

**SAMSUNG**

GSM TELEPHONE  
SGH-E730

# ***SERVICE*** *Manual*

GSM TELEPHONE



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# 1. Specification

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## 1-1. GSM General Specification

	<b>GSM900 Phase 1</b>	<b>EGSM 900 Phase 2</b>	<b>DCS1800 Phase 1</b>	<b>PCS1900</b>
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

<b>TX Power control level</b>	<b>GSM900</b>	<b>TX Power control level</b>	<b>DCS1800</b>	<b>TX Power control level</b>	<b>PCS1900</b>
5	33±3 dBm	0	30±3 dBm	0	30±3 dBm
6	31±3 dBm	1	28±3 dBm	1	28±3 dBm
7	29±3 dBm	2	26±3 dBm	2	26±3 dBm
8	27±3 dBm	3	24±3 dBm	3	24±3 dBm
9	25±3 dBm	4	22±3 dBm	4	22±3 dBm
10	23±3 dBm	5	20±3 dBm	5	20±3 dBm
11	21±3 dBm	6	18±3 dBm	6	18±3 dBm
12	19±3 dBm	7	16±3 dBm	7	16±3 dBm
13	17±3 dBm	8	14±3 dBm	8	14±3 dBm
14	15±3 dBm	9	12±4 dBm	9	12±4 dBm
15	13±3 dBm	10	10±4 dBm	10	10±4 dBm
16	11±5 dBm	11	8±4dBm	11	8±4dBm
17	9±5 dBm	12	6±4 dBm	12	6±4 dBm
18	7±5 dBm	13	4±4 dBm	13	4±4 dBm
19	5±5 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-E730 RF Circuit Description

#### 2-1-1. RX PART

- ANTENNA SWITCH (Module1 Front End Module)

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

- ANTENNA SWITCH Control Logic (Module1) 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

- VC-TCXO (U102)

This module generates the 26MHz reference clock to drive the logic and RF.

It is turned on when the supply voltage Vcc(SYN) is applied.

After buffering a reference clock of 26MHz is supplied to the other parts of the system through the transceiver pin CLKOUT.

- TRANSCEIVER (U100)

This chip is fully integrated GSM GPRS quad-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.

#### 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-E730

### 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).

#### - 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 262K TFT LCD) and sub LCD (color 65K OLED LCD)

Chip select signals in the U305, LCD\_MAIN\_CS, LCD\_SUB\_CS can enable LCD. BACKLIGHT 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, UGNZ3, 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 PCF5212EL1EL1.

### 2-2-4. Key

This is consisted of key interface pins KEY\_ROW(0:4) and KEY\_COL(0:4) in PCF5212EL1EL1. These signals compose the matrix. Result of matrix informs the key status to key interface in the PCF5212EL1EL1. Power on/off key is separated from the matrix. So power on/off signal is connected with PCF50603 to enable PCF50603. Key LED is consisted of 12 white LEDs for main key. Main key LED use the 3.3V LDO for a supply voltage. KEY\_LED\_ON signal enables 12 white LED.

"FLIP" informs the status of folder (open or closed) to the PCF5212EL1EL1. This uses the hall effect IC, EM-1681-FT. 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 connector

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 PCF5212EL1EL1 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. YMU765 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 64 tones by stereophonic hybrid synthesizer.

YMU765 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

This system uses Samsung's memory, KAP17WG00M-D444. The KAP17WG00M-D444 is a Multi Chip Package Memory which combines 256Mbit Synchronous Burst Multi Bank NOR Flash Memory and two 1Gbit OneNAND Flash and 128Mbit Synchronous Burst UtrAM.

It has 16 bit data line, HD[0~15] which is connected to PCF5212EL1EL1 and MV3315DOQ, 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 PCF5212EL1EL1 choose different memories.

### 2-2-10. PCF5212EL1EL1

The PCF5212EL1EL1 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, tightly-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. 2-3

HD(0:15), data lines and HA(0:23), address lines are connected to KBJ10KB00M (memory), MV3315DOQ (image dsp) and YMU765 (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 YMU765 to communicate.

MV3315DOQ(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. The system communicates with IrDA via IrDA\_TXD, IrDA\_RXD.

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. VC-TCXO-214C6-26.0C (26MHz)

This system uses the 26MHz TCXO, VC-TCXO-214C6-26.0C. AFC control signal from PCF5212EL1 controls frequency from 26MHz x-tal. It generates the clock frequency. This clock is connected to PCF5212EL1, YMU765 and HD155166BPB.

### 2-2-12. Camera DSP (MV3315DOQ)

MV3315DOQ 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. MV3315DOQ 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 resolution 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)

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 PCF5212EL1 of I2C.

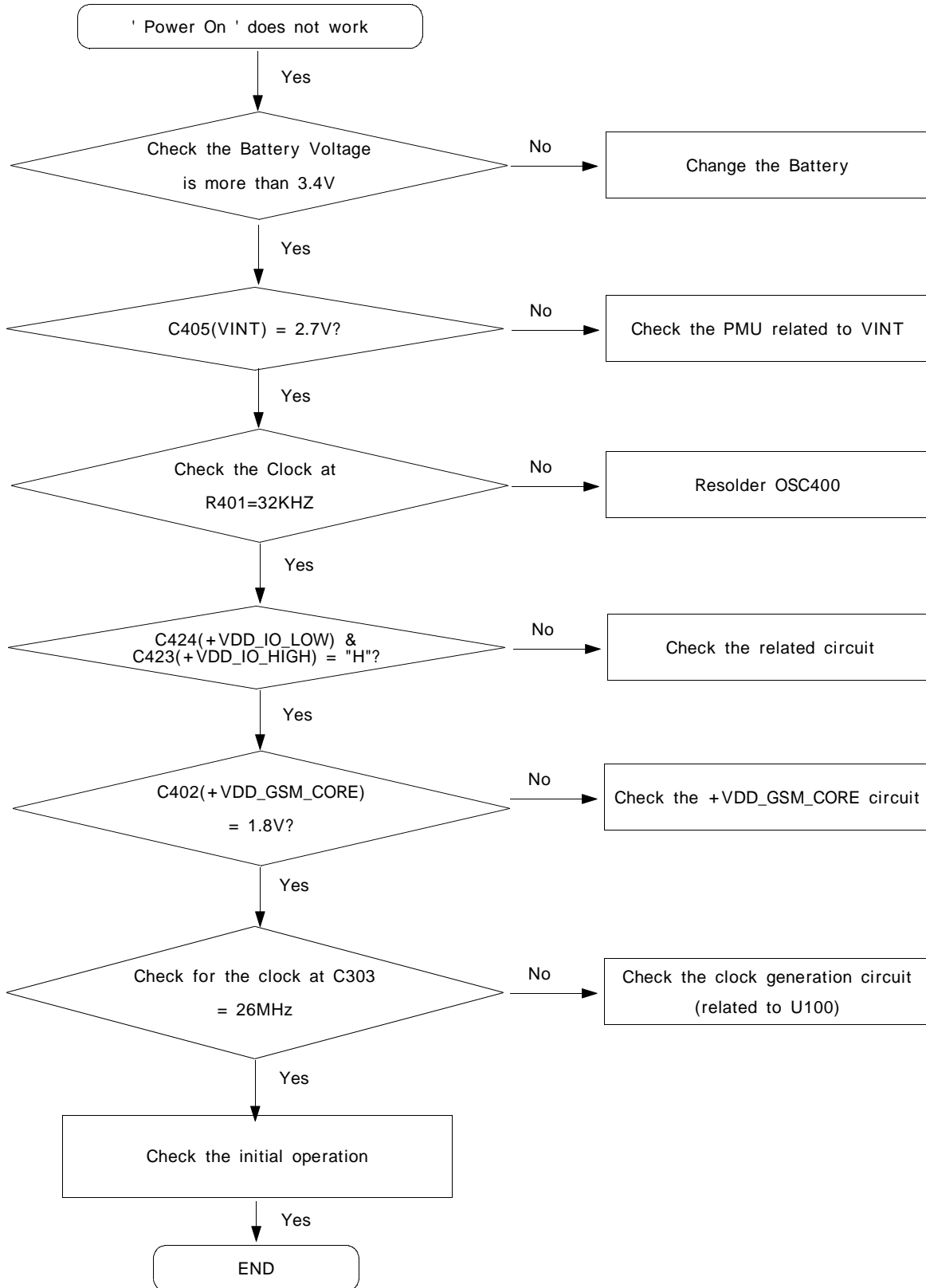


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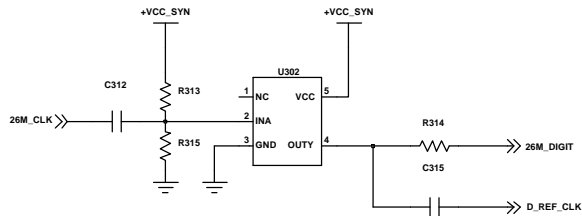
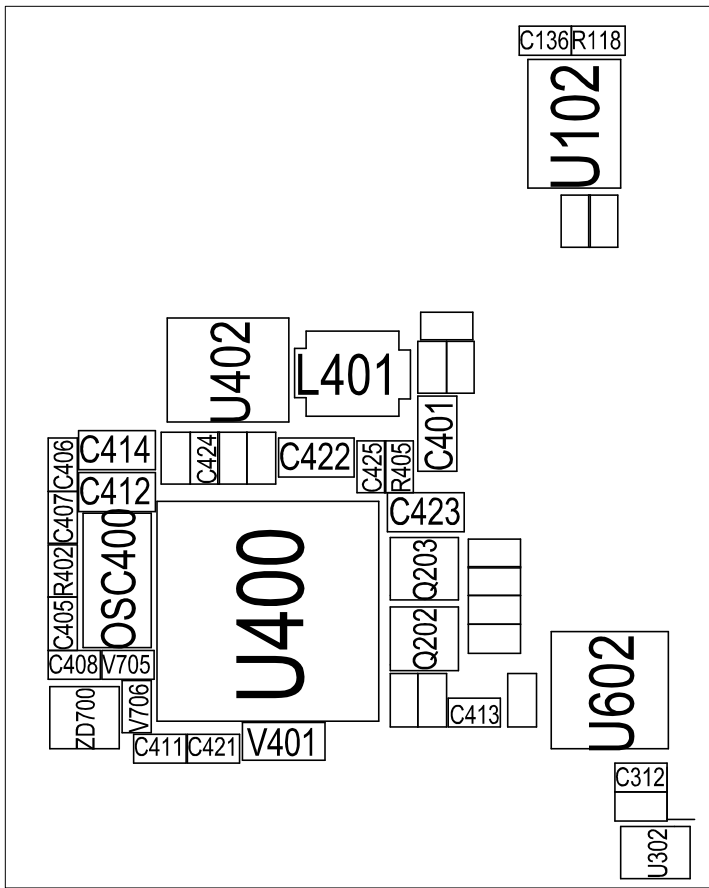
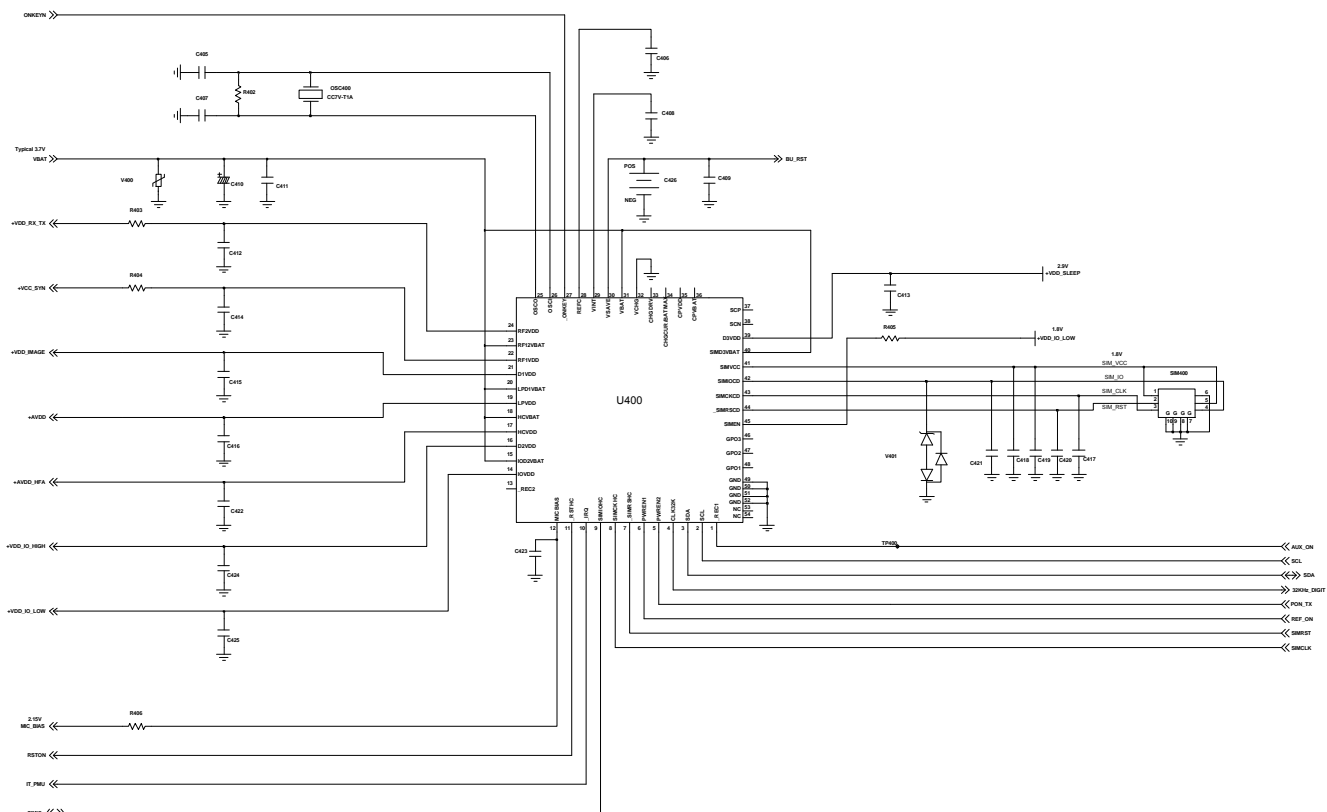
## 7. Flow Chart of Troubleshooting

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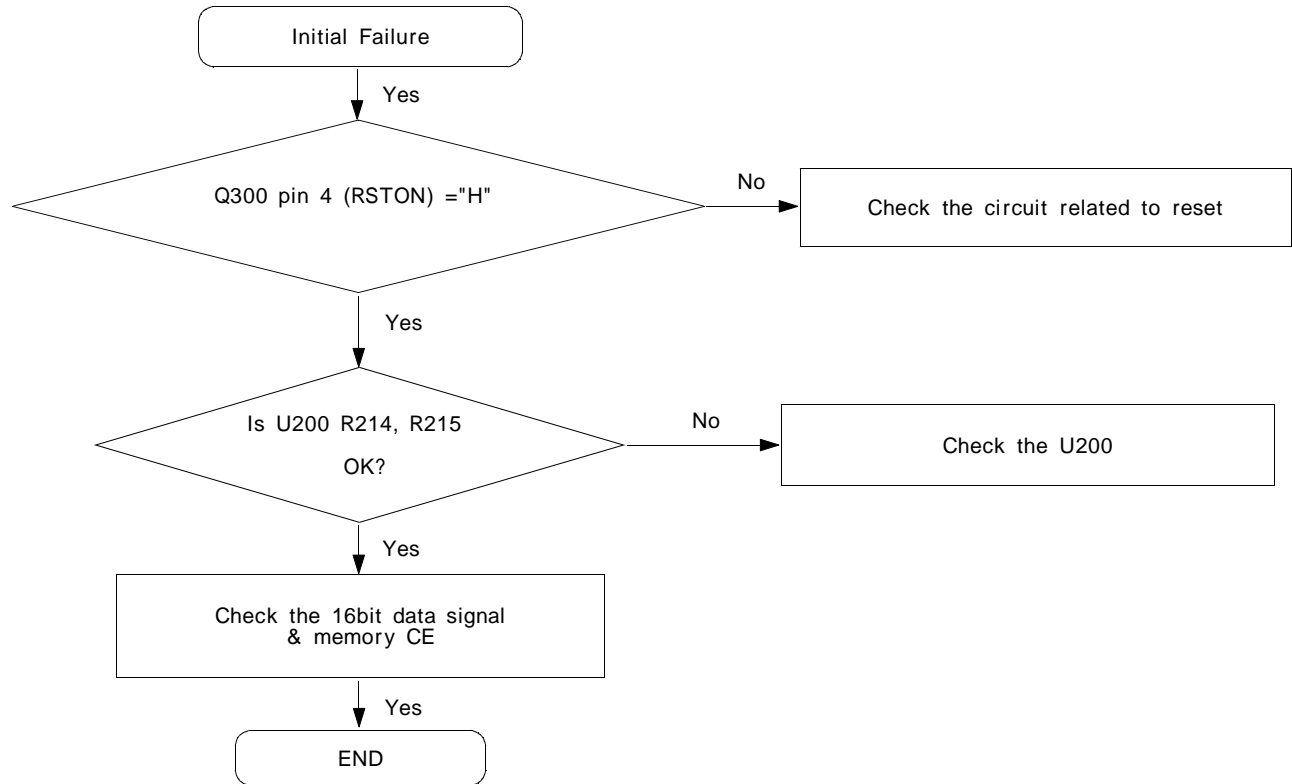
### 7-1. Power On



