

Hytera

SERVICE MANUAL

DMR PORTABLE RADIO 数字手持对讲机

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:

PD70X (X may indicate 2, 5, 6 or 8)

PD70XG (X may indicate 2, 5, 6 or 8)

PD78X (X may indicate 2, 5, 6 or 8)

PD78XG (X may indicate 2, 5, 6 or 8)

HD705

HD705G

HD785

HD785G

In this manual, the description related to the LCD is applicable to PD78X/ PD78XG/ HD785/ HD785G only, while the description related to GPS is applicable to PD70XG/ PD78XG/ HD705G/ HD785G 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; update the battery life.

2. Copyright Information

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U.S. Patent Nos. #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

The Company endeavors to achieve the accuracy and completeness of this manual, but no warranty of accuracy or reliability is given. All the specifications and designs are subject to change without notice due to continuous technology development. No part of this manual may be copied, modified, translated, or distributed in any manner without the express written permission of us.

If you have any suggestions or would like to learn more details, please visit our website at:
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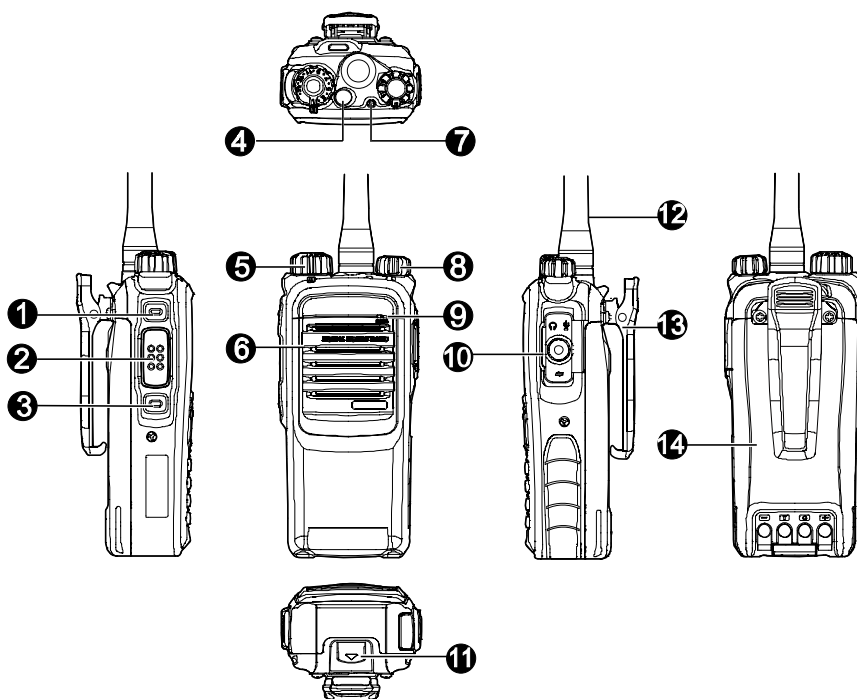
4. Introduction

Intended User

This manual is intended for use by qualified technicians only.

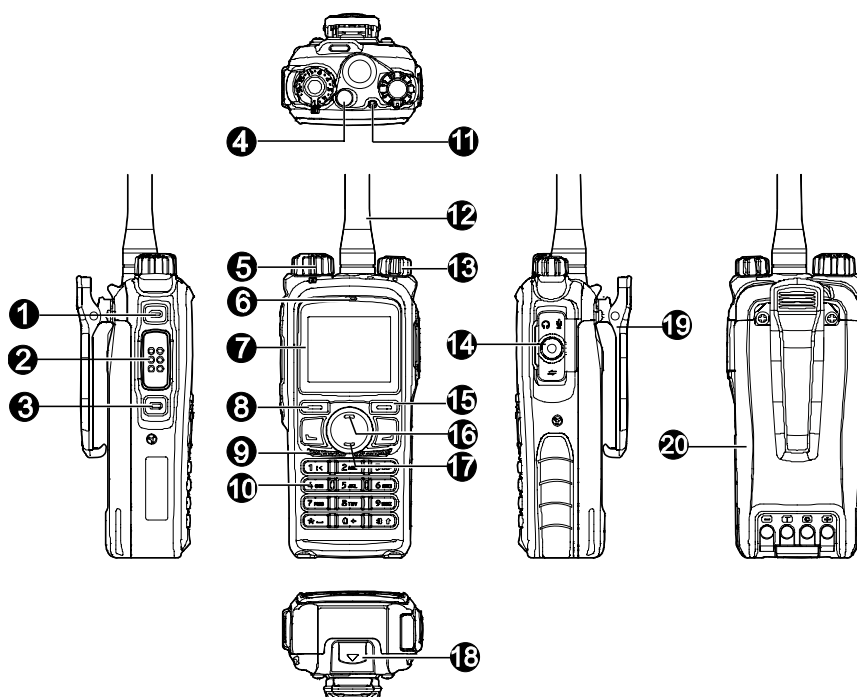
5. Product Controls

PD70X/ PD70XG/ HD705/ HD705G



No.	Part Name	No.	Part Name
①	SK1 (Side Key 1)	⑧	Radio On-Off/Volume Control Knob
②	PTT Key	⑨	Microphone
③	SK2 (Side Key 2)	⑩	Accessory Jack
④	TK (Top Key)	⑪	Battery Latch
⑤	Channel Selector knob	⑫	Antenna
⑥	Speaker	⑬	Belt Clip
⑦	LED Indicator	⑭	Battery

PD78X/ PD78XG/ HD785/ HD785G



No.	Part Name	No.	Part Name
①	SK1 (Side Key 1)	⑪	LED Indicator
②	PTT Key	⑫	Antenna
③	SK2 (Side Key 2)	⑬	Radio On-Off/Volume Control Knob
④	TK (Top Key)	⑭	Accessory Jack
⑤	Channel Selector knob	⑮	Exit Key
⑥	Microphone	⑯	Up Key
⑦	LCD Display	⑰	Down Key
⑧	OK/Menu Key	⑱	Battery Latch
⑨	Speaker	⑲	Belt Clip
⑩	Numeric Keypad	⑳	Battery

6. Baseband Section

6.1 Power Section

6.1.1 Diagram of Power Control

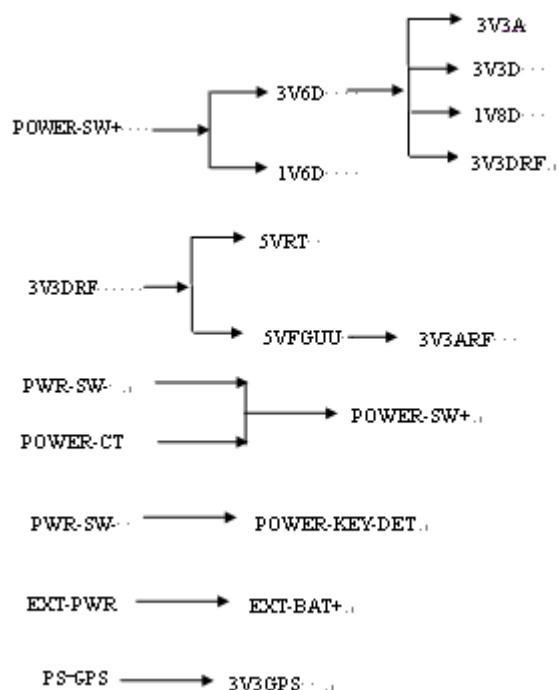


Figure 6-1 Diagram of Power Control

6.1.2 Radio On/Off

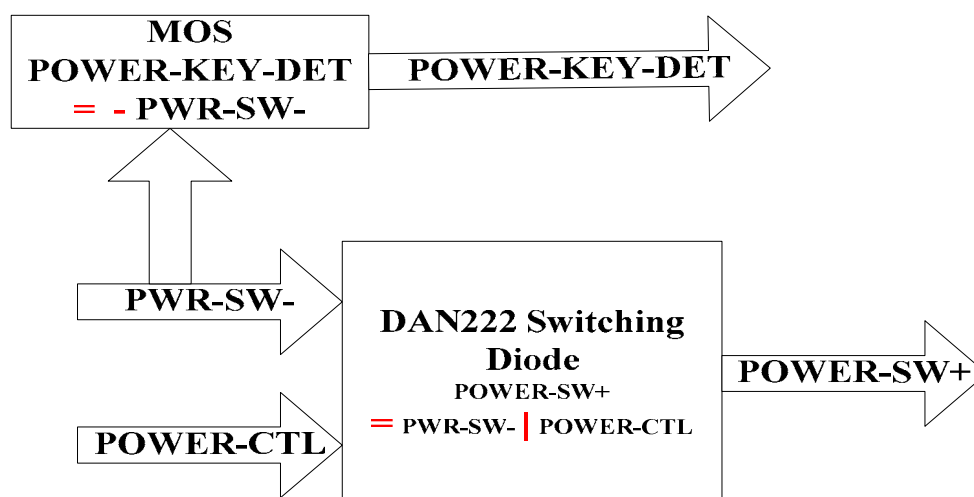


Figure 6-2 Diagram of Radio On/Off Control

The radio-on signal (POWER-SW+) satisfies the equation: $\text{POWER-SW+} = \text{PWR-SW-} \mid \text{POWER-CTL}$.

When the Volume Switch is on, PWR-SW- and POWER-SW+ are at high level, and the radio powers up.

After power-on, POWER-CTL goes to high level, and POWER-KEY-DET goes to low level. During power-off, POWER-SW+ is at low level, while POWER-KEY-DET is at high level. The system detects power-off procedure via POWER-KEY-DET and implements the power-off procedure. Then POWER-KEY-DET and POWER-SW+ go to low level, and the power is cut off.

6.1.3 Power Protection

Power protection includes over-current, reverse-voltage and ESD protection.

6.1.4 Power Consumption Control

OMAP can control and configure the power supply and working mode of the peripheral modules (RF section and baseband section) via I/O interface and serial bus, so as to reduce power consumption.

6.2 Control Section

6.2.1 OMAP5912 Dual-core Processor

The radio uses the dual-core processor OMAP5912, which is mainly composed of ARM926EJ-S and TMS320C55xx. ARM926EJ-S is the main controller, while TMS320C55xx is used for modulation/demodulation and voice encoding/decoding.

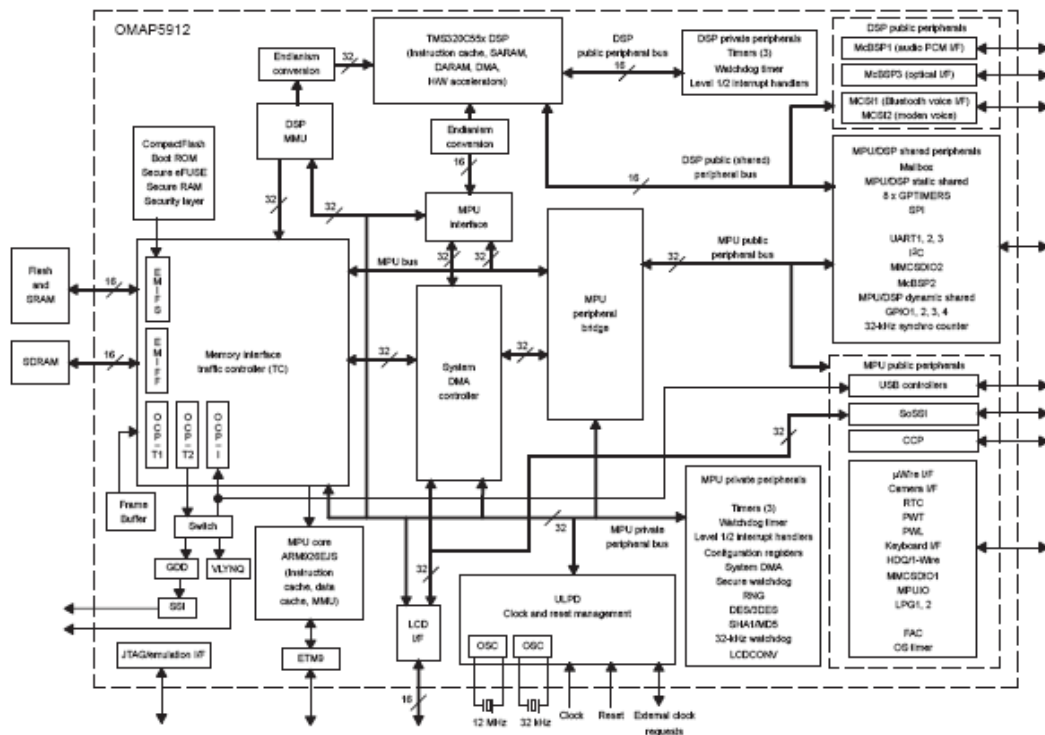
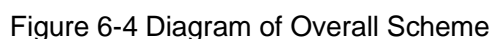
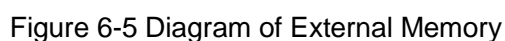


Figure 6-3 Diagram of OMAP5912



OMAP5912 provides two types of external memory interfaces: external memory interface slow (EMIFS) and external memory interface fast (EMIFF).



EMIFS is a 16-bit interface, and provides four 64MB chip selects (CS0~CS3). The interface supports

memories such as NAND Flash, NOR Flash and SRAM.

2) EMIFF

EMIFF is a 16-bit interface, and supports SDRAM (up to 128MB), mobile SDRAM and mobile DDR.

6.2.3 Clock

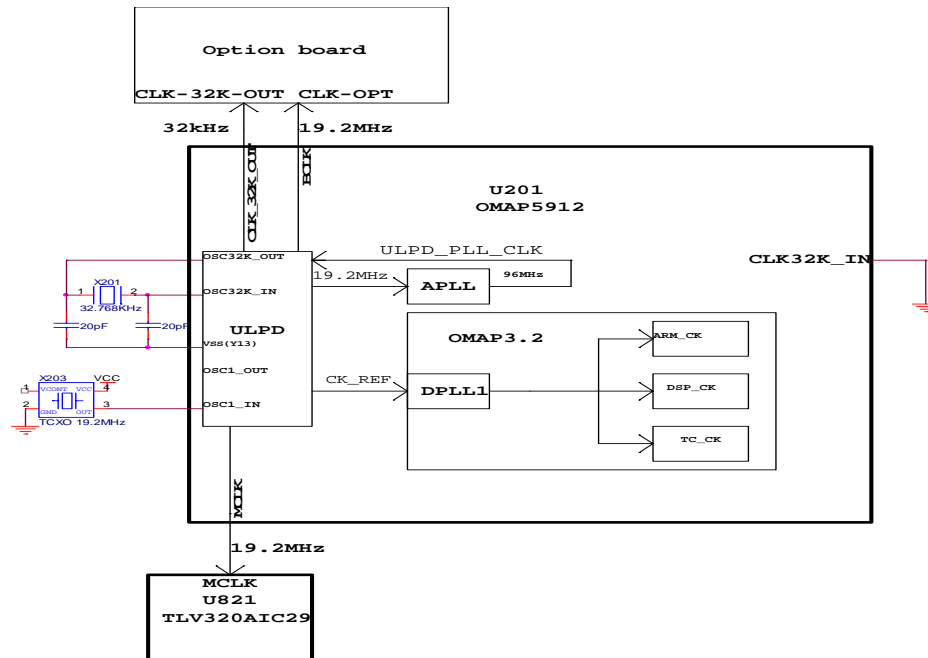


Figure 6-6 Diagram of Baseband Clock

Input Clock:

(A) 32K Clock: It is also called “sleep clock” and is mainly used for timing and sleeping of the system.

(B) 19.2MHz Clock: It is mainly used to provide input clock for APLL and DPLL.

Output Clock:

Three output clocks are provided: MCLK, BCLK and CLK32K_OUT. MCLK provides 19.2MHz clock to the audio codec; BCLK provides 19.2MHz clock to the option board; and CLK32K_OUT provides 32KHz clock to the option board.

6.2.4 Reset Signal

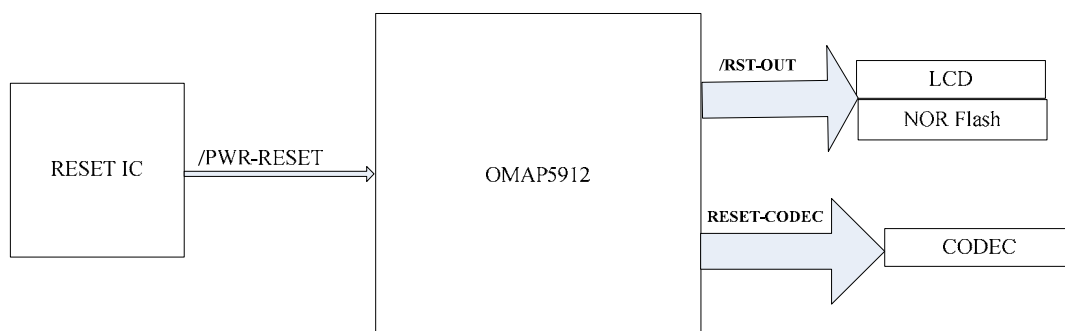


Figure 6-7 Diagram of Reset Signal

6.2.5 SPI

OMAP5912 has a SPI, which has four chip-selects for connecting four external SPI components. The SPI signals available are SPI.DOUT, SPI.DIN, SPI.CLK and SPI.CS. The system uses SPI.CS2 to select the IF processor AD9864, to configure register of AD9864. The connection of SPI is shown below.

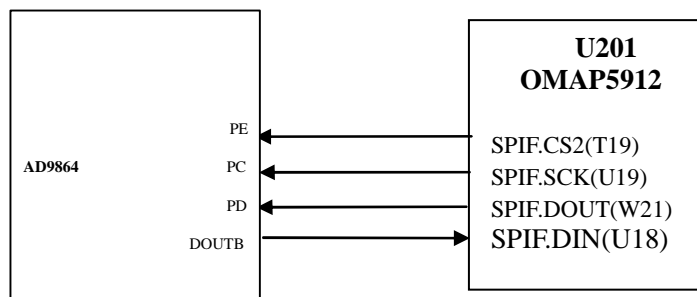


Figure 6-8 Diagram of SPI Connection

6.2.6 MCBSP

OMAP5912 provides 3 MCBSP interfaces: MCBSP1, MCBSP2 and MCBSP3. MCBSP1 is connected with the I2S interface of the audio codec, to realize two-way transmission of digital voice and data. MCBSP2 uses independent clock and frame synchronization for transmission and reception. AD9864 SSI is connected to the RX end of OMAP5912 MCBSP2. AD9864 works in master mode, while DSP works in slave mode. DAC is connected with the TX end of MCBSP2, and DSP works in master mode. MCBSP3 is connected to the option board. The connection of MCBSP is shown below.

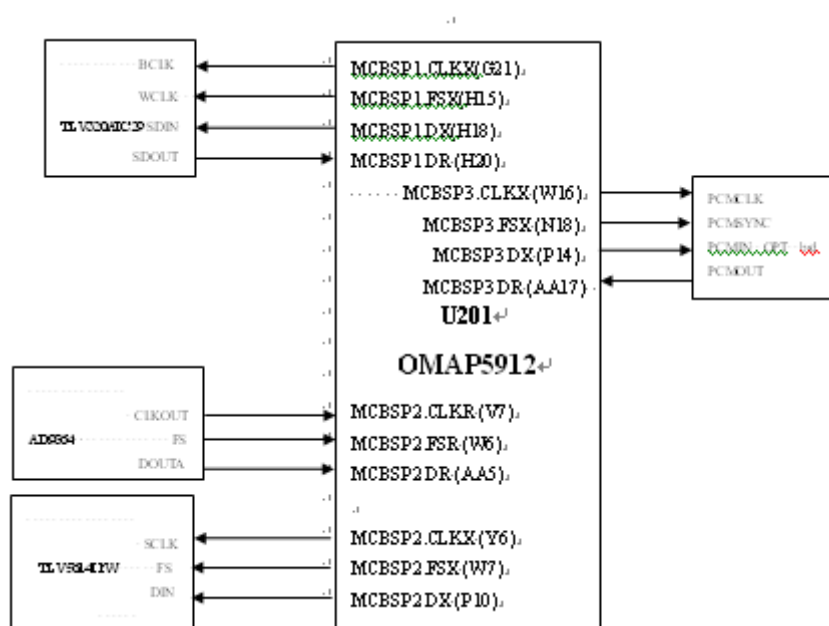


Figure 6-9 Diagram of MCBSP Connection

6.2.7 USB

OMAP5912 provides 3 USB interfaces. One interface integrates a USB transceiver, which is connected to the accessory jack and is used for program downloading and data application.

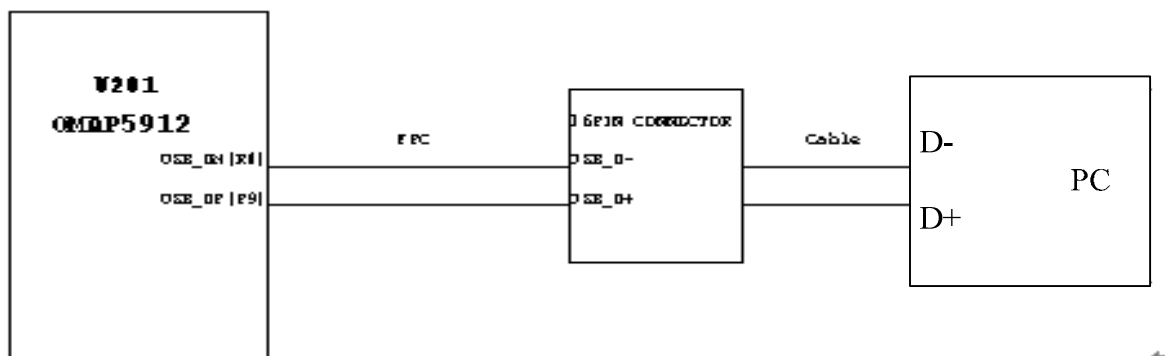


Figure 6-10 Diagram of USB Interface

6.2.8 UART

OMAP5912 has three UART interfaces (UART1, UART2 and UART3), and supports hardware flow control. The maximum communication rate is 1.5Mbps. The connection of UART is shown below. UART1 is connected with the accessory jack, and is used for updating and programming. UART2 is for GPS, and UART3 is for the option board.

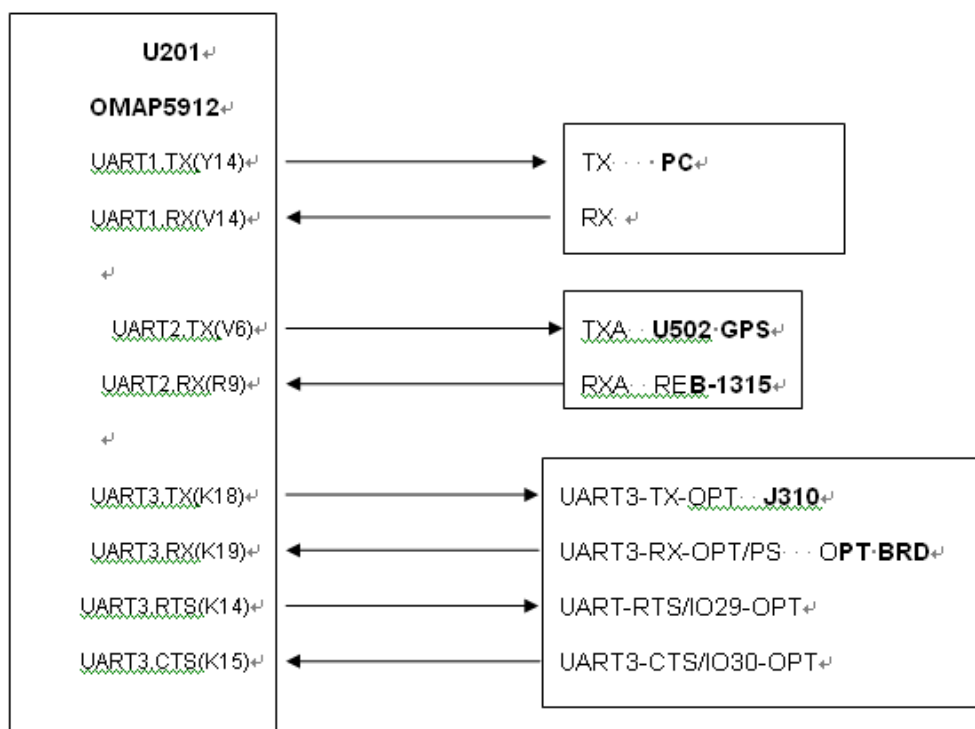


Figure 6-11 Diagram of UART Interface Connection

6.2.9 I2C

OMAP5912 provides one I2C interface, and supports communication rate up to 400Kbps. The I2C interface is connected with the acceleration sensor, and works in slave mode. The connection of I2C is shown below.

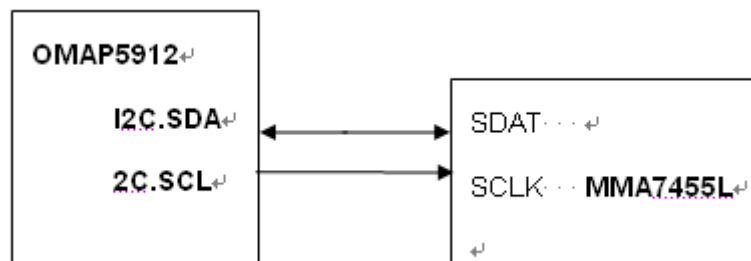


Figure 6-12 Diagram of I2C Connection

6.2.10 MICROWIRE

OMAP5912 provides a MICROWIRE. The four chip select signals can drive four external components. MICROWIRE is used to configure the audio codec and read the value of its register. It uses the chip select signal 3. The connection is shown below.

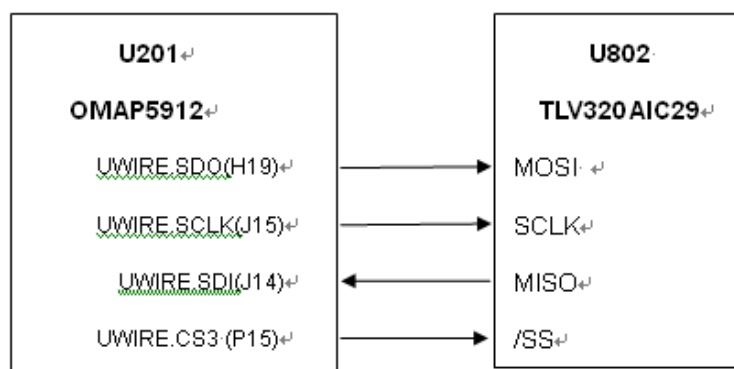


Figure 6-13 Diagram of MICROWIRE Connection

6.2.11 MCSI1

OMAP5912 has two MCSI interfaces. MCSI1 is used for PLL configuration and data transmission. The connection of MCSI1 is shown below.

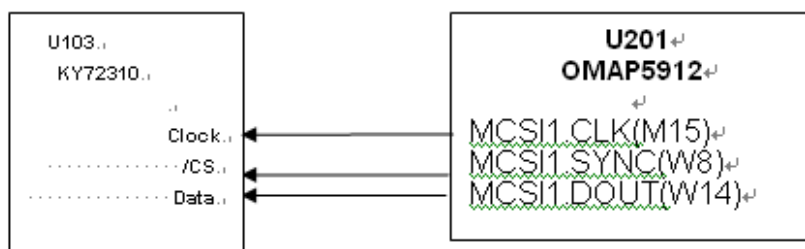


Figure 6-14 Diagram of SPI Connection

6.3 Audio Section

6.3.1 Audio Diagram

The audio module is mainly for audio input and output. TLV320AIC29 is used as the audio codec to convert and process audio signal and digital signal. The audio amplifier TDA8547TS is used to amplify the analog audio signal. DSP processes digital signal (audio signal encoding/decoding, digital I/Q signal decoding, digital audio signal processing). AD9864 converts and processes the RF IF signal, and sends the undemodulated serial digital I/Q signal to the DSP for processing. Then DAC5614 converts the digital signal output by DSP to analog signal.

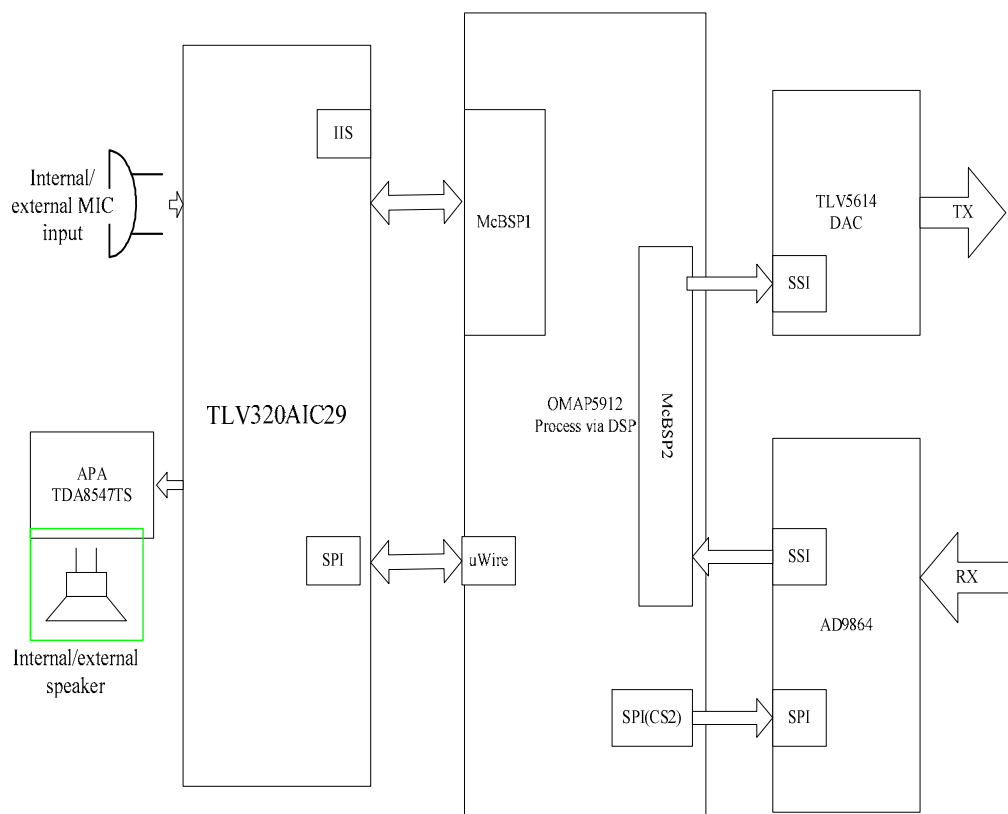


Figure 6-15 Diagram of Audio Section

6.3.2 Diagram of Signal Flow

The microphone converts the audio signal into electrical signal, which is then amplified by PGA of the codec and sent to ADC of the codec for sampling. After digital audio processing, the signal is output to DSP for processing. Then the signal is sent to DAC (TLV5614), which converts the signal to modulation signal. After modulated and amplified in the RF module, the signal is sent out from the antenna.

The RF signal received by the RF module is converted to digital signal by ADC (AD9864), and is then

sent to DSP for demodulation and processing. Then the digital signal is sent to the digital audio processor of the codec for digital audio processing, and is then converted into analog audio signal by DAC of the codec. Finally the signal is amplified by the external audio amplifier (TDA8547TS) to drive the speaker.

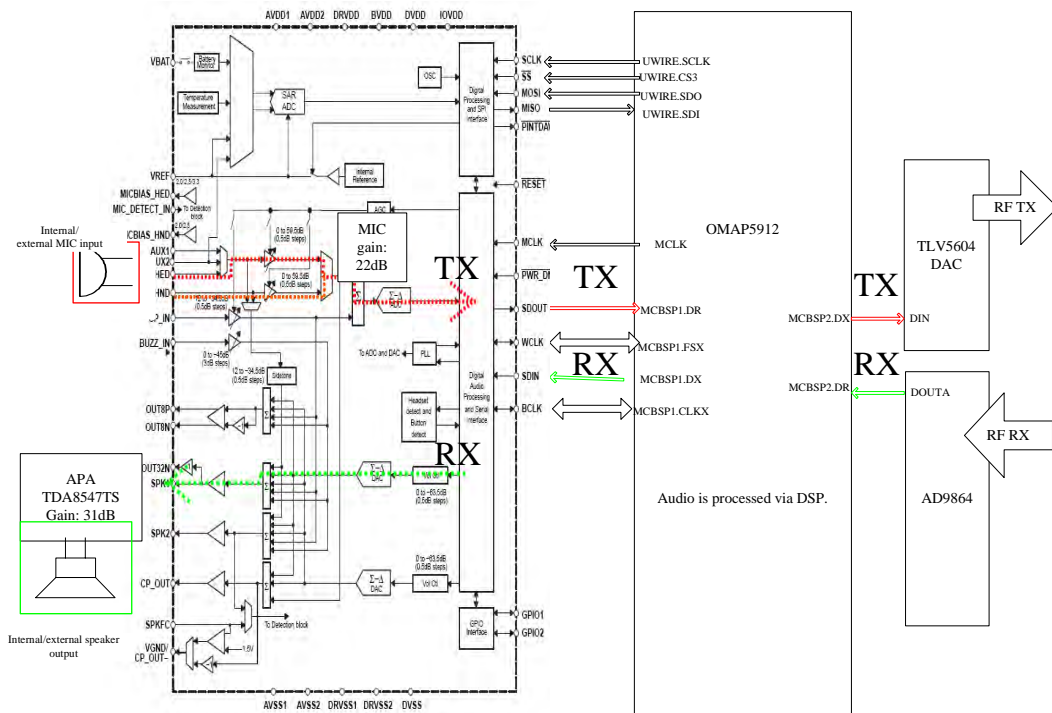


Figure 6-16 Diagram of Audio Signal Flow

6.3.3 Audio Amplifier

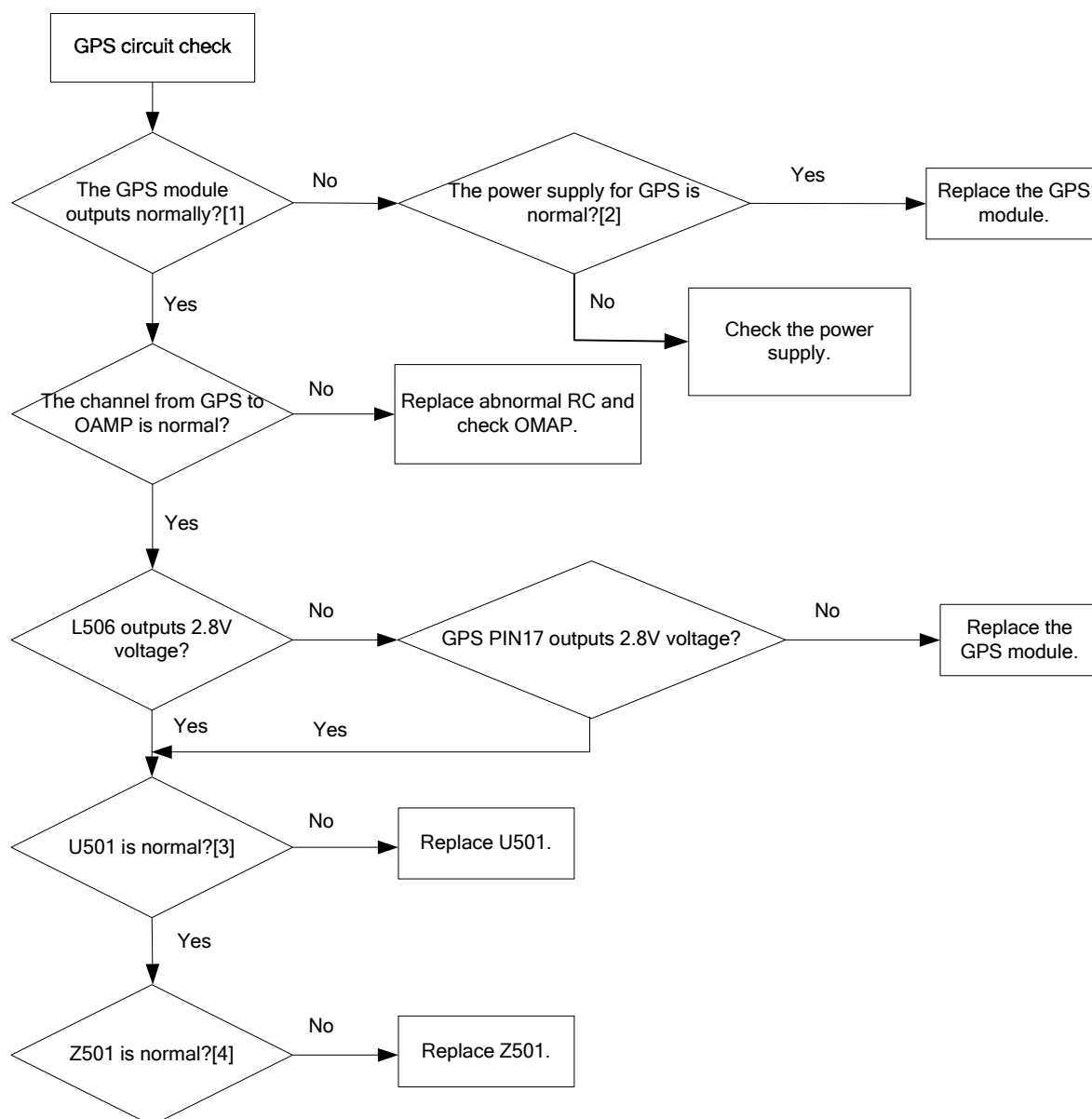
Main parameters of TDA8547TS are listed in the table below:

Rated Power (P_o)	0.5W	$R_L = 16\ \Omega$
Maximum Power (P_{max})	1.2W	$R_L = 16\ \Omega$

The operation status of the audio amplifier is controlled via GPIO of OMAP. See the table below.

Mode-Amp	SEL-SPK	MODE	SELECT	OUT
1	1	0	0	OUT2
1	0	0	1	OUT1
0	1	1	1	Standby

6.4 Troubleshooting Flow Chart



Description of Normal Situations:

- [1] The radio shows normal power-on screen, and the backlight is normal.
- [2] The RF power supply outputs normally, and the RX channel is on.
- [3] Vpp: 700mV~800mV, F: 19.2MHz.

6.5 PCB Difference

For UHF1 PCB, Version H and Version K are made on the basis of Version F.

1. The following changes are made for Version H:

- 1) Remove the board border and the small board.
- 2) C802 is compatible with 1206 and 0805.

2. The following changes are made for Version K:

- 1) Add test points (P609 and P610) for the GPS power supply.
- 2) Add capacitors C301, C302, C303, C304 and C305.
- 3) Add R208.
- 4) Remove the board border.
- 5) C802 is compatible with 1206 and 0805.

For VHF PCB, Version B is made on the basis of Version A. However, some changes are made for Version B:

- 1) Add test points (P609 and P610) for the GPS power supply.
- 2) Add R208.
- 3) C802 is compatible with 1206 and 0805.

7. GPS Circuit

7.1 Circuit Description

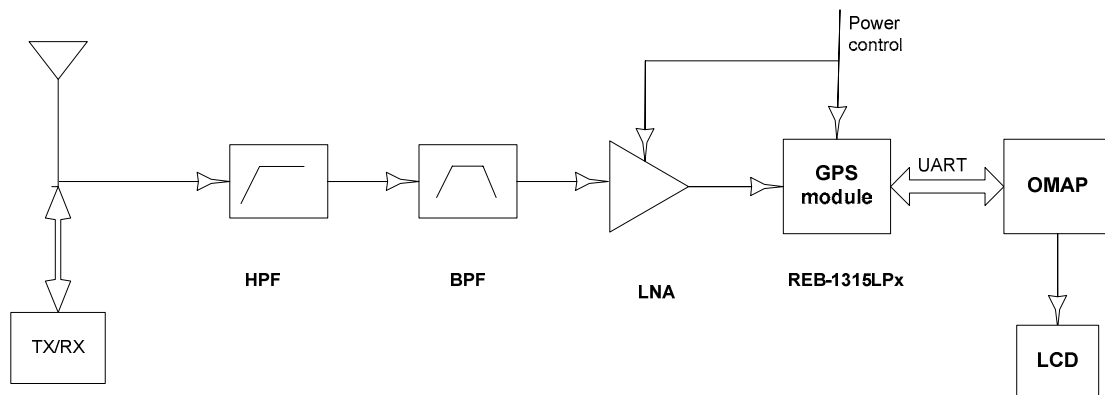


Figure 7-1 Diagram of GPS Circuit

The GPS function is realized via REB-1315LPx. The GPS circuit integrates a baseband processor, a LNA and a SAW. The 1575.42MHz GPS signal is received by the antenna, and then goes to HPF to remove the in-band signals used for transmission and reception. After that, the signal goes to BPF to further remove in-band signals, as well as harmonic and spurious signals. Then the weak GPS signal goes to a low-noise amplifier (LNA) for amplification. After amplified, the signal goes to the GPS module for further amplification and filtering, and is then sent to the baseband section for calculation. Then the calculated GPS positioning information is sent to OMAP via the UART interface. Meanwhile, OMPA can send appropriate command information to the GPS module via the UART interface. Finally, OMAP sends the processed data information to LCD.

7.2 Schematic Diagram

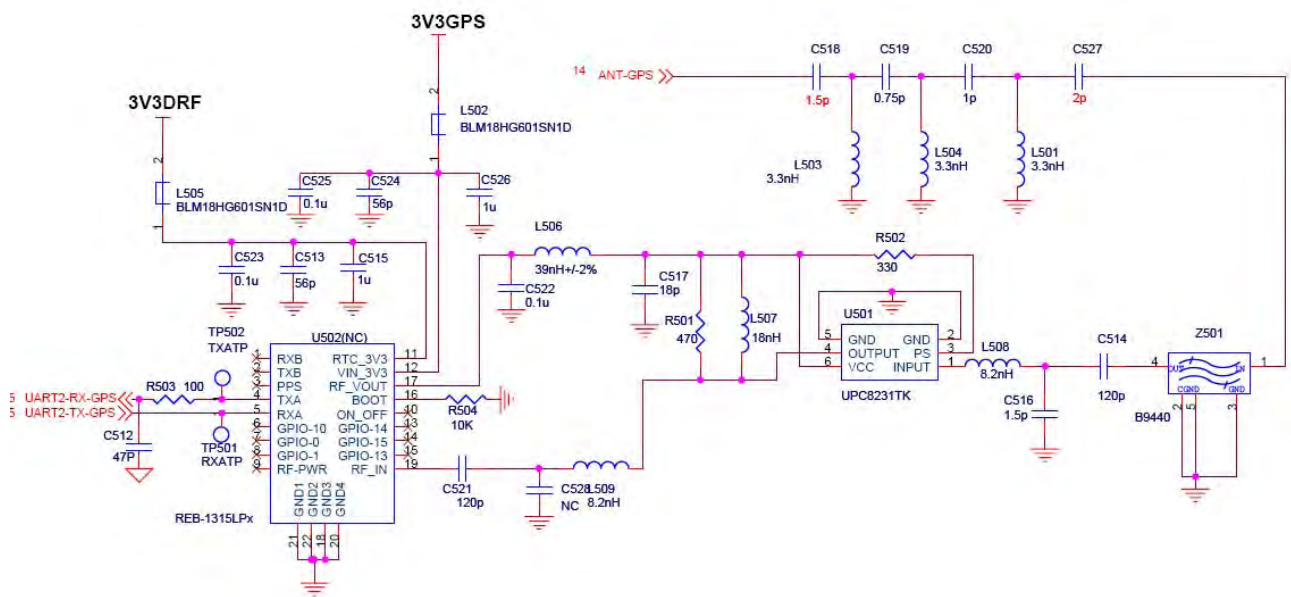
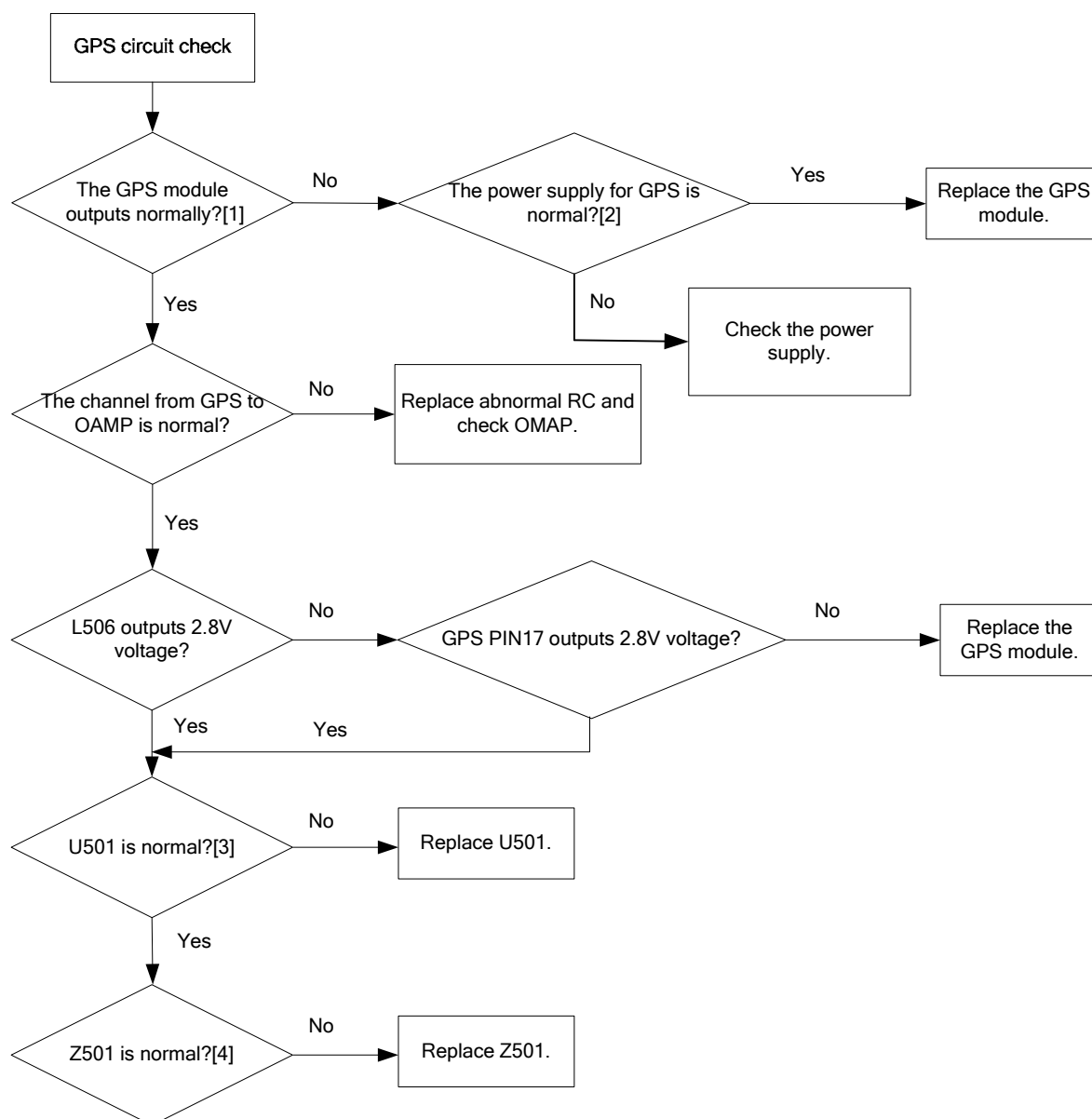


Figure 7-2 Schematic Diagram

7.3 Parts List

No.	Ref. No.	Part No.	Description
1	C518	3101051590000	1.5P
2	C519	3199050758000	0.75P
3	C520	3101050100030	1P
4	C527	3101050200010	2P
5	C514	3101051210000	120P
6	C516	3101051590070	1.5P
7	C517	3101051800010	18P
8	C522	3101051040060	0.1U
9	C521	3101051210000	120P
10	C512	3101054710010	470P
11	C515	3101051050000	1UF
12	C513	3101055600000	56P
13	C523	3101051040060	0.1UF
14	C524	3101055600000	56P
15	C525	3101051040060	0.1UF
16	C526	3101051050000	1UF
17	L503	3297106339000	3.3nH
18	L504	3297106339000	3.3nH
19	L501	3297106339000	3.3nH
20	L508	3210305829000	8.2nH
21	L507	3210305180000	18nH
22	L506	3210106390000	39nH
23	L509	3210305829000	8.2nH
24	L502	322150660108	Bead
25	L505	322150660108	Bead
26	R502	3001053310000	330Ω
27	R501	3001054710000	470Ω
28	R504	3001051030050	10KΩ
29	R503	3001051010000	100Ω
30	Z501	3804157560000	GPS filter
31	U501	3609999000300	GPS low-noise amplifier
32	U502	1615000001720	GPS module

7.4 Troubleshooting Flow Chart



Description of Normal Situations:

[1] Detect with a multimeter. The voltage of TP502 changes within the range 1.2V~2.8V.

[2] Voltage at L502 and L505: about 3.3V.

[3] Gain for U501 (@1.57542GHz): >15dB.

[4] Insertion loss for Z501 (@1.57542GHz): <4dB.

8. Tuning Description

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

9. Interface Definition

J1601: 50-Pin Interface

Pin No.	Name	Function	Valid Level
2、5、49	GND	Power supply: ground (analog)	
1 3	AF-CODEC-TO-50PIN AF-50PIN-TO-CODEC	Analog audio signal output/input	
4 6	EXT-MIC+ EXT-MIC-	External MIC interface	
8 10 12 14 16	IO5-OPT IO4-OPT IO3-OPT IO2-OPT IO1-OPT	GPIO pin of the option board	L/H
7	3V6D	Power supply: 3.6V	
9 11	USB-D+ USB-D-	USB data cable	
13	EMERGENCY	Emergency key	L
32 43	DGND	Power supply: ground (digital)	
18	GPIO	GPIO	
20	LED-K-KEY	LED indication for key operation	L
15 17 19 21	KB-R1 KB-R2 KB-R3 KB-R4	Keyboard row	L
22 24 26 28 30	KB-C4 KB-C3 KB-C2 KB-C1 KB-C0	Keyboard column	
23	EXT-PTT	External PTT detection	L
25 27 29	SEL1-Accessory SEL2-Accessory SEL3-Accessory	Accessory identifier	L
34 36	UART1-RX-OPT/PS UART1-TX-OPT/PS	UART1	
38 40 42 44	UART3-TX-OPT UART3-RX-OPT UART3-CTS/IO30-OPT UART3-RTS/IO29-OPT	UART3	
31 33 35	MCBSP3-FSX-OPT MCBSP3-DX-OPT MCBSP3-WCLK-OPT	MCBSP3	

37	MCBSP3-DR-OPT		
39	IIC-SCL-Acce/CLK-32K-OUT	IIC-SDA-Acce (for Version K of UHF1/UHF2/UHF3 and Version B of VHF) CLK-32K-OUT (for Version F/H of UHF1)	
41	IIC-SDA-Acce/CLK-OPT	IIC-SCL-Acce (for Version K of UHF1/UHF2/UHF3 and Version B of VHF) CLK-32K-OUT (for Version F/H of UHF1)	
46	EXT-BAT+	Power supply for accessory or option board	
48 50	IN-SPK- IN-SPK+	Internal speaker	
45 47	EXT-SPK- EXT-SPK+	External speaker	

J311: 30-Pin LCD Interface

Pin No.	Name	Function	Valid Level
1 26		Ground (digital)	
2-17	M-D0----M-D15	LCD data	
18	/CS-LCD	LCD chip select	L
19	/RST-OUT	Reset signal	
20	M-A1	Data and command	
21	/WE	Write signal	L
22	/OE	Read signal	L
23	IMO	16/8-bit LCD data selection	
24	3V3D	Power supply: 3.3V	
25	VFLASH	Power supply for IO	
27	3V6D	Power supply for backlight	
28 29 30		Backlight control	L

J821: Channel Board Interface

Pin No.	Name	Function	Valid Level
1	Emergency	Emergency	L
2	CH2	Channel select	
3	CH8	Channel select	
4	VOL	Volume adjust	
5	CH4	Channel select	
6	CH1	Channel select	

7	LED1	Red LED enable	H
8	LED2	Green LED enable	H
9	GND		
10	INT-MIC+780	Microphone+	
11	INT-MIC-780	Microphone-	
12	NC/GND	NC (for Version K of UHF1/UHF2/UHF3 and Version B of VHF) GND (for Version F/H of UHF1)	
13	PWR-SW-	Power-on enable input	
14	PWR-SW+	Power-on enable output	
15	3V3DRF	3.3V power supply	
16	NC/GND	NC (for Version K of UHF1/UHF2/UHF3 and Version B of VHF) GND (for Version F/H of UHF1)	

J2: 20-Pin Option Board Interface

Pin No.	Name	Function	Valid Level
1 3 5 7 9	IO1-OPT IO2-OPT IO3-OPT IO4-OPT IO5-OPT	GPIO	L/H
11 13 15 17	UART3-TX-OPT UART3-RX-OPT UART3-CTS/IO30-OPT UART3-CTS/IO30-OPT	UART3	
2	IIC-SDA-Acce/CLK-32K-OUT	IIC-SDA-Acce (for Version K of UHF1/UHF2/UHF3 and Version B of VHF) CLK-32K-OUT (for Version F/H of UHF1)	
4	IIC-SCL-Acce/CLK-OPT	IIC-SCL-Acce (for Version K of UHF1/UHF2/UHF3 and Version B of VHF) CLK-32K-OUT (for Version F/H of UHF1)	
6 8 10 12	MCBSP3-DR-OPT MCBSP3-WCLK-OPT MCBSP3-DX-OPT MCBSP3-FSX-OPT	MCBSP3	
14		Ground (analog)	
16	AF-50PIN-TO-CODEC	Analog audio signal	

18	AF-CODEC-TO-50PIN	Analog audio signal	
19		Ground (digital)	
20	3V6D	Power supply for digital circuit	

16-Pin Accessory Interface

Pin No.	Name	Function	Valid Level
1	GND	Ground (analog & digital)	
2	SPK-	External speaker-	
3	SEL1-Accessory	Accessory identifier 1	L
4	SEL2-Accessory	Accessory identifier 2	L
5	Emergency	Emergency	L
6	SPK+	External speaker+	
7	USB+ / RTS	USB+ / RTS	
8	USB- / CTS	USB- / CTS	
9	SWB+	Power supply for the interface	
10	MIC-	External MIC-	
11	GPIO	GPIO	
12	MIC+	External MIC+	
13	SEL3-Accessory	Accessory identifier 3 or 1-wire communication interface	L
14	TX	TX end of serial port communication	
15	RX	RX end of serial port communication	
16	PTT	TX control	L

Definition of Accessory Identifiers

No.	OPT_SEL1	OPT_SEL2	OPT_SEL3	Definition
1	0	0	0	Reserved
2	0	0	1	Reserved
3	0	1	0	USB master mode for the radio
4	0	1	1	For connecting earpieces
5	1	0	0	For connecting MODEM
6	1	0	1	For connecting remote speaker microphones
7	1	1	0	Programming cable (serial port)/ USB slave mode for the radio
8	1	1	1	No accessory

10. UHF1 (400-470MHz) Information

10.1 Transmitter Circuit

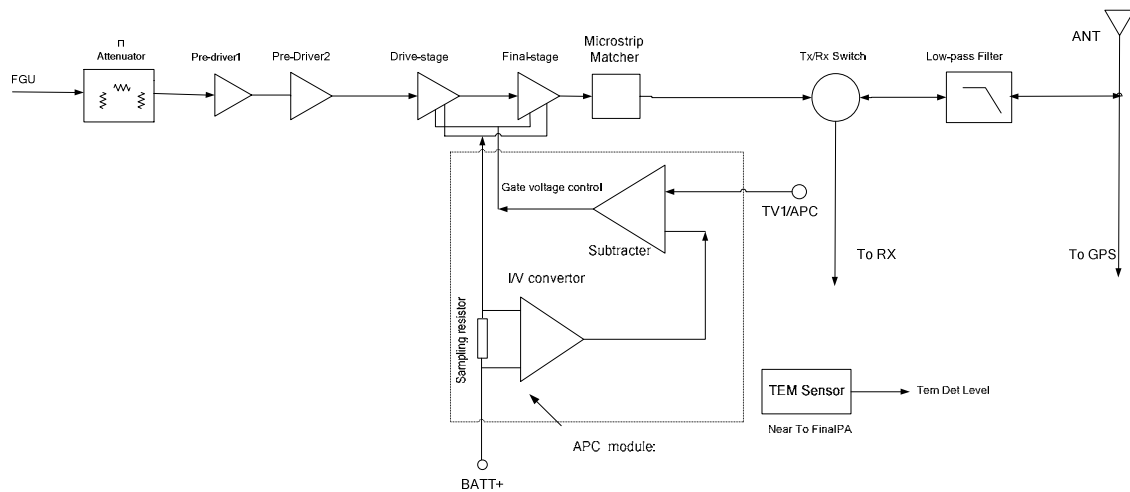


Figure 10-1 Diagram of Transmitter Circuit

The transmitter circuit is mainly composed of:

- ① RF power amplifier circuit
- ② Low-pass filter circuit (for suppressing harmonics)
- ③ Auto power control circuit (APC) (including temperature detection circuit)

The carrier signal generated by TX VCO is modulated and amplified, and then feeds to the transmitter circuit. In this circuit, the signal passes through a π -type attenuator first, allowing certain isolation between the RF power amplifier circuit and TX VCO. Then it goes to a pre-driver amplifier (2SC3356) for pre-amplification, also providing certain isolation. After that, the signal goes to another pre-driver amplifier (2SC4988) and a driver amplifier (RD01) for further power amplification, to provide appropriate signal to the final-stage amplifier (RD07) for final power amplification. After processed by multiple amplifiers, the signal is processed by a microstrip matcher to complete output impedance matching, so as to reduce output power loss due to impedance mismatch. Then the signal passes through the TX/RX switch and goes to the low-pass filter.

The low-pass filter is a high-order Chebyshev filter composed of lumped-parameter inductors and capacitors. Via this filter, the spurious signal within the stop band can be attenuated as much as possible while the in-band ripple is within the required range.

In the auto power control and temperature detection circuit, the drain current from the driver amplifier and final-stage amplifier is converted to voltage via the sampling resistor and subtraction circuit (composed of the first operational amplifier). This voltage is compared with the APC control voltage (output by DAC) at the second operational amplifier. Then the error voltage, which is output by the second operational amplifier, controls TX power by controlling the bias voltage at the gates of the amplifiers (including the driver amplifier and the final-stage amplifier). The temperature sensor detects the surface temperature of the final-stage amplifier, and converts it to DC voltage. Then the DC voltage is compared with the voltage corresponding to the protection temperature (generally 80% of the extreme temperature) of the amplifier. If the surface temperature is too high, the bias voltage of the amplifier will be reduced, so as to reduce output power. The bias voltage will not be increased until the surface temperature restores to normal level. This process will be repeated while the radio operates.

10.2 Receiver Circuit

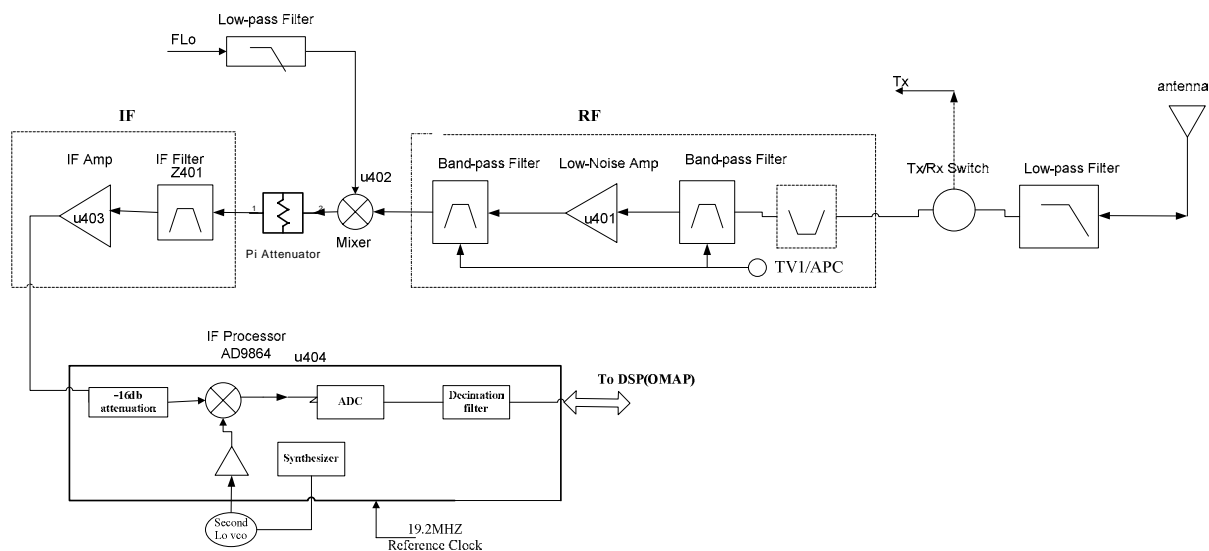


Figure 10-2 Diagram of Receiver Circuit

The receiver circuit mainly comprises the RF band-pass filter, low-noise amplifier, mixer, IF filter, IF amplifier and IF processor.

10.2.1 Receiver Front-end

The HF signal from the low-pass filter passes through the electrically tunable band-pass filter controlled via APC/TV1 level, to remove out-of-band interference signal and to send wanted band-pass signal to the low-noise amplifier (Q9001). The amplified signal goes to a band-pass filter controlled via APC/TV1 level, to remove out-of-band interference signal generated during amplification, and to send wanted HF

signal to the mixer.

The wanted signal passes through the RF band-pass filter and low-noise amplifier and goes to the mixer (D9017). Meanwhile, the first local oscillator (LO) signal generated by VCO passes through the low-pass filter and also goes to the mixer (D9017). In the mixer, the wanted signal and the first LO signal are mixed to generate the first IF signal (73.35MHz). Then the signal passes through a π -type attenuator (2dB) and the LC, to suppress carrier other than the first IF signal, and to increase the isolation between the mixer and the IF filter. After that, the first IF signal is processed by the crystal filter (Z9001), and is sent to the two-stage IF amplifier circuit (composed of 2SC3356) for amplification. Then the amplified signal goes to the IF processor AD9864(U401) for processing.

10.2.2 Receiver Back-end

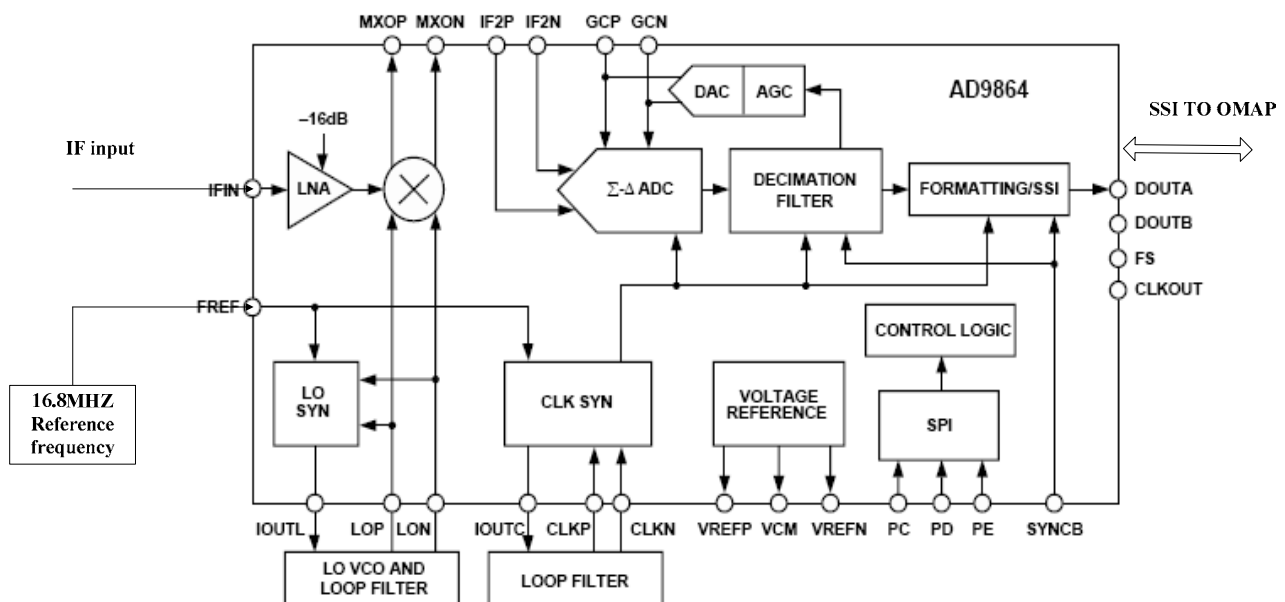


Figure 10-3 Diagram of IF Processor

The first IF signal (73.35MHz) output by the IF amplifier goes into AD9864 (U401) via Pin 47, where the signal is converted to the second IF signal (2.25MHz). Then the signal is converted to digital signal via ADC sampling, and output via the SSI interface. Finally, the digital signal is sent to DSP (OMAP5912) for demodulation.

AD9864 employs reference frequency of 19.2MHz and shares the crystal with OMAP. The second LO VCO comprises an oscillator, a varactor and some other components, to provide the 71.1/75.6MHz LO signal. The 18MHz clock frequency is generated by the LC resonance loop.

10.3 Frequency Generation Unit (FGU)

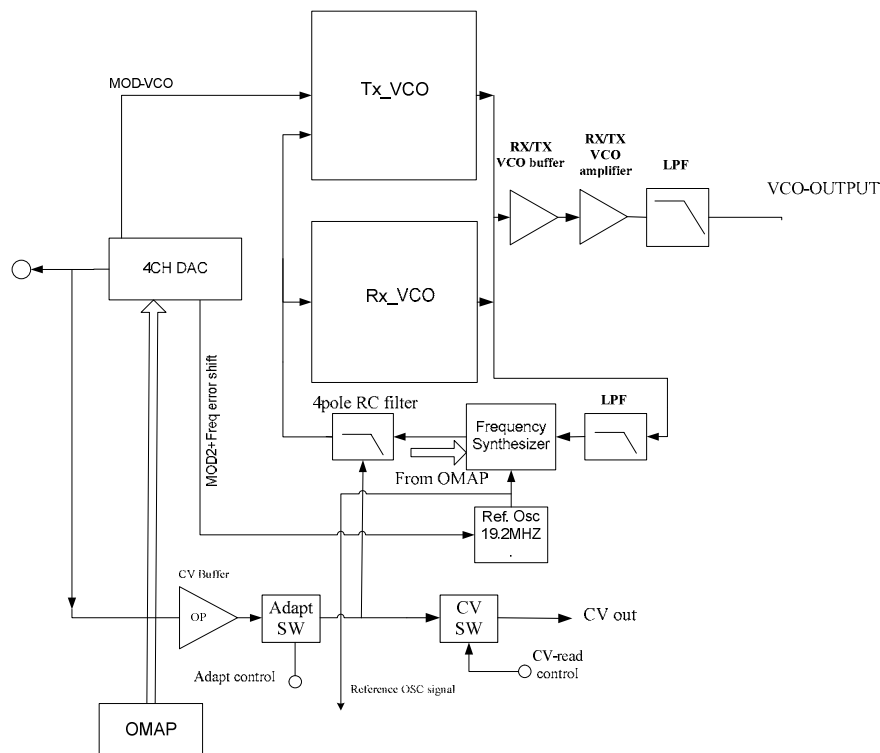


Figure 10-4 Diagram of FGU

The FGU is composed of VCO and PLL. It is the core module of the whole TX-RX system. This circuit provides accurate carrier frequency during transmission, and stable LO signal during reception. It has a direct influence on the performance of the system.

10.3.1 Working Principle of PLL

The 19.2MHz frequency generated by the reference crystal oscillator goes to PLL for division, generating the reference frequency (i.e. step frequency f_1). Meanwhile, the frequency generated by VCO generates another frequency (f_2) through the frequency divider in PLL. Then frequencies f_1 and f_2 are compared in the phase detector (PD), to generate continuous pulse current. The current goes to the loop filter for RC integration, and is then converted to CV voltage. Then the CV voltage is sent to the varactor of VCO. It adjusts the output frequency of VCO directly until the CV voltage becomes constant. Then PLL is locked, and the stable frequency output by VCO goes to the TX-RX channel after passing through two buffer amplifiers.

10.3.2 Working Principle of VCO

VCO employs Colpitts oscillator circuit (the RX oscillator circuit is composed of D102, D103, D106, D107 and L112; the TX oscillator circuit is composed of D108, D109, D110, D101 and L117). It obtains different

output frequencies by changing the varactor's control voltage (i.e. CV voltage).

There are two types of VCO: TX VCO and RX VCO. Both types control EMD22 to switch operating status via OMAP. RX VCO is composed of the oscillator loop and Q104, to provide LO signal. TX VCO is composed of the oscillator loop and Q108, to provide carrier for TX signal.

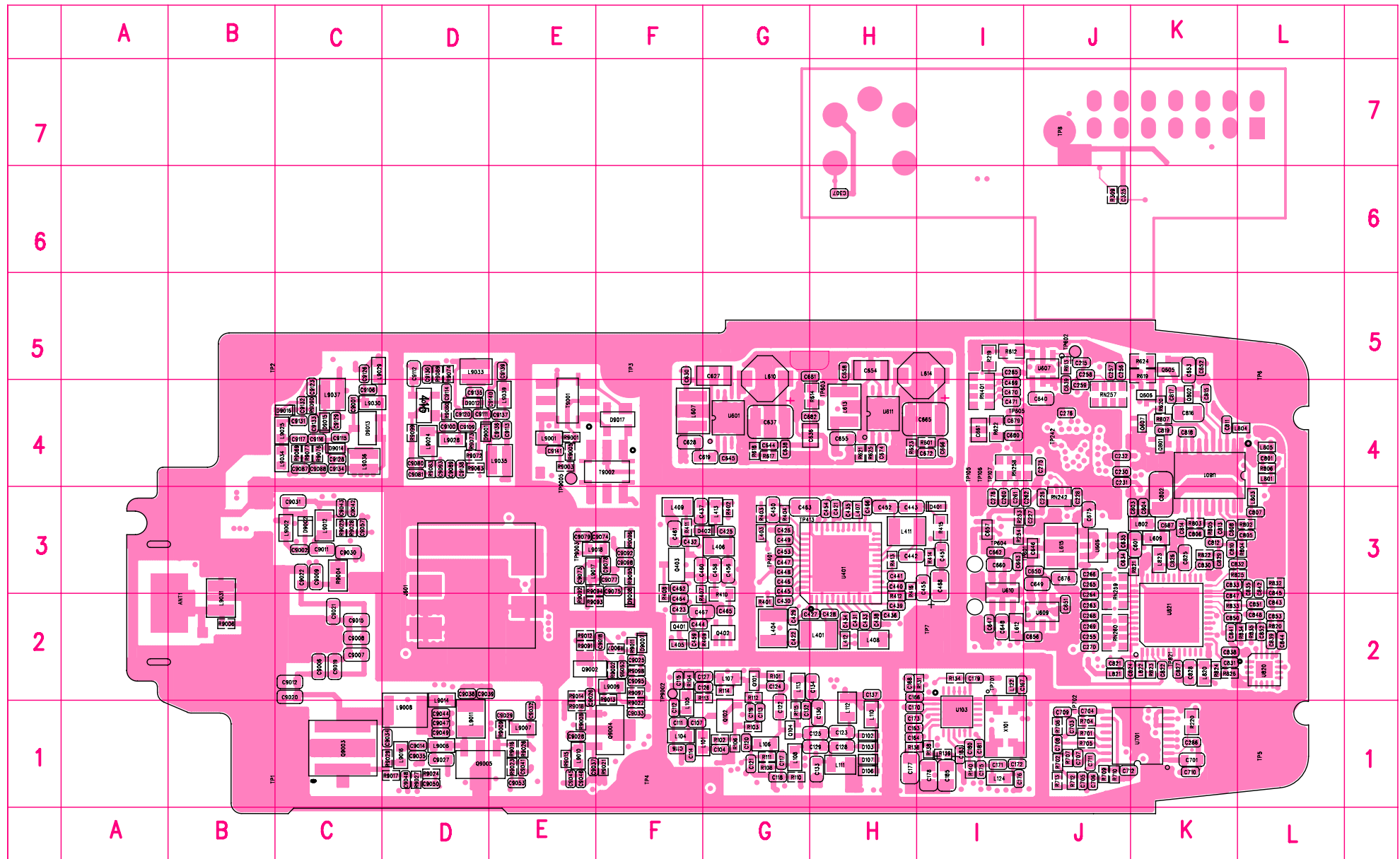
10.3.3 Two-point Modulation

In TX mode, the two-point modulation technology is employed, to obtain higher modulation accuracy and lower 4FSK bit error rate. MOD-VCO and MOD-XO send the modulation signal to the modulation end of VCO and the reference crystal oscillator of PLL respectively to modulate TX VCO and the reference crystal oscillator.

10.4 PCB View

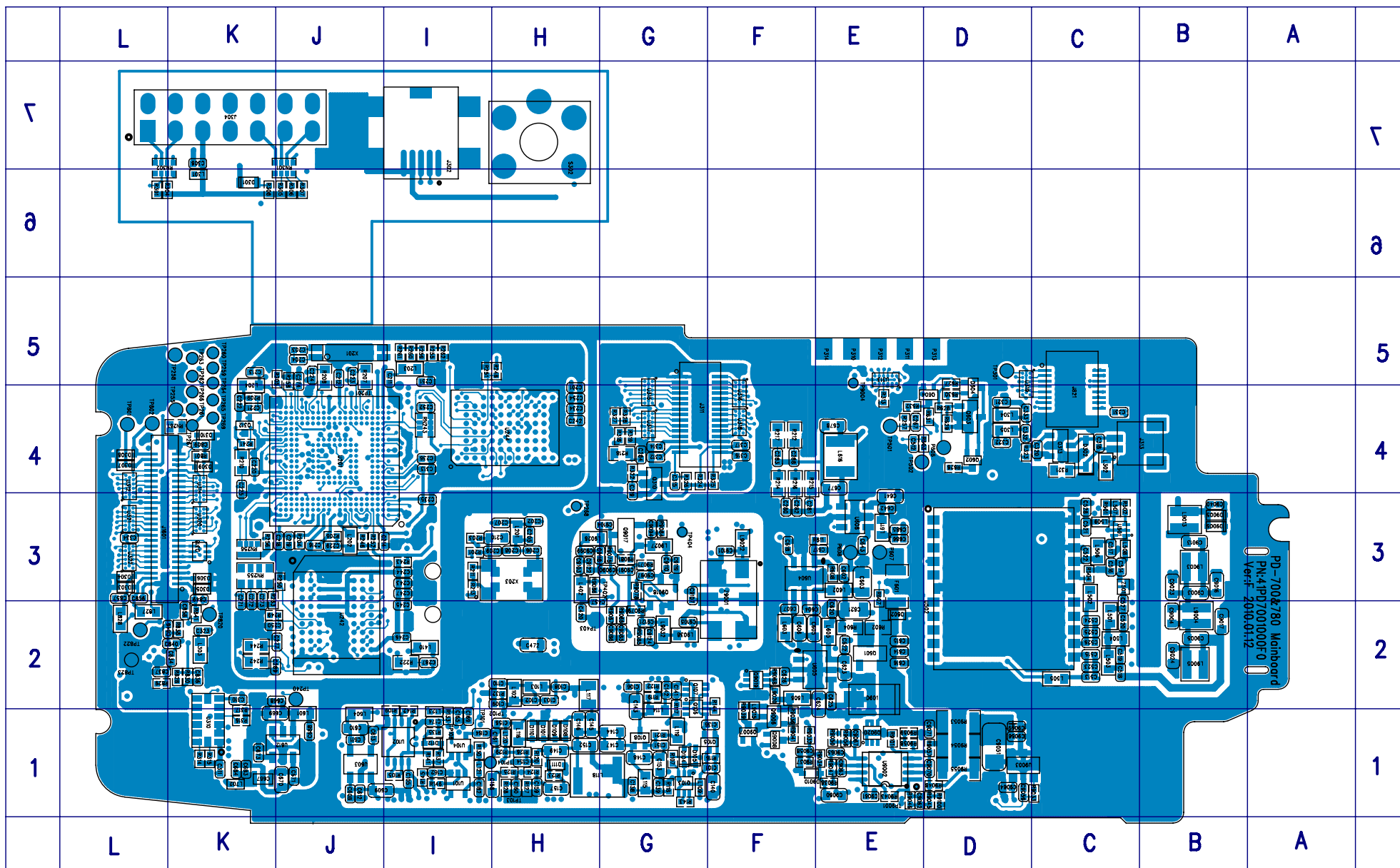
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G PCB View (Main Board)

Top Layer

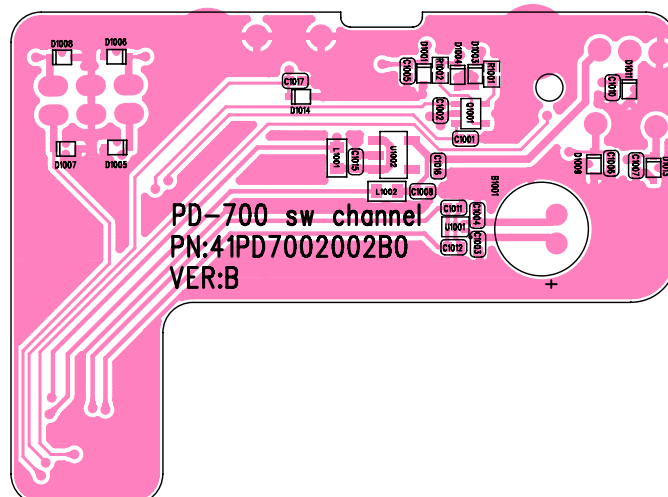


PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G PCB View (Main Board)

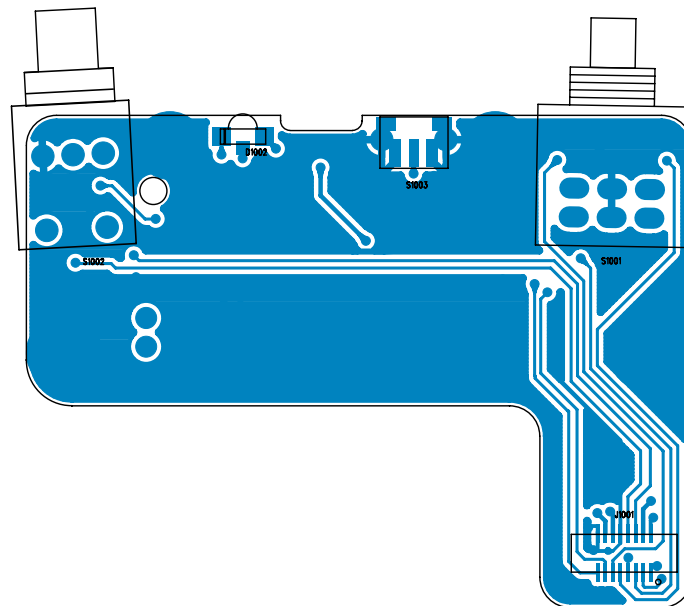
Bottom Layer



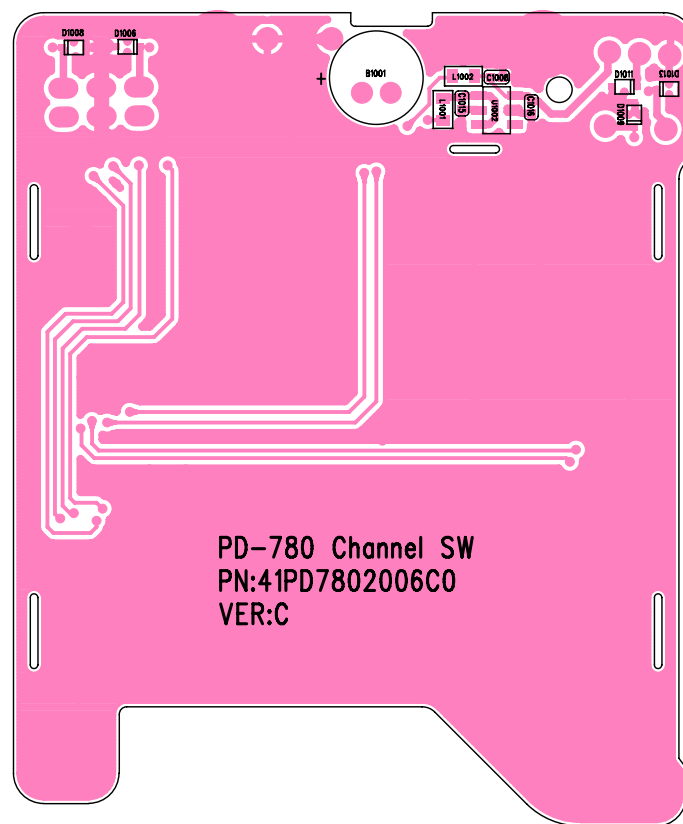
PD70X/PD70XG/HD705/HD705G PCB View (Channel Board) Top Layer



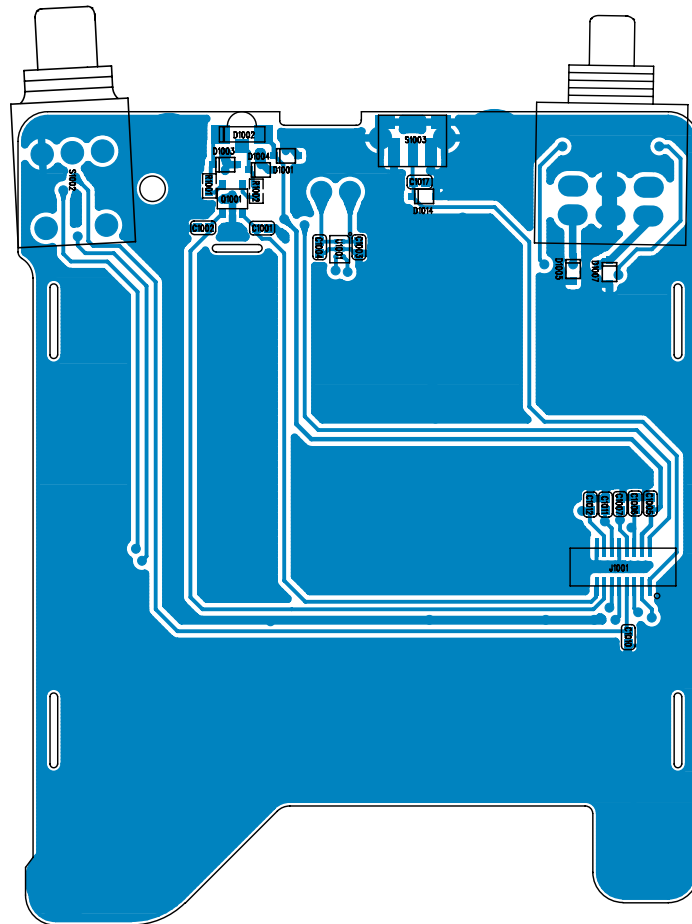
PD70X/PD70XG/HD705/HD705G PCB View (Channel Board) Bottom Layer



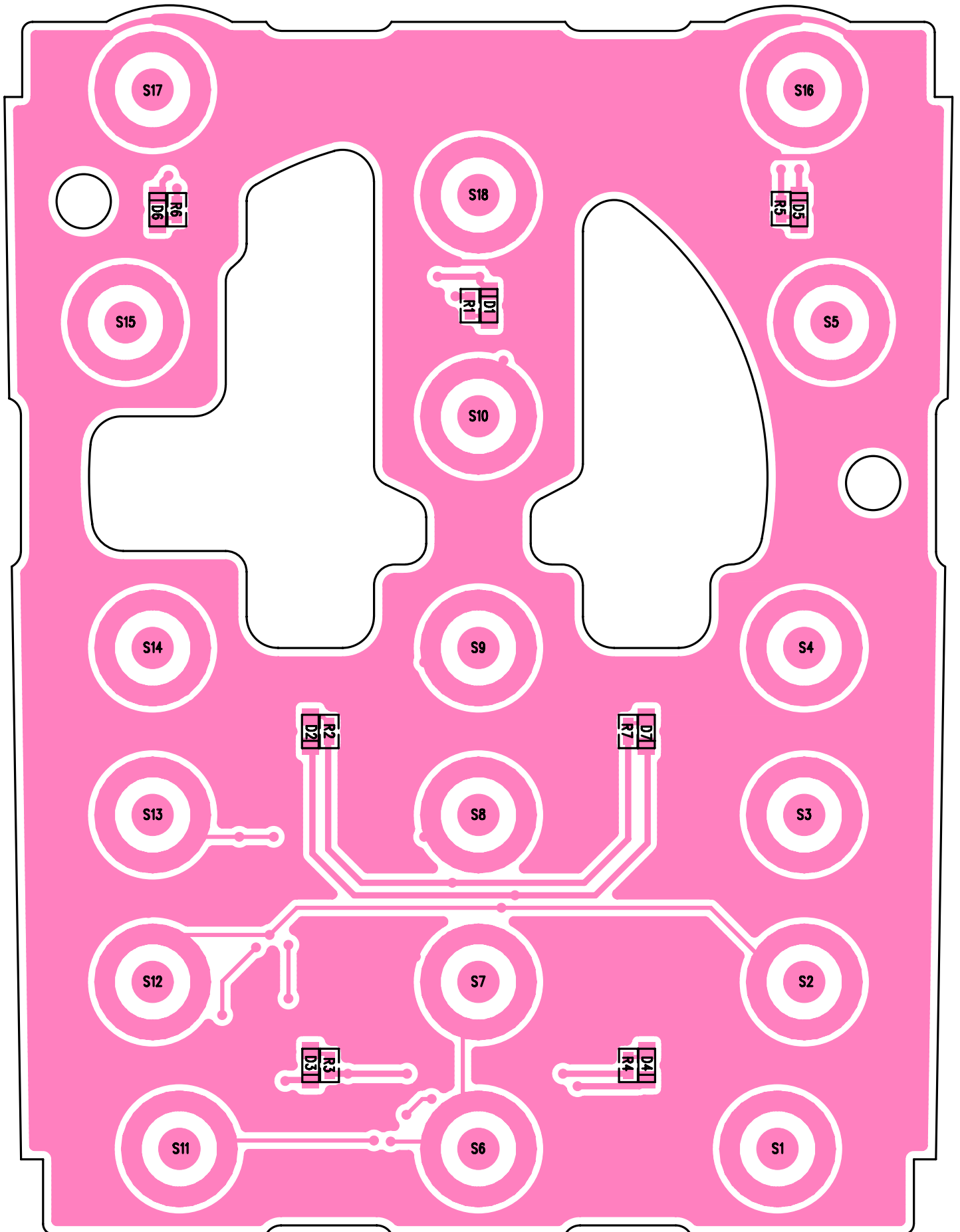
PD78X/PD78XG/HD785/HD785G PCB View (Channel Board) Top Layer



