SAMSUNG

GSM TELEPHONE
SGH-X670

SERVICE Manual

GSM TELEPHONE

CONTENTS

SAMSUNG
ELECTRONICS

Code No.: GH68-09954A
BASIC.

1. Specification

1-1. GSM General Specification

	GSM900 Phase 1	EGSM 900 Phase 2	DCS1800 Phase 1	PCS1900
Freq. Band[MHz] Uplink/Downlink	890~915 935~960	880~915 925~960	1710~1785 1805~1880	1850~1910 1930~1990
ARFCN range	1~124	0~124 & 975~1023	512~885	512~810
Tx/Rx spacing	45MHz	45MHz	95MHz	80MHz
Mod. Bit rate / Bit Period	270.833kbps 3.692us	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	576.9us 4.615ms
Modulation	0.3GMSK	0.3GMSK	0.3GMSK	0.3GMSK
MS Power	33dBm~5dBm	33dBm~5dBm	30dBm~0dBm	30dBm~0dBm
Power Class	5pcl ~ 19pcl	5pcl ~ 19pcl	0pcl ~ 15pcl	0pcl ~ 15pcl
Sensitivity	-102dBm	-102dBm	-100dBm	-100dBm
TDMA Mux	8	8	8	8
Cell Radius	35Km	35Km	2Km	-

1-2. GSM TX power class

TX Power control level	GSM900
5	33±2 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±2 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±2 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

1-3. GSM EDGE TX power class

TX Power control level	GSM900
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
2	26 -4/+3 dBm
3	24±3 dBm
4	22±3 dBm
5	20±3 dBm
6	18±3 dBm
7	16±3 dBm
8	12±3 dBm
9	10±3 dBm
10	14±3 dBm
11	12±4 dBm
12	10±4 dBm
13	8±4dBm
14	6±4 dBm
15	4±4 dBm

TX Power control level	PCS1900
2	26 -4/+3 dBm
3	24±3 dBm
4	22±3 dBm
5	20±3 dBm
6	18±3 dBm
7	16±3 dBm
8	12±3 dBm
9	10±3 dBm
10	14±3 dBm
11	12±4 dBm
12	10±4 dBm
13	8±4dBm
14	6±4 dBm
15	4±4 dBm

2. Circuit Description

2-1. SGH-X670 RF Circuit Description

2-1-1. RX PART

- ANTENNA SWITCH (F101 Front End Module)

→ Switching Tx, Rx path for GSM900, DCS1800 and PCS1900 by logic controlling.

- ANTENNA SWITCH Control Losic (F101) → Truth Table

	VC1	VC2	VC3
Tx Mode (GSM900)	H	L	L
Tx Mode (DCS1800/1900)	L	H	L(H)
Rx Mode (GSM900)	L	L	L
Rx Mode (DCS1800)	L	L	L
Rx Mode (PCS1900)	L	L	H

- TRANSCEIVER (U102)

This chip is fully integrated GSM GPRS tri-band transceiver with transmit baluns(balanced-unbalanced matching devices) , 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 E-GSM900, 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.

-PAM(PAM101)

The module consists of two separated line-ups, one for low band(LB 850/900) and one for high band(HB,1800/1900) with input and output matching and internal power detection function and power control loop in GSM mode.

in GSM mode, the internal power control circuit ensures a stable power output, set by the level of V_{DAC} stabilsed to compensate variations of supply voltage, input power and temperature, with a control range fully compaliant with ETSI tome mask and power spectrum requirements

in EDGE mode the output power is controlled by the input power. The V_{REF} signal is used to control the efficiency by controlling the quiescent current of the final RF-statges of both line-ups.

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-X670

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 LEDs or to control a DC/DC converter that drives LCD backlight.

  This phone (SGH-X670) 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 65K UFB LCD) and sub LCD(color 65K UFB LCD)

Chip select signals in the U305, LCD_MAIN_CS, LCD_SUB_CS can enable LCD. DIM-EN signal enables white LED of main LCD. These signal is from U200.

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. BLUE TOOTH

This system uses Blue Tooth module, UGNZ6XG23A, ALPS. This has signals, "BT_INT"(Interrupt signal), "RXD2"(input data) and "TXD2"(output data), PCM control signal(DCL[PCMCLK], DO[PCM_IN], DU[PCM_OUT], FSC[PCM_SYNC]) These signals are connected to PCF5213EL1EL1.

2-2-4. 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 12 LEDs. key LED use the 3.3V LDO(U700) for a supply voltage. KEY_LED_ON signal enables eight white LED.

"FLIP" informs the status of slide (up or down) to the PCF5213EL1. This uses the hall effect IC, EM-1681-FT(U503). A magnet under LCD enables EM-1681-FT.

2-2-5. EMI ESD Filter

This system uses the EMI ESD filter, U500 to protect noise from IF CONNECTOR part.

2-2-6. IF connetor(IFC500)

It is 18-pin connector. They are designed to use VBAT, V_EXT_CHARGE, USB_D+, +VBUS, USB_D-, TXD1, RXD1, AUX_ON, EXT1, EXT2 and GND. They connected to power supply IC, microprocessor and signal processor IC.

2-2-7. Battery Charge Management

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

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.

2-2-8. Audio

HFR_P and HFR_N from PCF5213EL1 are connected to the main speaker via analog switches. MIC_P and MIC_N are connected to the main MIC as well. 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.

2-2-9. Memory(UME303)

This system uses Samsung's memory, KAP17VG00M. The KAP17VG00M is a Multi Chip Package Memory which combines 256Mbit Synchronous Burst Multi Bank NOR Flash Memory and 256Mbit NAND 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 Writing 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.

2-2-10. 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 KAP17SG00A (memory), MV3018B (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.

MV3018B(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.

2-2-11. TOH2600DGI4KRA (26MHz)(TCX101)

This system uses the 26MHz VCTCXO; TOH2600DGI4KRA. AFC control signal form PCF5213EL1 controls frequency from 26MHz x-tal. It generates the clock frequency. This clock is connected to PCF5213EL1, YMU762 and UAA3587C2.

2-2-12. Camera DSP(MV3017SAQ)(U305)

MV3018SAQ 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. MV3018SAQ 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.

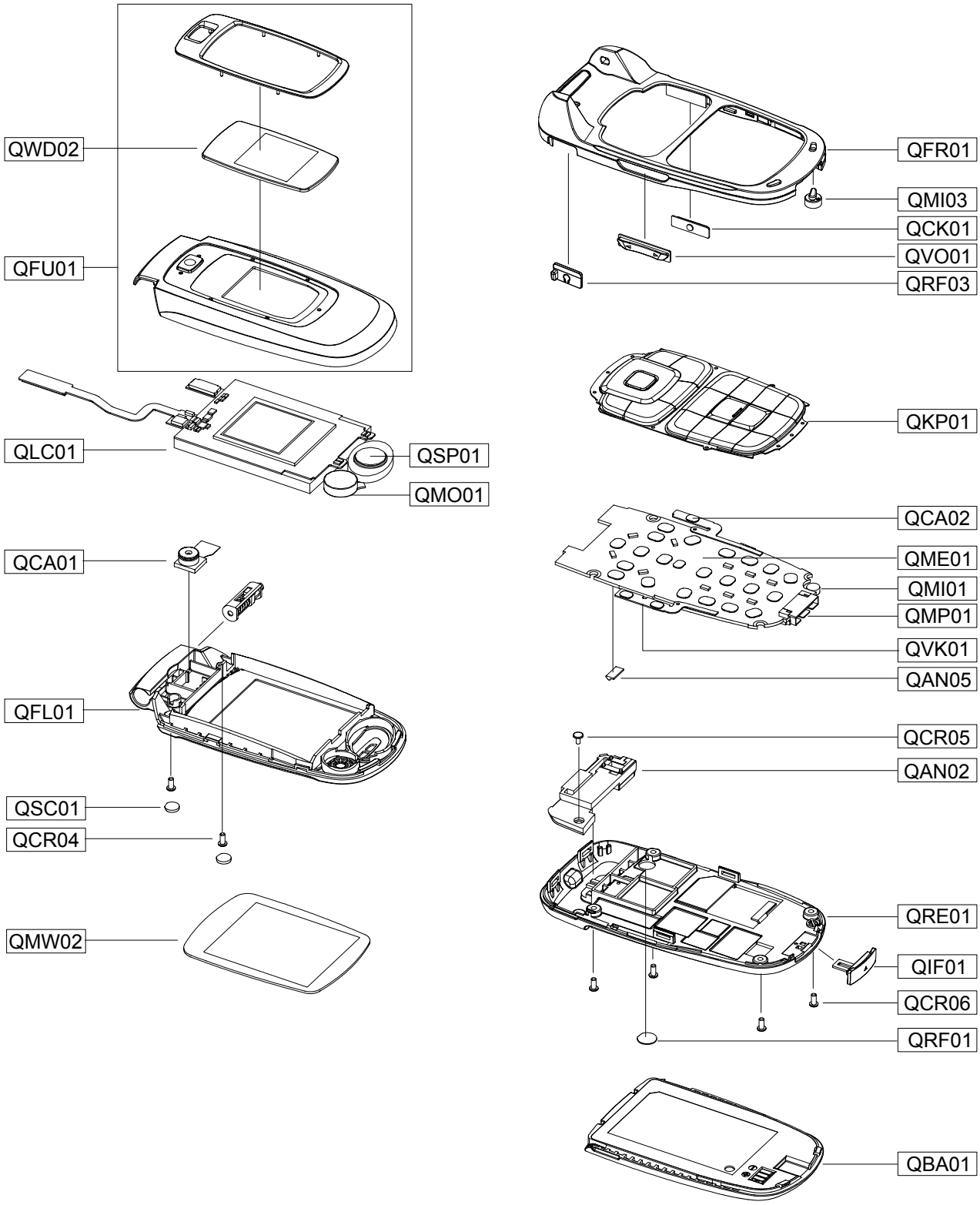
2-2-13. FM Radio (TEA5761UK)(U603)

The TEA5761 is a single chip electronically tuned FM stereo radio for low voltage application with fully integrated IF selectivity and demodulation.

TEA5761UK provide FM mixer for conversion of the US/Europe (87.5 MHz to 108 MHz) and Japanese FM band (76 MHz to 90 MHz) to IF.Preset tuning to receive Japanese TV audio up to 108 MHz, raster 100 kHz. and is connected to PCF5213EL1 of I2C.

3. Exploded View and Parts List

3-1. Exploded View

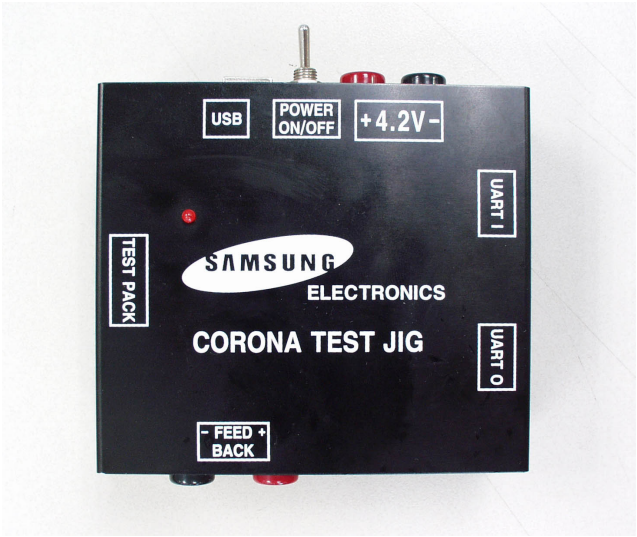


3-2. Parts List

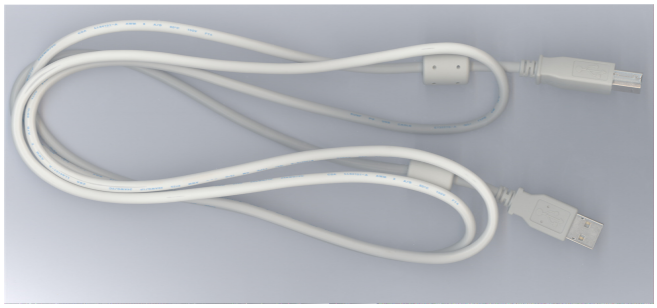
Location NO.		SEC CODE	Description
QSP01		SPEAKER	3001-001912
QCR06		SCREW-MACHINE	6001-001155
QCR05		SCREW-MACHINE	6001-001478
QCR04		SCREW-MACHINE	6001-001479
QMI01		MICROPHONE-ASSY-SGHX670	GH30-00248A
QMO01		MOTOR DC-SGHX670	GH31-00154E
QAN02		INTENNA-SGHX670	GH42-00753A
QBA01		BATTERY-800MAH,SIL,ENG,M	GH43-02348A
QME01		UNIT-METAL DOME	GH59-02873A
QVK01		UNIT-VOLUME KEY	GH59-02874A
QCA02		UNIT-CAMERA KEY	GH59-02875A
QCA01		UNIT-CAMERA	GH59-02876A
QRF03		PMO-COVER EAR	GH72-27157A
QIF01		PMO-COVER IF	GH72-27165A
QWD02		PCT-WINDOW SUB	GH72-27169A
QMW02		PCT-WINDOW MAIN	GH72-27171A
QRF01		MPR-SHEET RF	GH74-21697A
QAN05		MEC-INTENNA CONTACT	GH75-08168A
QFU01		MEC-CASE UPPER FOLDER	GH75-08684A
QFL01		MEC-CASE LOWER FOLDER	GH75-08685A
QRE01		MEC-CASE REAR	GH75-08687A
QKP01		MEC-KEYPAD(XEF/SIL)	GH75-09270A
QSC01		MEC-SCREW CAP	GH75-09586A
QMP01		PBA MAIN-SGHX670	GH92-02512A
QLC01		MEA-LCD MODULE KIT(X670)	GH97-05644A
QFR01		MEC-CASE FRONT	GH75-08686A
	QCK01	PMO-CAMERA KEY	GH72-27155A
	QMI03	RMO-MIC HOLDER	GH73-06436A
	QVO01	PMO-VOLUME KEY	GH72-27156A

SEC CODE	Description
BAG PE	6902-000634
ADAPTOR-TAD	GH44-00482A
UNIT-EARPHONE(SIL)	GH59-02472B
SPRING ETC-BATT LOCKER	GH61-00120A
LABEL(P)-IMEI	GH68-01335D
LABEL(P)-WATER SOAK	GH68-02026A
LABEL(R)-MAIN(EU)	GH68-09241A
MANUAL USERS-EU ITALIAN	GH68-09437A
CUSHION-CASE(1~2)	GH69-03629A
BOX(P)-SGHX670(EU)	GH69-03630A
MPR-BOHO VINYL LCD CONN	GH74-15350A
MPR-SHEET FILTER LCD FPCB	GH74-21694A
MPR-VINYL BOHO UPPER	GH74-21700A
MPR-VINYL BOHO MAIN LCD	GH74-21701A
MPR-VINYL BOHO LOWER	GH74-21702A
MPR-CUSHION LCD	GH74-22342A
MPR-TAPE FOAM CAMERA	GH74-22344A
MPR-TAPE INSULATION CAM CONN	GH74-22611A
MPR-GASKET UPPER	GH74-22612A
MPR-TAPE CONDUCTION DOME SHEET	GH74-22613A
MPR-TAPE INSULATION HALL IC	GH74-22614A
MPR-TAPE INSULATION J TAG	GH74-22615A
MPR-VINYL BOHO SUB	GH74-22719A
MEC-HANGER	GH75-03673B

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



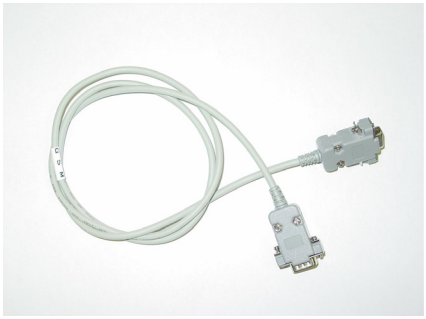
3-3-1. USB JIG Cable



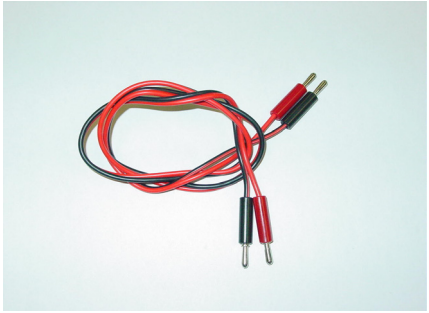
3-3-2. RF Test Cable (GH39-00283A)

3-3-3. Test Cable (GH39-00337A)

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



3-3-5. Power Supply Cable



3-3-6. DATA CABLE (GH39-00331A]

3-3-7. TA (GH44-00482A)

4. Electrical Parts List

Ddsign LOC	Discription	SEC Code	STATUS
ANT100	NPR-ANTENNA CONTACT	GH71-05666A	SNA
ANT101	NPR-ANTENNA CONTACT	GH71-05666A	SNA
ANT300	ANTENNA-CHIP	4202-001124	SA
BAT400	BATTERY-LI(2ND)	4302-001130	SA
BTC500	HEADER-BATTERY	3711-005897	SA
C101	C-CER,CHIP	2203-000278	SA
C105	C-CER,CHIP	2203-000278	SA
C106	C-CER,CHIP	2203-000812	SA
C109	C-CER,CHIP	2203-000278	SA
C112	C-CER,CHIP	2203-000812	SA
C113	C-CER,CHIP	2203-000233	SA
C114	C-CER,CHIP	2203-000233	SA
C115	C-CER,CHIP	2203-000812	SA
C116	C-CER,CHIP	2203-000233	SA
C117	C-CER,CHIP	2203-000812	SA
C118	C-CER,CHIP	2203-000233	SA
C119	C-CER,CHIP	2203-000812	SA
C123	C-CER,CHIP	2203-000278	SA
C124	C-CER,CHIP	2203-005281	SA
C125	C-CER,CHIP	2203-005281	SA
C126	C-CER,CHIP	2203-000233	SA
C130	C-CER,CHIP	2203-000854	SA
C131	C-CER,CHIP	2203-000854	SA
C132	C-CER,CHIP	2203-000254	SA
C134	C-CER,CHIP	2203-005444	SA
C136	C-CER,CHIP	2203-000530	SA
C137	C-CER,CHIP	2203-000233	SA
C142	C-CER,CHIP	2203-000278	SA
C143	C-CER,CHIP	2203-000278	SA
C144	C-CER,CHIP	2203-000812	SA
C200	C-CER,CHIP	2203-006562	SA
C201	C-CER,CHIP	2203-005482	SA
C202	C-CER,CHIP	2203-000254	SA
C203	C-CER,CHIP	2203-005482	SA
C204	C-CER,CHIP	2203-005482	SA
C205	C-CER,CHIP	2203-000812	SA
C206	C-CER,CHIP	2203-005482	SA
C207	C-CER,CHIP	2203-005482	SA
C208	C-CER,CHIP	2203-005482	SA
C209	C-CER,CHIP	2203-005482	SA
C210	C-CER,CHIP	2203-005482	SA
C211	C-CER,CHIP	2203-005482	SA
C212	C-CER,CHIP	2203-005482	SA
C213	C-CER,CHIP	2203-000812	SA
C214	C-CER,CHIP	2203-005482	SA
C217	C-CER,CHIP	2203-005482	SA
C222	C-CER,CHIP	2203-006260	SA
C223	C-CER,CHIP	2203-006260	SA
C300	C-CER,CHIP	2203-000679	SA
C301	C-CER,CHIP	2203-005482	SA
C302	C-CER,CHIP	2203-005482	SA
C303	C-CER,CHIP	2203-000438	SA
C304	C-CER,CHIP	2203-006348	SA
C305	C-CER,CHIP	2203-005482	SA
C306	C-CER,CHIP	2203-000438	SA
C307	C-CER,CHIP	2203-005993	SNA
C308	C-CER,CHIP	2203-005482	SA

Ddsign LOC	Discription	SEC Code	STATUS
C309	C-CER,CHIP	2203-005482	SA
C310	C-CER,CHIP	2203-005482	SA
C311	C-CER,CHIP	2203-006048	SA
C312	C-CER,CHIP	2203-000233	SA
C313	C-CER,CHIP	2203-000679	SA
C314	C-CER,CHIP	2203-005482	SA
C315	C-CER,CHIP	2203-005482	SA
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C322	C-CER,CHIP	2203-005482	SA
C323	C-CER,CHIP	2203-005482	SA
C401	C-CER,CHIP	2203-006208	SA
C402	C-CER,CHIP	2203-006562	SA
C403	C-CER,CHIP	2203-006562	SA
C404	C-CER,CHIP	2203-006324	SA
C405	C-CER,CHIP	2203-000627	SNA
C406	C-CER,CHIP	2203-005482	SA
C407	C-CER,CHIP	2203-000627	SNA
C408	C-CER,CHIP	2203-006257	SA
C409	C-CER,CHIP	2203-000233	SA
C410	C-TA,CHIP	2404-001381	SA
C411	C-CER,CHIP	2203-000812	SA
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C414	C-CER,CHIP	2203-006208	SA
C415	C-CER,CHIP	2203-006257	SA
C416	C-CER,CHIP	2203-006257	SA
C418	C-CER,CHIP	2203-006825	SA
C419	C-CER,CHIP	2203-005482	SA
C421	C-CER,CHIP	2203-001153	SA
C422	C-CER,CHIP	2203-006208	SA
C423	C-CER,CHIP	2203-006208	SA
C424	C-CER,CHIP	2203-006257	SA
C425	C-CER,CHIP	2203-006257	SA
C500	C-CER,CHIP	2203-002443	SA
C501	C-CER,CHIP	2203-006562	SA
C502	C-CER,CHIP	2203-005482	SA
C503	C-CER,CHIP	2203-005482	SA
C504	C-TA,CHIP	2404-001381	SA
C505	C-CER,CHIP	2203-005482	SA
C506	C-CER,CHIP	2203-006562	SA
C507	C-CER,CHIP	2203-000812	SA
C600	C-TA,CHIP	2404-001402	SA
C601	C-CER,CHIP	2203-000278	SA
C603	C-CER,CHIP	2203-005482	SA
C604	C-CER,CHIP	2203-001383	SA
C605	C-CER,CHIP	2203-005393	SA
C606	C-CER,CHIP	2203-005482	SA
C607	C-CER,CHIP	2203-000278	SA
C612	C-CER,CHIP	2203-005393	SA
C615	C-CER,CHIP	2203-000386	SA
C616	C-CER,CHIP	2203-005344	SA
C617	C-CER,CHIP	2203-000386	SA
C618	C-CER,CHIP	2203-006047	SA
C619	C-CER,CHIP	2203-000254	SA

Ddsign LOC	Discription	SEC Code	STATUS
C620	C-CER,CHIP	2203-000233	SA
C621	C-CER,CHIP	2203-006047	SA
C622	C-CER,CHIP	2203-006047	SA
C623	C-CER,CHIP	2203-000995	SA
C624	C-CER,CHIP	2203-000679	SA
C625	C-CER,CHIP	2203-006562	SA
C626	C-CER,CHIP	2203-005482	SA
C627	C-CER,CHIP	2203-006047	SA
C628	C-CER,CHIP	2203-006257	SA
C700	C-CER,CHIP	2203-006562	SA
C701	C-CER,CHIP	2203-006562	SA
C702	C-CER,CHIP	2203-006626	SA
C703	C-CER,CHIP	2203-005482	SA
C704	C-CER,CHIP	2203-005482	SA
C705	C-CER,CHIP	2203-000812	SA
C706	C-CER,CHIP	2203-000812	SA
C707	C-CER,CHIP	2203-001259	SA
C710	C-CER,CHIP	2203-005683	SA
C711	C-CER,CHIP	2203-005683	SA
C712	C-CER,CHIP	2203-005683	SA
C713	C-CER,CHIP	2203-005683	SA
C714	C-CER,CHIP	2203-005683	SA
C715	C-CER,CHIP	2203-005683	SA
C716	C-CER,CHIP	2203-005683	SA
C717	C-CER,CHIP	2203-005683	SA
C718	C-CER,CHIP	2203-005683	SA
C719	C-CER,CHIP	2203-005683	SA
C720	C-CER,CHIP	2203-005683	SA
C721	C-CER,CHIP	2203-005683	SA
C722	C-CER,CHIP	2203-005683	SA
C723	C-CER,CHIP	2203-005683	SA
D100	DIODE-TVS	0406-001231	SA
D600	DIODE-TVS	0406-001231	SA
D601	DIODE-TVS	0406-001231	SA
D602	DIODE-TVS	0406-001231	SA
D603	DIODE-TVS	0406-001231	SA
D700	DIODE-TVS	0406-001231	SA
D701	DIODE-TVS	0406-001231	SA
D702	DIODE-TVS	0406-001231	SA
D703	DIODE-TVS	0406-001231	SA
D704	DIODE-TVS	0406-001231	SA
D705	DIODE-TVS	0406-001231	SA
D706	DIODE-TVS	0406-001235	SA
D707	DIODE-TVS	0406-001235	SA
D708	DIODE-TVS	0406-001231	SA
D709	DIODE-TVS	0406-001231	SA
D710	DIODE-TVS	0406-001231	SA
D711	DIODE-TVS	0406-001235	SA
D712	DIODE-TVS	0406-001235	SA
D713	DIODE-TVS	0406-001231	SA
D714	DIODE-TVS	0406-001231	SA
D715	DIODE-TVS	0406-001231	SA
EAR600	JACK-PHONE	3722-002082	SA
F101	DUPLEXER-ASM	2911-000018	SA
F102	FILTER-EMI SMD	2901-001254	SA
F103	FILTER-SAW	2904-001553	SA
F700	FILTER-EMI SMD	2901-001286	SA

