ETS2228 Maintenance Manual

Contents

Chapter 1 Overview

1.1 Brief Introduction of Product

Based on the protocol IS-2000 and CDMA technology, supporting 450M/800M/1900M with jointing different RF modules in PIPU, HUAWEI ETS2228 Fixed Wireless Terminal has the following features:

- Working on frequency 800M;
- Voice services;
- Call ID display, Call forwarding, Three-way calling, DTMF, Emergency calling;
- SMS
- Supporting CDMA2000 1X PS data service (MSM6025);
- Being compatible with internal antenna or external antenna(external antenna connected with the standard RF-connector, which can be disassembled);
- Power supply with charge battery or linear power adapter;
- Supporting ROMSIM ;

1.2 Specifications of the Software and Hardware

1.2.1 Introduction to software functions

Functional modules within software structure as follows:

(1)Application processing module: Management of voice service.

(2) Protocol shed processing module: to support the CDMA2000 1X standard and being compatible with the protocol IS-95.

(3)Platform service sub-system: there the common platform to run the software, which includes starting, diagnosing, downloading, watch-dog etc.

(4)Driver modules: to control the hardware, like RF modules, environment detecting, storage equipments. In additional, to control modulation and demodulation, to control user interface.

(5)Background Software Management Modules: to write the user configuration information into flash and to replace configuration parameters to different software versions ,which to meet different operater's requirements.

1.2.2 Specification of hardware

- Working Frequency Band: Uplink: 824MHz~849MHz；Downlink ：869MHz~894MHz
- Max. transmitting power: more than 23dBm；
- Max. inputting power: - 25dBm；
- Receiving sensitivity : - 104dBm；
- Interfaces: Date serial port: DB9 (female), for parameters configuration;

  Antenna interface: for installing indoor or outdoor antenna;

  Power interface: for power supply;
- Common power consumption while calling: 1.2W

  Common standby power consumption: 40mW
- Dimension: 185 mm × 162 mm × 79 mm

Chapter 2 ETS2228 Principles

2.1 Principles

ETS2228 Fixed Wireless Terminal (FWT) is composed by two boards, keypad and LCD etc. one board is Terminal Communication Process Unit (TCPU), the other one is Phone Interface Process Unit(PIPU). The TCPU includes MSM6000 subsystem, Power supply and power management subsystem, RF subsystem and TCPU interface subsystem; the PIPU includes user interface subsystem(Serial port protection module, AF channel 1, AF channel 2, Environment monitoring module and PCB version number check module), power supply and power manager subsystem(Primary power supply module, Primary power supply check module, Battery charge/discharge module, DC/DC power module, Power switch control module).

2.1.1 ETS2228 principle structure

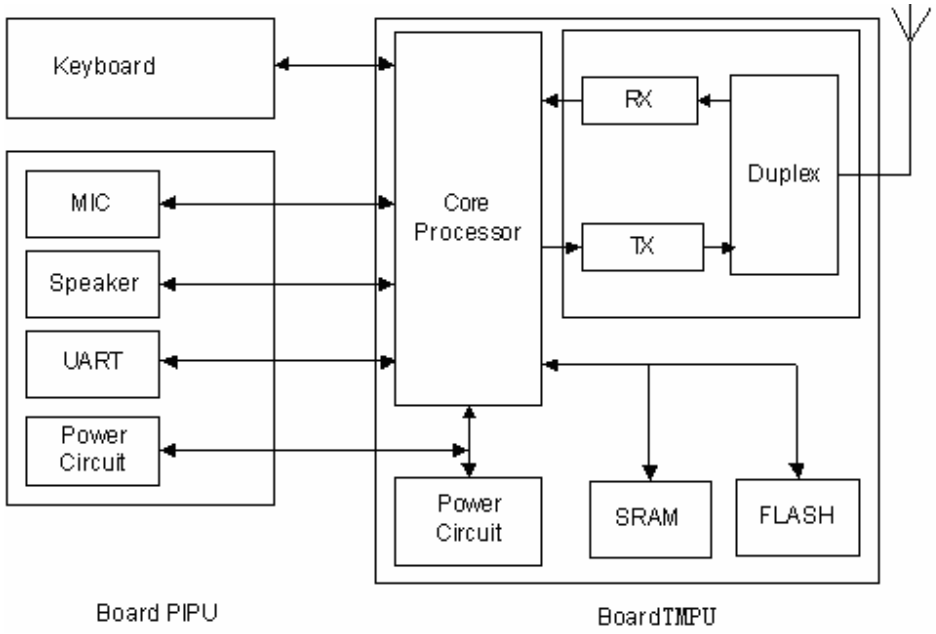


Figure 1: ETS2288 FWT Structure

HUAWEI ETS2228 Fixed Wireless Terminal is composed of two boards and keypad & LCD. One

board is Terminal Communication Process Unit (TCPU) and Phone Interface Process Unit (PIPU). The hardware architecture of FWT is shown in Figure 1.

The TCPU is the core of an FWT, including a radio frequency (RF) receiving and transmitting unit, a central processing unit and a power module.

The PIPU and the TCPU are connected through a 72-pin weld-pads (72 weld-pads locates around the TCPU, which to connect the PIPU in the castellation form). The PIPU provides functions of power conversion from the external power into the power needed by system, battery charge/discharge management, voice signals processing. Besides the PIPU is the bridge between the TCPU and keypad & LCD.

2.1.2 Detailed Introduction to Functional Circuit Unit

- Power-on Circuit(Battery and Power adapter)

When powering on WL71PIPU, the whole process as follows:

There are two ways of power supply: one is battery, the other is external power. When using the later one, VEXT_DC up to 5V, then PM6610 begins to work and software startups. At this moment, some functions of software have been running and the system begins to detect and charge the battery, the display of LCD in charging status. If holding the Power-off key for 4S (keeping down the voltage of TERM_ON), the process of Power-on will be closed, the software all in running, searching the net and being in idle status.

When using the battery, there is only the voltage of VREG_PHONE, the system keeping down the signal Term_on, PM6610 begins power conversion to the one needed by other modules and software started up. The programme is the same if we turn on the Power-on switch: when turning it on, PM6610 and software starts up. The software only detects the Power-on switch being holding over 4S, it means the normal power-on. If not, the process will be closed.

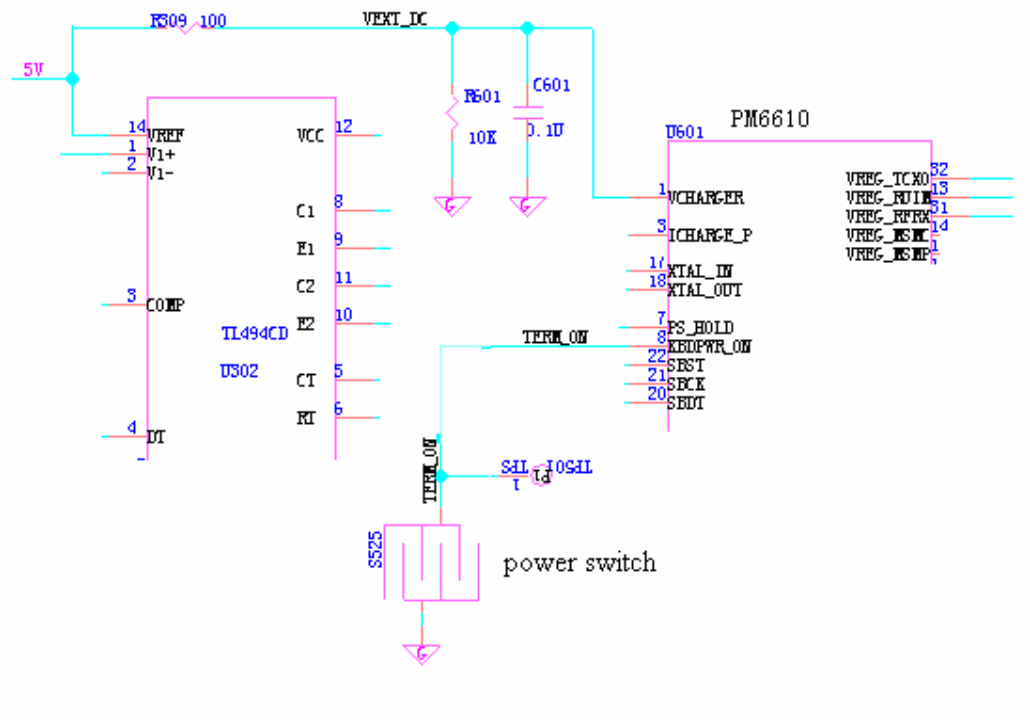


Figure 2 Power-on Circuit With Battery

➢ Charging Circuit

When charging or discharging to battery, the management module is controlled by MSM6000 in TCPU. MSM6000 detects the voltage of the battery to output the signal CHG_EN, which control the charging to battery or not. If needed, the system will charge the battery.

1. Battery discharging: If there is no external power, MSM6000 control PM6610 to power supply the system by battery.

2. Battery charging: if there is external power, MSM6000 control PM6610 to charge the battery or not.

The battery is charged or not, which by controlling the output current form the secondary power. When the battery in fast charging status, the grid of Q303 is low and not through. The internal differential amplifier (TL494) will control the pulse duty ratio of PWM, which the current output of switch power supply will be restricted to 830mA; when the battery in slow charging status, the grid of Q303 is high and through. The internal differential amplifier (TL494) will control the pulse duty ratio of PWM, which the current output of switch power supply will be restricted to 75mA. Finally the fast charging operation will be stopped and replaced by the slow charging operation. The feedback loop is accomplished by the internal differential amplifier (TL494).

Signal	Modules	Function Description
VREG_PHONE	the secondary power conversion module	the output of the secondary power:4.44V
V_BATT	Battery - >PM6610	the battery output voltage
CHG_EN	PM6610->TL494	PM6610:control the output

List 1 Battery Charging/Discharging Module Signals

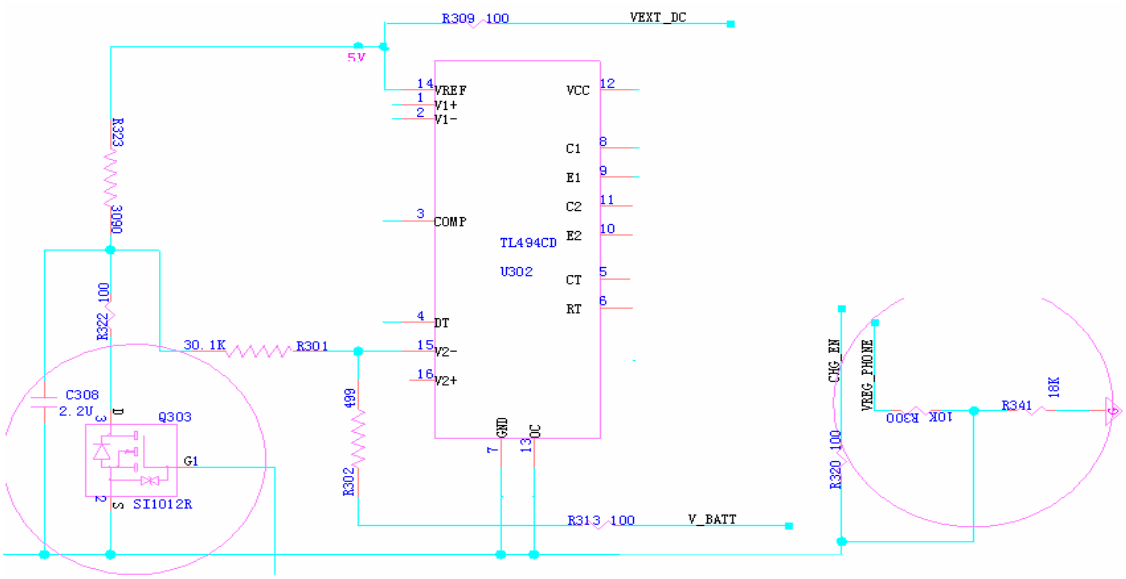


Figure 3 Battery charging Circuit

Battery is connected to the output of the secondary power supply(4.4V) directly. When there is no external power supply, battery powers the system supply through the signal VREG_PHONE, and there is no special discharging control circuit.

- Audio Interface Circuit

ETS2228 audio interface includes handle receiver (the microphone and earphone is included), speaker interface and hands-free MIC interface. The power of speaker is quit bigger than the others, which must be amplified through the audio amplifier, but for hands-free MIC interface and handle receiver can be connected directly.

1）Handset MIC Interface。Bead and capacitor constitute the filter circuit.

