PF
846	C265	3101052210010	220PF
847	C269	3101052210010	220PF
848	C270	3101052210010	220PF
849	C271	3101052210010	220PF
850	C272	3101052210010	220PF
851	C273	3101052210010	220PF
852	C28	3101052210010	220PF
853	C280	3101052210010	220PF
854	C29	3101052210010	220PF
855	C421	3101052210010	220PF
856	C423	3101052210010	220PF
857	C424	3101052210010	220PF
858	C425	3101052210010	220PF
859	C432	3101052210010	220PF
860	C433	3101052210010	220PF
861	C434	3101052210010	220PF
862	C436	3101052210010	220PF
863	C437	3101052210010	220PF
864	C46	3101052210010	220PF
865	C52	3101052210010	220PF
866	C6	3101052210010	220PF
867	C6103	3101052210010	220PF
868	C6105	3101052210010	220PF
869	C6106	3101052210010	220PF
870	C6107	3101052210010	220PF
871	C6144	3101052210010	220PF
872	C6159	3101052210010	220PF
873	C704	3101052210010	220PF
874	C883	3101052210010	220PF
875	C890	3101052210010	220PF
876	C895	3101052210010	220PF

No.	Ref. No.	Part No.	Description
877	C896	3101052210010	220PF
878	C897	3101052210010	220PF
879	C898	3101052210010	220PF
880	C921	3101052210010	220PF
881	C242	3101062210000	220PF
882	C245	3101062210000	220PF
883	C808	3101062210000	220PF
884	C809	3101062210000	220PF
885	C822	3101062210000	220PF
886	C845	3101062210000	220PF
887	C853	3101062210000	220PF
888	C877	3101062210000	220PF
889	C878	3101062210000	220PF
890	C887	3101062210000	220PF
891	C892	3101062210000	220PF
892	C99	3101052710000	270PF
893	C501	3101053310020	330PF
894	C911	3101053310020	330PF
895	C1001	3101054710010	470PF
896	C1003	3101054710010	470PF
897	C1015	3101054710010	470PF
898	C142	3101054710010	470PF
899	C148	3101054710010	470PF
900	C21	3101054710010	470PF
901	C50	3101054710010	470PF
902	C6102	3101054710010	470PF
903	C6118	3101054710010	470PF
904	C6146	3101054710010	470PF
905	C6148	3101054710010	470PF
906	C6151	3101054710010	470PF
907	C706	3101054710010	470PF
908	C717	3101054710010	470PF
909	C727	3101054710010	470PF
910	C746	3101054710010	470PF
911	C8	3101054710010	470PF
912	C945	3101054710010	470PF
913	C811	3101064710000	470PF
914	C817	3101064710000	470PF
915	C843	3101064710000	470PF
916	C827	3101084710010	470PF
917	C850	3101084710010	470PF
918	C885	3101084710010	470PF
919	C893	3101374710000	470PF
920	C1	3101051020010	1000PF

No.	Ref. No.	Part No.	Description
921	C1002	3101051020010	1000PF
922	C1010	3101051020010	1000PF
923	C337	3101051020010	1000PF
924	C338	3101051020010	1000PF
925	C513	3101051020010	1000PF
926	C60	3101051020010	1000PF
927	C6108	3101051020010	1000PF
928	C710	3101051020010	1000PF
929	C728	3101051020010	1000PF
930	C75	3101051020010	1000PF
931	C79	3101051020010	1000PF
932	C82	3101051020010	1000PF
933	C910	3101051020010	1000PF
934	C937	3101051020010	1000PF
935	C944	3101051020010	1000PF
936	C96	3101051020010	1000PF
937	C815	3101061020040	1000PF
938	C839	3101061020040	1000PF
939	C801	3101081020010	1000PF
940	C503	3101051820000	1800PF
941	C502	3101053320010	3300PF
942	C802	3101063320000	3300PF
943	C889	3101063320000	3300PF
944	C916	3101063320000	3300PF
945	C943	3101063320000	3300PF
946	C713	3101053920000	3900PF
947	C863	3101064720000	4700PF
948	C199	3101051030020	0.01UF
949	C235	3101051030020	0.01UF
950	C260	3101051030020	0.01UF
951	C261	3101051030020	0.01UF
952	C306	3101051030020	0.01UF
953	C381	3101051030020	0.01UF
954	C384	3101051030020	0.01UF
955	C399	3101051030020	0.01UF
956	C506	3101051030020	0.01UF
957	C507	3101051030020	0.01UF
958	C58	3101051030020	0.01UF
959	C6147	3101051030020	0.01UF
960	C6155	3101051030020	0.01UF
961	C6178	3101051030020	0.01UF
962	C701	3101051030020	0.01UF
963	C702	3101051030020	0.01UF
964	C725	3101051030020	0.01UF

No.	Ref. No.	Part No.	Description
965	C736	3101051030020	0.01UF
966	C80	3101051030020	0.01UF
967	C95	3101051030020	0.01UF
968	C97	3101051030020	0.01UF
969	C952	3101061030010	0.01UF
970	C913	3101061830000	0.018UF
971	C930	3101061830000	0.018UF
972	C246	3101052230000	0.022UF
973	C880	3101064730000	0.047UF
974	C122	3101065630000	0.056UF
975	C894	3101051830000	0.1UF
976	C1006	3101051040010	0.1UF
977	C141	3101051040010	0.1UF
978	C149	3101051040010	0.1UF
979	C163	3101051040010	0.1UF
980	C167	3101051040010	0.1UF
981	C195	3101051040010	0.1UF
982	C232	3101051040010	0.1UF
983	C233	3101051040010	0.1UF
984	C236	3101051040010	0.1UF
985	C239	3101051040010	0.1UF
986	C24	3101051040010	0.1UF
987	C240	3101051040010	0.1UF
988	C243	3101051040010	0.1UF
989	C248	3101051040010	0.1UF
990	C256	3101051040010	0.1UF
991	C258	3101051040010	0.1UF
992	C267	3101051040010	0.1UF
993	C274	3101051040010	0.1UF
994	C285	3101051040010	0.1UF
995	C30	3101051040010	0.1UF
996	C308	3101051040010	0.1UF
997	C311	3101051040010	0.1UF
998	C321	3101051040010	0.1UF
999	C323	3101051040010	0.1UF
1000	C329	3101051040010	0.1UF
1001	C334	3101051040010	0.1UF
1002	C336	3101051040010	0.1UF
1003	C356	3101051040010	0.1UF
1004	C379	3101051040010	0.1UF
1005	C380	3101051040010	0.1UF
1006	C382	3101051040010	0.1UF
1007	C383	3101051040010	0.1UF
1008	C386	3101051040010	0.1UF

No.	Ref. No.	Part No.	Description
1009	C387	3101051040010	0.1UF
1010	C388	3101051040010	0.1UF
1011	C389	3101051040010	0.1UF
1012	C391	3101051040010	0.1UF
1013	C392	3101051040010	0.1UF
1014	C393	3101051040010	0.1UF
1015	C394	3101051040010	0.1UF
1016	C398	3101051040010	0.1UF
1017	C400	3101051040010	0.1UF
1018	C407	3101051040010	0.1UF
1019	C422	3101051040010	0.1UF
1020	C473	3101051040010	0.1UF
1021	C509	3101051040010	0.1UF
1022	C512	3101051040010	0.1UF
1023	C514	3101051040010	0.1UF
1024	C515	3101051040010	0.1UF
1025	C6104	3101051040010	0.1UF
1026	C6113	3101051040010	0.1UF
1027	C6168	3101051040010	0.1UF
1028	C6169	3101051040010	0.1UF
1029	C6171	3101051040010	0.1UF
1030	C6173	3101051040010	0.1UF
1031	C6175	3101051040010	0.1UF
1032	C6179	3101051040010	0.1UF
1033	C6180	3101051040010	0.1UF
1034	C7	3101051040010	0.1UF
1035	C705	3101051040010	0.1UF
1036	C707	3101051040010	0.1UF
1037	C708	3101051040010	0.1UF
1038	C709	3101051040010	0.1UF
1039	C712	3101051040010	0.1UF
1040	C720	3101051040010	0.1UF
1041	C729	3101051040010	0.1UF
1042	C733	3101051040010	0.1UF
1043	C735	3101051040010	0.1UF
1044	C737	3101051040010	0.1UF
1045	C740	3101051040010	0.1UF
1046	C741	3101051040010	0.1UF
1047	C744	3101051040010	0.1UF
1048	C756	3101051040010	0.1UF
1049	C83	3101051040010	0.1UF
1050	C85	3101051040010	0.1UF
1051	C86	3101051040010	0.1UF
1052	C87	3101051040010	0.1UF

No.	Ref. No.	Part No.	Description
1053	C89	3101051040010	0.1UF
1054	C947	3101051040010	0.1UF
1055	C950	3101051040010	0.1UF
1056	C955	3101051040010	0.1UF
1057	C958	3101051040010	0.1UF
1058	C967	3101051040010	0.1UF
1059	C968	3101051040010	0.1UF
1060	C969	3101051040010	0.1UF
1061	C98	3101051040010	0.1UF
1062	C1016	3101061040010	0.1UF
1063	C123	3101061040010	0.1UF
1064	C132	3101061040010	0.1UF
1065	C283	3101061040010	0.1UF
1066	C289	3101061040010	0.1UF
1067	C6193	3101061040010	0.1UF
1068	C748	3101061040010	0.1UF
1069	C829	3101061040010	0.1UF
1070	C854	3101061040010	0.1UF
1071	C868	3101061040010	0.1UF
1072	C907	3101061040010	0.1UF
1073	C927	3101061040010	0.1UF
1074	C935	3101061040010	0.1UF
1075	C936	3101061040010	0.1UF
1076	C939	3101061040010	0.1UF
1077	C942	3101061040010	0.1UF
1078	C948	3101061040010	0.1UF
1079	C963	3101061040010	0.1UF
1080	L6122	3101061040010	0.1UF
1081	L6126	3101061040010	0.1UF
1082	C1005	3101061040010	0.1UF
1083	C1007	3101061040010	0.1UF
1084	C64	3101061040010	0.1UF
1085	C66	3101061040010	0.1UF
1086	C67	3101061040010	0.1UF
1087	C68	3101061040010	0.1UF
1088	C69	3101061040010	0.1UF
1089	C70	3101061040010	0.1UF
1090	C72	3101061040010	0.1UF
1091	C74	3101061040010	0.1UF
1092	C78	3101061040010	0.1UF
1093	C84	3101061040010	0.1UF
1094	C88	3101061040010	0.1UF
1095	C91	3101061040010	0.1UF
1096	C94	3101061040010	0.1UF

No.	Ref. No.	Part No.	Description
1097	C941	3101062240050	0.22UF
1098	C438	3101054740000	0.47UF
1099	C439	3101054740000	0.47UF
1100	C287	3101064740000	0.47UF
1101	C715	3101064740000	0.47UF
1102	C255	3101051050000	1UF
1103	C276	3101051050000	1UF
1104	C305	3101051050000	1UF
1105	C310	3101051050000	1UF
1106	C719	3101051050000	1UF
1107	C962	3101051050000	1UF
1108	C238	3101061050020	1UF
1109	C249	3101061050020	1UF
1110	C251	3101061050020	1UF
1111	C252	3101061050020	1UF
1112	C253	3101061050020	1UF
1113	C257	3101061050020	1UF
1114	C259	3101061050020	1UF
1115	C262	3101061050020	1UF
1116	C263	3101061050020	1UF
1117	C264	3101061050020	1UF
1118	C266	3101061050020	1UF
1119	C268	3101061050020	1UF
1120	C277	3101061050020	1UF
1121	C278	3101061050020	1UF
1122	C279	3101061050020	1UF
1123	C281	3101061050020	1UF
1124	C282	3101061050020	1UF
1125	C290	3101061050020	1UF
1126	C291	3101061050020	1UF
1127	C294	3101061050020	1UF
1128	C298	3101061050020	1UF
1129	C299	3101061050020	1UF
1130	C396	3101061050020	1UF
1131	C6100	3101061050020	1UF
1132	C6145	3101061050020	1UF
1133	C6149	3101061050020	1UF
1134	C6185	3101061050020	1UF
1135	C6190	3101061050020	1UF
1136	C742	3101061050020	1UF
1137	C754	3101061050020	1UF
1138	C900	3101061050020	1UF
1139	C901	3101061050020	1UF
1140	C905	3101061050020	1UF

No.	Ref. No.	Part No.	Description
1141	C906	3101061050020	1UF
1142	C908	3101061050020	1UF
1143	C923	3101061050020	1UF
1144	C924	3101061050020	1UF
1145	C925	3101061050020	1UF
1146	C938	3101061050020	1UF
1147	C946	3101061050020	1UF
1148	C966	3101061050020	1UF
1149	C750	3101071050020	1UF
1150	C1009	3104071050070	1UF
1151	C71	3104071050070	1UF
1152	C920	3101062250000	2.2UF
1153	C932	3101062250000	2.2UF
1154	C934	3101062250000	2.2UF
1155	C965	3101062250000	2.2UF
1156	C912	3101072250030	2.2UF
1157	C292	3101064750030	4.7UF
1158	C136	3101074750010	4.7UF
1159	C275	3101071060010	10UF
1160	C408	3101071060010	10UF
1161	C926	3101071060010	10UF
1162	C234	3101081060010	10UF
1163	C286	3101081060010	10UF
1164	C807	3101081060010	10UF
1165	C956	3101081060010	10UF
1166	C957	3101081060010	10UF
1167	C980	3101081060010	10UF
1168	C981	3101081060010	10UF
1169	C1013	3104071060070	10UF
1170	C293	3104071060070	10UF
1171	C401	3104071060070	10UF
1172	C402	3104071060070	10UF
1173	C508	3104071060070	10UF
1174	C511	3104071060070	10UF
1175	C519	3104071060070	10UF
1176	C520	3104071060070	10UF
1177	C726	3104071060070	10UF
1178	C755	3104071060070	10UF
1179	C917	3104071060070	10UF
1180	C929	3104071060070	10UF
1181	C928	3104081060120	10UF
1182	C951	3104081060120	10UF
1183	C919	3101072260000	22UF
1184	C915	3101082260020	22UF

No.	Ref. No.	Part No.	Description
1185	C933	3101092260010	22UF
1186	C284	3103994760180	47uf
1187	C804	3103994760180	47uf
1188	C914	3103994760180	47uf
1189	L814	3212106569000	5.6nH
1190	L105	3237199080000	8nH
1191	L114	3237199080000	8nH
1192	L811	3217106829010	8.2nH
1193	C6194	3212106100000	10nH
1194	L6103	3212106100000	10nH
1195	L832	3212106100000	10nH
1196	L124	3237199120000	12.5nH
1197	L137	3237199120000	12.5nH
1198	L122	3210306150000	15nH
1199	L123	3210306150000	15nH
1200	L128	3210306150000	15nH
1201	L136	3210306150000	15nH
1202	L173	3210306150000	15nH
1203	L2	3210306150000	15nH
1204	L6110	3210306150000	15nH
1205	L171	3210306180000	18nH
1206	L6116	3210306180000	18nH
1207	L6118	3210306180000	18nH
1208	C826	3210306220000	22nH
1209	L6117	3210306220000	22nH
1210	L6119	3210306220000	22nH
1211	L805	3210306220000	22nH
1212	L132	3210306270000	27nH
1213	L135	3210306270000	27nH
1214	L138	3210306270000	27nH
1215	L162	3210306270000	27nH
1216	L166	3210306270000	27nH
1217	L167	3210306270000	27nH
1218	L168	3210306270000	27nH
1219	L169	3210306270000	27nH
1220	L106	3214307270010	27nH
1221	L115	3214307270010	27nH
1222	L139	3210107330000	33nH
1223	L827	3212106390000	39nH
1224	L126	3214307390000	39nH
1225	L6120	3210306470000	47nH
1226	L6102	3210306221000	220nH
1227	L708	3217107221010	220nH
1228	L6125	3210406331000	330nH

No.	Ref. No.	Part No.	Description
1229	L716	3210406331000	330nH
1230	L147	3210406471000	470nH
1231	L151	3210406471000	470nH
1232	L718	3210406471000	470nH
1233	L103	3217607471000	470nH
1234	L107	3217607471000	470nH
1235	L108	3217607471000	470nH
1236	L110	3217607471000	470nH
1237	L112	3217607471000	470nH
1238	L116	3217607471000	470nH
1239	L117	3217607471000	470nH
1240	L118	3217607471000	470nH
1241	L121	3217607471000	470nH
1242	L127	3217607471000	470nH
1243	L129	3217607471000	470nH
1244	L133	3217607471000	470nH
1245	L134	3217607471000	470nH
1246	L140	3217607471000	470nH
1247	L4	3217607471000	470nH
1248	L5	3217607471000	470nH
1249	L154	3213306561000	0.56uH
1250	L713	3213306561000	0.56uH
1251	L6123	3213306821000	0.82uH
1252	L131	3221506601000	Bead
1253	L152	3221506601000	Bead
1254	L6	3221506601000	Bead
1255	L7	3221506601000	Bead
1256	L701	3221506601000	Bead
1257	L702	3221506601000	Bead
1258	L703	3221506601000	Bead
1259	L706	3221506601000	Bead
1260	L707	3221506601000	Bead
1261	L709	3221506601000	Bead
1262	L710	3221506601000	Bead
1263	L711	3221506601000	Bead
1264	L712	3221506601000	Bead
1265	L714	3221506601000	Bead
1266	L8	3221506601000	Bead
1267	L815	3221506601000	Bead
1268	L821	3221506601000	Bead
1269	L822	3221506601000	Bead
1270	L824	3221506601000	Bead
1271	L825	3221506601000	Bead
1272	L9	3221506601000	Bead

No.	Ref. No.	Part No.	Description
1273	R153	3221506601000	Bead
1274	R157	3221506601000	Bead
1275	R179	3221506601000	Bead
1276	R186	3221506601000	Bead
1277	L801	3221513600000	Bead
1278	L802	3221513600000	Bead
1279	L803	3221513600000	Bead
1280	L900	3221513600000	Bead
1281	L916	3221513600000	Bead
1282	L917	3221513600000	Bead
1283	L940	3221513600000	Bead
1284	L232	3221506300000	Bead
1285	L401	3221506300000	Bead
1286	L402	3221506300000	Bead
1287	L403	3221506300000	Bead
1288	L404	3221506300000	Bead
1289	L405	3221506300000	Bead
1290	L406	3221506300000	Bead
1291	L407	3221506300000	Bead
1292	L408	3221506300000	Bead
1293	L409	3221506300000	Bead
1294	L410	3221506300000	Bead
1295	L411	3221506300000	Bead
1296	L412	3221506300000	Bead
1297	L901	3221506300000	Bead
1298	L912	3221506300000	Bead
1299	L913	3221506300000	Bead
1300	R905	3221506300000	Bead
1301	L904	3221506181000	Bead
1302	L908	3221506181000	Bead
1303	L233	3211506101000	Bead
1304	L234	3211506101000	Bead
1305	L235	3211506101000	Bead
1306	L6100	3211506101000	Bead
1307	L6101	3211506101000	Bead
1308	L6114	3211506101000	Bead
1309	L6115	3211506101000	Bead
1310	L6121	3211506101000	Bead
1311	L816	3231083011000	Air-core coil
1312	L804	3231132803000	Air-core coil
1313	L809	3231132803000	Air-core coil
1314	L810	3231132803000	Air-core coil
1315	L813	3231132803000	Air-core coil
1316	L817	3231132803000	Air-core coil

No.	Ref. No.	Part No.	Description
1317	L807	3210306101000	100nH
1318	L806	3213306102000	1uH
1319	L820	3217112102020	1uH
1320	L828	3217112102020	1uH
1321	L1	3213212332000	3.3uH
1322	L156	3213212332000	3.3uH
1323	L715	3213212332000	3.3uH
1324	L717	3212206682000	6.8uH
1325	L903	3213099472000	4.7uH
1326	L931	3213099472000	4.7uH
1327	L902	3217299103000	10uH
1328	L930	3241799103000	10uH
1329	L704	3213212103000	10uH
1330	L705	3213212103000	10uH
1331	D100	3303990000060	Switching diode
1332	D701	3304060300050	Varactor
1333	D101	3304010100220	Varactor
1334	D102	3304010100220	Varactor
1335	D105	3304010100220	Varactor
1336	D106	3304010100220	Varactor
1337	D107	3304010100220	Varactor
1338	D108	3304010100220	Varactor
1339	D109	3304010100220	Varactor
1340	D110	3304010100220	Varactor
1341	D111	3304010100220	Varactor
1342	D112	3304010100220	Varactor
1343	D113	3304010100220	Varactor
1344	D116	3304010100220	Varactor
1345	D117	3304010100220	Varactor
1346	D121	3304010100220	Varactor
1347	D122	3304010100220	Varactor
1348	D125	3304010100220	Varactor
1349	D126	3304010100220	Varactor
1350	D127	3303030100010	Switching diode
1351	D128	3303030100010	Switching diode
1352	D230	3310240000000	ESD protection diode
1353	D231	3310240000000	ESD protection diode
1354	D233	3310240000000	ESD protection diode
1355	D240	3310240000000	ESD protection diode
1356	D402	3310240000000	ESD protection diode
1357	D403	3310240000000	ESD protection diode
1358	D404	3310240000000	ESD protection diode
1359	D405	3310240000000	ESD protection diode
1360	D406	3310240000000	ESD protection diode

No.	Ref. No.	Part No.	Description
1361	D234	3310240200000	ESD protection diode
1362	D236	3310240200000	ESD protection diode
1363	D239	3310240200000	ESD protection diode
1364	D235	3302031100010	Zener diode
1365	D409	3310240000040	ESD protection diode
1366	D237	3310990000090	ESD protection diode
1367	D238	3310990000090	ESD protection diode
1368	D407	3399040600010	ESD protection diode
1369	D408	3399040600010	ESD protection diode
1370	D450	3699037000010	USB protection IC
1371	D601	3307110100080	LED
1372	D702	3304060300010	Varactor
1373	D801	3303210100000	Switching diode
1374	D802	3303210100000	Switching diode
1375	D803	3303030300000	Diode
1376	D804	3303030300000	Diode
1377	D901	3303040400000	Switching diode
1378	D902	3301100300030	Rectifier diode
1379	D904	3301240000000	Schottky diode
1380	D905	3301240000000	Schottky diode
1381	D6100	3303060300010	Switching diode
1382	D906	3303060300010	Switching diode
1383	D907	3303060300010	Switching diode
1384	D909	3303060300010	Switching diode
1385	D911	3303060300010	Switching diode
1386	D910	3302030500010	Zener diode
1387	D915	3303010500290	Switching diode
1388	D805	3302030500030	Zener diode
1389	D917	3302030500030	Zener diode
1390	D6101	3304010100890	Varactor
1391	D6102	3304010100890	Varactor
1392	D6103	3304010100890	Varactor
1393	D6104	3304010100890	Varactor
1394	D6105	3399990000260	Rectifier diode
1395	D6106	3699019000000	Mixer
1396	Q1	3503020000030	N-MOSFET
1397	Q912	3503020000030	N-MOSFET
1398	Q100	3408002000080	NPN transistor
1399	Q103	3408002000080	NPN transistor
1400	Q106	3408002000080	NPN transistor
1401	Q110	3408002000080	NPN transistor
1402	Q101	3403999000000	Transistor
1403	Q105	3403999000000	Transistor
1404	Q108	3403999000000	Transistor

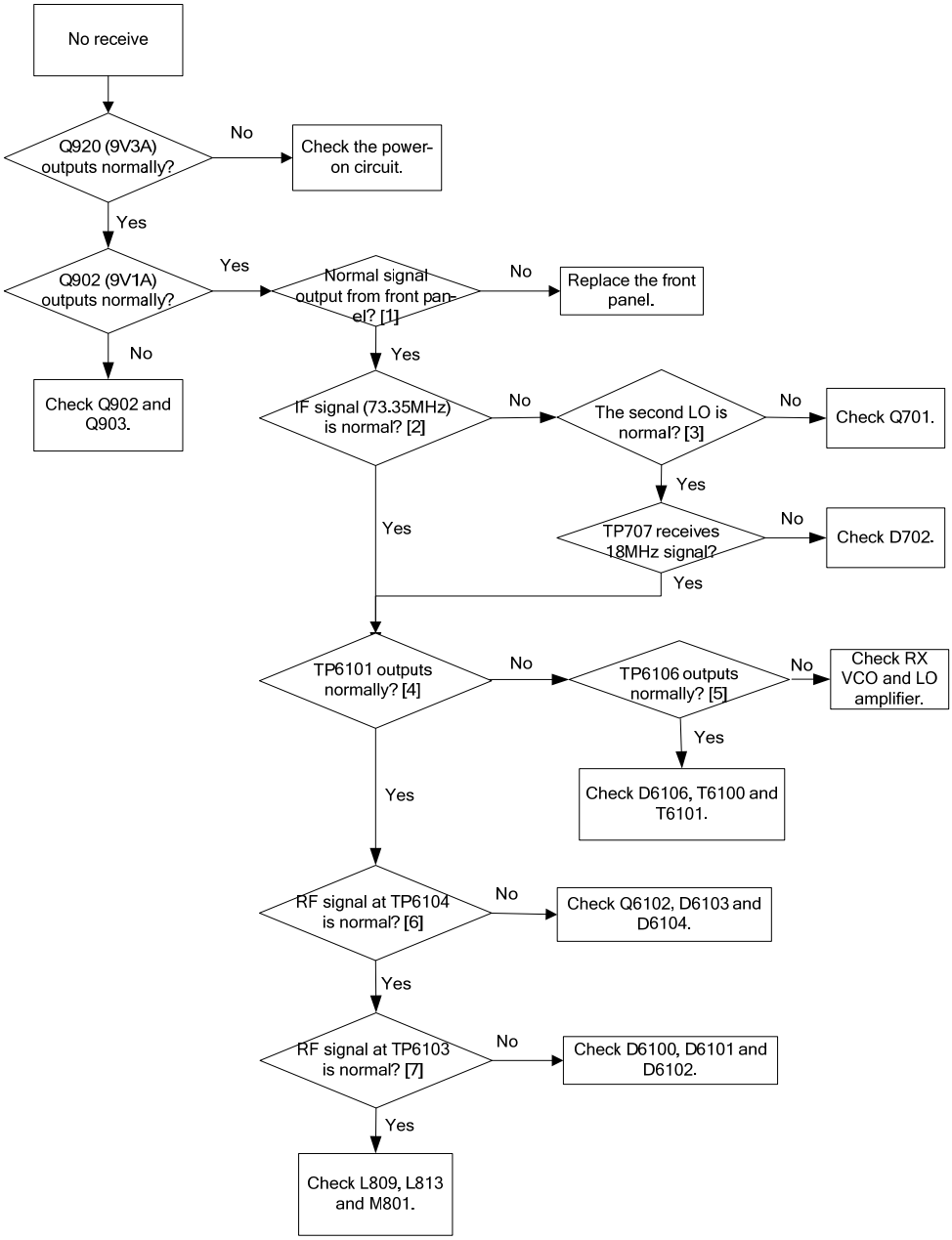
No.	Ref. No.	Part No.	Description
1405	Q112	3403999000000	Transistor
1406	Q116	3403999000000	Transistor
1407	Q117	3403999000000	Transistor
1408	Q102	3401002000990	NPN transistor
1409	Q111	3401002000990	NPN transistor
1410	Q104	3403003000060	NPN transistor
1411	Q702	3403003000060	NPN transistor
1412	Q107	3404006000000	NPN transistor
1413	Q109	3404006000000	NPN transistor
1414	Q6104	3404006000000	NPN transistor
1415	Q6105	3404006000000	NPN transistor
1416	Q230	3499000000150	Transistor
1417	Q231	3499000000150	Transistor
1418	Q232	3499000000150	Transistor
1419	Q233	3499000000150	Transistor
1420	Q234	3499000000150	Transistor
1421	Q235	3499000000150	Transistor
1422	Q6100	3499000000150	Transistor
1423	Q905	3499000000150	Transistor
1424	Q322	3403008000010	Transistor
1425	Q323	3403008000010	Transistor
1426	Q401	3403008000010	Transistor
1427	Q402	3403008000010	Transistor
1428	Q403	3403008000010	Transistor
1429	Q404	3403008000010	Transistor
1430	Q405	3403008000010	Transistor
1431	Q413	3403008000010	Transistor
1432	Q811	3403008000010	Transistor
1433	Q812	3403008000010	Transistor
1434	Q813	3403008000010	Transistor
1435	Q903	3403008000010	Transistor
1436	Q908	3403008000010	Transistor
1437	Q913	3403008000010	Transistor
1438	Q914	3403008000010	Transistor
1439	Q922	3403008000010	Transistor
1440	Q923	3403008000010	Transistor
1441	Q406	3414999000000	Transistor
1442	Q407	3414999000000	Transistor
1443	Q408	3414999000000	Transistor
1444	Q409	3414999000000	Transistor
1445	Q410	3414999000000	Transistor
1446	Q411	3414999000000	Transistor
1447	Q412	3414999000000	Transistor
1448	Q701	3408002000000	NPN transistor

No.	Ref. No.	Part No.	Description
1449	Q6102	3404999000000	NPN transistor
1450	Q6103	3404999000000	NPN transistor
1451	Q801	3404999000000	NPN transistor
1452	Q804	3504990000030	MOSFET
1453	Q805	3504990000010	MOSFET
1454	Q810	3403002000000	PNP transistor
1455	Q902	3403002000000	PNP transistor
1456	Q906	3414001000020	NPN transistor
1457	Q910	3414001000020	NPN transistor
1458	Q909	3403002000010	PNP transistor
1459	Q6101	3403014000020	Transistor
1460	T6100	3244599189000	4BLH
1461	T6101	3244599189000	4BLH
1462	U100	3604019000000	PLL IC
1463	U101	3616059000000	Switch IC
1464	U102	3616059000000	Switch IC
1465	U201	3602017006350	Audio amplifier
1466	U231	3613010000000	Baseband processing IC
1467	U233	3612002000020	Memory
1468	U235	3605010000020	Operational amplifier
1469	U236	3605010000020	Operational amplifier
1470	U237	3616010000000	Switch IC
1471	U238	3605008005070	Operational amplifier
1472	U914	3605008005070	Operational amplifier
1473	U302	3610010000010	U302
1474	U401	3699053000000	SmartSwitch
1475	U500	3606010000010	D/A conversion IC
1476	U701	3603999000000	IF processor
1477	U702	3608006000000	Power management IC
1478	U900	3608006000000	Power management IC
1479	U901	3608006000000	Power management IC
1480	U909	3608006000000	Power management IC
1481	U703	3608015000060	Power management IC
1482	U905	3608015000060	Power management IC
1483	U915	3608015000060	Power management IC
1484	U902	3608053000010	Power management IC
1485	U903	3608015000170	Power management IC
1486	U918	3608015000210	Power management IC
1487	U919	3608010006230	Power management IC
1488	U801	3605025000020	Operational amplifier
1489	U802	3605002054590	Operational amplifier
1490	U6000	3605002057090	Operational amplifier
1491	U803	3605002057090	Operational amplifier
1492	U910	3609010000170	Reset IC

No.	Ref. No.	Part No.	Description
1493	U917	3609006003050	Reset IC
1494	X100	3701019250030	TCXO (19.2MHz)
1495	X302	3701019250040	Temperature compensated crystal oscillator(19.2MHz)
1496	X375	3701327610060	Crystal
1497	F900	4099000000050	Fuse
1498	J400	5201020000020	Connector
1499	J404	5206040200010	FFC connector
1500	PCB	41MD7801000F0	PCB
1501		6201928000000	VCO shielding mask
1502		6202010000000	APC shielding mask
1503	L819	3233099470000	47nH
1504	C752	3101074750000	4.7UF
1505	C718	3101051050160	1uF
1506	C237	3101054740020	0.47uF
1507	Q400	3413001000010	PNP transistor
1508	D900	3302060000000	Zener diode
1509	Q921	3404999000020	NPN transistor
1510	U232	3612044000010	Memory
1511	U327	3607082000040	Logic IC
1512	U328	3607082000040	Logic IC
1513	R6121	3001053600000	36Ω
1514	R6124	3001051510000	150Ω
1515	R6125	3001051510000	150Ω
1516	Z6100	3802733540030	Crystal filter

11.8 Troubleshooting Flow Chart

Receiver Circuit



Description of Normal Situations:

[1] During sensitivity test, use a communication test set to demodulate the audio signal (TP4012 and TP4016). If the signal is demodulated normally, it is concluded that the front panel is defective.

[2] Use the communication test set to input a 73.35MHz IF signal at the mixer, and see whether it can be processed normally afterwards.

[3] Use a spectrum analyzer to check whether TP704 can output the second LO signal (71.1MHz).

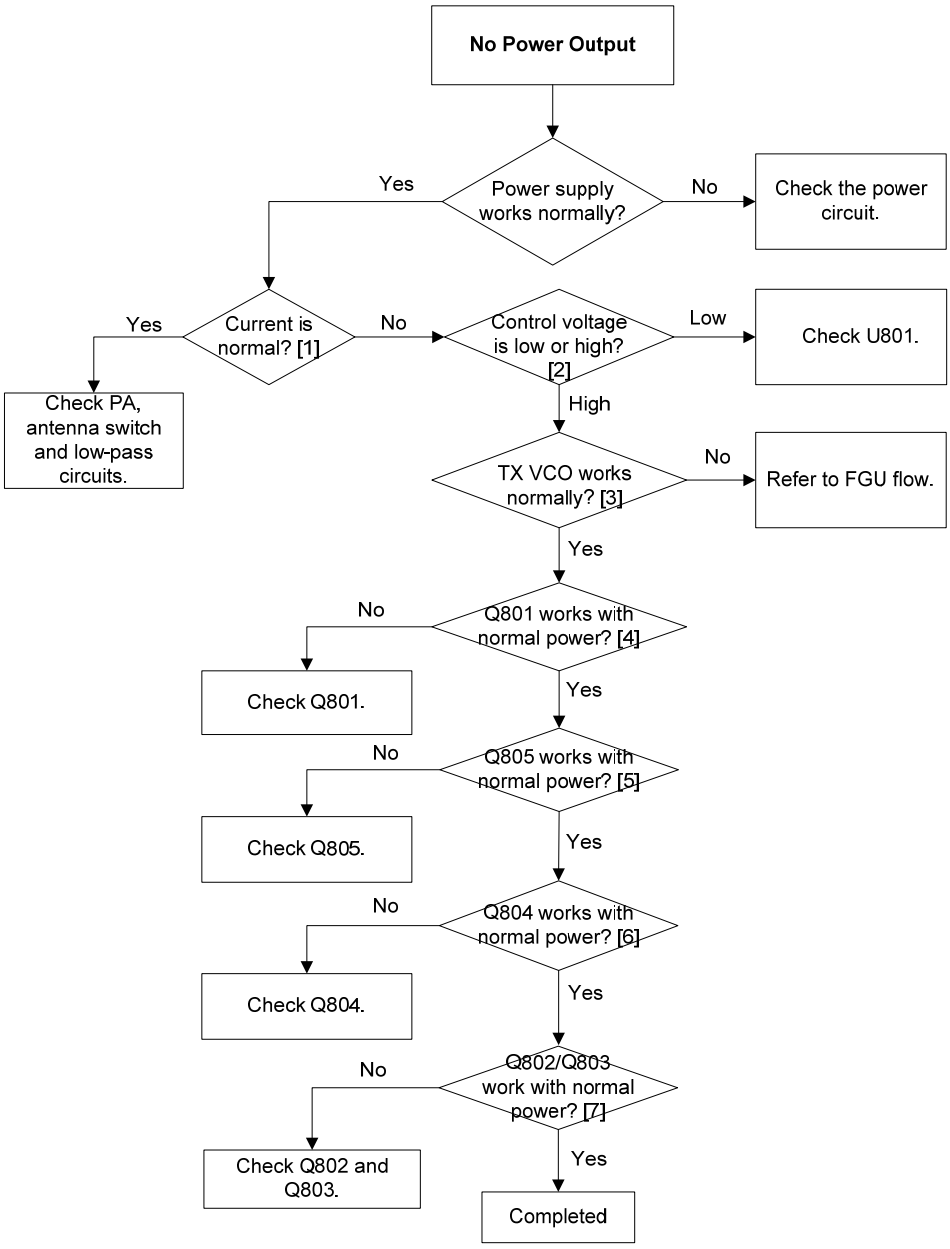
[4] Use the communication test set to apply an RF signal of -100dBm, and test the sensitivity.

[5] Use a spectrum analyzer to test the LO signal received by TP6106. If its strength is about 18dBm, go to check the mixer; otherwise, check the VCO.

[6] Use the communication test set to apply an RF signal of -110dBm at TP6104, and test the sensitivity.

[7] Use the communication test set to apply an RF signal of -110dBm at TP6103, and test the sensitivity.

Transmitter Circuit



Description of Normal Situations:

[1] The current in analog mode is above 6A under 45W power supply and above 1A under 5W. However, in digital mode, the current will be reduced by 50%.

[2] The APC voltage should be above 2V at TP811.

[3] Check whether there is an appropriate TX LO signal at TP803.

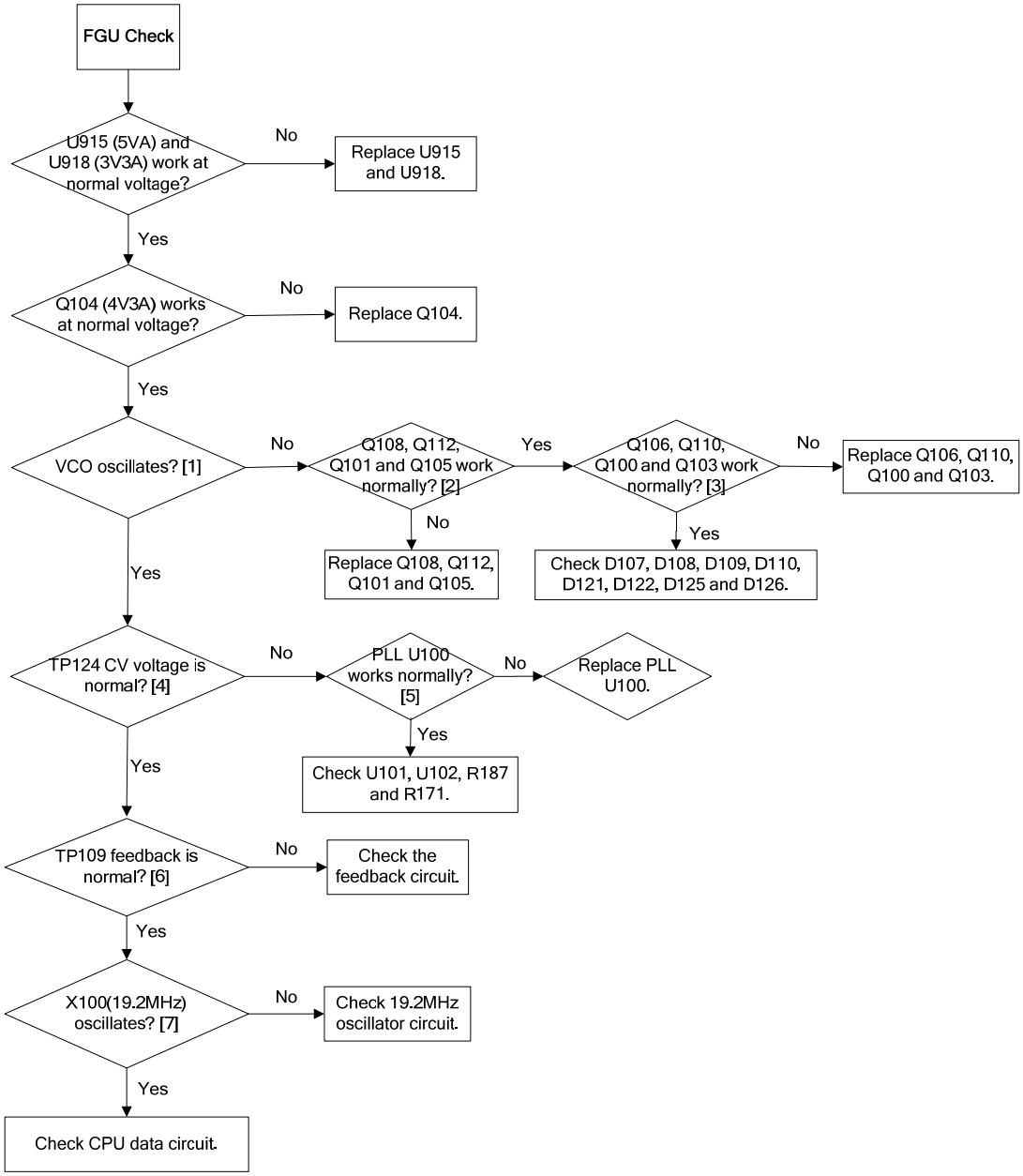
[4] Check whether the gain is 16dB and the input signal is 0dBm at Q801.

[5] Check whether the gain is 15dB and the input signal is 0dBm at Q805.

[6] Check whether the gain is 11dB and the input signal is 0dBm at Q804.

[7] Check whether the gain is 10dB and the input signal is 0dBm at Q802 and Q803.

FGU


FGU Check
U915 (5VA) and U918 (3V3A) work at normal voltage?
No
Replace U915 and U918.
Yes
Q104 (4V3A) works at normal voltage?
No
Replace Q104.
Yes
VCO oscillates? [1]
No
Q108, Q112, Q101 and Q105 work normally? [2]
Yes
Q106, Q110, Q100 and Q103 work normally? [3]
No
Replace Q106, Q110, Q100 and Q103.
No
Replace Q108, Q112, Q101 and Q105.
Yes
Check D107, D108, D109, D110, D121, D122, D125 and D126.
Yes
TP124 CV voltage is normal? [4]
No
PLL U100 works normally? [5]
No
Replace PLL U100.
Yes
Check U101, U102, R187 and R171.
Yes
TP109 feedback is normal? [6]
No
Check the feedback circuit.
Yes
X100(19.2MHz) oscillates? [7]
No
Check 19.2MHz oscillator circuit.
Yes
Check CPU data circuit.

Description of Normal Situations:

[1] Detect the oscillation frequency of RX TP123 and TX TP111 using a spectrum analyzer.

[2] Check whether switches (Q108, Q112, Q101 and Q105) are turned on and output 3.6V.

[3] Check whether the emitter voltage of the four transistors (Q106, Q110, Q100 and Q103) is about 1.8V under normal RX/TX status.

[4] Check the CV of TP124. The normal value should range from 0.5V to 4.5V.

[5] Check whether U100 is supplied by 5V and 3.3V normally.

[6] Check whether the power from TP109 to PLL is about -15dBm.

[7] Check whether TP100 outputs 19.2MHz signal.

12.UHF1 (400-470MHz 45W) Information

12.1 Transmitter Circuit

The transmitter circuit is composed of power amplifier circuit and power control circuit. The former is used to amplify the VCO signal to the desired output power level, while the latter can keep the output power at the desired level, so as to protect the power amplifier from damage caused by over heat, antenna mismatch, and out-of-range voltage (over voltage or under voltage may result in damage to Q801, Q805, Q804, Q802 and Q803).

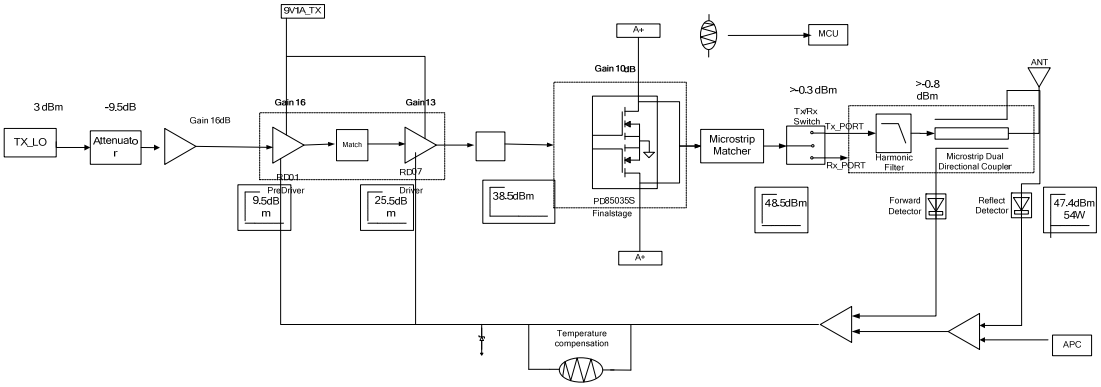


Figure 12-1 Diagram of Transmitter Circuit

12.1.1 Power Amplifier

The 4-stage power amplifier amplifies the signal output from VCO to the required output power level. The first stage is a buffer amplifier circuit with fixed gain; the second stage is a pre-driver power amplifier circuit with variable gain (formed by Q805); the third stage is a driver power amplifier circuit with variable gain (formed by Q804); and the final stage is the final power amplifier circuit with fixed gain (formed by Q802 and Q803). In addition, this power amplifier contains a TX/RX switch and a low-pass filter.

12.1.2 TX Buffer Amplifier

The first stage (Q801) provides about 16dB power gain, and adjusts its bias circuit to get a quiescent bias current of 28mA (for Q801). Power supply for the switching transistor Q810 is controlled by TX signal (enabled by antenna switch) so as to further control the power supply for the whole circuit.

12.1.3 Pre-driver Power Amplifier

The pre-driver power amplifier is formed by Q805, with variable gain controlled by voltage VGG. The input matching circuit is composed of C826, L826, L814, C843 and R824.

12.1.4 Driver Power Amplifier

The driver power amplifier is formed by Q804, with variable gain controlled by voltage VGG. The

maximum output power is 38.5dBm, and the maximum variable gain is 11dB.

12.1.5 Final Power Amplifier

The final power amplifier comprises Q802 and Q803, with the maximum output power of 48.5dBm, and the maximum variable gain of 10dB. The input matching circuit is composed of C815, C839, R804, R806, R807, R813, R818 and R861, while the power combining circuit is composed of C820, C8330, C831, C819, C812, C841 and C842.

12.1.6 Antenna Switch

The antenna switch is used to switch between the transmitter circuit and the receiver circuit.

In TX mode, the switching transistor Q810 is controlled by TX signal, so as to supply 9V 3A to the PIN diodes D801 and D802. Quiescent bias current of the PIN diode is controlled by the resistors R821 and R825. In this mode, D801 and D802 are turned on; RF signals are applied to the low-pass filter (composed of C871, C816, C836, C837, C838, L809, L813, and L810) and then transmitted via the antenna port.

In RX mode, TX signal controls the switching transistor Q810, to further control the power supply for the PIN diodes D801 and D802, which are not applied with DC bias current. When the two PIN diodes are turned off, signals feed into the RX path through the low-pass filter (composed of L871, C852 and C862).

12.1.7 Low-pass Filter

A low-pass filter that consists of inductors L809, L813 and L810, and capacitors C836, C837, C830, is used to attenuate harmonic energy from the transmitter.

12.1.8 Directional Coupler

A directional coupler that consists of microstrip directional coupler, D803, D804 and etc, is used to detect both forward and reverse directed power of the transmitter. The forward power is coupled to the diode D803, and the voltage is applied to the power control circuit (U801). Then the voltage VGG is output to control the gate voltage of pre-driver and driver PA, ensuring a constant power output.

The directional coupler can adjust the TX power and detect the VSWR load. The reverse power is coupled to D804. The voltage is applied to U802 and then feeds into U302 for detection

12.1.9 Output Power Control

The TX power is controlled by U801. The forward power is applied to the directional coupler, to output a voltage that can represent the forward power. The voltage together with the preset voltage feeds to U801 to output a voltage VGG, which can control both gate voltage and gain of Q804 and Q805, ensuring a constant power output.

12.1.10 Thermal and Over-voltage Protections

The circuit consists of thermistor RT804 and resistor R884. The output voltage is proportional to the detected temperature. Both the voltage used for temperature detection and the threshold voltage are fed into the operational amplifier U803, to output a voltage signal that is in proportion to the detected temperature. Afterwards, the voltage is applied to software for judgment, and then the preset voltage will be subsequently changed to reduce the TX power, and to protect the PA from over-heating.

12.1.11 Pressure Pad Switch

The power control circuit includes a pressure pad switch SW1, which is controlled by the conductive rubber part mounted on the top cover. If the switch is turned off, VGG will become low, and no power will be output from PA. Otherwise, PA will work normally.

12.2 Receiver Circuit

The receiver utilizes double conversion superheterodyne technique. The first IF is 73.35MHz and the second IF is 2.25MHz. The first local oscillator signal is from the PLL circuit U100, and the second local oscillator signal (71.1MHz) from the PLL circuit U701. The major units are BPF, LNA, mixer, IF filter, IF amplifier and IF processor.

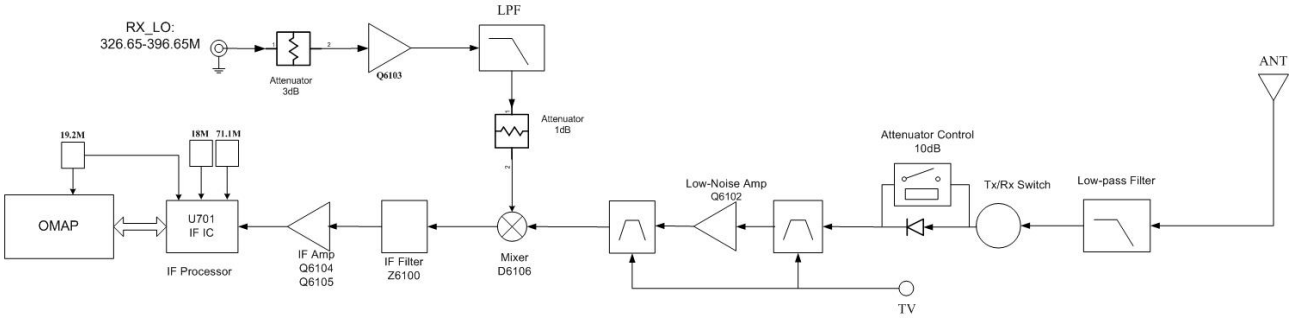


Figure 12-2 Diagram of Receiver Circuit

12.2.1 Receiver Front-end

RF signals feed to the low-pass filter to remove out-of-band signals, and are applied to the two-stage electrically tunable band-pass filter to get useful signals. After passing through the RF band-pass filter and LNA (Q6102), the RF signals together with the first LO signal feed to the mixer for the first frequency conversion, to generate the first IF signal (73.35MHz). The mixer that employs the passive diode can ensure good dynamic range and port isolation. The LO signal (3-5dBm) from the VCO feeds to Q6103 to get a gain (17dB). The first LO signals (73.35MHz) pass through the crystal filter (Z6100) to remove out-of-band spurious signals, and then feed to the two-stage IF amplifier circuit (composed of Q6133 and Q6134) for amplification. Finally the amplified signals go to the IF IC for processing

12.2.2 Receiver Back-end

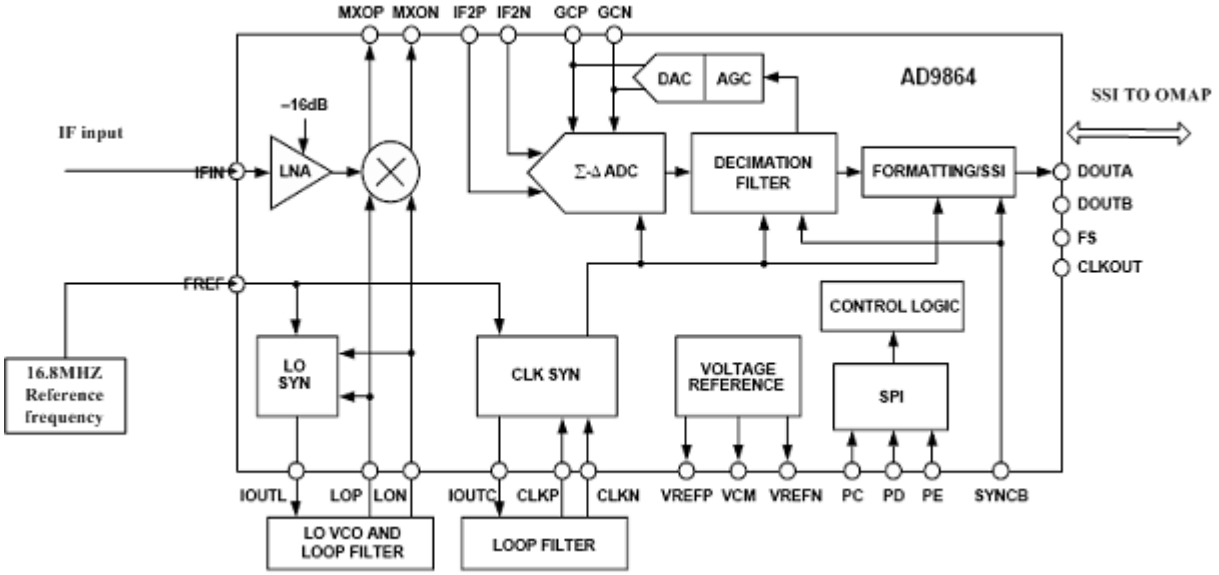


Figure 12-3 Diagram of IF Processor

The first IF signal (73.35MHz) output by the IF amplifier goes into IF IC via Pin 47, where the signal is converted to the second IF signal (2.25MHz). Then the un-demodulated digital I/Q signal output from the SSI interface is sent to U302 for demodulation. IF IC employs a reference frequency of 19.2MHz and shares the crystal with U302. The second LO VCO consists of the external transistor, varactor and some other components, to provide the second LO signal. The 18MHz clock frequency is generated by the LC resonance loop (D702, L715 and C745).

DSP (U302) gets the audio signal from IF IC (U701). Then this signal goes through U302 to output data signal, which is sent to U231 and PIN44 (SSI_DI) for digital-to-analog conversion. Finally, the output analog audio signal will be subjected to gain control, and then fed to the speaker.

12.3 Frequency Generation Unit (FGU)

12.3.1 PLL Synthesizer

The PLL synthesizer that consists of the reference oscillator (X100), PLL IC (U100) and VCO, is utilized to supply excitation signal source to the transmitter, and local oscillator signal to the receiver.

12.3.2 Reference Oscillator

X100 is a 19.2MHz TCXO, and its reference frequency is calibrated by the digital-to-analog converter (U500) for accuracy.

12.3.3 PLL IC

The PLL IC (U100) is a fractional frequency divider. The logic IC U101 and U102 work with the PLL IC (U100) to achieve locking.

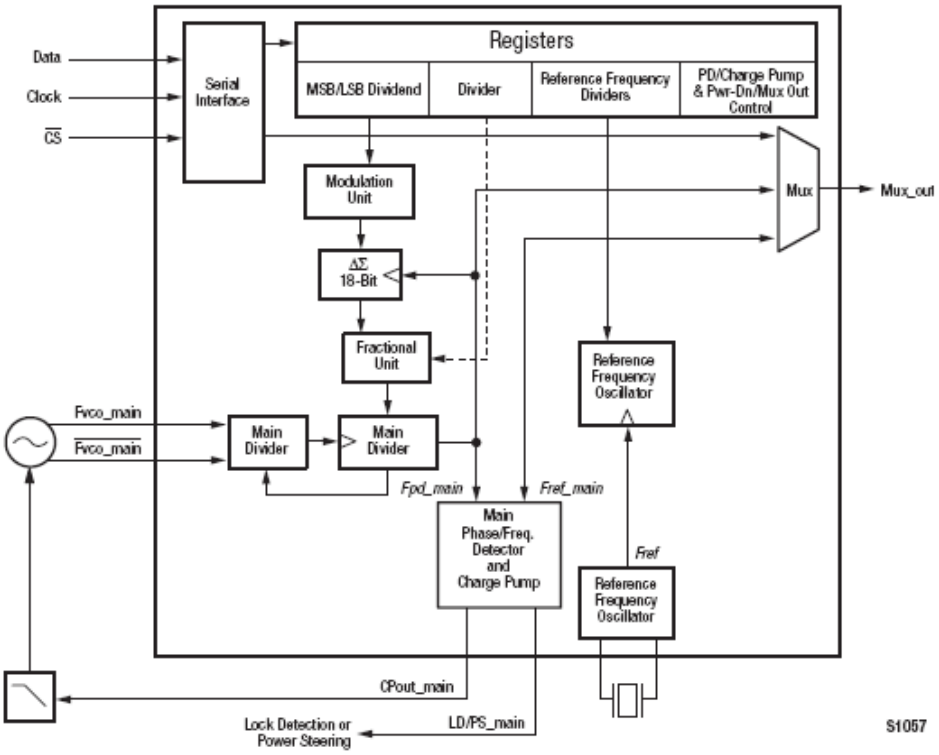


Figure 12-4 Diagram of PLL IC

The 19.2MHz frequency generated by the reference oscillator goes into the PLL IC for division, generating the reference frequency. Meanwhile, the frequency generated by VCO goes into PLL IC (U100) for frequency division. The resulting frequency will be compared with the reference frequency in terms of phase difference in the phase detector. After comparison, the resulting frequency is converted to CV voltage via the loop filter, to control and lock the frequency.

12.3.4 VCO

The VCO is composed of transistors (Q100, Q103, Q106 and Q110), varactors and four Colpitts oscillators. There are four VCOs in all: two VCOs (Q100 and Q103) used to transmit excitation signals and the other two VCOs (Q106 and Q110) to receive LO signals. U302 controls the operating frequency of the VCO. Q102 and Q107 constitute the buffer amplifiers for the transmitter circuit, while Q111 and Q109 for the receiver circuit. The digital-to-analog converter (U500) modulates the TX oscillator signal.

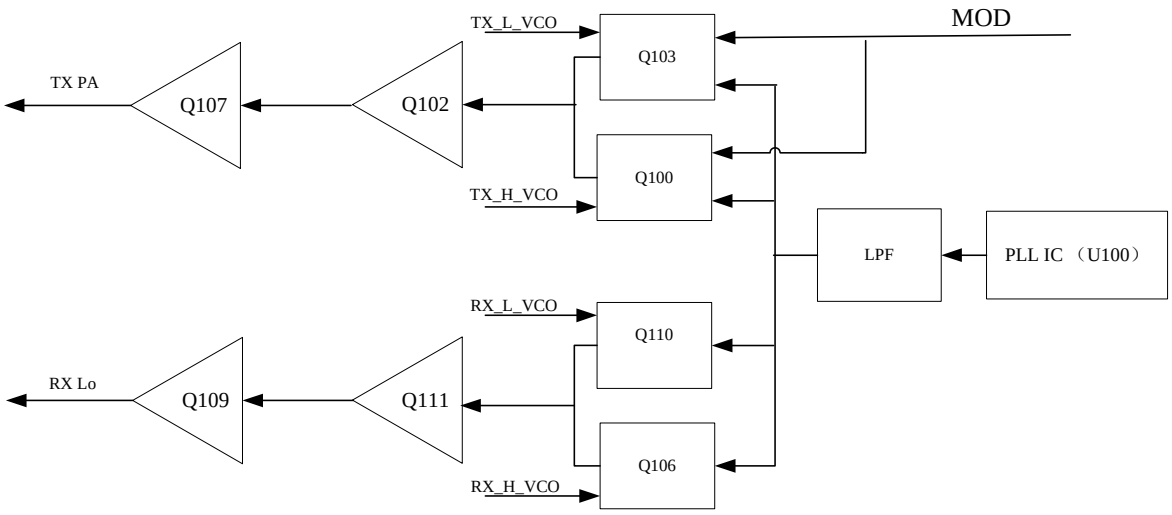
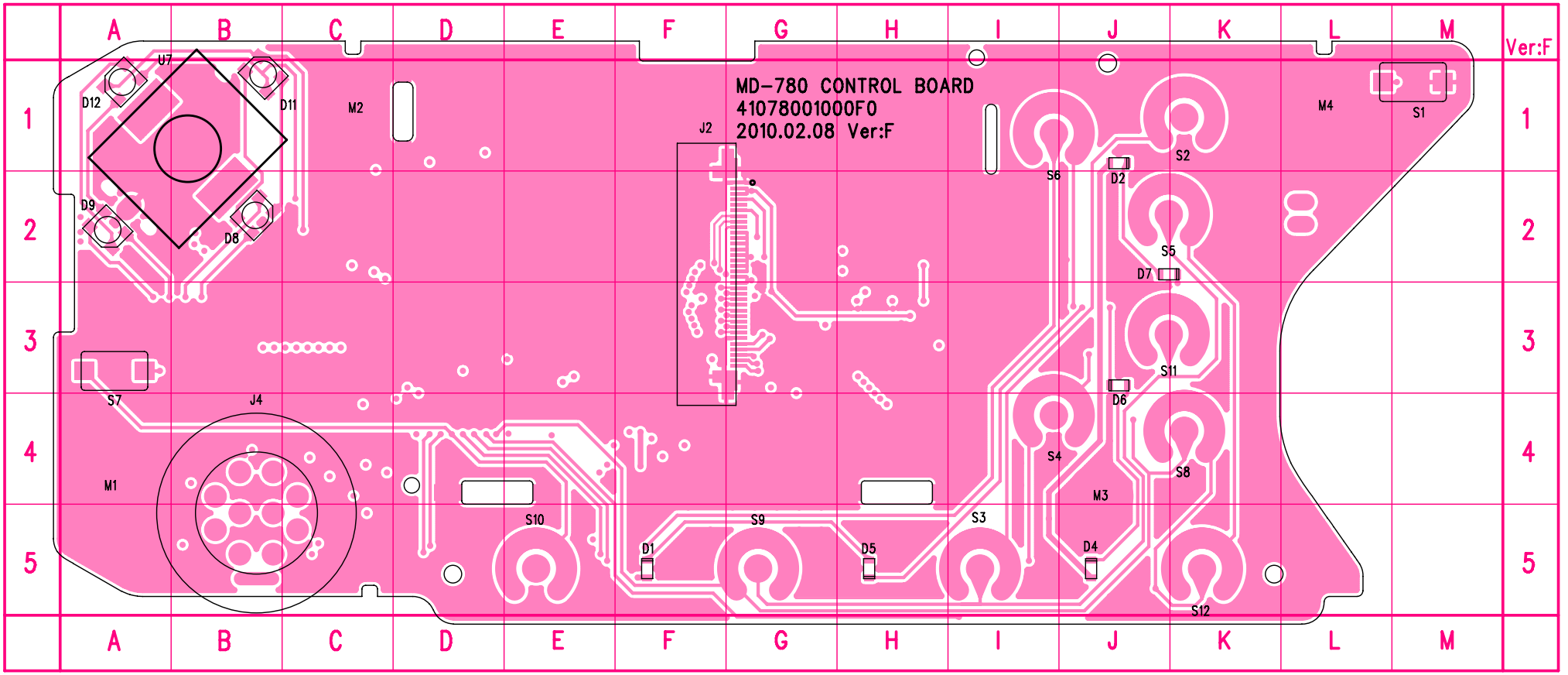


Figure 12-5 Diagram of VCO

12.4 PCB View

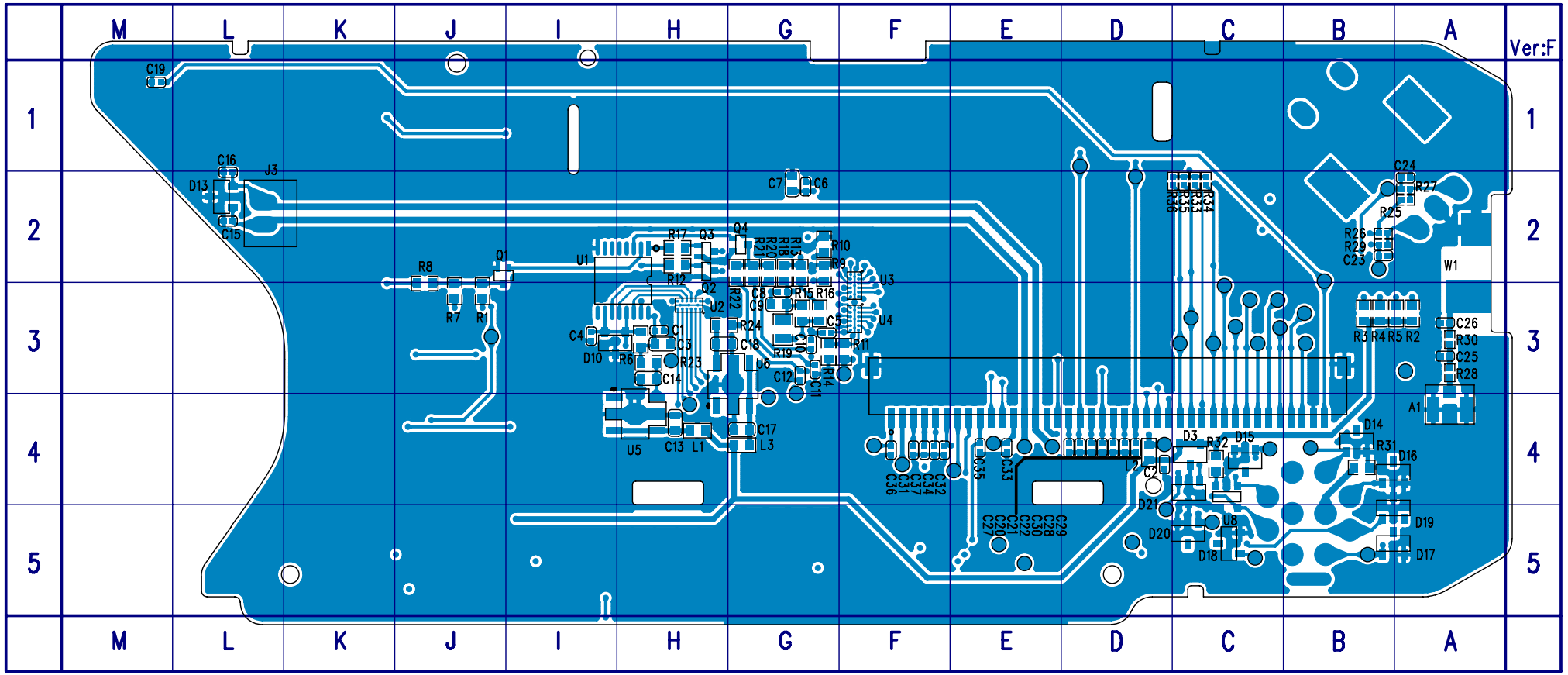
MD78X/MD78XG PCB View (Front Panel)

Top Layer

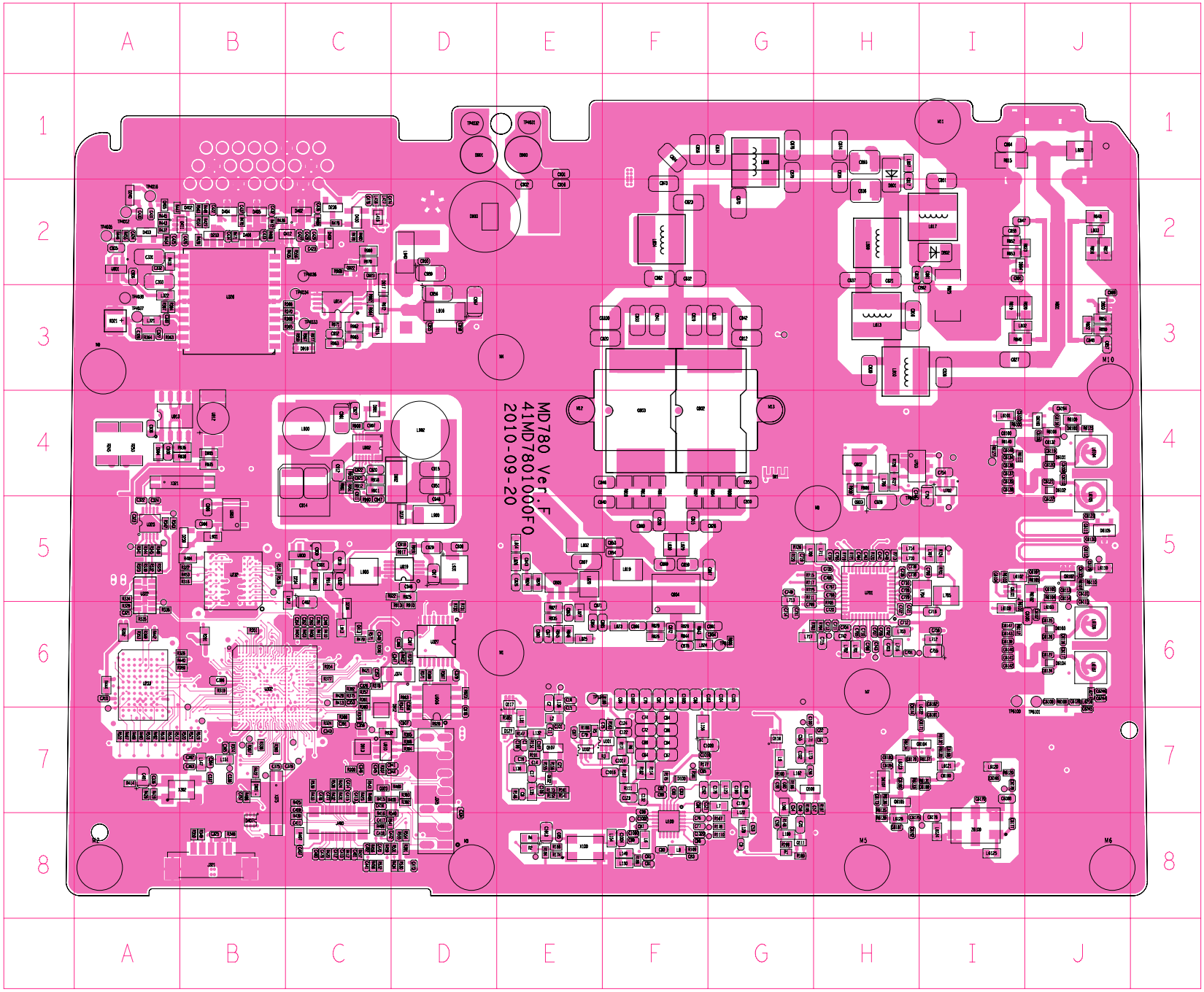


MD78X/MD78XG PCB View (Front Panel)

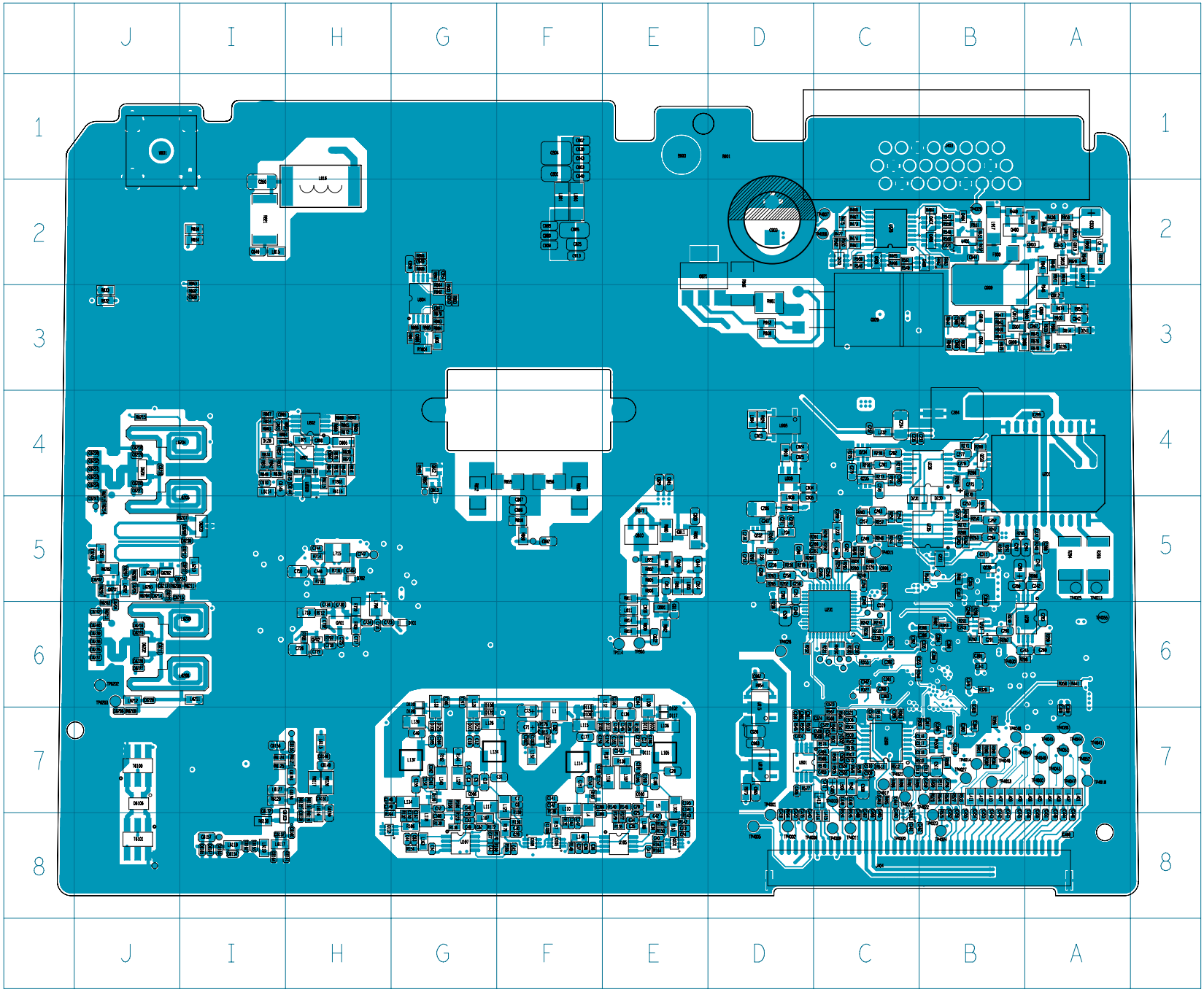
Bottom Layer



MD78X/MD78XG PCB View (Main Board)
Top Layer

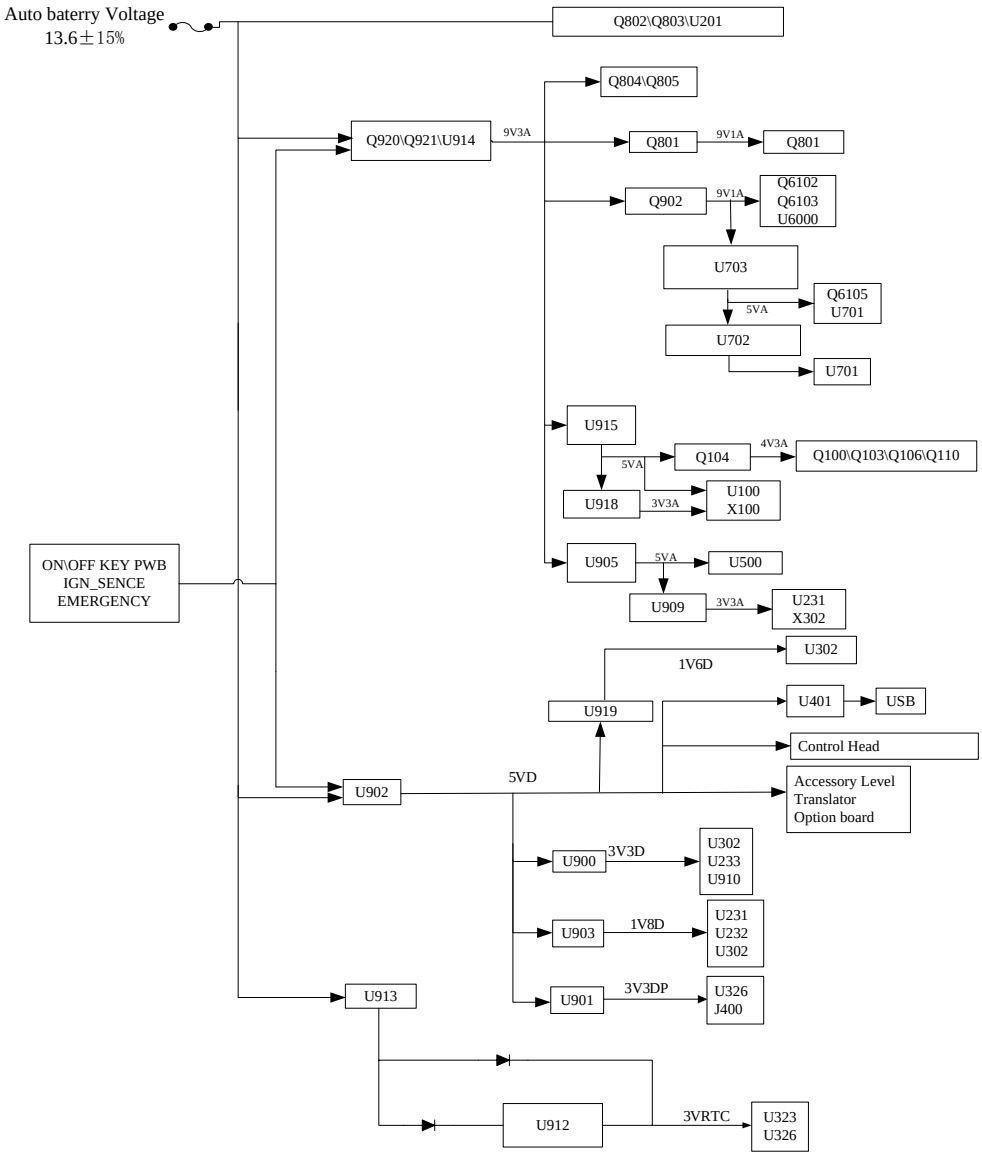


MD78X/MD78XG PCB View (Main Board)
Bottom Laver

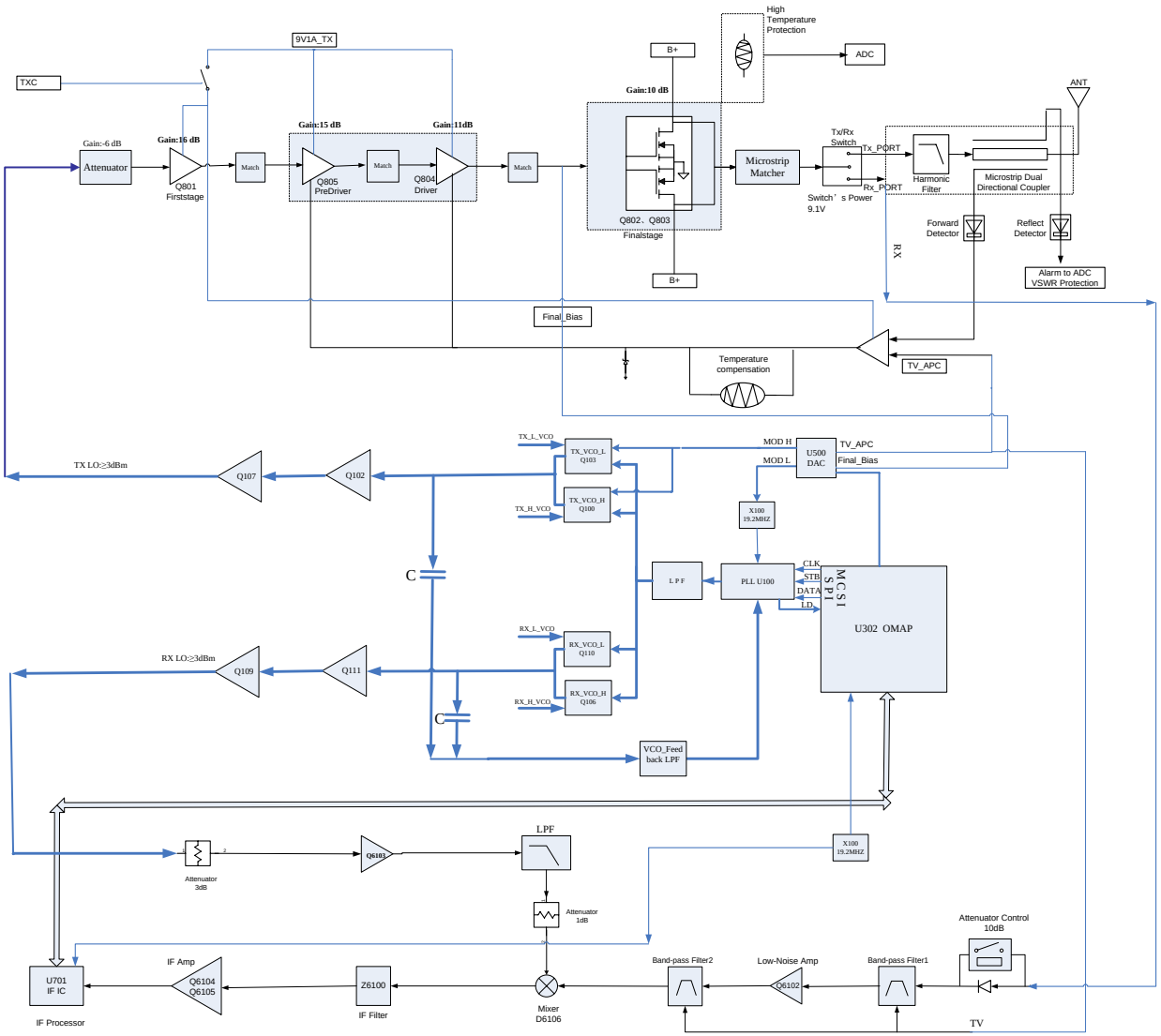


12.5 Block Diagram

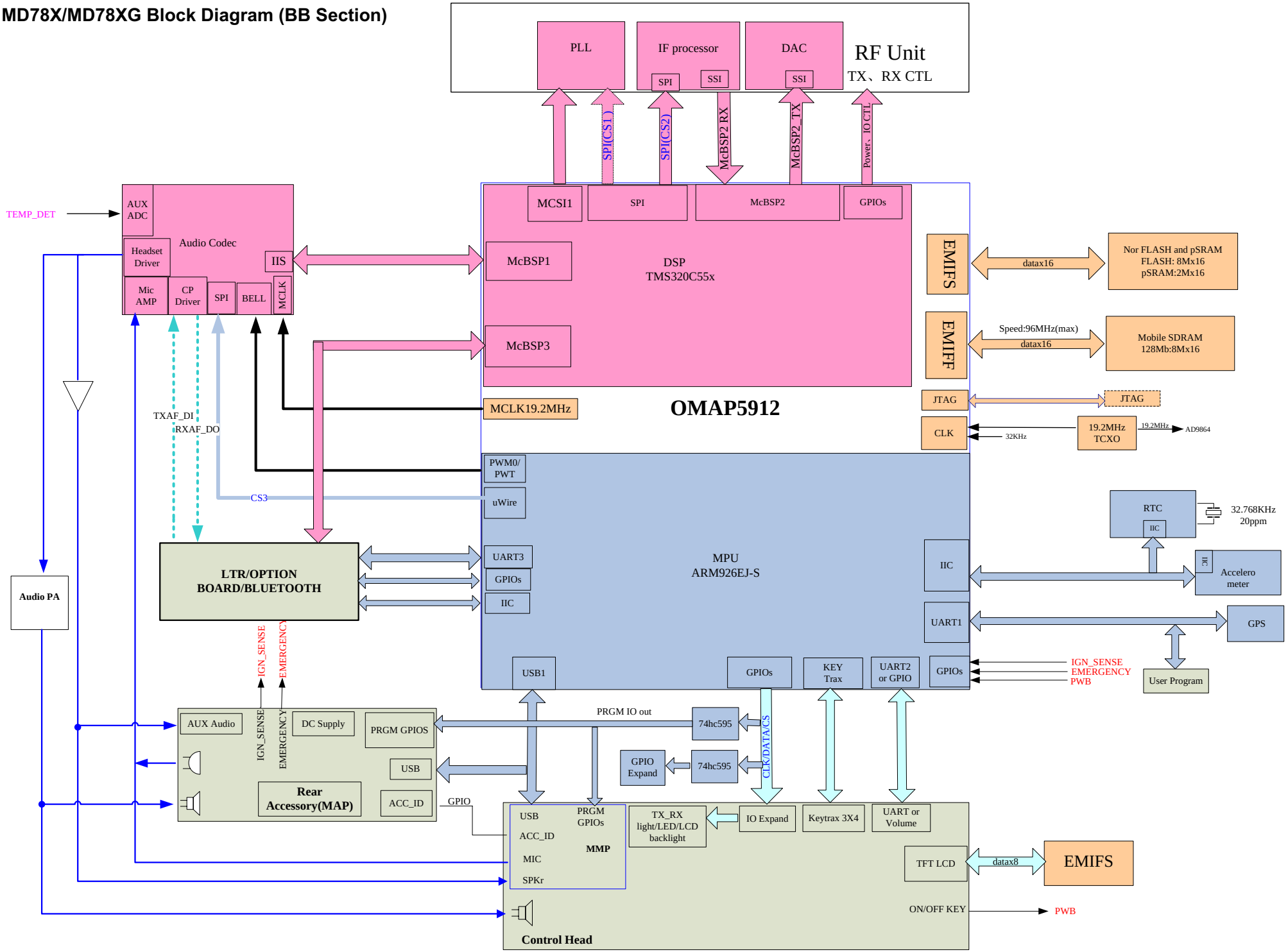
MD78X/MD78XG Block Diagram (Power Section)



MD78X/MD78XG Block Diagram (RF Section)

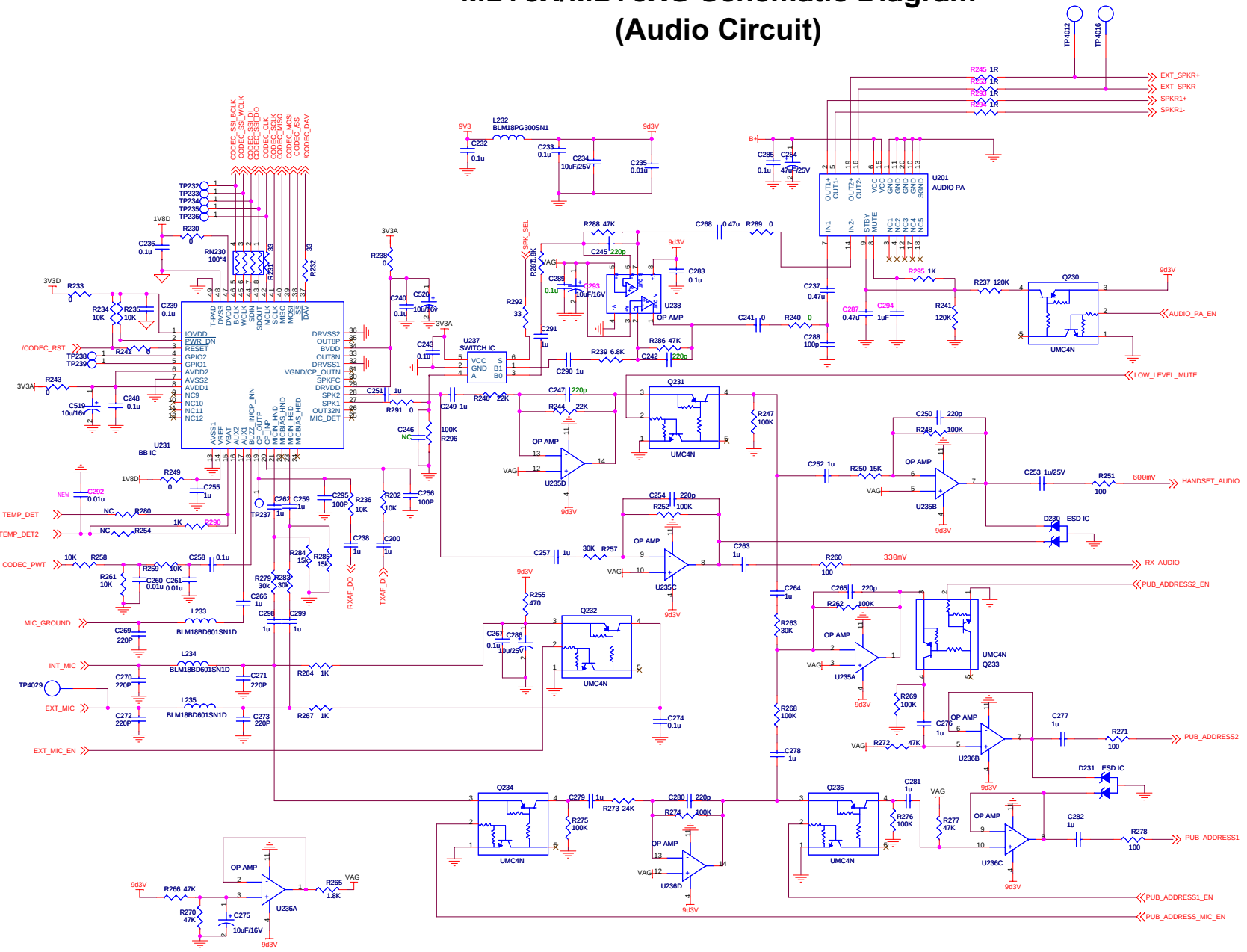


MD78X/MD78XG Block Diagram (BB Section)

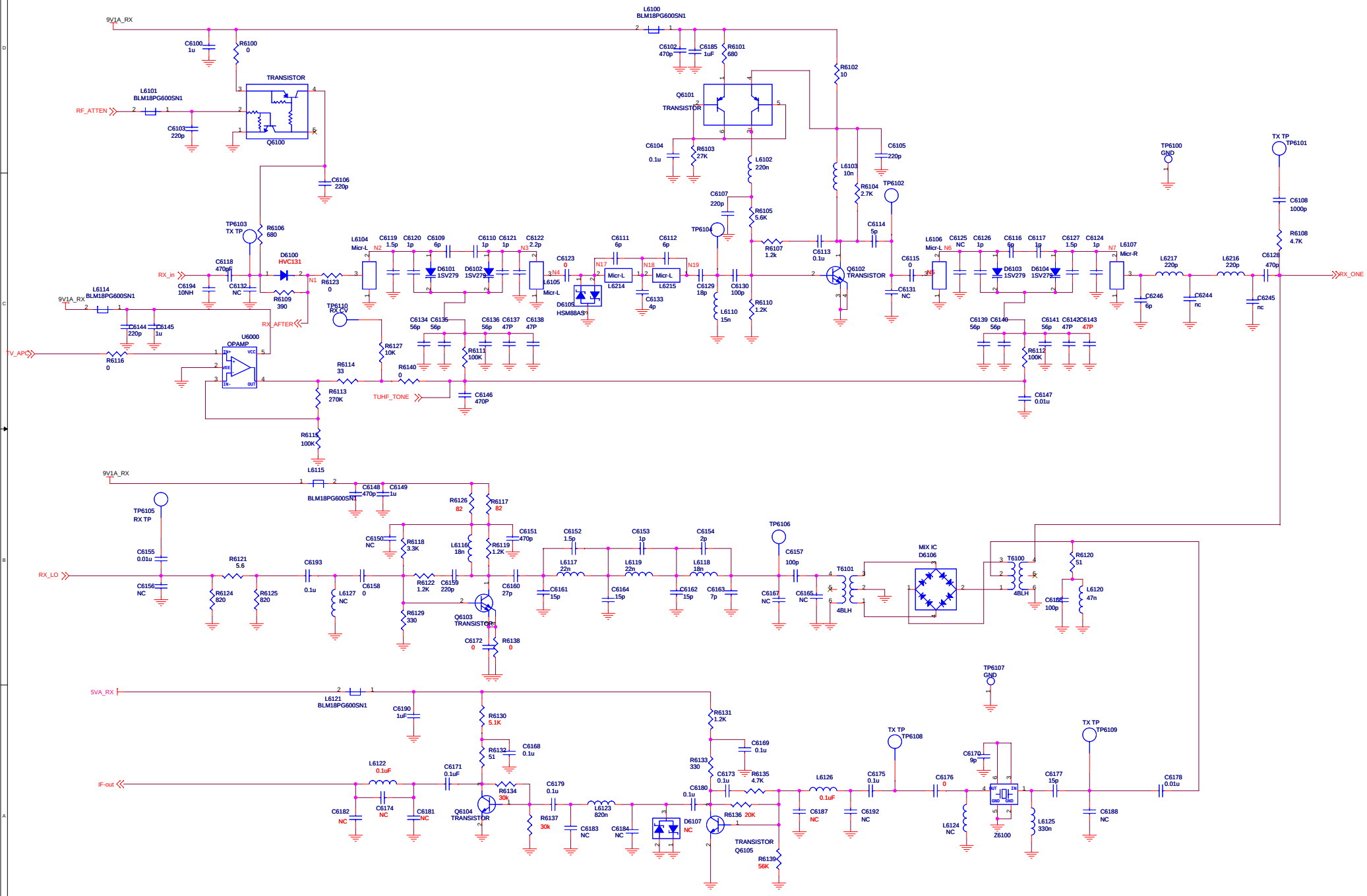


12.6 Schematic Diagram

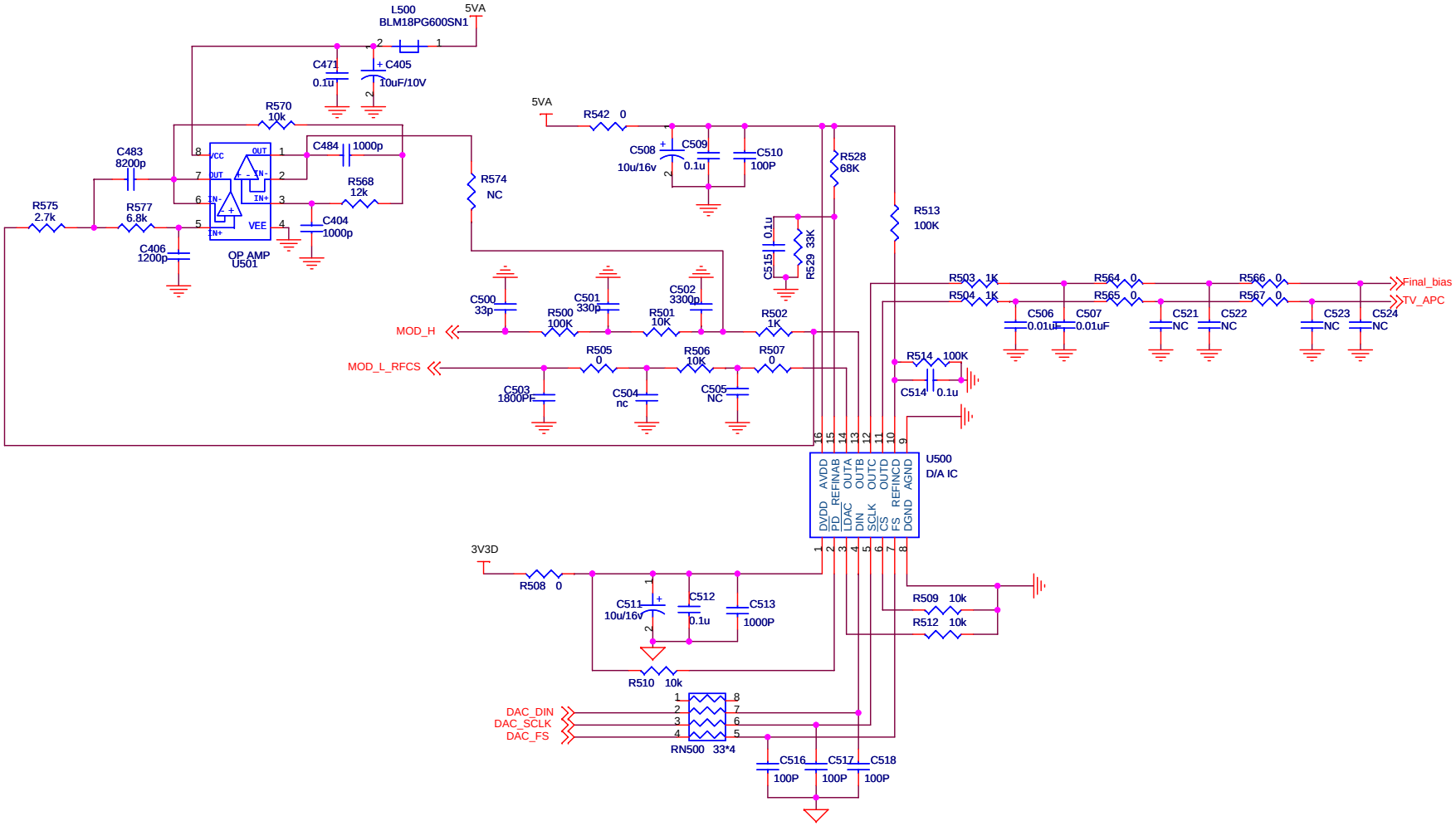
MD78X/MD78XG Schematic Diagram (Audio Circuit)



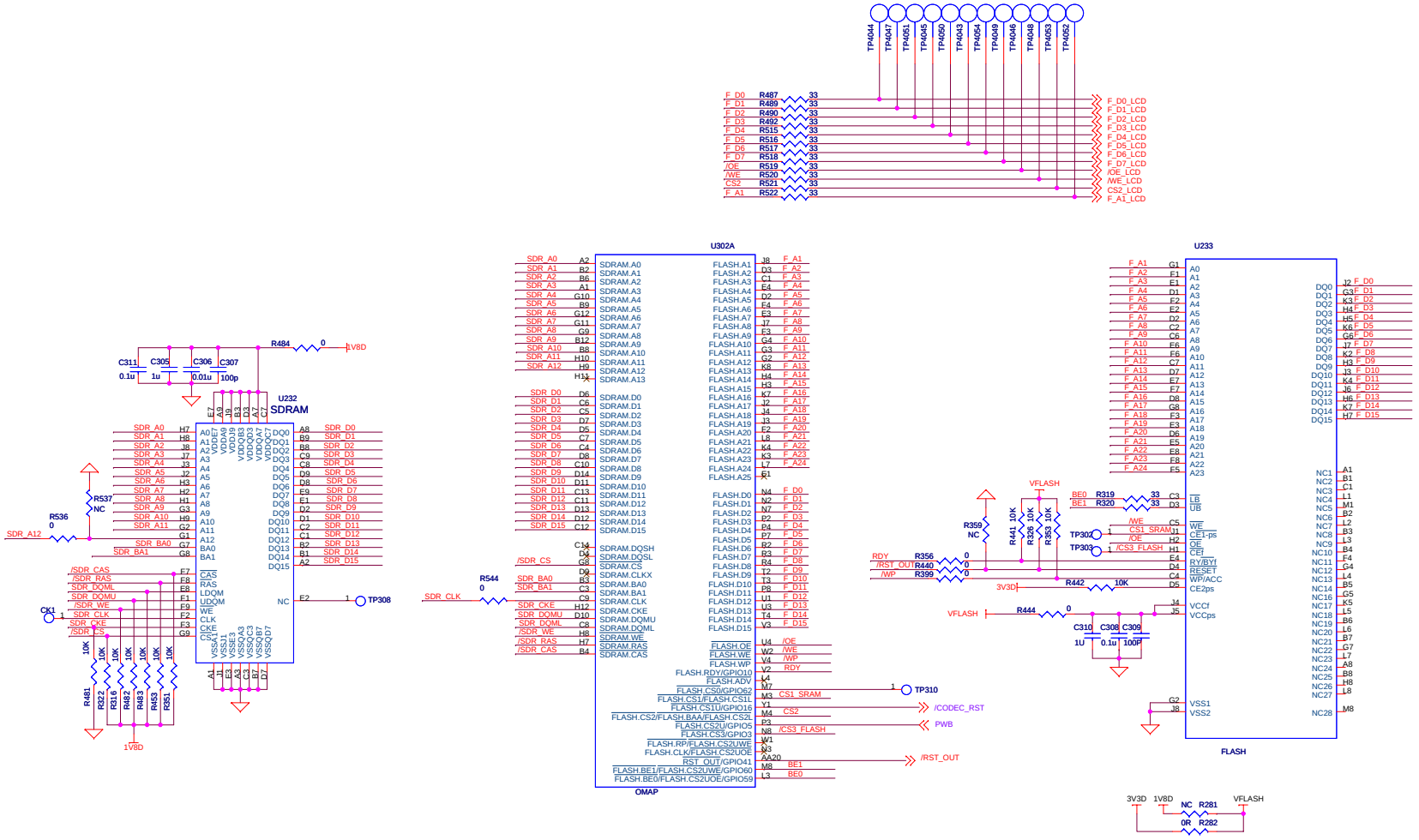
MD78X/MD78XG Schematic Diagram
(RX Circuit)



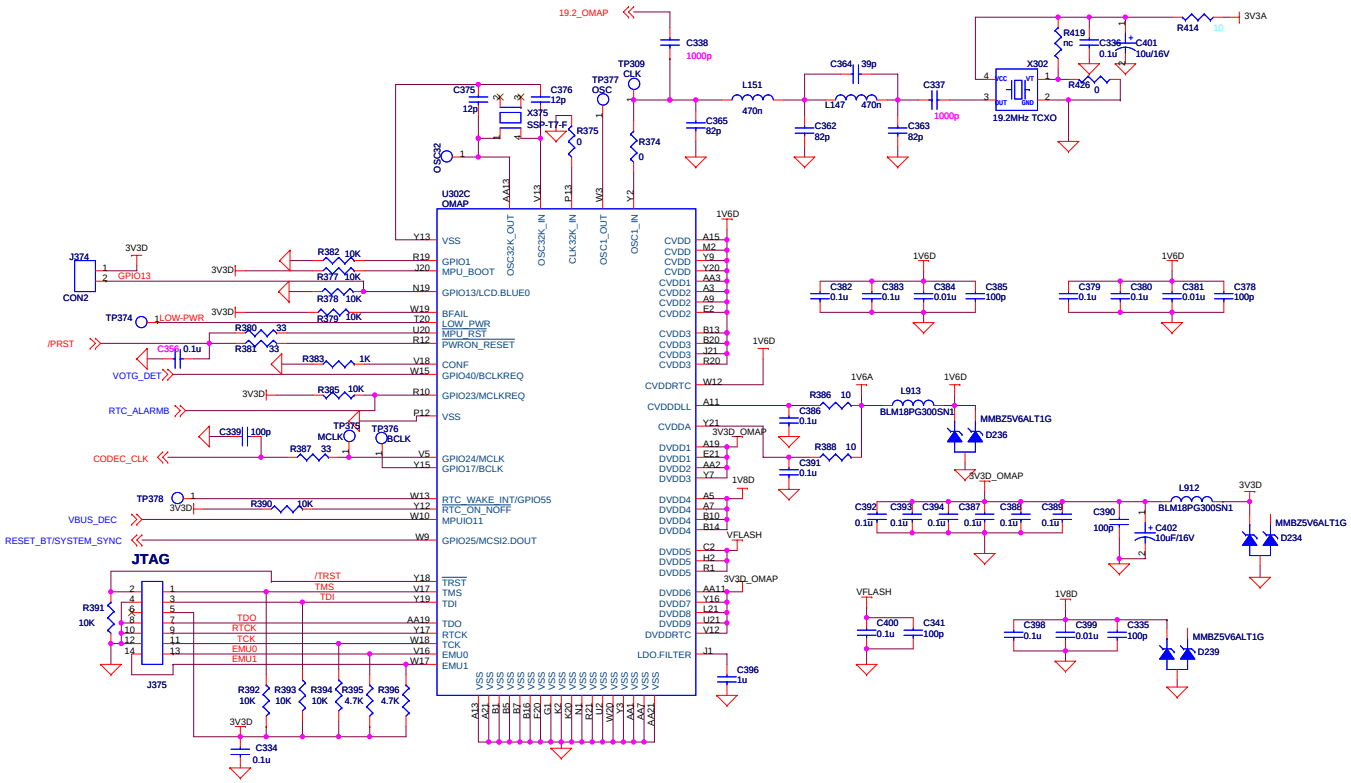
MD78X/MD78XG Schematic Diagram
(DAC Circuit)



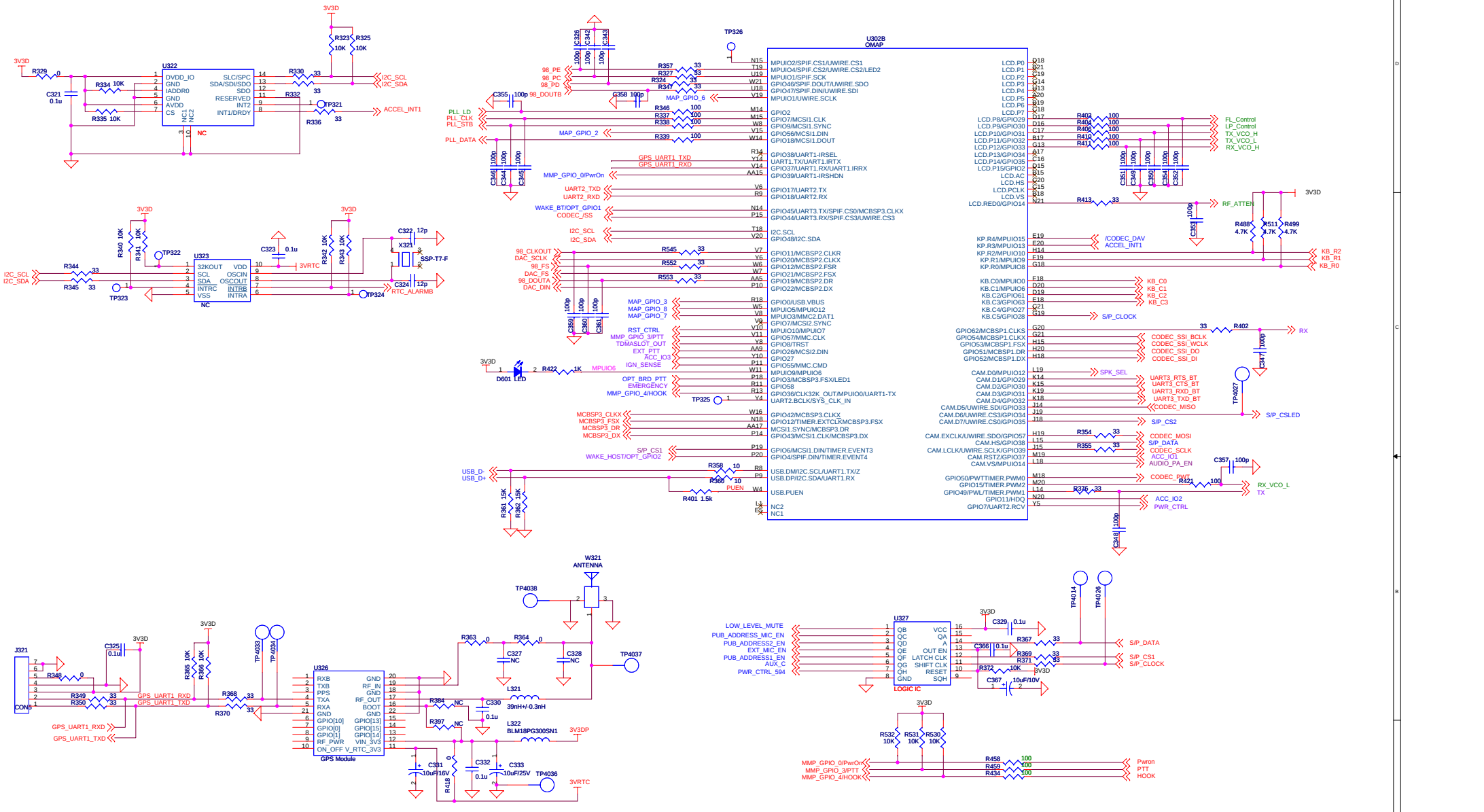
MD78X/MD78XG Schematic Diagram
(Memory Circuit)



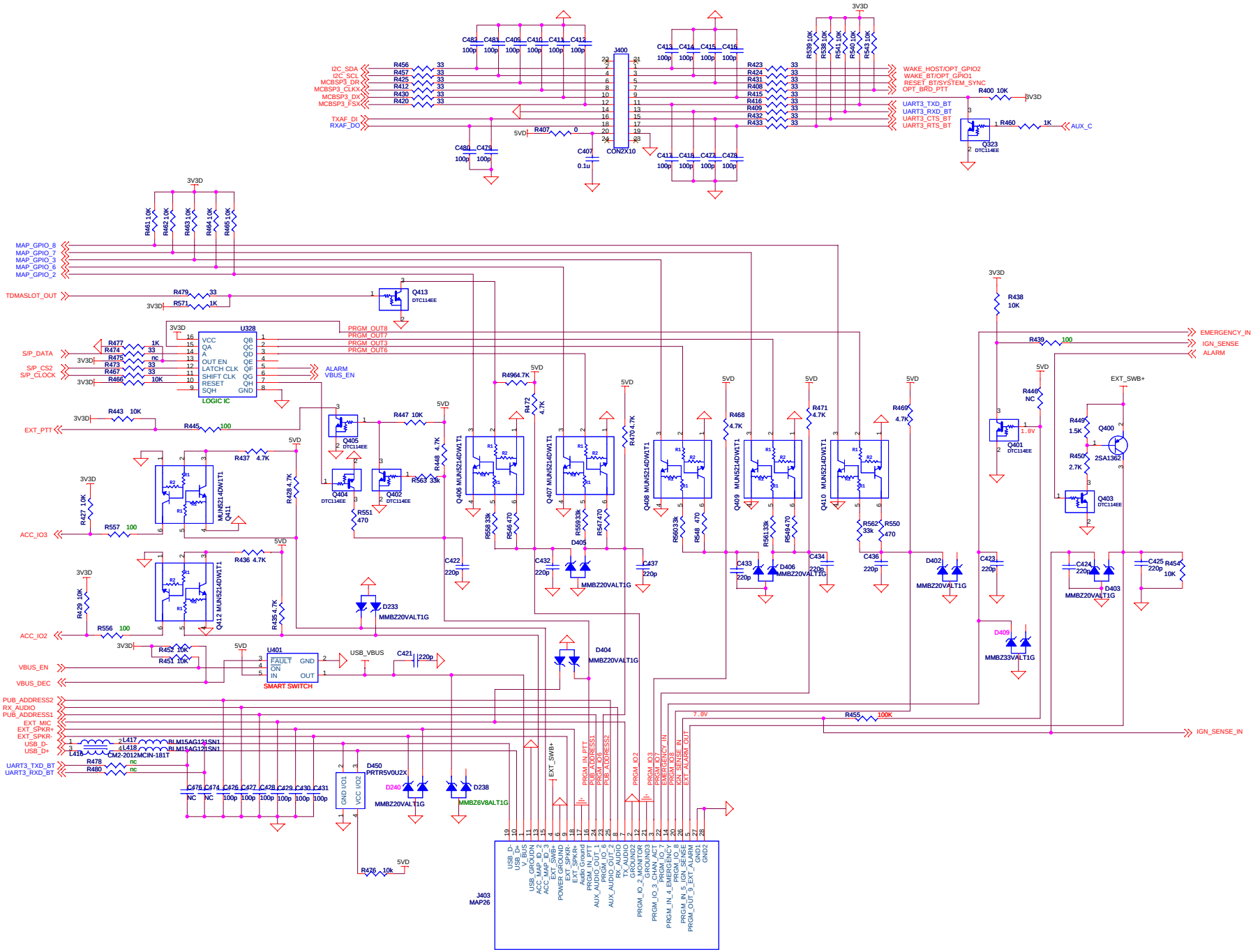
MD78X/MD78XG Schematic Diagram
(OMAP Circuit)



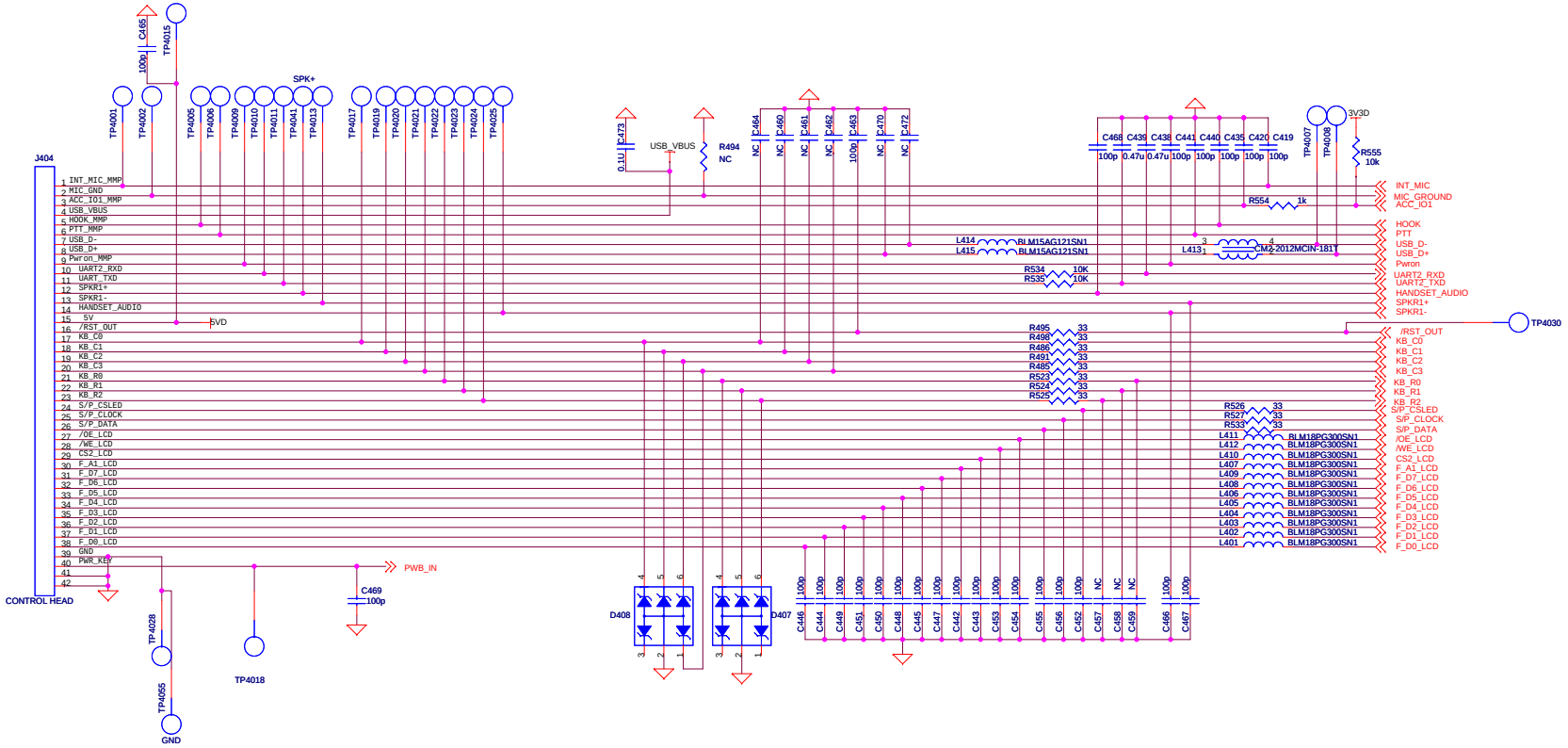
MD78X/MD78XG Schematic Diagram
(OMAP & GPS Circuit)



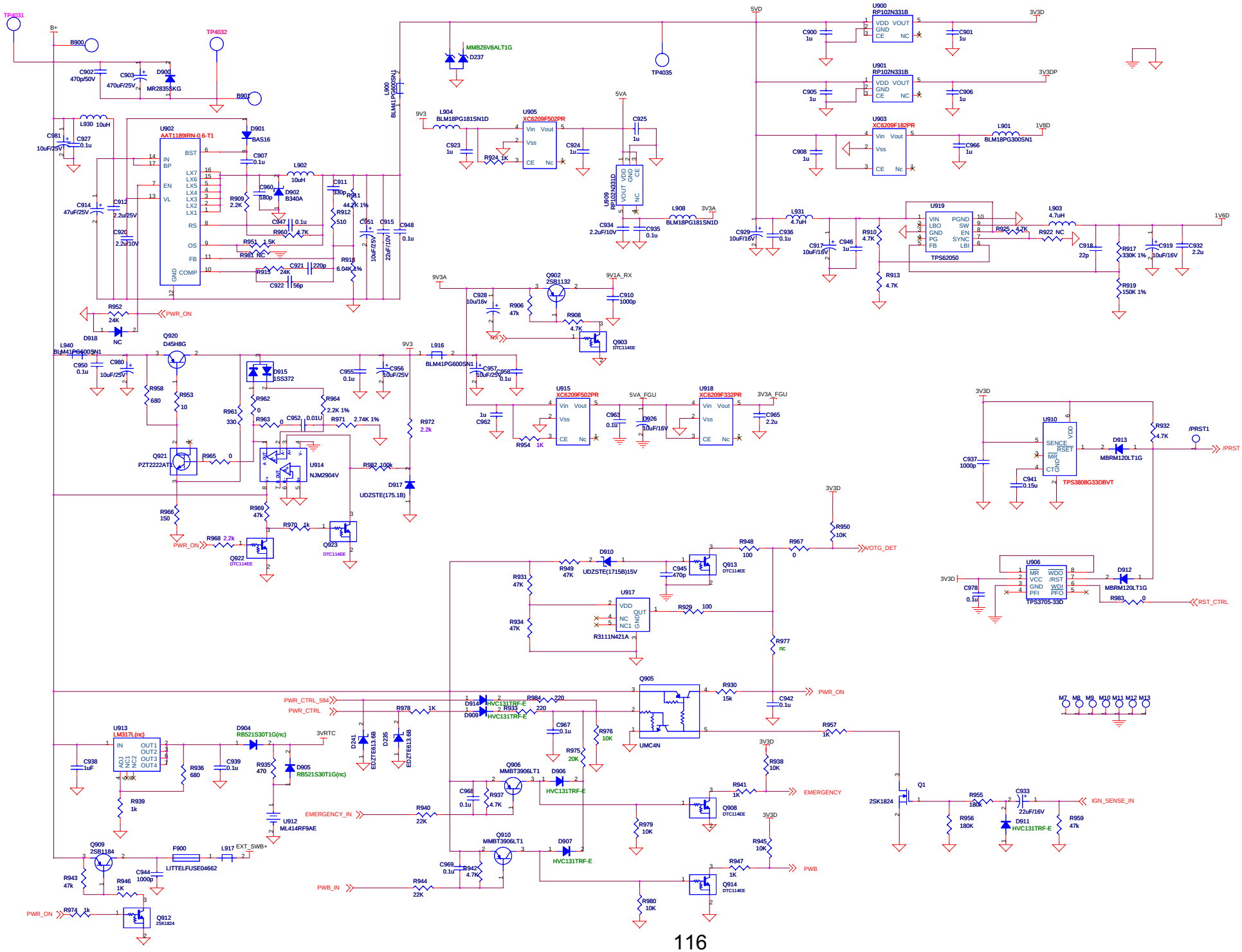
MD78X/MD78XG Schematic Diagram (Peripheral Interface Circuit)



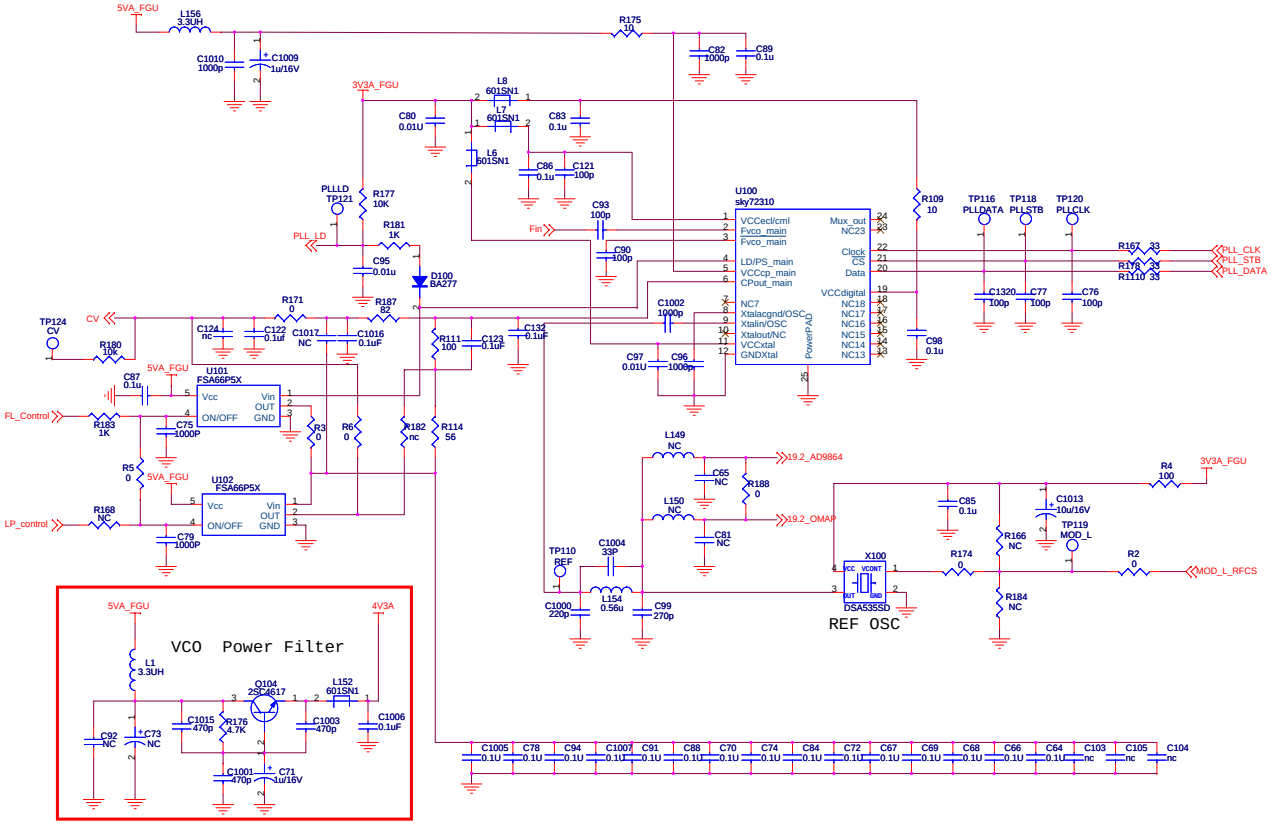
MD78X/MD78XG Schematic Diagram
(40-Pin Interface Circuit)



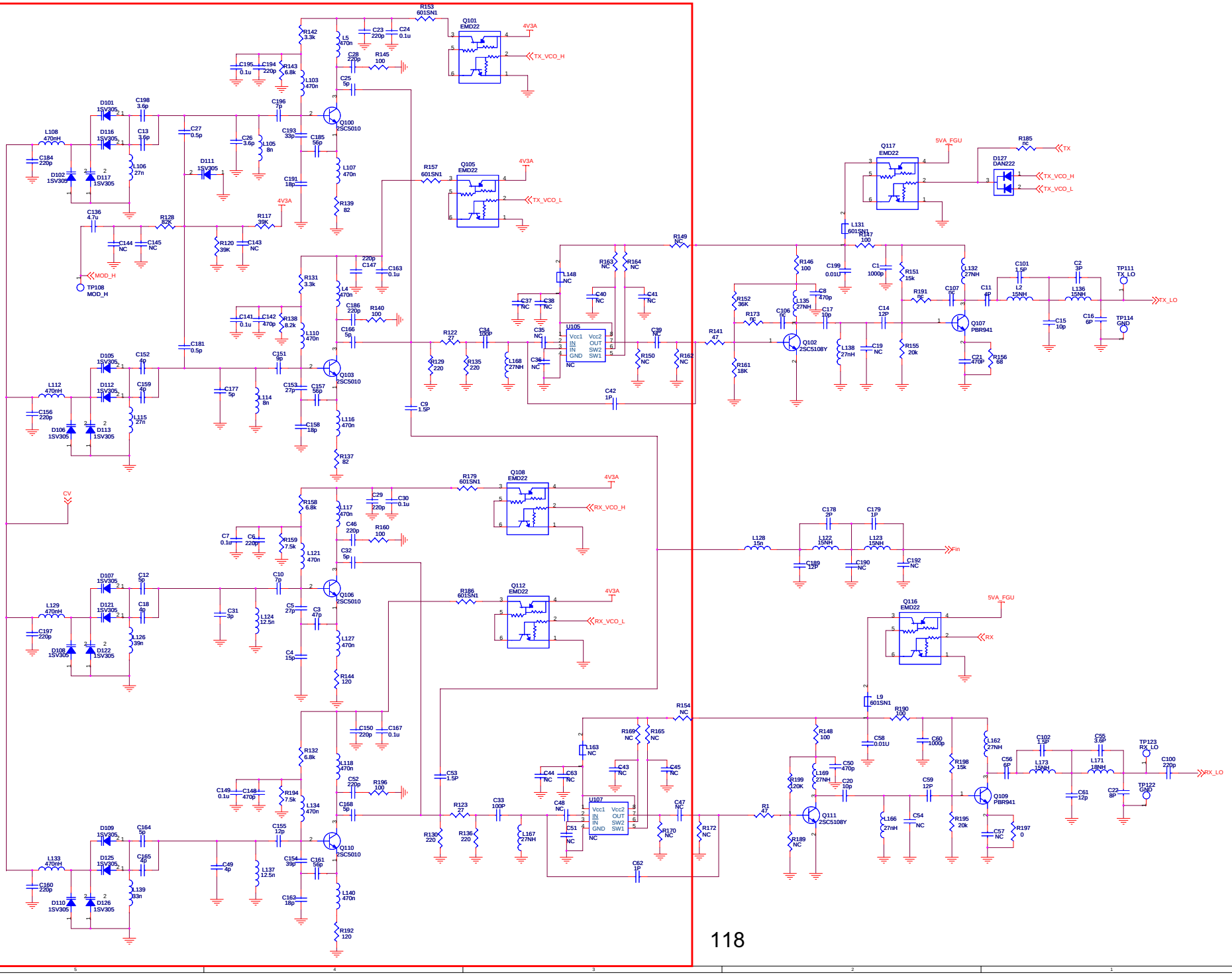
MD78X/MD78XG Schematic Diagram (Power Circuit)



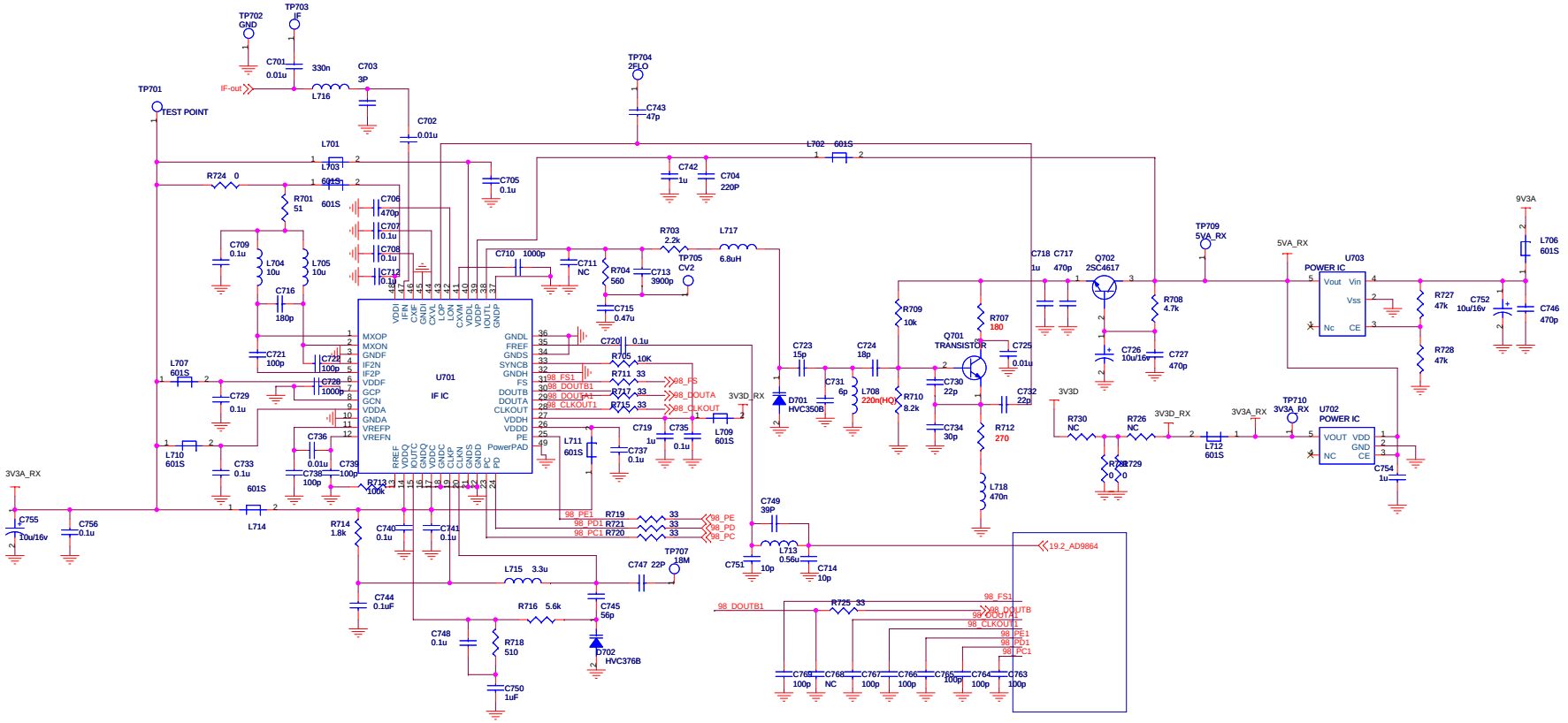
MD78X/MD78XG Schematic Diagram
(PLL Circuit)



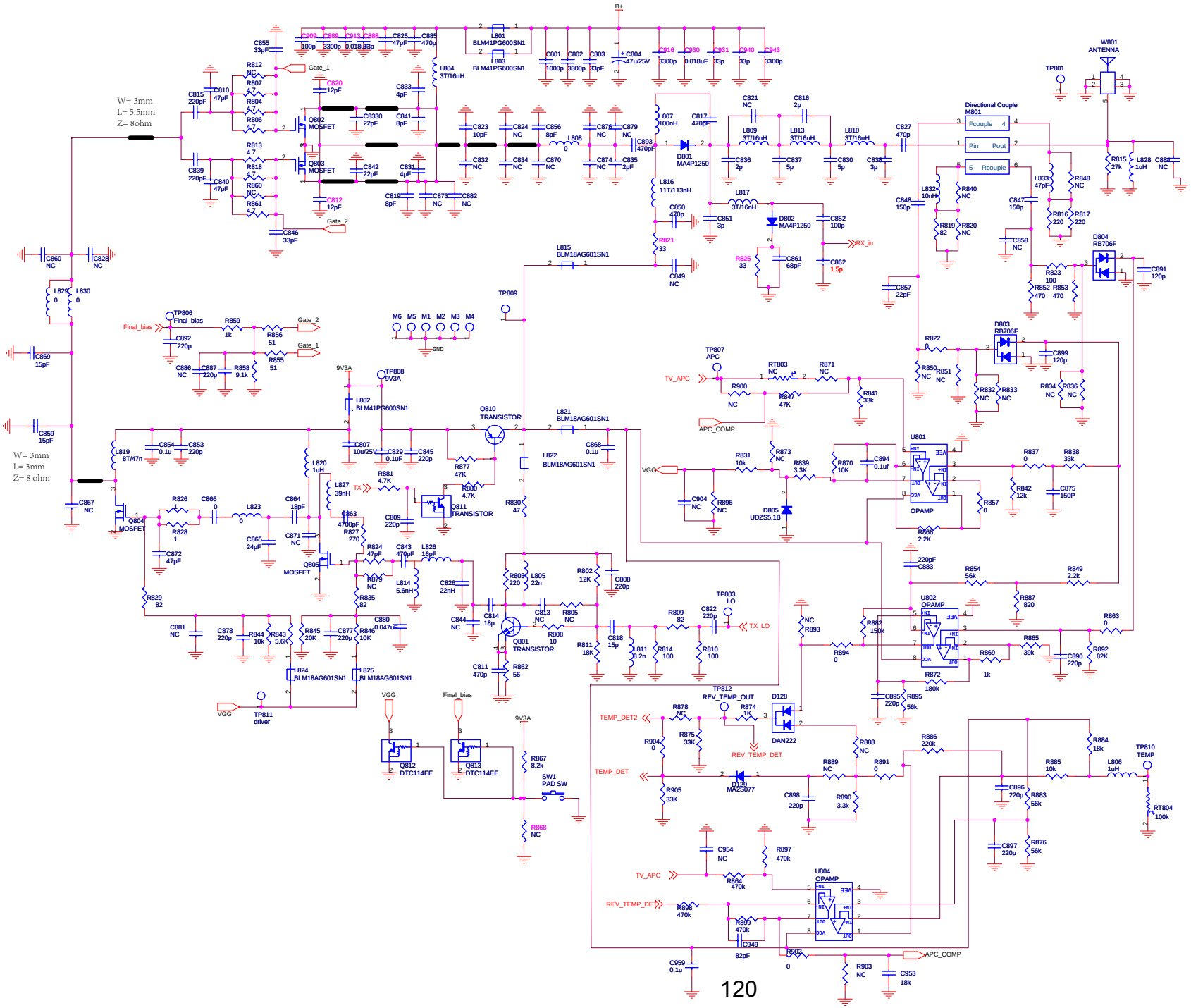
MD78X/MD78XG Schematic Diagram (VCO Circuit)



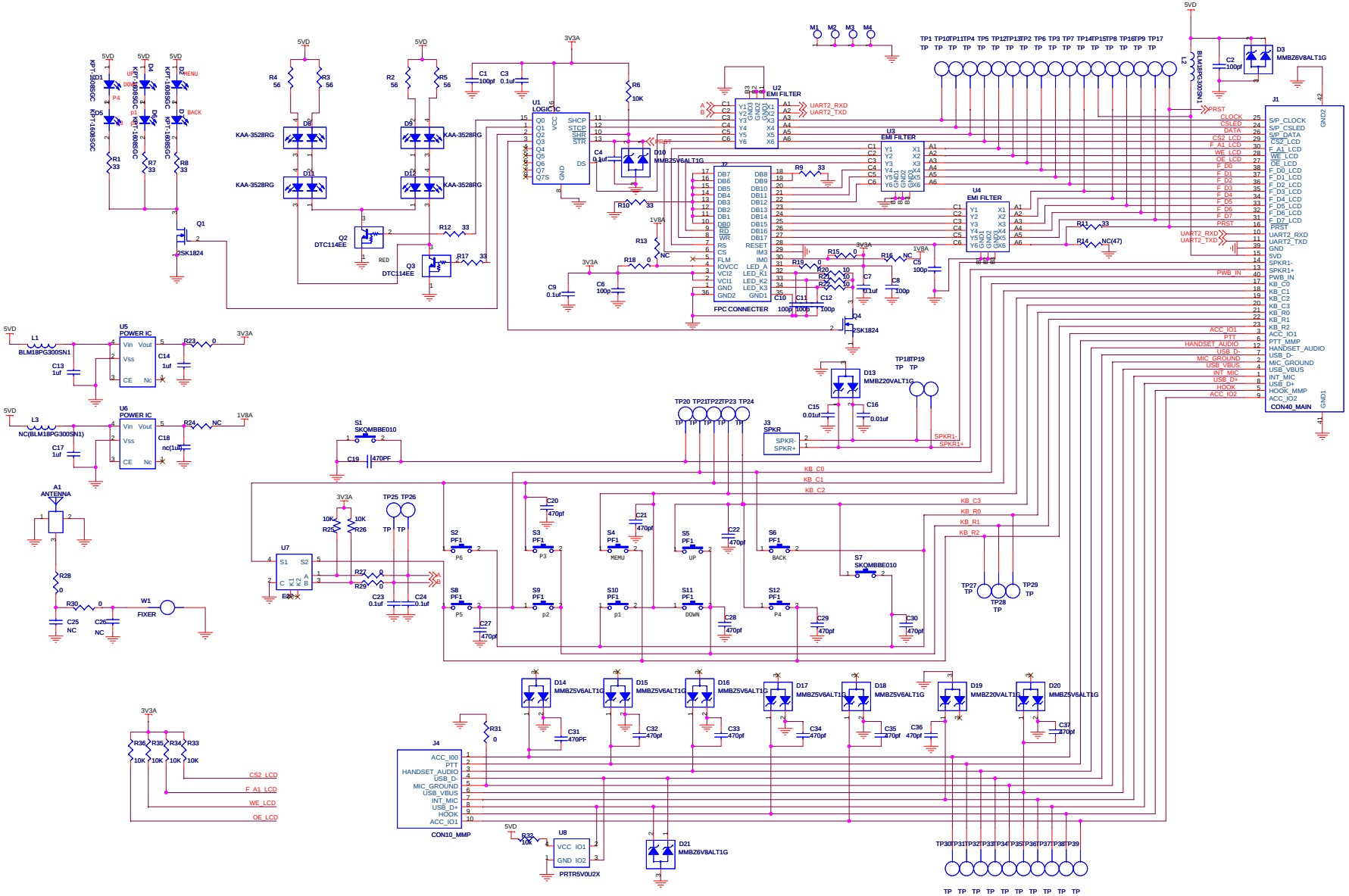
MD78X/MD78XG Schematic Diagram
(IF Circuit)



MD78X/MD78XG Schematic Diagram (TX Circuit)



MD78X/MD78XG Schematic Diagram
(Front Panel)



V1.0

12.7 Parts List

Main Board *for MD78X/MD78XG*

No.	Ref. No.	Part No.	Description
1	C6115	3001050000000	0Ω
2	C6123	3001050000000	0Ω
3	C6172	3001050000000	0Ω
4	R127	3001050000000	0Ω
5	R174	3001050000000	0Ω
6	R188	3001050000000	0Ω
7	R197	3001050000000	0Ω
8	R230	3001050000000	0Ω
9	R233	3001050000000	0Ω
10	R238	3001050000000	0Ω
11	R240	3001050000000	0Ω
12	R242	3001050000000	0Ω
13	R243	3001050000000	0Ω
14	R249	3001050000000	0Ω
15	R289	3001050000000	0Ω
16	R329	3001050000000	0Ω
17	R356	3001050000000	0Ω
18	R374	3001050000000	0Ω
19	R375	3001050000000	0Ω
20	R399	3001050000000	0Ω
21	R426	3001050000000	0Ω
22	R440	3001050000000	0Ω
23	R493	3001050000000	0Ω
24	R497	3001050000000	0Ω
25	R5	3001050000000	0Ω
26	R505	3001050000000	0Ω
27	R507	3001050000000	0Ω
28	R508	3001050000000	0Ω
29	R536	3001050000000	0Ω
30	R544	3001050000000	0Ω
31	R564	3001050000000	0Ω
32	R565	3001050000000	0Ω
33	R566	3001050000000	0Ω
34	R567	3001050000000	0Ω
35	R6123	3001050000000	0Ω
36	R729	3001050000000	0Ω
37	R731	3001050000000	0Ω
38	R837	3001050000000	0Ω
39	R857	3001050000000	0Ω
40	R863	3001050000000	0Ω
41	R888	3001050000000	0Ω

No.	Ref. No.	Part No.	Description
42	R891	3001050000000	0Ω
43	R894	3001050000000	0Ω
44	R967	3001050000000	0Ω
45	C241	3001060000000	0Ω
46	C6158	3001060000000	0Ω
47	C6176	3001060000000	0Ω
48	C866	3001060000000	0Ω
49	L823	3001060000000	0Ω
50	R171	3001060000000	0Ω
51	R2	3001060000000	0Ω
52	R282	3001060000000	0Ω
53	R405	3001060000000	0Ω
54	R444	3001060000000	0Ω
55	R484	3001060000000	0Ω
56	R542	3001060000000	0Ω
57	R6116	3001060000000	0Ω
58	R6138	3001060000000	0Ω
59	R6140	3001060000000	0Ω
60	R724	3001060000000	0Ω
61	R822	3001060000000	0Ω
62	R901	3001060000000	0Ω
63	R914	3001060000000	0Ω
64	R916	3001060000000	0Ω
65	R962	3001060000000	0Ω
66	R963	3001060000000	0Ω
67	R965	3001060000000	0Ω
68	R973	3001060000000	0Ω
69	L829	3001070000000	0Ω
70	L830	3001070000000	0Ω
71	L808	3001080000000	0Ω
72	R245	3001160100000	1Ω
73	R253	3001160100000	1Ω
74	R293	3001160100000	1Ω
75	R294	3001160100000	1Ω
76	R826	3001060100000	1Ω
77	R828	3001060100000	1Ω
78	R804	3001084790000	4.7Ω
79	R806	3001084790000	4.7Ω
80	R807	3001084790000	4.7Ω
81	R813	3001084790000	4.7Ω
82	R818	3001084790000	4.7Ω
83	R861	3001084790000	4.7Ω
84	R109	3001051000000	10Ω
85	R175	3001051000000	10Ω

No.	Ref. No.	Part No.	Description
86	R358	3001051000000	10Ω
87	R360	3001051000000	10Ω
88	R386	3001051000000	10Ω
89	R388	3001051000000	10Ω
90	R414	3001051000000	10Ω
91	R456	3001051000000	10Ω
92	R457	3001051000000	10Ω
93	R808	3001061000000	10Ω
94	R953	3001061000000	10Ω
95	R6102	3001071000000	10Ω
96	R878	3001081000000	10Ω
97	R122	3001052700010	27Ω
98	R123	3001052700010	27Ω
99	R1110	3001053300010	33Ω
100	R167	3001053300010	33Ω
101	R178	3001053300010	33Ω
102	R231	3001053300010	33Ω
103	R232	3001053300010	33Ω
104	R292	3001053300010	33Ω
105	R319	3001053300010	33Ω
106	R320	3001053300010	33Ω
107	R324	3001053300010	33Ω
108	R327	3001053300010	33Ω
109	R330	3001053300010	33Ω
110	R332	3001053300010	33Ω
111	R336	3001053300010	33Ω
112	R344	3001053300010	33Ω
113	R345	3001053300010	33Ω
114	R347	3001053300010	33Ω
115	R354	3001053300010	33Ω
116	R355	3001053300010	33Ω
117	R357	3001053300010	33Ω
118	R367	3001053300010	33Ω
119	R369	3001053300010	33Ω
120	R371	3001053300010	33Ω
121	R376	3001053300010	33Ω
122	R380	3001053300010	33Ω
123	R381	3001053300010	33Ω
124	R387	3001053300010	33Ω
125	R389	3001053300010	33Ω
126	R400	3001053300010	33Ω
127	R402	3001053300010	33Ω
128	R407	3001053300010	33Ω
129	R408	3001053300010	33Ω

No.	Ref. No.	Part No.	Description
130	R409	3001053300010	33Ω
131	R412	3001053300010	33Ω
132	R413	3001053300010	33Ω
133	R420	3001053300010	33Ω
134	R423	3001053300010	33Ω
135	R424	3001053300010	33Ω
136	R425	3001053300010	33Ω
137	R430	3001053300010	33Ω
138	R431	3001053300010	33Ω
139	R432	3001053300010	33Ω
140	R433	3001053300010	33Ω
141	R467	3001053300010	33Ω
142	R473	3001053300010	33Ω
143	R474	3001053300010	33Ω
144	R479	3001053300010	33Ω
145	R485	3001053300010	33Ω
146	R486	3001053300010	33Ω
147	R487	3001053300010	33Ω
148	R489	3001053300010	33Ω
149	R490	3001053300010	33Ω
150	R491	3001053300010	33Ω
151	R492	3001053300010	33Ω
152	R495	3001053300010	33Ω
153	R498	3001053300010	33Ω
154	R515	3001053300010	33Ω
155	R516	3001053300010	33Ω
156	R517	3001053300010	33Ω
157	R518	3001053300010	33Ω
158	R519	3001053300010	33Ω
159	R520	3001053300010	33Ω
160	R521	3001053300010	33Ω
161	R522	3001053300010	33Ω
162	R523	3001053300010	33Ω
163	R524	3001053300010	33Ω
164	R525	3001053300010	33Ω
165	R526	3001053300010	33Ω
166	R527	3001053300010	33Ω
167	R533	3001053300010	33Ω
168	R545	3001053300010	33Ω
169	R552	3001053300010	33Ω
170	R553	3001053300010	33Ω
171	R6114	3001053300010	33Ω
172	R711	3001053300010	33Ω
173	R715	3001053300010	33Ω

No.	Ref. No.	Part No.	Description
174	R717	3001053300010	33Ω
175	R719	3001053300010	33Ω
176	R720	3001053300010	33Ω
177	R721	3001053300010	33Ω
178	R725	3001053300010	33Ω
179	R821	3001113300000	33Ω
180	R825	3001113300000	33Ω
181	R6117	3001063900000	39Ω
182	R1	3001054700000	47Ω
183	R141	3001054700000	47Ω
184	R830	3001074700000	47Ω
185	R6120	3001055100010	51Ω
186	R6132	3001055100010	51Ω
187	R701	3001055100010	51Ω
188	R114	3001065600000	56Ω
189	R862	3001065600000	56Ω
190	R156	3001056800000	68Ω
191	R137	3001068200000	82Ω
192	R139	3001068200000	82Ω
193	R187	3001068200000	82Ω
194	R809	3001068200000	82Ω
195	R829	3001068200000	82Ω
196	R835	3001068200000	82Ω
197	R819	3001078200000	82Ω
198	R140	3001051010040	100Ω
199	R145	3001051010040	100Ω
200	R146	3001051010040	100Ω
201	R147	3001051010040	100Ω
202	R148	3001051010040	100Ω
203	R160	3001051010040	100Ω
204	R190	3001051010040	100Ω
205	R196	3001051010040	100Ω
206	R251	3001051010040	100Ω
207	R260	3001051010040	100Ω
208	R271	3001051010040	100Ω
209	R278	3001051010040	100Ω
210	R337	3001051010040	100Ω
211	R338	3001051010040	100Ω
212	R339	3001051010040	100Ω
213	R346	3001051010040	100Ω
214	R403	3001051010040	100Ω
215	R404	3001051010040	100Ω
216	R406	3001051010040	100Ω
217	R410	3001051010040	100Ω

No.	Ref. No.	Part No.	Description
218	R411	3001051010040	100Ω
219	R421	3001051010040	100Ω
220	R434	3001051010040	100Ω
221	R439	3001051010040	100Ω
222	R445	3001051010040	100Ω
223	R458	3001051010040	100Ω
224	R459	3001051010040	100Ω
225	R556	3001051010040	100Ω
226	R557	3001051010040	100Ω
227	R929	3001051010040	100Ω
228	R948	3001051010040	100Ω
229	R111	3001061010000	100Ω
230	R4	3001061010000	100Ω
231	R810	3001061010000	100Ω
232	R814	3001061010000	100Ω
233	R823	3001061010000	100Ω
234	R855	3001061010000	100Ω
235	R856	3001061010000	100Ω
236	R144	3001061210000	120Ω
237	R192	3001061210000	120Ω
238	R966	3001161510010	150Ω
239	R707	3001051810010	180Ω
240	R129	3001052210000	220Ω
241	R130	3001052210000	220Ω
242	R135	3001052210000	220Ω
243	R136	3001052210000	220Ω
244	R933	3001052210000	220Ω
245	R803	3001062210000	220Ω
246	R816	3001072210000	220Ω
247	R817	3001072210000	220Ω
248	R712	3001052710010	270Ω
249	R827	3001062710000	270Ω
250	R6133	3001053310010	330Ω
251	R6129	3001063310010	330Ω
252	R961	3001083310010	330Ω
253	R6109	3001063910000	390Ω
254	R546	3001054710000	470Ω
255	R547	3001054710000	470Ω
256	R548	3001054710000	470Ω
257	R549	3001054710000	470Ω
258	R550	3001054710000	470Ω
259	R551	3001054710000	470Ω
260	R255	3001064710000	470Ω
261	R852	3001064710000	470Ω

No.	Ref. No.	Part No.	Description
262	R853	3001064710000	470Ω
263	R935	3001064710000	470Ω
264	R6100	3001055110000	510Ω
265	R718	3001055110000	510Ω
266	R912	3001055110000	510Ω
267	R704	3001055610010	560Ω
268	R6101	3001056810000	680Ω
269	R6106	3001066810000	680Ω
270	R936	3001066810000	680Ω
271	R958	3001066810000	680Ω
272	R887	3001058210000	820Ω
273	R181	3001051020000	1KΩ
274	R183	3001051020000	1KΩ
275	R264	3001051020000	1KΩ
276	R267	3001051020000	1KΩ
277	R290	3001051020000	1KΩ
278	R295	3001051020000	1KΩ
279	R383	3001051020000	1KΩ
280	R416	3001051020000	1KΩ
281	R417	3001051020000	1KΩ
282	R422	3001051020000	1KΩ
283	R460	3001051020000	1KΩ
284	R477	3001051020000	1KΩ
285	R502	3001051020000	1KΩ
286	R503	3001051020000	1KΩ
287	R504	3001051020000	1KΩ
288	R554	3001051020000	1KΩ
289	R831	3001051020000	1KΩ
290	R869	3001051020000	1KΩ
291	R874	3001051020000	1KΩ
292	R941	3001051020000	1KΩ
293	R947	3001051020000	1KΩ
294	R957	3001051020000	1KΩ
295	R978	3001051020000	1KΩ
296	R859	3001061020010	1KΩ
297	R924	3001061020010	1KΩ
298	R939	3001061020010	1KΩ
299	R954	3001061020010	1KΩ
300	R970	3001061020010	1KΩ
301	R974	3001061020010	1KΩ
302	R946	3001071020010	1KΩ
303	R291	3001051220000	1.2K
304	R6107	3001051220000	1.2K
305	R6110	3001051220000	1.2K

No.	Ref. No.	Part No.	Description
306	R6119	3001051220000	1.2K
307	R6122	3001051220000	1.2K
308	R6131	3001051220000	1.2K
309	R401	3001051520010	1.5K
310	R951	3001051520010	1.5K
311	R449	3001061520000	1.5K
312	R265	3001051820000	1.8K
313	R714	3001051820000	1.8K
314	R703	3001052220010	2.2K
315	R849	3001052220010	2.2K
316	R866	3001052220010	2.2K
317	R909	3001052220010	2.2K
318	R964	3001052220010	2.2K
319	R968	3001052220010	2.2K
320	R972	3001062220000	2.2K
321	R6104	3001052720000	2.7K
322	R450	3001072720010	2.7K
323	R971	3099052741000	2.74Ω
324	R131	3001053320000	3.3K
325	R142	3001053320000	3.3K
326	R6118	3001053320000	3.3K
327	R890	3001053320000	3.3K
328	R960	3001054790010	4.7K
329	R176	3001054720000	4.7K
330	R395	3001054720000	4.7K
331	R396	3001054720000	4.7K
332	R428	3001054720000	4.7K
333	R435	3001054720000	4.7K
334	R436	3001054720000	4.7K
335	R437	3001054720000	4.7K
336	R448	3001054720000	4.7K
337	R468	3001054720000	4.7K
338	R469	3001054720000	4.7K
339	R470	3001054720000	4.7K
340	R471	3001054720000	4.7K
341	R472	3001054720000	4.7K
342	R488	3001054720000	4.7K
343	R496	3001054720000	4.7K
344	R499	3001054720000	4.7K
345	R511	3001054720000	4.7K
346	R6108	3001054720000	4.7K
347	R6135	3001054720000	4.7K
348	R708	3001054720000	4.7K
349	R908	3001054720000	4.7K

No.	Ref. No.	Part No.	Description
350	R910	3001054720000	4.7K
351	R913	3001054720000	4.7K
352	R937	3001054720000	4.7K
353	R942	3001054720000	4.7K
354	R925	3001064720000	4.7K
355	R932	3001064720000	4.7K
356	R880	3001074720010	4.7K
357	R881	3001074720010	4.7K
358	R6130	3001055120030	5.1K
359	R839	3001053320000	5.6K
360	R239	3001055620000	5.6K
361	R287	3001055620000	5.6K
362	R6105	3001055620000	5.6K
363	R716	3001055620000	5.6K
364	R843	3001065620000	5.6K
365	R918	3099066041010	6K
366	R132	3001056820000	6.8K
367	R143	3001056820000	6.8K
368	R158	3001056820000	6.8K
369	R159	3001057520000	7.5K
370	R194	3001057520000	7.5K
371	R138	3001058220000	8.2K
372	R710	3001058220000	8.2K
373	R867	3001058220000	8.2K
374	R858	3001069120000	9.1K
375	R3	3001050000000	10KΩ
376	R6	3001050000000	10KΩ
377	R177	3001051030000	10KΩ
378	R180	3001051030000	10KΩ
379	R234	3001051030000	10KΩ
380	R235	3001051030000	10KΩ
381	R236	3001051030000	10KΩ
382	R256	3001051030000	10KΩ
383	R258	3001051030000	10KΩ
384	R259	3001051030000	10KΩ
385	R261	3001051030000	10KΩ
386	R316	3001051030000	10KΩ
387	R322	3001051030000	10KΩ
388	R323	3001051030000	10KΩ
389	R325	3001051030000	10KΩ
390	R326	3001051030000	10KΩ
391	R334	3001051030000	10KΩ
392	R335	3001051030000	10KΩ
393	R340	3001051030000	10KΩ

No.	Ref. No.	Part No.	Description
394	R341	3001051030000	10KΩ
395	R342	3001051030000	10KΩ
396	R343	3001051030000	10KΩ
397	R351	3001051030000	10KΩ
398	R353	3001051030000	10KΩ
399	R372	3001051030000	10KΩ
400	R373	3001051030000	10KΩ
401	R377	3001051030000	10KΩ
402	R378	3001051030000	10KΩ
403	R379	3001051030000	10KΩ
404	R382	3001051030000	10KΩ
405	R385	3001051030000	10KΩ
406	R390	3001051030000	10KΩ
407	R391	3001051030000	10KΩ
408	R392	3001051030000	10KΩ
409	R393	3001051030000	10KΩ
410	R394	3001051030000	10KΩ
411	R398	3001051030000	10KΩ
412	R427	3001051030000	10KΩ
413	R429	3001051030000	10KΩ
414	R438	3001051030000	10KΩ
415	R441	3001051030000	10KΩ
416	R442	3001051030000	10KΩ
417	R443	3001051030000	10KΩ
418	R447	3001051030000	10KΩ
419	R451	3001051030000	10KΩ
420	R452	3001051030000	10KΩ
421	R453	3001051030000	10KΩ
422	R454	3001051030000	10KΩ
423	R461	3001051030000	10KΩ
424	R462	3001051030000	10KΩ
425	R463	3001051030000	10KΩ
426	R464	3001051030000	10KΩ
427	R465	3001051030000	10KΩ
428	R466	3001051030000	10KΩ
429	R476	3001051030000	10KΩ
430	R481	3001051030000	10KΩ
431	R482	3001051030000	10KΩ
432	R483	3001051030000	10KΩ
433	R501	3001051030000	10KΩ
434	R506	3001051030000	10KΩ
435	R509	3001051030000	10KΩ
436	R510	3001051030000	10KΩ
437	R512	3001051030000	10KΩ

No.	Ref. No.	Part No.	Description
438	R530	3001051030000	10KΩ
439	R531	3001051030000	10KΩ
440	R532	3001051030000	10KΩ
441	R534	3001051030000	10KΩ
442	R535	3001051030000	10KΩ
443	R538	3001051030000	10KΩ
444	R539	3001051030000	10KΩ
445	R540	3001051030000	10KΩ
446	R541	3001051030000	10KΩ
447	R543	3001051030000	10KΩ
448	R555	3001051030000	10KΩ
449	R705	3001051030000	10KΩ
450	R709	3001051030000	10KΩ
451	R885	3001051030000	10KΩ
452	R938	3001051030000	10KΩ
453	R945	3001051030000	10KΩ
454	R950	3001051030000	10KΩ
455	R976	3001051030000	10KΩ
456	R979	3001051030000	10KΩ
457	R980	3001051030000	10KΩ
458	R844	3001051030000	10KΩ
459	R846	3001051030000	10KΩ
460	R842	3001051030000	10KΩ
461	R870	3001051030000	10KΩ
462	R802	3001051030000	10KΩ
463	R151	3001051030000	10KΩ
464	R198	3001051030000	10KΩ
465	R250	3001051030000	10KΩ
466	R284	3001051030000	10KΩ
467	R285	3001051030000	10KΩ
468	R361	3001051030000	10KΩ
469	R362	3001051030000	10KΩ
470	R884	3001051030000	10KΩ
471	R930	3001051030000	10KΩ
472	R161	3001051830000	18KΩ
473	R811	3001061830010	18KΩ
474	R155	3001052030000	20KΩ
475	R195	3001052030000	20KΩ
476	R6136	3001052030000	20KΩ
477	R975	3001052030000	20KΩ
478	R845	3001062030000	20KΩ
479	R244	3001052230010	22KΩ
480	R246	3001052230010	22KΩ
481	R940	3001052230010	22KΩ

No.	Ref. No.	Part No.	Description
482	R944	3001052230010	22KΩ
483	R273	3001052430010	24KΩ
484	R915	3001052430010	24KΩ
485	R952	3001062430000	24KΩ
486	R6103	3001052730010	27KΩ
487	R815	3001082730000	27KΩ
488	R257	3001053030000	30KΩ
489	R263	3001053030000	30KΩ
490	R279	3001053030000	30KΩ
491	R283	3001053030000	30KΩ
492	R6134	3001053030000	30KΩ
493	R6137	3001053030000	30KΩ
494	R529	3001053330000	33KΩ
495	R558	3001053330000	33KΩ
496	R559	3001053330000	33KΩ
497	R560	3001053330000	33KΩ
498	R561	3001053330000	33KΩ
499	R562	3001053330000	33KΩ
500	R563	3001053330000	33KΩ
501	R838	3001053330000	33KΩ
502	R841	3001053330000	33KΩ
503	R875	3001053330000	33KΩ
504	R152	3001053630000	36KΩ
505	R117	3001053930000	39KΩ
506	R120	3001053930000	39KΩ
507	R865	3001053930000	39KΩ
508	R911	3099064422010	44KΩ
509	R266	3001054730000	47KΩ
510	R270	3001054730000	47KΩ
511	R272	3001054730000	47KΩ
512	R277	3001054730000	47KΩ
513	R286	3001054730000	47KΩ
514	R288	3001054730000	47KΩ
515	R847	3001054730000	47KΩ
516	R877	3001054730000	47KΩ
517	R931	3001054730000	47KΩ
518	R949	3001054730000	47KΩ
519	R959	3001054730000	47KΩ
520	R727	3001064730000	47KΩ
521	R728	3001064730000	47KΩ
522	R906	3001064730000	47KΩ
523	R943	3001064730000	47KΩ
524	R969	3001064730000	47KΩ
525	R934	3001055130010	51KΩ