Ddsign LOC	Discription	SEC Code	STATUS
F701	FILTER-EMI SMD	2901-001286	SA
F702	FILTER-EMI SMD	2901-001286	SA
F703	FILTER-EMI SMD	2901-001286	SA
F704	FILTER-EMI SMD	2901-001286	SA
HDC700	HEADER-BOARD TO BOARD	3711-005918	SA
IFC500	CONNECTOR-INTERFACE	3710-001994	SA
L101	R-CHIP	2007-000171	SA
L102	INDUCTOR-SMD	2703-001747	SA
L104	R-CHIP	2007-000171	SA
L106	INDUCTOR-SMD	2703-002314	SA
L108	INDUCTOR-SMD	2703-002313	SA
L110	INDUCTOR-SMD	2703-002485	SA
L111	INDUCTOR-SMD	2703-001752	SA
L112	INDUCTOR-SMD	2703-002267	SA
L114	BEAD-SMD	3301-001729	SA
L115	INDUCTOR-SMD	2703-002268	SA
L116	INDUCTOR-SMD	2703-002199	SA
L117	INDUCTOR-SMD	2703-002268	SA
L200	BEAD-SMD	3301-001789	SA
L300	INDUCTOR-SMD	2703-001752	SA
L400	BEAD-SMD	3301-001120	SA
L401	INDUCTOR-SMD	2703-002840	SA
L500	BEAD-SMD	3301-001534	SA
L600	BEAD-SMD	3301-001438	SA
L601	BEAD-SMD	3301-001438	SA
L603	INDUCTOR-SMD	2703-001231	SA
L604	INDUCTOR-SMD	2703-001673	SA
L605	INDUCTOR-SMD	2703-002206	SA
L606	BEAD-SMD	3301-001756	SA
L607	BEAD-SMD	3301-001756	SA
L608	BEAD-SMD	3301-001756	SA
LED700	LED	0601-002055	SA
LED701	LED	0601-002055	SA
LED702	LED	0601-002055	SA
LED703	LED	0601-002055	SA
LED704	LED	0601-002055	SA
LED705	LED	0601-002055	SA
LED706	LED	0601-002055	SA
LED707	LED	0601-002055	SA
LED708	LED	0601-002055	SA
LED709	LED	0601-002055	SA
LED710	LED	0601-002055	SA
LED711	LED	0601-002055	SA
OSC400	CRYSTAL-SMD	2801-004373	SA
PAM101	IC-POWER AMP	1201-002280	SA
Q300	FET-SILICON	0505-001923	SA
Q500	TR-DIGITAL	0504-001151	SA
R107	R-CHIP	2007-000148	SA
R108	R-CHIP	2007-000172	SA
R109	R-CHIP	2007-000566	SA
R110	R-CHIP	2007-003001	SA
R111	R-CHIP	2007-000566	SA
R113	R-CHIP	2007-000932	SA
R114	R-CHIP	2007-000932	SA
R115	R-CHIP	2007-000171	SA
R116	R-CHIP	2007-000140	SA
R117	R-CHIP	2007-001288	SA

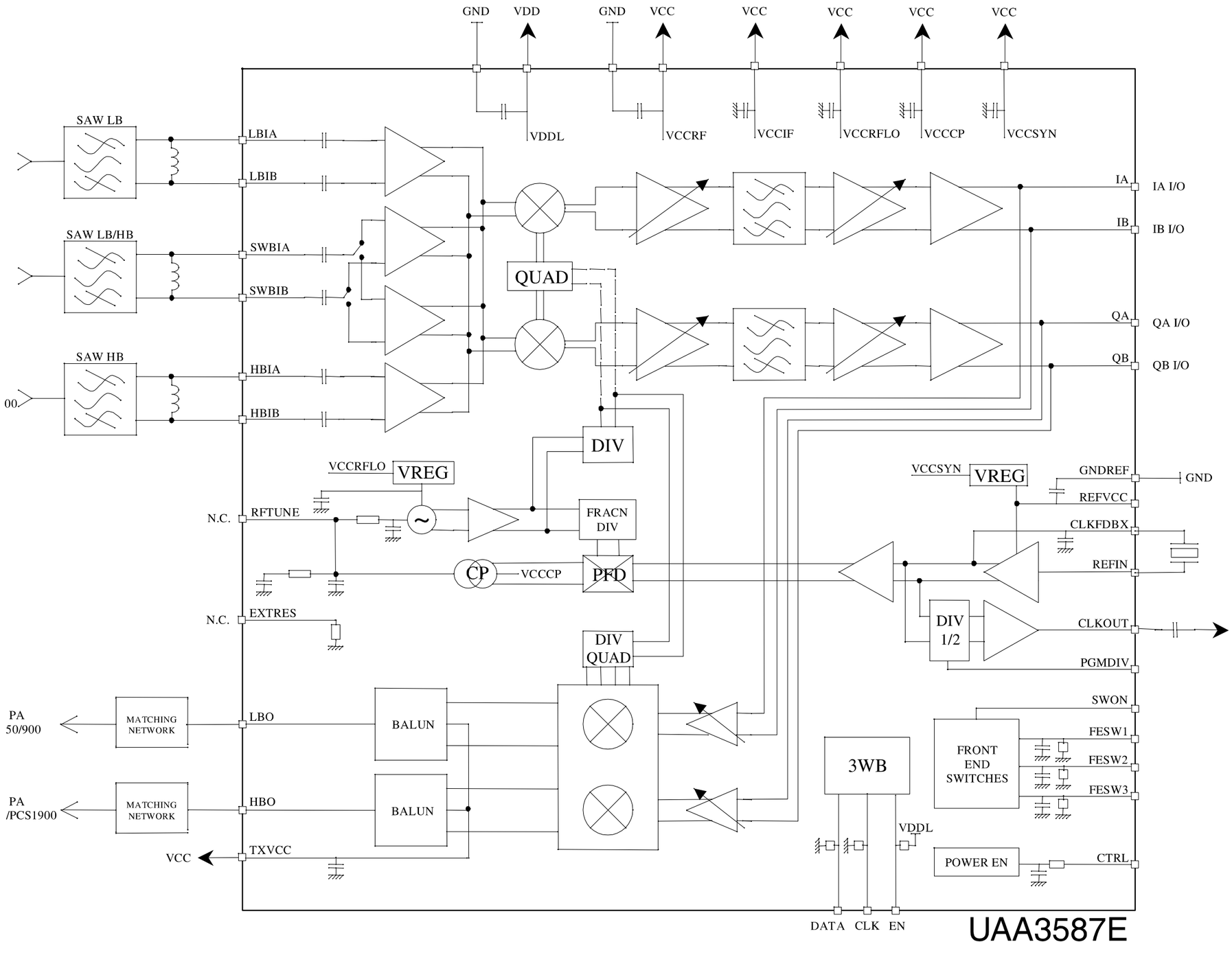
Ddsign LOC	Discription	SEC Code	STATUS
R118	R-CHIP	2007-001313	SA
R119	R-CHIP	2007-001313	SA
R120	R-CHIP	2007-000171	SA
R121	R-CHIP	2007-000171	SA
R122	R-CHIP	2007-000171	SA
R123	R-CHIP	2007-000171	SA
R124	R-CHIP	2007-000171	SA
R125	R-CHIP	2007-000171	SA
R200	R-CHIP	2007-000171	SA
R201	R-CHIP	2007-000148	SA
R203	R-CHIP	2007-000162	SA
R204	R-CHIP	2007-000171	SA
R205	R-CHIP	2007-000171	SA
R207	R-CHIP	2007-000171	SA
R208	R-CHIP	2007-000171	SA
R214	R-CHIP	2007-007137	SA
R215	R-CHIP	2007-007137	SA
R217	R-NET	2011-001394	SA
R218	R-CHIP	2007-000143	SA
R220	R-CHIP	2007-000171	SA
R300	R-CHIP	2007-001325	SA
R301	R-CHIP	2007-000162	SA
R302	R-CHIP	2007-000171	SA
R303	R-CHIP	2007-000155	SA
R304	R-CHIP	2007-000171	SA
R305	R-CHIP	2007-000137	SA
R306	R-CHIP	2007-001329	SA
R307	R-CHIP	2007-000162	SA
R308	R-CHIP	2007-000148	SA
R309	R-CHIP	2007-000162	SA
R310	R-CHIP	2007-000171	SA
R311	R-CHIP	2007-000141	SA
R312	R-CHIP	2007-000141	SA
R313	R-CHIP	2007-007014	SA
R314	R-CHIP	2007-001303	SA
R315	R-CHIP	2007-007014	SA
R316	R-CHIP	2007-000171	SA
R319	R-CHIP	2007-000171	SA
R320	R-CHIP	2007-000171	SA
R321	R-CHIP	2007-000171	SA
R401	R-CHIP	2007-000148	SA
R402	R-CHIP	2007-007100	SA
R403	R-CHIP	2007-000162	SA
R404	R-CHIP	2007-000171	SA
R405	R-CHIP	2007-000162	SA
R406	R-CHIP	2007-002796	SA
R500	R-CHIP	2007-000162	SA
R501	R-CHIP	2007-000758	SA
R502	R-CHIP	2007-000758	SA
R503	R-CHIP	2007-000162	SA
R504	R-CHIP	2007-000148	SA
R505	R-CHIP	2007-007334	SA
R506	R-CHIP	2007-000152	SA
R508	R-CHIP	2007-000170	SA
R509	R-CHIP	2007-000170	SA
R510	R-CHIP	2007-007573	SA
R511	R-CHIP	2007-000137	SA

Ddsign LOC	Discription	SEC Code	STATUS
R512	R-CHIP	2007-007334	SA
R513	R-CHIP	2007-000162	SA
R514	R-CHIP	2007-008275	SA
R515	R-CHIP	2007-007489	SA
R516	R-CHIP	2007-000172	SA
R517	R-CHIP	2007-000172	SA
R601	R-CHIP	2007-000242	SA
R602	R-CHIP	2007-000148	SA
R603	R-CHIP	2007-000242	SA
R604	R-CHIP	2007-002796	SA
R605	R-CHIP	2007-000831	SA
R606	R-CHIP	2007-000162	SA
R607	R-CHIP	2007-000171	SA
R608	R-CHIP	2007-000171	SA
R611	R-CHIP	2007-000162	SA
R612	R-CHIP	2007-001339	SA
R616	R-CHIP	2007-000138	SA
R617	R-CHIP	2007-000775	SA
R618	R-CHIP	2007-001325	SA
R619	R-CHIP	2007-000171	SA
R621	R-CHIP	2007-000162	SA
R624	R-CHIP	2007-000171	SA
R625	R-CHIP	2007-000140	SA
R700	R-CHIP	2007-007009	SA
R701	R-CHIP	2007-007009	SA
R702	R-CHIP	2007-007009	SA
R703	R-CHIP	2007-007009	SA
R704	R-CHIP	2007-007009	SA
R705	R-CHIP	2007-007009	SA
R706	R-CHIP	2007-007009	SA
R707	R-CHIP	2007-007009	SA
R708	R-CHIP	2007-007009	SA
R709	R-CHIP	2007-007009	SA
R710	R-CHIP	2007-007009	SA
R711	R-CHIP	2007-007009	SA
R713	R-CHIP	2007-000171	SA
R715	R-CHIP	2007-000170	SA
R716	R-CHIP	2007-000138	SA
R717	R-CHIP	2007-000138	SA
R718	R-CHIP	2007-000138	SA
R719	R-CHIP	2007-000138	SA
R720	R-CHIP	2007-000138	SA
RFS101	CONNECTOR-COAXIAL	3705-001358	SA
SIM400	CONNECTOR-CARD EDGE	3709-001229	SA
TA101	C-TA,CHIP	2404-001411	SA
TCX101	OSCILLATOR-VCTCXO	2809-001281	SA
U102	IC-TRANSCEIVER	1205-002817	SA
U300	IC-MELODY	1204-002161	SA
U301	BLUETOOTH MODULE	4709-001422	SA
U302	IC-CMOS LOGIC	0801-003025	SA
U304	IC-CMOS LOGIC	0801-003025	SA
U305	IC ASIC-SGHX670	GH13-00036A	SA
U400	IC-POWER SUPERVISOR	1203-003882	SA
U401	IC-POSI.FIXED REG.	1203-003531	SA
U402	IC-DC/DC CONVERTER	1203-003974	SA
U500	DIODE-TVS	0406-001188	SA
U501	FILTER-EMI SMD	2901-001315	SA

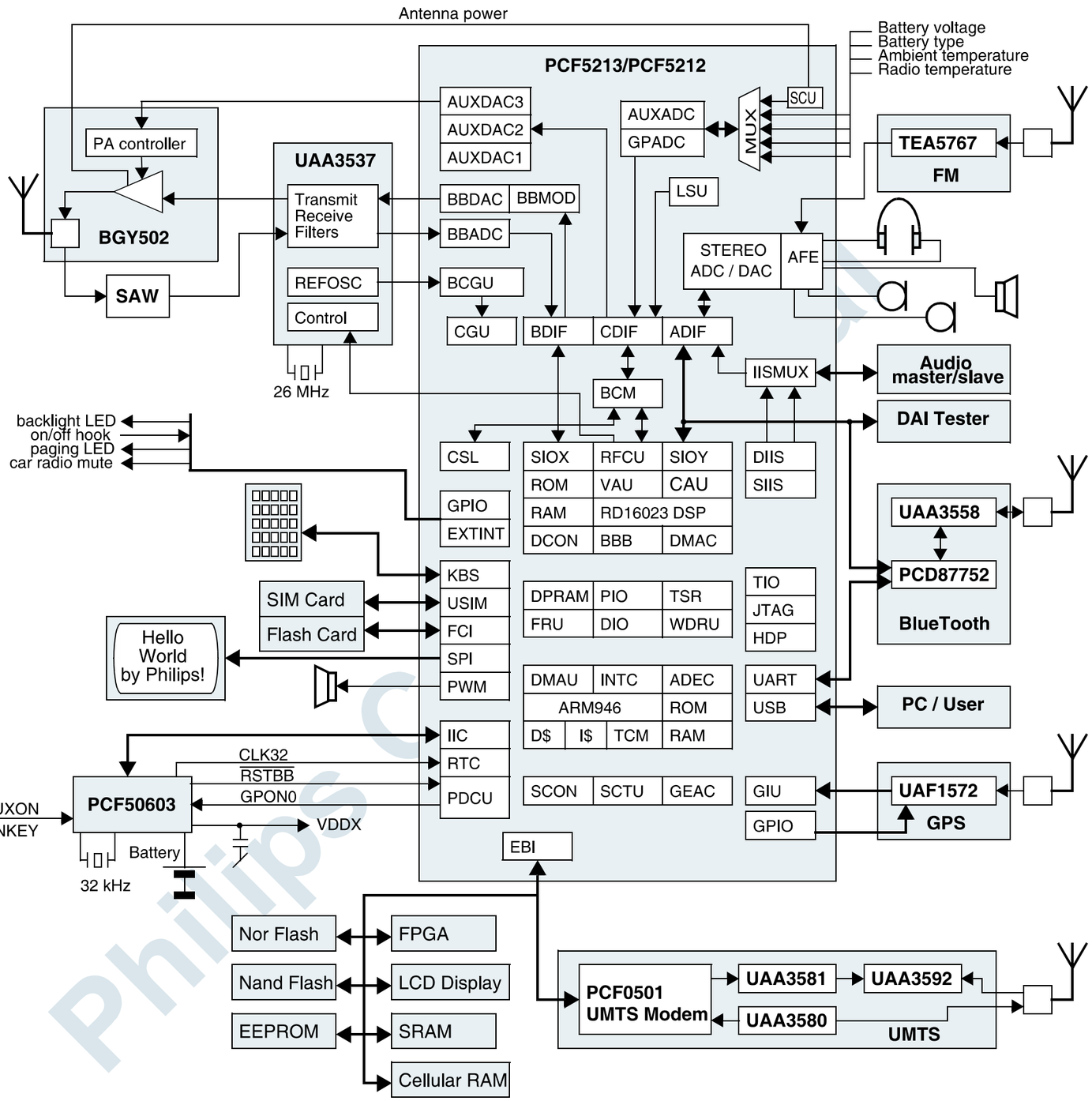
Ddsign LOC	Discription	SEC Code	STATUS
U502	IC-BATTERY	1203-003742	SA
U503	IC-HALL EFFECT S/W	1009-001020	SA
U600	IC-ANALOG SWITCH	1001-001359	SA
U602	IC-ANALOG MULTIPLEX	1001-001345	SA
U603	IC-DEMODULATOR	1204-002398	SA
U604	IC-ANALOG SWITCH	1001-001231	SA
U610	IC-ANALOG SWITCH	1001-001362	SA
U700	IC-POSI.FIXED REG.	1203-003531	SA
UCP200	IC-COMM. CONTROLLER	1205-002670	SA
UME303	IC-MCP	1108-000062	SNA
V400	VARISTOR	1405-001082	SA
V401	DIODE-TVS	0406-001231	SA
V500	THERMISTOR-NTC	1404-001221	SA
VR100	VARISTOR	1405-001082	SA
ZD500	DIODE-ZENER	0403-001547	SA
ZD501	DIODE-ZENER	0403-001427	SA
ZD502	DIODE-TVS	0406-001201	SA
ZD601	DIODE-TVS	0406-001104	SA