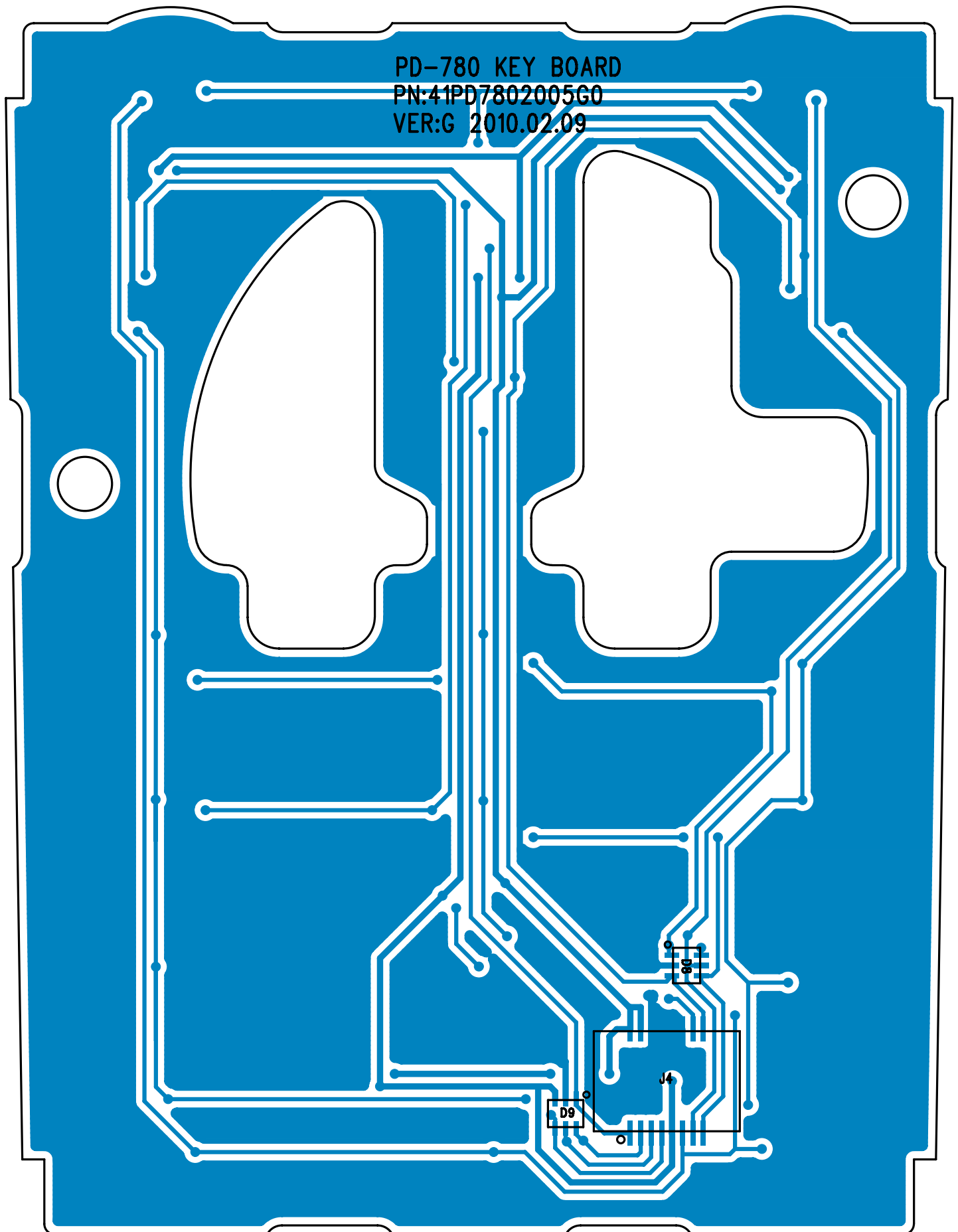
**PD78X/PD78XG/HD785/HD785G PCB View (Channel Board)
Bottom Layer**



PD78X/PD78XG/HD785/HD785G PCB View (Keyboard) Top Layer

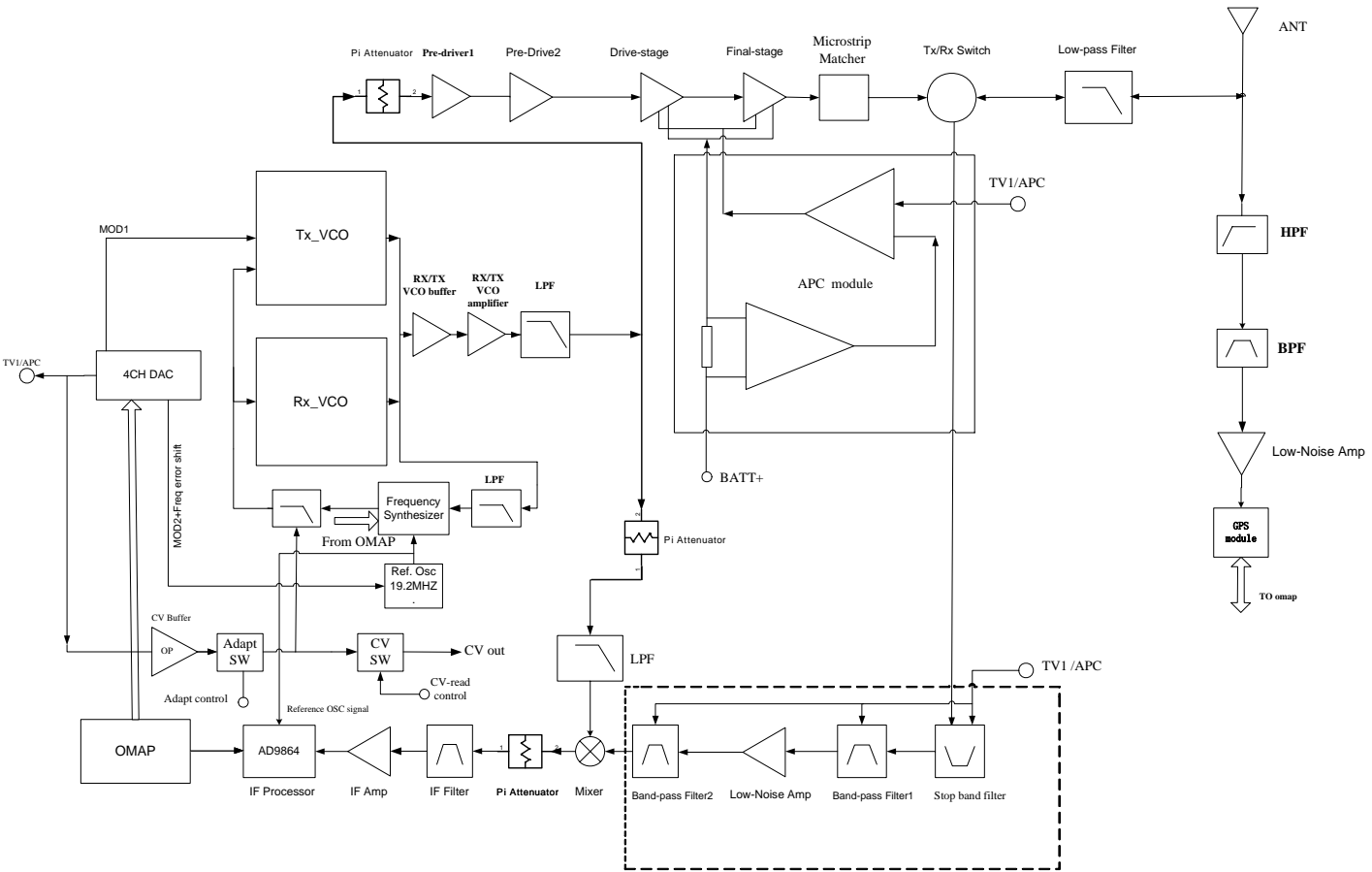


PD78X/PD78XG/HD785/HD785G PCB View (Keyboard)
Bottom Layer



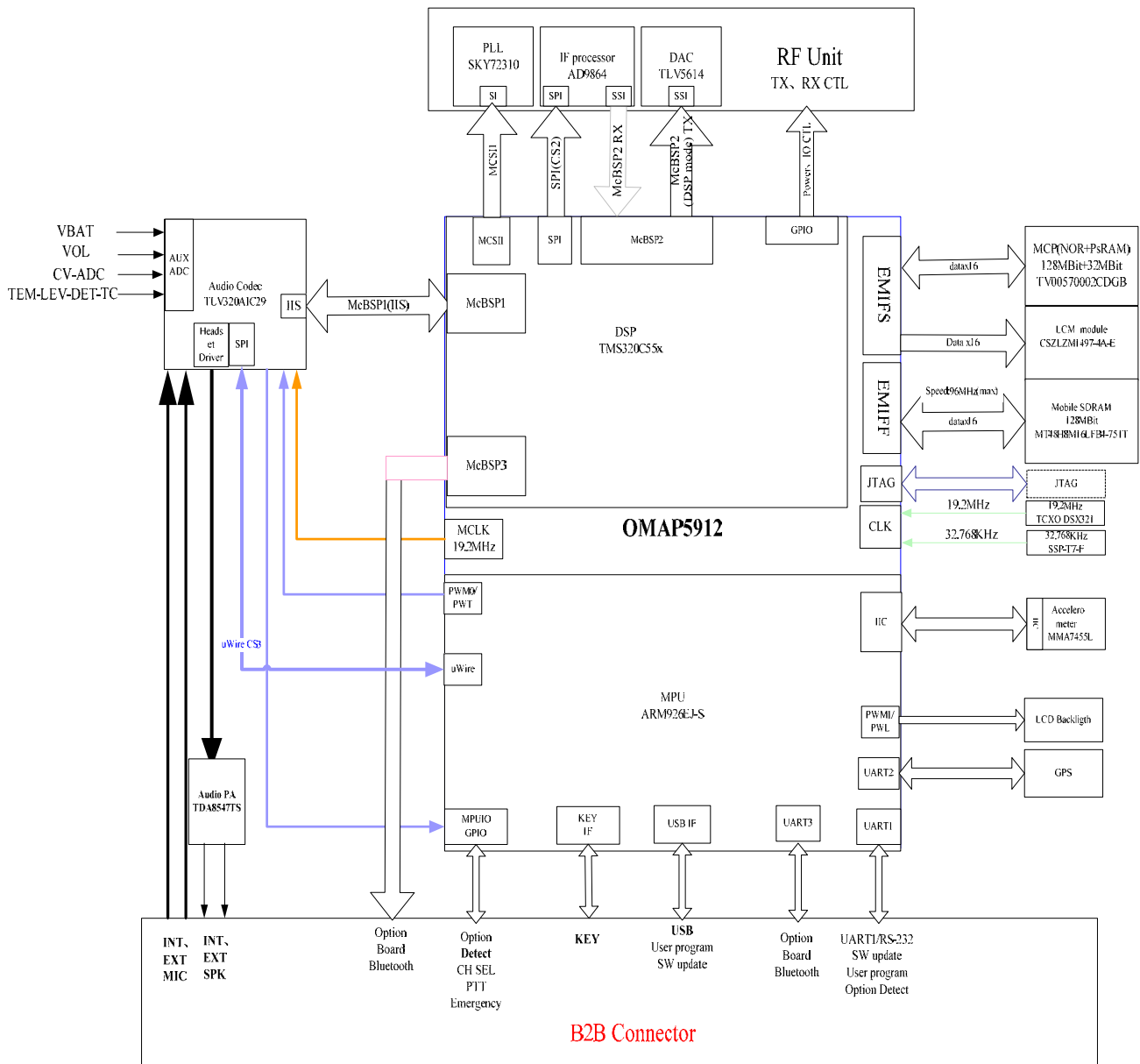
10.5 Block Diagram

PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Block Diagram (RF Section)

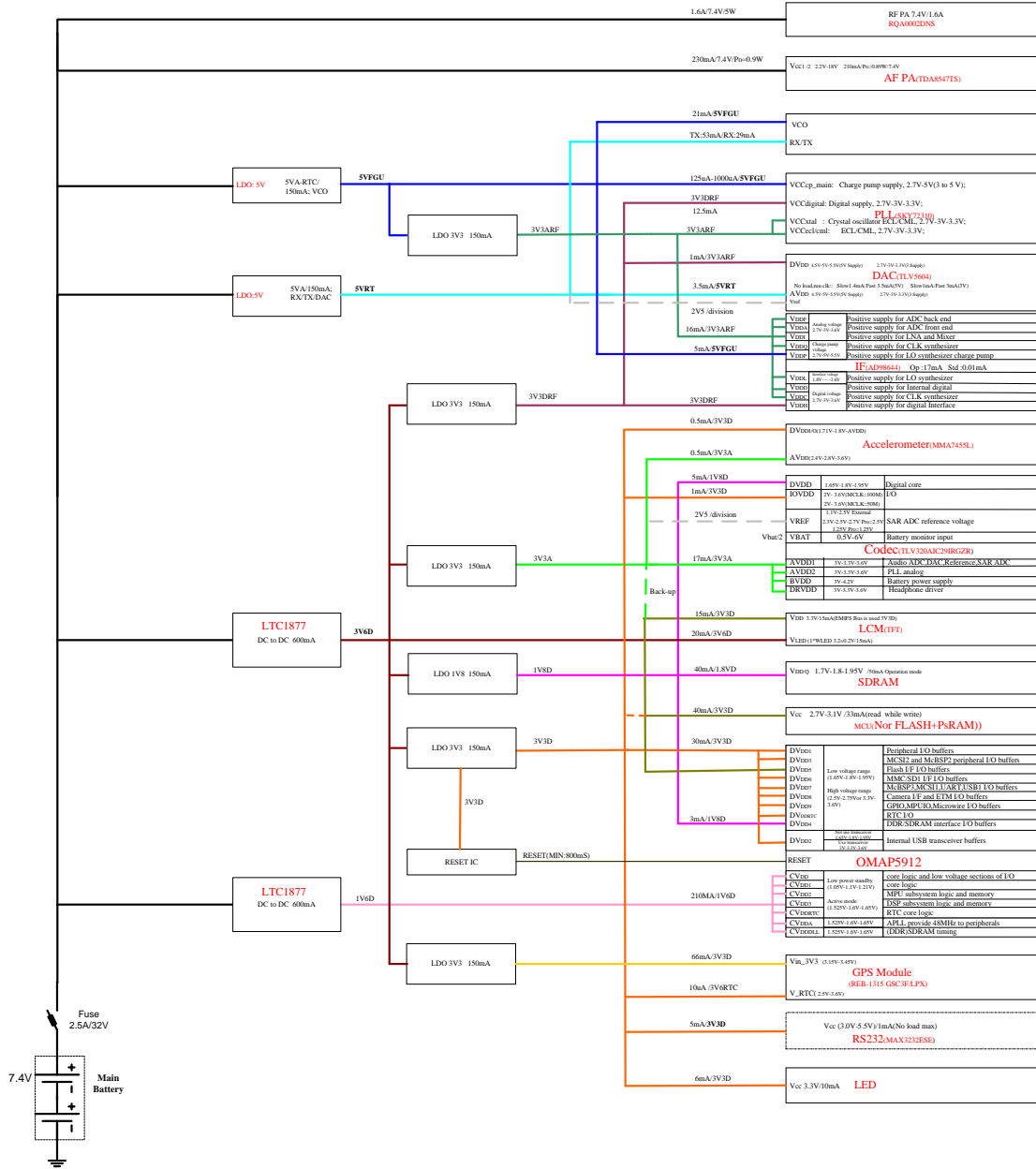


PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G

Block Diagram (Baseband Section)



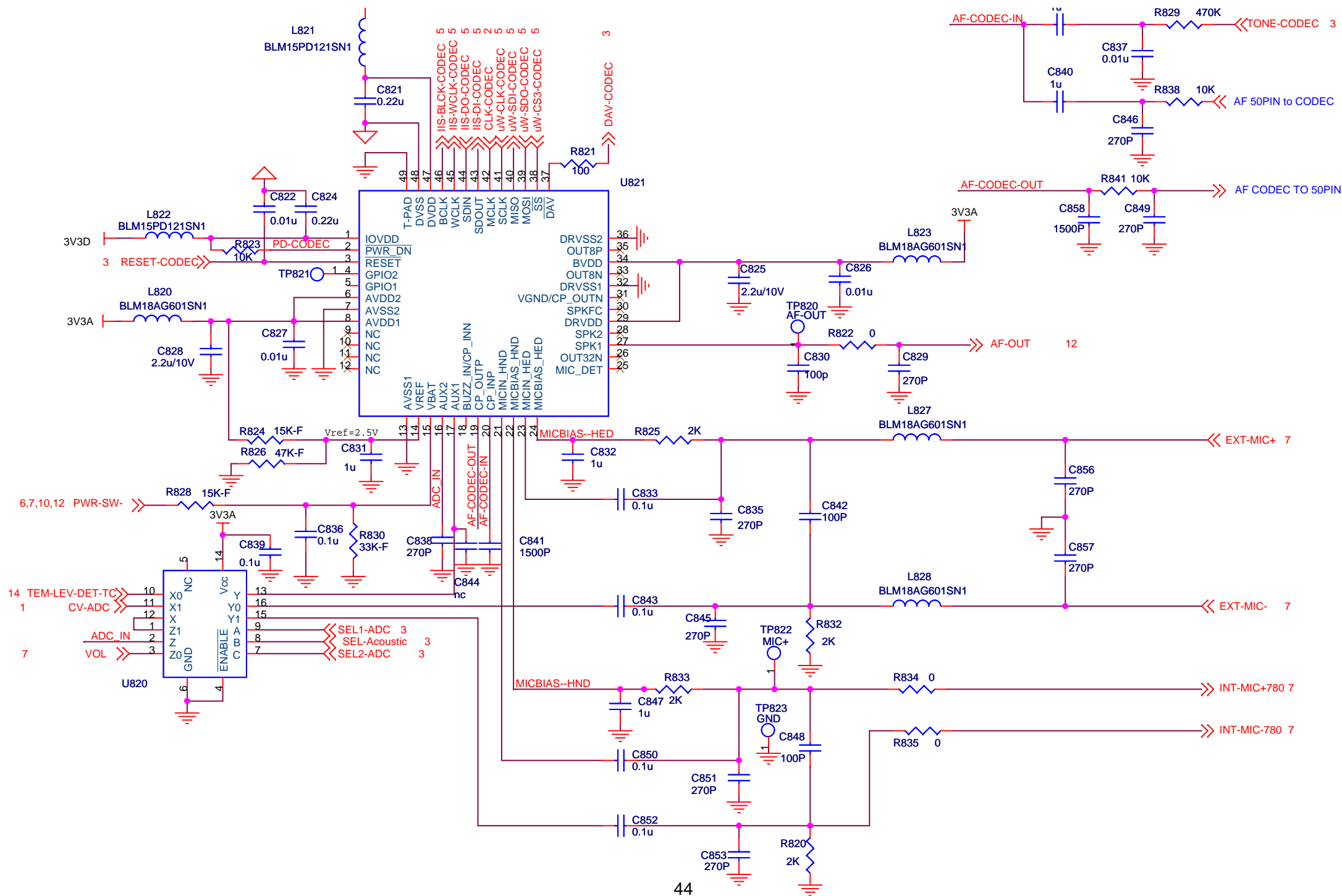
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G
Block Diagram (Power Section)



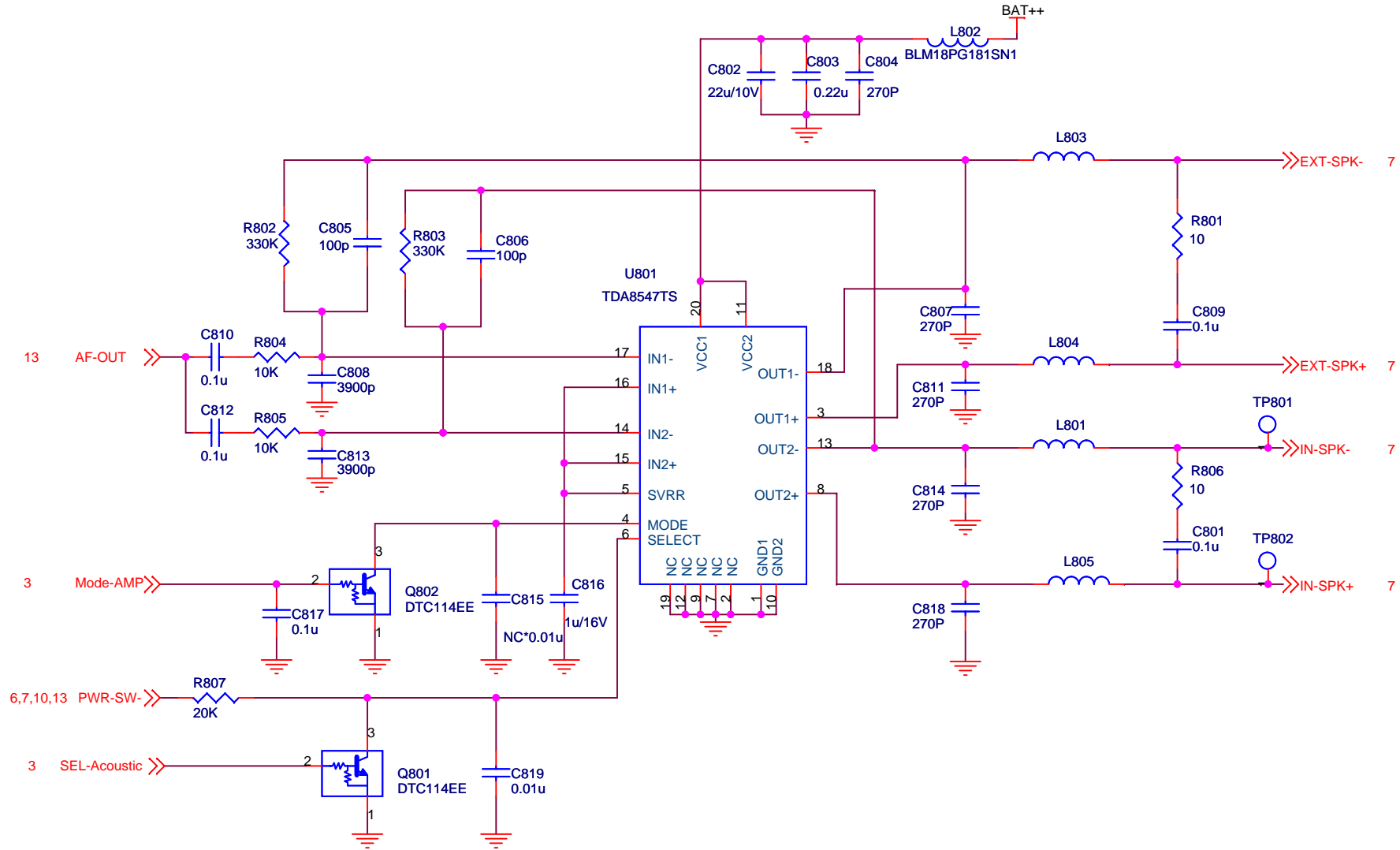
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (Transmitter/Receiver)



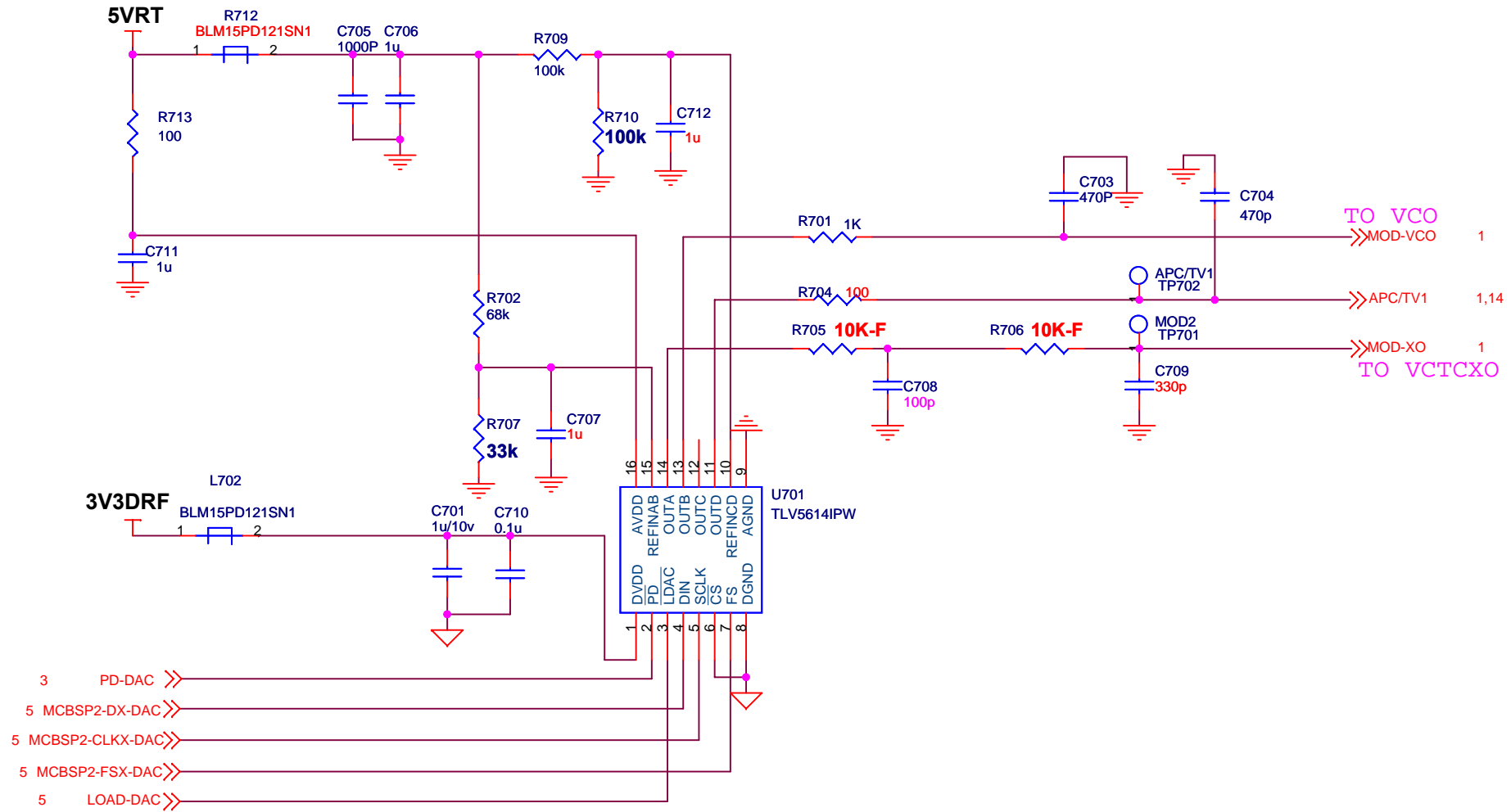
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (CODEC)



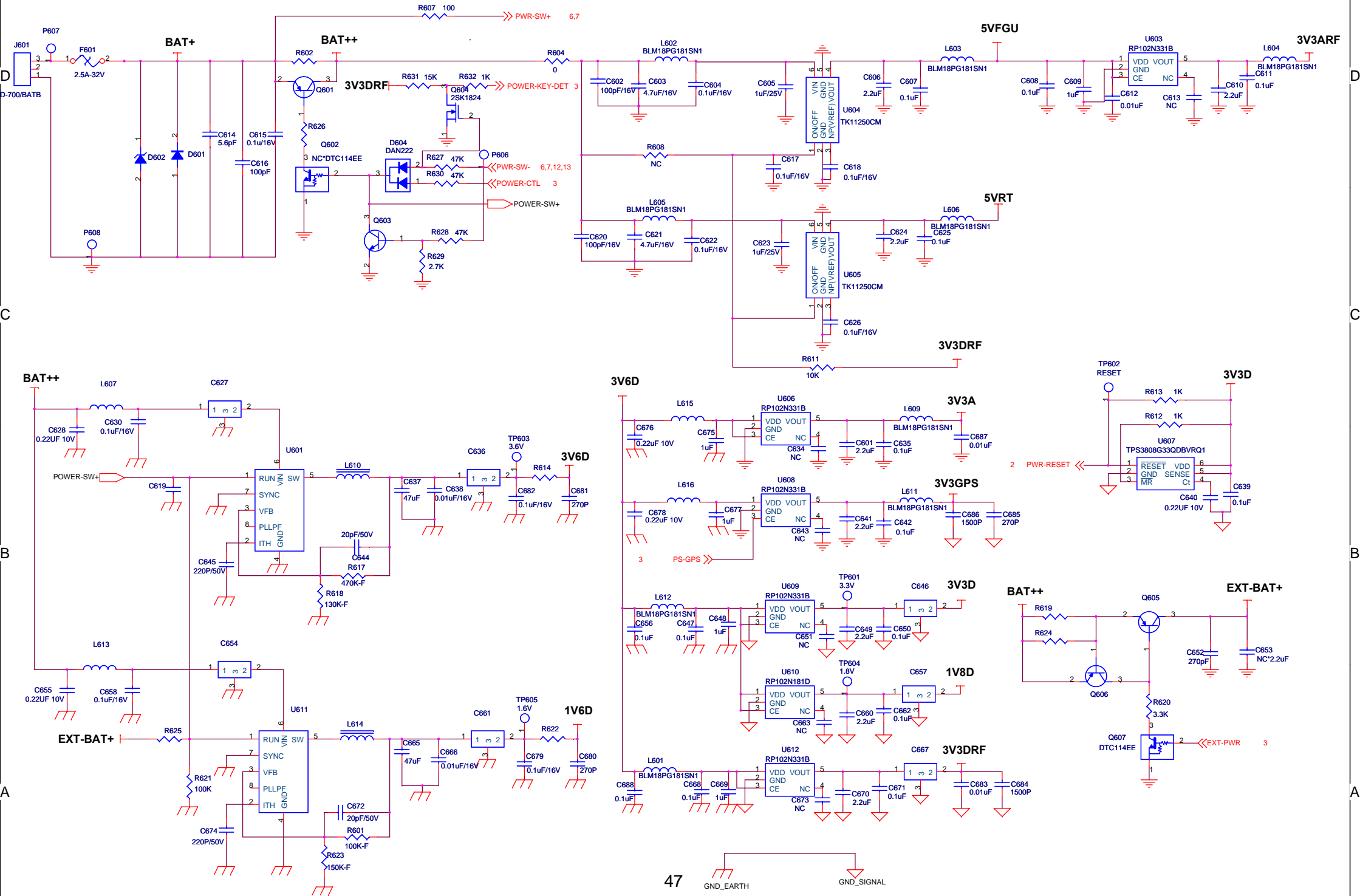
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (Audio Amplifier)



PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (DAC)



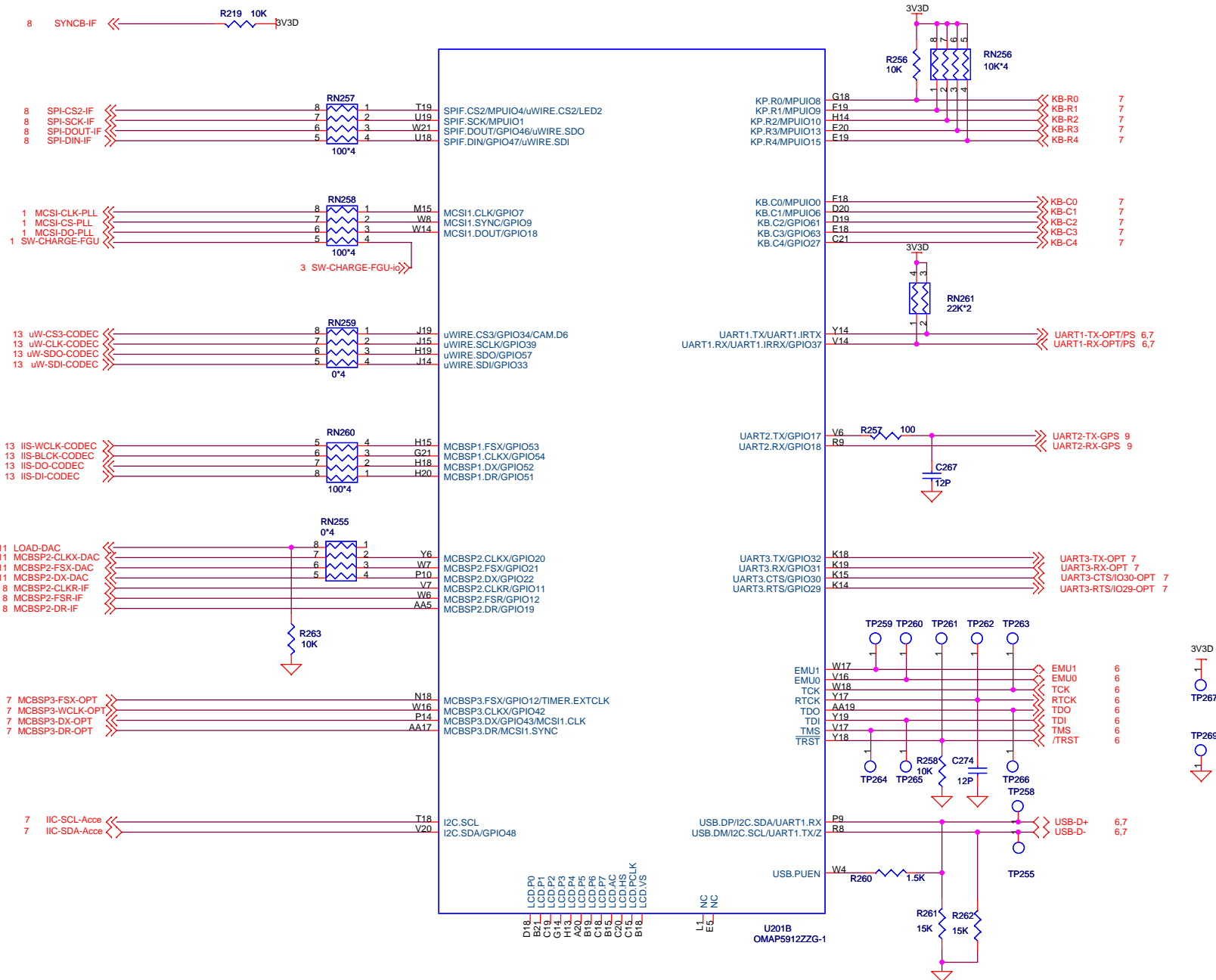
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (Power)



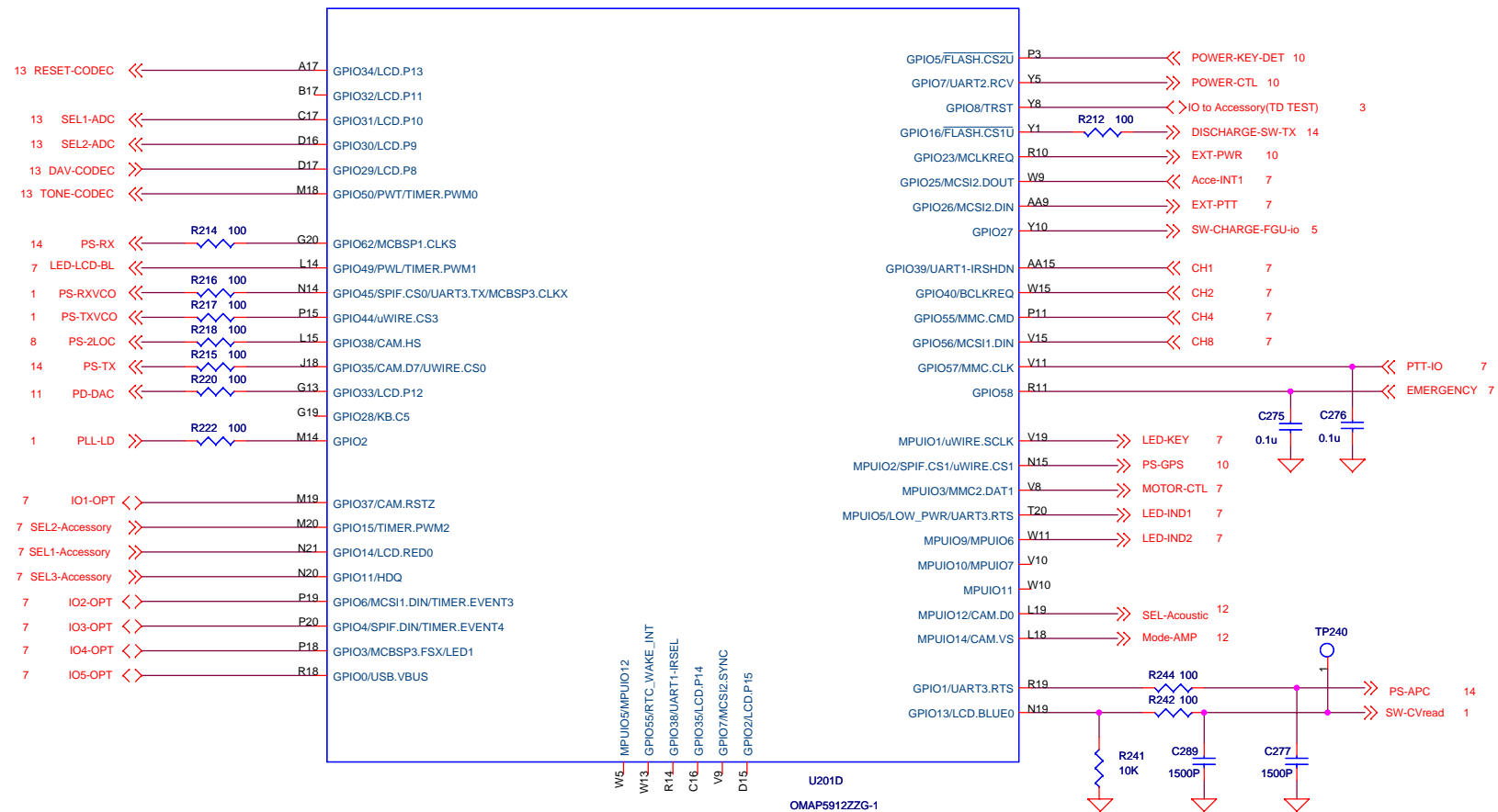
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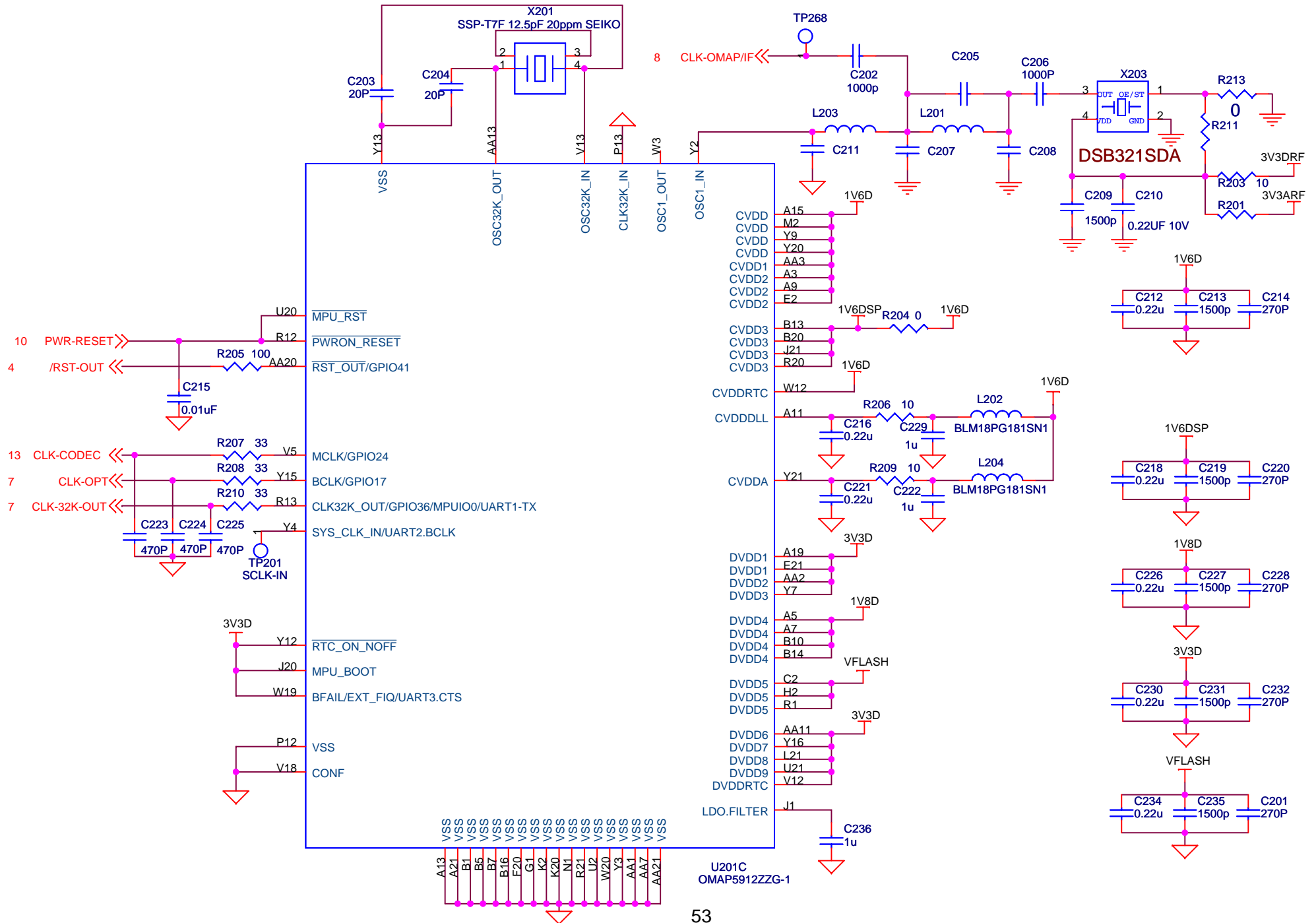
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (OMAP SI)



PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (OMAP IO)



PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (OMAP CORE)



PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (FGU)

D

C

B

A

D

C

B

A

3

11

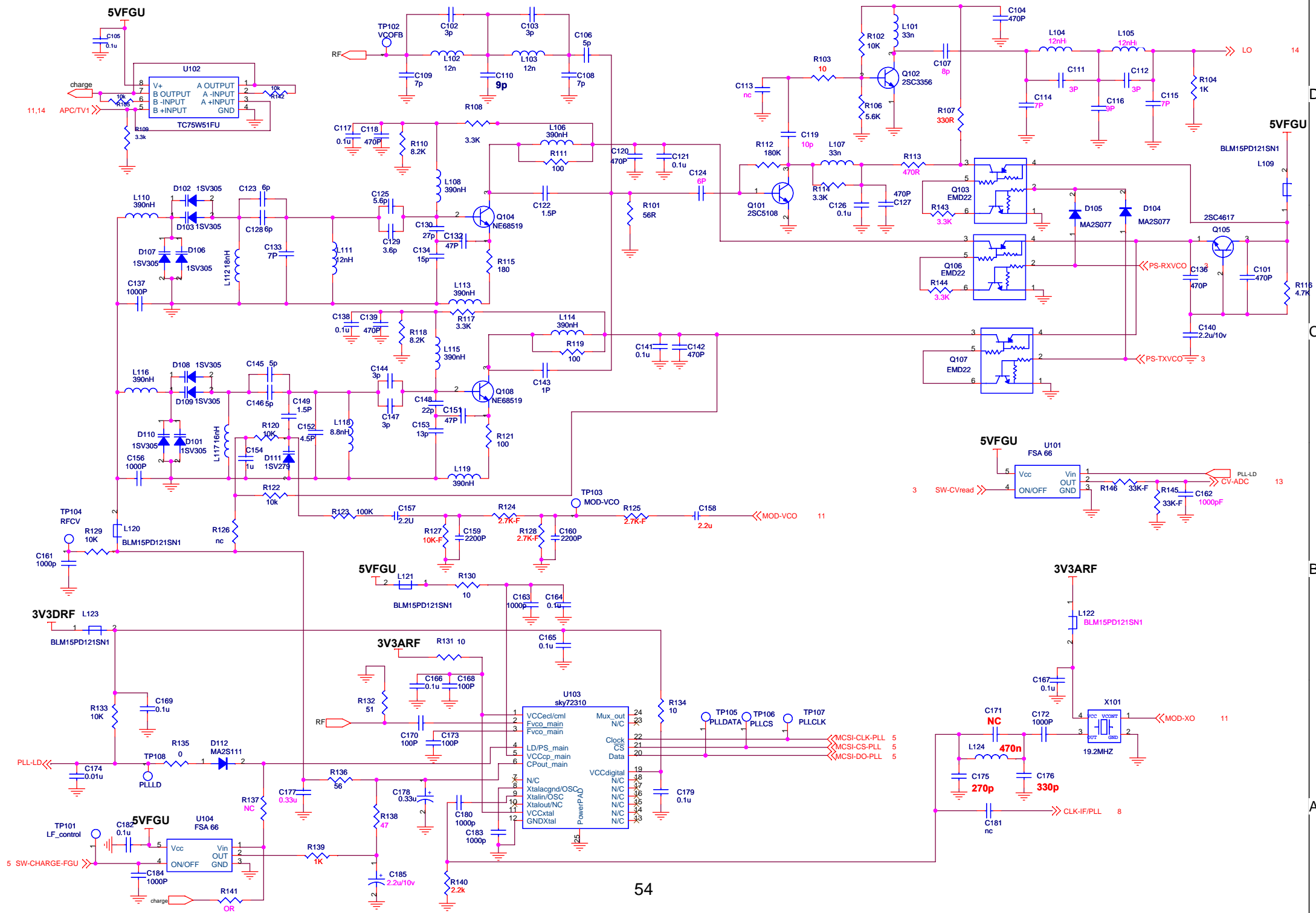
5

4

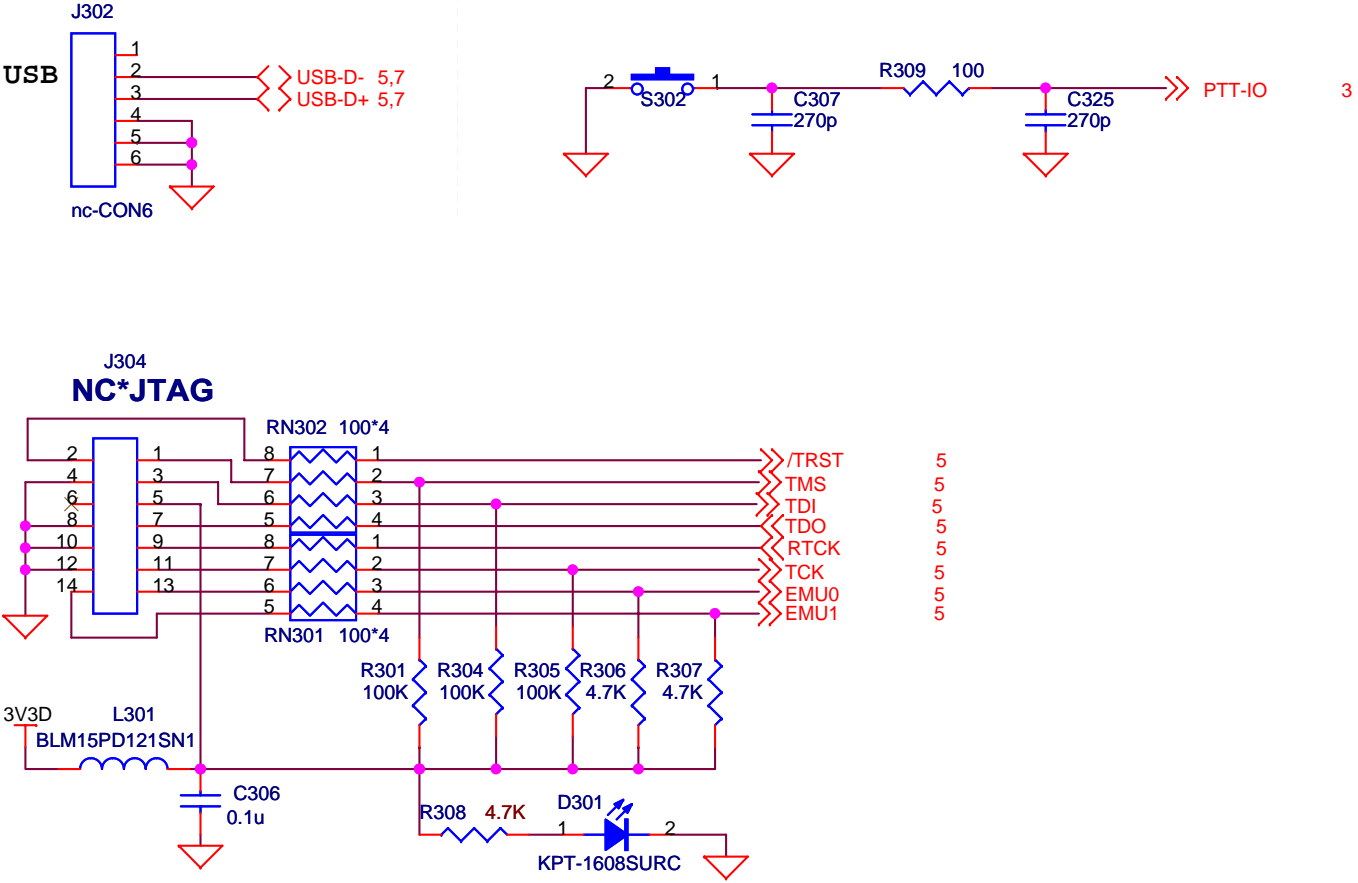
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2

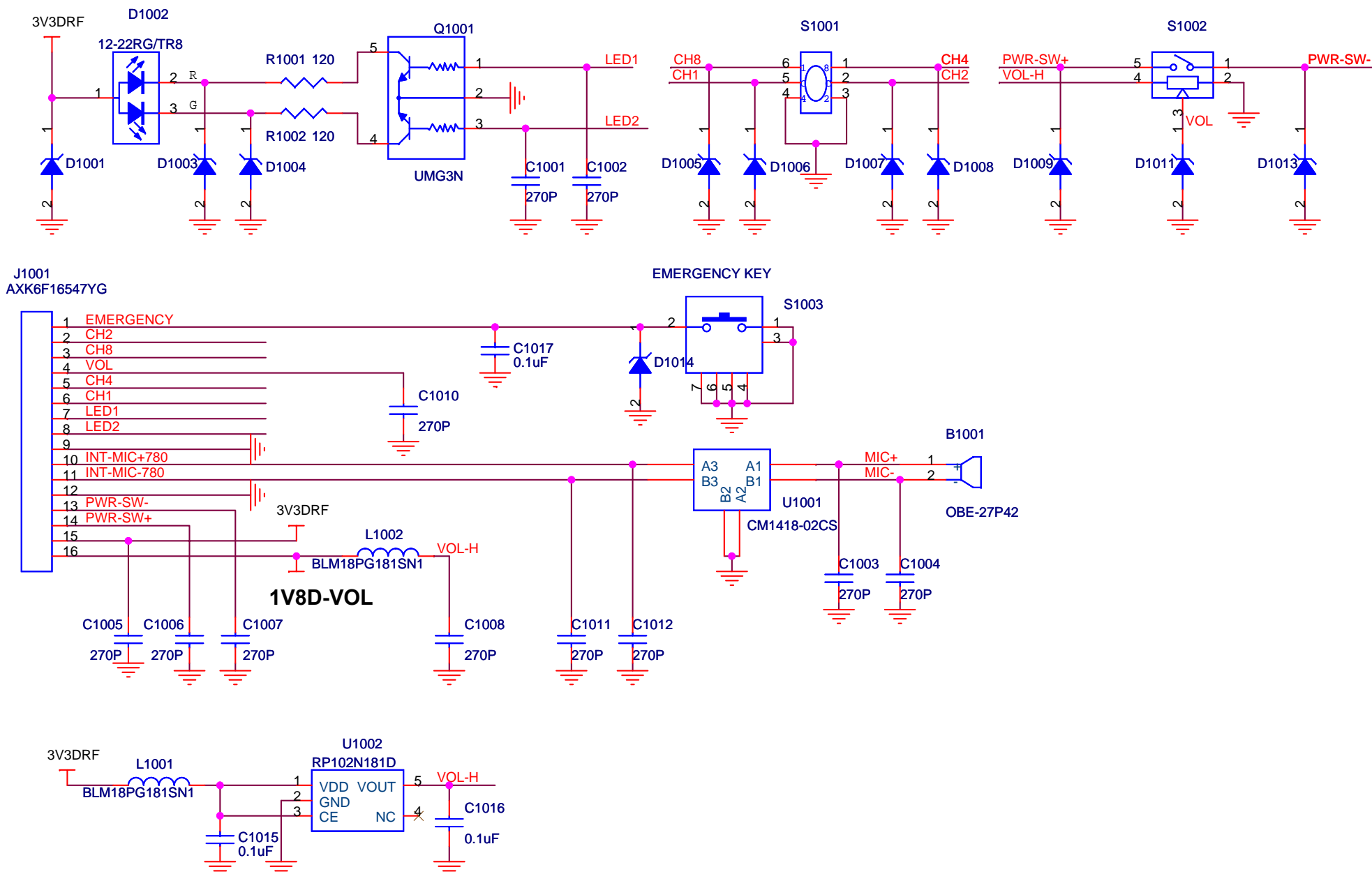
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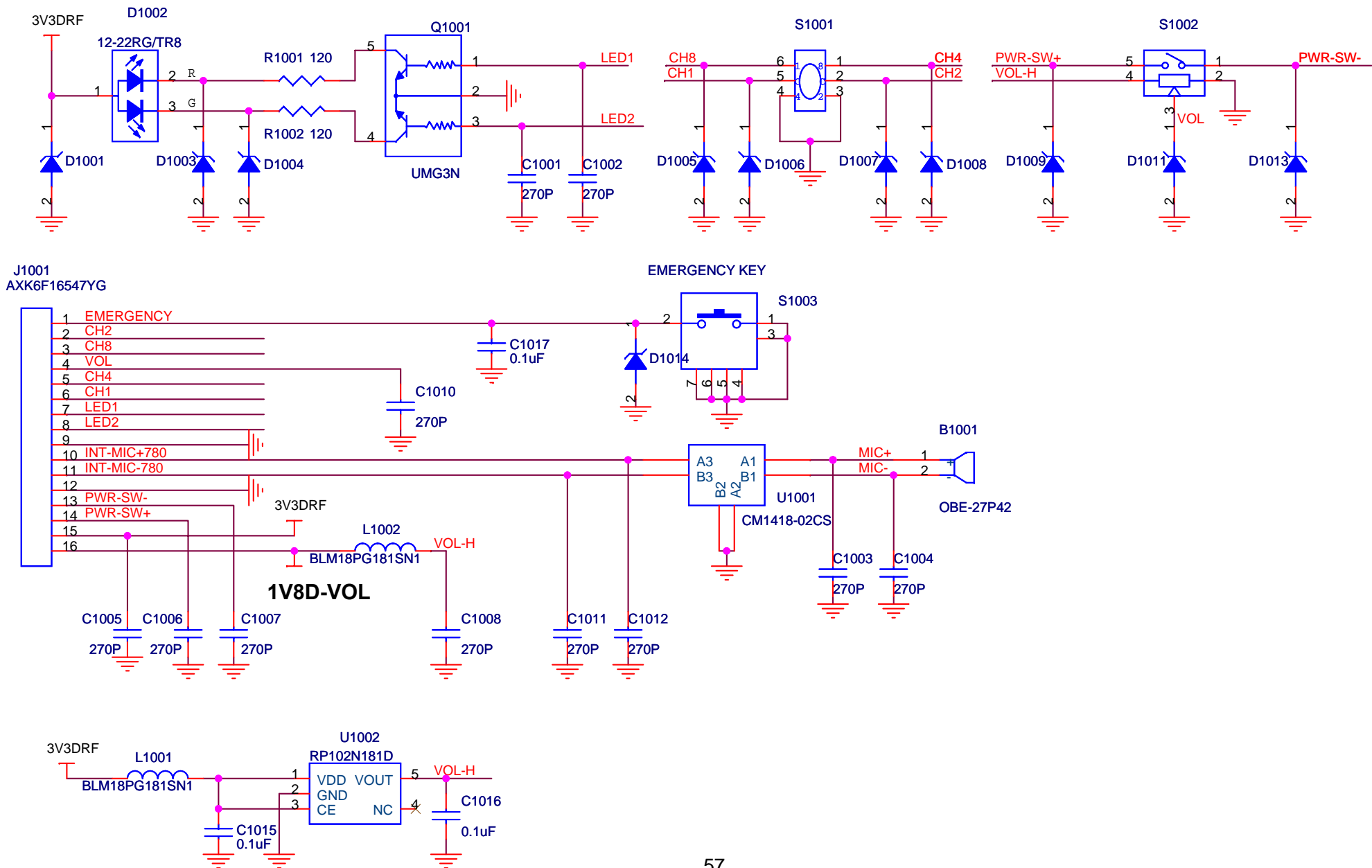
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (External Interface)



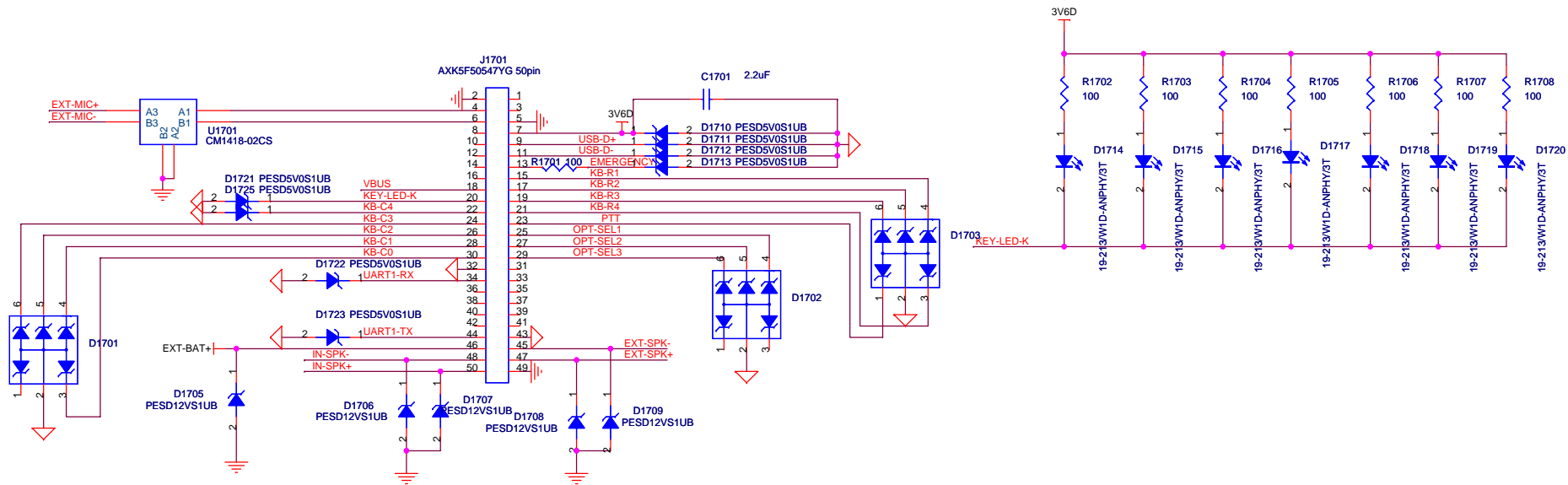
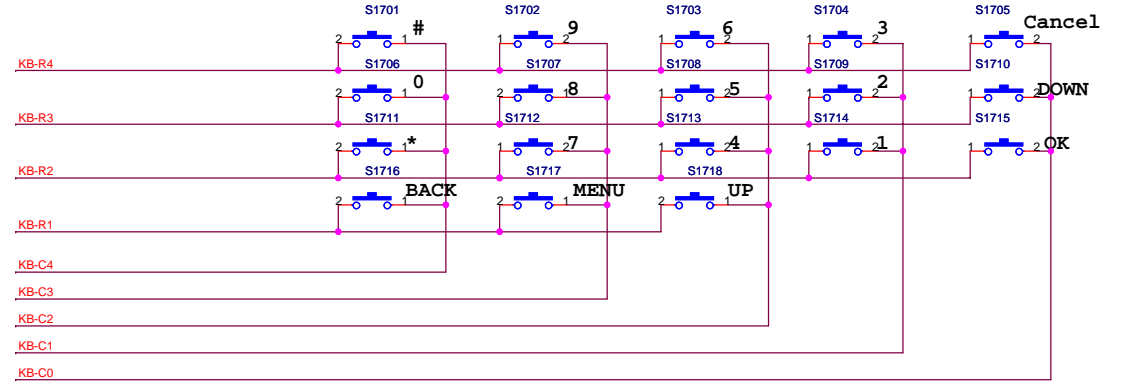
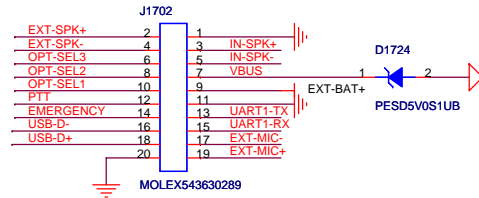
PD70X/PD70XG/HD705/HD705G Schematic Diagram (Channel Board)



PD78X/PD78XG/HD785/HD785G Schematic Diagram (Channel Board)



PD78X/PD78XG/HD785/HD785G Schematic Diagram (Keyboard)



10.7 Parts List

Main Board for PD70X/ PD70XG/ PD78X/ PD78XG/ HD705/ HD705G/ HD785/ HD785G

No.	Ref. No.	Part No.	Description
1	C9132	3001050000000	0Ω
2	R135	3001050000000	0Ω
3	R141	3001050000000	0Ω
4	R204	3001050000000	0Ω
5	R213	3001050000000	0Ω
6	R243	3001050000000	0Ω
7	R254	3001050000000	0Ω
8	R319	3001050000000	0Ω
9	R822	3001050000000	0Ω
10	R834	3001050000000	0Ω
11	R835	3001050000000	0Ω
12	R9094	3001050000000	0Ω
13	L9038	3001060000000	0Ω
14	L9039	3001060000000	0Ω
15	R602	3001060000000	0Ω
16	R604	3001060000000	0Ω
17	R9053	3099080398010	0.39Ω
18	R9054	3099080398010	0.39Ω
19	R9055	3099080398010	0.39Ω
20	R9005	3001055690000	5.6Ω
21	R103	3001051000000	10Ω
22	R130	3001051000000	10Ω
23	R131	3001051000000	10Ω
24	R134	3001051000000	10Ω
25	R203	3001051000000	10Ω
26	R206	3001051000000	10Ω
27	R209	3001051000000	10Ω
28	R249	3001051000000	10Ω
29	R801	3001051000000	10Ω
30	R806	3001051000000	10Ω
31	R9022	3001052200000	22Ω
32	R324	3001053300000	33Ω
33	R325	3001053300000	33Ω
34	R326	3001053300000	33Ω
35	R9009	3001053300000	33Ω
36	R207	3001063300000	33Ω
37	R208	3001063300000	33Ω
38	R210	3001063300000	33Ω
39	R138	3001054700000	47Ω
40	R9021	3001054700000	47Ω
41	R132	3001055100020	51Ω

No.	Ref. No.	Part No.	Description
42	R401	3001055100020	51Ω
43	R9075	3001055100020	51Ω
44	R101	3001055600000	56Ω
45	R136	3001055600000	56Ω
46	R503	3001051010000	100Ω
47	R111	3001051010000	100Ω
48	R119	3001051010000	100Ω
49	R121	3001051010000	100Ω
50	R205	3001051010000	100Ω
51	R257	3001051010000	100Ω
52	R327	3001051010000	100Ω
53	R408	3001051010000	100Ω
54	R607	3001051010000	100Ω
55	R713	3001051010000	100Ω
56	R821	3001051010000	100Ω
57	R9011	3001051010000	100Ω
58	R9012	3001051010000	100Ω
59	R9017	3001051010000	100Ω
60	R9039	3001051010000	100Ω
61	R212	3001061010000	100Ω
62	R214	3001061010000	100Ω
63	R215	3001061010000	100Ω
64	R216	3001061010000	100Ω
65	R217	3001061010000	100Ω
66	R218	3001061010000	100Ω
67	R220	3001061010000	100Ω
68	R222	3001061010000	100Ω
69	R242	3001061010000	100Ω
70	R244	3001061010000	100Ω
71	R9016	3001051510000	150Ω
72	R115	3001051810010	180Ω
73	R9001	3001052710010	270Ω
74	R9003	3001052710010	270Ω
75	R9025	3001052710010	270Ω
76	R9028	3001052710010	270Ω
77	R502	3001053310010	330Ω
78	R9015	3001053310010	330Ω
79	R9071	3001053310010	330Ω
80	R9083	3001053310010	330Ω
81	R411	3001053910000	390Ω
82	R113	3001054710000	470Ω
83	R313	3001054710000	470Ω
84	R501	3001054710000	470Ω
85	R404	3001056810000	680Ω

No.	Ref. No.	Part No.	Description
86	R9018	3001056810000	680Ω
87	R416	3001058210000	820Ω
88	R139	3001051020000	1KΩ
89	R403	3001051020000	1KΩ
90	R613	3001051020000	1KΩ
91	R701	3001051020000	1KΩ
92	R9033	3001051020000	1KΩ
93	R9038	3001051020000	1KΩ
94	R260	3001051520000	1.5KΩ
95	R9008	3001051520000	1.5KΩ
96	R9066	3001051520000	1.5KΩ
97	R413	3001051820000	1.8KΩ
98	R820	3001052020020	2KΩ
99	R825	3001052020020	2KΩ
100	R832	3001052020020	2KΩ
101	R833	3001052020020	2KΩ
102	R140	3001052220000	2.2KΩ
103	R322	3001052220000	2.2KΩ
104	R323	3001052220000	2.2KΩ
105	R414	3001052720000	2.7KΩ
106	R629	3001054720000	4.7KΩ
107	R108	3001053320000	3.3KΩ
108	R109	3001053320000	3.3KΩ
109	R114	3001053320000	3.3KΩ
110	R117	3001053320000	3.3KΩ
111	R143	3001053320000	3.3KΩ
112	R144	3001053320000	3.3KΩ
113	R314	3001053320000	3.3KΩ
114	R315	3001053320000	3.3KΩ
115	R620	3001053320000	3.3KΩ
116	R9013	3001053320000	3.3KΩ
117	R9043	3001053320000	3.3KΩ
118	R9068	3001053320000	3.3KΩ
119	R9095	3001053320000	3.3KΩ
120	R9096	3001053320000	3.3KΩ
121	R9097	3001053320000	3.3KΩ
122	R9098	3001053320000	3.3KΩ
123	R116	3001054720000	4.7KΩ
124	R409	3001054720000	4.7KΩ
125	R9041	3001054720000	4.7KΩ
126	C9114	3001055620000	5.6KΩ
127	R106	3001055620000	5.6KΩ
128	R9078	3001055620000	5.6KΩ
129	R9089	3001055620000	5.6KΩ

No.	Ref. No.	Part No.	Description
130	R9024	3001056820000	6.8KΩ
131	R9067	3001056820000	6.8KΩ
132	R110	3001058220000	8.2KΩ
133	R118	3001058220000	8.2KΩ
134	R407	3001058220000	8.2KΩ
135	R9027	3001058220000	8.2KΩ
136	R102	3001051030000	10KΩ
137	R105	3001051030000	10KΩ
138	R122	3001051030000	10KΩ
139	R129	3001051030000	10KΩ
140	R133	3001051030000	10KΩ
141	R142	3001051030000	10KΩ
142	R241	3001051030000	10KΩ
143	R246	3001051030000	10KΩ
144	R250	3001051030000	10KΩ
145	R252	3001051030000	10KΩ
146	R256	3001051030000	10KΩ
147	R258	3001051030000	10KΩ
148	R263	3001051030000	10KΩ
149	R316	3001051030000	10KΩ
150	R317	3001051030000	10KΩ
151	R402	3001051030000	10KΩ
152	R611	3001051030000	10KΩ
153	R804	3001051030000	10KΩ
154	R805	3001051030000	10KΩ
155	R838	3001051030000	10KΩ
156	R841	3001051030000	10KΩ
157	R9006	3001051030000	10KΩ
158	R9036	3001051030000	10KΩ
159	R9063	3001051030000	10KΩ
160	R9074	3001051030000	10KΩ
161	R9081	3001051030000	10KΩ
162	R219	3001061030010	10KΩ
163	R410	3001061030010	10KΩ
164	R415	3001061030010	10KΩ
165	RN242	3005051030010	10KΩ
166	RN243	3005051030010	10KΩ
167	RN256	3005051030010	10KΩ
168	R261	3001051530000	15KΩ
169	R262	3001051530000	15KΩ
170	R631	3001051530000	15KΩ
171	R824	3001051530010	15KΩ
172	R828	3001051530010	15KΩ
173	R807	3001052030000	20KΩ

No.	Ref. No.	Part No.	Description
174	R145	3001053330000	33KΩ
175	R146	3001053330000	33KΩ
176	R707	3001053330000	33KΩ
177	R830	3001053330000	33KΩ
178	R9047	3001053330000	33KΩ
179	R9079	3001053330000	33KΩ
180	R627	3001054730010	47KΩ
181	R628	3001054730010	47KΩ
182	R630	3001054730010	47KΩ
183	R826	3001054730010	47KΩ
184	R9084	3001055630000	56KΩ
185	R702	3001056830000	68KΩ
186	R601	3001051040000	100KΩ
187	R123	3001051040000	100KΩ
188	R251	3001051040000	100KΩ
189	R412	3001051040000	100KΩ
190	R621	3001051040000	100KΩ
191	R709	3001051040000	100KΩ
192	R710	3001051040000	100KΩ
193	R9072	3001051040000	100KΩ
194	R9073	3001051040000	100KΩ
195	R9076	3001051040000	100KΩ
196	R9077	3001051040000	100KΩ
197	R9085	3001051040000	100KΩ
198	R618	3001051340000	130KΩ
199	R623	3001051540000	150KΩ
200	R9048	3001051540000	150KΩ
201	R9057	3001051540000	150KΩ
202	R112	3001051840000	180KΩ
203	R617	3001054740010	470KΩ
204	R829	3001054740010	470KΩ
205	R9046	3001054740010	470KΩ
206	R9059	3001051040000	100KΩ
207	C519	3199050758000	0.75PF
208	C520	3101050100030	1PF
209	C143	3101060100010	1PF
210	C9003	3101060100010	1PF
211	C527	3101050200010	2PF
212	C9004	3101060200010	2PF
213	C102	3101050300000	3PF
214	C103	3101050300000	3PF
215	C111	3101050300000	3PF
216	C112	3101050300000	3PF
217	C144	3101060300010	3PF

No.	Ref. No.	Part No.	Description
218	C147	3101060300010	3PF
219	C129	3101063690000	3.6PF
220	C456	3101063690000	3.6PF
221	C9021	3101063690000	3.6PF
222	C106	3101050500010	5PF
223	C145	3101060500010	5PF
224	C146	3101060500010	5PF
225	C125	3101065690000	5.6PF
226	C124	3101050600010	6PF
227	C9117	3101050600010	6PF
228	C9134	3101050600010	6PF
229	C123	3101060600010	6PF
230	C128	3101060600010	6PF
231	C108	3101050700010	7PF
232	C109	3101050700010	7PF
233	C114	3101050700010	7PF
234	C115	3101050700010	7PF
235	C9028	3101050700010	7PF
236	C9107	3101050700010	7PF
237	C9131	3101050700010	7PF
238	C133	3101060700020	7PF
239	C452	3101060700020	7PF
240	C9007	3101060700020	7PF
241	C9023	3101060700020	7PF
242	C9026	3101050800000	8PF
243	C107	3101050800000	8PF
244	C9032	3101050800000	8PF
245	C9115	3101050800000	8PF
246	C9124	3101050800000	8PF
247	C9129	3101050800000	8PF
248	C9137	3101050800000	8PF
249	C9015	3101060800010	8PF
250	C9024	3101060800010	8PF
251	C110	3101050900000	9PF
252	C116	3101050900000	9PF
253	C9014	3101050900000	9PF
254	C9113	3101050900000	9PF
255	C119	3101051000020	10PF
256	C9025	3101051000020	10PF
257	C9077	3101051000020	10PF
258	C9099	3101051000020	10PF
259	C267	3101051200020	12PF
260	C274	3101051200020	12PF
261	C420	3101051200020	12PF

No.	Ref. No.	Part No.	Description
262	C9120	3101051200020	12PF
263	C9027	3101061200000	12PF
264	C153	3101061300000	13PF
265	C9079	3101051500020	15PF
266	C9101	3101051500020	15PF
267	C9105	3101051500020	15PF
268	C9109	3101051500020	15PF
269	C134	3101061500010	15PF
270	C425	3101051800010	18PF
271	C517	3101051800010	18PF
272	C458	3101061800000	18PF
273	C9112	3101061800000	18PF
274	C672	3101052000020	20PF
275	C203	3101052000020	20PF
276	C204	3101052000020	20PF
277	C644	3101052000020	20PF
278	C9078	3101052000020	20PF
279	C9106	3101052000020	20PF
280	C432	3101052200010	22PF
281	C9035	3101052200010	22PF
282	C148	3101062200010	22PF
283	C9118	3101052700000	27PF
284	C9122	3101052700000	27PF
285	C130	3101062700010	27PF
286	C460	3101063000010	30PF
287	C448	3101053300000	33PF
288	C132	3101054700010	47PF
289	C151	3101054700010	47PF
290	C223	3101054710010	470PF
291	C224	3101054710010	470PF
292	C225	3101054710010	470PF
293	C512	3101054700010	47PF
294	C9141	3101054700010	47PF
295	R9080	3101054700010	47PF
296	C513	3101055600000	56PF
297	C524	3101055600000	56PF
298	C168	3101051010030	100PF
299	C170	3101051010030	100PF
300	C173	3101051010030	100PF
301	C280	3101051010030	100PF
302	C281	3101051010030	100PF
303	C284	3101051010030	100PF
304	C288	3101051010030	100PF
305	C428	3101051010030	100PF

No.	Ref. No.	Part No.	Description
306	C429	3101051010030	100PF
307	C438	3101051010030	100PF
308	C439	3101051010030	100PF
309	C602	3101051010030	100PF
310	C616	3101051010030	100PF
311	C620	3101051010030	100PF
312	C708	3101051010030	100PF
313	C805	3101051010030	100PF
314	C806	3101051010030	100PF
315	C830	3101051010030	100PF
316	C842	3101051010030	100PF
317	C848	3101051010030	100PF
318	C9002	3101051010030	100PF
319	C9011	3101061010010	100PF
320	C427	3101052210010	220PF
321	C645	3101052210010	220PF
322	C674	3101052210010	220PF
323	C201	3101052700000	27PF
324	C469	3101052710000	270PF
325	C845	3101052710000	270PF
326	C175	3101052710000	270PF
327	C207	3101052710000	270PF
328	C214	3101052710000	270PF
329	C220	3101052710000	270PF
330	C228	3101052710000	270PF
331	C232	3101052710000	270PF
332	C243	3101052710000	270PF
333	C282	3101052710000	270PF
334	C283	3101052710000	270PF
335	C286	3101052710000	270PF
336	C287	3101052710000	270PF
337	C313	3101052710000	270PF
338	C315	3101052710000	270PF
339	C316	3101052710000	270PF
340	C317	3101052710000	270PF
341	C319	3101052710000	270PF
342	C320	3101052710000	270PF
343	C321	3101052710000	270PF
344	C322	3101052710000	270PF
345	C331	3101052710000	270PF
346	C332	3101052710000	270PF
347	C333	3101052710000	270PF
348	C334	3101052710000	270PF
349	C470	3101052710000	270PF

No.	Ref. No.	Part No.	Description
350	C471	3101052710000	270PF
351	C652	3101052710000	270PF
352	C680	3101052710000	270PF
353	C681	3101052710000	270PF
354	C685	3101052710000	270PF
355	C709	3101052710000	270PF
356	C804	3101052710000	270PF
357	C807	3101052710000	270PF
358	C811	3101052710000	270PF
359	C814	3101052710000	270PF
360	C818	3101052710000	270PF
361	C829	3101052710000	270PF
362	C835	3101052710000	270PF
363	C838	3101052710000	270PF
364	C846	3101052710000	270PF
365	C849	3101052710000	270PF
366	C851	3101052710000	270PF
367	C853	3101052710000	270PF
368	C856	3101052710000	270PF
369	C857	3101052710000	270PF
370	C101	3101054710010	470PF
371	C104	3101054710010	470PF
372	C118	3101054710010	470PF
373	C120	3101054710010	470PF
374	C127	3101054710010	470PF
375	C136	3101054710010	470PF
376	C139	3101054710010	470PF
377	C142	3101054710010	470PF
378	C444	3101054710010	470PF
379	C459	3101054710010	470PF
380	C703	3101054710010	470PF
381	C704	3101054710010	470PF
382	C9018	3101054710010	470PF
383	C9029	3101054710010	470PF
384	C9033	3101054710010	470PF
385	C9034	3101054710010	470PF
386	C9037	3101054710010	470PF
387	C9039	3101054710010	470PF
388	C9042	3101054710010	470PF
389	C9045	3101054710010	470PF
390	C9047	3101054710010	470PF
391	C9048	3101054710010	470PF
392	C9050	3101054710010	470PF
393	C9069	3101054710010	470PF

No.	Ref. No.	Part No.	Description
394	C9075	3101054710010	470PF
395	C9081	3101054710010	470PF
396	C9096	3101054710010	470PF
397	C9098	3101054710010	470PF
398	C9013	3101064710000	470PF
399	C137	3101051020010	1000PF
400	C156	3101051020010	1000PF
401	C161	3101051020010	1000PF
402	C162	3101051020010	1000PF
403	C163	3101051020010	1000PF
404	C172	3101051020010	1000PF
405	C180	3101051020010	1000PF
406	C183	3101051020010	1000PF
407	C184	3101051020010	1000PF
408	C202	3101051020010	1000PF
409	C206	3101051020010	1000PF
410	C252	3101051020010	1000PF
411	C705	3101051020010	1000PF
412	C9001	3101051020010	1000PF
413	C9059	3101051020010	1000PF
414	C9061	3101051020010	1000PF
415	C9064	3101051020010	1000PF
416	C9067	3101051020010	1000PF
417	C9085	3101051020010	1000PF
418	C9088	3101051020010	1000PF
419	C9089	3101051020010	1000PF
420	C9093	3101051020010	1000PF
421	C9103	3101051020010	1000PF
422	C9121	3101051020010	1000PF
423	C9060	3101061020000	1000PF
424	C289	3101051520000	1500PF
425	C209	3101051520000	1500PF
426	C213	3101051520000	1500PF
427	C219	3101051520000	1500PF
428	C227	3101051520000	1500PF
429	C231	3101051520000	1500PF
430	C235	3101051520000	1500PF
431	C244	3101051520000	1500PF
432	C275	3101051520000	1500PF
433	C276	3101051520000	1500PF
434	C277	3101051520000	1500PF
435	C684	3101051520000	1500PF
436	C686	3101051520000	1500PF
437	C841	3101051520000	1500PF

No.	Ref. No.	Part No.	Description
438	C858	3101051520000	1500PF
439	C9065	3101051520000	1500PF
440	C159	3101052220010	2200PF
441	C160	3101052220010	2200PF
442	C431	3101052220010	2200PF
443	C455	3101063320000	3300PF
444	C215	3101051030020	0.01UF
445	C174	3101051030020	0.01UF
446	C251	3101051030020	0.01UF
447	C426	3101051030020	0.01UF
448	C436	3101051030020	0.01UF
449	C440	3101051030020	0.01UF
450	C447	3101051030020	0.01UF
451	C449	3101051030020	0.01UF
452	C453	3101051030020	0.01UF
453	C454	3101051030020	0.01UF
454	C457	3101051030020	0.01UF
455	C612	3101051030020	0.01UF
456	C638	3101051030020	0.01UF
457	C666	3101051030020	0.01UF
458	C683	3101051030020	0.01UF
459	C687	3101051030020	0.01UF
460	C819	3101051030020	0.01UF
461	C822	3101051030020	0.01UF
462	C826	3101051030020	0.01UF
463	C827	3101051030020	0.01UF
464	C837	3101051030020	0.01UF
465	C9044	3101051030020	0.01UF
466	C9066	3101051030020	0.01UF
467	C9090	3101051030020	0.01UF
468	C9110	3101051030020	0.01UF
469	C619	3101061030010	0.01UF
470	C442	3101061030010	0.01UF
471	C450	3101061230000	0.012UF
472	C242	3101052230000	0.022UF
473	C245	3101052230000	0.022UF
474	C617	3101051040060	0.1UF
475	C630	3101051040060	0.1UF
476	C658	3101051040060	0.1UF
477	C105	3101051040060	0.1UF
478	C117	3101051040060	0.1UF
479	C121	3101051040060	0.1UF
480	C126	3101051040060	0.1UF
481	C138	3101051040060	0.1UF

No.	Ref. No.	Part No.	Description
482	C141	3101051040060	0.1UF
483	C164	3101051040060	0.1UF
484	C165	3101051040060	0.1UF
485	C166	3101051040060	0.1UF
486	C167	3101051040060	0.1UF
487	C169	3101051040060	0.1UF
488	C179	3101051040060	0.1UF
489	C182	3101051040060	0.1UF
490	C310	3101051040060	0.1UF
491	C311	3101051040060	0.1UF
492	C318	3101051040060	0.1UF
493	C422	3101051040060	0.1UF
494	C430	3101051040060	0.1UF
495	C433	3101051040060	0.1UF
496	C434	3101051040060	0.1UF
497	C435	3101051040060	0.1UF
498	C441	3101051040060	0.1UF
499	C445	3101051040060	0.1UF
500	C446	3101051040060	0.1UF
501	C462	3101051040060	0.1UF
502	C464	3101051040060	0.1UF
503	C465	3101051040060	0.1UF
504	C466	3101051040060	0.1UF
505	C522	3101051040060	0.1UF
506	C523	3101051040060	0.1UF
507	C525	3101051040060	0.1UF
508	C604	3101051040060	0.1UF
509	C607	3101051040060	0.1UF
510	C608	3101051040060	0.1UF
511	C611	3101051040060	0.1UF
512	C615	3101051040060	0.1UF
513	C618	3101051040060	0.1UF
514	C622	3101051040060	0.1UF
515	C625	3101051040060	0.1UF
516	C626	3101051040060	0.1UF
517	C635	3101051040060	0.1UF
518	C639	3101051040060	0.1UF
519	C642	3101051040060	0.1UF
520	C647	3101051040060	0.1UF
521	C650	3101051040060	0.1UF
522	C656	3101051040060	0.1UF
523	C662	3101051040060	0.1UF
524	C668	3101051040060	0.1UF
525	C671	3101051040060	0.1UF

No.	Ref. No.	Part No.	Description
526	C679	3101051040060	0.1UF
527	C682	3101051040060	0.1UF
528	C688	3101051040060	0.1UF
529	C710	3101051040060	0.1UF
530	C801	3101051040060	0.1UF
531	C809	3101051040060	0.1UF
532	C810	3101051040060	0.1UF
533	C812	3101051040060	0.1UF
534	C817	3101051040060	0.1UF
535	C833	3101051040060	0.1UF
536	C836	3101051040060	0.1UF
537	C839	3101051040060	0.1UF
538	C843	3101051040060	0.1UF
539	C850	3101051040060	0.1UF
540	C852	3101051040060	0.1UF
541	C9038	3101051040060	0.1UF
542	C9043	3101051040060	0.1UF
543	C9046	3101051040060	0.1UF
544	C9049	3101051040060	0.1UF
545	C9057	3101051040060	0.1UF
546	C9071	3101051040060	0.1UF
547	C9080	3101051040060	0.1UF
548	C9086	3101051040060	0.1UF
549	C9091	3101051040060	0.1UF
550	C9092	3101051040060	0.1UF
551	C9097	3101051040060	0.1UF
552	C9104	3101051040060	0.1UF
553	C234	3101052240010	0.22UF
554	C212	3101052240010	0.22UF
555	C216	3101052240010	0.22UF
556	C218	3101052240010	0.22UF
557	C221	3101052240010	0.22UF
558	C226	3101052240010	0.22UF
559	C230	3101052240010	0.22UF
560	C246	3101052240010	0.22UF
561	C821	3101052240010	0.22UF
562	C824	3101052240010	0.22UF
563	C210	3101062240000	0.22UF
564	C628	3101062240000	0.22UF
565	C640	3101062240000	0.22UF
566	C655	3101062240000	0.22UF
567	C676	3101062240000	0.22UF
568	C678	3101062240000	0.22UF
569	C463	3101072240000	0.22UF

No.	Ref. No.	Part No.	Description
570	C468	3104076840020	0.68UF
571	C9041	3101051050000	1UF
572	C646	3110061050000	1uF
573	C657	3110061050000	1uF
574	C667	3110061050000	1uF
575	C154	3101051050000	1UF
576	C222	3101051050000	1UF
577	C229	3101051050000	1UF
578	C236	3101051050000	1UF
579	C247	3101051050000	1UF
580	C254	3101051050000	1UF
581	C312	3101051050000	1UF
582	C314	3101051050000	1UF
583	C323	3101051050000	1UF
584	C423	3101051050000	1UF
585	C515	3101051050000	1UF
586	C526	3101051050000	1UF
587	C706	3101051050000	1UF
588	C707	3101051050000	1UF
589	C711	3101051050000	1UF
590	C712	3101051050000	1UF
591	C831	3101051050000	1UF
592	C832	3101051050000	1UF
593	C834	3101051050000	1UF
594	C840	3101051050000	1UF
595	C847	3101051050000	1UF
596	C9095	3101051050000	1UF
597	C605	3101061050020	1UF
598	C609	3101061050020	1UF
599	C623	3101061050020	1UF
600	C648	3101061050020	1UF
601	C669	3101061050020	1UF
602	C675	3101061050020	1UF
603	C677	3101061050020	1UF
604	C701	3101061050020	1UF
605	C472	3101062250000	2.2UF
606	C140	3101062250000	2.2UF
607	C157	3101062250000	2.2UF
608	C158	3101062250000	2.2UF
609	C467	3101062250000	2.2UF
610	C601	3101062250000	2.2UF
611	C606	3101062250000	2.2UF
612	C610	3101062250000	2.2UF
613	C624	3101062250000	2.2UF

No.	Ref. No.	Part No.	Description
614	C641	3101062250000	2.2UF
615	C649	3101062250000	2.2UF
616	C660	3101062250000	2.2UF
617	C670	3101062250000	2.2UF
618	C825	3101062250000	2.2UF
619	C828	3101062250000	2.2UF
620	C603	3101074750000	4.7UF
621	C621	3101074750000	4.7UF
622	C636	3110071030000	Capacitor
623	C661	3110071030000	Capacitor
624	C802	3101082260020	22UF
625	C9051	3104082260060	22UF
626	L9016	3210306339000	3.3nH
627	L9030	3210306339000	3.3nH
628	L118	3217138889000	8.8nH
629	L9006	3215006100010	10nH
630	L9007	3215006100010	10nH
631	L102	3212106120000	12nH
632	L103	3212106120000	12nH
633	L111	3217107120000	12nH
634	L117	3217107160000	16nH
635	L112	3217107180010	18nH
636	L9009	3210306220000	22nH
637	L9010	3210306220000	22nH
638	L9028	3210306220000	22nH
639	L101	3210306330000	33nH
640	L107	3210306330000	33nH
641	L506	3210106390000	39nH
642	L9025	3210106390000	39nH
643	L9026	3210106101000	100nH
644	L9012	3210107221000	220nH
645	L406	3217107221010	220nH
646	L402	3210406271000	270nH
647	L9022	3210406271000	270nH
648	L106	3210106391000	390nH
649	L108	3210106391000	390nH
650	L110	3210106391000	390nH
651	L113	3210106391000	390nH
652	L114	3210106391000	390nH
653	L115	3210106391000	390nH
654	L116	3210106391000	390nH
655	L119	3210106391000	390nH
656	L203	3212206471000	470nH
657	L9027	3213306821000	0.82uH

