GSM TELEPHONE
SGH-T509

SERVICE Manual

GSM TELEPHONE

CONTENTS

SAMSUNG ELECTRONICS

Code No.: GH68-09816A
BASIC.

1. Specification

1-1. GSM General Specification

	GSM850 Phase 2	DCS1800 Phase 1	PCS1900
Freq. Band[MHz] Uplink/Downlink	824~849 869~894	1710~1785 1805~1880	1850~1910 1930~1990
ARFCN range	128~251	512~885	512~810
Tx/Rx spacing	45MHz	95MHz	80MHz
Mod. Bit rate / Bit Period	270.833kbps 3.692us	270.833kbps 3.692us	270.833kbps 3.692us
Time Slot Period / Frame Period	576.9us 4.615ms	576.9us 4.615ms	576.9us 4.615ms
Modulation	0.3GMSK	0.3GMSK	0.3GMSK
MS Power	33dBm~5dBm	30dBm~0dBm	30dBm~0dBm
Power Class	5pcl ~ 19pcl	0pcl ~ 15pcl	0pcl ~ 15pcl
Sensitivity	-102dBm	-100dBm	-100dBm
TDMA Mux	8	8	8
Cell Radius	35Km	2Km	-

1-2. GSM TX power class

TX Power control level	GSM850
5	33±3 dBm
6	31±3 dBm
7	29±3 dBm
8	27±3 dBm
9	25±3 dBm
10	23±3 dBm
11	21±3 dBm
12	19±3 dBm
13	17±3 dBm
14	15±3 dBm
15	13±3 dBm
16	11±5 dBm
17	9±5 dBm
18	7±5 dBm
19	5±5 dBm

TX Power control level	DCS1800
0	30±3 dBm
1	28±3 dBm
2	26±3 dBm
3	24±3 dBm
4	22±3 dBm
5	20±3 dBm
6	18±3 dBm
7	16±3 dBm
8	14±3 dBm
9	12±4 dBm
10	10±4 dBm
11	8±4dBm
12	6±4 dBm
13	4±4 dBm
14	2±5 dBm
15	0±5 dBm

TX Power control level	PCS1900
0	30±3 dBm
1	28±3 dBm
2	26±3 dBm
3	24±3 dBm
4	22±3 dBm
5	20±3 dBm
6	18±3 dBm
7	16±3 dBm
8	14±3 dBm
9	12±4 dBm
10	10±4 dBm
11	8±4dBm
12	6±4 dBm
13	4±4 dBm
14	2±5 dBm
15	0±5 dBm

2. Circuit Description

2-1. SGH-T509 RF Circuit Description

2-1-1. RX PART

- **FRONT END MODULE**(ANTENNA SWITCH MODULE + RX SAW FILTER) (F102)
  → Switching Tx, Rx path for GSM850, DCS1800 and PCS1900 by logic controlling.

- **FRONT END MODULE Control Logic** (F102) → Truth Table

	VC1	VC2
Tx Mode (GSM850)	H	L
Tx Mode (DCS1800/1900)	L	H
Rx Mode (GSM850)	L	L
Rx Mode (DCS1800)	L	L
Rx Mode (PCS1900)	L	L

- **VC-TCXO (TCX100)**

  This module generates the 26MHz reference clock to drive the logic and RF.
  It is turned on when the supply voltage REFVCC is applied.
  After buffering a reference clock of 26MHz is supplied to the other parts of the system through the transceiver pin OUT.

- **TRANSCEIVER (U102)**

  This chip is fully integrated GSM GPRS tri-band transceiver with VCO, loop filters and most of the passive component in it.
  And also fully integrated fractional N RF synthesizer with AFC control possibility, RF VCO with integrated supply regulator. Semi integrated reference oscillator with integrated supply regulator.
  RF Receiver front-end amplifies the GSM850, DCS1800 and PCS1900 aerial signal, convert the chosen channel down to a low IF of 100kHz.
  In IF section, further amplifies the wanted channel output level to the desired value and rejects DC.

2-1-2. TX PART

The transmitter is fully differential using a direct up conversion architecture. It consists of a signal side band power up mixer. Gain is controlled by 6 dB via 3-wire serial bus programing. The fully integrated VCO and power mixer achieve LO suppression, quadrature phase error, quadrature amplitude balance and low noise floor specification. Output matching/balun components drive a standard 50 ohms single ended load.

2-2. Baseband Circuit description of SGH-T509

2-2-1. PCF50603 (U400)

- **Power Management**

  Eight low-dropout regulators designed specifically for GSM applications power the terminal and help ensure optimal system performance and long battery life. A programmable boost converter provides support for 1.8V, 3.0V SIMs, while a self-resetting, electronically fused switch supplies power to external accessories. Ancillary support functions, such as RTC module and High Voltage Charge pump, Clock generator, aid in reducing both board area and system complexity.

  I2C BUS serial interface provides access to control and configuration registers. This interface gives a microprocessor full control of the PCF50603 and enables system designers to maximize both standby and talk times.

  Supervisory functions. including a reset generator, an input voltage monitor, and a temperature sensor, 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).

- **Backlight Brightness Modulator**

  The Backlight Brightness Modulator (BBM) contains a programmable Pulse-width modulator (PWM) and FET to modulate the intensity of a series of LED's or to control a DC/DC converter that drives LCD backlight.

  This phone (SGH-E350E) use PWM control to contrast the backlight brightness.

- **Clock Generator**

  The Clock Generator (CG) generates all clocks for internal and external usage. The 32.768 kHz crystal oscillator provides an accurate low clock frequency for the PCF50603 and other circuitry.

2-2-2. LCD Connector

LCD is consisted of main LCD(color 6.5K TFT LCD).

Chip select signals in the U303, LCD_MAIN_CS, can enable LCD. BACKLIGHT signal enables white LED of main LCD. These signal is from U400.

16-bit data lines(LD(0)~LD(15)) transfers data and commands to LCD. Data and commands use "RS" signal. If this signal is high, Inputs to LCD are commands. If it is low, Inputs to LCD are data. The signal which informs the input or output state to LCD, is required. But this system is not necessary this signal. So "L_WR" signal is used to write data or commands to LCD. Power signals for LCD are "VDD_IO_HIGH".

2-2-3. Key

This is consisted of key interface pins KEY_ROW(0:4) and KEY_COL(0:4) in PCF5213EL1. These signals compose the matrix. Result of matrix informs the key status to key interface in the PCF5213EL1. Power on/off key is seperated from the matrix. So power on/off signal is connected with PCF50603 to enable PCF50603. Key LED is consisted of sixteen blue LEDs.

key LED use the 3.3V LDO(U601) for a supply voltage. KEY_LED_ON signal enables eight white LED.

2-2-4. EMI ESD Filter(U501,U505)

This system uses the EMI ESD filter, U501,U505 to protect noise from IF CONNECTOR part.

2-2-5. IF connetor(IFC500)

It is 20-pin connector. They are designed to use VBAT, V_EXT_CHARGE, USB_D+, +VBUS, USB_D-, TXD1, RXD1, AUX_ON, and GND. They connected to power supply IC, microprocessor and signal processor IC.

2-2-6. Battery Charge Management IC(U503)

A complete constant-current/constant-voltage linear charger for single cell lithium-ion batteries is used.

If TA connected to phone, "V_EXT_CHARGE" enable charger IC and supply current to battery.

When fault condition caused, "CHG_ON" signal level change low to high and charger IC stop charging process.

2-2-7. Audio

HFR_P and HFR_N from PCF5213EL1 are connected to the main speaker. MIC_P and MIC_N are connected to the main MIC via analog switch. EAR1 is the source of External Speaker. YMU762 is a synthesizer LSI for mobile phones. This LSI has a built-in speaker amplifier 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.

It provides simultaneous generation of up to 40 tones by stereophonic hybrid synthesizer.

YMU762 has built a speaker amplifier of which maximum out is 580 mW at SPVDD=3.6V in this device.

There is Stereophonic analog output for Headphone.

2-2-8. Memory(UME300)

This system uses Samsung's memory, KAP17YG00M-DUUU. The KAP17YG00M-DUUU is a Multi Chip Package Memory which combines 256Mbit Synchronous Burst Multi Bank NOR Flash Memory and 128Mbit OneNAND Flash and 128Mbit Synchronous Burst UtRAM.

It has 16 bit data line, HD[1~16] which is connected to PCF5213EL1 and MV3017SAQ, also has 24 bit address lines, HA[1~24]. There are 3 chip select signals, CS0n_FLASH, CS4n_NAND, and CS1n_RAM.

In the Wrting process, WEn is fallen to low and it enables writing process to operate. During reading process, OEn is fallen to low and it enables reading process to operate. Each chip select signals in the PCF5213EL1 choose different memories.

2-2-9. PCF5213EL1(UCP200)

The PCF5213EL1 is mainly composed of embeded DSP and ARM core. The DSP subsystem includes the Saturn DSP core with embedded RAM and ROM, and a set of peripherals. It has 24kx16 bits PRAM, 104k*16 bits, 32k*16 XYRAM and 63k*16 XYROM in the DSP.

The ARM946E-S consists of an ARM9E-S processor core, 8 kbyte instruction cache and 8 kbyte data cache, tghtly-coupled ITCM(Instruction Tightly Coupled Memory) and DTCM(Data Tightly Coupled Memory) memories, a memory protection unit, and an AMBA(Advanced Microcontroller Bus Architecture) AHB(Advanced High-performance Bus) bus interface with a write buffer.

HD(0:15), data lines and HA(0:23), address lines are connected to KAP17YG00M-DUUU (memory), MV3017SAQ (image dsp) and YMU762 (melody IC). It has 64 kbyte SC RAM (0.5 Mbit) and 32 kbyte SC program ROM for bootstrap loader in the ARM core.

HD(0:15), data lines and HA(0:23), address lines are connected to memory and YMU762 to communicate.

MV3017SAQ (Camera DSP Chip) controls the communication between ARM core and DSP core.

OEn, WEn control the access of memory. KROW, and KCOL recognize the key string input status.

It has J-TAG control pins (TDI/TDO/TCK) for ARM and DSP core. J-SEL signal controls different access to ARM and DSP core.

ADC(Analog to Digital Convertor) receives the condition of temperature, battery type and battery voltage.

2-2-10. VC-TCXO-214C6(26MHz)(TCX100)

This system uses the 26MHz TCXO, VC-TCXO-214C6, Kinseki. AFC control signal form PCF5213EL1 controls frequency from 26MHz x-tal. It generates the clock frequency. This clock is connected to PCF5213EL1, YMU762 and UAA3587EHN.

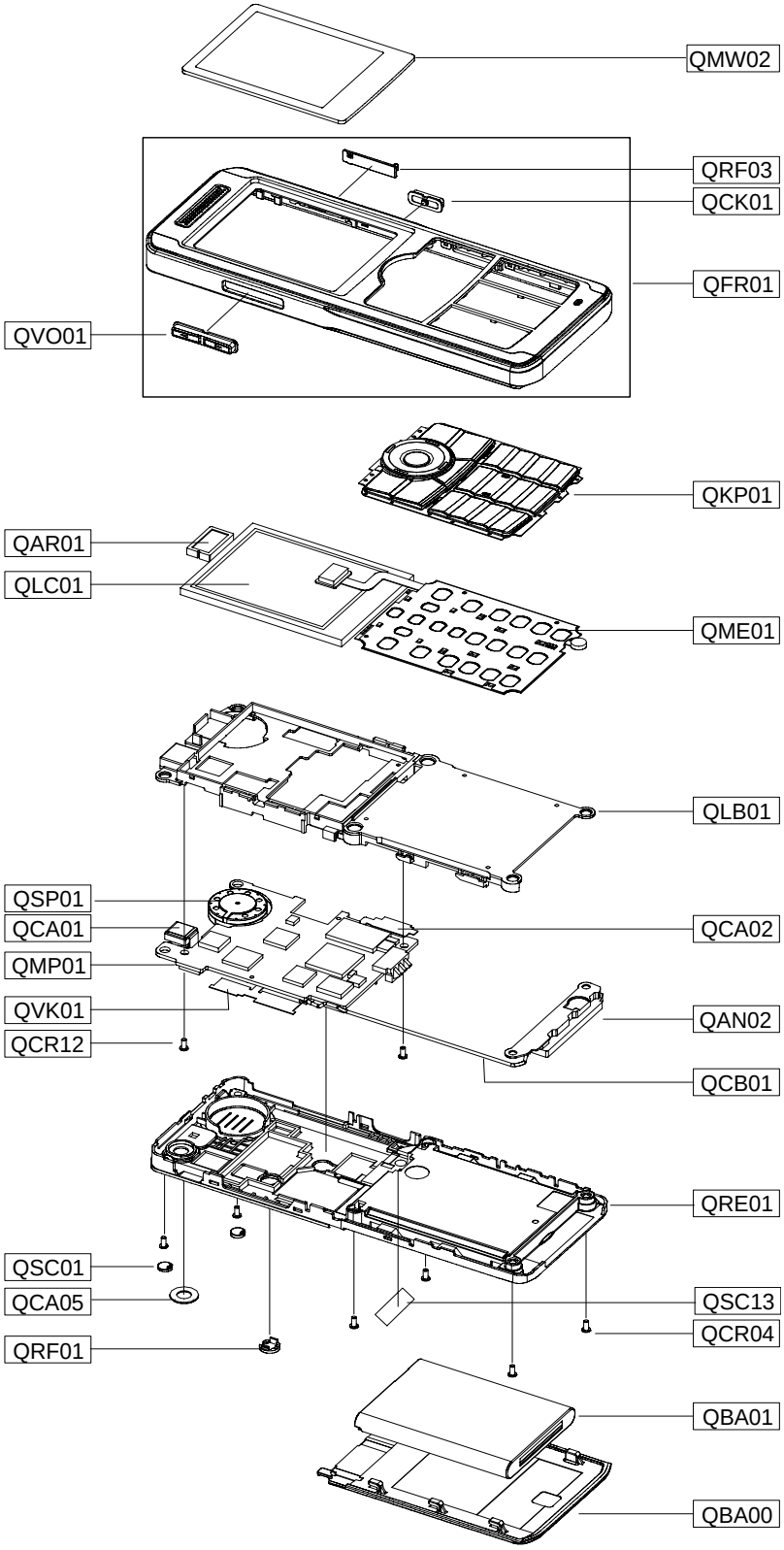
2-2-11. Camera DSP(MV3017SAQ)(U303)

MV3017SAQ provides rich video functions up to 30-frame display with minimized tasks in the handset main processor as well as hardware based real-time JPEG compression and decompression. MV3017SAQ directly transmits and previews the RGB data to the LCD graphic memory by processing the sensor output data according to the handset's command. It can save the raw RGB data up to VGA resoultion into its image buffer and allows the host processor to download with scalable sized compressed data.

It utilizes 16 bit data bus for communication with the main processor, including bus interface types.

3. Exploded View and Parts List

3-1. Exploded View



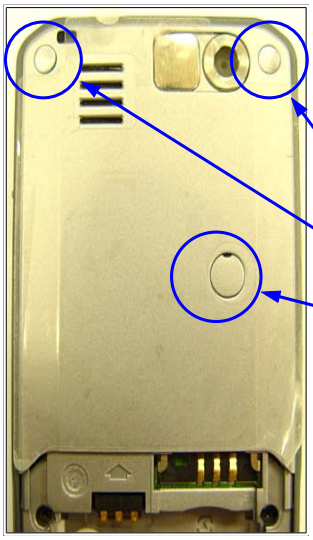
3-2. Parts List

QAN02		INTENNA-SGHT509	GH42-00755A
QAR01		AUDIO-RECEIVER	3009-001167
QBA00		ASSY MEC-CASE BATT	GH75-09394B
QBA01		INNER BATTERY PACK-800MAH,BLAC	GH43-02321A
QCA01		UNIT-CAMERA	GH59-02861A
QCA02		UNIT-CAMERA KEY	GH59-02805A
QCA05		ASSY MEC-DECO CAMERA	GH75-09342A
QCB01		CBF COAXIAL CABLE	GH39-00518A
QCR04		SCREW-MACHINE	6001-001479
QCR12		SCREW-MACHINE	6001-001530
QKP01		ASSY MEC-KEYPAD(TMB/DVA)	GH75-09340B
QLB01		ASSY MEC-BRACKET LCD	GH75-09341A
QLC01		LCD-LCD MODULE	GH07-00800A
QME01		UNIT-KEY PAD	GH59-02862A
QMP01		PBA MAIN-SGHT509	GH92-02599A
QMW02		PCT-COVER MAIN WINDOW	GH72-29522A
QRE01		ASSY MEC-CASE REAR	GH75-09339B
QRF01		ASSY COVER-RF	GH98-01104B
QSC01		RMO-COVER SCREW	GH73-06393F
QSC13		MPR-TAPE REAR SHEET	GH74-21416B
QSP01		UNIT-MULTI MODE SPEAKER	GH59-02891A
QVK01		UNIT-VOLUME KEY	GH59-02806A
QFR01		ASSY MEC-CASE FRONT	GH75-09338B
	QCK01	ASSY MEC-CAMERA KEY	GH75-09150A
	QRF03	PMO-COVER EAR JACK	GH72-27739F
	QVO01	ASSY MEC-VOLUME KEY	GH75-09149A

MPR-VINYL BOHO MAIN WIN	GH74-23190A
MPR-VINYL BOHO DC JACK	GH74-26513A
RMO-CUSHION MSM	GH73-06586A
RMO-CUSHION MEMORY	GH73-06587A
MPR-TAPE INSULATOR FPCB	GH74-21414A
MPR-TAPE LCD CONECTOR	GH74-21522A
MPR-TAPE J TAG	GH74-22262A
MPR-TAPE TP	GH74-22264A
MPR-TAPE V BAT	GH74-22265A
MPR-TAPE CAMERA FPCB	GH74-22266A
MPR-TAPE MIC	GH74-22267A
MPR-TAPE SPK SHEET	GH74-22278A
MPR-VINYL BOHO CAMERA	GH74-22188A
RMO-RUBBER MELODY CHIP	GH73-07372A
RMO-RUBBER CAMERA CHIP	GH73-07373A
MPR-TAPE LCD RMS	GH74-24443A
MPR-TAPE MASKING HALL IC	GH74-22078A
MPR-VINYL BOHO KEY PAD	GH74-20858A
MPR-VINYL BOHO F/CASE	GH74-21424A
MPR-VINYL BOHO WIN MAIN	GH74-21426A
MPR-TAPE MAIN WINDOW	GH74-21417A
MPR-VINYL BOHO WIN CAM	GH74-20855A
MPR-VINYL BOHO REAR CASE	GH74-21425A
LABEL(R)-WATER SOAK T_MOBILE	GH68-05914A
MPR-VINYL BOHO REAR CASE	GH74-21425A
BAG PE	6902-000634
CUSHION-CASE UPPER(T809_NEW)	GH69-03561A
BOX(P)-UNIT(DARK VIOLET)	GH69-03594C
CUSHION-CASE LOW(T509)	GH69-03596A
PAA ETC-SGH T509 TMB	GH99-19944A
EARPHONE-MONO HEADSET	GH59-03202A
ADAPTOR-SGHT809 BLK CKD(USA)	GH44-01265A

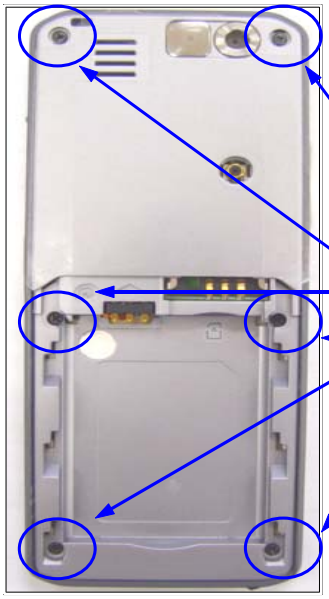
3-3. Disassembling Manual

1 Remove the RF conn. & screw cover



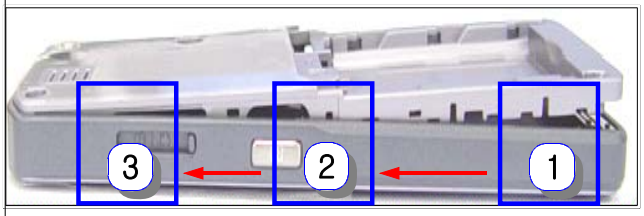
1) Be careful of the damage of cover and scratch.

