SERVICE MANUAL
TWO-WAY RADIO

TC-320

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8130032000010

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Revision History

Part No.	Date of Issue	Description
8130032000000	2009.4	Initial Release
8130032000010	2010.9	Circuit Description, Schematic Diagrams, PCB View, Level Diagram, Block Diagram, Parts List 1 & 2, and Specifications are updated.

Copyright Information

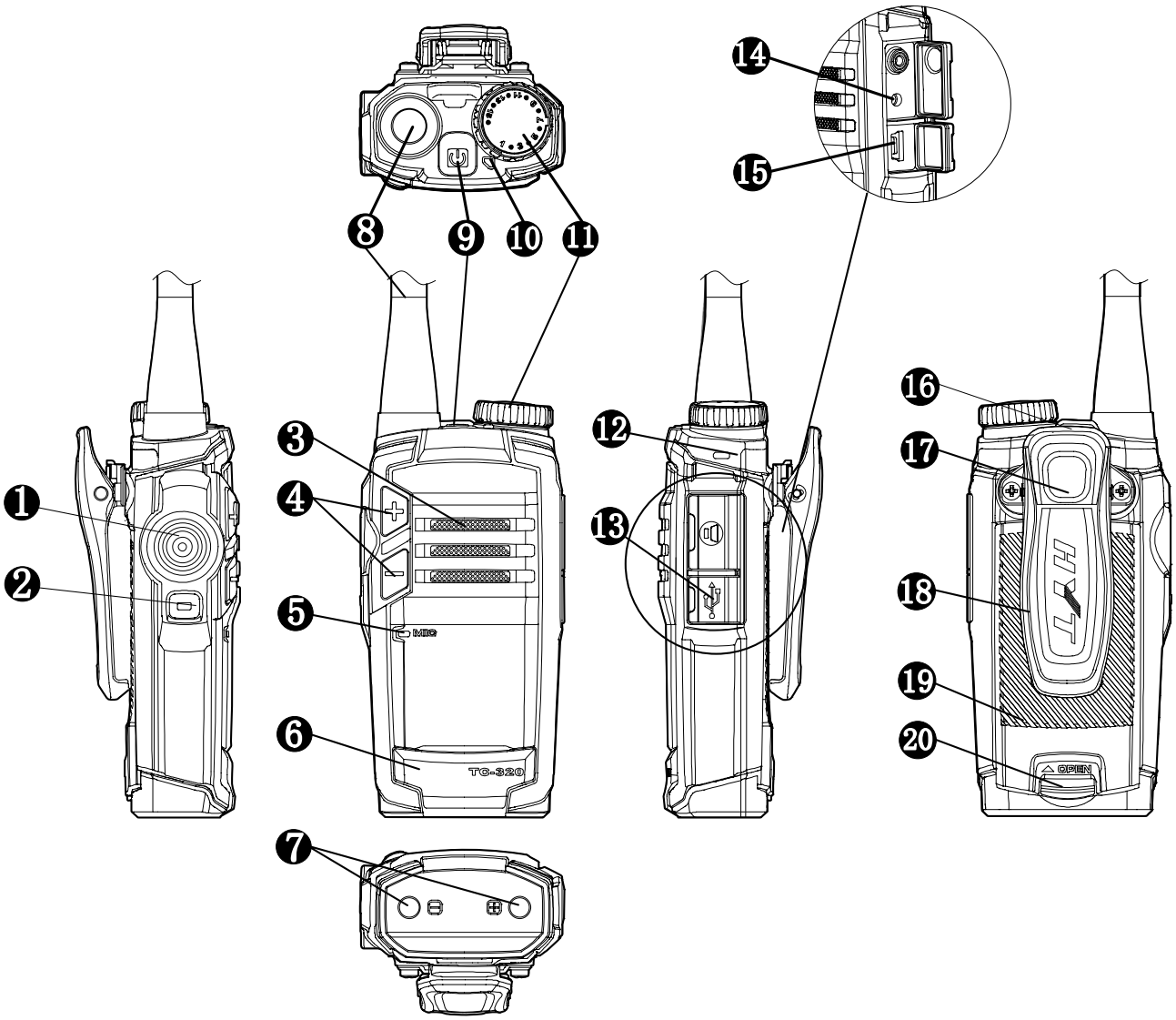
Disclaimer

Introduction

Manual Scope

This manual is intended for use by qualified technicians only.

Radio Overview



(1)PTT (Push-to-Talk) Key	(2)SK (Side Key)	(3) Speaker	(4)Volume Adjust Keys [+]/[-]
(5) Microphone	(6) Nameplate	(7) Charging Terminal	(8) Antenna
(9)Power Switch	(10) Channel/Status Indicator	(11)Channel Selector Knob	(12)Charge Indicator
(13)Accessory Jack Cover	(14)Accessory Jack	(15)Mini USB Jack	(16)Strap Hole
(17)Screw (Belt Clip)	(18)Belt Clip	(19)Rear Cover	(20)Battery Latch

Software Specifications

Status Indications

Operations/Functions		LED Indications and Alert Tones
Wired Clone Mode	To enter Wired Clone mode	Power on the source radio while holding down **SK**, and the LED flashes red once.
		Turn on the target radio directly.
	Status of the source radio (After the target radio is turned on and the cloning cable is connected, hold down **PTT** of the source radio to begin cloning.)	The LED glows red during cloning process. Error occurs during cloning: a. User Clone: Once clone begins, frequency band and radio ID (Model ID) will be checked. The LED glows orange for 2 seconds and then goes out to indicate a failed check. If the check is successfully carried out but error occurs during data cloning, the LED will flash orange. In this situation, press any key other than the **Power Switch** to turn it off. b. Factory Clone: If error occurs during data cloning, the LED will flash orange until you press any key other than the **Power Switch** to cancel it. Once cloning is completed, the LED will glow green. And if the battery runs low in Clone mode, the LED will flash red.
	Status of the target radio	The LED glows green when cloning is in progress. The green LED goes out once cloning is completed.
Power On (to enter User Mode)		When the radio is turned on, an alert tone sounds and the LED flashes orange once. When the radio is currently on a blank channel, it sounds beep tones continuously.
Power Off		When the radio is turned off, the power-off alert tone is heard.

Low Battery Alert	The LED flashes red, and a low-pitched tone sounds every 10 seconds.
Transmitting	The LED glows red during transmitting. When the TOT timer expires, the radio sounds beep tones continuously. A TOT pre-alert tone sounds before the TOT timer expires.
Receiving	The LED glows green during receiving.
Scan	The LED flashes green once every second during the scanning process. Scan Start Alert (programmable by the dealer): one beep. Scan End Alert (programmable by the dealer): one beep.
Writing/Reading	The LED glows red in reading data. The LED glows green in writing data.
Power Adjustment	A low-pitched tone is heard when the radio switches from high power to low power. A high-pitched tone is heard when the radio switches from low power to high power.
Monitor/VOX	The alert tone sounds once if the feature is enabled. The alert tone sounds twice if the feature is disabled.

Description of Modes

User Mode

It is a conventional communication mode. The radio will enter this mode if you turn it on directly.

PC Programming Mode

The radio in User Mode enters PC Programming Mode through specific protocol based communication with the programming software. In this mode, radio functions and adjustment parameters can be set

through the programming software (including User Version and Factory Version).

The operation procedures are as follows:

1) Install PC programming software and its driver dedicated for TC-320 before your initial use.

2) Connect the USB port of PC with the Mini USB jack of the radio using a programming cable.

3) Turn on the radio.

4) Launch the programming software to perform reading or writing operation.

Note:

1) When reading/writing data is in progress, red/green LED glows; when reading/writing data is completed, red/green LED goes out.

2) During the operation, if any abnormal situation occurs or no reply is given within a period, the reading/writing operation will fail and an error message window will pop up.

Wired Clone Mode

1. Description

Wired Clone Mode is an independent mode. To access other modes, you must restart the radio.

Wired Clone Mode covers User Clone Mode and Factory Clone Mode.

1） User Clone Mode:

Connect two radios using a clone cable. Power on the source radio while holding down **SK**, and it will enter User Clone Mode after 2 seconds. The target radio can be directly turned on to enter user mode. In this mode, data stored in EEPROM of the source radio will be cloned to EEPROM of the target radio. The data transferred only involves channel data and common parameters, excluding adjustment data, version and serial No. of the model.

2） Factory Clone Mode:

Connect two radios using a clone cable. Power on the source radio while holding down **SK**, and it will enter User Clone Mode by default after 2 seconds. Press **SK** afterwards to switch to Factory Clone Mode. The target radio can be directly turned on to enter the mode. The data transferred covers all data in EEPROM other than serial No, with flag of manual adjustment switch included.

2. Process

Process of Wired Clone:

1) The LED flashes red once after the source radio enters Wired Clone Mode. Hold down **PTT** to clone data to the target radio.

2) During communication, LED of the source radio glows red, and LED of the target radio glows green. When communication finishes, LED of the source radio glows green and LED of the target radio goes out, indicating that both radios are ready for another cloning operation.

3) If any abnormal situation occurs during cloning, the source radio will stop cloning and its LED will flash orange, indicating both radios are ready for another cloning operation.

4) When the communication ends, the source radio goes back to standby status. Hold down PTT again to begin another cloning.

Manual Adjust Mode

Hold down **PTT** and **SK** on the radio while powering it on, and the radio enters Manual Adjust Mode. (Note: This operation is subject to the option Panel Test Mode in the programming software. When this option is unchecked, the radio will be unable to enter the adjustment mode. It helps avoid change of parameters and degradation of radio performance caused by user's misoperations.)

Keep this option unchecked after values are well adjusted from factory, to avoid any unexpected change of values. The adjustment values can be reset and changed in Factory Mode only.

Description of adjustment:

1) To enter Manual Adjust Mode

Hold down **PTT** and **SK** for 2 seconds while powering on the radio. The LED will glow orange when the radio is in Adjust Mode. When the keys are released, the radio will enter item N of TX group (N depends on the position where the **Channel Selector** knob locates).

2) To switch between TX group and RX group

This operation is done through the **Channel Selector** knob.

The LED glows red when adjusting items in TX group.

The LED glows green when adjusting items in RX group.

3) To switch between items of TX group/RX group

This operation is done through the **Channel Selector** knob.

TX group: CH1 to CH9 stand for TX Low Power, TX High Power, CDCSS Balance, CDCSS Deviation, CTCSS Deviation (low), CTCSS Deviation (medium), CTCSS Deviation (high), TX Low Voltage Threshold and Max. Deviation of TX Audio respectively.

The LED solidly glows red when adjusting items CH1 to CH9.

RX group: CH10 to CH12 stand for SQL On 5, SQL Off 5, and RX Low Voltage Threshold respectively.

The LED solidly glows green when adjusting items CH10 to CH12.

CH13 to CH16 are invalid and the LED goes out, indicating that no adjustment item is carried out.

4) To switch between wide and narrow bandwidth

In adjusting a certain item, short press **SK** (the LED flashes orange to indicate valid press) to switch between wide and narrow bandwidth. After this operation, the first frequency of the current bandwidth is the frequency for adjustment by default.

5) To switch frequency

Short press **PTT** (the LED flashes green to indicate valid press) to switch frequency one by one, under certain bandwidth and adjustment item.

6) To increase/decrease adjustment value under certain bandwidth and adjustment item

Short press **[+]** under certain bandwidth and adjustment item, and the adjustment value will increase in steps of 1; hold down **[+]**, and the adjustment value will keep increasing in steps of 1. The adjustment value will remain unchanged once it reaches the allowed maximum value.

Short press **[-]** under certain bandwidth and adjustment item, and the adjustment value will decrease in steps of 1; hold down **[-]**, and the adjustment value will keep decreasing in steps of 1. The adjustment value will remain unchanged once it reaches the allowed minimum value.

7) Operations on special items:

TX group: CH8 is the TX Low Voltage Threshold. This adjustment item is related to AD sampling. Press **[+]** or **[-]** after entering the above item, to activate AD sampling (including calculation) once. Rotate the **Channel Selector** knob to save the current AD sampling value.

RX group: CH10 to CH12 stand for SQL On 5, SQL Off 5, and RX Low Voltage Threshold respectively. These adjustment items are related to AD sampling. Press **[+]** or **[-]** after entering the above items, to activate AD sampling (including calculation) once. Rotate the **Channel Selector** knob to save the current AD sampling value.

8) Description of key press:

Short press: key press no longer than 1 second;

Long press: key press time longer than 1 second.

Circuit Description

1. General Diagram

The general circuit is composed of TX section, RX section, power supply circuit, control circuit and etc. The block diagram is shown in the figure below:

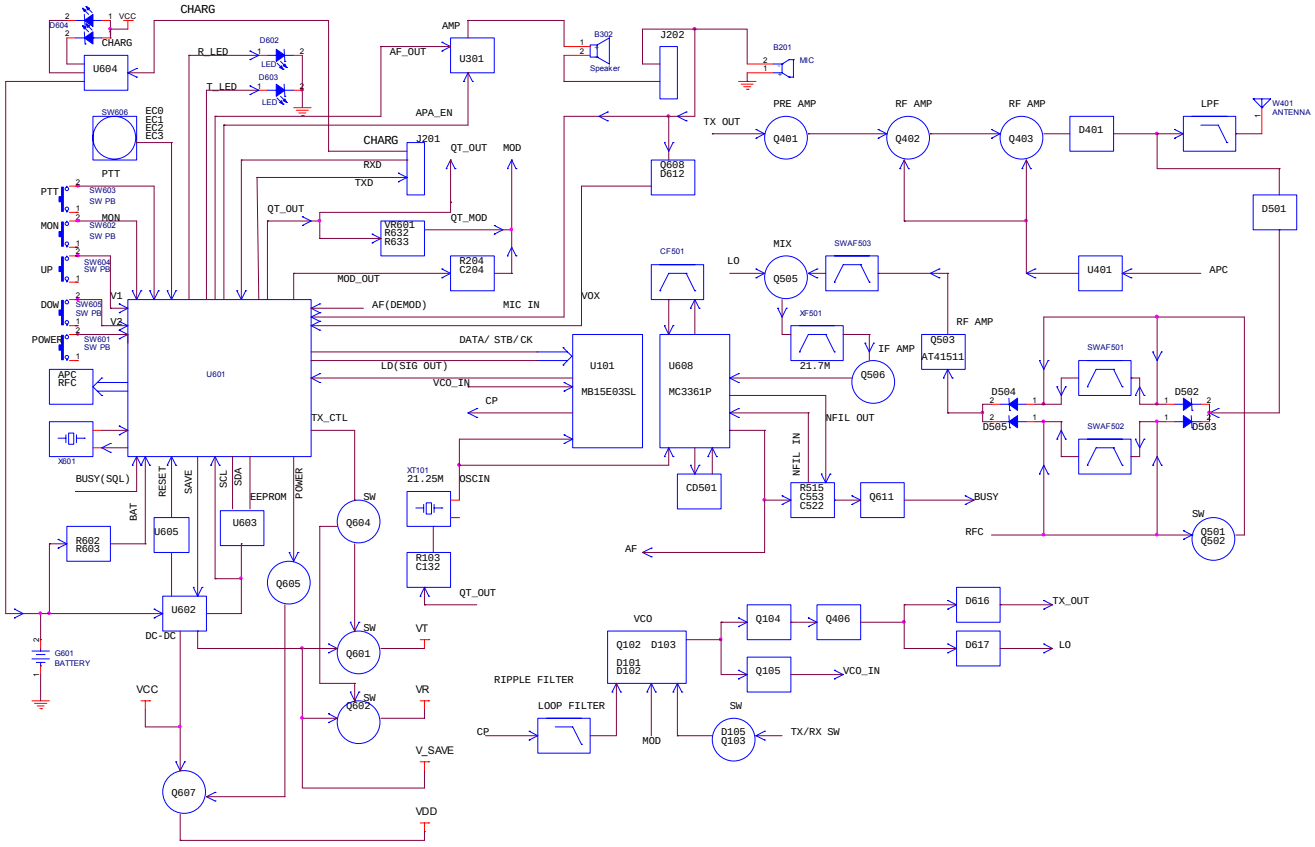


Figure 1

TX Section: The audio signal from MIC is sent to the MCU chip (U601) directly. The baseband signal processing circuit in U601 converts the amplified audio signal to digital signal via A/D conversion, and then converts the digital signal to modulation signal via D/A conversion after all processing procedures such as filtering, signal compression, encryption, pre-emphasis, TX gain control and amplitude limiting are completed. Then the modulation signal from MCU passes through the low-pass filter circuit and goes to VCO for direct frequency modulation.

The modulated HF carrier signal passes through the buffer amplifiers (Q104 and Q406), and goes to the amplifier (Q401) through the RF switching diode (D616). Then the amplified RF signal enters the low-pass filter circuit through the switching diode (D401) after it is further amplified by the driver (Q402) and final-stage power amplifier (Q403), and then it will be finally transmitted via antenna after high-order harmonics are removed. The RX-TX switch circuit is composed of D401 and D501.

RX Section: RF signal received via the antenna is fed to the bandpass filter (composed of SAWF501 and SAWF502) to filter out unwanted out-of-band interference signal, and then amplified by LNA Q503. The amplified signal is then fed to the bandpass filter (SAWF503) to further filter out unwanted out-of-band interference signal. The desired RF signal is mixed with the first local oscillator signal (output from VCO) by Q505. The newly generated signal is processed by the crystal filter (XF501) to get the first IF signal (21.7MHz). After amplified by Q506, this IF signal enters U608 to be further mixed with the second LO (local oscillator) signal and to generate the second IF signal (450 KHz). This second IF signal is demodulated by U608 to output audio signal, which is sent to MCU for A/D conversion and filtering. Afterwards, the audio signal is divided into two flows. One flow is processed by CTCSS/CDCSS decoder; the other is restored to audio signal through filtering, de-emphasis, decoding, signal expansion and D/A conversion. Then the restored audio signal is amplified by the audio power amplifier (U301) to drive the speaker directly.

Power Supply Section: The 3.8V battery voltage is converted to two flows of 3.0V DC voltage by the LDO module (U602), that is, VCC and V_SAVE. VCC powers CPU while V_SAVE controls VT and VR. VT goes through Q604 and Q601, and outputs 3V voltage for TX circuit under the control of TX-CTRL; VR supplies 3V voltage for RX circuit under the control of Q604 and Q602. VDD (3V) supplies the PLL U101 and XT101.

2. Realization Methods of Basic Functional Modules

2.1 PLL Frequency Synthesizer

The PLL circuit mainly provides the local oscillator signal for RX and RF carrier signal for TX. It is composed of VCO and PLL processor, allowing frequency tracking and channel switching under the control of MCU signals.

1） PLL

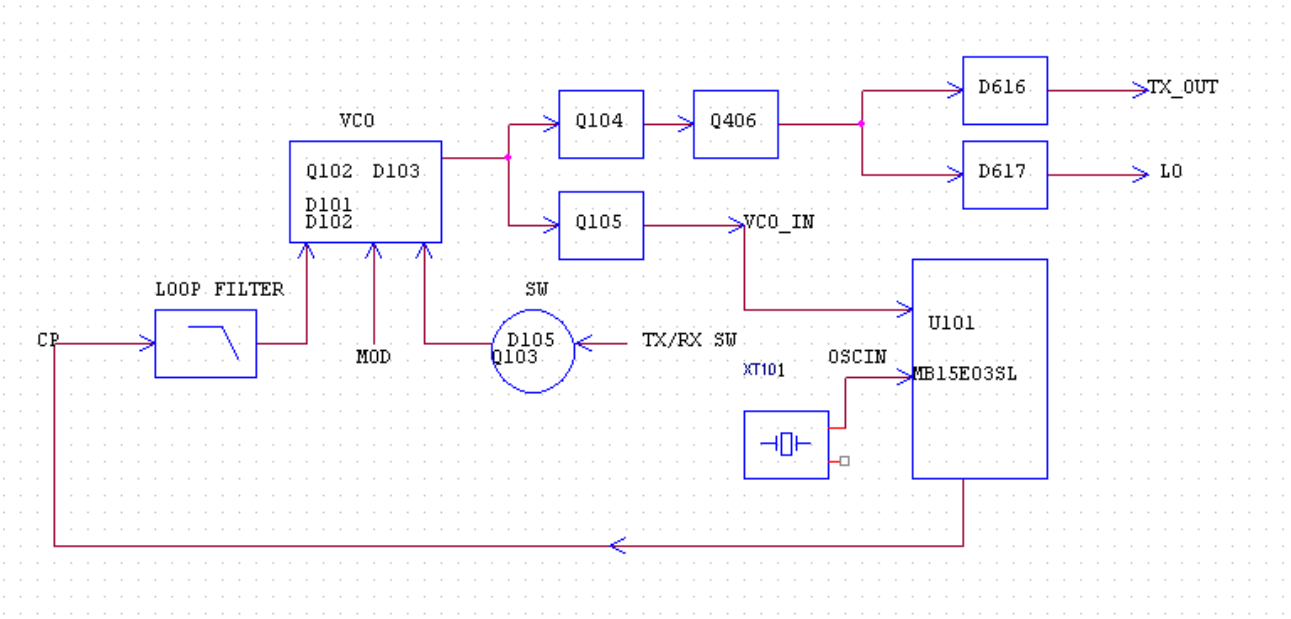


Figure 2

The PLL circuit generates RF carrier signal for TX and the first local oscillator signal for RX.

PLL: Step frequency of the PLL circuit is 6.25 KHz, 10.0 KHz or 12.5 KHz. In U101, the 21.25MHz reference oscillator signal is divided into 6.25 KHz, 10.0 KHz or 12.5 KHz reference frequencies via a fixed counter in PLL. Processed by the buffer amplifier, the signal output from the VCO (TX/RX VCO) enters PLL. The amplified signal is further processed in PLL by the variable frequency-divider. Then the signal is compared with the reference frequency in the phase detector (PD) of PLL. The signal from the PD passes through a low-pass filter, and then is sent to the varactors (D101 and D102) of VCO so as to control output frequency. Then the RF signal is processed by the buffer amplifiers (Q104 and Q406), and controlled by D616 and D617 to only serve as RF signal or RX first local oscillator signal.

2） **VCO**

VCO section is realized by the oscillator circuit of three-point capacitance. TX VCO and RX VCO share the same oscillator circuit. In TX mode, Q103 is cut off and C130 gets invalid; in RX mode, Q103 is turned on and C130 gets valid.

