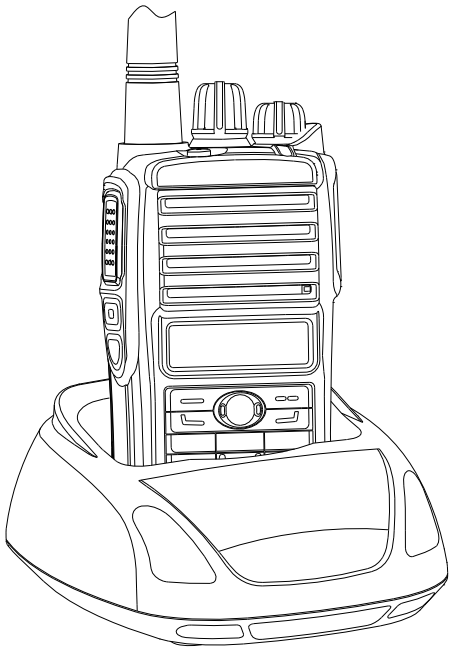
DR5800-2 Series

Service Manual

2019-12 V01 version

----------CONTENTS----------



This product complies with the RoHs directive for the European market.

DISCLAIMER

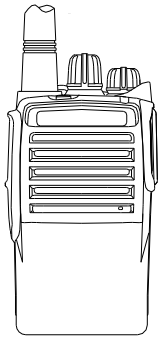
While every precaution has taken in the preparation of this manual, our company assumes no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of the information contained herein. Our company reserves the right to make changes to any products herein at any time for improvement purposes.

GENERAL

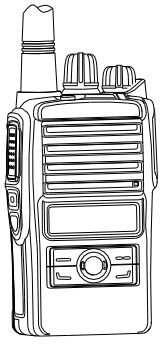
MODEL CHART

Model							Description
DR5800-2							16 keys LCD 1000-Ch
	DR5810-2						16 keys LCD 1000-Ch
		DR5600-2					6 keys LCD 1000-Ch
			DR5610-2				6 keys LCD 1000-Ch
				DR5500-2			16-Ch
					DR5510-2		16-Ch
						Item	**Description**
				X	X	DR5800-2_A PCBA	ROTARY SWITCH(300 °), MIC
X	X	X	X			DR5800-2_B PCBA	ROTARY SWITCH(360 °)
X	X	X	X			DR5800-LCD PCBA	
X	X					DR5800KEY18-V01 PCBA	
X	X					DR5810 Keys metal dome plate	
X	X					DR5810 Keyboard	
		X	X			DR5800key6-V02 PCBA	
		X	X			DR5610 Keys metal dome plate	
		X	X			DR5610 Keyboard	
X	X	X	X	X	X	UHF Whip Antenna	400-470MHz
X	X	X	X	X	X	Battery Standard	CB-01A 1700mAh

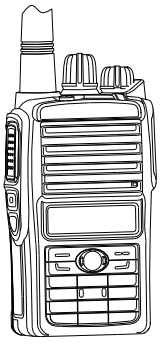
X = Indicates one of each is required.



DR5510



DR5610



DR5810

SCOPE OF THIS MANUAL

This manual applies to the service and maintenance of DR5100-2 radio, and is for the engineers and professional technicians that have been trained by our company. In this manual you can find all the information of product service.

ATTENTION

PERSONAL SAFETY

- ✧ Do not touch the antenna connector with your skin directly.
- ✧ Do not reverse the power polarities.
- ✧ DO NOT transmit until all RF connectors are verified secure and any open connectors are properly terminated.
- ✧ **SHUT OFF** and **DO NOT** operate this equipment near electrical blasting caps or in an explosive atmosphere.
- ✧ This equipment should be serviced by a qualified technician only.
- ✧ Change Components

All the components used in repair service should be supplied by our company.

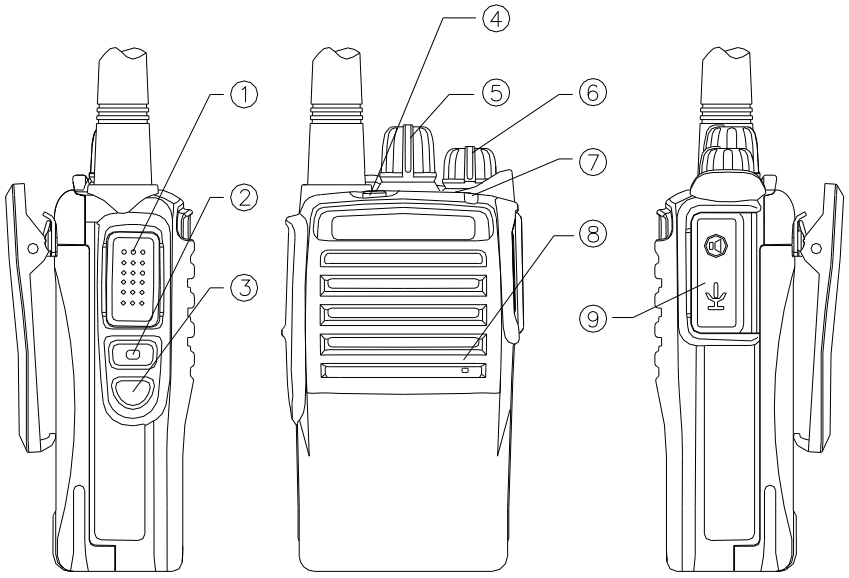
Other components of the same models available on the market are not surely able to use in this product and we do not guarantee the quality of the product using such components.

Service

- ✧ All our company products are subject to the service warranty.
- ✧ After-sales service will be provided, and the length of warranty is stated by our company. The radio and its accessories are all in the warranty. However, in one of the following cases, charge free service will be not available.
- ✧ No valid service warranty or original invoice.
- ✧ Malfunction caused by disassemble, repair or reconstruct the radio by the users without permission.
- ✧ Wear and tear or any man-made sabotage such as mechanical damage, burning or water leaking.
- ✧ Product serial number has been damage or the product trademark is difficult to identify.
- ✧ Beyond the warranty time, lifetime service is still available with paid. And we also provide service components to service stations and staff.

RADIO OVERVIEW

1. DR5510



1. PTT (PUSH-TO-TALK) Button
2. Side Button 1 (Programmable Button)
3. Side Button 2(Programmable Button)
4. Top Button (Programmable Button)
5. Channel Selector 1~16CH.
6. Power/Volume Knob
7. LED Indicator LED Indicates Status/Alert.

   Green LED lights when a carrier is detected in the current channel.

   Red LED lights during transmission.

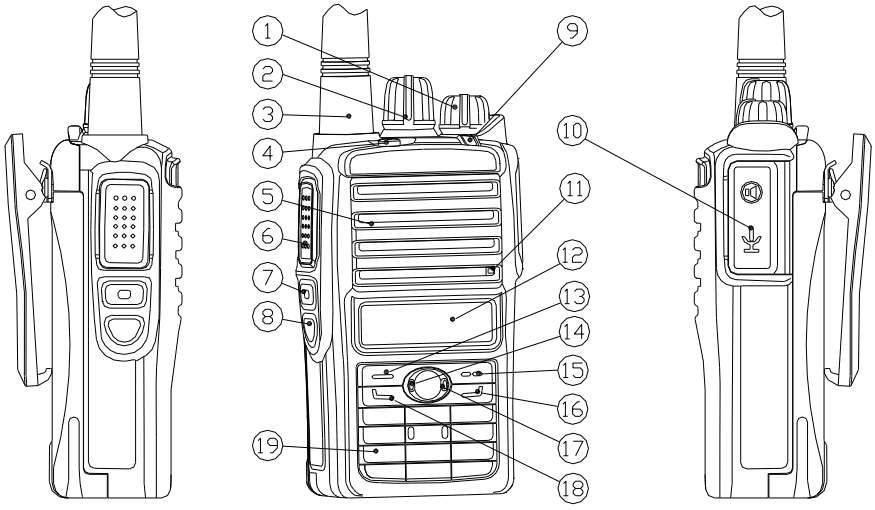
   Orange LED flashes when receiving the Radio ID 5-Tone signaling or 2-Tone signaling or MDC signaling.

   Red LED flashes when battery voltage too low.
8. MIC Input

   Please keep your mouth about 10 cm (3-4 inches) away from the microphone input to achieve the best voice quality. If the distance is too far or too close to the radio, it will affect the voice quality.
9. Speaker/Microphone Jacks

   Used for connect the optional speaker/microphone.

DR5610 & DR5810



1. **Power/Volume Knob**
   Turn clockwise to switch on the radio. Turn counterclockwise till a click is heard to switch off the radio. Rotate to adjust the volume after turning on the radio.
2. **Channel Selector**
   Rotate to select channel 1~2000.
3. **Antenna**
4. **Top Button** (Programmable Button)
5. **Speaker**
6. **PTT (PUSH-TO-TALK) Button**
7. **Side Button 1** (Programmable Button)
8. **Side Button 2**(Programmable Button)
9. **LED Indicator**
   Green LED lights when a carrier is detected in the current channel.
   Red LED lights during transmission.
   Orange LED flashes when receiving the Radio ID 5-Tone signaling or 2-Tone signaling or MDC signaling.
   Green LED flashes when scanning.
   Red LED flashes when battery voltage too low.
10. **Speaker/Microphone Jacks**
    Used for connect the optional speaker/microphone.
11. **MIC Input**
    Please keep your mouth about 10 cm (3-4 inches) away from the microphone input to achieve the best voice quality.
12. **LCD**
13. **“OK”**
14. **Select “UP”**
15. **“BACK”**

16. **P2**

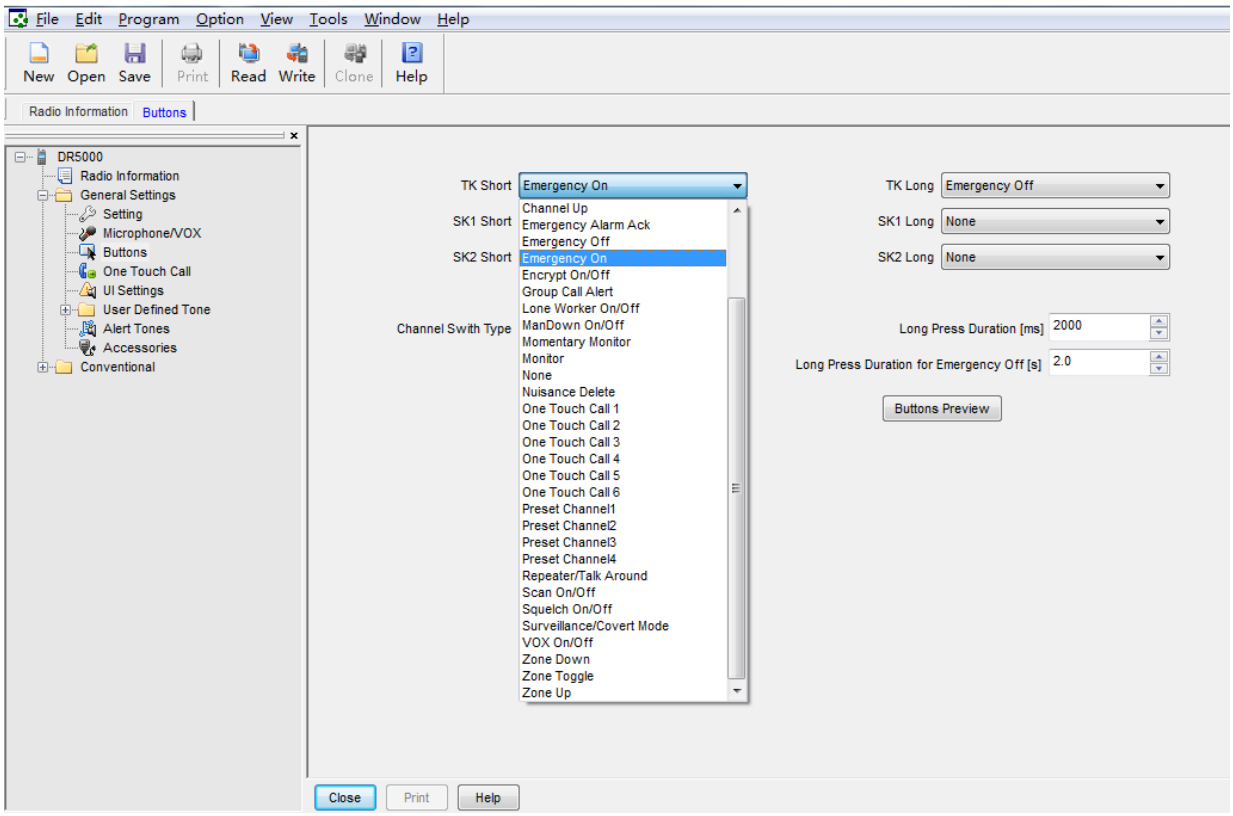
17. **Select “DOWN”**

18. **P1**

19. **Number Key Pad （DR5810 Only）**

Programmable Button Function

The dealer can program the Side Button 1, Side Button 2 and the Top Button with the following Optional functions:



REALIGNMENT

Mode combinations

Mode		Function	Operation
User Mode	User Mode	For normal use	Power on
PC Mode	Data Programming Mode	Reading and writing frequency data and other functions	Receive instructions from the PC
	Test Mode	Used to tune the radio using the PC.	Receive instructions from the PC
	Firmware Upgrading Mode	Upgrades the software when new features are added	Receive instructions from the PC

Normal User Mode：

You can enter Normal User Mode (conventional communication mode) by turning on the power switch. Users in the mode can use the defined function of the radio.

Data programming mode:

Before leaving the factory, the radio has been set in factory. However, due to different requirements of users, functional parameters of the radio such as working frequency, channels, CTCSS/DCS and auto scanning, etc. should be set again. Therefore, the company has specially designed a set of DR5100 programming software with friendly interface, convenient operation and visualized display for setting functional parameters of the radio. The programming software is DMR_CPSXXXX_Vx.xx.xx.

Steps for setting the functional parameters of the Radio by computer are as follows:

1. Install programming software on the computer.
2. As shown in the figure below, connect the radio to the computer through a USB programming cable (CPL-04).
3. Turn on the power of the computer.
4. Turn on the power of the Radio.
5. Click on DR5100 icon to perform the program.
6. In the main menu of the programming software, click on [Read] to read the parameters of the radio into the computer; click on [Write] to write the parameters set in the computer into the radio.

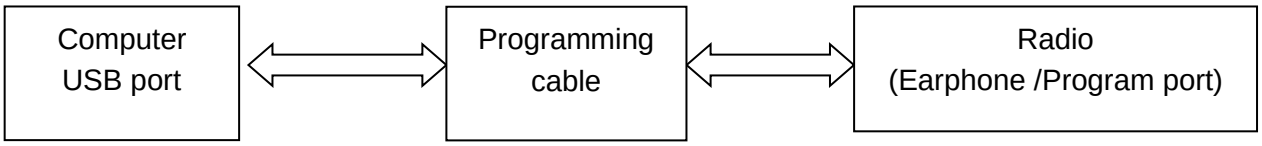


Figure 3-1

Caution:

1. Before editing for the first time, the data should be read from the Radio and properly backed up.
2. If the edited data cannot work normally after being written into the Radio, please open the backup data and rewrite them.
3. “Model Information” is the important information of the Radio and should not be altered.

Test Mode

According to Figure 3-1, connect the radio to the computer with the programming cable (CPL-04). The test software is DMR Tuner x.xx.

Warning:

Before entering the Test Mode, please first connect a high-frequency load of 50 ohm to the antenna port of the radio or connect the radio a certain test instrument.

With the DR5100 Tuner Software, you can enter the adjustment status in Computer Test Mode to adjust the following parameters of the radio:

1) Frequency stability
2) RF transmitting high power
3) RF transmitting Middle power
4) RF transmitting Low power
5) Maximum TX voice deviation
6) VOX1(Tight)
7) VOX10
8) 2/5 tone deviation
9) DTMF deviation
10) MSK deviation
11) DCS/LTR balance
12) DCS deviation
13) CTCSS(67.0Hz) deviation
14) CTCSS(254.1Hz) deviation
15) Battery warning level
16) RX Sensitivity
17) RX squelch 9 open level
18) RX squelch 9 close level
19) RX squelch 1 open level
20) RX squelch 1 close level
21) RSSI(-120dBm)
22) RSSI(-70dBm)
23) TX Low Voltage

Firmware Upgrading Mode

The radio is equipped with an internal FLASH ROM, it can be upgraded if required.

1. Connect the radio to the PC with a programming cable, then power on the radio.
2. Run computer programming software.
3. Select the right “com port” and suitable Baud Rate you connected and the upgrading firmware and then click on “E.P” to start downloading.
4. Turn off the radio and exit the programming software.

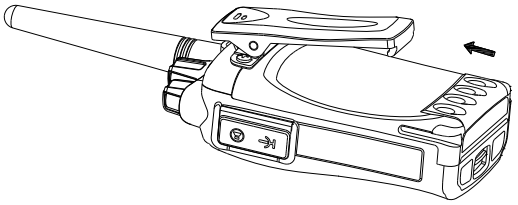
DISASSEMBLY FOR REPAIR

Installing/Removing the Battery Pack

To install the battery, please place it into the groove on the top of the radio chassis about 5mm away from latch.

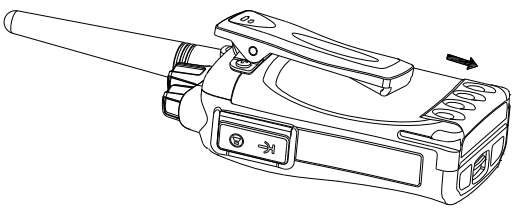
If the radio has the belt clip installed, you will have to press one side of the clip, to raise it and slide the battery in proper position.

Press the battery with your fingers and push the battery until you hear a latch click, the battery is now installed.



Removing the battery pack：

If you want to remove the battery from the radio, first press the battery latch located on the bottom of the radio, and then press down to slide the battery about 5mm to release the latch.

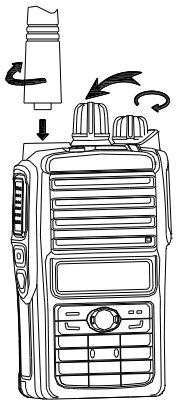


Notice:

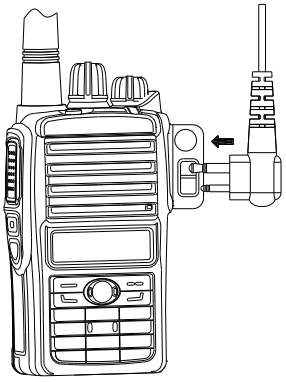
- Do not short-circuit the battery terminals or dispose the battery in fire.
- Do not disassemble the battery case.

Installing/Removing Antenna, Channel Selector, Power/Volume Knob

Screw the antenna out of the connector at the top of the radio by holding the bottom of the antenna and turn it counter clockwise until apart.
Using a smooth tool or a tool protected with cloth to hold or prize up from the bottom of channel selector or volume knob until apart.



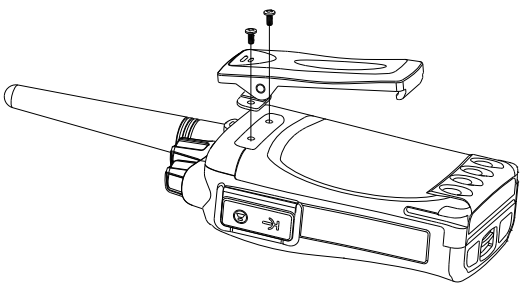
Install external speaker/MIC



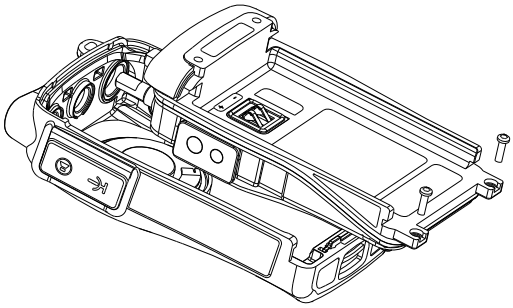
Open the cover of the jack for external speaker/MIC, and then insert the plug of the external speaker or microphone into the jack on the radio. When inserting the accessory plug, make sure it is properly aligned (straight) to avoid internal damage to the connector in the radio.

Installing/Removing the Belt Clip

Use the 2 screws (M2.5x8.0) supplied with the radio and fix these screws on the holes in the radio clip and into the holes in the aluminum case. If you want to remove the clip from the radio, just unscrew them, and remove the clip, you can put the screws back to make sure you do not loosen them.



Installing/Removing the Chassis, PCB

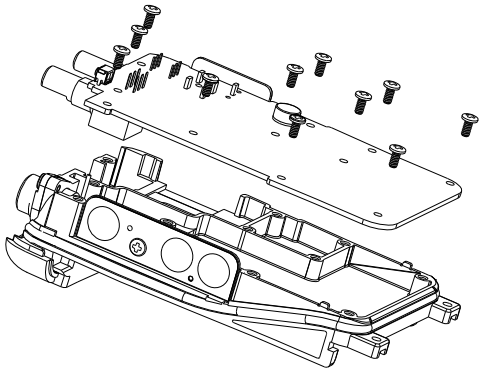


Screw off the two screws at the bottom of the radio by a hexagon screwdriver.

Pry up the chassis by peaking a straight screwdriver in the cross-slot at the bottom of the chassis, and then pull out the front cover after placing the chassis inclined to the back ;

please be careful not to snap off the wires of the speaker.