No.	Ref. No.	Part No.	Description
658	L9011	3210209102010	1uH
659	L607	3290299220000	Inductor
660	L613	3290299220000	Inductor
661	L615	3290299220000	Inductor
662	L616	3290299220000	Inductor
663	L411	3213212332000	3.3uH
664	L408	3210407472000	4.7uH
665	L413	3213306682000	6.8uH
666	L614	3217099153000	15uH
667	L610	3217099153000	15uH
668	L502	3221506601080	Bead
669	L505	3221506601080	Bead
670	L302	3221506601000	Bead
671	L304	3221506601000	Bead
672	L305	3221506601000	Bead
673	L410	3221506601000	Bead
674	L820	3221506601000	Bead
675	L823	3221506601000	Bead
676	L827	3221506601000	Bead
677	L828	3221506601000	Bead
678	L9014	3221506121000	Bead
679	L109	3221505121010	Bead
680	L120	3221505121010	Bead
681	L121	3221505121010	Bead
682	L122	3221505121010	Bead
683	L123	3221505121010	Bead
684	L403	3221505121010	Bead
685	L405	3221505121010	Bead
686	L407	3221505121010	Bead
687	L412	3221505121010	Bead
688	L702	3221505121010	Bead
689	L801	3221505121010	Bead
690	L803	3221505121010	Bead
691	L804	3221505121010	Bead
692	L805	3221505121010	Bead
693	L821	3221505121010	Bead
694	L822	3221505121010	Bead
695	L9015	3221505121010	Bead
696	L9020	3221505121010	Bead
697	R712	3221505121010	Bead
698	R614	3221506181000	Bead
699	L202	3221506181000	Bead
700	L204	3221506181000	Bead
701	L303	3221506181000	Bead

No.	Ref. No.	Part No.	Description
702	L601	3221506181000	Bead
703	L602	3221506181000	Bead
704	L603	3221506181000	Bead
705	L604	3221506181000	Bead
706	L605	3221506181000	Bead
707	L606	3221506181000	Bead
708	L609	3221506181000	Bead
709	L611	3221506181000	Bead
710	L612	3221506181000	Bead
711	L802	3221506181000	Bead
712	R622	3221506181000	Bead
713	F601	4099000000050	Fuse
714	L9003	3233099185900	18.5nH
715	L9004	3233099185900	18.5nH
716	L9005	3233099185900	18.5nH
717	L9013	3233099185900	18.5nH
718	L9008	3233099470000	47nH
719	T9001	5406000000200	Transformer
720	T9002	5406000000200	Transformer
721	D104	3303020100080	Switching diode
722	D105	3303020100080	Switching diode
723	D9005	3303020100080	Switching diode
724	D9006	3303020100080	Switching diode
725	D9007	3303020100080	Switching diode
726	D9008	3303020100080	Switching diode
727	D101	3304010100220	Varactor
728	D102	3304010100220	Varactor
729	D103	3304010100220	Varactor
730	D106	3304010100220	Varactor
731	D107	3304010100220	Varactor
732	D108	3304010100220	Varactor
733	D109	3304010100220	Varactor
734	D110	3304010100220	Varactor
735	D402	3304010100220	Varactor
736	D401	3304060300050	Varactor
737	D9001	3304060300050	Varactor
738	D9012	3304060300050	Varactor
739	D9014	3304060300050	Varactor
740	D9015	3304060300050	Varactor
741	D112	3303020100020	Switching diode
742	D9002	3303030800040	Switching diode
743	D302	3303990000010	Switching diode
744	D601	3399990000110	Diode
745	D9010	3399990000080	Zener diode

No.	Ref. No.	Part No.	Description
746	D9013	3399990000260	Rectifier diode
747	D9017	3301250300000	Schottky barrier diode
748	D307	3399040600020	ESD protection diode
749	D308	3399040600020	ESD protection diode
750	D309	3399040600020	ESD protection diode
751	D310	3399040600020	ESD protection diode
752	D602	3399040600020	ESD protection diode
753	Q101	3401002000990	NPN transistor
754	Q9002	3408002000000	NPN transistor
755	Q102	3408002000000	NPN transistor
756	Q403	3408002000000	NPN transistor
757	Q9017	3404006000000	NPN transistor
758	Q9018	3404006000000	NPN transistor
759	Q103	3403999000000	Transistor
760	Q106	3403999000000	Transistor
761	Q107	3403999000000	Transistor
762	Q9019	3403999000000	Transistor
763	Q9020	3403999000000	Transistor
764	Q104	3408002000080	NPN transistor
765	Q108	3408002000080	NPN transistor
766	Q105	3403003000060	NPN transistor
767	Q401	3403003000060	NPN transistor
768	Q402	3499000000150	Transistor
769	Q9001	3418001000010	NPN transistor
770	Q9004	3406001000090	NPN transistor
771	Q605	3410001000020	PNP Transistor
772	Q9006	3410001000020	PNP Transistor
773	Q312	3403008000010	Transistor
774	Q607	3403008000010	Transistor
775	Q801	3403008000010	Transistor
776	Q802	3403008000010	Transistor
777	Q9007	3403008000010	Transistor
778	Q9008	3403008000010	Transistor
779	Q606	3401001000490	PNP Transistor
780	Q604	3503020000030	N-MOSFET
781	U102	3605002057290	Operational amplifier
782	U103	3604019000000	PLL
783	U401	3603999000000	IF processor
784	U701	3606010000010	D/A converter
785	U9003	5404000000060	Sensor
786	X101	3701019250030	TCXO 19.2MHZ
787	Z9001	3802733540020	Crystal filter
788	X201	3701327610060	Crystal 32.768KHz
789	U201	3610010000010	MCU OMAP5912ZZG

No.	Ref. No.	Part No.	Description
790	U604	3608020005750	Power management IC
791	U605	3608020005750	Power management IC
792	U610	3608006000030	Power management IC
793	U603	3608006000000	Power management IC
794	U606	3608006000000	Power management IC
795	U608	3608006000000	Power management IC
796	U609	3608006000000	Power management IC
797	U612	3608006000000	Power management IC
798	U801	3602023005740	Audio amplifier
799	U312	3805000000030	EMI filter
800	U313	3805000000030	EMI filter
801	U314	3805000000030	EMI filter
802	U315	3805000000030	EMI filter
803	U316	3805000000030	EMI filter
804	U317	3805000000030	EMI filter
805	U318	3805000000030	EMI filter
806	U319	3805000000030	EMI filter
807	U320	3805000000030	EMI filter
808	U321	3805000000030	EMI filter
809	U322	3805000000030	EMI filter
810	U601	3608011000050	Power management IC
811	U611	3608011000050	Power management IC
812	U820	3616037000020	Switch
813	U607	3609010000170	Reset IC
814	U821	3613010000000	Baseband processor
815	U244	3612002000020	NOR-FLASH+PSRAM
816	J313	5202002100200	Board-to-wire connector
817	J311	5201030000040	Board-to-board connector
818	J601	5205003100020	Battery connector
819	C627	3110081040000	Capacitor
820	C654	3110081040000	Capacitor
821	RN257	3005061010000	100Ω
822	RN258	3005061010000	100Ω
823	RN260	3005061010000	100Ω
824	ANT1	6201847000000	Antenna spring plate
825	C514	3101051210000	120PF
826	C521	3101051210000	120PF
827	U242	3612044000010	Mobile-SDRAM
828	C178	3101073340010	0.33UF
829	C9019	3101060900010	9PF
830	C9031	3101060900010	9PF
831	C122	3101061590010	1.5PF
832	C149	3101061590010	1.5PF
833	C177	3101073340000	0.33UF

No.	Ref. No.	Part No.	Description
834	L9002	3210306820000	82nH
835	R104	3001051020010	1KΩ
836	R632	3001051020010	1KΩ
837	C9128	3101050400010	4PF
838	C9133	3101050400010	4PF
839	C9135	3101050400010	4PF
840	C9136	3101050400010	4PF
841	C518	3101051590000	1.5PF
842	C9100	3101052790000	2.7PF
843	C176	3101053310030	330PF
844	C208	3101053310030	330PF
845	C9116	3101053690000	3.6PF
846	C9087	3101054730000	0.047UF
847	C9138	3101054730000	0.047UF
848	C461	3101063300000	33PF
849	C9020	3101064300000	43PF
850	C637	3110994760000	47uF
851	C665	3110994760000	47uF
852	L124	3210406471000	470nH
853	L201	3210406471000	470nH
854	L409	3210406471000	470nH
855	L9032	3210406471000	470nH
856	L9024	3217607221000	220nH
857	Q310	3511990000010	N-MOSFET
858	Q313	3511990000010	N-MOSFET
859	X203	3701019250040	TCXO 19.2MHz
860	J821	5201016000010	Board-to-board connector
861		6201809000000	Shielding can for IF processor
862		6201810000000	Shielding can for baseband processor
863		6201859000000	Shielding frame for lowpass filter
864		6201860000000	Shielding frame for GPS
865		6201862000000	Shielding can for TX VCO
866		6201865000000	Shielding can for crystal oscillator
867		6201915000000	Shielding can for antenna spring plate
868	C9030	3101062490000	2.4PF
869	L9001	3210106820000	82nH
870	Q9005	3504990000010	MOSFET
871	Q9003	3504990000040	MOSFET
872	R704	3001051010040	100Ω
873	R120	3001051030050	10KΩ
874	R127	3001051030050	10KΩ
875	R504	3001051030050	10KΩ
876	R705	3001051030050	10KΩ
877	R706	3001051030050	10KΩ

No.	Ref. No.	Part No.	Description
878	R823	3001051030050	10K Ω
879	R124	3001052720010	2.7K Ω
880	R125	3001052720010	2.7K Ω
881	R128	3001052720010	2.7K Ω
882	R107	3001053310000	330 Ω
883	R9029	3001053310000	330 Ω
884	C443	3101063900000	39PF
885	C816	3101071050020	1UF
886	L104	3290106120000	12nH
887	L105	3290106120000	12nH
888	C803	3101052240030	220nF
889	C437	3101065620010	5600PF
890	L501	3297106339000	3.3nH
891	L503	3297106339000	3.3nH
892	L504	3297106339000	3.3nH
893	R9004	3233099449000	4.4nH
894	R612	3001061020010	1K Ω
895	R321	3099063018000	3.01 Ω
896	R619	3099063018000	3.01 Ω
897	R624	3099063018000	3.01 Ω
898	C9111	3101052490020	2.4PF
899	C614	3101055690020	5.6PF
900	C9009	3101060400010	4PF
901	L9034	3101060400010	4PF
902	L9033	3237199170000	17nH
903	L9035	3237199170000	17nH
904	L9036	3237199170000	17nH
905	L9037	3237199170000	17nH
906	D604	3303030100010	Switching diode
907	D303	3310040000000	ESD protection diode
908	D304	3310040000000	ESD protection diode
909	D305	3399040600000	ESD protection diode
910	D306	3399040600000	ESD protection diode
911	D318	3399040600010	ESD protection diode
912	Q603	3414001000040	NPN transistor
913	J1601	5201050100030	Board-to-board connector
914		6201935000000	Shielding can for switching power
915	RN255	3005060000000	0 Ω
916	RN259	3005060000000	0 Ω
917	RN401	3005060000000	0 Ω
918	RN261	3001052230020	22K*2
919	L9018	3210106150000	15nH
920	L9017	3210106220000	22nH
921	L401	3217107103010	10uH

No.	Ref. No.	Part No.	Description
922	L404	3217107103010	10uH
923	U501	3609999000300	GPS LNA
924	Z501	3804157560000	GPS filter
925	R9045	3001051050000	1MΩ
926	R9058	3001051050000	1MΩ
927	R802	3001053340010	330KΩ
928	R803	3001053340010	330KΩ
929	R9002	3001054730000	47KΩ
930	R9050	3001054730000	47KΩ
931	R9007	3001058200000	82Ω
932	C185	3104072250060	2.2UF
933	R9099	3217105010000	1nH
934	D111	3304010100890	Varactor
935	U101	3616059000000	Switch
936	U104	3616059000000	Switch
937	R9023	3001053920010	3.9KΩ
938	U9002	3605025000020	Operational amplifier
939	C808	3101053920000	3900PF
940	C813	3101053920000	3900PF
941		41PD7001000F0	PCB main board
942	C516	3101051590070	1.5PF
943	C9063	3101051020010	1000PF
944	C152	3101064590010	4.5PF
945	L507	3210305180000	18nH
946	L508	3210305829000	8.2nH
947	L509	3210305829000	8.2nH
948	U502	1615000001650	GPS module

Channel Board for PD70X/ PD70XG/ HD705/ HD705G

No.	Ref. No.	Part No.	Description
1	R1002	3001051210010	120Ω
2	C1001	3101052710000	270PF
3	C1002	3101052710000	270PF
4	C1003	3101052710000	270PF
5	C1004	3101052710000	270PF
6	C1005	3101052710000	270PF
7	C1006	3101052710000	270PF
8	C1007	3101052710000	270PF
9	C1010	3101052710000	270PF
10	C1011	3101052710000	270PF
11	C1012	3101052710000	270PF
12	D1001	3310040000000	ESD protection diode
13	D1003	3310040000000	ESD protection diode
14	D1004	3310040000000	ESD protection diode
15	D1005	3310040000000	ESD protection diode
16	D1006	3310040000000	ESD protection diode
17	D1007	3310040000000	ESD protection diode
18	D1008	3310040000000	ESD protection diode
19	D1011	3310040000000	ESD protection diode
20	D1014	3310040000000	ESD protection diode
21	D1009	3399040600020	ESD protection diode
22	D1013	3399040600020	ESD protection diode
23	D1002	3307120100050	LED
24	Q1001	3403009000010	Compound transistor
25	U1001	3805000000040	EMI filter
26	J1001	5201016100040	Board-to-board filter
27	S1003	4301080000020	Momentary contact switch
28		41PD7002002B0	PCB
29	R1001	3001056810000	680Ω
30	C1015	3101051040060	0.1UF
31	C1016	3101051040060	0.1UF
32	L1001	3221506181000	Bead
33	U1002	3608006000030	Power management IC

Channel Board for PD78X/ PD78XG/ HD785/ HD785G

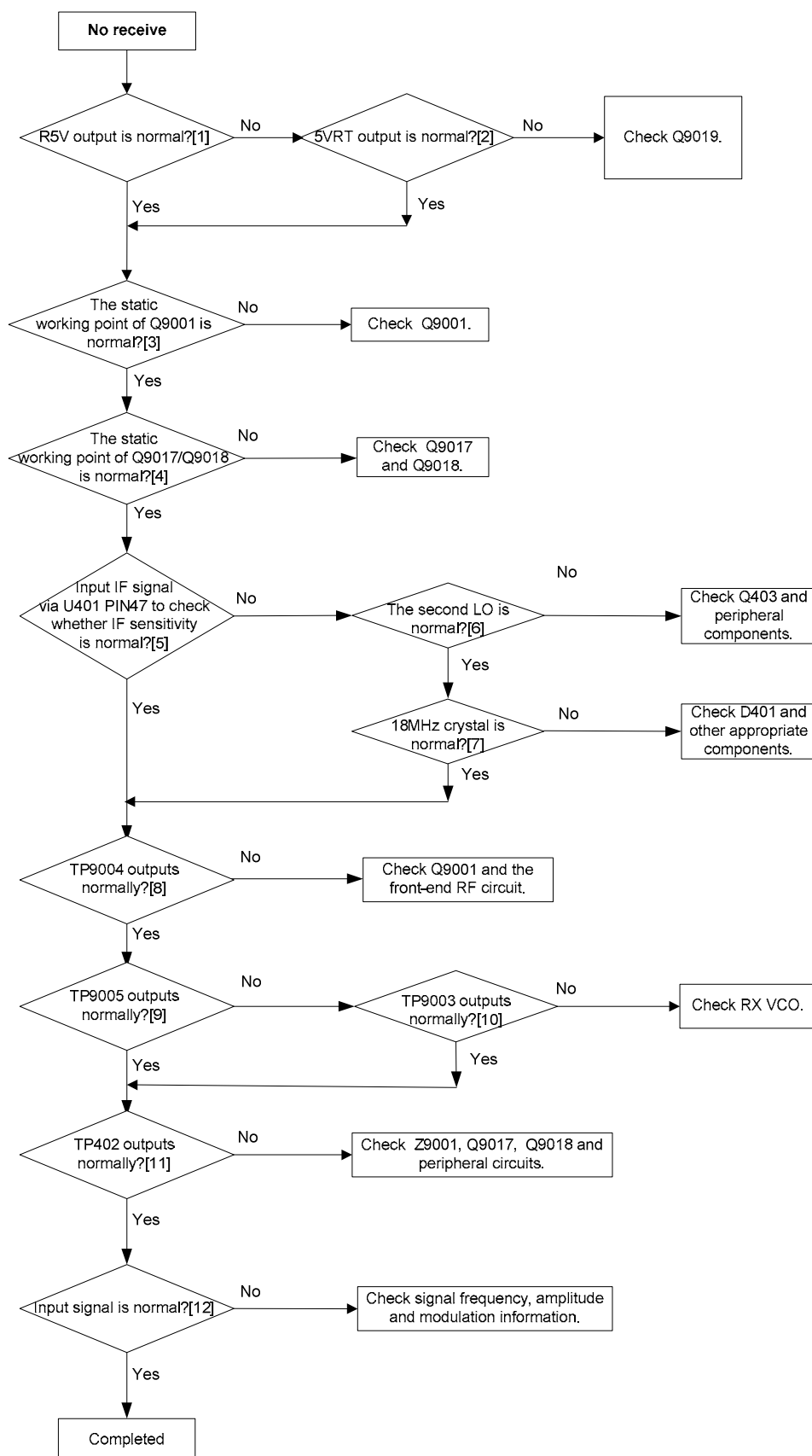
No.	Ref. No.	Part No.	Description
1	R1002	3001051210010	120Ω
2	C1001	3101052710000	270PF
3	C1002	3101052710000	270PF
4	C1003	3101052710000	270PF
5	C1004	3101052710000	270PF
6	C1005	3101052710000	270PF
7	C1006	3101052710000	270PF
8	C1007	3101052710000	270PF
9	C1010	3101052710000	270PF
10	C1011	3101052710000	270PF
11	C1012	3101052710000	270PF
12	D1001	3310040000000	ESD protection diode
13	D1003	3310040000000	ESD protection diode
14	D1004	3310040000000	ESD protection diode
15	D1005	3310040000000	ESD protection diode
16	D1006	3310040000000	ESD protection diode
17	D1007	3310040000000	ESD protection diode
18	D1008	3310040000000	ESD protection diode
19	D1011	3310040000000	ESD protection diode
20	D1014	3310040000000	ESD protection diode
21	D1009	3399040600020	ESD protection diode
22	D1013	3399040600020	ESD protection diode
23	D1002	3307120100050	LED
24	Q1001	3403009000010	Compound transistor
25	U1001	3805000000040	EMI filter
26	J1001	5201016100040	Board-to-board connector
27	S1003	4301080000020	Momentary contact switch
28		41PD7802006C0	PCB
29	R1001	3001056810000	680Ω
30	C1015	3101051040060	0.1UF
31	C1016	3101051040060	0.1UF
32	L1001	3221506181000	Bead
33	U1002	3608006000030	Power management IC

Keyboard for PD78X/ PD78XG/ HD785/ HD785G

No.	Ref. No.	Part No.	Description
1	R1	3001051010000	100Ω
2	R2	3001051010000	100Ω
3	R3	3001051010000	100Ω
4	R4	3001051010000	100Ω
5	R5	3001051010000	100Ω
6	R6	3001051010000	100Ω
7	R7	3001051010000	100Ω
8	D1	3307990000260	LED
9	D2	3307990000260	LED
10	D3	3307990000260	LED
11	D4	3307990000260	LED
12	D5	3307990000260	LED
13	D6	3307990000260	LED
14	D7	3307990000260	LED
15	D8	3310040000010	ESD protection diode
16	D9	3310040000010	ESD protection diode
17	J4	5201016000010	Board-to-board connector

10.8 Troubleshooting Flow Chart

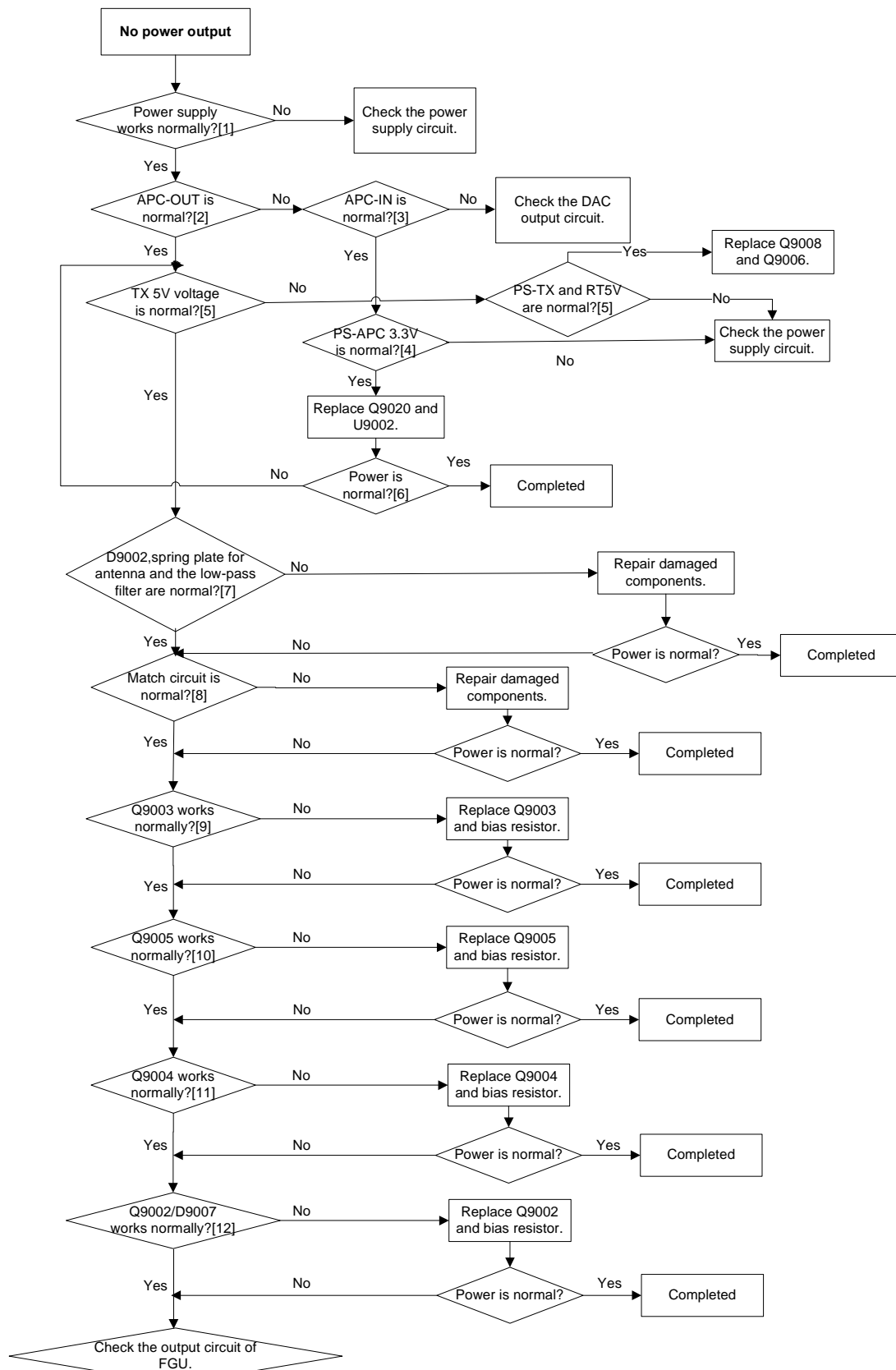
Receiver Circuit



Description of Normal Situations:

- [1] Output voltage by Q9019 PIN3: about 4.95V.
- [2] Output voltage by U605 PIN4 or input voltage into Q9019 PIN4: about 5V.
- [3] Vbe: about 0.74V; Vce: about 2.5V (in the case of no signal reception).
- [4] For Q9018, Vbe: about 0.76V; Vce: about 0.95V;
for Q9017, Vbe: about 0.7V; Vce: 0.85V (in the case of no signal reception).
- [5] Cut off the front-end circuit, and input a 73.35MHz IF signal at TP402 to test IF sensitivity. Normally, the IF sensitivity is -109dBm.
- [6] Frequency of Q403: 71.1MHz.
- [7] Frequency of L411: 18MHz.
- [8] Input -30dBm RF signal at the antenna connector and test at TP9004. Normally, gain>10dB, output signal>-20dBm.
- [9] Input -30dBm RF signal at the antenna connector and test at R9005 (do not cut off the back-end circuit). Normally, gain>1dB, output signal>-29dBm.
- [10] Signal frequency: RF-IF, signal amplitude>2dBm.
- [11] For input of -80dBm signal at L9022, gain>25dB, output signal>-55dBm;
for input of -30dBm signal, output signal<-20dBm.
- [12] The input signal at the antenna connector, with standard tuning information (AF=1KHz, FM=3KHz), is -47dBm.

Transmitter Circuit



Description of Normal Situations:

- [1] Voltage of the power supply: about 7.4V.
- [2] For low power, APC-OUT: 1.8-2.1V; for high power, APC-OUT: 2.4-2.8V.
- [3] For low power, APC-IN: 1-1.3V; for high power, APC-IN: 1.8-2.1V.
- [4] PS-APC: about 3.3V.
- [5] TX5V: about 5V; RT5V: about 5V; PS-TX: about 3.3V.
- [6] High power: about 4.2W; low power: about 1.2W.
- [7] Start-up voltage of D9002: about 0.7V. The low-pass filter must be soldered appropriately and remain in good condition. The spring plate for the antenna must be well fitted into the antenna connector.
- [8] The match components must not be soldered inappropriately or damaged.
- [9] Vdd: about 7.3V; for low power, Vgg: 1-1.2V; for high power, Vgg: 1.35-1.55V.
- [10] Vdd: about 7.3V; for low power, Vgg: 1.8-2.1V; for high power, Vgg: 2.4-2.8V.
- [11] Vc: about 4.8V; Vb: about 1.4V; Ve: about 1.1V.
- [12] Vc: about 4.7V; Vb: about 0.7V; Ve: 0V. Start-up voltage of D9007: about 0.7V.

Note: The above check operations should be made under 7.4V voltage.

FGU



Description of Normal Situations:

- [1] During transmission, output voltage by Q107 PIN3: about 4V.
During reception, output voltage by Q106 PIN3: about 4V.
- [2] During transmission, voltage at Q108 E: about 1.8V.
During reception, voltage at Q104 E: about 1.8V.
- [3] The CV value varies with frequencies. Generally, it is within the range 0.5V-4.5V.
- [4] L110/L116 is on.
- [5] Voltage at Q101/Q102 B: about 0.7V.
- [6] MCSI-CLK-PLL outputs 960KHz clock.

11. UHF2 (450-520MHz) Information

11.1 Transmitter Circuit

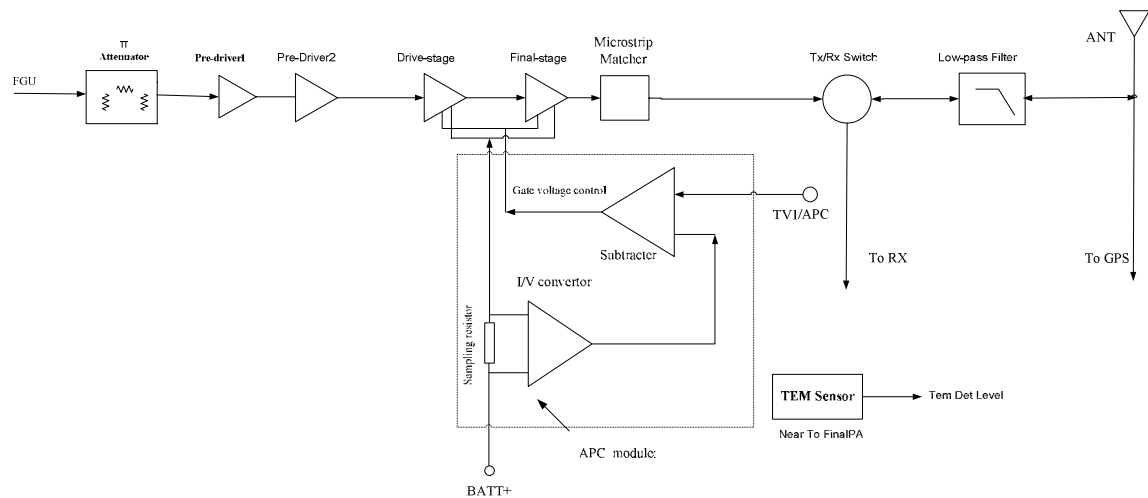


Figure 11-1 Diagram of Transmitter Circuit

The transmitter circuit is mainly composed of:

- ① RF power amplifier circuit
- ② Low-pass filter circuit (for suppressing harmonics)
- ③ Auto power control circuit (APC) (including temperature detection circuit)

The carrier signal generated by TX VCO is modulated and amplified, and then feeds to the transmitter circuit. In this circuit, the signal passes through a π -type attenuator first, allowing certain isolation between the RF power amplifier circuit and TX VCO. Then it goes to a pre-driver amplifier (2SC3356) for pre-amplification, also providing certain isolation. After that, the signal goes to another pre-driver amplifier (2SC4988) and a driver amplifier (RD01) for further power amplification, to provide appropriate signal to the final-stage amplifier (RD07) for final power amplification. After processed by multiple amplifiers, the signal is processed by a microstrip matcher to complete output impedance matching, so as to reduce output power loss due to impedance mismatch. Then the signal passes through the TX/RX switch and goes to the low-pass filter.

The low-pass filter is a high-order Chebyshev filter composed of lumped-parameter inductors and capacitors. Via this filter, the spurious signal within the stop band can be attenuated as much as possible while the in-band ripple is within the required range.

In the auto power control and temperature detection circuit, the drain current from the driver amplifier and final-stage amplifier is converted to voltage via the sampling resistor and subtraction circuit (composed of the first operational amplifier). This voltage is compared with the APC control voltage (output by DAC) at the second operational amplifier. Then the error voltage, which is output by the second operational amplifier, controls TX power by controlling the bias voltage at the gates of the amplifiers (including the driver amplifier and the final-stage amplifier). The temperature sensor detects the surface temperature of the final-stage amplifier, and converts it to DC voltage. Then the DC voltage is compared with the voltage corresponding to the protection temperature (generally 80% of the extreme temperature) of the amplifier. If the surface temperature is too high, the bias voltage of the amplifier will be reduced, so as to reduce output power. The bias voltage will not be increased until the surface temperature restores to normal level. This process will be repeated while the radio operates.

11.2 Receiver Circuit

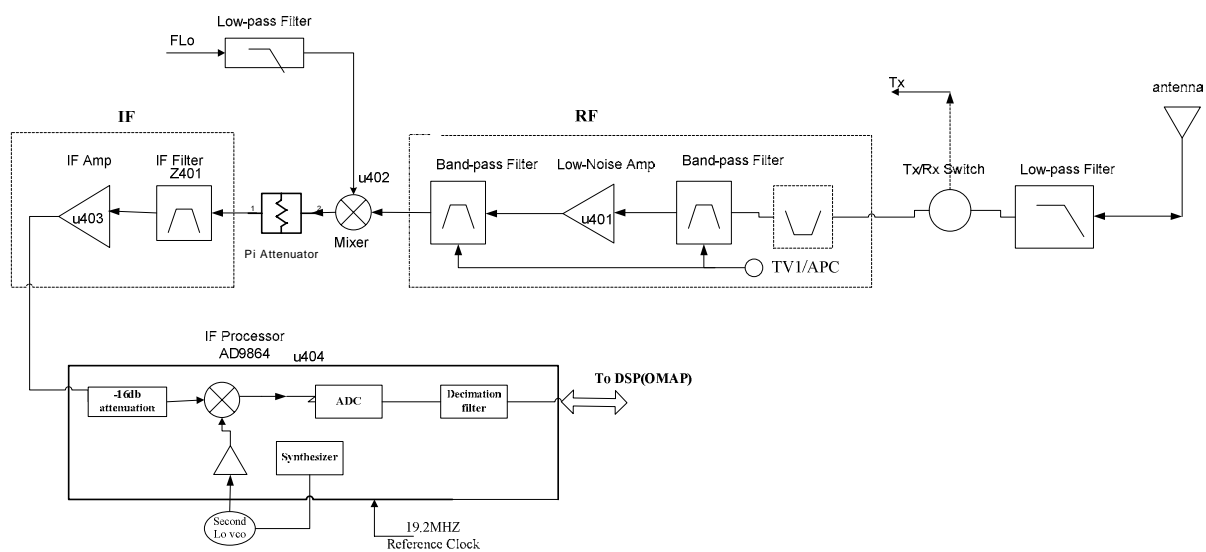


Figure 11-2 Diagram of Receiver Circuit

The receiver circuit mainly comprises the RF band-pass filter, low-noise amplifier, mixer, IF filter, IF amplifier and IF processor.

11.2.1 Receiver Front-end

The HF signal from the low-pass filter passes through the electrically tunable band-pass filter controlled via APC/TV1 level, to remove out-of-band interference signal and to send wanted band-pass signal to the low-noise amplifier (Q9001). The amplified signal goes to a band-pass filter controlled via APC/TV1 level, to remove out-of-band interference signal generated during amplification, and to send wanted HF

signal to the mixer.

The wanted signal passes through the RF band-pass filter and low-noise amplifier and goes to the mixer (D9017). Meanwhile, the first local oscillator (LO) signal generated by VCO passes through the low-pass filter and also goes to the mixer (D9017). In the mixer, the wanted signal and the first LO signal are mixed to generate the first IF signal (73.35MHz). Then the signal passes through a π -type attenuator (2dB) and the LC, to suppress carrier other than the first IF signal, and to increase the isolation between the mixer and the IF filter. After that, the first IF signal is processed by the crystal filter (Z9001), and is sent to the two-stage IF amplifier circuit (composed of 2SC3356) for amplification. Then the amplified signal goes to the IF processor AD9864(U401) for processing.

11.2.2 Receiver Back-end

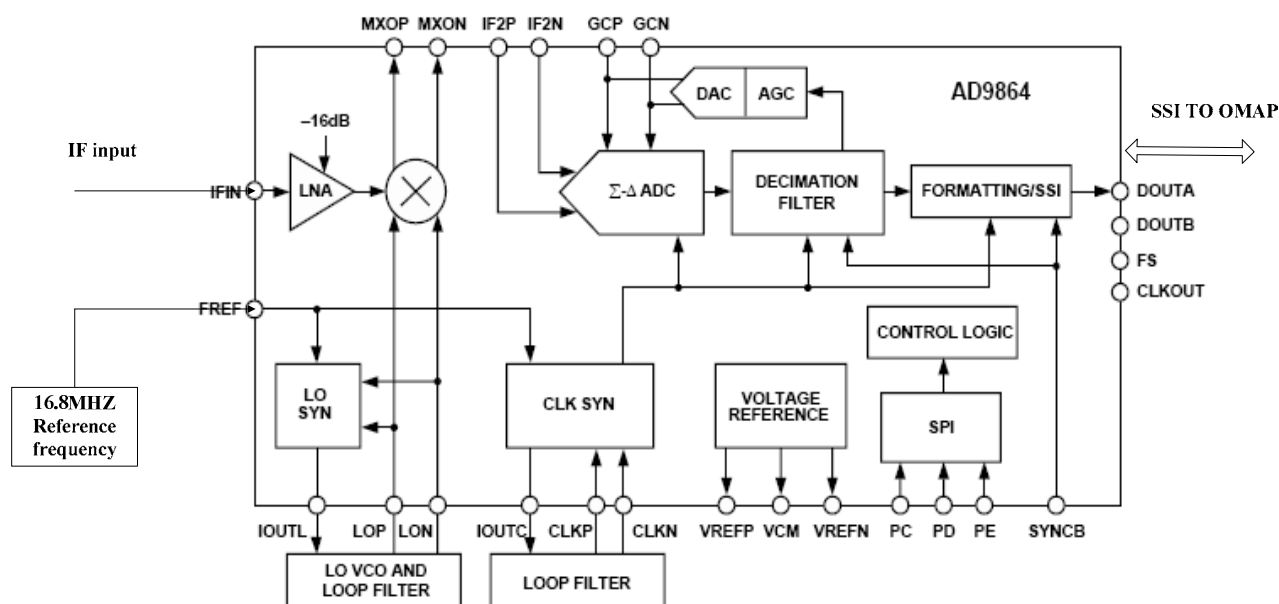


Figure 11-3 Diagram of IF Processor

The first IF signal (73.35MHz) output by the IF amplifier goes into AD9864 (U401) via Pin 47, where the signal is converted to the second IF signal (2.25MHz). Then the signal is converted to digital signal via ADC sampling, and output via the SSI interface. Finally, the digital signal is sent to DSP (OMAP5912) for demodulation.

AD9864 employs reference frequency of 19.2MHz and shares the crystal with OMAP. The second LO VCO comprises an oscillator, a varactor and some other components, to provide the 71.1/75.6MHz LO signal. The 18MHz clock frequency is generated by the LC resonance loop.

11.3 Frequency Generation Unit (FGU)

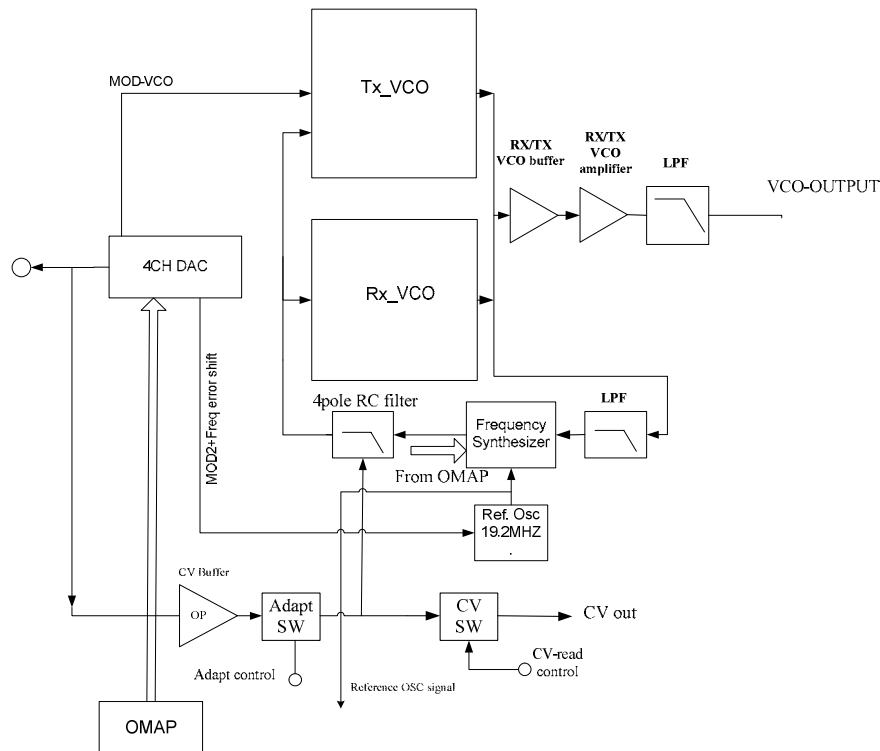


Figure 11-4 Diagram of FGU

The FGU is composed of VCO and PLL. It is the core module of the whole TX-RX system. This circuit provides accurate carrier frequency during transmission, and stable LO signal during reception. It has a direct influence on the performance of the system.

11.3.1 Working Principle of PLL

The 19.2MHz frequency generated by the reference crystal oscillator goes to PLL for division, generating the reference frequency (i.e. step frequency f_1). Meanwhile, the frequency generated by VCO generates another frequency (f_2) through the frequency divider in PLL. Then frequencies f_1 and f_2 are compared in the phase detector (PD), to generate continuous pulse current. The current goes to the loop filter for RC integration, and is then converted to CV voltage. Then the CV voltage is sent to the varactor of VCO. It adjusts the output frequency of VCO directly until the CV voltage becomes constant. Then PLL is locked, and the stable frequency output by VCO goes to the TX-RX channel after passing through two buffer amplifiers.

10.3.2 Working Principle of VCO

VCO employs Colpitts oscillator circuit (the RX oscillator circuit is composed of D102, D103, D106, D107 and L112; the TX oscillator circuit is composed of D108, D109, D110, D101 and L117). It obtains different

output frequencies by changing the varactor's control voltage (i.e. CV voltage).

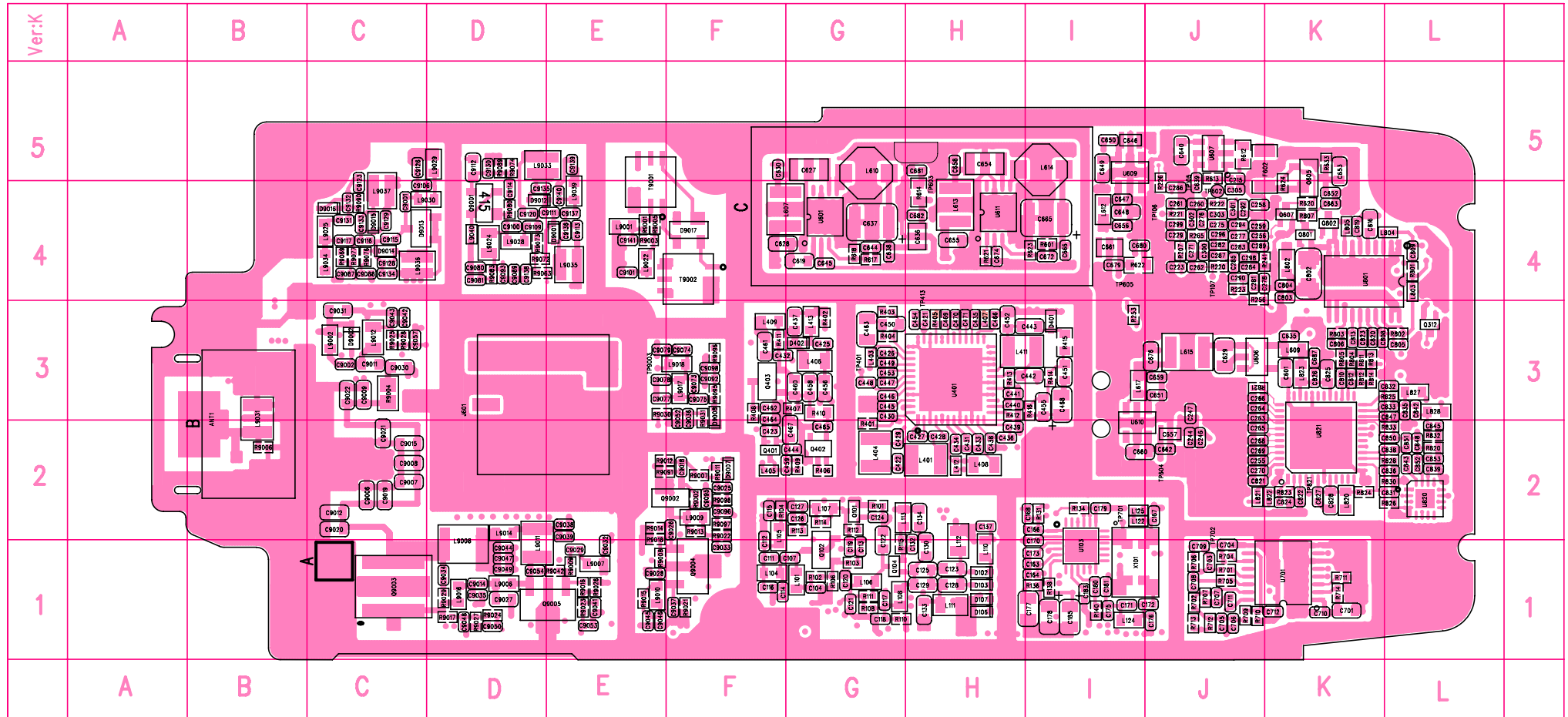
There are two types of VCO: TX VCO and RX VCO. Both types control EMD22 to switch operating status via OMAP. RX VCO is composed of the oscillator loop and Q104, to provide LO signal. TX VCO is composed of the oscillator loop and Q108, to provide carrier for TX signal.

11.3.3 Two-point Modulation

In TX mode, the two-point modulation technology is employed, to obtain higher modulation accuracy and lower 4FSK bit error rate. MOD-VCO and MOD-XO send the modulation signal to the modulation end of VCO and the reference crystal oscillator of PLL respectively to modulate TX VCO and the reference crystal oscillator.

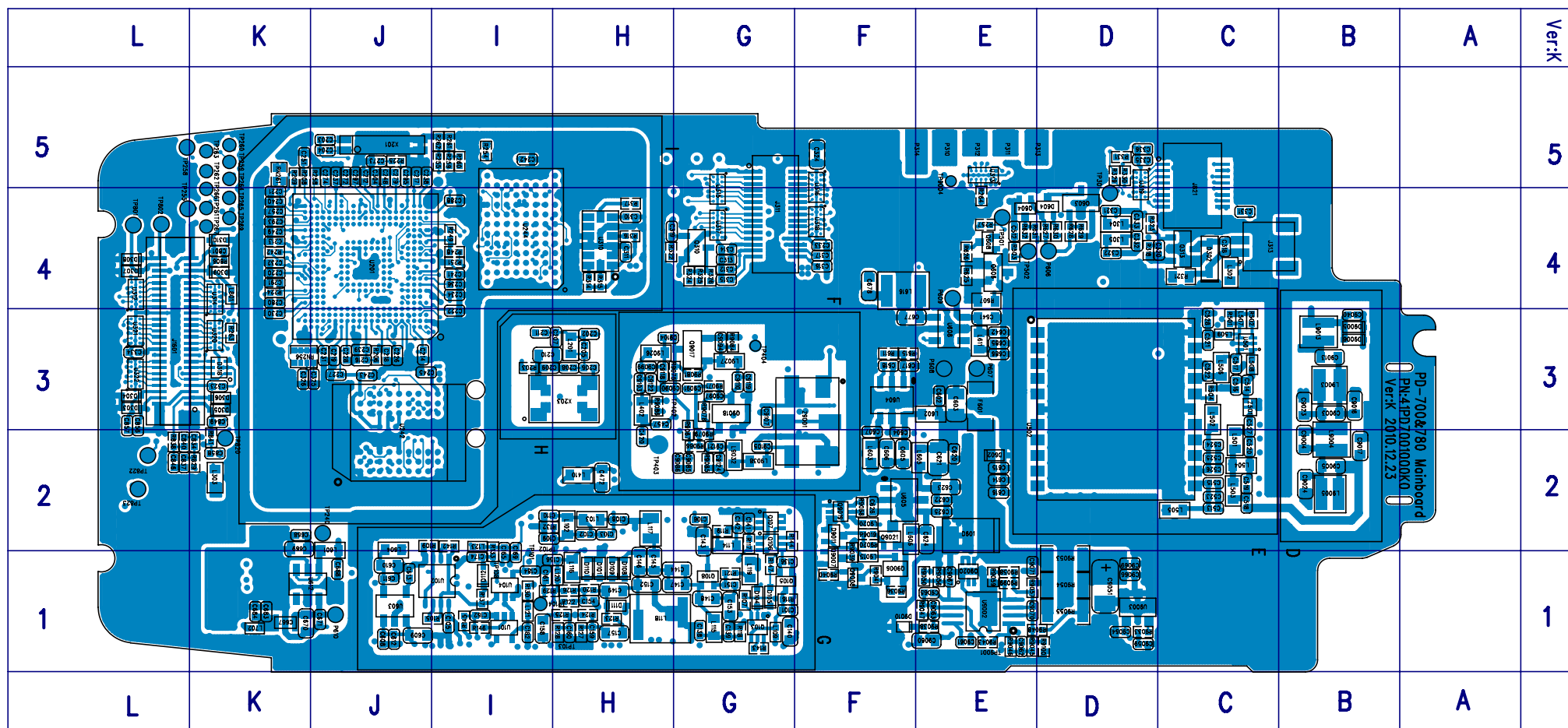
11.4 PCB View

PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G PCB View (Main Board) Top Layer

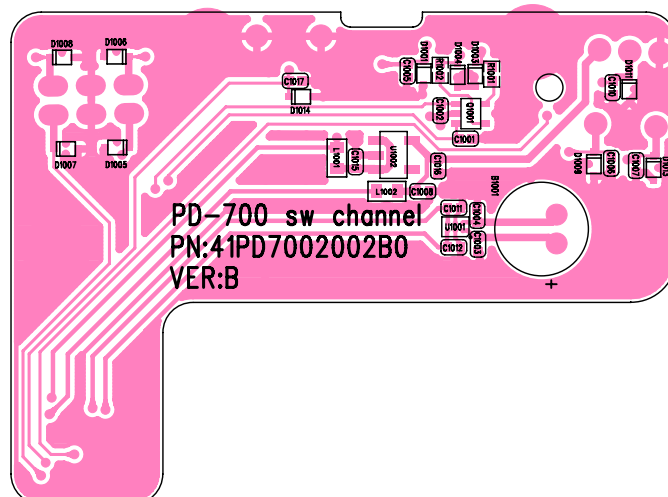


PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G PCB View (Main Board)

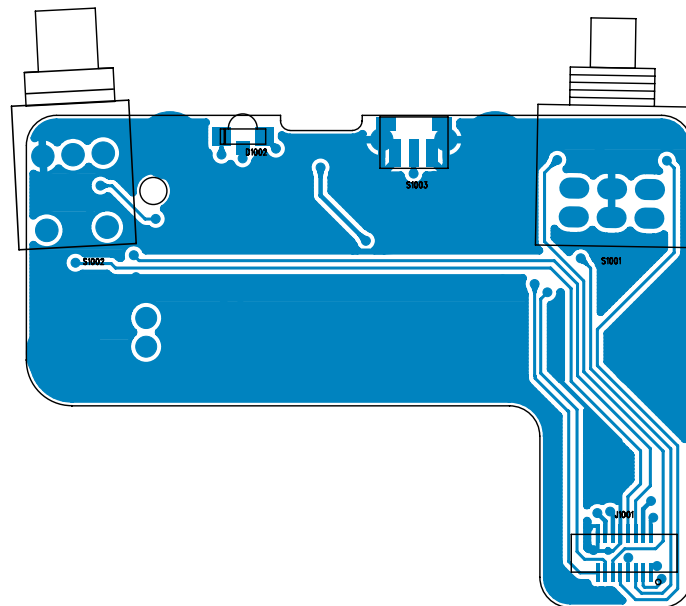
Bottom Layer



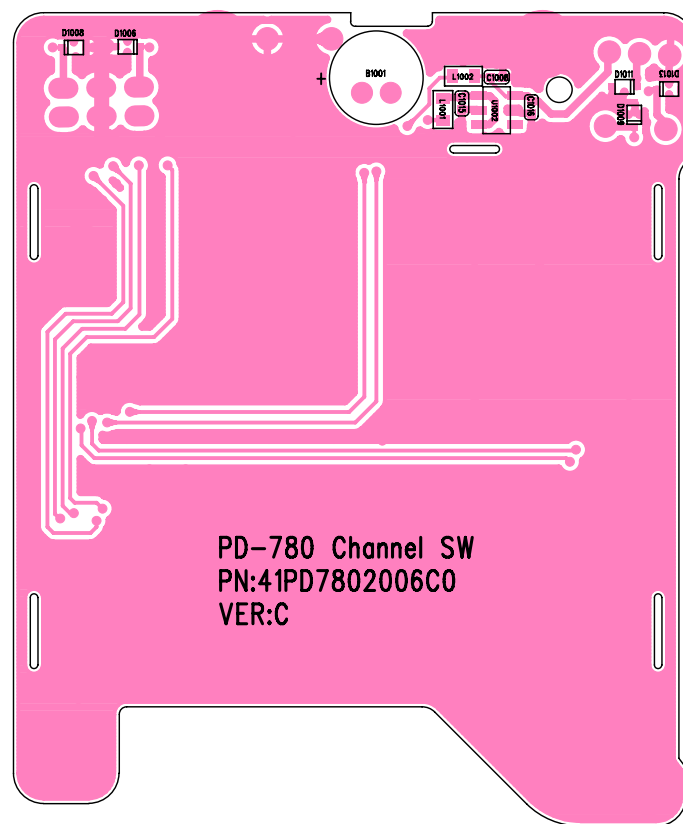
PD70X/PD70XG/HD705/HD705G PCB View (Channel Board)
Top Layer



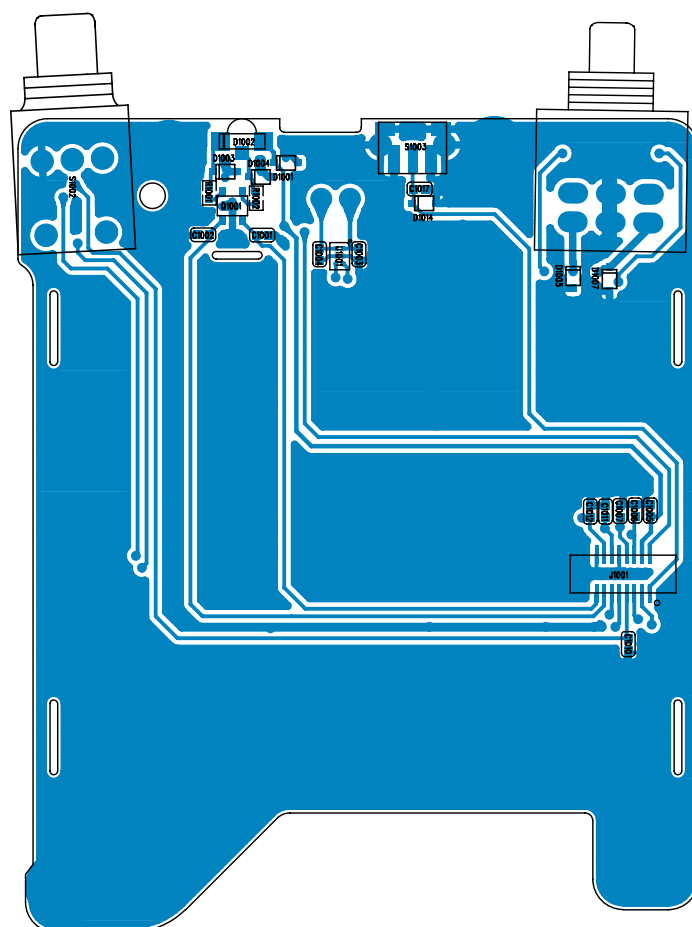
PD70X/PD70XG/HD705/HD705G PCB View (Channel Board) Bottom Layer



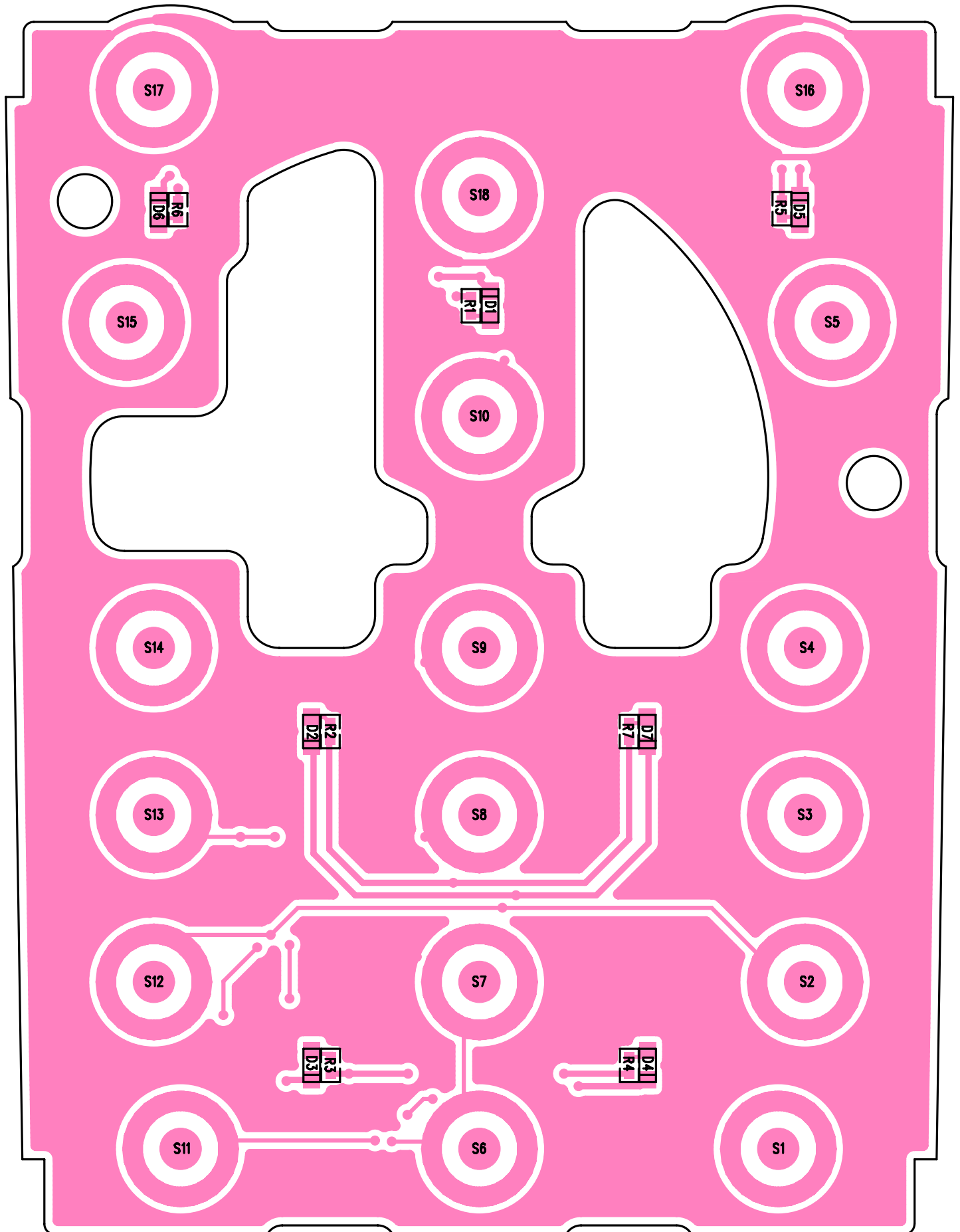
PD78X/PD78XG/HD785/HD785G PCB View (Channel Board) Top Layer



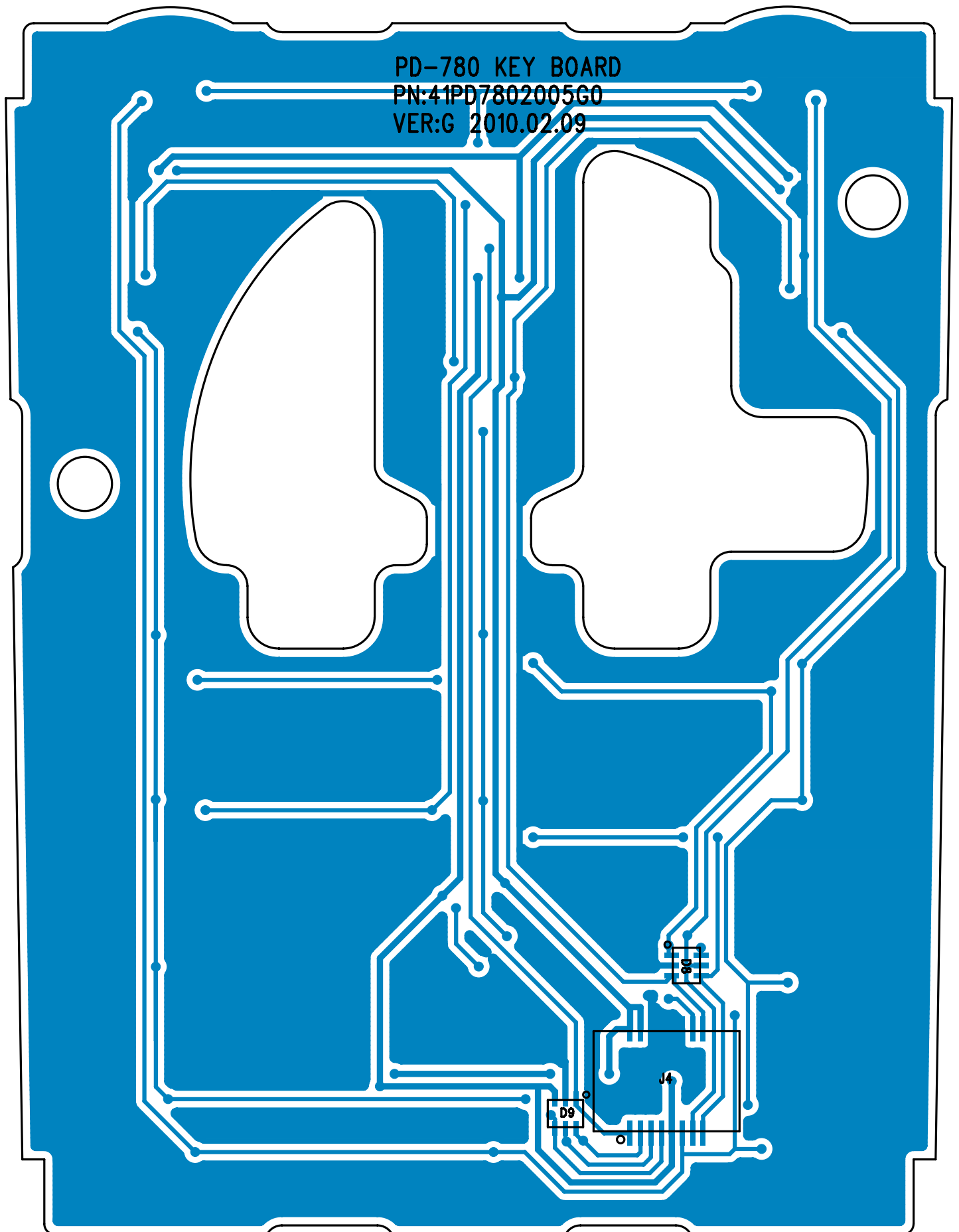
PD78X/PD78XG/HD785/HD785G PCB View (Channel Board)
Bottom Layer



PD78X/PD78XG/HD785/HD785G PCB View (Keyboard) Top Layer

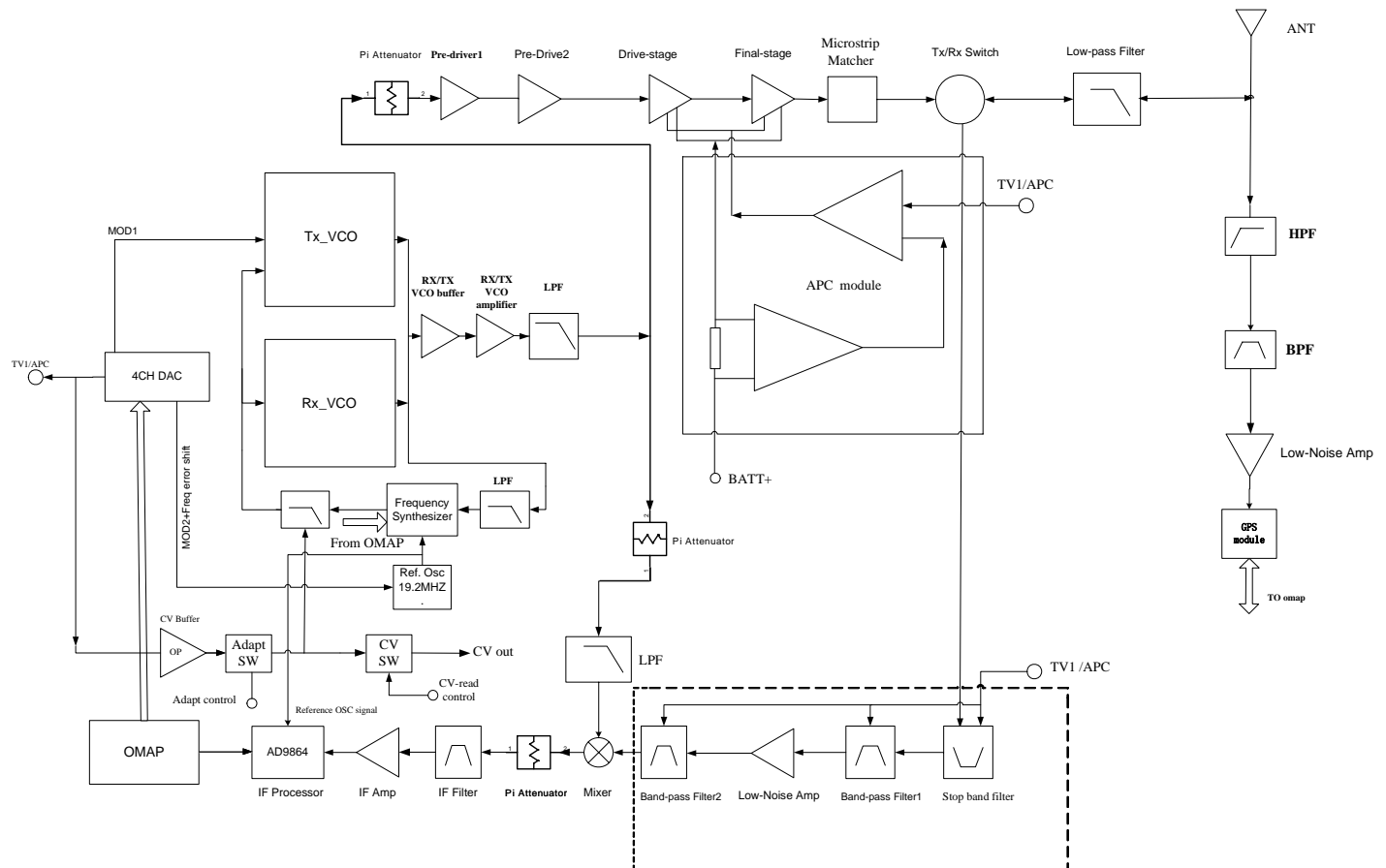


PD78X/PD78XG/HD785/HD785G PCB View (Keyboard)
Bottom Layer



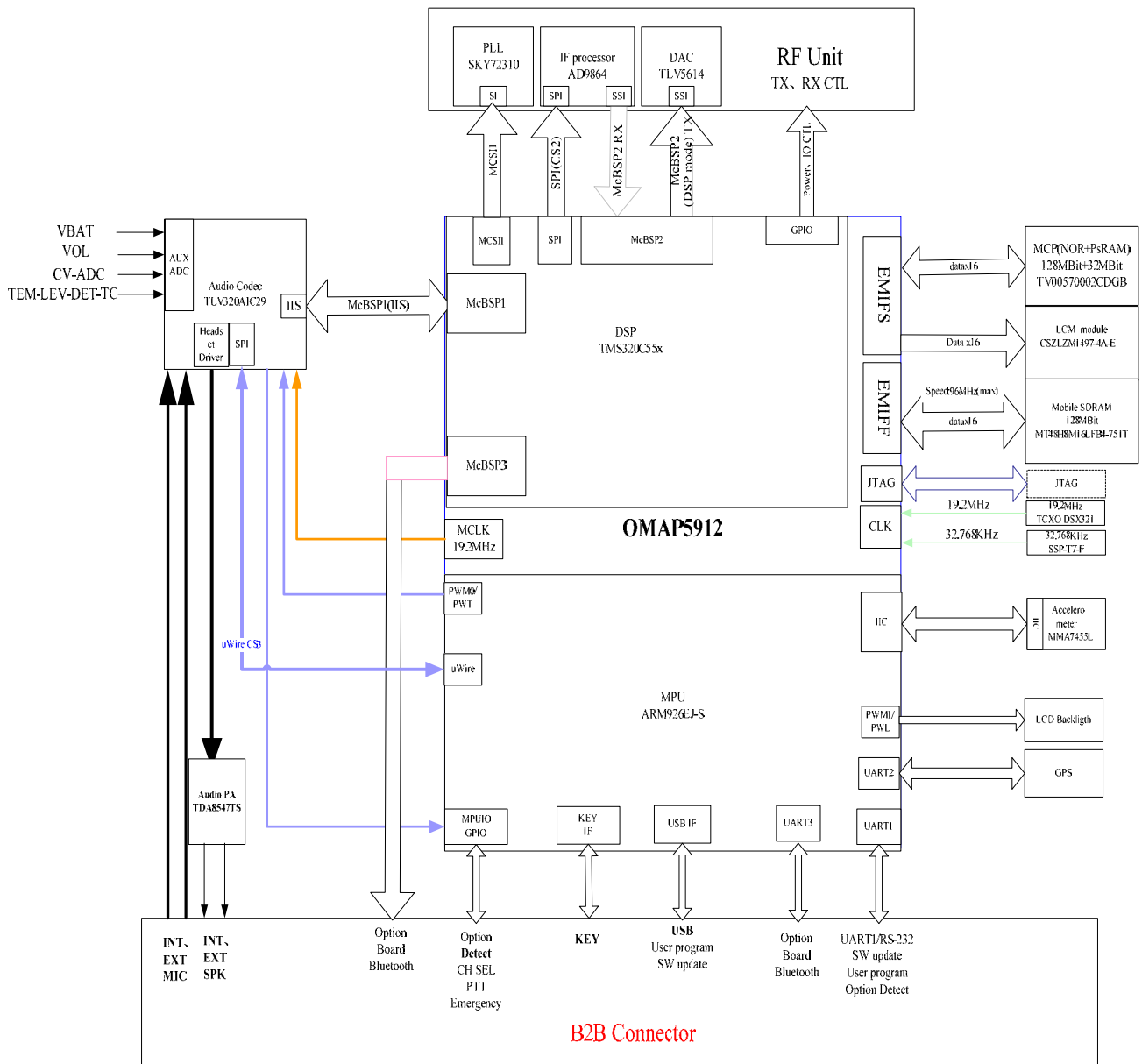
11.5 Block Diagram

PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Block Diagram (RF Section)

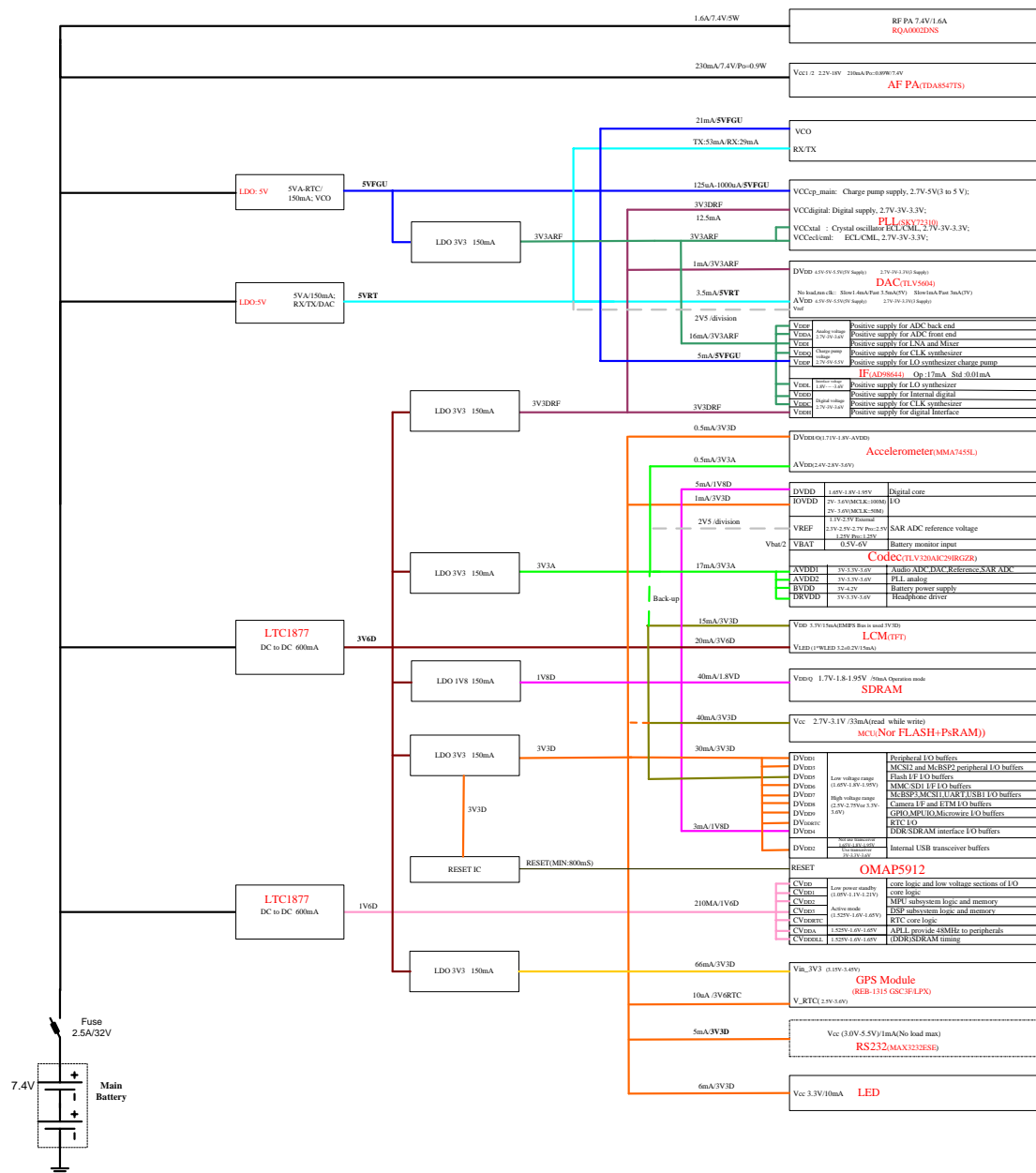


PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G

Block Diagram (Baseband Section)

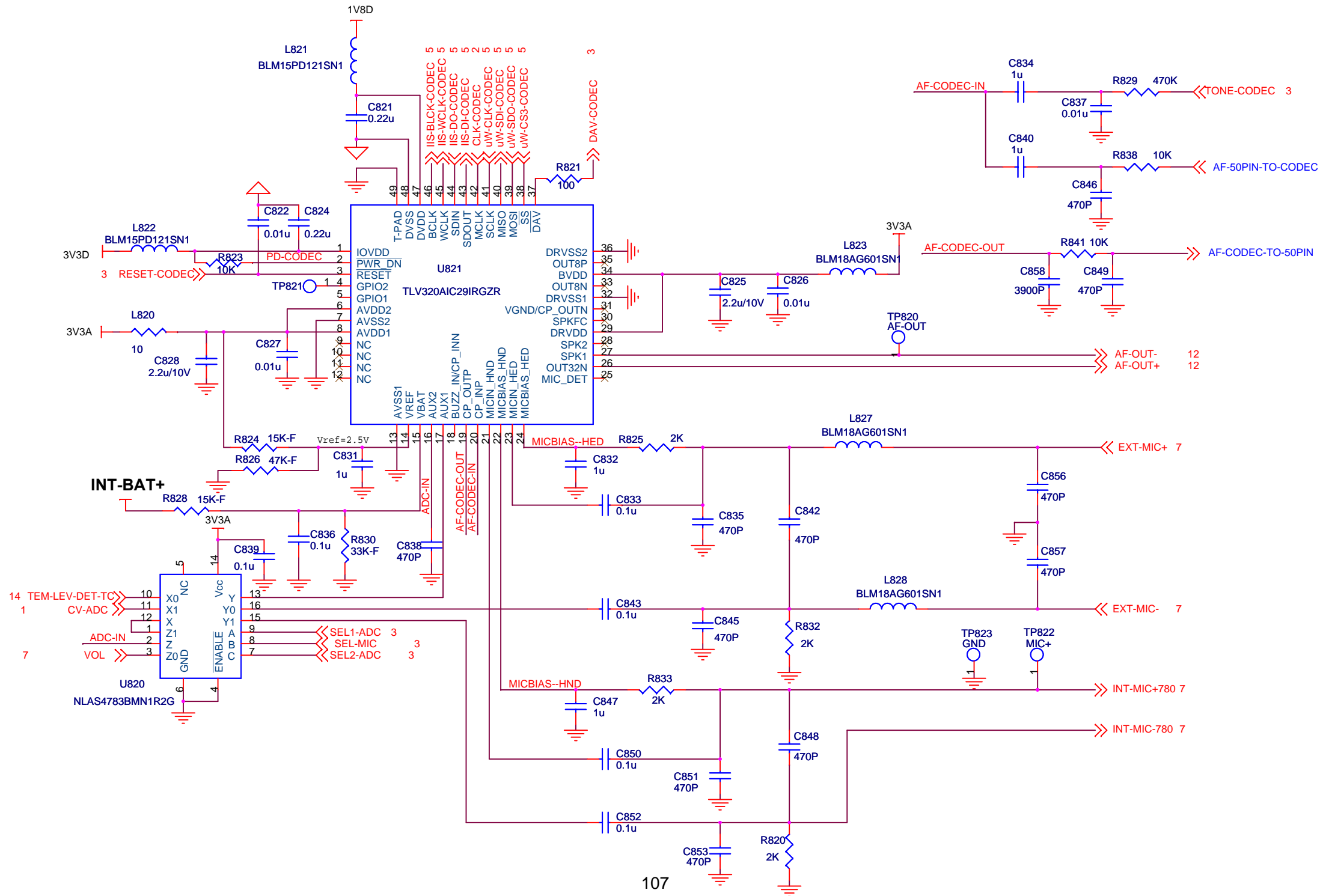


PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G
Block Diagram (Power Section)

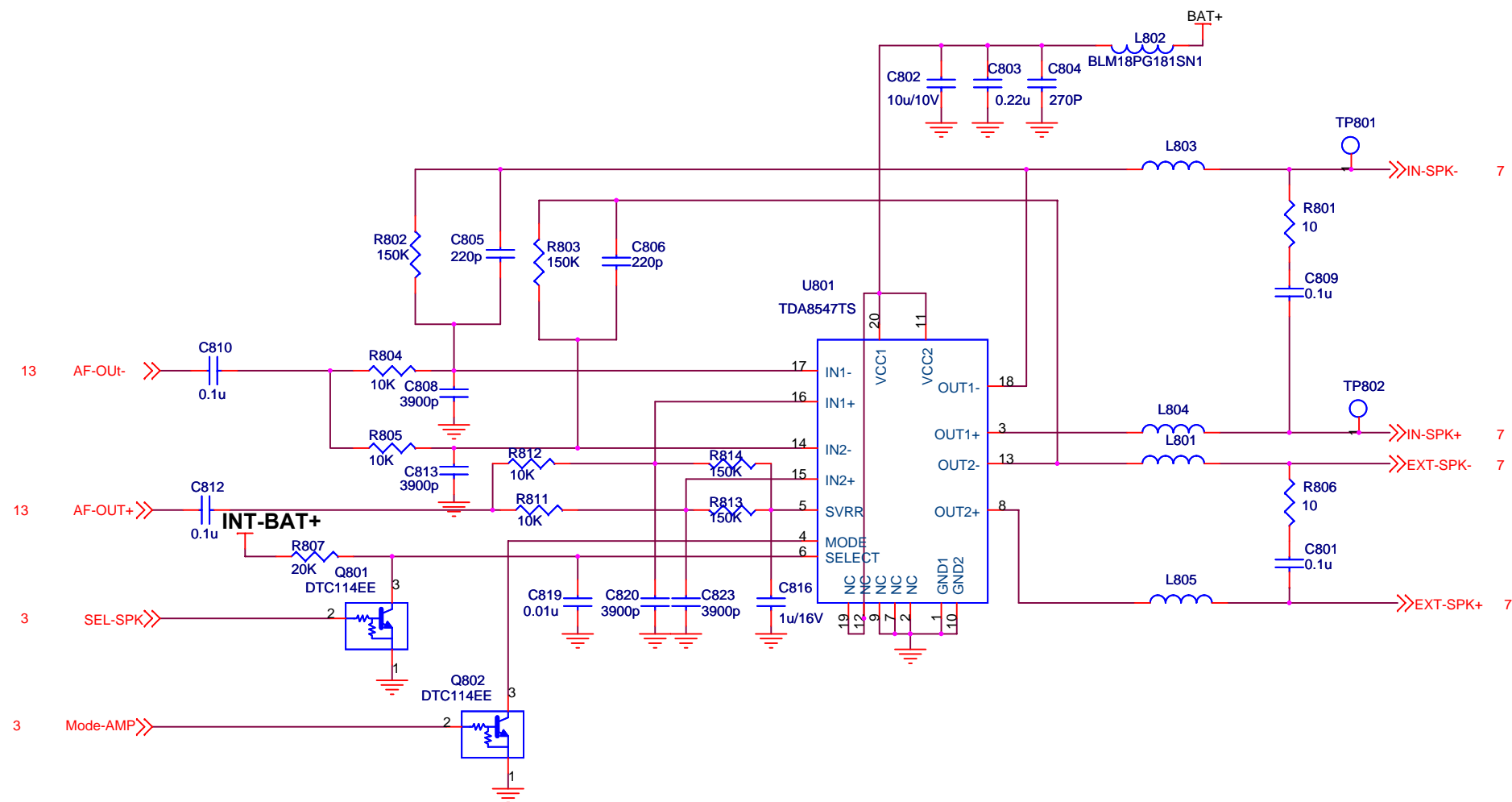




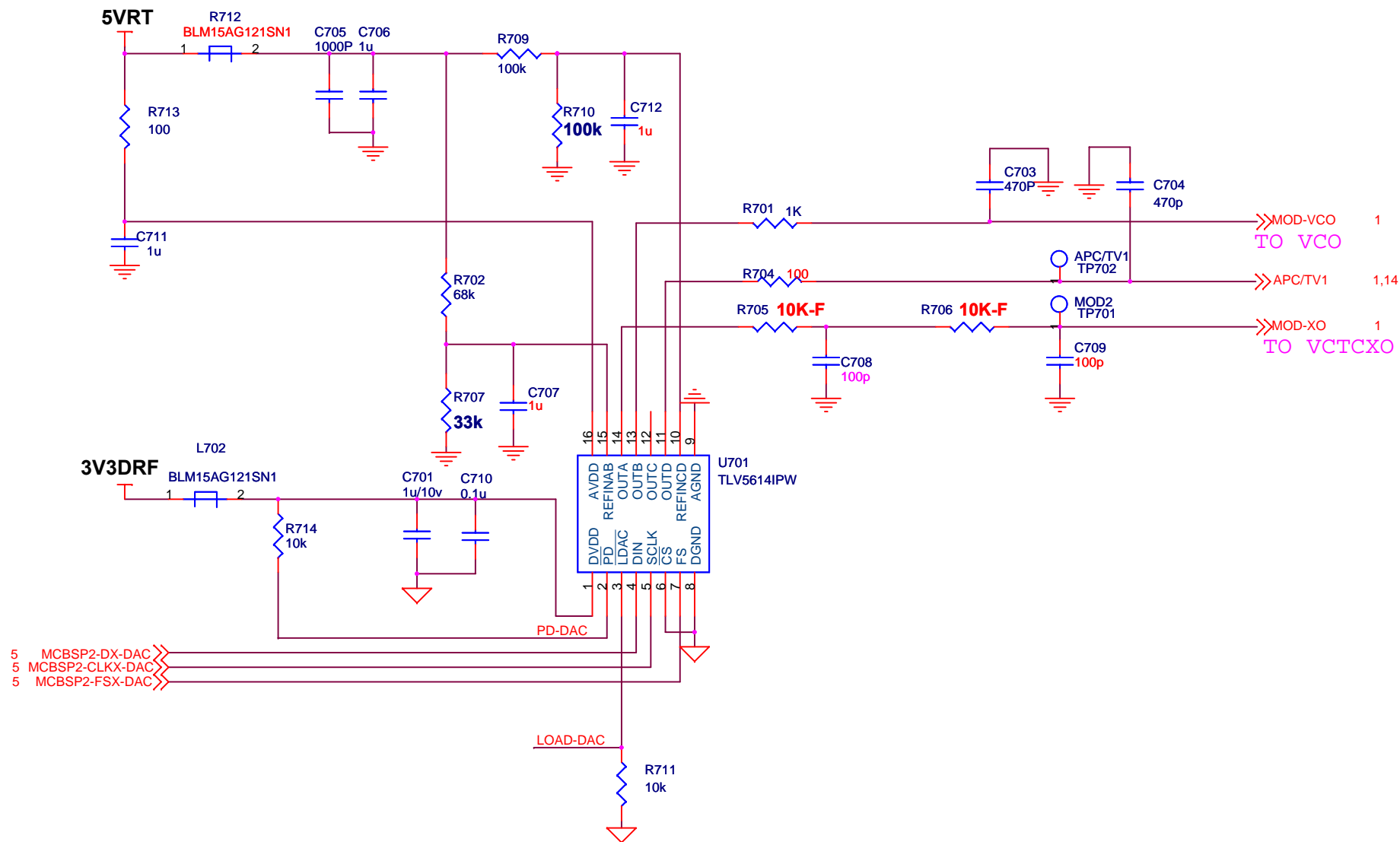
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (CODEC)



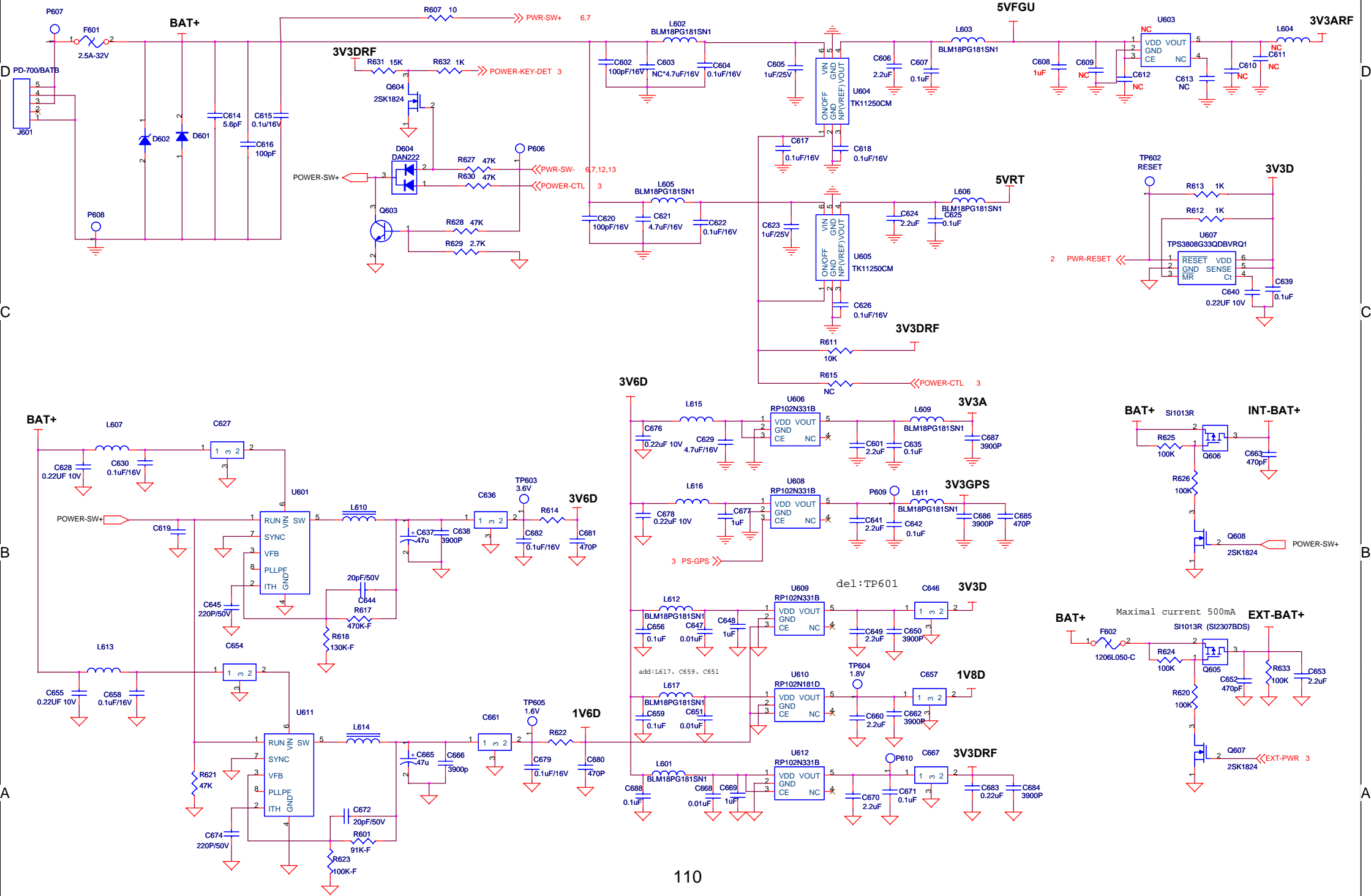
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (Audio Amplifier)