Note: If the PLL is unlocked, the LD pin of U101 outputs low level. If the microprocessor detects such situation, TX/RX operation is prohibited, and an alarm sounds.

2.2 RF Power Amplifier Circuit (TX Section)

The block diagram of the RF power amplifier circuit is shown as below:

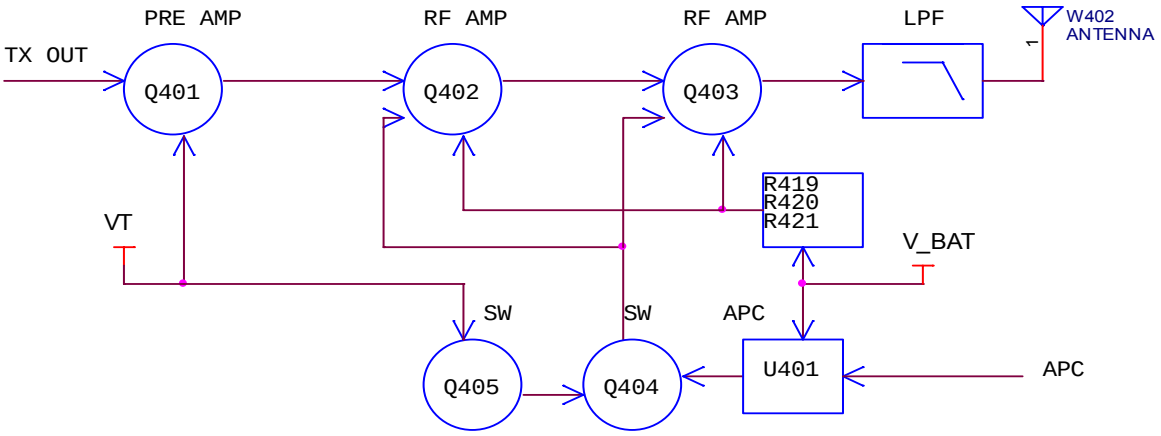


Figure 3

The modulated carrier signal from VCO is pre-amplified by Q104 and Q406, and controlled at D617 and D616. Then it is processed by the front-stage amplifier Q401, the pre-driver amplifier Q402 and the final-stage amplifier Q403 respectively. Afterwards, the amplified RF signal enters the low-pass filter (LPF) circuit through diode D401, and then is transmitted via the antenna after ultroharmonics are removed.

APC circuit is composed of Q404, Q405 and U401. U401 controls the bias voltage at the gates of Q402 and Q403, to control TX current and to further regulate power.

2.3 RX LNA and Mixer Circuit (RX Section)

The block diagram of the RX circuit is shown as below:

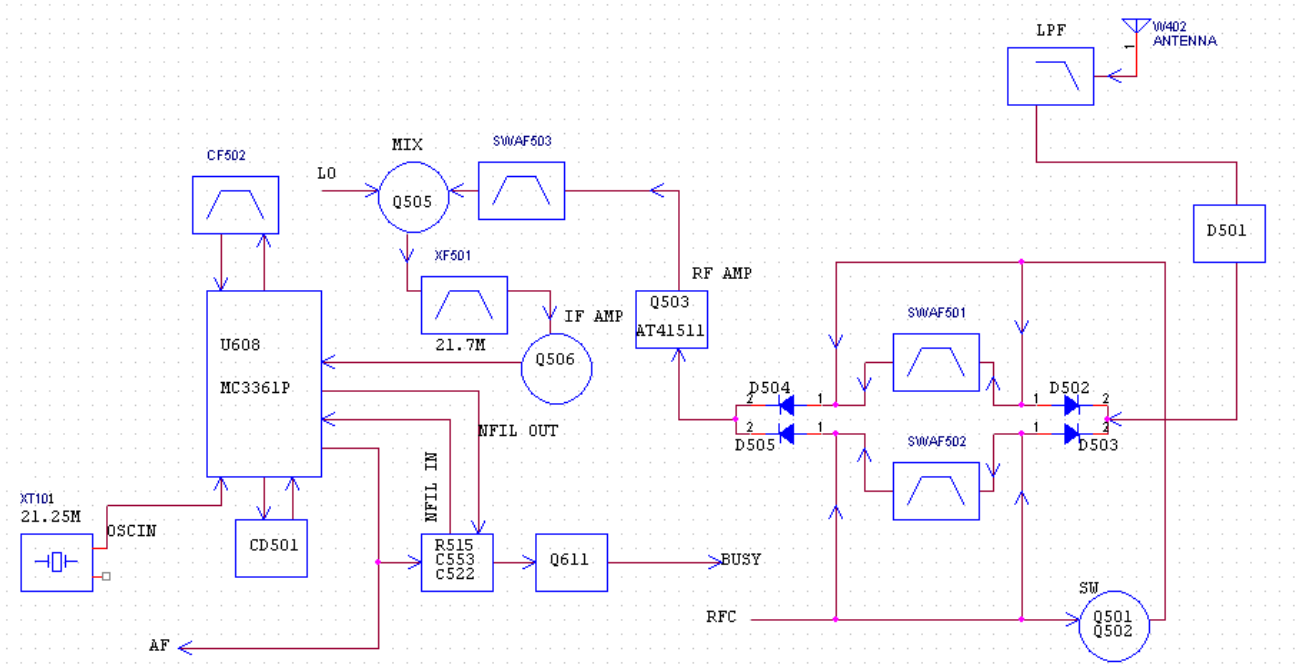


Figure 4

Desired and undesired RF signals received via the antenna are fed to the bandpass filter (composed of SAWF501 and SAWF502) to filter out undesired out-of-band interference signal. Then the desired RF signal is amplified by LNA Q503, and goes through the bandpass filter (to filter out undesired out-of-band interference signal. The desired RF signal is mixed with the first local oscillator signal (output from VCO) by Q505. The newly generated signal is processed by the crystal filter (XF501) to get the first IF signal (21.7MHz).

After amplified by Q506, this IF signal enters U608 to be further mixed with the second LO (local oscillator) signal and to generate the second IF signal (450 KHz). Then the second IF signal is demodulated by U608 to output audio signal, which is sent to MCU for A/D conversion and filtering. Afterwards, the audio signal is divided into two flows. One flow is processed by CTCSS/CDCSS decoder; the other is restored to audio signal through filtering, de-emphasis, decoding, signal expansion and D/A conversion. Then the restored audio signal is amplified by the audio power amplifier (U301) to drive the speaker directly.

2.4 MCU Control, Signal Processing and Audio Power Amplification

The block diagram of this section is shown as below:

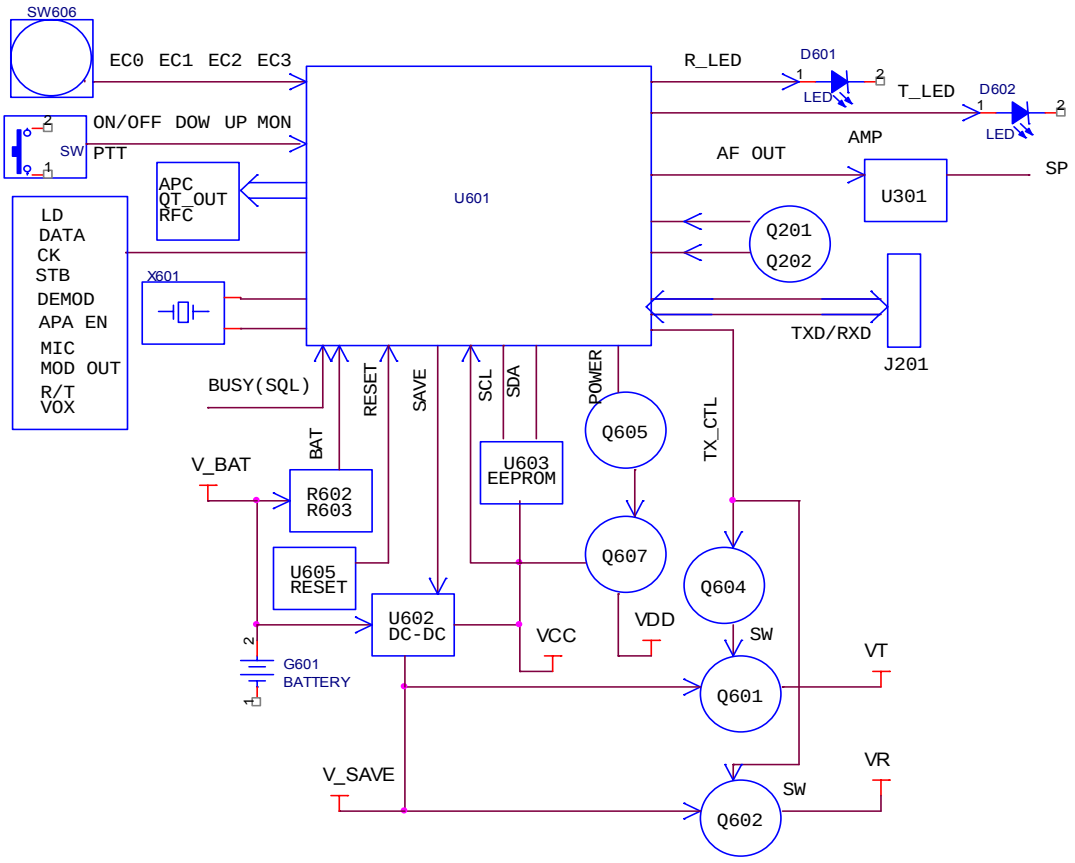


Figure 5

2.4.1 MCU Control Circuit

MCU control circuit is composed of MCU, EEPROM, keys and etc. This section has the following functions: to initialize data of the radio and save data to EEPROM; to detect battery voltage and signals from external keys, LD and VOX, and to make response; to transmit required data to PLL based on the channel encoding status; to switch and control RX/TX based on the input PTT signal; to switch the squelch circuit on/off based on the input signaling decode signal and squelch level signal; to control circuits of high/low power switch, audio power amplifier, VCO power supply, RX power supply and TX power supply; (for programming) to communicate with PC via RXD/TXD based on the RS232 protocol, and transmit/receive data to/from PC.

2.4.2 Signal Processing Section

a. TX Baseband Processing The audio signals input from MIC are divided into two flows. One flow serves as the signal of VOX detection by Q508 and D612; the other enters U601, and then is converted into digital signal by analog-to-digital conversion (ADC). Afterwards, the digital signal will go through a series of processing including low-pass filtering, AGC, companding, high-pass filtering, encrypting and pre-emphasizing. Finally, the signal is processed by the active low-pass filter and then sent to VCO for modulation after it is converted by digital-to-analog conversion (DAC).

b. RX Baseband Processing

After entering U601, the DEMOD signal derived from IF demodulation is converted to digital signal via analog-to-digital conversion (ADC), and then is sent to the digital low-pass filter. The signal is divided into two flows. One flow is processed by CTCSS/CDCSS decoder; the other is processed by high-pass filter, and then is subject to processing procedures such as de-emphasis, decryption, and signal expansion, and finally is output as audio signal after digital-to-analog conversion.

2.4.3 Audio Power Amplifier

The audio signal output from U601 is amplified by the audio power amplifier (U301) to drive the speaker directly.

2.5 Power Supply Processing

The block diagram of the power supply circuit is shown as below:

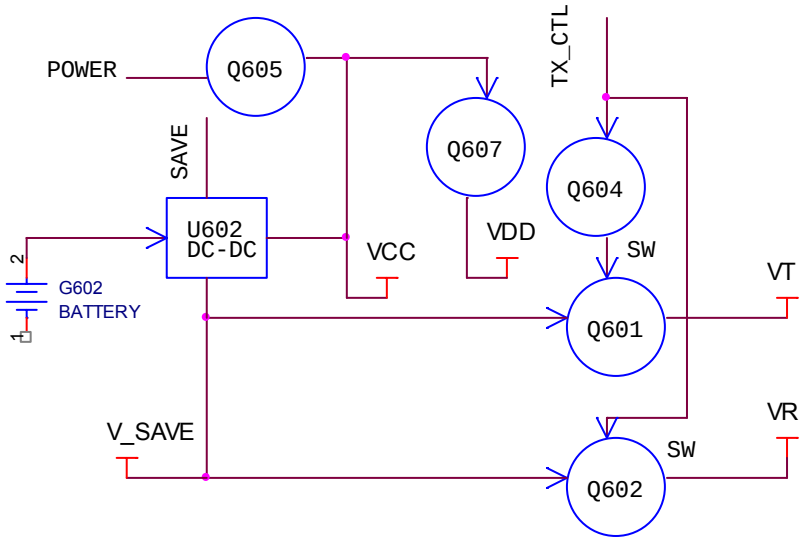


Figure 6

Power Supply Section: The 3.8V battery voltage is converted to two flows of 3.0V DC voltage by the LDO module (U602), that is, VCC and V_SAVE. VCC powers CPU while V_SAVE controls VT and VR. VT goes through Q604 and Q601, and outputs 3V voltage for TX circuit under the control of TX-CTRL; VR supplies 3V voltage for RX circuit under the control of Q604 and Q602. VDD (3V) supplies the PLL U101 and XT101.

CPU Pins

Pin No.	Port Name	Pin Name	I/O	Function
1	NC	/	/	/
2	NC	/	/	/
3	NC	/	/	/
4	NC	/	/	/
5	NC	/	/	/
6	TXD	TXD	O	UART TXD
7	RXD	RXD	I	UART RXD
8	P60	APA_EN	O	To control the speaker; H: unmute, L: mute
9	P61	SAVE_CTL	O	To control Power Save: it is at high level in non-Power-Save status
10	P62	EXT MIC	I	To check MIC connection (valid at high level)
11	P63	EXT PTT	I	PTT key on the earpiece (valid at high level)
12	P64	Red LED	O	Red LED
13	P65	Green LED	O	Green LED
14	P66	Reserve	O	Reserved
15	P67	Reserve	O	Reserved
16	Vssd	GND	S	Ground power supply for digital circuit
17	Vddd	VCC (3.0V)	S	Power supply for digital circuit
18	P50/INT0	VOL+	I	Volume Adjust Key [+]
19	P51/INT1	VOL-	I	Volume Adjust Key [-]
20	P52/INT2	Reserve	O	Reserved
21	P53/INT3	/POWER SWITCH	I	Power Switch
22	P54/INT4	SK	I	Programmable function key (side key) (valid at low level), connected with a pull-up resistor
23	P55/INT5	PTT	I	PTT key (valid at low level), connected with a pull-up resistor
24	P56/INT6	Reserve	O	Reserved
25	P57/INT7	Reserve	O	Reserved
26	Vdd_CLD	VCC (3.0V)	S	Power supply for digital PA
27	CLD_OUTP	AF_OUT	O	Audio output

28	VSS_CLD	GND	S	Ground power supply for digital PA
29	CLD_OUTM	Reserve	O	Reserved
30	Vdd_CLD	VCC (3.0V)	S	Power supply for digital PA
31	P77	RF_CTRL	O	To control RX frequency band; valid at high level (high frequency band); valid at low level (low frequency band)
32	P76/DAC1	APC	DA	To control TX power
33	P75/VREF	VCC (3.0V)	I	Input pin of reference voltage of ADC and DAC
34	P74/DAC0	QT_OUT	DA	CTCSS/CDCSS output
35	P73/AD3	VOX	AD	VOX energy detection pin
36	Vssa	GND	S	Ground power supply for analog circuit
37	Vdda	VCC (3.0V)	S	Power supply for analog circuit
38	P72/AD2	Reserve	AD	Reserved
39	P71/AD1	SQL	AD	To detect noise
40	P70/AD0	BAT_DET	AD	To detect battery strength
41	XTAL0	OSC0	/	To connect 32.678KHz main crystal oscillator
42	XTAL1	OSC1	/	
43	PLL_CAP	PLL_CAP	/	To connect the external capacitor (10nF) of PLL
44	NC	/	/	/
45	NC	/	/	/
46	NC	/	/	/
47	NC	/	/	/
48	NC	/	/	/
49	P03/COM3	Reserve	O	Reserved
50	P02/COM2	Reserve	O	Reserved
51	P01/COM1	Reserve	O	Reserved
52	P00/COM0	Reserve	O	Reserved
53	P10/SEG0	Reserve	O	Reserved
54	P11/SEG1	Reserve	O	Reserved
55	P12/SEG2	Reserve	O	Reserved
56	P13/SEG3	Reserve	O	Reserved
57	P14/SEG4	Reserve	O	Reserved

58	P15/SEG5	Reserve	O	Reserved
59	P16/SEG6	Reserve	O	Reserved
60	P17/SEG7	Reserve	O	Reserved
61	P20/SEG8	EN0	I	To detect input from the encoder switch
62	P21/SEG9	EN1	I	
63	P22/SEG10	EN2	I	
64	P23/SEG11	EN3	I	
65	P24/SEG12	Reserve	O	Reserved
66	P25SEG13	Reserve	O	Reserved
67	P26/SEG14	Reserve	O	Reserved
68	P27/SEG15	Reserve	O	Reserved
69	P30/SEG16	Reserve	O	Reserved
70	P31/SEG17	Reserve	O	Reserved
71	NC	/	/	/
72	NC	/	/	/
73	NC	/	/	/
74	NC	/	/	/
75	NC	/	/	/
76	P32/SEG18	Reserve	O	Reserved
77	P33/SEG19	Reserve	O	Reserved
78	P34/SEG20	Reserve	O	Reserved
79	P35/SEG21	Reserve	O	Reserved
80	P36/SEG22	Reserve	O	Reserved
81	P37/SEG23	POWER	O	Power control pin
82	P40/SEG24	Reserve	O	Reserved
83	P41/SEG25	SCL	O	EEPROM CLOCK, connected with a pull-up resistor
84	P42/SEG26	SDA	O	EEPROM DATA, connected with a pull-up resistor
85	P43/SEG27	LD	I	To detect PLL circuit unlock (H: lock; L: unlock), connected with a pull-up resistor
86	P44/SEG28	DATA	O	PLL DATA
87	P45/SEG29	CK	O	PLL CLOCK

88	P46/SEG30	STB	O	PLL ENABLE
89	Vssd	GND	S	Ground power supply for digital circuit
90	Vddd	VCC (3.0V)	S	Power supply for digital circuit
91	SW_P0	R/T	O	To control RX/TX, H: RX; L: TX (switch to VCO)
92	SW_P1	TX_CTRL	O	To control power supply for TX (transmit at high level)
93	RESET	RESET	I	Reset input
94	Vssa	GND	S	Ground power supply for analog circuit
95	Vdda	VCC (3.0V)	S	Power supply for analog circuit
96	BG_REF		O	Reference voltage output pin
97	MIC_IN	MIC_IN	I	Microphone input pin
98	DEMODE	DEMODE	I	Baseband signal (audio and CTCSS/CDCSS) input pin
99	MODOUT	MODOUT	O	Baseband signal (audio and CTCSS/CDCSS) output pin
100	NC	/	/	/
Requirement: As the port of Reserved is set to O, its configuration should be Output and Open.				

Parts List 1

No.	Part No.	Description	Qty.	Ref No.	Print No.	Remark
1	3001050000000	Chip resistor 0Ω J 1/16W (RoHS)	1	L510	B2H	
2	3001050000000	Chip resistor 0Ω J 1/16W (RoHS)	1	R223	T3G	
3	3001050000000	Chip resistor 0Ω J 1/16W (RoHS)	1	R518	B3H	
4	3001050000000	Chip resistor 0Ω J 1/16W (RoHS)	1	R527	B2H	
5	3001051000020	Chip resistor 10Ω F 1/16W (RoHS)	1	R101	B4H	
6	3001051000020	Chip resistor 10Ω F 1/16W (RoHS)	1	R108	B4G	
7	3001051000020	Chip resistor 10Ω F 1/16W (RoHS)	1	R119	B3F	
8	3001051000020	Chip resistor 10Ω F 1/16W (RoHS)	1	R311	T3A	
9	3001051000020	Chip resistor 10Ω F 1/16W (RoHS)	1	R429	B2F	
10	3001051000020	Chip resistor 10Ω F 1/16W (RoHS)	1	R516	B3I	
11	3001051000020	Chip resistor 10Ω F 1/16W (RoHS)	1	R530	B2G	
12	3001051010040	Chip resistor 100Ω F 1/16W (RoHS)	1	R604	T2E	
13	3001051010040	Chip resistor 100Ω F 1/16W (RoHS)	1	R614	T4E	
14	3001051010040	Chip resistor 100Ω F 1/16W (RoHS)	1	R621	T4E	
15	3001051010040	Chip resistor 100Ω F 1/16W (RoHS)	1	R623	T4E	
16	3001051020000	Chip resistor 1KΩ F 1/16W (RoHS)	1	R104	B4F	
17	3001051020000	Chip resistor 1KΩ F 1/16W (RoHS)	1	R109	B4E	
18	3001051020000	Chip resistor 1KΩ F 1/16W (RoHS)	1	R207	T2G	
19	3001051020000	Chip resistor 1KΩ F 1/16W (RoHS)	1	R214	T3D	
20	3001051020000	Chip resistor 1KΩ F 1/16W (RoHS)	1	R309	T4D	
21	3001051020000	Chip resistor 1KΩ F 1/16W (RoHS)	1	R613	T2G	
22	3001051020000	Chip resistor 1KΩ F 1/16W (RoHS)	1	R637	T5F	
23	3001051020000	Chip resistor 1KΩ F 1/16W (RoHS)	1	R640	T4E	U1
24	3001055610000	Chip resistor 560Ω J 1/16W(RoHS)	1	R640	T4E	U2
25	3001051020000	Chip resistor 1KΩ F 1/16W (RoHS)	1	R645	T5D	
26	3001051030000	Chip resistor 10KΩ J 1/16W (RoHS)	1	R107	B4E	
27	3001051030000	Chip resistor 10KΩ J 1/16W (RoHS)	1	R116	B3E	
28	3001051030000	Chip resistor 10KΩ J 1/16W (RoHS)	1	R219	T2D	
29	3001051030000	Chip resistor 10KΩ J 1/16W (RoHS)	1	R301	T3A	
30	3001051030000	Chip resistor 10KΩ J 1/16W (RoHS)	1	R409	T2B	
31	3001051030000	Chip resistor 10KΩ J 1/16W (RoHS)	1	R413	B2F	
32	3001051030000	Chip resistor 10KΩ J 1/16W (RoHS)	1	R428	T2B	
33	3001051040000	Chip resistor 100KΩ F 1/16W (RoHS)	1	R113	B3E	
34	3001051040000	Chip resistor 100KΩ F 1/16W (RoHS)	1	R120	B3F	
35	3001051040000	Chip resistor 100KΩ F 1/16W (RoHS)	1	R213	T3D	
36	3001051040000	Chip resistor 100KΩ F 1/16W (RoHS)	1	R424	T3B	
37	3001051040000	Chip resistor 100KΩ F 1/16W (RoHS)	1	R427	T2A	
38	3001051040000	Chip resistor 100KΩ F 1/16W (RoHS)	1	R433	B2G	
39	3001051040000	Chip resistor 100KΩ F 1/16W (RoHS)	1	R504	T3H	
40	3001051050000	Chip resistor 1MΩ F 1/16W (RoHS)	1	R218	T2D	
41	3001051050000	Chip resistor 1MΩ F 1/16W (RoHS)	1	R405	T2B	
42	3001051230000	Chip resistor 12KΩ J 1/16W (RoHS)	1	R224	T3G	