No.	Ref. No.	Part No.	Description
526	R237	3001055630000	56KΩ
527	R241	3001055630000	56KΩ
528	R6139	3001055630000	56KΩ
529	R854	3001055630000	56KΩ
530	R876	3001055630000	56KΩ
531	R883	3001055630000	56KΩ
532	R895	3001055630000	56KΩ
533	R528	3001056830000	68KΩ
534	R128	3001058230000	82KΩ
535	R892	3001058230000	82KΩ
536	R247	3001051040000	100K
537	R248	3001051040000	100K
538	R252	3001051040000	100K
539	R262	3001051040000	100K
540	R268	3001051040000	100K
541	R269	3001051040000	100K
542	R274	3001051040000	100K
543	R275	3001051040000	100K
544	R276	3001051040000	100K
545	R296	3001051040000	100K
546	R455	3001051040000	100K
547	R500	3001051040000	100K
548	R513	3001051040000	100K
549	R514	3001051040000	100K
550	R6111	3001051040000	100K
551	R6112	3001051040000	100K
552	R6115	3001051040000	100K
553	R713	3001051040000	100K
554	R982	3001051040000	100K
555	RT804	3003061040000	Thermistor 100KΩ
556	R199	3001051240000	120K
557	R882	3001051540000	150K
558	R919	3001051540000	150K
559	R872	3001051840000	180K
560	R955	3001051840000	180K
561	R956	3001051840000	180K
562	R886	3001052240000	220K
563	R6113	3001052740000	270K
564	R917	3001053340010	330K
565	RN230	3005051010010	100Ω
566	RN500	3005051010010	100Ω
567	C181	3101050590010	0.5PF
568	C27	3101050590010	0.5PF
569	C42	3101050100030	1PF

No.	Ref. No.	Part No.	Description
570	C6117	3101050100030	1PF
571	C6120	3101050100030	1PF
572	C6121	3101050100030	1PF
573	C6124	3101050100030	1PF
574	C6126	3101050100030	1PF
575	C6153	3101050100030	1PF
576	C62	3101050100030	1PF
577	C179	3101060100010	1PF
578	C821	3101080100010	1PF
579	C832	3101080100010	1PF
580	C101	3101051590000	1.5PF
581	C53	3101051590000	1.5PF
582	C6110	3101051590000	1.5PF
583	C6119	3101051590000	1.5PF
584	C6122	3101051590000	1.5PF
585	C6127	3101051590000	1.5PF
586	C6152	3101051590000	1.5PF
587	C9	3101051590000	1.5PF
588	C102	3101061590010	1.5PF
589	C6154	3101050200010	2PF
590	C178	3101060200010	2PF
591	C862	3101060200010	2PF
592	C816	3101080200010	2p
593	C835	3101080200010	2p
594	C836	3101080200010	2p
595	C2	3101060300010	3PF
596	C31	3101060300010	3PF
597	C703	3101060300010	3PF
598	C838	3101080300010	3p
599	C851	3101080300010	3p
600	C13	3101053690030	3.6P
601	C198	3101053690030	3.6P
602	C26	3101063690000	3.6P
603	C55	3101063690000	3.6P
604	C11	3101050400010	4P
605	C165	3101050400010	4P
606	C6133	3101050400010	4P
607	C152	3101054090010	4P
608	C159	3101054090010	4P
609	C18	3101054090010	4P
610	C49	3101060400010	4P
611	C831	3101080400010	4p
612	C833	3101080400010	4p
613	C166	3101050500010	5PF

No.	Ref. No.	Part No.	Description
614	C168	3101050500010	5PF
615	C25	3101050500010	5PF
616	C32	3101050500010	5PF
617	C6114	3101050500010	5PF
618	C12	3101050500030	5PF
619	C164	3101050500030	5PF
620	C177	3101060500010	5PF
621	C830	3101080500010	5PF
622	C837	3101080500010	5PF
623	C16	3101050600010	6PF
624	C56	3101050600010	6PF
625	C6109	3101050600010	6PF
626	C6111	3101050600010	6PF
627	C6112	3101050600010	6PF
628	C6116	3101050600010	6PF
629	C731	3101050600010	6PF
630	L6111	3101060600010	6PF
631	C6163	3101050700010	7PF
632	C10	3101060700020	7PF
633	C196	3101060700020	7PF
634	C22	3101050800000	8PF
635	C819	3101080800010	8PF
636	C841	3101080800010	8PF
637	C856	3101080800010	8PF
638	C6170	3101050900000	9PF
639	C151	3101060900010	9PF
640	C15	3101051000020	10PF
641	C714	3101051000020	10PF
642	C751	3101051000020	10PF
643	C17	3101061000000	10PF
644	C20	3101061000000	10PF
645	C823	3101081000010	10pF
646	C14	3101051200020	12PF
647	C322	3101051200020	12PF
648	C324	3101051200020	12PF
649	C375	3101051200020	12PF
650	C376	3101051200020	12PF
651	C59	3101051200020	12PF
652	C61	3101051200020	12PF
653	C155	3101061200000	12PF
654	C189	3101061200000	12PF
655	C812	3101081200010	12PF
656	C820	3101081200010	12PF
657	C6161	3101051500020	15PF

No.	Ref. No.	Part No.	Description
658	C6162	3101051500020	15PF
659	C6164	3101051500020	15PF
660	C6177	3101051500020	15PF
661	C723	3101051500020	15PF
662	C4	3101051500080	15PF
663	C818	3101061500010	15PF
664	L826	3101061600000	16PF
665	C6129	3101051800010	18PF
666	C724	3101051800010	18PF
667	C158	3101051800070	18PF
668	C162	3101051800070	18PF
669	C191	3101051800070	18PF
670	C6128	3101061800000	18PF
671	C814	3101061800000	18PF
672	C864	3101061800000	18PF
673	C730	3101052200010	22PF
674	C732	3101052200010	22PF
675	C747	3101052200010	22PF
676	C918	3101052200010	22PF
677	C857	3101062200010	22PF
678	C8330	3101372200000	22PF
679	C842	3101372200000	22PF
680	C865	3101062400010	24PF
681	C153	3101052700000	27PF
682	C5	3101052700000	27PF
683	C6160	3101052700000	27PF
684	C734	3101053000010	30PF
685	C193	3101053300000	33PF
686	C500	3101053300000	33PF
687	C1004	3101063300000	33PF
688	C803	3101063300000	33PF
689	C888	3101063300000	33PF
690	C931	3101063300000	33PF
691	C940	3101063300000	33PF
692	C846	3101073300000	33PF
693	C855	3101073300000	33PF
694	C154	3101053900000	39PF
695	C364	3101053900000	39PF
696	C749	3101053900000	39PF
697	C3	3101054700010	47PF
698	C6137	3101054700010	47PF
699	C6138	3101054700010	47PF
700	C6142	3101054700010	47PF
701	C6143	3101054700010	47PF

No.	Ref. No.	Part No.	Description
702	C743	3101054700010	47PF
703	C872	3101064700000	47PF
704	C902	3101064700000	47PF
705	L833	3101064700000	47PF
706	R824	3101064700000	47PF
707	C810	3101074700000	47PF
708	C825	3101074700000	47PF
709	C840	3101074700000	47PF
710	C157	3101055600000	56PF
711	C161	3101055600000	56PF
712	C185	3101055600000	56PF
713	C6134	3101055600000	56PF
714	C6135	3101055600000	56PF
715	C6136	3101055600000	56PF
716	C6139	3101055600000	56PF
717	C6140	3101055600000	56PF
718	C6141	3101055600000	56PF
719	C745	3101055600000	56PF
720	C922	3101055600000	56PF
721	C861	3101066800000	68PF
722	C362	3101058200000	82PF
723	C363	3101058200000	82PF
724	C365	3101058200000	82PF
725	C121	3101051010030	100PF
726	C1320	3101051010030	100PF
727	C288	3101051010030	100PF
728	C307	3101051010030	100PF
729	C309	3101051010030	100PF
730	C326	3101051010030	100PF
731	C33	3101051010030	100PF
732	C335	3101051010030	100PF
733	C339	3101051010030	100PF
734	C34	3101051010030	100PF
735	C340	3101051010030	100PF
736	C341	3101051010030	100PF
737	C342	3101051010030	100PF
738	C343	3101051010030	100PF
739	C344	3101051010030	100PF
740	C345	3101051010030	100PF
741	C346	3101051010030	100PF
742	C347	3101051010030	100PF
743	C348	3101051010030	100PF
744	C349	3101051010030	100PF
745	C350	3101051010030	100PF

No.	Ref. No.	Part No.	Description
746	C351	3101051010030	100PF
747	C352	3101051010030	100PF
748	C353	3101051010030	100PF
749	C354	3101051010030	100PF
750	C355	3101051010030	100PF
751	C357	3101051010030	100PF
752	C358	3101051010030	100PF
753	C359	3101051010030	100PF
754	C360	3101051010030	100PF
755	C361	3101051010030	100PF
756	C378	3101051010030	100PF
757	C385	3101051010030	100PF
758	C390	3101051010030	100PF
759	C409	3101051010030	100PF
760	C410	3101051010030	100PF
761	C411	3101051010030	100PF
762	C412	3101051010030	100PF
763	C413	3101051010030	100PF
764	C414	3101051010030	100PF
765	C415	3101051010030	100PF
766	C416	3101051010030	100PF
767	C417	3101051010030	100PF
768	C418	3101051010030	100PF
769	C419	3101051010030	100PF
770	C420	3101051010030	100PF
771	C426	3101051010030	100PF
772	C427	3101051010030	100PF
773	C428	3101051010030	100PF
774	C429	3101051010030	100PF
775	C430	3101051010030	100PF
776	C431	3101051010030	100PF
777	C435	3101051010030	100PF
778	C440	3101051010030	100PF
779	C441	3101051010030	100PF
780	C442	3101051010030	100PF
781	C443	3101051010030	100PF
782	C444	3101051010030	100PF
783	C445	3101051010030	100PF
784	C446	3101051010030	100PF
785	C447	3101051010030	100PF
786	C448	3101051010030	100PF
787	C449	3101051010030	100PF
788	C450	3101051010030	100PF
789	C451	3101051010030	100PF

No.	Ref. No.	Part No.	Description
790	C452	3101051010030	100PF
791	C453	3101051010030	100PF
792	C454	3101051010030	100PF
793	C455	3101051010030	100PF
794	C456	3101051010030	100PF
795	C463	3101051010030	100PF
796	C465	3101051010030	100PF
797	C466	3101051010030	100PF
798	C467	3101051010030	100PF
799	C468	3101051010030	100PF
800	C469	3101051010030	100PF
801	C470	3101051010030	100PF
802	C472	3101051010030	100PF
803	C510	3101051010030	100PF
804	C516	3101051010030	100PF
805	C517	3101051010030	100PF
806	C518	3101051010030	100PF
807	C6130	3101051010030	100PF
808	C6166	3101051010030	100PF
809	C721	3101051010030	100PF
810	C722	3101051010030	100PF
811	C738	3101051010030	100PF
812	C739	3101051010030	100PF
813	C76	3101051010030	100PF
814	C763	3101051010030	100PF
815	C764	3101051010030	100PF
816	C765	3101051010030	100PF
817	C766	3101051010030	100PF
818	C767	3101051010030	100PF
819	C769	3101051010030	100PF
820	C77	3101051010030	100PF
821	C90	3101051010030	100PF
822	C93	3101051010030	100PF
823	C6157	3101061010010	100PF
824	C852	3101061010010	100PF
825	C909	3101061010010	100PF
826	C891	3101051210000	120PF
827	C899	3101051210000	120PF
828	C875	3101051510000	150PF
829	C847	3101061510000	150PF
830	C848	3101061510000	150PF
831	C716	3101061810010	180PF
832	C100	3101052210010	220PF
833	C1000	3101052210010	220PF

No.	Ref. No.	Part No.	Description
834	C147	3101052210010	220PF
835	C150	3101052210010	220PF
836	C156	3101052210010	220PF
837	C160	3101052210010	220PF
838	C184	3101052210010	220PF
839	C186	3101052210010	220PF
840	C194	3101052210010	220PF
841	C197	3101052210010	220PF
842	C23	3101052210010	220PF
843	C247	3101052210010	220PF
844	C250	3101052210010	220PF
845	C254	3101052210010	220PF
846	C265	3101052210010	220PF
847	C269	3101052210010	220PF
848	C270	3101052210010	220PF
849	C271	3101052210010	220PF
850	C272	3101052210010	220PF
851	C273	3101052210010	220PF
852	C28	3101052210010	220PF
853	C280	3101052210010	220PF
854	C29	3101052210010	220PF
855	C421	3101052210010	220PF
856	C423	3101052210010	220PF
857	C424	3101052210010	220PF
858	C425	3101052210010	220PF
859	C432	3101052210010	220PF
860	C433	3101052210010	220PF
861	C434	3101052210010	220PF
862	C436	3101052210010	220PF
863	C437	3101052210010	220PF
864	C46	3101052210010	220PF
865	C52	3101052210010	220PF
866	C6	3101052210010	220PF
867	C6103	3101052210010	220PF
868	C6105	3101052210010	220PF
869	C6106	3101052210010	220PF
870	C6107	3101052210010	220PF
871	C6144	3101052210010	220PF
872	C6159	3101052210010	220PF
873	C704	3101052210010	220PF
874	C883	3101052210010	220PF
875	C890	3101052210010	220PF
876	C895	3101052210010	220PF
877	C896	3101052210010	220PF

No.	Ref. No.	Part No.	Description
878	C897	3101052210010	220PF
879	C898	3101052210010	220PF
880	C921	3101052210010	220PF
881	C242	3101062210000	220PF
882	C245	3101062210000	220PF
883	C808	3101062210000	220PF
884	C809	3101062210000	220PF
885	C822	3101062210000	220PF
886	C845	3101062210000	220PF
887	C853	3101062210000	220PF
888	C877	3101062210000	220PF
889	C878	3101062210000	220PF
890	C887	3101062210000	220PF
891	C892	3101062210000	220PF
892	C99	3101052710000	270PF
893	C501	3101053310020	330PF
894	C911	3101053310020	330PF
895	C1001	3101054710010	470PF
896	C1003	3101054710010	470PF
897	C1015	3101054710010	470PF
898	C142	3101054710010	470PF
899	C148	3101054710010	470PF
900	C21	3101054710010	470PF
901	C50	3101054710010	470PF
902	C6102	3101054710010	470PF
903	C6118	3101054710010	470PF
904	C6146	3101054710010	470PF
905	C6148	3101054710010	470PF
906	C6151	3101054710010	470PF
907	C706	3101054710010	470PF
908	C717	3101054710010	470PF
909	C727	3101054710010	470PF
910	C746	3101054710010	470PF
911	C8	3101054710010	470PF
912	C945	3101054710010	470PF
913	C811	3101064710000	470PF
914	C817	3101064710000	470PF
915	C843	3101064710000	470PF
916	C827	3101084710010	470PF
917	C850	3101084710010	470PF
918	C885	3101084710010	470PF
919	C893	3101374710000	470PF
920	C1	3101051020010	1000PF
921	C1002	3101051020010	1000PF

No.	Ref. No.	Part No.	Description
922	C1010	3101051020010	1000PF
923	C337	3101051020010	1000PF
924	C338	3101051020010	1000PF
925	C513	3101051020010	1000PF
926	C60	3101051020010	1000PF
927	C6108	3101051020010	1000PF
928	C710	3101051020010	1000PF
929	C728	3101051020010	1000PF
930	C75	3101051020010	1000PF
931	C79	3101051020010	1000PF
932	C82	3101051020010	1000PF
933	C910	3101051020010	1000PF
934	C937	3101051020010	1000PF
935	C944	3101051020010	1000PF
936	C96	3101051020010	1000PF
937	C815	3101061020040	1000PF
938	C839	3101061020040	1000PF
939	C801	3101081020010	1000PF
940	C503	3101051820000	1800PF
941	C502	3101053320010	3300PF
942	C802	3101063320000	3300PF
943	C889	3101063320000	3300PF
944	C916	3101063320000	3300PF
945	C943	3101063320000	3300PF
946	C713	3101053920000	3900PF
947	C863	3101064720000	4700PF
948	C199	3101051030020	0.01UF
949	C235	3101051030020	0.01UF
950	C260	3101051030020	0.01UF
951	C261	3101051030020	0.01UF
952	C306	3101051030020	0.01UF
953	C381	3101051030020	0.01UF
954	C384	3101051030020	0.01UF
955	C399	3101051030020	0.01UF
956	C506	3101051030020	0.01UF
957	C507	3101051030020	0.01UF
958	C58	3101051030020	0.01UF
959	C6147	3101051030020	0.01UF
960	C6155	3101051030020	0.01UF
961	C6178	3101051030020	0.01UF
962	C701	3101051030020	0.01UF
963	C702	3101051030020	0.01UF
964	C725	3101051030020	0.01UF
965	C736	3101051030020	0.01UF

No.	Ref. No.	Part No.	Description
966	C80	3101051030020	0.01UF
967	C95	3101051030020	0.01UF
968	C97	3101051030020	0.01UF
969	C952	3101061030010	0.01UF
970	C913	3101061830000	0.018UF
971	C930	3101061830000	0.018UF
972	C246	3101052230000	0.022UF
973	C880	3101064730000	0.047UF
974	C122	3101065630000	0.056UF
975	C894	3101051830000	0.1UF
976	C1006	3101051040010	0.1UF
977	C141	3101051040010	0.1UF
978	C149	3101051040010	0.1UF
979	C163	3101051040010	0.1UF
980	C167	3101051040010	0.1UF
981	C195	3101051040010	0.1UF
982	C232	3101051040010	0.1UF
983	C233	3101051040010	0.1UF
984	C236	3101051040010	0.1UF
985	C239	3101051040010	0.1UF
986	C24	3101051040010	0.1UF
987	C240	3101051040010	0.1UF
988	C243	3101051040010	0.1UF
989	C248	3101051040010	0.1UF
990	C256	3101051040010	0.1UF
991	C258	3101051040010	0.1UF
992	C267	3101051040010	0.1UF
993	C274	3101051040010	0.1UF
994	C285	3101051040010	0.1UF
995	C30	3101051040010	0.1UF
996	C308	3101051040010	0.1UF
997	C311	3101051040010	0.1UF
998	C321	3101051040010	0.1UF
999	C323	3101051040010	0.1UF
1000	C329	3101051040010	0.1UF
1001	C334	3101051040010	0.1UF
1002	C336	3101051040010	0.1UF
1003	C356	3101051040010	0.1UF
1004	C379	3101051040010	0.1UF
1005	C380	3101051040010	0.1UF
1006	C382	3101051040010	0.1UF
1007	C383	3101051040010	0.1UF
1008	C386	3101051040010	0.1UF
1009	C387	3101051040010	0.1UF

No.	Ref. No.	Part No.	Description
1010	C388	3101051040010	0.1UF
1011	C389	3101051040010	0.1UF
1012	C391	3101051040010	0.1UF
1013	C392	3101051040010	0.1UF
1014	C393	3101051040010	0.1UF
1015	C394	3101051040010	0.1UF
1016	C398	3101051040010	0.1UF
1017	C400	3101051040010	0.1UF
1018	C407	3101051040010	0.1UF
1019	C422	3101051040010	0.1UF
1020	C473	3101051040010	0.1UF
1021	C509	3101051040010	0.1UF
1022	C512	3101051040010	0.1UF
1023	C514	3101051040010	0.1UF
1024	C515	3101051040010	0.1UF
1025	C6104	3101051040010	0.1UF
1026	C6113	3101051040010	0.1UF
1027	C6168	3101051040010	0.1UF
1028	C6169	3101051040010	0.1UF
1029	C6171	3101051040010	0.1UF
1030	C6173	3101051040010	0.1UF
1031	C6175	3101051040010	0.1UF
1032	C6179	3101051040010	0.1UF
1033	C6180	3101051040010	0.1UF
1034	C7	3101051040010	0.1UF
1035	C705	3101051040010	0.1UF
1036	C707	3101051040010	0.1UF
1037	C708	3101051040010	0.1UF
1038	C709	3101051040010	0.1UF
1039	C712	3101051040010	0.1UF
1040	C720	3101051040010	0.1UF
1041	C729	3101051040010	0.1UF
1042	C733	3101051040010	0.1UF
1043	C735	3101051040010	0.1UF
1044	C737	3101051040010	0.1UF
1045	C740	3101051040010	0.1UF
1046	C741	3101051040010	0.1UF
1047	C744	3101051040010	0.1UF
1048	C756	3101051040010	0.1UF
1049	C83	3101051040010	0.1UF
1050	C85	3101051040010	0.1UF
1051	C86	3101051040010	0.1UF
1052	C87	3101051040010	0.1UF
1053	C89	3101051040010	0.1UF

No.	Ref. No.	Part No.	Description
1054	C947	3101051040010	0.1UF
1055	C950	3101051040010	0.1UF
1056	C955	3101051040010	0.1UF
1057	C958	3101051040010	0.1UF
1058	C967	3101051040010	0.1UF
1059	C968	3101051040010	0.1UF
1060	C969	3101051040010	0.1UF
1061	C98	3101051040010	0.1UF
1062	C1016	3101061040010	0.1UF
1063	C123	3101061040010	0.1UF
1064	C132	3101061040010	0.1UF
1065	C283	3101061040010	0.1UF
1066	C289	3101061040010	0.1UF
1067	C6193	3101061040010	0.1UF
1068	C748	3101061040010	0.1UF
1069	C829	3101061040010	0.1UF
1070	C854	3101061040010	0.1UF
1071	C868	3101061040010	0.1UF
1072	C907	3101061040010	0.1UF
1073	C927	3101061040010	0.1UF
1074	C935	3101061040010	0.1UF
1075	C936	3101061040010	0.1UF
1076	C939	3101061040010	0.1UF
1077	C942	3101061040010	0.1UF
1078	C948	3101061040010	0.1UF
1079	C963	3101061040010	0.1UF
1080	L6122	3101061040010	0.1UF
1081	L6126	3101061040010	0.1UF
1082	C1005	3101061040010	0.1UF
1083	C1007	3101061040010	0.1UF
1084	C64	3101061040010	0.1UF
1085	C66	3101061040010	0.1UF
1086	C67	3101061040010	0.1UF
1087	C68	3101061040010	0.1UF
1088	C69	3101061040010	0.1UF
1089	C70	3101061040010	0.1UF
1090	C72	3101061040010	0.1UF
1091	C74	3101061040010	0.1UF
1092	C78	3101061040010	0.1UF
1093	C84	3101061040010	0.1UF
1094	C88	3101061040010	0.1UF
1095	C91	3101061040010	0.1UF
1096	C94	3101061040010	0.1UF
1097	C941	3101062240050	0.22UF

No.	Ref. No.	Part No.	Description
1098	C438	3101054740000	0.47UF
1099	C439	3101054740000	0.47UF
1100	C287	3101064740000	0.47UF
1101	C715	3101064740000	0.47UF
1102	C255	3101051050000	1UF
1103	C276	3101051050000	1UF
1104	C305	3101051050000	1UF
1105	C310	3101051050000	1UF
1106	C719	3101051050000	1UF
1107	C962	3101051050000	1UF
1108	C238	3101061050020	1UF
1109	C249	3101061050020	1UF
1110	C251	3101061050020	1UF
1111	C252	3101061050020	1UF
1112	C253	3101061050020	1UF
1113	C257	3101061050020	1UF
1114	C259	3101061050020	1UF
1115	C262	3101061050020	1UF
1116	C263	3101061050020	1UF
1117	C264	3101061050020	1UF
1118	C266	3101061050020	1UF
1119	C268	3101061050020	1UF
1120	C277	3101061050020	1UF
1121	C278	3101061050020	1UF
1122	C279	3101061050020	1UF
1123	C281	3101061050020	1UF
1124	C282	3101061050020	1UF
1125	C290	3101061050020	1UF
1126	C291	3101061050020	1UF
1127	C294	3101061050020	1UF
1128	C298	3101061050020	1UF
1129	C299	3101061050020	1UF
1130	C396	3101061050020	1UF
1131	C6100	3101061050020	1UF
1132	C6145	3101061050020	1UF
1133	C6149	3101061050020	1UF
1134	C6185	3101061050020	1UF
1135	C6190	3101061050020	1UF
1136	C742	3101061050020	1UF
1137	C754	3101061050020	1UF
1138	C900	3101061050020	1UF
1139	C901	3101061050020	1UF
1140	C905	3101061050020	1UF
1141	C906	3101061050020	1UF

No.	Ref. No.	Part No.	Description
1142	C908	3101061050020	1UF
1143	C923	3101061050020	1UF
1144	C924	3101061050020	1UF
1145	C925	3101061050020	1UF
1146	C938	3101061050020	1UF
1147	C946	3101061050020	1UF
1148	C966	3101061050020	1UF
1149	C750	3101071050020	1UF
1150	C1009	3104071050070	1UF
1151	C71	3104071050070	1UF
1152	C920	3101062250000	2.2UF
1153	C932	3101062250000	2.2UF
1154	C934	3101062250000	2.2UF
1155	C965	3101062250000	2.2UF
1156	C912	3101072250030	2.2UF
1157	C292	3101064750030	4.7UF
1158	C136	3101074750010	4.7UF
1159	C275	3101071060010	10UF
1160	C408	3101071060010	10UF
1161	C926	3101071060010	10UF
1162	C234	3101081060010	10UF
1163	C286	3101081060010	10UF
1164	C807	3101081060010	10UF
1165	C956	3101081060010	10UF
1166	C957	3101081060010	10UF
1167	C980	3101081060010	10UF
1168	C981	3101081060010	10UF
1169	C1013	3104071060070	10UF
1170	C293	3104071060070	10UF
1171	C401	3104071060070	10UF
1172	C402	3104071060070	10UF
1173	C508	3104071060070	10UF
1174	C511	3104071060070	10UF
1175	C519	3104071060070	10UF
1176	C520	3104071060070	10UF
1177	C726	3104071060070	10UF
1178	C755	3104071060070	10UF
1179	C917	3104071060070	10UF
1180	C929	3104071060070	10UF
1181	C928	3104081060120	10UF
1182	C951	3104081060120	10UF
1183	C919	3101072260000	22UF
1184	C915	3101082260020	22UF
1185	C933	3101092260010	22UF

No.	Ref. No.	Part No.	Description
1186	C284	3103994760180	47uf
1187	C804	3103994760180	47uf
1188	C914	3103994760180	47uf
1189	L814	3212106569000	5.6nH
1190	L105	3237199080000	8nH
1191	L114	3237199080000	8nH
1192	L811	3217106829010	8.2nH
1193	C6194	3212106100000	10nH
1194	L6103	3212106100000	10nH
1195	L832	3212106100000	10nH
1196	L124	3237199120000	12.5nH
1197	L137	3237199120000	12.5nH
1198	L122	3210306150000	15nH
1199	L123	3210306150000	15nH
1200	L128	3210306150000	15nH
1201	L136	3210306150000	15nH
1202	L173	3210306150000	15nH
1203	L2	3210306150000	15nH
1204	L6110	3210306150000	15nH
1205	L171	3210306180000	18nH
1206	L6116	3210306180000	18nH
1207	L6118	3210306180000	18nH
1208	C826	3210306220000	22nH
1209	L6117	3210306220000	22nH
1210	L6119	3210306220000	22nH
1211	L805	3210306220000	22nH
1212	L132	3210306270000	27nH
1213	L135	3210306270000	27nH
1214	L138	3210306270000	27nH
1215	L162	3210306270000	27nH
1216	L166	3210306270000	27nH
1217	L167	3210306270000	27nH
1218	L168	3210306270000	27nH
1219	L169	3210306270000	27nH
1220	L106	3214307270010	27nH
1221	L115	3214307270010	27nH
1222	L139	3210107330000	33nH
1223	L827	3212106390000	39nH
1224	L126	3214307390000	39nH
1225	L6120	3210306470000	47nH
1226	L6102	3210306221000	220nH
1227	L708	3217107221010	220nH
1228	L6125	3210406331000	330nH
1229	L716	3210406331000	330nH

No.	Ref. No.	Part No.	Description
1230	L147	3210406471000	470nH
1231	L151	3210406471000	470nH
1232	L718	3210406471000	470nH
1233	L103	3217607471000	470nH
1234	L107	3217607471000	470nH
1235	L108	3217607471000	470nH
1236	L110	3217607471000	470nH
1237	L112	3217607471000	470nH
1238	L116	3217607471000	470nH
1239	L117	3217607471000	470nH
1240	L118	3217607471000	470nH
1241	L121	3217607471000	470nH
1242	L127	3217607471000	470nH
1243	L129	3217607471000	470nH
1244	L133	3217607471000	470nH
1245	L134	3217607471000	470nH
1246	L140	3217607471000	470nH
1247	L4	3217607471000	470nH
1248	L5	3217607471000	470nH
1249	L154	3213306561000	0.56uH
1250	L713	3213306561000	0.56uH
1251	L6123	3213306821000	0.82uH
1252	L131	3221506601000	Bead
1253	L152	3221506601000	Bead
1254	L6	3221506601000	Bead
1255	L7	3221506601000	Bead
1256	L701	3221506601000	Bead
1257	L702	3221506601000	Bead
1258	L703	3221506601000	Bead
1259	L706	3221506601000	Bead
1260	L707	3221506601000	Bead
1261	L709	3221506601000	Bead
1262	L710	3221506601000	Bead
1263	L711	3221506601000	Bead
1264	L712	3221506601000	Bead
1265	L714	3221506601000	Bead
1266	L8	3221506601000	Bead
1267	L815	3221506601000	Bead
1268	L821	3221506601000	Bead
1269	L822	3221506601000	Bead
1270	L824	3221506601000	Bead
1271	L825	3221506601000	Bead
1272	L9	3221506601000	Bead
1273	R153	3221506601000	Bead

No.	Ref. No.	Part No.	Description
1274	R157	3221506601000	Bead
1275	R179	3221506601000	Bead
1276	R186	3221506601000	Bead
1277	L801	3221513600000	Bead
1278	L802	3221513600000	Bead
1279	L803	3221513600000	Bead
1280	L900	3221513600000	Bead
1281	L916	3221513600000	Bead
1282	L917	3221513600000	Bead
1283	L940	3221513600000	Bead
1284	L232	3221506300000	Bead
1285	L401	3221506300000	Bead
1286	L402	3221506300000	Bead
1287	L403	3221506300000	Bead
1288	L404	3221506300000	Bead
1289	L405	3221506300000	Bead
1290	L406	3221506300000	Bead
1291	L407	3221506300000	Bead
1292	L408	3221506300000	Bead
1293	L409	3221506300000	Bead
1294	L410	3221506300000	Bead
1295	L411	3221506300000	Bead
1296	L412	3221506300000	Bead
1297	L901	3221506300000	Bead
1298	L912	3221506300000	Bead
1299	L913	3221506300000	Bead
1300	R905	3221506300000	Bead
1301	L904	3221506181000	Bead
1302	L908	3221506181000	Bead
1303	L233	3211506101000	Bead
1304	L234	3211506101000	Bead
1305	L235	3211506101000	Bead
1306	L6100	3211506101000	Bead
1307	L6101	3211506101000	Bead
1308	L6114	3211506101000	Bead
1309	L6115	3211506101000	Bead
1310	L6121	3211506101000	Bead
1311	L816	3231083011000	Air-core coil
1312	L804	3231132803000	Air-core coil
1313	L809	3231132803000	Air-core coil
1314	L810	3231132803000	Air-core coil
1315	L813	3231132803000	Air-core coil
1316	L817	3231132803000	Air-core coil
1317	L807	3210306101000	100nH

No.	Ref. No.	Part No.	Description
1318	L806	3213306102000	1uH
1319	L820	3217112102020	1uH
1320	L828	3217112102020	1uH
1321	L1	3213212332000	3.3uH
1322	L156	3213212332000	3.3uH
1323	L715	3213212332000	3.3uH
1324	L717	3212206682000	6.8uH
1325	L903	3213099472000	4.7uH
1326	L931	3213099472000	4.7uH
1327	L902	3217299103000	10uH
1328	L930	3241799103000	10uH
1329	L704	3213212103000	10uH
1330	L705	3213212103000	10uH
1331	D100	3303990000060	Switching diode
1332	D701	3304060300050	Varactor
1333	D101	3304010100220	Varactor
1334	D102	3304010100220	Varactor
1335	D105	3304010100220	Varactor
1336	D106	3304010100220	Varactor
1337	D107	3304010100220	Varactor
1338	D108	3304010100220	Varactor
1339	D109	3304010100220	Varactor
1340	D110	3304010100220	Varactor
1341	D111	3304010100220	Varactor
1342	D112	3304010100220	Varactor
1343	D113	3304010100220	Varactor
1344	D116	3304010100220	Varactor
1345	D117	3304010100220	Varactor
1346	D121	3304010100220	Varactor
1347	D122	3304010100220	Varactor
1348	D125	3304010100220	Varactor
1349	D126	3304010100220	Varactor
1350	D127	3303030100010	Switching diode
1351	D128	3303030100010	Switching diode
1352	D230	3310240000000	ESD protection diode
1353	D231	3310240000000	ESD protection diode
1354	D233	3310240000000	ESD protection diode
1355	D240	3310240000000	ESD protection diode
1356	D402	3310240000000	ESD protection diode
1357	D403	3310240000000	ESD protection diode
1358	D404	3310240000000	ESD protection diode
1359	D405	3310240000000	ESD protection diode
1360	D406	3310240000000	ESD protection diode
1361	D234	3310240200000	ESD protection diode

No.	Ref. No.	Part No.	Description
1362	D236	3310240200000	ESD protection diode
1363	D239	3310240200000	ESD protection diode
1364	D235	3302031100010	Zener diode
1365	D409	3310240000040	ESD protection diode
1366	D237	3310990000090	ESD protection diode
1367	D238	3310990000090	ESD protection diode
1368	D407	3399040600010	ESD protection diode
1369	D408	3399040600010	ESD protection diode
1370	D450	3699037000010	USB protection IC
1371	D601	3307110100080	LED
1372	D702	3304060300010	Varactor
1373	D801	3303210100000	Switching diode
1374	D802	3303210100000	Switching diode
1375	D803	3303030300000	Diode
1376	D804	3303030300000	Diode
1377	D901	3303040400000	Switching diode
1378	D902	3301100300030	Rectifier diode
1379	D904	3301240000000	Schottky diode
1380	D905	3301240000000	Schottky diode
1381	D6100	3303060300010	Switching diode
1382	D906	3303060300010	Switching diode
1383	D907	3303060300010	Switching diode
1384	D909	3303060300010	Switching diode
1385	D911	3303060300010	Switching diode
1386	D910	3302030500010	Zener diode
1387	D915	3303010500290	Switching diode
1388	D805	3302030500030	Zener diode
1389	D917	3302030500030	Zener diode
1390	D6101	3304010100890	Varactor
1391	D6102	3304010100890	Varactor
1392	D6103	3304010100890	Varactor
1393	D6104	3304010100890	Varactor
1394	D6105	3399990000260	Rectifier diode
1395	D6106	3699019000000	Mixer
1396	Q1	3503020000030	N-MOSFET
1397	Q912	3503020000030	N-MOSFET
1398	Q100	3408002000080	NPN transistor
1399	Q103	3408002000080	NPN transistor
1400	Q106	3408002000080	NPN transistor
1401	Q110	3408002000080	NPN transistor
1402	Q101	3403999000000	Transistor
1403	Q105	3403999000000	Transistor
1404	Q108	3403999000000	Transistor
1405	Q112	3403999000000	Transistor

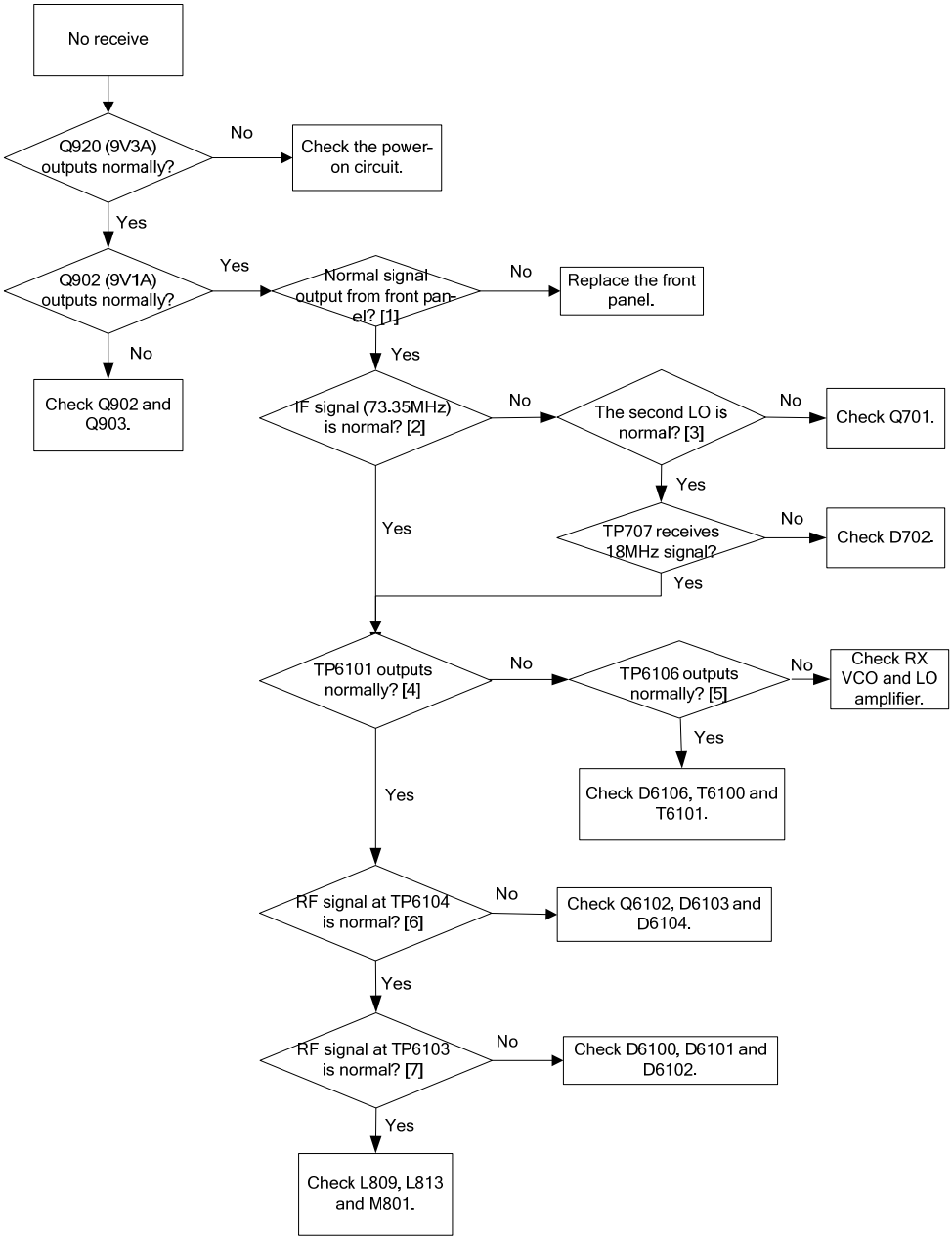
No.	Ref. No.	Part No.	Description
1406	Q116	3403999000000	Transistor
1407	Q117	3403999000000	Transistor
1408	Q102	3401002000990	NPN transistor
1409	Q111	3401002000990	NPN transistor
1410	Q104	3403003000060	NPN transistor
1411	Q702	3403003000060	NPN transistor
1412	Q107	3404006000000	NPN transistor
1413	Q109	3404006000000	NPN transistor
1414	Q6104	3404006000000	NPN transistor
1415	Q6105	3404006000000	NPN transistor
1416	Q230	3499000000150	Transistor
1417	Q231	3499000000150	Transistor
1418	Q232	3499000000150	Transistor
1419	Q233	3499000000150	Transistor
1420	Q234	3499000000150	Transistor
1421	Q235	3499000000150	Transistor
1422	Q6100	3499000000150	Transistor
1423	Q905	3499000000150	Transistor
1424	Q322	3403008000010	Transistor
1425	Q323	3403008000010	Transistor
1426	Q401	3403008000010	Transistor
1427	Q402	3403008000010	Transistor
1428	Q403	3403008000010	Transistor
1429	Q404	3403008000010	Transistor
1430	Q405	3403008000010	Transistor
1431	Q413	3403008000010	Transistor
1432	Q811	3403008000010	Transistor
1433	Q812	3403008000010	Transistor
1434	Q813	3403008000010	Transistor
1435	Q903	3403008000010	Transistor
1436	Q908	3403008000010	Transistor
1437	Q913	3403008000010	Transistor
1438	Q914	3403008000010	Transistor
1439	Q922	3403008000010	Transistor
1440	Q923	3403008000010	Transistor
1441	Q406	3414999000000	Transistor
1442	Q407	3414999000000	Transistor
1443	Q408	3414999000000	Transistor
1444	Q409	3414999000000	Transistor
1445	Q410	3414999000000	Transistor
1446	Q411	3414999000000	Transistor
1447	Q412	3414999000000	Transistor
1448	Q701	3408002000000	NPN transistor
1449	Q6102	3404999000000	NPN transistor

No.	Ref. No.	Part No.	Description
1450	Q6103	3404999000000	NPN transistor
1451	Q801	3404999000000	NPN transistor
1452	Q804	3504990000030	MOSFET
1453	Q805	3504990000010	MOSFET
1454	Q810	3403002000000	PNP transistor
1455	Q902	3403002000000	PNP transistor
1456	Q906	3414001000020	NPN transistor
1457	Q910	3414001000020	NPN transistor
1458	Q909	3403002000010	PNP transistor
1459	Q6101	3403014000020	Transistor
1460	T6100	3244599189000	4BLH
1461	T6101	3244599189000	4BLH
1462	U100	3604019000000	PLL IC
1463	U101	3616059000000	Switch IC
1464	U102	3616059000000	Switch IC
1465	U201	3602017006350	Audio amplifier
1466	U231	3613010000000	Baseband processing IC
1467	U233	3612002000020	Memory
1468	U235	3605010000020	Operational amplifier
1469	U236	3605010000020	Operational amplifier
1470	U237	3616010000000	Switch IC
1471	U238	3605008005070	Operational amplifier
1472	U914	3605008005070	Operational amplifier
1473	U302	3610010000010	U302
1474	U401	3699053000000	SmartSwitch
1475	U500	3606010000010	D/A conversion IC
1476	U701	3603999000000	IF processor
1477	U702	3608006000000	Power management IC
1478	U900	3608006000000	Power management IC
1479	U901	3608006000000	Power management IC
1480	U909	3608006000000	Power management IC
1481	U703	3608015000060	Power management IC
1482	U905	3608015000060	Power management IC
1483	U915	3608015000060	Power management IC
1484	U902	3608053000010	Power management IC
1485	U903	3608015000170	Power management IC
1486	U918	3608015000210	Power management IC
1487	U919	3608010006230	Power management IC
1488	U801	3605025000020	Operational amplifier
1489	U802	3605002054590	Operational amplifier
1490	U6000	3605002057090	Operational amplifier
1491	U803	3605002057090	Operational amplifier
1492	U910	3609010000170	Reset IC
1493	U917	3609006003050	Reset IC

No.	Ref. No.	Part No.	Description
1494	X100	3701019250030	TCXO (19.2MHz)
1495	X302	3701019250040	Temperature compensated crystal oscillator (19.2MHz)
1496	X375	3701327610060	Crystal
1497	F900	4099000000050	Fuse
1498	J400	5201020000020	Connector
1499	J404	5206040200010	FFC connector
1500	PCB	41MD7801000F0	PCB
1501		6201928000000	VCO shielding mask
1502		6202010000000	APC shielding mask
1503	L819	3233099470000	47nH
1504	C752	3101074750000	4.7UF
1505	C718	3101051050160	1uF
1506	C237	3101054740020	0.47uF
1507	Q400	3413001000010	PNP transistor
1508	D900	3302060000000	Zener diode
1509	Q921	3404999000020	NPN transistor
1510	U232	3612044000010	Memory
1511	U327	3607082000040	Logic IC
1512	U328	3607082000040	Logic IC
1513	R6121	3001053600000	36Ω
1514	R6124	3001051510000	150Ω
1515	R6125	3001051510000	150Ω
1516	Z6100	3802733540030	Crystal filter

12.8 Troubleshooting Flow Chart

Receiver Circuit



Description of Normal Situations:

[1] During sensitivity test, use a communication test set to demodulate the audio signal (TP4012 and TP4016). If the signal is demodulated normally, it is concluded that the front panel is defective.

[2] Use the communication test set to input a 73.35MHz IF signal at the mixer, and see whether it can be processed normally afterwards.

[3] Use a spectrum analyzer to check whether TP704 can output the second LO signal (71.1MHz).

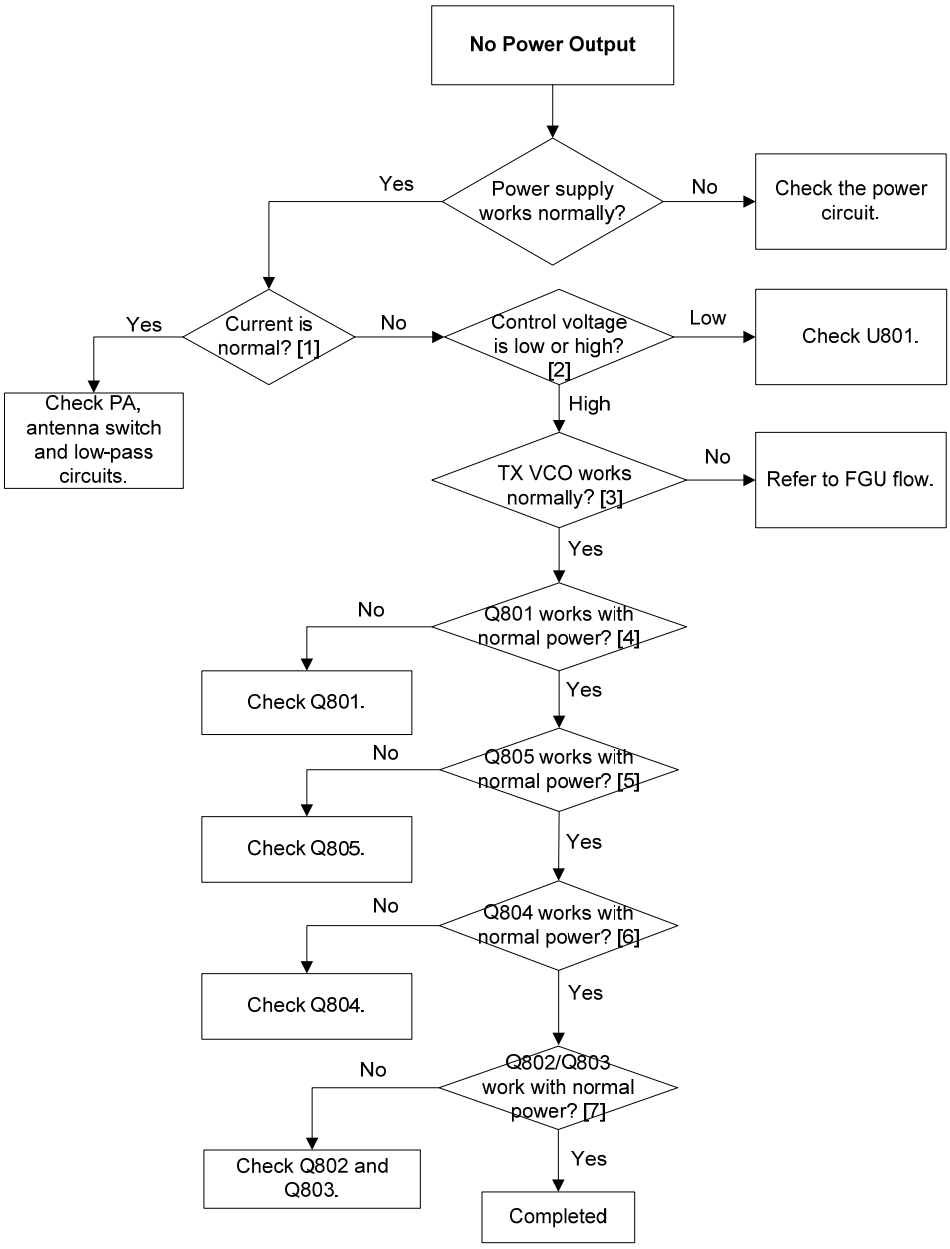
[4] Use the communication test set to apply an RF signal of -100dBm, and test the sensitivity.

[5] Use a spectrum analyzer to test the LO signal received by TP6106. If its strength is about 18dBm, go to check the mixer; otherwise, check the VCO.

[6] Use the communication test set to apply an RF signal of -110dBm at TP6104, and test the sensitivity.

[7] Use the communication test set to apply an RF signal of -110dBm at TP6103, and test the sensitivity.

Transmitter Circuit



Description of Normal Situations:

[1] The current in analog mode is above 6A under 45W power supply and above 1A under 5W. However, in digital mode, the current will be reduced by 50%.

[2] The APC voltage should be above 2V at TP811.

[3] Check whether there is an appropriate TX LO signal at TP803.

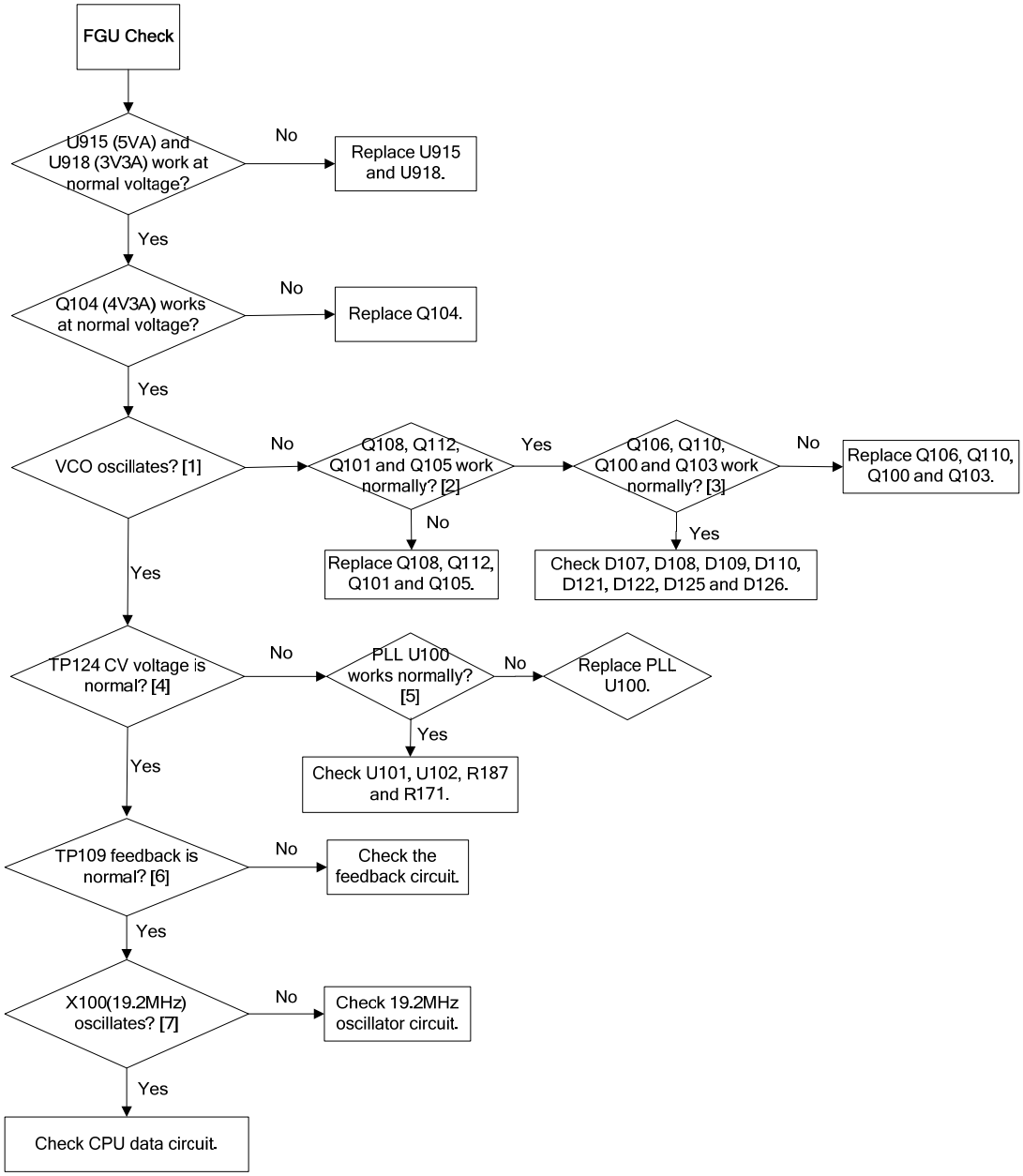
[4] Check whether the gain is 16dB and the input signal is 0dBm at Q801.

[5] Check whether the gain is 15dB and the input signal is 0dBm at Q805.

[6] Check whether the gain is 11dB and the input signal is 0dBm at Q804.

[7] Check whether the gain is 10dB and the input signal is 0dBm at Q802 and Q803.

FGU


FGU Check
U915 (5VA) and U918 (3V3A) work at normal voltage?
No
Replace U915 and U918.
Yes
Q104 (4V3A) works at normal voltage?
No
Replace Q104.
Yes
VCO oscillates? [1]
No
Q108, Q112, Q101 and Q105 work normally? [2]
Yes
Q106, Q110, Q100 and Q103 work normally? [3]
No
Replace Q106, Q110, Q100 and Q103.
No
Replace Q108, Q112, Q101 and Q105.
Yes
Check D107, D108, D109, D110, D121, D122, D125 and D126.
Yes
TP124 CV voltage is normal? [4]
No
PLL U100 works normally? [5]
No
Replace PLL U100.
Yes
Check U101, U102, R187 and R171.
Yes
TP109 feedback is normal? [6]
No
Check the feedback circuit.
Yes
X100(19.2MHz) oscillates? [7]
No
Check 19.2MHz oscillator circuit.
Yes
Check CPU data circuit.

Description of Normal Situations:

[1] Detect the oscillation frequency of RX TP123 and TX TP111 using a spectrum analyzer.

[2] Check whether switches (Q108, Q112, Q101 and Q105) are turned on and output 3.6V.

[3] Check whether the emitter voltage of the four transistors (Q106, Q110, Q100 and Q103) is about 1.8V under normal RX/TX status.

[4] Check the CV of TP124. The normal value should range from 0.5V to 4.5V.

[5] Check whether U100 is supplied by 5V and 3.3V normally.

[6] Check whether the power from TP109 to PLL is about -15dBm.

[7] Check whether TP100 outputs 19.2MHz signal.

13.UHF2 (450-520MHz 25W) Information

13.1 Transmitter Circuit

The transmitter circuit is composed of power amplifier circuit and power control circuit. The former is used to amplify the VCO signal to the desired output power level, while the latter can keep the output power at the desired level, so as to protect the power amplifier from damage caused by over heat, antenna mismatch, and out-of-range voltage (over voltage or under voltage may result in damage to Q801, Q805, Q804, Q802 and Q803).

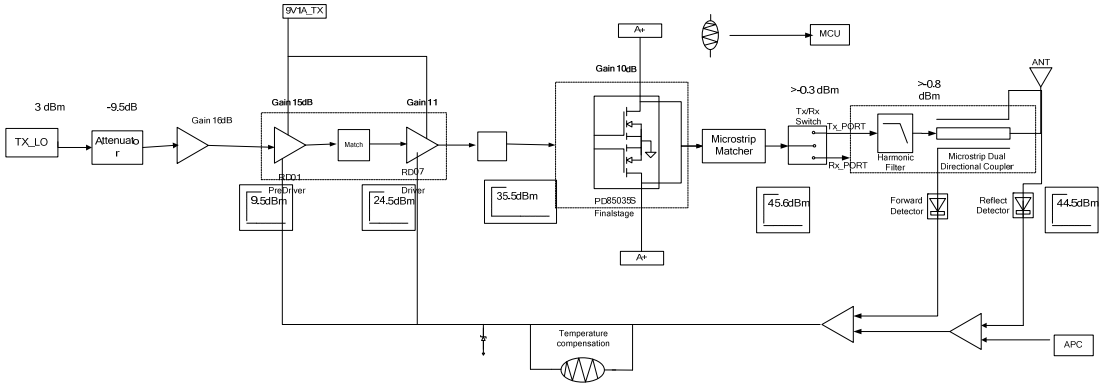


Figure 13-1 Diagram of Transmitter Circuit

13.1.1 Power Amplifier

The 4-stage power amplifier amplifies the signal output from VCO to the required output power level. The first stage is a buffer amplifier circuit with fixed gain; the second stage is a pre-driver power amplifier circuit with variable gain (formed by Q805); the third stage is a driver power amplifier circuit with variable gain (formed by Q804); and the final stage is the final power amplifier circuit with fixed gain (formed by Q802 and Q803). In addition, this power amplifier contains a TX/RX switch and a low-pass filter.

Note: only a final power amplifier (Q803) is available in later versions (including version H).

13.1.2 TX Buffer Amplifier

The first stage (Q801) provides about 16dB power gain, and adjusts its bias circuit to get a quiescent bias current of 28mA (for Q801). Power supply for the switching transistor Q810 is controlled by TX signal (enabled by antenna switch) so as to further control the power supply for the whole circuit.

13.1.3 Pre-driver Power Amplifier

The pre-driver power amplifier is formed by Q805, with variable gain controlled by voltage VGG. The input matching circuit is composed of C826, L826, L814, C843 and R824.

13.1.4 Driver Power Amplifier

The driver power amplifier is formed by Q804, with variable gain controlled by voltage VGG. The maximum output power is 38.5dBm, and the maximum variable gain is 11dB.

13.1.5 Final Power Amplifier

The final power amplifier comprises Q802 and Q803, with the maximum output power of 48.5dBm, and the maximum variable gain of 10dB. The input matching circuit is composed of C815, C839, R804, R806, R807, R813, R818 and R861, while the power combining circuit is composed of C820, C8330, C831, C819, C812, C841 and C842.

13.1.6 Antenna Switch

The antenna switch is used to switch between the transmitter circuit and the receiver circuit.

In TX mode, the switching transistor Q810 is controlled by TX signal, so as to supply 9V 3A to the PIN diodes D801 and D802. Quiescent bias current of the PIN diode is controlled by the resistors R821 and R825. In this mode, D801 and D802 are turned on; RF signals are applied to the low-pass filter (composed of C871, C816, C836, C837, C838, L809, L813, and L810) and then transmitted via the antenna port.

In RX mode, TX signal controls the switching transistor Q810, to further control the power supply for the PIN diodes D801 and D802, which are not applied with DC bias current. When the two PIN diodes are turned off, signals feed into the RX path through the low-pass filter (composed of L871, C852 and C862).

13.1.7 Low-pass Filter

A low-pass filter that consists of inductors L809, L813 and L810, and capacitors C836, C837, C830, is used to attenuate harmonic energy from the transmitter.

13.1.8 Directional Coupler

A directional coupler that consists of microstrip directional coupler, D803, D804 and etc, is used to detect both forward and reverse directed power of the transmitter. The forward power is coupled to the diode D803, and the voltage is applied to the power control circuit (U801). Then the voltage VGG is output to control the gate voltage of pre-driver and driver PA, ensuring a constant power output.

The directional coupler can adjust the TX power and detect the VSWR load. The reverse power is coupled to D804. The voltage is applied to U802 and then feeds into U302 for detection

13.1.9 Output Power Control

The TX power is controlled by U801. The forward power is applied to the directional coupler, to output a voltage that can represent the forward power. The voltage together with the preset voltage feeds to U801

to output a voltage VGG, which can control both gate voltage and gain of Q804 and Q805, ensuring a constant power output.

13.1.10 Thermal and Over-voltage Protections

The circuit consists of thermistor RT804 and resistor R884. The output voltage is proportional to the detected temperature. Both the voltage used for temperature detection and the threshold voltage are fed into the operational amplifier U803, to output a voltage signal that is in proportion to the detected temperature. Afterwards, the voltage is applied to software for judgment, and then the preset voltage will be subsequently changed to reduce the TX power, and to protect the PA from over-heating.

13.1.11 Pressure Pad Switch

The power control circuit includes a pressure pad switch SW1, which is controlled by the conductive rubber part mounted on the top cover. If the switch is turned off, VGG will become low, and no power will be output from PA. Otherwise, PA will work normally.

13.2 Receiver Circuit

The receiver utilizes double conversion superheterodyne technique. The first IF is 73.35MHz and the second IF is 2.25MHz. The first local oscillator signal is from the PLL circuit U100, and the second local oscillator signal (71.1MHz) from the PLL circuit U701. The major units are BPF, LNA, mixer, IF filter, IF amplifier and IF processor.

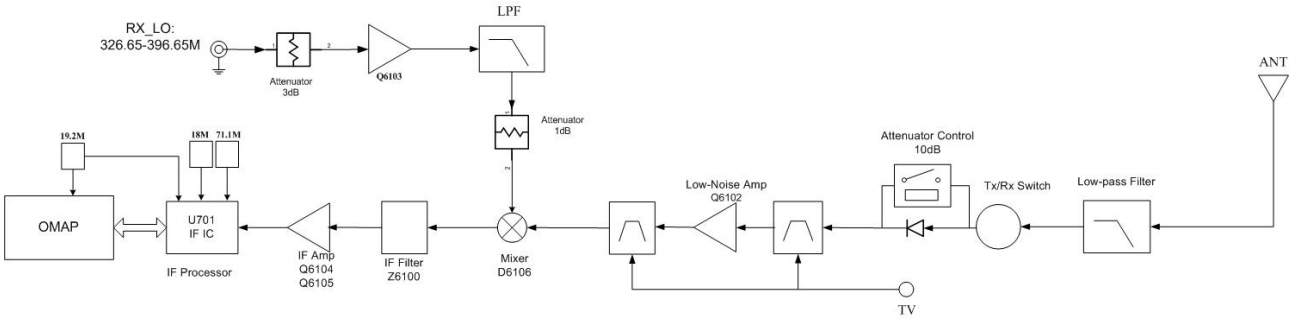


Figure 13-2 Diagram of Receiver Circuit

13.2.1 Receiver Front-end

RF signals feed to the low-pass filter to remove out-of-band signals, and are applied to the two-stage electrically tunable band-pass filter to get useful signals. After passing through the RF band-pass filter and LNA (Q6102), the RF signals together with the first LO signal feed to the mixer for the first frequency conversion, to generate the first IF signal (73.35MHz). The mixer that employs the passive diode can ensure good dynamic range and port isolation. The LO signal (3-5dBm) from the VCO feeds to Q6103 to get a gain (17dB). The first LO signals (73.35MHz) pass through the crystal filter (Z6100) to remove

out-of-band spurious signals, and then feed to the two-stage IF amplifier circuit (composed of Q6133 and Q6134) for amplification. Finally the amplified signals go to the IF IC for processing

13.2.2 Receiver Back-end

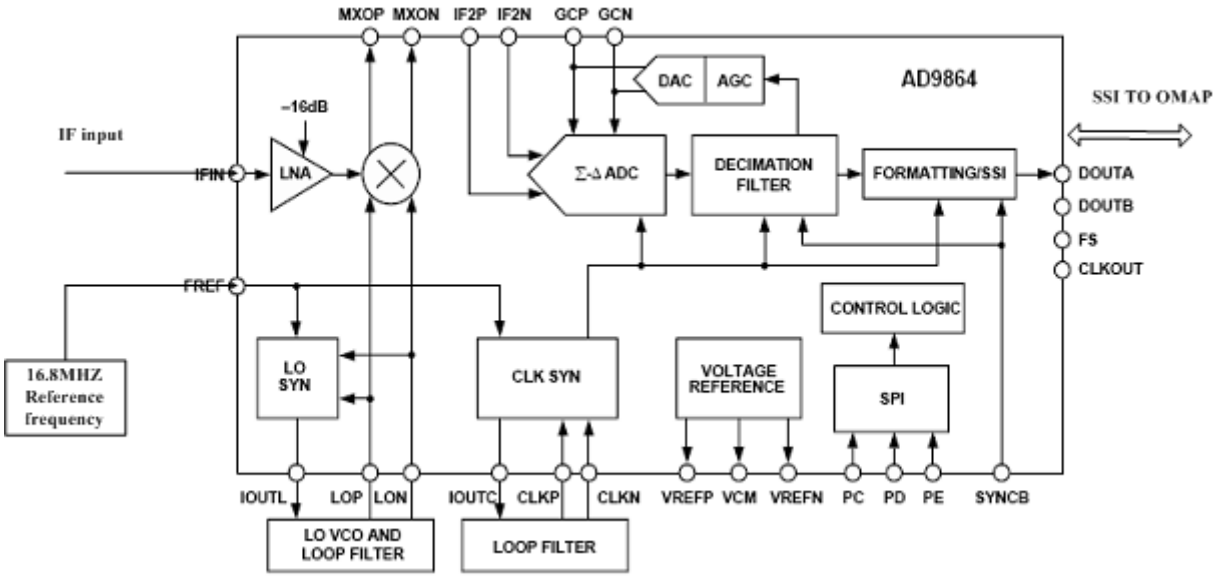


Figure 13-3 Diagram of IF Processor

The first IF signal (73.35MHz) output by the IF amplifier goes into IF IC via Pin 47, where the signal is converted to the second IF signal (2.25MHz). Then the un-demodulated digital I/Q signal output from the SSI interface is sent to U302 for demodulation. IF IC employs a reference frequency of 19.2MHz and shares the crystal with U302. The second LO VCO consists of the external transistor, varactor and some other components, to provide the second LO signal. The 18MHz clock frequency is generated by the LC resonance loop (D702, L715 and C745).

DSP (U302) gets the audio signal from IF IC (U701). Then this signal goes through U302 to output data signal, which is sent to U231 and PIN44 (SSI_DI) for digital-to-analog conversion. Finally, the output analog audio signal will be subjected to gain control, and then fed to the speaker.

13.3 Frequency Generation Unit (FGU)

13.3.1 PLL Synthesizer

The PLL synthesizer that consists of the reference oscillator (X100), PLL IC (U100) and VCO, is utilized to supply excitation signal source to the transmitter, and local oscillator signal to the receiver.

13.3.2 Reference Oscillator

X100 is a 19.2MHz TCXO, and its reference frequency is calibrated by the digital-to-analog converter (U500) for accuracy.

13.3.3 PLL IC

The PLL IC (U100) is a fractional frequency divider. The logic IC U101 and U102 work with the PLL IC (U100) to achieve locking.

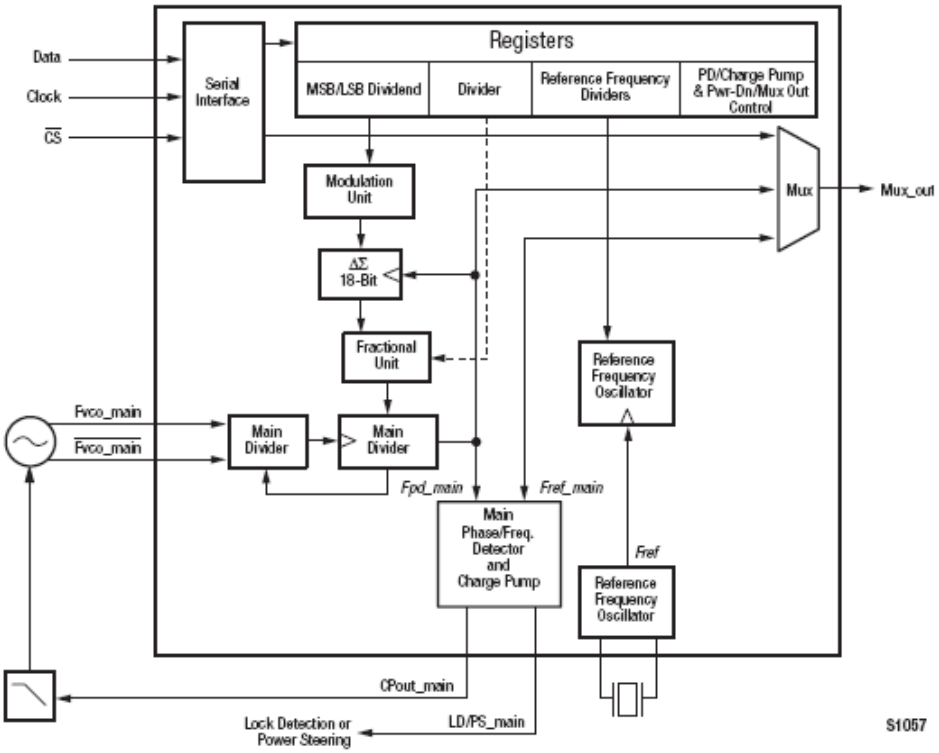


Figure 13-4 Diagram of PLL IC

The 19.2MHz frequency generated by the reference oscillator goes into the PLL IC for division, generating the reference frequency. Meanwhile, the frequency generated by VCO goes into PLL IC (U100) for frequency division. The resulting frequency will be compared with the reference frequency in terms of phase difference in the phase detector. After comparison, the resulting frequency is converted to CV voltage via the loop filter, to control and lock the frequency.

13.3.4 VCO

The VCO is composed of transistors (Q100, Q103, Q106 and Q110), varactors and four Colpitts oscillators. There are four VCOs in all: two VCOs (Q100 and Q103) used to transmit excitation signals and the other two VCOs (Q106 and Q110) to receive LO signals. U302 controls the operating frequency of the VCO. Q102 and Q107 constitute the buffer amplifiers for the transmitter circuit, while Q111 and Q109 for the receiver circuit. The digital-to-analog converter (U500) modulates the TX oscillator signal.

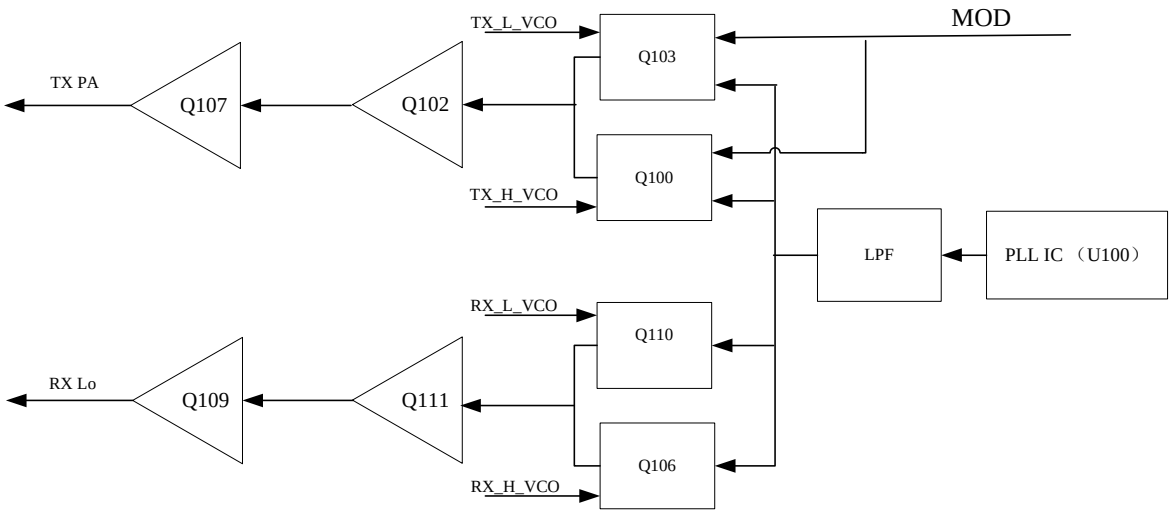
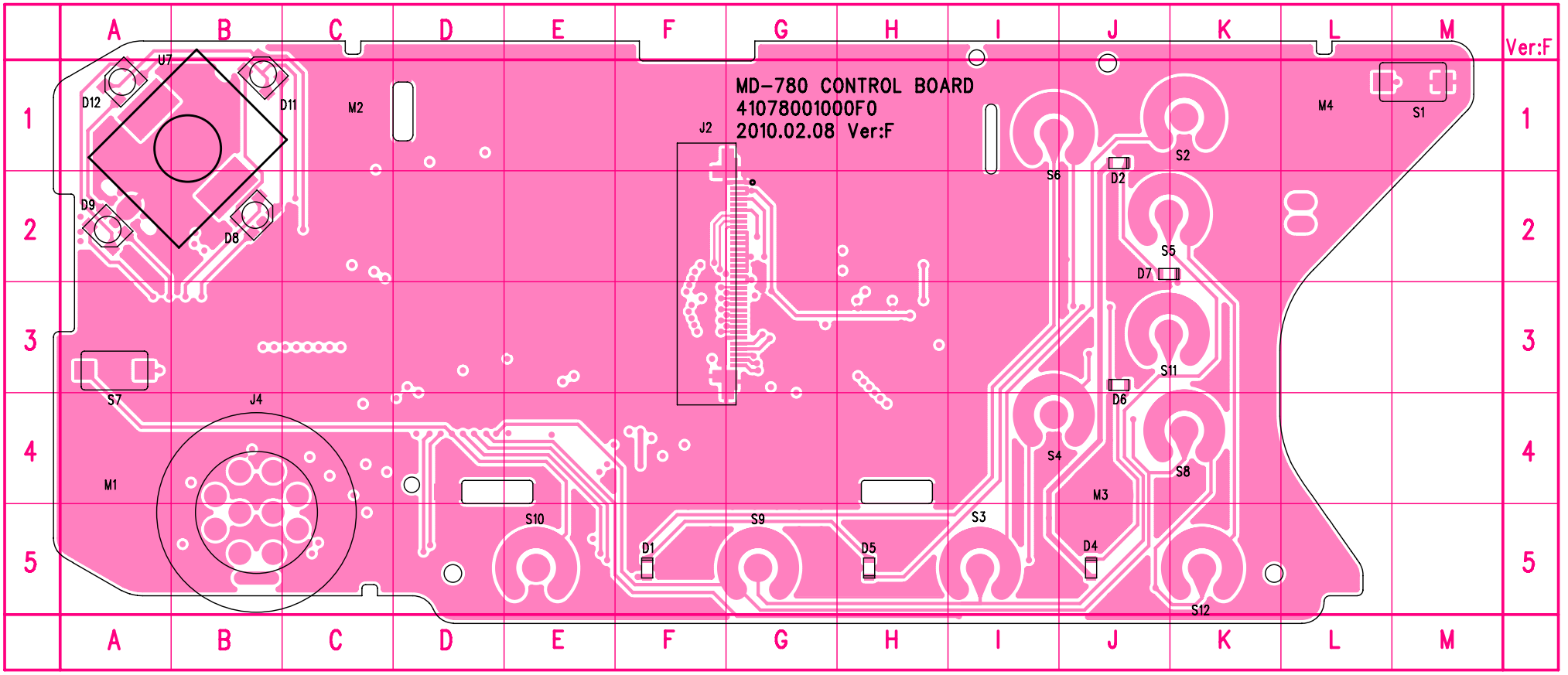


Figure 13-5 Diagram of VCO

13.4 PCB View

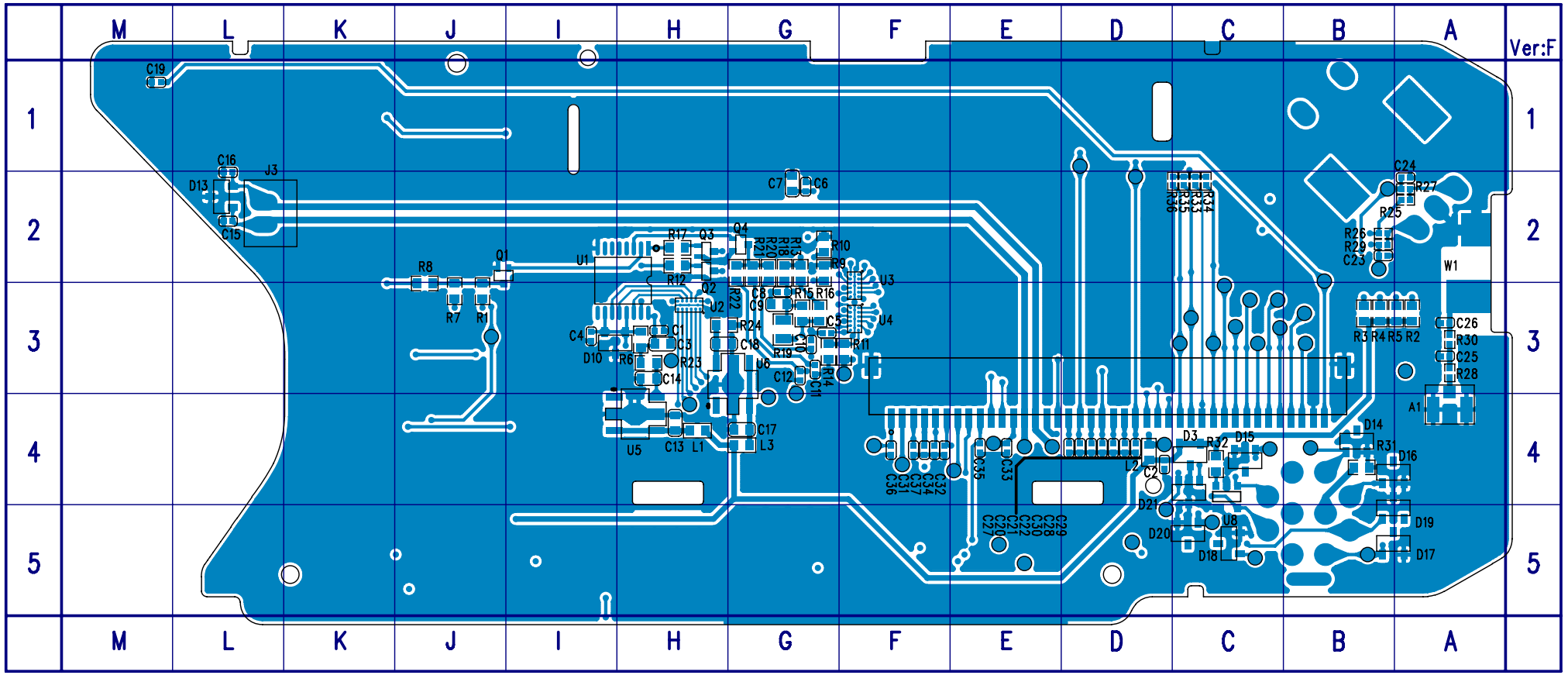
MD78X/MD78XG PCB View (Front Panel)

Top Layer

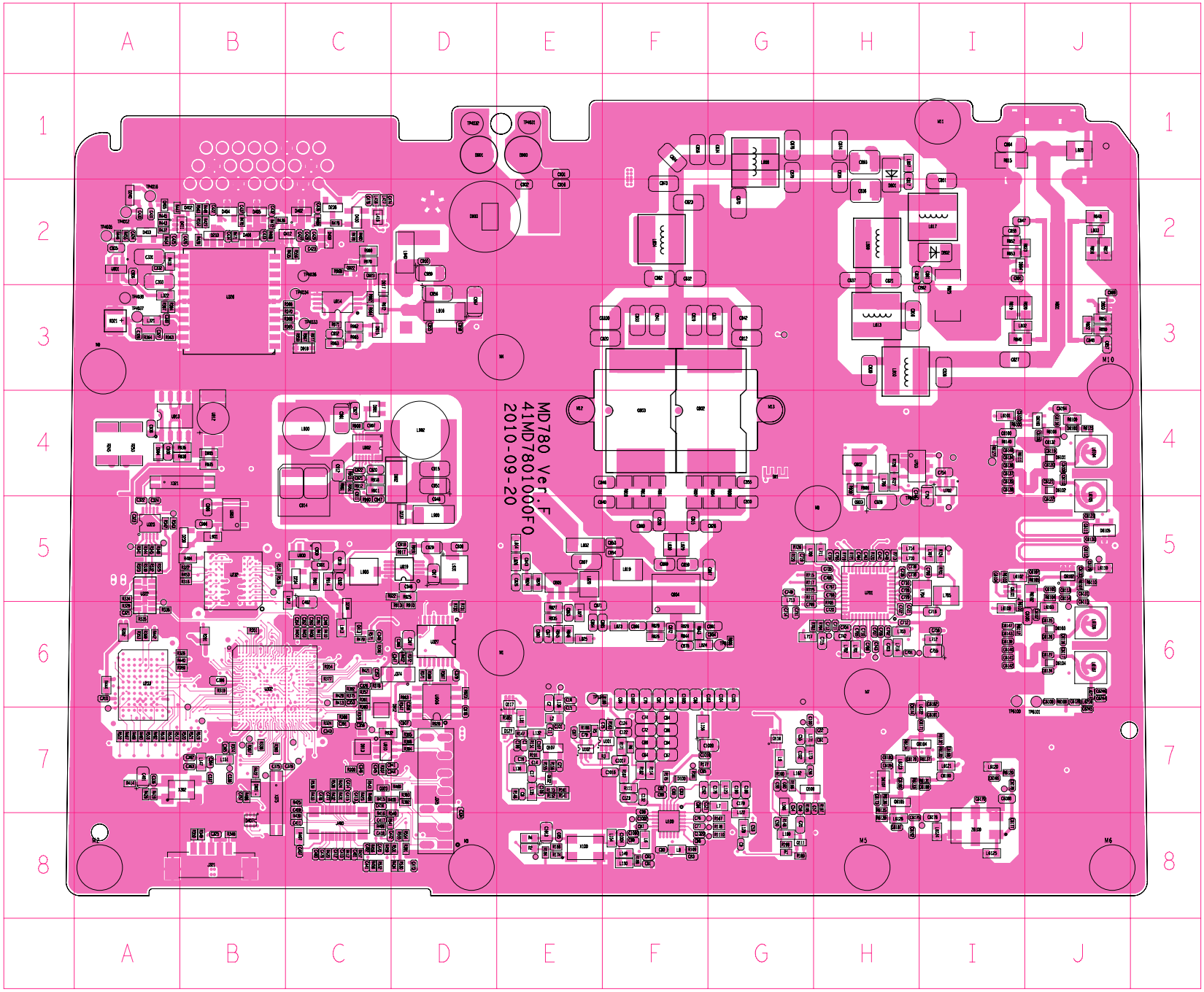


MD78X/MD78XG PCB View (Front Panel)

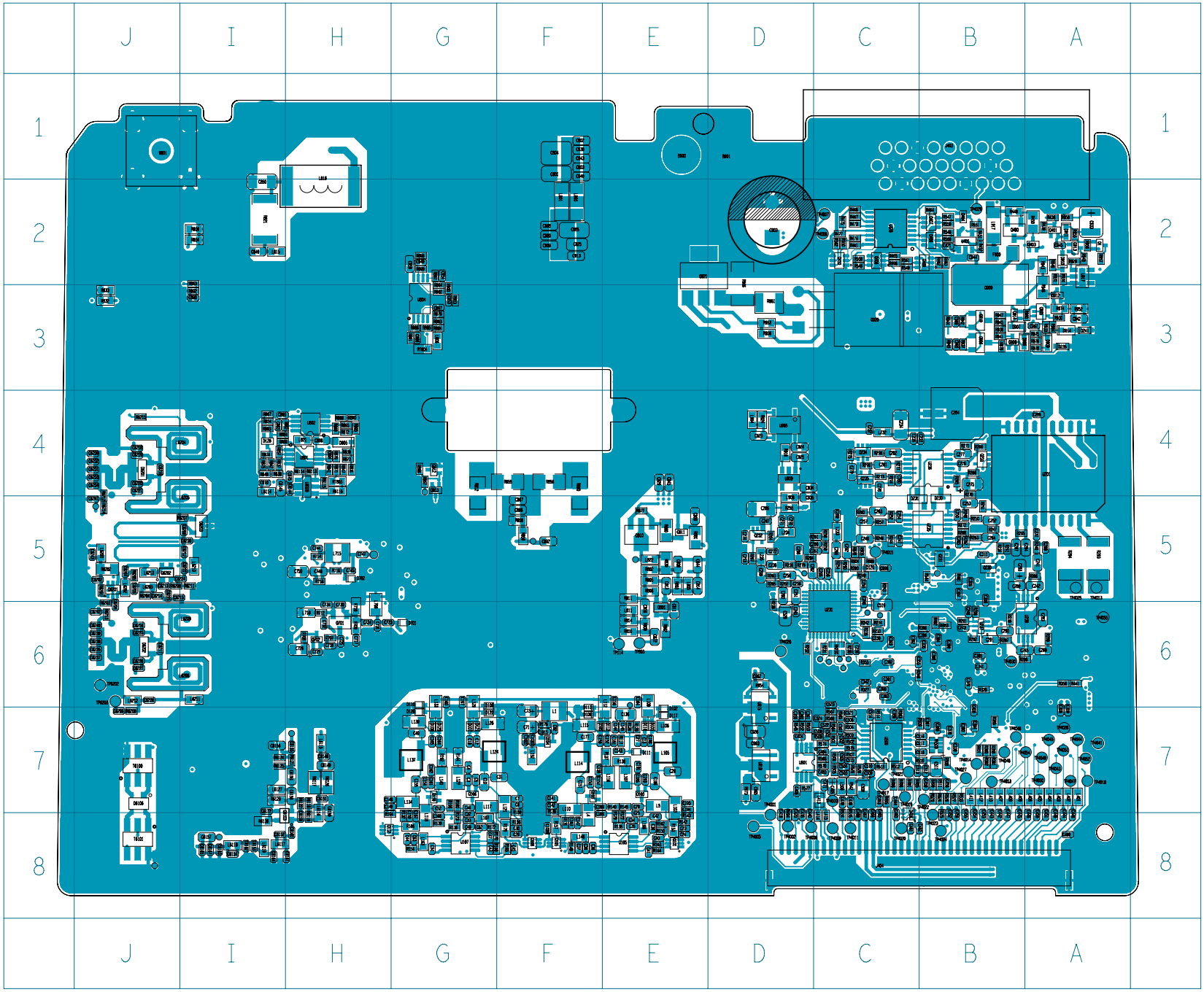
Bottom Layer



MD78X/MD78XG PCB View (Main Board)
Top Layer

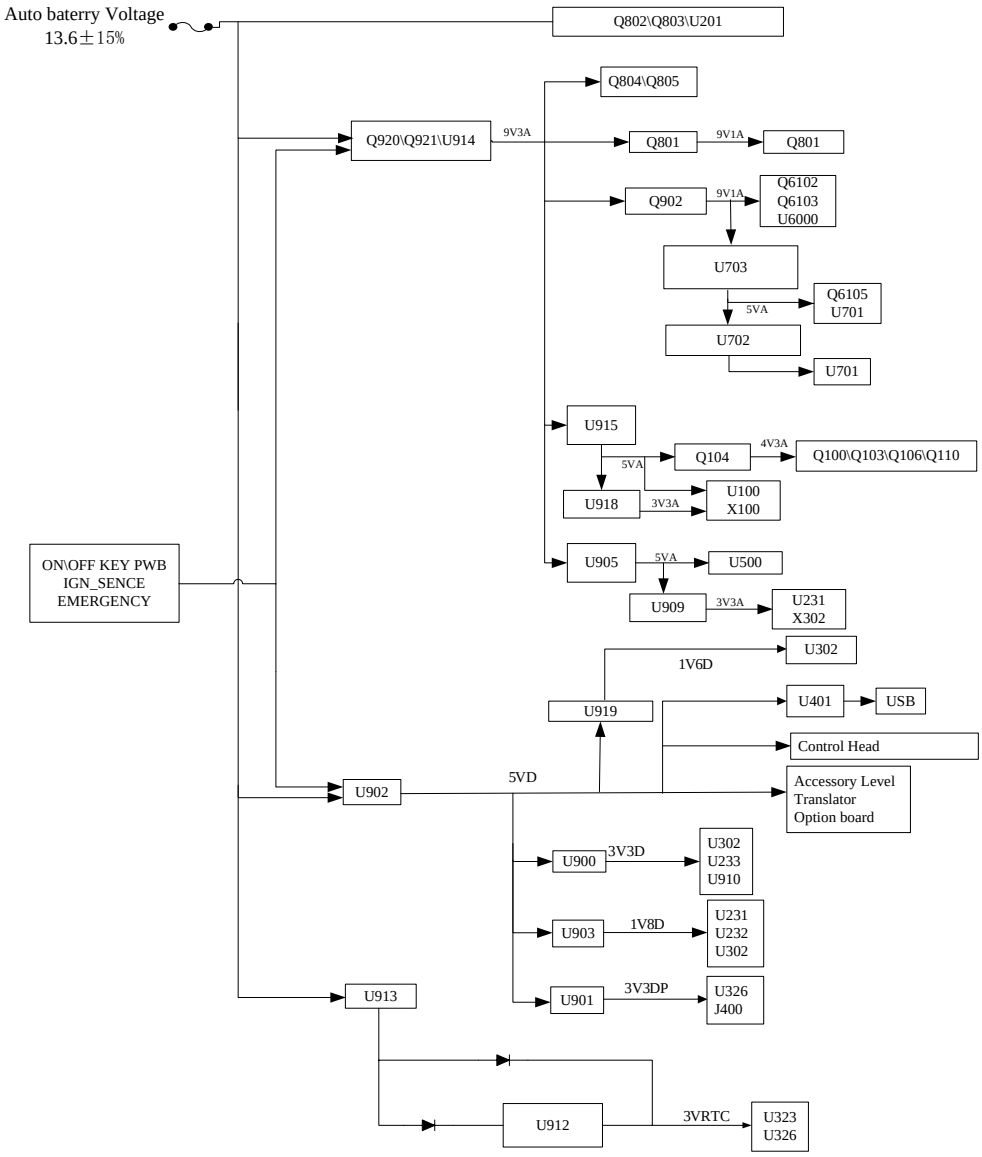


MD78X/MD78XG PCB View (Main Board)
Bottom Layer

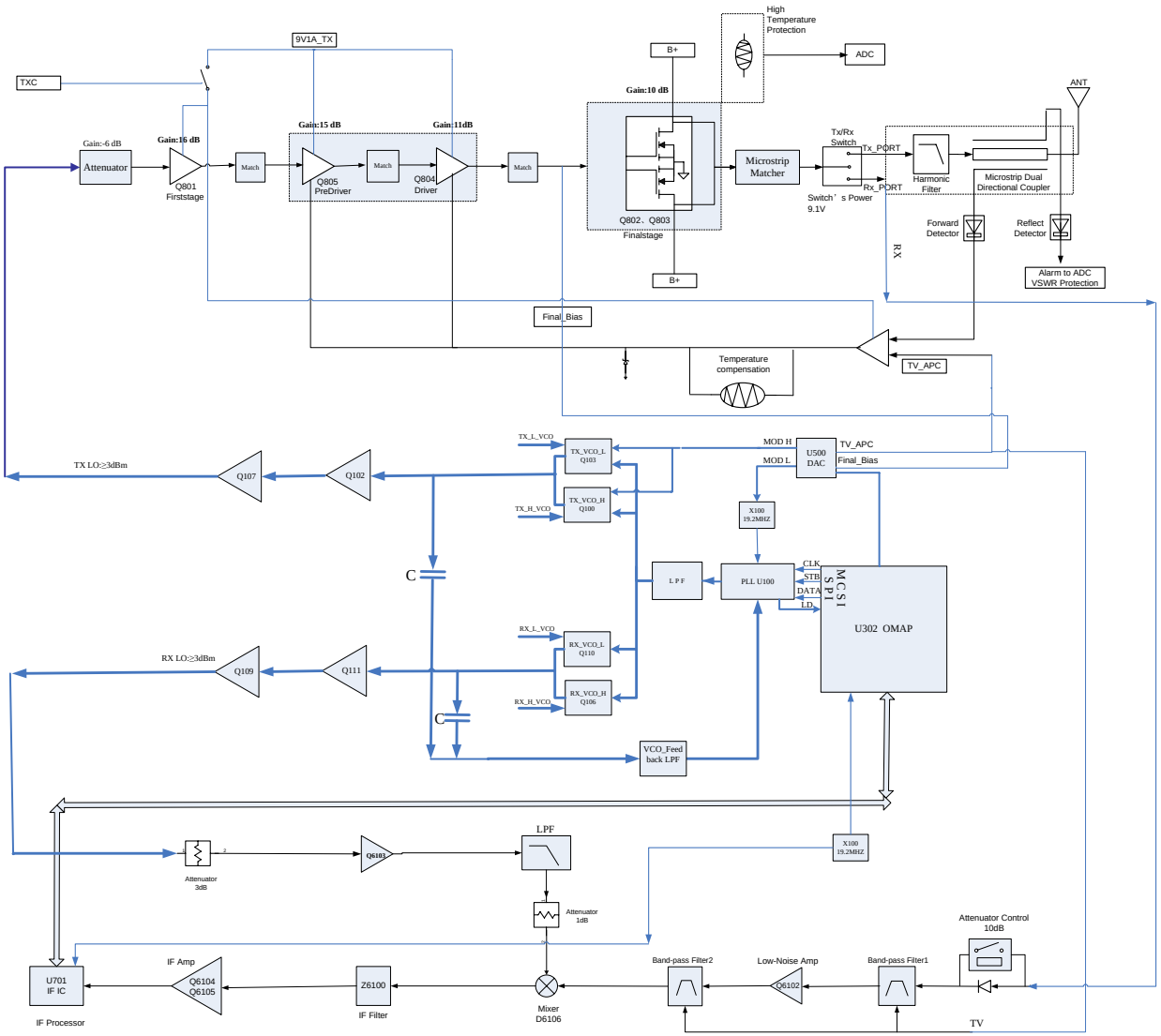


13.5 Block Diagram

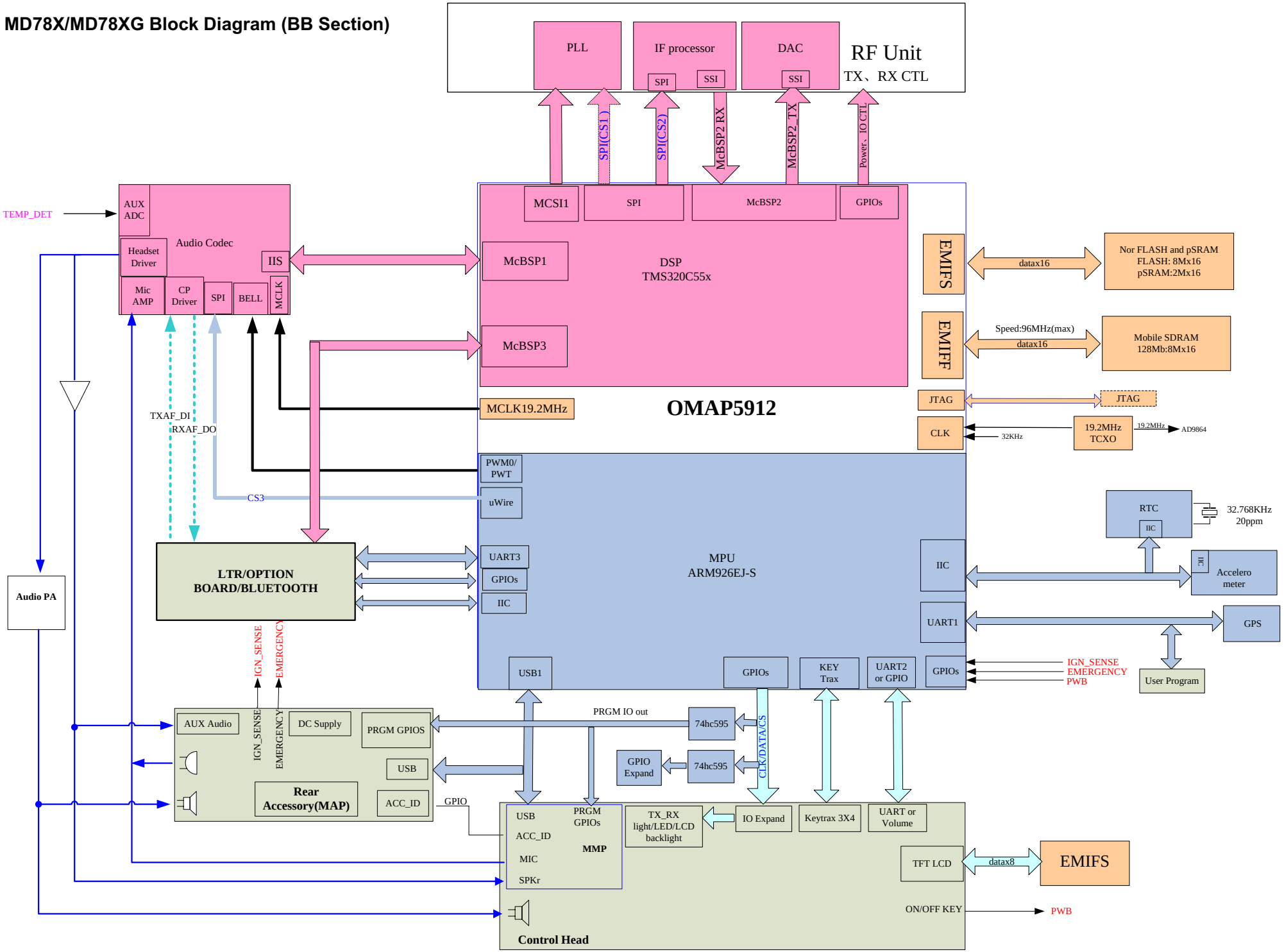
MD78X/MD78XG Block Diagram (Power Section)



MD78X/MD78XG Block Diagram (RF Section)

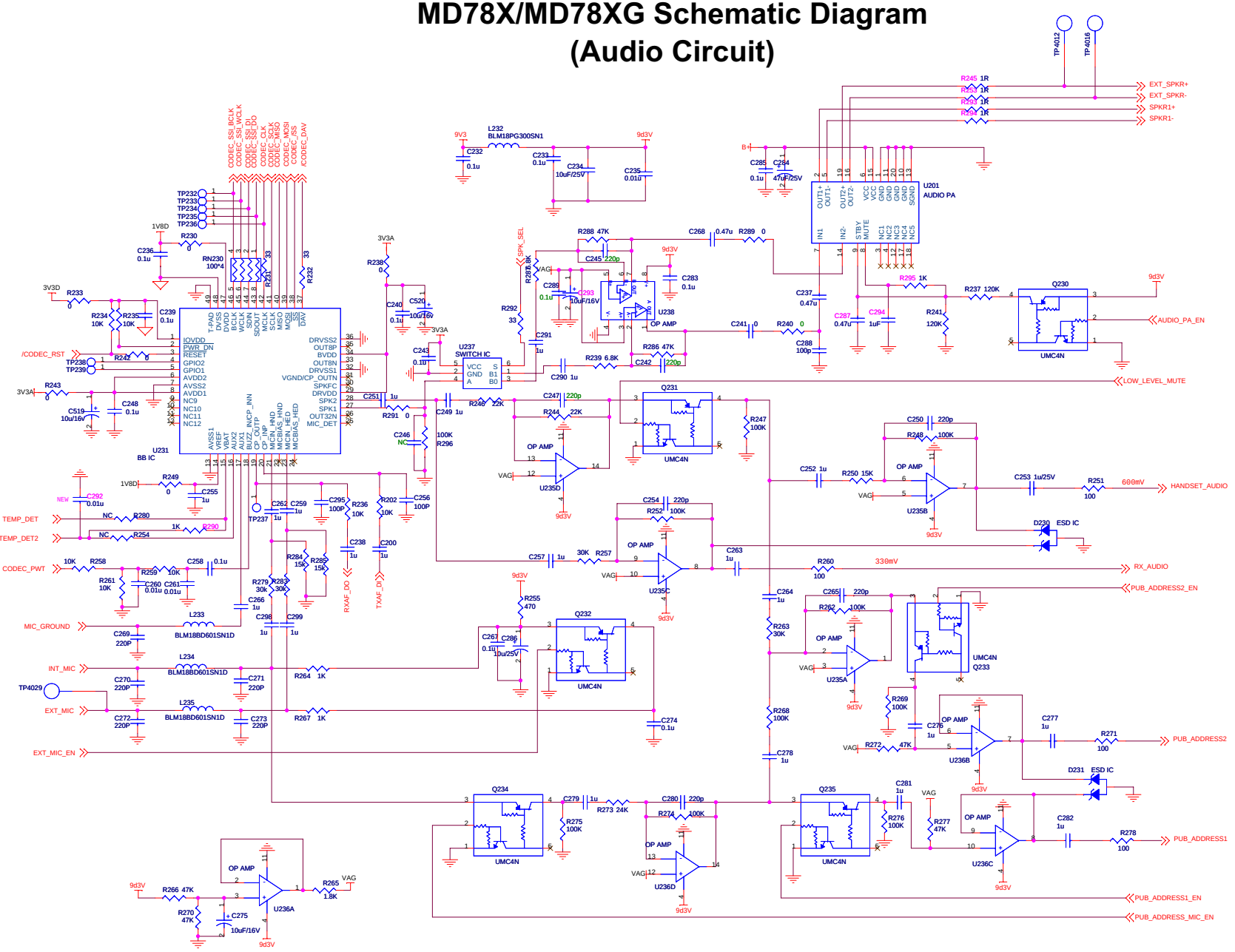


MD78X/MD78XG Block Diagram (BB Section)

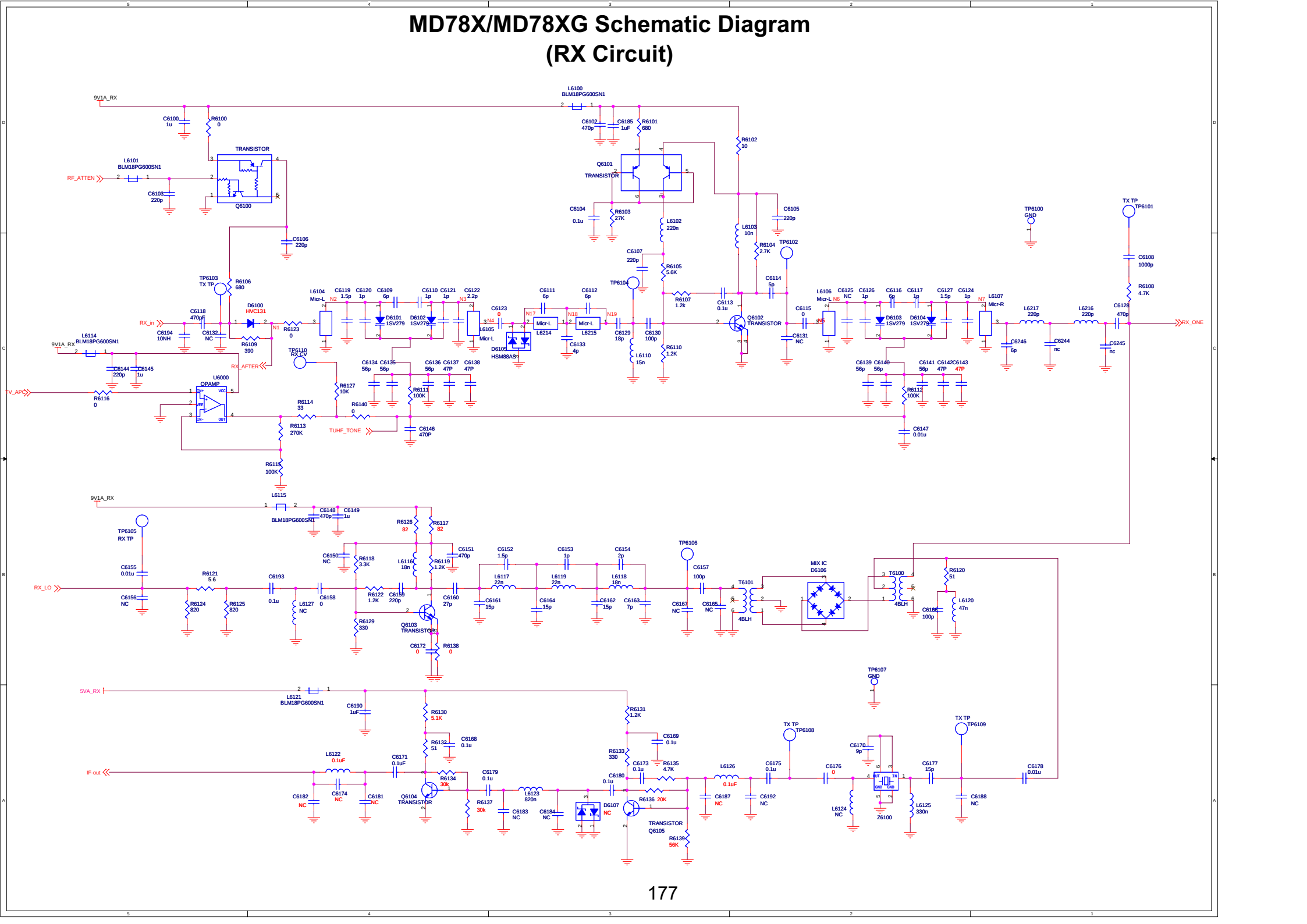


13.6 Schematic Diagram

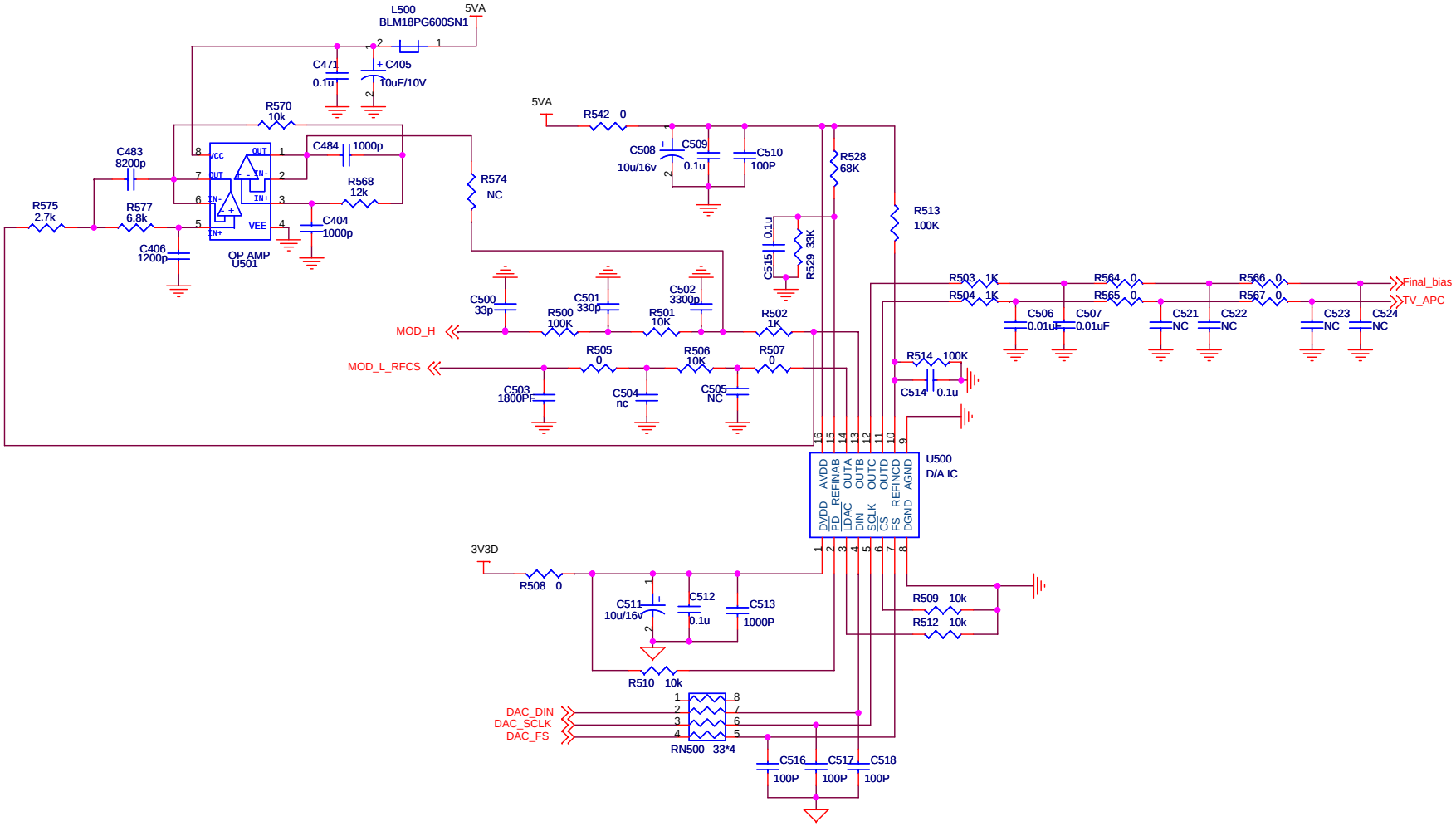
MD78X/MD78XG Schematic Diagram (Audio Circuit)



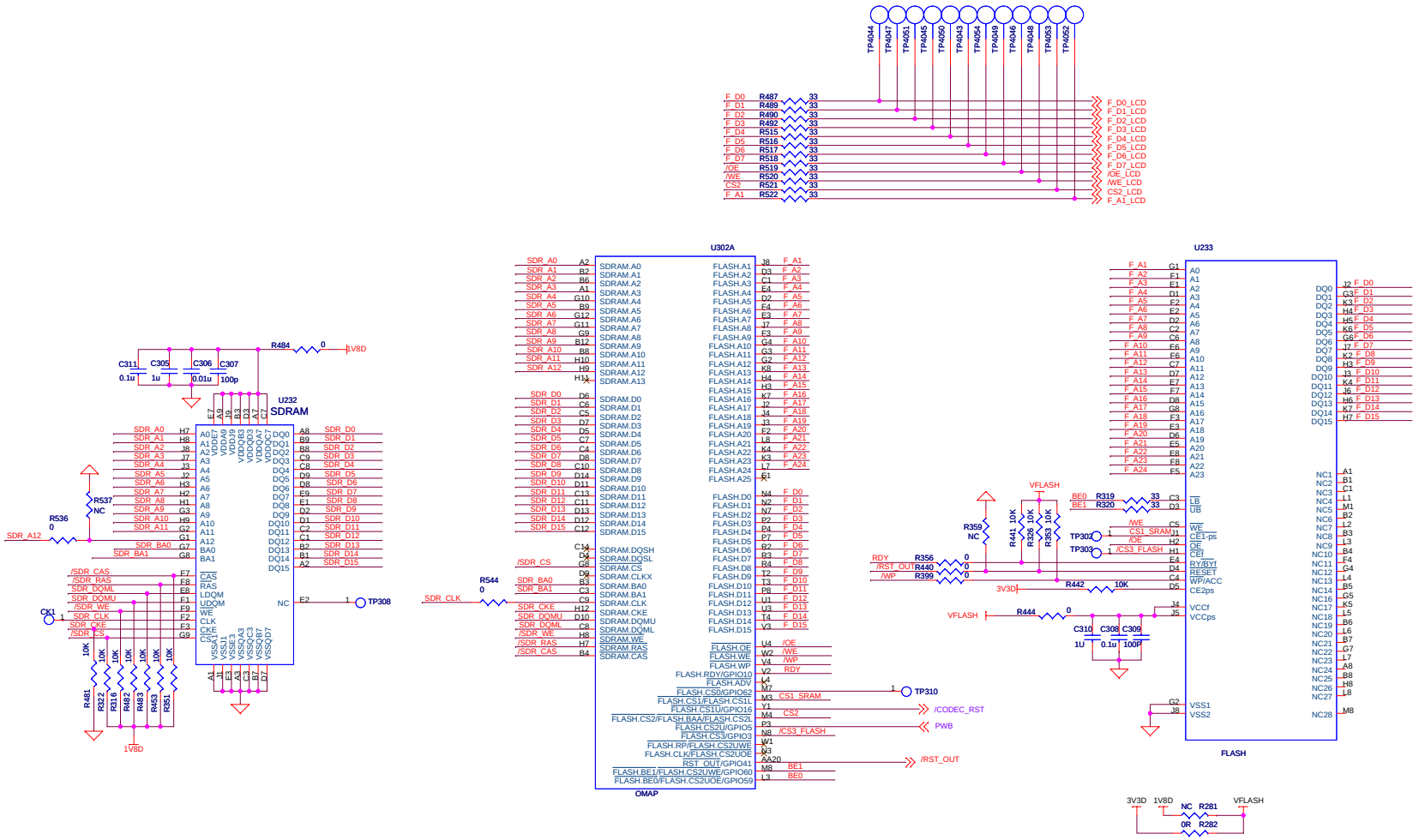
MD78X/MD78XG Schematic Diagram
(RX Circuit)



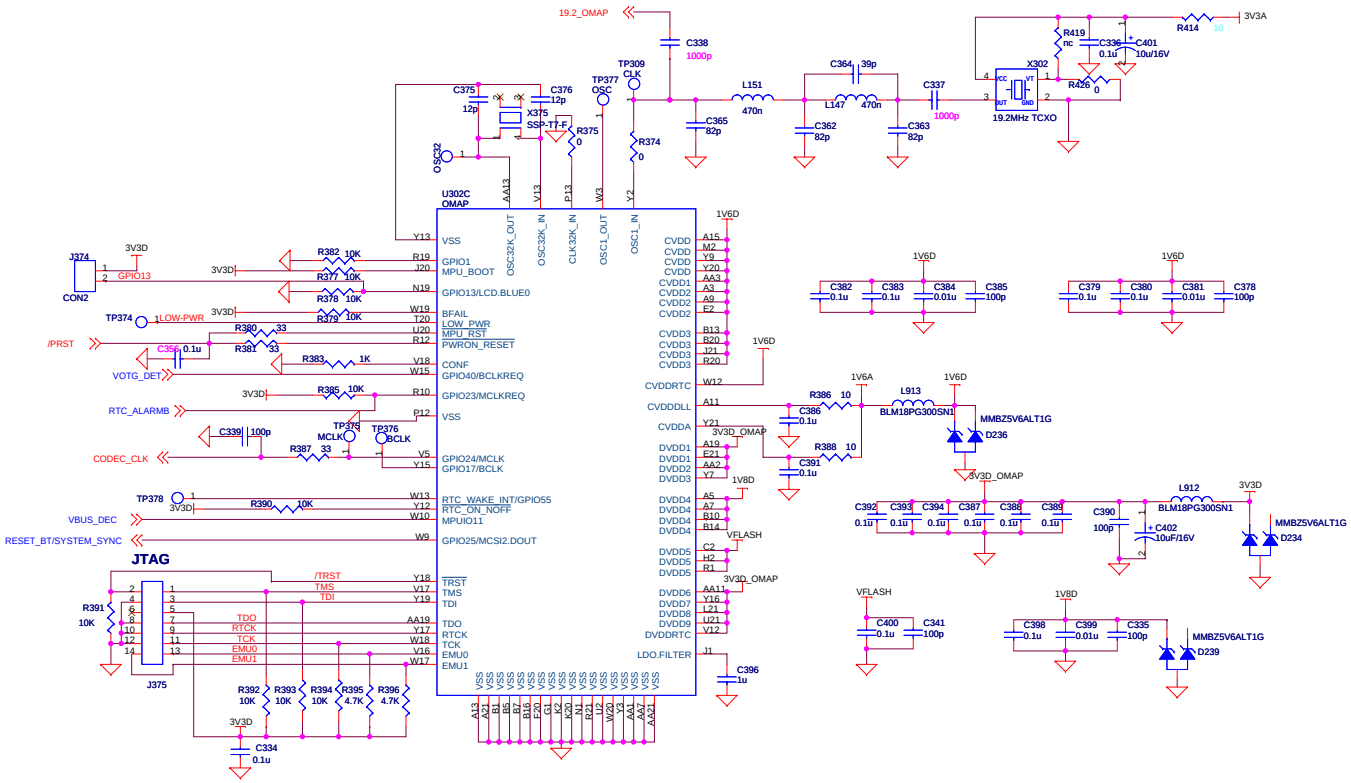
MD78X/MD78XG Schematic Diagram
(DAC Circuit)



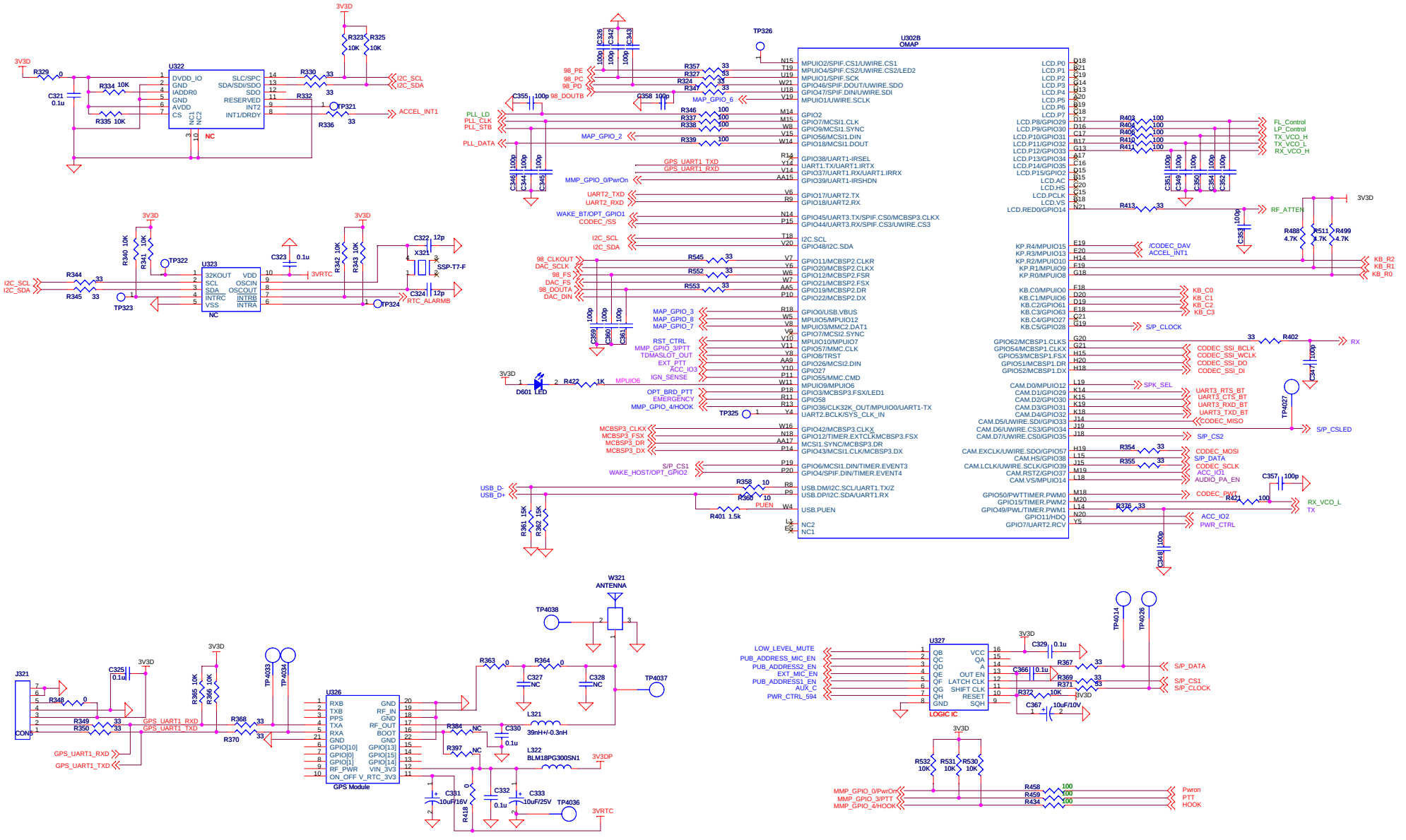
MD78X/MD78XG Schematic Diagram
(Memory Circuit)



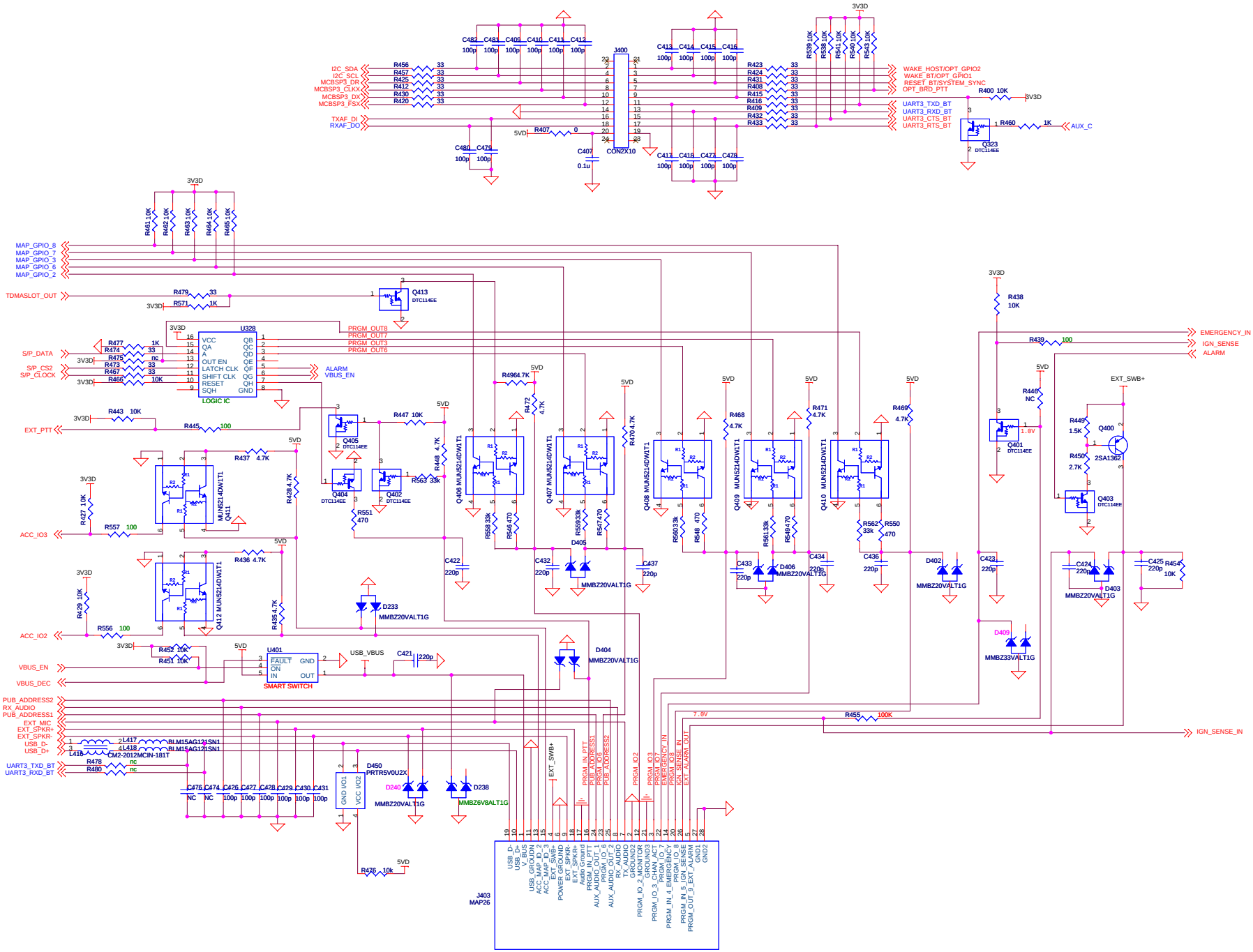
MD78X/MD78XG Schematic Diagram
(OMAP Circuit)



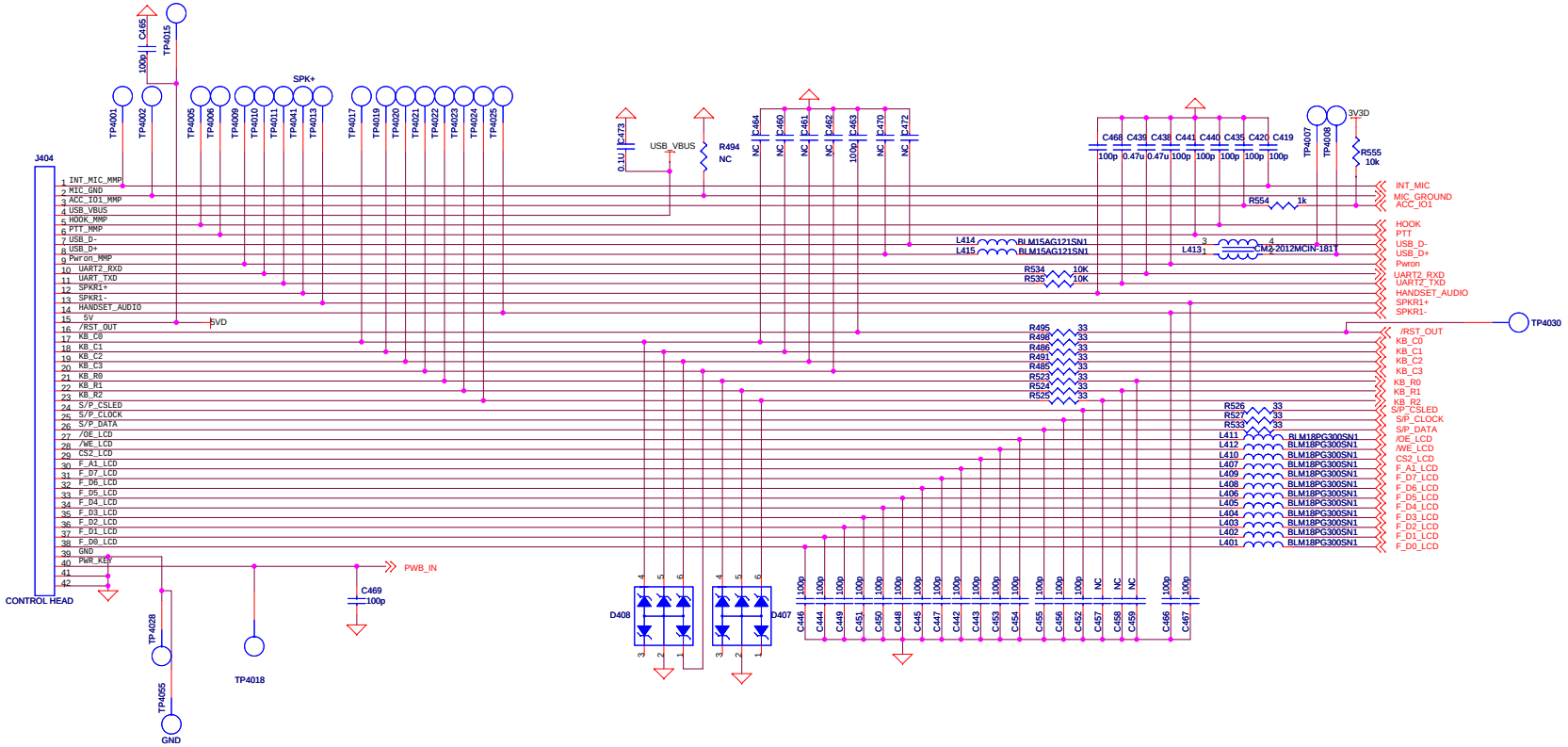
MD78X/MD78XG Schematic Diagram
(OMAP & GPS Circuit)



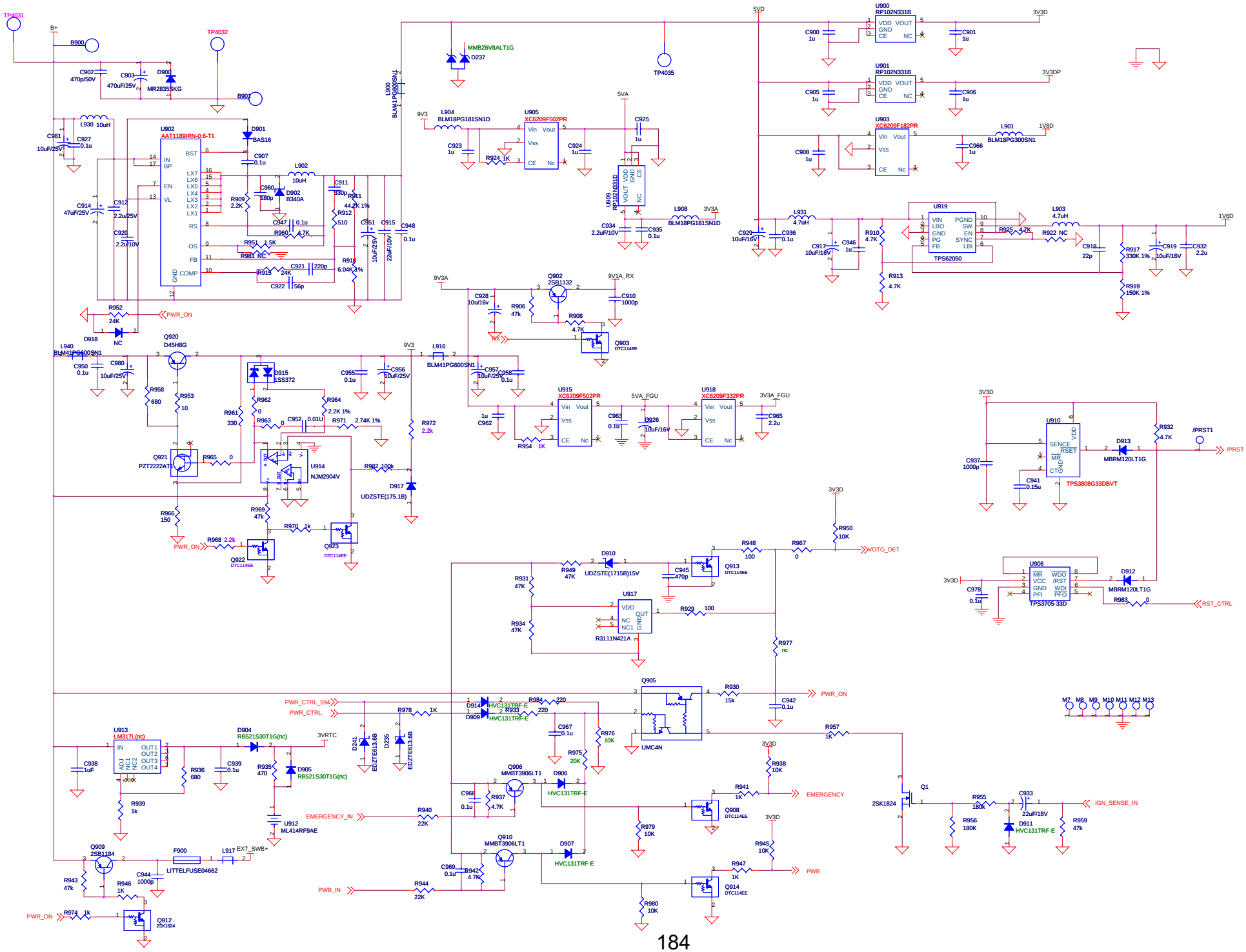
MD78X/MD78XG Schematic Diagram (Peripheral Interface Circuit)



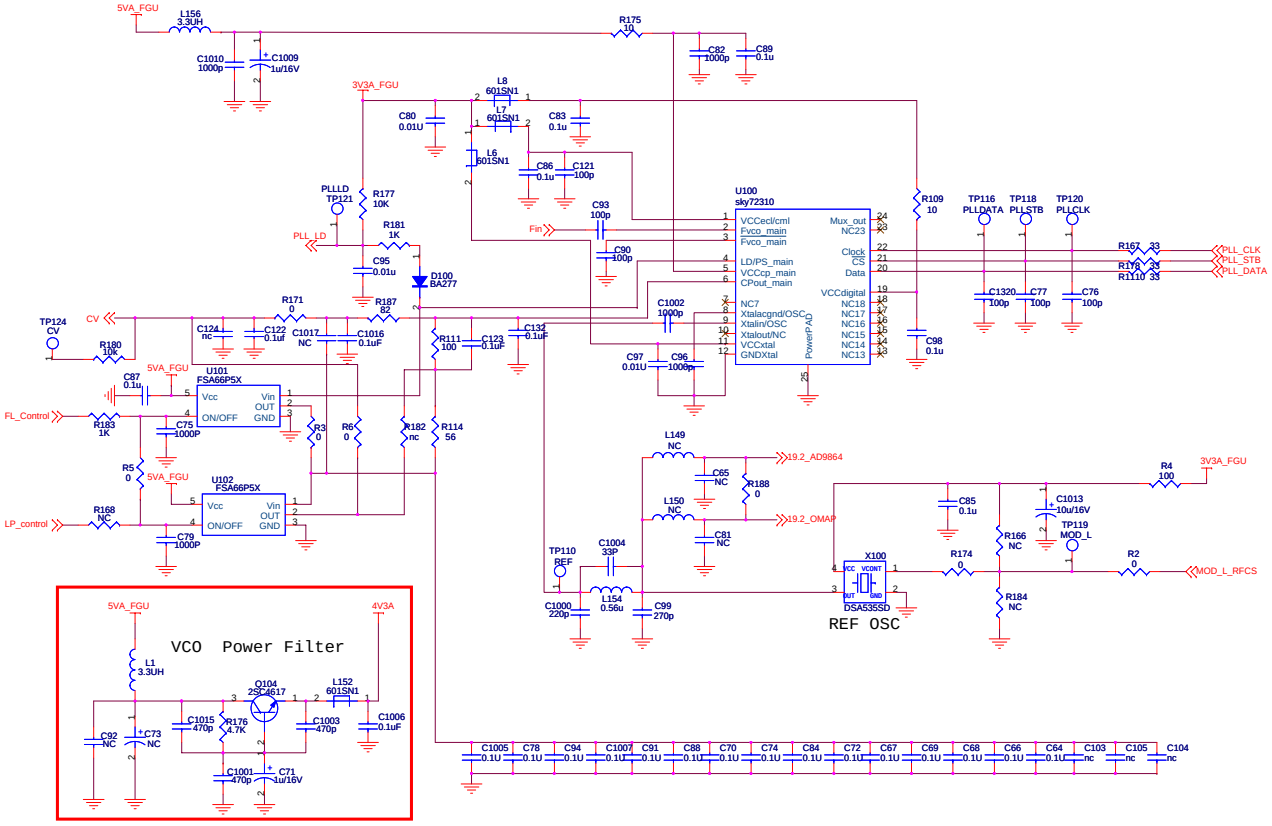
MD78X/MD78XG Schematic Diagram
(40-Pin Interface Circuit)



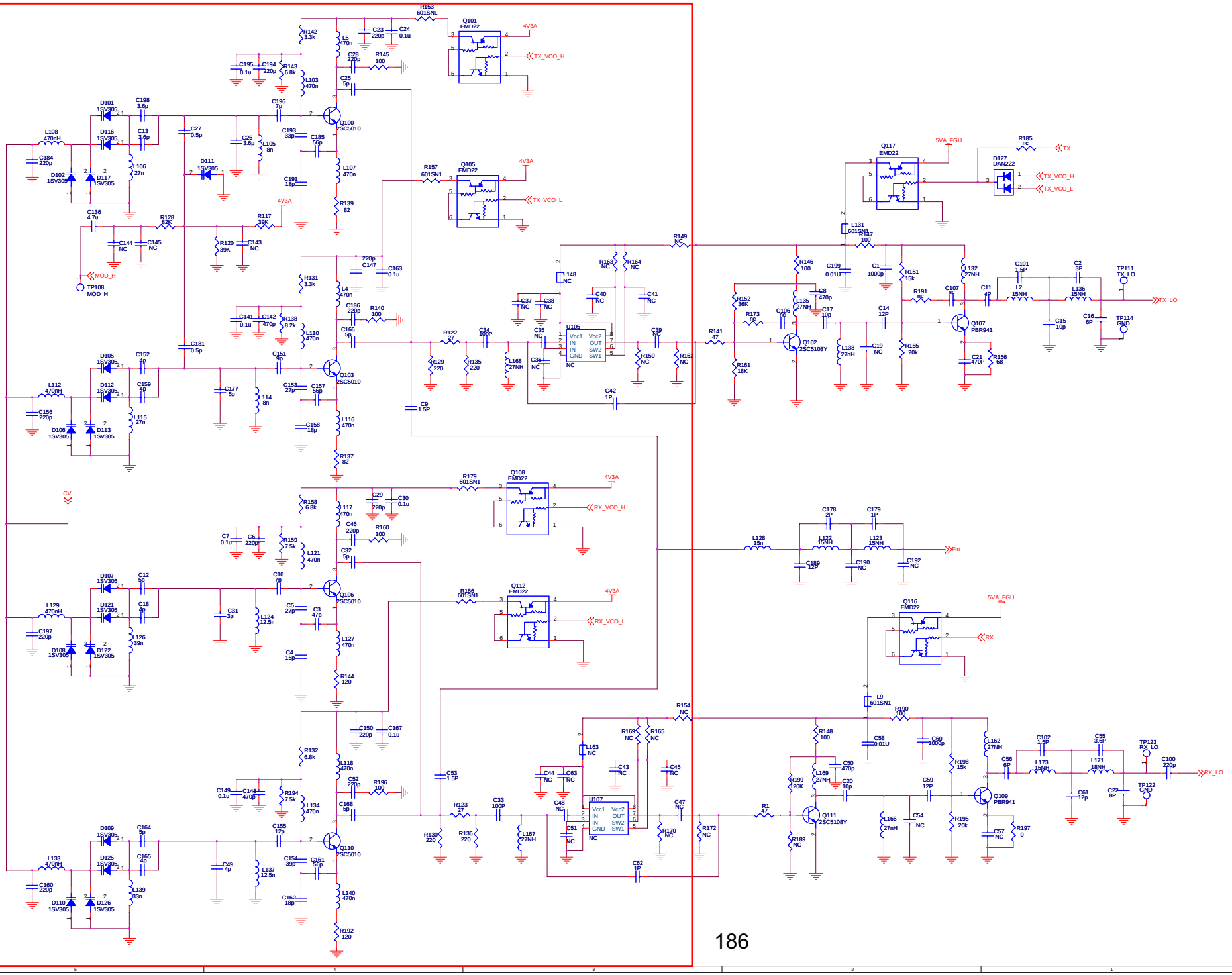
MD78X/MD78XG Schematic Diagram (Power Circuit)



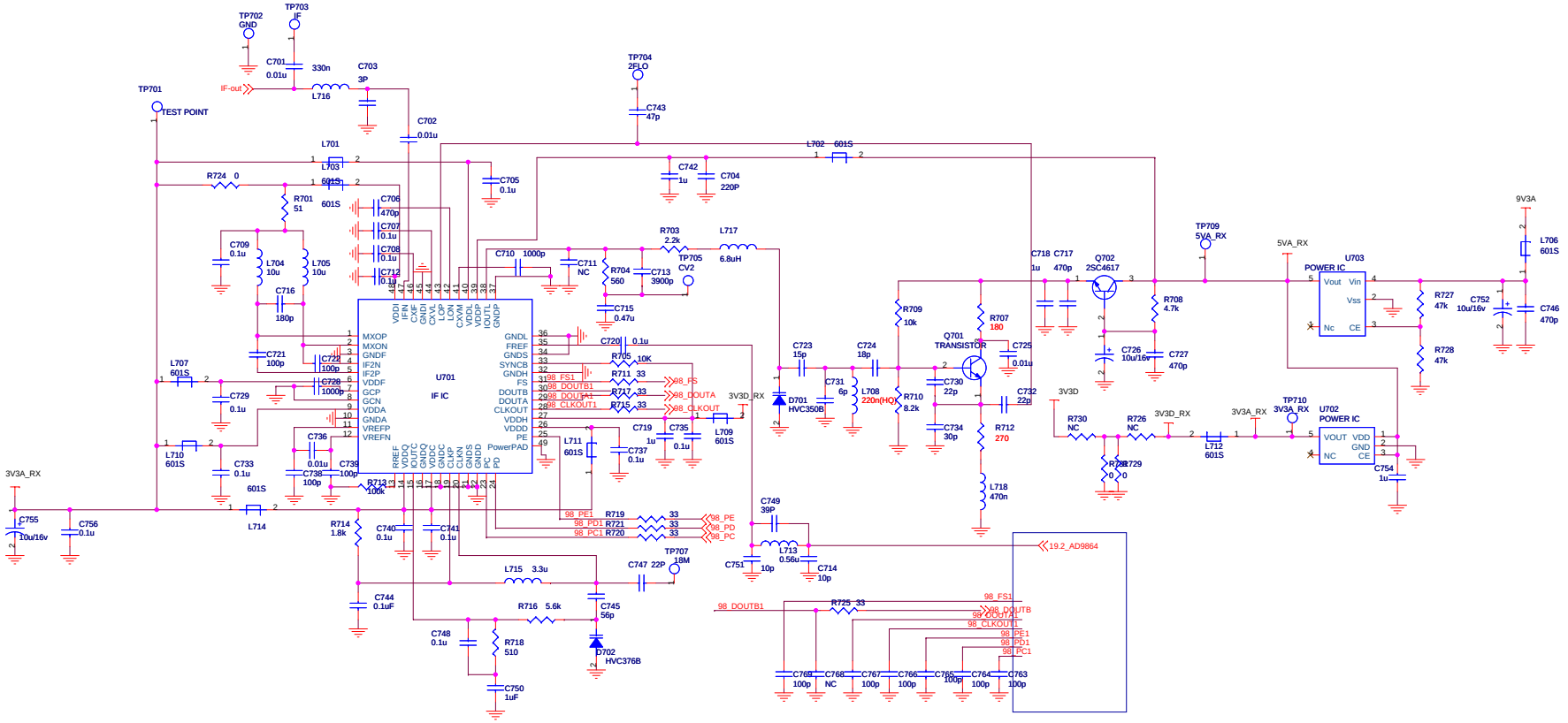
MD78X/MD78XG Schematic Diagram
(PLL Circuit)



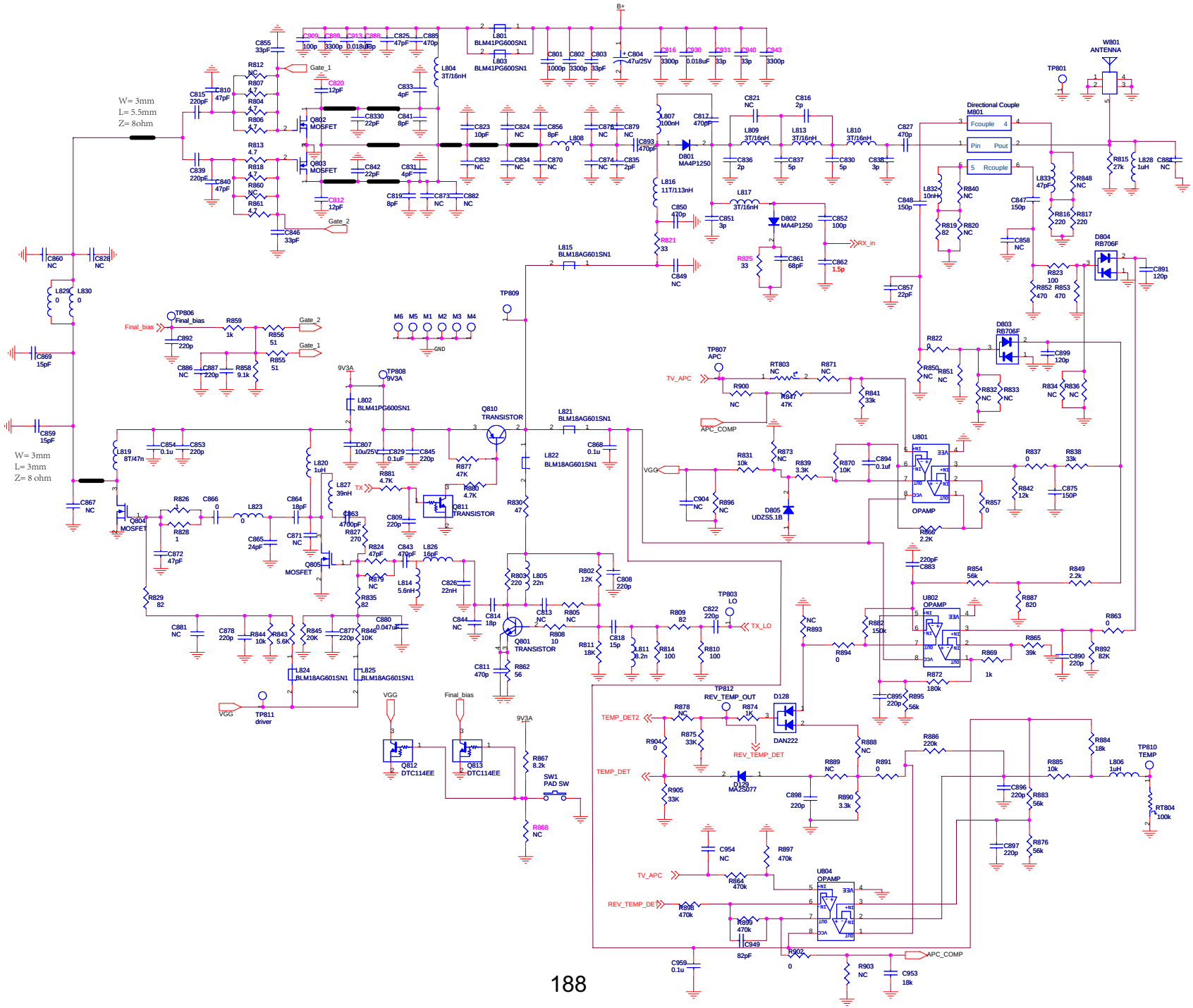
MD78X/MD78XG Schematic Diagram (VCO Circuit)



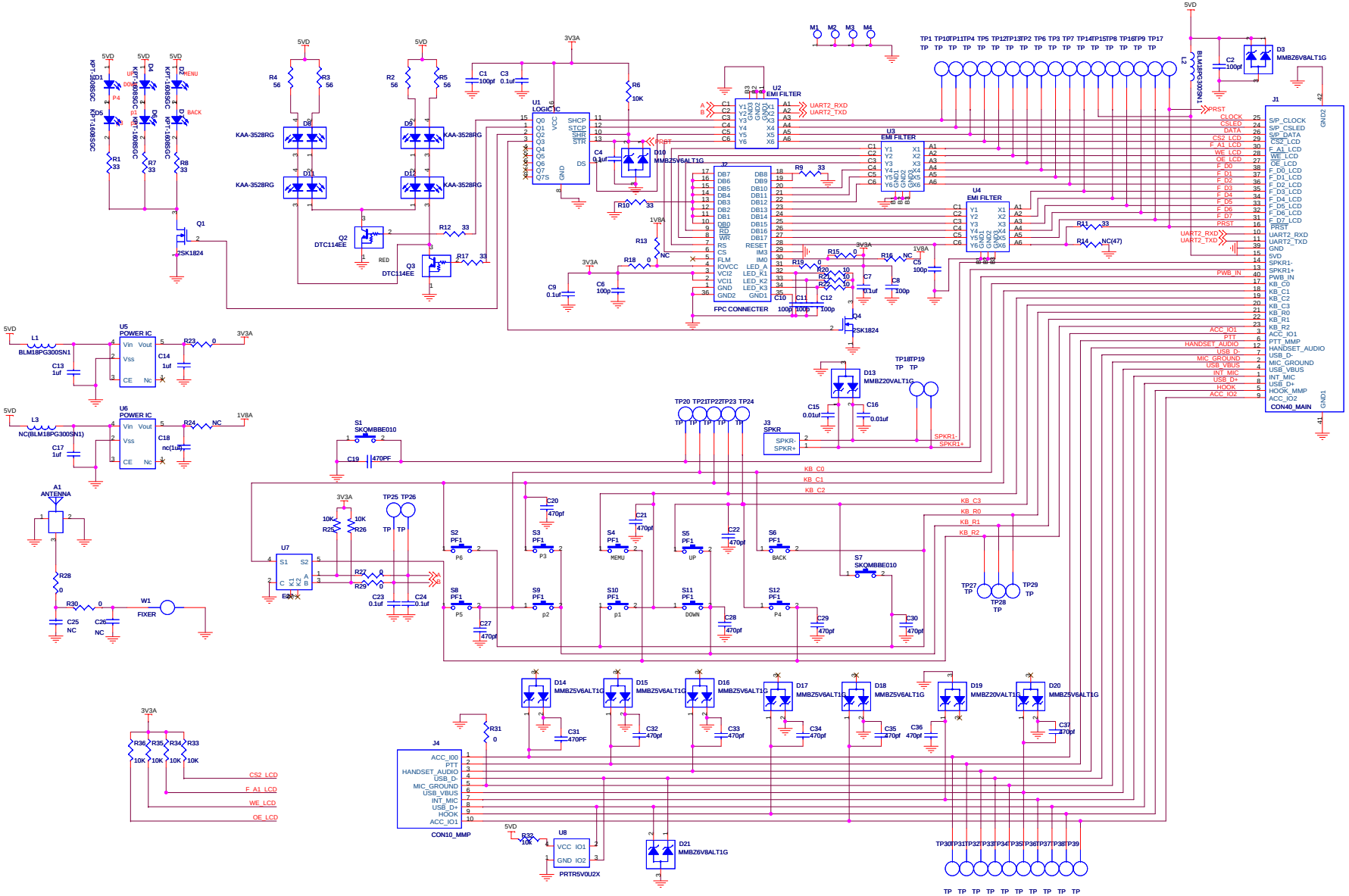
MD78X/MD78XG Schematic Diagram
(IF Circuit)



MD78X/MD78XG Schematic Diagram (TX Circuit)



MD78X/MD78XG Schematic Diagram
(Front Panel)



13.7 Parts List

Main Board *for MD78X/MD78XG*

No.	Ref. No.	Part No.	Description
1	C6115	3001050000000	0Ω
2	C6123	3001050000000	0Ω
3	C6172	3001050000000	0Ω
4	L414	3001050000000	0Ω
5	L415	3001050000000	0Ω
6	L417	3001050000000	0Ω
7	L418	3001050000000	0Ω
8	R174	3001050000000	0Ω
9	R188	3001050000000	0Ω
10	R197	3001050000000	0Ω
11	R230	3001050000000	0Ω
12	R233	3001050000000	0Ω
13	R238	3001050000000	0Ω
14	R240	3001050000000	0Ω
15	R242	3001050000000	0Ω
16	R243	3001050000000	0Ω
17	R249	3001050000000	0Ω
18	R289	3001050000000	0Ω
19	R3	3001050000000	0Ω
20	R348	3001050000000	0Ω
21	R356	3001050000000	0Ω
22	R358	3001050000000	0Ω
23	R360	3001050000000	0Ω
24	R363	3001050000000	0Ω
25	R364	3001050000000	0Ω
26	R374	3001050000000	0Ω
27	R375	3001050000000	0Ω
28	R399	3001050000000	0Ω
29	R426	3001050000000	0Ω
30	R440	3001050000000	0Ω
31	R5	3001050000000	0Ω
32	R505	3001050000000	0Ω
33	R507	3001050000000	0Ω
34	R508	3001050000000	0Ω
35	R536	3001050000000	0Ω
36	R544	3001050000000	0Ω
37	R564	3001050000000	0Ω
38	R565	3001050000000	0Ω
39	R566	3001050000000	0Ω
40	R567	3001050000000	0Ω
41	R6	3001050000000	0Ω

No.	Ref. No.	Part No.	Description
42	R6123	3001050000000	0Ω
43	R729	3001050000000	0Ω
44	R731	3001050000000	0Ω
45	R837	3001050000000	0Ω
46	R857	3001050000000	0Ω
47	R863	3001050000000	0Ω
48	R889	3001050000000	0Ω
49	R891	3001050000000	0Ω
50	R894	3001050000000	0Ω
51	R902	3001050000000	0Ω
52	R904	3001050000000	0Ω
53	R920	3001050000000	0Ω
54	R923	3001050000000	0Ω
55	R967	3001050000000	0Ω
56	R983	3001050000000	0Ω
57	C241	3001060000000	0Ω
58	C6158	3001060000000	0Ω
59	C6176	3001060000000	0Ω
60	L413A	3001060000000	0Ω
61	L413B	3001060000000	0Ω
62	L416A	3001060000000	0Ω
63	L416B	3001060000000	0Ω
64	L806	3001060000000	0Ω
65	L823	3001060000000	0Ω
66	R171	3001060000000	0Ω
67	R2	3001060000000	0Ω
68	R282	3001060000000	0Ω
69	R407	3001060000000	0Ω
70	R418	3001060000000	0Ω
71	R444	3001060000000	0Ω
72	R484	3001060000000	0Ω
73	R542	3001060000000	0Ω
74	R6116	3001060000000	0Ω
75	R6138	3001060000000	0Ω
76	R6140	3001060000000	0Ω
77	R724	3001060000000	0Ω
78	R822	3001060000000	0Ω
79	R901	3001060000000	0Ω
80	R914	3001060000000	0Ω
81	R916	3001060000000	0Ω
82	R962	3001060000000	0Ω
83	R963	3001060000000	0Ω
84	R965	3001060000000	0Ω
85	R973	3001060000000	0Ω

No.	Ref. No.	Part No.	Description
86	C815	3001070000000	0Ω
87	C839	3001070000000	0Ω
88	L808	3001080000000	0Ω
89	R245	3001160100000	1Ω
90	R253	3001160100000	1Ω
91	R293	3001160100000	1Ω
92	R294	3001160100000	1Ω
93	R826	3001060100000	1Ω
94	R828	3001060100000	1Ω
95	R804	3001084790000	4.7Ω
96	R806	3001084790000	4.7Ω
97	R807	3001084790000	4.7Ω
98	R812	3001084790000	4.7Ω
99	R813	3001084790000	4.7Ω
100	R818	3001084790000	4.7Ω
101	R860	3001084790000	4.7Ω
102	R861	3001084790000	4.7Ω
103	R109	3001051000000	10Ω
104	R175	3001051000000	10Ω
105	R386	3001051000000	10Ω
106	R388	3001051000000	10Ω
107	R414	3001051000000	10Ω
108	R187	3001061000000	10Ω
109	R808	3001061000000	10Ω
110	R953	3001061000000	10Ω
111	R6102	3001071000000	10Ω
112	R6121	3001051800000	18Ω
113	R123	3001052700010	27Ω
114	R1110	3001053300010	33Ω
115	R167	3001053300010	33Ω
116	R178	3001053300010	33Ω
117	R231	3001053300010	33Ω
118	R232	3001053300010	33Ω
119	R292	3001053300010	33Ω
120	R319	3001053300010	33Ω
121	R320	3001053300010	33Ω
122	R324	3001053300010	33Ω
123	R327	3001053300010	33Ω
124	R347	3001053300010	33Ω
125	R349	3001053300010	33Ω
126	R350	3001053300010	33Ω
127	R354	3001053300010	33Ω
128	R355	3001053300010	33Ω
129	R357	3001053300010	33Ω

No.	Ref. No.	Part No.	Description
130	R367	3001053300010	33Ω
131	R368	3001053300010	33Ω
132	R369	3001053300010	33Ω
133	R370	3001053300010	33Ω
134	R371	3001053300010	33Ω
135	R376	3001053300010	33Ω
136	R380	3001053300010	33Ω
137	R381	3001053300010	33Ω
138	R387	3001053300010	33Ω
139	R400	3001053300010	33Ω
140	R402	3001053300010	33Ω
141	R408	3001053300010	33Ω
142	R409	3001053300010	33Ω
143	R412	3001053300010	33Ω
144	R413	3001053300010	33Ω
145	R415	3001053300010	33Ω
146	R416	3001053300010	33Ω
147	R420	3001053300010	33Ω
148	R423	3001053300010	33Ω
149	R424	3001053300010	33Ω
150	R425	3001053300010	33Ω
151	R430	3001053300010	33Ω
152	R431	3001053300010	33Ω
153	R432	3001053300010	33Ω
154	R433	3001053300010	33Ω
155	R456	3001053300010	33Ω
156	R457	3001053300010	33Ω
157	R467	3001053300010	33Ω
158	R473	3001053300010	33Ω
159	R474	3001053300010	33Ω
160	R479	3001053300010	33Ω
161	R485	3001053300010	33Ω
162	R486	3001053300010	33Ω
163	R487	3001053300010	33Ω
164	R489	3001053300010	33Ω
165	R490	3001053300010	33Ω
166	R491	3001053300010	33Ω
167	R492	3001053300010	33Ω
168	R495	3001053300010	33Ω
169	R498	3001053300010	33Ω
170	R515	3001053300010	33Ω
171	R516	3001053300010	33Ω
172	R517	3001053300010	33Ω
173	R518	3001053300010	33Ω

No.	Ref. No.	Part No.	Description
174	R519	3001053300010	33Ω
175	R520	3001053300010	33Ω
176	R521	3001053300010	33Ω
177	R522	3001053300010	33Ω
178	R523	3001053300010	33Ω
179	R524	3001053300010	33Ω
180	R525	3001053300010	33Ω
181	R526	3001053300010	33Ω
182	R527	3001053300010	33Ω
183	R533	3001053300010	33Ω
184	R545	3001053300010	33Ω
185	R552	3001053300010	33Ω
186	R553	3001053300010	33Ω
187	R6114	3001053300010	33Ω
188	R711	3001053300010	33Ω
189	R715	3001053300010	33Ω
190	R717	3001053300010	33Ω
191	R719	3001053300010	33Ω
192	R720	3001053300010	33Ω
193	R721	3001053300010	33Ω
194	R725	3001053300010	33Ω
195	R821	3001113300000	33Ω
196	R825	3001113300000	33Ω
197	R1	3001054700000	47Ω
198	R141	3001054700000	47Ω
199	R830	3001074700000	47Ω
200	R6120	3001055100010	51Ω
201	R6132	3001055100010	51Ω
202	R701	3001055100010	51Ω
203	R855	3001083300000	33Ω
204	R856	3001083300000	33Ω
205	R829	3001063900000	39Ω
206	R114	3001065100000	51Ω
207	R862	3001065600000	56Ω
208	R156	3001056800000	68Ω
209	R137	3001068200000	82Ω
210	R139	3001068200000	82Ω
211	R809	3001068200000	82Ω
212	R835	3001068200000	82Ω
213	R6117	3001078200000	82Ω
214	R6126	3001078200000	82Ω
215	R819	3001078200000	82Ω
216	R140	3001051010040	100Ω
217	R145	3001051010040	100Ω