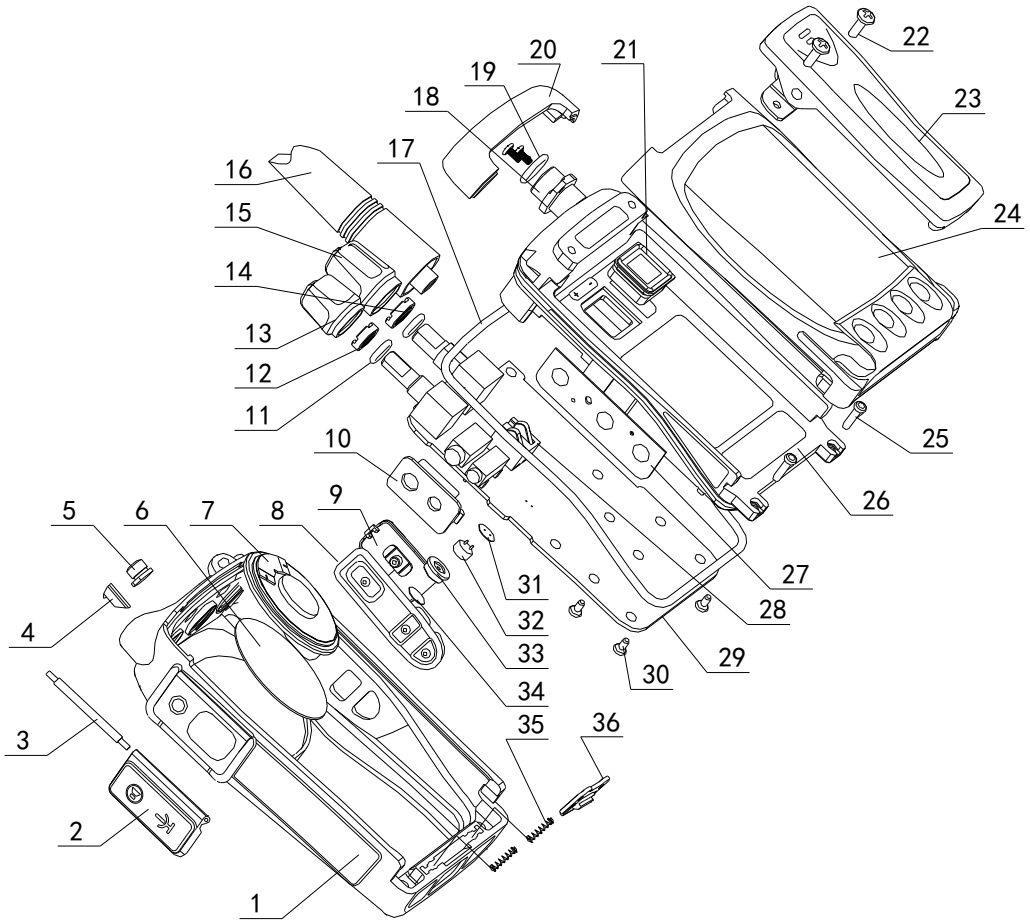
1. Screw off the 12 screws on the PCB by a cross screwdriver.
2. Unsolder the endpoints of the antenna, PTT key board and speaker by an electric iron, remove the main board.



After the disassembly above, you can carry out corresponding reparation and debugging according to the actual malfunction.

Exploded View of the Parts

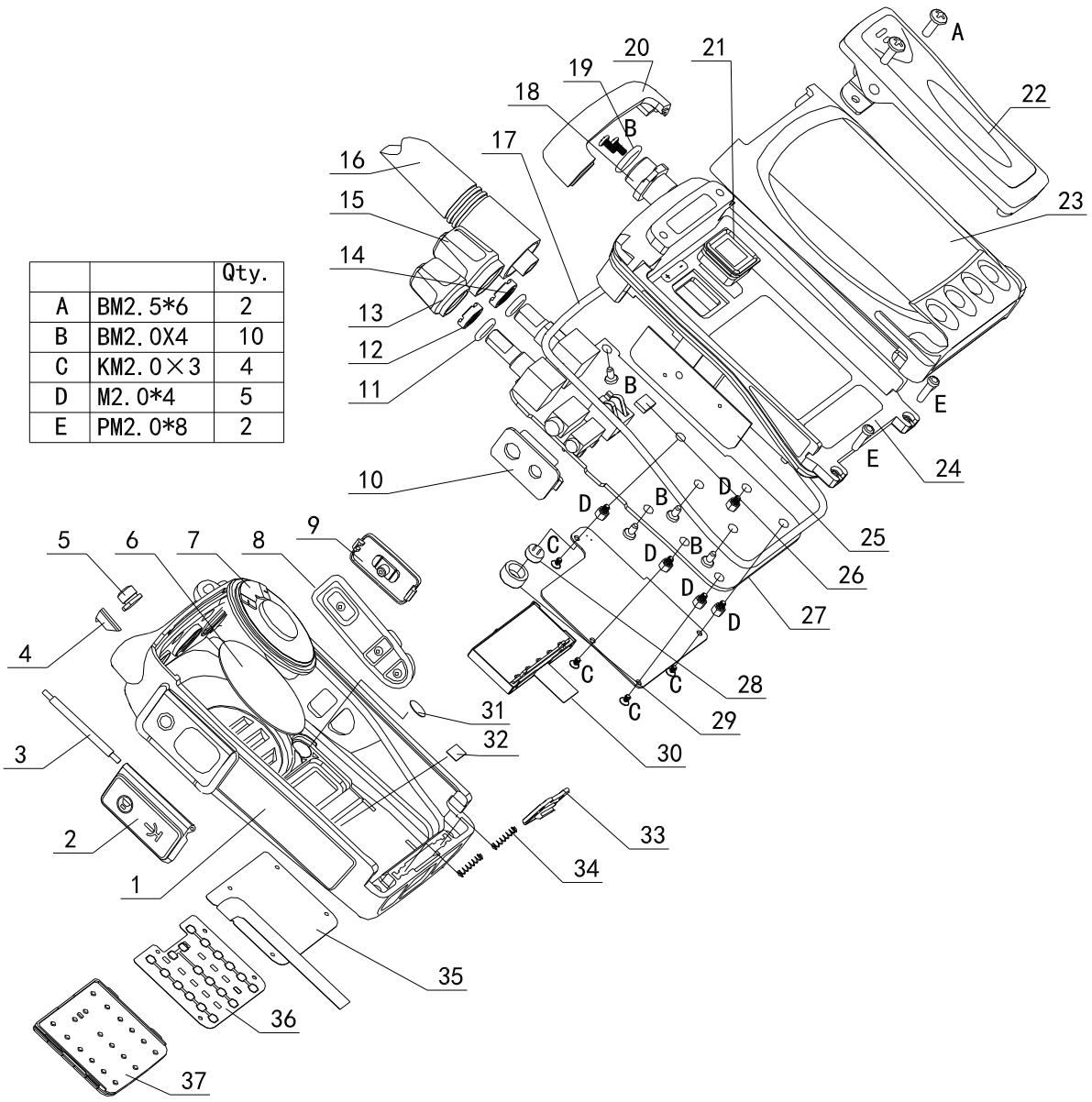
DR5510-2



No.	Parts No.	Description	Component Name /Specification	Qty.
1	201DR5100001A	DR5100 radio front cabinet	black PC1414 (61.72X103.9X31.5)	1
2	201002320008X	DR5100 Accessory connector cover	Black TPU 85D	1
3	203002320001X	DR5100 Axis of Ear phone cover	stainless steel Φ1.5X34mm	1
4	201002320010X	DR5100 light-guider	Clear PC	1
5	2020CU600003X	CU600 alarm silicon key	orange 60A 50% high spring silicon	1
6	204DR5000001A	DR5100 air filter nylon weave	32.68*30.21*0.1	1
7	1211361601001	SPEAKER	φ36 16Ω 1W	1
8	2020CU600001X	CU600 PTT silicon key	black 60A 50% high spring silicon	1
9	2010CU600002X	PTT cover Plastic	black PC+ABS 2950	1
10	2010CU600004X	CU600 ear phone cabinet	PC+ABS 2950	1
11	2020CU500004A	switch washer Φ5X1.5	60A 50% high spring silicon	2
12	304060250001A	Volume screw M6X0.75X2.5	special shape brass	1
13	201DR5000006X	DR5100 volume knob	Black PC1414	1
14	304070250001A	Encoder screw M7X0.75X2.5	special shape brass	1

15	201DR5000007X	DR5100 encoder knob	Black PC1414	1
16	7100500240471	CU500-2 standard configuration antenna	400-470MHz	1
17	2020CU500001A	CU500 cabinet waterproof ring	orange 40A 50% high spring silicon	1
18	2030CU600003X	SMA RF socket		1
19	2020CU500003A	RF socket washer Φ7X1.5	60A 50% high spring silicon	1
20	2010CU600005X	CU600 radio top cover	black PC+ABS 2950	1
21	2020CU500002A	CU500 power socket washer	60A 50% high spring silicon	1
22	301250607001X	Machine screw M2.5X6.0 PB(+)	black Ni-plate	2
23	7110CLP02001	CLP-02 clip		1
24	7060CB01A001	CB-01A Li-ion battery	1700mAh	1
25	301200807001X	Machine screw M2.0X8.0 six lobe pan	Ni-plate Nylok blue patch	2
26	2030CU500001A	CU500 AL chassis	polishing ADC 12	1
27	1010600200202	CU600 KEY PCB	CU600pttV03.PCB	1
	2040CU600002X	CU600 PTT metal dome plate		1
28	2040CU500001X	2 PIN power socket		1
29	10105000200102	DR5100-2 main PCBA		1
30	301200407001X	Machine screw M2.0X4.0 PB(+)	Ni-plate Nylok blue patch	14
31	306006005001X	Mic pad Φ6.0X0.5mm	soft PVC	1
32	1212602762201	MIC ELEMENT	PF0-6027P-62±2dB	1
33	2020CU600004X	CU600 mic waterproof washer	60A 50% high spring silicon	1
34	2040CU600004X	Mic waterproof net	Φ7.0-Φ4.5X0.2	
35	2030CU600004X	Spring Φ2.3X10.5	Φ0.25 spring steel Ni-plate	2
36	2010CU600009X	CU600 battery locker	black PC+ABS 2950	1

DR5810-2



		Qty.
A	BM2.5*6	2
B	BM2.0X4	10
C	KM2.0×3	4
D	M2.0*4	5
E	PM2.0*8	2

DR5810 STRUCTURE PARTS LIST

No.	Parts No.	Description	Component Name /Specification	Qty.	Ref. No.
		DR5810 Structure			
1	201-DR5810-001A	DR5810 radio front cabinet	black PC1414 (61.72X103.9X31.5)	1	
2	201-002320-008X	DR5100 Accessory connector cover	Black TPU 85D	1	
3	203-002320-001X	DR5100 Axis of Ear phone cover	stainless steel Φ1.5X34mm	1	

4	201-002320-010X	DR5100 light-guider	Clear PC	1	
5	202-0CU600-003X	CU600 alarm silicon key	orange 60A 50% high spring silicon	1	
6	204-0CU600-003A	DR5100 air filter nylon weave	32.68*30.21*0.1	1	
7	121-136160-1001	SPEAKER	φ36 16Ω 1W	1	
8	202-0CU600-001A	CU600 PTT silicon key	black 60A 50% high spring silicon	1	
9	201-0CU600-002X	PTT cover Plastic	black PC+ABS 2950	1	
10	201-0CU600-004A	CU600 ear phone cabinet	PC+ABS 2950	1	
11	202-0CU500-004A	switch washer Φ5X1.5	60A 50% high spring silicon	2	
12	304-060250-001A	Volume screw M6X0.75X2.5	special shape brass	1	
13	201-DR5000-006X	DR5100 volume knob	Black PC1414	1	
14	304-070250-001A	Encoder screw M7X0.75X2.5	special shape brass	1	
15	201-DR5000-007X	DR5100 encoder knob	Black PC1414	1	
16	710-0500240471	CU500-2 standard configuration antenna	400-470MHz	1	
17	202-0CU500-001A	CU500 cabinet waterproof ring	orange 40A 50% high spring silicon	1	
18	203-0CU600-003A	SMA RF socket		1	
19	202-0CU500-003A	RF socket washer Φ7X1.5	60A 50% high spring silicon	1	
20	201-0CU600-005A	CU600 radio top cover	black PC+ABS 2950	1	
21	202-0CU500-002A	CU500 power socket washer	60A 50% high spring silicon	1	
22	711-0CLP02-001	CLP-02 clip		1	
23	7060CB01A001	CB-01A Li-ion battery	1700mAh	1	
24	203-0CU500-001A	CU500 AL chassis	polishing ADC 12	1	
25	1010600200202	CU600 KEY PCB	CU600pttV03.PCB	1	
	2040CU600002X	CU600 PTT metal dome plate		1	
26	204-0CU600-005A	silica pad for heat dissipation		1	
27		DR5810-2 main PCBA		1	
28	1212602762201	MIC ELEMENT	PF0-6027P-62±2dB	1	
29	202-0CU780-002A	CU780 mic waterproof washer	60A 50% high spring silicon	1	
30	107-058100-0002	DR5810LCD module		1	
31	204-0CU600-004A	Mic waterproof net	Φ7.0-Φ4.5X0.2	1	
32	204-DR5810-003A	DR5810 connector foam		1	
33	2010CU600009X	CU600 battery locker	black PC+ABS 2950	1	
34	2030CU600004X	Spring Φ2.3X10.5	Φ0.25 spring steel Ni-plate	2	
35	1010580001801	DR5800KEY18-V01 PCBA		1	
36	204-DR5810-001A	DR5810 Keys metal dome plate	18PCS the ellipse 4*3.05	1	
37	202-DR5810-001A	DR5810 Keyboard		1	

CIRCUIT DESCRIPTION

Frequency configuration

The receiver utilizes double conversion. The first IF is 49.95MHz, and the second IF is 450kHz.

The first local oscillation signal of the receiver is supplied by PLL circuit and the second local oscillation signal selects the 3^{rd} harmonics of 16.8MHz of crystal oscillator X601 TCXO. The reference frequency of frequency synthesizer is provided by 16.8MHz crystal oscillator X601 TCXO.

The PLL circuit in the transmitter generates the necessary frequencies.

Figure 1 show the frequencies.

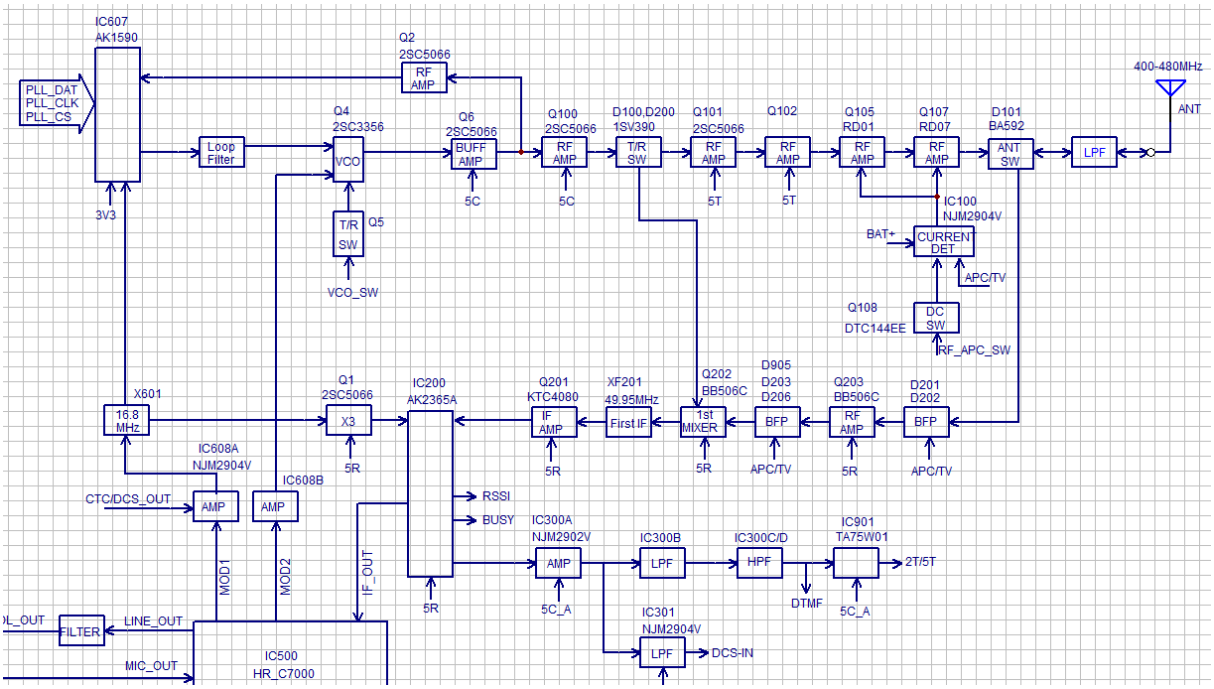


Figure 1 Frequency configuration

Receiver（Rx）

Front End (RF AMP) of Receiver

The signals coming from the antenna passes through transmit /receive switching diode circuit (D101 D102 D103) and a BPF (L208 L209 L211), and is then amplified by the RF amplifier (Q203). The resulting signal passes through a BPF (L214 L204 L203 L207) and goes to the mixer. These BPF are adjusted by variable capacitance diodes (D905 D203 D206 D201 D202 D204). The input voltage to the variable capacitance diode is a regulated voltage (APC/TV) output from the IC500 (HR_C7000 Base band processor & SOC).

The PWM wave is output composed of K1 foot and then commutated to adjustable voltage after filtering to change the capacity of variable capacitance diode D905 D203 D206 D201 D202 and D204 to control the center frequency of BPF.

First mixer

The signal from the front end is mixed with the first local oscillator signal generated in the PLL circuit by Q202 to produce a first IF frequency of 49.95MHz.

The resulting signal passes through the XF201 MCF to cut the adjacent spurious and provide the optimum characteristics, such as adjacent frequency selectivity.

IF Amplifier Circuit

The first IF signal is passed through a four-pole monolithic crystal filter XF201 to remove the adjacent channel signal. The filtered first IF signal is amplified by the first IF amplifier (Q201) and is then applied to the IF system IC (IC200 , AK2365).

The IF system IC provides a second mixer, IF limiting amplifier, noise amplifier and RSSI (Received Signal Strength Indicator) . The second mixer mixes the first IF signal with 50.4MHz signal of second local oscillator (Q1) output and produces the second IF signal of 450kHz.

Frequency (16.8MHz) produced by TCXO(X1) is amplified and then selects the third harmonics (50.4MHz) as the second local oscillator signal source.

Squelch Circuit

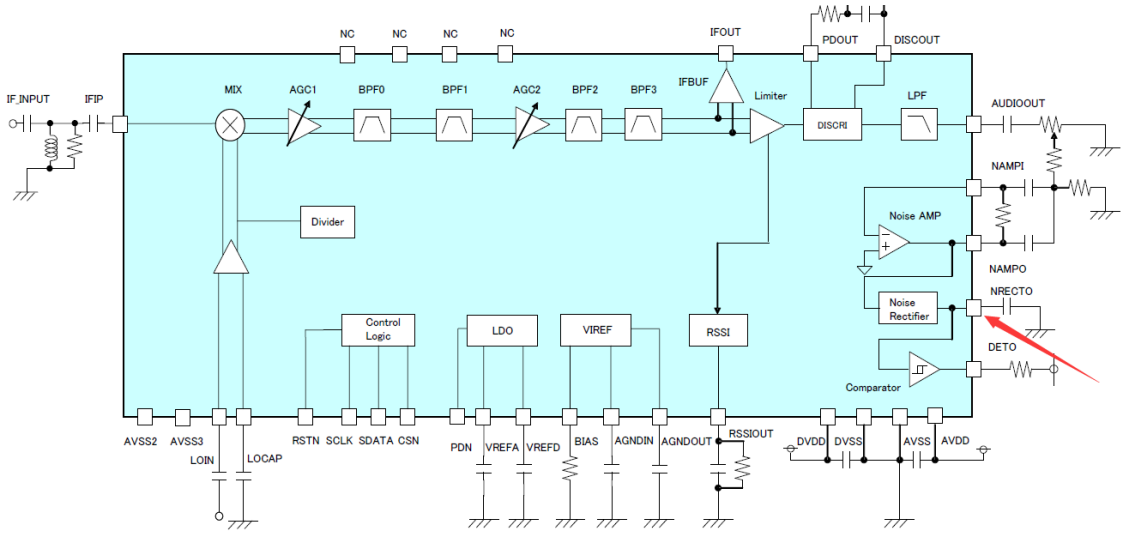


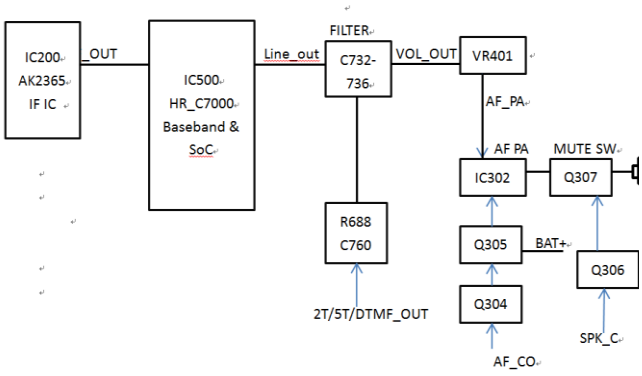
Figure 2 IC200 Block Diagram

Part of the AF signal from the IC200 enters the FM IC again, and the noise component is amplified and rectified by a filter and an amplifier to produce a DC voltage corresponding to the noise level.