No.	Part No.	Description	Qty.	Ref No.	Print No.	Remark
43	3001051230000	Chip resistor 12KΩ J 1/16W (RoHS)	1	R528	B2G	
44	3001051530000	Chip resistor 15KΩ J 1/16W (RoHS)	1	R406	T2A	
45	3001051530000	Chip resistor 15KΩ J 1/16W (RoHS)	1	R607	T3G	
46	3001051540000	Chip resistor 150KΩ F 1/16W (RoHS)	1	R422	T3A	
47	3001051540000	Chip resistor 150KΩ F 1/16W (RoHS)	1	R423	T3B	
48	3001051540000	Chip resistor 150KΩ F 1/16W (RoHS)	1	R425	T3B	
49	3001051540000	Chip resistor 150KΩ F 1/16W (RoHS)	1	R426	T3A	
50	3001052220000	Chip resistor 2.2KΩ J 1/16W (RoHS)	1	R110	B4E	
51	3001052220000	Chip resistor 2.2KΩ J 1/16W (RoHS)	1	R202	T2D	
52	3001052220000	Chip resistor 2.2KΩ J 1/16W (RoHS)	1	R216	T3D	
53	3001052220000	Chip resistor 2.2KΩ J 1/16W (RoHS)	1	R507	B3H	
54	3001052220000	Chip resistor 2.2KΩ J 1/16W (RoHS)	1	R508	T3H	
55	3001052220000	Chip resistor 2.2KΩ J 1/16W (RoHS)	1	R615	T3H	
56	3001052220000	Chip resistor 2.2KΩ J 1/16W (RoHS)	1	R641	T5D	U1
57	3001052020020	Chip resistor 2KΩ F 1/16W (RoHS)	1	R641	T5D	U2
58	3001052230010	Chip resistor 22KΩ J 1/16W (RoHS)	1	R103	B4G	U1
59	3001051530000	Chip resistor 15KΩ J 1/16W (RoHS)	1	R103	B4G	U2
60	3001052230010	Chip resistor 22KΩ J 1/16W (RoHS)	1	R215	T3D	
61	3001052240010	Chip resistor 220KΩ F 1/16W (RoHS)	1	R602	T2E	
62	3001052240010	Chip resistor 220KΩ F 1/16W (RoHS)	1	R603	T2E	
63	3001052710010	Chip resistor 270Ω J 1/16W (RoHS)	1	R115	B3E	
64	3001052710010	Chip resistor 270Ω J 1/16W (RoHS)	1	R505	B2I	
65	3001052710010	Chip resistor 270Ω J 1/16W (RoHS)	1	R506	B3H	
66	3001052730010	Chip resistor 27KΩ F 1/16W (RoHS)	1	R121	T4F	
67	3001052730010	Chip resistor 27KΩ F 1/16W (RoHS)	1	R408	T2A	
68	3001053310010	Chip resistor 330Ω J 1/16W (RoHS)	1	R404	B2E	
69	3001053320000	Chip resistor 3.3KΩ J 1/16W (RoHS)	1	R203	T4E	
70	3001053320000	Chip resistor 3.3KΩ J 1/16W (RoHS)	1	R204	T4E	
71	3001053320000	Chip resistor 3.3KΩ J 1/16W (RoHS)	1	R401	B2F	
72	3001053320000	Chip resistor 3.3KΩ J 1/16W (RoHS)	1	R402	B2E	
73	3001053320000	Chip resistor 3.3KΩ J 1/16W (RoHS)	1	R534	B4H	U1
74	3001055620000	Chip resistor 5.6KΩ J 1/16W (RoHS)	1	R534	B4H	U2
75	3001053320000	Chip resistor 3.3KΩ J 1/16W (RoHS)	1	R536	B4H	U1
76	3001055620000	Chip resistor 5.6KΩ J 1/16W (RoHS)	1	R536	B4H	U2
77	3001053920010	Chip resistor 3.9KΩ J 1/16W (RoHS)	1	R431	B3F	
78	3001058220000	Chip resistor 8.2KΩ J 1/16W (RoHS)	1	R606	T4C	
79	3001053920010	Chip resistor 3.9KΩ J 1/16W (RoHS)	1	R633	T3G	
80	3001054790000	Chip resistor 4.7Ω J 1/16W (RoHS)	1	R308	T3A	
81	3001054790000	Chip resistor 4.7Ω J 1/16W (RoHS)	1	R310	T3A	
82	3001054790000	Chip resistor 4.7Ω J 1/16W (RoHS)	1	R403	B2E	
83	3001054700000	Chip resistor 47Ω J 1/16W (RoHS)	1	R111	B4E	
84	3001054700000	Chip resistor 47Ω J 1/16W (RoHS)	1	R123	B3F	
85	3001054700000	Chip resistor 47Ω J 1/16W (RoHS)	1	R618	T4G	
86	3001054700000	Chip resistor 47Ω J 1/16W (RoHS)	1	R619	T3G	

No.	Part No.	Description	Qty.	Ref No.	Print No.	Remark
87	3001054710000	Chip resistor 470Ω J 1/16W (RoHS)	1	R201	T2D	
88	3001054710000	Chip resistor 470Ω J 1/16W (RoHS)	1	R503	T3H	
89	3001054720000	Chip resistor 4.7KΩ J 1/16W (RoHS)	1	R112	B3E	
90	3001054720000	Chip resistor 4.7KΩ J 1/16W (RoHS)	1	R206	T3G	
91	3001054720000	Chip resistor 4.7KΩ J 1/16W (RoHS)	1	R434	B2F	
92	3001054720000	Chip resistor 4.7KΩ J 1/16W (RoHS)	1	R511	B2H	
93	3001054720000	Chip resistor 4.7KΩ J 1/16W (RoHS)	1	R512	B1E	
94	3001054720000	Chip resistor 4.7KΩ J 1/16W (RoHS)	1	R525	B2G	
95	3001054720000	Chip resistor 4.7KΩ J 1/16W (RoHS)	1	R608	T4C	
96	3001054720000	Chip resistor 4.7KΩ J 1/16W (RoHS)	1	R622	T5C	
97	3001054730000	Chip resistor 47KΩ J 1/16W (RoHS)	1	R106	B3E	
98	3001054730000	Chip resistor 47KΩ J 1/16W (RoHS)	1	R205	T4D	
99	3001054730000	Chip resistor 47KΩ J 1/16W (RoHS)	1	R217	T3D	
100	3001054730000	Chip resistor 47KΩ J 1/16W (RoHS)	1	R610	T4B	
101	3001054730000	Chip resistor 47KΩ J 1/16W (RoHS)	1	R611	T4B	
102	3001054730000	Chip resistor 47KΩ J 1/16W (RoHS)	1	R612	T4B	
103	3001054730000	Chip resistor 47KΩ J 1/16W (RoHS)	1	R616	T4G	
104	3001054730000	Chip resistor 47KΩ J 1/16W (RoHS)	1	R617	T4G	
105	3001054730000	Chip resistor 47KΩ J 1/16W (RoHS)	1	R620	T4B	
106	3001054730000	Chip resistor 47KΩ J 1/16W (RoHS)	1	R624	T4E	
107	3001054730000	Chip resistor 47KΩ J 1/16W (RoHS)	1	R630	T2G	
108	3001054730000	Chip resistor 47KΩ J 1/16W (RoHS)	1	R631	T3H	
109	3001054730000	Chip resistor 47KΩ J 1/16W (RoHS)	1	R638	T4E	
110	3001054730000	Chip resistor 47KΩ J 1/16W (RoHS)	1	R643	T5G	
111	3001054740000	Chip resistor 470KΩ J 1/16W (RoHS)	1	R517	B3H	
112	3001054740000	Chip resistor 470KΩ J 1/16W (RoHS)	1	R519	B4H	
113	3001056830000	Chip resistor 68KΩ J 1/16W (RoHS)	1	R102	B4H	
114	3001056830000	Chip resistor 68KΩ J 1/16W (RoHS)	1	R124	B4F	
115	3001056830000	Chip resistor 68KΩ J 1/16W (RoHS)	1	R127	B3F	
116	3001056830000	Chip resistor 68KΩ J 1/16W (RoHS)	1	R302	T3A	
117	3001056830000	Chip resistor 68KΩ J 1/16W (RoHS)	1	R632	T3G	U1
118	3001058230000	Chip resistor 82KΩ J 1/16W (RoHS)	1	R632	T3G	U2
119	3001056830000	Chip resistor 68KΩ J 1/16W (RoHS)	1	R642	T4D	
120	3001056840000	Chip resistor 680KΩ J 1/16W (RoHS)	1	R501	B3H	
121	3001057520000	Chip resistor 7.5KΩ J 1/16W (RoHS)	1	R118	B3E	U1
122	3001051030000	Chip resistor 10KΩ J 1/16W (RoHS)	1	R118	B3E	U2
123	3001060000000	Chip resistor 0Ω J 1/10W (RoHS)	1	L105	B3F	
124	3001060000000	Chip resistor 0Ω J 1/10W (RoHS)	1	L115	B2H	
125	3001061010000	Chip resistor 100Ω J 1/10W (RoHS)	1	R418	T2B	
126	3001061010000	Chip resistor 100Ω J 1/10W (RoHS)	1	R605	T3A	
127	3001066820000	Chip resistor 6.8KΩ J 1/10W (RoHS)	1	R416	B2D	
128	3001061020010	Chip resistor 1KΩ J 1/10W (RoHS)	1	R416	B2D	
129	3001064700000	Chip resistor 47Ω J 1/10W (RoHS)	1	R410	B2D	
130	3001064700000	Chip resistor 47Ω J 1/10W (RoHS)	1	R415	B3C	

No.	Part No.	Description	Qty.	Ref No.	Print No.	Remark
131	3001066810010	Chip resistor 680Ω J 1/10W (RoHS)	1	R625	T4A	
132	3099080398000	Chip resistor 0.39Ω J 1/4W (RoHS)	1	R419	T3B	
133	3099080398000	Chip resistor 0.39Ω J 1/4W (RoHS)	1	R420	T3B	
134	3099080398000	Chip resistor 0.39Ω J 1/4W (RoHS)	1	R421	T3B	
135	3005051020010	Integrated resistor 1K J 1/16W (RoHS)	1	RN101	T4F	
136	3101050590010	Chip capacitor 0.5PF B 50V (RoHS)	1	C109	B3E	
137	3101050590010	Chip capacitor 0.5PF B 50V (RoHS)	1	C144	B3F	
138	3101051590000	Chip capacitor 1.5PF B 50V (RoHS)	1	C431	B3A	
139	3101050200010	Chip capacitor 2PF B 50V (RoHS)	1	C401	B2F	U1
140	3101050500010	Chip capacitor 5PF B 50V (RoHS)	1	C401	B2F	U2
141	3101050200010	Chip capacitor 2PF B 50V (RoHS)	1	C428	B3A	
142	3101050200010	Chip capacitor 2PF B 50V (RoHS)	1	C433	B3A	
143	3101050200010	Chip capacitor 2PF B 50V (RoHS)	1	C449	B3G	
144	3101050200010	Chip capacitor 2PF B 50V (RoHS)	1	C502	B2B	
145	3199052290000	Chip capacitor 2.2PF B 50V (RoHS)	1	C110	B3E	U1
146	3101050200010	Chip capacitor 2PF B 50V (RoHS)	1	C110	B3E	U2
147	3101050300000	Chip capacitor 3PF B 50V (RoHS)	1	C130	B3E	U1
148	3101052790000	Chip capacitor 2.7PF C 50V (RoHS)	1	C130	B3E	U2
149	3101050300000	Chip capacitor 3PF B 50V (RoHS)	1	C501	B2B	
150	3101053690000	Chip capacitor 3.6PF B 50V (RoHS)	1	C432	B3A	U1
151	3101052490010	Chip capacitor 2.4PF B 50V (RoHS)	1	C432	B3A	U2
152	3199054790000	Chip capacitor 4.7PF C 50V (RoHS)	1	C430	B3A	U1
153	3101054790040	Chip capacitor 4.7PF B 50V (RoHS)	1	C430	B3A	U2
154	3101050600010	Chip capacitor 6PF B 50V (RoHS)	1	C148	B3E	U1
155	3101055690080	Chip capacitor 5.6PF C 50V (RoHS)	1	C148	B3E	U2
156	3101050600010	Chip capacitor 6PF B 50V (RoHS)	1	C453	B2F	U1
157	3101052200010	Chip capacitor 22PF J 50V (RoHS)	1	C453	B2F	U2
158	3101050900000	Chip capacitor 9PF B 50V (RoHS)	1	C112	B3F	U1
159	3101050800000	Chip capacitor 8PF B 50V (RoHS)	1	C112	B3F	U2
160	3101051000020	Chip capacitor 10PF J 50V (RoHS)	1	C103	B5G	
161	3101051000020	Chip capacitor 10PF J 50V (RoHS)	1	C104	B4G	
162	3101051000020	Chip capacitor 10PF J 50V (RoHS)	1	C107	B3E	
163	3101051000020	Chip capacitor 10PF J 50V (RoHS)	1	C118	B4G	
164	3101051000020	Chip capacitor 10PF J 50V (RoHS)	1	C151	B3F	
165	3101051000020	Chip capacitor 10PF J 50V (RoHS)	1	C414	B4F	
166	3101051000020	Chip capacitor 10PF J 50V (RoHS)	1	C439	B2F	
167	3101051000020	Chip capacitor 10PF J 50V (RoHS)	1	C448	B3G	
168	3101051000020	Chip capacitor 10PF J 50V (RoHS)	1	C452	B3G	
169	3101051000020	Chip capacitor 10PF J 50V (RoHS)	1	C530	T2H	U1
170	3101051500020	Chip capacitor 15PF J 50V (RoHS)	1	C530	T2H	U2
171	3101051000020	Chip capacitor 10PF J 50V (RoHS)	1	C556	B4G	
172	3101054700010	Chip capacitor 47PF J 50V (RoHS)	1	C314	B4D	
173	3101054700010	Chip capacitor 47PF J 50V (RoHS)	1	C315	B4H	
174	3101054700010	Chip capacitor 47PF J 50V (RoHS)	1	C404	B2E	

No.	Part No.	Description	Qty.	Ref No.	Print No.	Remark
175	3101051500020	Chip capacitor 15PF J 50V (RoHS)	1	C421	B3B	U1
176	3101051200020	Chip capacitor 12PF J 50V (RoHS)	1	C421	B3B	U2
177	3101051500020	Chip capacitor 15PF J 50V (RoHS)	1	C544	B3H	U1
178	3101054790040	Chip capacitor 4.7PF B 50V (RoHS)	1	C544	B3H	U2
179	3101051500020	Chip capacitor 15PF J 50V (RoHS)	1	C638	T2E	
180	3101051500020	Chip capacitor 15PF J 50V (RoHS)	1	C639	T2F	
181	3101053300000	Chip capacitor 33PF J 50V (RoHS)	1	C415	B3D	U1
182	3101053900000	Chip capacitor 39PF J 50V (RoHS)	1	C415	B3D	U2
183	3101053300000	Chip capacitor 33PF J 50V (RoHS)	1	C526	B3H	
184	3101051010030	Chip capacitor 100PF J 50V (RoHS)	1	C117	B3F	
185	3101051010030	Chip capacitor 100PF J 50V (RoHS)	1	C119	B4F	
186	3101051010030	Chip capacitor 100PF J 50V (RoHS)	1	C121	B4F	
187	3101051010030	Chip capacitor 100PF J 50V (RoHS)	1	C124	B4F	
188	3101051010030	Chip capacitor 100PF J 50V (RoHS)	1	C125	B4F	
189	3101051010030	Chip capacitor 100PF J 50V (RoHS)	1	C127	B4G	
190	3101051010030	Chip capacitor 100PF J 50V (RoHS)	1	C131	B4E	
191	3101051010030	Chip capacitor 100PF J 50V (RoHS)	1	C150	B3F	
192	3101051010030	Chip capacitor 100PF J 50V (RoHS)	1	C152	B3F	
193	3101051010030	Chip capacitor 100PF J 50V (RoHS)	1	C202	B2E	
194	3101051010030	Chip capacitor 100PF J 50V (RoHS)	1	C512	B2B	
195	3101051010030	Chip capacitor 100PF J 50V (RoHS)	1	C516	B1E	
196	3101051010030	Chip capacitor 100PF J 50V (RoHS)	1	C523	B2H	
197	3101051010030	Chip capacitor 100PF J 50V (RoHS)	1	C614	T3G	
198	3101051010030	Chip capacitor 100PF J 50V (RoHS)	1	C629	T4E	
199	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C142	B3E	
200	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C147	B3F	
201	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C209	T5D	
202	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C403	T2B	
203	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C405	B2E	
204	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C410	B2F	
205	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C411	B2F	
206	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C416	B3D	
207	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C424	B2D	
208	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C426	T2B	
209	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C440	B3B	
210	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C443	T2B	
211	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C444	T3B	
212	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C445	T2A	
213	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C446	T2B	
214	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C447	T2B	
215	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C450	B4G	
216	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C504	B2G	
217	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C506	T2G	
218	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C509	B2G	

No.	Part No.	Description	Qty.	Ref No.	Print No.	Remark
219	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C522	B4H	
220	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C524	B2H	
221	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C553	B4H	
222	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C562	B3H	
223	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C601	T3A	
224	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C611	T3E	
225	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C622	T4G	
226	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C623	T4A	
227	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C624	T4B	
228	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C625	T4A	
229	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C626	T4B	
230	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C631	T2E	
231	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C632	T2D	
232	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C633	T2C	
233	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C636	T2E	
234	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C641	T1B	
235	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C644	T2D	
236	3101054710010	Chip capacitor 470PF K 50V (RoHS)	1	C657	T4D	
237	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C102	B5G	
238	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C105	B4E	
239	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C111	B4G	
240	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C120	B4H	
241	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C126	B4H	
242	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C133	B2E	
243	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C139	B3E	
244	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C141	B2E	
245	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C145	B3E	
246	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C215	B4F	
247	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C216	T3D	
248	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C219	T3D	
249	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C412	B2D	
250	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C413	B3D	
251	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C417	B2C	
252	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C425	B2B	
253	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C427	B2B	
254	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C518	B4G	
255	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C539	B3I	
256	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C558	B3H	
257	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C563	B2H	
258	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C604	B4C	
259	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C605	T2E	
260	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C608	T4D	
261	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C613	T4D	
262	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C616	T2G	

No.	Part No.	Description	Qty.	Ref No.	Print No.	Remark
263	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C617	T5D	
264	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C619	T2H	
265	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C620	T2H	
266	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C640	T4C	
267	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C648	T2G	
268	3101051020010	Chip capacitor 1000PF K 50V (RoHS)	1	C651	T4C	
269	3101054720000	Chip capacitor 4700PF K 50V (RoHS)	1	C204	T4E	
270	3101054720000	Chip capacitor 4700PF K 50V (RoHS)	1	C549	T3H	
271	3101054720000	Chip capacitor 4700PF K 50V (RoHS)	1	C554	B4H	
272	3101054720000	Chip capacitor 4700PF K 50V (RoHS)	1	C561	B4H	
273	3101054720000	Chip capacitor 4700PF K 50V (RoHS)	1	C647	T5E	
274	3101051030020	Chip capacitor 0.01UF K 25V (RoHS)	1	C138	B2E	
275	3101051030020	Chip capacitor 0.01UF K 25V (RoHS)	1	C437	B3B	
276	3101051030020	Chip capacitor 0.01UF K 25V (RoHS)	1	C508	T2G	
277	3101051030020	Chip capacitor 0.01UF K 25V (RoHS)	1	C510	T2H	
278	3101051030020	Chip capacitor 0.01UF K 25V (RoHS)	1	C513	T2G	
279	3101051030020	Chip capacitor 0.01UF K 25V (RoHS)	1	C514	T2H	
280	3101051030020	Chip capacitor 0.01UF K 25V (RoHS)	1	C540	B3I	
281	3101051030020	Chip capacitor 0.01UF K 25V (RoHS)	1	C552	T3H	
282	3101051030020	Chip capacitor 0.01UF K 25V (RoHS)	1	C559	T3H	
283	3101051030020	Chip capacitor 0.01UF K 25V (RoHS)	1	C607	T4D	
284	3101051030020	Chip capacitor 0.01UF K 25V (RoHS)	1	C612	T4D	
285	3101051030020	Chip capacitor 0.01UF K 25V (RoHS)	1	C635	T2E	
286	3101051030020	Chip capacitor 0.01UF K 25V (RoHS)	1	C637	T2F	
287	3101051030020	Chip capacitor 0.01UF K 25V (RoHS)	1	C645	T5C	
288	3101051030020	Chip capacitor 0.01UF K 25V (RoHS)	1	C646	T5C	
289	3101051030020	Chip capacitor 0.01UF K 25V (RoHS)	1	C656	T5G	
290	3101052230000	Chip capacitor 0.022UF K 16V (RoHS)	1	C550	T3H	
291	3101052230000	Chip capacitor 0.022UF K 16V (RoHS)	1	C642	T3G	
292	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C123	B5H	
293	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C134	B3E	
294	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C135	B2F	
295	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C146	B3F	
296	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C217	T2D	
297	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C218	T2D	
298	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C304	T3A	
299	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C311	T3A	
300	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C312	T3A	
301	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C313	T3A	
302	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C316	T3B	U1
303	3101053330000	Chip capacitor 0.033UF K 16V (RoHS)	1	C316	T3B	U2
304	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C422	T2B	
305	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C436	B3B	
306	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C438	T2A	