No.	Ref. No.	Part No.	Description
218	R146	3001051010040	100Ω
219	R147	3001051010040	100Ω
220	R148	3001051010040	100Ω
221	R160	3001051010040	100Ω
222	R190	3001051010040	100Ω
223	R196	3001051010040	100Ω
224	R129	3001051010000	100Ω
225	R135	3001051010000	100Ω
226	R251	3001051010000	100Ω
227	R260	3001051010000	100Ω
228	R271	3001051010000	100Ω
229	R278	3001051010000	100Ω
230	R337	3001051010000	100Ω
231	R338	3001051010000	100Ω
232	R339	3001051010000	100Ω
233	R346	3001051010000	100Ω
234	R403	3001051010000	100Ω
235	R404	3001051010000	100Ω
236	R406	3001051010000	100Ω
237	R410	3001051010000	100Ω
238	R411	3001051010000	100Ω
239	R421	3001051010000	100Ω
240	R434	3001051010000	100Ω
241	R439	3001051010000	100Ω
242	R445	3001051010000	100Ω
243	R458	3001051010000	100Ω
244	R459	3001051010000	100Ω
245	R556	3001051010000	100Ω
246	R557	3001051010000	100Ω
247	R929	3001051010000	100Ω
248	R948	3001051010000	100Ω
249	R111	3001061010000	100Ω
250	R192	3001061010000	100Ω
251	R4	3001061010000	100Ω
252	R810	3001061010000	100Ω
253	R814	3001061010000	100Ω
254	R823	3001061010000	100Ω
255	R144	3001061210000	120Ω
256	R6124	3001052710010	270Ω
257	R6125	3001052710010	270Ω
258	R712	3001052710010	270Ω
259	R966	3001161510010	150Ω
260	R707	3001051810010	180Ω
261	R130	3001052210000	220Ω

No.	Ref. No.	Part No.	Description
262	R136	3001052210000	220Ω
263	R933	3001052210000	220Ω
264	R984	3001052210000	220Ω
265	R803	3001062210000	220Ω
266	R816	3001072210000	220Ω
267	R817	3001072210000	220Ω
268	R827	3001062710000	270Ω
269	R6133	3001053310010	330Ω
270	R6129	3001063310010	330Ω
271	R961	3001083310010	330Ω
272	R546	3001054710000	470Ω
273	R547	3001054710000	470Ω
274	R548	3001054710000	470Ω
275	R549	3001054710000	470Ω
276	R550	3001054710000	470Ω
277	R551	3001054710000	470Ω
278	R255	3001064710000	470Ω
279	R853	3001064710000	470Ω
280	R6100	3001055110000	510Ω
281	R718	3001055110000	510Ω
282	R912	3001055110000	510Ω
283	R704	3001055610010	560Ω
284	R6101	3001056810000	680Ω
285	R6106	3001066810000	680Ω
286	R958	3001066810000	680Ω
287	R887	3001058210000	820Ω
288	R181	3001051020000	1KΩ
289	R183	3001051020000	1KΩ
290	R290	3001051020000	1KΩ
291	R295	3001051020000	1KΩ
292	R502	3001051020000	1KΩ
293	R503	3001051020000	1KΩ
294	R504	3001051020000	1KΩ
295	R571	3001051020000	1KΩ
296	R831	3001051020000	1KΩ
297	R869	3001051020000	1KΩ
298	R874	3001051020000	1KΩ
299	R264	3001051020010	1KΩ
300	R267	3001051020010	1KΩ
301	R383	3001051020010	1KΩ
302	R422	3001051020010	1KΩ
303	R460	3001051020010	1KΩ
304	R477	3001051020010	1KΩ
305	R554	3001051020010	1KΩ

No.	Ref. No.	Part No.	Description
306	R941	3001051020010	1KΩ
307	R947	3001051020010	1KΩ
308	R957	3001051020010	1KΩ
309	R978	3001051020010	1KΩ
310	R859	3001061020010	1KΩ
311	R924	3001061020010	1KΩ
312	R939	3001061020010	1KΩ
313	R954	3001061020010	1KΩ
314	R970	3001061020010	1KΩ
315	R974	3001061020010	1KΩ
316	R946	3001071020000	1KΩ
317	R291	3001051220000	1.2K
318	R6119	3001051220000	1.2K
319	R6122	3001051220000	1.2K
320	R6131	3001051220000	1.2K
321	R401	3001051520000	1.5K
322	R951	3001051520000	1.5K
323	R449	3001061520000	1.5K
324	R265	3001051820000	1.8K
325	R714	3001051820000	1.8K
326	R703	3001052220010	2.2K
327	R849	3001052220010	2.2K
328	R866	3001052220010	2.2K
329	R909	3001052220010	2.2K
330	R964	3001052220010	2.2K
331	R6110	3001052220000	2.2K
332	R968	3001052220000	2.2K
333	R972	3001062220000	2.2K
334	R6104	3001052720000	2.7K
335	R450	3001072720010	2.7K
336	R971	3099052741000	2.74K
337	R131	3001053320000	3.3K
338	R142	3001053320000	3.3K
339	R6107	3001053320000	3.3K
340	R6118	3001053320000	3.3K
341	R839	3001053320000	3.3K
342	R890	3001053320000	3.3K
343	R960	3001054790010	4.7K
344	R176	3001054720000	4.7K
345	R395	3001054720000	4.7K
346	R396	3001054720000	4.7K
347	R428	3001054720000	4.7K
348	R435	3001054720000	4.7K
349	R436	3001054720000	4.7K

No.	Ref. No.	Part No.	Description
350	R437	3001054720000	4.7K
351	R448	3001054720000	4.7K
352	R468	3001054720000	4.7K
353	R469	3001054720000	4.7K
354	R470	3001054720000	4.7K
355	R471	3001054720000	4.7K
356	R472	3001054720000	4.7K
357	R488	3001054720000	4.7K
358	R496	3001054720000	4.7K
359	R499	3001054720000	4.7K
360	R511	3001054720000	4.7K
361	R6135	3001054720000	4.7K
362	R708	3001054720000	4.7K
363	R908	3001054720000	4.7K
364	R910	3001054720000	4.7K
365	R913	3001054720000	4.7K
366	R937	3001054720000	4.7K
367	R942	3001054720000	4.7K
368	R925	3001064720000	4.7K
369	R932	3001064720000	4.7K
370	R880	3001074720010	4.7K
371	R881	3001074720010	4.7K
372	R6130	3001055120030	5.1K
373	R239	3001055620000	5.6K
374	R287	3001055620000	5.6K
375	R6105	3001055620000	5.6K
376	R716	3001055620000	5.6K
377	R843	3001065620000	5.6K
378	R918	3099066041010	6.04K
379	R132	3001056820000	6.8K
380	R158	3001056820000	6.8K
381	R577	3001056820000	6.8K
382	R143	3001057520000	7.5K
383	R159	3001057520000	7.5K
384	R194	3001057520000	7.5K
385	R138	3001058220000	8.2K
386	R710	3001058220000	8.2K
387	R867	3001058220000	8.2K
388	R858	3001069120000	9.1K
389	D601	3001051030000	10KΩ
390	R177	3001051030000	10KΩ
391	R180	3001051030000	10KΩ
392	R202	3001051030000	10KΩ
393	R234	3001051030000	10KΩ

No.	Ref. No.	Part No.	Description
394	R235	3001051030000	10KΩ
395	R236	3001051030000	10KΩ
396	R258	3001051030000	10KΩ
397	R259	3001051030000	10KΩ
398	R261	3001051030000	10KΩ
399	R316	3001051030000	10KΩ
400	R322	3001051030000	10KΩ
401	R326	3001051030000	10KΩ
402	R351	3001051030000	10KΩ
403	R353	3001051030000	10KΩ
404	R365	3001051030000	10KΩ
405	R366	3001051030000	10KΩ
406	R372	3001051030000	10KΩ
407	R377	3001051030000	10KΩ
408	R378	3001051030000	10KΩ
409	R379	3001051030000	10KΩ
410	R382	3001051030000	10KΩ
411	R385	3001051030000	10KΩ
412	R390	3001051030000	10KΩ
413	R391	3001051030000	10KΩ
414	R392	3001051030000	10KΩ
415	R393	3001051030000	10KΩ
416	R394	3001051030000	10KΩ
417	R427	3001051030000	10KΩ
418	R429	3001051030000	10KΩ
419	R438	3001051030000	10KΩ
420	R441	3001051030000	10KΩ
421	R442	3001051030000	10KΩ
422	R443	3001051030000	10KΩ
423	R447	3001051030000	10KΩ
424	R451	3001051030000	10KΩ
425	R452	3001051030000	10KΩ
426	R453	3001051030000	10KΩ
427	R454	3001051030000	10KΩ
428	R461	3001051030000	10KΩ
429	R462	3001051030000	10KΩ
430	R463	3001051030000	10KΩ
431	R464	3001051030000	10KΩ
432	R465	3001051030000	10KΩ
433	R466	3001051030000	10KΩ
434	R476	3001051030000	10KΩ
435	R481	3001051030000	10KΩ
436	R482	3001051030000	10KΩ
437	R483	3001051030000	10KΩ

No.	Ref. No.	Part No.	Description
438	R501	3001051030000	10KΩ
439	R506	3001051030000	10KΩ
440	R509	3001051030000	10KΩ
441	R510	3001051030000	10KΩ
442	R512	3001051030000	10KΩ
443	R530	3001051030000	10KΩ
444	R531	3001051030000	10KΩ
445	R532	3001051030000	10KΩ
446	R534	3001051030000	10KΩ
447	R535	3001051030000	10KΩ
448	R538	3001051030000	10KΩ
449	R539	3001051030000	10KΩ
450	R540	3001051030000	10KΩ
451	R541	3001051030000	10KΩ
452	R543	3001051030000	10KΩ
453	R555	3001051030000	10KΩ
454	R570	3001051030000	10KΩ
455	R6127	3001051030000	10KΩ
456	R705	3001051030000	10KΩ
457	R709	3001051030000	10KΩ
458	R885	3001051030000	10KΩ
459	R938	3001051030000	10KΩ
460	R945	3001051030000	10KΩ
461	R950	3001051030000	10KΩ
462	R976	3001051030000	10KΩ
463	R979	3001051030000	10KΩ
464	R980	3001051030000	10KΩ
465	R844	3001061030000	10KΩ
466	R846	3001061030000	10KΩ
467	R568	3001051230000	12KΩ
468	R842	3001051230000	12KΩ
469	R870	3001051230000	12KΩ
470	R802	3001061230000	12KΩ
471	R151	3001051530010	15KΩ
472	R198	3001051530010	15KΩ
473	R884	3001051530010	15KΩ
474	R930	3001051530010	15KΩ
475	R250	3001051530000	15KΩ
476	R284	3001051530000	15KΩ
477	R285	3001051530000	15KΩ
478	R361	3001051530000	15KΩ
479	R362	3001051530000	15KΩ
480	C953	3001051830000	18KΩ
481	R161	3001051830000	18KΩ

No.	Ref. No.	Part No.	Description
482	R811	3001061830010	18KΩ
483	R155	3001052030000	20KΩ
484	R195	3001052030000	20KΩ
485	R6136	3001052030000	20KΩ
486	R975	3001052030000	20KΩ
487	R845	3001062030000	20KΩ
488	R244	3001052230010	22KΩ
489	R246	3001052230010	22KΩ
490	R940	3001052230010	22KΩ
491	R944	3001052230010	22KΩ
492	R273	3001052430010	24KΩ
493	R915	3001052430010	24KΩ
494	R952	3001062430000	24KΩ
495	R6103	3001052730010	27KΩ
496	R815	3001082730000	27KΩ
497	R6134	3001053030000	30KΩ
498	R6137	3001053030000	30KΩ
499	R257	3001053030010	30KΩ
500	R263	3001053030010	30KΩ
501	R279	3001053030010	30KΩ
502	R283	3001053030010	30KΩ
503	R529	3001053330000	33KΩ
504	R838	3001053330000	33KΩ
505	R841	3001053330000	33KΩ
506	R875	3001053330000	33KΩ
507	R905	3001053330000	33KΩ
508	R558	3001053330010	33KΩ
509	R559	3001053330010	33KΩ
510	R560	3001053330010	33KΩ
511	R561	3001053330010	33KΩ
512	R562	3001053330010	33KΩ
513	R563	3001053330010	33KΩ
514	R152	3001053630000	36KΩ
515	R117	3001053930000	39KΩ
516	R120	3001053930000	39KΩ
517	R865	3001053930000	39KΩ
518	R911	3099064422010	44.2KΩ
519	R266	3001054730000	47KΩ
520	R270	3001054730000	47KΩ
521	R272	3001054730000	47KΩ
522	R277	3001054730000	47KΩ
523	R286	3001054730000	47KΩ
524	R288	3001054730000	47KΩ
525	R847	3001054730000	47KΩ

No.	Ref. No.	Part No.	Description
526	R877	3001054730000	47KΩ
527	R931	3001054730000	47KΩ
528	R949	3001054730000	47KΩ
529	R959	3001054730000	47KΩ
530	R727	3001064730000	47KΩ
531	R728	3001064730000	47KΩ
532	R906	3001064730000	47KΩ
533	R943	3001064730000	47KΩ
534	R969	3001064730000	47KΩ
535	R895	3001055130010	51KΩ
536	R934	3001055130010	51KΩ
537	R237	3001055630000	56KΩ
538	R241	3001055630000	56KΩ
539	R6139	3001055630000	56KΩ
540	R854	3001055630000	56KΩ
541	R876	3001055630000	56KΩ
542	R883	3001055630000	56KΩ
543	R528	3001056830000	68KΩ
544	R128	3001058230000	82KΩ
545	R892	3001058230000	82KΩ
546	R296	3001051040000	100KΩ
547	R500	3001051040000	100KΩ
548	R513	3001051040000	100KΩ
549	R514	3001051040000	100KΩ
550	R6111	3001051040000	100KΩ
551	R6112	3001051040000	100KΩ
552	R6115	3001051040000	100KΩ
553	R713	3001051040000	100KΩ
554	R982	3001051040000	100KΩ
555	R247	3001051040010	100KΩ
556	R248	3001051040010	100KΩ
557	R252	3001051040010	100KΩ
558	R262	3001051040010	100KΩ
559	R268	3001051040010	100KΩ
560	R269	3001051040010	100KΩ
561	R274	3001051040010	100KΩ
562	R275	3001051040010	100KΩ
563	R276	3001051040010	100KΩ
564	R455	3001051040010	100KΩ
565	RT804	3003061040000	Thermistor
566	R199	3001051240000	120K
567	R919	3001051540000	150K
568	R872	3001051840000	180K
569	R955	3001051840000	180K

No.	Ref. No.	Part No.	Description
570	R956	3001051840000	180K
571	R882	3001052240000	220K
572	R886	3001052240000	220K
573	R6113	3001052740000	270K
574	R917	3001053340010	330K
575	R864	3001054740010	470K
576	R897	3001054740010	470K
577	R898	3001054740010	470K
578	R899	3001054740010	470K
579	RN230	3005051010010	100Ω
580	RN500	3005051010010	100Ω
581	C181	3101050590010	0.5PF
582	C27	3101050590010	0.5PF
583	C42	3101050100030	1PF
584	C6124	3101050100030	1PF
585	C6152	3101050100030	1PF
586	C6154	3101050100030	1PF
587	C62	3101050100030	1PF
588	C836	3101080100010	1PF
589	C851	3101080100010	1PF
590	C870	3101080100010	1PF
591	C873	3101080100010	1PF
592	C101	3101051590000	1.5PF
593	C102	3101060200010	2PF
594	C178	3101060200010	2PF
595	C2	3101060200010	2PF
596	C6153	3101050200010	2PF
597	C53	3101052290020	2.2PF
598	C9	3101052290020	2.2PF
599	C179	3101062490000	2.4PF
600	C830	3101080300010	3PF
601	C837	3101080300010	3PF
602	C838	3101080300010	3PF
603	C856	3101080300010	3PF
604	C6163	3101053390010	3.3PF
605	C13	3101053690000	3.6PF
606	C152	3101053690000	3.6PF
607	C159	3101053690000	3.6PF
608	C198	3101053690000	3.6PF
609	C55	3101063690000	3.6PF
610	C879	3101080400010	4PF
611	C11	3101050400010	4PF
612	C12	3101050400010	4PF
613	C18	3101050400010	4PF

No.	Ref. No.	Part No.	Description
614	C31	3101060500010	5PF
615	C6111	3101050500000	5PF
616	C6112	3101050500000	5PF
617	C192	3101060400010	4PF
618	C812	3101080500010	5PF
619	C820	3101080500010	5PF
620	C831	3101080500010	5PF
621	C833	3101080500010	5PF
622	C16	3101050500010	5PF
623	C164	3101050500010	5PF
624	C165	3101050500010	5PF
625	C166	3101050500010	5PF
626	C168	3101050500010	5PF
627	C25	3101050500010	5PF
628	C32	3101050500010	5PF
629	C819	3101080600010	6PF
630	C841	3101080600010	6PF
631	C56	3101050600010	6PF
632	C6114	3101050600010	6PF
633	C731	3101050600010	6PF
634	C190	3101060700020	7PF
635	C196	3101060700020	7PF
636	C26	3101060700020	7PF
637	C49	3101060700020	7PF
638	C177	3101060800010	8PF
639	C20	3101060800010	8PF
640	L166	3101060800010	8PF
641	R840	3101060800010	8PF
642	C22	3101050800000	8PF
643	C10	3101060900010	9PF
644	C6170	3101050900000	9PF
645	C823	3101081000010	10PF
646	C15	3101051000020	10PF
647	C61	3101051000020	10PF
648	C6117	3101051000020	10PF
649	C714	3101051000020	10PF
650	C751	3101051000020	10PF
651	C151	3101061000000	10PF
652	C155	3101061000000	10PF
653	C17	3101061000000	10PF
654	C14	3101051200020	12PF
655	C375	3101051200020	12PF
656	C376	3101051200020	12PF
657	C59	3101051200020	12PF

No.	Ref. No.	Part No.	Description
658	C6161	3101051200020	12PF
659	C6162	3101051200020	12PF
660	C6164	3101051200020	12PF
661	C189	3101061200000	12PF
662	C6129	3101051500020	15PF
663	C6130	3101051500020	15PF
664	C6177	3101051500020	15PF
665	C723	3101051500020	15PF
666	C818	3101061500010	15PF
667	L826	3101061600000	16PF
668	C4	3101051800010	18PF
669	C724	3101051800010	18PF
670	C814	3101061800000	18PF
671	C864	3101061800000	18PF
672	C8330	3101372200000	22PF
673	C842	3101372200000	22PF
674	C191	3101052200010	22PF
675	C6160	3101052200010	22PF
676	C730	3101052200010	22PF
677	C732	3101052200010	22PF
678	C918	3101052200010	22PF
679	C857	3101062200010	22PF
680	C889	3101062200010	22PF
681	C902	3101062200010	22PF
682	C193	3101052400010	24PF
683	C865	3101062400010	24PF
684	C158	3101052700000	27PF
685	C162	3101052700000	27PF
686	C931	3101062700010	27PF
687	C943	3101062700010	27PF
688	C846	3101072700000	27PF
689	C855	3101072700000	27PF
690	C885	3101082700010	27PF
691	C153	3101053000010	30PF
692	C154	3101053000010	30PF
693	C734	3101053000010	30PF
694	C500	3101053300000	33PF
695	C6134	3101053300000	33PF
696	C6135	3101053300000	33PF
697	C6136	3101053300000	33PF
698	C6137	3101053300000	33PF
699	C6138	3101053300000	33PF
700	C6139	3101053300000	33PF
701	C6140	3101053300000	33PF

No.	Ref. No.	Part No.	Description
702	C6141	3101053300000	33PF
703	C6142	3101053300000	33PF
704	C6143	3101053300000	33PF
705	C1004	3101063300000	33PF
706	C803	3101063300000	33PF
707	C888	3101063300000	33PF
708	C913	3101063300000	33PF
709	C364	3101053900000	39PF
710	C749	3101053900000	39PF
711	C3	3101054700010	47PF
712	L833	3101064700000	47PF
713	R824	3101064700000	47PF
714	C825	3101074700000	47PF
715	C157	3101055600000	56PF
716	C161	3101055600000	56PF
717	C185	3101055600000	56PF
718	C745	3101055600000	56PF
719	C922	3101055600000	56PF
720	C852	3101066800000	68PF
721	C940	3101066800000	68PF
722	C362	3101058200000	82PF
723	C363	3101058200000	82PF
724	C365	3101058200000	82PF
725	C949	3101058200000	82PF
726	C866	3101068200000	82PF
727	L829	3101068200000	82PF
728	L830	3101068200000	82PF
729	C121	3101051010030	100PF
730	C1320	3101051010030	100PF
731	C256	3101051010030	100PF
732	C288	3101051010030	100PF
733	C295	3101051010030	100PF
734	C307	3101051010030	100PF
735	C309	3101051010030	100PF
736	C326	3101051010030	100PF
737	C33	3101051010030	100PF
738	C335	3101051010030	100PF
739	C339	3101051010030	100PF
740	C34	3101051010030	100PF
741	C341	3101051010030	100PF
742	C342	3101051010030	100PF
743	C343	3101051010030	100PF
744	C344	3101051010030	100PF
745	C345	3101051010030	100PF

No.	Ref. No.	Part No.	Description
746	C346	3101051010030	100PF
747	C347	3101051010030	100PF
748	C348	3101051010030	100PF
749	C349	3101051010030	100PF
750	C350	3101051010030	100PF
751	C351	3101051010030	100PF
752	C352	3101051010030	100PF
753	C353	3101051010030	100PF
754	C354	3101051010030	100PF
755	C355	3101051010030	100PF
756	C357	3101051010030	100PF
757	C358	3101051010030	100PF
758	C359	3101051010030	100PF
759	C360	3101051010030	100PF
760	C361	3101051010030	100PF
761	C378	3101051010030	100PF
762	C385	3101051010030	100PF
763	C390	3101051010030	100PF
764	C409	3101051010030	100PF
765	C410	3101051010030	100PF
766	C411	3101051010030	100PF
767	C412	3101051010030	100PF
768	C413	3101051010030	100PF
769	C414	3101051010030	100PF
770	C415	3101051010030	100PF
771	C416	3101051010030	100PF
772	C417	3101051010030	100PF
773	C418	3101051010030	100PF
774	C419	3101051010030	100PF
775	C420	3101051010030	100PF
776	C426	3101051010030	100PF
777	C427	3101051010030	100PF
778	C428	3101051010030	100PF
779	C429	3101051010030	100PF
780	C430	3101051010030	100PF
781	C431	3101051010030	100PF
782	C435	3101051010030	100PF
783	C440	3101051010030	100PF
784	C441	3101051010030	100PF
785	C442	3101051010030	100PF
786	C443	3101051010030	100PF
787	C444	3101051010030	100PF
788	C445	3101051010030	100PF
789	C446	3101051010030	100PF

No.	Ref. No.	Part No.	Description
790	C447	3101051010030	100PF
791	C448	3101051010030	100PF
792	C449	3101051010030	100PF
793	C450	3101051010030	100PF
794	C451	3101051010030	100PF
795	C452	3101051010030	100PF
796	C453	3101051010030	100PF
797	C454	3101051010030	100PF
798	C455	3101051010030	100PF
799	C456	3101051010030	100PF
800	C463	3101051010030	100PF
801	C465	3101051010030	100PF
802	C466	3101051010030	100PF
803	C467	3101051010030	100PF
804	C468	3101051010030	100PF
805	C469	3101051010030	100PF
806	C470	3101051010030	100PF
807	C472	3101051010030	100PF
808	C477	3101051010030	100PF
809	C478	3101051010030	100PF
810	C479	3101051010030	100PF
811	C480	3101051010030	100PF
812	C510	3101051010030	100PF
813	C516	3101051010030	100PF
814	C517	3101051010030	100PF
815	C518	3101051010030	100PF
816	C6166	3101051010030	100PF
817	C721	3101051010030	100PF
818	C722	3101051010030	100PF
819	C738	3101051010030	100PF
820	C739	3101051010030	100PF
821	C76	3101051010030	100PF
822	C763	3101051010030	100PF
823	C764	3101051010030	100PF
824	C765	3101051010030	100PF
825	C766	3101051010030	100PF
826	C767	3101051010030	100PF
827	C769	3101051010030	100PF
828	C77	3101051010030	100PF
829	C90	3101051010030	100PF
830	C93	3101051010030	100PF
831	C6157	3101061010010	100PF
832	C891	3101051210000	120PF
833	C899	3101051210000	120PF

No.	Ref. No.	Part No.	Description
834	C6118	3101051510000	150PF
835	C875	3101051510000	150PF
836	C843	3101061510000	150PF
837	C847	3101061510000	150PF
838	C848	3101061510000	150PF
839	C716	3101061810010	180PF
840	C861	3101061810010	180PF
841	C100	3101052210010	220PF
842	C1000	3101052210010	220PF
843	C147	3101052210010	220PF
844	C150	3101052210010	220PF
845	C156	3101052210010	220PF
846	C160	3101052210010	220PF
847	C184	3101052210010	220PF
848	C186	3101052210010	220PF
849	C194	3101052210010	220PF
850	C197	3101052210010	220PF
851	C23	3101052210010	220PF
852	C247	3101052210010	220PF
853	C250	3101052210010	220PF
854	C254	3101052210010	220PF
855	C265	3101052210010	220PF
856	C269	3101052210010	220PF
857	C270	3101052210010	220PF
858	C271	3101052210010	220PF
859	C272	3101052210010	220PF
860	C273	3101052210010	220PF
861	C28	3101052210010	220PF
862	C280	3101052210010	220PF
863	C29	3101052210010	220PF
864	C421	3101052210010	220PF
865	C423	3101052210010	220PF
866	C424	3101052210010	220PF
867	C425	3101052210010	220PF
868	C432	3101052210010	220PF
869	C433	3101052210010	220PF
870	C434	3101052210010	220PF
871	C436	3101052210010	220PF
872	C437	3101052210010	220PF
873	C46	3101052210010	220PF
874	C52	3101052210010	220PF
875	C6	3101052210010	220PF
876	C6103	3101052210010	220PF
877	C6105	3101052210010	220PF

No.	Ref. No.	Part No.	Description
878	C6106	3101052210010	220PF
879	C6107	3101052210010	220PF
880	C6128	3101052210010	220PF
881	C6144	3101052210010	220PF
882	C6159	3101052210010	220PF
883	C704	3101052210010	220PF
884	C883	3101052210010	220PF
885	C890	3101052210010	220PF
886	C895	3101052210010	220PF
887	C896	3101052210010	220PF
888	C897	3101052210010	220PF
889	C898	3101052210010	220PF
890	C921	3101052210010	220PF
891	L6216	3101052210010	220PF
892	L6217	3101052210010	220PF
893	C242	3101062210000	220PF
894	C245	3101062210000	220PF
895	C808	3101062210000	220PF
896	C809	3101062210000	220PF
897	C822	3101062210000	220PF
898	C845	3101062210000	220PF
899	C853	3101062210000	220PF
900	C877	3101062210000	220PF
901	C878	3101062210000	220PF
902	C887	3101062210000	220PF
903	C892	3101062210000	220PF
904	C99	3101052710000	270PF
905	C501	3101053310020	330PF
906	C911	3101053310020	330PF
907	C909	3101063310010	330PF
908	C1001	3101054710010	470PF
909	C1003	3101054710010	470PF
910	C1015	3101054710010	470PF
911	C142	3101054710010	470PF
912	C148	3101054710010	470PF
913	C21	3101054710010	470PF
914	C50	3101054710010	470PF
915	C6102	3101054710010	470PF
916	C6146	3101054710010	470PF
917	C6148	3101054710010	470PF
918	C6151	3101054710010	470PF
919	C706	3101054710010	470PF
920	C717	3101054710010	470PF
921	C727	3101054710010	470PF

No.	Ref. No.	Part No.	Description
922	C746	3101054710010	470PF
923	C8	3101054710010	470PF
924	C945	3101054710010	470PF
925	C811	3101064710000	470PF
926	C817	3101064710000	470PF
927	C850	3101084710010	470PF
928	C827	3101374710000	470PF
929	C893	3101374710000	470PF
930	C1	3101051020010	1000PF
931	C1002	3101051020010	1000PF
932	C1010	3101051020010	1000PF
933	C337	3101051020010	1000PF
934	C338	3101051020010	1000PF
935	C404	3101051020010	1000PF
936	C484	3101051020010	1000PF
937	C503	3101051020010	1000PF
938	C513	3101051020010	1000PF
939	C60	3101051020010	1000PF
940	C710	3101051020010	1000PF
941	C728	3101051020010	1000PF
942	C75	3101051020010	1000PF
943	C79	3101051020010	1000PF
944	C82	3101051020010	1000PF
945	C910	3101051020010	1000PF
946	C937	3101051020010	1000PF
947	C944	3101051020010	1000PF
948	C96	3101051020010	1000PF
949	C801	3101081020010	1000PF
950	C406	3101051220000	1200PF
951	C502	3101053320010	3300PF
952	C802	3101063320000	3300PF
953	C916	3101063320000	3300PF
954	C713	3101053920000	3900PF
955	C863	3101064720000	4700PF
956	C483	3101058220000	8200PF
957	C199	3101051030020	0.01UF
958	C235	3101051030020	0.01UF
959	C260	3101051030020	0.01UF
960	C261	3101051030020	0.01UF
961	C306	3101051030020	0.01UF
962	C381	3101051030020	0.01UF
963	C384	3101051030020	0.01UF
964	C399	3101051030020	0.01UF
965	C506	3101051030020	0.01UF

No.	Ref. No.	Part No.	Description
966	C507	3101051030020	0.01UF
967	C58	3101051030020	0.01UF
968	C6147	3101051030020	0.01UF
969	C6178	3101051030020	0.01UF
970	C702	3101051030020	0.01UF
971	C725	3101051030020	0.01UF
972	C736	3101051030020	0.01UF
973	C80	3101051030020	0.01UF
974	C95	3101051030020	0.01UF
975	C97	3101051030020	0.01UF
976	C952	3101061030010	0.01UF
977	C894	3101051830000	0.018UF
978	C930	3101061830000	0.018UF
979	C246	3101052230000	0.022UF
980	C880	3101063930000	0.039UF
981	C1016	3101065630000	0.056UF
982	C1006	3101051040010	0.1UF
983	C141	3101051040010	0.1UF
984	C149	3101051040010	0.1UF
985	C163	3101051040010	0.1UF
986	C167	3101051040010	0.1UF
987	C195	3101051040010	0.1UF
988	C232	3101051040010	0.1UF
989	C233	3101051040010	0.1UF
990	C236	3101051040010	0.1UF
991	C239	3101051040010	0.1UF
992	C24	3101051040010	0.1UF
993	C240	3101051040010	0.1UF
994	C243	3101051040010	0.1UF
995	C248	3101051040010	0.1UF
996	C258	3101051040010	0.1UF
997	C267	3101051040010	0.1UF
998	C274	3101051040010	0.1UF
999	C285	3101051040010	0.1UF
1000	C30	3101051040010	0.1UF
1001	C308	3101051040010	0.1UF
1002	C311	3101051040010	0.1UF
1003	C325	3101051040010	0.1UF
1004	C329	3101051040010	0.1UF
1005	C330	3101051040010	0.1UF
1006	C332	3101051040010	0.1UF
1007	C334	3101051040010	0.1UF
1008	C336	3101051040010	0.1UF
1009	C356	3101051040010	0.1UF

No.	Ref. No.	Part No.	Description
1010	C366	3101051040010	0.1UF
1011	C379	3101051040010	0.1UF
1012	C380	3101051040010	0.1UF
1013	C382	3101051040010	0.1UF
1014	C383	3101051040010	0.1UF
1015	C386	3101051040010	0.1UF
1016	C387	3101051040010	0.1UF
1017	C388	3101051040010	0.1UF
1018	C389	3101051040010	0.1UF
1019	C391	3101051040010	0.1UF
1020	C392	3101051040010	0.1UF
1021	C393	3101051040010	0.1UF
1022	C394	3101051040010	0.1UF
1023	C398	3101051040010	0.1UF
1024	C400	3101051040010	0.1UF
1025	C407	3101051040010	0.1UF
1026	C422	3101051040010	0.1UF
1027	C471	3101051040010	0.1UF
1028	C473	3101051040010	0.1UF
1029	C509	3101051040010	0.1UF
1030	C512	3101051040010	0.1UF
1031	C514	3101051040010	0.1UF
1032	C515	3101051040010	0.1UF
1033	C6104	3101051040010	0.1UF
1034	C6113	3101051040010	0.1UF
1035	C6168	3101051040010	0.1UF
1036	C6169	3101051040010	0.1UF
1037	C6171	3101051040010	0.1UF
1038	C6173	3101051040010	0.1UF
1039	C6175	3101051040010	0.1UF
1040	C6179	3101051040010	0.1UF
1041	C6180	3101051040010	0.1UF
1042	C7	3101051040010	0.1UF
1043	C705	3101051040010	0.1UF
1044	C707	3101051040010	0.1UF
1045	C708	3101051040010	0.1UF
1046	C712	3101051040010	0.1UF
1047	C720	3101051040010	0.1UF
1048	C729	3101051040010	0.1UF
1049	C733	3101051040010	0.1UF
1050	C735	3101051040010	0.1UF
1051	C737	3101051040010	0.1UF
1052	C740	3101051040010	0.1UF
1053	C741	3101051040010	0.1UF

No.	Ref. No.	Part No.	Description
1054	C744	3101051040010	0.1UF
1055	C756	3101051040010	0.1UF
1056	C83	3101051040010	0.1UF
1057	C85	3101051040010	0.1UF
1058	C86	3101051040010	0.1UF
1059	C87	3101051040010	0.1UF
1060	C89	3101051040010	0.1UF
1061	C947	3101051040010	0.1UF
1062	C950	3101051040010	0.1UF
1063	C955	3101051040010	0.1UF
1064	C958	3101051040010	0.1UF
1065	C967	3101051040010	0.1UF
1066	C968	3101051040010	0.1UF
1067	C969	3101051040010	0.1UF
1068	C978	3101051040010	0.1UF
1069	C98	3101051040010	0.1UF
1070	C122	3101061040010	0.1UF
1071	C123	3101061040010	0.1UF
1072	C283	3101061040010	0.1UF
1073	C289	3101061040010	0.1UF
1074	C6193	3101061040010	0.1UF
1075	C748	3101061040010	0.1UF
1076	C829	3101061040010	0.1UF
1077	C854	3101061040010	0.1UF
1078	C868	3101061040010	0.1UF
1079	C907	3101061040010	0.1UF
1080	C927	3101061040010	0.1UF
1081	C935	3101061040010	0.1UF
1082	C936	3101061040010	0.1UF
1083	C942	3101061040010	0.1UF
1084	C948	3101061040010	0.1UF
1085	C959	3101061040010	0.1UF
1086	C963	3101061040010	0.1UF
1087	L6122	3101061040010	0.1UF
1088	L6126	3101061040010	0.1UF
1089	C1005	3110071040000	0.1UF
1090	C1007	3110071040000	0.1UF
1091	C64	3110071040000	0.1UF
1092	C66	3110071040000	0.1UF
1093	C67	3110071040000	0.1UF
1094	C68	3110071040000	0.1UF
1095	C69	3110071040000	0.1UF
1096	C70	3110071040000	0.1UF
1097	C72	3110071040000	0.1UF

No.	Ref. No.	Part No.	Description
1098	C74	3110071040000	0.1UF
1099	C78	3110071040000	0.1UF
1100	C84	3110071040000	0.1UF
1101	C88	3110071040000	0.1UF
1102	C91	3110071040000	0.1UF
1103	C94	3110071040000	0.1UF
1104	C941	3101051540000	0.15UF
1105	C132	3101062240000	0.22UF
1106	C294	3101063340000	0.33UF
1107	C438	3101054740000	0.47UF
1108	C439	3101054740000	0.47UF
1109	C287	3101064740000	0.47UF
1110	C715	3101064740000	0.47UF
1111	C255	3101051050000	1UF
1112	C276	3101051050000	1UF
1113	C305	3101051050000	1UF
1114	C310	3101051050000	1UF
1115	C719	3101051050000	1UF
1116	C962	3101051050000	1UF
1117	C200	3101061050020	1UF
1118	C238	3101061050020	1UF
1119	C249	3101061050020	1UF
1120	C251	3101061050020	1UF
1121	C252	3101061050020	1UF
1122	C253	3101061050020	1UF
1123	C257	3101061050020	1UF
1124	C259	3101061050020	1UF
1125	C262	3101061050020	1UF
1126	C263	3101061050020	1UF
1127	C264	3101061050020	1UF
1128	C266	3101061050020	1UF
1129	C268	3101061050020	1UF
1130	C277	3101061050020	1UF
1131	C278	3101061050020	1UF
1132	C279	3101061050020	1UF
1133	C281	3101061050020	1UF
1134	C282	3101061050020	1UF
1135	C290	3101061050020	1UF
1136	C291	3101061050020	1UF
1137	C298	3101061050020	1UF
1138	C299	3101061050020	1UF
1139	C396	3101061050020	1UF
1140	C6100	3101061050020	1UF
1141	C6145	3101061050020	1UF

No.	Ref. No.	Part No.	Description
1142	C6149	3101061050020	1UF
1143	C6185	3101061050020	1UF
1144	C6190	3101061050020	1UF
1145	C742	3101061050020	1UF
1146	C754	3101061050020	1UF
1147	C900	3101061050020	1UF
1148	C901	3101061050020	1UF
1149	C905	3101061050020	1UF
1150	C906	3101061050020	1UF
1151	C908	3101061050020	1UF
1152	C923	3101061050020	1UF
1153	C924	3101061050020	1UF
1154	C925	3101061050020	1UF
1155	C946	3101061050020	1UF
1156	C966	3101061050020	1UF
1157	C71	3101071050020	1UF
1158	C750	3101071050020	1UF
1159	C920	3101062250000	2.2UF
1160	C932	3101062250000	2.2UF
1161	C934	3101062250000	2.2UF
1162	C965	3101062250000	2.2UF
1163	C912	3101072250030	2.2UF
1164	C292	3101064750030	4.7UF
1165	C136	3101074750010	4.7UF
1166	C405	3104074750070	4.7UF
1167	C275	3101071060010	10UF
1168	C293	3101071060010	10UF
1169	C401	3101071060010	10UF
1170	C402	3101071060010	10UF
1171	C508	3101071060010	10UF
1172	C511	3101071060010	10UF
1173	C519	3101071060010	10UF
1174	C520	3101071060010	10UF
1175	C917	3101071060010	10UF
1176	C926	3101071060010	10UF
1177	C929	3101071060010	10UF
1178	C234	3101081060010	10UF
1179	C286	3101081060010	10UF
1180	C331	3101081060010	10UF
1181	C333	3101081060010	10UF
1182	C807	3101081060010	10UF
1183	C928	3101081060010	10UF
1184	C956	3101081060010	10UF
1185	C957	3101081060010	10UF

No.	Ref. No.	Part No.	Description
1186	C980	3101081060010	10UF
1187	C981	3101081060010	10UF
1188	C951	3104081060120	10UF
1189	C919	3101072260000	22UF
1190	C915	3101082260020	22UF
1191	C804	3101092260010	22UF
1192	C933	3101092260010	22UF
1193	C284	3103994760180	47UF
1194	C914	3103994760180	47UF
1195	L105	3237199050000	5nH
1196	L114	3237199050000	5nH
1197	L814	3212106569000	5.6nH
1198	C6194	3212106689000	6.8nH
1199	L832	3212106689000	6.8nH
1200	L811	3217106829010	8.2nH
1201	L124	3237199080000	Air-core coil
1202	L137	3237199080000	Air-core coil
1203	L136	3212106120000	12nH
1204	L122	3210306150000	15nH
1205	L123	3210306150000	15nH
1206	L128	3210306150000	15nH
1207	L171	3210306150000	15nH
1208	L173	3210306150000	15nH
1209	L2	3210306150000	15nH
1210	L6103	3210306150000	15nH
1211	L6110	3210306150000	15nH
1212	L6116	3210306150000	15nH
1213	L6118	3210306150000	15nH
1214	L106	3214307180000	18nH
1215	L115	3214307180000	18nH
1216	L6117	3210306180000	18nH
1217	L6119	3210306180000	18nH
1218	C826	3210306220000	22nH
1219	L805	3210306220000	22nH
1220	L126	3214307270010	27nH
1221	L139	3214307270010	27nH
1222	L132	3210306270000	27nH
1223	L135	3210306270000	27nH
1224	L162	3210306270000	27nH
1225	L167	3210306270000	27nH
1226	L168	3210306270000	27nH
1227	L169	3210306270000	27nH
1228	L321	3212106390000	39nH
1229	L827	3212106390000	39nH

No.	Ref. No.	Part No.	Description
1230	L6120	3210306470000	47nH
1231	L6102	3210306221000	220nH
1232	L708	3217107221010	220nH
1233	L6125	3210406331000	330nH
1234	L716	3210406331000	330nH
1235	L147	3210406471000	470nH
1236	L151	3210406471000	470nH
1237	L718	3210406471000	470nH
1238	L103	3217607471000	470nH
1239	L107	3217607471000	470nH
1240	L108	3217607471000	470nH
1241	L110	3217607471000	470nH
1242	L112	3217607471000	470nH
1243	L116	3217607471000	470nH
1244	L117	3217607471000	470nH
1245	L118	3217607471000	470nH
1246	L121	3217607471000	470nH
1247	L127	3217607471000	470nH
1248	L129	3217607471000	470nH
1249	L133	3217607471000	470nH
1250	L134	3217607471000	470nH
1251	L140	3217607471000	470nH
1252	L4	3217607471000	470nH
1253	L5	3217607471000	470nH
1254	L154	3213306561000	560nH
1255	L713	3213306561000	560nH
1256	L6123	3213306821000	820nH
1257	L131	3221506601000	Bead
1258	L152	3221506601000	Bead
1259	L6	3221506601000	Bead
1260	L7	3221506601000	Bead
1261	L701	3221506601000	Bead
1262	L702	3221506601000	Bead
1263	L703	3221506601000	Bead
1264	L706	3221506601000	Bead
1265	L707	3221506601000	Bead
1266	L709	3221506601000	Bead
1267	L710	3221506601000	Bead
1268	L711	3221506601000	Bead
1269	L712	3221506601000	Bead
1270	L714	3221506601000	Bead
1271	L8	3221506601000	Bead
1272	L815	3221506601000	Bead
1273	L821	3221506601000	Bead

No.	Ref. No.	Part No.	Description
1274	L822	3221506601000	Bead
1275	L824	3221506601000	Bead
1276	L825	3221506601000	Bead
1277	L9	3221506601000	Bead
1278	R153	3221506601000	Bead
1279	R157	3221506601000	Bead
1280	R179	3221506601000	Bead
1281	R186	3221506601000	Bead
1282	L801	3221513600000	Bead
1283	L802	3221513600000	Bead
1284	L803	3221513600000	Bead
1285	L900	3221513600000	Bead
1286	L916	3221513600000	Bead
1287	L917	3221513600000	Bead
1288	L940	3221513600000	Bead
1289	L232	3221506300000	Bead
1290	L322	3221506300000	Bead
1291	L401	3221506300000	Bead
1292	L402	3221506300000	Bead
1293	L403	3221506300000	Bead
1294	L404	3221506300000	Bead
1295	L405	3221506300000	Bead
1296	L406	3221506300000	Bead
1297	L407	3221506300000	Bead
1298	L408	3221506300000	Bead
1299	L409	3221506300000	Bead
1300	L410	3221506300000	Bead
1301	L411	3221506300000	Bead
1302	L412	3221506300000	Bead
1303	L901	3221506300000	Bead
1304	L912	3221506300000	Bead
1305	L913	3221506300000	Bead
1306	L904	3221506181000	Bead
1307	L908	3221506181000	Bead
1308	L233	3211506101000	Bead
1309	L234	3211506101000	Bead
1310	L235	3211506101000	Bead
1311	L500	3211506101000	Bead
1312	L6100	3211506101000	Bead
1313	L6101	3211506101000	Bead
1314	L6114	3211506101000	Bead
1315	L6115	3211506101000	Bead
1316	L6121	3211506101000	Bead
1317	L816	3233099111000	111nH

No.	Ref. No.	Part No.	Description
1318	L804	3233099160000	16nH
1319	L809	3233099160000	16nH
1320	L810	3233099160000	16nH
1321	L813	3233099160000	16nH
1322	L817	3233099160000	16nH
1323	L807	3210306101000	100nH
1324	L820	3217112102020	1uH
1325	L828	3217112102020	1uH
1326	L1	3213212332000	3.3uH
1327	L156	3213212332000	3.3uH
1328	L715	3213212332000	3.3uH
1329	L717	3212206682000	6.8uH
1330	L903	3213099472000	4.7uH
1331	L931	3213099472000	4.7uH
1332	L902	3217299103000	10uH
1333	L930	3241799103000	10uH
1334	L704	3213212103000	10uH
1335	L705	3213212103000	10uH
1336	D100	3303990000060	Switching diode
1337	D129	3303990000060	Switching diode
1338	D701	3304060300050	Varactor
1339	D101	3304010100220	Varactor
1340	D102	3304010100220	Varactor
1341	D105	3304010100220	Varactor
1342	D106	3304010100220	Varactor
1343	D107	3304010100220	Varactor
1344	D108	3304010100220	Varactor
1345	D109	3304010100220	Varactor
1346	D110	3304010100220	Varactor
1347	D111	3304010100220	Varactor
1348	D112	3304010100220	Varactor
1349	D113	3304010100220	Varactor
1350	D116	3304010100220	Varactor
1351	D117	3304010100220	Varactor
1352	D121	3304010100220	Varactor
1353	D122	3304010100220	Varactor
1354	D125	3304010100220	Varactor
1355	D126	3304010100220	Varactor
1356	D127	3303030100010	Switching diode
1357	D128	3303030100010	Switching diode
1358	D230	3310240000000	Diode
1359	D231	3310240000000	Diode
1360	D233	3310240000000	Diode
1361	D240	3310240000000	Diode

No.	Ref. No.	Part No.	Description
1362	D402	3310240000000	Diode
1363	D403	3310240000000	Diode
1364	D404	3310240000000	Diode
1365	D405	3310240000000	Diode
1366	D406	3310240000000	Diode
1367	D234	3310240200000	Diode
1368	D236	3310240200000	Diode
1369	D239	3310240200000	Diode
1370	D235	3302031100010	Zener diode
1371	D241	3302031100010	Zener diode
1372	D409	3310240000040	Diode
1373	D237	3310990000090	Diode
1374	D238	3310990000090	Diode
1375	D407	3399040600010	Diode
1376	D408	3399040600010	Diode
1377	D450	3699037000010	USB IC
1378	D702	3304060300010	Varactor
1379	D801	3303210100000	Switching diode
1380	D802	3303210100000	Switching diode
1381	D803	3303030300000	Diode
1382	D804	3303030300000	Diode
1383	D901	3303040400000	Switching diode
1384	D902	3301100300030	Diode
1385	D6100	3303060300010	Switching diode
1386	D906	3303060300010	Switching diode
1387	D907	3303060300010	Switching diode
1388	D909	3303060300010	Switching diode
1389	D911	3303060300010	Switching diode
1390	D914	3303060300010	Switching diode
1391	D910	3302030500010	Zener diode
1392	D915	3303010500290	Switching diode
1393	D805	3302030500030	Zener diode
1394	D917	3302030500030	Zener diode
1395	D6101	3304010101100	Varactor
1396	D6102	3304010101100	Varactor
1397	D6103	3304010101100	Varactor
1398	D6104	3304010101100	Varactor
1399	D6105	3399990000260	Diode
1400	D6106	3699019000000	Mixer
1401	Q1	3503020000030	N-MOSFET
1402	Q100	3408002000080	NPN transistor
1403	Q103	3408002000080	NPN transistor
1404	Q106	3408002000080	NPN transistor
1405	Q110	3408002000080	NPN transistor

No.	Ref. No.	Part No.	Description
1406	Q101	3403999000000	Transistor
1407	Q105	3403999000000	Transistor
1408	Q108	3403999000000	Transistor
1409	Q112	3403999000000	Transistor
1410	Q116	3403999000000	Transistor
1411	Q117	3403999000000	Transistor
1412	Q102	3401002000990	NPN transistor
1413	Q111	3401002000990	NPN transistor
1414	Q104	3403003000060	NPN transistor
1415	Q702	3403003000060	NPN transistor
1416	Q107	3404006000000	NPN transistor
1417	Q109	3404006000000	NPN transistor
1418	Q6104	3404006000000	NPN transistor
1419	Q6105	3404006000000	NPN transistor
1420	Q230	3499000000150	Transistor
1421	Q231	3499000000150	Transistor
1422	Q232	3499000000150	Transistor
1423	Q233	3499000000150	Transistor
1424	Q234	3499000000150	Transistor
1425	Q235	3499000000150	Transistor
1426	Q6100	3499000000150	Transistor
1427	Q905	3499000000150	Transistor
1428	Q323	3403008000010	Transistor
1429	Q401	3403008000010	Transistor
1430	Q402	3403008000010	Transistor
1431	Q403	3403008000010	Transistor
1432	Q404	3403008000010	Transistor
1433	Q405	3403008000010	Transistor
1434	Q413	3403008000010	Transistor
1435	Q811	3403008000010	Transistor
1436	Q812	3403008000010	Transistor
1437	Q813	3403008000010	Transistor
1438	Q903	3403008000010	Transistor
1439	Q908	3403008000010	Transistor
1440	Q912	3403008000010	Transistor
1441	Q913	3403008000010	Transistor
1442	Q914	3403008000010	Transistor
1443	Q922	3403008000010	Transistor
1444	Q923	3403008000010	Transistor
1445	Q406	3414999000000	Transistor
1446	Q407	3414999000000	Transistor
1447	Q408	3414999000000	Transistor
1448	Q409	3414999000000	Transistor
1449	Q410	3414999000000	Transistor

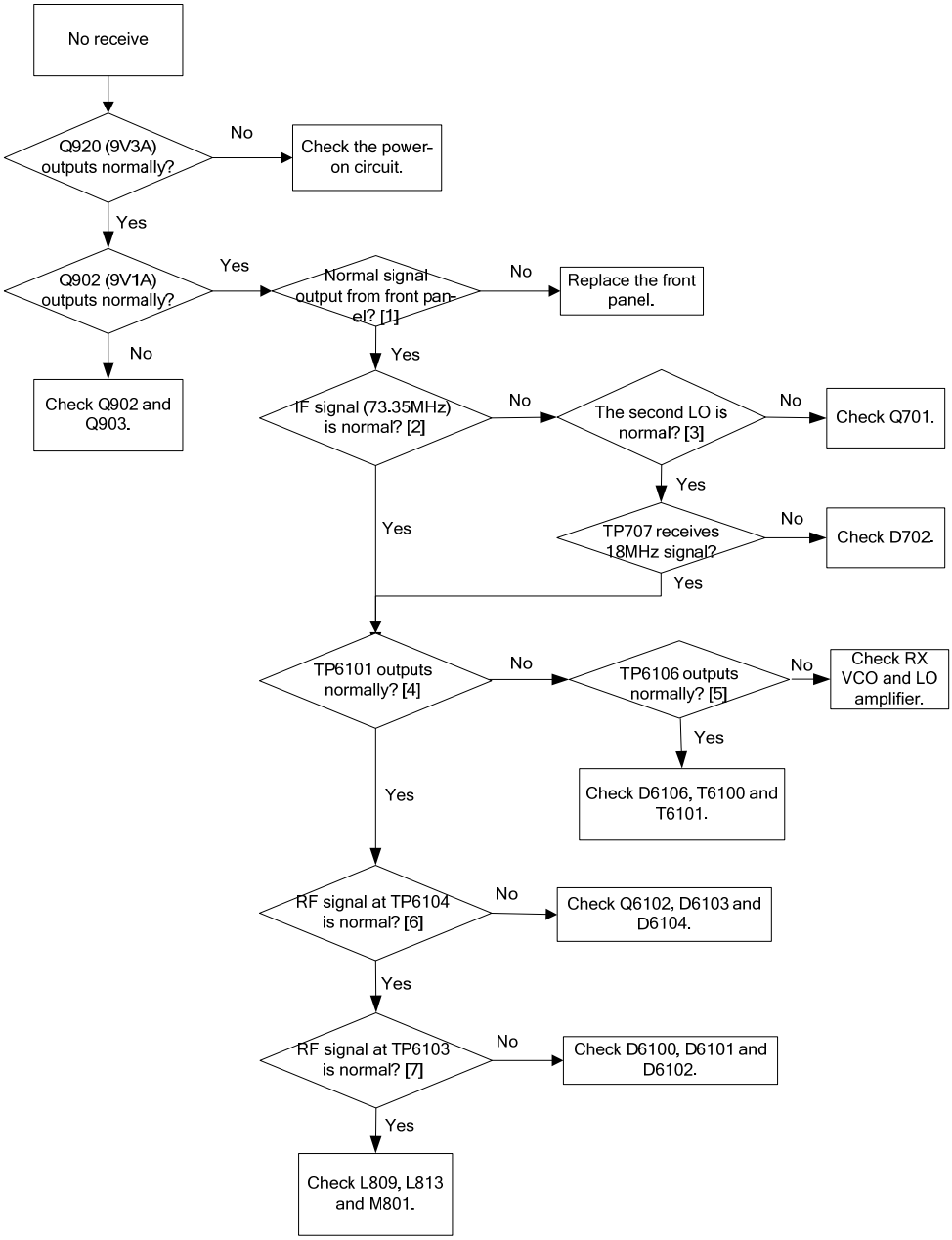
No.	Ref. No.	Part No.	Description
1450	Q411	3414999000000	Transistor
1451	Q412	3414999000000	Transistor
1452	Q701	3408002000000	NPN transistor
1453	Q6102	3404999000000	NPN transistor
1454	Q6103	3404999000000	NPN transistor
1455	Q801	3404999000000	NPN transistor
1456	Q804	3504990000040	RD07MU
1457	Q805	3504990000010	RD01MU
1458	Q810	3403002000000	PNP transistor
1459	Q902	3403002000000	PNP transistor
1460	Q906	3414001000020	NPN transistor
1461	Q910	3414001000020	NPN transistor
1462	Q909	3403002000010	PNPtransistor
1463	Q6101	3403014000020	Transistor
1464	T6100	3244599189000	4BLH
1465	T6101	3244599189000	4BLH
1466	U100	3604019000000	SKY2310
1467	U101	3616059000000	FS66P5X
1468	U102	3616059000000	FS66P5X
1469	U201	3602017006350	TDA7297D
1470	U231	3613010000000	TLV320A
1471	U233	3612002000020	NOR-FLASH+PSRAM
1472	U235	3605010000020	LM2902
1473	U236	3605010000020	LM2902
1474	U237	3616010000000	TS5A3159DCKR
1475	U238	3605008005070	NJM2904
1476	U804	3605008005070	NJM2904
1477	U914	3605008005070	NJM2904
1478	U302	3610010000010	OMAP5912Z
1479	U401	3699053000000	SmartSwich
1480	U500	3606010000010	TLV5614IPWR
1481	U701	3603999000000	AD9864
1482	U702	3608006000000	Power management IC
1483	U900	3608006000000	Power management IC
1484	U901	3608006000000	Power management IC
1485	U909	3608006000000	Power management IC
1486	U703	3608015000060	Power management IC
1487	U905	3608015000060	Power management IC
1488	U915	3608015000060	Power management IC
1489	U902	3608053000010	Power management IC
1490	U903	3608015000170	Power management IC
1491	U918	3608015000210	Power management IC
1492	U919	3608010006230	Power management IC
1493	U802	3605002054590	OPAMP

No.	Ref. No.	Part No.	Description
1494	U6000	3605002057090	OPAMP
1495	U910	3609010000170	Reset IC
1496	U917	3609006003050	Reset IC
1497	X100	3701019250030	19.2MHZ TCXO
1498	X302	3701019250040	19.2MHZ TCXO
1499	X375	3701327610060	CRYSTAL 32.768KHz
1500	Z6100	3802733540030	D73312GQ22
1501	PCB	41MD7801000F0	PCB
1502		6202010000000	APC shielding mask
1503		6201928000000	VCO shielding mask
1504	F900	4099000000050	Fuse
1505	J404	5206040200010	FFC
1506	L819	3233099470000	47nH
1507	C726	3101074750000	4.7UF
1508	C752	3101074750000	4.7UF
1509	C755	3101074750000	4.7UF
1510	C718	3101051050160	1uF
1511	C237	3101054740020	0.47uF
1512	Q400	3413001000010	NPN transistor
1513	D900	3302060000000	Zener diode
1514	Q921	3404999000020	NPN transistor
1515	U232	3612044000010	MT48H8M16LFB4
1516	U328	3607082000040	MC4HC595ADTG
1517	D912	3311240100000	MBRM120LT1G
1518	D913	3311240100000	MBRM120LT1G
1519	U906	3609010000210	Reset IC
1520	U327	3607023000150	74AHCT594PW
1521	R122	3001056800010	68Ω
1522	C881	3001065120000	5.1k
1523	C6109	3101050300000	3PF
1524	C6133	3101050300000	3PF
1525	C5	3101052000020	20PF
1526	C504	3101056810010	680PF
1527	C810	3101073000000	30PF
1528	C840	3101073000000	30PF
1529	C816	3101371590000	1.5pF
1530	U801	3605025000020	AD8566ARMZ
1531	C6116	3199050758000	0.75PF
1532	U326	3625999000030	GPS
1533	C6119	3101050590020	0.5PF
1534	C6122	3101050590020	0.5PF
1535	C6110	3101051290040	1.2PF
1536	C6120	3101051890050	1.8PF
1537	C6121	3101051890050	1.8PF

No.	Ref. No.	Part No.	Description
1538	C6126	3101051890050	1.8PF
1539	C6127	3101051890050	1.8PF

13.8 Troubleshooting Flow Chart

Receiver Circuit



Description of Normal Situations:

[1] During sensitivity test, use a communication test set to demodulate the audio signal (TP4012 and TP4016). If the signal is demodulated normally, it is concluded that the front panel is defective.

[2] Use the communication test set to input a 73.35MHz IF signal at the mixer, and see whether it can be processed normally afterwards.

[3] Use a spectrum analyzer to check whether TP704 can output the second LO signal (71.1MHz).

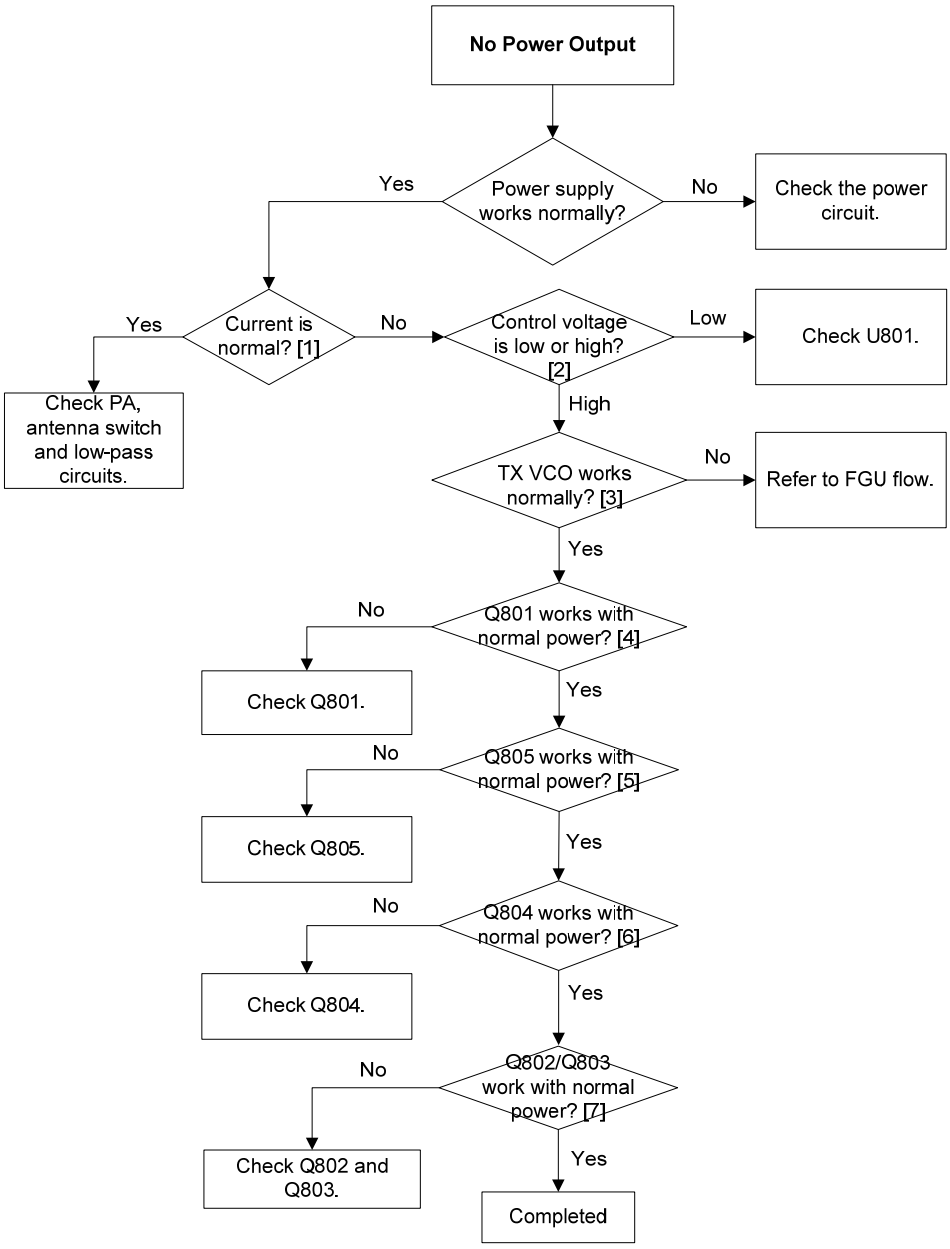
[4] Use the communication test set to apply an RF signal of -100dBm, and test the sensitivity.

[5] Use a spectrum analyzer to test the LO signal received by TP6106. If its strength is about 18dBm, go to check the mixer; otherwise, check the VCO.

[6] Use the communication test set to apply an RF signal of -110dBm at TP6104, and test the sensitivity.

[7] Use the communication test set to apply an RF signal of -110dBm at TP6103, and test the sensitivity.

Transmitter Circuit



Description of Normal Situations:

[1] The current in analog mode is above 6A under 45W power supply and above 1A under 5W. However, in digital mode, the current will be reduced by 50%.

[2] The APC voltage should be above 2V at TP811.

[3] Check whether there is an appropriate TX LO signal at TP803.

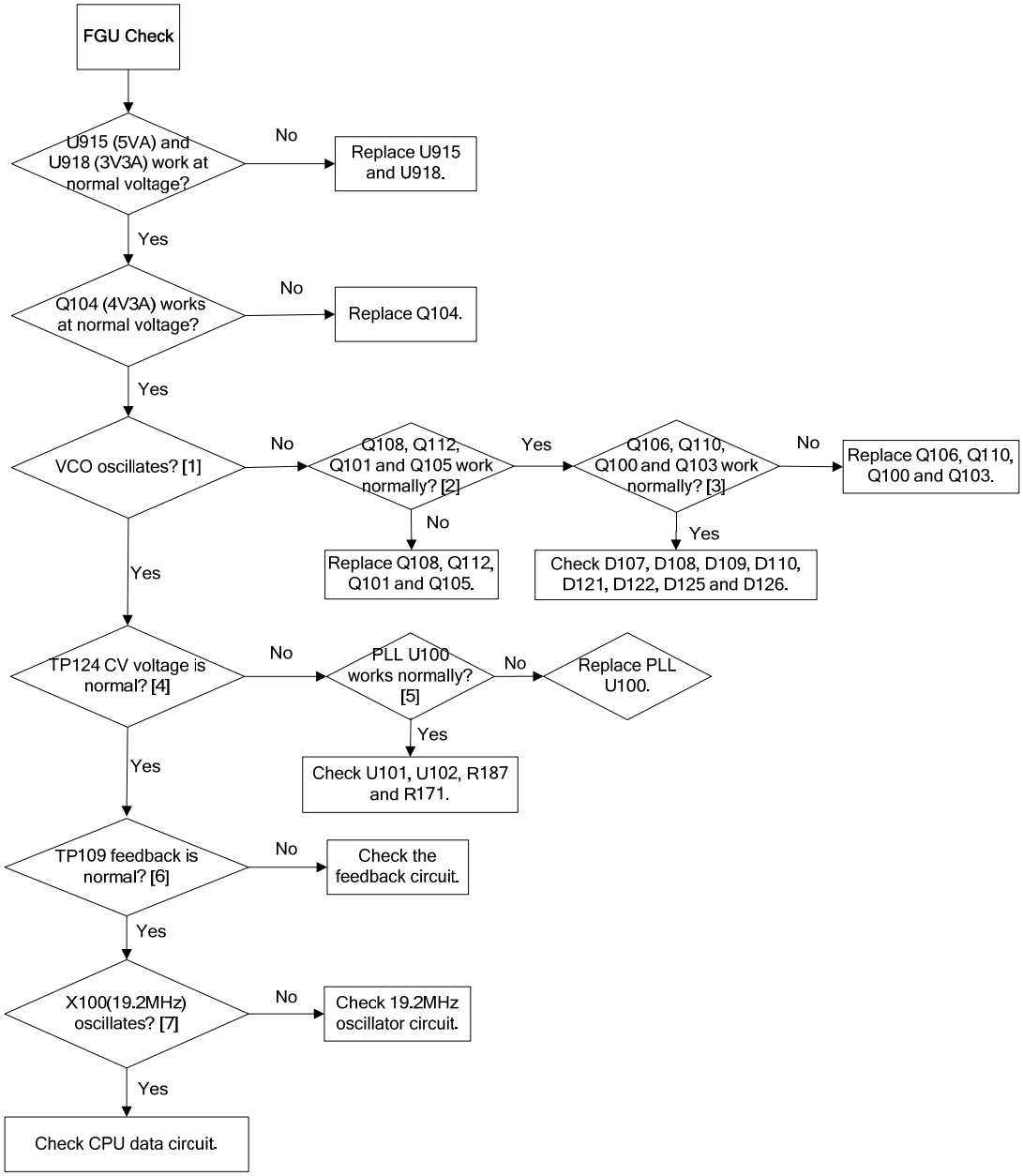
[4] Check whether the gain is 16dB and the input signal is 0dBm at Q801.

[5] Check whether the gain is 15dB and the input signal is 0dBm at Q805.

[6] Check whether the gain is 11dB and the input signal is 0dBm at Q804.

[7] Check whether the gain is 10dB and the input signal is 0dBm at Q802 and Q803.

FGU


FGU Check
U915 (5VA) and U918 (3V3A) work at normal voltage?
No
Replace U915 and U918.
Yes
Q104 (4V3A) works at normal voltage?
No
Replace Q104.
Yes
VCO oscillates? [1]
No
Q108, Q112, Q101 and Q105 work normally? [2]
Yes
Q106, Q110, Q100 and Q103 work normally? [3]
No
Replace Q106, Q110, Q100 and Q103.
No
Replace Q108, Q112, Q101 and Q105.
Yes
Check D107, D108, D109, D110, D121, D122, D125 and D126.
Yes
TP124 CV voltage is normal? [4]
No
PLL U100 works normally? [5]
No
Replace PLL U100.
Yes
Check U101, U102, R187 and R171.
Yes
TP109 feedback is normal? [6]
No
Check the feedback circuit.
Yes
X100(19.2MHz) oscillates? [7]
No
Check 19.2MHz oscillator circuit.
Yes
Check CPU data circuit.

Description of Normal Situations:

[1] Detect the oscillation frequency of RX TP123 and TX TP111 using a spectrum analyzer.

[2] Check whether switches (Q108, Q112, Q101 and Q105) are turned on and output 3.6V.

[3] Check whether the emitter voltage of the four transistors (Q106, Q110, Q100 and Q103) is about 1.8V under normal RX/TX status.

[4] Check the CV of TP124. The normal value should range from 0.5V to 4.5V.

[5] Check whether U100 is supplied by 5V and 3.3V normally.

[6] Check whether the power from TP109 to PLL is about -15dBm.

[7] Check whether TP100 outputs 19.2MHz signal.

14.UHF2 (450-520MHz 45W) Information

14.1 Transmitter Circuit

The transmitter circuit is composed of power amplifier circuit and power control circuit. The former is used to amplify the VCO signal to the desired output power level, while the latter can keep the output power at the desired level, so as to protect the power amplifier from damage caused by over heat, antenna mismatch, and out-of-range voltage (over voltage or under voltage may result in damage to Q801, Q805, Q804, Q802 and Q803).

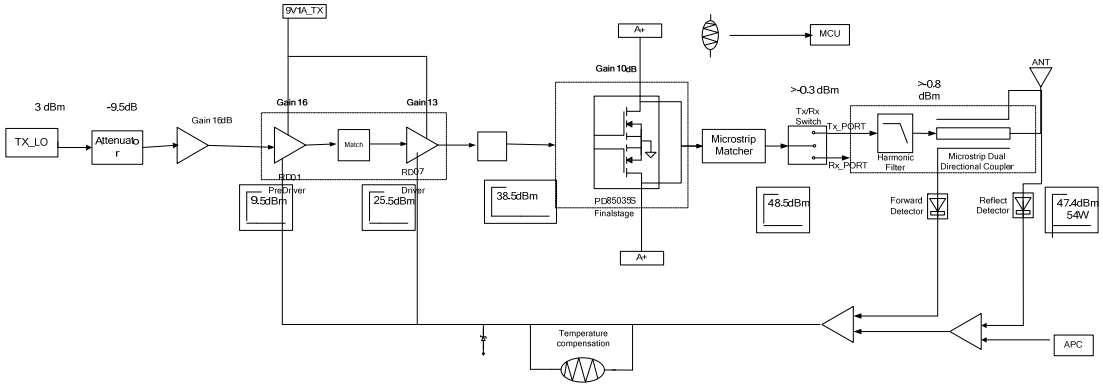


Figure 14-1 Diagram of Transmitter Circuit

14.1.1 Power Amplifier

The 4-stage power amplifier amplifies the signal output from VCO to the required output power level. The first stage is a buffer amplifier circuit with fixed gain; the second stage is a pre-driver power amplifier circuit with variable gain (formed by Q805); the third stage is a driver power amplifier circuit with variable gain (formed by Q804); and the final stage is the final power amplifier circuit with fixed gain (formed by Q802 and Q803). In addition, this power amplifier contains a TX/RX switch and a low-pass filter.

14.1.2 TX Buffer Amplifier

The first stage (Q801) provides about 16dB power gain, and adjusts its bias circuit to get a quiescent bias current of 28mA (for Q801). Power supply for the switching transistor Q810 is controlled by TX signal (enabled by antenna switch) so as to further control the power supply for the whole circuit.

14.1.3 Pre-driver Power Amplifier

The pre-driver power amplifier is formed by Q805, with variable gain controlled by voltage VGG. The input matching circuit is composed of C826, L826, L814, C843 and R824.

4.1.4 Driver Power Amplifier

The driver power amplifier is formed by Q804, with variable gain controlled by voltage VGG. The

maximum output power is 38.5dBm, and the maximum variable gain is 11dB.

14.1.5 Final Power Amplifier

The final power amplifier comprises Q802 and Q803, with the maximum output power of 48.5dBm, and the maximum variable gain of 10dB. The input matching circuit is composed of C815, C839, R804, R806, R807, R813, R818 and R861, while the power combining circuit is composed of C820, C8330, C831, C819, C812, C841 and C842.

14.1.6 Antenna Switch

The antenna switch is used to switch between the transmitter circuit and the receiver circuit.

In TX mode, the switching transistor Q810 is controlled by TX signal, so as to supply 9V 3A to the PIN diodes D801 and D802. Quiescent bias current of the PIN diode is controlled by the resistors R821 and R825. In this mode, D801 and D802 are turned on; RF signals are applied to the low-pass filter (composed of C871, C816, C836, C837, C838, L809, L813, and L810) and then transmitted via the antenna port.

In RX mode, TX signal controls the switching transistor Q810, to further control the power supply for the PIN diodes D801 and D802, which are not applied with DC bias current. When the two PIN diodes are turned off, signals feed into the RX path through the low-pass filter (composed of L871, C852 and C862).

14.1.7 Low-pass Filter

A low-pass filter that consists of inductors L809, L813 and L810, and capacitors C836, C837, C830, is used to attenuate harmonic energy from the transmitter.

14.1.8 Directional Coupler

A directional coupler that consists of microstrip directional coupler, D803, D804 and etc, is used to detect both forward and reverse directed power of the transmitter. The forward power is coupled to the diode D803, and the voltage is applied to the power control circuit (U801). Then the voltage VGG is output to control the gate voltage of pre-driver and driver PA, ensuring a constant power output.

The directional coupler can adjust the TX power and detect the VSWR load. The reverse power is coupled to D804. The voltage is applied to U802 and then feeds into U302 for detection

14.1.9 Output Power Control

The TX power is controlled by U801. The forward power is applied to the directional coupler, to output a voltage that can represent the forward power. The voltage together with the preset voltage feeds to U801 to output a voltage VGG, which can control both gate voltage and gain of Q804 and Q805, ensuring a

constant power output.

14.1.10 Thermal and Over-voltage Protections

The circuit consists of thermistor RT804 and resistor R884. The output voltage is proportional to the detected temperature. Both the voltage used for temperature detection and the threshold voltage are fed into the operational amplifier U803, to output a voltage signal that is in proportion to the detected temperature. Afterwards, the voltage is applied to software for judgment, and then the preset voltage will be subsequently changed to reduce the TX power, and to protect the PA from over-heating.

14.1.11 Pressure Pad Switch

The power control circuit includes a pressure pad switch SW1, which is controlled by the conductive rubber part mounted on the top cover. If the switch is turned off, VGG will become low, and no power will be output from PA. Otherwise, PA will work normally.

14.2 Receiver Circuit

The receiver utilizes double conversion superheterodyne technique. The first IF is 73.35MHz and the second IF is 2.25MHz. The first local oscillator signal is from the PLL circuit U100, and the second local oscillator signal (71.1MHz) from the PLL circuit U701. The major units are BPF, LNA, mixer, IF filter, IF amplifier and IF processor.

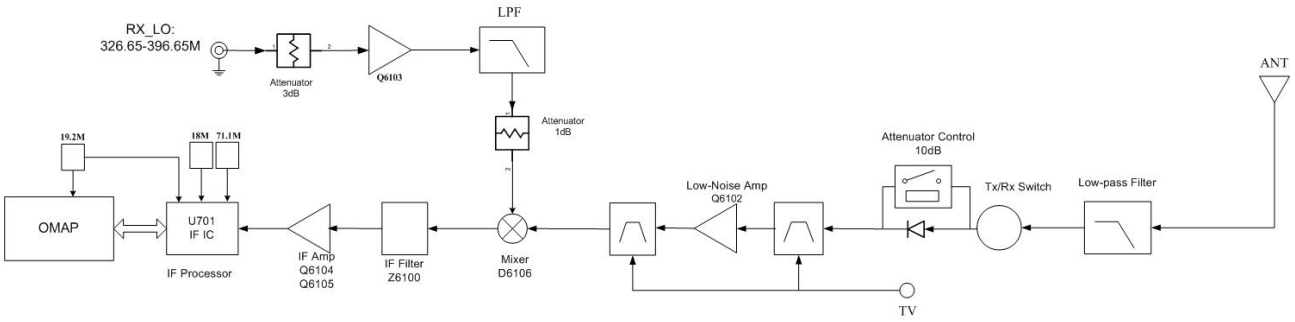


Figure 14-2 Diagram of Receiver Circuit

14.2.1 Receiver Front-end

RF signals feed to the low-pass filter to remove out-of-band signals, and are applied to the two-stage electrically tunable band-pass filter to get useful signals. After passing through the RF band-pass filter and LNA (Q6102), the RF signals together with the first LO signal feed to the mixer for the first frequency conversion, to generate the first IF signal (73.35MHz). The mixer that employs the passive diode can ensure good dynamic range and port isolation. The LO signal (3-5dBm) from the VCO feeds to Q6103 to get a gain (17dB). The first LO signals (73.35MHz) pass through the crystal filter (Z6100) to remove out-of-band spurious signals, and then feed to the two-stage IF amplifier circuit (composed of Q6133 and

Q6134) for amplification. Finally the amplified signals go to the IF IC for processing

14.2.2 Receiver Back-end

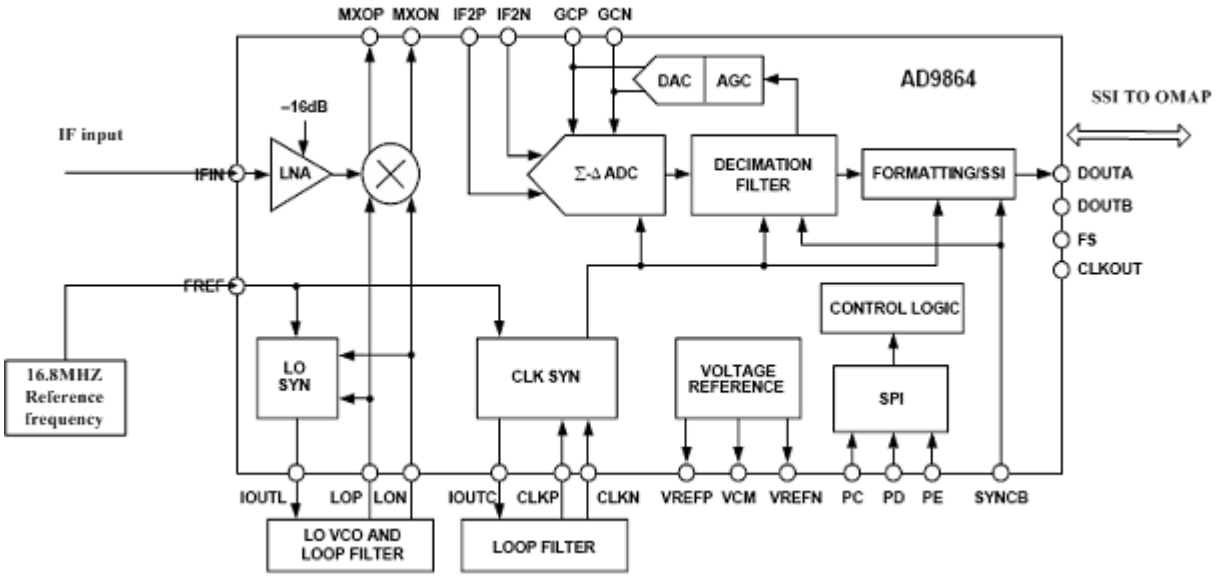


Figure 14-3 Diagram of IF Processor

The first IF signal (73.35MHz) output by the IF amplifier goes into IF IC via Pin 47, where the signal is converted to the second IF signal (2.25MHz). Then the un-demodulated digital I/Q signal output from the SSI interface is sent to U302 for demodulation. IF IC employs a reference frequency of 19.2MHz and shares the crystal with U302. The second LO VCO consists of the external transistor, varactor and some other components, to provide the second LO signal. The 18MHz clock frequency is generated by the LC resonance loop (D702, L715 and C745).

DSP (U302) gets the audio signal from IF IC (U701). Then this signal goes through U302 to output data signal, which is sent to U231 and PIN44 (SSI_DI) for digital-to-analog conversion. Finally, the output analog audio signal will be subjected to gain control, and then fed to the speaker.

14.3 Frequency Generation Unit (FGU)

14.3.1 PLL Synthesizer

The PLL synthesizer that consists of the reference oscillator (X100), PLL IC (U100) and VCO, is utilized to supply excitation signal source to the transmitter, and local oscillator signal to the receiver.

14.3.2 Reference Oscillator

X100 is a 19.2MHz TCXO, and its reference frequency is calibrated by the digital-to-analog converter (U500) for accuracy.

14.3.3 PLL IC

The PLL IC (U100) is a fractional frequency divider. The logic IC U101 and U102 work with the PLL IC (U100) to achieve locking.

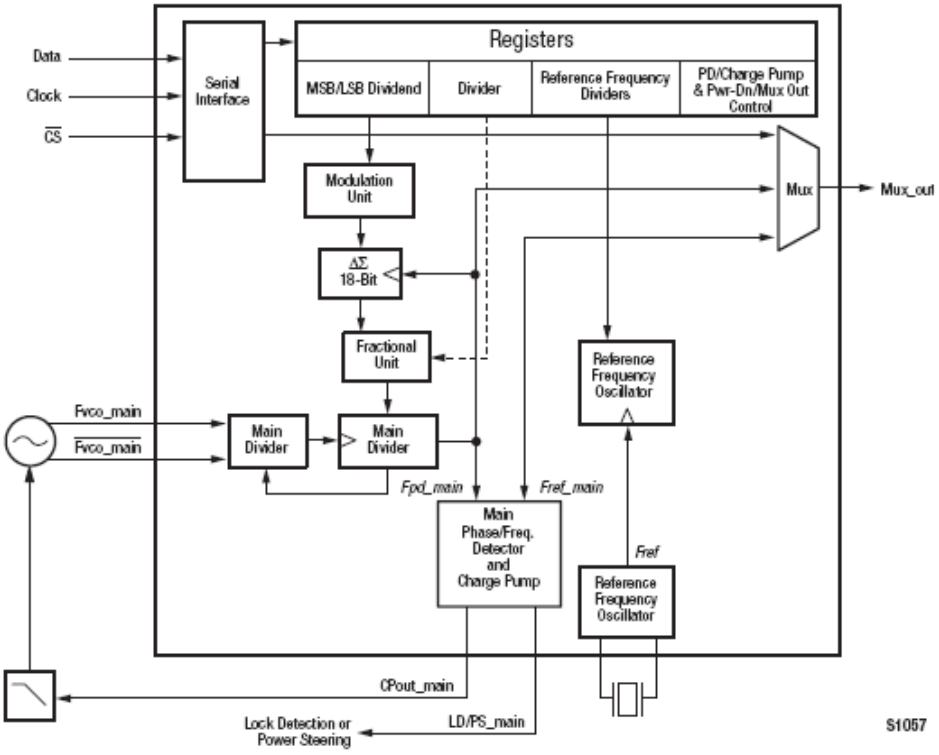


Figure 14-4 Diagram of PLL IC

The 19.2MHz frequency generated by the reference oscillator goes into the PLL IC for division, generating the reference frequency. Meanwhile, the frequency generated by VCO goes into PLL IC (U100) for frequency division. The resulting frequency will be compared with the reference frequency in terms of phase difference in the phase detector. After comparison, the resulting frequency is converted to CV voltage via the loop filter, to control and lock the frequency.

14.3.4 VCO

The VCO is composed of transistors (Q100, Q103, Q106 and Q110), varactors and four Colpitts oscillators. There are four VCOs in all: two VCOs (Q100 and Q103) used to transmit excitation signals and the other two VCOs (Q106 and Q110) to receive LO signals. U302 controls the operating frequency of the VCO. Q102 and Q107 constitute the buffer amplifiers for the transmitter circuit, while Q111 and Q109 for the receiver circuit. The digital-to-analog converter (U500) modulates the TX oscillator signal.

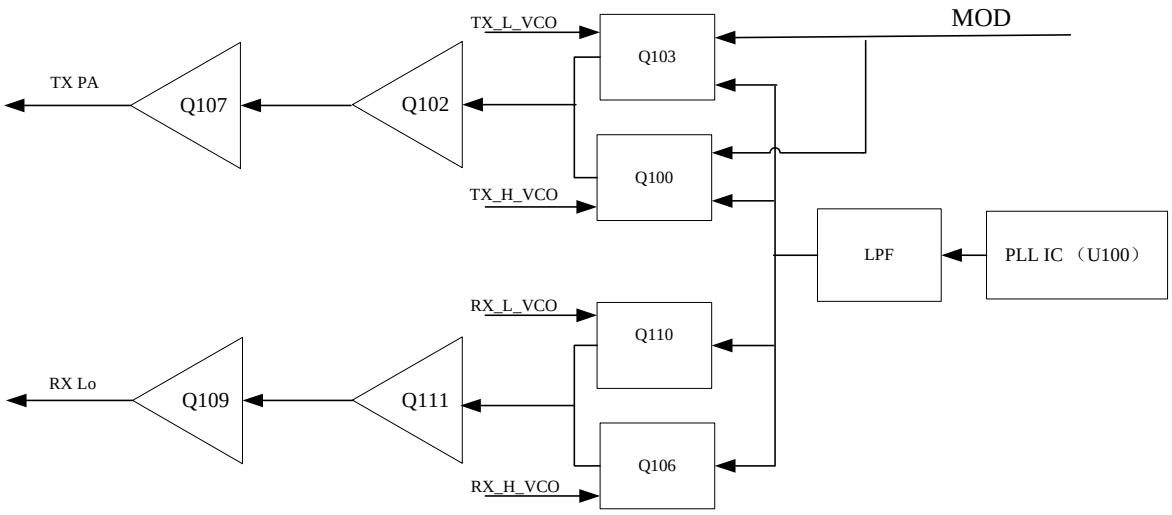
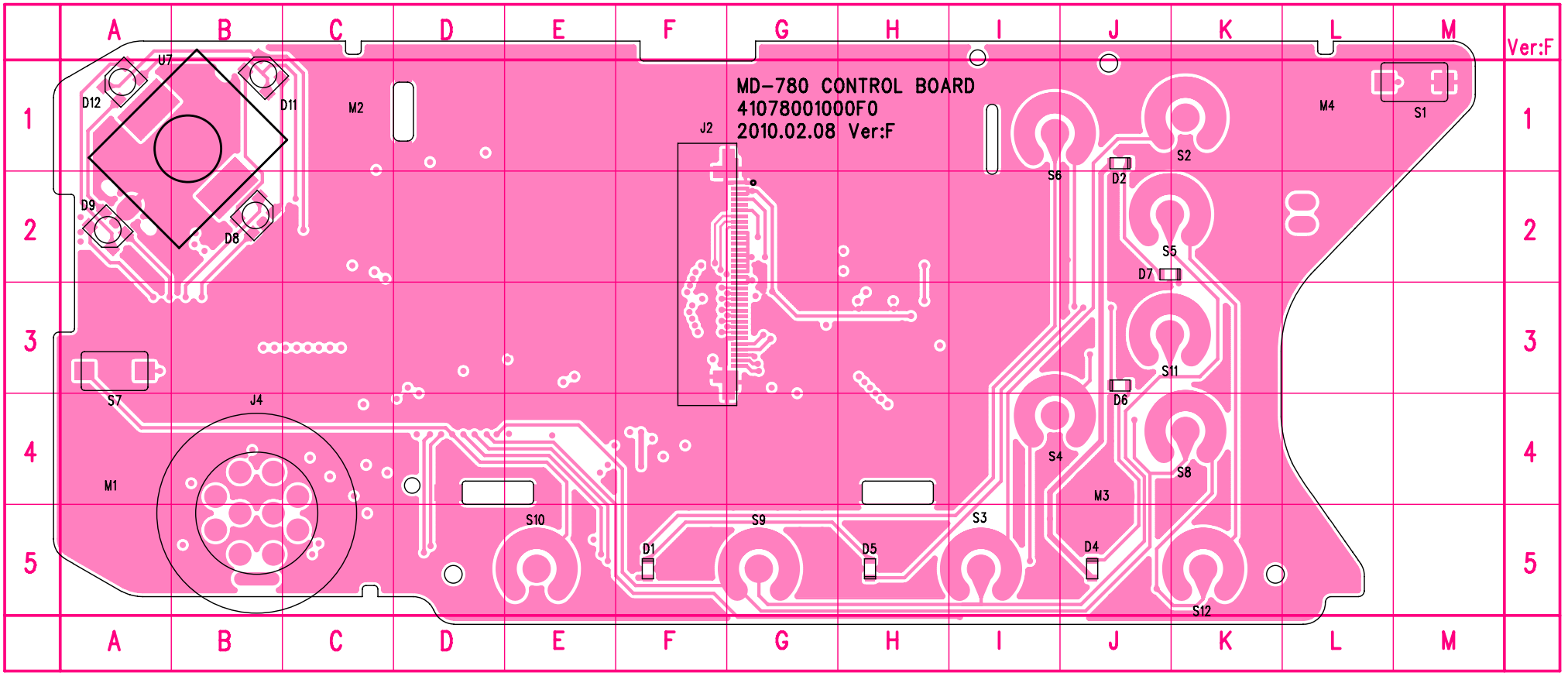


Figure 14-5 Diagram of VCO

14.4 PCB View

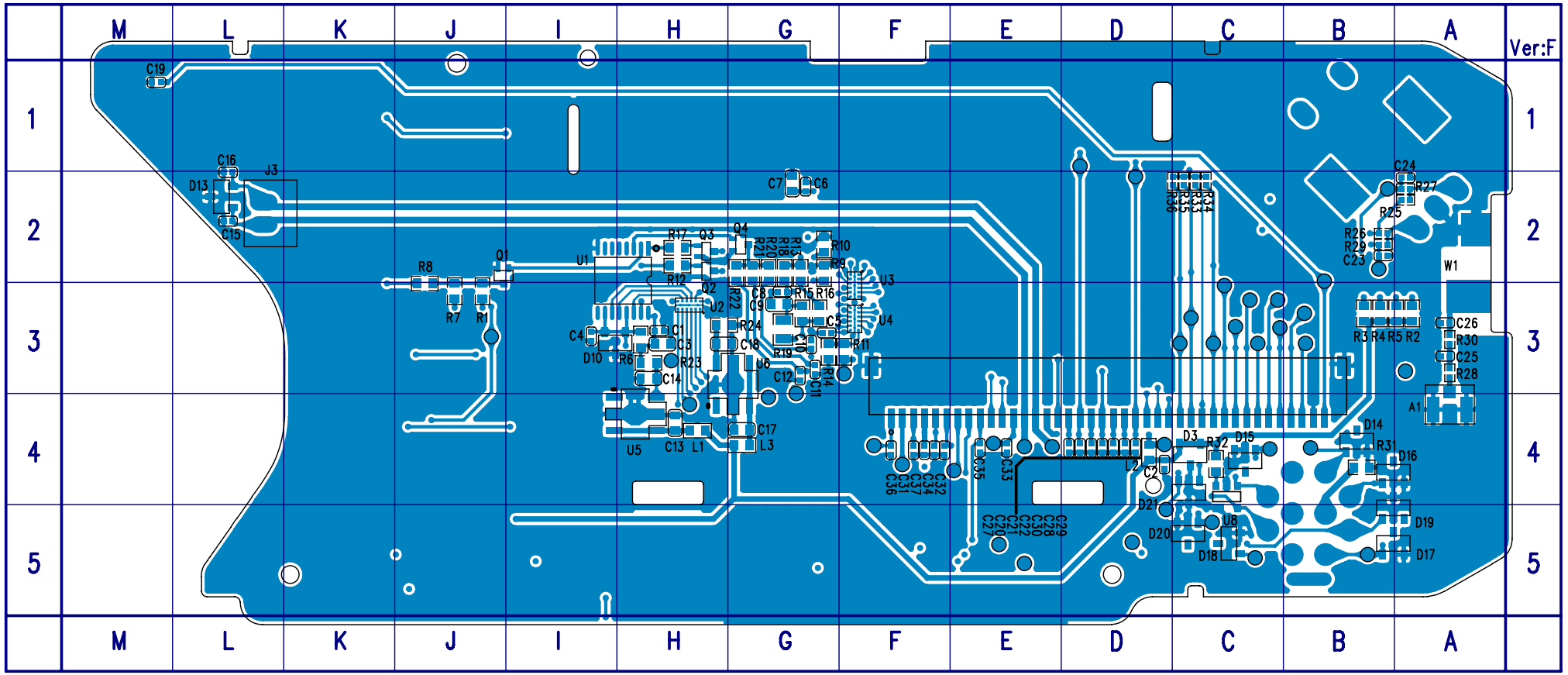
MD78X/MD78XG PCB View (Front Panel)

Top Layer

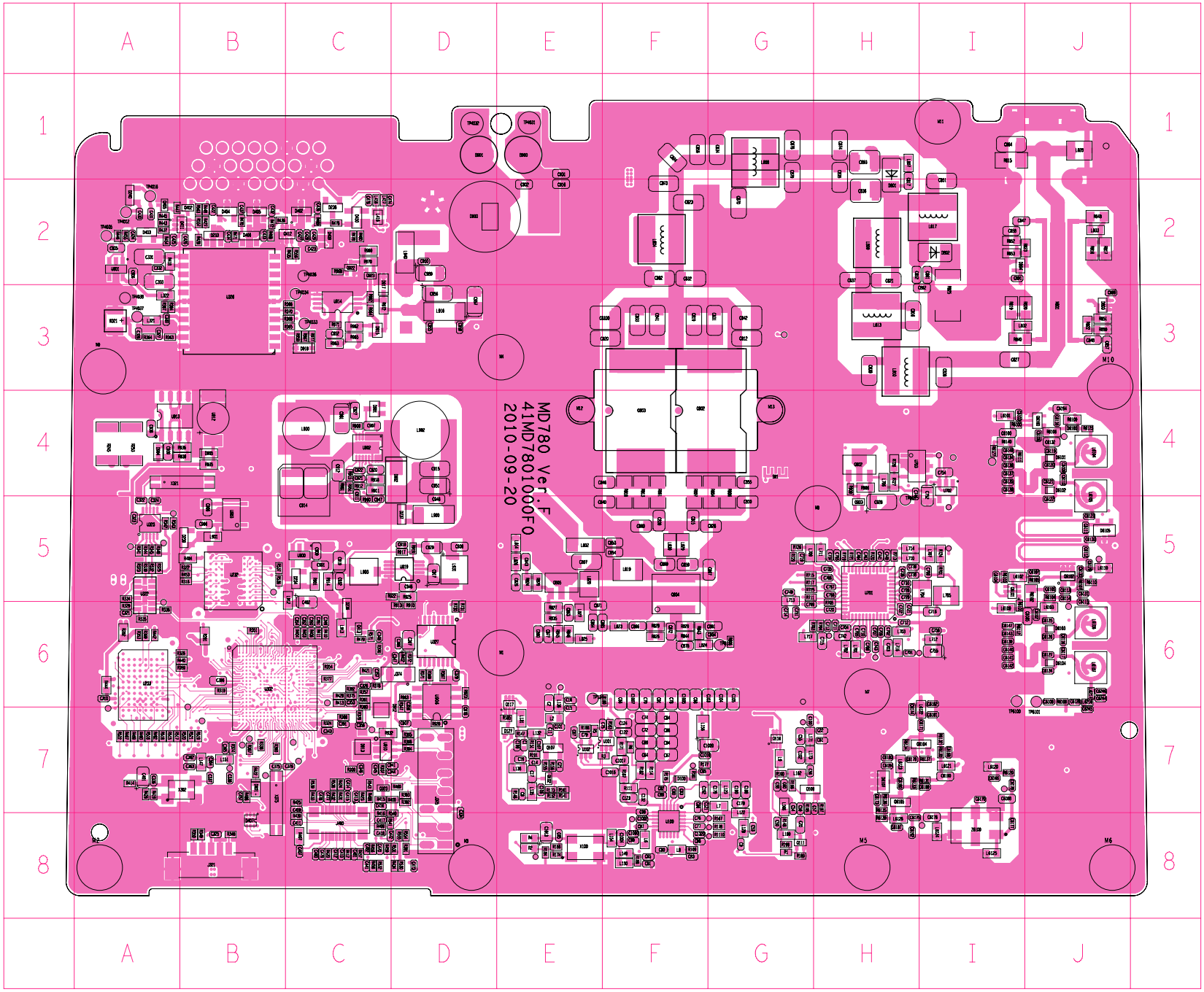


MD78X/MD78XG PCB View (Front Panel)

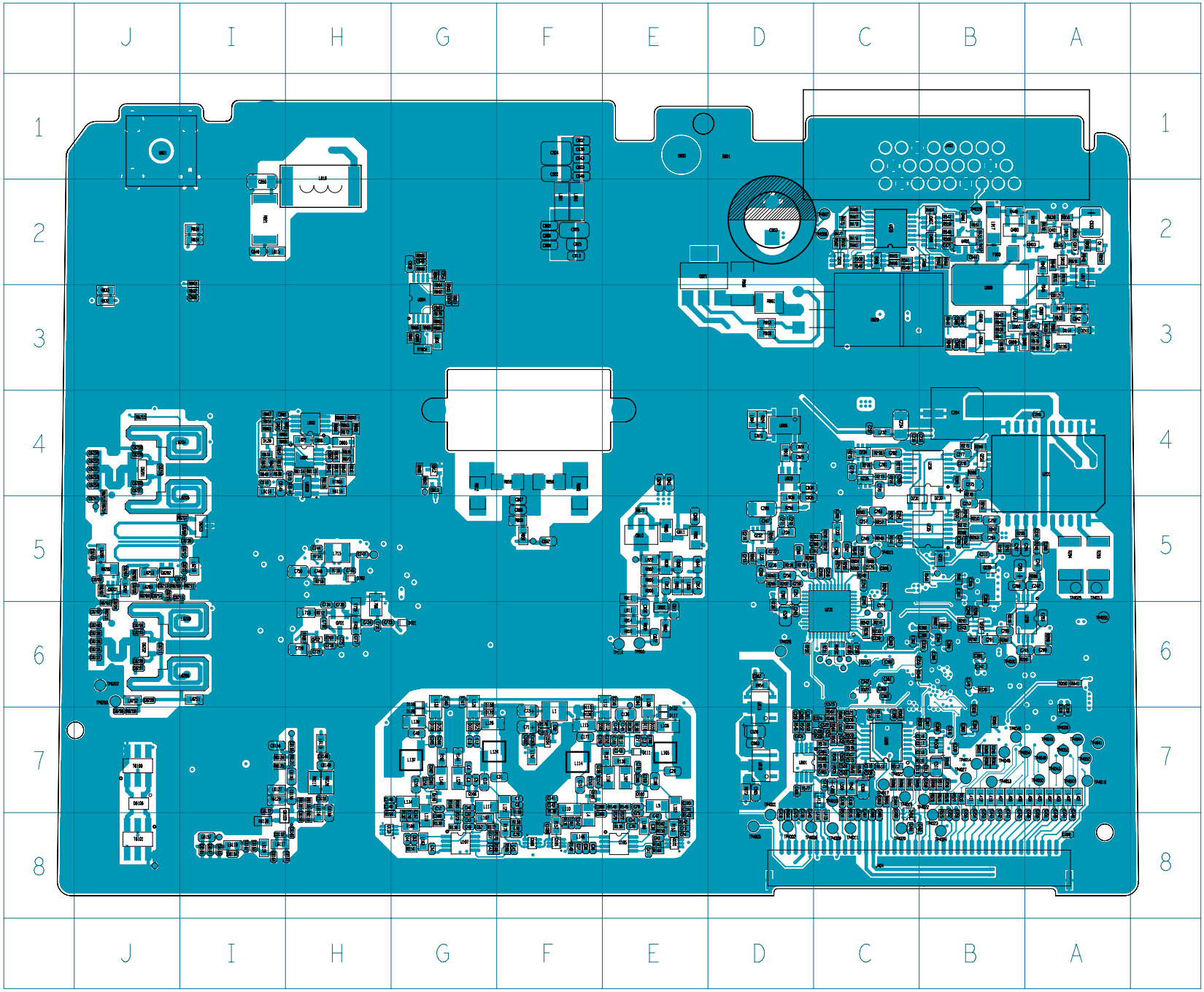
Bottom Layer



MD78X/MD78XG PCB View (Main Board)
Top Layer

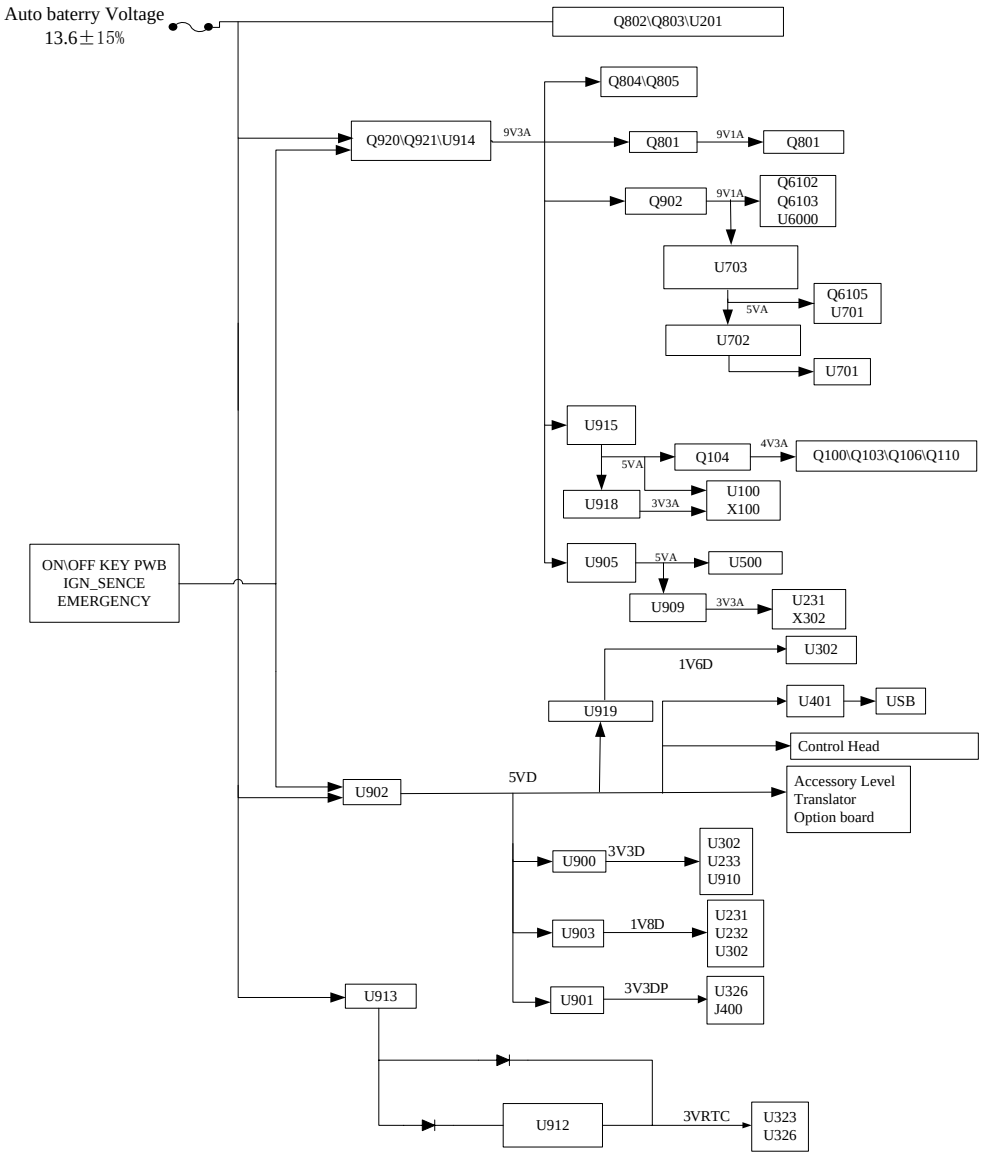


MD78X/MD78XG PCB View (Main Board)
Bottom Layer

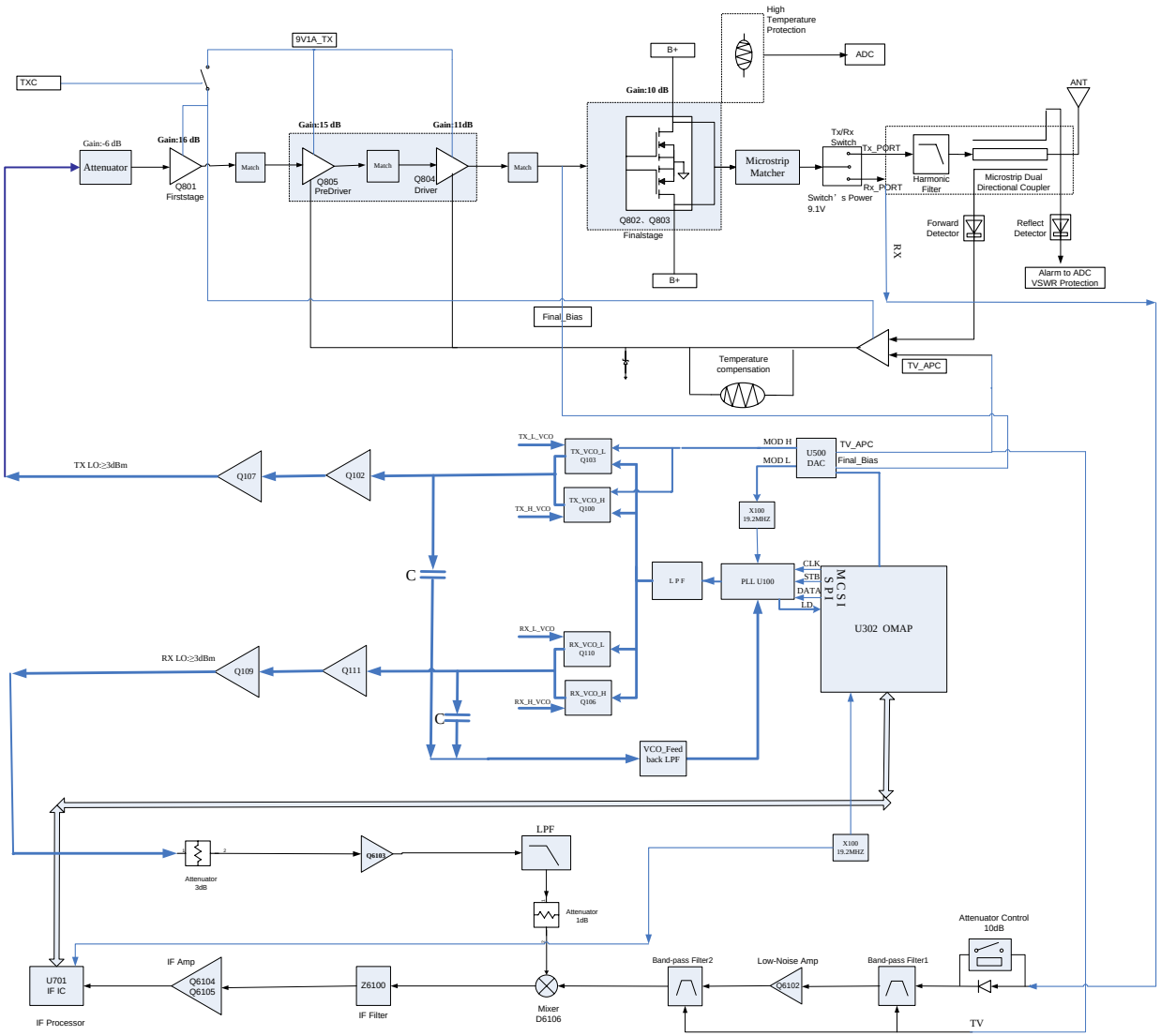


14.5 Block Diagram

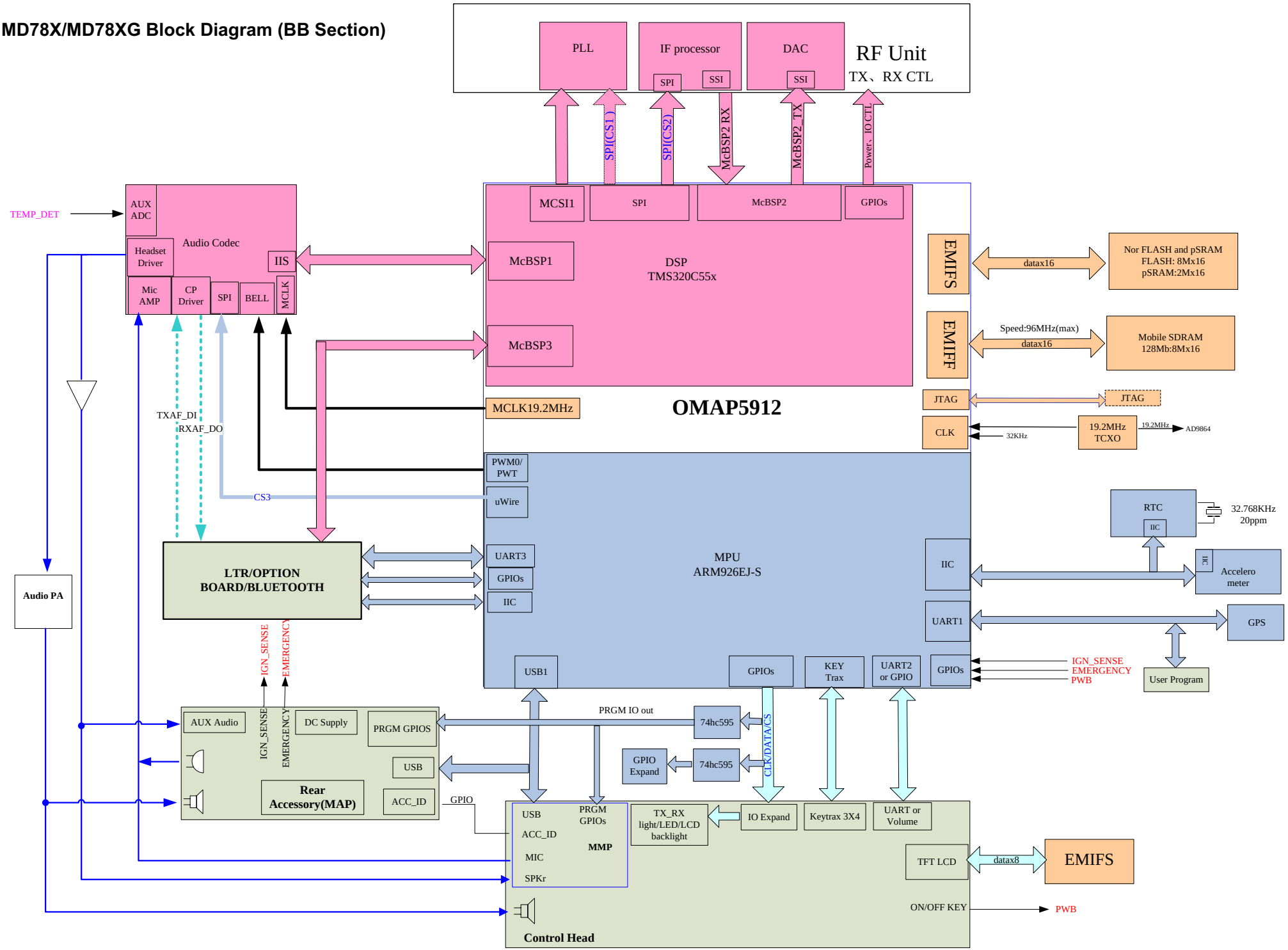
MD78X/MD78XG Block Diagram (Power Section)



MD78X/MD78XG Block Diagram (RF Section)

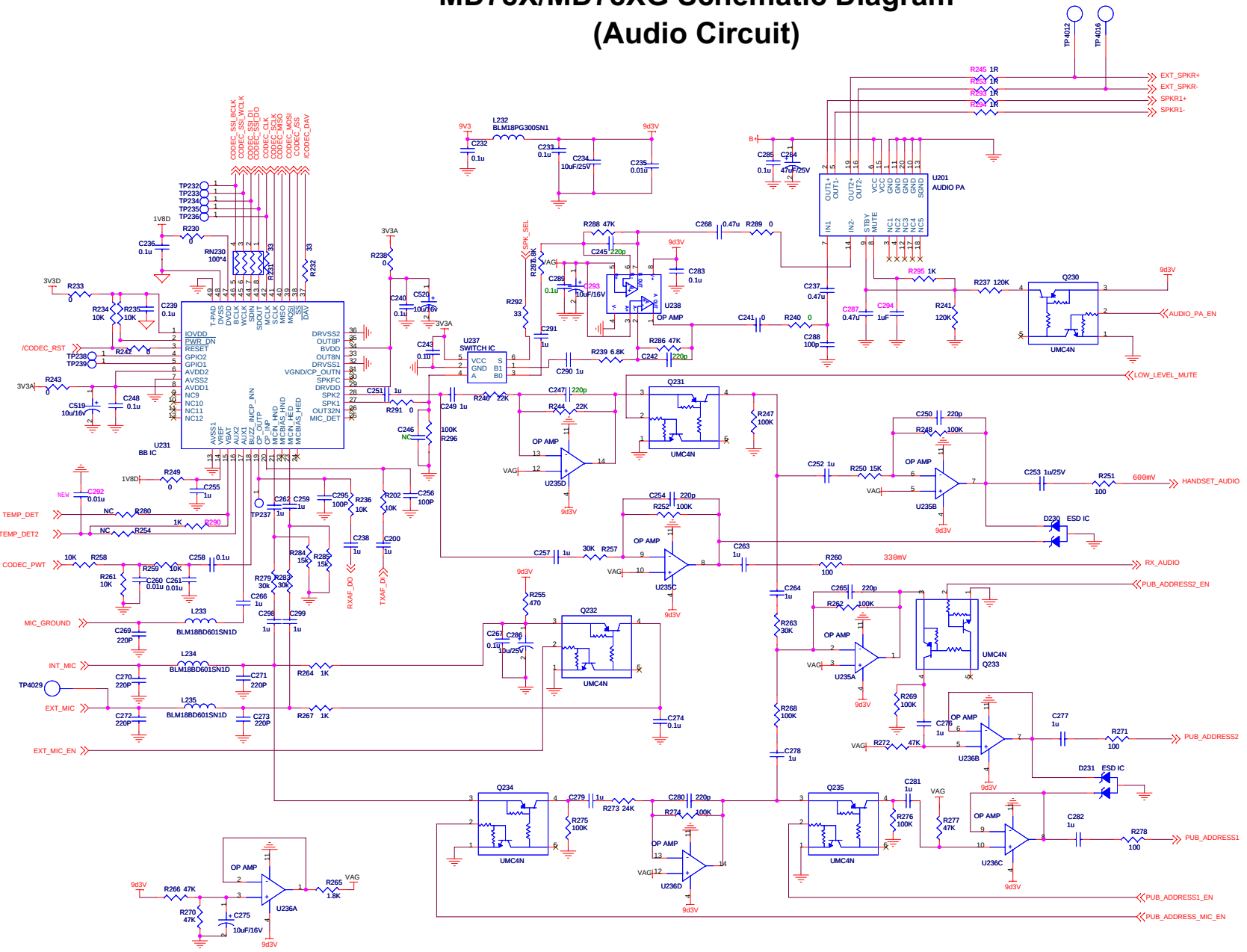


MD78X/MD78XG Block Diagram (BB Section)

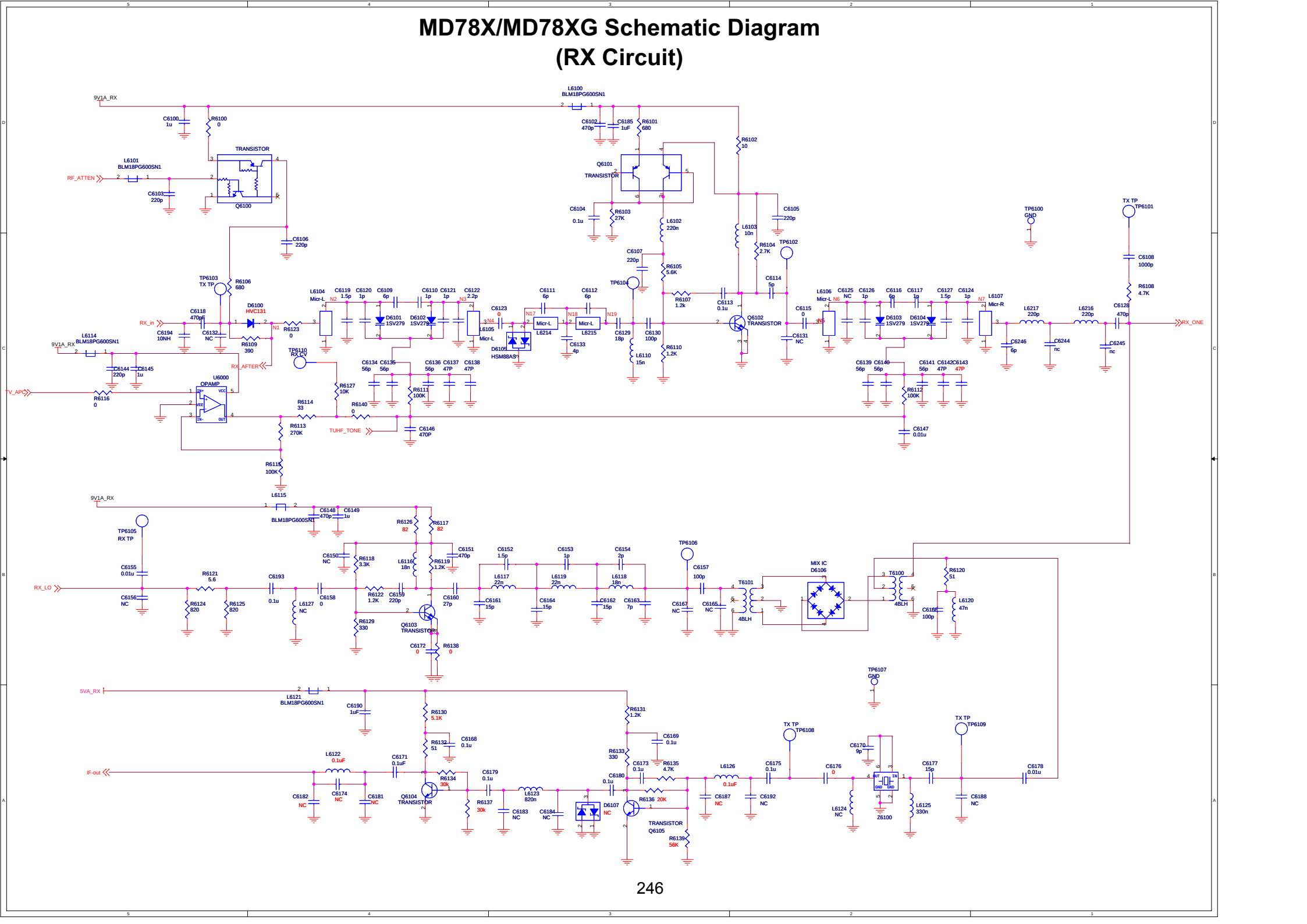


14.6 Schematic Diagram

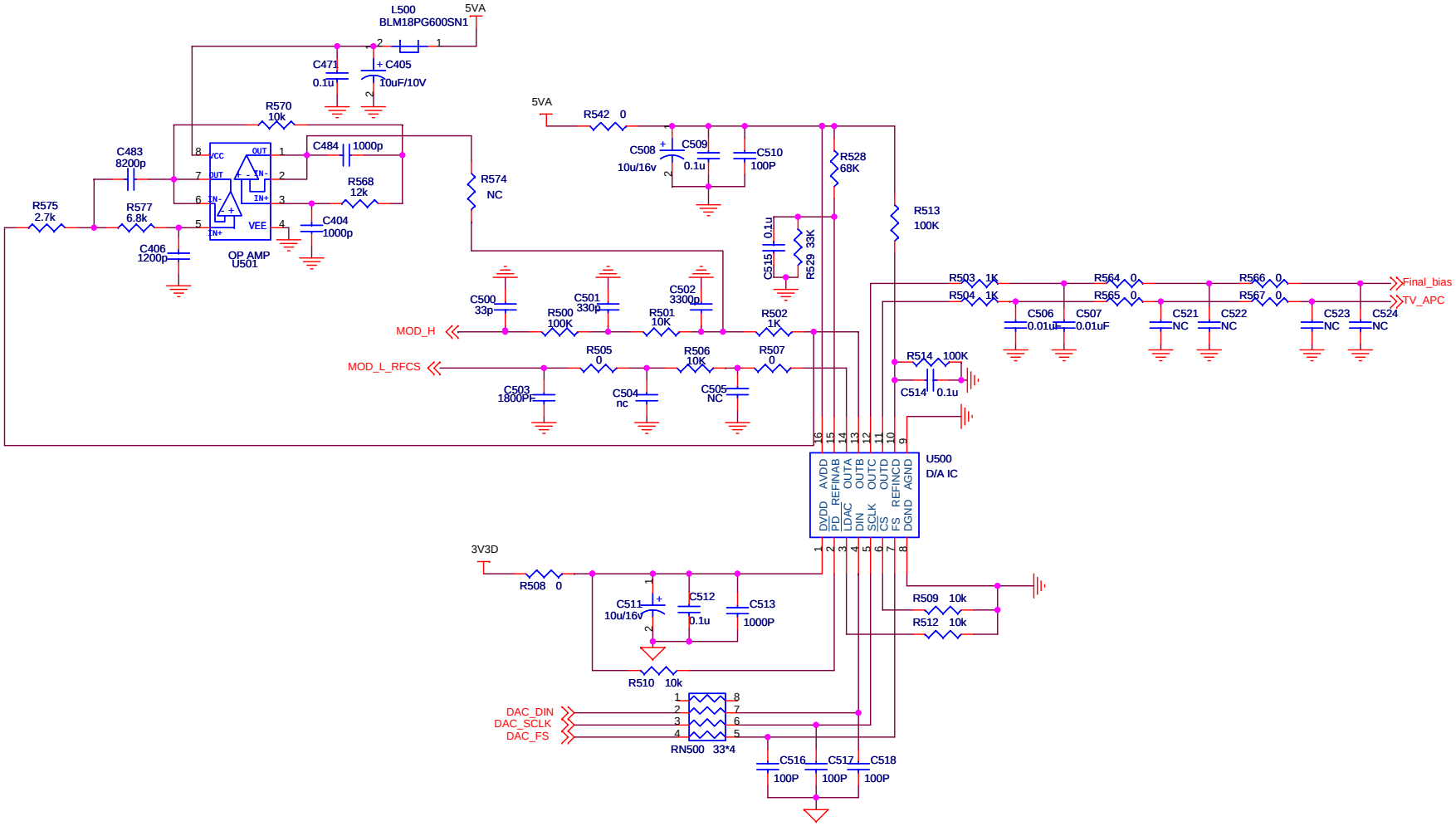
MD78X/MD78XG Schematic Diagram (Audio Circuit)



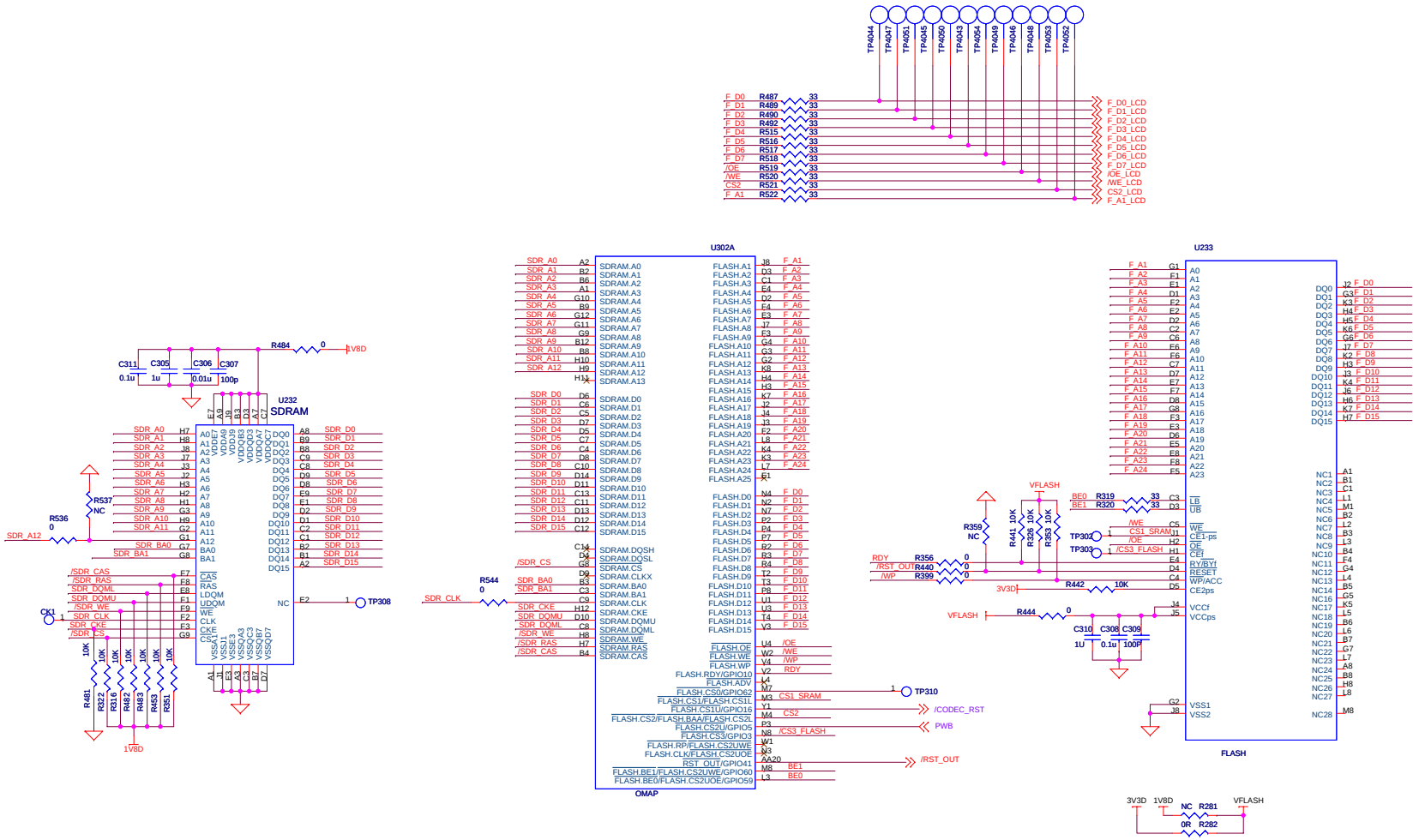
MD78X/MD78XG Schematic Diagram
(RX Circuit)



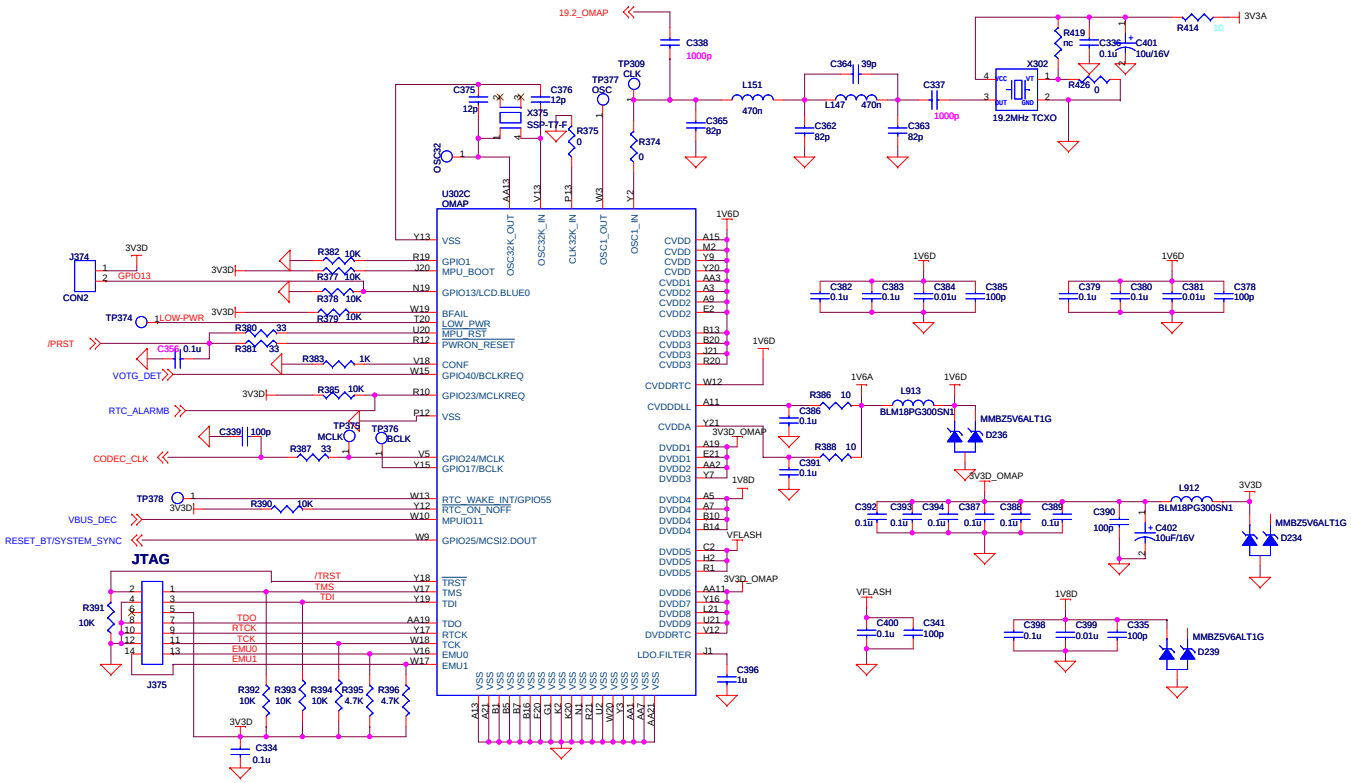
MD78X/MD78XG Schematic Diagram
(DAC Circuit)



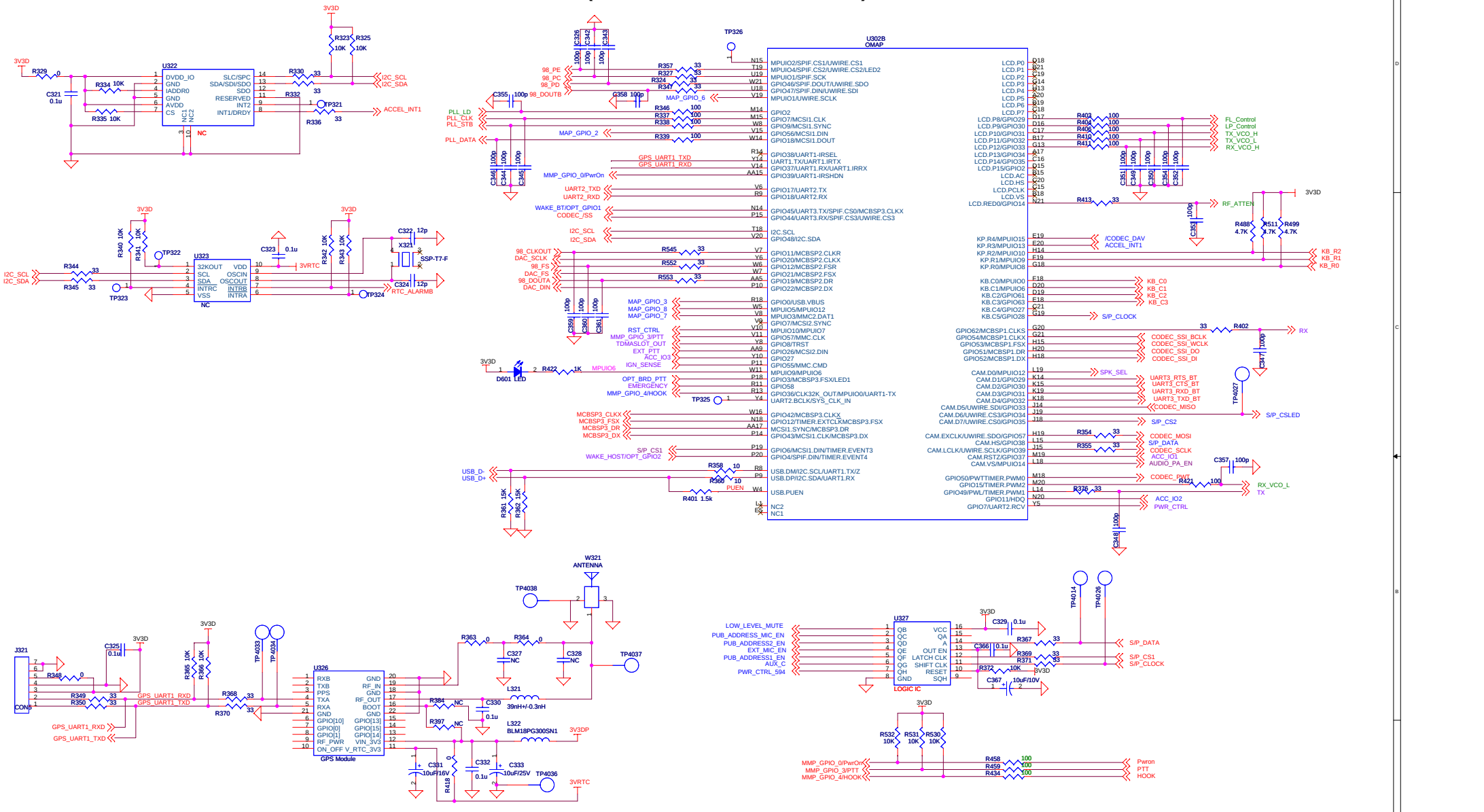
MD78X/MD78XG Schematic Diagram
(Memory Circuit)



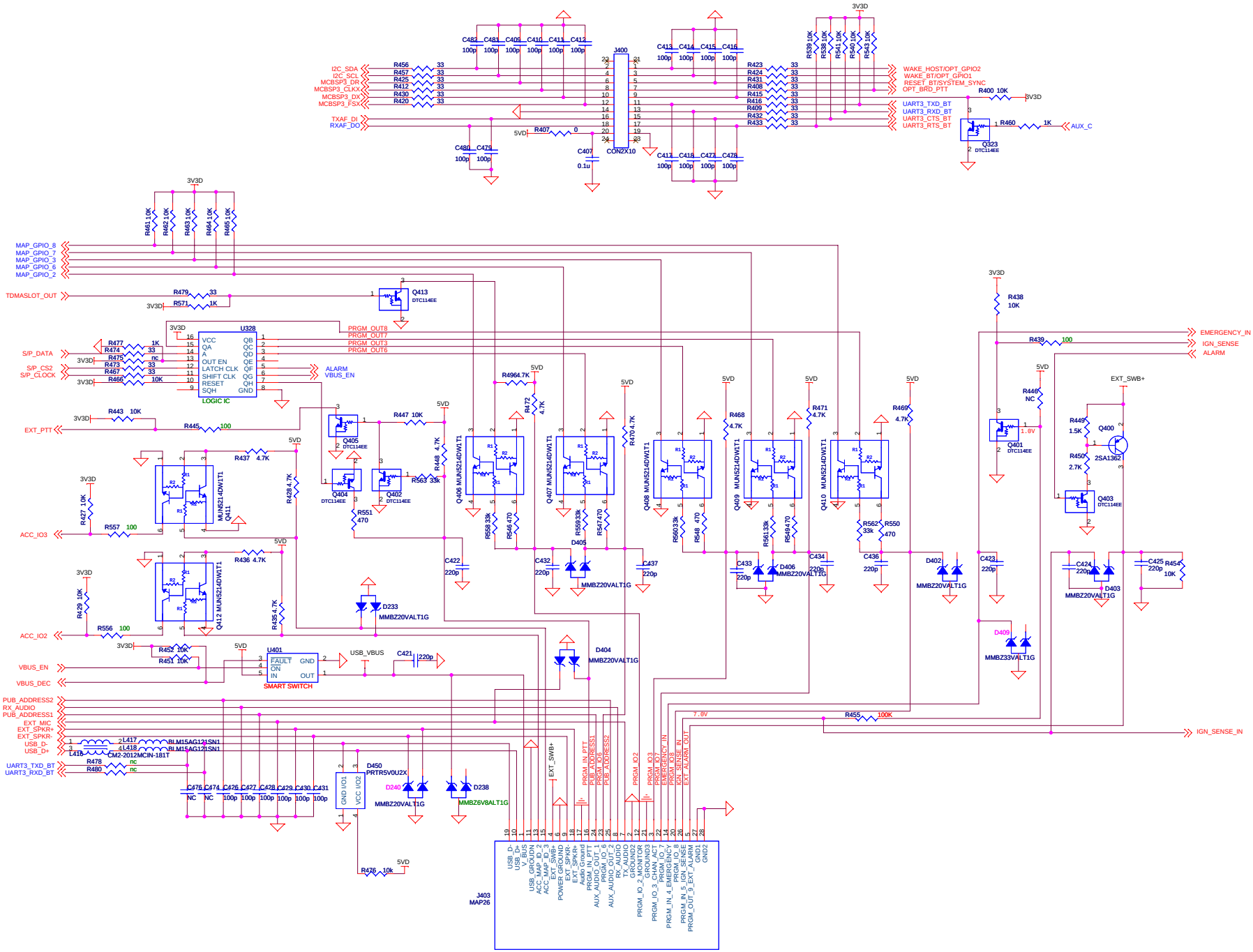
MD78X/MD78XG Schematic Diagram
(OMAP Circuit)



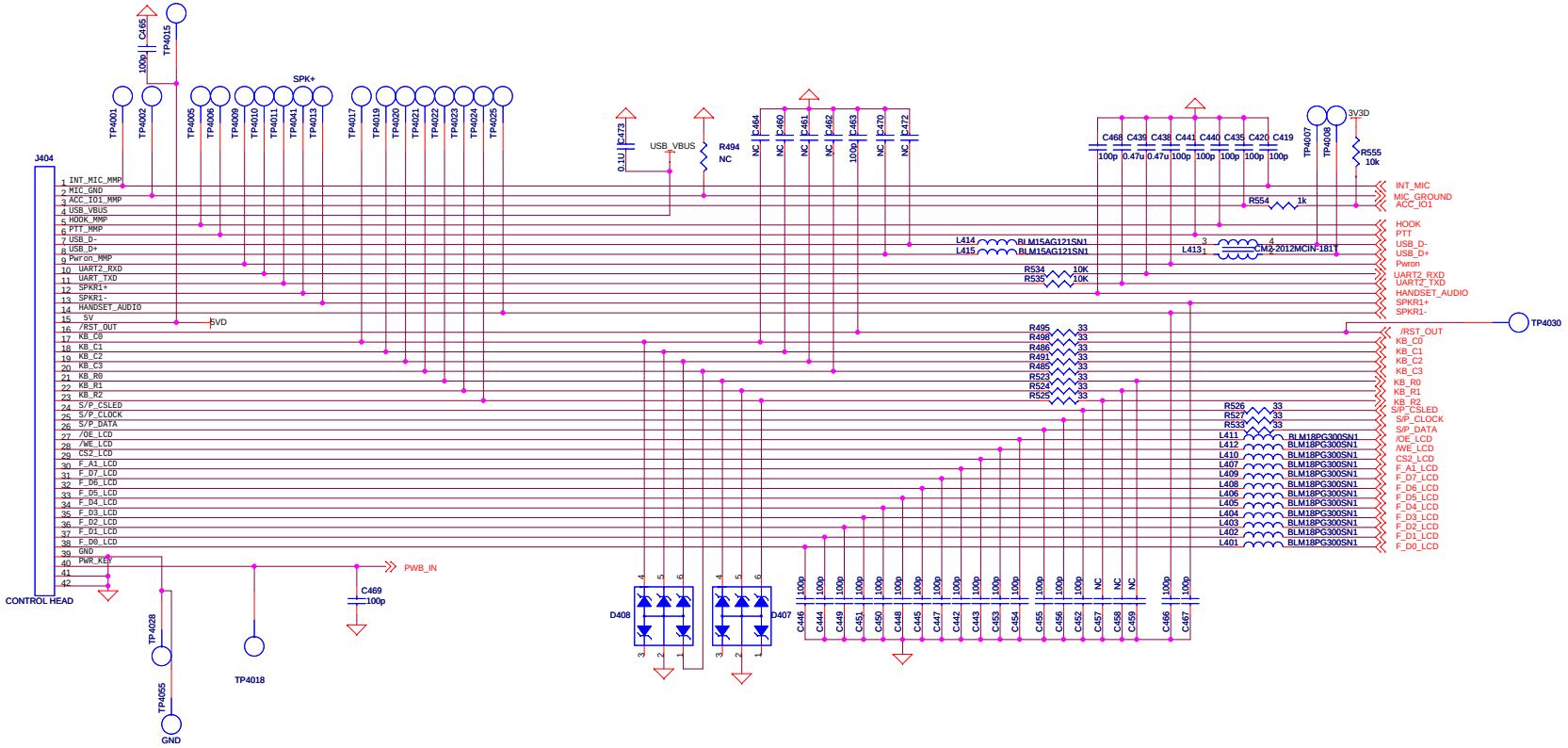
MD78X/MD78XG Schematic Diagram
(OMAP & GPS Circuit)



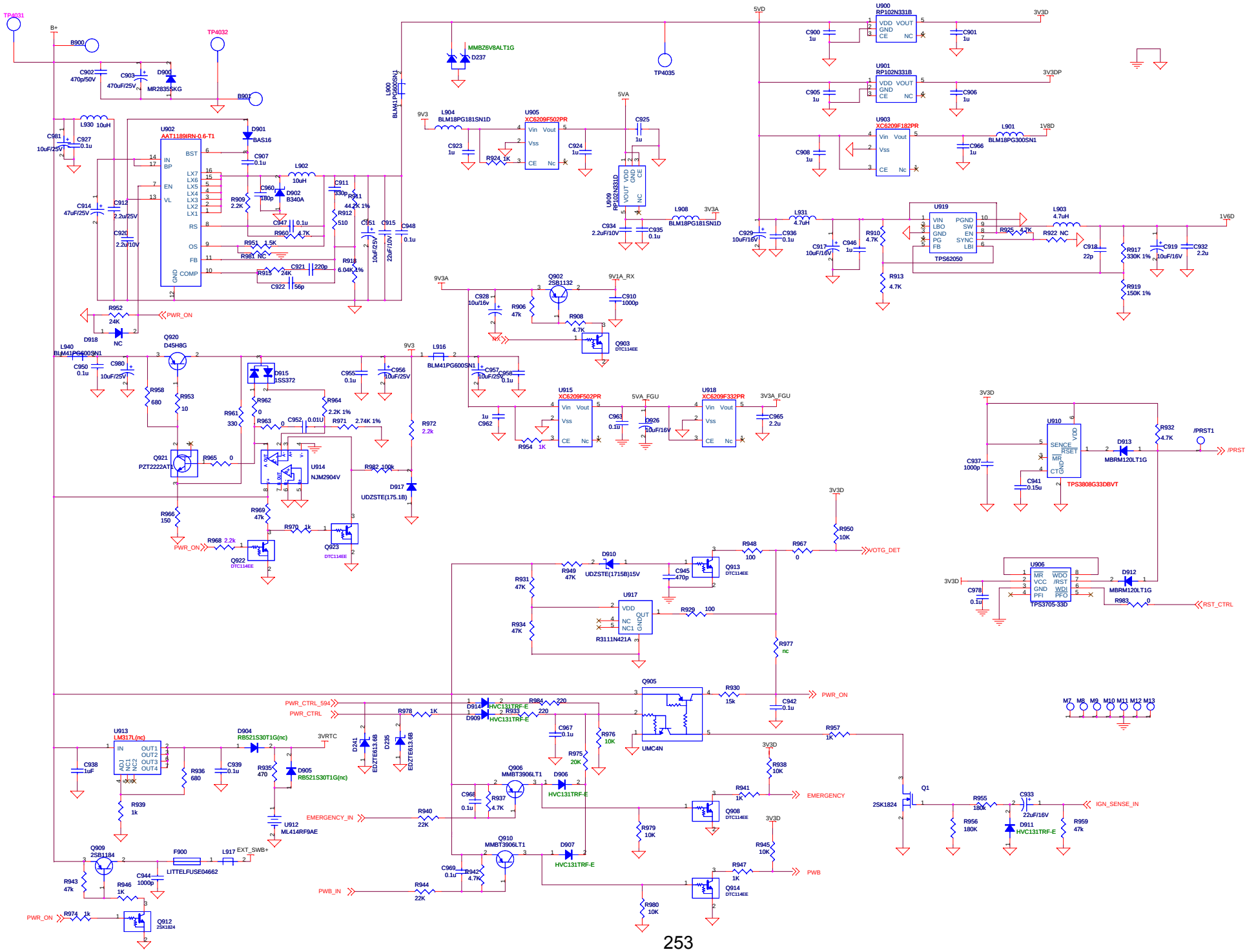
MD78X/MD78XG Schematic Diagram (Peripheral Interface Circuit)



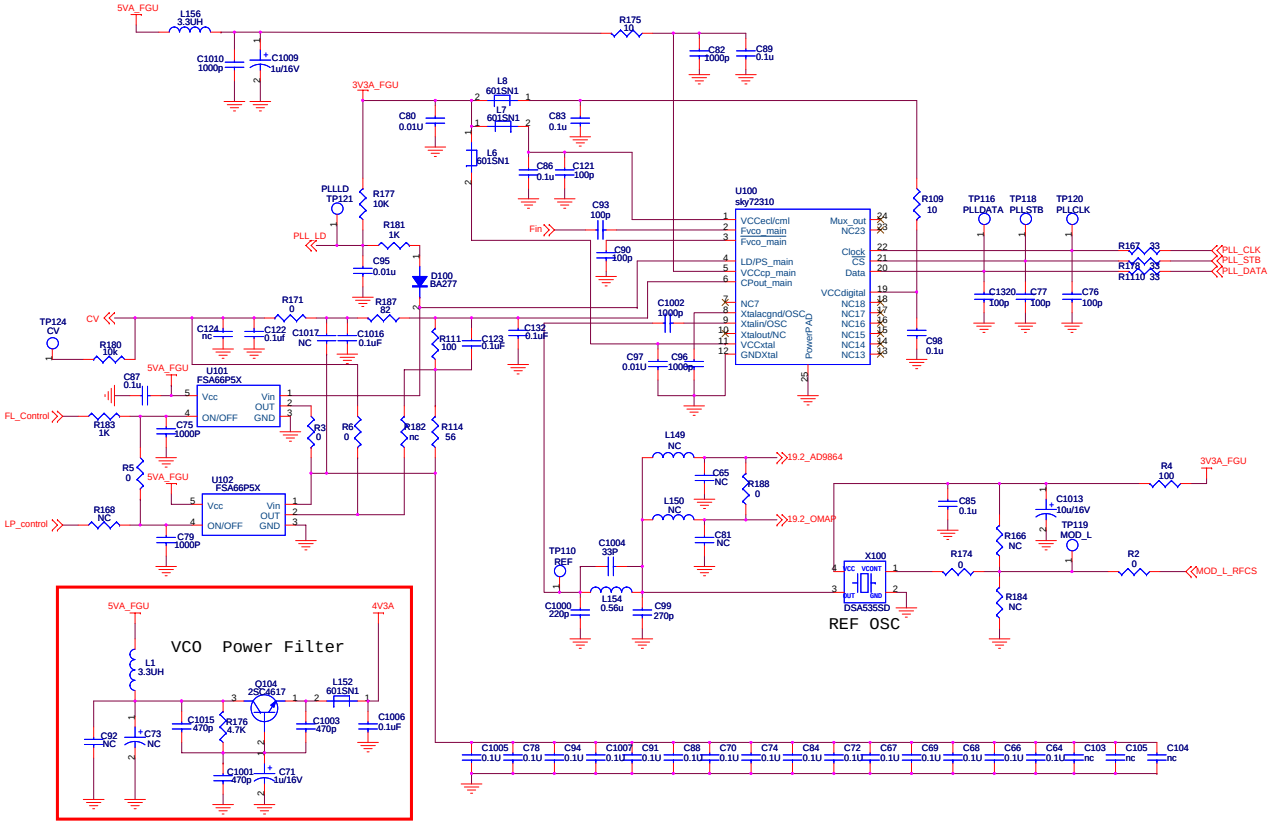
MD78X/MD78XG Schematic Diagram
(40-Pin Interface Circuit)



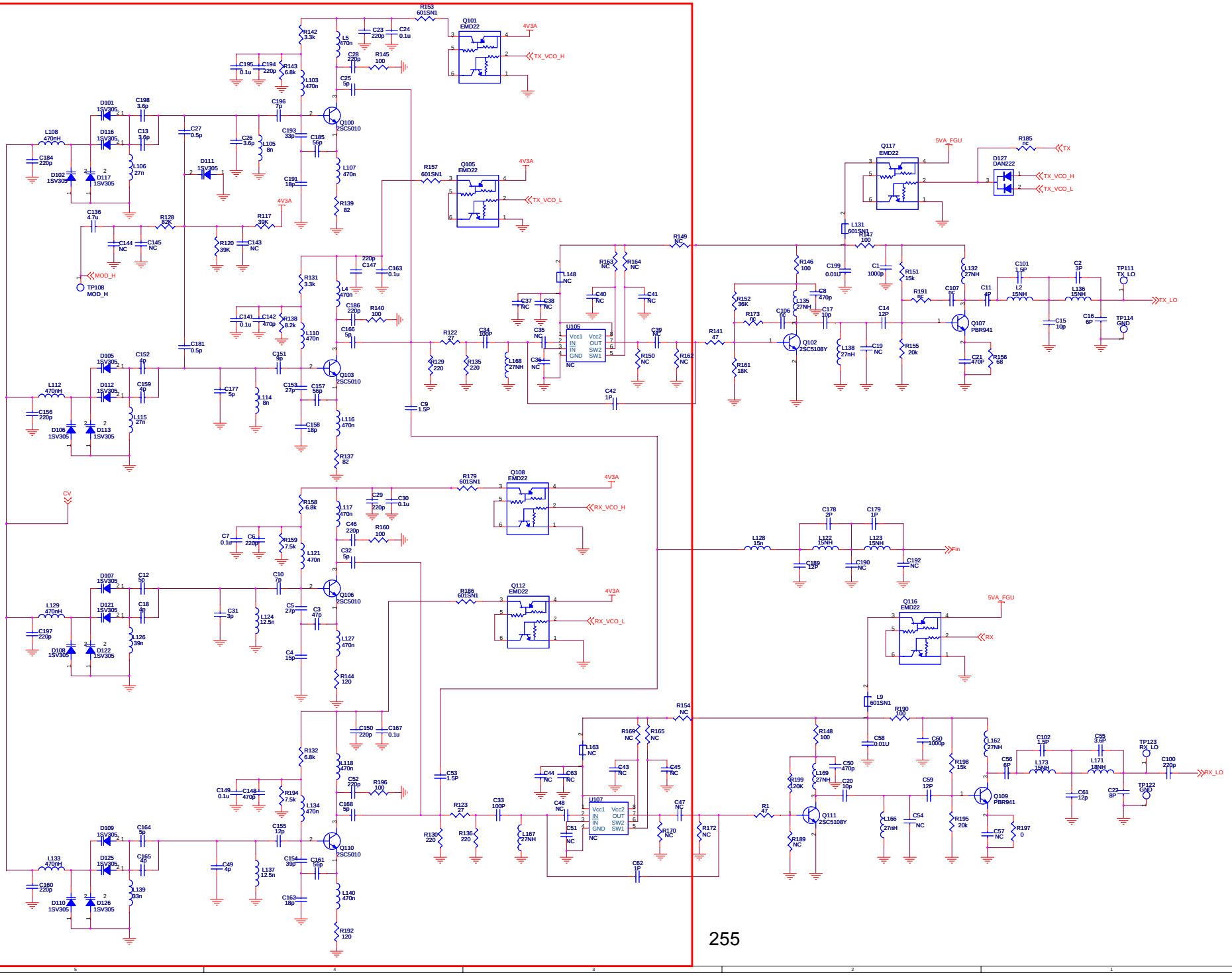
MD78X/MD78XG Schematic Diagram (Power Circuit)



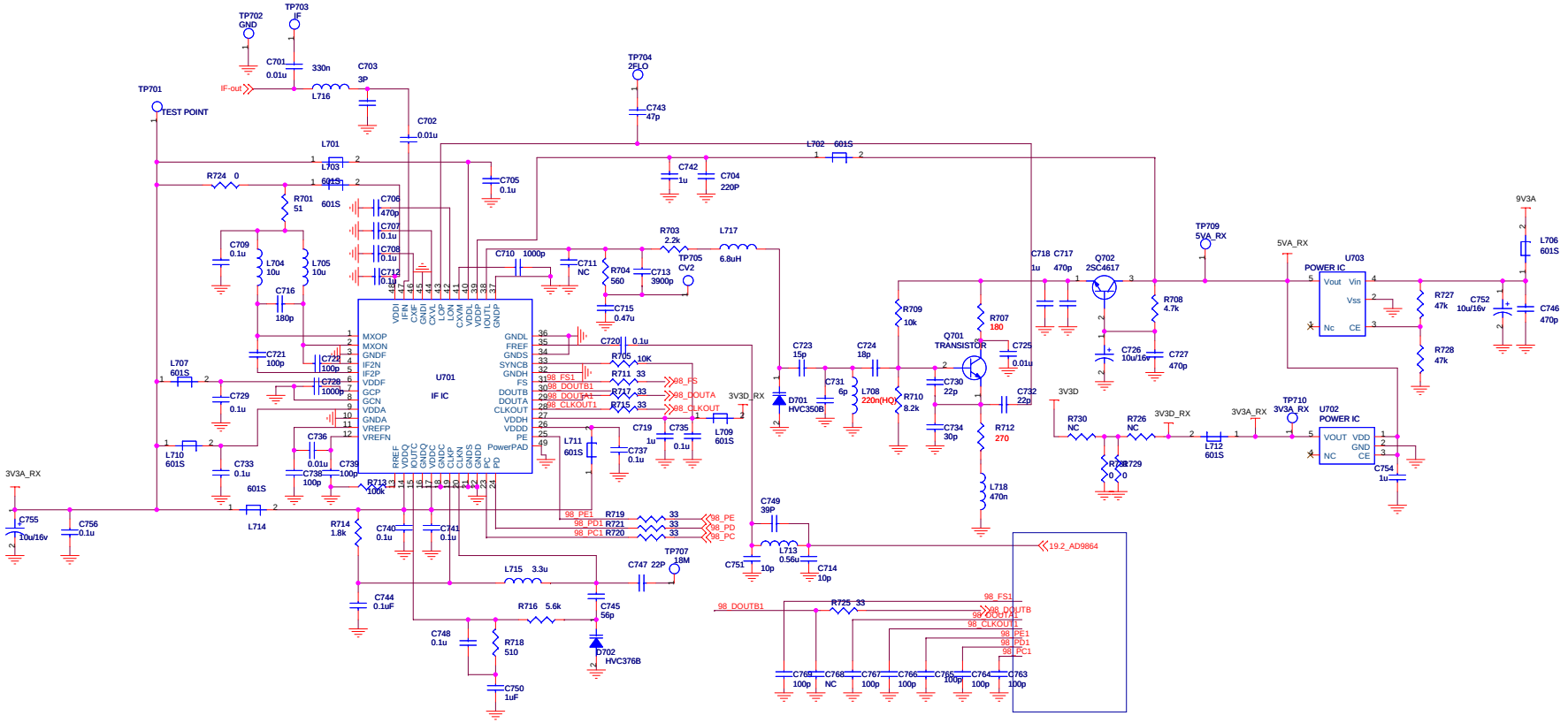
MD78X/MD78XG Schematic Diagram
(PLL Circuit)



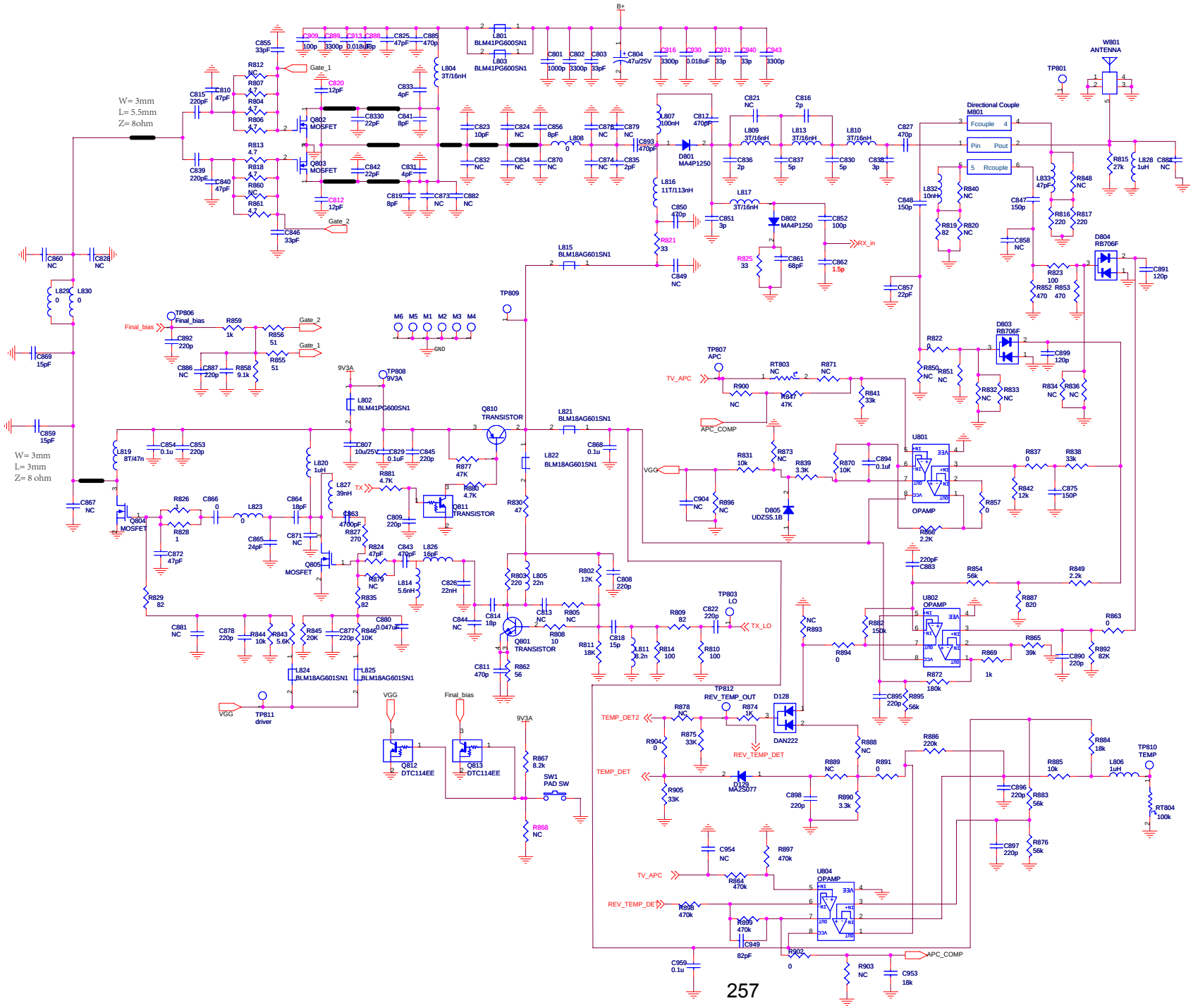
MD78X/MD78XG Schematic Diagram (VCO Circuit)