5. Block Diagrams

5-1. RF Solution Block Diagram



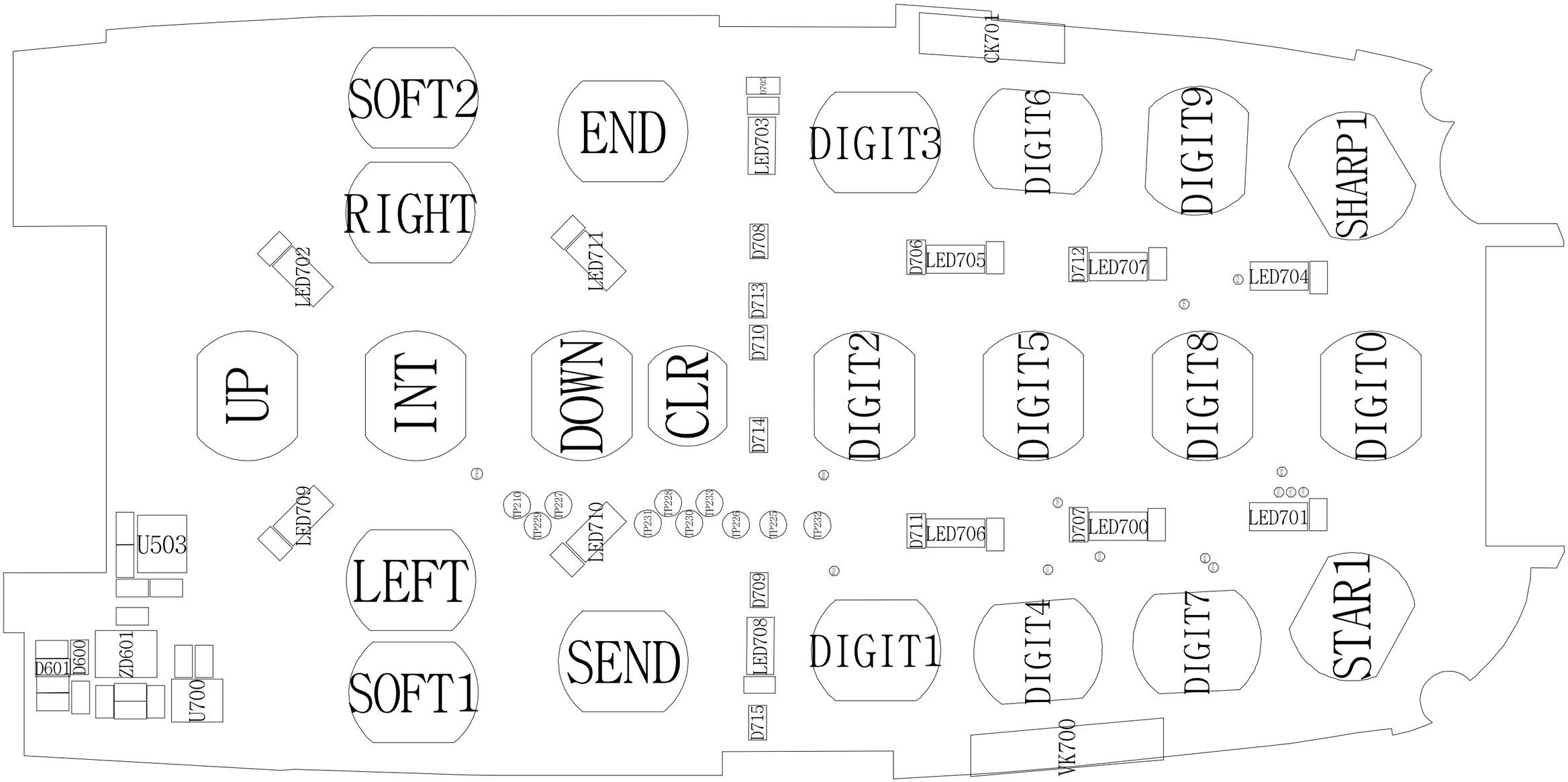
5-2. Base Band Solution Block Diagram



6. PCB Diagrams

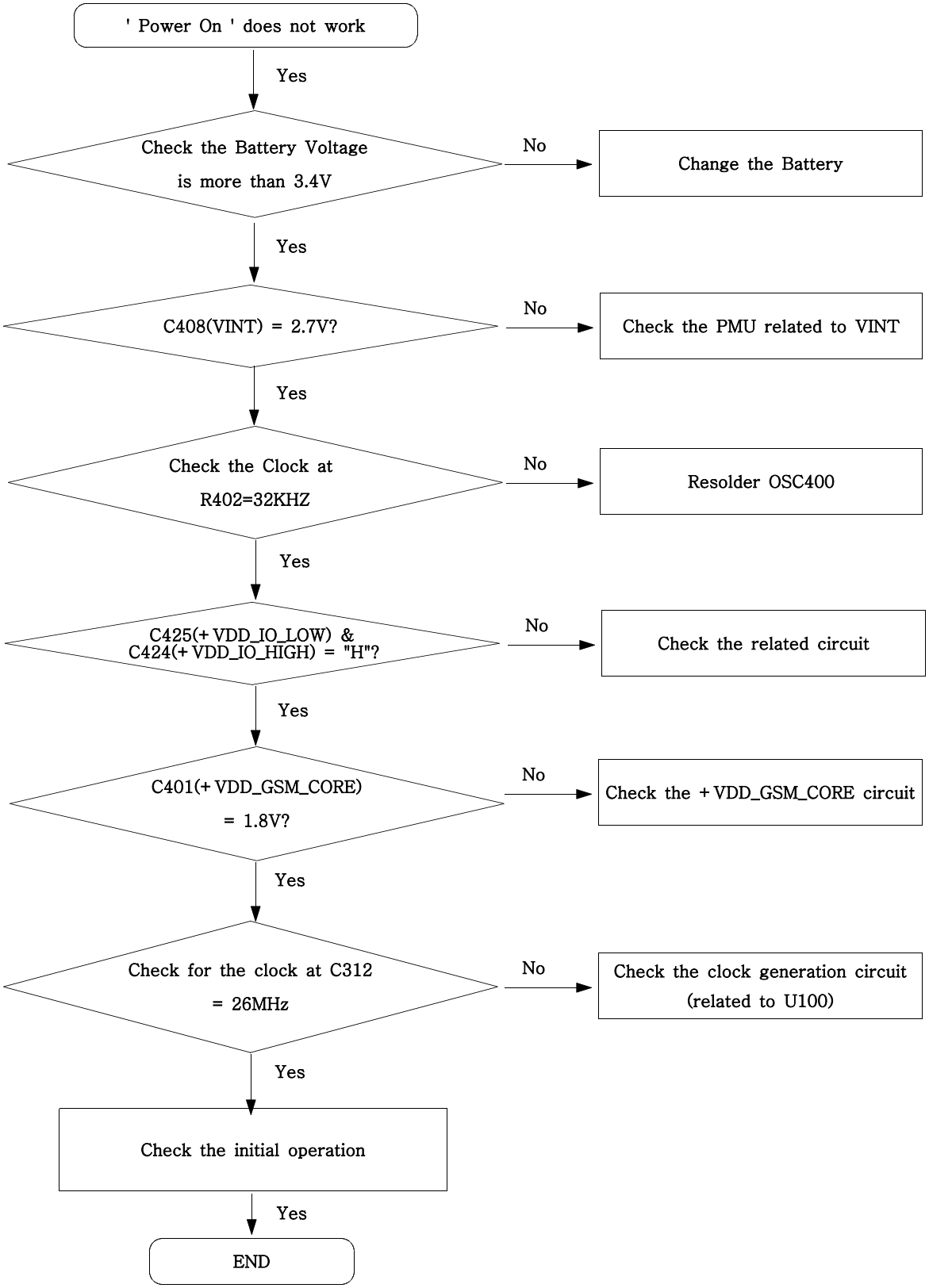
6-1. PCB Top Diagram

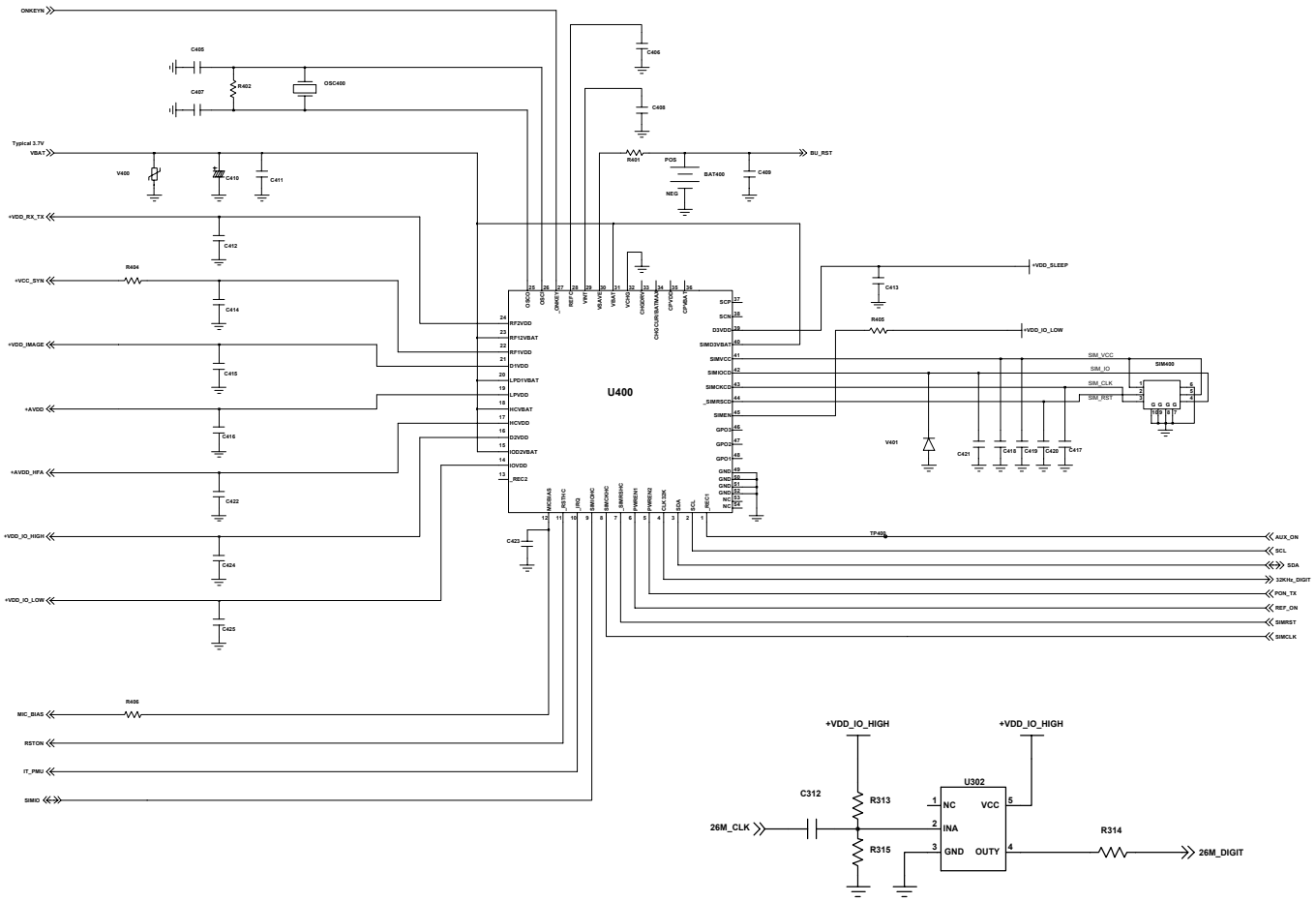
6-2. PCB Bottom Diagram

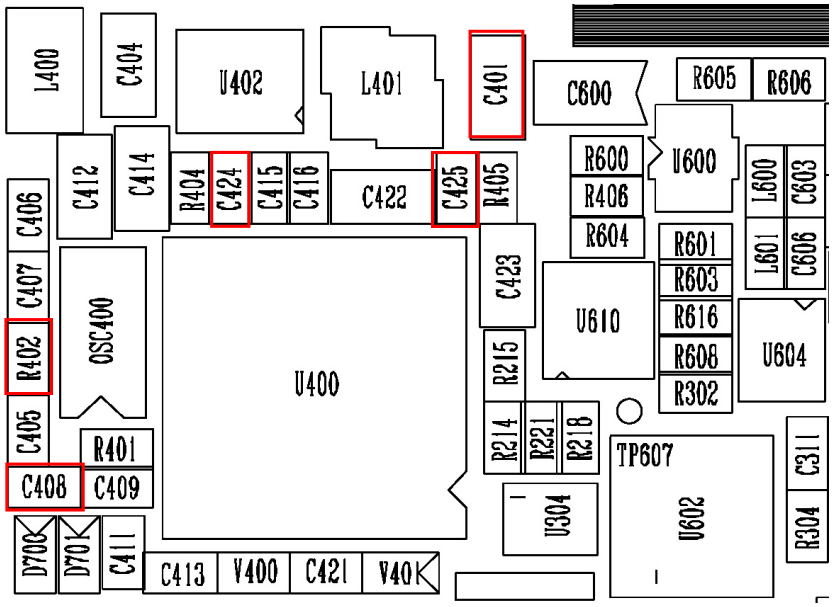


7. Flow Chart of Troubleshooting

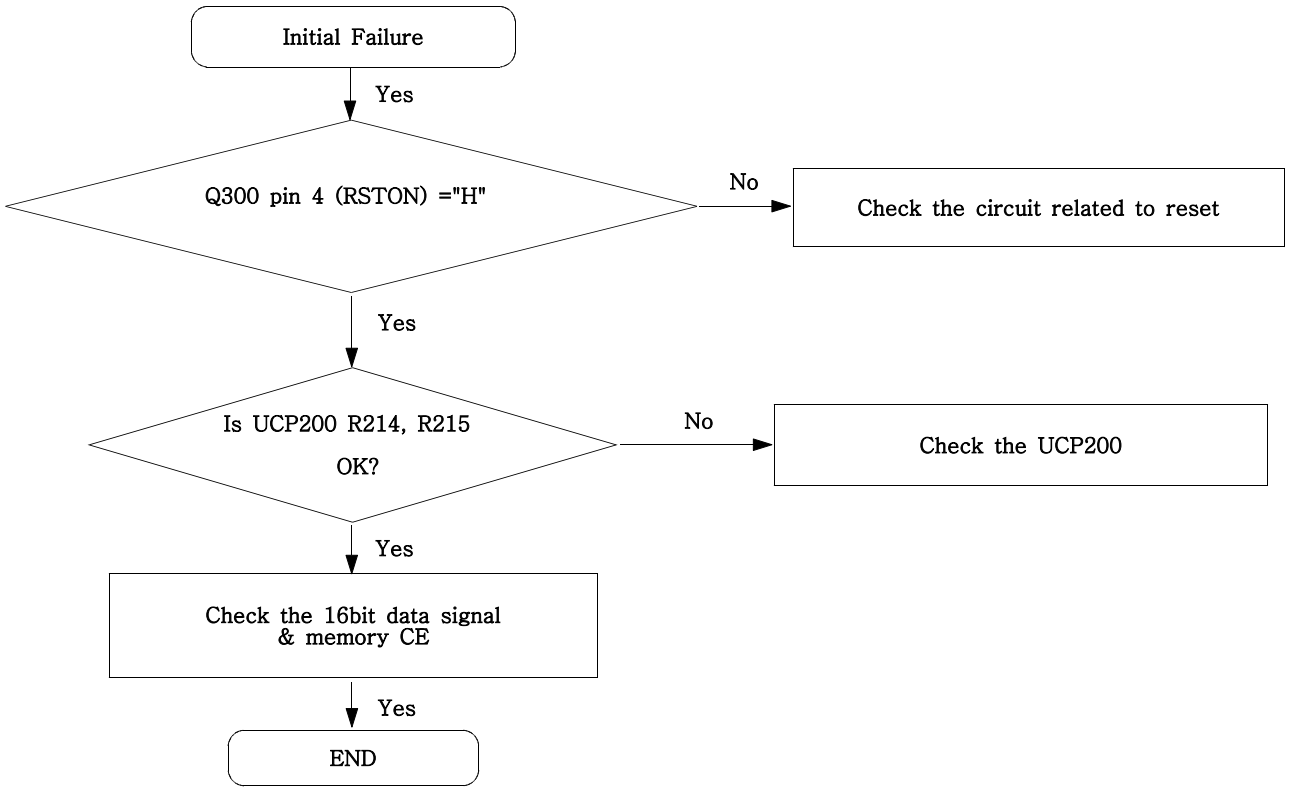
7-1. Power On

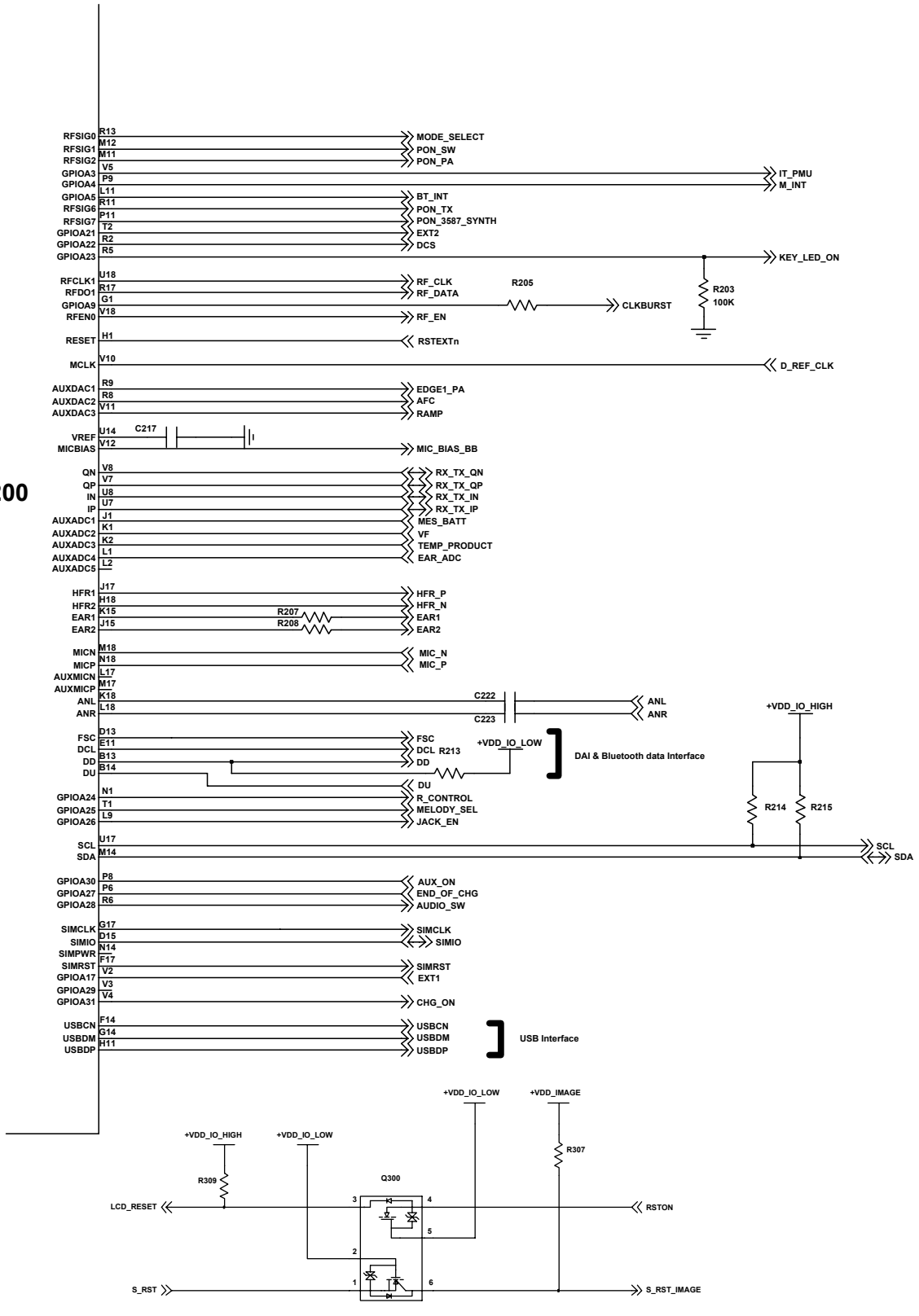




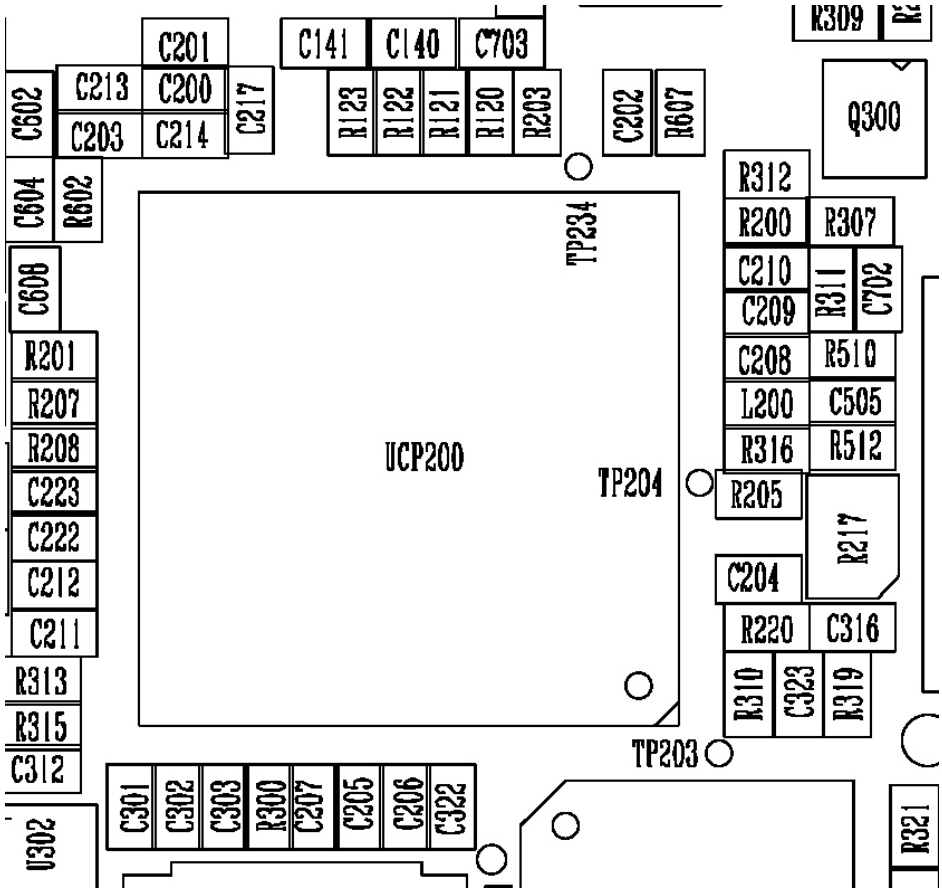


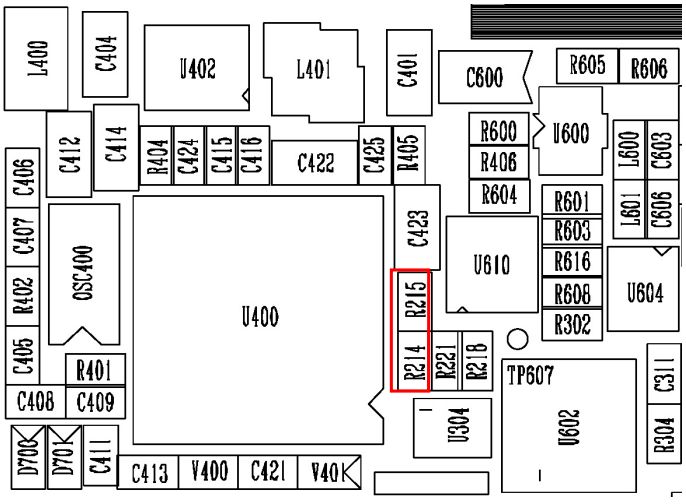
7-2. Initial



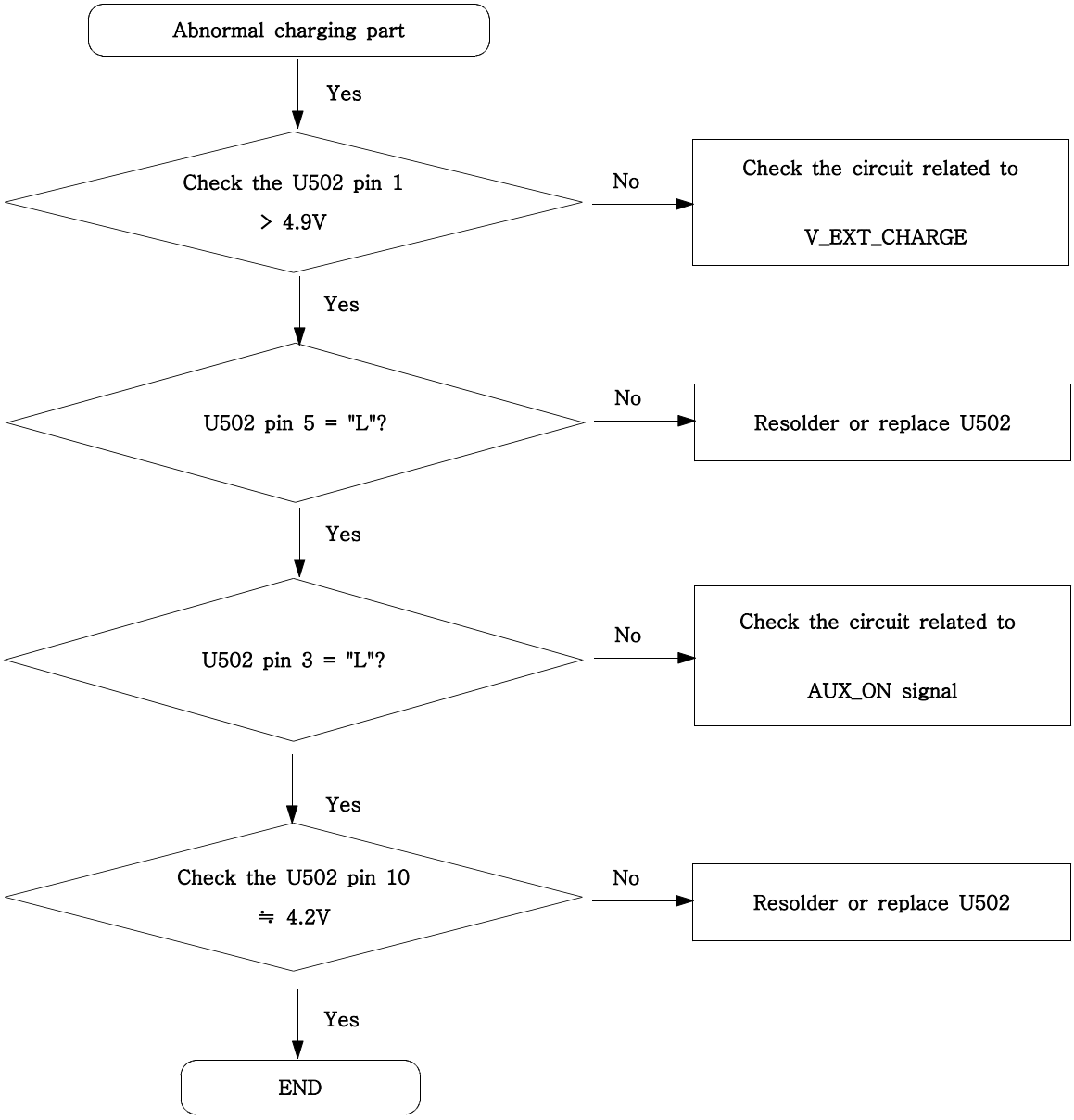


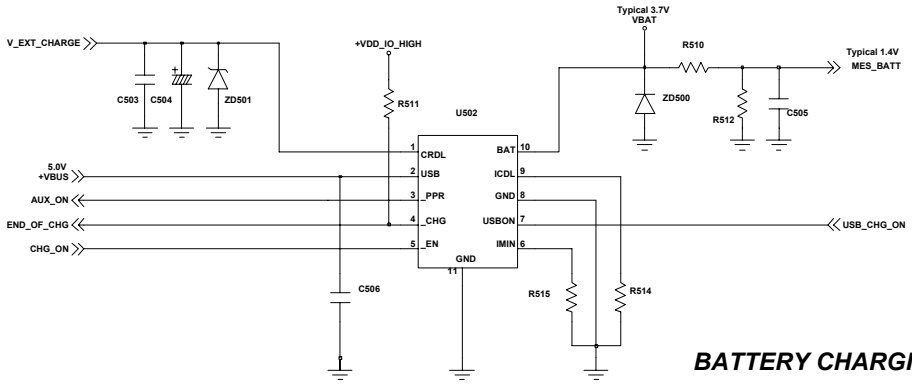