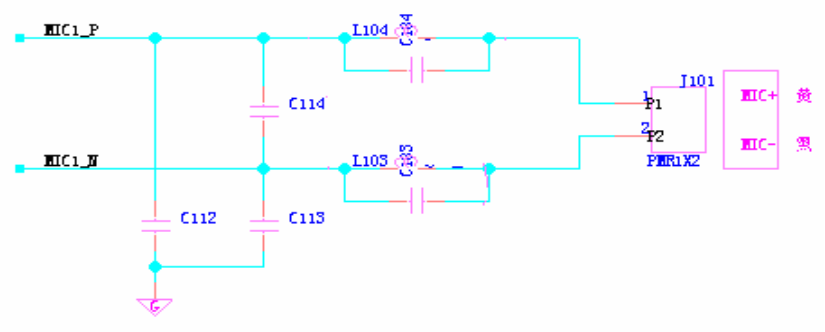


Figure 4 Handset MIC Circuit

2) Handle Receiver Interface. Bead and capacitor constitutes the filter circuit.

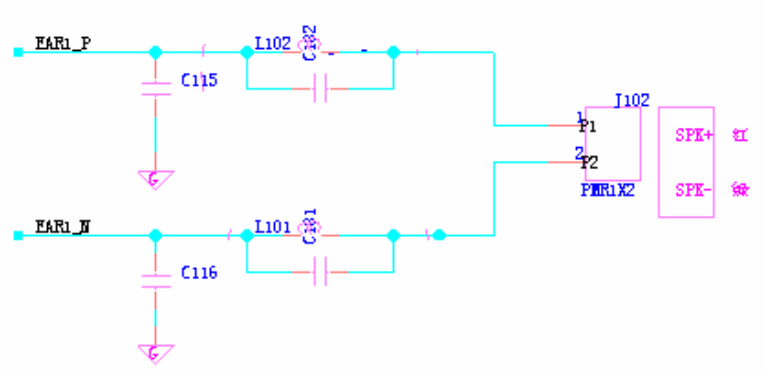


Figure 5 Handle Receiver Interface

3) Hands-free Interface Circuit

The audio amplifier amplifies EAR2 signal to speaker, the switch of speaker is controlled by the bias voltage of MIC2_P. And when the bias voltage of MIC2_P is zero, the voice channel and the audio amplification is shut-down, which the system is in idle status. Possible faults of the hands-free channel: no ringing, then check whether U603 is wrong or not.

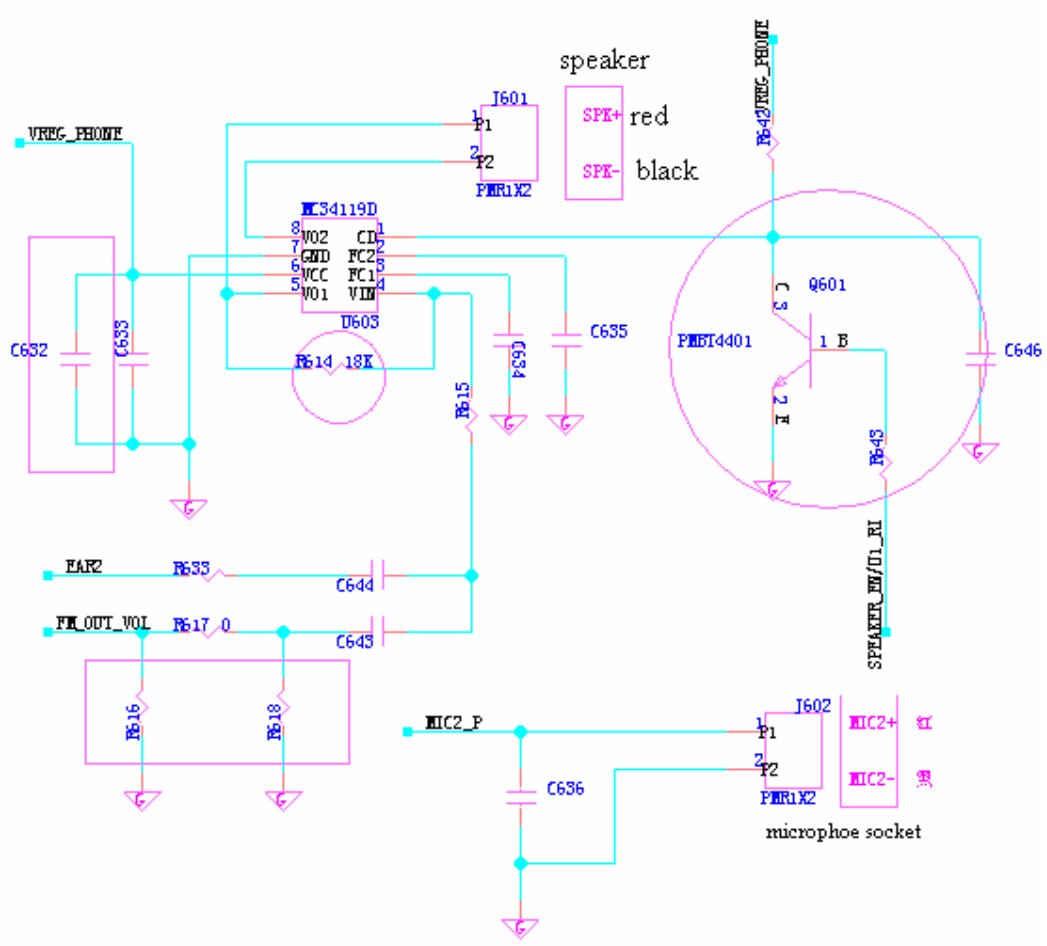


Figure 6 Hands-free Interface Circuit

- LCD unit

  In the ETS2228 FWT, LCD is a peripheral component. If wrong with LCD, it can be replaced directly. The PIPU is compatible with the lattice LCD and the segment LCD, ETS2228 adopt the lattice LCD.

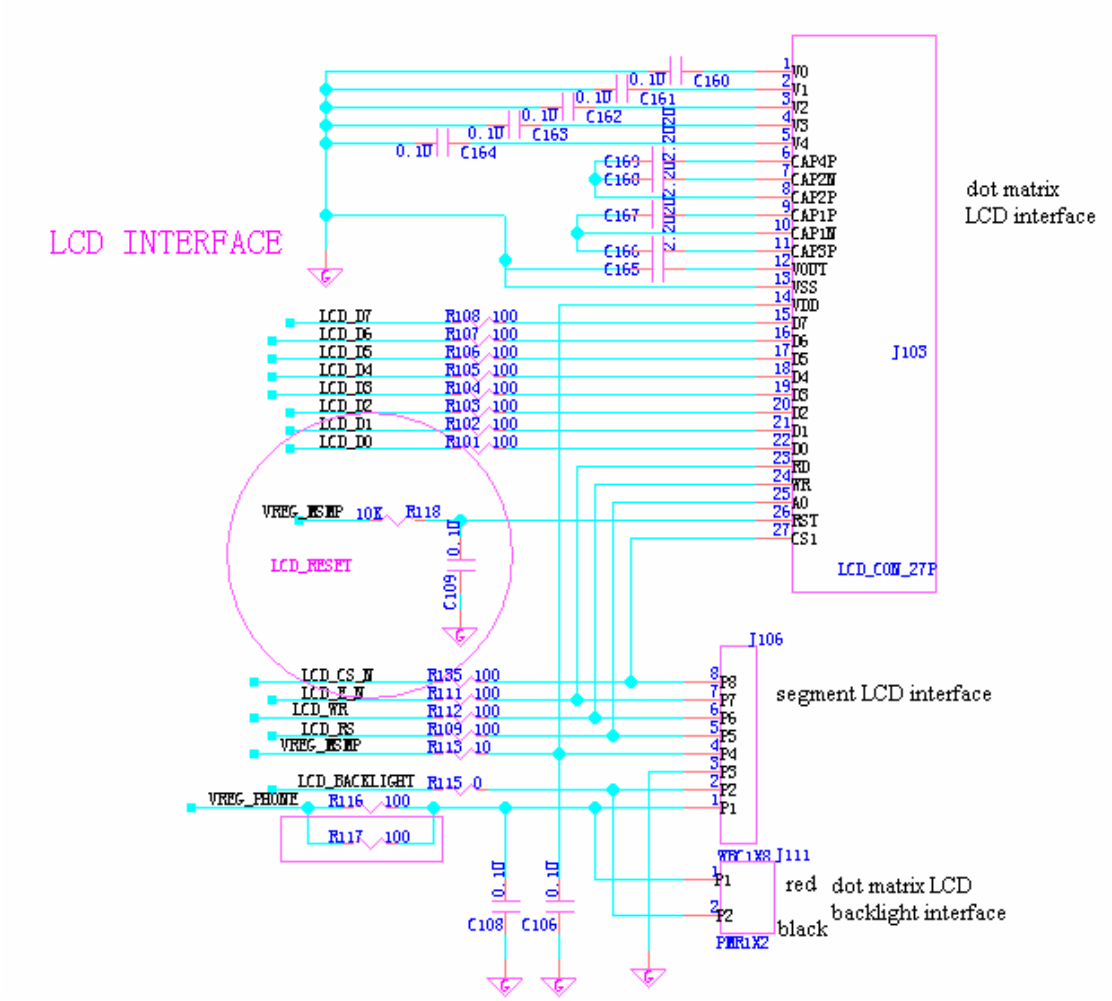


Figure 7 LCD Hardware Interface Circuit

PIN NO.	FUNCTION DESCRIPTIONS	SYMBOL
1	This is the chip select signal.	/CS1
2	When /RES is set to "L," the settings are initialized.	/RES
3	This is connect to the least significant bit of the normal MPU address bus, and it determines whether the data bits are data or a command. A0 = "H": Indicates that D0 to D7 are display data. A0 = "L": Indicates that D0 to D7 are control data.	A0
4	• When connected to a 6800 Series MPU: This is the read/write control signal input terminal. When R/W = "H": Read. When R/W = "L": Write.	R/W
5	• When connected to a 6800 Series MPU, this is active HIGH. This is the 6800 Series MPU enable clock input terminal.	E

6~13	DATA BUS	DB0~ DB7
14	Power supply	VDD
15	Ground	VSS
16	DC/DC voltage converter. Connect a capacitor between this terminal and VSS or VDD	VOUT
17	DC/DC voltage converter.	CAP3P
18		CAP1N
19		CAP1P
20		CAP2P
21		CAP2N
22		CAP4P
23	This is a multi-level power supply for the liquid crystal drive. The voltage Supply applied is determined by the liquid crystal cell, and is changed through the use of a resistive voltage divided or through changing the impedance using an op. amp. Voltage levels are determined based on Vss, and must maintain the relative magnitudes shown below. V0 ≧V1 ≧V2 ≧V3 ≧V4 ≧Vss	V4
24		V3
25		V2
26		V1
27		V0

List 2 Lattice LCD Signals

- Keypad unit

In the ETS2288 series FWTs, the keypad is a peripheral component. If it is broken, it can be directly replaced. And 72PIPU veneer uses 5×5 keypad。

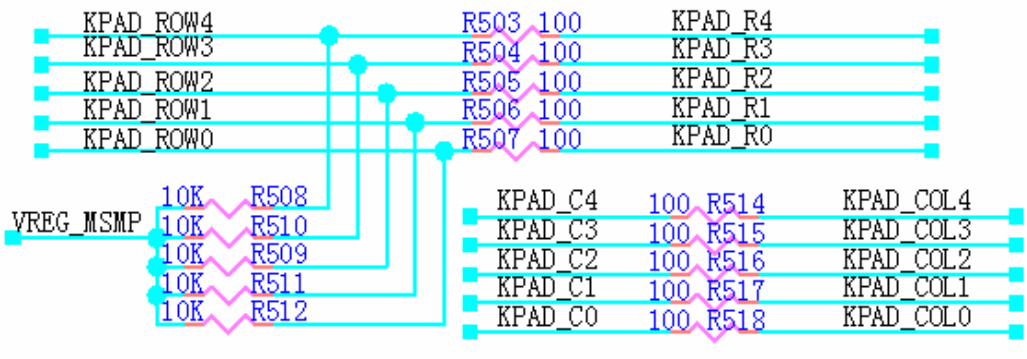


Figure 10 keypad implements circuit

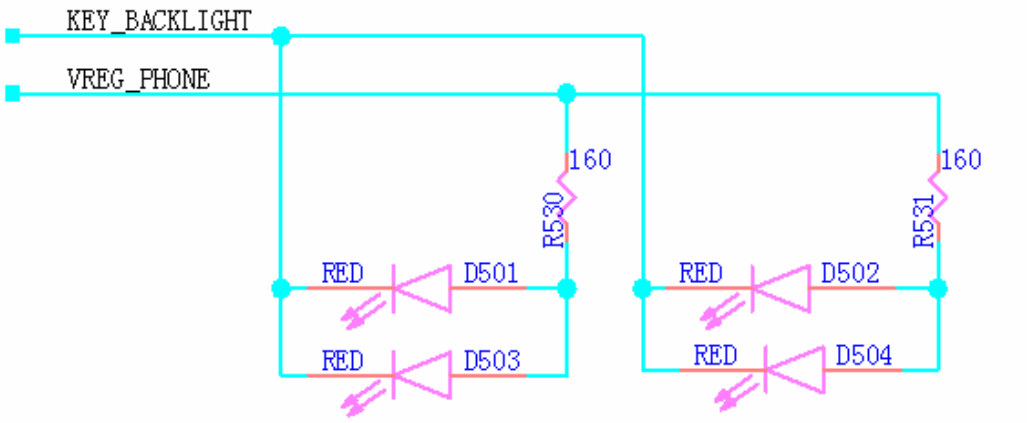


Figure 1 keypad back facet circuit

- Asynchronous serial port drive circuit

We put the drive of the serial port onto the serial port line. The output power level of the serial port drive does not match the MSM6000 power level---The high power level of MSM6000 is 2.8V, while the high power level of the serial port drive is 4.4V. Thus, what is needed is to make a power-level conversion and protection circuit for the transistor to convert the power level of the serial port circuit. The dual transient suppression diode protects the serial port and prevents the damage towards the system from abnormal power level input such as ESD.