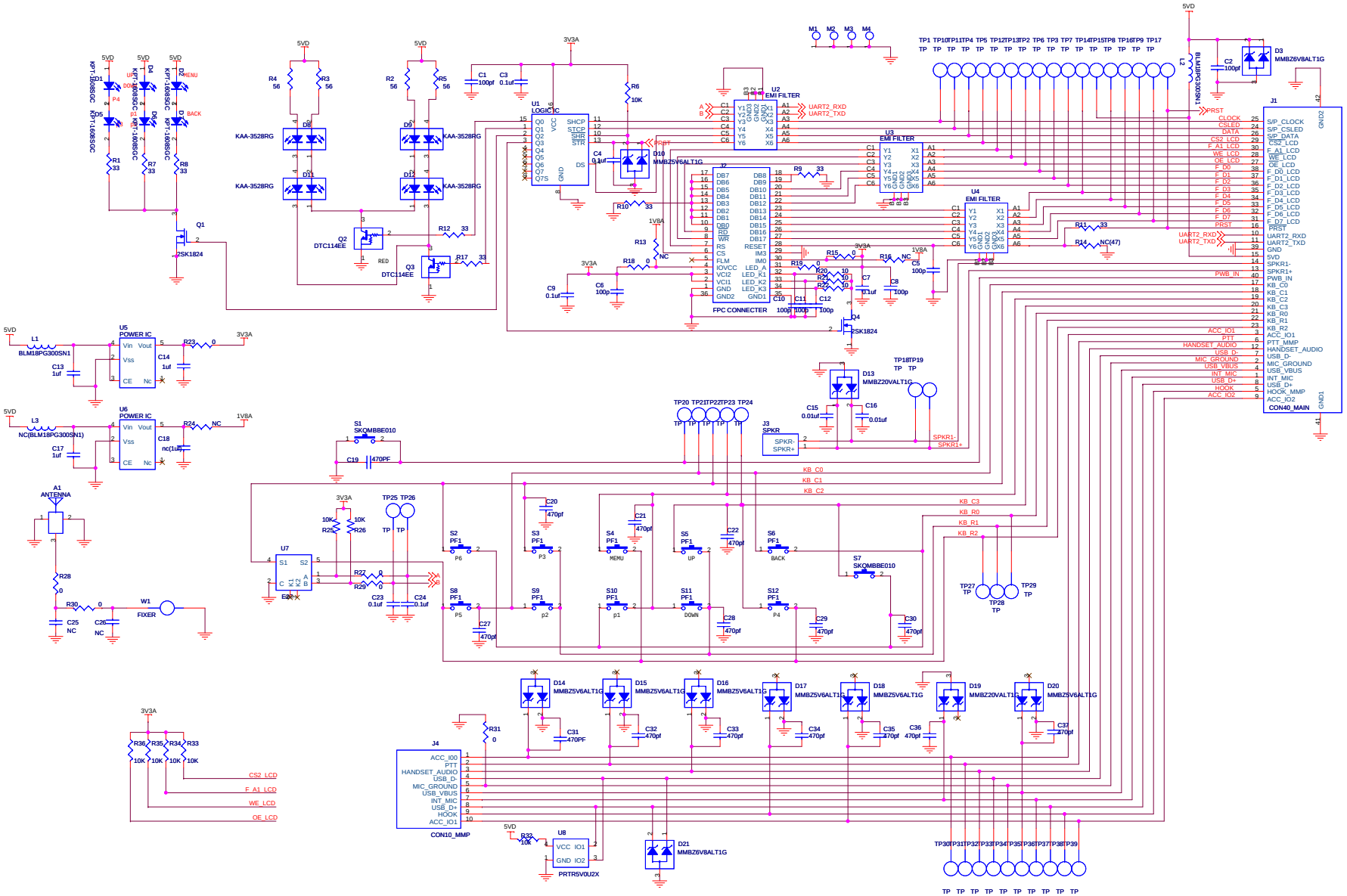
MD78X/MD78XG Schematic Diagram
(IF Circuit)



MD78X/MD78XG Schematic Diagram (TX Circuit)



MD78X/MD78XG Schematic Diagram
(Front Panel)



V1.0

14.7 Parts List

Main Board *for MD78X/MD78XG*

No.	Ref. No.	Part No.	Description
1	C6115	3001050000000	0Ω
2	C6123	3001050000000	0Ω
3	C6172	3001050000000	0Ω
4	L414	3001050000000	0Ω
5	L415	3001050000000	0Ω
6	L417	3001050000000	0Ω
7	L418	3001050000000	0Ω
8	R174	3001050000000	0Ω
9	R188	3001050000000	0Ω
10	R197	3001050000000	0Ω
11	R230	3001050000000	0Ω
12	R233	3001050000000	0Ω
13	R238	3001050000000	0Ω
14	R240	3001050000000	0Ω
15	R242	3001050000000	0Ω
16	R243	3001050000000	0Ω
17	R249	3001050000000	0Ω
18	R289	3001050000000	0Ω
19	R3	3001050000000	0Ω
20	R348	3001050000000	0Ω
21	R356	3001050000000	0Ω
22	R358	3001050000000	0Ω
23	R360	3001050000000	0Ω
24	R363	3001050000000	0Ω
25	R364	3001050000000	0Ω
26	R374	3001050000000	0Ω
27	R375	3001050000000	0Ω
28	R399	3001050000000	0Ω
29	R426	3001050000000	0Ω
30	R440	3001050000000	0Ω
31	R5	3001050000000	0Ω
32	R505	3001050000000	0Ω
33	R507	3001050000000	0Ω
34	R508	3001050000000	0Ω
35	R536	3001050000000	0Ω
36	R544	3001050000000	0Ω
37	R564	3001050000000	0Ω
38	R565	3001050000000	0Ω
39	R566	3001050000000	0Ω
40	R567	3001050000000	0Ω
41	R6	3001050000000	0Ω

No.	Ref. No.	Part No.	Description
42	R6123	3001050000000	0Ω
43	R729	3001050000000	0Ω
44	R731	3001050000000	0Ω
45	R837	3001050000000	0Ω
46	R857	3001050000000	0Ω
47	R863	3001050000000	0Ω
48	R889	3001050000000	0Ω
49	R891	3001050000000	0Ω
50	R894	3001050000000	0Ω
51	R902	3001050000000	0Ω
52	R904	3001050000000	0Ω
53	R920	3001050000000	0Ω
54	R923	3001050000000	0Ω
55	R967	3001050000000	0Ω
56	R983	3001050000000	0Ω
57	C241	3001060000000	0Ω
58	C6158	3001060000000	0Ω
59	C6176	3001060000000	0Ω
60	L413A	3001060000000	0Ω
61	L413B	3001060000000	0Ω
62	L416A	3001060000000	0Ω
63	L416B	3001060000000	0Ω
64	L806	3001060000000	0Ω
65	L823	3001060000000	0Ω
66	R171	3001060000000	0Ω
67	R2	3001060000000	0Ω
68	R282	3001060000000	0Ω
69	R407	3001060000000	0Ω
70	R418	3001060000000	0Ω
71	R444	3001060000000	0Ω
72	R484	3001060000000	0Ω
73	R542	3001060000000	0Ω
74	R6116	3001060000000	0Ω
75	R6138	3001060000000	0Ω
76	R6140	3001060000000	0Ω
77	R724	3001060000000	0Ω
78	R822	3001060000000	0Ω
79	R901	3001060000000	0Ω
80	R914	3001060000000	0Ω
81	R916	3001060000000	0Ω
82	R962	3001060000000	0Ω
83	R963	3001060000000	0Ω
84	R965	3001060000000	0Ω
85	R973	3001060000000	0Ω

No.	Ref. No.	Part No.	Description
86	C815	3001070000000	0Ω
87	C839	3001070000000	0Ω
88	L808	3001080000000	0Ω
89	R245	3001160100000	1Ω
90	R253	3001160100000	1Ω
91	R293	3001160100000	1Ω
92	R294	3001160100000	1Ω
93	R826	3001060100000	1Ω
94	R828	3001060100000	1Ω
95	R804	3001084790000	4.7Ω
96	R806	3001084790000	4.7Ω
97	R807	3001084790000	4.7Ω
98	R812	3001084790000	4.7Ω
99	R813	3001084790000	4.7Ω
100	R818	3001084790000	4.7Ω
101	R860	3001084790000	4.7Ω
102	R861	3001084790000	4.7Ω
103	R109	3001051000000	10Ω
104	R175	3001051000000	10Ω
105	R386	3001051000000	10Ω
106	R388	3001051000000	10Ω
107	R414	3001051000000	10Ω
108	R187	3001061000000	10Ω
109	R808	3001061000000	10Ω
110	R953	3001061000000	10Ω
111	R6102	3001071000000	10Ω
112	R6121	3001051800000	18Ω
113	R123	3001052700010	27Ω
114	R1110	3001053300010	33Ω
115	R167	3001053300010	33Ω
116	R178	3001053300010	33Ω
117	R231	3001053300010	33Ω
118	R232	3001053300010	33Ω
119	R292	3001053300010	33Ω
120	R319	3001053300010	33Ω
121	R320	3001053300010	33Ω
122	R324	3001053300010	33Ω
123	R327	3001053300010	33Ω
124	R347	3001053300010	33Ω
125	R349	3001053300010	33Ω
126	R350	3001053300010	33Ω
127	R354	3001053300010	33Ω
128	R355	3001053300010	33Ω
129	R357	3001053300010	33Ω

No.	Ref. No.	Part No.	Description
130	R367	3001053300010	33Ω
131	R368	3001053300010	33Ω
132	R369	3001053300010	33Ω
133	R370	3001053300010	33Ω
134	R371	3001053300010	33Ω
135	R376	3001053300010	33Ω
136	R380	3001053300010	33Ω
137	R381	3001053300010	33Ω
138	R387	3001053300010	33Ω
139	R400	3001053300010	33Ω
140	R402	3001053300010	33Ω
141	R408	3001053300010	33Ω
142	R409	3001053300010	33Ω
143	R412	3001053300010	33Ω
144	R413	3001053300010	33Ω
145	R415	3001053300010	33Ω
146	R416	3001053300010	33Ω
147	R420	3001053300010	33Ω
148	R423	3001053300010	33Ω
149	R424	3001053300010	33Ω
150	R425	3001053300010	33Ω
151	R430	3001053300010	33Ω
152	R431	3001053300010	33Ω
153	R432	3001053300010	33Ω
154	R433	3001053300010	33Ω
155	R456	3001053300010	33Ω
156	R457	3001053300010	33Ω
157	R467	3001053300010	33Ω
158	R473	3001053300010	33Ω
159	R474	3001053300010	33Ω
160	R479	3001053300010	33Ω
161	R485	3001053300010	33Ω
162	R486	3001053300010	33Ω
163	R487	3001053300010	33Ω
164	R489	3001053300010	33Ω
165	R490	3001053300010	33Ω
166	R491	3001053300010	33Ω
167	R492	3001053300010	33Ω
168	R495	3001053300010	33Ω
169	R498	3001053300010	33Ω
170	R515	3001053300010	33Ω
171	R516	3001053300010	33Ω
172	R517	3001053300010	33Ω
173	R518	3001053300010	33Ω

No.	Ref. No.	Part No.	Description
174	R519	3001053300010	33Ω
175	R520	3001053300010	33Ω
176	R521	3001053300010	33Ω
177	R522	3001053300010	33Ω
178	R523	3001053300010	33Ω
179	R524	3001053300010	33Ω
180	R525	3001053300010	33Ω
181	R526	3001053300010	33Ω
182	R527	3001053300010	33Ω
183	R533	3001053300010	33Ω
184	R545	3001053300010	33Ω
185	R552	3001053300010	33Ω
186	R553	3001053300010	33Ω
187	R6114	3001053300010	33Ω
188	R711	3001053300010	33Ω
189	R715	3001053300010	33Ω
190	R717	3001053300010	33Ω
191	R719	3001053300010	33Ω
192	R720	3001053300010	33Ω
193	R721	3001053300010	33Ω
194	R725	3001053300010	33Ω
195	R821	3001113300000	33Ω
196	R825	3001113300000	33Ω
197	R1	3001054700000	47Ω
198	R141	3001054700000	47Ω
199	R830	3001074700000	47Ω
200	R6120	3001055100010	51Ω
201	R6132	3001055100010	51Ω
202	R701	3001055100010	51Ω
203	R855	3001083300000	33Ω
204	R856	3001083300000	33Ω
205	R829	3001063900000	39Ω
206	R114	3001065100000	51Ω
207	R862	3001065600000	56Ω
208	R156	3001056800000	68Ω
209	R137	3001068200000	82Ω
210	R139	3001068200000	82Ω
211	R809	3001068200000	82Ω
212	R835	3001068200000	82Ω
213	R6117	3001078200000	82Ω
214	R6126	3001078200000	82Ω
215	R819	3001078200000	82Ω
216	R140	3001051010040	100Ω
217	R145	3001051010040	100Ω

No.	Ref. No.	Part No.	Description
218	R146	3001051010040	100Ω
219	R147	3001051010040	100Ω
220	R148	3001051010040	100Ω
221	R160	3001051010040	100Ω
222	R190	3001051010040	100Ω
223	R196	3001051010040	100Ω
224	R129	3001051010000	100Ω
225	R135	3001051010000	100Ω
226	R251	3001051010000	100Ω
227	R260	3001051010000	100Ω
228	R271	3001051010000	100Ω
229	R278	3001051010000	100Ω
230	R337	3001051010000	100Ω
231	R338	3001051010000	100Ω
232	R339	3001051010000	100Ω
233	R346	3001051010000	100Ω
234	R403	3001051010000	100Ω
235	R404	3001051010000	100Ω
236	R406	3001051010000	100Ω
237	R410	3001051010000	100Ω
238	R411	3001051010000	100Ω
239	R421	3001051010000	100Ω
240	R434	3001051010000	100Ω
241	R439	3001051010000	100Ω
242	R445	3001051010000	100Ω
243	R458	3001051010000	100Ω
244	R459	3001051010000	100Ω
245	R556	3001051010000	100Ω
246	R557	3001051010000	100Ω
247	R929	3001051010000	100Ω
248	R948	3001051010000	100Ω
249	R111	3001061010000	100Ω
250	R192	3001061010000	100Ω
251	R4	3001061010000	100Ω
252	R810	3001061010000	100Ω
253	R814	3001061010000	100Ω
254	R823	3001061010000	100Ω
255	R144	3001061210000	120Ω
256	R6124	3001052710010	270Ω
257	R6125	3001052710010	270Ω
258	R712	3001052710010	270Ω
259	R966	3001161510010	150Ω
260	R707	3001051810010	180Ω
261	R130	3001052210000	220Ω

No.	Ref. No.	Part No.	Description
262	R136	3001052210000	220Ω
263	R933	3001052210000	220Ω
264	R984	3001052210000	220Ω
265	R803	3001062210000	220Ω
266	R816	3001072210000	220Ω
267	R817	3001072210000	220Ω
268	R827	3001062710000	270Ω
269	R6133	3001053310010	330Ω
270	R6129	3001063310010	330Ω
271	R961	3001083310010	330Ω
272	R546	3001054710000	470Ω
273	R547	3001054710000	470Ω
274	R548	3001054710000	470Ω
275	R549	3001054710000	470Ω
276	R550	3001054710000	470Ω
277	R551	3001054710000	470Ω
278	R255	3001064710000	470Ω
279	R853	3001064710000	470Ω
280	R6100	3001055110000	510Ω
281	R718	3001055110000	510Ω
282	R912	3001055110000	510Ω
283	R704	3001055610010	560Ω
284	R6101	3001056810000	680Ω
285	R6106	3001066810000	680Ω
286	R958	3001066810000	680Ω
287	R887	3001058210000	820Ω
288	R181	3001051020000	1KΩ
289	R183	3001051020000	1KΩ
290	R290	3001051020000	1KΩ
291	R295	3001051020000	1KΩ
292	R502	3001051020000	1KΩ
293	R503	3001051020000	1KΩ
294	R504	3001051020000	1KΩ
295	R571	3001051020000	1KΩ
296	R831	3001051020000	1KΩ
297	R869	3001051020000	1KΩ
298	R874	3001051020000	1KΩ
299	R264	3001051020010	1KΩ
300	R267	3001051020010	1KΩ
301	R383	3001051020010	1KΩ
302	R422	3001051020010	1KΩ
303	R460	3001051020010	1KΩ
304	R477	3001051020010	1KΩ
305	R554	3001051020010	1KΩ

No.	Ref. No.	Part No.	Description
306	R941	3001051020010	1KΩ
307	R947	3001051020010	1KΩ
308	R957	3001051020010	1KΩ
309	R978	3001051020010	1KΩ
310	R859	3001061020010	1KΩ
311	R924	3001061020010	1KΩ
312	R939	3001061020010	1KΩ
313	R954	3001061020010	1KΩ
314	R970	3001061020010	1KΩ
315	R974	3001061020010	1KΩ
316	R946	3001071020000	1KΩ
317	R291	3001051220000	1.2K
318	R6119	3001051220000	1.2K
319	R6122	3001051220000	1.2K
320	R6131	3001051220000	1.2K
321	R401	3001051520000	1.5K
322	R951	3001051520000	1.5K
323	R449	3001061520000	1.5K
324	R265	3001051820000	1.8K
325	R714	3001051820000	1.8K
326	R703	3001052220010	2.2K
327	R849	3001052220010	2.2K
328	R866	3001052220010	2.2K
329	R909	3001052220010	2.2K
330	R964	3001052220010	2.2K
331	R6110	3001052220000	2.2K
332	R968	3001052220000	2.2K
333	R972	3001062220000	2.2K
334	R6104	3001052720000	2.7K
335	R450	3001072720010	2.7K
336	R971	3099052741000	2.74K
337	R131	3001053320000	3.3K
338	R142	3001053320000	3.3K
339	R6107	3001053320000	3.3K
340	R6118	3001053320000	3.3K
341	R839	3001053320000	3.3K
342	R890	3001053320000	3.3K
343	R960	3001054790010	4.7K
344	R176	3001054720000	4.7K
345	R395	3001054720000	4.7K
346	R396	3001054720000	4.7K
347	R428	3001054720000	4.7K
348	R435	3001054720000	4.7K
349	R436	3001054720000	4.7K

No.	Ref. No.	Part No.	Description
350	R437	3001054720000	4.7K
351	R448	3001054720000	4.7K
352	R468	3001054720000	4.7K
353	R469	3001054720000	4.7K
354	R470	3001054720000	4.7K
355	R471	3001054720000	4.7K
356	R472	3001054720000	4.7K
357	R488	3001054720000	4.7K
358	R496	3001054720000	4.7K
359	R499	3001054720000	4.7K
360	R511	3001054720000	4.7K
361	R6135	3001054720000	4.7K
362	R708	3001054720000	4.7K
363	R908	3001054720000	4.7K
364	R910	3001054720000	4.7K
365	R913	3001054720000	4.7K
366	R937	3001054720000	4.7K
367	R942	3001054720000	4.7K
368	R925	3001064720000	4.7K
369	R932	3001064720000	4.7K
370	R880	3001074720010	4.7K
371	R881	3001074720010	4.7K
372	R6130	3001055120030	5.1K
373	R239	3001055620000	5.6K
374	R287	3001055620000	5.6K
375	R6105	3001055620000	5.6K
376	R716	3001055620000	5.6K
377	R843	3001065620000	5.6K
378	R918	3099066041010	6.04K
379	R132	3001056820000	6.8K
380	R158	3001056820000	6.8K
381	R577	3001056820000	6.8K
382	R143	3001057520000	7.5K
383	R159	3001057520000	7.5K
384	R194	3001057520000	7.5K
385	R138	3001058220000	8.2K
386	R710	3001058220000	8.2K
387	R867	3001058220000	8.2K
388	R858	3001069120000	9.1K
389	D601	3001051030000	10KΩ
390	R177	3001051030000	10KΩ
391	R180	3001051030000	10KΩ
392	R202	3001051030000	10KΩ
393	R234	3001051030000	10KΩ

No.	Ref. No.	Part No.	Description
394	R235	3001051030000	10KΩ
395	R236	3001051030000	10KΩ
396	R258	3001051030000	10KΩ
397	R259	3001051030000	10KΩ
398	R261	3001051030000	10KΩ
399	R316	3001051030000	10KΩ
400	R322	3001051030000	10KΩ
401	R326	3001051030000	10KΩ
402	R351	3001051030000	10KΩ
403	R353	3001051030000	10KΩ
404	R365	3001051030000	10KΩ
405	R366	3001051030000	10KΩ
406	R372	3001051030000	10KΩ
407	R377	3001051030000	10KΩ
408	R378	3001051030000	10KΩ
409	R379	3001051030000	10KΩ
410	R382	3001051030000	10KΩ
411	R385	3001051030000	10KΩ
412	R390	3001051030000	10KΩ
413	R391	3001051030000	10KΩ
414	R392	3001051030000	10KΩ
415	R393	3001051030000	10KΩ
416	R394	3001051030000	10KΩ
417	R427	3001051030000	10KΩ
418	R429	3001051030000	10KΩ
419	R438	3001051030000	10KΩ
420	R441	3001051030000	10KΩ
421	R442	3001051030000	10KΩ
422	R443	3001051030000	10KΩ
423	R447	3001051030000	10KΩ
424	R451	3001051030000	10KΩ
425	R452	3001051030000	10KΩ
426	R453	3001051030000	10KΩ
427	R454	3001051030000	10KΩ
428	R461	3001051030000	10KΩ
429	R462	3001051030000	10KΩ
430	R463	3001051030000	10KΩ
431	R464	3001051030000	10KΩ
432	R465	3001051030000	10KΩ
433	R466	3001051030000	10KΩ
434	R476	3001051030000	10KΩ
435	R481	3001051030000	10KΩ
436	R482	3001051030000	10KΩ
437	R483	3001051030000	10KΩ

No.	Ref. No.	Part No.	Description
438	R501	3001051030000	10KΩ
439	R506	3001051030000	10KΩ
440	R509	3001051030000	10KΩ
441	R510	3001051030000	10KΩ
442	R512	3001051030000	10KΩ
443	R530	3001051030000	10KΩ
444	R531	3001051030000	10KΩ
445	R532	3001051030000	10KΩ
446	R534	3001051030000	10KΩ
447	R535	3001051030000	10KΩ
448	R538	3001051030000	10KΩ
449	R539	3001051030000	10KΩ
450	R540	3001051030000	10KΩ
451	R541	3001051030000	10KΩ
452	R543	3001051030000	10KΩ
453	R555	3001051030000	10KΩ
454	R570	3001051030000	10KΩ
455	R6127	3001051030000	10KΩ
456	R705	3001051030000	10KΩ
457	R709	3001051030000	10KΩ
458	R885	3001051030000	10KΩ
459	R938	3001051030000	10KΩ
460	R945	3001051030000	10KΩ
461	R950	3001051030000	10KΩ
462	R976	3001051030000	10KΩ
463	R979	3001051030000	10KΩ
464	R980	3001051030000	10KΩ
465	R844	3001061030000	10KΩ
466	R846	3001061030000	10KΩ
467	R568	3001051230000	12KΩ
468	R842	3001051230000	12KΩ
469	R870	3001051230000	12KΩ
470	R802	3001061230000	12KΩ
471	R151	3001051530010	15KΩ
472	R198	3001051530010	15KΩ
473	R884	3001051530010	15KΩ
474	R930	3001051530010	15KΩ
475	R250	3001051530000	15KΩ
476	R284	3001051530000	15KΩ
477	R285	3001051530000	15KΩ
478	R361	3001051530000	15KΩ
479	R362	3001051530000	15KΩ
480	C953	3001051830000	18KΩ
481	R161	3001051830000	18KΩ

No.	Ref. No.	Part No.	Description
482	R811	3001061830010	18KΩ
483	R155	3001052030000	20KΩ
484	R195	3001052030000	20KΩ
485	R6136	3001052030000	20KΩ
486	R975	3001052030000	20KΩ
487	R845	3001062030000	20KΩ
488	R244	3001052230010	22KΩ
489	R246	3001052230010	22KΩ
490	R940	3001052230010	22KΩ
491	R944	3001052230010	22KΩ
492	R273	3001052430010	24KΩ
493	R915	3001052430010	24KΩ
494	R952	3001062430000	24KΩ
495	R6103	3001052730010	27KΩ
496	R815	3001082730000	27KΩ
497	R6134	3001053030000	30KΩ
498	R6137	3001053030000	30KΩ
499	R257	3001053030010	30KΩ
500	R263	3001053030010	30KΩ
501	R279	3001053030010	30KΩ
502	R283	3001053030010	30KΩ
503	R529	3001053330000	33KΩ
504	R838	3001053330000	33KΩ
505	R841	3001053330000	33KΩ
506	R875	3001053330000	33KΩ
507	R905	3001053330000	33KΩ
508	R558	3001053330010	33KΩ
509	R559	3001053330010	33KΩ
510	R560	3001053330010	33KΩ
511	R561	3001053330010	33KΩ
512	R562	3001053330010	33KΩ
513	R563	3001053330010	33KΩ
514	R152	3001053630000	36KΩ
515	R117	3001053930000	39KΩ
516	R120	3001053930000	39KΩ
517	R865	3001053930000	39KΩ
518	R911	3099064422010	44.2KΩ
519	R266	3001054730000	47KΩ
520	R270	3001054730000	47KΩ
521	R272	3001054730000	47KΩ
522	R277	3001054730000	47KΩ
523	R286	3001054730000	47KΩ
524	R288	3001054730000	47KΩ
525	R847	3001054730000	47KΩ

No.	Ref. No.	Part No.	Description
526	R877	3001054730000	47KΩ
527	R931	3001054730000	47KΩ
528	R949	3001054730000	47KΩ
529	R959	3001054730000	47KΩ
530	R727	3001064730000	47KΩ
531	R728	3001064730000	47KΩ
532	R906	3001064730000	47KΩ
533	R943	3001064730000	47KΩ
534	R969	3001064730000	47KΩ
535	R895	3001055130010	51KΩ
536	R934	3001055130010	51KΩ
537	R237	3001055630000	56KΩ
538	R241	3001055630000	56KΩ
539	R6139	3001055630000	56KΩ
540	R854	3001055630000	56KΩ
541	R876	3001055630000	56KΩ
542	R883	3001055630000	56KΩ
543	R528	3001056830000	68KΩ
544	R128	3001058230000	82KΩ
545	R892	3001058230000	82KΩ
546	R296	3001051040000	100KΩ
547	R500	3001051040000	100KΩ
548	R513	3001051040000	100KΩ
549	R514	3001051040000	100KΩ
550	R6111	3001051040000	100KΩ
551	R6112	3001051040000	100KΩ
552	R6115	3001051040000	100KΩ
553	R713	3001051040000	100KΩ
554	R982	3001051040000	100KΩ
555	R247	3001051040010	100KΩ
556	R248	3001051040010	100KΩ
557	R252	3001051040010	100KΩ
558	R262	3001051040010	100KΩ
559	R268	3001051040010	100KΩ
560	R269	3001051040010	100KΩ
561	R274	3001051040010	100KΩ
562	R275	3001051040010	100KΩ
563	R276	3001051040010	100KΩ
564	R455	3001051040010	100KΩ
565	RT804	3003061040000	Thermistor
566	R199	3001051240000	120K
567	R919	3001051540000	150K
568	R872	3001051840000	180K
569	R955	3001051840000	180K

No.	Ref. No.	Part No.	Description
570	R956	3001051840000	180K
571	R882	3001052240000	220K
572	R886	3001052240000	220K
573	R6113	3001052740000	270K
574	R917	3001053340010	330K
575	R864	3001054740010	470K
576	R897	3001054740010	470K
577	R898	3001054740010	470K
578	R899	3001054740010	470K
579	RN230	3005051010010	100Ω
580	RN500	3005051010010	100Ω
581	C181	3101050590010	0.5PF
582	C27	3101050590010	0.5PF
583	C42	3101050100030	1PF
584	C6124	3101050100030	1PF
585	C6152	3101050100030	1PF
586	C6154	3101050100030	1PF
587	C62	3101050100030	1PF
588	C836	3101080100010	1PF
589	C851	3101080100010	1PF
590	C870	3101080100010	1PF
591	C873	3101080100010	1PF
592	C101	3101051590000	1.5PF
593	C102	3101060200010	2PF
594	C178	3101060200010	2PF
595	C2	3101060200010	2PF
596	C6153	3101050200010	2PF
597	C53	3101052290020	2.2PF
598	C9	3101052290020	2.2PF
599	C179	3101062490000	2.4PF
600	C830	3101080300010	3PF
601	C837	3101080300010	3PF
602	C838	3101080300010	3PF
603	C856	3101080300010	3PF
604	C6163	3101053390010	3.3PF
605	C13	3101053690000	3.6PF
606	C152	3101053690000	3.6PF
607	C159	3101053690000	3.6PF
608	C198	3101053690000	3.6PF
609	C55	3101063690000	3.6PF
610	C879	3101080400010	4PF
611	C11	3101050400010	4PF
612	C12	3101050400010	4PF
613	C18	3101050400010	4PF

No.	Ref. No.	Part No.	Description
614	C31	3101060500010	5PF
615	C6111	3101050500000	5PF
616	C6112	3101050500000	5PF
617	C192	3101060400010	4PF
618	C812	3101080500010	5PF
619	C820	3101080500010	5PF
620	C831	3101080500010	5PF
621	C833	3101080500010	5PF
622	C16	3101050500010	5PF
623	C164	3101050500010	5PF
624	C165	3101050500010	5PF
625	C166	3101050500010	5PF
626	C168	3101050500010	5PF
627	C25	3101050500010	5PF
628	C32	3101050500010	5PF
629	C819	3101080600010	6PF
630	C841	3101080600010	6PF
631	C56	3101050600010	6PF
632	C6114	3101050600010	6PF
633	C731	3101050600010	6PF
634	C190	3101060700020	7PF
635	C196	3101060700020	7PF
636	C26	3101060700020	7PF
637	C49	3101060700020	7PF
638	C177	3101060800010	8PF
639	C20	3101060800010	8PF
640	L166	3101060800010	8PF
641	R840	3101060800010	8PF
642	C22	3101050800000	8PF
643	C10	3101060900010	9PF
644	C6170	3101050900000	9PF
645	C823	3101081000010	10PF
646	C15	3101051000020	10PF
647	C61	3101051000020	10PF
648	C6117	3101051000020	10PF
649	C714	3101051000020	10PF
650	C751	3101051000020	10PF
651	C151	3101061000000	10PF
652	C155	3101061000000	10PF
653	C17	3101061000000	10PF
654	C14	3101051200020	12PF
655	C375	3101051200020	12PF
656	C376	3101051200020	12PF
657	C59	3101051200020	12PF

No.	Ref. No.	Part No.	Description
658	C6161	3101051200020	12PF
659	C6162	3101051200020	12PF
660	C6164	3101051200020	12PF
661	C189	3101061200000	12PF
662	C6129	3101051500020	15PF
663	C6130	3101051500020	15PF
664	C6177	3101051500020	15PF
665	C723	3101051500020	15PF
666	C818	3101061500010	15PF
667	L826	3101061600000	16PF
668	C4	3101051800010	18PF
669	C724	3101051800010	18PF
670	C814	3101061800000	18PF
671	C864	3101061800000	18PF
672	C8330	3101372200000	22PF
673	C842	3101372200000	22PF
674	C191	3101052200010	22PF
675	C6160	3101052200010	22PF
676	C730	3101052200010	22PF
677	C732	3101052200010	22PF
678	C918	3101052200010	22PF
679	C857	3101062200010	22PF
680	C889	3101062200010	22PF
681	C902	3101062200010	22PF
682	C193	3101052400010	24PF
683	C865	3101062400010	24PF
684	C158	3101052700000	27PF
685	C162	3101052700000	27PF
686	C931	3101062700010	27PF
687	C943	3101062700010	27PF
688	C846	3101072700000	27PF
689	C855	3101072700000	27PF
690	C885	3101082700010	27PF
691	C153	3101053000010	30PF
692	C154	3101053000010	30PF
693	C734	3101053000010	30PF
694	C500	3101053300000	33PF
695	C6134	3101053300000	33PF
696	C6135	3101053300000	33PF
697	C6136	3101053300000	33PF
698	C6137	3101053300000	33PF
699	C6138	3101053300000	33PF
700	C6139	3101053300000	33PF
701	C6140	3101053300000	33PF

No.	Ref. No.	Part No.	Description
702	C6141	3101053300000	33PF
703	C6142	3101053300000	33PF
704	C6143	3101053300000	33PF
705	C1004	3101063300000	33PF
706	C803	3101063300000	33PF
707	C888	3101063300000	33PF
708	C913	3101063300000	33PF
709	C364	3101053900000	39PF
710	C749	3101053900000	39PF
711	C3	3101054700010	47PF
712	L833	3101064700000	47PF
713	R824	3101064700000	47PF
714	C825	3101074700000	47PF
715	C157	3101055600000	56PF
716	C161	3101055600000	56PF
717	C185	3101055600000	56PF
718	C745	3101055600000	56PF
719	C922	3101055600000	56PF
720	C852	3101066800000	68PF
721	C940	3101066800000	68PF
722	C362	3101058200000	82PF
723	C363	3101058200000	82PF
724	C365	3101058200000	82PF
725	C949	3101058200000	82PF
726	C866	3101068200000	82PF
727	L829	3101068200000	82PF
728	L830	3101068200000	82PF
729	C121	3101051010030	100PF
730	C1320	3101051010030	100PF
731	C256	3101051010030	100PF
732	C288	3101051010030	100PF
733	C295	3101051010030	100PF
734	C307	3101051010030	100PF
735	C309	3101051010030	100PF
736	C326	3101051010030	100PF
737	C33	3101051010030	100PF
738	C335	3101051010030	100PF
739	C339	3101051010030	100PF
740	C34	3101051010030	100PF
741	C341	3101051010030	100PF
742	C342	3101051010030	100PF
743	C343	3101051010030	100PF
744	C344	3101051010030	100PF
745	C345	3101051010030	100PF

No.	Ref. No.	Part No.	Description
746	C346	3101051010030	100PF
747	C347	3101051010030	100PF
748	C348	3101051010030	100PF
749	C349	3101051010030	100PF
750	C350	3101051010030	100PF
751	C351	3101051010030	100PF
752	C352	3101051010030	100PF
753	C353	3101051010030	100PF
754	C354	3101051010030	100PF
755	C355	3101051010030	100PF
756	C357	3101051010030	100PF
757	C358	3101051010030	100PF
758	C359	3101051010030	100PF
759	C360	3101051010030	100PF
760	C361	3101051010030	100PF
761	C378	3101051010030	100PF
762	C385	3101051010030	100PF
763	C390	3101051010030	100PF
764	C409	3101051010030	100PF
765	C410	3101051010030	100PF
766	C411	3101051010030	100PF
767	C412	3101051010030	100PF
768	C413	3101051010030	100PF
769	C414	3101051010030	100PF
770	C415	3101051010030	100PF
771	C416	3101051010030	100PF
772	C417	3101051010030	100PF
773	C418	3101051010030	100PF
774	C419	3101051010030	100PF
775	C420	3101051010030	100PF
776	C426	3101051010030	100PF
777	C427	3101051010030	100PF
778	C428	3101051010030	100PF
779	C429	3101051010030	100PF
780	C430	3101051010030	100PF
781	C431	3101051010030	100PF
782	C435	3101051010030	100PF
783	C440	3101051010030	100PF
784	C441	3101051010030	100PF
785	C442	3101051010030	100PF
786	C443	3101051010030	100PF
787	C444	3101051010030	100PF
788	C445	3101051010030	100PF
789	C446	3101051010030	100PF

No.	Ref. No.	Part No.	Description
790	C447	3101051010030	100PF
791	C448	3101051010030	100PF
792	C449	3101051010030	100PF
793	C450	3101051010030	100PF
794	C451	3101051010030	100PF
795	C452	3101051010030	100PF
796	C453	3101051010030	100PF
797	C454	3101051010030	100PF
798	C455	3101051010030	100PF
799	C456	3101051010030	100PF
800	C463	3101051010030	100PF
801	C465	3101051010030	100PF
802	C466	3101051010030	100PF
803	C467	3101051010030	100PF
804	C468	3101051010030	100PF
805	C469	3101051010030	100PF
806	C470	3101051010030	100PF
807	C472	3101051010030	100PF
808	C477	3101051010030	100PF
809	C478	3101051010030	100PF
810	C479	3101051010030	100PF
811	C480	3101051010030	100PF
812	C510	3101051010030	100PF
813	C516	3101051010030	100PF
814	C517	3101051010030	100PF
815	C518	3101051010030	100PF
816	C6166	3101051010030	100PF
817	C721	3101051010030	100PF
818	C722	3101051010030	100PF
819	C738	3101051010030	100PF
820	C739	3101051010030	100PF
821	C76	3101051010030	100PF
822	C763	3101051010030	100PF
823	C764	3101051010030	100PF
824	C765	3101051010030	100PF
825	C766	3101051010030	100PF
826	C767	3101051010030	100PF
827	C769	3101051010030	100PF
828	C77	3101051010030	100PF
829	C90	3101051010030	100PF
830	C93	3101051010030	100PF
831	C6157	3101061010010	100PF
832	C891	3101051210000	120PF
833	C899	3101051210000	120PF

No.	Ref. No.	Part No.	Description
834	C6118	3101051510000	150PF
835	C875	3101051510000	150PF
836	C843	3101061510000	150PF
837	C847	3101061510000	150PF
838	C848	3101061510000	150PF
839	C716	3101061810010	180PF
840	C861	3101061810010	180PF
841	C100	3101052210010	220PF
842	C1000	3101052210010	220PF
843	C147	3101052210010	220PF
844	C150	3101052210010	220PF
845	C156	3101052210010	220PF
846	C160	3101052210010	220PF
847	C184	3101052210010	220PF
848	C186	3101052210010	220PF
849	C194	3101052210010	220PF
850	C197	3101052210010	220PF
851	C23	3101052210010	220PF
852	C247	3101052210010	220PF
853	C250	3101052210010	220PF
854	C254	3101052210010	220PF
855	C265	3101052210010	220PF
856	C269	3101052210010	220PF
857	C270	3101052210010	220PF
858	C271	3101052210010	220PF
859	C272	3101052210010	220PF
860	C273	3101052210010	220PF
861	C28	3101052210010	220PF
862	C280	3101052210010	220PF
863	C29	3101052210010	220PF
864	C421	3101052210010	220PF
865	C423	3101052210010	220PF
866	C424	3101052210010	220PF
867	C425	3101052210010	220PF
868	C432	3101052210010	220PF
869	C433	3101052210010	220PF
870	C434	3101052210010	220PF
871	C436	3101052210010	220PF
872	C437	3101052210010	220PF
873	C46	3101052210010	220PF
874	C52	3101052210010	220PF
875	C6	3101052210010	220PF
876	C6103	3101052210010	220PF
877	C6105	3101052210010	220PF

No.	Ref. No.	Part No.	Description
878	C6106	3101052210010	220PF
879	C6107	3101052210010	220PF
880	C6128	3101052210010	220PF
881	C6144	3101052210010	220PF
882	C6159	3101052210010	220PF
883	C704	3101052210010	220PF
884	C883	3101052210010	220PF
885	C890	3101052210010	220PF
886	C895	3101052210010	220PF
887	C896	3101052210010	220PF
888	C897	3101052210010	220PF
889	C898	3101052210010	220PF
890	C921	3101052210010	220PF
891	L6216	3101052210010	220PF
892	L6217	3101052210010	220PF
893	C242	3101062210000	220PF
894	C245	3101062210000	220PF
895	C808	3101062210000	220PF
896	C809	3101062210000	220PF
897	C822	3101062210000	220PF
898	C845	3101062210000	220PF
899	C853	3101062210000	220PF
900	C877	3101062210000	220PF
901	C878	3101062210000	220PF
902	C887	3101062210000	220PF
903	C892	3101062210000	220PF
904	C99	3101052710000	270PF
905	C501	3101053310020	330PF
906	C911	3101053310020	330PF
907	C909	3101063310010	330PF
908	C1001	3101054710010	470PF
909	C1003	3101054710010	470PF
910	C1015	3101054710010	470PF
911	C142	3101054710010	470PF
912	C148	3101054710010	470PF
913	C21	3101054710010	470PF
914	C50	3101054710010	470PF
915	C6102	3101054710010	470PF
916	C6146	3101054710010	470PF
917	C6148	3101054710010	470PF
918	C6151	3101054710010	470PF
919	C706	3101054710010	470PF
920	C717	3101054710010	470PF
921	C727	3101054710010	470PF

No.	Ref. No.	Part No.	Description
922	C746	3101054710010	470PF
923	C8	3101054710010	470PF
924	C945	3101054710010	470PF
925	C811	3101064710000	470PF
926	C817	3101064710000	470PF
927	C850	3101084710010	470PF
928	C827	3101374710000	470PF
929	C893	3101374710000	470PF
930	C1	3101051020010	1000PF
931	C1002	3101051020010	1000PF
932	C1010	3101051020010	1000PF
933	C337	3101051020010	1000PF
934	C338	3101051020010	1000PF
935	C404	3101051020010	1000PF
936	C484	3101051020010	1000PF
937	C503	3101051020010	1000PF
938	C513	3101051020010	1000PF
939	C60	3101051020010	1000PF
940	C710	3101051020010	1000PF
941	C728	3101051020010	1000PF
942	C75	3101051020010	1000PF
943	C79	3101051020010	1000PF
944	C82	3101051020010	1000PF
945	C910	3101051020010	1000PF
946	C937	3101051020010	1000PF
947	C944	3101051020010	1000PF
948	C96	3101051020010	1000PF
949	C801	3101081020010	1000PF
950	C406	3101051220000	1200PF
951	C502	3101053320010	3300PF
952	C802	3101063320000	3300PF
953	C916	3101063320000	3300PF
954	C713	3101053920000	3900PF
955	C863	3101064720000	4700PF
956	C483	3101058220000	8200PF
957	C199	3101051030020	0.01UF
958	C235	3101051030020	0.01UF
959	C260	3101051030020	0.01UF
960	C261	3101051030020	0.01UF
961	C306	3101051030020	0.01UF
962	C381	3101051030020	0.01UF
963	C384	3101051030020	0.01UF
964	C399	3101051030020	0.01UF
965	C506	3101051030020	0.01UF

No.	Ref. No.	Part No.	Description
966	C507	3101051030020	0.01UF
967	C58	3101051030020	0.01UF
968	C6147	3101051030020	0.01UF
969	C6178	3101051030020	0.01UF
970	C702	3101051030020	0.01UF
971	C725	3101051030020	0.01UF
972	C736	3101051030020	0.01UF
973	C80	3101051030020	0.01UF
974	C95	3101051030020	0.01UF
975	C97	3101051030020	0.01UF
976	C952	3101061030010	0.01UF
977	C894	3101051830000	0.018UF
978	C930	3101061830000	0.018UF
979	C246	3101052230000	0.022UF
980	C880	3101063930000	0.039UF
981	C1016	3101065630000	0.056UF
982	C1006	3101051040010	0.1UF
983	C141	3101051040010	0.1UF
984	C149	3101051040010	0.1UF
985	C163	3101051040010	0.1UF
986	C167	3101051040010	0.1UF
987	C195	3101051040010	0.1UF
988	C232	3101051040010	0.1UF
989	C233	3101051040010	0.1UF
990	C236	3101051040010	0.1UF
991	C239	3101051040010	0.1UF
992	C24	3101051040010	0.1UF
993	C240	3101051040010	0.1UF
994	C243	3101051040010	0.1UF
995	C248	3101051040010	0.1UF
996	C258	3101051040010	0.1UF
997	C267	3101051040010	0.1UF
998	C274	3101051040010	0.1UF
999	C285	3101051040010	0.1UF
1000	C30	3101051040010	0.1UF
1001	C308	3101051040010	0.1UF
1002	C311	3101051040010	0.1UF
1003	C325	3101051040010	0.1UF
1004	C329	3101051040010	0.1UF
1005	C330	3101051040010	0.1UF
1006	C332	3101051040010	0.1UF
1007	C334	3101051040010	0.1UF
1008	C336	3101051040010	0.1UF
1009	C356	3101051040010	0.1UF

No.	Ref. No.	Part No.	Description
1010	C366	3101051040010	0.1UF
1011	C379	3101051040010	0.1UF
1012	C380	3101051040010	0.1UF
1013	C382	3101051040010	0.1UF
1014	C383	3101051040010	0.1UF
1015	C386	3101051040010	0.1UF
1016	C387	3101051040010	0.1UF
1017	C388	3101051040010	0.1UF
1018	C389	3101051040010	0.1UF
1019	C391	3101051040010	0.1UF
1020	C392	3101051040010	0.1UF
1021	C393	3101051040010	0.1UF
1022	C394	3101051040010	0.1UF
1023	C398	3101051040010	0.1UF
1024	C400	3101051040010	0.1UF
1025	C407	3101051040010	0.1UF
1026	C422	3101051040010	0.1UF
1027	C471	3101051040010	0.1UF
1028	C473	3101051040010	0.1UF
1029	C509	3101051040010	0.1UF
1030	C512	3101051040010	0.1UF
1031	C514	3101051040010	0.1UF
1032	C515	3101051040010	0.1UF
1033	C6104	3101051040010	0.1UF
1034	C6113	3101051040010	0.1UF
1035	C6168	3101051040010	0.1UF
1036	C6169	3101051040010	0.1UF
1037	C6171	3101051040010	0.1UF
1038	C6173	3101051040010	0.1UF
1039	C6175	3101051040010	0.1UF
1040	C6179	3101051040010	0.1UF
1041	C6180	3101051040010	0.1UF
1042	C7	3101051040010	0.1UF
1043	C705	3101051040010	0.1UF
1044	C707	3101051040010	0.1UF
1045	C708	3101051040010	0.1UF
1046	C712	3101051040010	0.1UF
1047	C720	3101051040010	0.1UF
1048	C729	3101051040010	0.1UF
1049	C733	3101051040010	0.1UF
1050	C735	3101051040010	0.1UF
1051	C737	3101051040010	0.1UF
1052	C740	3101051040010	0.1UF
1053	C741	3101051040010	0.1UF

No.	Ref. No.	Part No.	Description
1054	C744	3101051040010	0.1UF
1055	C756	3101051040010	0.1UF
1056	C83	3101051040010	0.1UF
1057	C85	3101051040010	0.1UF
1058	C86	3101051040010	0.1UF
1059	C87	3101051040010	0.1UF
1060	C89	3101051040010	0.1UF
1061	C947	3101051040010	0.1UF
1062	C950	3101051040010	0.1UF
1063	C955	3101051040010	0.1UF
1064	C958	3101051040010	0.1UF
1065	C967	3101051040010	0.1UF
1066	C968	3101051040010	0.1UF
1067	C969	3101051040010	0.1UF
1068	C978	3101051040010	0.1UF
1069	C98	3101051040010	0.1UF
1070	C122	3101061040010	0.1UF
1071	C123	3101061040010	0.1UF
1072	C283	3101061040010	0.1UF
1073	C289	3101061040010	0.1UF
1074	C6193	3101061040010	0.1UF
1075	C748	3101061040010	0.1UF
1076	C829	3101061040010	0.1UF
1077	C854	3101061040010	0.1UF
1078	C868	3101061040010	0.1UF
1079	C907	3101061040010	0.1UF
1080	C927	3101061040010	0.1UF
1081	C935	3101061040010	0.1UF
1082	C936	3101061040010	0.1UF
1083	C942	3101061040010	0.1UF
1084	C948	3101061040010	0.1UF
1085	C959	3101061040010	0.1UF
1086	C963	3101061040010	0.1UF
1087	L6122	3101061040010	0.1UF
1088	L6126	3101061040010	0.1UF
1089	C1005	3110071040000	0.1UF
1090	C1007	3110071040000	0.1UF
1091	C64	3110071040000	0.1UF
1092	C66	3110071040000	0.1UF
1093	C67	3110071040000	0.1UF
1094	C68	3110071040000	0.1UF
1095	C69	3110071040000	0.1UF
1096	C70	3110071040000	0.1UF
1097	C72	3110071040000	0.1UF

No.	Ref. No.	Part No.	Description
1098	C74	3110071040000	0.1UF
1099	C78	3110071040000	0.1UF
1100	C84	3110071040000	0.1UF
1101	C88	3110071040000	0.1UF
1102	C91	3110071040000	0.1UF
1103	C94	3110071040000	0.1UF
1104	C941	3101051540000	0.15UF
1105	C132	3101062240000	0.22UF
1106	C294	3101063340000	0.33UF
1107	C438	3101054740000	0.47UF
1108	C439	3101054740000	0.47UF
1109	C287	3101064740000	0.47UF
1110	C715	3101064740000	0.47UF
1111	C255	3101051050000	1UF
1112	C276	3101051050000	1UF
1113	C305	3101051050000	1UF
1114	C310	3101051050000	1UF
1115	C719	3101051050000	1UF
1116	C962	3101051050000	1UF
1117	C200	3101061050020	1UF
1118	C238	3101061050020	1UF
1119	C249	3101061050020	1UF
1120	C251	3101061050020	1UF
1121	C252	3101061050020	1UF
1122	C253	3101061050020	1UF
1123	C257	3101061050020	1UF
1124	C259	3101061050020	1UF
1125	C262	3101061050020	1UF
1126	C263	3101061050020	1UF
1127	C264	3101061050020	1UF
1128	C266	3101061050020	1UF
1129	C268	3101061050020	1UF
1130	C277	3101061050020	1UF
1131	C278	3101061050020	1UF
1132	C279	3101061050020	1UF
1133	C281	3101061050020	1UF
1134	C282	3101061050020	1UF
1135	C290	3101061050020	1UF
1136	C291	3101061050020	1UF
1137	C298	3101061050020	1UF
1138	C299	3101061050020	1UF
1139	C396	3101061050020	1UF
1140	C6100	3101061050020	1UF
1141	C6145	3101061050020	1UF

No.	Ref. No.	Part No.	Description
1142	C6149	3101061050020	1UF
1143	C6185	3101061050020	1UF
1144	C6190	3101061050020	1UF
1145	C742	3101061050020	1UF
1146	C754	3101061050020	1UF
1147	C900	3101061050020	1UF
1148	C901	3101061050020	1UF
1149	C905	3101061050020	1UF
1150	C906	3101061050020	1UF
1151	C908	3101061050020	1UF
1152	C923	3101061050020	1UF
1153	C924	3101061050020	1UF
1154	C925	3101061050020	1UF
1155	C946	3101061050020	1UF
1156	C966	3101061050020	1UF
1157	C71	3101071050020	1UF
1158	C750	3101071050020	1UF
1159	C920	3101062250000	2.2UF
1160	C932	3101062250000	2.2UF
1161	C934	3101062250000	2.2UF
1162	C965	3101062250000	2.2UF
1163	C912	3101072250030	2.2UF
1164	C292	3101064750030	4.7UF
1165	C136	3101074750010	4.7UF
1166	C405	3104074750070	4.7UF
1167	C275	3101071060010	10UF
1168	C293	3101071060010	10UF
1169	C401	3101071060010	10UF
1170	C402	3101071060010	10UF
1171	C508	3101071060010	10UF
1172	C511	3101071060010	10UF
1173	C519	3101071060010	10UF
1174	C520	3101071060010	10UF
1175	C917	3101071060010	10UF
1176	C926	3101071060010	10UF
1177	C929	3101071060010	10UF
1178	C234	3101081060010	10UF
1179	C286	3101081060010	10UF
1180	C331	3101081060010	10UF
1181	C333	3101081060010	10UF
1182	C807	3101081060010	10UF
1183	C928	3101081060010	10UF
1184	C956	3101081060010	10UF
1185	C957	3101081060010	10UF

No.	Ref. No.	Part No.	Description
1186	C980	3101081060010	10UF
1187	C981	3101081060010	10UF
1188	C951	3104081060120	10UF
1189	C919	3101072260000	22UF
1190	C915	3101082260020	22UF
1191	C804	3101092260010	22UF
1192	C933	3101092260010	22UF
1193	C284	3103994760180	47UF
1194	C914	3103994760180	47UF
1195	L105	3237199050000	5nH
1196	L114	3237199050000	5nH
1197	L814	3212106569000	5.6nH
1198	C6194	3212106689000	6.8nH
1199	L832	3212106689000	6.8nH
1200	L811	3217106829010	8.2nH
1201	L124	3237199080000	Air-core coil
1202	L137	3237199080000	Air-core coil
1203	L136	3212106120000	12nH
1204	L122	3210306150000	15nH
1205	L123	3210306150000	15nH
1206	L128	3210306150000	15nH
1207	L171	3210306150000	15nH
1208	L173	3210306150000	15nH
1209	L2	3210306150000	15nH
1210	L6103	3210306150000	15nH
1211	L6110	3210306150000	15nH
1212	L6116	3210306150000	15nH
1213	L6118	3210306150000	15nH
1214	L106	3214307180000	18nH
1215	L115	3214307180000	18nH
1216	L6117	3210306180000	18nH
1217	L6119	3210306180000	18nH
1218	C826	3210306220000	22nH
1219	L805	3210306220000	22nH
1220	L126	3214307270010	27nH
1221	L139	3214307270010	27nH
1222	L132	3210306270000	27nH
1223	L135	3210306270000	27nH
1224	L162	3210306270000	27nH
1225	L167	3210306270000	27nH
1226	L168	3210306270000	27nH
1227	L169	3210306270000	27nH
1228	L321	3212106390000	39nH
1229	L827	3212106390000	39nH

No.	Ref. No.	Part No.	Description
1230	L6120	3210306470000	47nH
1231	L6102	3210306221000	220nH
1232	L708	3217107221010	220nH
1233	L6125	3210406331000	330nH
1234	L716	3210406331000	330nH
1235	L147	3210406471000	470nH
1236	L151	3210406471000	470nH
1237	L718	3210406471000	470nH
1238	L103	3217607471000	470nH
1239	L107	3217607471000	470nH
1240	L108	3217607471000	470nH
1241	L110	3217607471000	470nH
1242	L112	3217607471000	470nH
1243	L116	3217607471000	470nH
1244	L117	3217607471000	470nH
1245	L118	3217607471000	470nH
1246	L121	3217607471000	470nH
1247	L127	3217607471000	470nH
1248	L129	3217607471000	470nH
1249	L133	3217607471000	470nH
1250	L134	3217607471000	470nH
1251	L140	3217607471000	470nH
1252	L4	3217607471000	470nH
1253	L5	3217607471000	470nH
1254	L154	3213306561000	560nH
1255	L713	3213306561000	560nH
1256	L6123	3213306821000	820nH
1257	L131	3221506601000	Bead
1258	L152	3221506601000	Bead
1259	L6	3221506601000	Bead
1260	L7	3221506601000	Bead
1261	L701	3221506601000	Bead
1262	L702	3221506601000	Bead
1263	L703	3221506601000	Bead
1264	L706	3221506601000	Bead
1265	L707	3221506601000	Bead
1266	L709	3221506601000	Bead
1267	L710	3221506601000	Bead
1268	L711	3221506601000	Bead
1269	L712	3221506601000	Bead
1270	L714	3221506601000	Bead
1271	L8	3221506601000	Bead
1272	L815	3221506601000	Bead
1273	L821	3221506601000	Bead

No.	Ref. No.	Part No.	Description
1274	L822	3221506601000	Bead
1275	L824	3221506601000	Bead
1276	L825	3221506601000	Bead
1277	L9	3221506601000	Bead
1278	R153	3221506601000	Bead
1279	R157	3221506601000	Bead
1280	R179	3221506601000	Bead
1281	R186	3221506601000	Bead
1282	L801	3221513600000	Bead
1283	L802	3221513600000	Bead
1284	L803	3221513600000	Bead
1285	L900	3221513600000	Bead
1286	L916	3221513600000	Bead
1287	L917	3221513600000	Bead
1288	L940	3221513600000	Bead
1289	L232	3221506300000	Bead
1290	L322	3221506300000	Bead
1291	L401	3221506300000	Bead
1292	L402	3221506300000	Bead
1293	L403	3221506300000	Bead
1294	L404	3221506300000	Bead
1295	L405	3221506300000	Bead
1296	L406	3221506300000	Bead
1297	L407	3221506300000	Bead
1298	L408	3221506300000	Bead
1299	L409	3221506300000	Bead
1300	L410	3221506300000	Bead
1301	L411	3221506300000	Bead
1302	L412	3221506300000	Bead
1303	L901	3221506300000	Bead
1304	L912	3221506300000	Bead
1305	L913	3221506300000	Bead
1306	L904	3221506181000	Bead
1307	L908	3221506181000	Bead
1308	L233	3211506101000	Bead
1309	L234	3211506101000	Bead
1310	L235	3211506101000	Bead
1311	L500	3211506101000	Bead
1312	L6100	3211506101000	Bead
1313	L6101	3211506101000	Bead
1314	L6114	3211506101000	Bead
1315	L6115	3211506101000	Bead
1316	L6121	3211506101000	Bead
1317	L816	3233099111000	111nH

No.	Ref. No.	Part No.	Description
1318	L804	3233099160000	16nH
1319	L809	3233099160000	16nH
1320	L810	3233099160000	16nH
1321	L813	3233099160000	16nH
1322	L817	3233099160000	16nH
1323	L807	3210306101000	100nH
1324	L820	3217112102020	1uH
1325	L828	3217112102020	1uH
1326	L1	3213212332000	3.3uH
1327	L156	3213212332000	3.3uH
1328	L715	3213212332000	3.3uH
1329	L717	3212206682000	6.8uH
1330	L903	3213099472000	4.7uH
1331	L931	3213099472000	4.7uH
1332	L902	3217299103000	10uH
1333	L930	3241799103000	10uH
1334	L704	3213212103000	10uH
1335	L705	3213212103000	10uH
1336	D100	3303990000060	Switching diode
1337	D129	3303990000060	Switching diode
1338	D701	3304060300050	Varactor
1339	D101	3304010100220	Varactor
1340	D102	3304010100220	Varactor
1341	D105	3304010100220	Varactor
1342	D106	3304010100220	Varactor
1343	D107	3304010100220	Varactor
1344	D108	3304010100220	Varactor
1345	D109	3304010100220	Varactor
1346	D110	3304010100220	Varactor
1347	D111	3304010100220	Varactor
1348	D112	3304010100220	Varactor
1349	D113	3304010100220	Varactor
1350	D116	3304010100220	Varactor
1351	D117	3304010100220	Varactor
1352	D121	3304010100220	Varactor
1353	D122	3304010100220	Varactor
1354	D125	3304010100220	Varactor
1355	D126	3304010100220	Varactor
1356	D127	3303030100010	Switching diode
1357	D128	3303030100010	Switching diode
1358	D230	3310240000000	Diode
1359	D231	3310240000000	Diode
1360	D233	3310240000000	Diode
1361	D240	3310240000000	Diode

No.	Ref. No.	Part No.	Description
1362	D402	3310240000000	Diode
1363	D403	3310240000000	Diode
1364	D404	3310240000000	Diode
1365	D405	3310240000000	Diode
1366	D406	3310240000000	Diode
1367	D234	3310240200000	Diode
1368	D236	3310240200000	Diode
1369	D239	3310240200000	Diode
1370	D235	3302031100010	Zener diode
1371	D241	3302031100010	Zener diode
1372	D409	3310240000040	Diode
1373	D237	3310990000090	Diode
1374	D238	3310990000090	Diode
1375	D407	3399040600010	Diode
1376	D408	3399040600010	Diode
1377	D450	3699037000010	USB IC
1378	D702	3304060300010	Varactor
1379	D801	3303210100000	Switching diode
1380	D802	3303210100000	Switching diode
1381	D803	3303030300000	Diode
1382	D804	3303030300000	Diode
1383	D901	3303040400000	Switching diode
1384	D902	3301100300030	Diode
1385	D6100	3303060300010	Switching diode
1386	D906	3303060300010	Switching diode
1387	D907	3303060300010	Switching diode
1388	D909	3303060300010	Switching diode
1389	D911	3303060300010	Switching diode
1390	D914	3303060300010	Switching diode
1391	D910	3302030500010	Zener diode
1392	D915	3303010500290	Switching diode
1393	D805	3302030500030	Zener diode
1394	D917	3302030500030	Zener diode
1395	D6101	3304010101100	Varactor
1396	D6102	3304010101100	Varactor
1397	D6103	3304010101100	Varactor
1398	D6104	3304010101100	Varactor
1399	D6105	3399990000260	Diode
1400	D6106	3699019000000	Mixer
1401	Q1	3503020000030	N-MOSFET
1402	Q100	3408002000080	NPN transistor
1403	Q103	3408002000080	NPN transistor
1404	Q106	3408002000080	NPN transistor
1405	Q110	3408002000080	NPN transistor

No.	Ref. No.	Part No.	Description
1406	Q101	3403999000000	Transistor
1407	Q105	3403999000000	Transistor
1408	Q108	3403999000000	Transistor
1409	Q112	3403999000000	Transistor
1410	Q116	3403999000000	Transistor
1411	Q117	3403999000000	Transistor
1412	Q102	3401002000990	NPN transistor
1413	Q111	3401002000990	NPN transistor
1414	Q104	3403003000060	NPN transistor
1415	Q702	3403003000060	NPN transistor
1416	Q107	3404006000000	NPN transistor
1417	Q109	3404006000000	NPN transistor
1418	Q6104	3404006000000	NPN transistor
1419	Q6105	3404006000000	NPN transistor
1420	Q230	3499000000150	Transistor
1421	Q231	3499000000150	Transistor
1422	Q232	3499000000150	Transistor
1423	Q233	3499000000150	Transistor
1424	Q234	3499000000150	Transistor
1425	Q235	3499000000150	Transistor
1426	Q6100	3499000000150	Transistor
1427	Q905	3499000000150	Transistor
1428	Q323	3403008000010	Transistor
1429	Q401	3403008000010	Transistor
1430	Q402	3403008000010	Transistor
1431	Q403	3403008000010	Transistor
1432	Q404	3403008000010	Transistor
1433	Q405	3403008000010	Transistor
1434	Q413	3403008000010	Transistor
1435	Q811	3403008000010	Transistor
1436	Q812	3403008000010	Transistor
1437	Q813	3403008000010	Transistor
1438	Q903	3403008000010	Transistor
1439	Q908	3403008000010	Transistor
1440	Q912	3403008000010	Transistor
1441	Q913	3403008000010	Transistor
1442	Q914	3403008000010	Transistor
1443	Q922	3403008000010	Transistor
1444	Q923	3403008000010	Transistor
1445	Q406	3414999000000	Transistor
1446	Q407	3414999000000	Transistor
1447	Q408	3414999000000	Transistor
1448	Q409	3414999000000	Transistor
1449	Q410	3414999000000	Transistor

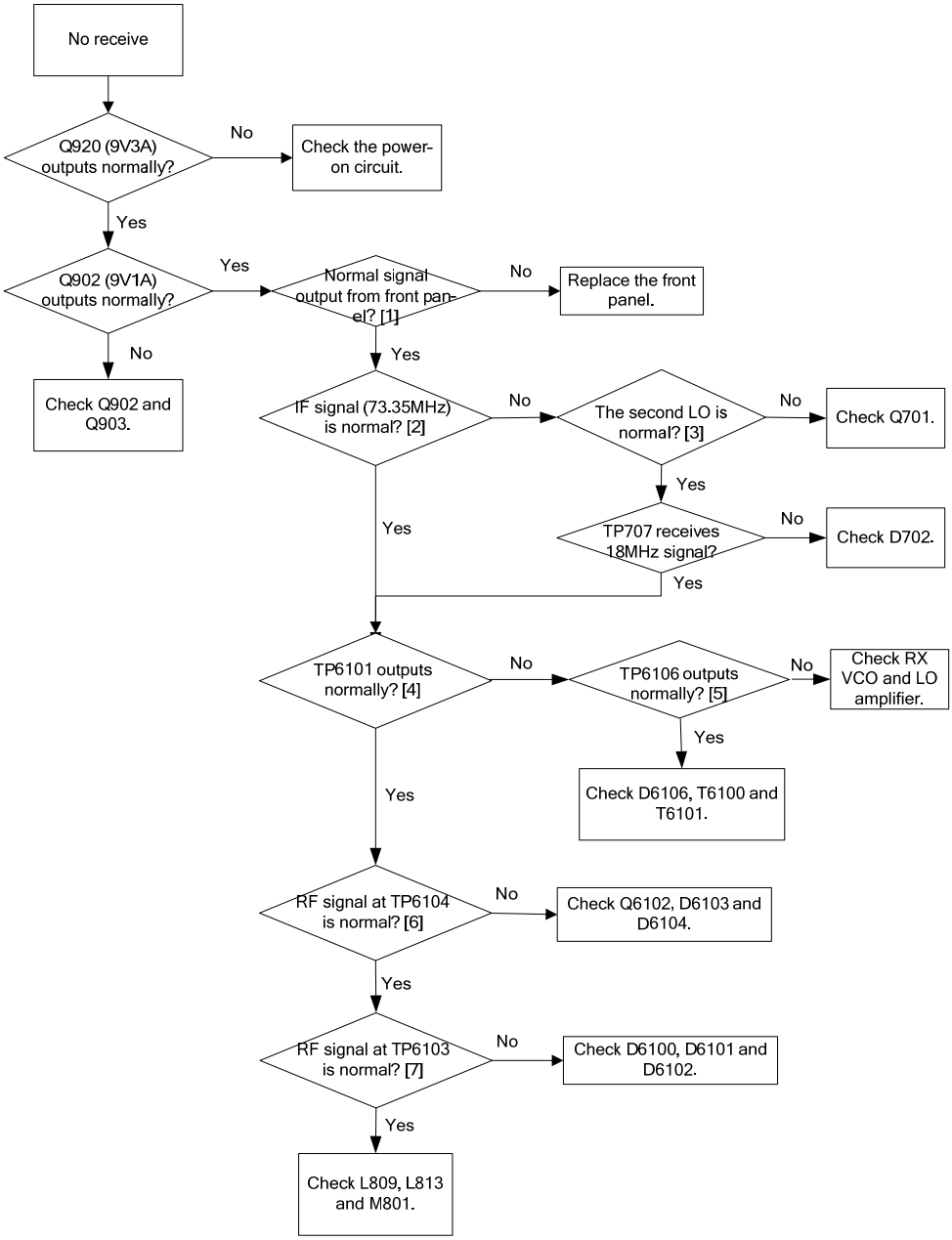
No.	Ref. No.	Part No.	Description
1450	Q411	3414999000000	Transistor
1451	Q412	3414999000000	Transistor
1452	Q701	3408002000000	NPN transistor
1453	Q6102	3404999000000	NPN transistor
1454	Q6103	3404999000000	NPN transistor
1455	Q801	3404999000000	NPN transistor
1456	Q804	3504990000040	RD07MU
1457	Q805	3504990000010	RD01MU
1458	Q810	3403002000000	PNP transistor
1459	Q902	3403002000000	PNP transistor
1460	Q906	3414001000020	NPN transistor
1461	Q910	3414001000020	NPN transistor
1462	Q909	3403002000010	PNPtransistor
1463	Q6101	3403014000020	Transistor
1464	T6100	3244599189000	4BLH
1465	T6101	3244599189000	4BLH
1466	U100	3604019000000	SKY2310
1467	U101	3616059000000	FS66P5X
1468	U102	3616059000000	FS66P5X
1469	U201	3602017006350	TDA7297D
1470	U231	3613010000000	TLV320A
1471	U233	3612002000020	NOR-FLASH+PSRAM
1472	U235	3605010000020	LM2902
1473	U236	3605010000020	LM2902
1474	U237	3616010000000	TS5A3159DCKR
1475	U238	3605008005070	NJM2904
1476	U804	3605008005070	NJM2904
1477	U914	3605008005070	NJM2904
1478	U302	3610010000010	OMAP5912Z
1479	U401	3699053000000	SmartSwich
1480	U500	3606010000010	TLV5614IPWR
1481	U701	3603999000000	AD9864
1482	U702	3608006000000	Power management IC
1483	U900	3608006000000	Power management IC
1484	U901	3608006000000	Power management IC
1485	U909	3608006000000	Power management IC
1486	U703	3608015000060	Power management IC
1487	U905	3608015000060	Power management IC
1488	U915	3608015000060	Power management IC
1489	U902	3608053000010	Power management IC
1490	U903	3608015000170	Power management IC
1491	U918	3608015000210	Power management IC
1492	U919	3608010006230	Power management IC
1493	U802	3605002054590	OPAMP

No.	Ref. No.	Part No.	Description
1494	U6000	3605002057090	OPAMP
1495	U910	3609010000170	Reset IC
1496	U917	3609006003050	Reset IC
1497	X100	3701019250030	19.2MHZ TCXO
1498	X302	3701019250040	19.2MHZ TCXO
1499	X375	3701327610060	CRYSTAL 32.768KHz
1500	Z6100	3802733540030	D73312GQ22
1501	PCB	41MD7801000F0	PCB
1502		6202010000000	APC shielding mask
1503		6201928000000	VCO shielding mask
1504	F900	4099000000050	Fuse
1505	J404	5206040200010	FFC
1506	L819	3233099470000	47nH
1507	C726	3101074750000	4.7UF
1508	C752	3101074750000	4.7UF
1509	C755	3101074750000	4.7UF
1510	C718	3101051050160	1uF
1511	C237	3101054740020	0.47uF
1512	Q400	3413001000010	NPN transistor
1513	D900	3302060000000	Zener diode
1514	Q921	3404999000020	NPN transistor
1515	U232	3612044000010	MT48H8M16LFB4
1516	U328	3607082000040	MC4HC595ADTG
1517	D912	3311240100000	MBRM120LT1G
1518	D913	3311240100000	MBRM120LT1G
1519	U906	3609010000210	Reset IC
1520	U327	3607023000150	74AHCT594PW
1521	R122	3001056800010	68Ω
1522	C881	3001065120000	5.1k
1523	C6109	3101050300000	3PF
1524	C6133	3101050300000	3PF
1525	C5	3101052000020	20PF
1526	C504	3101056810010	680PF
1527	C810	3101073000000	30PF
1528	C840	3101073000000	30PF
1529	C816	3101371590000	1.5pF
1530	U801	3605025000020	AD8566ARMZ
1531	C6116	3199050758000	0.75PF
1532	U326	3625999000030	GPS
1533	C6119	3101050590020	0.5PF
1534	C6122	3101050590020	0.5PF
1535	C6110	3101051290040	1.2PF
1536	C6120	3101051890050	1.8PF
1537	C6121	3101051890050	1.8PF

No.	Ref. No.	Part No.	Description
1538	C6126	3101051890050	1.8PF
1539	C6127	3101051890050	1.8PF

14.8 Troubleshooting Flow Chart

Receiver Circuit



Description of Normal Situations:

[1] During sensitivity test, use a communication test set to demodulate the audio signal (TP4012 and TP4016). If the signal is demodulated normally, it is concluded that the front panel is defective.

[2] Use the communication test set to input a 73.35MHz IF signal at the mixer, and see whether it can be processed normally afterwards.

[3] Use a spectrum analyzer to check whether TP704 can output the second LO signal (71.1MHz).

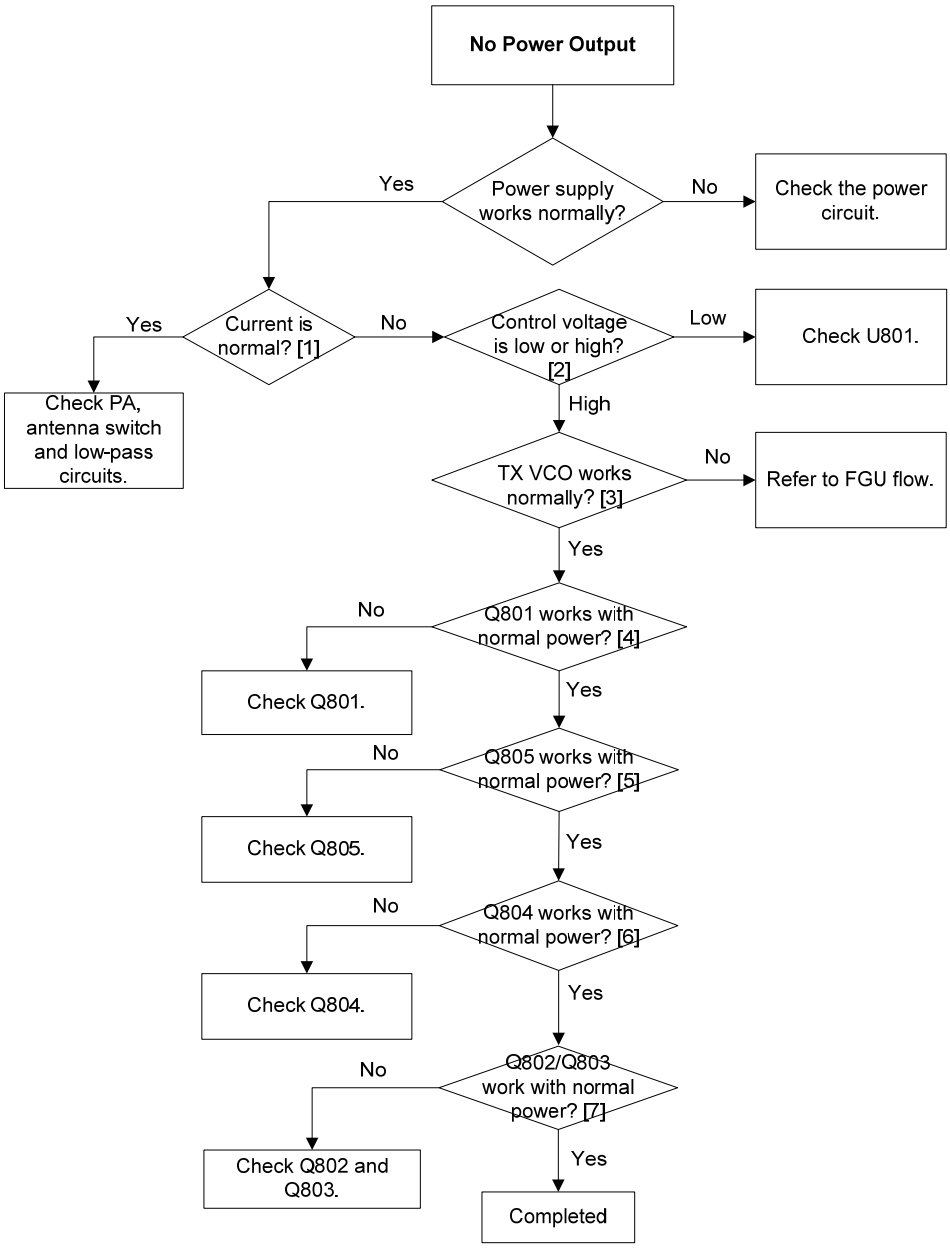
[4] Use the communication test set to apply an RF signal of -100dBm, and test the sensitivity.

[5] Use a spectrum analyzer to test the LO signal received by TP6106. If its strength is about 18dBm, go to check the mixer; otherwise, check the VCO.

[6] Use the communication test set to apply an RF signal of -110dBm at TP6104, and test the sensitivity.

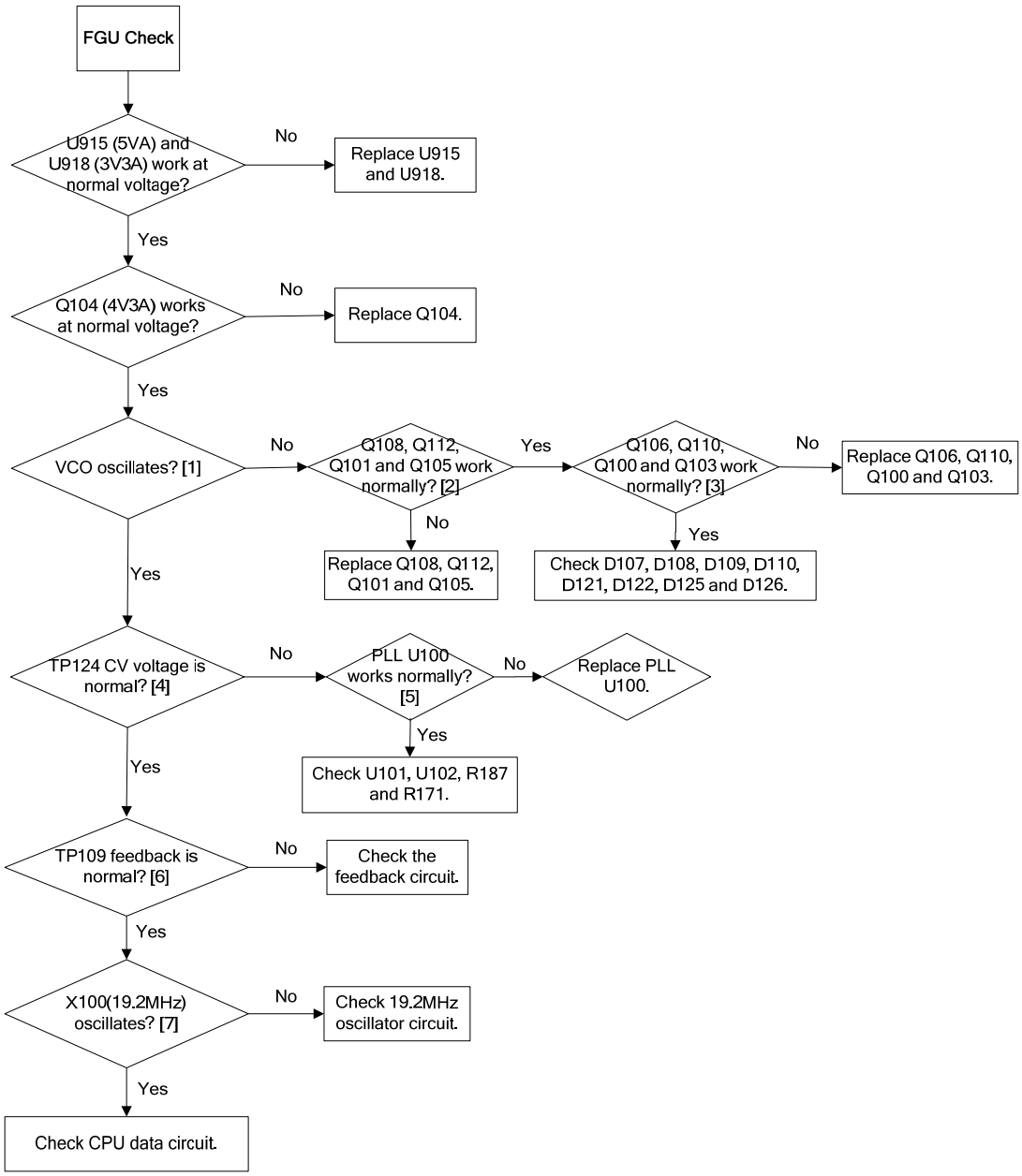
[7] Use the communication test set to apply an RF signal of -110dBm at TP6103, and test the sensitivity.

Transmitter Circuit



Description of Normal Situations:
[1] The current in analog mode is above 6A under 45W power supply and above 1A under 5W. However, in digital mode, the current will be reduced by 50%.
[2] The APC voltage should be above 2V at TP811.
[3] Check whether there is an appropriate TX LO signal at TP803.
[4] Check whether the gain is 16dB and the input signal is 0dBm at Q801.
[5] Check whether the gain is 15dB and the input signal is 0dBm at Q805.
[6] Check whether the gain is 11dB and the input signal is 0dBm at Q804.
[7] Check whether the gain is 10dB and the input signal is 0dBm at Q802 and Q803.

FGU


FGU Check
U915 (5VA) and U918 (3V3A) work at normal voltage?
No
Replace U915 and U918.
Yes
Q104 (4V3A) works at normal voltage?
No
Replace Q104.
Yes
VCO oscillates? [1]
No
Q108, Q112, Q101 and Q105 work normally? [2]
Yes
Q106, Q110, Q100 and Q103 work normally? [3]
No
Replace Q106, Q110, Q100 and Q103.
No
Replace Q108, Q112, Q101 and Q105.
Yes
Check D107, D108, D109, D110, D121, D122, D125 and D126.
Yes
TP124 CV voltage is normal? [4]
No
PLL U100 works normally? [5]
No
Replace PLL U100.
Yes
Check U101, U102, R187 and R171.
Yes
TP109 feedback is normal? [6]
No
Check the feedback circuit.
Yes
X100(19.2MHz) oscillates? [7]
No
Check 19.2MHz oscillator circuit.
Yes
Check CPU data circuit.

Description of Normal Situations:

[1] Detect the oscillation frequency of RX TP123 and TX TP111 using a spectrum analyzer.

[2] Check whether switches (Q108, Q112, Q101 and Q105) are turned on and output 3.6V.

[3] Check whether the emitter voltage of the four transistors (Q106, Q110, Q100 and Q103) is about 1.8V under normal RX/TX status.

[4] Check the CV of TP124. The normal value should range from 0.5V to 4.5V.

[5] Check whether U100 is supplied by 5V and 3.3V normally.

[6] Check whether the power from TP109 to PLL is about -15dBm.

[7] Check whether TP100 outputs 19.2MHz signal.

15.UHF3 (350-400MHz 25W) Information

15.1 Transmitter Circuit

The transmitter circuit is composed of power amplifier circuit and power control circuit. The former is used to amplify the VCO signal to the desired output power level, while the latter can keep the output power at the desired level, so as to protect the power amplifier from damage caused by over heat, antenna mismatch, and out-of-range voltage (over voltage or under voltage may result in damage to Q801, Q805, Q804, Q802 and Q803).

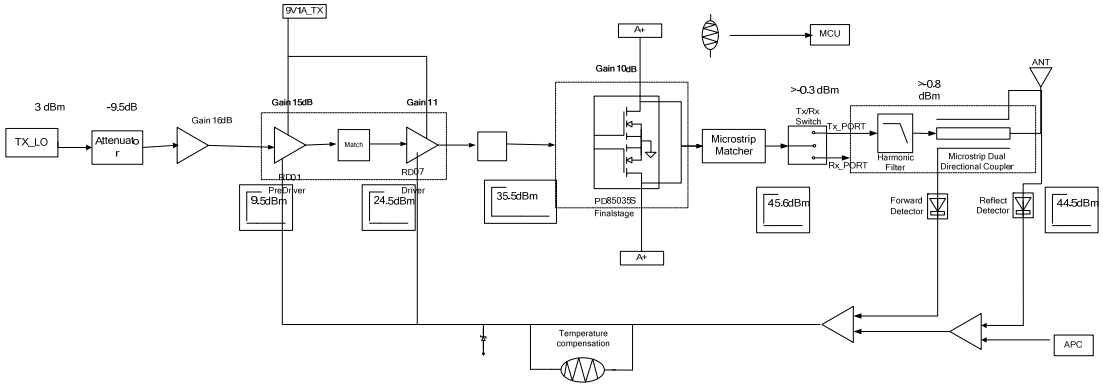


Figure 15-1 Diagram of Transmitter Circuit

15.1.1 Power Amplifier

The 4-stage power amplifier amplifies the signal output from VCO to the required output power level. The first stage is a buffer amplifier circuit with fixed gain; the second stage is a pre-driver power amplifier circuit with variable gain (formed by Q805); the third stage is a driver power amplifier circuit with variable gain (formed by Q804); and the final stage is the final power amplifier circuit with fixed gain (formed by Q802 and Q803). In addition, this power amplifier contains a TX/RX switch and a low-pass filter.

Note: only a final power amplifier (Q803) is available in later versions (including version H).

15.1.2 TX Buffer Amplifier

The first stage (Q801) provides about 16dB power gain, and adjusts its bias circuit to get a quiescent bias current of 28mA (for Q801). Power supply for the switching transistor Q810 is controlled by TX signal (enabled by antenna switch) so as to further control the power supply for the whole circuit.

15.1.3 Pre-driver Power Amplifier

The pre-driver power amplifier is formed by Q805, with variable gain controlled by voltage VGG. The input matching circuit is composed of C826, L826, L814, C843 and R824.

15.1.4 Driver Power Amplifier

The driver power amplifier is formed by Q804, with variable gain controlled by voltage VGG. The maximum output power is 38.5dBm, and the maximum variable gain is 11dB.

15.1.5 Final Power Amplifier

The final power amplifier comprises Q802 and Q803, with the maximum output power of 48.5dBm, and the maximum variable gain of 10dB. The input matching circuit is composed of C815, C839, R804, R806, R807, R813, R818 and R861, while the power combining circuit is composed of C820, C8330, C831, C819, C812, C841 and C842.

15.1.6 Antenna Switch

The antenna switch is used to switch between the transmitter circuit and the receiver circuit.

In TX mode, the switching transistor Q810 is controlled by TX signal, so as to supply 9V 3A to the PIN diodes D801 and D802. Quiescent bias current of the PIN diode is controlled by the resistors R821 and R825. In this mode, D801 and D802 are turned on; RF signals are applied to the low-pass filter (composed of C871, C816, C836, C837, C838, L809, L813, and L810) and then transmitted via the antenna port.

In RX mode, TX signal controls the switching transistor Q810, to further control the power supply for the PIN diodes D801 and D802, which are not applied with DC bias current. When the two PIN diodes are turned off, signals feed into the RX path through the low-pass filter (composed of L871, C852 and C862).

15.1.7 Low-pass Filter

A low-pass filter that consists of inductors L809, L813 and L810, and capacitors C836, C837, C830, is used to attenuate harmonic energy from the transmitter.

15.1.8 Directional Coupler

A directional coupler that consists of microstrip directional coupler, D803, D804 and etc, is used to detect both forward and reverse directed power of the transmitter. The forward power is coupled to the diode D803, and the voltage is applied to the power control circuit (U801). Then the voltage VGG is output to control the gate voltage of pre-driver and driver PA, ensuring a constant power output.

The directional coupler can adjust the TX power and detect the VSWR load. The reverse power is coupled to D804. The voltage is applied to U802 and then feeds into U302 for detection

15.1.9 Output Power Control

The TX power is controlled by U801. The forward power is applied to the directional coupler, to output a

voltage that can represent the forward power. The voltage together with the preset voltage feeds to U801 to output a voltage VGG, which can control both gate voltage and gain of Q804 and Q805, ensuring a constant power output.

15.1.10 Thermal and Over-voltage Protections

The circuit consists of thermistor RT804 and resistor R884. The output voltage is proportional to the detected temperature. Both the voltage used for temperature detection and the threshold voltage are fed into the operational amplifier U803, to output a voltage signal that is in proportion to the detected temperature. Afterwards, the voltage is applied to software for judgment, and then the preset voltage will be subsequently changed to reduce the TX power, and to protect the PA from over-heating.

15.1.11 Pressure Pad Switch

The power control circuit includes a pressure pad switch SW1, which is controlled by the conductive rubber part mounted on the top cover. If the switch is turned off, VGG will become low, and no power will be output from PA. Otherwise, PA will work normally.

15.2 Receiver Circuit

The receiver utilizes double conversion superheterodyne technique. The first IF is 73.35MHz and the second IF is 2.25MHz. The first local oscillator signal is from the PLL circuit U100, and the second LO signal (71.1MHz) is generated by the PLL circuit U701. The major units are BPF, LNA, mixer, IF filter, IF amplifier and IF processor.

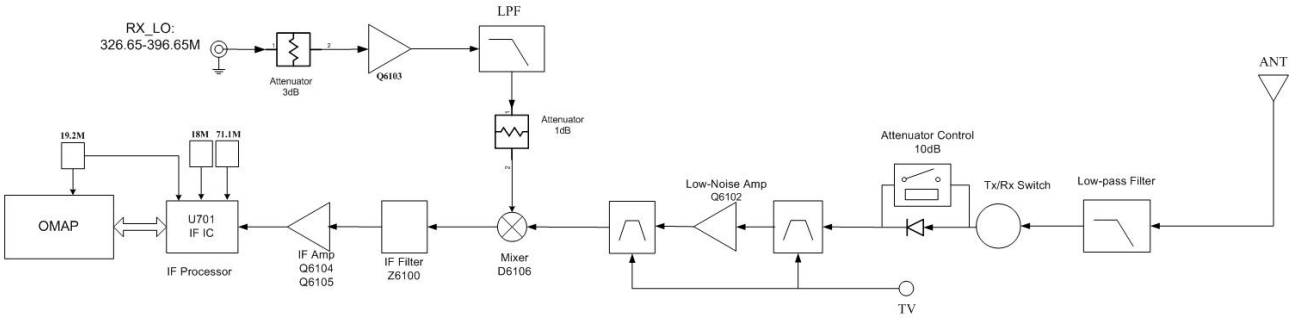


Figure 15-2 Diagram of Receiver Circuit

15.2.1 Receiver Front-end

RF signals feed to the low-pass filter to remove out-of-band signals, and are applied to the two-stage electrically tunable band-pass filter to get useful signals. After passing through the RF band-pass filter and LNA (Q6102), the RF signals together with the first LO signal feed to the mixer for the first frequency conversion, to generate the first IF signal (73.35MHz). The mixer that employs the passive diode can ensure good dynamic range and port isolation. The LO signal (3-5dBm) from the VCO feeds to Q6103

to get a gain (17dB). The first LO signals (73.35MHz) pass through the crystal filter (Z6100) to remove out-of-band spurious signals, and then feed to the two-stage IF amplifier circuit (composed of Q6133 and Q6134) for amplification. Finally the amplified signals go to the IF IC for processing

15.2.2 Receiver Back-end

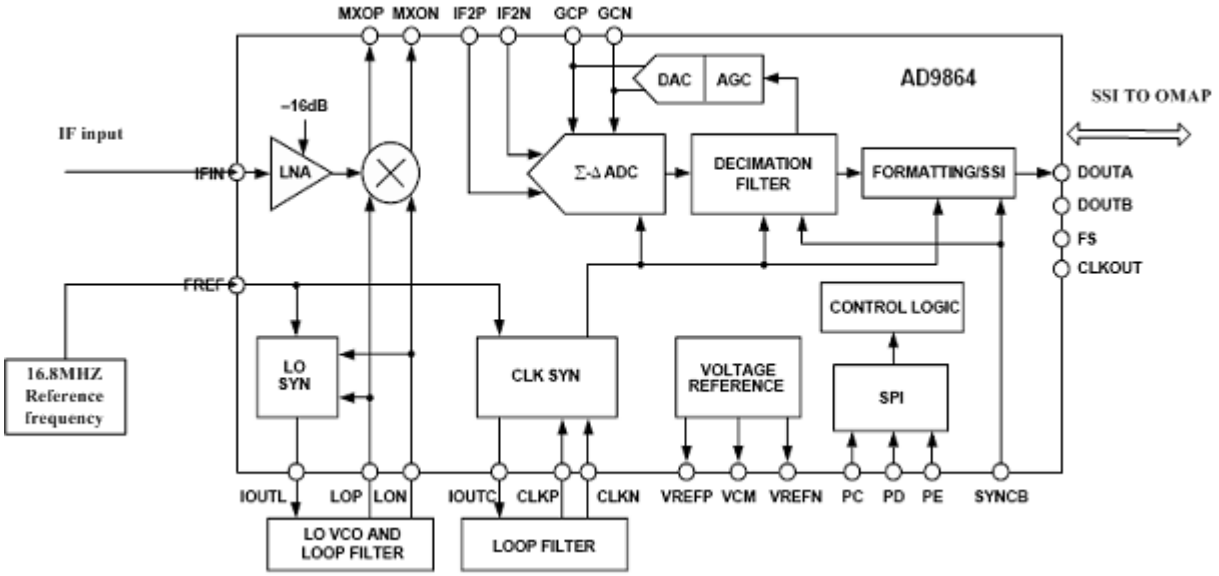


Figure 15-3 Diagram of IF Processor

The first IF signal (73.35MHz) output by the IF amplifier goes into IF IC via Pin 47, where the signal is converted to the second IF signal (2.25MHz). Then the un-demodulated digital I/Q signal output from the SSI interface is sent to U302 for demodulation. IF IC employs a reference frequency of 19.2MHz and shares the crystal with U302. The second LO VCO consists of the external transistor, varactor and some other components, to provide the second LO signal. The 18MHz clock frequency is generated by the LC resonance loop (D702, L715 and C745).

DSP (U302) gets the audio signal from IF IC (U701). Then this signal goes through U302 to output data signal, which is sent to U231 and PIN44 (SSI_DI) for digital-to-analog conversion. Finally, the output analog audio signal will be subjected to gain control, and then fed to the speaker.

15.3 Frequency Generation Unit (FGU)

15.3.1 PLL Synthesizer

The PLL synthesizer that consists of the reference oscillator (X100), PLL IC (U100) and VCO, is utilized to supply excitation signal source to the transmitter, and local oscillator signal to the receiver.

15.3.2 Reference Oscillator

X100 is a 19.2MHz TCXO, and its reference frequency is calibrated by the digital-to-analog converter

(U500) for accuracy.

15.3.3 PLL IC

The PLL IC (U100) is a fractional frequency divider. The logic IC U101 and U102 work with the PLL IC (U100) to achieve locking.

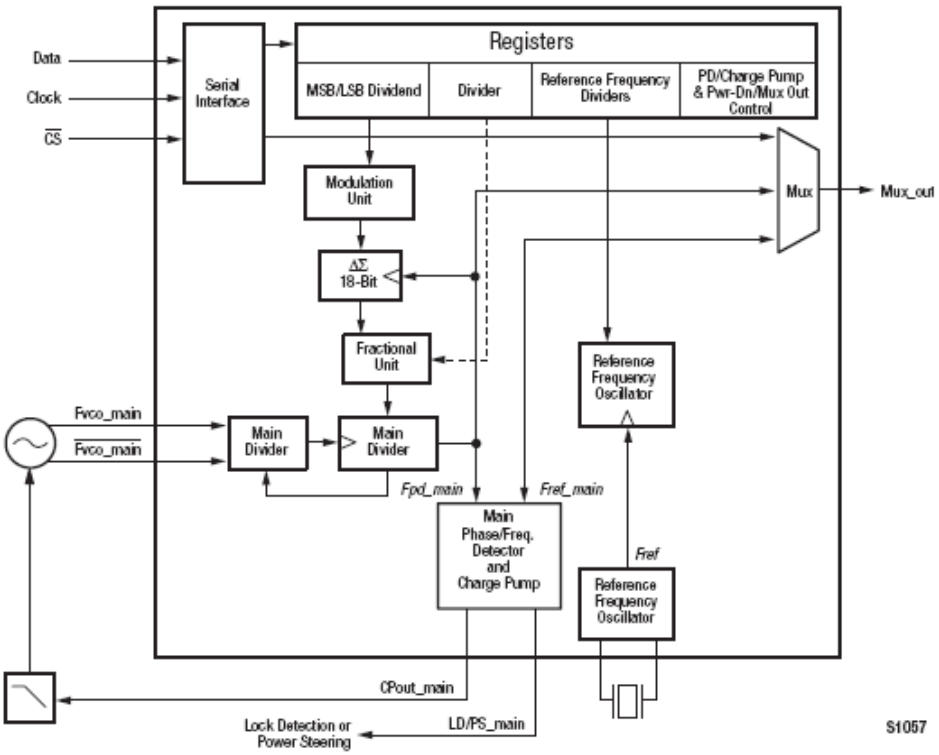


Figure 15-4 Diagram of PLL IC

The 19.2MHz frequency generated by the reference oscillator goes into the PLL IC for division, generating the reference frequency. Meanwhile, the frequency generated by VCO goes into PLL IC (U100) for frequency division. The resulting frequency will be compared with the reference frequency in terms of phase difference in the phase detector. After comparison, the resulting frequency is converted to CV voltage via the loop filter, to control and lock the frequency.

15.3.4 VCO

The VCO is composed of transistors (Q100, Q103, Q106 and Q110), varactors and four Colpitts oscillators. There are four VCOs in all: two VCOs (Q100 and Q103) used to transmit excitation signals and the other two VCOs (Q106 and Q110) to receive LO signals. U302 controls the operating frequency of the VCO. Q102 and Q107 constitute the buffer amplifiers for the transmitter circuit, while Q111 and Q109 for the receiver circuit. The digital-to-analog converter (U500) modulates the TX oscillator signal.

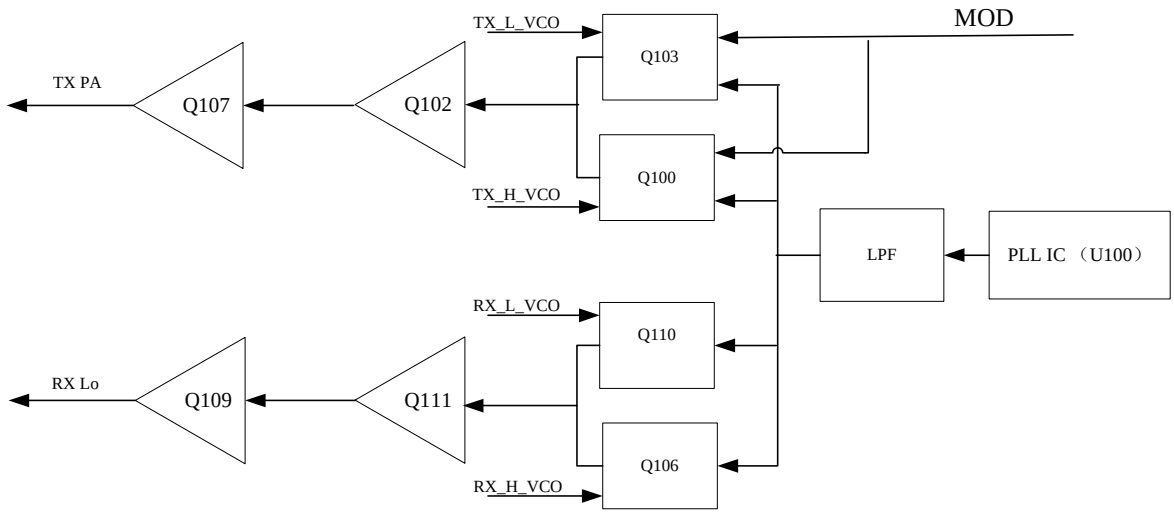
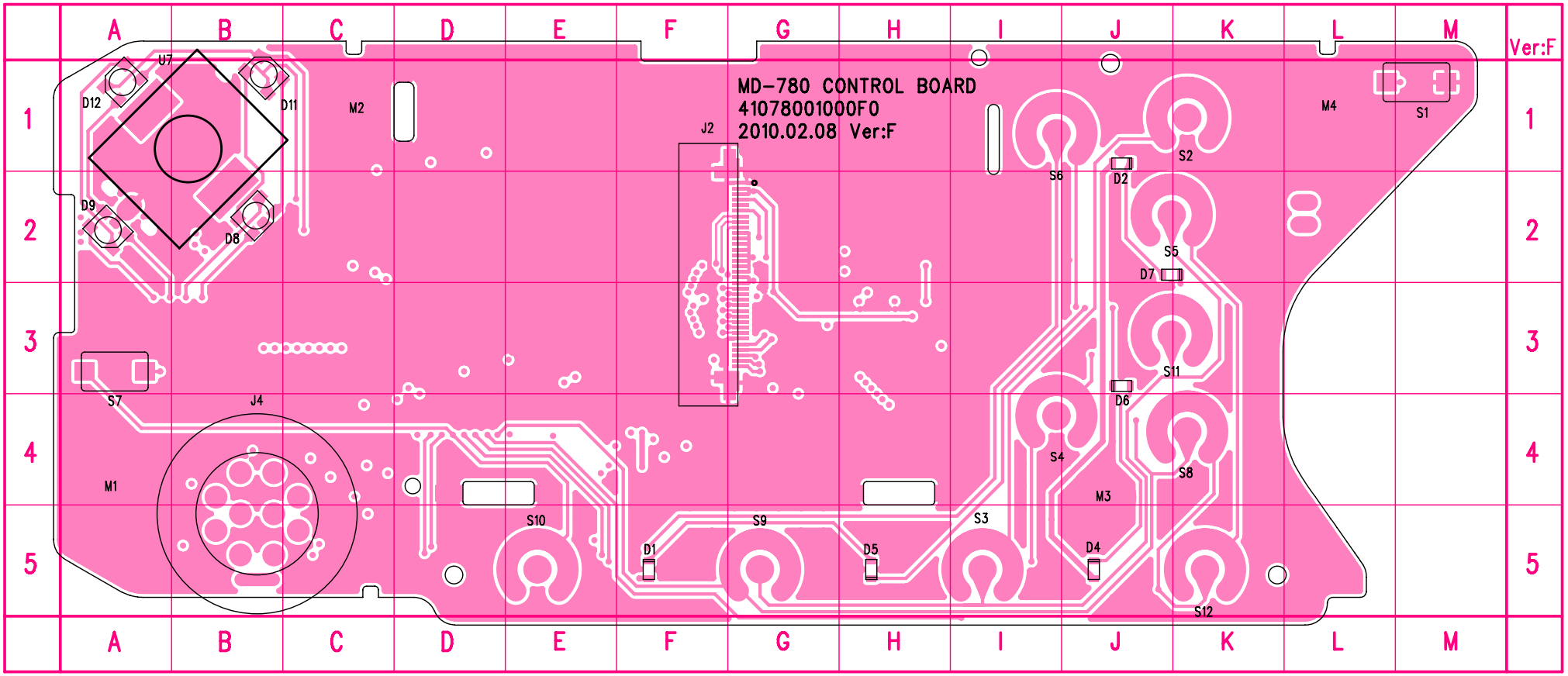


Figure 15-5 Diagram of VCO

15.4 PCB View

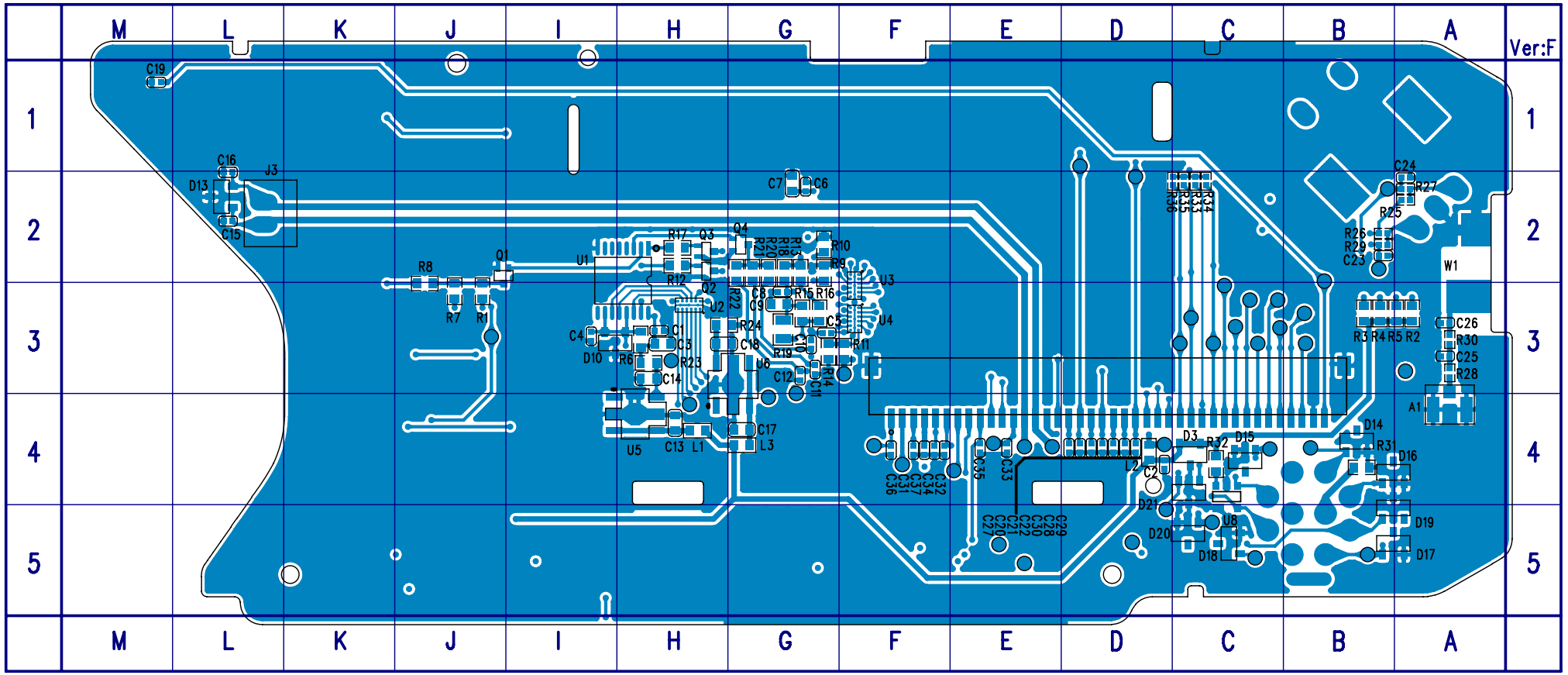
MD78X/MD78XG PCB View (Front Panel)

Top Layer

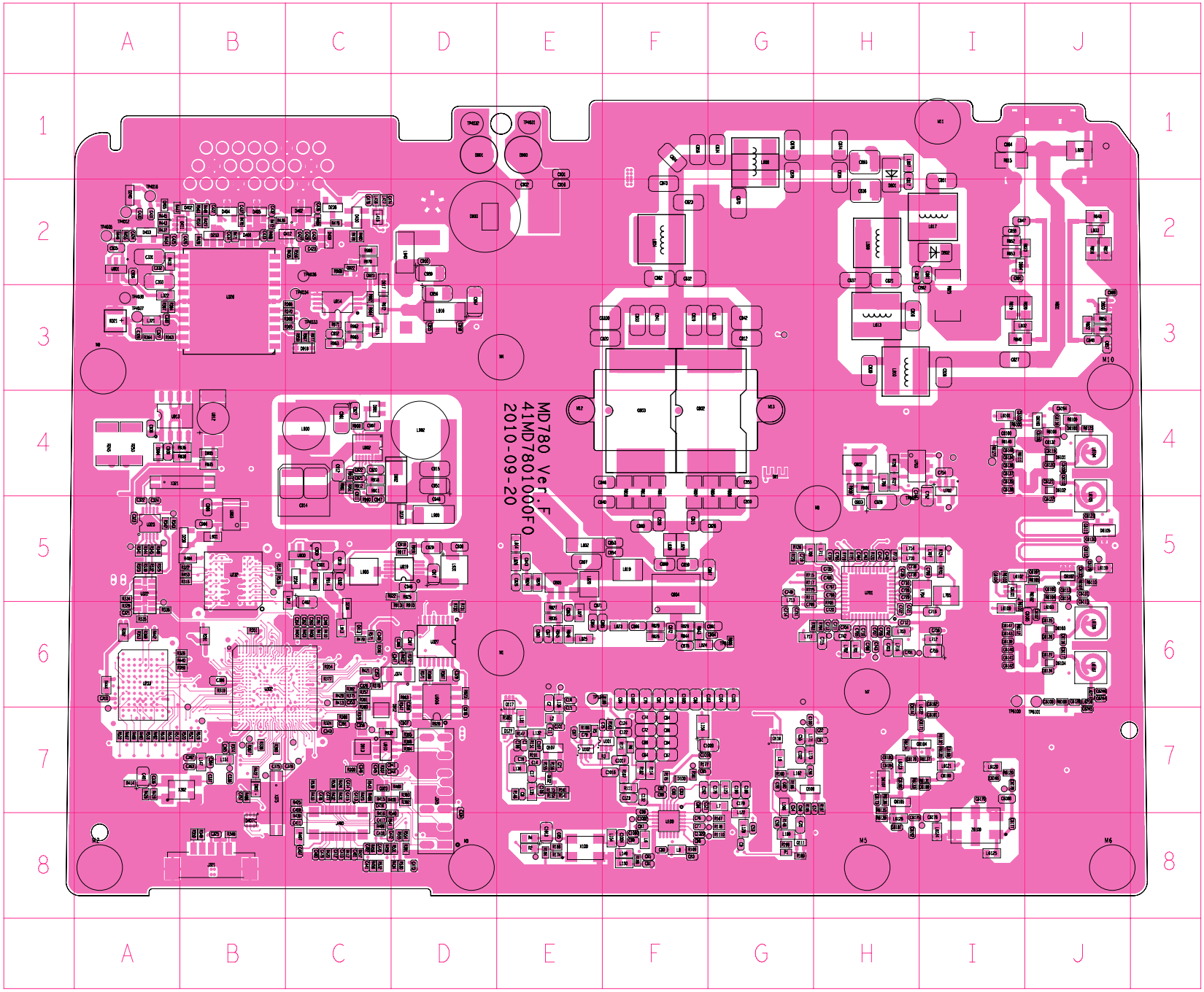


MD78X/MD78XG PCB View (Front Panel)

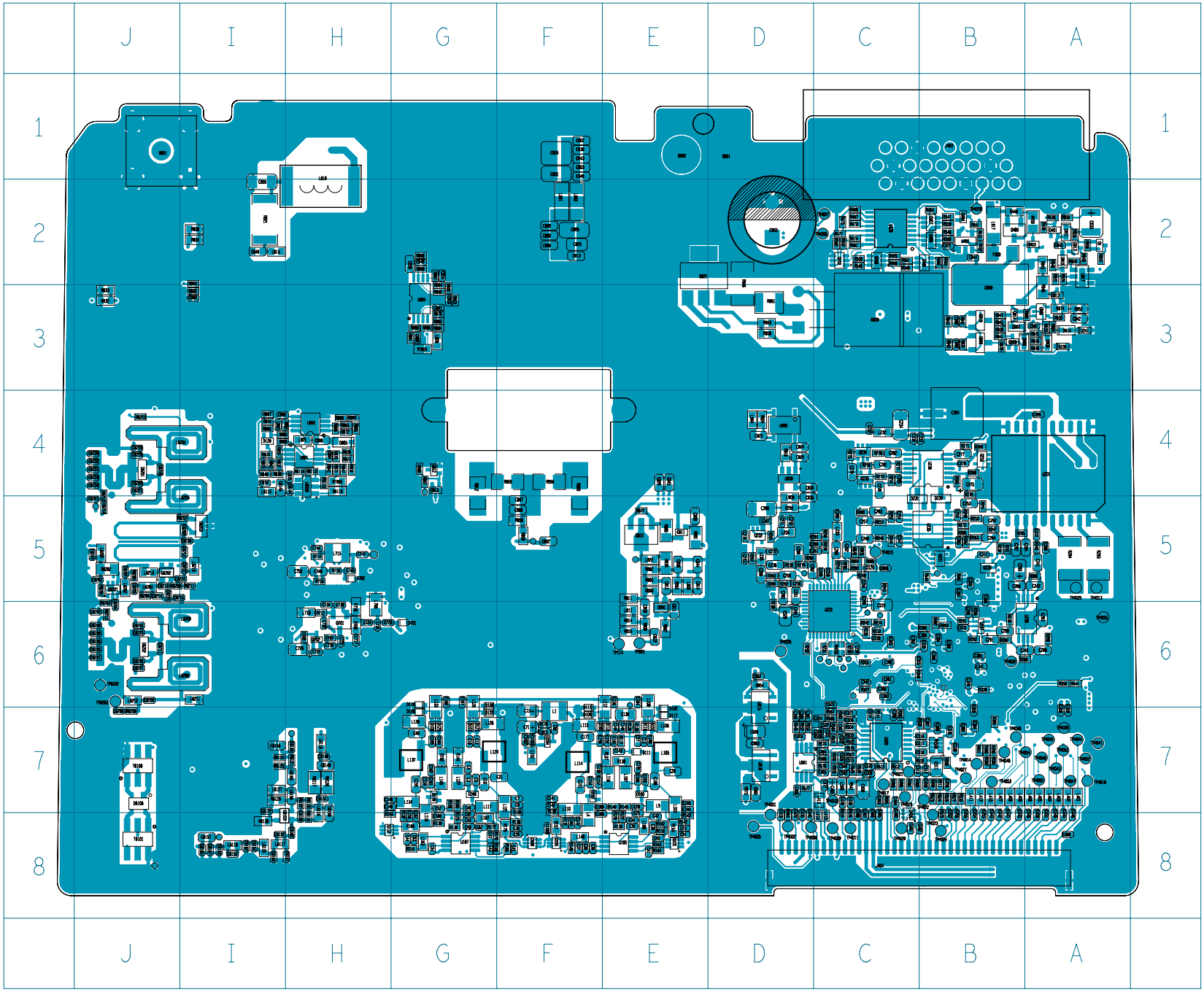
Bottom Layer



MD78X/MD78XG PCB View (Main Board)
Top Layer

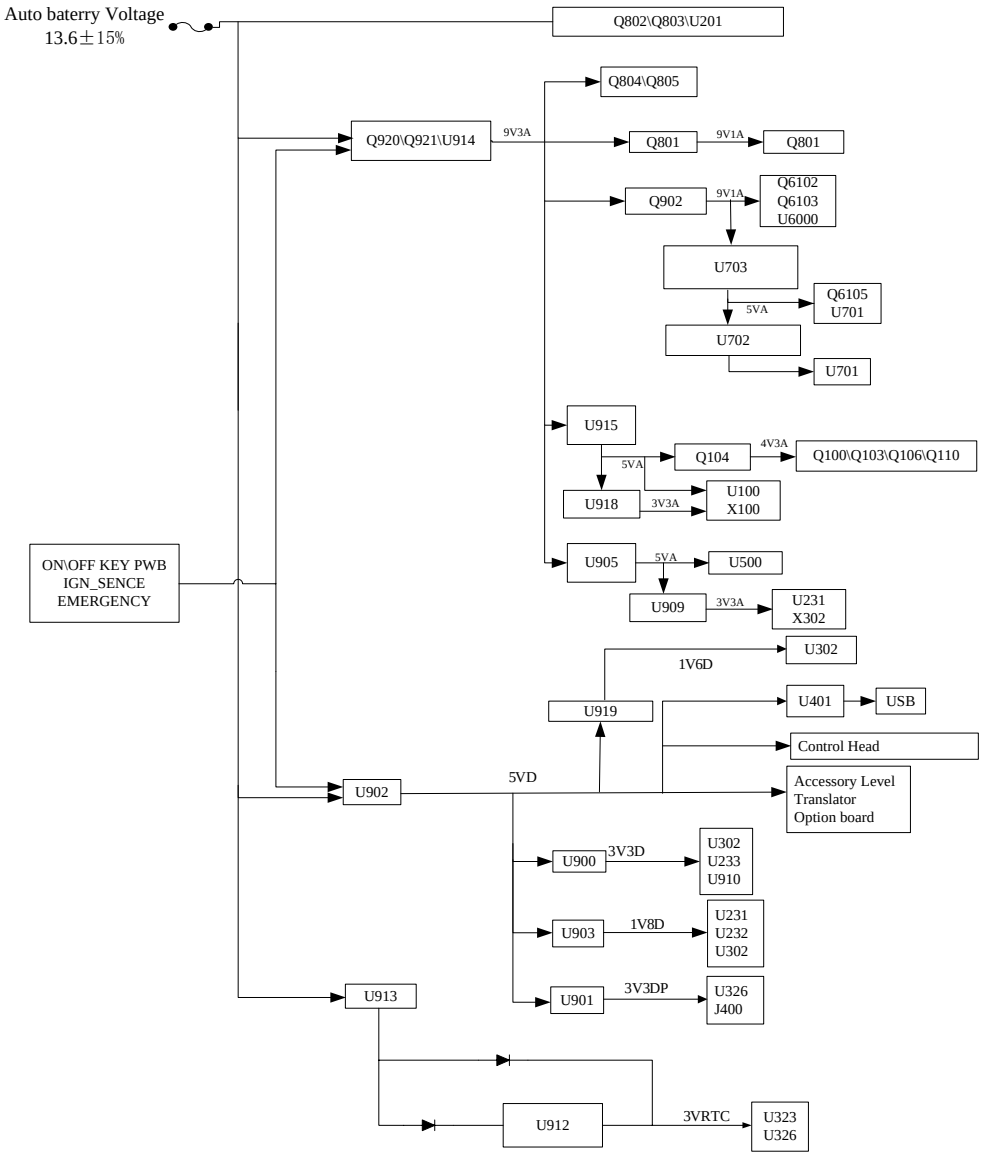


MD78X/MD78XG PCB View (Main Board)
Bottom Layer

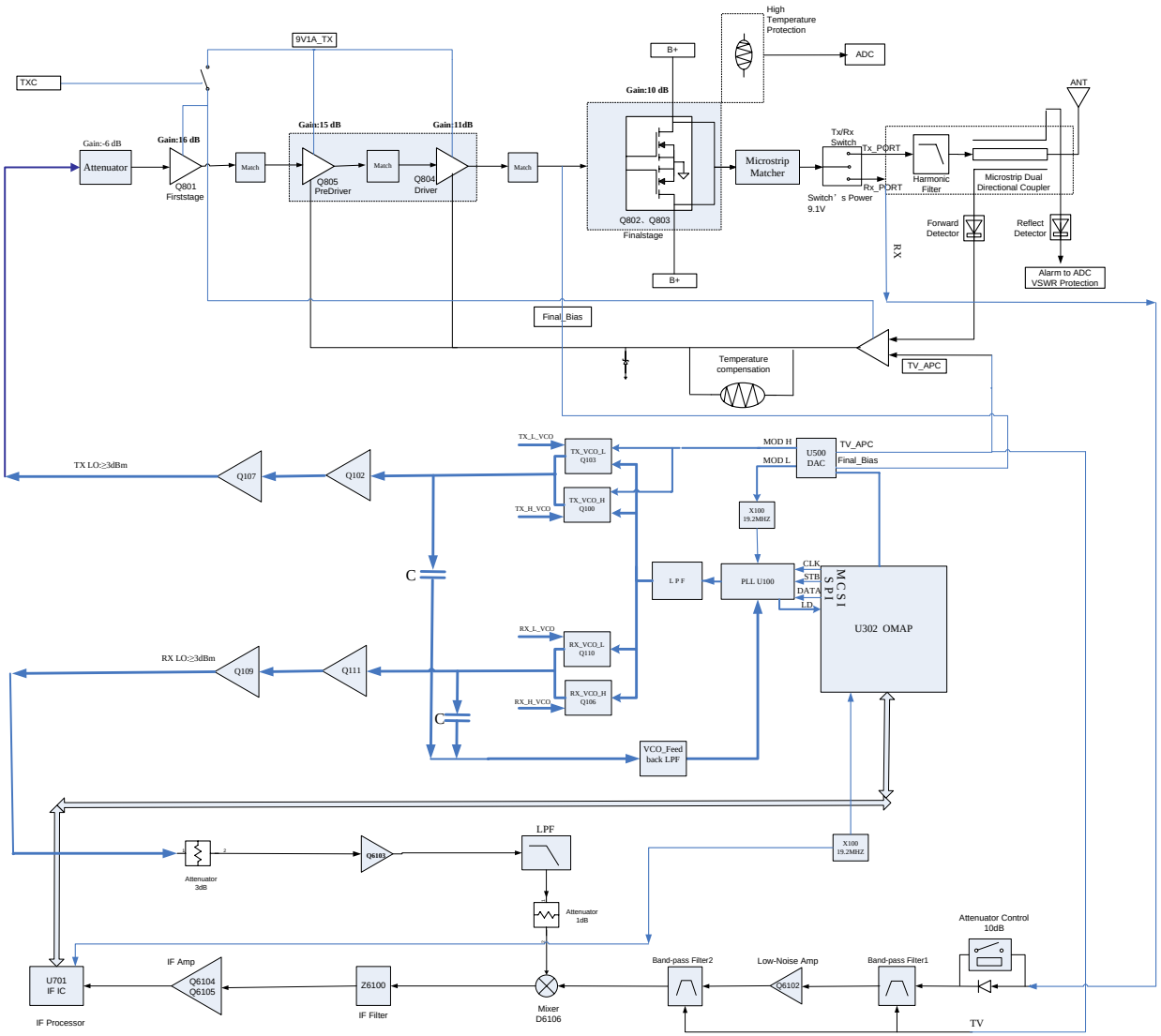


15.5 Block Diagram

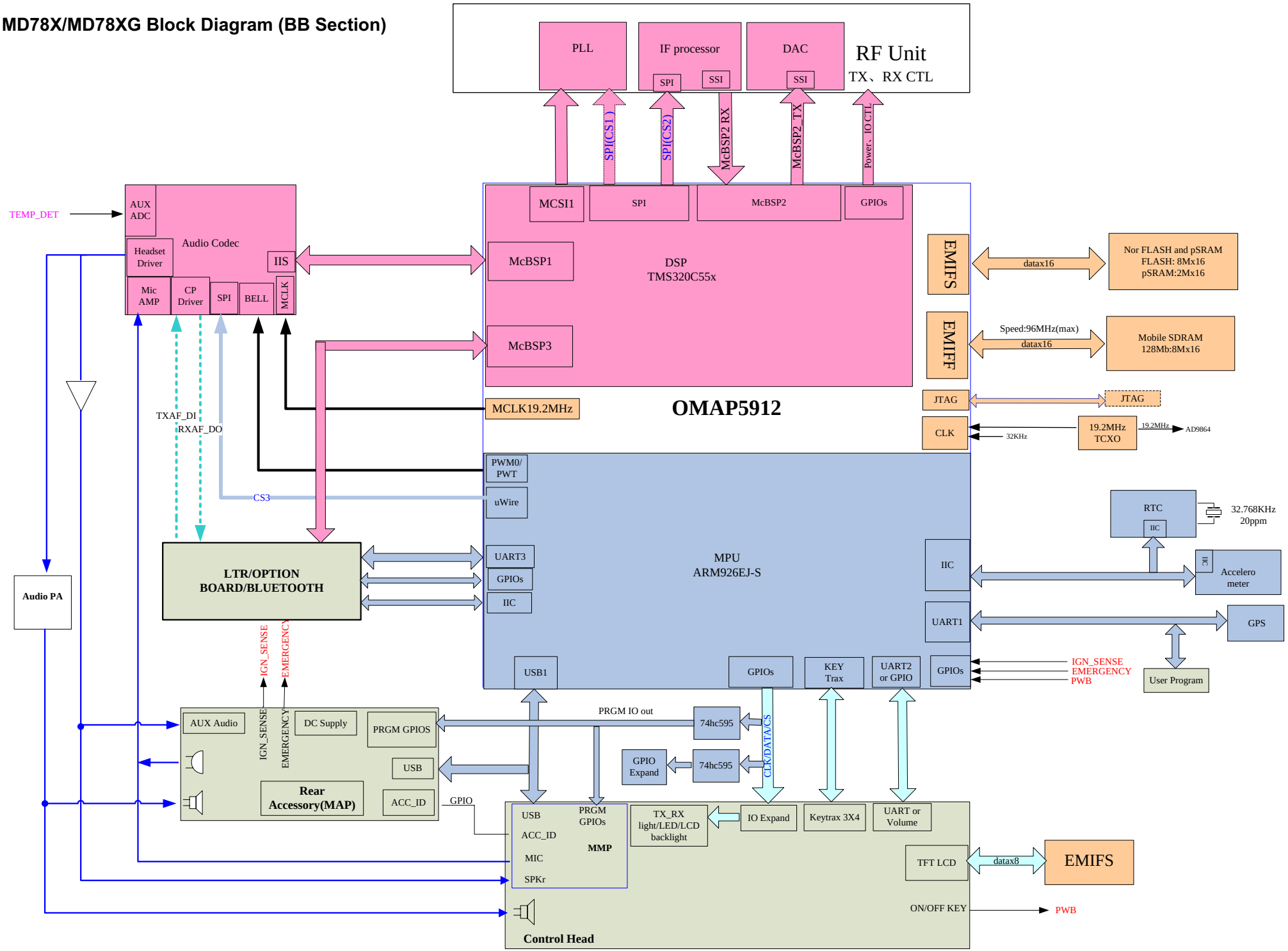
MD78X/MD78XG Block Diagram (Power Section)



MD78X/MD78XG Block Diagram (RF Section)

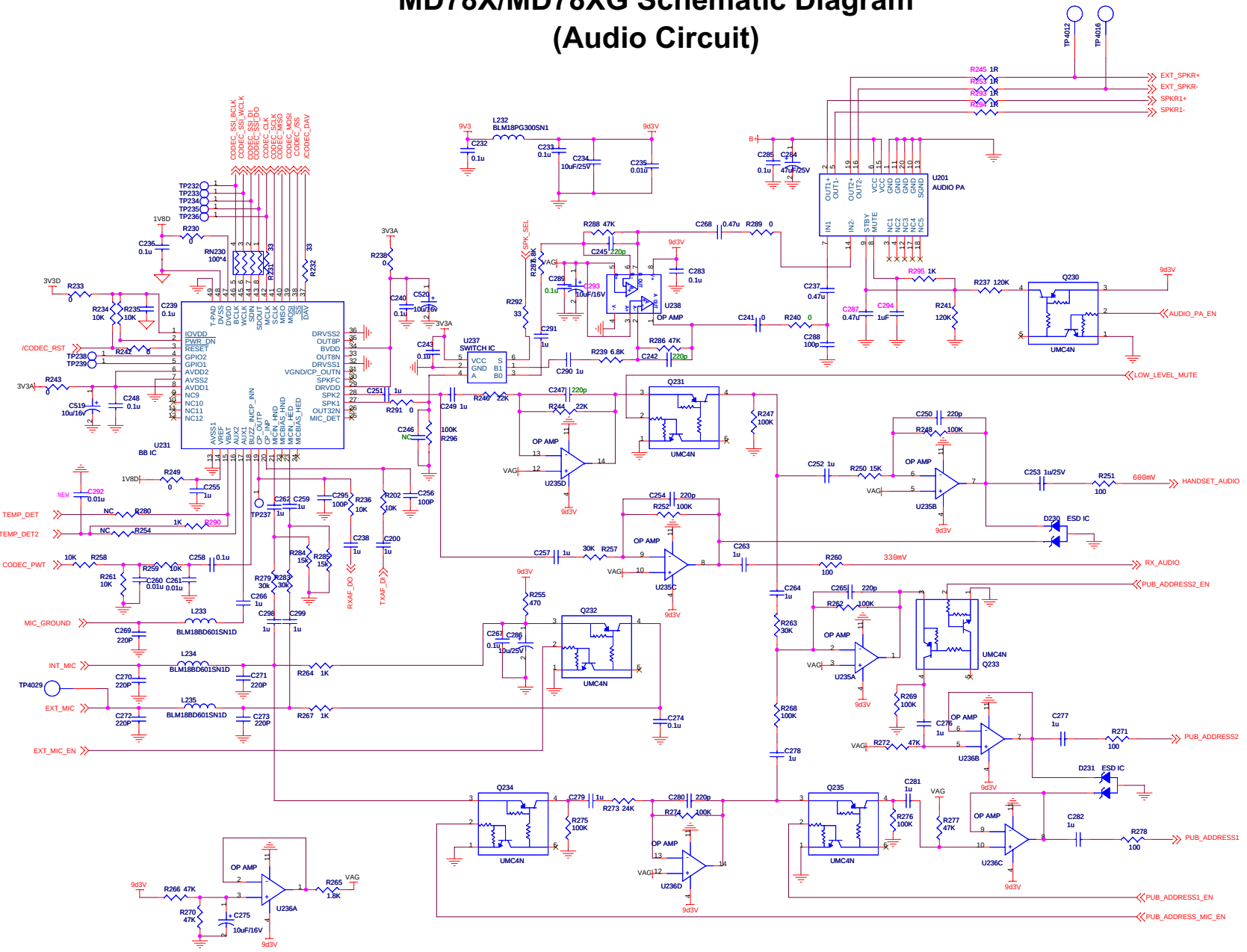


MD78X/MD78XG Block Diagram (BB Section)

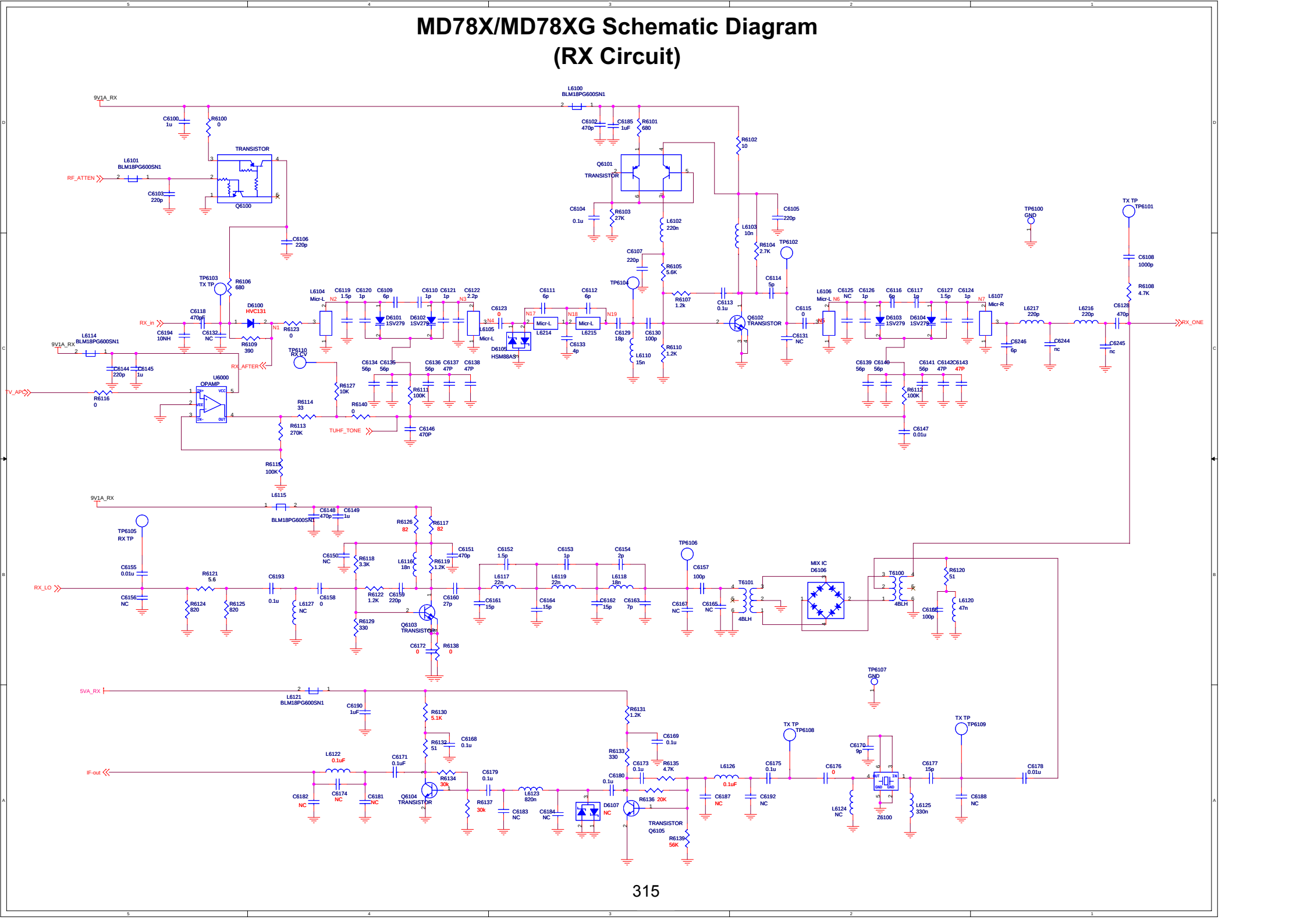


15.6 Schematic Diagram

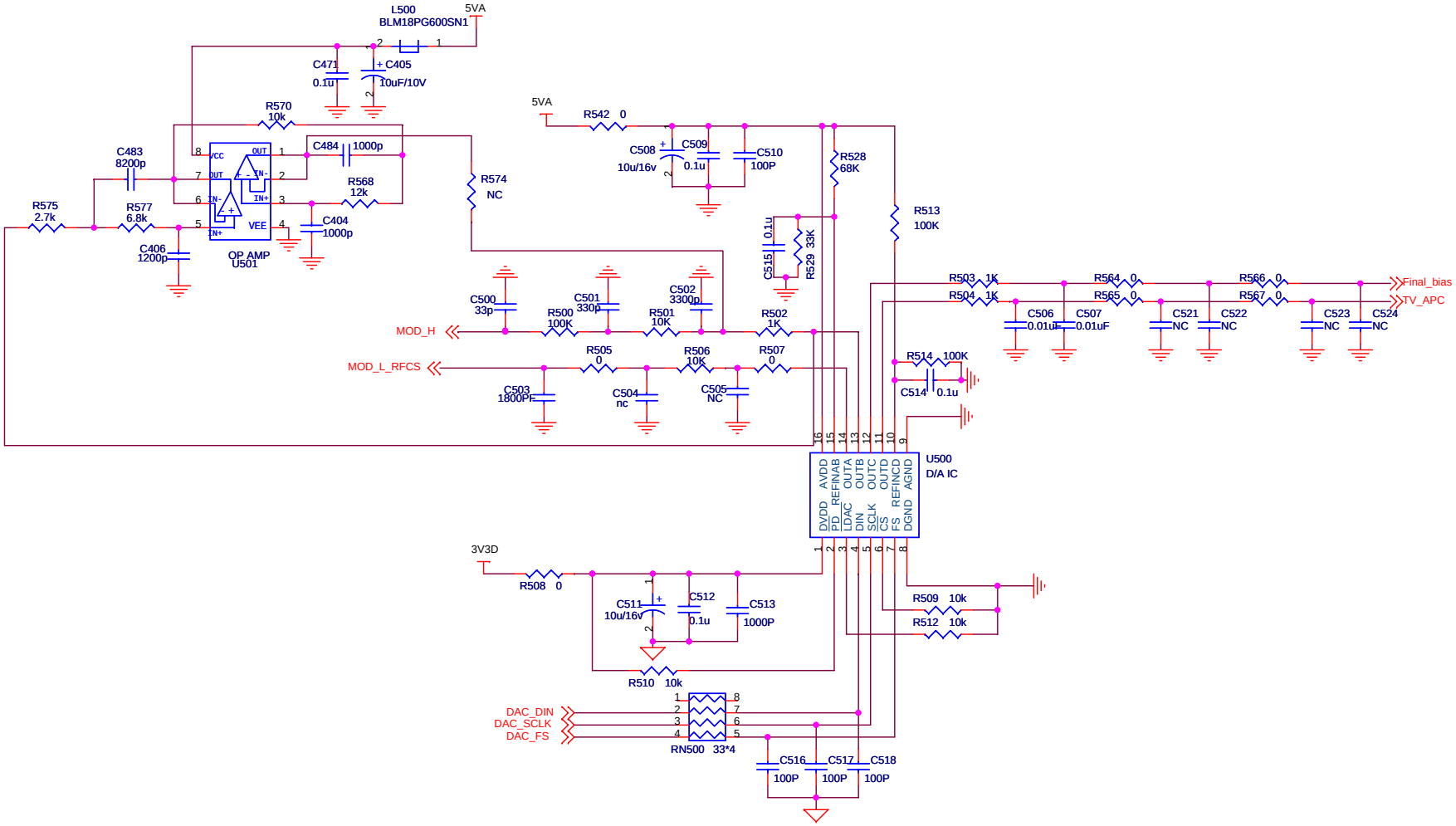
MD78X/MD78XG Schematic Diagram (Audio Circuit)



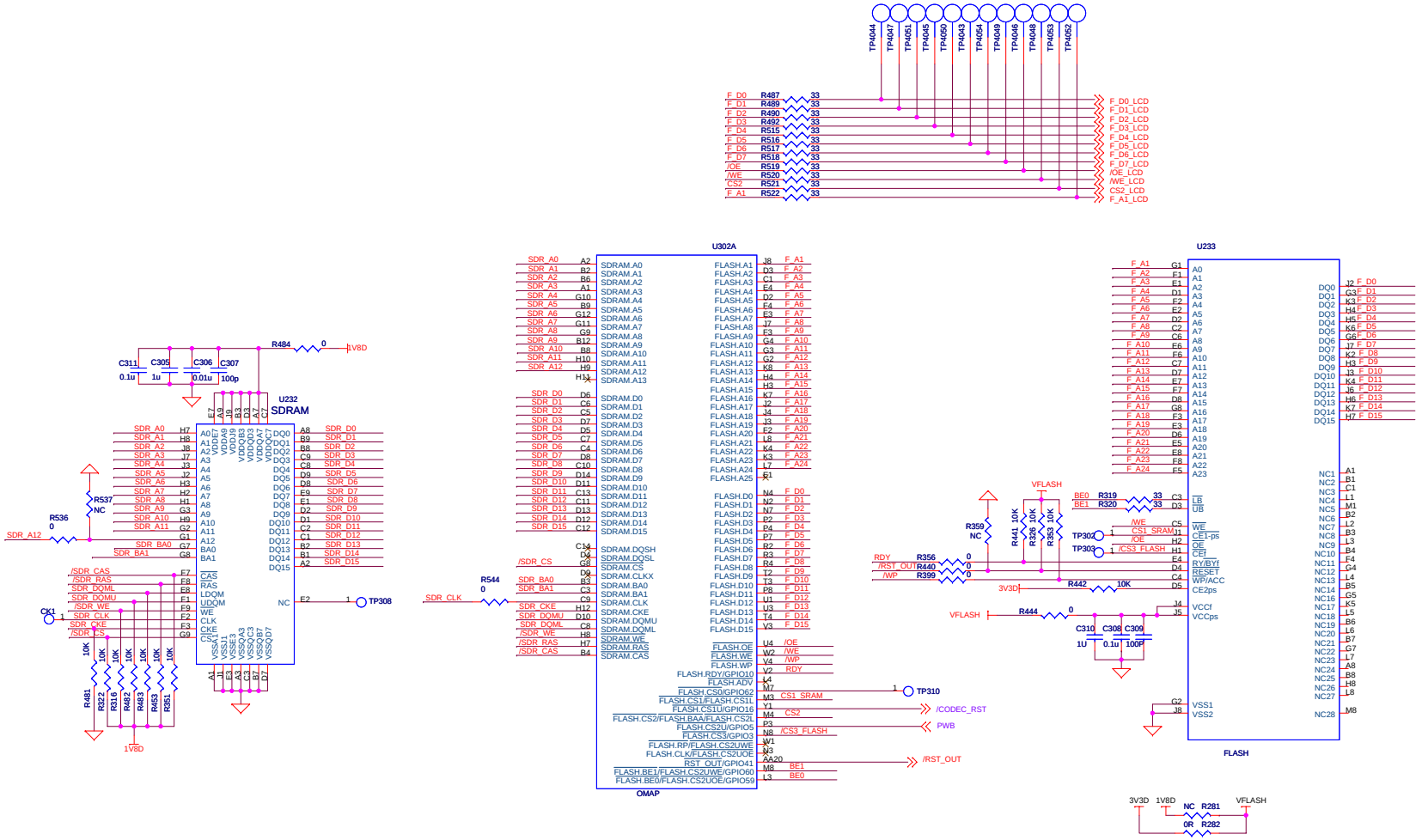
MD78X/MD78XG Schematic Diagram
(RX Circuit)



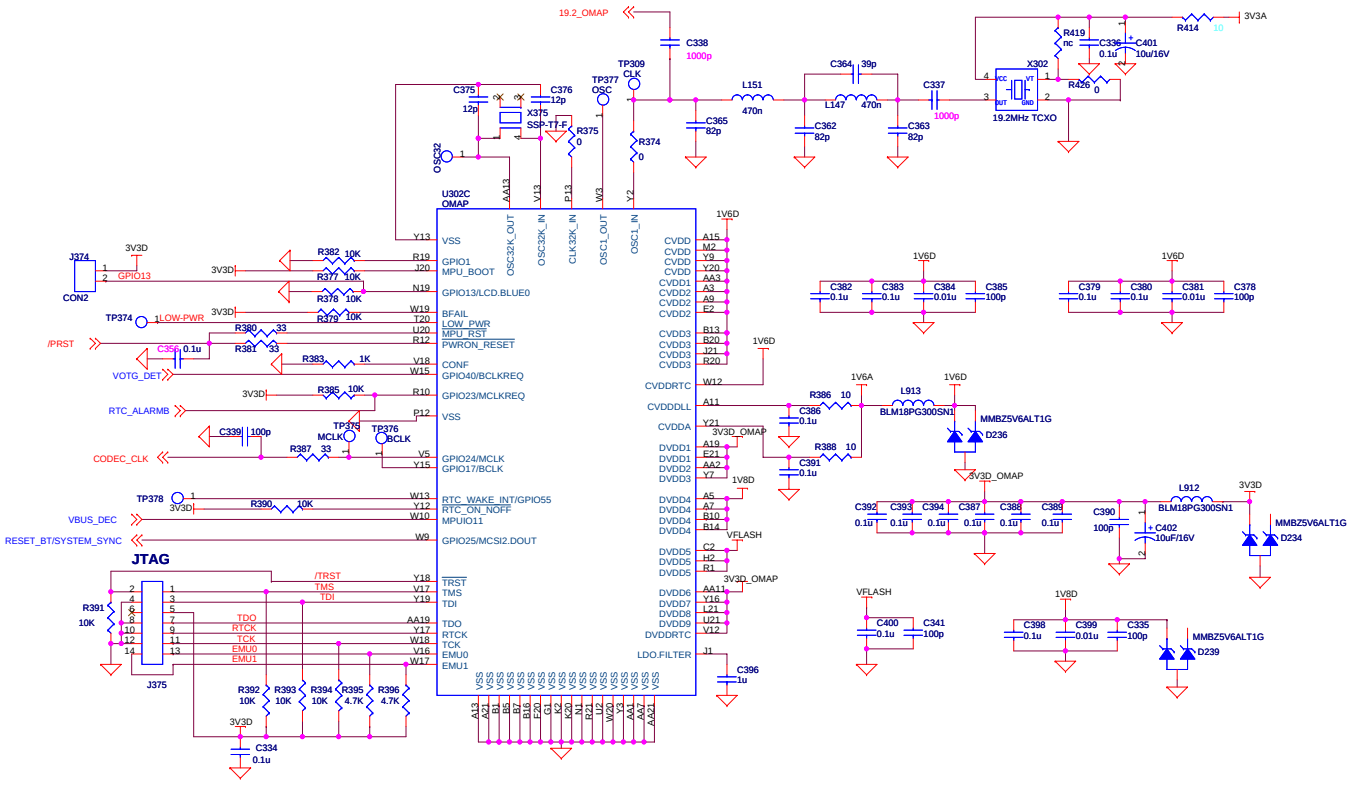
MD78X/MD78XG Schematic Diagram
(DAC Circuit)



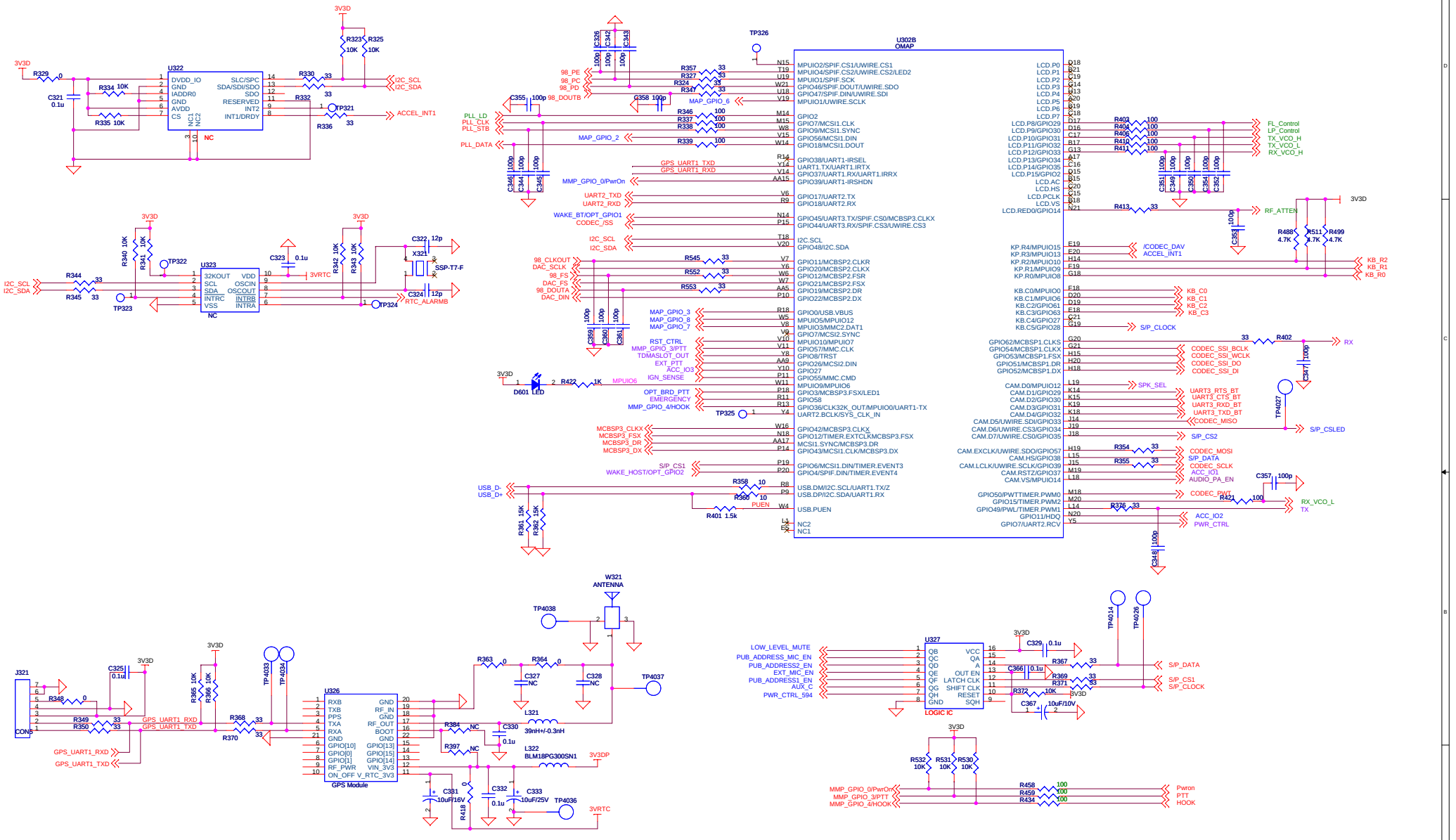
MD78X/MD78XG Schematic Diagram
(Memory Circuit)



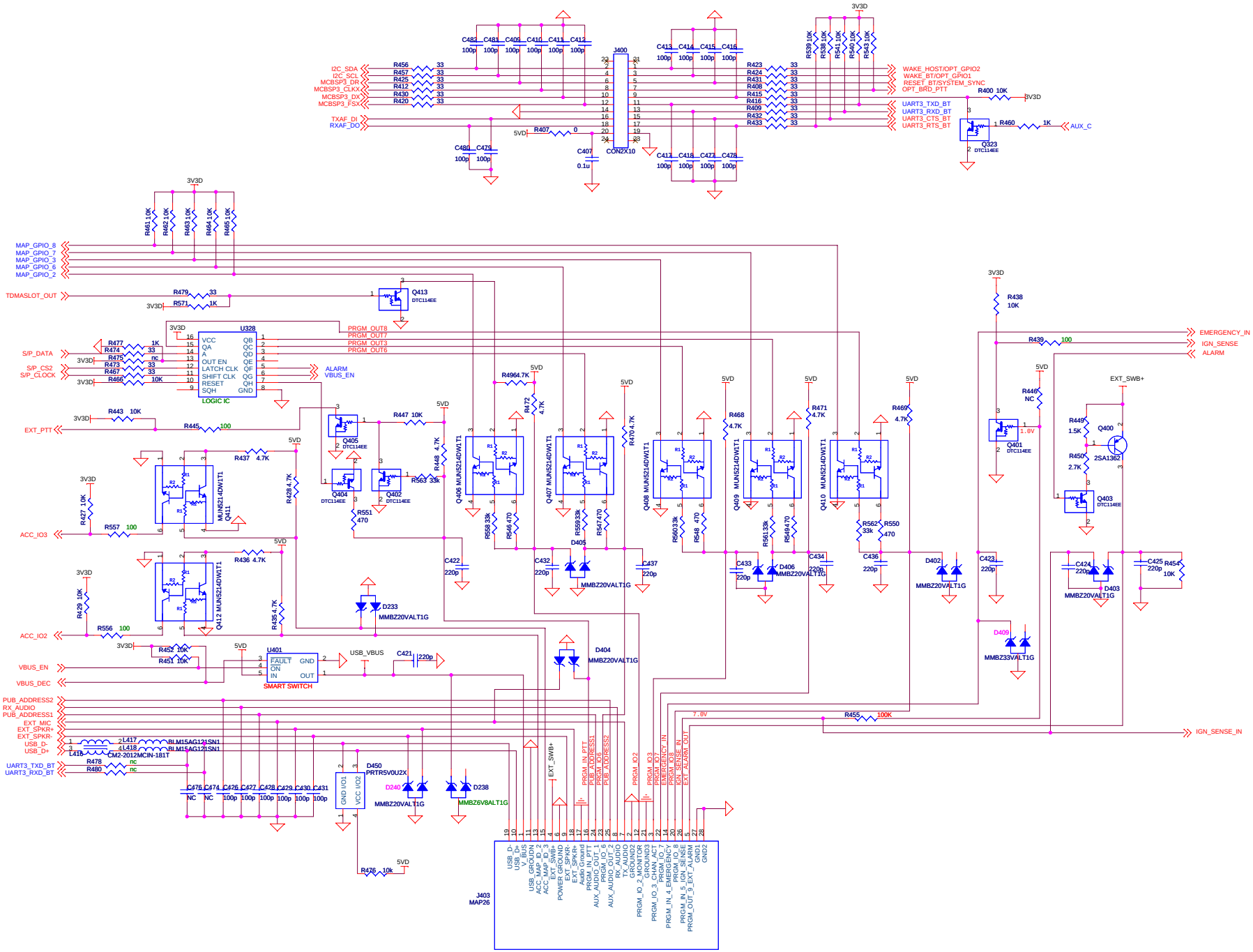
MD78X/MD78XG Schematic Diagram
(OMAP Circuit)



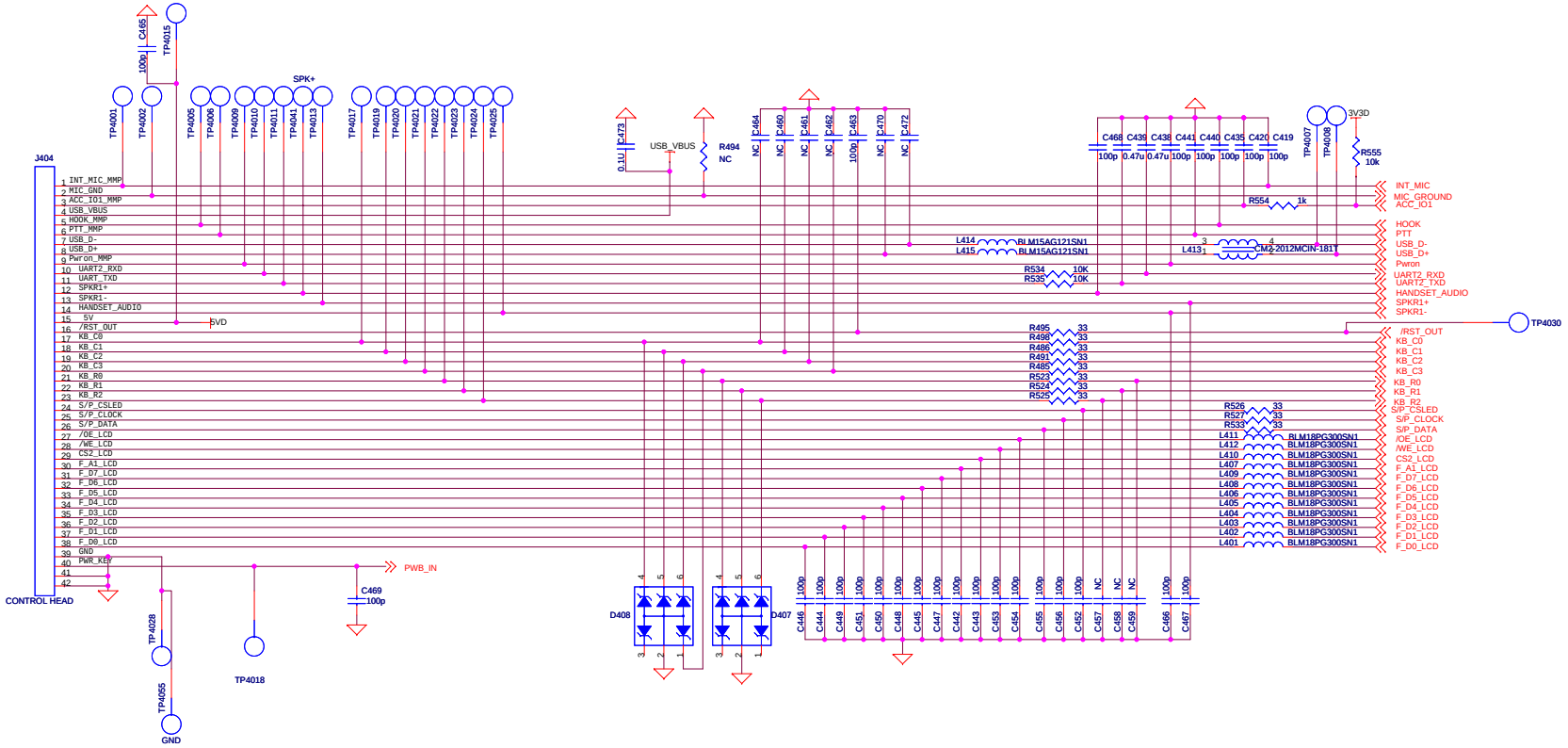
MD78X/MD78XG Schematic Diagram
(OMAP & GPS Circuit)



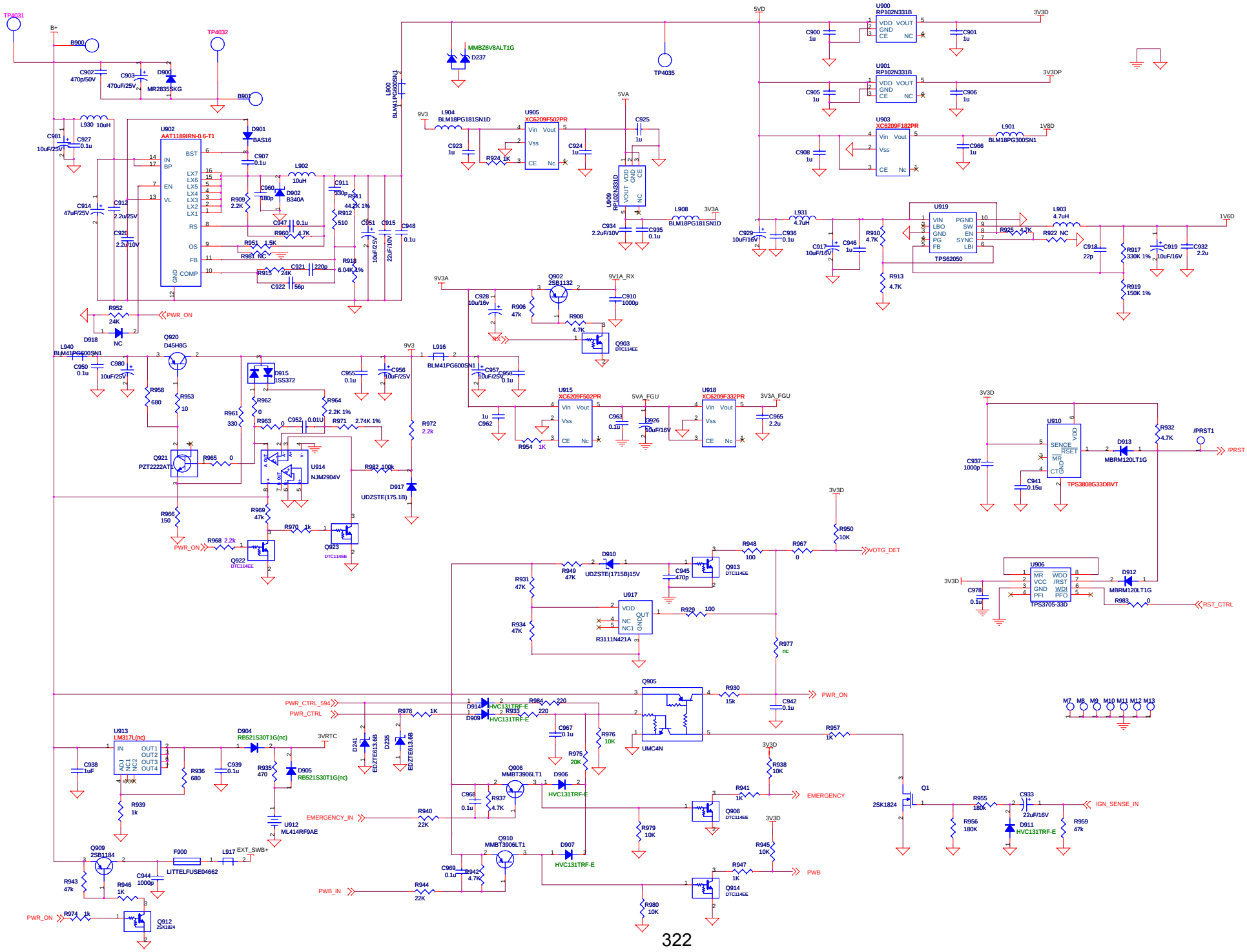
MD78X/MD78XG Schematic Diagram (Peripheral Interface Circuit)



