

**SAMSUNG**

# UMTS TELEPHONE

## SGH-Z140

# ***SERVICE*** *Manual*

### UMTS TELEPHONE



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# 1. Specification

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## 1-1. GSM General Specification

|                                       | EGSM900                | DCS1800                | PCS1900                | W-CDMA                         |
|---------------------------------------|------------------------|------------------------|------------------------|--------------------------------|
| Freq.<br>Band[MHz]<br>Uplink/Downlink | 890~915<br>935~960     | 1710~1785<br>1805~1880 | 1850~1910<br>1930~1990 | 1920~1980<br>2110~2170         |
| ARFCN range                           | 0~124 &<br>975~1023    | 512~885                | 512~810                | UL:9612~9888<br>DL:10562~10838 |
| Tx/Rx spacing                         | 45MHz                  | 95MHz                  | 80MHz                  | 190MHz                         |
| Mod. Bit rate/<br>Bit Period          | 270.833kbps<br>3.692us | 270.833kbps<br>3.692us | 270.833kbps<br>3.692us | 3.84Mcps                       |
| Time Slot<br>Period/Frame<br>Period   | 576.9us<br>4.615ms     | 576.9us<br>4.615ms     | 576.9us<br>4.615ms     | Frame length : 10ms            |
| Modulation                            | 0.3GMSK                | 0.3GMSK                | 0.3GMSK                | QPSK<br>HQPSK                  |
| MS Power                              | 33dBm~5dBm             | 30dBm~0dBm             | 30dBm~0dBm             | 24dBm ~ - 50dBm                |
| Power Class                           | 4<br>(max +33dBm)      | 1<br>(max +30dBm)      | 1<br>(max +30dBm)      | 3<br>(max +24dBm)              |
| Sensitivity                           | -102dBm                | -100dBm                | -100dBm                | -106.7dBm                      |
| TDMA Mux                              | 8                      | 8                      | 8                      |                                |
| Cell Radius                           | 35Km                   | 2Km                    | 2Km                    | 2Km                            |

## 1-2. GSM TX power class

| <b>TX Power<br/>control level</b> | <b>GSM900</b> | <b>TX Power<br/>control level</b> | <b>DCS1800</b> | <b>TX Power<br/>control level</b> | <b>PCS1800</b> |
|-----------------------------------|---------------|-----------------------------------|----------------|-----------------------------------|----------------|
| 5                                 | 33±2 dBm      | 0                                 | 30±3 dBm       | 0                                 | 30±3 dBm       |
| 6                                 | 31±2 dBm      | 1                                 | 28±3 dBm       | 1                                 | 28±3 dBm       |
| 7                                 | 29±2 dBm      | 2                                 | 26±3 dBm       | 2                                 | 26±3 dBm       |
| 8                                 | 27±2 dBm      | 3                                 | 24±3 dBm       | 3                                 | 24±3 dBm       |
| 9                                 | 25±2 dBm      | 4                                 | 22±3 dBm       | 4                                 | 22±3 dBm       |
| 10                                | 23±2 dBm      | 5                                 | 20±3 dBm       | 5                                 | 20±3 dBm       |
| 11                                | 21±2 dBm      | 6                                 | 18±3 dBm       | 6                                 | 18±3 dBm       |
| 12                                | 19±2 dBm      | 7                                 | 16±3 dBm       | 7                                 | 16±3 dBm       |
| 13                                | 17±2 dBm      | 8                                 | 14±3 dBm       | 8                                 | 14±3 dBm       |
| 14                                | 15±2 dBm      | 9                                 | 12±4 dBm       | 9                                 | 12±4 dBm       |
| 15                                | 13±2 dBm      | 10                                | 10±4 dBm       | 10                                | 10±4 dBm       |
| 16                                | 11±3 dBm      | 11                                | 8±4dBm         | 11                                | 8±4dBm         |
| 17                                | 9±3dBm        | 12                                | 6±4 dBm        | 12                                | 6±4 dBm        |
| 18                                | 7±3 dBm       | 13                                | 4±4 dBm        | 13                                | 4±4 dBm        |
| 19                                | 5±3 dBm       | 14                                | 2±5 dBm        | 14                                | 2±5 dBm        |
|                                   |               | 15                                | 0±5 dBm        | 15                                | 0±5 dBm        |

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## 2. Circuit Description

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### 2-1. SGH-Z140 RF Circuit Description

#### - Antenna Switch Module (U103)

The antenna switch module allows multiple operating bands and modes to share the same antenna. A common antenna connects to one of seven paths: 1) UMTS-2100 Rx/Tx, 2) EGSM-900 Rx, 3) EGSM-900 Tx, 4) DCS-1800 Rx, and 5) DCS-1800 Tx. 6) PCS-1900 Tx, 7) PCS-1900 Rx, UMTS operation requires simultaneous reception and transmission.

#### - Filter

To convert Electromagnetic Field Wave to Acoustic Wave and then pass the specific frequency band.

- GSM Rx FILTER (F100) → For filtering the frequency band between 925 ~ 960 MHz.
- DCS Rx FILTER (F101) → For filtering the frequency band 1805 and 1880 MHz.
- PCS Rx FILTER (F102) → For filtering the frequency band 1930 and 1990 MHz.
- WCDMA Rx FILTER (F200) → For filtering the frequency band 2110 and 2170 MHz.
- WCDMA Tx FILTER (F201) → For filtering the frequency band 1920 and 1980 MHz.

#### - VCTCXO (OSC200)

To generate the 19.2MHz reference clock to drive the logic and RF.

#### - Duplexer (F203)

A duplexer splits a single operating band into receive and transmit paths.

#### - WCDMA PAM (U201)

This is a key component in the transmitter chain and must complement the RTR6200 IC precisely; jointly they dominate the UMTS transmitter performance characteristics. Parameters such as gain, output power level, ACLR, harmonics, Rx-band noise, and power supply current are critical.

#### - GSM/DCS PAM (U102)

The PAM is a key component in any transmitter chain and must complement the rest of the transmitter precisely. For GSM, DCS, PCS operation, the closed-loop transmit power control functions add even more requirements relative to the UMTS PA. In addition to gain control and switching requirements, the usual RF parameters such as gain, output power level, several output spectrum requirements, and power supply current are critical.

#### - GSM/DCS Dual Tx VCO (OSC101)

The dual Tx VCO outputs, one for EGSM and one for DCS, drive a resistive network that splits the active signal into two signals: 1) the input to the active PAM – this is the low loss path, and 2) the OPLL feedback signal.

#### - Dual VCO (OSC201)

The dual-band UHF VCO is a key component within its phase-locked loop; VCO performance directly impacts PLL and transceiver performance. GSM/DCS Rx/Tx LO & UMTS Rx LO signal is generated from this dual VCO's output.

- RFL6200 (U200)

The RFL6200 includes an LNA circuit optimized for UMTS-2100 operation. The LNA is separated from all other receive functions contained within the RFR6200 receiver IC to improve mixer LO to RF isolation – a critical parameter in the Zero-IF architecture.

- RFR6200 (U203)

The RFR6200 provides the Zero-IF receiver signal path, from RF to analog baseband, for UMTS-2100 applications. The RFR6200 accepts its UMTS input signal from the handset RF front-end design. The UMTS input is configured differentially to optimize second-order inter-modulation and common mode rejection performance, and implements MSM-controlled gain adjustments to extend the receiver dynamic range.

- RTR6250 (U101)

The RTR6250 supports multi-band, multi-mode phones with two receiver signal paths and three transmitter signal paths:

- 1) Receiver paths

- EGSM-900
- DCS-1800
- PCS-1900

- 2) Transmitter paths

- EGSM-900 (using OPLL technique)
- DCS-1800 (using OPLL technique)
- PCS-1900
- UMTS-2100

Numerous secondary functions are integrated on-chip as well:

- 3) Phase-locked loop circuits

- PLL#1 and an on-chip VCO supports UMTS Tx
- PLL#2 and an external VCO supports EGSM Rx and Tx, DCS Rx and Tx, DCS Rx and Tx and UMTS Rx

- 4) Transceiver LO generation and distribution circuits

- EGSM-900 Rx and Tx
- DCS-1800 Rx and Tx
- PCS-1900 Rx and Tx
- UMTS-2100 Tx

## 2-2. Baseband Circuit description of SGH-Z140

### 2-2-1. PM6650

#### - Power Management

Ten low-dropout regulators designed specifically for GSM applications power the terminal and help ensure optimal system performance and long battery life. It provides seven LDO support for 1.375V, 1.8V, 2.6V, 2.85V, 3.0V, 3.3V while a self-resetting, electronically fused switch supplies power to external accessories. Ancillary support functions, such as RTC module and RTC charger, Clock Buffer, aid in reducing both board area and system complexity. SBI BUS serial interface provides access to control and configuration registers. This interface gives full control of the MSM6250 and enables system designers to maximize both standby and talk times.

Supervisory functions, including a reset generator, an input voltage monitor, and a ADC Converter support reliable system design. These functions work together to ensure proper system behavior during start-up or in the event of a fault condition (low microprocessor voltage, insufficient battery energy, or excessive die temperature).

#### - TCXO Controller and Buffers

The PM6650 IC includes circuits for controlling the TCXO warm-up and buffering its signal for distribution throughout the handset. Performance specifications are presented below.

### 2-2-2. Connector

#### - LCD Connector

LCD is consisted of main LCD (color 260K TFT LCD) and small LCD (color 65K LCD). Main LCD has 1.8", 176x220 resolution and sub LCD has 1.07", 96x96 resolution. Sub LCD uses STR to improve reflection performance. Chip select signals in MSM6250, MLCD\_CS\_N can enable main LCD and SLCD\_CS\_N can enable small LCD. MLCD\_BL\_EN enables white LED of main LCD. MLCD\_RESET signal initiates the reset process of the main LCD. SLCD\_RESET signal initiates the Reset process of the small LCD.

#### - Key

This is consisted of key interface pins among U301, KEY\_N(0:4). These signals compose the matrix. Result of matrix informs the key status to key interface in the U301. Power on/off key is separated from the matrix. The key LED use the "VREG\_KEY\_LED" supply voltage. "HALL\_SW" informs the status of folder (open or closed) to the.

#### - EMI ESD Filter

This system uses the EMI ESD filter, GMF05LC to protect noise from IF CONNECTOR part.

#### - IF connector

It is 24-pin connector. They are designed to use VBATT, VF, MSM\_TDI, MSM\_TDO, MSM\_TCK, MSM\_TMS, MSM\_TRST, MSM\_RTCK, RFR, CTS, JIG\_ON, USB\_VBUS, RXD, TXD, BOOT\_SW and GND. They connected to power supply IC, microprocessor and signal processor IC.

### 2-2-3. Audio

YMU765 has a built-in amplifier, and thus, is an ideal device for outputting sounds that are used by mobile phones in addition to game sounds and ringing melodies that are replayed by a synthesizer.

The synthesizer section adopts "stereophonic hybrid synthesizer system" that are given advantages of both FM synthesizers and Wave Table synthesizers to allow simultaneous generation of up to 32 FM voices and 32 Wave Table voices. Furthermore, YMU765 has a built-in hardware sequencer that helps to realize complex play without heavily loading the host CPU. And this device also has a built-in circuit for controlling vibrators and LEDs synchronizing with play of music. The consumed electric current can be stopped to the minimum by power down mode when not operating.

The hardware sequence built in this device allows playing of the complex music without giving excessive load to the CPU of the portable telephones. Moreover, the registers of the FM synthesizer can be operated directly for real time sound generation, allowing, for example, utilization of various sound effects when using the game software installed in the portable telephone.

### 2-2-4. Memory

The signals in the MSM6250 enable two memories. They use volt supply voltage, VREG\_MSMP, VREG\_MSME from the PM6650. This system uses SEC's memory, KBE00F005M-F411. It is consisted of 1G bits flash NAND memory and 512M bits SDRAM memory. It has 16 bit data line, D1[0~15] which is connected to MSM6250.

### 2-2-5. Camera

The camera module consists of VGA pixel of system LSI(Samsung Techwin), 1/5.8" VGA CMOS image sensor with an embedded image signal processor. Pixel size is 4.0 um and effective resolution is 640(H) x 480(V).

### 2-2-6. Irda

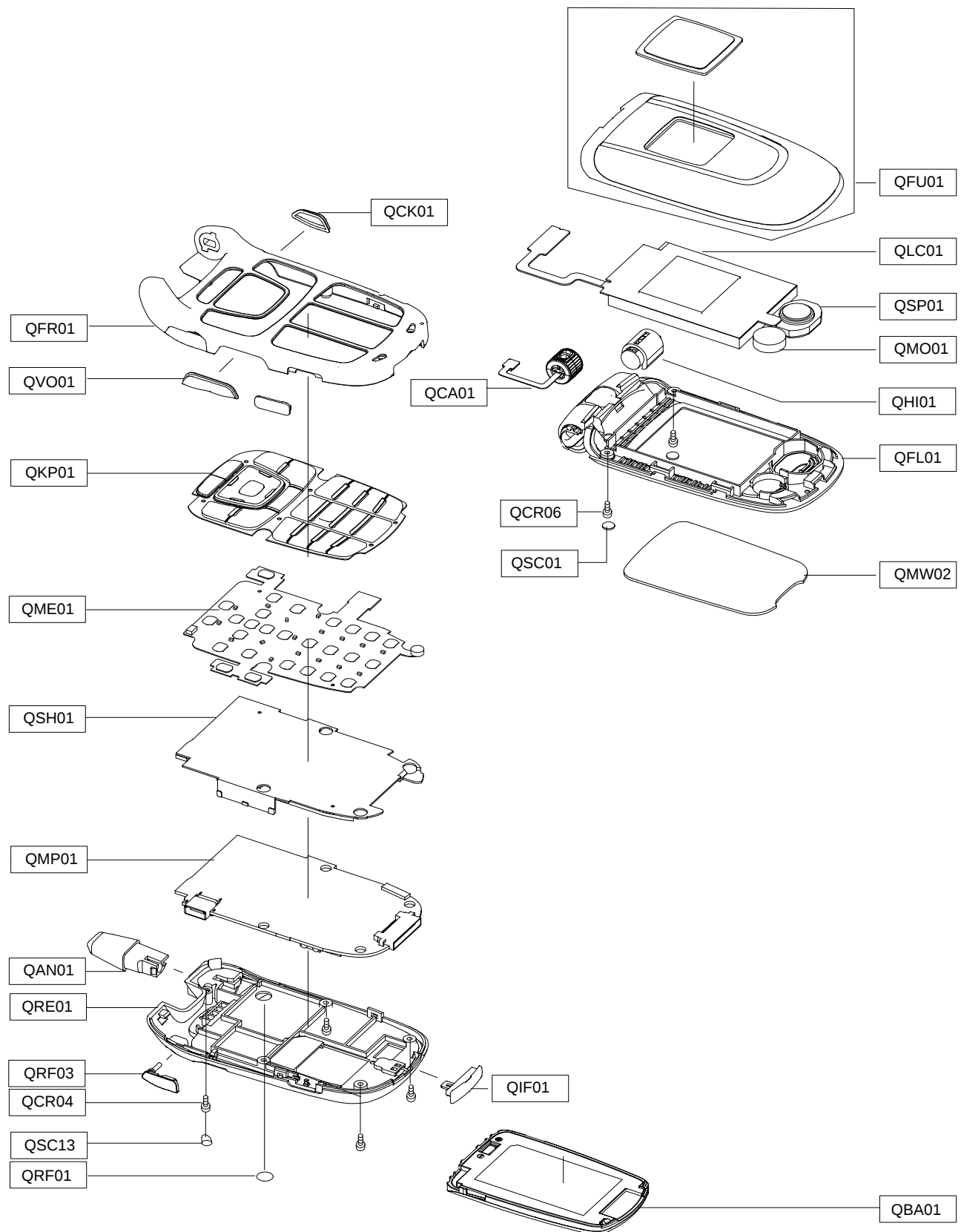
This system uses IRDA module, HSDL\_32085, Agilent's. It uses two power signals, "VREG\_MSMP" for circuit and "VBATT" for LED.

### 2-2-7. Bluetooth

This system uses Bluetooth module, LBDA245AN0, Murata's. Chip solution is of Broadcom, BCM2004. It uses a power signal, "VREG\_BT". This system uses Blue-Q interface in that module has RF circuit and base band bluetooth part is in MSM6250.

