



**PROFESSIONAL
TWO-WAY RADIO**

PT7200

**FM PORTABLE RADIO
SERVICE MANUAL**



DANGEROUS!!

Do not connect the AC power or DC power over 7.4V with any connector or terminals of the radio. Otherwise it will cause fire, electric shock or damage to the radio.

WARNING

Do not reverse power connection.

It may cause harm to the radio if signal input on the antenna connector is bigger than 20 dBm (100mW).

Do not turn on the power before the antenna or load connection is completed.

If the antenna has been damaged, do not use the radio. Damaged antenna may cause lightly burning on skin.

Though the radio is waterproof, it's better to avoid putting it in rain or snow, or any other liquid to ensure its life and performance.

STATEMENT

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Chapter 1 Introduction

1.1 Introduction

This manual applies to the service and maintenance of PT7200 series of FM portable radios, and is designed for the engineers and professional technicians that have been trained by Kirisun. In this manual you can find all the information of product service. Kirisun reserves the rights to modify the product structure and specification without notice in order to enhance product performance and quality. You can also log on our website www.kirisun.com to download the latest service manual or contact your local dealer or us.

Read this manual before repairing the product.

1.2 Service Precautions

Safety

Avoid skin contacting with the antenna connector and PCB.

Do not reverse the power polarities.

If signal input at antenna connector is bigger than 20dBm(100mW), it may cause damage to the radio.

Do not turn on the power before the antenna and load connection is completed.

Do not use the radio if the antenna has been damaged. Contacting the damaged antenna will cause slightly burning on the skin.

Electromagnetism Interference

It's prohibited to use or repair the radio in the following places:

Hospital, health center, air port

Any area with a potentially explosive atmosphere (where the air contains gas, dust and smog, etc.), such as the storage or transportation facilities of fuel or chemicals.

Any area of dynamite or exploder.

It's recommended to avoid using or repairing the radio in the following places:

It's recommended to avoid using the radio in a car that is moving. The radio wave might interfere the auto engine and cause it to stop working.

Component Replacement

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

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.

Please fill in a component application forms if you want to apply for any components from Kirisun.

The following is one sample form that might be used to apply for any components from Kirisun.

Component Application

Radio Model	Component	No.	Model/ Specifications	Material Serial No.	Quantity
PT7200-01	FET	Q68	RD07MVS1	105-RD07MV-001	1
PT7200-01	Triode	Q57	2SC5108(Y)	104-SC5108-001	1

1.3 Service

All the Kirisun products are subject to the service warranty.

The main unit of the radio is guaranteed for free service of 18 months. Accessories (such as battery pack, power adapter, antenna or charger) are guaranteed for free service of 6 months. Earphones

are wearing parts and out of warranty.

In one of the following situations, charge-free service will not be available.

No valid service warranty or original invoice.

Malfunction caused by disassembling, repairing or reconstructing the radio by the users without permission.

Wearing and tearing or any man-made damage such as mechanical damage, burning or water leaking.

Product serial number has been damaged or the product trademark is difficult to identify.

After the warranty expires, lifetime service is still available. And we also provide service components to service stations and service staff.

Chapter 2 Radio Overview and Function Keys

2.1 Radio Overview

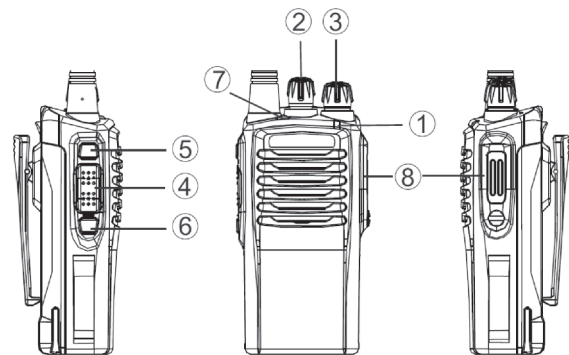


Figure2-1

① LED Indicator

Lights red while transmitting signals; lights green while receiving signals.

Flashes red while in low battery power during transmitting.

② Channel Selector

Rotate it to select channel 1-16.

③ Power/Volume Switch

Turn clockwise till a click is heard to switch on the radio.

Turn counterclockwise till a click is heard to switch off the radio.

Rotate it to adjust the volume after turning on the radio.

④ PTT (Push-to-talk)

To make a call, press and hold the PTT button, then speak into the microphone in normal voice.

Release the PTT button to receive a call.

⑤ Side key 1

Programmable function button: Press it to activate the programmed auxiliary function.

⑥ Side key 2

Programmable function button: Press it to activate the programmed auxiliary function.

⑦ Top Button

Programmable function button: Press it to activate the programmed auxiliary function.

⑧ Microphone/Speaker Jacks

For connecting the optional Microphone/Speaker.

Chapter 3 Electro-circuit

3.1 Frequency Configuration

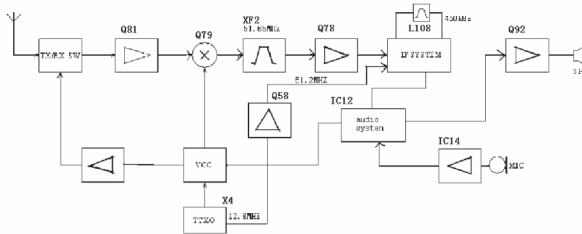


Figure 3.3 Frequency structure

This radio receiver adopts the 2nd Mixer, the 1st IF 51.65MHz, the 2nd IF 450kHz.

The receiver's first local oscillation is generated by the frequency synthesizer, the 2nd local oscillation selects the 4th harmonic wave 51.2MHz of TCXO.

The transmitter signal is generated by the frequency synthesizer.

The standard frequency of the frequency synthesizer is generated by TCXO.

3.2 Receiver Elements (RX)

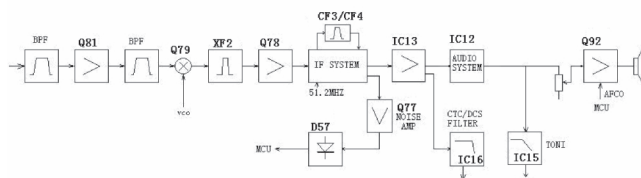


Figure 3.4 Receiver Illustration

① The receiver front terminal

Signals from the antenna pass through the low pass filter consisting of L104, C546, L103, C545, L102, C534 and the RX/TX switch (D51); and then undesirable out-of-band signals will be filtered out at the band pass filter (BPF) consisting of L104, C546, L103, C545, L102, C534; then signals are amplified at the low noise amplifier (LNA) consisting of Q81 and its peripheral components.

The output of LNA is sent to the first mixer (Q79) through the BPF filter consisting of L115, C541, D63, C528, C591, L114, D62, C527, C590, L113, D60 and C526.

② The First Frequency Mixer

After mixing the receiving signals and the first local oscillation signals from the frequency synthesizer, the 1st IF signals (51.65MHz) are generated. The 1st IF signals pass the crystal filter (XF2), which will filter the signals of adjacent channel and those out of band, and are sent to the IF amplifier.

③ IF Circuit

The IF signals from the crystal filter are amplified at the 1st IF amplifier (Q78), and then are sent to the IF processing IC (U9, TA31136FN). The IF IC consists of the 2nd frequency mixer, the 2nd local oscillator, IF amplifier, limiter, phase frequency detector, and noise amplifier.

TCXO (X4, 12.8MHz) selects the 4th harmonic wave 51.2MHz

as the 2nd local oscillation signal source after amplification. The 2nd local oscillation (51.2MHz) and the 1st IF signal (51.65MHz) are mixed at U9 to generate the 2nd IF (450kHz). After the 2nd IF signal is amplified and its amplitude is limited inside U9, and then filtered at porcelain filter (wideband CF4/Narrowband 3, 450kHz) and then sent to U9 to demodulate the output audio signals which are finally output from the 9th pin of U9.

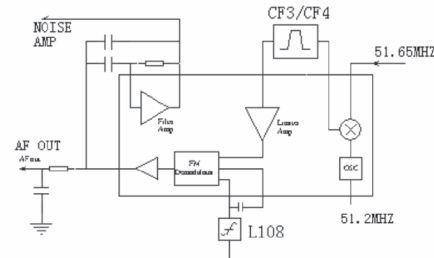


Figure 3.5 IF System

④ Receiver Audio Signal Processing

IC13, IC12, IC16, IC15 and their peripheral circuit compose the receiver audio signal processing circuit. After being sent to IC13 from U9 for amplification Audio, the audio signal is sent to IC15 CTCSS signaling filter circuit for waveform shaping and then sent to MCU; and it is simultaneously sent to IC12 and through IC12 amplification, deemphasis, filtration to remove high frequency and low frequency elements in the audio, only audio components of 300~3000Hz are kept to be sent to audio power amplifier (U9) after volume potentiometer adjustment, and simultaneously sent to MCU through IC15 (2 tone/5 tone filtration circuit).

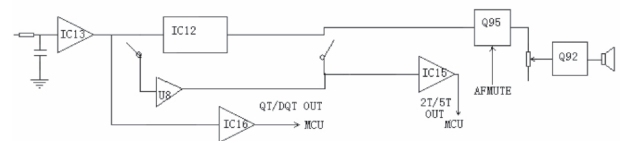


Figure 3.6 Receiver Audio Processing

⑤ Squelch Circuit

The audio signal output from the demodulation of U9 is sent back to U9 internal noise amplifier and composes the frequency selection noise amplifier together with C320, Q77, R167, C439 and C319. Filtered from the demodulation signals, the noise is changed into DC level by D57 demodulation after amplification by Q77 and then sent to MCU, which distinguishes the noise volume so as to decide whether to enable the squelch, which achieves the control of the squelch.

⑥ Audio Power Amplifier

Q92 and peripheral compose the BTL-audio and power amplifier.

The audio receiving signals, voice indication signals, indication tone signals and warning tone signals are converged to be amplified by the audio power amplifier to drive the speaker.

Speaker impedance: 16Ω

Q95: Receiving audio signal switch

Note: No terminal of the speaker can be grounded!

⑦ CTCSS signaling filter

The U9 Demodulation output audio signals may contain CTCSS (continuous tone coded squelch system) or DCTCSS (Digital coded squelch) signals. The frequency spectrum of CTCSS/DCS is 20-250Hz. The filtering circuit constructed by IC16 can filter out the signals out of the CTCSS/DCS frequency spectrum to ensure MCU

to decode CTCSS/DCS more precisely.

3.3 Transmitter (TX) Transmitter Power Amplifier

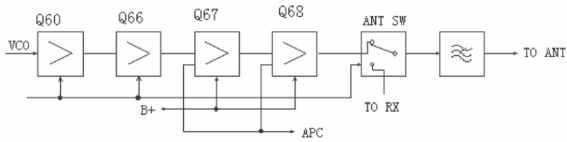


Figure 3.7 Amplifier and antenna switch diagram

The modulated RF signals from VCO are amplified at Q60, Q66, Q67 and then are sent to Q68 for power amplification. Q68 output power: 4.5W.

The Q67, Q68 grid offset is controlled by APC circuit. Changing the grid bias can control the transmitter output power conveniently.

APC (Auto Power Control)

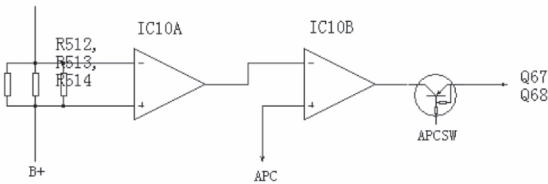


Figure 3.8 APC Circuits

R512, R513, R514 are the amplifier current checker; IC10A the sample amplifier of the amplification current. IC10B is the power comparison amplifier.

If the transmitter output power is too high, the amplifier current will increase, IC10A output will mount, IC10B output voltage decrease, the offset voltage added to Q67 and Q68 will decrease, and then the transmitter output power will decrease. Vice versa, such can ensure steady transmitter output power in different working circumstances.

MCU changes the voltage input to IC10B to set the power.

Transmitter Audio Signal Processing

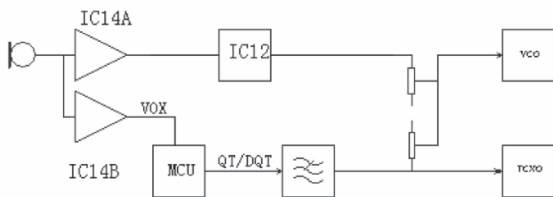


Figure 3.9 Transmitter Audio Circuits

IC14, IC12 and the peripherals components compose the transmitter audio processing circuit. The audio signals from MIC are amplified to be sent to MCU after the demodulation (VOX signal); simultaneously they are amplified after preemphasis, amplitude limit and filtration in the C12 where they have been sent there through the ACC circuit and finally sent to VCO modulation together with CTCSS/DCS for modulation.

J2 is the external MIC socket, when the external MIC is used, the internal MIC will be off automatically while the internal PTT will remain activated.

3.4 Frequency Synthesizer

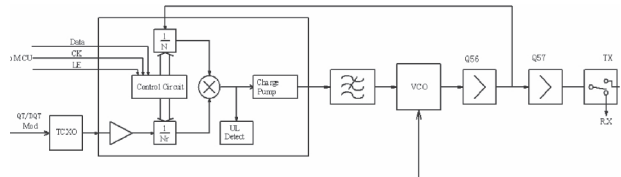


Figure 3.10 Frequency Synthesizer

The radio adopts Phase Locked Loop (PLL) frequency synthesizer.

The frequency synthesizer consists of standard oscillator, voltage controlled oscillator (VCO), programmable frequency demultiplier, phase comparator, and low pass filter.

IC9 (ADF4111) is PLL integrated circuit, including programmable reference frequency demultiplier, programmable frequency demultiplier, phase comparator, and charge pump.

R334, C464, R333, R311, C448, C484 and R336 construct the low pass filter.

The standard frequency is supplied by X4 (TCXO, 12.8MHz).

The standard frequency from TCXO (Temperature Control Transistor Oscillator) is demultiplied by the programmable reference frequency demultiplier at IC9 to acquire 6kHz or 6.5kHz reference frequency (controlled by MCU according to the preset channel frequency).

The oscillation frequency from VCO is sent to IC1, and demultiplied by programmable frequency demultiplier and compared with reference frequency to acquire the error signals. Then pass the low pass filter and are sent to VCO to change VCO oscillation frequency to the preset value, and then VCO is locked.

$$N = F_{VCO} / F_R$$

N: Frequency demultiplication times

F_{VCO} : VCO oscillation frequency

F_R : Reference frequency

Check Loss of Lock: When PLL is in loss of lock, IC pin14 sends out low level signals to MCU, which controls the transmitter not to transmit and initiate warning tone.

3.5 Voice Prompt Circuit:

The radio features voice prompt, which is very useful at night or in the environment of dim light.

The internal memory IC of MCU is provided with voices like channel indication, etc., each time switch a channel, the speaker will prompt the current channel number by voice prompt.

3.6 Power Supply:

The radio is equipped with 7.4V, 1700mAh li-polymer battery, transmitter power amplifier circuit (Q67, Q68), receiver audio power amplifier (Q92) directly adopt the power supplied by the battery and other circuits adopt the regulated 5V to supply power.

U13: 5V low voltage difference, micro-power regulator, together with U12 to supply 5V power with high current.

Q76: T5V switch, controlled by MCU.

T5V: Supply power for the Transmitter front terminal

Q85: R5V switch, controlled by MCU.

R5V: Supplies power for the receiver RF amplification, mixing, IF processing, audio signal processing.

Q83: C5V switch, controlled by MCU.

C5V: The 5V power controlled by power saving supplies power for the frequency synthesizer.

3.7 MCU:

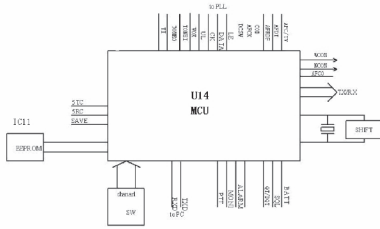


Figure 3.11 MCU Diagram

MCU controls the working of each unit of the radio to realize all the radio functions.

- 1) Connects with the PC
- 2) Accesses the radio status data
- 3) Controls PLL to generate the receiving and transmitting local oscillation frequency.

- 4) Accesses the current channel status.
- 5) Controls the LED status indication
- 6) Controls the power supply of each location
- 7) Checks the action of each function key
- 8) Generates voice contents
- 9) Generates power on voice prompt
- 10) Generates CTCSS/DCS signals
- 11) Generates 2 tone/5 tone signals
- 12) Generates power control signals
- 13) Completes CTCSS/DCS decoding
- 14) Completes 2 tone/5 tone decoding
- 15) Squelch check and control
- 16) VOX level sampling

Controls the audio processing chips to complete emphasis/deemphasis, scrambling/descrambling, companding, filtration and amplification etc.

① Memorizer (E²PROM, AT24C64)

Memorizes the channel data, CTCSS/DCS data as well as other function setting data and parameter setting data of the radio.

② CTCSS/DCS Encoding and Decoding:

CTCSS/DCS signals generated by MCU (pin24, pin28 output, PWM wave) are filtered at the filter circuit and then sent to VCO and TCXO modulation respectively.

CTCSS/DCS signals from the receiver are sent to MCU for decoding. MCU determines whether the signals contain the same CTCSS/DCS as that set on the radio and decides whether to turn on the speaker.

③ Power adjustment:

MCU PIN1 output DC signals, inputted to APC unit to control the output power of the transmitter.