Serial port signals are divided into 5 groups:

1) Data receiving signal RS_RD (Input); Data sending signal RS_TD (Output).

2) Traffic signal clearing/sending RS_CTS(Input); Request sending RS_RTS (Output)

3) Modem status signal (modem refers to FWT); Carrier wave detection UART1_DCD (Output); Data terminal ready UART1_DRT (Output)

4) Serial port indicating UART1_IND (Output). The power level (high/low) is determined by the serial port line. The power level differentiates debugging data line and high-speed data line. Low power level indicates high-speed (230400BPS) and high power level indicates low speed (115200BPS).

5) External serial port drive power supply VDD1_RS. The power switch is controlled by the MSM_P voltage.

The circuits are shown by the following diagrams:

Input power level conversion circuit:

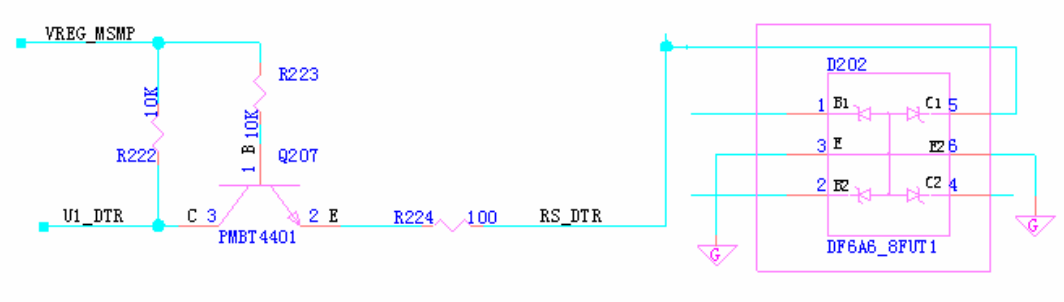


Figure 2 Input power level conversion circuit

Output power level conversion circuit:

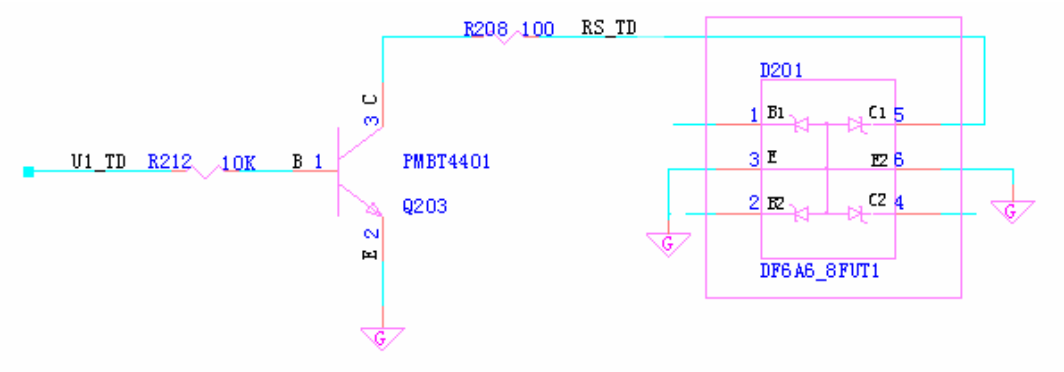


Figure 3 Output power level conversion circuit

Data receiving signal power level conversion circuit. The power level conversion of signal UART1_RX is accomplished by clamp circuit. The reason lies in that the signal power-level needs to be lowered to detect whether or not the serial port line is connected when there are no data lines.

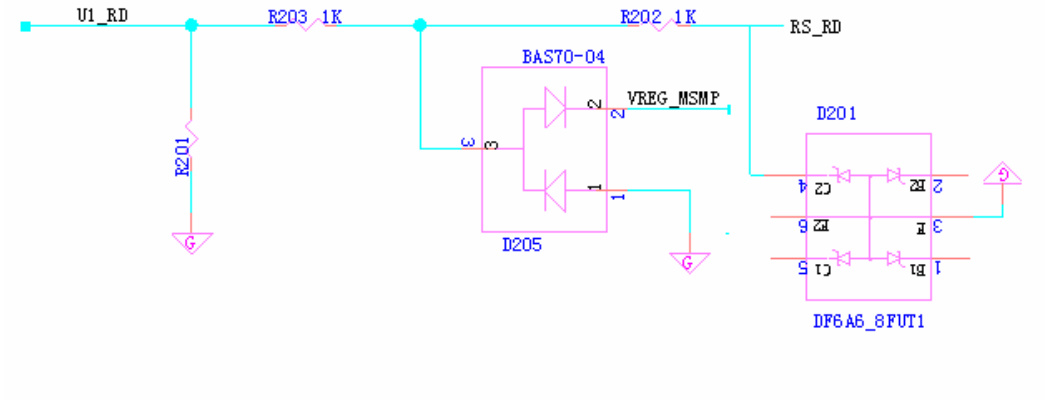


Figure 4 Data receiving signal power level conversion circuit

Chapter 3 Detailed Introduction of Functional Module

3.1 Power Part (including power supply and power management)

1 .DC/DC power protect module

This part is chosen joint circuit .the external power over voltage protection module protects the input power. When the input voltage exceeds 30V, the protection circuit will function. Then the silicon controlled thyristor is in the continuity status and the self-healing fuse F301/F302 (we only need to joint one of them and now we joint F301) will be blown. Thus, the power protection circuit will be cut.

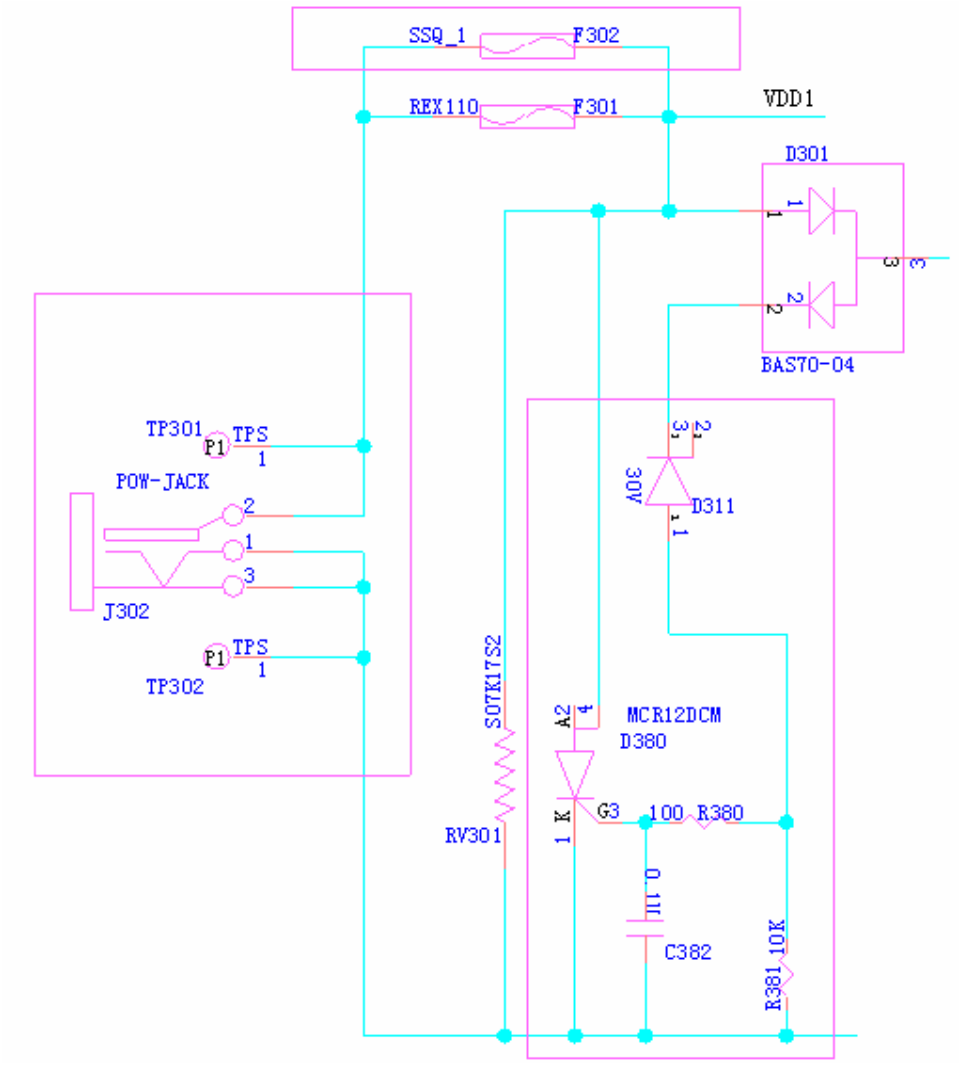


Figure16 External power over voltage protection module

2. DC/DC power module

The DC/DC power module generates 4.4V main power necessary for the operation of the whole machine. It also fulfills the constant current charging function. The maximum output current is 830mA. We mainly use the PWM control chip (U302) and the switch transistor (Q301) to complete the second-time switch power circuit. It is the switch power supply that converts the external power into 4.4V.

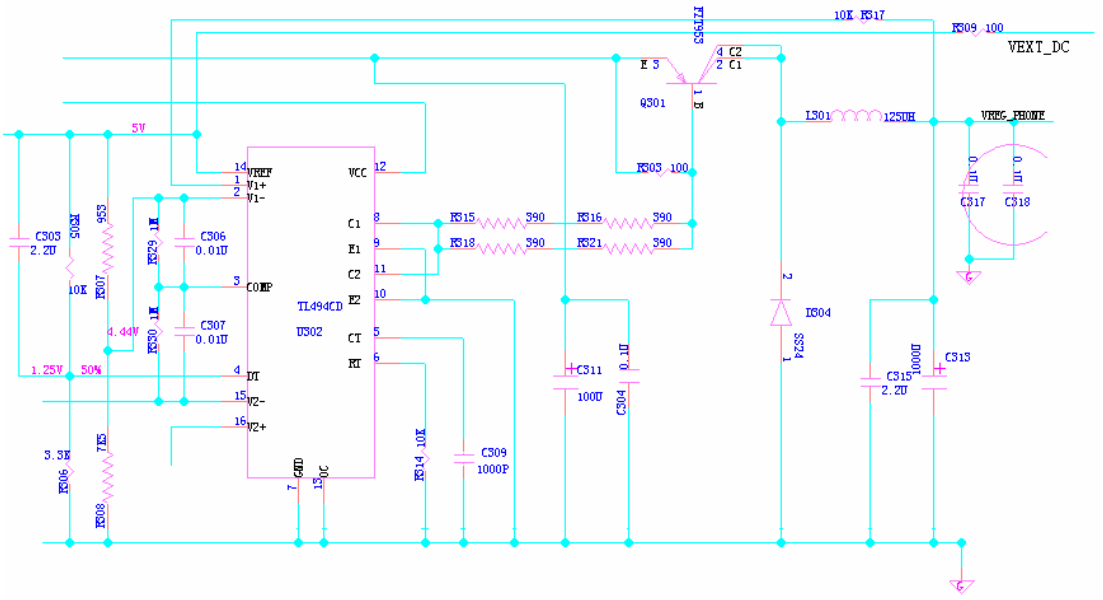


Figure 5 DC/DC Power transfer circuit

The PWM control chip adopts TL494, including 2 differential amplifiers, 1 external adjustable oscillator, 1 pulse comparer, 1 time overflow controller, and 1 output control circuit.