### 3. Exploded View and Parts List

#### 3-1. Exploded View



## 3-2. Parts List

| Location NO. |       | Description                           | SEC CODE    |
|--------------|-------|---------------------------------------|-------------|
| QBA01        |       | BATTERY-1000MAH,BLK,ENG,M;BST456ABVC  | GH43-01797A |
| QCA01        |       | UNIT-CAMERA;SGH-Z140,S5K53BEA,-,USA,  | GH59-02091A |
| QCK01        |       | PMO-CAMERA KEY;SGH-Z140,PC+POLY URET  | GH72-24665A |
| QCR04        |       | SCREW-MACHINE;PH,+ ,M1.4,L4,NYLOK,SWR | 6001-001479 |
| QCR06        |       | SCREW-MACHINE;PH(PI2.5),+ ,M1.4,L3.5, | 6001-001155 |
| QIF01        |       | PMO-IF COVER;SGH-Z140,PC+POLY URETHA  | GH72-22380A |
| QLC01        |       | LCD-SGHZ140 LCD;LTD180QC-F0A,SGH-Z14  | GH07-00712A |
| QME01        |       | UNIT-KEY PAD;SGH-Z140,KBSGHZ140KM R2  | GH59-02092A |
| QMO01        |       | MOTOR DC-SPHA880 MOTOR;DMJBRK20ML,SP  | GH31-00145A |
| QMP01        |       | PBA MAIN-SGHZ140;SGHZ140,SEG,GERM,PB  | GH92-02145A |
| QMW02        |       | PCT-MAIN WINDOW V2;SGH-Z140,ACRYL SH  | GH72-24809A |
| QRF01        |       | MPR-TAPE RF COVER;SGH-Z140,PET,PI7XT  | GH74-15117A |
| QSC01        |       | MPR-SCREW CAP PC SHEET;SGH-Z140,PC S  | GH74-15486A |
| QSC13        |       | RMO-REAR SCREW CAP RUBBE;SGH-Z140,SI  | GH73-05129A |
| QSH01        |       | MEC-SHIELD CAN;SGH-Z140,EU,-,-,-,-,S  | GH75-07325A |
| QSP01        |       | SPEAKER;0.7W,8ohm,89dB+ -2dB,800Hz,14 | 3001-001766 |
| QVO01        |       | PMO-VOLUME KEY;SGH-Z140,PC+POLY URET  | GH72-24664A |
| QFL01        |       | MEC-FOLDER LOWER;SGH-Z140,EU,-,-,-,-  | GH75-07178A |
|              | QHI01 | MEC-HINGE;SGH-Z140,EU,-,-,-,-,SIL,-   | GH75-07179A |
| QCH03        |       | MEC-CAMERA HINGE;SGH-Z140,EU,-,-,-,-  | GH75-07180A |
| QFR01        |       | MEC-FRONT COVER;SGH-Z140,EU,-,-,-,-   | GH75-07181A |
|              | QRF03 | PMO-EAR COVER;SGH-Z140,PC+POLY URETH  | GH72-22392A |
| QKP01        |       | MEC-KEYPAD;SGH-Z140,EU,-,-,-,-,BLK,-  | GH75-07257A |
| QFU01        |       | MEC-FOLDER UPPER V2;SGH-Z140,EU,-,-,- | GH75-07996A |
|              | QLB02 | MEC-SUB LCD BRACKET V2;SGH-Z140,EU,-  | GH75-08025A |
| QAN01        |       | ANTENNA-SGHZ140;HFP-01502-0000AA,SGH  | GH42-00562A |
| QRE01        |       | MEC-REAR COVER;SGH-Z140,EU,-,-,-,-,B  | GH75-07182A |

| Description                          | SEC CODE    |
|--------------------------------------|-------------|
| BAG PE;LDPE,T0.05,W80,L180,TRP,-,-   | 6902-000634 |
| CBF INTERFACE-DATA LINK CABLE;SGH-Z1 | GH39-00421A |
| CHARGER-SGHZ500 TC;TCH137EBE,SGH-Z50 | GH44-01007A |
| S/W CD-VODA_PN;SGH-Z500V,SGH-Z500V,E | GH46-00151A |
| UNIT-EARPHONE;SGH-C230,EM-SS550E-STB | GH59-02166A |
| LABEL(P)-WATER SOAK;COMM,NORGE,100G, | GH68-02026A |
| MANUAL-SVR CARD;COMM,XEP,PORTUGUESE, | GH68-02552A |
| LABEL(R)-MAIN( EU);SGH-Z140,EU,POLYE | GH68-07010A |
| MANUAL-WEEE CARD;COMM,SEC,ENGLISH,UN | GH68-07013A |
| MANUAL-USER;SGH-Z140,XEP,PORTUGUESE, | GH68-07596A |
| BOX(P)-UNIT(EU);SGH-Z140,SC300+S120+ | GH69-02623A |
| CUSHION-CASE(1-2);SGH-Z140,PULP,T0.8 | GH69-03037A |
| PMO-BATT LOCKER;SGH-Z140,PC,BLK,-,-, | GH72-22394A |
| MPR-SPK CUSHION;SGH-S100,PORON,PI8XT | GH74-03121A |
| MPR-BOHO VINYL IF;SGH-E720,#950,85X1 | GH74-13606A |
| MPR-BOHO VINYL F/UP 2;SGH-Z140,ST-55 | GH74-15134A |
| MPR-BOHO VINYL M/WIN 1;SGH-Z140,ST-5 | GH74-15135A |
| MPR-BOHO VINYL M/WIN 2;SGH-Z140,SP-3 | GH74-15136A |
| MPR-BOHO VINYL REAR;SGH-Z140,ST-5543 | GH74-15142A |
| MEC-HANGER;SGH-Z500,TMN,STRAP,-,BLK, | GH75-03673H |

### 3-3. Test Jig (GH80-03308A)



3-3-1. RF Test Cable  
(GH39-00283A)



3-3-2. Test Cable  
(GH39-00337E)



3-3-3. Serial Cable



3-3-4. Power Supply Cable



3-3-5. DATA CABLE  
(GH39-00279A)



3-3-6. TC  
(GH44-00701A)



## 4. Electrical Parts List

| Design LOC          | Description        | SEC CODE      |
|---------------------|--------------------|---------------|
| AN1                 | ANTENNA(BLUETOOTH) | 4202 - 001048 |
| BAT500              | BATTERY            | 4302 - 001177 |
| C100,C103,C118,C127 | C - CERAMIC,CHIP   | 2203 - 000254 |
| C101,C104,C108,C109 | C - CERAMIC,CHIP   | 2203 - 000812 |
| C102,C116,C141,C151 | C - CERAMIC,CHIP   | 2203 - 000438 |
| C105,C110,C112,C115 | C - CERAMIC,CHIP   | 2203 - 005482 |
| C111,C117,C122,C126 | C - CERAMIC,CHIP   | 2203 - 000812 |
| C113,C203,C244      | C - CERAMIC,CHIP   | 2203 - 000885 |
| C114,C123,C129,C356 | C - CERAMIC,CHIP   | 2203 - 000854 |
| C119,C200,C206,C217 | C - CERAMIC,CHIP   | 2203 - 000233 |
| C120,C124,C144,C238 | C - CERAMIC,CHIP   | 2203 - 000995 |
| C121,C128,C138,C139 | C - CERAMIC,CHIP   | 2203 - 005482 |
| C130                | C - CERAMIC,CHIP   | 2203 - 000725 |
| C132,C137,C140,C146 | C - CERAMIC,CHIP   | 2203 - 000812 |
| C133                | C - CERAMIC,CHIP   | 2203 - 000836 |
| C134,C142,C215,C216 | C - CERAMIC,CHIP   | 2203 - 002668 |
| C145                | C - CERAMIC,CHIP   | 2203 - 006141 |
| C147,C229,C505,C517 | C - CERAMIC,CHIP   | 2203 - 006208 |
| C148,C201,C218,C220 | C - CERAMIC,CHIP   | 2203 - 005482 |
| C149,C150,C156,C168 | C - CERAMIC,CHIP   | 2203 - 000254 |
| C152                | C - CERAMIC,CHIP   | 2203 - 000311 |
| C153,C720           | C - TA,CHIP        | 2404 - 001274 |
| C154,C341           | C - CERAMIC,CHIP   | 2203 - 005480 |
| C159,C210,C248,C340 | C - CERAMIC,CHIP   | 2203 - 000812 |
| C160                | C - CERAMIC,CHIP   | 2203 - 005503 |
| C161                | C - CERAMIC,CHIP   | 2203 - 002443 |
| C162                | C - CERAMIC,CHIP   | 2203 - 005234 |
| C163,C165,C345,C617 | C - CERAMIC,CHIP   | 2203 - 000386 |
| C169,C235,C239,C337 | C - CERAMIC,CHIP   | 2203 - 000254 |
| C204,C236,C411      | C - TA,CHIP        | 2404 - 001225 |
| C205,C207,C211,C232 | C - CERAMIC,CHIP   | 2203 - 000330 |
| C208,C209,C645,C646 | C - CERAMIC,CHIP   | 2203 - 000278 |
| C221,C227,C231,C234 | C - CERAMIC,CHIP   | 2203 - 000233 |
| C222,C225           | C - CERAMIC,CHIP   | 2203 - 005288 |
| C223,C241,C421,C689 | C - CERAMIC,CHIP   | 2203 - 000438 |
| C224,C226,C230,C233 | C - CERAMIC,CHIP   | 2203 - 005482 |
| C228,C242           | C - CERAMIC,CHIP   | 2203 - 000679 |

| Design LOC          | Description      | SEC CODE      |
|---------------------|------------------|---------------|
| C237,C406,C576      | C - CERAMIC,CHIP | 2203 - 006257 |
| C240,C424,C428,C540 | C - CERAMIC,CHIP | 2203 - 005482 |
| C243,C575           | C - CERAMIC,CHIP | 2203 - 000940 |
| C247,C339,C423,C566 | C - CERAMIC,CHIP | 2203 - 000233 |
| C300,C320,C330,C353 | C - CERAMIC,CHIP | 2203 - 006093 |
| C301,C302,C303,C304 | C - CERAMIC,CHIP | 2203 - 006194 |
| C305,C308,C309,C404 | C - CERAMIC,CHIP | 2203 - 005806 |
| C306,C307,C331,C332 | C - CERAMIC,CHIP | 2203 - 006194 |
| C310,C311,C312,C313 | C - CERAMIC,CHIP | 2203 - 006423 |
| C314,C315,C316,C317 | C - CERAMIC,CHIP | 2203 - 006423 |
| C318,C319,C321,C322 | C - CERAMIC,CHIP | 2203 - 006423 |
| C323,C324,C325,C326 | C - CERAMIC,CHIP | 2203 - 006423 |
| C327,C328,C329,C343 | C - CERAMIC,CHIP | 2203 - 006423 |
| C333,C403,C414      | C - CERAMIC,CHIP | 2203 - 006194 |
| C334,C335           | C - CERAMIC,CHIP | 2203 - 000628 |
| C336                | C - CERAMIC,CHIP | 2203 - 000489 |
| C338,C342,C420,C422 | C - CERAMIC,CHIP | 2203 - 000254 |
| C344                | C - TA,CHIP      | 2404 - 001380 |
| C346,C348,C350,C352 | C - CERAMIC,CHIP | 2203 - 006423 |
| C347,C351           | C - CERAMIC,CHIP | 2203 - 006091 |
| C354,C520,C524,C527 | C - CERAMIC,CHIP | 2203 - 006201 |
| C355,C400,C401,C402 | C - CERAMIC,CHIP | 2203 - 006423 |
| C409,C410,C417,C427 | C - CERAMIC,CHIP | 2203 - 006324 |
| C412,C413,C416,C419 | C - CERAMIC,CHIP | 2203 - 006423 |
| C415,C536,C537,C541 | C - CERAMIC,CHIP | 2203 - 005806 |
| C418,C426,C702      | C - CERAMIC,CHIP | 2203 - 006053 |
| C425                | C - TA,CHIP      | 2404 - 001394 |
| C429                | C - TA,CHIP      | 2404 - 001386 |
| C500,C501           | C - CERAMIC,CHIP | 2203 - 005138 |
| C502,C506,C511,C514 | C - CERAMIC,CHIP | 2203 - 006423 |
| C508,C516,C530,C532 | C - CERAMIC,CHIP | 2203 - 006093 |
| C509                | C - CERAMIC,CHIP | 2203 - 005736 |
| C515,C549,C550,C551 | C - CERAMIC,CHIP | 2203 - 006423 |
| C518,C522,C523,C546 | C - CERAMIC,CHIP | 2203 - 006208 |
| C521,C526,C529,C531 | C - CERAMIC,CHIP | 2203 - 006344 |
| C528,C560,C577      | C - CERAMIC,CHIP | 2203 - 006201 |
| C533                | C - CERAMIC,CHIP | 2203 - 006344 |

| Design LOC          | Description      | SEC CODE      |
|---------------------|------------------|---------------|
| C538,C539,C544,C703 | C - CERAMIC,CHIP | 2203 - 000812 |
| C542,C543,C672      | C - CERAMIC,CHIP | 2203 - 005806 |
| C545                | C - TA,CHIP      | 2404 - 001281 |
| C547,C548,C657,C673 | C - CERAMIC,CHIP | 2203 - 006208 |
| C552,C553,C554,C562 | C - CERAMIC,CHIP | 2203 - 006423 |
| C561,C564,C565,C578 | C - CERAMIC,CHIP | 2203 - 006093 |
| C563,C628,C658,C669 | C - CERAMIC,CHIP | 2203 - 006423 |
| C567,C569,C729      | C - CERAMIC,CHIP | 2203 - 000233 |
| C571,C704,C706,C707 | C - CERAMIC,CHIP | 2203 - 005482 |
| C572                | C - CERAMIC,CHIP | 2203 - 006324 |
| C573,C574           | C - CERAMIC,CHIP | 2203 - 000425 |
| C602,C603,C604,C606 | C - CERAMIC,CHIP | 2203 - 006093 |
| C607,C615,C641,C642 | C - TA,CHIP      | 2404 - 001348 |
| C608,C663,C686,C688 | C - CERAMIC,CHIP | 2203 - 006093 |
| C610,C621,C625,C626 | C - CERAMIC,CHIP | 2203 - 000854 |
| C616,C635,C639,C643 | C - CERAMIC,CHIP | 2203 - 003054 |
| C624,C668,C716      | C - TA,CHIP      | 2404 - 001381 |
| C629,C630,C633,C650 | C - CERAMIC,CHIP | 2203 - 000854 |
| C636,C640,C644,C670 | C - CERAMIC,CHIP | 2203 - 000386 |
| C637,C638,C647,C648 | C - CERAMIC,CHIP | 2203 - 006137 |
| C651,C655,C656,C665 | C - CERAMIC,CHIP | 2203 - 000854 |
| C662,C671           | C - CERAMIC,CHIP | 2203 - 006190 |
| C666,C667,C687      | C - CERAMIC,CHIP | 2203 - 000854 |
| C674,C675,C694,C696 | C - CERAMIC,CHIP | 2203 - 006423 |
| C690,C691           | C - TA,CHIP      | 2404 - 001348 |
| C692                | C - CERAMIC,CHIP | 2203 - 006137 |
| C693,U611,U612      | C - TA,CHIP      | 2404 - 001339 |
| C695                | C - CERAMIC,CHIP | 2203 - 000654 |
| C697                | C - CERAMIC,CHIP | 2203 - 000438 |
| C698,C699           | C - CERAMIC,CHIP | 2203 - 005481 |
| C701                | C - TA,CHIP      | 2404 - 001268 |
| C708                | C - CERAMIC,CHIP | 2203 - 000254 |
| C709,C715,C727      | C - CERAMIC,CHIP | 2203 - 005482 |
| C710,C711           | C - CERAMIC,CHIP | 2203 - 006093 |
| C721                | C - CERAMIC,CHIP | 2203 - 006423 |
| C722,C723,C724      | C - CERAMIC,CHIP | 2203 - 000386 |
| C730,C731           | C - CERAMIC,CHIP | 2203 - 000386 |

| Design LOC          | Description           | SEC CODE      |
|---------------------|-----------------------|---------------|
| CA600               | VARISTOR              | 1405 - 001119 |
| CN100               | CONNECTOR - COAXIAL   | 3705 - 001358 |
| CN500               | CONNECTOR - CARD EDGE | 3709 - 001355 |
| CN600               | JACK - PHONE          | 3722 - 002175 |
| CN701               | CONNECTOR - HEADER    | 3711 - 005370 |
| CN703               | CONNECTOR - HEADER    | 3711 - 005962 |
| CN704               | CONNECTOR - HEADER    | 3711 - 005296 |
| CN705               | CONNECTOR - SOCKET    | 3710 - 002120 |
| CN706               | CONNECTOR - HEADER    | 3711 - 005783 |
| D501,D700           | DIODE - ARRAY         | 0407 - 001002 |
| F100                | FILTER - SAW          | 2904 - 001550 |
| F101                | FILTER - SAW          | 2904 - 001570 |
| F102                | FILTER - SAW          | 2904 - 001571 |
| F200                | FILTER - SAW          | 2904 - 001439 |
| F201                | FILTER - SAW          | 2904 - 001438 |
| F203                | FILTER - Duplexer     | 2910 - 000004 |
| F700,F701,F702,F703 | FILTER - EMI SMD      | 2901 - 001311 |
| F704,F705,F706      | FILTER - EMI SMD      | 2901 - 001311 |
| L101                | INDUCTOR - SMD        | 2703 - 002207 |
| L102                | INDUCTOR - SMD        | 2703 - 002200 |
| L103,L125,L126,L200 | INDUCTOR - SMD        | 2703 - 002314 |
| L105                | INDUCTOR - SMD        | 2703 - 001723 |
| L107,L109           | INDUCTOR - SMD        | 2703 - 002208 |
| L108,L112,L113,L709 | INDUCTOR - SMD        | 2703 - 002203 |
| L110,L400,L600,L701 | CORE - FERRITE BEAD   | 3301 - 001534 |
| L111,L114,L115,L117 | INDUCTOR - SMD        | 2703 - 001229 |
| L116,L119,L121,L123 | INDUCTOR - SMD        | 2703 - 002176 |
| L118,L204           | INDUCTOR - SMD        | 2703 - 002268 |
| L120                | INDUCTOR - SMD        | 2703 - 002199 |
| L128                | INDUCTOR - SMD        | 2703 - 002369 |
| L201                | INDUCTOR - SMD        | 2703 - 002198 |
| L202                | INDUCTOR - SMD        | 2703 - 002205 |
| L203                | INDUCTOR - SMD        | 2703 - 002267 |
| L205                | INDUCTOR - SMD        | 2703 - 001750 |
| L206,L209,L210      | CORE - FERRITE BEAD   | 3301 - 001729 |
| L207,L208,L211      | INDUCTOR - SMD        | 2703 - 002368 |
| L501,L502           | INDUCTOR - SMD        | 2703 - 002782 |

| Design LOC          | Description       | SEC CODE    |
|---------------------|-------------------|-------------|
| L601,L602           | CORE-FERRITE BEAD | 3301-001630 |
| L603,L604           | CORE-FERRITE BEAD | 3301-001756 |
| L702,L703,L704,L705 | CORE-FERRITE BEAD | 3301-001534 |
| L706,L707           | CORE-FERRITE BEAD | 3301-001534 |
| L712                | INDUCTOR-SMD      | 2703-001178 |
| LED400              | PHOTO-IRDA        | 0604-001261 |
| MIS201              | ISOLATOR          | 4709-001370 |
| OSC101              | OSCILLATOR-VCO    | 2806-001360 |
| OSC200              | OSCILLATOR-VCTCXO | 2809-001280 |
| OSC201              | OSCILLATOR-VCO    | 2806-001361 |
| OSC501              | CRYSTAL-UNIT      | 2801-004339 |
| Q400                | TR-DIGITAL        | 0504-000168 |
| R100,R207           | R-CHIP            | 2007-007491 |
| R101,R126,R127,R130 | R-CHIP            | 2007-000138 |
| R102,R312           | R-CHIP            | 2007-000140 |
| R105,R108,R110,R203 | R-CHIP            | 2007-007318 |
| R106,R112,R212      | R-CHIP            | 2007-000172 |
| R107,R633           | R-CHIP            | 2007-007316 |
| R111                | R-CHIP            | 2007-000145 |
| R114,R128,R129      | R-CHIP            | 2007-001217 |
| R115,R116           | R-CHIP            | 2007-001291 |
| R117,R123           | R-CHIP            | 2007-001301 |
| R118,R119,R120,R121 | R-CHIP            | 2007-001307 |
| R122,R420,R421,R422 | R-CHIP            | 2007-001305 |
| R124                | R-CHIP            | 2007-000147 |
| R125,R330,R520,R720 | R-CHIP            | 2007-007142 |
| R131,R213,R214,R303 | R-CHIP            | 2007-000171 |
| R200,R206,R208,R315 | R-CHIP            | 2007-007314 |
| R201                | R-CHIP            | 2007-000173 |
| R202,R210,R211      | R-CHIP            | 2007-000138 |
| R204                | R-CHIP            | 2007-000141 |
| R209,R505           | R-CHIP            | 2007-001298 |
| R216                | R-CHIP            | 2007-007001 |
| R217                | R-CHIP            | 2007-000146 |
| R307,R309,R324,R336 | R-CHIP            | 2007-008542 |
| R310                | R-CHIP            | 2007-007135 |
| R313                | R-CHIP            | 2007-000137 |