LEVEL SHIFT



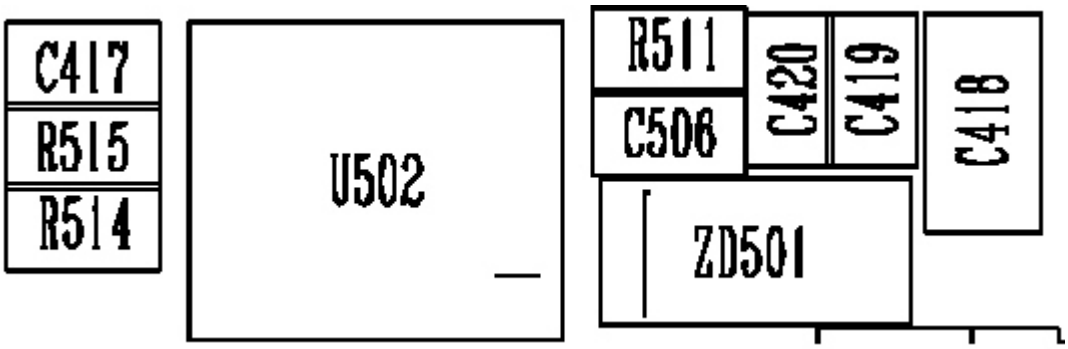


7-3. Charging Part

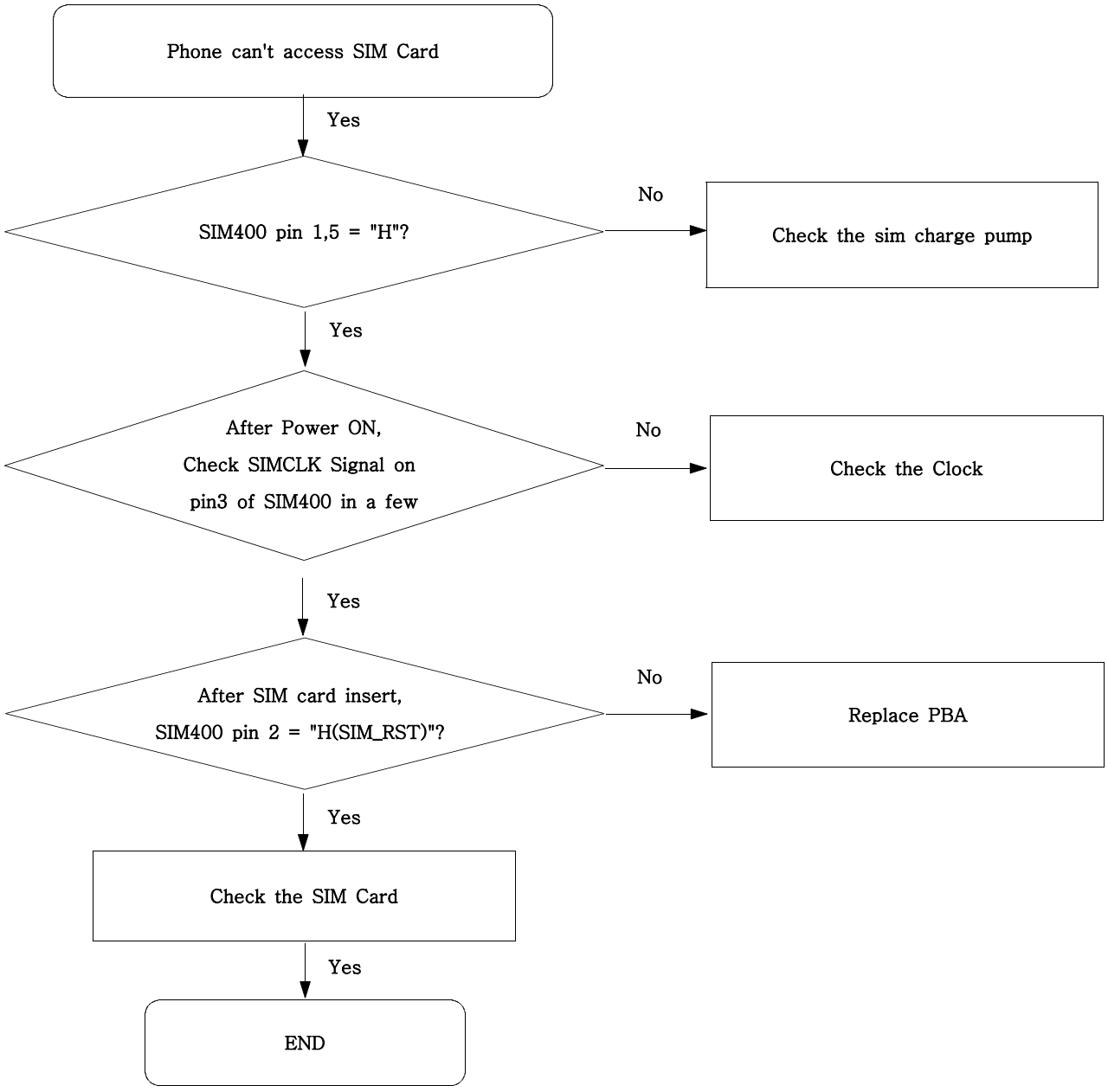


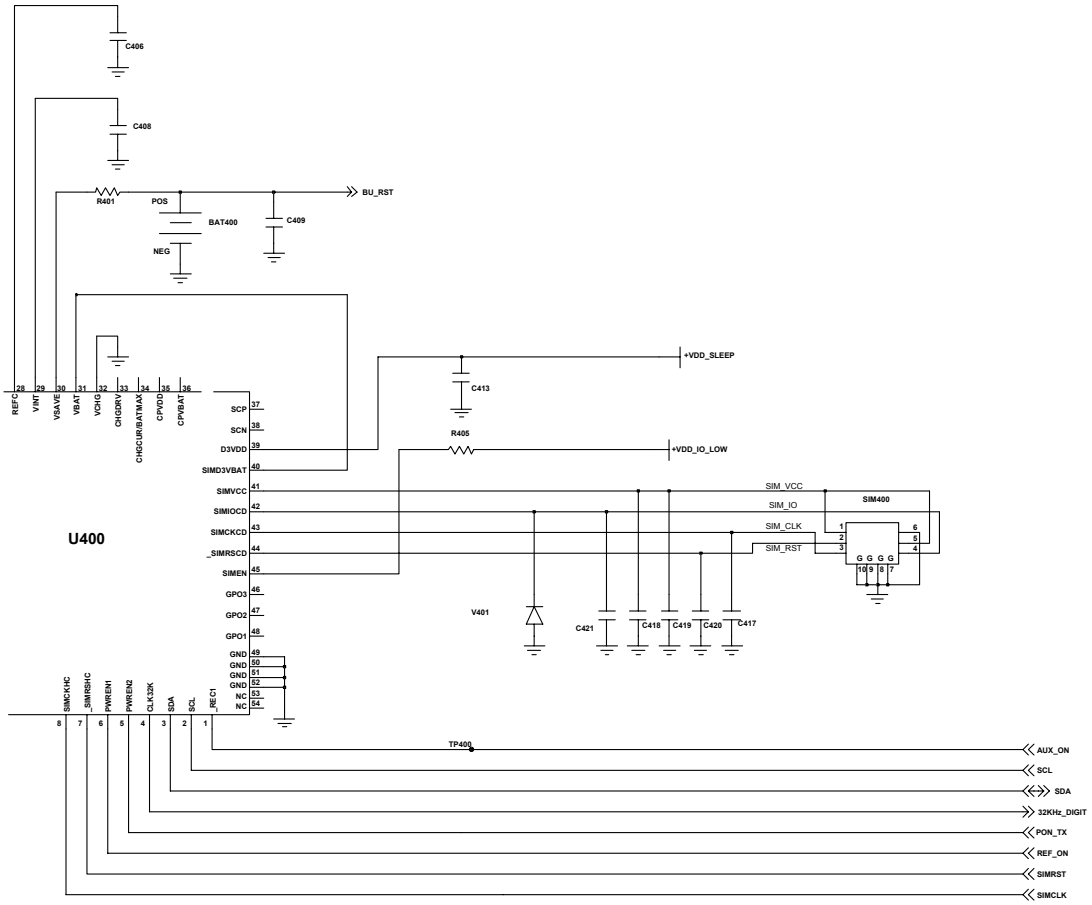


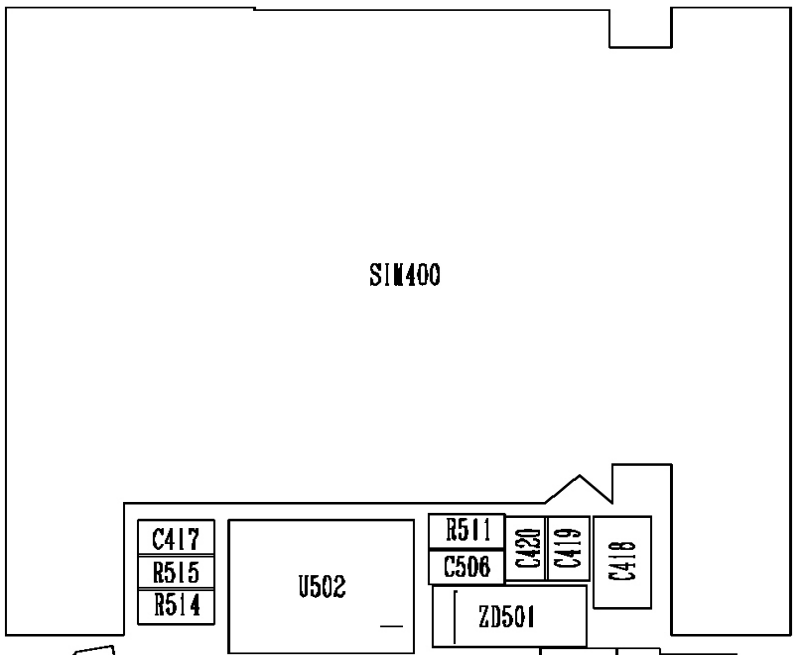
BATTERY CHARGING



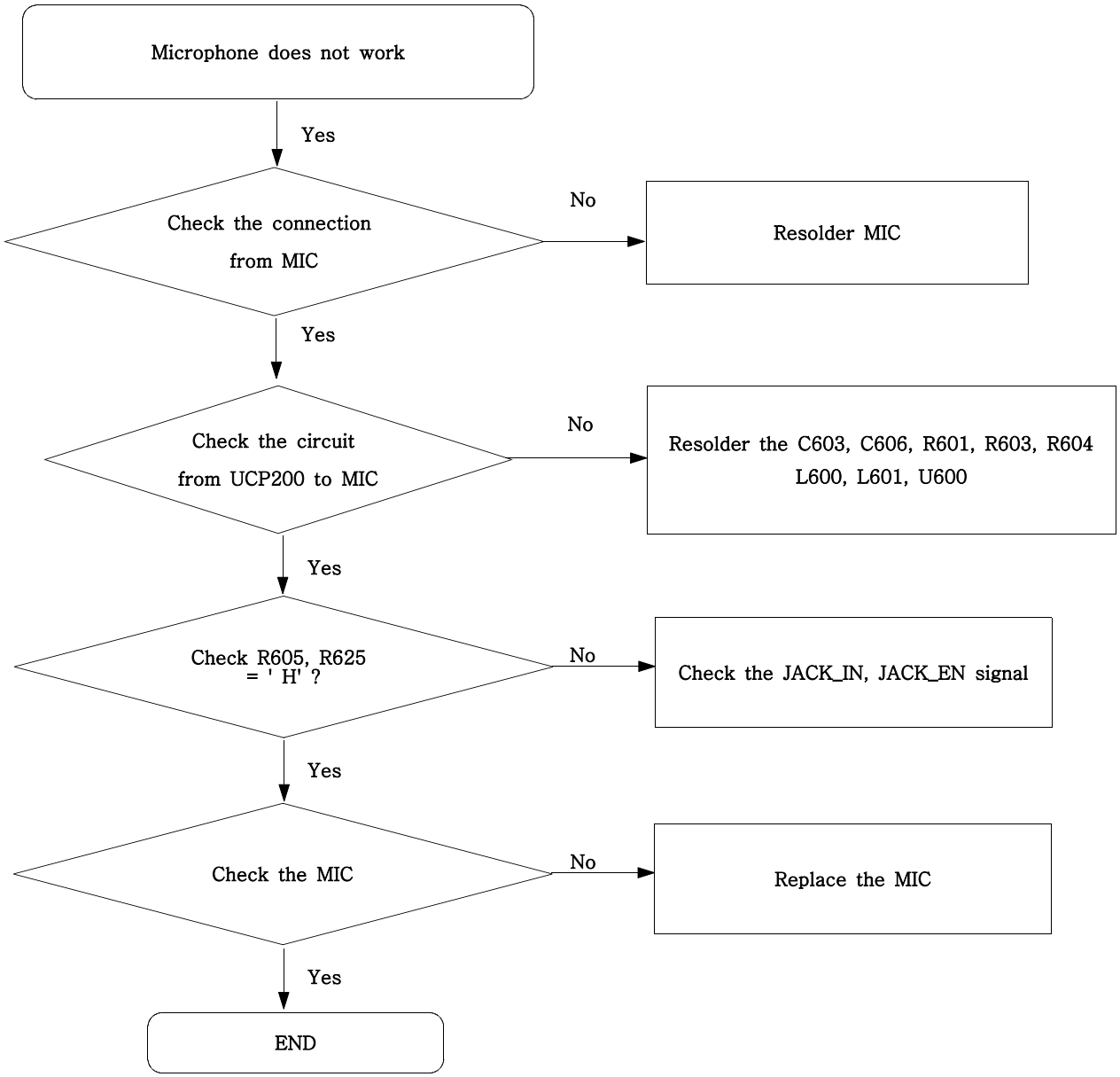
7-4. Sim Part





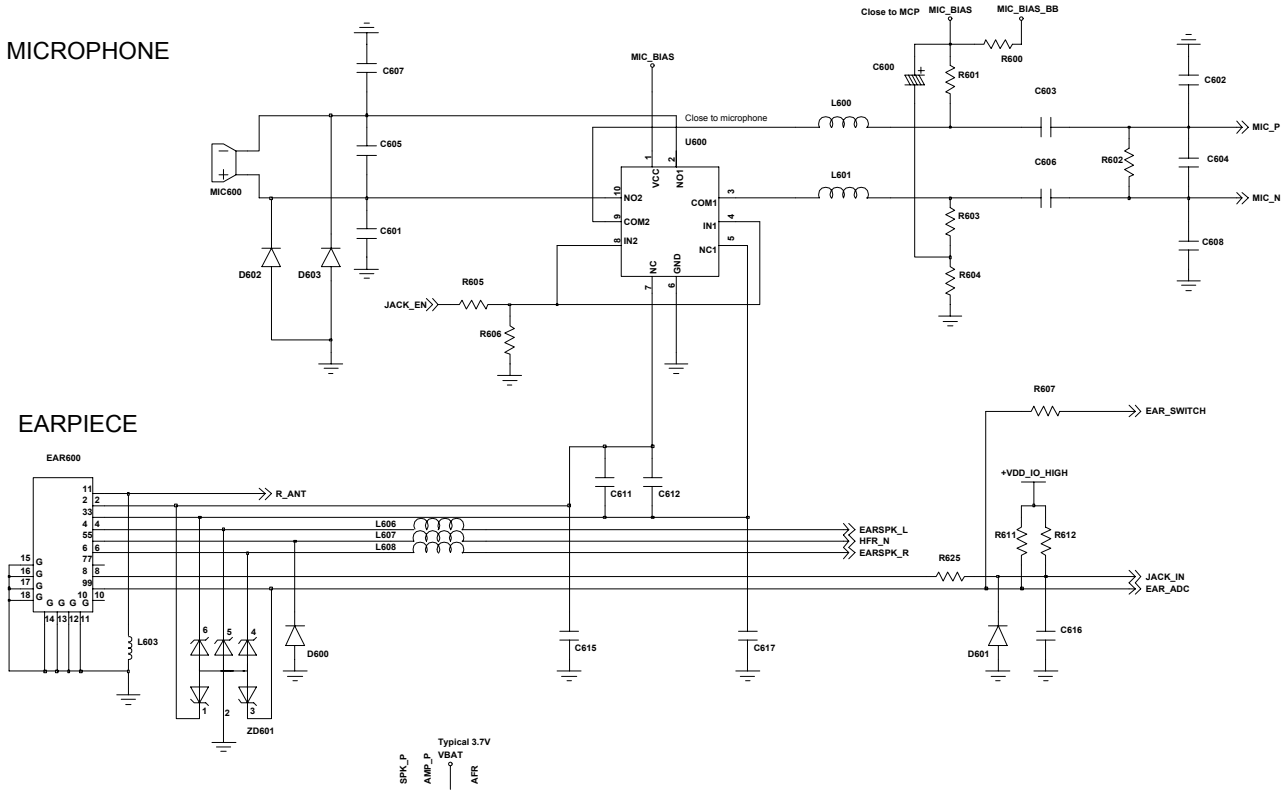


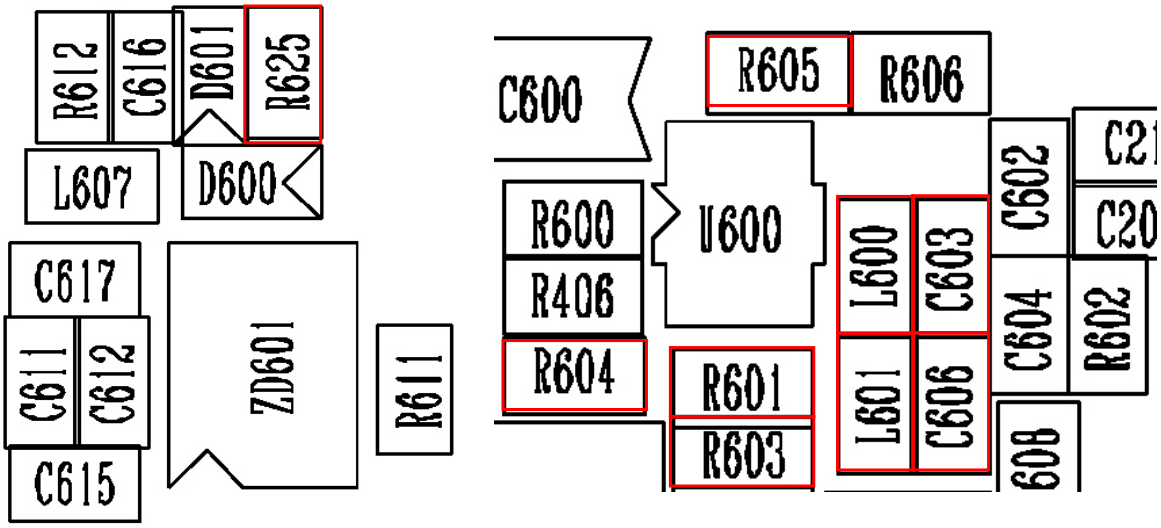
7-5. Microphone Part



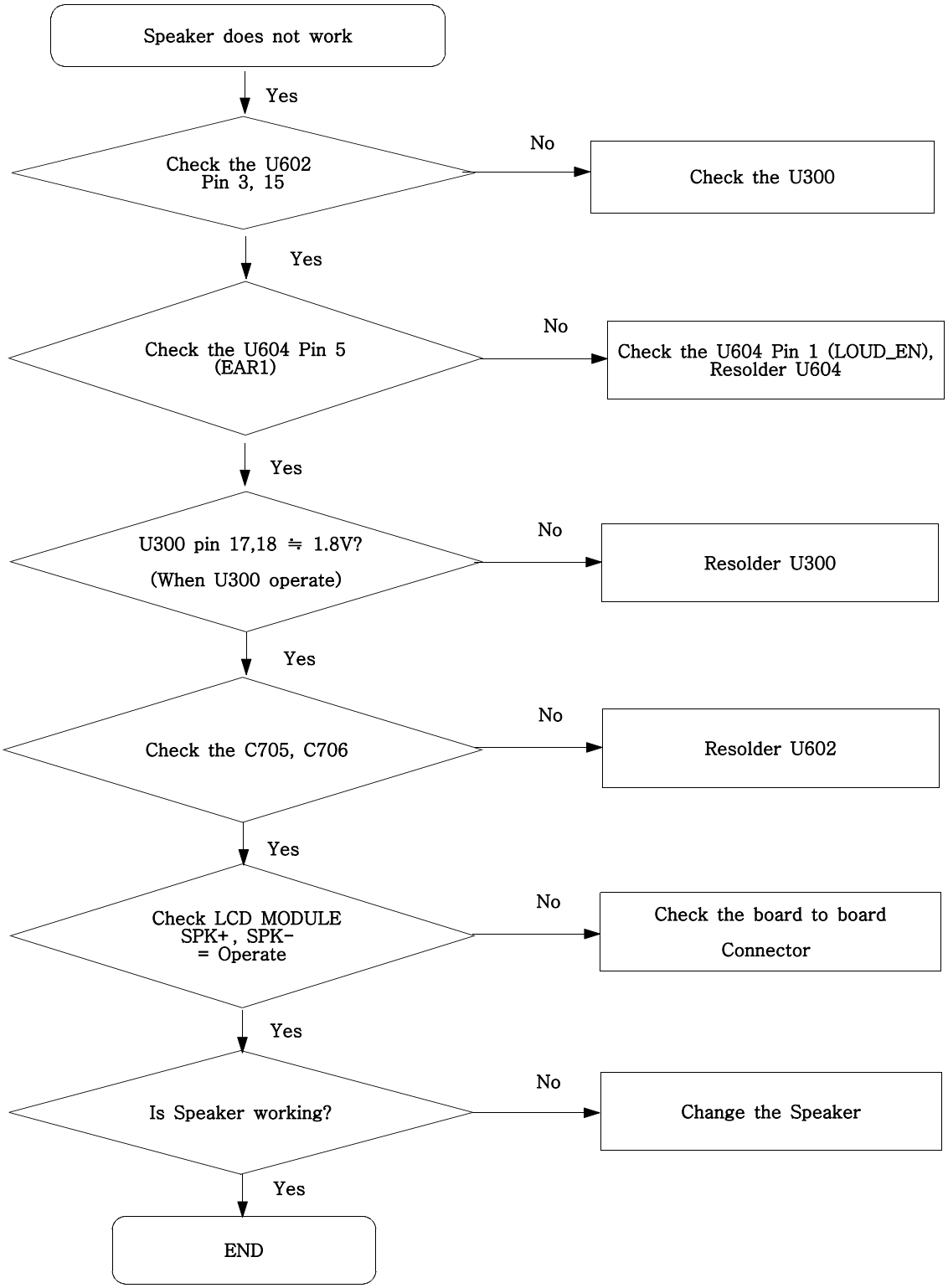
MICROPHONE

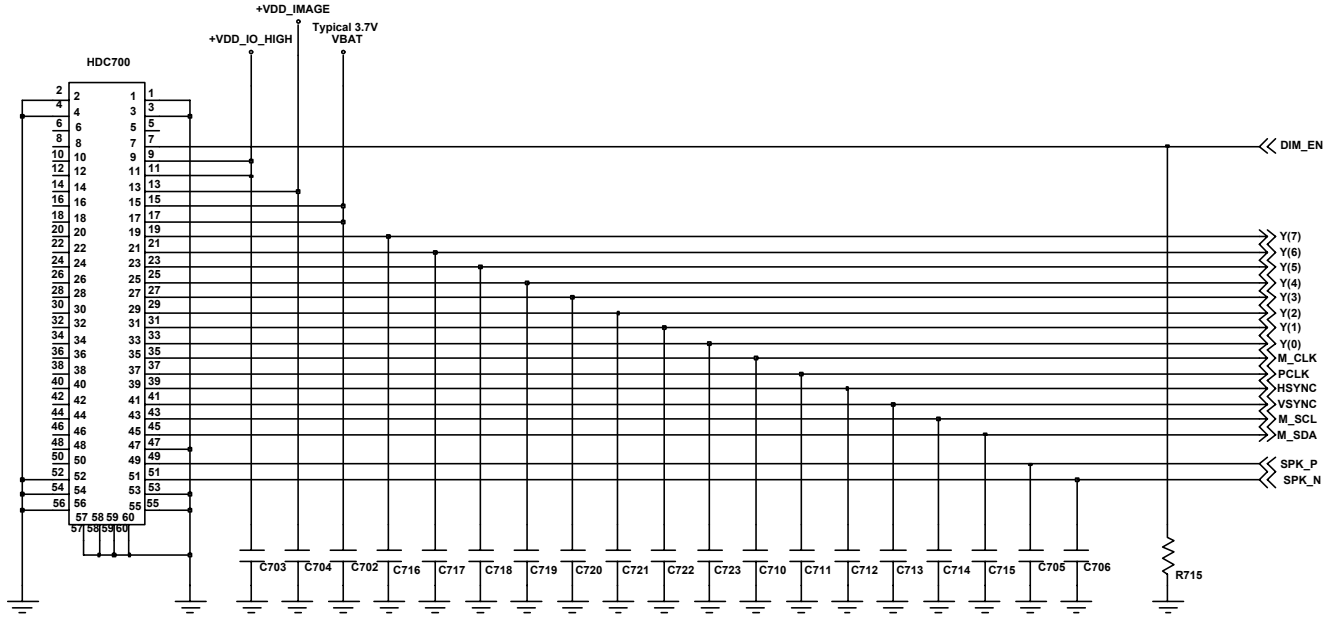
EARPIECE

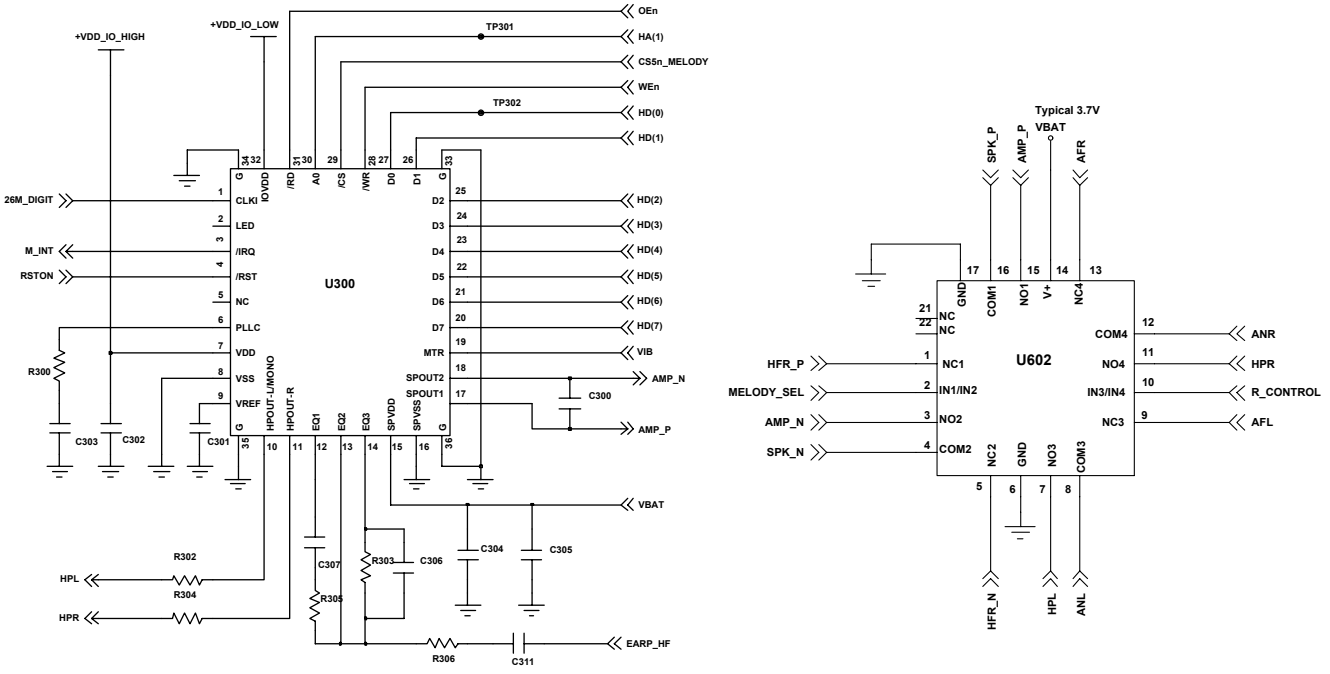




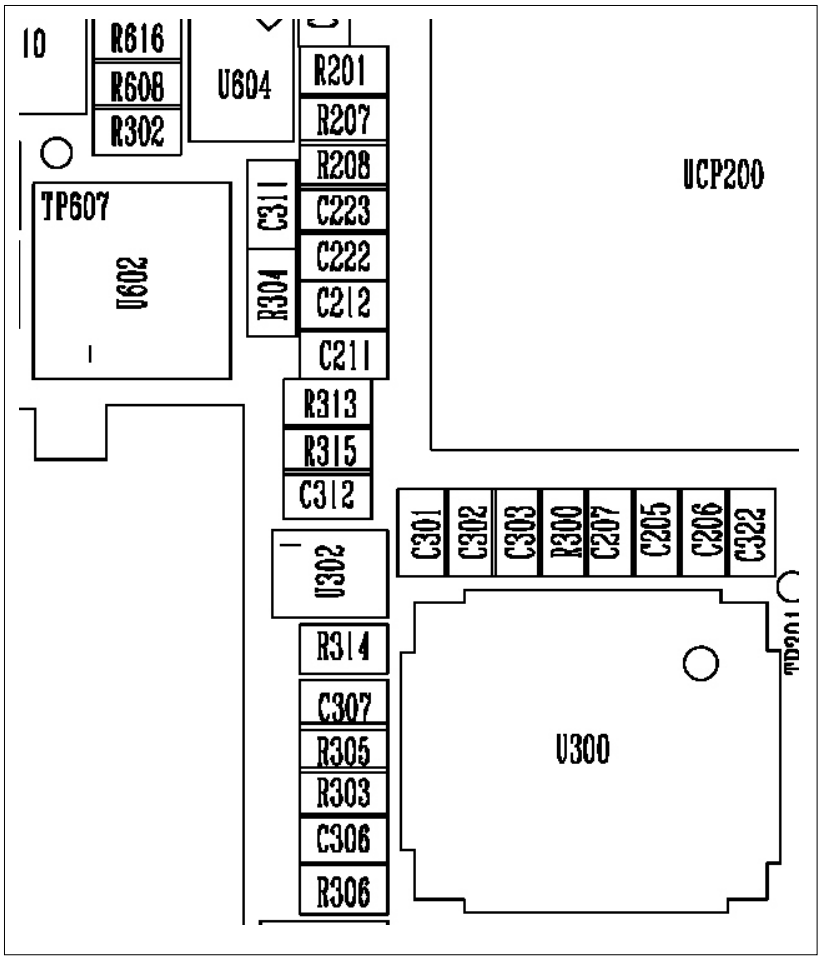
7-6. Speaker Part(Melody)