2 Unscrew 6 screws in rear



1) Be careful of the damage of cover and scratch.

3 Separate the rear cover

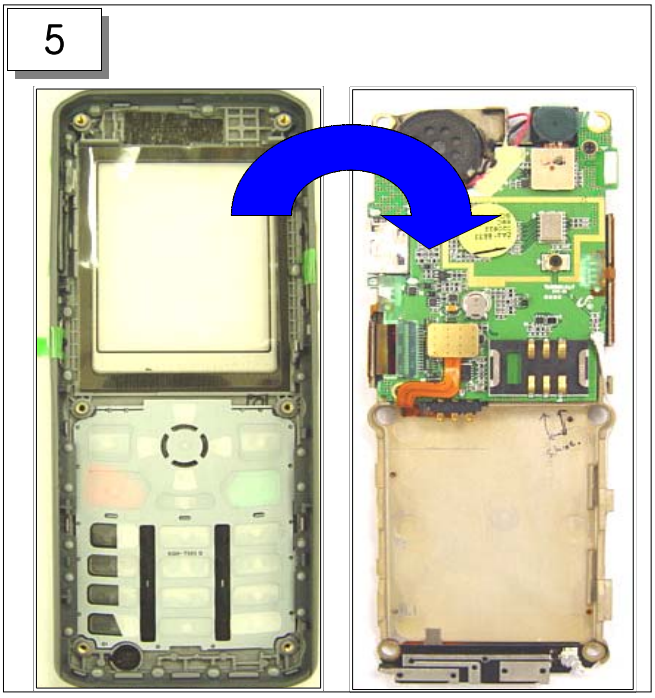


From the bottom part separte the rear cover

1) Be careful of the damage of cover and scratch.

4 Separate the LCD metal bracket from front case

1) Be careful not to detach antenna cable from the PCB



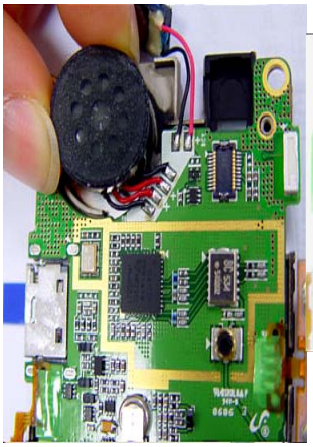
3-4. Assembling Manual

1 Inserting the LCD FPCB to the PBA

Inserting the LCD FPCB to the LCD conn. on the PBA

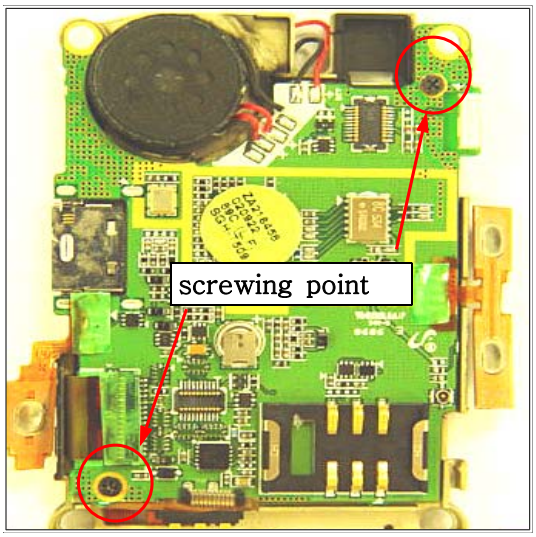
.

2 place speaker & Receiver on the LCD bracket



Do not twist the wire of speaker & Receiver

3 screw the PBA to the LCD bracket



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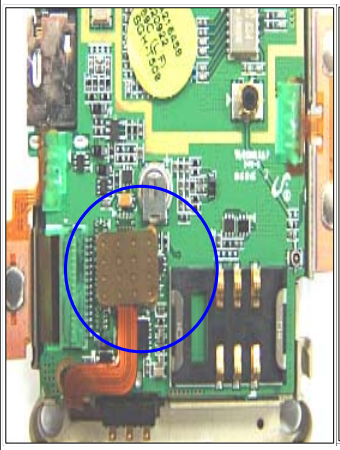
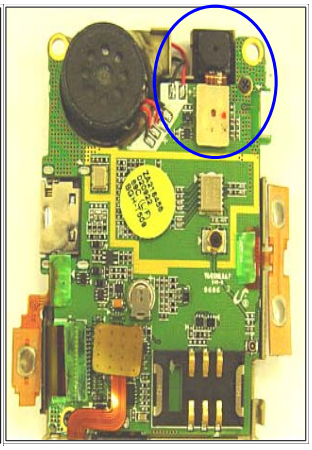
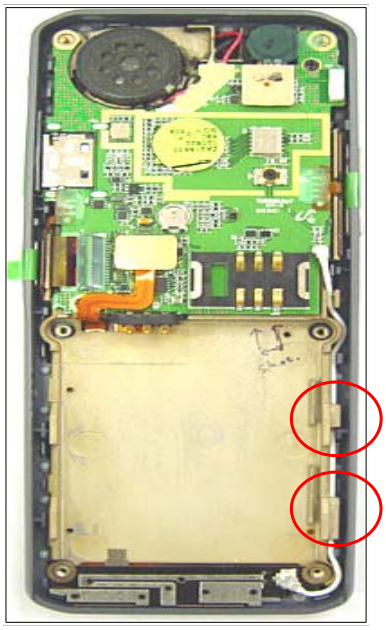
4 Insert key conn. & camera conn. to the PBA





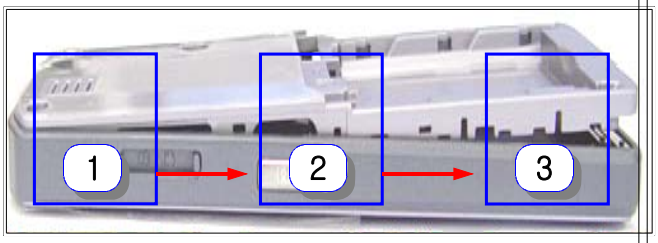
5 Put the LCD bracket to the front case

6

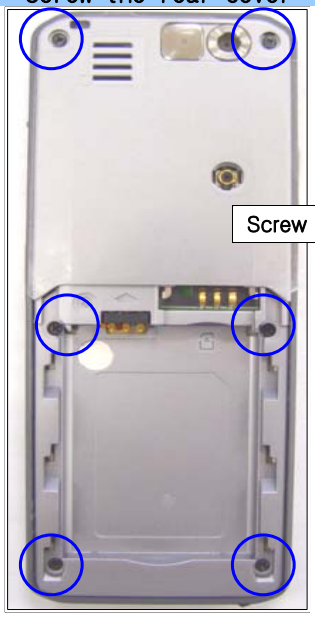


Be careful of intenna cable.
Cable must be placed below the bracket hook.

7 Assemble the rear case

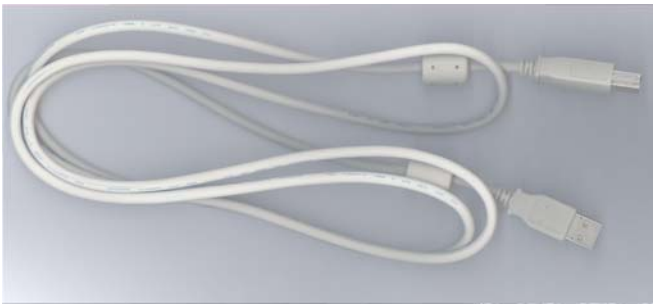


8 Screw the rear cover



3-5. Test Jig (GH80-03306A)

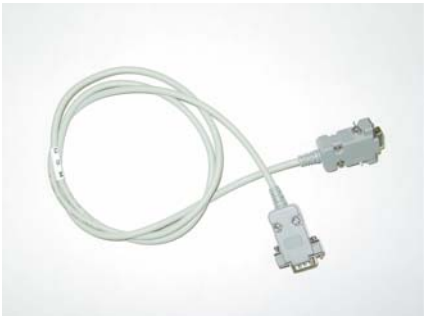
3-5-1. USB JIG Cable



3-5-2. RF Test Cable (GH39-00397A)

3-5-3. Test Cable (GH39-00499A)

3-5-4. Serial Cable (CSA LL64151-A)



3-5-5. Power Supply Cable

3-5-6. DATA CABLE (GH39-00444B)

3-5-7. TA (GH44-01077B)

4. Electrical Parts List

Design LOC	Description	SEC CODE	STATUS
ANT600	ANTENNA-CHIP	4202-001120	SA
BAT400	BATTERY-LI(2ND)	4302-001180	SA
BTC500	CONNECTOR-BATTERY	3711-006003	SA
C100	C-CER,CHIP	2203-000233	SA
C101	C-CER,CHIP	2203-000812	SA
C102	C-CER,CHIP	2203-000278	SA
C104	C-CER,CHIP	2203-000812	SA
C105	C-CER,CHIP	2203-000812	SA
C106	C-CER,CHIP	2203-000812	SA
C107	C-CER,CHIP	2203-000812	SA
C109	C-CER,CHIP	2203-001201	SA
C112	C-CER,CHIP	2203-005234	SA
C113	C-CER,CHIP	2203-000812	SA
C114	C-CER,CHIP	2203-000812	SA
C115	C-CER,CHIP	2203-000585	SA
C116	C-CER,CHIP	2203-000233	SA
C118	C-CER,CHIP	2203-000812	SA
C120	C-CER,CHIP	2203-000585	SA
C121	C-CER,CHIP	2203-000425	SA
C122	C-CER,CHIP	2203-000254	SA
C124	C-CER,CHIP	2203-000812	SA
C125	C-CER,CHIP	2203-000425	SA
C126	C-CER,CHIP	2203-005552	SA
C129	C-CER,CHIP	2203-000995	SA
C130	C-CER,CHIP	2203-000654	SA
C131	C-CER,CHIP	2203-000233	SA
C132	C-CER,CHIP	2203-002668	SA
C134	C-CER,CHIP	2203-000812	SA
C137	C-CER,CHIP	2203-002968	SA
C138	C-CER,CHIP	2203-000854	SA
C139	C-CER,CHIP	2203-000233	SA
C200	C-CER,CHIP	2203-006824	SA
C201	C-CER,CHIP	2203-000254	SA
C202	C-CER,CHIP	2203-006048	SA
C203	C-CER,CHIP	2203-006048	SA
C204	C-CER,CHIP	2203-000812	SA
C205	C-CER,CHIP	2203-006048	SA
C206	C-CER,CHIP	2203-006048	SA
C207	C-CER,CHIP	2203-006048	SA
C208	C-CER,CHIP	2203-006048	SA
C209	C-CER,CHIP	2203-006048	SA
C210	C-CER,CHIP	2203-000812	SA
C211	C-CER,CHIP	2203-006048	SA
C212	C-CER,CHIP	2203-006048	SA
C213	C-CER,CHIP	2203-006048	SA
C214	C-CER,CHIP	2203-006048	SA
C301	C-CER,CHIP	2203-006048	SA
C302	C-CER,CHIP	2203-006048	SA
C303	C-CER,CHIP	2203-000679	SA
C304	C-CER,CHIP	2203-006048	SA

Design LOC	Description	SEC CODE	STATUS
C305	C-CER,CHIP	2203-006048	SA
C306	C-CER,CHIP	2203-006963	SA
C307	C-CER,CHIP	2203-000725	SA
C308	C-CER,CHIP	2203-000438	SA
C309	C-CER,CHIP	2203-006048	SA
C310	C-CER,CHIP	2203-006048	SA
C311	C-CER,CHIP	2203-006048	SA
C314	C-CER,CHIP	2203-002525	SA
C315	C-CER,CHIP	2203-006048	SA
C316	C-CER,CHIP	2203-005344	SA
C318	C-CER,CHIP	2203-000438	SA
C319	C-CER,CHIP	2203-006257	SA
C320	C-CER,CHIP	2203-000233	SA
C321	C-CER,CHIP	2203-006048	SA
C322	C-CER,CHIP	2203-006048	SA
C323	C-CER,CHIP	2203-006048	SA
C324	C-CER,CHIP	2203-006048	SA
C325	C-CER,CHIP	2203-006562	SA
C400	C-CER,CHIP	2203-006562	SA
C401	C-CER,CHIP	2203-006824	SA
C402	C-CER,CHIP	2203-006047	SA
C403	C-CER,CHIP	2203-006562	SA
C405	C-CER,CHIP	2203-000254	SA
C406	C-CER,CHIP	2203-006048	SA
C407	C-CER,CHIP	2203-000386	SA
C408	C-CER,CHIP	2203-006257	SA
C409	C-CER,CHIP	2203-000233	SA
C410	C-CER,CHIP	2203-000386	SA
C412	C-CER,CHIP	2203-000254	SA
C414	C-CER,CHIP	2203-006562	SA
C416	C-CER,CHIP	2203-006257	SA
C417	C-CER,CHIP	2203-006257	SA
C419	C-CER,CHIP	2203-006824	SA
C420	C-CER,CHIP	2203-006048	SA
C423	C-CER,CHIP	2203-006824	SA
C424	C-CER,CHIP	2203-006257	SA
C426	C-CER,CHIP	2203-006824	SA
C427	C-CER,CHIP	2203-006824	SA
C500	C-CER,CHIP	2203-001437	SA
C501	C-CER,CHIP	2203-001259	SA
C502	C-CER,CHIP	2203-001437	SA
C503	C-CER,CHIP	2203-000254	SA
C505	C-CER,CHIP	2203-003054	SA
C508	C-CER,CHIP	2203-006048	SA
C510	C-CER,CHIP	2203-002759	SA
C511	C-CER,CHIP	2203-000812	SA
C512	C-CER,CHIP	2203-006348	SA
C513	C-CER,CHIP	2203-006048	SA

Design LOC	Description	SEC CODE	STATUS
C601	C-CER,CHIP	2203-000278	SA
C602	C-CER,CHIP	2203-000278	SA
C603	C-CER,CHIP	2203-006048	SA
C604	C-CER,CHIP	2203-000278	SA
C605	C-CER,CHIP	2203-000995	SA
C606	C-CER,CHIP	2203-006048	SA
C607	C-CER,CHIP	2203-000679	SA
C609	C-CER,CHIP	2203-000278	SA
C610	C-CER,CHIP	2203-000278	SA
C611	C-CER,CHIP	2203-006562	SA
C614	C-CER,CHIP	2203-006048	SA
C615	C-CER,CHIP	2203-005281	SA
C616	C-CER,CHIP	2203-005056	SA
C617	C-CER,CHIP	2203-006048	SA
C623	C-CER,CHIP	2203-006562	SA
C624	C-CER,CHIP	2203-006562	SA
C627	C-CER,CHIP	2203-006562	SA
C628	C-CER,CHIP	2203-006048	SA
C629	C-CER,CHIP	2203-006562	SA
C630	C-CER,CHIP	2203-006562	SA
C701	C-CER,CHIP	2203-006260	SA
C702	C-CER,CHIP	2203-006562	SA
C703	C-CER,CHIP	2203-006562	SA
C704	C-CER,CHIP	2203-006562	SA
C705	C-CER,CHIP	2203-000550	SA
C706	C-CER,CHIP	2203-006562	SA
C710	C-CER,CHIP	2203-006562	SA
C711	C-CER,CHIP	2203-006048	SA
C713	C-CER,CHIP	2203-000438	SA
C714	C-CER,CHIP	2203-000438	SA
C716	C-CER,CHIP	2203-006423	SA
C717	C-CER,CHIP	2203-006423	SA
C718	C-CER,CHIP	2203-006562	SA
C719	C-CER,CHIP	2203-006562	SA
CPL600	BLUETOOTH MODULE	4709-001422	SA
D500	DIODE-SCHOTTKY	0404-001172	SA
D600	DIODE-SWITCHING	0401-001141	SA
D700	DIODE-TVS	0406-001235	SA
D701	DIODE-TVS	0406-001235	SA
D702	DIODE-TVS	0406-001235	SA
D703	DIODE-TVS	0406-001235	SA
D704	DIODE-TVS	0406-001235	SA
D705	DIODE-TVS	0406-001235	SA
D706	DIODE-TVS	0406-001235	SA
F101	FILTER-EMI SMD	2901-001254	SA
F102	DUPLEXER-FEM	2911-000031	SA
F103	FILTER-SAW	2904-001502	SA
F500	FILTER-EMI/ESD	2901-001322	SA
F501	FILTER-EMI SMD	2901-001315	SA
F701	FILTER-EMI/ESD	2901-001319	SA

Design LOC	Description	SEC CODE	STATUS
F702	FILTER-EMI/ESD	2901-001319	SA
F703	FILTER-EMI/ESD	2901-001319	SA
F704	FILTER-EMI/ESD	2901-001319	SA
F705	FILTER-EMI/ESD	2901-001319	SA
F706	FILTER-EMI/ESD	2901-001319	SA
F707	FILTER-EMI/ESD	2901-001319	SA
F708	FILTER-EMI/ESD	2901-001319	SA
F709	FILTER-EMI/ESD	2901-001319	SA
HDC700	HEADER-BOARD TO BOARD	3711-005345	SA
HDC701	HEADER-BOARD TO BOARD	3711-005659	SNA
IFC500	SOCKET-INTERFACE	3710-002363	SA
L100	INDUCTOR-SMD	2703-001749	SA
L101	INDUCTOR-SMD	2703-001722	SA
L102	INDUCTOR-SMD	2703-002586	SA
L103	INDUCTOR-SMD	2703-001751	SA
L104	INDUCTOR-SMD	2703-002586	SA
L105	INDUCTOR-SMD	2703-002597	SA
L107	INDUCTOR-SMD	2703-001729	SA
L108	INDUCTOR-SMD	2703-002586	SA
L109	INDUCTOR-SMD	2703-002636	SA
L111	INDUCTOR-SMD	2703-001409	SA
L112	INDUCTOR-SMD	2703-002155	SA
L400	BEAD-SMD	3301-001120	SA
L401	INDUCTOR-SMD	2703-002653	SA
L601	BEAD-SMD	3301-001438	SA
L602	BEAD-SMD	3301-001438	SA
L603	BEAD-SMD	3301-001438	SA
L604	BEAD-SMD	3301-001438	SA
L701	BEAD-SMD	3301-001756	SA
OSC400	CRYSTAL-SMD	2801-004339	SA
PAM100	IC-POWER AMP	1201-002275	SA
R101	R-CHIP	2007-000171	SA
R102	R-CHIP	2007-000171	SA
R103	R-CHIP	2007-000171	SA
R106	R-CHIP	2007-000148	SA
R107	R-CHIP	2007-000172	SA
R108	R-CHIP	2007-000148	SA
R110	R-CHIP	2007-000162	SA
R111	R-CHIP	2007-000171	SA
R113	R-CHIP	2007-000171	SA
R114	R-CHIP	2007-000171	SA
R115	R-CHIP	2007-000171	SA
R116	R-CHIP	2007-000171	SA
R117	R-CHIP	2007-000566	SA
R118	R-CHIP	2007-000566	SA
R119	R-CHIP	2007-000171	SA
R200	R-CHIP	2007-000148	SA
R203	R-CHIP	2007-000242	SA
R204	R-CHIP	2007-000242	SA