No.	Part No.	Description	Qty.	Ref No.	Print No.	Remark
307	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C441	T3B	
308	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C519	T3H	
309	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C520	B4H	
310	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C528	B3G	
311	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C537	T4G	
312	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C546	B2G	
313	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C555	B4H	
314	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C557	T4I	
315	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C560	T3I	
316	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C603	B4C	
317	3101051040060	Chip capacitor 0.1UF K 16V X7R (RoHS)	1	C654	T4D	
318	3101052240010	Chip capacitor 0.22UF Z 10V Y5V (RoHS)	1	C208	T5D	
319	3101052240010	Chip capacitor 0.22UF Z 10V Y5V (RoHS)	1	C649	T5D	
320	3101052240010	Chip capacitor 0.22UF Z 10V Y5V (RoHS)	1	C653	T4D	
321	3101051050000	Chip capacitor 1UF K 6.3V (RoHS)	1	C203	T4E	
322	3101051050000	Chip capacitor 1UF K 6.3V (RoHS)	1	C207	T4E	U1
323	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C207	T4E	U2
324	3101051050000	Chip capacitor 1UF K 6.3V (RoHS)	1	C547	B3G	
325	3101051050000	Chip capacitor 1UF K 6.3V (RoHS)	1	C627	T4E	
326	3101051050000	Chip capacitor 1UF K 6.3V (RoHS)	1	C628	T4E	
327	3101051050000	Chip capacitor 1UF K 6.3V (RoHS)	1	C630	T3E	
328	3101051050000	Chip capacitor 1UF K 6.3V (RoHS)	1	C634	T2E	
329	3101064740000	Chip capacitor 0.47UF K 25V (RoHS)	1	C302	T3B	
330	3101061050020	Chip capacitor 1UF K 25V (RoHS)	1	C609	T5D	
331	3101061050020	Chip capacitor 1UF K 25V (RoHS)	1	C610	T4D	
332	3101061050020	Chip capacitor 1UF K 25V (RoHS)	1	C615	T2G	
333	3101061050020	Chip capacitor 1UF K 25V (RoHS)	1	C621	T2H	
334	3101062250000	Chip capacitor 2.2UF K 10V (RoHS)	1	C618	T5D	
335	3104071050070	Tantalum capacitor 1UF M 16V (RoHS)	1	C420	B2C	
336	3104074750070	Tantalum capacitor 4.7UF M 10V (RoHS)	1	C128	B4G	
337	3104074750070	Tantalum capacitor 4.7UF M 10V (RoHS)	1	C140	B3E	
338	3104074750070	Tantalum capacitor 4.7UF M 10V (RoHS)	1	C201	T2E	
339	3104074750070	Tantalum capacitor 4.7UF M 10V (RoHS)	1	C206	T4E	
340	3104074750070	Tantalum capacitor 4.7UF M 10V (RoHS)	1	C305	T3A	
341	3104074750070	Tantalum capacitor 4.7UF M 10V (RoHS)	1	C442	T3A	
342	3104074750070	Tantalum capacitor 4.7UF M 10V (RoHS)	1	C602	B5B	
343	3104074750070	Tantalum capacitor 4.7UF M 10V (RoHS)	1	C606	T4C	
344	3104074750070	Tantalum capacitor 4.7UF M 10V (RoHS)	1	C643	T4C	
345	3102992000040	Trimmer capacitor 10pF ±2.5pF 55V (RoHS)	1	TC101	B3E	
346	3210305479000	Multi-layer chip inductor 4.7nH S 300mA 0.18ohm (RoHS)	1	L513	B1E	
347	3210305150010	Multi-layer chip inductor 15nH J 300mA 0.32ohm (RoHS)	1	C515	B1E	
348	3210305150010	Multi-layer chip inductor 15nH J 300mA 0.32ohm (RoHS)	1	L504	B2H	
349	3210305150010	Multi-layer chip inductor 15nH J 300mA 0.32ohm (RoHS)	1	L511	B3H	U1
350	3210305180000	Multi-layer chip inductor 18nH J 300mA 0.36ohm (RoHS)	1	L511	B3H	U2

No.	Part No.	Description	Qty.	Ref No.	Print No.	Remark
351	3210305220000	Multi-layer chip inductor 22nH J 300mA 0.42ohm (RoHS)	1	L111	B4F	
352	3210305220000	Multi-layer chip inductor 22nH J 300mA 0.42ohm (RoHS)	1	L114	B3G	
353	3210305220000	Multi-layer chip inductor 22nH J 300mA 0.42ohm (RoHS)	1	L401	B2E	
354	3210305220000	Multi-layer chip inductor 22nH J 300mA 0.42ohm (RoHS)	1	L404	B3F	
355	3210305220000	Multi-layer chip inductor 22nH J 300mA 0.42ohm (RoHS)	1	L416	B2F	
356	3210305220000	Multi-layer chip inductor 22nH J 300mA 0.42ohm (RoHS)	1	L516	T2H	U1
357	3210305390000	Multi-layer chip inductor 39nH J 200mA 0.65ohm(RoHS)	1	L516	T2H	U2
358	3210305101000	Multi-layer chip inductor 100nH J 150mA 1.25ohm(RoHS)	1	L517	B2H	
359	3210305101000	Multi-layer chip inductor 100nH J 150mA 1.25ohm (RoHS)	1	R509	T2G	
360	3210305101000	Multi-layer chip inductor 100nH J 150mA 1.25ohm(RoHS)	1	R510	T2G	
361	3210305101000	Multi-layer chip inductor 100nH J 150mA 1.25ohm(RoHS)	1	R513	T2G	
362	3210305101000	Multi-layer chip inductor 100nH J 150mA 1.25ohm (RoHS)	1	R514	T2G	
363	3210306479000	Multi-layer chip inductor 4.7nH S 450mA 0.20ohm (RoHS)	1	L405	B2D	
364	3210306479000	Multi-layer chip inductor 4.7nH S 450mA 0.20ohm (RoHS)	1	L408	B3D	U1
365	3210306569000	Multi-layer chip inductor 5.6nH S 430mA 0.20ohm (RoHS)	1	L408	B3D	U2
366	3210305399000	Multi-layer chip inductor 3.9nH S 300mA 0.18ohm (RoHS)	1	R414	B3C	U1
367	3001060000000	Chip resistor 0Ω J 1/10W (RoHS)	1	R414	B3C	U2
368	3213306561000	Multi-layer chip inductor 0.56uH K 35mA 1.55Ω Q:15(RoHS)	1	L411	B2B	
369	3213306102000	Multi-layer chip inductor 1uH K 25mA 0.6Ω Q:35(RoHS)	1	L110	B4G	
370	3213306102000	Multi-layer chip inductor 1uH K 25mA 0.6Ω Q:35(RoHS)	1	L201	T4D	
371	3213306222000	Multi-layer chip inductor 2.2uH K 15mA 1.15Ω Q:35(RoHS)	1	L509	B3H	
372	3213306332000	Multi-layer chip inductor 3.3uH K 15mA 1.55Ω Q:35(RoHS)	1	L102	B4E	
373	3213306332000	Multi-layer chip inductor 3.3uH K 15mA 1.55Ω Q:35(RoHS)	1	L103	B4E	
374	3221506601000	Bead 600Ω 100MHz ±25% 500mA (RoHS)	1	L101	B4E	
375	3221506601000	Bead 600Ω 100MHz ±25% 500mA (RoHS)	1	L106	B2E	
376	3221506601000	Bead 600Ω 100MHz ±25% 500mA (RoHS)	1	L107	B4H	
377	3221506601000	Bead 600Ω 100MHz ±25% 500mA (RoHS)	1	L108	B3G	
378	3221506601000	Bead 600Ω 100MHz ±25% 500mA (RoHS)	1	L109	B4G	
379	3221506601000	Bead 600Ω 100MHz ±25% 500mA (RoHS)	1	L113	B3G	
380	3221506601000	Bead 600Ω 100MHz ±25% 500mA (RoHS)	1	L202	T5D	
381	3221506601000	Bead 600Ω 100MHz ±25% 500mA (RoHS)	1	L417	B2E	
382	3221506601000	Bead 600Ω 100MHz ±25% 500mA (RoHS)	1	L602	T2E	
383	3221506601000	Bead 600Ω 100MHz ±25% 500mA(RoHS)	1	L603	T3D	
384	3221506601000	Bead 600Ω 100MHz ±25% 500mA(RoHS)	1	L605	T4E	
385	3221506601000	Bead 600Ω 100MHz ±25% 500mA (RoHS)	1	L606	T4E	
386	3221507600000	Bead 60Ω 100MHz ±25% 3000mA (RoHS)	1	L410	B3B	
387	3221507600000	Bead 60Ω 100MHz ±25% 3000mA (RoHS)	1	L601	T4B	
388	3221507600000	Bead 60Ω 100MHz ±25% 3000mA (RoHS)	1	L607	T4C	
389	3221507221000	Bead 220Ω 100MHz ±25% 2000mA (RoHS)	1	L407	B3D	
390	3231301250000	Air-core inductor E2-0.30*1.2*5TL (RoHS)	1	L406	B3D	
391	3210108270000	Wire-wound chip inductor 27nH J 560mA 0.051ohm (RoHS)	1	L104	B3E	U1
392	3210108230010	Wire-wound chip inductor 23nH J 590mA 0.046ohm (RoHS)	1	L104	B3E	U2
393	3210209102010	Wire-wound chip inductor 1uH M 445mA 0.5ohm （RoHS）	1	L415	B2A	
394	3231351640000	Air-core inductor E2-0.35*1.6*4TL(RoHS)	1	L412	B3A	

No.	Part No.	Description	Qty.	Ref No.	Print No.	Remark
395	3231351640000	Air-core inductor E2-0.35*1.6*4TL(RoHS)	1	L413	B3A	
396	3231351640000	Air-core inductor E2-0.35*1.6*4TL(RoHS)	1	L414	B3A	
397	3231351640000	Air-core inductor E2-0.35*1.6*4TL(RoHS)	1	L501	B2B	
398	3231351650000	Air-core inductor E2-0.35*1.6*5TL(RoHS)	1	L409	B3B	
399	3304060300050	Varactor HVC350BTRF-E (RoHS)	1	D101	B4E	
400	3304060300050	Varactor VR:15V 16.4pF/1VR 5.5pF/4VR(RoHS)	1	D102	B4E	
401	3304040200000	Varactor VR:30V 19.7pF/1VR 2.1pF/28VR(RoHS)	1	D103	B3E	
402	3303030800040	Switching diode 35V 100mA 0.8V/10mA (RoHS)	1	D501	B2B	
403	3303060300010	Switching diode 60V 100mA 0.8V/10mA(RoHS)	1	D105	B3E	
404	3303060300010	Switching diode 60V 100mA 0.8V/10mA (RoHS)	1	D502	B1F	
405	3303060300010	Switching diode 60V 100mA 0.8V/10mA (RoHS)	1	D503	B1F	
406	3303060300010	Switching diode 60V 100mA 0.8V/10mA (RoHS)	1	D504	B1H	
407	3303060300010	Switching diode 60V 100mA 0.8V/10mA (RoHS)	1	D505	B1H	
408	3303060300010	Switching diode 60V 100mA 0.8V/10mA (RoHS)	1	D616	B2F	
409	3303060300010	Switching diode 60V 100mA 0.8V/10mA(RoHS)	1	D617	B2G	
410	3307110100080	LED 15mcd 25mA 2.2V (RoHS)	1	D601	T4A	
411	3307110100080	LED 15mcd 25mA 2.2V (RoHS)	1	D603	B5A	
412	3307110100060	LED 200mcd 30mA 1.9V (RoHS)	1	D602	T4A	
413	3307110100060	LED 200mcd 30mA (RoHS)	1	D604	B5A	
414	3309030600000	Zener Diode 6.1V (RoHS)	1	D605	T4B	
415	3411002000020	NPN transistor 50V 150mA (RoHS)	1	Q101	B2E	
416	3411002000020	NPN transistor 50V 150mA (RoHS)	1	Q608	T4D	
417	3404002000000	NPN transistor 20V 100mA (RoHS)	1	Q102	B3F	
418	3403008000010	BRT Vce:50V VIoff:0.5V VIon:3V 100mA(RoHS)	1	Q103	B2F	
419	3403008000010	BRT Vce:50V VIoff:0.5V VIon:3V 100mA(RoHS)	1	Q405	T2B	
420	3403008000010	BRT Vce:50V VIoff:0.5V VIon:3V 100mA(RoHS)	1	Q501	T2G	
421	3403008000010	BRT Vce:50V VIoff:0.5V VIon:3V 100mA(RoHS)	1	Q604	T2G	
422	3403008000010	BRT Vce:50V VIoff:0.5V VIon:3V 100mA(RoHS)	1	Q605	T4F	
423	3401002000990	NPN transistor10V 30mA (RoHS)	1	Q104	B4F	
424	3401002000990	NPN transistor10V 30mA (RoHS)	1	Q105	B3F	
425	3401001000490	PNP transistor 50V 150mA (RoHS)	1	Q201	T3D	
426	3401001000490	PNP transistor 50V 150mA (RoHS)	1	Q607	T5G	
427	3503020000030	N-MOSFET VDS:30V ID:100mA VGS(th):3.0V(RoHS)	1	Q202	T2D	
428	3408002000030	NPN transistor 12V 100mA (RoHS)	1	Q401	B2F	
429	3408002000030	NPN transistor 12V 100mA (RoHS)	1	Q406	B3F	
430	3408002000030	NPN transistor 12V 100mA (RoHS)	1	Q505	B3H	
431	3408002000030	NPN transistor 12V 100mA (RoHS)	1	Q506	B3H	
432	3502010000130	N-MOSFET VDS:10V ID:500mA VGS(th):0.7V(RoHS)	1	Q402	B3D	
433	3403007000020	BRT Vce:50V VIoff:0.3V VIon:1.4V 70mA (RoHS)	1	Q404	T2B	
434	3403007000020	BRT Vce:50V VIoff:0.3V VIon:1.4V 70mA (RoHS)	1	Q502	T2G	
435	3410001000020	PNP transistor 15V 500mA 135~600 (RoHS)	1	Q601	T2G	
436	3410001000020	PNP transistor 15V 500mA 135~600 (RoHS)	1	Q602	T2H	
437	4301080000020	Momentary contact switch 12VDC 0.05A (RoHS)	1	SW601	T3A	
438	4301080000090	Momentary contact switch 12VDC 0.05A (RoHS)	1	SW604	T1B	

No.	Part No.	Description	Qty.	Ref No.	Print No.	Remark
439	4301080000090	Momentary contact switch 12VDC 0.05A (RoHS)	1	SW605	T1D	
440	3602999000000	Audio amplifier 1W 2.2~5.5V 62dB (RoHS)	1	U301	T3A	
441	3605008005070	Operational amplifier3~32V 300mW 100dB (RoHS)	1	U401	T2B	
442	3610999000060	SCM 100Pin (RoHS)	1	U601	T3F	
443	3609049000010	Power management IC LDO 3V 300mA(RoHS)	1	U602	T5D	
444	3612031000510	Memory EEPROM 16KB 1.8~5.5V(RoHS)	1	U603	T4G	
445	3609006000000	Reset IC 2.7V (RoHS)	1	U605	T5E	
446	3701212540030	TCXO 21.25MHz 2.8~3.0V ±1.5ppm (RoHS)	1	XT101	B4G	
447	6201648000000	VCO shielding mask 0.30mm 00 (RoHS)	1			
448	6201651000000	Filter shielding mask 0.20mm 00 (RoHS)	1			
449	7000183000000	Heat-sinking device3*5*1.5mm 00 (RoHS)	1			
450	3001053330000	Chip resistor 33KΩ F 1/16W (RoHS)	1	R125	B4H	
451	3210305330000	Multi-layer chip inductor 33nH J 200mA 0.58ohm(RoHS)	1	L503	B2H	
452	3001056820000	Chip resistor 6.8KΩ J 1/16W (RoHS)	1	R208	T4D	
453	3001056820000	Chip resistor 6.8KΩ J 1/16W (RoHS)	1	R524	B4H	
454	3001056820000	Chip resistor 6.8KΩ J 1/16W (RoHS)	1	R529	B2G	
455	5205006000010	Earpiece jack LGK1503-03xx (RoHS)	1	J202	B4C	
456	3399990000080	Zener Diode 6.8V (RoHS)	1	D301	T3A	
457	3399990000080	Zener Diode 6.8V (RoHS)	1	D402	B2D	
458	3399990000080	Zener Diode 6.8V (RoHS)	1	D403	B3C	
459	3399990000080	Zener Diode 6.8V (RoHS)	1	D607	B4C	
460	3399990000080	Zener Diode 6.8V (RoHS)	1	D608	B4D	
461	3399990000080	Zener Diode 6.8V (RoHS)	1	D610	T4H	
462	3701327610060	Crystal 32.768KHz ±20ppm 12.5pF (RoHS)	1	X601	T2F	
463	3002991030160	Trimmer resistor 10K ±25% 0.15W (RoHS)	1	VR101	B4H	
464	3001058200000	Chip resistor 82Ω F 1/16W (RoHS)	1	R526	B3G	
465	3001064710000	Chip resistor 470Ω J 1/10W (RoHS)	1	R609	B5A	
466	3001064710000	Chip resistor 470Ω J 1/10W (RoHS)	1	R634	B5A	
467	3101050390000	Chip capacitor 0.3PF B 50V (RoHS)	1	C534	B3H	
468	3101051040010	Chip capacitor 0.1UF Z 25V (RoHS)	1	C220	T3D	U1
469	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C220	T3D	U2
470	3101051040010	Chip capacitor 0.1UF Z 25V (RoHS)	1	C536	B2G	U1
471	3101051040060	Chip capacitor 0.1UF K 16V (RoHS)	1	C536	B2G	U2
472	3101051800010	Chip capacitor 18PF J 50V (RoHS)	1	C106	B4E	U1
473	3101051200020	Chip capacitor 12PF J 50V (RoHS)	1	C106	B4E	U2
474	3101052700000	Chip capacitor 27PF J 50V (RoHS)	1	C418	B3B	U1
475	3101054700010	Chip capacitor 47PF J 50V (RoHS)	1	C418	B3B	U2
476	3101052700000	Chip capacitor 27PF J 50V (RoHS)	1	C517	B2H	U1
477	3101052200010	Chip capacitor 22PF J 50V (RoHS)	1	C517	B2H	U2
478	3210105100000	Multi-layer chip inductor 10nH J 300mA 0.26ohm (RoHS)	1	L508	B3H	U1
479	3210305120000	Multi-layer chip inductor 12nH J 300mA 0.28ohm(RoHS)	1	L508	B3H	U2
480	3210105100000	Multi-layer chip inductor 10nH J 300mA 0.26ohm (RoHS)	1	L514	B3H	U1
481	3210305120000	Multi-layer chip inductor 12nH J 300mA(RoHS)	1	L514	B3H	U2
482	3418001000010	NPN transistor10V 50mA 150 (RoHS)	1	Q503	B2H	

No.	Part No.	Description	Qty.	Ref No.	Print No.	Remark
483	41003203000H0	PCB board 4L 4P H (RoHS)	1	PCB		
484	3101051810010	Chip capacitor 180p J 50V (RoHS)	1	C507	B3G	
485	3101050100030	Chip capacitor 1PF B 50V (RoHS)	1	C423	B3B	U1
486	3101050300000	Chip capacitor 3PF B 50V (RoHS)	1	C423	B3B	U2
487	3101050100030	Chip capacitor 1PF B 50V (RoHS)	1	C527	T2H	
488	3101050100030	Chip capacitor 1PF B 50V (RoHS)	1	C545	B3H	U1
489	1616100001420	Built-in software for HYT conventioanl portable radio(RoHS)	1	C545		U2
490	3001051820000	Chip resistor 1.8KΩ J 1/16W (RoHS)	1	R114	B3E	
491	3001055620000	Chip resistor 5.6KΩ J 1/16W (RoHS)	1	R117	B3F	U1
492	3001057520000	Chip resistor 7.5KΩ J 1/16W (RoHS)	1	R117	B3F	U2
493	3001064730000	Chip resistor 47KΩ J 1/10W (RoHS)	1	R411	B2D	U1
494	3001062730000	Chip resistor 27KΩ D 1/10W (RoHS)	1	R411	B2D	U2
495	3001061830000	Chip resistor 18KΩ D 1/10W (RoHS)	1	R412	B2D	
496	3001066830000	Chip resistor 68KΩ J 1/10W (RoHS)	1	R417	B2C	U1
497	3001064730000	Chip resistor 47KΩ J 1/10W (RoHS)	1	R417	B2C	U2
498	3101058200000	Chip capacitor 82PF J 50V (RoHS)	1	C538	T4G	
499	3101052400010	Chip capacitor 24PF J 50V (RoHS)	1	C541	B3H	
500	3104071060080	Tantalum capacitor 10UF M 6.3V (RoHS)	1	C132	B4G	
501	3303240000000	Switching diode 75V 200mA 1.25V 6ns(RoHS)	1	D104	B3E	
502	3504990000040	Power amplifier MOSFET 10uA 25V 10uA 7.2V 7W(RoHS)	1	Q403	B3C	
503	3101050500010	Chip capacitor 5PF B 50V (RoHS)	1	C434	B3A	U1
504	3101050300000	Chip capacitor 3PF B 50V (RoHS)	1	C434	B3A	U2
505	3101050500010	Chip capacitor 5PF B 50V (RoHS)	1	C451	B4G	
506	3104081550030	Tantalum capacitor 1.5UF M 16V (RoHS)	1	C115	B5E	
507	3101061300000	Chip capacitor 13PF J 50V (RoHS)	1	C419	B2B	U1
508	3101061200000	Chip capacitor 12PF J 50V (RoHS)	1	C419	B2B	U2
509	3101061040020	Chip capacitor 0.1UF Z 25V (RoHS)	1	C114	B4F	
510	3101061040020	Chip capacitor 0.1UF Z 25V (RoHS)	1	C116	B5E	
511	3101064710000	Chip capacitor 470PF K 50V (RoHS)	1	C655	T4F	
512	3001052200000	Chip resistor 22Ω J 1/16W (RoHS)	1	R639	T5D	
513	3303030300000	Schottky barrier diode 40V 30mA 0.26V/1mA (RoHS)	1	D612	T5E	
514	3303030300000	Schottky barrier diode 40V 30mA 0.26V/1mA (RoHS)	1	D619	T3H	
515	3101054740000	Chip capacitor 0.47UF Z 6.3V(RoHS)	1	C548	T3G	U1
516	3101051050000	Chip capacitor 1UF K 6.3V(RoHS)	1	C548	T3G	U2
517	3101054740000	Chip capacitor 0.47UF Z 6.3V Y5V(RoHS)	1	C652	T4E	
518	3615042000010	Power management IC 4.2V 1.2A (RoHS)	1	U606	T4C	
519	3399990000260	Rectifier Diode 10V 15mA 380mV/1mA (RoHS)	1	D508	B1B	
520	3001058220000	Chip resistor 8.2KΩ J 1/16W (RoHS)	1	R407	T2B	
521	3001058220000	Chip resistor 8.2KΩ J 1/16W (RoHS)	1	R430	B3F	
522	3001055610000	Chip resistor 560Ω J 1/16W (RoHS)	1	R126	B3G	
523	3210305180000	Multi-layer chip inductor 18nH J 300mA 0.36ohm (RoHS)	1	L112	B3G	
524	3001051220000	Chip resistor 1.2KΩ J 1/16W(RoHS)	1	R523	B3H	
525	3001051220000	Chip resistor 1.2KΩ J 1/16W(RoHS)	1	R636	T3G	
526	3603042004860	IF processor IC 10.245MHz (RoHS)	1	U608	B4H	