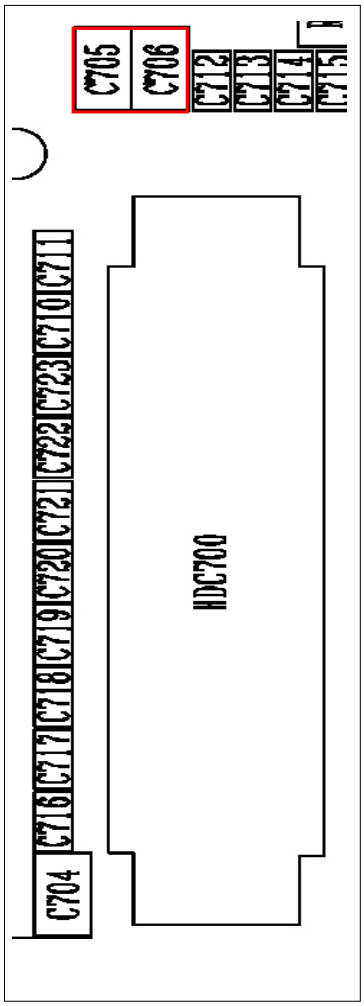




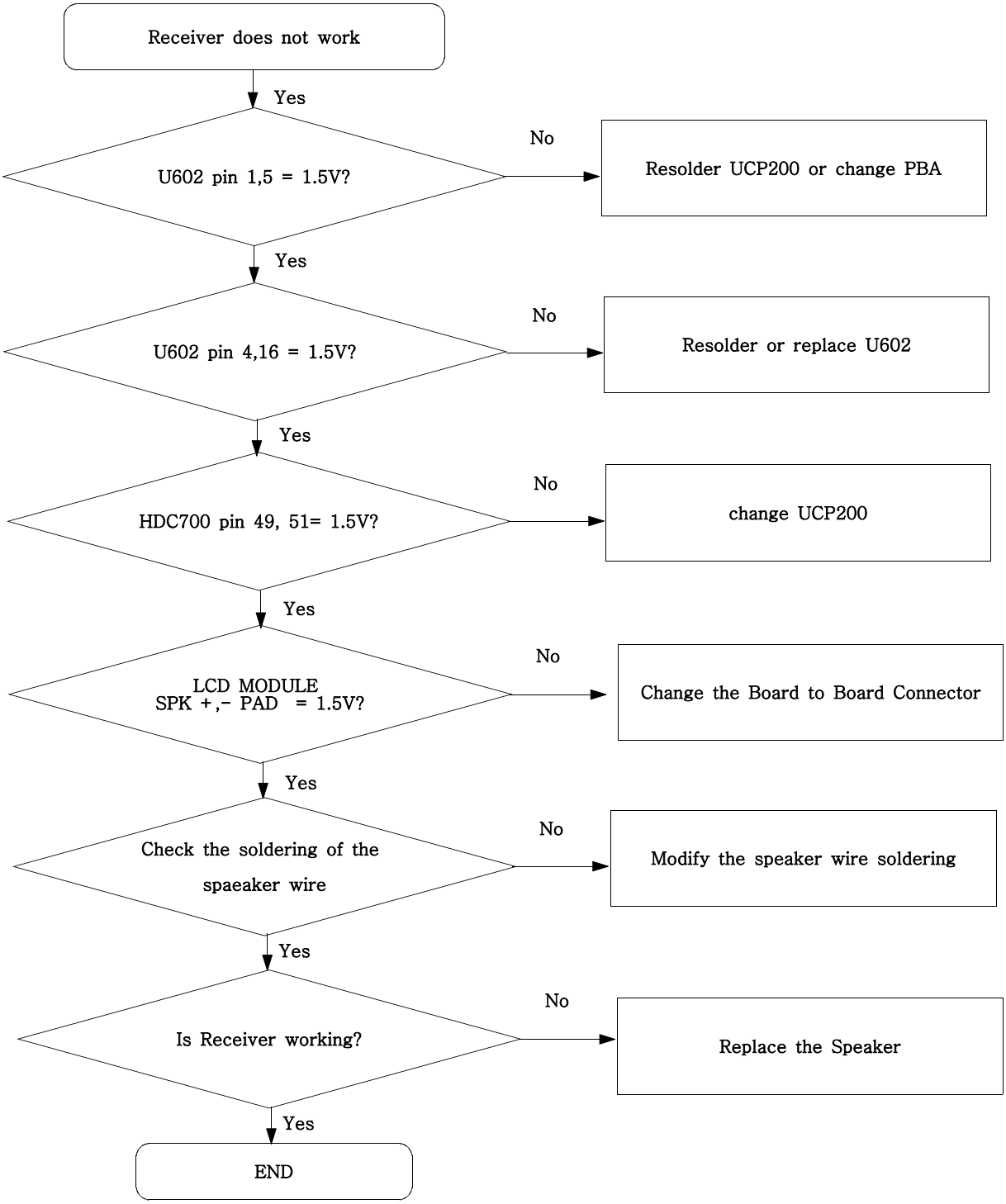


MELODY IC

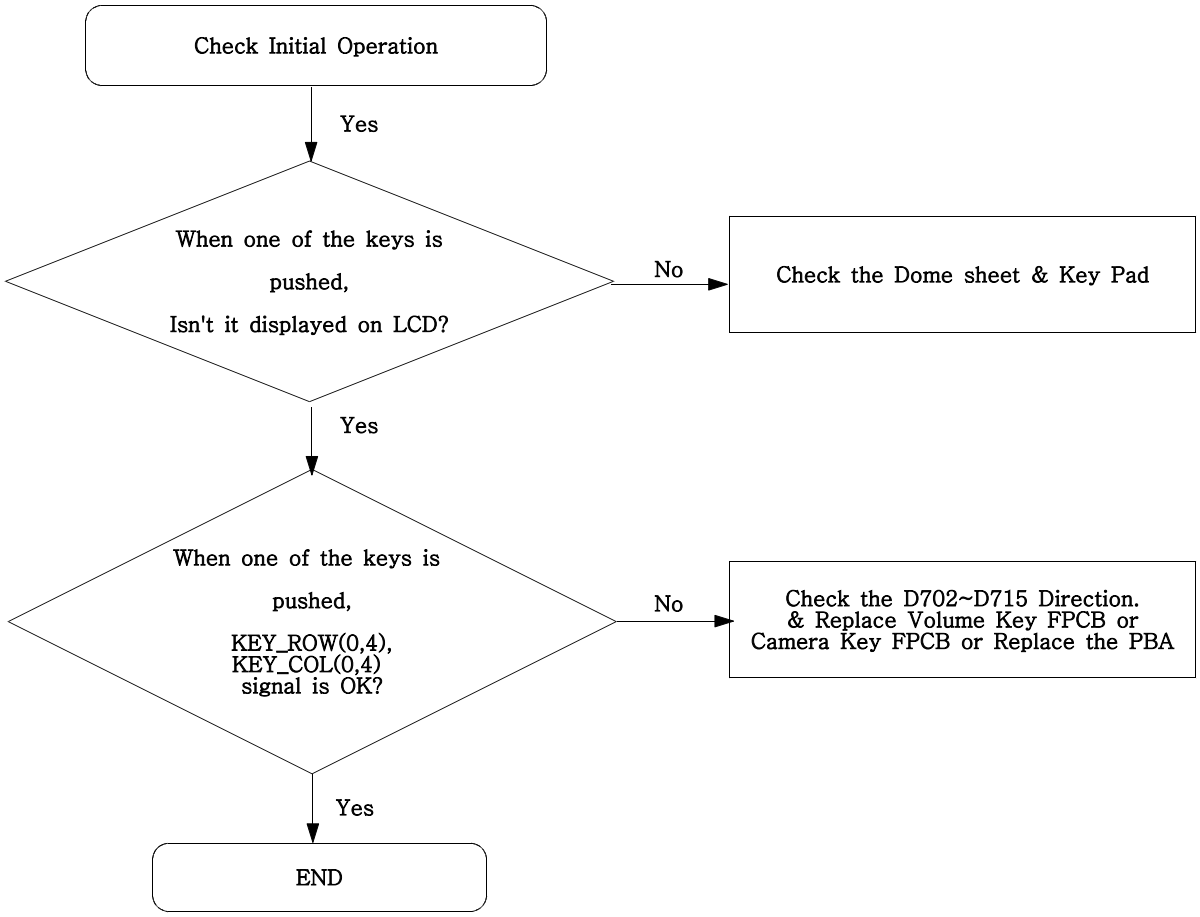


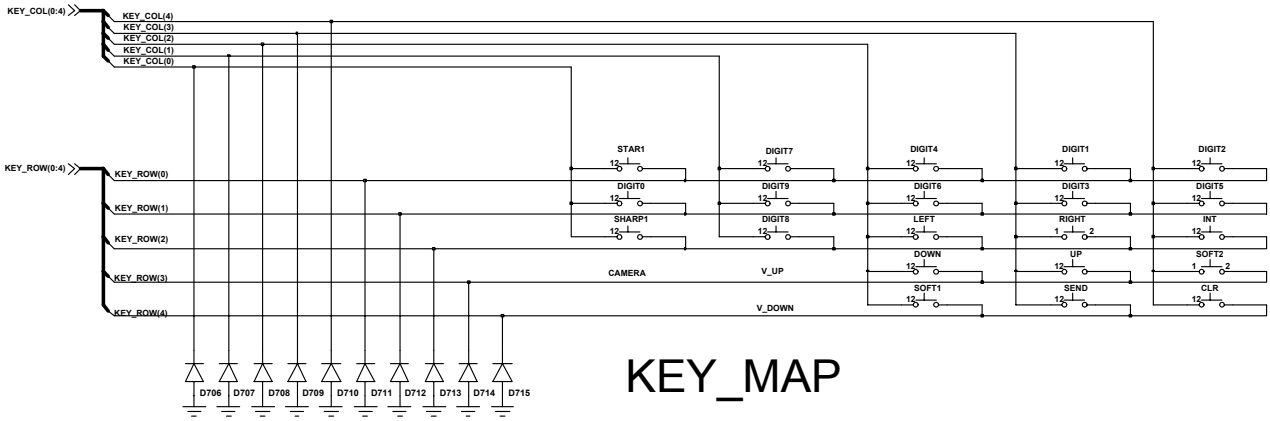


7-7. Receiver Part

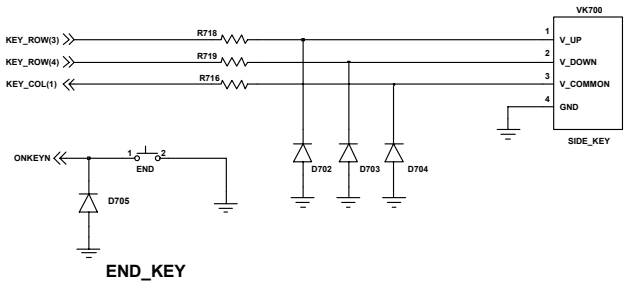


7-8. Key Data Input



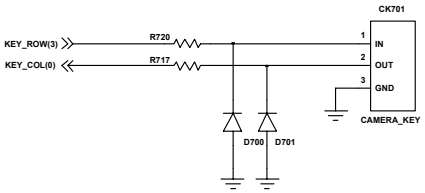


KEY_MAP

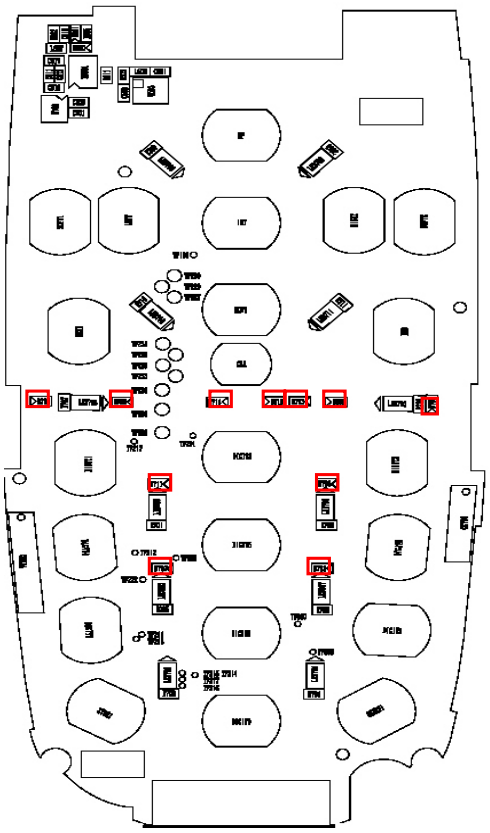


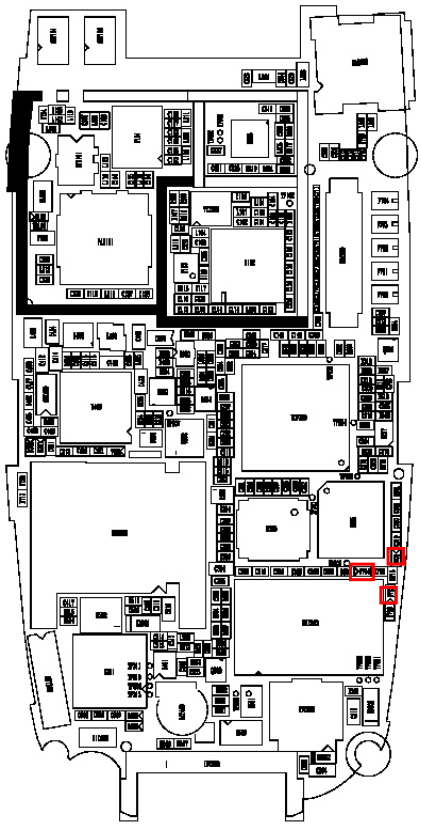
END_KEY

VOLUME_KEY

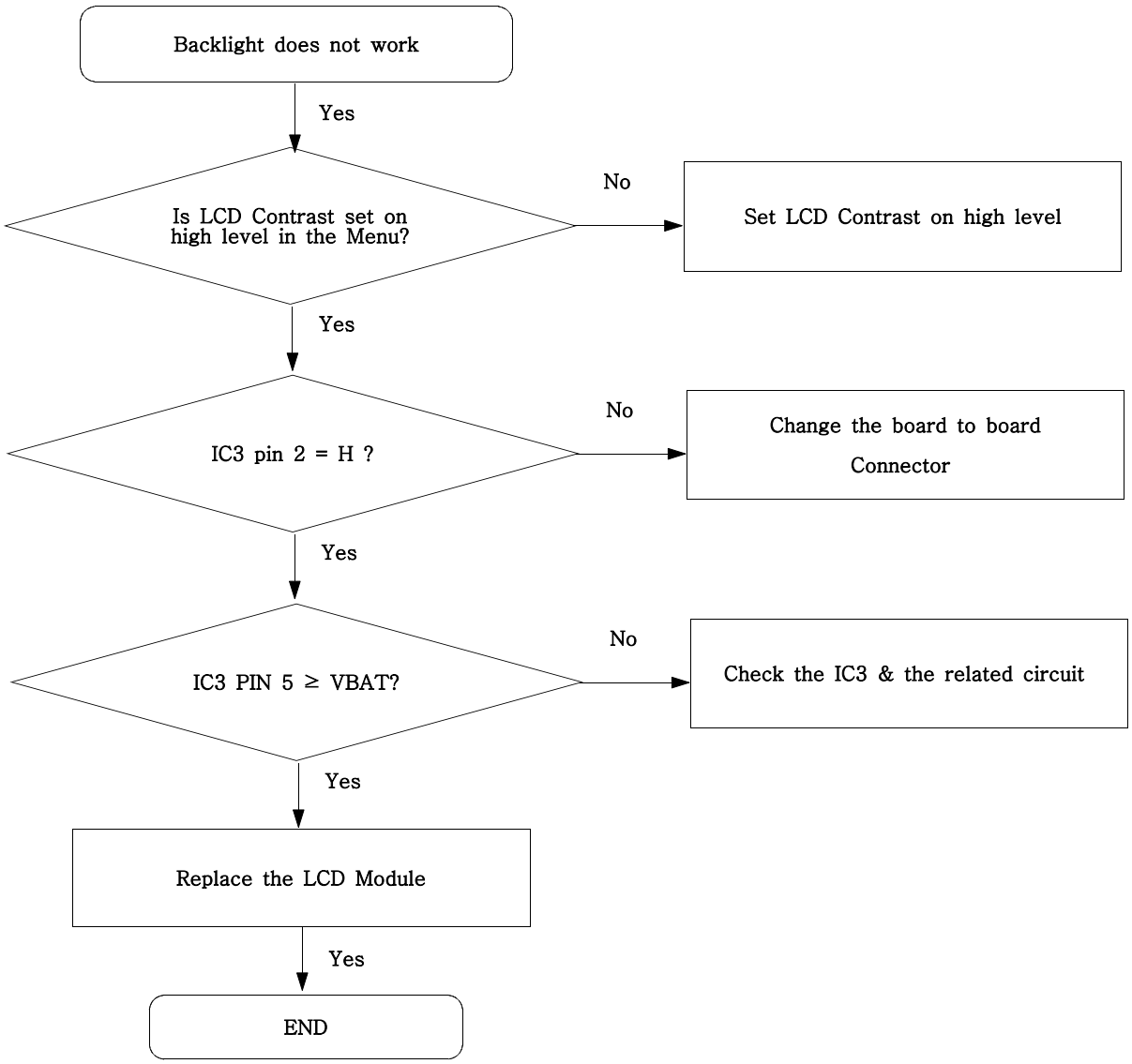


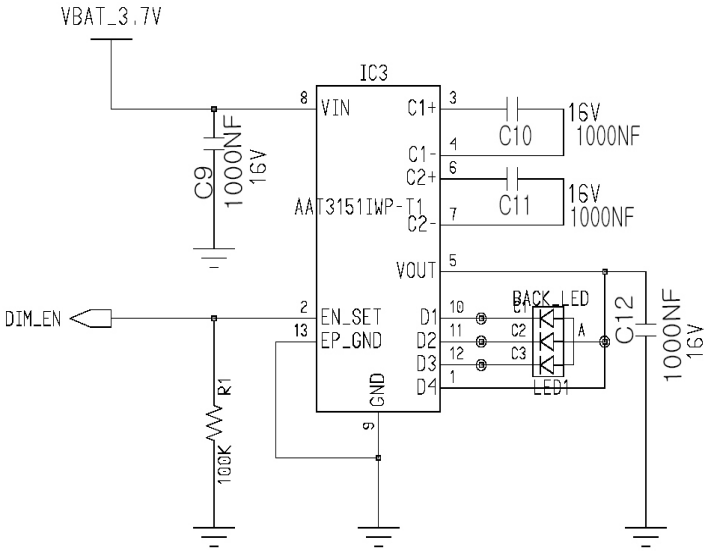
CAMERA_KEY

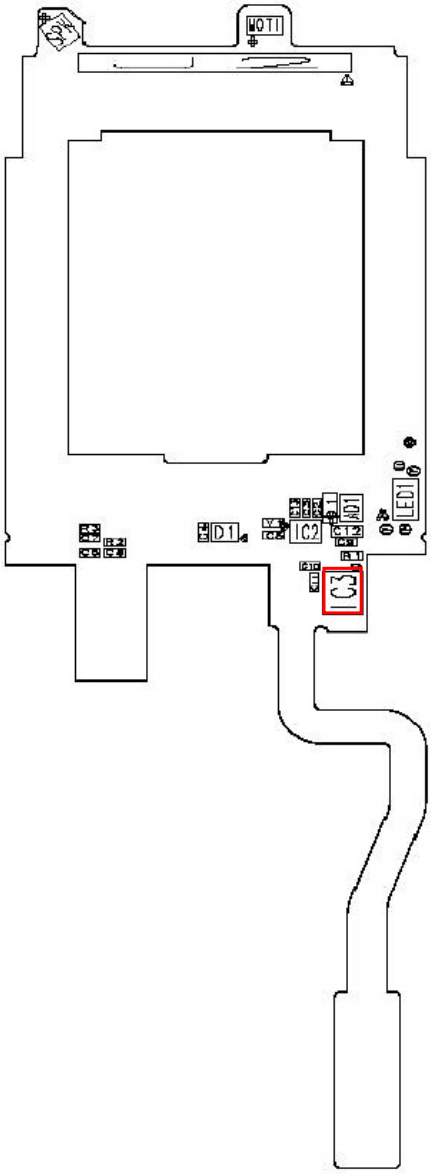




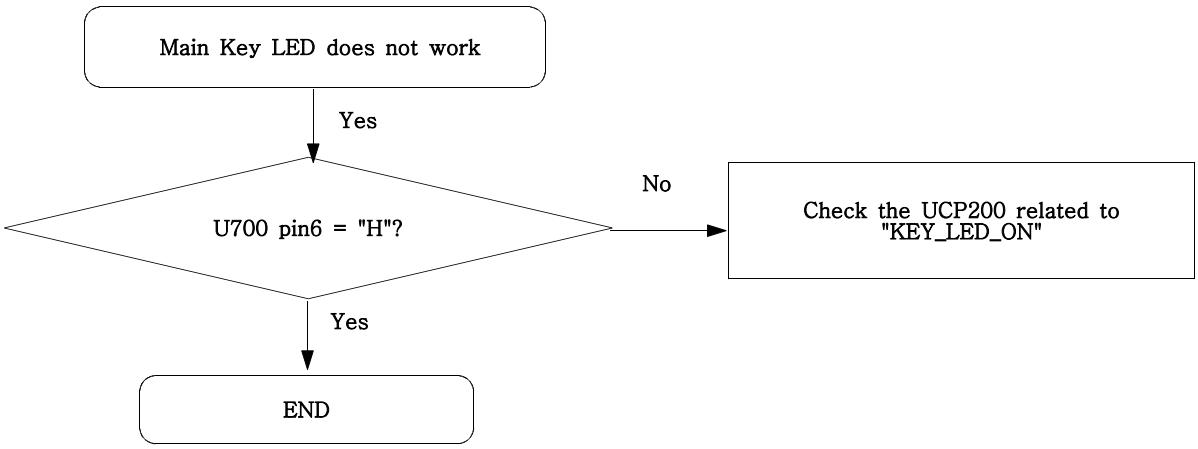
7-9. Back Light (for Color Main LCD)