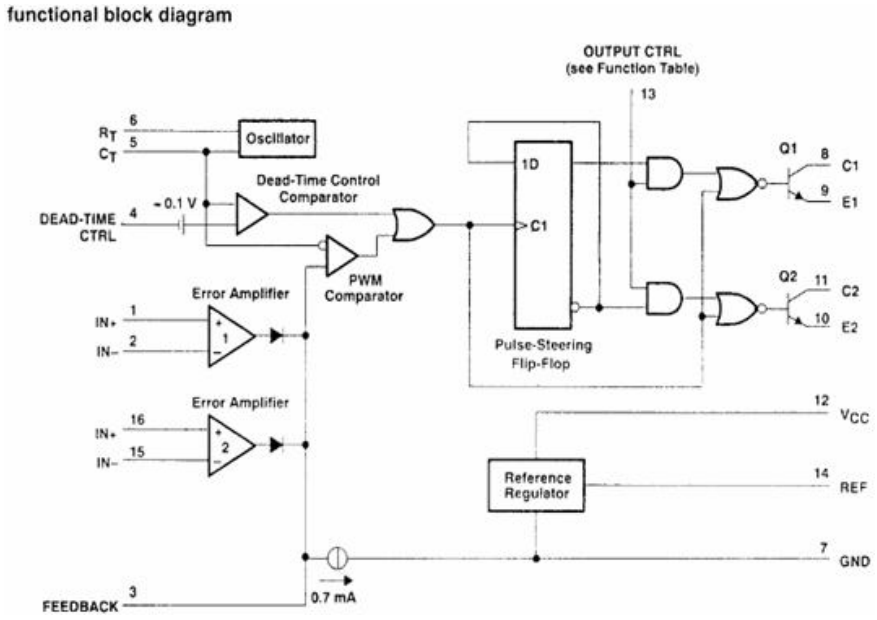


Figure 6 TL494

The differential amplifier can work within the range from AC -0.2V to 0.2V. The time overflow controller has a fixed offset to assure the stable output in case of the changed external input. The external oscillating circuit can be set through Rt/Ct (The working frequency to be set is 100KHZ).

3 .Power supply anti-reverse-insertion circuit and external interface

D305 and D301 fulfill the anti-reverse=insertion function of the external power supply. EXT_DC signal: Whether or not the external power supply exists; V_BATT signal: Battery voltage; VREG_PHONE signal: Voltage of the second-time power supply.

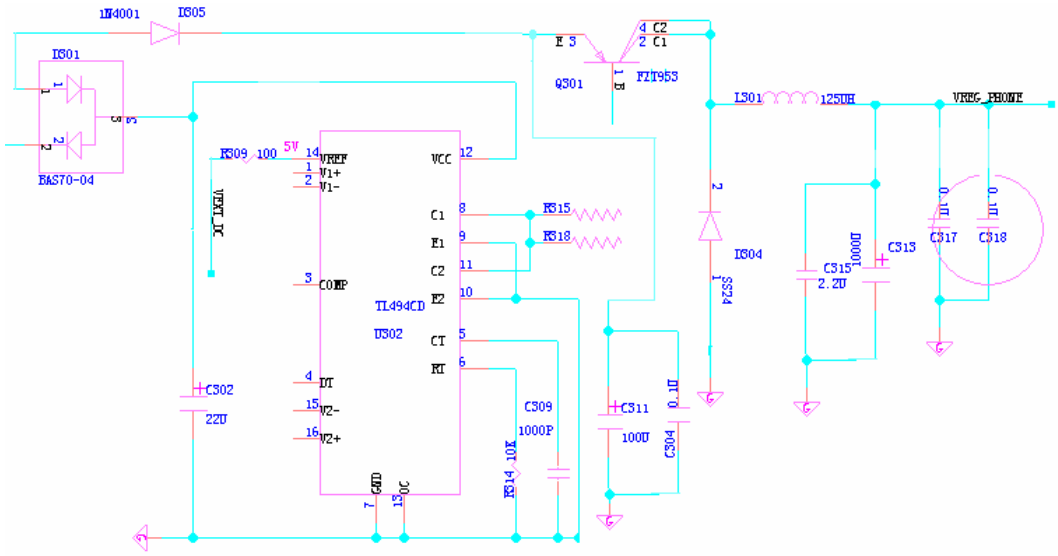


Figure19 Anti-reverse-insertion circuit

4 .Second-time power voltage-limiting module

The second-time power voltage-limiting module limits the second-time power voltage to 4.4V. When the constant current charging operation is ended, the second-time power output is stabilized to 4.4V to provide power for the back-level circuit.. The feedback loop is accomplished by operational amplifier 1 of TL494.

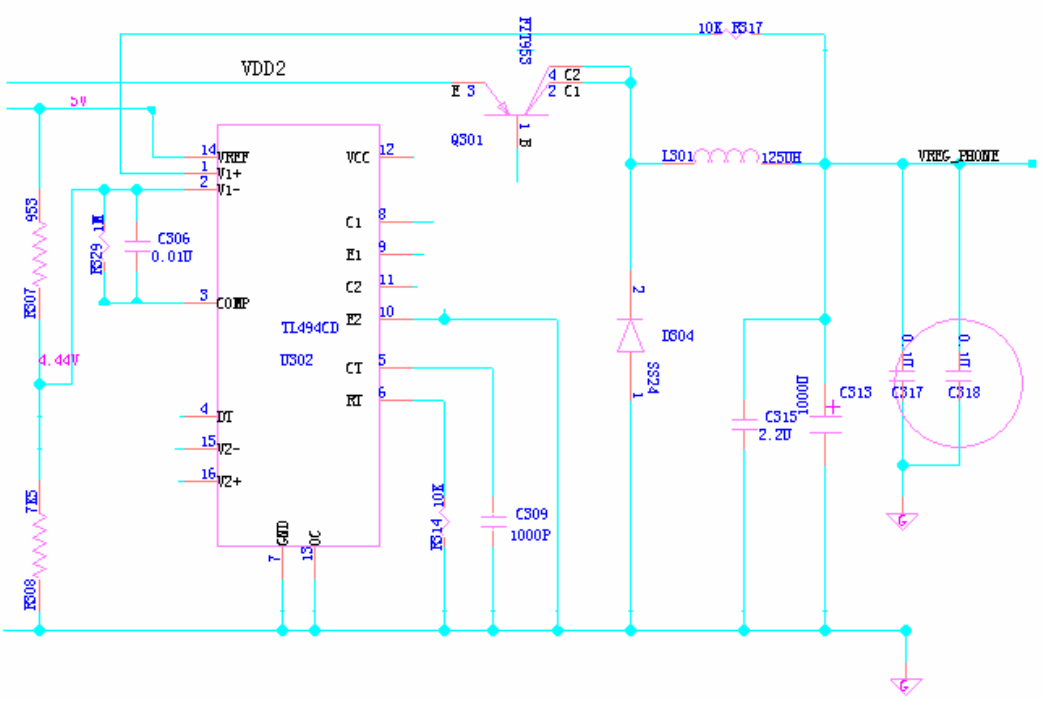


Figure 7 Second-time power voltage-limiting module

5 .Battery temperature switchover module

The temperature's measure is finished on TTPU veneer, and the battery's ID measure is finished on PIPU veneer.

This module converts the thermistor into voltage and sends the voltage to ADC on the TCPU board to be measured. Thus, the battery temperature will be measured.

See the following figure for the circuit.

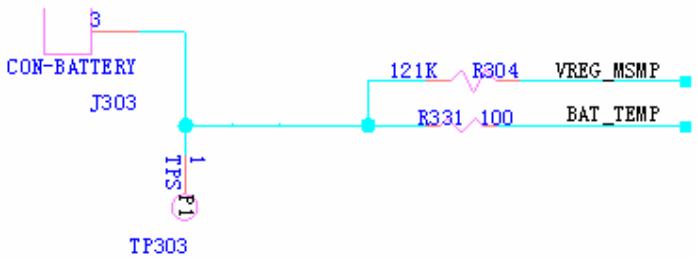


Figure21 Battery temperature switchover module

PM6610 PIN NO.	Function Description	Signal Name
HKADC5	Veneer temperature sampling	PHONE_THERM
HKADC8	Battery temperature sampling	BAT_TEMP
HKADC9	Battery identify(Battery ID)	BAT_ID

Table 1 Environment variable measure PIN

3.2 Base Band Part

The MSM6000 sub-system includes voice coding/decoding unit, baseband signal processing unit, and CPU system on which protocol software runs. All these functional units are integrated into the MSM6000 chip. The main function of the voice coding/decoding unit is to conduct compressing and coding operations over 64K voice and digital code traffics like EVRC codes, to let them be suitable for being transmitted in wireless environment. The baseband signal processing unit mainly includes functions like baseband modulation/demodulation and channel coding/decoding. It also includes the CPU system through which protocol software runs, as well as FLASH for storing software and SRAM for running software.

3.3 Power Management Part

Power management sub-system mainly fulfils DC-DC converting of external input power and managing power voltage which is used by inside circuit.

The function of power management can be divided to two parts: battery management and veneer circuit's power management. Battery management mainly supplies the functions of charging/discharging management and temperature protect etc. veneer circuit's power management manages power of veneer unit circuit in order to reduce equipment's power consumption according to operation state .Such as user interface circuit ,RF transmitter,MSM6000 all can be set dormancy state to reduce equipment's power consumption a lot.

See the following table for Power management module interface signal:

Signal direction	Signal name	Signal flow	Signal function	Receive unit's PIN name
I	VREG-PHONE	interface→PM6610	Interface board power supply power VDD，supply power to PM6610	ICHARGE_P(3), VDD-ANA(12)、VDD-MSM(15)、VDD-MAIN(30)
I	VEXT-DC	interface→PM6610	prescription of external power supply	VCHARGER(1)
I	V-BATT	interface→PM6610	Stakeout battery voltage，directly connect to +pole of battery	ICHARGE_M(4)
I	TCXO	TCXO→PM6610	Main frequency input signal	TCXO-IN(24)
O	BUFF-TCXO	PM6610→MSM6000	Main frequency output signal	TCXO-OUT(23)
I	TCXO-EN	MSM6000→PM6610	TCXO enable signal	TCXO-EN(25)
I	PS-HOLD、JTAG ON	MSM6000→PM6610 MSM6000→register unit	Control whether supply power to MSM6000 continuance	PS-HOLD(7)
O	TERM ON	interface→PM6610	Control replacement signal	KBDPWR-ON(8)

			which produces power chip	
I	SBI-ST	MSM6000→PM6610	MSM6000 control signal	SBST(22)
I	SBI-CK	MSM6000→PM6610	MSM6000 control signal	SBCK(21)
I	SBI-DT	MSM6000→PM6610	MSM6000 control signal	SBDT(20)
O	KEY_BACKLIGHT	MSM6000→interface	keypad back facet drive headstream	KEYBD-DRV(10)
O	VERG-TCXO	PM6610→TCXO	Supply TCXO voltage which produces circuit	VERG-TCXO（32）
O	VREF-RFRX	PM6610→RFR6122	Supply voltage to RFR6122	VREG-RFRX(31)
O	VREG-MSMC	PM6610→MSM6000	Supply digital signal voltage to MSM6000	VREG-MSMC(14)
O	VREG-MSMP	PM6610→others	Supply voltage to kinds of external equipment	VREG-MSMP(16)
O	VREG-MSMA	PM6610→MSM6000	Supply analog signal voltage to MSM6000	VREG-MSMA(11)
O	VREG-RFTX	PM6610→RFT6122	Supply voltage to RFT6122	VREG-RFTX(29)
O	SLEEP-CLK	PM6610→MSM6000	Supply dormancy signal to MSM6000	SLEEP-CLK(19)

O	RESIN-N	PM6610→MSM6000	Supply replacement signal to MSM6000	PON-RESETB(5)
O	PM-INT-N	PM6610→MSM6000	Supply break request signal to MSM6000	MSM-INTERUPTB(6)

Table 2 power management module interface's signal description

3.4 RF Part

ETS2228 is the FWT working in the 800M frequency band .The structure of the FWTs which use WL71PIPU but working different frequency band is the same and the difference is RF part.

1 .Receiving unit

Unit function: After the duplex module sufficiently suppresses the out-of-band spurious filter, the received radio frequency signals will be sent to the down-convert frequency mixer via the radio frequency low noise amplifier and radio frequency SAW filter to experience the frequency mixing operation. Since RFR6120 assumes the "Zero Intermediate Frequency" structure, the radio frequency signal can be directly converted into baseband signals. The following operations are I/Q demodulation and filter amplifying, and ADC processing. Finally, the digital base band signal will be sent to baseband processing unit MSM6000.