3.8 Semiconductor Component

MCU Description

Table 3.3 Microprocessor (M30620FCPPF) Port Description

PinNo.	Port Name	Input/ output	Function
1	PCTV	D/A Output	Receiver sensitivity adjusting voltage output/power control (V)
2	DTMF	D/A Output	DTMF/Tone output, beep output
3	HSDI	I	Tone decoding input
4	EPDT	I/O	EEPROM data input/ output
5	EPCK	O	EEPROM clock
6	BYTE	I	Gnd
7	CNVSS	I	Gnd

PinNo.	Port Name	Input/ output	Function
8	BSHIFT	O	Clock beat frequency control
9	SV	O	Min. volume control
10	RESET	I	CPU reset input
11	XOUT	O	CPU reset output
12	VSS	-	Gnd
13	XIN	I	CPU clock input
14	VCC	-	+5V
15	NC	I	+5V
16	VDET	I	Voltage down detection
17	RDT	I	AK2346 MSK signal input
18	TCLK	I	AK2346 MSK data transmission clock
19	SCLK	O	AK2346 data transmission clock
20	QT/DQT	I/O	CTCSS/DCS output
21	TDATA	O	AK2346 MSK data transmission output
22	StCtrl	O	Side tone volume control pin
23	DI/O	I	AK2346数据输入输出控制脚
24	QTVCO	O	CTCSS/DCS output VCO (PWM)
25	DIR	O	AK2346 IO control
26	APC	O	Power control (U)
27	NC	-	NC
28	QTTCXO	O	QT/DQT Outputs TCXO (PWM)
29	TXD	O	TXD1 output
30	RXD	I	RXD1 input
31	NC	-	NC
32	APC SW	O	Power control output switch
33	TXD0	O	Extension
34	RXD0	I	Extension
35	DC SW	O	Power control switch
36	TX W/N	O	Transmission bandwidth switch
37	RX SW	O	Receiver VCO switch
38	TX SW	O	Transmitter VCO switch
39	NC	-	Gnd
40	PLL UL	I	Phase-locked loop loss of lock check pin
41	PLL STD	O	Phase-locked loop enabling control
42	PLL DATA	O	Phase-locked loop data output
43	PLL CLK	O	Phase-locked loop clock
44	NC	-	NC
45	RX W/N	O	Receiving bandwidth switch
46	EN1	I	UV band selection
47	EN2	I	Encoding switch input pin
48	EN3	I	Encoding switch input pin
49	EN4	I	Encoding switch input pin
50	EN5	I	Encoding switch input pin
51	W/N R1	O	Receiving IF bandwidth switch
52	W/N R2	O	Receiving IF bandwidth switch
53	AFCON	O	Audio power amplifier enabling control
54	RX MUTE	O	Receiving mute switch
55	A BUSY	I	Number reporting chip control
56	A DATA	O	Number reporting chip data output
57	A SCLK	O	Number reporting chip clock
58	A MUTE	O	Number reporting chip control
59	NC	-	NC
60	ACC	-	+5V
61	NC	-	NC

PinNo.	Port Name	Input/ output	Function
62	VSS	-	Gnd
63	NC	-	NC
64	SELF	-	Factory control options
65	OPT S1	I	Earphone check
66	OPT S2	I	External PTT
67	PIO3	I/O	MAN DOWN input
68	PIO2	I/O	Extension
69	PIO1	I/O	Extension
70	PINT	I	Extension
71	TK1	I	Extension
72	PTT	I	Top key
73	Sk2	I	PTT key
74	SK1	I	Side key 2
75	SP SW	O	Side key 1
76	MIC SW	O	Speaker switch
77	R LED	O	MIC switch
78	G LED	O	LED red switch
79	5T C	O	LED green switch
80	5R C	O	5T control pin
81	5C C	O	5R control pin
82	P03	O	5C control pin
83	P02	O	Fixed side tone control
84	NC	O	Phase-locked loop filter
85	NC	-	NC
86	MAN DOWN	I	NC
87	BATT	I	Reverse detection input
88	RSSI	I	Voltage check input
89	BUSY	I	Receiving filed intensity signal input
90	VOX	I	Squelch voltage check input
91	QT/DQT IN	I	VOX voltage check input
92	DTMF IN	I	CTCSS/DCS input
93	AVSS	-	DTMF input
94	NC	-	Gnd
95	VREF	-	NC
96	AVCC	-	+5V
97	NC	-	+5V
98	MIC MUTE	O	NC
99	MIC MUTE	O	External and internal MIC switch
100	HPF PC	O	High pass filter switch

Table3.4: Semi-Conductor Component Function

Location mark	Model	Function description
Ic9	ADF4111	Phase-locked loop chip
Ic10	NJM2904	APC, voltage comparison, drive
U9	Ta31136	Receiver's 2nd local oscillation, 2nd IF amplifier, amplitude limit, demodulation , noise amplification
Ic12	AK2346	Audio processing
IC14	TC75W51FU	MIC amplification
Q92	TDA8541	Receiver audio power amplifier
Ic11	AT24C64	E2PROM, memory channel frequency data, function setting parameter, debugging status parameter

Location mark	Model	Functiondescription
U14	M30620FCPPF	MCU
U11	PST9140NR	MCU reset circuit
Q60	2SC5108	Transmitter 1st amplification
Q66	2SC3356	Transmitter 2nd amplification
Q56	2SC5108	VCO buffering amplifier
Q57	2SC5108	VCO buffering amplifier
Q65	2SC4617	VCO power filter
Q77	2SC2412K	noise amplifier
Q68	RD07MVS1	Transmitter final amplifier
Q67	RD01MUS1	Transmitter amplifier drive
Q69	DTA144EE	APC output switch
Q79	3SK318	The first frequency mixer
Q81	3SK318	Receiver HF amplifier
Q78	2SC5108	The first IF amplifier
Q73	DTC144EE	Red LED drive
Q74	DTC144EE	Green LED drive
Q83	2SJ243	C5V switch
Q76	2SA1745	T5V switch
Q85	2SJ243	R5V switch

Table 3.5 Diode Function Description

Location mark	Model	Function Description
D	Ma77	Transmitter antenna switch diode
D101	HSC277	VCO output switch
D103	HSC277	Antenna switch
D104	HSC277	Antenna switch
D201	HSC277	VCO output switch
D302	MA2S376	VCO oscillation variable capacitance diode
D304	MA2S376	VCO oscillation variable capacitance diode
D305	MA360	VCO modulation diode
D310	MA2S376	VCO oscillation variable capacitance diode
D308	MA2S376	VCO oscillation variable capacitance diode
ZD12	HZU5ALL	APC output voltage-limiting diode
D38	MA2S111	Loss of lock check diode
D48	MA2S111	VCO power filtering accelerating diode
D57	1N4148	Noise detector
D53	LED RED	Transmitting indication
D55	LED GREEN	Receiving indication
D54	LED RED	Transmitting indication
D56	LED GREEN	Receiving indication

Table 3.6: XF203 crystal filter features

Item	Rated value
Nominal center frequency	51.65MHz
Transmission bandwidth	± 7.5kHz or bigger within 3dB
40dB barrage bandwidth	± 20.0kHz or smaller
Pulse	1.0dB or smaller
Insertion loss	3.0dB or smaller
Guarantee attenuation	80dB or bigger within fo-910kHz
Terminal resistance	1.5kΩ/6PF

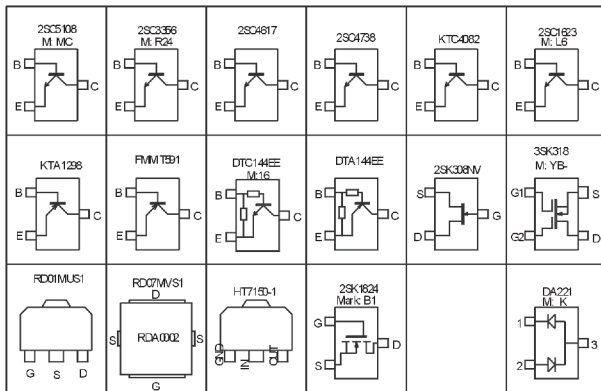
Table 3.7 CF201 LTWC450F functions and features

Item	Rated value
Nominal center frequency	450kHz
6Db bandwidth	± 5.0kHz or bigger
50dB bandwidth	± 13.5kHz or smaller
Pulse	3.0dB or smaller
Insertion loss	7.0dB or smaller
Guarantee attenuation	45.0dB or bigger within $f_0 \pm 100\text{kHz}$

Table 3.8 CF202 LTWC450G functions and features

Item	Rated value
Nominal center frequency	450kHz
6Db bandwidth	± 3.5kHz or bigger
50dB bandwidth	± 12kHz or smaller
Pulse	3.0dB or smaller
Insertion loss	7.0dB or smaller
Guarantee attenuation	45.0dB or bigger within $f_0 \pm 100\text{kHz}$

Table 3.9 Semiconductor Component Packaging Illustration:



Chapter 4 Function Description and Parameter Setting

4.1 Major Functions

4.1.1 16 Channels

The radio stores 16 channels.

4.1.2 Scanning Channel Function (this function can be disabled by the programming software)

1) Press the key set to the function of “scan” to enter the scanning function. During the scanning, the radio will check signals of each channel to the signal is found, and then the radio will stay on the channel with signals till the signal disappear. If the time delay between the signals disappearing and the scan is set, the radio will remain on the channel when any signal is received during the delayed time.

The scanning function can be used only when at least one channel is programmed and the scanning is valid.

2) Response channel (the transmitting channel when scanning) during the scanning set by the dealer has the following options:

①. The start channel

Press PTT or the CALL key or enable VOX transmitting during the scanning or when the scanning stays, the radio will transmit signals on the channel under scanning.

②. Start channel + current channel (when response channel is enabled)

If pressing PTT or the CALL key or enabling VOX transmitting during the scanning, the radio will transmit signals on the channel under scanning.

If pressing PTT or the CALL key or enabling VOX transmitting when the scanning is staying, the radio will transmit signals in the current channel.

③. Designated channel

If pressing PTT or the CALL key or enabling VOX transmitting during the scanning or when the scanning stays, the radio will transmit signals in the designated channel.

④. Designated channel + current channel (when response channel is enabled)

If pressing PTT or the CALL key or enabling VOX transmitting during the scanning, the radio will transmit signals at the designated channel.

If pressing PTT or the CALL key or enabling VOX transmitting when the scanning is staying, the radio will transmit signals in the current channel.

1) . Last received call channel

When pressing PTT key, the radio will transmit signals on the channel of the last received call.

2) . Last used channel

When pressing PTT key, the radio will transmit signals on the channel where the last transmitting was made.

3) . Last used channel + current channel (when response channel is enabled)

If pressing PTT or the CALL key or enabling VOX transmitting during the scanning, the radio will transmit signals on the channel where the last transmitting was made.

If pressing PTT or the CALL key or enabling VOX transmitting when the scanning stays, the radio will transmit signals in current channel.

① Priority scan:

During the scanning, if priority channels of the radio have been set, even if the normal channels are receiving signals, the radio will scan the priority channels according to the preset time of scanning, when the priority channels receive signals, the radio will automatically switch to the priority channels and stay there till the signals disappear, the dealer has set the time delay between the signal disappearing and the continuing scanning, if the scanning stays on 2nd priority channel, it will scan back 1st priority channel, on which if it stays, no channel will be scanned back.

② Excescent channel (temporary) deletion

If the scanning stays on a certain channel, you can press the key programmed for deletion of excescent channel (temporary) to temporarily delete the channel for the scan list, if you press the scan key to resume the scanning, this channel will be automatically added into the scan list again.

Note: priority channels cannot be deleted, when there are only 2 channels for scanning, neither of them can be deleted.

4.1.3 CTCSS and DCS

The dealer may have programmed CTCSS or DCS signals on channels of the radio, you can ignore calls from other irrelevant stations using the same channel.

If a certain channel is programmed CTCSS or DCS signals, only when the correct CTCSS or DCS signals are received can the squelch be enabled. Similarly, only stations using the same

CTCSS/DCS signals as being used in your radio can receive the signals you transmit.

4.1.4 TOT function

1) TOT timer:

a) The purpose of the time-out timer is to prevent any person from overlong using a channel to speak and to prevent radio from too long continuous transmitting.

b) TOT timer indicates the time allowed for the radio to continuously transmit signals. If the allowed time is exceeded, the radio will alarm and stop transmitting.

2) TOT key:

a) It regulates the time span of prohibited transmitting after the action of the TOT timer.

b) During the time span of prohibited transmitting, if pressing the PTT key or the CALL or starting the VOX, indication tone will be generated and the transmitting will be prohibited.

3) TOT Pre-alarm

a) The radio will alarm in advance before the TOT timer stops the transmitting.

b) After the alert, if the transmitting time exceeds the preset time, the TOT timer will act.

4) TOT Reset:

a) It regulates the time delay from PTT key releasing to the TOT timer resetting.

b) If the time of releasing the PTT key is shorter than that of the resetting time, the countdown will continue.

4.1.5 Auto Power Saving

The dealer can set the power-saving mode of the battery by programming.

Provided that the function is enabled, the radio will be in the power-saving mode in 10 seconds if no signal is received or no operation is carried out. When any signal is received or any operation is carried out, the radio can automatically quit this mode.

Power-saving modes: short, med, long and off.

Setting the power-saving function of a battery can reduce the power consumption of the battery.

4.1.6 Low Power Warning

Receiving low power warning: If the battery power is lower than the preset value during receiving, the radio will produce a alert tone of “Doo” every 15 seconds.

Transmitting low power warning: When the battery power appears low, the indicator flashes. If the battery power is lower than the preset value during transmitting, the status indicator flashes red. If the battery level is too low, the radio cannot transmit signals.

4.1.7 Squelch enabled function

If no signal is received, the squelch circuit of the radio will prevent the speaker from making any sound.

Press the function key for “squelch off switch”, you can disable the squelch control circuit and the speaker will produce continuous sound (whether signals are received). This operation is very useful for adjusting volume or receiving weak signals (avoiding discontinuous sound due to weak signals).

Press the function key for “squelch on switch”, the green light will be on and the radio is in the monitoring status.

4.1.8 5TONE signaling

5Tone has 9 encoding formats: CCIR1, CCIR2, ZVEI1, ZVEI2, ZVEI3, EEA, EIA, USER DEFINED1 and USER DEFINED2. The last two formats are customized modes.

1. 5tone decoding

The decoding template is the 5tone decoding template. If the decoding template is the same to that of encoding, the decoding will be successful.

When the radio receives correct 5tone signaling, turning on squelch according to the “receiving squelch mode” set by the user, you can receive the call and the orange LED will flash.

After successful decoding, the radio will operate according to the decoding call response set by the dealer.

2. 5tone encoding

The ending template is made of 1-3 encoding sequences. Each encoding sequence can be set to 5tone or DTMF. If 5tone is selected, you need to set its content.

If the PTT ID of the selected channel is set to “5Tone”, 5Tone will be transmitted when calling.

Or, when pressing the side key for “Call1/2/3/4”, 5tone signaling will be sent, this function is programmed by the dealer.

4.1.11 PC Programmable

You can program the radio functions and adjust some parameters by PC programming software KSP7200.

4.1.12 Squelch Level Selection

The purpose of the squelch is to mute the speaker noise when no signals are received or the signals are weak. When the squelch is activated, you can hear noise from the speaker; when the squelch is inactivated, you will not hear noise from the speaker. Selecting the squelch level is to select which the signal strength level is strong enough to enable the squelch or weak enough to disable the squelch. Over high squelch level will make the radio unable to receive signals efficiently when signals are weak; over low squelch level will make the radio communication affected by noise or other irrelevant signals. The squelch level has 0-9 options..

4.1.13 Beep Tone Volume

This setting controls the power on tone, channel busy tone and TOT tone, etc..

4.2 Parameter Setting (PC Mode)

The radio parameters have been programmed in the factory. The user can reset the radio parameters such as working frequency, channels, CTCSS/DCS and auto scanning. We designed a user-friendly and convenient programming software KSP7200 for users to set parameters on the radio. The programming steps are as follows:

- a. Install the programming software KSP7200.
- b. Connect the radio to the computer serial port with the specified programming line (KSPL-08), See Figure 4-1.

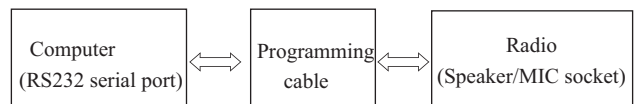


Figure 4-1

- c. Turn on the computer power.
- d. Turn on the radio power.
- e. Click the KSP7200 program to run the programming software.

f. Click on [Read] in the KSP7200 main menu to read the radio parameters into the computer; click on [Write] to transfer the PC programming parameters into the radio.

g. You can program the following parameters with the KSP 7200:

- 1) The RX and TX frequency of each channel;
- 2) The receiving and transmitting signaling of each channel;
- 3) Busy channel lockout option;
- 4) TOT;
- 5) Squelch level option;
- 6) 5-tone or 2-tone settings
- 7) Power saving option.
- 8) Alarm function setting.
- 9) Monitor mode option.
- 10) Scan mode option.
- 11) Scan the reverting channel option.
- 12) Scan the priority channel selection.

For more details, please refer to the “ Help ” document of KSP7200 software.

ATTENTION:

1. Turn off the radio before connection.
2. When the data is read on the radio, the indicator light turn red and it's prohibited to press the PTT button; when the data is written on the radio, the indicator light turns green.
3. Before the first time of editing, you should read data on the radio firstly and then and backup the data.
4. If the radio cannot work normally after being written in with the editing data, open the data backup and rewrite the backup into the radio.
5. “Model” information is important radio data and is prohibited to modify.

4.3 Computer Test Mode:

As shown in figure 4-1,connect the radio to the radio communication port with the specified testing cable.

Warning: Before enter the computer test mode, connect a HF load of 50 to the radio antenna connector or connect the radio to a comprehensive test device.

Under the computer test mode, you can modify the following parameters with KSP7200 programming software:

- 1) Frequency Stability
- 2) Low/High power
- 3) Max. Tone deviation
- 4) DCTCSS balance
- 5) DCTCSS frequency deviation
- 6) CTCSS frequency deviation
- 7) DTMF frequency deviation
- 8) Tone frequency deviation
- 9) MSK frequency deviation
- 10) VOX plus
- 11) Sensitivity
- 12) SQL 1/9 (OPEN/SQUELCH)

For mort details,please refer to the “ Help ” document of ksp7200 software.

4.4 Wired Clone Parameters

Wired clone mode:

It can be enabled/disabled by programming software, this mode can only be entered when the wired clone functions of both the host

radio and the client radio are enabled.

Operating steps are as follows:

- 1.Press the side keys SK1 and SK2 of the primary, and then press and hold the power switch of the radio for about 2 seconds, the orange light flashes twice and the beep sound of “Clone” will be produced, and then the radio enters the wired clone mode.
- 2.Press the PTT button on the host radio, the host radio will start to send data, the client radio for receiving data will enter the wired clone mode.
- 3.During the data duplication, the red light of the host radio will be continuously on and the green light of the client radio will be continuously on.
- 4.After the data are successfully cloned, the host radio will report “ Success ” and be automatically restarted; the client radio will also be automatically restarted.