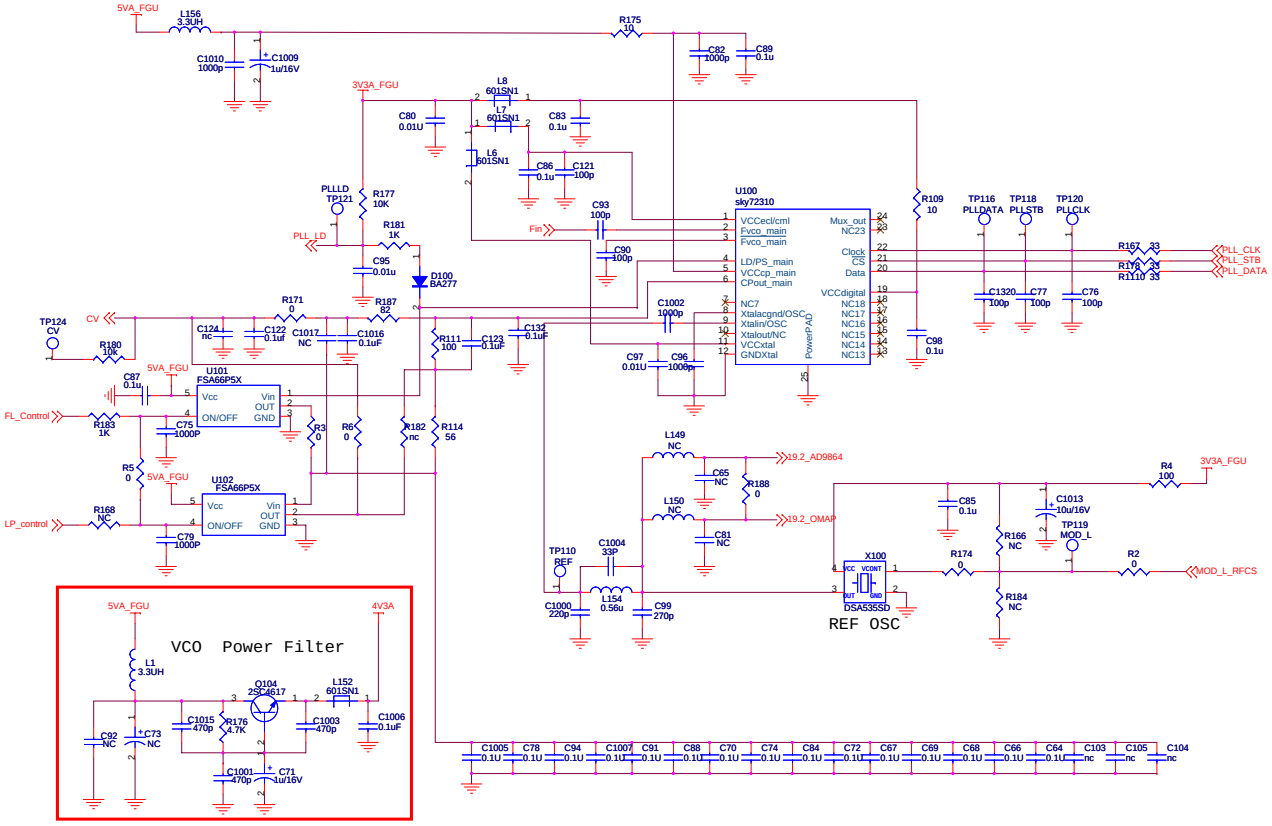
MD78X/MD78XG Schematic Diagram
(40-Pin Interface Circuit)



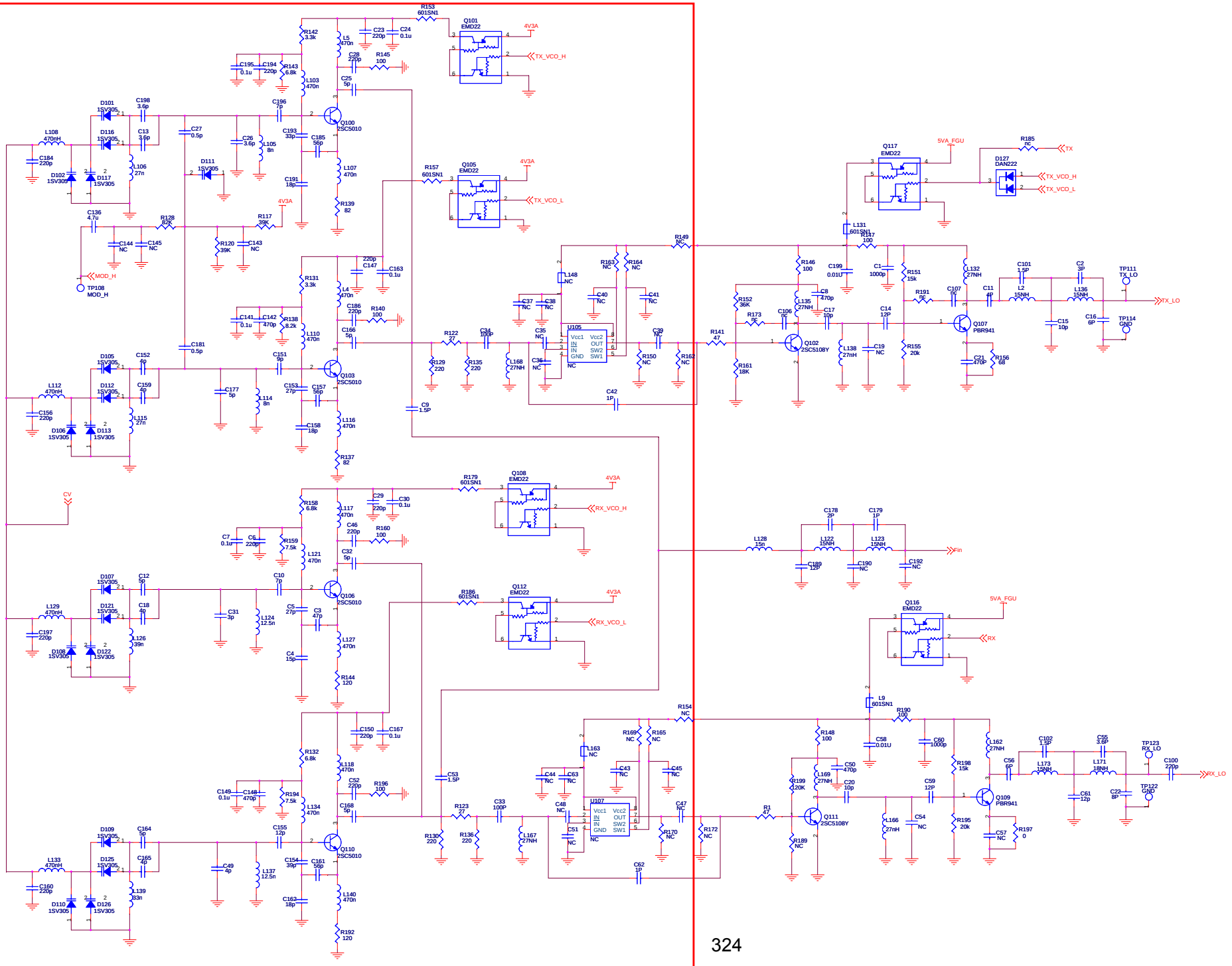
MD78X/MD78XG Schematic Diagram (Power Circuit)



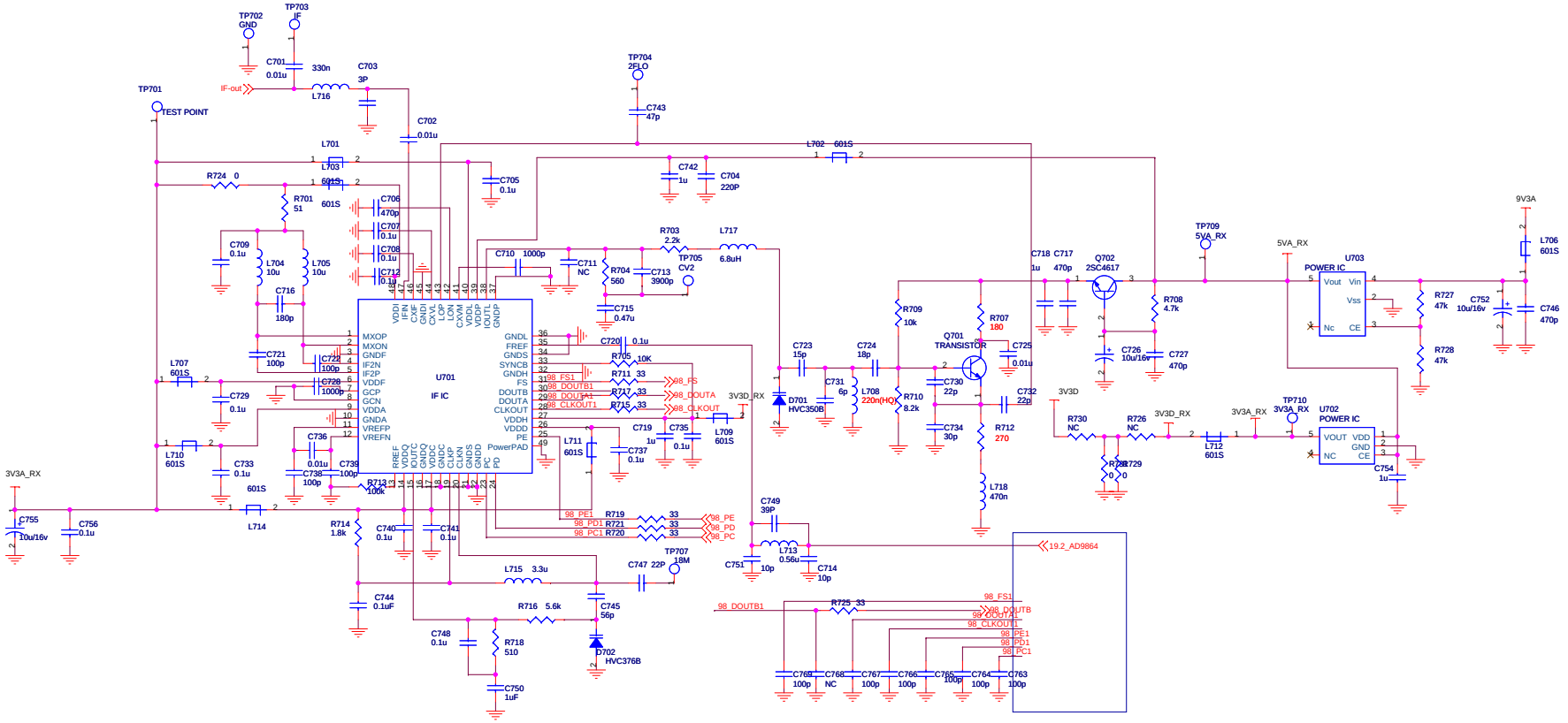
MD78X/MD78XG Schematic Diagram
(PLL Circuit)



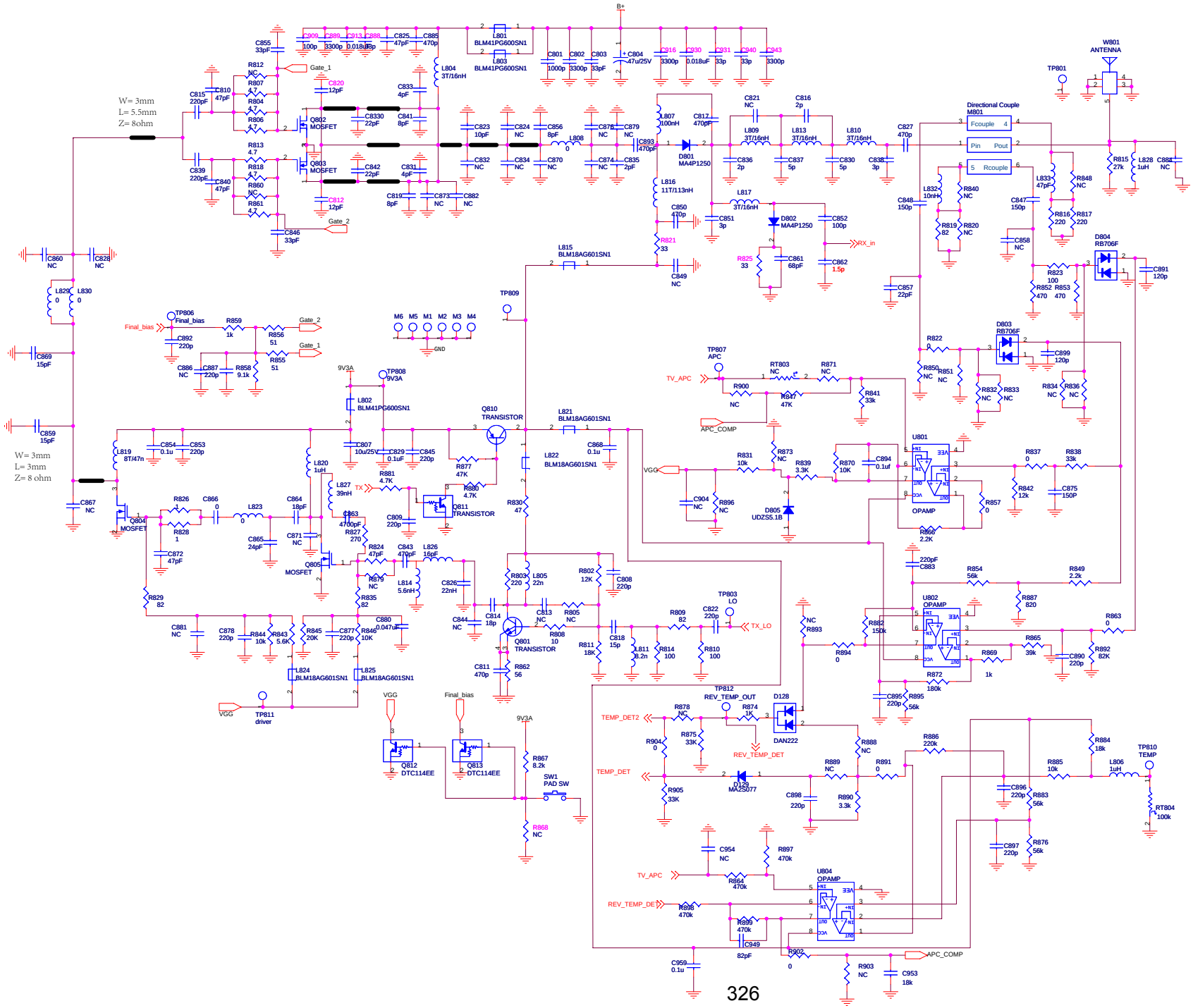
MD78X/MD78XG Schematic Diagram (VCO Circuit)



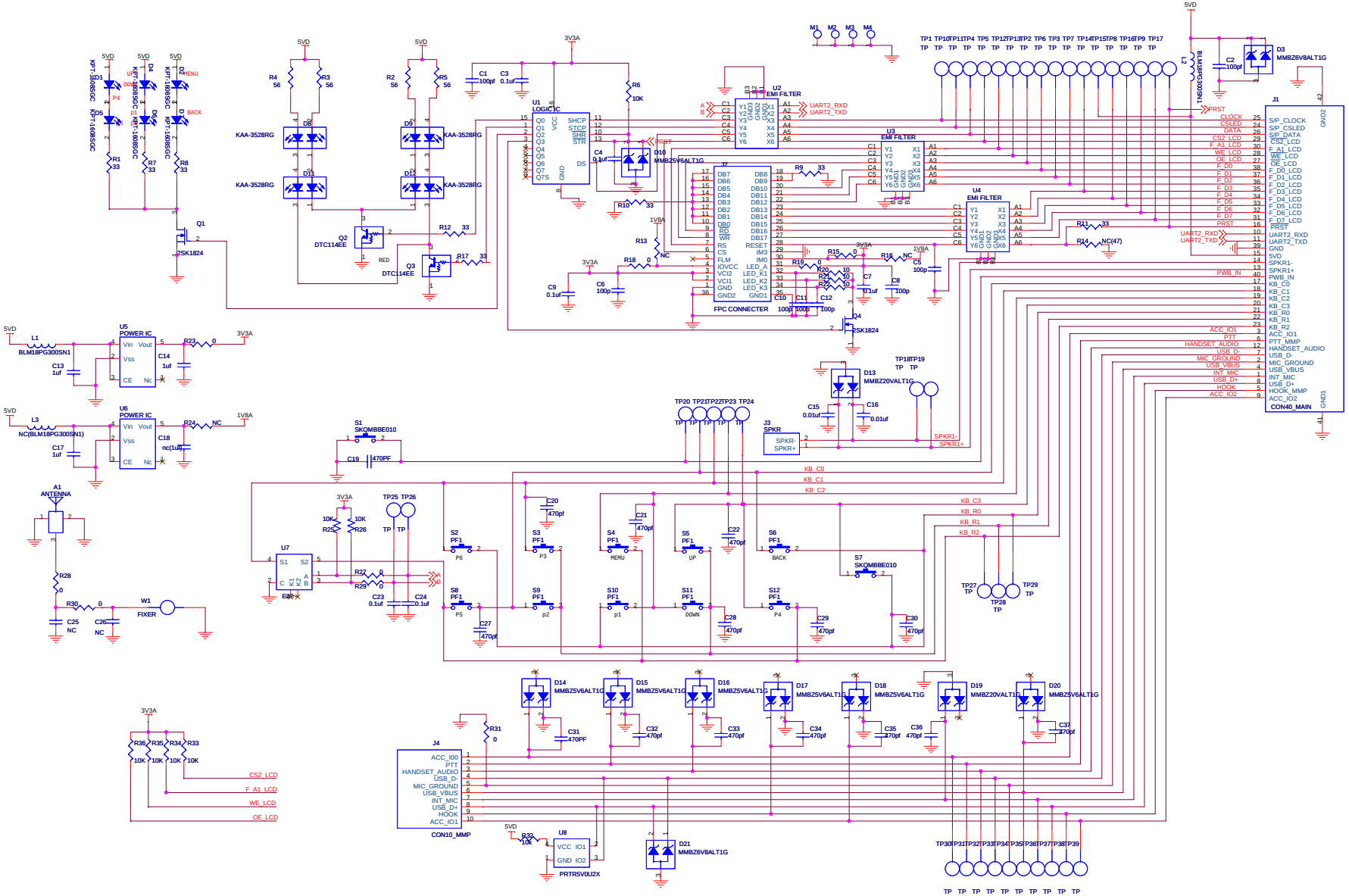
MD78X/MD78XG Schematic Diagram
(IF Circuit)



MD78X/MD78XG Schematic Diagram (TX Circuit)



MD78X/MD78XG Schematic Diagram
(Front Panel)



V1.0

15.7 Parts List

Main Board *for MD78X/MD78XG*

No.	Ref. No.	Part No.	Description
1	C6115	3001050000000	0Ω
2	C6123	3001050000000	0Ω
3	C6172	3001050000000	0Ω
4	R156	3001050000000	0Ω
5	R174	3001050000000	0Ω
6	R188	3001050000000	0Ω
7	R197	3001050000000	0Ω
8	R230	3001050000000	0Ω
9	R233	3001050000000	0Ω
10	R238	3001050000000	0Ω
11	R240	3001050000000	0Ω
12	R242	3001050000000	0Ω
13	R243	3001050000000	0Ω
14	R249	3001050000000	0Ω
15	R289	3001050000000	0Ω
16	R329	3001050000000	0Ω
17	R356	3001050000000	0Ω
18	R374	3001050000000	0Ω
19	R375	3001050000000	0Ω
20	R399	3001050000000	0Ω
21	R426	3001050000000	0Ω
22	R440	3001050000000	0Ω
23	R5	3001050000000	0Ω
24	R505	3001050000000	0Ω
25	R506	3001050000000	0Ω
26	R508	3001050000000	0Ω
27	R536	3001050000000	0Ω
28	R544	3001050000000	0Ω
29	R564	3001050000000	0Ω
30	R565	3001050000000	0Ω
31	R566	3001050000000	0Ω
32	R567	3001050000000	0Ω
33	R6100	3001050000000	0Ω
34	R6123	3001050000000	0Ω
35	R729	3001050000000	0Ω
36	R731	3001050000000	0Ω
37	R837	3001050000000	0Ω
38	R857	3001050000000	0Ω
39	R863	3001050000000	0Ω
40	R889	3001050000000	0Ω
41	R891	3001050000000	0Ω

No.	Ref. No.	Part No.	Description
42	R894	3001050000000	0Ω
43	R902	3001050000000	0Ω
44	R904	3001050000000	0Ω
45	R920	3001050000000	0Ω
46	R923	3001050000000	0Ω
47	R967	3001050000000	0Ω
48	R983	3001050000000	0Ω
49	C241	3001060000000	0Ω
50	C6158	3001060000000	0Ω
51	C6176	3001060000000	0Ω
52	C843	3001060000000	0Ω
53	R171	3001060000000	0Ω
54	R2	3001060000000	0Ω
55	R282	3001060000000	0Ω
56	R407	3001060000000	0Ω
57	R444	3001060000000	0Ω
58	R484	3001060000000	0Ω
59	R542	3001060000000	0Ω
60	R6116	3001060000000	0Ω
61	R6138	3001060000000	0Ω
62	R6140	3001060000000	0Ω
63	R724	3001060000000	0Ω
64	R822	3001060000000	0Ω
65	R901	3001060000000	0Ω
66	R914	3001060000000	0Ω
67	R916	3001060000000	0Ω
68	R962	3001060000000	0Ω
69	R963	3001060000000	0Ω
70	R965	3001060000000	0Ω
71	R973	3001060000000	0Ω
72	L829	3001070000000	0Ω
73	L830	3001070000000	0Ω
74	L808	3001080000000	0Ω
75	R245	3001160100000	1Ω
76	R253	3001160100000	1Ω
77	R293	3001160100000	1Ω
78	R294	3001160100000	1Ω
79	R826	3001060100000	1Ω
80	R828	3001060100000	1Ω
81	R109	3001051000000	10Ω
82	R175	3001051000000	10Ω
83	R386	3001051000000	10Ω
84	R388	3001051000000	10Ω
85	R414	3001051000000	10Ω

No.	Ref. No.	Part No.	Description
86	R187	3001061000000	10Ω
87	R808	3001061000000	10Ω
88	R953	3001061000000	10Ω
89	R6102	3001071000000	10Ω
90	R122	3001052700010	27Ω
91	R123	3001052700010	27Ω
92	R6121	3001051800000	18Ω
93	R1110	3001053300010	33Ω
94	R167	3001053300010	33Ω
95	R178	3001053300010	33Ω
96	R231	3001053300010	33Ω
97	R232	3001053300010	33Ω
98	R292	3001053300010	33Ω
99	R319	3001053300010	33Ω
100	R320	3001053300010	33Ω
101	R324	3001053300010	33Ω
102	R327	3001053300010	33Ω
103	R330	3001053300010	33Ω
104	R332	3001053300010	33Ω
105	R336	3001053300010	33Ω
106	R344	3001053300010	33Ω
107	R345	3001053300010	33Ω
108	R347	3001053300010	33Ω
109	R354	3001053300010	33Ω
110	R355	3001053300010	33Ω
111	R357	3001053300010	33Ω
112	R367	3001053300010	33Ω
113	R369	3001053300010	33Ω
114	R371	3001053300010	33Ω
115	R376	3001053300010	33Ω
116	R380	3001053300010	33Ω
117	R381	3001053300010	33Ω
118	R387	3001053300010	33Ω
119	R402	3001053300010	33Ω
120	R408	3001053300010	33Ω
121	R409	3001053300010	33Ω
122	R412	3001053300010	33Ω
123	R413	3001053300010	33Ω
124	R415	3001053300010	33Ω
125	R416	3001053300010	33Ω
126	R420	3001053300010	33Ω
127	R423	3001053300010	33Ω
128	R424	3001053300010	33Ω
129	R425	3001053300010	33Ω

No.	Ref. No.	Part No.	Description
130	R430	3001053300010	33Ω
131	R431	3001053300010	33Ω
132	R432	3001053300010	33Ω
133	R433	3001053300010	33Ω
134	R467	3001053300010	33Ω
135	R473	3001053300010	33Ω
136	R474	3001053300010	33Ω
137	R479	3001053300010	33Ω
138	R485	3001053300010	33Ω
139	R486	3001053300010	33Ω
140	R487	3001053300010	33Ω
141	R489	3001053300010	33Ω
142	R490	3001053300010	33Ω
143	R491	3001053300010	33Ω
144	R492	3001053300010	33Ω
145	R495	3001053300010	33Ω
146	R498	3001053300010	33Ω
147	R515	3001053300010	33Ω
148	R516	3001053300010	33Ω
149	R517	3001053300010	33Ω
150	R518	3001053300010	33Ω
151	R519	3001053300010	33Ω
152	R520	3001053300010	33Ω
153	R521	3001053300010	33Ω
154	R522	3001053300010	33Ω
155	R523	3001053300010	33Ω
156	R524	3001053300010	33Ω
157	R525	3001053300010	33Ω
158	R526	3001053300010	33Ω
159	R527	3001053300010	33Ω
160	R533	3001053300010	33Ω
161	R545	3001053300010	33Ω
162	R552	3001053300010	33Ω
163	R553	3001053300010	33Ω
164	R6114	3001053300010	33Ω
165	R711	3001053300010	33Ω
166	R715	3001053300010	33Ω
167	R717	3001053300010	33Ω
168	R719	3001053300010	33Ω
169	R720	3001053300010	33Ω
170	R721	3001053300010	33Ω
171	R725	3001053300010	33Ω
172	R821	3001113300000	33Ω
173	R825	3001113300000	33Ω

No.	Ref. No.	Part No.	Description
174	R1	3001054700000	47Ω
175	R141	3001054700000	47Ω
176	R830	3001074700000	47Ω
177	R6120	3001055100010	51Ω
178	R6132	3001055100010	51Ω
179	R701	3001055100010	51Ω
180	R114	3001065100000	51Ω
181	R111	3001065600000	56Ω
182	R862	3001065600000	56Ω
183	R809	3001068200000	82Ω
184	R829	3001068200000	82Ω
185	R835	3001068200000	82Ω
186	R6117	3001078200000	82Ω
187	R6126	3001078200000	82Ω
188	R819	3001078200000	82Ω
189	R140	3001051010040	100Ω
190	R145	3001051010040	100Ω
191	R146	3001051010040	100Ω
192	R147	3001051010040	100Ω
193	R148	3001051010040	100Ω
194	R160	3001051010040	100Ω
195	R190	3001051010040	100Ω
196	R196	3001051010040	100Ω
197	R251	3001051010040	100Ω
198	R260	3001051010040	100Ω
199	R271	3001051010040	100Ω
200	R278	3001051010040	100Ω
201	R337	3001051010040	100Ω
202	R338	3001051010040	100Ω
203	R339	3001051010040	100Ω
204	R346	3001051010040	100Ω
205	R403	3001051010040	100Ω
206	R404	3001051010040	100Ω
207	R406	3001051010040	100Ω
208	R410	3001051010040	100Ω
209	R411	3001051010040	100Ω
210	R421	3001051010040	100Ω
211	R434	3001051010040	100Ω
212	R439	3001051010040	100Ω
213	R445	3001051010040	100Ω
214	R458	3001051010040	100Ω
215	R459	3001051010040	100Ω
216	R556	3001051010040	100Ω
217	R557	3001051010040	100Ω

No.	Ref. No.	Part No.	Description
218	R929	3001051010040	100Ω
219	R948	3001051010040	100Ω
220	R4	3001061010000	100Ω
221	R810	3001061010000	100Ω
222	R814	3001061010000	100Ω
223	R823	3001061010000	100Ω
224	R137	3001061210000	120Ω
225	R139	3001061210000	120Ω
226	R966	3001161510010	150Ω
227	R144	3001061510000	150Ω
228	R6124	3001052710000	270Ω
229	R6125	3001052710000	270Ω
230	R707	3001051810010	180Ω
231	R192	3001061810000	180Ω
232	R129	3001052210000	220Ω
233	R130	3001052210000	220Ω
234	R135	3001052210000	220Ω
235	R136	3001052210000	220Ω
236	R933	3001052210000	220Ω
237	R984	3001052210000	220Ω
238	R803	3001062210000	220Ω
239	R816	3001072210000	220Ω
240	R817	3001072210000	220Ω
241	R712	3001052710010	270Ω
242	R827	3001062710000	270Ω
243	R6133	3001053310010	330Ω
244	R6129	3001063310010	330Ω
245	R961	3001083310010	330Ω
246	R6109	3001063910000	390Ω
247	R546	3001054710000	470Ω
248	R547	3001054710000	470Ω
249	R548	3001054710000	470Ω
250	R549	3001054710000	470Ω
251	R550	3001054710000	470Ω
252	R551	3001054710000	470Ω
253	R255	3001064710000	470Ω
254	R852	3001064710000	470Ω
255	R853	3001064710000	470Ω
256	R935	3001064710000	470Ω
257	R718	3001055110000	510Ω
258	R912	3001055110000	510Ω
259	R704	3001055610010	560Ω
260	R6101	3001056810000	680Ω
261	R6107	3001056810000	680Ω

No.	Ref. No.	Part No.	Description
262	R6106	3001066810000	680Ω
263	R936	3001066810000	680Ω
264	R958	3001066810000	680Ω
265	R887	3001058210000	820Ω
266	R181	3001051020000	1KΩ
267	R183	3001051020000	1KΩ
268	R264	3001051020000	1KΩ
269	R267	3001051020000	1KΩ
270	R290	3001051020000	1KΩ
271	R295	3001051020000	1KΩ
272	R383	3001051020000	1KΩ
273	R422	3001051020000	1KΩ
274	R460	3001051020000	1KΩ
275	R477	3001051020000	1KΩ
276	R502	3001051020000	1KΩ
277	R503	3001051020000	1KΩ
278	R504	3001051020000	1KΩ
279	R554	3001051020000	1KΩ
280	R571	3001051020000	1KΩ
281	R869	3001051020000	1KΩ
282	R874	3001051020000	1KΩ
283	R941	3001051020000	1KΩ
284	R947	3001051020000	1KΩ
285	R957	3001051020000	1KΩ
286	R978	3001051020000	1KΩ
287	R859	3001061020010	1KΩ
288	R924	3001061020010	1KΩ
289	R939	3001061020010	1KΩ
290	R954	3001061020010	1KΩ
291	R970	3001061020010	1KΩ
292	R974	3001061020010	1KΩ
293	R946	3001071020010	1KΩ
294	R291	3001051220000	1.2K
295	R6110	3001051220000	1.2K
296	R6119	3001051220000	1.2K
297	R6122	3001051220000	1.2K
298	R6131	3001051220000	1.2K
299	R401	3001051520010	1.5K
300	R951	3001051520010	1.5K
301	R449	3001061520000	1.5K
302	R265	3001051820000	1.8K
303	R714	3001051820000	1.8K
304	R703	3001052220010	2.2K
305	R849	3001052220010	2.2K

No.	Ref. No.	Part No.	Description
306	R866	3001052220010	2.2K
307	R909	3001052220010	2.2K
308	R964	3001052220010	2.2K
309	R968	3001052220010	2.2K
310	R972	3001062220000	2.2K
311	R6104	3001052720000	2.7K
312	R450	3001072720010	2.7K
313	R971	3099052741000	2.74kΩ
314	R839	3001053320000	3.3K
315	R890	3001053320000	3.3K
316	R6118	3001053920010	3.9K
317	R132	3001053920000	3.9K
318	R158	3001053920000	3.9K
319	R960	3001054790010	4.7K
320	R176	3001054720000	4.7K
321	R395	3001054720000	4.7K
322	R396	3001054720000	4.7K
323	R428	3001054720000	4.7K
324	R435	3001054720000	4.7K
325	R436	3001054720000	4.7K
326	R437	3001054720000	4.7K
327	R448	3001054720000	4.7K
328	R468	3001054720000	4.7K
329	R469	3001054720000	4.7K
330	R470	3001054720000	4.7K
331	R471	3001054720000	4.7K
332	R472	3001054720000	4.7K
333	R488	3001054720000	4.7K
334	R496	3001054720000	4.7K
335	R499	3001054720000	4.7K
336	R511	3001054720000	4.7K
337	R6108	3001054720000	4.7K
338	R6135	3001054720000	4.7K
339	R708	3001054720000	4.7K
340	R908	3001054720000	4.7K
341	R910	3001054720000	4.7K
342	R913	3001054720000	4.7K
343	R937	3001054720000	4.7K
344	R942	3001054720000	4.7K
345	R925	3001064720000	4.7K
346	R932	3001064720000	4.7K
347	R880	3001074720010	4.7K
348	R881	3001074720010	4.7K
349	R6130	3001055120030	5.1K

No.	Ref. No.	Part No.	Description
350	R577	3001056820000	6.8K
351	R831	3001055620000	5.6K
352	R239	3001055620000	5.6K
353	R287	3001055620000	5.6K
354	R6105	3001055620000	5.6K
355	R716	3001055620000	5.6K
356	R843	3001065620000	5.6K
357	R918	3099066041010	6.04K
358	R131	3001056820010	6.8K
359	R142	3001056820010	6.8K
360	R138	3001057520000	7.5K
361	R143	3001057520000	7.5K
362	R710	3001058220000	8.2K
363	R867	3001058220000	8.2K
364	R858	3001069120000	9.1K
365	R3	3001051030000	10KΩ
366	R6	3001051030000	10KΩ
367	R159	3001051030000	10KΩ
368	R177	3001051030000	10KΩ
369	R180	3001051030000	10KΩ
370	R202	3001051030000	10KΩ
371	R234	3001051030000	10KΩ
372	R235	3001051030000	10KΩ
373	R236	3001051030000	10KΩ
374	R258	3001051030000	10KΩ
375	R259	3001051030000	10KΩ
376	R261	3001051030000	10KΩ
377	R316	3001051030000	10KΩ
378	R322	3001051030000	10KΩ
379	R323	3001051030000	10KΩ
380	R325	3001051030000	10KΩ
381	R326	3001051030000	10KΩ
382	R334	3001051030000	10KΩ
383	R335	3001051030000	10KΩ
384	R341	3001051030000	10KΩ
385	R342	3001051030000	10KΩ
386	R343	3001051030000	10KΩ
387	R351	3001051030000	10KΩ
388	R353	3001051030000	10KΩ
389	R372	3001051030000	10KΩ
390	R377	3001051030000	10KΩ
391	R378	3001051030000	10KΩ
392	R379	3001051030000	10KΩ
393	R382	3001051030000	10KΩ

No.	Ref. No.	Part No.	Description
394	R385	3001051030000	10KΩ
395	R390	3001051030000	10KΩ
396	R391	3001051030000	10KΩ
397	R392	3001051030000	10KΩ
398	R393	3001051030000	10KΩ
399	R394	3001051030000	10KΩ
400	R400	3001051030000	10KΩ
401	R427	3001051030000	10KΩ
402	R429	3001051030000	10KΩ
403	R438	3001051030000	10KΩ
404	R441	3001051030000	10KΩ
405	R442	3001051030000	10KΩ
406	R443	3001051030000	10KΩ
407	R447	3001051030000	10KΩ
408	R451	3001051030000	10KΩ
409	R452	3001051030000	10KΩ
410	R453	3001051030000	10KΩ
411	R454	3001051030000	10KΩ
412	R461	3001051030000	10KΩ
413	R462	3001051030000	10KΩ
414	R463	3001051030000	10KΩ
415	R464	3001051030000	10KΩ
416	R465	3001051030000	10KΩ
417	R466	3001051030000	10KΩ
418	R476	3001051030000	10KΩ
419	R481	3001051030000	10KΩ
420	R482	3001051030000	10KΩ
421	R483	3001051030000	10KΩ
422	R501	3001051030000	10KΩ
423	R507	3001051030000	10KΩ
424	R509	3001051030000	10KΩ
425	R510	3001051030000	10KΩ
426	R512	3001051030000	10KΩ
427	R530	3001051030000	10KΩ
428	R531	3001051030000	10KΩ
429	R532	3001051030000	10KΩ
430	R534	3001051030000	10KΩ
431	R535	3001051030000	10KΩ
432	R538	3001051030000	10KΩ
433	R539	3001051030000	10KΩ
434	R540	3001051030000	10KΩ
435	R541	3001051030000	10KΩ
436	R543	3001051030000	10KΩ
437	R555	3001051030000	10KΩ

No.	Ref. No.	Part No.	Description
438	R570	3001051030000	10KΩ
439	R6127	3001051030000	10KΩ
440	R705	3001051030000	10KΩ
441	R709	3001051030000	10KΩ
442	R885	3001051030000	10KΩ
443	R938	3001051030000	10KΩ
444	R945	3001051030000	10KΩ
445	R950	3001051030000	10KΩ
446	R976	3001051030000	10KΩ
447	R979	3001051030000	10KΩ
448	R980	3001051030000	10KΩ
449	R844	3001061030000	10KΩ
450	R846	3001061030000	10KΩ
451	R194	3001051230000	12KΩ
452	R568	3001051230000	12KΩ
453	R842	3001051230000	12KΩ
454	R151	3001051530010	15KΩ
455	R198	3001051530010	15KΩ
456	R250	3001051530010	15KΩ
457	R284	3001051530010	15KΩ
458	R285	3001051530010	15KΩ
459	R361	3001051530010	15KΩ
460	R362	3001051530010	15KΩ
461	R884	3001051530010	15KΩ
462	R930	3001051530010	15KΩ
463	R802	3001061530010	15KΩ
464	R811	3001061530010	15KΩ
465	R161	3001051830000	18KΩ
466	R870	3001052030000	20KΩ
467	R155	3001052030000	20KΩ
468	R6136	3001052030000	20KΩ
469	R975	3001052030000	20KΩ
470	R845	3001062030000	20KΩ
471	R244	3001052230010	22KΩ
472	R246	3001052230010	22KΩ
473	R940	3001052230010	22KΩ
474	R944	3001052230010	22KΩ
475	R273	3001052430010	24KΩ
476	R915	3001052430010	24KΩ
477	R952	3001062430000	24KΩ
478	R195	3001052730010	27KΩ
479	R6103	3001052730010	27KΩ
480	R815	3001082730000	27KΩ
481	R257	3001053030000	30KΩ

No.	Ref. No.	Part No.	Description
482	R263	3001053030000	30KΩ
483	R279	3001053030000	30KΩ
484	R283	3001053030000	30KΩ
485	R6134	3001053030000	30KΩ
486	R6137	3001053030000	30KΩ
487	R529	3001053330000	33KΩ
488	R558	3001053330000	33KΩ
489	R559	3001053330000	33KΩ
490	R560	3001053330000	33KΩ
491	R561	3001053330000	33KΩ
492	R562	3001053330000	33KΩ
493	R563	3001053330000	33KΩ
494	R838	3001053330000	33KΩ
495	R841	3001053330000	33KΩ
496	R875	3001053330000	33KΩ
497	R905	3001053330000	33KΩ
498	R152	3001053630000	36KΩ
499	R117	3001053930000	39KΩ
500	R120	3001053930000	39KΩ
501	R865	3001053930000	39KΩ
502	R911	3099064422010	44.2kΩ
503	R266	3001054730000	47KΩ
504	R270	3001054730000	47KΩ
505	R272	3001054730000	47KΩ
506	R277	3001054730000	47KΩ
507	R286	3001054730000	47KΩ
508	R288	3001054730000	47KΩ
509	R847	3001054730000	47KΩ
510	R877	3001054730000	47KΩ
511	R931	3001054730000	47KΩ
512	R949	3001054730000	47KΩ
513	R959	3001054730000	47KΩ
514	R727	3001064730000	47KΩ
515	R728	3001064730000	47KΩ
516	R906	3001064730000	47KΩ
517	R943	3001064730000	47KΩ
518	R969	3001064730000	47KΩ
519	R934	3001055130010	51KΩ
520	R237	3001055630000	56KΩ
521	R241	3001055630000	56KΩ
522	R6139	3001055630000	56KΩ
523	R854	3001055630000	56KΩ
524	R876	3001055630000	56KΩ
525	R883	3001055630000	56KΩ

No.	Ref. No.	Part No.	Description
526	R895	3001055630000	56KΩ
527	R528	3001056830000	68KΩ
528	R128	3001058230000	82KΩ
529	R892	3001058230000	82KΩ
530	R247	3001051040000	100K
531	R248	3001051040000	100K
532	R252	3001051040000	100K
533	R262	3001051040000	100K
534	R268	3001051040000	100K
535	R269	3001051040000	100K
536	R274	3001051040000	100K
537	R275	3001051040000	100K
538	R276	3001051040000	100K
539	R296	3001051040000	100K
540	R455	3001051040000	100K
541	R500	3001051040000	100K
542	R513	3001051040000	100K
543	R514	3001051040000	100K
544	R6111	3001051040000	100K
545	R6112	3001051040000	100K
546	R6115	3001051040000	100K
547	R713	3001051040000	100K
548	R982	3001051040000	100K
549	RT804	3003061040000	Thermistor 100KΩ
550	R199	3001051240000	120K
551	R882	3001051540000	150K
552	R919	3001051540000	150K
553	R872	3001051840000	180K
554	R955	3001051840000	180K
555	R956	3001051840000	180K
556	R886	3001052240000	220K
557	R6113	3001052740000	270K
558	R917	3001053340010	330K
559	RN230	3005051010010	100Ω
560	RN500	3005051010010	100Ω
561	C181	3101050590010	0.5PF
562	C27	3101050590010	0.5PF
563	C42	3101050100030	1PF
564	C6110	3101050100030	1PF
565	C62	3101050100030	1PF
566	C53	3101051590000	1.5PF
567	C6117	3101051590000	1.5PF
568	C9	3101051590000	1.5PF
569	C101	3101050200010	2PF

No.	Ref. No.	Part No.	Description
570	C6122	3101050200010	2PF
571	C6125	3101050200010	2PF
572	C178	3101060200010	2PF
573	C179	3101060200010	2PF
574	C821	3101080200010	2pF
575	C26	3101062590010	2.5PF
576	C6120	3101050300000	3PF
577	C6121	3101050300000	3PF
578	C6126	3101050300000	3PF
579	C6127	3101050300000	3PF
580	C6152	3101050300000	3PF
581	C6124	3101054390010	4.3P
582	C177	3101060300010	3PF
583	C2	3101060300010	3PF
584	C31	3101060300010	3PF
585	C703	3101060300010	3PF
586	C12	3101053690000	3.6PF
587	C13	3101054090010	4PF
588	C152	3101054090010	4PF
589	C198	3101054090010	4PF
590	C6153	3101050400010	4PF
591	C6154	3101050400010	4PF
592	C55	3101060400010	4PF
593	C836	3101080400010	4PF
594	C838	3101080400010	4PF
595	C166	3101050500010	5PF
596	C168	3101050500010	5PF
597	C25	3101050500010	5PF
598	C32	3101050500010	5PF
599	C11	3101050500030	5PF
600	C159	3101050500030	5PF
601	C164	3101050500030	5PF
602	C18	3101050500030	5PF
603	C165	3101050600010	6PF
604	C6109	3101050600010	6PF
605	C6116	3101050600010	6PF
606	C6133	3101050600010	6PF
607	C6245	3101050600010	6PF
608	C6246	3101050600010	6PF
609	C731	3101050600010	6PF
610	C6163	3101050700010	7PF
611	C196	3101060700020	7PF
612	C49	3101060700020	7PF
613	C830	3101080700010	7PF

No.	Ref. No.	Part No.	Description
614	C837	3101080700010	7PF
615	C192	3101060800010	8PF
616	C6114	3101050700050	7PF
617	C6170	3101050900000	9PF
618	C10	3101060900010	9PF
619	C155	3101060900010	9PF
620	C6111	3101051000020	10PF
621	C6112	3101051000020	10PF
622	C6129	3101051000020	10PF
623	C714	3101051000020	10PF
624	C751	3101051000020	10PF
625	C17	3101061000000	10PF
626	C20	3101061000000	10PF
627	C16	3101051000030	10PF
628	C56	3101051000030	10PF
629	C14	3101051200020	12PF
630	C15	3101051200020	12PF
631	C322	3101051200020	12PF
632	C324	3101051200020	12PF
633	C375	3101051200020	12PF
634	C376	3101051200020	12PF
635	C59	3101051200020	12PF
636	C102	3101061200000	12PF
637	C151	3101061200000	12PF
638	C189	3101061200000	12PF
639	L826	3101061200000	12PF
640	C823	3101081200010	12PF
641	C832	3101081200010	12PF
642	C834	3101081200010	12PF
643	C6161	3101051500020	15PF
644	C6162	3101051500020	15PF
645	C6164	3101051500020	15PF
646	C6177	3101051500020	15PF
647	C723	3101051500020	15PF
648	C191	3101051500080	15PF
649	C864	3101061500010	15PF
650	C61	3101051800010	18PF
651	C724	3101051800010	18PF
652	C158	3101051800070	18PF
653	C814	3101061800000	18PF
654	C162	3101052000020	20PF
655	C4	3101052000020	20PF
656	C22	3101052200010	22PF
657	C730	3101052200010	22PF

No.	Ref. No.	Part No.	Description
658	C732	3101052200010	22PF
659	C747	3101052200010	22PF
660	C918	3101052200010	22PF
661	C857	3101062200010	22PF
662	C889	3101062200010	22PF
663	C902	3101062200010	22PF
664	C193	3101052700000	27PF
665	C734	3101053000010	30PF
666	C500	3101053300000	33PF
667	C6160	3101053300000	33PF
668	C1004	3101063300000	33PF
669	C803	3101063300000	33PF
670	C865	3101063300000	33PF
671	C888	3101063300000	33PF
672	C913	3101063300000	33PF
673	C846	3101073300000	33PF
674	C153	3101053900000	39PF
675	C364	3101053900000	39PF
676	C5	3101053900000	39PF
677	C855	3101053900000	39PF
678	C749	3101063900000	39PF
679	C818	3101063900000	39PF
680	C812	3101373900000	39PF
681	R824	3101373900000	39PF
682	C154	3101054700010	47PF
683	C820	3101054700010	47PF
684	C743	3101064700000	47PF
685	C872	3101064700000	47PF
686	C810	3101074700000	47PF
687	C825	3101074700000	47PF
688	C859	3101074700000	47PF
689	L833	3101074700000	47PF
690	C157	3101055600000	56PF
691	C161	3101055600000	56PF
692	C185	3101055600000	56PF
693	C3	3101055600000	56PF
694	C745	3101055600000	56PF
695	C840	3101055600000	56PF
696	C922	3101055600000	56PF
697	C6134	3101056800000	68PF
698	C6135	3101056800000	68PF
699	C6136	3101056800000	68PF
700	C6137	3101056800000	68PF
701	C6138	3101056800000	68PF

No.	Ref. No.	Part No.	Description
702	C6139	3101056800000	68PF
703	C6140	3101056800000	68PF
704	C6141	3101056800000	68PF
705	C6142	3101056800000	68PF
706	C6143	3101056800000	68PF
707	C362	3101058200000	82PF
708	C363	3101058200000	82PF
709	C365	3101058200000	82PF
710	C121	3101051010030	100PF
711	C1320	3101051010030	100PF
712	C256	3101051010030	100PF
713	C288	3101051010030	100PF
714	C295	3101051010030	100PF
715	C307	3101051010030	100PF
716	C309	3101051010030	100PF
717	C326	3101051010030	100PF
718	C33	3101051010030	100PF
719	C335	3101051010030	100PF
720	C339	3101051010030	100PF
721	C34	3101051010030	100PF
722	C341	3101051010030	100PF
723	C342	3101051010030	100PF
724	C343	3101051010030	100PF
725	C344	3101051010030	100PF
726	C345	3101051010030	100PF
727	C346	3101051010030	100PF
728	C347	3101051010030	100PF
729	C348	3101051010030	100PF
730	C349	3101051010030	100PF
731	C350	3101051010030	100PF
732	C351	3101051010030	100PF
733	C352	3101051010030	100PF
734	C353	3101051010030	100PF
735	C354	3101051010030	100PF
736	C355	3101051010030	100PF
737	C357	3101051010030	100PF
738	C358	3101051010030	100PF
739	C359	3101051010030	100PF
740	C360	3101051010030	100PF
741	C361	3101051010030	100PF
742	C378	3101051010030	100PF
743	C385	3101051010030	100PF
744	C390	3101051010030	100PF
745	C409	3101051010030	100PF

No.	Ref. No.	Part No.	Description
746	C410	3101051010030	100PF
747	C411	3101051010030	100PF
748	C412	3101051010030	100PF
749	C413	3101051010030	100PF
750	C414	3101051010030	100PF
751	C415	3101051010030	100PF
752	C416	3101051010030	100PF
753	C417	3101051010030	100PF
754	C418	3101051010030	100PF
755	C419	3101051010030	100PF
756	C420	3101051010030	100PF
757	C426	3101051010030	100PF
758	C427	3101051010030	100PF
759	C428	3101051010030	100PF
760	C429	3101051010030	100PF
761	C430	3101051010030	100PF
762	C431	3101051010030	100PF
763	C435	3101051010030	100PF
764	C440	3101051010030	100PF
765	C441	3101051010030	100PF
766	C442	3101051010030	100PF
767	C443	3101051010030	100PF
768	C444	3101051010030	100PF
769	C445	3101051010030	100PF
770	C446	3101051010030	100PF
771	C447	3101051010030	100PF
772	C448	3101051010030	100PF
773	C449	3101051010030	100PF
774	C450	3101051010030	100PF
775	C451	3101051010030	100PF
776	C452	3101051010030	100PF
777	C453	3101051010030	100PF
778	C454	3101051010030	100PF
779	C455	3101051010030	100PF
780	C456	3101051010030	100PF
781	C463	3101051010030	100PF
782	C465	3101051010030	100PF
783	C466	3101051010030	100PF
784	C467	3101051010030	100PF
785	C468	3101051010030	100PF
786	C469	3101051010030	100PF
787	C470	3101051010030	100PF
788	C472	3101051010030	100PF
789	C477	3101051010030	100PF

No.	Ref. No.	Part No.	Description
790	C478	3101051010030	100PF
791	C479	3101051010030	100PF
792	C480	3101051010030	100PF
793	C481	3101051010030	100PF
794	C482	3101051010030	100PF
795	C510	3101051010030	100PF
796	C516	3101051010030	100PF
797	C517	3101051010030	100PF
798	C518	3101051010030	100PF
799	C6130	3101051010030	100PF
800	C6166	3101051010030	100PF
801	C721	3101051010030	100PF
802	C722	3101051010030	100PF
803	C738	3101051010030	100PF
804	C739	3101051010030	100PF
805	C76	3101051010030	100PF
806	C763	3101051010030	100PF
807	C764	3101051010030	100PF
808	C765	3101051010030	100PF
809	C766	3101051010030	100PF
810	C767	3101051010030	100PF
811	C769	3101051010030	100PF
812	C77	3101051010030	100PF
813	C90	3101051010030	100PF
814	C93	3101051010030	100PF
815	C6157	3101061010010	100PF
816	C852	3101061010010	100PF
817	C891	3101051210000	120PF
818	C899	3101051210000	120PF
819	C875	3101051510000	150PF
820	C847	3101061510000	150PF
821	C848	3101061510000	150PF
822	C716	3101061810010	180PF
823	C100	3101052210010	220PF
824	C1000	3101052210010	220PF
825	C147	3101052210010	220PF
826	C150	3101052210010	220PF
827	C156	3101052210010	220PF
828	C160	3101052210010	220PF
829	C184	3101052210010	220PF
830	C186	3101052210010	220PF
831	C194	3101052210010	220PF
832	C197	3101052210010	220PF
833	C23	3101052210010	220PF

No.	Ref. No.	Part No.	Description
834	C247	3101052210010	220PF
835	C250	3101052210010	220PF
836	C254	3101052210010	220PF
837	C265	3101052210010	220PF
838	C269	3101052210010	220PF
839	C270	3101052210010	220PF
840	C271	3101052210010	220PF
841	C272	3101052210010	220PF
842	C273	3101052210010	220PF
843	C28	3101052210010	220PF
844	C280	3101052210010	220PF
845	C29	3101052210010	220PF
846	C421	3101052210010	220PF
847	C423	3101052210010	220PF
848	C424	3101052210010	220PF
849	C425	3101052210010	220PF
850	C432	3101052210010	220PF
851	C433	3101052210010	220PF
852	C434	3101052210010	220PF
853	C436	3101052210010	220PF
854	C437	3101052210010	220PF
855	C46	3101052210010	220PF
856	C52	3101052210010	220PF
857	C6	3101052210010	220PF
858	C6103	3101052210010	220PF
859	C6105	3101052210010	220PF
860	C6106	3101052210010	220PF
861	C6107	3101052210010	220PF
862	C6144	3101052210010	220PF
863	C6159	3101052210010	220PF
864	C704	3101052210010	220PF
865	C883	3101052210010	220PF
866	C890	3101052210010	220PF
867	C895	3101052210010	220PF
868	C896	3101052210010	220PF
869	C897	3101052210010	220PF
870	C898	3101052210010	220PF
871	C921	3101052210010	220PF
872	C242	3101062210000	220PF
873	C245	3101062210000	220PF
874	C808	3101062210000	220PF
875	C809	3101062210000	220PF
876	C822	3101062210000	220PF
877	C845	3101062210000	220PF

No.	Ref. No.	Part No.	Description
878	C853	3101062210000	220PF
879	C877	3101062210000	220PF
880	C878	3101062210000	220PF
881	C892	3101062210000	220PF
882	C99	3101052710000	270PF
883	C501	3101053310020	330PF
884	C505	3101053310020	330PF
885	C911	3101053310020	330PF
886	C1001	3101054710010	470PF
887	C1003	3101054710010	470PF
888	C1015	3101054710010	470PF
889	C142	3101054710010	470PF
890	C148	3101054710010	470PF
891	C50	3101054710010	470PF
892	C504	3101054710010	470PF
893	C6102	3101054710010	470PF
894	C6118	3101054710010	470PF
895	C6128	3101054710010	470PF
896	C6146	3101054710010	470PF
897	C6148	3101054710010	470PF
898	C6151	3101054710010	470PF
899	C706	3101054710010	470PF
900	C717	3101054710010	470PF
901	C727	3101054710010	470PF
902	C746	3101054710010	470PF
903	C8	3101054710010	470PF
904	C945	3101054710010	470PF
905	C811	3101064710000	470PF
906	C817	3101064710000	470PF
907	C827	3101084710010	470PF
908	C850	3101084710010	470PF
909	C893	3101084710010	470PF
910	C1	3101051020010	1000PF
911	C1002	3101051020010	1000PF
912	C1010	3101051020010	1000PF
913	C337	3101051020010	1000PF
914	C338	3101051020010	1000PF
915	C404	3101051020010	1000PF
916	C484	3101051020010	1000PF
917	C503	3101051020010	1000PF
918	C513	3101051020010	1000PF
919	C60	3101051020010	1000PF
920	C6108	3101051020010	1000PF
921	C710	3101051020010	1000PF

No.	Ref. No.	Part No.	Description
922	C728	3101051020010	1000PF
923	C75	3101051020010	1000PF
924	C79	3101051020010	1000PF
925	C82	3101051020010	1000PF
926	C910	3101051020010	1000PF
927	C937	3101051020010	1000PF
928	C944	3101051020010	1000PF
929	C96	3101051020010	1000PF
930	C839	3101061020040	1000PF
931	C887	3101061020040	1000PF
932	C801	3101081020010	1000PF
933	C502	3101053320010	3300PF
934	C802	3101063320000	3300PF
935	C916	3101063320000	3300PF
936	C713	3101053920000	3900PF
937	C815	3101064720000	4700PF
938	C863	3101064720000	4700PF
939	C199	3101051030020	0.01UF
940	C235	3101051030020	0.01UF
941	C260	3101051030020	0.01UF
942	C261	3101051030020	0.01UF
943	C306	3101051030020	0.01UF
944	C381	3101051030020	0.01UF
945	C384	3101051030020	0.01UF
946	C399	3101051030020	0.01UF
947	C506	3101051030020	0.01UF
948	C507	3101051030020	0.01UF
949	C58	3101051030020	0.01UF
950	C6147	3101051030020	0.01UF
951	C6155	3101051030020	0.01UF
952	C6178	3101051030020	0.01UF
953	C701	3101051030020	0.01UF
954	C702	3101051030020	0.01UF
955	C725	3101051030020	0.01UF
956	C736	3101051030020	0.01UF
957	C80	3101051030020	0.01UF
958	C95	3101051030020	0.01UF
959	C97	3101051030020	0.01UF
960	C952	3101061030010	0.01UF
961	C894	3101051830000	0.018UF
962	C930	3101061830000	0.018UF
963	C246	3101052230000	0.022UF
964	C880	3101064730000	0.047UF
965	C1006	3101051040010	0.1UF

No.	Ref. No.	Part No.	Description
966	C141	3101051040010	0.1UF
967	C149	3101051040010	0.1UF
968	C163	3101051040010	0.1UF
969	C167	3101051040010	0.1UF
970	C195	3101051040010	0.1UF
971	C232	3101051040010	0.1UF
972	C233	3101051040010	0.1UF
973	C236	3101051040010	0.1UF
974	C239	3101051040010	0.1UF
975	C24	3101051040010	0.1UF
976	C240	3101051040010	0.1UF
977	C243	3101051040010	0.1UF
978	C248	3101051040010	0.1UF
979	C258	3101051040010	0.1UF
980	C267	3101051040010	0.1UF
981	C274	3101051040010	0.1UF
982	C285	3101051040010	0.1UF
983	C30	3101051040010	0.1UF
984	C308	3101051040010	0.1UF
985	C311	3101051040010	0.1UF
986	C321	3101051040010	0.1UF
987	C323	3101051040010	0.1UF
988	C329	3101051040010	0.1UF
989	C334	3101051040010	0.1UF
990	C336	3101051040010	0.1UF
991	C356	3101051040010	0.1UF
992	C366	3101051040010	0.1UF
993	C379	3101051040010	0.1UF
994	C380	3101051040010	0.1UF
995	C382	3101051040010	0.1UF
996	C383	3101051040010	0.1UF
997	C386	3101051040010	0.1UF
998	C387	3101051040010	0.1UF
999	C388	3101051040010	0.1UF
1000	C389	3101051040010	0.1UF
1001	C391	3101051040010	0.1UF
1002	C392	3101051040010	0.1UF
1003	C393	3101051040010	0.1UF
1004	C394	3101051040010	0.1UF
1005	C398	3101051040010	0.1UF
1006	C400	3101051040010	0.1UF
1007	C407	3101051040010	0.1UF
1008	C422	3101051040010	0.1UF
1009	C471	3101051040010	0.1UF

No.	Ref. No.	Part No.	Description
1010	C473	3101051040010	0.1UF
1011	C509	3101051040010	0.1UF
1012	C512	3101051040010	0.1UF
1013	C514	3101051040010	0.1UF
1014	C515	3101051040010	0.1UF
1015	C6104	3101051040010	0.1UF
1016	C6113	3101051040010	0.1UF
1017	C6168	3101051040010	0.1UF
1018	C6169	3101051040010	0.1UF
1019	C6171	3101051040010	0.1UF
1020	C6173	3101051040010	0.1UF
1021	C6175	3101051040010	0.1UF
1022	C6179	3101051040010	0.1UF
1023	C6180	3101051040010	0.1UF
1024	C7	3101051040010	0.1UF
1025	C705	3101051040010	0.1UF
1026	C707	3101051040010	0.1UF
1027	C708	3101051040010	0.1UF
1028	C709	3101051040010	0.1UF
1029	C712	3101051040010	0.1UF
1030	C720	3101051040010	0.1UF
1031	C729	3101051040010	0.1UF
1032	C733	3101051040010	0.1UF
1033	C735	3101051040010	0.1UF
1034	C737	3101051040010	0.1UF
1035	C740	3101051040010	0.1UF
1036	C741	3101051040010	0.1UF
1037	C744	3101051040010	0.1UF
1038	C756	3101051040010	0.1UF
1039	C83	3101051040010	0.1UF
1040	C85	3101051040010	0.1UF
1041	C86	3101051040010	0.1UF
1042	C87	3101051040010	0.1UF
1043	C89	3101051040010	0.1UF
1044	C947	3101051040010	0.1UF
1045	C950	3101051040010	0.1UF
1046	C955	3101051040010	0.1UF
1047	C958	3101051040010	0.1UF
1048	C967	3101051040010	0.1UF
1049	C968	3101051040010	0.1UF
1050	C969	3101051040010	0.1UF
1051	C978	3101051040010	0.1UF
1052	C98	3101051040010	0.1UF
1053	C122	3101061040010	0.1UF

No.	Ref. No.	Part No.	Description
1054	C283	3101061040010	0.1UF
1055	C289	3101061040010	0.1UF
1056	C6193	3101061040010	0.1UF
1057	C748	3101061040010	0.1UF
1058	C829	3101061040010	0.1UF
1059	C854	3101061040010	0.1UF
1060	C868	3101061040010	0.1UF
1061	C907	3101061040010	0.1UF
1062	C927	3101061040010	0.1UF
1063	C935	3101061040010	0.1UF
1064	C936	3101061040010	0.1UF
1065	C939	3101061040010	0.1UF
1066	C942	3101061040010	0.1UF
1067	C948	3101061040010	0.1UF
1068	C959	3101061040010	0.1UF
1069	C963	3101061040010	0.1UF
1070	L6122	3101061040010	0.1UF
1071	L6126	3101061040010	0.1UF
1072	C1005	3110071040000	0.1UF
1073	C1007	3110071040000	0.1UF
1074	C64	3110071040000	0.1UF
1075	C66	3110071040000	0.1UF
1076	C67	3110071040000	0.1UF
1077	C68	3110071040000	0.1UF
1078	C69	3110071040000	0.1UF
1079	C70	3110071040000	0.1UF
1080	C72	3110071040000	0.1UF
1081	C74	3110071040000	0.1UF
1082	C78	3110071040000	0.1UF
1083	C84	3110071040000	0.1UF
1084	C88	3110071040000	0.1UF
1085	C91	3110071040000	0.1UF
1086	C94	3110071040000	0.1UF
1087	C941	3101051540000	0.15UF
1088	C123	3101062240000	0.22UF
1089	C132	3101062240000	0.22UF
1090	C438	3101054740000	0.47UF
1091	C439	3101054740000	0.47UF
1092	C287	3101064740000	0.47UF
1093	C715	3101064740000	0.47UF
1094	C237	3101054740020	0.47uF
1095	C1016	3101065630000	0.056uF
1096	C255	3101051050000	1UF
1097	C276	3101051050000	1UF

No.	Ref. No.	Part No.	Description
1098	C305	3101051050000	1UF
1099	C310	3101051050000	1UF
1100	C719	3101051050000	1UF
1101	C962	3101051050000	1UF
1102	C200	3101061050020	1UF
1103	C238	3101061050020	1UF
1104	C249	3101061050020	1UF
1105	C251	3101061050020	1UF
1106	C252	3101061050020	1UF
1107	C253	3101061050020	1UF
1108	C257	3101061050020	1UF
1109	C259	3101061050020	1UF
1110	C262	3101061050020	1UF
1111	C263	3101061050020	1UF
1112	C264	3101061050020	1UF
1113	C266	3101061050020	1UF
1114	C268	3101061050020	1UF
1115	C277	3101061050020	1UF
1116	C278	3101061050020	1UF
1117	C279	3101061050020	1UF
1118	C281	3101061050020	1UF
1119	C282	3101061050020	1UF
1120	C290	3101061050020	1UF
1121	C291	3101061050020	1UF
1122	C294	3101061050020	1UF
1123	C298	3101061050020	1UF
1124	C299	3101061050020	1UF
1125	C396	3101061050020	1UF
1126	C6100	3101061050020	1UF
1127	C6145	3101061050020	1UF
1128	C6149	3101061050020	1UF
1129	C6185	3101061050020	1UF
1130	C6190	3101061050020	1UF
1131	C742	3101061050020	1UF
1132	C754	3101061050020	1UF
1133	C900	3101061050020	1UF
1134	C901	3101061050020	1UF
1135	C905	3101061050020	1UF
1136	C906	3101061050020	1UF
1137	C908	3101061050020	1UF
1138	C923	3101061050020	1UF
1139	C924	3101061050020	1UF
1140	C925	3101061050020	1UF
1141	C938	3101061050020	1UF

No.	Ref. No.	Part No.	Description
1142	C946	3101061050020	1UF
1143	C966	3101061050020	1UF
1144	C718	3101051050160	1uF
1145	C750	3101071050020	1uF
1146	C1009	3104071050070	1UF
1147	C71	3104071050070	1UF
1148	C933	3104082260070	22uF
1149	C920	3101062250000	2.2UF
1150	C932	3101062250000	2.2UF
1151	C934	3101062250000	2.2UF
1152	C965	3101062250000	2.2UF
1153	C912	3101072250030	2.2UF
1154	C292	3101064750030	4.7UF
1155	C136	3101074750010	4.7UF
1156	C275	3101071060010	10UF
1157	C367	3101071060010	10UF
1158	C926	3101071060010	10UF
1159	C234	3101081060010	10UF
1160	C286	3101081060010	10UF
1161	C807	3101081060010	10UF
1162	C928	3101081060010	10UF
1163	C956	3101081060010	10UF
1164	C957	3101081060010	10UF
1165	C980	3101081060010	10UF
1166	C981	3101081060010	10UF
1167	C1013	3104071060070	10UF
1168	C293	3104071060070	10UF
1169	C401	3104071060070	10UF
1170	C402	3104071060070	10UF
1171	C508	3104071060070	10UF
1172	C511	3104071060070	10UF
1173	C519	3104071060070	10UF
1174	C520	3104071060070	10UF
1175	C726	3104071060070	10UF
1176	C752	3104071060070	10UF
1177	C755	3104071060070	10UF
1178	C917	3104071060070	10UF
1179	C929	3104071060070	10UF
1180	C951	3104081060120	10UF
1181	C919	3101072260000	22UF
1182	C915	3101082260020	22UF
1183	C284	3103994760180	47uf
1184	C804	3103994760180	47uf
1185	C914	3103994760180	47uf

No.	Ref. No.	Part No.	Description
1186	L814	3212106689000	6.8nH
1187	L832	3212106100000	10nH
1188	L811	3215006100010	10nH
1189	L173	3212106120000	12nH
1190	L105	3237199120000	12.5nH
1191	L114	3237199120000	12.5nH
1192	L171	3210306150000	15nH
1193	C826	3210306180000	18nH
1194	L122	3210306180000	18nH
1195	L123	3210306180000	18nH
1196	L136	3210306180000	18nH
1197	L2	3210306180000	18nH
1198	L124	3237199190000	18.5nH
1199	L137	3237199190000	18.5nH
1200	L6110	3210306220000	22nH
1201	L6117	3210306220000	22nH
1202	L6118	3210306220000	22nH
1203	L6119	3210306220000	22nH
1204	L805	3210306220000	22nH
1205	L167	3210306270000	27nH
1206	L168	3210306270000	27nH
1207	L6116	3210306270000	27nH
1208	L6103	3212106270000	27nH
1209	L128	3210306330000	33nH
1210	L132	3210306330000	33nH
1211	L135	3210306330000	33nH
1212	L138	3210306330000	33nH
1213	L115	3217607330000	33nH
1214	L827	3212106390000	39nH
1215	L106	3214307390000	39nH
1216	L126	3214307390000	39nH
1217	L139	3214307390000	39nH
1218	L6120	3210306470000	47nH
1219	L6102	3210306221000	220nH
1220	L807	3210306221000	220nH
1221	L708	3217107221010	220nH
1222	L6125	3210406331000	330nH
1223	L716	3210406331000	330nH
1224	L147	3210406471000	330nH
1225	L151	3210406471000	330nH
1226	L718	3210406471000	330nH
1227	L103	3217607471000	470nH
1228	L107	3217607471000	470nH
1229	L108	3217607471000	470nH

No.	Ref. No.	Part No.	Description
1230	L110	3217607471000	470nH
1231	L112	3217607471000	470nH
1232	L116	3217607471000	470nH
1233	L117	3217607471000	470nH
1234	L118	3217607471000	470nH
1235	L121	3217607471000	470nH
1236	L127	3217607471000	470nH
1237	L129	3217607471000	470nH
1238	L133	3217607471000	470nH
1239	L134	3217607471000	470nH
1240	L140	3217607471000	470nH
1241	L4	3217607471000	470nH
1242	L5	3217607471000	470nH
1243	L154	3213306561000	0.56uH
1244	L713	3213306561000	0.56uH
1245	L162	3210306560000	56nH
1246	L166	3210306560000	56nH
1247	L169	3210306560000	56nH
1248	L6123	3213306821000	0.82uH
1249	L131	3221506601000	Bead
1250	L152	3221506601000	Bead
1251	L6	3221506601000	Bead
1252	L7	3221506601000	Bead
1253	L701	3221506601000	Bead
1254	L702	3221506601000	Bead
1255	L703	3221506601000	Bead
1256	L706	3221506601000	Bead
1257	L707	3221506601000	Bead
1258	L709	3221506601000	Bead
1259	L710	3221506601000	Bead
1260	L711	3221506601000	Bead
1261	L712	3221506601000	Bead
1262	L714	3221506601000	Bead
1263	L8	3221506601000	Bead
1264	L815	3221506601000	Bead
1265	L821	3221506601000	Bead
1266	L822	3221506601000	Bead
1267	L824	3221506601000	Bead
1268	L825	3221506601000	Bead
1269	L9	3221506601000	Bead
1270	R153	3221506601000	Bead
1271	R157	3221506601000	Bead
1272	R179	3221506601000	Bead
1273	R186	3221506601000	Bead

No.	Ref. No.	Part No.	Description
1274	L801	3221513600000	Bead
1275	L802	3221513600000	Bead
1276	L803	3221513600000	Bead
1277	L900	3221513600000	Bead
1278	L916	3221513600000	Bead
1279	L917	3221513600000	Bead
1280	L940	3221513600000	Bead
1281	L232	3221506300000	Bead
1282	L401	3221506300000	Bead
1283	L402	3221506300000	Bead
1284	L403	3221506300000	Bead
1285	L404	3221506300000	Bead
1286	L405	3221506300000	Bead
1287	L406	3221506300000	Bead
1288	L407	3221506300000	Bead
1289	L408	3221506300000	Bead
1290	L409	3221506300000	Bead
1291	L410	3221506300000	Bead
1292	L411	3221506300000	Bead
1293	L412	3221506300000	Bead
1294	L901	3221506300000	Bead
1295	L912	3221506300000	Bead
1296	L913	3221506300000	Bead
1297	L904	3221506181000	Bead
1298	L908	3221506181000	Bead
1299	L233	3211506101000	Bead
1300	L234	3211506101000	Bead
1301	L235	3211506101000	Bead
1302	L500	3211506101000	Bead
1303	L6100	3211506101000	Bead
1304	L6101	3211506101000	Bead
1305	L6114	3211506101000	Bead
1306	L6115	3211506101000	Bead
1307	L6121	3211506101000	Bead
1308	L819	3233099470000	Air-core coil 47nH
1309	L804	3233099160000	Air-core coil 16nH
1310	L809	3233099160000	Air-core coil 16nH
1311	L810	3233099160000	Air-core coil 16nH
1312	L813	3233099160000	Air-core coil 16nH
1313	L817	3233099160000	Air-core coil 16nH
1314	L806	3213306102000	1uH
1315	L820	3217112102020	1uH
1316	L828	3217112102020	1uH
1317	L1	3213212332000	3.3uH

No.	Ref. No.	Part No.	Description
1318	L156	3213212332000	3.3uH
1319	L715	3213212332000	3.3uH
1320	L717	3212206682000	6.8uH
1321	L903	3213099472000	4.7uH
1322	L931	3213099472000	4.7uH
1323	L902	3217299103000	10uH
1324	L930	3241799103000	10uH
1325	L704	3213212103000	10uH
1326	L705	3213212103000	10uH
1327	D100	3303990000060	Switching diode
1328	D129	3303990000060	Switching diode
1329	D701	3304060300050	Varactor
1330	D101	3304010100220	Varactor
1331	D102	3304010100220	Varactor
1332	D105	3304010100220	Varactor
1333	D106	3304010100220	Varactor
1334	D107	3304010100220	Varactor
1335	D108	3304010100220	Varactor
1336	D109	3304010100220	Varactor
1337	D110	3304010100220	Varactor
1338	D111	3304010100220	Varactor
1339	D112	3304010100220	Varactor
1340	D113	3304010100220	Varactor
1341	D116	3304010100220	Varactor
1342	D117	3304010100220	Varactor
1343	D121	3304010100220	Varactor
1344	D122	3304010100220	Varactor
1345	D125	3304010100220	Varactor
1346	D126	3304010100220	Varactor
1347	D127	3303030100010	Switching diode
1348	D128	3303030100010	Switching diode
1349	D230	3310240000000	ESD protection diode
1350	D231	3310240000000	ESD protection diode
1351	D233	3310240000000	ESD protection diode
1352	D240	3310240000000	ESD protection diode
1353	D402	3310240000000	ESD protection diode
1354	D403	3310240000000	ESD protection diode
1355	D404	3310240000000	ESD protection diode
1356	D405	3310240000000	ESD protection diode
1357	D406	3310240000000	ESD protection diode
1358	D234	3310240200000	ESD protection diode
1359	D236	3310240200000	ESD protection diode
1360	D239	3310240200000	ESD protection diode
1361	D235	3302031100010	Zener diode

No.	Ref. No.	Part No.	Description
1362	D241	3302031100010	Zener diode
1363	D409	3310240000040	ESD protection diode
1364	D237	3310990000090	ESD protection diode
1365	D238	3310990000090	ESD protection diode
1366	D407	3399040600010	ESD protection diode
1367	D408	3399040600010	ESD protection diode
1368	D450	3699037000010	USB protection IC
1369	D601	3307110100080	LED
1370	D702	3304060300010	Varactor
1371	D801	3303210100000	Switching diode
1372	D802	3303210100000	Switching diode
1373	D803	3303030300000	Diode
1374	D804	3303030300000	Diode
1375	D901	3303040400000	Switching diode
1376	D902	3301100300030	Rectifier diode
1377	D904	3301240000000	Diode
1378	D905	3301240000000	Diode
1379	D6100	3303060300010	Switching diode
1380	D906	3303060300010	Switching diode
1381	D907	3303060300010	Switching diode
1382	D909	3303060300010	Switching diode
1383	D911	3303060300010	Switching diode
1384	D914	3303060300010	Switching diode
1385	D910	3302030500010	Zener diode
1386	D915	3303010500290	Switching diode
1387	D805	3302030500030	Zener diode
1388	D917	3302030500030	Zener diode
1389	D6101	3304010100890	Varactor
1390	D6102	3304010100890	Varactor
1391	D6103	3304010100890	Varactor
1392	D6104	3304010100890	Varactor
1393	D6105	3399990000260	Rectifier diode
1394	D6106	3699019000000	Mixer
1395	Q1	3503020000030	N-MOSFET
1396	Q912	3503020000030	N-MOSFET
1397	Q100	3408002000080	NPN transistor
1398	Q103	3408002000080	NPN transistor
1399	Q106	3408002000080	NPN transistor
1400	Q110	3408002000080	NPN transistor
1401	Q101	3403999000000	Transistor
1402	Q105	3403999000000	Transistor
1403	Q108	3403999000000	Transistor
1404	Q112	3403999000000	Transistor
1405	Q116	3403999000000	Transistor

No.	Ref. No.	Part No.	Description
1406	Q117	3403999000000	Transistor
1407	Q102	3401002000990	NPN transistor
1408	Q111	3401002000990	NPN transistor
1409	Q104	3403003000060	NPN transistor
1410	Q702	3403003000060	NPN transistor
1411	Q107	3404006000000	NPN transistor
1412	Q109	3404006000000	NPN transistor
1413	Q6104	3404006000000	NPN transistor
1414	Q6105	3404006000000	NPN transistor
1415	Q230	3499000000150	Transistor
1416	Q231	3499000000150	Transistor
1417	Q232	3499000000150	Transistor
1418	Q233	3499000000150	Transistor
1419	Q234	3499000000150	Transistor
1420	Q235	3499000000150	Transistor
1421	Q6100	3499000000150	Transistor
1422	Q905	3499000000150	Transistor
1423	Q323	3403008000010	Transistor
1424	Q401	3403008000010	Transistor
1425	Q402	3403008000010	Transistor
1426	Q403	3403008000010	Transistor
1427	Q404	3403008000010	Transistor
1428	Q405	3403008000010	Transistor
1429	Q413	3403008000010	Transistor
1430	Q811	3403008000010	Transistor
1431	Q812	3403008000010	Transistor
1432	Q813	3403008000010	Transistor
1433	Q903	3403008000010	Transistor
1434	Q908	3403008000010	Transistor
1435	Q913	3403008000010	Transistor
1436	Q914	3403008000010	Transistor
1437	Q922	3403008000010	Transistor
1438	Q923	3403008000010	Transistor
1439	Q406	3414999000000	Transistor
1440	Q407	3414999000000	Transistor
1441	Q408	3414999000000	Transistor
1442	Q409	3414999000000	Transistor
1443	Q410	3414999000000	Transistor
1444	Q411	3414999000000	Transistor
1445	Q412	3414999000000	Transistor
1446	Q701	3408002000000	NPN transistor
1447	Q6102	3404999000000	NPN transistor
1448	Q6103	3404999000000	NPN transistor
1449	Q801	3404999000000	NPN transistor

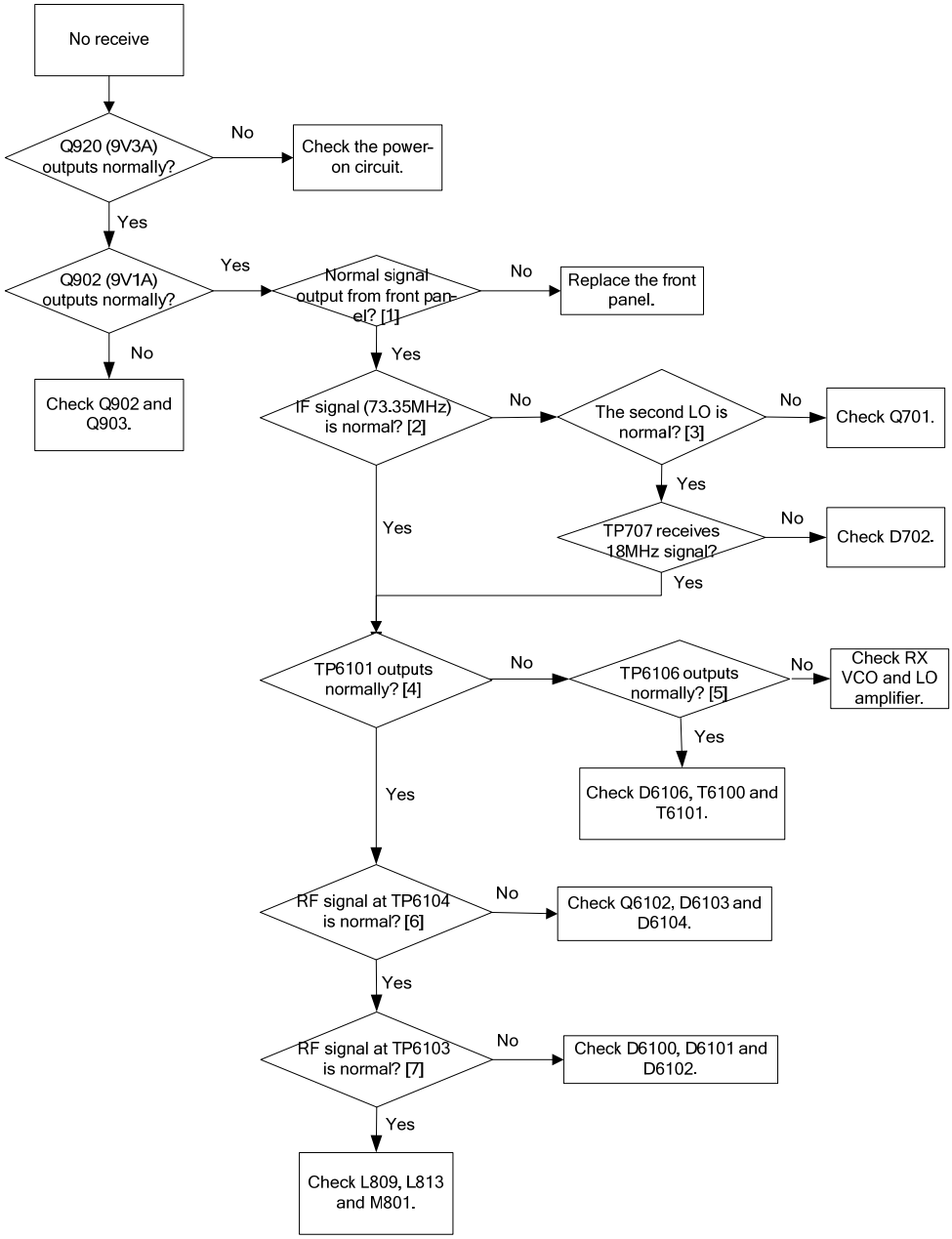
No.	Ref. No.	Part No.	Description
1450	Q804	3504990000030	PA MOSFET
1451	Q805	3504990000010	PA MOSFET
1452	Q810	3403002000000	PNP transistor
1453	Q902	3403002000000	PNP transistor
1454	Q400	3413001000010	PNP transistor
1455	Q906	3414001000020	NPN transistor
1456	Q910	3414001000020	NPN transistor
1457	Q909	3403002000010	PNP transistor
1458	Q6101	3403014000020	Transistor
1459	T6100	3244599189000	4BLH
1460	T6101	3244599189000	4BLH
1461	U100	3604019000000	PLL IC
1462	U101	3616059000000	Switch IC
1463	U102	3616059000000	Switch IC
1464	U201	3602017006350	Audio amplifier
1465	U231	3613010000000	Baseband processing IC
1466	U233	3612002000020	Memory
1467	U235	3605010000020	Operational amplifier
1468	U236	3605010000020	Operational amplifier
1469	U237	3616010000000	Switch IC
1470	U238	3605008005070	Operational amplifier
1471	U804	3605008005070	Operational amplifier
1472	U914	3605008005070	Operational amplifier
1473	U302	3610010000010	U302
1474	U401	3699053000000	SmartSwitch
1475	U500	3606010000010	D/A conversion IC
1476	U701	3603999000000	IF processor
1477	U702	3608006000000	Power management IC
1478	U900	3608006000000	Power management IC
1479	U901	3608006000000	Power management IC
1480	U909	3608006000000	Power management IC
1481	U703	3608015000060	Power management IC
1482	U905	3608015000060	Power management IC
1483	U915	3608015000060	Power management IC
1484	U902	3608053000010	Power management IC
1485	U903	3608015000170	Power management IC
1486	U918	3608015000210	Power management IC
1487	U919	3608010006230	Power management IC
1488	U801	3605025000020	Operational amplifier
1489	U802	3605002054590	Operational amplifier
1490	U6000	3605002057090	Operational amplifier
1491	U910	3609010000170	Reset IC
1492	U917	3609006003050	Reset IC
1493	X100	3701019250030	TCXO (19.2MHz)

No.	Ref. No.	Part No.	Description
1494	X302	3701019250040	Crystal oscillator (19.2MHz)
1495	X375	3701327610060	Crystal
1496	Z6100	3802733540030	Crystal filter
1497	F900	4099000000050	Fuse
1498	J400	5201020100110	Board-to-board connector
1499	J404	5206040200010	FFC connector
1500	PCB	41MD7801000F0	PCB
1501		6202010000000	APC shielding mask
1502		6201928000000	VCO shielding mask
1503	D900	3302060000000	Zener diode
1504	Q921	3404999000020	NPN transistor
1505	U232	3612044000010	Memory
1506	U327	3607023000150	Logic IC
1507	U328	3607082000040	Logic IC
1508	D912	3311240100000	Schottky diode
1509	D913	3311240100000	Schottky diode
1510	U906	3609010000210	Reset IC
1511	C406	3101051220000	1200PF
1512	L414	3221505121000	Bead
1513	L415	3221505121000	Bead
1514	L417	3221505121000	Bead
1515	L418	3221505121000	Bead
1516	R358	3221505121000	Bead
1517	R360	3221505121000	Bead
1518	L413	3240707181000	Common-mode choke coil
1519	L416	3240707181000	Common-mode choke coil
1520	C405	3104074750070	4.7UF
1521	R864	3001054740010	470K
1522	R897	3001054740010	470K
1523	R898	3001054740010	470K
1524	R899	3001054740010	470K
1525	C885	3101082700010	27pF
1526	C909	3101063310010	330PF
1527	C940	3101066800000	68PF
1528	C931	3101062700010	27PF
1529	C943	3101062700010	27PF
1530	L6216	3210305270000	27nH
1531	L6217	3210305270000	27nH
1532	C6244	3101050800050	8PF
1533	C483	3101058220000	8200PF
1534	R804	3001081000000	10Ω
1535	R806	3001081000000	10Ω
1536	R807	3001081000000	10Ω
1537	R813	3001081000000	10Ω

No.	Ref. No.	Part No.	Description
1538	R818	3001081000000	10Ω
1539	R861	3001081000000	10Ω
1540	R855	3001085100000	51Ω
1541	R856	3001085100000	51Ω
1542	C866	3101062710000	270PF
1543	C861	3101068200000	82PF
1544	C816	3101080300010	3pF
1545	C835	3101080300010	3pF
1546	C851	3101080300010	3pF
1547	L823	3210306339000	3.3nH
1548	L816	3233099111000	111nH

15.8 Troubleshooting Flow Chart

Receiver Circuit



Description of Normal Situations:

[1] During sensitivity test, use a communication test set to demodulate the audio signal (TP4012 and TP4016). If the signal is demodulated normally, it is concluded that the front panel is defective.

[2] Use the communication test set to input a 73.35MHz IF signal at the mixer, and see whether it can be processed normally afterwards.

[3] Use a spectrum analyzer to check whether TP704 can output the second LO signal (71.1MHz).

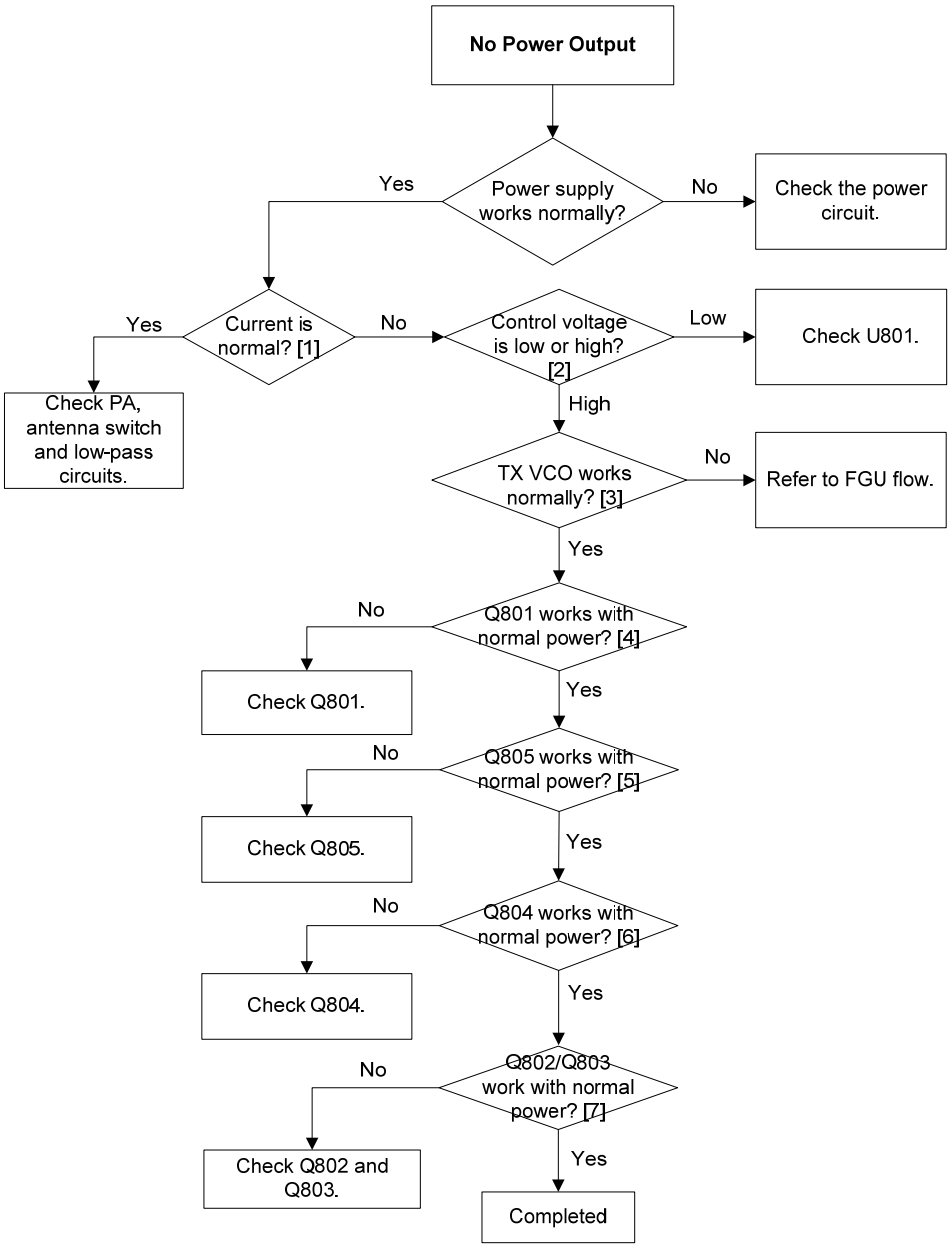
[4] Use the communication test set to apply an RF signal of -100dBm, and test the sensitivity.

[5] Use a spectrum analyzer to test the LO signal received by TP6106. If its strength is about 18dBm, go to check the mixer; otherwise, check the VCO.

[6] Use the communication test set to apply an RF signal of -110dBm at TP6104, and test the sensitivity.

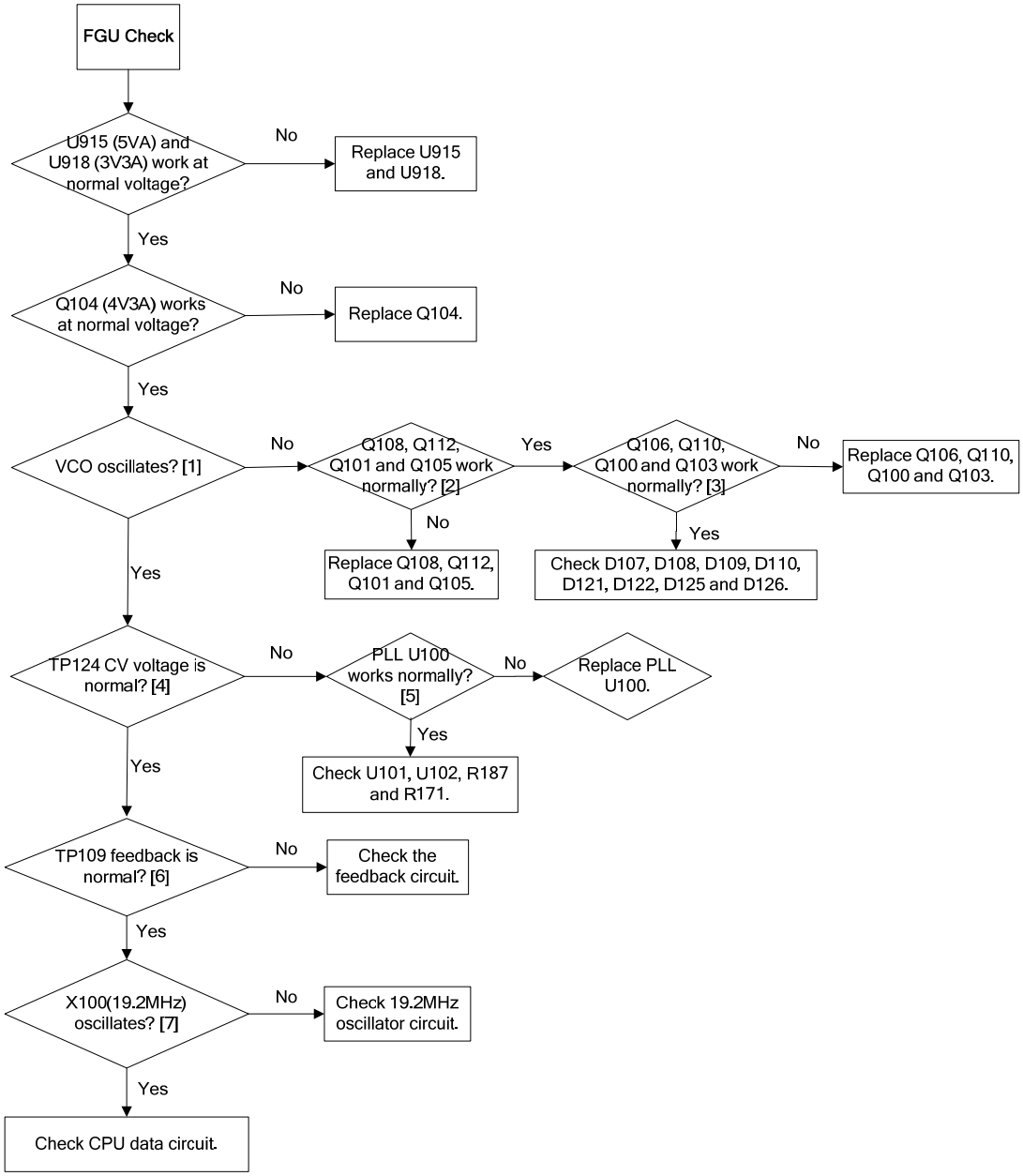
[7] Use the communication test set to apply an RF signal of -110dBm at TP6103, and test the sensitivity.

Transmitter Circuit



Description of Normal Situations:
[1] The current in analog mode is above 6A under 45W power supply and above 1A under 5W. However, in digital mode, the current will be reduced by 50%.
[2] The APC voltage should be above 2V at TP811.
[3] Check whether there is an appropriate TX LO signal at TP803.
[4] Check whether the gain is 16dB and the input signal is 0dBm at Q801.
[5] Check whether the gain is 15dB and the input signal is 0dBm at Q805.
[6] Check whether the gain is 11dB and the input signal is 0dBm at Q804.
[7] Check whether the gain is 10dB and the input signal is 0dBm at Q802 and Q803.

FGU


FGU Check
U915 (5VA) and U918 (3V3A) work at normal voltage?
No
Replace U915 and U918.
Yes
Q104 (4V3A) works at normal voltage?
No
Replace Q104.
Yes
VCO oscillates? [1]
No
Q108, Q112, Q101 and Q105 work normally? [2]
Yes
Q106, Q110, Q100 and Q103 work normally? [3]
No
Replace Q106, Q110, Q100 and Q103.
No
Replace Q108, Q112, Q101 and Q105.
Yes
Check D107, D108, D109, D110, D121, D122, D125 and D126.
Yes
TP124 CV voltage is normal? [4]
No
PLL U100 works normally? [5]
No
Replace PLL U100.
Yes
Check U101, U102, R187 and R171.
Yes
TP109 feedback is normal? [6]
No
Check the feedback circuit.
Yes
X100(19.2MHz) oscillates? [7]
No
Check 19.2MHz oscillator circuit.
Yes
Check CPU data circuit.

Description of Normal Situations:

[1] Detect the oscillation frequency of RX TP123 and TX TP111 using a spectrum analyzer.

[2] Check whether switches (Q108, Q112, Q101 and Q105) are turned on and output 3.6V.

[3] Check whether the emitter voltage of the four transistors (Q106, Q110, Q100 and Q103) is about 1.8V under normal RX/TX status.

[4] Check the CV of TP124. The normal value should range from 0.5V to 4.5V.

[5] Check whether U100 is supplied by 5V and 3.3V normally.

[6] Check whether the power from TP109 to PLL is about -15dBm.

[7] Check whether TP100 outputs 19.2MHz signal.

16.UHF3 (350-400MHz 45W) Information

16.1 Transmitter Circuit

The transmitter circuit is composed of power amplifier circuit and power control circuit. The former is used to amplify the VCO signal to the desired output power level, while the latter can keep the output power at the desired level, so as to protect the power amplifier from damage caused by over heat, antenna mismatch, and out-of-range voltage (over voltage or under voltage may result in damage to Q801, Q805, Q804, Q802 and Q803).

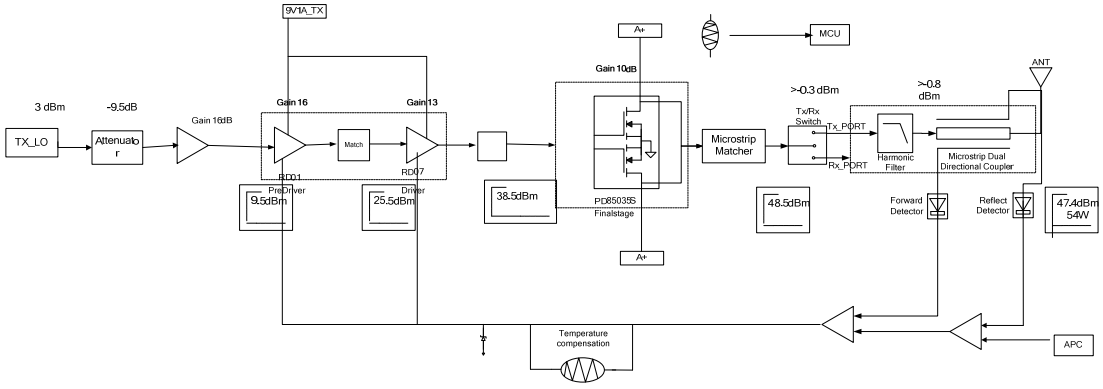


Figure 16-1 Diagram of Transmitter Circuit

16.1.1 Power Amplifier

The 4-stage power amplifier amplifies the signal output from VCO to the required output power level. The first stage is a buffer amplifier circuit with fixed gain; the second stage is a pre-driver power amplifier circuit with variable gain (formed by Q805); the third stage is a driver power amplifier circuit with variable gain (formed by Q804); and the final stage is the final power amplifier circuit with fixed gain (formed by Q802 and Q803). In addition, this power amplifier contains a TX/RX switch and a low-pass filter.

16.1.2 TX Buffer Amplifier

The first stage (Q801) provides about 16dB power gain, and adjusts its bias circuit to get a quiescent bias current of 28mA (for Q801). Power supply for the switching transistor Q810 is controlled by TX signal (enabled by antenna switch) so as to further control the power supply for the whole circuit.

16.1.3 Pre-driver Power Amplifier

The pre-driver power amplifier is formed by Q805, with variable gain controlled by voltage VGG. The input matching circuit is composed of C826, L826, L814, C843 and R824.

16.1.4 Driver Power Amplifier

The driver power amplifier is formed by Q804, with variable gain controlled by voltage VGG. The maximum output power is 38.5dBm, and the maximum variable gain is 11dB.

16.1.5 Final Power Amplifier

The final power amplifier comprises Q802 and Q803, with the maximum output power of 48.5dBm, and the maximum variable gain of 10dB. The input matching circuit is composed of C815, C839, R804, R806, R807, R813, R818 and R861, while the power combining circuit is composed of C820, C8330, C831, C819, C812, C841 and C842.

16.1.6 Antenna Switch

The antenna switch is used to switch between the transmitter circuit and the receiver circuit.

In TX mode, the switching transistor Q810 is controlled by TX signal, so as to supply 9V 3A to the PIN diodes D801 and D802. Quiescent bias current of the PIN diode is controlled by the resistors R821 and R825. In this mode, D801 and D802 are turned on; RF signals are applied to the low-pass filter (composed of C871, C816, C836, C837, C838, L809, L813, and L810) and then transmitted via the antenna port.

In RX mode, TX signal controls the switching transistor Q810, to further control the power supply for the PIN diodes D801 and D802, which are not applied with DC bias current. When the two PIN diodes are turned off, signals feed into the RX path through the low-pass filter (composed of L871, C852 and C862).

16.1.7 Low-pass Filter

A low-pass filter that consists of inductors L809, L813 and L810, and capacitors C836, C837, C830, is used to attenuate harmonic energy from the transmitter.

16.1.8 Directional Coupler

A directional coupler that consists of microstrip directional coupler, D803, D804 and etc, is used to detect both forward and reverse directed power of the transmitter. The forward power is coupled to the diode D803, and the voltage is applied to the power control circuit (U801). Then the voltage VGG is output to control the gate voltage of pre-driver and driver PA, ensuring a constant power output.

The directional coupler can adjust the TX power and detect the VSWR load. The reverse power is coupled to D804. The voltage is applied to U802 and then feeds into U302 for detection

16.1.9 Output Power Control

The TX power is controlled by U801. The forward power is applied to the directional coupler, to output a voltage that can represent the forward power. The voltage together with the preset voltage feeds to U801

to output a voltage VGG, which can control both gate voltage and gain of Q804 and Q805, ensuring a constant power output.

16.1.10 Thermal and Over-voltage Protections

The circuit consists of thermistor RT804 and resistor R884. The output voltage is proportional to the detected temperature. Both the voltage used for temperature detection and the threshold voltage are fed into the operational amplifier U803, to output a voltage signal that is in proportion to the detected temperature. Afterwards, the voltage is applied to software for judgment, and then the preset voltage will be subsequently changed to reduce the TX power, and to protect the PA from over-heating.

16.1.11 Pressure Pad Switch

The power control circuit includes a pressure pad switch SW1, which is controlled by the conductive rubber part mounted on the top cover. If the switch is turned off, VGG will become low, and no power will be output from PA. Otherwise, PA will work normally.

16.2 Receiver Circuit

The receiver utilizes double conversion superheterodyne technique. The first IF is 73.35MHz and the second IF is 2.25MHz. The first local oscillator signal is from the PLL circuit U100, and the second LO signal (71.1MHz) is generated by the PLL circuit U701. The major units are BPF, LNA, mixer, IF filter, IF amplifier and IF processor.

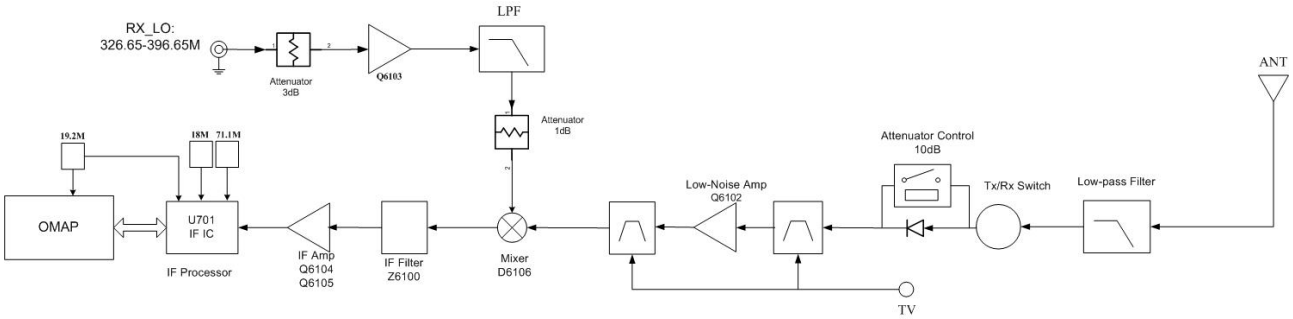


Figure 16-2 Diagram of Receiver Circuit

16.2.1 Receiver Front-end

RF signals feed to the low-pass filter to remove out-of-band signals, and are applied to the two-stage electrically tunable band-pass filter to get useful signals. After passing through the RF band-pass filter and LNA (Q6102), the RF signals together with the first LO signal feed to the mixer for the first frequency conversion, to generate the first IF signal (73.35MHz). The mixer that employs the passive diode can ensure good dynamic range and port isolation. The LO signal (3-5dBm) from the VCO feeds to Q6103 to get a gain (17dB). The first LO signals (73.35MHz) pass through the crystal filter (Z6100) to remove

out-of-band spurious signals, and then feed to the two-stage IF amplifier circuit (composed of Q6133 and Q6134) for amplification. Finally the amplified signals go to the IF IC for processing

16.2.2 Receiver Back-end

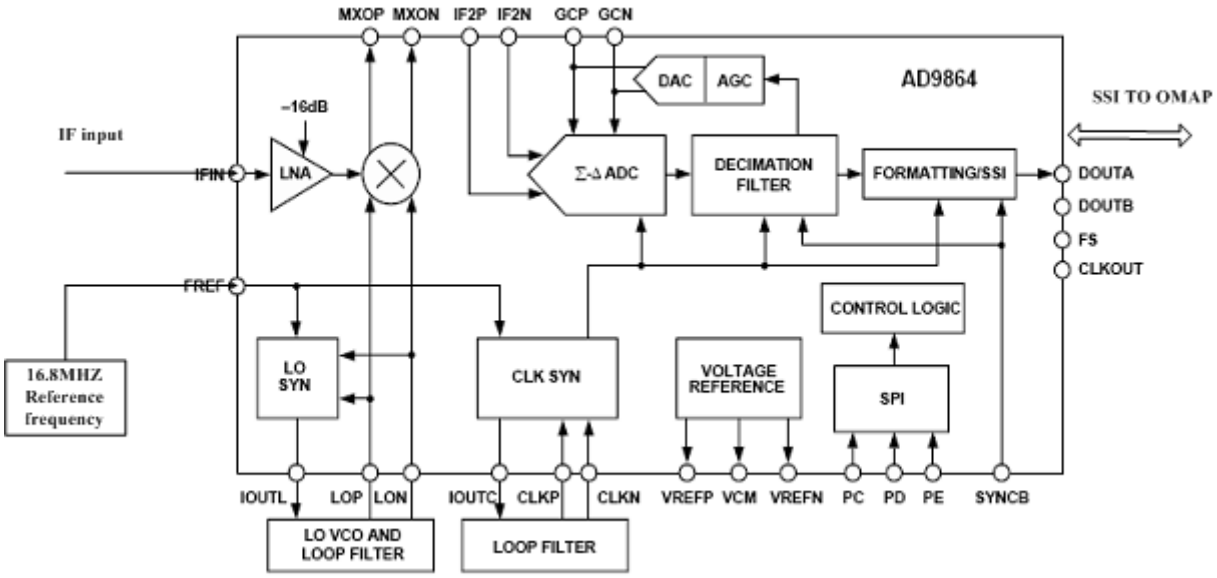


Figure 16-3 Diagram of IF Processor

The first IF signal (73.35MHz) output by the IF amplifier goes into IF IC via Pin 47, where the signal is converted to the second IF signal (2.25MHz). Then the un-demodulated digital I/Q signal output from the SSI interface is sent to U302 for demodulation. IF IC employs a reference frequency of 19.2MHz and shares the crystal with U302. The second LO VCO consists of the external transistor, varactor and some other components, to provide the second LO signal. The 18MHz clock frequency is generated by the LC resonance loop (D702, L715 and C745).

DSP (U302) gets the audio signal from IF IC (U701). Then this signal goes through U302 to output data signal, which is sent to U231 and PIN44 (SSI_DI) for digital-to-analog conversion. Finally, the output analog audio signal will be subjected to gain control, and then fed to the speaker.

16.3 Frequency Generation Unit (FGU)

16.3.1 PLL Synthesizer

The PLL synthesizer that consists of the reference oscillator (X100), PLL IC (U100) and VCO, is utilized to supply excitation signal source to the transmitter, and local oscillator signal to the receiver.

16.3.2 Reference Oscillator

X100 is a 19.2MHz TCXO, and its reference frequency is calibrated by the digital-to-analog converter (U500) for accuracy.

16.3.3 PLL IC

The PLL IC (U100) is a fractional frequency divider. The logic IC U101 and U102 work with the PLL IC (U100) to achieve locking.

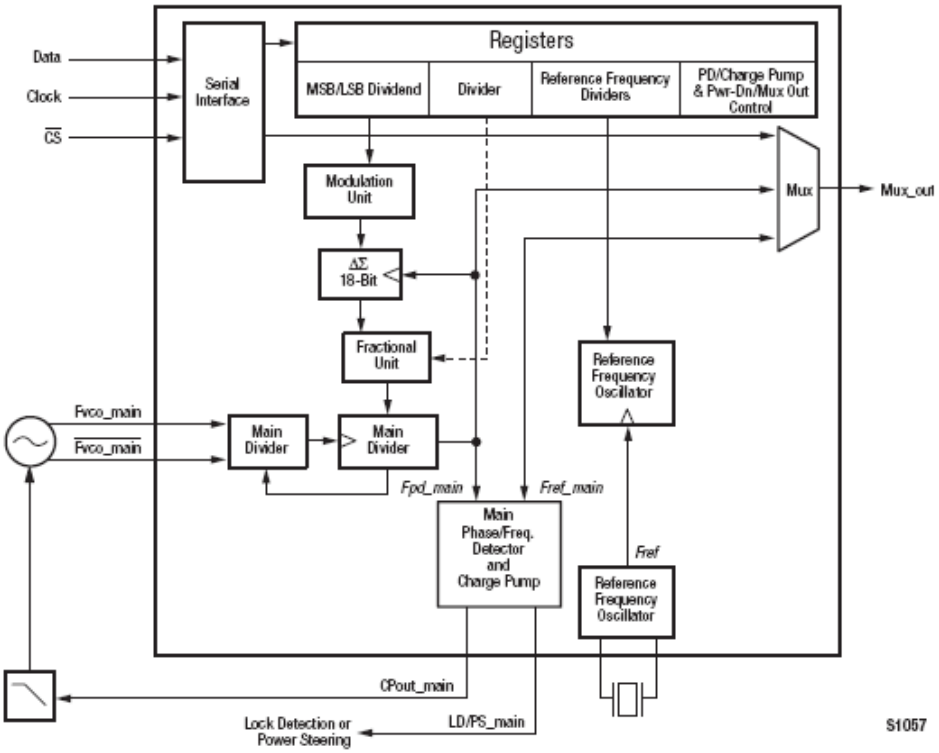


Figure 16-4 Diagram of PLL IC

The 19.2MHz frequency generated by the reference oscillator goes into the PLL IC for division, generating the reference frequency. Meanwhile, the frequency generated by VCO goes into PLL IC (U100) for frequency division. The resulting frequency will be compared with the reference frequency in terms of phase difference in the phase detector. After comparison, the resulting frequency is converted to CV voltage via the loop filter, to control and lock the frequency.

16.3.4 VCO

The VCO is composed of transistors (Q100, Q103, Q106 and Q110), varactors and four Colpitts oscillators. There are four VCOs in all: two VCOs (Q100 and Q103) used to transmit excitation signals and the other two VCOs (Q106 and Q110) to receive LO signals. U302 controls the operating frequency of the VCO. Q102 and Q107 constitute the buffer amplifiers for the transmitter circuit, while Q111 and Q109 for the receiver circuit. The digital-to-analog converter (U500) modulates the TX oscillator signal.

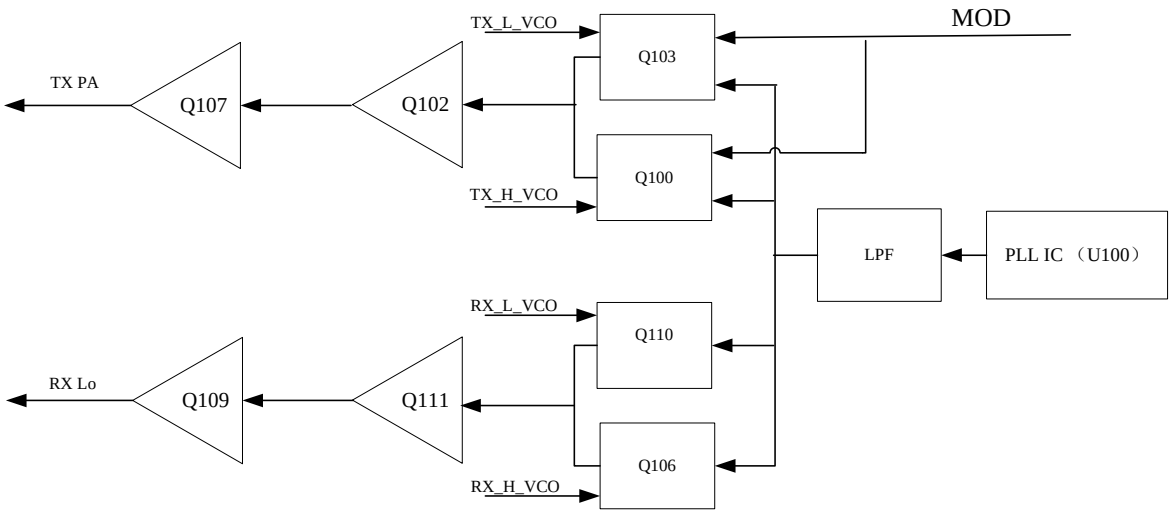
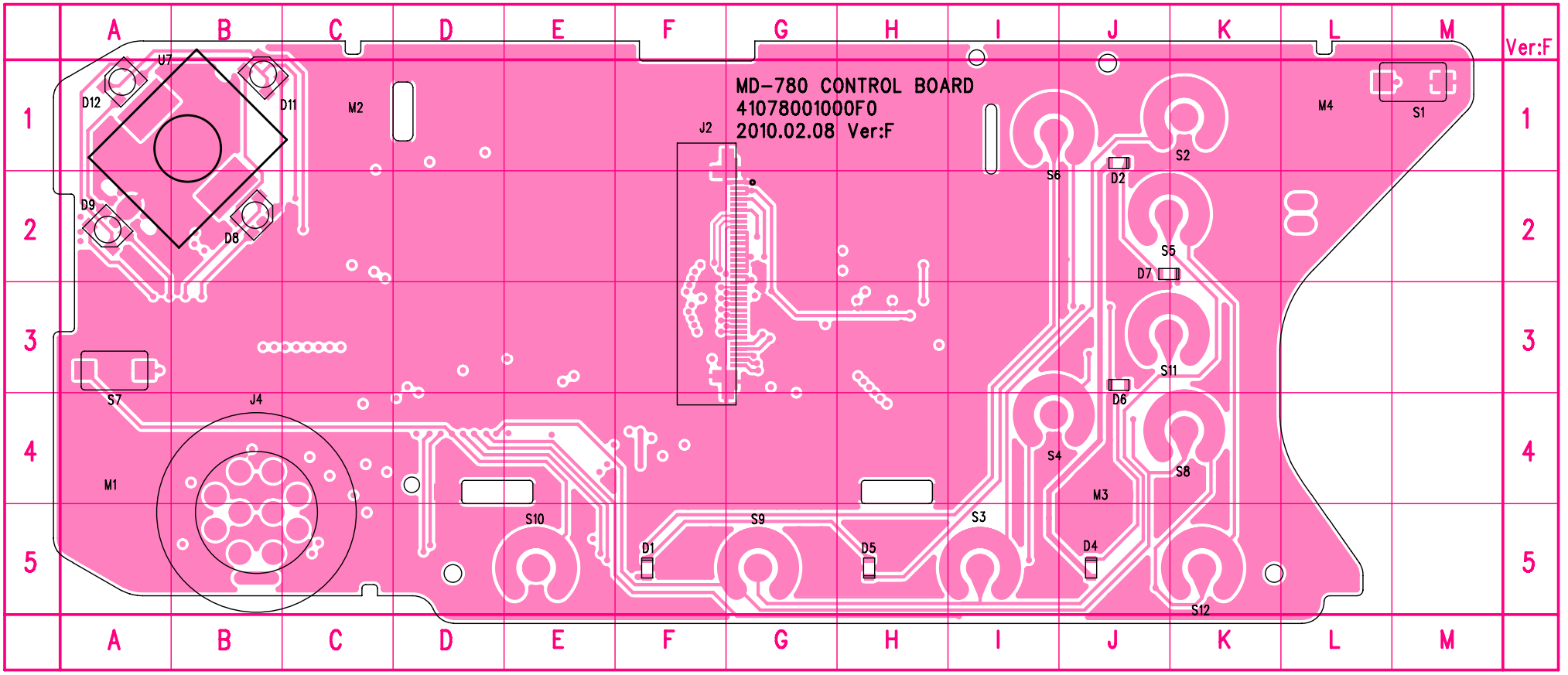


Figure 16-5 Diagram of VCO

16.4 PCB View

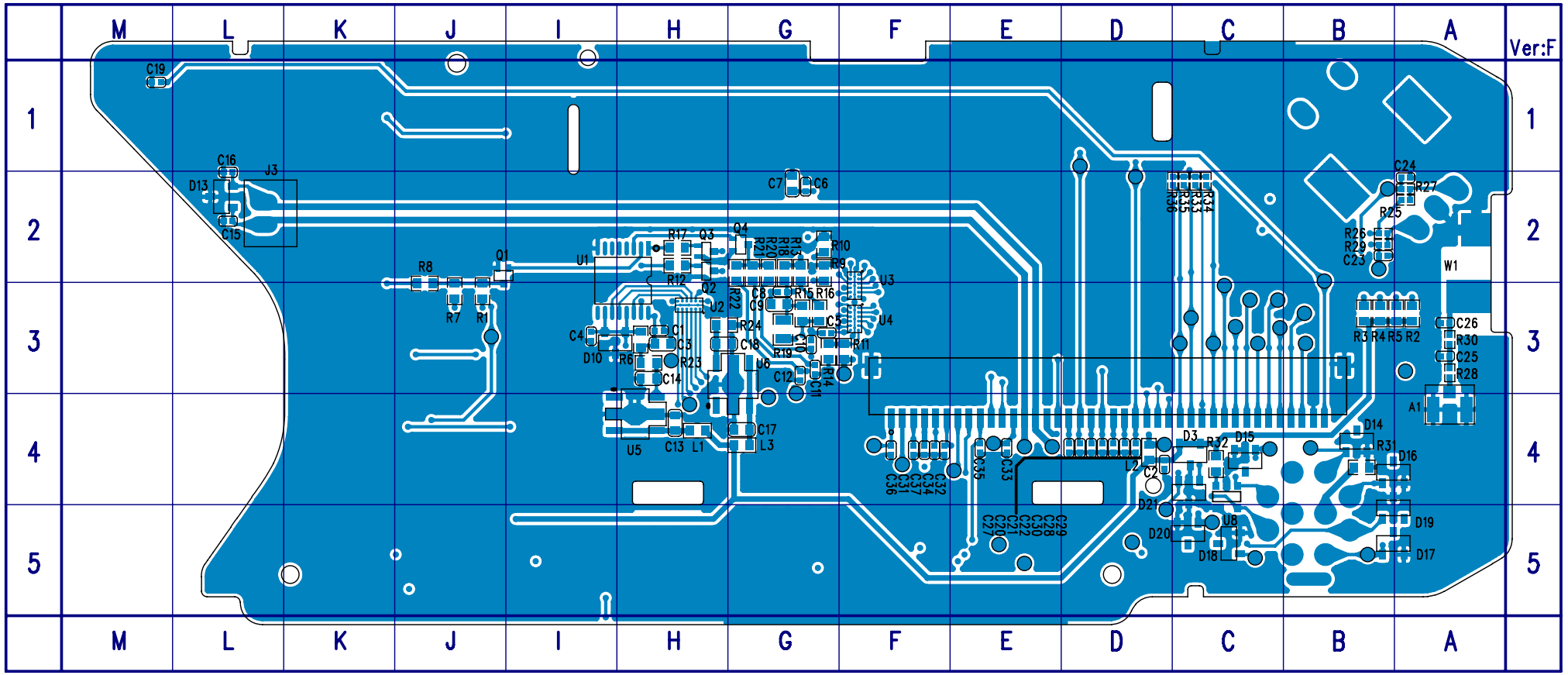
MD78X/MD78XG PCB View (Front Panel)

Top Layer

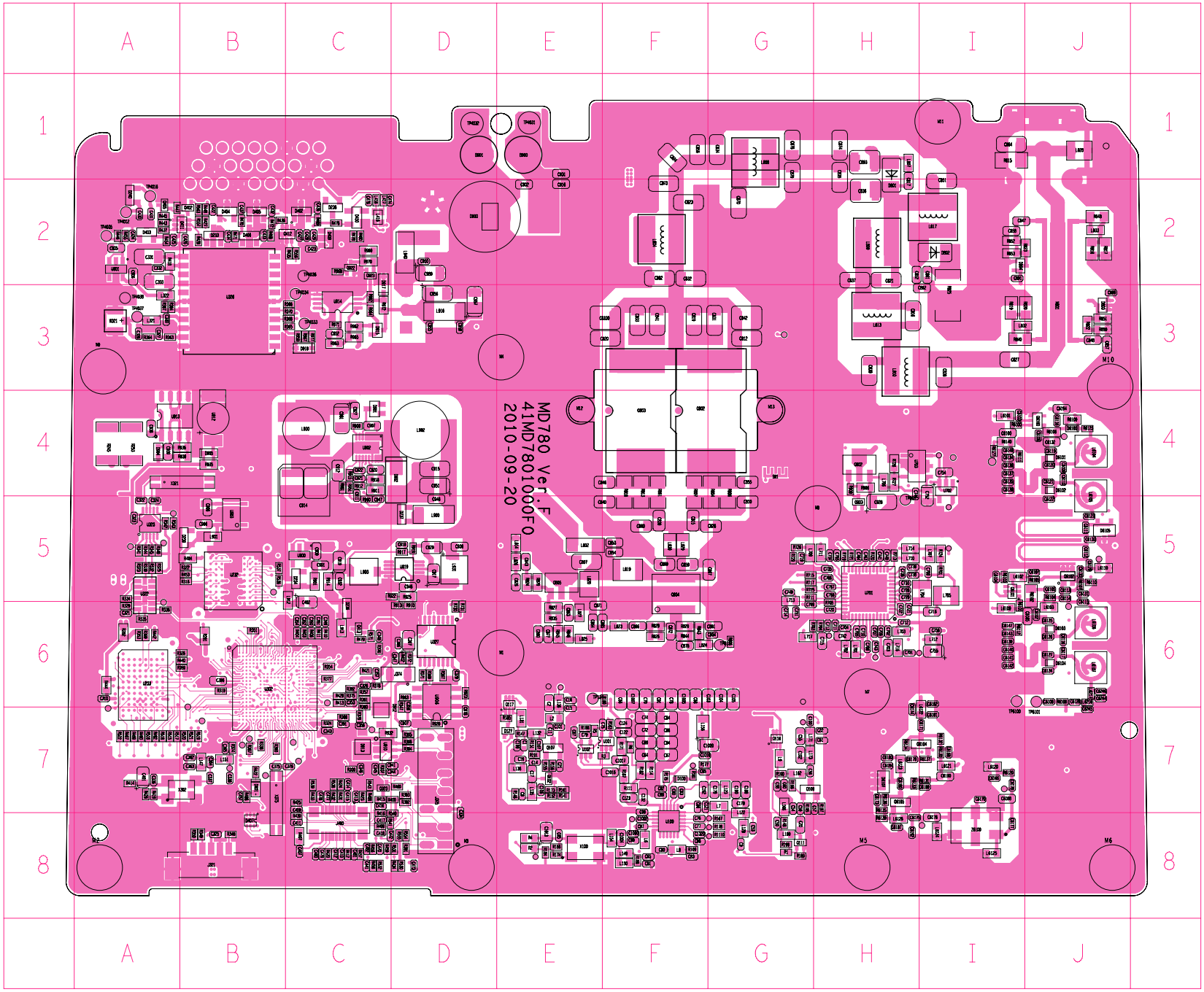


MD78X/MD78XG PCB View (Front Panel)

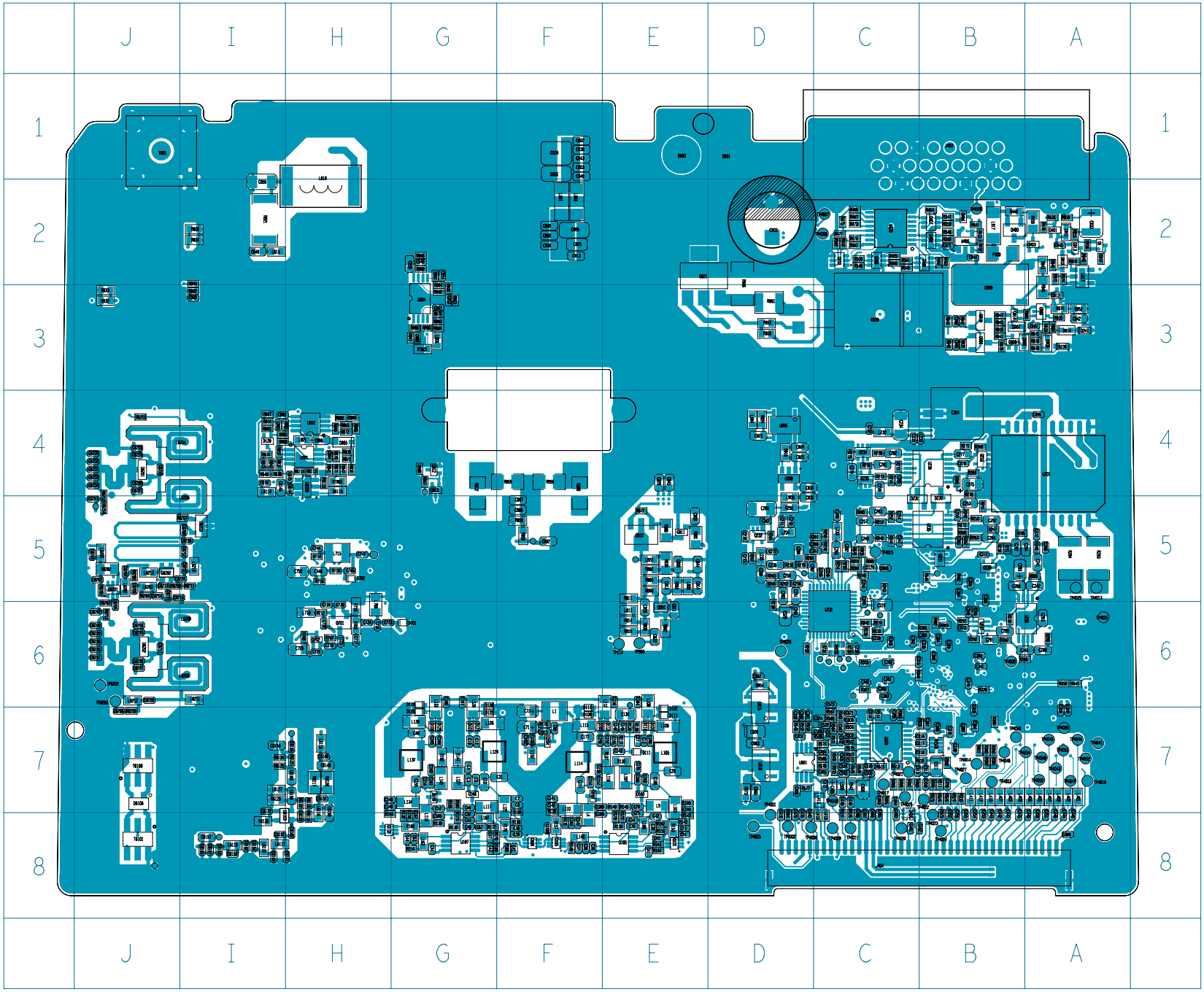
Bottom Layer



MD78X/MD78XG PCB View (Main Board)
Top Layer

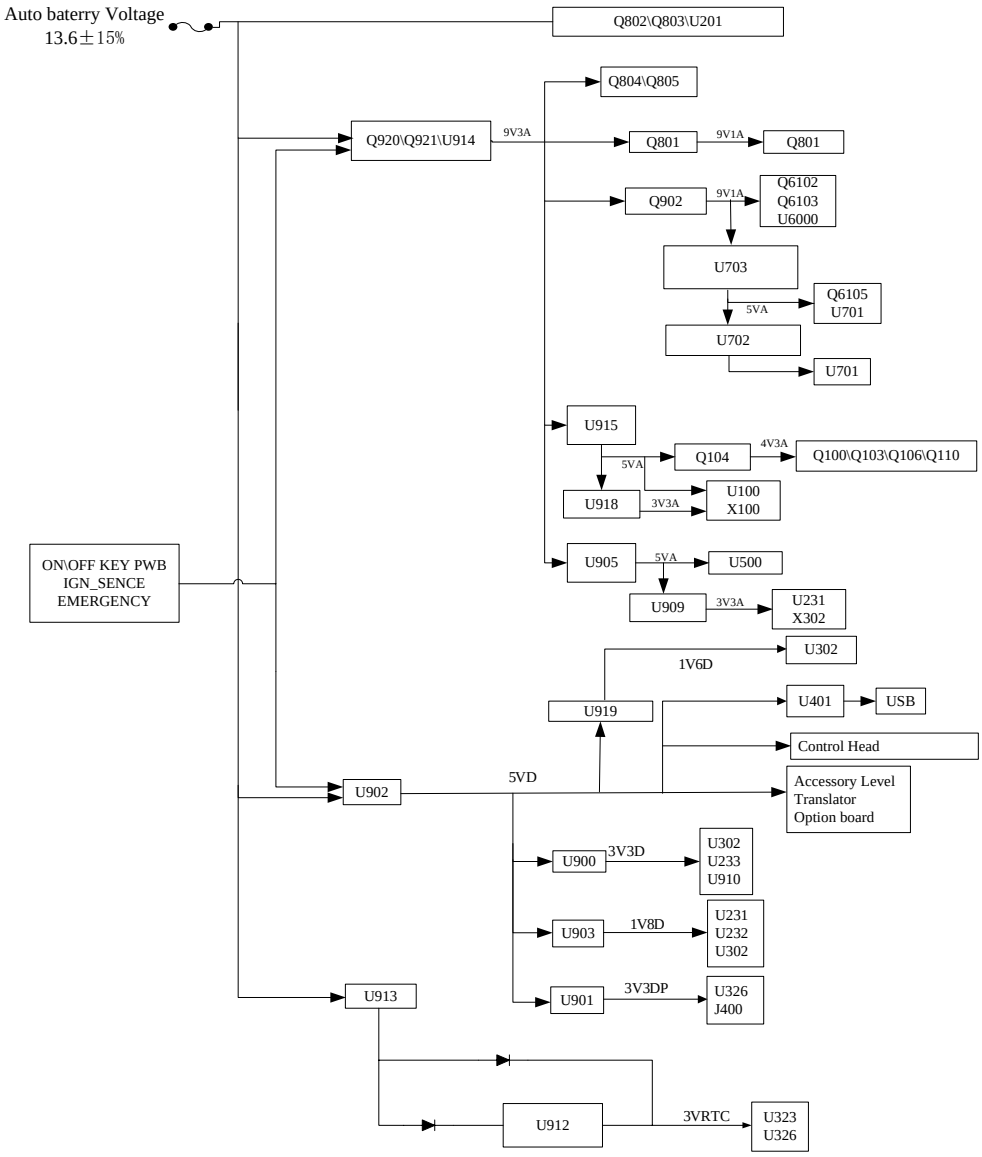


MD78X/MD78XG PCB View (Main Board)
Bottom Layer

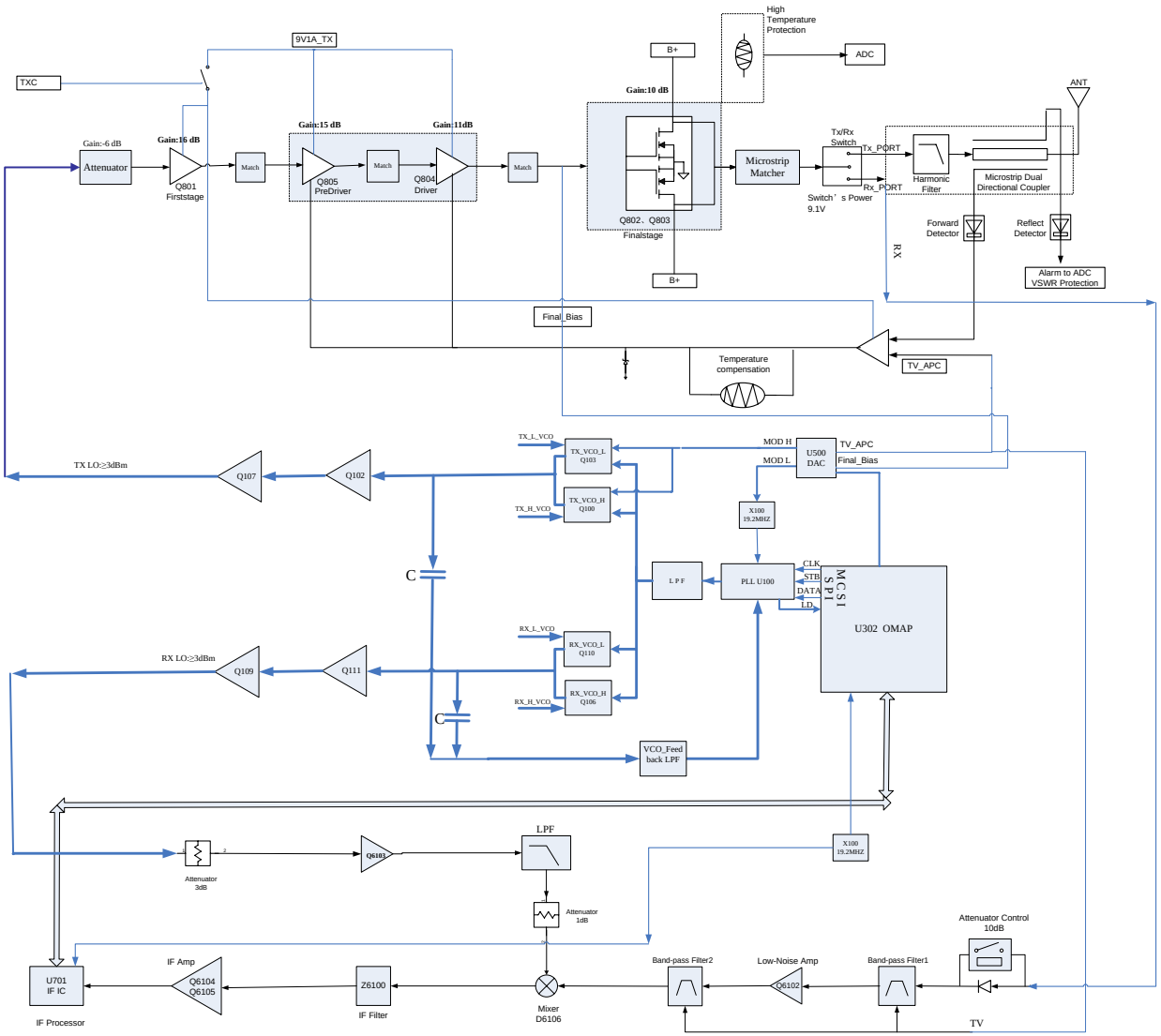


16.5 Block Diagram

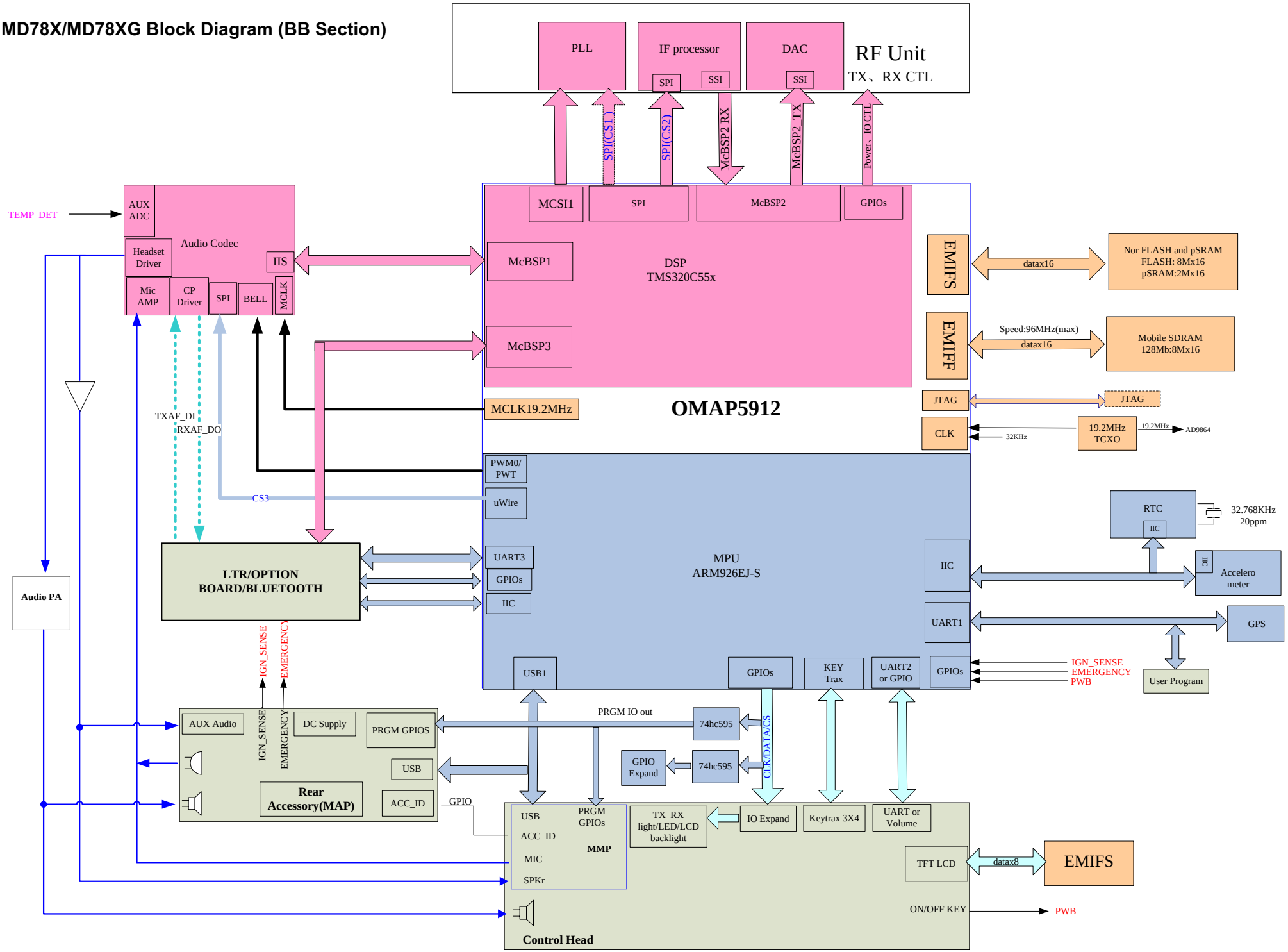
MD78X/MD78XG Block Diagram (Power Section)



MD78X/MD78XG Block Diagram (RF Section)

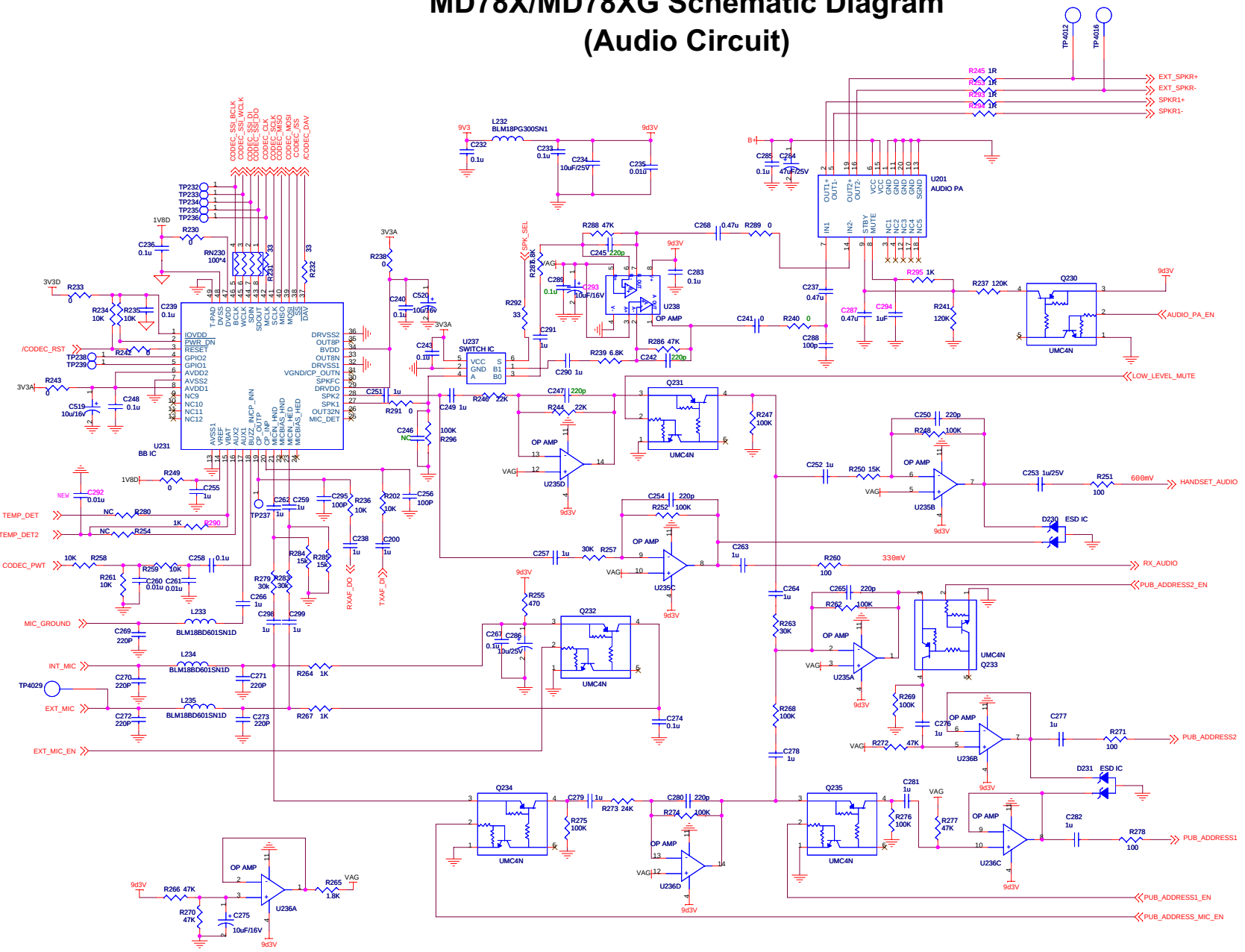


MD78X/MD78XG Block Diagram (BB Section)

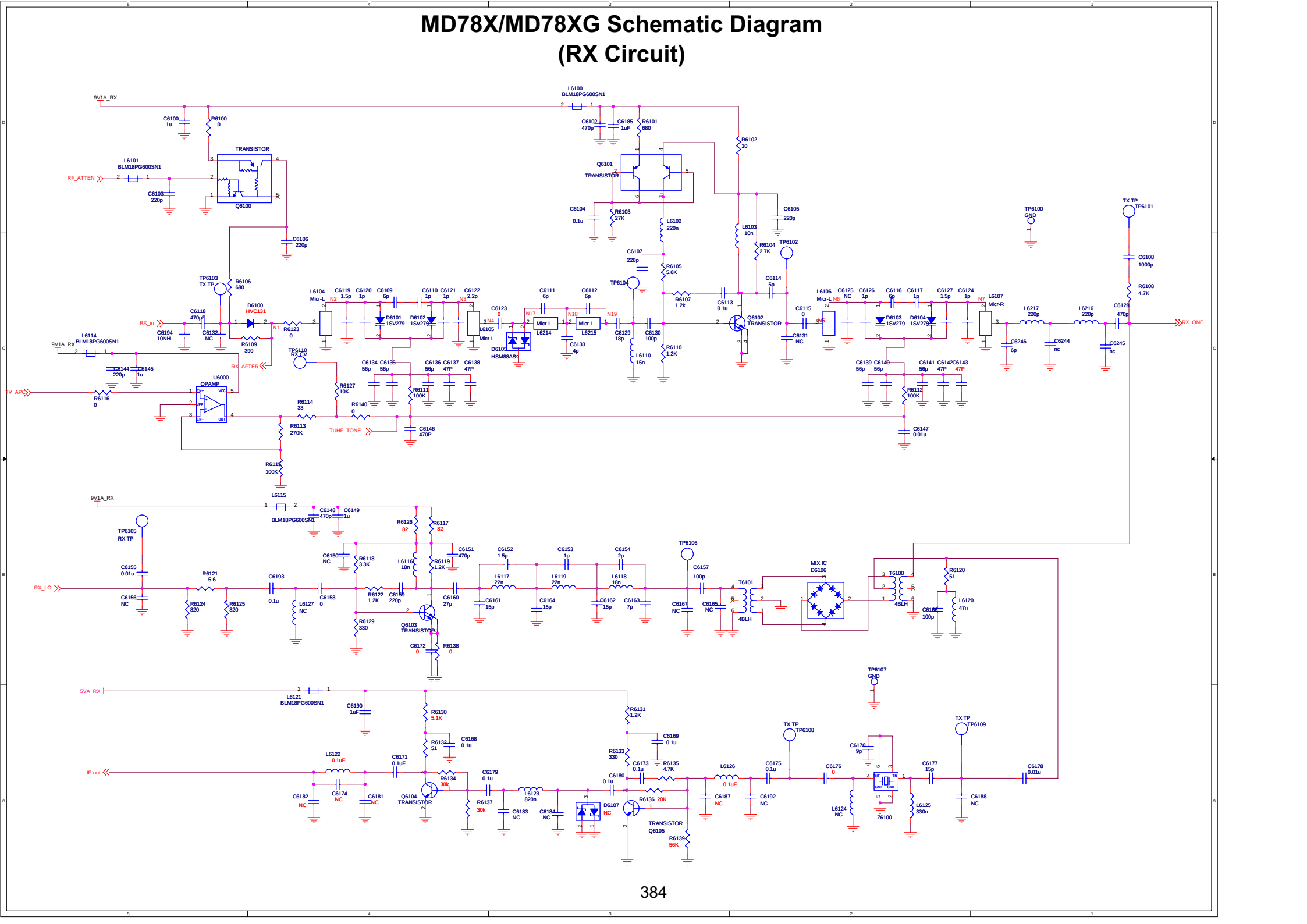


16.6 Schematic Diagram

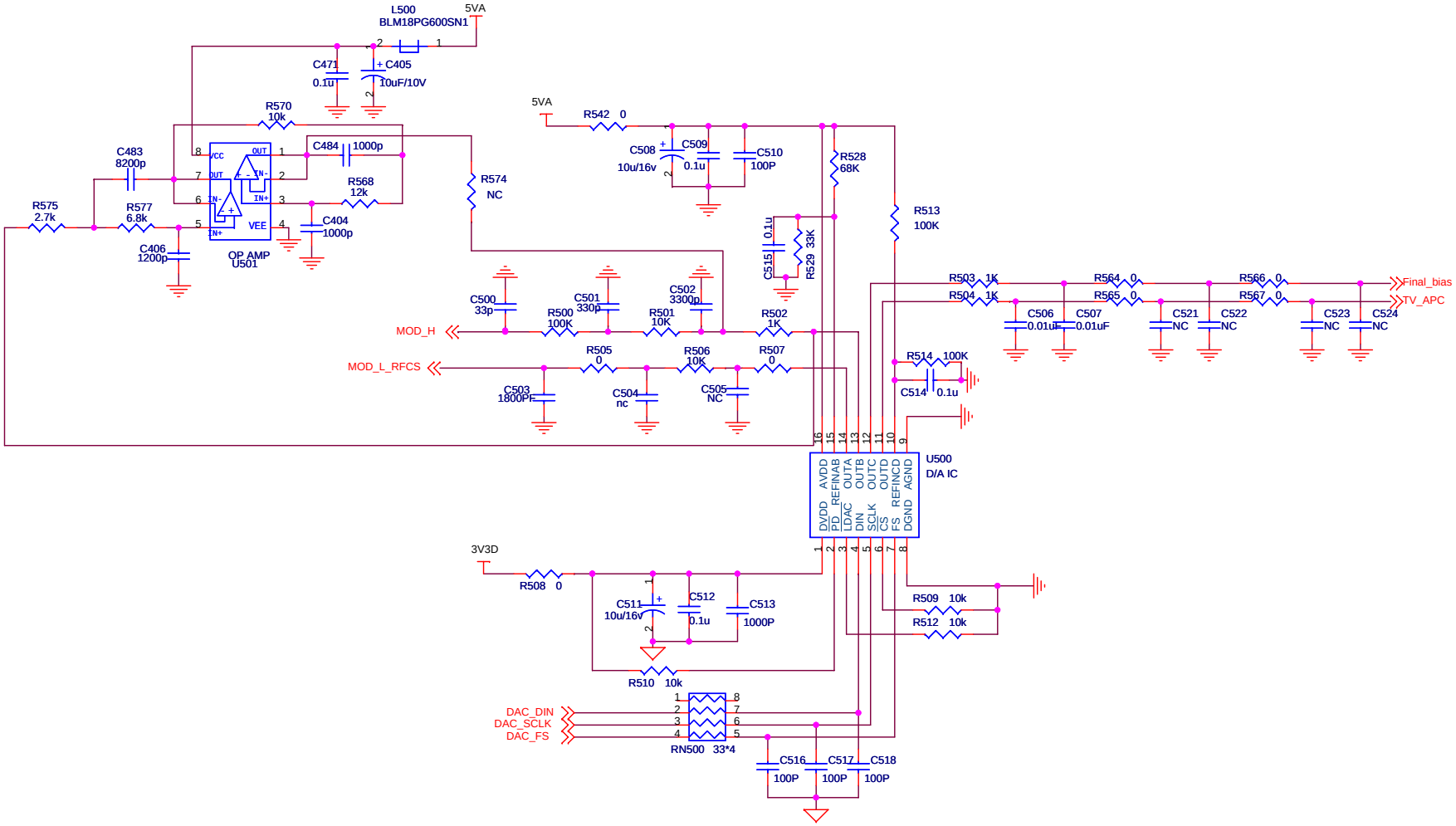
MD78X/MD78XG Schematic Diagram (Audio Circuit)



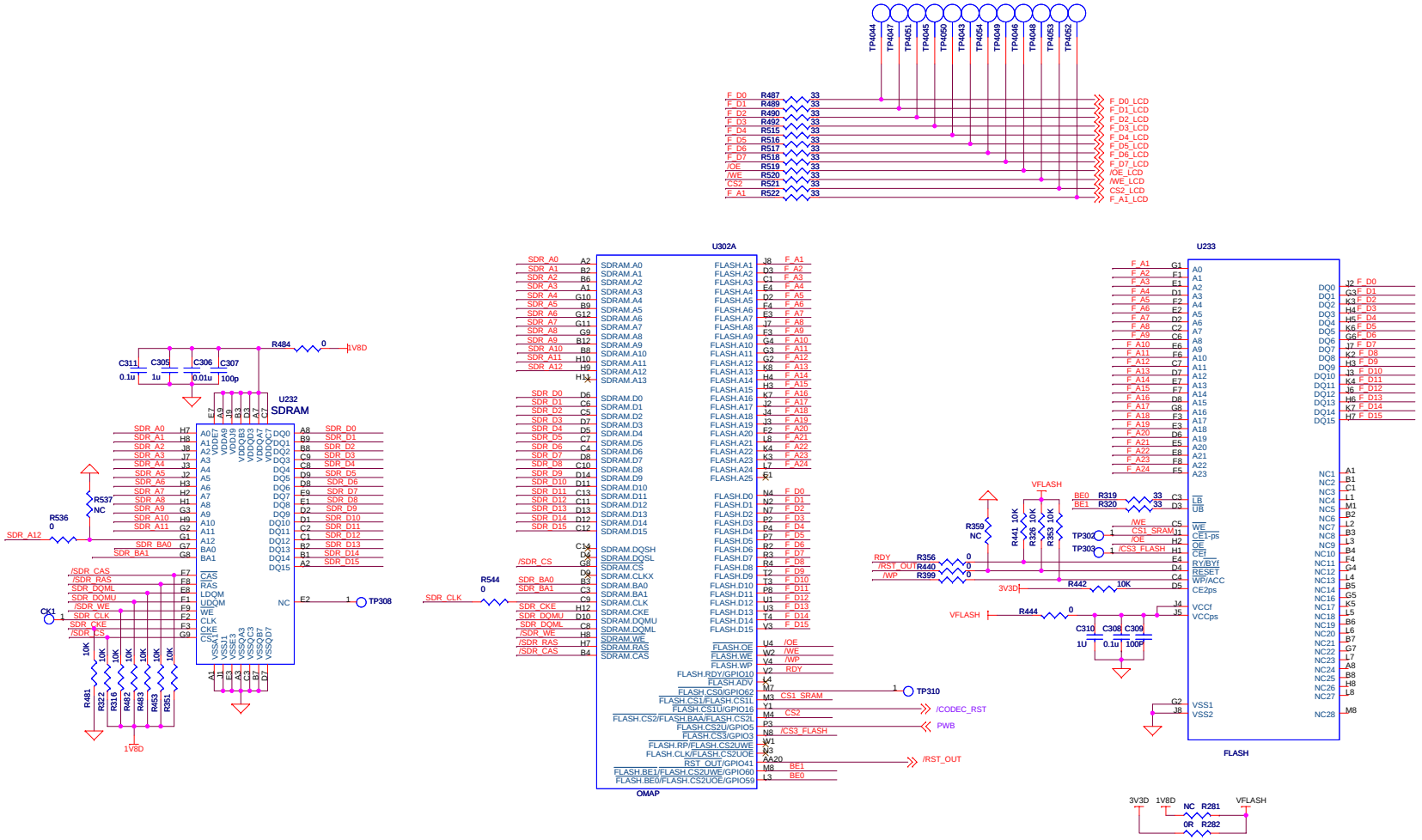
MD78X/MD78XG Schematic Diagram
(RX Circuit)



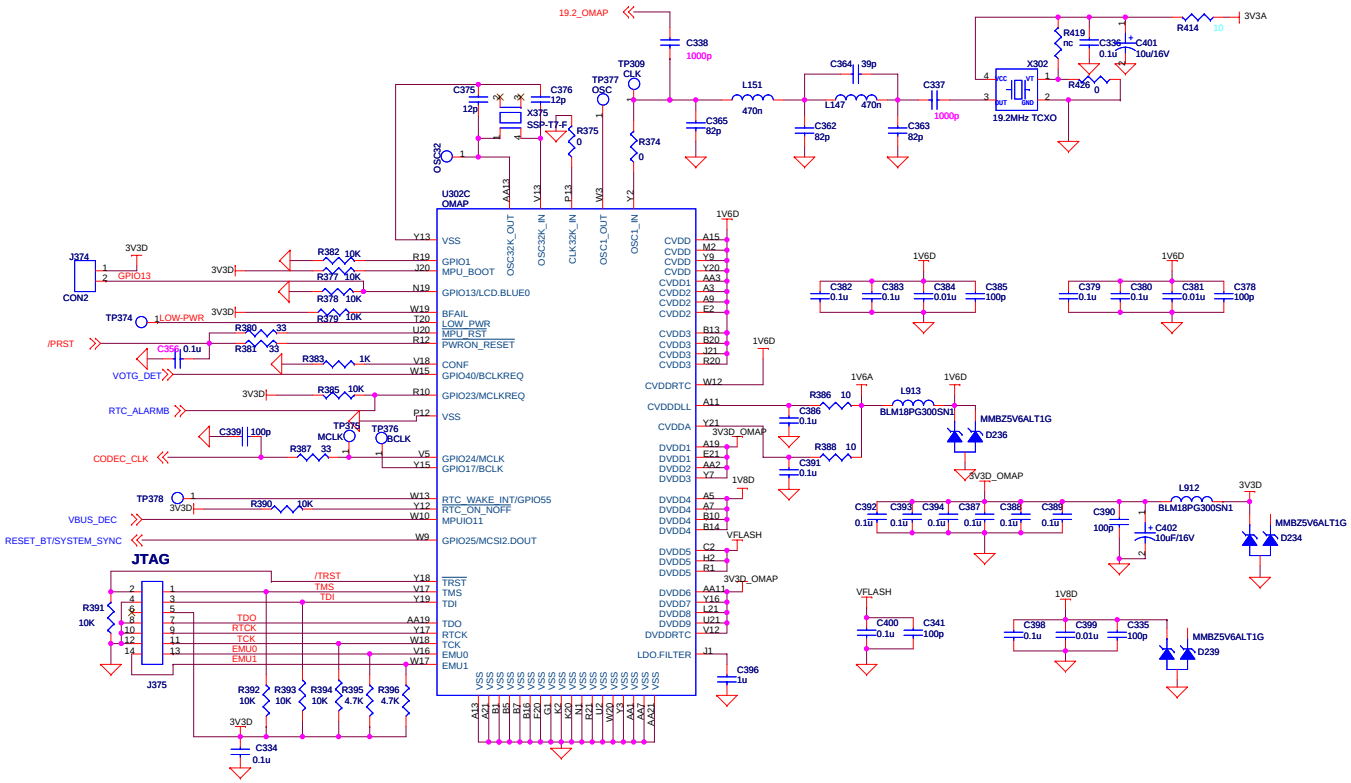
MD78X/MD78XG Schematic Diagram
(DAC Circuit)



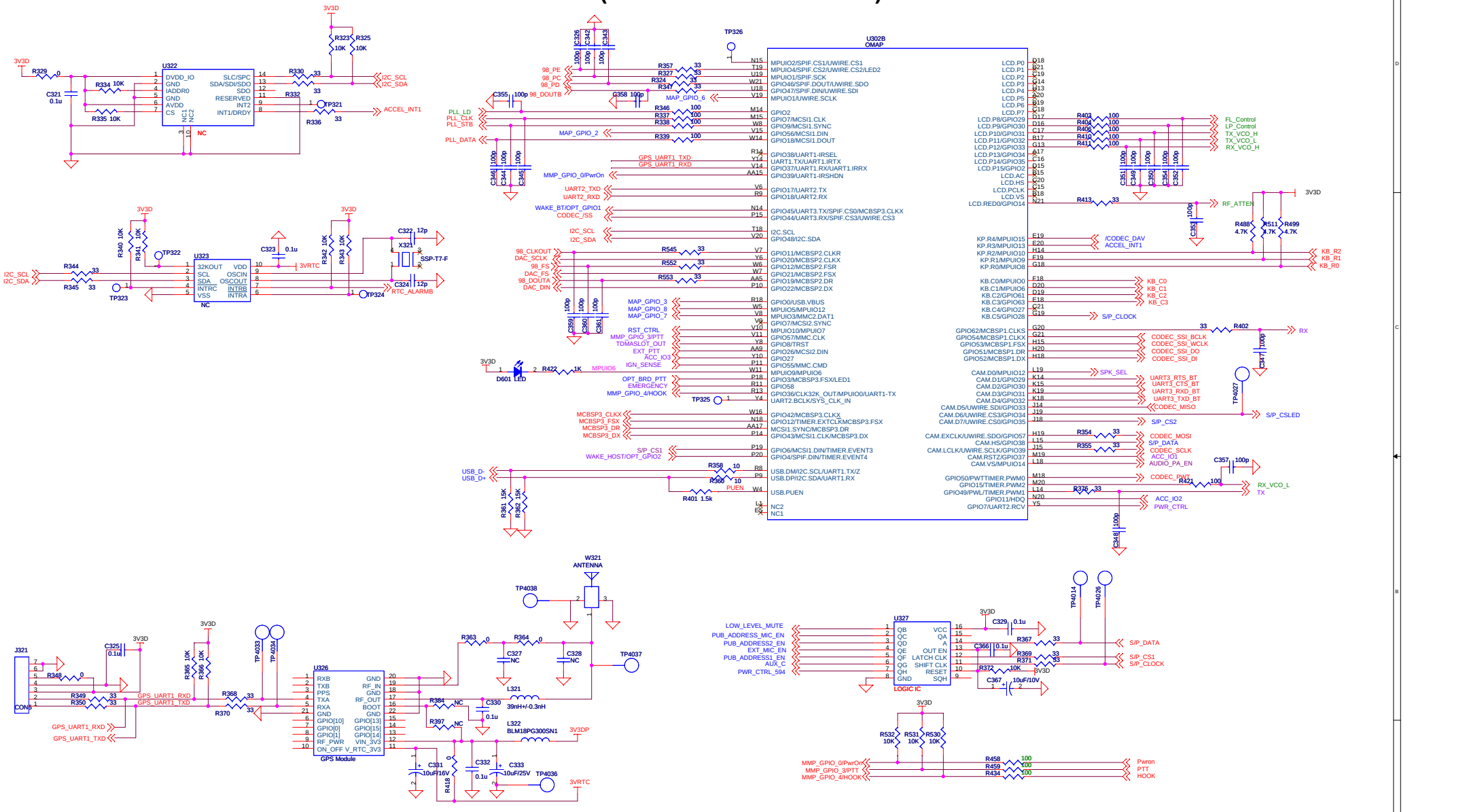
MD78X/MD78XG Schematic Diagram
(Memory Circuit)