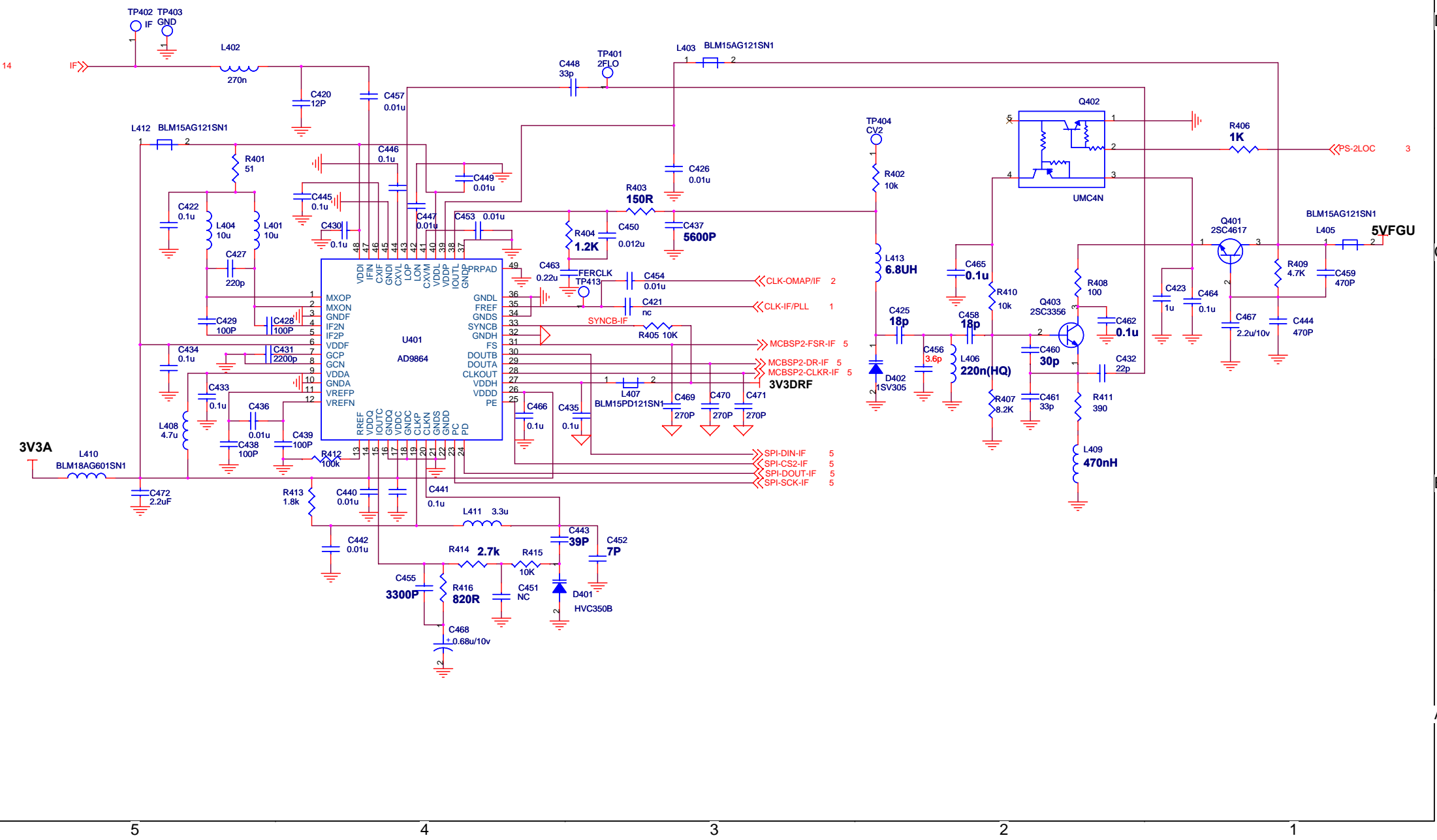
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (DAC)



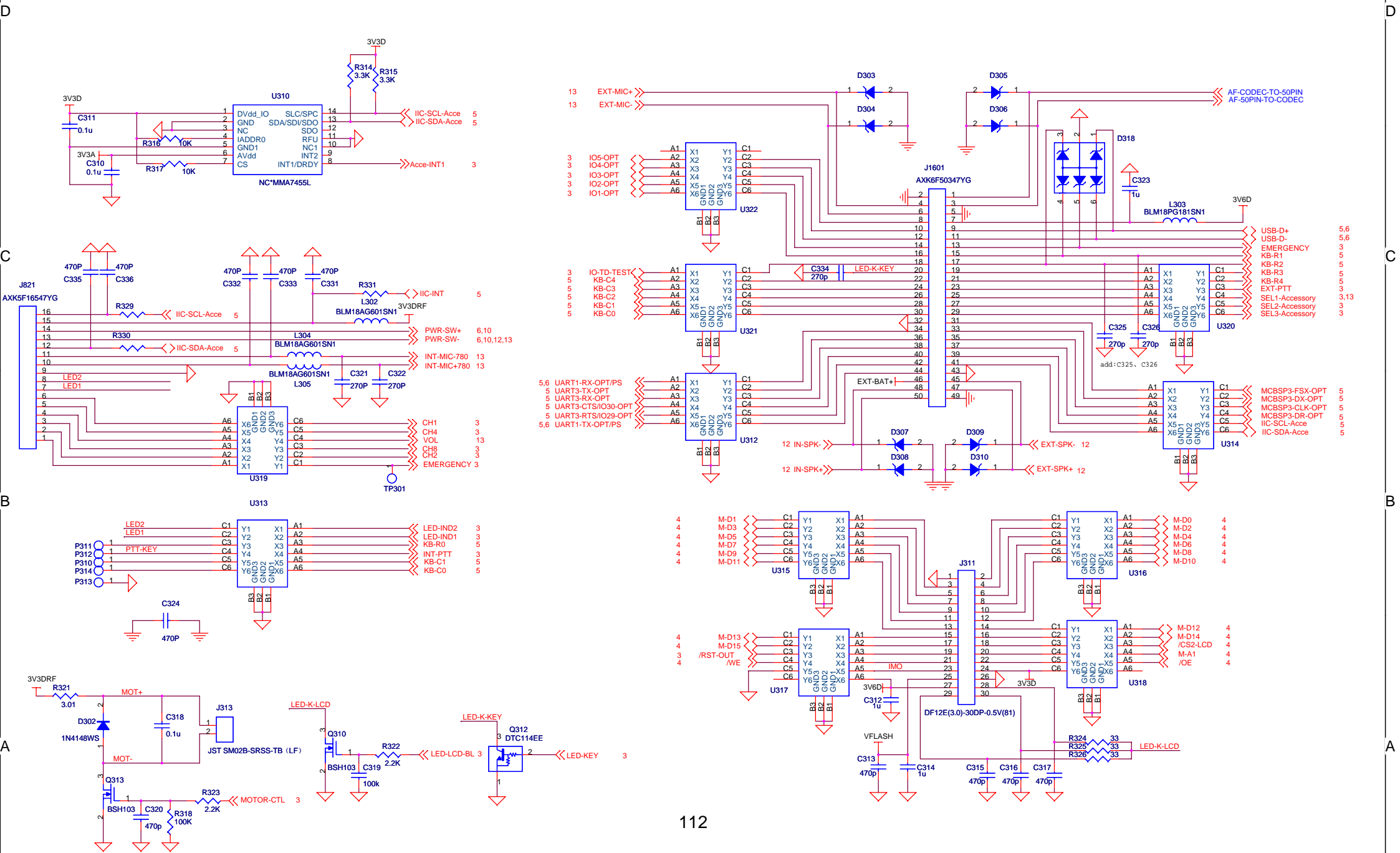
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (Power)



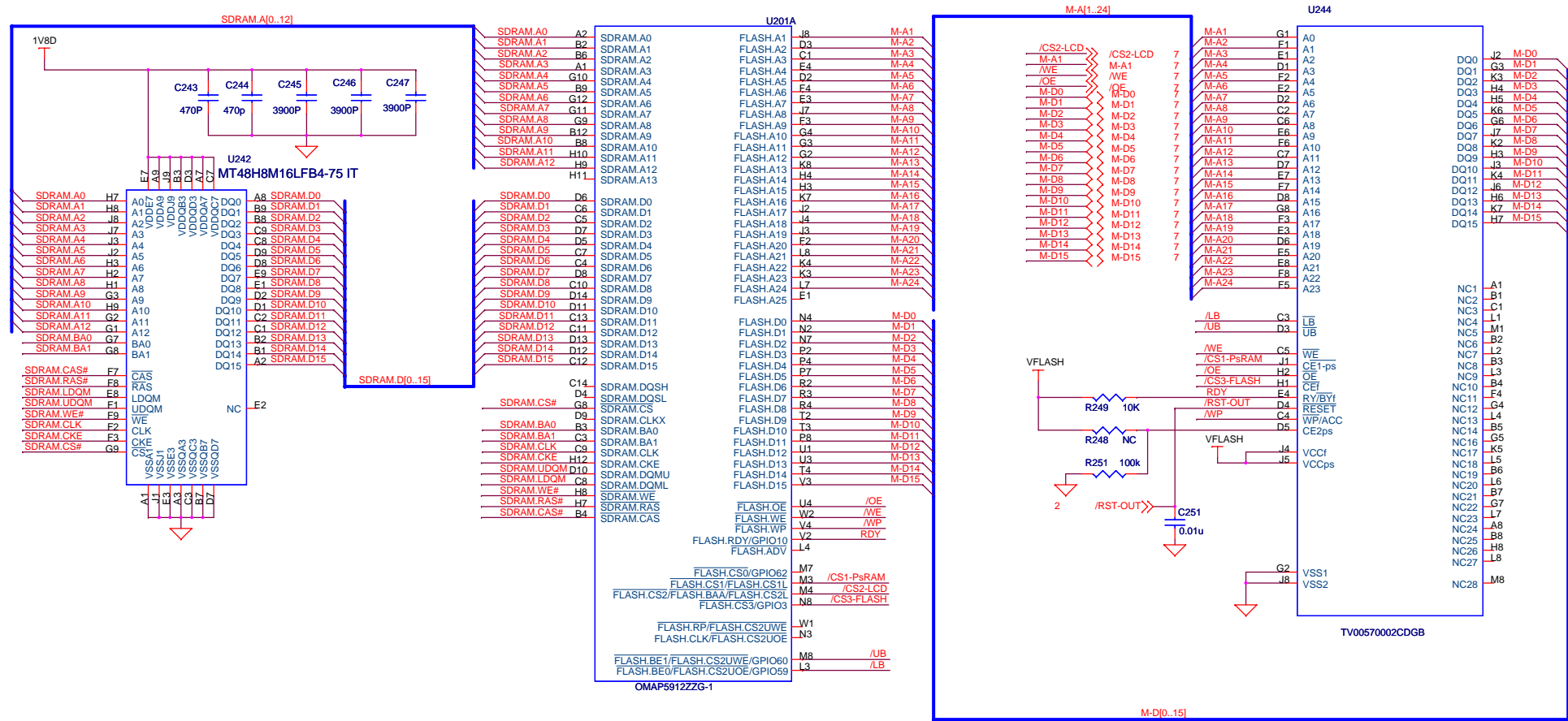
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (AD9864)



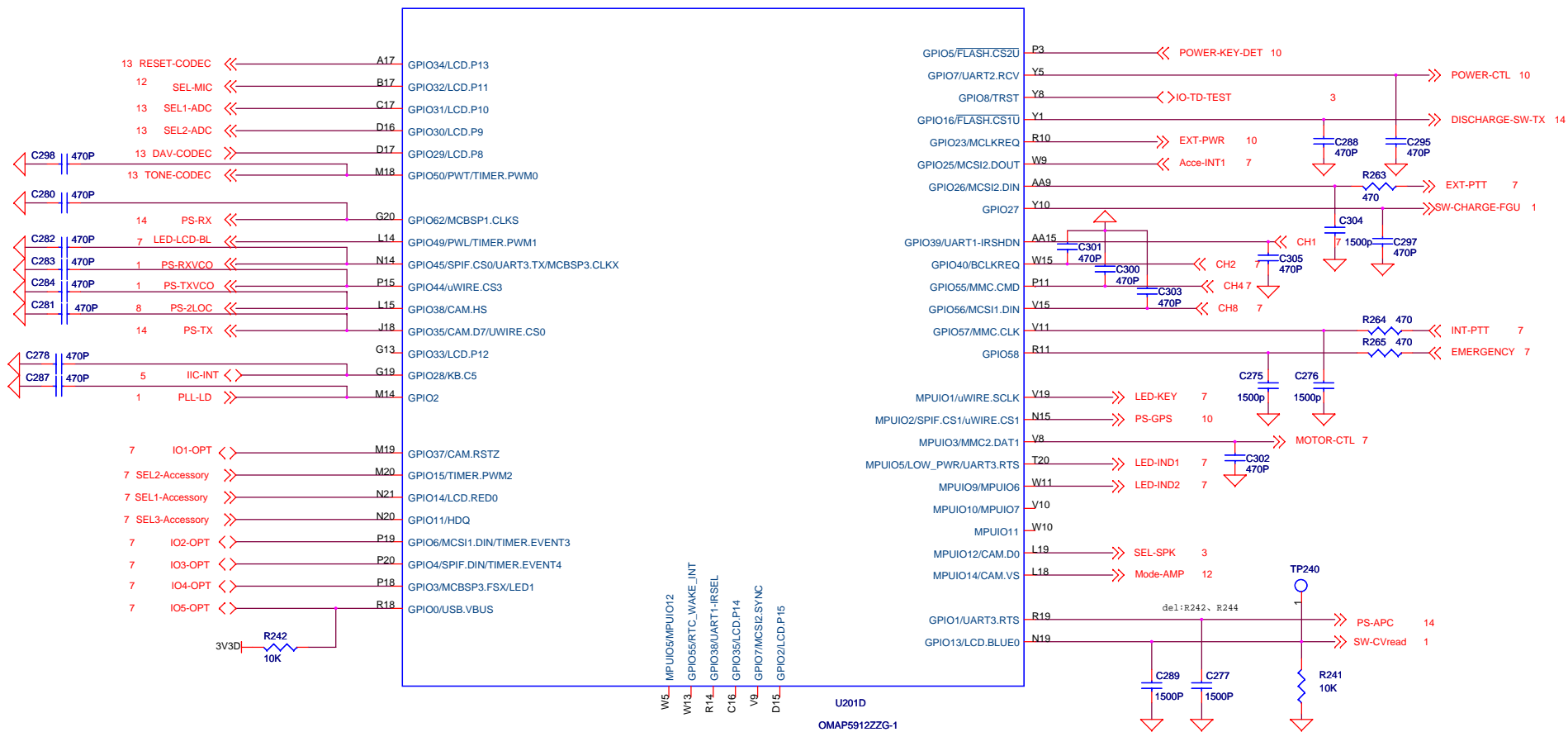
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (Internal Interface)



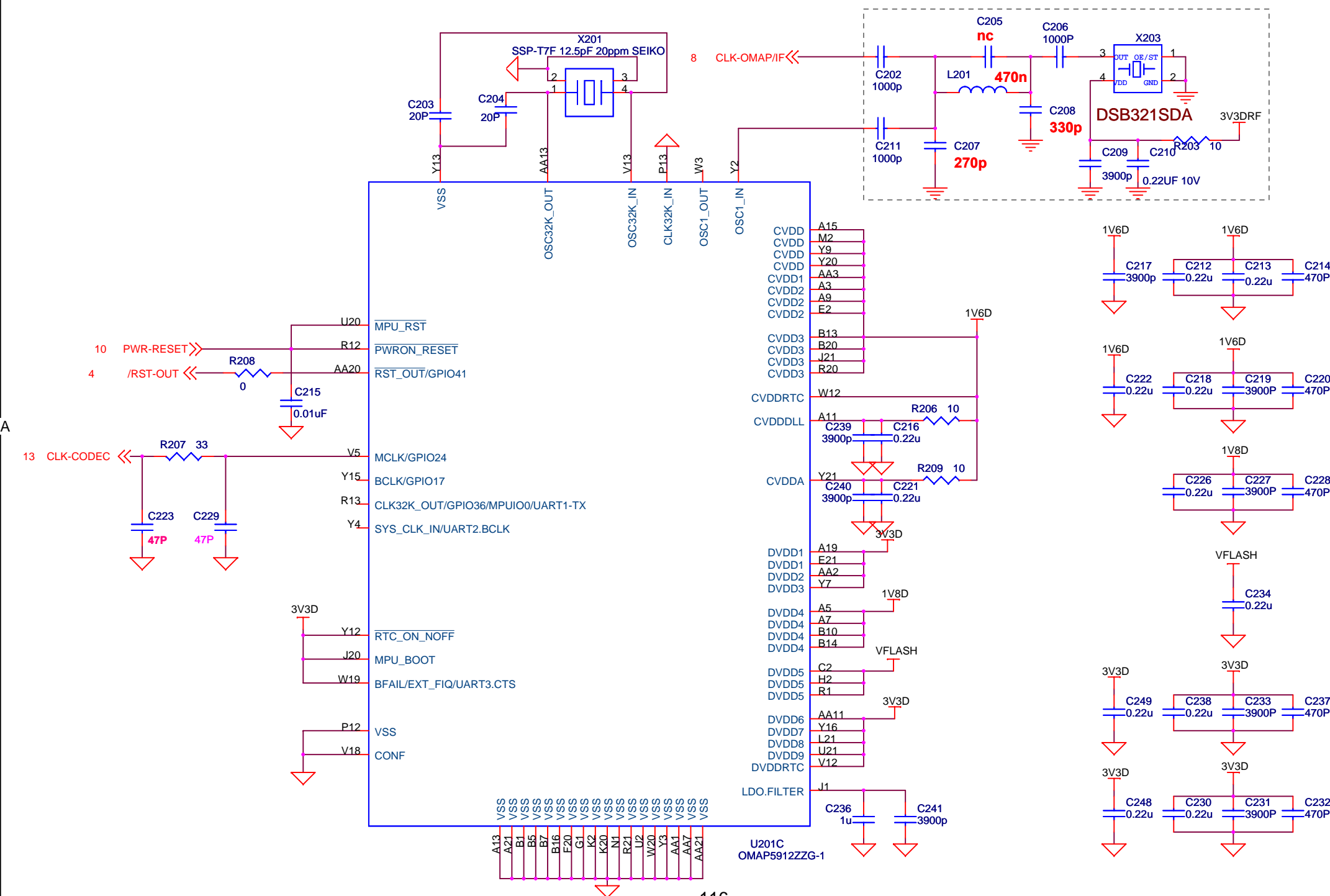
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (OMAP MEN)



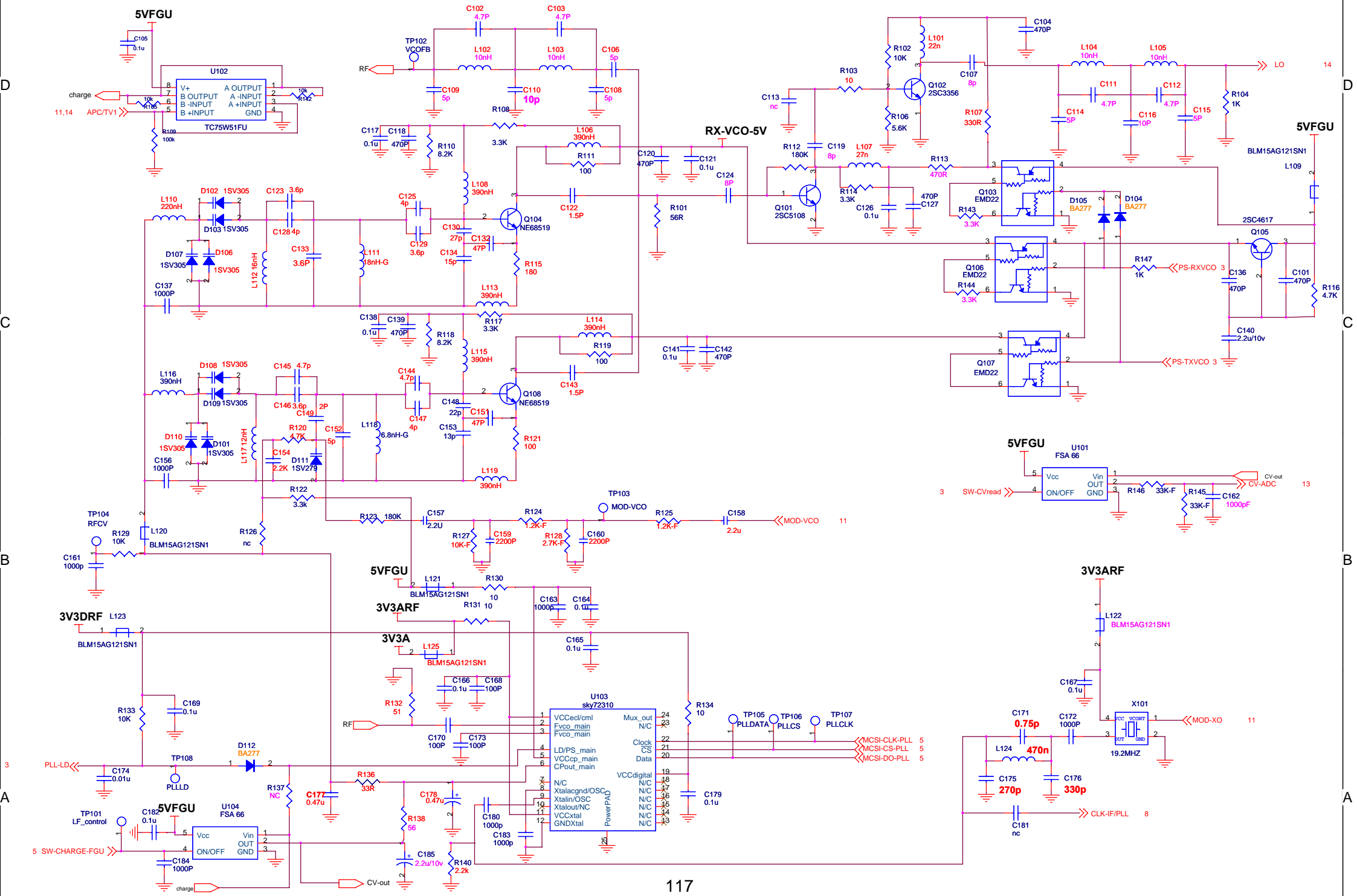
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (OMAP IO)



PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (OMAP CORE)



PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (FGU)



PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (External Interface)

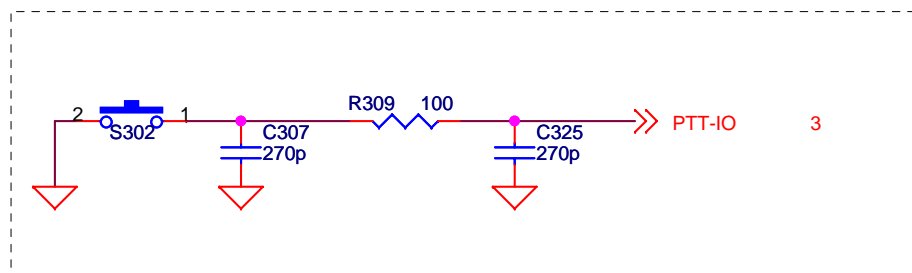
The schematic diagram illustrates the external interfaces for the PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G. It is divided into three main sections:

- USB Interface (J302):** A 6-pin connector. Pins 1 and 2 are connected to USB-D- (5,7). Pins 3 and 4 are connected to USB-D+ (5,7). Pins 5 and 6 are connected to nc-CON6.
- PTT-IO Interface (S302):** A 2-pin connector. Pin 1 is connected to C307 (270pF) and R309 (100Ω). Pin 2 is connected to C325 (270pF) and PTT-IO (3).
- NC*JTAG Interface (J304):** A 14-pin connector. Pins 1-14 are connected to various components and signals:
 - Pins 1-4: Connected to RN302 (100*4) and RN301 (100*4).
 - Pins 5-8: Connected to /TRST, TMS, TDI, and TDO.
 - Pins 9-12: Connected to RTCK, TCK, EMU0, and EMU1.
 - Pins 13-14: Connected to R301 (100K), R304 (100K), R305 (100K), R306 (4.7K), and R307 (4.7K).

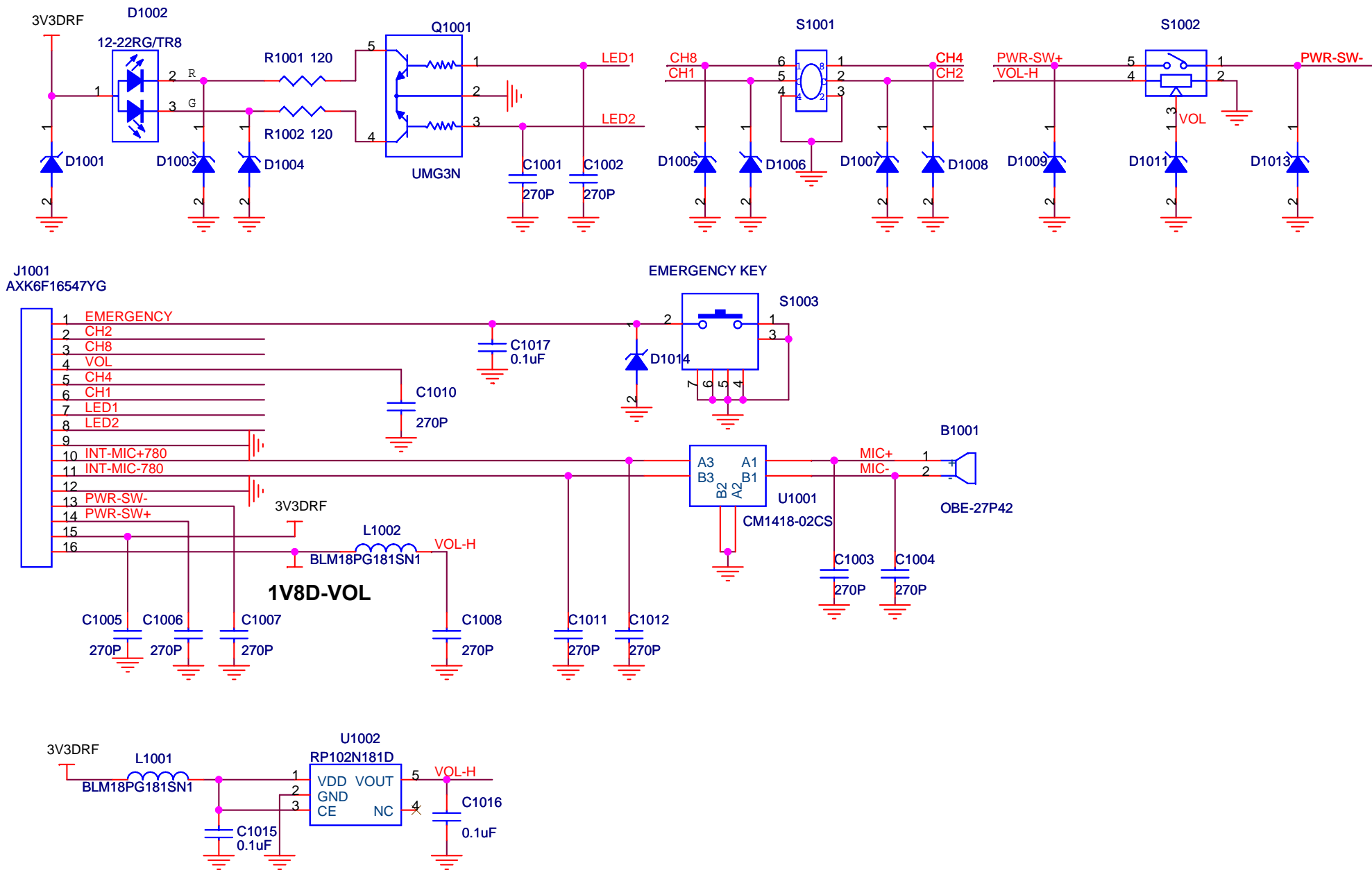
Additional components and connections include:

- Power and Grounding:** 3V3D is connected to L301 (BLM15PD121SN1) and C306 (0.1uF). Ground connections are shown for pins 1, 2, 5, 6, 7, 8, 9, 10, 11, 12, 13, and 14.
- Resistors:** R301 (100K), R304 (100K), R305 (100K), R306 (4.7K), R307 (4.7K), and R308 (4.7K).
- Capacitors:** C306 (0.1uF), C307 (270pF), and C325 (270pF).
- Diode:** D301 (KPT-1608SURC).

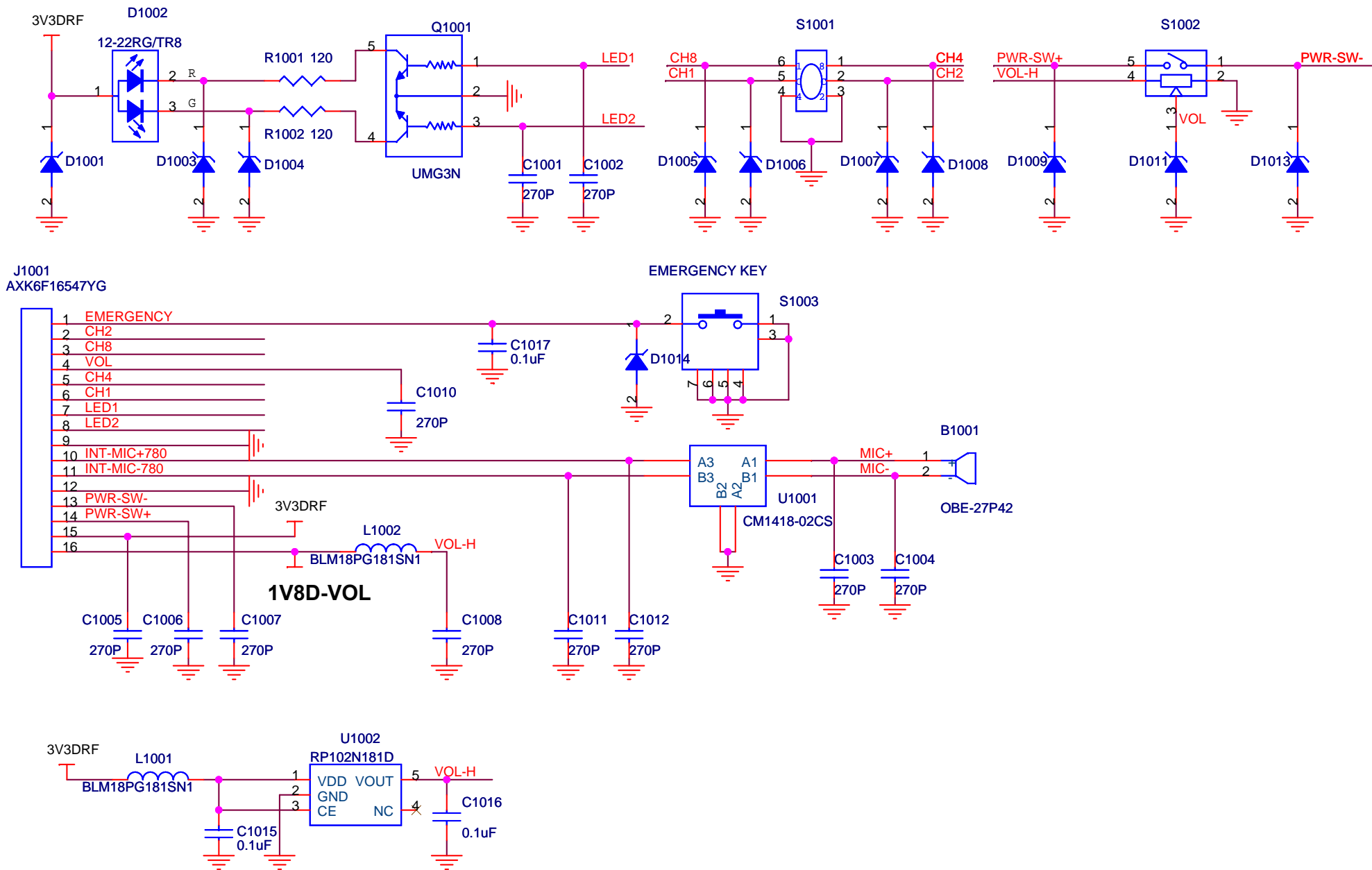
118



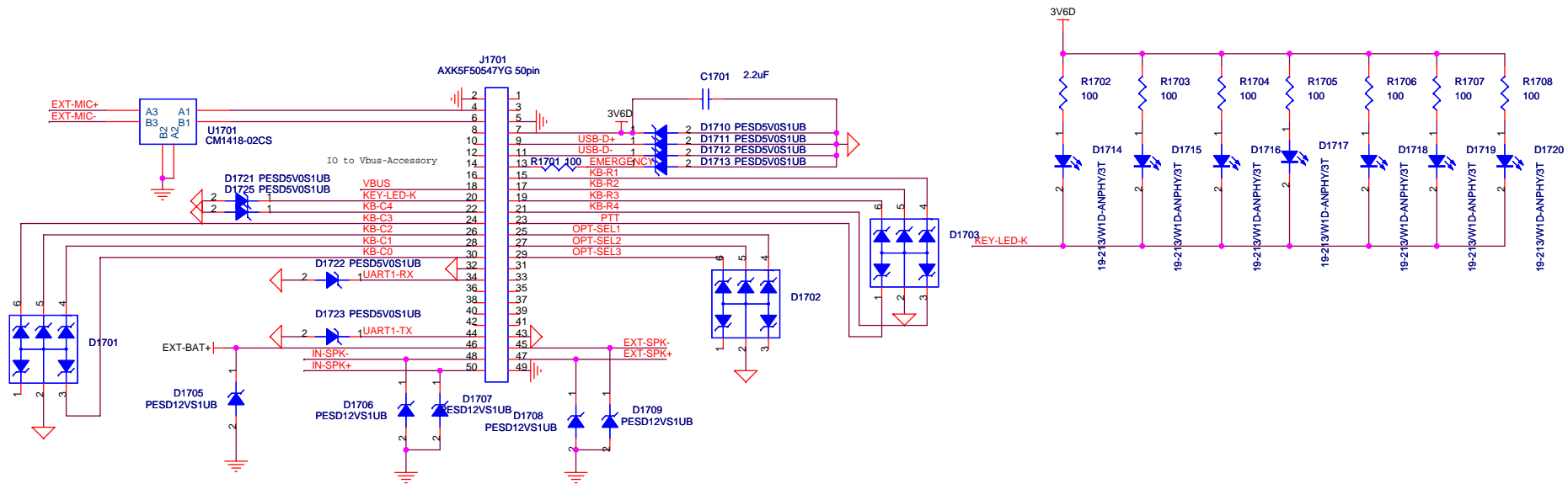
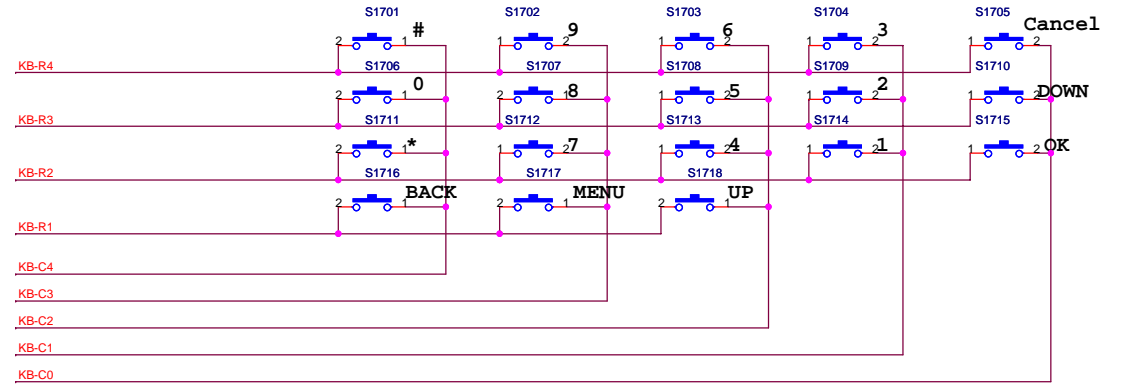
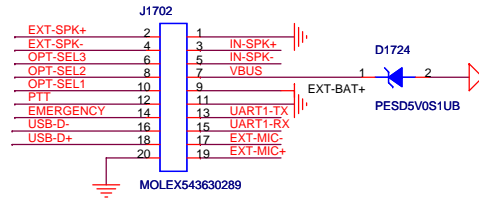
PD70X/PD70XG/HD705/HD705G Schematic Diagram (Channel Board)



PD78X/PD78XG/HD785/HD785G Schematic Diagram (Channel Board)



PD78X/PD78XG/HD785/HD785G Schematic Diagram (Keyboard)



11.7 Parts List

Main Board for PD70X/ PD70XG/ PD78X/ PD78XG/ HD705/ HD705G/ HD785/ HD785G

No.	Ref. No.	Part No.	Description
1	R208	3001050000000	0Ω
2	R254	3001050000000	0Ω
3	R9069	3001050000000	0Ω
4	C646	3001060000000	0Ω
5	C657	3001060000000	0Ω
6	C667	3001060000000	0Ω
7	R9053	3099080398010	0.39Ω
8	R9054	3099080398010	0.39Ω
9	R9055	3099080398010	0.39Ω
10	R321	3099063018000	3.01Ω
11	R9005	3001055690000	5.6Ω
12	R103	3001051000000	10Ω
13	R130	3001051000000	10Ω
14	R131	3001051000000	10Ω
15	R134	3001051000000	10Ω
16	R203	3001051000000	10Ω
17	R206	3001051000000	10Ω
18	R209	3001051000000	10Ω
19	R801	3001051000000	10Ω
20	R806	3001051000000	10Ω
21	L820	3001061000000	10Ω
22	R607	3001061000000	10Ω
23	R9022	3001052200000	22Ω
24	R207	3001053300000	33Ω
25	R223	3001053300000	33Ω
26	R255	3001053300000	33Ω
27	R259	3001053300000	33Ω
28	R324	3001053300000	33Ω
29	R325	3001053300000	33Ω
30	R326	3001053300000	33Ω
31	R9009	3001053300000	33Ω
32	R138	3001055600000	56Ω
33	R9021	3001054700000	47Ω
34	R132	3001055100020	51Ω
35	R401	3001055100020	51Ω
36	R9075	3001055100020	51Ω
37	R101	3001055600000	56Ω
38	R136	3001054700000	47Ω
39	R9007	3001058200000	82Ω
40	R111	3001051010000	100Ω
41	R119	3001051010000	100Ω

No.	Ref. No.	Part No.	Description
42	R121	3001051010000	100Ω
43	R220	3001051010000	100Ω
44	R221	3001051010000	100Ω
45	R222	3001051010000	100Ω
46	R224	3001051010000	100Ω
47	R225	3001051010000	100Ω
48	R226	3001051010000	100Ω
49	R257	3001051010000	100Ω
50	R408	3001051010000	100Ω
51	R503	3001051010000	100Ω
52	R704	3001051010000	100Ω
53	R713	3001051010000	100Ω
54	R821	3001051010000	100Ω
55	R9011	3001051010000	100Ω
56	R9012	3001051010000	100Ω
57	R9017	3001051010000	100Ω
58	R9039	3001051010000	100Ω
59	R115	3001051810010	180Ω
60	R403	3001051510000	150Ω
61	R9016	3001051510000	150Ω
62	R9001	3001052710010	270Ω
63	R9003	3001052710010	270Ω
64	R9025	3001052710010	270Ω
65	R9028	3001052710010	270Ω
66	R107	3001053310000	330Ω
67	R502	3001053310000	330Ω
68	R9015	3001053310000	330Ω
69	R9029	3001053310000	330Ω
70	R9071	3001053310000	330Ω
71	R9083	3001053310000	330Ω
72	R411	3001053910000	390Ω
73	R113	3001054710000	470Ω
74	R263	3001054710000	470Ω
75	R264	3001054710000	470Ω
76	R265	3001054710000	470Ω
77	R501	3001054710000	470Ω
78	R9018	3001056810000	680Ω
79	R416	3001058210000	820Ω
80	R104	3001051020000	1KΩ
81	R147	3001051020000	1KΩ
82	R406	3001051020000	1KΩ
83	R613	3001051020000	1KΩ
84	R632	3001051020000	1KΩ
85	R701	3001051020000	1KΩ

No.	Ref. No.	Part No.	Description
86	R9033	3001051020000	1KΩ
87	R9038	3001051020000	1KΩ
88	R9040	3001051020000	1KΩ
89	R612	3001061020010	1KΩ
90	R260	3001051520000	1.5KΩ
91	R9008	3001051520000	1.5KΩ
92	R9066	3001051520000	1.5KΩ
93	R413	3001051820000	1.8KΩ
94	R820	3001052020020	2KΩ
95	R825	3001052020020	2KΩ
96	R832	3001052020020	2KΩ
97	R833	3001052020020	2KΩ
98	R140	3001052220000	2.2KΩ
99	R322	3001052220000	2.2KΩ
100	R323	3001052220000	2.2KΩ
101	R128	3001052720010	2.7KΩ
102	R414	3001052720010	2.7KΩ
103	R629	3001052720010	2.7KΩ
104	R108	3001053320000	3.3KΩ
105	R114	3001053320000	3.3KΩ
106	R117	3001053320000	3.3KΩ
107	R143	3001053320000	3.3KΩ
108	R144	3001053320000	3.3KΩ
109	R314	3001053320000	3.3KΩ
110	R315	3001053320000	3.3KΩ
111	R9013	3001053320000	3.3KΩ
112	R9030	3001053320000	3.3KΩ
113	R9043	3001053320000	3.3KΩ
114	R9068	3001053320000	3.3KΩ
115	R9095	3001053320000	3.3KΩ
116	R9096	3001053320000	3.3KΩ
117	R9097	3001053320000	3.3KΩ
118	R9098	3001053320000	3.3KΩ
119	R116	3001054720000	4.7KΩ
120	R409	3001054720000	4.7KΩ
121	R9019	3001054720000	4.7KΩ
122	R9041	3001054720000	4.7KΩ
123	C9114	3001055620000	5.6KΩ
124	R106	3001055620000	5.6KΩ
125	R9078	3001055620000	5.6KΩ
126	R9089	3001055620000	5.6KΩ
127	R9024	3001056820000	6.8KΩ
128	R9067	3001056820000	6.8KΩ
129	R110	3001058220000	8.2KΩ

No.	Ref. No.	Part No.	Description
130	R118	3001058220000	8.2KΩ
131	R407	3001058220000	8.2KΩ
132	R9027	3001058220000	8.2KΩ
133	R102	3001051030000	10KΩ
134	R105	3001051030000	10KΩ
135	R129	3001051030000	10KΩ
136	R133	3001051030000	10KΩ
137	R142	3001051030000	10KΩ
138	R241	3001051030000	10KΩ
139	R242	3001051030000	10KΩ
140	R249	3001051030000	10KΩ
141	R256	3001051030000	10KΩ
142	R258	3001051030000	10KΩ
143	R316	3001051030000	10KΩ
144	R317	3001051030000	10KΩ
145	R402	3001051030000	10KΩ
146	R405	3001051030000	10KΩ
147	R611	3001051030000	10KΩ
148	R711	3001051030000	10KΩ
149	R714	3001051030000	10KΩ
150	R804	3001051030000	10KΩ
151	R805	3001051030000	10KΩ
152	R811	3001051030000	10KΩ
153	R812	3001051030000	10KΩ
154	R838	3001051030000	10KΩ
155	R841	3001051030000	10KΩ
156	R9006	3001051030000	10KΩ
157	R9036	3001051030000	10KΩ
158	R9074	3001051030000	10KΩ
159	R9081	3001051030000	10KΩ
160	R127	3001051030050	10KΩ
161	R504	3001051030050	10KΩ
162	R705	3001051030050	10KΩ
163	R706	3001051030050	10KΩ
164	R823	3001051030050	10KΩ
165	R9072	3001051030050	10KΩ
166	R9073	3001051030050	10KΩ
167	R9076	3001051030050	10KΩ
168	R9077	3001051030050	10KΩ
169	R9090	3001051030050	10KΩ
170	R410	3001061030010	10KΩ
171	R415	3001061030010	10KΩ
172	RN256	3005051030010	10KΩ
173	R261	3001051530010	15KΩ

No.	Ref. No.	Part No.	Description
174	R262	3001051530010	15KΩ
175	R631	3001051530010	15KΩ
176	R824	3001051530010	15KΩ
177	R828	3001051530010	15KΩ
178	R807	3001052030000	20KΩ
179	RN261	3001052230020	22K*2
180	R145	3001053330000	33KΩ
181	R146	3001053330000	33KΩ
182	R707	3001053330000	33KΩ
183	R830	3001053330000	33KΩ
184	R9079	3001053330000	33KΩ
185	R621	3001054730010	47KΩ
186	R627	3001054730010	47KΩ
187	R628	3001054730010	47KΩ
188	R630	3001054730010	47KΩ
189	R826	3001054730010	47KΩ
190	R9002	3001054730010	47KΩ
191	R9050	3001054730010	47KΩ
192	R9063	3001054730010	47KΩ
193	R9084	3001055630000	56KΩ
194	R702	3001056830000	68KΩ
195	C319	3001051040000	100KΩ
196	R109	3001051040000	100KΩ
197	R251	3001051040000	100KΩ
198	R318	3001051040000	100KΩ
199	R412	3001051040000	100KΩ
200	R620	3001051040000	100KΩ
201	R623	3001051040000	100KΩ
202	R624	3001051040000	100KΩ
203	R625	3001051040000	100KΩ
204	R626	3001051040000	100KΩ
205	R633	3001051040000	100KΩ
206	R709	3001051040000	100KΩ
207	R710	3001051040000	100KΩ
208	R9085	3001051040000	100KΩ
209	R618	3001051340000	130KΩ
210	R802	3001051540000	150KΩ
211	R803	3001051540000	150KΩ
212	R813	3001051540000	150KΩ
213	R814	3001051540000	150KΩ
214	R9048	3001051540000	150KΩ
215	R9057	3001051540000	150KΩ
216	R112	3001051840000	180KΩ
217	R617	3001054740010	470KΩ

No.	Ref. No.	Part No.	Description
218	R829	3001054740010	470KΩ
219	R9046	3001054740010	470KΩ
220	R9059	3001054740010	470KΩ
221	R9045	3001051050000	1MΩ
222	R9058	3001051050000	1MΩ
223	C171	3199050758000	0.75PF
224	C519	3199050758000	0.75PF
225	C520	3101050100030	1PF
226	C518	3101051590000	1.5PF
227	C516	3101051590070	1.5PF
228	C122	3101061590010	1.5PF
229	C143	3101061590010	1.5PF
230	C9004	3101061590010	1.5PF
231	C9009	3101060390010	3PF
232	C527	3101050200010	2PF
233	C9100	3101050200010	2PF
234	C9021	3101062490000	2.4PF
235	C9116	3101050300000	3PF
236	C123	3101063690000	3.6PF
237	C129	3101063690000	3.6PF
238	C133	3101063690000	3.6PF
239	C146	3101063690000	3.6PF
240	C456	3101063690000	3.6PF
241	C9132	3101050400010	4PF
242	C125	3101060400010	4PF
243	C128	3101060400010	4PF
244	C147	3101060400010	4PF
245	L9034	3101060400010	4PF
246	C144	3101064790010	4.7PF
247	C145	3101064790010	4.7PF
248	C9031	3101064790010	4.7PF
249	C106	3101050500010	5PF
250	C108	3101050500010	5PF
251	C109	3101050500010	5PF
252	C114	3101050500010	5PF
253	C115	3101050500010	5PF
254	C9115	3101050500010	5PF
255	C9117	3101050500010	5PF
256	C9128	3101050500010	5PF
257	C9133	3101050500010	5PF
258	C9135	3101050500010	5PF
259	C9136	3101050500010	5PF
260	C614	3101055690020	5.6PF
261	C9101	3101050600010	6PF

No.	Ref. No.	Part No.	Description
262	C9109	3101050600010	6PF
263	C9124	3101050600010	6PF
264	C9131	3101050600010	6PF
265	C9137	3101050600010	6PF
266	C9023	3101060600010	6PF
267	C9024	3101060600010	6PF
268	C9028	3101050700010	7PF
269	C107	3101050800000	8PF
270	C119	3101050800000	8PF
271	C124	3101050800000	8PF
272	C9026	3101050800000	8PF
273	C9032	3101050800000	8PF
274	C9107	3101050800000	8PF
275	C9113	3101050800000	8PF
276	C9120	3101050800000	8PF
277	C9129	3101050800000	8PF
278	C9030	3101060800010	8PF
279	C9019	3101060900010	9PF
280	C110	3101051000020	10PF
281	C116	3101051000020	10PF
282	C9014	3101051000020	10PF
283	C9025	3101051000020	10PF
284	C9077	3101051000020	10PF
285	C9099	3101051000020	10PF
286	C9105	3101051000020	10PF
287	C274	3101051200020	12PF
288	C420	3101051200020	12PF
289	C9079	3101051200020	12PF
290	C9027	3101061200000	12PF
291	C153	3101061300000	13PF
292	C9035	3101051500020	15PF
293	C9106	3101051500080	15PF
294	C134	3101061500010	15PF
295	C425	3101051800010	18PF
296	C517	3101051800010	18PF
297	C203	3101052000020	20PF
298	C204	3101052000020	20PF
299	C644	3101052000020	20PF
300	C672	3101052000020	20PF
301	C9078	3101052000020	20PF
302	R9080	3101052000020	20PF
303	C432	3101052200010	22PF
304	C148	3101062200010	22PF
305	C9112	3101062200010	22PF

No.	Ref. No.	Part No.	Description
306	C9118	3101052700000	27PF
307	C9122	3101052700000	27PF
308	C460	3101063000010	30PF
309	C448	3101053300000	33PF
310	C461	3101063300000	33PF
311	C443	3101063900000	39PF
312	C9020	3101064300000	43PF
313	C132	3101054700010	47PF
314	C151	3101054700010	47PF
315	C223	3101054700010	47PF
316	C229	3101054700010	47PF
317	C271	3101054700010	47PF
318	C272	3101054700010	47PF
319	C273	3101054700010	47PF
320	C279	3101054700010	47PF
321	C286	3101054700010	47PF
322	C9141	3101054700010	47PF
323	C513	3101055600000	56PF
324	C524	3101055600000	56PF
325	C168	3101051010030	100PF
326	C170	3101051010030	100PF
327	C173	3101051010030	100PF
328	C265	3101051010030	100PF
329	C428	3101051010030	100PF
330	C429	3101051010030	100PF
331	C438	3101051010030	100PF
332	C439	3101051010030	100PF
333	C602	3101051010030	100PF
334	C616	3101051010030	100PF
335	C620	3101051010030	100PF
336	C708	3101051010030	100PF
337	C709	3101051010030	100PF
338	C9002	3101051010030	100PF
339	R9099	3101051010030	100PF
340	R9100	3101051010030	100PF
341	C514	3101051210000	120PF
342	C521	3101051210000	120PF
343	C427	3101052210010	220PF
344	C645	3101052210010	220PF
345	C674	3101052210010	220PF
346	C805	3101052210010	220PF
347	C806	3101052210010	220PF
348	C175	3101052710000	270PF
349	C207	3101052710000	270PF

No.	Ref. No.	Part No.	Description
350	C262	3101052710000	270PF
351	C270	3101052710000	270PF
352	C285	3101052710000	270PF
353	C290	3101052710000	270PF
354	C291	3101052710000	270PF
355	C292	3101052710000	270PF
356	C321	3101052710000	270PF
357	C322	3101052710000	270PF
358	C325	3101052710000	270PF
359	C326	3101052710000	270PF
360	C334	3101052710000	270PF
361	C469	3101052710000	270PF
362	C470	3101052710000	270PF
363	C471	3101052710000	270PF
364	C804	3101052710000	270PF
365	C176	3101053310030	330PF
366	C208	3101053310030	330PF
367	C101	3101054710010	470PF
368	C104	3101054710010	470PF
369	C118	3101054710010	470PF
370	C120	3101054710010	470PF
371	C127	3101054710010	470PF
372	C136	3101054710010	470PF
373	C139	3101054710010	470PF
374	C142	3101054710010	470PF
375	C214	3101054710010	470PF
376	C220	3101054710010	470PF
377	C228	3101054710010	470PF
378	C232	3101054710010	470PF
379	C237	3101054710010	470PF
380	C243	3101054710010	470PF
381	C244	3101054710010	470PF
382	C255	3101054710010	470PF
383	C256	3101054710010	470PF
384	C257	3101054710010	470PF
385	C258	3101054710010	470PF
386	C259	3101054710010	470PF
387	C263	3101054710010	470PF
388	C264	3101054710010	470PF
389	C266	3101054710010	470PF
390	C268	3101054710010	470PF
391	C269	3101054710010	470PF
392	C278	3101054710010	470PF
393	C280	3101054710010	470PF

No.	Ref. No.	Part No.	Description
394	C281	3101054710010	470PF
395	C282	3101054710010	470PF
396	C283	3101054710010	470PF
397	C284	3101054710010	470PF
398	C287	3101054710010	470PF
399	C288	3101054710010	470PF
400	C293	3101054710010	470PF
401	C294	3101054710010	470PF
402	C295	3101054710010	470PF
403	C296	3101054710010	470PF
404	C297	3101054710010	470PF
405	C298	3101054710010	470PF
406	C299	3101054710010	470PF
407	C300	3101054710010	470PF
408	C301	3101054710010	470PF
409	C302	3101054710010	470PF
410	C303	3101054710010	470PF
411	C305	3101054710010	470PF
412	C313	3101054710010	470PF
413	C315	3101054710010	470PF
414	C316	3101054710010	470PF
415	C317	3101054710010	470PF
416	C320	3101054710010	470PF
417	C331	3101054710010	470PF
418	C332	3101054710010	470PF
419	C333	3101054710010	470PF
420	C335	3101054710010	470PF
421	C336	3101054710010	470PF
422	C444	3101054710010	470PF
423	C459	3101054710010	470PF
424	C512	3101054710010	470PF
425	C652	3101054710010	470PF
426	C663	3101054710010	470PF
427	C680	3101054710010	470PF
428	C681	3101054710010	470PF
429	C685	3101054710010	470PF
430	C703	3101054710010	470PF
431	C704	3101054710010	470PF
432	C835	3101054710010	470PF
433	C838	3101054710010	470PF
434	C842	3101054710010	470PF
435	C845	3101054710010	470PF
436	C846	3101054710010	470PF
437	C848	3101054710010	470PF

No.	Ref. No.	Part No.	Description
438	C849	3101054710010	470PF
439	C851	3101054710010	470PF
440	C853	3101054710010	470PF
441	C856	3101054710010	470PF
442	C857	3101054710010	470PF
443	C9018	3101054710010	470PF
444	C9029	3101054710010	470PF
445	C9033	3101054710010	470PF
446	C9034	3101054710010	470PF
447	C9037	3101054710010	470PF
448	C9039	3101054710010	470PF
449	C9042	3101054710010	470PF
450	C9045	3101054710010	470PF
451	C9047	3101054710010	470PF
452	C9048	3101054710010	470PF
453	C9069	3101054710010	470PF
454	C9075	3101054710010	470PF
455	C9081	3101054710010	470PF
456	C9096	3101054710010	470PF
457	C9098	3101054710010	470PF
458	C324	3101064710000	470PF
459	C9013	3101064710000	470PF
460	C260	3101055610000	560PF
461	C261	3101055610000	560PF
462	C9067	3101055610000	560PF
463	C137	3101051020010	1000PF
464	C156	3101051020010	1000PF
465	C161	3101051020010	1000PF
466	C162	3101051020010	1000PF
467	C163	3101051020010	1000PF
468	C172	3101051020010	1000PF
469	C180	3101051020010	1000PF
470	C183	3101051020010	1000PF
471	C184	3101051020010	1000PF
472	C202	3101051020010	1000PF
473	C206	3101051020010	1000PF
474	C211	3101051020010	1000PF
475	C705	3101051020010	1000PF
476	C9001	3101051020010	1000PF
477	C9036	3101051020010	1000PF
478	C9059	3101051020010	1000PF
479	C9061	3101051020010	1000PF
480	C9064	3101051020010	1000PF
481	C9085	3101051020010	1000PF

No.	Ref. No.	Part No.	Description
482	C9088	3101051020010	1000PF
483	C9089	3101051020010	1000PF
484	C9093	3101051020010	1000PF
485	C9103	3101051020010	1000PF
486	C9121	3101051020010	1000PF
487	C9123	3101051020010	1000PF
488	C9060	3101061020000	1000PF
489	L9039	3101061020000	1000PF
490	C275	3101051520000	1500PF
491	C276	3101051520000	1500PF
492	C277	3101051520000	1500PF
493	C289	3101051520000	1500PF
494	C304	3101051520000	1500PF
495	C9065	3101051520000	1500PF
496	C455	3101063320000	3300PF
497	C209	3101053920000	3900PF
498	C217	3101053920000	3900PF
499	C219	3101053920000	3900PF
500	C227	3101053920000	3900PF
501	C231	3101053920000	3900PF
502	C233	3101053920000	3900PF
503	C239	3101053920000	3900PF
504	C240	3101053920000	3900PF
505	C241	3101053920000	3900PF
506	C245	3101053920000	3900PF
507	C246	3101053920000	3900PF
508	C247	3101053920000	3900PF
509	C638	3101053920000	3900PF
510	C650	3101053920000	3900PF
511	C662	3101053920000	3900PF
512	C666	3101053920000	3900PF
513	C684	3101053920000	3900PF
514	C686	3101053920000	3900PF
515	C687	3101053920000	3900PF
516	C808	3101053920000	3900PF
517	C813	3101053920000	3900PF
518	C820	3101053920000	3900PF
519	C823	3101053920000	3900PF
520	C858	3101053920000	3900PF
521	C9063	3101054720000	4700PF
522	C437	3101065620010	5600PF
523	C174	3101051030020	0.01UF
524	C215	3101051030020	0.01UF
525	C251	3101051030020	0.01UF

No.	Ref. No.	Part No.	Description
526	C426	3101051030020	0.01UF
527	C436	3101051030020	0.01UF
528	C440	3101051030020	0.01UF
529	C447	3101051030020	0.01UF
530	C449	3101051030020	0.01UF
531	C453	3101051030020	0.01UF
532	C454	3101051030020	0.01UF
533	C457	3101051030020	0.01UF
534	C647	3101051030020	0.01UF
535	C651	3101051030020	0.01UF
536	C668	3101051030020	0.01UF
537	C819	3101051030020	0.01UF
538	C822	3101051030020	0.01UF
539	C826	3101051030020	0.01UF
540	C827	3101051030020	0.01UF
541	C837	3101051030020	0.01UF
542	C9044	3101051030020	0.01UF
543	C9066	3101051030020	0.01UF
544	C9087	3101051030020	0.01UF
545	C9090	3101051030020	0.01UF
546	C9110	3101051030020	0.01UF
547	C9138	3101051030020	0.01UF
548	C442	3101061030010	0.01UF
549	C619	3101061030010	0.01UF
550	C450	3101061230000	0.012UF
551	C105	3101051040060	0.1UF
552	C117	3101051040060	0.1UF
553	C121	3101051040060	0.1UF
554	C126	3101051040060	0.1UF
555	C138	3101051040060	0.1UF
556	C141	3101051040060	0.1UF
557	C164	3101051040060	0.1UF
558	C165	3101051040060	0.1UF
559	C166	3101051040060	0.1UF
560	C167	3101051040060	0.1UF
561	C169	3101051040060	0.1UF
562	C179	3101051040060	0.1UF
563	C182	3101051040060	0.1UF
564	C310	3101051040060	0.1UF
565	C311	3101051040060	0.1UF
566	C318	3101051040060	0.1UF
567	C422	3101051040060	0.1UF
568	C430	3101051040060	0.1UF
569	C433	3101051040060	0.1UF

No.	Ref. No.	Part No.	Description
570	C434	3101051040060	0.1UF
571	C435	3101051040060	0.1UF
572	C441	3101051040060	0.1UF
573	C445	3101051040060	0.1UF
574	C446	3101051040060	0.1UF
575	C462	3101051040060	0.1UF
576	C464	3101051040060	0.1UF
577	C465	3101051040060	0.1UF
578	C466	3101051040060	0.1UF
579	C522	3101051040060	0.1UF
580	C523	3101051040060	0.1UF
581	C525	3101051040060	0.1UF
582	C604	3101051040060	0.1UF
583	C607	3101051040060	0.1UF
584	C615	3101051040060	0.1UF
585	C617	3101051040060	0.1UF
586	C618	3101051040060	0.1UF
587	C622	3101051040060	0.1UF
588	C625	3101051040060	0.1UF
589	C626	3101051040060	0.1UF
590	C630	3101051040060	0.1UF
591	C635	3101051040060	0.1UF
592	C639	3101051040060	0.1UF
593	C642	3101051040060	0.1UF
594	C656	3101051040060	0.1UF
595	C658	3101051040060	0.1UF
596	C659	3101051040060	0.1UF
597	C671	3101051040060	0.1UF
598	C679	3101051040060	0.1UF
599	C682	3101051040060	0.1UF
600	C688	3101051040060	0.1UF
601	C710	3101051040060	0.1UF
602	C801	3101051040060	0.1UF
603	C809	3101051040060	0.1UF
604	C810	3101051040060	0.1UF
605	C812	3101051040060	0.1UF
606	C833	3101051040060	0.1UF
607	C836	3101051040060	0.1UF
608	C839	3101051040060	0.1UF
609	C843	3101051040060	0.1UF
610	C850	3101051040060	0.1UF
611	C852	3101051040060	0.1UF
612	C9038	3101051040060	0.1UF
613	C9041	3101051040060	0.1UF

No.	Ref. No.	Part No.	Description
614	C9043	3101051040060	0.1UF
615	C9046	3101051040060	0.1UF
616	C9049	3101051040060	0.1UF
617	C9057	3101051040060	0.1UF
618	C9071	3101051040060	0.1UF
619	C9080	3101051040060	0.1UF
620	C9086	3101051040060	0.1UF
621	C9091	3101051040060	0.1UF
622	C9092	3101051040060	0.1UF
623	C9097	3101051040060	0.1UF
624	C9104	3101051040060	0.1UF
625	C212	3101052240010	0.22UF
626	C213	3101052240010	0.22UF
627	C216	3101052240010	0.22UF
628	C218	3101052240010	0.22UF
629	C221	3101052240010	0.22UF
630	C222	3101052240010	0.22UF
631	C226	3101052240010	0.22UF
632	C230	3101052240010	0.22UF
633	C234	3101052240010	0.22UF
634	C238	3101052240010	0.22UF
635	C242	3101052240010	0.22UF
636	C248	3101052240010	0.22UF
637	C249	3101052240010	0.22UF
638	C683	3101052240010	0.22UF
639	C803	3101052240010	0.22UF
640	C821	3101052240010	0.22UF
641	C824	3101052240010	0.22UF
642	C210	3101062240000	0.22UF
643	C628	3101062240000	0.22UF
644	C640	3101062240000	0.22UF
645	C655	3101062240000	0.22UF
646	C676	3101062240000	0.22UF
647	C678	3101062240000	0.22UF
648	C463	3101072240000	0.22UF
649	C177	3101074740000	0.47UF
650	C468	3104076840020	0.68UF
651	C236	3101051050000	1UF
652	C312	3101051050000	1UF
653	C314	3101051050000	1UF
654	C323	3101051050000	1UF
655	C423	3101051050000	1UF
656	C515	3101051050000	1UF
657	C526	3101051050000	1UF

No.	Ref. No.	Part No.	Description
658	C706	3101051050000	1UF
659	C707	3101051050000	1UF
660	C711	3101051050000	1UF
661	C712	3101051050000	1UF
662	C831	3101051050000	1UF
663	C832	3101051050000	1UF
664	C834	3101051050000	1UF
665	C840	3101051050000	1UF
666	C847	3101051050000	1UF
667	C9052	3101051050000	1UF
668	C9095	3101051050000	1UF
669	C605	3101061050020	1UF
670	C623	3101061050020	1UF
671	C648	3101061050020	1UF
672	C669	3101061050020	1UF
673	C677	3101061050020	1UF
674	C701	3101061050020	1UF
675	C816	3101061050020	1UF
676	C140	3101062250000	2.2UF
677	C157	3101062250000	2.2UF
678	C158	3101062250000	2.2UF
679	C467	3101062250000	2.2UF
680	C472	3101062250000	2.2UF
681	C601	3101062250000	2.2UF
682	C606	3101062250000	2.2UF
683	C624	3101062250000	2.2UF
684	C641	3101062250000	2.2UF
685	C649	3101062250000	2.2UF
686	C653	3101062250000	2.2UF
687	C660	3101062250000	2.2UF
688	C670	3101062250000	2.2UF
689	C825	3101062250000	2.2UF
690	C828	3101062250000	2.2UF
691	C185	3104072250060	2.2UF
692	C621	3101074750000	4.7UF
693	C629	3101074750000	4.7UF
694	C636	3110071060000	10uF
695	C661	3110071060000	10uF
696	C627	3110081060000	10uF
697	C654	3110081060000	10uF
698	C9051	3104082260060	22UF
699	C637	3110994760000	47uF
700	C665	3110994760000	47uF
701	L407	3221505121010	Bead

No.	Ref. No.	Part No.	Description
702	L801	3221505121010	Bead
703	L803	3221505121010	Bead
704	L804	3221505121010	Bead
705	L805	3221505121010	Bead
706	L821	3221505121010	Bead
707	L822	3221505121010	Bead
708	L9015	3221505121010	Bead
709	L9020	3221505121010	Bead
710	L302	3221506601000	Bead
711	L304	3221506601000	Bead
712	L305	3221506601000	Bead
713	L410	3221506601000	Bead
714	L823	3221506601000	Bead
715	L827	3221506601000	Bead
716	L828	3221506601000	Bead
717	L502	3221506601080	Bead
718	L505	3221506601080	Bead
719	L303	3221506181000	Bead
720	L601	3221506181000	Bead
721	L602	3221506181000	Bead
722	L603	3221506181000	Bead
723	L605	3221506181000	Bead
724	L606	3221506181000	Bead
725	L609	3221506181000	Bead
726	L611	3221506181000	Bead
727	L612	3221506181000	Bead
728	L617	3221506181000	Bead
729	L802	3221506181000	Bead
730	R614	3221506181000	Bead
731	R622	3221506181000	Bead
732	L9014	3221506121000	Bead
733	L9040	3217105010000	1nH
734	L9030	3210306279000	2.7nH
735	L501	3297106339000	3.3nH
736	L503	3297106339000	3.3nH
737	L504	3297106339000	3.3nH
738	L9016	3210306339000	3.3nH
739	L508	3210305829000	8.2nH
740	L509	3210305829000	8.2nH
741	L9006	3212106829000	8.2nH
742	L9007	3212106829000	8.2nH
743	L104	3210106100010	10nH
744	L105	3210106100010	10nH
745	L102	3212106100000	10nH

No.	Ref. No.	Part No.	Description
746	L103	3212106100000	10nH
747	L9018	3210106150000	15nH
748	L9033	3237199170000	17nH
749	L9035	3237199170000	17nH
750	L9036	3237199170000	17nH
751	L9037	3237199170000	17nH
752	L507	3210305180000	18nH
753	L117	3217107120000	12nH
754	L112	3217107160000	16nH
755	L9017	3217106180010	18nH
756	L9028	3210106220000	22nH
757	L9009	3210306150000	15nH
758	L9010	3210306150000	15nH
759	L9003	3233099185900	18.5nH
760	L9004	3233099185900	18.5nH
761	L9005	3233099185900	18.5nH
762	L9013	3233099185900	18.5nH
763	L506	3210106390000	39nH
764	L9008	3233099470000	47nH
765	L9001	3210106820000	82nH
766	L9026	3210106101000	100nH
767	L9012	3210107221000	220nH
768	L9024	3217107331000	330nH
769	L402	3210406271000	270nH
770	L9022	3210406271000	270nH
771	L106	3210106391000	390nH
772	L108	3210106391000	390nH
773	L113	3210106391000	390nH
774	L114	3210106391000	390nH
775	L115	3210106391000	390nH
776	L116	3210106391000	390nH
777	L119	3210106391000	390nH
778	L124	3210406471000	470nH
779	L201	3210406471000	470nH
780	L409	3210406471000	470nH
781	L9027	3213306821000	0.82uH
782	L9011	3210209102010	1uH
783	L607	3290299222000	2.2uH
784	L613	3290299222000	2.2uH
785	L615	3290299222000	2.2uH
786	L616	3290299222000	2.2uH
787	L408	3210407472000	4.7uH
788	L413	3213306682000	6.8uH
789	L401	3215099103000	10uH

No.	Ref. No.	Part No.	Description
790	L404	3215099103000	10uH
791	L610	3217099153000	15uH
792	L614	3217099153000	15uH
793	D302	3303990000010	Switching diode
794	D601	3399990000110	Diode
795	D9002	3303030800040	Switching diode
796	D111	3304010100890	Varactor
797	D101	3304010100220	Varactor
798	D102	3304010100220	Varactor
799	D103	3304010100220	Varactor
800	D106	3304010100220	Varactor
801	D107	3304010100220	Varactor
802	D108	3304010100220	Varactor
803	D109	3304010100220	Varactor
804	D110	3304010100220	Varactor
805	D402	3304010100220	Varactor
806	D401	3304060300050	Varactor
807	D104	3303990000060	Switching diode
808	D105	3303990000060	Switching diode
809	D112	3303990000060	Switching diode
810	D9005	3303990000060	Switching diode
811	D9006	3303990000060	Switching diode
812	D9007	3303990000060	Switching diode
813	D604	3303030100010	Switching diode
814	D9011	3303030100010	Switching diode
815	D9010	3399990000080	Zener diode
816	D9013	3399990000260	Rectifier diode
817	D9017	3301250300000	Schottky barrier diode
818	D307	3399040600020	ESD protection diode
819	D308	3399040600020	ESD protection diode
820	D309	3399040600020	ESD protection diode
821	D310	3399040600020	ESD protection diode
822	D602	3399040600020	ESD protection diode
823	D318	3399040600010	ESD protection diode
824	D303	3399040600000	ESD protection diode
825	D304	3399040600000	ESD protection diode
826	D305	3399040600000	ESD protection diode
827	D306	3399040600000	ESD protection diode
828	Q9006	3410001000020	PNP transistor
829	Q102	3408002000000	NPN transistor
830	Q403	3408002000000	NPN transistor
831	Q9002	3408002000000	NPN transistor
832	Q105	3403003000060	NPN transistor
833	Q401	3403003000060	NPN transistor

No.	Ref. No.	Part No.	Description
834	Q9004	3406001000090	NPN transistor
835	Q101	3401002000990	NPN transistor
836	Q604	3503020000030	N-MOSFET
837	Q607	3503020000030	N-MOSFET
838	Q608	3503020000030	N-MOSFET
839	Q9001	3418001000010	NPN transistor
840	Q310	3511990000010	N-MOSFET
841	Q313	3511990000010	N-MOSFET
842	Q312	3403008000010	BRT
843	Q801	3403008000010	BRT
844	Q802	3403008000010	BRT
845	Q9007	3403008000010	BRT
846	Q9008	3403008000010	BRT
847	Q103	3403999000000	Compound transistor
848	Q106	3403999000000	Compound transistor
849	Q107	3403999000000	Compound transistor
850	Q9019	3403999000000	Compound transistor
851	Q9020	3403999000000	Compound transistor
852	Q603	3414001000040	NPN transistor
853	Q104	3408002000080	NPN transistor
854	Q108	3408002000080	NPN transistor
855	Q9017	3404006000000	NPN transistor
856	Q9018	3404006000000	NPN transistor
857	Q9005	3504990000010	MOSFET
858	Q9003	3504990000040	MOSFET
859	Q605	3505010000210	P-MOSFET
860	Q606	3505010000210	P-MOSFET
861	Q402	3499000000150	Compound transistor
862	U401	3603999000000	IF processor
863	U312	3805000000030	EMI filter
864	U313	3805000000030	EMI filter
865	U314	3805000000030	EMI filter
866	U315	3805000000030	EMI filter
867	U316	3805000000030	EMI filter
868	U317	3805000000030	EMI filter
869	U318	3805000000030	EMI filter
870	U319	3805000000030	EMI filter
871	U320	3805000000030	EMI filter
872	U321	3805000000030	EMI filter
873	U322	3805000000030	EMI filter
874	U101	3616059000000	Switch
875	U104	3616059000000	Switch
876	U9003	5404000000060	Sensor
877	U601	3608011000050	DC-DC

No.	Ref. No.	Part No.	Description
878	U611	3608011000050	DC-DC
879	U242	3612044000010	Memory
880	U9002	3605025000020	Operational amplifier
881	U820	3616037000020	Switch
882	U201	3610010000010	MCU
883	U610	3608006000030	Power management IC
884	U606	3608006000000	Power management IC
885	U608	3608006000000	Power management IC
886	U609	3608006000000	Power management IC
887	U612	3608006000000	Power management IC
888	U103	3604019000000	PLL
889	U102	3605002057290	Operational amplifier
890	U801	3602023005740	Audio amplifier
891	U604	3608020005750	Power management IC
892	U605	3608020005750	Power management IC
893	U821	3613010000000	Baseband processor
894	U701	3606010000010	D/A converter
895	U607	3609010000170	Reset IC
896	U244	3612002000020	Memory
897	U501	36099990000300	GPS LNA
898	ANT1	6201847000000	Antenna spring plate
899	F601	40990000000050	Fuse
900	F602	40100000000010	Fuse
901	J821	5201016000010	Board-to-board connector
902	J311	5201030000040	Board-to-board connector
903	J1601	5201050100030	Board-to-board connector
904	J313	5202002100200	Board-to-wire connector
905	J601	5205003100020	Battery connector
906	T9001	54060000000200	Transformer
907	T9002	54060000000200	Transformer
908	X101	3701019250030	TCXO
909	X203	3701019250040	TCXO
910	X201	3701327610060	Crystal
911	Z501	3804157560000	GPS filter
912	R404	3001051220000	1.2KΩ
913	L110	3210306221000	220nH
914	L9032	3210306221000	220nH
915	L9038	3210406331000	330nH
916	R9004	3233099449000	4.4nH
917	C802	3101071060010	10UF
918	C9011	3101061010010	100PF
919	Z9001	3802733540030	Crystal filter
920	U502	1615000001720	GPS module
921	R9020	3001051030010	10KΩ

No.	Ref. No.	Part No.	Description
922	R9023	3001053920010	3.9KΩ
923	R9047	3001053920010	3.9KΩ
924	C159	3101052220010	2200pF
925	C160	3101052220010	2200pF
926	C431	3101052220010	2200pF
927	C102	3101054790010	4.7PF
928	C103	3101054790010	4.7PF
929	C111	3101054790010	4.7PF
930	C112	3101054790010	4.7PF
931	C130	3101062700010	27PF
932	C9007	3101060700020	7PF
933	C152	3101060500010	5PF
934	C452	3101060500010	5PF
935	C9015	3101060500010	5PF
936	Q9021	3401001000490	PNP transistor
937	C178	3101074740000	0.47UF
938	C9003	3199060758000	0.75PF
939	L101	3210306220000	22nH
940	L107	3210306270000	27nH
941	L9002	3210306560000	56nH
942	L9025	3210306560000	56nH
943	L406	3217107221020	220nH
944	D9001	3304010100200	Varactor
945	D9012	3304010100200	Varactor
946	D9014	3304010100200	Varactor
947	D9015	3304010100200	Varactor
948	D9016	3304010100200	Varactor
949	L109	3221505121000	Bead
950	L120	3221505121000	Bead
951	L121	3221505121000	Bead
952	L122	3221505121000	Bead
953	L123	3221505121000	Bead
954	L125	3221505121000	Bead
955	L403	3221505121000	Bead
956	L405	3221505121000	Bead
957	L412	3221505121000	Bead
958	L702	3221505121000	Bead
959	R712	3221505121000	Bead
960	L118	3237138689000	6.8nH
961	C9134	3101057590000	7.5PF
962	L411	3217107392000	3.9uH
963	D9008	3303060300010	Switching diode
964	L111	3247107180000	18nH
965	R124	3001051220090	1.2KΩ

No.	Ref. No.	Part No.	Description
966	R125	3001051220090	1.2K Ω
967	R9056	3001051240010	120K Ω
968	R123	3001051840010	180K Ω
969	C154	3001052220010	2.2K Ω
970	R122	3001053320010	3.3K Ω
971	R120	3001054790010	4.7K Ω
972	R601	3001059130000	91K Ω
973	C608	3101051050160	1 μ F
974	C9111	3101050690050	6PF
975	C149	3101060200010	2PF
976	C458	3101061800000	18PF
977		6201810000000	Shielding can for baseband processor
978		6201860000000	Shielding frame for GPS
979		6201865000000	Shielding can for crystal oscillator
980		6201915000000	Shielding can for antenna spring plate
981		6201935000000	Shielding can for switching power
982		6201859000000	Shielding frame for lowpass filter
983		6201862000000	Shielding can for TX VCO
984		41PD7001000K0	Main board
985		9830000000001	Voice coding software

Channel Board for PD70X/ PD70XG/ HD705/ HD705G

No.	Ref. No.	Part No.	Description
1	R1002	3001051210010	120Ω
2	C1001	3101052710000	270PF
3	C1002	3101052710000	270PF
4	C1003	3101052710000	270PF
5	C1004	3101052710000	270PF
6	C1005	3101052710000	270PF
7	C1006	3101052710000	270PF
8	C1007	3101052710000	270PF
9	C1010	3101052710000	270PF
10	C1011	3101052710000	270PF
11	C1012	3101052710000	270PF
12	D1001	3310040000000	ESD protection diode
13	D1003	3310040000000	ESD protection diode
14	D1004	3310040000000	ESD protection diode
15	D1005	3310040000000	ESD protection diode
16	D1006	3310040000000	ESD protection diode
17	D1007	3310040000000	ESD protection diode
18	D1008	3310040000000	ESD protection diode
19	D1011	3310040000000	ESD protection diode
20	D1014	3310040000000	ESD protection diode
21	D1009	3399040600020	ESD protection diode
22	D1013	3399040600020	ESD protection diode
23	D1002	3307120100050	LED
24	Q1001	3403009000010	Compound transistor
25	U1001	3805000000040	EMI filter
26	J1001	5201016100040	Board-to-board connector
27	S1003	4301080000020	Momentary contact switch
28		41PD7002002B0	PCB
29	R1001	3001056810000	680Ω
30	C1015	3101051040060	0.1UF
31	C1016	3101051040060	0.1UF
32	C1017	3101051040060	0.1UF
33	L1001	3221506181000	Bead
34	U1002	3608006000030	Power management IC

Channel Board for PD78X/ PD78XG/ HD785/ HD785G

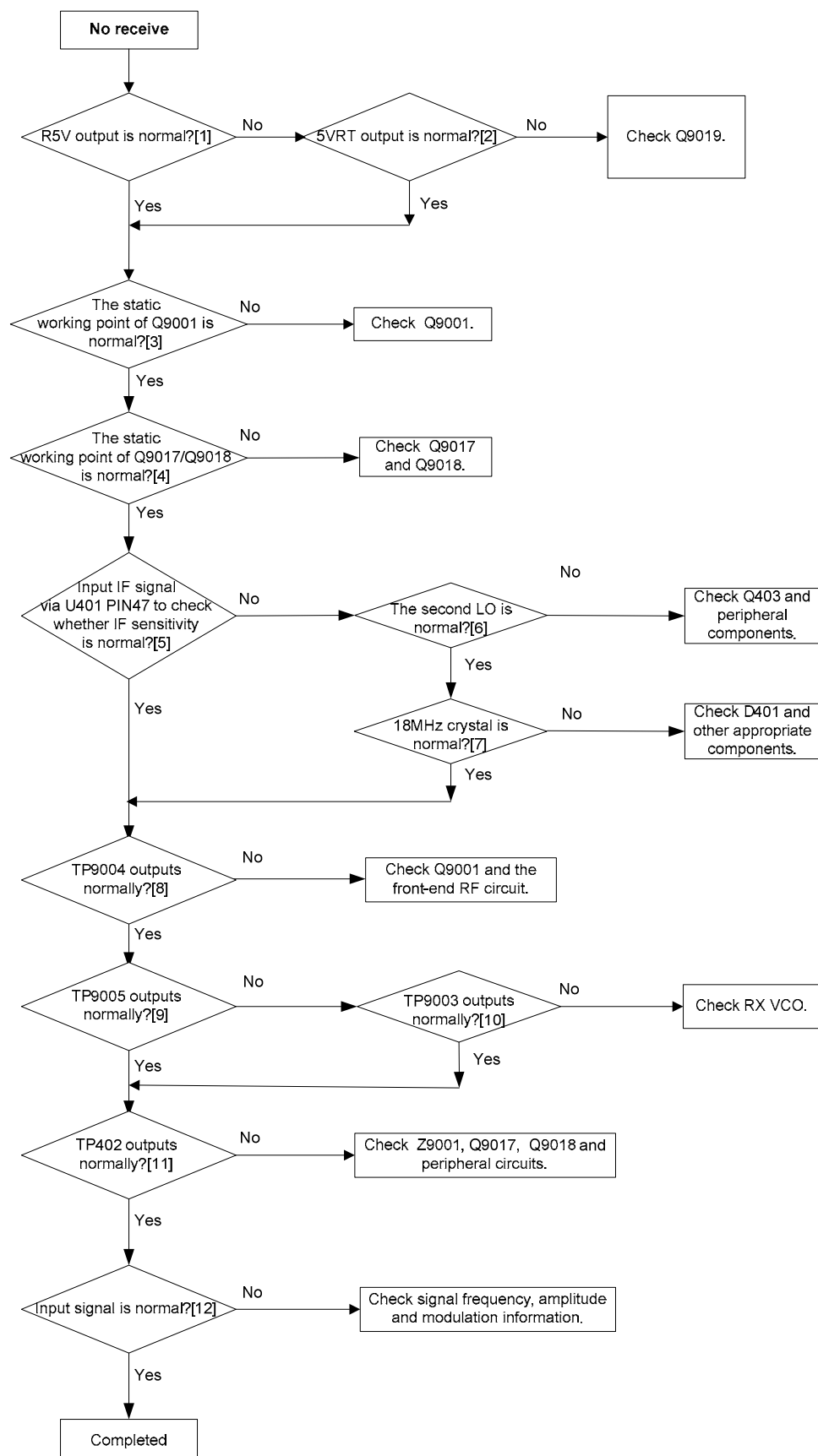
No.	Ref. No.	Part No.	Description
1	R1002	3001051210010	120Ω
2	C1001	3101052710000	270PF
3	C1002	3101052710000	270PF
4	C1003	3101052710000	270PF
5	C1004	3101052710000	270PF
6	C1005	3101052710000	270PF
7	C1006	3101052710000	270PF
8	C1007	3101052710000	270PF
9	C1010	3101052710000	270PF
10	C1011	3101052710000	270PF
11	C1012	3101052710000	270PF
12	D1001	3310040000000	ESD protection diode
13	D1003	3310040000000	ESD protection diode
14	D1004	3310040000000	ESD protection diode
15	D1005	3310040000000	ESD protection diode
16	D1006	3310040000000	ESD protection diode
17	D1007	3310040000000	ESD protection diode
18	D1008	3310040000000	ESD protection diode
19	D1011	3310040000000	ESD protection diode
20	D1014	3310040000000	ESD protection diode
21	D1009	3399040600020	ESD protection diode
22	D1013	3399040600020	ESD protection diode
23	D1002	3307120100050	LED
24	Q1001	3403009000010	Compound transistor
25	U1001	3805000000040	EMI filter
26	J1001	5201016100040	Board-to-board connector
27	S1003	4301080000020	Momentary contact switch
28		41PD7802006C0	PCB
29	R1001	3001056810000	680Ω
30	C1015	3101051040060	0.1UF
31	C1016	3101051040060	0.1UF
32	C1017	3101051040060	0.1UF
33	L1001	3221506181000	Bead
34	U1002	3608006000030	Power management IC

Keyboard for PD78X/ PD78XG/ HD785/ HD785G

No.	Ref. No.	Part No.	Description
1	R1	3001051010000	100Ω
2	R2	3001051010000	100Ω
3	R3	3001051010000	100Ω
4	R4	3001051010000	100Ω
5	R5	3001051010000	100Ω
6	R6	3001051010000	100Ω
7	R7	3001051010000	100Ω
8	D1	3307990000260	LED
9	D2	3307990000260	LED
10	D3	3307990000260	LED
11	D4	3307990000260	LED
12	D5	3307990000260	LED
13	D6	3307990000260	LED
14	D7	3307990000260	LED
15	D8	3310040000010	ESD protection diode
16	D9	3310040000010	ESD protection diode
17	J4	5201016000010	Board-to-board connector

11.8 Troubleshooting Flow Chart

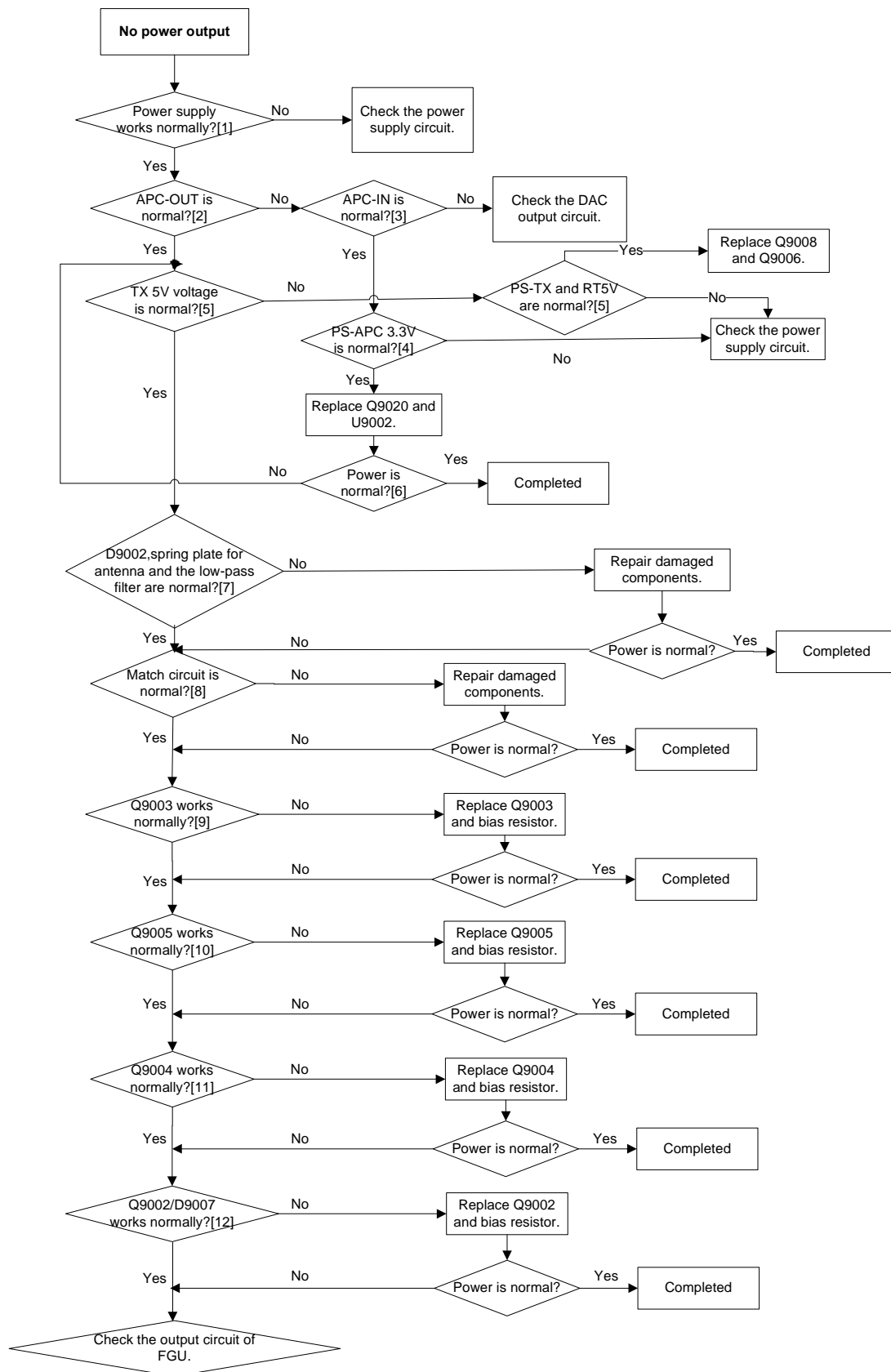
Receiver Circuit



Description of Normal Situations:

- [1] Output voltage by Q9019 PIN3: about 4.95V.
- [2] Output voltage by U605 PIN4 or input voltage into Q9019 PIN4: about 5V.
- [3] Vbe: about 0.74V; Vce: about 2.5V (in the case of no signal reception).
- [4] For Q9018, Vbe: about 0.76V; Vce: about 0.95V;
for Q9017, Vbe: about 0.7V; Vce: 0.85V (in the case of no signal reception).
- [5] Cut off the front-end circuit, and input a 73.35MHz IF signal at TP402 to test IF sensitivity. Normally, the IF sensitivity is -109dBm.
- [6] Frequency of Q403: 71.1MHz.
- [7] Frequency of L411: 18MHz.
- [8] Input -30dBm RF signal at the antenna connector and test at TP9004. Normally, gain>10dB, output signal>-20dBm.
- [9] Input -30dBm RF signal at the antenna connector and test at R9005 (do not cut off the back-end circuit). Normally, gain>1dB, output signal>-29dBm.
- [10] Signal frequency: RF-IF, signal amplitude>2dBm.
- [11] For input of -80dBm signal at L9022, gain>25dB, output signal>-55dBm;
for input of -30dBm signal, output signal<-20dBm.
- [12] The input signal at the antenna connector, with standard tuning information (AF=1KHz, FM=3KHz), is -47dBm.