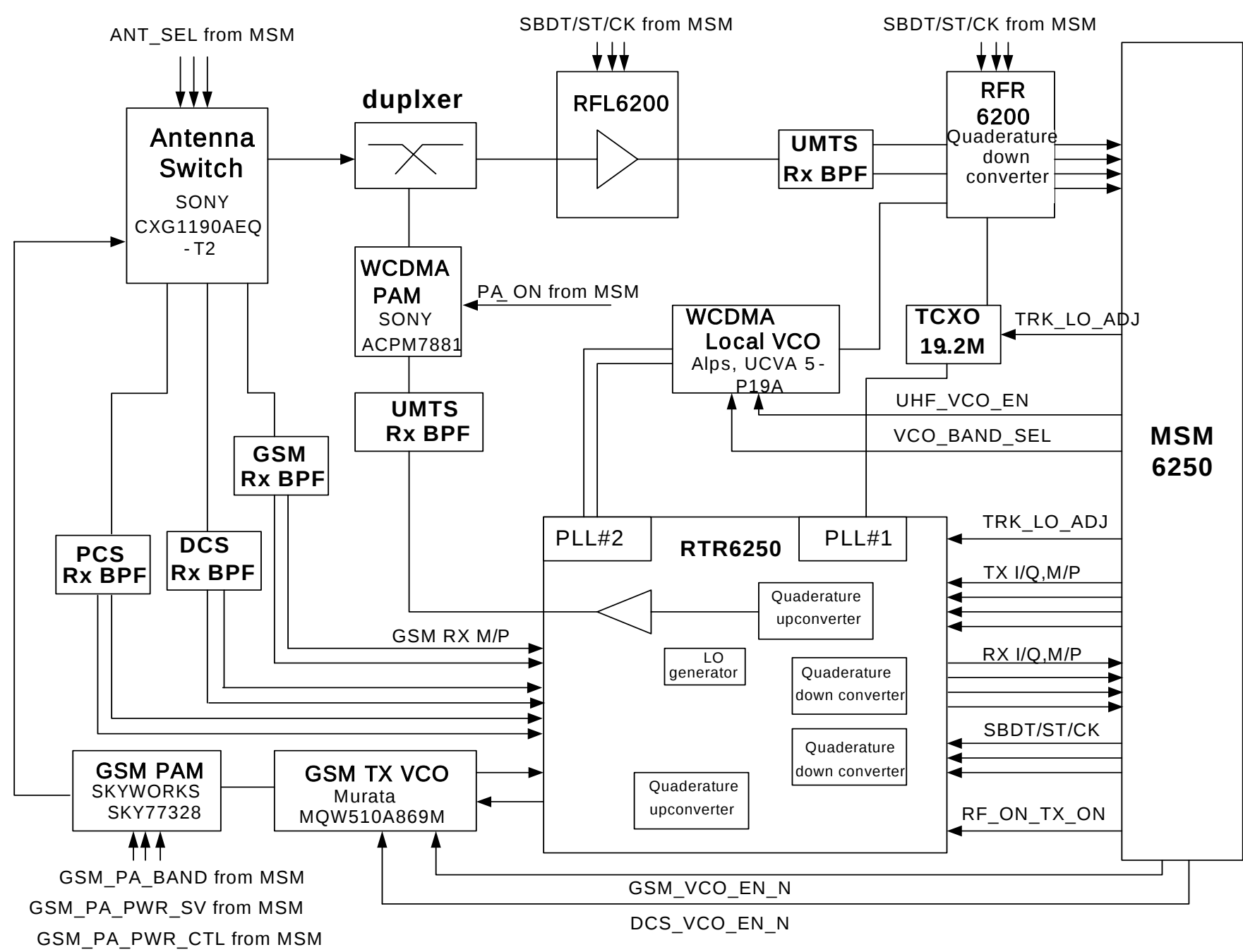
| Design LOC          | Description | SEC CODE      |
|---------------------|-------------|---------------|
| R314,R602,R603,R614 | R - CHIP    | 2007 - 007318 |
| R327,R332           | R - CHIP    | 2007 - 000148 |
| R328,R331,R620      | R - CHIP    | 2007 - 001339 |
| R339,R521,R650      | R - CHIP    | 2007 - 000566 |
| R341,R342           | R - CHIP    | 2007 - 008588 |
| R344,R408,R657      | R - CHIP    | 2007 - 008542 |
| R345,R346,R347,R348 | R - CHIP    | 2007 - 007014 |
| R349                | R - CHIP    | 2007 - 007014 |
| R350,R351           | R - CHIP    | 2007 - 003001 |
| R400,R404,R405,R406 | R - CHIP    | 2007 - 000171 |
| R403,R419           | R - CHIP    | 2007 - 000162 |
| R410,R503           | R - CHIP    | 2007 - 008516 |
| R411,R412,R700      | R - CHIP    | 2007 - 008055 |
| R414,R448,R507      | R - CHIP    | 2007 - 000171 |
| R413,R511,R617      | R - CHIP    | 2007 - 007107 |
| R415                | R - CHIP    | 2007 - 001313 |
| R418                | R - CHIP    | 2007 - 001311 |
| R423                | R - CHIP    | 2007 - 001305 |
| R500,R501           | R - CHIP    | 2007 - 003015 |
| R504                | R - CHIP    | 2007 - 008483 |
| R506                | R - CHIP    | 2007 - 007468 |
| R508                | R - CHIP    | 2007 - 000151 |
| R510,R514,R515,R516 | R - CHIP    | 2007 - 000171 |
| R517,R518,R519,R631 | R - CHIP    | 2007 - 000171 |
| R604,R605,R610,R612 | R - CHIP    | 2007 - 007137 |
| R615                | R - CHIP    | 2007 - 007318 |
| R616,R618           | R - CHIP    | 2007 - 007334 |
| R623,R625           | R - CHIP    | 2007 - 007311 |
| R634,R638,R642,R651 | R - CHIP    | 2007 - 000171 |
| R643                | R - CHIP    | 2007 - 000159 |
| R644,R645           | R - CHIP    | 2007 - 000775 |
| R646,R647           | R - CHIP    | 2007 - 007529 |
| R652,R653,R659,R710 | R - CHIP    | 2007 - 000171 |
| R702,R705,R706      | R - CHIP    | 2007 - 008542 |
| R701,R703           | R - CHIP    | 2007 - 008419 |
| R704                | R - CHIP    | 2007 - 008045 |
| R709                | R - CHIP    | 2007 - 007139 |

| Design LOC          | Description           | SEC CODE      |
|---------------------|-----------------------|---------------|
| R711,R712,R713,R714 | R - CHIP              | 2007 - 000171 |
| R715,R716,R717,R718 | R - CHIP              | 2007 - 000171 |
| R719,R721           | R - CHIP              | 2007 - 000171 |
| R722                | R - CHIP              | 2007 - 007193 |
| TH300               | THERMISTOR            | 1404 - 001196 |
| U101                | IC - TRANSCEIVER      | 1205 - 002645 |
| U102                | IC - POWER AMP        | 1201 - 002218 |
| U103                | IC - SWITCH           | 1205 - 002724 |
| U200                | IC - RF AMP           | 1201 - 001984 |
| U201                | IC - POWER AMP        | 1201 - 002219 |
| U203                | IC - RECEIVER         | 1205 - 002297 |
| U300,U402,U502      | IC - SWITCH           | 1205 - 002568 |
| U301                | IC - MODEM            | 1205 - 002527 |
| U302,U503           | IC - POSI.FIXED REG.  | 1203 - 003105 |
| U400                | IC - MCP              | 1108 - 000005 |
| U401,U603           | IC - ANALOG SWITCH    | 1001 - 001231 |
| U403                | IC - CMOS LOGIC       | 0801 - 002345 |
| U405,U604,U608,U613 | IC - ANALOG SWITCH    | 1001 - 001296 |
| U407                | FILTER - EMI SMD      | 2901 - 001283 |
| U408                | BLUETOOTH MODULE      | 4709 - 001363 |
| U409                | IC - POWER            | 1203 - 003728 |
| U410                | FET - SILICON         | 0505 - 001889 |
| U500                | IC - POWER SUPERVISOR | 1203 - 003335 |
| U501                | IC - POSI.FIXED REG.  | 1203 - 002236 |
| U601                | IC - VOLTAGE COMP.    | 1202 - 001036 |
| U605                | IC - ANALOG MULTIPLEX | 1001 - 001306 |
| U607                | IC - MELODY           | 1204 - 002138 |
| U609                | IC - AUDIO AMP        | 1201 - 002195 |
| U610                | IC - AUDIO AMP        | 1201 - 002240 |
| U615                | FILTER - EMI SMD      | 2901 - 001294 |
| X300                | RESONATOR - CERAMIC   | 2802 - 001182 |
| ZD406               | DIODE - ZENER         | 0403 - 001387 |
| ZD500,ZD707         | DIODE - TVS           | 0406 - 001200 |
| ZD600,ZD601,ZD709   | DIODE - TVS           | 0406 - 001197 |
| ZD710,ZD712,ZD717   | DIODE - TVS           | 0406 - 001197 |
| ZD718,ZD719         | DIODE - TVS           | 0406 - 001197 |
| ZD720               | DIODE - ZENER         | 0403 - 001427 |

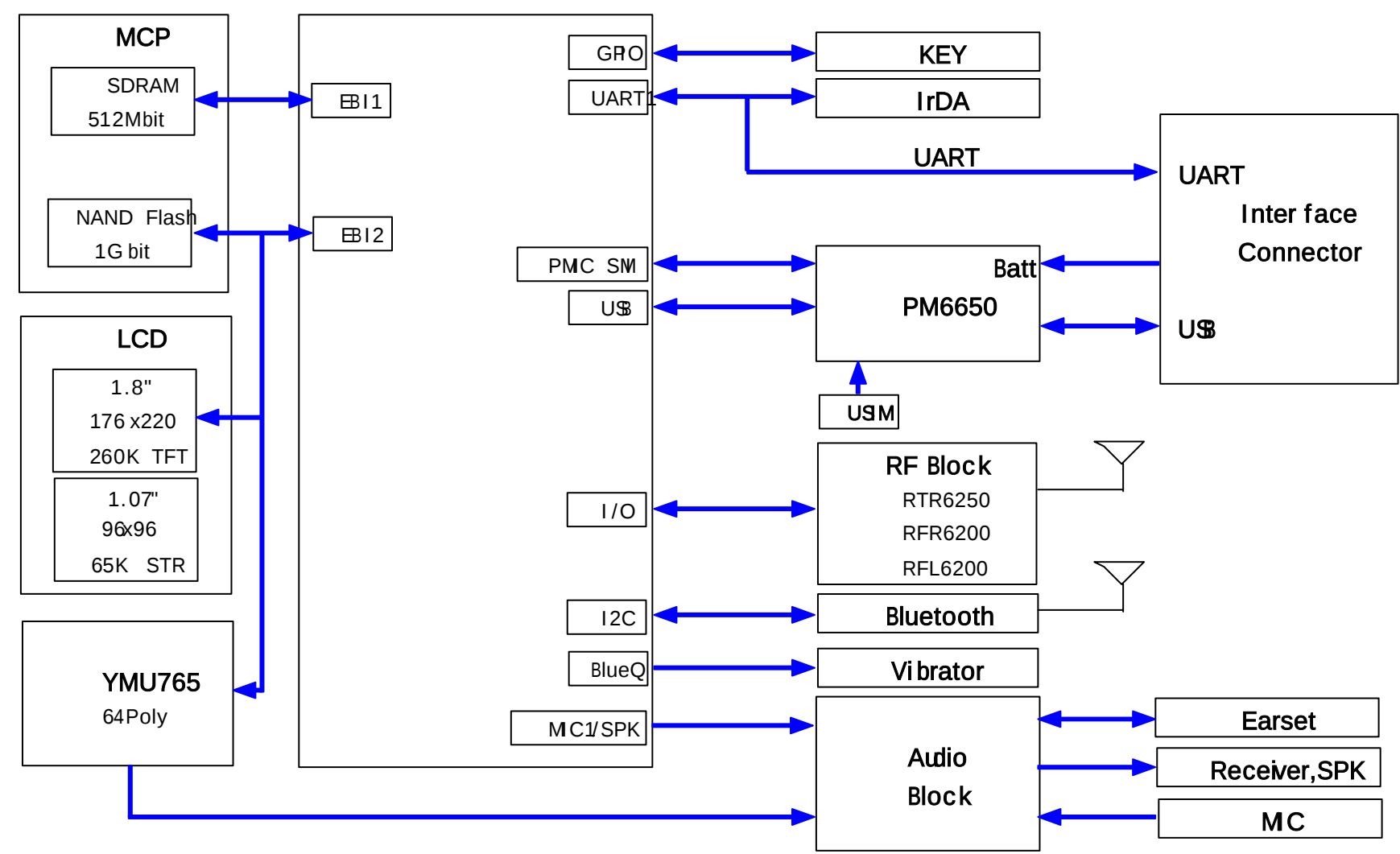
| Design LOC | Description   | SEC CODE    |
|------------|---------------|-------------|
| ZD721      | DIODE - ZENER | 0403-001411 |