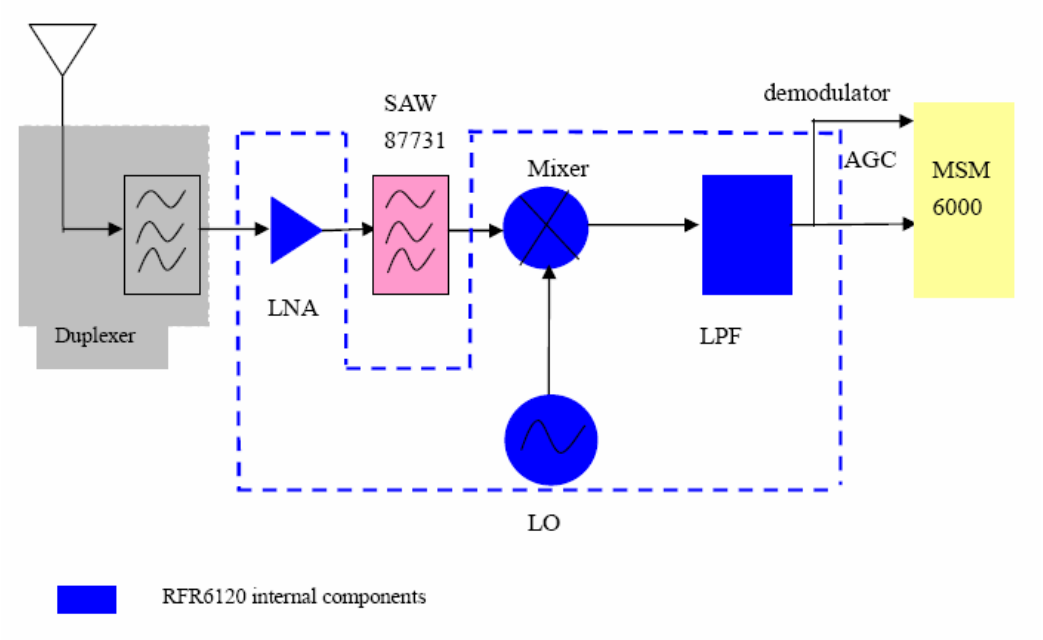


Figure 8 RF receiving unit

2 .Transmit unit

Primary unit function: Emission modulation module RFT6120 directly amplifies analog I/O signals after DA conversion. Next, radio frequency signals are generated after RF Mixer and RF filter function on the signals. Then the RF signals are amplified by the RF amplifier, so that RF emission signals set with certain output power value are generated. Finally, after the duplex module sufficiently filters out-of-band spurious emission signals, the signals will be sent to the antenna. The other function of the duplex module is to prevent the emission signals from disturbing the work of the receiver.

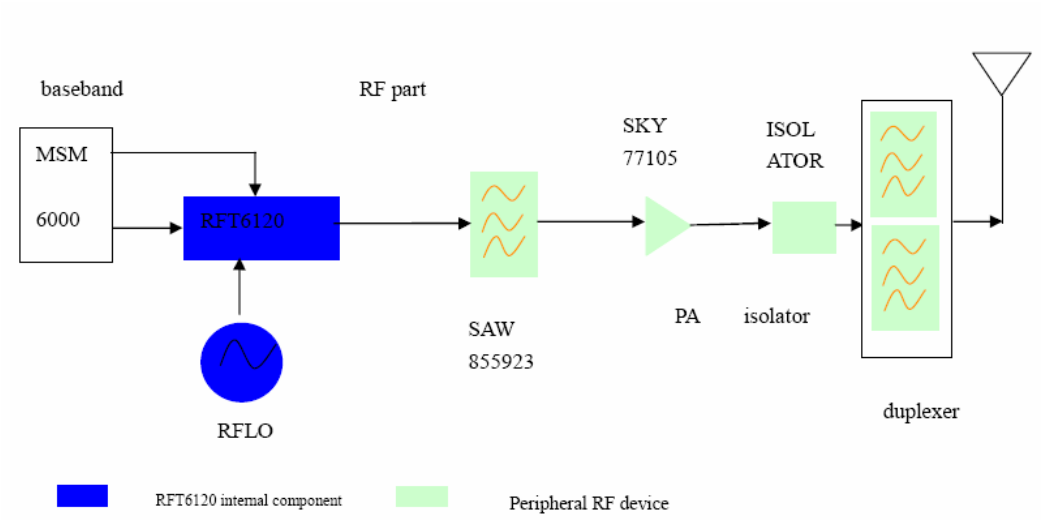
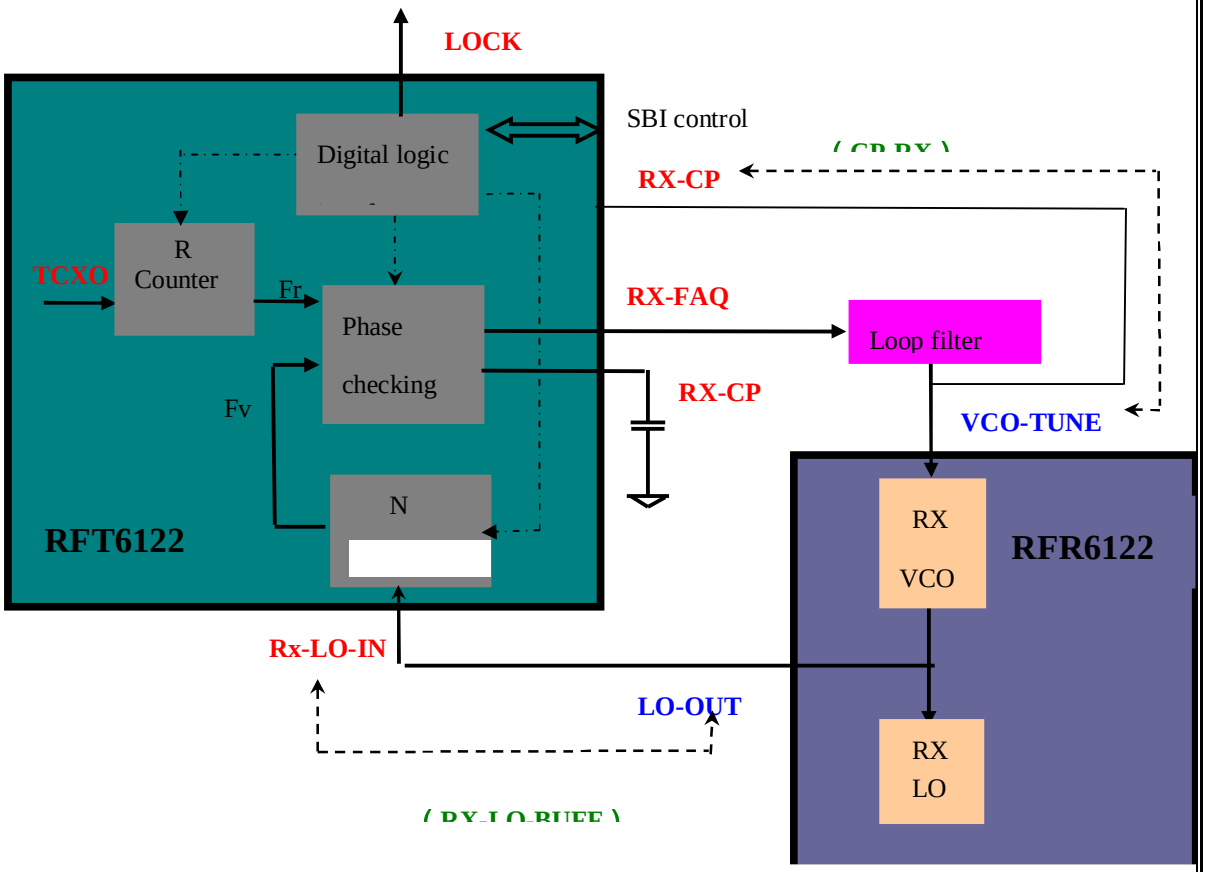


Table 9 RF emission unit

3 .RF tracing unit

The main unit function is to provide RF local oscillation signals for transceiver. The RF duplex interval is 45MHz. Therefore, we design the RF oscillator to be shared by both receiving and transmitting operations. For both of them receiving and transmission operations, the RF local oscillator is high. The reference clock signal frequency is 19.2MHz and the phase detection frequency is 25 KHz. The Rx PLL circuit is integrated into RFT6122, but RX VCO and RX LO are still in RFR6122.



note :Red signal is the definition of RFT pins, blue signal is the definition of RFR PIN, green signal is the definition of interface.

Table 10 PLL circuit

RX-QP/RX-QM/RX-IM/RX-IP refers to the output of 4 baseband signals. They are to be sent to MSM to be processed. SBST/SBCK/SBDT are 3 control BUSES. MSM controls RFR6122 by controlling these three signals. The TCXO signal provides clock reference signals for all internal components. Three categories of power provide power for RFR: VREG-RFRX provides power voltage for PM6610; VREG-TCXO provides voltage needed by the clock for RFR6122; VREG-MSMP provides voltage for internal RFR6122 components. RF local oscillation signals are for receiving/transmission channels to conduct down/up conversion operations. Both channels share the same RF local oscillation signal.

3.5 Parameter Indices

1 .Performance Indices

- Primary indices of the receiving unit:

(1) Basic indices

(2) Frequency range: Work frequency 869MHZ--894MHZ MHz

(3) Noise coefficient under sensitivity condition: <=7.5dB (Note: Including the loss from duplexer)

(4) Linearity requirement

(5) Sensitivity capability indices：≤-106dBm/1.23MHz

(6) Amplitude frequency characteristics

(7) Amplitude range：<±1dB, within 1.23MHz (After being calibrated)

(8) double-work distance：10MHz

(9) channel distance：25 KHz

- Primary indices of the emission unit:

(1) Frequency range: 824MHZ ~ 849MHZ MHz

(2) Maximum emission power:>23dBm

(3) Maximum linearity output power: 28 dBm

(4) ACLR requirement：-42dBc/30KHZ@885KHZ ~ 1.98MHZ

-56dBc/30KHZ@1.98MHZ ~ 4MHZ

(5) In-band low-noise requirement

Under the condition of the minimum output power, the low noise should be lower than -54dBm/1.23MHZ

- PLL indices:

Reference source signal indices: :

（1）Frequency 19.2MHz

（2）Frequency error ±2ppm（-30℃~85℃）

（3）Output signal amplitude 0.5Vpp（min）

Indices of emitting and receiving intermediate frequency local oscillation signals

：Zero intermediate frequency method

RF local oscillation signals Indices :

（1）Output frequency: 1664~1788MHz；

（2）Output power: -12dBm

2 .Electric Indices

Parameter	Reference index	Parameter	Reference index
Maximum power consumption	2W	Maximal TxPwr	23 dBm
Overall power consumption	40mw	Sensitivity of Receiver	<-104 dBm
Power voltage	12V±20%	Primary power supply	220V AC input
Tandby time	40-120 hours	Conversation time	3-5 hours
Charging current	830mA		

Chapter4 Engineering Mode and Test Mode

4.1 Entrance to engineering mode and test mode

1、Entering test mode ：

Inputting keypad command ＃＃10999* to enter factory test mode：

- Press 4 to hands-freeing voice loopback.
- Press 6 to handle loopback.
- Press “Delete” long time to LCD test in which all LCD will light and ring utter afterwards.

2、Entering RF calibration - FTM mode ：

Open tool software QXDM and input “mode offline - d” in command window to modify 453NV as “1”（”0” for normal mode ）