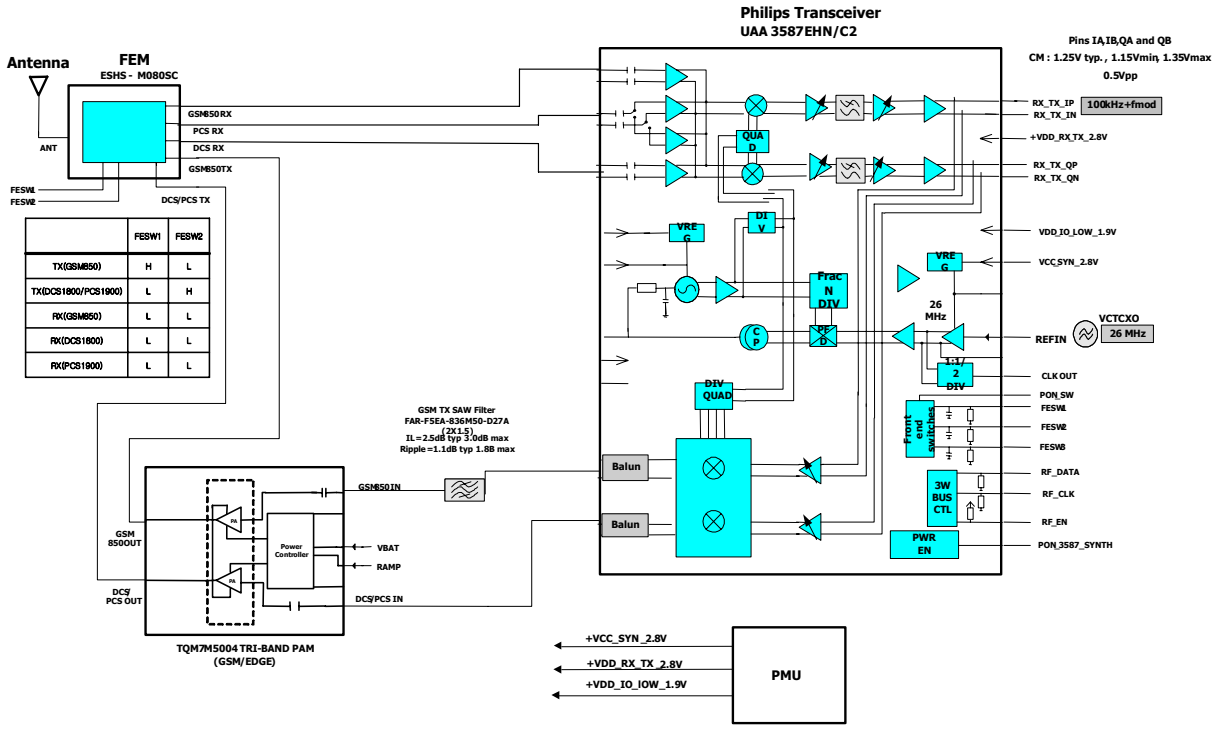
Design LOC	Description	SEC CODE	STATUS
R205	R-NET	2011-001394	SA
R206	R-CHIP	2007-000143	SA
R208	R-CHIP	2007-007142	SA
R213	R-CHIP	2007-000171	SA
R301	R-CHIP	2007-001325	SA
R302	R-CHIP	2007-000148	SA
R303	R-CHIP	2007-001335	SA
R304	R-CHIP	2007-007015	SA
R305	R-CHIP	2007-007142	SA
R306	R-CHIP	2007-000141	SA
R307	R-CHIP	2007-000141	SA
R309	R-CHIP	2007-000162	SA
R310	R-CHIP	2007-000171	SA
R311	R-CHIP	2007-007014	SA
R312	R-CHIP	2007-001303	SA
R313	R-CHIP	2007-007014	SA
R314	R-CHIP	2007-001303	SA
R315	R-CHIP	2007-007107	SA
R401	R-CHIP	2007-007100	SA
R402	R-CHIP	2007-000171	SA
R403	R-CHIP	2007-000171	SA
R404	R-CHIP	2007-000171	SA
R405	R-CHIP	2007-000171	SA
R406	R-CHIP	2007-000171	SA
R407	R-CHIP	2007-000162	SA
R500	R-CHIP	2007-000162	SA
R501	R-CHIP	2007-001339	SA
R502	R-CHIP	2007-007573	SA
R503	R-CHIP	2007-000162	SA
R504	R-CHIP	2007-000162	SA
R505	R-CHIP	2007-000171	SA
R506	R-CHIP	2007-000171	SA
R507	R-CHIP	2007-007142	SA
R508	R-CHIP	2007-000170	SA
R509	R-CHIP	2007-000170	SA
R510	R-CHIP	2007-007334	SA
R511	R-CHIP	2007-000148	SA
R512	R-CHIP	2007-007334	SA
R513	R-CHIP	2007-000152	SA
R514	R-CHIP	2007-000137	SA
R515	R-CHIP	2007-007573	SA
R516	R-CHIP	2007-007875	SA
R517	R-CHIP	2007-007334	SA
R518	R-CHIP	2007-007489	SA
R519	R-CHIP	2007-000156	SA
R600	R-CHIP	2007-000140	SA
R601	R-CHIP	2007-000137	SA
R602	R-CHIP	2007-000148	SA
R603	R-CHIP	2007-000171	SA
R604	R-CHIP	2007-000137	SA

Design LOC	Description	SEC CODE	STATUS
R605	R-CHIP	2007-000140	SA
R606	R-CHIP	2007-000171	SA
R607	R-CHIP	2007-002796	SA
R608	R-CHIP	2007-000140	SA
R609	R-CHIP	2007-000140	SA
R610	R-CHIP	2007-002796	SA
R611	R-CHIP	2007-000138	SA
R612	R-CHIP	2007-000162	SA
R616	R-CHIP	2007-000171	SA
R617	R-CHIP	2007-000162	SA
R619	R-CHIP	2007-000171	SA
R621	R-CHIP	2007-000171	SA
R701	R-CHIP	2007-000162	SA
R702	R-CHIP	2007-007131	SA
R703	R-CHIP	2007-000162	SA
R704	R-CHIP	2007-000758	SA
RFS100	CONNECTOR-COAXIAL	3705-001358	SA
RFS101	CONNECTOR-COAXIAL	3705-001339	SNA
SIM400	CONNECTOR-CARD EDGE	3709-001391	SA
SLC700	CONNECTOR-FPC/FFC/PIC	3708-002162	SA
TA123	C-TA,CHIP	2404-001406	SA
TA404	C-TA,CHIP	2404-001381	SA
TA411	C-TA,CHIP	2404-001381	SA
TA413	C-TA,CHIP	2404-001225	SA
TA415	C-TA,CHIP	2404-001225	SA
TA425	C-TA,CHIP	2404-001225	SA
TA504	C-TA,CHIP	2404-001377	SA
TA506	C-TA,CHIP	2404-001377	SA
TA507	C-TA,CHIP	2404-001381	SA
TA509	C-TA,CHIP	2404-001385	SA
TA600	C-TA,CHIP	2404-001377	SA
TA612	C-TA,CHIP	2404-001377	SA
TA626	C-TA,CHIP	2404-001268	SA
TCX100	OSCILLATOR-VCTCXO	2809-001287	SA
TR500	TR-DIGITAL	0504-001151	SA
U102	IC-TRANSCEIVER	1205-002817	SA
U201	IC-ANALOG SWITCH	1001-001231	SA
U202	IC-CMOS LOGIC	0801-003031	SA
U301	IC-MELODY	1204-002161	SA
U302	IC-CMOS LOGIC	0801-002237	SA
U303	IC ASIC-SGHX670	GH13-00036A	SA
U305	IC-CMOS LOGIC	0801-003022	SA
U400	IC-POWER SUPERVISOR	1203-003882	SA
U401	IC-POSI.FIXED REG.	1203-003737	SA
U402	IC-DC/DC CONVERTER	1203-003545	SA
U501	DIODE-TVS	0406-001215	SA
U503	IC-BATTERY	1203-003742	SA
U505	DIODE-TVS	0406-001215	SA
U600	IC-ANALOG SWITCH	1001-001231	SA

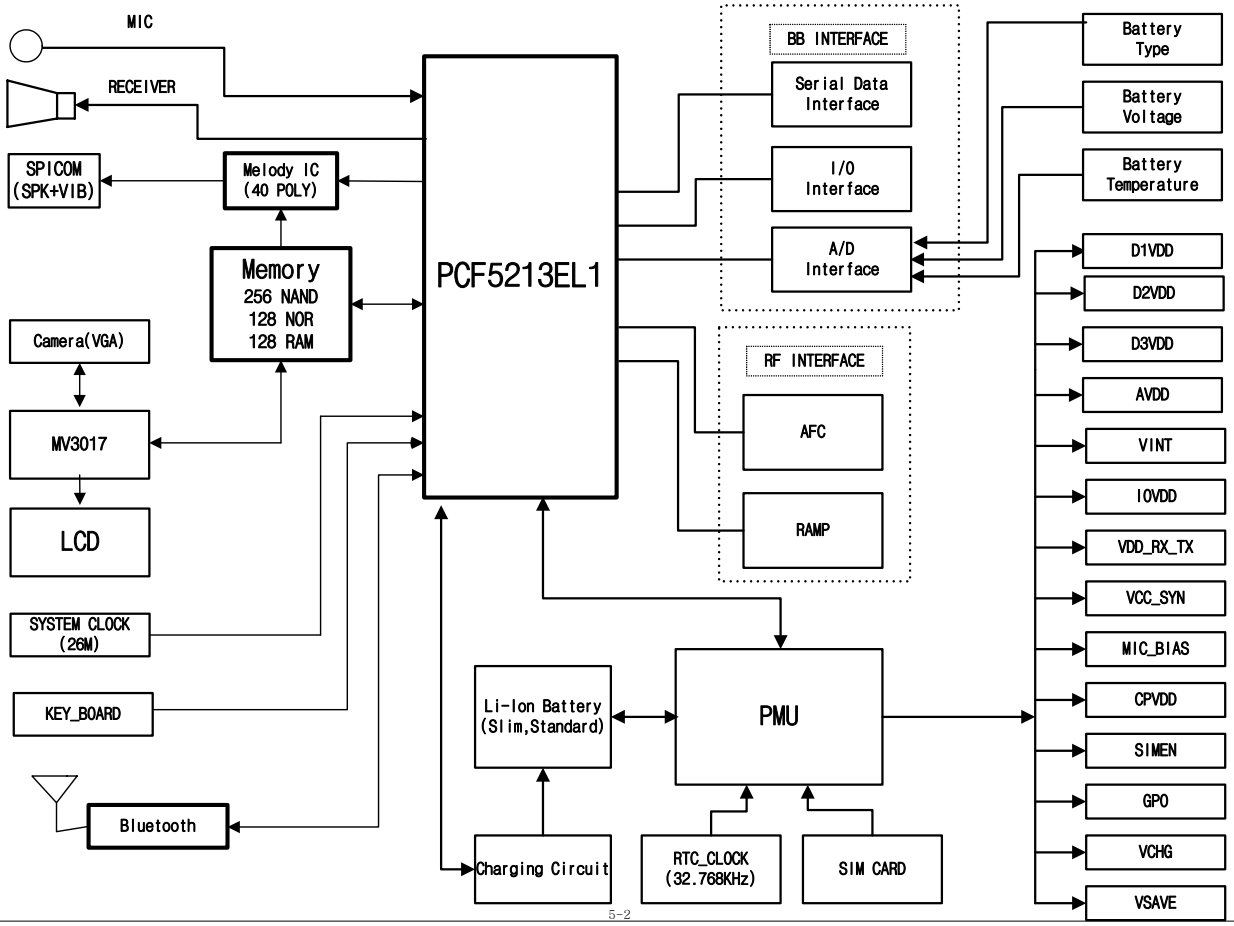
Design LOC	Description	SEC CODE	STATUS
U601	IC-POSI.FIXED REG.	1203-003737	SA
U603	IC-POSI.FIXED REG.	1203-003737	SA
U604	IC-POSI.FIXED REG.	1203-003688	SA
U704	DIODE-TVS	0406-001215	SA
U705	IC-DC/DC CONVERTER	1203-003496	SA
U711	IC-POSI.FIXED REG.	1203-003787	SA
UCP200	IC-COMM. CONTROLLER	1205-002757	SA
UME300	IC-MCP	1108-000029	SA
VR400	VARISTOR	1405-001082	SA
VR500	THERMISTOR-NTC	1404-001221	SA
VR501	VARISTOR	1405-001133	SA
VR701	VARISTOR	1405-001082	SA
VR702	VARISTOR	1405-001082	SA
ZD500	DIODE-ZENER	0403-001547	SA
ZD501	DIODE-ZENER	0403-000772	SA
	PCB-SGHT509 PCB	GH41-01108A	SNA