Note: During the duplication of data, if the radio models or software versions are not consistent, the red light of the host radio will flash (0.25s On 0.25s Off) and the sub radio will be automatically restarted; if no data was received within 3 seconds, the red light of the host radio will flash (0.5s On 0.5s Off) and the client radio will be automatically restarted.

Chapter 5 Service, Assembly and Disassembly

The radio is a precision communication equipment. Please be careful when assemble or disassemble the radio during service. Instructions for assembly and disassembly are as follows:

5. 1 Removing and Installing the Battery

To remove the battery, push the latch upwards and remove the battery away from the radio. (See figure 5.1)

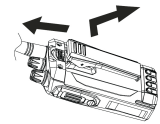


Figure5.1

To install the battery, match the tow bulges at the bottom of the battery with the corresponding grooves at the radio aluminum alloy frame and insert it in. Then press the upper end of the battery till the latch secure. (See figure 5.2 and figure 5.3)



Figure5.2

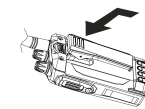


Figure 5.3

5. 2 Removing and Installing the Belt Clip

To remove the belt clip, use your nail or a tool to lift the metal spring piece in the belt clip from the topside, and then pull the belt out wards.

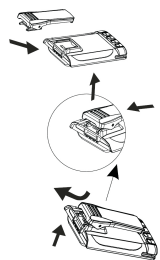


Figure 5.4

To install the belt clip, match the upper head of the belt clip with the glides on the rear of the battery, and then press the belt clip downwards

5. 3 Removing the Casing from the Chassis

- 1.Remove the knobs;
 - 2.Remove the two knob nuts and the antenna nut;
 - 3.Remove the two cross head screws that fix the top cover at the top;
 - 4.Remove the two cross head screws that fix the aluminum alloy frame at the bottom by tool;
 - 5.Pull the aluminum alloy frame out of the casing;
- See Figure 5-5

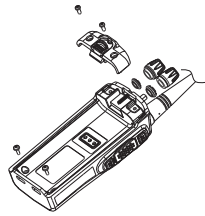


Figure5-5

5. 4 Remove the Chassis from the Main Board

- 1.Remove the screw;
 - 2.Melt the solder at the antenna point with a electric soldering iron and take off the main board;
 - 3.Take away the two screws and the antenna connector..
- See Figure 5-6

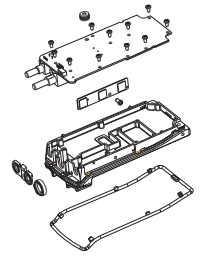


Figure 5-6

After the aforesaid operations, you can carry out corresponding service or debugging according to the actual situation.

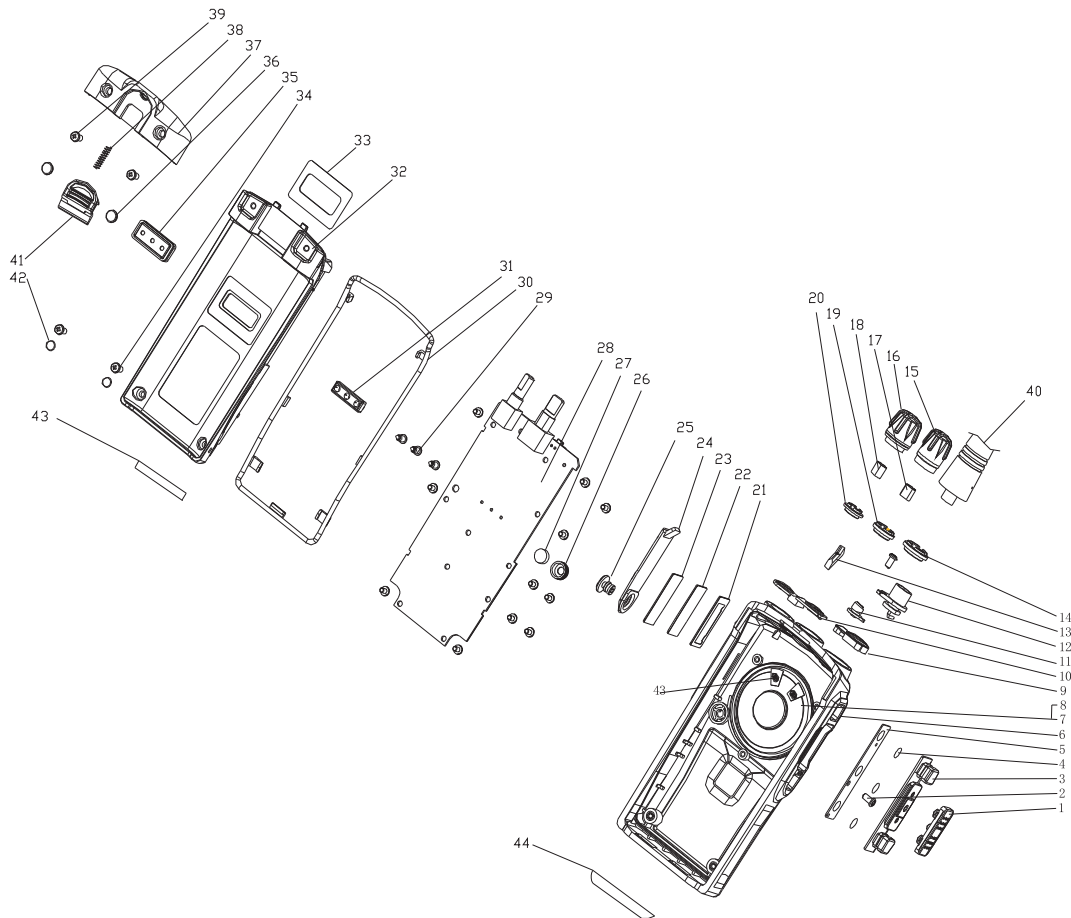


Figure 5-7 Exploded View

NO	PARTNUMBER	DESCRIPTION	NUMBER
1	201-007200-R04	KEY PTT	1
2	301-20040G-R01	SCREW 2*4	12
3	202-007200-R04	RUBBER KEY PTT	1
4	203-007200-R04	METAL DOME	1
5	101-007200-R03	PCB FOR PTT	1
6	201-007200-R01	FRONT CABINET	1
7	121-100000-R18	SPEAKER	1
8	204-000558-R01	DUST-PROOF NET FOR SPEAKER	1
9	202-007200-R03	WATERPROOF FOR ANTENNA SOCKET	1
10	202-007200-R02	WATERPROOF FOR ENCODER & VR	1
11	202-007200-R05	EMERGENCY RUBBER KEY	1
12	203-007200-R01	ANTENNA SOCKET	1
13	201-007200-R10	LIGHT GUIDER	1
14	203-007200-R07	NUT FOR ANTENNA SOCKET	1
15	201-007200-R03	ENCODER KNOB	1
16	201-007200-R02	VR KNOB	1
17	203-006800-R26	ENCODER CIRCLIP	1
18	203-003208-R09	VR CIRCLIP	1
19	203-007200-R08	ENCODER NUT	1
20	203-000558-R02	VR NUT	1
21	204-007200-R02	EARPHONE ADHESIVE TAPE	1
22	101-072001-R03	EARPHONE PCB	1
23	204-007200-R01	EARPHONE LABEL	1
24	201-007200-R08	EARPHONE COVER	1
25	304-30040G-R01	SPECIAL SCREW M3.0*4 ANSI 4-40#	1
26	202-000558-R09	MIC WATERPROOF	1
27	204-006800-R06	DUST-PROOF NET FOR MIC	1
28		MIAN PCB	1
29	203-007200-R02	POGO PIN	3
30	202-007200-R01	MAIN WATERPROOF	1
31	201-007200-R09	POGO PIN SOCKET	1
32	203-007200-R03	AL CABINET	1
33	204-007200-R03	AL CABINET SPONGE	1
34	301-20080G-R03	SCREW M2.0*8	2
35	202-007200-R06	POGO PIN WATERPROOF	1
36	202-007200-R07	RUBBERY STUFFER	2
37	201-007200-R06	COPING	1
38	203-007200-R06	CROSSBAR SPRING	1
39	301-25050J-R01	SCREW M2.5*5	2
40		ANTENNA	1
41	201-007200-R07	SLIDE CROSSBAR	1
42	204-007200-R05	SCREW PLATE	2

Chapter 6 Radio Debugging

Before test/debugging, make sure all the equipments have been well connected to the ground!

Before test/debugging, make sure the antenna output terminal has been connected properly to the corresponding devices and load!

The transmitter output must pass RF power attenuator before being connected to the standard signal source/ frequency deviator/frequency spectrum!

When testing the receiver, make sure not to conduct transmitting operation!

When in debugging/testing/service, make sure static free measures for human body and equipments.

6.1 Service Equipment and Software.

The following equipments and software in Table 6.1 are necessary for the service and test of the radio.

Table 6.1 For Test and Service: Equipment and Software

No.	Name	Parameter requirements
1	Computer	Above P2, compatible with IBM PC, WINDOWS 98/ME/2000/XP
2	Programming software	KSP7200
3	Programming Cable	
4	Tunning cable	Order
5	Cloning line	
6	DC regulated power	Output voltage: 7.5V, output current: ≥ 5A
7	Power meter	Measuring rang: 0.5---10W Frequency range: 100MHz500MHz Impedance: 50Ω
8	Frequency meter	Frequency range: 0.1600MHz Frequency precision: higher than $\pm 1 \times 10^{-6}$ Sensitivity: higher than 100mV
9	Frequency Deviator	Frequency range: DC600MHz Measuring range: 0-- ± 5 kHz
10	Digital Multimeter	Input impedance: higher than 10MΩ/V DC, with the ability of testing voltage, current, impedance
11	Audio Signal Generator	Frequency range: 2---3000Hz output level: 1---500mV
12	RF Power attenuator	Attenuation: 40dB or 50dB Supporting power: Higher than 10W
13	Standard signal source	Frequency range: 10MHz---1000MHz Output level: 0.1uV~32mV (-127dBm~-17dBm)
14	Oscillograph	Frequency range: DC~20MHz Test range: 10mV~20V
15	Audio voltmeter	Test range: 10mV~10V

Recommendation: Equipment in item 6, 7, 8, 10, 11, and 12 can be replaced by the HP8920 comprehensive test instrument.

6.2 Debugging

1) . VCO:

Receiving:

① High end, adjust TC4 to make VCO voltage-controlled voltage (CV terminal) be $4.2V \pm 0.2V$.

② Low end, check VCO voltage-controlled voltage (CV terminal) to be $\geq 0.8V$.

Transmitting:

③ High end, adjust TC3, to make VCO voltage-controlled voltage (CV terminal) be $4.2V \pm 0.2V$.

④ Low end, check VCO voltage-controlled voltage (CV terminal) to be $\geq 0.8V$.

2) . Transmitting:

In computer debugging mode

① Frequency adjustment

Adjusts the transmitting frequency to within $\pm 100\text{Hz}$ of the nominal frequency in the computer debugging mode.

② High power adjustment

Adjusts the transmitting power to 3.8-4.6W in the computer debugging mode..

(5 frequency points including Higher, High, Med, Low, lower)

③ Low power adjustment

Adjust the transmitting power to 0.8-1.5W in the computer debugging mode..

(5 frequency points including Higher, High, Med, Low, lower)

④ Max. frequency deviation

Signal source: MOD:1kHz/120mV LPF:15kHz

Adjust the max frequency deviation in the computer debugging mode.

3.9kHz---4.6kHz (wideband)

3.2kHz---3.9kHz (median band)

between 1.8kHz---2.4kHz (narrowband)

⑤ DCTCSS balance

Signal source: LPF: 300Hz

Adjust DCTCSS balance in the computer debugging mode.

Make the transmitting demodulation waveform be flat square wave.

⑥ CTCSS frequency deviation

Signal source: LPF: 300Hz

Adjust CTCSS frequency deviation in the computer debugging mode.

0.50kHz---0.85kHz (wideband)

0.50kHz ---0.65kHz (median band)

0.25kHz--0.50kHz (narrowband)

The waveform shall be good.

⑦ DCTCSS frequency deviation

Signal source:LPF:300Hz

Adjust DCTCSS frequency deviation in the computer debugging mode.

0.70kHz ---1.10kHz (wideband)

0.60kHz ---0.85kHz (median band)

0.25kHz---0.50kHz (narrowband)

The waveform shall be good.

⑧ DTMF、TONE、FSK、5T/2T frequency deviation

Adjust DTMF, TONE, FSK and 5T/2T frequency deviation in the computer debugging mode.

3.2---4.0 kHz (wideband)

3.0kHz---3.6kHz (median band)

1.6---2.4kHz (narrowband)

⑨ Transmitting low battery warning

Adjust the transmitting low battery warning in the computer debugging mode.

Set the power supply voltage at 6.8V, and press “start” and then “end”

3)Receiving :

①Sensitivity adjustment

Adjust the sensitivity in the computer debugging mode.

Make the sensitivity of all frequency points the highest (provided the sensitivity is the highest, the bigger computer debugging data, the better)

②Squelch adjustment

Adjust squelch in the computer debugging mode.

1) 9-levelsquelchon

This signal level output should be -118dBm(wideband)

-117dBm(narrowband)

Automatically records the corresponding squelch level

2) 9-levelsquelchoff

signal level output -120dBm(wideband

-119dBm(narrowband)

Automatically records the corresponding squelch level

1-levelsquelchon

Signal level output -124dBm(wideband)

-123dBm(narrowband)

Automatically records the corresponding squelch level

3) 1-levelsquelchoff

Signal level output -126dBm(wideband)

-125dBm(narrowband)

Automatically records the corresponding squelch level

Note: Voltage for the aforesaid tests: 7.5V $\pm 0.1V$ in room temperature

Frequency range: 350MHz400MHz 400MHz470MHz 450MHz520MHz

Chapter 7 Technical Specifications

7.1 General Specification

Frequency (MHz)	136~174MHz	470~512 MHz
	400~470MHz	350~390 MHz
Modulation	16K0F3E/8K0F3E	
Number of Channels	16	
Channel Spacing	25 kHz (W) , 20 kHz (M) , 12.5 kHz (N)	
MF	1st MF: 51.65MHz 2nd MF: 450kHz	
Working Voltage	7.5V $\pm 0.1V$ negative grounding	
Working Temperature	-25°C ~ +55°C	
Antenna Impetance	50 Ω	
Mic Impedance	2k Ω	
Battery (Standard)	Model: KB-70B, Li-Ion Battery DC 7.4V , 1700mAh	
Dimension (WxHxD)	56 mm \times 102 mm \times 29 mm	
Weight	235g (With battery and antenna)	

7.2 Receiver

- 1) . Sensitivity $\leq -116\text{dBm}$ (0.35 μV) (wideband) (narrowband)
Hi, Med, Low frequency points 14dB SINAD
MOD:1kHz, DEV:+/-3kHz (wideband)
+/-1.5kHz(narrowband)
- 2) . Distortion half audio power $\leq 8\%$
Max audio power $\leq 20\%$
16 Ω Speaker, BTL output, 1000mW audio power .
MOD:1kHz, DEV:+/-3kHz (wideband)
+/-1.5kHz(narrowband)
- 3) . Current
 - a. Static current $\leq 85\text{ mA}$
Volume at the min. value, squelch off.
 - b.1000mW audio power, current $\leq 500\text{ mA}$
- 4) . Audio correspondence (relative to 6dB/octave deviation) +2dB / -6dB
- 5) . Adjacent-channel selectivity $\geq 70\text{dB}$
(Wideband) / $\geq 60\text{dB}$ (narrowband)
- 6) . Intermediation rejection $\geq 65\text{dB}$ (wideband) (narrowband)
- 7) . Parasitic suppression $\geq 70\text{Db}$
- 8) . Signal-to-Noise Ratio $\geq 40\text{dB}$ (wideband) / $\geq 35\text{dB}$
(narrowband)
- 9) . Squelch off: off when signal source level = -125dBm+/-3 dBm (level-1 squelch)
10. Squelch on: on when signal source level = -123dBm +/-3 dBm (level-1 squelch)

7.3. Transmitter

- 1) .output power High power (3.8W---4.6W)
Low power (0.8W---1.5W)
Hi, Med, Low frequency points, MOD:1kHz, DEV:+/-3kHz.
Red light on when transmitting.
- 2) .Transmitting current High power $\leq 1.8\text{A}$ low power $\leq 1.1\text{A}$
- 3) .Max. frequency deviation
3.9kHz---4.6kHz (wideband)
3.2kHz---3.9kHz (median band)
1.8kHz---2.4kHz (narrowband)
MOD:1kHz/120mv
- 4) .Modulation Sensitivity
(mic input1kHz/19mv
2.2---3.8kHz(wideband)
1.2---1.8kHz(narrowband)
- 5) .Transmitting distortion
MOD: 1kHz, DEV: 3kHz $< 3\%$
MOD: 0.3kHz, DEV: 3kHz $< 10\%$
MOD: 0.4kHz, DEV: 3kHz $< 5\%$
MOD: 0.5kHz, DEV: 3kHz $< 5\%$
MOD: 0.6kHz, DEV: 3kHz $< 5\%$
MOD: 0.8kHz, DEV: 3kHz $< 5\%$
MOD: 1.5kHz, DEV: 3kHz $< 5\%$
MOD: 2.0kHz, DEV: 3kHz $< 5\%$
MOD: 2.5kHz, DEV: 3kHz $< 5\%$
MOD: 1kHz/120mv $< 15\%$
- 6) .CTCSS frequency deviation
0.50kHz---0.85kHz (wideband)
0.50kHz ---0.65kHz (median band)
0.25kHz--0.50kHz (narrowband)
The waveform shall be good.
- 7) .DCTCSS frequency deviation
0.70kHz ---1.10kHz (wideband)

- 0.60kHz ---0.85kHz (median band)
0.25kHz---0.50kHz (narrowband)
The waveform shall be good.
- 8) .DTMF、TONE、FSK、5T/2T frequency deviation
3.2---4.0 kHz(wideband)
3.0kHz---3.6kHz (median band)
1.6---2.4 kHz (narrowband)
- 9) .Transmitting frequency deviation
nominal frequency +/-200Hz
- 10) .modulation feature (relative to 6dB/ octave deviation)
+3dB / -3dB
- 11) .Transmitting harmonic suppression $\geq 70\text{dB}$
- 12) .Signal-to-Noise Ratio $\geq 40\text{dB}$ (wideband) / $\geq 35\text{dB}$ (narrowband)
- 13) .Frequency stability +/- 2.5ppm
- 14) .Under voltage indication
Set the voltage at 6.8V, press the ptt key and the red light
Hould flash and no transmitting power .
- 15) .Starting time of transmitting should be =55ms
Voltage for aforesaid tests: 7.5V +/-0.1V in room temperature
Frequency range:136MHz-174MHz 350MHz--400MHz
400MHz--470MHz 450MHz--520MHz

Chapter 8 Troubleshooting

No.	Problem	Cause and Solutions
1	Power on failnre	A. Battery power may be insufficient. Recharge or change the battery pack. B. The power switch is broken, please change it. C. The CPU is broken, please change it. D. Turned off remotely, reprogramming is required.
2	Phase-locked loop is unlocked (Beep sounds)	A. The PLL crystal oscillator X4 is broken, please change it. B. The oscillating tube is broken, and please change it. C. Phase-locked loop chip IC9 is broken please change it.
3	Cannot talk to or hear other group	A. Make sure the two communication radios are using the channel of the same frequency. B. Make sure the CTCSS/DCS tone is the same as that of your group members. C. Out of the effective communication range.
4	Cannot receive Signals.	A. The antenna is not well connected, please screw the antenna again until secure. B. The high frequency amplification tube Q81 is broken, please change it. C. The squelch level is too high and the squelch cannot be activated. Reset the squelch level with a computer. D. Mixer tube Q79 is broken, and please change it. E. MF processing chip U9 is broken, please change it.