Chapter 5 Troubleshooting

（1）Troubleshooting Procedure of the Baseband

1、Power fault maintenance procedure

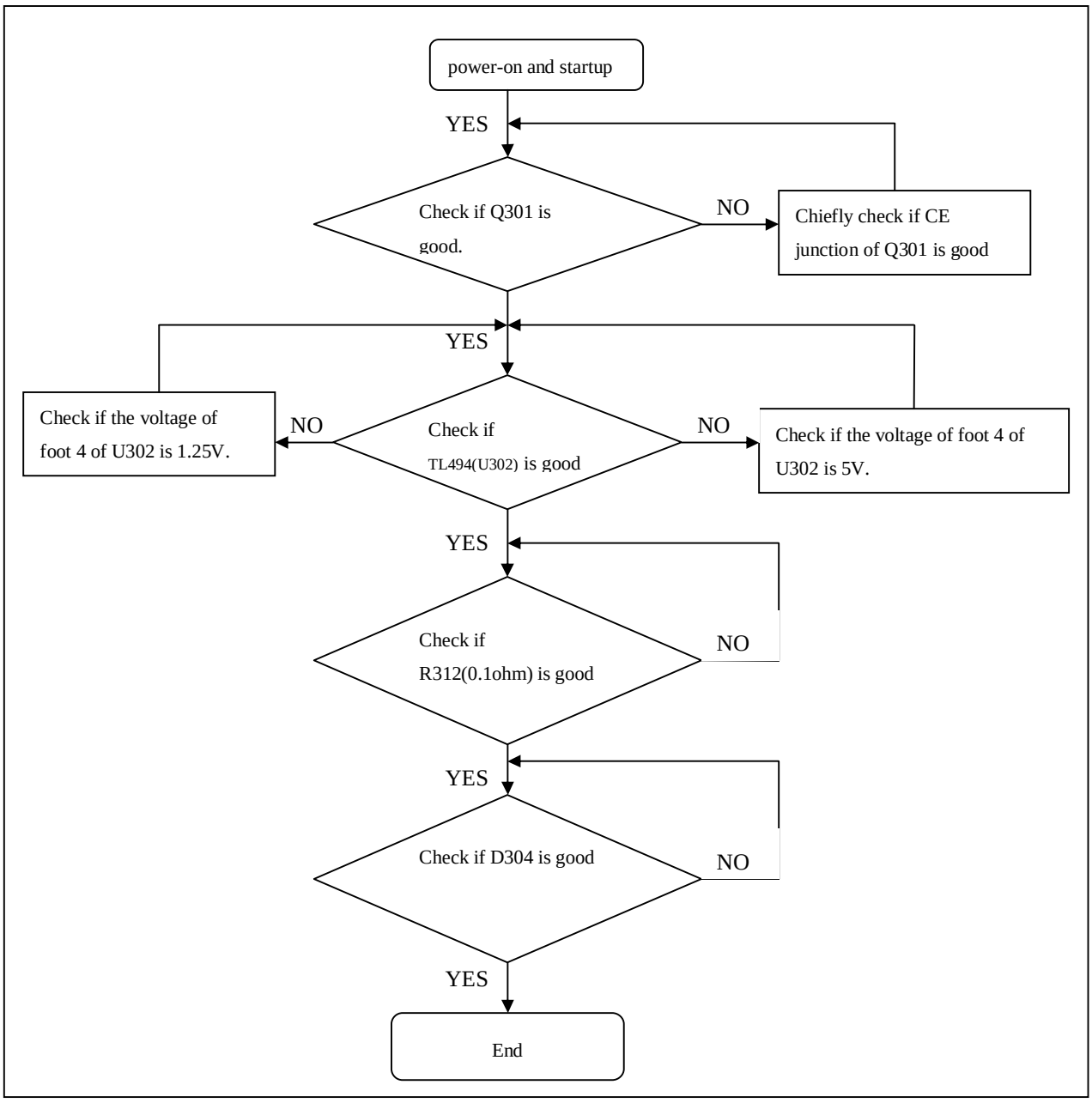


Figure 11 Power fault maintenance procedure

2、Initialization fault maintenance procedure

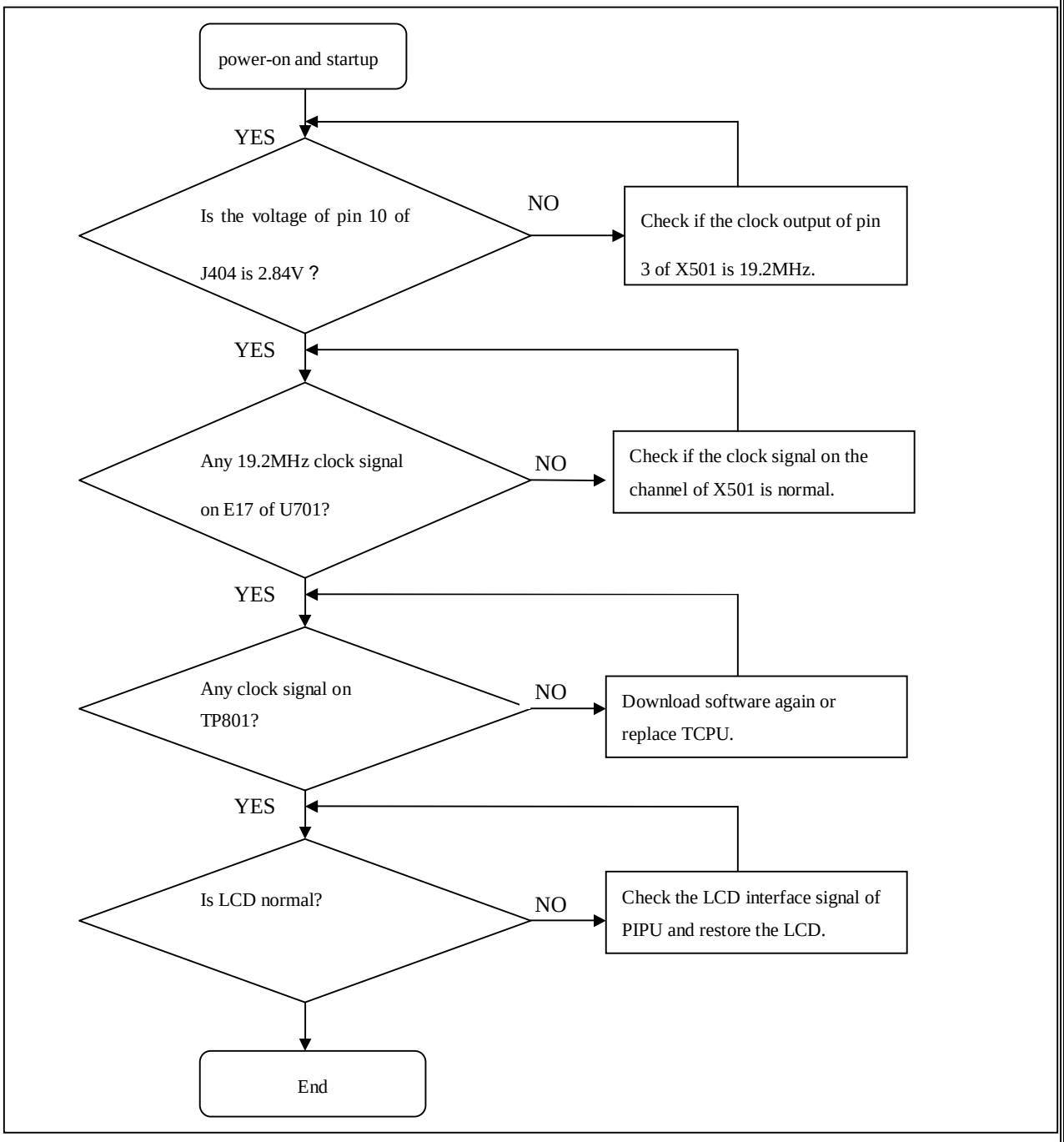


Figure 12 Initialization fault maintenance procedure

3、Key-press fault maintenance procedure

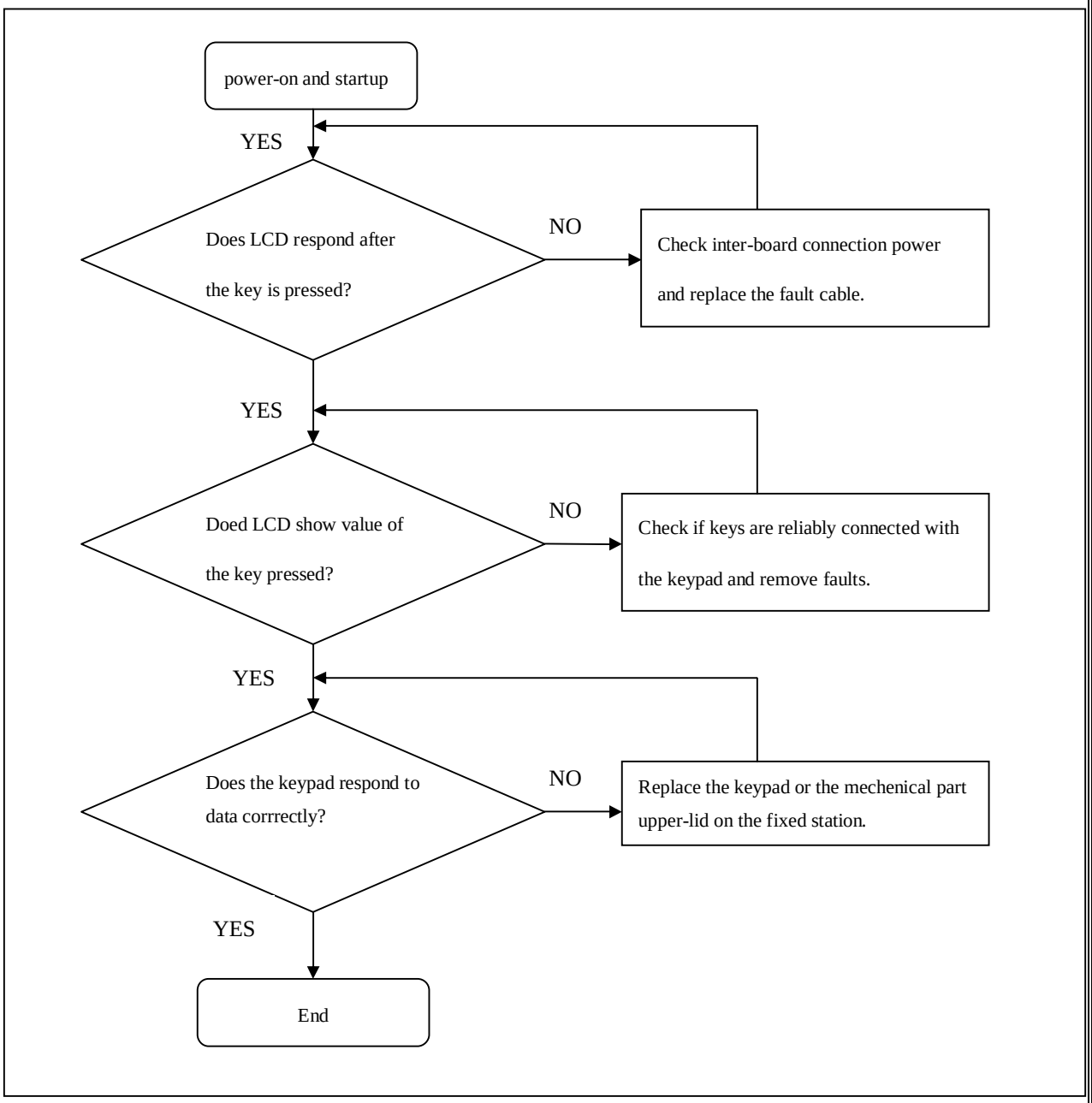


Figure 13 Key-press fault maintenance procedure

4、LCD display fault maintenance procedure

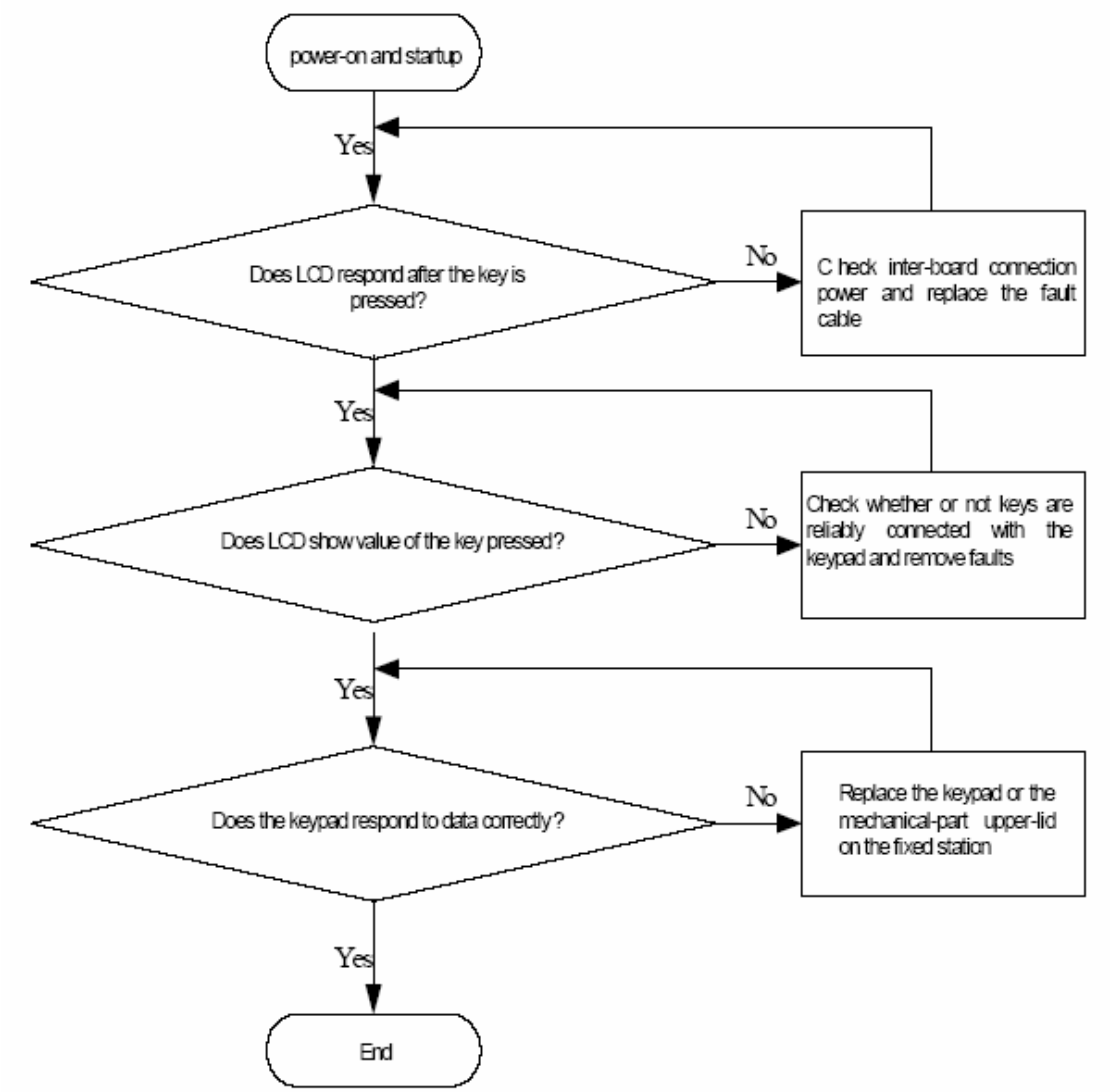


Figure 14 LCD LCD display fault maintenance procedure

5、Hands-free fault maintenance procedure

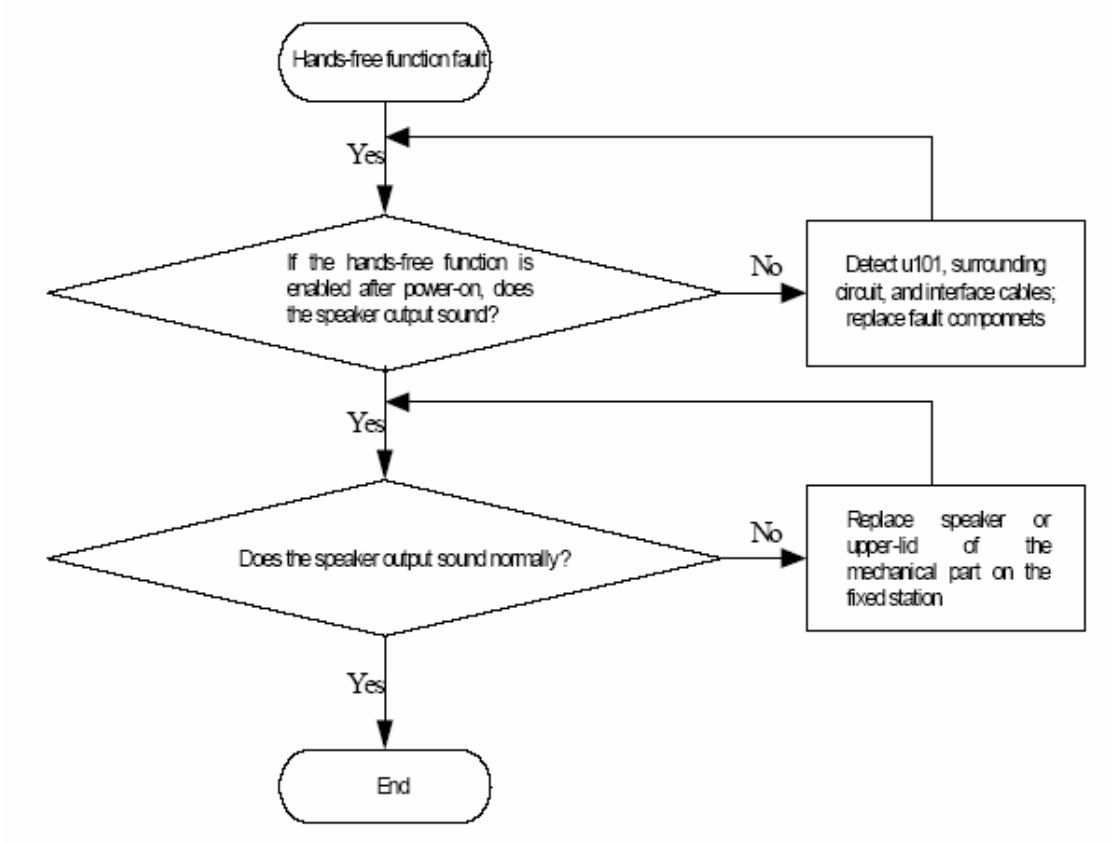


Figure 15 Hands-free fault maintenance procedure

6、Charging fault maintenance procedure

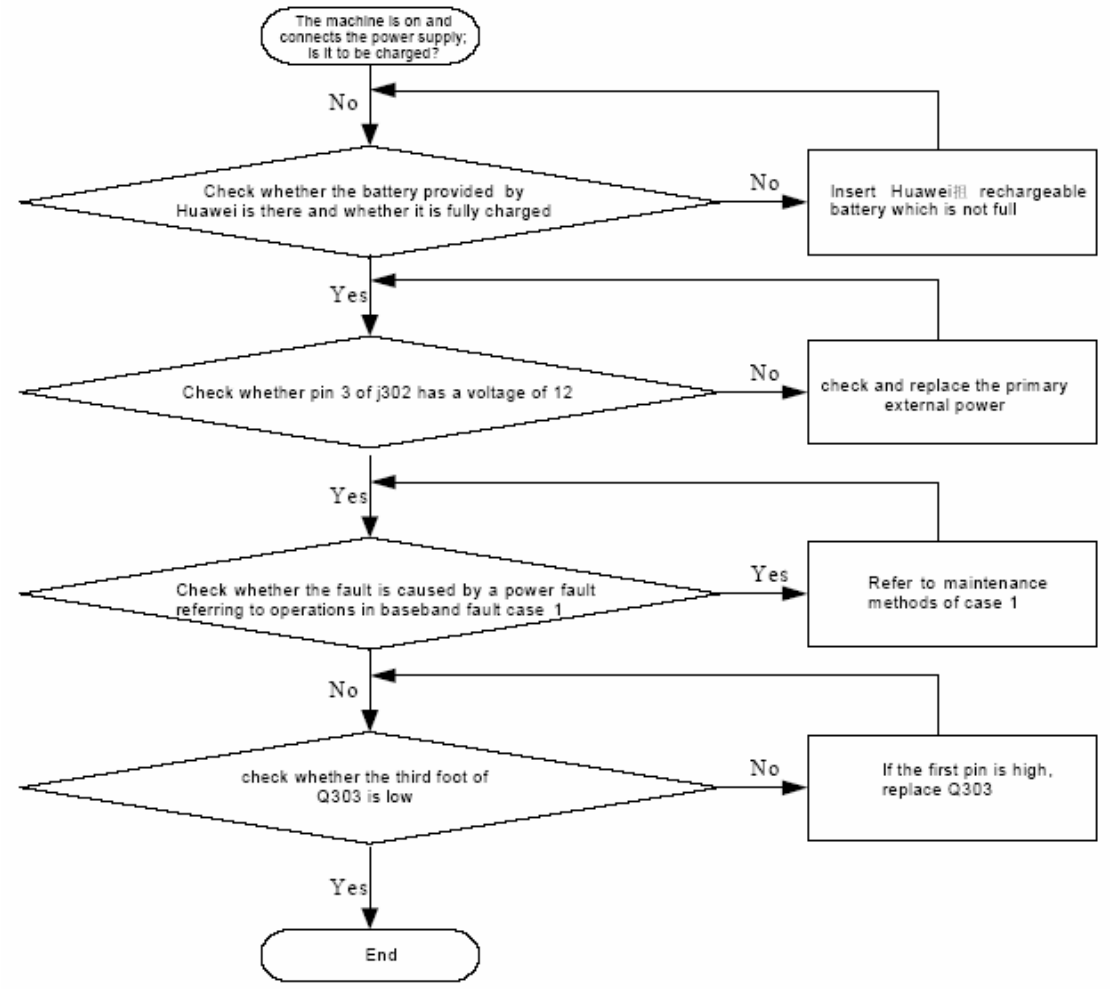


Figure 16 Charging fault maintenance procedure

7、Data service fault maintenance procedure

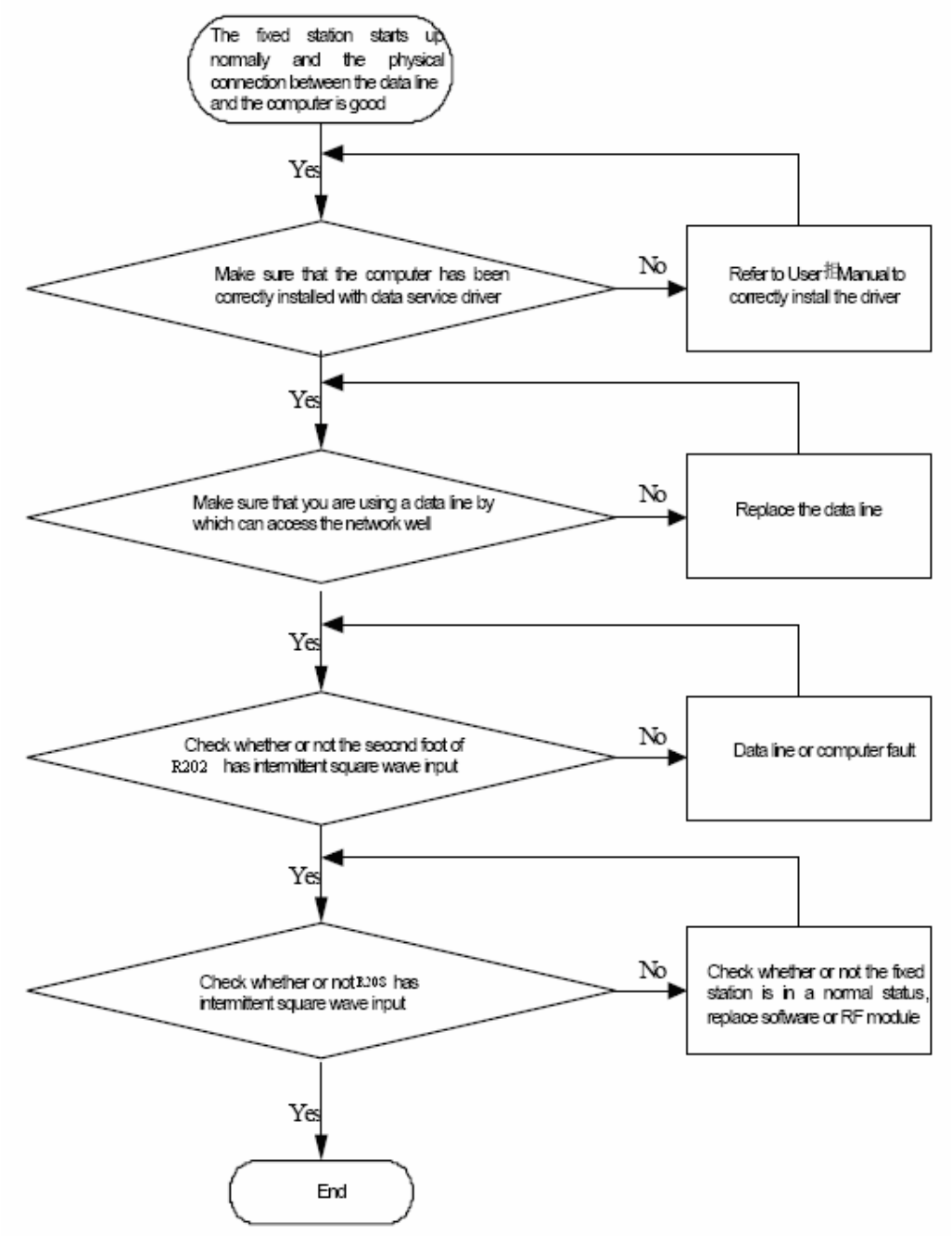


Figure 17 Data service fault maintenance procedure

（2）RF Processing Module Fault Maintenance Procedure

1、RF Channel Fault Maintenance Procedure

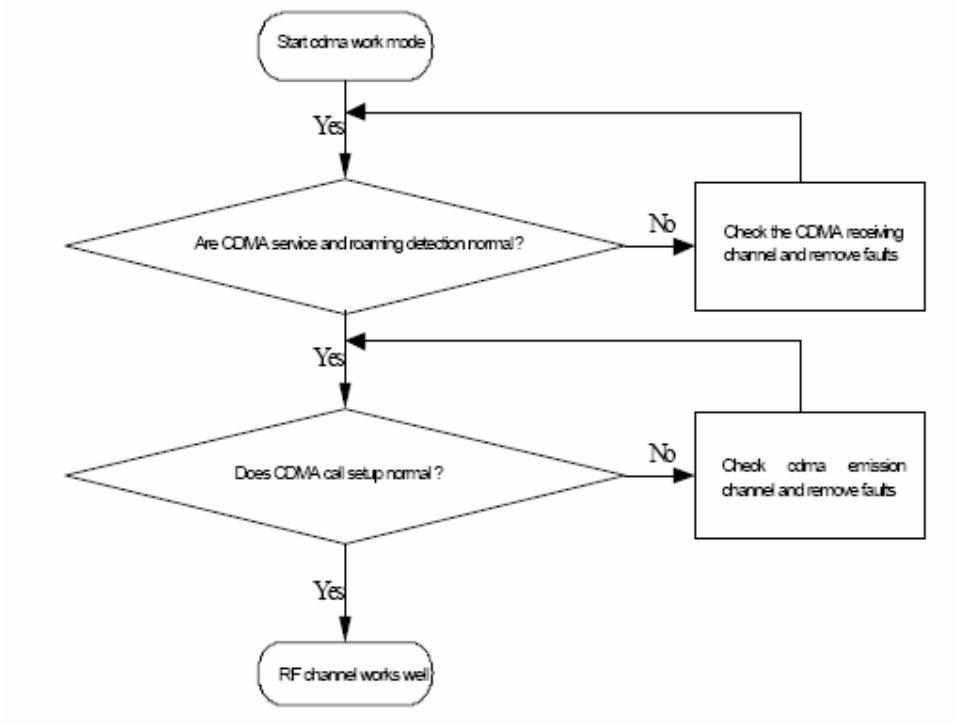


Figure 18 RF Channel Fault Maintenance Procedure

2、RF receiving channel fault maintenance procedure

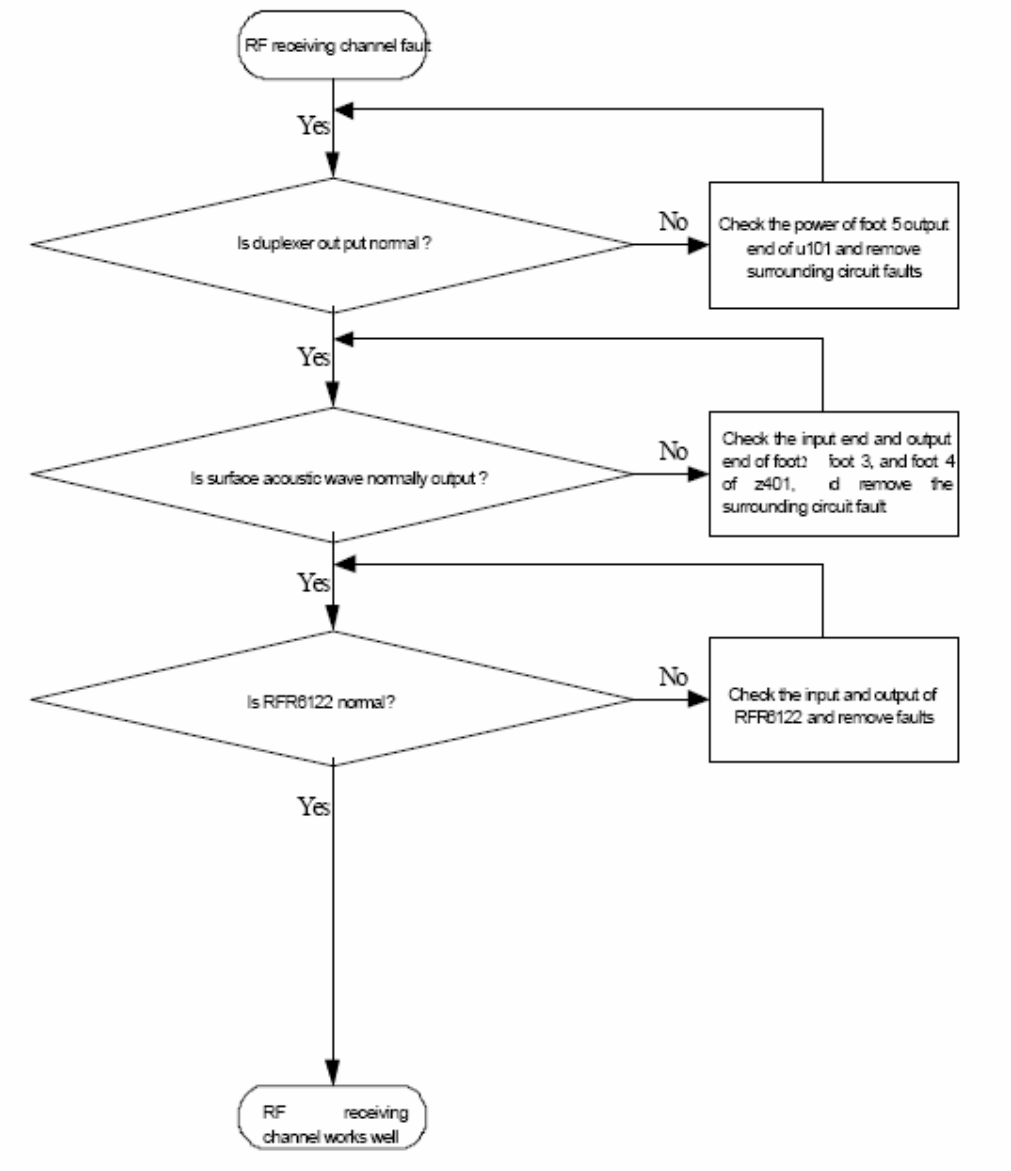


Figure 19 RF receiving channel fault maintenance procedure

3、RF emission channel fault maintenance procedure