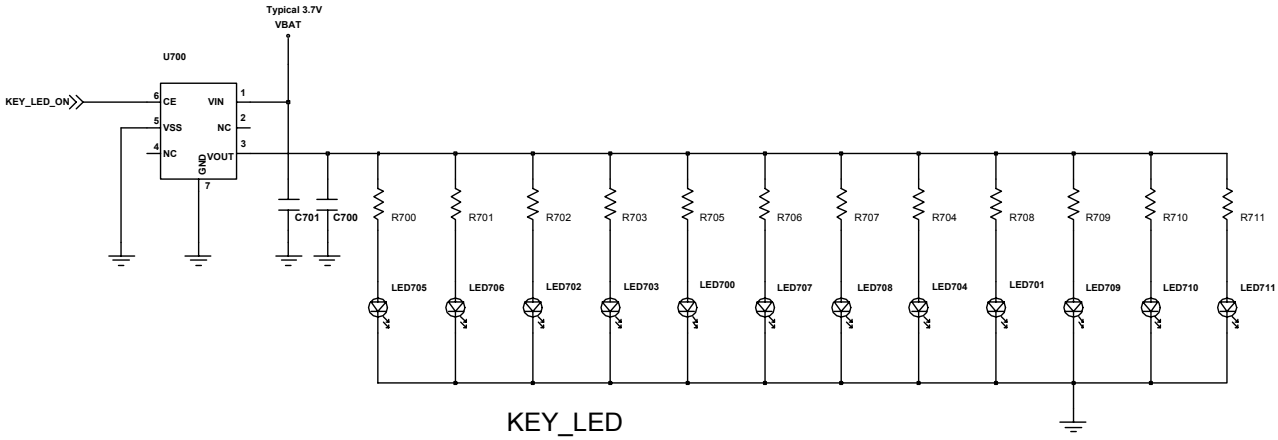




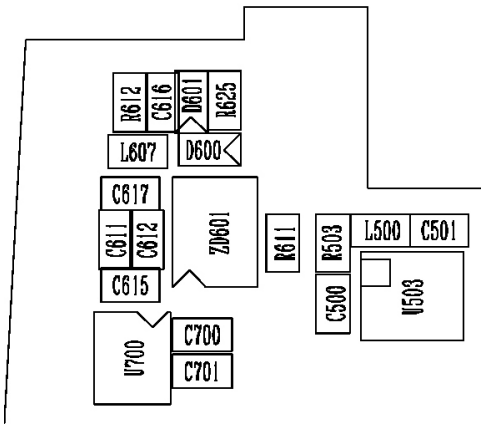


7-10. Key Back Light

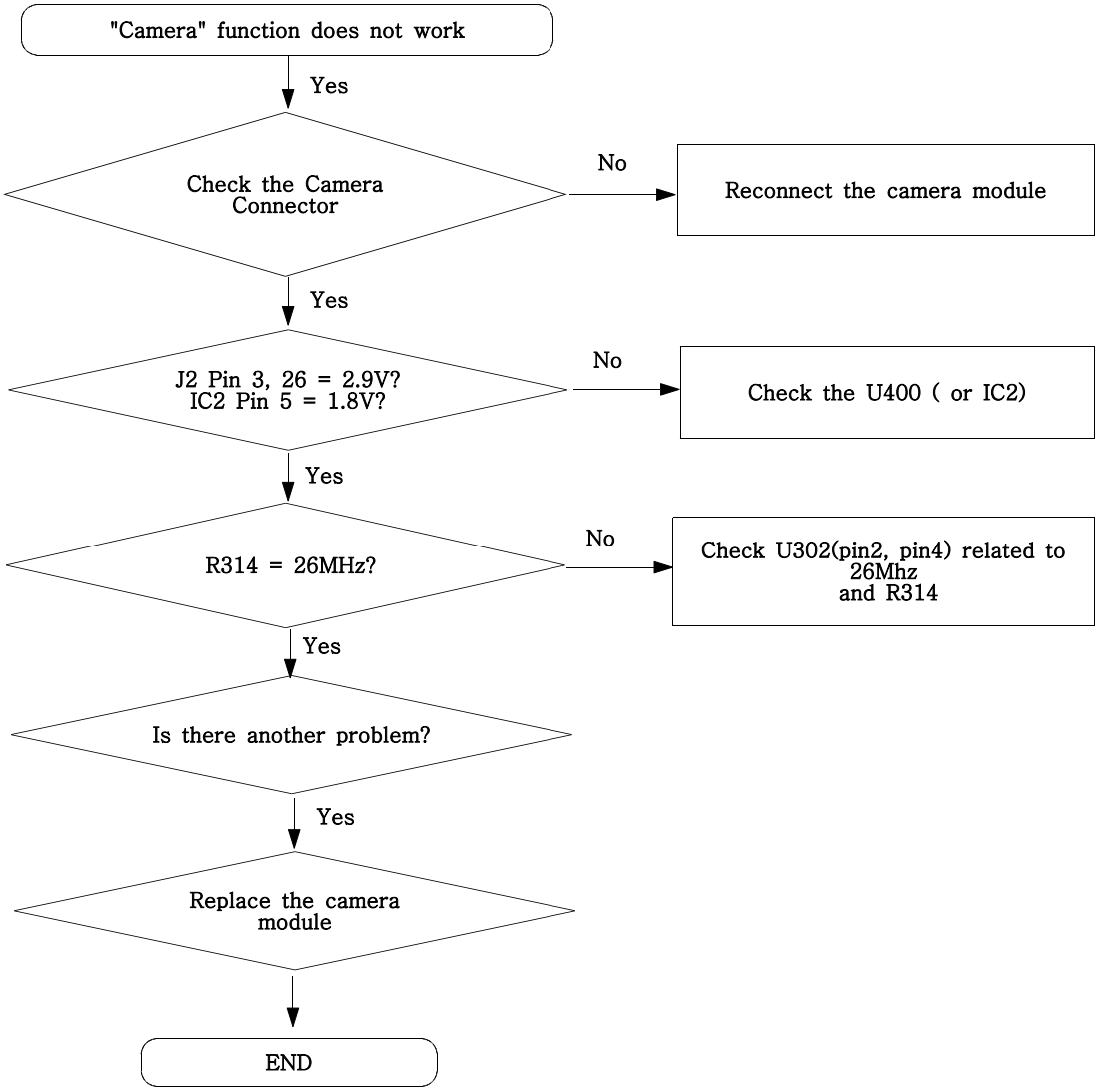


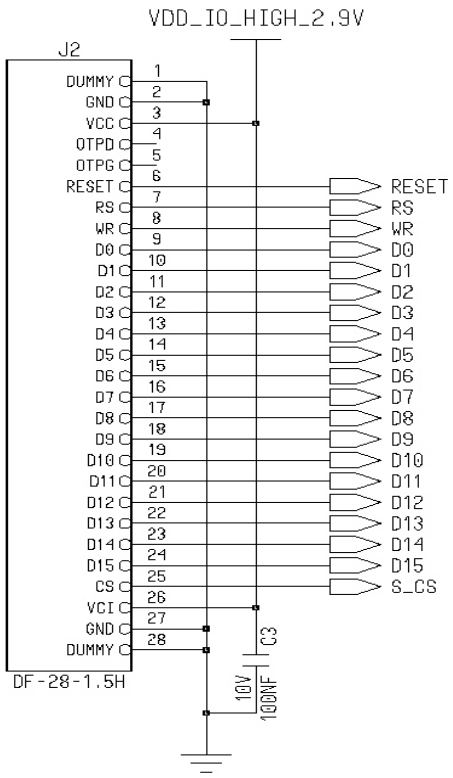


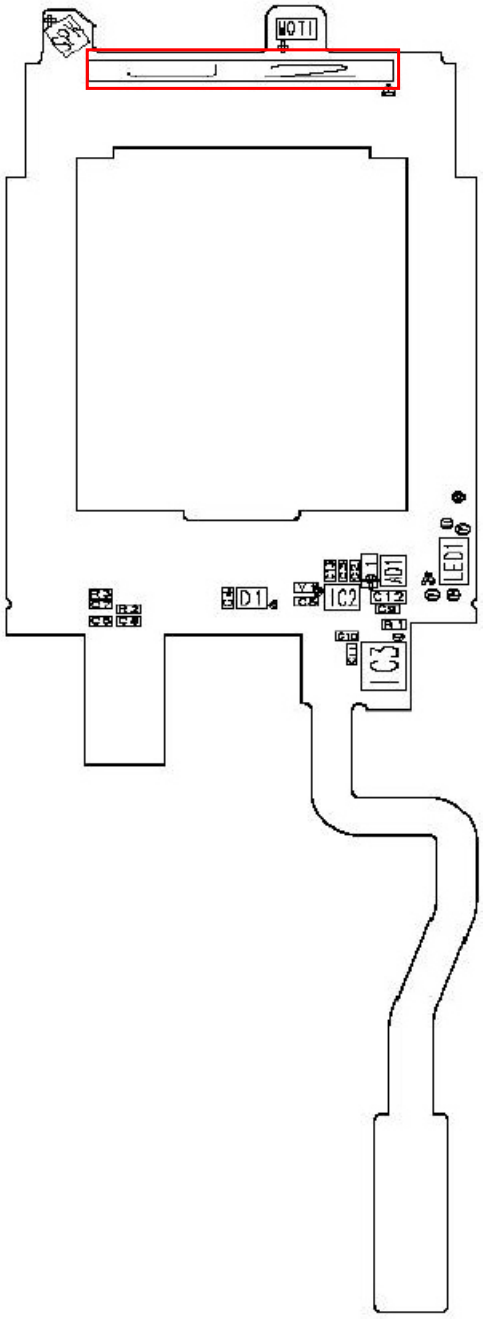
KEY_LED

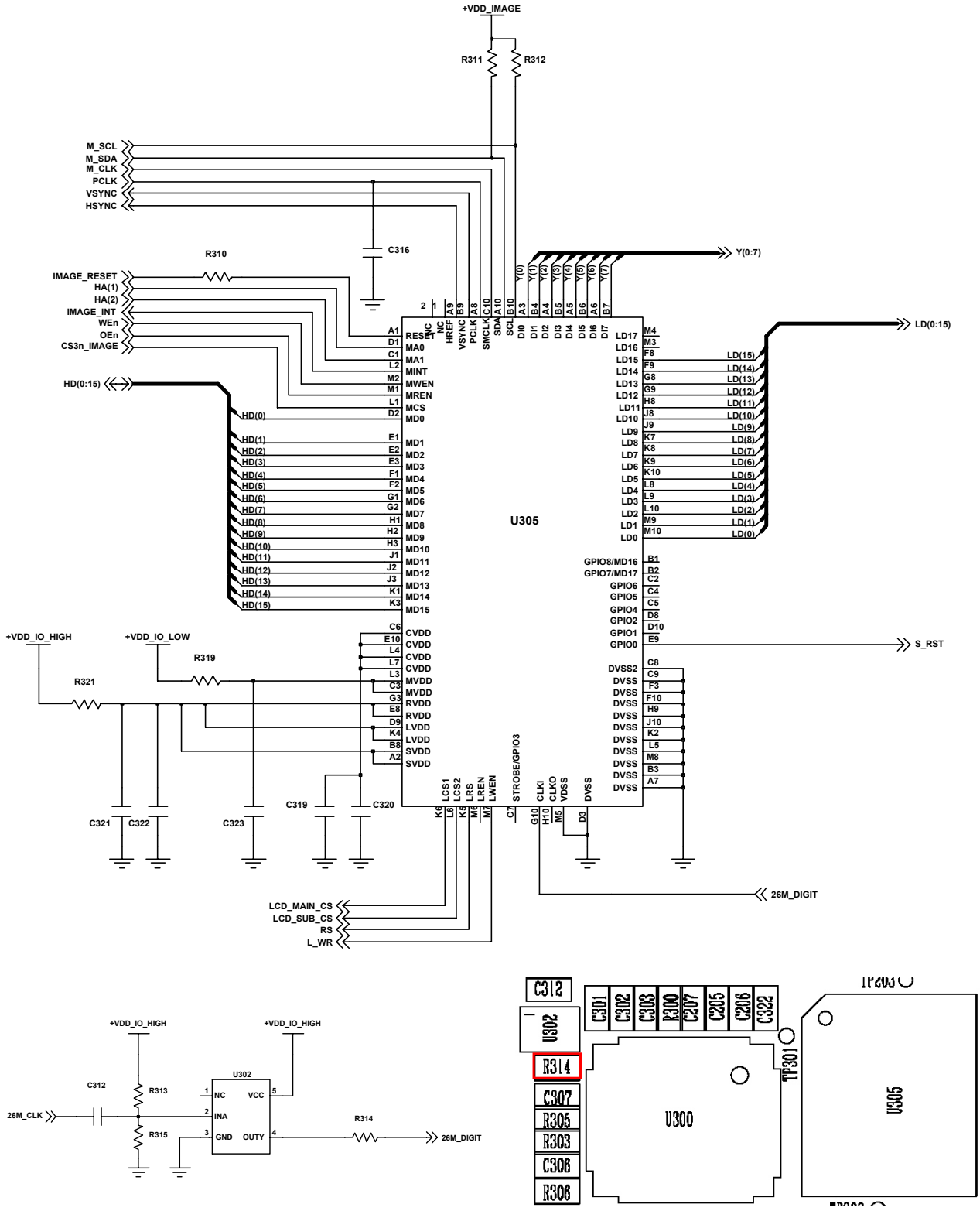


7-11. Camera part

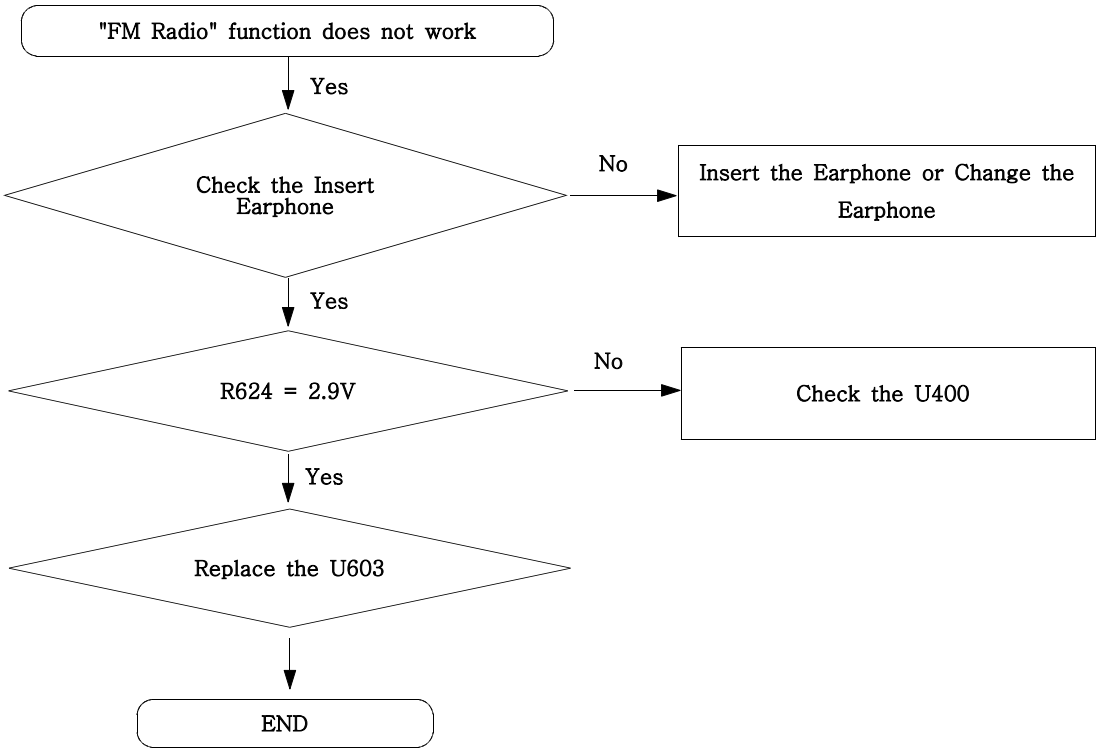


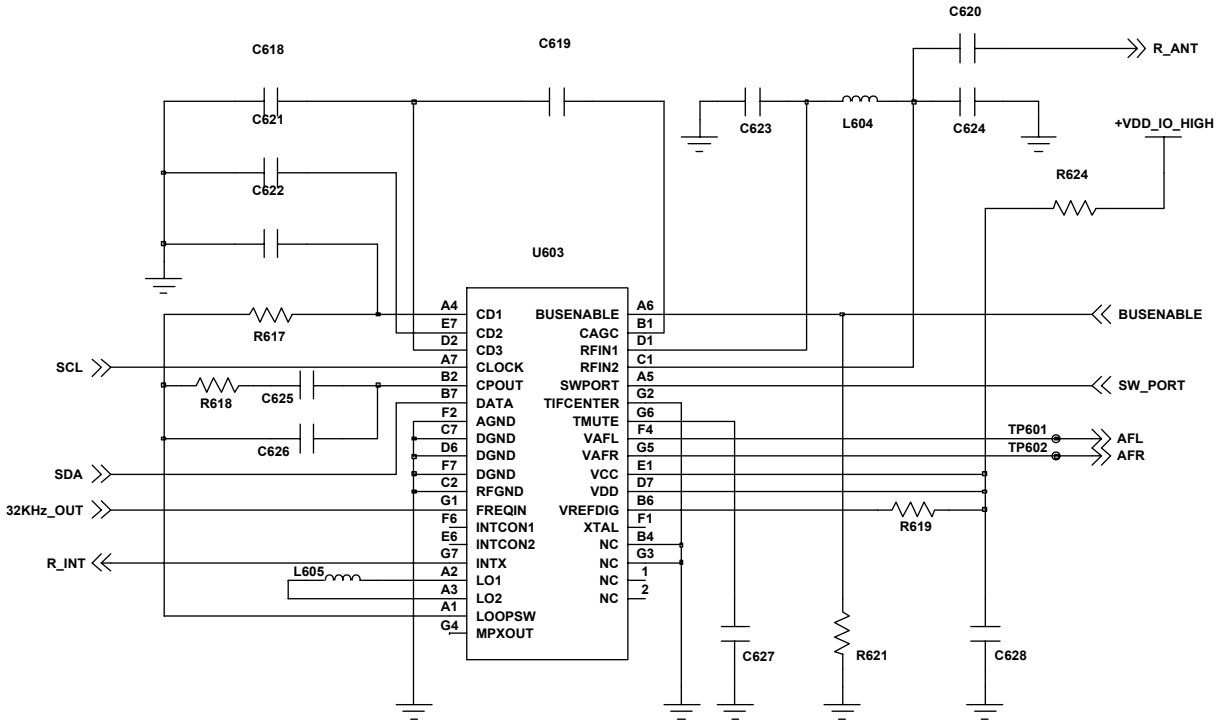


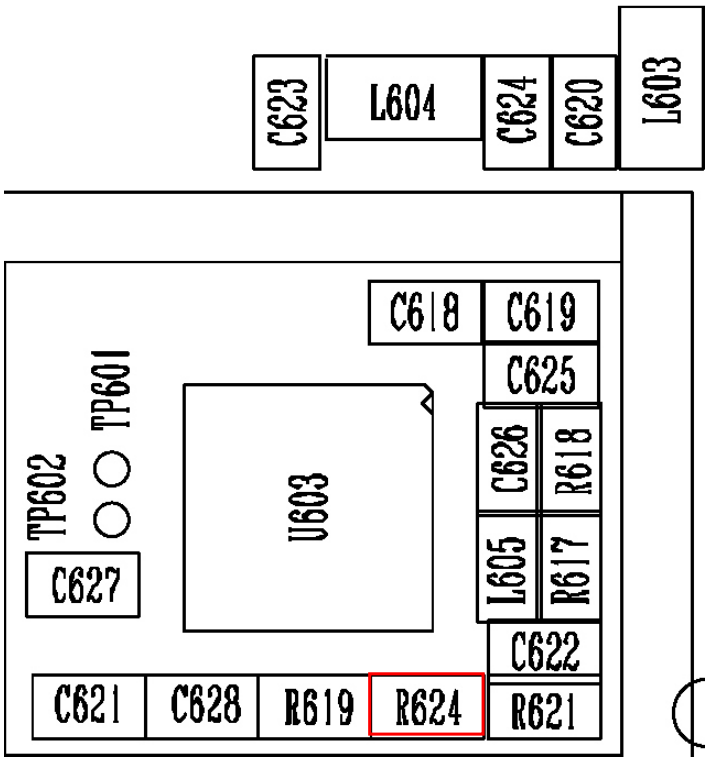




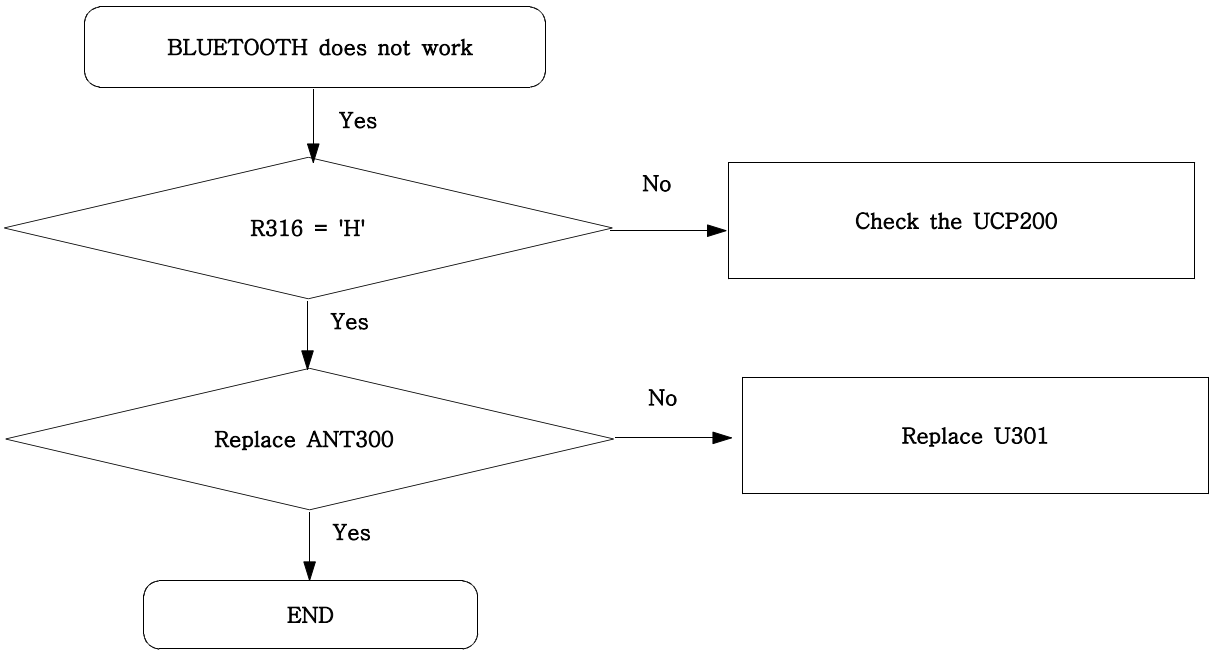
7-12. FM RADIO

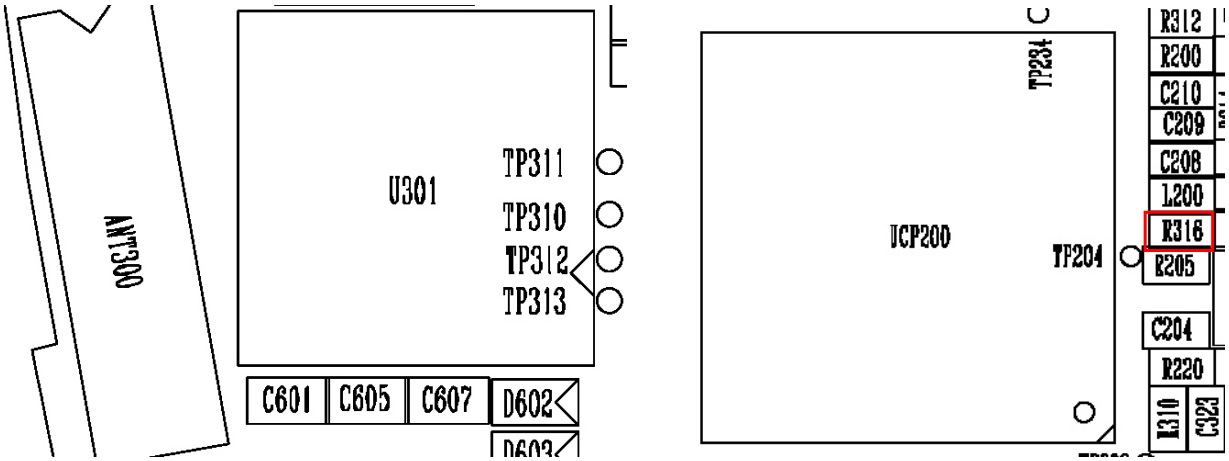


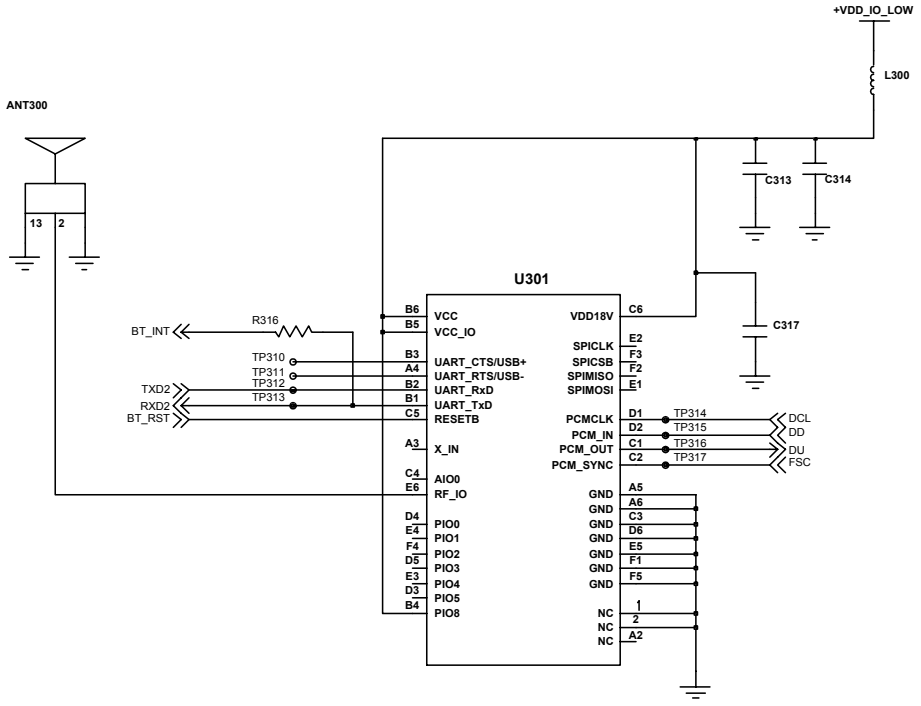




7-13. BLUETOOTH

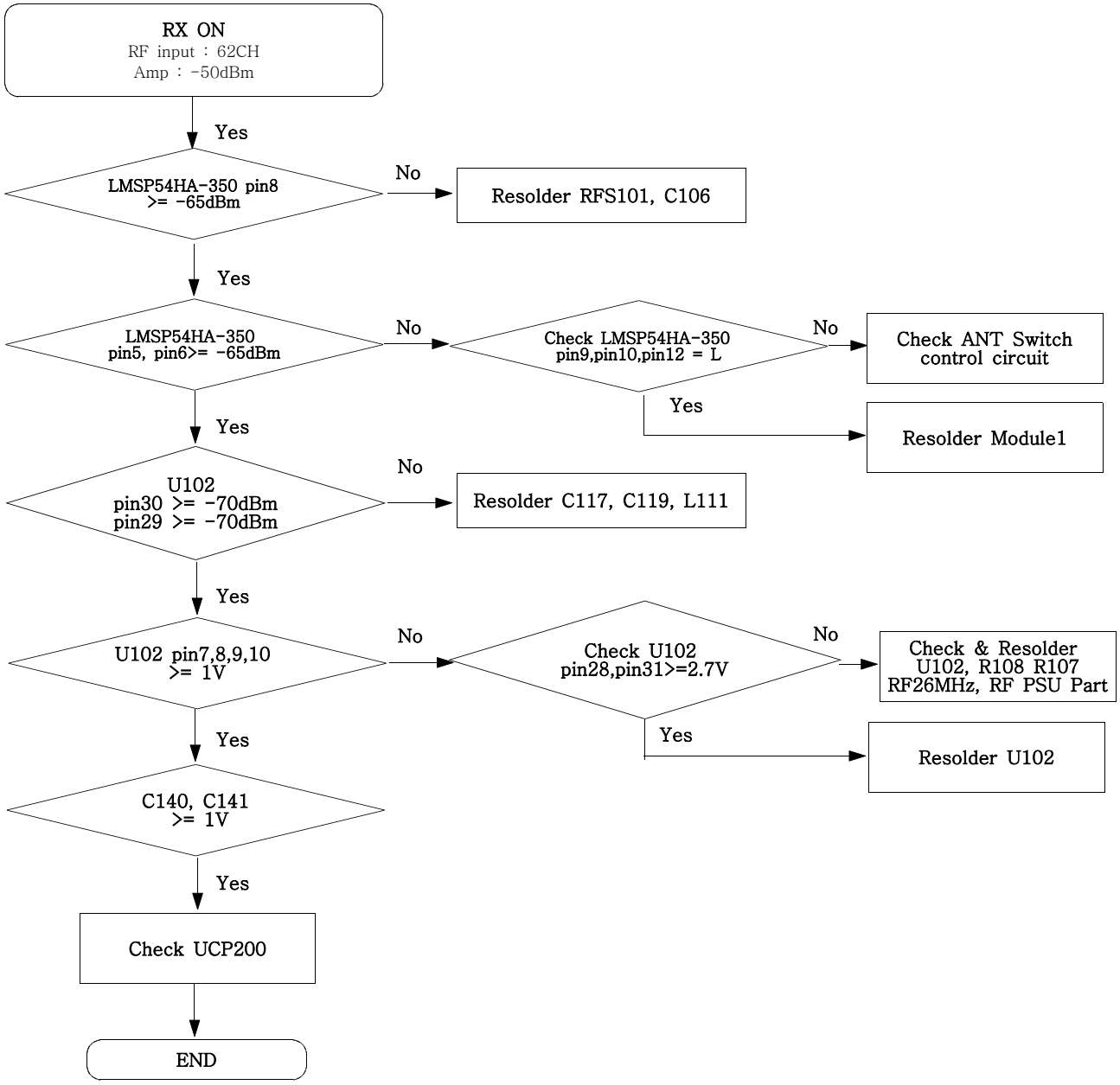




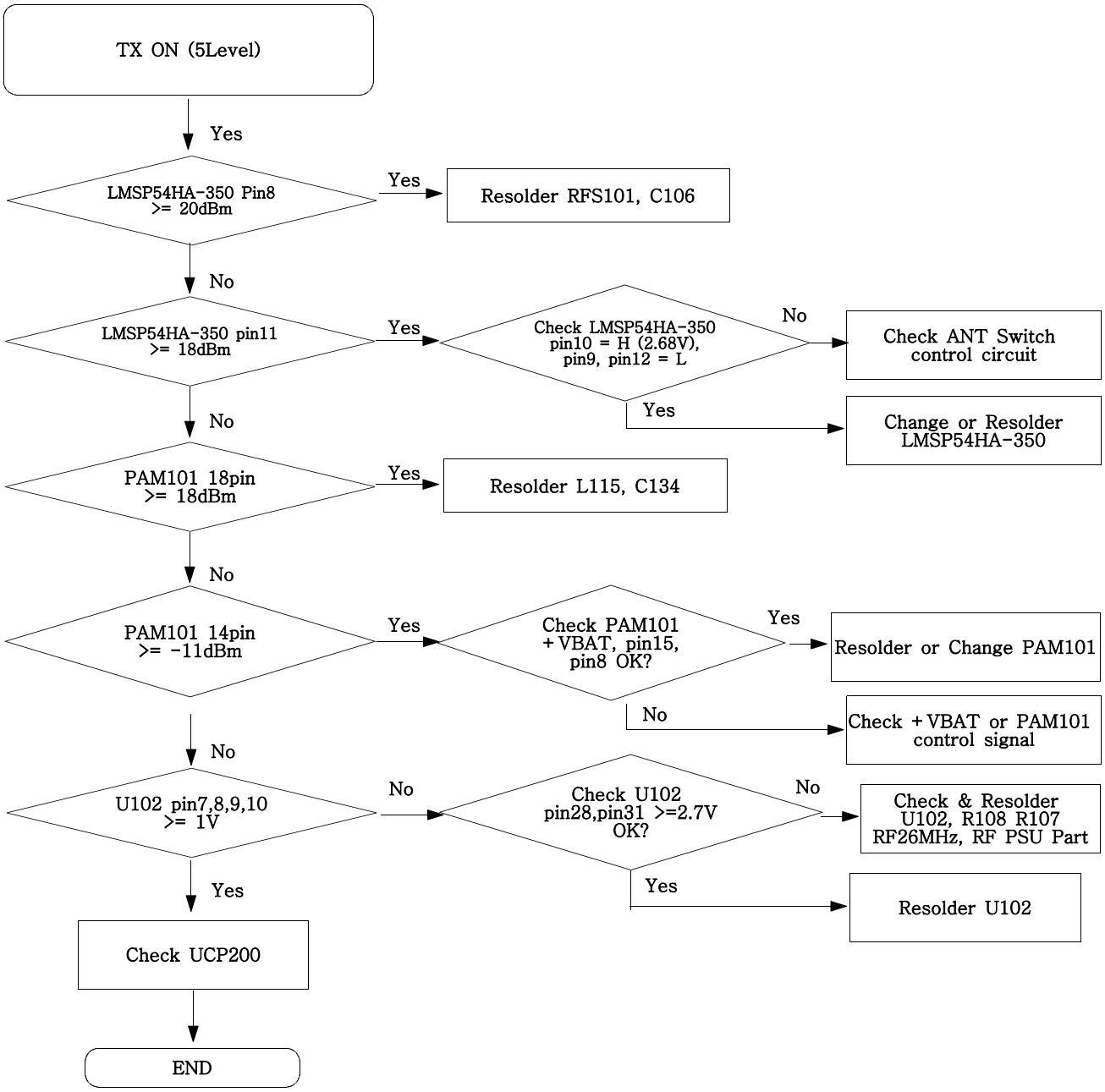


BLUE TOOTH

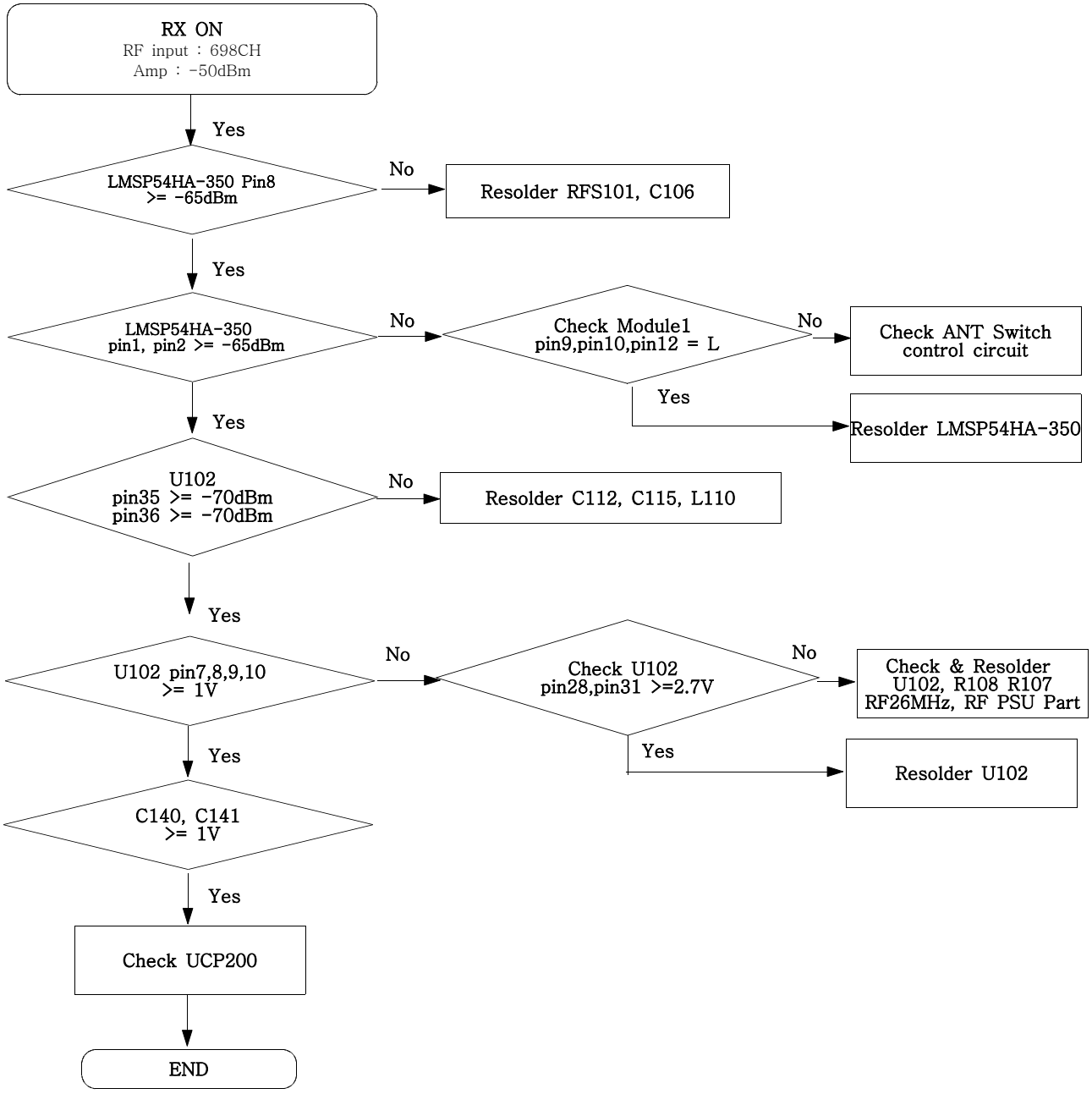
7-14. GSM Receiver



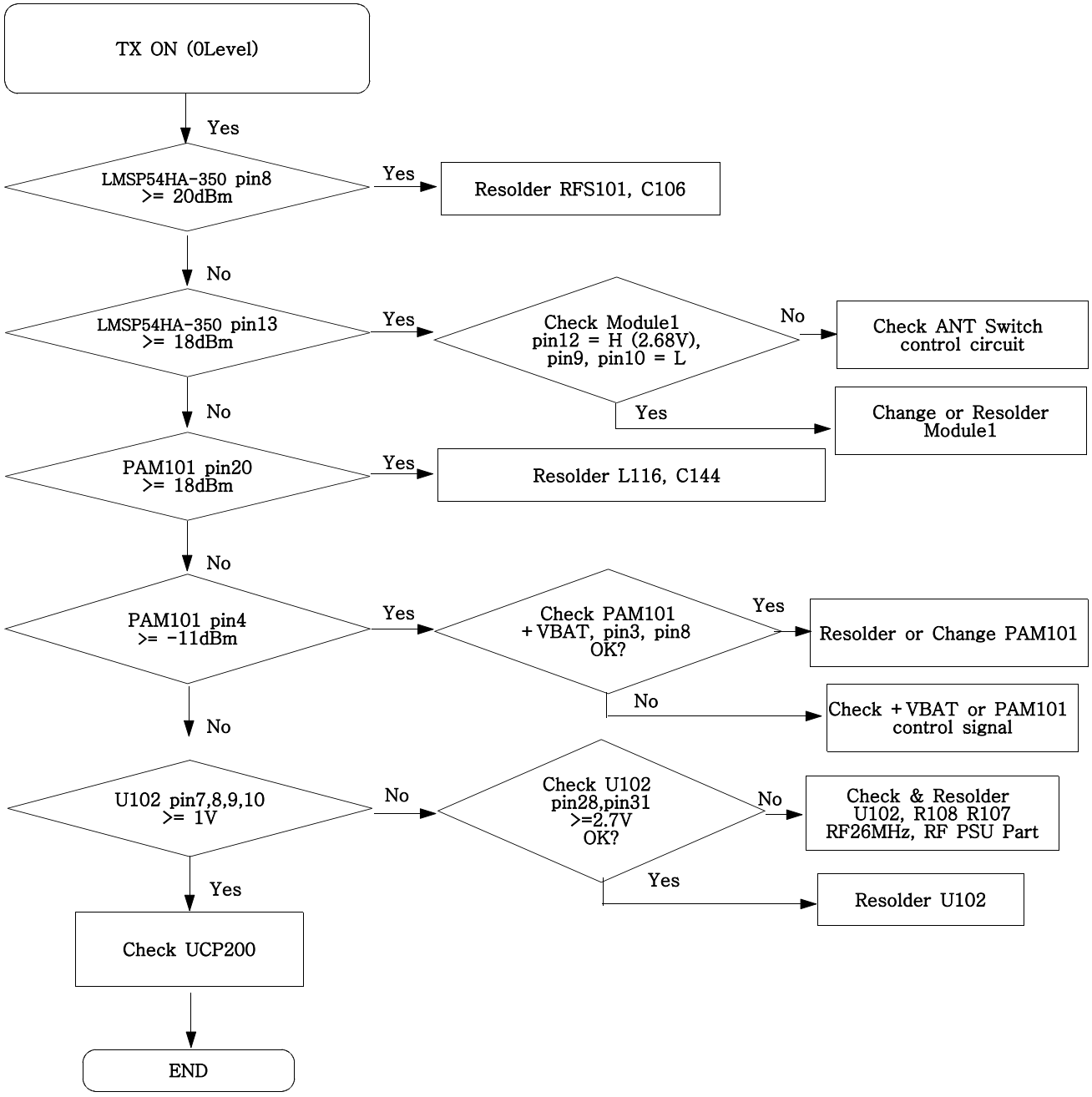
7-15. GSM Transmitter



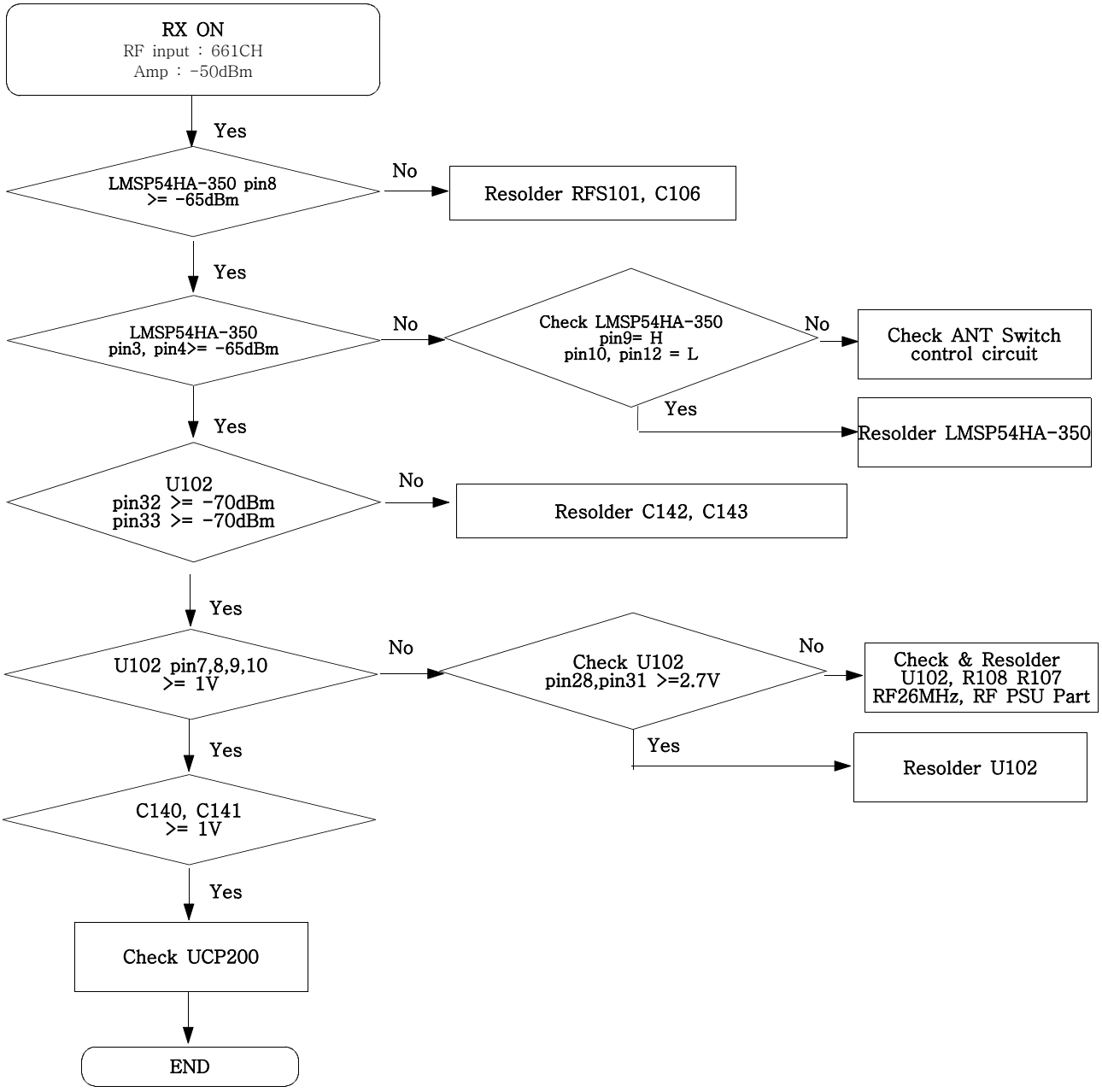
7-16. DCS Receiver



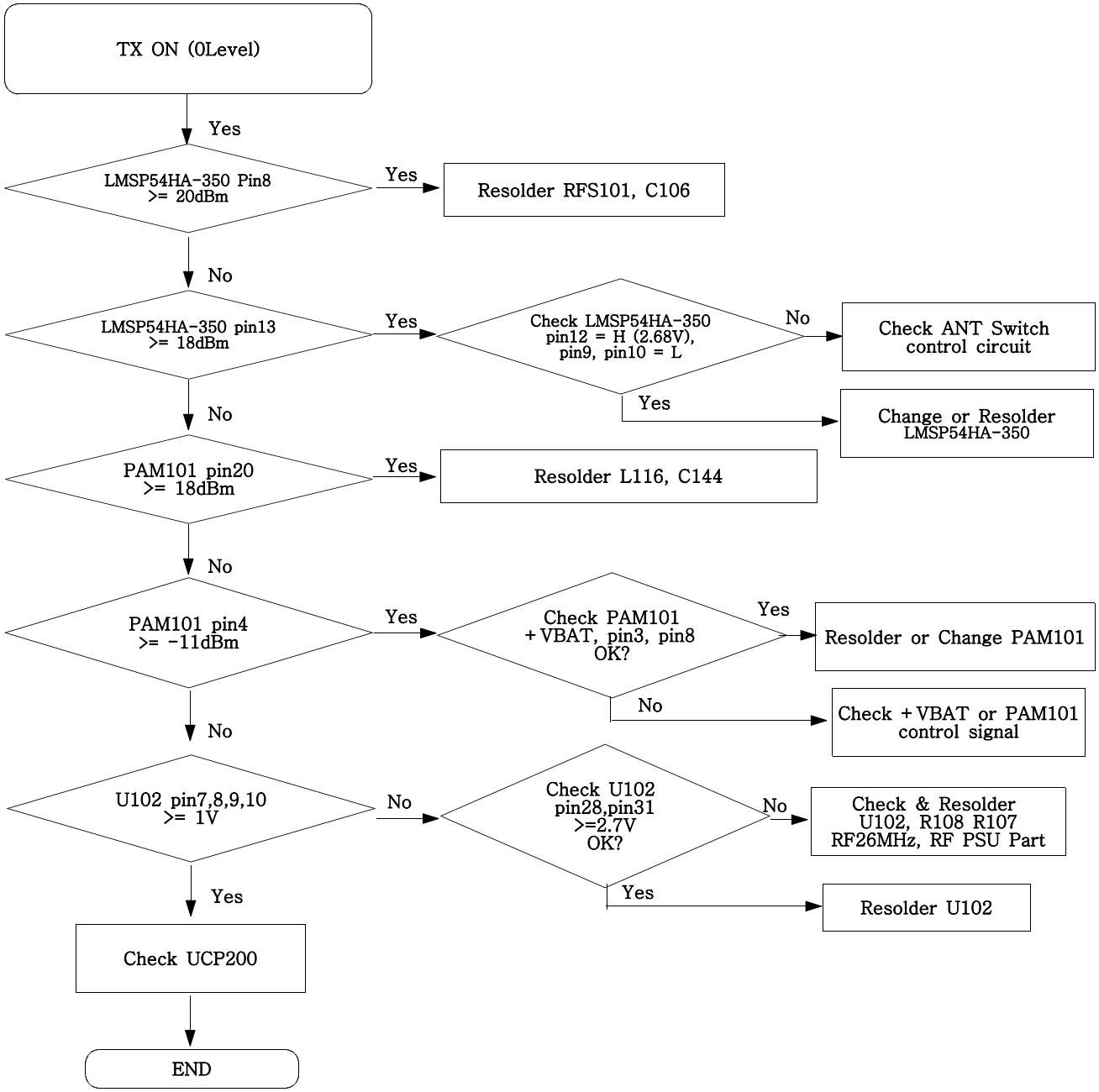
7-17. DCS Transmitter

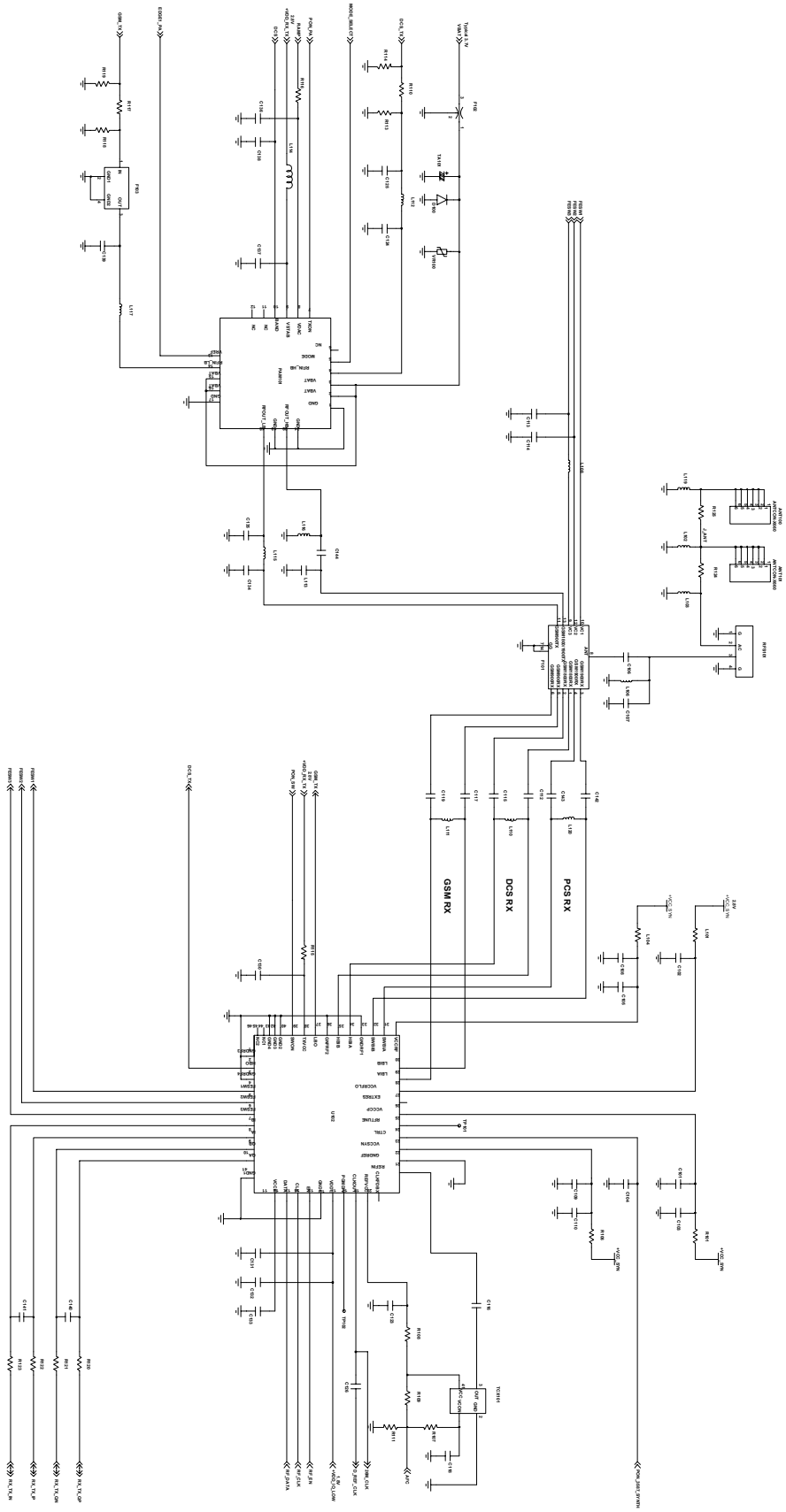


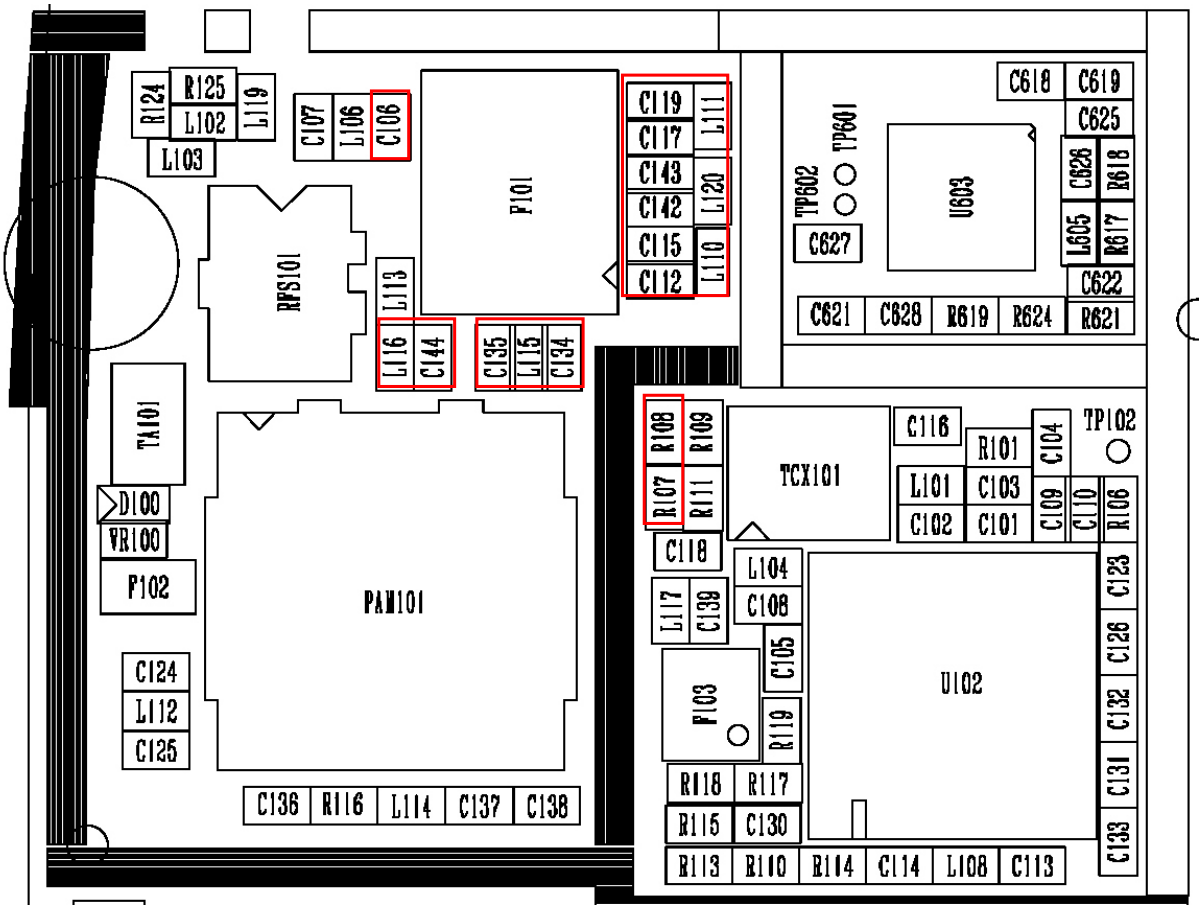
7-18. PCS Receiver



7-19. PCS Transmitter

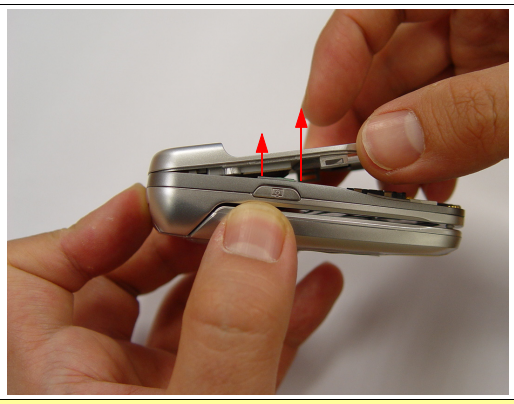