The DC signal from the FM IC goes to the analog port of the base band processor & microprocessor (IC500). IC500 determines whether to output sounds from the speaker by checking whether the input voltage is higher or lower than the preset value.

To output sounds from the speaker, IC500 sends a high level to the MUTE and AFCO lines and turns IC302 on through Q304 Q305 and Q306.

Audio Power Amplification



The audio power amplifying circuit consists of IC302 and the peripheral components.

The signals are amplified by audio power amplifier to drive the speaker after collecting the receiving audio signals, voice signals and warning tone signals. The warning tone has no volume limitation.

When AFCO is high level, Q304 is on, IC302 begins to work and the speaker sounds.

Speaker Impedance: 16 ohm

Transmitter System

Drive and Final Amplifier circuit

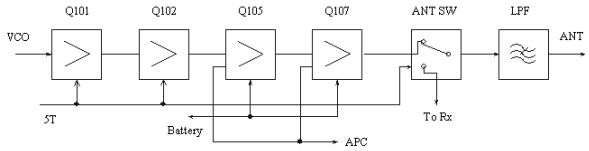


Figure 4 Power Amplifier and Antenna Switch

The signal from the T/R switch (D100 D200) is amplified by the pre-drive amplifier (Q101 Q102) to 30mW.

The output of the pre-drive amplifier is amplified by the drive amplifier (Q105) and the RF final amplifier (Q107) to 37dBm (1W when the power is low).

The drive amplifier and the RF final amplifier consist of two MOS FET stages.

The output of the RF final amplifier is then passed through the harmonic filter (LPF) and antenna switch (D101 D102 D103) and is applied to the antenna terminal.

Gate bias of Q105 and Q107 is controlled by APC circuit, so the output power of transmitter can be controlled conveniently by changing the gate bias voltage.

APC (Automatic Power Control)

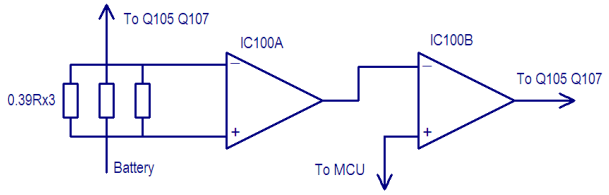


Figure 5 APC Circuit

The APC circuit always monitors the current flowing through the drive amplifier (Q105) and the final power amplifier (Q107) and keeps a constant current. The voltage drop at R130 R131 and R132 is caused by the current flowing through the RF final amplifier. This voltage is applied to differential amplifier IC100A.

IC100B compares the output voltage of IC100A with the reference voltage from IC500 APC/TV. The output of IC100B controls the gate bias voltage of the RF power amplifier and the drive amplifier to make both voltages the same.

The change of power high/low is carried out by the change of the reference voltage.

IC500 can set the power by changing the voltage input to IC100B.

Microphone Amplifier Circuit

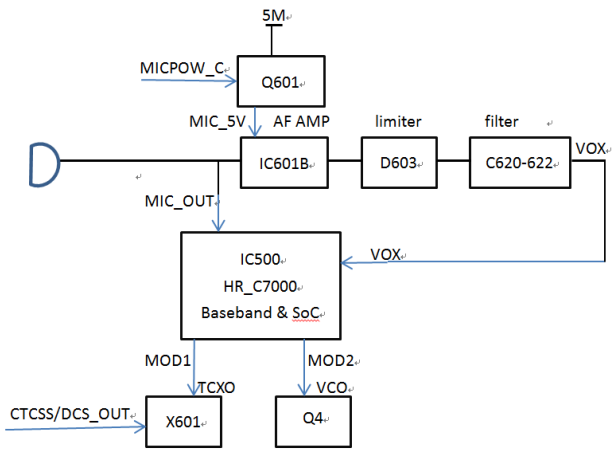


Figure 6 MIC AMP Circuit

The signal from the microphone input IC500 . IC500 is composed of a high-pass filter, low-pass filter and pre-emphasis/IDC circuit.

The signal from the microphone and the low speed data from the SoC IC500 enter the baseband IC500 and pass through each path and are mixed inside the IC.

The output signal from the audio processor goes to the VCO modulation input. The other output signal goes to the TCXO modulation input.

J501 is the socket for external MIC, and the internal MIC will disconnect automatically when using external MIC, but the internal PTT is still effective.

Frequency Synthesizer Unit

The frequency synthesizer consists of the TCXO(X601), VCO, PLL-IC (IC607), and buffer amplifiers.

The TCXO generates 16.8MHz. The frequency stability is 1.0ppm within the temperature range of -30℃ to +60℃. The frequency tuning and modulation of the TCXO are done to apply voltage pin 10 of the TCXO. The output of TCXO is applied to pin 10 of PLL-IC.

The VCO consists of 2 VCOs and covers a dual range of 350.05-430.05MHz and 400-480MHz. The VCO generates 350.05-430.05MHz for providing the first local signal for reception. The operating frequency is generated by Q4. The oscillation frequency is controlled by applying the VCO control voltage CV, obtained from the phase comparator (IC607) to the variable capacitance diodes (D907 D908 D4 D2). The conversion of the transmitting mode and the receiving mode is done by the voltage (VCO_SW). The voltage controls the variable capacitance diode (D1). The VCO_SW goes “high” in receiving mode. The VCO_SW goes “low” in transmitting mode.

The output from Q4 is amplified by a buffer amplifier Q6, and then sent to the PLL_IC. The PLL_IC consists of a pre-scaler, reference divider, phase comparator, and charge pump. The input signal from pin 17 of the PLL_IC is divider down and compared. The pulsed output signal of the comparator is applied to the charge pump and transformed into a DC signal in the VCO and locked to keep the VCO frequency constant.

Control circuit

The control consists of the Base Band processor & SoC IC (IC500) and its peripheral circuit. It controls the TX-RX unit. IC500 mainly performs the follow:

1) Switching between transmission and reception by PTT signal input.
2) Reading channel information, frequency, and program data from the memory circuit. PLL data is output from PLL_CS (pin P6), PLL_DATA (pin P7), PLL_CLK (pin P8) of IC500. The data is input to the PLL-IC when the channel is changed or transmission is changed to reception and vice versa. The PLL lock condition is always monitored by pin P5 PLL_LD of IC500. When the PLL is unlocked, PLL_LD goes low.
3) Sending frequency program data to the PLL.
4) Controlling squelch on/off via the DC voltage from the squelch circuit.
5) Controlling the audio mute circuit via the decode data input.
6) Transmitting tone and encode data.
7) Memory circuit

Memory circuit consists of the IC500 and FLASH IC (IC401 IC402). Channel data, CTCSS/DCS data and other function setting data and parameter adjustment data.

8) frequency shift circuit
9) Low Battery Warning

   The battery voltage is monitored by the IC500 (pin B4). When the battery voltage falls below the voltage set by the Low Battery Warning adjustment, the red LED blinks, notifying the operator that it is time to replace the battery (when the always option(default setting) under the Battery Warning function in the FPU is selected). If the battery voltage falls to 5.9V, the transceiver does not transmit and the warning tone beeps while the PTT switch is pressed.

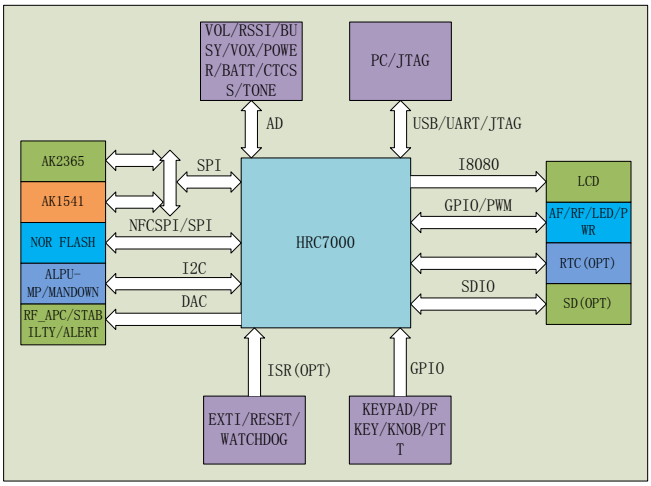


Figure 9 IC500 controlling circuit schematic diagram

Baseband & SoC IC

HR_C7000 (IC500) is a low power high performance base band processor supporting Tier 1 and Tier 2 of the DMR protocol. it completes the entire physical layer and data link layer, and voice processing part of the call control layer of DMR compliant with ETSI TS 102 361.

HR-C7000 built-in high performance digital baseband modulation and demodulation/MCU/vocoder and AD/DA interface voice Codec module.

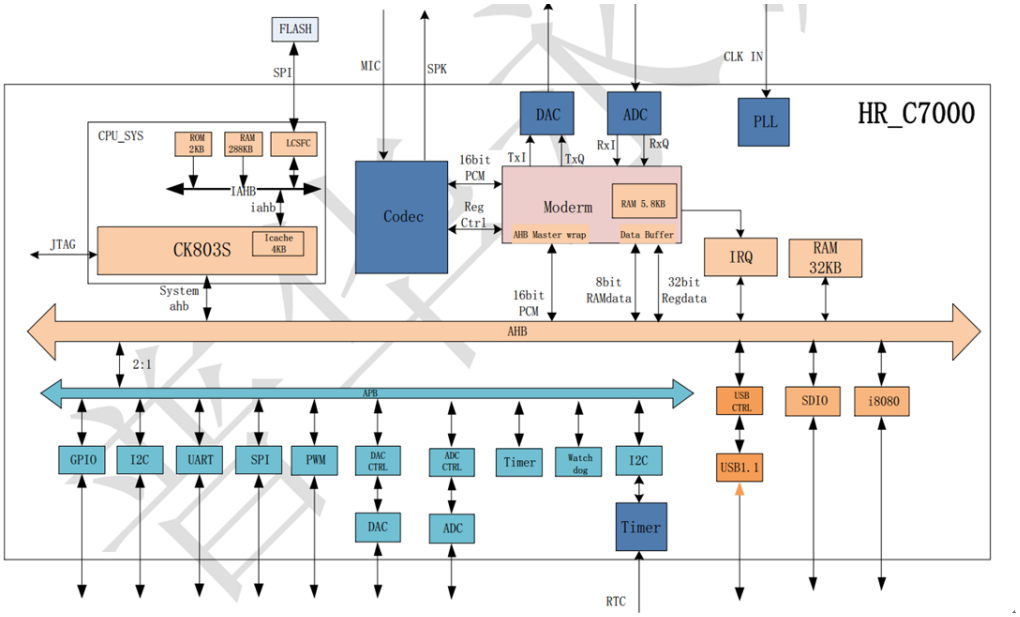


Figure 8 Base Band Processor & SoC

Signaling Circuit

1/ Encode

Low-speed data CTCSS /DCS

Low speed data is output from T15 of IC500. The signal passes through the amplifier IC608A, is mixed with the audio signal and goes to the VCO and TCXO (X601) modulation input after passing through the D/A converter inside IC500 for BAL adjustment. See to figure 6

High-speed data (2-tone, 5-tone/DTMF/MSK/MDC-1200)

High-speed data is output from pin J1 J2 of the IC500 is generated in the audio processor. The signal passes through the D/A converter (inside the baseband IC: IC500), and is touted to VCO and 2/ Decode

CTCSS Signal filtering

The audio signals after demodulation in IC200 may contain CTCSS (continuous tone control squelch system) or DCS(digital squelch)signals. The spectrum component of CTCSS/DCS is 67 to 250Hz. The filtering circuit composed of IC301 can filter out signals except CTCSS/DCS spectrum, which makes MCU decode the CTCSS/DCS more accurately.

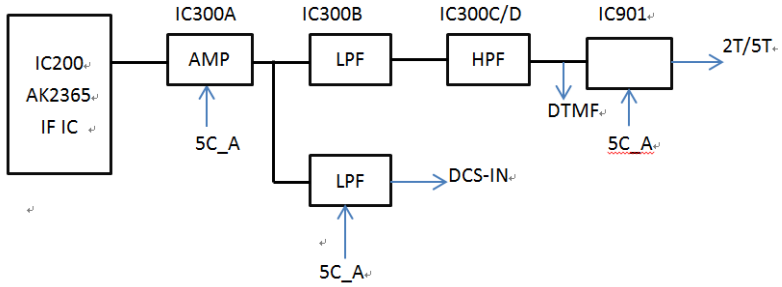


Figure 9 Decode signal circuit

Power Supply:

The station use lithium battery (7.4V, 1700mAh), while transmitter amplifier circuit (Q105 Q107) and receiver audio amplifier (IC302) use battery directly for power supply that passing through power switch VR401, and other circuits use regulated voltage that is four 5V power supply and one 3.3V power supply.

Q606: BAT7V5, 7.5V is controlled by POW_SW, POW_DET and POW_C.

IC603 : 5M (controlled by MCU) and 3.3V are always output while the power is on, 3.3V is always output, but turns off when the power is turned off, to prevent malfunction of SoC.

Q613 :5C (controlled by MCU), 5V is for VCO and output when SAVE is not set to ON.

Q615: 5C_A, 5V is for signaling circuit and output when FM_SW is set to ON.

Q614 : 5T (controlled by MCU) is 5V for transmission and output during transmission.

IC605 : 3.3V DC/DC, is 3.3V for PLL and SoC.

Q604 : 5R (controlled by MCU), is 5V for reception (RX RF and IF) and output during reception.

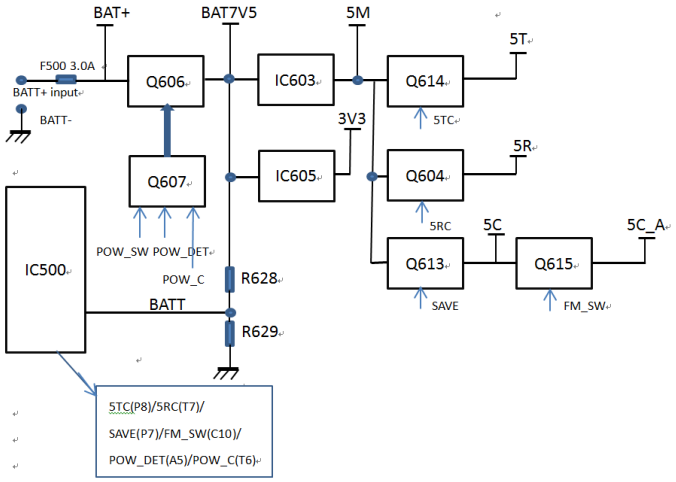


Figure 10 Power supply circuit

CTCSS/DCS signal coding and decoding:

CTCSS/DCS signals from MCU are sent to TCXO for modulation respectively .

CTCSS/DCS signals from receiver are sent to MCU(pin 25) for decoding, and then MCU test if there are CTCSS/DCS signals with the same setting of the station to decide whether open the speaker or not.

The station has 39 groups of standard CTCSS frequency for your selection, such as Table 1.

CTCSS signals produced by MCU are sent to TCXO for modulation.

Table 1 CTCSS Frequency Table

No	Freq. [Hz]	No.	Freq. [Hz]	No.	Freq. [Hz]	No.	Freq. [Hz]
1	67.0	11	94.8	21	131.8	31	186.2
2	69.3	12	97.4	22	136.5	32	192.8
3	71.9	13	100.0	23	141.3	33	203.5
4	74.4	14	103.5	24	146.2	34	210.7
5	77.0	15	107.2	25	151.4	35	218.1
6	79.7	16	110.9	26	156.7	36	225.7
7	82.5	17	114.8	27	162.2	37	233.6
8	85.4	18	118.8	28	167.9	38	241.8
9	88.5	19	123.0	29	173.8	39	250.3
10	91.5	20	127.3	30	179.9		

DCS signaling :

DCS (Digital code squelch), is a kind of continuous digital code modulated on carrier with voice signal and used for squelch control. If DCS function is set, the speaker is available only when receiving the same DCS code to avoid the disturbance of useless signals.

The station has 83 kinds of standard codes including positive and inverse code for your selection, such as Table 2.

DCS signals produced by MCU (PWM waveform) are sent to TCXO for modulation.

CTCSS/DCS signals from receiver are sent to MCU for decoding, and then MCU test if there are DCS codes with the same setting of the station to decide whether open the speaker or not.

Table 2 DCS Coding Schedule

023	114	174	315	445	631
025	115	205	331	464	632
026	116	223	343	465	654
031	125	226	346	466	662
032	131	243	351	503	664
043	132	244	364	506	703
047	134	245	365	516	712
051	143	251	371	532	723
054	152	261	411	546	731
065	155	263	412	565	732
071	156	265	413	606	734
072	162	271	423	612	743
073	165	306	431	624	754
074	172	311	432	627	

Description of Semiconductor Devices

Table 5 Functional description of semiconductor device

Item	Model	Function Description
IC200	AK2365A	Receiver 2nd Local Oscillation, 2nd IF Amplification, Limitation, Demodulation, Noise Amplification
IC300	NJM2902V	Receiver demodulated signal Amplification, Filtering
IC302	TDA2822D	Audio Frequency Power Amplification
IC401 IC402	W25Q64FVSIG W25Q128FVSIG	FLASH, Channel Frequency Data Storage, Function Setting Parameter, Debug Mode Parameter
IC500	HR_C7000	Base Band Processor and SoC
IC601	TA75W01FU	MIC Amplification
IC603	ME6209A50	LDO
IC605	MP2359DJ	Power IC
IC607	AK1590	Frequency Synthesizer
IC615	PST9124NR	MCU Reset Circuit

EXT interface

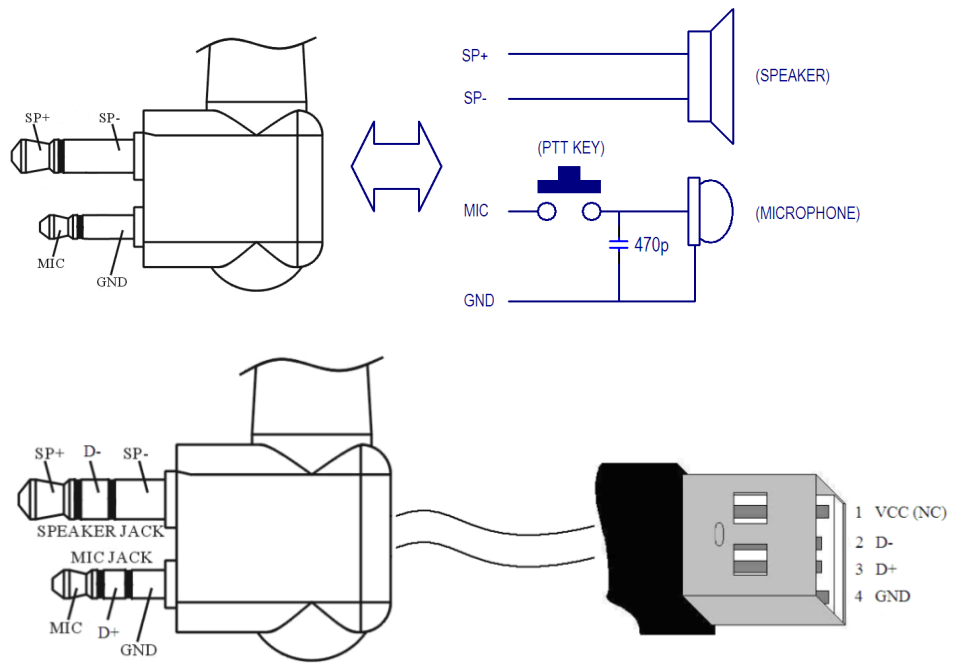
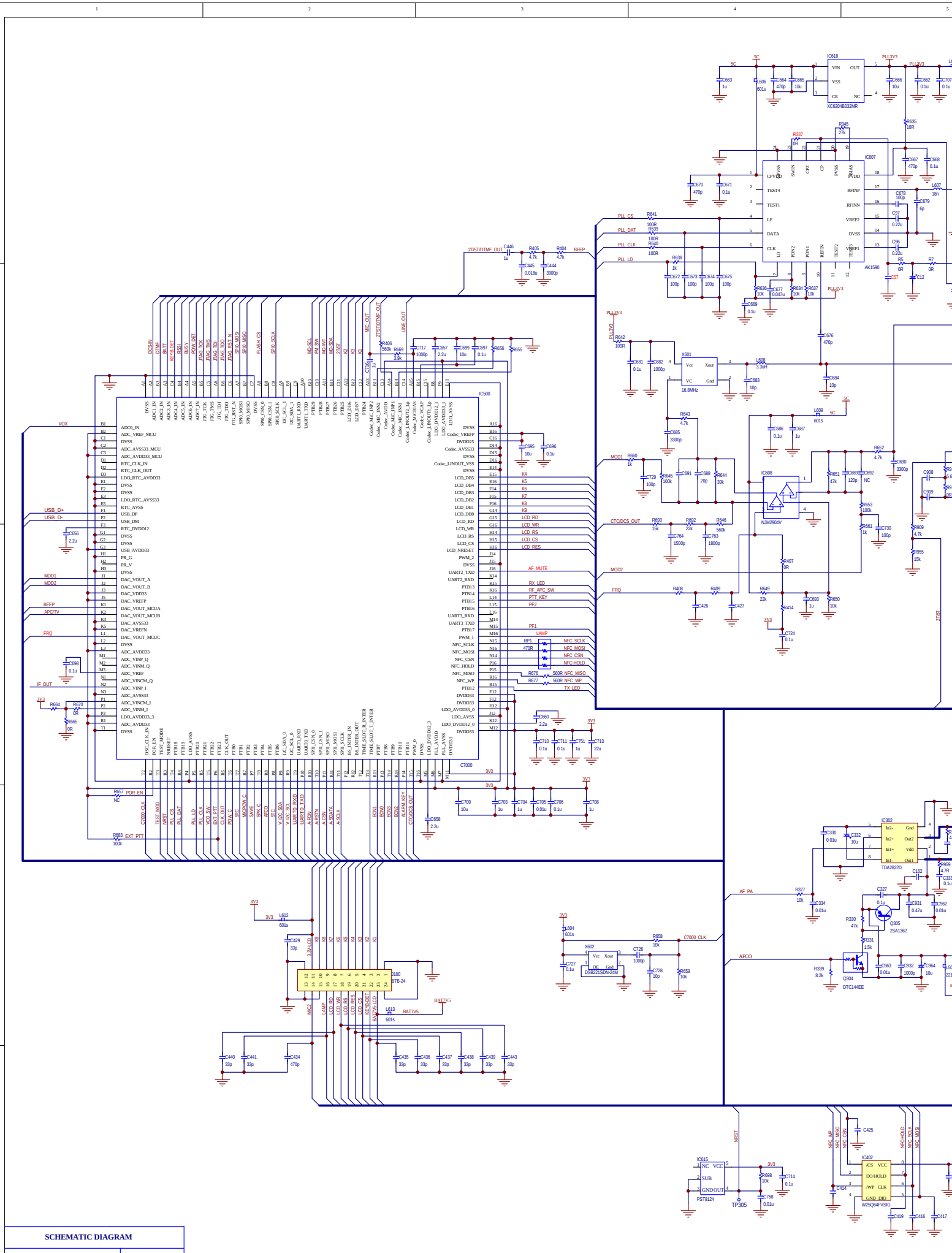