No.	Part No.	Description	Qty.	Ref No.	Print No.	Remark
527	3001056810000	Chip resistor 680Ω J 1/16W (RoHS)	1	R515	B4H	
528	3404001000040	NPN transistor45V 100mA (RoHS)	1	Q611	T3H	
529	3604007000000	PLL IC 1.2GHZ(RoHS)	1	U101	B4G	
530	3001059120000	Chip resistor 9.1K J 1/16W (RoHS)	1	R635	T3G	U1
531	3001058220000	Chip resistor 8.2KΩ J 1/16W (RoHS)	1	R635	T3G	U2
532	3001052220010	Chip resistor 2.2KΩ F 1/16W (RoHS)	1	R502	T3H	U1
533	3001052220000	Chip resistor 2.2KΩ J 1/16W (RoHS)	1	R502	T3H	U2
534	3305180300000	Diode 100mA max 1Ω(RoHS)	1	D401	B2B	
535	5205005000100	USB connector 5Pin 0.5mm 9.9*9.2*4.0mm(RoHS)	1	J201	B4D	
536	3803040560030	SAW Filter 405MHz ±5MHz 3.5dB(RoHS)	1	SAWF50	G2	U1
537	3803045560000	SAW Filter 455MHz ±5MHz 4.5dB(RoHS)	1	SAWF50	G2	U2
538	3803041560000	SAW Filter 415MHz ±5MHz 3.5dB(RoHS)	1	SAWF50	G1	U1
539	3803046560040	SAW Filter 465MHz±6MHz 4.0dB(RoHS)	1	SAWF50	G1	U2
540	3803041060000	SAW Filter 410MHz ±10MHz 3.5dB(RoHS)	1	SAWF50	G2	U1
541	3803046060000	SAW Filter 460MHz ±10MHz 3.5dB(RoHS)	1	SAWF50	G2	U2
542	3920450300000	Frequency detector 100mv±40mv 450KHz ±4kHz	1	CD501	T4H	
543	3801045030390	Ceramic filter 450KHz ±6.0KHz	1	CF501	B4I	
544	3802021750090	Crystal filter UM-5 21.7MHz ±6KHZ	1	XF501	B3I	

Adjustment Description

Required Test Instruments:

Radio communication test set（HP8921）	1 set
10V/3A regulated DC power supply	1 set
Digital voltmeter	1 set
Ammeter	1 set

Preparations:

Place the board to be tested on the test fixture (please ensure good connection between each test point and the fixture), and connect the board to a power supply with DC voltage of 3.8V.

Wired Clone

1. Operations:

1) Connect two radios using a clone cable. Power on the source radio while holding down **SK**, and it will enter Wired Clone Mode after 2 seconds. The target radio can be directly turned on to enter user mode.

(2) In Wired Clone mode, press **SK** of the source radio to switch between User Clone Mode and Factory Clone Mode (check the Factory Clone Mode option when programming or you will fail to switch.).

3) Hold down **PTT** key of the source radio to clone data to the target radio. You can clone the data to multiple target radios in the same way.

2. LED Indications:

Status of the source radio:

During the cloning process, the LED solidly glows red. Once it finishes, the LED will solidly glow green.

Clone errors:

(1). User clone. Once clone begins, frequency band and radio ID (Model ID) will be checked. The LED glows orange for 2 seconds and then goes out to indicate a failed check. If the check is successfully carried out but error occurs during data cloning, the LED will flash orange. In this situation, press any key other than the **Power Switch** to turn it off.

(2) Factory Clone: If error occurs during data cloning, the LED will flash orange. In this situation, press any key other than the **Power Switch** to turn it off. Hold down **PTT** to initiate a new clone process.

Status of the target radio:

The LED solidly glows green during the cloning process and goes out once it finishes.

3. Differences between Factory Clone Mode and User Clone Mode:

(1) User Clone Mode: Only clone the data of user mode. Test parameters like adjustment frequencies, adjustment items and baseband parameters will not be cloned.

(2) Factory Clone Mode: Clone all the data excluding serial No.

4. Instructions:

(1) Error will occur when data is cloned without cable connection. Please refer to 2-(2).

(2) Error may occur during test data clone in Factory Clone Mode if you wrongly press the side key and switch into User Clone mode (LED flashes red once).

(3) If battery of the source radio runs low in clone mode, red LED will flash and low battery alert will be given as well.

Adjustment

1. Description of Adjustment Procedures:

(1) Power on the radio while holding down **PTT** and **SK** for more than 2s to enter adjustment mode (the LED flashes orange). After the keys are released, the radio will enter the adjustment item in this mode (the item entered depends on the position where the **Channel Selector** knob locates). And the LED will glow red/green for adjustment items in TX/RX groups respectively.

(2) Or connect the programming cable to the radio for real-time adjustment in PC mode.

2. Description of Adjustment Items:

(1) **Switch of Wide/Narrow Bandwidth and Frequency in an Adjustment Item:**

In an adjustment item, short press **SK** to switch between wide and narrow bandwidth. The default adjustment point is the first frequency (low frequency) of current bandwidth. Short press **PTT** to switch among different frequencies after selecting a bandwidth.

(2) **Adjustment Items Include:**

TX Items:

TX Frequency Tolerance and VCO Lock Voltage.

Note: These items are adjusted outside the adjustment mode via hardware.

TX Low Power, TX High Power, CDCSS Waveform, CDCSS Deviation, CTCSS Deviation (low), CTCSS Deviation (medium), CTCSS Deviation (high), TX Low Voltage Threshold and Max. Deviation.

Note: These items are adjusted inside the adjustment mode.

RX Items:

VCO Lock Voltage (outside the mode), Squelch and RX Low Voltage Threshold.

3. Specific Operations and Requirements:

(1) Conventional Adjustment Items (outside the adjustment mode): TX Frequency Tolerance, VCO Lock Voltage.

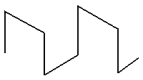
(Note: The configuration file has preset CH1, CH2 and CH3 as wide bandwidth with low, medium and high frequency respectively and CH4, CH5 and CH6 as narrow bandwidth with low, medium and high frequency respectively. Make sure the antenna or load is connected before adjustment.)

Item	Condition	Test		Adjustment		Specification/ Remarks
		Test Instrument	Test point	Part	Method	
TX Frequency Tolerance	Rotate the **Channel Selector** knob to CH1 and press **PTT** to transmit.	Communication test set	Antenna	VR101	Adjust VR101 with ceramic tuning tool to control the center frequency within the error range.	≤150Hz
TX VCO Lock Voltage	Rotate the **Channel Selector** knob to CH3 and press **PTT** to transmit.	Digital voltmeter	CV	TC101	Check	2.2V~2.6V
	Rotate the **Channel Selector** knob to CH1 and press **PTT** to transmit.				Check	≥0.5V

RX VCO Lock Voltage	Rotate the **Channel Selector** knob to CH3.			TC101	Adjust TC101 with ceramic tuning tool until the lock voltage meets the requirements.	2.2V~2.6V
	Rotate the **Channel Selector** knob to CH1.				Check	≥0.5V

(2) Adjustment in the Adjustment Mode (Note: Make sure the antenna or load is connected before adjustment; rotate the **Channel Selector** knob to save the adjusted values automatically.)

Item		**Condition**	**Test**		**Adjustment**		**Specification/ Remarks**
			Test Instrument	**Test point**	**Part**	**Method**	
TX Power	High Power	Rotate the **Channel Selector** knob to CH2 and select low frequency.	Communication Test Set / Ammeter	Antenna Connector		Press **[+]** or **[-]** key to adjust the output power, and rotate the **Channel Selector** knob to save it.	1.8-2.2W I≤1.4A
		Short press **PTT** key to switch among different frequencies (low, medium and high)					
	Low Power	Rotate the **Channel Selector** knob to CH1 and select low frequency.				Press **[+]** or **[-]** key to adjust the output power, and	0.5W±0.2W I≤0.8A

		Short press **PTT** key to switch among different frequencies (low, medium and high)				rotate the **Channel Selector** knob to save it.	
CDCSS Waveform		Rotate the **Channel Selector** knob to CH3 and “wide bandwidth” and “low frequency” are selected.	Communication test set BPF: <20Hz~300Hz	Antenna	VR601	Adjust the waveform to make it similar to square waveform.	
		Short press **PTT** to switch among frequencies; and long press **PTT** to switch between wide and narrow band.					
CDCSS Deviation	Wide Bandwidth	Rotate the **Channel Selector** knob to CH4 and “wide bandwidth” and “low frequency” are selected.				Press **[+]** or **[-]** key to make adjustment until the CDCSS deviation meets the requirements.	600~900Hz
		Short press **PTT** key to switch among different frequencies (low, medium and high)					

	Narrow Bandwidth	Short press **SK** key to enter the “narrow bandwidth” and select low frequency. Short press **PTT** key to switch among different frequencies (low, medium and high)				Press **[+]** or **[-]** key to make adjustments until the CDCSS deviation meets the requirements.	350~550Hz
CTCSS Deviation	Wide Bandwidth	Rotate the **Channel Selector** knob to CH5, CH6 and CH7 with CTCSS respectively corresponding to: low, medium and high frequencies. Short press **PTT** key to switch among different CTCSS frequencies on each channel.	Communication Test Set :<20Hz~300Hz	Antenna		Use **[+]** or **[-]** key to make slight adjustment until the CTCSS deviation meets the requirements.	600~900Hz

	Narrow Bandwidth	On CH5, CH6 and CH7, short press **SK** key to enter “narrow bandwidth”, and short press **PTT** key to switch among different frequencies.				Use **[+]** or **[-]** key to make slight adjustment until the CDCSS deviation meets the requirements.	350~550Hz
Maximum Frequency Deviation	Wide Bandwidth	Rotate the **Channel Selector** knob to CH9. Short press **SK** key to switch between wide and narrow bandwidth.	Communication Test Set BPF: <20Hz~15kHz AF:1kHz 120mV	Antenna Earpiece Socket		Use **[+]** or **[-]** key to ensure that the specifications meet the requirements. Rotate the **Channel Selector** knob to save the value after wide and narrow bandwidth adjustment.	3.7~4.3KHz
	Narrow Bandwidth						1.7～2.3KHz
Modulation Sensitivity	Wide Bandwidth	Rotate the **Channel Selector** knob to CH9. Short press **SK** key	Communication Test Set BPF:			Check	3.0KHz

	Narrow Bandwidth	to switch between wide and narrow bandwidth.	<20Hz~15kHz AF:1kHz 13±3mV				1.5KHz
TX Low Voltage Threshold	Rotate the **Channel Selector** knob to CH8.		Digital voltmeter	Power Supply Port	Power Supply	Adjust output voltage of the power supply to 3.42V, and press [+] or [-] key to sample the current value.	≤3.40V: the continuous alert tone will sound to indicate transmission inhibition.

(3) RX Circuit Adjustment

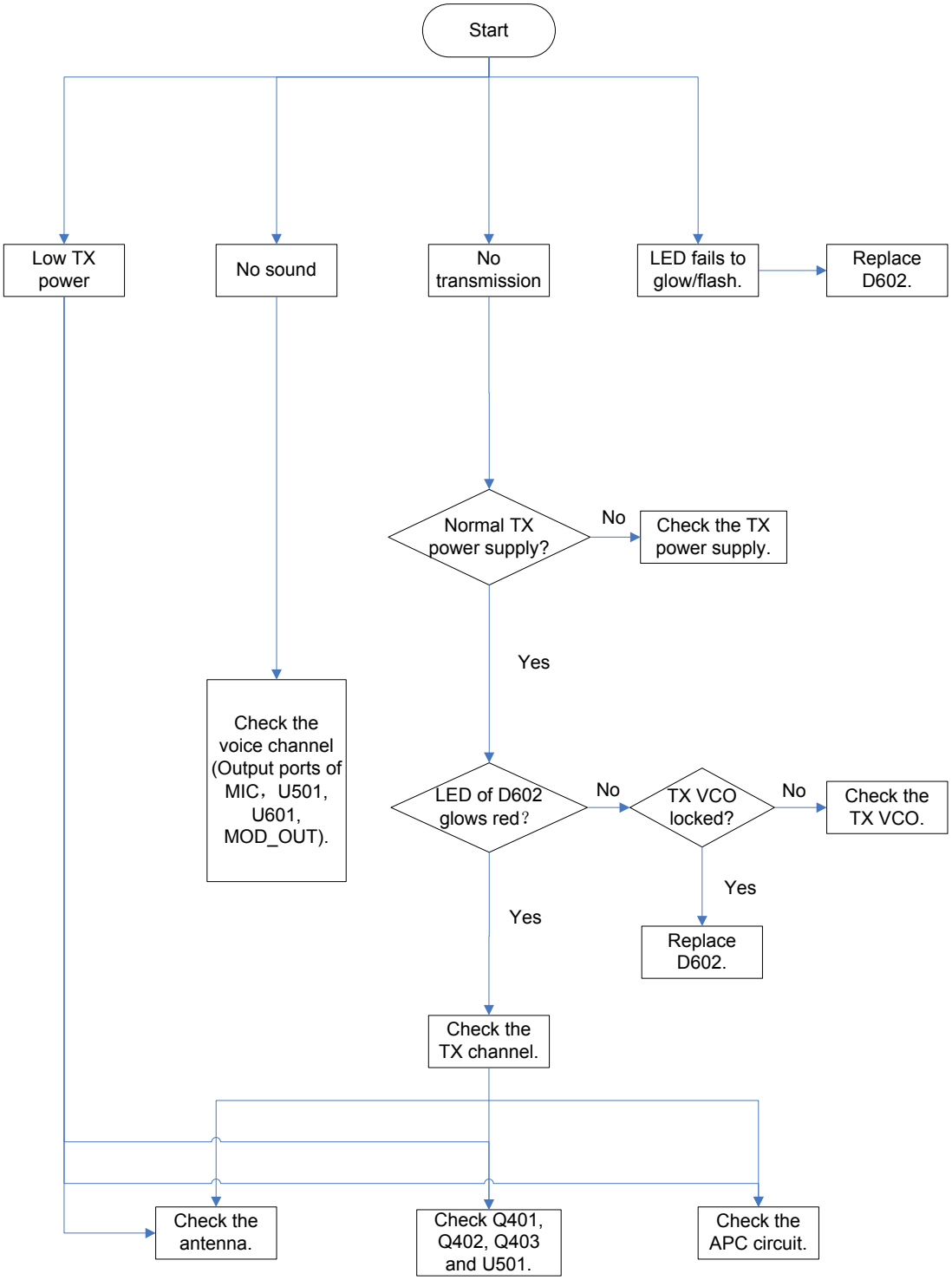
Item		Condition	Test Instrument	Part		Method	Specification/ Remarks
Squelch On	Wide Bandwidth	Rotate the **Channel Selector** knob to CH10 and SQL level 5 ON is set. Press **[+]** or **[-]** key to sample current value. At this time, wide bandwidth and low frequency are selected. Short press **PTT** key to switch the frequency (low, medium and high).	Communication Test Set SSG:-119dBm MOD:1KHz DEV:3KHz Filter: 0.3～3KHz	Antenna Earpiece Socket		Adjust the output signals of SSG to the squelch level. Rotate the **Channel Selector** knob to save the value after three-point adjustment.	Squelch level (Level 5): -121±1dBm

	Narrow Bandwidth	Short press SK to enter “narrow band”. Press [+] or [-] key to adjust squelch level. Short press PTT key to switch the frequency.(low, medium and high)	Communication Test Set SSG:-118dBm MOD:1KHz DEV: 1.5KHz Filter: 0.3～3KHz			Same as above.	Squelch level(Level 5): -120±1dBm
Squelch Off	Wide Bandwidth	Rotate the **Channel Selector** knob to CH11 and SQL level 5 ON is set. Press **[+]** or **[-]** key to sample current value. At this time, wide bandwidth and low frequency are selected. Short press **PTT** to switch the frequency.	Communication Test Set SSG:-121dBm MOD:1KHz DEV: 3KHz Filter: 0.3～3KHz	Antenna Earpiece Socket		Adjust the output signals of SSG to the squelch level. Rotate the **Channel Selector** knob to save the value after three-point adjustment.	Squelch level (Level 5): -122±1dBm
	Narrow Bandwidth	Short press **SK** to enter “narrow band”. Press **[+]** or **[-]** key to sample the current value. Short press **PTT** key to switch the frequency.	Communication Test Set SSG:-120dBm MOD:1KHz DEV: 1.5KHz Filter: 0.3～3KHz			Same as above.	Squelch level(Level 5): -121±1dBm
RX Low Voltage Threshold	Rotate the **Channel Selector** knob to CH12.		Digital voltmeter	Power Supply Port	Power Supply	Adjust output voltage of the power supply to 3.52V, and press **[+]** or **[-]** key to	Alert tone will not be given without red LED flashing when RX voltage is

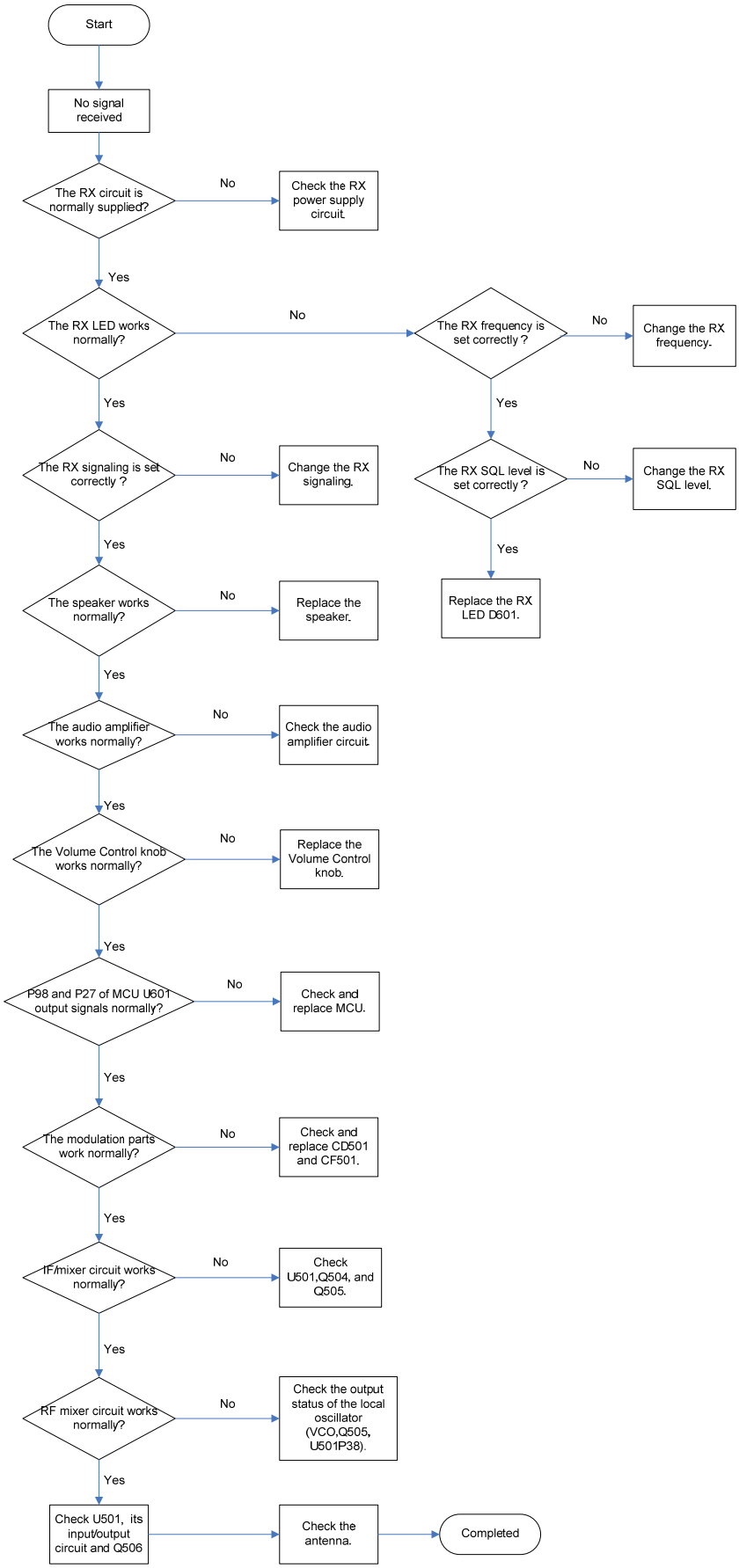
						sample the current value.	3.52V.
Sensitivity	Wide Bandwidth	High, medium, low frequency out of the mode	Communication Test Set SSG:-121dBm MOD:1KHz DEV: 3KHz Filter: 0.3～3KHz	Antenna Earpiece Socket		Check	-119dBm or above
	Narrow Bandwidth	High, medium, low frequency out of the mode	Communication Test Set SSG:-120dBm MOD:1KHz DEV: 1.5KHz Filter: 0.3～3KHz				-117dBm or above