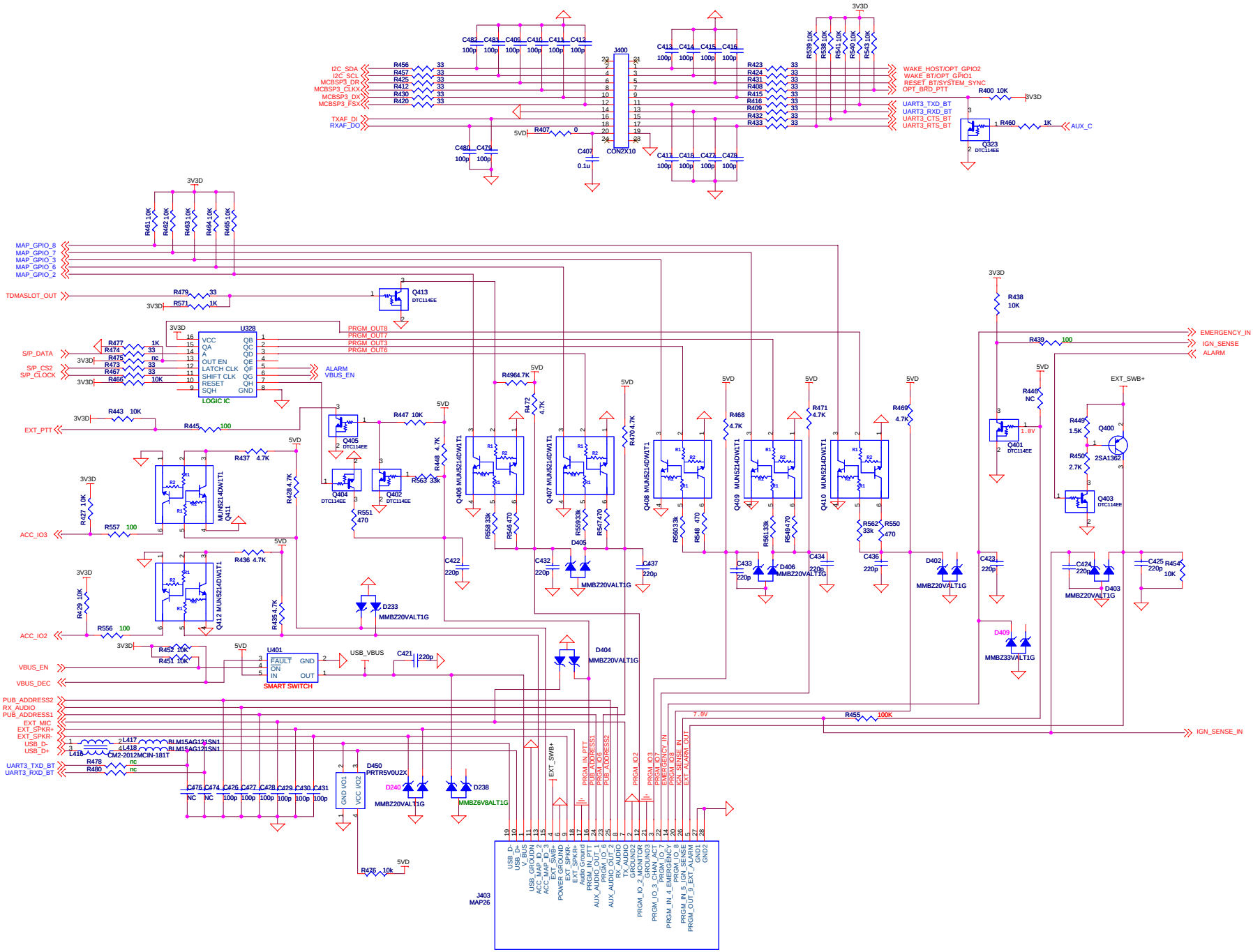
MD78X/MD78XG Schematic Diagram
(OMAP Circuit)



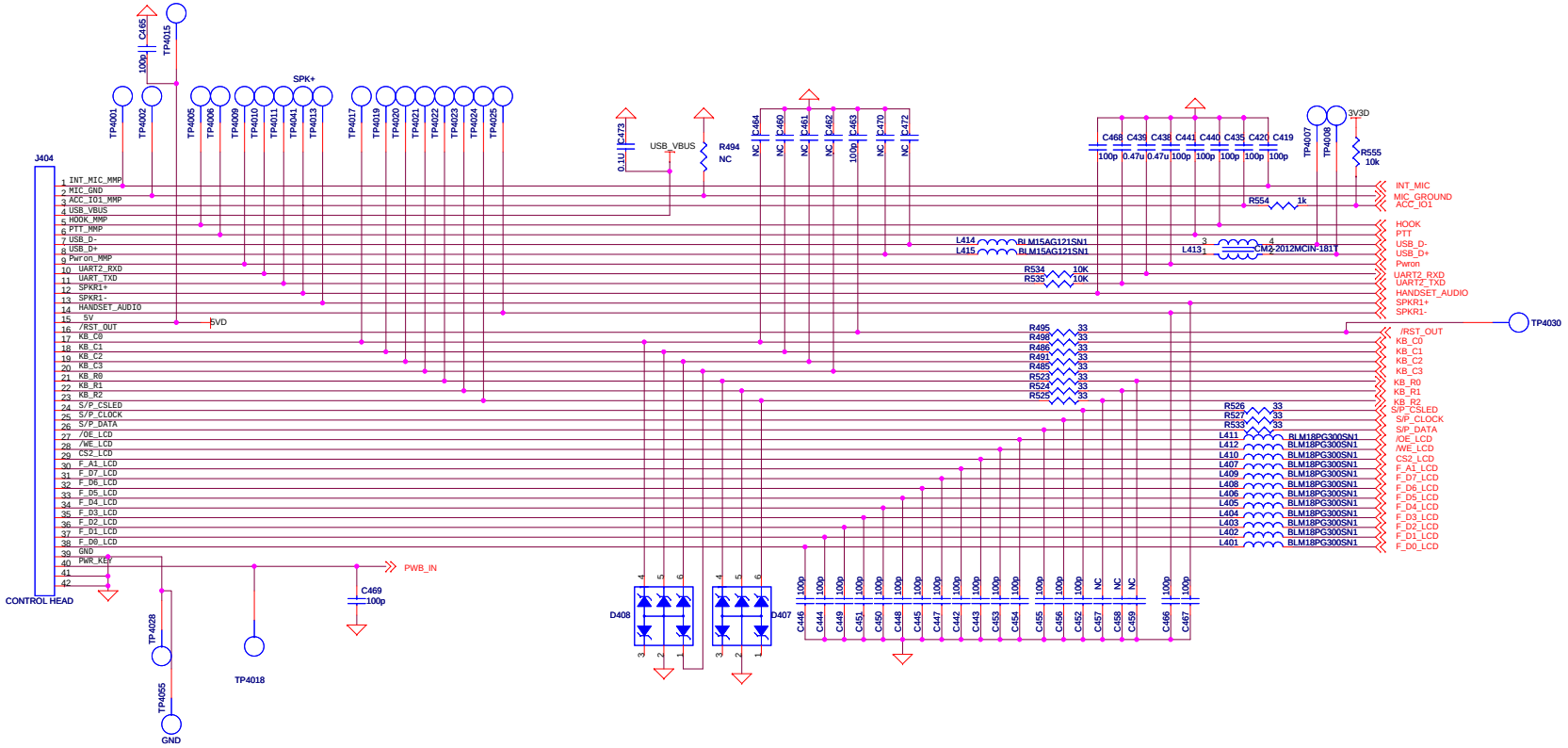
MD78X/MD78XG Schematic Diagram
(OMAP & GPS Circuit)



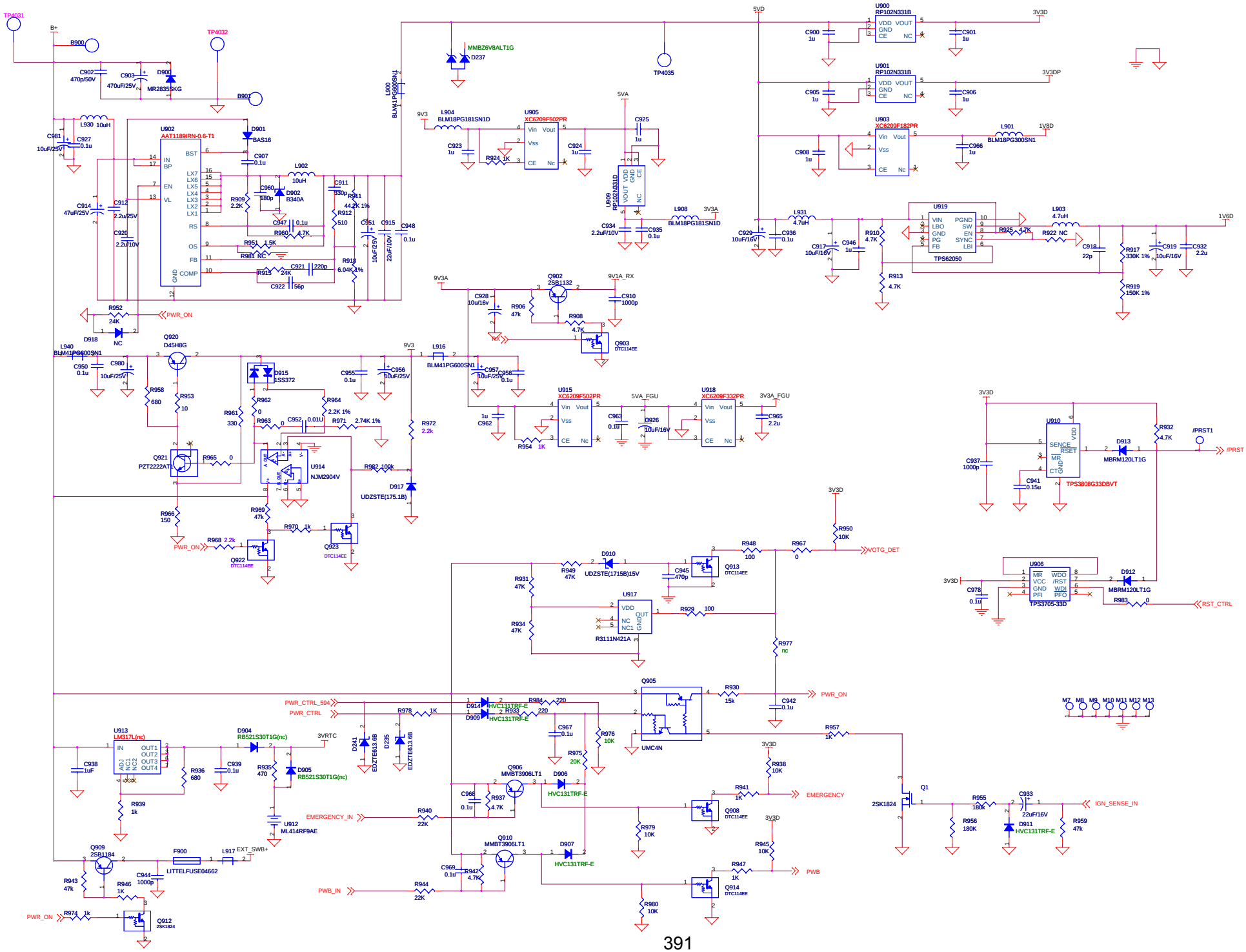
MD78X/MD78XG Schematic Diagram (Peripheral Interface Circuit)



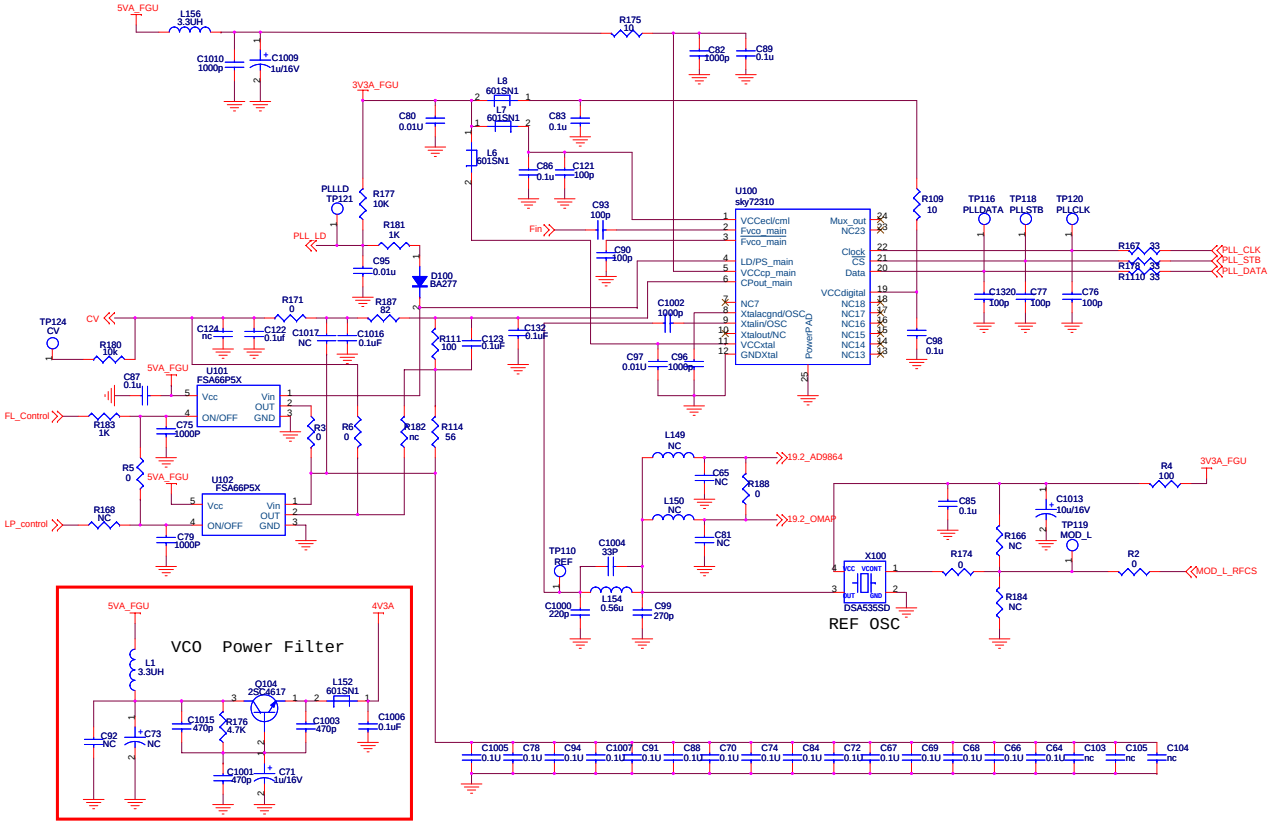
MD78X/MD78XG Schematic Diagram
(40-Pin Interface Circuit)



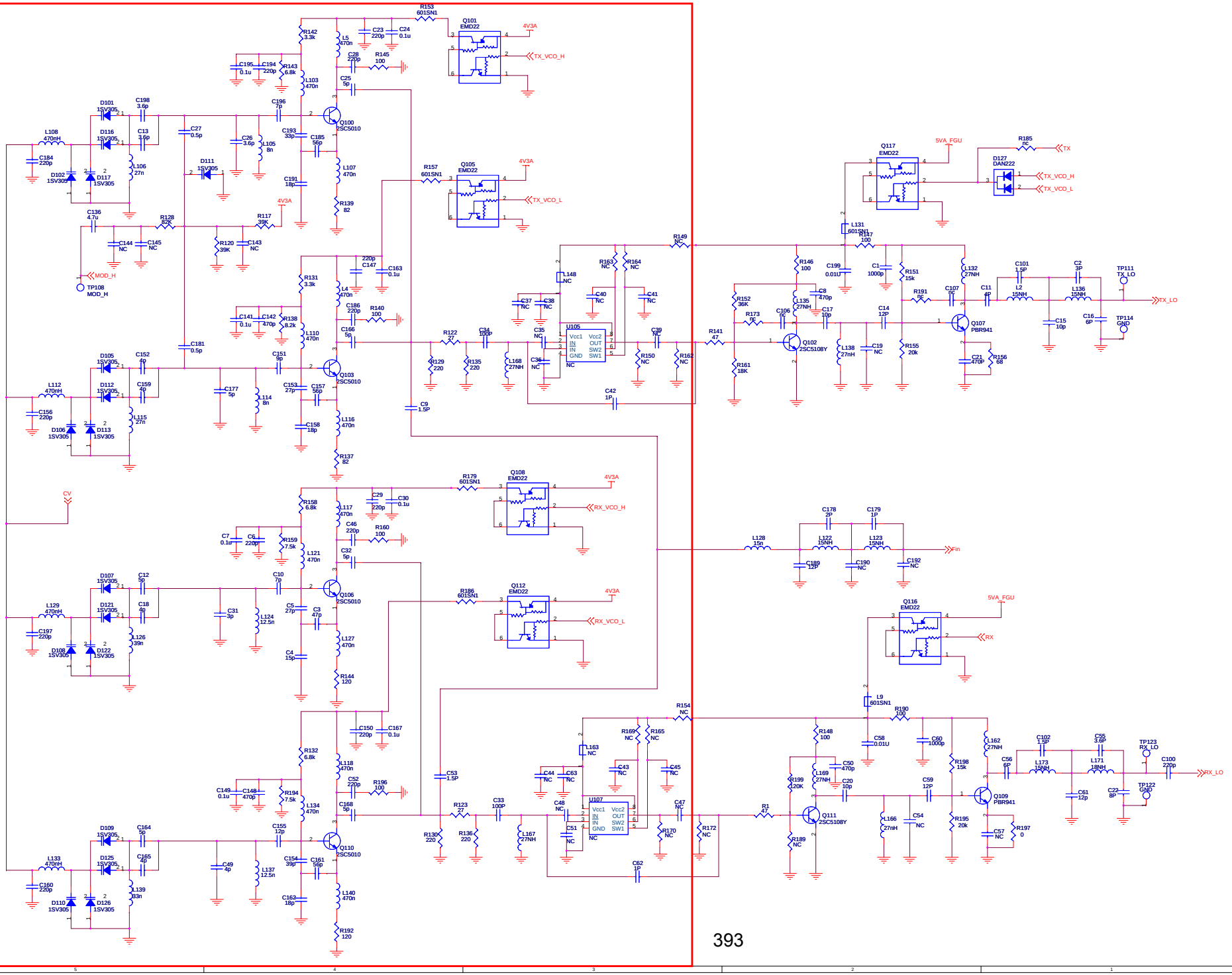
MD78X/MD78XG Schematic Diagram (Power Circuit)



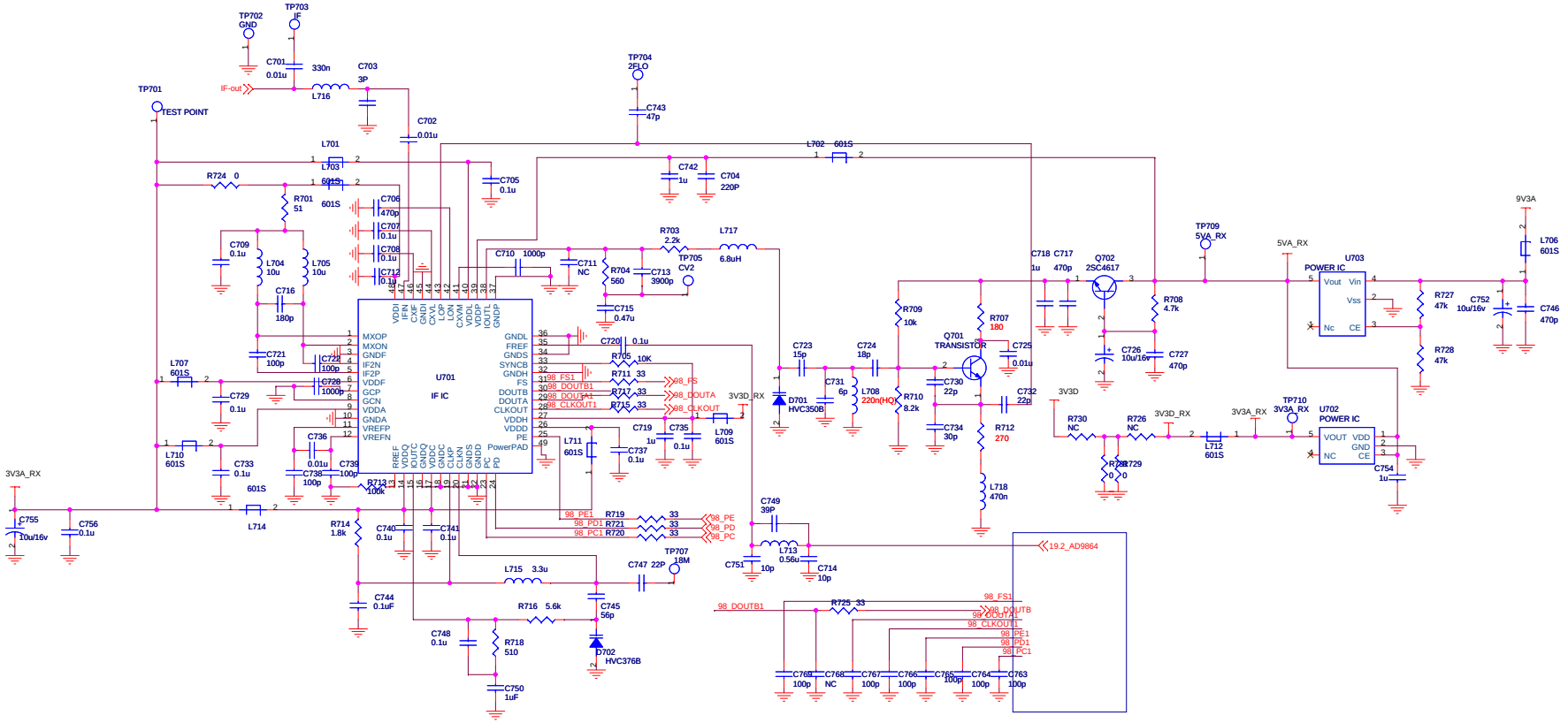
MD78X/MD78XG Schematic Diagram
(PLL Circuit)



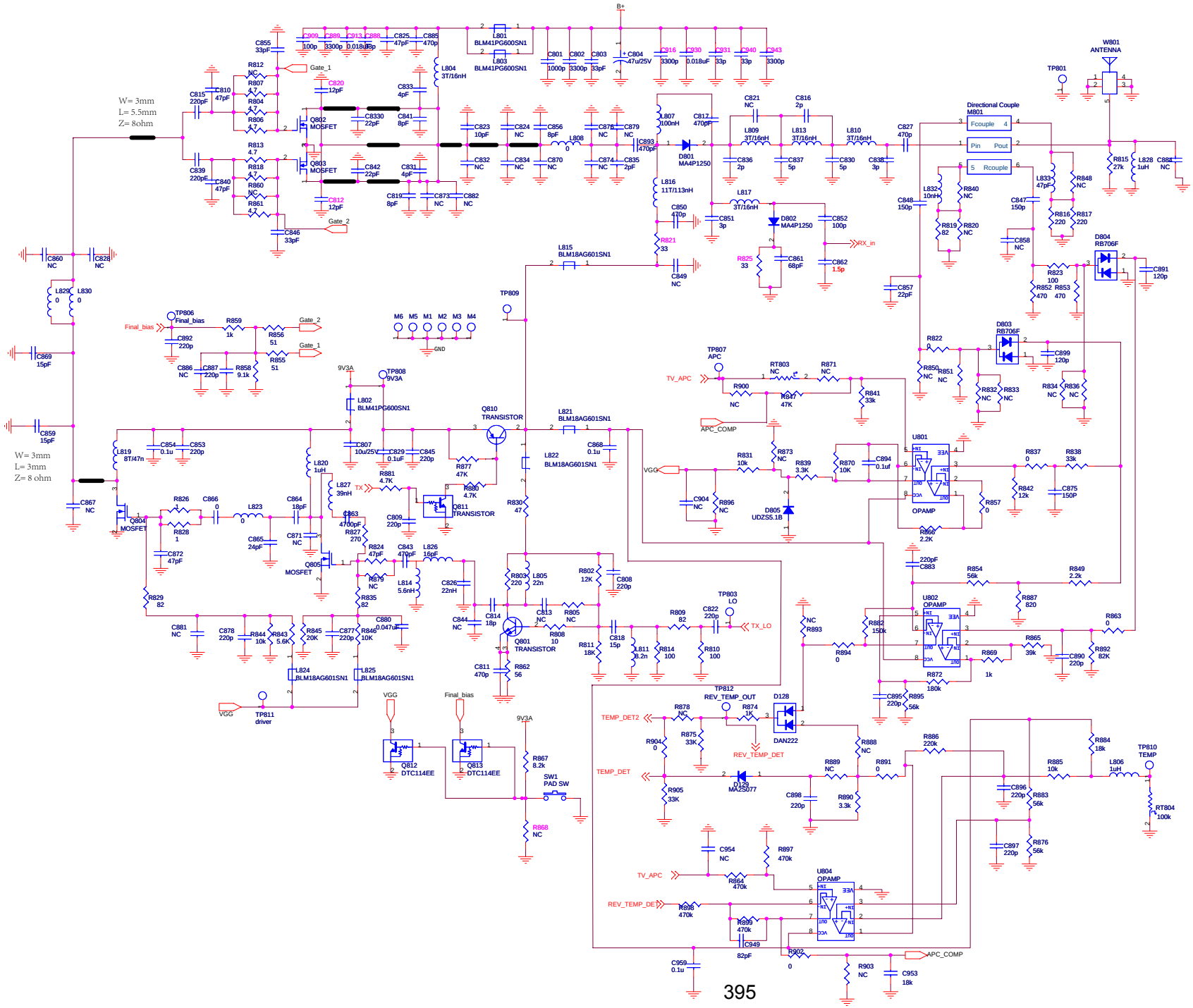
MD78X/MD78XG Schematic Diagram (VCO Circuit)



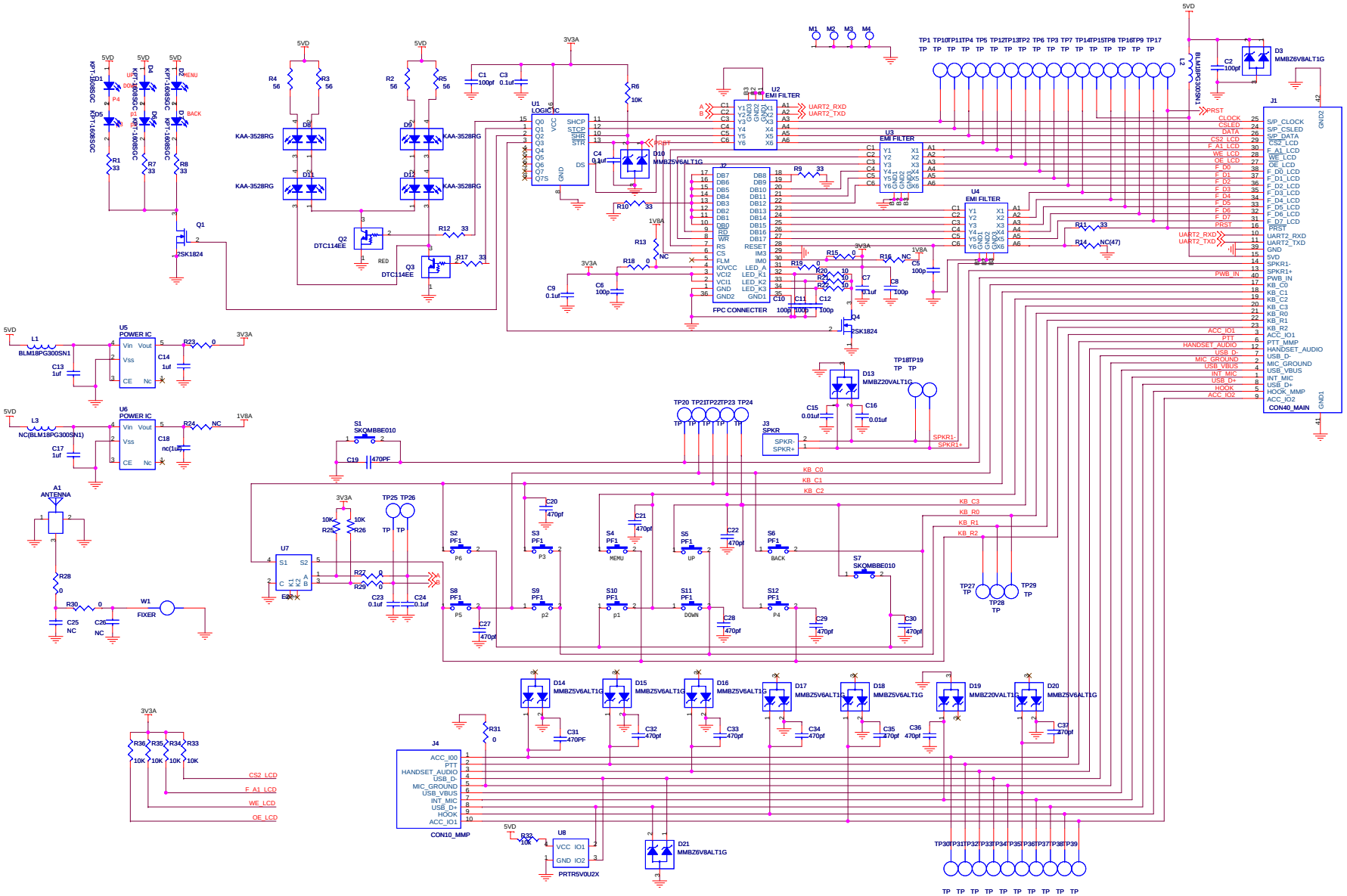
MD78X/MD78XG Schematic Diagram
(IF Circuit)



MD78X/MD78XG Schematic Diagram (TX Circuit)



MD78X/MD78XG Schematic Diagram
(Front Panel)



16.7 Parts List

Main Board *for MD78X/MD78XG*

No.	Ref. No.	Part No.	Description
1	C6115	3001050000000	0Ω
2	C6123	3001050000000	0Ω
3	C6172	3001050000000	0Ω
4	R156	3001050000000	0Ω
5	R174	3001050000000	0Ω
6	R188	3001050000000	0Ω
7	R197	3001050000000	0Ω
8	R230	3001050000000	0Ω
9	R233	3001050000000	0Ω
10	R238	3001050000000	0Ω
11	R240	3001050000000	0Ω
12	R242	3001050000000	0Ω
13	R243	3001050000000	0Ω
14	R249	3001050000000	0Ω
15	R289	3001050000000	0Ω
16	R329	3001050000000	0Ω
17	R356	3001050000000	0Ω
18	R374	3001050000000	0Ω
19	R375	3001050000000	0Ω
20	R399	3001050000000	0Ω
21	R426	3001050000000	0Ω
22	R440	3001050000000	0Ω
23	R5	3001050000000	0Ω
24	R505	3001050000000	0Ω
25	R506	3001050000000	0Ω
26	R508	3001050000000	0Ω
27	R536	3001050000000	0Ω
28	R544	3001050000000	0Ω
29	R564	3001050000000	0Ω
30	R565	3001050000000	0Ω
31	R566	3001050000000	0Ω
32	R567	3001050000000	0Ω
33	R6100	3001050000000	0Ω
34	R6123	3001050000000	0Ω
35	R729	3001050000000	0Ω
36	R731	3001050000000	0Ω
37	R837	3001050000000	0Ω
38	R857	3001050000000	0Ω
39	R863	3001050000000	0Ω
40	R889	3001050000000	0Ω
41	R891	3001050000000	0Ω

No.	Ref. No.	Part No.	Description
42	R894	3001050000000	0Ω
43	R902	3001050000000	0Ω
44	R904	3001050000000	0Ω
45	R920	3001050000000	0Ω
46	R923	3001050000000	0Ω
47	R967	3001050000000	0Ω
48	R983	3001050000000	0Ω
49	C241	3001060000000	0Ω
50	C6158	3001060000000	0Ω
51	C6176	3001060000000	0Ω
52	C843	3001060000000	0Ω
53	R171	3001060000000	0Ω
54	R2	3001060000000	0Ω
55	R282	3001060000000	0Ω
56	R407	3001060000000	0Ω
57	R444	3001060000000	0Ω
58	R484	3001060000000	0Ω
59	R542	3001060000000	0Ω
60	R6116	3001060000000	0Ω
61	R6138	3001060000000	0Ω
62	R6140	3001060000000	0Ω
63	R724	3001060000000	0Ω
64	R822	3001060000000	0Ω
65	R901	3001060000000	0Ω
66	R914	3001060000000	0Ω
67	R916	3001060000000	0Ω
68	R962	3001060000000	0Ω
69	R963	3001060000000	0Ω
70	R965	3001060000000	0Ω
71	R973	3001060000000	0Ω
72	L829	3001070000000	0Ω
73	L830	3001070000000	0Ω
74	L808	3001080000000	0Ω
75	R245	3001160100000	1Ω
76	R253	3001160100000	1Ω
77	R293	3001160100000	1Ω
78	R294	3001160100000	1Ω
79	R826	3001060100000	1Ω
80	R828	3001060100000	1Ω
81	R109	3001051000000	10Ω
82	R175	3001051000000	10Ω
83	R386	3001051000000	10Ω
84	R388	3001051000000	10Ω
85	R414	3001051000000	10Ω

No.	Ref. No.	Part No.	Description
86	R187	3001061000000	10Ω
87	R808	3001061000000	10Ω
88	R953	3001061000000	10Ω
89	R6102	3001071000000	10Ω
90	R122	3001052700010	27Ω
91	R123	3001052700010	27Ω
92	R6121	3001051800000	18Ω
93	R1110	3001053300010	33Ω
94	R167	3001053300010	33Ω
95	R178	3001053300010	33Ω
96	R231	3001053300010	33Ω
97	R232	3001053300010	33Ω
98	R292	3001053300010	33Ω
99	R319	3001053300010	33Ω
100	R320	3001053300010	33Ω
101	R324	3001053300010	33Ω
102	R327	3001053300010	33Ω
103	R330	3001053300010	33Ω
104	R332	3001053300010	33Ω
105	R336	3001053300010	33Ω
106	R344	3001053300010	33Ω
107	R345	3001053300010	33Ω
108	R347	3001053300010	33Ω
109	R354	3001053300010	33Ω
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112	R367	3001053300010	33Ω
113	R369	3001053300010	33Ω
114	R371	3001053300010	33Ω
115	R376	3001053300010	33Ω
116	R380	3001053300010	33Ω
117	R381	3001053300010	33Ω
118	R387	3001053300010	33Ω
119	R402	3001053300010	33Ω
120	R408	3001053300010	33Ω
121	R409	3001053300010	33Ω
122	R412	3001053300010	33Ω
123	R413	3001053300010	33Ω
124	R415	3001053300010	33Ω
125	R416	3001053300010	33Ω
126	R420	3001053300010	33Ω
127	R423	3001053300010	33Ω
128	R424	3001053300010	33Ω
129	R425	3001053300010	33Ω

No.	Ref. No.	Part No.	Description
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131	R431	3001053300010	33Ω
132	R432	3001053300010	33Ω
133	R433	3001053300010	33Ω
134	R467	3001053300010	33Ω
135	R473	3001053300010	33Ω
136	R474	3001053300010	33Ω
137	R479	3001053300010	33Ω
138	R485	3001053300010	33Ω
139	R486	3001053300010	33Ω
140	R487	3001053300010	33Ω
141	R489	3001053300010	33Ω
142	R490	3001053300010	33Ω
143	R491	3001053300010	33Ω
144	R492	3001053300010	33Ω
145	R495	3001053300010	33Ω
146	R498	3001053300010	33Ω
147	R515	3001053300010	33Ω
148	R516	3001053300010	33Ω
149	R517	3001053300010	33Ω
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151	R519	3001053300010	33Ω
152	R520	3001053300010	33Ω
153	R521	3001053300010	33Ω
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160	R533	3001053300010	33Ω
161	R545	3001053300010	33Ω
162	R552	3001053300010	33Ω
163	R553	3001053300010	33Ω
164	R6114	3001053300010	33Ω
165	R711	3001053300010	33Ω
166	R715	3001053300010	33Ω
167	R717	3001053300010	33Ω
168	R719	3001053300010	33Ω
169	R720	3001053300010	33Ω
170	R721	3001053300010	33Ω
171	R725	3001053300010	33Ω
172	R821	3001113300000	33Ω
173	R825	3001113300000	33Ω

No.	Ref. No.	Part No.	Description
174	R1	3001054700000	47Ω
175	R141	3001054700000	47Ω
176	R830	3001074700000	47Ω
177	R6120	3001055100010	51Ω
178	R6132	3001055100010	51Ω
179	R701	3001055100010	51Ω
180	R114	3001065100000	51Ω
181	R111	3001065600000	56Ω
182	R862	3001065600000	56Ω
183	R809	3001068200000	82Ω
184	R829	3001068200000	82Ω
185	R835	3001068200000	82Ω
186	R6117	3001078200000	82Ω
187	R6126	3001078200000	82Ω
188	R819	3001078200000	82Ω
189	R140	3001051010040	100Ω
190	R145	3001051010040	100Ω
191	R146	3001051010040	100Ω
192	R147	3001051010040	100Ω
193	R148	3001051010040	100Ω
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200	R278	3001051010040	100Ω
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202	R338	3001051010040	100Ω
203	R339	3001051010040	100Ω
204	R346	3001051010040	100Ω
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208	R410	3001051010040	100Ω
209	R411	3001051010040	100Ω
210	R421	3001051010040	100Ω
211	R434	3001051010040	100Ω
212	R439	3001051010040	100Ω
213	R445	3001051010040	100Ω
214	R458	3001051010040	100Ω
215	R459	3001051010040	100Ω
216	R556	3001051010040	100Ω
217	R557	3001051010040	100Ω

No.	Ref. No.	Part No.	Description
218	R929	3001051010040	100Ω
219	R948	3001051010040	100Ω
220	R4	3001061010000	100Ω
221	R810	3001061010000	100Ω
222	R814	3001061010000	100Ω
223	R823	3001061010000	100Ω
224	R137	3001061210000	120Ω
225	R139	3001061210000	120Ω
226	R966	3001161510010	150Ω
227	R144	3001061510000	150Ω
228	R6124	3001052710000	270Ω
229	R6125	3001052710000	270Ω
230	R707	3001051810010	180Ω
231	R192	3001061810000	180Ω
232	R129	3001052210000	220Ω
233	R130	3001052210000	220Ω
234	R135	3001052210000	220Ω
235	R136	3001052210000	220Ω
236	R933	3001052210000	220Ω
237	R984	3001052210000	220Ω
238	R803	3001062210000	220Ω
239	R816	3001072210000	220Ω
240	R817	3001072210000	220Ω
241	R712	3001052710010	270Ω
242	R827	3001062710000	270Ω
243	R6133	3001053310010	330Ω
244	R6129	3001063310010	330Ω
245	R961	3001083310010	330Ω
246	R6109	3001063910000	390Ω
247	R546	3001054710000	470Ω
248	R547	3001054710000	470Ω
249	R548	3001054710000	470Ω
250	R549	3001054710000	470Ω
251	R550	3001054710000	470Ω
252	R551	3001054710000	470Ω
253	R255	3001064710000	470Ω
254	R852	3001064710000	470Ω
255	R853	3001064710000	470Ω
256	R935	3001064710000	470Ω
257	R718	3001055110000	510Ω
258	R912	3001055110000	510Ω
259	R704	3001055610010	560Ω
260	R6101	3001056810000	680Ω
261	R6107	3001056810000	680Ω

No.	Ref. No.	Part No.	Description
262	R6106	3001066810000	680Ω
263	R936	3001066810000	680Ω
264	R958	3001066810000	680Ω
265	R887	3001058210000	820Ω
266	R181	3001051020000	1KΩ
267	R183	3001051020000	1KΩ
268	R264	3001051020000	1KΩ
269	R267	3001051020000	1KΩ
270	R290	3001051020000	1KΩ
271	R295	3001051020000	1KΩ
272	R383	3001051020000	1KΩ
273	R422	3001051020000	1KΩ
274	R460	3001051020000	1KΩ
275	R477	3001051020000	1KΩ
276	R502	3001051020000	1KΩ
277	R503	3001051020000	1KΩ
278	R504	3001051020000	1KΩ
279	R554	3001051020000	1KΩ
280	R571	3001051020000	1KΩ
281	R869	3001051020000	1KΩ
282	R874	3001051020000	1KΩ
283	R941	3001051020000	1KΩ
284	R947	3001051020000	1KΩ
285	R957	3001051020000	1KΩ
286	R978	3001051020000	1KΩ
287	R859	3001061020010	1KΩ
288	R924	3001061020010	1KΩ
289	R939	3001061020010	1KΩ
290	R954	3001061020010	1KΩ
291	R970	3001061020010	1KΩ
292	R974	3001061020010	1KΩ
293	R946	3001071020010	1KΩ
294	R291	3001051220000	1.2K
295	R6110	3001051220000	1.2K
296	R6119	3001051220000	1.2K
297	R6122	3001051220000	1.2K
298	R6131	3001051220000	1.2K
299	R401	3001051520010	1.5K
300	R951	3001051520010	1.5K
301	R449	3001061520000	1.5K
302	R265	3001051820000	1.8K
303	R714	3001051820000	1.8K
304	R703	3001052220010	2.2K
305	R849	3001052220010	2.2K

No.	Ref. No.	Part No.	Description
306	R866	3001052220010	2.2K
307	R909	3001052220010	2.2K
308	R964	3001052220010	2.2K
309	R968	3001052220010	2.2K
310	R972	3001062220000	2.2K
311	R6104	3001052720000	2.7K
312	R450	3001072720010	2.7K
313	R971	3099052741000	2.74kΩ
314	R839	3001053320000	3.3K
315	R890	3001053320000	3.3K
316	R6118	3001053920010	3.9K
317	R132	3001053920000	3.9K
318	R158	3001053920000	3.9K
319	R960	3001054790010	4.7K
320	R176	3001054720000	4.7K
321	R395	3001054720000	4.7K
322	R396	3001054720000	4.7K
323	R428	3001054720000	4.7K
324	R435	3001054720000	4.7K
325	R436	3001054720000	4.7K
326	R437	3001054720000	4.7K
327	R448	3001054720000	4.7K
328	R468	3001054720000	4.7K
329	R469	3001054720000	4.7K
330	R470	3001054720000	4.7K
331	R471	3001054720000	4.7K
332	R472	3001054720000	4.7K
333	R488	3001054720000	4.7K
334	R496	3001054720000	4.7K
335	R499	3001054720000	4.7K
336	R511	3001054720000	4.7K
337	R6108	3001054720000	4.7K
338	R6135	3001054720000	4.7K
339	R708	3001054720000	4.7K
340	R908	3001054720000	4.7K
341	R910	3001054720000	4.7K
342	R913	3001054720000	4.7K
343	R937	3001054720000	4.7K
344	R942	3001054720000	4.7K
345	R925	3001064720000	4.7K
346	R932	3001064720000	4.7K
347	R880	3001074720010	4.7K
348	R881	3001074720010	4.7K
349	R6130	3001055120030	5.1K

No.	Ref. No.	Part No.	Description
350	R577	3001056820000	6.8K
351	R831	3001055620000	5.6K
352	R239	3001055620000	5.6K
353	R287	3001055620000	5.6K
354	R6105	3001055620000	5.6K
355	R716	3001055620000	5.6K
356	R843	3001065620000	5.6K
357	R918	3099066041010	6.04K
358	R131	3001056820010	6.8K
359	R142	3001056820010	6.8K
360	R138	3001057520000	7.5K
361	R143	3001057520000	7.5K
362	R710	3001058220000	8.2K
363	R867	3001058220000	8.2K
364	R858	3001069120000	9.1K
365	R3	3001051030000	10KΩ
366	R6	3001051030000	10KΩ
367	R159	3001051030000	10KΩ
368	R177	3001051030000	10KΩ
369	R180	3001051030000	10KΩ
370	R202	3001051030000	10KΩ
371	R234	3001051030000	10KΩ
372	R235	3001051030000	10KΩ
373	R236	3001051030000	10KΩ
374	R258	3001051030000	10KΩ
375	R259	3001051030000	10KΩ
376	R261	3001051030000	10KΩ
377	R316	3001051030000	10KΩ
378	R322	3001051030000	10KΩ
379	R323	3001051030000	10KΩ
380	R325	3001051030000	10KΩ
381	R326	3001051030000	10KΩ
382	R334	3001051030000	10KΩ
383	R335	3001051030000	10KΩ
384	R341	3001051030000	10KΩ
385	R342	3001051030000	10KΩ
386	R343	3001051030000	10KΩ
387	R351	3001051030000	10KΩ
388	R353	3001051030000	10KΩ
389	R372	3001051030000	10KΩ
390	R377	3001051030000	10KΩ
391	R378	3001051030000	10KΩ
392	R379	3001051030000	10KΩ
393	R382	3001051030000	10KΩ

No.	Ref. No.	Part No.	Description
394	R385	3001051030000	10KΩ
395	R390	3001051030000	10KΩ
396	R391	3001051030000	10KΩ
397	R392	3001051030000	10KΩ
398	R393	3001051030000	10KΩ
399	R394	3001051030000	10KΩ
400	R400	3001051030000	10KΩ
401	R427	3001051030000	10KΩ
402	R429	3001051030000	10KΩ
403	R438	3001051030000	10KΩ
404	R441	3001051030000	10KΩ
405	R442	3001051030000	10KΩ
406	R443	3001051030000	10KΩ
407	R447	3001051030000	10KΩ
408	R451	3001051030000	10KΩ
409	R452	3001051030000	10KΩ
410	R453	3001051030000	10KΩ
411	R454	3001051030000	10KΩ
412	R461	3001051030000	10KΩ
413	R462	3001051030000	10KΩ
414	R463	3001051030000	10KΩ
415	R464	3001051030000	10KΩ
416	R465	3001051030000	10KΩ
417	R466	3001051030000	10KΩ
418	R476	3001051030000	10KΩ
419	R481	3001051030000	10KΩ
420	R482	3001051030000	10KΩ
421	R483	3001051030000	10KΩ
422	R501	3001051030000	10KΩ
423	R507	3001051030000	10KΩ
424	R509	3001051030000	10KΩ
425	R510	3001051030000	10KΩ
426	R512	3001051030000	10KΩ
427	R530	3001051030000	10KΩ
428	R531	3001051030000	10KΩ
429	R532	3001051030000	10KΩ
430	R534	3001051030000	10KΩ
431	R535	3001051030000	10KΩ
432	R538	3001051030000	10KΩ
433	R539	3001051030000	10KΩ
434	R540	3001051030000	10KΩ
435	R541	3001051030000	10KΩ
436	R543	3001051030000	10KΩ
437	R555	3001051030000	10KΩ

No.	Ref. No.	Part No.	Description
438	R570	3001051030000	10KΩ
439	R6127	3001051030000	10KΩ
440	R705	3001051030000	10KΩ
441	R709	3001051030000	10KΩ
442	R885	3001051030000	10KΩ
443	R938	3001051030000	10KΩ
444	R945	3001051030000	10KΩ
445	R950	3001051030000	10KΩ
446	R976	3001051030000	10KΩ
447	R979	3001051030000	10KΩ
448	R980	3001051030000	10KΩ
449	R844	3001061030000	10KΩ
450	R846	3001061030000	10KΩ
451	R194	3001051230000	12KΩ
452	R568	3001051230000	12KΩ
453	R842	3001051230000	12KΩ
454	R151	3001051530010	15KΩ
455	R198	3001051530010	15KΩ
456	R250	3001051530010	15KΩ
457	R284	3001051530010	15KΩ
458	R285	3001051530010	15KΩ
459	R361	3001051530010	15KΩ
460	R362	3001051530010	15KΩ
461	R884	3001051530010	15KΩ
462	R930	3001051530010	15KΩ
463	R802	3001061530010	15KΩ
464	R811	3001061530010	15KΩ
465	R161	3001051830000	18KΩ
466	R870	3001052030000	20KΩ
467	R155	3001052030000	20KΩ
468	R6136	3001052030000	20KΩ
469	R975	3001052030000	20KΩ
470	R845	3001062030000	20KΩ
471	R244	3001052230010	22KΩ
472	R246	3001052230010	22KΩ
473	R940	3001052230010	22KΩ
474	R944	3001052230010	22KΩ
475	R273	3001052430010	24KΩ
476	R915	3001052430010	24KΩ
477	R952	3001062430000	24KΩ
478	R195	3001052730010	27KΩ
479	R6103	3001052730010	27KΩ
480	R815	3001082730000	27KΩ
481	R257	3001053030000	30KΩ

No.	Ref. No.	Part No.	Description
482	R263	3001053030000	30KΩ
483	R279	3001053030000	30KΩ
484	R283	3001053030000	30KΩ
485	R6134	3001053030000	30KΩ
486	R6137	3001053030000	30KΩ
487	R529	3001053330000	33KΩ
488	R558	3001053330000	33KΩ
489	R559	3001053330000	33KΩ
490	R560	3001053330000	33KΩ
491	R561	3001053330000	33KΩ
492	R562	3001053330000	33KΩ
493	R563	3001053330000	33KΩ
494	R838	3001053330000	33KΩ
495	R841	3001053330000	33KΩ
496	R875	3001053330000	33KΩ
497	R905	3001053330000	33KΩ
498	R152	3001053630000	36KΩ
499	R117	3001053930000	39KΩ
500	R120	3001053930000	39KΩ
501	R865	3001053930000	39KΩ
502	R911	3099064422010	44.2kΩ
503	R266	3001054730000	47KΩ
504	R270	3001054730000	47KΩ
505	R272	3001054730000	47KΩ
506	R277	3001054730000	47KΩ
507	R286	3001054730000	47KΩ
508	R288	3001054730000	47KΩ
509	R847	3001054730000	47KΩ
510	R877	3001054730000	47KΩ
511	R931	3001054730000	47KΩ
512	R949	3001054730000	47KΩ
513	R959	3001054730000	47KΩ
514	R727	3001064730000	47KΩ
515	R728	3001064730000	47KΩ
516	R906	3001064730000	47KΩ
517	R943	3001064730000	47KΩ
518	R969	3001064730000	47KΩ
519	R934	3001055130010	51KΩ
520	R237	3001055630000	56KΩ
521	R241	3001055630000	56KΩ
522	R6139	3001055630000	56KΩ
523	R854	3001055630000	56KΩ
524	R876	3001055630000	56KΩ
525	R883	3001055630000	56KΩ

No.	Ref. No.	Part No.	Description
526	R895	3001055630000	56KΩ
527	R528	3001056830000	68KΩ
528	R128	3001058230000	82KΩ
529	R892	3001058230000	82KΩ
530	R247	3001051040000	100K
531	R248	3001051040000	100K
532	R252	3001051040000	100K
533	R262	3001051040000	100K
534	R268	3001051040000	100K
535	R269	3001051040000	100K
536	R274	3001051040000	100K
537	R275	3001051040000	100K
538	R276	3001051040000	100K
539	R296	3001051040000	100K
540	R455	3001051040000	100K
541	R500	3001051040000	100K
542	R513	3001051040000	100K
543	R514	3001051040000	100K
544	R6111	3001051040000	100K
545	R6112	3001051040000	100K
546	R6115	3001051040000	100K
547	R713	3001051040000	100K
548	R982	3001051040000	100K
549	RT804	3003061040000	Thermistor 100KΩ
550	R199	3001051240000	120K
551	R882	3001051540000	150K
552	R919	3001051540000	150K
553	R872	3001051840000	180K
554	R955	3001051840000	180K
555	R956	3001051840000	180K
556	R886	3001052240000	220K
557	R6113	3001052740000	270K
558	R917	3001053340010	330K
559	RN230	3005051010010	100Ω
560	RN500	3005051010010	100Ω
561	C181	3101050590010	0.5PF
562	C27	3101050590010	0.5PF
563	C42	3101050100030	1PF
564	C6110	3101050100030	1PF
565	C62	3101050100030	1PF
566	C53	3101051590000	1.5PF
567	C6117	3101051590000	1.5PF
568	C9	3101051590000	1.5PF
569	C101	3101050200010	2PF

No.	Ref. No.	Part No.	Description
570	C6122	3101050200010	2PF
571	C6125	3101050200010	2PF
572	C178	3101060200010	2PF
573	C179	3101060200010	2PF
574	C821	3101080200010	2pF
575	C26	3101062590010	2.5PF
576	C6120	3101050300000	3PF
577	C6121	3101050300000	3PF
578	C6126	3101050300000	3PF
579	C6127	3101050300000	3PF
580	C6152	3101050300000	3PF
581	C6124	3101054390010	4.3P
582	C177	3101060300010	3PF
583	C2	3101060300010	3PF
584	C31	3101060300010	3PF
585	C703	3101060300010	3PF
586	C12	3101053690000	3.6PF
587	C13	3101054090010	4PF
588	C152	3101054090010	4PF
589	C198	3101054090010	4PF
590	C6153	3101050400010	4PF
591	C6154	3101050400010	4PF
592	C55	3101060400010	4PF
593	C836	3101080400010	4PF
594	C838	3101080400010	4PF
595	C166	3101050500010	5PF
596	C168	3101050500010	5PF
597	C25	3101050500010	5PF
598	C32	3101050500010	5PF
599	C11	3101050500030	5PF
600	C159	3101050500030	5PF
601	C164	3101050500030	5PF
602	C18	3101050500030	5PF
603	C165	3101050600010	6PF
604	C6109	3101050600010	6PF
605	C6116	3101050600010	6PF
606	C6133	3101050600010	6PF
607	C6245	3101050600010	6PF
608	C6246	3101050600010	6PF
609	C731	3101050600010	6PF
610	C6163	3101050700010	7PF
611	C196	3101060700020	7PF
612	C49	3101060700020	7PF
613	C830	3101080700010	7PF

No.	Ref. No.	Part No.	Description
614	C837	3101080700010	7PF
615	C192	3101060800010	8PF
616	C6114	3101050700050	7PF
617	C6170	3101050900000	9PF
618	C10	3101060900010	9PF
619	C155	3101060900010	9PF
620	C6111	3101051000020	10PF
621	C6112	3101051000020	10PF
622	C6129	3101051000020	10PF
623	C714	3101051000020	10PF
624	C751	3101051000020	10PF
625	C17	3101061000000	10PF
626	C20	3101061000000	10PF
627	C16	3101051000030	10PF
628	C56	3101051000030	10PF
629	C14	3101051200020	12PF
630	C15	3101051200020	12PF
631	C322	3101051200020	12PF
632	C324	3101051200020	12PF
633	C375	3101051200020	12PF
634	C376	3101051200020	12PF
635	C59	3101051200020	12PF
636	C102	3101061200000	12PF
637	C151	3101061200000	12PF
638	C189	3101061200000	12PF
639	L826	3101061200000	12PF
640	C823	3101081200010	12PF
641	C832	3101081200010	12PF
642	C834	3101081200010	12PF
643	C6161	3101051500020	15PF
644	C6162	3101051500020	15PF
645	C6164	3101051500020	15PF
646	C6177	3101051500020	15PF
647	C723	3101051500020	15PF
648	C191	3101051500080	15PF
649	C864	3101061500010	15PF
650	C61	3101051800010	18PF
651	C724	3101051800010	18PF
652	C158	3101051800070	18PF
653	C814	3101061800000	18PF
654	C162	3101052000020	20PF
655	C4	3101052000020	20PF
656	C22	3101052200010	22PF
657	C730	3101052200010	22PF

No.	Ref. No.	Part No.	Description
658	C732	3101052200010	22PF
659	C747	3101052200010	22PF
660	C918	3101052200010	22PF
661	C857	3101062200010	22PF
662	C889	3101062200010	22PF
663	C902	3101062200010	22PF
664	C193	3101052700000	27PF
665	C734	3101053000010	30PF
666	C500	3101053300000	33PF
667	C6160	3101053300000	33PF
668	C1004	3101063300000	33PF
669	C803	3101063300000	33PF
670	C865	3101063300000	33PF
671	C888	3101063300000	33PF
672	C913	3101063300000	33PF
673	C846	3101073300000	33PF
674	C153	3101053900000	39PF
675	C364	3101053900000	39PF
676	C5	3101053900000	39PF
677	C855	3101053900000	39PF
678	C749	3101063900000	39PF
679	C818	3101063900000	39PF
680	C812	3101373900000	39PF
681	R824	3101373900000	39PF
682	C154	3101054700010	47PF
683	C820	3101054700010	47PF
684	C743	3101064700000	47PF
685	C872	3101064700000	47PF
686	C810	3101074700000	47PF
687	C825	3101074700000	47PF
688	C859	3101074700000	47PF
689	L833	3101074700000	47PF
690	C157	3101055600000	56PF
691	C161	3101055600000	56PF
692	C185	3101055600000	56PF
693	C3	3101055600000	56PF
694	C745	3101055600000	56PF
695	C840	3101055600000	56PF
696	C922	3101055600000	56PF
697	C6134	3101056800000	68PF
698	C6135	3101056800000	68PF
699	C6136	3101056800000	68PF
700	C6137	3101056800000	68PF
701	C6138	3101056800000	68PF

No.	Ref. No.	Part No.	Description
702	C6139	3101056800000	68PF
703	C6140	3101056800000	68PF
704	C6141	3101056800000	68PF
705	C6142	3101056800000	68PF
706	C6143	3101056800000	68PF
707	C362	3101058200000	82PF
708	C363	3101058200000	82PF
709	C365	3101058200000	82PF
710	C121	3101051010030	100PF
711	C1320	3101051010030	100PF
712	C256	3101051010030	100PF
713	C288	3101051010030	100PF
714	C295	3101051010030	100PF
715	C307	3101051010030	100PF
716	C309	3101051010030	100PF
717	C326	3101051010030	100PF
718	C33	3101051010030	100PF
719	C335	3101051010030	100PF
720	C339	3101051010030	100PF
721	C34	3101051010030	100PF
722	C341	3101051010030	100PF
723	C342	3101051010030	100PF
724	C343	3101051010030	100PF
725	C344	3101051010030	100PF
726	C345	3101051010030	100PF
727	C346	3101051010030	100PF
728	C347	3101051010030	100PF
729	C348	3101051010030	100PF
730	C349	3101051010030	100PF
731	C350	3101051010030	100PF
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733	C352	3101051010030	100PF
734	C353	3101051010030	100PF
735	C354	3101051010030	100PF
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737	C357	3101051010030	100PF
738	C358	3101051010030	100PF
739	C359	3101051010030	100PF
740	C360	3101051010030	100PF
741	C361	3101051010030	100PF
742	C378	3101051010030	100PF
743	C385	3101051010030	100PF
744	C390	3101051010030	100PF
745	C409	3101051010030	100PF

No.	Ref. No.	Part No.	Description
746	C410	3101051010030	100PF
747	C411	3101051010030	100PF
748	C412	3101051010030	100PF
749	C413	3101051010030	100PF
750	C414	3101051010030	100PF
751	C415	3101051010030	100PF
752	C416	3101051010030	100PF
753	C417	3101051010030	100PF
754	C418	3101051010030	100PF
755	C419	3101051010030	100PF
756	C420	3101051010030	100PF
757	C426	3101051010030	100PF
758	C427	3101051010030	100PF
759	C428	3101051010030	100PF
760	C429	3101051010030	100PF
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762	C431	3101051010030	100PF
763	C435	3101051010030	100PF
764	C440	3101051010030	100PF
765	C441	3101051010030	100PF
766	C442	3101051010030	100PF
767	C443	3101051010030	100PF
768	C444	3101051010030	100PF
769	C445	3101051010030	100PF
770	C446	3101051010030	100PF
771	C447	3101051010030	100PF
772	C448	3101051010030	100PF
773	C449	3101051010030	100PF
774	C450	3101051010030	100PF
775	C451	3101051010030	100PF
776	C452	3101051010030	100PF
777	C453	3101051010030	100PF
778	C454	3101051010030	100PF
779	C455	3101051010030	100PF
780	C456	3101051010030	100PF
781	C463	3101051010030	100PF
782	C465	3101051010030	100PF
783	C466	3101051010030	100PF
784	C467	3101051010030	100PF
785	C468	3101051010030	100PF
786	C469	3101051010030	100PF
787	C470	3101051010030	100PF
788	C472	3101051010030	100PF
789	C477	3101051010030	100PF

No.	Ref. No.	Part No.	Description
790	C478	3101051010030	100PF
791	C479	3101051010030	100PF
792	C480	3101051010030	100PF
793	C481	3101051010030	100PF
794	C482	3101051010030	100PF
795	C510	3101051010030	100PF
796	C516	3101051010030	100PF
797	C517	3101051010030	100PF
798	C518	3101051010030	100PF
799	C6130	3101051010030	100PF
800	C6166	3101051010030	100PF
801	C721	3101051010030	100PF
802	C722	3101051010030	100PF
803	C738	3101051010030	100PF
804	C739	3101051010030	100PF
805	C76	3101051010030	100PF
806	C763	3101051010030	100PF
807	C764	3101051010030	100PF
808	C765	3101051010030	100PF
809	C766	3101051010030	100PF
810	C767	3101051010030	100PF
811	C769	3101051010030	100PF
812	C77	3101051010030	100PF
813	C90	3101051010030	100PF
814	C93	3101051010030	100PF
815	C6157	3101061010010	100PF
816	C852	3101061010010	100PF
817	C891	3101051210000	120PF
818	C899	3101051210000	120PF
819	C875	3101051510000	150PF
820	C847	3101061510000	150PF
821	C848	3101061510000	150PF
822	C716	3101061810010	180PF
823	C100	3101052210010	220PF
824	C1000	3101052210010	220PF
825	C147	3101052210010	220PF
826	C150	3101052210010	220PF
827	C156	3101052210010	220PF
828	C160	3101052210010	220PF
829	C184	3101052210010	220PF
830	C186	3101052210010	220PF
831	C194	3101052210010	220PF
832	C197	3101052210010	220PF
833	C23	3101052210010	220PF

No.	Ref. No.	Part No.	Description
834	C247	3101052210010	220PF
835	C250	3101052210010	220PF
836	C254	3101052210010	220PF
837	C265	3101052210010	220PF
838	C269	3101052210010	220PF
839	C270	3101052210010	220PF
840	C271	3101052210010	220PF
841	C272	3101052210010	220PF
842	C273	3101052210010	220PF
843	C28	3101052210010	220PF
844	C280	3101052210010	220PF
845	C29	3101052210010	220PF
846	C421	3101052210010	220PF
847	C423	3101052210010	220PF
848	C424	3101052210010	220PF
849	C425	3101052210010	220PF
850	C432	3101052210010	220PF
851	C433	3101052210010	220PF
852	C434	3101052210010	220PF
853	C436	3101052210010	220PF
854	C437	3101052210010	220PF
855	C46	3101052210010	220PF
856	C52	3101052210010	220PF
857	C6	3101052210010	220PF
858	C6103	3101052210010	220PF
859	C6105	3101052210010	220PF
860	C6106	3101052210010	220PF
861	C6107	3101052210010	220PF
862	C6144	3101052210010	220PF
863	C6159	3101052210010	220PF
864	C704	3101052210010	220PF
865	C883	3101052210010	220PF
866	C890	3101052210010	220PF
867	C895	3101052210010	220PF
868	C896	3101052210010	220PF
869	C897	3101052210010	220PF
870	C898	3101052210010	220PF
871	C921	3101052210010	220PF
872	C242	3101062210000	220PF
873	C245	3101062210000	220PF
874	C808	3101062210000	220PF
875	C809	3101062210000	220PF
876	C822	3101062210000	220PF
877	C845	3101062210000	220PF

No.	Ref. No.	Part No.	Description
878	C853	3101062210000	220PF
879	C877	3101062210000	220PF
880	C878	3101062210000	220PF
881	C892	3101062210000	220PF
882	C99	3101052710000	270PF
883	C501	3101053310020	330PF
884	C505	3101053310020	330PF
885	C911	3101053310020	330PF
886	C1001	3101054710010	470PF
887	C1003	3101054710010	470PF
888	C1015	3101054710010	470PF
889	C142	3101054710010	470PF
890	C148	3101054710010	470PF
891	C50	3101054710010	470PF
892	C504	3101054710010	470PF
893	C6102	3101054710010	470PF
894	C6118	3101054710010	470PF
895	C6128	3101054710010	470PF
896	C6146	3101054710010	470PF
897	C6148	3101054710010	470PF
898	C6151	3101054710010	470PF
899	C706	3101054710010	470PF
900	C717	3101054710010	470PF
901	C727	3101054710010	470PF
902	C746	3101054710010	470PF
903	C8	3101054710010	470PF
904	C945	3101054710010	470PF
905	C811	3101064710000	470PF
906	C817	3101064710000	470PF
907	C827	3101084710010	470PF
908	C850	3101084710010	470PF
909	C893	3101084710010	470PF
910	C1	3101051020010	1000PF
911	C1002	3101051020010	1000PF
912	C1010	3101051020010	1000PF
913	C337	3101051020010	1000PF
914	C338	3101051020010	1000PF
915	C404	3101051020010	1000PF
916	C484	3101051020010	1000PF
917	C503	3101051020010	1000PF
918	C513	3101051020010	1000PF
919	C60	3101051020010	1000PF
920	C6108	3101051020010	1000PF
921	C710	3101051020010	1000PF

No.	Ref. No.	Part No.	Description
922	C728	3101051020010	1000PF
923	C75	3101051020010	1000PF
924	C79	3101051020010	1000PF
925	C82	3101051020010	1000PF
926	C910	3101051020010	1000PF
927	C937	3101051020010	1000PF
928	C944	3101051020010	1000PF
929	C96	3101051020010	1000PF
930	C839	3101061020040	1000PF
931	C887	3101061020040	1000PF
932	C801	3101081020010	1000PF
933	C502	3101053320010	3300PF
934	C802	3101063320000	3300PF
935	C916	3101063320000	3300PF
936	C713	3101053920000	3900PF
937	C815	3101064720000	4700PF
938	C863	3101064720000	4700PF
939	C199	3101051030020	0.01UF
940	C235	3101051030020	0.01UF
941	C260	3101051030020	0.01UF
942	C261	3101051030020	0.01UF
943	C306	3101051030020	0.01UF
944	C381	3101051030020	0.01UF
945	C384	3101051030020	0.01UF
946	C399	3101051030020	0.01UF
947	C506	3101051030020	0.01UF
948	C507	3101051030020	0.01UF
949	C58	3101051030020	0.01UF
950	C6147	3101051030020	0.01UF
951	C6155	3101051030020	0.01UF
952	C6178	3101051030020	0.01UF
953	C701	3101051030020	0.01UF
954	C702	3101051030020	0.01UF
955	C725	3101051030020	0.01UF
956	C736	3101051030020	0.01UF
957	C80	3101051030020	0.01UF
958	C95	3101051030020	0.01UF
959	C97	3101051030020	0.01UF
960	C952	3101061030010	0.01UF
961	C894	3101051830000	0.018UF
962	C930	3101061830000	0.018UF
963	C246	3101052230000	0.022UF
964	C880	3101064730000	0.047UF
965	C1006	3101051040010	0.1UF

No.	Ref. No.	Part No.	Description
966	C141	3101051040010	0.1UF
967	C149	3101051040010	0.1UF
968	C163	3101051040010	0.1UF
969	C167	3101051040010	0.1UF
970	C195	3101051040010	0.1UF
971	C232	3101051040010	0.1UF
972	C233	3101051040010	0.1UF
973	C236	3101051040010	0.1UF
974	C239	3101051040010	0.1UF
975	C24	3101051040010	0.1UF
976	C240	3101051040010	0.1UF
977	C243	3101051040010	0.1UF
978	C248	3101051040010	0.1UF
979	C258	3101051040010	0.1UF
980	C267	3101051040010	0.1UF
981	C274	3101051040010	0.1UF
982	C285	3101051040010	0.1UF
983	C30	3101051040010	0.1UF
984	C308	3101051040010	0.1UF
985	C311	3101051040010	0.1UF
986	C321	3101051040010	0.1UF
987	C323	3101051040010	0.1UF
988	C329	3101051040010	0.1UF
989	C334	3101051040010	0.1UF
990	C336	3101051040010	0.1UF
991	C356	3101051040010	0.1UF
992	C366	3101051040010	0.1UF
993	C379	3101051040010	0.1UF
994	C380	3101051040010	0.1UF
995	C382	3101051040010	0.1UF
996	C383	3101051040010	0.1UF
997	C386	3101051040010	0.1UF
998	C387	3101051040010	0.1UF
999	C388	3101051040010	0.1UF
1000	C389	3101051040010	0.1UF
1001	C391	3101051040010	0.1UF
1002	C392	3101051040010	0.1UF
1003	C393	3101051040010	0.1UF
1004	C394	3101051040010	0.1UF
1005	C398	3101051040010	0.1UF
1006	C400	3101051040010	0.1UF
1007	C407	3101051040010	0.1UF
1008	C422	3101051040010	0.1UF
1009	C471	3101051040010	0.1UF

No.	Ref. No.	Part No.	Description
1010	C473	3101051040010	0.1UF
1011	C509	3101051040010	0.1UF
1012	C512	3101051040010	0.1UF
1013	C514	3101051040010	0.1UF
1014	C515	3101051040010	0.1UF
1015	C6104	3101051040010	0.1UF
1016	C6113	3101051040010	0.1UF
1017	C6168	3101051040010	0.1UF
1018	C6169	3101051040010	0.1UF
1019	C6171	3101051040010	0.1UF
1020	C6173	3101051040010	0.1UF
1021	C6175	3101051040010	0.1UF
1022	C6179	3101051040010	0.1UF
1023	C6180	3101051040010	0.1UF
1024	C7	3101051040010	0.1UF
1025	C705	3101051040010	0.1UF
1026	C707	3101051040010	0.1UF
1027	C708	3101051040010	0.1UF
1028	C709	3101051040010	0.1UF
1029	C712	3101051040010	0.1UF
1030	C720	3101051040010	0.1UF
1031	C729	3101051040010	0.1UF
1032	C733	3101051040010	0.1UF
1033	C735	3101051040010	0.1UF
1034	C737	3101051040010	0.1UF
1035	C740	3101051040010	0.1UF
1036	C741	3101051040010	0.1UF
1037	C744	3101051040010	0.1UF
1038	C756	3101051040010	0.1UF
1039	C83	3101051040010	0.1UF
1040	C85	3101051040010	0.1UF
1041	C86	3101051040010	0.1UF
1042	C87	3101051040010	0.1UF
1043	C89	3101051040010	0.1UF
1044	C947	3101051040010	0.1UF
1045	C950	3101051040010	0.1UF
1046	C955	3101051040010	0.1UF
1047	C958	3101051040010	0.1UF
1048	C967	3101051040010	0.1UF
1049	C968	3101051040010	0.1UF
1050	C969	3101051040010	0.1UF
1051	C978	3101051040010	0.1UF
1052	C98	3101051040010	0.1UF
1053	C122	3101061040010	0.1UF

No.	Ref. No.	Part No.	Description
1054	C283	3101061040010	0.1UF
1055	C289	3101061040010	0.1UF
1056	C6193	3101061040010	0.1UF
1057	C748	3101061040010	0.1UF
1058	C829	3101061040010	0.1UF
1059	C854	3101061040010	0.1UF
1060	C868	3101061040010	0.1UF
1061	C907	3101061040010	0.1UF
1062	C927	3101061040010	0.1UF
1063	C935	3101061040010	0.1UF
1064	C936	3101061040010	0.1UF
1065	C939	3101061040010	0.1UF
1066	C942	3101061040010	0.1UF
1067	C948	3101061040010	0.1UF
1068	C959	3101061040010	0.1UF
1069	C963	3101061040010	0.1UF
1070	L6122	3101061040010	0.1UF
1071	L6126	3101061040010	0.1UF
1072	C1005	3110071040000	0.1UF
1073	C1007	3110071040000	0.1UF
1074	C64	3110071040000	0.1UF
1075	C66	3110071040000	0.1UF
1076	C67	3110071040000	0.1UF
1077	C68	3110071040000	0.1UF
1078	C69	3110071040000	0.1UF
1079	C70	3110071040000	0.1UF
1080	C72	3110071040000	0.1UF
1081	C74	3110071040000	0.1UF
1082	C78	3110071040000	0.1UF
1083	C84	3110071040000	0.1UF
1084	C88	3110071040000	0.1UF
1085	C91	3110071040000	0.1UF
1086	C94	3110071040000	0.1UF
1087	C941	3101051540000	0.15UF
1088	C123	3101062240000	0.22UF
1089	C132	3101062240000	0.22UF
1090	C438	3101054740000	0.47UF
1091	C439	3101054740000	0.47UF
1092	C287	3101064740000	0.47UF
1093	C715	3101064740000	0.47UF
1094	C237	3101054740020	0.47uF
1095	C1016	3101065630000	0.056uF
1096	C255	3101051050000	1UF
1097	C276	3101051050000	1UF

No.	Ref. No.	Part No.	Description
1098	C305	3101051050000	1UF
1099	C310	3101051050000	1UF
1100	C719	3101051050000	1UF
1101	C962	3101051050000	1UF
1102	C200	3101061050020	1UF
1103	C238	3101061050020	1UF
1104	C249	3101061050020	1UF
1105	C251	3101061050020	1UF
1106	C252	3101061050020	1UF
1107	C253	3101061050020	1UF
1108	C257	3101061050020	1UF
1109	C259	3101061050020	1UF
1110	C262	3101061050020	1UF
1111	C263	3101061050020	1UF
1112	C264	3101061050020	1UF
1113	C266	3101061050020	1UF
1114	C268	3101061050020	1UF
1115	C277	3101061050020	1UF
1116	C278	3101061050020	1UF
1117	C279	3101061050020	1UF
1118	C281	3101061050020	1UF
1119	C282	3101061050020	1UF
1120	C290	3101061050020	1UF
1121	C291	3101061050020	1UF
1122	C294	3101061050020	1UF
1123	C298	3101061050020	1UF
1124	C299	3101061050020	1UF
1125	C396	3101061050020	1UF
1126	C6100	3101061050020	1UF
1127	C6145	3101061050020	1UF
1128	C6149	3101061050020	1UF
1129	C6185	3101061050020	1UF
1130	C6190	3101061050020	1UF
1131	C742	3101061050020	1UF
1132	C754	3101061050020	1UF
1133	C900	3101061050020	1UF
1134	C901	3101061050020	1UF
1135	C905	3101061050020	1UF
1136	C906	3101061050020	1UF
1137	C908	3101061050020	1UF
1138	C923	3101061050020	1UF
1139	C924	3101061050020	1UF
1140	C925	3101061050020	1UF
1141	C938	3101061050020	1UF

No.	Ref. No.	Part No.	Description
1142	C946	3101061050020	1UF
1143	C966	3101061050020	1UF
1144	C718	3101051050160	1uF
1145	C750	3101071050020	1uF
1146	C1009	3104071050070	1UF
1147	C71	3104071050070	1UF
1148	C933	3104082260070	22uF
1149	C920	3101062250000	2.2UF
1150	C932	3101062250000	2.2UF
1151	C934	3101062250000	2.2UF
1152	C965	3101062250000	2.2UF
1153	C912	3101072250030	2.2UF
1154	C292	3101064750030	4.7UF
1155	C136	3101074750010	4.7UF
1156	C275	3101071060010	10UF
1157	C367	3101071060010	10UF
1158	C926	3101071060010	10UF
1159	C234	3101081060010	10UF
1160	C286	3101081060010	10UF
1161	C807	3101081060010	10UF
1162	C928	3101081060010	10UF
1163	C956	3101081060010	10UF
1164	C957	3101081060010	10UF
1165	C980	3101081060010	10UF
1166	C981	3101081060010	10UF
1167	C1013	3104071060070	10UF
1168	C293	3104071060070	10UF
1169	C401	3104071060070	10UF
1170	C402	3104071060070	10UF
1171	C508	3104071060070	10UF
1172	C511	3104071060070	10UF
1173	C519	3104071060070	10UF
1174	C520	3104071060070	10UF
1175	C726	3104071060070	10UF
1176	C752	3104071060070	10UF
1177	C755	3104071060070	10UF
1178	C917	3104071060070	10UF
1179	C929	3104071060070	10UF
1180	C951	3104081060120	10UF
1181	C919	3101072260000	22UF
1182	C915	3101082260020	22UF
1183	C284	3103994760180	47uf
1184	C804	3103994760180	47uf
1185	C914	3103994760180	47uf

No.	Ref. No.	Part No.	Description
1186	L814	3212106689000	6.8nH
1187	L832	3212106100000	10nH
1188	L811	3215006100010	10nH
1189	L173	3212106120000	12nH
1190	L105	3237199120000	12.5nH
1191	L114	3237199120000	12.5nH
1192	L171	3210306150000	15nH
1193	C826	3210306180000	18nH
1194	L122	3210306180000	18nH
1195	L123	3210306180000	18nH
1196	L136	3210306180000	18nH
1197	L2	3210306180000	18nH
1198	L124	3237199190000	18.5nH
1199	L137	3237199190000	18.5nH
1200	L6110	3210306220000	22nH
1201	L6117	3210306220000	22nH
1202	L6118	3210306220000	22nH
1203	L6119	3210306220000	22nH
1204	L805	3210306220000	22nH
1205	L167	3210306270000	27nH
1206	L168	3210306270000	27nH
1207	L6116	3210306270000	27nH
1208	L6103	3212106270000	27nH
1209	L128	3210306330000	33nH
1210	L132	3210306330000	33nH
1211	L135	3210306330000	33nH
1212	L138	3210306330000	33nH
1213	L115	3217607330000	33nH
1214	L827	3212106390000	39nH
1215	L106	3214307390000	39nH
1216	L126	3214307390000	39nH
1217	L139	3214307390000	39nH
1218	L6120	3210306470000	47nH
1219	L6102	3210306221000	220nH
1220	L807	3210306221000	220nH
1221	L708	3217107221010	220nH
1222	L6125	3210406331000	330nH
1223	L716	3210406331000	330nH
1224	L147	3210406471000	330nH
1225	L151	3210406471000	330nH
1226	L718	3210406471000	330nH
1227	L103	3217607471000	470nH
1228	L107	3217607471000	470nH
1229	L108	3217607471000	470nH

No.	Ref. No.	Part No.	Description
1230	L110	3217607471000	470nH
1231	L112	3217607471000	470nH
1232	L116	3217607471000	470nH
1233	L117	3217607471000	470nH
1234	L118	3217607471000	470nH
1235	L121	3217607471000	470nH
1236	L127	3217607471000	470nH
1237	L129	3217607471000	470nH
1238	L133	3217607471000	470nH
1239	L134	3217607471000	470nH
1240	L140	3217607471000	470nH
1241	L4	3217607471000	470nH
1242	L5	3217607471000	470nH
1243	L154	3213306561000	0.56uH
1244	L713	3213306561000	0.56uH
1245	L162	3210306560000	56nH
1246	L166	3210306560000	56nH
1247	L169	3210306560000	56nH
1248	L6123	3213306821000	0.82uH
1249	L131	3221506601000	Bead
1250	L152	3221506601000	Bead
1251	L6	3221506601000	Bead
1252	L7	3221506601000	Bead
1253	L701	3221506601000	Bead
1254	L702	3221506601000	Bead
1255	L703	3221506601000	Bead
1256	L706	3221506601000	Bead
1257	L707	3221506601000	Bead
1258	L709	3221506601000	Bead
1259	L710	3221506601000	Bead
1260	L711	3221506601000	Bead
1261	L712	3221506601000	Bead
1262	L714	3221506601000	Bead
1263	L8	3221506601000	Bead
1264	L815	3221506601000	Bead
1265	L821	3221506601000	Bead
1266	L822	3221506601000	Bead
1267	L824	3221506601000	Bead
1268	L825	3221506601000	Bead
1269	L9	3221506601000	Bead
1270	R153	3221506601000	Bead
1271	R157	3221506601000	Bead
1272	R179	3221506601000	Bead
1273	R186	3221506601000	Bead

No.	Ref. No.	Part No.	Description
1274	L801	3221513600000	Bead
1275	L802	3221513600000	Bead
1276	L803	3221513600000	Bead
1277	L900	3221513600000	Bead
1278	L916	3221513600000	Bead
1279	L917	3221513600000	Bead
1280	L940	3221513600000	Bead
1281	L232	3221506300000	Bead
1282	L401	3221506300000	Bead
1283	L402	3221506300000	Bead
1284	L403	3221506300000	Bead
1285	L404	3221506300000	Bead
1286	L405	3221506300000	Bead
1287	L406	3221506300000	Bead
1288	L407	3221506300000	Bead
1289	L408	3221506300000	Bead
1290	L409	3221506300000	Bead
1291	L410	3221506300000	Bead
1292	L411	3221506300000	Bead
1293	L412	3221506300000	Bead
1294	L901	3221506300000	Bead
1295	L912	3221506300000	Bead
1296	L913	3221506300000	Bead
1297	L904	3221506181000	Bead
1298	L908	3221506181000	Bead
1299	L233	3211506101000	Bead
1300	L234	3211506101000	Bead
1301	L235	3211506101000	Bead
1302	L500	3211506101000	Bead
1303	L6100	3211506101000	Bead
1304	L6101	3211506101000	Bead
1305	L6114	3211506101000	Bead
1306	L6115	3211506101000	Bead
1307	L6121	3211506101000	Bead
1308	L819	3233099470000	Air-core coil 47nH
1309	L804	3233099160000	Air-core coil 16nH
1310	L809	3233099160000	Air-core coil 16nH
1311	L810	3233099160000	Air-core coil 16nH
1312	L813	3233099160000	Air-core coil 16nH
1313	L817	3233099160000	Air-core coil 16nH
1314	L806	3213306102000	1uH
1315	L820	3217112102020	1uH
1316	L828	3217112102020	1uH
1317	L1	3213212332000	3.3uH

No.	Ref. No.	Part No.	Description
1318	L156	3213212332000	3.3uH
1319	L715	3213212332000	3.3uH
1320	L717	3212206682000	6.8uH
1321	L903	3213099472000	4.7uH
1322	L931	3213099472000	4.7uH
1323	L902	3217299103000	10uH
1324	L930	3241799103000	10uH
1325	L704	3213212103000	10uH
1326	L705	3213212103000	10uH
1327	D100	3303990000060	Switching diode
1328	D129	3303990000060	Switching diode
1329	D701	3304060300050	Varactor
1330	D101	3304010100220	Varactor
1331	D102	3304010100220	Varactor
1332	D105	3304010100220	Varactor
1333	D106	3304010100220	Varactor
1334	D107	3304010100220	Varactor
1335	D108	3304010100220	Varactor
1336	D109	3304010100220	Varactor
1337	D110	3304010100220	Varactor
1338	D111	3304010100220	Varactor
1339	D112	3304010100220	Varactor
1340	D113	3304010100220	Varactor
1341	D116	3304010100220	Varactor
1342	D117	3304010100220	Varactor
1343	D121	3304010100220	Varactor
1344	D122	3304010100220	Varactor
1345	D125	3304010100220	Varactor
1346	D126	3304010100220	Varactor
1347	D127	3303030100010	Switching diode
1348	D128	3303030100010	Switching diode
1349	D230	3310240000000	ESD protection diode
1350	D231	3310240000000	ESD protection diode
1351	D233	3310240000000	ESD protection diode
1352	D240	3310240000000	ESD protection diode
1353	D402	3310240000000	ESD protection diode
1354	D403	3310240000000	ESD protection diode
1355	D404	3310240000000	ESD protection diode
1356	D405	3310240000000	ESD protection diode
1357	D406	3310240000000	ESD protection diode
1358	D234	3310240200000	ESD protection diode
1359	D236	3310240200000	ESD protection diode
1360	D239	3310240200000	ESD protection diode
1361	D235	3302031100010	Zener diode

No.	Ref. No.	Part No.	Description
1362	D241	3302031100010	Zener diode
1363	D409	3310240000040	ESD protection diode
1364	D237	3310990000090	ESD protection diode
1365	D238	3310990000090	ESD protection diode
1366	D407	3399040600010	ESD protection diode
1367	D408	3399040600010	ESD protection diode
1368	D450	3699037000010	USB protection IC
1369	D601	3307110100080	LED
1370	D702	3304060300010	Varactor
1371	D801	3303210100000	Switching diode
1372	D802	3303210100000	Switching diode
1373	D803	3303030300000	Diode
1374	D804	3303030300000	Diode
1375	D901	3303040400000	Switching diode
1376	D902	3301100300030	Rectifier diode
1377	D904	3301240000000	Diode
1378	D905	3301240000000	Diode
1379	D6100	3303060300010	Switching diode
1380	D906	3303060300010	Switching diode
1381	D907	3303060300010	Switching diode
1382	D909	3303060300010	Switching diode
1383	D911	3303060300010	Switching diode
1384	D914	3303060300010	Switching diode
1385	D910	3302030500010	Zener diode
1386	D915	3303010500290	Switching diode
1387	D805	3302030500030	Zener diode
1388	D917	3302030500030	Zener diode
1389	D6101	3304010100890	Varactor
1390	D6102	3304010100890	Varactor
1391	D6103	3304010100890	Varactor
1392	D6104	3304010100890	Varactor
1393	D6105	3399990000260	Rectifier diode
1394	D6106	3699019000000	Mixer
1395	Q1	3503020000030	N-MOSFET
1396	Q912	3503020000030	N-MOSFET
1397	Q100	3408002000080	NPN transistor
1398	Q103	3408002000080	NPN transistor
1399	Q106	3408002000080	NPN transistor
1400	Q110	3408002000080	NPN transistor
1401	Q101	3403999000000	Transistor
1402	Q105	3403999000000	Transistor
1403	Q108	3403999000000	Transistor
1404	Q112	3403999000000	Transistor
1405	Q116	3403999000000	Transistor

No.	Ref. No.	Part No.	Description
1406	Q117	3403999000000	Transistor
1407	Q102	3401002000990	NPN transistor
1408	Q111	3401002000990	NPN transistor
1409	Q104	3403003000060	NPN transistor
1410	Q702	3403003000060	NPN transistor
1411	Q107	3404006000000	NPN transistor
1412	Q109	3404006000000	NPN transistor
1413	Q6104	3404006000000	NPN transistor
1414	Q6105	3404006000000	NPN transistor
1415	Q230	3499000000150	Transistor
1416	Q231	3499000000150	Transistor
1417	Q232	3499000000150	Transistor
1418	Q233	3499000000150	Transistor
1419	Q234	3499000000150	Transistor
1420	Q235	3499000000150	Transistor
1421	Q6100	3499000000150	Transistor
1422	Q905	3499000000150	Transistor
1423	Q323	3403008000010	Transistor
1424	Q401	3403008000010	Transistor
1425	Q402	3403008000010	Transistor
1426	Q403	3403008000010	Transistor
1427	Q404	3403008000010	Transistor
1428	Q405	3403008000010	Transistor
1429	Q413	3403008000010	Transistor
1430	Q811	3403008000010	Transistor
1431	Q812	3403008000010	Transistor
1432	Q813	3403008000010	Transistor
1433	Q903	3403008000010	Transistor
1434	Q908	3403008000010	Transistor
1435	Q913	3403008000010	Transistor
1436	Q914	3403008000010	Transistor
1437	Q922	3403008000010	Transistor
1438	Q923	3403008000010	Transistor
1439	Q406	3414999000000	Transistor
1440	Q407	3414999000000	Transistor
1441	Q408	3414999000000	Transistor
1442	Q409	3414999000000	Transistor
1443	Q410	3414999000000	Transistor
1444	Q411	3414999000000	Transistor
1445	Q412	3414999000000	Transistor
1446	Q701	3408002000000	NPN transistor
1447	Q6102	3404999000000	NPN transistor
1448	Q6103	3404999000000	NPN transistor
1449	Q801	3404999000000	NPN transistor

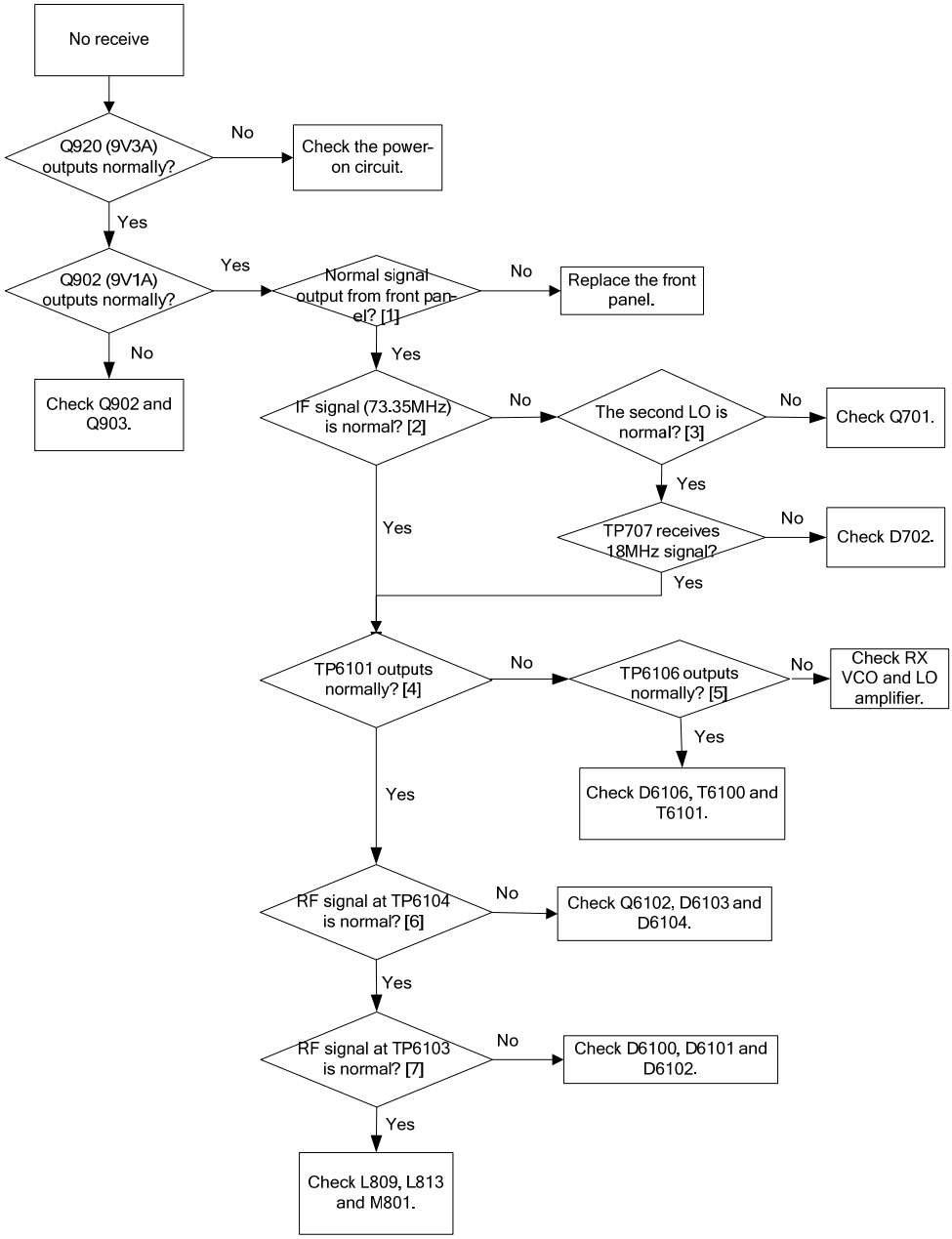
No.	Ref. No.	Part No.	Description
1450	Q804	3504990000030	PA MOSFET
1451	Q805	3504990000010	PA MOSFET
1452	Q810	3403002000000	PNP transistor
1453	Q902	3403002000000	PNP transistor
1454	Q400	3413001000010	PNP transistor
1455	Q906	3414001000020	NPN transistor
1456	Q910	3414001000020	NPN transistor
1457	Q909	3403002000010	PNP transistor
1458	Q6101	3403014000020	Transistor
1459	T6100	3244599189000	4BLH
1460	T6101	3244599189000	4BLH
1461	U100	3604019000000	PLL IC
1462	U101	3616059000000	Switch IC
1463	U102	3616059000000	Switch IC
1464	U201	3602017006350	Audio amplifier
1465	U231	3613010000000	Baseband processing IC
1466	U233	3612002000020	Memory
1467	U235	3605010000020	Operational amplifier
1468	U236	3605010000020	Operational amplifier
1469	U237	3616010000000	Switch IC
1470	U238	3605008005070	Operational amplifier
1471	U804	3605008005070	Operational amplifier
1472	U914	3605008005070	Operational amplifier
1473	U302	3610010000010	U302
1474	U401	3699053000000	SmartSwitch
1475	U500	3606010000010	D/A conversion IC
1476	U701	3603999000000	IF processor
1477	U702	3608006000000	Power management IC
1478	U900	3608006000000	Power management IC
1479	U901	3608006000000	Power management IC
1480	U909	3608006000000	Power management IC
1481	U703	3608015000060	Power management IC
1482	U905	3608015000060	Power management IC
1483	U915	3608015000060	Power management IC
1484	U902	3608053000010	Power management IC
1485	U903	3608015000170	Power management IC
1486	U918	3608015000210	Power management IC
1487	U919	3608010006230	Power management IC
1488	U801	3605025000020	Operational amplifier
1489	U802	3605002054590	Operational amplifier
1490	U6000	3605002057090	Operational amplifier
1491	U910	3609010000170	Reset IC
1492	U917	3609006003050	Reset IC
1493	X100	3701019250030	TCXO (19.2MHz)

No.	Ref. No.	Part No.	Description
1494	X302	3701019250040	Crystal oscillator (19.2MHz)
1495	X375	3701327610060	Crystal
1496	Z6100	3802733540030	Crystal filter
1497	F900	4099000000050	Fuse
1498	J400	5201020100110	Board-to-board connector
1499	J404	5206040200010	FFC connector
1500	PCB	41MD7801000F0	PCB
1501		6202010000000	APC shielding mask
1502		6201928000000	VCO shielding mask
1503	D900	3302060000000	Zener diode
1504	Q921	3404999000020	NPN transistor
1505	U232	3612044000010	Memory
1506	U327	3607023000150	Logic IC
1507	U328	3607082000040	Logic IC
1508	D912	3311240100000	Schottky diode
1509	D913	3311240100000	Schottky diode
1510	U906	3609010000210	Reset IC
1511	C406	3101051220000	1200PF
1512	L414	3221505121000	Bead
1513	L415	3221505121000	Bead
1514	L417	3221505121000	Bead
1515	L418	3221505121000	Bead
1516	R358	3221505121000	Bead
1517	R360	3221505121000	Bead
1518	L413	3240707181000	Common-mode choke coil
1519	L416	3240707181000	Common-mode choke coil
1520	C405	3104074750070	4.7UF
1521	R864	3001054740010	470K
1522	R897	3001054740010	470K
1523	R898	3001054740010	470K
1524	R899	3001054740010	470K
1525	C885	3101082700010	27pF
1526	C909	3101063310010	330PF
1527	C940	3101066800000	68PF
1528	C931	3101062700010	27PF
1529	C943	3101062700010	27PF
1530	L6216	3210305270000	27nH
1531	L6217	3210305270000	27nH
1532	C6244	3101050800050	8PF
1533	C483	3101058220000	8200PF
1534	R804	3001081000000	10Ω
1535	R806	3001081000000	10Ω
1536	R807	3001081000000	10Ω
1537	R813	3001081000000	10Ω

No.	Ref. No.	Part No.	Description
1538	R818	3001081000000	10Ω
1539	R861	3001081000000	10Ω
1540	R855	3001085100000	51Ω
1541	R856	3001085100000	51Ω
1542	C866	3101062710000	270PF
1543	C861	3101068200000	82PF
1544	C816	3101080300010	3pF
1545	C835	3101080300010	3pF
1546	C851	3101080300010	3pF
1547	L823	3210306339000	3.3nH
1548	L816	3233099111000	111nH

16.8 Troubleshooting Flow Chart

Receiver Circuit



Description of Normal Situations:

[1] During sensitivity test, use a communication test set to demodulate the audio signal (TP4012 and TP4016). If the signal is demodulated normally, it is concluded that the front panel is defective.

[2] Use the communication test set to input a 73.35MHz IF signal at the mixer, and see whether it can be processed normally afterwards.

[3] Use a spectrum analyzer to check whether TP704 can output the second LO signal (71.1MHz).

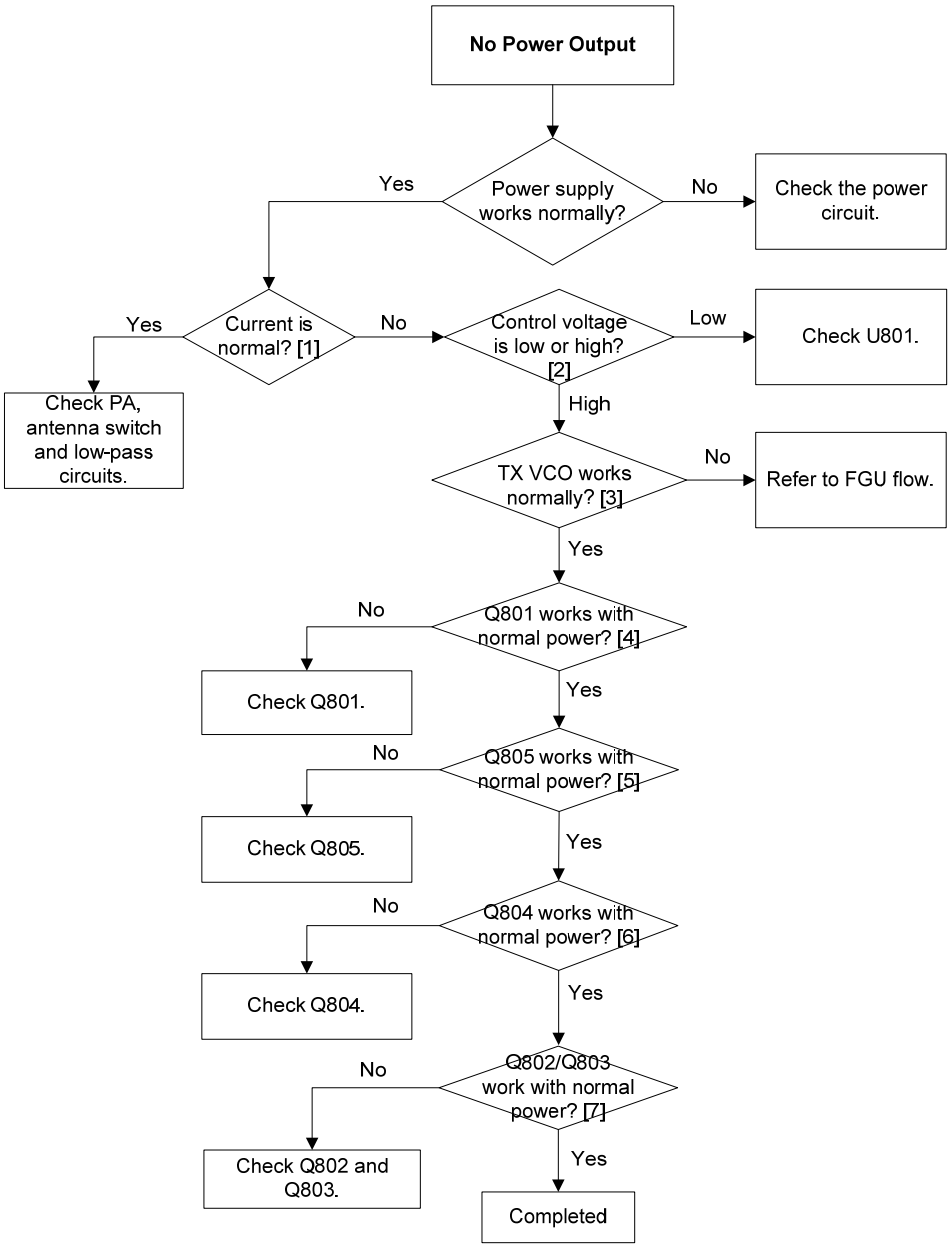
[4] Use the communication test set to apply an RF signal of -100dBm, and test the sensitivity.

[5] Use a spectrum analyzer to test the LO signal received by TP6106. If its strength is about 18dBm, go to check the mixer; otherwise, check the VCO.

[6] Use the communication test set to apply an RF signal of -110dBm at TP6104, and test the sensitivity.

[7] Use the communication test set to apply an RF signal of -110dBm at TP6103, and test the sensitivity.

Transmitter Circuit



Description of Normal Situations:

[1] The current in analog mode is above 6A under 45W power supply and above 1A under 5W. However, in digital mode, the current will be reduced by 50%.

[2] The APC voltage should be above 2V at TP811.

[3] Check whether there is an appropriate TX LO signal at TP803.

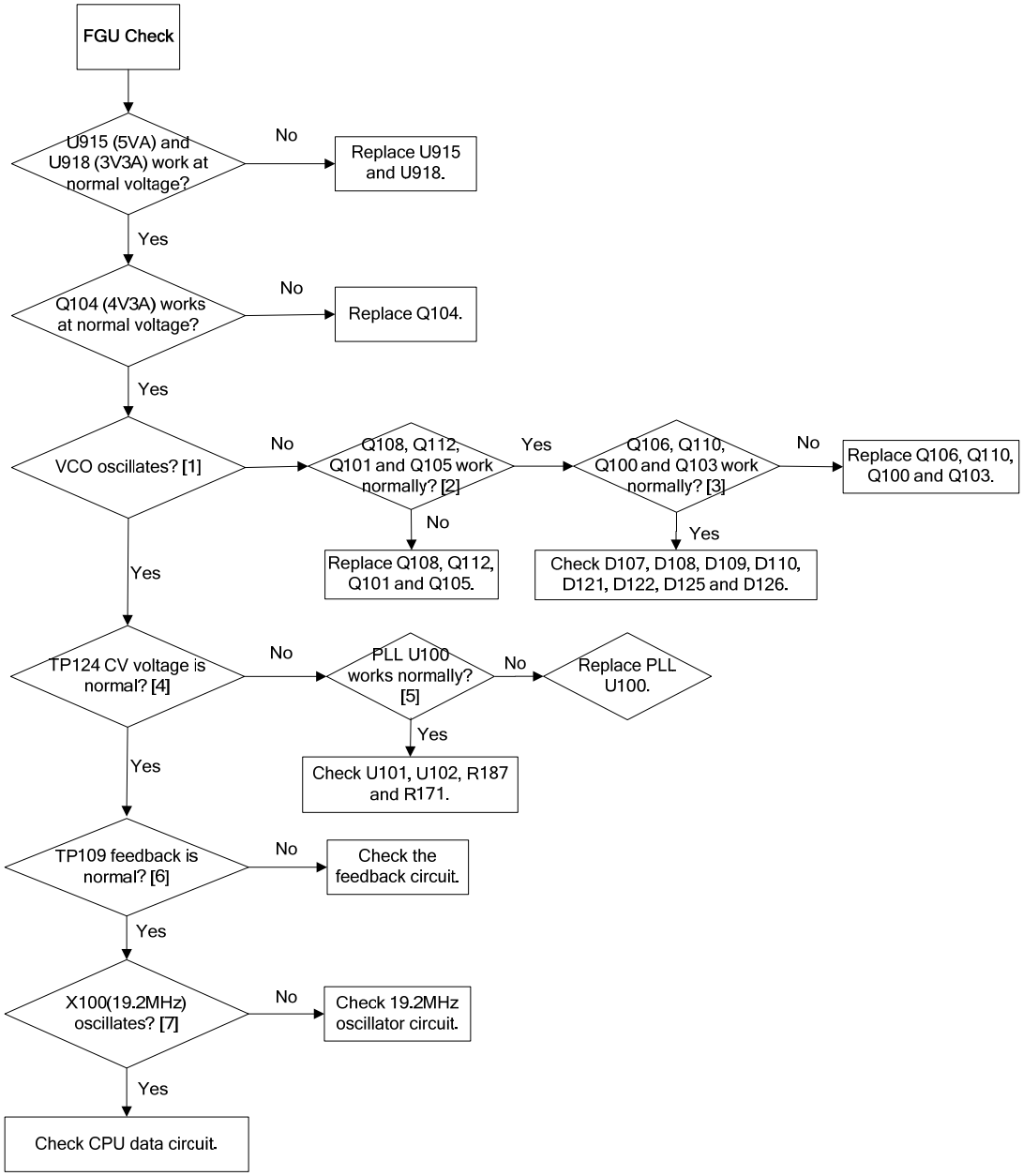
[4] Check whether the gain is 16dB and the input signal is 0dBm at Q801.

[5] Check whether the gain is 15dB and the input signal is 0dBm at Q805.

[6] Check whether the gain is 11dB and the input signal is 0dBm at Q804.

[7] Check whether the gain is 10dB and the input signal is 0dBm at Q802 and Q803.

FGU


FGU Check
U915 (5VA) and U918 (3V3A) work at normal voltage?
No
Replace U915 and U918.
Yes
Q104 (4V3A) works at normal voltage?
No
Replace Q104.
Yes
VCO oscillates? [1]
No
Q108, Q112, Q101 and Q105 work normally? [2]
Yes
Q106, Q110, Q100 and Q103 work normally? [3]
No
Replace Q106, Q110, Q100 and Q103.
No
Replace Q108, Q112, Q101 and Q105.
Yes
Check D107, D108, D109, D110, D121, D122, D125 and D126.
Yes
TP124 CV voltage is normal? [4]
No
PLL U100 works normally? [5]
No
Replace PLL U100.
Yes
Check U101, U102, R187 and R171.
Yes
TP109 feedback is normal? [6]
No
Check the feedback circuit.
Yes
X100(19.2MHz) oscillates? [7]
No
Check 19.2MHz oscillator circuit.
Yes
Check CPU data circuit.

Description of Normal Situations:

[1] Detect the oscillation frequency of RX TP123 and TX TP111 using a spectrum analyzer.

[2] Check whether switches (Q108, Q112, Q101 and Q105) are turned on and output 3.6V.

[3] Check whether the emitter voltage of the four transistors (Q106, Q110, Q100 and Q103) is about 1.8V under normal RX/TX status.

[4] Check the CV of TP124. The normal value should range from 0.5V to 4.5V.

[5] Check whether U100 is supplied by 5V and 3.3V normally.

[6] Check whether the power from TP109 to PLL is about -15dBm.

[7] Check whether TP100 outputs 19.2MHz signal.

17.VHF (136-174MHz 25W) Information

17.1 Transmitter Circuit

The transmitter circuit is composed of power amplifier circuit and power control circuit. The former is used to amplify the VCO signal to the desired output power level, while the latter can keep the output power at the desired level, so as to protect the power amplifier from damage caused by over heat, antenna mismatch, and out-of-range voltage (over voltage or under voltage may result in damage to Q801, Q805, Q804, Q802 and Q803).

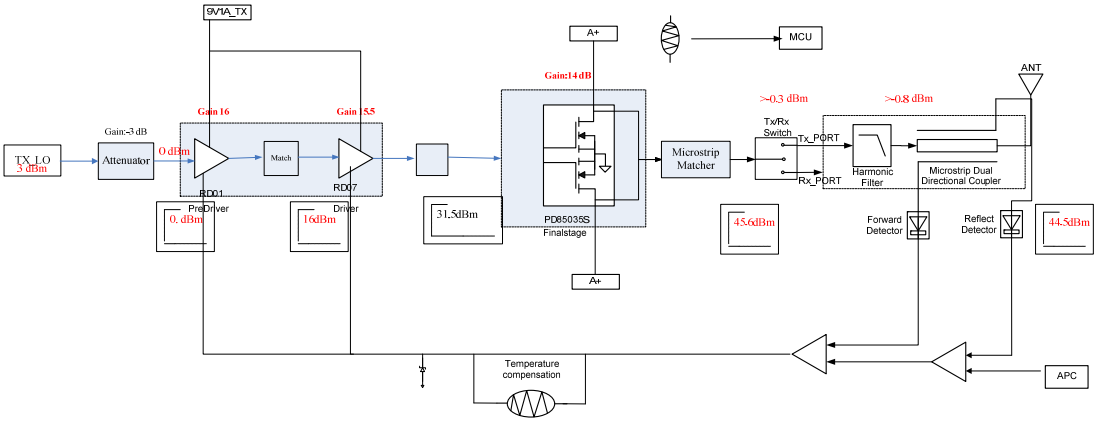


Figure 17-1 Diagram of Transmitter Circuit

17.1.1 Power Amplifier

The 3-stage power amplifier amplifies the signal output from VCO to the required output power level. The first stage is a pre-driver power amplifier circuit with variable gain (formed by Q805); the second stage is a driver power amplifier circuit with variable gain (formed by Q804); and the final stage is the final power amplifier circuit with fixed gain (formed by Q802 and Q803). In addition, this power amplifier contains a TX/RX switch and a low-pass filter.

Note: only a final power amplifier (Q803) is available in later versions (including version D).

17.1.2 Pre-driver Power Amplifier

The pre-driver power amplifier is formed by Q805, with variable gain controlled by voltage VGG. The input matching circuit is composed of C826, L826, L814, C843 and R824.

17.1.3 Driver Power Amplifier

The driver power amplifier is formed by Q804, with variable gain controlled by voltage VGG. The maximum output power is 34.5dBm, and the maximum variable gain is 15dB.

17.1.4 Final Power Amplifier

The final power amplifier comprises Q802 and Q803, with the maximum output power of 48.5dBm, and the maximum variable gain of 14dB. The input matching circuit is composed of C815, C839, R804, R806, R807, R813, R818 and R861, while the power combining circuit is composed of C820, C8330, C833, C831, C819, C812, C841 and C842.

17.1.5 Antenna Switch

The antenna switch is used to switch between the transmitter circuit and the receiver circuit.

In TX mode, the switching transistor Q810 is controlled by TX signal, so as to supply 9V 3A to the PIN diodes D801 and D802. Quiescent bias current of the PIN diode is controlled by the resistors R821 and R825. In this mode, D801 and D802 are turned on; RF signals are applied to the low-pass filter (composed of C821, C816, C836, C837, C830, C838, L809, L813 and L810) and then transmitted via the antenna port.

In RX mode, TX signal controls the switching transistor Q810, to further control the power supply for the PIN diodes D801 and D802, which are not applied with DC bias current. When the two PIN diodes are turned off, signals feed into the RX path through the low-pass filter (composed of L871, C852 and C862).

171.6 Low-pass Filter

A low-pass filter that consists of inductors L809, L813 and L810, and capacitors C821, C816, C836, C837, C830 and C838, is used to attenuate harmonic energy from the transmitter.

17.1.7 Directional Coupler

A directional coupler that consists of microstrip directional coupler, D803, D804 and etc, is used to detect both forward and reverse directed power of the transmitter. The forward power is coupled to the diode D803, and the voltage is applied to the power control circuit (U801). Then the voltage VGG is output to control the gate voltage of pre-driver and driver PA, ensuring a constant power output.

The directional coupler can adjust the TX power and detect the VSWR load. The reverse power is coupled to D804. The voltage is applied to U802 and then feeds into APC for detection.

17.1.8 Output Power Control

The TX power is controlled by U801. The forward power is applied to the directional coupler, to output a voltage that can represent the forward power. The voltage together with the preset voltage feeds to U801 to output a voltage VGG, which can control both gate voltage and gain of Q804 and Q805, ensuring a constant power output.

17.1.9 Thermal and Over-voltage Protections

The circuit consists of thermistor RT804 and resistor R884. The output voltage is proportional to the detected temperature. Both the voltage used for temperature detection and the threshold voltage are fed into the operational amplifier U803, to output a voltage signal that is in proportion to the detected temperature. Afterwards, the voltage is applied to software for judgment, and then the preset voltage will be subsequently changed to reduce the TX power, and to protect the PA from over-heating.

17.1.10 Pressure Pad Switch

The power control circuit includes a pressure pad switch SW1, which is controlled by the conductive rubber part mounted on the top cover. If the switch is turned off, VGG will become low, and no power will be output from PA. Otherwise, PA will work normally.

17.2 Receiver Circuit

The receiver utilizes double conversion superheterodyne technique. The first IF is 44.85MHz and the second IF is 2.25MHz. The first local oscillator signal is from the PLL circuit U100, and the second LO signal (47.1MHz) is generated by the PLL circuit U701. The major units are BPF, LNA, mixer, IF filter, IF amplifier and IF processor.

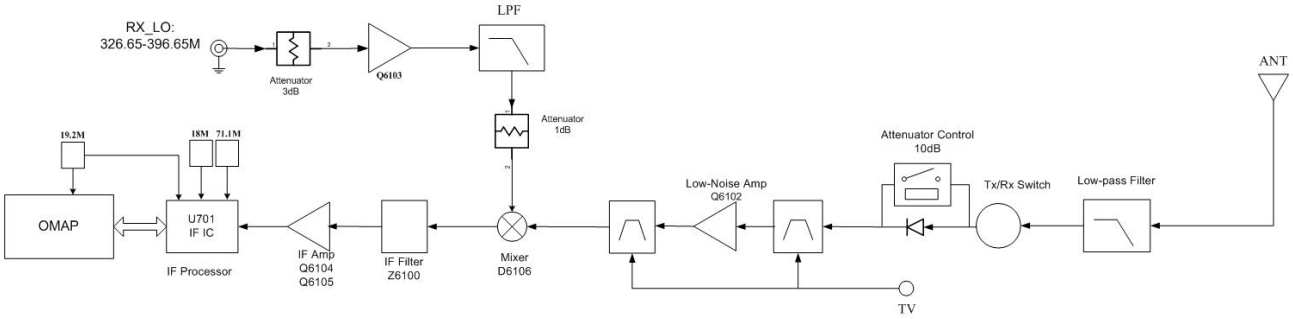


Figure 17-2 Diagram of Receiver Circuit

17.2.1 Receiver Front-end

RF signals feed to the low-pass filter to remove out-of-band signals, and are applied to the two-stage electrically tunable band-pass filter to get useful signals. After passing through the RF band-pass filter and LNA (Q6102), the RF signals together with the first LO signal feed to the mixer for the first frequency conversion, to generate the first IF signal (44.85MHz). The mixer that employs the passive diode can ensure good dynamic range and port isolation. The LO signal (3-5dBm) from the VCO feeds to Q6103 to get a gain (17dB). The first LO signals (44.85MHz) pass through the crystal filter (Z6100) to remove out-of-band spurious signals, and then feed to the two-stage IF amplifier circuit (composed of Q6133 and Q6134) for amplification. Finally the amplified signals go to the IF IC for processing

17.2.2 Receiver Back-end

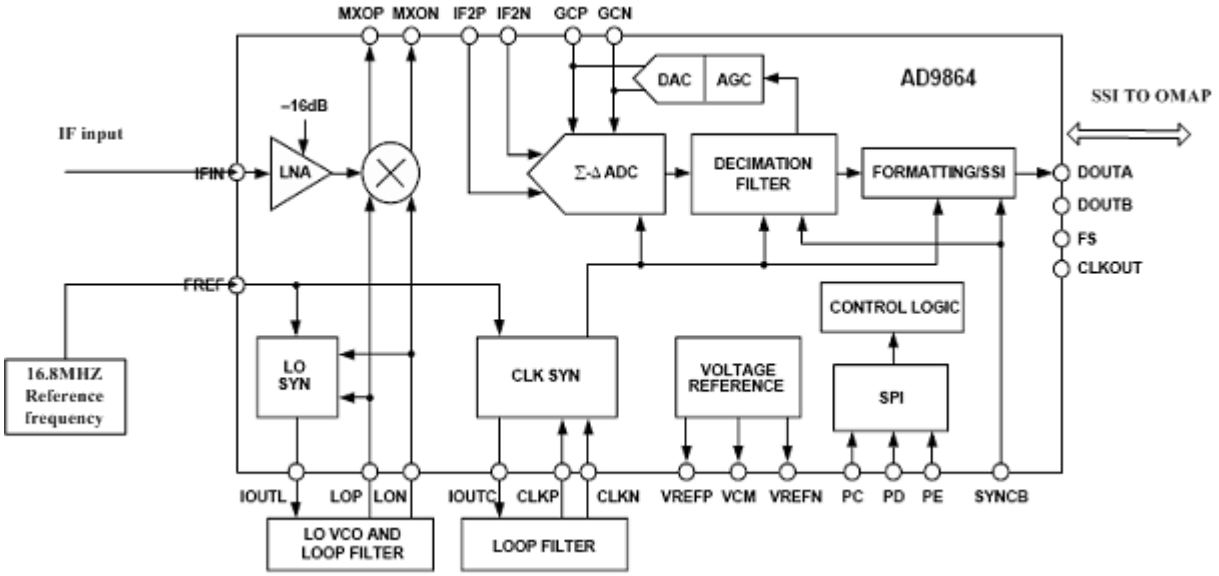


Figure 17-3 Diagram of IF Processor

The first IF signal (44.85MHz) output by the IF amplifier goes into IF IC via Pin 47, where the signal is converted to the second IF signal (2.25MHz). Then the un-demodulated digital I/Q signal output from the SSI interface is sent to U302 for demodulation. IF IC employs a reference frequency of 19.2MHz and shares the crystal with U302. The second LO VCO consists of the external transistor, varactor and some other components, to provide the second LO signal. The 18MHz clock frequency is generated by the LC resonance loop (D702, L715 and C745).

DSP (U302) gets the audio signal from IF IC (U701). Then this signal goes through U302 to output data signal, which is sent to U231 and PIN44 (SSI_DI) for digital-to-analog conversion. Finally, the output analog audio signal will be subjected to gain control, and then fed to the speaker.

17.3 Frequency Generation Unit (FGU)

17.3.1 PLL Synthesizer

The PLL synthesizer that consists of the reference oscillator (X100), PLL IC (U100) and VCO, is utilized to supply excitation signal source to the transmitter, and local oscillator signal to the receiver.

17.3.2 Reference Oscillator

X100 is a 19.2MHz TCXO, and its reference frequency is calibrated by the digital-to-analog converter (U500) for accuracy.

17.3.3 PLL IC

The PLL IC (U100) is a fractional frequency divider. The logic IC U101 and U102 work with the PLL IC

(U100) to achieve locking.

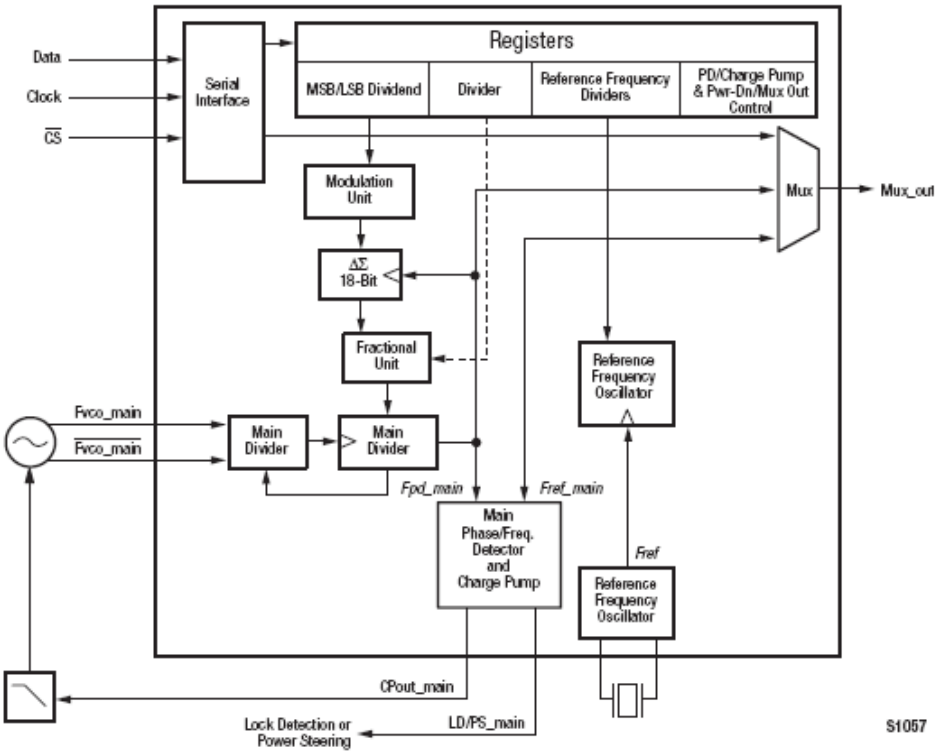


Figure 17-4 Diagram of PLL IC

The 19.2MHz frequency generated by the reference oscillator (X100) goes into the PLL IC (U100) for division, generating the reference frequency. Meanwhile, the frequency generated by VCO goes into PLL IC (U100) for frequency division. The resulting frequency will be compared with the reference frequency in terms of phase difference in the phase detector. After comparison, the resulting frequency is converted to CV voltage via the loop filter, to control and lock the frequency.

17.3.4 VCO

The VCO is composed of transistors (Q100, Q103, Q106 and Q110), varactors and four Colpitts oscillators. There are four VCOs in all: two VCOs (Q100 and Q103) used to transmit excitation signals and the other two VCOs (Q106 and Q110) to receive LO signals. U302 controls the operating frequency of the VCO. Q102 and Q107 constitute the buffer amplifiers for the transmitter circuit, while Q111 and Q109 for the receiver circuit. The digital-to-analog converter (U500) modulates the TX oscillator signal.

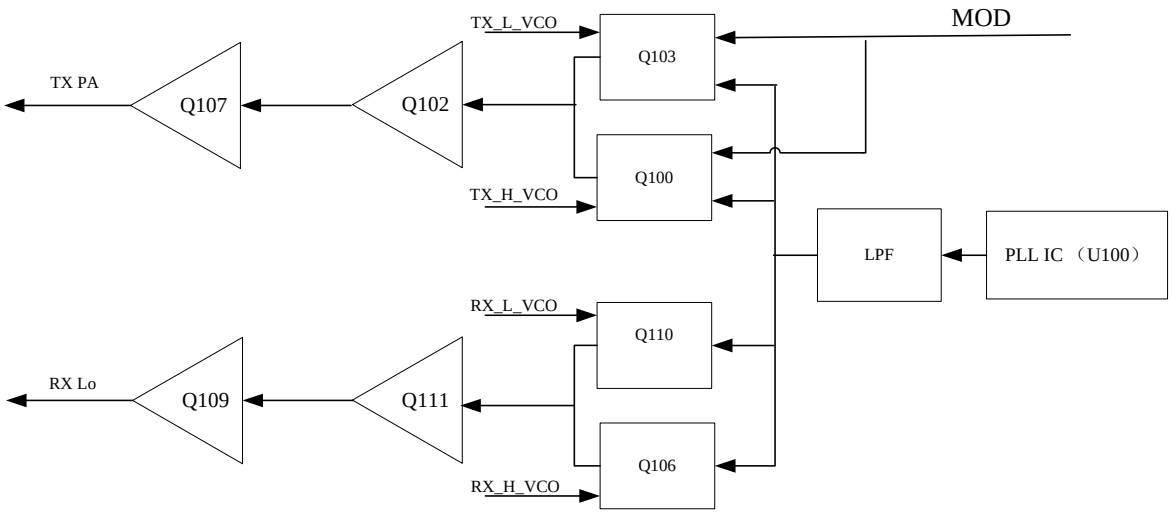
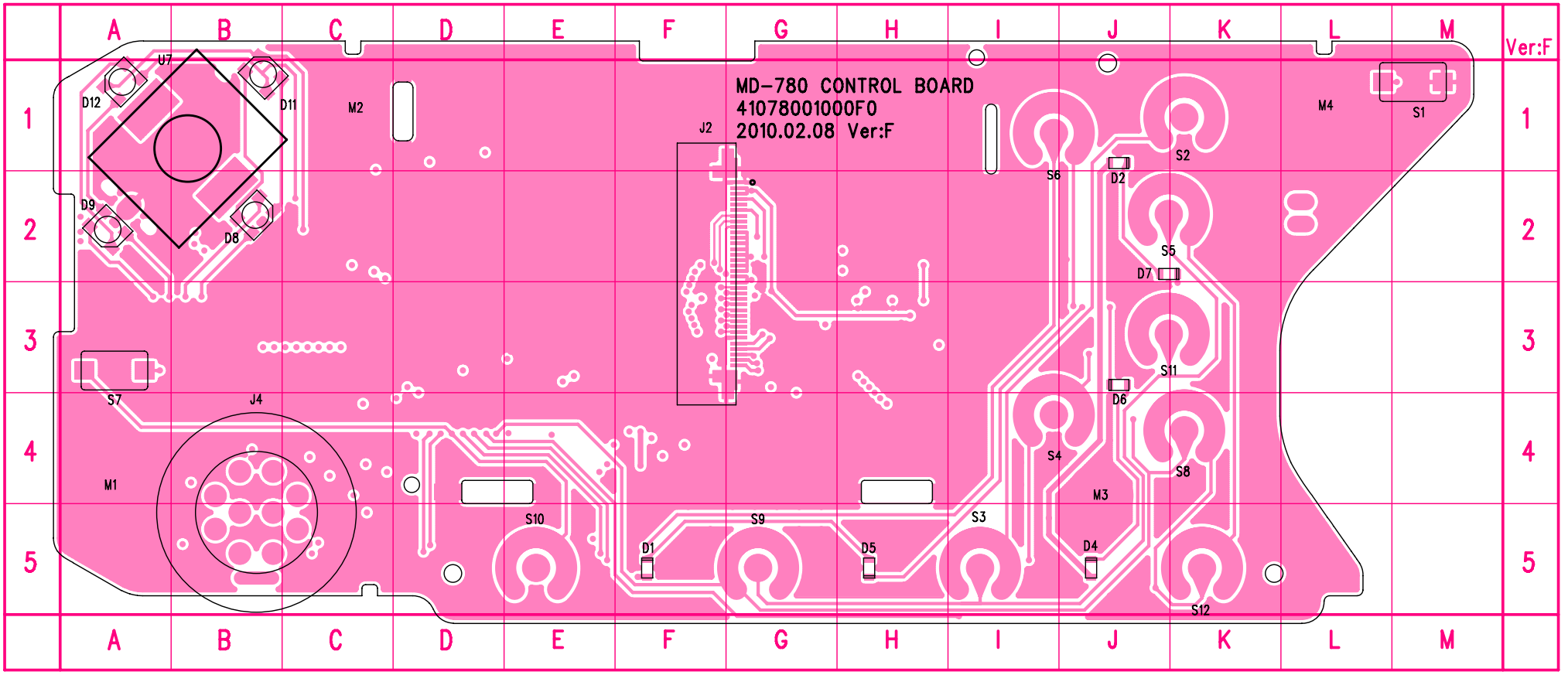


Figure 17-5 Diagram of VCO

17.4 PCB View

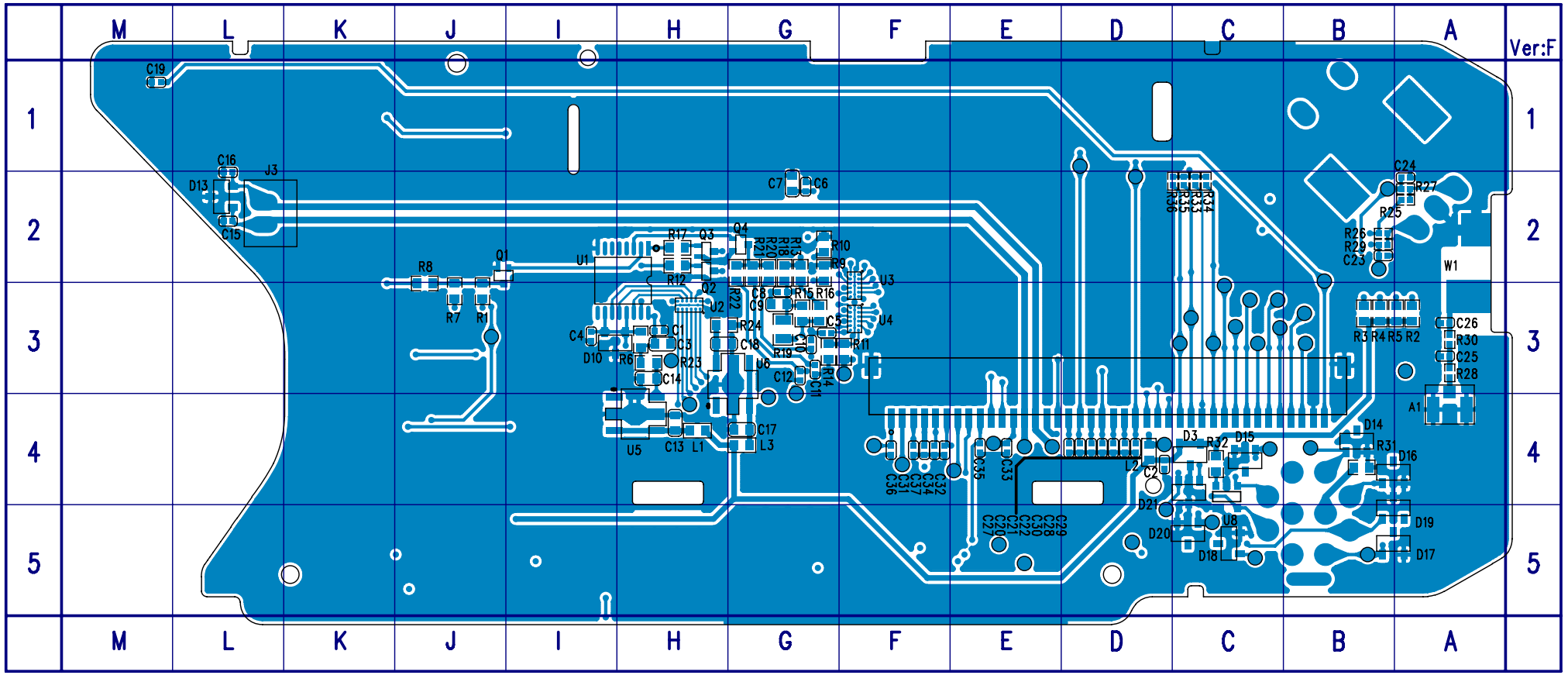
MD78X/MD78XG PCB View (Front Panel)

Top Layer

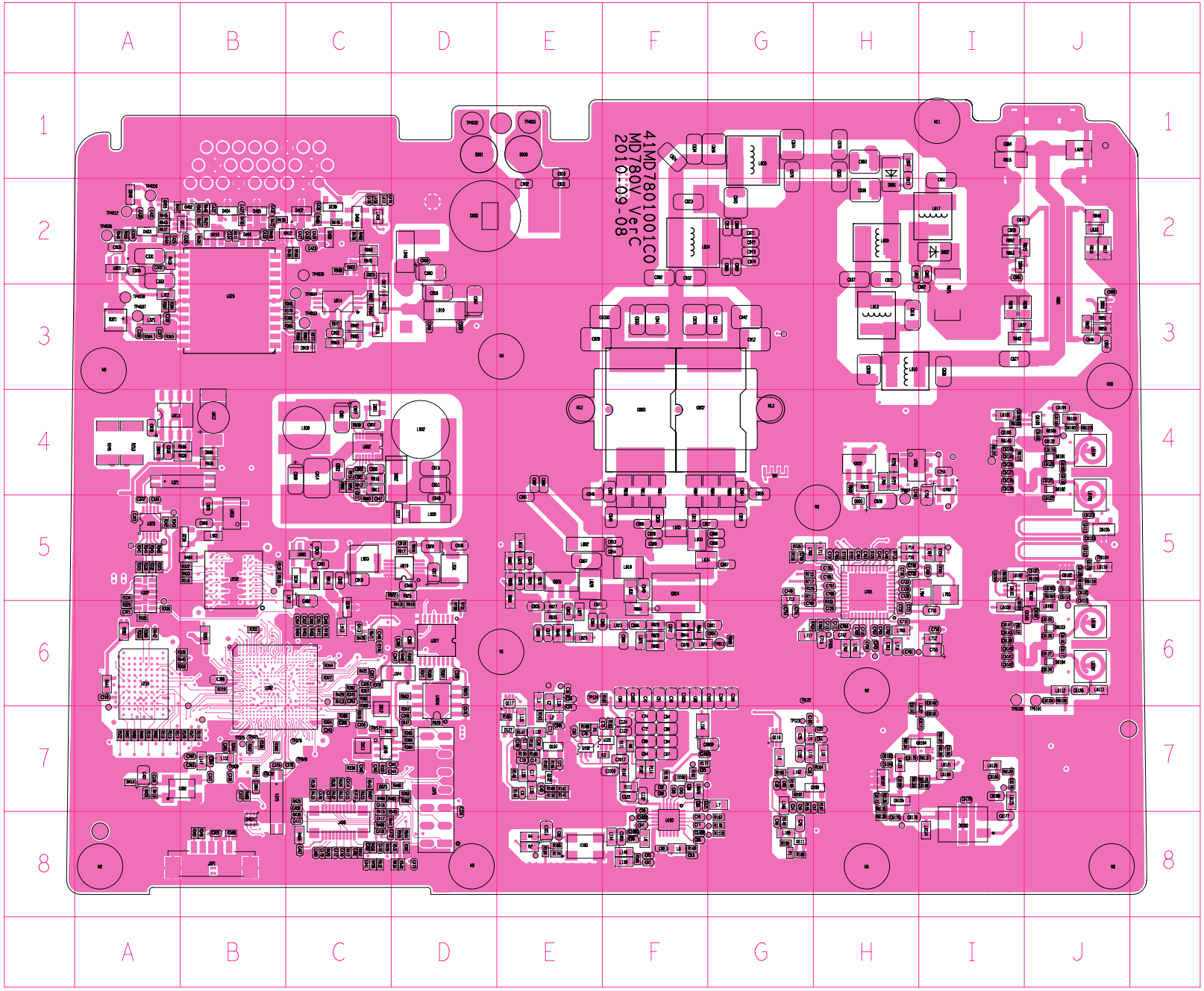


MD78X/MD78XG PCB View (Front Panel)

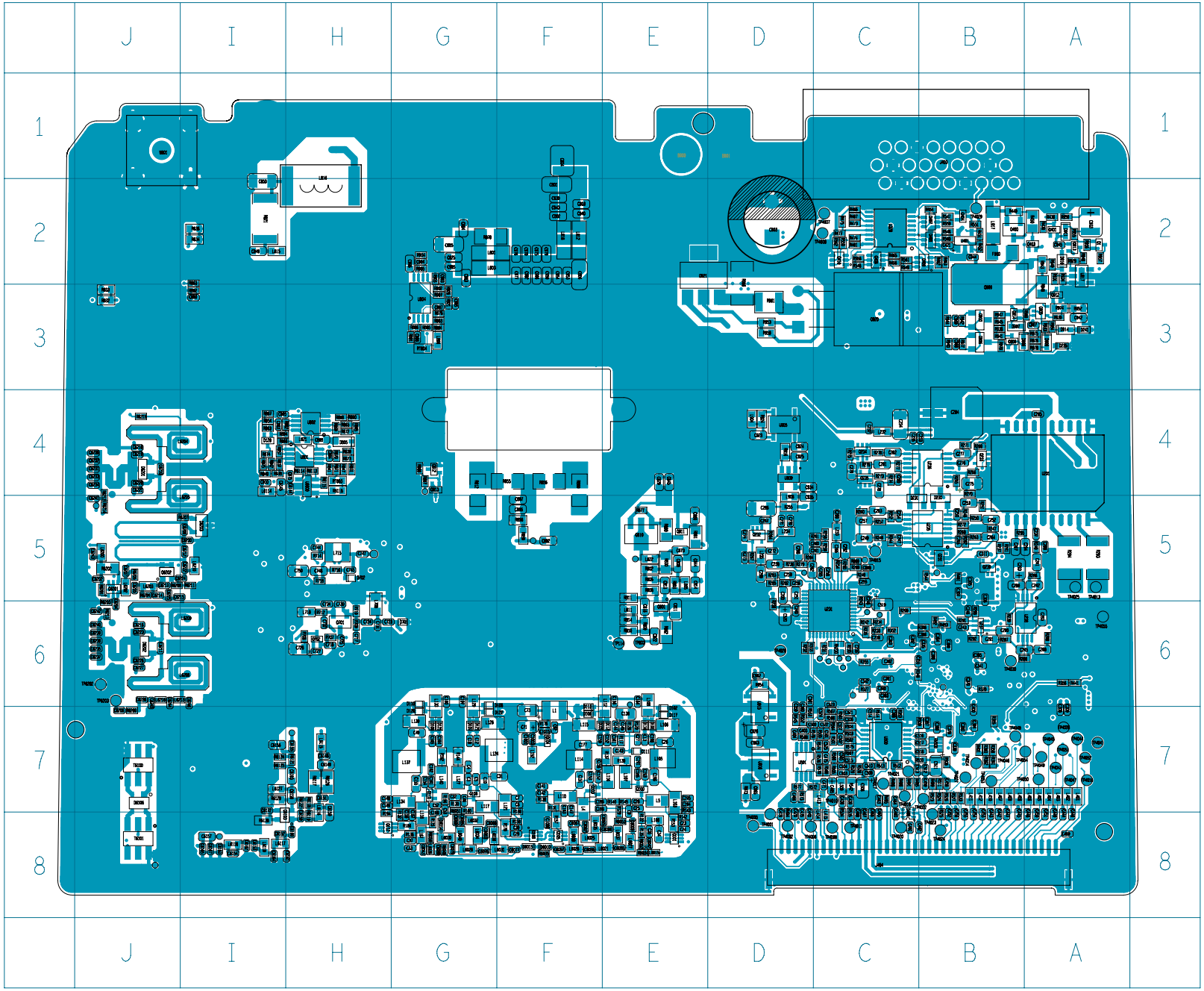
Bottom Layer



MD78X/MD78XG PCB View (Main Board)
Top Layer

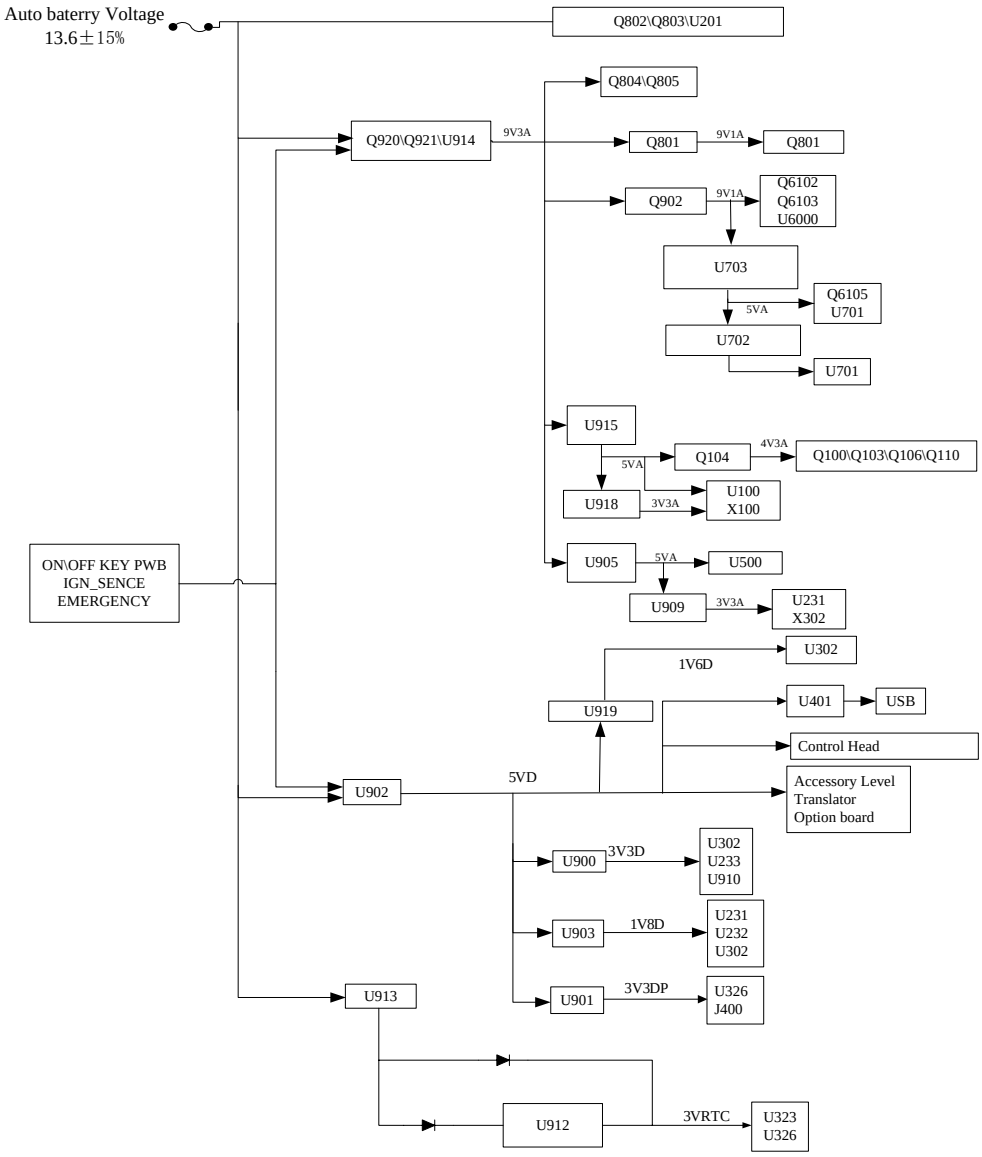


MD78X/MD78XG PCB View (Main Board)
Bottom Layer

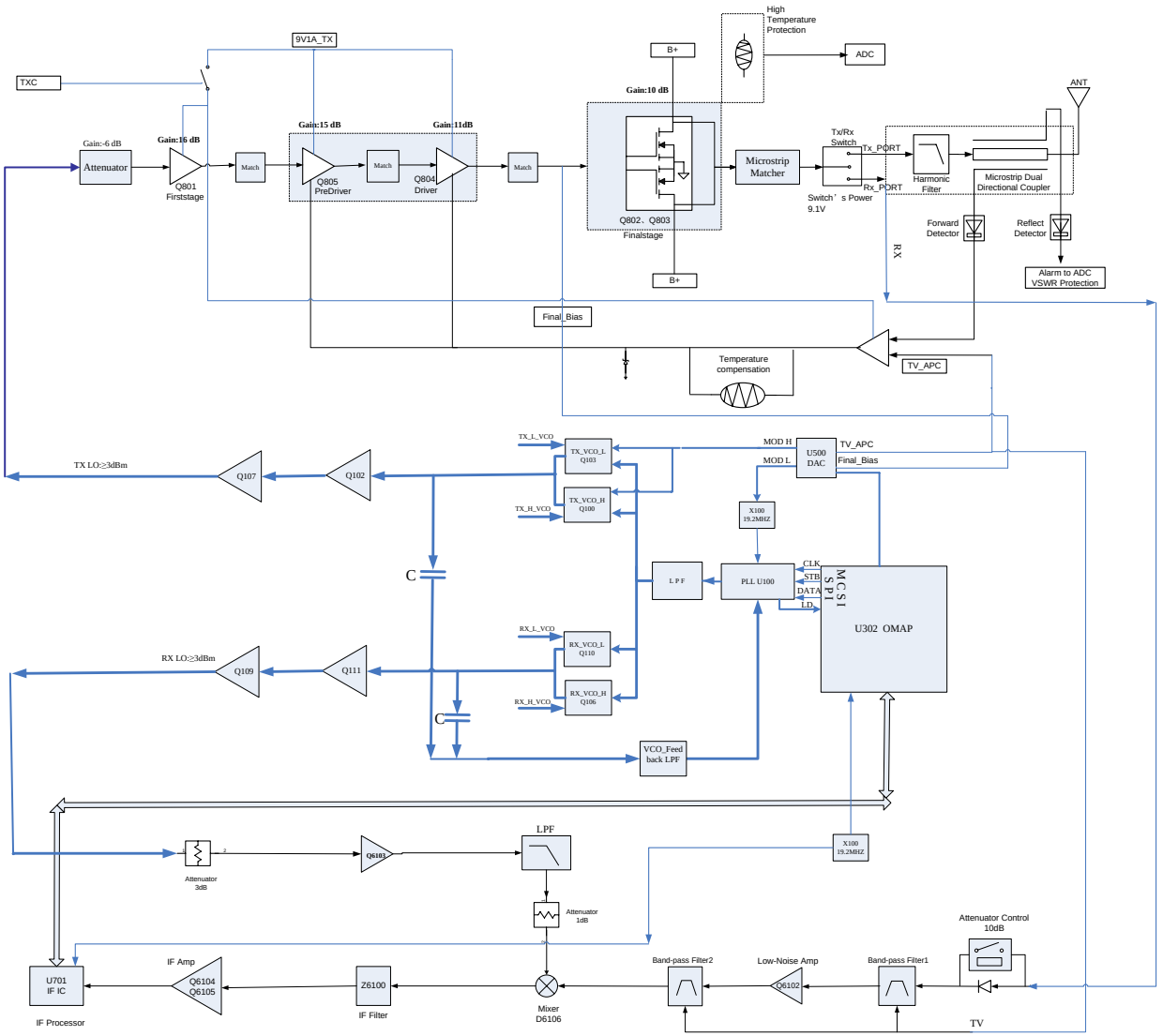


17.5 Block Diagram

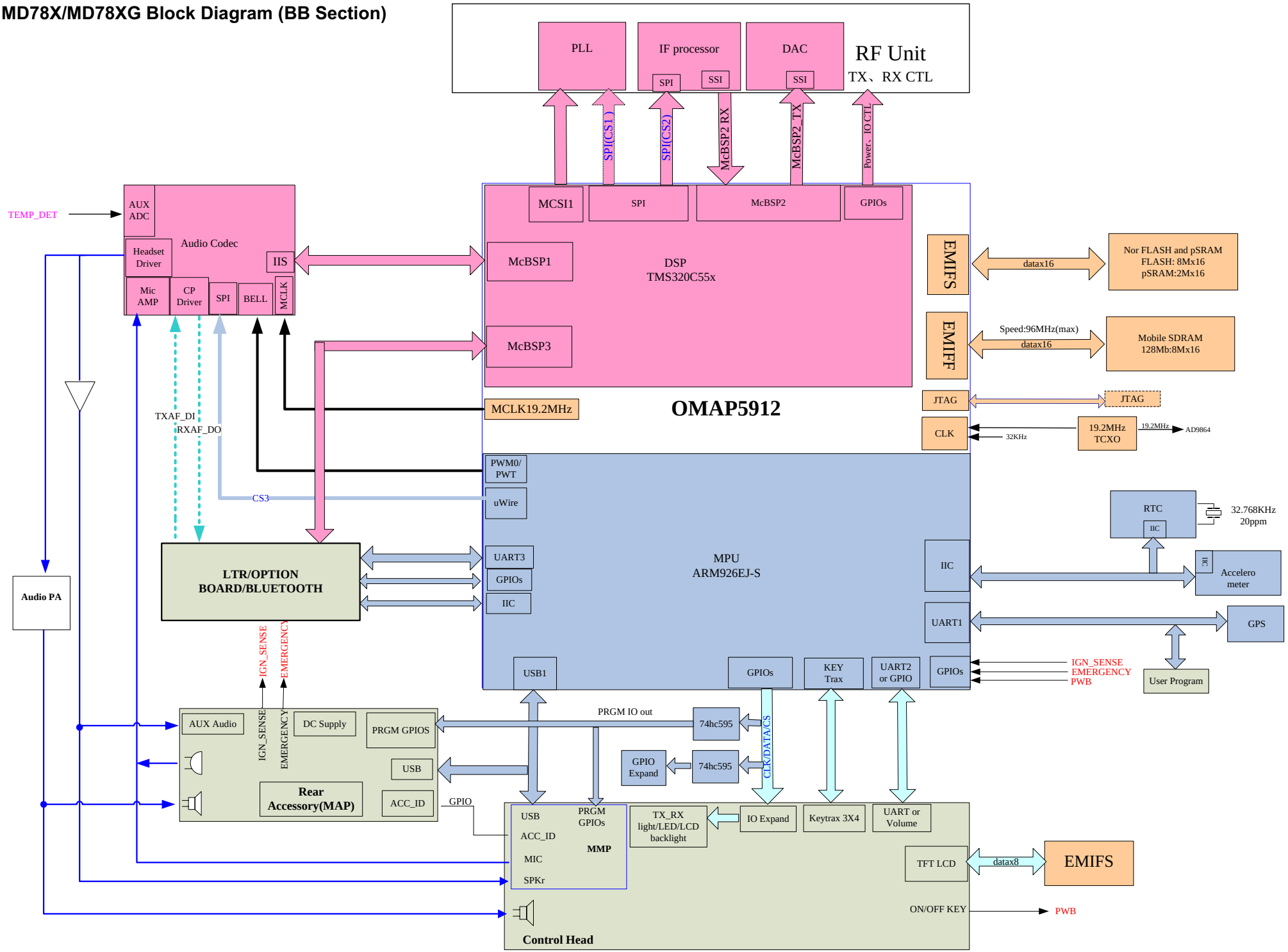
MD78X/MD78XG Block Diagram (Power Section)



MD78X/MD78XG Block Diagram (RF Section)

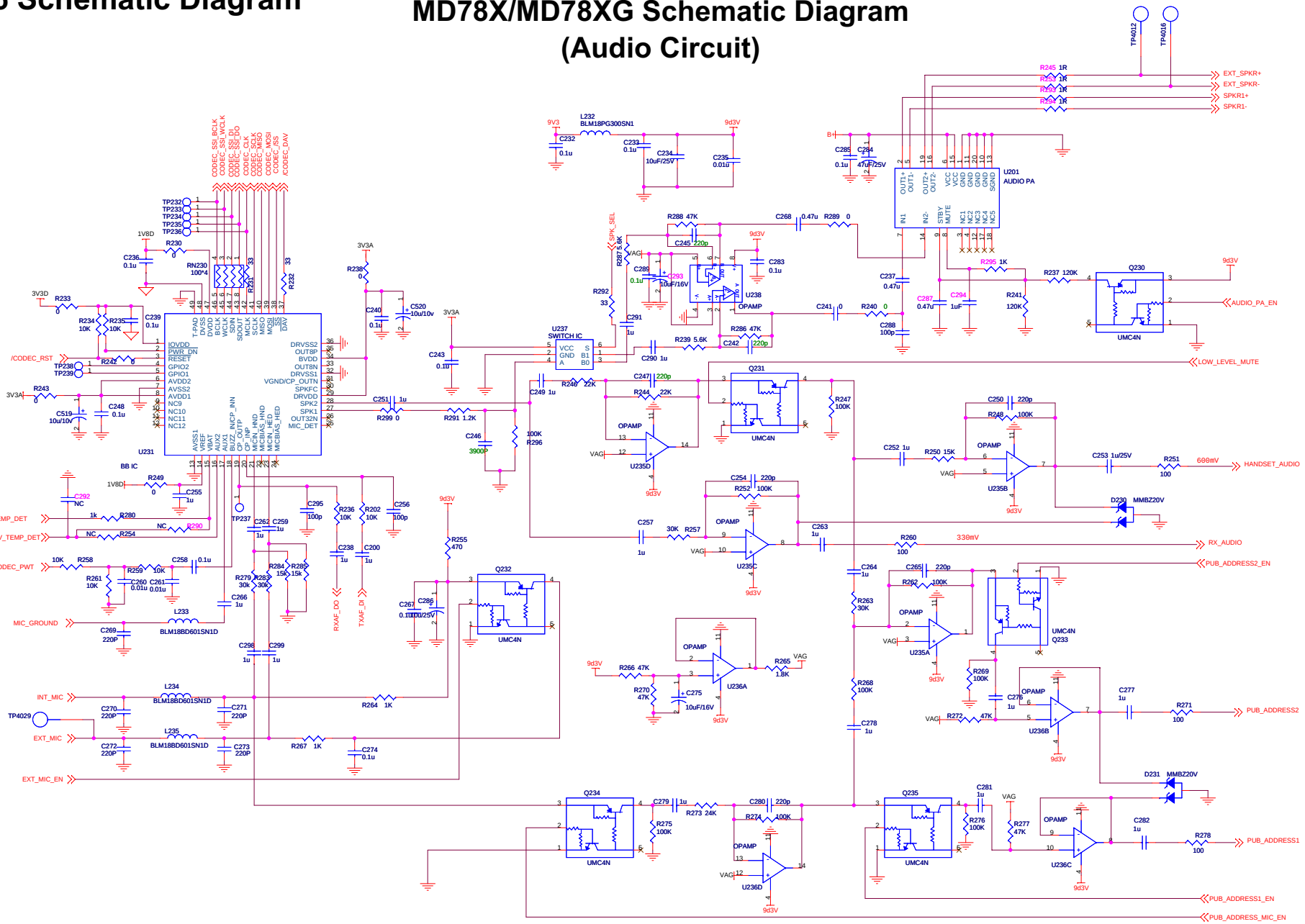


MD78X/MD78XG Block Diagram (BB Section)

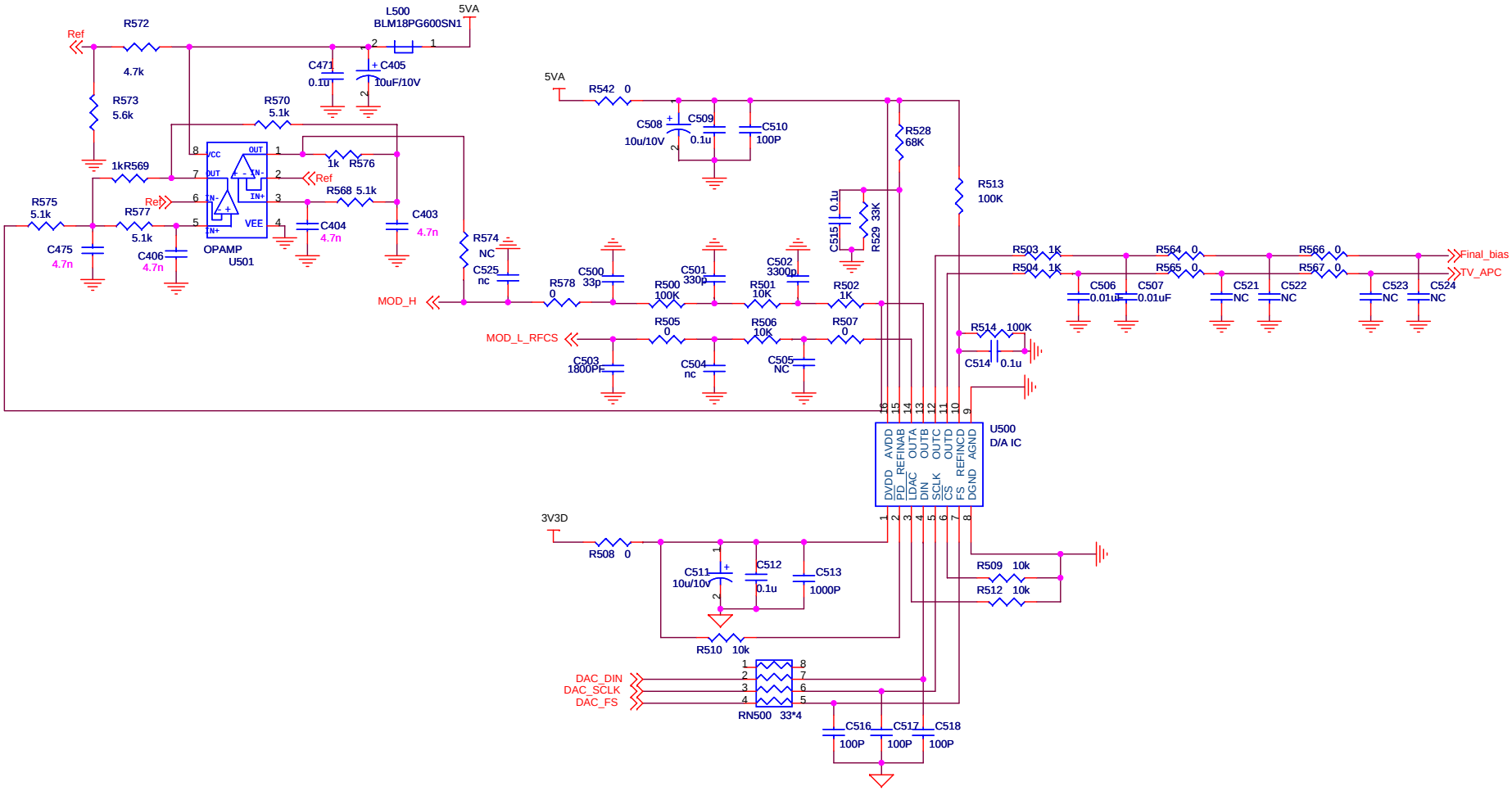


17.6 Schematic Diagram

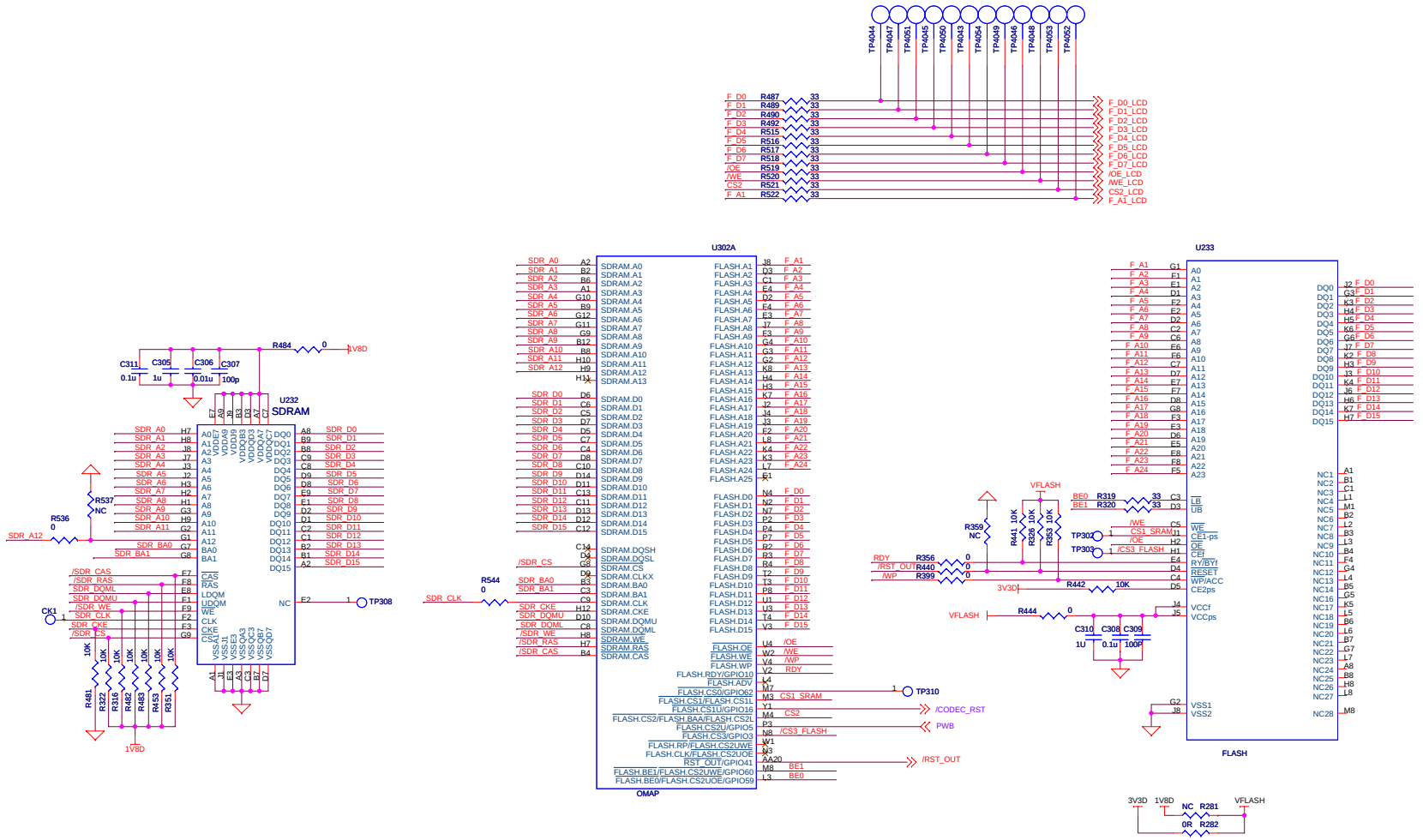
MD78X/MD78XG Schematic Diagram (Audio Circuit)