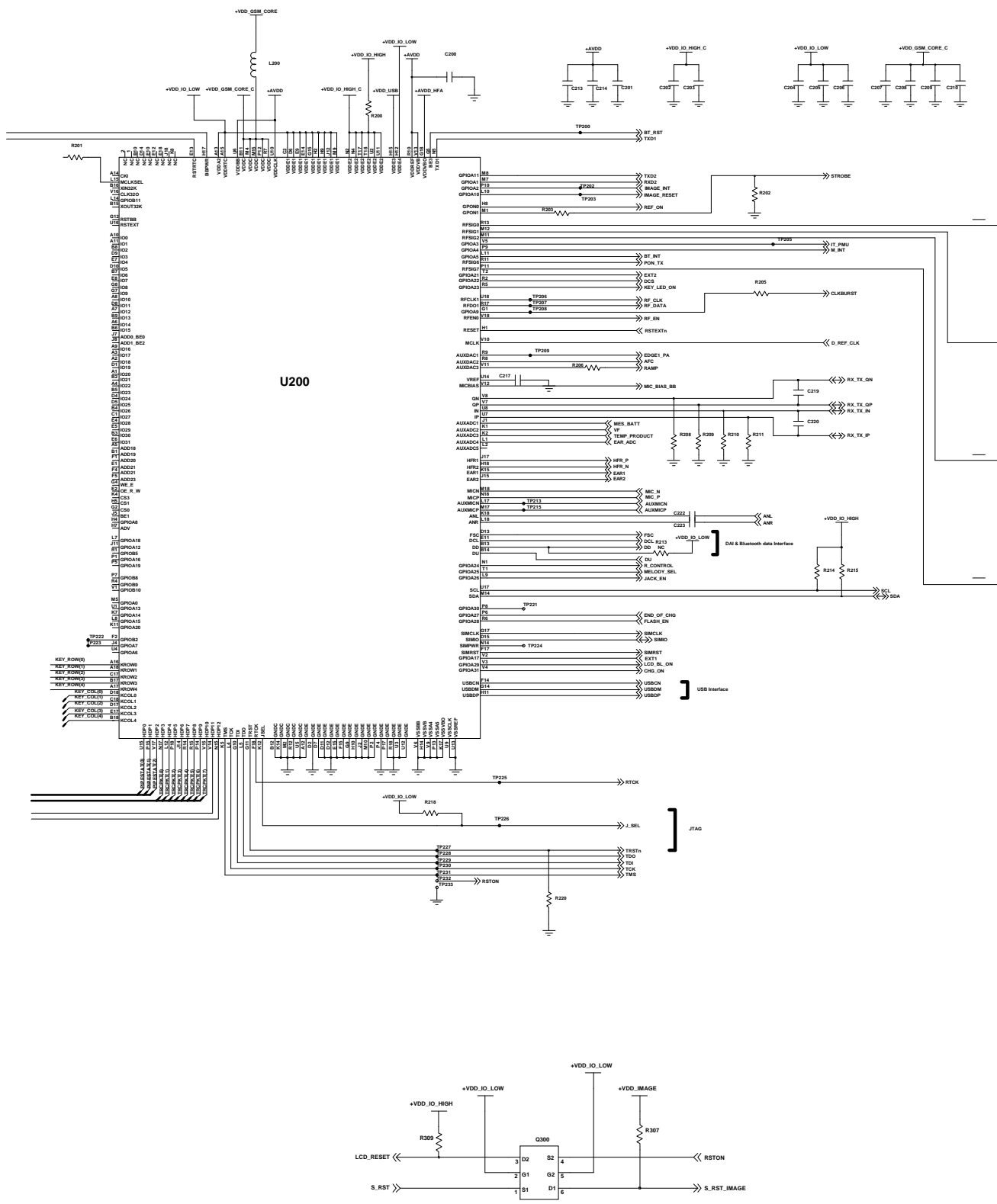
Flow Chart of Troubleshooting

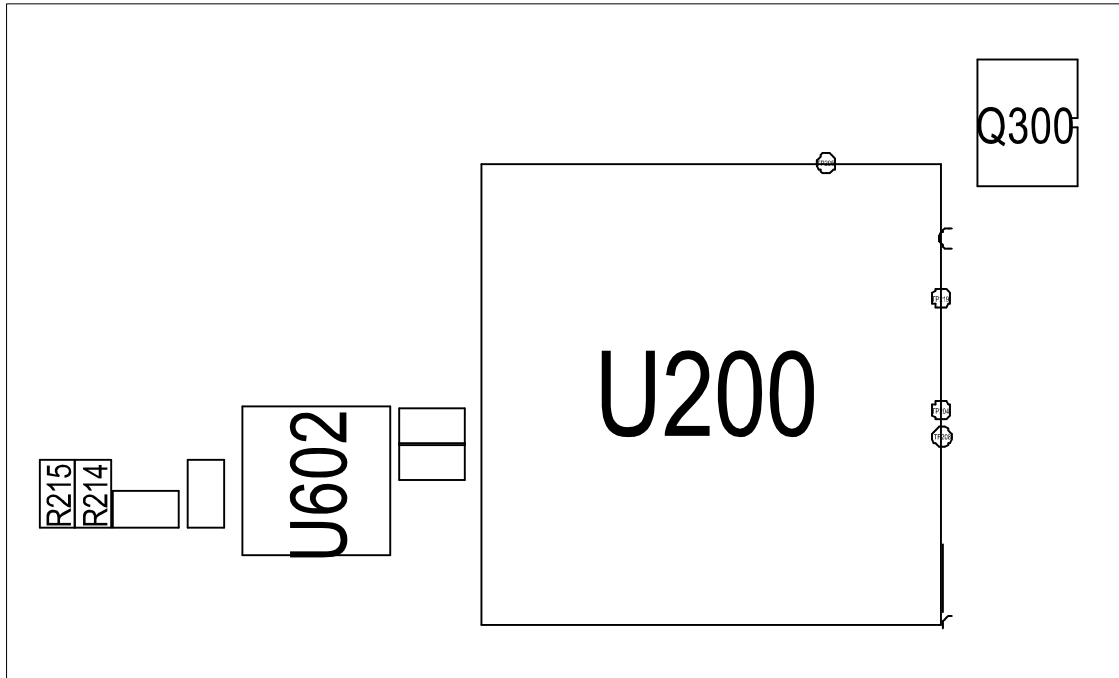


## 7-2. Initial

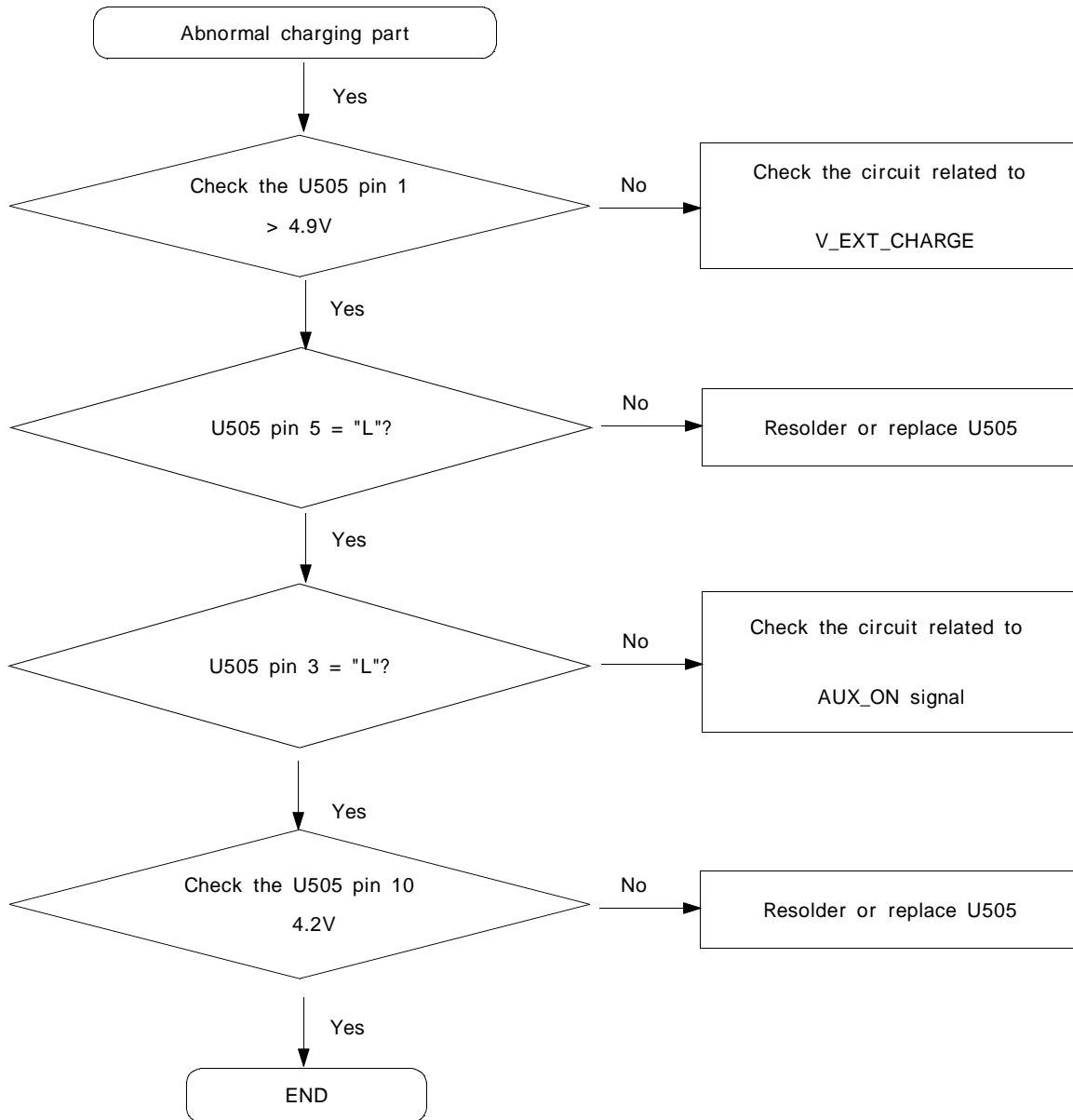


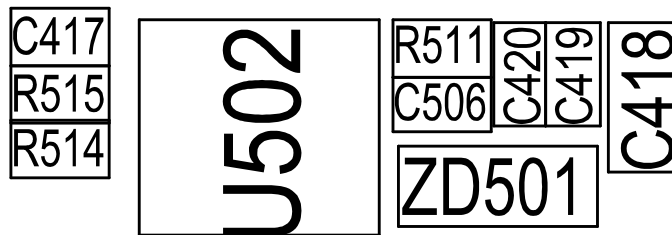
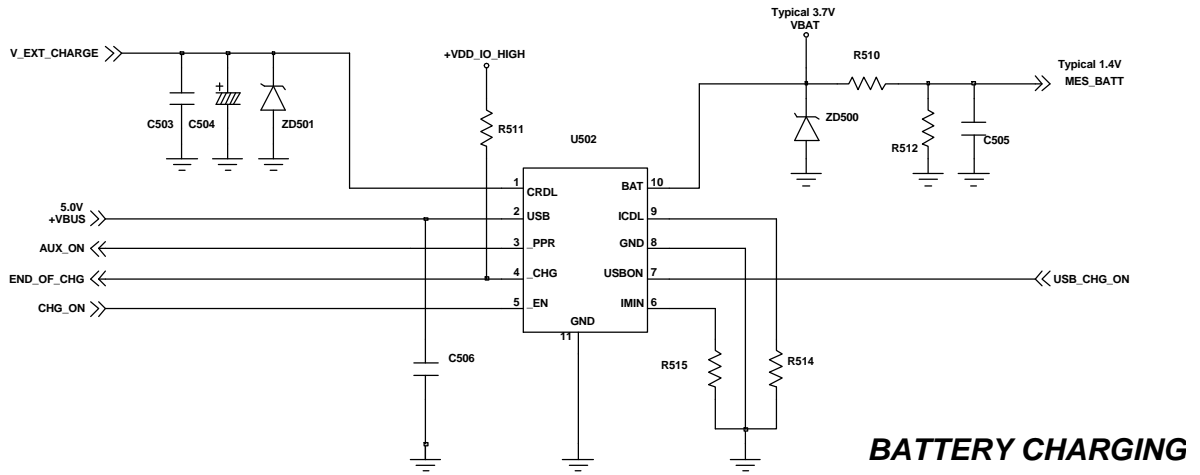
# Flow Chart of Troubleshooting



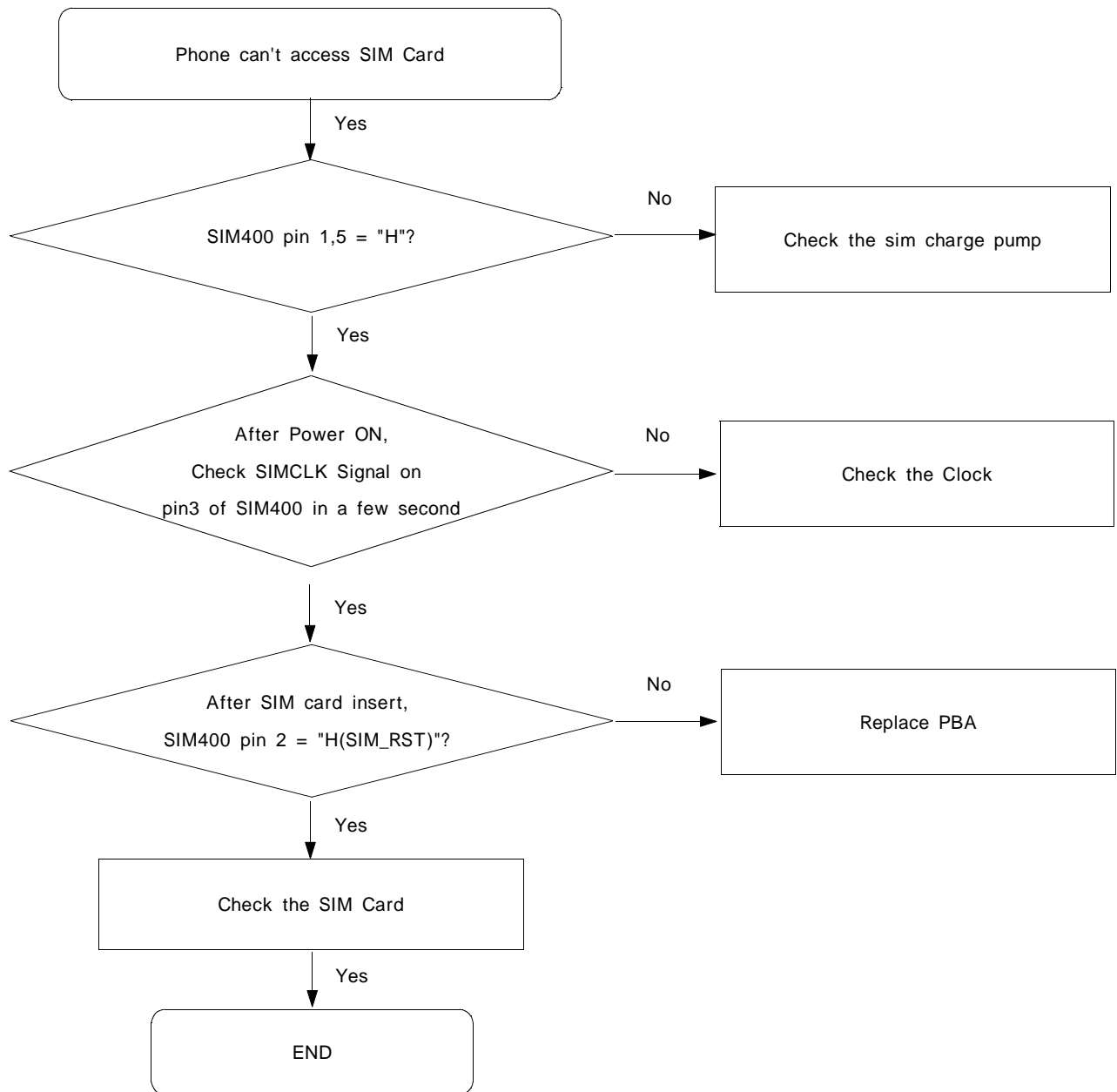


### 7-3. Charging Part

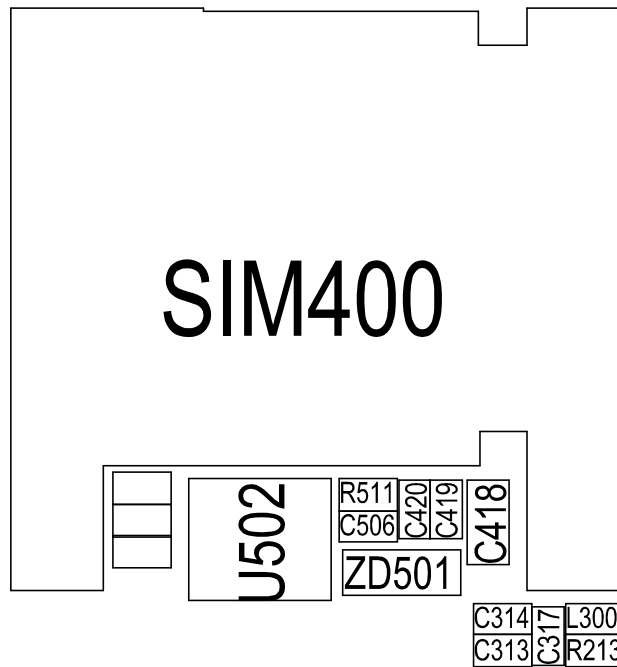
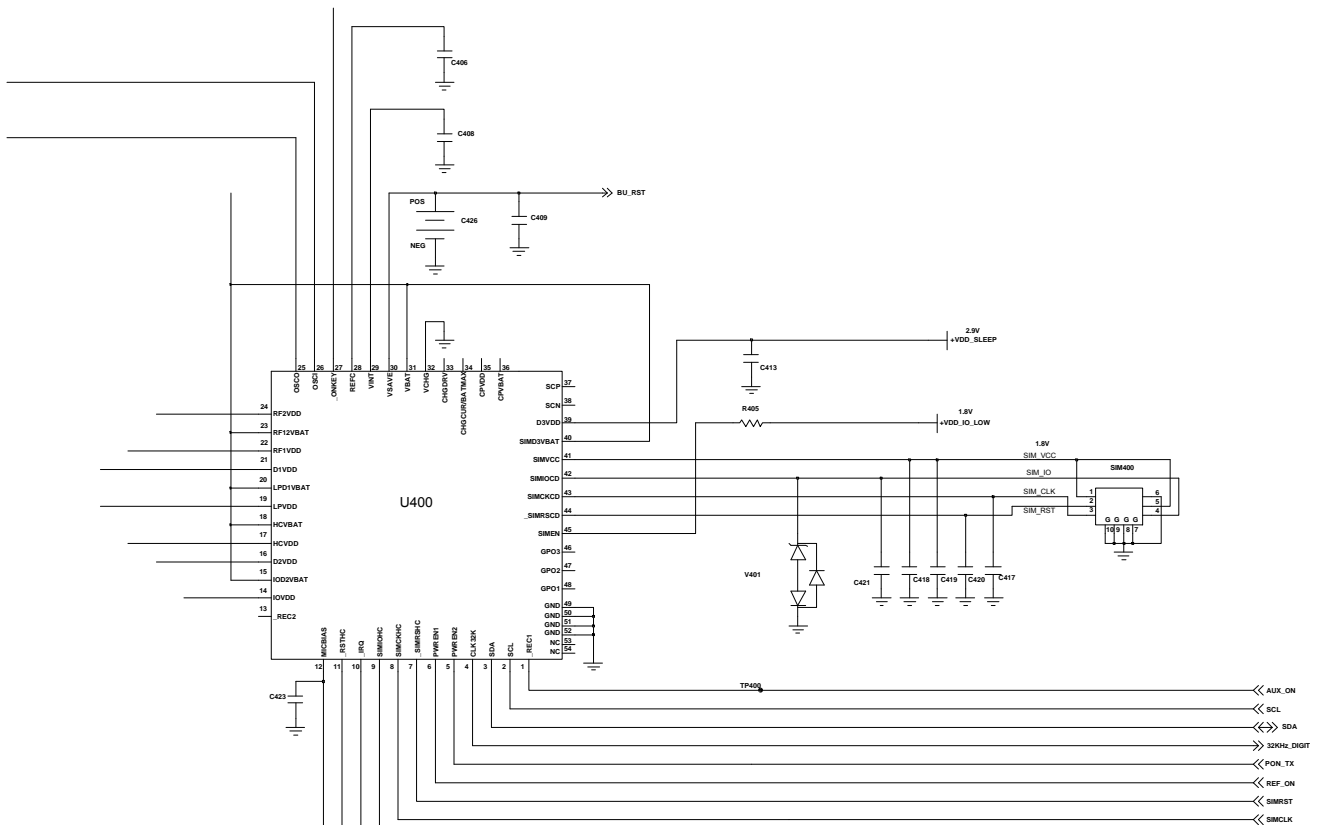