Transmitter Circuit

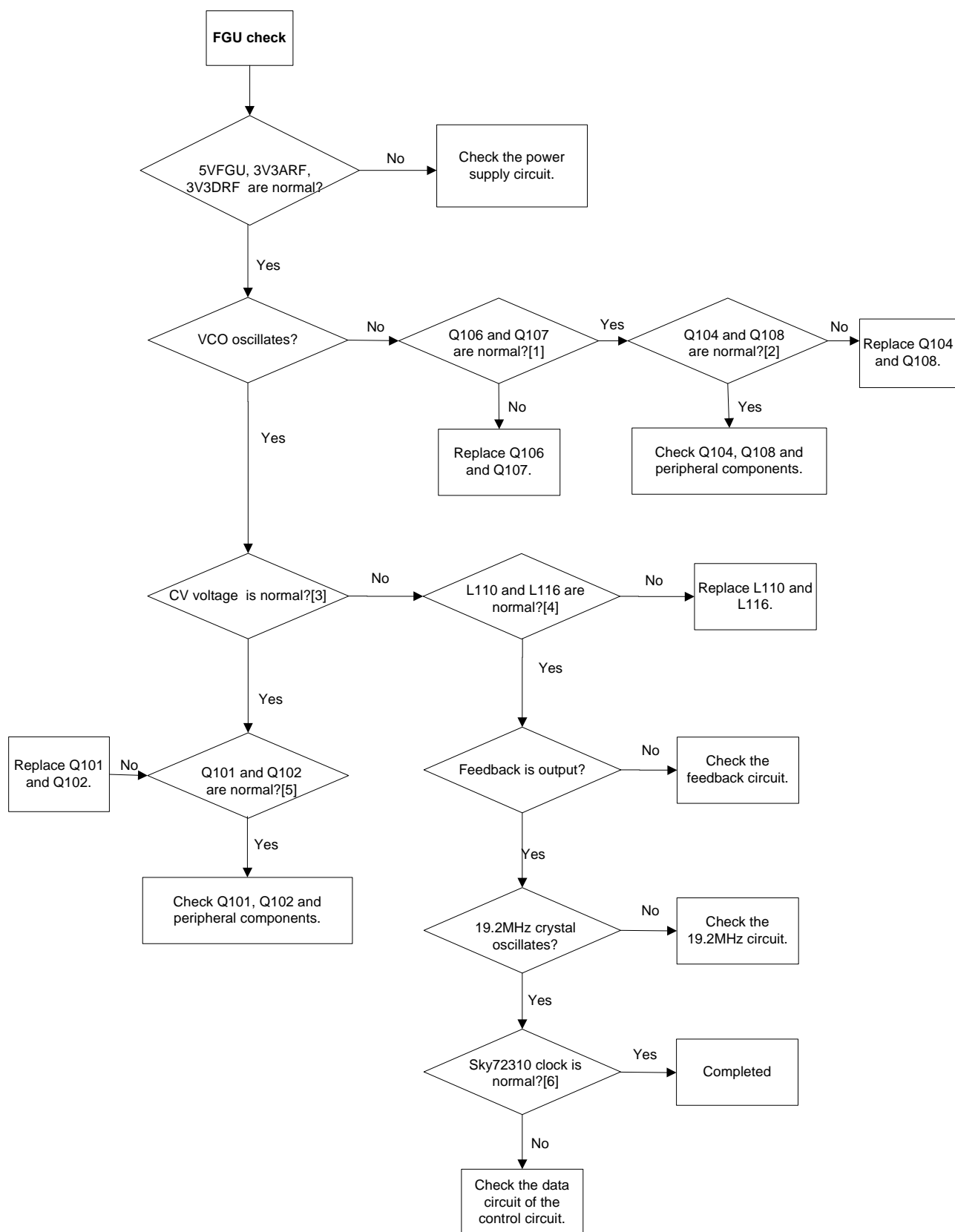


Description of Normal Situations:

- [1] Voltage of the power supply: about 7.4V.
- [2] For low power, APC-OUT: 1.8-2.1V; for high power, APC-OUT: 2.4-2.8V.
- [3] For low power, APC-IN: 1-1.3V; for high power, APC-IN: 1.8-2.1V.
- [4] PS-APC: about 3.3V.
- [5] TX5V: about 5V; RT5V: about 5V; PS-TX: about 3.3V.
- [6] High power: about 4.2W; low power: about 1.2W.
- [7] Start-up voltage of D9002: about 0.7V. The low-pass filter must be soldered appropriately and remain in good condition. The spring plate for the antenna must be well fitted into the antenna connector.
- [8] The match components must not be soldered inappropriately or damaged.
- [9] Vdd: about 7.3V; for low power, Vgg: 1-1.2V; for high power, Vgg: 1.35-1.55V.
- [10] Vdd: about 7.3V; for low power, Vgg: 1.7-2.1V; for high power, Vgg: 2.4-2.8V.
- [11] Vc: about 4.8V; Vb: about 1.4V; Ve: about 1.1V.
- [12] Vc: about 4.7V; Vb: about 0.7V; Ve: 0V. Start-up voltage of D9007: about 0.7V.

Note: The above check operations should be made under 7.4V voltage.

FGU



Description of Normal Situations:

- [1] During transmission, output voltage by Q107 PIN3: about 4V.
During reception, output voltage by Q106 PIN3: about 4V.
- [2] During transmission, voltage at Q108 E: about 1.8V.
During reception, voltage at Q104 E: about 1.8V.
- [3] The CV value varies with frequencies. Generally, it is within the range 0.5V-4.5V.
- [4] L110/L116 is on.
- [5] Voltage at Q101/Q102 B: about 0.7V.
- [6] MCSI-CLK-PLL outputs 960KHz clock.

12. UHF3 (350-400MHz) Information

12.1 Transmitter Circuit

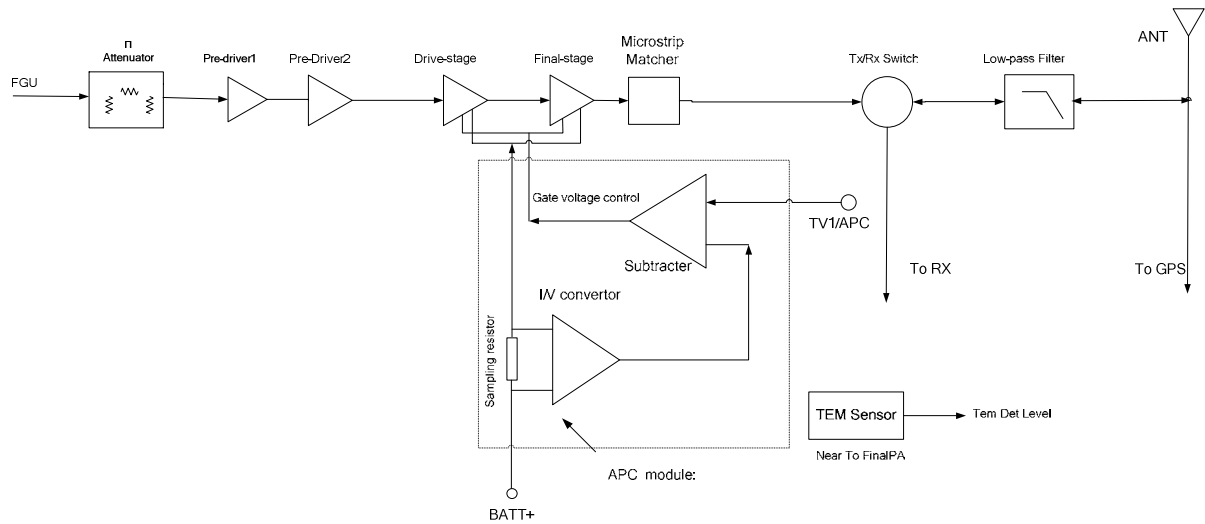


Figure 12-1 Diagram of Transmitter Circuit

The transmitter circuit is mainly composed of:

- ① RF power amplifier circuit
- ② Low-pass filter circuit (for suppressing harmonics)
- ③ Auto power control circuit (APC) (including temperature detection circuit)

The carrier signal generated by TX VCO is modulated and amplified, and then feeds to the transmitter circuit. In this circuit, the signal passes through a π -type attenuator first, allowing certain isolation between the RF power amplifier circuit and TX VCO. Then it goes to a pre-driver amplifier (2SC3356) for pre-amplification, also providing certain isolation. After that, the signal goes to another pre-driver amplifier (2SC4988) and a driver amplifier (RD01) for further power amplification, to provide appropriate signal to the final-stage amplifier (RD07) for final power amplification. After processed by multiple amplifiers, the signal is processed by a microstrip matcher to complete output impedance matching, so as to reduce output power loss due to impedance mismatch. Then the signal passes through the TX/RX switch and goes to the low-pass filter.

The low-pass filter is a high-order Chebyshev filter composed of lumped-parameter inductors and capacitors. Via this filter, the spurious signal within the stop band can be attenuated as much as possible while the in-band ripple is within the required range.

In the auto power control and temperature detection circuit, the drain current from the driver amplifier and final-stage amplifier is converted to voltage via the sampling resistor and subtraction circuit (composed of the first operational amplifier). This voltage is compared with the APC control voltage (output by DAC) at the second operational amplifier. Then the error voltage, which is output by the second operational amplifier, controls TX power by controlling the bias voltage at the gates of the amplifiers (including the driver amplifier and the final-stage amplifier). The temperature sensor detects the surface temperature of the final-stage amplifier, and converts it to DC voltage. Then the DC voltage is compared with the voltage corresponding to the protection temperature (generally 80% of the extreme temperature) of the amplifier. If the surface temperature is too high, the bias voltage of the amplifier will be reduced, so as to reduce output power. The bias voltage will not be increased until the surface temperature restores to normal level. This process will be repeated while the radio operates.

12.2 Receiver Circuit

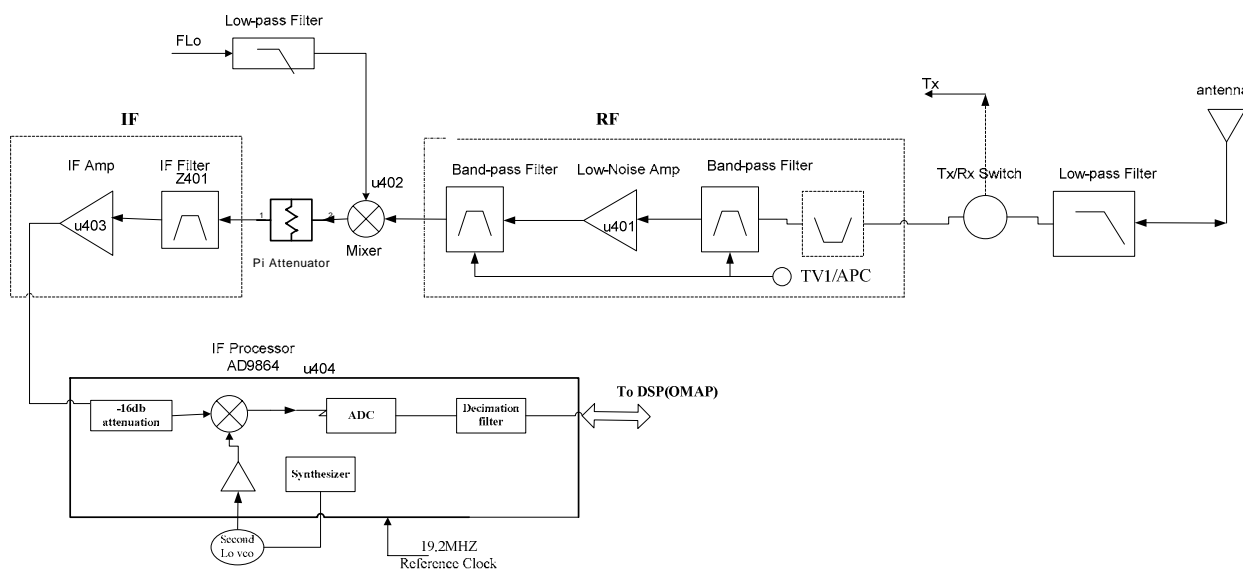


Figure 12-2 Diagram of Receiver Circuit

The receiver circuit mainly comprises the RF band-pass filter, low-noise amplifier, mixer, IF filter, IF amplifier and IF processor.

12.2.1 Receiver Front-end

The HF signal from the low-pass filter passes through the electrically tunable band-pass filter controlled via APC/TV1 level, to remove out-of-band interference signal and to send wanted band-pass signal to the low-noise amplifier (Q9001). The amplified signal goes to a band-pass filter controlled via APC/TV1

level, to remove out-of-band interference signal generated during amplification, and to send wanted HF signal to the mixer.

The wanted signal passes through the RF band-pass filter and low-noise amplifier and goes to the mixer (D9017). Meanwhile, the first local oscillator (LO) signal generated by VCO passes through the low-pass filter and also goes to the mixer (D9017). In the mixer, the wanted signal and the first LO signal are mixed to generate the first IF signal (73.35MHz). Then the signal passes through a π -type attenuator (2dB) and the LC, to suppress carrier other than the first IF signal, and to increase the isolation between the mixer and the IF filter. After that, the first IF signal is processed by the crystal filter (Z9001), and is sent to the two-stage IF amplifier circuit (composed of 2SC3356) for amplification. Then the amplified signal goes to the IF processor AD9864(U401) for processing.

12.2.2 Receiver Back-end

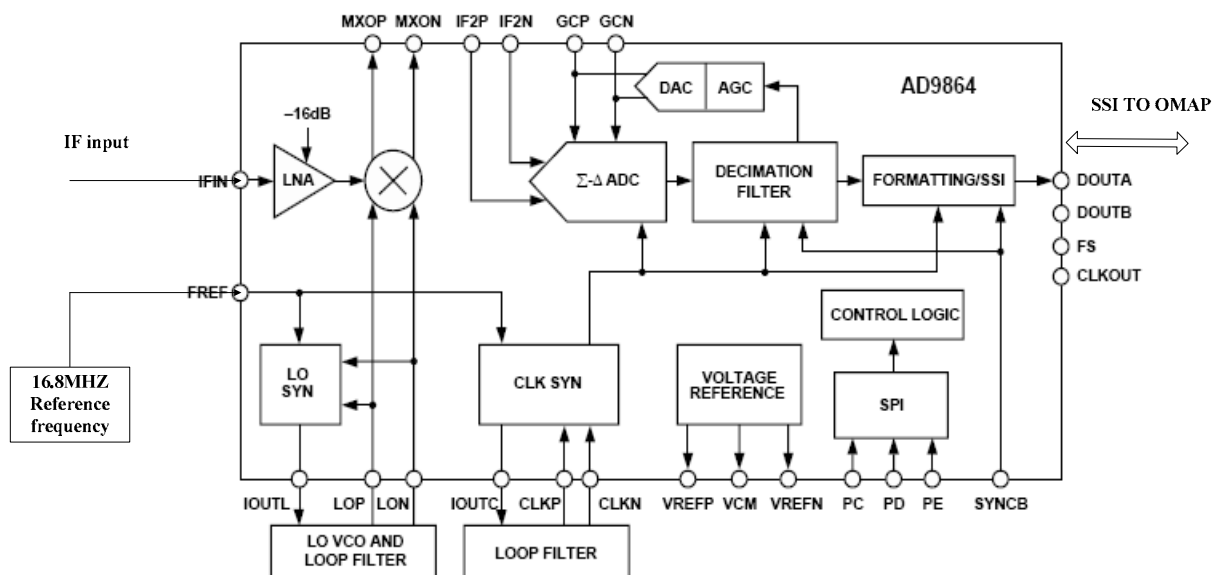


Figure 12-3 Diagram of IF Processor

The first IF signal (73.35MHz) output by the IF amplifier goes into AD9864 (U401) via Pin 47, where the signal is converted to the second IF signal (2.25MHz). Then the signal is converted to digital signal via ADC sampling, and output via the SSI interface. Finally, the digital signal is sent to DSP (OMAP5912) for demodulation.

AD9864 employs reference frequency of 19.2MHz and shares the crystal with OMAP. The second LO VCO comprises an oscillator, a varactor and some other components, to provide the 71.1/75.6MHz LO signal. The 18MHz clock frequency is generated by the LC resonance loop.

12.3 Frequency Generation Unit (FGU)

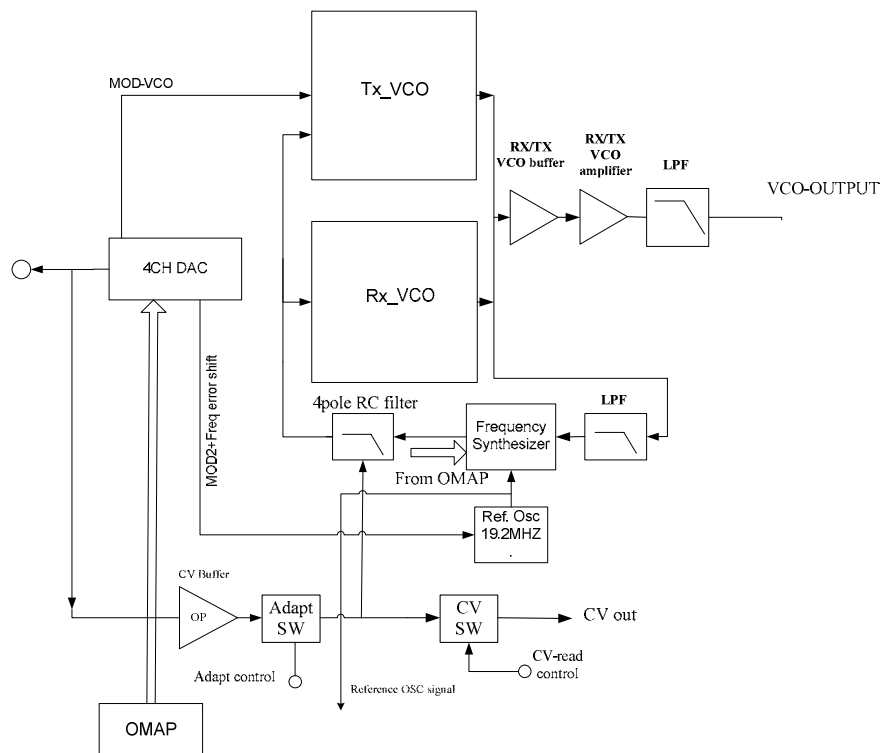


Figure 12-4 Diagram of FGU

The FGU is composed of VCO and PLL. It is the core module of the whole TX-RX system. This circuit provides accurate carrier frequency during transmission, and stable LO signal during reception. It has a direct influence on the performance of the system.

12.3.1 Working Principle of PLL

The 19.2MHz frequency generated by the reference crystal oscillator goes to PLL for division, generating the reference frequency (i.e. step frequency f_1). Meanwhile, the frequency generated by VCO generates another frequency (f_2) through the frequency divider in PLL. Then frequencies f_1 and f_2 are compared in the phase detector (PD), to generate continuous pulse current. The current goes to the loop filter for RC integration, and is then converted to CV voltage. Then the CV voltage is sent to the varactor of VCO. It adjusts the output frequency of VCO directly until the CV voltage becomes constant. Then PLL is locked, and the stable frequency output by VCO goes to the TX-RX channel after passing through two buffer amplifiers.

12.3.2 Working Principle of VCO

VCO employs Colpitts oscillator circuit (the RX oscillator circuit is composed of D102, D103, D106, D107 and L112; the TX oscillator circuit is composed of D108, D109, D110, D101 and L117). It obtains different

output frequencies by changing the varactor's control voltage (i.e. CV voltage).

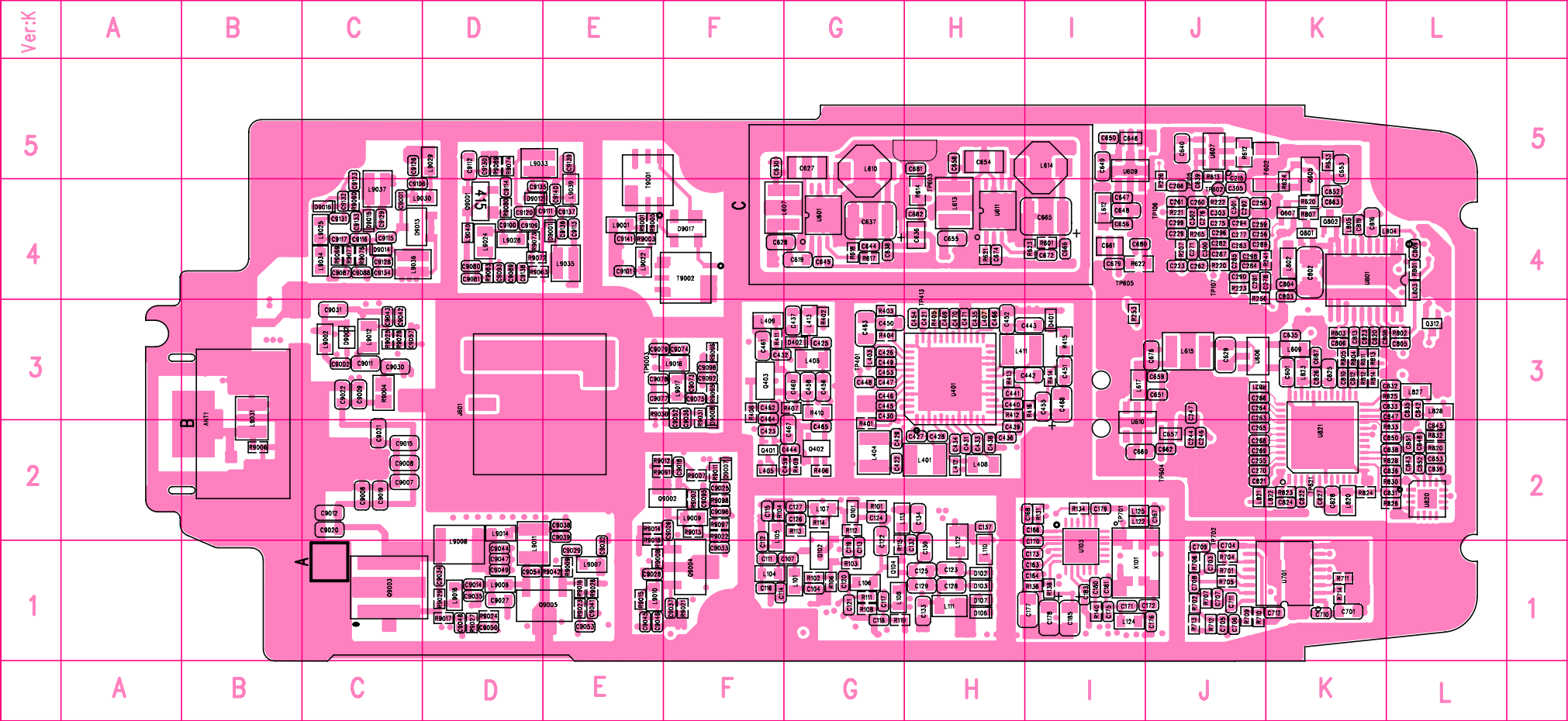
There are two types of VCO: TX VCO and RX VCO. Both types control EMD22 to switch operating status via OMAP. RX VCO is composed of the oscillator loop and Q104, to provide LO signal. TX VCO is composed of the oscillator loop and Q108, to provide carrier for TX signal.

12.3.3 Two-point Modulation

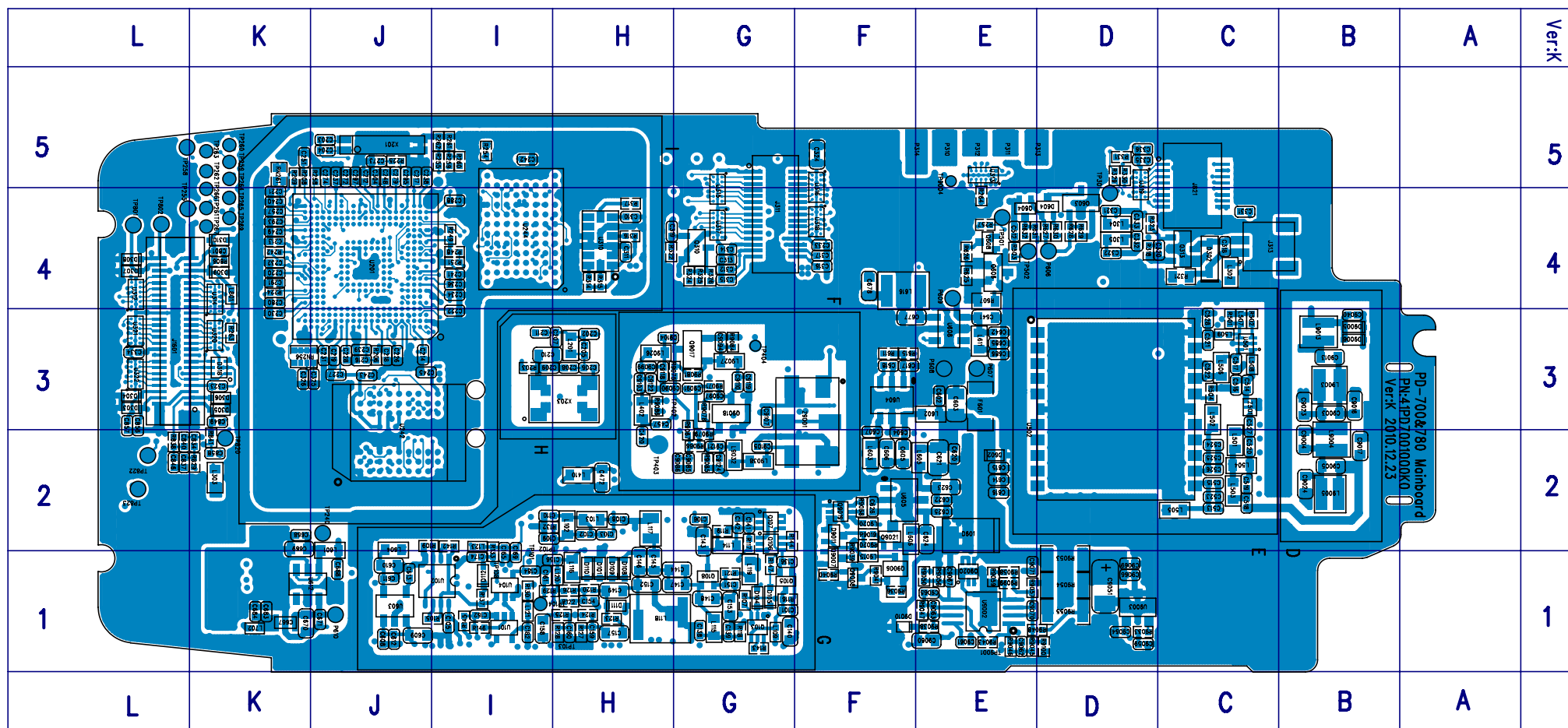
In TX mode, the two-point modulation technology is employed, to obtain higher modulation accuracy and lower 4FSK bit error rate. MOD-VCO and MOD-XO send the modulation signal to the modulation end of VCO and the reference crystal oscillator of PLL respectively to modulate TX VCO and the reference crystal oscillator.

12.4 PCB View

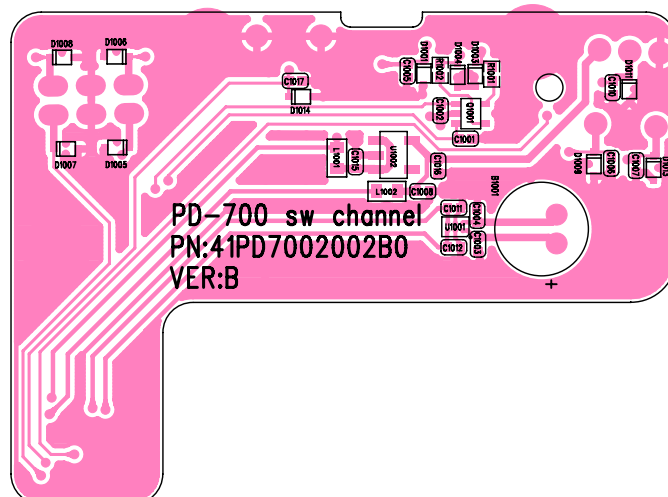
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G PCB View (Main Board)
Top Layer



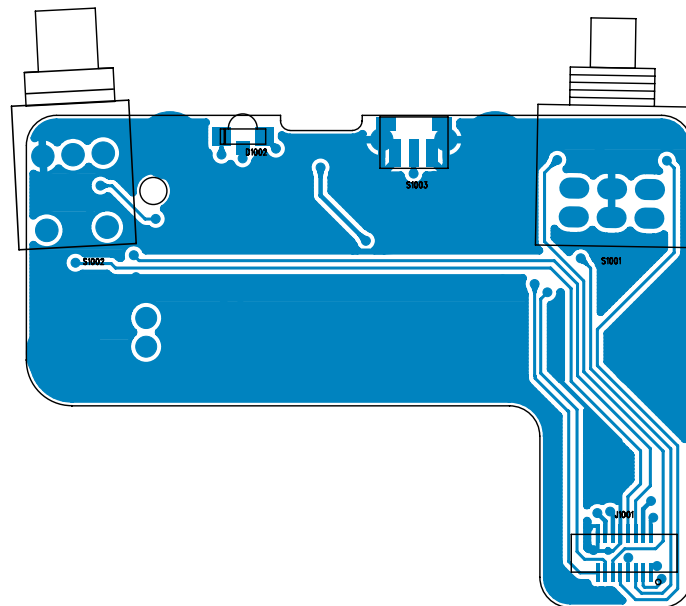
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G PCB View (Main Board) Bottom Layer



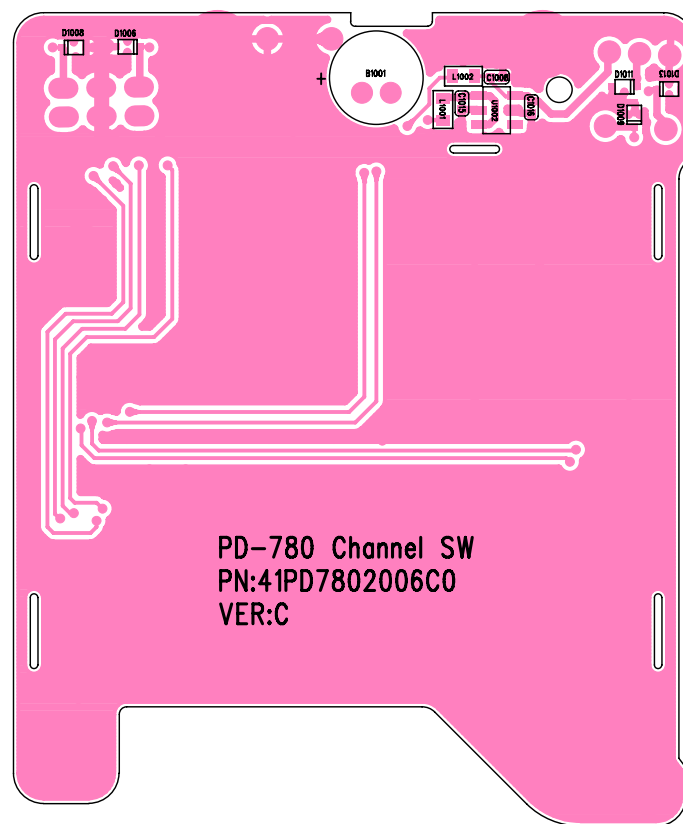
PD70X/PD70XG/HD705/HD705G PCB View (Channel Board)
Top Layer



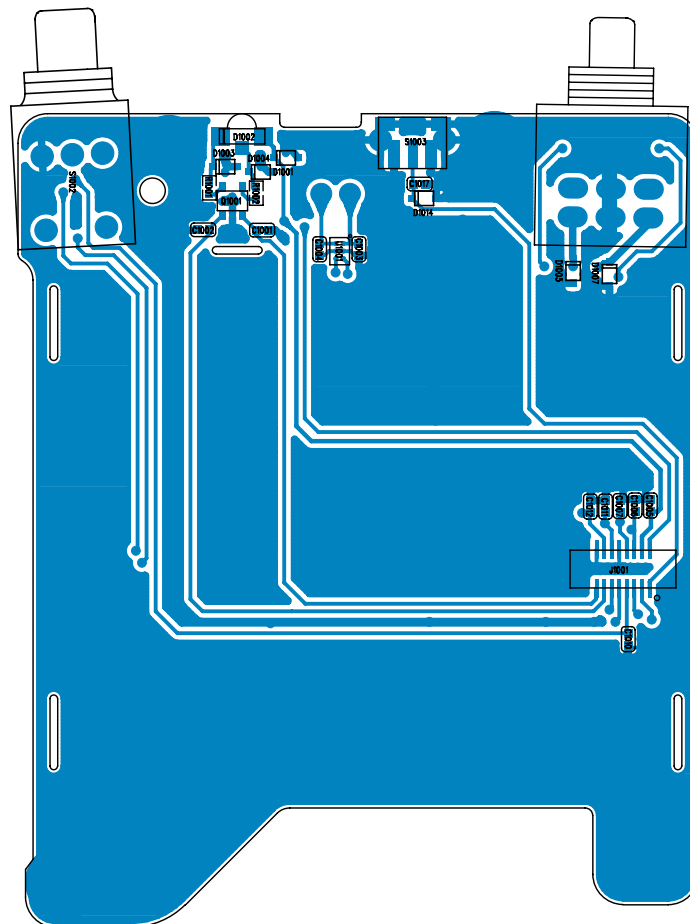
PD70X/PD70XG/HD705/HD705G PCB View (Channel Board) Bottom Layer



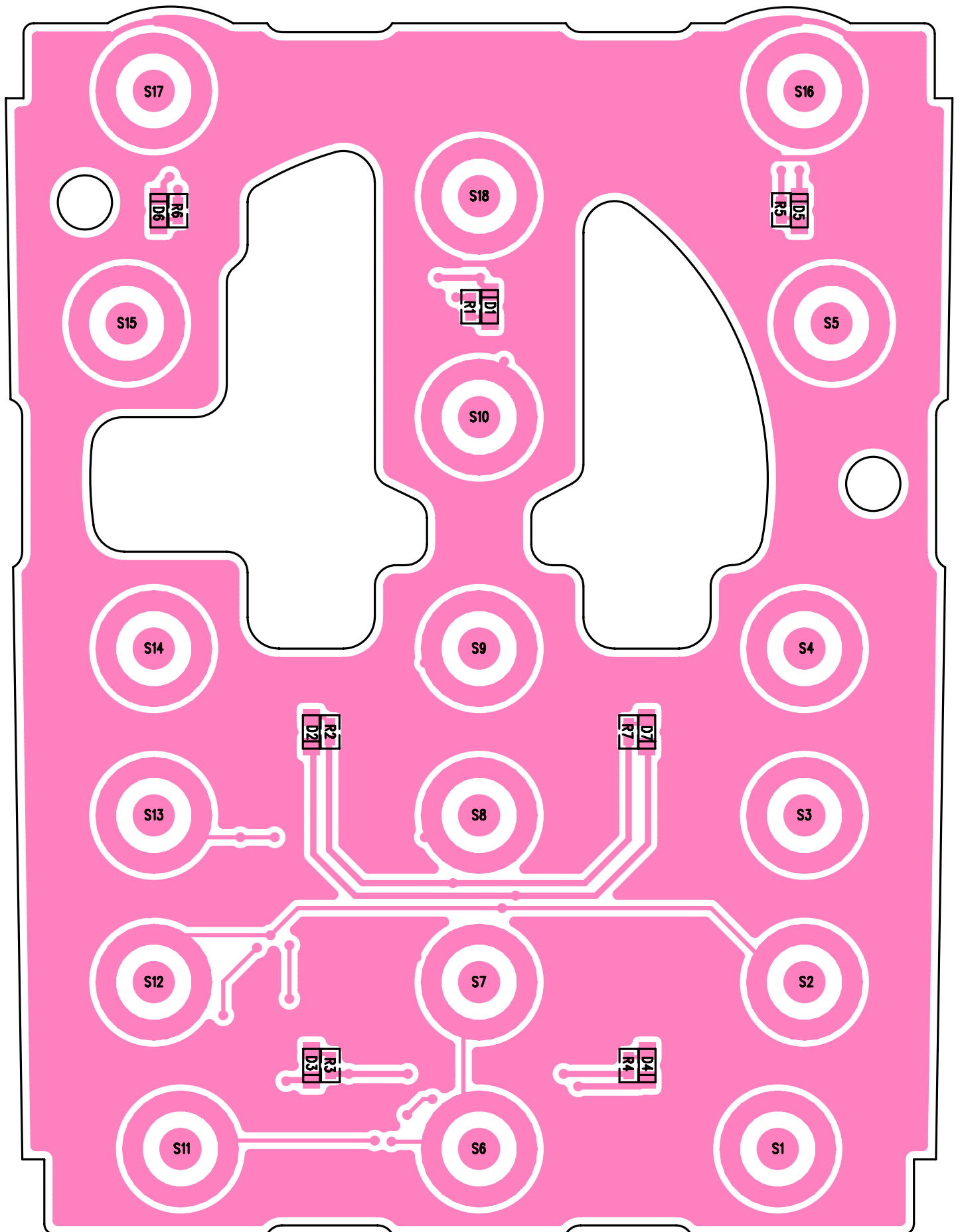
PD78X/PD78XG/HD785/HD785G PCB View (Channel Board) Top Layer



PD78X/PD78XG/HD785/HD785G PCB View (Channel Board)
Bottom Layer

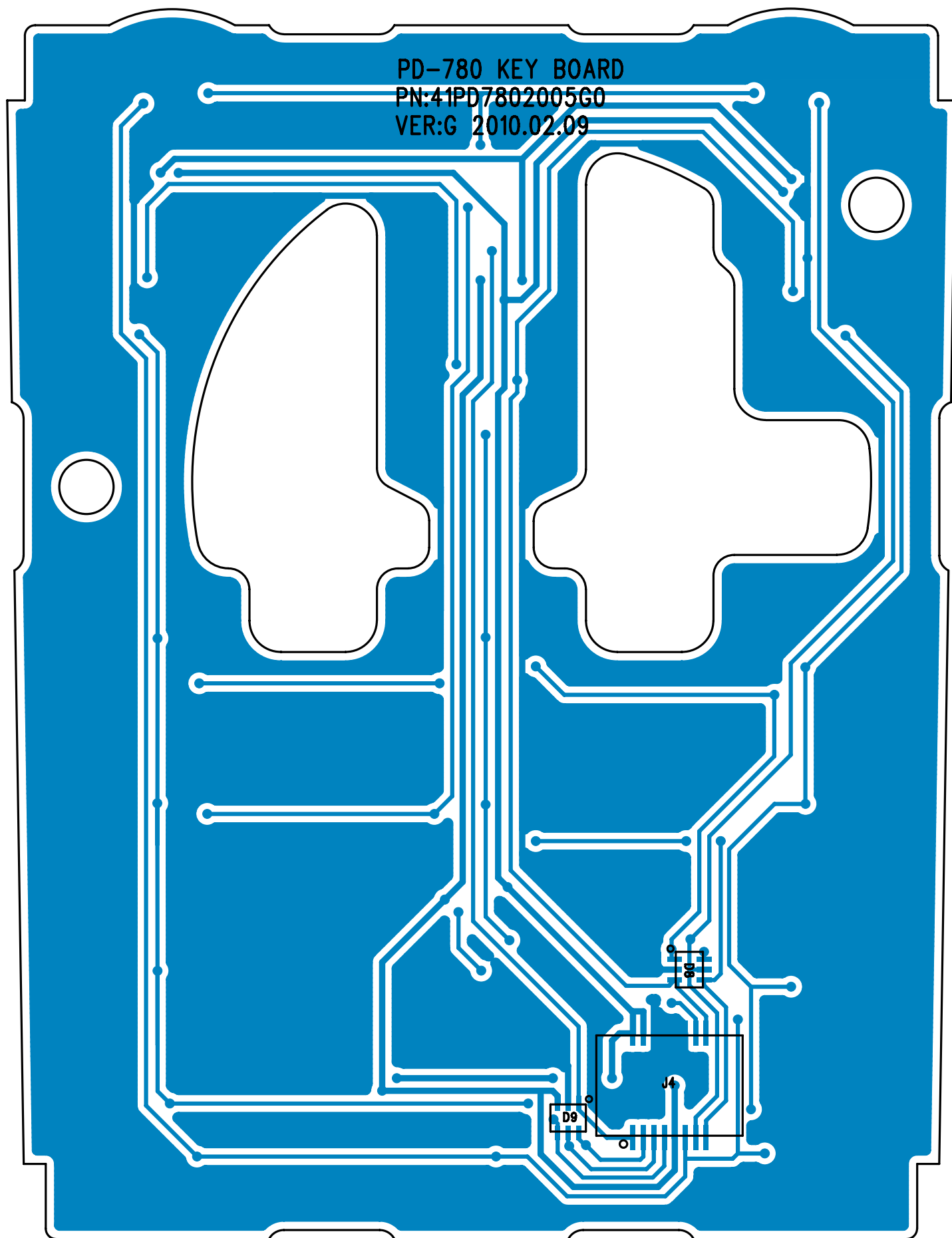


PD78X/PD78XG/HD785/HD785G PCB View (Keyboard) Top Layer



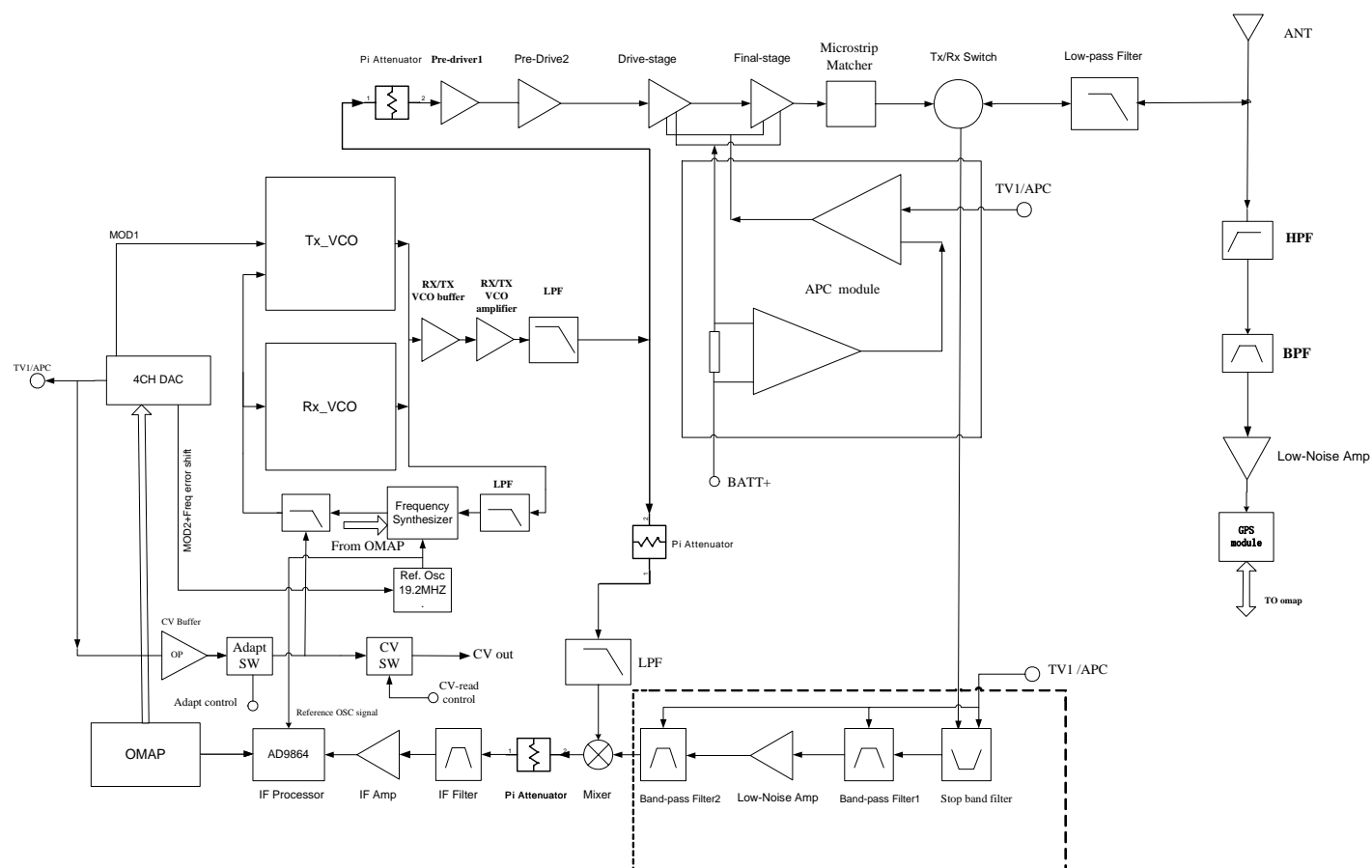
PD78X/PD78XG/HD785/HD785G PCB View (Keyboard)
Bottom Layer

PD-780 KEY BOARD
PN:41PD7802005G0
VER:G 2010.02.09



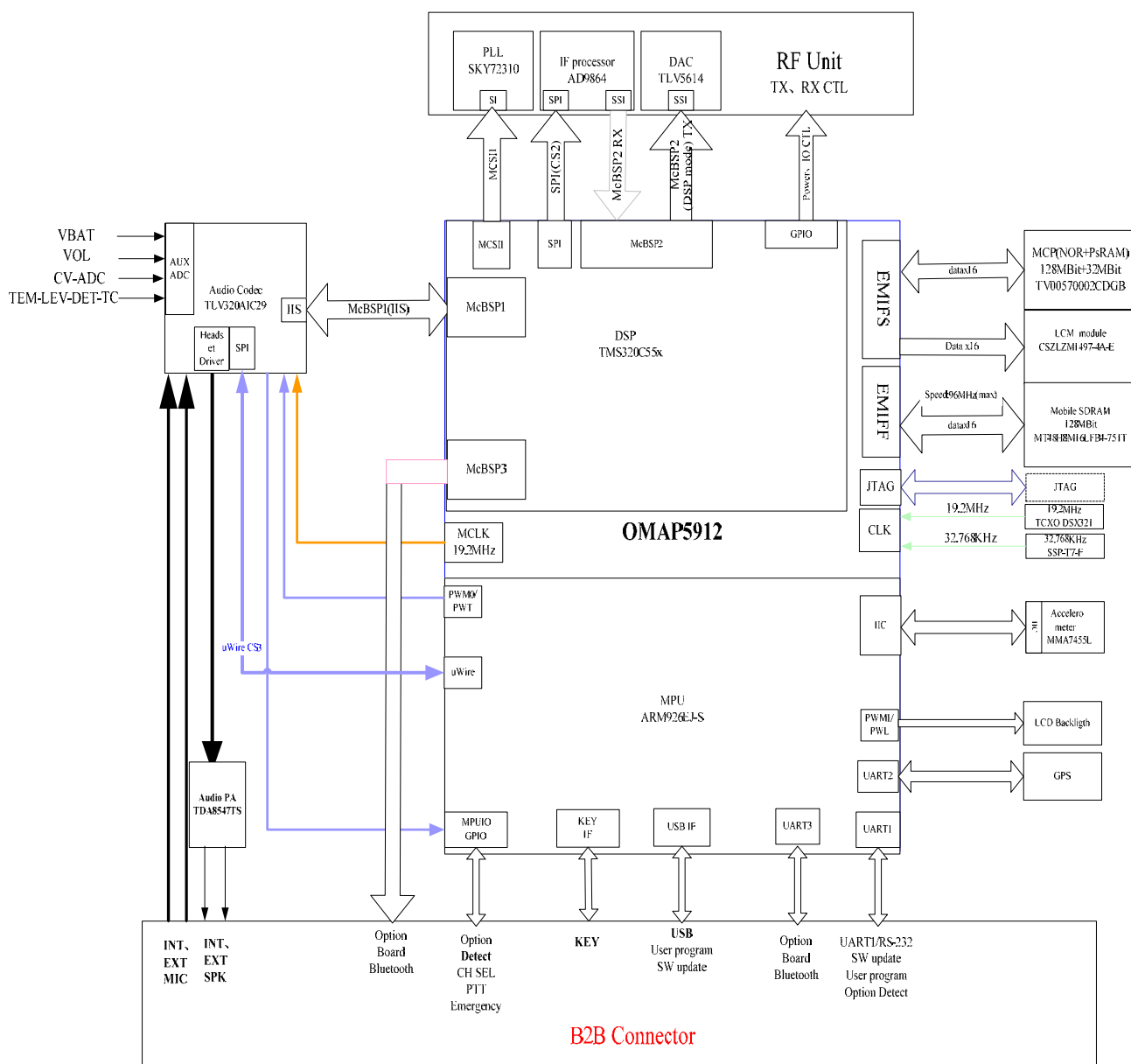
12.5 Block Diagram

PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G
Block Diagram (RF Section)

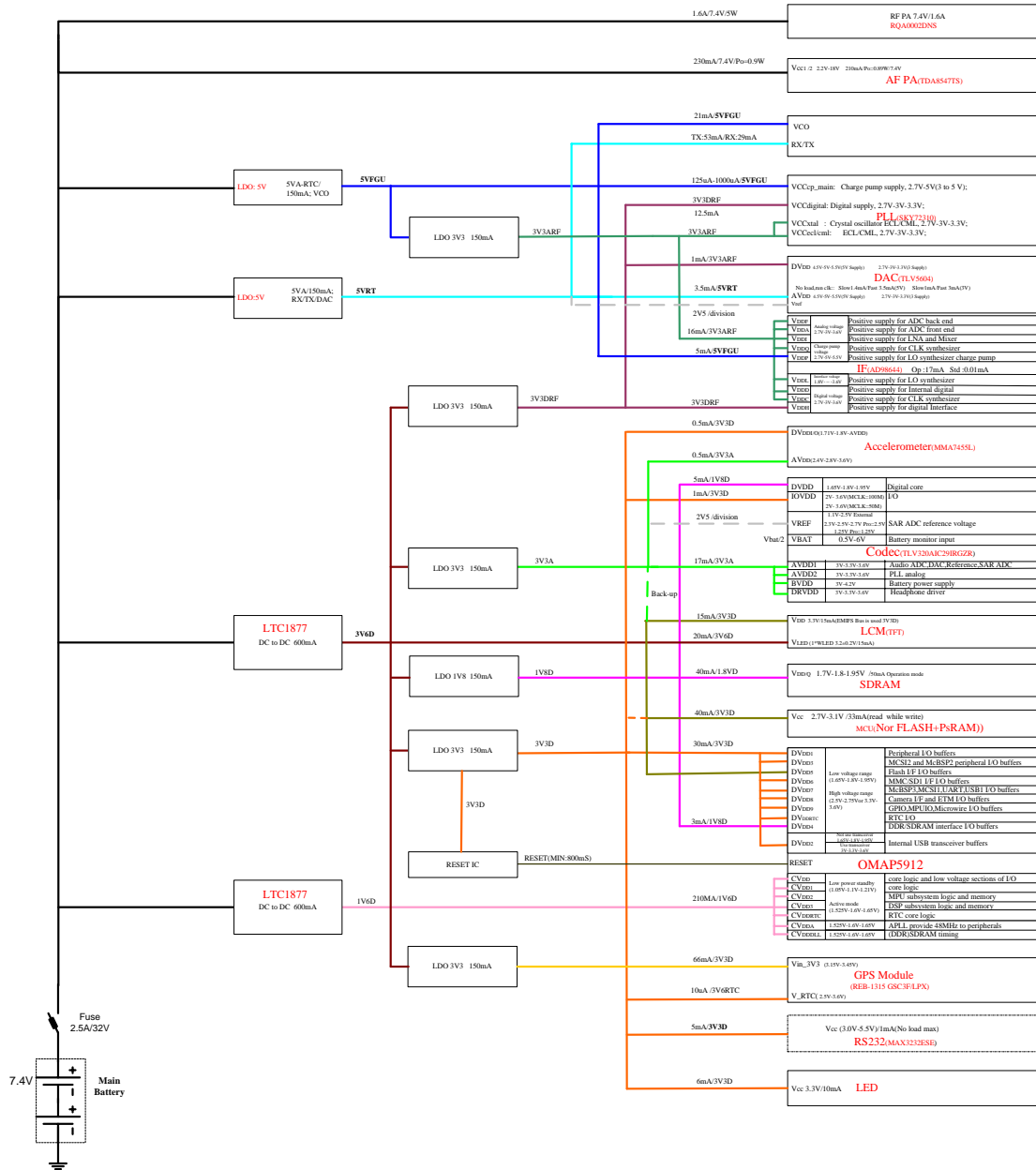


PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G

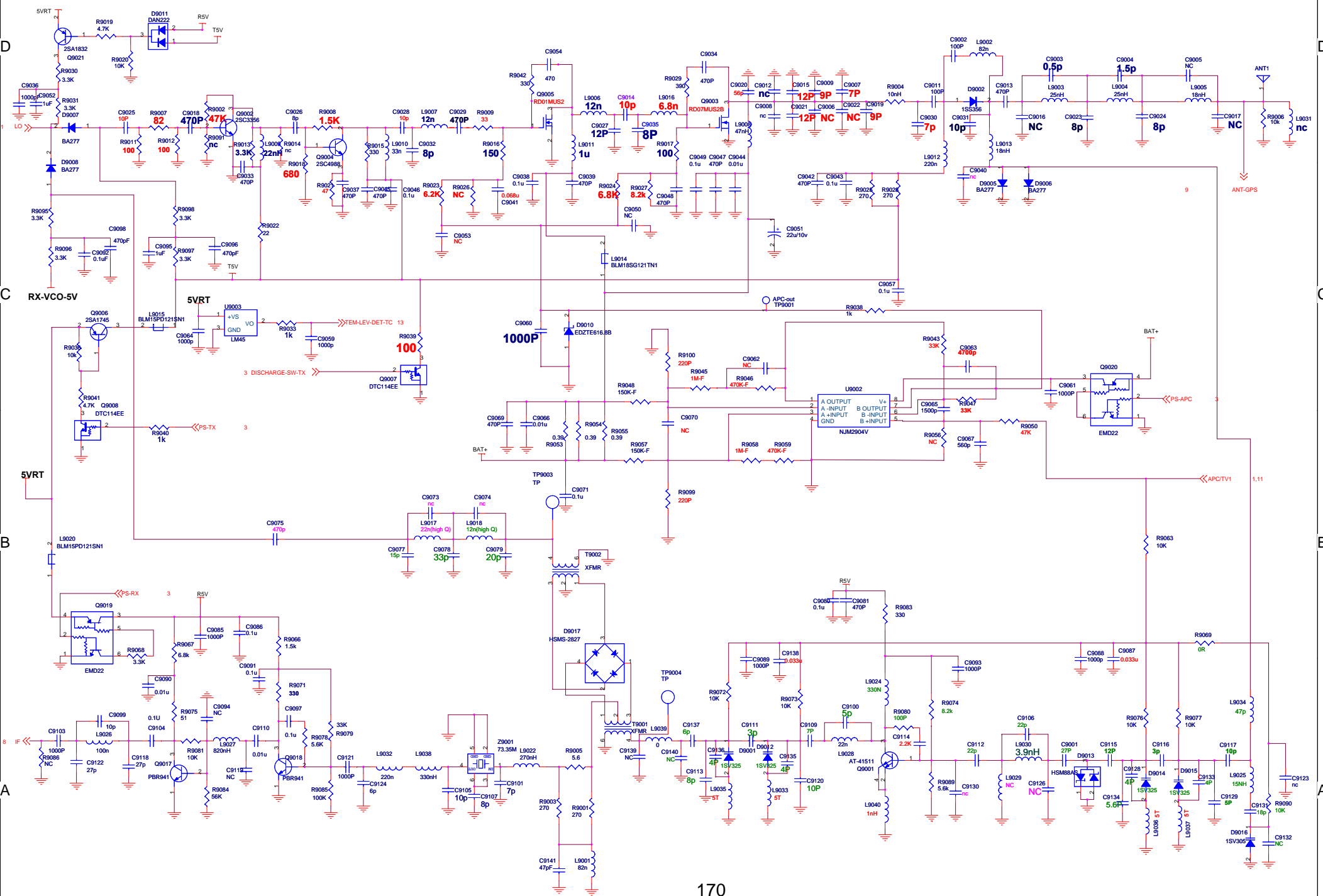
Block Diagram (Baseband Section)



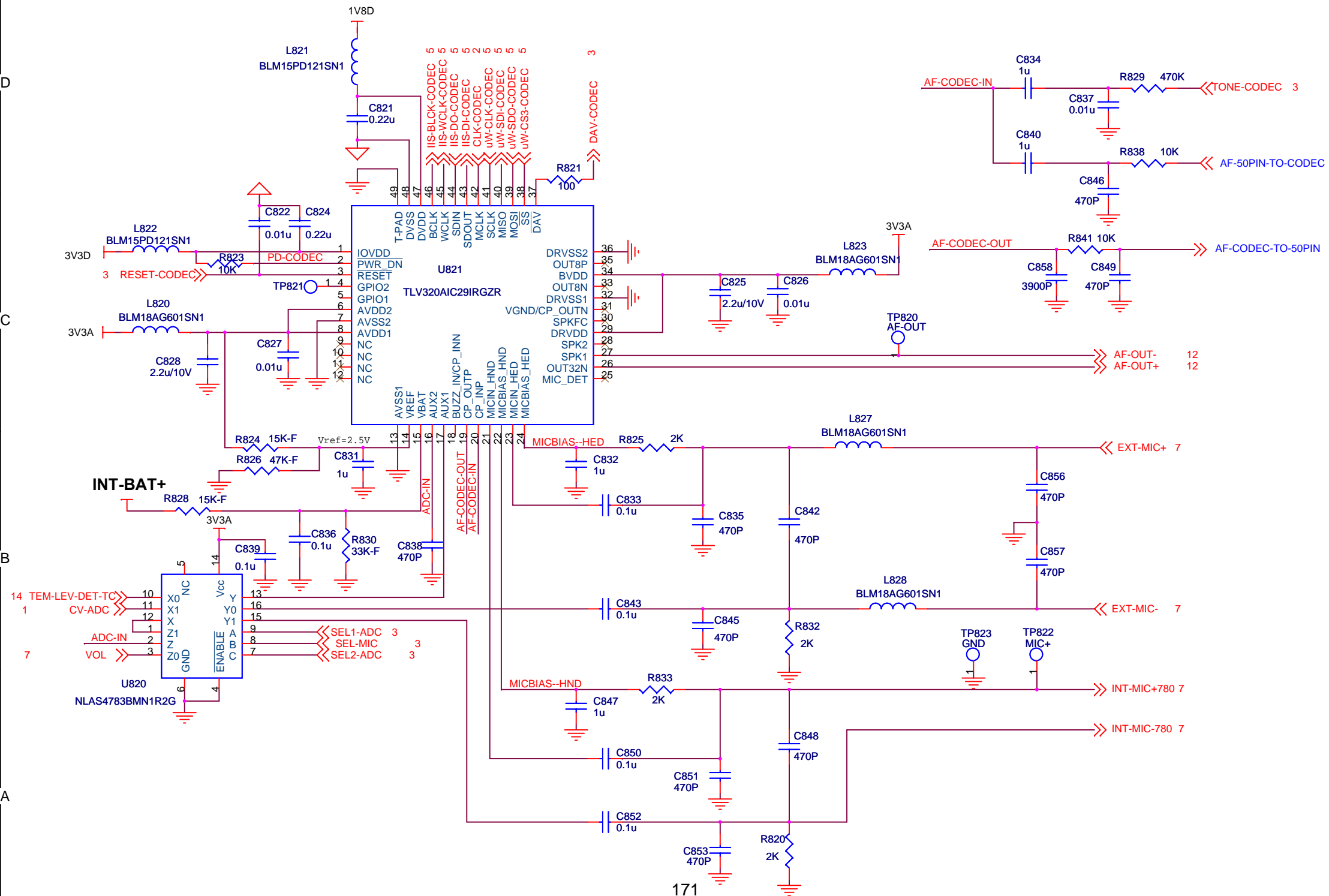
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G
Block Diagram (Power Section)



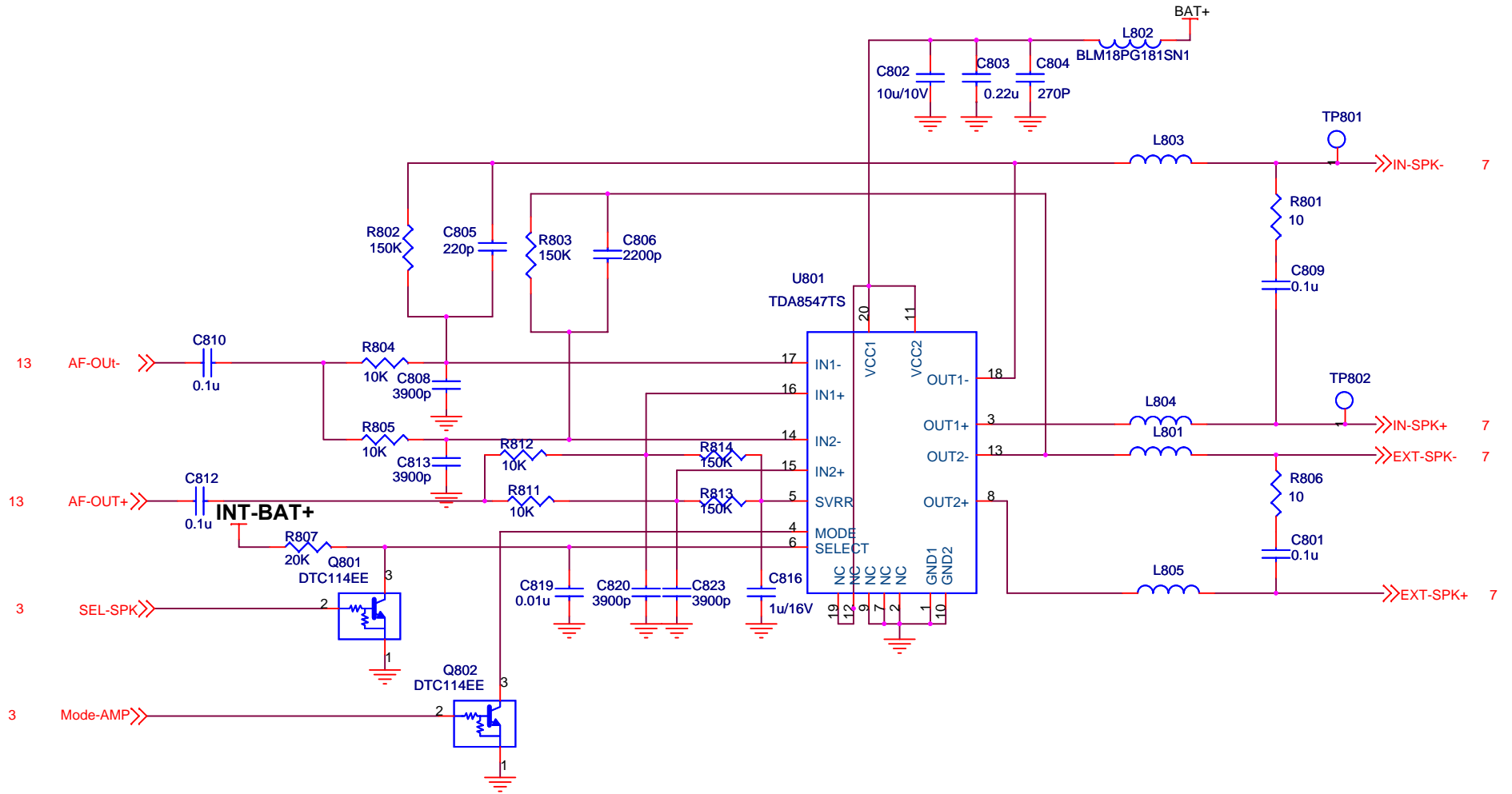
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (Transmitter/Receiver)



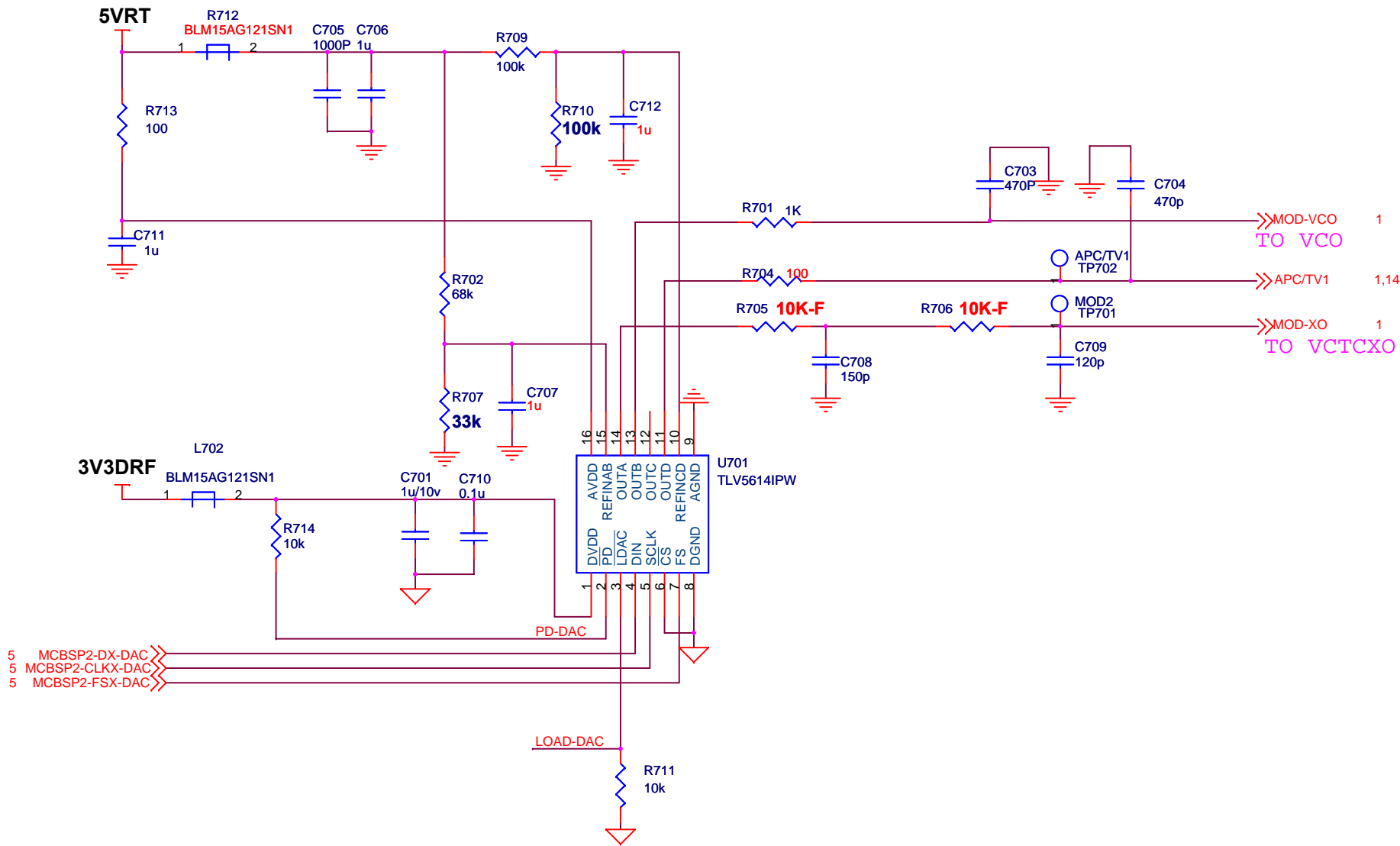
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (CODEC)



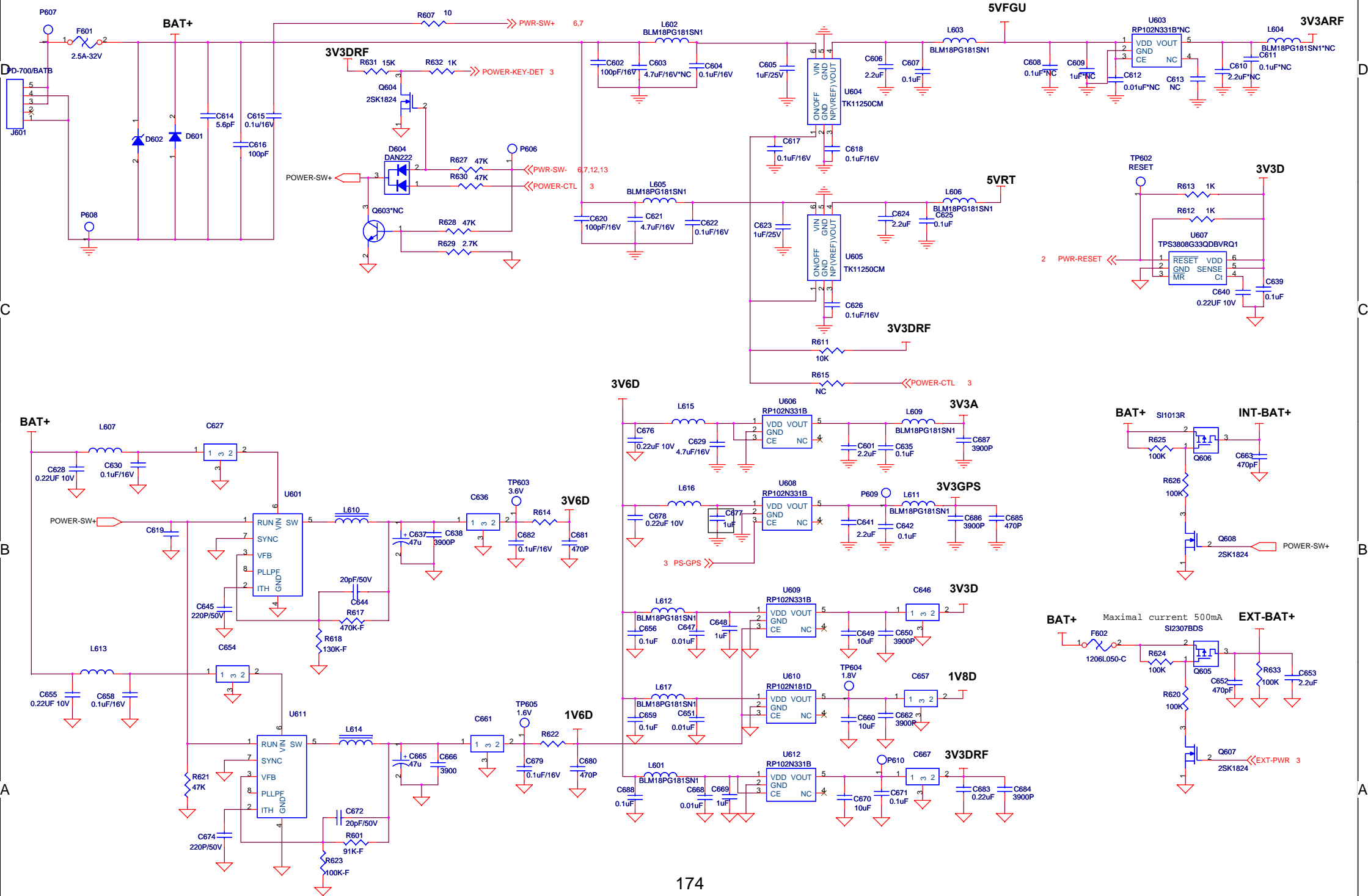
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (Audio Amplifier)



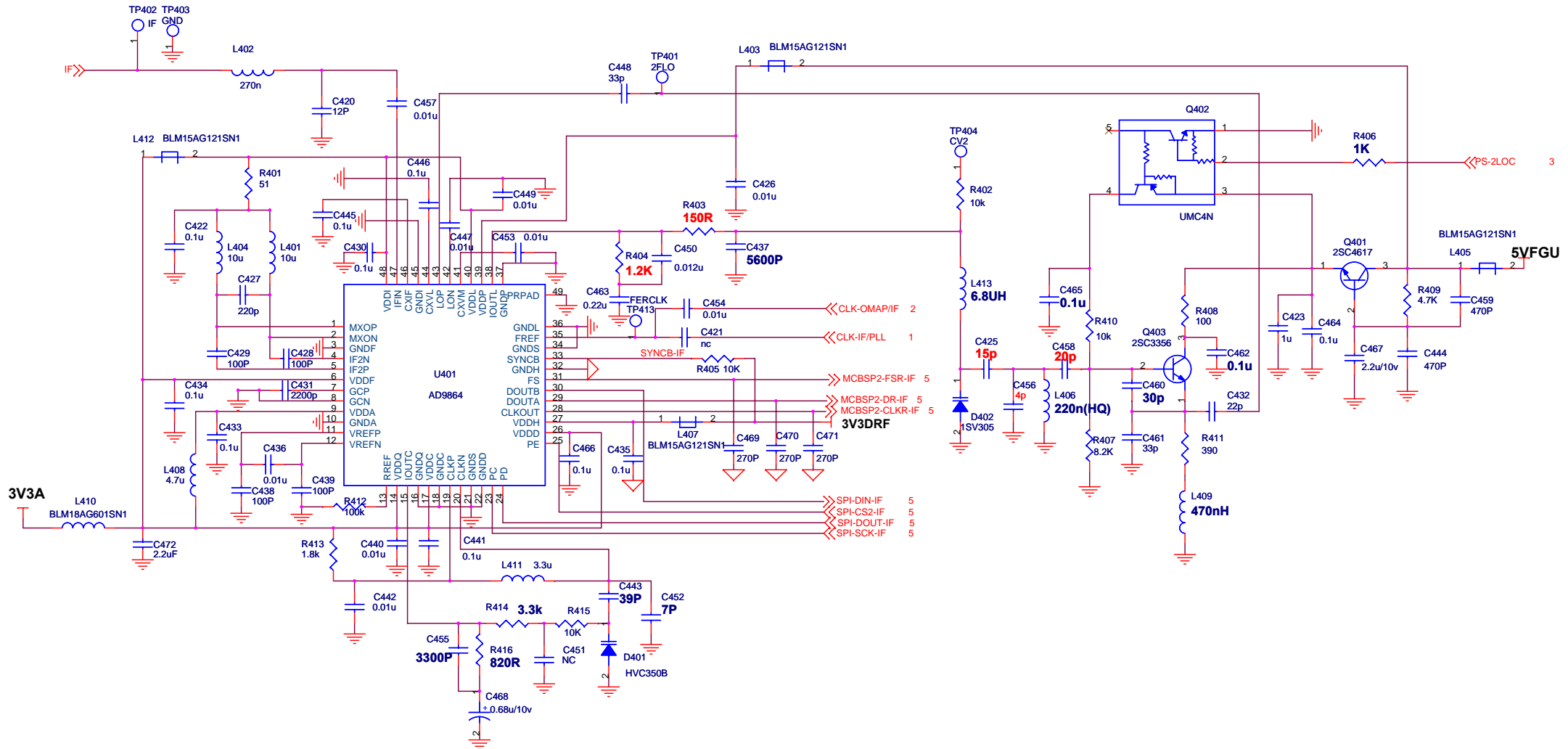
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (DAC)



PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (Power)



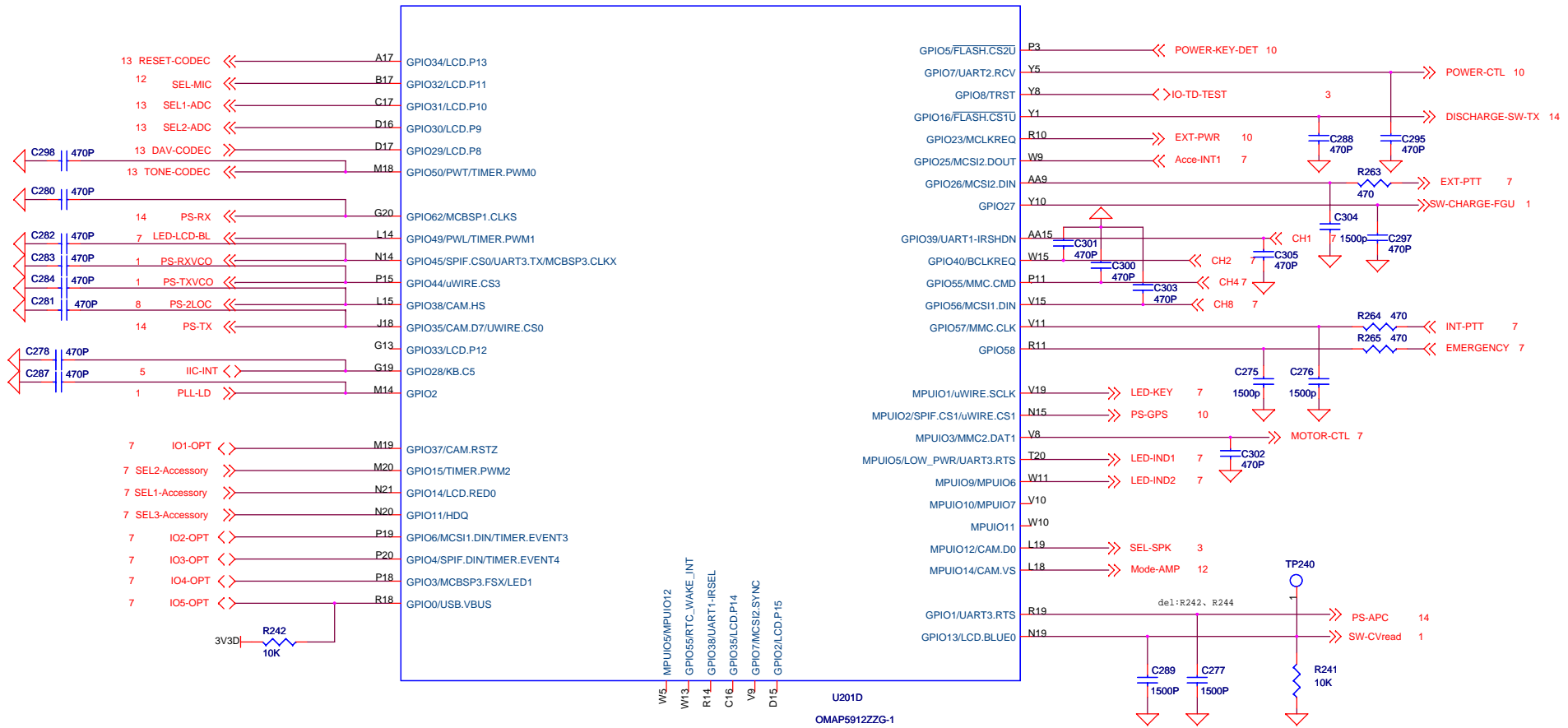
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (AD9864)



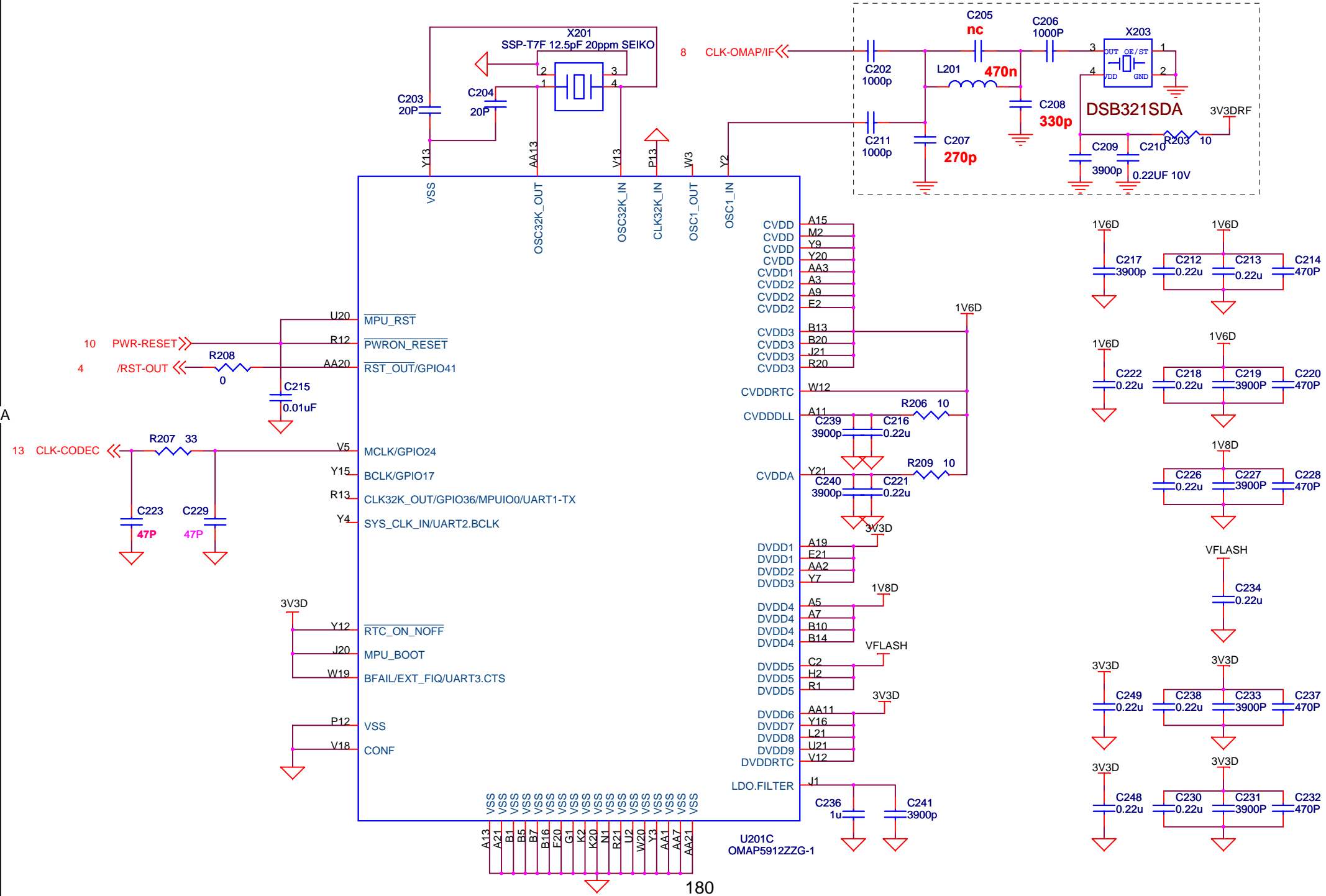
A



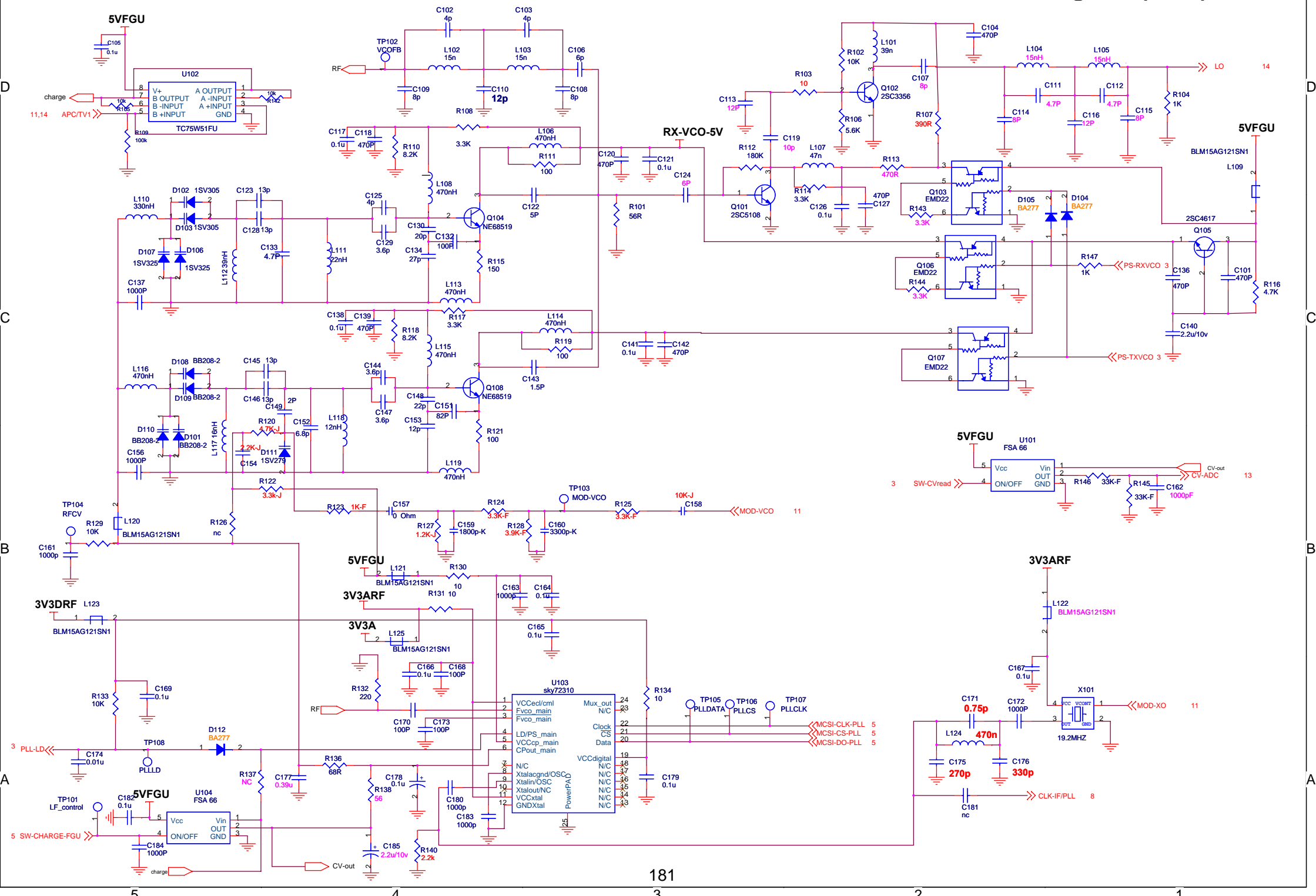
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (OMAP IO)