5	The indicator lights red when in transmitting but no voice can be heard.	<p>A. The power amplifier tube Q68 is broken and there is no power output, please change it with a new tube.</p> <p>B. The microphone is broken, please change it with a new one.</p> <p>C. The operational amplifier IC14 is broken, please change it with a new one.</p>
6	The indicator lights green when in receiving but no voice can be heard.	<p>A. The speaker is broken, please change it with a new one.</p> <p>B. The audio amplifier Q92 is broken, please change it with a new one.</p> <p>C. The switch tubes Q86 and Q87 are broken and please change them with new ones.</p> <p>D. The operational amplifier IC13 is broken, please change it with a new one.</p>
7	Cannot program the radio parameters normally.	<p>A. Make sure the programming cable is well connected.</p> <p>B. The computer RS-232 serial port output is unmoral, please fix the computer.</p> <p>C. The MIC is not well connected with the SPK socket. Check the socket and if it is unable to work normally please change it with a new one.</p>

Chapter 9 KBC-70C Charger

9.1 General Description:

Function: intelligent rapid charging

Applicable battery: KB-70B (1700mAH, 7.4V Li-ion battery),
KB-70A (1350mAH, 7.2V nickel-hydrogen pile)

Battery type identification: External

Input power supply: DC11V-20V, 500mA, ripples <500mV

9.2 Operating environment

Temperature: $-5^{\circ}\text{C} \pm 2^{\circ}\text{C}$ -- $+55^{\circ}\text{C} \pm 2^{\circ}\text{C}$

Humidity: 95%@40°C

9.3 Safety requirements

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

9.4 Technical Specifications

- Idling input current: $\leq 15\text{mA}$
- Fast charging current: $410 \pm 25\text{mA}$
- Max. charging time of nickel-hydrogen battery: $285\text{m} \pm 15\text{m}$
- Max. charging time of li-ion battery: $510\text{m} \pm 30\text{m}$
- Max. charging limit voltage : $9.6\text{V} \pm 0.2\text{V}$
- Max. battery temperature: $+50^{\circ}\text{C} \pm 2^{\circ}\text{C}$
- Specified voltage of charged battery:
 Nickel-hydrogen battery: pre-charging when the voltage $< 5.5 \pm 0.1\text{V}$, when the battery voltage reaches $6.5 \pm 0.1\text{V}$, the charging turns to rapid charging. When the battery voltage reaches $9.6\text{V} \pm 0.2\text{V}$, the battery will be deemed as full and the charging will be stopped.
 Li-ion battery: pre-charging when the voltage $< 6.5 \pm 0.1\text{V}$, when the battery voltage reaches $6.5 \pm 0.1\text{V}$, the charging turns to rapid charging.
- Charging process checking: battery voltage, battery temperature rise, $-\Delta\text{V}$, charging time, max. Battery temperature
- Min battery voltage: $5.5\text{V} \pm 0.1\text{V}$ for nickel-hydrogen battery
 $6.5\text{V} \pm 0.1\text{V}$ for Li-ion battery

- Pre-charging current of battery: $180\text{mA} \pm 10\text{mA}$ for nickel-hydrogen battery
 $90\text{mA} \pm 10\text{mA}$ for li-ion battery
- Pre-charging time: 15~20m
- The battery voltage is checked during the pre-charging, when it reaches the threshold voltage of the battery, the charging will turn to fast charging.
- Conditions to stop charging:
 Normal conditions: battery full, nickel-hydrogen battery: $-\Delta\text{V} = 30\text{mV} \sim 60\text{mV}$
 Abnormal conditions:
 - 1) Battery temperature is higher than the limit value
 - 2) Battery voltage exceeds the limit value
 - 3) Charging time exceeds the limit value
 - 4) The battery voltage fails to reach the min. voltage allowed for normal battery during the pre-charging

- Charging efficiency: after being charged in constant temperature, the capacity of the battery should not be lower than 90% of the actual capacity.

After being charged in high temperature, the capacity of the battery should not be lower than 70% of the actual capacity.

After being charged in low temperature, the capacity of the battery should not be lower than 80% of the actual capacity.

- Other functions:
 - 1) Charging process indication
 - 2) Charging abnormality indication
 - 3) Pre-charging function for over-discharged battery
 - 4) Trickle charging for nickel-hydrogen battery
 - 5) Output short-circuit protection function (short-circuit current < 10mA)

9.5 LED Status Table:

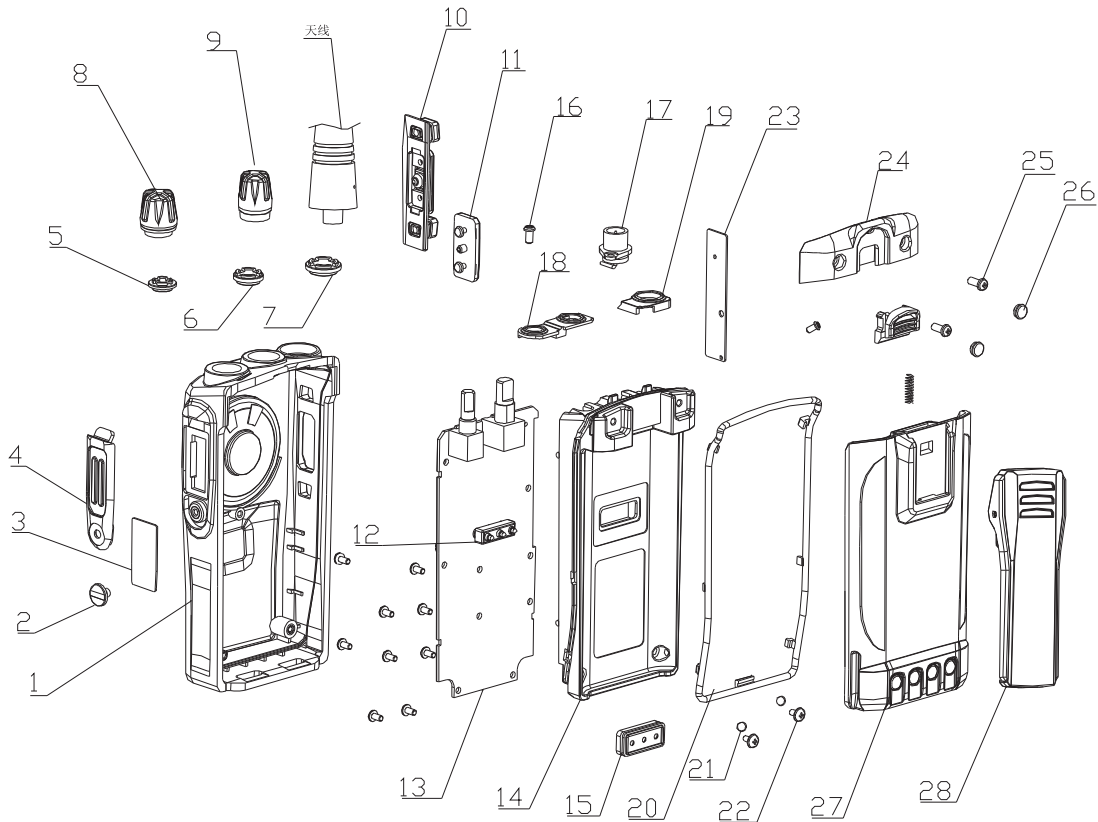
Charger status	LED Status		
	Charging Indication (red)	Power LED(green)	Battery Temperature, battery and circuit abnormality indication (yellow)
Standby/battery not installed		ON	
Pre-charging	Flashing		
Fast charging	ON		
Charging completed		ON(Nickel-hydrogen battery)	
Charger output short circuit			
Abnormal charging status			ON

9.6 Description of interfaces

- LED red: Charging indication
- LED green: Power indication or charging completion indication or Trickle charging indication
- LED yellow: Charging abnormality indication
- Facing the charger, from left to right:**
- BAT- : Charging output cathode
- TYPE: battery type detection
- Suspension: nickel-hydrogen battery
- Grounding: Li-ion battery
- TEMP: battery temperature detection
- BAT+ : Charging output anode

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
- E2PROM electrically erasable programmable read-only memory
- 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
- RX receiver
- SPK speaker
- TCXO temperature compensated crystal oscillators
- TX transmitter
- UL un-lock
- VCO voltage control oscillator



Appendix 2: Spare List

NO.	PART NUMBER	DESCRIPTION	NUMBER
1	604-072000-R01	CABINET ASM.	1
2	304-30040G-R01	SPECIAL SCREWM3.0*4	1
3	604-072000-R02	EARPHONE PCBASM.	1
4	201-007200-R08	EARPHONE COVER	1
5	203-000558-R02	VR NUT	1
6	203-007200-R08	ENCODER NUT	1
7	203-007200-R07	NUT FOR ANTENNA SOCKET	1
8	604-072000-R03	VR KNOBASM.	1
9	604-072000-R04	ENCODER KNOBASM.	1
10	202-007200-R04	RUBBER KEYPTT	1
11	201-007200-R04	KEY PTT	1
12	202-007200-R09	POGO PIN SOCKET	1
13		MAIN PCBASM.	1
14	604-072000-R07	ALCABINET ASM.	1
15	202-007200-R06	POGO PIN WATERPROOF	1
16	301-20040G-R01	SCREW M2.0*4	12
17	203-007200-R01	ANTENNASOCKET	1
18	202-007200-R01	WATERPROOFFOR ENCODER & VR	1
19	202-007200-R03	WATTERPROOFFOR ANTENNASOCKET	1
20	202-007200-R01	MAIN WATERPROOF	1
21	204-007200-R05	SCREW PLATE	2
22	301-20080G-R03	SCREW M2.0*8.0	2
23	604-072000-R05	PTT PCBASM.	1
24	604-072000-R06	COPING ASM.	1
25	301-25050J-R01	SCREW M2.5*5	2
26	202-007200-R07	RUBBERY STUFFER	2

CABINET ASM.

NO.	PART NUMBER	DESCRIPTION	NUMBER
1	201-007200-R01	FRONT CABINET	1
2	204-000558-R01	PT558 DUST PROOF NET FOR SPEAKER	1
3	204-006800-R06	DUST-PROOF NET FOR MIC	1
4	204-000558-R09	MIC WATERPROOF	1
5	201-007200-R10	LIGHT GUIDER	1
6	204-006200-R09	SPEAKER	1
7	401-0101E1-RD8	LOGO	
8			1
EARPHONE PCB ASM.			
1	101-072001-R03	EARPHONE PCB	1
2	204-007200-R01	EARPHONE LABEL	1
3	204-007200-R02	EARPHONE ADHESIVE TAPE	1
4	101-072002-R03	EARPHONE FPC	1
AL CABINET ASM.			
1	203-007200-R04	AL CABINET	1
2	204-007200-R03	AL CABINET SPONGE	1
3	202-003208-R07	TRANSMITTING RUBBER	1
ENCODER KNOB ASM.			
1	201-007200-R03	ENCODER KNOB	1
2	203-006800-R26	ENCODER CIRCLIP	1
VR KNOB ASM.			
1	201-007200-R02	VR KNOB	1
2	203-003208-R09	VR CIRCLIP	1
COPING ASM			
1	201-007200-R06	COPING	1
2	201-007200-R07	SLIDE CROSSBAR	1
3	203-007200-R06	CROSSBAR SPRING	1
PTT PCB ASM			
1	101-007200-R03	PCB FOR PTT	1
2	203-007200-R04	METAL DOME	1

Appendix 3: STRUCTURE PART LIST

NO	PARTNUMBER	DESCRIPTION	REMARK	NUMBER
1	101-007200-R03	MAIN PCB / PTT PCB		1
2	121-100000-R18B	SPEAKER		1
3	201-007200-R01	FRONT CABINET		1
4	201-007200-R02	VR KNOB		1
5	201-007200-R03	ENCODER KNOB		1
6	201-007200-R04	KEY PTT		1
7	201-007200-R06	COPING		1
8	201-007200-R07	SLIDE CROSSBAR		1
9	201-007200-R08	EARPHONE COVER		1
10	201-007200-R09	POGO PIN SOCKET		1
11	201-007200-R10	LIGHT GUIDER		1
12	202-000558-R09	MIC WATERPROOF		1
13	202-003208-R07	TRANSMITTING RUBBER		1
14	202-007200-R01	MAIN WATERPROOF		1
15	202-007200-R02	WATERPROOF FOR ENCODER & VR		1
16	202-007200-R03	WATERPROOF FOR ANTENNA SOCKET		1
17	202-007200-R04	RUBBER KEY PTT		1
18	202-007200-R05	EMERGENCY RUBBER KEY		1
19	202-007200-R06	POGO PIN WATERPROOF		1
20	202-007200-R07	RUBBERY STUFFER		2
21	203-000558-R02	VR NUT		1
22	203-003208-R09	VR CIRCLIP		1
23	203-006800-R26	ENCODER CIRCLIP		1
24	203-007200-R01	ANTENNA SOCKET		1
25	203-007200-R03	AL CABINET		1
26	203-007200-R04	METAL DOME		1
27	203-007200-R06	CROOSBAR SPRING		1
28	203-007200-R07	NUT FOR ANTENNA SOCKET		1
29	203-007200-R08	ENCODER NUT		1
30	204-000558-R01	DUST-PROOF NET FOR SPEAKER		1
31	204-006800-R06	DUST-PROOF NET FOR MIC		1
32	204-006800-R07	MIC SPONGE		1
33	204-007200-R01	EARPHONE LABEL		1
34	204-007200-R02	EARPHONE ADHESIVE TAPE		1
35	204-007200-R03	AL CABINET SPONGE		1
36	204-007200-R05	SCREW PLATE	FOR SCREW M2.0*8.0	2
37	204-0KB36L-R03	SPONGE PLATE	FOR ANTENNA MAIN PCB/PTT PCB	0.3
38	301-20040G-R01	SCREW M2.0*4.0	FOR CRYSTAL OSCILLATOR	12
39	301-20080G-R03	SCREW M2.0*8.0	FOR CABINET	2
40	301-25050J-R01	SCREW M2.5*5.0	FOR COPING	2
41	304-30040G-R02	ASPECIAL SCREW M3.0*4.0 ANSI 4-40#	FOR EARPHONE COVER	1

Appendix 4: Electronic Component List (136-174MHz)