5. Block Diagrams

5-1. RF Solution Block Diagram

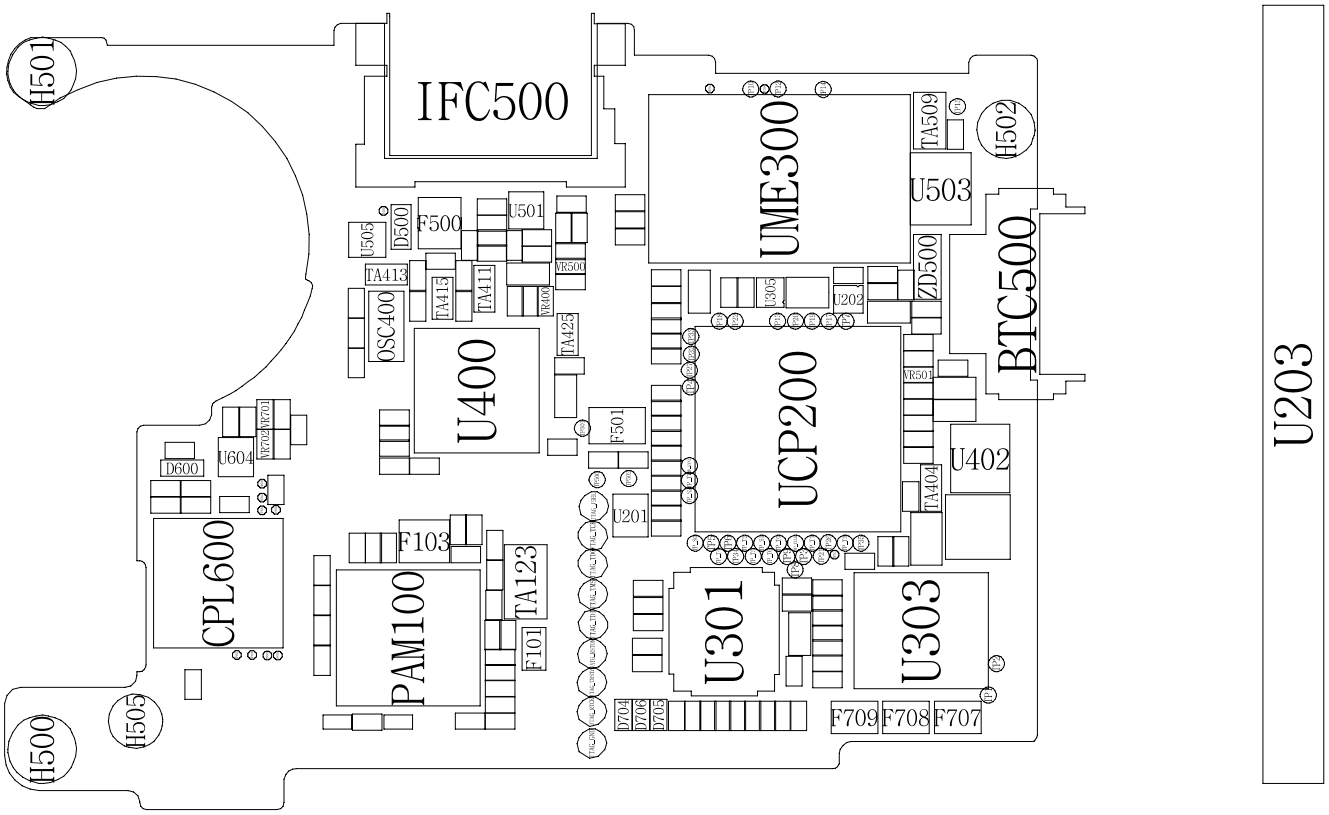


5-2. Base Band Solution Block Diagram

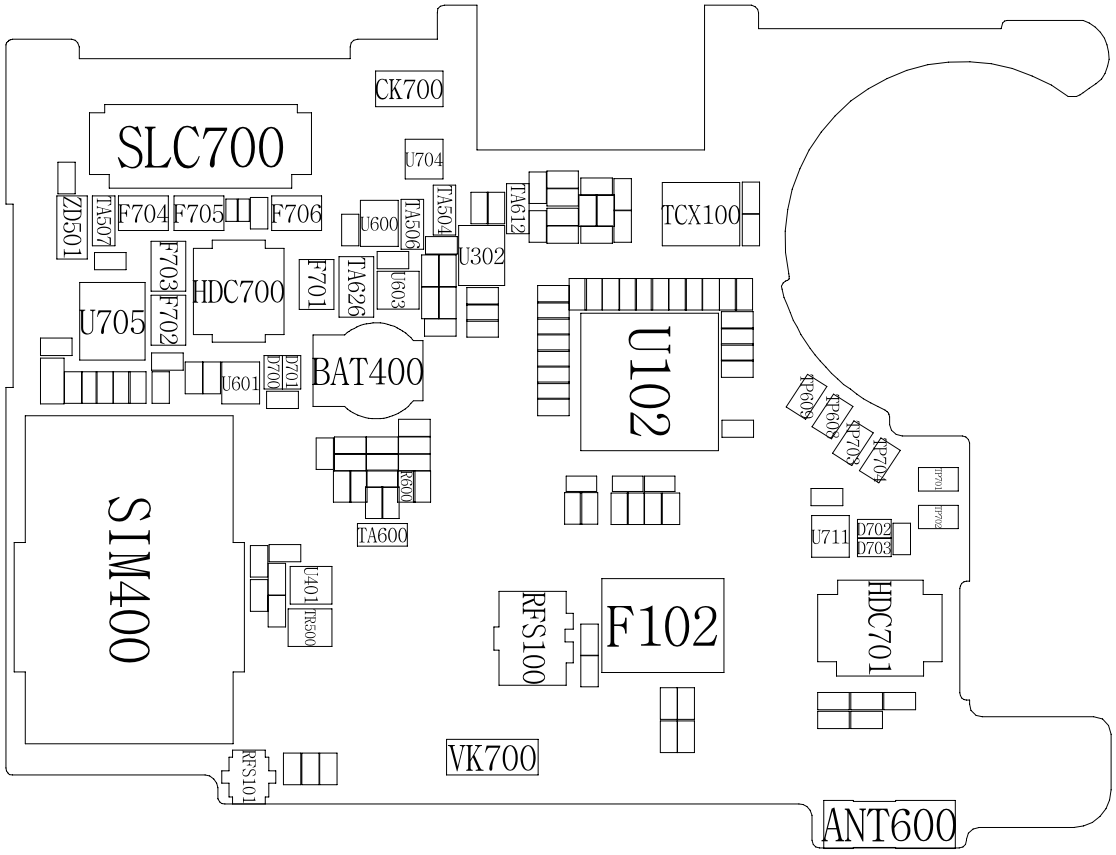


6. PCB Diagrams

6-1. Main PCB Top Diagram

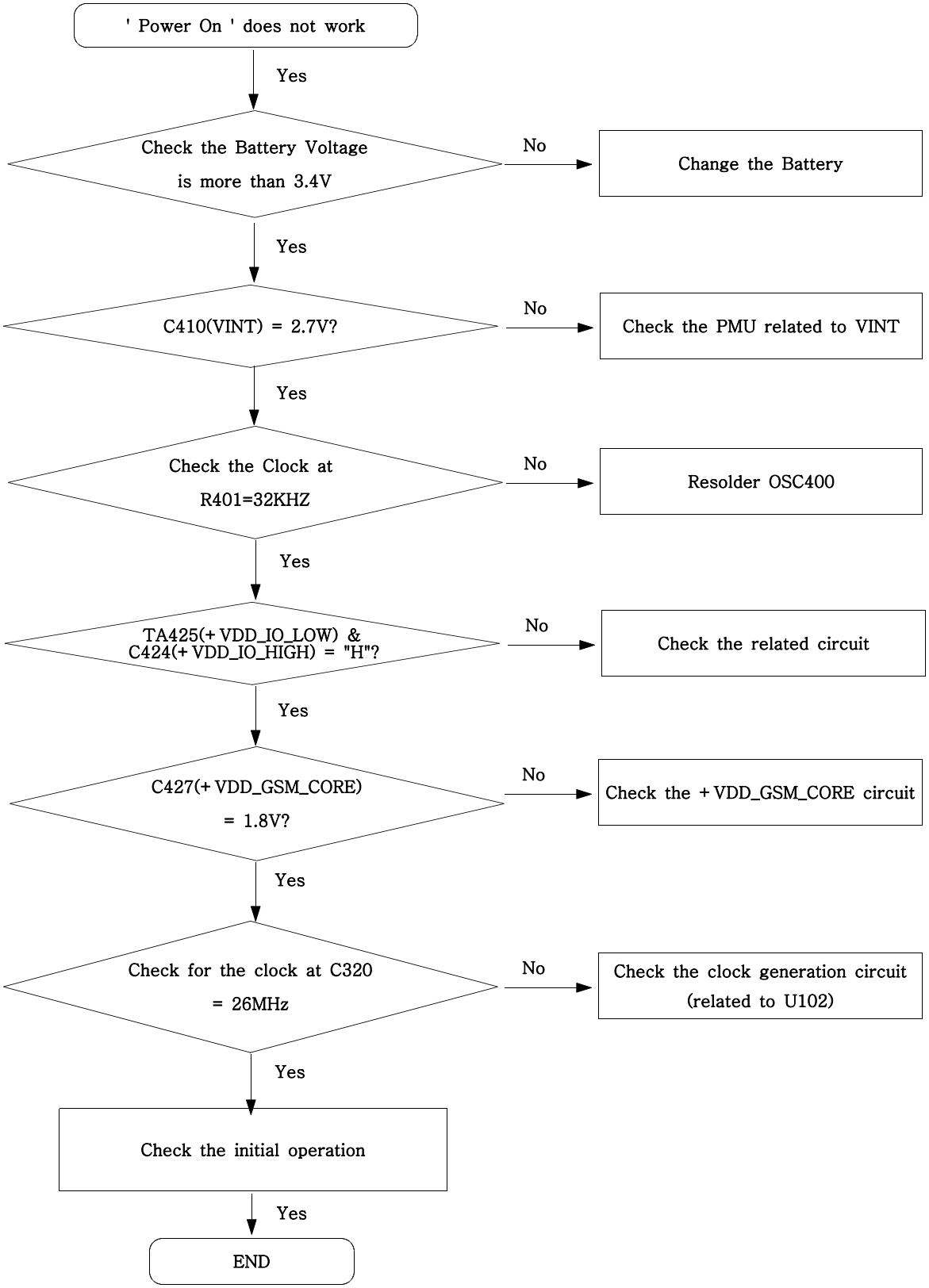


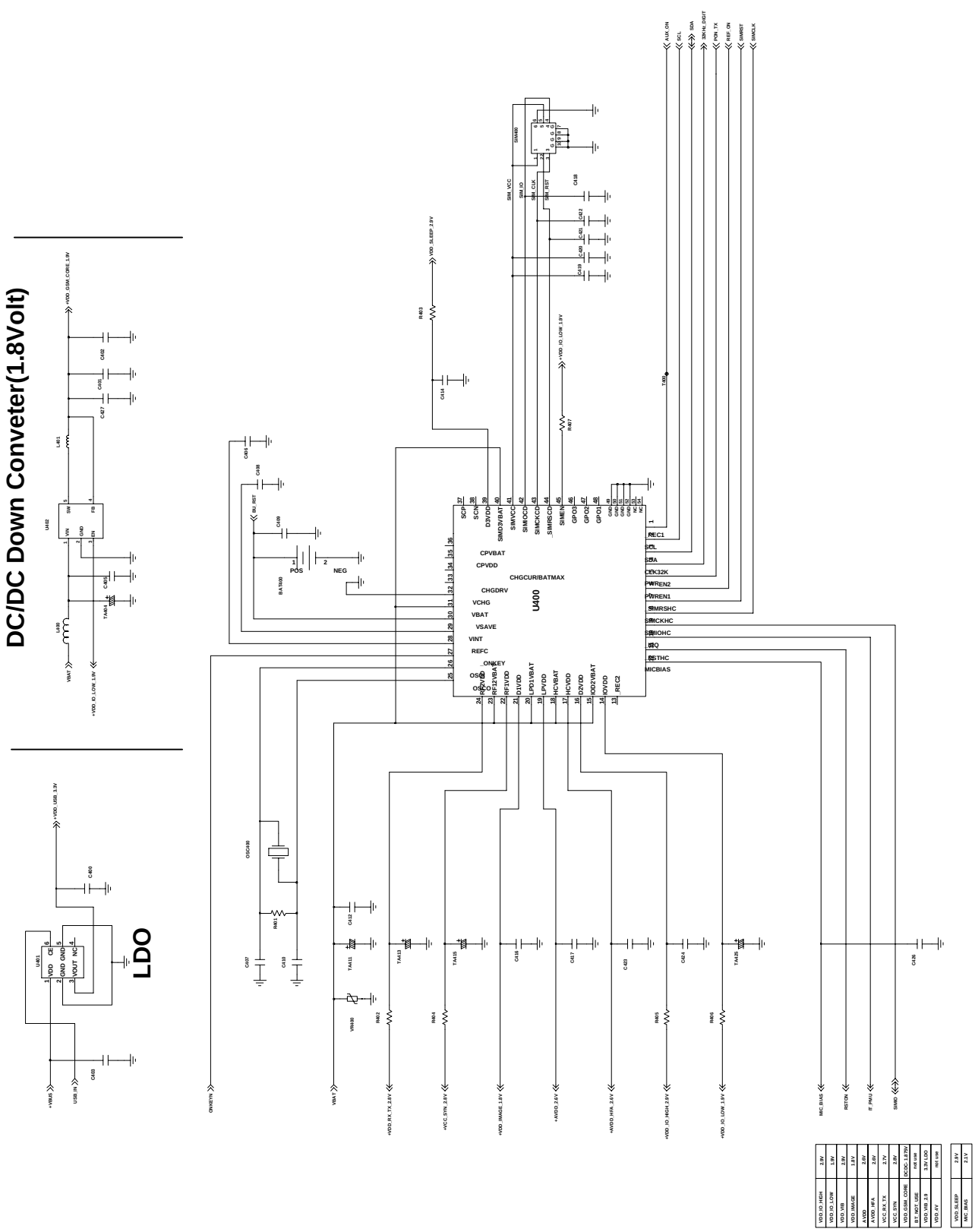
6-2. Main PCB Bottom Diagram

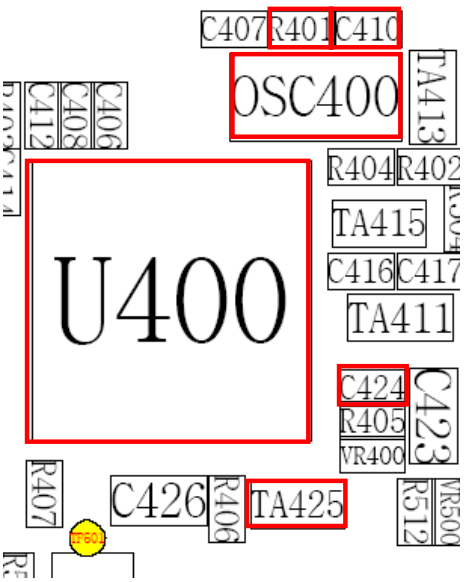


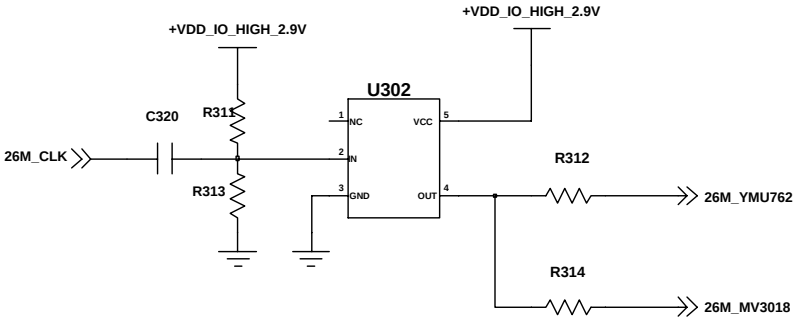
7. Flow Chart of Troubleshooting

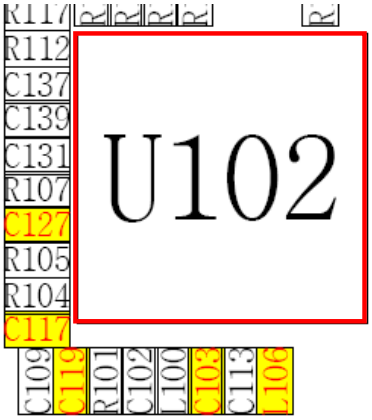