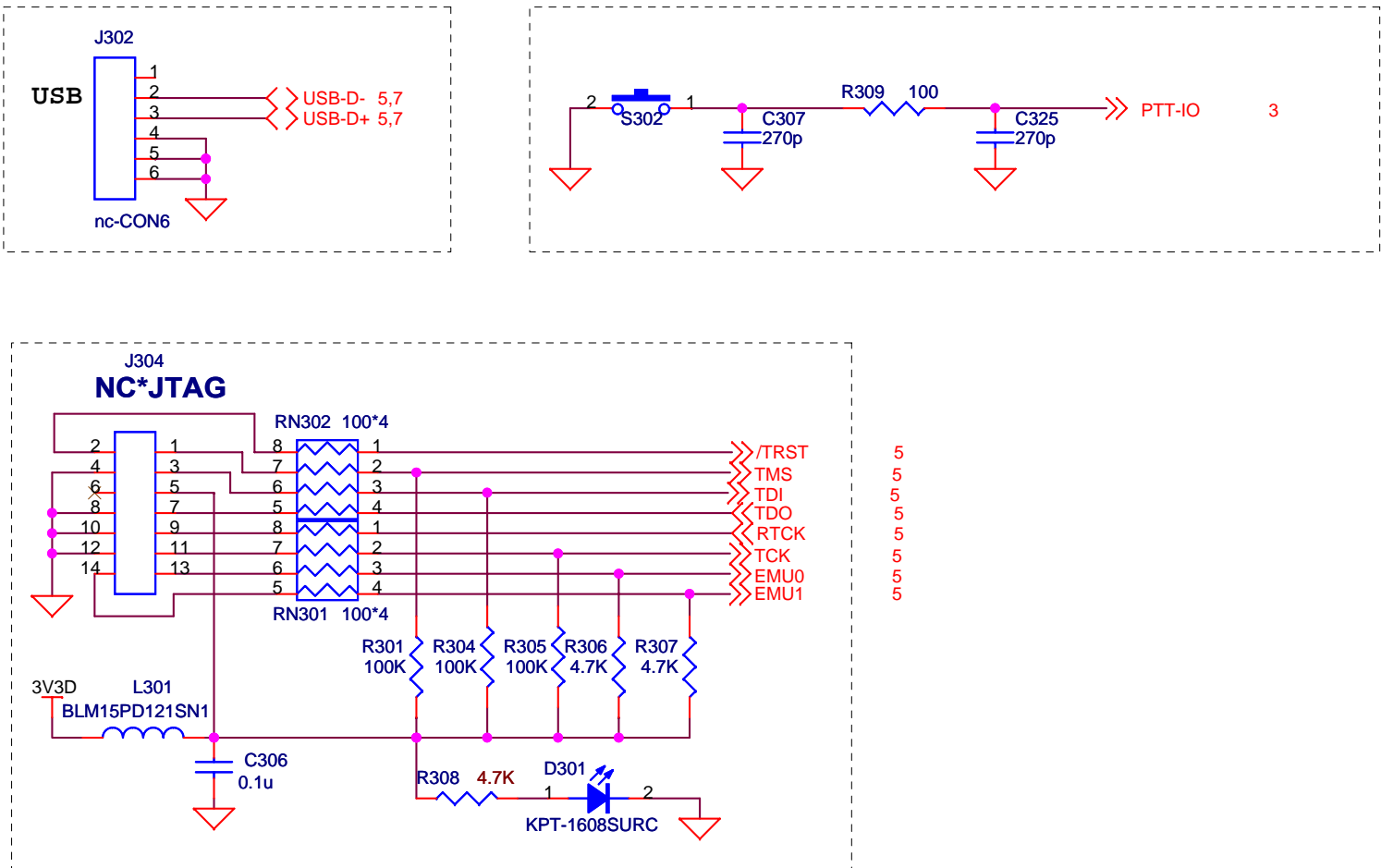
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (OMAP CORE)



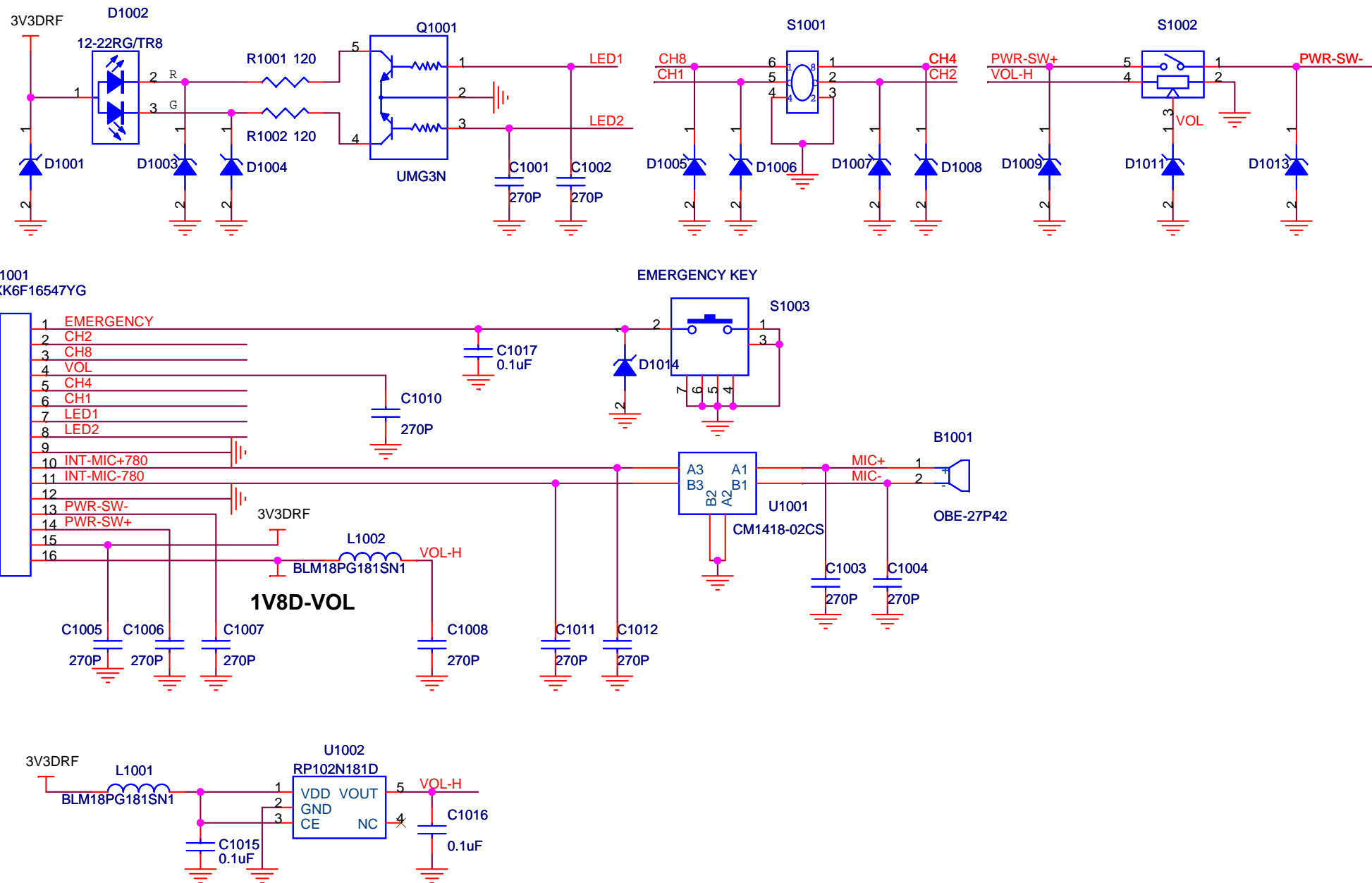
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (FGU)



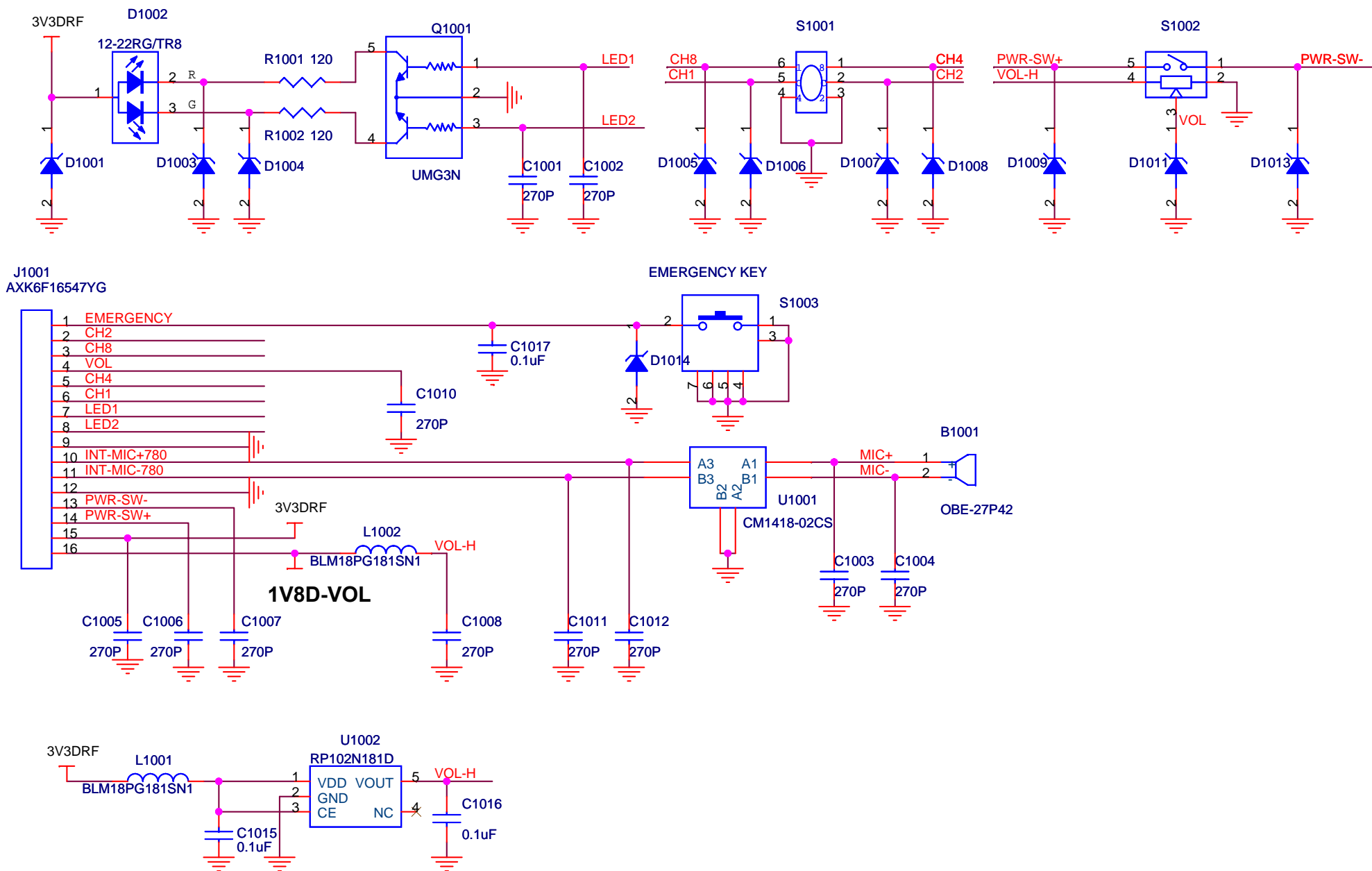
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (External Interface)



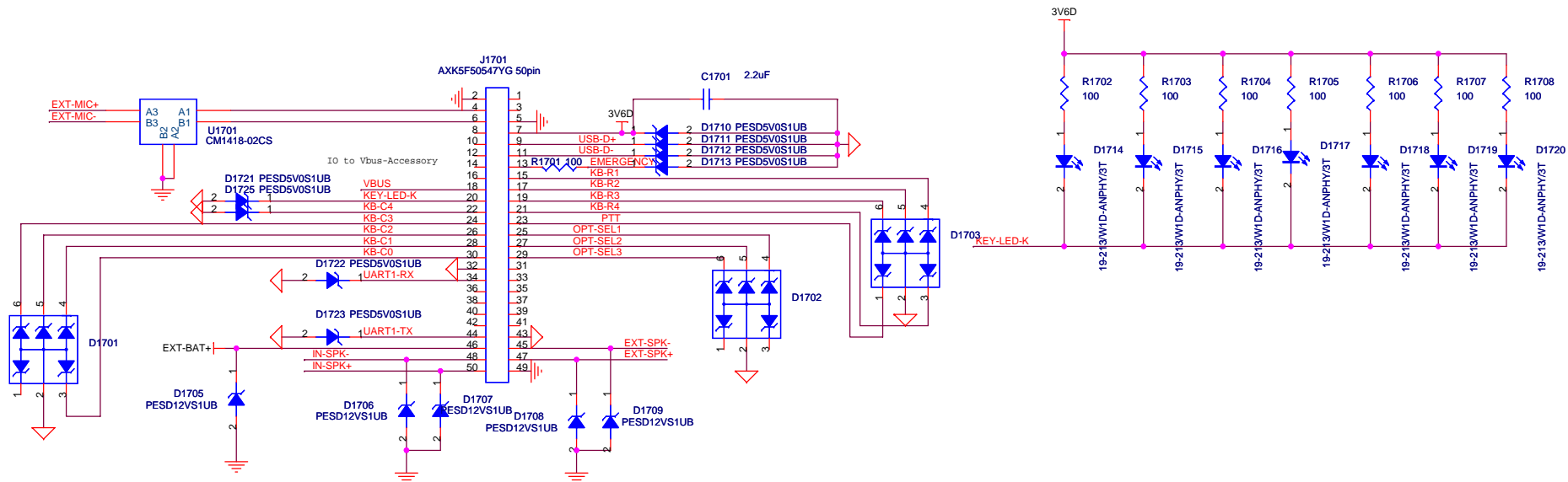
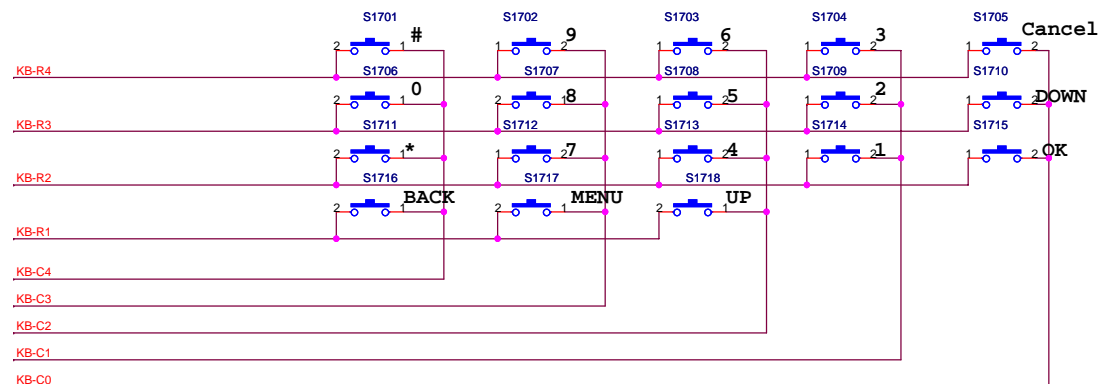
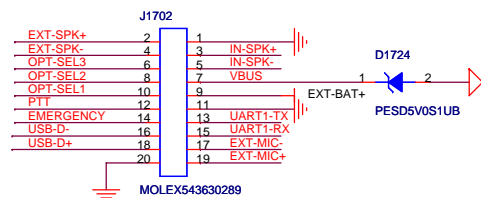
PD70X/PD70XG/HD705/HD705G Schematic Diagram (Channel Board)



PD78X/PD78XG/HD785/HD785G Schematic Diagram (Channel Board)



PD78X/PD78XG/HD785/HD785G Schematic Diagram (Keyboard)



12.7 Parts List

Main Board for PD70X/ PD70XG/ PD78X/ PD78XG/ HD705/ HD705G/ HD785/ HD785G

No.	Ref. No.	Part No.	Description
1	R208	3001050000000	0Ω
2	R254	3001050000000	0Ω
3	R9069	3001050000000	0Ω
4	C157	3001060000000	0Ω
5	C646	3001060000000	0Ω
6	C657	3001060000000	0Ω
7	C667	3001060000000	0Ω
8	L9039	3001060000000	0Ω
9	R9053	3099080398010	0.39Ω
10	R9054	3099080398010	0.39Ω
11	R9055	3099080398010	0.39Ω
12	R321	3099063018000	3.01Ω
13	R9005	3001055690000	5.6Ω
14	R103	3001051000000	10Ω
15	R130	3001051000000	10Ω
16	R131	3001051000000	10Ω
17	R134	3001051000000	10Ω
18	R203	3001051000000	10Ω
19	R206	3001051000000	10Ω
20	R209	3001051000000	10Ω
21	R801	3001051000000	10Ω
22	R806	3001051000000	10Ω
23	R607	3001061000000	10Ω
24	R9022	3001052200000	22Ω
25	R207	3001053300000	33Ω
26	R223	3001053300000	33Ω
27	R255	3001053300000	33Ω
28	R259	3001053300000	33Ω
29	R324	3001053300000	33Ω
30	R325	3001053300000	33Ω
31	R326	3001053300000	33Ω
32	R9009	3001053300000	33Ω
33	R9021	3001054700000	47Ω
34	R401	3001055100020	51Ω
35	R9075	3001055100020	51Ω
36	R101	3001055600000	56Ω
37	R9007	3001058200000	82Ω
38	L407	3001051010000	100Ω
39	R111	3001051010000	100Ω
40	R119	3001051010000	100Ω
41	R121	3001051010000	100Ω

No.	Ref. No.	Part No.	Description
42	R220	3001051010000	100Ω
43	R221	3001051010000	100Ω
44	R222	3001051010000	100Ω
45	R224	3001051010000	100Ω
46	R225	3001051010000	100Ω
47	R257	3001051010000	100Ω
48	R408	3001051010000	100Ω
49	R503	3001051010000	100Ω
50	R704	3001051010000	100Ω
51	R713	3001051010000	100Ω
52	R821	3001051010000	100Ω
53	R9011	3001051010000	100Ω
54	R9012	3001051010000	100Ω
55	R9017	3001051010000	100Ω
56	R9039	3001051010000	100Ω
57	R115	3001051510000	150Ω
58	R403	3001051510000	150Ω
59	R9016	3001051510000	150Ω
60	R132	3001052210000	220Ω
61	R9001	3001052710010	270Ω
62	R9003	3001052710010	270Ω
63	R9025	3001052710010	270Ω
64	R9028	3001052710010	270Ω
65	R502	3001053310000	330Ω
66	R9015	3001053310000	330Ω
67	R9042	3001053310000	330Ω
68	R9071	3001053310000	330Ω
69	R9083	3001053310000	330Ω
70	R107	3001053910000	390Ω
71	R411	3001053910000	390Ω
72	R113	3001054710000	470Ω
73	R263	3001054710000	470Ω
74	R264	3001054710000	470Ω
75	R265	3001054710000	470Ω
76	R501	3001054710000	470Ω
77	R9018	3001056810000	680Ω
78	R416	3001058210000	820Ω
79	R104	3001051020000	1KΩ
80	R123	3001051020000	1KΩ
81	R147	3001051020000	1KΩ
82	R406	3001051020000	1KΩ
83	R613	3001051020000	1KΩ
84	R632	3001051020000	1KΩ
85	R701	3001051020000	1KΩ

No.	Ref. No.	Part No.	Description
86	R9033	3001051020000	1KΩ
87	R9038	3001051020000	1KΩ
88	R9040	3001051020000	1KΩ
89	R612	3001061020010	1KΩ
90	R260	3001051520000	1.5KΩ
91	R9008	3001051520000	1.5KΩ
92	R9066	3001051520000	1.5KΩ
93	R820	3001052020020	2KΩ
94	R825	3001052020020	2KΩ
95	R832	3001052020020	2KΩ
96	R833	3001052020020	2KΩ
97	C154	3001052220000	2.2KΩ
98	C9114	3001052220000	2.2KΩ
99	R140	3001052220000	2.2KΩ
100	R322	3001052220000	2.2KΩ
101	R323	3001052220000	2.2KΩ
102	R124	3001053320000	3.3KΩ
103	R125	3001053320000	3.3KΩ
104	R414	3001053320000	3.3KΩ
105	R108	3001053320000	3.3KΩ
106	R114	3001053320000	3.3KΩ
107	R117	3001053320000	3.3KΩ
108	R122	3001053320000	3.3KΩ
109	R143	3001053320000	3.3KΩ
110	R144	3001053320000	3.3KΩ
111	R314	3001053320000	3.3KΩ
112	R315	3001053320000	3.3KΩ
113	R9013	3001053320000	3.3KΩ
114	R9030	3001053320000	3.3KΩ
115	R9031	3001053320000	3.3KΩ
116	R9068	3001053320000	3.3KΩ
117	R9095	3001053320000	3.3KΩ
118	R9096	3001053320000	3.3KΩ
119	R9097	3001053320000	3.3KΩ
120	R9098	3001053320000	3.3KΩ
121	R128	3001053920000	3.9KΩ
122	R116	3001054720000	4.7KΩ
123	R120	3001054720000	4.7KΩ
124	R409	3001054720000	4.7KΩ
125	R9019	3001054720000	4.7KΩ
126	R9041	3001054720000	4.7KΩ
127	R106	3001055620000	5.6KΩ
128	R413	3001055620000	5.6KΩ
129	R9078	3001055620000	5.6KΩ

No.	Ref. No.	Part No.	Description
130	R9089	3001055620000	5.6KΩ
131	R9024	3001056820000	6.8KΩ
132	R9067	3001056820000	6.8KΩ
133	R110	3001058220000	8.2KΩ
134	R118	3001058220000	8.2KΩ
135	R407	3001058220000	8.2KΩ
136	R9027	3001058220000	8.2KΩ
137	R102	3001051030000	10KΩ
138	R105	3001051030000	10KΩ
139	R129	3001051030000	10KΩ
140	R133	3001051030000	10KΩ
141	R142	3001051030000	10KΩ
142	R241	3001051030000	10KΩ
143	R242	3001051030000	10KΩ
144	R249	3001051030000	10KΩ
145	R256	3001051030000	10KΩ
146	R258	3001051030000	10KΩ
147	R316	3001051030000	10KΩ
148	R317	3001051030000	10KΩ
149	R402	3001051030000	10KΩ
150	R405	3001051030000	10KΩ
151	R611	3001051030000	10KΩ
152	R711	3001051030000	10KΩ
153	R714	3001051030000	10KΩ
154	R804	3001051030000	10KΩ
155	R805	3001051030000	10KΩ
156	R811	3001051030000	10KΩ
157	R812	3001051030000	10KΩ
158	R838	3001051030000	10KΩ
159	R841	3001051030000	10KΩ
160	R9006	3001051030000	10KΩ
161	R9036	3001051030000	10KΩ
162	R9074	3001051030000	10KΩ
163	R9081	3001051030000	10KΩ
164	R504	3001051030050	10KΩ
165	R705	3001051030050	10KΩ
166	R706	3001051030050	10KΩ
167	R823	3001051030050	10KΩ
168	R9063	3001051030050	10KΩ
169	R9072	3001051030050	10KΩ
170	R9073	3001051030050	10KΩ
171	R9076	3001051030050	10KΩ
172	R9077	3001051030050	10KΩ
173	R9090	3001051030050	10KΩ

No.	Ref. No.	Part No.	Description
174	C158	3001061030010	10KΩ
175	R410	3001061030010	10KΩ
176	R415	3001061030010	10KΩ
177	RN256	3005051030010	10KΩ
178	R261	3001051530010	15KΩ
179	R262	3001051530010	15KΩ
180	R631	3001051530010	15KΩ
181	R824	3001051530010	15KΩ
182	R828	3001051530010	15KΩ
183	R807	3001052030000	20KΩ
184	RN261	3001052230020	22K*2
185	R145	3001053330000	33KΩ
186	R146	3001053330000	33KΩ
187	R707	3001053330000	33KΩ
188	R830	3001053330000	33KΩ
189	R9043	3001053330000	33KΩ
190	R9047	3001053330000	33KΩ
191	R9079	3001053330000	33KΩ
192	R621	3001054730010	47KΩ
193	R627	3001054730010	47KΩ
194	R628	3001054730010	47KΩ
195	R630	3001054730010	47KΩ
196	R826	3001054730010	47KΩ
197	R9002	3001054730010	47KΩ
198	R9050	3001054730010	47KΩ
199	R9084	3001055630000	56KΩ
200	R702	3001056830000	68KΩ
201	C319	3001051040000	100KΩ
202	R109	3001051040000	100KΩ
203	R251	3001051040000	100KΩ
204	R318	3001051040000	100KΩ
205	R412	3001051040000	100KΩ
206	R620	3001051040000	100KΩ
207	R623	3001051040000	100KΩ
208	R624	3001051040000	100KΩ
209	R625	3001051040000	100KΩ
210	R626	3001051040000	100KΩ
211	R633	3001051040000	100KΩ
212	R709	3001051040000	100KΩ
213	R710	3001051040000	100KΩ
214	R9085	3001051040000	100KΩ
215	R618	3001051340000	130KΩ
216	R802	3001051540000	150KΩ
217	R803	3001051540000	150KΩ

No.	Ref. No.	Part No.	Description
218	R813	3001051540000	150KΩ
219	R814	3001051540000	150KΩ
220	R9048	3001051540000	150KΩ
221	R9057	3001051540000	150KΩ
222	R112	3001051840000	180KΩ
223	R617	3001054740010	470KΩ
224	R829	3001054740010	470KΩ
225	R9046	3001054740010	470KΩ
226	R9059	3001054740010	470KΩ
227	R9045	3001051050000	1MΩ
228	R9058	3001051050000	1MΩ
229	C9003	3101060590010	0.5PF
230	C171	3199050758000	0.75PF
231	C519	3199050758000	0.75PF
232	C520	3101050100030	1PF
233	C518	3101051590000	1.5PF
234	C516	3101051590070	1.5PF
235	C143	3101061590010	1.5PF
236	C9004	3101050300000	3PF
237	C527	3101050200010	2PF
238	C9116	3101050300000	3PF
239	C9111	3101050300000	3PF
240	C129	3101063690000	3.6PF
241	C144	3101063690000	3.6PF
242	C147	3101063690000	3.6PF
243	C102	3101050400010	4PF
244	C103	3101050400010	4PF
245	C9128	3101050400010	4PF
246	C9133	3101050400010	4PF
247	C9135	3101050400010	4PF
248	C9136	3101050400010	4PF
249	C125	3101060400010	4PF
250	C456	3101060400010	4PF
251	C122	3101060500010	5PF
252	C614	3101055690020	5.6PF
253	C9134	3101055690020	5.6PF
254	C106	3101050600010	6PF
255	C124	3101050600010	6PF
256	C9124	3101050600010	6PF
257	C9137	3101050600010	6PF
258	C9101	3101050700010	7PF
259	C9109	3101050700010	7PF
260	C452	3101060700020	7PF
261	C9007	3101060700020	7PF

No.	Ref. No.	Part No.	Description
262	C9030	3101060700020	7PF
263	C107	3101050800000	8PF
264	C108	3101050800000	8PF
265	C109	3101050800000	8PF
266	C114	3101050800000	8PF
267	C9035	3101050800000	8PF
268	C115	3101050800000	8PF
269	C9026	3101050800000	8PF
270	C9032	3101050800000	8PF
271	C9107	3101050800000	8PF
272	C9113	3101050800000	8PF
273	C9023	3101060800010	8PF
274	C9024	3101060800010	8PF
275	C9009	3101060900010	9PF
276	C9019	3101060900010	9PF
277	C119	3101051000020	10PF
278	C9025	3101051000020	10PF
279	C9028	3101051000020	10PF
280	C9014	3101051000020	10PF
281	C9099	3101051000020	10PF
282	C9105	3101051000020	10PF
283	C9117	3101051000020	10PF
284	C9120	3101051000020	10PF
285	C9031	3101061000000	10PF
286	C110	3101051200020	12PF
287	C113	3101051200020	12PF
288	C116	3101051200020	12PF
289	C274	3101051200020	12PF
290	C420	3101051200020	12PF
291	C9115	3101051200020	12PF
292	C153	3101061200000	12PF
293	C9015	3101061200000	12PF
294	C9021	3101061200000	12PF
295	C9027	3101061200000	12PF
296	C123	3101061300000	13PF
297	C128	3101061300000	13PF
298	C145	3101061300000	13PF
299	C146	3101061300000	13PF
300	C425	3101051500020	15PF
301	C9077	3101051500020	15PF
302	C517	3101051800010	18PF
303	C9131	3101051800070	18PF
304	C203	3101052000020	20PF
305	C204	3101052000020	20PF

No.	Ref. No.	Part No.	Description
306	C644	3101052000020	20PF
307	C672	3101052000020	20PF
308	C9079	3101052000020	20PF
309	C432	3101052200010	22PF
310	C9106	3101052200010	22PF
311	C148	3101062200010	22PF
312	C9112	3101062200010	22PF
313	C9001	3101052700000	27PF
314	C9118	3101052700000	27PF
315	C9122	3101052700000	27PF
316	C134	3101062700010	27PF
317	C460	3101063000010	30PF
318	C448	3101053300000	33PF
319	C9078	3101053300000	33PF
320	C461	3101063300000	33PF
321	C443	3101063900000	39PF
322	C223	3101054700010	47PF
323	C229	3101054700010	47PF
324	C271	3101054700010	47PF
325	C272	3101054700010	47PF
326	C273	3101054700010	47PF
327	C279	3101054700010	47PF
328	C9141	3101054700010	47PF
329	L9034	3101064700000	47PF
330	C513	3101055600000	56PF
331	C524	3101055600000	56PF
332	C9020	3101065600000	56PF
333	C151	3101058200000	82PF
334	C132	3101051010030	100PF
335	C168	3101051010030	100PF
336	C170	3101051010030	100PF
337	C173	3101051010030	100PF
338	C265	3101051010030	100PF
339	C428	3101051010030	100PF
340	C429	3101051010030	100PF
341	C438	3101051010030	100PF
342	C439	3101051010030	100PF
343	C602	3101051010030	100PF
344	C616	3101051010030	100PF
345	C620	3101051010030	100PF
346	C9002	3101051010030	100PF
347	R9080	3101051010030	100PF
348	C514	3101051210000	120PF
349	C521	3101051210000	120PF

No.	Ref. No.	Part No.	Description
350	C709	3101051210000	120PF
351	C427	3101052210010	220PF
352	C645	3101052210010	220PF
353	C674	3101052210010	220PF
354	C805	3101052210010	220PF
355	C806	3101052210010	220PF
356	R9099	3101052210010	220PF
357	R9100	3101052210010	220PF
358	C175	3101052710000	270PF
359	C207	3101052710000	270PF
360	C262	3101052710000	270PF
361	C270	3101052710000	270PF
362	C285	3101052710000	270PF
363	C290	3101052710000	270PF
364	C291	3101052710000	270PF
365	C292	3101052710000	270PF
366	C321	3101052710000	270PF
367	C322	3101052710000	270PF
368	C325	3101052710000	270PF
369	C326	3101052710000	270PF
370	C334	3101052710000	270PF
371	C469	3101052710000	270PF
372	C804	3101052710000	270PF
373	C176	3101053310030	330PF
374	C208	3101053310030	330PF
375	C101	3101054710010	470PF
376	C104	3101054710010	470PF
377	C118	3101054710010	470PF
378	C120	3101054710010	470PF
379	C127	3101054710010	470PF
380	C136	3101054710010	470PF
381	C139	3101054710010	470PF
382	C142	3101054710010	470PF
383	C214	3101054710010	470PF
384	C220	3101054710010	470PF
385	C228	3101054710010	470PF
386	C232	3101054710010	470PF
387	C237	3101054710010	470PF
388	C243	3101054710010	470PF
389	C244	3101054710010	470PF
390	C255	3101054710010	470PF
391	C256	3101054710010	470PF
392	C257	3101054710010	470PF
393	C258	3101054710010	470PF

No.	Ref. No.	Part No.	Description
394	C259	3101054710010	470PF
395	C263	3101054710010	470PF
396	C264	3101054710010	470PF
397	C266	3101054710010	470PF
398	C268	3101054710010	470PF
399	C269	3101054710010	470PF
400	C278	3101054710010	470PF
401	C280	3101054710010	470PF
402	C281	3101054710010	470PF
403	C282	3101054710010	470PF
404	C283	3101054710010	470PF
405	C284	3101054710010	470PF
406	C287	3101054710010	470PF
407	C288	3101054710010	470PF
408	C293	3101054710010	470PF
409	C294	3101054710010	470PF
410	C295	3101054710010	470PF
411	C296	3101054710010	470PF
412	C297	3101054710010	470PF
413	C298	3101054710010	470PF
414	C299	3101054710010	470PF
415	C300	3101054710010	470PF
416	C301	3101054710010	470PF
417	C302	3101054710010	470PF
418	C303	3101054710010	470PF
419	C305	3101054710010	470PF
420	C313	3101054710010	470PF
421	C315	3101054710010	470PF
422	C316	3101054710010	470PF
423	C317	3101054710010	470PF
424	C320	3101054710010	470PF
425	C331	3101054710010	470PF
426	C332	3101054710010	470PF
427	C333	3101054710010	470PF
428	C335	3101054710010	470PF
429	C336	3101054710010	470PF
430	C444	3101054710010	470PF
431	C459	3101054710010	470PF
432	C512	3101054710010	470PF
433	C652	3101054710010	470PF
434	C663	3101054710010	470PF
435	C680	3101054710010	470PF
436	C681	3101054710010	470PF
437	C685	3101054710010	470PF

No.	Ref. No.	Part No.	Description
438	C703	3101054710010	470PF
439	C704	3101054710010	470PF
440	C835	3101054710010	470PF
441	C838	3101054710010	470PF
442	C842	3101054710010	470PF
443	C845	3101054710010	470PF
444	C846	3101054710010	470PF
445	C848	3101054710010	470PF
446	C849	3101054710010	470PF
447	C851	3101054710010	470PF
448	C853	3101054710010	470PF
449	C856	3101054710010	470PF
450	C857	3101054710010	470PF
451	C9018	3101054710010	470PF
452	C9029	3101054710010	470PF
453	C9033	3101054710010	470PF
454	C9034	3101054710010	470PF
455	C9037	3101054710010	470PF
456	C9039	3101054710010	470PF
457	C9042	3101054710010	470PF
458	C9045	3101054710010	470PF
459	C9047	3101054710010	470PF
460	C9048	3101054710010	470PF
461	C9054	3101054710010	470PF
462	C9069	3101054710010	470PF
463	C9075	3101054710010	470PF
464	C9081	3101054710010	470PF
465	C9096	3101054710010	470PF
466	C9098	3101054710010	470PF
467	C324	3101064710000	470PF
468	C9013	3101064710000	470PF
469	C260	3101055610000	560PF
470	C261	3101055610000	560PF
471	C470	3101055610000	560PF
472	C9067	3101055610000	560PF
473	C137	3101051020010	1000PF
474	C156	3101051020010	1000PF
475	C161	3101051020010	1000PF
476	C162	3101051020010	1000PF
477	C163	3101051020010	1000PF
478	C172	3101051020010	1000PF
479	C180	3101051020010	1000PF
480	C183	3101051020010	1000PF
481	C184	3101051020010	1000PF

No.	Ref. No.	Part No.	Description
482	C202	3101051020010	1000PF
483	C206	3101051020010	1000PF
484	C211	3101051020010	1000PF
485	C705	3101051020010	1000PF
486	C9036	3101051020010	1000PF
487	C9059	3101051020010	1000PF
488	C9061	3101051020010	1000PF
489	C9064	3101051020010	1000PF
490	C9085	3101051020010	1000PF
491	C9088	3101051020010	1000PF
492	C9089	3101051020010	1000PF
493	C9093	3101051020010	1000PF
494	C9103	3101051020010	1000PF
495	C9121	3101051020010	1000PF
496	C9060	3101061020000	1000PF
497	C275	3101051520000	1500PF
498	C276	3101051520000	1500PF
499	C277	3101051520000	1500PF
500	C289	3101051520000	1500PF
501	C304	3101051520000	1500PF
502	C9065	3101051520000	1500PF
503	C159	3101051820000	1800PF
504	C431	3101052220010	2200pF
505	C455	3101063320000	3300PF
506	C209	3101053920000	3900PF
507	C217	3101053920000	3900PF
508	C219	3101053920000	3900PF
509	C227	3101053920000	3900PF
510	C231	3101053920000	3900PF
511	C233	3101053920000	3900PF
512	C239	3101053920000	3900PF
513	C240	3101053920000	3900PF
514	C241	3101053920000	3900PF
515	C245	3101053920000	3900PF
516	C246	3101053920000	3900PF
517	C247	3101053920000	3900PF
518	C638	3101053920000	3900PF
519	C650	3101053920000	3900PF
520	C662	3101053920000	3900PF
521	C666	3101053920000	3900PF
522	C684	3101053920000	3900PF
523	C686	3101053920000	3900PF
524	C687	3101053920000	3900PF
525	C808	3101053920000	3900PF

No.	Ref. No.	Part No.	Description
526	C813	3101053920000	3900PF
527	C820	3101053920000	3900PF
528	C823	3101053920000	3900PF
529	C858	3101053920000	3900PF
530	C9063	3101054720000	4700PF
531	C437	3101065620010	5600PF
532	C174	3101051030020	0.01UF
533	C215	3101051030020	0.01UF
534	C251	3101051030020	0.01UF
535	C426	3101051030020	0.01UF
536	C436	3101051030020	0.01UF
537	C440	3101051030020	0.01UF
538	C447	3101051030020	0.01UF
539	C449	3101051030020	0.01UF
540	C453	3101051030020	0.01UF
541	C454	3101051030020	0.01UF
542	C457	3101051030020	0.01UF
543	C647	3101051030020	0.01UF
544	C651	3101051030020	0.01UF
545	C668	3101051030020	0.01UF
546	C819	3101051030020	0.01UF
547	C822	3101051030020	0.01UF
548	C826	3101051030020	0.01UF
549	C827	3101051030020	0.01UF
550	C837	3101051030020	0.01UF
551	C9044	3101051030020	0.01UF
552	C9066	3101051030020	0.01UF
553	C9090	3101051030020	0.01UF
554	C9110	3101051030020	0.01UF
555	C442	3101061030010	0.01UF
556	C619	3101061030010	0.01UF
557	C450	3101061230000	0.012UF
558	C105	3101051040060	0.1UF
559	C117	3101051040060	0.1UF
560	C121	3101051040060	0.1UF
561	C126	3101051040060	0.1UF
562	C138	3101051040060	0.1UF
563	C141	3101051040060	0.1UF
564	C164	3101051040060	0.1UF
565	C165	3101051040060	0.1UF
566	C166	3101051040060	0.1UF
567	C167	3101051040060	0.1UF
568	C169	3101051040060	0.1UF
569	C179	3101051040060	0.1UF

No.	Ref. No.	Part No.	Description
570	C182	3101051040060	0.1UF
571	C310	3101051040060	0.1UF
572	C311	3101051040060	0.1UF
573	C318	3101051040060	0.1UF
574	C422	3101051040060	0.1UF
575	C430	3101051040060	0.1UF
576	C433	3101051040060	0.1UF
577	C434	3101051040060	0.1UF
578	C435	3101051040060	0.1UF
579	C441	3101051040060	0.1UF
580	C445	3101051040060	0.1UF
581	C446	3101051040060	0.1UF
582	C462	3101051040060	0.1UF
583	C464	3101051040060	0.1UF
584	C465	3101051040060	0.1UF
585	C466	3101051040060	0.1UF
586	C522	3101051040060	0.1UF
587	C523	3101051040060	0.1UF
588	C525	3101051040060	0.1UF
589	C604	3101051040060	0.1UF
590	C607	3101051040060	0.1UF
591	C615	3101051040060	0.1UF
592	C617	3101051040060	0.1UF
593	C618	3101051040060	0.1UF
594	C622	3101051040060	0.1UF
595	C625	3101051040060	0.1UF
596	C626	3101051040060	0.1UF
597	C630	3101051040060	0.1UF
598	C635	3101051040060	0.1UF
599	C639	3101051040060	0.1UF
600	C642	3101051040060	0.1UF
601	C656	3101051040060	0.1UF
602	C658	3101051040060	0.1UF
603	C659	3101051040060	0.1UF
604	C671	3101051040060	0.1UF
605	C679	3101051040060	0.1UF
606	C682	3101051040060	0.1UF
607	C688	3101051040060	0.1UF
608	C710	3101051040060	0.1UF
609	C801	3101051040060	0.1UF
610	C809	3101051040060	0.1UF
611	C810	3101051040060	0.1UF
612	C812	3101051040060	0.1UF
613	C833	3101051040060	0.1UF

No.	Ref. No.	Part No.	Description
614	C836	3101051040060	0.1UF
615	C839	3101051040060	0.1UF
616	C843	3101051040060	0.1UF
617	C850	3101051040060	0.1UF
618	C852	3101051040060	0.1UF
619	C9038	3101051040060	0.1UF
620	C9043	3101051040060	0.1UF
621	C9046	3101051040060	0.1UF
622	C9049	3101051040060	0.1UF
623	C9057	3101051040060	0.1UF
624	C9071	3101051040060	0.1UF
625	C9080	3101051040060	0.1UF
626	C9086	3101051040060	0.1UF
627	C9091	3101051040060	0.1UF
628	C9092	3101051040060	0.1UF
629	C9097	3101051040060	0.1UF
630	C9104	3101051040060	0.1UF
631	C212	3101052240010	0.22UF
632	C213	3101052240010	0.22UF
633	C216	3101052240010	0.22UF
634	C218	3101052240010	0.22UF
635	C221	3101052240010	0.22UF
636	C222	3101052240010	0.22UF
637	C226	3101052240010	0.22UF
638	C230	3101052240010	0.22UF
639	C234	3101052240010	0.22UF
640	C238	3101052240010	0.22UF
641	C242	3101052240010	0.22UF
642	C248	3101052240010	0.22UF
643	C249	3101052240010	0.22UF
644	C683	3101052240010	0.22UF
645	C803	3101052240010	0.22UF
646	C821	3101052240010	0.22UF
647	C824	3101052240010	0.22UF
648	C210	3101062240000	0.22UF
649	C628	3101062240000	0.22UF
650	C640	3101062240000	0.22UF
651	C655	3101062240000	0.22UF
652	C676	3101062240000	0.22UF
653	C678	3101062240000	0.22UF
654	C463	3101072240000	0.22UF
655	C177	3101073940000	0.39UF
656	C468	3104076840020	0.68UF
657	C236	3101051050000	1UF

No.	Ref. No.	Part No.	Description
658	C312	3101051050000	1UF
659	C314	3101051050000	1UF
660	C323	3101051050000	1UF
661	C423	3101051050000	1UF
662	C515	3101051050000	1UF
663	C526	3101051050000	1UF
664	C706	3101051050000	1UF
665	C707	3101051050000	1UF
666	C711	3101051050000	1UF
667	C712	3101051050000	1UF
668	C831	3101051050000	1UF
669	C832	3101051050000	1UF
670	C834	3101051050000	1UF
671	C840	3101051050000	1UF
672	C847	3101051050000	1UF
673	C9052	3101051050000	1UF
674	C9095	3101051050000	1UF
675	C605	3101061050020	1UF
676	C623	3101061050020	1UF
677	C648	3101061050020	1UF
678	C669	3101061050020	1UF
679	C677	3101061050020	1UF
680	C701	3101061050020	1UF
681	C816	3101061050020	1UF
682	C140	3101062250000	2.2UF
683	C467	3101062250000	2.2UF
684	C472	3101062250000	2.2UF
685	C601	3101062250000	2.2UF
686	C606	3101062250000	2.2UF
687	C624	3101062250000	2.2UF
688	C641	3101062250000	2.2UF
689	C653	3101062250000	2.2UF
690	C825	3101062250000	2.2UF
691	C828	3101062250000	2.2UF
692	C185	3104072250060	2.2UF
693	C649	3101064750140	4.7uF
694	C660	3101064750140	4.7uF
695	C670	3101064750140	4.7uF
696	C621	3101074750000	4.7uF
697	C629	3101074750000	4.7uF
698	C636	3110071060000	10uF
699	C661	3110071060000	10uF
700	C627	3110081060000	10uF
701	C654	3110081060000	10uF

No.	Ref. No.	Part No.	Description
702	C9051	3104082260060	22uF
703	C637	3110994760000	47uF
704	C665	3110994760000	47uF
705	L801	3221505121010	Bead
706	L803	3221505121010	Bead
707	L804	3221505121010	Bead
708	L805	3221505121010	Bead
709	L821	3221505121010	Bead
710	L822	3221505121010	Bead
711	L9015	3221505121010	Bead
712	L9020	3221505121010	Bead
713	R226	3221505121010	Bead
714	L302	3221506601000	Bead
715	L304	3221506601000	Bead
716	L305	3221506601000	Bead
717	L410	3221506601000	Bead
718	L820	3221506601000	Bead
719	L823	3221506601000	Bead
720	L827	3221506601000	Bead
721	L828	3221506601000	Bead
722	L502	3221506601080	Bead
723	L505	3221506601080	Bead
724	L303	3221506181000	Bead
725	L601	3221506181000	Bead
726	L602	3221506181000	Bead
727	L603	3221506181000	Bead
728	L604	3221506181000	Bead
729	L605	3221506181000	Bead
730	L606	3221506181000	Bead
731	L609	3221506181000	Bead
732	L611	3221506181000	Bead
733	L612	3221506181000	Bead
734	L617	3221506181000	Bead
735	L802	3221506181000	Bead
736	R614	3221506181000	Bead
737	R622	3221506181000	Bead
738	L9014	3221506121000	Bead
739	L9040	3217105010000	1nH
740	L501	3297106339000	3.3nH
741	L503	3297106339000	3.3nH
742	L504	3297106339000	3.3nH
743	L9030	3220106399000	3.9nH
744	L9016	3212106689000	6.8nH
745	L508	3210305829000	8.2nH

No.	Ref. No.	Part No.	Description
746	L509	3210305829000	8.2nH
747	L9006	3212106120000	12nH
748	L9007	3212106120000	12nH
749	L104	3210106150000	15nH
750	L105	3210106150000	15nH
751	L9025	3210106150000	15nH
752	L102	3210306150000	15nH
753	L103	3210306150000	15nH
754	L9018	3290106120000	12nH
755	L9033	3237199170000	Air-core coil
756	L9035	3237199170000	Air-core coil
757	L9036	3237199170000	Air-core coil
758	L9037	3237199170000	Air-core coil
759	L9005	3233099185900	Air-core coil
760	L9013	3233099185900	Air-core coil
761	L507	3210305180000	18nH
762	L9017	3210106220000	22nH
763	L9028	3210106220000	22nH
764	L9009	3210306220000	22nH
765	L9010	3210306330000	33nH
766	L101	3210106390000	39nH
767	L506	3210106390000	39nH
768	L9008	3233099470000	47nH
769	L9001	3210106820000	82nH
770	L9002	3210306820000	82nH
771	L9026	3210106101000	100nH
772	L9012	3210107221000	220nH
773	L9024	3217107331000	330nH
774	L402	3210406271000	270nH
775	L9022	3210406271000	270nH
776	L106	3217106471000	470nH
777	L108	3217106471000	470nH
778	L113	3217106471000	470nH
779	L114	3217106471000	470nH
780	L115	3217106471000	470nH
781	L116	3217106471000	470nH
782	L119	3217106471000	470nH
783	L124	3210406471000	470nH
784	L201	3210406471000	470nH
785	L409	3210406471000	470nH
786	L9027	3213306821000	0.82uH
787	L9011	3210209102010	1uH
788	L607	3290299222000	2.2uH
789	L613	3290299222000	2.2uH

No.	Ref. No.	Part No.	Description
790	L615	3290299222000	2.2uH
791	L616	3290299222000	2.2uH
792	L411	3213212332000	3.3uH
793	L408	3210407472000	4.7uH
794	L413	3213306682000	6.8uH
795	L401	3215099103000	10uH
796	L404	3215099103000	10uH
797	L610	3217099153000	15uH
798	L614	3217099153000	15uH
799	D302	3303990000010	Switching diode
800	D601	3399990000110	Switching diode
801	D9002	3303030800040	Switching diode
802	D111	3304010100890	Varactor
803	D102	3304010100220	Varactor
804	D103	3304010100220	Varactor
805	D402	3304010100220	Varactor
806	D9016	3304010100220	Varactor
807	D106	3304010100180	Varactor
808	D107	3304010100180	Varactor
809	D9001	3304010100180	Varactor
810	D9012	3304010100180	Varactor
811	D9014	3304010100180	Varactor
812	D9015	3304010100180	Varactor
813	D104	3303990000060	Switching diode
814	D105	3303990000060	Switching diode
815	D112	3303990000060	Switching diode
816	D9005	3303990000060	Switching diode
817	D9006	3303990000060	Switching diode
818	D9007	3303990000060	Switching diode
819	D9008	3303990000060	Switching diode
820	D604	3303030100010	Switching diode
821	D9011	3303030100010	Switching diode
822	D9010	3399990000080	Zener diode
823	D9013	3399990000260	Rectifier diode
824	D9017	3301250300000	Schottky barrier diode
825	D401	3304060300050	Varactor
826	D307	3399040600020	ESD protection diode
827	D308	3399040600020	ESD protection diode
828	D309	3399040600020	ESD protection diode
829	D310	3399040600020	ESD protection diode
830	D602	3399040600020	ESD protection diode
831	D318	3399040600010	ESD protection diode
832	D303	3399040600000	ESD protection diode
833	D304	3399040600000	ESD protection diode

No.	Ref. No.	Part No.	Description
834	D305	3399040600000	ESD protection diode
835	D306	3399040600000	ESD protection diode
836	Q9006	3410001000020	PNP transistor
837	Q102	3408002000000	NPN transistor
838	Q403	3408002000000	NPN transistor
839	Q9002	3408002000000	NPN transistor
840	Q105	3403003000060	NPN transistor
841	Q401	3403003000060	NPN transistor
842	Q9004	3406001000090	NPN transistor
843	Q101	3401002000990	NPN transistor
844	Q604	3503020000030	N-MOSFET
845	Q607	3503020000030	N-MOSFET
846	Q608	3503020000030	N-MOSFET
847	Q9001	3418001000010	NPN transistor
848	Q310	3511990000010	N-MOSFET
849	Q313	3511990000010	N-MOSFET
850	Q312	3403008000010	BRT
851	Q801	3403008000010	BRT
852	Q802	3403008000010	BRT
853	Q9007	3403008000010	BRT
854	Q9008	3403008000010	BRT
855	Q103	3403999000000	PNP+NPN
856	Q106	3403999000000	PNP+NPN
857	Q107	3403999000000	PNP+NPN
858	Q9019	3403999000000	PNP+NPN
859	Q9020	3403999000000	PNP+NPN
860	Q104	3408002000080	NPN transistor
861	Q108	3408002000080	NPN transistor
862	Q9017	3404006000000	NPN transistor
863	Q9018	3404006000000	NPN transistor
864	Q9005	3504990000010	MOSFET
865	Q9003	3504990000040	MOSFET
866	Q605	3505010000210	P-MOSFET
867	Q606	3505010000210	P-MOSFET
868	Q402	3499000000150	PNP+NPN
869	U401	3603999000000	IF processor
870	U312	3805000000030	EMI filter
871	U313	3805000000030	EMI filter
872	U314	3805000000030	EMI filter
873	U315	3805000000030	EMI filter
874	U316	3805000000030	EMI filter
875	U317	3805000000030	EMI filter
876	U318	3805000000030	EMI filter
877	U319	3805000000030	EMI filter

No.	Ref. No.	Part No.	Description
878	U320	3805000000030	EMI filter
879	U321	3805000000030	EMI filter
880	U322	3805000000030	EMI filter
881	U101	3616059000000	Switch IC
882	U104	3616059000000	Switch IC
883	U9003	5404000000060	Sensor
884	U601	3608011000050	DC-DC
885	U611	3608011000050	DC-DC
886	U242	3612044000010	Memory
887	U9002	3605025000020	Operational amplifier
888	U820	3616037000020	Switch IC
889	U201	3610010000010	MCU
890	U610	3608006000030	Power management IC
891	U606	3608006000000	Power management IC
892	U608	3608006000000	Power management IC
893	U609	3608006000000	Power management IC
894	U612	3608006000000	Power management IC
895	U103	3604019000000	PLL
896	U102	3605002057290	Operational amplifier
897	U801	3602023005740	Audio amplifier
898	U604	3608020005750	Power management IC
899	U605	3608020005750	Power management IC
900	U821	3613010000000	Baseband processor
901	U701	3606010000010	D/A converter
902	U607	3609010000170	Reset IC
903	U244	3612002000020	Memory
904	U501	3609999000300	LNA
905	ANT1	6201847000000	Antenna spring plate
906	F601	4099000000050	Fuse
907	F602	4010000000010	Fuse
908	J821	5201016000010	Board-to-board connector
909	J311	5201030000040	Board-to-board connector
910	J1601	5201050100030	Board-to-board connector
911	J313	5202002100200	Board-to-wire connector
912	J601	5205003100020	Battery connector
913	T9001	5406000000200	Transformer
914	T9002	5406000000200	Transformer
915	X101	3701019250030	TCXO
916	X203	3701019250040	TCXO
917	X201	3701327610060	Crystal
918	Z501	3804157560000	GPS filter
919	U310	3609042000000	Sensor
920	R127	3001051220000	1.2K Ω
921	R404	3001051220000	1.2K Ω

No.	Ref. No.	Part No.	Description
922	C9100	3101050500010	5PF
923	C9129	3101050500010	5PF
924	C149	3101060200010	2PF
925	C133	3101064790010	4.7PF
926	L9032	3210306221000	220nH
927	L9038	3210406331000	330nH
928	R9004	3233099100000	Air-core coil
929	C802	3101071060010	10UF
930	C9011	3101061010010	100PF
931	Z9001	3802733540030	Crystal filter
932	U502	1615000001720	GPS module
933	R9020	3001051030010	10KΩ
934	R9023	3001056220000	6.2KΩ
935	R136	3001056800010	68Ω
936	C160	3101053320010	3300PF
937	C111	3101054790040	4.7PF
938	C112	3101054790040	4.7PF
939	C9041	3101056830040	0.068uF
940	C130	3101062000000	20PF
941	C458	3101062000000	20PF
942	C152	3101066890020	6.8PF
943	C178	3101071040030	0.1UF
944	L107	3210106470000	47nH
945	L112	3217107390010	39nH
946	L118	3237138129000	Air-core coil
947	Q9021	3401001000490	50V
948	R138	3001055600010	56Ω
949	C708	3101051510000	150PF
950	C286	3101058210010	820PF
951	L111	3217107220000	22nH
952	L117	3217107220000	22nH
953	L109	3221505121000	Bead
954	L120	3221505121000	Bead
955	L121	3221505121000	Bead
956	L122	3221505121000	Bead
957	L123	3221505121000	Bead
958	L125	3221505121000	Bead
959	L403	3221505121000	Bead
960	L405	3221505121000	Bead
961	L412	3221505121000	Bead
962	L702	3221505121000	Bead
963	R712	3221505121000	Bead
964	L9003	3239999250000	Air-core coil
965	L9004	3239999250000	Air-core coil

No.	Ref. No.	Part No.	Description
966	L406	3217107221020	220nH
967	D101	3304990000030	Varactor
968	D108	3304990000030	Varactor
969	D109	3304990000030	Varactor
970	D110	3304990000030	Varactor
971	R629	3001052720000	2.7K Ω
972	R9029	3001053910010	390 Ω
973	R601	3001059130000	91K Ω
974	L110	3217106331000	330nH
975	C9087	3101053330000	0.033UF
976	C9138	3101053330000	0.033UF
977	/	6201810000000	Shielding can for baseband processor
978	/	6201859000000	Shielding frame for lowpass filter
979	/	6201860000000	Shielding frame for GPS
980	/	6201862000000	Shielding can for TX VCO
981	/	6201865000000	Shielding can for crystal oscillator
982	/	6201915000000	Shielding can for antenna spring plate
983	/	6201935000000	Shielding can for switching power
984	/	41PD7001000K0	Main board
985	/	9830000000001	Voice coding software

Channel Board for PD70X/ PD70XG/ HD705/ HD705G

No.	Ref. No.	Part No.	Description
1	R1002	3001051210010	120Ω
2	C1001	3101052710000	270PF
3	C1002	3101052710000	270PF
4	C1003	3101052710000	270PF
5	C1004	3101052710000	270PF
6	C1005	3101052710000	270PF
7	C1006	3101052710000	270PF
8	C1007	3101052710000	270PF
9	C1010	3101052710000	270PF
10	C1011	3101052710000	270PF
11	C1012	3101052710000	270PF
12	D1001	3310040000000	ESD protection diode
13	D1003	3310040000000	ESD protection diode
14	D1004	3310040000000	ESD protection diode
15	D1005	3310040000000	ESD protection diode
16	D1006	3310040000000	ESD protection diode
17	D1007	3310040000000	ESD protection diode
18	D1008	3310040000000	ESD protection diode
19	D1011	3310040000000	ESD protection diode
20	D1014	3310040000000	ESD protection diode
21	D1009	3399040600020	ESD protection diode
22	D1013	3399040600020	ESD protection diode
23	D1002	3307120100050	LED
24	Q1001	3403009000010	Compound transistor
25	U1001	3805000000040	EMI filter
26	J1001	5201016100040	Board-to-board connector
27	S1003	4301080000020	Momentary contact switch
28		41PD7002002B0	PCB
29	R1001	3001056810000	680Ω
30	C1015	3101051040060	0.1UF
31	C1016	3101051040060	0.1UF
32	C1017	3101051040060	0.1UF
33	L1001	3221506181000	Bead
34	U1002	3608006000030	Power management IC

Channel Board for PD78X/ PD78XG/ HD785/ HD785G

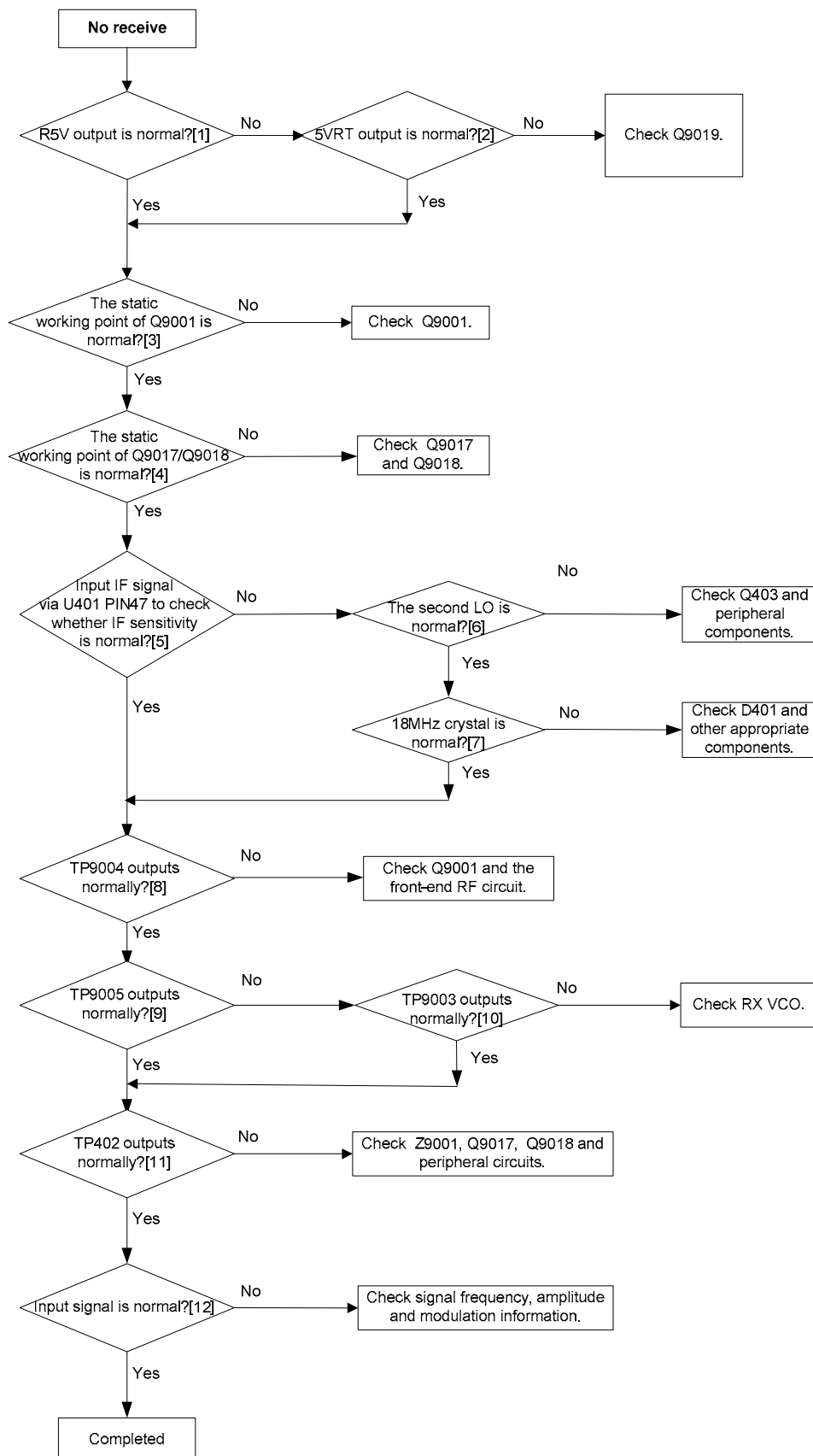
No.	Ref. No.	Part No.	Description
1	R1002	3001051210010	120Ω
2	C1001	3101052710000	270PF
3	C1002	3101052710000	270PF
4	C1003	3101052710000	270PF
5	C1004	3101052710000	270PF
6	C1005	3101052710000	270PF
7	C1006	3101052710000	270PF
8	C1007	3101052710000	270PF
9	C1010	3101052710000	270PF
10	C1011	3101052710000	270PF
11	C1012	3101052710000	270PF
12	D1001	3310040000000	ESD protection diode
13	D1003	3310040000000	ESD protection diode
14	D1004	3310040000000	ESD protection diode
15	D1005	3310040000000	ESD protection diode
16	D1006	3310040000000	ESD protection diode
17	D1007	3310040000000	ESD protection diode
18	D1008	3310040000000	ESD protection diode
19	D1011	3310040000000	ESD protection diode
20	D1014	3310040000000	ESD protection diode
21	D1009	3399040600020	ESD protection diode
22	D1013	3399040600020	ESD protection diode
23	D1002	3307120100050	LED
24	Q1001	3403009000010	Compound transistor
25	U1001	3805000000040	EMI filter
26	J1001	5201016100040	Board-to-board connector
27	S1003	4301080000020	Momentary contact switch
28		41PD7802006C0	PCB
29	R1001	3001056810000	680Ω
30	C1015	3101051040060	0.1UF
31	C1016	3101051040060	0.1UF
32	C1017	3101051040060	0.1UF
33	L1001	3221506181000	Bead
34	U1002	3608006000030	Power management IC

Keyboard for PD78X/ PD78XG/ HD785/ HD785G

No.	Ref. No.	Part No.	Description
1	R1	3001051010000	100Ω
2	R2	3001051010000	100Ω
3	R3	3001051010000	100Ω
4	R4	3001051010000	100Ω
5	R5	3001051010000	100Ω
6	R6	3001051010000	100Ω
7	R7	3001051010000	100Ω
8	D1	3307990000260	LED
9	D2	3307990000260	LED
10	D3	3307990000260	LED
11	D4	3307990000260	LED
12	D5	3307990000260	LED
13	D6	3307990000260	LED
14	D7	3307990000260	LED
15	D8	3310040000010	ESD protection diode
16	D9	3310040000010	ESD protection diode
17	J4	5201016000010	Board-to-board connector

12.8 Troubleshooting Flow Chart

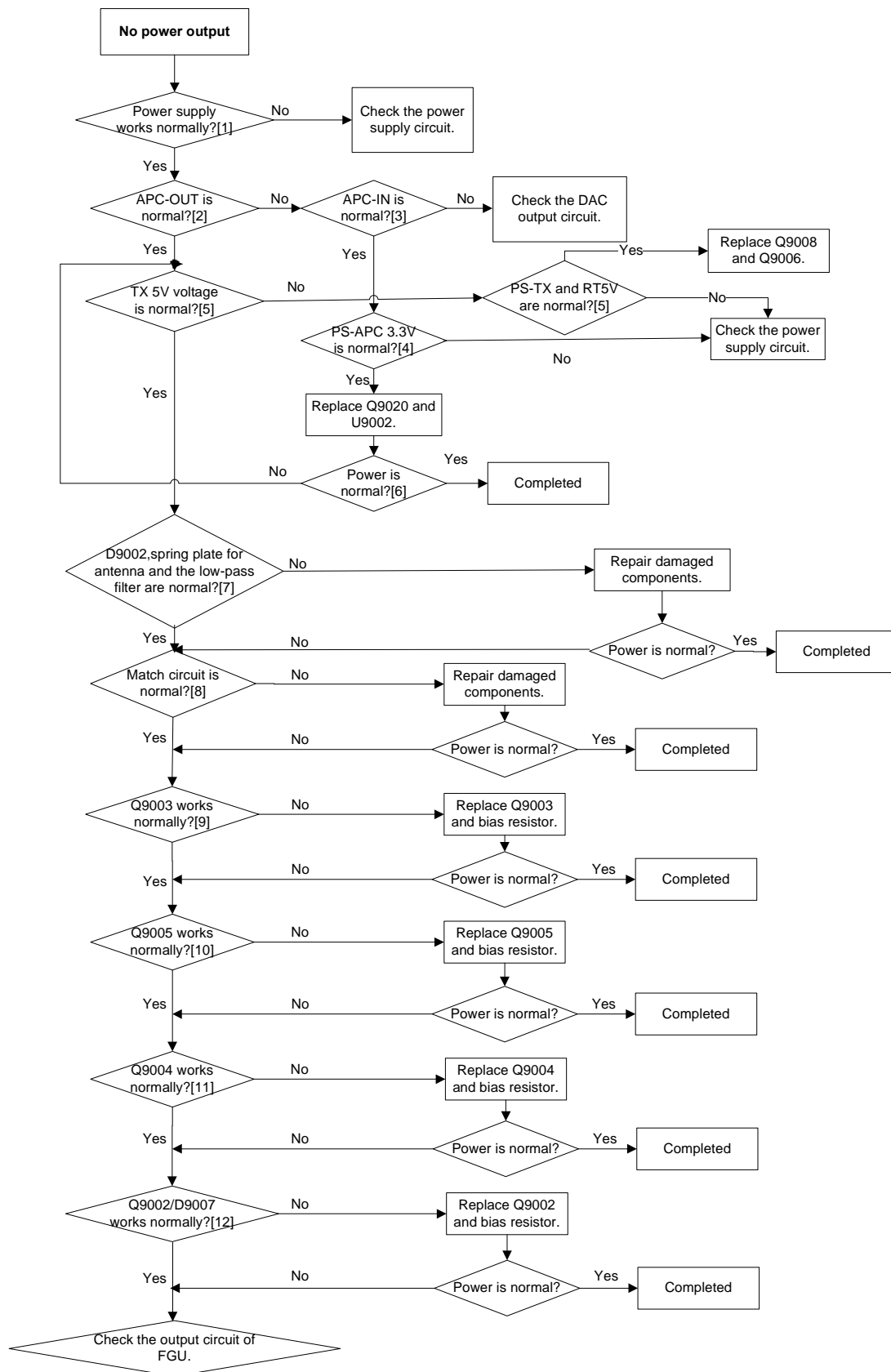
Receiver Circuit



Description of Normal Situations:

- [1] Output voltage by Q9019 PIN3: about 4.95V.
- [2] Output voltage by U605 PIN4 or input voltage into Q9019 PIN4: about 5V.
- [3] Vbe: about 0.74V; Vce: about 2.5V (in the case of no signal reception).
- [4] For Q9018, Vbe: about 0.76V; Vce: about 0.95V;
for Q9017, Vbe: about 0.7V; Vce: 0.85V (in the case of no signal reception).
- [5] Cut off the front-end circuit, and input a 73.35MHz IF signal at TP402 to test IF sensitivity. Normally, the IF sensitivity is -109dBm.
- [6] Frequency of Q403: 71.1MHz.
- [7] Frequency of L411: 18MHz.
- [8] Input -30dBm RF signal at the antenna connector and test at TP9004. Normally, gain>10dB, output signal>-20dBm.
- [9] Input -30dBm RF signal at the antenna connector and test at R9005 (do not cut off the back-end circuit). Normally, gain>1dB, output signal>-29dBm.
- [10] Signal frequency: RF-IF, signal amplitude>2dBm.
- [11] For input of -80dBm signal at L9022, gain>25dB, output signal>-55dBm;
for input of -30dBm signal, output signal<-20dBm.
- [12] The input signal at the antenna connector, with standard tuning information (AF=1KHz, FM=3KHz), is -47dBm.

Transmitter Circuit

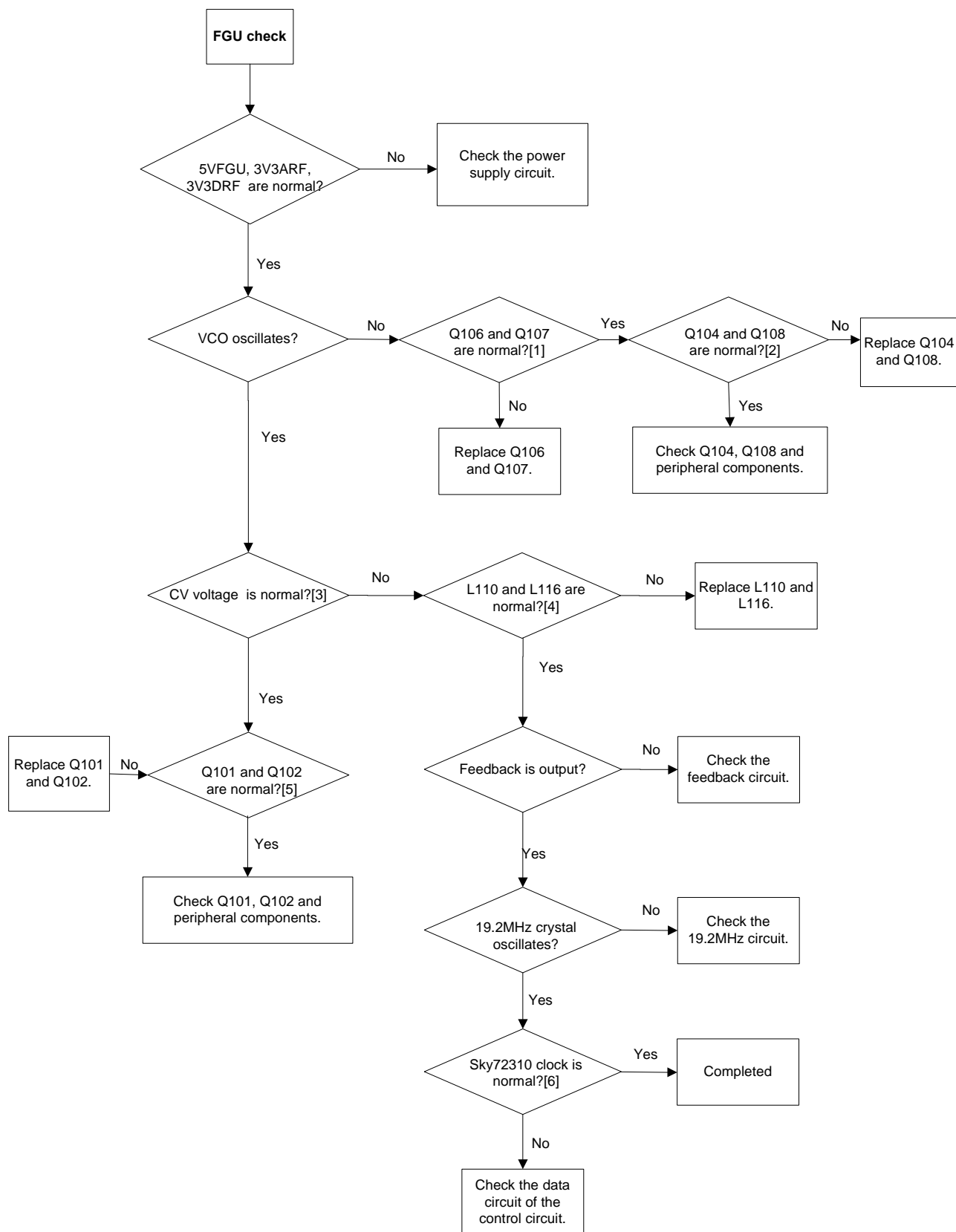


Description of Normal Situations:

- [1] Voltage of the power supply: about 7.4V.
- [2] For low power, APC-OUT: 1.8-2.1V; for high power, APC-OUT: 2.4-2.8V.
- [3] For low power, APC-IN: 1-1.3V; for high power, APC-IN: 1.8-2.1V.
- [4] PS-APC: about 3.3V.
- [5] TX5V: about 5V; RT5V: about 5V; PS-TX: about 3.3V.
- [6] High power: about 4.2W; low power: about 1.2W.
- [7] Start-up voltage of D9002: about 0.7V. The low-pass filter must be soldered appropriately and remain in good condition. The spring plate for the antenna must be well fitted into the antennaconnector.
- [8] The match components must not be soldered inappropriately or damaged.
- [9] Vdd: about 7.3V; for low power, Vgg: 1-1.2V; for high power, Vgg: 1.35-1.55V.
- [10] Vdd: about 7.3V; for low power, Vgg: 1.7-2.1V; for high power, Vgg: 2.4-2.8V.
- [11] Vc: about 4.8V; Vb: about 1.4V; Ve: about 1.1V.
- [12] Vc: about 4.7V; Vb: about 0.7V; Ve: 0V. Start-up voltage of D9007: about 0.7V.

Note: The above check operations should be made under 7.4V voltage.

FGU



Description of Normal Situations:

- [1] During transmission, output voltage by Q107 PIN3: about 4V.
During reception, output voltage by Q106 PIN3: about 4V.
- [2] During transmission, voltage at Q108 E: about 1.8V.
During reception, voltage at Q104 E: about 1.8V.
- [3] The CV value varies with frequencies. Generally, it is within the range 0.5V-4.5V.
- [4] L110/L116 is on.
- [5] Voltage at Q101/Q102 B: about 0.7V.
- [6] MCSI-CLK-PLL outputs 960KHz clock.

13. VHF (136-174MHz) Information

13.1 Transmitter Circuit

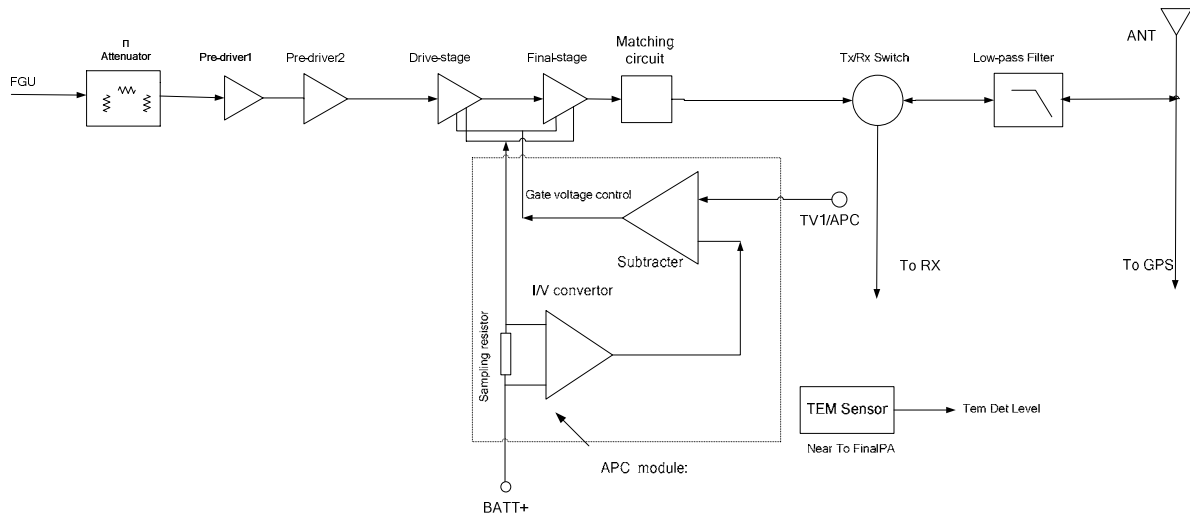


Figure 13-1 Diagram of Transmitter Circuit

The transmitter circuit is mainly composed of:

- ① RF power amplifier circuit
- ② Low-pass filter circuit (for suppressing harmonics)
- ③ Auto power control circuit (APC) (including temperature detection circuit)

The carrier signal generated by TX VCO is modulated and amplified, and then feeds to the transmitter circuit. In this circuit, the signal passes through a π -type attenuator first, allowing certain isolation between the RF power amplifier circuit and TX VCO. Then it goes to a pre-driver amplifier (2SC3356) for pre-amplification, also providing certain isolation. After that, the signal goes to another pre-driver amplifier (2SC4988) and a driver amplifier (RD01) for further power amplification, to provide appropriate signal to the final-stage amplifier (RD07) for final power amplification. After processed by multiple amplifiers, the signal passes through an impedance matching circuit, so as to reduce output power loss due to impedance mismatch. Then the signal passes through the TX/RX switch and goes to the low-pass filter.

The low-pass filter is a high-order Chebyshev filter composed of lumped-parameter inductors and capacitors. Via this filter, the spurious signal within the stop band can be attenuated as much as possible while the in-band ripple is within the required range.

In the auto power control and temperature detection circuit, the drain current from the driver amplifier and final-stage amplifier is converted to voltage via the sampling resistor and subtraction circuit (composed of the first operational amplifier). This voltage is compared with the APC control voltage (output by DAC) at the second operational amplifier. Then the error voltage, which is output by the second operational amplifier, controls TX power by controlling the bias voltage at the gates of the amplifiers (including the driver amplifier and the final-stage amplifier). The temperature sensor detects the surface temperature of the final-stage amplifier, and converts it to DC voltage. Then the DC voltage is compared with the voltage corresponding to the protection temperature (generally 80% of the extreme junction temperature) of the amplifier. If the surface temperature is too high, the bias voltage of the amplifier will be reduced until the surface temperature is below the protection temperature, so as to reduce output power.

13.2 Receiver Circuit

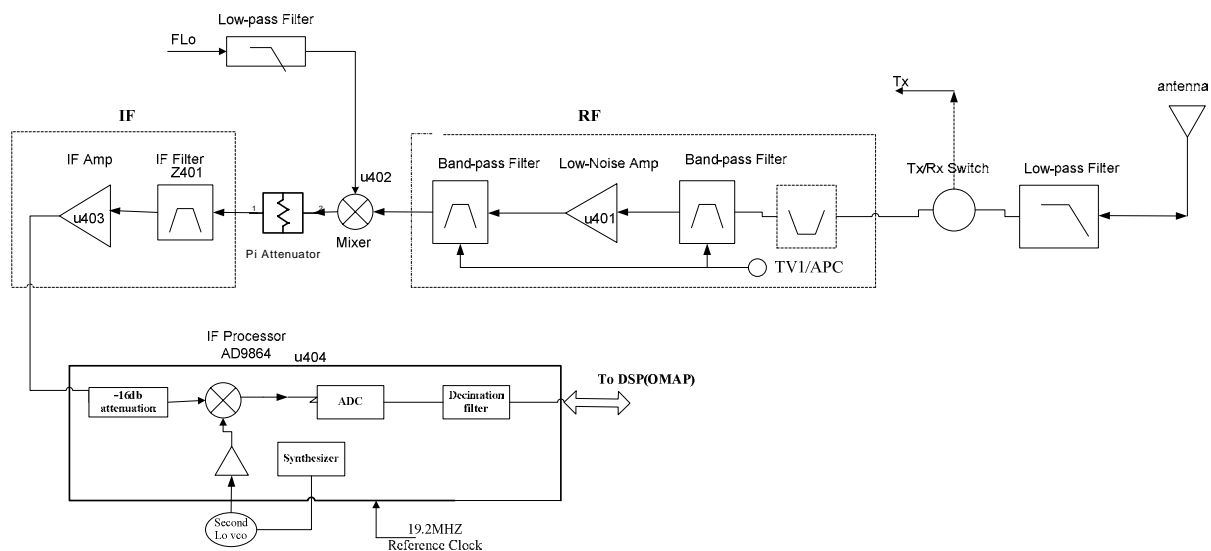


Figure 13-2 Diagram of Receiver Circuit

The receiver circuit mainly comprises the RF band-pass filter, low-noise amplifier, mixer, IF filter, IF amplifier and IF processor.

13.2.1 Receiver Front-end

The HF signal from the low-pass filter passes through the electrically tunable band-pass filter controlled via APC/TV1 level, to remove out-of-band interference signal and to send wanted band-pass signal to the low-noise amplifier (Q9009). The amplified signal goes to a band-pass filter controlled via APC/TV1 level, to remove out-of-band interference signal generated during amplification, and to send wanted HF

signal to the mixer.

The wanted signal passes through the RF band-pass filter and low-noise amplifier and goes to the mixer (D9017). Meanwhile, the first local oscillator (LO) signal generated by VCO passes through the low-pass filter and also goes to the mixer (D9017). In the mixer, the wanted signal and the first LO signal are mixed to generate the first IF signal (44.85 MHz). Then the signal passes through a π -type attenuator (2dB) and the LC, to suppress carrier other than the first IF signal, and to increase the isolation between the mixer and the IF filter. After that, the first IF signal is processed by the crystal filter (Z9001), and is sent to the two-stage IF amplifier circuit (composed of PBR941) for amplification. Then the amplified signal goes to the IF processor AD9864(U401) for processing.

13.2.2 Receiver Back-end

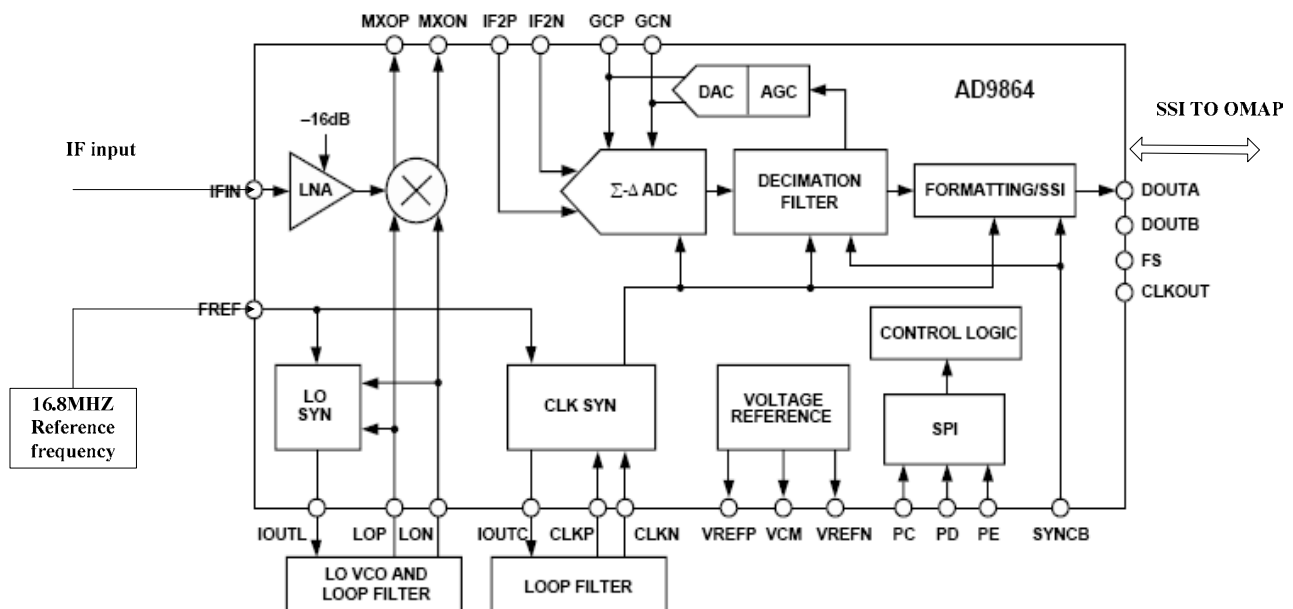


Figure 13-3 Diagram of IF Processor

The first IF signal (44.85MHz) output by the IF amplifier goes into AD9864 (U401) via Pin 47, where the signal is converted to the second IF signal (2.25MHz). Then the signal is converted to digital signal via ADC sampling, and output via the SSI interface. Finally, the digital signal is sent to DSP (OMAP5912) for demodulation.