Figure 10 External interface diagram

SCHEMATIC DIAGRAM

PCB



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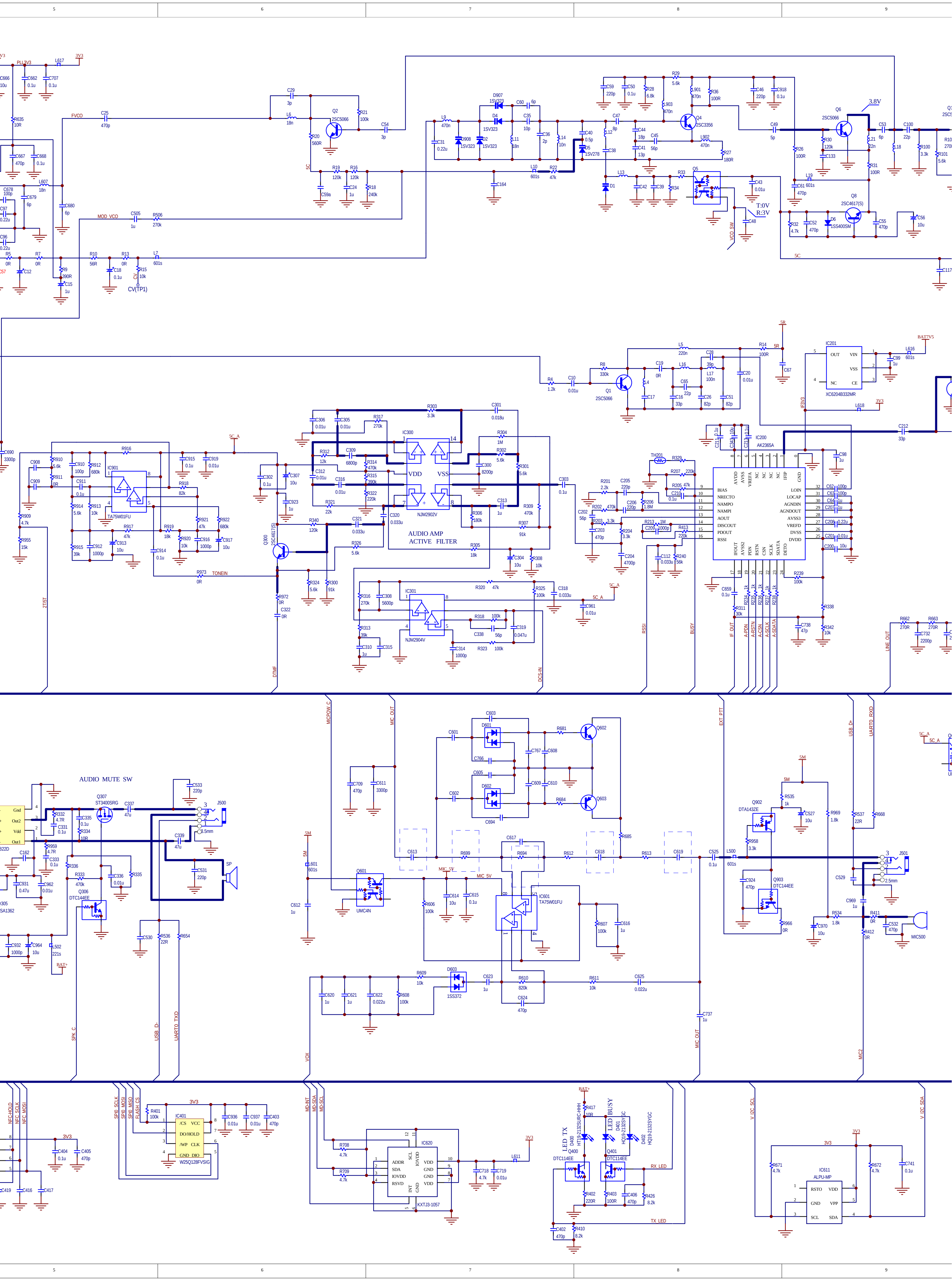

5
6
7
8
9
PLL3V3
3V3
FVCO
MOD_VCO
CV(TP1)
5C
3.8V
T:0V
R:3V
VCO_SW
IC201
OUT
VIN
VSS
NC
CE
XC6204B332MR
BAT7V5
IF3V3
5R
IC300
VDD
VSS
NJM2902V
AUDIO AMP
ACTIVE FILTER
IC301
NJM2904V
IC901
TA75W01FU
TONEIN
2TST
DTMF
DCS-IN
RSSI
BUSY
IF OUT
A-PDN
A-RSTN
A-CSN
A-SCLK
A-SDATA
LINE_OUT
IC200
AK2365A
AVDD
AVSS
VREFA
GND
IFIP
BIAS
NRECTO
NAMPO
NAMPI
AOUT
DISCOUT
PDOUT
RSSI
LOIN
LOCAP
AGNDIN
AGNDOUT
AVSS3
VREFD
DVSS
DVDD
IFOUT
AVSS2
PDN
RSTN
CSN
SCLK
SDATA
DETO
5C_A
AUDIO MUTE SW
Q307
ST3400SRG
J500
3.5mm
SP
Q306
DTC144EE
SPK_C
USB_D-
UART0_TXD
MICROW_C
MIC_OUT
5M
Q601
UMC4N
VOX
IC601
TA75W01FU
MIC_5V
D601
D602
Q602
Q603
1SS372
MIC_OUT
EXT_PTT
USB_D+
UART0_RXD
Q902
DTA143ZE
Q903
DTC144EE
J501
2.5mm
MIC500
MIC2
NFC-HOLD
NFC_SCLK
NFC_MOSI
SPI0_SCLK
SPI0_MOSI
SPI0_MISO
FLASH_CS
IC401
/CS
VCC
DO/HOLD
/WP
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GND
DIO
W25Q128FVSIG
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MD-SDA
MD-SCL
IC620
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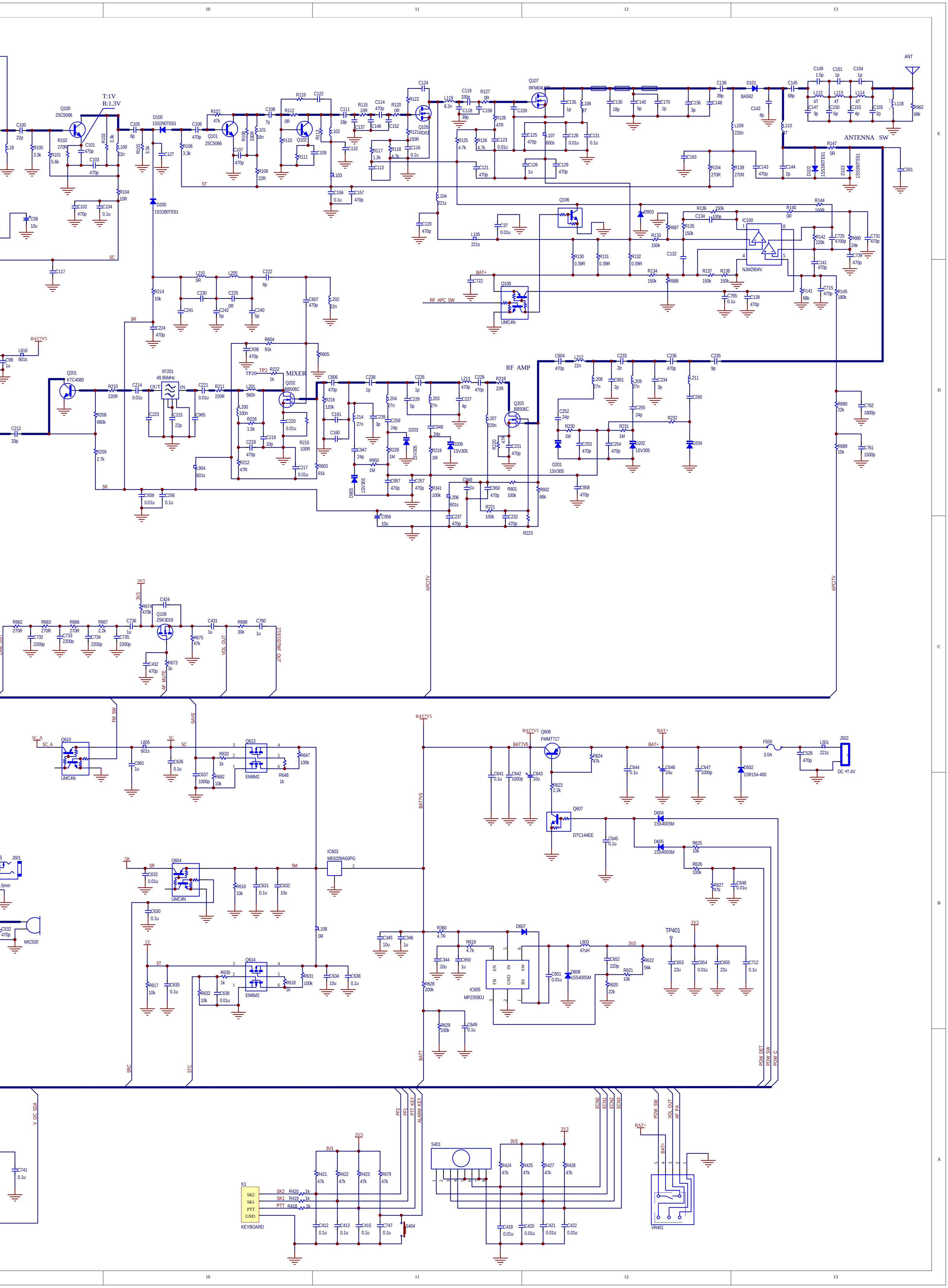
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Q202
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Q109
2SK3019
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Q613
EM6M2
Q606
FMMT717
Q607
DTC144EE
F500
3.0A
J502
DC +7.4V
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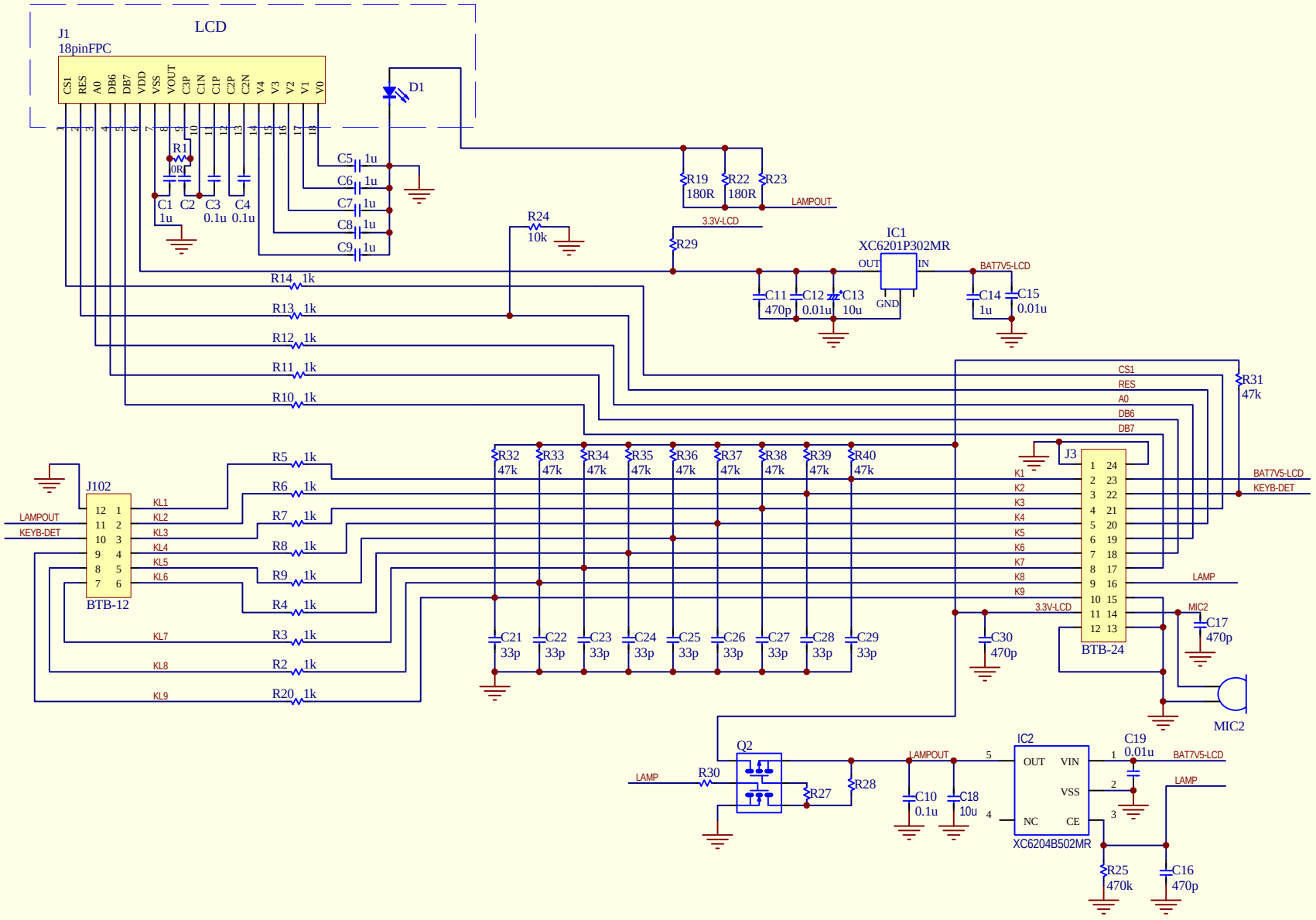
POW_C
ALARM_KEY
PTT_KEY



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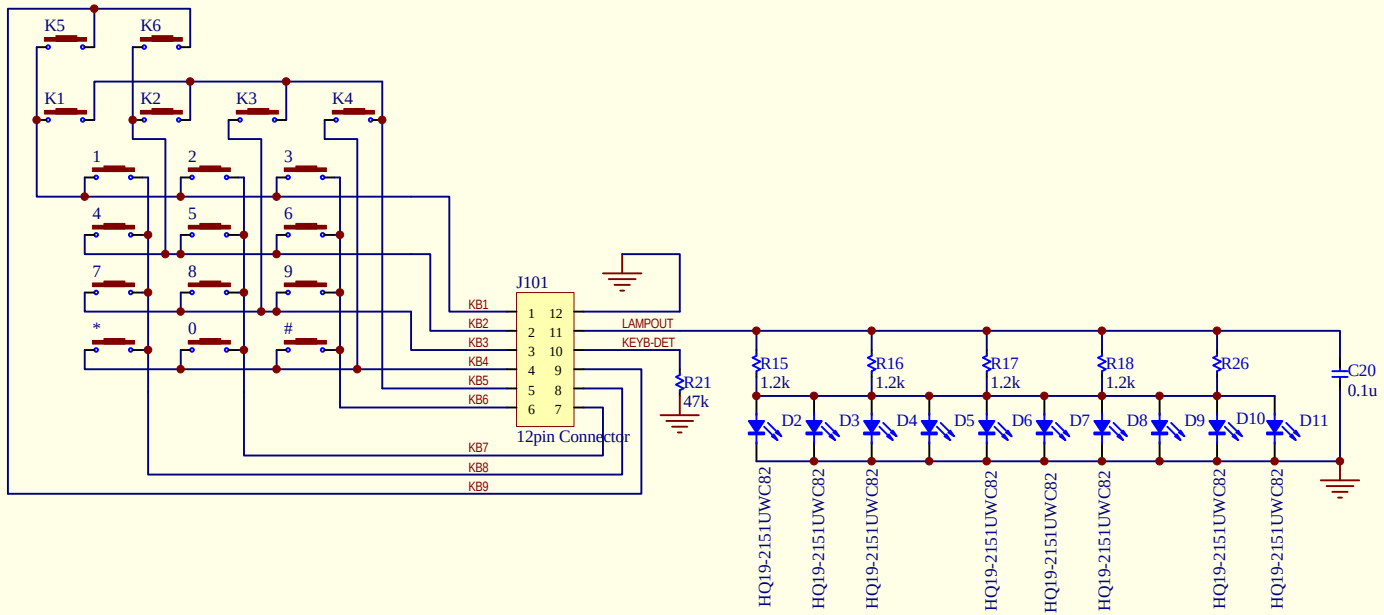

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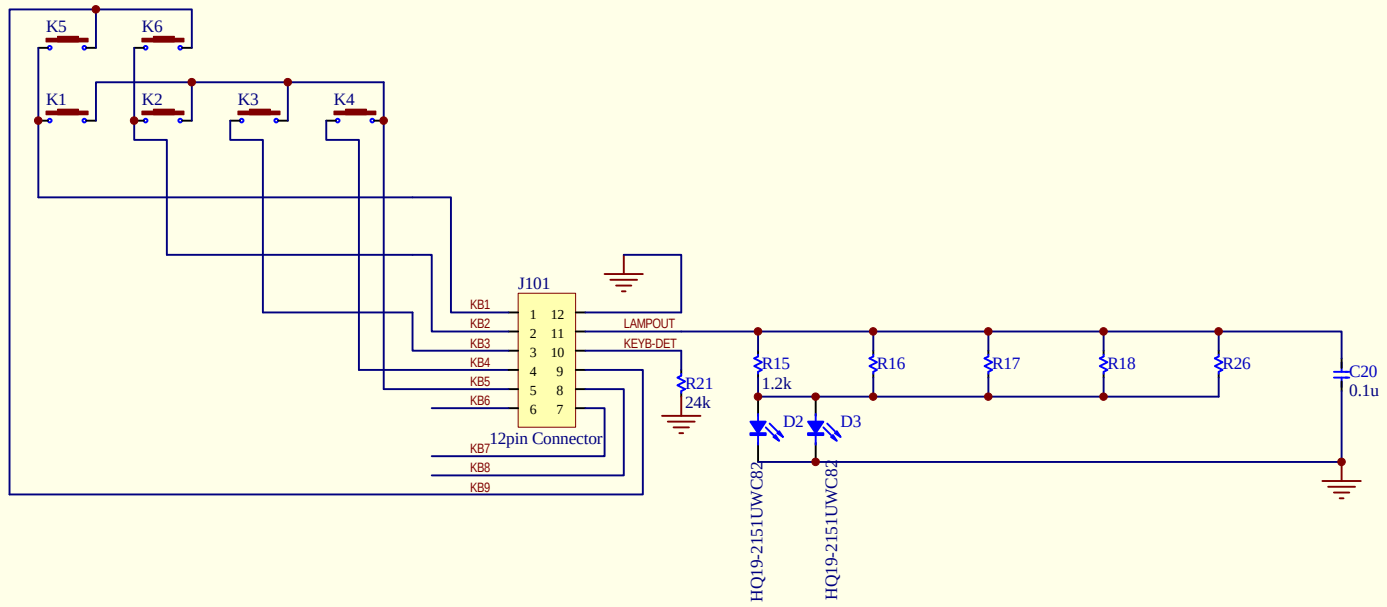