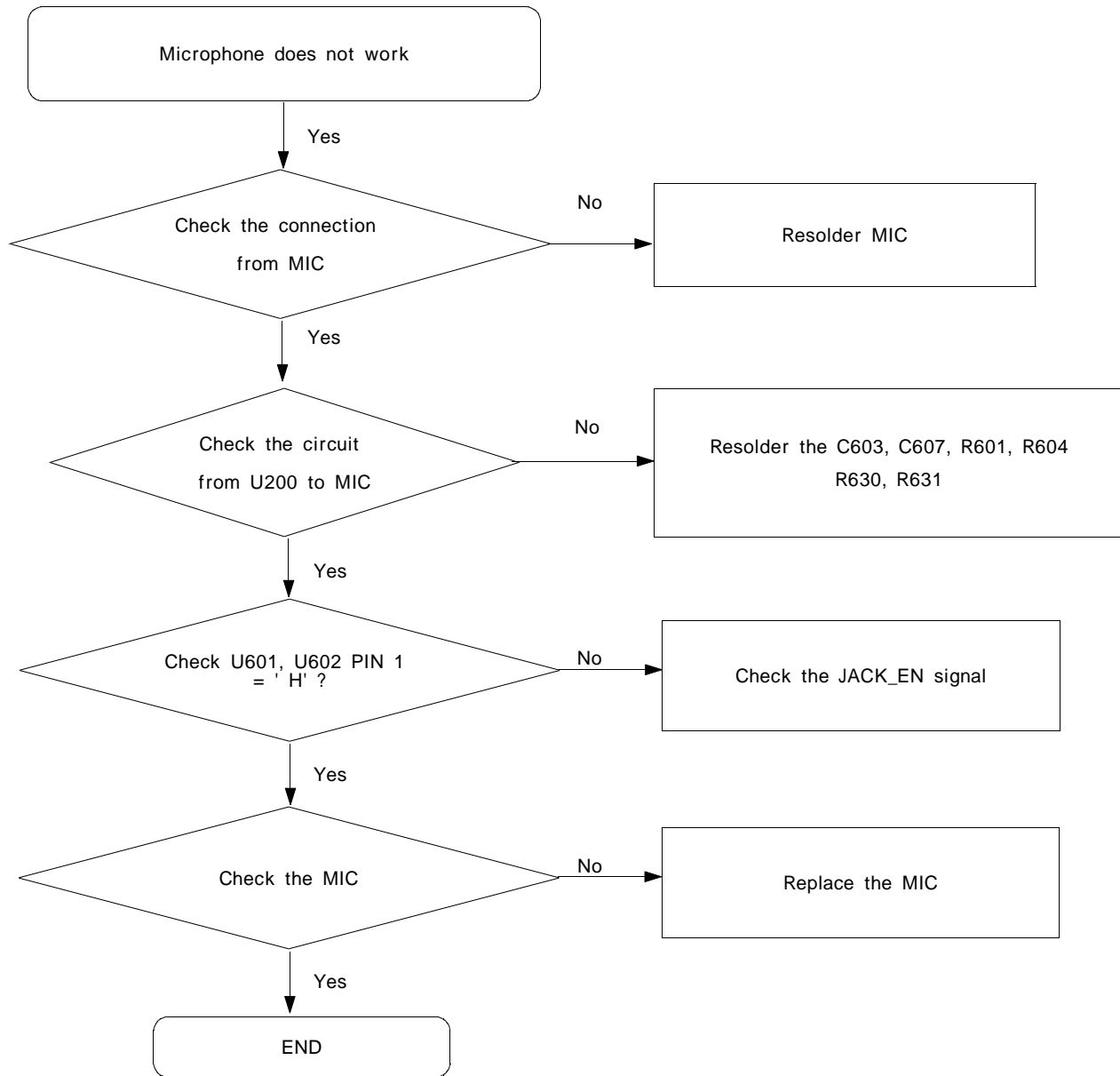
### 7-4. Sim Part

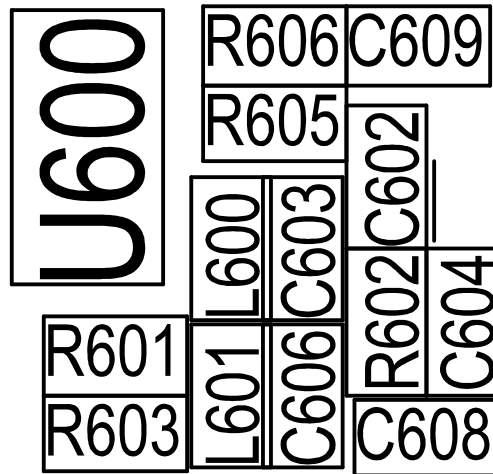
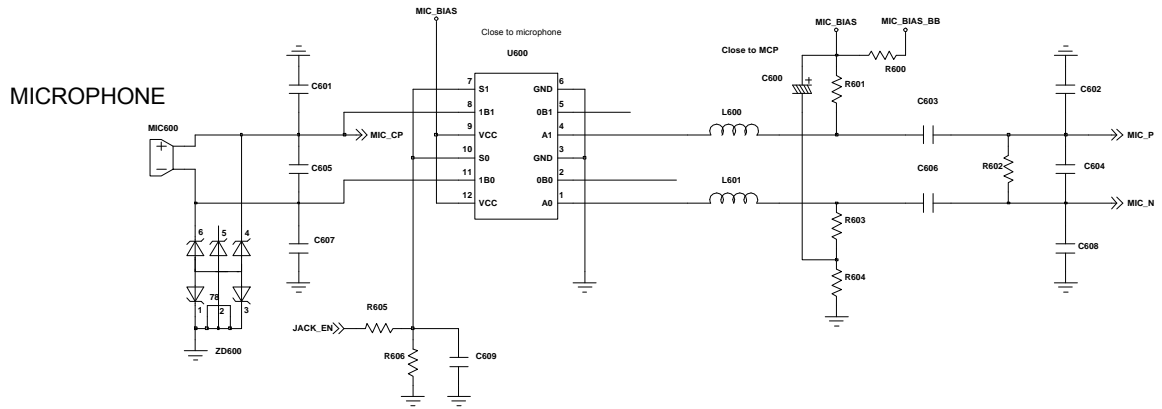




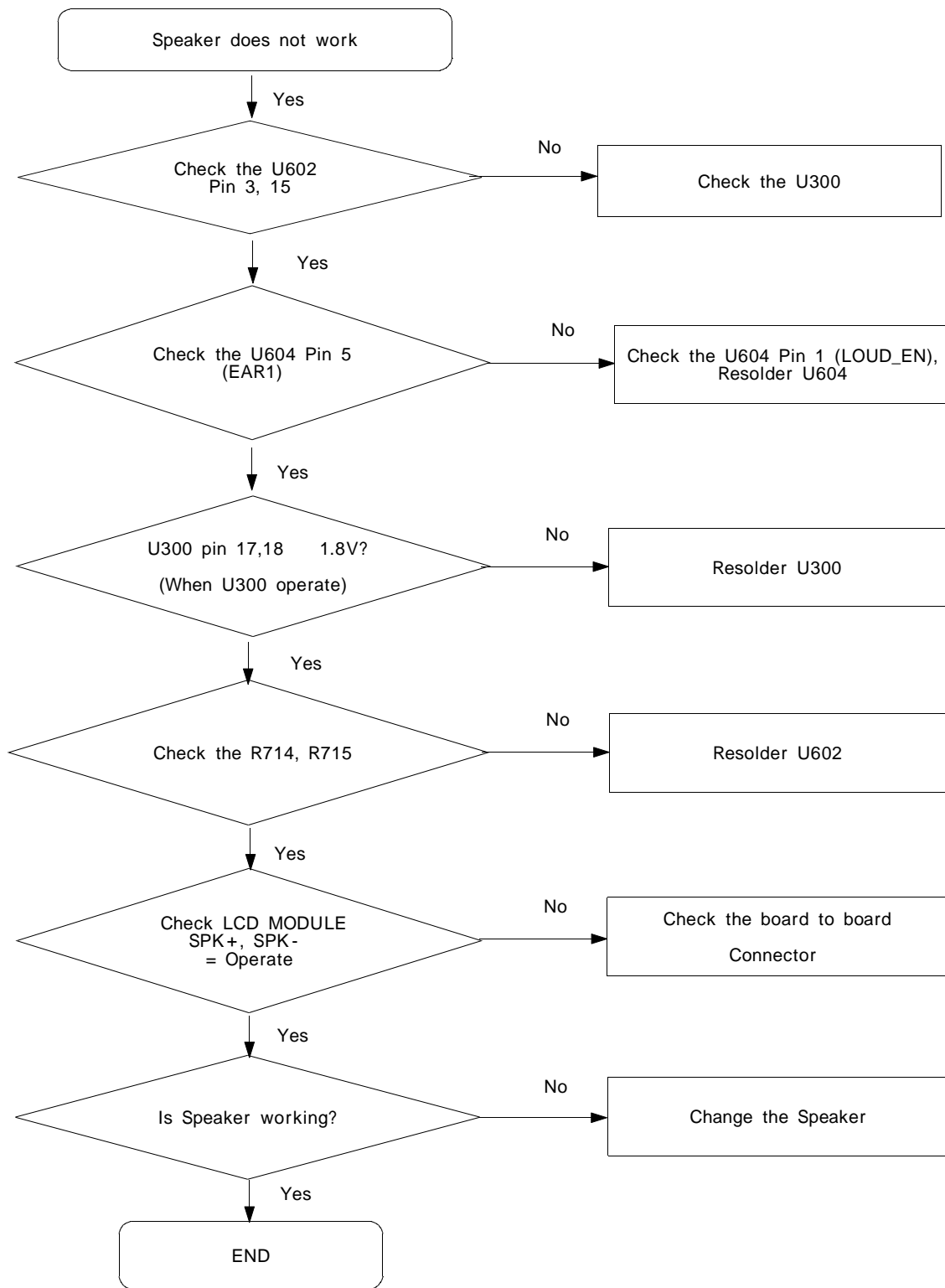


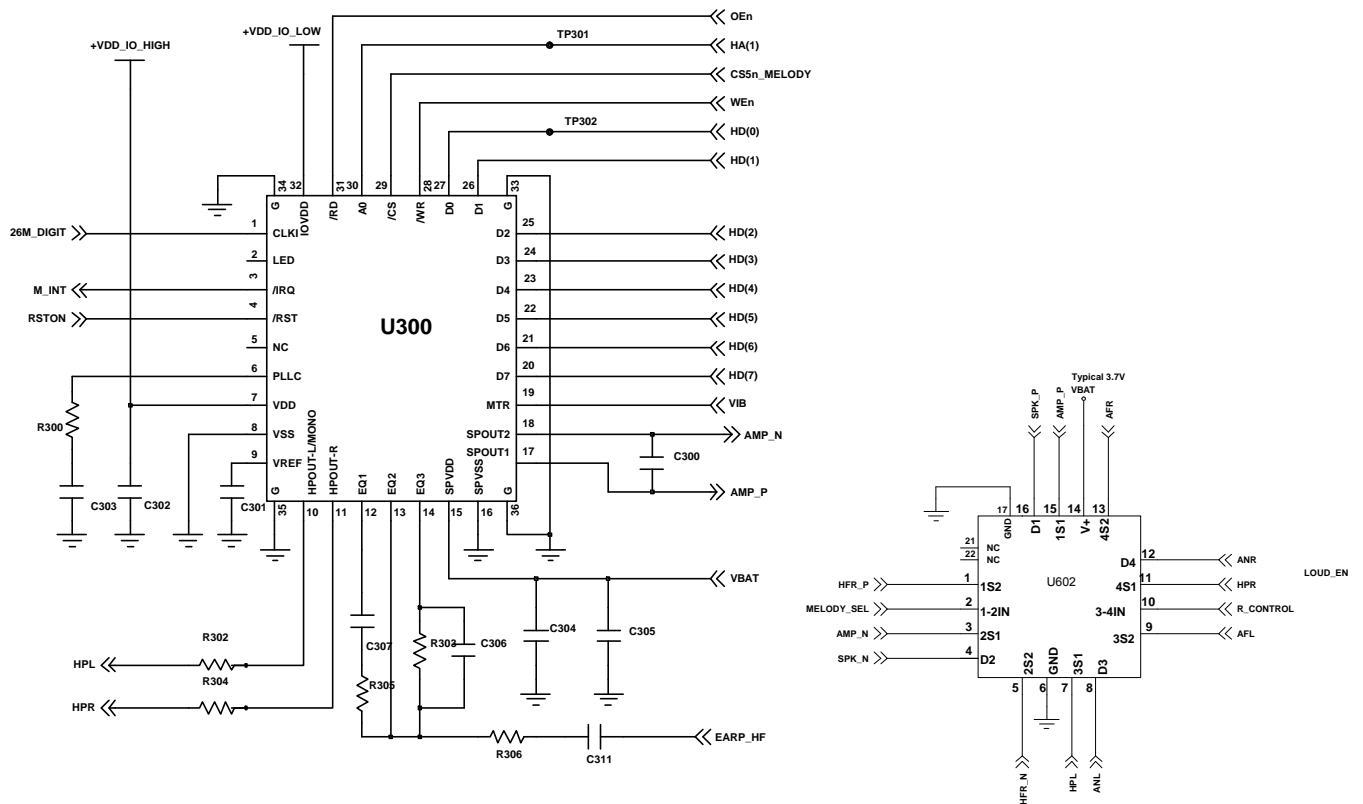
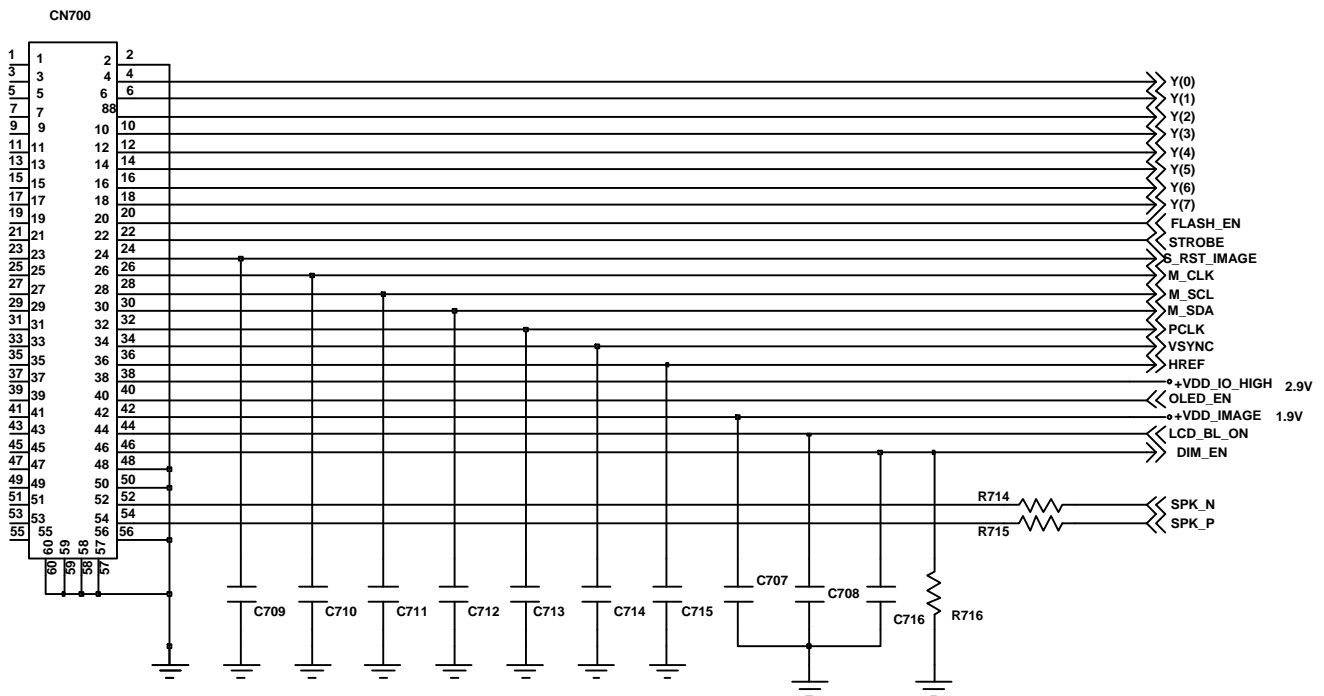
### 7-5. Microphone Part



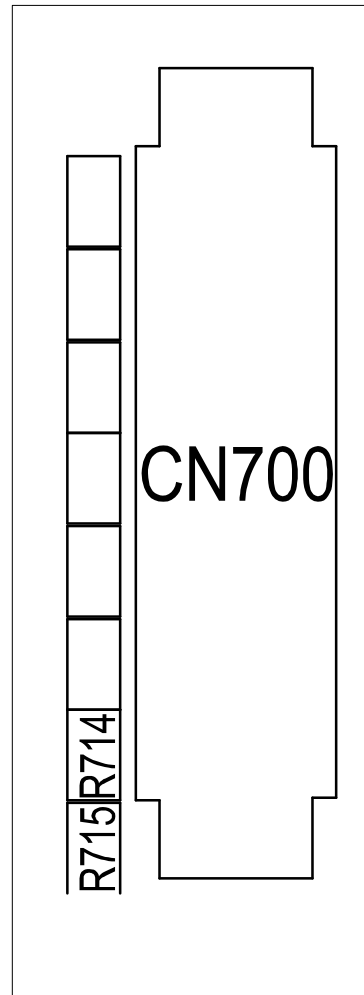
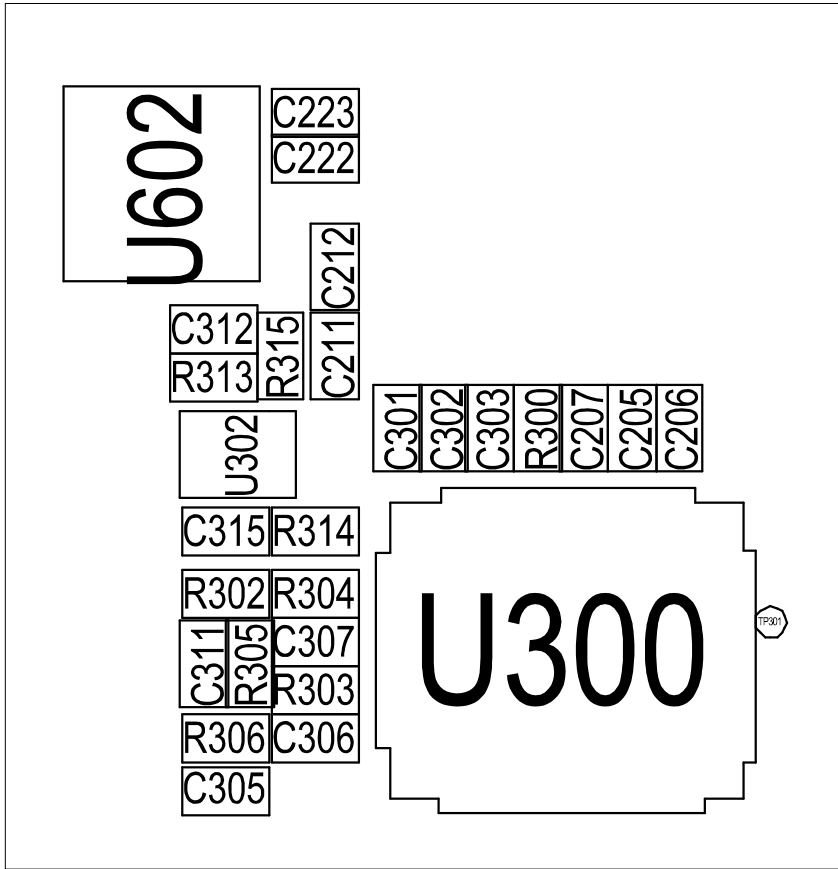