No	MaterialSerial No	ComponentName/Specification	Quantity
1	101-072001-R04	PT7200PCB/speaker connector,double, FR4,0.6MM,PT7200JK1-071121.PCB,ROHS	1
2	101-072002-R04	PT7200PCB/FPC,Double,0.1MM, PT7200JK2-FPC-071121.PCB,ROHS	1
3	101-07200V-R02	PT7200PCB/Vbandmainboard,PT7200V-070411.PCB,ROHS	1
4	102-1509GV-R01	FrequencyDivider/UPB1509GV,ROHS	U8
5	102-9140NR-R01	ResetIC/PST9140NR,ROHS	U11, U12
6	102-A31136-R01	IF(MF)modulationIC/TA31136FN,SSOP,ROHS IC/AK2346, ROHS	U10
7	102-AK2346-R01	VoltagereregulatorICXC6204B502MR, ROHS	Ic12
8	102-B502MR-R01	Operationalamplifier/TC75W51FU,SSOP8-P-0.65, ROHS	U13, U14
9	102-C75W51-R01	,AUDIO,AMP/TDA8541,SO8,ROHS	IC13, IC14, IC15, IC16, U9
10	102-DA8541-R01	PLLIC/ADF4111,TSSOP, ROHS	Q90
11	102-DF4111-R01	Operationalamplifier/NJM2904V,OP-AMP,ROHS	IC9
12	102-M2904V-R01	MCU/M16C-M3062LFGPGP,FLASH,100P6Q-A,ROHS	IC10
13	102-M3062L-R01	MemoryIC/AT24C64AN-10SU2.7,ROHS	U16
14	102-T24C64-R01	ChipHFswitchdiode/MA77,0805,ROHS	IC11
15	103-00MA77-R01	Chipswitchdiode/MA742(PANASONIC),ROHS	D48
16	103-0MA742-R01	Chipdiode/1SR154-400(ROHM),ROHS	D65, D66, D67, D68, D54
17	103-1SR154-R01	Chipvarialblecapacitordiode/1SV278,ROHS	D49
18	103-1SV278-R01	Chipvarialblecapacitordiode/1SV305,ROHS	D44
19	103-1SV305-R01	Chipvarialblecapacitordiode/1SV325,ROHS	D60
20	103-1SV325-R01	Chipswitchdiode/0603,MA2S111(PANASONIC),ROHS	D36, D37, D38, D39
21	103-A2S111-R01	Chip switchdiode/DAN222,(ROHM),ROHS	D64, D35, D45
22	103-DAN222-R01	Chipdiode/Wavebandswitch,HSC277(HITACHI),ROHS	D55, D56
23	103-HSC277-R01	ChipHFswitchdiode/0603,HVC131(HITACHI),ROHS	D46, D47
24	103-HVC131-R01	Chipvarialblecapacitordiode/HVC376B,ROHS	D62, D63
25	103-HVC376-R01	ChipLED/0603,green,,H19-213SYGC,ROHS	D57, D58, D59
26	103-L190YG-R01	ChipLED/0603,red,19-21SURC/S530-A2/TR8,ROHS	D52, D53
27	103-MHC190-R02	Chipregulatordiode/MAZ806800L,ROHS	D50, D51
28	103-Z80680-R01	Chiptriode/DTA123JE(ROHM),ROHS	ZD13, ZD14, ZD15, ZD16, ZD17, ZD18, ZD19, ZD20, ZD21, ZD22
29	104-A123JE-R01	Chiptriode/DTA144EE(ROHM),ROHS	Q84, Q85
30	104-A144EE-R01	Chiptriode/DTC114EE(ROHM),ROHS	Q69, Q70
31	104-C114EE-R01	Chiptriode/DTC144EE(ROHM),ROHS	Q71, Q72, Q73, Q74, Q75, Q95
32	104-C144EE-R01	Chiptriode/2SA1774(QR), ROHS	Q86
33	104-SA1774-R01	Chiptriode/2SC2412K,ROHS	Q94
34	104-SC2412-R01	Chiptriode/2SC3356,ROHS	Q78
35	104-SC3356-R01	Chiptriode/2SC4116-GR, ROHS	Q66
36	104-SC4116-R01	Chiptriode/2SC4617(S)(ROHM),ROHS	Q93
37	104-SC4617-R01	Chiptriode/2SC4627J-C(TX),ROHS	Q87, Q88, Q89, Q65
38	104-SC4627-R01	Chiptriode/2SC5108Y(TOSHIBA),ROHS	Q79
39	104-SC5108-R01	ChipFET(field-effecttransistor)2SJ243,ROHS	Q55, Q56, Q57, Q58
40	105-2SJ243-R01	ChipFET(field-effecttransistor)2SK508NV(K52),ROHS	Q63, Q64
41	105-2SK508-R01	ChipFET(field-effecttransistor)3SK318,ROHS	Q61, Q62
42	105-3SK318-R01	ChipFET(field-effecttransistor)RD01MUS2,ROHS	Q80, Q82
43	105-RD01MU-R01	ChipFET(field-effecttransistor)RD07MVS1,ROHS	Q67
44	105-RD07MV-R01	ChipFET(field-effecttransistor)2SK1824,ROHS	Q68
45	105-SK1824-R01	ChipFET(field-effecttransistor)ST2301,ROHS	Q47, Q48, Q49, Q50, Q51, Q52, Q53, Q54, Q83
46	105-ST2301-R01	ChipFET(field-effecttransistor)ST2302,ROHS	Q76, Q77
47	105-ST2302-R01	Carbonencoderswitch/EC10SP16-85A0,ROHS	Q91, Q92
48	106-EC10SP-R01	Alarm switch/TD-30EAY-K00,ROHS	K5
49	106-TD30EA-R01	Plug-inphasefrequencydetector/JTBM450CX24,ROHS	K6
50	108-450C24-R02	Plug-inporcelainfilter/LTWC450F,450kHz±7kHz,ROHS	L113
51	108-CF450F-R02	ChipCeramicFilter/LTWC450H,450kHz±3kHz,ROHS	CF4
52	108-CF450H-R02	chipIFfilter/DSF753SBF,51.65MHz±4kHz/3dB, (7.0x5.0x1.3)mm,ROHS	CF3
53	108-XF5165-R01		Xf2

No	MaterialSerial No	ComponentName/Specification	Quantity	
54	109-040000-R01	Chipresistor /0402,0R±5%,ROHS	C392, R413, R339, R345, R346, R347, R348, R351, R352, R353, R354, R355, R357, R358, R563, C367, R559	17
55	109-040100-R01	Chipresistor/0402,10R±5%,ROHS	R102, R103, R106, R107, R109	5
56	109-040101-R01	Chipresistor/0402,100R±5%,ROHS	R114, R167, R385, R386	4
57	109-040102-R01	Chipresistor/0402,1K±5%,ROHS	R282, R283, R287, R288, R289, R280, R284, R290	8
58	109-040103-R01	Chipresistor/0402,10K±5%,ROHS	R415, R416, R417, R418, R419, R392, R307, R309, R300, R292, R360, R373, R406, R407, R421, R285, R323, R324, R330	19
59	109-040104-R01	Chipresistor/0402,100K±5%,ROHS	R497, R505, R503, R504, R506, R507, R509, R510, R511, R423, R281, R435	12
60	109-040105-R01	Chipresistor/0402,1M±5%,ROHS	R525, R527, R526, R493, R494, R499, R500	7
61	109-040122-R01	Chipresistor/0402,1.2K±5%,ROHS	R404	1
62	109-040123-R01	Chipresistor/0402,12K±5%,ROHS	R562, R299, R539,	3
63	109-040124-R01	Chipresistor/0402,120K±5%,ROHS	R479, R481	2
64	109-040131-R01	Chipresistor/0402,130R±5%,ROHS	R377	1
65	109-040150-R01	Chipresistor/0402,15R±5%,ROHS	R424	1
66	109-040152-R01	Chipresistor/0402,1.5K±5%,ROHS	R389, R468, R467, R311, R488, R432	6
67	109-040153-R01	Chipresistor/0402,15K±5%,ROHS	R306, R308	2
68	109-040154-R01	Chipresistor/0402,150K±5%,ROHS	R240, R244, R380, R169, R245, R279, R508, R490,	8
69	109-040180-R01	Chipresistor/0402,18R±5%,ROHS	R341	1
70	109-040182-R01	Chipresistor/0402,1.8K±5%,ROHS	R557	1
71	109-040183-R01	Chipresistor/0402,18K±5%,ROHS	R540, R541, R542, R543	4
72	109-040184-R01	Chipresistor/0402,180K±1%,ROHS	R530, R531, R533	3
73	109-040185-R01	Chipresistor/0402,1.8M±5%,ROHS	R561	1
74	109-040203-R01	Chipresistor/0402,20K±5%,ROHS	R362	1
75	109-040204-R01	Chipresistor/0402,200K±5%,ROHS	R335, R480, R491, R492, R480	5
76	109-040221-R01	Chipresistor/0402,220R±5%,ROHS	R400, R379	2
77	109-040222-R01	Chipresistor/0402,2.2K±5%,ROHS	R401, R403, R438	3
78	109-040223-R01	Chipresistor/0402,22K±5%,ROHS	R293, R294, R295, R296, R291, R301, R302, R304, R305	9
79	109-040224-R01	Chipresistor/0402,220K±5%,ROHS	R546, R545	2
80	109-040243-R01	Chipresistor/0402,24K±5%,ROHS	R551, R552	2
81	109-040272-R01	Chipresistor/0402,2.7K±5%,ROHS	R310, R313, R314, R412, R297	5
82	109-040273-R01	Chipresistor/0402,27K±5%,ROHS	R553, R554, R555, R409	4
83	109-040274-R01	Chipresistor/0402,270K±5%,ROHS	R560, R363, R452	3
84	109-040331-R01	Chipresistor/0402,330R±5%,ROHS	R398, R427, R430, R431, R512, R513, R455, R466	8
85	109-040332-R01	Chipresistor/0402,3.3K±5%,ROHS	R428, R429	2
86	109-040333-R01	Chipresistor/0402,33K±5%,ROHS	R446, R447, R449, R450	4
87	109-040334-R01	Chipresistor/0402,330K±5%,ROHS	R484, R485, R486	3
88	109-040391-R01	Chipresistor/0402,390R±5%,ROHS	R112	1
89	109-040392-R01	Chipresistor/0402,3.9K±5%,ROHS	R298	1
90	109-040393-R01	Chipresistor/0402,39K±5%,ROHS	R478, R361, R444	3
91	109-040394-R01	Chipresistor/0402,390K±5%,ROHS	R535, R537, R538	3
92	109-040433-R01	Chipresistor/0402,43K±5%,ROHS	R502	1
93	109-040470-R01	Chipresistor/0402,47R±5%,ROHS	R340, L121, R343	3
94	109-040471-R01	Chipresistor/0402,470R±5%,ROHS	R558, R464, R465	3
95	109-040472-R01	Chipresistor/0402,4.7K±5%,ROHS	R319, R321, R322, R325, R326, R327, R328, R329, R331, R334, R333, R303, R420, R405, R422	15
96	109-040473-R01	Chipresistor/0402,47K±5%,ROHS	R370, R371, R372, R375, R376, R451, R359, R374	8
97	109-040474-R01	Chipresistor/0402,470K±5%,ROHS	R470, R471, R473, R476, R477	5
98	109-040513-R01	Chipresistor/0402,51K±5%,ROHS	R544	1
99	109-040561-R01	Chipresistor/0402,560R±5%,ROHS	R336, R337, R338, R391, R410, R393	6
100	109-040562-R01	Chipresistor/0402,5.6K±5%,ROHS	R388, R390, R394, R395, R414, R469	6
101	109-040563-R01	Chipresistor/0402,56K±5%,ROHS	R516, R517	2
102	109-040564-R01	Chipresistor/0402,560K±5%,ROHS	R498	1
103	109-040680-R01	Chipresistor/0402,68R±5%,ROHS	R113	1
104	109-040681-R01	Chipresistor/0402,680R±5%,ROHS	R101	1
105	109-040682-R01	Chipresistor/0402,6.8K±5%,ROHS	R396, R397, R532	3
106	109-040683-R01	Chipresistor/0402,68K±5%,ROHS	R453, R383, R381	3
107	109-040684-R01	Chipresistor/0402,680K±5%,ROHS	R536	1
108	109-040823-R01	Chipresistor/0402,82K±5%,ROHS	R534, R514, R515, R382,	4

No	MaterialSerialNo	ComponentName/Specification		Quantity
109	109-040824-R01	Chipresistor/0402,820K±5%,ROHS	R564	1
110	109-040913-R01	Chipresistor/0402,91K±5%,ROHS	R482, R483	2
111	109-060000-R01	Chipresistor/0603,0R±5%,ROHS	L125, R342, R344, R349, R350, R445	6
112	109-060100-R01	Chipresistor/0603,10R±5%,ROHS	R318	1
113	109-060101-R01	Chipresistor/0603,100R±5%,ROHS	R387, R316, R317	3
114	109-060103-R01	Chipresistor/0603,10K±5%,ROHS	R408, R332	2
115	109-060105-R01	Chipresistor/0603,1M±5%,ROHS	R524	1
116	109-060124-R01	Chipresistor/0603,120K±5%,ROHS	R474	1
117	109-060151-R01	Chipresistor/0603,150R±5%,ROHS	R378	1
118	109-060154-R01	Chipresistor/0603,150K±5%,ROHS	R241, R456, R457, R458, R459, R460, R461	7
119	109-060184-R01	Chipresistor/0603,180K±5%,ROHS	R528	1
120	109-060220-R01	Chipresistor/0603,22R±5%,ROHS	R556	1
121	109-060222-R01	Chipresistor/0603,2.2K±5%,ROHS	R402	1
122	109-060271-R01	Chipresistor/0603,270R±5%,ROHS	R462, R463	2
123	109-060470-R01	Chipresistor/0603,47R±5%,ROHS	R433	1
124	109-060473-R01	Chipresistor/0603,47K±5%,ROHS	R365, R366, R367, R368, R369	5
125	109-060683-R01	Chipresistor/0603,68K±5%,ROHS	R364	1
126	109-100R39-R01	Chipresistor/1206,0.39R±5%,ROHS	R519, R521, R522	3
127	110-220103-R03	Volumeswitch/Ry-6932, ROHS	K4	1
128	111-030000-R01	Chip FUSE/433003,3A/32V, 1206(429003), ROHS	Fs2	1
129	112-043100-R01	Chipcapacitor/0402,10P±0.5P,50V,C0G,ROHS	C460, C462, C464, C466, C467	5
130	112-043101-R01	Chipcapacitor/0402,100P±5%,50V,C0G,ROHS	C439, C420, C421, C422, C321,C999	6
131	112-043102-R01	Chipcapacitor/ 0402,1000P±10%,50V,X7R,ROHS	C305, C306, C308, C309, C310, C312, C313, C314, C316, C317, C318, C319, C322, C323, C324, C325, C328, C329, C330, C331, C334, C335, C339, C355, C332, C333, C357, C360, C463, C465, C579, C18, C560, C423, C425, C300, c514, C522, C404, C639, C638, C636, C537	44
132	112-043103-R01	Chipcapacitor/0402,0.01uF±10%,50V,X7R,ROHS	C618, C424, C572, C573 C576, C577, C307, C557, C559, C556, C625	11
133	112-043104-R02	Chipcapacitor/0402,0.1uF±10%,10V,X5R,ROHS	C593, C19, C20, C385, C386, C387, C388, C389, C391, C394, C395, C396, C397, C398, C399, C400, C401, C402, C403, C405, C407, C409, C410, C411, C412, C413, C414, C415, C416, C417, C418, C22, C17, C558, C626	35
134	112-043105-R01	Chipcapacitor/0402,1uF±10%,6.3V,X5R,ROHS	C12, C601, C406, C393, C471, C472, C518, C540, C637, C635, C547, C533, C542, C548, C549, C535, C536, C539, C541, C543, C544, C545, C546	23
135	112-043110-R01	Chipcapacitor/0402,11P±5%,50V,C0G,ROHS	C499	1
136	112-043123-R01	Chipcapacitor/0402,0.012uF±10%,50V,X7R,ROHS	C623	1
137	112-043130-R01	Chipcapacitor/0402,13P±5%,50V,C0G,ROHS	C480	1
138	112-043150-R01	Chipcapacitor/0402,15P±5%,50V,C0G,ROHS	C481, C509	2
139	112-043151-R01	Chipcapacitor/0402,150P±5%,50V,C0G,ROHS	C606	1
140	112-043180-R01	Chipcapacitor/0402,18P±5%,50V,C0G,ROHS	C517, C475	2
141	112-043181-R01	Chipcapacitor/0402,180P±10%,50V,X7R,ROHS	C364, C365	2
142	112-043182-R01	Chipcapacitor/0402,1800P±10%,50V,X7R,ROHS	C571	1
143	112-0431R0-R01	Chipcapacitor/0402,1P±0.25P,50V,C0G,ROHS	C486	1
144	112-043200-R01	Chipcapacitor/0402,20P±5%,50V,C0G,ROHS	C592	1
145	112-043220-R01	Chipcapacitor/0402,22P±5%,50V,C0GROHS	C504, C505, C506	3
146	112-043221-R01	Chipcapacitor/0402,220P±5%,50V,C0G,ROHS	C13, C534	2
147	112-043222-R01	Chipcapacitor/0402,2200P±10%,50V,X7R,ROHS	C622	1
148	112-043223-R01	Chipcapacitor/0402,0.022uF±10%,50V,X7R,ROHS	C427, C430, C21	3
149	112-043224-R02	Chipcapacitor/0402,0.22uF±10%,16V,X7R,ROHS	C600, C602, C575	3
150	112-043244-R01	Chipcapacitor/0402,0.24uF±10%,16V,X7R,ROHS	C602	1
151	112-043270-R01	Chipcapacitor/0402,27P±5%,50V,C0G,ROHS	C493, C492	2
152	112-043273-R01	Chipcapacitor/0402,0.027uF±10%,50V,X7R,ROHS	C605	1
153	112-0432R0-R01	Chipcapacitor/0402,2P±0.25P,50V,C0G,ROHS	C366	1
154	112-043330-R01	Chipcapacitor/0402,33P±5%,50V,C0G,ROHS	C478, C482, C503, C483	4
155	112-043331-R01	Chipcapacitor/0402,330P±10%,50V,X7R,ROHS	C566	1
156	112-043333-R01	Chipcapacitor/0402,0.033uF±10%,16V,X7R,ROHS	C594, C595, C596, C597, C615, C616, C431, C432, C433, C434	10
157	112-043360-R01	Chipcapacitor/0402,36P±5%,50V,C0G,ROHS	C470	1
158	112-043390-R01	Chipcapacitor/0402,39P±5%,50V,C0G,ROHS	C489, C511, C510	3