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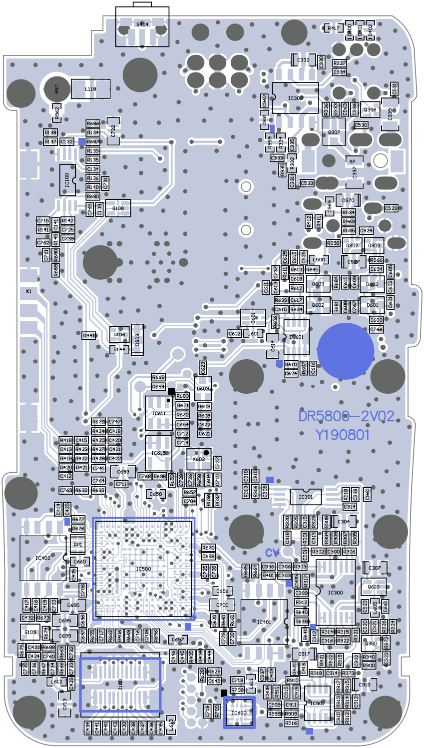
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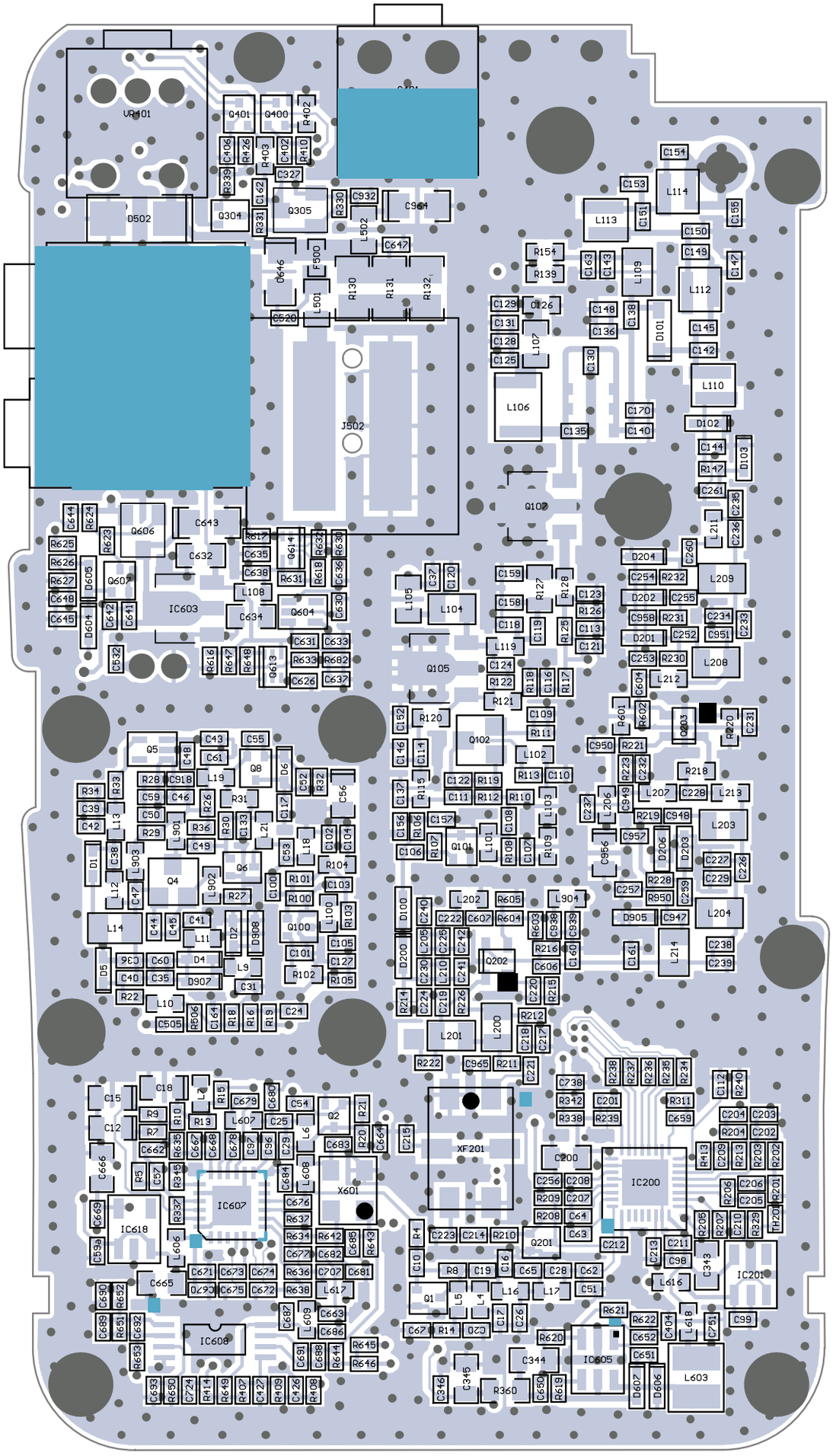
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L200
L201
R212
C218
C217
R222
C965
R211
C221
C738
R342
R338
C201
R239
R238
R237
R236
R235
R234
R311
C659
C112
R240
C204
C203
R204
C202
R413
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R213
R203
R202
C200
C256
C208
R209
C207
R208
C64
C63
Q201
C212
IC200
R206
C206
C205
R205
R207
C210
R329
TH201
C213
C211
C98
C343
C616
IC201
C99
C618
C751
C404
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C652
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R620
C344
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C345
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C680
C54
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C12
R9
R10
R13
L607
C25
R7
C667
R635
C668
C678
C97
C96
C29
L6
C683
R20
C664
C215
XF201
C666
R5
C57
R345
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C669
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C214
R210
C10
R8
C19
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L17
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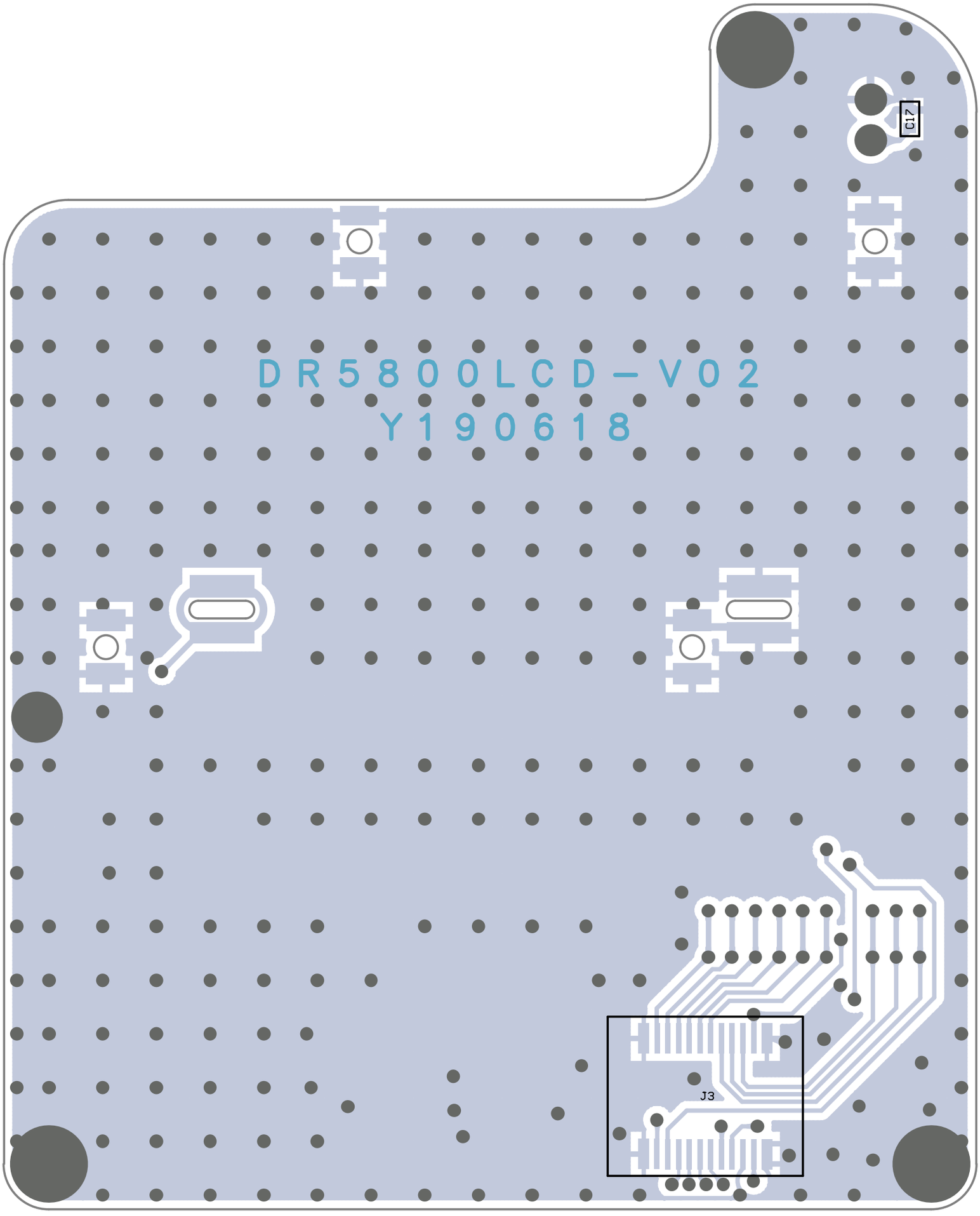
R14
C20
C17
C26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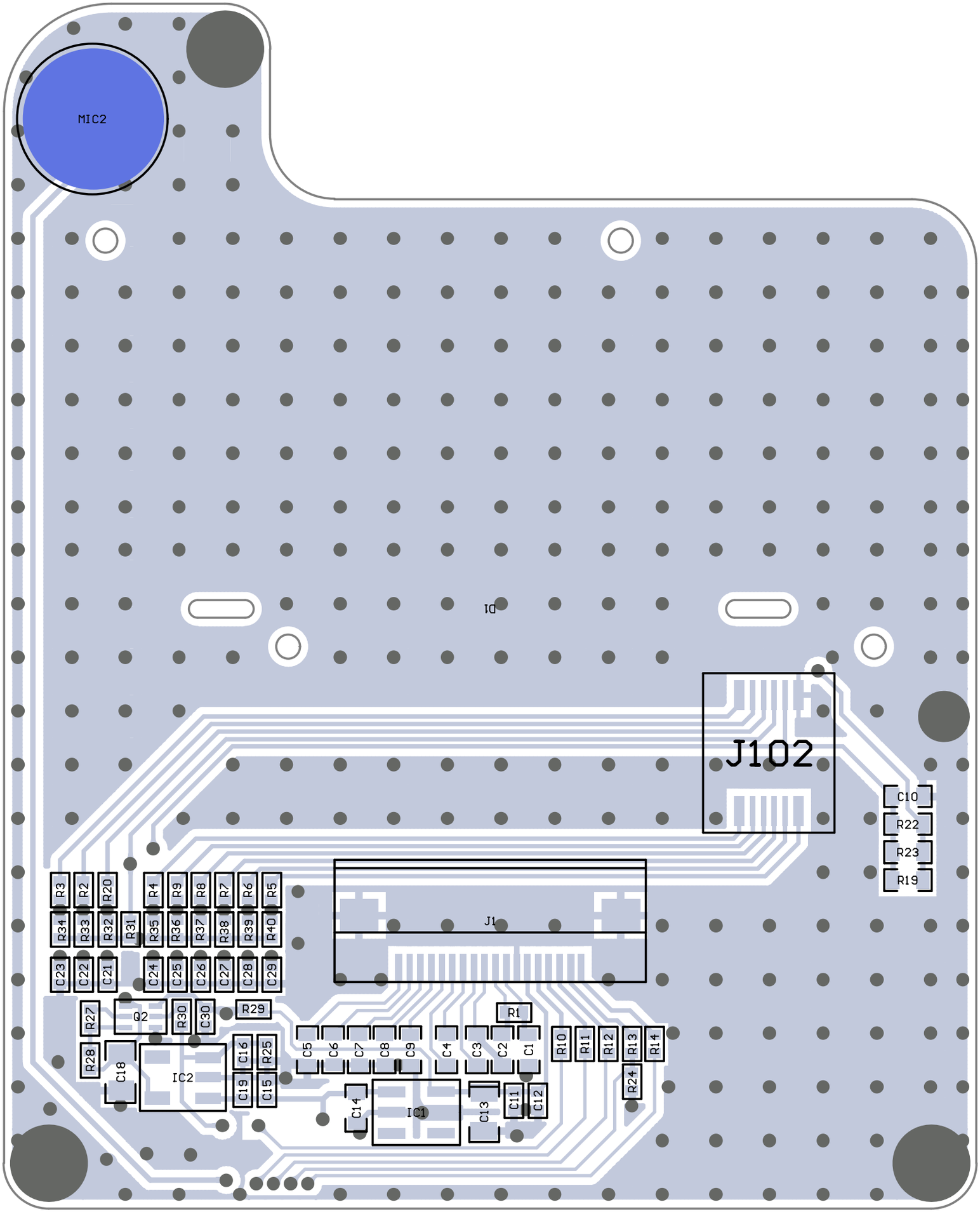
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R2
R20
R4
R9
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R5
R34
R33
R32
R31
R35
R36
R37
R38
R39
R40
C23
C22
C21
C24
C25
C26
C27
C28
C29
R27
Q2
R30
C30
R29
R28
C18
IC2
C16
R25
C19
C15
C5
C6
C7
C8
C9
C4
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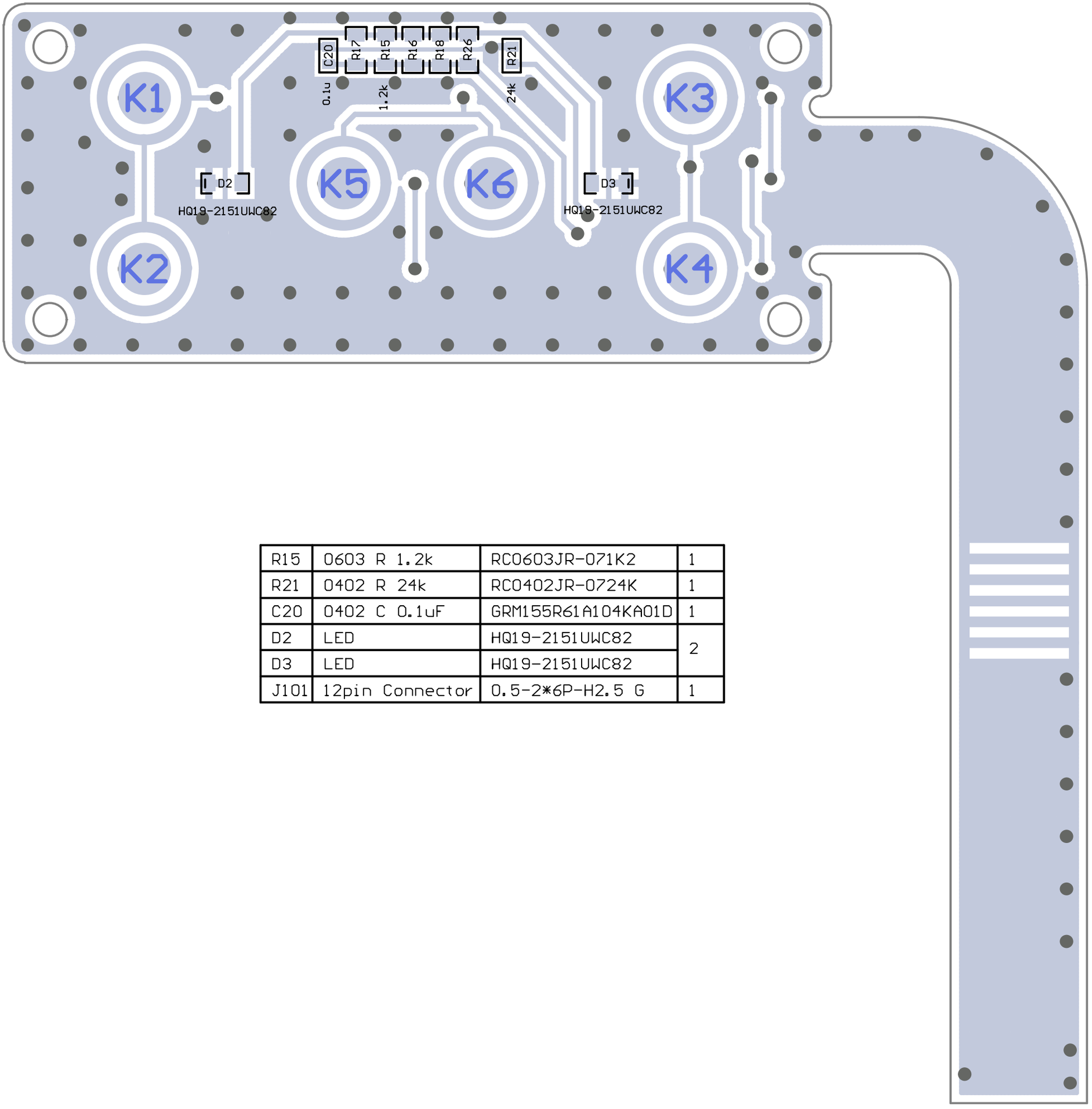
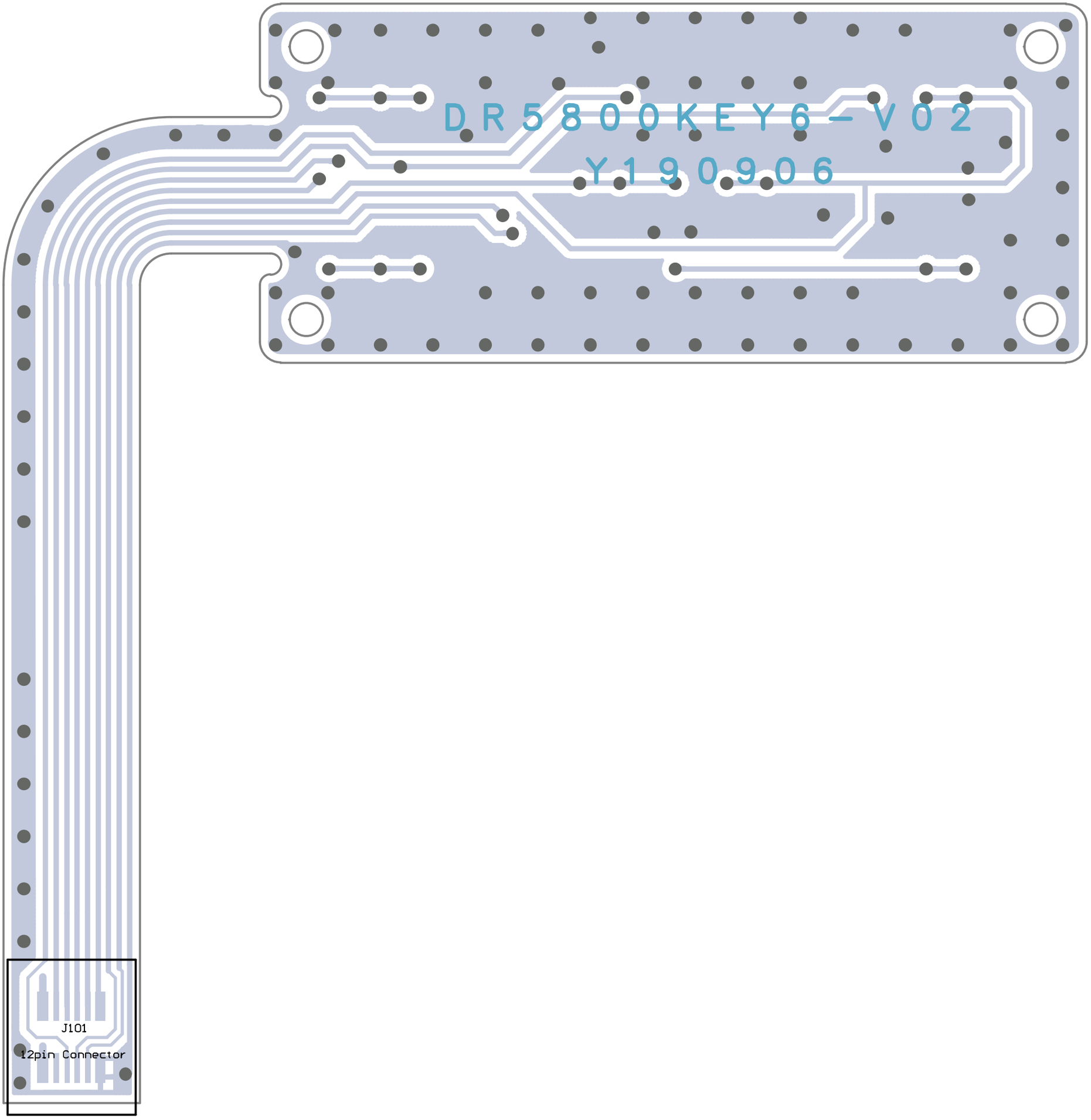
C13
C11
C12