7-1. Power On

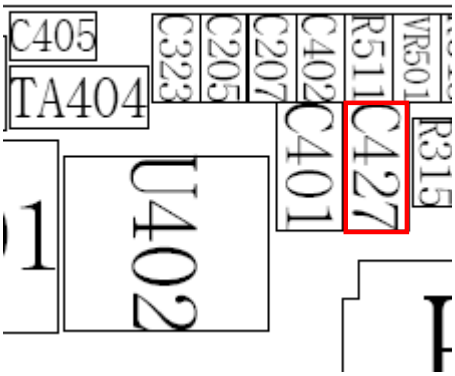


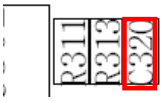




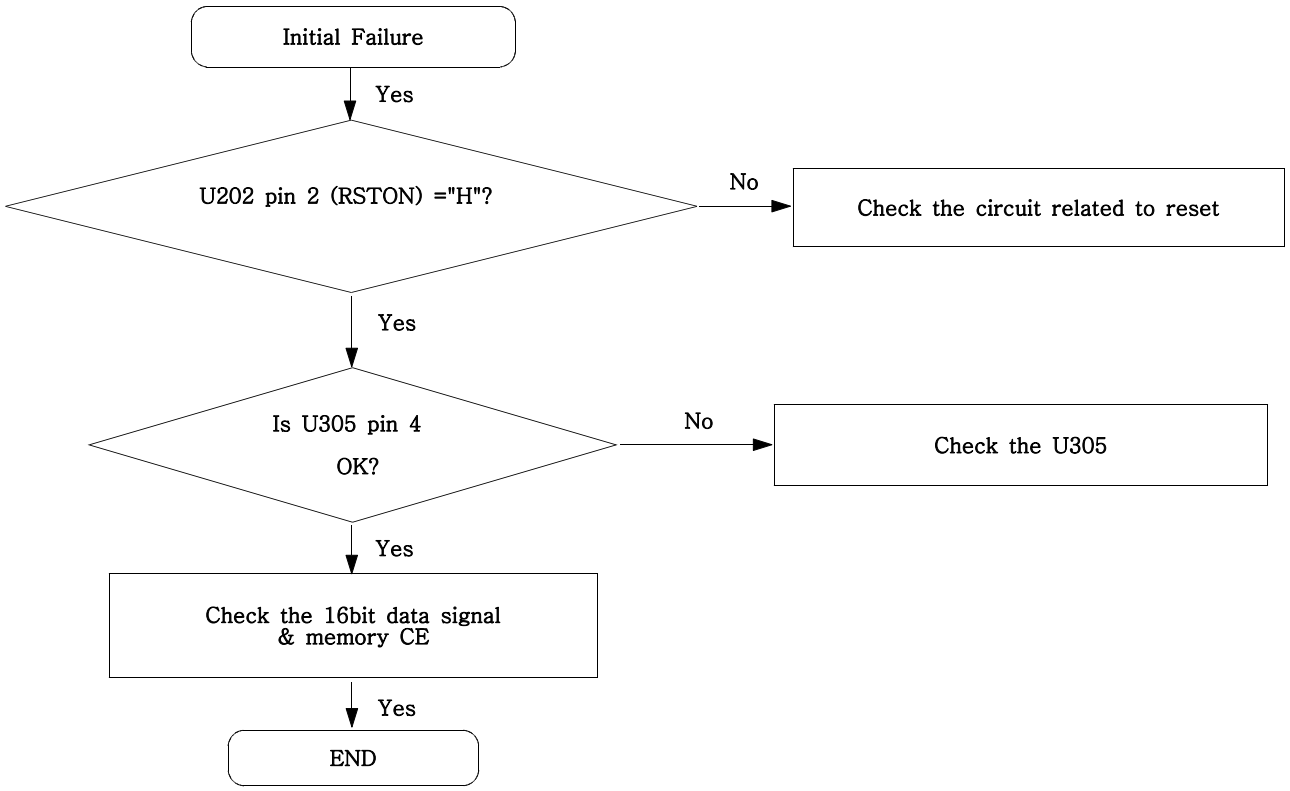


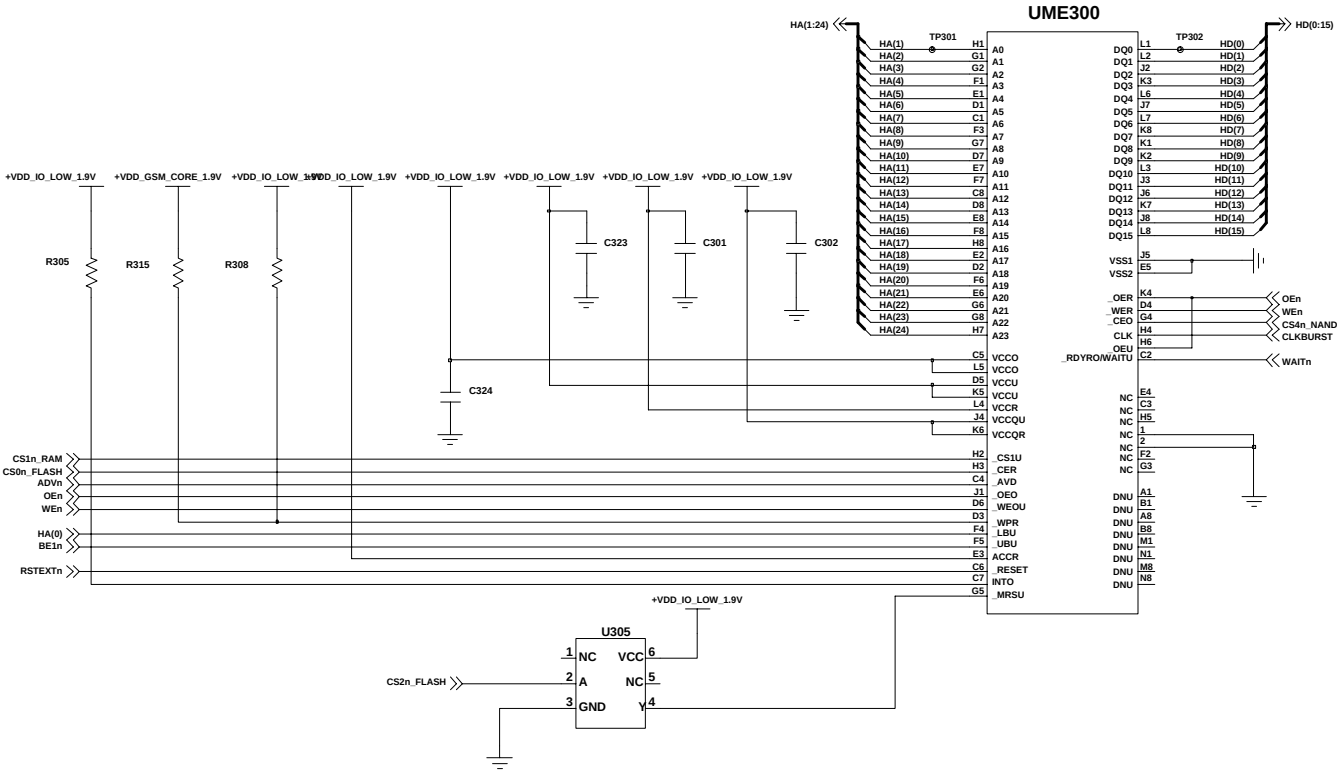


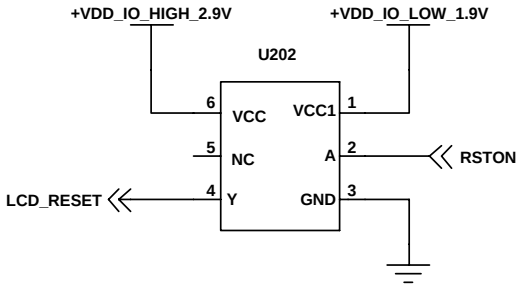


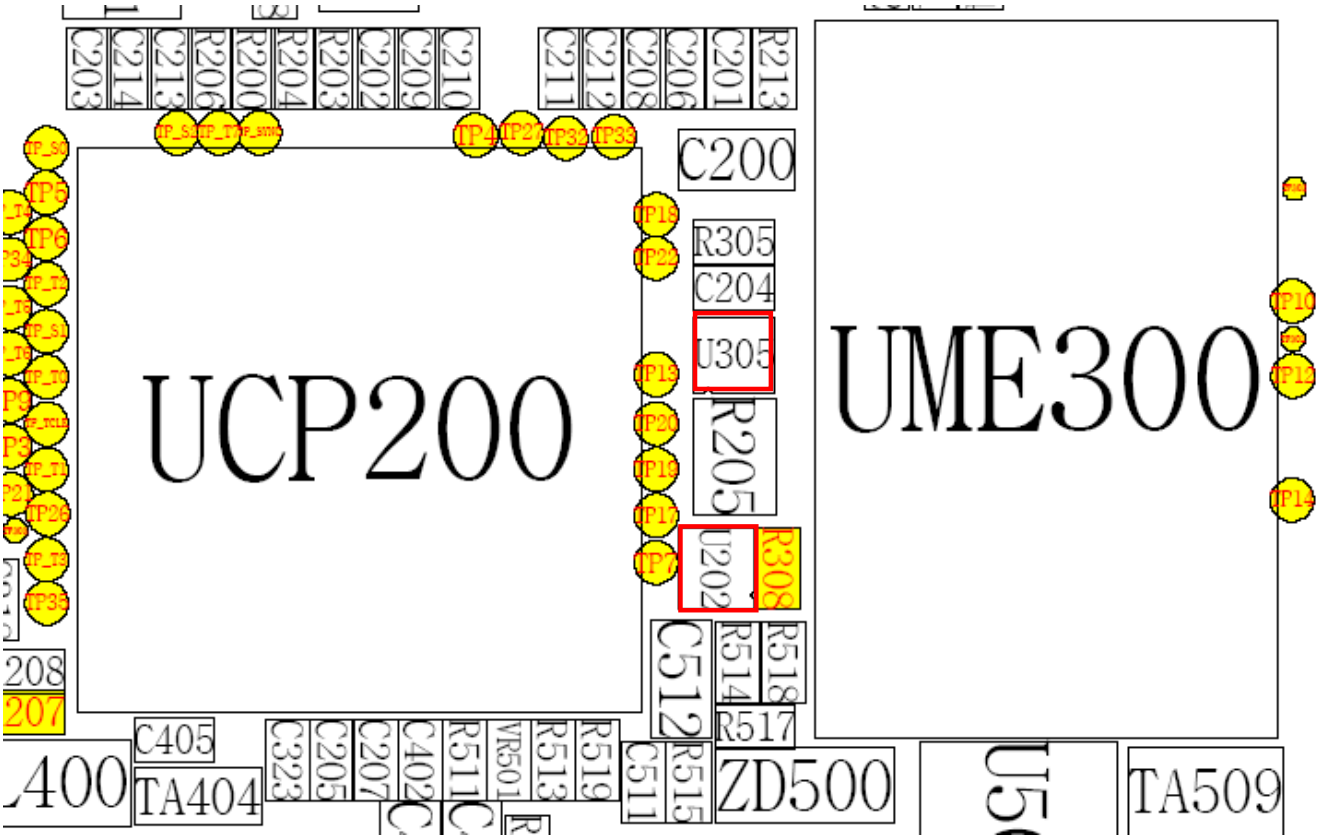


7-2. Initial

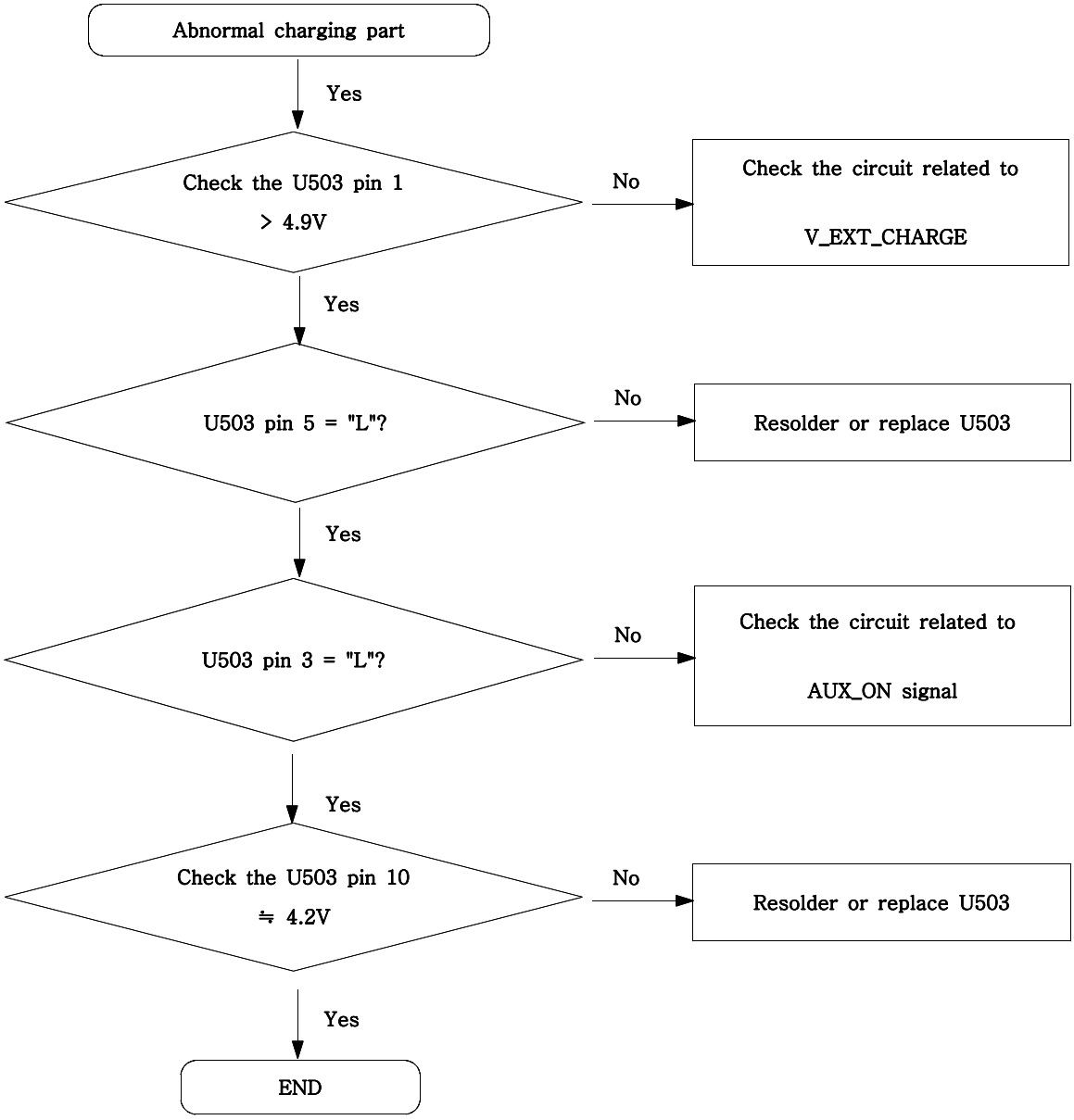


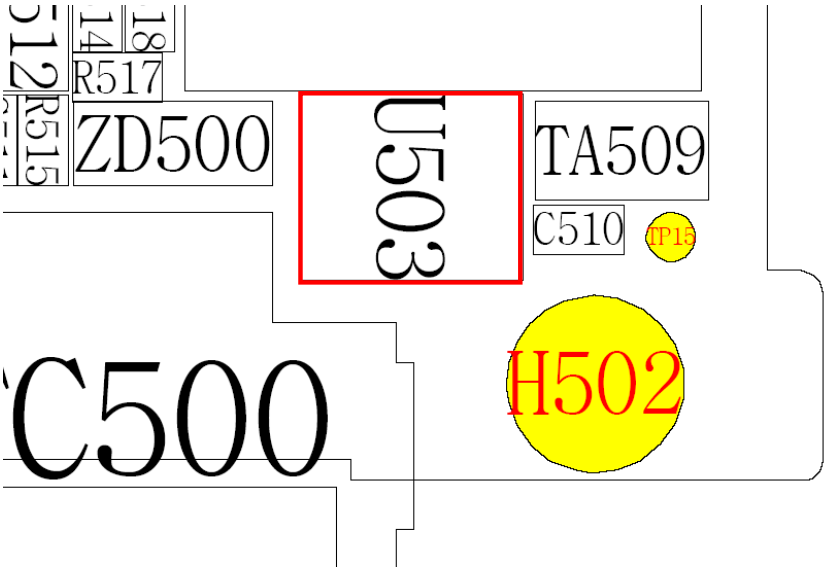


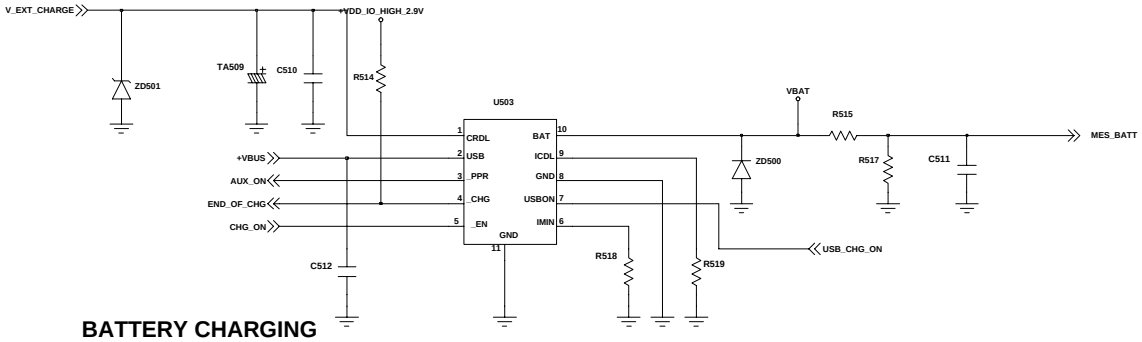




7-3. Charging Part

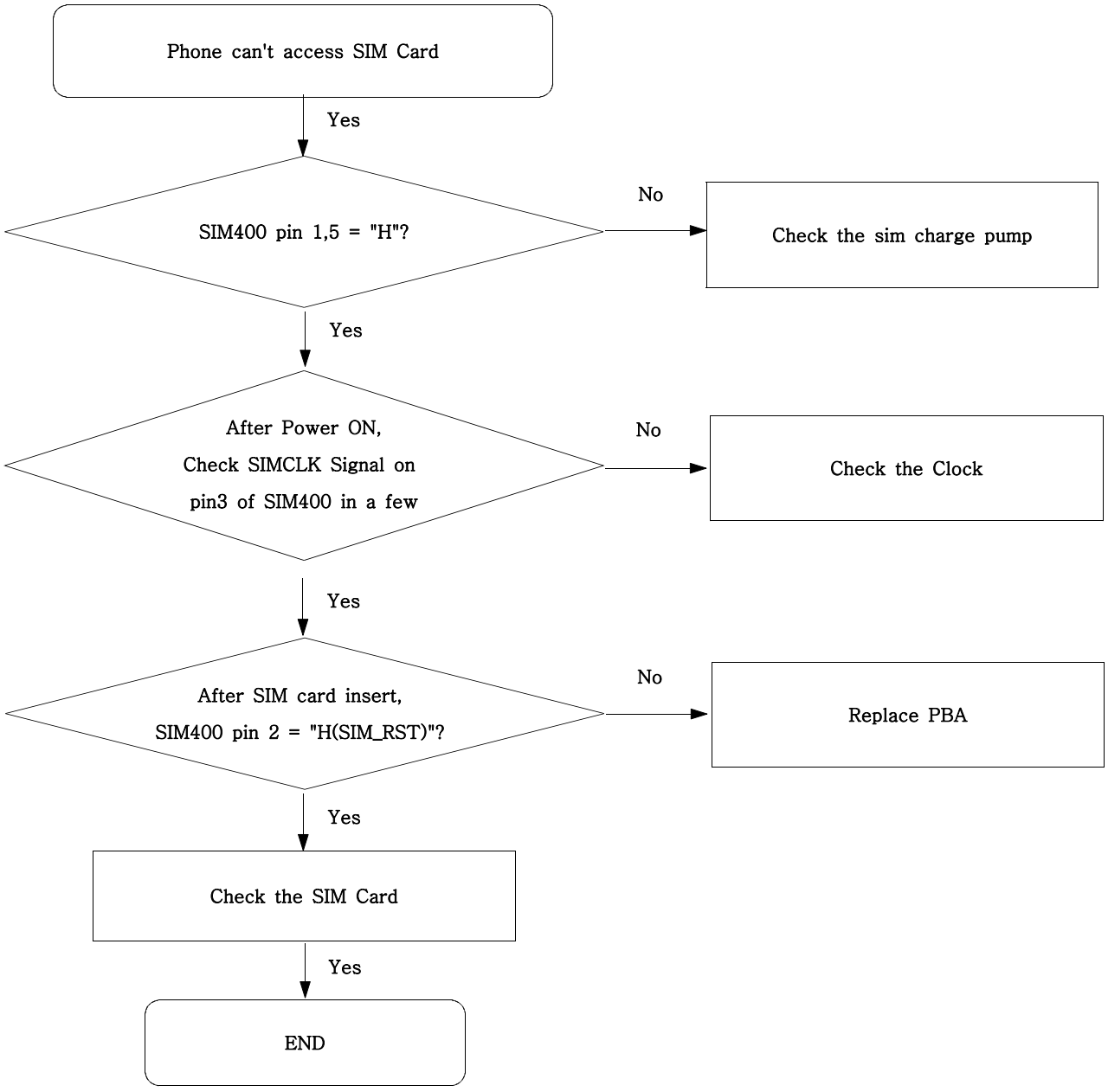