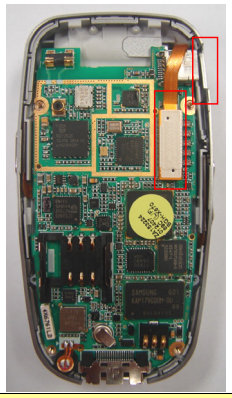
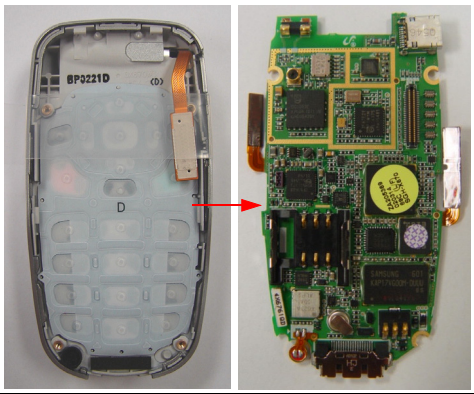
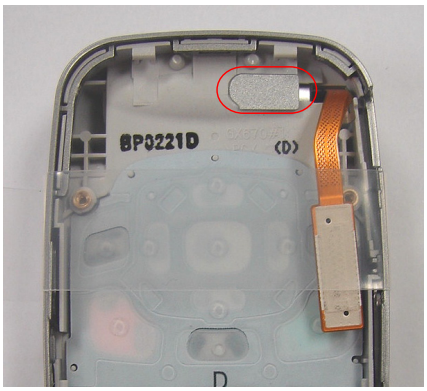


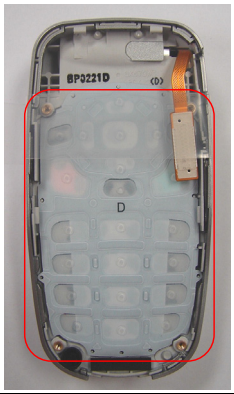
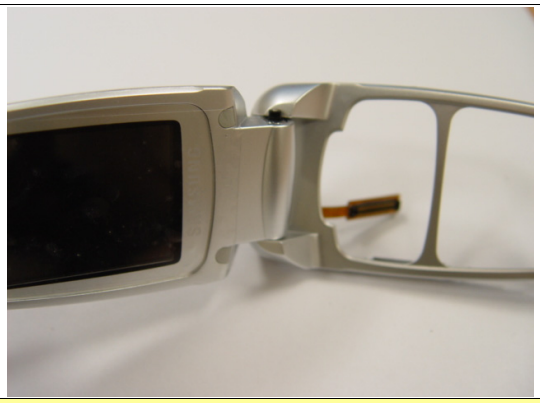




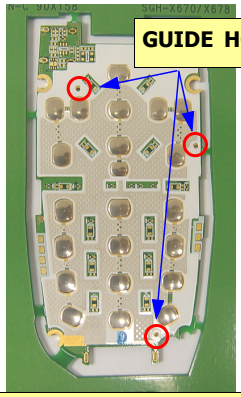
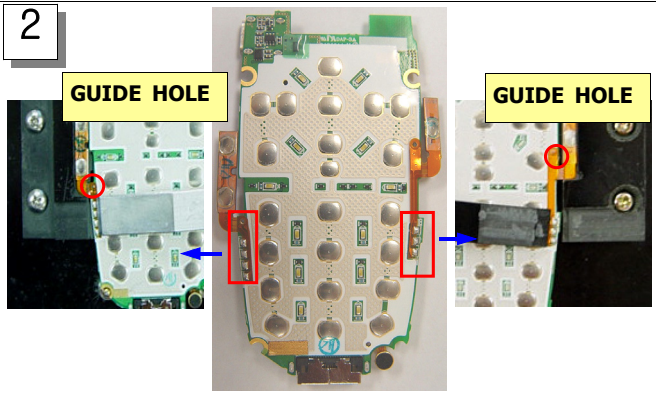
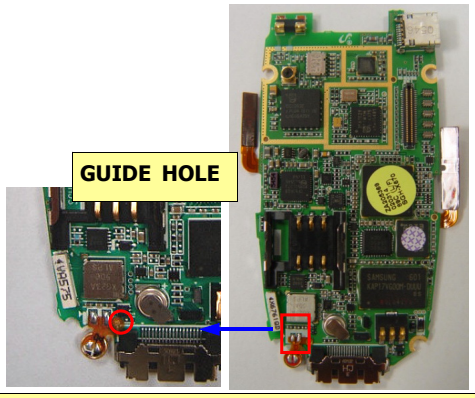
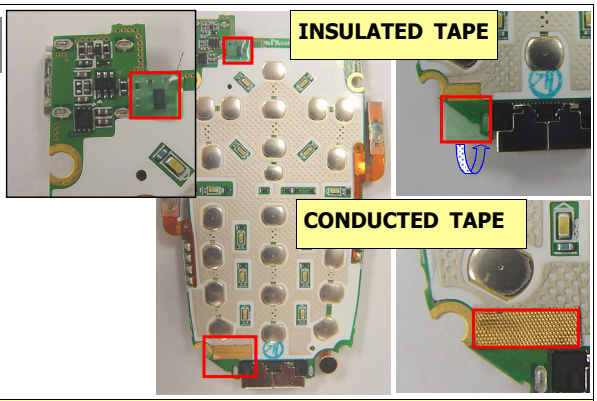
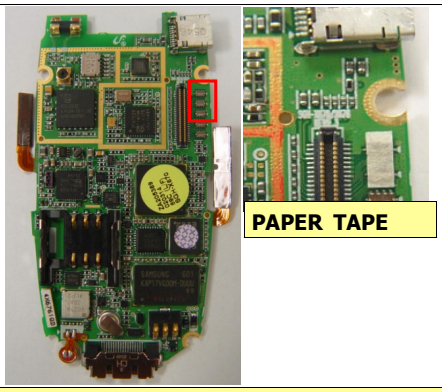
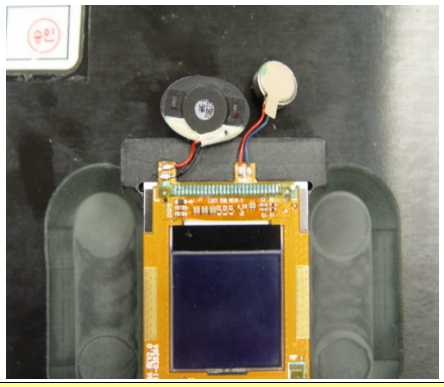
8. Exploded and assembling View

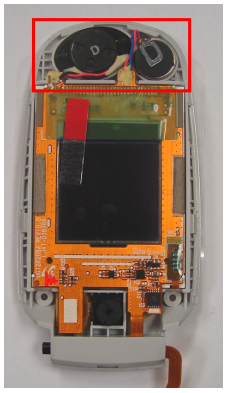
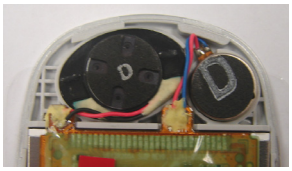
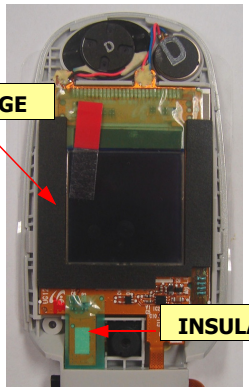
Disassembling Procedure

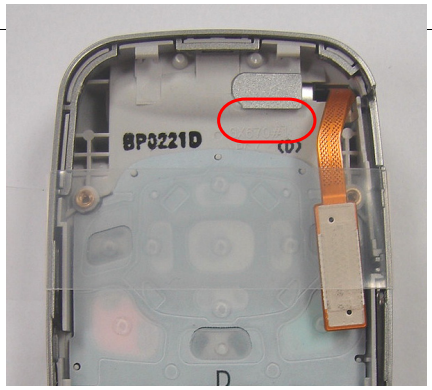
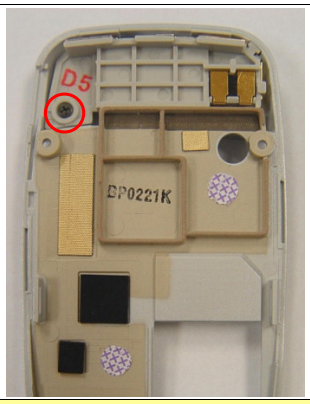
1 	2 
Loosen the Rear Screw.	**Disassemble the Folder Ass'y and the Rear from the bottom of side.**
3 	4 
Separate the Folder Ass'y and the Rear.	**Take out the Ear Cover and separate the LCD Connector.**
5 	6 
Separate the PBA and the Folder Ass'y.	**Remove the Tape.**

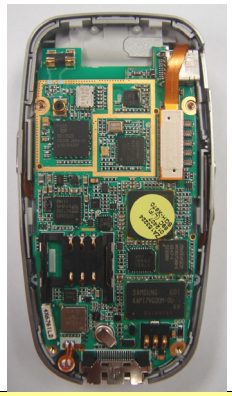
7 	8 
Take out the Keypad.	**Separate the Folder and the Front.**
9  	10  
Detach the Folder Screw Cap and loosen the Folder Screw.	**Disassemble the Folder from the bottom.**