No	MaterialSerialNo	ComponentName/Specification	Quantity	
159	112-043392-R01	Chip capacitor / 0402,3900P±10%,50V,X7R, ROHS	C14, C15, C16	3
160	112-0433R5-R01	Chip capacitor / 0402,3.5P±0.25P,50V,C0G, ROHS	C495, C587	1
161	112-043430-R01	Chip capacitor / 0402,43P±5%,50V,C0G, ROHS	C586, C588	2
162	112-043470-R01	Chip capacitor / 0402,47P±5%,50V,C0G, ROHS	C562, C564, C565, C563, C485	5
163	112-043471-R01	Chip capacitor / 0402,470P±10%,50V,X7R, ROHS	C627, C628, C629, C630, C631, C632, C578, C580, C582, C583, C584, C340, C341, C342, C343, C344, C345, C346, C347, C348, C350, C351, C352, C354, C356, C358, C361, C363, C370, C371, C372, C373, C378, C379, C380, C381, C382, C383, C384	39
164	112-043472-R01	Chip capacitor / 0402,4700P±10%,25V,C0G, ROHS	C552, C554, C555	3
165	112-043474-R01	Chip capacitor / 0402,0.47uF±10%,10V,X5R, ROHS	C608	1
166	112-0434R0-R01	Chip capacitor / 0402,4P±0.25P,50V,C0G, ROHS	C461, C476, C477, C529, C585, C449	6
167	112-0434R7-R01	Chip capacitor / 0402,4.5P/4.7P±0.25P,50V,C0G, ROHS	C451	1
168	112-043561-R01	Chip capacitor / 0402,560P±10%,16V,X7R, ROHS	C598, C599	2
169	112-043562-R01	Chip capacitor / 0402,5600P±10%,16V,X7R, ROHS	C619	1
170	112-0435R0-R01	Chip capacitor / 0402,5P±0.25P,50V,C0G, ROHS	C450, C530	2
171	112-043680-R01	Chip capacitor / 0402,68P±5%,50V,C0G, ROHS	C484	1
172	112-043681-R01	Chip capacitor / 0402,680P±10%,16V,X7R, ROHS	C338	1
173	112-043683-R01	Chip capacitor / 0402,0.068uF±10%,16V,X7R, ROHS	C624, C621	2
174	112-0436R0-R01	Chip capacitor / 0402,6P±0.5P,50V,C0G, ROHS	C445, C497, C498	3
175	112-0437R0-R01	Chip capacitor / 0402,7P±0.5P,50V,C0G, ROHS	C520	1
176	112-043820-R01	Chip capacitor / 0402,82P±5%,50V,C0G, ROHS	C570	1
177	112-0438R0-R01	Chip capacitor / 0402,8P±0.5P,50V,C0G, ROHS	C519, C443, C442	3
178	112-0439R0-R01	Chip capacitor / 0402,9P±0.5P,50V,C0G, ROHS	C468	1
179	112-043R50-R01	Chip capacitor / 0402,0.5P±0.1P,50V,C0G, ROHS	C501	1
180	112-043R75-R01	Chip capacitor / 0402,0.75P±0.1P,50V,C0G, ROHS	C494	1
181	112-063100-R01	Chip capacitor / 0603,10P±5%,50V,C0G, ROHS	C491	1
182	112-063101-R01	Chip capacitor / 0603,100P±5%,50V,C0G, ROHS	C440, C426	2
183	112-063102-R01	Chip capacitor / 0603,1000P±10%,50V,X7R, ROHS	C38, C311, C315	3
184	112-063103-R01	Chip capacitor / 0603,0.01uF±10%,50V,X7R, ROHS	C574	1
185	112-063104-R01	Chip capacitor / 0603,0.1uF±10%,50V,X7R, ROHS	C408	1
186	112-063110-R01	Chip capacitor / 0603,11P±5%,50V,C0G, ROHS	C524, C525, C527	3
187	112-063121-R01	Chip capacitor / 0603,120P±5%,50V,C0G, ROHS	C620	1
188	112-063150-R01	Chip capacitor / 0603,15P±5%,50V,C0G, ROHS	C507, C508, C523	3
189	112-063160-R01	Chip capacitor / 0603,16P±5%,50V,C0G, ROHS	C455	1
190	112-063180-R01	Chip capacitor / 0603,18P±5%,50V,C0G, ROHS	C448	1
191	112-063181-R01	Chip capacitor / 0603,180P±10%,50V,X7R, ROHS	C488	1
192	112-063220-R01	Chip capacitor / 0603,22P±5%,50V,C0G, ROHS	C531, C515, C532	3
193	112-063240-R01	Chip capacitor / 0603,24P±5%,50V,C0G, ROHS	C454	1
194	112-063334-R01	Chip capacitor / 0603,0.33uF±10%,50V,X7R, ROHS	C567	1
195	112-063390-R01	Chip capacitor / 0603,39P±5%,50V,C0G, ROHS	C490	1
196	112-0633R0-R01	Chip capacitor / 0603,3P±0.25P,50V,C0G, ROHS	C458	1
197	112-063471-R01	Chip capacitor / 0603,470P±10%,50V,X7R, ROHS	C581, C349, C359, C362, C368, C369, C374, C375, C376, C377	10
198	112-063472-R01	Chip capacitor / 0603,4700P±10%,50V,X7R, ROHS	C553	1
199	112-0634R0-R01	Chip capacitor / 0603,4P±0.25P,50V,C0G, ROHS	C452, C528,	2
200	112-063560-R01	Chip capacitor / 0603,56P±5%,50V,C0G, ROHS	C441	1
201	112-0635R0-R01	Chip capacitor / 0603,5P±0.25P,50V,C0G, ROHS	C446, C447, C453C496	4
202	112-063680-R01	Chip capacitor ROHS / 0603,68P±5%,50V,C0G, ROHS	C516	1
203	112-0636R0-R01	Chip capacitor / 0603,6P±0.5P,50V,C0G, ROHS	C444	1
204	112-0638R0-R01	Chip capacitor / 0603,8P±0.5P,50V,C0G, ROHS	C469	1
205	112-063R50-R01	Chip capacitor / 0603,0.5P±0.1P,50V,C0G, ROHS	C500	1
206	112-072105-R01	Chip Ta capacitor / TP Model, SIZE P, 1uF±20%, 10V, ROHS	C435, C436, C419, C603, C604, C590, C591	7
207	112-072106-R01	Chip Ta capacitor / TP Model, SIZE P, 10uF±20%, 6.3V, ROHS	C550, C551, C607, C502, C589	5
208	112-072155-R01	Chip Ta capacitor / TP Model, SIZE P, 1.5uF±20%, 10V, ROHS	C633, C634	2
209	112-072475-R01	Chip Ta capacitor / TP Model, SIZE P, 4.7uF±20%, 10V, ROHS	C568, C561, C526, C612, C609, C610, C611	7
210	112-102104-R01	Chip Ta capacitor / TS Model, SIZE A, 0.1uF±20%, 35V, ROHS	C487	1
211	112-102106-R02	Chip Tacapacitor / TS Model, SIZE A, 10uF±20%, 10V, ROHS	C512, C614, C513	3
212	112-102334-R01	Chip Ta capacitor / TS Model, SIZE A, 0.33uF±20%, 35V, ROHS	C459	1
213	112-102335-R01	Chip Ta capacitor / TS Model, SIZE A, 3.3uF±20%, 16V, ROHS	C437	1

No	MaterialSerialNo	ComponentName/Specification		Quantity
214	112-102475-R02	Chip Ta capacitor/ TS Model,SIZE A,4.7uF±20%,16V, ROHS	C613	1
215	112-172107-R02	Chip Ta capacitor/ TS Model,SIZE C,100uF±20%,10V, ROHS	C617, C569	2
216	113-010100-R01	Chip trimming capacitor / TZV2Z100A110,3~10p+100, ROHS	TC3, TC4	2
217	114-06E180-R01	Chip wire inductor/ C1608CB-18NJ, ceramic core18NH±5%,0603,ROHS	L63, L67	2
218	114-06E181-R01	Chip wire inductor/ C1608CB-R18J, ceramiccore180nH±5%,0603, ROHS	L71, L72	2
219	114-06E221-R01	Chip wire inductor/ C1608CB-R22J, ceramic core220nH±5%,0603, ROHS	L77, L78, L73, L74	4
220	114-06E330-R01	Chip wire inductor/ C1608CB-33NJ, green,ceramic core33NH±5%,0603,ROHS	L118	1
221	114-06E390-R01	Chip wire inductor/ C1608CB-39NJ, ceramiccore39nH±5%,0603, ROHS	L82	1
222	114-06E560-R01	Chip wire inductor/ C1608CB-56NJ, ceramic core56nH±5%,0603,ROHS	L120, L127	2
223	114-06G101-R01	Chip inductor / MLF1608DR10K,100nH±10%,0603, ROHS	L87	1
224	114-06G102-R01	Chip inductor/ MLF1608A1R0K,1uH±5%,0603, ROHS	L400	1
225	114-06G151-R01	Chip inductor/ MLF1608DR15K,150nH±10%,0603, ROHS	L116	1
226	114-06G270-R01	Chip inductor / MLG1608B27NJ,27nH±5%,0603, ROHS	L96, L97	2
227	114-06G332-R01	Chip inductor/ MLF1608A3R3K,3.3uH±5%,0603, ROHS	L79, L80	2
228	114-06G470-R01	Chip inductor / MLG1608B47NJ,47nH±5%,0603,ROHS	L117	1
229	114-06G471-R01	Chip inductor / MLF1608DR47K,470nH±10%,0603, ROHS	L64,L65,L66	3
230	114-06G561-R01	Chip inductor/ MLF1608DR56K,560nH±10%,0603, ROHS	L62	1
231	114-06G820-R01	Chip inductor / MLG1608B82N,82nH±5%,0603, ROHS	L84	1
232	114-07E220-R01	Chip wire inductor/ C2012C-22NJ,22nH±5%,0805, ROHS	L76	1
233	114-07E390-R01	Chip wire inductor / C2012C-39NJ,39nH±5%,0805, ROHS	L75	1
234	114-07E470-R01	Chip wire inductor / C2012C-47NJ,47nH±5%,0805, ROHS	L126	1
235	114-07E560-R02	Chip wire inductor/ C2012C-56NJ,56nH±5%,0805, ROHS	L104, L122	2
236	114-08E102-R01	Chip wire inductor/ FHW1008UC1R0GB, ceramic core,1uH±2%,1008, ROHS	L99	1
237	114-08E103-R01	Chip inductor / FSLM2520-100J,10uH±5%,1008, ROHS	L61	1
238	114-08E222-R02	Chip inductor / FSLM2520-2R2K,2.2uH±10%,1008, ROHS	L106	1
239	114-08E331-R01	Chip inductor/ FSLM2520-R33K,330nH±10%,1008, ROHS	L115	1
240	114-08E821-R01	Chip inductor / FSLM2520-R82K,820nH±10%,1008, ROHS	L114	1
241	115-1R04R0-R02	Chip air-cored coil / 0.3*1.0*4TR, positive,high pin, ROHS	L102, L103	2
242	115-1R25R0-R01	Chip air-cored coil/ 0.3*1.2*5TR, positive, highpin, ROHS	L105	1
243	115-1R55R0-R02	Chip air-cored coil/ 0.3*1.5*5TR, positive, highpin, ROHS	L108,	1
244	115-1R56R0-R04	Chip air-cored coil/ 0.3*1.5*6TR, positive, highpin, ROHS	L107, L109	2
245	115-1R57R0-R05	Chip air-cored coil / 0.3*1.5*7TR, positive,high pin, ROHS	L128	1
246	115-1R58R0-R03	Chip air-cored coil / 0.4*1.5*8TR, positive,high pin, ROHS	L101	1
247	117-000000-R04	Chip bead/ EMI,FILTER,SMT,BLM11A221S,0603, ROHS	L88, L89, L90, L91, L92, L93, L94, L95, L98	9
248	117-000000-R08	Chip bead / EMI,FILTER, SMT,BLM11A601S,0603, ROHS	L81, L83, L111, L112, L68, L70, L123, L124	8
249	117-000000-R09	Chip bead/ EMI,FILTER,SMT,BLM21P600S,0805, ROHS	L100	1
250	119-060332-R01	thermistor / NTH5G16P39B332J,3.3K±5%,0603, ROHS	TH3	1
251	119-060473-R01	thermistor / NTH5G16P40B473J,47K±5%,0603, ROHS	TH1	1
252	121-200000-R01	Microphone / B6027AP402-88(B6027AP402-65), ROHS	MIC2	1
253	122-112M80-R01	Chip transistor/ NT5032SC,12.8±2.5PPM,5.0*3.2*1.6mm, ROHS	X4	1
254	122-13M686-R01	Chip crystal resonator / 3.6864MHz, ROHS	X6	1
255	122-19M830-R01	Chip crystal resonator / 9.8304MHZ-NX5032GA,ROHS	X5	1
256	124-020000-R04	Chip connector / BL112-14RL,14PIN, ROHS	RP2	1
257	125-041022-R01	Chip network resistor / 1K*2,0402,1/16W, ROHS	CP14, CP15, CP16, CP17, CP18	5
258	125-041024-R01	Chip network resistor / 1K*4,0402,1/16W, ROHS	CP10, CP11, CP12, Cp13	4
259	203-000558-R04	Speaker contact spring,carbon spring steel wire0.25 gilt		2
260	203-007200-R02	PT7200pogo pin /brass/ Auplate/ ROHS		3
261	603-0W558A-R01	Voice recorder IC /W588A080, binding	JP4	1

Appendix 4: Electronic Component List (400-470MHz)

No	MaterialSerialNo	ComponentName/Specification		Quantity
1	101-072001-R05	PT7200PCB/speaker connector,double, FR4,0.6MM,PT7200JK1-071228.PCB, ROHS		1
2	101-072002-R05	PT7200PCB/FPC,Double,0.1MM, PT7200JK2-FPC-071228.PCB, ROHS		1
3	101-07200U-R05	PT7200PCB/U band mainboard, PT7200U-070614.PCB, ROHS		1
4	102-9140NR-R01	Reset IC / PST9140NR, ROHS		2
5	102-A31136-R01	IF(MF) modulation IC / TA31136FN,SSOP, ROHS	U11, U10	1
6	102-AK2346-R01	IC / AK2346, ROHS	U9	1
7	102-B502MR-R01	Voltage regulator IC / XC6204B502MR, ROHS	IC12	2
8	102-C75W51-R01	Operational amplifier / TC75W51FU,SSOP8-P-0.65,ROHS	U13, U12	5
9	102-DA8541-R01	AUDIO,AMP / TDA8541,SO8, ROHS	IC14, IC15, IC13, IC16, U8	1
10	102-DF4111-R01	PLL IC / ADF4111,TSSOP, ROHS	Q92	1
11	102-M2904V-R01	Operational amplifier/ NJM2904V,OP-AMP, ROHS	IC9	1
12	102-T24C64-R01	Memory IC / AT24C64AN-10SU2.7, ROHS	IC10	1
13	103-00MA77-R01	Chip HF switch diode / MA77,0805, ROHS	IC11	1
14	103-0MA742-R01	Chip switch diode / MA742(PANASONIC), ROHS	D51	5
15	103-1SR154-R01	Chip diode / 1SR154-400(ROHM), ROHS	D57, D72, D73, D74, D71	1
16	103-1SV278-R01	Chip variable capacitor diode / 1SV278, ROHS	D52	1
17	103-1SV325-R01	Chip variable capacitor diode / 1SV325, ROHS	D47	4
18	103-A2S111-R01	Chip switch diode / 0603,MA2S111(PANASONIC), ROHS	D40, D39, D41, D42	3
19	103-DAN222-R01	Chip switch diode / DAN222,(ROHM), ROHS	D70, D38, D48	2
20	103-HSC277-R01	Chip diode / Waveband switch,HSC277(HITACHI),ROHS	D59, D58	2
21	103-HVC131-R01	Chip HF switch diode / 0603,HVC131(HITACHI), ROHS	D49, D50	2
22	103-HVC355-R02	Chip variable capacitor diode / HVC355B, ROHS	D68, D69	7
23	103-HZU5AL-R01	Chip regulator diode / HZU5ALL(HITACHI),ROHS	D61, D65, D60, D62, D63, D64, D66	1
24	103-L190YG-R01	Chip LED / 0603, green,,H19-213SYGC, ROHS	ZD12	2
25	103-MHC190-R02	Chip LED / 0603,red,19-21SURC/S530-A2/TR8, ROHS	D55, D56	2
26	103-Z80680-R01	Chip regulator diode / MAZ806800L, ROHS	D53, D54 ZD20, ZD13, ZD14, ZD15, ZD16, ZD17, ZD18, ZD19, ZD21,	11
27	104-A123JE-R01	Chip triode / DTA123JE(ROHM), ROHS	Zd22, ZD23	2
28	104-A144EE-R01	Chip triode / DTA144EE(ROHM), ROHS	Q83, Q84	2
29	104-C114EE-R01	Chip triode / DTC114EE(ROHM), ROHS	Q69, Q70	6
30	104-C144EE-R01	Chip triode / DTC144EE(ROHM), ROHS	Q95, Q71, Q72, Q73, Q74, Q75	1
31	104-SA1774-R01	Chip triode / 2SA1774(Q R), ROHS	Q88	1
32	104-SC2412-R01	Chip triode / 2SC2412K, ROHS	Q96	1
33	104-SC3356-R01	Chip triode / 2SC3356, ROHS	Q77	1
34	104-SC4116-R01	Chip triode / 2SC4116-GR, ROHS	Q66	1
35	104-SC4617-R01	Chip triode/ 2SC4617(S)(ROHM), ROHS	Q93	4
36	104-SC5108-R01	Chip triode / 2SC5108Y(TOSHIBA), ROHS	Q90, Q89, Q91, Q65	6
37	105-2SJ243-R01	Chip FET(field-effect transistor) / 2SJ243, ROHS	Q58, Q57, Q56, Q55, Q60, Q78	2
38	105-2SK508-R01	Chip FET(field-effect transistor) / 2SK508NV(K52), ROHS	Q63, Q64	2
39	105-3SK318-R01	Chip FET(field-effect transistor) / 3SK318, ROHS	Q61, Q62	2
40	105-QA0002-R01	Chip FET(field-effect transistor) / RQA0002, ROHS	Q81, Q79	1
41	105-RD01MU-R01	Chip FET(field-effect transistor) / RD01MUS2, ROHS	Q68	1
42	105-SK1824-R01	Chip FET(field-effect transistor) / 2SK1824, ROHS	Q67	10
43	105-ST2301-R01	Chip FET(field-effect transistor) / ST2301, ROHS	Q47, Q59, Q48, Q49, Q50, Q51, Q52, Q53, Q54, Q82	2
44	105-ST2302-R01	Chip FET(field-effect transistor) / ST2302, ROHS	Q76, Q85	2
45	106-EC10SP-R01	Carbon encoder switch / EC10SP16-85A0,无铅	Q86, Q87	1
46	106-TD30EA-R01	Alarm switch / TD-30EAY-K00, ROHS	K5	1
47	108-450C24-R02	Plug-in phase frequency detector/ JTBM450CX24, ROHS	K6	1
48	108-CF450F-R02	Plug-in porcelain filter / LTWC450F,450kHz±7kHz, ROHS	L108	1
49	108-CF450H-R02	Chip Ceramic Filter / LTWC450H,450kHz±3kHz,ROHS	CF4	1
50	108-XF5165-R01	chip IF filter/ DSF753SBF,51.65MHz±4kHz/3dB, (7.0x5.0x1.3)mm, ROHS	CF3 XF2	1
51	109-040000-R01	Chip resistor / 0402,0R±5%,ROHS	R578, R421, C317, R341, R344, R345, R349, R350, R351, R352,	20