### 7-6. Speaker Part(Melody)

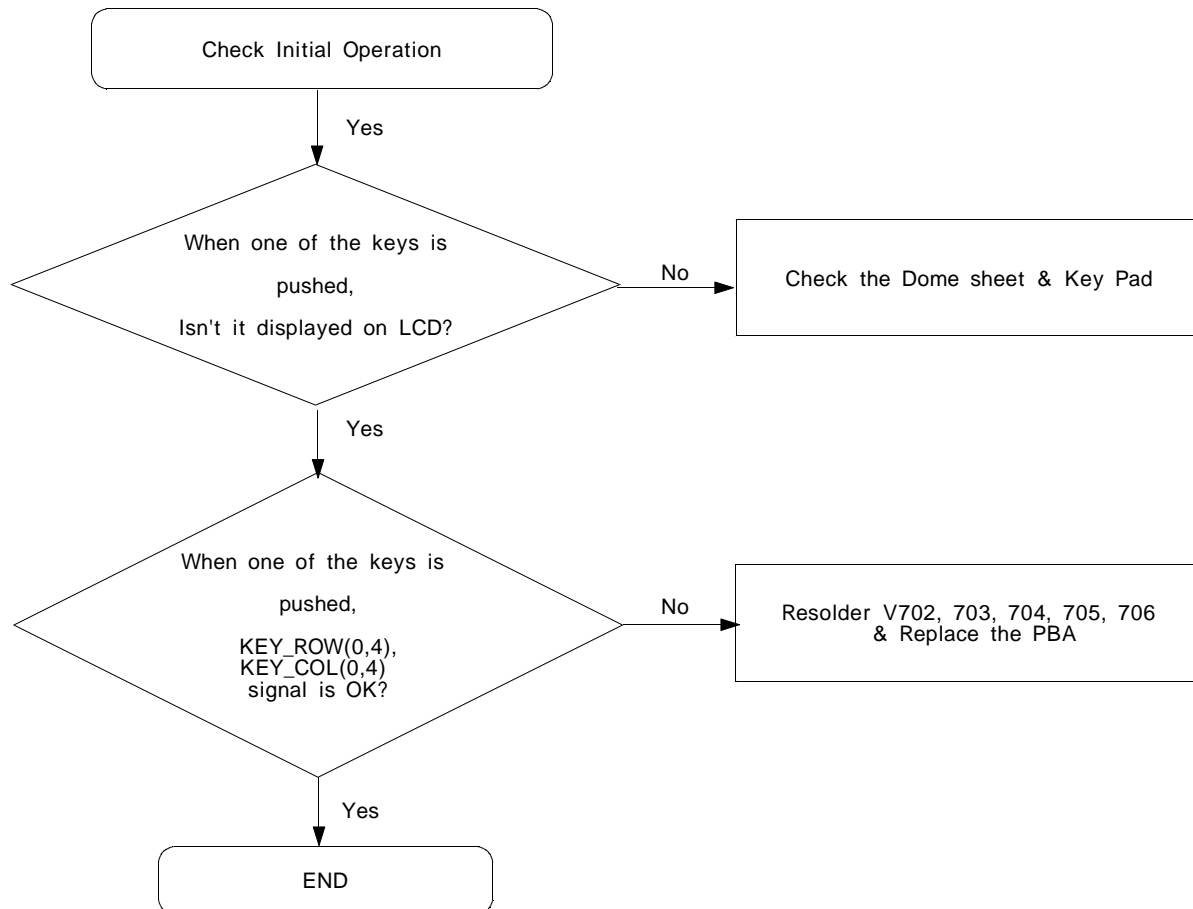


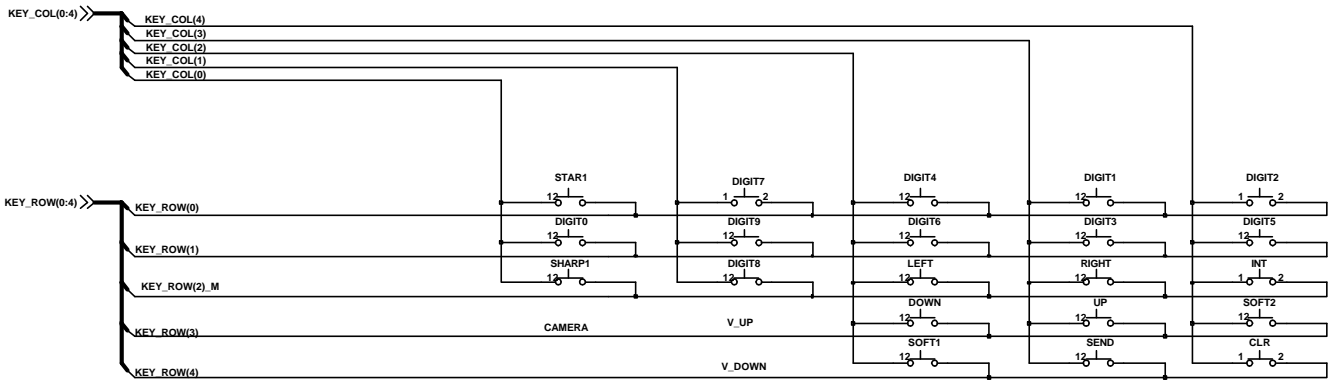


# MELODY IC

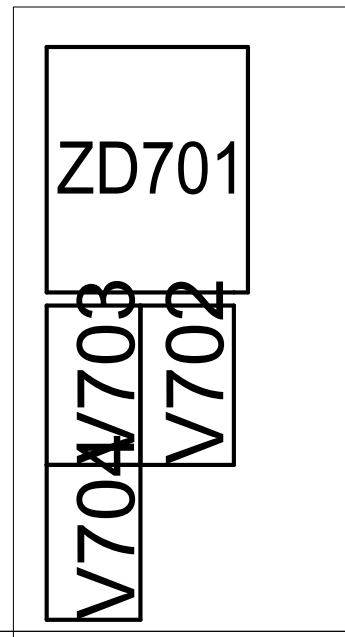
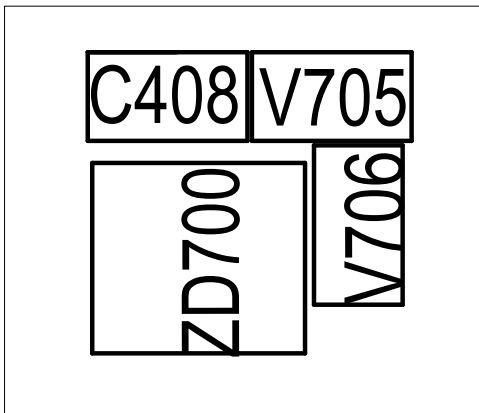
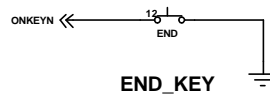
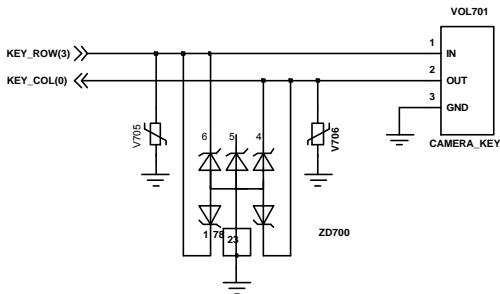
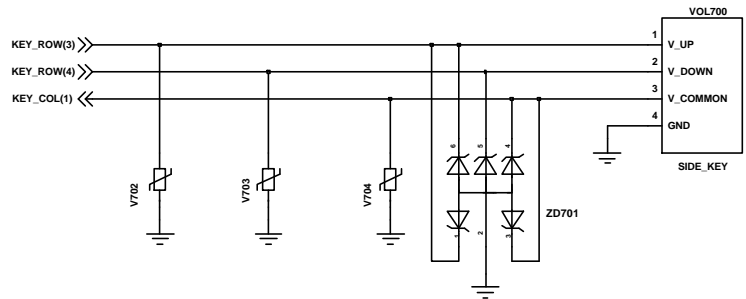
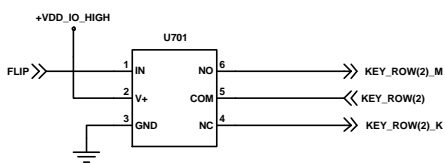


## 7-7. Key Data Input



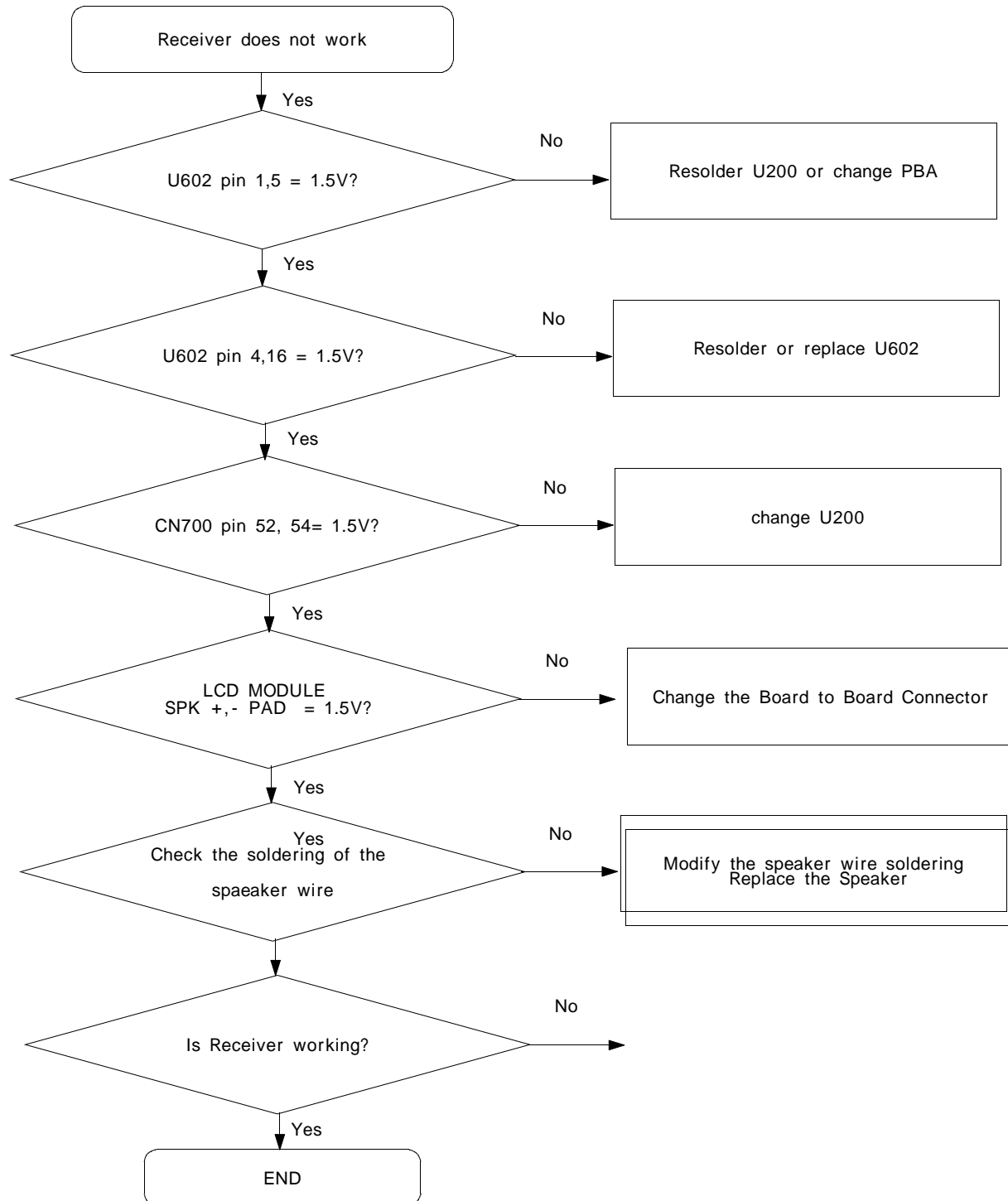


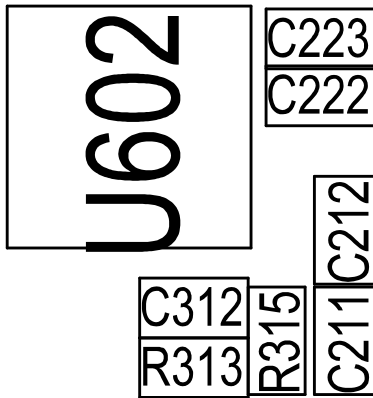
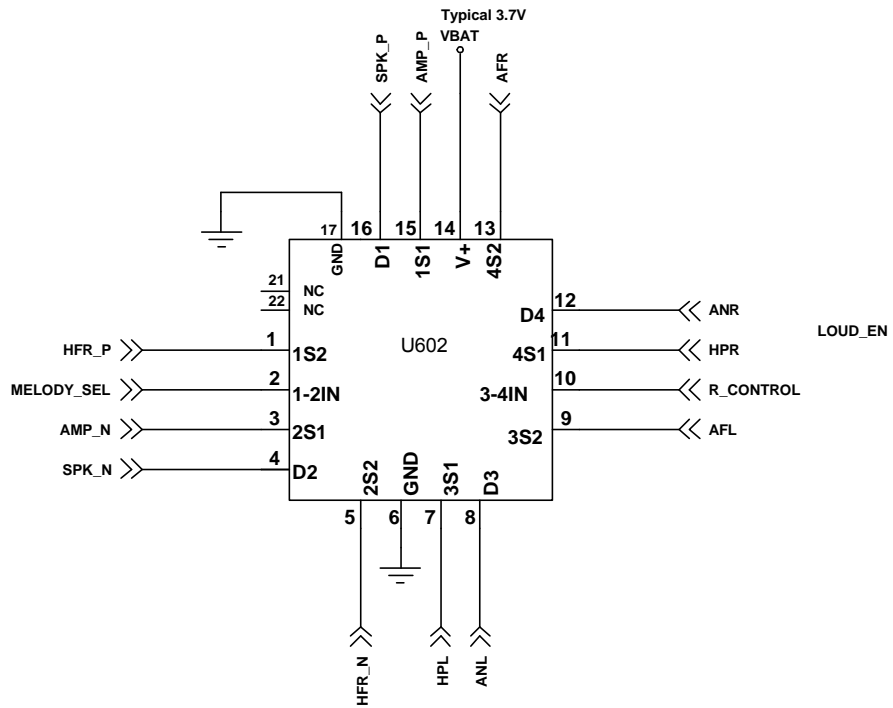
## KEY\_MAP



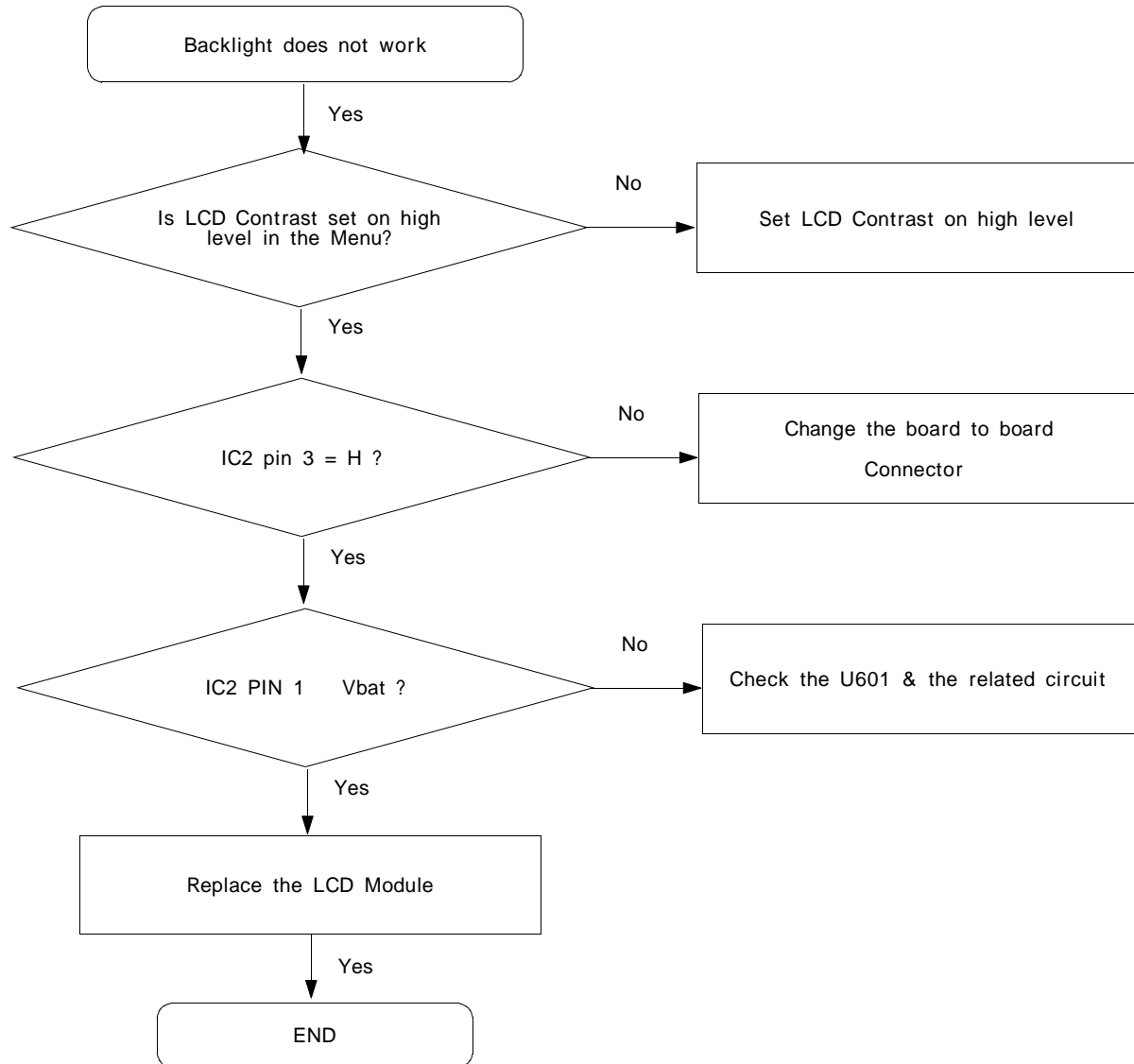


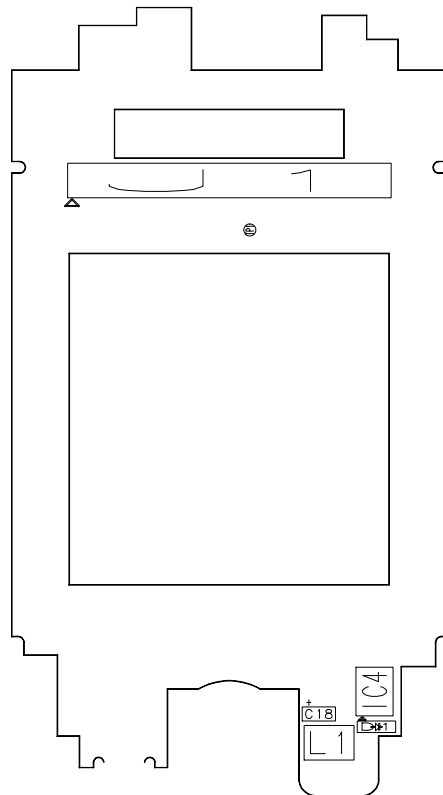
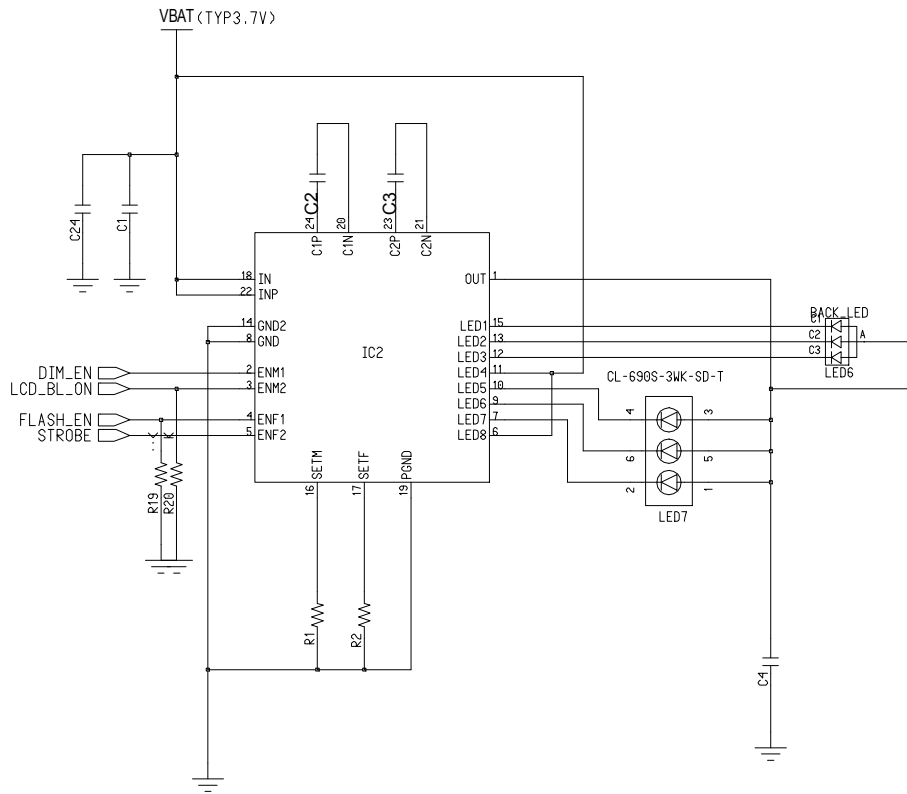
## 7-8. Receiver Part



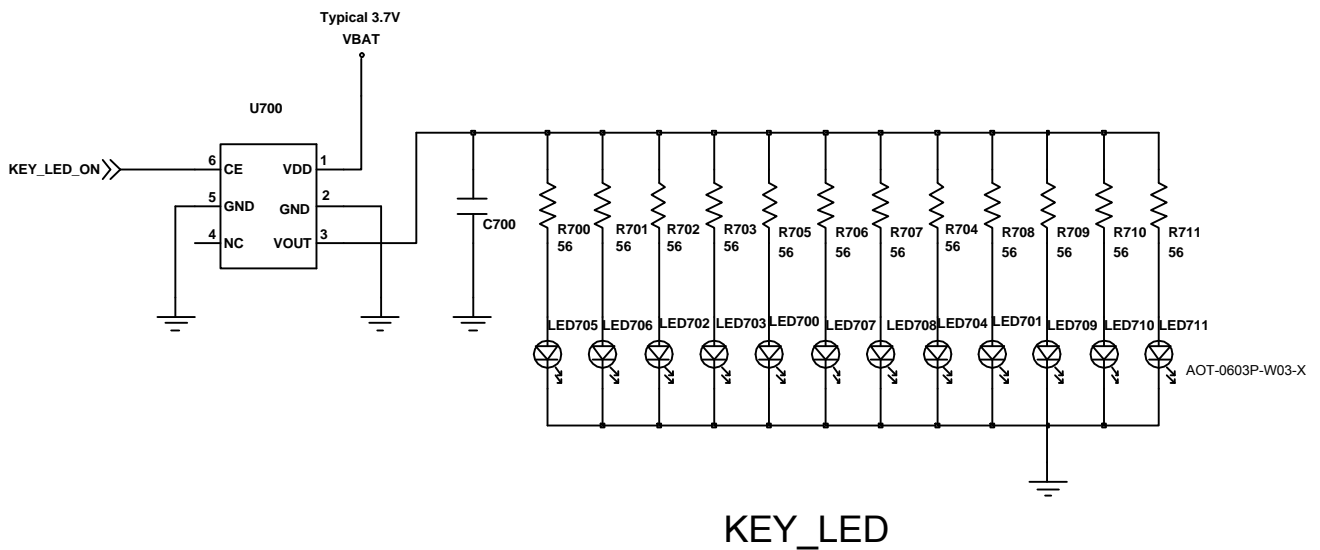
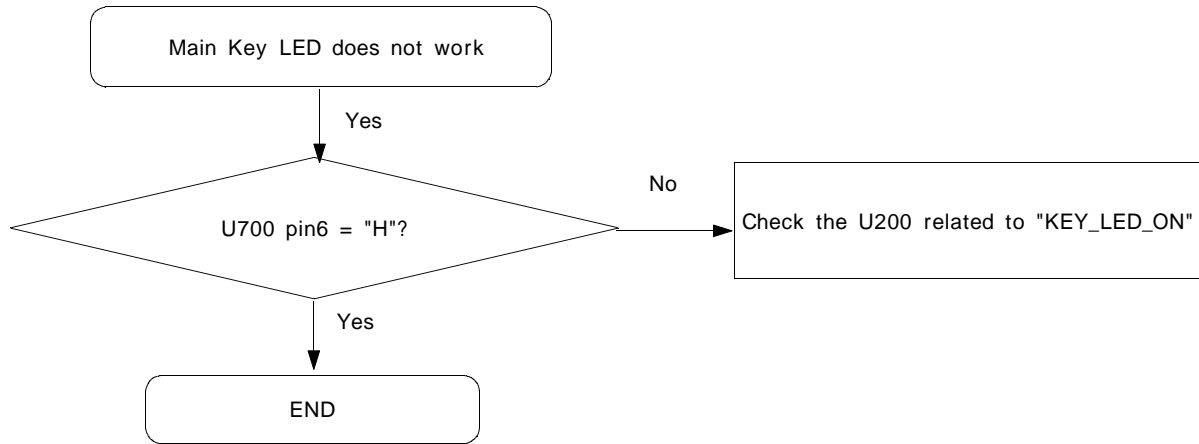