5. Block Diagrams

5-1. RF Solution Block Diagram



5-2. Base Band Solution Block Diagram

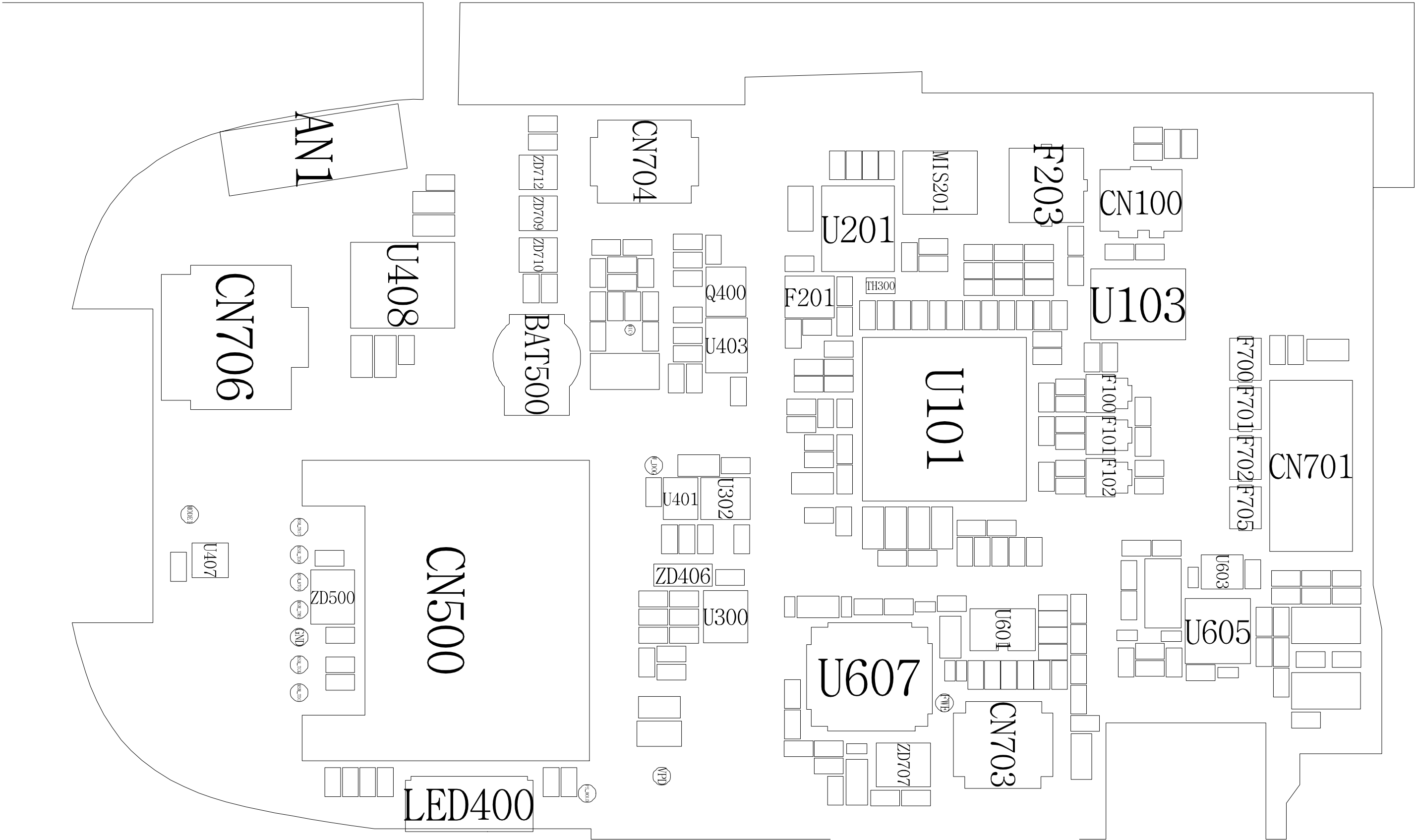


## 6. PCB Diagrams

### 6-1. PCB Top Diagram

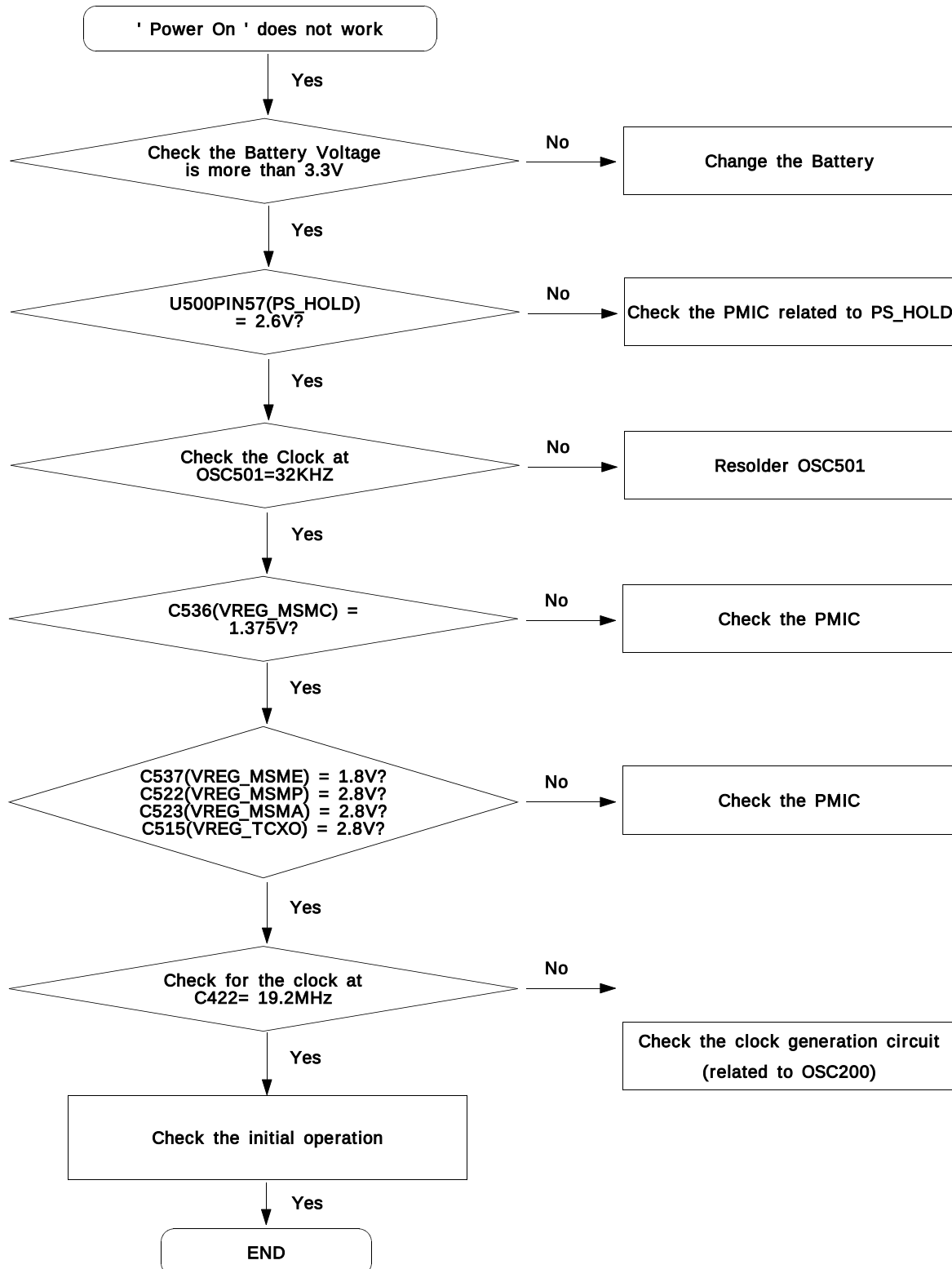


6-2. PCB Bottom Diagram

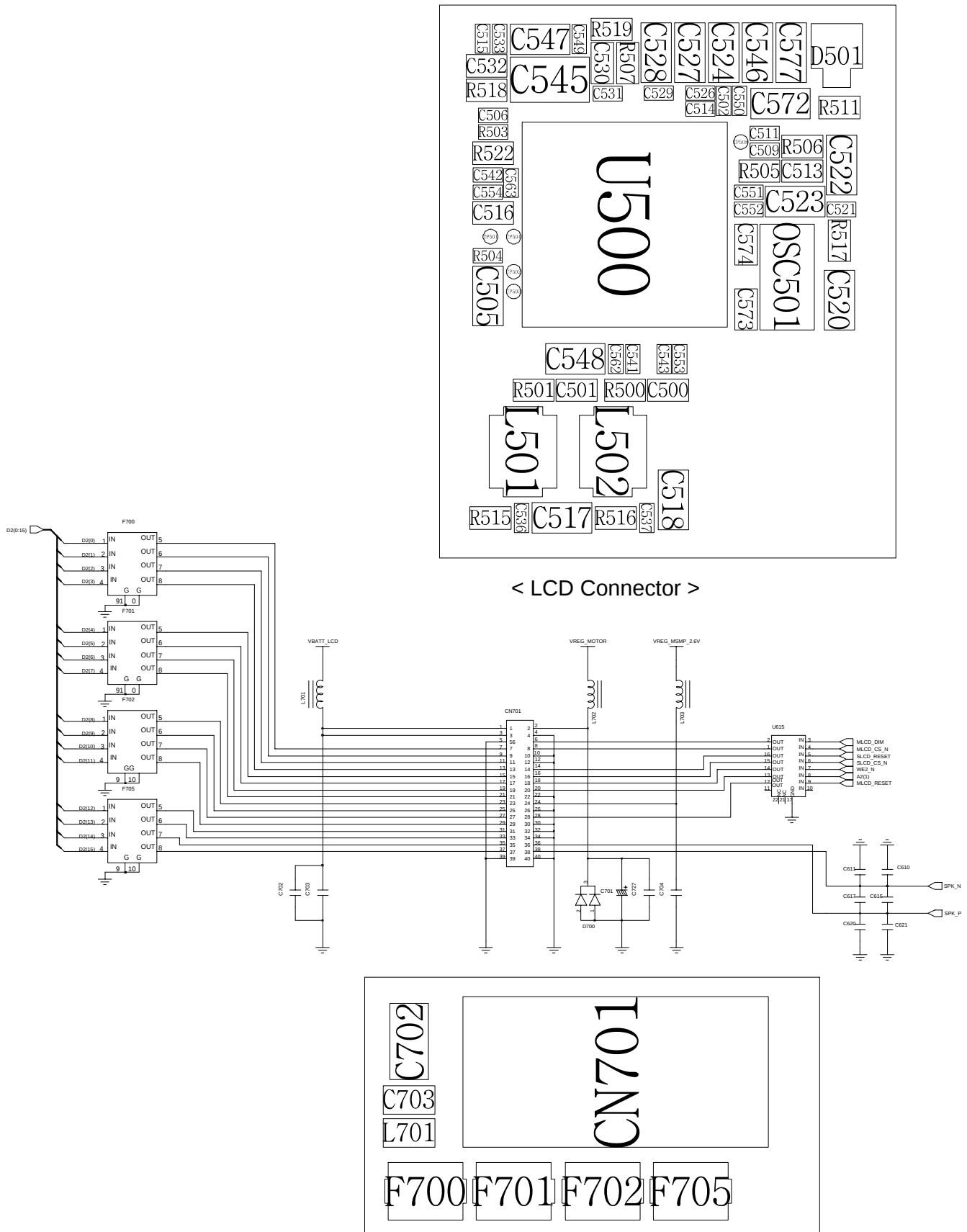


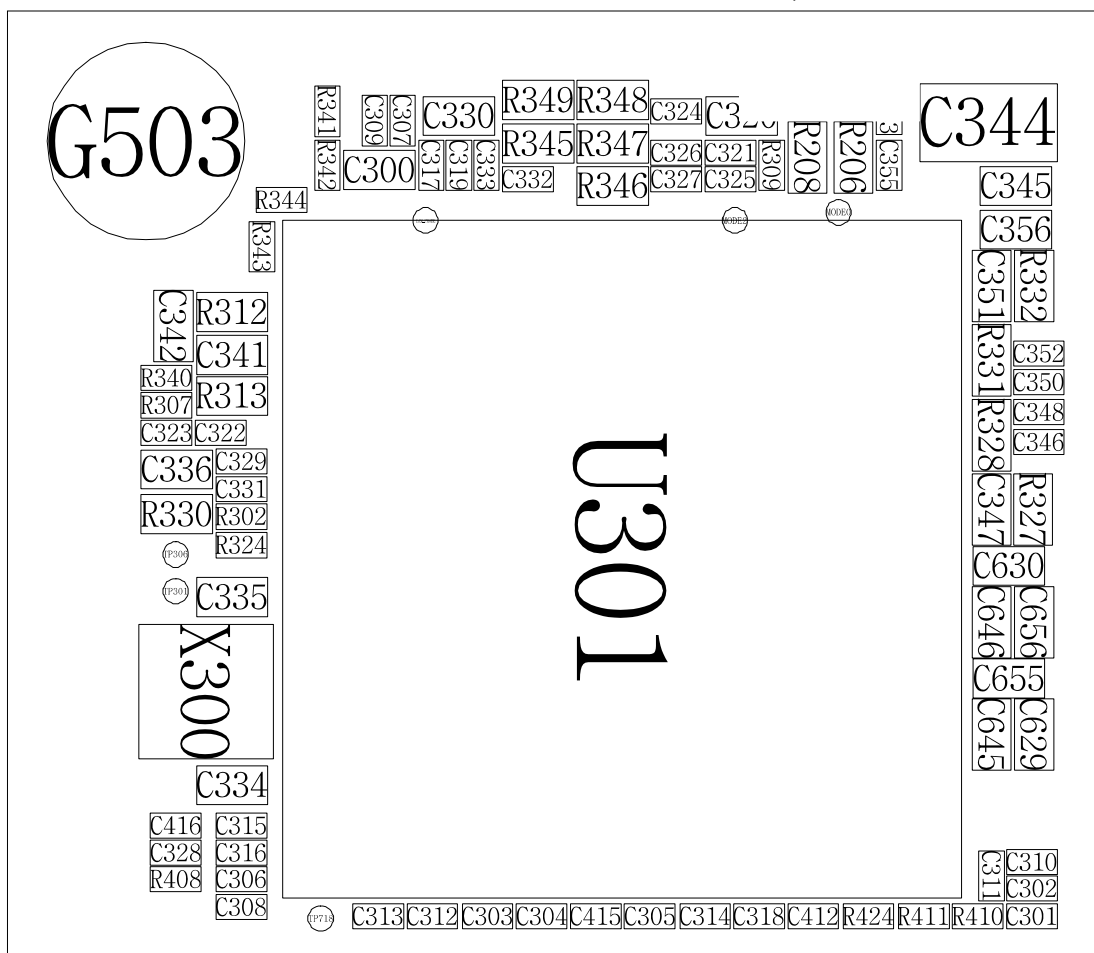
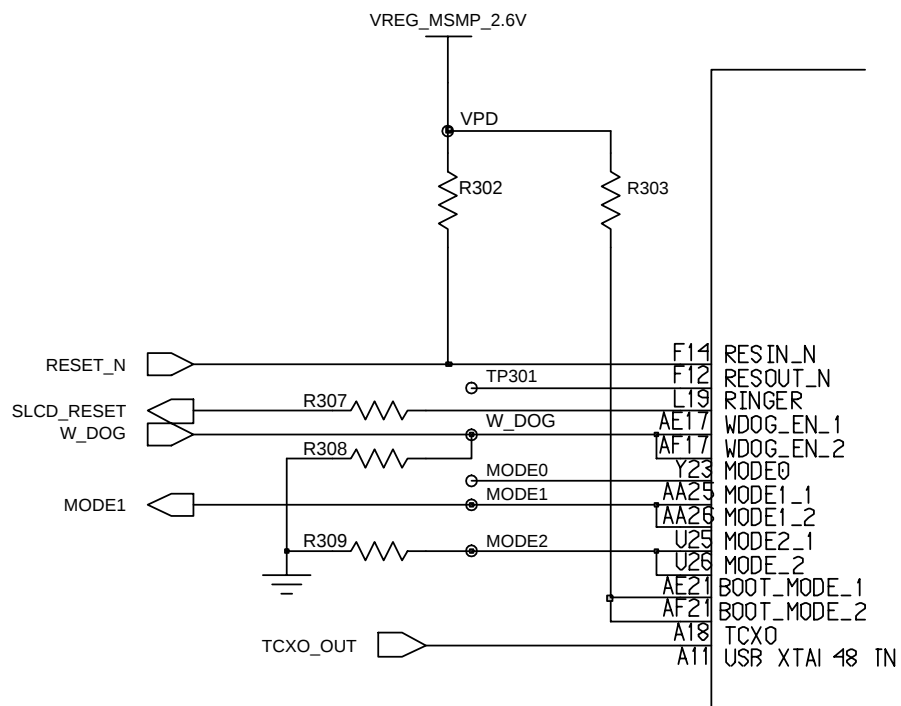
## 7. Flow Chart of Troubleshooting

### 7-1. Power On



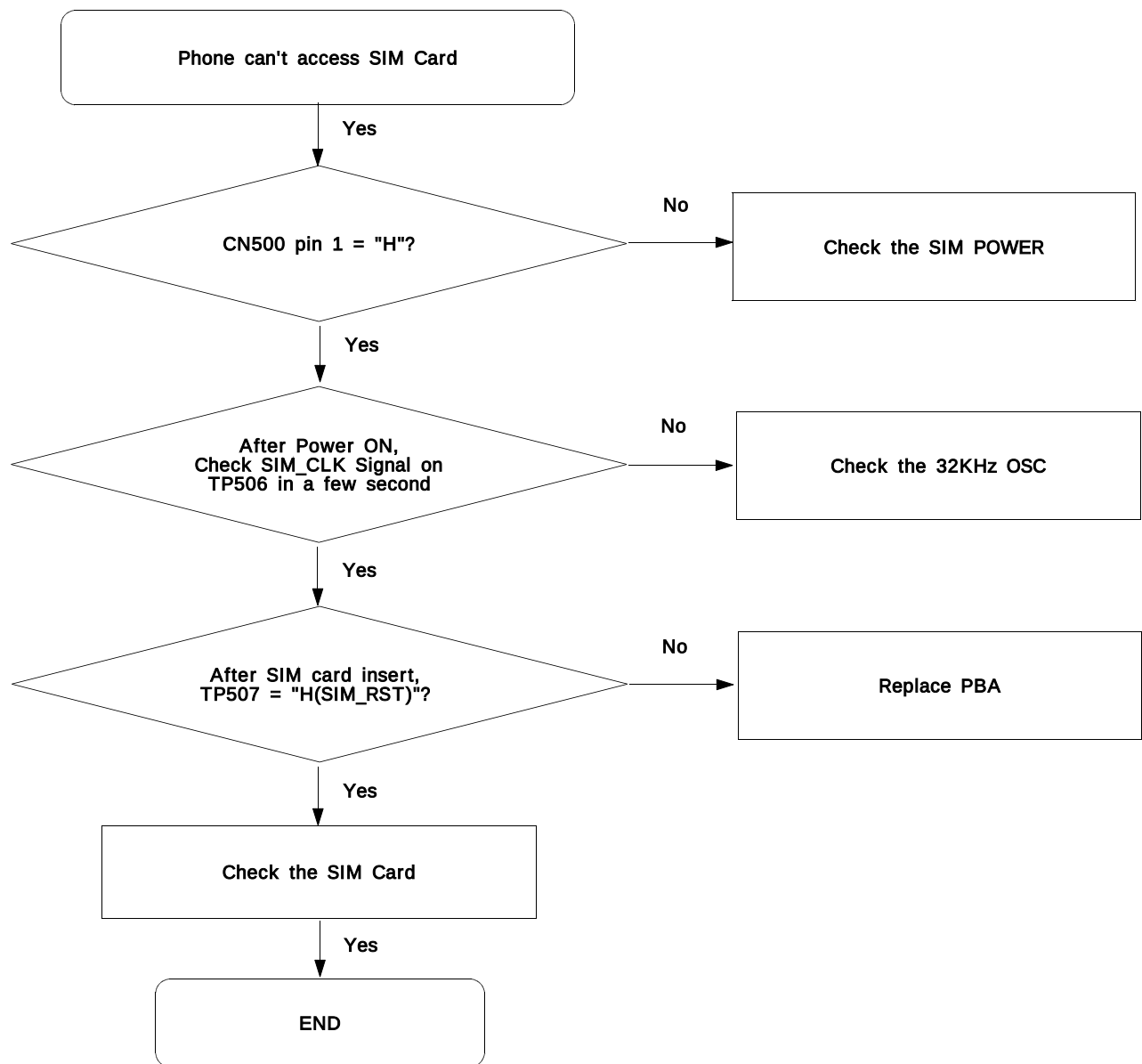
[illegible]