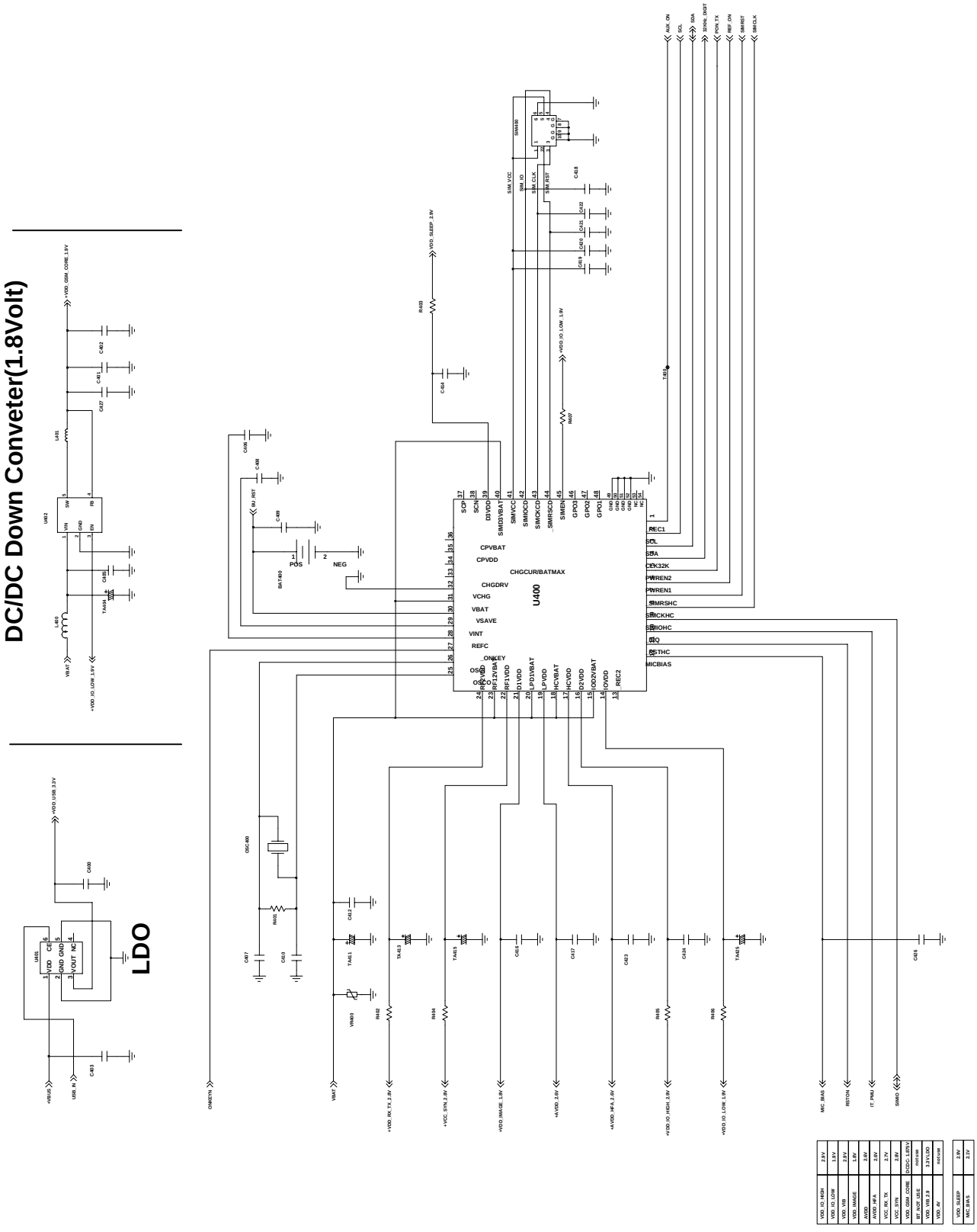


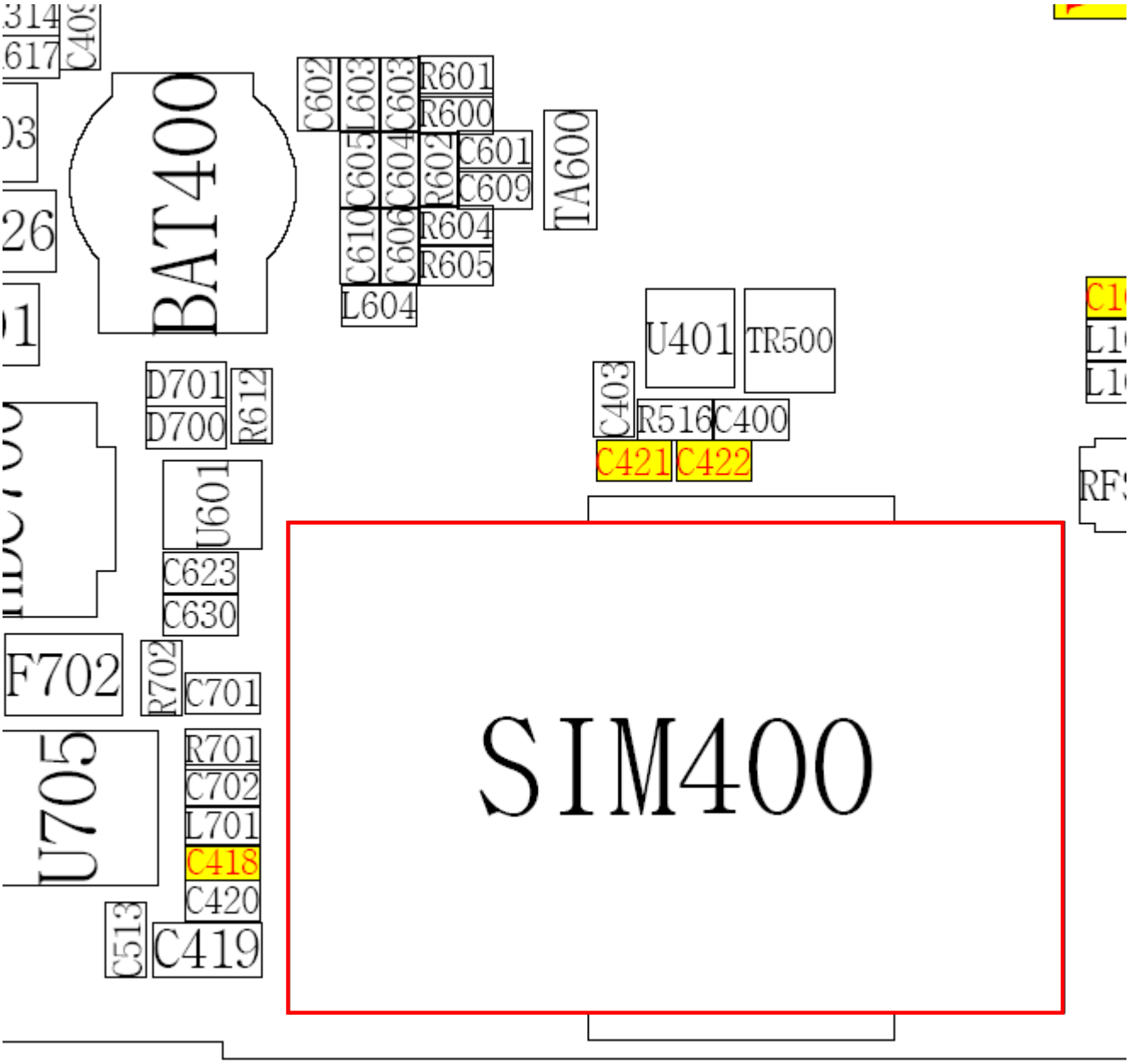


BATTERY CHARGING

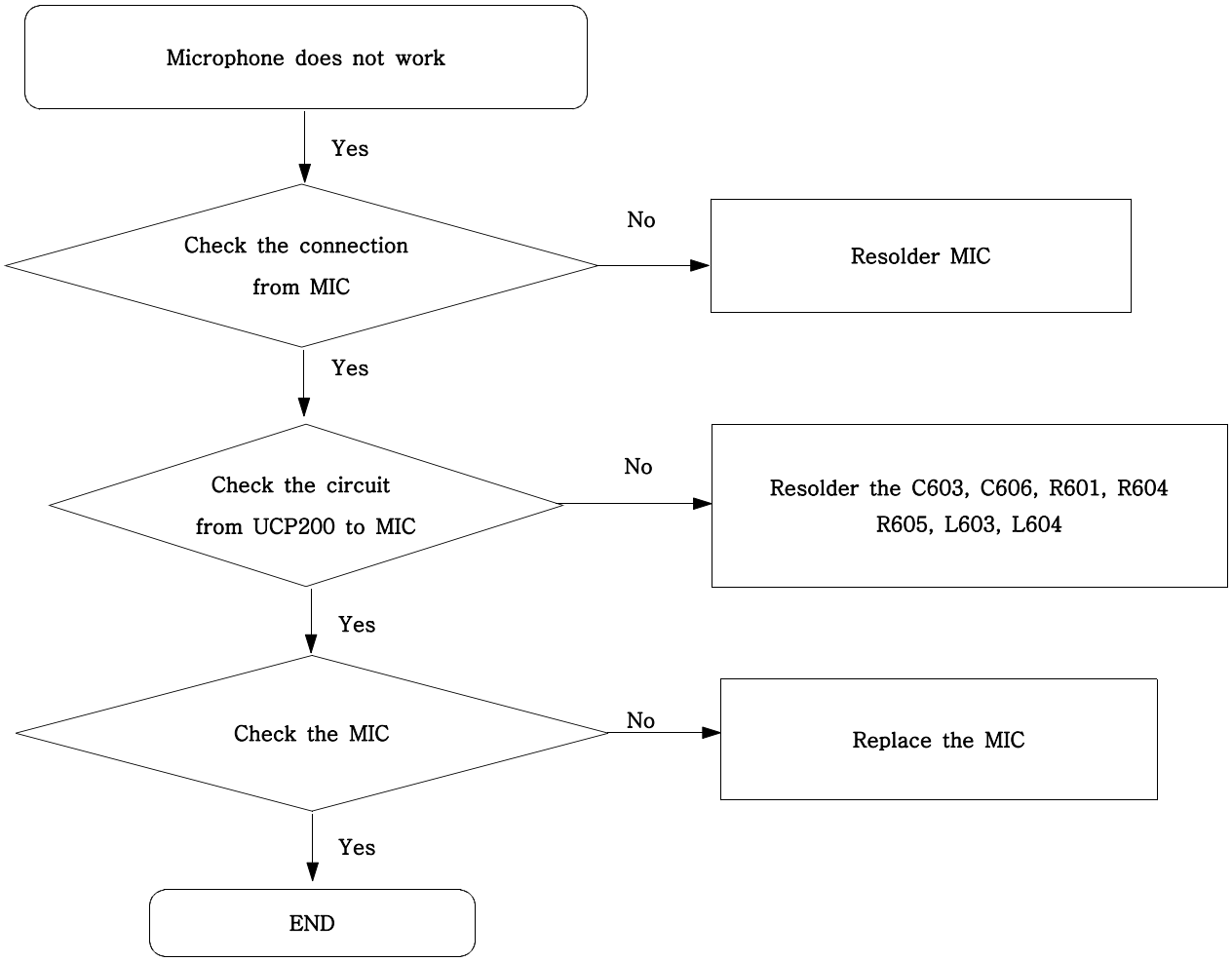
7-4. Sim Part

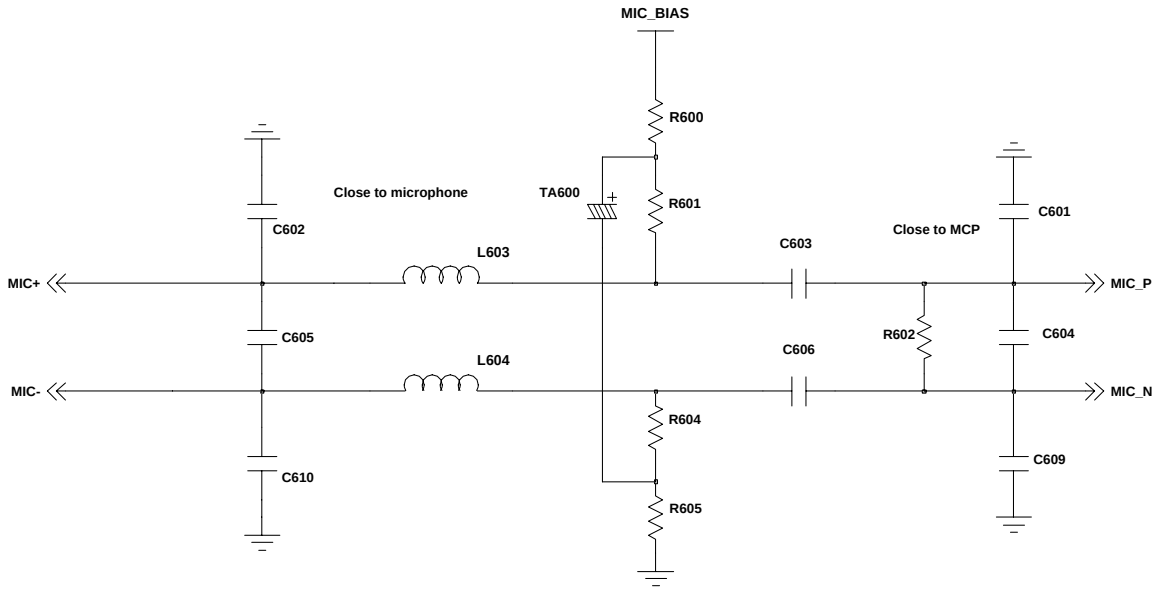




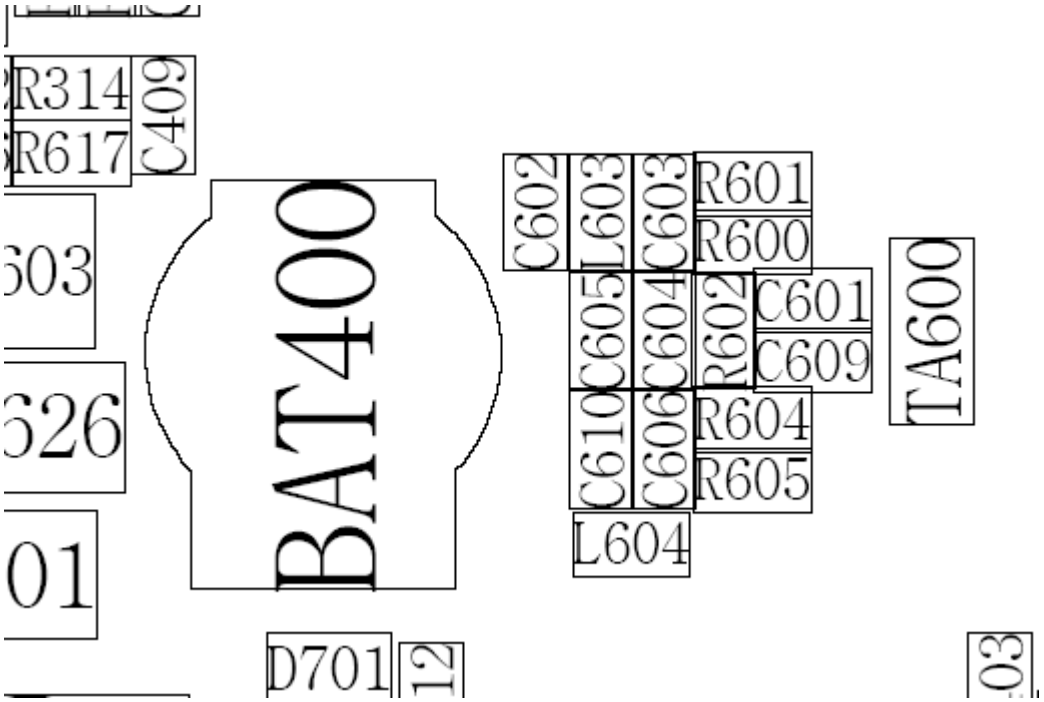


7-5. Microphone Part

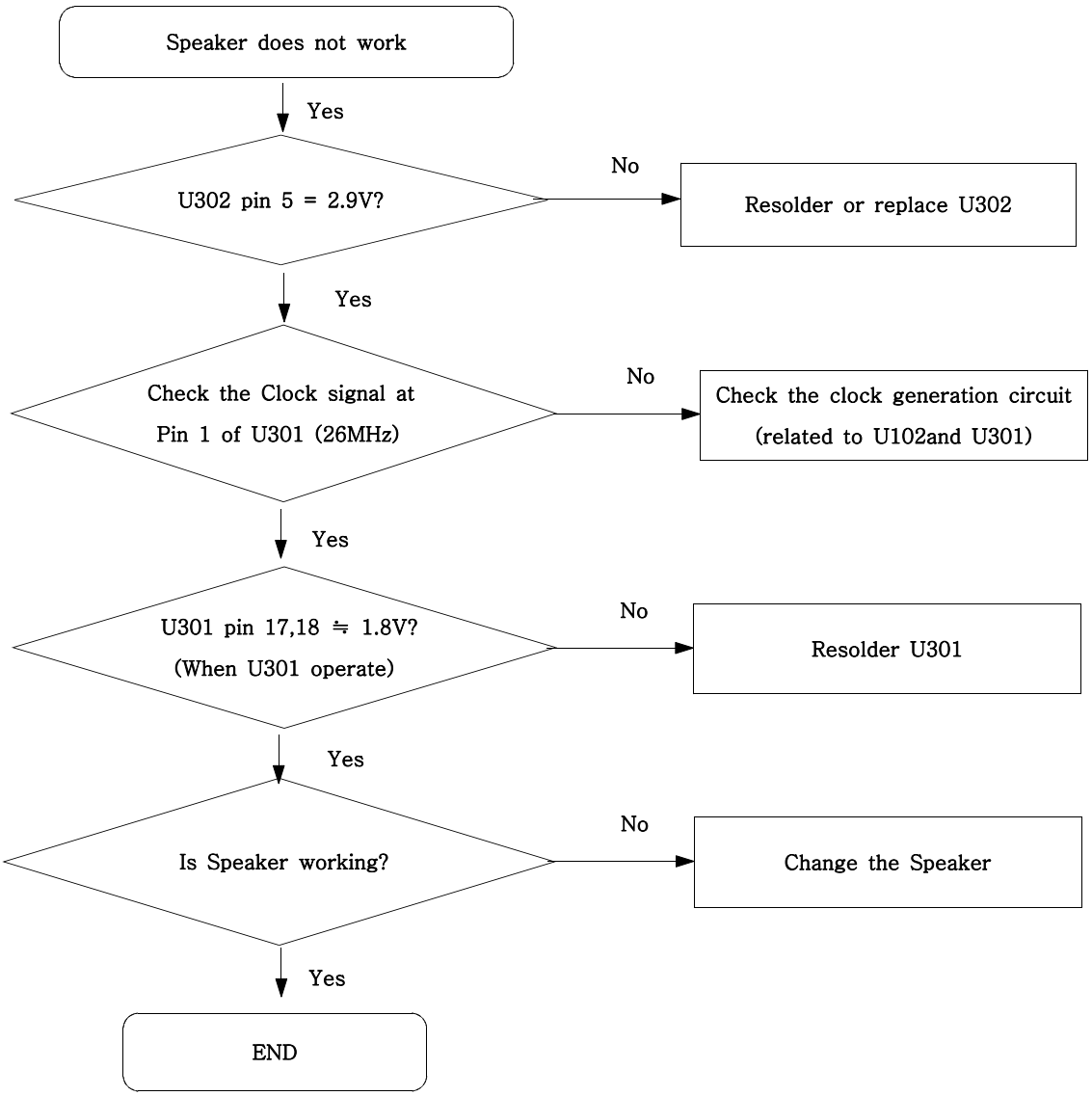


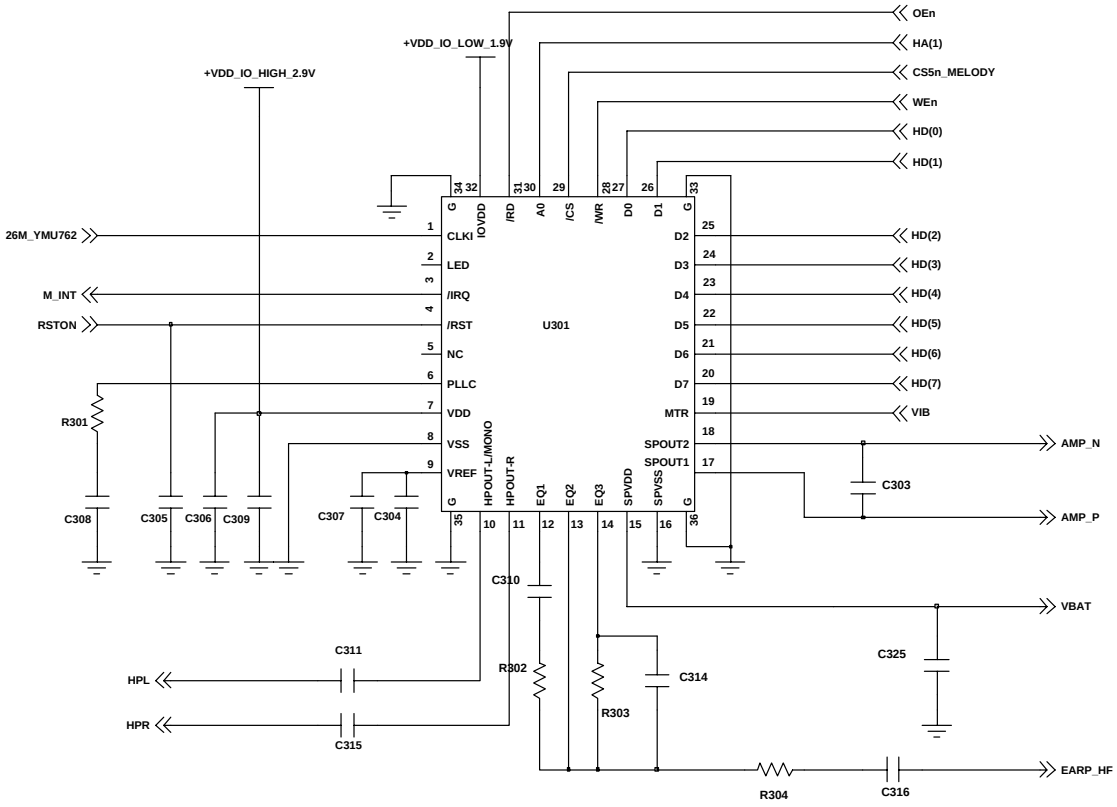


MAIN_MIC

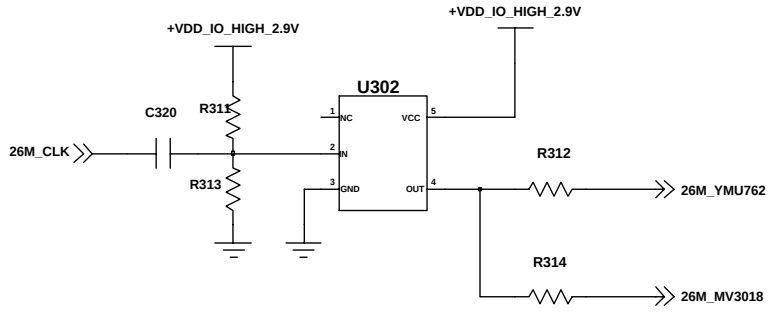


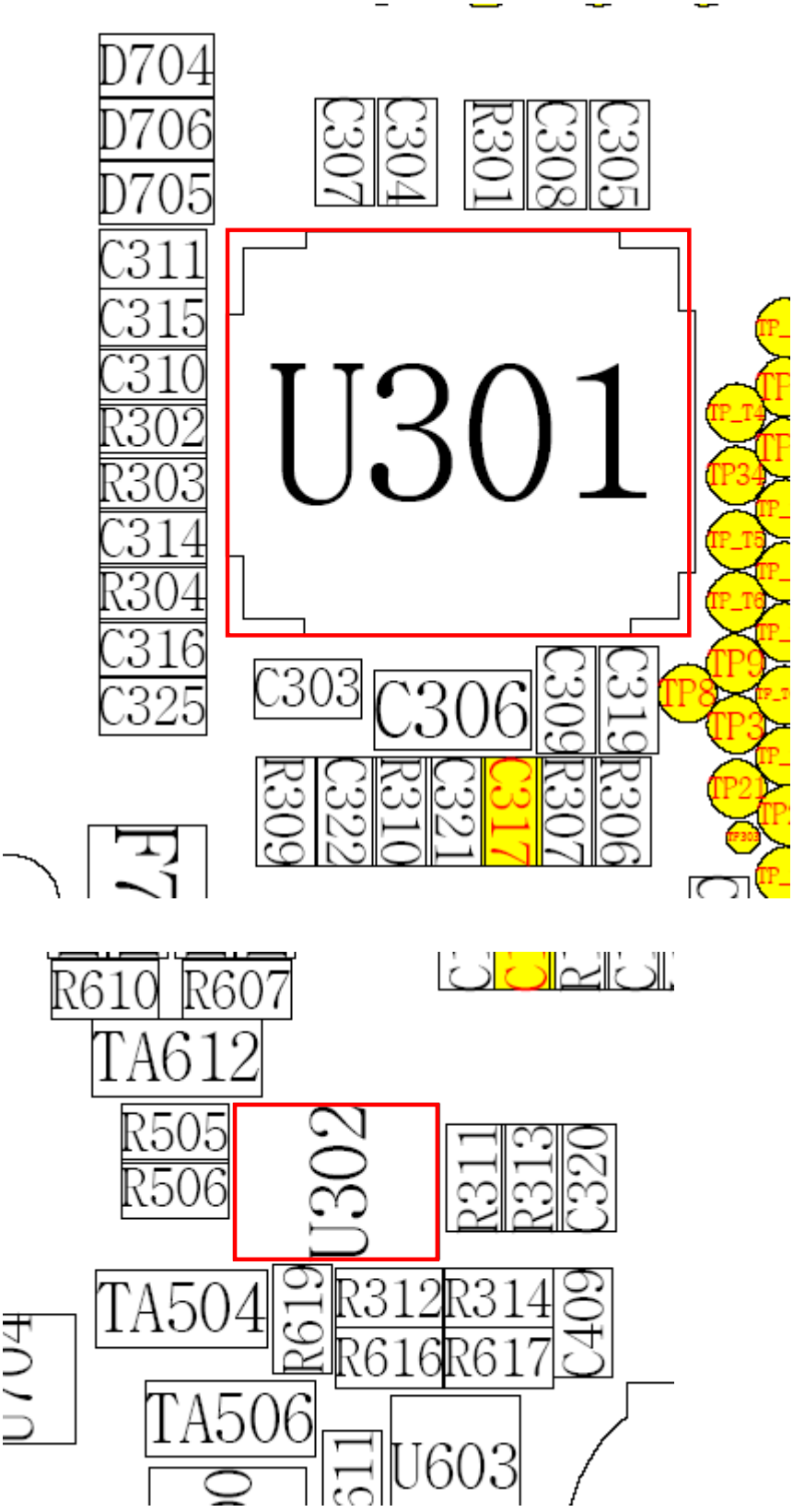
7-6. Speaker Part(Melody)