Troubleshooting Flow Chart

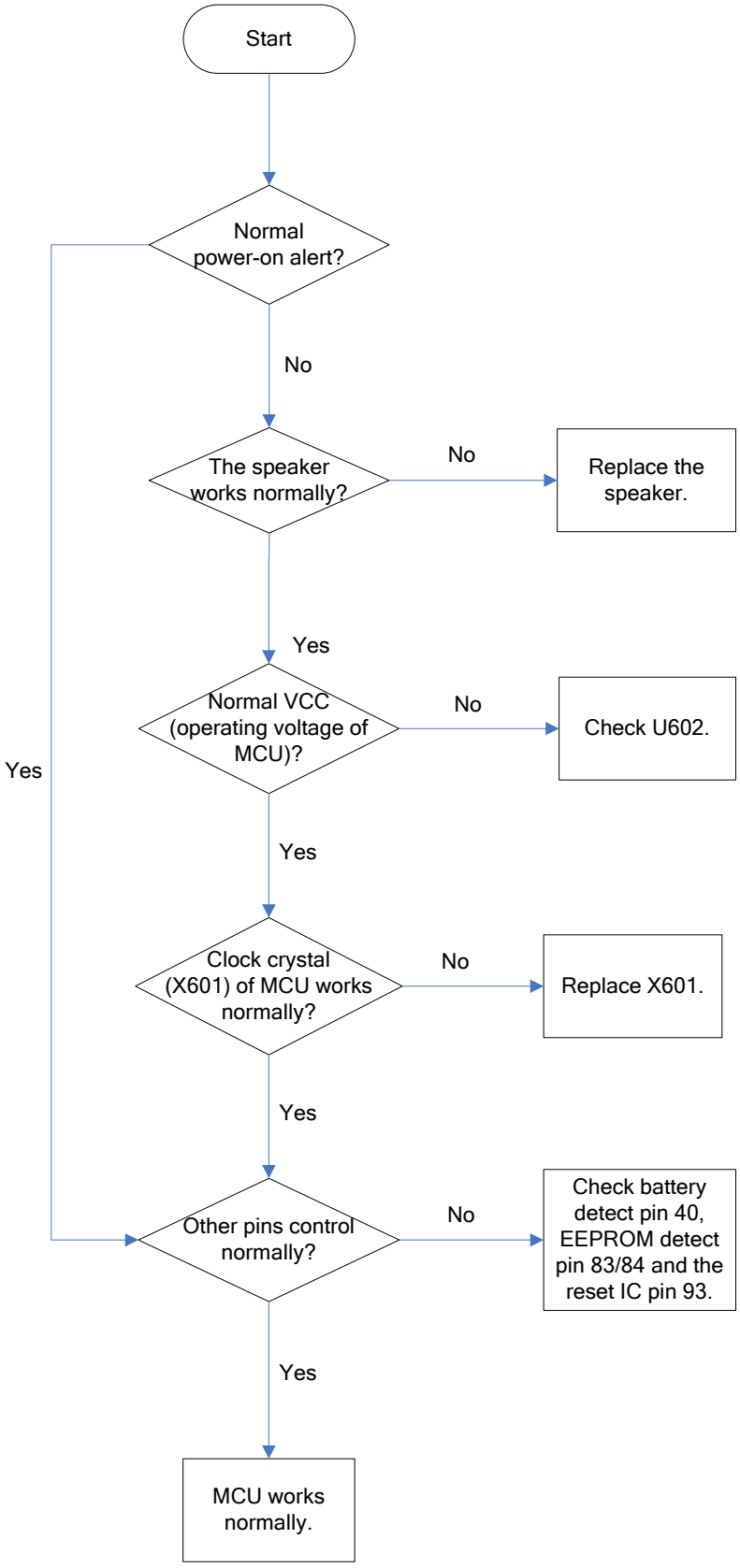
Transmit Circuit



Receive Circuit



MCU

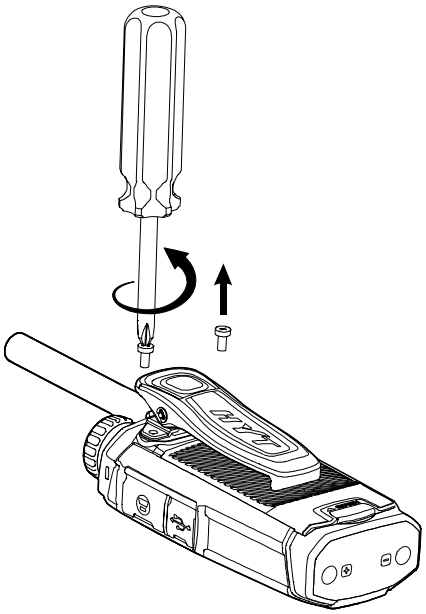

Start
Normal power-on alert?
No
The speaker works normally?
No
Replace the speaker.
Yes
Normal VCC (operating voltage of MCU)?
No
Check U602.
Yes
Clock crystal (X601) of MCU works normally?
No
Replace X601.
Yes
Other pins control normally?
No
Check battery detect pin 40, EEPROM detect pin 83/84 and the reset IC pin 93.
Yes
MCU works normally.
Yes

Disassembly and Assembly

Disassembly

1. Power off the radio

2. Remove the belt clip.

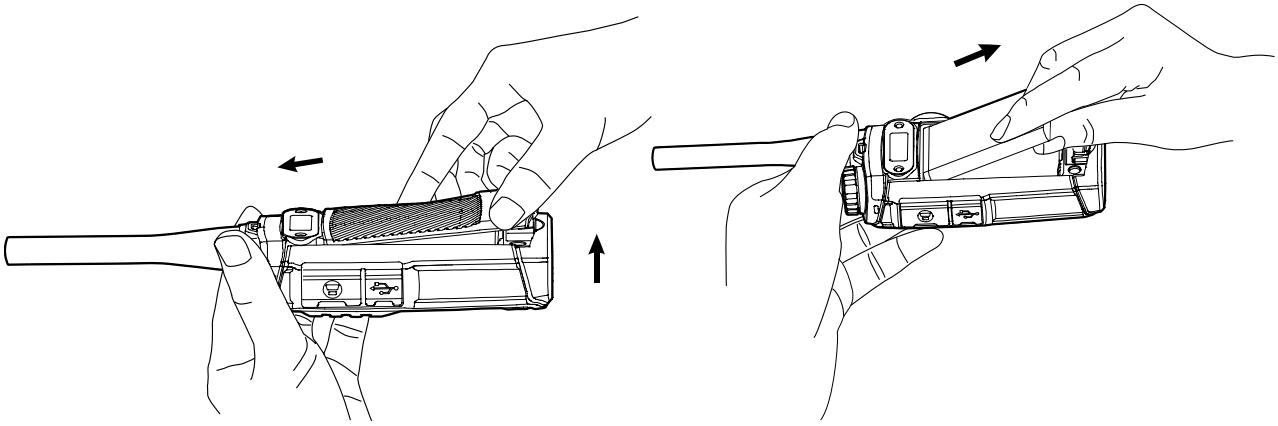


3. Remove the battery

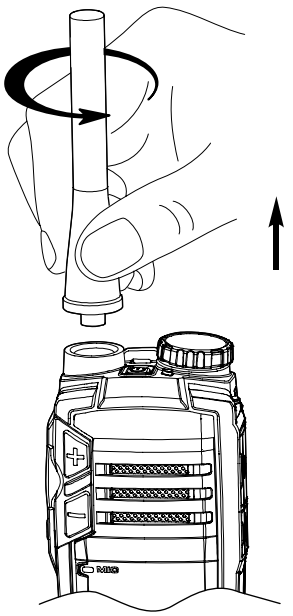
a. Push the battery latch upwards;

b. Remove the battery cover;

c. Take out the battery by lifting its bottom side.



4. Remove the antenna



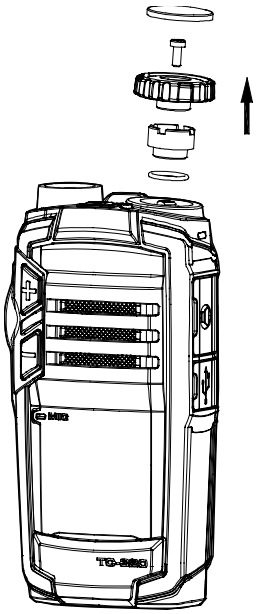
5. Remove the Channel Selector knob, nut and waterproof ring

a. Detach the Channel Selector knob cover;

b. Unfasten the screw;

c. Remove Channel Selector knob;

d. Remove the nut and waterproof ring.



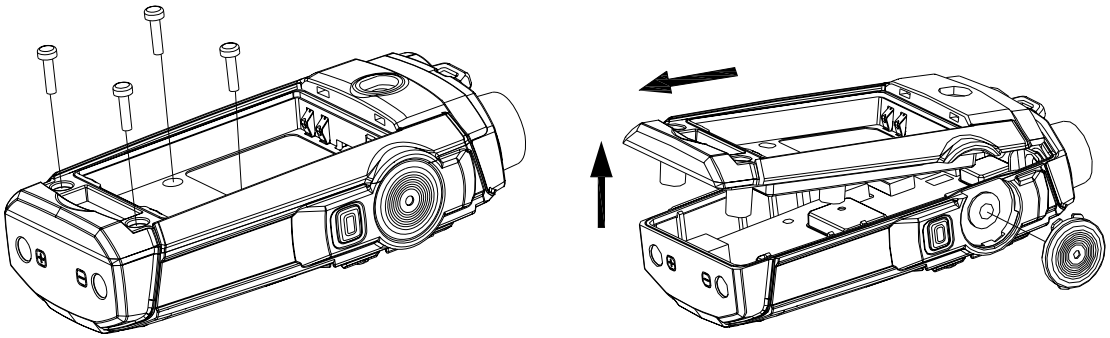
6. Disassemble chassis of the radio and the cover of PTT key.

a. Unfasten the 4 screws on the chassis;

b. Lift the bottom of the chassis;

c. Pull the chassis out.

d. Remove the cover of PTT key.

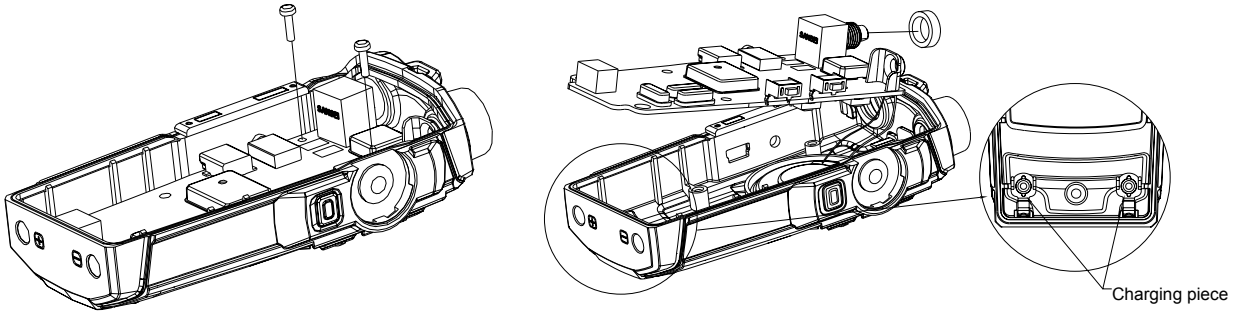


7. Disassemble the main PCB

a. Remove the two fixing screws on the PCB;

b. Remove the PCB and supporting ring of the Channel Selector knob.

c. Beware of the speaker cable and the charging piece at the bottom.



Assembly

1. Install the main PCB

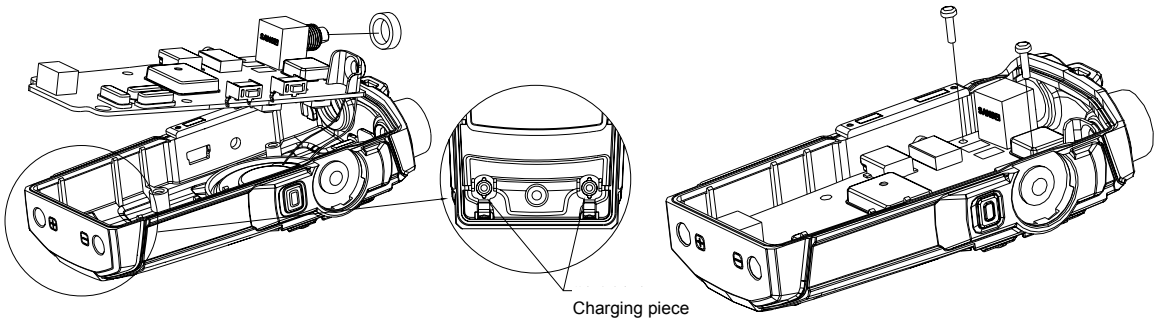
a. Make sure that the speaker is well connected, and the charging piece on the bottom is correctly installed;

b. Install the supporting ring of the Channel Selector knob;

c. Attach the main PCB;

d. Attach and secure two screws (Note: Control the torsion force within 0.8-1.2kgf);

e. Don't damage the speaker cable during installation.

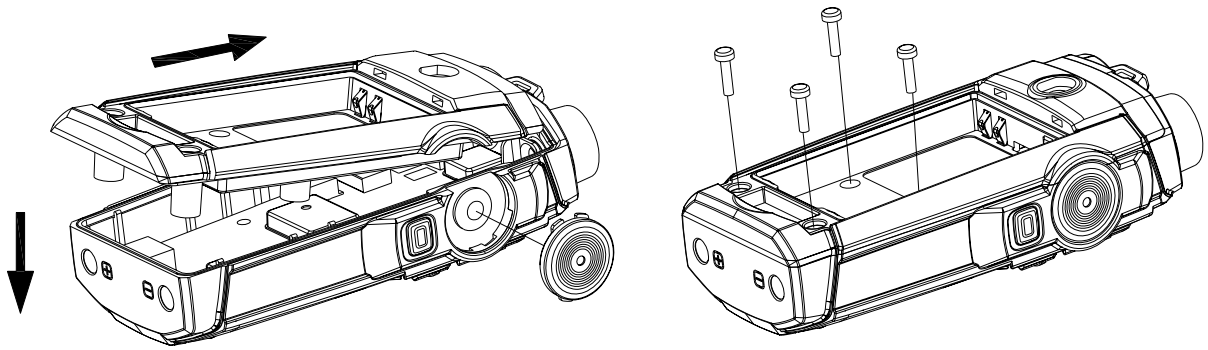


2. Assemble the chassis

a. Attach the cover of PTT key.

b. Attach the chassis of radio;

c. Attach and secure the four fixing screws (Note: Control torsion force within 1.2-1.5kgf).



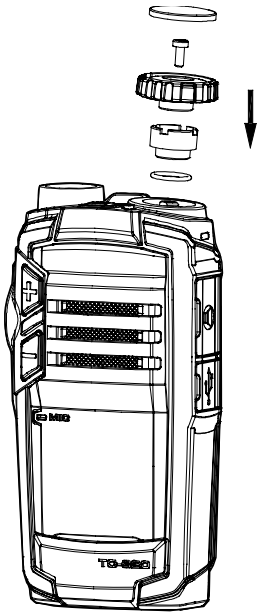
3. Assemble the nuts and Channel Selector knob on the top

a. Attach and secure the nuts on the top of the radio (with a waterproof ring);

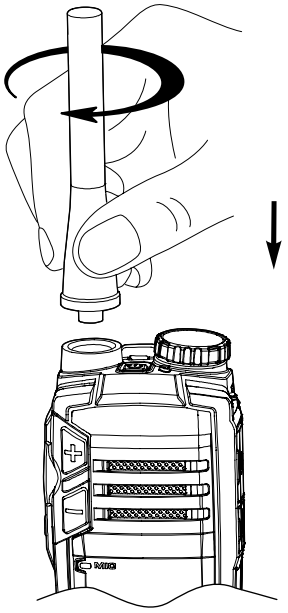
b. Attach the Channel Selector knob;

c. Attach and secure the fixing screw;

d. Attach and secure the Channel Selector knob cover;



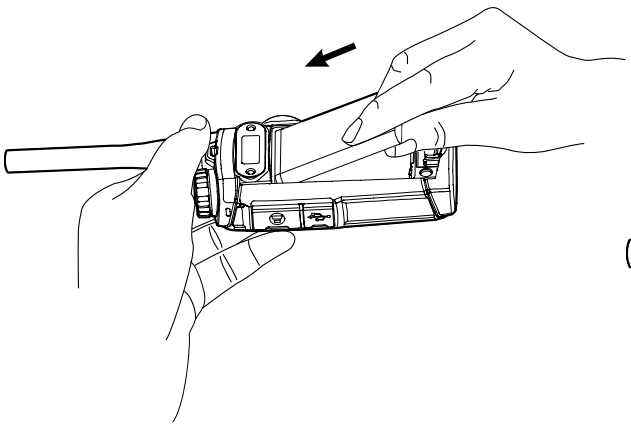
4. Assemble the antenna

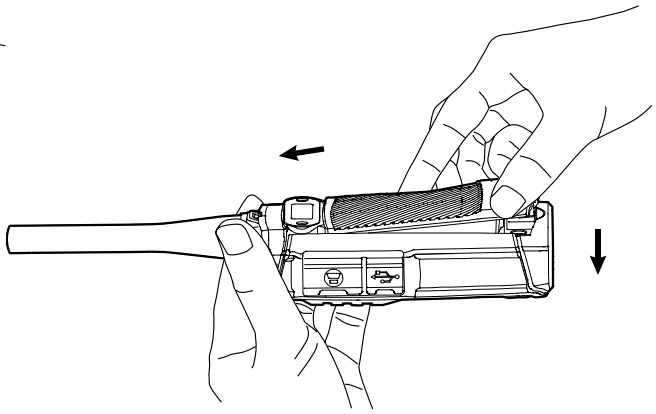


5. Attach the battery

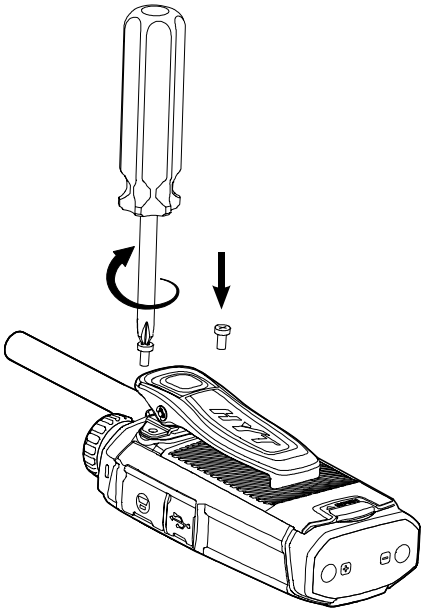
a. Insert the battery;

b. Attach the battery cover.