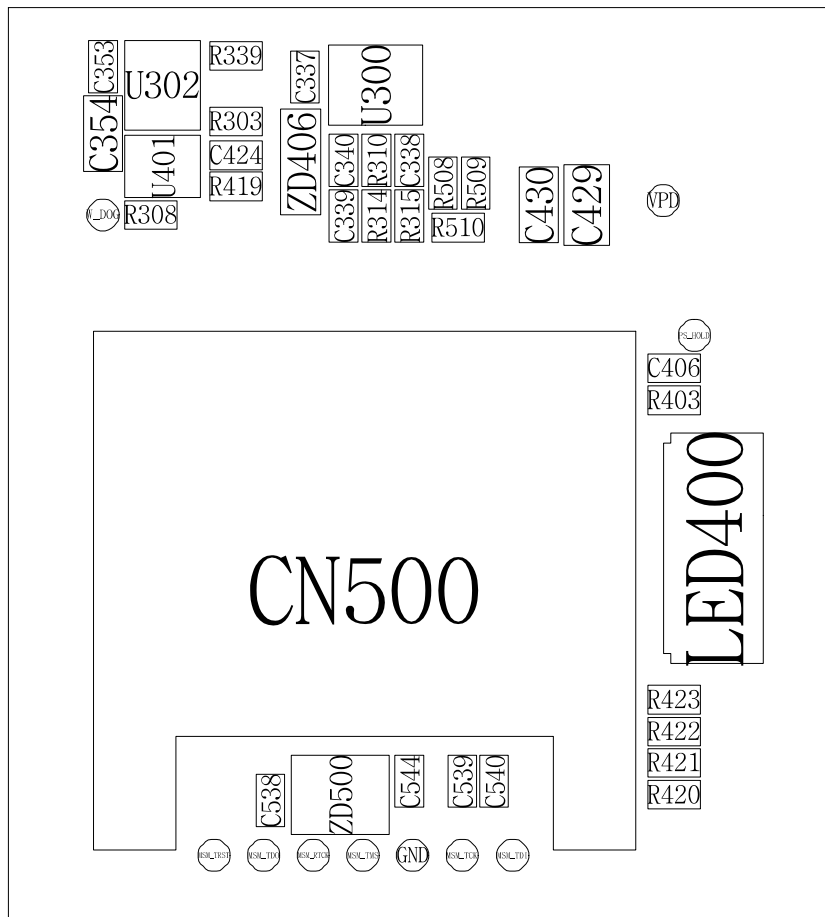
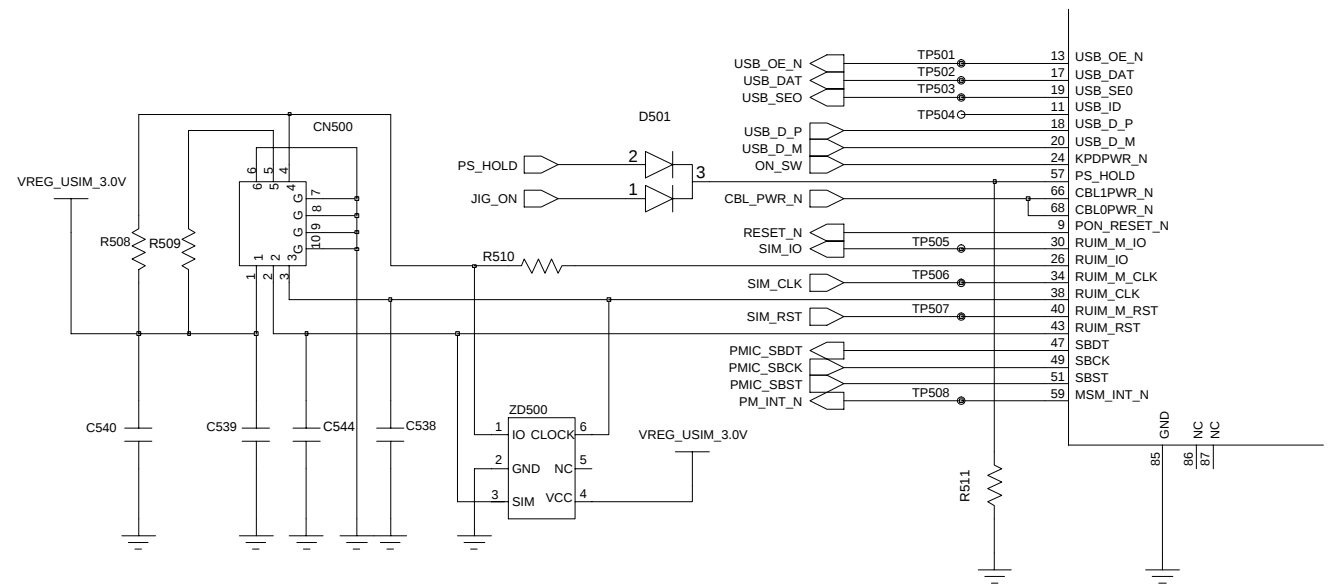




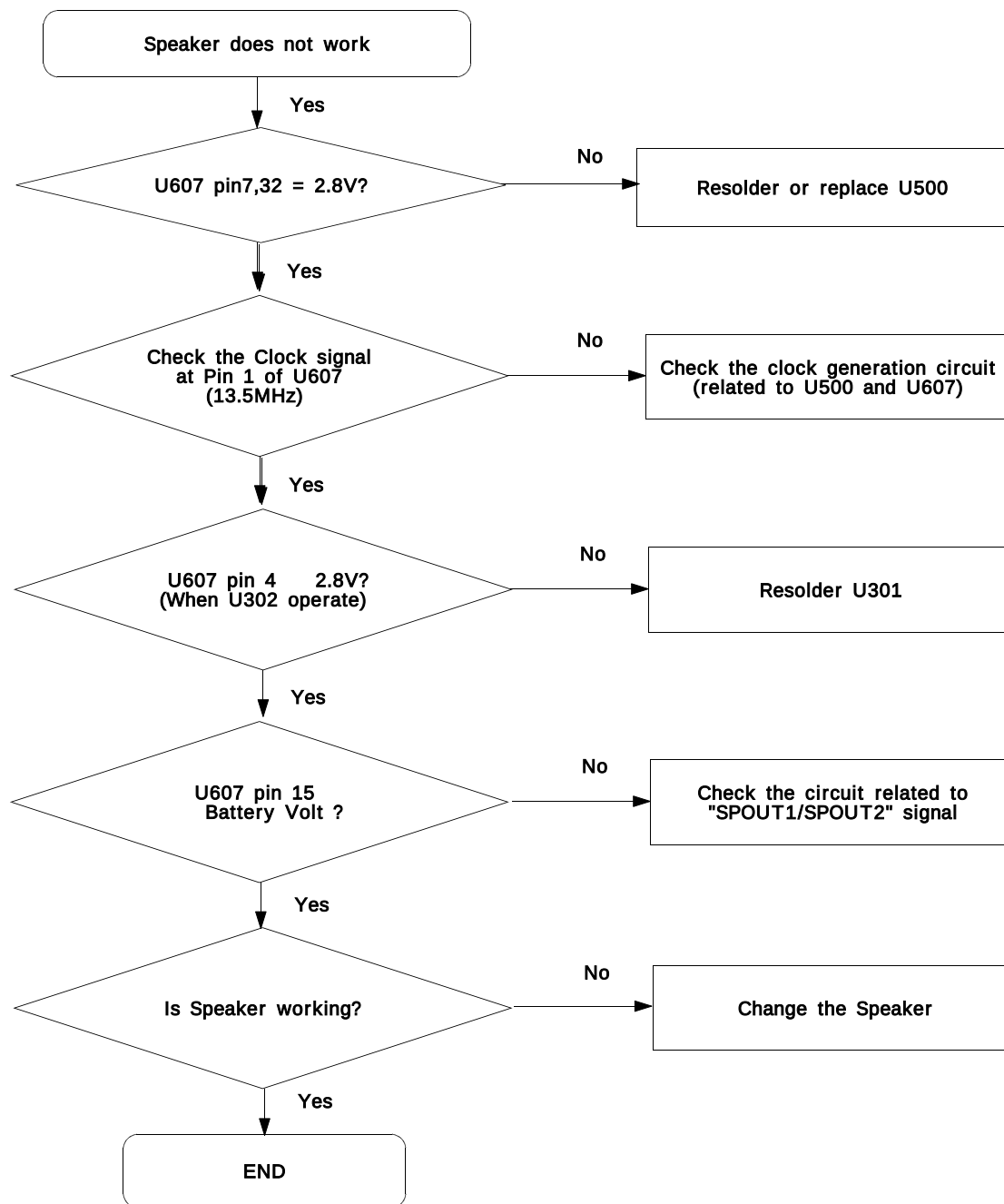
### 7-3. Sim Part



SIM

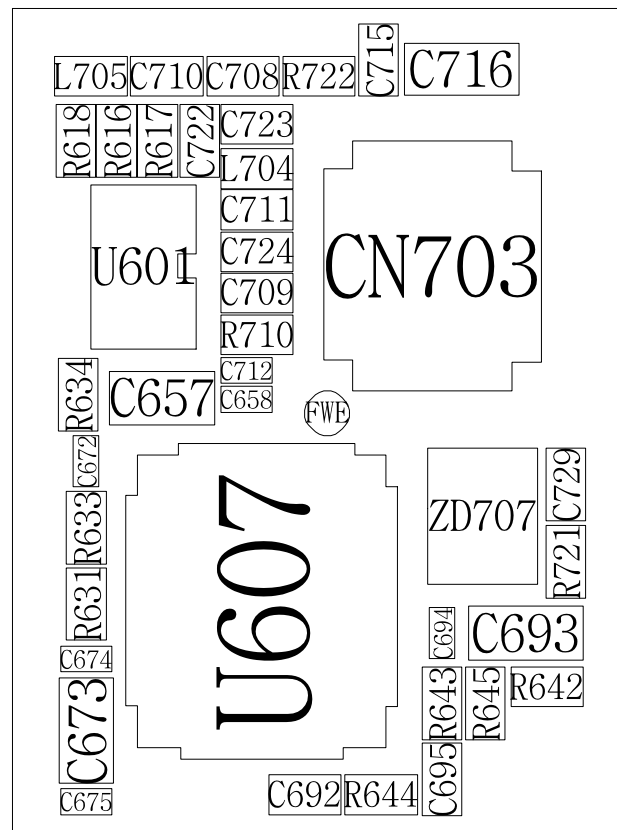


## 7-4. Speaker Part(Melody)

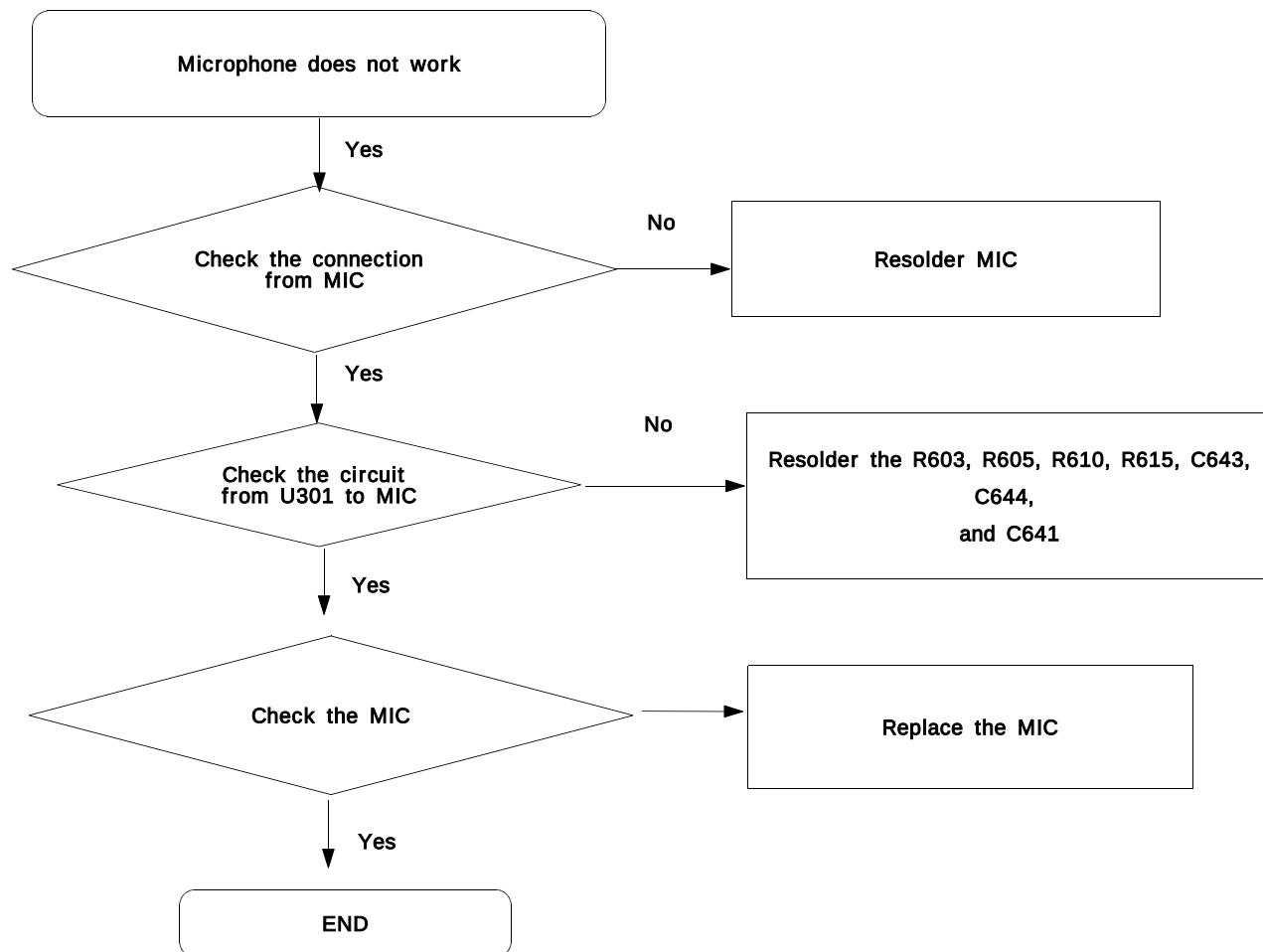


The schematic diagram illustrates the internal circuitry of the U607 module. Key components and connections include:

- Power and Grounding:**
  - VREG\_YMU 2.85V:** Connected to pin 34 (VDD) via resistor R631. It also branches to pin 35 (VSS) through a network of capacitors (C657, C658) and a diode.
  - VBATT 4.2V:** Connected to pin 36 (SPVDD) via resistor R642 and capacitor C694. A diode is connected from SPVDD to ground.
  - Internal Grounding:** Pins 35 (VSS), 10 (VSS), 11 (GND), 12 (EQ1), 13 (EQ2), 14 (EQ3), 15 (SPVSS), and 16 (SPVSS) are connected to ground through various capacitors (C672, C673, C674, C675, C692, C695) and resistors (R643, R645).
- Control and Data Signals:**
  - YMU\_CLK:** Connected to pin 1 (CLK).
  - YMU\_IRQ:** Connected to pin 3 (LED).
  - YMU\_RESET:** Connected to pin 4 (/RST) via resistor R634.
  - MEL\_L and MEL\_R:** Connected to pins 11 (HPOUT\_R) and 12 (EQ1) respectively.
  - Data Bus:** Pins 26 (D1), 27 (D0), 28 (/WR), 29 (/CS), 30 (A0), 31 (/RD), 25 (D2), 24 (D3), 23 (D4), 22 (D5), 21 (D6), and 20 (D7) are connected to external data lines.
  - Serial Interface:** Pins 17 (SPOUT2) and 18 (SPOUT1) are connected to external serial output lines.
- Internal Structure:** The module is divided into several functional blocks, including a PLL (pins 6, 7), a VDDMON (pins 8, 9), and a VSSMON (pins 10, 11).

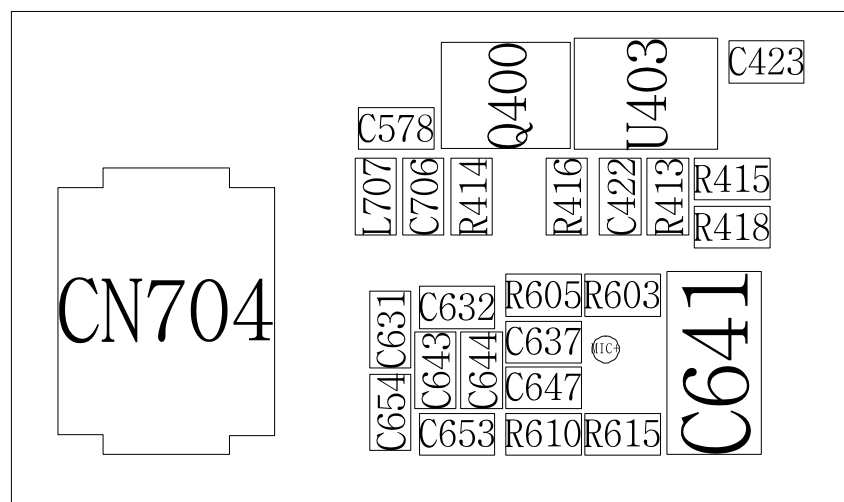
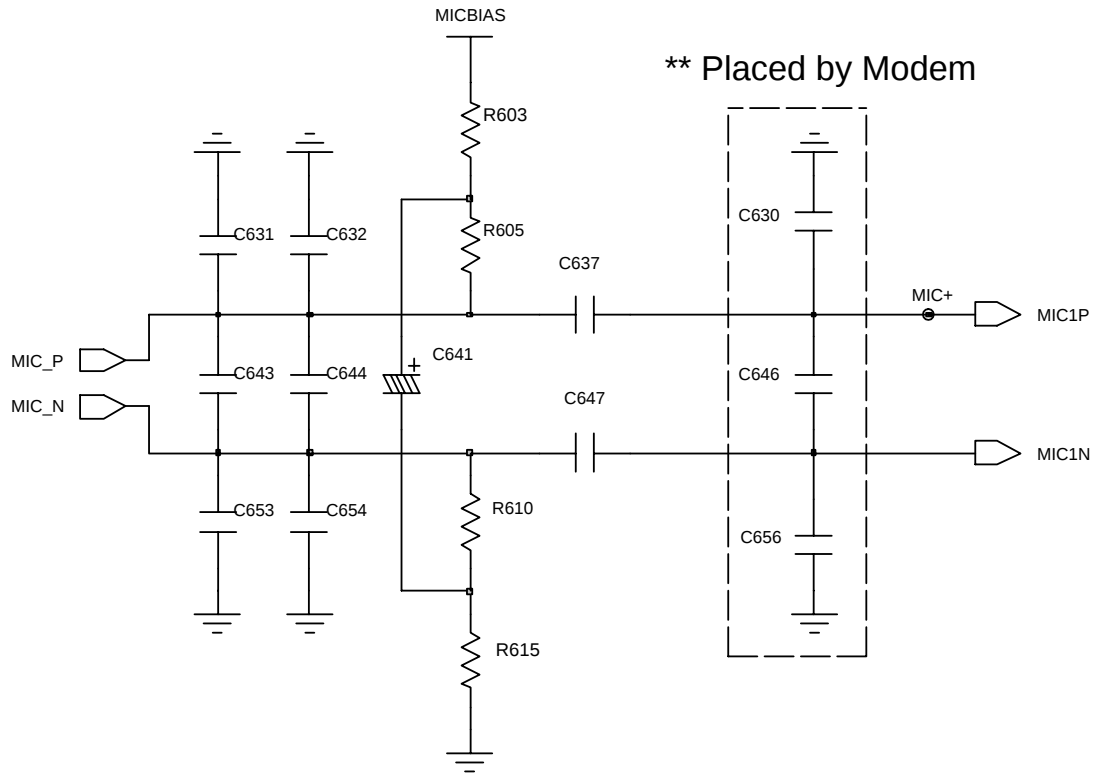