R15	0603 R 1.2k	RC0603JR-071K2	1
R21	0402 R 24k	RC0402JR-0724K	1
C20	0402 C 0.1uF	GRM155R61A104KA01D	1
D2	LED	HQ19-2151UWC82	2
D3	LED	HQ19-2151UWC82	
J101	12pin Connector	0.5-2*6P-H2.5 G	1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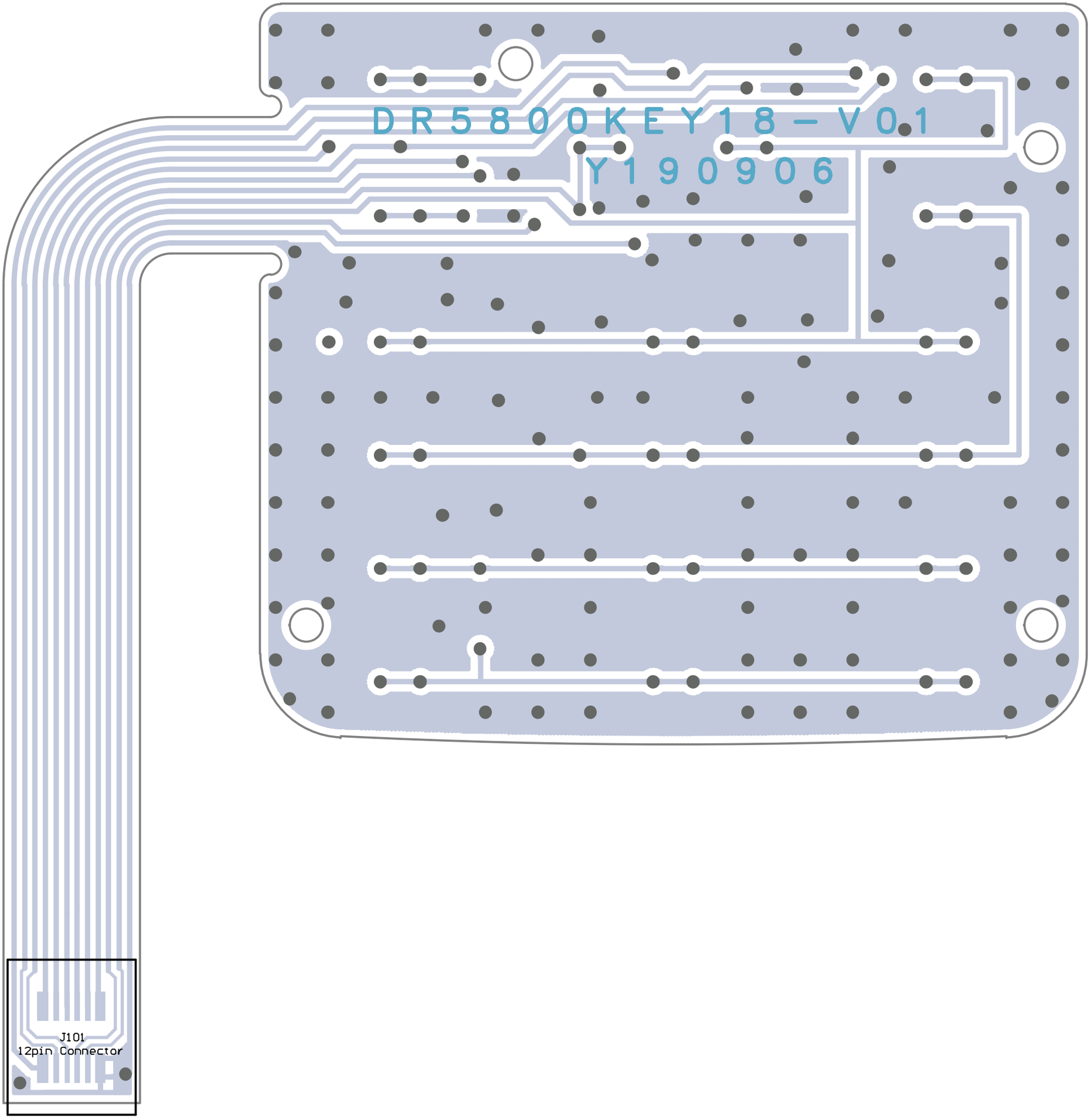
J101
12pin Connector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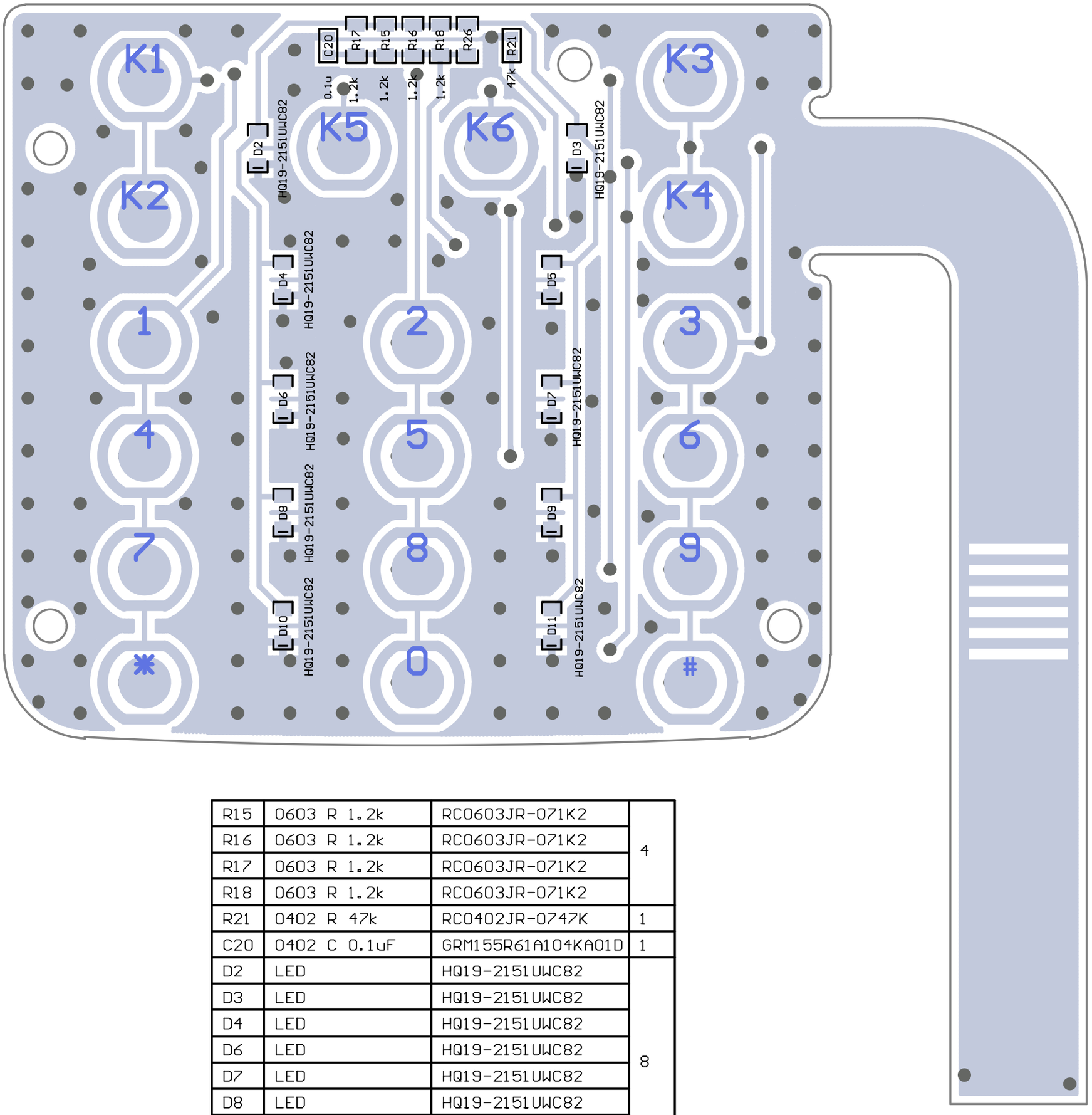
12pin Connector



R15	0603 R 1.2k	RC0603JR-071K2	4
R16	0603 R 1.2k	RC0603JR-071K2	
R17	0603 R 1.2k	RC0603JR-071K2	
R18	0603 R 1.2k	RC0603JR-071K2	
R21	0402 R 47k	RC0402JR-0747K	1
C20	0402 C 0.1uF	GRM155R61A104KA01D	1
D2	LED	HQ19-2151UWC82	8
D3	LED	HQ19-2151UWC82	
D4	LED	HQ19-2151UWC82	
D6	LED	HQ19-2151UWC82	
D7	LED	HQ19-2151UWC82	
D8	LED	HQ19-2151UWC82	
D10	LED	HQ19-2151UWC82	
D11	LED	HQ19-2151UWC82	
J101	12pin Connector	0.5-2*6P-H2.5 G	1

ADJUSTMENT

Required Test Equipment

Table 1

Number	Name	Parameter requirements
1	Computer	Above P2, compatible IBM PC, WINDOWS 98/ME/2000/XPOperating System
2	Programming software	ARD001
3	Programming cable	CPL-04
4	Dubbing cable	CPL-01
5	DC regulator	Output voltage:7.4V, output electric current:≥ 5A
6	RF power meter	Test range: 0.5---10W Frequency range: 100MHz—500MHz Resistance: 50Ω SWR≤1.2
7	Frequency meter	Frequency range: 0.1—600MHz Frequency accuracy: higher than$\pm 1\times 10^{-6}$ Sensitivity: higher than 100mV
8	Frequency deviator	Frequency range: DC—600MHz Test range: 0--±5kHz
9	DMM	Input resistance: above 10MΩ/V DC, capable of measuring voltage, electric current and resistance.
10	Audio signal generator	Frequency range:2---3000Hz Output level: 1---500mV
11	RF power attenuator	Decrement: 40dB or 50dB Receive power : higher than10W
12	Standard signal source	Frequency range:10MHz---1000MHz Output level:0.1uV~32mV (-127dBm~-17dBm)
13	Oscilloscope	Frequency range: DC~20MHz Test range: 10mV~20V
14	Audio Frequency voltmeter	Test range: 10mV~10V
15	communication system analyzer	
16	Digital radio test set	

Recommend how to use: item 6, 7, 8, 10, 11 and 12 which listed in the table can be substituted by integrated tester HP8920/HP8921.

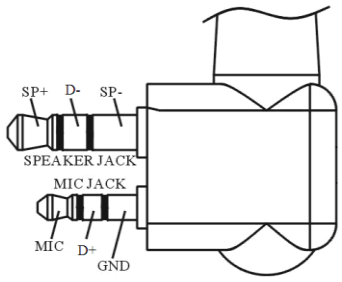


Figure 11 Terminals of Test cable Definition

Adjustment Items

Some detection and adjustment shall be made to the station technical data after changing the components during the maintenance. The debugging introduction of some related circuits goes as follows:

Some parameters of the product can be adjusted ("Interphone Performance Tuning") by use of ARD001 Programming Software of our company.

Steps for adjustment：

a、Enter Computer Test Mode by selecting "Test Mode" in main menu of XXXX Programming Software.

b、Select the items to be adjusted in choice menus, and then adjust the parameters by function keys on the computer keyboard.

c、Exit Computer Test Mode after adjustment.

Table 2 High/ Intermediate/ Low Frequency Point （MHz） of All Models

TEST CH	Freq. 1	Freq. 2	Freq. 3	Freq. 4	Freq. 5
RX	400.05	420.55	440.05	460.55	479.975
TX	400.1	420.6	440.1	460.6	479.9

VCO Adjustment

Close "Power-saving Mode". Set receiving frequency to Freq. 1 (see Table 2) and in the receiving state, test voltage of PD by DMM CV voltage of 0.8-1.5V

Set transmitting frequency to Freq.1 and Freq. 5 (refer to Table 2), press PTT and test voltage of PD by DMM, which shall be within 3.4- 4.2V

PLL frequency calibration

Double-click to enter "Freq. Adjust" in "Interphone Performance Tuning" to achieve the rated transmitting frequency by adjusting the number from 0 to 255 (Error<100Hz).

Transmit Power adjustment

Double-click to enter "Power Adjust" in "Interphone Performance Tuning" to adjust "High" at the five frequency points " **Freq. 1, Freq. 2, Freq. 3, Freq. 4, Freq. 5**" respectively and set transmitting power to 4W-4.5W by adjusting the number from 0 to 255 and observe the operating current (≤1.6A) at the same time.

Double-click to enter "Low" in "Interphone Performance Tuning" to adjust the five frequency points including " **Freq. 1, Freq. 2, Freq. 3, Freq. 4, Freq. 5**" respectively and set transmitting power to 1-1.4W by adjusting the number from 0 to 255.

Transmitting low-voltage alarm

Adjust power voltage to 6.8V and double-click to enter “Transmitting Low Voltage” in “Interphone Performance Tuning” Mode for automatic detection of the software, and then click “Save” for exit after no or little variation in numbers.

Frequency offset adjustment (I &Q)

Input audio signal (12mV, 1000Hz) at MIC jack of interphone. Adjust the number of Analog_ I_Q_ range from 0 to 255 and set frequency offset to 2.1±0.15kHz.

CTCSS frequency offset adjustment

Double-click to enter “QT(67) frequency offset” in “Interphone Performance Tuning” Mode and click “Broadband” to adjust the five frequency points including ” **Freq. 1, Freq. 2, Freq. 3, Freq. 4, Freq. 5**” respectively to 0.75±0.15kHz and then click “Narrowband” to adjust the frequency offset to 0.35±0.15kHz.

Select “QT(254) frequency offset” in “Interphone Performance Tuning” Mode, and the debugging method is the same as that of “QT(670) frequency offset”.

Receiving Sensitivity

Double-click to enter “Receiving Sensitivity” in “Interphone Performance Tuning” Mode to adjust the five frequency points including ” **Freq. 1, Freq. 2, Freq. 3, Freq. 4, Freq. 5**” respectively and the number from 0 to 255 for setting max sensitivity of all points.

Receiver Squelch setting

Double-click to enter “SQL9 open” in “Interphone Performance Tuning” Mode and click “Broadband” to make the frequency of the transmitting signal corresponding to the receiving frequency (level of -116dBm, modulation signal of 1kHz and frequency offset of 3kHz) showed at each frequency point of the software. Enter all points including ” **Freq. 1, Freq. 2, Freq. 3, Freq. 4, Freq. 5**” respectively for automatic adjustment of software and then press next point after no big change to numbers. After that, adjust “Narrowband”, the debugging method is the same as that of “Broadband” except the input modulation signal is changed to frequency of 1kHz and frequency offset of 1.5kHz.

Select “SQL9 open” in “Interphone Performance Tuning” Mode and click “Broadband” to make the frequency of the transmitting signal corresponding to the receiving frequency (level of -118dBm, modulation signal of 1kHz and frequency offset of 1.5kHz) showed at each frequency point of the software. Enter all points including ” **Freq. 1, Freq. 2, Freq. 3, Freq. 4, Freq. 5**” respectively for automatic adjustment of software and then press next point after no big change to numbers. After that, adjust “Narrowband”, the debugging method is the same as that of “Broadband” except the input modulation signal is changed to frequency of 1kHz and frequency offset of 1.5kHz.

Select “SQL1 open” and “SQL1 close” respectively in “Interphone Performance Tuning” Mode, and adjust by the same method except the open level of transmitting signal changed to -120dBm and the close level to -126dBm.

Receiving Low-voltage Alarm

Adjust power voltage to 6.8V and double-click to enter “Receiving Low Voltage” in “Interphone Performance Tuning” Mode for automatic detection of the software, and then click “Save” for exit after no or little variation in numbers.

Table 3 Voltage controlled oscillator

Item	Test condition	Instrumentation	Test point	Requirement	Remarks
Setting	Supply voltage battery terminal:7.4V	DMM	CV		
Locking voltage	CH: Receiving Freq.1 and Freq.5	Digital Voltage multimeter		0.8-1.5V	Observation
	CH: Transmitting Freq.1 and Freq. 5	Digital Voltage multimeter		3.4-4.2	Observation

Table 4 Receiving part

Item	Test condition	Instrumentation	Test point	Correcting member	Requirement	Remarks
Audio Power	Test frequency: Freq 3 Antenna Interface Input: RF OUT : -47dBm(1mV) AF freq : 1kHz MOD DEV : ±1.5kHz Audio load: 16Ω	RF signal generator Oscilloscope Audio frequency voltmeter distortion tester /Integrated tester	Speaker Interface		(Volume knob clockwise to the end) Audio Power>0.3W	Power of the internal speaker :>1.1W
RX Sensitivity	CH: **Freq. 1, Freq. 2, Freq. 3, Freq. 4, Freq. 5** SSG output: -120dBm AF freq : 1kHz MOD DEV : ±1.5kHz				SINAD : 12dB or higher	
RSSI_1	CH :**Freq. 3** SSG output: -115dBm AF freq : 1kHz MOD DEV : ±1.5kHz					Auto tuning “save”
RSSI_4	CH :**Freq. 3** SSG output: -95dBm AF freq : 1kHz MOD DEV : ±1.5kHz					Auto tuning “save”
Open_SQL_9 Open_SQL_1	TEST CH: **Freq. 1, Freq. 2, Freq. 3, Freq. 4, Freq. 5** **Level-9** SSG output :-116dBm			Computer Test Mode	Normal squelch opening after adjustment	
	AF freq : 1kHz MOD DEV : ±1.5kHz **Level-1** SSG output :-124dBm AF freq. : 1kHz MOD DEV : ±1.5kHz				Normal squelch opening after adjustment	

Close_SQL_9 Close_SQL_1	CH: **Freq 1, Freq 2, Freq 3, Freq 4, Freq 5**			Computer Test Mode	Normal squelch opening after adjustment	
	Level-9 SSG output :-118dBm AF freq. : 1kHz MOD DEV : ±1.5kHz					
	Level-1 SSG output :-126dBm AF freq : 1kHz MOD DEV : ±1.5kHz				Normal squelch opening after adjustment	

Table 5 Transmitting part

Item	Test condition	Instrumentation	Test point	Correcting member	Requirement	Remarks
Freq. Adjust	TEST CH: Center	Frequency Counter / Integrated Tester	Antenna	Computer Test Mode	Within ±100Hz	
Power Adjust	Power supply 7.4V TEST CH: **Freq 1, Freq 2, Freq 3, Freq 4, Freq 5**	Power Tester / Integrated Tester Ammeter		Computer Test Mode	High Power Adjust to 4.25W Low Power Adjust to 1.25W	Within ±0.25W
VOX_1 VOX_10	TEST CH: Freq 3 Deviation meter filter LPF:3kHz HPF:OFF PTT: ON				VOX_1 45mV; VOX_10 8mV	Auto tuning (save)
CTCSS_Offset 67.0Hz and _254.1Hz	TEST CH: **Freq 1, Freq 2, Freq 3, Freq 4, Freq 5** Deviation meter filter LPF:3kHz HPF:OFF PTT: ON CTCSS: 67Hz&254.1Hz	Frequency deviator/Integration Tester		Computer Test Mode	Adjust to ±0.35kHz	±150Hz
DCS_Offset	TEST CH: **Freq 1, Freq 2, Freq 3, Freq 4, Freq 5** Deviation meter filter LPF:3kHz HPF:OFF PTT: ON DCS : 023N	Frequency deviator/Integration Tester		Computer Test Mode	Adjust to ±0.35kHz	±150Hz
Analog_I_Q_Range	TEST CH: **Freq 1, Freq 2, Freq 3, Freq 4, Freq 5** Deviation meter filter LPF:3kHz HPF:OFF PTT: ON	Frequency deviator/Integration Tester			Adjust to ±2.1kHz	±200Hz

Modulation Sensitivity	CH：Transmitting Center Frequency Point AG：1kHz/11mV				Check Frequency Offset 1.1kHz~1.8kHz	
Tone_Offset	TEST CH: **Freq 1, Freq 2, Freq 3, Freq 4, Freq 5** Deviation meter filter LPF:15kHz HPF:OFF PTT: ON	Frequency deviator/Integration Tester		Computer Test Mode	Adjust to 1.7kHz	±100Hz
DTMF_Offset	TEST CH: **Freq 1, Freq 2, Freq 3, Freq 4, Freq 5** Deviation meter filter LPF:15kHz HPF:OFF PTT: ON	Frequency deviator /Integration Tester		Computer Test Mode	Adjust to 1.6kHz	±100Hz
MSK_Offset	TEST CH: **Freq 1, Freq 2, Freq 3, Freq 4, Freq 5** Deviation meter filter LPF:15kHz HPF:OFF PTT: ON	Frequency deviator /Integration Tester		Computer Test Mode	Adjust to 1.6kHz	±100Hz
Digital_I_Q_Range	TEST CH: **Freq 1, Freq 2, Freq 3, Freq 4, Freq 5** Deviation meter filter LPF:15kHz HPF:OFF PTT: ON High power	Vector signal analyzer/		Computer Test Mode	Adjust to 1.5kHz	±50Hz
FSK Error rate	TEST CH: **Freq. 1;Freq. 3; Freq. 5** Deviation meter filter LPF:15kHz HPF:OFF PTT: ON	Digital radio test set			BER 3.4%	
Value Error rate	TEST CH: **Freq. 1;Freq. 3; Freq. 5** Deviation meter filter LPF:15kHz HPF:OFF PTT: ON	Digital radio test set			<1%	

PART LIST

DR5800-2 PARTS LIST					file No.:TP-DR5800-2 Ver.:02A
No.	Parts No.	Description	Component Name /Specification	Qty.	Ref. No.
1					