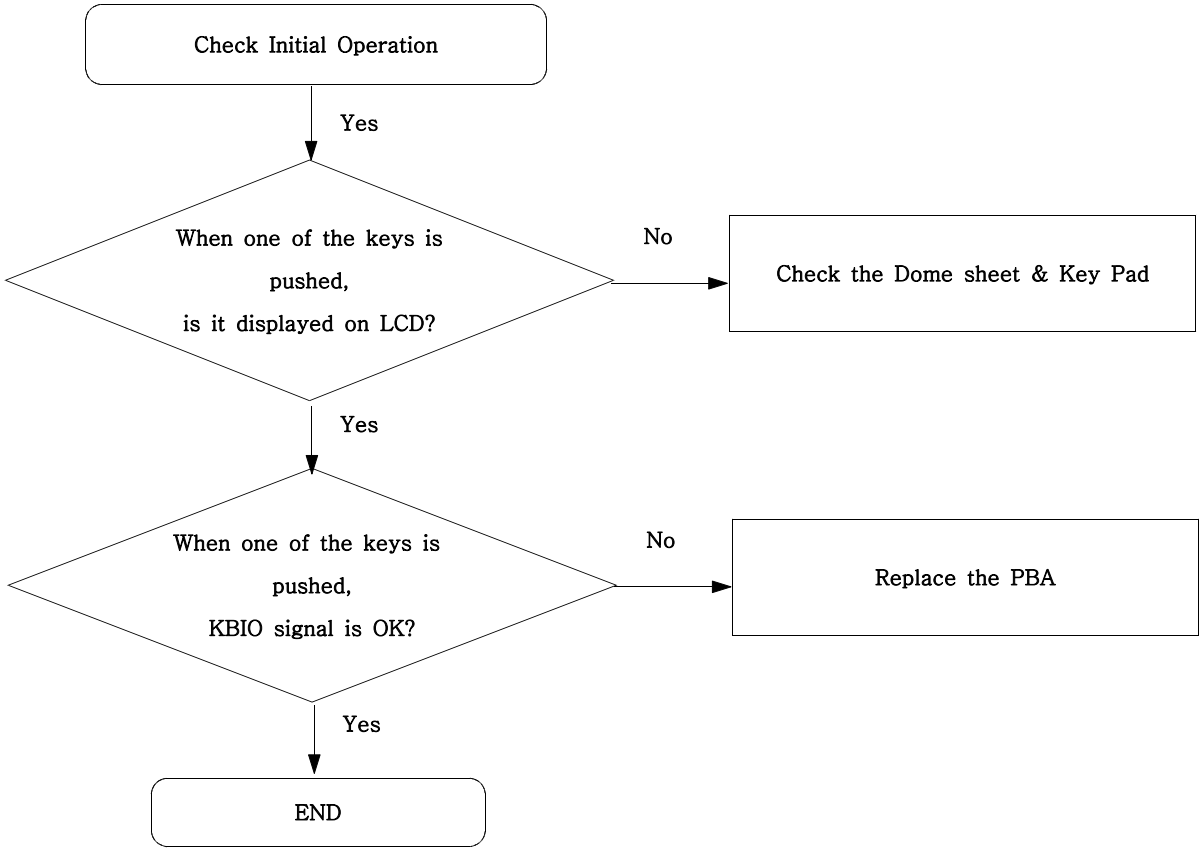


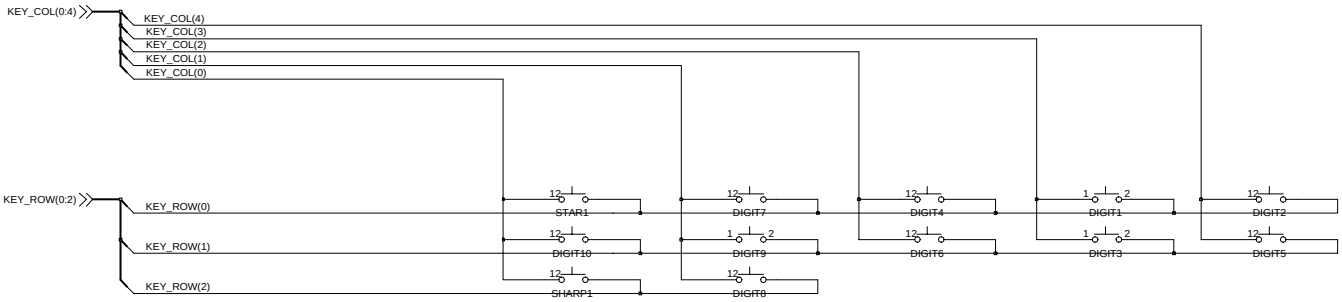
MELODY IC





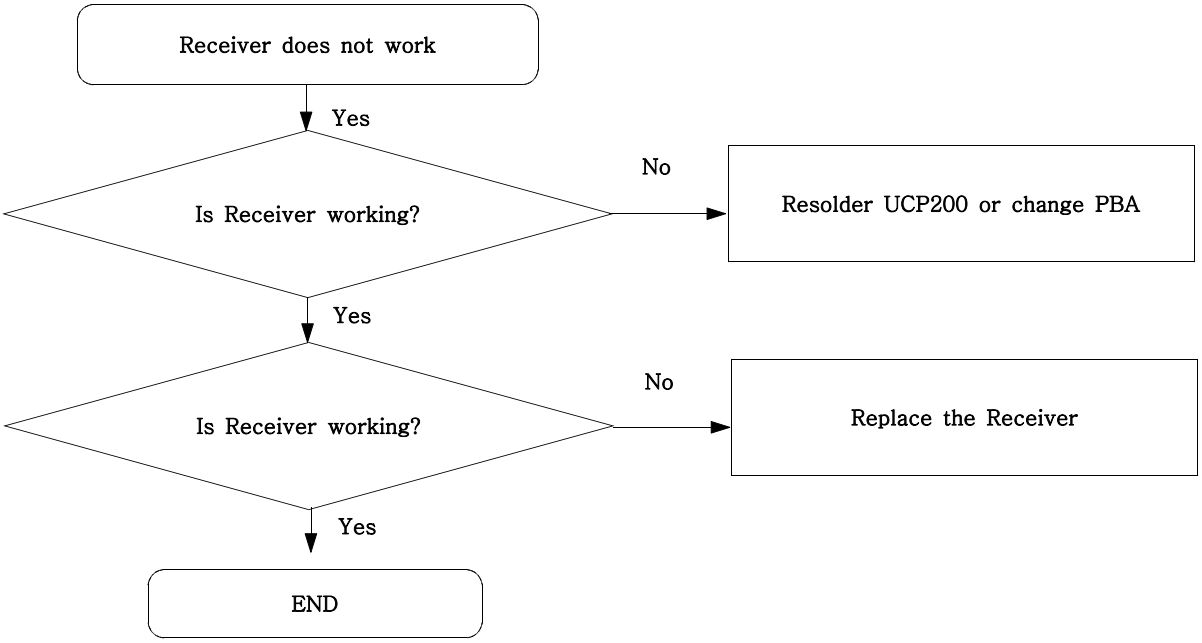
7-7. Key Data Input



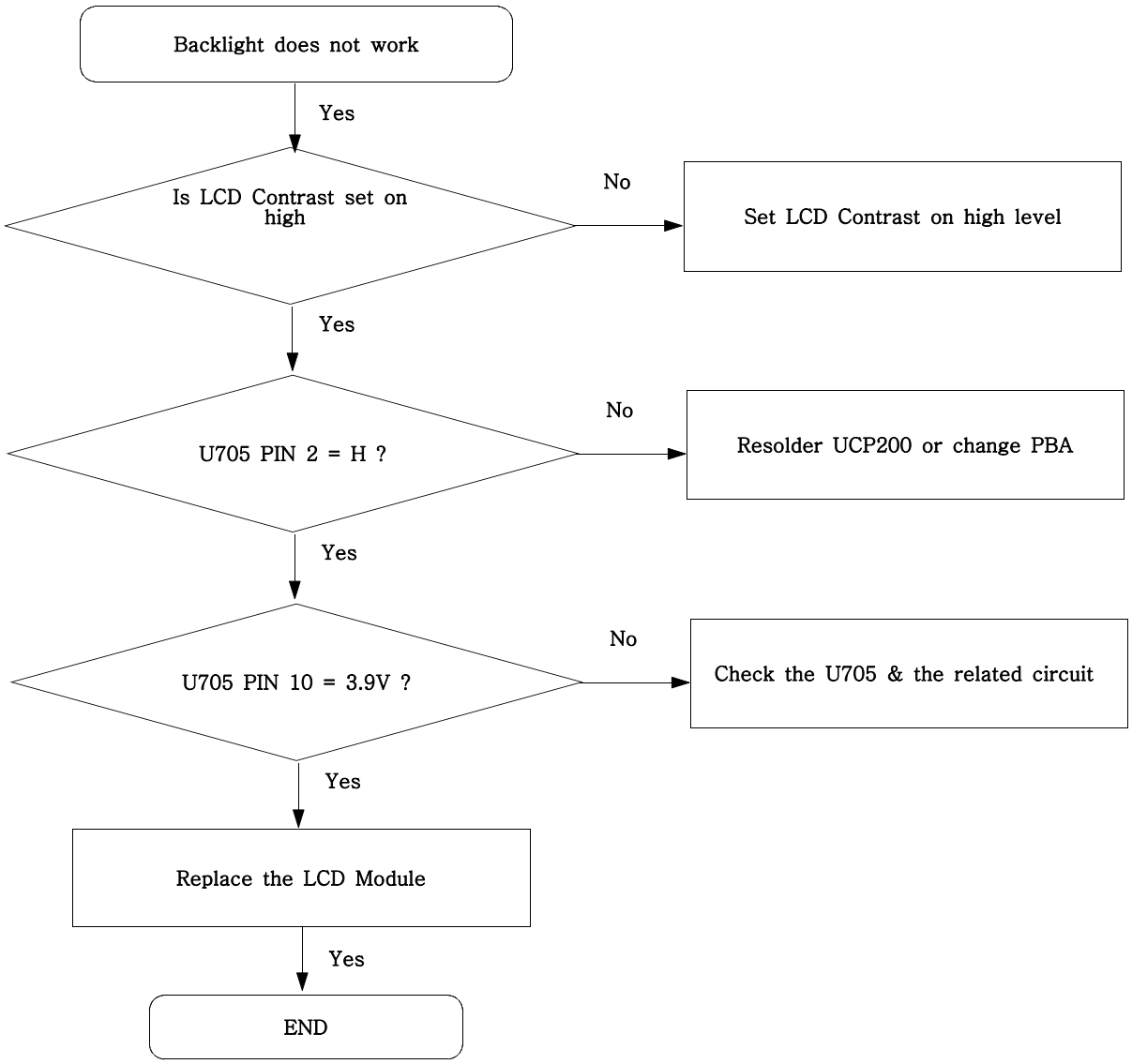


KEY_MAP

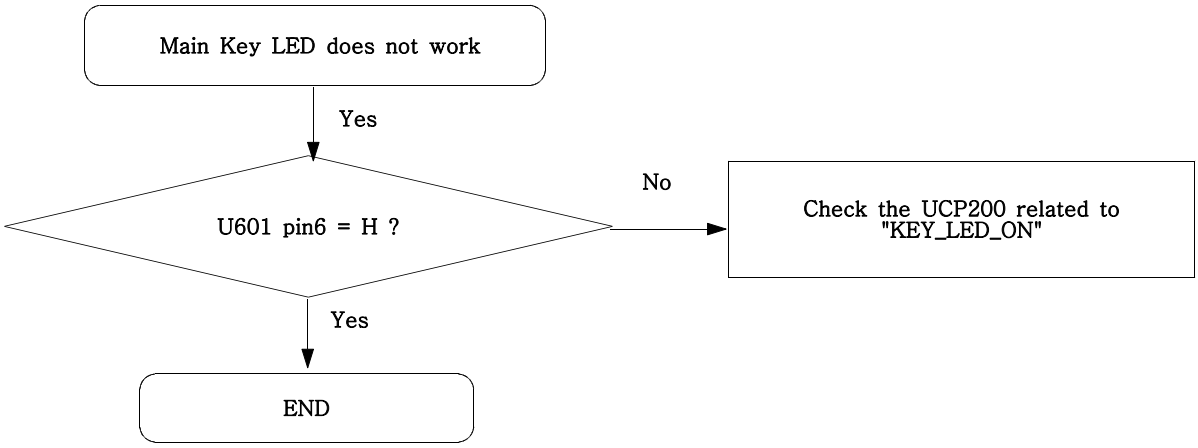
7-8. Receiver Part

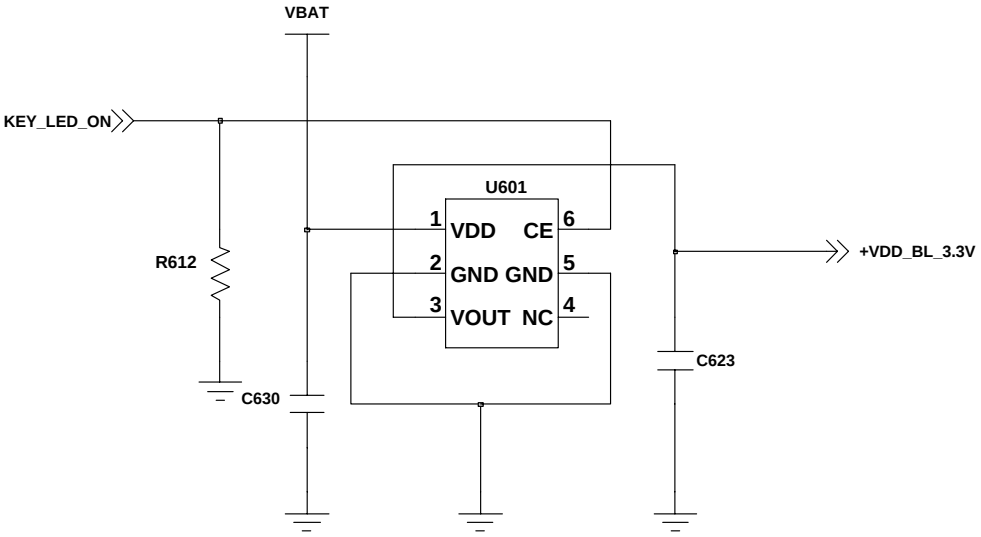


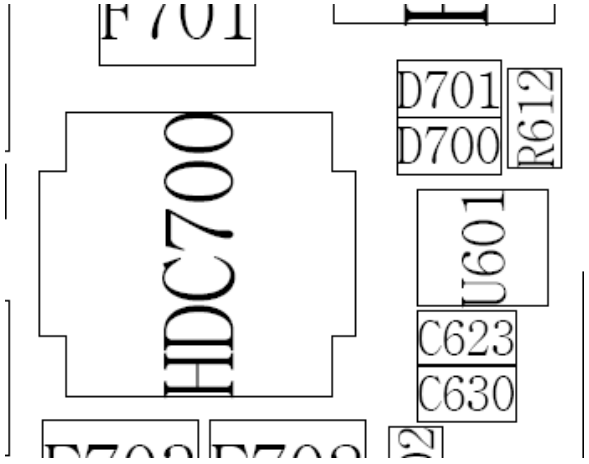
7-9. Back Light (for Color Main LCD)