## 7-5. Microphone Part

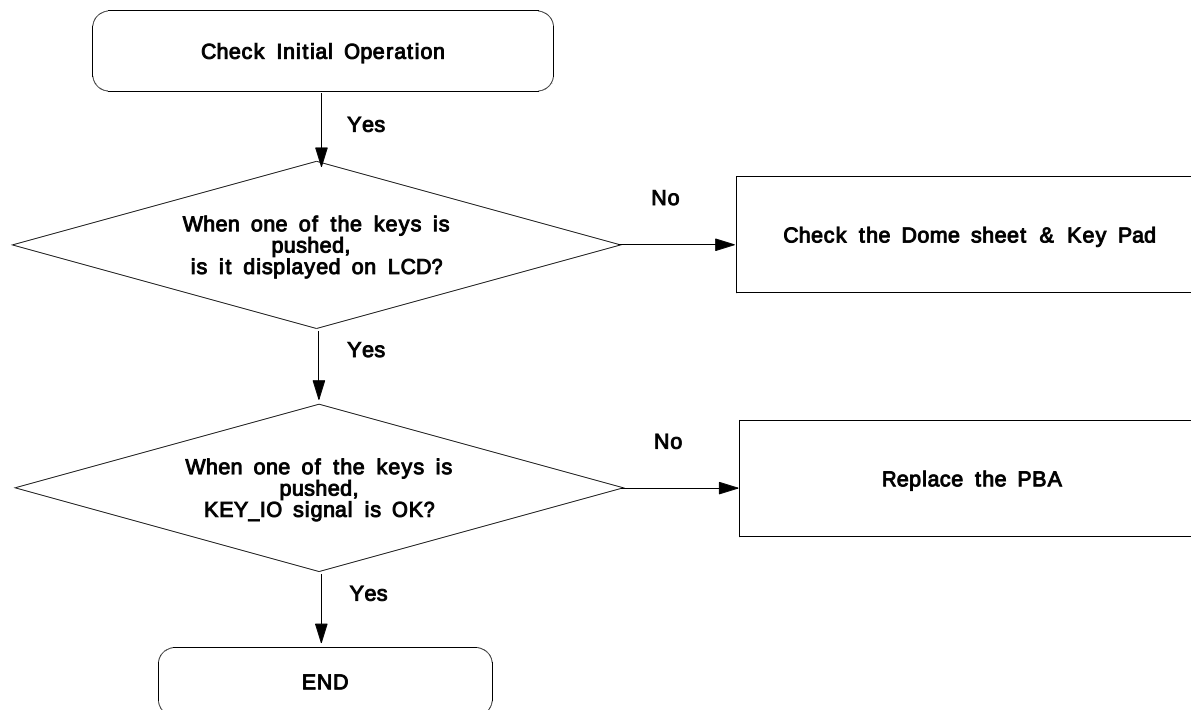


## Microphone

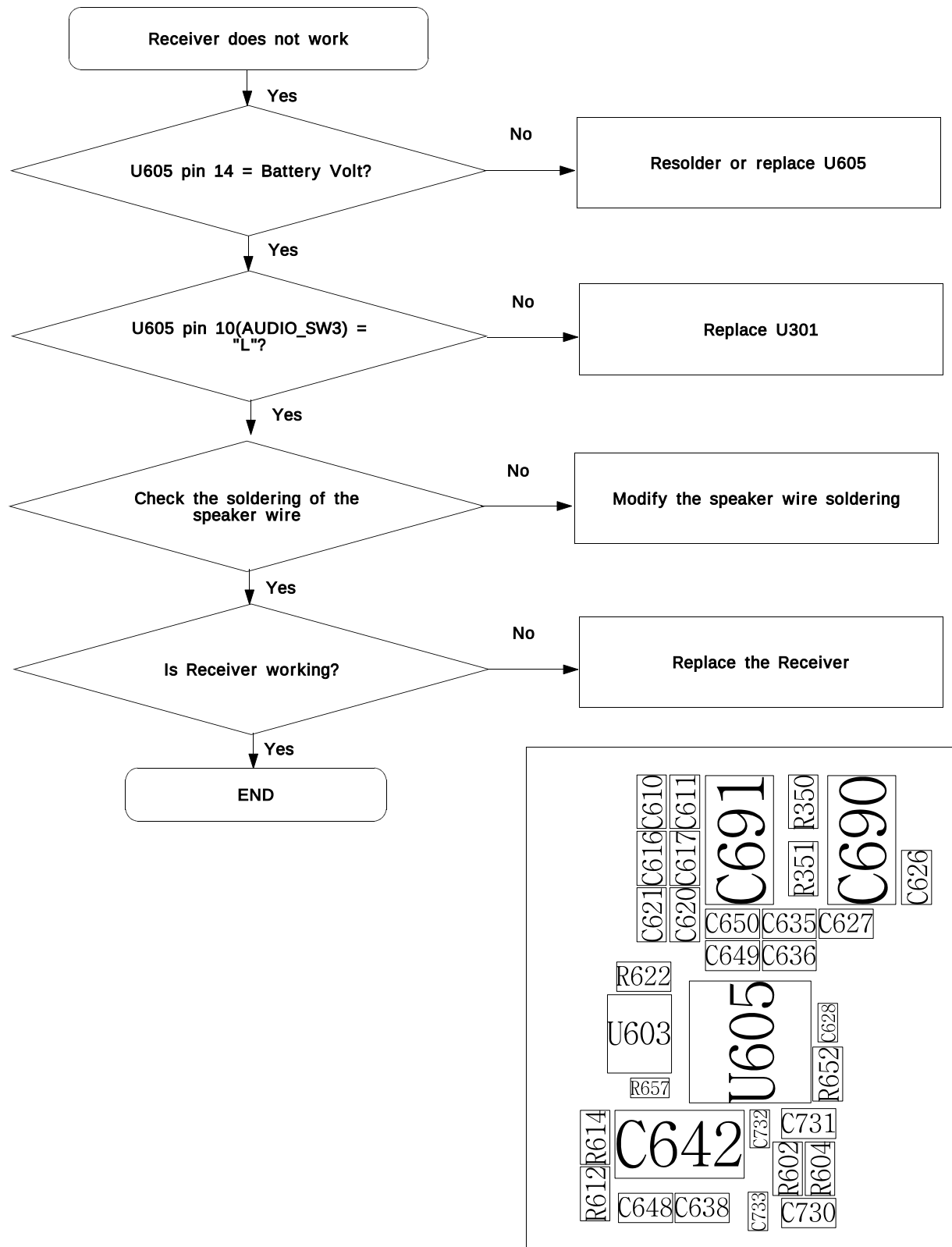
## &lt; Phone Mic Path &gt;



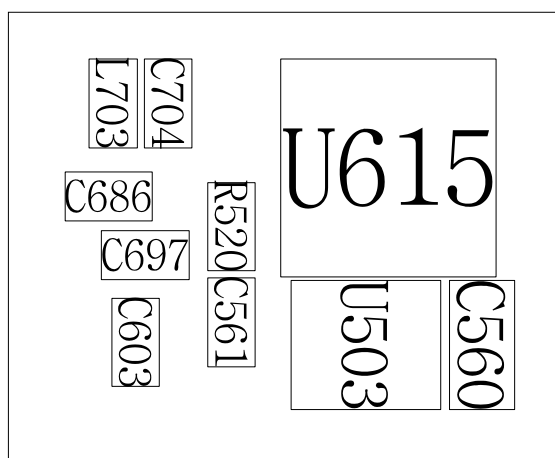
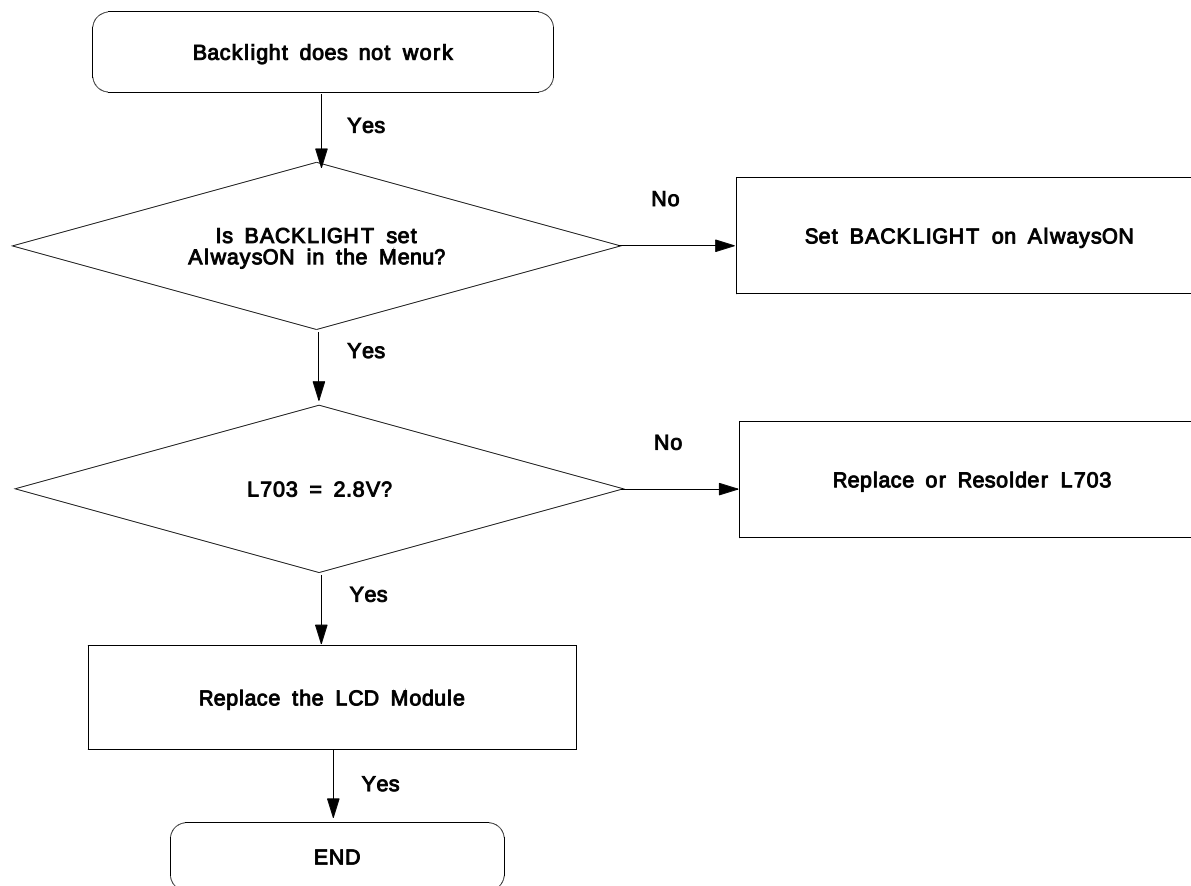
## 7-6. Key Data Input



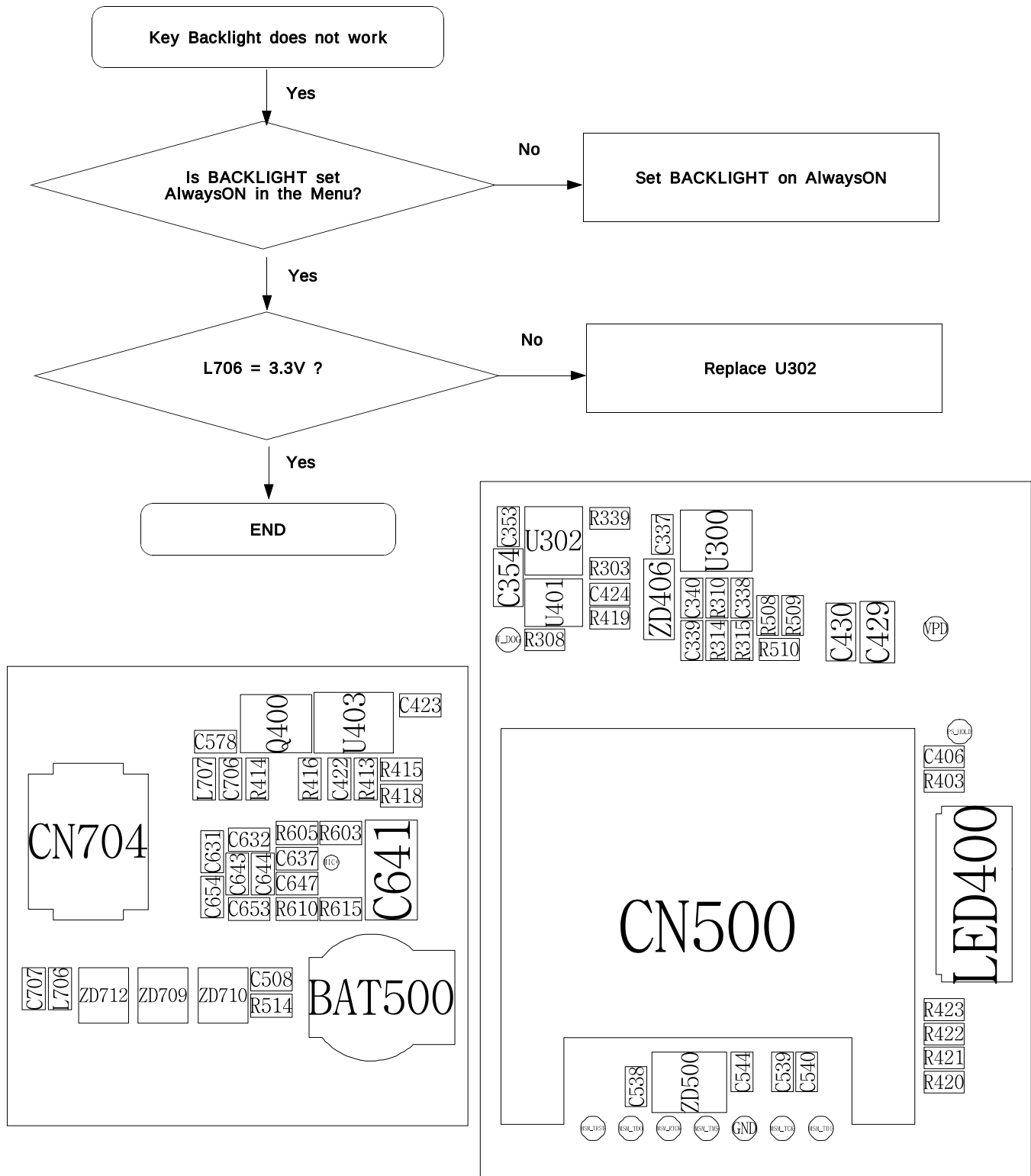
## 7-7. Receiver Part



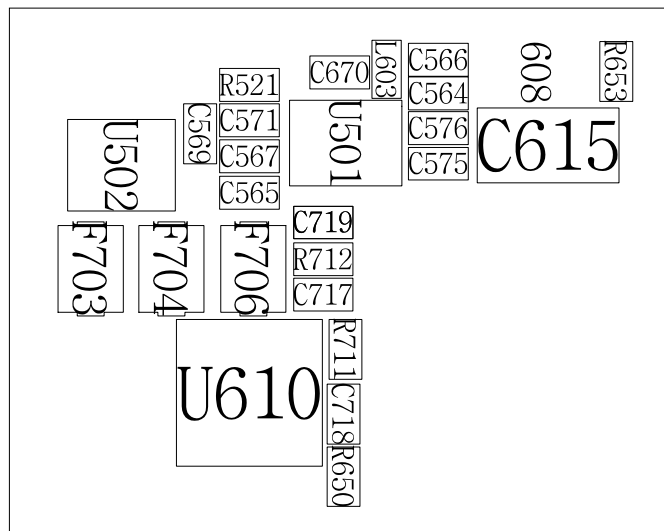
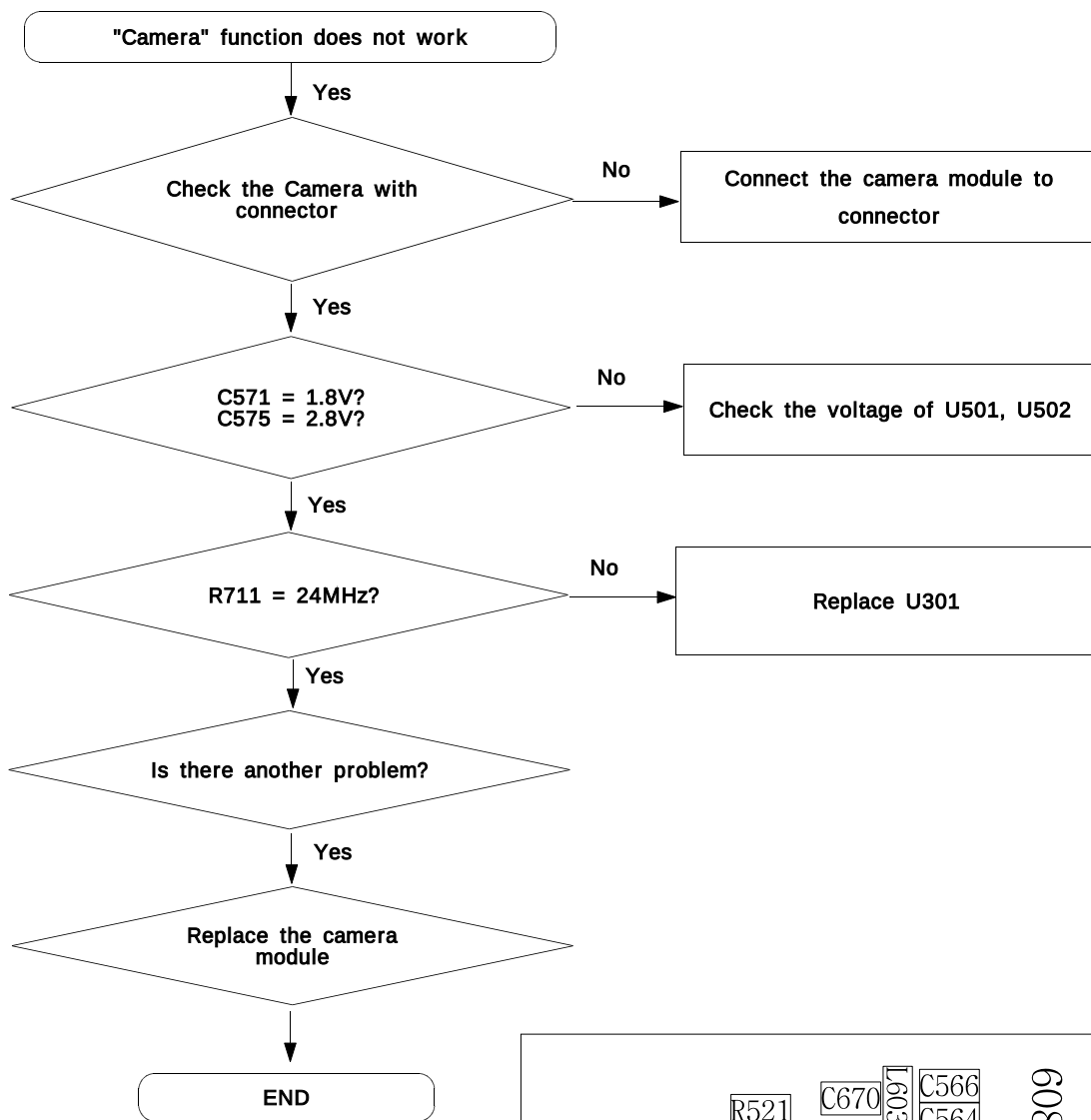
## 7-8. Back Light (for Color Main LCD)