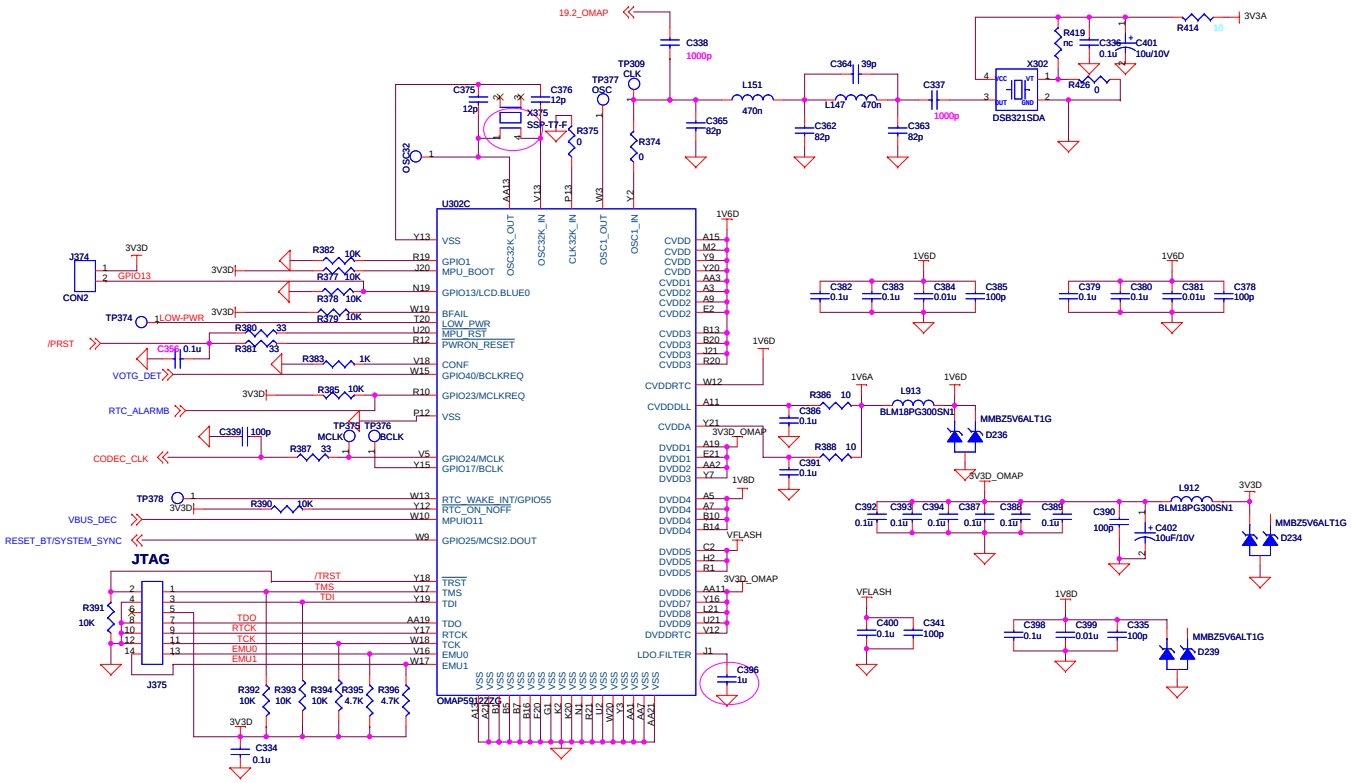
MD78X/MD78XG Schematic Diagram
(DAC Circuit)



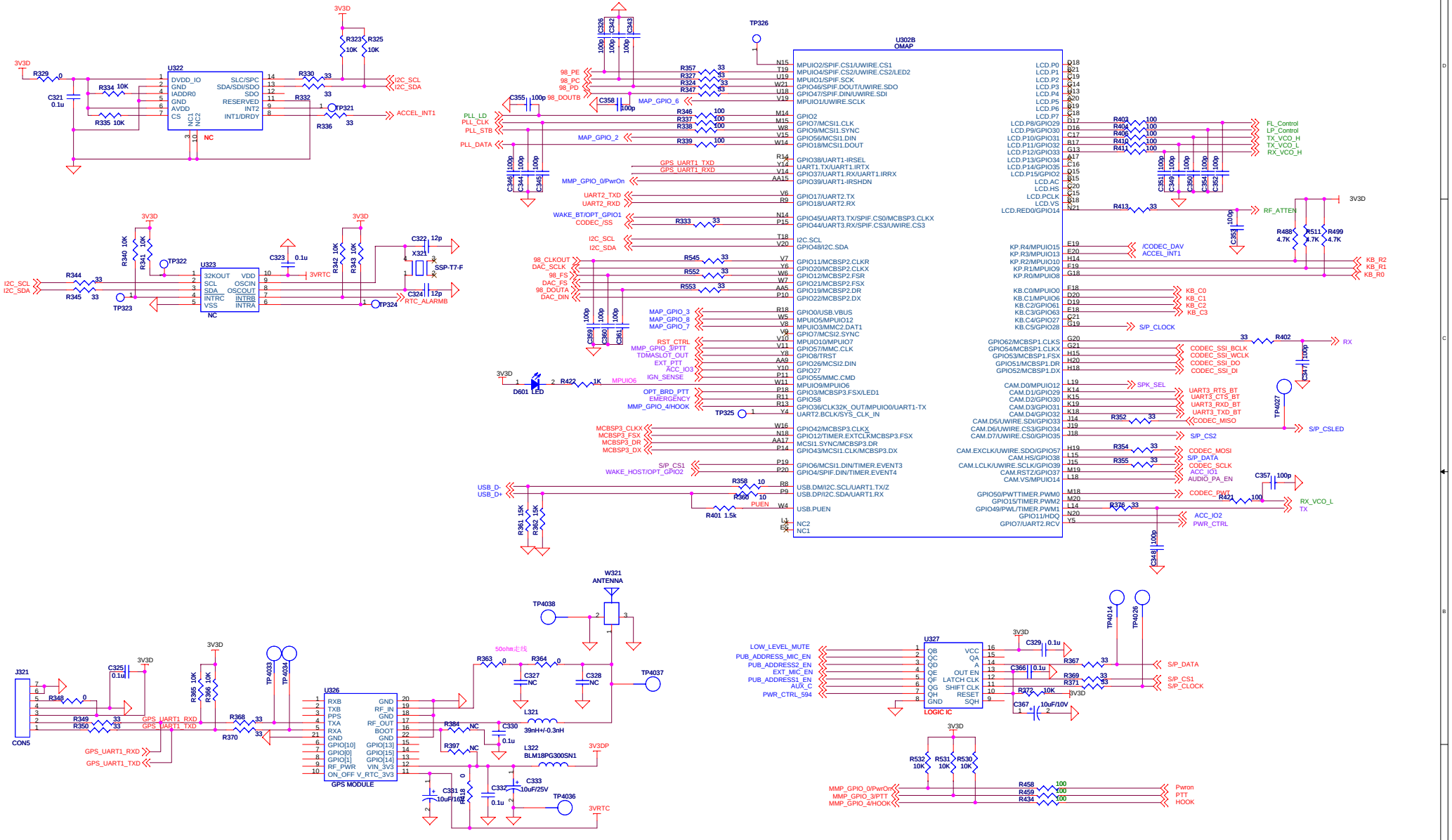
MD78X/MD78XG Schematic Diagram (Memory Circuit)



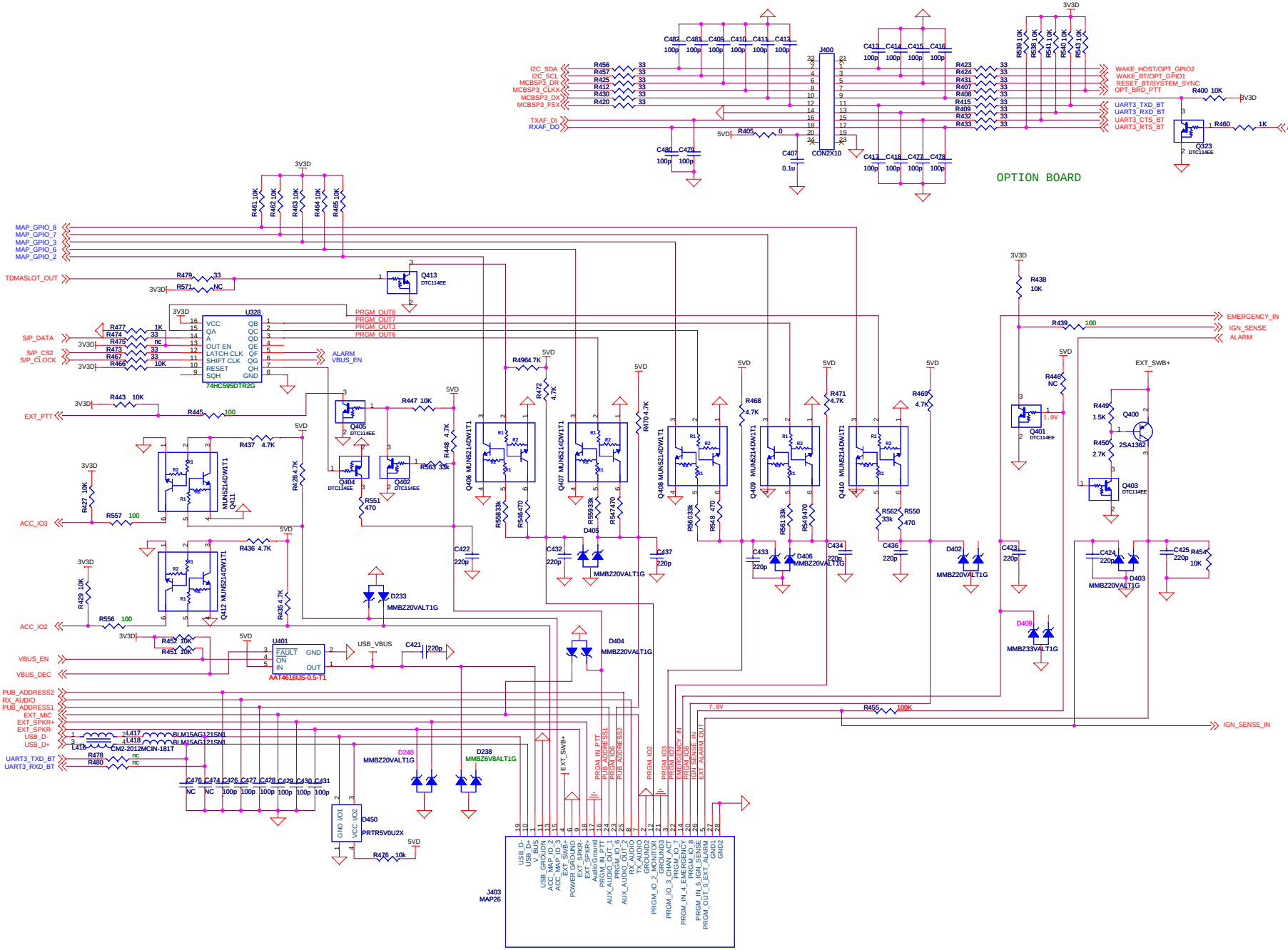
MD78X/MD78XG Schematic Diagram
(OMAP Circuit)



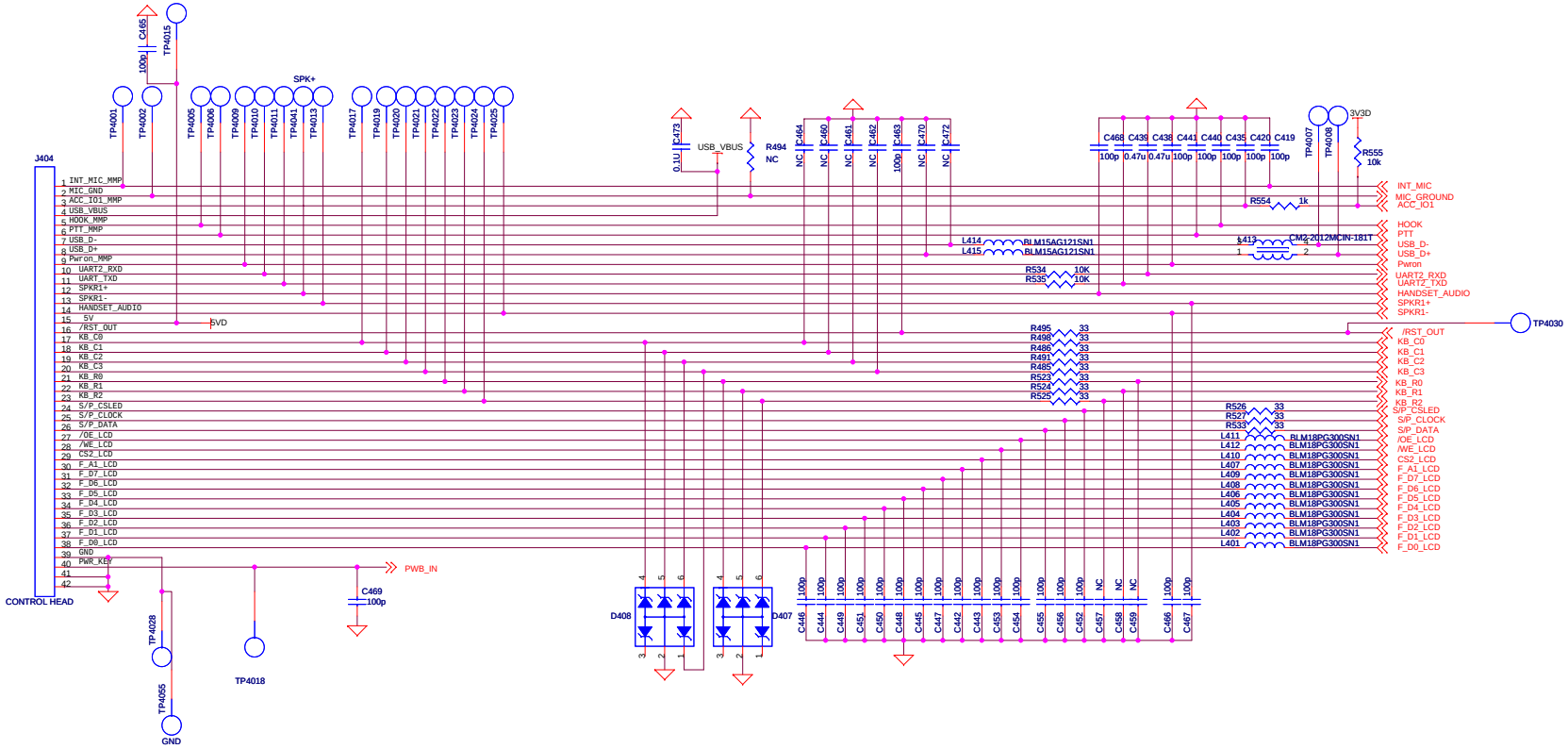
MD78X/MD78XG Schematic Diagram (OMAP & GPS Circuit)



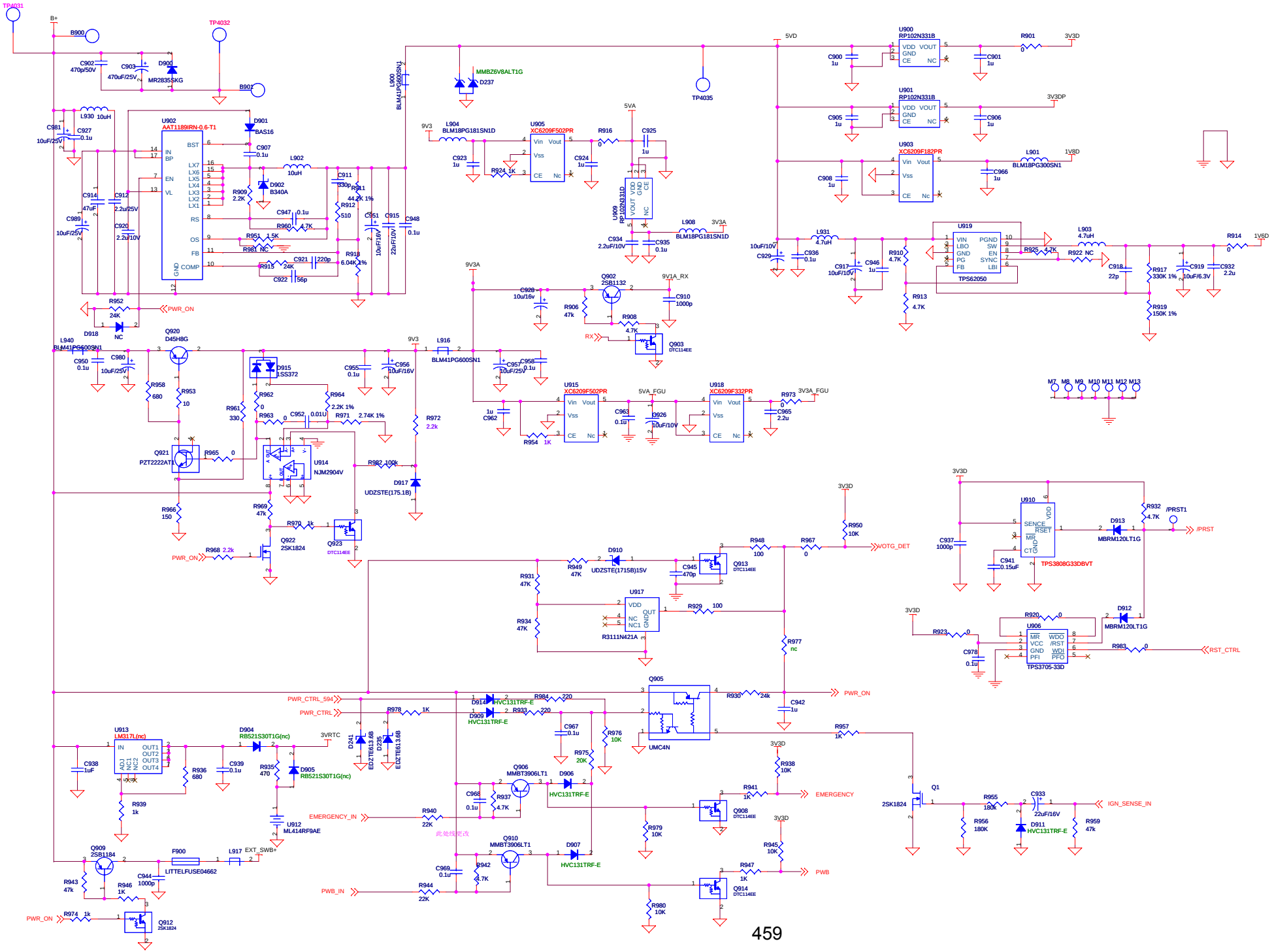
MD78X/MD78XG Schematic Diagram (Peripheral Interface Circuit)



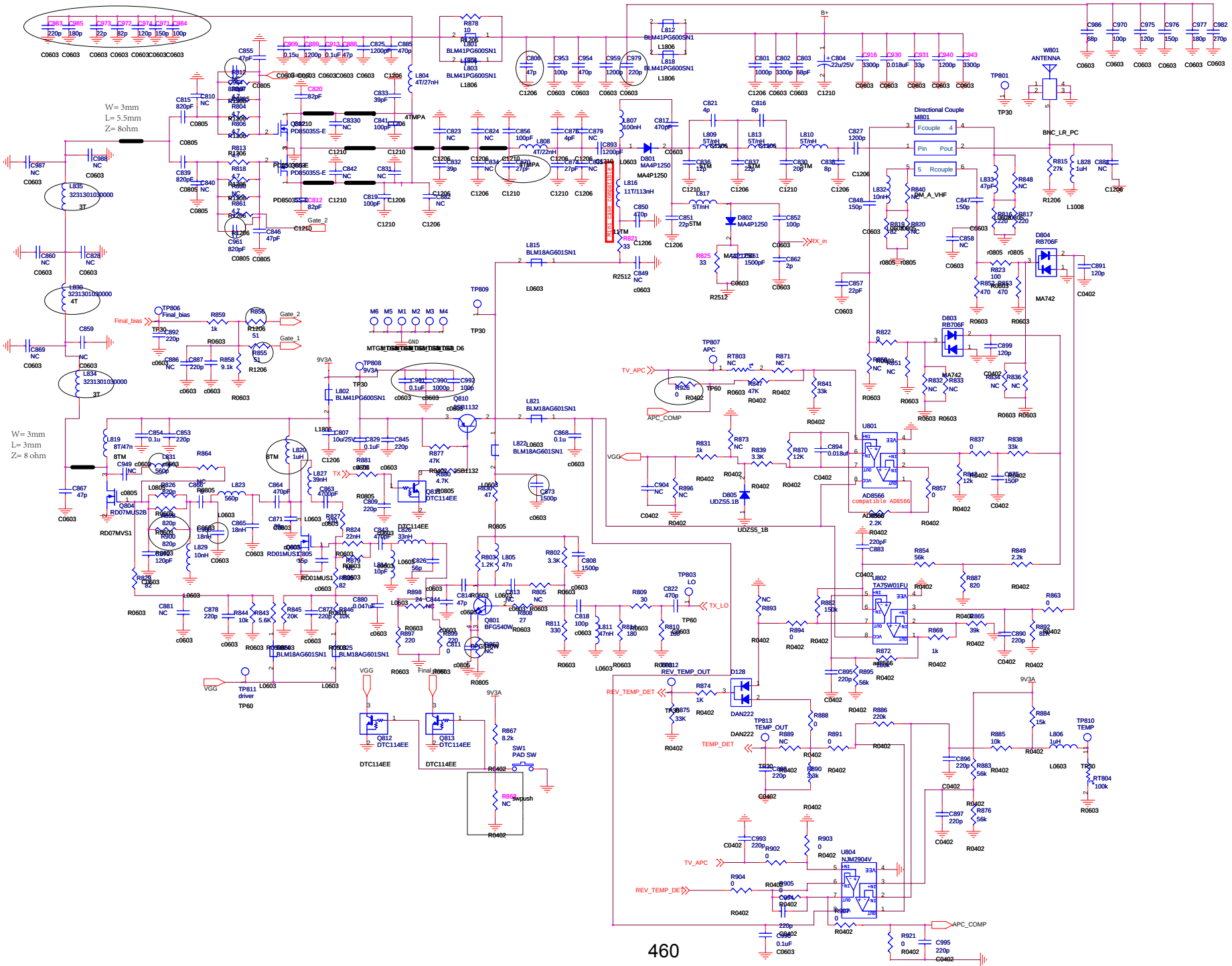
MD78X/MD78XG Schematic Diagram
(40-Pin Interface Circuit)



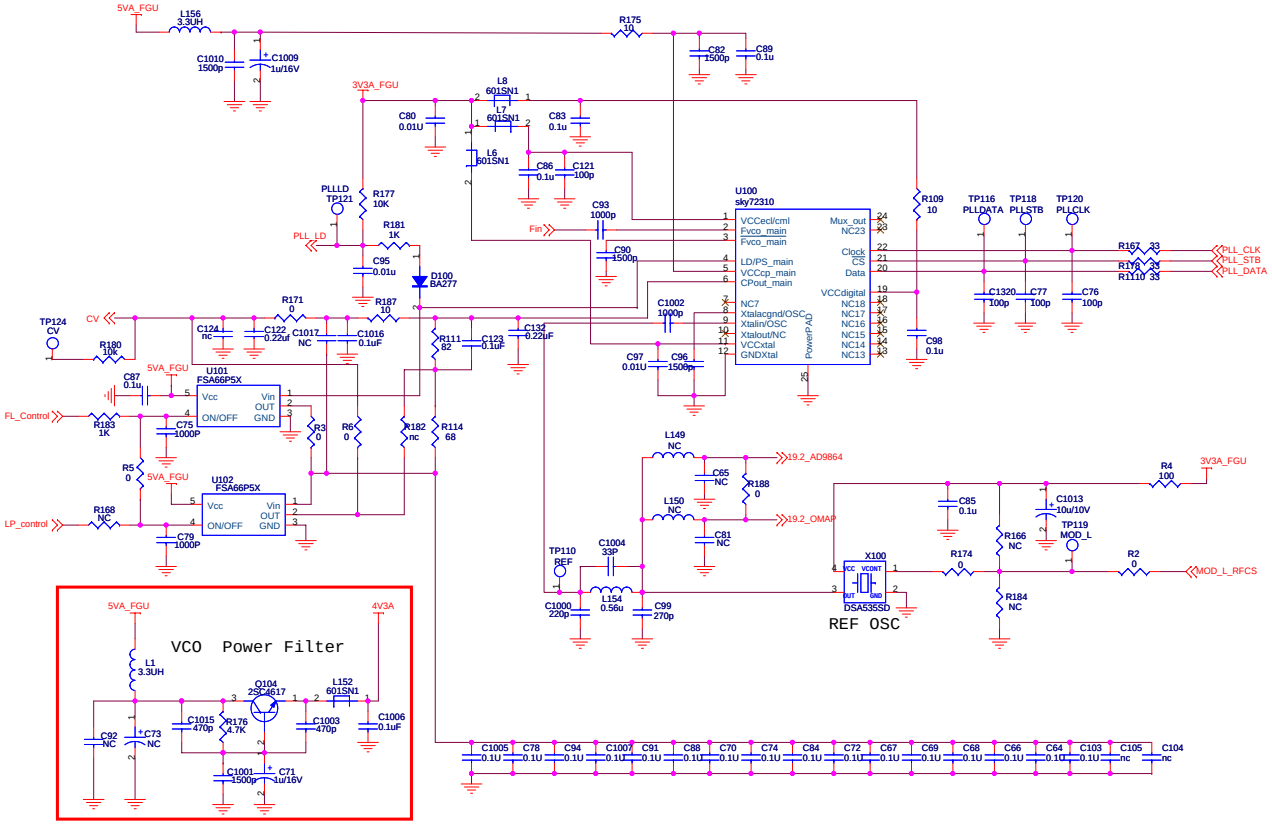
MD78X/MD78XG Schematic Diagram (Power Circuit)



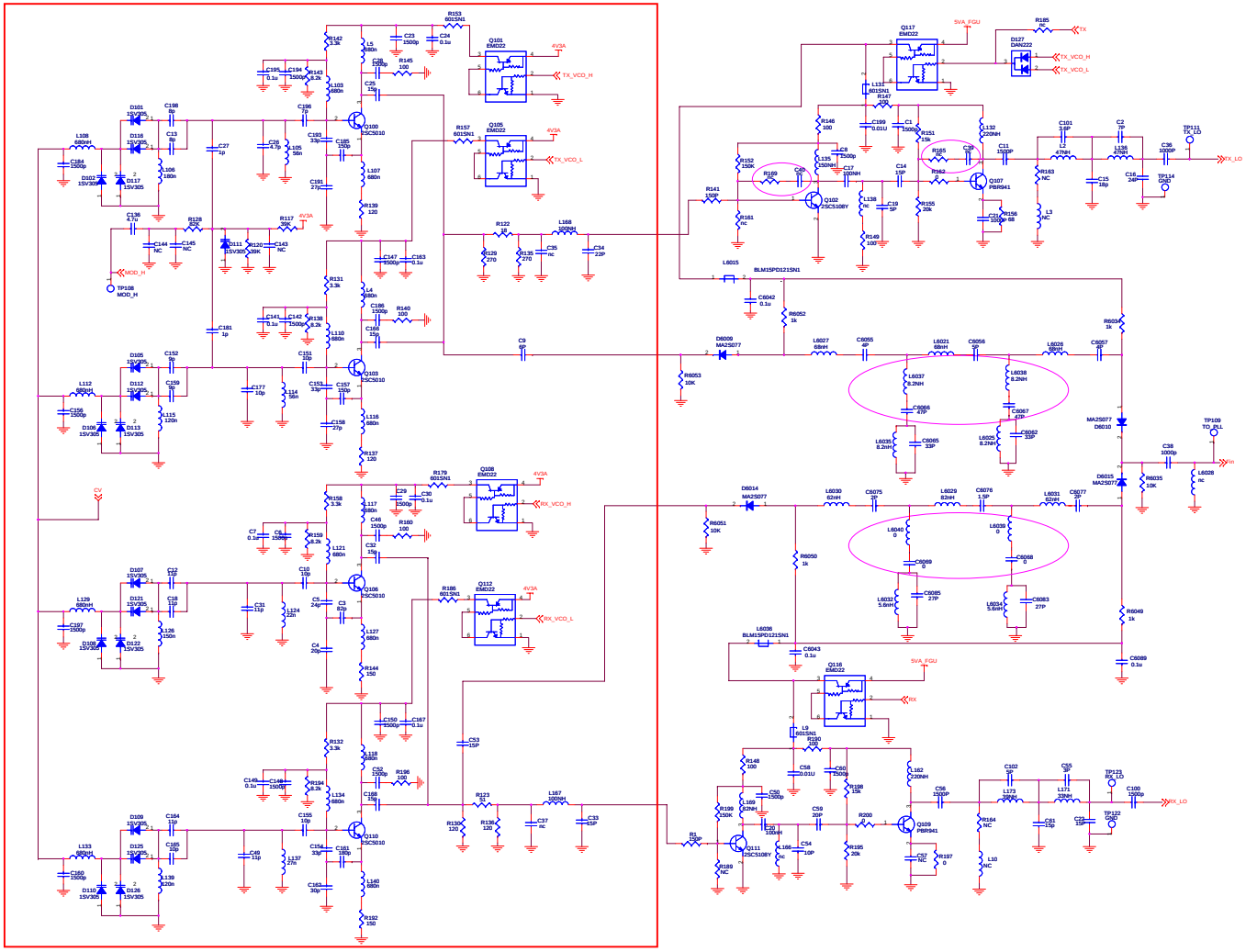
MD78X/MD78XG Schematic Diagram (TX Circuit)



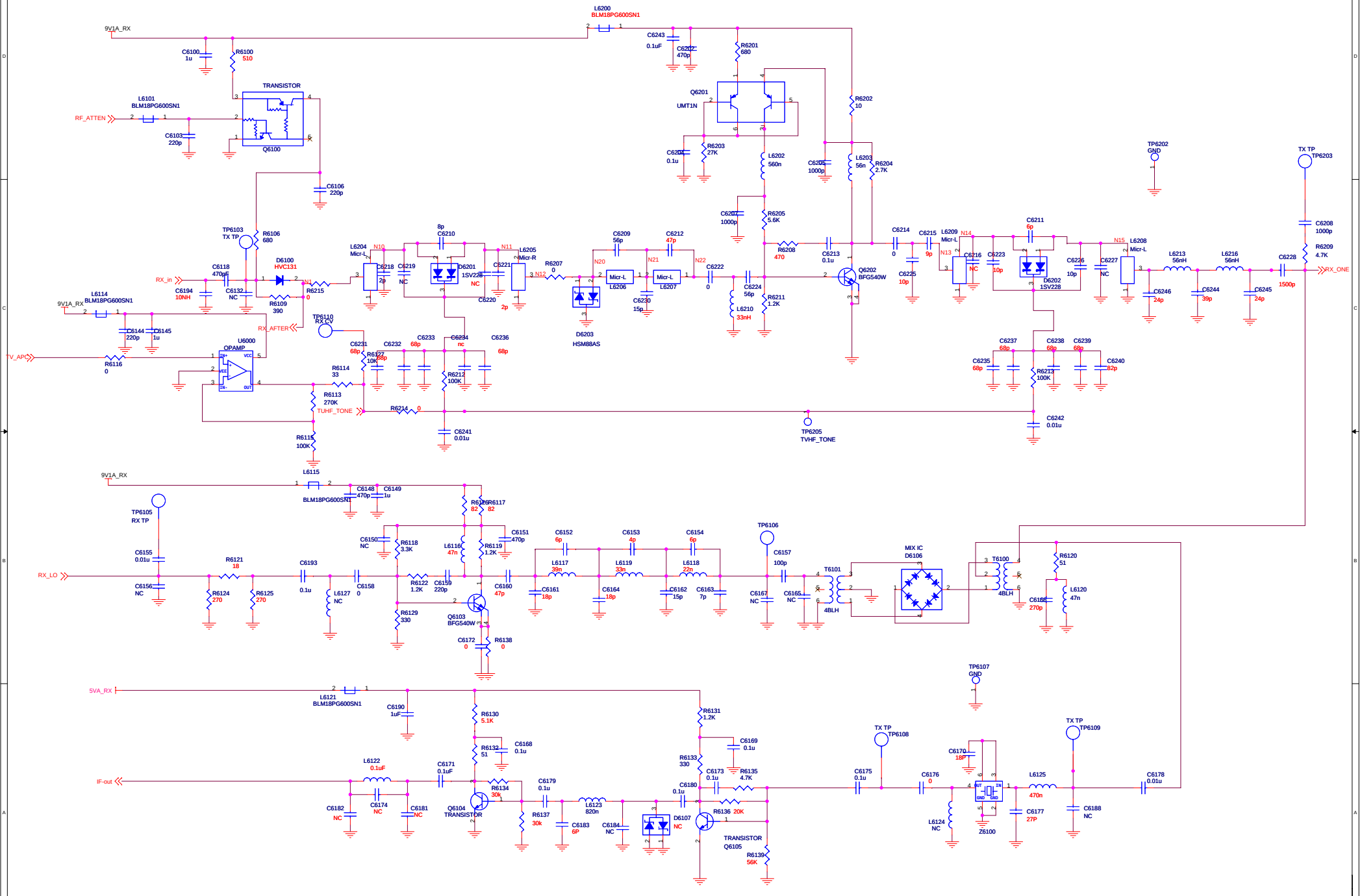
MD78X/MD78XG Schematic Diagram
(PLL Circuit)



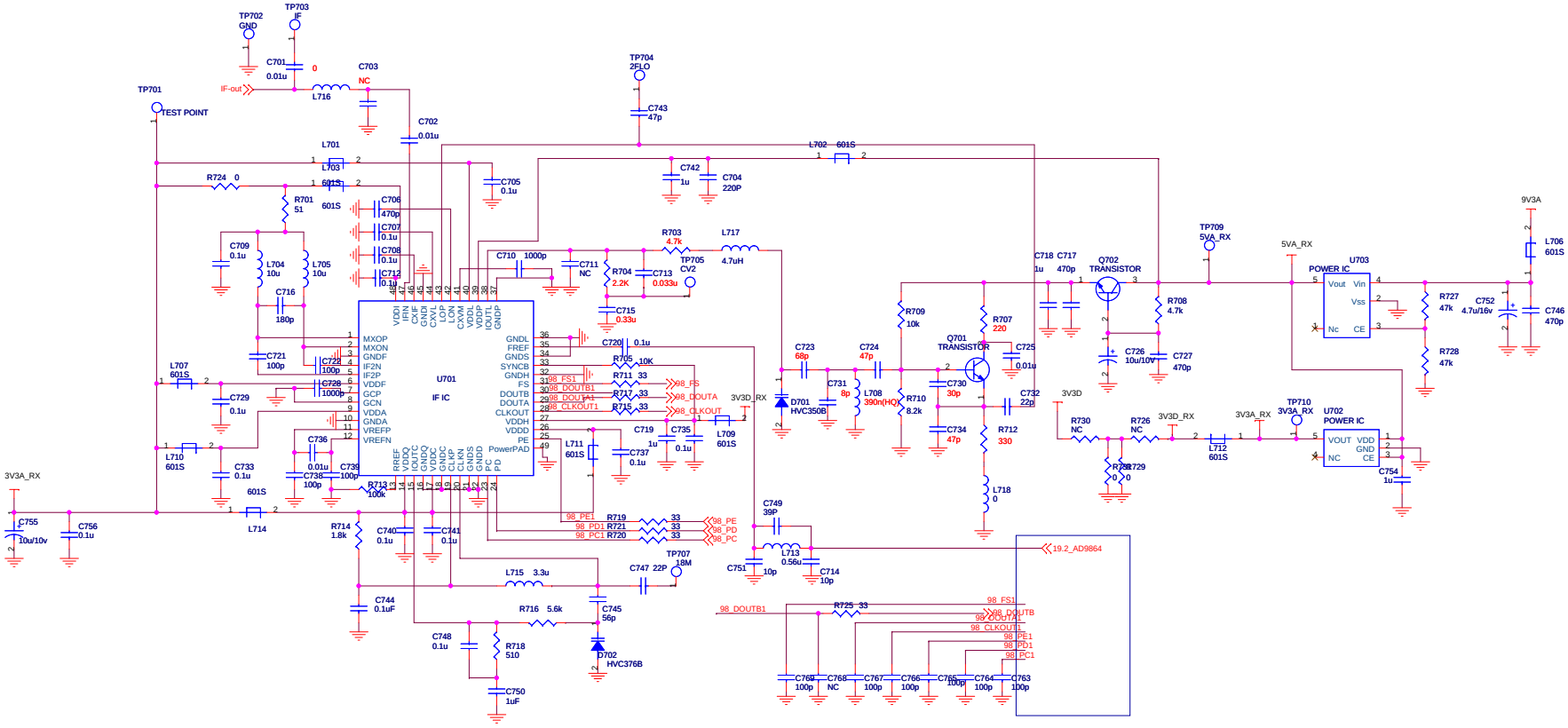
MD78X/MD78XG Schematic Diagram (VCO Circuit)



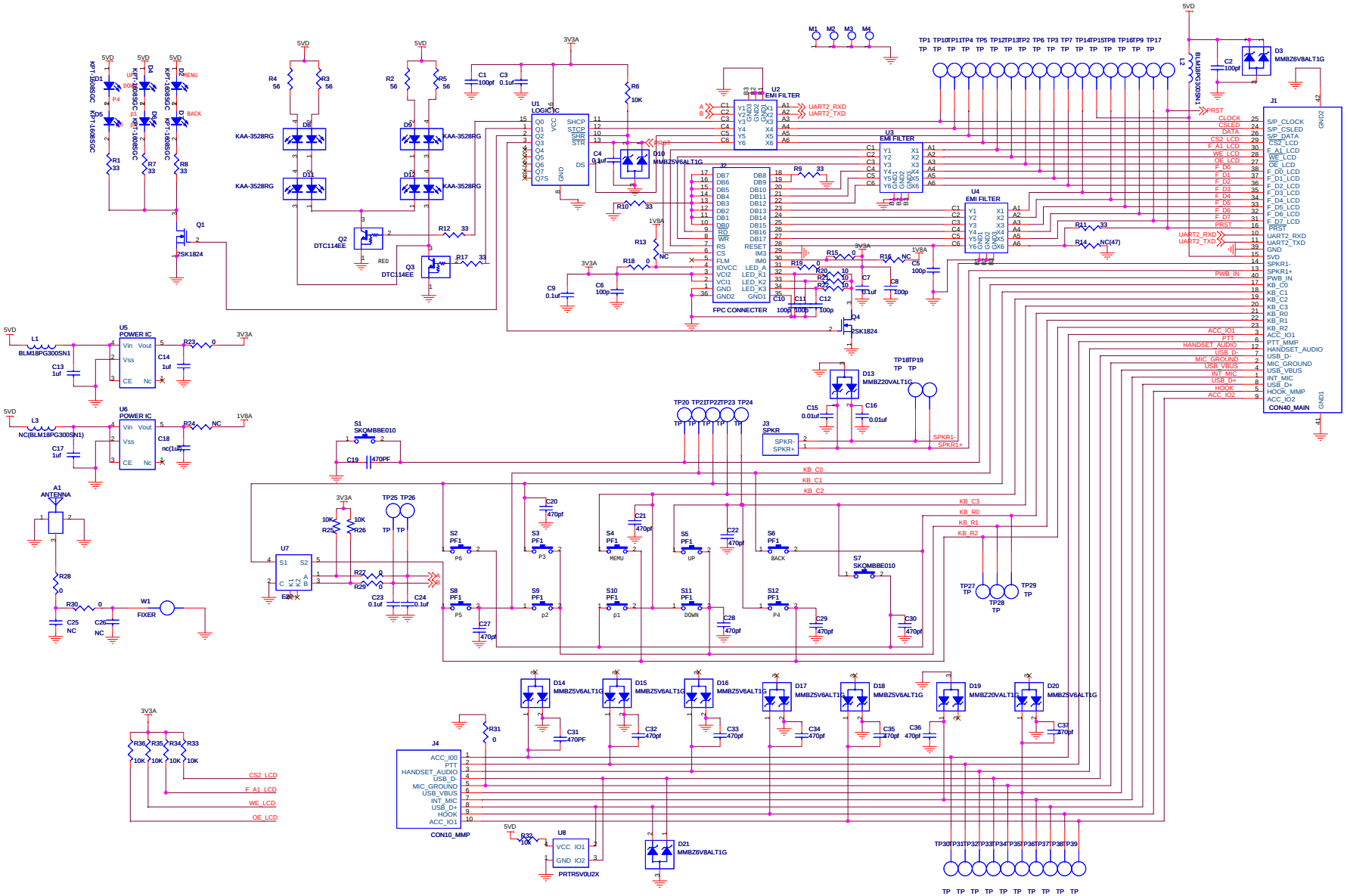
MD78X/MD78XG Schematic Diagram (RX Circuit)



MD78X/MD78XG Schematic Diagram
(IF Circuit)



MD78X/MD78XG Schematic Diagram
(Front Panel)



17.7 Parts List

Main Board *for MD78X/MD78XG*

No.	Ref. No.	Part No.	Description
1	C1	3101051520000	1500PF
2	C100	3101051520000	1500PF
3	C1001	3101051520000	1500PF
4	C1010	3101051520000	1500PF
5	C11	3101051520000	1500PF
6	C14	3101051520000	1500PF
7	C142	3101051520000	1500PF
8	C147	3101051520000	1500PF
9	C148	3101051520000	1500PF
10	C150	3101051520000	1500PF
11	C156	3101051520000	1500PF
12	C160	3101051520000	1500PF
13	C184	3101051520000	1500PF
14	C186	3101051520000	1500PF
15	C194	3101051520000	1500PF
16	C197	3101051520000	1500PF
17	C23	3101051520000	1500PF
18	C28	3101051520000	1500PF
19	C29	3101051520000	1500PF
20	C46	3101051520000	1500PF
21	C50	3101051520000	1500PF
22	C52	3101051520000	1500PF
23	C56	3101051520000	1500PF
24	C6	3101051520000	1500PF
25	C60	3101051520000	1500PF
26	C6202	3101051520000	1500PF
27	C6228	3101051520000	1500PF
28	C6241	3101051520000	1500PF
29	C6242	3101051520000	1500PF
30	C8	3101051520000	1500PF
31	C82	3101051520000	1500PF
32	C90	3101051520000	1500PF
33	C96	3101051520000	1500PF
34	C196	3101060700020	7PF
35	C2	3101060700020	7PF
36	C362	3101058200000	82PF
37	C363	3101058200000	82PF
38	C365	3101058200000	82PF
39	C6240	3101058200000	82PF
40	C994	3101058200000	82PF
41	C16	3101052400010	24PF

No.	Ref. No.	Part No.	Description
42	C5	3101052400010	24PF
43	C6083	3101052400010	24PF
44	C6085	3101052400010	24PF
45	C6245	3101052000040	20PF
46	C6246	3101052000040	20PF
47	C747	3101052200010	22PF
48	C918	3101052200010	22PF
49	C1006	3101051040010	0.1UF
50	C141	3101051040010	0.1UF
51	C149	3101051040010	0.1UF
52	C163	3101051040010	0.1UF
53	C167	3101051040010	0.1UF
54	C195	3101051040010	0.1UF
55	C232	3101051040010	0.1UF
56	C233	3101051040010	0.1UF
57	C236	3101051040010	0.1UF
58	C239	3101051040010	0.1UF
59	C24	3101051040010	0.1UF
60	C240	3101051040010	0.1UF
61	C243	3101051040010	0.1UF
62	C248	3101051040010	0.1UF
63	C258	3101051040010	0.1UF
64	C267	3101051040010	0.1UF
65	C274	3101051040010	0.1UF
66	C285	3101051040010	0.1UF
67	C30	3101051040010	0.1UF
68	C308	3101051040010	0.1UF
69	C311	3101051040010	0.1UF
70	C321	3101051040010	0.1UF
71	C323	3101051040010	0.1UF
72	C329	3101051040010	0.1UF
73	C334	3101051040010	0.1UF
74	C336	3101051040010	0.1UF
75	C356	3101051040010	0.1UF
76	C366	3101051040010	0.1UF
77	C379	3101051040010	0.1UF
78	C380	3101051040010	0.1UF
79	C382	3101051040010	0.1UF
80	C383	3101051040010	0.1UF
81	C386	3101051040010	0.1UF
82	C387	3101051040010	0.1UF
83	C388	3101051040010	0.1UF
84	C389	3101051040010	0.1UF
85	C391	3101051040010	0.1UF

No.	Ref. No.	Part No.	Description
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89	C398	3101051040010	0.1UF
90	C400	3101051040010	0.1UF
91	C407	3101051040010	0.1UF
92	C422	3101051040010	0.1UF
93	C471	3101051040010	0.1UF
94	C473	3101051040010	0.1UF
95	C509	3101051040010	0.1UF
96	C512	3101051040010	0.1UF
97	C514	3101051040010	0.1UF
98	C515	3101051040010	0.1UF
99	C6042	3101051040010	0.1UF
100	C6043	3101051040010	0.1UF
101	C6089	3101051040010	0.1UF
102	C6168	3101051040010	0.1UF
103	C6169	3101051040010	0.1UF
104	C6171	3101051040010	0.1UF
105	C6173	3101051040010	0.1UF
106	C6175	3101051040010	0.1UF
107	C6179	3101051040010	0.1UF
108	C6180	3101051040010	0.1UF
109	C6204	3101051040010	0.1UF
110	C6213	3101051040010	0.1UF
111	C6243	3101051040010	0.1UF
112	C7	3101051040010	0.1UF
113	C705	3101051040010	0.1UF
114	C707	3101051040010	0.1UF
115	C708	3101051040010	0.1UF
116	C709	3101051040010	0.1UF
117	C712	3101051040010	0.1UF
118	C720	3101051040010	0.1UF
119	C729	3101051040010	0.1UF
120	C733	3101051040010	0.1UF
121	C735	3101051040010	0.1UF
122	C737	3101051040010	0.1UF
123	C740	3101051040010	0.1UF
124	C741	3101051040010	0.1UF
125	C744	3101051040010	0.1UF
126	C756	3101051040010	0.1UF
127	C83	3101051040010	0.1UF
128	C85	3101051040010	0.1UF
129	C86	3101051040010	0.1UF

No.	Ref. No.	Part No.	Description
130	C87	3101051040010	0.1UF
131	C89	3101051040010	0.1UF
132	C947	3101051040010	0.1UF
133	C950	3101051040010	0.1UF
134	C955	3101051040010	0.1UF
135	C958	3101051040010	0.1UF
136	C967	3101051040010	0.1UF
137	C968	3101051040010	0.1UF
138	C969	3101051040010	0.1UF
139	C978	3101051040010	0.1UF
140	C98	3101051040010	0.1UF
141	C166	3101051500080	15PF
142	C168	3101051500080	15PF
143	C22	3101051500080	15PF
144	C25	3101051500080	15PF
145	C32	3101051500080	15PF
146	C33	3101051500080	15PF
147	C53	3101051500080	15PF
148	C61	3101051500080	15PF
149	C6162	3101051500080	15PF
150	C6230	3101051500080	15PF
151	C159	3101051000020	10PF
152	C54	3101051000020	10PF
153	C152	3101050900000	9PF
154	C6215	3101050900000	9PF
155	C12	3101051100010	11PF
156	C164	3101051100010	11PF
157	C18	3101051100010	11PF
158	C165	3101051000030	10PF
159	C6223	3101051000030	10PF
160	C6225	3101051000030	10PF
161	C6226	3101051000030	10PF
162	C714	3101051000030	10PF
163	C751	3101051000030	10PF
164	C6152	3101050500010	5PF
165	C6056	3101050300000	3PF
166	C13	3101050600010	6PF
167	C6154	3101050600010	6PF
168	C6211	3101050600010	6PF
169	C9	3101050600010	6PF
170	C322	3101051200020	12PF
171	C324	3101051200020	12PF
172	C375	3101051200020	12PF
173	C376	3101051200020	12PF

No.	Ref. No.	Part No.	Description
174	C15	3101051800070	18PF
175	C6170	3101051800070	18PF
176	C4	3101052000020	20PF
177	C59	3101052000020	20PF
178	C6161	3101052000020	20PF
179	C6164	3101052000020	20PF
180	C1002	3101051020010	1000PF
181	C337	3101051020010	1000PF
182	C338	3101051020010	1000PF
183	C36	3101051020010	1000PF
184	C513	3101051020010	1000PF
185	C6205	3101051020010	1000PF
186	C6207	3101051020010	1000PF
187	C6208	3101051020010	1000PF
188	C710	3101051020010	1000PF
189	C728	3101051020010	1000PF
190	C75	3101051020010	1000PF
191	C79	3101051020010	1000PF
192	C910	3101051020010	1000PF
193	C93	3101051020010	1000PF
194	C937	3101051020010	1000PF
195	C944	3101051020010	1000PF
196	C21	3101054720000	4700PF
197	C26	3101064590010	4.5PF
198	C181	3101050100030	1PF
199	C27	3101050100030	1PF
200	C10	3101061300000	13PF
201	C151	3101061100010	11PF
202	C31	3101061100010	11PF
203	C34	3101062200010	22PF
204	C867	3101062200010	22PF
205	C38	3101061020040	1000PF
206	C817	3101061020040	1000PF
207	L132	3210406331000	330nH
208	L162	3210406331000	330nH
209	L807	3210406331000	330nH
210	C177	3101061000000	10PF
211	C49	3101061000000	10PF
212	L814	3212106470000	47nH
213	C55	3101060300010	3PF
214	C199	3101051030020	0.01UF
215	C235	3101051030020	0.01UF
216	C260	3101051030020	0.01UF
217	C261	3101051030020	0.01UF

No.	Ref. No.	Part No.	Description
218	C306	3101051030020	0.01UF
219	C381	3101051030020	0.01UF
220	C384	3101051030020	0.01UF
221	C399	3101051030020	0.01UF
222	C506	3101051030020	0.01UF
223	C507	3101051030020	0.01UF
224	C58	3101051030020	0.01UF
225	C6155	3101051030020	0.01UF
226	C6178	3101051030020	0.01UF
227	C701	3101051030020	0.01UF
228	C702	3101051030020	0.01UF
229	C725	3101051030020	0.01UF
230	C736	3101051030020	0.01UF
231	C80	3101051030020	0.01UF
232	C95	3101051030020	0.01UF
233	C97	3101051030020	0.01UF
234	C1005	3101051030020	0.01UF
235	C1007	3101051030020	0.01UF
236	C103	3101051030020	0.01UF
237	C64	3101051030020	0.01UF
238	C66	3101051030020	0.01UF
239	C67	3101051030020	0.01UF
240	C68	3101051030020	0.01UF
241	C69	3101051030020	0.01UF
242	C70	3101051030020	0.01UF
243	C72	3101051030020	0.01UF
244	C74	3101051030020	0.01UF
245	C78	3101051030020	0.01UF
246	C84	3101051030020	0.01UF
247	C88	3101051030020	0.01UF
248	C91	3101051030020	0.01UF
249	C94	3101051030020	0.01UF
250	C1009	3101071050020	1UF
251	C71	3101071050020	1UF
252	C750	3101071050020	1UF
253	C121	3101051010030	100PF
254	C1320	3101051010030	100PF
255	C256	3101051010030	100PF
256	C288	3101051010030	100PF
257	C295	3101051010030	100PF
258	C307	3101051010030	100PF
259	C309	3101051010030	100PF
260	C326	3101051010030	100PF
261	C335	3101051010030	100PF

No.	Ref. No.	Part No.	Description
262	C339	3101051010030	100PF
263	C341	3101051010030	100PF
264	C342	3101051010030	100PF
265	C343	3101051010030	100PF
266	C344	3101051010030	100PF
267	C345	3101051010030	100PF
268	C346	3101051010030	100PF
269	C347	3101051010030	100PF
270	C348	3101051010030	100PF
271	C349	3101051010030	100PF
272	C350	3101051010030	100PF
273	C351	3101051010030	100PF
274	C352	3101051010030	100PF
275	C353	3101051010030	100PF
276	C354	3101051010030	100PF
277	C355	3101051010030	100PF
278	C357	3101051010030	100PF
279	C358	3101051010030	100PF
280	C359	3101051010030	100PF
281	C360	3101051010030	100PF
282	C361	3101051010030	100PF
283	C378	3101051010030	100PF
284	C385	3101051010030	100PF
285	C390	3101051010030	100PF
286	C409	3101051010030	100PF
287	C410	3101051010030	100PF
288	C411	3101051010030	100PF
289	C412	3101051010030	100PF
290	C413	3101051010030	100PF
291	C414	3101051010030	100PF
292	C415	3101051010030	100PF
293	C416	3101051010030	100PF
294	C417	3101051010030	100PF
295	C418	3101051010030	100PF
296	C419	3101051010030	100PF
297	C420	3101051010030	100PF
298	C426	3101051010030	100PF
299	C427	3101051010030	100PF
300	C428	3101051010030	100PF
301	C429	3101051010030	100PF
302	C430	3101051010030	100PF
303	C431	3101051010030	100PF
304	C435	3101051010030	100PF
305	C440	3101051010030	100PF

No.	Ref. No.	Part No.	Description
306	C441	3101051010030	100PF
307	C442	3101051010030	100PF
308	C443	3101051010030	100PF
309	C444	3101051010030	100PF
310	C445	3101051010030	100PF
311	C446	3101051010030	100PF
312	C447	3101051010030	100PF
313	C448	3101051010030	100PF
314	C449	3101051010030	100PF
315	C450	3101051010030	100PF
316	C451	3101051010030	100PF
317	C452	3101051010030	100PF
318	C453	3101051010030	100PF
319	C454	3101051010030	100PF
320	C455	3101051010030	100PF
321	C456	3101051010030	100PF
322	C463	3101051010030	100PF
323	C465	3101051010030	100PF
324	C466	3101051010030	100PF
325	C467	3101051010030	100PF
326	C468	3101051010030	100PF
327	C469	3101051010030	100PF
328	C477	3101051010030	100PF
329	C478	3101051010030	100PF
330	C479	3101051010030	100PF
331	C480	3101051010030	100PF
332	C481	3101051010030	100PF
333	C482	3101051010030	100PF
334	C510	3101051010030	100PF
335	C516	3101051010030	100PF
336	C517	3101051010030	100PF
337	C518	3101051010030	100PF
338	C721	3101051010030	100PF
339	C722	3101051010030	100PF
340	C738	3101051010030	100PF
341	C739	3101051010030	100PF
342	C76	3101051010030	100PF
343	C763	3101051010030	100PF
344	C764	3101051010030	100PF
345	C765	3101051010030	100PF
346	C766	3101051010030	100PF
347	C767	3101051010030	100PF
348	C769	3101051010030	100PF
349	C77	3101051010030	100PF

No.	Ref. No.	Part No.	Description
350	C6166	3101052710000	270PF
351	C99	3101052710000	270PF
352	C101	3101053690010	3.6PF
353	C102	3101060500010	5PF
354	C123	3101061040010	0.1UF
355	C283	3101061040010	0.1UF
356	C289	3101061040010	0.1UF
357	C6193	3101061040010	0.1UF
358	C748	3101061040010	0.1UF
359	C829	3101061040010	0.1UF
360	C854	3101061040010	0.1UF
361	C868	3101061040010	0.1UF
362	C907	3101061040010	0.1UF
363	C927	3101061040010	0.1UF
364	C935	3101061040010	0.1UF
365	C936	3101061040010	0.1UF
366	C939	3101061040010	0.1UF
367	C942	3101061040010	0.1UF
368	C948	3101061040010	0.1UF
369	C963	3101061040010	0.1UF
370	C991	3101061040010	0.1UF
371	C996	3101061040010	0.1UF
372	L6122	3101061040010	0.1UF
373	C122	3101062240000	0.22UF
374	C132	3101062240000	0.22UF
375	C136	3101074750000	4.7UF
376	C752	3101074750000	4.7UF
377	C6218	3101050200010	2PF
378	C6221	3101050200010	2PF
379	C6075	3101052490010	2.4PF
380	C6077	3101052490010	2.4PF
381	C1000	3101052210010	220PF
382	C247	3101052210010	220PF
383	C250	3101052210010	220PF
384	C254	3101052210010	220PF
385	C265	3101052210010	220PF
386	C269	3101052210010	220PF
387	C270	3101052210010	220PF
388	C271	3101052210010	220PF
389	C272	3101052210010	220PF
390	C273	3101052210010	220PF
391	C280	3101052210010	220PF
392	C421	3101052210010	220PF
393	C423	3101052210010	220PF

No.	Ref. No.	Part No.	Description
394	C424	3101052210010	220PF
395	C425	3101052210010	220PF
396	C432	3101052210010	220PF
397	C433	3101052210010	220PF
398	C434	3101052210010	220PF
399	C436	3101052210010	220PF
400	C437	3101052210010	220PF
401	C6103	3101052210010	220PF
402	C6106	3101052210010	220PF
403	C6144	3101052210010	220PF
404	C6159	3101052210010	220PF
405	C704	3101052210010	220PF
406	C883	3101052210010	220PF
407	C890	3101052210010	220PF
408	C895	3101052210010	220PF
409	C896	3101052210010	220PF
410	C897	3101052210010	220PF
411	C898	3101052210010	220PF
412	C921	3101052210010	220PF
413	C153	3101053900000	39PF
414	C193	3101053900000	39PF
415	C364	3101053900000	39PF
416	C6244	3101053900000	39PF
417	C749	3101053900000	39PF
418	C157	3101051510000	150PF
419	C185	3101051510000	150PF
420	C3	3101051510000	150PF
421	C875	3101051510000	150PF
422	R1	3101051510000	150PF
423	R141	3101051510000	150PF
424	C162	3101053000010	30PF
425	C730	3101053000010	30PF
426	C154	3101053300000	33PF
427	C158	3101053300000	33PF
428	C191	3101053300000	33PF
429	C500	3101053300000	33PF
430	C6062	3101053300000	33PF
431	C6065	3101053300000	33PF
432	C6068	3101053300000	33PF
433	C6069	3101053300000	33PF
434	C161	3101051810010	180p
435	C200	3101061050020	1UF
436	C238	3101061050020	1UF
437	C249	3101061050020	1UF

No.	Ref. No.	Part No.	Description
438	C251	3101061050020	1UF
439	C252	3101061050020	1UF
440	C253	3101061050020	1UF
441	C257	3101061050020	1UF
442	C259	3101061050020	1UF
443	C262	3101061050020	1UF
444	C263	3101061050020	1UF
445	C264	3101061050020	1UF
446	C266	3101061050020	1UF
447	C268	3101061050020	1UF
448	C277	3101061050020	1UF
449	C278	3101061050020	1UF
450	C279	3101061050020	1UF
451	C281	3101061050020	1UF
452	C282	3101061050020	1UF
453	C290	3101061050020	1UF
454	C291	3101061050020	1UF
455	C298	3101061050020	1UF
456	C299	3101061050020	1UF
457	C396	3101061050020	1UF
458	C6100	3101061050020	1UF
459	C6145	3101061050020	1UF
460	C6149	3101061050020	1UF
461	C6190	3101061050020	1UF
462	C742	3101061050020	1UF
463	C754	3101061050020	1UF
464	C900	3101061050020	1UF
465	C901	3101061050020	1UF
466	C905	3101061050020	1UF
467	C906	3101061050020	1UF
468	C908	3101061050020	1UF
469	C923	3101061050020	1UF
470	C924	3101061050020	1UF
471	C925	3101061050020	1UF
472	C938	3101061050020	1UF
473	C946	3101061050020	1UF
474	C966	3101061050020	1UF
475	C234	3101081060010	10UF
476	C286	3101081060010	10UF
477	C807	3101081060010	10UF
478	C928	3101081060010	10UF
479	C956	3101081060010	10UF
480	C957	3101081060010	10UF
481	C980	3101081060010	10UF

No.	Ref. No.	Part No.	Description
482	C981	3101081060010	10UF
483	C237	3101054740020	0.47uF
484	C438	3101054740000	0.47UF
485	C439	3101054740000	0.47UF
486	C241	3001060000000	0Ω
487	C6158	3001060000000	0Ω
488	C6176	3001060000000	0Ω
489	C813	3001060000000	0Ω
490	C814	3001060000000	0Ω
491	L716	3001060000000	0Ω
492	L718	3001060000000	0Ω
493	R171	3001060000000	0Ω
494	R2	3001060000000	0Ω
495	R282	3001060000000	0Ω
496	R405	3001060000000	0Ω
497	R444	3001060000000	0Ω
498	R484	3001060000000	0Ω
499	R542	3001060000000	0Ω
500	R6116	3001060000000	0Ω
501	R6138	3001060000000	0Ω
502	R6140	3001060000000	0Ω
503	R724	3001060000000	0Ω
504	R805	3001060000000	0Ω
505	R809	3001060000000	0Ω
506	R822	3001060000000	0Ω
507	R901	3001060000000	0Ω
508	R914	3001060000000	0Ω
509	R916	3001060000000	0Ω
510	R962	3001060000000	0Ω
511	R963	3001060000000	0Ω
512	R965	3001060000000	0Ω
513	R973	3001060000000	0Ω
514	C866	3210106220000	22nH
515	C242	3101062210000	220PF
516	C245	3101062210000	220PF
517	C809	3101062210000	220PF
518	C845	3101062210000	220PF
519	C878	3101062210000	220PF
520	C887	3101062210000	220PF
521	C892	3101062210000	220PF
522	C909	3101062210000	220PF
523	C974	3101062210000	220PF
524	C976	3101062210000	220PF
525	C982	3101062210000	220PF

No.	Ref. No.	Part No.	Description
526	C985	3101062210000	220PF
527	C246	3101052230000	0.022UF
528	C255	3101051050000	1UF
529	C276	3101051050000	1UF
530	C305	3101051050000	1UF
531	C310	3101051050000	1UF
532	C719	3101051050000	1UF
533	C962	3101051050000	1UF
534	C287	3101064740000	0.47UF
535	C1013	3104071060070	10UF
536	C293	3104071060070	10UF
537	C367	3104071060070	10UF
538	C401	3104071060070	10UF
539	C402	3104071060070	10UF
540	C405	3104071060070	10UF
541	C508	3104071060070	10UF
542	C511	3104071060070	10UF
543	C519	3104071060070	10UF
544	C520	3104071060070	10UF
545	C726	3104071060070	10UF
546	C755	3104071060070	10UF
547	C917	3104071060070	10UF
548	C929	3104071060070	10UF
549	C275	3101071060010	10UF
550	C926	3101071060010	10UF
551	C284	3103994760180	47uf
552	C914	3101104760000	47UF
553	C894	3101061030010	0.01UF
554	C952	3101061030010	0.01UF
555	C403	3210305479000	4.7nH
556	C404	3210305479000	4.7nH
557	C406	3210305479000	4.7nH
558	C475	3210305479000	4.7nH
559	C501	3101053310020	330PF
560	C911	3101053310020	330PF
561	C502	3101053320010	3300PF
562	C503	3101051820000	1800PF
563	C1003	3101054710010	470PF
564	C1015	3101054710010	470PF
565	C6118	3101054710010	470PF
566	C6148	3101054710010	470PF
567	C6151	3101054710010	470PF
568	C706	3101054710010	470PF
569	C717	3101054710010	470PF

No.	Ref. No.	Part No.	Description
570	C727	3101054710010	470PF
571	C746	3101054710010	470PF
572	C945	3101054710010	470PF
573	C713	3101053330000	0.033UF
574	C294	3101063340000	0.33UF
575	C715	3101063340000	0.33UF
576	C716	3101061810010	180PF
577	C940	3101061810010	180PF
578	C977	3101061810010	180PF
579	C198	3101050800000	8PF
580	C6183	3101050800000	8PF
581	C6210	3101050800000	8PF
582	C731	3101050800000	8PF
583	C6066	3101054700010	47PF
584	C6067	3101054700010	47PF
585	C6160	3101054700010	47PF
586	C6212	3101054700010	47PF
587	C724	3101054700010	47PF
588	C734	3101054700010	47PF
589	C743	3101054700010	47PF
590	C6209	3101055600000	56PF
591	C6224	3101055600000	56PF
592	C745	3101055600000	56PF
593	C922	3101055600000	56PF
594	C6231	3101056800000	68PF
595	C6232	3101056800000	68PF
596	C6233	3101056800000	68PF
597	C6235	3101056800000	68PF
598	C6236	3101056800000	68PF
599	C6237	3101056800000	68PF
600	C6238	3101056800000	68PF
601	C6239	3101056800000	68PF
602	C723	3101056800000	68PF
603	C954	3101062710000	270PF
604	C889	3101061020000	1000PF
605	C930	3101061020000	1000PF
606	C953	3101061020000	1000PF
607	C983	3101061020000	1000PF
608	C803	3101063320000	3300PF
609	C916	3101063320000	3300PF
610	C1004	3101063300000	33PF
611	C857	3101063300000	33PF
612	C864	3101063300000	33PF
613	C931	3101065610000	560PF

No.	Ref. No.	Part No.	Description
614	C984	3101065610000	560PF
615	C804	3101092260010	22UF
616	C933	3101092260010	22UF
617	C812	3101371010000	100pF
618	C820	3101371010000	100pF
619	C870	3101371010000	100pF
620	C8330	3101376800000	68pF
621	C842	3101376800000	68pF
622	C861	3101068210000	820PF
623	C17	3101061520010	1500PF
624	C822	3101061520010	1500PF
625	C853	3101061520010	1500PF
626	C990	3101061520010	1500PF
627	C816	3101080800010	8PF
628	C836	3101081200010	12PF
629	C879	3101083300010	33PF
630	C838	3101080700010	7PF
631	C843	3212106829000	8.2nH
632	C902	3101064710000	470PF
633	L823	3101064710000	470PF
634	L826	3101064710000	470PF
635	R824	3101064710000	470PF
636	C818	3001061500000	15Ω
637	R898	3001063600010	36Ω
638	C821	3101080400010	4PF
639	C827	3101081020010	1000pF
640	C850	3101081020010	1000pF
641	C893	3101081020010	1000pF
642	C830	3101372000000	20pF
643	C837	3101372400000	24pF
644	C851	3101081800010	18pF
645	C847	3101061510000	150PF
646	C848	3101061510000	150PF
647	C973	3101061510000	150PF
648	C979	3101061510000	150PF
649	C801	3101084710010	470pF
650	C806	3101084710010	470pF
651	C885	3101084710010	470pF
652	C6157	3101061010010	100PF
653	C825	3101061010010	100PF
654	C852	3101061010010	100PF
655	C860	3101061010010	100PF
656	C959	3101061010010	100PF
657	C971	3101061010010	100PF

No.	Ref. No.	Part No.	Description
658	C992	3101061010010	100PF
659	C970	3101063910000	390PF
660	C862	3101060200010	2PF
661	C886	3101064720000	4700PF
662	C949	3101062720000	2700PF
663	C819	3101082700010	27pF
664	C841	3101082700010	27pF
665	C856	3101082700010	27pF
666	C891	3101051210000	120PF
667	C899	3101051210000	120PF
668	C802	3101064700000	47PF
669	C986	3101064700000	47PF
670	L833	3001061000070	10Ω
671	C912	3101072250030	2.2UF
672	C913	3101061040030	0.1UF
673	C915	3101082260020	22UF
674	C919	3101072260000	22UF
675	C920	3101062250000	2.2UF
676	C932	3101062250000	2.2UF
677	C934	3101062250000	2.2UF
678	C965	3101062250000	2.2UF
679	C951	3104081060120	10UF
680	C941	3101051540000	0.15UF
681	C732	3101052700000	27PF
682	C6076	3101052790060	2.7PF
683	C6172	3001050000000	0Ω
684	C6214	3001050000000	0Ω
685	C6222	3001050000000	0Ω
686	R174	3001050000000	0Ω
687	R188	3001050000000	0Ω
688	R197	3001050000000	0Ω
689	R200	3001050000000	0Ω
690	R230	3001050000000	0Ω
691	R233	3001050000000	0Ω
692	R238	3001050000000	0Ω
693	R240	3001050000000	0Ω
694	R242	3001050000000	0Ω
695	R243	3001050000000	0Ω
696	R249	3001050000000	0Ω
697	R289	3001050000000	0Ω
698	R299	3001050000000	0Ω
699	R329	3001050000000	0Ω
700	R356	3001050000000	0Ω
701	R374	3001050000000	0Ω

No.	Ref. No.	Part No.	Description
702	R375	3001050000000	0Ω
703	R399	3001050000000	0Ω
704	R426	3001050000000	0Ω
705	R440	3001050000000	0Ω
706	R5	3001050000000	0Ω
707	R505	3001050000000	0Ω
708	R507	3001050000000	0Ω
709	R508	3001050000000	0Ω
710	R536	3001050000000	0Ω
711	R544	3001050000000	0Ω
712	R564	3001050000000	0Ω
713	R565	3001050000000	0Ω
714	R566	3001050000000	0Ω
715	R567	3001050000000	0Ω
716	R578	3001050000000	0Ω
717	R6	3001050000000	0Ω
718	R6207	3001050000000	0Ω
719	R6214	3001050000000	0Ω
720	R6215	3001050000000	0Ω
721	R729	3001050000000	0Ω
722	R731	3001050000000	0Ω
723	R837	3001050000000	0Ω
724	R857	3001050000000	0Ω
725	R863	3001050000000	0Ω
726	R891	3001050000000	0Ω
727	R894	3001050000000	0Ω
728	R907	3001050000000	0Ω
729	R920	3001050000000	0Ω
730	R923	3001050000000	0Ω
731	R967	3001050000000	0Ω
732	R983	3001050000000	0Ω
733	C6153	3101050400010	4PF
734	C6055	3101053690000	3.6PF
735	C6057	3101053690000	3.6PF
736	C6163	3101050700010	7PF
737	C6177	3101062700010	27PF
738	D100	3303990000060	Switching diode
739	D6009	3303990000060	Switching diode
740	D6010	3303990000060	Switching diode
741	D6014	3303990000060	Switching diode
742	D6015	3303990000060	Switching diode
743	D101	3304010100220	Varactor
744	D102	3304010100220	Varactor
745	D105	3304010100220	Varactor

No.	Ref. No.	Part No.	Description
746	D106	3304010100220	Varactor
747	D107	3304010100220	Varactor
748	D108	3304010100220	Varactor
749	D109	3304010100220	Varactor
750	D110	3304010100220	Varactor
751	D111	3304010100220	Varactor
752	D112	3304010100220	Varactor
753	D113	3304010100220	Varactor
754	D116	3304010100220	Varactor
755	D117	3304010100220	Varactor
756	D121	3304010100220	Varactor
757	D122	3304010100220	Varactor
758	D125	3304010100220	Varactor
759	D126	3304010100220	Varactor
760	D127	3303030100010	Switching diode
761	D128	3303030100010	Switching diode
762	D230	3310240000000	ESD protection diode
763	D231	3310240000000	ESD protection diode
764	D233	3310240000000	ESD protection diode
765	D240	3310240000000	ESD protection diode
766	D402	3310240000000	ESD protection diode
767	D403	3310240000000	ESD protection diode
768	D404	3310240000000	ESD protection diode
769	D405	3310240000000	ESD protection diode
770	D406	3310240000000	ESD protection diode
771	D234	3310240200000	ESD protection diode
772	D236	3310240200000	ESD protection diode
773	D239	3310240200000	ESD protection diode
774	D235	3302031100010	Zener diode
775	D241	3302031100010	Zener diode
776	D237	3310990000090	ESD protection diode
777	D238	3310990000090	ESD protection diode
778	D407	3399040600010	ESD protection diode
779	D408	3399040600010	ESD protection diode
780	D409	3310240000040	ESD protection diode
781	D450	3699037000010	USB protection IC
782	D601	3307110100080	LED
783	D701	3304060300050	Varactor
784	D702	3304060300010	Varactor
785	D801	3303210100000	Switching diode
786	D802	3303210100000	Switching diode
787	D803	3303030300000	Diode
788	D804	3303030300000	Diode
789	D805	3302030500030	Zener diode

No.	Ref. No.	Part No.	Description
790	D917	3302030500030	Zener diode
791	D901	3303040400000	Switching diode
792	D902	3301100300030	Rectifier diode
793	D904	3301240000000	Diode
794	D905	3301240000000	Diode
795	D6100	3303060300010	Switching diode
796	D906	3303060300010	Switching diode
797	D907	3303060300010	Switching diode
798	D909	3303060300010	Switching diode
799	D911	3303060300010	Switching diode
800	D914	3303060300010	Switching diode
801	D912	3311240100000	Diode
802	D913	3311240100000	Diode
803	D910	3302030500010	Zener diode
804	D915	3303010500290	Switching diode
805	D6203	3399990000260	Rectifier diode
806	D6106	3699019000000	Mixer
807	D6201	3304010100390	Varactor
808	D6202	3304010100390	Varactor
809	F900	4099000000050	Fuse
810	L1	3213212332000	3.3uH
811	L156	3213212332000	3.3uH
812	L715	3213212332000	3.3uH
813	L107	3217607681000	680nH
814	L108	3217607681000	680nH
815	L112	3217607681000	680nH
816	L116	3217607681000	680nH
817	L117	3217607681000	680nH
818	L118	3217607681000	680nH
819	L127	3217607681000	680nH
820	L129	3217607681000	680nH
821	L133	3217607681000	680nH
822	L140	3217607681000	680nH
823	L4	3217607681000	680nH
824	L5	3217607681000	680nH
825	L131	3221506601000	600Ω
826	L152	3221506601000	600Ω
827	L6	3221506601000	600Ω
828	L7	3221506601000	600Ω
829	L701	3221506601000	600Ω
830	L702	3221506601000	600Ω
831	L703	3221506601000	600Ω
832	L706	3221506601000	600Ω
833	L707	3221506601000	600Ω

No.	Ref. No.	Part No.	Description
834	L709	3221506601000	600Ω
835	L710	3221506601000	600Ω
836	L711	3221506601000	600Ω
837	L712	3221506601000	600Ω
838	L714	3221506601000	600Ω
839	L8	3221506601000	600Ω
840	L815	3221506601000	600Ω
841	L821	3221506601000	600Ω
842	L824	3221506601000	600Ω
843	L825	3221506601000	600Ω
844	L9	3221506601000	600Ω
845	R153	3221506601000	600Ω
846	R157	3221506601000	600Ω
847	R179	3221506601000	600Ω
848	R186	3221506601000	600Ω
849	L105	3211256000000	56nH
850	L114	3211256000000	56nH
851	L115	3217107121000	120nH
852	L139	3217107121000	120nH
853	L124	3237110220000	22NH
854	L126	3214307151000	150nH
855	L135	3210306151000	150nH
856	L137	3237110270000	27NH
857	L147	3210406471000	470nH
858	L151	3210406471000	470nH
859	L6125	3210406471000	470nH
860	L154	3213306561000	0.56uH
861	L713	3213306561000	0.56uH
862	L167	3210306101000	100nH
863	L168	3210306101000	100nH
864	L169	3210306820000	82nH
865	L6029	3217106560000	56nH
866	L171	3210306330000	33nH
867	L6119	3210306330000	33nH
868	L6210	3210306330000	33nH
869	L173	3210306390000	39nH
870	L6117	3210306390000	39nH
871	L232	3221506300000	30Ω
872	L401	3221506300000	30Ω
873	L402	3221506300000	30Ω
874	L403	3221506300000	30Ω
875	L404	3221506300000	30Ω
876	L405	3221506300000	30Ω
877	L406	3221506300000	30Ω

No.	Ref. No.	Part No.	Description
878	L407	3221506300000	30Ω
879	L408	3221506300000	30Ω
880	L409	3221506300000	30Ω
881	L410	3221506300000	30Ω
882	L411	3221506300000	30Ω
883	L412	3221506300000	30Ω
884	L901	3221506300000	30Ω
885	L912	3221506300000	30Ω
886	L913	3221506300000	30Ω
887	L233	3211506101000	100nH
888	L234	3211506101000	100nH
889	L235	3211506101000	100nH
890	L500	3211506101000	100nH
891	L6101	3211506101000	100nH
892	L6114	3211506101000	100nH
893	L6115	3211506101000	100nH
894	L6121	3211506101000	100nH
895	L6200	3211506101000	100nH
896	L704	3213212103000	10uH
897	L705	3213212103000	10uH
898	L708	3297107391000	390nH
899	L717	3213306472000	4.7uH
900	L801	3221513600000	60Ω
901	L802	3221513600000	60Ω
902	L803	3221513600000	60Ω
903	L812	3221513600000	60Ω
904	L818	3221513600000	60Ω
905	L900	3221513600000	60Ω
906	L916	3221513600000	60Ω
907	L917	3221513600000	60Ω
908	L940	3221513600000	60Ω
909	L804	3233099270000	27nH
910	L809	3233099400010	40nH
911	L810	3233099400010	40nH
912	L813	3233099400010	40nH
913	L817	3233099400010	40nH
914	L6118	3210306220000	22nH
915	L808	3233099220000	22nH
916	L816	3233099111000	111nH
917	L828	3217112102020	1uH
918	L6025	3217106689010	6.8nH
919	L6035	3217106689010	6.8nH
920	L6037	3217106689010	6.8nH
921	L6038	3217106689010	6.8nH

No.	Ref. No.	Part No.	Description
922	L832	3212106180000	18nH
923	L830	3233099185900	18.5nH
924	L902	3217299103000	10uH
925	L903	3213099472000	4.7uH
926	L931	3213099472000	4.7uH
927	L904	3221506181000	180Ω
928	L908	3221506181000	180Ω
929	L930	3241799103000	10uH
930	L6015	3221505121010	Bead
931	L6036	3221505121010	Bead
932	L6026	3210106680000	68nH
933	L6027	3210106680000	68nH
934	L6030	3217106470000	47nH
935	L6031	3217106470000	47nH
936	L6021	3217106820010	82nH
937	L6032	3217106569000	5.6nH
938	L6034	3217106569000	5.6nH
939	L6039	3217106569000	5.6nH
940	L6040	3217106569000	5.6nH
941	L6123	3213306821000	0.82uH
942	L6202	3210306561010	560nH
943	L6203	3210106560000	56nH
944	Q323	3403008000010	Transistor
945	Q401	3403008000010	Transistor
946	Q402	3403008000010	Transistor
947	Q403	3403008000010	Transistor
948	Q404	3403008000010	Transistor
949	Q405	3403008000010	Transistor
950	Q413	3403008000010	Transistor
951	Q811	3403008000010	Transistor
952	Q812	3403008000010	Transistor
953	Q813	3403008000010	Transistor
954	Q903	3403008000010	Transistor
955	Q908	3403008000010	Transistor
956	Q913	3403008000010	Transistor
957	Q914	3403008000010	Transistor
958	Q922	3403008000010	Transistor
959	Q923	3403008000010	Transistor
960	Q1	3503020000030	N-MOSFET
961	Q912	3503020000030	N-MOSFET
962	Q100	3408002000080	NPN transistor
963	Q103	3408002000080	NPN transistor
964	Q106	3408002000080	NPN transistor
965	Q110	3408002000080	NPN transistor

No.	Ref. No.	Part No.	Description
966	Q101	3403999000000	Transistor
967	Q105	3403999000000	Transistor
968	Q108	3403999000000	Transistor
969	Q112	3403999000000	Transistor
970	Q116	3403999000000	Transistor
971	Q117	3403999000000	Transistor
972	Q102	3401002000990	NPN transistor
973	Q111	3401002000990	NPN transistor
974	Q104	3403003000060	NPN transistor
975	Q702	3403003000060	NPN transistor
976	Q107	3404006000000	NPN transistor
977	Q109	3404006000000	NPN transistor
978	Q6104	3404006000000	NPN transistor
979	Q6105	3404006000000	NPN transistor
980	Q230	3499000000150	Transistor
981	Q231	3499000000150	Transistor
982	Q232	3499000000150	Transistor
983	Q233	3499000000150	Transistor
984	Q234	3499000000150	Transistor
985	Q235	3499000000150	Transistor
986	Q6100	3499000000150	Transistor
987	Q905	3499000000150	Transistor
988	Q400	3413001000010	PNP transistor
989	Q406	3414999000000	Transistor
990	Q407	3414999000000	Transistor
991	Q408	3414999000000	Transistor
992	Q409	3414999000000	Transistor
993	Q410	3414999000000	Transistor
994	Q411	3414999000000	Transistor
995	Q412	3414999000000	Transistor
996	Q701	3408002000000	NPN transistor
997	Q6103	3404999000000	NPN transistor
998	Q6202	3404999000000	NPN transistor
999	Q804	3504990000030	MOSFET
1000	Q805	3504990000010	MOSFET
1001	Q810	3403002000000	PNP transistor
1002	Q902	3403002000000	PNP transistor
1003	Q906	3414001000020	NPN transistor
1004	Q910	3414001000020	NPN transistor
1005	Q909	3403002000010	PNP transistor
1006	Q6201	3403014000020	Transistor
1007	RN230	3005051010010	100Ω
1008	RN500	3005051010010	100Ω
1009	RT804	3003061040000	Thermistor 100KΩ

No.	Ref. No.	Part No.	Description
1010	R4	3001061010000	100Ω
1011	R823	3001062200000	22Ω
1012	R162	3001058200000	82Ω
1013	R109	3001051000000	10Ω
1014	R175	3001051000000	10Ω
1015	R386	3001051000000	10Ω
1016	R388	3001051000000	10Ω
1017	R414	3001051000000	10Ω
1018	R114	3001066800000	68Ω
1019	R865	3001053930000	39KΩ
1020	R122	3001051800000	18Ω
1021	R6121	3001051800000	18Ω
1022	R123	3001055100010	51Ω
1023	R6120	3001055100010	51Ω
1024	R6132	3001055100010	51Ω
1025	R701	3001055100010	51Ω
1026	R128	3001058230000	82KΩ
1027	R892	3001058230000	82KΩ
1028	R129	3001052710000	270Ω
1029	R135	3001052710000	270Ω
1030	R6124	3001052710000	270Ω
1031	R6125	3001052710000	270Ω
1032	R130	3001051210010	120Ω
1033	R136	3001051210010	120Ω
1034	R132	3001053320000	3.3K
1035	R142	3001053320000	3.3K
1036	R158	3001053320000	3.3K
1037	R6118	3001053320000	3.3K
1038	R890	3001053320000	3.3K
1039	R139	3001061210000	120Ω
1040	R138	3001058220000	8.2K
1041	R143	3001058220000	8.2K
1042	R159	3001058220000	8.2K
1043	R194	3001058220000	8.2K
1044	R710	3001058220000	8.2K
1045	R867	3001058220000	8.2K
1046	R140	3001051010040	100Ω
1047	R145	3001051010040	100Ω
1048	R146	3001051010040	100Ω
1049	R147	3001051010040	100Ω
1050	R148	3001051010040	100Ω
1051	R160	3001051010040	100Ω
1052	R190	3001051010040	100Ω
1053	R196	3001051010040	100Ω

No.	Ref. No.	Part No.	Description
1054	R251	3001051010040	100Ω
1055	R260	3001051010040	100Ω
1056	R271	3001051010040	100Ω
1057	R278	3001051010040	100Ω
1058	R337	3001051010040	100Ω
1059	R338	3001051010040	100Ω
1060	R339	3001051010040	100Ω
1061	R346	3001051010040	100Ω
1062	R403	3001051010040	100Ω
1063	R404	3001051010040	100Ω
1064	R406	3001051010040	100Ω
1065	R410	3001051010040	100Ω
1066	R411	3001051010040	100Ω
1067	R421	3001051010040	100Ω
1068	R434	3001051010040	100Ω
1069	R439	3001051010040	100Ω
1070	R445	3001051010040	100Ω
1071	R458	3001051010040	100Ω
1072	R459	3001051010040	100Ω
1073	R556	3001051010040	100Ω
1074	R557	3001051010040	100Ω
1075	R889	3001051010040	100Ω
1076	R929	3001051010040	100Ω
1077	R948	3001051010040	100Ω
1078	R137	3001061510000	150Ω
1079	R144	3001061510000	150Ω
1080	R192	3001061510000	150Ω
1081	R897	3001061510000	150Ω
1082	R899	3001061510000	150Ω
1083	R151	3001051530010	15KΩ
1084	R250	3001051530010	15KΩ
1085	R284	3001051530010	15KΩ
1086	R285	3001051530010	15KΩ
1087	R361	3001051530010	15KΩ
1088	R362	3001051530010	15KΩ
1089	R930	3001051530010	15KΩ
1090	R199	3001051540000	150K
1091	R919	3001051540000	150K
1092	R882	3001051840010	180K
1093	R155	3001051830000	18KΩ
1094	R870	3001052030000	20KΩ
1095	R195	3001052030000	20KΩ
1096	R6136	3001052030000	20KΩ
1097	R975	3001052030000	20KΩ

No.	Ref. No.	Part No.	Description
1098	R1110	3001053300010	33Ω
1099	R156	3001053300010	33Ω
1100	R167	3001053300010	33Ω
1101	R178	3001053300010	33Ω
1102	R231	3001053300010	33Ω
1103	R232	3001053300010	33Ω
1104	R292	3001053300010	33Ω
1105	R319	3001053300010	33Ω
1106	R320	3001053300010	33Ω
1107	R324	3001053300010	33Ω
1108	R327	3001053300010	33Ω
1109	R330	3001053300010	33Ω
1110	R332	3001053300010	33Ω
1111	R333	3001053300010	33Ω
1112	R336	3001053300010	33Ω
1113	R344	3001053300010	33Ω
1114	R345	3001053300010	33Ω
1115	R347	3001053300010	33Ω
1116	R352	3001053300010	33Ω
1117	R354	3001053300010	33Ω
1118	R355	3001053300010	33Ω
1119	R357	3001053300010	33Ω
1120	R367	3001053300010	33Ω
1121	R369	3001053300010	33Ω
1122	R371	3001053300010	33Ω
1123	R376	3001053300010	33Ω
1124	R380	3001053300010	33Ω
1125	R381	3001053300010	33Ω
1126	R387	3001053300010	33Ω
1127	R400	3001053300010	33Ω
1128	R402	3001053300010	33Ω
1129	R407	3001053300010	33Ω
1130	R408	3001053300010	33Ω
1131	R409	3001053300010	33Ω
1132	R412	3001053300010	33Ω
1133	R413	3001053300010	33Ω
1134	R415	3001053300010	33Ω
1135	R420	3001053300010	33Ω
1136	R423	3001053300010	33Ω
1137	R424	3001053300010	33Ω
1138	R425	3001053300010	33Ω
1139	R430	3001053300010	33Ω
1140	R431	3001053300010	33Ω
1141	R432	3001053300010	33Ω

No.	Ref. No.	Part No.	Description
1142	R433	3001053300010	33Ω
1143	R456	3001053300010	33Ω
1144	R457	3001053300010	33Ω
1145	R467	3001053300010	33Ω
1146	R473	3001053300010	33Ω
1147	R474	3001053300010	33Ω
1148	R479	3001053300010	33Ω
1149	R485	3001053300010	33Ω
1150	R486	3001053300010	33Ω
1151	R487	3001053300010	33Ω
1152	R489	3001053300010	33Ω
1153	R490	3001053300010	33Ω
1154	R491	3001053300010	33Ω
1155	R492	3001053300010	33Ω
1156	R495	3001053300010	33Ω
1157	R498	3001053300010	33Ω
1158	R515	3001053300010	33Ω
1159	R516	3001053300010	33Ω
1160	R517	3001053300010	33Ω
1161	R518	3001053300010	33Ω
1162	R519	3001053300010	33Ω
1163	R520	3001053300010	33Ω
1164	R521	3001053300010	33Ω
1165	R522	3001053300010	33Ω
1166	R523	3001053300010	33Ω
1167	R524	3001053300010	33Ω
1168	R525	3001053300010	33Ω
1169	R526	3001053300010	33Ω
1170	R527	3001053300010	33Ω
1171	R533	3001053300010	33Ω
1172	R545	3001053300010	33Ω
1173	R552	3001053300010	33Ω
1174	R553	3001053300010	33Ω
1175	R6114	3001053300010	33Ω
1176	R711	3001053300010	33Ω
1177	R715	3001053300010	33Ω
1178	R717	3001053300010	33Ω
1179	R719	3001053300010	33Ω
1180	R720	3001053300010	33Ω
1181	R721	3001053300010	33Ω
1182	R725	3001053300010	33Ω
1183	R176	3001054720000	4.7K
1184	R395	3001054720000	4.7K
1185	R396	3001054720000	4.7K

No.	Ref. No.	Part No.	Description
1186	R428	3001054720000	4.7K
1187	R435	3001054720000	4.7K
1188	R436	3001054720000	4.7K
1189	R437	3001054720000	4.7K
1190	R448	3001054720000	4.7K
1191	R468	3001054720000	4.7K
1192	R469	3001054720000	4.7K
1193	R470	3001054720000	4.7K
1194	R471	3001054720000	4.7K
1195	R472	3001054720000	4.7K
1196	R488	3001054720000	4.7K
1197	R496	3001054720000	4.7K
1198	R499	3001054720000	4.7K
1199	R511	3001054720000	4.7K
1200	R572	3001054720000	4.7K
1201	R6135	3001054720000	4.7K
1202	R6209	3001054720000	4.7K
1203	R708	3001054720000	4.7K
1204	R908	3001054720000	4.7K
1205	R910	3001054720000	4.7K
1206	R913	3001054720000	4.7K
1207	R937	3001054720000	4.7K
1208	R942	3001054720000	4.7K
1209	R703	3001052720000	2.7K
1210	R960	3001054790010	4.7K
1211	R3	3001051020000	10KΩ
1212	R831	3001051020000	10KΩ
1213	R177	3001051030000	10KΩ
1214	R180	3001051030000	10KΩ
1215	R202	3001051030000	10KΩ
1216	R234	3001051030000	10KΩ
1217	R235	3001051030000	10KΩ
1218	R236	3001051030000	10KΩ
1219	R258	3001051030000	10KΩ
1220	R259	3001051030000	10KΩ
1221	R261	3001051030000	10KΩ
1222	R316	3001051030000	10KΩ
1223	R322	3001051030000	10KΩ
1224	R323	3001051030000	10KΩ
1225	R325	3001051030000	10KΩ
1226	R326	3001051030000	10KΩ
1227	R334	3001051030000	10KΩ
1228	R335	3001051030000	10KΩ
1229	R340	3001051030000	10KΩ

No.	Ref. No.	Part No.	Description
1230	R341	3001051030000	10KΩ
1231	R342	3001051030000	10KΩ
1232	R343	3001051030000	10KΩ
1233	R351	3001051030000	10KΩ
1234	R353	3001051030000	10KΩ
1235	R372	3001051030000	10KΩ
1236	R377	3001051030000	10KΩ
1237	R378	3001051030000	10KΩ
1238	R379	3001051030000	10KΩ
1239	R382	3001051030000	10KΩ
1240	R385	3001051030000	10KΩ
1241	R390	3001051030000	10KΩ
1242	R391	3001051030000	10KΩ
1243	R392	3001051030000	10KΩ
1244	R393	3001051030000	10KΩ
1245	R394	3001051030000	10KΩ
1246	R427	3001051030000	10KΩ
1247	R429	3001051030000	10KΩ
1248	R438	3001051030000	10KΩ
1249	R441	3001051030000	10KΩ
1250	R442	3001051030000	10KΩ
1251	R443	3001051030000	10KΩ
1252	R447	3001051030000	10KΩ
1253	R451	3001051030000	10KΩ
1254	R452	3001051030000	10KΩ
1255	R453	3001051030000	10KΩ
1256	R454	3001051030000	10KΩ
1257	R461	3001051030000	10KΩ
1258	R462	3001051030000	10KΩ
1259	R463	3001051030000	10KΩ
1260	R464	3001051030000	10KΩ
1261	R465	3001051030000	10KΩ
1262	R466	3001051030000	10KΩ
1263	R476	3001051030000	10KΩ
1264	R481	3001051030000	10KΩ
1265	R482	3001051030000	10KΩ
1266	R483	3001051030000	10KΩ
1267	R501	3001051030000	10KΩ
1268	R506	3001051030000	10KΩ
1269	R509	3001051030000	10KΩ
1270	R510	3001051030000	10KΩ
1271	R512	3001051030000	10KΩ
1272	R530	3001051030000	10KΩ
1273	R531	3001051030000	10KΩ

No.	Ref. No.	Part No.	Description
1274	R532	3001051030000	10KΩ
1275	R534	3001051030000	10KΩ
1276	R535	3001051030000	10KΩ
1277	R538	3001051030000	10KΩ
1278	R539	3001051030000	10KΩ
1279	R540	3001051030000	10KΩ
1280	R541	3001051030000	10KΩ
1281	R543	3001051030000	10KΩ
1282	R555	3001051030000	10KΩ
1283	R6035	3001051030000	10KΩ
1284	R6051	3001051030000	10KΩ
1285	R6053	3001051030000	10KΩ
1286	R705	3001051030000	10KΩ
1287	R885	3001051030000	10KΩ
1288	R938	3001051030000	10KΩ
1289	R945	3001051030000	10KΩ
1290	R950	3001051030000	10KΩ
1291	R976	3001051030000	10KΩ
1292	R979	3001051030000	10KΩ
1293	R980	3001051030000	10KΩ
1294	R709	3001051030050	10KΩ
1295	R181	3001051020000	1KΩ
1296	R183	3001051020000	1KΩ
1297	R264	3001051020000	1KΩ
1298	R267	3001051020000	1KΩ
1299	R280	3001051020000	1KΩ
1300	R295	3001051020000	1KΩ
1301	R383	3001051020000	1KΩ
1302	R422	3001051020000	1KΩ
1303	R460	3001051020000	1KΩ
1304	R477	3001051020000	1KΩ
1305	R502	3001051020000	1KΩ
1306	R503	3001051020000	1KΩ
1307	R504	3001051020000	1KΩ
1308	R554	3001051020000	1KΩ
1309	R569	3001051020000	1KΩ
1310	R576	3001051020000	1KΩ
1311	R6034	3001051020000	1KΩ
1312	R6049	3001051020000	1KΩ
1313	R6050	3001051020000	1KΩ
1314	R6052	3001051020000	1KΩ
1315	R869	3001051020000	1KΩ
1316	R874	3001051020000	1KΩ
1317	R941	3001051020000	1KΩ

No.	Ref. No.	Part No.	Description
1318	R947	3001051020000	1KΩ
1319	R957	3001051020000	1KΩ
1320	R978	3001051020000	1KΩ
1321	R111	3001068200000	82Ω
1322	R835	3001063300000	33Ω
1323	R239	3001055620000	5.6K
1324	R287	3001055620000	5.6K
1325	R573	3001055620000	5.6K
1326	R6205	3001055620000	5.6K
1327	R716	3001055620000	5.6K
1328	R244	3001052230010	22KΩ
1329	R246	3001052230010	22KΩ
1330	R940	3001052230010	22KΩ
1331	R944	3001052230010	22KΩ
1332	R245	3001160100000	1Ω
1333	R253	3001160100000	1Ω
1334	R293	3001160100000	1Ω
1335	R294	3001160100000	1Ω
1336	R117	3001051040000	100K
1337	R247	3001051040000	100K
1338	R248	3001051040000	100K
1339	R252	3001051040000	100K
1340	R262	3001051040000	100K
1341	R268	3001051040000	100K
1342	R269	3001051040000	100K
1343	R274	3001051040000	100K
1344	R275	3001051040000	100K
1345	R276	3001051040000	100K
1346	R296	3001051040000	100K
1347	R455	3001051040000	100K
1348	R500	3001051040000	100K
1349	R513	3001051040000	100K
1350	R514	3001051040000	100K
1351	R6115	3001051040000	100K
1352	R6212	3001051040000	100K
1353	R6213	3001051040000	100K
1354	R713	3001051040000	100K
1355	R982	3001051040000	100K
1356	R255	3001064710000	470Ω
1357	R852	3001064710000	470Ω
1358	R853	3001064710000	470Ω
1359	R935	3001064710000	470Ω
1360	R257	3001053030000	30KΩ
1361	R263	3001053030000	30KΩ

No.	Ref. No.	Part No.	Description
1362	R279	3001053030000	30KΩ
1363	R283	3001053030000	30KΩ
1364	R6134	3001053030000	30KΩ
1365	R6137	3001053030000	30KΩ
1366	R265	3001051820000	1.8K
1367	R714	3001051820000	1.8K
1368	R839	3001051820000	1.8K
1369	R152	3001054730000	47KΩ
1370	R266	3001054730000	47KΩ
1371	R270	3001054730000	47KΩ
1372	R272	3001054730000	47KΩ
1373	R277	3001054730000	47KΩ
1374	R286	3001054730000	47KΩ
1375	R288	3001054730000	47KΩ
1376	R847	3001054730000	47KΩ
1377	R877	3001054730000	47KΩ
1378	R931	3001054730000	47KΩ
1379	R949	3001054730000	47KΩ
1380	R959	3001054730000	47KΩ
1381	R273	3001052430010	24KΩ
1382	R915	3001052430010	24KΩ
1383	R291	3001051220000	1.2K
1384	R6119	3001051220000	1.2K
1385	R6122	3001051220000	1.2K
1386	R6131	3001051220000	1.2K
1387	R6211	3001051220000	1.2K
1388	R401	3001051520010	1.5K
1389	R951	3001051520010	1.5K
1390	R449	3001061520000	1.5K
1391	R450	3001072720010	2.7K
1392	R120	3001056830000	68KΩ
1393	R528	3001056830000	68KΩ
1394	R529	3001053330000	33KΩ
1395	R558	3001053330000	33KΩ
1396	R559	3001053330000	33KΩ
1397	R560	3001053330000	33KΩ
1398	R561	3001053330000	33KΩ
1399	R562	3001053330000	33KΩ
1400	R563	3001053330000	33KΩ
1401	R838	3001053330000	33KΩ
1402	R841	3001053330000	33KΩ
1403	R875	3001053330000	33KΩ
1404	R546	3001054710000	470Ω
1405	R547	3001054710000	470Ω

No.	Ref. No.	Part No.	Description
1406	R548	3001054710000	470Ω
1407	R549	3001054710000	470Ω
1408	R550	3001054710000	470Ω
1409	R551	3001054710000	470Ω
1410	R6208	3001054710000	470Ω
1411	R568	3001055120030	5.1K
1412	R570	3001055120030	5.1K
1413	R577	3001055120030	5.1K
1414	R6130	3001055120030	5.1K
1415	R6133	3001053310000	330Ω
1416	R712	3001053310000	330Ω
1417	R6100	3001055110000	510Ω
1418	R718	3001055110000	510Ω
1419	R912	3001055110000	510Ω
1420	R727	3001064730000	47KΩ
1421	R728	3001064730000	47KΩ
1422	R906	3001064730000	47KΩ
1423	R943	3001064730000	47KΩ
1424	R969	3001064730000	47KΩ
1425	C865	3210306470000	47nH
1426	L136	3210306470000	47nH
1427	L2	3210306470000	47nH
1428	L6116	3210306470000	47nH
1429	L6120	3210306470000	47nH
1430	R815	3001082730000	27KΩ
1431	R816	3001076800000	68Ω
1432	R819	3001076800000	68Ω
1433	R6117	3001078200000	82Ω
1434	R6126	3001078200000	82Ω
1435	R864	3001078200000	82Ω
1436	R821	3001113300000	33Ω
1437	R825	3001113300000	33Ω
1438	R842	3001051230000	12KΩ
1439	R704	3001052220010	2.2K
1440	R849	3001052220010	2.2K
1441	R866	3001052220010	2.2K
1442	R909	3001052220010	2.2K
1443	R964	3001052220010	2.2K
1444	R968	3001052220010	2.2K
1445	R237	3001055630000	56KΩ
1446	R241	3001055630000	56KΩ
1447	R6139	3001055630000	56KΩ
1448	R854	3001055630000	56KΩ
1449	R883	3001055630000	56KΩ

No.	Ref. No.	Part No.	Description
1450	R895	3001055630000	56KΩ
1451	R858	3001069120000	9.1K
1452	R859	3001061020010	1KΩ
1453	R924	3001061020010	1KΩ
1454	R939	3001061020010	1KΩ
1455	R954	3001061020010	1KΩ
1456	R970	3001061020010	1KΩ
1457	R974	3001061020010	1KΩ
1458	R872	3001051840000	180K
1459	R955	3001051840000	180K
1460	R956	3001051840000	180K
1461	R804	3001081000000	10Ω
1462	R806	3001081000000	10Ω
1463	R807	3001081000000	10Ω
1464	R813	3001081000000	10Ω
1465	R818	3001081000000	10Ω
1466	R861	3001081000000	10Ω
1467	R878	3001081000000	10Ω
1468	R880	3001074720010	4.7K
1469	R881	3001074720010	4.7K
1470	R886	3001052240000	220K
1471	R887	3001058210000	820Ω
1472	R911	3099064422010	44.2kΩ
1473	R917	3001053340010	330K
1474	R918	3099066041010	6.04kΩ
1475	R925	3001064720000	4.7K
1476	R932	3001064720000	4.7K
1477	R707	3001052210000	220Ω
1478	R933	3001052210000	220Ω
1479	R984	3001052210000	220Ω
1480	R6106	3001066810000	680Ω
1481	R936	3001066810000	680Ω
1482	R958	3001066810000	680Ω
1483	R946	3001071020010	1KΩ
1484	R952	3001062430000	24KΩ
1485	R187	3001061000000	10Ω
1486	R953	3001061000000	10Ω
1487	R961	3001083310010	330Ω
1488	R966	3001161510010	150Ω
1489	R971	3099052741000	2.74kΩ
1490	R972	3001062220000	2.2K
1491	R6201	3001056810000	680Ω
1492	R6202	3001071000000	10Ω
1493	R6203	3001052730010	27KΩ

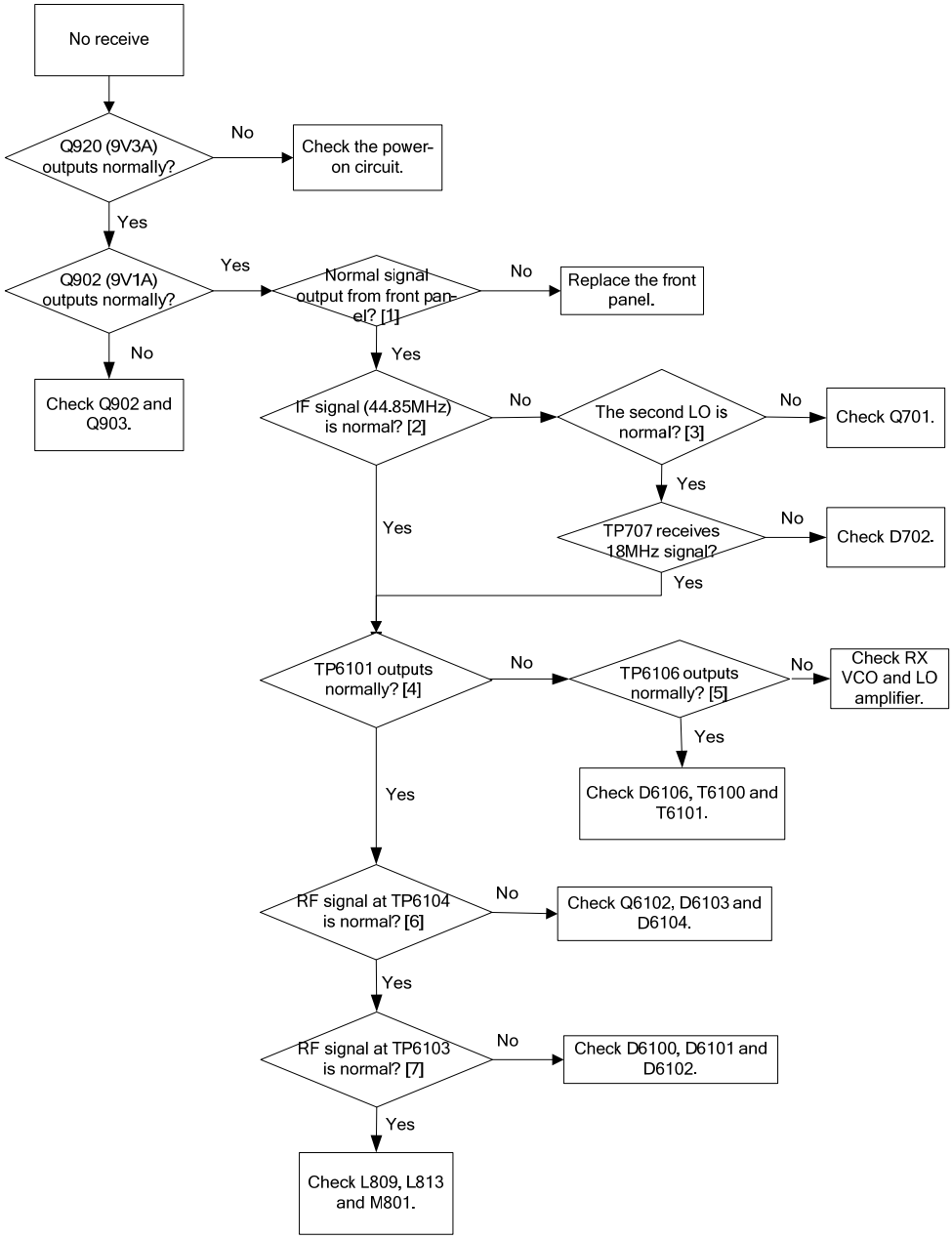
No.	Ref. No.	Part No.	Description
1494	R6204	3001052730010	27KΩ
1495	R6109	3001063910000	390Ω
1496	R6113	3001052740000	270K
1497	L811	3001063310010	330Ω
1498	R6129	3001063310010	330Ω
1499	R811	3001063310010	330Ω
1500	T6100	3244599189000	4BLH
1501	T6101	3244599189000	4BLH
1502	U100	3604019000000	PLL IC
1503	U101	3616059000000	Switch IC
1504	U102	3616059000000	Switch IC
1505	U201	3602017006350	Audio amplifier
1506	U231	3613010000000	Baseband processing IC
1507	U233	3612002000020	Memory
1508	U235	3605010000020	Operational amplifier
1509	U236	3605010000020	Operational amplifier
1510	U237	3616010000000	Switch IC
1511	U238	3605008005070	Operational amplifier
1512	U804	3605008005070	Operational amplifier
1513	U914	3605008005070	Operational amplifier
1514	U302	3610010000010	U302
1515	U327	3607023000150	Serial-to-parallel converter
1516	U401	3699053000000	SmartSwitch
1517	U500	3606010000010	D/A conversion IC
1518	U802	3605002054590	Operational amplifier
1519	U701	3603999000000	IF processor
1520	U702	3608006000000	Power management IC
1521	U900	3608006000000	Power management IC
1522	U901	3608006000000	Power management IC
1523	U909	3608006000000	Power management IC
1524	U703	3608015000060	Power management IC
1525	U905	3608015000060	Power management IC
1526	U915	3608015000060	Power management IC
1527	U801	3605025000020	Operational amplifier
1528	U6000	3605002057090	Operational amplifier
1529	U902	3608053000010	Power management IC
1530	U903	3608015000170	Power management IC
1531	U906	3609010000210	Reset IC
1532	U910	3609010000170	Reset IC
1533	U917	3609006003050	Reset IC
1534	U918	3608015000210	Power management IC
1535	U919	3608010006230	Power management IC
1536	X100	3701019250030	Crystal oscillator (19.2MHz)
1537	X302	3701019250040	Oscillator (19.2MHz)

No.	Ref. No.	Part No.	Description
1538	R934	3001055130010	51KΩ
1539	C718	3101051050160	1uF
1540	L106	3214307181000	180nH
1541	C859	3101068200000	82PF
1542	C888	3101068200000	82PF
1543	L6213	3210305560000	56nH
1544	L6216	3210305560000	56nH
1545	L414	3221505121000	120Ω
1546	L415	3221505121000	120Ω
1547	L417	3221505121000	120Ω
1548	L418	3221505121000	120Ω
1549	R358	3221505121000	120Ω
1550	R360	3221505121000	120Ω
1551	L413	3240707181000	Common-mode choke coil
1552	L416	3240707181000	Common-mode choke coil
1553	C960	3101065600000	56PF
1554	R826	3001061200010	12Ω
1555	R828	3001061200010	12Ω
1556	R900	3001061200010	12Ω
1557	L831	3217607470000	47nH
1558	C943	3101061210000	120PF
1559	C972	3101061210000	120PF
1560	C975	3101063310010	330PF
1561	L834	3233099100000	10nH
1562	L835	3233099100000	10nH
1563	C858	3101060400010	4PF
1564	J404	5206040200010	FFC connector
1565	X375	3701327610060	Crystal
1566	Z6100	3802448540040	44.85MHz
1567		6201928000000	VCO shielding mask
1568		6202010000000	APC shielding mask
1569		41MD7801001C0	PCB
1570	R198	3001053330010	33KΩ
1571	R829	3001062010000	200Ω
1572	R843	3001063320000	3.3K
1573	R846	3001063620000	3.6K
1574	R844	3001065620000	5.6K
1575	R845	3001065620000	5.6K
1576	R855	3001081800000	18Ω
1577	R856	3001081800000	18Ω
1578	C155	3101061600000	16PF
1579	C20	3101061500010	15PF
1580	C877	3101061540000	0.15UF
1581	L103	3217107102000	1uH

No.	Ref. No.	Part No.	Description
1582	L110	3217107102000	1uH
1583	L121	3217107102000	1uH
1584	L134	3217107102000	1uH
1585	L819	3233099470000	47nH
1586	L820	3233099470000	47nH
1587	D900	3302060000000	Zener diode
1588	Q921	3404999000020	NPN transistor
1589	U328	3607082000040	Serial-to-parallel converter
1590	U232	3612044000010	Memory
1591	J400	5201020100110	Board-to-board connector
1592	R902	3001054740010	470K
1593	R903	3001054740010	470K
1594	R904	3001054740010	470K
1595	R905	3001054740010	470K
1596	R876	3001054330000	43KΩ
1597	C880	3101062730000	0.027UF
1598	C831	3101080100010	1pF
1599	C833	3101080100010	1pF
1600	C874	3101080100010	1pF
1601	L806	3213306102000	1uH
1602	R884	3001051830010	18KΩ
1603	R921	3001051830010	18KΩ
1604	R131	3001053320010	3.3K
1605	C815	3101071830000	0.018UF
1606	C839	3101071830000	0.018UF

17.8 Troubleshooting Flow Chart

Receiver Circuit



Description of Normal Situations:

[1] During sensitivity test, use a communication test set to demodulate the audio signal (TP4012 and TP4016). If the signal is demodulated normally, it is concluded that the front panel is defective.

[2] Use the communication test set to input a 44.85MHz IF signal at the mixer, and see whether it can be processed normally afterwards.

[3] Use a spectrum analyzer to check whether TP704 can output the second LO signal (47.1MHz).

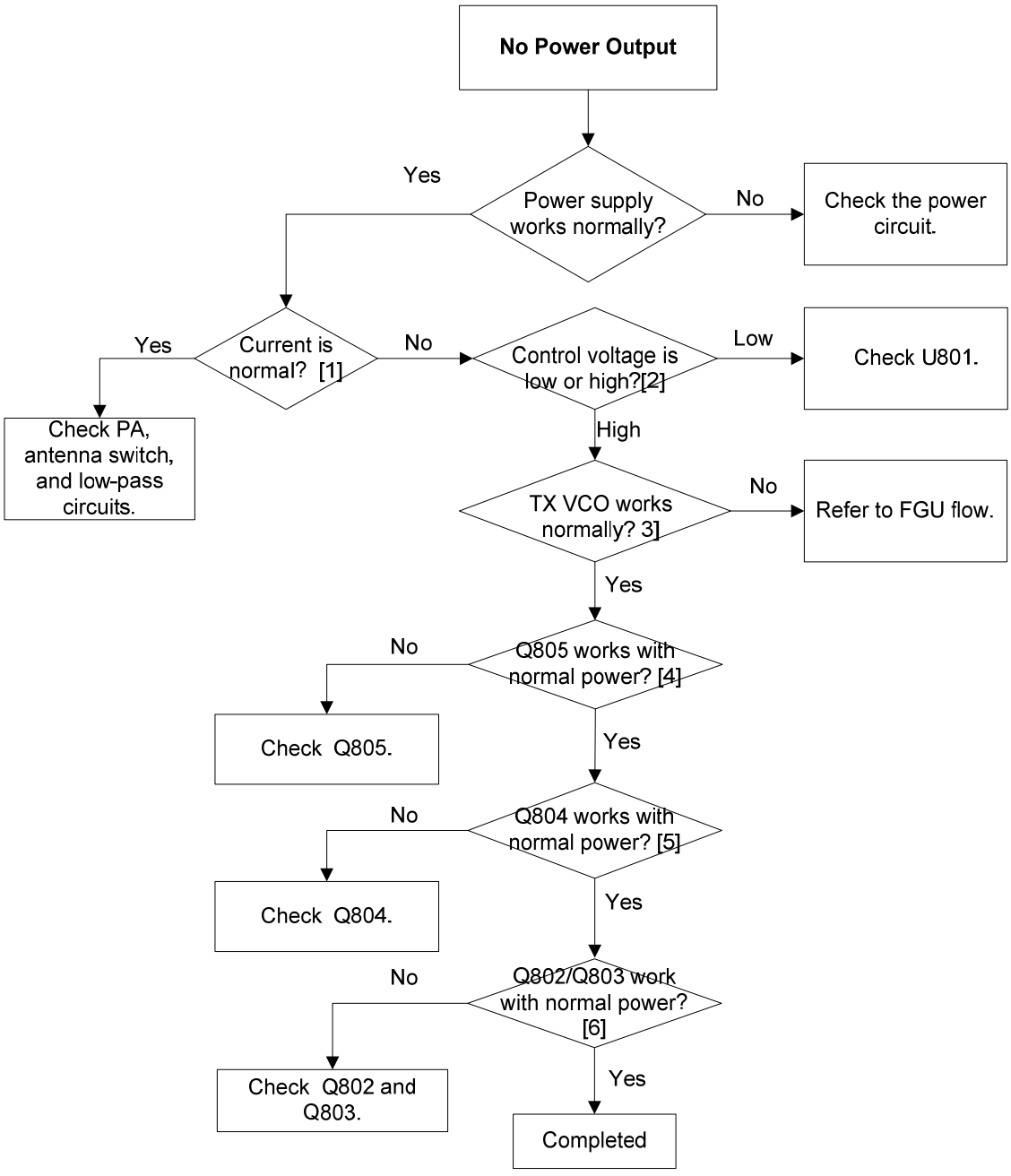
[4] Use the communication test set to apply an RF signal of -100dBm, and test the sensitivity.

[5] Use a spectrum analyzer to test the LO signal received by TP6106. If its strength is about 18dBm, go to check the mixer; otherwise, check the VCO.

[6] Use the communication test set to apply an RF signal of -110dBm at TP6104, and test the sensitivity.

[7] Use the communication test set to apply an RF signal of -110dBm at TP6103, and test the sensitivity.

Transmitter Circuit



Description of Normal Situations:

[1] The current in analog mode is above 6A under 45W power supply and above 1A under 5W. However, in digital mode, the current will be reduced by 50%.

[2] The APC voltage should be above 2V at TP811.

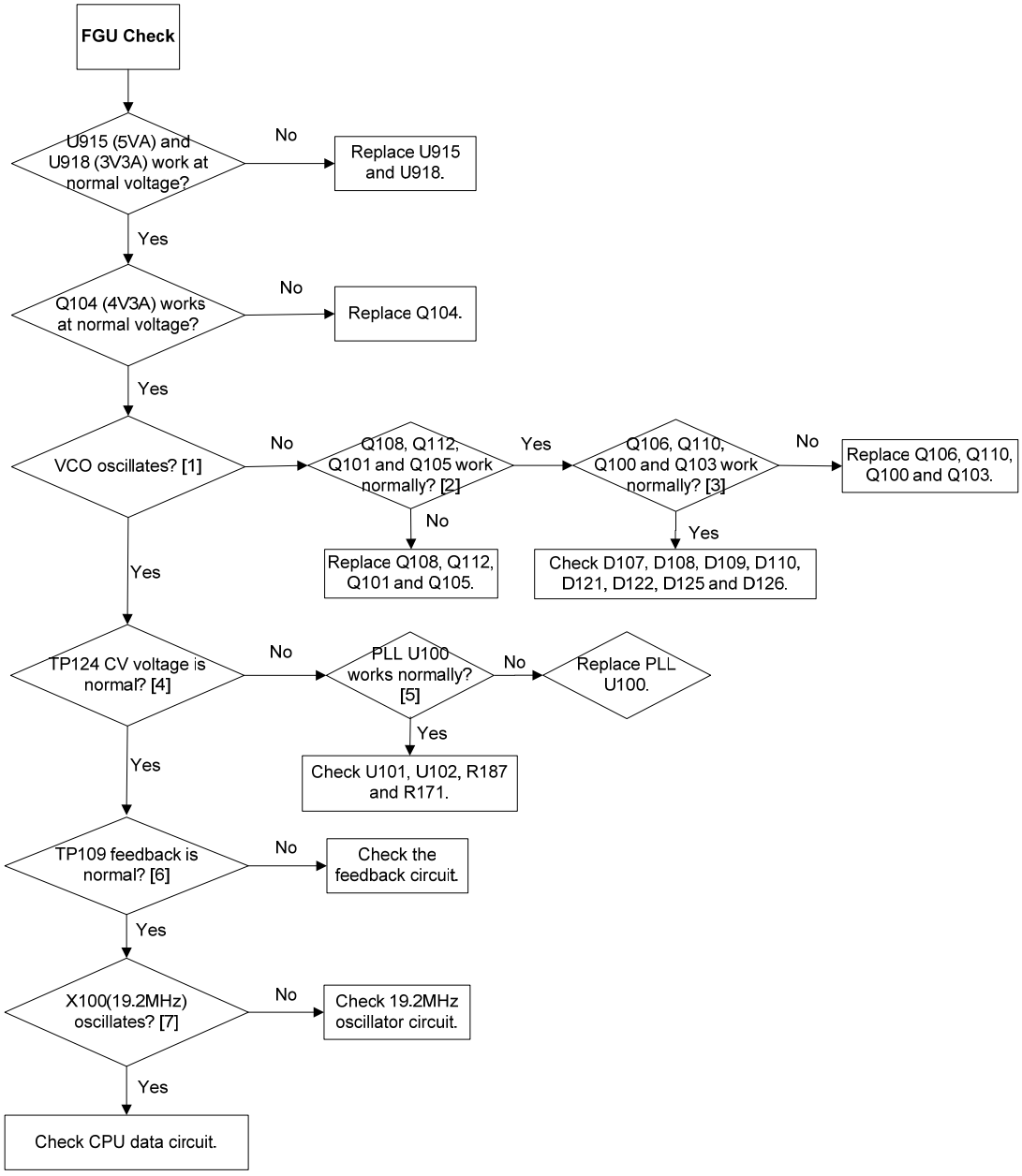
[3] Check whether there is an appropriate TX LO signal at TP803.

[4] Check whether the gain is 20dB and the input signal is 0dBm at Q805.

[5] Check whether the gain is 14dB and the input signal is 0dBm at Q804.

[6] Check whether the gain is 10dB and the input signal is 0dBm at Q802 and Q803.

FGU


FGU Check
U915 (5VA) and U918 (3V3A) work at normal voltage?
No
Replace U915 and U918.
Yes
Q104 (4V3A) works at normal voltage?
No
Replace Q104.
Yes
VCO oscillates? [1]
No
Q108, Q112, Q101 and Q105 work normally? [2]
Yes
Q106, Q110, Q100 and Q103 work normally? [3]
No
Replace Q106, Q110, Q100 and Q103.
No
Replace Q108, Q112, Q101 and Q105.
Yes
Check D107, D108, D109, D110, D121, D122, D125 and D126.
Yes
TP124 CV voltage is normal? [4]
No
PLL U100 works normally? [5]
No
Replace PLL U100.
Yes
Check U101, U102, R187 and R171.
Yes
TP109 feedback is normal? [6]
No
Check the feedback circuit.
Yes
X100(19.2MHz) oscillates? [7]
No
Check 19.2MHz oscillator circuit.
Yes
Check CPU data circuit.

Description of Normal Situations:

[1] Detect the oscillation frequency of RX TP123 and TX TP111 using a spectrum analyzer or the communication test set.

[2] Check whether switches (Q108, Q112, Q101 and Q105) are turned on and output 4.3V.

[3] Check whether the emitter-base voltage of the four transistors (Q106, Q110, Q100 and Q103) is about 0.7V under normal RX/TX status.

[4] Check the CV of TP124. The normal value should range from 0.5V to 4.5V.

[5] Check whether U100 is supplied by 5V and 3.3V normally.

[6] Check whether the power from TP109 to PLL is about -13dBm.

[7] Check whether TP100 outputs 19.2MHz signal.

18.VHF (136-174MHz 50W) Information

18.1 Transmitter Circuit

The transmitter circuit is composed of power amplifier circuit and power control circuit. The former is used to amplify the VCO signal to the desired output power level, while the latter can keep the output power at the desired level, so as to protect the power amplifier from damage caused by over heat, antenna mismatch, and out-of-range voltage (over voltage or under voltage may result in damage to Q801, Q805, Q804, Q802 and Q803).

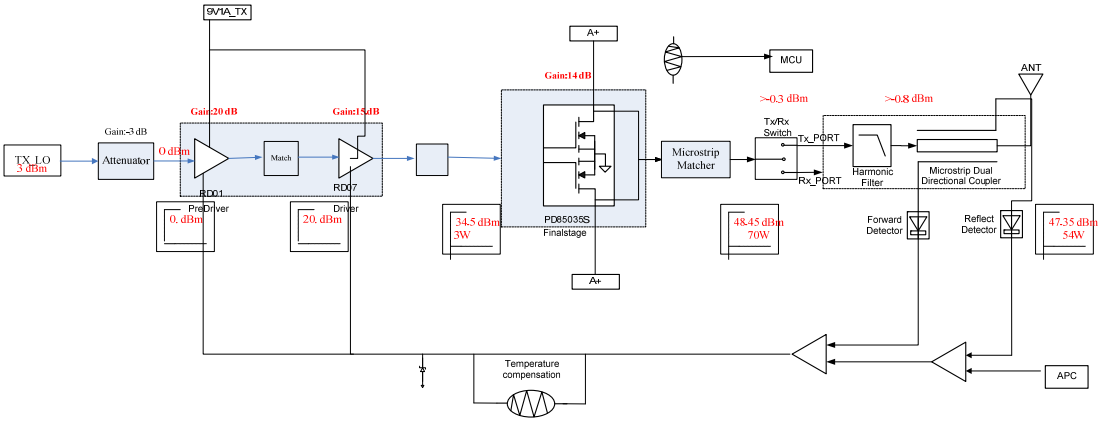


Figure 18-1 Diagram of Transmitter Circuit

18.1.1 Power Amplifier

The 3-stage power amplifier amplifies the signal output from VCO to the required output power level. The first stage is a pre-driver power amplifier circuit with variable gain (formed by Q805); the second stage is a driver power amplifier circuit with variable gain (formed by Q804); and the final stage is the final power amplifier circuit with fixed gain (formed by Q802 and Q803). In addition, this power amplifier contains a TX/RX switch and a low-pass filter.

18.1.2 Pre-driver Power Amplifier

The pre-driver power amplifier is formed by Q805, with variable gain controlled by voltage VGG. The input matching circuit is composed of C826, L826, L814, C843 and R824.

18.1.3 Driver Power Amplifier

The driver power amplifier is formed by Q804, with variable gain controlled by voltage VGG. The maximum output power is 34.5dBm, and the maximum variable gain is 15dB.

18.1.4 Final Power Amplifier

The final power amplifier comprises Q802 and Q803, with the maximum output power of 48.5dBm, and

the maximum variable gain of 14dB. The input matching circuit is composed of C815, C839, R804, R806, R807, R813, R818 and R861, while the power combining circuit is composed of C820, C8330, C833, C831, C819, C812, C841 and C842.

18.1.5 Antenna Switch

The antenna switch is used to switch between the transmitter circuit and the receiver circuit.

In TX mode, the switching transistor Q810 is controlled by TX signal, so as to supply 9V 3A to the PIN diodes D801 and D802. Quiescent bias current of the PIN diode is controlled by the resistors R821 and R825. In this mode, D801 and D802 are turned on; RF signals are applied to the low-pass filter (composed of C821, C816, C836, C837, C830, C838, L809, L813 and L810) and then transmitted via the antenna port.

In RX mode, TX signal controls the switching transistor Q810, to further control the power supply for the PIN diodes D801 and D802, which are not applied with DC bias current. When the two PIN diodes are turned off, signals feed into the RX path through the low-pass filter (composed of L871, C852 and C862).

18.1.6 Low-pass Filter

A low-pass filter that consists of inductors L809, L813 and L810, and capacitors C821, C816, C836, C837, C830 and C838, is used to attenuate harmonic energy from the transmitter.

18.1.7 Directional Coupler

A directional coupler that consists of microstrip directional coupler, D803, D804 and etc, is used to detect both forward and reverse directed power of the transmitter. The forward power is coupled to the diode D803, and the voltage is applied to the power control circuit (U801). Then the voltage VGG is output to control the gate voltage of pre-driver and driver PA, ensuring a constant power output.

The directional coupler can adjust the TX power and detect the VSWR load. The reverse power is coupled to D804. The voltage is applied to U802 and then feeds into APC for detection.

18.1.8 Output Power Control

The TX power is controlled by U801. The forward power is applied to the directional coupler, to output a voltage that can represent the forward power. The voltage together with the preset voltage feeds to U801 to output a voltage VGG, which can control both gate voltage and gain of Q804 and Q805, ensuring a constant power output.

18.1. 9 Thermal and Over-voltage Protections

The circuit consists of thermistor RT804 and resistor R884. The output voltage is proportional to the

detected temperature. Both the voltage used for temperature detection and the threshold voltage are fed into the operational amplifier U803, to output a voltage signal that is in proportion to the detected temperature. Afterwards, the voltage is applied to software for judgment, and then the preset voltage will be subsequently changed to reduce the TX power, and to protect the PA from over-heating.

18.1.10 Pressure Pad Switch

The power control circuit includes a pressure pad switch SW1, which is controlled by the conductive rubber part mounted on the top cover. If the switch is turned off, VGG will become low, and no power will be output from PA. Otherwise, PA will work normally.

18.2 Receiver Circuit

The receiver utilizes double conversion superheterodyne technique. The first IF is 44.85MHz and the second IF is 2.25MHz. The first local oscillator signal is from the PLL circuit U100, and the second LO signal (47.1MHz) is generated by the PLL circuit U701. The major units are BPF, LNA, mixer, IF filter, IF amplifier and IF processor.

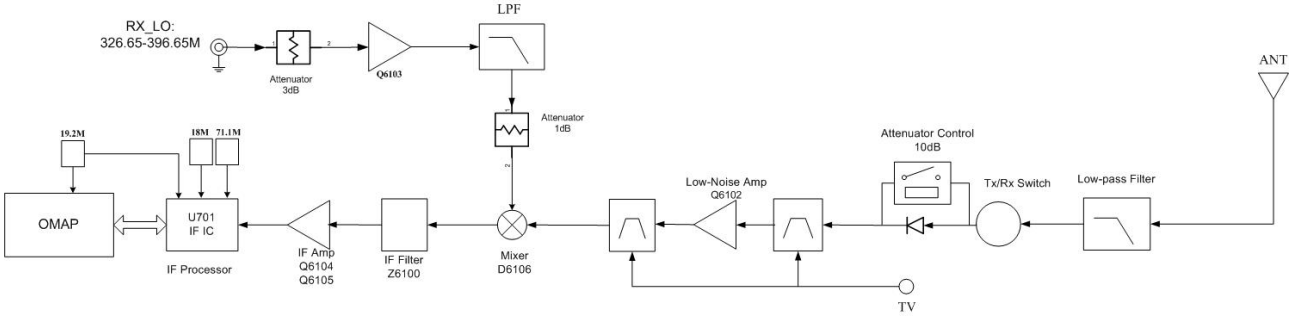


Figure 18-2 Diagram of Receiver Circuit

18.2.1 Receiver Front-end

RF signals feed to the low-pass filter to remove out-of-band signals, and are applied to the two-stage electrically tunable band-pass filter to get useful signals. After passing through the RF band-pass filter and LNA (Q6102), the RF signals together with the first LO signal feed to the mixer for the first frequency conversion, to generate the first IF signal (44.85MHz). The mixer that employs the passive diode can ensure good dynamic range and port isolation. The LO signal (3-5dBm) from the VCO feeds to Q6103 to get a gain (17dB). The first LO signals (44.85MHz) pass through the crystal filter (Z6100) to remove out-of-band spurious signals, and then feed to the two-stage IF amplifier circuit (composed of Q6133 and Q6134) for amplification. Finally the amplified signals go to the IF IC for processing

18.2.2 Receiver Back-end

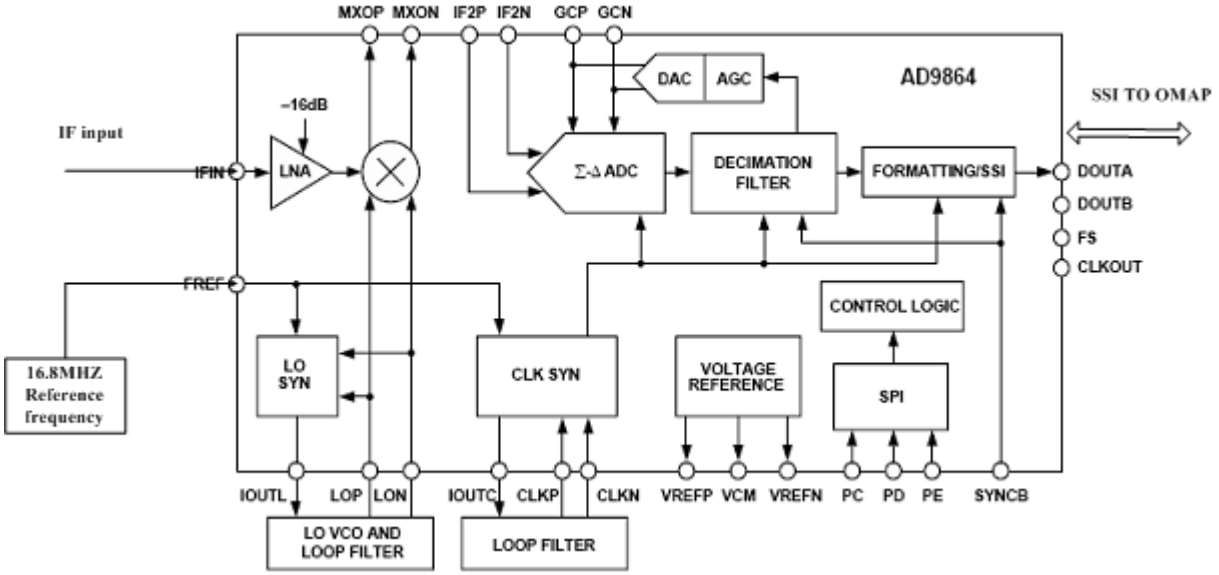


Figure 18-3 Diagram of IF Processor

The first IF signal (44.85MHz) output by the IF amplifier goes into IF IC via Pin 47, where the signal is converted to the second IF signal (2.25MHz). Then the un-demodulated digital I/Q signal output from the SSI interface is sent to U302 for demodulation. IF IC employs a reference frequency of 19.2MHz and shares the crystal with U302. The second LO VCO consists of the external transistor, varactor and some other components, to provide the second LO signal. The 18MHz clock frequency is generated by the LC resonance loop (D702, L715 and C745).

DSP (U302) gets the audio signal from IF IC (U701). Then this signal goes through U302 to output data signal, which is sent to U231 and PIN44 (SSI_DI) for digital-to-analog conversion. Finally, the output analog audio signal will be subjected to gain control, and then fed to the speaker.

18.3 Frequency Generation Unit (FGU)

18.3.1 PLL Synthesizer

The PLL synthesizer that consists of the reference oscillator (X100), PLL IC (U100) and VCO, is utilized to supply excitation signal source to the transmitter, and local oscillator signal to the receiver.

18.3.2 Reference Oscillator

X100 is a 19.2MHz TCXO, and its reference frequency is calibrated by the digital-to-analog converter (U500) for accuracy.

18.3.3 PLL IC

The PLL IC (U100) is a fractional frequency divider. The logic IC U101 and U102 work with the PLL IC (U100) to achieve locking.

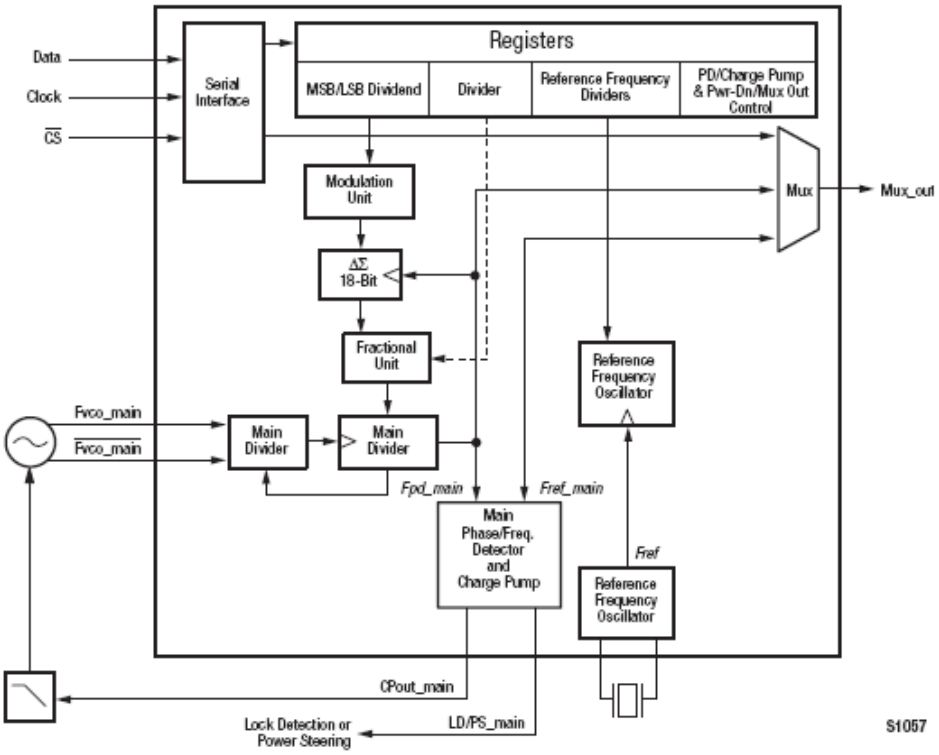


Figure 18-4 Diagram of PLL IC

The 19.2MHz frequency generated by the reference oscillator (X100) goes into the PLL IC (U100) for division, generating the reference frequency. Meanwhile, the frequency generated by VCO goes into PLL IC (U100) for frequency division. The resulting frequency will be compared with the reference frequency in terms of phase difference in the phase detector. After comparison, the resulting frequency is converted to CV voltage via the loop filter, to control and lock the frequency.

18.3.4 VCO

The VCO is composed of transistors (Q100, Q103, Q106 and Q110), varactors and four Colpitts oscillators. There are four VCOs in all: two VCOs (Q100 and Q103) used to transmit excitation signals and the other two VCOs (Q106 and Q110) to receive LO signals. U302 controls the operating frequency of the VCO. Q102 and Q107 constitute the buffer amplifiers for the transmitter circuit, while Q111 and Q109 for the receiver circuit. The digital-to-analog converter (U500) modulates the TX oscillator signal.