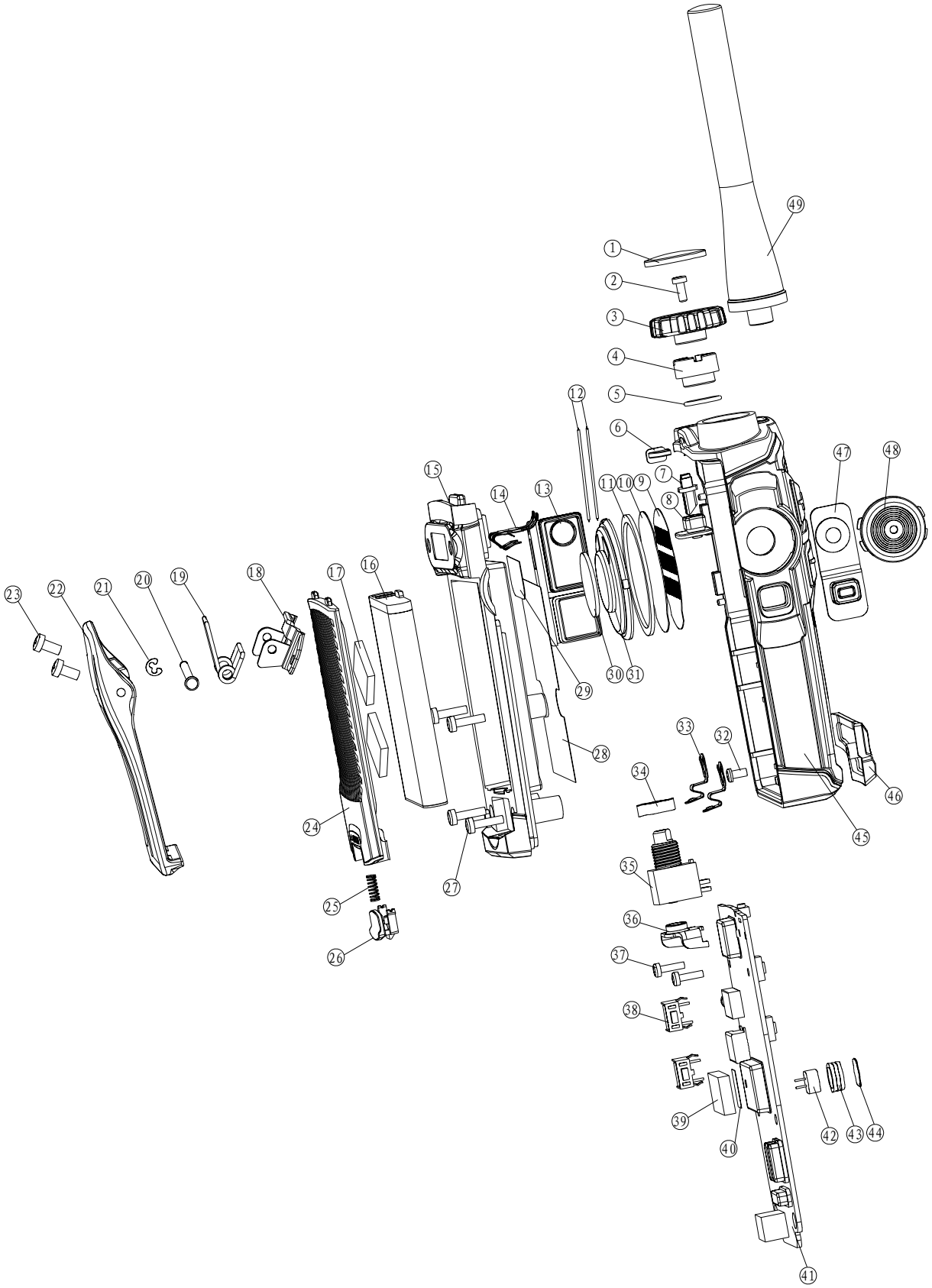




6. Attach the belt clip



Exploded View



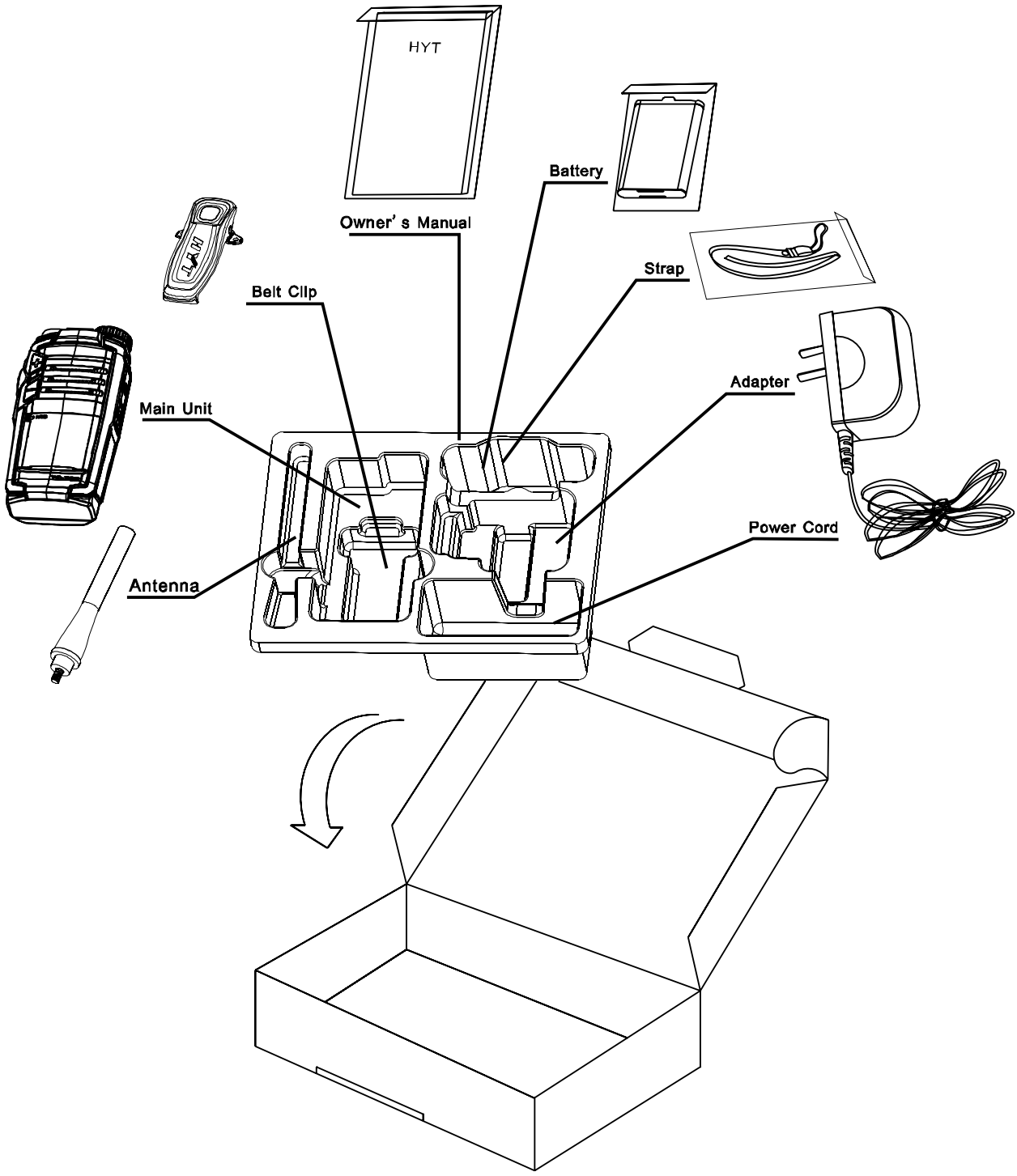
Parts List 2

No.	Part No	Items	Qty (PCS).
1	6201658001010	Encoder knob cover (RoHS)	1
2	7102006000100	Machine screw M2.0*6.0mm	1
3	6000718100000	Encoder knob (RoHS)	1
4	7206007400000	Fixing nut of encoder switch (RoHS)	1
5	6100335000000	O_RING for antenna (RoHS)	1
6	6000737100010	Light guide (charge LED) (RoHS)	1
7	6000736100000	Light guide (signal indicator) (RoHS)	1
8	6100363000010	POWER key (RoHS)	1
9	6201644000000	Speaker felt (steel) (RoHS)	1
10	7400229000000	Speaker felt (cloth) (RoHS)	1
11	7500250000000	Speaker washer (RoHS)	1
12	4210038000000	Cable (RoHS)	2
13	6000739000000	Accessory jack cover (RoHS)	1
14	6201643000000	Battery discharging piece (RoHS)	2
15	6000734000010	Radio chassis (RoHS)	1
16		Li-ion battery pack (RoHS)	1
17	7500249000000	Sponge pad for rear cover (RoHS)	2
18	6201796000000	metal holder of belt clip	1
19	7000205000000	Belt clip spring (RoHS)	1
20	7000181000000	Fender washer (RoHS)	1
21	6000836000010	Belt clip, black (RoHS)	1
22	7102505000200	Machine screw M2.5x4.8mm (RoHS)	2
23	7000206000000	Shaft for belt clip (RoHS)	1
24	6000733000000	Battery cover(RoHS)	1
25	7000179000000	Spring of battery latch(RoHS)	1
26	6000738000000	Battery latch(RoHS)	1
27	7102008020100	Self-tapping screw PT2.0*8.0mm(RoHS)	4
28	7600036000000	Shield of main unit (RoHS)	1
29	7400233000000	PCB shield (RoHS)	1
30	7400034000000	Speaker insulation pad (RoHS)	1
31	5001000000090	Speaker (RoHS)	1
32	7101904020200	Self-tapping screw ST1.9*4.0mm(RoHS)	1
33	6201671000000	Charging piece (RoHS)	2
34	7209802800010	Supporting ring of encoder switch (RoHS)	1
35	4304030000030	Gray code rotary switch (RoHS)	1
36	6201653000020	Antenna bracket (RoHS)	1
37	7101704020100	Self-tapping screw ST1.7*4.0mm(RoHS)	2
38	4301040000060	PTT switch (RoHS)	2
39	7600037000000	Conductive sponge (RoHS)	1
40	7600020000000	3M embossed copper foil (RoHS)	1

41		Main PCB(RoHS)	1
42	5002230000010	MIC (RoHS)	1
43	6100111000010	MIC cover (silicone rubber) (RoHS)	1
44	7400077000000	MIC net (RoHS)	1
45	6000732001010	Front case (RoHS)	1
46	6300062001010	Decorative sheet (zink alloy) (RoHS)	1
47	6100365000000	PTT key (silicone rubber) (RoHS)	1
48	6000735000020	PTT key (RoHS)	1
49		Antenna (RoHS)	1

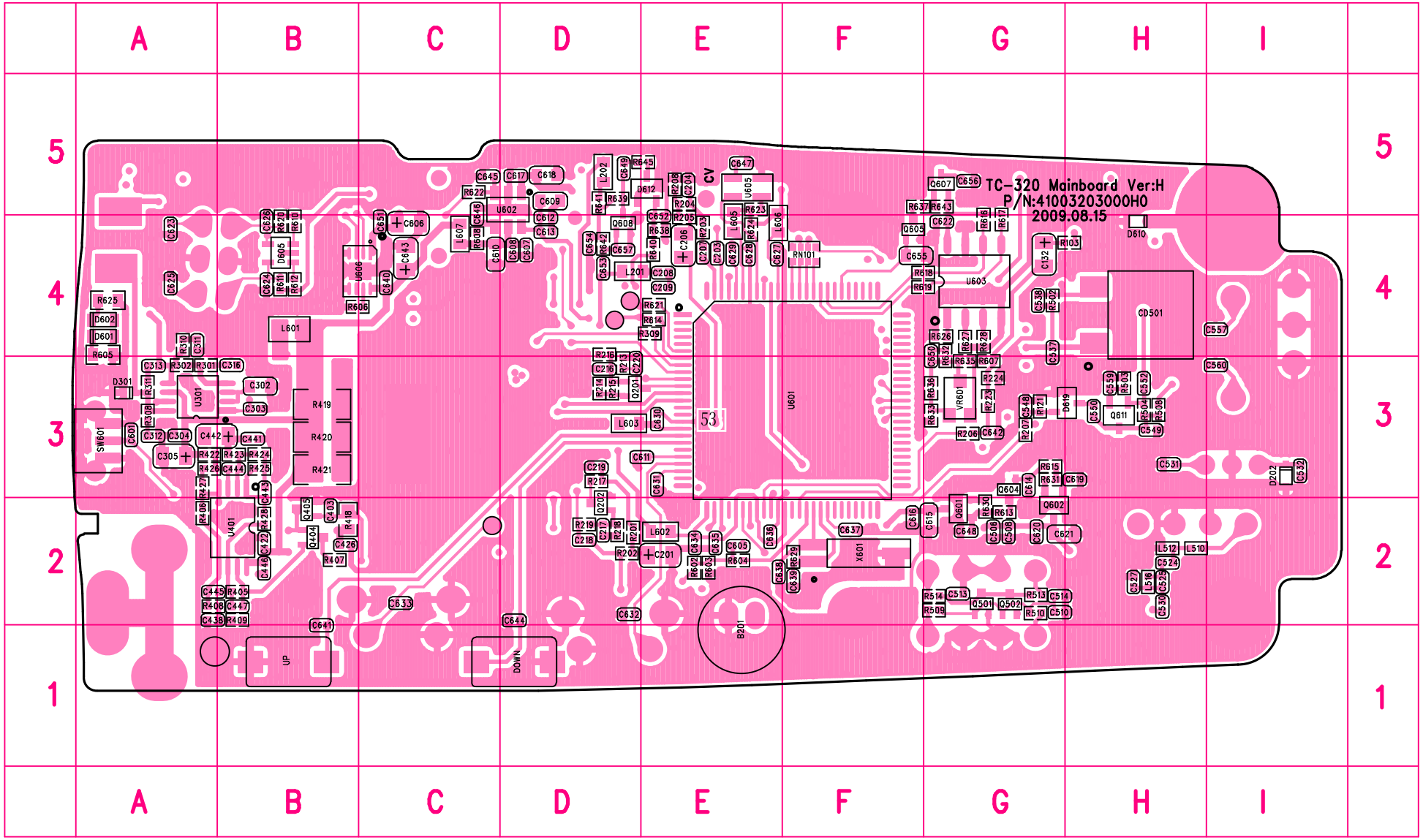
Note: Parts that are not marked with part number may vary with radio frequency band.