AD9864 employs reference frequency of 19.2MHz and shares the crystal with OMAP. The second LO VCO comprises an oscillator, a varactor and some other components, to provide the 47.1/42.6MHz LO signal. The sampling frequency of AD9864 is 18MHz, and is generated by the LC resonance loop.

13.3 Frequency Generation Unit (FGU)

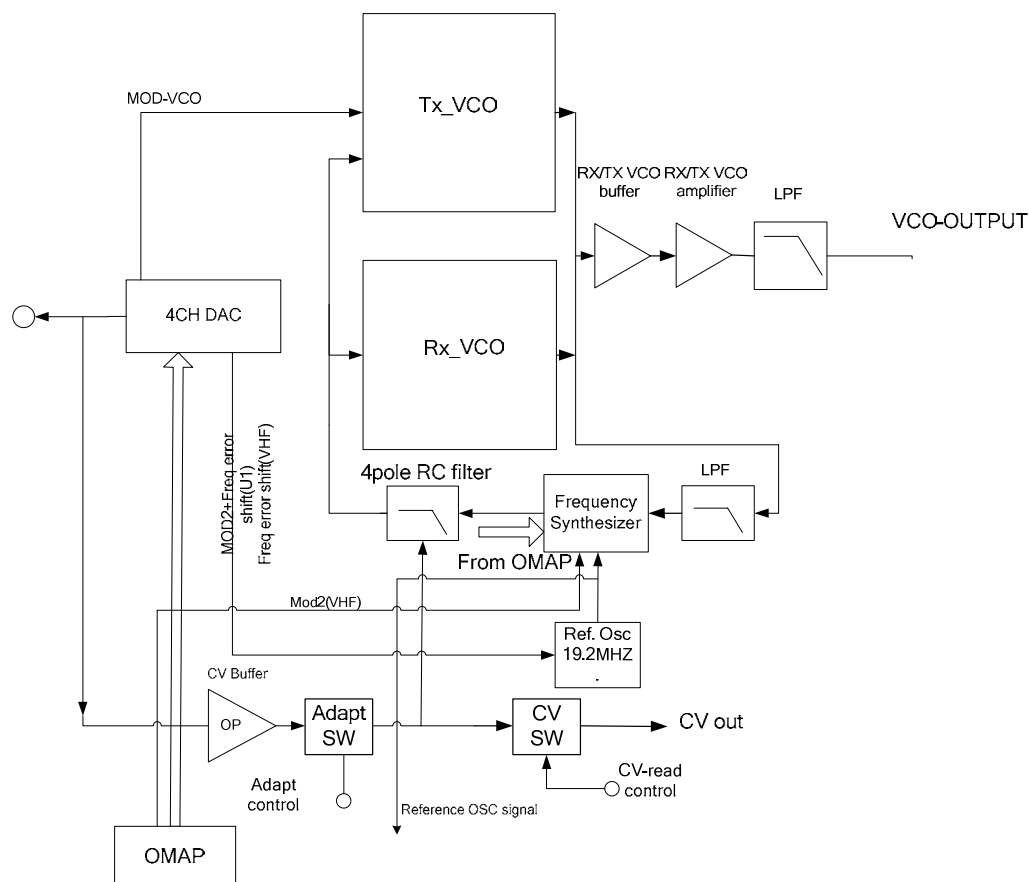


Figure 13-4 Diagram of FGU

The FGU is composed of VCO and PLL. It is the core module of the whole TX-RX system. This circuit provides accurate carrier frequency during transmission, and stable LO signal during reception. It has a direct influence on the performance of the system.

13.3.1 Working Principle of PLL

The 19.2MHz frequency generated by the reference crystal oscillator goes to PLL for division, generating the reference frequency (i.e. step frequency f_1). Meanwhile, the frequency generated by VCO passes through the band-pass filter, and the second harmonic goes into the PLL, where frequency f_2 is generated through frequency division. Then frequencies f_1 and f_2 are compared in the phase detector (PD), to generate continuous pulse current. The current goes to the loop filter for RC integration, and is then converted to CV voltage. Then the CV voltage is sent to the varactor of VCO. It adjusts the output frequency of VCO directly until the CV voltage becomes constant. Then PLL is locked, and the fundamental frequency output by VCO goes to the TX-RX channel after passing through two buffer amplifiers.

13.3.2 Working Principle of VCO

VCO employs Colpitts oscillator circuit (the RX oscillator circuit is composed of D102, D103, D106, D107 and L112; the TX oscillator circuit is composed of D108, D109, D110, D101 and L117). It obtains different output frequencies by changing the varactor's control voltage (i.e. CV voltage).

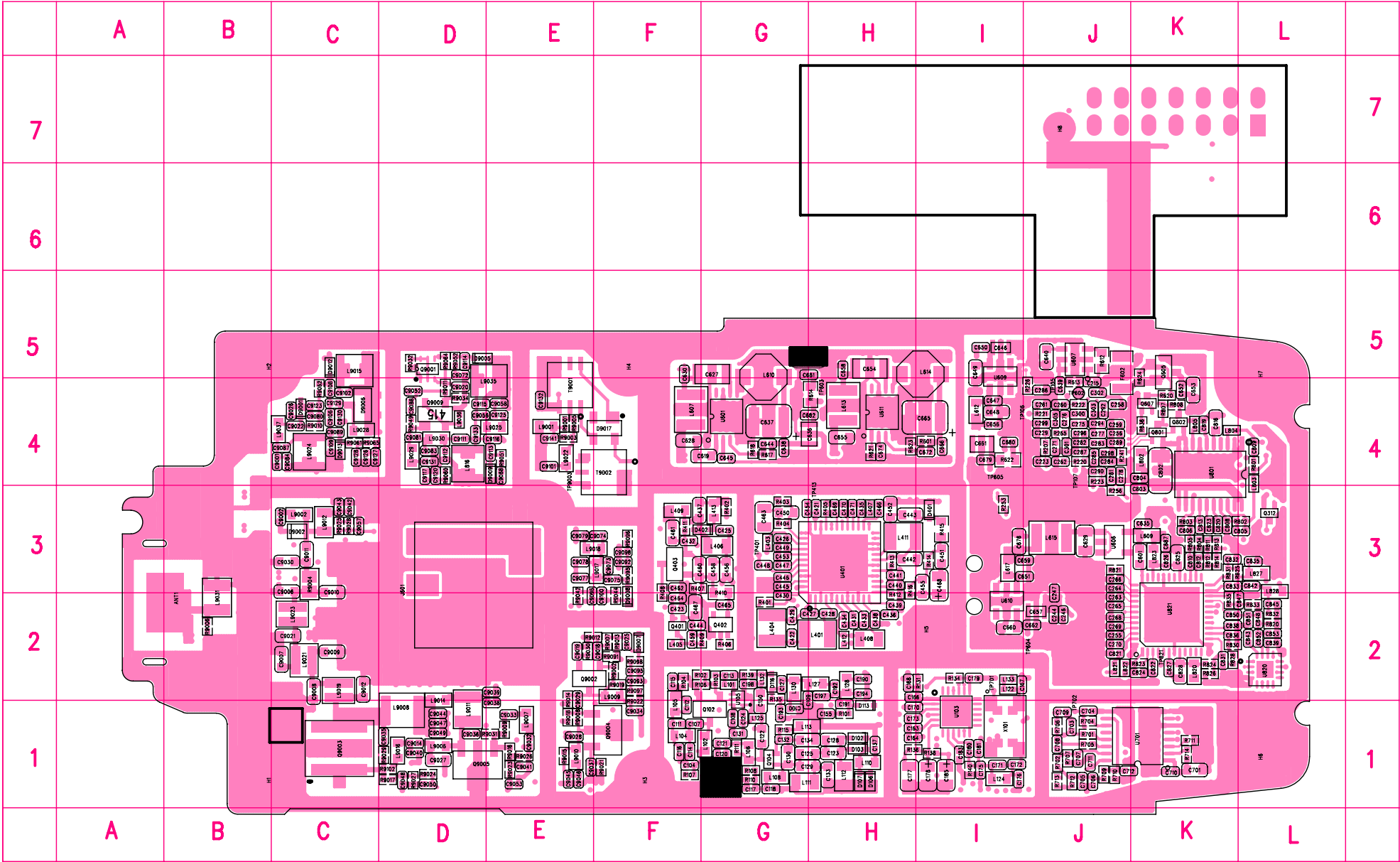
There are two types of VCO: TX VCO and RX VCO. Both types control EMD22 to switch operating status via OMAP. RX VCO is composed of the oscillator loop and Q104, to provide LO signal. TX VCO is composed of the oscillator loop and Q108, to provide carrier for TX signal.

13.3.3 Direct Modulation

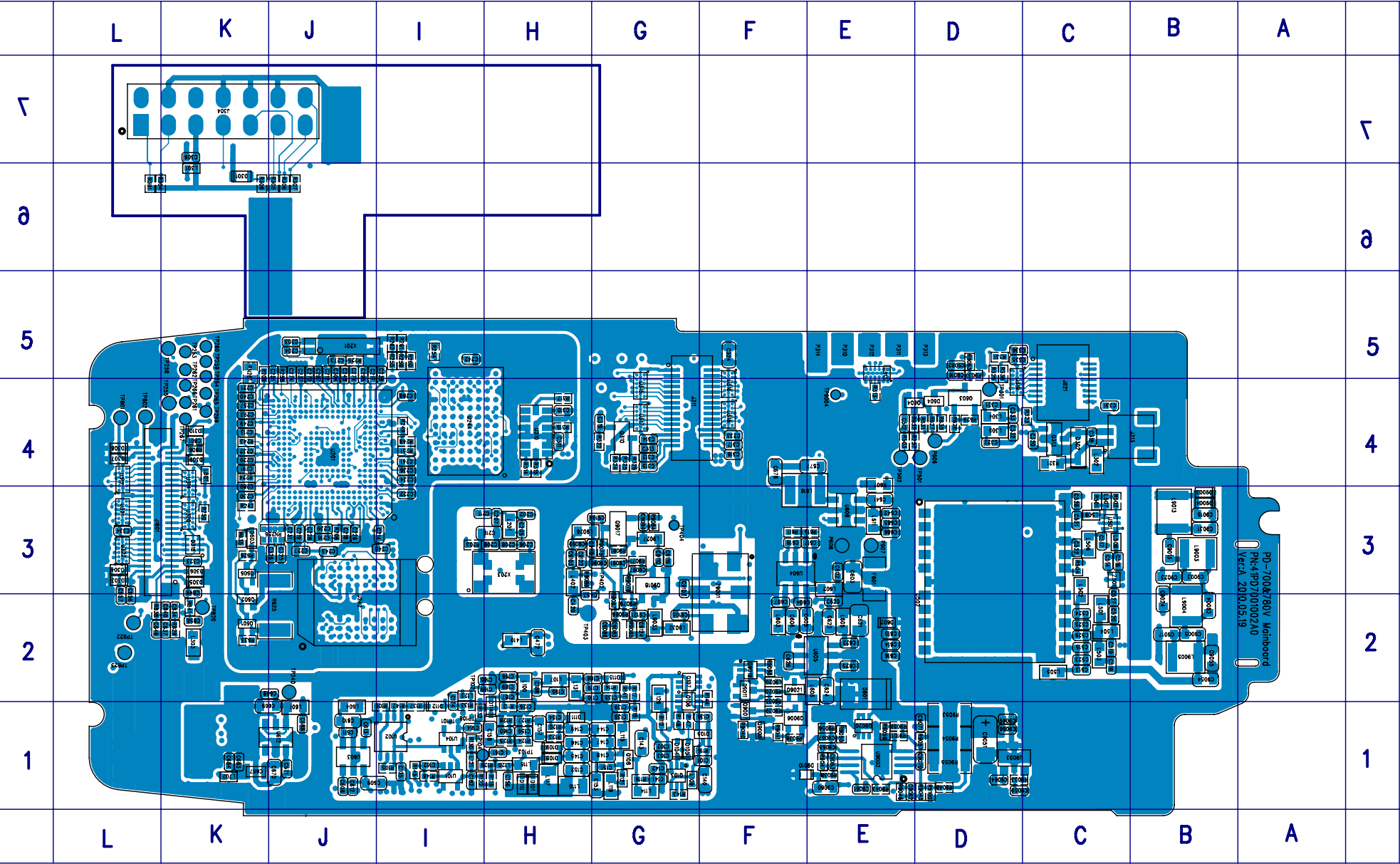
In TX mode, direct modulation will be applied because of low VHF frequency. MOD-VCO and MOD-XO send modulation signal to VCO and PLL respectively to modulate TX VCO and PLL.

13.4 PCB View

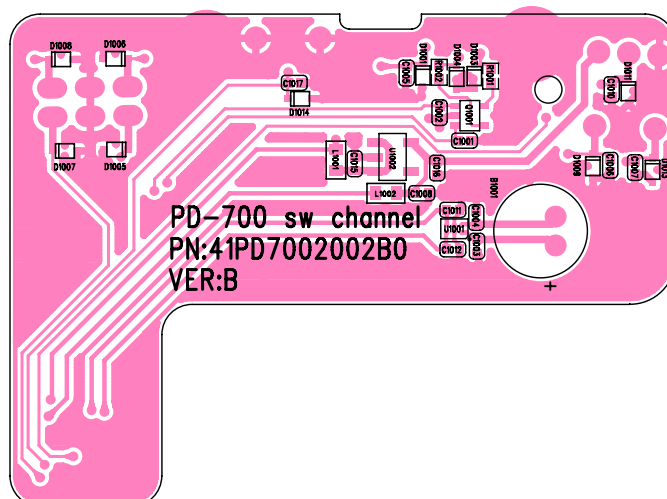
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G PCB View (Main Board) Top Layer



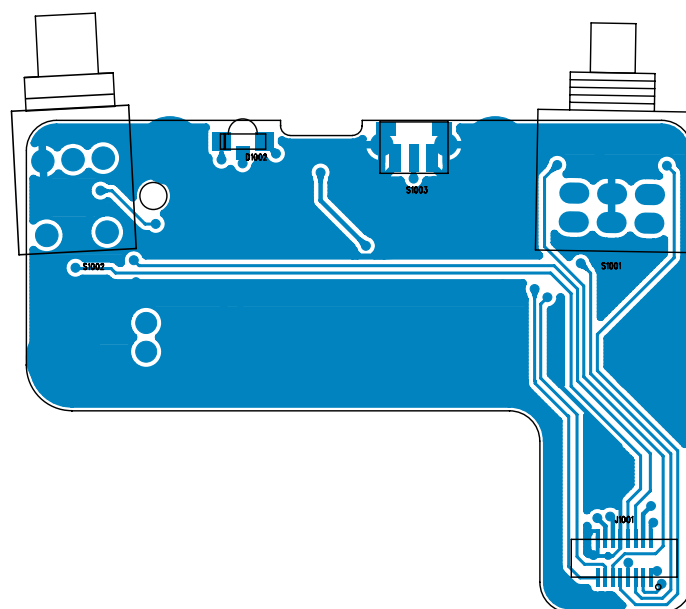
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G PCB View (Main Board)
Bottom Layer



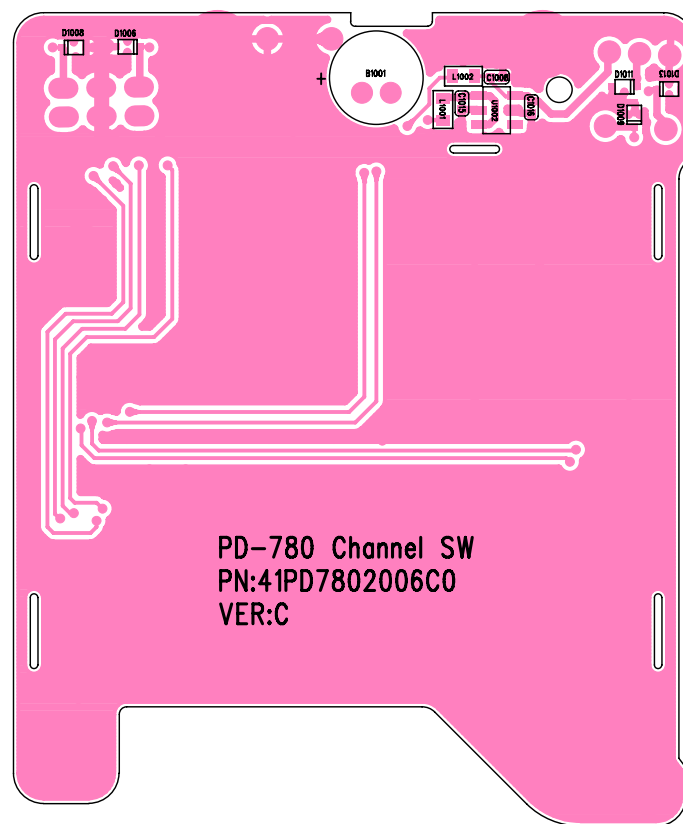
PD70X/PD70XG/HD705/HD705G PCB View (Channel Board)
Top Layer



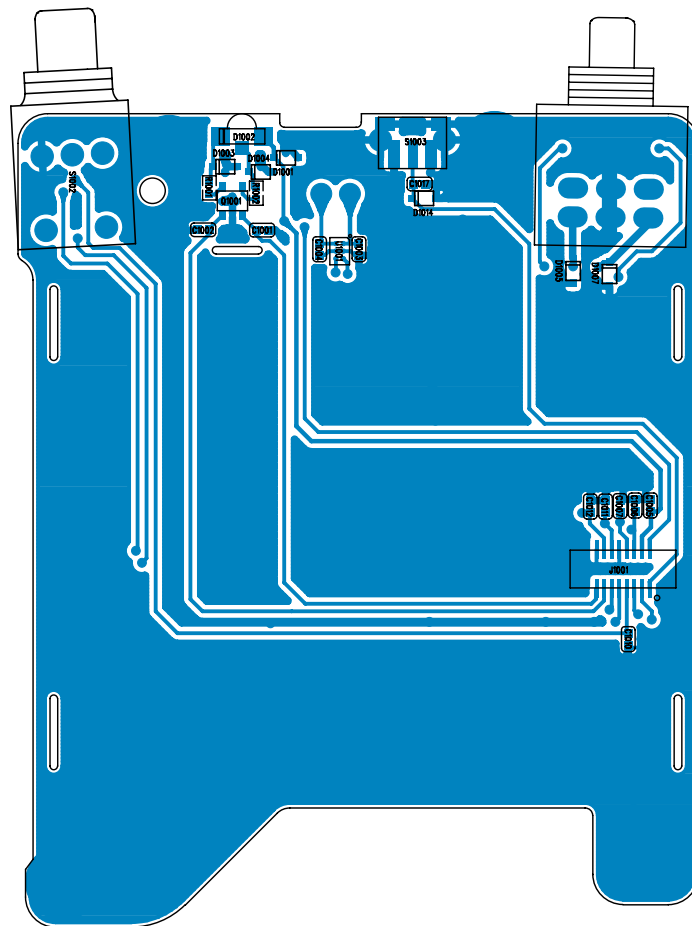
PD70X/PD70XG/HD705/HD705G PCB View (Channel Board) Bottom Layer



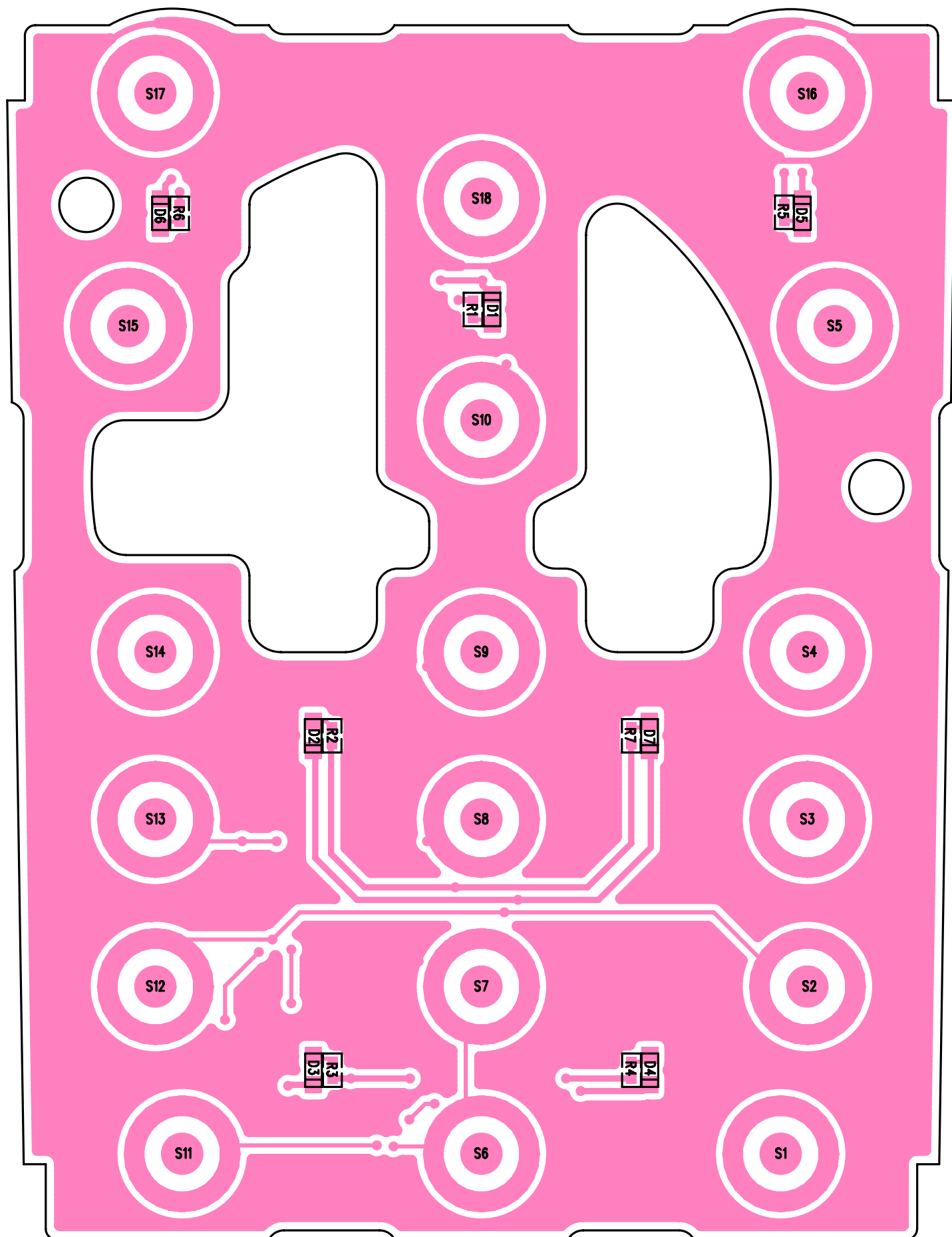
PD78X/PD78XG/HD785/HD785G PCB View (Channel Board) Top Layer



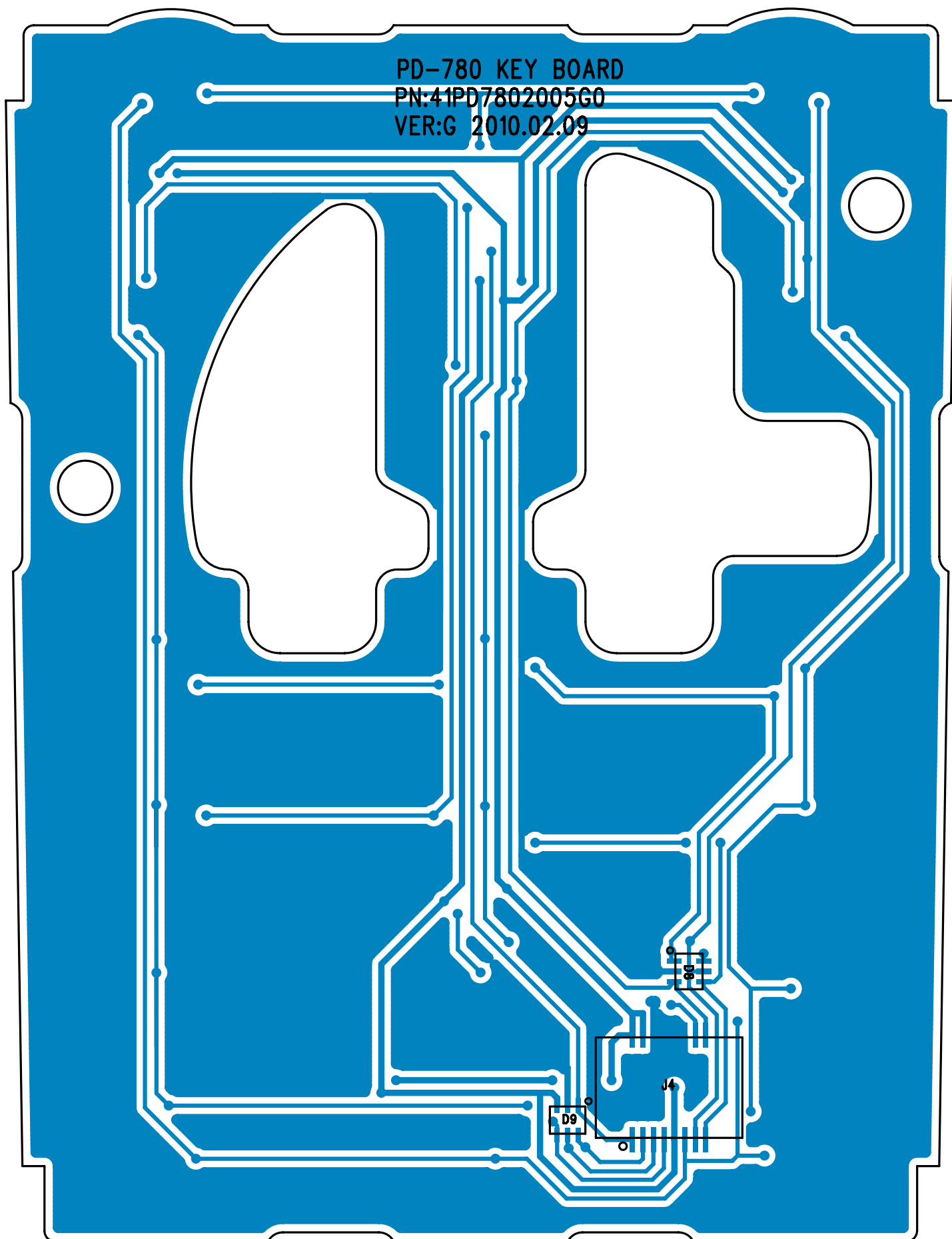
PD78X/PD78XG/HD785/HD785G PCB View (Channel Board)
Bottom Layer



PD78X/PD78XG/HD785/HD785G PCB View (Keyboard) Top Layer

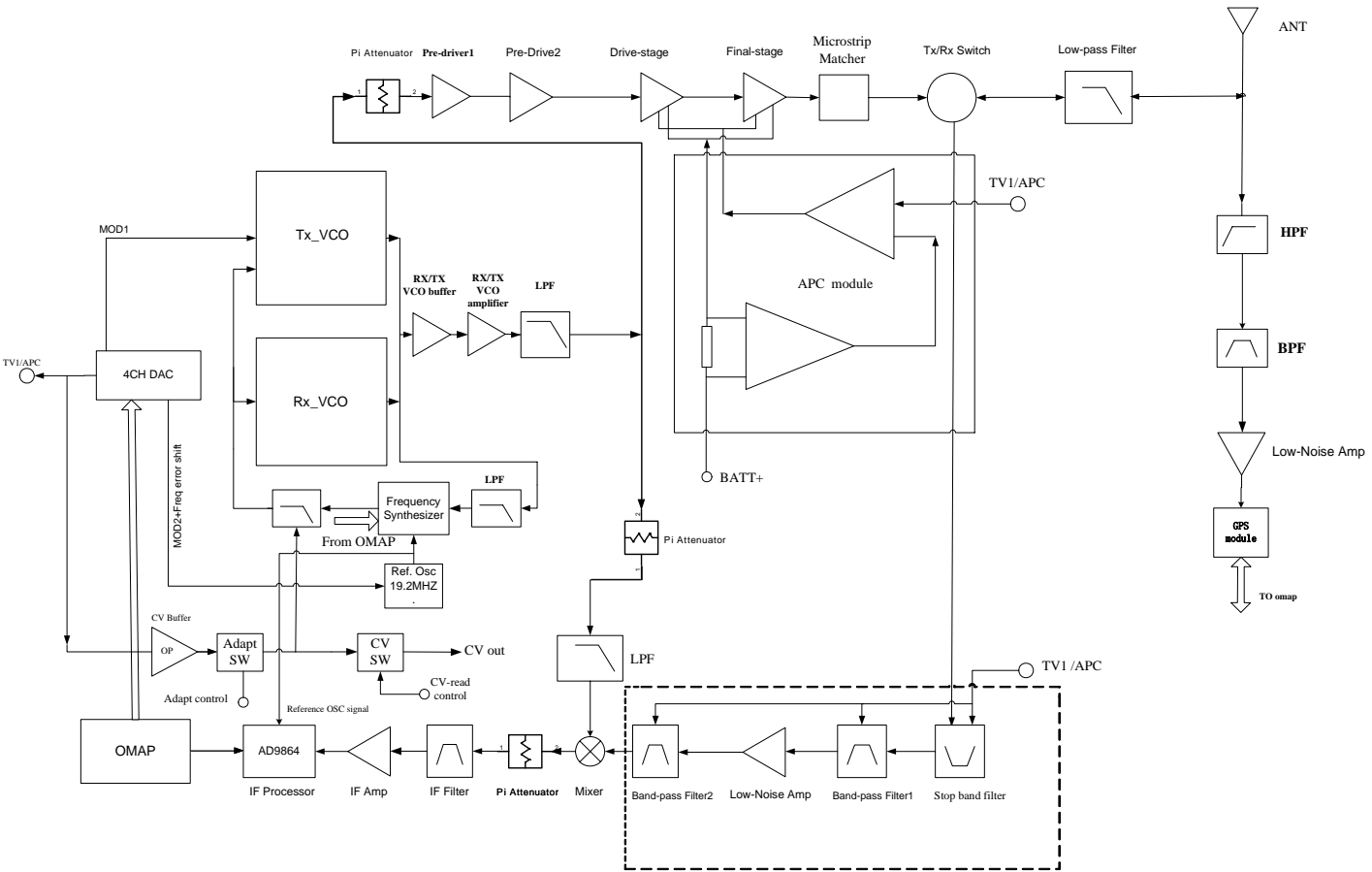


PD78X/PD78XG/HD785/HD785G PCB View (Keyboard)
Bottom Layer



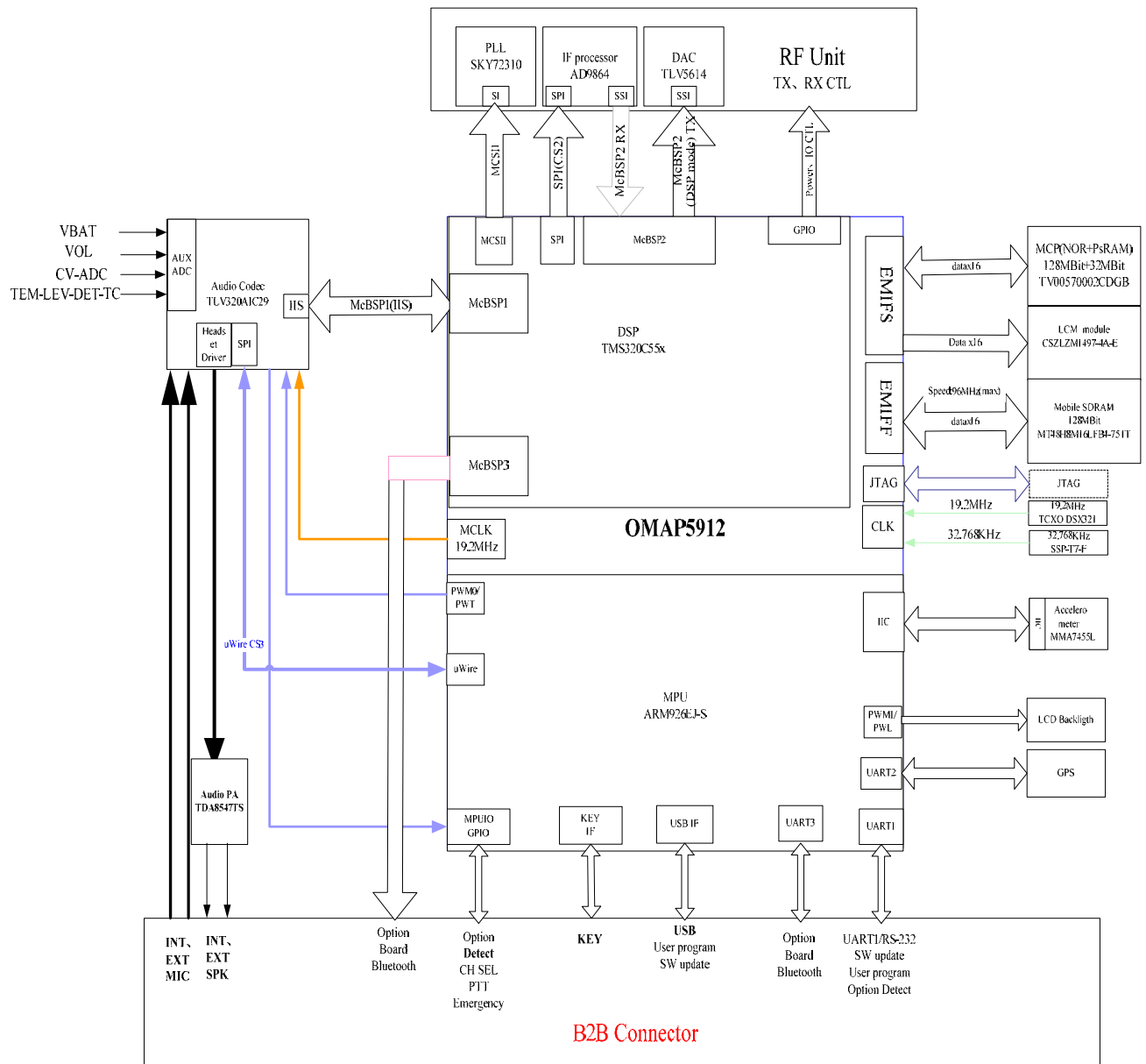
13.5 Block Diagram

PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Block Diagram (RF Section)

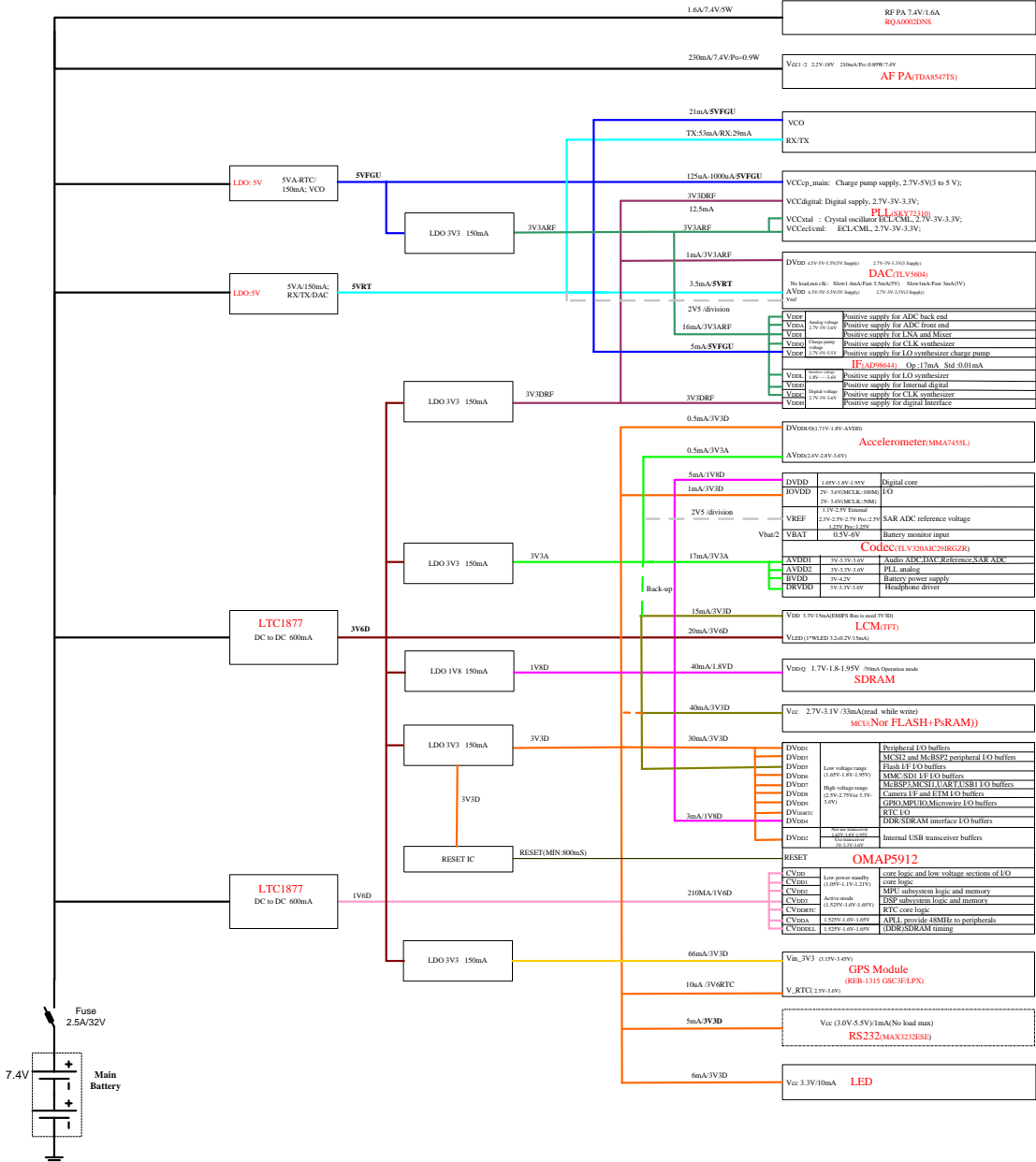


PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G

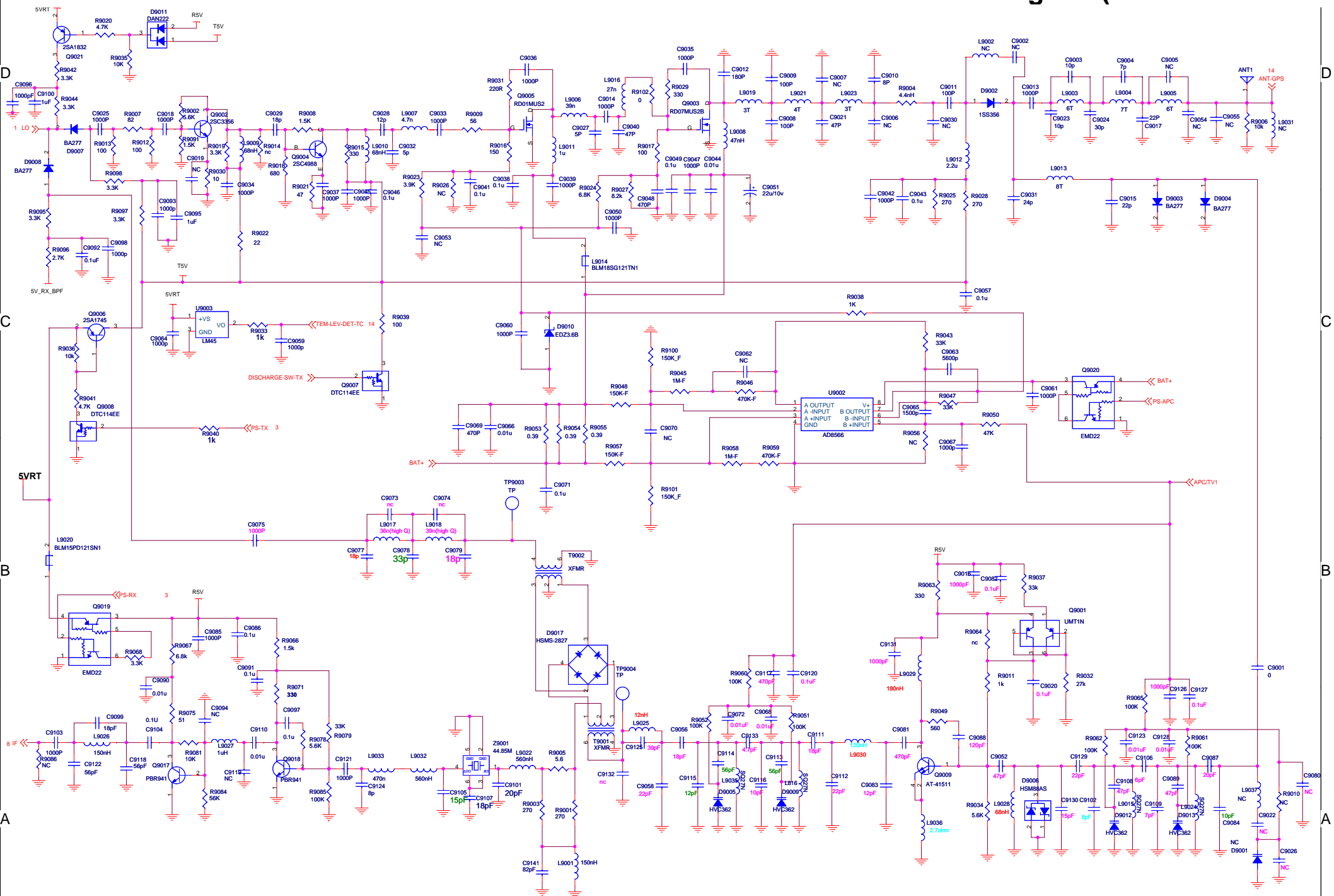
Block Diagram (Baseband Section)



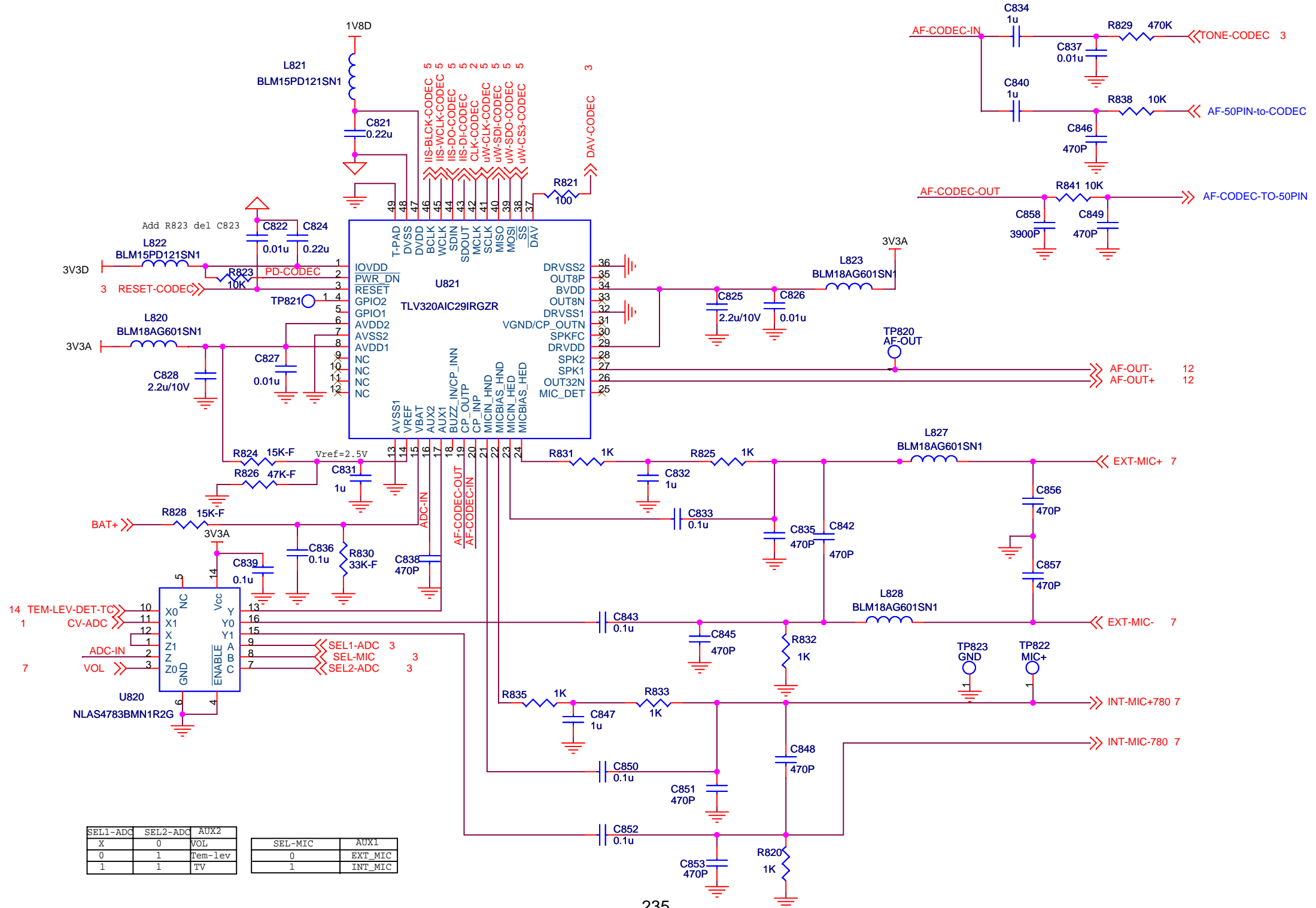
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G
Block Diagram (Power Section)



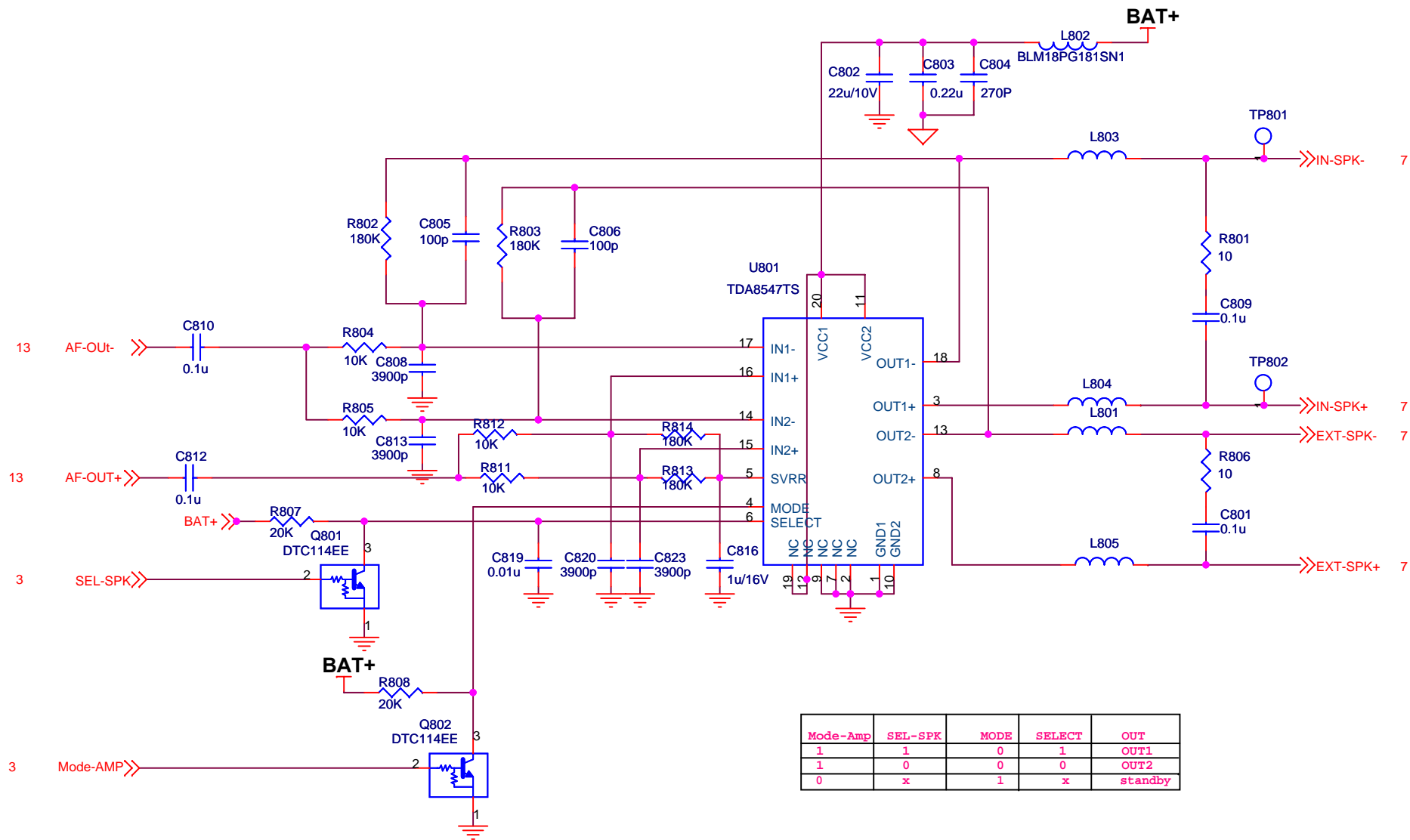
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (Transmitter/Receiver)



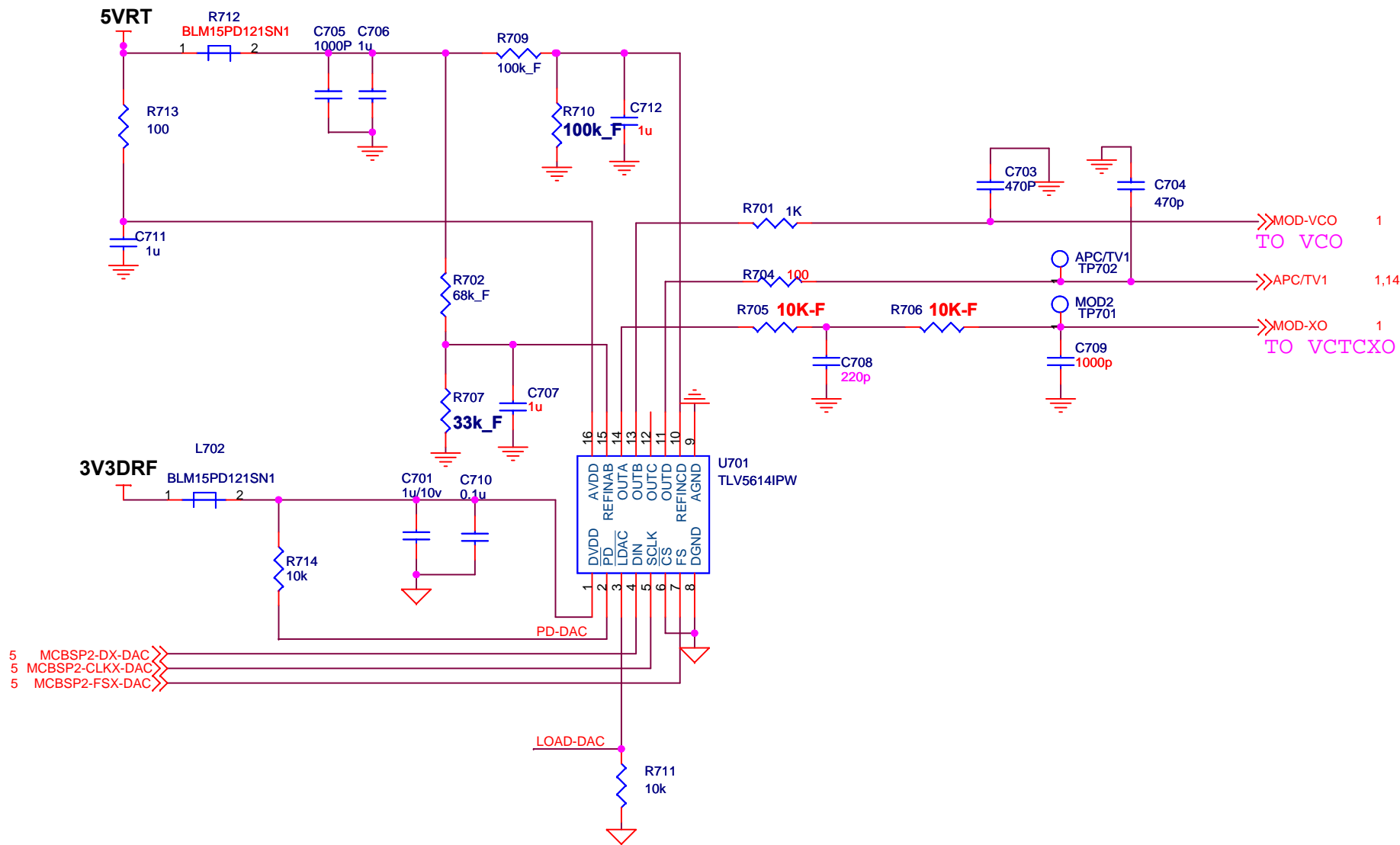
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (CODEC)



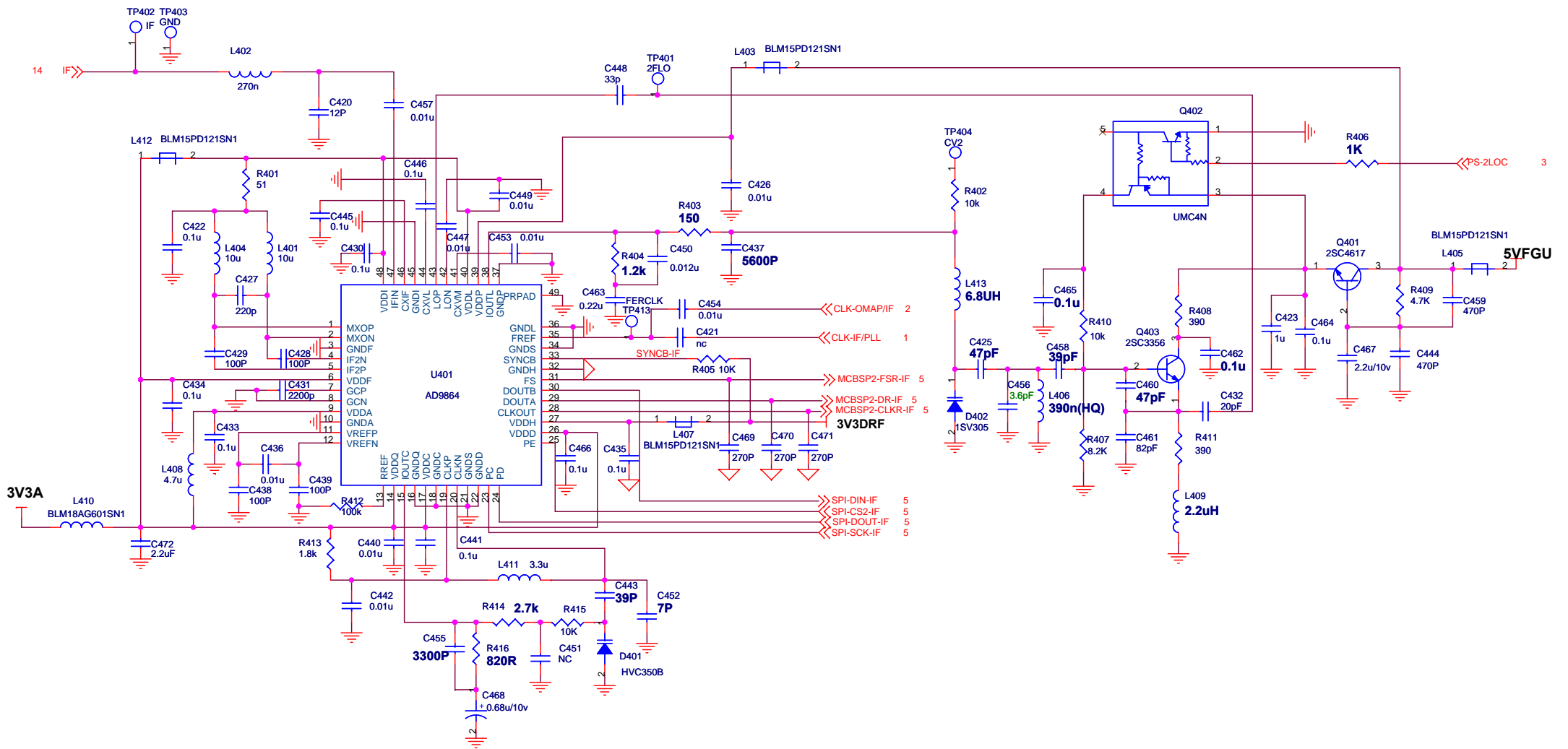
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (Audio Amplifier)



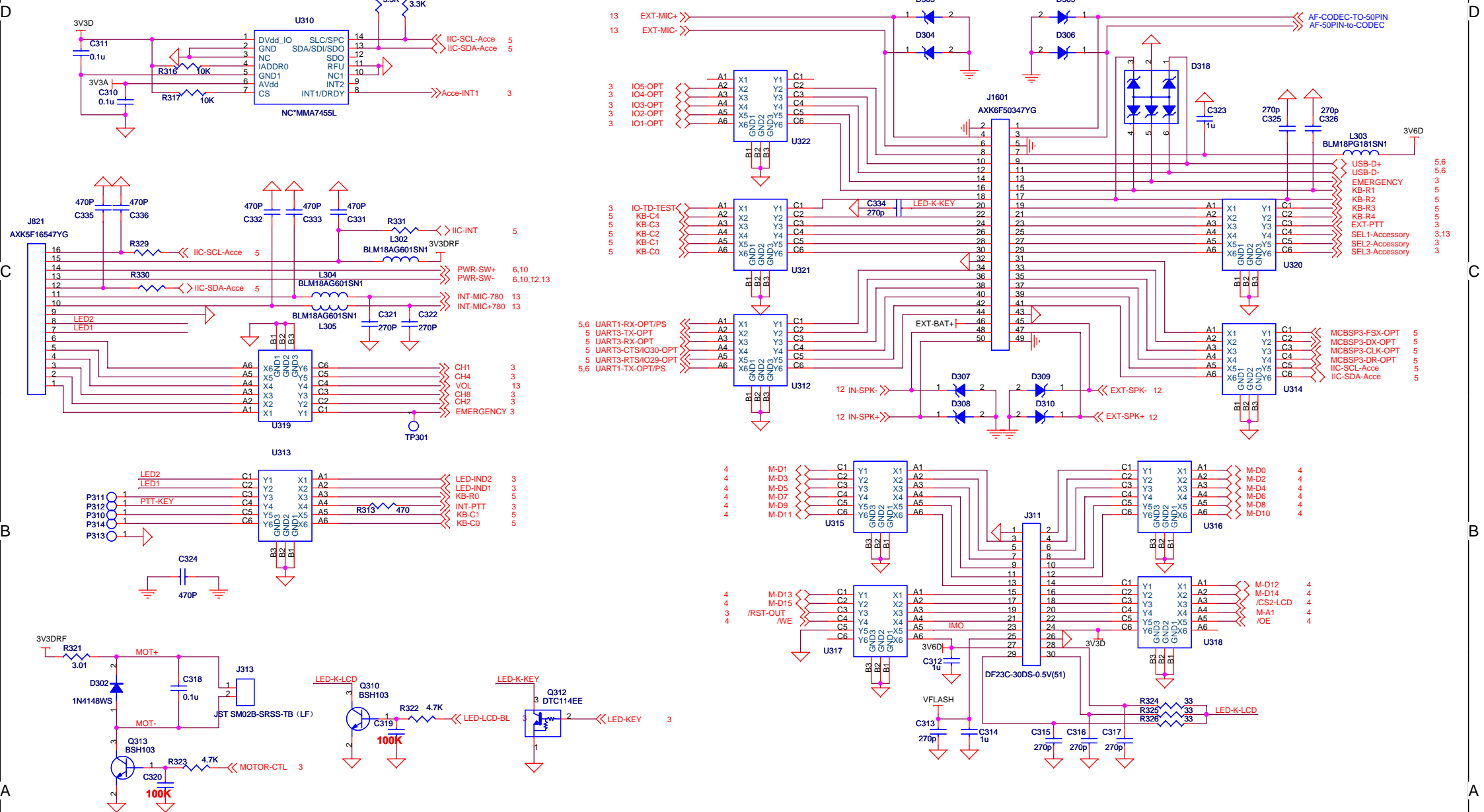
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (DAC)



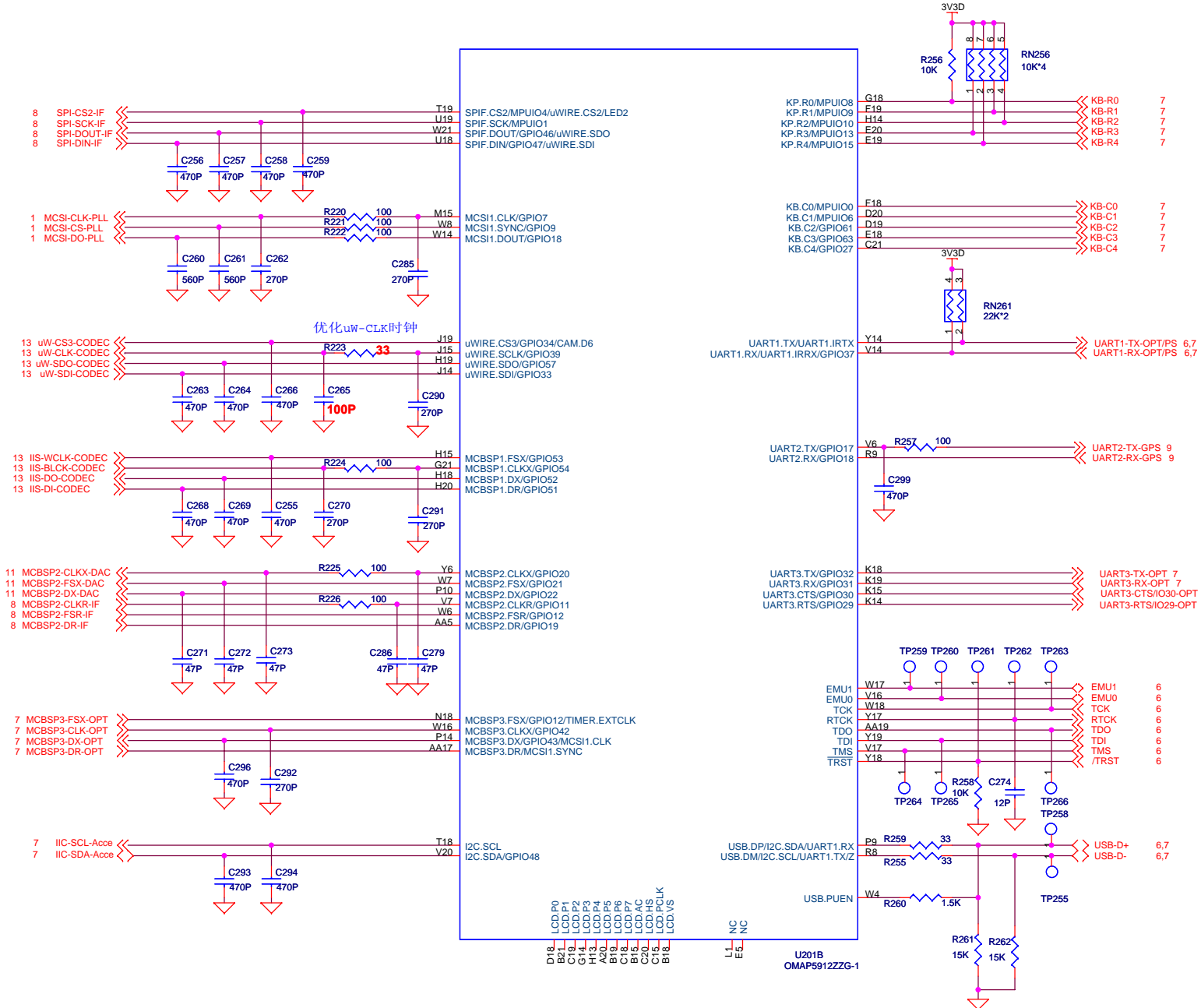
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (AD9864)



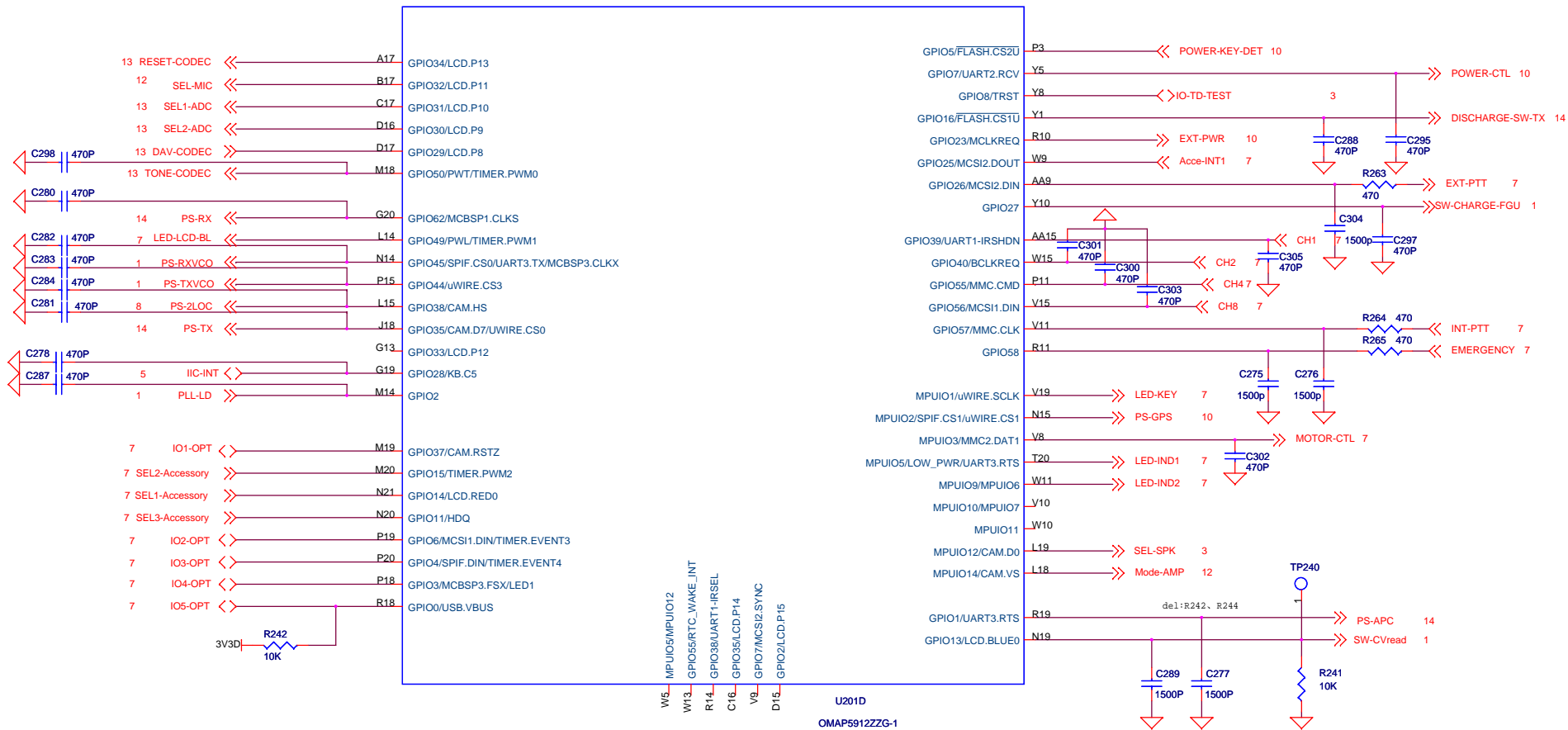
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (Internal Interface)



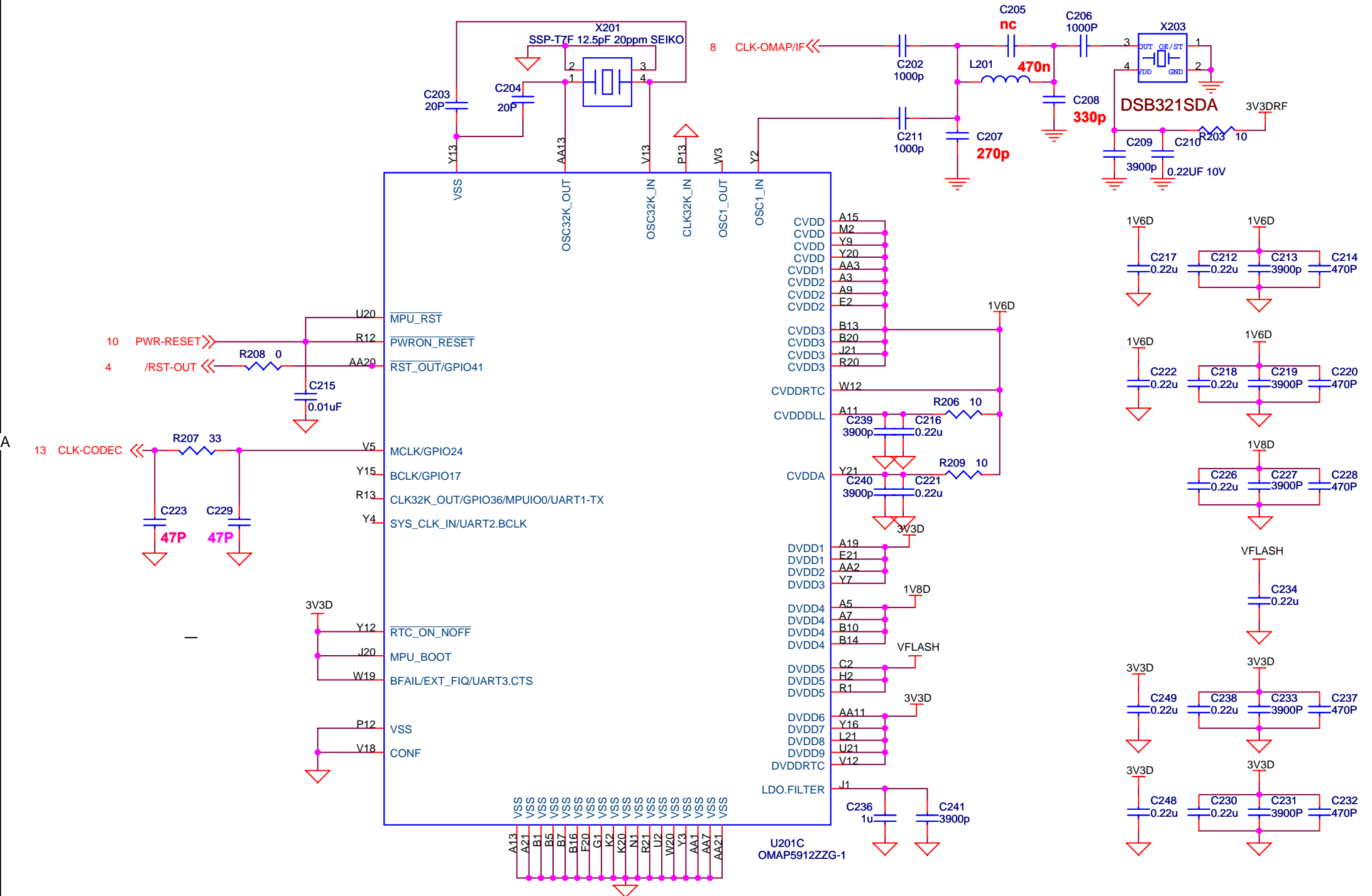
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (OMAP SI)



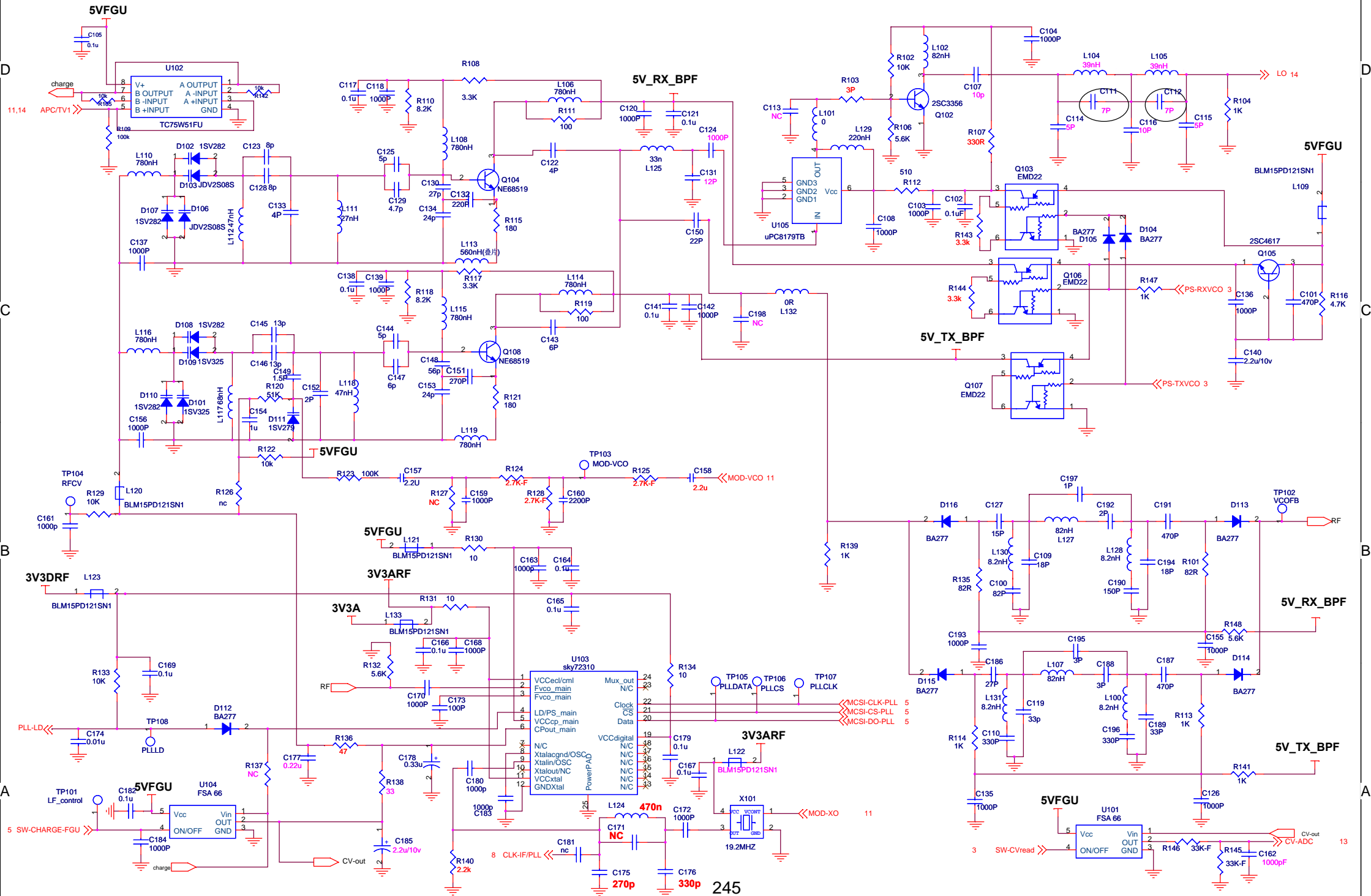
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (OMAP IO)



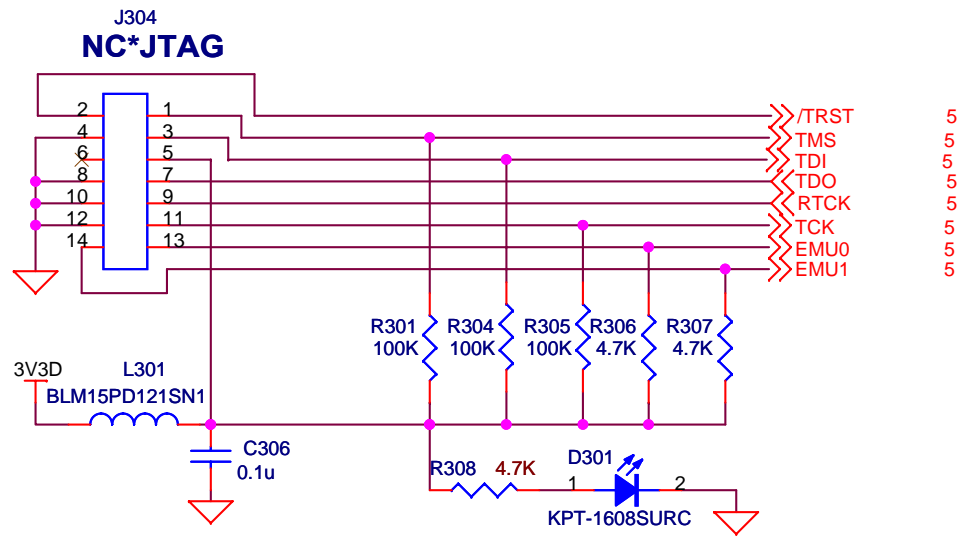
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (OMAP CORE)



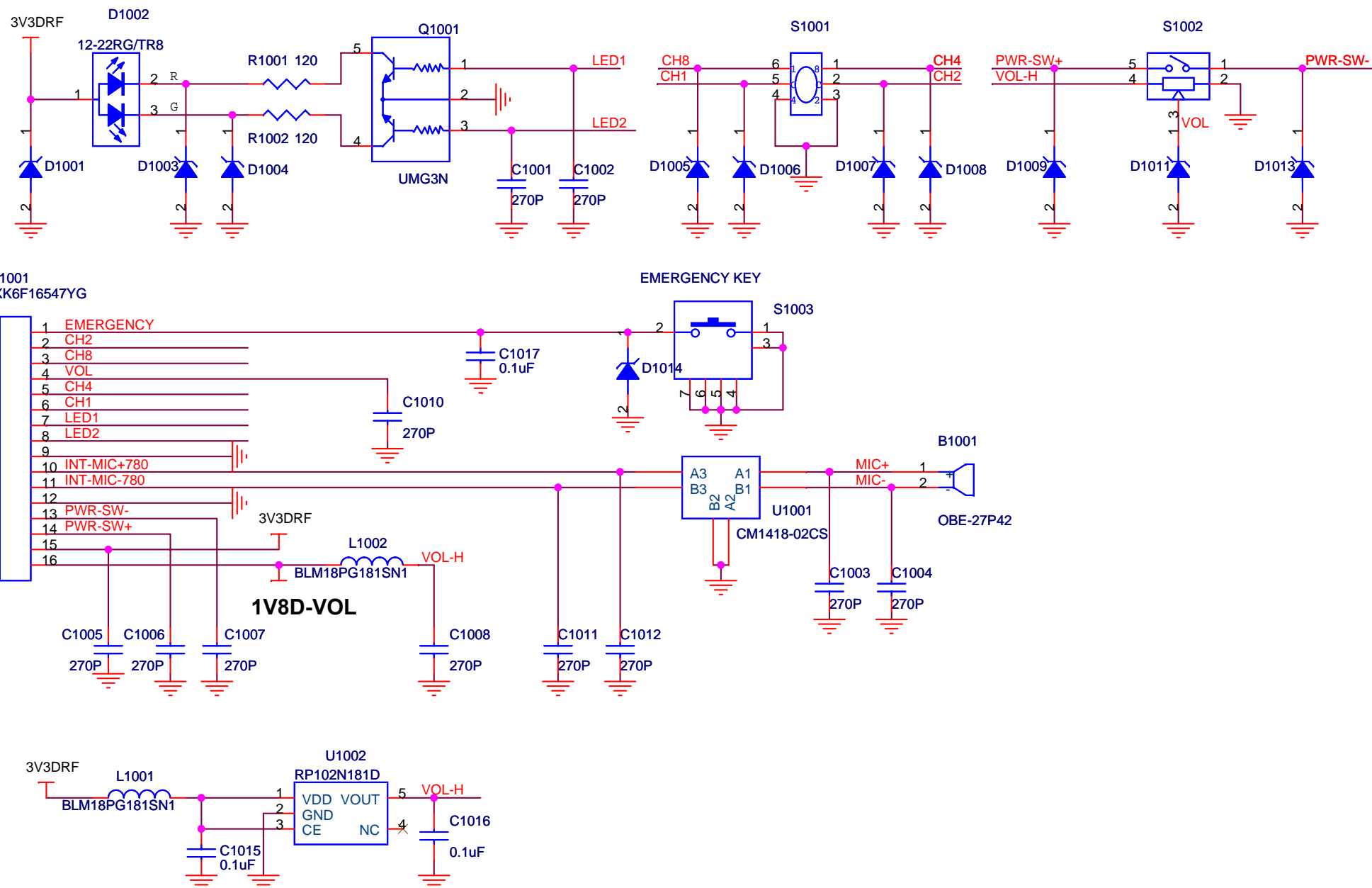
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (FGU)



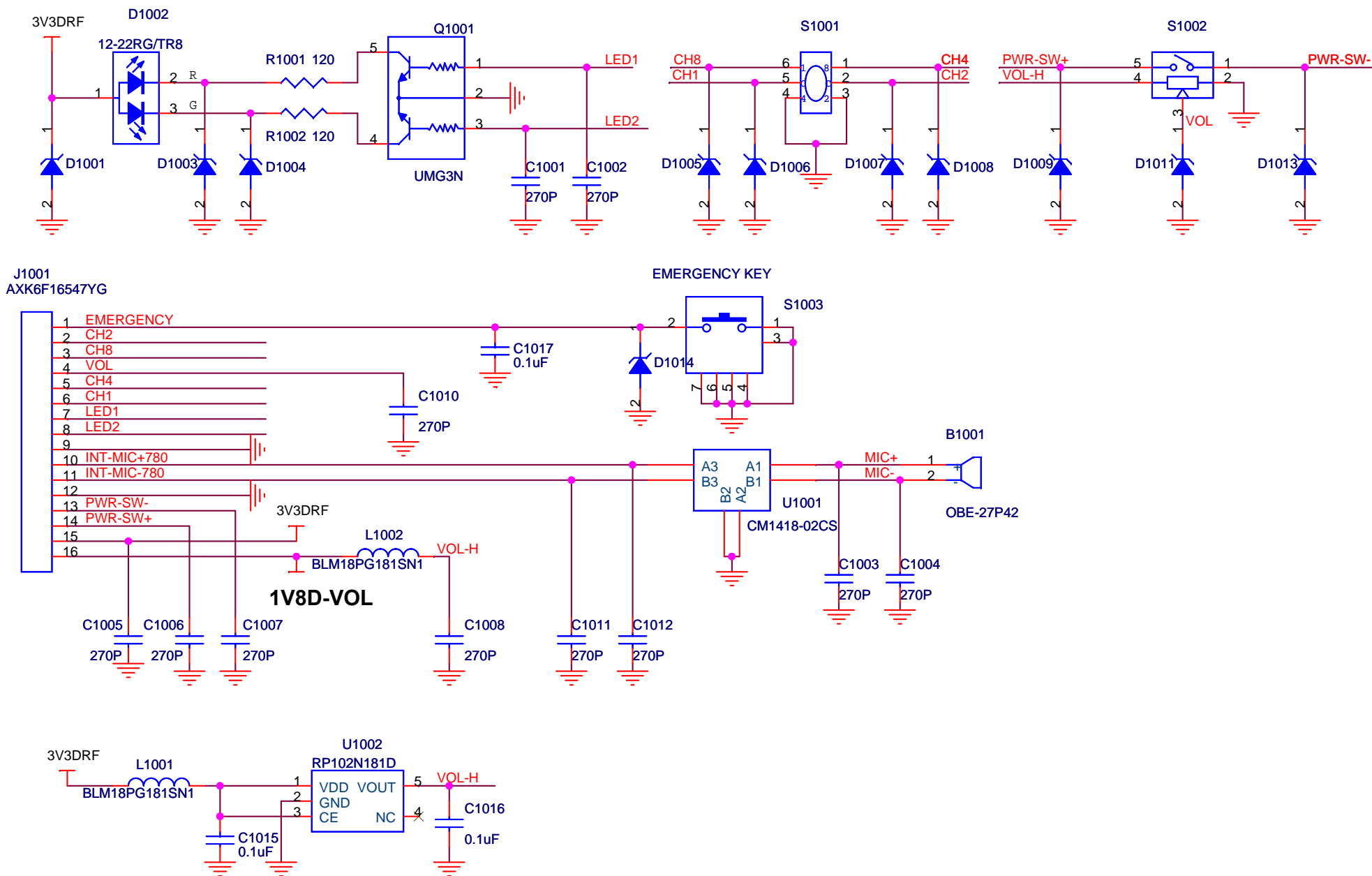
PD70X/PD70XG/PD78X/PD78XG/HD705/HD705G/HD785/HD785G Schematic Diagram (External Interface)