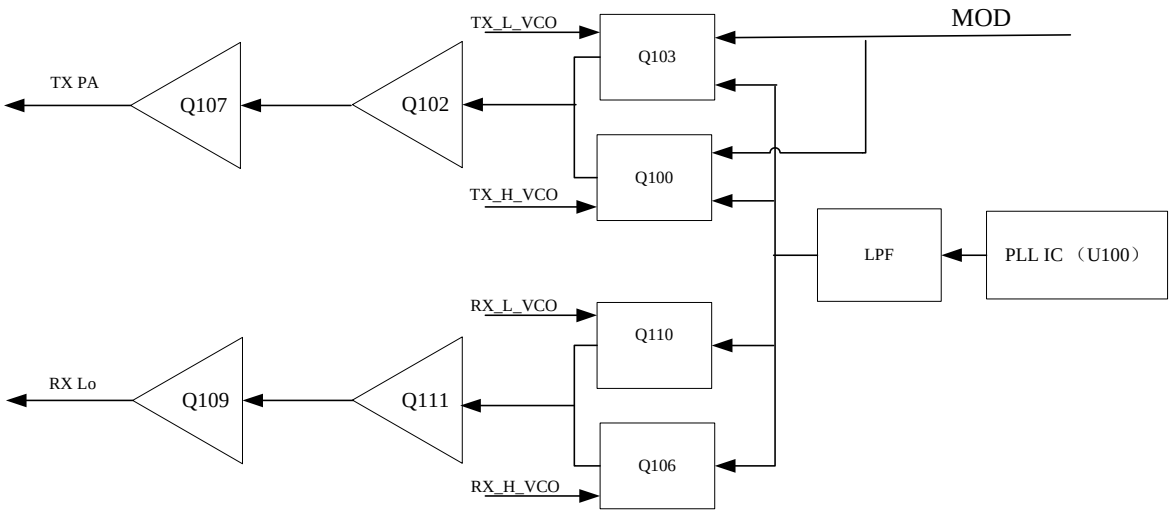
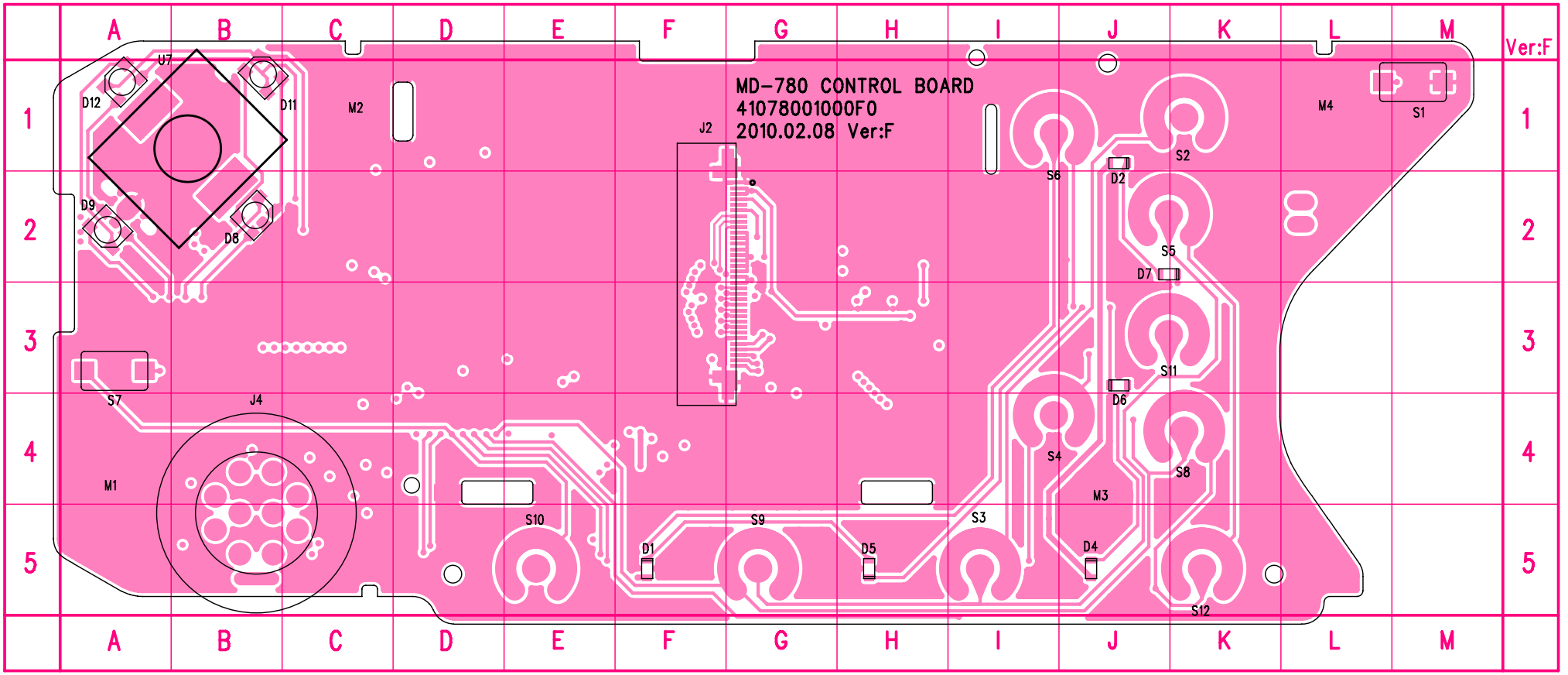


Figure 18-5 Diagram of VCO

18.4 PCB View

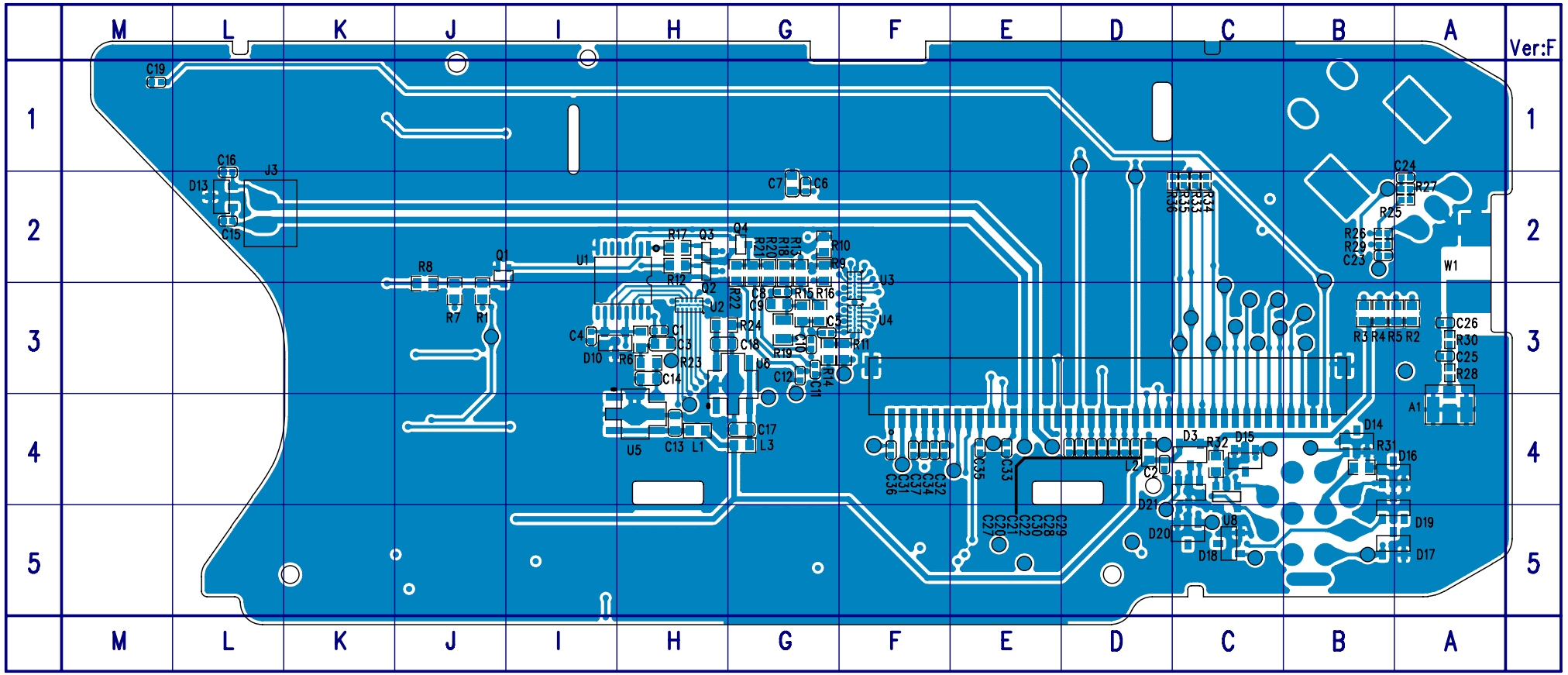
MD78X/MD78XG PCB View (Front Panel)

Top Layer

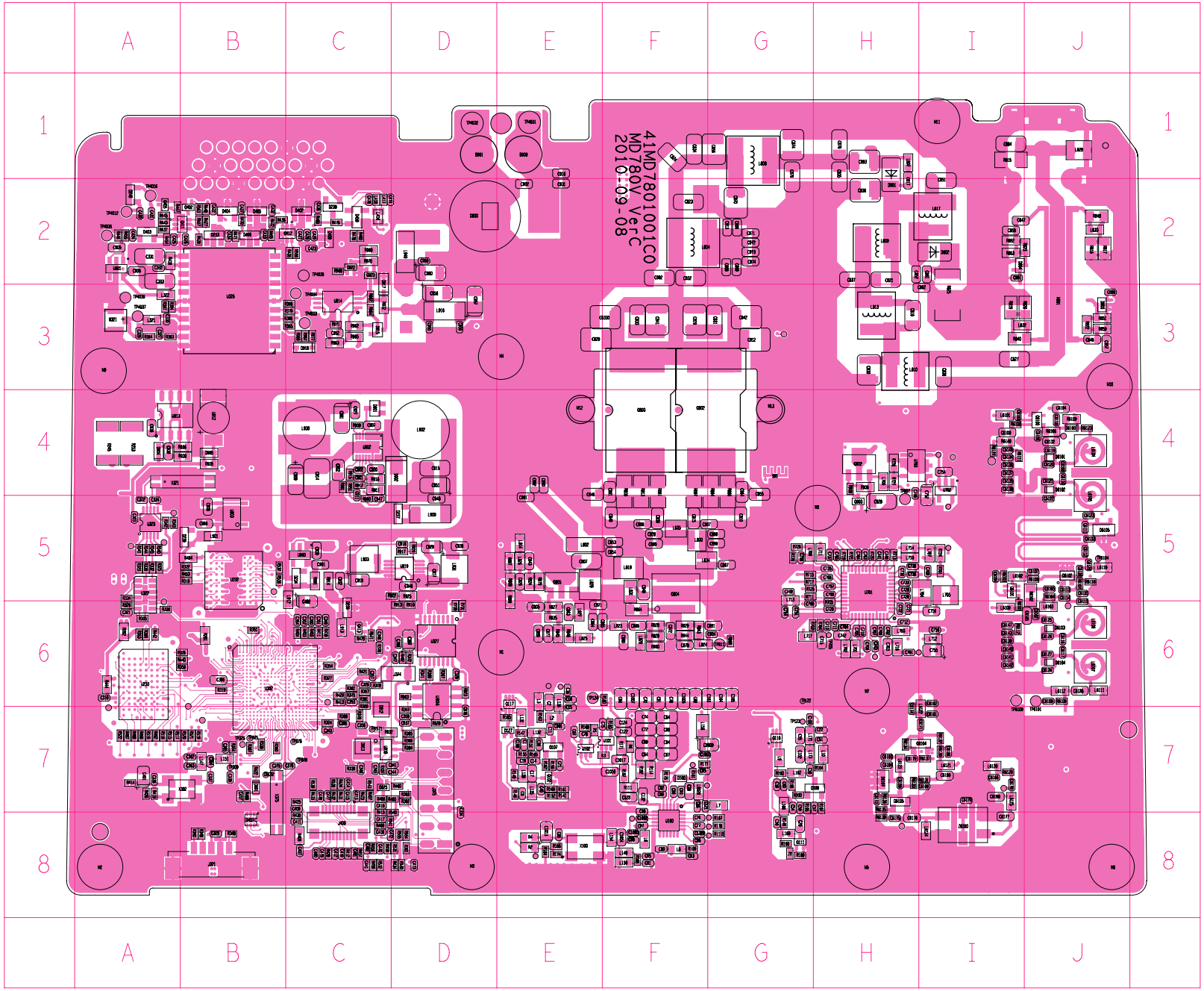


MD78X/MD78XG PCB View (Front Panel)

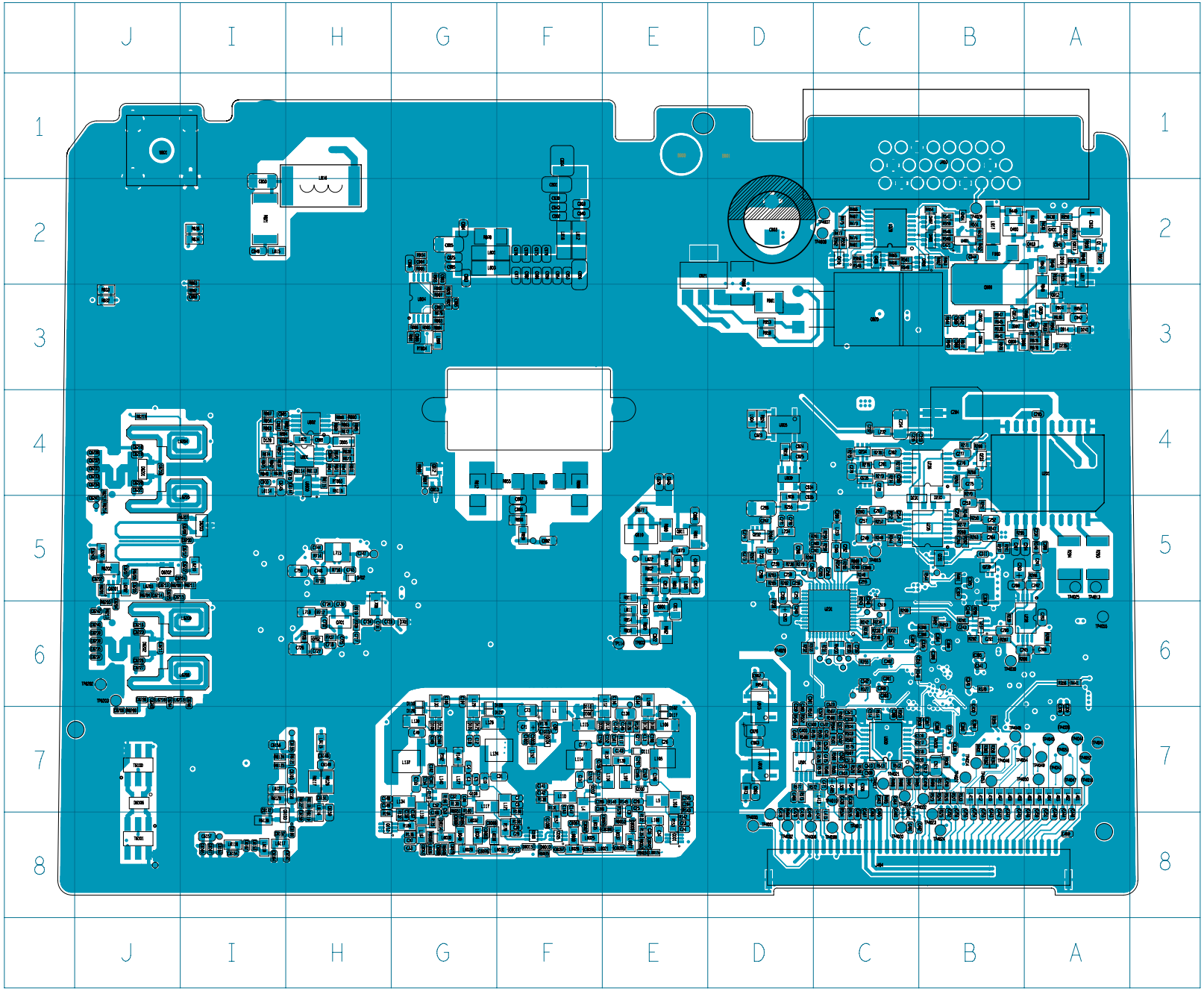
Bottom Layer



MD78X/MD78XG PCB View (Main Board)
Top Layer

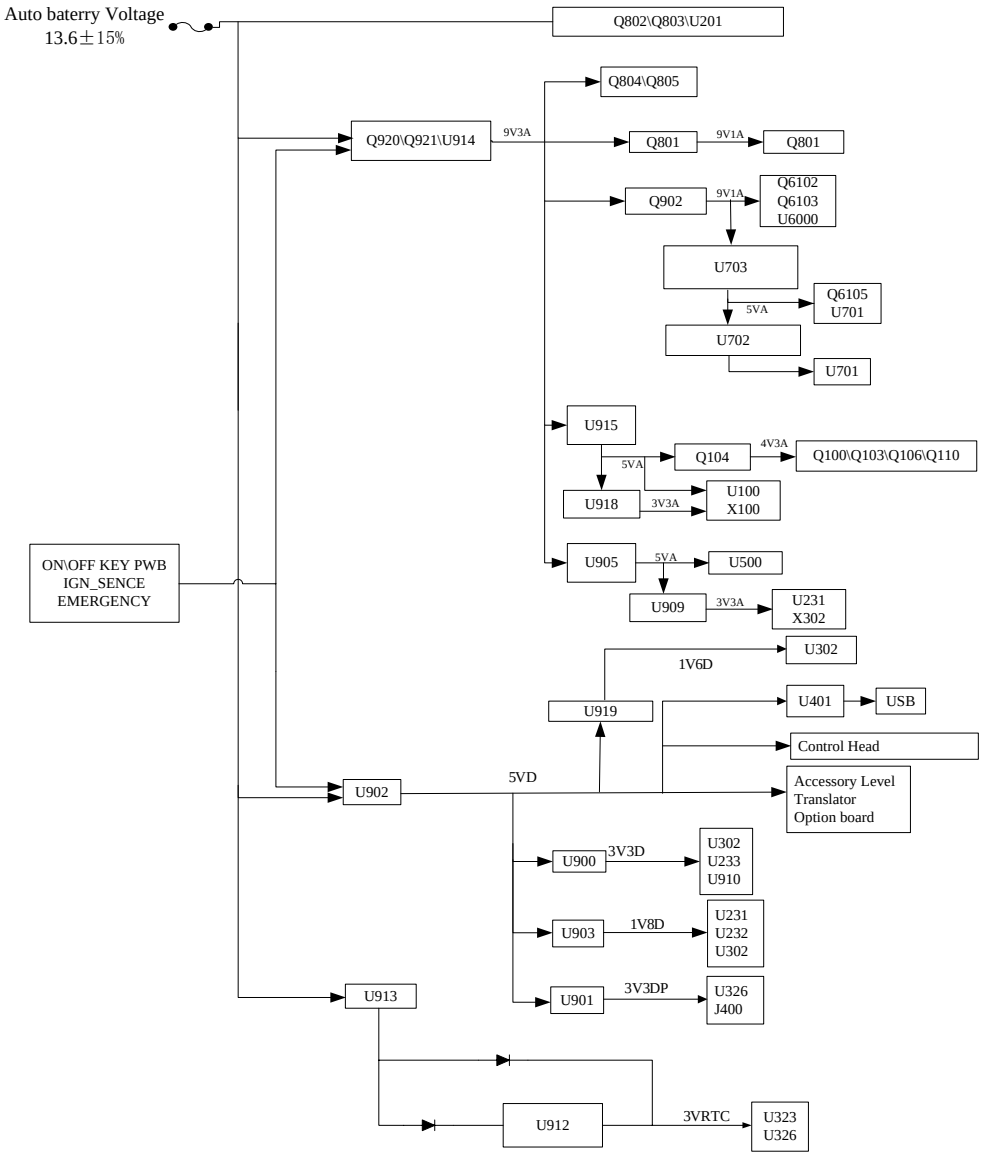


MD78X/MD78XG PCB View (Main Board)
Bottom Layer

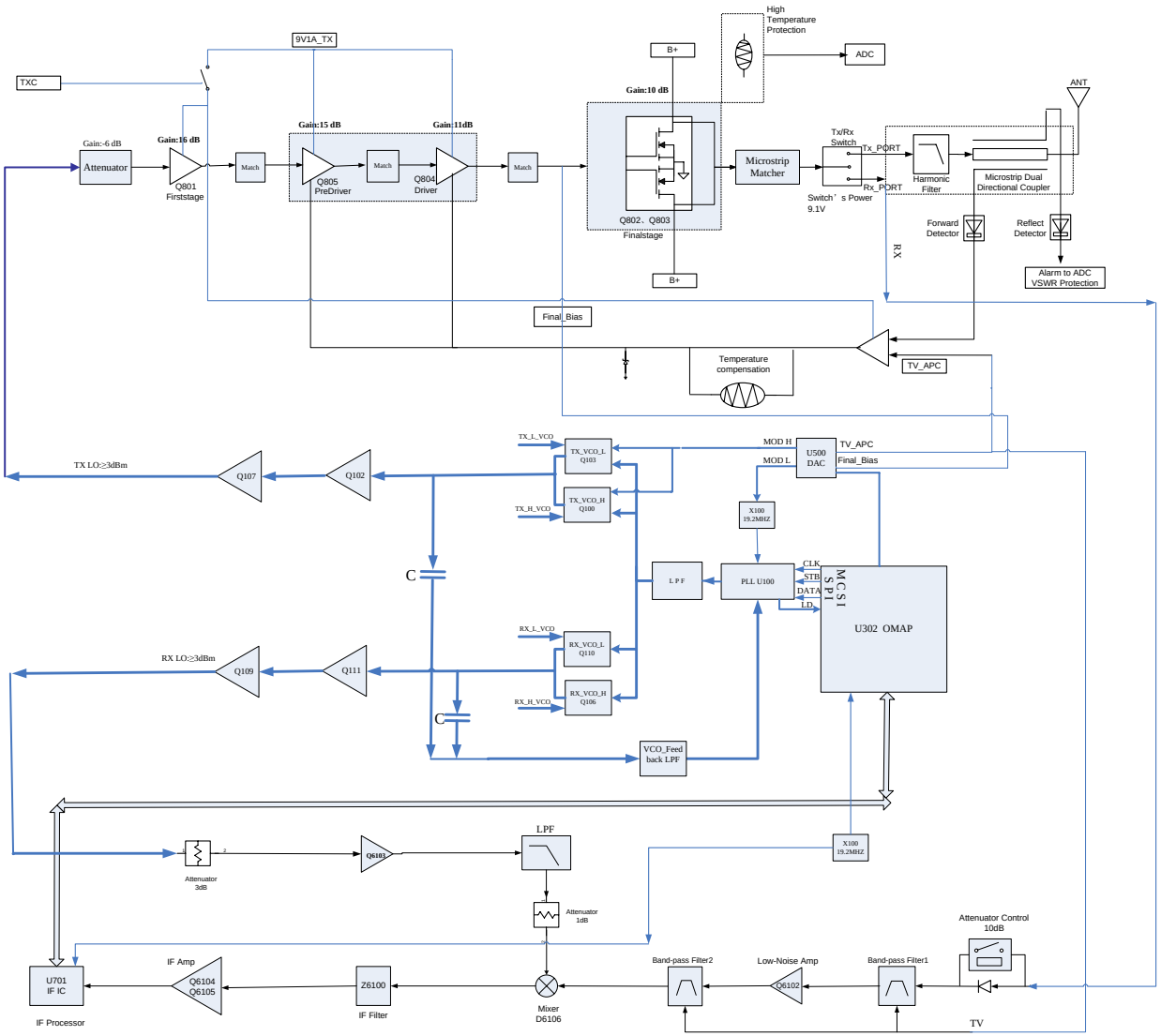


18.5 Block Diagram

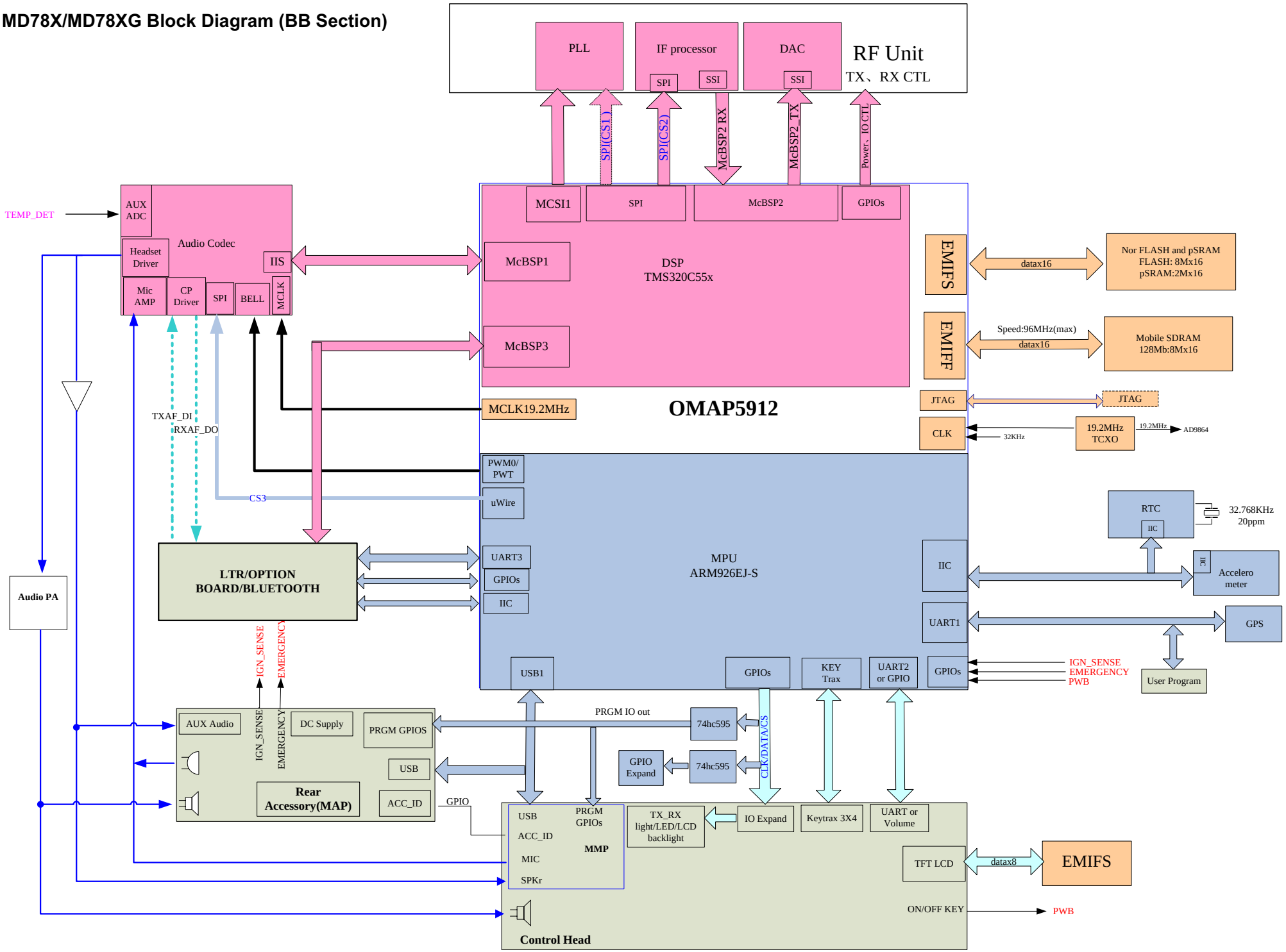
MD78X/MD78XG Block Diagram (Power Section)



MD78X/MD78XG Block Diagram (RF Section)

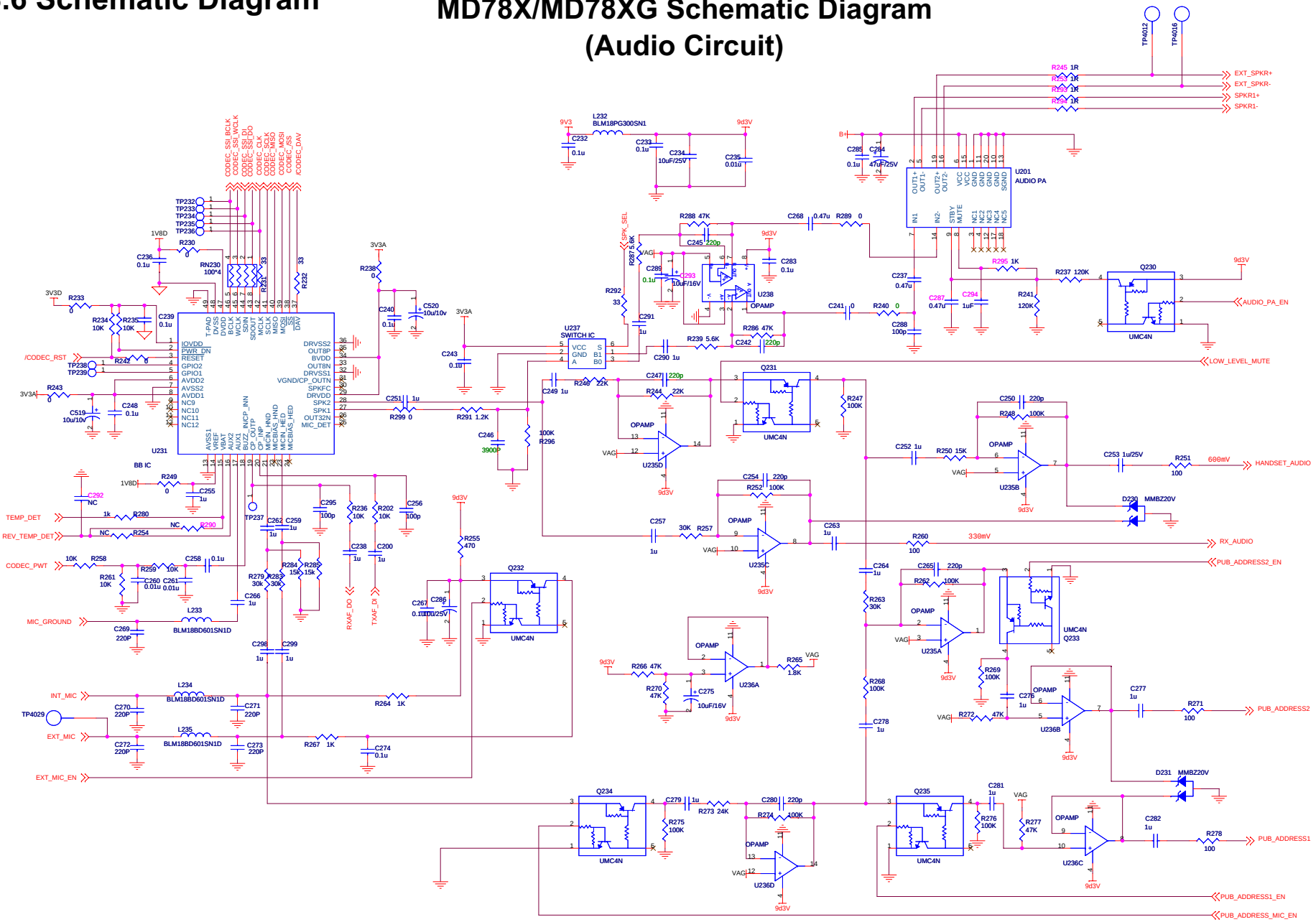


MD78X/MD78XG Block Diagram (BB Section)

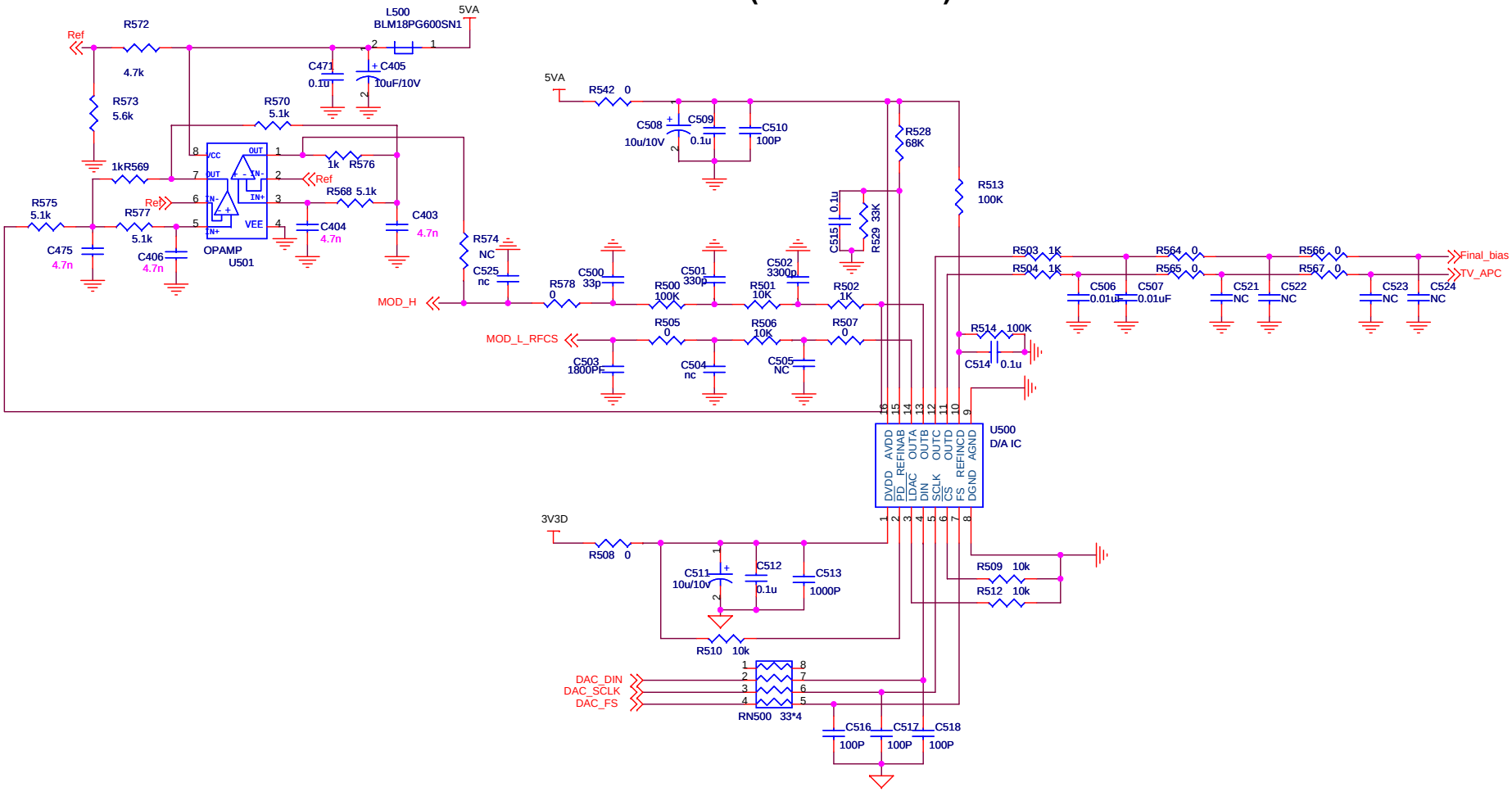


18.6 Schematic Diagram

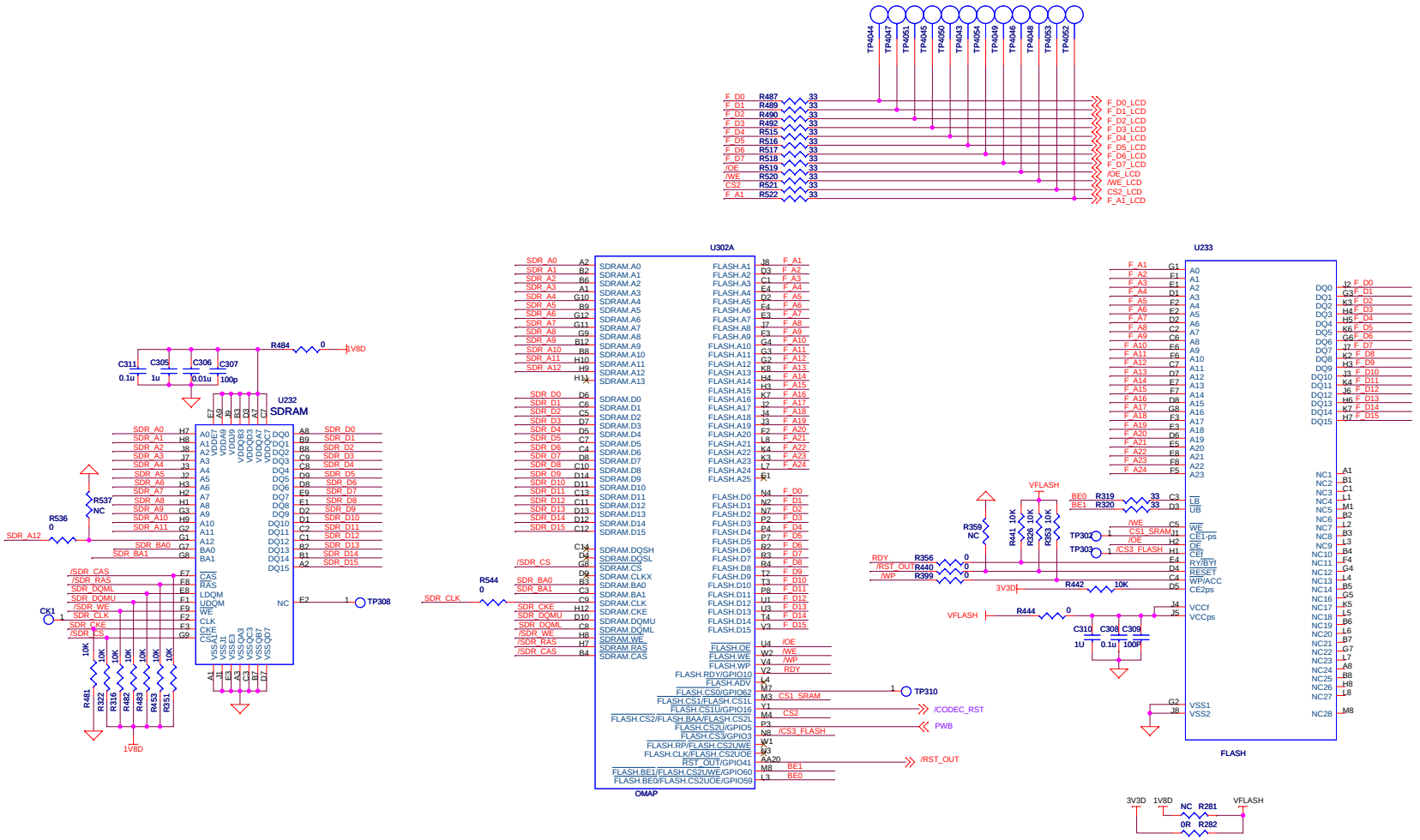
MD78X/MD78XG Schematic Diagram (Audio Circuit)



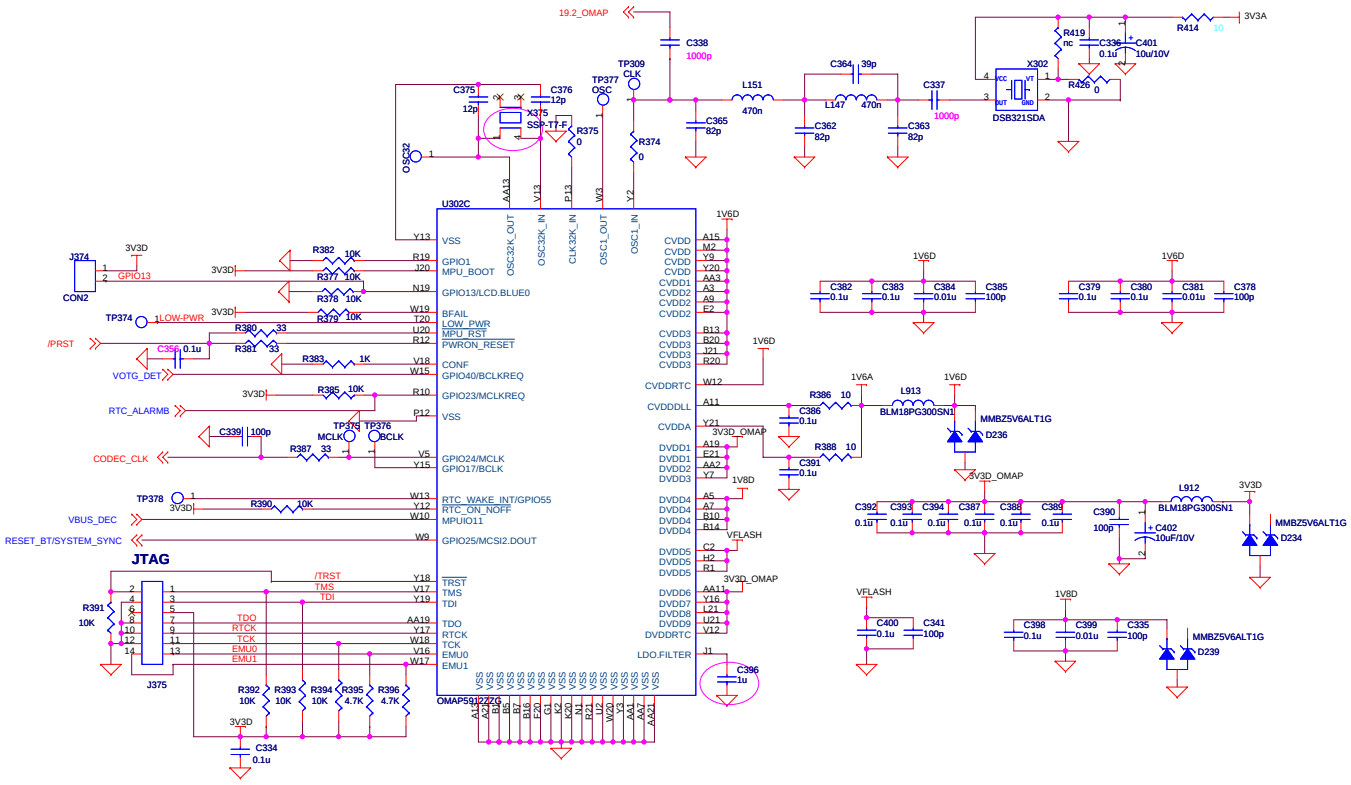
MD78X/MD78XG Schematic Diagram
(DAC Circuit)



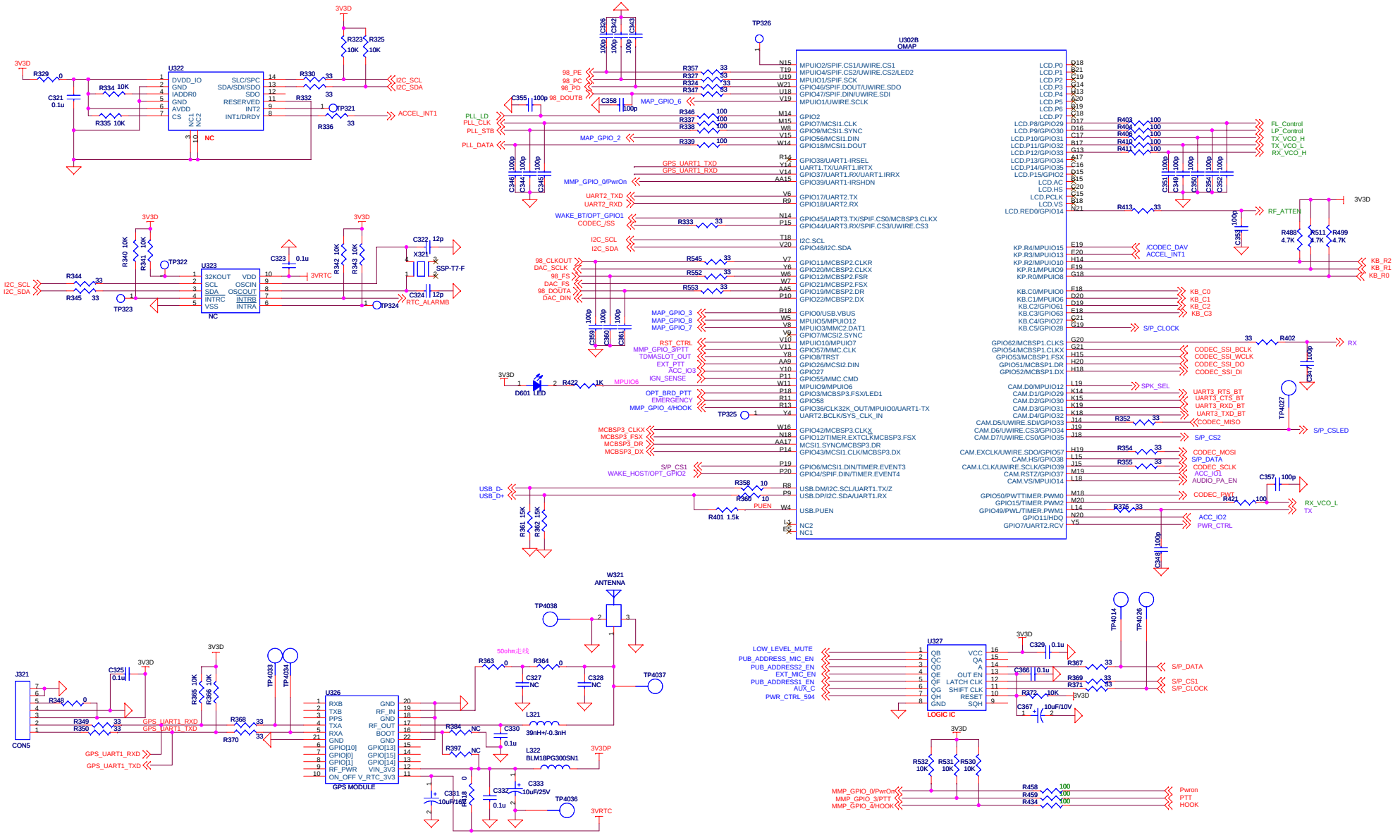
MD78X/MD78XG Schematic Diagram (Memory Circuit)



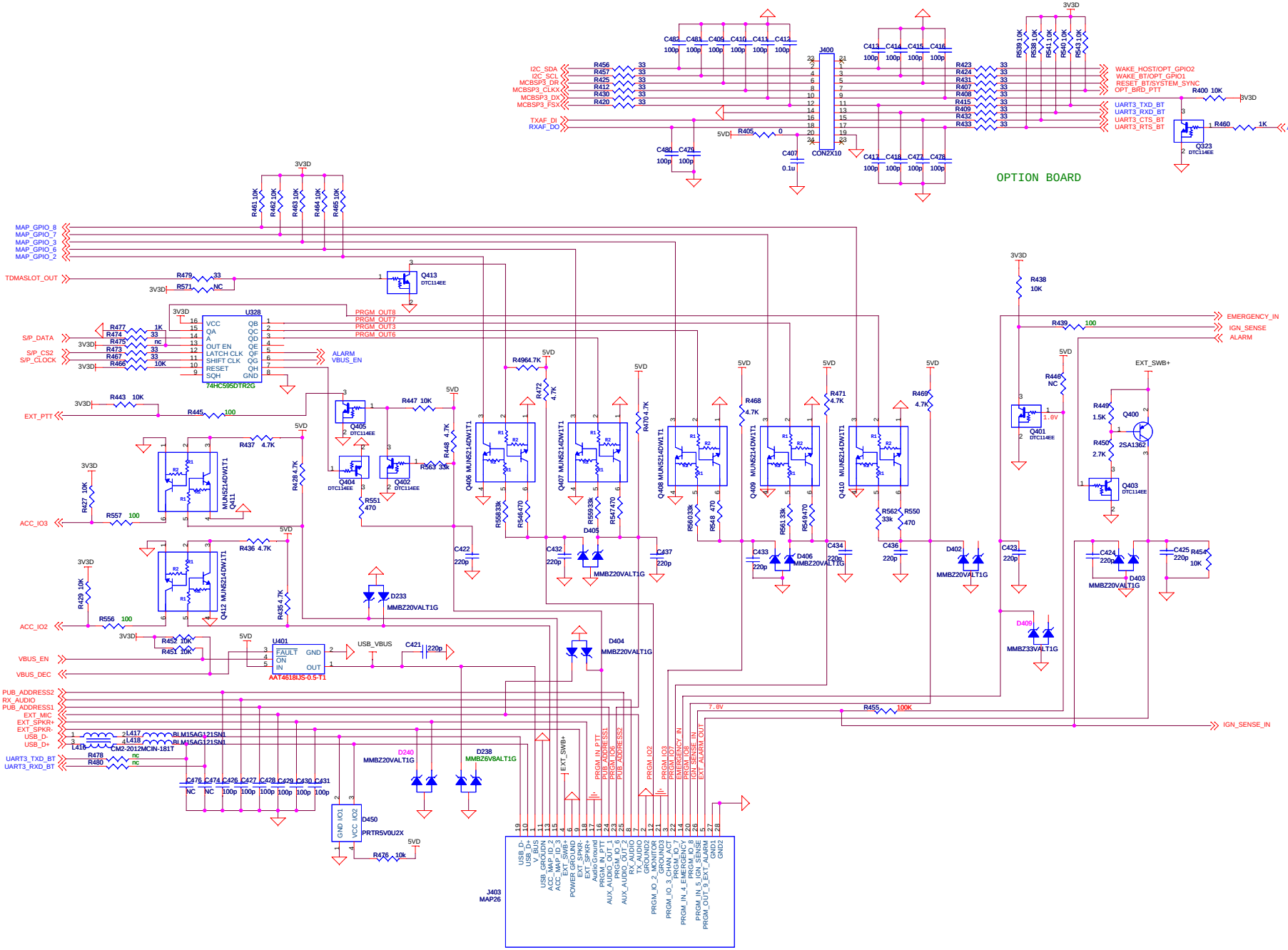
MD78X/MD78XG Schematic Diagram
(OMAP Circuit)



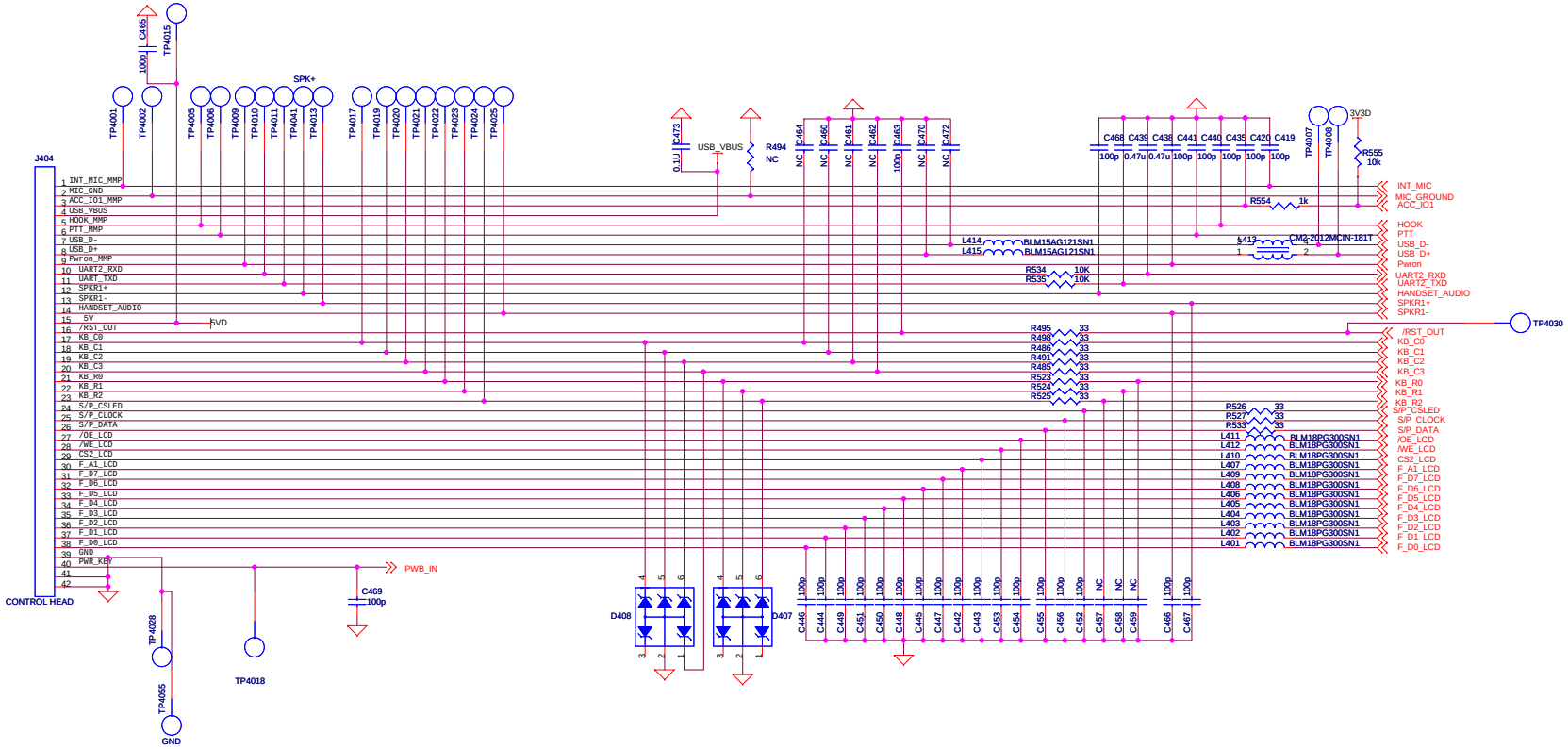
MD78X/MD78XG Schematic Diagram (OMAP & GPS Circuit)



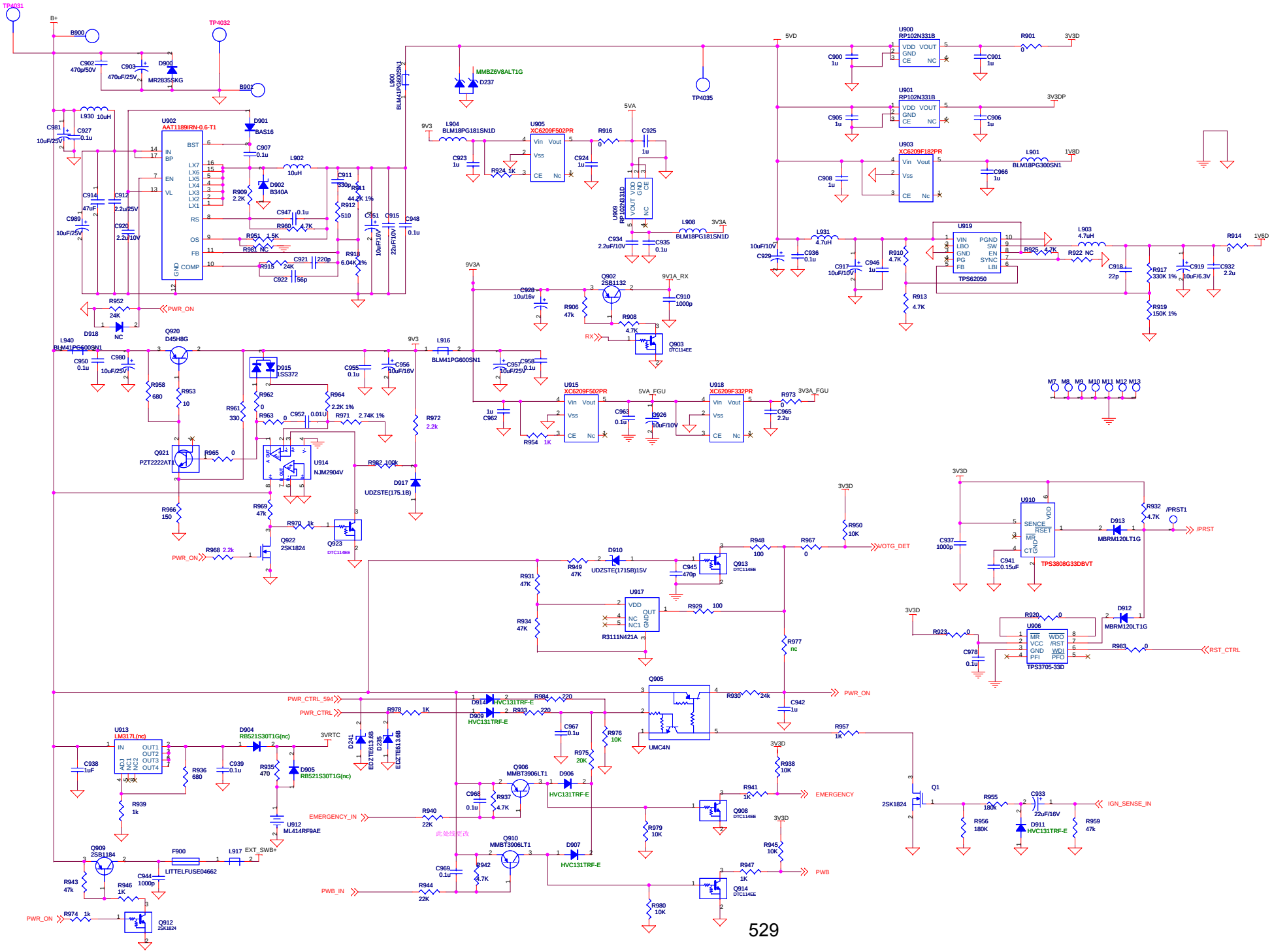
MD78X/MD78XG Schematic Diagram (Peripheral Interface Circuit)



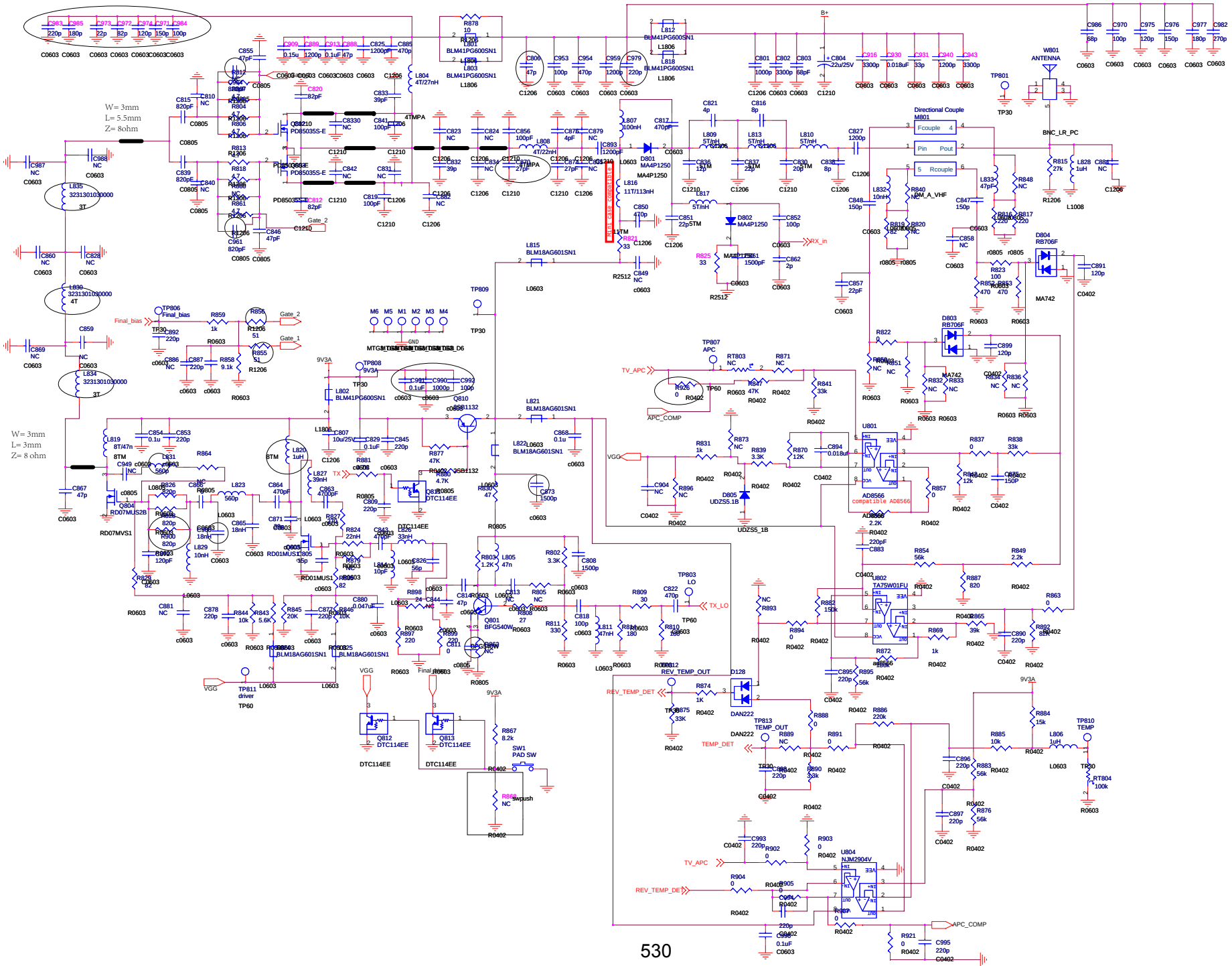
MD78X/MD78XG Schematic Diagram
(40-Pin Interface Circuit)



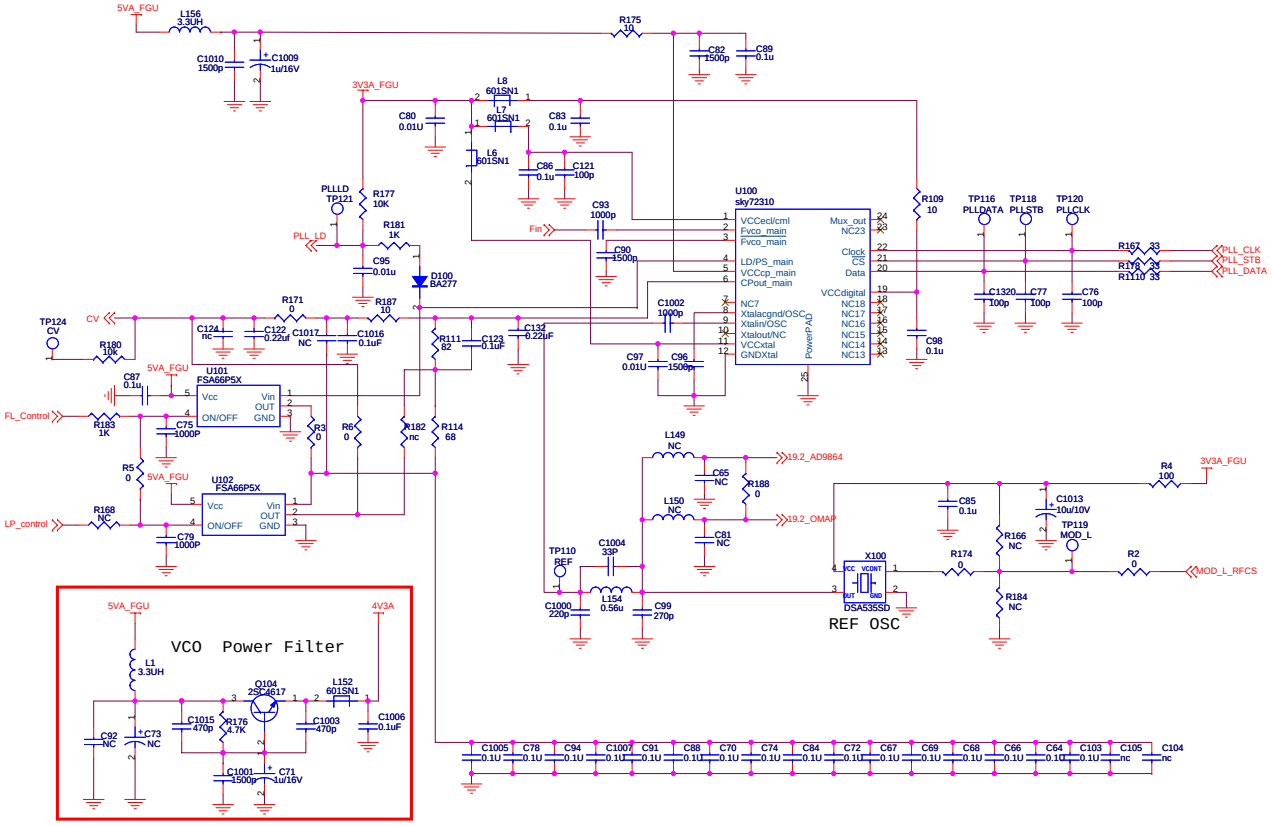
MD78X/MD78XG Schematic Diagram (Power Circuit)



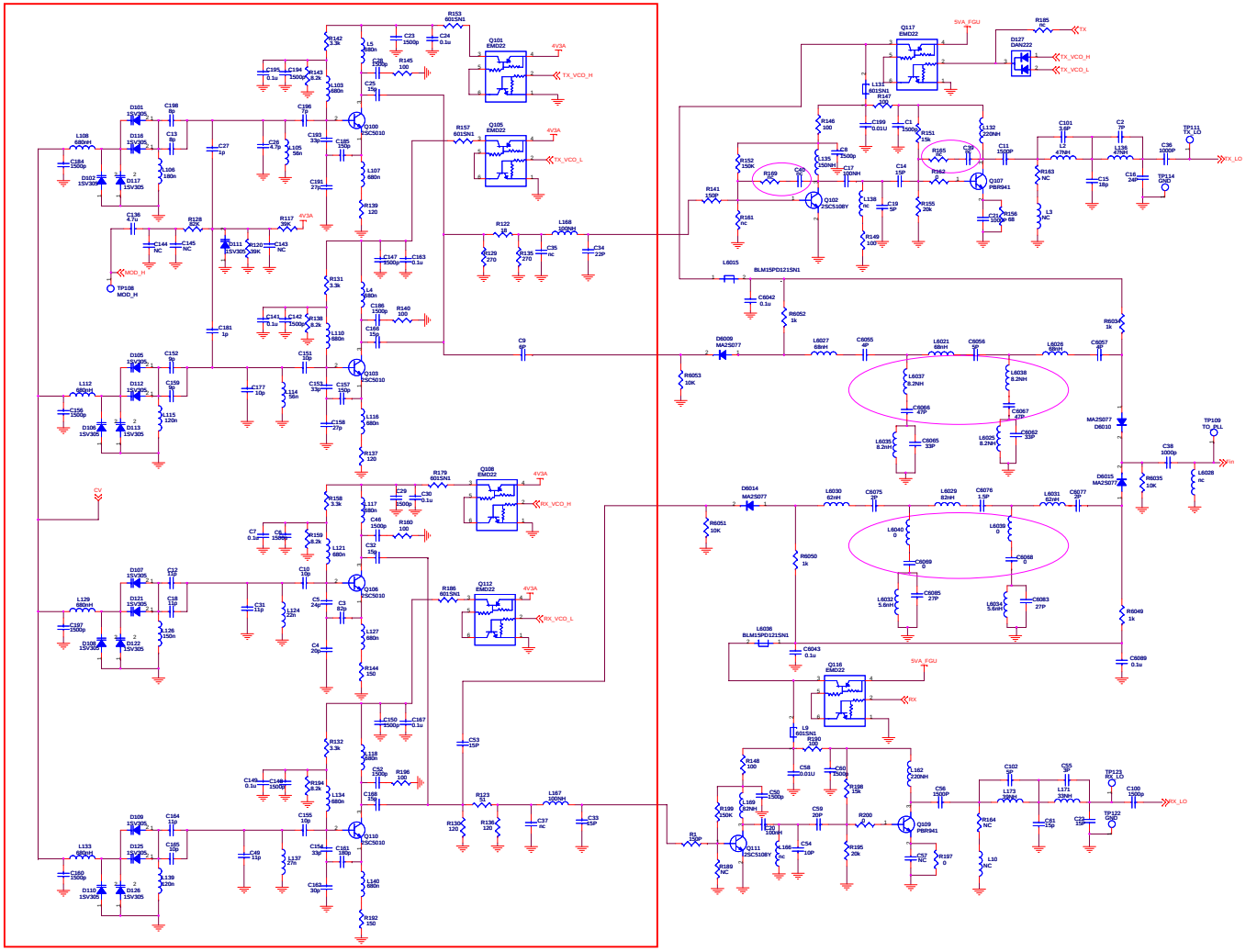
MD78X/MD78XG Schematic Diagram (TX Circuit)



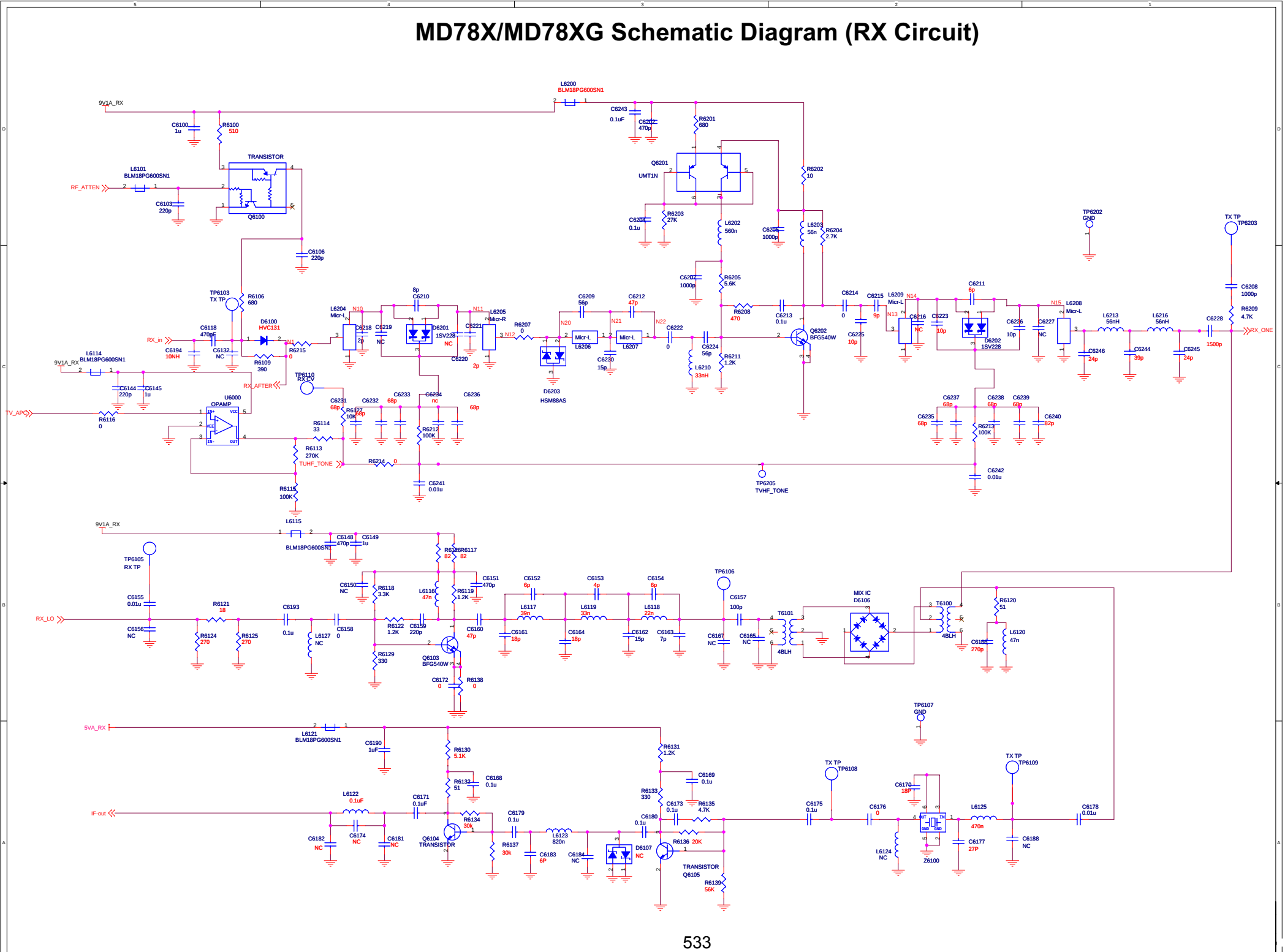
MD78X/MD78XG Schematic Diagram
(PLL Circuit)



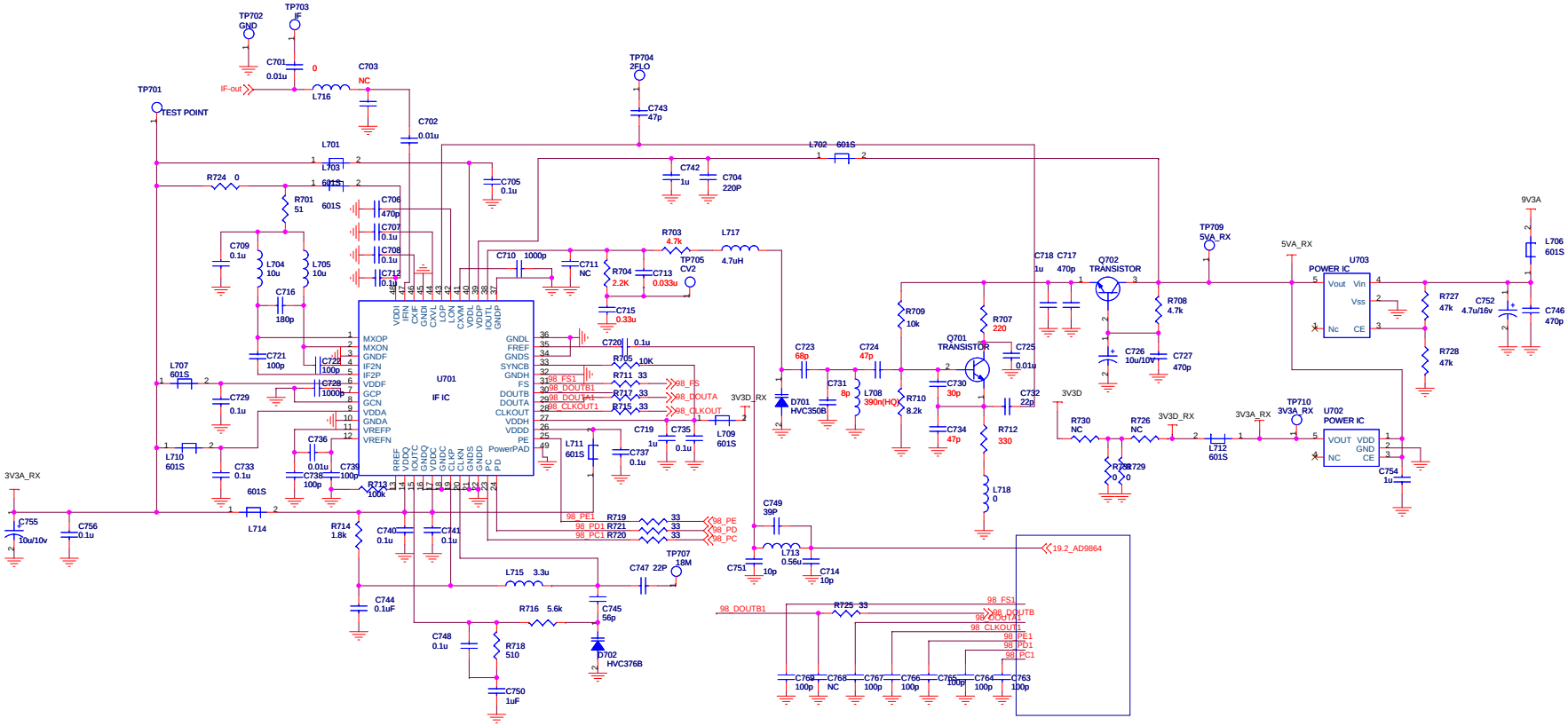
MD78X/MD78XG Schematic Diagram (VCO Circuit)



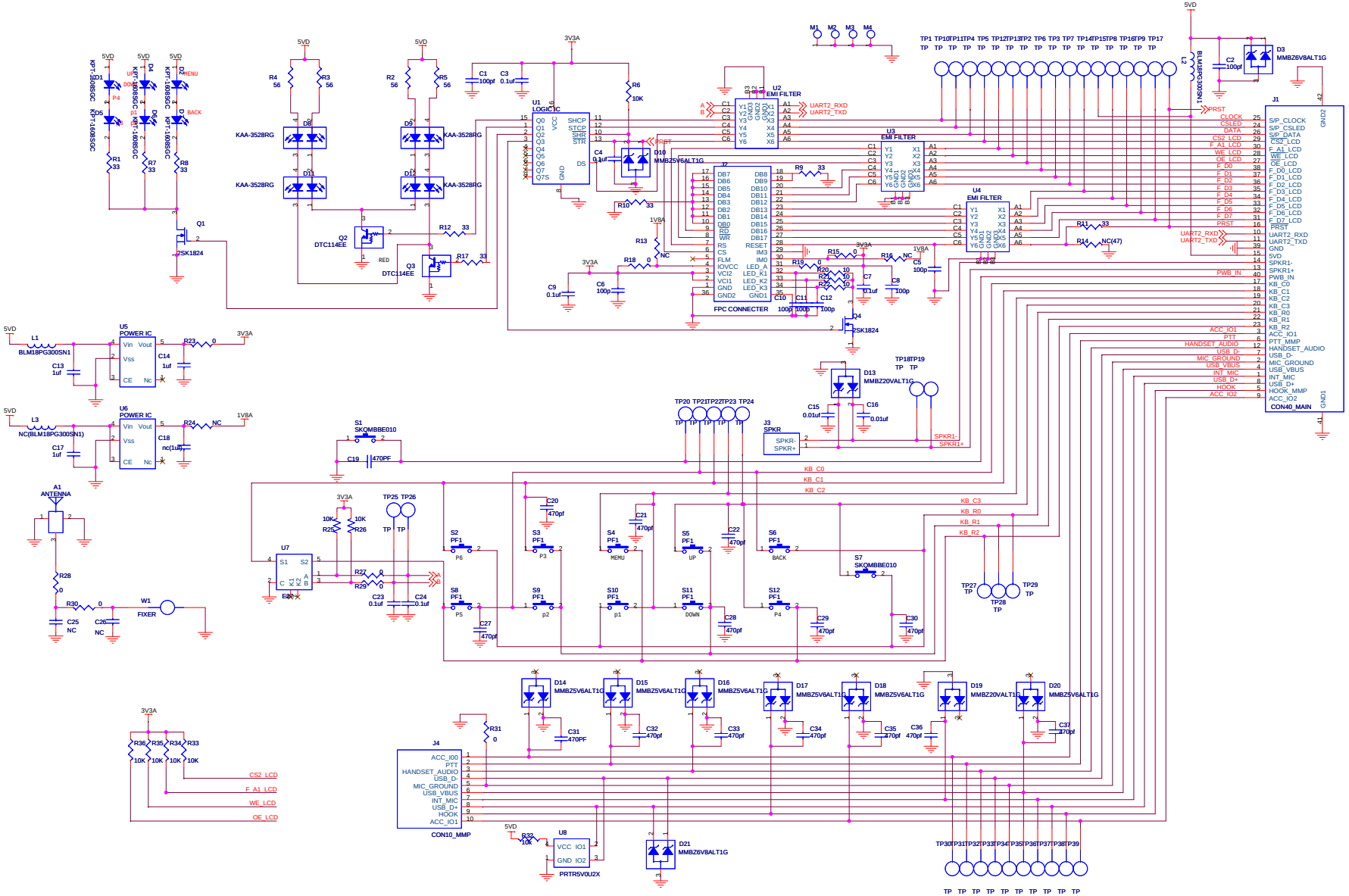
MD78X/MD78XG Schematic Diagram (RX Circuit)



MD78X/MD78XG Schematic Diagram
(IF Circuit)



MD78X/MD78XG Schematic Diagram
(Front Panel)



18.7 Parts List

Main Board *for MD78X/MD78XG*

No.	Ref. No.	Part No.	Description
1	C1	3101051520000	1500PF
2	C100	3101051520000	1500PF
3	C1001	3101051520000	1500PF
4	C1010	3101051520000	1500PF
5	C11	3101051520000	1500PF
6	C14	3101051520000	1500PF
7	C142	3101051520000	1500PF
8	C147	3101051520000	1500PF
9	C148	3101051520000	1500PF
10	C150	3101051520000	1500PF
11	C156	3101051520000	1500PF
12	C160	3101051520000	1500PF
13	C184	3101051520000	1500PF
14	C186	3101051520000	1500PF
15	C194	3101051520000	1500PF
16	C197	3101051520000	1500PF
17	C23	3101051520000	1500PF
18	C28	3101051520000	1500PF
19	C29	3101051520000	1500PF
20	C46	3101051520000	1500PF
21	C50	3101051520000	1500PF
22	C52	3101051520000	1500PF
23	C56	3101051520000	1500PF
24	C6	3101051520000	1500PF
25	C60	3101051520000	1500PF
26	C6202	3101051520000	1500PF
27	C6228	3101051520000	1500PF
28	C6241	3101051520000	1500PF
29	C6242	3101051520000	1500PF
30	C8	3101051520000	1500PF
31	C82	3101051520000	1500PF
32	C90	3101051520000	1500PF
33	C96	3101051520000	1500PF
34	C196	3101060700020	7PF
35	C2	3101060700020	7PF
36	C362	3101058200000	82PF
37	C363	3101058200000	82PF
38	C365	3101058200000	82PF
39	C6240	3101058200000	82PF
40	C994	3101058200000	82PF
41	C16	3101052400010	24PF

No.	Ref. No.	Part No.	Description
42	C5	3101052400010	24PF
43	C6083	3101052400010	24PF
44	C6085	3101052400010	24PF
45	C6245	3101052000040	20PF
46	C6246	3101052000040	20PF
47	C747	3101052200010	22PF
48	C918	3101052200010	22PF
49	C1006	3101051040010	0.1UF
50	C141	3101051040010	0.1UF
51	C149	3101051040010	0.1UF
52	C163	3101051040010	0.1UF
53	C167	3101051040010	0.1UF
54	C195	3101051040010	0.1UF
55	C232	3101051040010	0.1UF
56	C233	3101051040010	0.1UF
57	C236	3101051040010	0.1UF
58	C239	3101051040010	0.1UF
59	C24	3101051040010	0.1UF
60	C240	3101051040010	0.1UF
61	C243	3101051040010	0.1UF
62	C248	3101051040010	0.1UF
63	C258	3101051040010	0.1UF
64	C267	3101051040010	0.1UF
65	C274	3101051040010	0.1UF
66	C285	3101051040010	0.1UF
67	C30	3101051040010	0.1UF
68	C308	3101051040010	0.1UF
69	C311	3101051040010	0.1UF
70	C321	3101051040010	0.1UF
71	C323	3101051040010	0.1UF
72	C329	3101051040010	0.1UF
73	C334	3101051040010	0.1UF
74	C336	3101051040010	0.1UF
75	C356	3101051040010	0.1UF
76	C366	3101051040010	0.1UF
77	C379	3101051040010	0.1UF
78	C380	3101051040010	0.1UF
79	C382	3101051040010	0.1UF
80	C383	3101051040010	0.1UF
81	C386	3101051040010	0.1UF
82	C387	3101051040010	0.1UF
83	C388	3101051040010	0.1UF
84	C389	3101051040010	0.1UF
85	C391	3101051040010	0.1UF

No.	Ref. No.	Part No.	Description
86	C392	3101051040010	0.1UF
87	C393	3101051040010	0.1UF
88	C394	3101051040010	0.1UF
89	C398	3101051040010	0.1UF
90	C400	3101051040010	0.1UF
91	C407	3101051040010	0.1UF
92	C422	3101051040010	0.1UF
93	C471	3101051040010	0.1UF
94	C473	3101051040010	0.1UF
95	C509	3101051040010	0.1UF
96	C512	3101051040010	0.1UF
97	C514	3101051040010	0.1UF
98	C515	3101051040010	0.1UF
99	C6042	3101051040010	0.1UF
100	C6043	3101051040010	0.1UF
101	C6089	3101051040010	0.1UF
102	C6168	3101051040010	0.1UF
103	C6169	3101051040010	0.1UF
104	C6171	3101051040010	0.1UF
105	C6173	3101051040010	0.1UF
106	C6175	3101051040010	0.1UF
107	C6179	3101051040010	0.1UF
108	C6180	3101051040010	0.1UF
109	C6204	3101051040010	0.1UF
110	C6213	3101051040010	0.1UF
111	C6243	3101051040010	0.1UF
112	C7	3101051040010	0.1UF
113	C705	3101051040010	0.1UF
114	C707	3101051040010	0.1UF
115	C708	3101051040010	0.1UF
116	C709	3101051040010	0.1UF
117	C712	3101051040010	0.1UF
118	C720	3101051040010	0.1UF
119	C729	3101051040010	0.1UF
120	C733	3101051040010	0.1UF
121	C735	3101051040010	0.1UF
122	C737	3101051040010	0.1UF
123	C740	3101051040010	0.1UF
124	C741	3101051040010	0.1UF
125	C744	3101051040010	0.1UF
126	C756	3101051040010	0.1UF
127	C83	3101051040010	0.1UF
128	C85	3101051040010	0.1UF
129	C86	3101051040010	0.1UF

No.	Ref. No.	Part No.	Description
130	C87	3101051040010	0.1UF
131	C89	3101051040010	0.1UF
132	C947	3101051040010	0.1UF
133	C950	3101051040010	0.1UF
134	C955	3101051040010	0.1UF
135	C958	3101051040010	0.1UF
136	C967	3101051040010	0.1UF
137	C968	3101051040010	0.1UF
138	C969	3101051040010	0.1UF
139	C978	3101051040010	0.1UF
140	C98	3101051040010	0.1UF
141	C166	3101051500080	15PF
142	C168	3101051500080	15PF
143	C22	3101051500080	15PF
144	C25	3101051500080	15PF
145	C32	3101051500080	15PF
146	C33	3101051500080	15PF
147	C53	3101051500080	15PF
148	C61	3101051500080	15PF
149	C6162	3101051500080	15PF
150	C6230	3101051500080	15PF
151	C159	3101051000020	10PF
152	C54	3101051000020	10PF
153	C152	3101050900000	9PF
154	C6215	3101050900000	9PF
155	C12	3101051100010	11PF
156	C164	3101051100010	11PF
157	C18	3101051100010	11PF
158	C165	3101051000030	10PF
159	C6223	3101051000030	10PF
160	C6225	3101051000030	10PF
161	C6226	3101051000030	10PF
162	C714	3101051000030	10PF
163	C751	3101051000030	10PF
164	C6152	3101050500010	5PF
165	C6056	3101050300000	3PF
166	C13	3101050600010	6PF
167	C6154	3101050600010	6PF
168	C6211	3101050600010	6PF
169	C9	3101050600010	6PF
170	C322	3101051200020	12PF
171	C324	3101051200020	12PF
172	C375	3101051200020	12PF
173	C376	3101051200020	12PF

No.	Ref. No.	Part No.	Description
174	C15	3101051800070	18PF
175	C6170	3101051800070	18PF
176	C4	3101052000020	20PF
177	C59	3101052000020	20PF
178	C6161	3101052000020	20PF
179	C6164	3101052000020	20PF
180	C1002	3101051020010	1000PF
181	C337	3101051020010	1000PF
182	C338	3101051020010	1000PF
183	C36	3101051020010	1000PF
184	C513	3101051020010	1000PF
185	C6205	3101051020010	1000PF
186	C6207	3101051020010	1000PF
187	C6208	3101051020010	1000PF
188	C710	3101051020010	1000PF
189	C728	3101051020010	1000PF
190	C75	3101051020010	1000PF
191	C79	3101051020010	1000PF
192	C910	3101051020010	1000PF
193	C93	3101051020010	1000PF
194	C937	3101051020010	1000PF
195	C944	3101051020010	1000PF
196	C21	3101054720000	4700PF
197	C26	3101064590010	4.5PF
198	C181	3101050100030	1PF
199	C27	3101050100030	1PF
200	C10	3101061300000	13PF
201	C151	3101061100010	11PF
202	C31	3101061100010	11PF
203	C34	3101062200010	22PF
204	C867	3101062200010	22PF
205	C38	3101061020040	1000PF
206	C817	3101061020040	1000PF
207	L132	3210406331000	330nH
208	L162	3210406331000	330nH
209	L807	3210406331000	330nH
210	C177	3101061000000	10PF
211	C49	3101061000000	10PF
212	L814	3212106470000	47nH
213	C55	3101060300010	3PF
214	C199	3101051030020	0.01UF
215	C235	3101051030020	0.01UF
216	C260	3101051030020	0.01UF
217	C261	3101051030020	0.01UF

No.	Ref. No.	Part No.	Description
218	C306	3101051030020	0.01UF
219	C381	3101051030020	0.01UF
220	C384	3101051030020	0.01UF
221	C399	3101051030020	0.01UF
222	C506	3101051030020	0.01UF
223	C507	3101051030020	0.01UF
224	C58	3101051030020	0.01UF
225	C6155	3101051030020	0.01UF
226	C6178	3101051030020	0.01UF
227	C701	3101051030020	0.01UF
228	C702	3101051030020	0.01UF
229	C725	3101051030020	0.01UF
230	C736	3101051030020	0.01UF
231	C80	3101051030020	0.01UF
232	C95	3101051030020	0.01UF
233	C97	3101051030020	0.01UF
234	C1005	3101051030020	0.01UF
235	C1007	3101051030020	0.01UF
236	C103	3101051030020	0.01UF
237	C64	3101051030020	0.01UF
238	C66	3101051030020	0.01UF
239	C67	3101051030020	0.01UF
240	C68	3101051030020	0.01UF
241	C69	3101051030020	0.01UF
242	C70	3101051030020	0.01UF
243	C72	3101051030020	0.01UF
244	C74	3101051030020	0.01UF
245	C78	3101051030020	0.01UF
246	C84	3101051030020	0.01UF
247	C88	3101051030020	0.01UF
248	C91	3101051030020	0.01UF
249	C94	3101051030020	0.01UF
250	C1009	3101071050020	1UF
251	C71	3101071050020	1UF
252	C750	3101071050020	1UF
253	C121	3101051010030	100PF
254	C1320	3101051010030	100PF
255	C256	3101051010030	100PF
256	C288	3101051010030	100PF
257	C295	3101051010030	100PF
258	C307	3101051010030	100PF
259	C309	3101051010030	100PF
260	C326	3101051010030	100PF
261	C335	3101051010030	100PF

No.	Ref. No.	Part No.	Description
262	C339	3101051010030	100PF
263	C341	3101051010030	100PF
264	C342	3101051010030	100PF
265	C343	3101051010030	100PF
266	C344	3101051010030	100PF
267	C345	3101051010030	100PF
268	C346	3101051010030	100PF
269	C347	3101051010030	100PF
270	C348	3101051010030	100PF
271	C349	3101051010030	100PF
272	C350	3101051010030	100PF
273	C351	3101051010030	100PF
274	C352	3101051010030	100PF
275	C353	3101051010030	100PF
276	C354	3101051010030	100PF
277	C355	3101051010030	100PF
278	C357	3101051010030	100PF
279	C358	3101051010030	100PF
280	C359	3101051010030	100PF
281	C360	3101051010030	100PF
282	C361	3101051010030	100PF
283	C378	3101051010030	100PF
284	C385	3101051010030	100PF
285	C390	3101051010030	100PF
286	C409	3101051010030	100PF
287	C410	3101051010030	100PF
288	C411	3101051010030	100PF
289	C412	3101051010030	100PF
290	C413	3101051010030	100PF
291	C414	3101051010030	100PF
292	C415	3101051010030	100PF
293	C416	3101051010030	100PF
294	C417	3101051010030	100PF
295	C418	3101051010030	100PF
296	C419	3101051010030	100PF
297	C420	3101051010030	100PF
298	C426	3101051010030	100PF
299	C427	3101051010030	100PF
300	C428	3101051010030	100PF
301	C429	3101051010030	100PF
302	C430	3101051010030	100PF
303	C431	3101051010030	100PF
304	C435	3101051010030	100PF
305	C440	3101051010030	100PF

No.	Ref. No.	Part No.	Description
306	C441	3101051010030	100PF
307	C442	3101051010030	100PF
308	C443	3101051010030	100PF
309	C444	3101051010030	100PF
310	C445	3101051010030	100PF
311	C446	3101051010030	100PF
312	C447	3101051010030	100PF
313	C448	3101051010030	100PF
314	C449	3101051010030	100PF
315	C450	3101051010030	100PF
316	C451	3101051010030	100PF
317	C452	3101051010030	100PF
318	C453	3101051010030	100PF
319	C454	3101051010030	100PF
320	C455	3101051010030	100PF
321	C456	3101051010030	100PF
322	C463	3101051010030	100PF
323	C465	3101051010030	100PF
324	C466	3101051010030	100PF
325	C467	3101051010030	100PF
326	C468	3101051010030	100PF
327	C469	3101051010030	100PF
328	C477	3101051010030	100PF
329	C478	3101051010030	100PF
330	C479	3101051010030	100PF
331	C480	3101051010030	100PF
332	C481	3101051010030	100PF
333	C482	3101051010030	100PF
334	C510	3101051010030	100PF
335	C516	3101051010030	100PF
336	C517	3101051010030	100PF
337	C518	3101051010030	100PF
338	C721	3101051010030	100PF
339	C722	3101051010030	100PF
340	C738	3101051010030	100PF
341	C739	3101051010030	100PF
342	C76	3101051010030	100PF
343	C763	3101051010030	100PF
344	C764	3101051010030	100PF
345	C765	3101051010030	100PF
346	C766	3101051010030	100PF
347	C767	3101051010030	100PF
348	C769	3101051010030	100PF
349	C77	3101051010030	100PF

No.	Ref. No.	Part No.	Description
350	C6166	3101052710000	270PF
351	C99	3101052710000	270PF
352	C101	3101053690010	3.6PF
353	C102	3101060500010	5PF
354	C123	3101061040010	0.1UF
355	C283	3101061040010	0.1UF
356	C289	3101061040010	0.1UF
357	C6193	3101061040010	0.1UF
358	C748	3101061040010	0.1UF
359	C829	3101061040010	0.1UF
360	C854	3101061040010	0.1UF
361	C868	3101061040010	0.1UF
362	C907	3101061040010	0.1UF
363	C927	3101061040010	0.1UF
364	C935	3101061040010	0.1UF
365	C936	3101061040010	0.1UF
366	C939	3101061040010	0.1UF
367	C942	3101061040010	0.1UF
368	C948	3101061040010	0.1UF
369	C963	3101061040010	0.1UF
370	C991	3101061040010	0.1UF
371	C996	3101061040010	0.1UF
372	L6122	3101061040010	0.1UF
373	C122	3101062240000	0.22UF
374	C132	3101062240000	0.22UF
375	C136	3101074750000	4.7UF
376	C752	3101074750000	4.7UF
377	C6218	3101050200010	2PF
378	C6221	3101050200010	2PF
379	C6075	3101052490010	2.4PF
380	C6077	3101052490010	2.4PF
381	C1000	3101052210010	220PF
382	C247	3101052210010	220PF
383	C250	3101052210010	220PF
384	C254	3101052210010	220PF
385	C265	3101052210010	220PF
386	C269	3101052210010	220PF
387	C270	3101052210010	220PF
388	C271	3101052210010	220PF
389	C272	3101052210010	220PF
390	C273	3101052210010	220PF
391	C280	3101052210010	220PF
392	C421	3101052210010	220PF
393	C423	3101052210010	220PF

No.	Ref. No.	Part No.	Description
394	C424	3101052210010	220PF
395	C425	3101052210010	220PF
396	C432	3101052210010	220PF
397	C433	3101052210010	220PF
398	C434	3101052210010	220PF
399	C436	3101052210010	220PF
400	C437	3101052210010	220PF
401	C6103	3101052210010	220PF
402	C6106	3101052210010	220PF
403	C6144	3101052210010	220PF
404	C6159	3101052210010	220PF
405	C704	3101052210010	220PF
406	C883	3101052210010	220PF
407	C890	3101052210010	220PF
408	C895	3101052210010	220PF
409	C896	3101052210010	220PF
410	C897	3101052210010	220PF
411	C898	3101052210010	220PF
412	C921	3101052210010	220PF
413	C153	3101053900000	39PF
414	C193	3101053900000	39PF
415	C364	3101053900000	39PF
416	C6244	3101053900000	39PF
417	C749	3101053900000	39PF
418	C157	3101051510000	150PF
419	C185	3101051510000	150PF
420	C3	3101051510000	150PF
421	C875	3101051510000	150PF
422	R1	3101051510000	150PF
423	R141	3101051510000	150PF
424	C162	3101053000010	30PF
425	C730	3101053000010	30PF
426	C154	3101053300000	33PF
427	C158	3101053300000	33PF
428	C191	3101053300000	33PF
429	C500	3101053300000	33PF
430	C6062	3101053300000	33PF
431	C6065	3101053300000	33PF
432	C6068	3101053300000	33PF
433	C6069	3101053300000	33PF
434	C161	3101051810010	180p
435	C200	3101061050020	1UF
436	C238	3101061050020	1UF
437	C249	3101061050020	1UF

No.	Ref. No.	Part No.	Description
438	C251	3101061050020	1UF
439	C252	3101061050020	1UF
440	C253	3101061050020	1UF
441	C257	3101061050020	1UF
442	C259	3101061050020	1UF
443	C262	3101061050020	1UF
444	C263	3101061050020	1UF
445	C264	3101061050020	1UF
446	C266	3101061050020	1UF
447	C268	3101061050020	1UF
448	C277	3101061050020	1UF
449	C278	3101061050020	1UF
450	C279	3101061050020	1UF
451	C281	3101061050020	1UF
452	C282	3101061050020	1UF
453	C290	3101061050020	1UF
454	C291	3101061050020	1UF
455	C298	3101061050020	1UF
456	C299	3101061050020	1UF
457	C396	3101061050020	1UF
458	C6100	3101061050020	1UF
459	C6145	3101061050020	1UF
460	C6149	3101061050020	1UF
461	C6190	3101061050020	1UF
462	C742	3101061050020	1UF
463	C754	3101061050020	1UF
464	C900	3101061050020	1UF
465	C901	3101061050020	1UF
466	C905	3101061050020	1UF
467	C906	3101061050020	1UF
468	C908	3101061050020	1UF
469	C923	3101061050020	1UF
470	C924	3101061050020	1UF
471	C925	3101061050020	1UF
472	C938	3101061050020	1UF
473	C946	3101061050020	1UF
474	C966	3101061050020	1UF
475	C234	3101081060010	10UF
476	C286	3101081060010	10UF
477	C807	3101081060010	10UF
478	C928	3101081060010	10UF
479	C956	3101081060010	10UF
480	C957	3101081060010	10UF
481	C980	3101081060010	10UF

No.	Ref. No.	Part No.	Description
482	C981	3101081060010	10UF
483	C237	3101054740020	0.47uF
484	C438	3101054740000	0.47UF
485	C439	3101054740000	0.47UF
486	C241	3001060000000	0Ω
487	C6158	3001060000000	0Ω
488	C6176	3001060000000	0Ω
489	C813	3001060000000	0Ω
490	C814	3001060000000	0Ω
491	L716	3001060000000	0Ω
492	L718	3001060000000	0Ω
493	R171	3001060000000	0Ω
494	R2	3001060000000	0Ω
495	R282	3001060000000	0Ω
496	R405	3001060000000	0Ω
497	R444	3001060000000	0Ω
498	R484	3001060000000	0Ω
499	R542	3001060000000	0Ω
500	R6116	3001060000000	0Ω
501	R6138	3001060000000	0Ω
502	R6140	3001060000000	0Ω
503	R724	3001060000000	0Ω
504	R805	3001060000000	0Ω
505	R809	3001060000000	0Ω
506	R822	3001060000000	0Ω
507	R901	3001060000000	0Ω
508	R914	3001060000000	0Ω
509	R916	3001060000000	0Ω
510	R962	3001060000000	0Ω
511	R963	3001060000000	0Ω
512	R965	3001060000000	0Ω
513	R973	3001060000000	0Ω
514	C866	3210106220000	22nH
515	C242	3101062210000	220PF
516	C245	3101062210000	220PF
517	C809	3101062210000	220PF
518	C845	3101062210000	220PF
519	C878	3101062210000	220PF
520	C887	3101062210000	220PF
521	C892	3101062210000	220PF
522	C909	3101062210000	220PF
523	C974	3101062210000	220PF
524	C976	3101062210000	220PF
525	C982	3101062210000	220PF

No.	Ref. No.	Part No.	Description
526	C985	3101062210000	220PF
527	C246	3101052230000	0.022UF
528	C255	3101051050000	1UF
529	C276	3101051050000	1UF
530	C305	3101051050000	1UF
531	C310	3101051050000	1UF
532	C719	3101051050000	1UF
533	C962	3101051050000	1UF
534	C287	3101064740000	0.47UF
535	C1013	3104071060070	10UF
536	C293	3104071060070	10UF
537	C367	3104071060070	10UF
538	C401	3104071060070	10UF
539	C402	3104071060070	10UF
540	C405	3104071060070	10UF
541	C508	3104071060070	10UF
542	C511	3104071060070	10UF
543	C519	3104071060070	10UF
544	C520	3104071060070	10UF
545	C726	3104071060070	10UF
546	C755	3104071060070	10UF
547	C917	3104071060070	10UF
548	C929	3104071060070	10UF
549	C275	3101071060010	10UF
550	C926	3101071060010	10UF
551	C284	3103994760180	47uf
552	C914	3101104760000	47UF
553	C894	3101061030010	0.01UF
554	C952	3101061030010	0.01UF
555	C403	3210305479000	4.7nH
556	C404	3210305479000	4.7nH
557	C406	3210305479000	4.7nH
558	C475	3210305479000	4.7nH
559	C501	3101053310020	330PF
560	C911	3101053310020	330PF
561	C502	3101053320010	3300PF
562	C503	3101051820000	1800PF
563	C1003	3101054710010	470PF
564	C1015	3101054710010	470PF
565	C6118	3101054710010	470PF
566	C6148	3101054710010	470PF
567	C6151	3101054710010	470PF
568	C706	3101054710010	470PF
569	C717	3101054710010	470PF

No.	Ref. No.	Part No.	Description
570	C727	3101054710010	470PF
571	C746	3101054710010	470PF
572	C945	3101054710010	470PF
573	C713	3101053330000	0.033UF
574	C294	3101063340000	0.33UF
575	C715	3101063340000	0.33UF
576	C716	3101061810010	180PF
577	C940	3101061810010	180PF
578	C977	3101061810010	180PF
579	C198	3101050800000	8PF
580	C6183	3101050800000	8PF
581	C6210	3101050800000	8PF
582	C731	3101050800000	8PF
583	C6066	3101054700010	47PF
584	C6067	3101054700010	47PF
585	C6160	3101054700010	47PF
586	C6212	3101054700010	47PF
587	C724	3101054700010	47PF
588	C734	3101054700010	47PF
589	C743	3101054700010	47PF
590	C6209	3101055600000	56PF
591	C6224	3101055600000	56PF
592	C745	3101055600000	56PF
593	C922	3101055600000	56PF
594	C6231	3101056800000	68PF
595	C6232	3101056800000	68PF
596	C6233	3101056800000	68PF
597	C6235	3101056800000	68PF
598	C6236	3101056800000	68PF
599	C6237	3101056800000	68PF
600	C6238	3101056800000	68PF
601	C6239	3101056800000	68PF
602	C723	3101056800000	68PF
603	C954	3101062710000	270PF
604	C889	3101061020000	1000PF
605	C930	3101061020000	1000PF
606	C953	3101061020000	1000PF
607	C983	3101061020000	1000PF
608	C803	3101063320000	3300PF
609	C916	3101063320000	3300PF
610	C1004	3101063300000	33PF
611	C857	3101063300000	33PF
612	C864	3101063300000	33PF
613	C931	3101065610000	560PF

No.	Ref. No.	Part No.	Description
614	C984	3101065610000	560PF
615	C804	3101092260010	22UF
616	C933	3101092260010	22UF
617	C812	3101371010000	100pF
618	C820	3101371010000	100pF
619	C870	3101371010000	100pF
620	C8330	3101376800000	68pF
621	C842	3101376800000	68pF
622	C861	3101068210000	820PF
623	C17	3101061520010	1500PF
624	C822	3101061520010	1500PF
625	C853	3101061520010	1500PF
626	C990	3101061520010	1500PF
627	C816	3101080800010	8PF
628	C836	3101081200010	12PF
629	C879	3101083300010	33PF
630	C838	3101080700010	7PF
631	C843	3212106829000	8.2nH
632	C902	3101064710000	470PF
633	L823	3101064710000	470PF
634	L826	3101064710000	470PF
635	R824	3101064710000	470PF
636	C818	3001061500000	15Ω
637	R898	3001063600010	36Ω
638	C821	3101080400010	4PF
639	C827	3101081020010	1000pF
640	C850	3101081020010	1000pF
641	C893	3101081020010	1000pF
642	C830	3101372000000	20pF
643	C837	3101372400000	24pF
644	C851	3101081800010	18pF
645	C847	3101061510000	150PF
646	C848	3101061510000	150PF
647	C973	3101061510000	150PF
648	C979	3101061510000	150PF
649	C801	3101084710010	470pF
650	C806	3101084710010	470pF
651	C885	3101084710010	470pF
652	C6157	3101061010010	100PF
653	C825	3101061010010	100PF
654	C852	3101061010010	100PF
655	C860	3101061010010	100PF
656	C959	3101061010010	100PF
657	C971	3101061010010	100PF

No.	Ref. No.	Part No.	Description
658	C992	3101061010010	100PF
659	C970	3101063910000	390PF
660	C862	3101060200010	2PF
661	C886	3101064720000	4700PF
662	C949	3101062720000	2700PF
663	C819	3101082700010	27pF
664	C841	3101082700010	27pF
665	C856	3101082700010	27pF
666	C891	3101051210000	120PF
667	C899	3101051210000	120PF
668	C802	3101064700000	47PF
669	C986	3101064700000	47PF
670	L833	3001061000070	10Ω
671	C912	3101072250030	2.2UF
672	C913	3101061040030	0.1UF
673	C915	3101082260020	22UF
674	C919	3101072260000	22UF
675	C920	3101062250000	2.2UF
676	C932	3101062250000	2.2UF
677	C934	3101062250000	2.2UF
678	C965	3101062250000	2.2UF
679	C951	3104081060120	10UF
680	C941	3101051540000	0.15UF
681	C732	3101052700000	27PF
682	C6076	3101052790060	2.7PF
683	C6172	3001050000000	0Ω
684	C6214	3001050000000	0Ω
685	C6222	3001050000000	0Ω
686	R174	3001050000000	0Ω
687	R188	3001050000000	0Ω
688	R197	3001050000000	0Ω
689	R200	3001050000000	0Ω
690	R230	3001050000000	0Ω
691	R233	3001050000000	0Ω
692	R238	3001050000000	0Ω
693	R240	3001050000000	0Ω
694	R242	3001050000000	0Ω
695	R243	3001050000000	0Ω
696	R249	3001050000000	0Ω
697	R289	3001050000000	0Ω
698	R299	3001050000000	0Ω
699	R329	3001050000000	0Ω
700	R356	3001050000000	0Ω
701	R374	3001050000000	0Ω

No.	Ref. No.	Part No.	Description
702	R375	3001050000000	0Ω
703	R399	3001050000000	0Ω
704	R426	3001050000000	0Ω
705	R440	3001050000000	0Ω
706	R5	3001050000000	0Ω
707	R505	3001050000000	0Ω
708	R507	3001050000000	0Ω
709	R508	3001050000000	0Ω
710	R536	3001050000000	0Ω
711	R544	3001050000000	0Ω
712	R564	3001050000000	0Ω
713	R565	3001050000000	0Ω
714	R566	3001050000000	0Ω
715	R567	3001050000000	0Ω
716	R578	3001050000000	0Ω
717	R6	3001050000000	0Ω
718	R6207	3001050000000	0Ω
719	R6214	3001050000000	0Ω
720	R6215	3001050000000	0Ω
721	R729	3001050000000	0Ω
722	R731	3001050000000	0Ω
723	R837	3001050000000	0Ω
724	R857	3001050000000	0Ω
725	R863	3001050000000	0Ω
726	R891	3001050000000	0Ω
727	R894	3001050000000	0Ω
728	R907	3001050000000	0Ω
729	R920	3001050000000	0Ω
730	R923	3001050000000	0Ω
731	R967	3001050000000	0Ω
732	R983	3001050000000	0Ω
733	C6153	3101050400010	4PF
734	C6055	3101053690000	3.6PF
735	C6057	3101053690000	3.6PF
736	C6163	3101050700010	7PF
737	C6177	3101062700010	27PF
738	D100	3303990000060	Switching diode
739	D6009	3303990000060	Switching diode
740	D6010	3303990000060	Switching diode
741	D6014	3303990000060	Switching diode
742	D6015	3303990000060	Switching diode
743	D101	3304010100220	Varactor
744	D102	3304010100220	Varactor
745	D105	3304010100220	Varactor

No.	Ref. No.	Part No.	Description
746	D106	3304010100220	Varactor
747	D107	3304010100220	Varactor
748	D108	3304010100220	Varactor
749	D109	3304010100220	Varactor
750	D110	3304010100220	Varactor
751	D111	3304010100220	Varactor
752	D112	3304010100220	Varactor
753	D113	3304010100220	Varactor
754	D116	3304010100220	Varactor
755	D117	3304010100220	Varactor
756	D121	3304010100220	Varactor
757	D122	3304010100220	Varactor
758	D125	3304010100220	Varactor
759	D126	3304010100220	Varactor
760	D127	3303030100010	Switching diode
761	D128	3303030100010	Switching diode
762	D230	3310240000000	ESD protection diode
763	D231	3310240000000	ESD protection diode
764	D233	3310240000000	ESD protection diode
765	D240	3310240000000	ESD protection diode
766	D402	3310240000000	ESD protection diode
767	D403	3310240000000	ESD protection diode
768	D404	3310240000000	ESD protection diode
769	D405	3310240000000	ESD protection diode
770	D406	3310240000000	ESD protection diode
771	D234	3310240200000	ESD protection diode
772	D236	3310240200000	ESD protection diode
773	D239	3310240200000	ESD protection diode
774	D235	3302031100010	Zener diode
775	D241	3302031100010	Zener diode
776	D237	3310990000090	ESD protection diode
777	D238	3310990000090	ESD protection diode
778	D407	3399040600010	ESD protection diode
779	D408	3399040600010	ESD protection diode
780	D409	3310240000040	ESD protection diode
781	D450	3699037000010	USB protection IC
782	D601	3307110100080	LED
783	D701	3304060300050	Varactor
784	D702	3304060300010	Varactor
785	D801	3303210100000	Switching diode
786	D802	3303210100000	Switching diode
787	D803	3303030300000	Diode
788	D804	3303030300000	Diode
789	D805	3302030500030	Zener diode

No.	Ref. No.	Part No.	Description
790	D917	3302030500030	Zener diode
791	D901	3303040400000	Switching diode
792	D902	3301100300030	Rectifier diode
793	D904	3301240000000	Diode
794	D905	3301240000000	Diode
795	D6100	3303060300010	Switching diode
796	D906	3303060300010	Switching diode
797	D907	3303060300010	Switching diode
798	D909	3303060300010	Switching diode
799	D911	3303060300010	Switching diode
800	D914	3303060300010	Switching diode
801	D912	3311240100000	Diode
802	D913	3311240100000	Diode
803	D910	3302030500010	Zener diode
804	D915	3303010500290	Switching diode
805	D6203	3399990000260	Rectifier diode
806	D6106	3699019000000	Mixer
807	D6201	3304010100390	Varactor
808	D6202	3304010100390	Varactor
809	F900	4099000000050	Fuse
810	L1	3213212332000	3.3uH
811	L156	3213212332000	3.3uH
812	L715	3213212332000	3.3uH
813	L107	3217607681000	680nH
814	L108	3217607681000	680nH
815	L112	3217607681000	680nH
816	L116	3217607681000	680nH
817	L117	3217607681000	680nH
818	L118	3217607681000	680nH
819	L127	3217607681000	680nH
820	L129	3217607681000	680nH
821	L133	3217607681000	680nH
822	L140	3217607681000	680nH
823	L4	3217607681000	680nH
824	L5	3217607681000	680nH
825	L131	3221506601000	600Ω
826	L152	3221506601000	600Ω
827	L6	3221506601000	600Ω
828	L7	3221506601000	600Ω
829	L701	3221506601000	600Ω
830	L702	3221506601000	600Ω
831	L703	3221506601000	600Ω
832	L706	3221506601000	600Ω
833	L707	3221506601000	600Ω

No.	Ref. No.	Part No.	Description
834	L709	3221506601000	600Ω
835	L710	3221506601000	600Ω
836	L711	3221506601000	600Ω
837	L712	3221506601000	600Ω
838	L714	3221506601000	600Ω
839	L8	3221506601000	600Ω
840	L815	3221506601000	600Ω
841	L821	3221506601000	600Ω
842	L824	3221506601000	600Ω
843	L825	3221506601000	600Ω
844	L9	3221506601000	600Ω
845	R153	3221506601000	600Ω
846	R157	3221506601000	600Ω
847	R179	3221506601000	600Ω
848	R186	3221506601000	600Ω
849	L105	3211256000000	56nH
850	L114	3211256000000	56nH
851	L115	3217107121000	120nH
852	L139	3217107121000	120nH
853	L124	3237110220000	22NH
854	L126	3214307151000	150nH
855	L135	3210306151000	150nH
856	L137	3237110270000	27NH
857	L147	3210406471000	470nH
858	L151	3210406471000	470nH
859	L6125	3210406471000	470nH
860	L154	3213306561000	0.56uH
861	L713	3213306561000	0.56uH
862	L167	3210306101000	100nH
863	L168	3210306101000	100nH
864	L169	3210306820000	82nH
865	L6029	3217106560000	56nH
866	L171	3210306330000	33nH
867	L6119	3210306330000	33nH
868	L6210	3210306330000	33nH
869	L173	3210306390000	39nH
870	L6117	3210306390000	39nH
871	L232	3221506300000	30Ω
872	L401	3221506300000	30Ω
873	L402	3221506300000	30Ω
874	L403	3221506300000	30Ω
875	L404	3221506300000	30Ω
876	L405	3221506300000	30Ω
877	L406	3221506300000	30Ω

No.	Ref. No.	Part No.	Description
878	L407	3221506300000	30Ω
879	L408	3221506300000	30Ω
880	L409	3221506300000	30Ω
881	L410	3221506300000	30Ω
882	L411	3221506300000	30Ω
883	L412	3221506300000	30Ω
884	L901	3221506300000	30Ω
885	L912	3221506300000	30Ω
886	L913	3221506300000	30Ω
887	L233	3211506101000	100nH
888	L234	3211506101000	100nH
889	L235	3211506101000	100nH
890	L500	3211506101000	100nH
891	L6101	3211506101000	100nH
892	L6114	3211506101000	100nH
893	L6115	3211506101000	100nH
894	L6121	3211506101000	100nH
895	L6200	3211506101000	100nH
896	L704	3213212103000	10uH
897	L705	3213212103000	10uH
898	L708	3297107391000	390nH
899	L717	3213306472000	4.7uH
900	L801	3221513600000	60Ω
901	L802	3221513600000	60Ω
902	L803	3221513600000	60Ω
903	L812	3221513600000	60Ω
904	L818	3221513600000	60Ω
905	L900	3221513600000	60Ω
906	L916	3221513600000	60Ω
907	L917	3221513600000	60Ω
908	L940	3221513600000	60Ω
909	L804	3233099270000	27nH
910	L809	3233099400010	40nH
911	L810	3233099400010	40nH
912	L813	3233099400010	40nH
913	L817	3233099400010	40nH
914	L6118	3210306220000	22nH
915	L808	3233099220000	22nH
916	L816	3233099111000	111nH
917	L828	3217112102020	1uH
918	L6025	3217106689010	6.8nH
919	L6035	3217106689010	6.8nH
920	L6037	3217106689010	6.8nH
921	L6038	3217106689010	6.8nH

No.	Ref. No.	Part No.	Description
922	L832	3212106180000	18nH
923	L830	3233099185900	18.5nH
924	L902	3217299103000	10uH
925	L903	3213099472000	4.7uH
926	L931	3213099472000	4.7uH
927	L904	3221506181000	180Ω
928	L908	3221506181000	180Ω
929	L930	3241799103000	10uH
930	L6015	3221505121010	Bead
931	L6036	3221505121010	Bead
932	L6026	3210106680000	68nH
933	L6027	3210106680000	68nH
934	L6030	3217106470000	47nH
935	L6031	3217106470000	47nH
936	L6021	3217106820010	82nH
937	L6032	3217106569000	5.6nH
938	L6034	3217106569000	5.6nH
939	L6039	3217106569000	5.6nH
940	L6040	3217106569000	5.6nH
941	L6123	3213306821000	0.82uH
942	L6202	3210306561010	560nH
943	L6203	3210106560000	56nH
944	Q323	3403008000010	Transistor
945	Q401	3403008000010	Transistor
946	Q402	3403008000010	Transistor
947	Q403	3403008000010	Transistor
948	Q404	3403008000010	Transistor
949	Q405	3403008000010	Transistor
950	Q413	3403008000010	Transistor
951	Q811	3403008000010	Transistor
952	Q812	3403008000010	Transistor
953	Q813	3403008000010	Transistor
954	Q903	3403008000010	Transistor
955	Q908	3403008000010	Transistor
956	Q913	3403008000010	Transistor
957	Q914	3403008000010	Transistor
958	Q922	3403008000010	Transistor
959	Q923	3403008000010	Transistor
960	Q1	3503020000030	N-MOSFET
961	Q912	3503020000030	N-MOSFET
962	Q100	3408002000080	NPN transistor
963	Q103	3408002000080	NPN transistor
964	Q106	3408002000080	NPN transistor
965	Q110	3408002000080	NPN transistor

No.	Ref. No.	Part No.	Description
966	Q101	3403999000000	Transistor
967	Q105	3403999000000	Transistor
968	Q108	3403999000000	Transistor
969	Q112	3403999000000	Transistor
970	Q116	3403999000000	Transistor
971	Q117	3403999000000	Transistor
972	Q102	3401002000990	NPN transistor
973	Q111	3401002000990	NPN transistor
974	Q104	3403003000060	NPN transistor
975	Q702	3403003000060	NPN transistor
976	Q107	3404006000000	NPN transistor
977	Q109	3404006000000	NPN transistor
978	Q6104	3404006000000	NPN transistor
979	Q6105	3404006000000	NPN transistor
980	Q230	3499000000150	Transistor
981	Q231	3499000000150	Transistor
982	Q232	3499000000150	Transistor
983	Q233	3499000000150	Transistor
984	Q234	3499000000150	Transistor
985	Q235	3499000000150	Transistor
986	Q6100	3499000000150	Transistor
987	Q905	3499000000150	Transistor
988	Q400	3413001000010	PNP transistor
989	Q406	3414999000000	Transistor
990	Q407	3414999000000	Transistor
991	Q408	3414999000000	Transistor
992	Q409	3414999000000	Transistor
993	Q410	3414999000000	Transistor
994	Q411	3414999000000	Transistor
995	Q412	3414999000000	Transistor
996	Q701	3408002000000	NPN transistor
997	Q6103	3404999000000	NPN transistor
998	Q6202	3404999000000	NPN transistor
999	Q804	3504990000030	MOSFET
1000	Q805	3504990000010	MOSFET
1001	Q810	3403002000000	PNP transistor
1002	Q902	3403002000000	PNP transistor
1003	Q906	3414001000020	NPN transistor
1004	Q910	3414001000020	NPN transistor
1005	Q909	3403002000010	PNP transistor
1006	Q6201	3403014000020	Transistor
1007	RN230	3005051010010	100Ω
1008	RN500	3005051010010	100Ω
1009	RT804	3003061040000	Thermistor 100KΩ

No.	Ref. No.	Part No.	Description
1010	R4	3001061010000	100Ω
1011	R823	3001062200000	22Ω
1012	R162	3001058200000	82Ω
1013	R109	3001051000000	10Ω
1014	R175	3001051000000	10Ω
1015	R386	3001051000000	10Ω
1016	R388	3001051000000	10Ω
1017	R414	3001051000000	10Ω
1018	R114	3001066800000	68Ω
1019	R865	3001053930000	39KΩ
1020	R122	3001051800000	18Ω
1021	R6121	3001051800000	18Ω
1022	R123	3001055100010	51Ω
1023	R6120	3001055100010	51Ω
1024	R6132	3001055100010	51Ω
1025	R701	3001055100010	51Ω
1026	R128	3001058230000	82KΩ
1027	R892	3001058230000	82KΩ
1028	R129	3001052710000	270Ω
1029	R135	3001052710000	270Ω
1030	R6124	3001052710000	270Ω
1031	R6125	3001052710000	270Ω
1032	R130	3001051210010	120Ω
1033	R136	3001051210010	120Ω
1034	R132	3001053320000	3.3K
1035	R142	3001053320000	3.3K
1036	R158	3001053320000	3.3K
1037	R6118	3001053320000	3.3K
1038	R890	3001053320000	3.3K
1039	R139	3001061210000	120Ω
1040	R138	3001058220000	8.2K
1041	R143	3001058220000	8.2K
1042	R159	3001058220000	8.2K
1043	R194	3001058220000	8.2K
1044	R710	3001058220000	8.2K
1045	R867	3001058220000	8.2K
1046	R140	3001051010040	100Ω
1047	R145	3001051010040	100Ω
1048	R146	3001051010040	100Ω
1049	R147	3001051010040	100Ω
1050	R148	3001051010040	100Ω
1051	R160	3001051010040	100Ω
1052	R190	3001051010040	100Ω
1053	R196	3001051010040	100Ω

No.	Ref. No.	Part No.	Description
1054	R251	3001051010040	100Ω
1055	R260	3001051010040	100Ω
1056	R271	3001051010040	100Ω
1057	R278	3001051010040	100Ω
1058	R337	3001051010040	100Ω
1059	R338	3001051010040	100Ω
1060	R339	3001051010040	100Ω
1061	R346	3001051010040	100Ω
1062	R403	3001051010040	100Ω
1063	R404	3001051010040	100Ω
1064	R406	3001051010040	100Ω
1065	R410	3001051010040	100Ω
1066	R411	3001051010040	100Ω
1067	R421	3001051010040	100Ω
1068	R434	3001051010040	100Ω
1069	R439	3001051010040	100Ω
1070	R445	3001051010040	100Ω
1071	R458	3001051010040	100Ω
1072	R459	3001051010040	100Ω
1073	R556	3001051010040	100Ω
1074	R557	3001051010040	100Ω
1075	R889	3001051010040	100Ω
1076	R929	3001051010040	100Ω
1077	R948	3001051010040	100Ω
1078	R137	3001061510000	150Ω
1079	R144	3001061510000	150Ω
1080	R192	3001061510000	150Ω
1081	R897	3001061510000	150Ω
1082	R899	3001061510000	150Ω
1083	R151	3001051530010	15KΩ
1084	R250	3001051530010	15KΩ
1085	R284	3001051530010	15KΩ
1086	R285	3001051530010	15KΩ
1087	R361	3001051530010	15KΩ
1088	R362	3001051530010	15KΩ
1089	R930	3001051530010	15KΩ
1090	R199	3001051540000	150K
1091	R919	3001051540000	150K
1092	R882	3001051840010	180K
1093	R155	3001051830000	18KΩ
1094	R870	3001052030000	20KΩ
1095	R195	3001052030000	20KΩ
1096	R6136	3001052030000	20KΩ
1097	R975	3001052030000	20KΩ

No.	Ref. No.	Part No.	Description
1098	R1110	3001053300010	33Ω
1099	R156	3001053300010	33Ω
1100	R167	3001053300010	33Ω
1101	R178	3001053300010	33Ω
1102	R231	3001053300010	33Ω
1103	R232	3001053300010	33Ω
1104	R292	3001053300010	33Ω
1105	R319	3001053300010	33Ω
1106	R320	3001053300010	33Ω
1107	R324	3001053300010	33Ω
1108	R327	3001053300010	33Ω
1109	R330	3001053300010	33Ω
1110	R332	3001053300010	33Ω
1111	R333	3001053300010	33Ω
1112	R336	3001053300010	33Ω
1113	R344	3001053300010	33Ω
1114	R345	3001053300010	33Ω
1115	R347	3001053300010	33Ω
1116	R352	3001053300010	33Ω
1117	R354	3001053300010	33Ω
1118	R355	3001053300010	33Ω
1119	R357	3001053300010	33Ω
1120	R367	3001053300010	33Ω
1121	R369	3001053300010	33Ω
1122	R371	3001053300010	33Ω
1123	R376	3001053300010	33Ω
1124	R380	3001053300010	33Ω
1125	R381	3001053300010	33Ω
1126	R387	3001053300010	33Ω
1127	R400	3001053300010	33Ω
1128	R402	3001053300010	33Ω
1129	R407	3001053300010	33Ω
1130	R408	3001053300010	33Ω
1131	R409	3001053300010	33Ω
1132	R412	3001053300010	33Ω
1133	R413	3001053300010	33Ω
1134	R415	3001053300010	33Ω
1135	R420	3001053300010	33Ω
1136	R423	3001053300010	33Ω
1137	R424	3001053300010	33Ω
1138	R425	3001053300010	33Ω
1139	R430	3001053300010	33Ω
1140	R431	3001053300010	33Ω
1141	R432	3001053300010	33Ω

No.	Ref. No.	Part No.	Description
1142	R433	3001053300010	33Ω
1143	R456	3001053300010	33Ω
1144	R457	3001053300010	33Ω
1145	R467	3001053300010	33Ω
1146	R473	3001053300010	33Ω
1147	R474	3001053300010	33Ω
1148	R479	3001053300010	33Ω
1149	R485	3001053300010	33Ω
1150	R486	3001053300010	33Ω
1151	R487	3001053300010	33Ω
1152	R489	3001053300010	33Ω
1153	R490	3001053300010	33Ω
1154	R491	3001053300010	33Ω
1155	R492	3001053300010	33Ω
1156	R495	3001053300010	33Ω
1157	R498	3001053300010	33Ω
1158	R515	3001053300010	33Ω
1159	R516	3001053300010	33Ω
1160	R517	3001053300010	33Ω
1161	R518	3001053300010	33Ω
1162	R519	3001053300010	33Ω
1163	R520	3001053300010	33Ω
1164	R521	3001053300010	33Ω
1165	R522	3001053300010	33Ω
1166	R523	3001053300010	33Ω
1167	R524	3001053300010	33Ω
1168	R525	3001053300010	33Ω
1169	R526	3001053300010	33Ω
1170	R527	3001053300010	33Ω
1171	R533	3001053300010	33Ω
1172	R545	3001053300010	33Ω
1173	R552	3001053300010	33Ω
1174	R553	3001053300010	33Ω
1175	R6114	3001053300010	33Ω
1176	R711	3001053300010	33Ω
1177	R715	3001053300010	33Ω
1178	R717	3001053300010	33Ω
1179	R719	3001053300010	33Ω
1180	R720	3001053300010	33Ω
1181	R721	3001053300010	33Ω
1182	R725	3001053300010	33Ω
1183	R176	3001054720000	4.7K
1184	R395	3001054720000	4.7K
1185	R396	3001054720000	4.7K

No.	Ref. No.	Part No.	Description
1186	R428	3001054720000	4.7K
1187	R435	3001054720000	4.7K
1188	R436	3001054720000	4.7K
1189	R437	3001054720000	4.7K
1190	R448	3001054720000	4.7K
1191	R468	3001054720000	4.7K
1192	R469	3001054720000	4.7K
1193	R470	3001054720000	4.7K
1194	R471	3001054720000	4.7K
1195	R472	3001054720000	4.7K
1196	R488	3001054720000	4.7K
1197	R496	3001054720000	4.7K
1198	R499	3001054720000	4.7K
1199	R511	3001054720000	4.7K
1200	R572	3001054720000	4.7K
1201	R6135	3001054720000	4.7K
1202	R6209	3001054720000	4.7K
1203	R708	3001054720000	4.7K
1204	R908	3001054720000	4.7K
1205	R910	3001054720000	4.7K
1206	R913	3001054720000	4.7K
1207	R937	3001054720000	4.7K
1208	R942	3001054720000	4.7K
1209	R703	3001052720000	2.7K
1210	R960	3001054790010	4.7K
1211	R3	3001051020000	10KΩ
1212	R831	3001051020000	10KΩ
1213	R177	3001051030000	10KΩ
1214	R180	3001051030000	10KΩ
1215	R202	3001051030000	10KΩ
1216	R234	3001051030000	10KΩ
1217	R235	3001051030000	10KΩ
1218	R236	3001051030000	10KΩ
1219	R258	3001051030000	10KΩ
1220	R259	3001051030000	10KΩ
1221	R261	3001051030000	10KΩ
1222	R316	3001051030000	10KΩ
1223	R322	3001051030000	10KΩ
1224	R323	3001051030000	10KΩ
1225	R325	3001051030000	10KΩ
1226	R326	3001051030000	10KΩ
1227	R334	3001051030000	10KΩ
1228	R335	3001051030000	10KΩ
1229	R340	3001051030000	10KΩ

No.	Ref. No.	Part No.	Description
1230	R341	3001051030000	10KΩ
1231	R342	3001051030000	10KΩ
1232	R343	3001051030000	10KΩ
1233	R351	3001051030000	10KΩ
1234	R353	3001051030000	10KΩ
1235	R372	3001051030000	10KΩ
1236	R377	3001051030000	10KΩ
1237	R378	3001051030000	10KΩ
1238	R379	3001051030000	10KΩ
1239	R382	3001051030000	10KΩ
1240	R385	3001051030000	10KΩ
1241	R390	3001051030000	10KΩ
1242	R391	3001051030000	10KΩ
1243	R392	3001051030000	10KΩ
1244	R393	3001051030000	10KΩ
1245	R394	3001051030000	10KΩ
1246	R427	3001051030000	10KΩ
1247	R429	3001051030000	10KΩ
1248	R438	3001051030000	10KΩ
1249	R441	3001051030000	10KΩ
1250	R442	3001051030000	10KΩ
1251	R443	3001051030000	10KΩ
1252	R447	3001051030000	10KΩ
1253	R451	3001051030000	10KΩ
1254	R452	3001051030000	10KΩ
1255	R453	3001051030000	10KΩ
1256	R454	3001051030000	10KΩ
1257	R461	3001051030000	10KΩ
1258	R462	3001051030000	10KΩ
1259	R463	3001051030000	10KΩ
1260	R464	3001051030000	10KΩ
1261	R465	3001051030000	10KΩ
1262	R466	3001051030000	10KΩ
1263	R476	3001051030000	10KΩ
1264	R481	3001051030000	10KΩ
1265	R482	3001051030000	10KΩ
1266	R483	3001051030000	10KΩ
1267	R501	3001051030000	10KΩ
1268	R506	3001051030000	10KΩ
1269	R509	3001051030000	10KΩ
1270	R510	3001051030000	10KΩ
1271	R512	3001051030000	10KΩ
1272	R530	3001051030000	10KΩ
1273	R531	3001051030000	10KΩ

No.	Ref. No.	Part No.	Description
1274	R532	3001051030000	10KΩ
1275	R534	3001051030000	10KΩ
1276	R535	3001051030000	10KΩ
1277	R538	3001051030000	10KΩ
1278	R539	3001051030000	10KΩ
1279	R540	3001051030000	10KΩ
1280	R541	3001051030000	10KΩ
1281	R543	3001051030000	10KΩ
1282	R555	3001051030000	10KΩ
1283	R6035	3001051030000	10KΩ
1284	R6051	3001051030000	10KΩ
1285	R6053	3001051030000	10KΩ
1286	R705	3001051030000	10KΩ
1287	R885	3001051030000	10KΩ
1288	R938	3001051030000	10KΩ
1289	R945	3001051030000	10KΩ
1290	R950	3001051030000	10KΩ
1291	R976	3001051030000	10KΩ
1292	R979	3001051030000	10KΩ
1293	R980	3001051030000	10KΩ
1294	R709	3001051030050	10KΩ
1295	R181	3001051020000	1KΩ
1296	R183	3001051020000	1KΩ
1297	R264	3001051020000	1KΩ
1298	R267	3001051020000	1KΩ
1299	R280	3001051020000	1KΩ
1300	R295	3001051020000	1KΩ
1301	R383	3001051020000	1KΩ
1302	R422	3001051020000	1KΩ
1303	R460	3001051020000	1KΩ
1304	R477	3001051020000	1KΩ
1305	R502	3001051020000	1KΩ
1306	R503	3001051020000	1KΩ
1307	R504	3001051020000	1KΩ
1308	R554	3001051020000	1KΩ
1309	R569	3001051020000	1KΩ
1310	R576	3001051020000	1KΩ
1311	R6034	3001051020000	1KΩ
1312	R6049	3001051020000	1KΩ
1313	R6050	3001051020000	1KΩ
1314	R6052	3001051020000	1KΩ
1315	R869	3001051020000	1KΩ
1316	R874	3001051020000	1KΩ
1317	R941	3001051020000	1KΩ

No.	Ref. No.	Part No.	Description
1318	R947	3001051020000	1KΩ
1319	R957	3001051020000	1KΩ
1320	R978	3001051020000	1KΩ
1321	R111	3001068200000	82Ω
1322	R835	3001063300000	33Ω
1323	R239	3001055620000	5.6K
1324	R287	3001055620000	5.6K
1325	R573	3001055620000	5.6K
1326	R6205	3001055620000	5.6K
1327	R716	3001055620000	5.6K
1328	R244	3001052230010	22KΩ
1329	R246	3001052230010	22KΩ
1330	R940	3001052230010	22KΩ
1331	R944	3001052230010	22KΩ
1332	R245	3001160100000	1Ω
1333	R253	3001160100000	1Ω
1334	R293	3001160100000	1Ω
1335	R294	3001160100000	1Ω
1336	R117	3001051040000	100K
1337	R247	3001051040000	100K
1338	R248	3001051040000	100K
1339	R252	3001051040000	100K
1340	R262	3001051040000	100K
1341	R268	3001051040000	100K
1342	R269	3001051040000	100K
1343	R274	3001051040000	100K
1344	R275	3001051040000	100K
1345	R276	3001051040000	100K
1346	R296	3001051040000	100K
1347	R455	3001051040000	100K
1348	R500	3001051040000	100K
1349	R513	3001051040000	100K
1350	R514	3001051040000	100K
1351	R6115	3001051040000	100K
1352	R6212	3001051040000	100K
1353	R6213	3001051040000	100K
1354	R713	3001051040000	100K
1355	R982	3001051040000	100K
1356	R255	3001064710000	470Ω
1357	R852	3001064710000	470Ω
1358	R853	3001064710000	470Ω
1359	R935	3001064710000	470Ω
1360	R257	3001053030000	30KΩ
1361	R263	3001053030000	30KΩ

No.	Ref. No.	Part No.	Description
1362	R279	3001053030000	30KΩ
1363	R283	3001053030000	30KΩ
1364	R6134	3001053030000	30KΩ
1365	R6137	3001053030000	30KΩ
1366	R265	3001051820000	1.8K
1367	R714	3001051820000	1.8K
1368	R839	3001051820000	1.8K
1369	R152	3001054730000	47KΩ
1370	R266	3001054730000	47KΩ
1371	R270	3001054730000	47KΩ
1372	R272	3001054730000	47KΩ
1373	R277	3001054730000	47KΩ
1374	R286	3001054730000	47KΩ
1375	R288	3001054730000	47KΩ
1376	R847	3001054730000	47KΩ
1377	R877	3001054730000	47KΩ
1378	R931	3001054730000	47KΩ
1379	R949	3001054730000	47KΩ
1380	R959	3001054730000	47KΩ
1381	R273	3001052430010	24KΩ
1382	R915	3001052430010	24KΩ
1383	R291	3001051220000	1.2K
1384	R6119	3001051220000	1.2K
1385	R6122	3001051220000	1.2K
1386	R6131	3001051220000	1.2K
1387	R6211	3001051220000	1.2K
1388	R401	3001051520010	1.5K
1389	R951	3001051520010	1.5K
1390	R449	3001061520000	1.5K
1391	R450	3001072720010	2.7K
1392	R120	3001056830000	68KΩ
1393	R528	3001056830000	68KΩ
1394	R529	3001053330000	33KΩ
1395	R558	3001053330000	33KΩ
1396	R559	3001053330000	33KΩ
1397	R560	3001053330000	33KΩ
1398	R561	3001053330000	33KΩ
1399	R562	3001053330000	33KΩ
1400	R563	3001053330000	33KΩ
1401	R838	3001053330000	33KΩ
1402	R841	3001053330000	33KΩ
1403	R875	3001053330000	33KΩ
1404	R546	3001054710000	470Ω
1405	R547	3001054710000	470Ω

No.	Ref. No.	Part No.	Description
1406	R548	3001054710000	470Ω
1407	R549	3001054710000	470Ω
1408	R550	3001054710000	470Ω
1409	R551	3001054710000	470Ω
1410	R6208	3001054710000	470Ω
1411	R568	3001055120030	5.1K
1412	R570	3001055120030	5.1K
1413	R577	3001055120030	5.1K
1414	R6130	3001055120030	5.1K
1415	R6133	3001053310000	330Ω
1416	R712	3001053310000	330Ω
1417	R6100	3001055110000	510Ω
1418	R718	3001055110000	510Ω
1419	R912	3001055110000	510Ω
1420	R727	3001064730000	47KΩ
1421	R728	3001064730000	47KΩ
1422	R906	3001064730000	47KΩ
1423	R943	3001064730000	47KΩ
1424	R969	3001064730000	47KΩ
1425	C865	3210306470000	47nH
1426	L136	3210306470000	47nH
1427	L2	3210306470000	47nH
1428	L6116	3210306470000	47nH
1429	L6120	3210306470000	47nH
1430	R815	3001082730000	27KΩ
1431	R816	3001076800000	68Ω
1432	R819	3001076800000	68Ω
1433	R6117	3001078200000	82Ω
1434	R6126	3001078200000	82Ω
1435	R864	3001078200000	82Ω
1436	R821	3001113300000	33Ω
1437	R825	3001113300000	33Ω
1438	R842	3001051230000	12KΩ
1439	R704	3001052220010	2.2K
1440	R849	3001052220010	2.2K
1441	R866	3001052220010	2.2K
1442	R909	3001052220010	2.2K
1443	R964	3001052220010	2.2K
1444	R968	3001052220010	2.2K
1445	R237	3001055630000	56KΩ
1446	R241	3001055630000	56KΩ
1447	R6139	3001055630000	56KΩ
1448	R854	3001055630000	56KΩ
1449	R883	3001055630000	56KΩ

No.	Ref. No.	Part No.	Description
1450	R895	3001055630000	56KΩ
1451	R858	3001069120000	9.1K
1452	R859	3001061020010	1KΩ
1453	R924	3001061020010	1KΩ
1454	R939	3001061020010	1KΩ
1455	R954	3001061020010	1KΩ
1456	R970	3001061020010	1KΩ
1457	R974	3001061020010	1KΩ
1458	R872	3001051840000	180K
1459	R955	3001051840000	180K
1460	R956	3001051840000	180K
1461	R804	3001081000000	10Ω
1462	R806	3001081000000	10Ω
1463	R807	3001081000000	10Ω
1464	R813	3001081000000	10Ω
1465	R818	3001081000000	10Ω
1466	R861	3001081000000	10Ω
1467	R878	3001081000000	10Ω
1468	R880	3001074720010	4.7K
1469	R881	3001074720010	4.7K
1470	R886	3001052240000	220K
1471	R887	3001058210000	820Ω
1472	R911	3099064422010	44.2kΩ
1473	R917	3001053340010	330K
1474	R918	3099066041010	6.04kΩ
1475	R925	3001064720000	4.7K
1476	R932	3001064720000	4.7K
1477	R707	3001052210000	220Ω
1478	R933	3001052210000	220Ω
1479	R984	3001052210000	220Ω
1480	R6106	3001066810000	680Ω
1481	R936	3001066810000	680Ω
1482	R958	3001066810000	680Ω
1483	R946	3001071020010	1KΩ
1484	R952	3001062430000	24KΩ
1485	R187	3001061000000	10Ω
1486	R953	3001061000000	10Ω
1487	R961	3001083310010	330Ω
1488	R966	3001161510010	150Ω
1489	R971	3099052741000	2.74kΩ
1490	R972	3001062220000	2.2K
1491	R6201	3001056810000	680Ω
1492	R6202	3001071000000	10Ω
1493	R6203	3001052730010	27KΩ

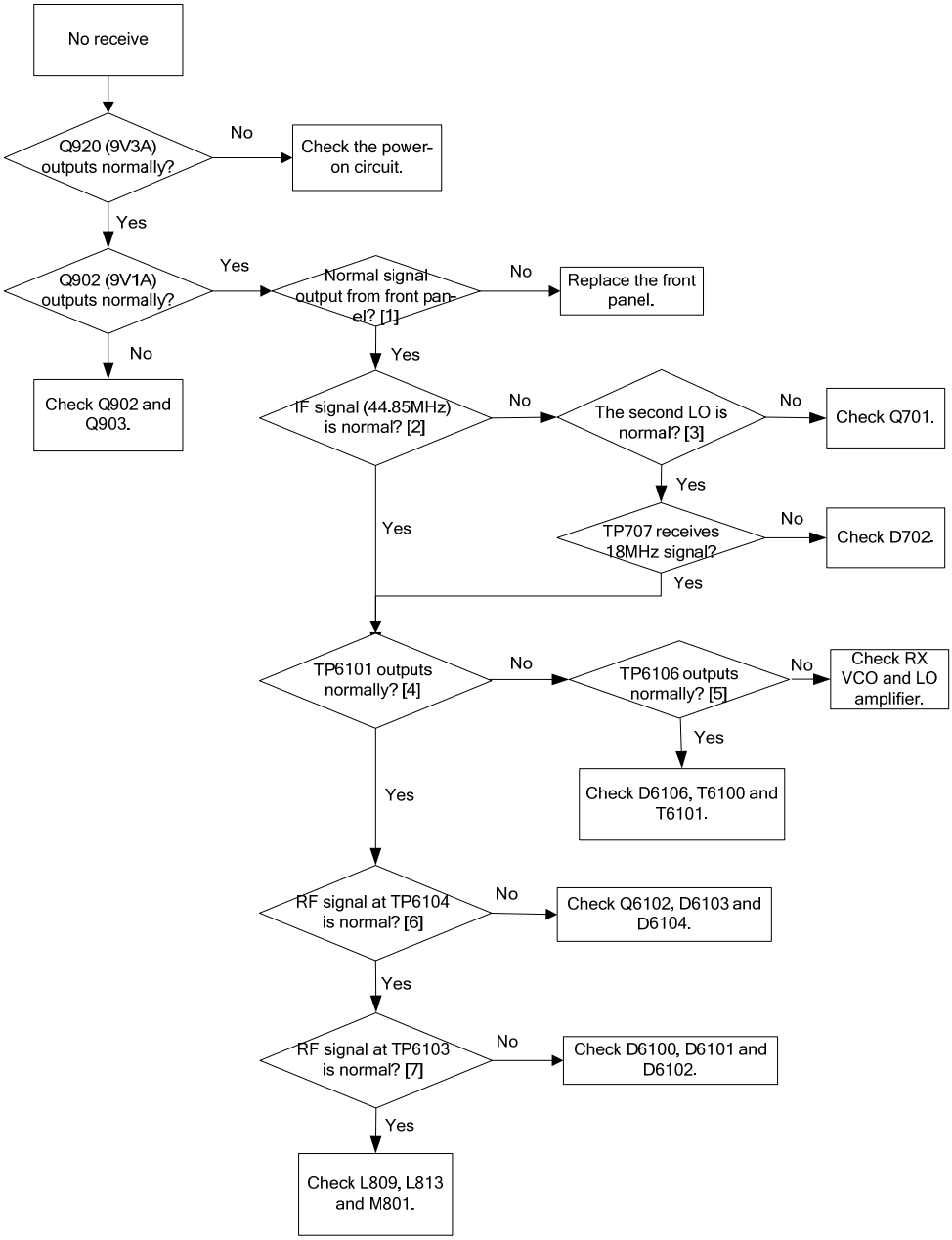
No.	Ref. No.	Part No.	Description
1494	R6204	3001052730010	27KΩ
1495	R6109	3001063910000	390Ω
1496	R6113	3001052740000	270K
1497	L811	3001063310010	330Ω
1498	R6129	3001063310010	330Ω
1499	R811	3001063310010	330Ω
1500	T6100	3244599189000	4BLH
1501	T6101	3244599189000	4BLH
1502	U100	3604019000000	PLL IC
1503	U101	3616059000000	Switch IC
1504	U102	3616059000000	Switch IC
1505	U201	3602017006350	Audio amplifier
1506	U231	3613010000000	Baseband processing IC
1507	U233	3612002000020	Memory
1508	U235	3605010000020	Operational amplifier
1509	U236	3605010000020	Operational amplifier
1510	U237	3616010000000	Switch IC
1511	U238	3605008005070	Operational amplifier
1512	U804	3605008005070	Operational amplifier
1513	U914	3605008005070	Operational amplifier
1514	U302	3610010000010	U302
1515	U327	3607023000150	Serial-to-parallel converter
1516	U401	3699053000000	SmartSwitch
1517	U500	3606010000010	D/A conversion IC
1518	U802	3605002054590	Operational amplifier
1519	U701	3603999000000	IF processor
1520	U702	3608006000000	Power management IC
1521	U900	3608006000000	Power management IC
1522	U901	3608006000000	Power management IC
1523	U909	3608006000000	Power management IC
1524	U703	3608015000060	Power management IC
1525	U905	3608015000060	Power management IC
1526	U915	3608015000060	Power management IC
1527	U801	3605025000020	Operational amplifier
1528	U6000	3605002057090	Operational amplifier
1529	U902	3608053000010	Power management IC
1530	U903	3608015000170	Power management IC
1531	U906	3609010000210	Reset IC
1532	U910	3609010000170	Reset IC
1533	U917	3609006003050	Reset IC
1534	U918	3608015000210	Power management IC
1535	U919	3608010006230	Power management IC
1536	X100	3701019250030	Crystal oscillator (19.2MHz)
1537	X302	3701019250040	Oscillator (19.2MHz)

No.	Ref. No.	Part No.	Description
1538	R934	3001055130010	51KΩ
1539	C718	3101051050160	1uF
1540	L106	3214307181000	180nH
1541	C859	3101068200000	82PF
1542	C888	3101068200000	82PF
1543	L6213	3210305560000	56nH
1544	L6216	3210305560000	56nH
1545	L414	3221505121000	120Ω
1546	L415	3221505121000	120Ω
1547	L417	3221505121000	120Ω
1548	L418	3221505121000	120Ω
1549	R358	3221505121000	120Ω
1550	R360	3221505121000	120Ω
1551	L413	3240707181000	Common-mode choke coil
1552	L416	3240707181000	Common-mode choke coil
1553	C960	3101065600000	56PF
1554	R826	3001061200010	12Ω
1555	R828	3001061200010	12Ω
1556	R900	3001061200010	12Ω
1557	L831	3217607470000	47nH
1558	C943	3101061210000	120PF
1559	C972	3101061210000	120PF
1560	C975	3101063310010	330PF
1561	L834	3233099100000	10nH
1562	L835	3233099100000	10nH
1563	C858	3101060400010	4PF
1564	J404	5206040200010	FFC connector
1565	X375	3701327610060	Crystal
1566	Z6100	3802448540040	44.85MHz
1567		6201928000000	VCO shielding mask
1568		6202010000000	APC shielding mask
1569		41MD7801001C0	PCB
1570	R198	3001053330010	33KΩ
1571	R829	3001062010000	200Ω
1572	R843	3001063320000	3.3K
1573	R846	3001063620000	3.6K
1574	R844	3001065620000	5.6K
1575	R845	3001065620000	5.6K
1576	R855	3001081800000	18Ω
1577	R856	3001081800000	18Ω
1578	C155	3101061600000	16PF
1579	C20	3101061500010	15PF
1580	C877	3101061540000	0.15UF
1581	L103	3217107102000	1uH

No.	Ref. No.	Part No.	Description
1582	L110	3217107102000	1uH
1583	L121	3217107102000	1uH
1584	L134	3217107102000	1uH
1585	L819	3233099470000	47nH
1586	L820	3233099470000	47nH
1587	D900	3302060000000	Zener diode
1588	Q921	3404999000020	NPN transistor
1589	U328	3607082000040	Serial-to-parallel converter
1590	U232	3612044000010	Memory
1591	J400	5201020100110	Board-to-board connector
1592	R902	3001054740010	470K
1593	R903	3001054740010	470K
1594	R904	3001054740010	470K
1595	R905	3001054740010	470K
1596	R876	3001054330000	43KΩ
1597	C880	3101062730000	0.027UF
1598	C831	3101080100010	1pF
1599	C833	3101080100010	1pF
1600	C874	3101080100010	1pF
1601	L806	3213306102000	1uH
1602	R884	3001051830010	18KΩ
1603	R921	3001051830010	18KΩ
1604	R131	3001053320010	3.3K
1605	C815	3101071830000	0.018UF
1606	C839	3101071830000	0.018UF

18.8 Troubleshooting Flow Chart

Receiver Circuit



Description of Normal Situations:

[1] During sensitivity test, use a communication test set to demodulate the audio signal (TP4012 and TP4016). If the signal is demodulated normally, it is concluded that the front panel is defective.

[2] Use the communication test set to input a 44.85MHz IF signal at the mixer, and see whether it can be processed normally afterwards.

[3] Use a spectrum analyzer to check whether TP704 can output the second LO signal (47.1MHz).

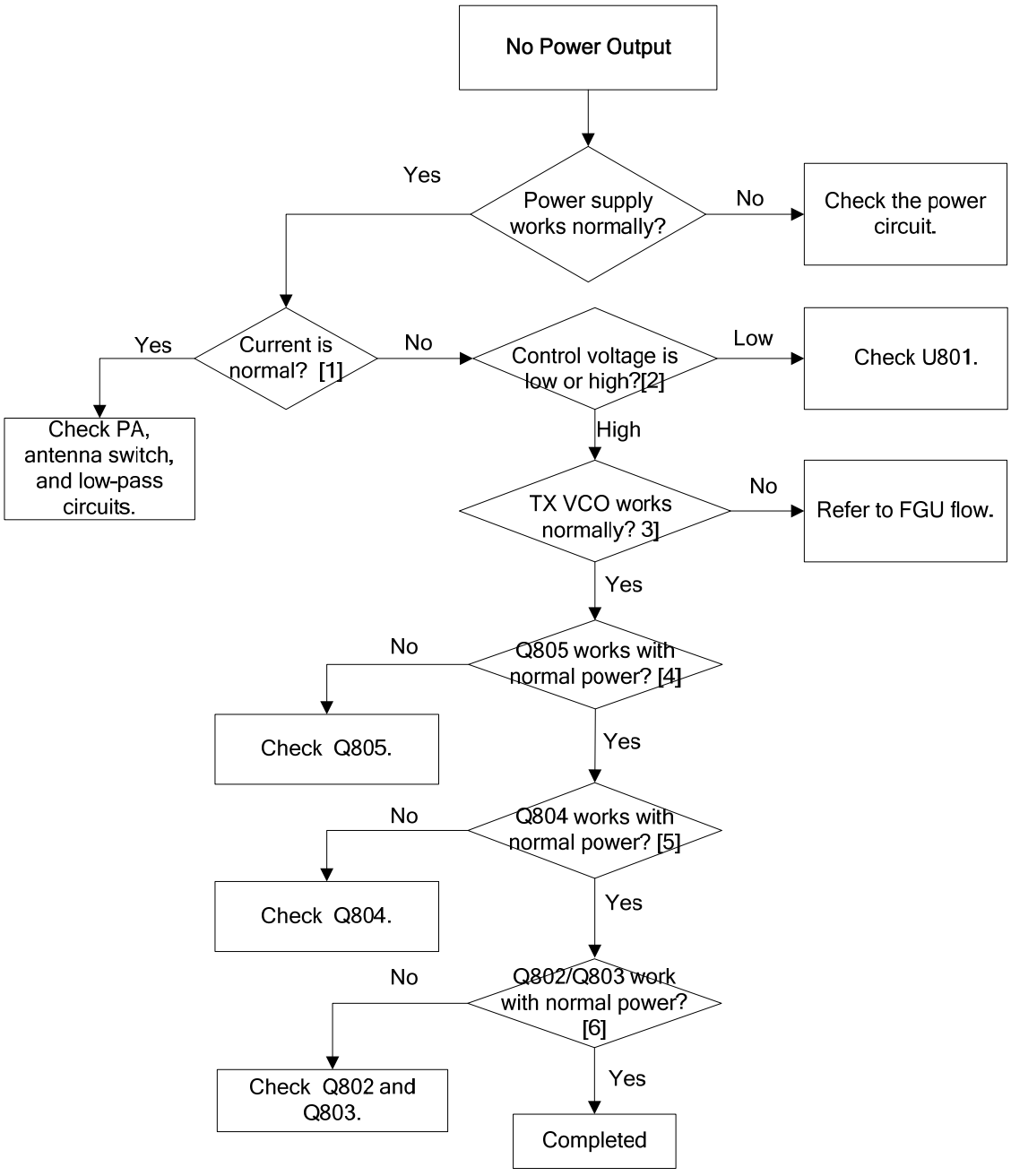
[4] Use the communication test set to apply an RF signal of -100dBm, and test the sensitivity.

[5] Use a spectrum analyzer to test the LO signal received by TP6106. If its strength is about 18dBm, go to check the mixer; otherwise, check the VCO.

[6] Use the communication test set to apply an RF signal of -110dBm at TP6104, and test the sensitivity.

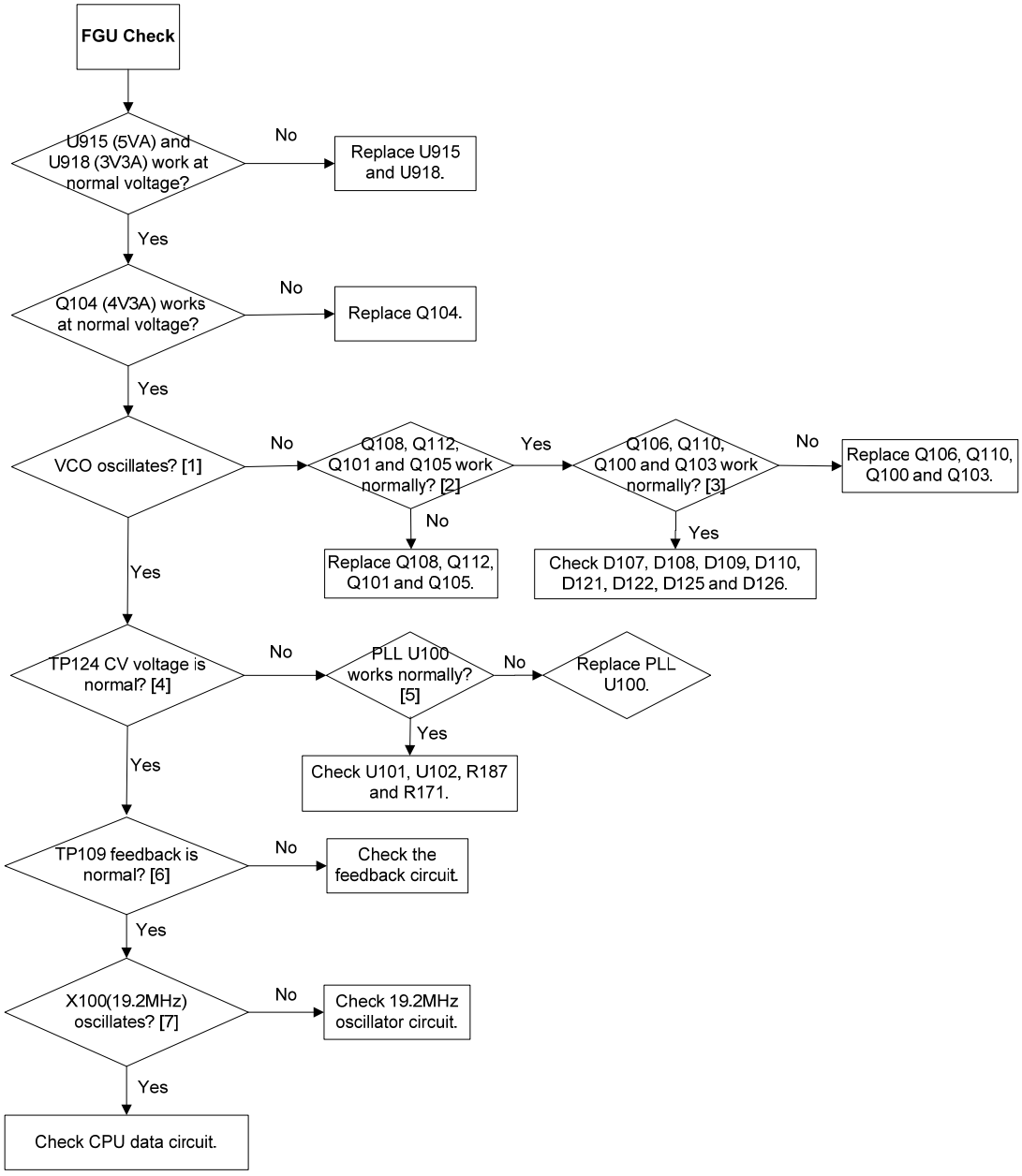
[7] Use the communication test set to apply an RF signal of -110dBm at TP6103, and test the sensitivity.

Transmitter Circuit



Description of Normal Situations:
[1] The current in analog mode is above 6A under 45W power supply and above 1A under 5W. However, in digital mode, the current will be reduced by 50%.
[2] The APC voltage should be above 2V at TP811.
[3] Check whether there is an appropriate TX LO signal at TP803.
[4] Check whether the gain is 20dB and the input signal is 0dBm at Q805.
[5] Check whether the gain is 14dB and the input signal is 0dBm at Q804.
[6] Check whether the gain is 10dB and the input signal is 0dBm at Q802 and Q803.

FGU


FGU Check
U915 (5VA) and U918 (3V3A) work at normal voltage?
No
Replace U915 and U918.
Yes
Q104 (4V3A) works at normal voltage?
No
Replace Q104.
Yes
VCO oscillates? [1]
No
Q108, Q112, Q101 and Q105 work normally? [2]
Yes
Q106, Q110, Q100 and Q103 work normally? [3]
No
Replace Q106, Q110, Q100 and Q103.
No
Replace Q108, Q112, Q101 and Q105.
Yes
Check D107, D108, D109, D110, D121, D122, D125 and D126.
Yes
TP124 CV voltage is normal? [4]
No
PLL U100 works normally? [5]
No
Replace PLL U100.
Yes
Check U101, U102, R187 and R171.
Yes
TP109 feedback is normal? [6]
No
Check the feedback circuit.
Yes
X100(19.2MHz) oscillates? [7]
No
Check 19.2MHz oscillator circuit.
Yes
Check CPU data circuit.

Description of Normal Situations:

[1] Detect the oscillation frequency of RX TP123 and TX TP111 using a spectrum analyzer or the communication test set.

[2] Check whether switches (Q108, Q112, Q101 and Q105) are turned on and output 4.3V.

[3] Check whether the emitter-base voltage of the four transistors (Q106, Q110, Q100 and Q103) is about 0.7V under normal RX/TX status.

[4] Check the CV of TP124. The normal value should range from 0.5V to 4.5V.

[5] Check whether U100 is supplied by 5V and 3.3V normally.

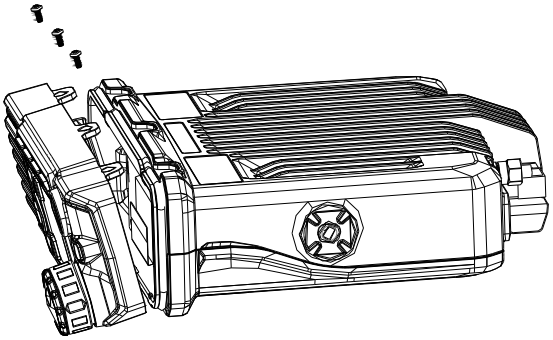
[6] Check whether the power from TP109 to PLL is about -13dBm.

[7] Check whether TP100 outputs 19.2MHz signal.

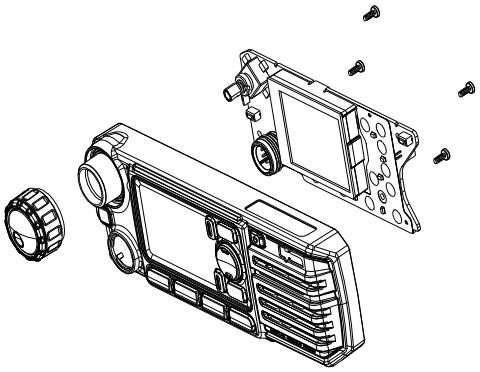
19.Disassembly and Assembly

Disassembly

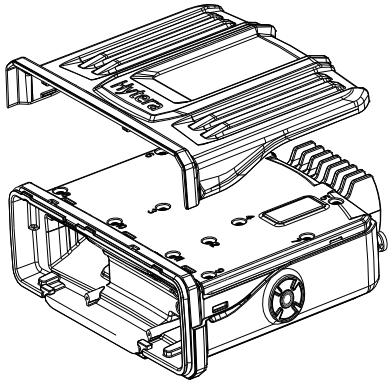
1. Turn off the radio and remove the power cord and antenna.
2. Loosen the three screws to remove the front panel. Then remove the FFC.



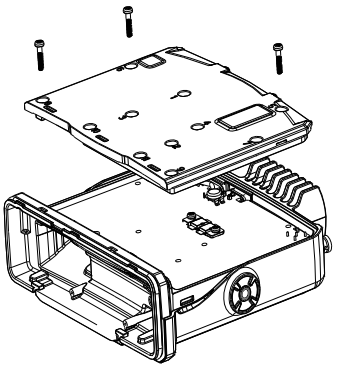
3. Detach the volume control knob and loosen the four screws. Then remove the PCB from the control panel.



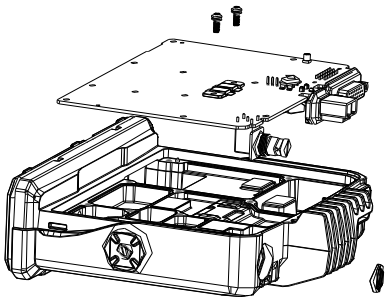
4. Undo the clips on both sides of the radio, and then remove the rear cover.



5. Loosen the eleven screws to remove the upper shield cover.



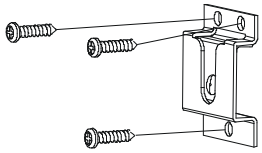
6. Loosen the screw fixing the antenna connector and two screws fixing the PA module. Then take the PCB out.



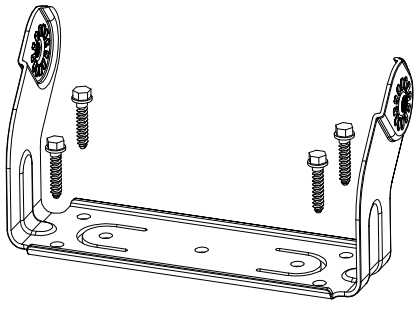
Assembly

To assemble the radio, perform the above steps in a reverse way. In addition, the following procedures shall be performed:

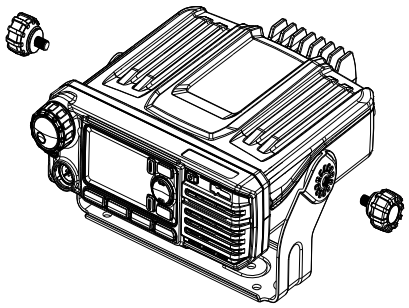
1. Fix the microphone hanger with three self-tapping screws (white, 4.0X16).



2. Fix the radio bracket with four or six self-tapping screws (black, 4.8X20).

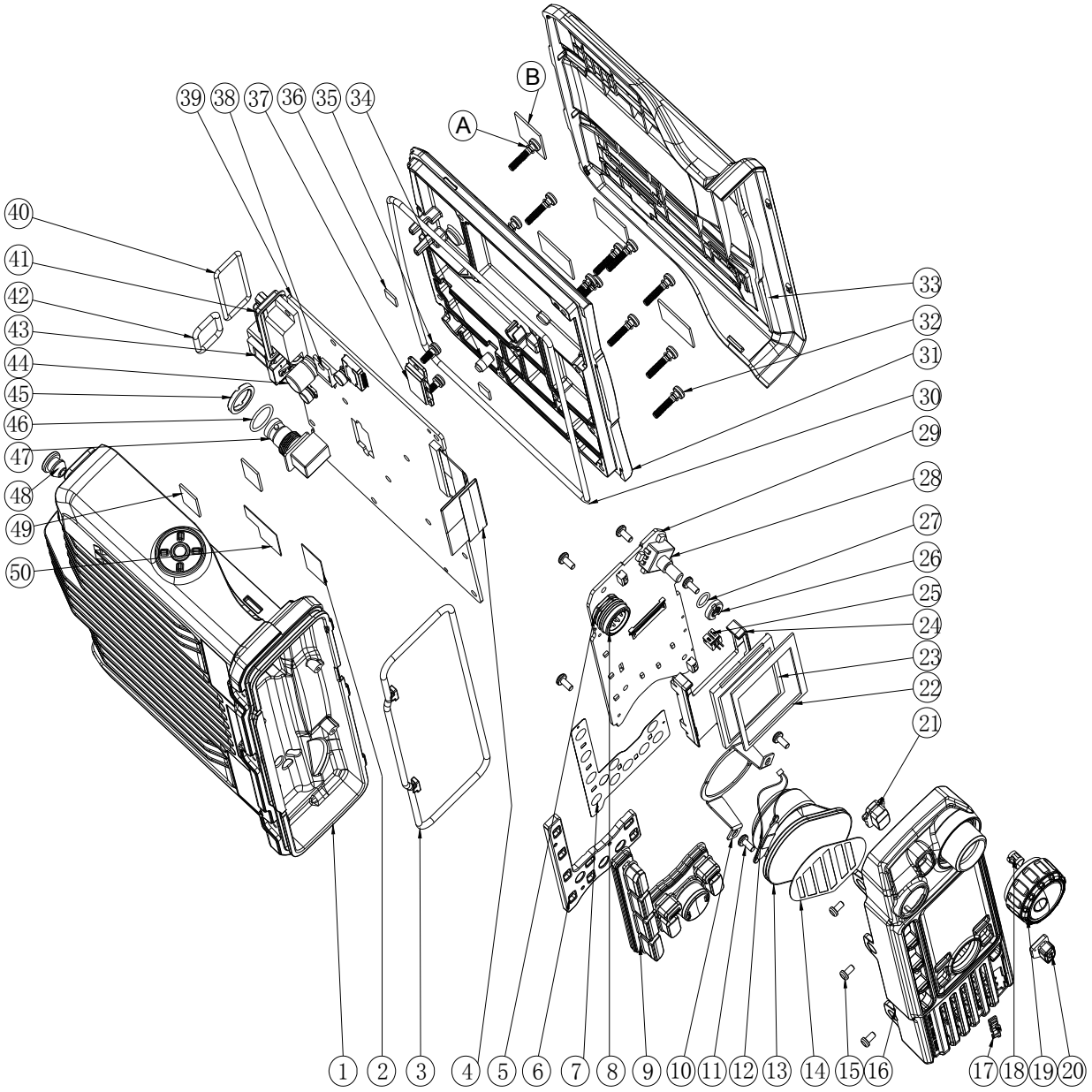


3. Fasten the two adjustment screws, each of which has a silicone rubber pad.



4. Connect the palm microphone to the radio (via front-panel connector). When the palm microphone is not in use, hang it on the microphone hanger.

20.Exploded View



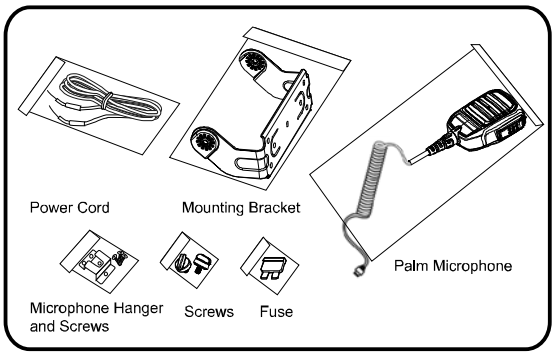
No.	Part Number	Description	Qty.
1	6300109000000	Aluminum chassis (RoHS)	1
2	7500358000000	Heat sink pad (RoHS)	1
3	6100492101000	Waterproof ring for front case (RoHS)	1
4	4210090000200	Signal cable (RoHS)	1
5	5208010100010	Connector (male) 10Pin (RoHS)	1
6	6001079000000	Light-guide plate for keys (RoHS)	1
7	7300048000000	Metal dome (RoHS)	1
8	6100408001000	Waterproof ring for microphone jack (RoHS)	1
9	6100488000000	P+R front panel keys (RoHS)	1
10	6201893000000	Speaker fixing sheet (RoHS)	1
11	7102606021000	Self-tapping screw (RoHS)	6
12	4210080000700	Speaker cable (with 2-Pin plug) (RoHS)	1
13	5001210000390	Speaker (RoHS)	1
14	7400297000000	Speaker felt (RoHS)	1
15	7102505000110	Machine screw (RoHS)	3
16	6001076000010	Front case for control panel (RoHS)	1
17	860P580600100	Logo (RoHS)	1
18	6201739000000	Inner lining of knob (RoHS)	1
19	6000876000000	Encoder knob (RoHS)	1
20	6100493000000	Power on/off key (RoHS)	1
21	6100404000000	Emergency key (RoHS)	1
22	7500344000000	PORON pad (RoHS)	1
23	5130000000040	TFT LCD 2.0" TFT (RoHS)	1
24	6001078000000	LCD bracket (RoHS)	1
25	5202002100270	Board-to-wire connector (RoHS)	1
26	7207003700000	Nut (RoHS)	1
27	6100334000000	O-ring for encoder switch (RoHS)	1
28	4399030000020	Rotary switch (RoHS)	1
29	41078001000F0	PCB for control panel	1
30	6100533101000	Waterproof ring for aluminum chassis (RoHS)	1
31	6300126000000	Aluminum upper cover (RoHS)	1
32	7103015000000	Machine screw (RoHS)	11
33	6001080000000	Plastic upper cover (RoHS)	1
34	6100496000000	Conductive silicone rubber for main board (RoHS)	1
35	7103008000400	Machine screw (RoHS)	2
36	7500272000000	Heat sink pad (RoHS)	2
37	1301000000000	Semi-finished PA with heat sink pad (RoHS)	1
38	3414999000020	PNP transistor (RoHS)	1
39		Main PCB	1
40	6100532100000	D_SUB waterproof ring (RoHS)	1
41	5208026100000	Jack (RoHS)	1

42	6100530100000	Waterproof ring for power socket (RoHS)	1
43	5205002100110	Power socket (male) (RoHS)	1
44	3103994770150	Electrolytic capacitor (RoHS)	1
45	7212002500000	Nut (RoHS)	1
46	6100531100000	Waterproof ring for antenna connector (RoHS)	1
47	4401000009000	BNC RF connector (RoHS)	1
48	6100494000000	Soft stopple for GPS antenna connector (RoHS)	1
49	7500159000100	Thermal conductive silicone rubber (RoHS)	2
50	7500357000000	Heat sink pad (RoHS)	1
A	6100574100000	O_ring (RoHS)	11
B	7500344000000	PORON pad (RoHS)	1

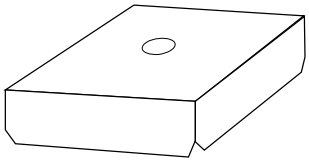
Note: Parts that are not marked with Part Number may vary with the radio frequency band.

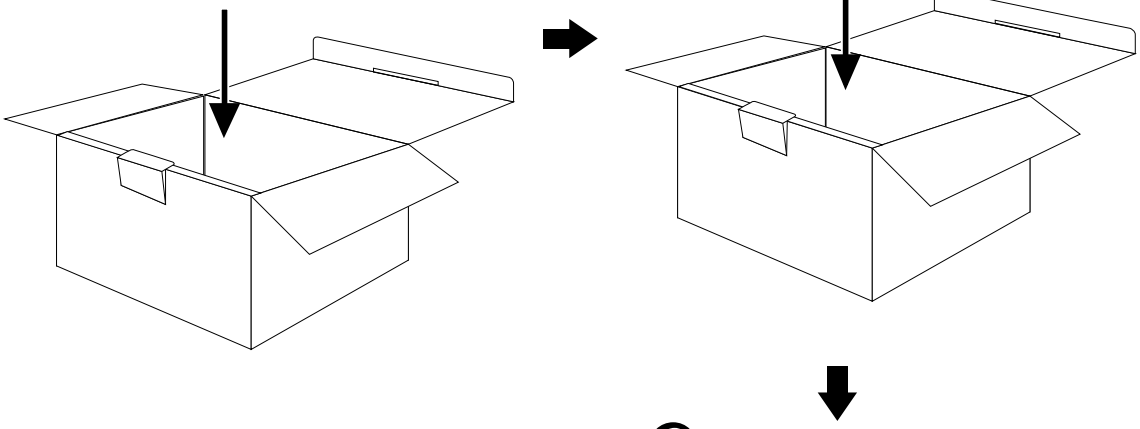
21.Packing Guide

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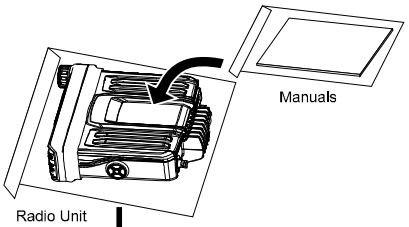


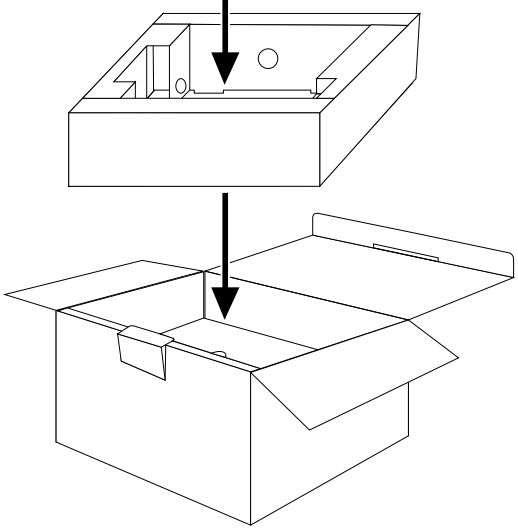
❷



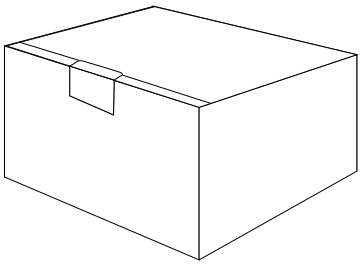


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22.Specifications

General			
Frequencies		UHF1: 400-470MHz UHF2: 450-520MHz UHF3: 350-400MHz VHF: 136-174MHz	
Channel Capacity		1024	
Zone Capacity		64 (each with a maximum of 16 channels)	
Channel Spacing		12.5 KHz /20KHz/25 KHz*	
Operating Voltage		13.6 V ±15%	
Current Drain	Standby	< 0.6A	
	Receive	< 2.0A	
	Transmit	5W	< 5A
		25W	< 8A
		45W/50W	< 12A
Frequency Stability		±1.5 ppm	
Antenna Impedance		50Ω	
Dimensions (H×W×D)		60×174×200 mm (2.362×6.850×7.874 inch)	
Weight		1.7kg (3.75lbs)	
LCD Display		220×176 pixels, 262000 colors 2.0 inch, 4 rows	
Transmitter			
RF Power Output		Low Power	UHF1 (400-470MHz): 5-25W UHF2 (450-520MHz): 5-25W UHF3 (350-400MHz): 5-25W VHF (136-174MHz): 5-25W
		High Power	UHF1 (400-470MHz): 5-45W UHF2 (450-520MHz): 5-45W UHF3 (350-400MHz): 5-45W VHF (136-174MHz): 5-50W
FM Modulation		11K0F3E@12.5KHz 14K0F3E@20KHz* 16K0F3E@25KHz*	
4FSK Digital Modulation		12.5KHz Data Only: 7K60FXD 12.5kHz Data & Voice: 7K60FXW	
Conducted/Radiated Emission		-36dBm<1GHz -30dBm>1GHz	
Modulation Limiting		±2.5KHz@12.5KHz ±4.0KHz@20KHz*	

		±5.0KHz@25KHz*	
FM Hum & Noise		-40dB@12.5KHz -43dB@20KHz* -45dB@25KHz*	
Adjacent Channel Power		60dB@12.5KHz 70dB@20/25KHz*	
Audio Response		+1 ~ -3 dB	
Audio Distortion		≤3 %	
Digital Vocoder Type		AMBE++ or SELP	
Digital Protocol		ETSI-TS102 361-1,- 2,-3	
Receiver			
Sensitivity	Analog	0.3μV (12dB SINAD) 0.22μV (Typical) (12dB SINAD) 0.4μV (20dB SINAD)	
	Digital	0.3μV /BER5%	
Adjacent Channel Selectivity TIA-603 ETSI		65dB@12.5 KHz /75dB@20&25KHz* 60dB@12.5KHz /70dB@25KHz&20KHz*	
Intermodulation TIA-603 ETSI		75dB@12.5/20/25KHz* 70dB@12.5/20/25KHz*	
Spurious Response Rejection TIA-603 ETSI		75dB@12.5/20/25KHz* 70dB@12.5/20/25KHz*	
Blocking TIA-603 ETSI		90dB 84dB	
Hum and Noise		-40dB@12.5kHz -43dB@20kHz* -45dB@25kHz*	
Rated Audio Power Output		Internal (@20 ohm load)	3W
		External (@8 ohm load)	7.5W
Max Audio Power Output		Internal (@20 ohm load)	8W
		External (@8 ohm load)	20W
Rated Audio Distortion		≤3%	
Audio Response		+1 ~ -3 dB	
Conducted Spurious Emission		< -57 dBm	
Environmental Specifications			
Operating Temperature		-30℃ ~ +60℃	
Storage Temperature		-40℃ ~ +85℃	
ESD		IEC 61000-4-2 （level 4） ±8kV (contact) ±15kV (air)	

American Military Standard	MIL-STD-810 C/D/E/F
Dust & Water Intrusion	IP54 Standard
Humidity	Per MIL-STD-810 C/D/E/F Standard
Shock & Vibration	Per MIL-STD-810 C/D/E/F Standard
GPS (for MD78XG only)	
Accuracy specs are for long-term tracking(95th percentile values>5 satellites visible at a nominal -130dBm signal strength)	
TTFF (Time To First Fix) Cold Start	<1 minute
TTFF (Time To First Fix) Hot Start	<10 seconds
Horizontal Accuracy	<10 meters

* 20KHz/25KHz will not be available on new equipment in the U.S. after 1/1/2011.

All Specifications are tested according to applicable standards, and subject to change without notice due to continuous development.

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