No	MaterialSerialNo	ComponentName/Specification		Quantity
			R353, R355, R356, R406, R423, R424, R510, R515, R573, R587	
52	109-040100-R01	Chip resistor / 0402,10R±5%,ROHS	R101, R288, R102, R103, R106, R107, R435, R109	8
53	109-040101-R01	Chip resistor / 0402,100R±5%,ROHS	R240, R402, R403, R405	4
54	109-040102-R01	Chip resistor / 0402,1K±5%,ROHS	CP13a, CP13b, CP13c, CP13d, CP11a, CP11b, CP11c, CP11d, CP15a, CP15b, CP16a, CP16b, CP18a, CP18b, R112, R474, R284, R285, R290, R282, R292, R291	22
55	109-040103-R01	Chip resistor / 0402,10K±5%,ROHS	R340, R360, R411, R414, R419, R431, R358, R420, R425, R427, R428, R429, R430, R570	14
56	109-040104-R01	Chip resistor/ 0402,100K±5%,ROHS	R393, R426, R394, R397, R398, R399, R400, R401, R519, R385, R386, R387, R388, R389, R390, R391, R396, R486, R508	19
57	109-040105-R01	Chip resistor / 0402,1M±5%,ROHS	R524, R525, R527	3
58	109-040121-R01	Chip resistor/ 0402,120R±5%,ROHS	R506	1
59	109-040122-R01	Chip resistor / 0402,1.2K±5%,ROHS	R338, R501	2
60	109-040123-R01	Chip resistor / 0402,12K±5%,ROHS	R576	1
61	109-040124-R01	Chip resistor / 0402,120K±5%,ROHS	R495, R493	2
62	109-040150-R01	Chip resistor / 0402,15R±5%,ROHS	R113	1
63	109-040151-R01	Chip resistor / 0402,150R±5%,ROHS	R378	1
64	109-040152-R01	Chip resistor / 0402,1.5K±5%,ROHS	R444, R445	2
65	109-040153-R01	Chip resistor / 0402,15K±5%,ROHS	R306, R308, R309, R307	4
66	109-040154-R01	Chip resistor / 0402,150K±5%,ROHS	R244, R241, R280, R281	4
67	109-040182-R01	Chip resistor/ 0402,1.8K±5%,ROHS	R571	1
68	109-040183-R01	Chip resistor/ 0402,18K±5%,ROHS	C573, R540, R541, R542, R543, R544	6
69	109-040184-R01	Chip resistor / 0402,180K±1%,ROHS	R532, R531	2
70	109-040204-R01	Chip resistor / 0402,200K±5%,ROHS	R494, R329, R384	3
71	109-040220-R01	Chip resistor / 0402,22R±5%,ROHS	R437, L117, R382, R441	4
72	109-040221-R01	Chip resistor / 0402,220R±5%,ROHS	R434	1
73	109-040222-R01	Chip resistor / 0402,2.2K±5%,ROHS	R337	1
74	109-040223-R01	Chip resistor/ 0402,22K±5%,ROHS	R415, R416, R417, R418, R294, R293, R297, R298, R299, R300, R301, R302, R304, R305	14
75	109-040224-R01	Chip resistor / 0402,220K±5%,ROHS	R332	2
76	109-040243-R01	Chip resistor / 0402,24K±5%,ROHS	R564, R546	2
77	109-040272-R01	Chip resistor/ 0402,2.7K±5%,ROHS	R289, R310, R311, R312, R313, R314	6
78	109-040273-R01	Chip resistor/ 0402,27K±5%,ROHS	R395, R518, R521	3
79	109-040274-R01	Chip resistor / 0402,270K±5%,ROHS	R575, R574	2
80	109-040302-R01	Chip resistor/ 0402,3K±5%,ROHS	R500, R502	2
81	109-040331-R01	Chip resistor / 0402,330R±5%,ROHS	R114, R436, C324, R505, R481, R482, R483, R459	8
82	109-040332-R01	Chip resistor / 0402,3.3K±5%,ROHS	R438, R498, R499	3
83	109-040333-R01	Chip resistor/ 0402,33K±5%,ROHS	R462, R460, R465, R464	4
84	109-040334-R01	Chip resistor / 0402,330K±5%,ROHS	R330, R331, R333	3
85	109-040392-R01	Chip resistor / 0402,3.9K±5%,ROHS	C318, R303	2
86	109-040393-R01	Chip resistor / 0402,39K±5%,ROHS	R461, R374, R452	3
87	109-040394-R01	Chip resistor/ 0402,390K±5%,ROHS	R538, R539, R534, R537, R536	5
88	109-040471-R01	Chip resistor / 0402,470R±5%,ROHS	R572, R503	2
89	109-040472-R01	Chip resistor/ 0402,4.7K±5%,ROHS	R295, R296, R315, R316, R317, R318, R319, R320, R321, R322, R323, R324, R325, R328, R409, R327	16
90	109-040473-R01	Chip resistor / 0402,47K±5%,ROHS	R357, R283, R361, R362, R375, R359, R371, R372, R376, R377, R412	11
91	109-040474-R01	Chip resistor/ 0402,470K±5%,ROHS	R489, R509, R484, R485, R490, R491, R492	7
92	109-040513-R01	Chip resistor/ 0402,51K±5%,ROHS	R545	1
93	109-040560-R01	Chip resistor / 0402,56R±5%,ROHS	R167	1
94	109-040561-R01	Chip resistor / 0402,560R±5%,ROHS	R476, R334, R335, R336	4
95	109-040562-R01	Chip resistor / 0402,5.6K±5%,ROHS	R477, R478, R479, R480	4
96	109-040563-R01	Chip resistor/ 0402,56K±5%,ROHS	R565, R566	2
97	109-040564-R01	Chip resistor / 0402,560K±5%,ROHS	R279	1
98	109-040682-R01	Chip resistor / 0402,6.8K±5%,ROHS	R432, R433, R533	3
99	109-040683-R01	Chip resistor / 0402,68K±5%,ROHS	R451, R567, R422	3

No	MaterialSerialNo	ComponentName/Specification		Quantity
100	109-040822-R01	Chip resistor / 0402,8.2K \pm 5%,ROHS	R439, R440	2
101	109-040823-R01	Chip resistor / 0402,82K \pm 5%,ROHS	R535, R568, R569, R488, R507, R383, R450	7
102	109-040824-R01	Chip resistor / 0402,820K \pm 5%,ROHS	R526	1
103	109-040913-R01	Chip resistor / 0402,91K \pm 5%,ROHS	R496, R497	2
104	109-060000-R01	Chip resistor / 0603,0R \pm 5%,ROHS	L85, D411, L124, R404, R343, R347, R348	7
105	109-060101-R01	Chip resistor/ 0603,100R \pm 5%,ROHS	R380, R381, R407	3
106	109-060102-R01	Chip resistor / 0603,1K \pm 5%,ROHS	CP17a, CP17b	2
107	109-060103-R01	Chip resistor/ 0603,10K \pm 5%,ROHS	R413, R408	2
108	109-060104-R01	Chip resistor / 0603,100K \pm 5%,ROHS	R365, R453	2
109	109-060105-R01	Chip resistor / 0603,1M \pm 5%,ROHS	R522	1
110	109-060121-R01	Chip resistor / 0603,120R \pm 5%,ROHS	R511	1
111	109-060151-R01	Chip resistor / 0603,150R \pm 5%,ROHS	R379	1
112	109-060152-R01	Chip resistor/ 0603,1.5K \pm 5%,ROHS	R454	1
113	109-060154-R01	Chip resistor / 0603,150K \pm 5%,ROHS	R245	1
114	109-060154-R02	Chip resistor / 0603,150K \pm 1%,ROHS	R466, R467, R468, R469, R470, R471	6
115	109-060184-R01	Chip resistor/ 0603,180K \pm 5%,ROHS	R528, R530	2
116	109-060220-R01	Chip resistor/ 0603,22R \pm 5%,ROHS	R442	1
117	109-060271-R01	Chip resistor/ 0603,270R \pm 5%,ROHS	R472, R473	2
118	109-060332-R01	Chip resistor/ 0603,3.3K \pm 5%,ROHS	R339	1
119	109-060333-R01	Chip resistor / 0603,33K \pm 5%,ROHS	R463	1
120	109-060470-R01	Chip resistor / 0603,47R \pm 5%,ROHS	R456	1
121	109-060472-R01	Chip resistor/ 0603,4.7K \pm 5%,ROHS	R326	1
122	109-060473-R01	Chip resistor / 0603,47K \pm 5%,ROHS	R363, R366, R367, R368, R369, R370	6
123	109-060474-R01	Chip resistor / 0603,470K \pm 5%,ROHS	R364	1
124	109-060562-R01	Chip resistor / 0603,5.6K \pm 5%,ROHS	R443	1
125	109-060683-R01	Chip resistor / 0603,68K \pm 5%,ROHS	R516	1
126	109-100R39-R01	Chip resistor / 1206,0.39R \pm 5%,ROHS	R512, R513, R514	3
127	110-220103-R03	Volume switch / RY-6932, ROHS	K4	1
128	111-030000-R01	Chip FUSE / 433003,3A/32V,1206. ROHS	FS2	1
129	112-043100-R01	Chip capacitor / 0402,10P \pm 0.5P,50V,C0G,ROHS	C473, C465, C466, C467, C468, C471, C472	7
130	112-043101-R01	Chip capacitor / 0402,100P \pm 5%,50V,C0G,ROHS	C450, C431, C432, C433	4
131	112-043102-R01	Chip capacitor / 0402,1000P \pm 10%,50V,X7R,ROHS	C306, C434, C307, C308, C309, C310, C311, C313, C315, C316, C319, C320, C321, C322, C327, C328, C329, C330, C331, C334, C336, C337, C383, C370, C340, C341, C548, C554, C414	29
132	112-043103-R01	Chip capacitor / 0402,0.01uF \pm 10%,50V,X7R,ROHS	C631, C323, R504, C594, C595, C596, C403	7
133	112-043104-R01	Chip capacitor / 0402,0.1uF,+80%--20%,16V,Y5V,ROHS	C19, C393, C394, C395, C396, C398, C400, C404, C405, C406, C408, C409, C410, C413, C415, C20, C402, C412, C417, C419, C420, C421, C422, C424, C426, C427, C428	27
134	112-043105-R01	Chip capacitor / 0402,1uF \pm 10%,6.3V,X5R,ROHS	C12, C3H, C4F, C559, C547, C561, C549, C550, C551, C553, C555, C556, C557, C558, C401, C605, C416	17
135	112-043120-R01	Chip capacitor / 0402,12P \pm 5%,50V,C0G,ROHS	C470, C506	2
136	112-043123-R01	Chip capacitor / 0402,0.012uF \pm 10%,50V,X7R,ROHS	C635	1
137	112-043150-R01	Chip capacitor/ 0402,15P \pm 5%,50V,C0G,ROHS	C530	1
138	112-043151-R01	Chip capacitor/ 0402,150P \pm 5%,50V,C0G,ROHS	C620	1
139	112-043153-R01	Chip capacitor / 0402,0.015uF \pm 10%,50V,X7R,ROHS	C569, C22	2
140	112-043180-R01	Chip capacitor / 0402,18P \pm 5%,50V,C0G,ROHS	C494, C587	2
141	112-043182-R01	Chip capacitor / 0402,1800P \pm 10%,50V,X7R,ROHS	C585	1
142	112-043183-R01	Chip capacitor / 0402,0.018uF \pm 10%,25V,X7R,ROHS	C21, C552, C571, C570, C572	5
143	112-0431R5-R01	Chip capacitor / 0402,1.5P \pm 0.25P,50V,C0G,ROHS	C543	1
144	112-043200-R01	Chip capacitor / 0402,20P \pm 5%,50V,C0G,ROHS	C522	1
145	112-043220-R01	Chip capacitor / 0402,22P \pm 5%,50V,C0G,ROHS	C500, C502, C503, C501	4
146	112-043221-R01	Chip capacitor / 0402,220P \pm 5%,50V,C0G,ROHS	C633	1
147	112-043222-R01	Chip capacitor / 0402,2200P \pm 10%,50V,X7R,ROHS	C601	1
148	112-043223-R01	Chip capacitor / 0402,0.022uF \pm 10%,50V,X7R,ROHS	C437, C438, C439, C441	4
149	112-043224-R02	Chip capacitor / 0402,0.22uF \pm 10%,16V,X7R,ROHS	C606, C604	2
150	112-043270-R01	Chip capacitor / 0402,27P \pm 5%,50V,C0G,ROHS	C526, C527, C529, C518, C478	5

No	MaterialSerialNo	ComponentName/Specification		Quantity
151	112-043273-R01	Chip capacitor / 0402,0.027uF ± 10%,50V,X7R,ROHS	C618	1
152	112-043330-R01	Chip capacitor / 0402,33P ± 5%,50V,C0G,ROHS	C476, C516, C480, C475, C479	5
153	112-043331-R01	Chip capacitor / 0402,330P ± 10%,50V,X7R,ROHS	C580	1
154	112-043333-R01	Chip capacitor / 0402,0.033uF ± 10%,16V,X7R,ROHS	C429, C440, C520, C600, C619, C442, C443, C444, C445	9
155	112-043390-R01	Chip capacitor / 0402,39P ± 5%,50V,C0G,ROHS	C477	1
156	112-043392-R01	Chip capacitor / 0402,3900P ± 10%,50V,X7R,ROHS	C13, C16, C17, C18, C14, C15	6
157	112-043393-R01	Chip capacitor / 0402,0.039uF ± 10%,50V,X7R,ROHS	C634	1
158	112-0433R0-R01	Chip capacitor / 0402,3P ± 0.25P,50V,C0G,ROHS	C463, C535	2
159	112-0433R5-R01	Chip capacitor / 0402,3.5P ± 0.25P,50V,C0G,ROHS	C335	1
160	112-043470-R01	Chip capacitor / 0402,47P ± 5%,50V,C0G,ROHS	C349, C350, C575, C579, C576, C528	6
161	112-043471-R01	Chip capacitor/ 0402,470P ± 10%,50V,X7R,ROHS	C354, C639, C640, C641, C646, C647, C648, C325, C326, C333, C407, C586, C435, C343, C344, C345, C346, C347, C348, C352, C353, C355, C356, C357, C358, C359, C361, C362, C364, C365, C367, C368, C369, C372, C375, C376, C377, C378, C390, C371, C342, C384, C385, C386, C387, C388, C389, C397	48
162	112-043472-R01	Chip capacitor / 0402,4700P ± 10%,25V,C0G,ROHS	C565, C567, C568	3
163	112-043474-R01	Chip capacitor / 0402,0.47uF ± 10%,10V,X5R,ROHS	C622	1
164	112-0434R0-R01	Chip capacitor / 0402,4P ± 0.25P,50V,C0G,ROHS	C455	1
165	112-043561-R01	Chip capacitor / 0402,560P ± 10%,16V,X7R,ROHS	C602, C603	2
166	112-043562-R01	Chip capacitor / 0402,5600P ± 10%,16V,X7R,ROHS	C632	1
167	112-0435R0-R01	Chip capacitor / 0402,5P ± 0.25P,50V,C0G,ROHS	C453, C454, C462, C460	4
168	112-043682-R01	Chip capacitor / 0402,6800P ± 10%,16V,X7R,ROHS	C637, C391, C392	3
169	112-043683-R01	Chip capacitor / 0402,0.068uF ± 10%,16V,X7R,ROHS	C636	1
170	112-0436R0-R01	Chip capacitor / 0402,6P ± 0.5P,50V,C0G,ROHS	C496	1
171	112-043820-R01	Chip capacitor / 0402,82P ± 5%,50V,C0G,ROHS	C510	1
172	112-043822-R01	Chip capacitor / 0402,8200P ± 10%,16V,X7R,ROHS	C638	1
173	112-0438R0-R01	Chip capacitor / 0402,8P ± 0.5P,50V,C0G,ROHS	C588	1
174	112-043R50-R01	Chip capacitor / 0402,0.5P ± 0.1P,50V,C0G,ROHS	C498	1
175	112-043R75-R01	Chip capacitor / 0402,0.75P ± 0.1P,50V,C0G,ROHS	C487	1
176	112-063100-R01	Chip capacitor / 0603,10P ± 5%,50V,C0G,ROHS	C486, C469	2
177	112-063101-R01	Chip capacitor / 0603,100P ± 5%,50V,C0G,ROHS	C452, C451, C436	3
178	112-063102-R01	Chip capacitor / 0603,1000P ± 10%,50V,X7R,ROHS	C312, C314, C332, C305, C338, C339	6
179	112-063103-R01	Chip capacitor / 0603,0.01uF ± 10%,50V,X7R,ROHS	C593	1
180	112-063104-R01	Chip capacitor / 0603,0.1uF ± 10%,50V,X7R,ROHS	C418	1
181	112-063130-R01	Chip capacitor / 0603,13P ± 5%,50V,C0G,ROHS	C511	1
182	112-063150-R01	Chip capacitor / 0603,15P ± 5%,50V,C0G,ROHS	C509	1
183	112-0631R0-R01	Chip capacitor / 0603,1P ± 0.25P,50V,C0G,ROHS	C539, C546, C461, C491	4
184	112-0631R5-R01	Chip capacitor / 0603,1.5P ± 0.25P,50V,C0G,ROHS	C536	1
185	112-063220-R01	Chip capacitor / 0603,22P ± 5%,50V,C0G,ROHS	C481	1
186	112-063270-R01	Chip capacitor / 0603,27P ± 5%,50V,C0G,ROHS	C512	1
187	112-0632R0-R01	Chip capacitor / 0603,2P ± 0.25P,50V,C0G,ROHS	C545, C534, C532	3
188	112-063334-R01	Chip capacitor / 0603,0.33uF ± 10%,50V,X7R,ROHS	C581	1
189	112-0633R0-R01	Chip capacitor / 0603,3P ± 0.25P,50V,C0G,ROHS	C492, C533, C590, C591, C542	5
190	112-0633R5-R01	Chip capacitor / 0603,3.5P ± 0.25P,50V,C0G,ROHS	C474	1
191	112-063471-R01	Chip capacitor / 0603,470P ± 10%,50V,X7R,ROHS	C411, C351, C360, C366, C363, C373, C374, C379, C380, C381, C382, Q54	12
192	112-063472-R01	Chip capacitor / 0603,4700P ± 10%,50V,X7R,ROHS	C566	1
193	112-0634R0-R01	Chip capacitor/ 0603,4P ± 0.25P,50V,C0G,ROHS	C488, C489, C457, C493, C458, C490	6
194	112-0635R0-R01	Chip capacitor / 0603,5P ± 0.25P,50V,C0G,ROHS	C456, C459	2
195	112-0635R6-R01	Chip capacitor / 0603,5.6P ± 0.25P,50V,C0G,ROHS	C541	1
196	112-063680-R01	Chip capacitor / 0603,68P ± 5%,50V,C0G,ROHS	C485	1
197	112-0636R0-R01	Chip capacitor / 0603,6P ± 0.5P,50V,C0G,ROHS	C531	1
198	112-0637R0-R01	Chip capacitor / 0603,7P ± 0.5P,50V,C0G,ROHS	C523	1
199	112-0639R0-R01	Chip capacitor / 0603,9P ± 0.5P,50V,C0G,ROHS	C524, C521	2
200	112-063R50-R01	Chip capacitor / 0603,0.5P ± 0.1P,50V,C0G,ROHS	C497	1
201	112-072105-R01	Chip Ta capacitor/ TP Model, SIZE P, 1uF ± 20%, 10V, ROHS	C562, C597, C598, C621, C446, C447, C607, C608, C430	9