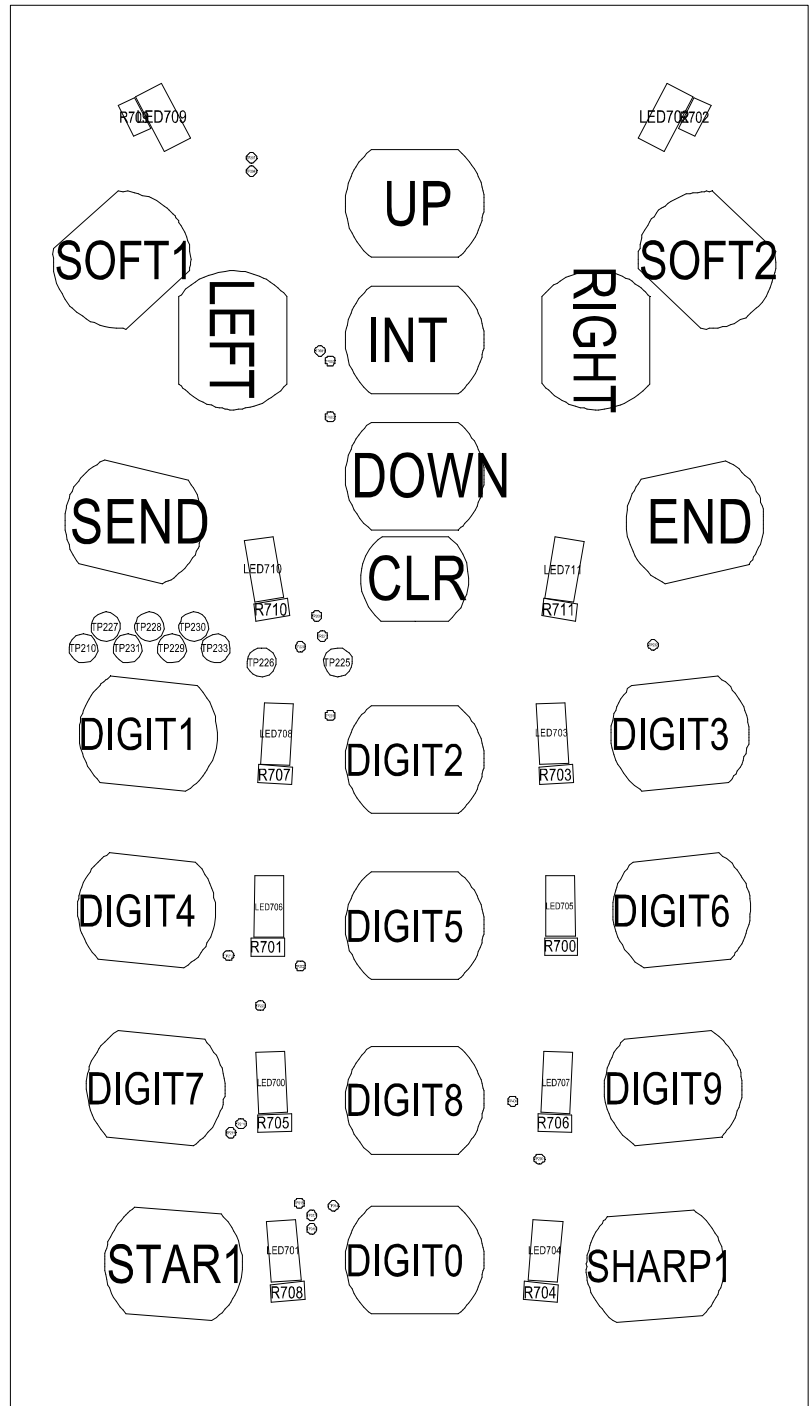
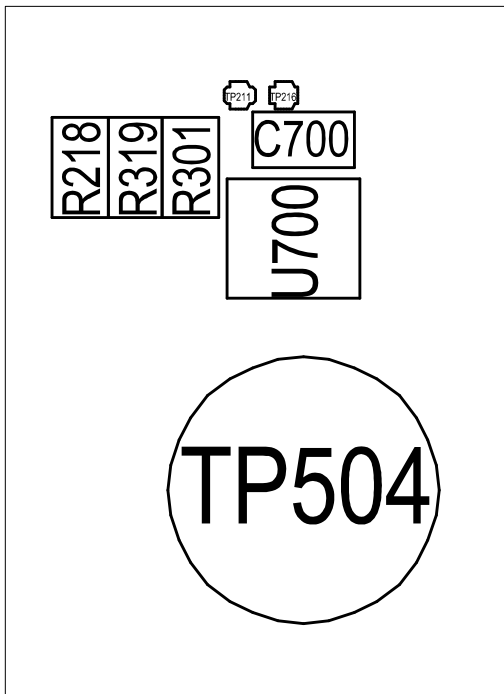
## 7-9. Back Light (for Color Main LCD)



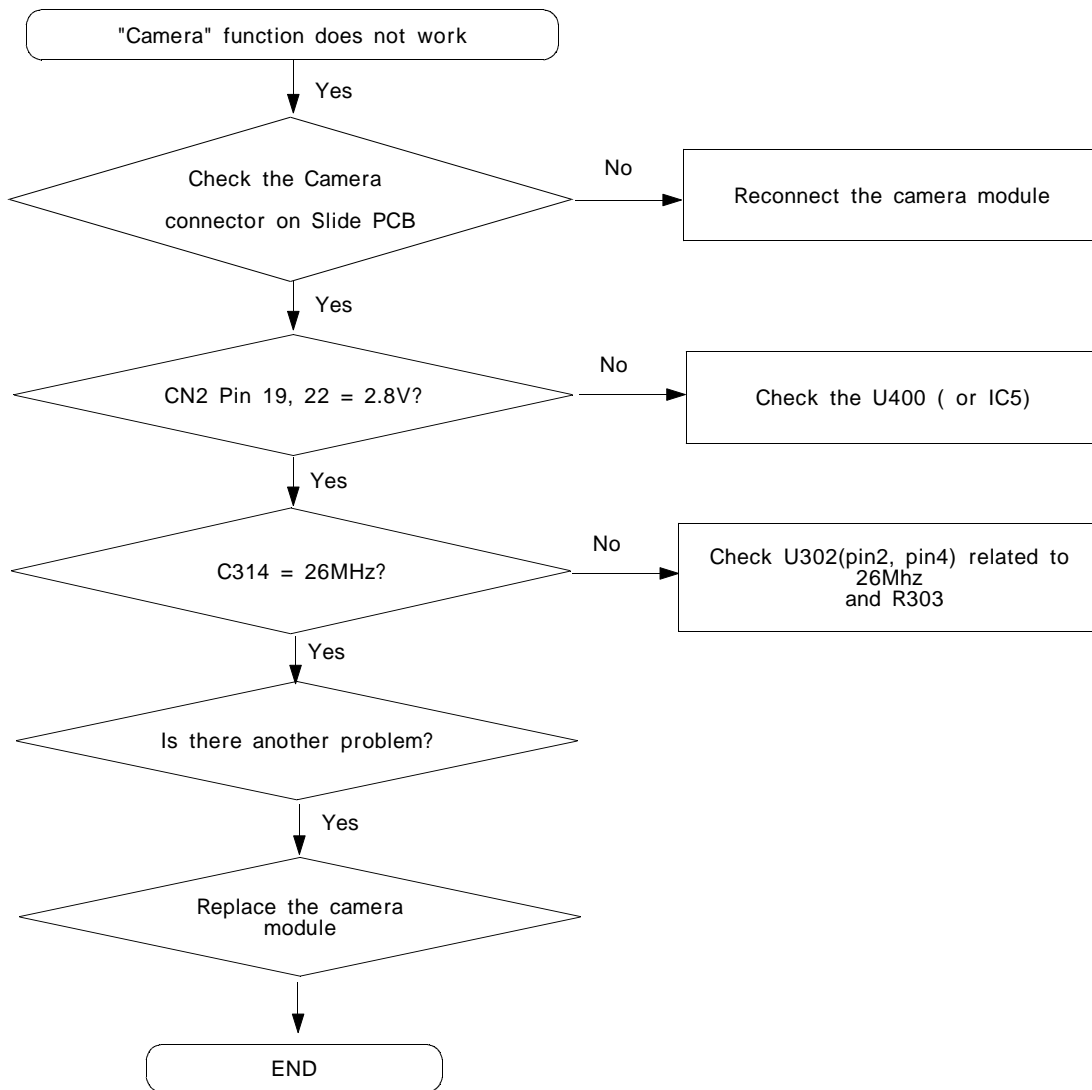


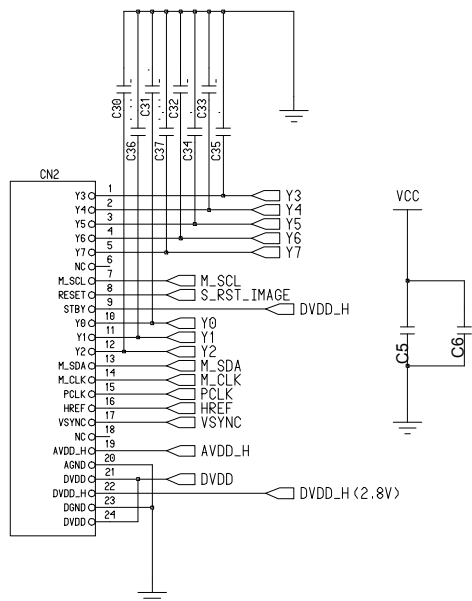
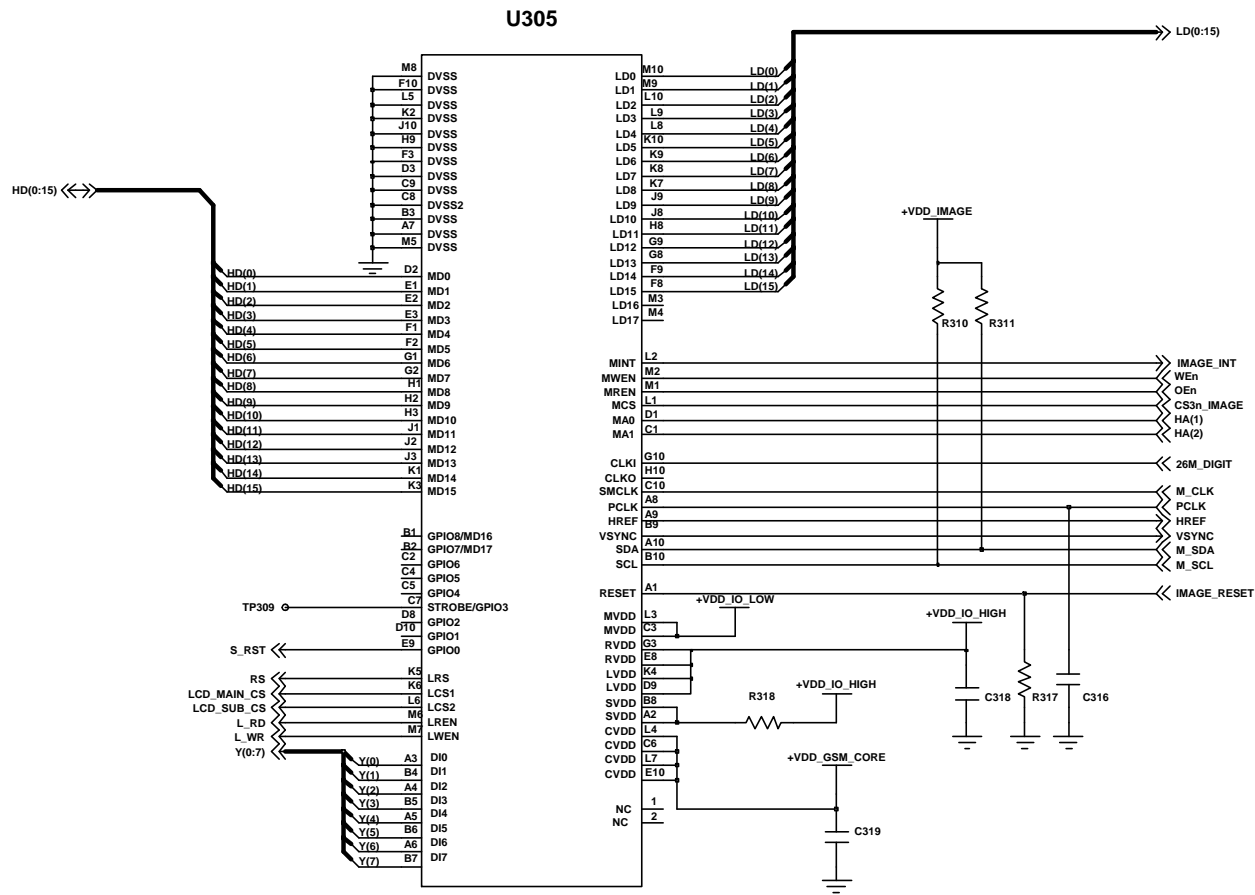
## 7-10. Key Back Light



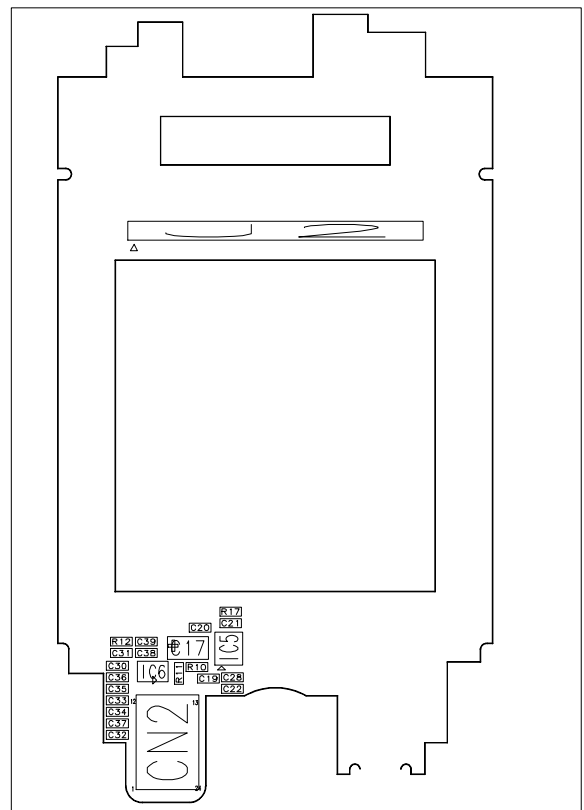
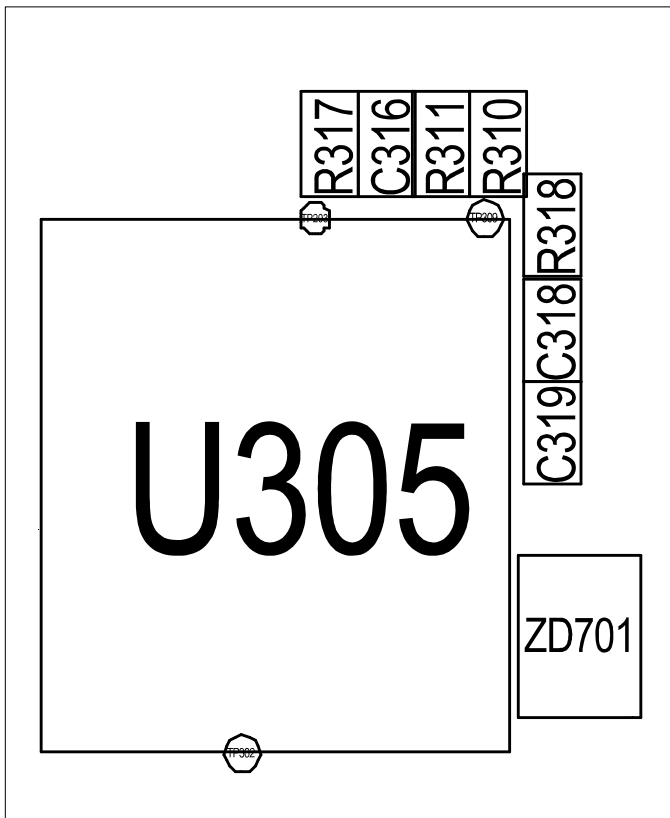