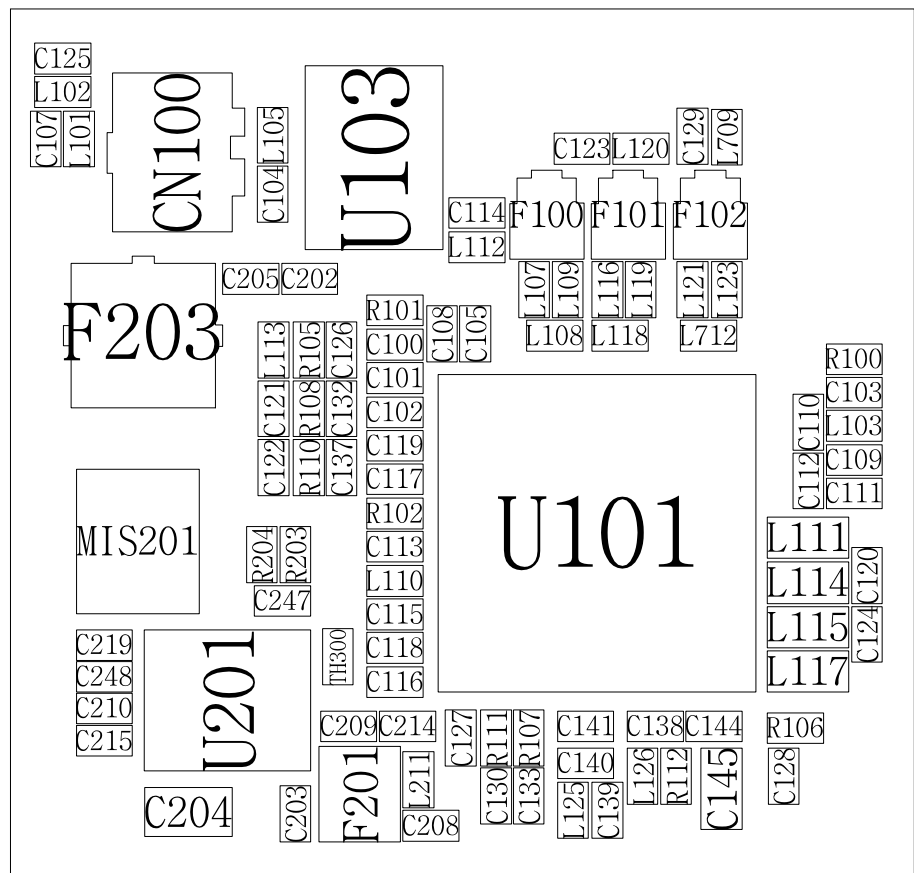
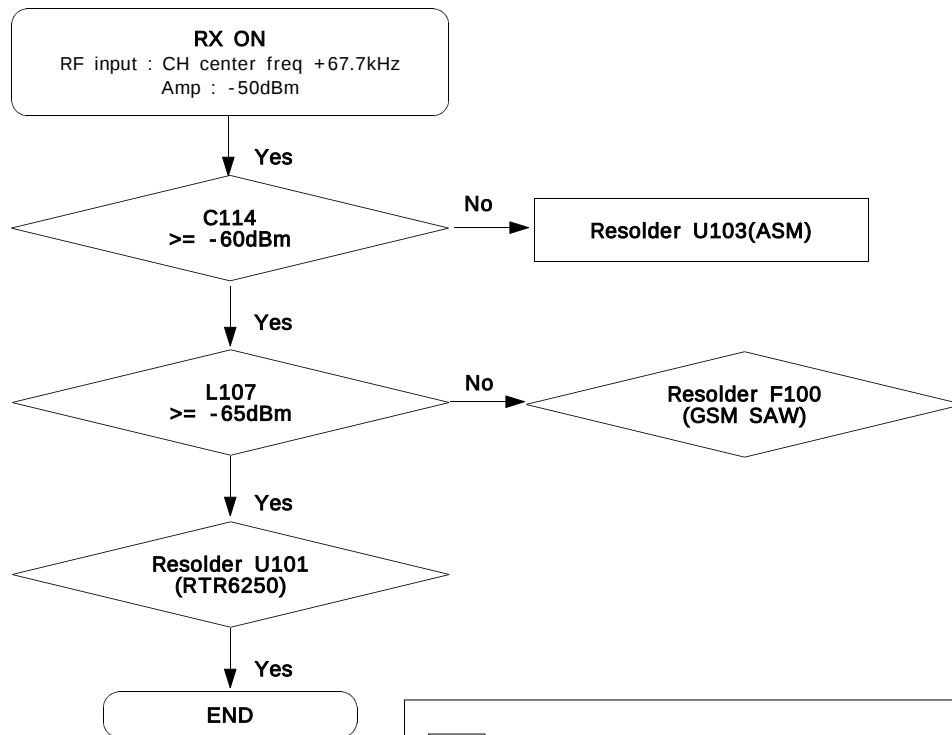
## 7-9. Key Back Light