Packing Diagram

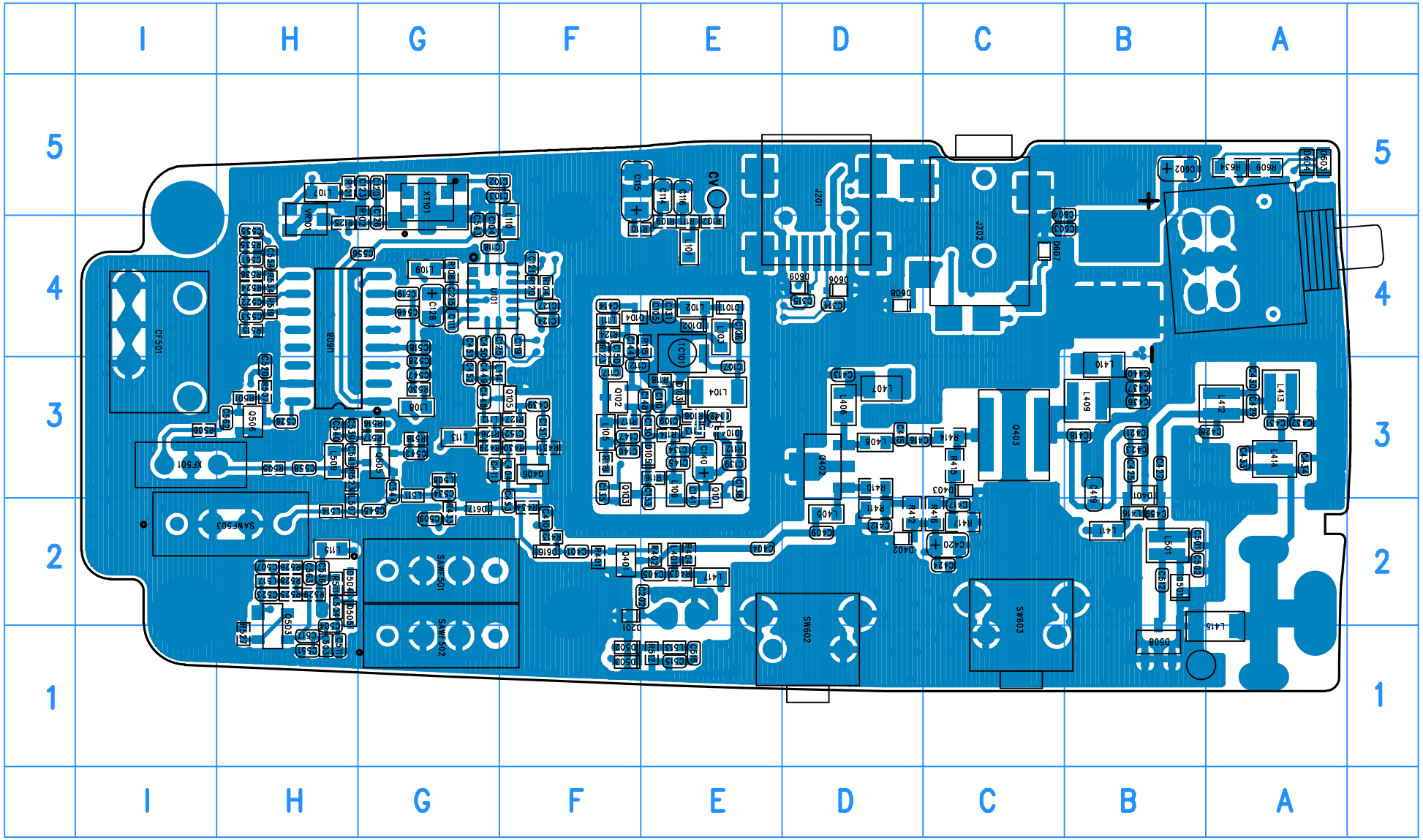


Gift Box

TC-320 PCB View
Top Layer

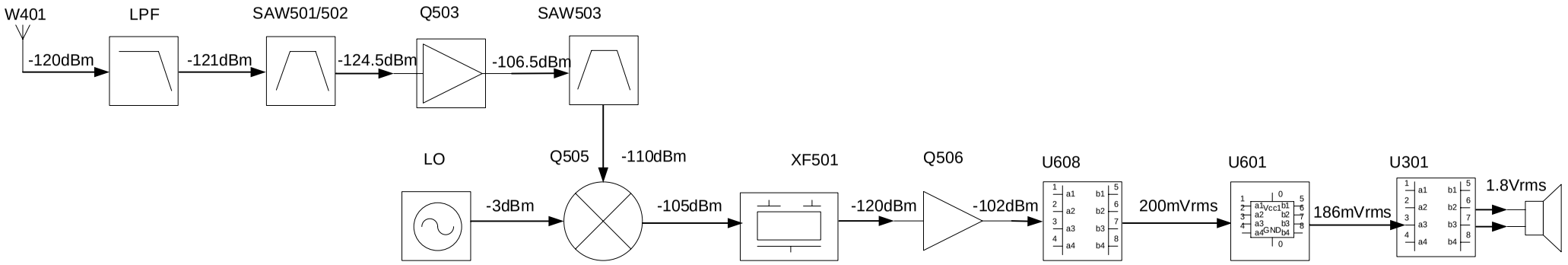


TC-320 PCB View
Bottom Layer

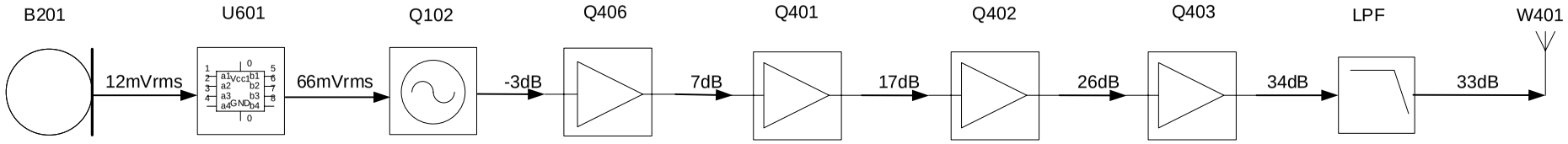


TC-320 Level Diagram

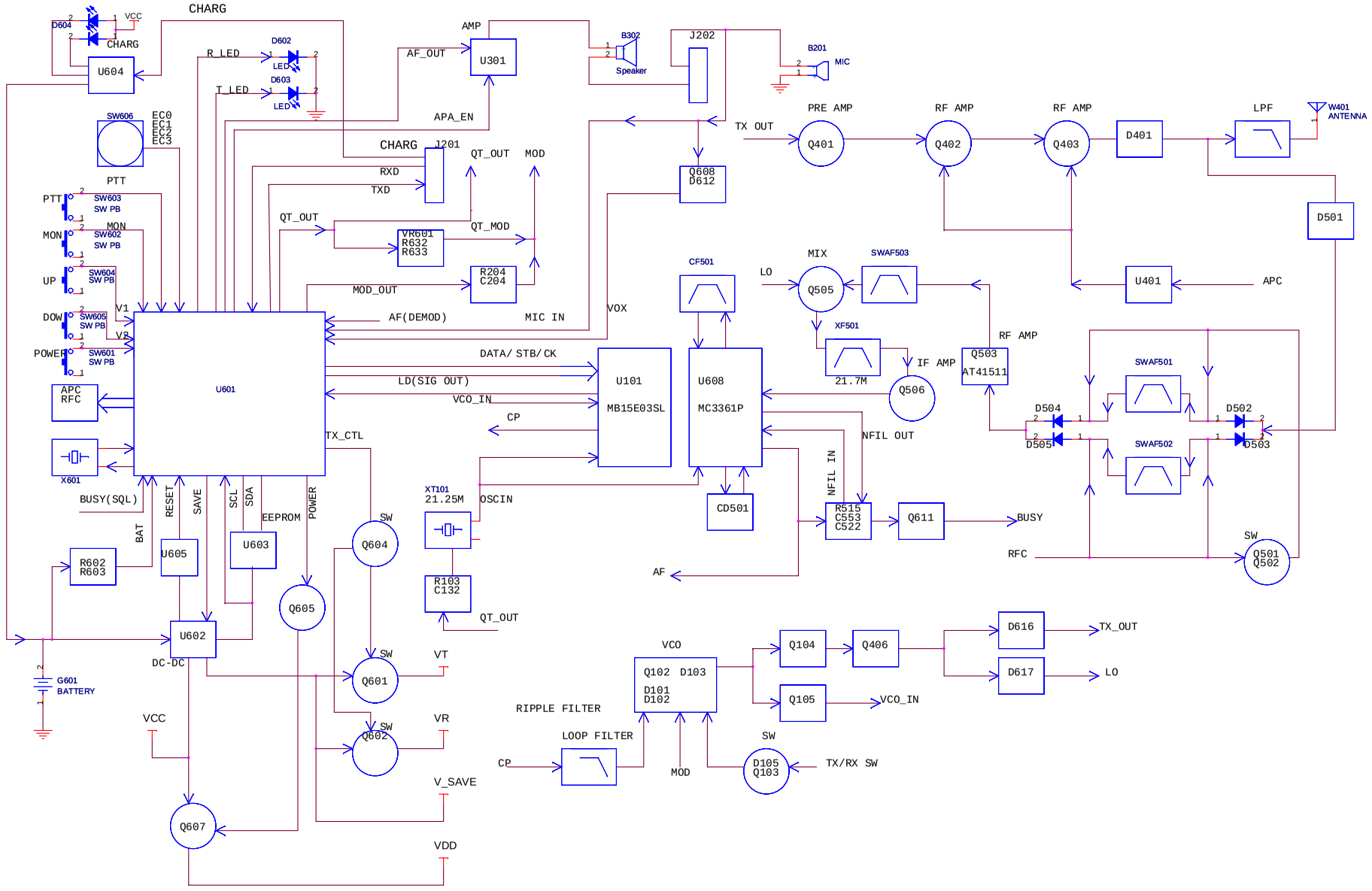
RX Section



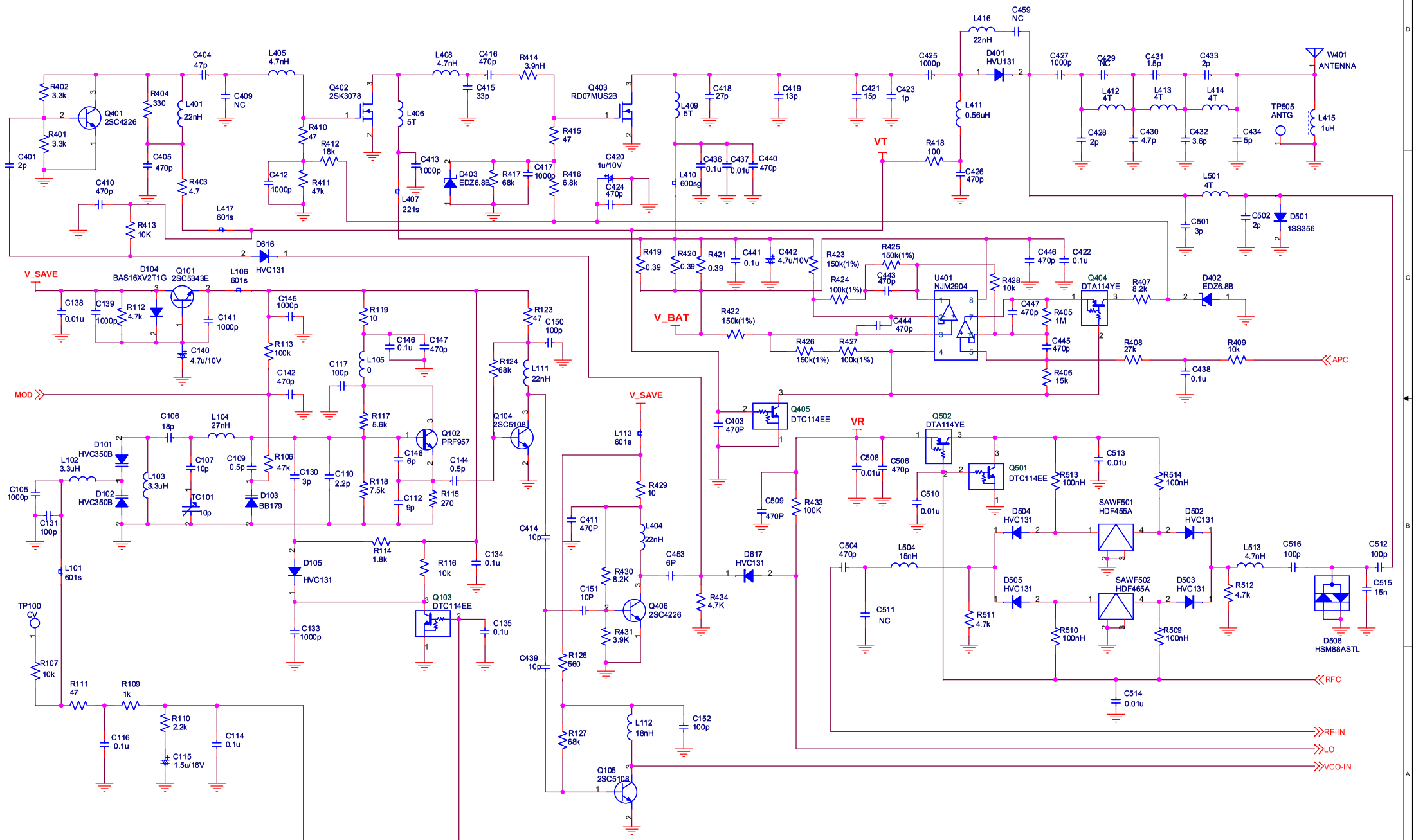
TX Section



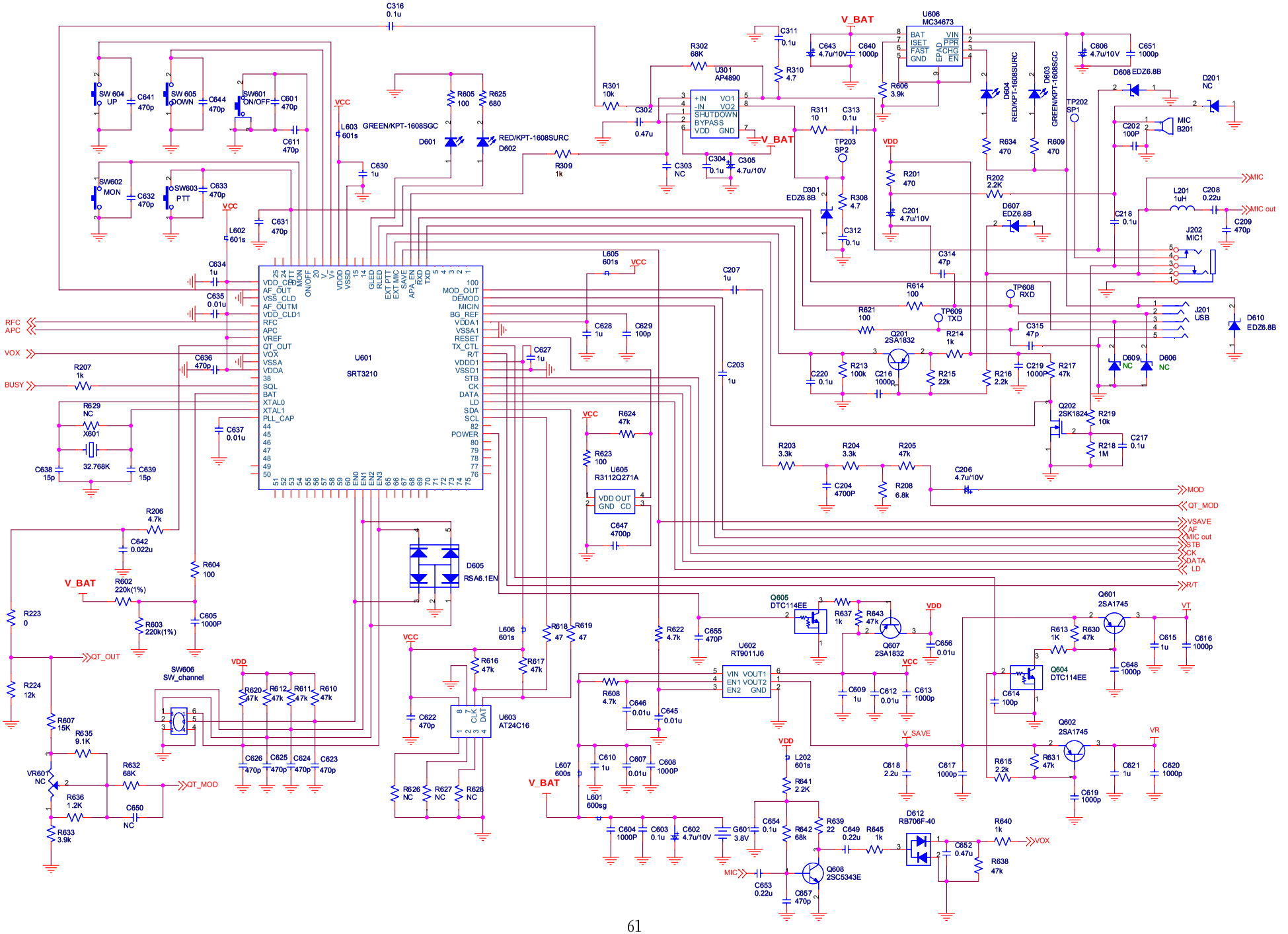
TC-320 Block Diagram



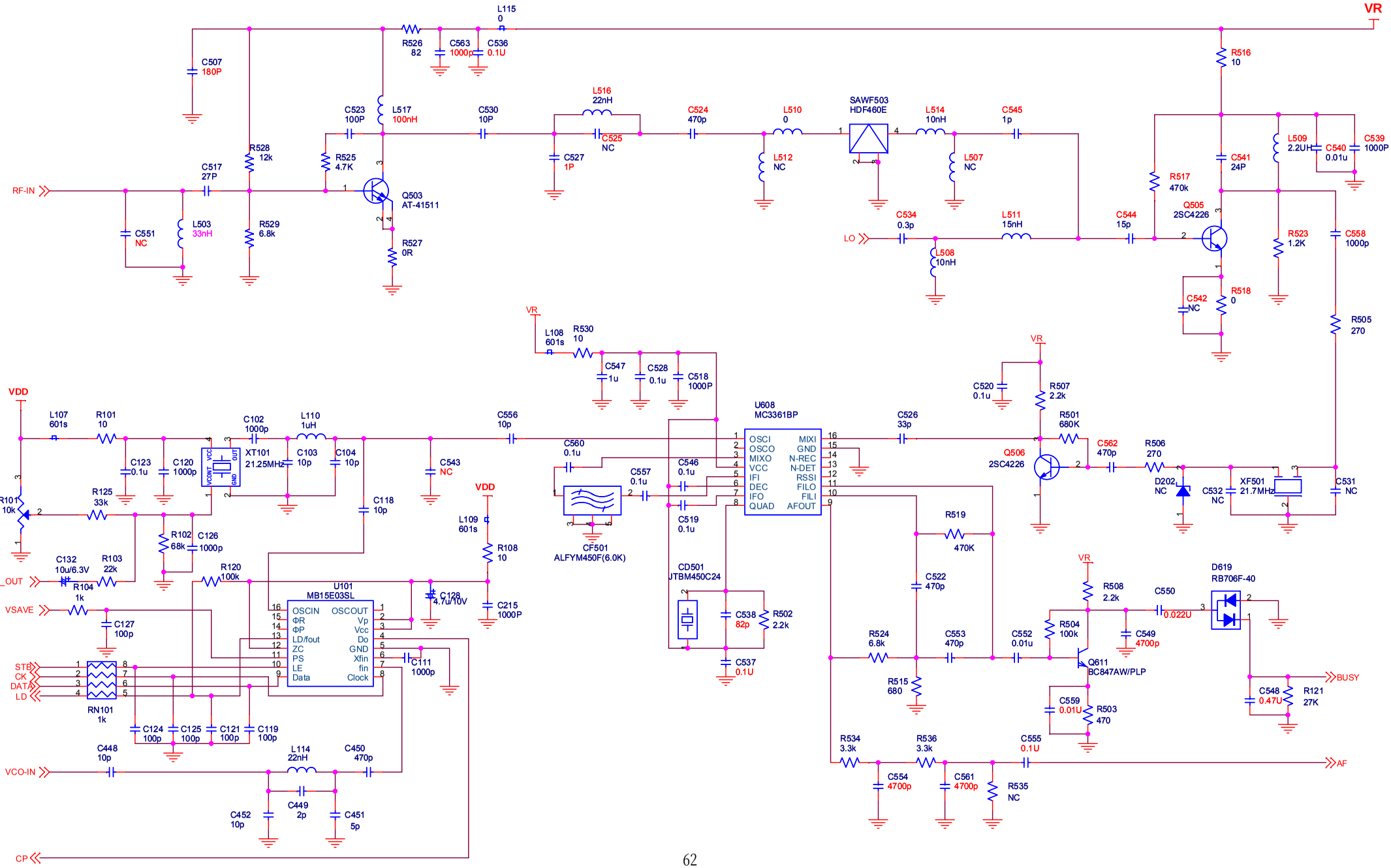
TC-320 U(1) Schematic Diagram (RF)



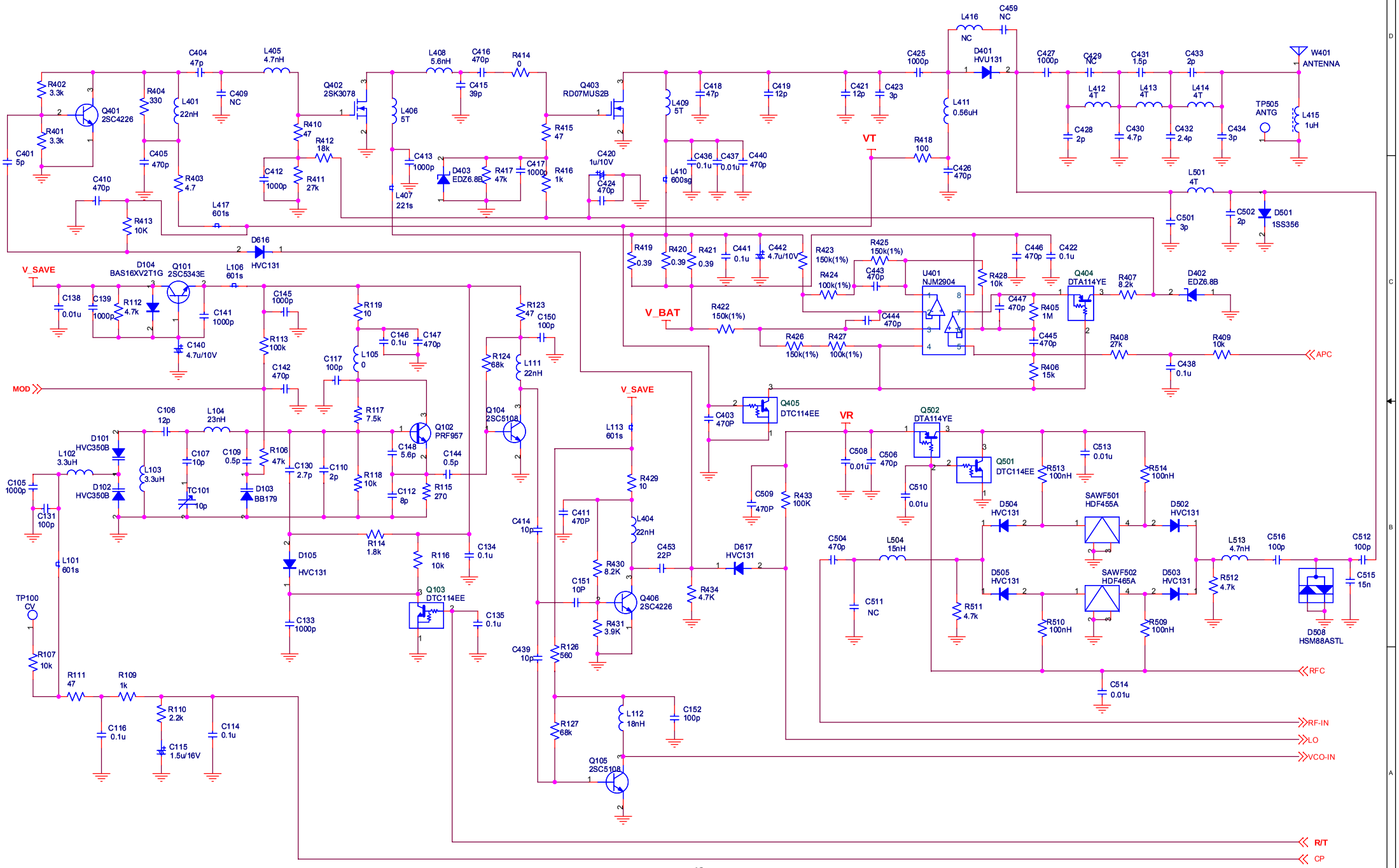
TC-320 U(1) Schematic Diagram (MCU&POWER)



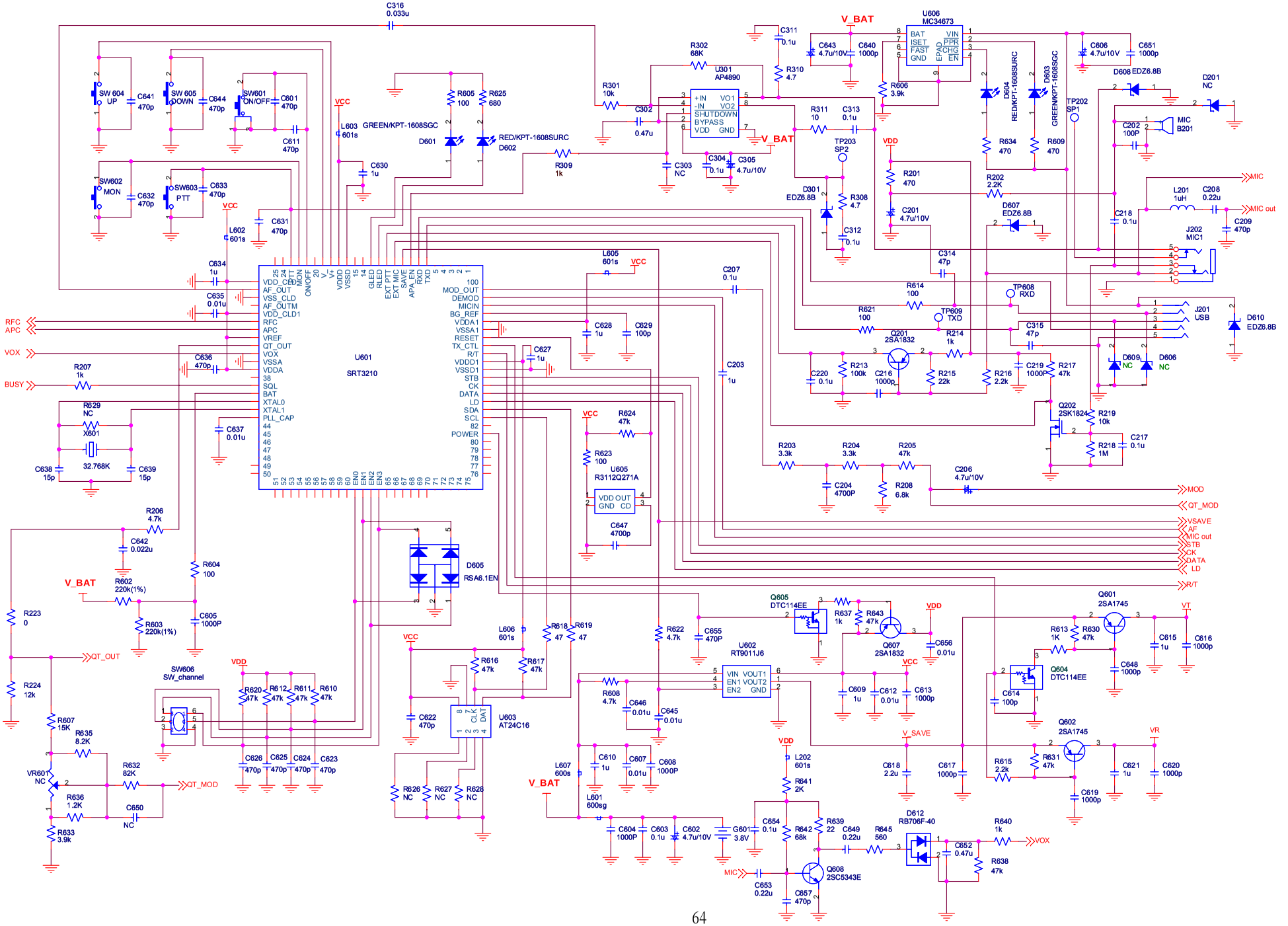
TC-320 U(1) Schematic Diagram (PLL&IF)



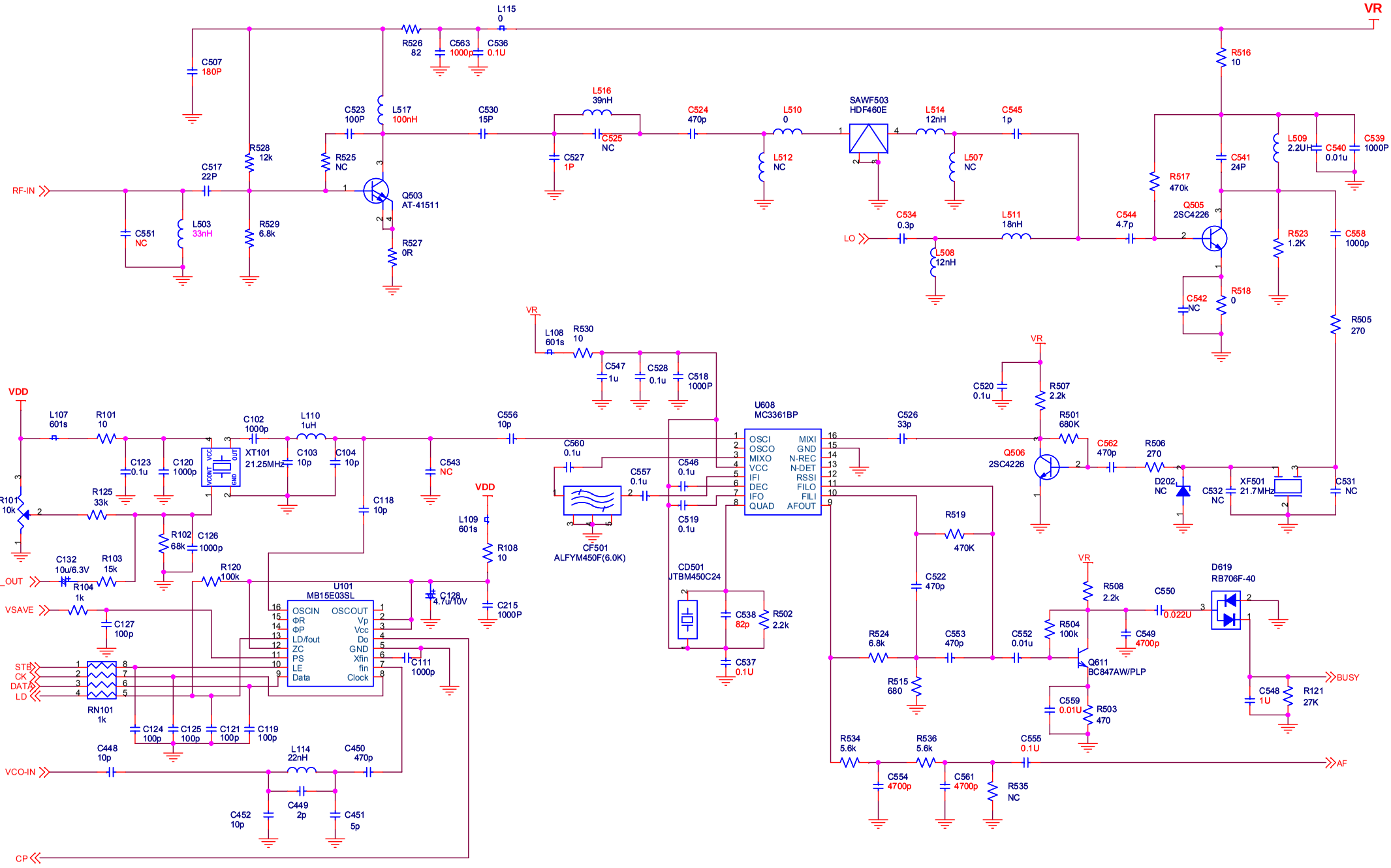
TC-320 U(2) Schematic Diagram (RF)



TC-320 U(2) Schematic Diagram (MCU&POWER)



TC-320 U(2) Schematic Diagram (PLL&IF)



Specifications

General Specifications	
Frequency Range	U1:400-420MHz, U2:450-470MHz
Channel Capacity	16
Channel Spacing	25 KHz /12.5KHz
Operating Voltage	3.8V DC
Battery	1700mAh Li-Ion battery
Battery Life (5-5-90 Duty Cycle)	≥10 hours
Operating Temperature	-20℃~+55℃
Dimensions (H×W×D) (with standard battery, without antenna)	100mm×48mm×27mm
Weight (with standard antenna & battery)	135g
Frequency Stability	±2.5ppm
Receiver	
Sensitivity	≤0.25uV (25KHz)/0.316uV (12.5KHz)
Adjacent Channel Selectivity	≥60dB(W)/≥50dB(N)
Intermodulation	≥55dB
Spurious Response Rejection	≥55dB(W)/≥50dB(N)
Rated Audio Power Output	0.4W (Speaker impedance: 8 ohm)
Rated Audio Distortion	≤5% (0.4W)
Transmitter	
RF Power Output	2W/0.5W
Spurious and Harmonics	≤-26dBm
Modulation Limiting	≤5/2.5KHz
TX S/N	≥38dB(W)/≥34dB(N)
Modulation Distortion	≤5%

Note: All Specifications are tested according to TIA/EIA-603, and subject to change without notice due to continuous development.