## 7-11. Camera part

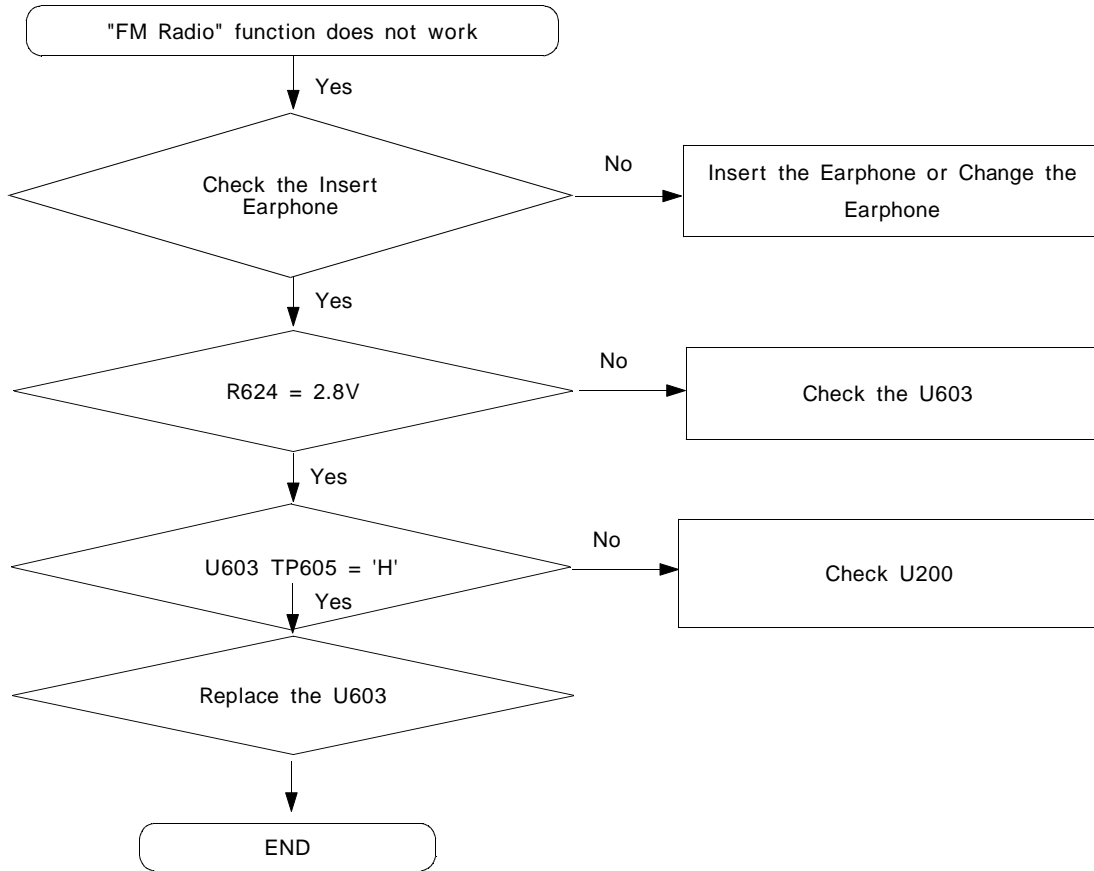


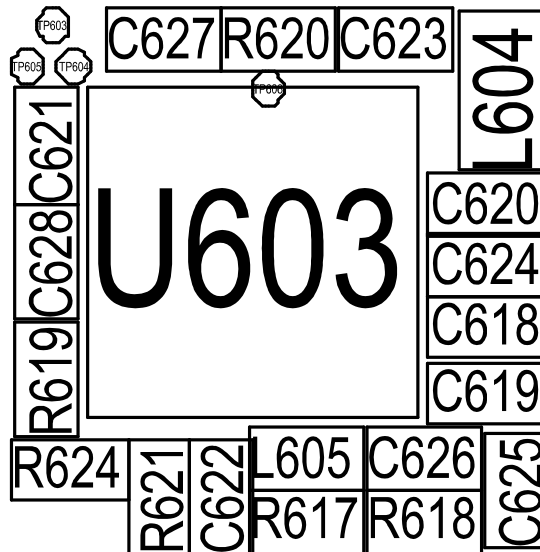
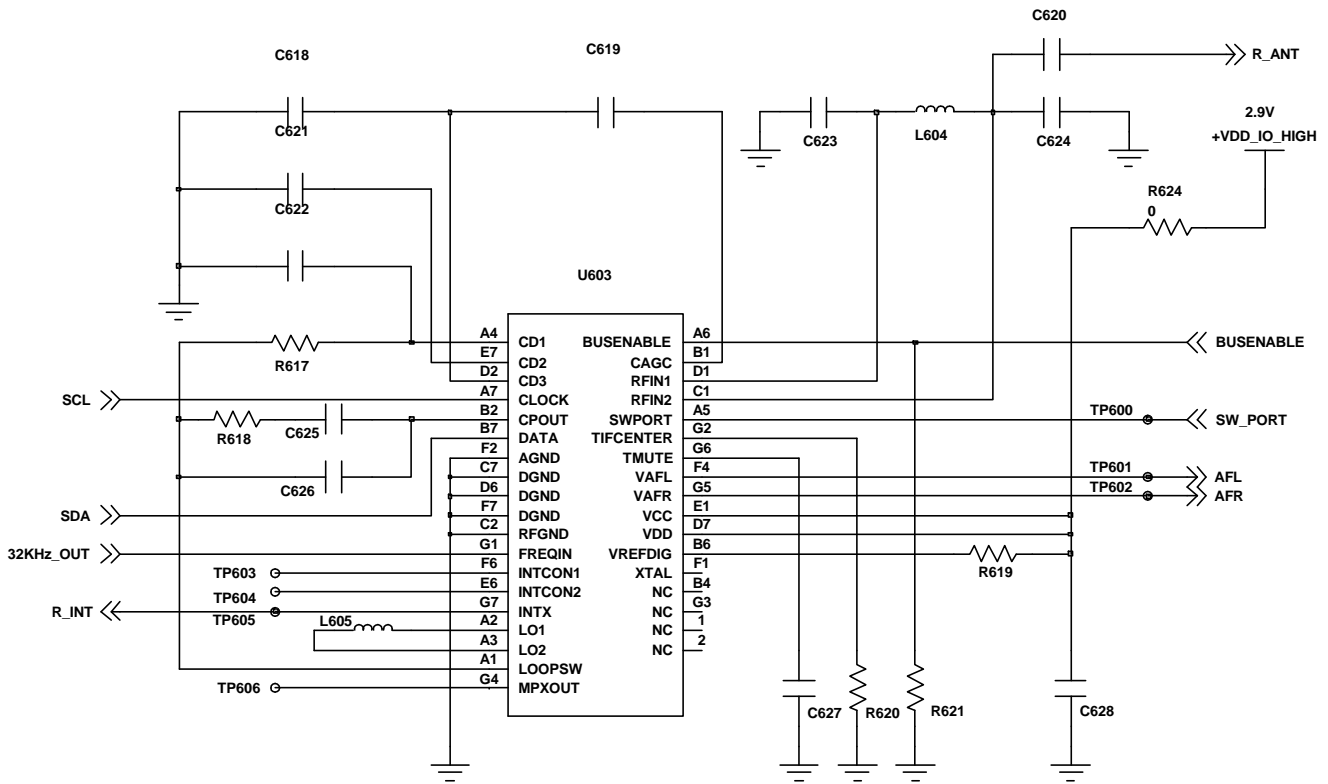