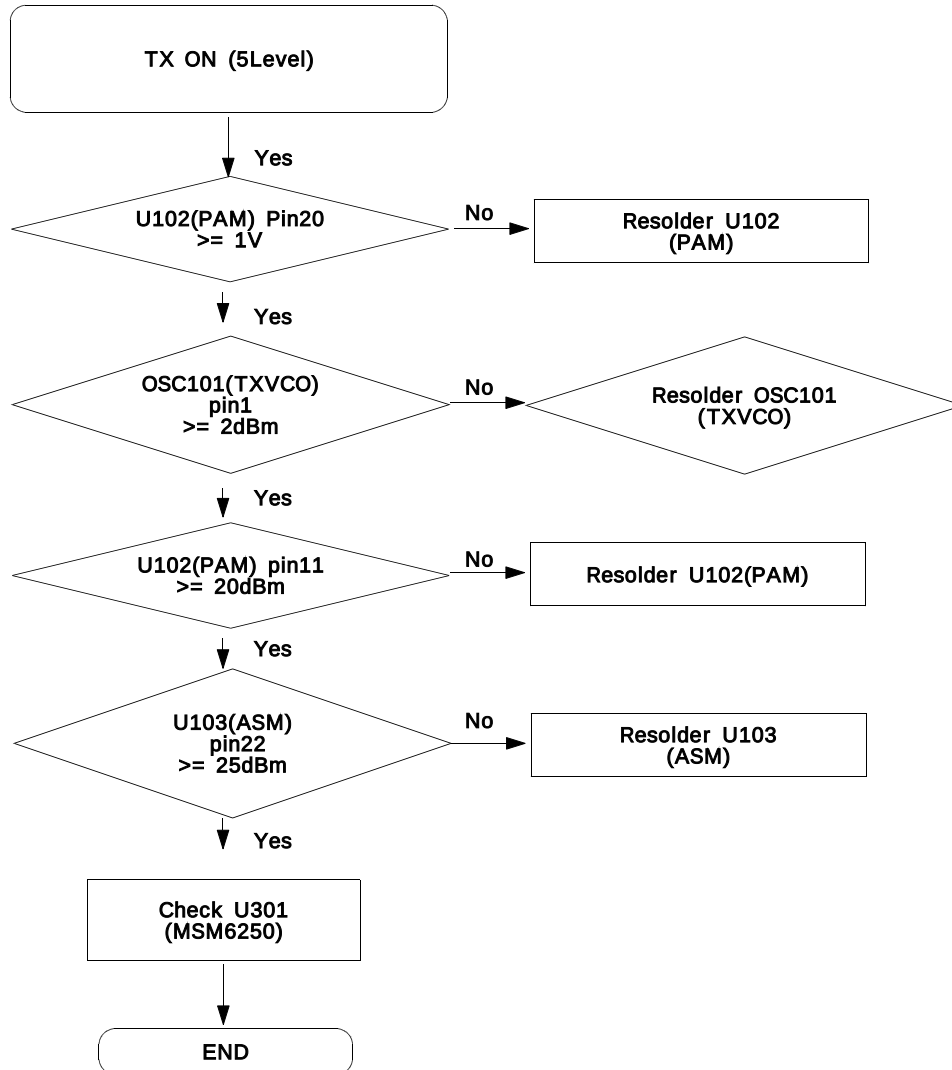
## 7-10. Camera part

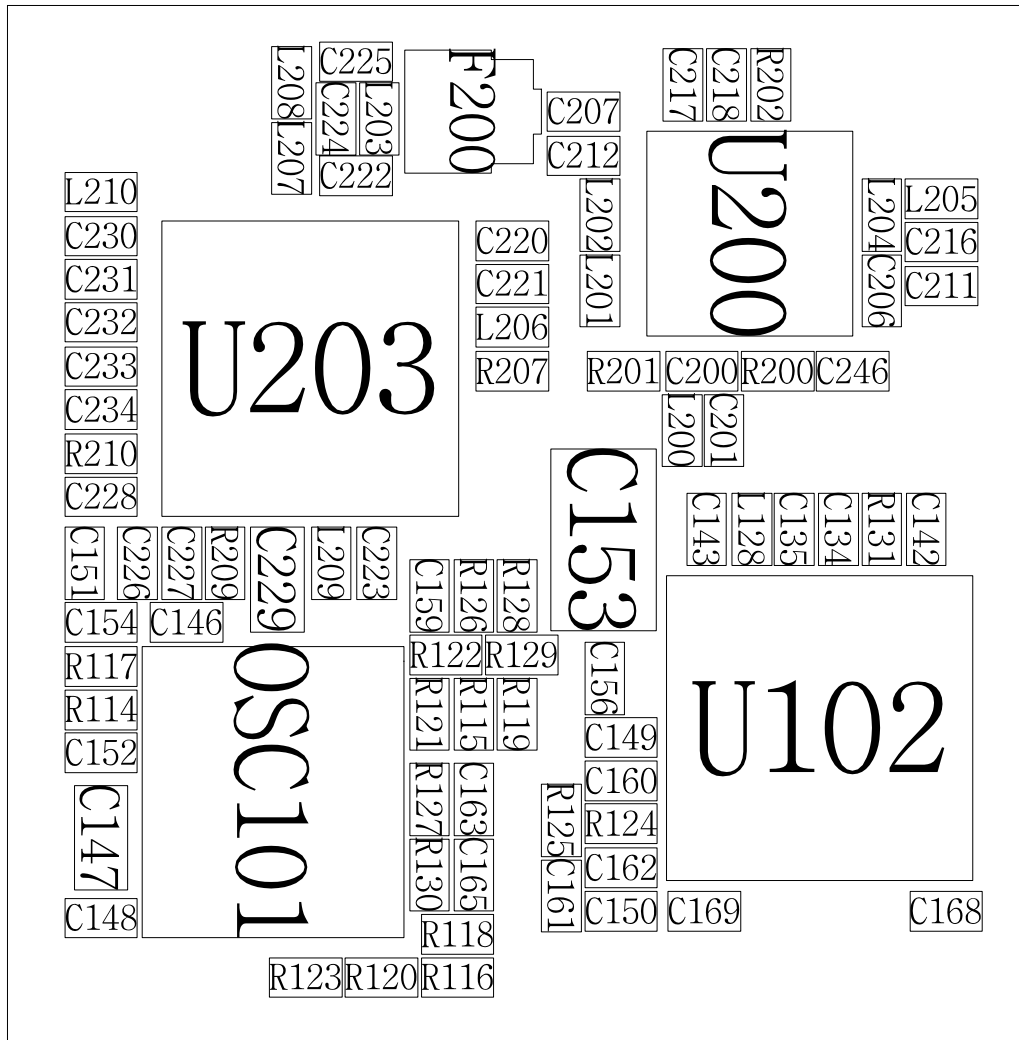


## 7-11. GSM Receiver

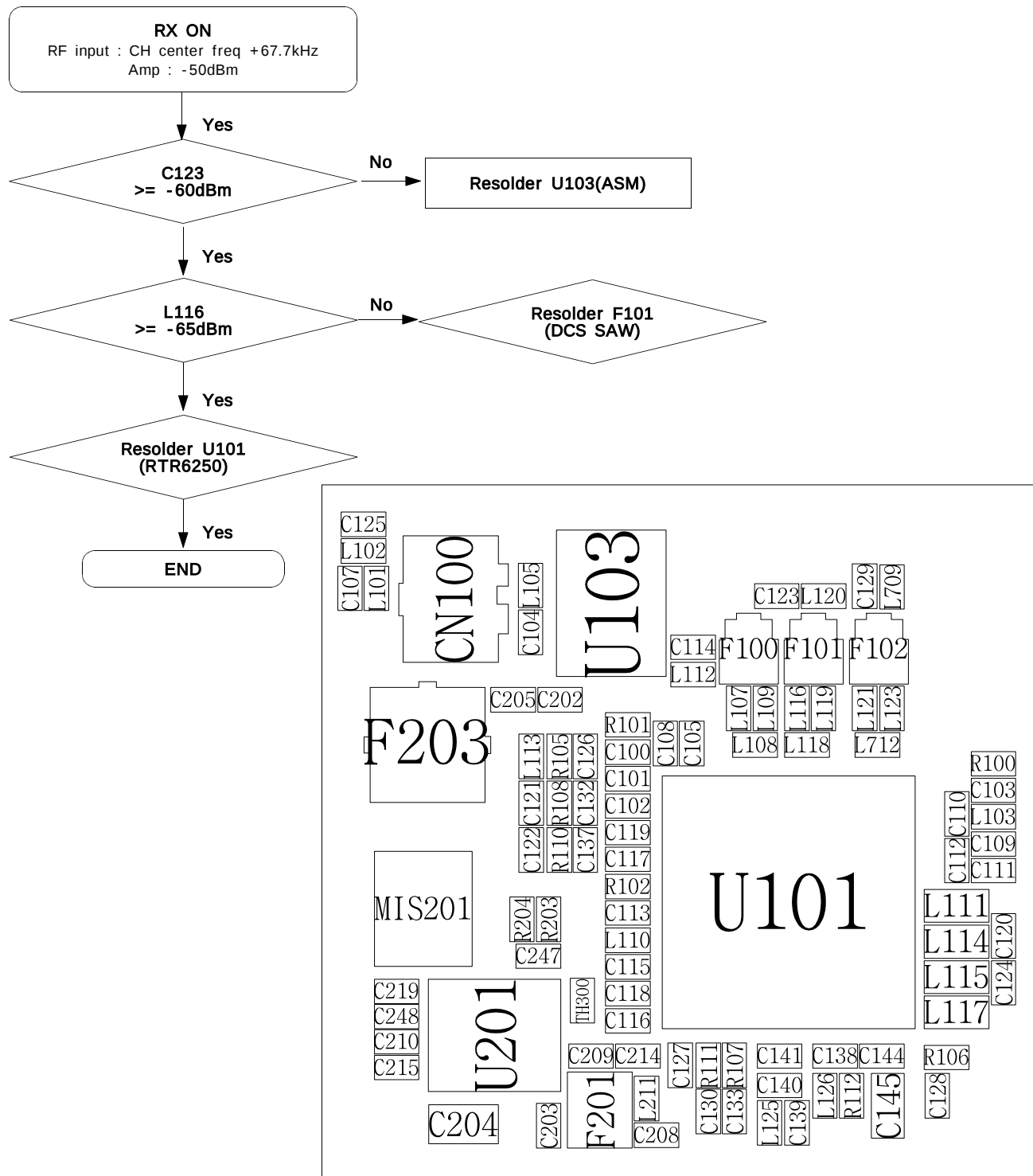


## 7-12. GSM Transmitter

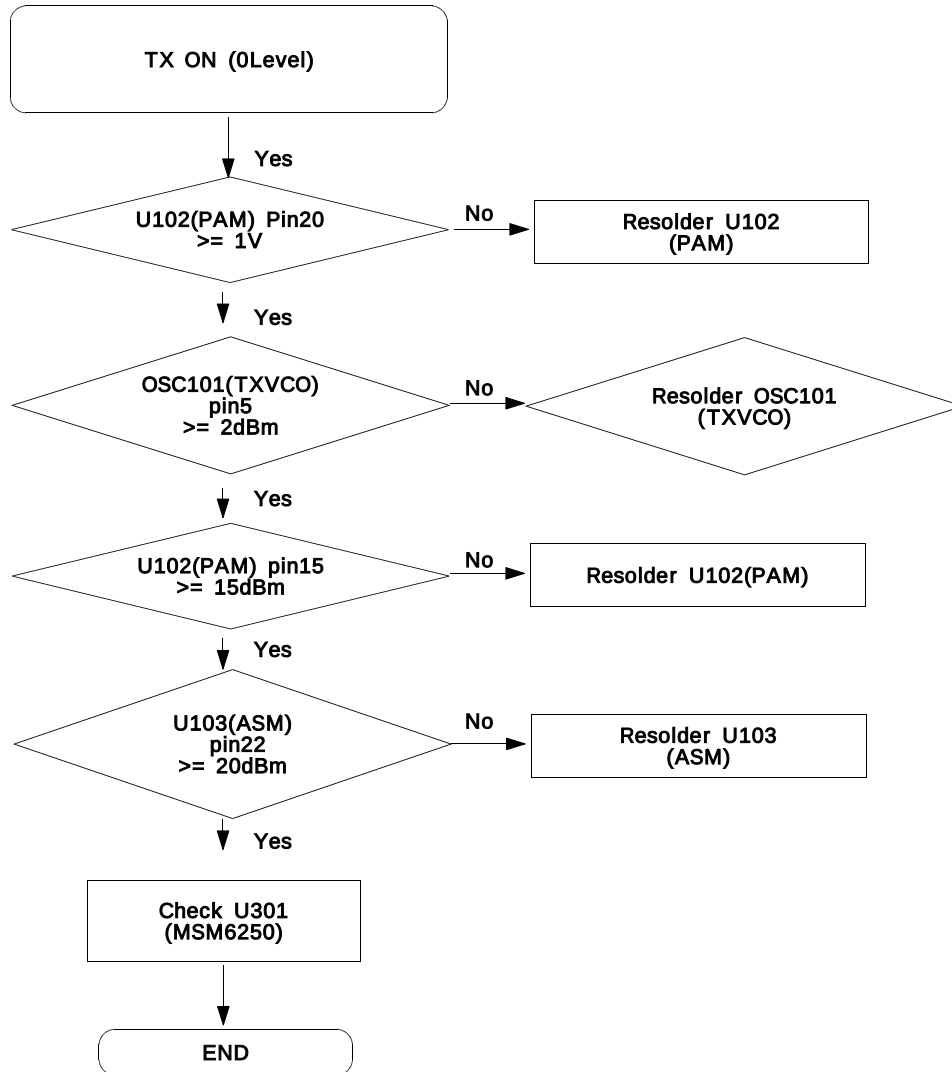


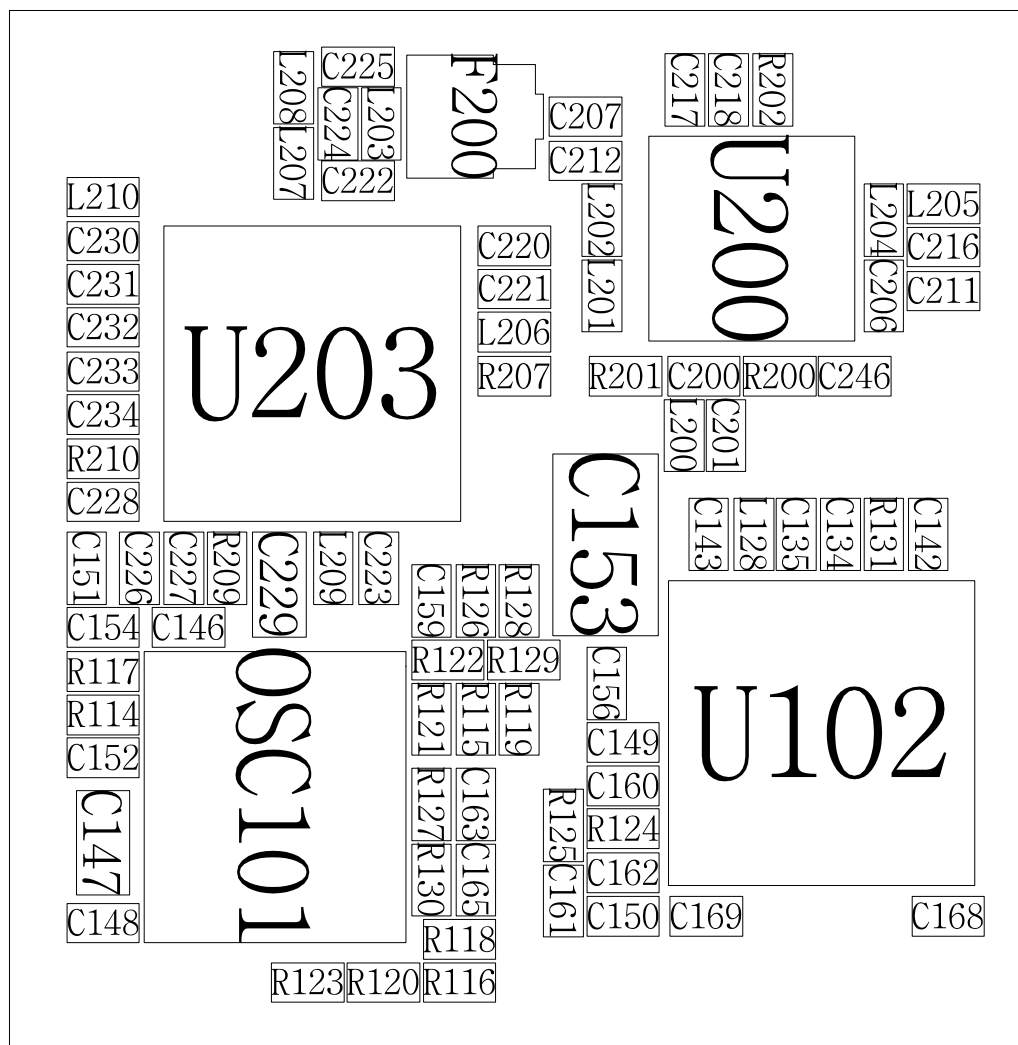


### 7-13. DCS Receiver

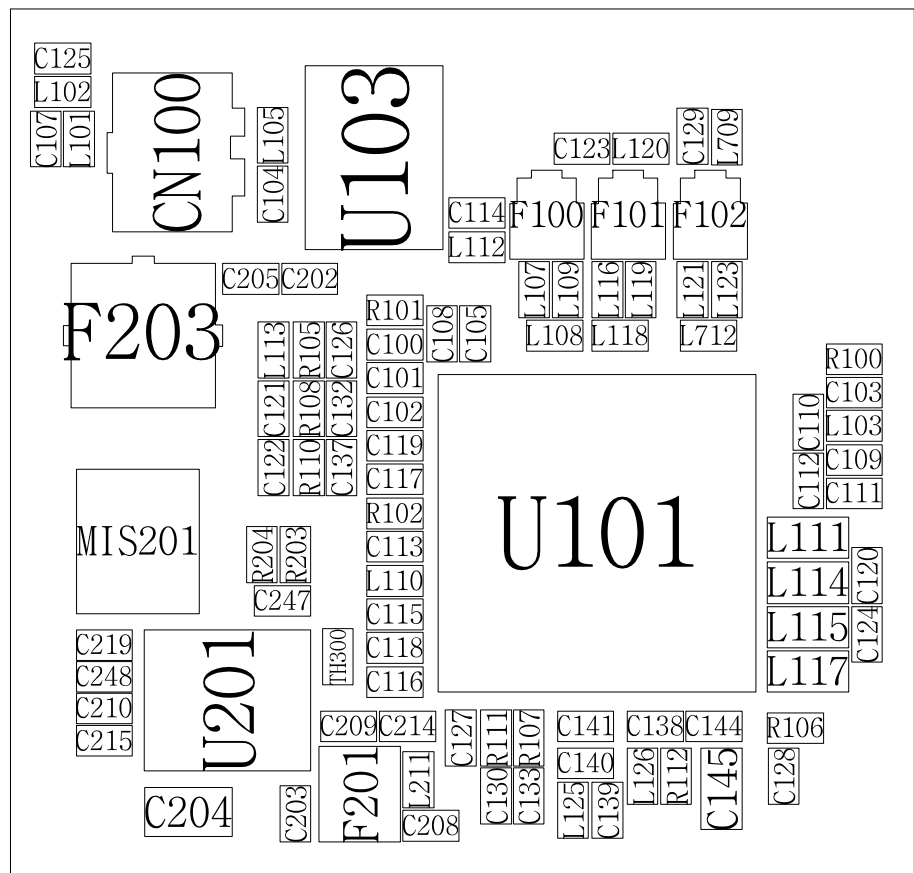
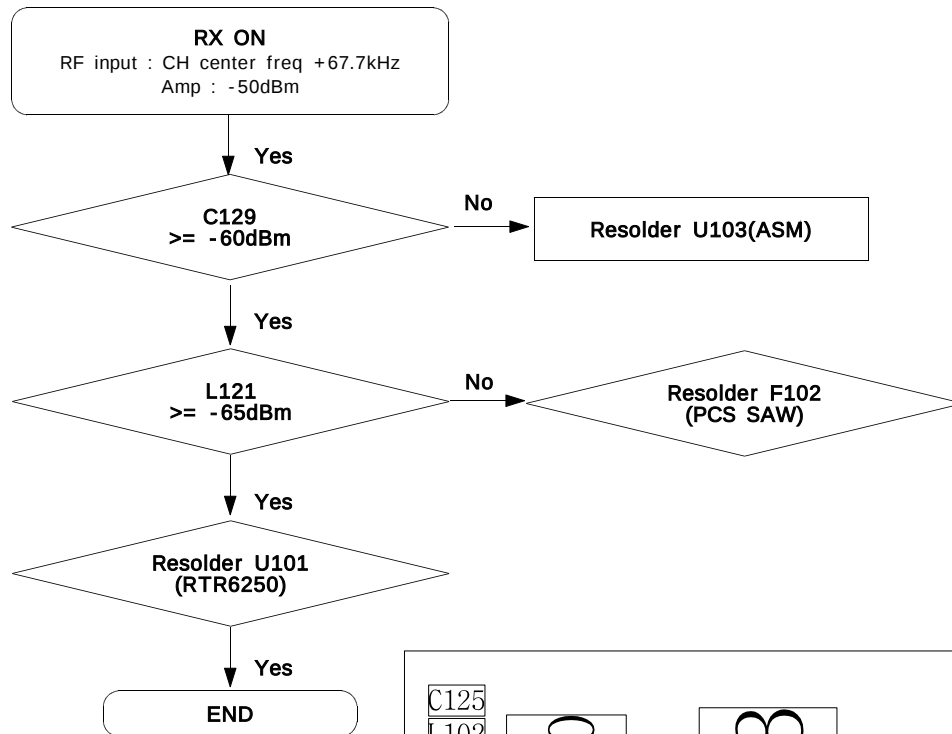


## 7-14. DCS Transmitter

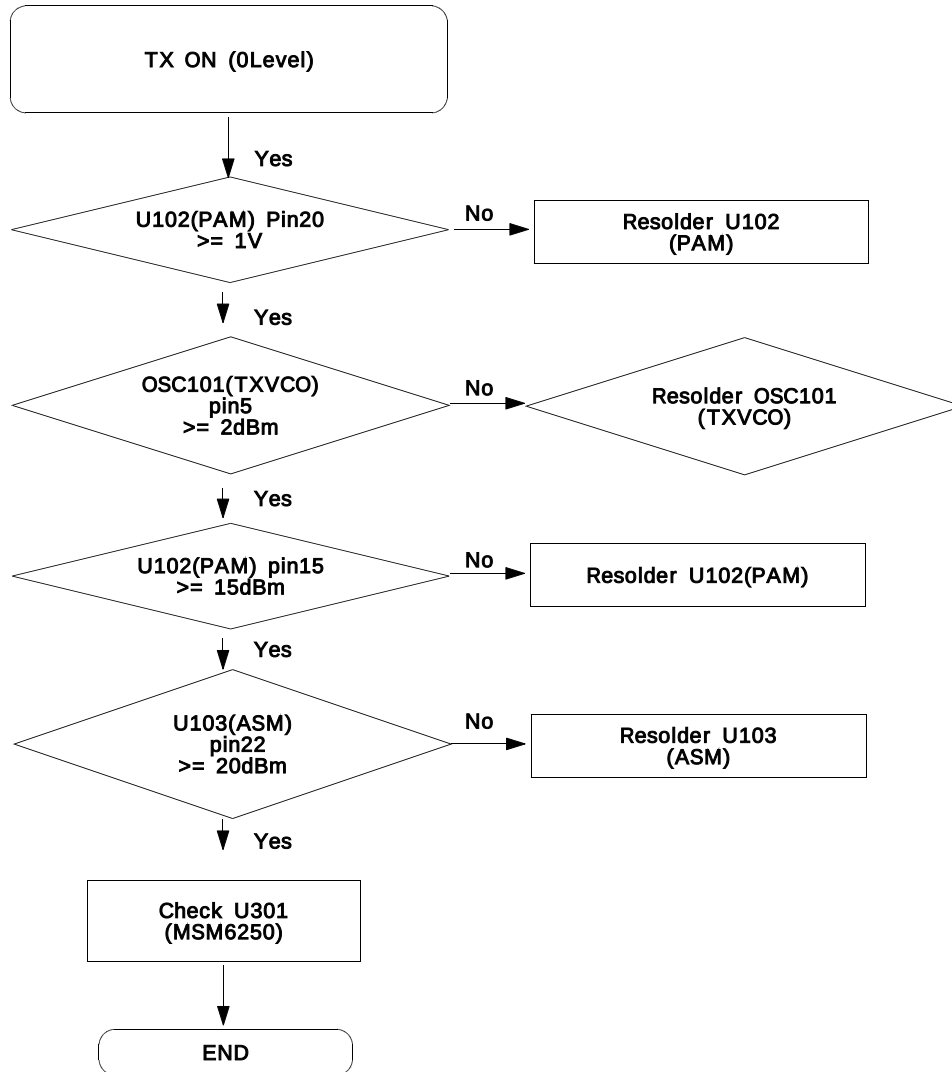


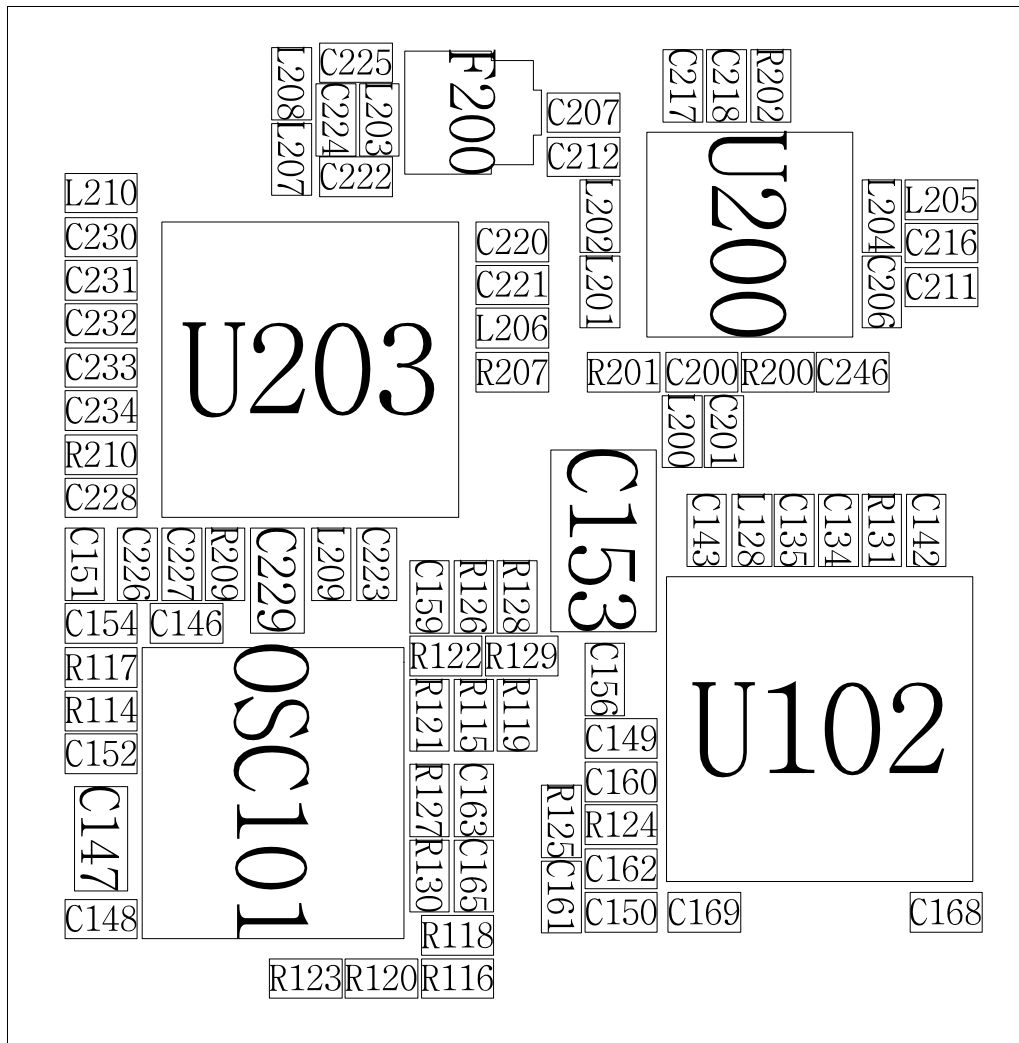


## 7-15. PCS Receiver

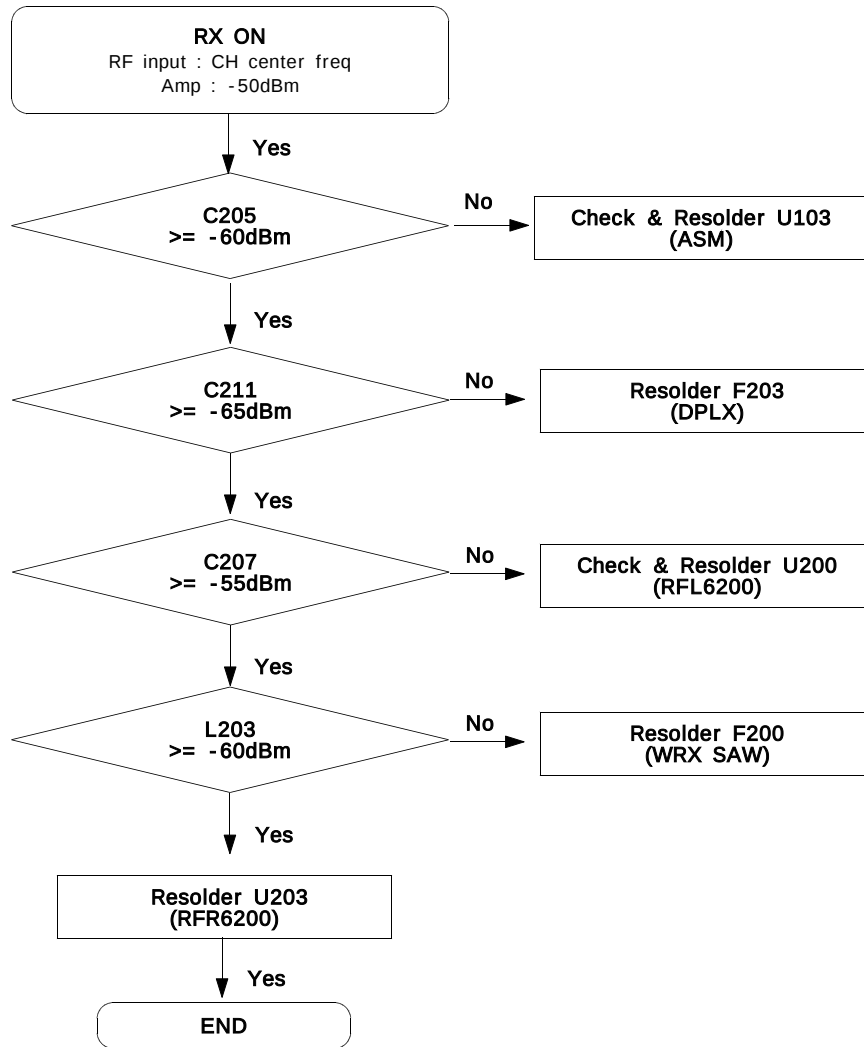


## 7-16. PCS Transmitter





## 7-17. WCDMA Receiver





## 7-18. WCDMA Transmitter