2		**DR5800-2 portable two-way radio**			
3		DR5800-2 PCBA		1	
4		DR5800 STRUCTURE PARTS		1	
5					
6		DR5800-2 PCBA			
7					
8		CHIP R			
9	1090400050001	0402 CHIP R 0Ω	RC0402JR-070R	20	R147 R911 R973 C19 C225 C322 L210 R5 R7 R13 R112 R140 R337 R407 R411 R412 R665 R670 R966 R972
10	1090410050001	0402 CHIP R 10Ω	RC0402JR-0710R	1	R635
11	1090422050001	0402 CHIP R 22Ω	RC0402JR-0722R	2	R536 R537
12	1090447050001	0402 CHIP R 47Ω	RC0402JR-0747R	1	R212
13	1090456050001	0402 CHIP R 56Ω	RC0402JR-0756R	1	R10
14	1090410150001	0402 CHIP R 100Ω	RC0402JR-07100R	8	R14 R26 R36 R215 R639 R640 R641 R642
15	1090418150001	0402 CHIP R 180Ω	RC0402JR-07180R	1	R27
16	1090422150001	0402 CHIP R 220Ω	RC0402JR-07220R	2	R210 R211
17	1090427150001	0402 CHIP R 270Ω	RC0402JR-07270R	3	R662 R663 R666
18	1090433150001	0402 CHIP R 330Ω	RC0402JR-07330R	1	R108
19	1090439150001	0402 CHIP R 390Ω	RC0402JR-07390R	1	R9
20	1090456150001	0402 CHIP R 560Ω	RC0402JR-07560R	3	R20 R676 R677
21	1090410250001	0402 CHIP R 1kΩ	RC0402JR-071K	18	R222 R234 R235 R236 R237 R238 R418 R419 R420 R535 R638 R660 R661 R673 R618 R630 R633 R648
22	1090412250001	0402 CHIP R 1.2kΩ	RC0402JR-071K2	2	R4 R117
23	1090415250001	0402 CHIP R 1.5kΩ	RC0402JR-071K5	2	R226 R331
24	1090418250001	0402 CHIP R 1.8kΩ	RC0402JR-071K8	2	R534 R969
25	1090422250001	0402 CHIP R 2.2kΩ	RC0402JR-072K2	3	R201 R623 R667
26	1090427250001	0402 CHIP R 2.7kΩ	RC0402JR-072K7	1	R209
27	1090433250001	0402 CHIP R 3.3kΩ	RC0402JR-073K3	8	R100 R103 R105 R106 R203 R204 R303 R958
28	1090439250001	0402 CHIP R 3.9kΩ	RC0402JR-073K9	1	R669
29	1090447250001	0402 CHIP R 4.7kΩ	RC0402JR-074K7	15	R32 R118 R126 R404 R405 R619 R643 R652 R671 R672 R708 R709

					R125 R909 C718
30	1090456250001	0402 CHIP R 5.6kΩ	RC0402JR-075K6	8	R29 R101 R301 R302 R324 R326 R910 R914
31	1090468250001	0402 CHIP R 6.8kΩ	RC0402JR-076K8	1	R28
32	1090482250001	0402 CHIP R 8.2kΩ	RC0402JR-078K2	3	R339 R410 R426
33	1090410350001	0402 CHIP R 10kΩ	RC0402JR-0710K	22	R15 R214 R308 R327 R342 R609 R611 R621 R625 R634 R636 R637 R650 R658 R659 R698 R616 R617 R632 R682 R913 R920
34	1090412350001	0402 CHIP R 12kΩ	RC0402JR-0712K	1	R312
35	1090415350001	0402 CHIP R 15kΩ	RC0402JR-0715K	3	R689 R693 R955
36	1090418350001	0402 CHIP R 18kΩ	RC0402JR-0718K	2	R305 R919
37	1090422350001	0402 CHIP R 22kΩ	RC0402JR-0722K	5	R321 R620 R649 R690 R692
38	1090424350001	0402 CHIP R 24kΩ	RC0402JR-0724K	1	R680
39	1090427350001	0402 CHIP R 27kΩ	RC0402JR-0727K	1	R345
40	1090430350001	0402 CHIP R 30kΩ	RC0402JR-0730K	2	R311 R688
41	1090439350001	0402 CHIP R 39kΩ	RC0402JR-0739K	3	R313 R644 R915
42	1090447350001	0402 CHIP R 47kΩ	RC0402JR-0747K	19	R22 R107 R205 R320 R330 R421 R422 R423 R424 R425 R427 R428 R624 R627 R651 R675 R679 R917 R921
43	1090456350001	0402 CHIP R 56kΩ	RC0402JR-0756K	2	R240 R622
44	1090468350001	0402 CHIP R 68kΩ	RC0402JR-0768K	2	R141 R602
45	1090482350001	0402 CHIP R 82kΩ	RC0402JR-0782K	1	R918
46	1090491350001	0402 CHIP R 91kΩ	RC0402JR-0791K	4	R300 R307 R603 R604
47	1090410450001	0402 CHIP R 100kΩ	RC0402JR-07100K	18	R21 R221 R239 R318 R323 R325 R341 R401 R606 R607 R608 R626 R629 R645 R653 R683 R631 R647
48	1090412450001	0402 CHIP R 120kΩ	RC0402JR-07120K	5	R16 R19 R30 R216 R340
49	1090415420001	0402 CHIP R 150kΩ	RC0402DR-07150K	6	R133 R134 R135 R136 R137 R138
50	1090418450001	0402 CHIP R 180kΩ	RC0402JR-07180K	2	R145 R306
51	1090420450001	0402 CHIP R 200kΩ	RC0402JR-07200K	1	R628
52	1090422450001	0402 CHIP R 220kΩ	RC0402JR-07220K	4	R142 R207 R322 R413
53	1090424450001	0402 CHIP R 240kΩ	RC0402JR-07240K	1	R18
54	1090427450001	0402 CHIP R 270kΩ	RC0402JR-07270K	3	R316 R317 R506

55	1090433450001	0402 CHIP R 330kΩ	RC0402JR-07330K	1	R8
56	1090439450001	0402 CHIP R 390kΩ	RC0402JR-07390K	1	R315
57	1090447450001	0402 CHIP R 470kΩ	RC0402JR-07470K	5	R202 R309 R314 R333 R674
58	1090456450001	0402 CHIP R 560kΩ	RC0402JR-07560K	2	R406 R646
59	1090468450001	0402 CHIP R 680kΩ	RC0402JR-07680K	3	R208 R912 R922
60	1090482450001	0402 CHIP R 820kΩ	RC0402JR-07820K	1	R610
61	1090410550001	0402 CHIP R 1MΩ	RC0402JR-071M0	7	R213 R219 R228 R230 R231 R304 R950
62	1090418550001	0402 CHIP R 1.8MΩ	RC0402JR-071M8	1	R206
63					
64	1090600050001	0603 CHIP R 0Ω	RC0603JR-070R	2	L108 R120
65	109064R750001	0603 CHIP R 4.7Ω	RC0603JR-074R7	2	R332 R959
66	1090610050001	0603 CHIP R 10Ω	RC0603JR-0710R	4	R104 R115 R334 R417
67	1090622050001	0603 CHIP R 22Ω	RC0603JR-0722R	2	R109 R218
68	1090647050001	0603 CHIP R 47Ω	RC0603JR-0747R	2	R128 R220
69	1090610150001	0603 CHIP R 100Ω	RC0603JR-07100R	3	R31 R144 R403
70	1090615150001	0603 CHIP R 150Ω	RC0603JR-07150R	1	R121
71	1090622150001	0603 CHIP R 220Ω	RC0603JR-07220R	1	R402
72	1090627150001	0603 CHIP R 270Ω	RC0603JR-07270R	3	R102 R139 R154
73	1090668350001	0603 CHIP R 68kΩ	RC0603JR-0768K	1	R962
74	1090610450001	0603 CHIP R 100kΩ	RC0603JR-07100K	1	R601
75					
76	1090700050001	0805 CHIP R 0Ω	RC0805JR-070R	1	R127
77	109074R750001	0805 CHIP R 4.7Ω	RC0805JR-074R7	1	R360
78					
79	10910R3950001	1206 CHIP R 0.39Ω	RC1206JR-07R39	3	R130 R131 R132
80					
81	1240447150041	Resistor Pack 470Ω	YC124JR-07470RL	1	RP1
82					
83		CHIP C			
84	112043P500091	0402 CHIP C 0.5pF	GRM1555C1HR50BZ01D	1	C40
85	1120431P00091	0402 CHIP C 1pF	GRM1555C1H1R0BZ01D	6	C135 C151 C154 C170 C226 C238
86	1120431P50091	0402 CHIP C 1.5pF	GRM1555C1H1R5BZ01D	1	C149
87	1120432P00091	0402 CHIP C 2pF	GRM1555C1H2R0BZ01D	5	C36 C233 C951 C144 C155
88	1120433P00091	0402 CHIP C 3pF	GRM1555C1H3R0BZ01D	6	C29 C54 C234 C239 C136 C147
89	1120434P00091	0402 CHIP C 4pF	GRM1555C1H4R0BZ01D	3	C142 C153 C227
90	1120435P00091	0402 CHIP C 5pF	GRM1555C1H5R0BZ01D	5	C49 C229 C240 C242 C140

91	1120436P00091	0402 CHIP C 6pF	GRM1555C1H6R0BZ01D	7	C53 C60 C105 C150 C222 C679 C680
92	1120437P00091	0402 CHIP C 7pF	GRM1555C1H7R0BZ01D	1	C108
93	1120438P00091	0402 CHIP C 8pF	GRM1555C1H8R0BZ01D	1	C47
94	1120439P00091	0402 CHIP C 9pF	GRM1555C1H9R0BZ01D	1	C235
95	1120431005091	0402 CHIP C 10pF	GRM1555C1H100JZ01D	5	C35 C219 C683 C684 C728
96	1120431305091	0402 CHIP C 13pF	GRM1555C1H130JZ01D	1	C41
97	1120431805091	0402 CHIP C 18pF	GRM1555C1H180JZ01D	3	C44 C111 C130
98	1120432005091	0402 CHIP C 20pF	GRM1555C1H200JZ01D	1	C688
99	1120432205091	0402 CHIP C 22pF	GRM1555C1H220JZ01D	3	C65 C100 C215
100	1120432405091	0402 CHIP C 24pF	GRM1555C1H240JZ01D	5	C252 C255 C259 C947 C948
101	1120433305091	0402 CHIP C 33pF	GRM1555C1H330JZ01D	11	C16 C212 C429 C435 C436 C437 C438 C439 C440 C441 C443
102	1120433905091	0402 CHIP C 39pF	GRM1555C1H390JZ01D	3	C28 C118 C138
103	1120434705091	0402 CHIP C 47pF	GRM1555C1H470JZ01D	1	C738
104	1120435605091	0402 CHIP C 56pF	GRM1555C1H560JZ01D	3	C45 C202 C338
105	1120436805091	0402 CHIP C 68pF	GRM1555C1H680JZ01D	1	C145
106	1120438205091	0402 CHIP C 82pF	GRM1555C1H820JZ01D	2	C26 C51
107	1120431015091	0402 CHIP C 100pF	GRM1555C1H101JZ01D	11	C62 C63 C134 C672 C673 C674 C675 C678 C729 C730 C910
108	1120431215091	0402 CHIP C 120pF	GRM1555C1H121JZ01D	1	C689
109	1120432216091	0402 CHIP C 220pF	GRM155R71H221KA01D	7	C46 C59 C205 C206 C531 C533 C652
110	1120433316091	0402 CHIP C 330pF	GRM155R71H331KA01D	1	C119
111	1120434716091	0402 CHIP C 470pF	GRM155R71H471KA01D	54	C25 C52 C55 C61 C101 C102 C103 C106 C107 C114 C120 C121 C125 C129 C139 C141 C143 C157 C203 C218 C224 C228 C231 C232 C236 C237 C253 C254 C257 C402 C403 C405 C406 C432 C434 C528 C532 C604 C606 C607 C624 C664 C667 C670 C676 C709 C715 C731 C739 C924 C938 C950 C957 C958
112	1120431026091	0402 CHIP C 1000pF	GRM155R71H102KA01D	11	C209 C314 C642 C647

					C682 C717 C726 C932 C637 C912 C916
113	1120431526091	0402 CHIP C 1500pF	GRM155R71H152KA01D	2	C761 C764
114	1120431826091	0402 CHIP C 1800pF	GRM155R71H182KA01D	2	C762 C763
115	1120432226091	0402 CHIP C 2200pF	GRM155R71H222KA01D	4	C732 C733 C734 C735
116	1120433326091	0402 CHIP C 3300pF	GRM155R71H332KA01D	3	C611 C685 C690
117	1120433926091	0402 CHIP C 3900pF	GRM155R71H392KA01D	1	C444
118	1120434726091	0402 CHIP C 4700pF	GRM155R71H472KA01D	2	C204 C725
119	1120435626091	0402 CHIP C 5600pF	GRM155R71H562KA01D	1	C308
120	1120436826091	0402 CHIP C 6800pF	GRM155R71H682KA01D	1	C309
121	1120438226091	0402 CHIP C 8200pF	GRM155R71H822KA01D	1	C300
122	1120431036071	0402 CHIP C 0.01μF	GRM155R71E103KA01D	37	C10 C20 C37 C43 C123 C128 C201 C214 C217 C220 C221 C305 C306 C312 C316 C330 C334 C336 C418 C420 C421 C422 C648 C651 C654 C705 C719 C768 C936 C937 C939 C961 C962 C963 C633 C636 C919
123	1120431836071	0402 CHIP C 0.018μF	GRM155R71E183KA01D	2	C301 C445
124	1120432236071	0402 CHIP C 0.022μF	GRM155R71E223KA12D	2	C622 C625
125	1120433336051	0402 CHIP C 0.033μF	GRM155R71C333KA01D	4	C112 C318 C320 C321
126	1120434736051	0402 CHIP C 0.047μF	GRM155R71C473KA01D	2	C319 C677
127	1120431046031	0402 CHIP C 0.1μF	GRM155R61A104KA01D	55	C50 C104 C116 C131 C156 C210 C211 C213 C256 C302 C303 C327 C331 C333 C335 C404 C412 C413 C415 C525 C615 C641 C644 C645 C649 C659 C662 C668 C669 C671 C681 C686 C696 C697 C698 C706 C707 C710 C711 C712 C714 C724 C727 C741 C747 C765 C918 C626 C630 C631 C635 C638 C911 C914 C915
128	1120432246031	0402 CHIP C 0.22μF	GRM155R61A224KA01D	4	C31 C96 C97 C208
129	1120431056031	0402 CHIP C 1μF	GRM155R61A105KE15D	31	C24 C64 C98 C99 C207 C310 C313 C346 C431 C446 C505 C612 C616 C620 C621 C623 C650

					C661 C663 C687 C693 C703 C704 C708 C716 C736 C737 C751 C760 C923 C949
130					
131	1120634716091	0603 CHIP C 470pF	GRM188R71H471KA01D	1	L213
132	1120634746051	0603 CHIP C 0.47μF	GRM188R71C474KA01D	1	C931
133	1120631056051	0603 CHIP C 1μF	GRM188R61C105KA01D	2	C126 C969
134	1120632256031	0603 CHIP C 2.2μF	GRM188R61A225KA01D	4	C656 C657 C658 C660
135					
136	1120731066031	0805 CHIP C 10μF	GRM21BR61A106K	21	C56 C304 C307 C332 C527 C913 C917 C956 C970 C200 C343 C344 C345 C614 C632 C634 C665 C666 C695 C699 C700
137	1120732267031	0805 CHIP C 22μF	GRM21BR61A226M	3	C653 C655 C713
138	1120721047081	CHIP-TAN C 0.1μF P	TC211P104M035A	1	C18
139	1120721057051	CHIP-TAN C 1μF P	TEESVP1C105M8R	1	C15
140	1121021066051	CHIP-TAN C 10μF A	TEESVA1C106K8R	3	C643 C646 C964
141	1121234767031	1206 CHIP C 47μF	GRM31CR61A476M15L	2	C337 C339
142					
143		INDUCTOR			
144	1170460100001	0402 FERRITE INDUCTOR	GZ1005U601CTF	1	L604
145	1170660100001	FERRITE INDUCTOR	BLM18AG601S	13	L7 L10 L19 L206 L500 L601 L605 L606 L609 L612 L613 L616 L904
146	1170722100001	FERRITE INDUCTOR	BLM21PG221S	4	L104 L105 L501 L502
147	1170760000001	FERRITE INDUCTOR	BLM21PG600S	1	L107
148	1140618N28001	0603SMALL FIXED INDUCTOR 8.2nH	MLG1608B8N2S(or SDCL1608C8N2JTDF)	1	L119
149	1140711005001	0805 SMALL FIXED INDUCTOR 10nH	MGTC0805CW100JST	1	L14
150	1140611805001	SMALL FIXED INDUCTOR 18nH	MLG1608B18NJ(or SDCL1608C18NJTDF)	4	L6 L11 L101 L607
151	1140612205001	SMALL FIXED INDUCTOR 22nH	MLG1608B22NJ(or SDCL1608C22NJTDF)	4	L21 L100 L202 L212
152	1140712705001	SMALL FIXED INDUCTOR 27nH	C2012C27NJ(or SDWL2012C27NJSTF)	5	L203 L204 L208 L209 L214
153	1140611015001	0603 SMALL FIXED INDUCTOR 100nH	MLG1608BR10J(or SDCL1608CR10JTDF)	1	L17

154	1140712215001	SMALL FIXED INDUCTOR 220nH	C2012CR22J(or SDWL2012CR22JSTF)	1	L109
155	1140612215001	SMALL FIXED INDUCTOR 220nH	MLG1608SR22J(or SDCL1608CR22JTDF)	2	L5 L207
156	1140713315001	SMALL FIXED INDUCTOR 330nH	C2012CR33J(or SDWL2012CR33JSTF)	1	L200
157	1140614715001	0603 SMALL FIXED INDUCTOR 470nH	MLG1608SR47JT000(or SDCL1608CR47JTDF)	4	L9 L901 L902 L903
158	1140715615001	SMALL FIXED INDUCTOR 560nH	C2012CR56J(or SDWL2012CR56JSTF)	1	L201
159	1140623326001	SMALL FIXED INDUCTOR 3.3μH	MLF1608A3R3KT(or SDFL1608Q3R3KTF)	1	L608
160	1142024737001	47μH SMALL FIXED INDUCTOR	SWPA3012S470MT	1	L603
161	1152R351R6041	AIR-CORE COIL 4T	E20.35*1.6*4TR	4	L110 L112 L113 L114
162	1152R351R6081	AIR-CORE COIL 8T	ER0.35×1.6×8	1	L106
163					
164		DIOED			
165	1030000137201	DIOED	1SS372	1	D603
166	1030000013101	DIOED	BA592	1	D101
167	1030000140001	DIOED	1SS400SM	4	D6 D604 D605 D606
168	1030000139001	DIOED	1SS390TE61	4	D100 D102 D103 D200
169	1030019213201	LED(RED)	HT19-2132SURC-HHH	1	D400
170	1030019213202	LED(GREEN)	HQ19-2132SYGC	2	D401 D402
171	1030000132301	VARIABLE CAPACITANCE DIOED	1SV323	4	D2 D4 D907 D908
172	1030000127801	VARIABLE CAPACITANCE DIOED	1SV278	1	D5
173	1030000130501	VARIABLE CAPACITANCE DIOED	1SV305	5	D201 D202 D203 D206 D905
174	1031544002501	DIOED	1SR154-400TE25	1	D502
175					
176					
177		TRANSISTOR & FET			
178	1040002136201	TRANSISTOR	2SA1362-GR	1	Q305
179	1040002461701	TRANSISTOR	2SC4617(S)	2	Q8 Q300
180	1040002506601	TRANSISTOR	2SC5066-Y	5	Q1 Q2 Q6 Q100 Q101
181	1040002335601	TRANSISTOR	2SC3356 (R25)	1	Q4
182	1040000014301	TRANSISTOR	DTA143ZETL	1	Q902
183	1040000011401	TRANSISTOR	DTC114EE-TL	2	Q400 Q401

184	1040000014402	TRANSISTOR	DTC144EE-TL	4	Q304 Q306 Q607 Q903
185	1040000000401	TRANSISTOR	UMC4 N TR	4	Q108 Q601 Q604 Q610
186	1040000071701	TRANSISTOR	FMMT717	1	Q606
187	1040002408001	TRANSISTOR	KTC4080	1	Q201
188	1050002182401	FET	2SK1824(or 2SK3019)	1	Q109
189	1050000340001	FET	ST3400SRG	1	Q307
190	1050000001201	FET	RD01MUS2-T113	1	Q105
191	1050000004601	FET	RFM04U6P	1	Q107
192	1050000050601	FET	BB506C	2	Q202 Q203
193	1050000006201	FET	EM6M2	2	Q613 Q614
194		**IC**			
195	1020620950891	LDO	ME6209A50PG/SOT-89	1	IC603
196	1020620433201	LDO	XC6204B332MR	2	IC201 IC618
197	1020000235901	DC/DC	MP2359DJ	1	IC605
198	1020000256401	FLASH IC	W25Q64FVSIG	1	IC402
199	1020000256401	FLASH IC	W25Q128FVSIG	1	IC401
200	1020000290201	OPERATIONAL AMPLIFIER	NJM2902V	1	IC300
201	1020000290401	OPERATIONAL AMPLIFIER	NJM2904V	3	IC100 IC608 IC301
202	1020000750101	OPERATIONAL AMPLIFIER	TA75W01FU	2	IC601 IC901
203	1020000282201	AF PA IC	TDA2822D	1	IC302
204	1020000300001	WATCHDOG IC	HR_V3000S	1	IC611
205	1020000700001	BASE BAND PROCESSOR IC	HR_C7000	1	IC500
206	1020000236501	FM IF DEMODULATOR IC	AK2365A	1	IC200
207	1020000159001	PLL IC	AK1590	1	IC607
208	1020000912401	RESET IC	PST9124NR	1	IC615
209	1020003105701	man down IC	KXTJ3-1057	1	IC620
210		**OTHERS**			
211	1221024000001	CHIP CRYSTAL RESONATOR	DSB221SDAN (24MHz/3.3V)	1	X602
212	1221016800001	VC-TCXO	DSA321SDM (16.8MHz)	1	X601
213	1080000499501	CRYSTAL FILTER	DSF753SDF(49.95MHz 5*7) (D49910GQ11)	1	XF201
214	1060000001001	TACT SWITCH	SKRTLAE010	1	S404
215	1110206303201	FUSE	F0603HI3000V032T (or S0603-S-3.0A)	1	F500
216	1010580200102	DR5800-2 PCB	DR5800-2V02.PCB	1	
217		2 PIN power socket		1	J502