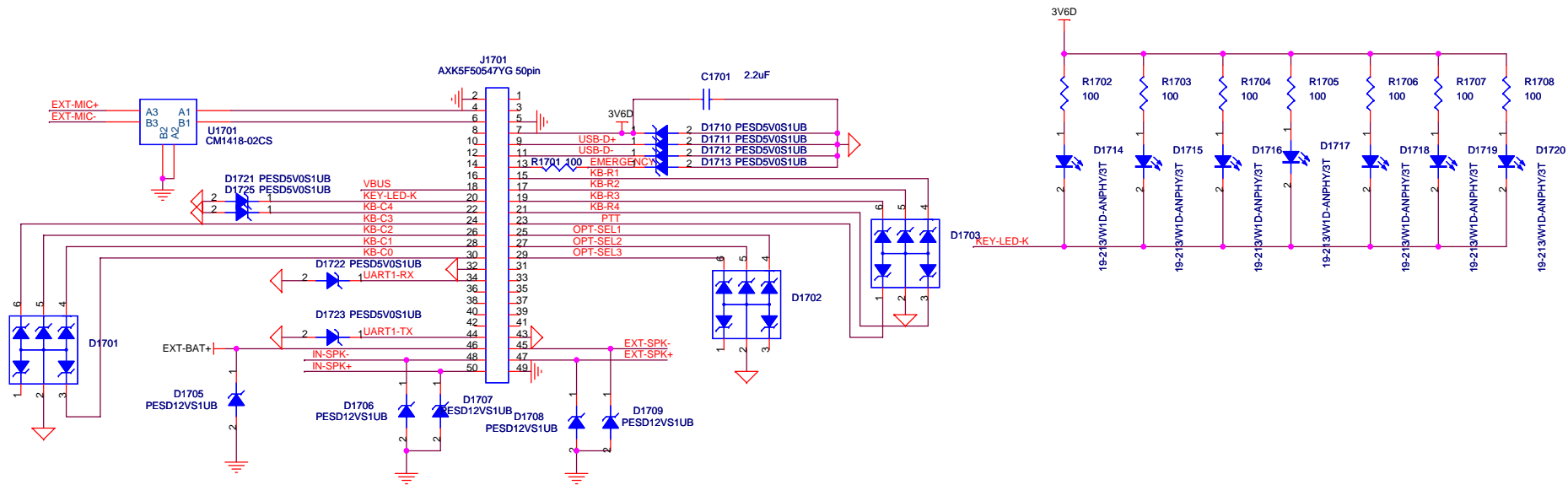
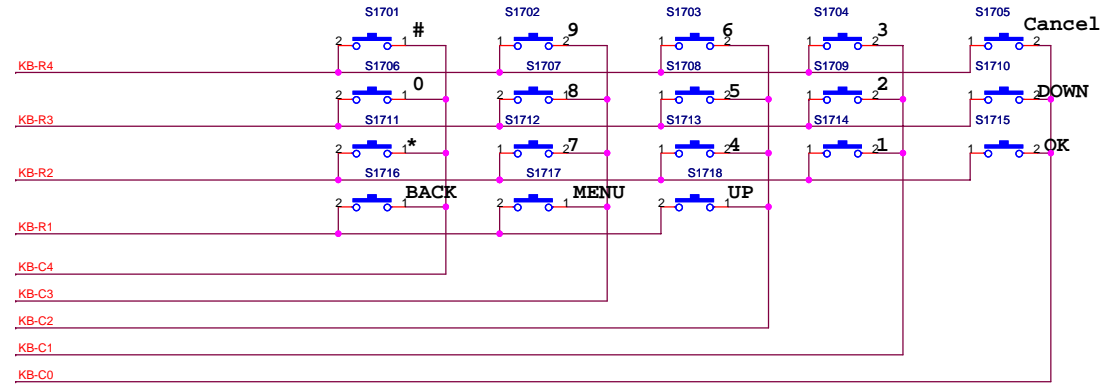
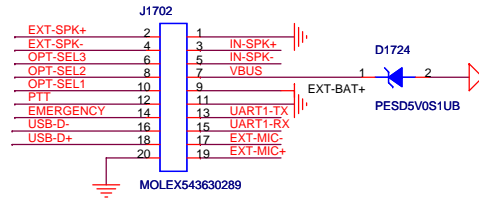
PD70X/PD70XG/HD705/HD705G Schematic Diagram (Channel Board)



PD78X/PD78XG/HD785/HD785G Schematic Diagram (Channel Board)



PD78X/PD78XG/HD785/HD785G Schematic Diagram (Keyboard)



13.7 Parts List

Main Board for PD70X/ PD70XG/ PD78X/ PD78XG/ HD705/ HD705G/ HD785/ HD785G

No.	Ref. No.	Part No.	Description
1	U502	1615000001650	GPS module
2	C9001	3001050000000	0Ω
3	L101	3001050000000	0Ω
4	L132	3001050000000	0Ω
5	R254	3001050000000	0Ω
6	R9102	3001050000000	0Ω
7	R130	3001051000000	10Ω
8	R131	3001051000000	10Ω
9	R134	3001051000000	10Ω
10	R203	3001051000000	10Ω
11	R206	3001051000000	10Ω
12	R209	3001051000000	10Ω
13	R801	3001051000000	10Ω
14	R806	3001051000000	10Ω
15	R9030	3001051000000	10Ω
16	R111	3001051010000	100Ω
17	R119	3001051010000	100Ω
18	R220	3001051010000	100Ω
19	R221	3001051010000	100Ω
20	R222	3001051010000	100Ω
21	R224	3001051010000	100Ω
22	R225	3001051010000	100Ω
23	R226	3001051010000	100Ω
24	R257	3001051010000	100Ω
25	R503	3001051010000	100Ω
26	R704	3001051010000	100Ω
27	R713	3001051010000	100Ω
28	R821	3001051010000	100Ω
29	R9012	3001051010000	100Ω
30	R9013	3001051010000	100Ω
31	R9017	3001051010000	100Ω
32	R9039	3001051010000	100Ω
33	R101	3001051020000	1KΩ
34	R104	3001051020000	1KΩ
35	R113	3001051020000	1KΩ
36	R114	3001051020000	1KΩ
37	R135	3001051020000	1KΩ
38	R139	3001051020000	1KΩ
39	R141	3001051020000	1KΩ
40	R147	3001051020000	1KΩ
41	R406	3001051020000	1KΩ

No.	Ref. No.	Part No.	Description
42	R613	3001051020000	1KΩ
43	R632	3001051020000	1KΩ
44	R701	3001051020000	1KΩ
45	R820	3001051020000	1KΩ
46	R825	3001051020000	1KΩ
47	R831	3001051020000	1KΩ
48	R832	3001051020000	1KΩ
49	R833	3001051020000	1KΩ
50	R835	3001051020000	1KΩ
51	R9011	3001051020000	1KΩ
52	R9033	3001051020000	1KΩ
53	R9038	3001051020000	1KΩ
54	R9040	3001051020000	1KΩ
55	R705	3001051030010	10KΩ
56	R706	3001051030010	10KΩ
57	R102	3001051030050	10KΩ
58	R105	3001051030050	10KΩ
59	R122	3001051030050	10KΩ
60	R129	3001051030050	10KΩ
61	R133	3001051030050	10KΩ
62	R142	3001051030050	10KΩ
63	R241	3001051030050	10KΩ
64	R242	3001051030050	10KΩ
65	R243	3001051030050	10KΩ
66	R249	3001051030050	10KΩ
67	R256	3001051030050	10KΩ
68	R258	3001051030050	10KΩ
69	R316	3001051030050	10KΩ
70	R317	3001051030050	10KΩ
71	R402	3001051030050	10KΩ
72	R405	3001051030050	10KΩ
73	R504	3001051030050	10KΩ
74	R611	3001051030050	10KΩ
75	R711	3001051030050	10KΩ
76	R714	3001051030050	10KΩ
77	R804	3001051030050	10KΩ
78	R805	3001051030050	10KΩ
79	R811	3001051030050	10KΩ
80	R812	3001051030050	10KΩ
81	R823	3001051030050	10KΩ
82	R838	3001051030050	10KΩ
83	R841	3001051030050	10KΩ
84	R9006	3001051030050	10KΩ
85	R9035	3001051030050	10KΩ

No.	Ref. No.	Part No.	Description
86	R9036	3001051030050	10KΩ
87	R9081	3001051030050	10KΩ
88	C319	3001051040000	100KΩ
89	C320	3001051040000	100KΩ
90	R109	3001051040000	100KΩ
91	R123	3001051040000	100KΩ
92	R251	3001051040000	100KΩ
93	R301	3001051040000	100KΩ
94	R304	3001051040000	100KΩ
95	R305	3001051040000	100KΩ
96	R412	3001051040000	100KΩ
97	R620	3001051040000	100KΩ
98	R623	3001051040000	100KΩ
99	R624	3001051040000	100KΩ
100	R709	3001051040000	100KΩ
101	R710	3001051040000	100KΩ
102	R9051	3001051040000	100KΩ
103	R9052	3001051040000	100KΩ
104	R9060	3001051040000	100KΩ
105	R9061	3001051040000	100KΩ
106	R9062	3001051040000	100KΩ
107	R9065	3001051040000	100KΩ
108	R9085	3001051040000	100KΩ
109	R9045	3001051050000	1MΩ
110	R9058	3001051050000	1MΩ
111	R404	3001051220000	1.2KΩ
112	R618	3001051340000	130KΩ
113	R403	3001051510000	150Ω
114	R9016	3001051510000	150Ω
115	R260	3001051520000	1.5KΩ
116	R9008	3001051520000	1.5KΩ
117	R9066	3001051520000	1.5KΩ
118	R9091	3001051520000	1.5KΩ
119	R261	3001051530010	15KΩ
120	R262	3001051530010	15KΩ
121	R631	3001051530010	15KΩ
122	R824	3001051530010	15KΩ
123	R828	3001051530010	15KΩ
124	R9048	3001051540000	150KΩ
125	R9057	3001051540000	150KΩ
126	R9100	3001051540000	150KΩ
127	R9101	3001051540000	150KΩ
128	R115	3001051810010	180Ω
129	R121	3001051810010	180Ω

No.	Ref. No.	Part No.	Description
130	R413	3001051820000	1.8KΩ
131	R802	3001051840000	180KΩ
132	R803	3001051840000	180KΩ
133	R813	3001051840000	180KΩ
134	R814	3001051840000	180KΩ
135	R807	3001052030000	20KΩ
136	R808	3001052030000	20KΩ
137	R9022	3001052200000	22Ω
138	R9031	3001052210000	220Ω
139	R140	3001052220000	2.2KΩ
140	RN261	3001052230020	22K*2
141	R9001	3001052710010	270Ω
142	R9003	3001052710010	270Ω
143	R9025	3001052710010	270Ω
144	R9028	3001052710010	270Ω
145	R124	3001052720010	2.7KΩ
146	R125	3001052720010	2.7KΩ
147	R128	3001052720010	2.7KΩ
148	R414	3001052720010	2.7KΩ
149	R629	3001052720010	2.7KΩ
150	R9096	3001052720010	2.7KΩ
151	R9032	3001052730000	27KΩ
152	L9036	3001052790000	2.7Ω
153	R138	3001053300000	33Ω
154	R207	3001053300000	33Ω
155	R223	3001053300000	33Ω
156	R255	3001053300000	33Ω
157	R259	3001053300000	33Ω
158	R324	3001053300000	33Ω
159	R325	3001053300000	33Ω
160	R326	3001053300000	33Ω
161	R107	3001053310000	330Ω
162	R502	3001053310000	330Ω
163	R9015	3001053310000	330Ω
164	R9029	3001053310000	330Ω
165	R9063	3001053310000	330Ω
166	R9071	3001053310000	330Ω
167	R108	3001053320000	3.3KΩ
168	R117	3001053320000	3.3KΩ
169	R143	3001053320000	3.3KΩ
170	R144	3001053320000	3.3KΩ
171	R314	3001053320000	3.3KΩ
172	R315	3001053320000	3.3KΩ
173	R636	3001053320000	3.3KΩ

No.	Ref. No.	Part No.	Description
174	R9019	3001053320000	3.3K Ω
175	R9042	3001053320000	3.3K Ω
176	R9044	3001053320000	3.3K Ω
177	R9068	3001053320000	3.3K Ω
178	R9095	3001053320000	3.3K Ω
179	R9097	3001053320000	3.3K Ω
180	R9098	3001053320000	3.3K Ω
181	R145	3001053330000	33K Ω
182	R146	3001053330000	33K Ω
183	R635	3001053330000	33K Ω
184	R707	3001053330000	33K Ω
185	R830	3001053330000	33K Ω
186	R9037	3001053330000	33K Ω
187	R9043	3001053330000	33K Ω
188	R9047	3001053330000	33K Ω
189	R9079	3001053330000	33K Ω
190	R408	3001053910000	390 Ω
191	R411	3001053910000	390 Ω
192	R9023	3001053920000	3.9K Ω
193	R9021	3001054700000	47 Ω
194	R250	3001054710000	470 Ω
195	R265	3001054710000	470 Ω
196	R313	3001054710000	470 Ω
197	R501	3001054710000	470 Ω
198	R116	3001054720000	4.7K Ω
199	R306	3001054720000	4.7K Ω
200	R307	3001054720000	4.7K Ω
201	R308	3001054720000	4.7K Ω
202	R322	3001054720000	4.7K Ω
203	R323	3001054720000	4.7K Ω
204	R409	3001054720000	4.7K Ω
205	R9020	3001054720000	4.7K Ω
206	R9041	3001054720000	4.7K Ω
207	R621	3001054730010	47K Ω
208	R627	3001054730010	47K Ω
209	R628	3001054730010	47K Ω
210	R630	3001054730010	47K Ω
211	R826	3001054730010	47K Ω
212	R9050	3001054730010	47K Ω
213	R617	3001054740010	470K Ω
214	R829	3001054740010	470K Ω
215	R9046	3001054740010	470K Ω
216	R9059	3001054740010	470K Ω
217	R401	3001055100020	51 Ω

No.	Ref. No.	Part No.	Description
218	R9075	3001055100020	51Ω
219	R112	3001055110000	510Ω
220	R120	3001055130000	51KΩ
221	R9009	3001055600000	56Ω
222	R9049	3001055610000	560Ω
223	R106	3001055620000	5.6KΩ
224	R132	3001055620000	5.6KΩ
225	R148	3001055620000	5.6KΩ
226	R9002	3001055620000	5.6KΩ
227	R9034	3001055620000	5.6KΩ
228	R9078	3001055620000	5.6KΩ
229	R9084	3001055630000	56KΩ
230	R9005	3001055690000	5.6Ω
231	R9018	3001056810000	680Ω
232	R9024	3001056820000	6.8KΩ
233	R9067	3001056820000	6.8KΩ
234	R702	3001056830000	68KΩ
235	R136	3001057500000	75Ω
236	R9007	3001058200000	82Ω
237	R416	3001058210000	820Ω
238	R110	3001058220000	8.2KΩ
239	R118	3001058220000	8.2KΩ
240	R407	3001058220000	8.2KΩ
241	R9027	3001058220000	8.2KΩ
242	R601	3001059130000	91KΩ
243	R607	3001061000000	10Ω
244	R612	3001061020010	1KΩ
245	R410	3001061030010	10KΩ
246	R415	3001061030010	10KΩ
247	RN256	3005051030010	10KΩ
248	R321	3099063018000	3.01Ω
249	R9053	3099080398010	0.39Ω
250	R9054	3099080398010	0.39Ω
251	R9055	3099080398010	0.39Ω
252	C197	3101050100030	1PF
253	C520	3101050100030	1PF
254	C192	3101050200010	2PF
255	C527	3101050200010	2PF
256	C188	3101050300000	3PF
257	C195	3101050300000	3PF
258	R103	3101050300000	3PF
259	C114	3101050500010	5PF
260	C115	3101050500010	5PF
261	C9032	3101050500010	5PF

No.	Ref. No.	Part No.	Description
262	C9106	3101050600010	6PF
263	C111	3101050700010	7PF
264	C112	3101050700010	7PF
265	C9109	3101050700010	7PF
266	C9102	3101050800000	8PF
267	C9124	3101050800000	8PF
268	C107	3101051000020	10PF
269	C116	3101051000020	10PF
270	C9084	3101051000020	10PF
271	C9116	3101051000020	10PF
272	C173	3101051010030	100PF
273	C265	3101051010030	100PF
274	C428	3101051010030	100PF
275	C429	3101051010030	100PF
276	C438	3101051010030	100PF
277	C439	3101051010030	100PF
278	C602	3101051010030	100PF
279	C616	3101051010030	100PF
280	C620	3101051010030	100PF
281	C805	3101051010030	100PF
282	C806	3101051010030	100PF
283	C103	3101051020010	1000PF
284	C104	3101051020010	1000PF
285	C108	3101051020010	1000PF
286	C118	3101051020010	1000PF
287	C120	3101051020010	1000PF
288	C124	3101051020010	1000PF
289	C126	3101051020010	1000PF
290	C135	3101051020010	1000PF
291	C136	3101051020010	1000PF
292	C137	3101051020010	1000PF
293	C139	3101051020010	1000PF
294	C142	3101051020010	1000PF
295	C155	3101051020010	1000PF
296	C156	3101051020010	1000PF
297	C159	3101051020010	1000PF
298	C161	3101051020010	1000PF
299	C162	3101051020010	1000PF
300	C163	3101051020010	1000PF
301	C168	3101051020010	1000PF
302	C170	3101051020010	1000PF
303	C172	3101051020010	1000PF
304	C180	3101051020010	1000PF
305	C183	3101051020010	1000PF

No.	Ref. No.	Part No.	Description
306	C184	3101051020010	1000PF
307	C193	3101051020010	1000PF
308	C202	3101051020010	1000PF
309	C206	3101051020010	1000PF
310	C211	3101051020010	1000PF
311	C705	3101051020010	1000PF
312	C709	3101051020010	1000PF
313	C9014	3101051020010	1000PF
314	C9016	3101051020010	1000PF
315	C9018	3101051020010	1000PF
316	C9025	3101051020010	1000PF
317	C9033	3101051020010	1000PF
318	C9034	3101051020010	1000PF
319	C9035	3101051020010	1000PF
320	C9036	3101051020010	1000PF
321	C9037	3101051020010	1000PF
322	C9039	3101051020010	1000PF
323	C9042	3101051020010	1000PF
324	C9045	3101051020010	1000PF
325	C9047	3101051020010	1000PF
326	C9050	3101051020010	1000PF
327	C9059	3101051020010	1000PF
328	C9061	3101051020010	1000PF
329	C9064	3101051020010	1000PF
330	C9067	3101051020010	1000PF
331	C9075	3101051020010	1000PF
332	C9085	3101051020010	1000PF
333	C9093	3101051020010	1000PF
334	C9096	3101051020010	1000PF
335	C9098	3101051020010	1000PF
336	C9103	3101051020010	1000PF
337	C9121	3101051020010	1000PF
338	C9126	3101051020010	1000PF
339	C9131	3101051020010	1000PF
340	C174	3101051030020	0.01UF
341	C215	3101051030020	0.01UF
342	C251	3101051030020	0.01UF
343	C426	3101051030020	0.01UF
344	C436	3101051030020	0.01UF
345	C440	3101051030020	0.01UF
346	C447	3101051030020	0.01UF
347	C449	3101051030020	0.01UF
348	C453	3101051030020	0.01UF
349	C454	3101051030020	0.01UF

No.	Ref. No.	Part No.	Description
350	C457	3101051030020	0.01UF
351	C612	3101051030020	0.01UF
352	C819	3101051030020	0.01UF
353	C822	3101051030020	0.01UF
354	C826	3101051030020	0.01UF
355	C827	3101051030020	0.01UF
356	C837	3101051030020	0.01UF
357	C9044	3101051030020	0.01UF
358	C9066	3101051030020	0.01UF
359	C9068	3101051030020	0.01UF
360	C9072	3101051030020	0.01UF
361	C9090	3101051030020	0.01UF
362	C9110	3101051030020	0.01UF
363	C9123	3101051030020	0.01UF
364	C9128	3101051030020	0.01UF
365	C102	3101051040060	0.1UF
366	C105	3101051040060	0.1UF
367	C117	3101051040060	0.1UF
368	C121	3101051040060	0.1UF
369	C138	3101051040060	0.1UF
370	C141	3101051040060	0.1UF
371	C164	3101051040060	0.1UF
372	C165	3101051040060	0.1UF
373	C166	3101051040060	0.1UF
374	C167	3101051040060	0.1UF
375	C169	3101051040060	0.1UF
376	C179	3101051040060	0.1UF
377	C182	3101051040060	0.1UF
378	C306	3101051040060	0.1UF
379	C310	3101051040060	0.1UF
380	C311	3101051040060	0.1UF
381	C318	3101051040060	0.1UF
382	C422	3101051040060	0.1UF
383	C430	3101051040060	0.1UF
384	C433	3101051040060	0.1UF
385	C434	3101051040060	0.1UF
386	C435	3101051040060	0.1UF
387	C441	3101051040060	0.1UF
388	C445	3101051040060	0.1UF
389	C446	3101051040060	0.1UF
390	C462	3101051040060	0.1UF
391	C464	3101051040060	0.1UF
392	C465	3101051040060	0.1UF
393	C466	3101051040060	0.1UF

No.	Ref. No.	Part No.	Description
394	C522	3101051040060	0.1UF
395	C523	3101051040060	0.1UF
396	C525	3101051040060	0.1UF
397	C604	3101051040060	0.1UF
398	C607	3101051040060	0.1UF
399	C608	3101051040060	0.1UF
400	C611	3101051040060	0.1UF
401	C615	3101051040060	0.1UF
402	C617	3101051040060	0.1UF
403	C618	3101051040060	0.1UF
404	C622	3101051040060	0.1UF
405	C625	3101051040060	0.1UF
406	C626	3101051040060	0.1UF
407	C630	3101051040060	0.1UF
408	C635	3101051040060	0.1UF
409	C639	3101051040060	0.1UF
410	C642	3101051040060	0.1UF
411	C647	3101051040060	0.1UF
412	C651	3101051040060	0.1UF
413	C656	3101051040060	0.1UF
414	C658	3101051040060	0.1UF
415	C659	3101051040060	0.1UF
416	C668	3101051040060	0.1UF
417	C671	3101051040060	0.1UF
418	C679	3101051040060	0.1UF
419	C682	3101051040060	0.1UF
420	C688	3101051040060	0.1UF
421	C710	3101051040060	0.1UF
422	C801	3101051040060	0.1UF
423	C809	3101051040060	0.1UF
424	C810	3101051040060	0.1UF
425	C812	3101051040060	0.1UF
426	C833	3101051040060	0.1UF
427	C836	3101051040060	0.1UF
428	C839	3101051040060	0.1UF
429	C843	3101051040060	0.1UF
430	C850	3101051040060	0.1UF
431	C852	3101051040060	0.1UF
432	C9020	3101051040060	0.1UF
433	C9038	3101051040060	0.1UF
434	C9041	3101051040060	0.1UF
435	C9043	3101051040060	0.1UF
436	C9046	3101051040060	0.1UF
437	C9049	3101051040060	0.1UF

No.	Ref. No.	Part No.	Description
438	C9057	3101051040060	0.1UF
439	C9071	3101051040060	0.1UF
440	C9082	3101051040060	0.1UF
441	C9086	3101051040060	0.1UF
442	C9091	3101051040060	0.1UF
443	C9092	3101051040060	0.1UF
444	C9097	3101051040060	0.1UF
445	C9104	3101051040060	0.1UF
446	C9120	3101051040060	0.1UF
447	C9127	3101051040060	0.1UF
448	C154	3101051050160	1uF
449	C236	3101051050160	1uF
450	C312	3101051050160	1uF
451	C314	3101051050160	1uF
452	C323	3101051050160	1uF
453	C423	3101051050160	1uF
454	C515	3101051050160	1uF
455	C526	3101051050160	1uF
456	C706	3101051050160	1uF
457	C707	3101051050160	1uF
458	C711	3101051050160	1uF
459	C712	3101051050160	1uF
460	C831	3101051050160	1uF
461	C832	3101051050160	1uF
462	C834	3101051050160	1uF
463	C840	3101051050160	1uF
464	C847	3101051050160	1uF
465	C9095	3101051050160	1uF
466	C9100	3101051050160	1uF
467	C131	3101051200020	12PF
468	C274	3101051200020	12PF
469	C420	3101051200020	12PF
470	C9028	3101051200020	12PF
471	C9083	3101051200020	12PF
472	C9115	3101051200020	12PF
473	C514	3101051210000	120PF
474	C521	3101051210000	120PF
475	C9088	3101051210000	120PF
476	C127	3101051500020	15PF
477	C9105	3101051500020	15PF
478	C9130	3101051500020	15PF
479	C190	3101051510000	150PF
480	C275	3101051520000	1500PF
481	C276	3101051520000	1500PF

No.	Ref. No.	Part No.	Description
482	C277	3101051520000	1500PF
483	C289	3101051520000	1500PF
484	C304	3101051520000	1500PF
485	C9065	3101051520000	1500PF
486	C516	3101051590000	1.5PF
487	C518	3101051590000	1.5PF
488	C109	3101051800010	18PF
489	C194	3101051800010	18PF
490	C517	3101051800010	18PF
491	C9029	3101051800010	18PF
492	C9056	3101051800010	18PF
493	C9077	3101051800010	18PF
494	C9079	3101051800010	18PF
495	C9099	3101051800010	18PF
496	C9107	3101051800010	18PF
497	C9111	3101051800010	18PF
498	C203	3101052000020	20PF
499	C204	3101052000020	20PF
500	C432	3101052000020	20PF
501	C644	3101052000020	20PF
502	C672	3101052000020	20PF
503	C9087	3101052000020	20PF
504	C9101	3101052000020	20PF
505	C9058	3101052200010	22PF
506	C9112	3101052200010	22PF
507	C9129	3101052200010	22PF
508	C132	3101052210010	220PF
509	C427	3101052210010	220PF
510	C645	3101052210010	220PF
511	C674	3101052210010	220PF
512	C708	3101052210020	220PF
513	C160	3101052220010	2200pF
514	C431	3101052220010	2200pF
515	C212	3101052240010	0.22UF
516	C216	3101052240010	0.22UF
517	C217	3101052240010	0.22UF
518	C218	3101052240010	0.22UF
519	C221	3101052240010	0.22UF
520	C222	3101052240010	0.22UF
521	C226	3101052240010	0.22UF
522	C230	3101052240010	0.22UF
523	C234	3101052240010	0.22UF
524	C238	3101052240010	0.22UF
525	C242	3101052240010	0.22UF

No.	Ref. No.	Part No.	Description
526	C248	3101052240010	0.22UF
527	C249	3101052240010	0.22UF
528	C683	3101052240010	0.22UF
529	C803	3101052240010	0.22UF
530	C821	3101052240010	0.22UF
531	C824	3101052240010	0.22UF
532	C186	3101052700000	27PF
533	C151	3101052710000	270PF
534	C175	3101052710000	270PF
535	C207	3101052710000	270PF
536	C262	3101052710000	270PF
537	C270	3101052710000	270PF
538	C285	3101052710000	270PF
539	C290	3101052710000	270PF
540	C291	3101052710000	270PF
541	C292	3101052710000	270PF
542	C313	3101052710000	270PF
543	C315	3101052710000	270PF
544	C316	3101052710000	270PF
545	C317	3101052710000	270PF
546	C321	3101052710000	270PF
547	C322	3101052710000	270PF
548	C325	3101052710000	270PF
549	C326	3101052710000	270PF
550	C334	3101052710000	270PF
551	C469	3101052710000	270PF
552	C470	3101052710000	270PF
553	C471	3101052710000	270PF
554	C804	3101052710000	270PF
555	C119	3101053300000	33PF
556	C189	3101053300000	33PF
557	C448	3101053300000	33PF
558	C9078	3101053300000	33PF
559	C110	3101053310030	330PF
560	C176	3101053310030	330PF
561	C196	3101053310030	330PF
562	C208	3101053310030	330PF
563	C9125	3101053900000	39PF
564	C209	3101053920000	3900PF
565	C213	3101053920000	3900PF
566	C219	3101053920000	3900PF
567	C227	3101053920000	3900PF
568	C231	3101053920000	3900PF
569	C233	3101053920000	3900PF

No.	Ref. No.	Part No.	Description
570	C239	3101053920000	3900PF
571	C240	3101053920000	3900PF
572	C241	3101053920000	3900PF
573	C245	3101053920000	3900PF
574	C246	3101053920000	3900PF
575	C247	3101053920000	3900PF
576	C638	3101053920000	3900PF
577	C650	3101053920000	3900PF
578	C662	3101053920000	3900PF
579	C666	3101053920000	3900PF
580	C684	3101053920000	3900PF
581	C686	3101053920000	3900PF
582	C687	3101053920000	3900PF
583	C808	3101053920000	3900PF
584	C813	3101053920000	3900PF
585	C820	3101053920000	3900PF
586	C823	3101053920000	3900PF
587	C858	3101053920000	3900PF
588	C223	3101054700010	47PF
589	C229	3101054700010	47PF
590	C271	3101054700010	47PF
591	C272	3101054700010	47PF
592	C273	3101054700010	47PF
593	C279	3101054700010	47PF
594	C286	3101054700010	47PF
595	C425	3101054700010	47PF
596	C9040	3101054700010	47PF
597	C9052	3101054700010	47PF
598	C9089	3101054700010	47PF
599	C9108	3101054700010	47PF
600	C101	3101054710010	470PF
601	C187	3101054710010	470PF
602	C191	3101054710010	470PF
603	C214	3101054710010	470PF
604	C220	3101054710010	470PF
605	C228	3101054710010	470PF
606	C232	3101054710010	470PF
607	C237	3101054710010	470PF
608	C243	3101054710010	470PF
609	C244	3101054710010	470PF
610	C255	3101054710010	470PF
611	C256	3101054710010	470PF
612	C257	3101054710010	470PF
613	C258	3101054710010	470PF

No.	Ref. No.	Part No.	Description
614	C259	3101054710010	470PF
615	C263	3101054710010	470PF
616	C264	3101054710010	470PF
617	C266	3101054710010	470PF
618	C268	3101054710010	470PF
619	C269	3101054710010	470PF
620	C278	3101054710010	470PF
621	C280	3101054710010	470PF
622	C281	3101054710010	470PF
623	C282	3101054710010	470PF
624	C283	3101054710010	470PF
625	C284	3101054710010	470PF
626	C287	3101054710010	470PF
627	C288	3101054710010	470PF
628	C293	3101054710010	470PF
629	C294	3101054710010	470PF
630	C295	3101054710010	470PF
631	C296	3101054710010	470PF
632	C297	3101054710010	470PF
633	C298	3101054710010	470PF
634	C299	3101054710010	470PF
635	C300	3101054710010	470PF
636	C301	3101054710010	470PF
637	C302	3101054710010	470PF
638	C303	3101054710010	470PF
639	C305	3101054710010	470PF
640	C331	3101054710010	470PF
641	C332	3101054710010	470PF
642	C333	3101054710010	470PF
643	C335	3101054710010	470PF
644	C336	3101054710010	470PF
645	C444	3101054710010	470PF
646	C459	3101054710010	470PF
647	C512	3101054710010	470PF
648	C652	3101054710010	470PF
649	C680	3101054710010	470PF
650	C681	3101054710010	470PF
651	C685	3101054710010	470PF
652	C703	3101054710010	470PF
653	C704	3101054710010	470PF
654	C835	3101054710010	470PF
655	C838	3101054710010	470PF
656	C842	3101054710010	470PF
657	C845	3101054710010	470PF

No.	Ref. No.	Part No.	Description
658	C846	3101054710010	470PF
659	C848	3101054710010	470PF
660	C849	3101054710010	470PF
661	C851	3101054710010	470PF
662	C853	3101054710010	470PF
663	C856	3101054710010	470PF
664	C857	3101054710010	470PF
665	C9048	3101054710010	470PF
666	C9069	3101054710010	470PF
667	C9081	3101054710010	470PF
668	C9117	3101054710010	470PF
669	C9063	3101054720000	4700PF
670	C9133	3101054790040	4.7PF
671	C513	3101055600000	56PF
672	C524	3101055600000	56PF
673	C9113	3101055600000	56PF
674	C9114	3101055600000	56PF
675	C9118	3101055600000	56PF
676	C9122	3101055600000	56PF
677	C260	3101055610000	560PF
678	C261	3101055610000	560PF
679	C614	3101055690110	5.6PF
680	C100	3101058200000	82PF
681	C9141	3101058200000	82PF
682	C152	3101060200010	2PF
683	C122	3101060400010	4PF
684	C133	3101060400010	4PF
685	C125	3101060500010	5PF
686	C144	3101060500010	5PF
687	C9027	3101060500010	5PF
688	C143	3101060600010	6PF
689	C147	3101060600010	6PF
690	C452	3101060700020	7PF
691	C9004	3101060700020	7PF
692	C9005	3101060700020	7PF
693	C123	3101060800010	8PF
694	C128	3101060800010	8PF
695	C9010	3101060800010	8PF
696	C9003	3101061000000	10PF
697	C9023	3101061000000	10PF
698	C9008	3101061010010	100PF
699	C9009	3101061010010	100PF
700	C9011	3101061010010	100PF
701	C9013	3101061020000	1000PF

No.	Ref. No.	Part No.	Description
702	C9060	3101061020000	1000PF
703	C442	3101061030010	0.01UF
704	C619	3101061030010	0.01UF
705	C605	3101061050060	1UF
706	C609	3101061050060	1UF
707	C623	3101061050060	1UF
708	C648	3101061050060	1UF
709	C669	3101061050060	1UF
710	C677	3101061050060	1UF
711	C701	3101061050060	1UF
712	C816	3101061050060	1UF
713	C450	3101061230000	0.012UF
714	C145	3101061300000	13PF
715	C146	3101061300000	13PF
716	C149	3101061590010	1.5PF
717	C9012	3101061810010	180PF
718	C150	3101062200010	22PF
719	C9015	3101062200010	22PF
720	C9017	3101062200010	22PF
721	C9054	3101062200010	22PF
722	C210	3101062240000	0.22UF
723	C628	3101062240000	0.22UF
724	C640	3101062240000	0.22UF
725	C655	3101062240000	0.22UF
726	C676	3101062240000	0.22UF
727	C678	3101062240000	0.22UF
728	C140	3101062250000	2.2UF
729	C157	3101062250000	2.2UF
730	C158	3101062250000	2.2UF
731	C467	3101062250000	2.2UF
732	C472	3101062250000	2.2UF
733	C601	3101062250000	2.2UF
734	C606	3101062250000	2.2UF
735	C610	3101062250000	2.2UF
736	C624	3101062250000	2.2UF
737	C641	3101062250000	2.2UF
738	C649	3101062250000	2.2UF
739	C653	3101062250000	2.2UF
740	C660	3101062250000	2.2UF
741	C670	3101062250000	2.2UF
742	C825	3101062250000	2.2UF
743	C828	3101062250000	2.2UF
744	C134	3101062400010	24PF
745	C153	3101062400010	24PF

No.	Ref. No.	Part No.	Description
746	C9031	3101062400010	24PF
747	C130	3101062700010	27PF
748	C9024	3101063000010	30PF
749	C455	3101063320000	3300PF
750	C456	3101063690000	3.6PF
751	C443	3101063900000	39PF
752	C458	3101063900000	39PF
753	C460	3101064700000	47PF
754	C9021	3101064700000	47PF
755	C324	3101064710000	470PF
756	C129	3101064790010	4.7PF
757	C148	3101065600000	56PF
758	C437	3101065620010	5600PF
759	C461	3101068200000	82PF
760	C802	3101071060010	10UF
761	C177	3101072240000	0.22UF
762	C463	3101072240000	0.22UF
763	C178	3101073340000	0.33UF
764	C603	3101074750000	4.7UF
765	C621	3101074750000	4.7UF
766	C629	3101074750000	4.7UF
767	C185	3104072250060	2.2UF
768	C468	3104076840020	0.68UF
769	C9051	3104082260060	22UF
770	C646	3110061050000	1uF
771	C657	3110061050000	1uF
772	C667	3110061050000	1uF
773	C636	3110071060000	10uF
774	C661	3110071060000	10uF
775	C627	3110081060000	10uF
776	C654	3110081060000	10uF
777	C637	3110994760000	47uF
778	C665	3110994760000	47uF
779	C519	3199050758000	0.75PF
780	L9030	3210106121000	120nH
781	L9017	3210106360000	36nH
782	L506	3210106390000	39nH
783	L127	3210106820000	82nH
784	L9011	3210209102010	1uH
785	L507	3210305180000	18nH
786	L125	3210305330000	33nH
787	L508	3210305829000	8.2nH
788	L509	3210305829000	8.2nH
789	L9026	3210306151000	150nH

No.	Ref. No.	Part No.	Description
790	L129	3210306221000	220nH
791	L9016	3210306270000	27nH
792	L9006	3210306390000	39nH
793	L9007	3210306479000	4.7nH
794	L9022	3210306561010	560nH
795	L9032	3210306561010	560nH
796	L9009	3210306680000	68nH
797	L9010	3210306680000	68nH
798	L9028	3210306680000	68nH
799	L402	3210406271000	270nH
800	L124	3210406471000	470nH
801	L201	3210406471000	470nH
802	L9033	3210406471000	470nH
803	L408	3210407472000	4.7uH
804	L9012	3212107222000	2.2uH
805	L411	3213212332000	3.3uH
806	L9027	3213306102000	1uH
807	L409	3213306222000	2.2uH
808	L413	3213306682000	6.8uH
809	L401	3215099103000	10uH
810	L404	3215099103000	10uH
811	L610	3217099153000	15uH
812	L614	3217099153000	15uH
813	L9025	3217106120010	12nH
814	L9001	3217106151000	150nH
815	L9029	3217106181010	180nH
816	L104	3217106390010	39nH
817	L105	3217106390010	39nH
818	L9018	3217106390010	39nH
819	L106	3217106781000	780nH
820	L108	3217106781000	780nH
821	L110	3217106781000	780nH
822	L113	3217106781000	780nH
823	L114	3217106781000	780nH
824	L115	3217106781000	780nH
825	L116	3217106781000	780nH
826	L119	3217106781000	780nH
827	L102	3217106820010	82nH
828	L107	3217106820010	82nH
829	L100	3217106829010	8.2nH
830	L128	3217106829010	8.2nH
831	L130	3217106829010	8.2nH
832	L131	3217106829010	8.2nH
833	L111	3217107270000	27nH

No.	Ref. No.	Part No.	Description
834	L112	3217107470000	47nH
835	L118	3217107470000	47nH
836	L117	3217107680010	68nH
837	L109	3221505121010	Bead
838	L120	3221505121010	Bead
839	L121	3221505121010	Bead
840	L122	3221505121010	Bead
841	L123	3221505121010	Bead
842	L133	3221505121010	Bead
843	L301	3221505121010	Bead
844	L403	3221505121010	Bead
845	L405	3221505121010	Bead
846	L407	3221505121010	Bead
847	L412	3221505121010	Bead
848	L702	3221505121010	Bead
849	L801	3221505121010	Bead
850	L803	3221505121010	Bead
851	L804	3221505121010	Bead
852	L805	3221505121010	Bead
853	L821	3221505121010	Bead
854	L822	3221505121010	Bead
855	L9020	3221505121010	Bead
856	R712	3221505121010	Bead
857	L9014	3221506121000	Bead
858	L303	3221506181000	Bead
859	L601	3221506181000	Bead
860	L602	3221506181000	Bead
861	L603	3221506181000	Bead
862	L605	3221506181000	Bead
863	L606	3221506181000	Bead
864	L609	3221506181000	Bead
865	L611	3221506181000	Bead
866	L612	3221506181000	Bead
867	L617	3221506181000	Bead
868	L802	3221506181000	Bead
869	R614	3221506181000	Bead
870	R622	3221506181000	Bead
871	L302	3221506601000	Bead
872	L304	3221506601000	Bead
873	L305	3221506601000	Bead
874	L410	3221506601000	Bead
875	L820	3221506601000	Bead
876	L823	3221506601000	Bead
877	L827	3221506601000	Bead

No.	Ref. No.	Part No.	Description
878	L828	3221506601000	Bead
879	L502	3221506601080	Bead
880	L505	3221506601080	Bead
881	L9019	3231301030000	Air-core coil
882	L9023	3233099100000	Air-core coil
883	L9021	3233099185900	Air-core coil
884	L9003	3233099330000	Air-core coil
885	L9005	3233099330000	Air-core coil
886	L9004	3233099400000	Air-core coil
887	R9004	3233099449000	Air-core coil
888	L9008	3233099470000	Air-core coil
889	L9013	3233099470000	Air-core coil
890	L816	3237199270000	Air-core coil
891	L9015	3237199270000	Air-core coil
892	L9024	3237199270000	Air-core coil
893	L9035	3237199270000	Air-core coil
894	L607	3290299222000	2.2uH
895	L613	3290299222000	2.2uH
896	L615	3290299222000	2.2uH
897	L616	3290299222000	2.2uH
898	L501	3297106339000	3.3nH
899	L503	3297106339000	3.3nH
900	L504	3297106339000	3.3nH
901	L406	3297107391000	390nH
902	D9017	3301250300000	Schottky barrier diode
903	D604	3303030100010	Switching diode
904	D9011	3303030100010	Switching diode
905	D9002	3303030800040	Switching diode
906	D302	3303990000010	Switching diode
907	D104	3303990000060	Switching diode
908	D105	3303990000060	Switching diode
909	D112	3303990000060	Switching diode
910	D113	3303990000060	Switching diode
911	D114	3303990000060	Switching diode
912	D115	3303990000060	Switching diode
913	D116	3303990000060	Switching diode
914	D9003	3303990000060	Switching diode
915	D9004	3303990000060	Switching diode
916	D9007	3303990000060	Switching diode
917	D9008	3303990000060	Switching diode
918	D101	3304010100180	Varactor
919	D109	3304010100180	Varactor
920	D402	3304010100220	Varactor
921	D111	3304010100890	Varactor

No.	Ref. No.	Part No.	Description
922	D102	3304010100990	Varactor
923	D107	3304010100990	Varactor
924	D108	3304010100990	Varactor
925	D110	3304010100990	Varactor
926	D103	3304010400000	Varactor
927	D106	3304010400000	Varactor
928	D9005	3304060300040	Varactor
929	D9009	3304060300040	Varactor
930	D9012	3304060300040	Varactor
931	D9013	3304060300040	Varactor
932	D401	3304060300050	Varactor
933	D301	3307110100060	LED
934	D303	3310040000000	LED
935	D304	3310040000000	ESD protection diode
936	D305	3310040000000	ESD protection diode
937	D306	3310040000000	ESD protection diode
938	D318	3399040600010	ESD protection diode
939	D307	3399040600020	ESD protection diode
940	D308	3399040600020	ESD protection diode
941	D309	3399040600020	ESD protection diode
942	D310	3399040600020	ESD protection diode
943	D602	3399040600020	ESD protection diode
944	D9010	3399990000080	ESD protection diode
945	D601	3399990000110	Diode
946	D9006	3399990000260	Switching diode
947	Q9021	3401001000490	PNP transistor
948	Q105	3403003000060	NPN transistor
949	Q401	3403003000060	NPN transistor
950	Q312	3403008000010	BRT
951	Q801	3403008000010	BRT
952	Q802	3403008000010	BRT
953	Q9007	3403008000010	BRT
954	Q9008	3403008000010	BRT
955	Q9001	3403014000020	Compound transistor
956	Q103	3403999000000	Compound transistor
957	Q106	3403999000000	Compound transistor
958	Q107	3403999000000	Compound transistor
959	Q9019	3403999000000	Compound transistor
960	Q9020	3403999000000	Compound transistor
961	Q9017	3404006000000	NPN transistor
962	Q9018	3404006000000	NPN transistor
963	Q9004	3406001000090	NPN transistor
964	Q102	3408002000000	NPN transistor
965	Q403	3408002000000	NPN transistor

No.	Ref. No.	Part No.	Description
966	Q9002	3408002000000	NPN transistor
967	Q104	3408002000080	NPN transistor
968	Q108	3408002000080	NPN transistor
969	Q9006	3410001000020	PNP transistor
970	Q603	3414001000040	NPN transistor
971	Q9009	3418001000010	NPN transistor
972	Q402	3499000000150	Compound transistor
973	Q604	3503020000030	N-MOSFET
974	Q607	3503020000030	N-MOSFET
975	Q9005	3504990000010	MOSFET
976	Q9003	3504990000040	MOSFET
977	Q605	3505010000059	P-MOSFET
978	Q310	3511990000010	N-MOSFET
979	Q313	3511990000010	N-MOSFET
980	U801	3602023005740	Audio amplifier
981	U401	3603999000000	IF processor
982	U103	3604019000000	PLL
983	U102	3605002057290	Operational amplifier
984	U9002	3605025000020	Operational amplifier
985	U701	3606010000010	D/A converter
986	U603	3608006000000	Power management IC
987	U606	3608006000000	Power management IC
988	U608	3608006000000	Power management IC
989	U609	3608006000000	Power management IC
990	U612	3608006000000	Power management IC
991	U610	3608006000030	Power management IC
992	U601	3608011000050	Power management IC
993	U611	3608011000050	Power management IC
994	U604	3608020005750	Power management IC
995	U605	3608020005750	Power management IC
996	U105	3609003999000	Mini IC
997	U607	3609010000170	Reset IC
998	U501	3609999000300	GPS LNA
999	U201	3610010000010	MCU
1000	U244	3612002000020	Memory
1001	U242	3612044000010	Memory
1002	U821	3613010000000	Baseband processor
1003	U820	3616037000020	Switch
1004	U101	3616059000000	Switch
1005	U104	3616059000000	Switch
1006	X101	3701019250030	VC-TCXO
1007	X203	3701019250040	TCXO
1008	X201	3701327610060	Crystal
1009	Z9001	3802448540040	Crystal filter

No.	Ref. No.	Part No.	Description
1010	Z501	3804157560000	GPS filter
1011	U312	3805000000030	EMI filter
1012	U313	3805000000030	EMI filter
1013	U314	3805000000030	EMI filter
1014	U315	3805000000030	EMI filter
1015	U316	3805000000030	EMI filter
1016	U317	3805000000030	EMI filter
1017	U318	3805000000030	EMI filter
1018	U319	3805000000030	EMI filter
1019	U320	3805000000030	EMI filter
1020	U321	3805000000030	EMI filter
1021	U322	3805000000030	EMI filter
1022	F602	4010000000010	Fuse
1023	F601	4099000000050	Fuse
1024	J821	5201016000010	Board-to-board connector
1025	J311	5201030000040	Board-to-board connector
1026	J1601	5201050100030	Board-to-board connector
1027	J313	5202002100200	Board-to-board connector
1028	J601	5205003100020	Battery connector
1029	U9003	5404000000060	Sensor
1030	T9001	5406000000200	Transformer
1031	T9002	5406000000200	Transformer
1032	/	6201809000000	Shielding can for IF processor
1033	/	6201810000000	Shielding can for baseband processor
1034	ANT1	6201847000000	Antenna spring plate
1035	/	6201859000000	Shielding frame for lowpass filter
1036	/	6201860000000	Shielding frame for GPS
1037	/	6201862000000	Shielding can for TX VCO
1038	/	6201865000000	Shielding can for crystal oscillator
1039	/	6201915000000	Shielding can for antenna spring plate
1040	/	6201935000000	Shielding can for switching power
1041		41PD7001002A0	Main board

Channel Board for PD70X/ PD70XG/ HD705/ HD705G

No.	Ref. No.	Part No.	Description
1	R1002	3001051210010	120Ω
2	C1001	3101052710000	270PF
3	C1002	3101052710000	270PF
4	C1003	3101052710000	270PF
5	C1004	3101052710000	270PF
6	C1005	3101052710000	270PF
7	C1006	3101052710000	270PF
8	C1007	3101052710000	270PF
9	C1010	3101052710000	270PF
10	C1011	3101052710000	270PF
11	C1012	3101052710000	270PF
12	D1001	3310040000000	ESD protection diode
13	D1003	3310040000000	ESD protection diode
14	D1004	3310040000000	ESD protection diode
15	D1005	3310040000000	ESD protection diode
16	D1006	3310040000000	ESD protection diode
17	D1007	3310040000000	ESD protection diode
18	D1008	3310040000000	ESD protection diode
19	D1011	3310040000000	ESD protection diode
20	D1014	3310040000000	ESD protection diode
21	D1009	3399040600020	ESD protection diode
22	D1013	3399040600020	ESD protection diode
23	D1002	3307120100050	LED
24	Q1001	3403009000010	Compound transistor
25	U1001	3805000000040	EMI filter
26	J1001	5201016100040	Board-to-board connector
27	S1003	4301080000020	Momentary contact switch
28		41PD7002002B0	PCB
29	R1001	3001056810000	680Ω
30	C1015	3101051040060	0.1UF
31	C1016	3101051040060	0.1UF
32	C1017	3101051040060	0.1UF
33	L1001	3221506181000	Bead
34	U1002	3608006000030	Power management IC

Channel Board for PD78X/ PD78XG/ HD785/ HD785G

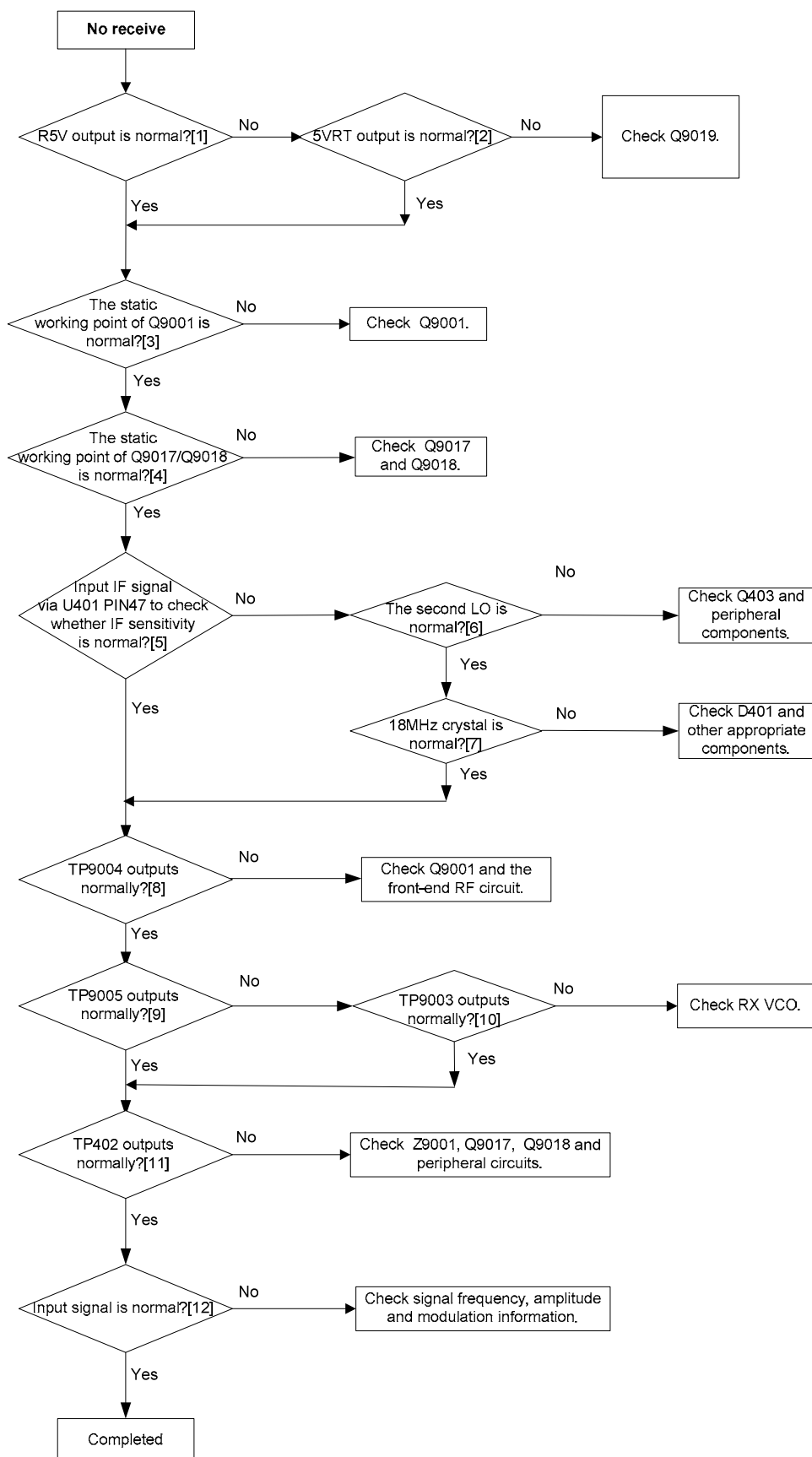
No.	Ref. No.	Part No.	Description
1	R1002	3001051210010	120Ω
2	C1001	3101052710000	270PF
3	C1002	3101052710000	270PF
4	C1003	3101052710000	270PF
5	C1004	3101052710000	270PF
6	C1005	3101052710000	270PF
7	C1006	3101052710000	270PF
8	C1007	3101052710000	270PF
9	C1010	3101052710000	270PF
10	C1011	3101052710000	270PF
11	C1012	3101052710000	270PF
12	D1001	3310040000000	ESD protection diode
13	D1003	3310040000000	ESD protection diode
14	D1004	3310040000000	ESD protection diode
15	D1005	3310040000000	ESD protection diode
16	D1006	3310040000000	ESD protection diode
17	D1007	3310040000000	ESD protection diode
18	D1008	3310040000000	ESD protection diode
19	D1011	3310040000000	ESD protection diode
20	D1014	3310040000000	ESD protection diode
21	D1009	3399040600020	ESD protection diode
22	D1013	3399040600020	ESD protection diode
23	D1002	3307120100050	LED
24	Q1001	3403009000010	Compound transistor
25	U1001	3805000000040	EMI filter
26	J1001	5201016100040	Board-to-board connector
27	S1003	4301080000020	Momentary contact switch
28		41PD7802006C0	PCB
29	R1001	3001056810000	680Ω
30	C1015	3101051040060	0.1UF
31	C1016	3101051040060	0.1UF
32	C1017	3101051040060	0.1UF
33	L1001	3221506181000	Bead
34	U1002	3608006000030	Power management IC

Keyboard for PD78X/ PD78XG/ HD785/ HD785G

No.	Ref. No.	Part No.	Description
1	R1	3001051010000	100Ω
2	R2	3001051010000	100Ω
3	R3	3001051010000	100Ω
4	R4	3001051010000	100Ω
5	R5	3001051010000	100Ω
6	R6	3001051010000	100Ω
7	R7	3001051010000	100Ω
8	D1	3307990000260	LED
9	D2	3307990000260	LED
10	D3	3307990000260	LED
11	D4	3307990000260	LED
12	D5	3307990000260	LED
13	D6	3307990000260	LED
14	D7	3307990000260	LED
15	D8	3310040000010	ESD protection diode
16	D9	3310040000010	ESD protection diode
17	J4	5201016000010	Board-to-board connector

13.8 Troubleshooting Flow Chart

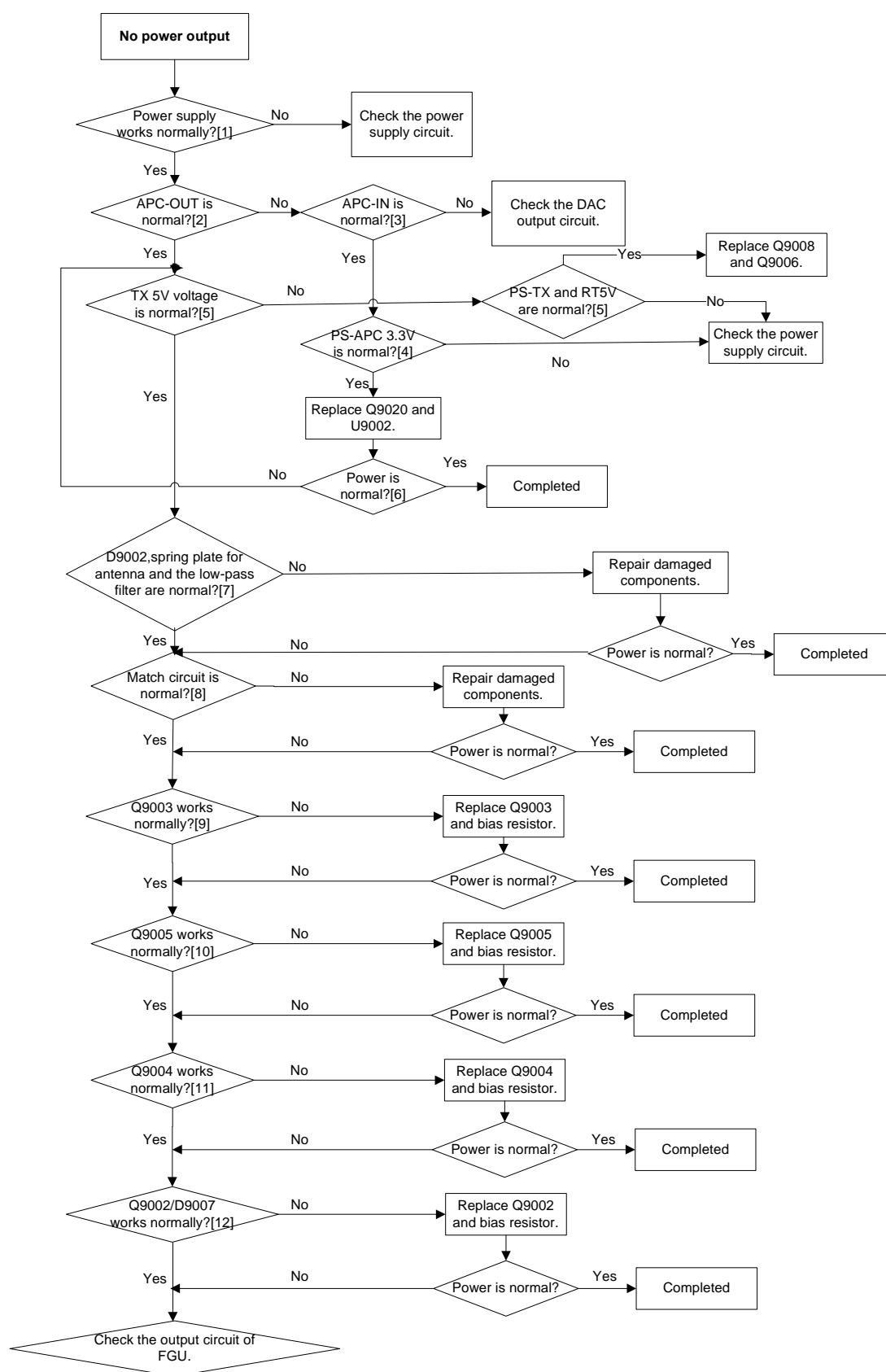
Receiver Circuit



Description of Normal Situations:

- [1] Output voltage by Q9019 PIN3: about 4.95V.
- [2] Output voltage by U605 PIN4 or input voltage into Q9019 PIN4: about 5V.
- [3] Vbe: about 0.74V; Vce: about 2.5V (in the case of no signal reception).
- [4] For Q9018, Vbe: about 0.76V; Vce: about 0.95V;
for Q9017, Vbe: about 0.7V; Vce: 0.85V (in the case of no signal reception).
- [5] Cut off the front-end circuit, and input a 44.85MHz IF signal at TP402 to test IF sensitivity. Normally, the IF sensitivity is -109dBm.
- [6] Frequency of Q403: 47.1/42.6MHz.
- [7] Frequency of L411: 18MHz.
- [8] Input -30dBm RF signal at the antenna connector and test at TP9004. Normally, gain>10dB, output signal>-20dBm.
- [9] Input -30dBm RF signal at the antenna connector and test at R9005 (do not cut off the back-end circuit). Normally, gain>1dB, output signal>-29dBm.
- [10] Signal frequency: RF-IF, signal amplitude>2dBm.
- [11] For input of -80dBm signal at L9022, gain>25dB, output signal>-55dBm;
for input of -30dBm signal, output signal<-20dBm.
- [12] The input signal at the antenna connector, with standard tuning information (AF=1KHz, FM=3KHz), is -47dBm.

Transmitter Circuit

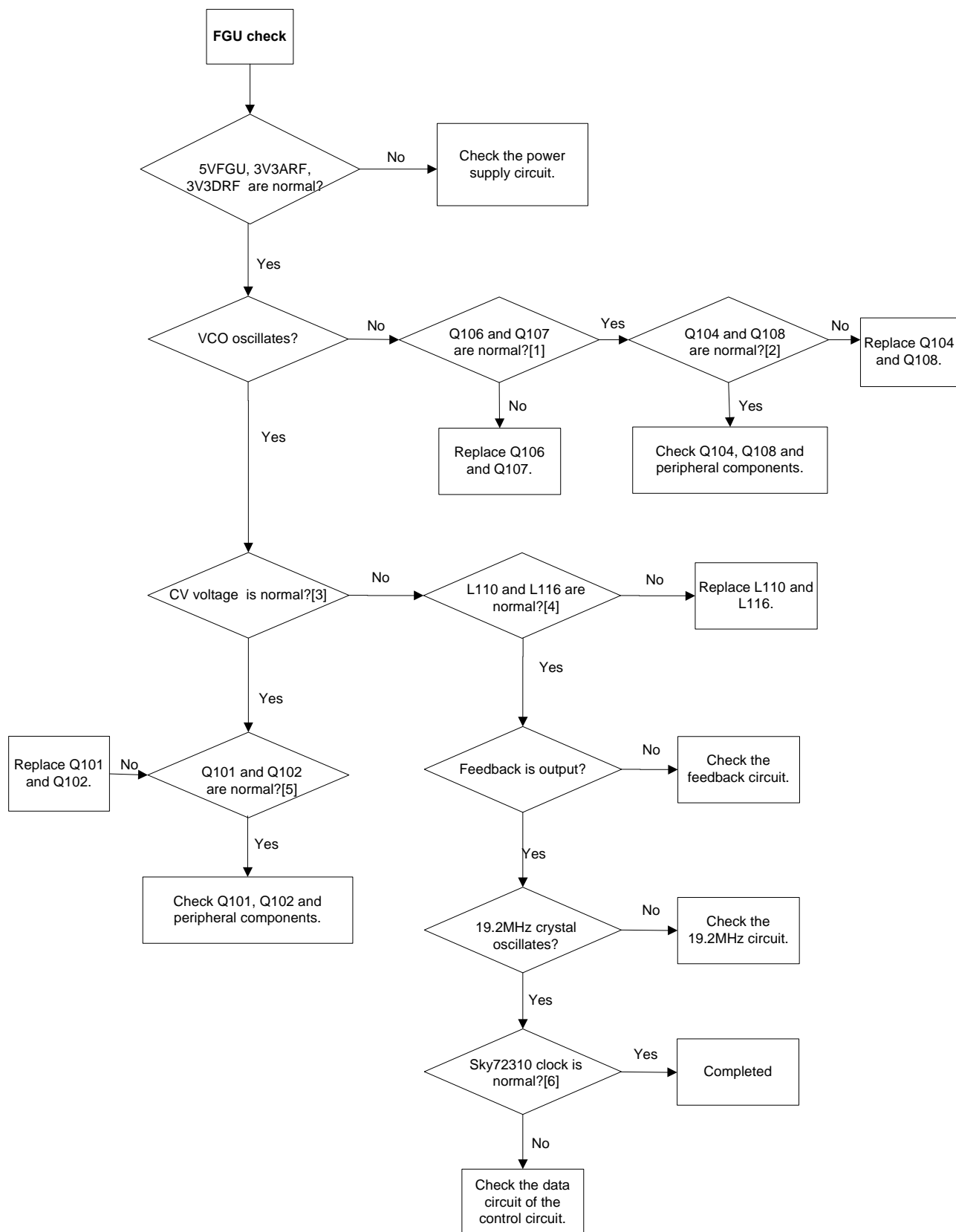


Description of Normal Situations:

- [1] Voltage of the power supply: about 7.4V.
- [2] For low power, APC-OUT: 1.8-2.1V; for high power, APC-OUT: 2.4-2.8V.
- [3] For low power, APC-IN: 1-1.3V; for high power, APC-IN: 1.8-2.1V.
- [4] PS-APC: about 3.3V.
- [5] TX5V: about 5V; RT5V: about 5V; PS-TX: about 3.3V.
High power: about 4.7W; low power: about 1.2W.
- [7] Start-up voltage of D9002: about 0.7V. The low-pass filter must be soldered appropriately and remain in good condition. The spring plate for the antenna must be well fitted into the antenna connector.
- [8] The match components must not be soldered inappropriately or damaged.
- [9] Vdd: about 7.3V; for low power, Vgg: 1-1.2V; for high power, Vgg: 1.35-1.55V.
- [10] Vdd: about 7.3V; for low power, Vgg: 1.8-2.1V; for high power, Vgg: 2.4-2.8V.
- [11] Vc: about 4.8V; Vb: about 1.4V; Ve: about 1.1V.
- [12] Vc: about 4.7V; Vb: about 0.7V; Ve: 0V. Start-up voltage of D9007: about 0.7V.

Note: The above check operations should be made under 7.4V voltage.

FGU



Description of Normal Situations:

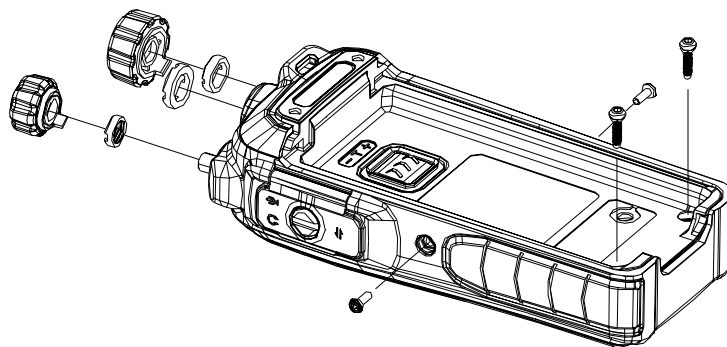
- [1] During transmission, output voltage by Q107 PIN3: about 4V.
During reception, output voltage by Q106 PIN3: about 4V.
- [2] During transmission, voltage at Q108 E: about 1.8V.
During reception, voltage at Q104 E: about 1.8V.
- [3] The CV value varies with frequencies. Generally, it is within the range 0.5V-4.5V.
- [4] L110/L116 is on.
- [5] Voltage at Q101/Q102 B: about 0.7V.
- [6] MCSI-CLK-PLL outputs 960KHz clock.

14. Disassembly and Assembly

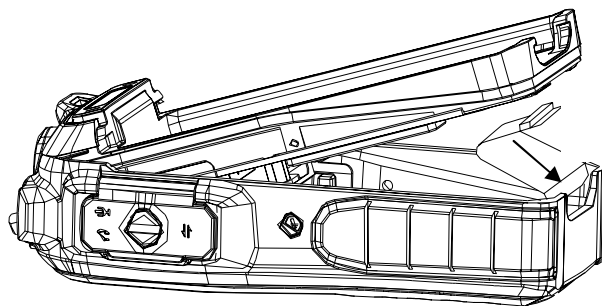
Note: The disassembly and assembly operations for PD70X/ PD70XG/ HD705/ HD705G and PD78X/ PD78XG/ HD785/ HD785G are similar. This section illustrates based on PD78X/ PD78XG/ HD785/ HD785G.

Disassembling the Chassis

1. Turn off the radio, and remove the two screws on the sides of the radio.
2. Remove the two screws on the bottom of the chassis.
3. Remove the Radio On-Off/Volume Control knob and Channel Selector knob.

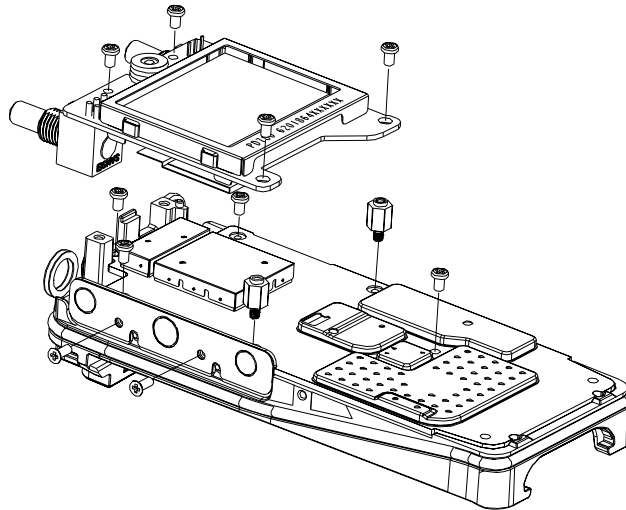


4. Push the chassis upwards, and take the 50-pin connector down (see the arrow in the figure below). Then you can take the chassis out.



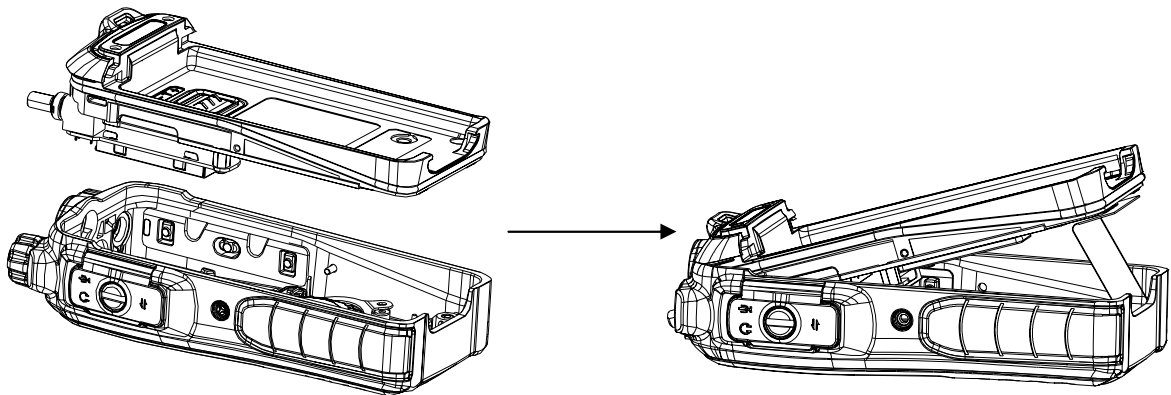
Disassembling the TX and RX Units

1. Remove the screws on the PTT board.
2. Remove the screws on the LCD board (for PD70X/ PD70XG/ HD705/ HD705G, please remove the screws on the small board).
3. Remove the screws on the main board.
4. Take the main board down the chassis.



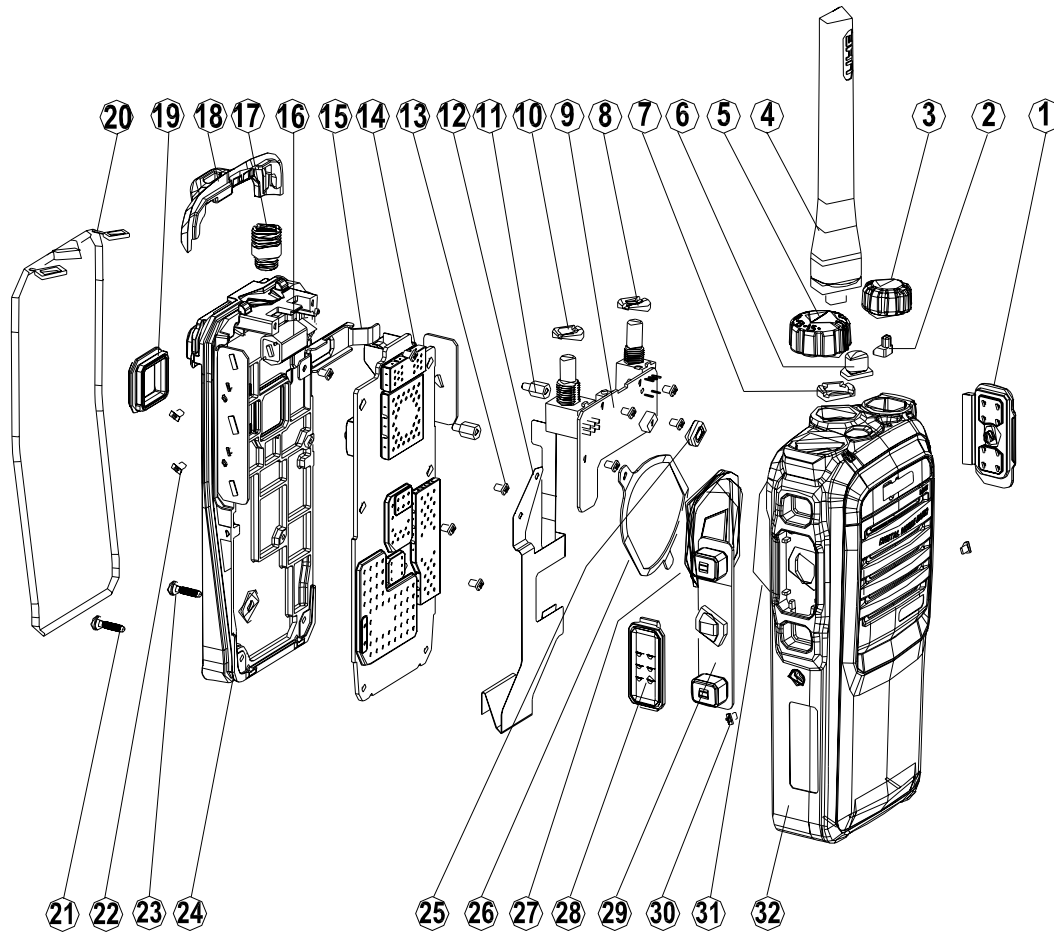
Precautions for Assembly

1. Make sure the waterproof ring surrounding the chassis is well fitted into the slot.
2. Insert the chassis into the radio case.
3. Attach the 50-pin board-to-board connector.
4. Press the bottom of the chassis downwards to fit the chassis into the radio case.



15. Exploded View

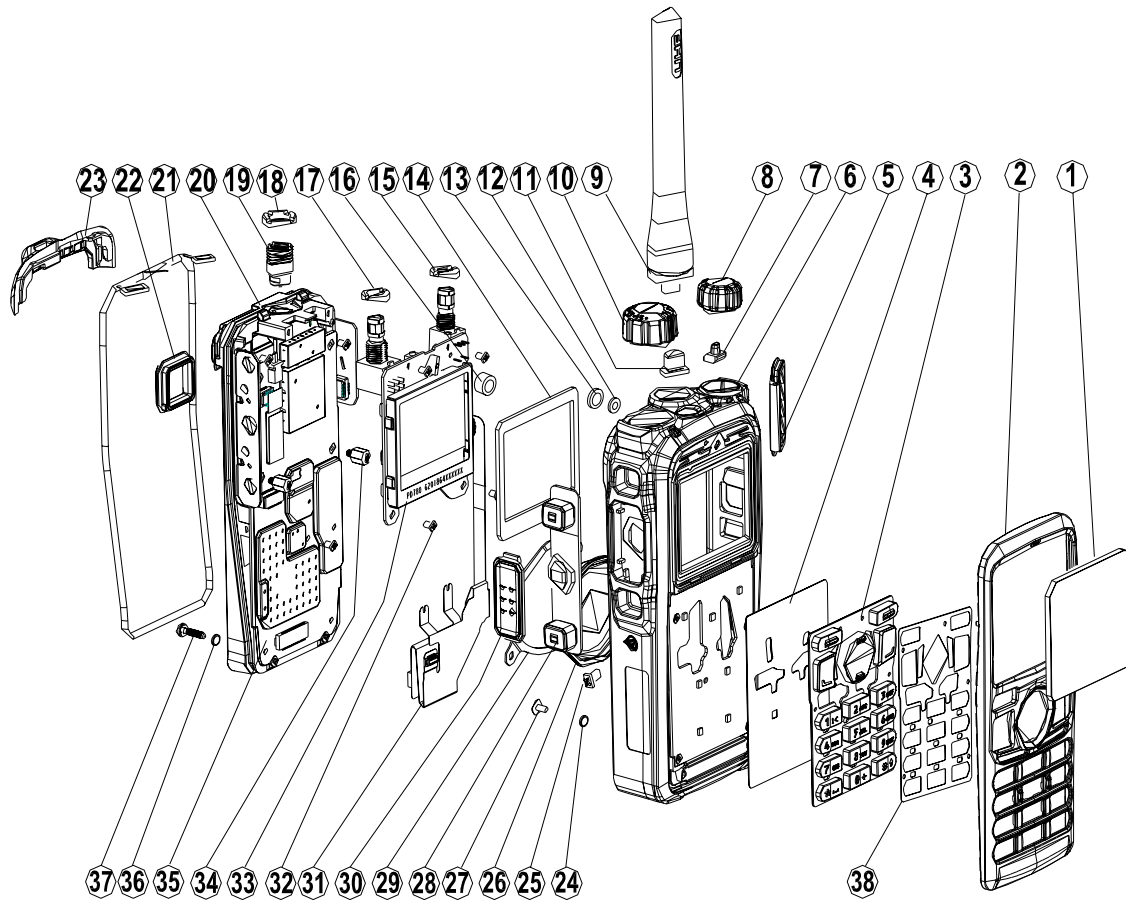
PD70X/ PD70XG/ HD705/ HD705G



No.	Part No.	Description	Qty.
1	6001277000000	Accessory jack cover (RoHS)	1
2	6001073000000	Light guide (RoHS)	1
3	6001069000010	Volume control knob (RoHS)	1
4	16010435H0010	Stubby antenna (RoHS)	1
5	6001068000010	Channel selector knob (RoHS)	1
6	6100502000000	Emergency key (RoHS)	1
7	7209002501000	Nut for antenna (RoHS)	1
8	7206002500200	Nut for volume switch (RoHS)	1
9		Channel board (RoHS)	1
10	7207002201000	Nut for encoder switch (RoHS)	1
11	7000218000000	Stud (RoHS)	2
12	1300PD7000090	FPC (RoHS)	1
13	7102003500210	Machine screw (RoHS)	11
14		Semi-finished main board (RoHS)	1
15	6201848000000	Motor fixing sheet (RoHS)	1
16	5402000000060	Motor connector (RoHS)	1
17	4400000048000	SMA RF connector (RoHS)	1
18	6001070000000	Rear cover (RoHS)	1
19	6100505000000	Waterproof ring for battery connector (RoHS)	1
20	6100503000000	Waterproof ring for radio (RoHS)	1
21	6100527100000	Waterproof ring for machine screw (RoHS)	4
22	7102009000020	Machine screw (RoHS)	2
23	7101904020300	Self-tapping screw (RoHS)	2
24	6300116001000	Aluminum chassis (RoHS)	1
25	6100111000010	Silicone rubber MIC cover (RoHS)	1
26	6201870000000	Speaker fixing sheet (RoHS)	1
27	5001210000400	Speaker (RoHS)	1
28	6000787000000	PTT key cover (RoHS)	1
29	6100442000000	Silicone rubber PTT key (RoHS)	1
30	7102004000400	Machine screw (RoHS)	2
31	7400264000000	Speaker felt (RoHS)	1
32	6001063000010	Front case (RoHS)	1

Note: Parts that are not marked with Part No. may vary with the radio frequency band.

PD78X/ PD78XG/ HD785/ HD785G

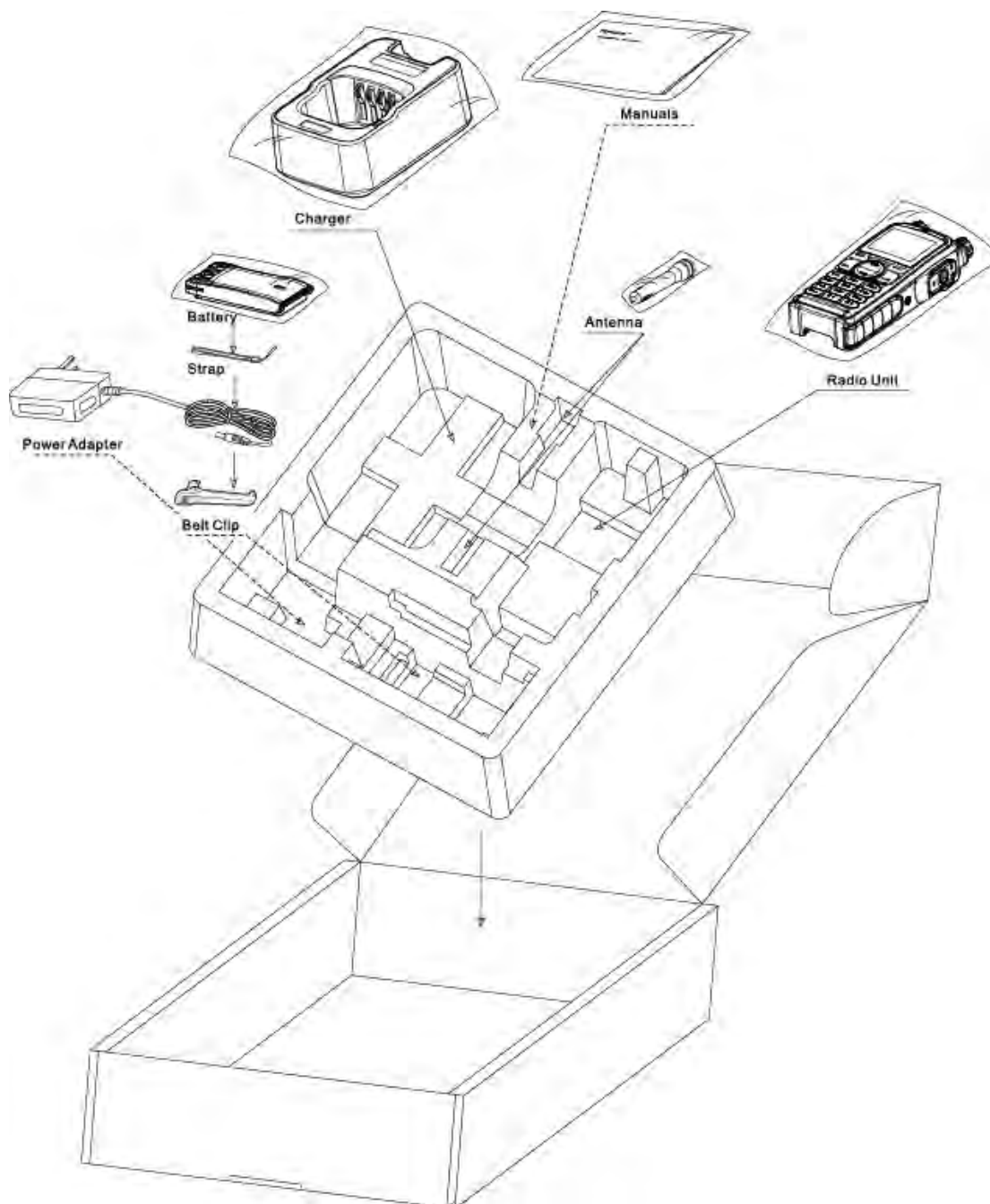


No.	Part No.	Description	Qty.
1	7400320000020	LCD lens (RoHS)	1
2	6001071000000	Front cover (RoHS)	1
3	6100441000000	Numeric keypad (RoHS)	1
4	7300044000010	Metal dome for function key 00 (RoHS)	1
5	6001277000000	Accessory jack cover (RoHS)	1
6	6001065000010	Front case (RoHS)	1
7	6001073000000	Light guide (RoHS)	1
8	6001069000010	Volume control knob (RoHS)	1
9	16010435H0010	Stubby antenna (RoHS)	1
10	6001068000010	Channel selector knob (RoHS)	1
11	6100502000000	Emergency key (RoHS)	1
12	7400184000000	Waterproof MIC net (RoHS)	1
13	7400329000000	MIC pad (RoHS)	1
14	7500346000000	PORON (RoHS)	1
15	7206002500200	Nut for volume switch (RoHS)	1
16	6100111000010	Silicone rubber MIC cover (RoHS)	1
17	7207002201000	Nut for encoder switch (RoHS)	1
18	7209002501000	Nut for antenna (RoHS)	1
19	44000000048000	SMA RF connector (RoHS)	1
20	6300116001000	Aluminum chassis (RoHS)	1
21	6100503000000	Waterproof ring for radio (RoHS)	1
22	6100505000000	Waterproof ring for battery connector (RoHS)	1
23	6001070000000	Rear cover (RoHS)	1
24	7000238000000	Pad (RoHS)	1
25	7102004000400	Machine screw (RoHS)	2
26	5001210000400	Speaker (RoHS)	1
27	7101904020300	Self-tapping screw (RoHS)	2
28	6100442000000	Silicone rubber PTT key (RoHS)	1
29	6201870000000	Speaker fixing sheet (RoHS)	1
30	6000787000000	PTT key cover (RoHS)	1
31	1300PD7800000	50PIN B2B connector (RoHS)	1
32	7102003500210	Machine screw (RoHS)	11
33		Semi-finished channel board (RoHS)	1
34	7000218000000	Stud (RoHS)	2
35		Semi-finished main board (RoHS)	1
36	6100527100000	Waterproof ring for machine screw (RoHS)	4
37	7102009000020	Machine screw (RoHS)	2
38	7400296000010	Speaker felt (RoHS)	1

Note: Parts that are not marked with Part No. may vary with the radio frequency band.

16. Packing Guide

Note: This section takes PD78X/ PD78XG/ HD785/ HD785G for example.



17. Specifications

General		
Frequency Range		UHF1: 400-470MHz UHF2: 450-520MHz UHF3: 350-400MHz VHF: 136-174MHz
Channel Capacity		PD70X/ PD70XG/ HD705/ HD705G: 32 PD78X/ PD78XG/ HD785/ HD785G: 1024
Channel Spacing		25/20/12.5KHz
Operating Voltage		7.4V (rated)
Battery		2000mAh Li-Ion battery
Battery Life (5-5-90 Duty Cycle, High TX Power) High-capacity 2000mAh Li-Ion Battery		PD70X/ HD705/ PD78X/ HD785: Analog: 12.5 hours (UHF); 11 hours (VHF) Digital: 14.5 hours (UHF); 13.5 hours (VHF) PD70XG/ HD705G/ PD78XG/ HD785G: Analog: 11 hours (UHF); 10 hours (VHF) Digital: 12.5 hours (UHF); 12 hours (VHF)
Operating Temperature		-30℃ ~ +60℃
Dimensions (H×W×D) (with standard battery, without antenna)		PD70X/ PD70XG/ HD705/ HD705G: 125×55×35 mm/ 4.921×2.165×1.378 inch PD78X/ PD78XG/ HD785/ HD785G: 125×55×37 mm/ 4.921×2.165×1.458 inch
Weight (with antenna & standard battery)		PD70X/ PD70XG/ HD705/ HD705G: 335g/ 0.74lb (UHF); 340g/ 0.75lb (VHF) PD78X/ PD78XG/ HD785/ HD785G: 355g/ 0.78lb (UHF); 360g/ 0.79lb (VHF)
Frequency Stability		±1.5ppm
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		60dB @ 12.5 kHz / 70dB @ 20&25 kHz 60dB @ 12.5 kHz / 70dB @ 20&25 kHz
Intermodulation TIA-603		70dB @ 12.5/20/25 kHz

ETSI	65dB @ 12.5/20/25 kHz
Spurious Response Rejection TIA-603 ETSI	70dB @ 12.5/20/25 kHz 70dB @ 12.5/20/25 kHz
Blocking	84dB
Rated Audio Power Output	0.5W (16Ω load)
Rated Audio Distortion	≤3%
Transmitter	
RF Power Output	UHF: 4W/1W VHF: 5W/1W
Conducted/Radiated Emission	-36dBm<1GHz -30dBm>1GHz
Modulation Limiting	±2.5kHz @ 12.5 kHz ±4.0kHz @ 20 kHz ±5.0kHz @ 25 kHz
FM Noise	40dB @ 12.5 kHz 43dB @ 20KHz 45dB @ 25 kHz
Audio Distortion	≤3%
GPS (open area)	
TTFF (Time To First Fix) Cold Start	<1 minute
TTFF (Time To First Fix) Hot Start	<10 seconds
Horizontal Accuracy	<10 meters

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

18. Appendix

Table of Blind Spots

No.	UHF1 (400-470MHz) Blind Spot (MHz)
1	403.2
2	422.4
3	441.6
4	460.8
5	414
6	432
7	450
8	468
9	434.7
10	463.275
11	407.4625
12	407.475
13	411.725
14	411.7375
15	416
16	424.5375
17	426.6625
18	428.8
19	430.9375
20	435.2
21	439.4625
22	439.475
23	443.7375
24	448
25	452.2625
26	452.275

27	456.525
28	456.5375
29	458.6625
30	465.0625
31	465.075

Note: Blind spots 11-31 are for R1.0 radios.

No.	UHF2 (450-520MHz) Blind Spot (MHz)
1	450
2	468
3	486
4	504
5	480
6	460.8
7	518.4
8	499.2

No.	UHF3 (350-400MHz) Blind Spot (MHz)
1	384
2	366.6
3	353.8
4	369.8
5	385.8
6	393.675

No.	VHF (136-174MHz) Blind Spot (MHz)
1	144
2	140.7
3	162
4	153.6



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