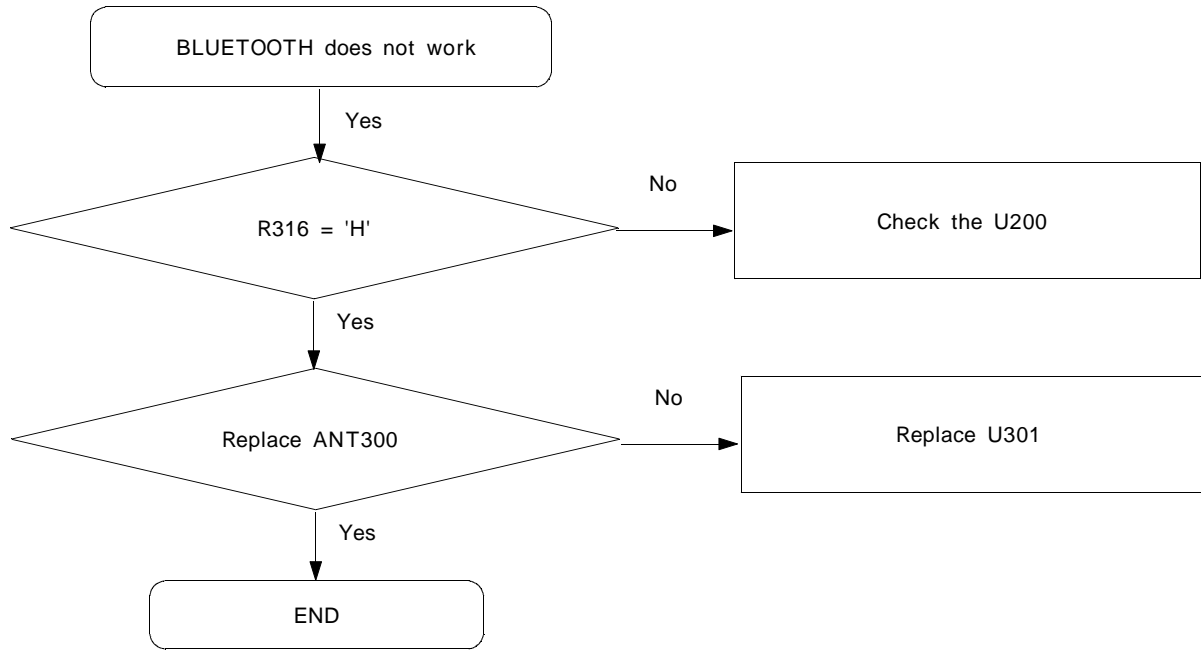


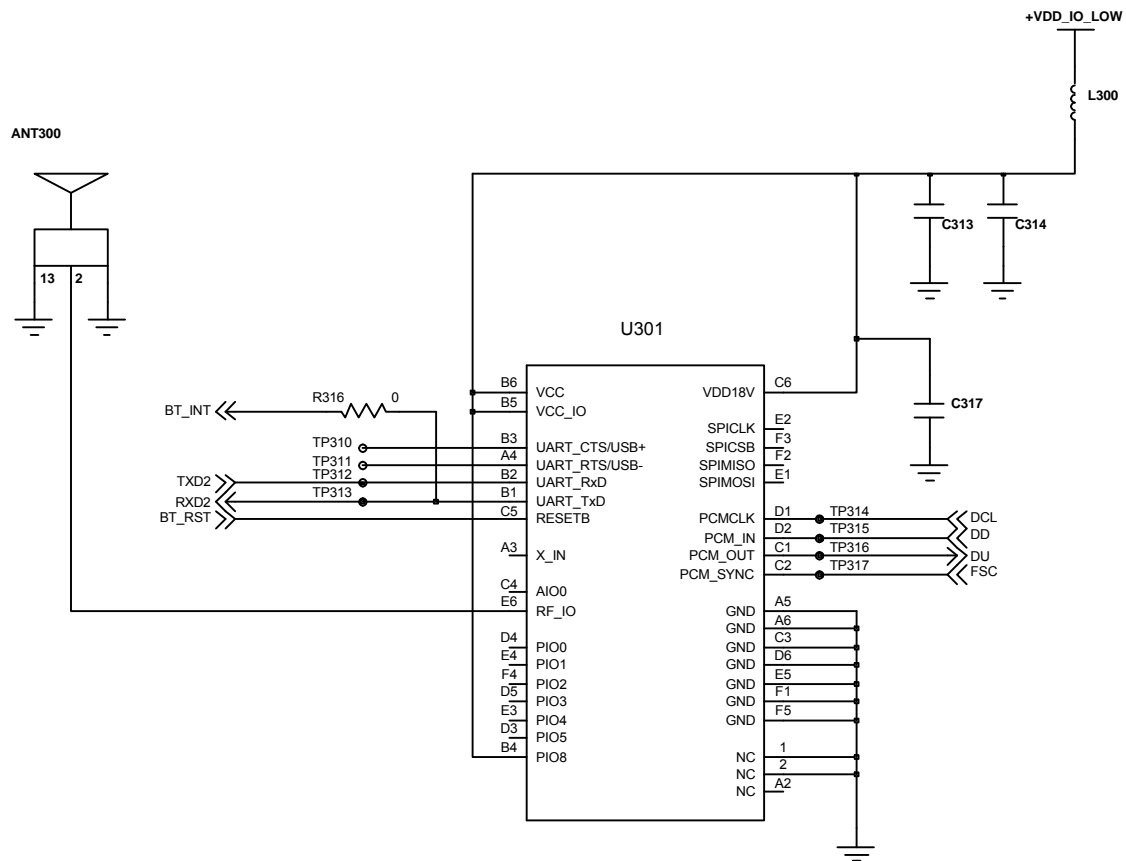
## 7-12. FM RADIO



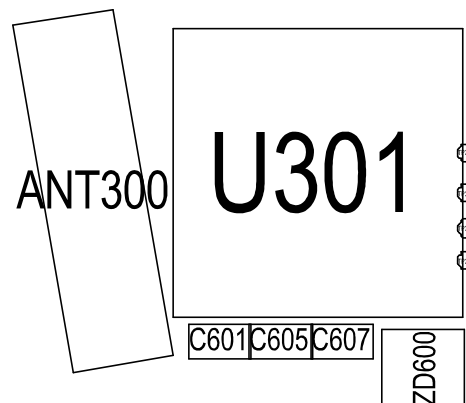


### 7-13. BLUETOOTH

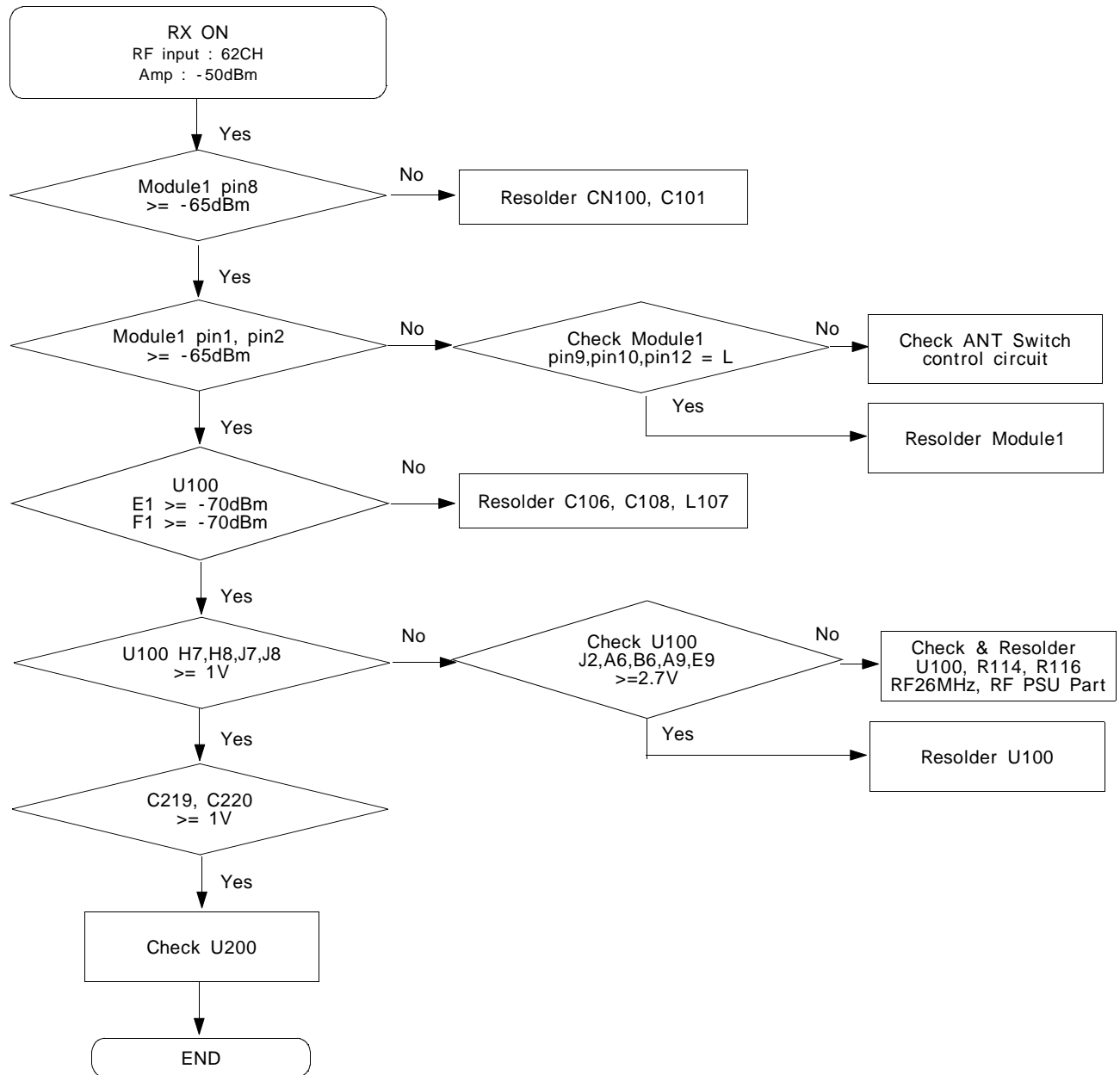




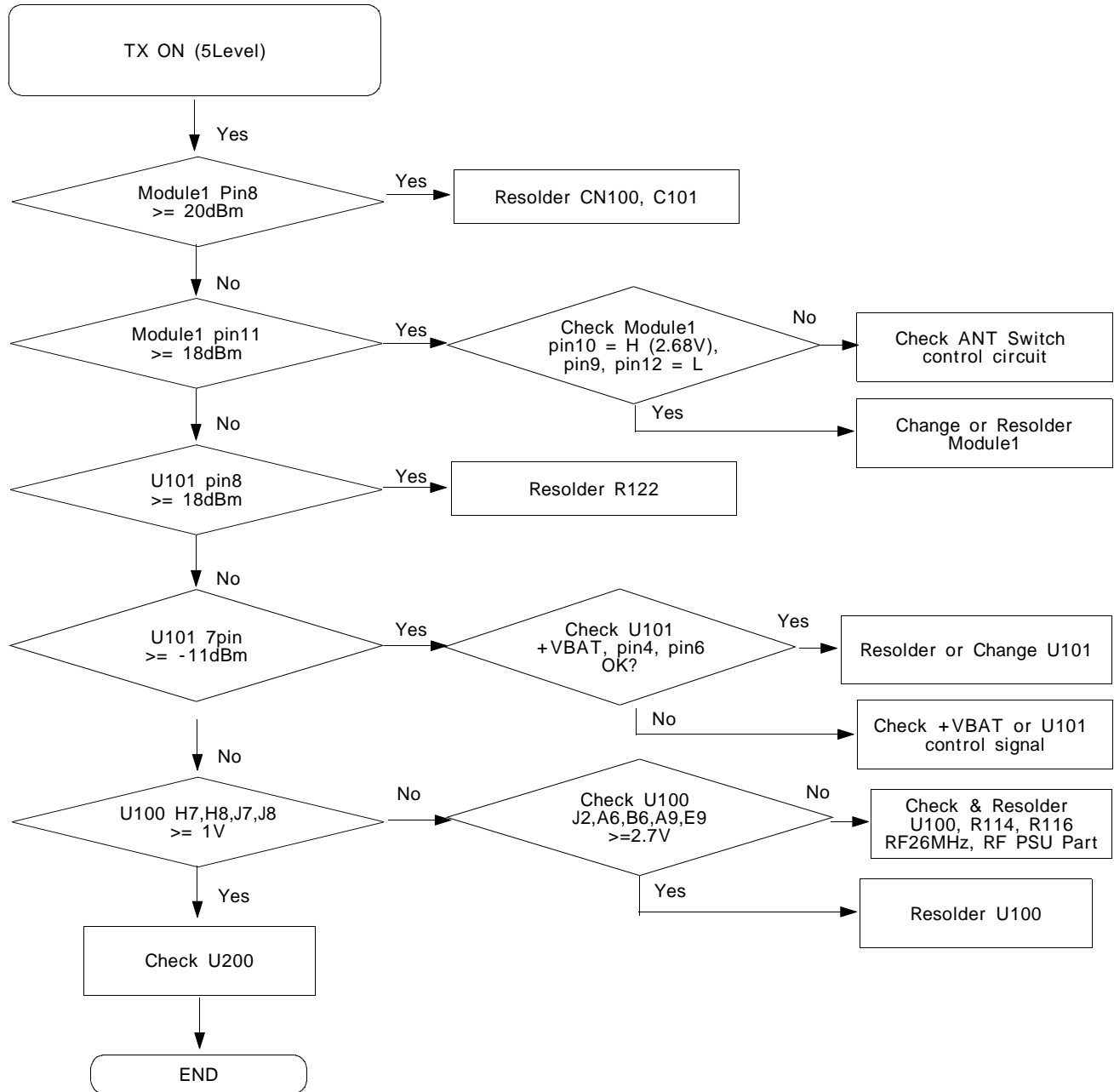
# BLUE TOOTH



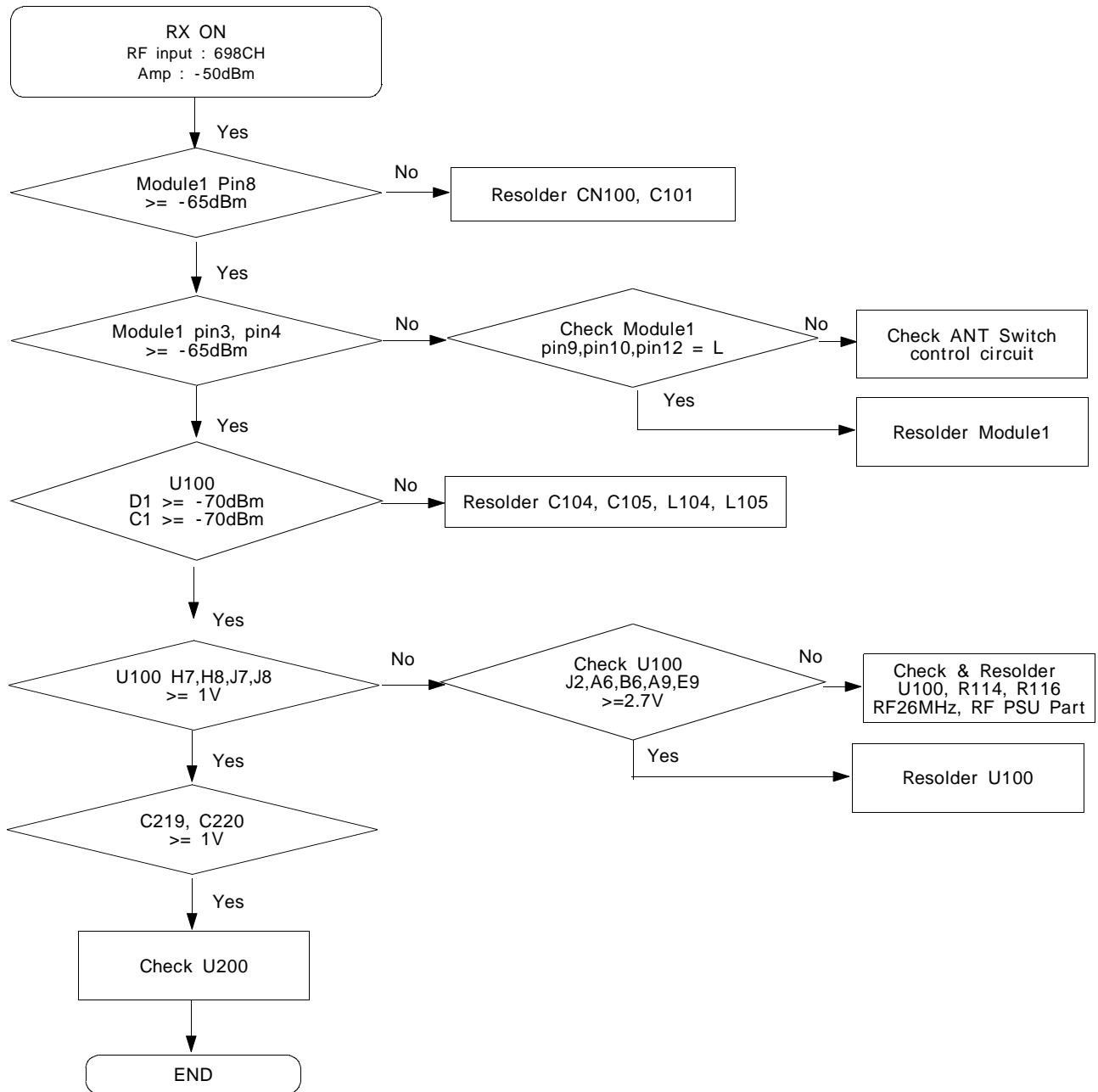
### 7-14. GSM Receiver



## 7-15. GSM Transmitter

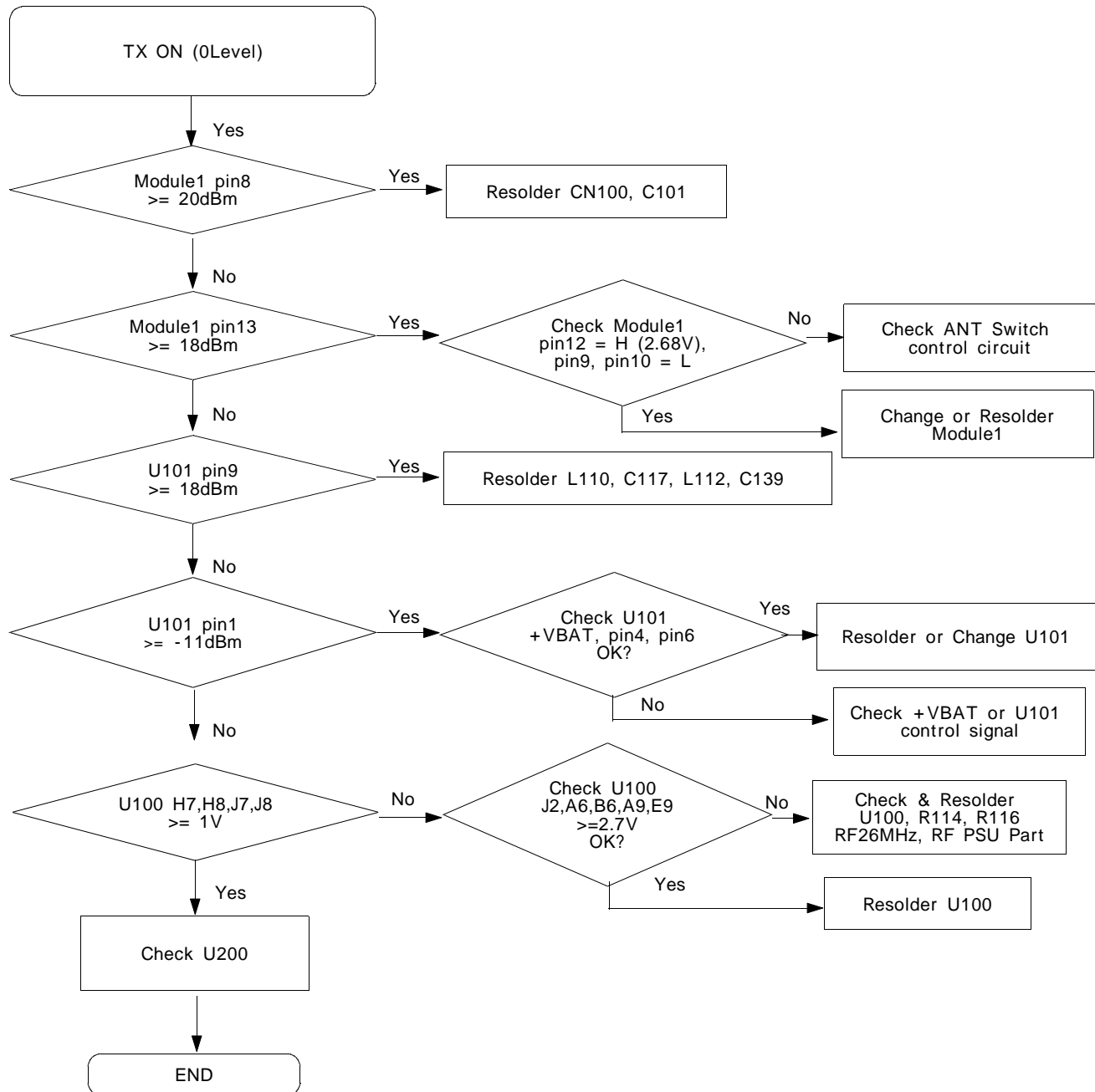


### 7-16. DCS Receiver

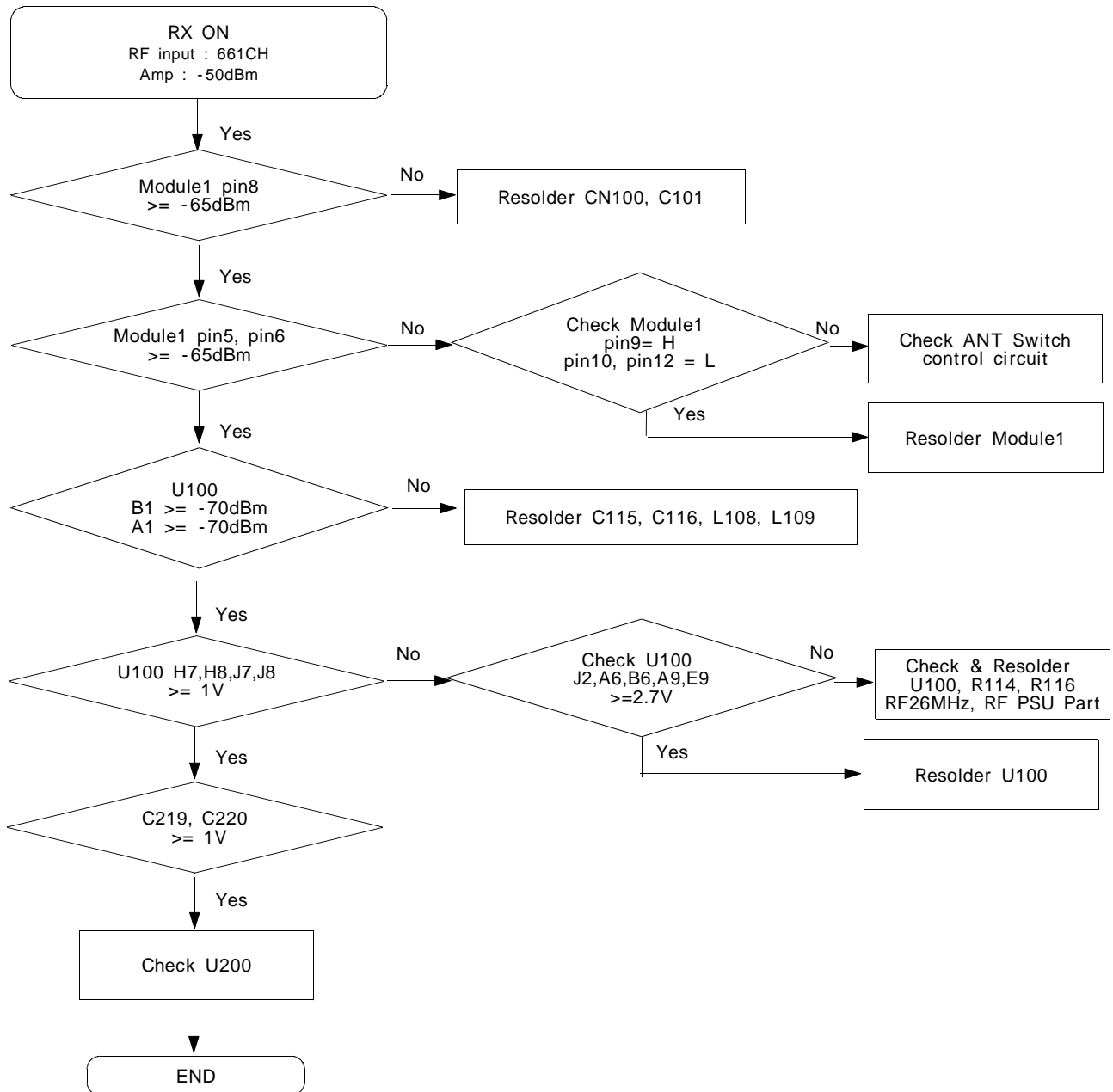




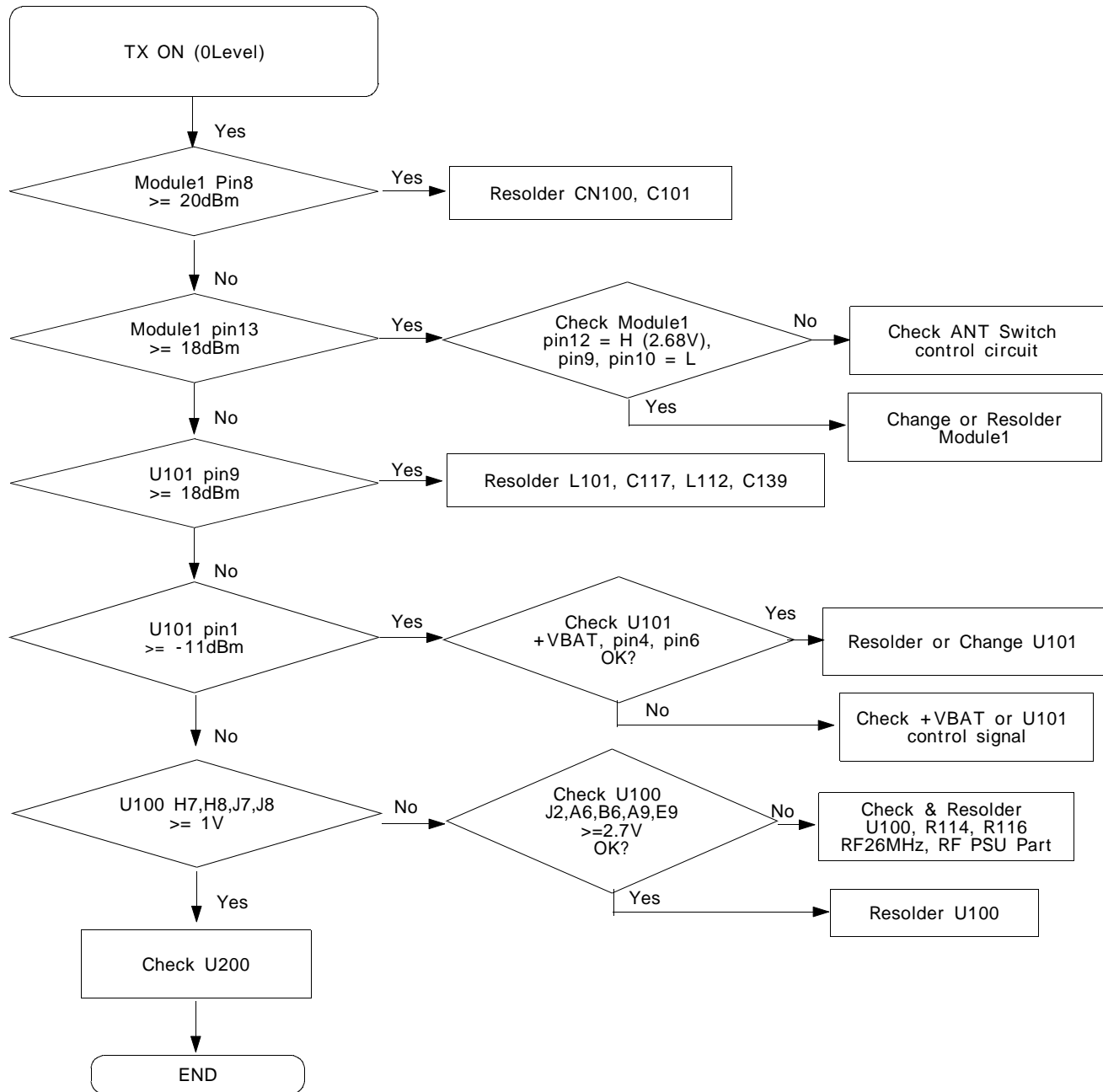
### 7-17. DCS Transmitter

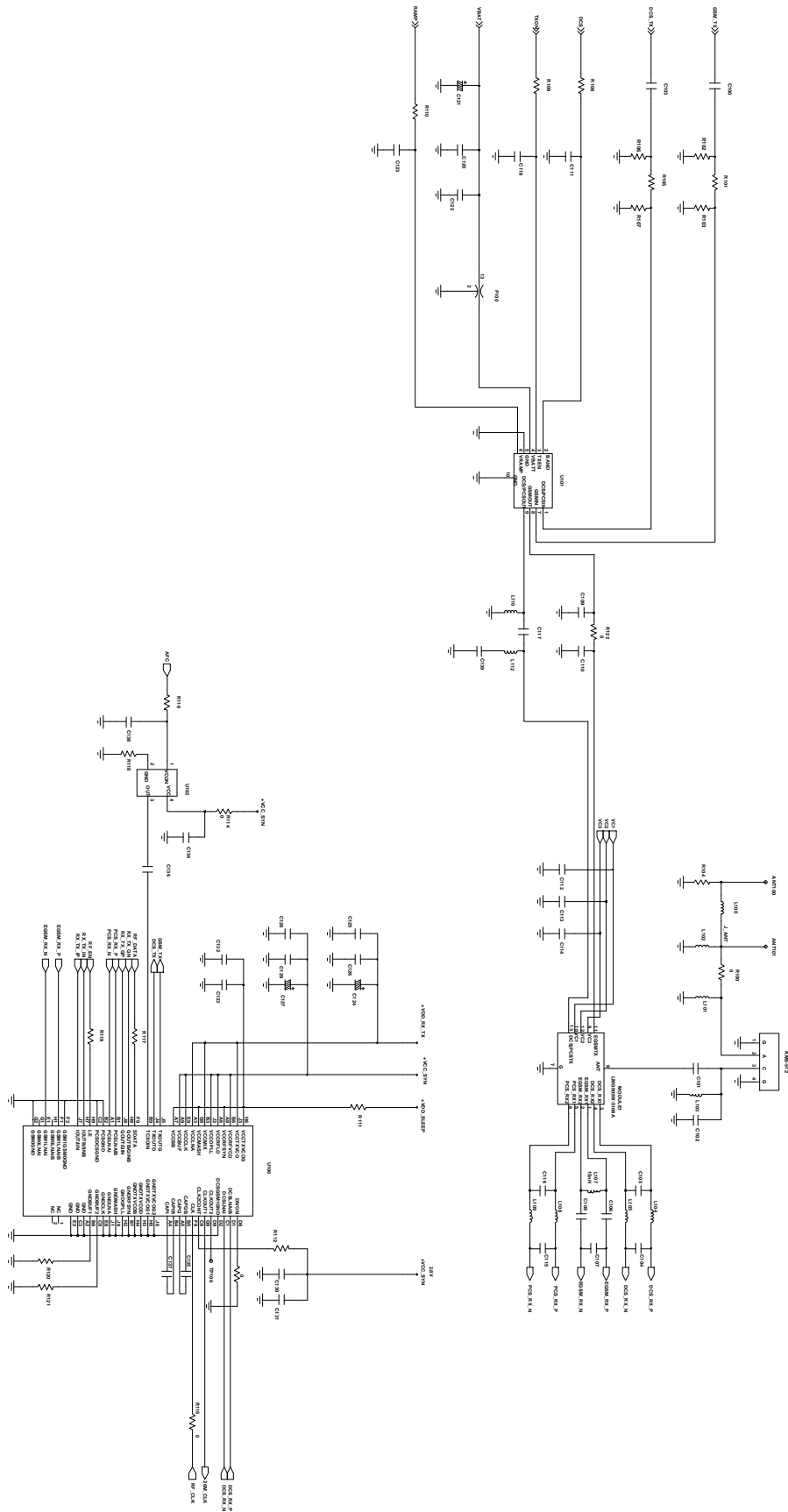


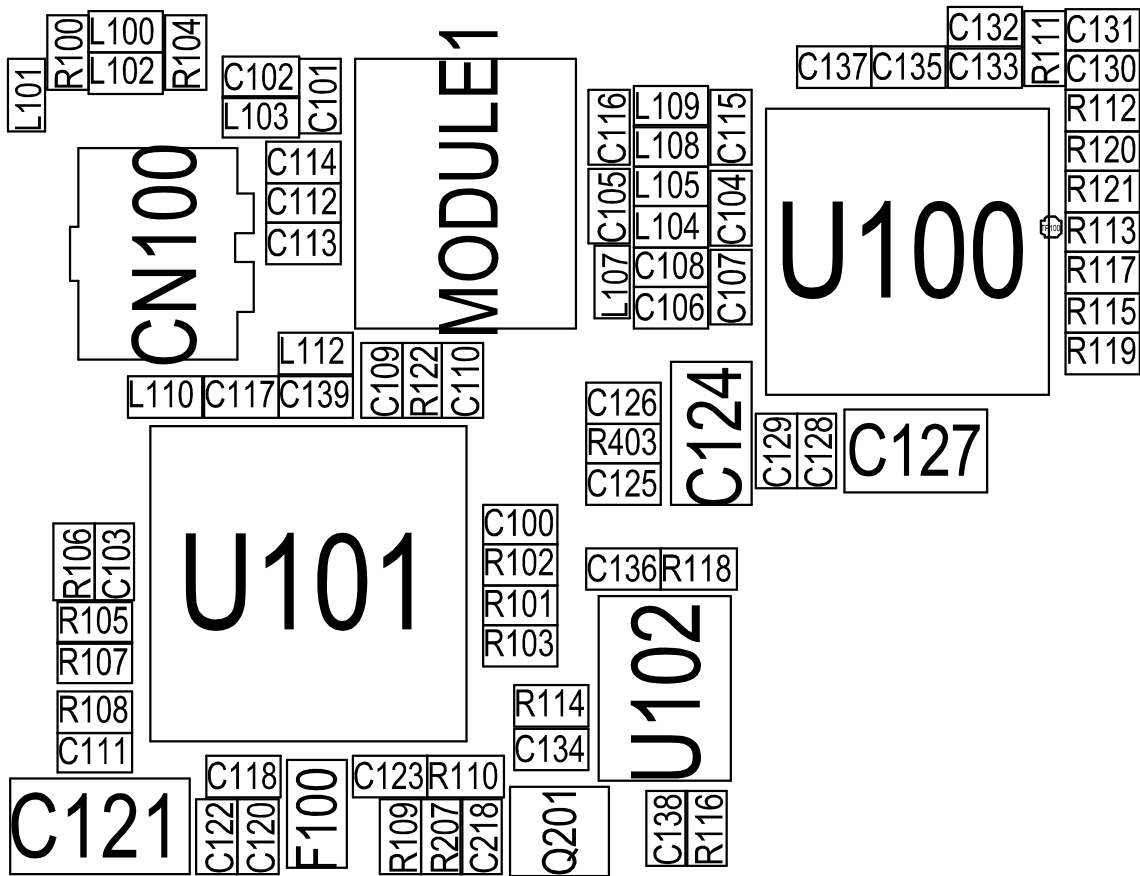
### 7-18. PCS Receiver



## 7-19. PCS Transmitter



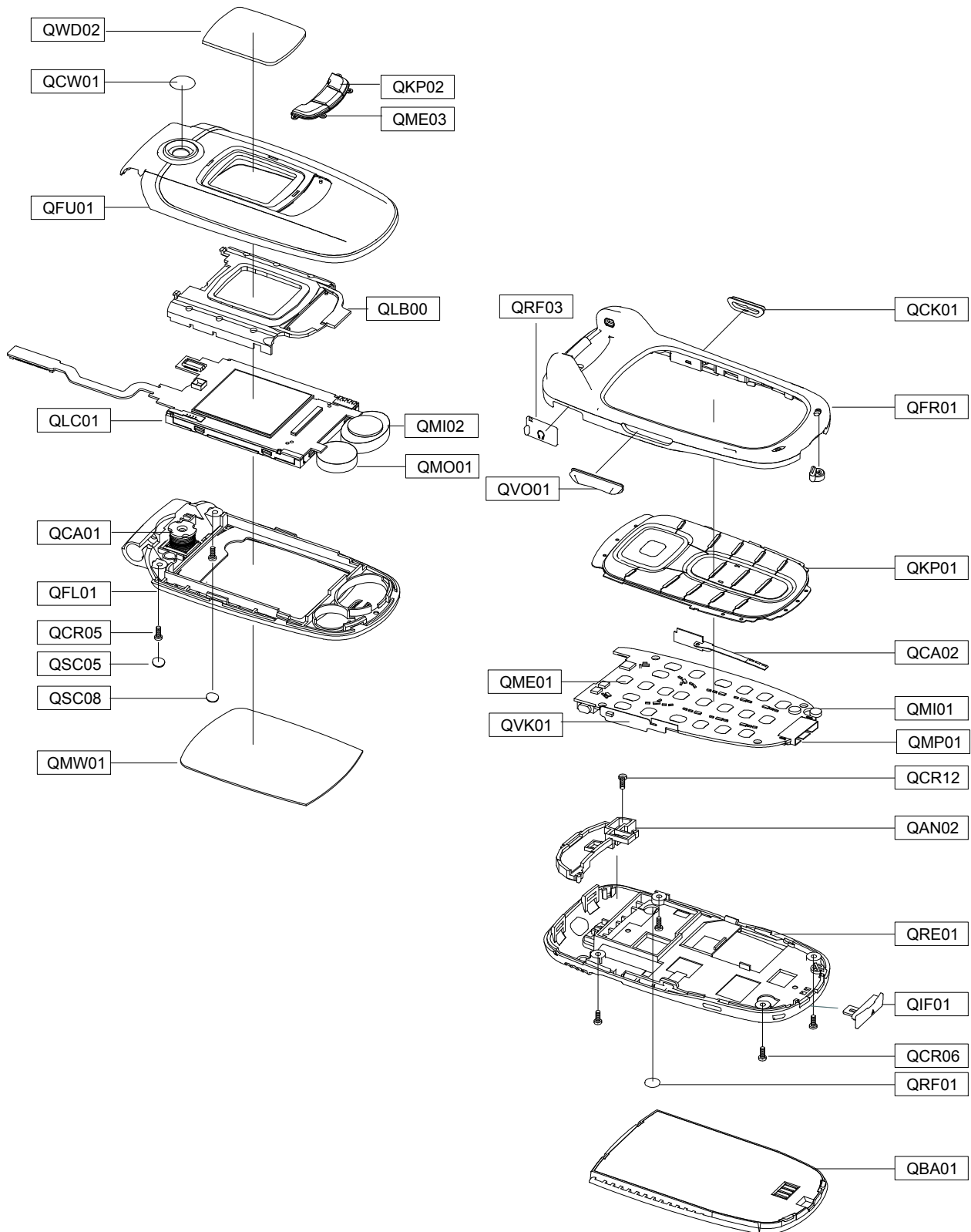






### 3. Exploded View and Parts List

#### 3-1. Exploded View



## 3-2. Parts List

Location NO.		SEC CODE	Description
QAN02		GH42-00568A	ANTENNA-SGHE730;HIR-01503-0000AA,SGH
QBA01		GH43-01773A	BATTERY-800MAH,B/K,ENG,M;BST3578BE,S
QCA01		GH59-01977A	UNIT-CAMERA;SGH-E730,IC03037AA,-,XEF
QCA02		GH59-02072A	UNIT-CAMERA KEY;SGH-E730,H/K F.P.C A
QCR05		6001-001478	SCREW-MACHINE;PH,+,M1.4,L3,ZPC(BLK),
QCR06		6001-001155	SCREW-MACHINE;PH(PI2.5),+,M1.4,L3.5,
QCR12		6001-001530	SCREW-MACHINE;PH,+,M1.4,L2.5,ZPC(BLK
QCW01		GH72-19281A	PMO-CAMERA LENS;SGH-E730,ACRYL,TRP,P
QFL01		GH75-06733A	MEC-FOLDER LOWER;SGH-E730,XET,PC,-,-
QFR01		GH75-06729A	MEC-FRONT COVER;SGH-E730,XET,PC,-,-,
	QVO01	GH75-06236A	MEC-VOLUME KEY;SGH-E730,EU,PC,17.8X3
	QCK01	GH75-06237A	MEC-CAMERA KEY;SGH-E730,EU,PC,3.7X12
QFU01		GH75-06732A	MEC-FOLDER UPPER;SGH-E730,XET,PC,-,-
QIF01		GH72-19296A	PMO-IF COVER;SGH-E730,PC+ELASTOMER,N
QKP01		GH75-06730A	MEC-KEYPAD(XET/BLK);SGH-E730,XET,PC,
QKP02		GH75-06731A	MEC-KEY FOLD;SGH-E730,XET,PC,-,-,-,S
QLB00		GH75-06737A	MEC-LCD BRACKET;SGH-E730,XET,PC,-,-,
QLC01		GH07-00697A	LCD-SGHE730 MODEL;UF-17E077-A,SGH-E7
QME01		GH59-02069A	UNIT-METAL DOME;SGH-E730,METAL DOME,
QME03		GH59-02071A	UNIT-MP3 KEY;SGH-E730,SGH-E730 MP3/K
QMI01		GH30-00188A	MICROPHONE-ASSY-SGHE730;2,130~500uA,
QMI02		3001-001750	MICRO SPEAKER;0.7W,8ohm,86dB± 2dB,80
QMO01		GH31-00154D	MOTOR DC-SGHZ130;DMJBRK20C,SGH-Z130,
QMP01		GH92-02149A	PBA MAIN-SGHE730;SGH-E730,XET,EU,PBA
QMW01		GH75-06238A	MEC-MAIN WINDOW;SGH-E730,EU,PC,-,-,-
QRE01		GH75-06734A	MEC-REAR COVER;SGH-E730,XET,PC,-,-,-
QRF01		GH74-14614A	MPR-SHEET RF;SGH-E730,PC SHEET,PI6.5
QRF03		GH72-19271A	PMO-EAR COVER;SGH-E730,PC,BLK,10.6X6
QSC05		GH73-04080A	RMO-RUBBER SCREW CAP(L);SGH-E730,SI
QSC08		GH73-04081A	RMO-RUBBER SCREW CAP(R);SGH-E730,SI
QVK01		GH59-02070A	UNIT-VOLUME KEY;SGH-E730,SGH-E730 V/
QWD02		GH72-19283A	PMO-SUB LCD WINDOW;SGH-E730,ACRYL,BL



SEC CODE	Description
6902-000634	BAG PE; LDPE, T0.05, W80, L180, TRP, -, -
GH44-00954A	ADAPTOR-SGHD500 BLK; TAD137EBE, SGH-D5
GH59-02166A	UNIT-EARPHONE; SGH-C230, EM-SS550E-STB
GH68-02026A	LABEL(P)-WATER SOAK; SCH-X110, NORGE, 1
GH68-06835A	LABEL(R)-MAIN(EU); SGH-E730, EU, POLYES
GH68-06897A	MANUAL-USE; SGH-E730, XEF, FRENCH, FRAN,
GH68-07013A	MANUAL-WEEE CARD; SGH-E720, SEC, ENGLIS
GH69-02842J	BOX(P)-SGHE730(IKF_EU); SGH-E730, SC30
GH69-02845A	CUSHION-CASE(1-2); SGH-E730, PULP, T0.8
GH74-05962A	MPR-FRONT FILTER; SGH-E700, BUZICPO, 16
GH74-05963A	MPR-BOHO FOLDER LOWER; SGH-E700, 3M 41
GH74-14607A	MPR-BOHO VINYL F/UPPER; SGH-E730, 3M 4
GH74-14608A	MPR-BOHO VINYL F/LOWER; SGH-E730, 3M 4
GH74-14609A	MPR-BOHO VINYL REAR; SGH-E730, 3M 4187
GH74-15238A	MPR-SPONGE MOTOR; SGH-E730, PORON, PI10
GH74-15350A	MPR-BOHO VINYL LCD CONN; SGH-E730, #95
GH74-15507A	MPR-TAPE PCB ESD 1; SGH-E730, CONDUCTI
GH74-15508A	MPR-TAPE PCB ESD 2; SGH-E730, CONDUCTI
GH74-15509A	MPR-TAPE PCB INSUALTION; SGH-E730, 3M
GH74-15513A	MPR-SPONGE PCB ESD; SGH-E730, CONDUCTI
GH74-15582A	MPR-BOHO VINYL SUB WIN; SGH-E730, PVC,
GH74-15635A	MPR-TAPE LCD ESD 1; SGH-E730, 3M EAD16
GH74-15641A	MPR-TAPE LCD ESD 3; SGH-E730, 3M 1352B
GH75-03207E	MEC-HAND STRAP; SGH-C100, SEC, -, -, BLK(

### 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

SEC CODE	Design LOC	Description
0403-001387	ZD500	DIODE-ZENER
0403-001427	ZD501	DIODE-ZENER
0406-001104	ZD601	DIODE-TVS
0406-001188	U500	DIODE-TVS
0406-001190	ZD600	DIODE-TVS
0406-001190	ZD700	DIODE-TVS
0406-001201	V700	DIODE-TVS
0406-001203	V401	DIODE-TVS
0406-001208	ZD701	DIODE-TVS
0504-001151	Q200	TR-DIGITAL
0504-001151	Q201	TR-DIGITAL
0504-001151	Q202	TR-DIGITAL
0504-001151	Q203	TR-DIGITAL
0504-001151	Q500	TR-DIGITAL
0505-001332	Q300	FET-SILICON
0601-001819	LED700	LED
0601-001819	LED701	LED
0601-001819	LED702	LED
0601-001819	LED703	LED
0601-001819	LED704	LED
0601-001819	LED705	LED
0601-001819	LED706	LED
0601-001819	LED707	LED
0601-001819	LED708	LED
0601-001819	LED709	LED
0601-001819	LED710	LED
0601-001819	LED711	LED
0801-003022	U304	IC-CMOS LOGIC
0801-003025	U302	IC-CMOS LOGIC
1001-001221	U600	IC-ANALOG SWITCH
1001-001231	U604	IC-ANALOG MULTIPLEX
1001-001231	U701	IC-ANALOG MULTIPLEX
1001-001306	U602	IC-ANALOG MULTIPLEX
1009-001020	U503	IC-HALL EFFECT S/W
1108-000022	U303	IC-MCP
1201-002223	U101	IC-TRANSMITTER
1202-001068	U601	IC-VOLTAGE AMP
1203-003568	U400	IC-POWER SUPERVISOR
1203-003736	U402	IC DC/DC CONVERTER
1203-003737	U401	IC-POSI. FIXED REG
1203-003737	U700	IC-POSI. FIXED REG
1203-003742	U502	IC-BATTERY
1204-002138	U300	IC-AUDIO AMP
1204-002398	U603	IC-TUNNER
1205-002647	U200	IC-COMM. CONTROLLER
1205-002709	U100	IC-MODEM
1404-001221	V500	THERMISTOR
1405-001082	V400	VARISTOR
1405-001082	V702	VARISTOR
1405-001082	V703	VARISTOR

Electrical Parts List

SEC CODE	Design LOC	Description
1405-001082	V704	VARISTOR
1405-001128	V705	VARISTOR
1405-001128	V706	VARISTOR
2007-000137	R511	R-CHIP
2007-000138	R105	R-CHIP
2007-000138	R116	R-CHIP
2007-000138	R616	R-CHIP
2007-000140	R625	R-CHIP
2007-000141	R310	R-CHIP
2007-000141	R311	R-CHIP
2007-000143	R218	R-CHIP
2007-000148	R201	R-CHIP
2007-000148	R305	R-CHIP
2007-000148	R308	R-CHIP
2007-000148	R504	R-CHIP