218	1230002401001	24PIN BTB connector male socket	single groove 0.5-2*12P-H2.5 male	1	J100
219	2040CU500001A				
220		**DR5800-2 PCBA with structure parts**			
221	1212602762201	MIC ELEMENT	PF0-6027P-62±2dB	1	MIC500
222	1102210300002	POWER SWITCH	RP08110SNAX-V02-0030	1	VR401
223	1061001010001	ROTARY SWITCH(300 °)	RE1001BA-V01-0001	1	S401
224	1061031810163	ROTARY SWITCH(360 °)	ED103180-FB15S7.0-A16-1011	1	S401
225	1230525200801	SOCKET(φ2.5)	PJ-D2008K	1	J501
226	1230535302702	SOCKET(φ3.5)	PJ-D3027D	1	J500
227	1010600200202	CU600 KEY PCB	CU600pttV03.PCB	1	
228	2030CU600003A	SMA RF socket		1	
229	2040CU600002A	CU600 PTT metal dome plate		1	
230	1211361601501	φ36 16Ω 1.5W speaker	QP36M16-37-R+W	1	with wires
231					
232	6025800lcd002	DR5800_LCD PCBA	DR5800lcd-V02 PCBA	1	
233	6025800key181	DR5800key18-V01 PCBA	DR5800key18-V01 PCBA	1	
234	6025800key062	DR5800key6-V02 PCBA	DR5800key6-V02 PCBA	1	

DR5800key18 PCBA PARTS LIST

No.	Parts No.	Description	Component Name /Specification	Qty.	Ref. No.
1	1090447350001	0402 CHIP R 47kΩ	RC0402JR-0747K	1	R21
2	1090612250001	0603 CHIP R 1.2kΩ	RC0603JR-071K2	4	R15 R16 R17 R18
3	1120431046031	0402 CHIP C 0.1μF	GRM155R61A104KA01D	1	C20
4	1030019215101	LED(white)	HQ19-2151UWC82	8	D2 D3 D4 D5 D6 D7 D8 D10 D11
5	123000526251	12PIN BTB connector male socket	single groove 0.5-2*6P-H2.5 male socket	1	J101
6	1010580001801	DR5800key18-V01.pcb	DR5800key18-V01.pcb	1	

DR5800key6-V02 PCBA PARTS LIST

No.	Parts No.	Description	Component Name /Specification	Qty.	Ref. No.
1	1090447350001	0402 CHIP R 24kΩ	RC0402JR-0724K	1	R21
2	1090612250001	0603 CHIP R 1.2kΩ	RC0603JR-071K2	1	R15
3	1120431046031	0402 CHIP C 0.1μF	GRM155R61A104KA01D	1	C20
4	1030019215101	LED(white)	HQ19-2151UWC82	2	D2 D3
5	123000526251	12PIN BTB connector male socket	single groove 0.5-2*6P-H2.5 male socket	1	J101
6	1010580000601	FPC2	DR5800key6-V02.pcb	1	

DR5800LCD PCBA PARTS LIST

No.	Parts No.	Description	Component Name /Specification	Qty.	Ref. No.
1		**DR5800 LCD PCBA**			
2					
3	1010580020201	DR5800lcd PCB	DR5800lcd-V02.PCB	1	
4					
5	1090400050001	0402 CHIP R 0Ω	RC0402JR-070R	1	R1
6	1090410250001	0402 CHIP R 1kΩ	RC0402JR-071K	14	R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13 R14 R20
7	1090410350001	0402 CHIP R 10kΩ	RC0402JR-0710K	1	R24
8	1090447350001	0402 CHIP R 47kΩ	RC0402JR-0747K	10	R31 R32 R33 R34 R35 R36 R37 R38 R39 R40
9	1090447450001	0402 CHIP R 470kΩ	RC0402JR-07470K	1	R25
10	1090618150001	0603 CHIP R 180Ω	RC0603JR-07180R	2	R19 R22
11	1120433305091	0402 CHIP C 33pF	GRM1555C1H330JZ01D	9	C21 C22 C23 C24 C25 C26 C27 C28 C29
12	1120434716091	0402 CHIP C 470pF	GRM155R71H471KA01D	4	C11 C16 C17 C30
13	1120431036071	0402 CHIP C 0.01μF	GRM155R71E103KA01D	3	C12 C15 C19
14	1120631046091	0603 CHIP C 0.1μF	GRM188R71H104KA01D	3	C3 C4 C10
15	1120631056051	0603 CHIP C 1μF	GRM188R61C105KA01D	7	C1 C5 C6 C7 C8 C9 C14
16	1120731066031	0805 CHIP C 10μF	GRM21BR61A106K	2	C13 C18
17	1020620450201	LDO	XC6204B502MR	1	IC2
18	1020620130201	LDO	XC6201P302MR	1	IC1
19	1230001801001	18PIN FPC socket	0.5-18P-H=2.0	1	J1

20	1230002401002	24PIN BTB connector female socket	single groove 0.5-2*12P-H2.5	1	J3
21	1230001201002	12PIN BTB connector female socket	single groove 0.5-2*6P-H2.5	1	J102
22		**DR5800 LCD others parts**			
23	1070580000001	DR5800 LCD module	WK13232PH09-GFFG-Y	1	
24	1212602762201	Micphone	PF0-6027P-62±2dB	1	MIC2

DR5810 STRUCTURE PARTS LIST

No.	Parts No.	Description	Component Name /Specification	Qty.	Ref. No.
		DR5810 Structure BOM			
1	201-DR5810-001A	DR5810 radio front cabinet	black PC1414 (61.72X103.9X31.5)	1	
2	201-002320-008X	DR5100 Accessory connector cover	Black TPU 85D	1	
3	203-002320-001X	DR5100 Axis of Ear phone cover	stainless steel Φ1.5X34mm	1	
4	201-002320-010X	DR5100 light-guider	Clear PC	1	
5	202-0CU600-003X	CU600 alarm silicon key	orange 60A 50% high spring silicon	1	
6	204-0CU600-003A	DR5100 air filter nylon weave	32.68*30.21*0.1	1	
7	121-136160-1001	SPEAKER	φ36 16Ω 1W	1	
8	202-0CU600-001A	CU600 PTT silicon key	black 60A 50% high spring silicon	1	
9	201-0CU600-002X	PTT cover Plastic	black PC+ABS 2950	1	
10	201-0CU600-004A	CU600 ear phone cabinet	PC+ABS 2950	1	
11	202-0CU500-004A	switch washer Φ5X1.5	60A 50% high spring silicon	2	
12	304-060250-001A	Volume screw M6X0.75X2.5	special shape brass	1	

13	201-DR5000-006X	DR5100 volume knob	Black PC1414	1	
14	304-070250-001A	Encoder screw M7X0.75X2.5	special shape brass	1	
15	201-DR5000-007X	DR5100 encoder knob	Black PC1414	1	
16	710-0500240471	CU500-2 standard configuration antenna	400-470MHz	1	
17	202-0CU500-001A	CU500 cabinet waterproof ring	orange 40A 50% high spring silicon	1	
18	203-0CU600-003A	SMA RF socket		1	
19	202-0CU500-003A	RF socket washer Φ7X1.5	60A 50% high spring silicon	1	
20	201-0CU600-005A	CU600 radio top cover	black PC+ABS 2950	1	
21	202-0CU500-002A	CU500 power socket washer	60A 50% high spring silicon	1	
22	711-0CLP02-001	CLP-02 clip		1	
23	7060CB01A001	CB-01A Li-ion battery	1700mAh	1	
24	203-0CU500-001A	CU500 AL chassis	polishing ADC 12	1	
25	1010600200202	CU600 KEY PCB	CU600pttV03.PCB	1	
	2040CU600002X	CU600 PTT metal dome plate		1	
26	204-0CU600-005A	silica pad for heat dissipation		1	
27		DR5810-2 main PCBA		1	
28	1212602762201	MIC ELEMENT	PF0-6027P-62±2dB	1	
29	202-0CU780-002A	CU780 mic waterproof washer	60A 50% high spring silicon	1	
30	107-058100-0002	DR5810LCD module		1	
31	204-0CU600-004A	Mic waterproof net	Φ7.0-Φ4.5X0.2	1	
32	204-DR5810-003A	DR5810 connector foam		1	

33	2010CU600009X	CU600 battery locker	black PC+ABS 2950	1	
34	2030CU600004X	Spring Φ2.3X10.5	Φ0.25 spring steel Ni-plate	2	
35	1010580001801	DR5800KEY18-V01 PCBA		1	
36	204-DR5810-001A	DR5810 Keys metal dome plate	18PCS the ellipse 4*3.05	1	
37	202-DR5810-001A	DR5810 Keyboard		1	
A		BM2.5X6.0		2	
B		BM2.0X4.0		10	
C		KM2.0X3		4	
D		M2.0X4		5	
E		PM2.0X8.0		2	

CP-02 CHARGER

General Description:

Function: intelligent rapid charging

Applicable battery: CB-01A (1700mAh, 7.4V Li-ion battery)

Battery type identification: External

Input power supply: DC12±0.5V, 500mA, ripples <500mV

Technical Specifications

Current: 500±100mA

Max. charging time : 300 minutes

Max. Battery temperature: +55℃

Specified voltage of charged battery:

Nickel-hydrogen battery: recovery the battery when the voltage < 3.7V; pre-charging when the voltage < 6.4±0.1V, when the battery voltage reaches 6.4±0.1V, the charging turns to rapid charging. When the battery voltage reaches 8.35V, the battery will be deemed as full and the charging will be stopped.

Li-ion battery: pre-charging when the voltage < 6.4±0.1V, when the battery voltage reaches 6.4±0.1V, the charging turns to rapid charging.

Charging process checking: battery voltage, battery temperature rise, -△V, charging time, max. Battery temperature

Operating environment

Temperature: -5℃±2℃-- +55℃±2℃

Humidity: 95%@40℃

Safety requirements

In accordance with safety requirements of CCC, CE and UL, etc.

LED Status Table：

	RED	GREEN
Standby or battery not installed	0.2s ON 4.5s OFF	/
charging	ON	/
Charging completed	/	ON
Error	0.2s ON 0.2s OFF	/

PACKING

Standard configuration

ITEM	name	Qty.	remark
1	antenna	1	7100500240471
2	radio	1	DR5800
3	battery	1	CB-01A
4	charger	1	CP-02
5	instruction manual	1	
6	belt clip	1	CLP-02 clip (under radio)
7	AC adapter	1	12V 500mA
8	packing fixture	1	
9	Item carton case	1	

OPTIONAL

Optionl & Spare Kit				
CLASS	ITEM	MANUFACTURER PART NO.	MODEL NUMBER	DESCRIPTION
Antenna	1	’7100500240471	DR5000-2	Antenna UHF(400-470MHz) 160mm
	2	’7100500240472	DR5000-2	Antenna UHF(400-470MHz) 100mm
	3	’7100500240473	DR5000-2	Antenna UHF(400-470MHz) 90mm
	4			
	5			
Battery	6	’7060CB01001	DR5000	CB-01 1300mAh Li-ion Battery
	7			
Charger	10	70700CP01001	DR6000 /DR7000	CP-01
Gang Charger	11	70700MC02001	DR6000 /DR7000	MC-02 (GC-01) 6-Slot Gang Charger
Adapter	12	709CA01US001	DR6000 /DR7000	Power adapter for charger 110/220V AC 1000mA
	13	70700MC02001	DR6000 /DR7000	6-Slot Gang charger with inside adapter(MC-02)
Belt clip	14	7110CLP02001	CU500	Spring Belt Clip (CLP-02)

Programming Cable	15	CPL-04	DR6000 /DR7000	DMR Portable Programming Cable
housing assembly	16	604DR5100S001	DR5100	Radio Front housing includes PTT, MIC jack cover, speaker
	17	604DR5800S001	DR5800	Radio Front housing includes PTT, MIC jack cover, speaker
Chassis assembly	18	604CU50001002	CU500	Aluminum cabinet polishing ADC 12 1 (Chassis)
PCBA	19	6020DR50002001	DR5000-2	MAIN PCB 1
		6020DR58002001	DR5800-2	MAIN PCB 1
PCB	20	‘6020006002002	DR6000 /DR7000	KEYBOARD PCB 2 with PTT metal dome plate

TROUBLE SHOOTING

No.	Problems	Solutions
1	The radio cannot be switched on or no display after switched on.	● Battery pack may not be installed properly. Remove the battery pack and install it again. ● Battery power may be insufficient. Recharge or replace the battery pack.
2	The battery power consume quickly after charging.	● The battery life is finished; please replace it with a new battery pack.
3	Cannot talk to or hear other members in your group.	● The frequency or CTCSS/DCS signaling are not identical and please reprogram it. ● Make sure the setting of the selective signaling 5-Tone in the RX Squelch Mode is proper. ● Beyond the radio efficient communication range.
4	Other voices from non-group members are heard on the channel.	● Change the CTCSS/DCS tone, and make sure change the tone on all radios in your group. ● Please set 5-Tone selective signaling on the channel.
5	Communication range is too small.	● Make sure the antenna is well connected. ● Make sure the antenna is the originally supplied one. ● Check if the battery power is in the normal state. ● Ask your local dealer to adjust the squelch level.
6	Unable to transmit.	● Make sure the PTT button has been pressed completely. ● Battery power may be insufficient. Recharge or replace the battery pack. ● Transmitting frequency has not been set on the channel and the radio has been remote killed.

7	Noise is too loud.	● Battery power may be insufficient. Recharge or replace the battery pack. ● Beyond the efficient communication range.

SPECIFICATIONS

General Specifications	
Items	DR 5810-2 Series
Power Supply	7.5V DC ±20%
Frequencies - Full Bandsplit	400-480MHz
Number of Channels	2000 Channels
Maximum number of Zones	250 Zones(LCD)/2 Zones (Non-LCD)
Maximum number of Channels Per Zone	999+1
Channel Spacing	12.5/25kHz
Operating Temperature	-30℃~ + 60℃
Dimensions: H x W x D(mm)	96.5 X 54X 33
With Standard Li-ion battery (1700mAh)	
Weight: (g) With Standard Li-ion battery	245g
Average Battery Life 5/5/90 Cycle: With Standard Li-ion battery	14h Digital Mode/11h Analog Mode
Transmitter	
Frequency Stability(-30℃ to 60℃, 25℃ Ref)	1.0 ppm
Power Output	1W(L),4W(UHF)/5W(VHF)(H)
Modulation Limiting	±2.5kHz@12.5kHz/±5kHz@25kHz
FM Hum & Noise	-40dB
Conducted/Radiated Emission	-36dBm < 1GHz, -30dBm > 1GHz
Adjacent Channel Power	-60dB@12.5kHz/-70dB@25kHz
FM Modulation Mode	12.5KHz：11K0F3E/25kHz:16K0F3E
4FSK Digital Mode	12.5KHz（data only）：7K60FXD
	12.5KHz（data + voice）：7K60FXE
4FSK Modulation Accuracy	5%@25℃, 10%@extreme temperature
Audio Response (300-3000Hz)	+1 ~ -3 dB
Digital Protocol	ETSI TS 102 361-1,-2,-3
Audio Distortion	< 3%
Vocoder	AMBE + 2™
Ext. Microphone Connector	Compatible with MOTO 2-pin
Receiver	
Analog Sensitivity	.35μV/-116dBm(20 dB SINAD)

	.22μV/-120dBm(12 dB SINAD)
Digital Sensitivity	.22μV /-120dBm (BER 5%)
	.25μV /-118dBm (BER 1%)
Intermodulation	TIA603 70 dB; ETSI 65dB
Adjacent Channel Selectivity	TIA603C 70dB; TESI:70dB @25KHz
	TIA603C 60dB; TESI:60dB @12.5KHz
Spurious Rejection	TIA603C:75dB; ETSI:70dB
Blocking	84 dB
Rated Audio/Maximum Audio	750 mW / 1000 mW
Audio Distortion @ Rated Audio	3%
Audio Response (300-3000Hz)	+1 ~ -3 dB
Conducted Spurious Emission	-57 dBm<1 GHz, -47 dBm>1GHz ETS 300 086

Appendix 1 Abbreviations

AMP (amplify, amplifier)

ANT (antenna)

APC (automatic power control)

BPF (band pass filter)

CTCSS (continuous tone control squelch system)

DCS (Digital code squelch)

DEMOD (demodulation)

HPF (high pass filter)

IDC (instantaneous deviation control)

IF (intermediate frequency)

LED (Light-Emitting Diode)

LNA (low noise amplifier)

LPF (low pass filter)

MCU (micro control unit)

MIC (microphone)

MOD (modulation)

MONI (monitor)

PLL (phase lock loop)

PTT (push-to-talk)

RSSI (Received Signal Strength Indicator)

RX (receiver)

SoC (System on Chip)

SPK (speaker)

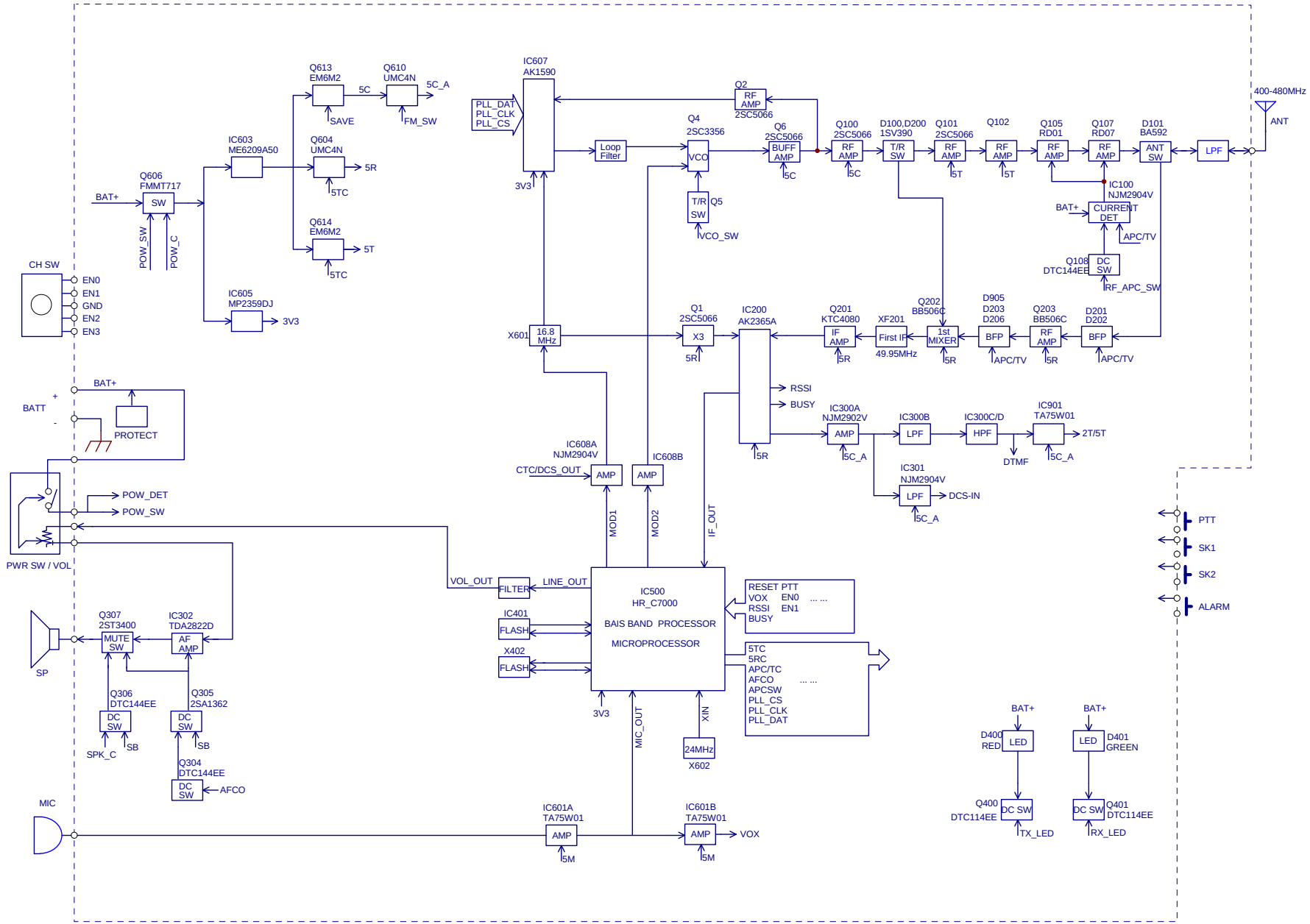
TCXO (Temperature Compensated Crystal Oscillators)

TX (transmitter)

UL (un-lock)

VCO (voltage control oscillator)

Appendix2 schematic and block diagram （Integrated diagram）



Title	DR5810-2 / DR5610-2 / DR5510-2 DR5800-2 / DR5600-2 / DR5500-2	BLOCK DIAGRAM
Size: A3	Number:	Revision: VER 1.0
Date:	Sheet of	
File:	Drawn By:	

SCHEMATIC DIAGRAM						
DR5800-2				File:		
DR:	STAND:	CHKD:	APPD:	VER	Sheet	Date
				V02A	1	19.11.28