11  	12  
Separate the Folder Lower and Folder Upper.	**Separate the Folder Lower and the LCD Ass'y.**

Assembling Procedure

1  	2 
Attach the Domesheet on the PBA according to Guide Hole.	**Resolder the Volume Key and the Camera Key.**
3  	4 
Resolder the Mic.	**Attach the Insulated Tape(2 POINT) and the Conducted Tape(1 POINT).**
5  	6 
Attach the Paper Tape.	**Bond the Motor and Speaker after resoldering with attention to polarity.**

7 	8 
Attach the Main Window on the Folder Lower.	**Put the Camera in the Folder Lower.**
9  	10 
Put the LCD Ass'y in the Folder Lower.	**Attach the Insulated Tape and Sponge on the LCD Ass'y.**
11 	12 
Attach the Sub Window on the Folder Upper.	**Assemble the Folder from the top.**

13 	14 
Tighten the Folder Screws.	**Attach the Screw Cap.**
15 	16 
Assemble the Folder and the Front.	**Insert the Keypad.**
17 	18 
Attach the Tape to prevent indraft of dust.	**Assemble the Intenna on the Rear and tighten the Screw.**

20 	21 
Insert the PBA and join the LCD Connector.	**Assemble the Folder Ass'y and the Rear.**
22 	
Tighten the Rear Screws.	