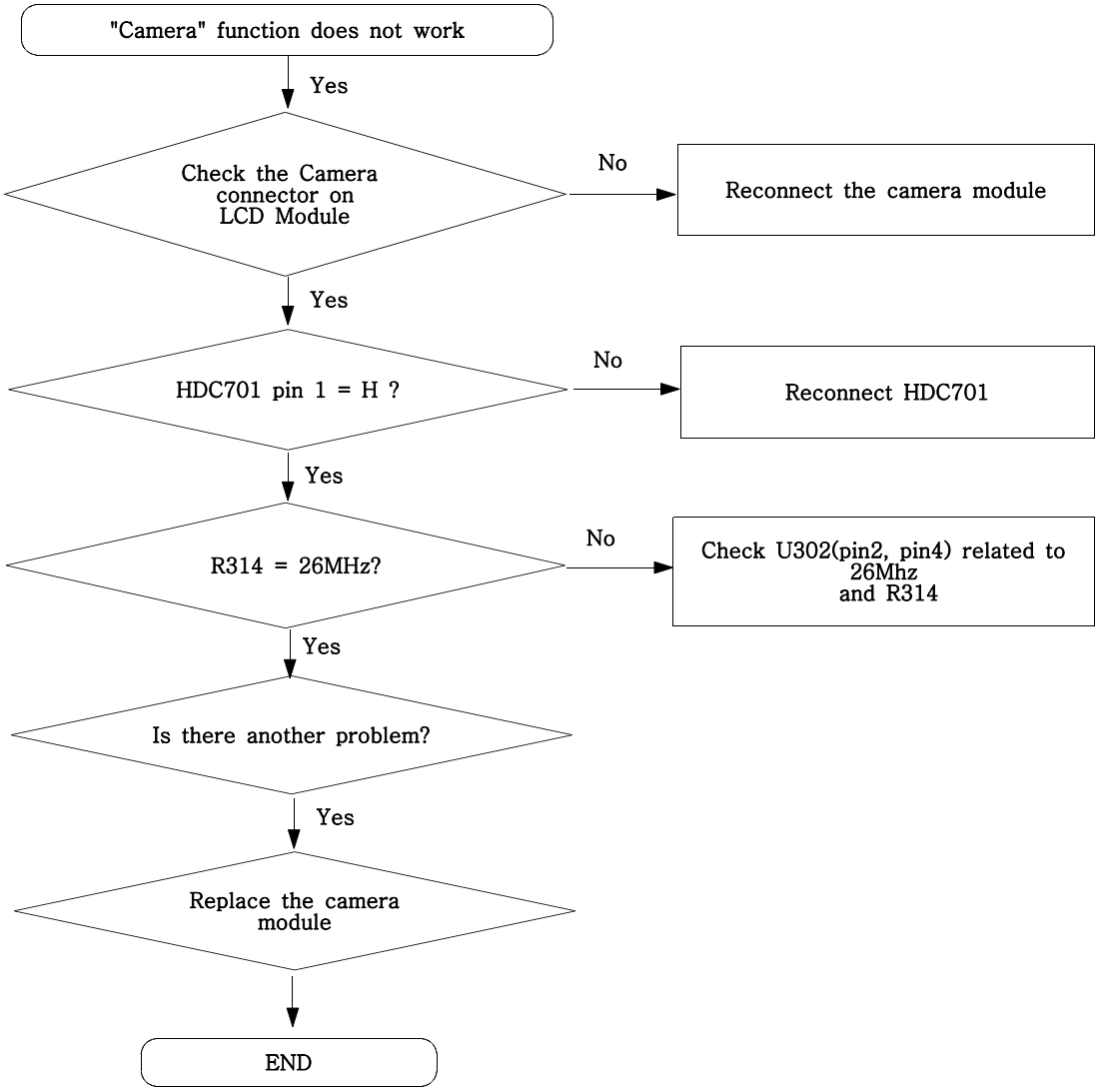
7-10. Key Back Light

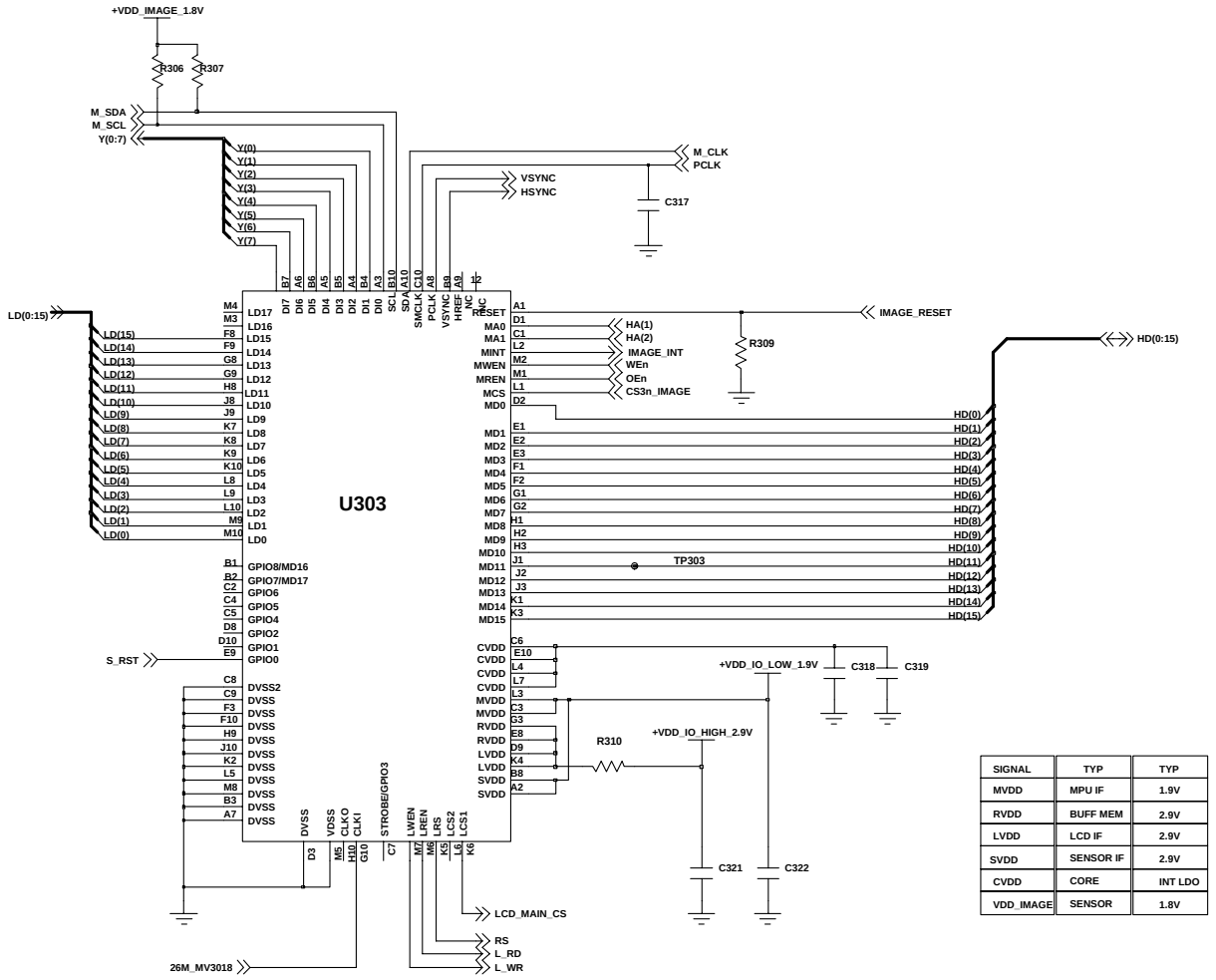




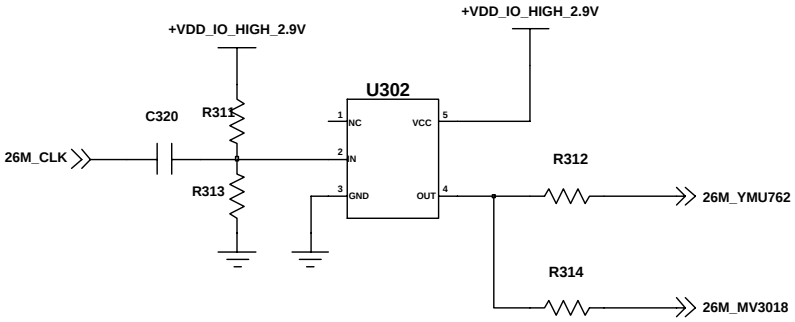


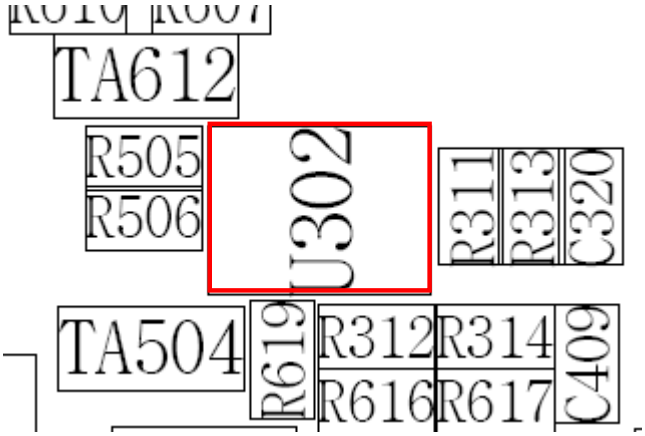
7-11. Camera part

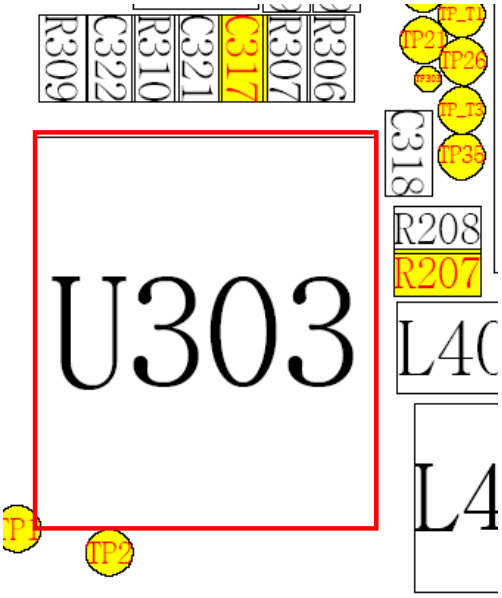




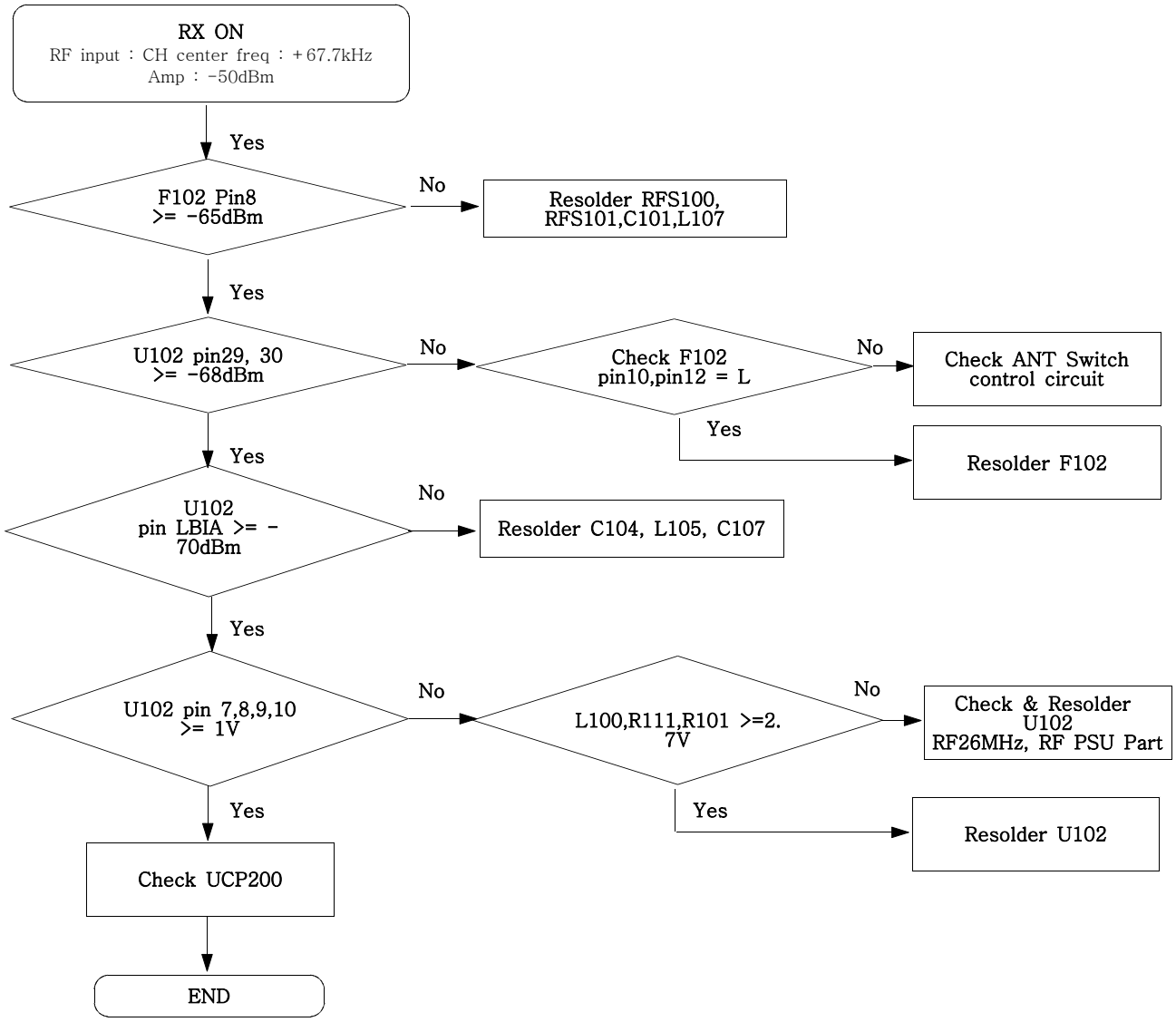
SIGNAL	TYP	TYP
MVDD	MPU IF	1.9V
RVDD	BUFF MEM	2.9V
LVDD	LCD IF	2.9V
SVDD	SENSOR IF	2.9V
CVDD	CORE	INT LDO
VDD_IMAGE	SENSOR	1.8V



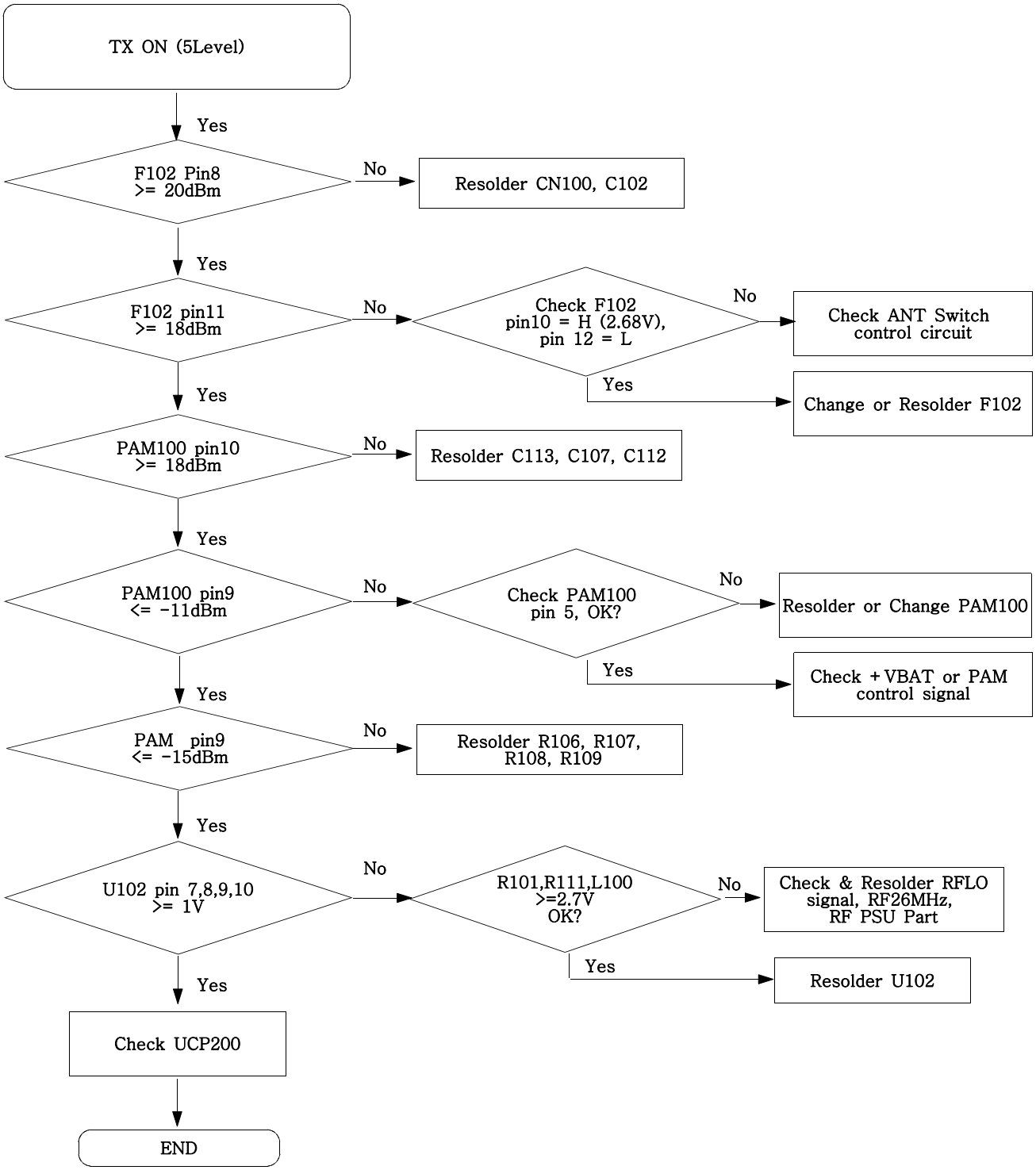




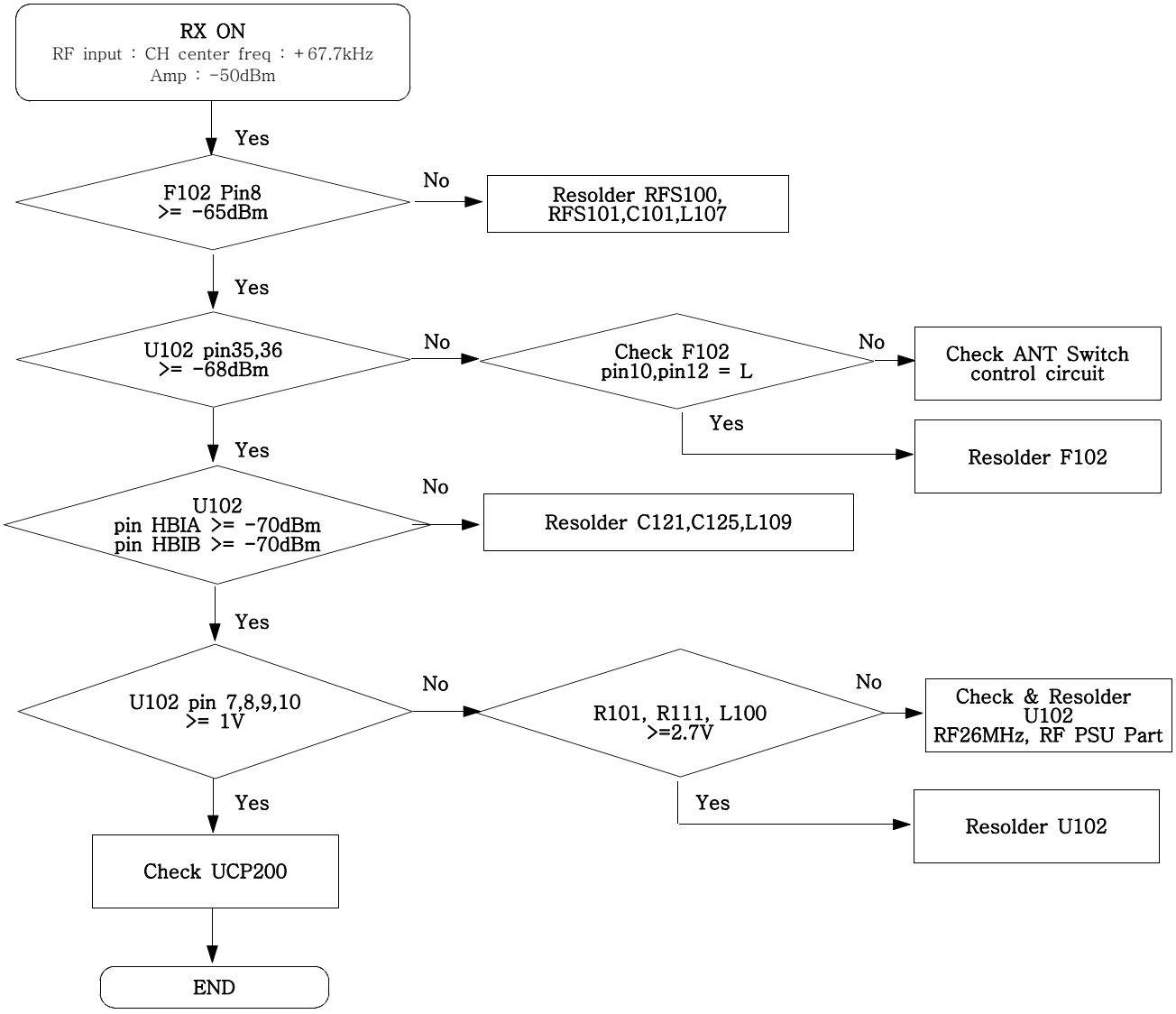
7-12. GSM Receiver



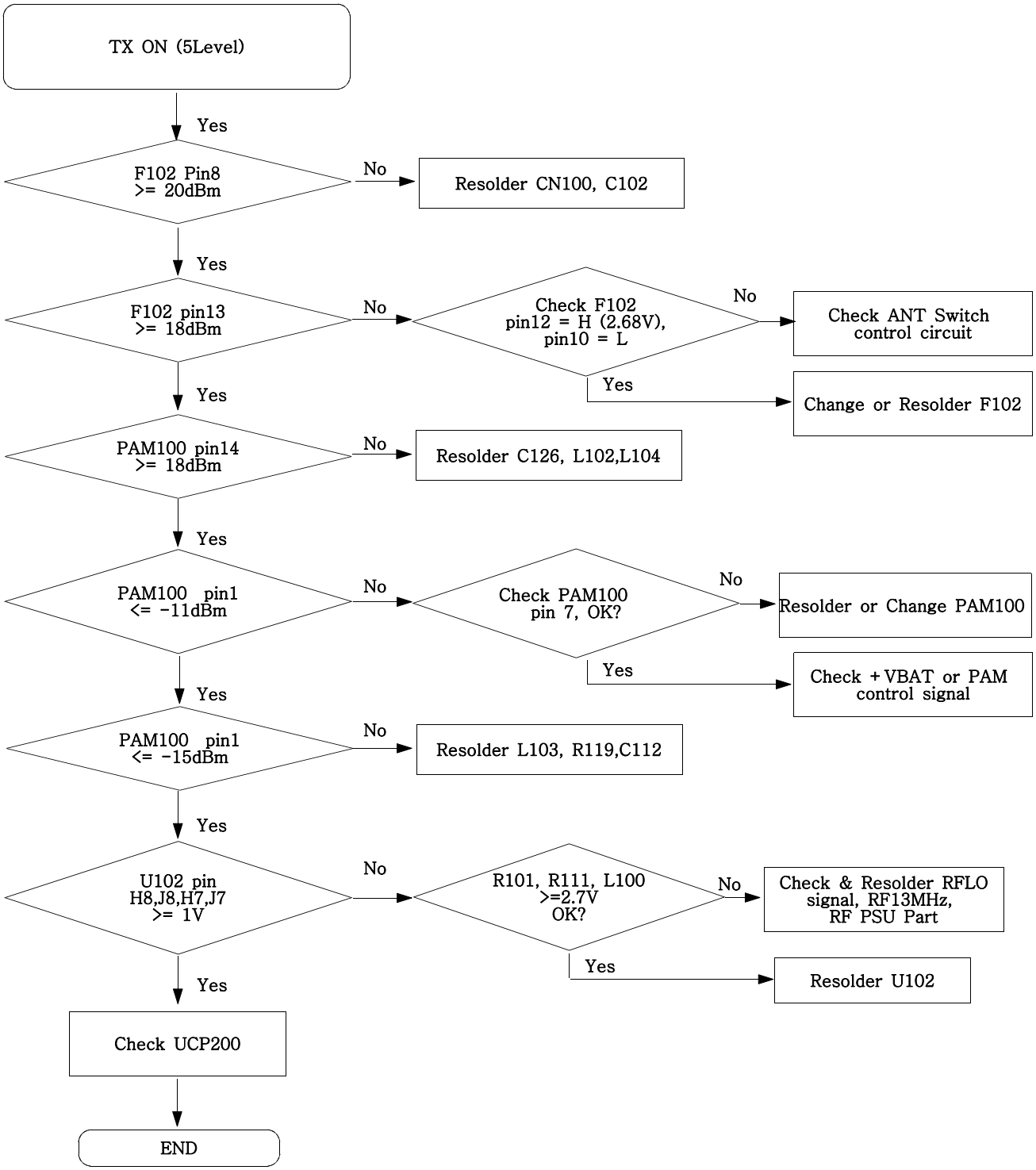
7-13. GSM Transmitter



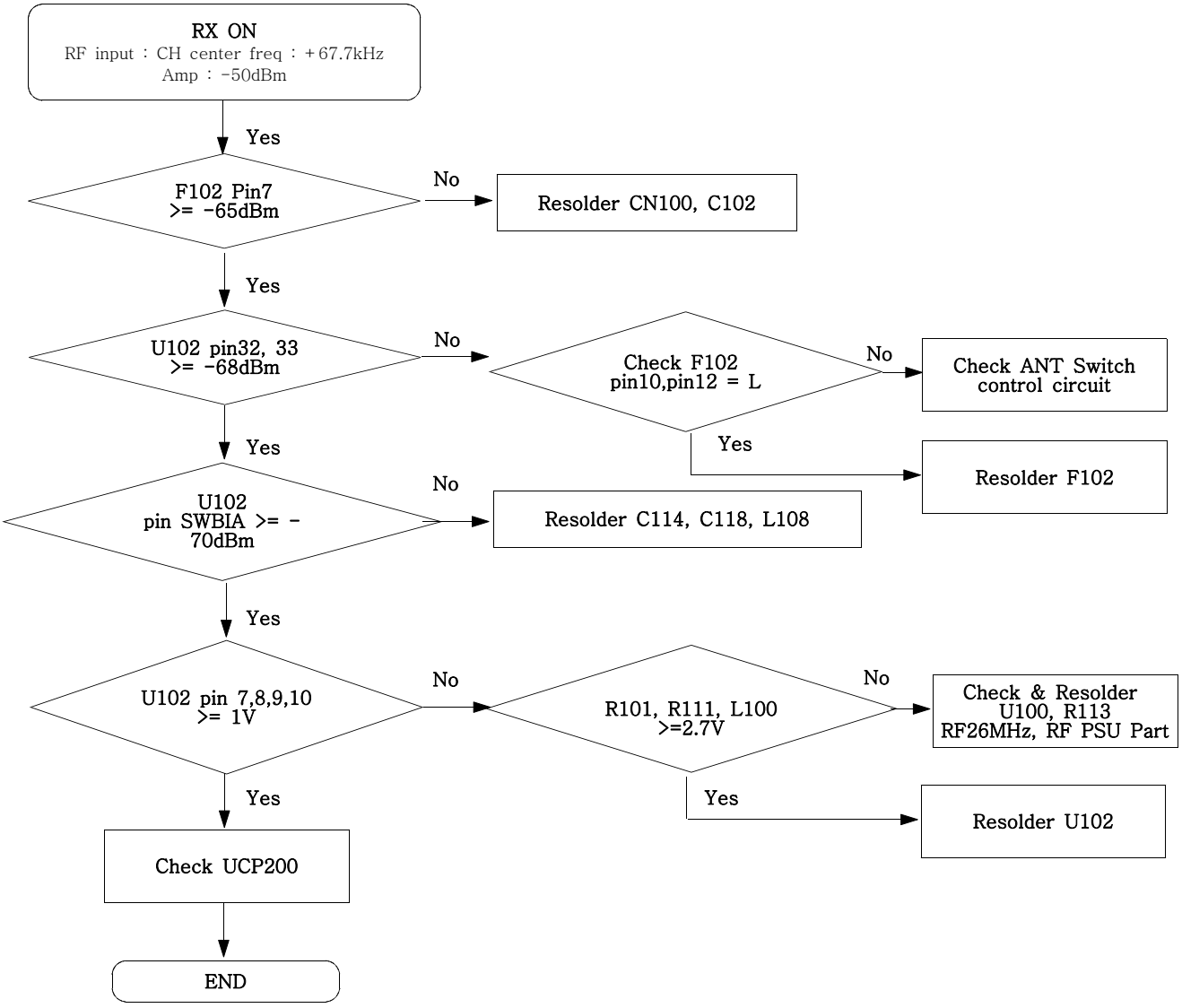
7-14. DCS Receiver



7-15. DCS Transmitter



7-16. PCS Receiver



7-17. PCS Transmitter