No	MaterialSerialNo	ComponentName/Specification		Quantity
202	112-072106-R01	Chip Ta capacitor/ TP Model,,SIZE P,10uF±20%,6.3V, ROHS	C499	1
203	112-072155-R01	Chip Ta capacitor/ TP Model,SIZE P,1.5uF±20%,10V, ROHS	C629, C650	2
204	112-072475-R01	Chip Ta capacitor/ TP Model,SIZE P,4.7uF±20%,10V, ROHS	C574, C564, C626, C544, C623, C625, C624, C592, C582	9
205	112-102104-R01	Chip Ta capacitor/ TS Model,SIZE A,0.1uF±20%,35V, ROHS	C484, C464	2
206	112-102105-R01	Chip Ta capacitor/ TS Model,SIZE A,1uF±20%,35V, ROHS	C449, C448	2
207	112-102106-R02	Chip Ta capacitor/ TS Model,SIZE A,10uF±20%,10V,ROHS	C628, C627	2
208	112-102106-R03	Chip Ta capacitor / TS Model,SIZE A,10uF±20%,16V,ROHS	C508, C507	2
209	112-172107-R02	Chip Ta capacitor/ TS Model,SIZE C,100uF±20%,10V,ROHS	C630, C584	2
210	113-010100-R01	Chip trimming capacitor / TZV2Z100A110,3~10p+100, ROHS	TC3, TC4	2
211	114-06E150-R01	Chip wire inductor / C1608CB-15NJ, ceramic core15nH±5%, 0603,ROHS	L84, L83, L86, L69	4
212	114-06E180-R01	Chip wire inductor / C1608CB-18NJ, ceramic core18nH±5%, 0603,ROHS	L68, L64	3
213	114-06E221-R01	Chip wire inductor / C1608CB-R22J, ceramic core220nH±5%, 0603,ROHS	L66, L78, L79	3
214	114-06E270-R01	Chip wire inductor/ C1608CB-27NJ,green, ceramic core 27nH±5%,0603,ROHS	L112,	1
215	114-06E470-R01	Chip wire inductor/ C1608CB-47NJ,green, ceramic core 47nH±5%,0603,ROHS	L111, L120	2
216	114-06E680-R01	Chip wire inductor/ C1608CB-68NJ, ceramic core68nH±5%, 0603,ROHS	L116	1
217	114-06G332-R01	Chip inductor / MLF1608A3R3K,3.3uH±5%,0603,ROHS	L80, L81	2
218	114-06G3R9-R01	Chip inductor / MLG1608B3N9ST,3.9nH±0.3nH,0603,ROHS	R342	1
219	114-06G471-R01	Chip inductor / MLF1608DR47K,470nH±10%,0603,ROHS	L65	1
220	114-06G561-R01	Chip inductor / MLF1608DR56K,560nH±10%,0603,ROHS	L63	1
221	114-06G6R8-R01	Chip inductor / MLG1608B6N8DT,6.8nH±0.5nH,0603,ROHS	L87	1
222	114-06GR27-R01	Chip inductor / MLG1608BR27J,270nH±5%,0603,ROHS	L75, L72, L73, L74	4
223	114-07E220-R01	Chip wire inductor / C2012C-22NJ,22nH±5%,0805,ROHS	L76	1
224	114-07E221-R01	Chip wire inductor / LQW2BHNR22NJ03L / LQN21AR22J, 220nH±5%,0805,ROHS	L101	1
225	114-07E270-R01	Chip wire inductor / C2012C-27NJ,27nH±5%,0805,ROHS	L77	1
226	114-08E100-R02	Chip wire inductor / SDWL2520F100JT,10uH±10%,1008,ROHS	L62	1
227	114-08E102-R01	Chip wire inductor / FHW1008UC1R0GB, ceramic core, 1uH±2%,1008,ROHS	L97	1
228	114-08E331-R01	Chip inductor / FSLM2520-R33K,330nH±10%,1008,ROHS	L110	1
229	114-08E821-R01	Chip inductor / FSLM2520-R82K,820nH±10%,1008,ROHS	L109	1
230	114-11D102-R01	Chip inductor / LQH32MN1R0M23,1uH±20%,1210,ROHS	L105+	1
231	115-1R53R0-R03	Chip air-cored coil / 0.4*1.5*3TR, positive,low pin,ROHS	L104, L102, L100, L115, L119, L113, L114, L118	8
232	115-1R54R0-R03	Chip air-cored coil/ 0.4*1.5*4TR, positive,low pin,ROHS	L103, L122	2
233	115-1R58R0-R01	Chip air-cored coil / 0.4*1.5*8TR, positive,low pin,ROHS	L99	1
234	117-000000-R04	Chip bead / EMI,FILTER, SMT,BLM11A221S,0603, ROHS	L88, L95, L89, L90, L91, L92, L93, L94	8
235	117-000000-R05	Chip bead / EMI,FILTER, SMT,BLM21P300S,0805, ROHS	L61, L96, L98	3
236	117-000000-R08	Chip bead / EMI,FILTER, SMT,BLM11A601S,0603, ROHS	L107, L106, L82, L70, L71	5
237	119-060104-R01	thermistor / NTH5G16P40B473J,100K±5%,0603, ROHS	TH4	1
238	119-060332-R01	thermistor / NTH5G16P39B332J,3.3K±5%,0603, ROHS	TH3	1
239	121-200000-R01	Microphone / B6027AP402-88, ROHS	MIC2	1
240	122-112M80-R01	Chip transistor/NT5032SC,12.8±2.5PPM,5.0*3.2*1.6mm, ROHS	X4	1
241	122-13M686-R01	Chip crystal resonator / 9.8304MHZ-NX5032GA, ROHS	X6	1
242	122-19M830-R01	Chip crystal resonator / 9.8304MHZ-NX5032GA, ROHS	X5	1
243	124-020000-R04	Chip connector / BL112-14RL,14PIN, ROHS	RP2	1
244	125-041022-R01	Chip network resistor / 1K*2,0402,1/16W, ROHS	CP14	1
245	125-041024-R01	Chip network resistor / 1K*4,0402,1/16W, ROHS	CP12, CP10	2
246	203-007200-R02	PT7200pogo pin /brass/ Au plate/ ROHS		3
247	603-007200-R01	MCU / M16C-M3062LFGPGP,FLASH,100P6Q-A, ROHS	U14	1
248	603-0W558A-R01	Voice recorder IC / W588A080,binding	Jp4	1

Appendix 5: Accessory List

Name	Type	Specification	Accessories
Battery	KB-70B	7.4V 1700mAh Li-ion battery	
Hanging Loop	KGS-03	Clip	
Earphone	KME-011	Earphone	
Charger	KBC-70C	Standard charger	
Antenna	KA	Whip Antenna	
	KA	Stubby antenna	

Figure 1 PT7200 Top Board Position Mark Diagram(400-470)

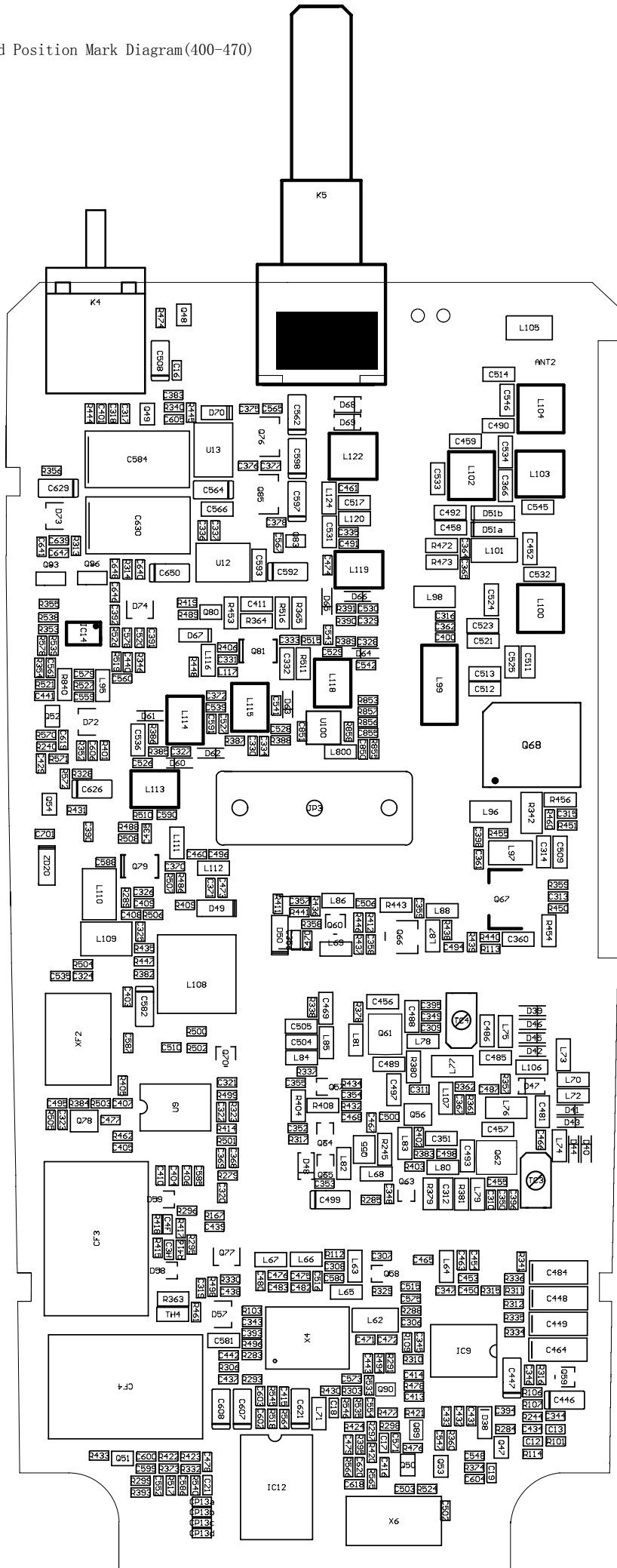


Figure 5 PT7200 Schematic Circuit Pane Diagram(136-174MHz)

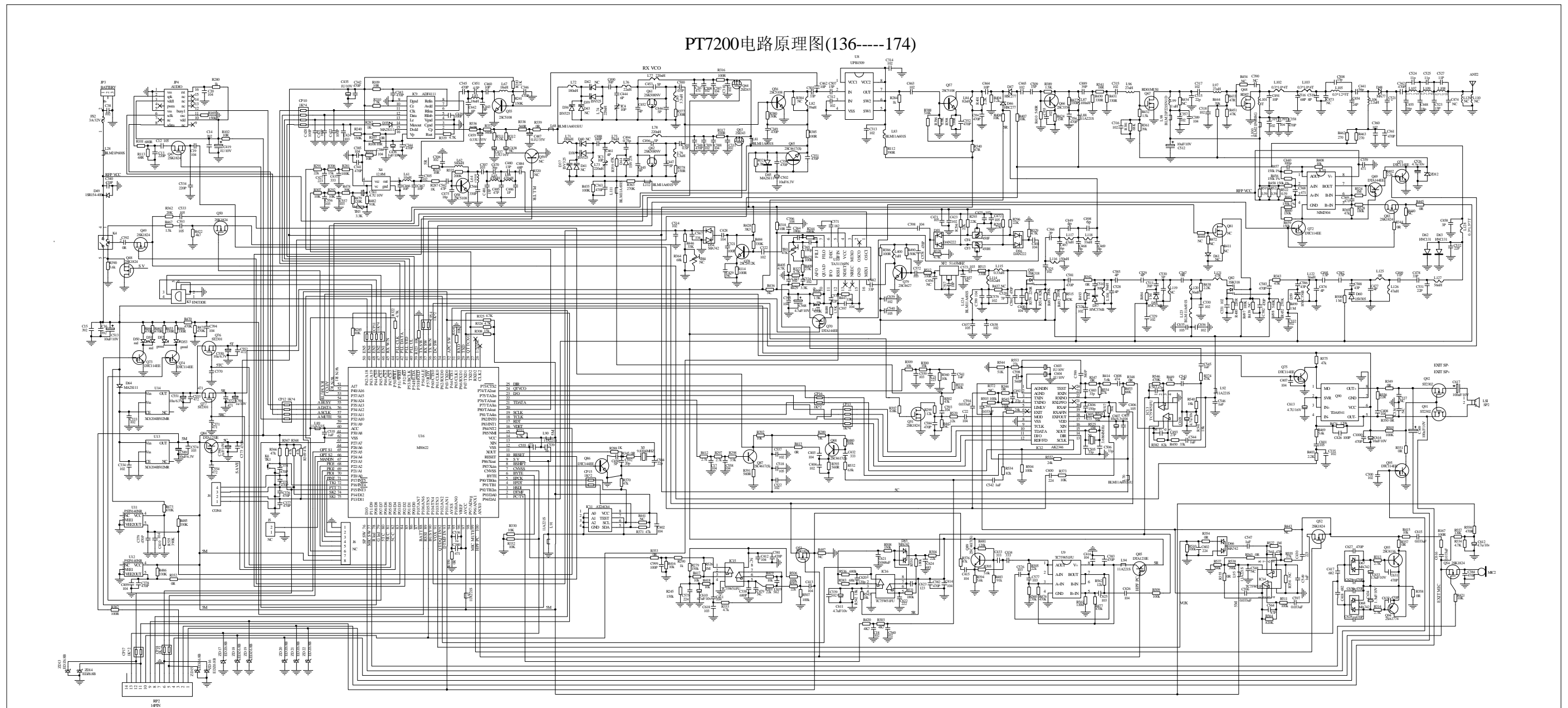
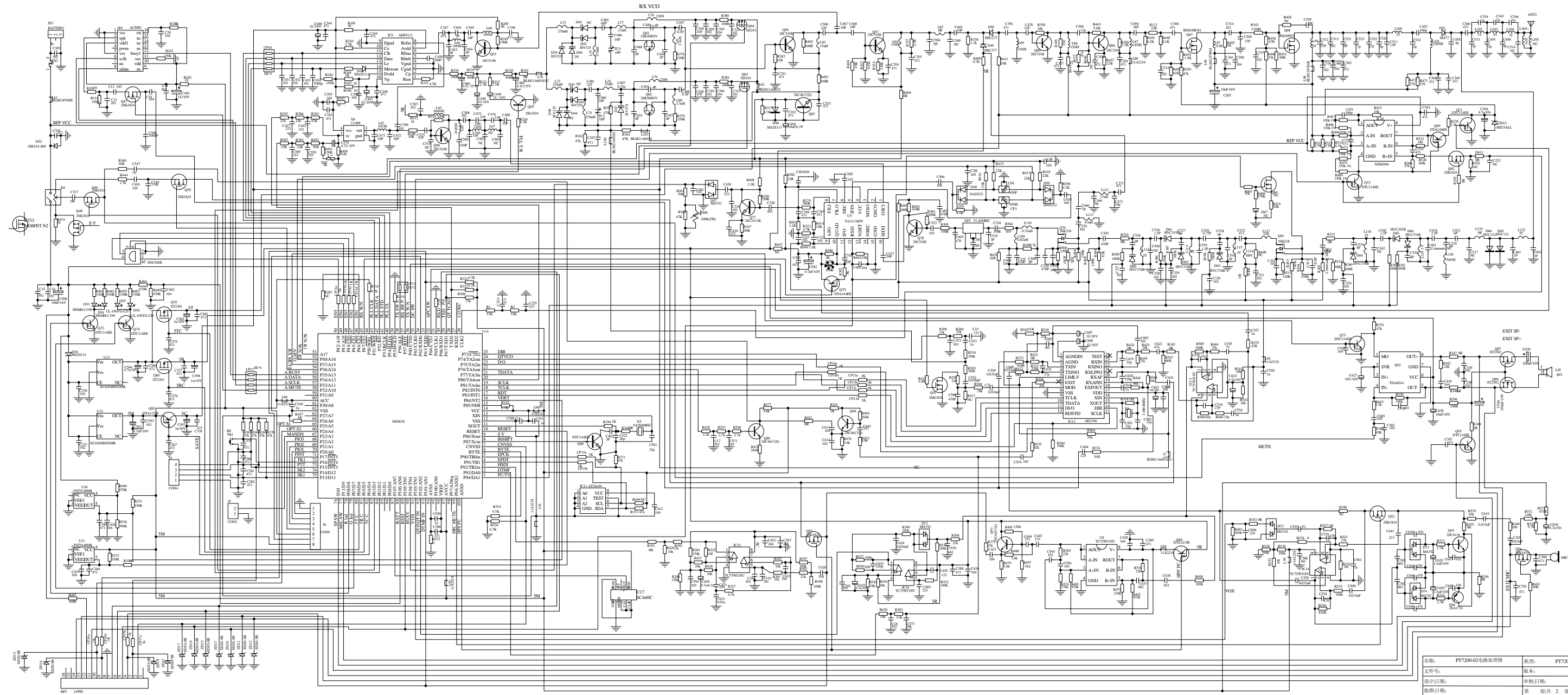


Figure 6 PT7200 Schematic Circuit Pane Diagram(400-470MHz)

PT7200-02电路原理图(400----470)



名称:	PT7200-02电路原理图	机型:	PT7200-02
文件号:		版本:	
设计日期:		审核日期:	
批准日期:		第	2 页