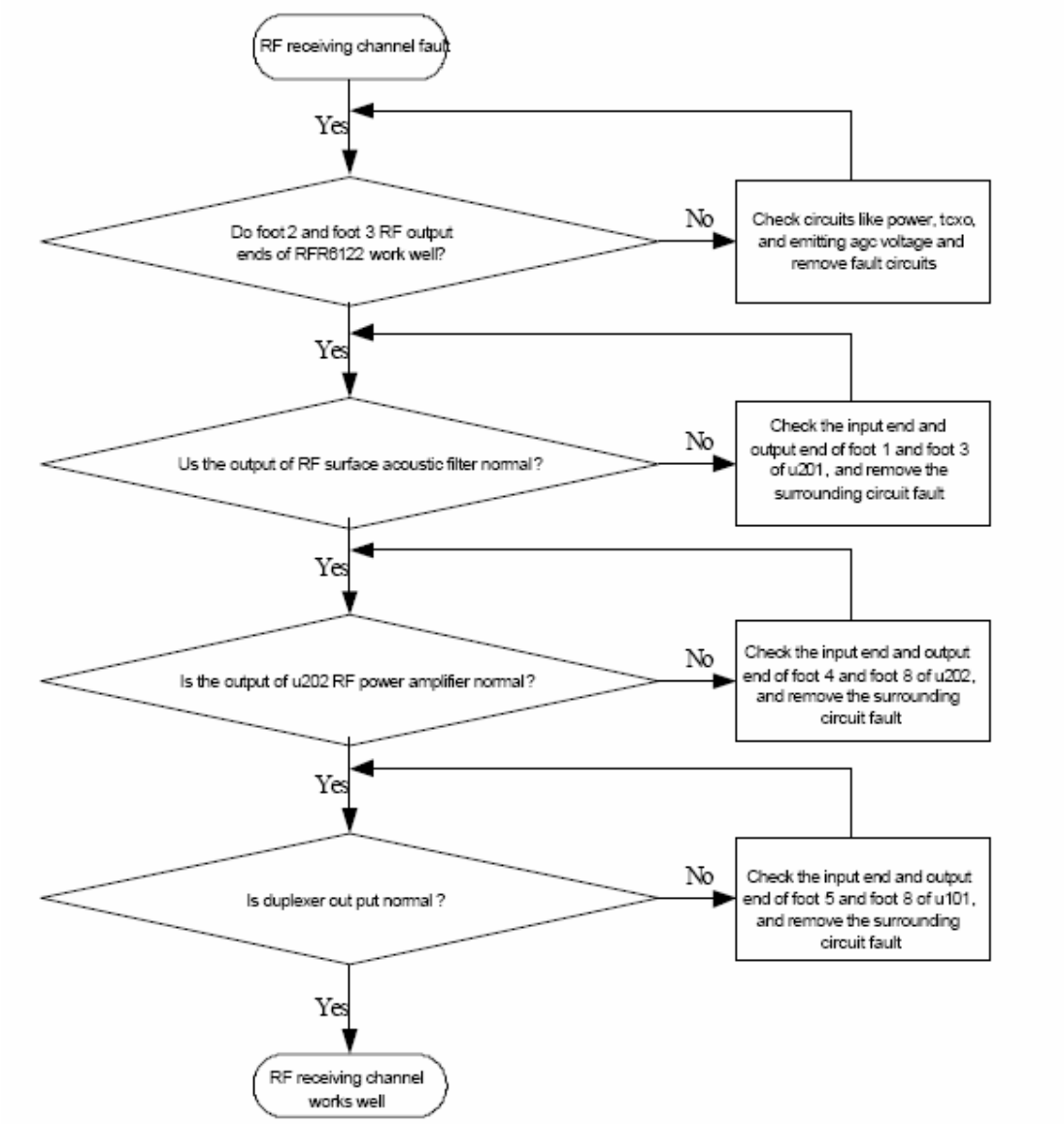


Figure 20 RF emission channel fault maintenance procedure

Chapter 6 Name Programming

Please refer to **Key Command Operation Guide**.enclosed.

Chapter 7 Appendix

7.1 Damageable Spare Part List

Code	Name	Location Number
03020ASS	Manufactured board-T601-450AS-WL71PIPB-RASYS FWT interface module-1*2	
02235191	T601-450AS,Phone type FWT Series Generally Parts Set,Graphic LCD,White,For ETS2X28	Suit
02130633	Primary power supply--5degC-45degC-190V-300V-(12V+/-5%)/0.5A	Accessory
24020480	Rechargeable battery,Nickel Metal Hydride Battery,3.6V,1.0Ah,Battery Pack,53*45*15.5mm	Accessory
48020117	Lens-DKBA8.074.1486-Segment lens（argentate）-SU2xx8	Accessory
07050057	PTC,0.29ohm,750mA,PTC,THT,11.0*16.5*3.1mm,Mobile Dedicated	F301
04050038	Made Wire,RF Cable,0.15m,TNC50SF-l,RG316-50-1.5/0.5BR-l,For Terminal	J401
15050150	Dynatron -PNP-100V-3000mA-3000mW-0.8V-SOT223-25	Q301
07040002	Varistor,27V,50A	RV301
16100002	Tact Switch,FKX,2*3,2P2T,6PIN	S101
39040062	Audio Frequency Circuit,MC34119D,Amplifier Of Telephone Application,2V to 16V,SOIC8（Tape）	U603
39110327	Control Chip,PWM Controller,SO16,Mobile Dedicated	U302
51620041	DKBA8.035.1320,Shielding Box,6025 Module(450M)	
51620042	DKBA8.035.1321,Shielding Box Cover,6025 Module(450M)	
13080003	Duplexer,824~849MHz/869~894MHz,2.1dB.,2.8dB.,21dB.	U101
39110306	Voltage Regulator,3.0V,3%,0.15A,SOT-23-5,Mobile Dedicated	U204
13010058	S.A.W.FILTER-836.5MHz-2.2dB-100V-SMP	U201
39200019	Terminal Dedicated IC,RFT6122 Baseband-to-RF Transmitter ,2.85V,32QFN	U301
13010086	SAW filter-881.5MHZ-2.4DB->250V-QCS5A	Z401
47100048	Power Amplifier Module-824-849MHz-Ghigh=29dB,Glow=26.5dB-28dBm-10-pin M7 4*4	U202
39200018	Terminal Dedicated IC,RFR6122 RF-to-Baseband Receiver,2.85V,32QFN	U401
39200022	Terminal Dedicated IC,PM6610 Power Management,3.6V,QFN32,Used with MSM6000（39200021）	U601
39200021	Terminal Dedicated IC,PM6610 Power Management,3.6V,QFN32,Used with MSM6000（39200021）	U701
40060083	FLASH-2M*16BIT FLASH+512K*16BIT SRAM-5MHZ-64KB-2.7V	U801

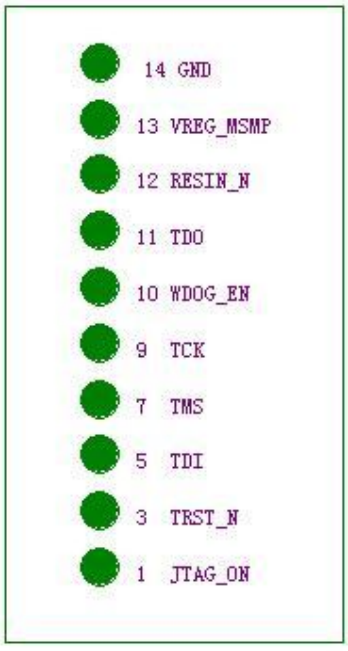
12070006	TCXO,19.2MHz,2.8V,2.5ppm,-30degC,85degC	X501
12020102	TCXO -32.768KHZ	X601
39080088	Operation Amplifier,Headphone Audio Power Amplifier with Digital Volume Control,2.0V~5.5V,1MHz,Stereo,LLP,Terminal Dedicated	U602

7.2 Schematic Circuit Diagram

7.3 Mainboard Structure Diagram

Please refer enclosed pages for BOM Schematics & Silk Screen.

7.4 Test Point Location Diagram



7.5 Abbreviations

Abbreviation	English
PLL	Phase lock loop
ACLR	Adjacent channel leakage power radio
RF	Radio frequncy
LCD	Liquid crystal display
LNA	Low noise amplifier
CDMA	Code-division multiple access
PCM	Pulse coded modulation
USB	Universal serial bus
UART	Universal Asynchronous Receiver
TCXO	Temperature-compensated crystal oscillator
Rx	Receive
Tx	Transmit

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