2007-000148	R602	R-CHIP
2007-000151	R306	R-CHIP
2007-000152	R506	R-CHIP
2007-000162	R202	R-CHIP
2007-000162	R204	R-CHIP
2007-000162	R207	R-CHIP
2007-000162	R212	R-CHIP
2007-000162	R216	R-CHIP
2007-000162	R307	R-CHIP
2007-000162	R309	R-CHIP
2007-000162	R317	R-CHIP
2007-000162	R319	R-CHIP
2007-000162	R405	R-CHIP
2007-000162	R500	R-CHIP
2007-000162	R503	R-CHIP
2007-000162	R505	R-CHIP
2007-000162	R513	R-CHIP
2007-000162	R606	R-CHIP
2007-000162	R611	R-CHIP
2007-000162	R621	R-CHIP
2007-000162	R716	R-CHIP
2007-000170	R208	R-CHIP
2007-000170	R209	R-CHIP
2007-000170	R210	R-CHIP
2007-000170	R211	R-CHIP
2007-000170	R508	R-CHIP
2007-000170	R509	R-CHIP
2007-000171	R100	R-CHIP
2007-000171	R108	R-CHIP
2007-000171	R109	R-CHIP
2007-000171	R110	R-CHIP
2007-000171	R111	R-CHIP
2007-000171	R113	R-CHIP
2007-000171	R114	R-CHIP
2007-000171	R115	R-CHIP

SEC CODE	Design LOC	Description
2007-000171	R117	R-CHIP
2007-000171	R118	R-CHIP
2007-000171	R119	R-CHIP
2007-000171	R121	R-CHIP
2007-000171	R122	R-CHIP
2007-000171	R200	R-CHIP
2007-000171	R203	R-CHIP
2007-000171	R205	R-CHIP
2007-000171	R206	R-CHIP
2007-000171	R220	R-CHIP
2007-000171	R301	R-CHIP
2007-000171	R302	R-CHIP
2007-000171	R304	R-CHIP
2007-000171	R316	R-CHIP
2007-000171	R318	R-CHIP
2007-000171	R403	R-CHIP
2007-000171	R404	R-CHIP
2007-000171	R610	R-CHIP
2007-000171	R613	R-CHIP
2007-000171	R619	R-CHIP
2007-000171	R620	R-CHIP
2007-000171	R622	R-CHIP
2007-000171	R623	R-CHIP
2007-000171	R624	R-CHIP
2007-000171	R712	R-CHIP
2007-000171	R713	R-CHIP
2007-000171	R714	R-CHIP
2007-000171	R715	R-CHIP
2007-000173	R101	R-CHIP
2007-000242	R601	R-CHIP
2007-000242	R603	R-CHIP
2007-000758	R501	R-CHIP
2007-000758	R502	R-CHIP
2007-000775	R617	R-CHIP
2007-000831	R605	R-CHIP
2007-001303	R314	R-CHIP
2007-001325	R300	R-CHIP
2007-001325	R618	R-CHIP
2007-001339	R612	R-CHIP
2007-002796	R406	R-CHIP
2007-002796	R604	R-CHIP
2007-002970	R700	R-CHIP
2007-002970	R701	R-CHIP
2007-002970	R702	R-CHIP
2007-002970	R703	R-CHIP
2007-002970	R704	R-CHIP
2007-002970	R705	R-CHIP
2007-002970	R705	R-CHIP
2007-002970	R706	R-CHIP
2007-002970	R707	R-CHIP

Electrical Parts List

SEC CODE	Design LOC	Description
2007-002970	R708	R-CHIP
2007-002970	R709	R-CHIP
2007-002970	R710	R-CHIP
2007-002970	R711	R-CHIP
2007-007014	R313	R-CHIP
2007-007014	R315	R-CHIP
2007-007100	R402	R-CHIP
2007-007101	R303	R-CHIP
2007-007107	R401	R-CHIP
2007-007137	R214	R-CHIP
2007-007137	R215	R-CHIP
2007-007308	R514	R-CHIP
2007-007334	R512	R-CHIP
2007-007480	R608	R-CHIP
2007-007489	R515	R-CHIP
2007-007573	R510	R-CHIP
2007-007573	R607	R-CHIP
2007-008812	R400	R-CHIP
2011-001394	R217	R-CHIP
2203-000233	C136	C-CERAMIC,CHIP
2203-000233	C312	C-CERAMIC,CHIP
2203-000233	C409	C-CERAMIC,CHIP
2203-000233	C620	C-CERAMIC,CHIP
2203-000254	C126	C-CERAMIC,CHIP
2203-000254	C129	C-CERAMIC,CHIP
2203-000254	C131	C-CERAMIC,CHIP
2203-000254	C138	C-CERAMIC,CHIP
2203-000254	C202	C-CERAMIC,CHIP
2203-000254	C310	C-CERAMIC,CHIP
2203-000254	C610	C-CERAMIC,CHIP
2203-000254	C619	C-CERAMIC,CHIP
2203-000278	C112	C-CERAMIC,CHIP
2203-000278	C113	C-CERAMIC,CHIP
2203-000278	C114	C-CERAMIC,CHIP
2203-000278	C601	C-CERAMIC,CHIP
2203-000278	C607	C-CERAMIC,CHIP
2203-000278	C612	C-CERAMIC,CHIP
2203-000359	C400	C-CERAMIC,CHIP
2203-000438	C135	C-CERAMIC,CHIP
2203-000438	C137	C-CERAMIC,CHIP
2203-000438	C139	C-CERAMIC,CHIP
2203-000438	C303	C-CERAMIC,CHIP
2203-000628	C125	C-CERAMIC,CHIP
2203-000628	C128	C-CERAMIC,CHIP
2203-000628	C130	C-CERAMIC,CHIP
2203-000628	C132	C-CERAMIC,CHIP
2203-000654	C315	C-CERAMIC,CHIP
2203-000679	C300	C-CERAMIC,CHIP
2203-000679	C313	C-CERAMIC,CHIP
2203-000679	C624	C-CERAMIC,CHIP

SEC CODE	Design LOC	Description
2203-000679	C405	C - CERAMIC,CHIP
2203-000679	C407	C - CERAMIC,CHIP
2203-000696	C604	C - CERAMIC,CHIP
2203-000812	C100	C - CERAMIC,CHIP
2203-000812	C101	C - CERAMIC,CHIP
2203-000812	C103	C - CERAMIC,CHIP
2203-000812	C120	C - CERAMIC,CHIP
2203-000812	C205	C - CERAMIC,CHIP
2203-000812	C213	C - CERAMIC,CHIP
2203-000812	C215	C - CERAMIC,CHIP
2203-000812	C218	C - CERAMIC,CHIP
2203-000812	C221	C - CERAMIC,CHIP
2203-000812	C224	C - CERAMIC,CHIP
2203-000812	C411	C - CERAMIC,CHIP
2203-000812	C706	C - CERAMIC,CHIP
2203-000812	C707	C - CERAMIC,CHIP
2203-000812	C708	C - CERAMIC,CHIP
2203-000812	C716	C - CERAMIC,CHIP
2203-000995	C605	C - CERAMIC,CHIP
2203-000995	C611	C - CERAMIC,CHIP
2203-000995	C623	C - CERAMIC,CHIP
2203-001153	C421	C - CERAMIC,CHIP
2203-001259	C106	C - CERAMIC,CHIP
2203-001259	C108	C - CERAMIC,CHIP
2203-001259	C709	C - CERAMIC,CHIP
2203-001259	C710	C - CERAMIC,CHIP
2203-001259	C711	C - CERAMIC,CHIP
2203-001259	C712	C - CERAMIC,CHIP
2203-001259	C713	C - CERAMIC,CHIP
2203-001259	C714	C - CERAMIC,CHIP
2203-001259	C715	C - CERAMIC,CHIP
2203-002443	C500	C - CERAMIC,CHIP
2203-002525	C306	C - CERAMIC,CHIP
2203-002668	C104	C - CERAMIC,CHIP
2203-002668	C115	C - CERAMIC,CHIP
2203-003054	C615	C - CERAMIC,CHIP
2203-003054	C617	C - CERAMIC,CHIP
2203-005050	C117	C - CERAMIC,CHIP
2203-005288	C105	C - CERAMIC,CHIP
2203-005288	C116	C - CERAMIC,CHIP
2203-005480	C311	C - CERAMIC,CHIP
2203-005480	C618	C - CERAMIC,CHIP
2203-005480	C621	C - CERAMIC,CHIP
2203-005480	C622	C - CERAMIC,CHIP
2203-005480	C627	C - CERAMIC,CHIP
2203-005482	C133	C - CERAMIC,CHIP
2203-005482	C134	C - CERAMIC,CHIP
2203-005482	C201	C - CERAMIC,CHIP
2203-005482	C203	C - CERAMIC,CHIP
2203-005482	C204	C - CERAMIC,CHIP

Electrical Parts List

SEC CODE	Design LOC	Description
2203-005482	C206	C - CERAMIC,CHIP
2203-005482	C207	C - CERAMIC,CHIP
2203-005482	C208	C - CERAMIC,CHIP
2203-005482	C209	C - CERAMIC,CHIP
2203-005482	C210	C - CERAMIC,CHIP
2203-005482	C211	C - CERAMIC,CHIP
2203-005482	C212	C - CERAMIC,CHIP
2203-005482	C214	C - CERAMIC,CHIP
2203-005482	C217	C - CERAMIC,CHIP
2203-005482	C301	C - CERAMIC,CHIP
2203-005482	C302	C - CERAMIC,CHIP
2203-005482	C305	C - CERAMIC,CHIP
2203-005482	C307	C - CERAMIC,CHIP
2203-005482	C308	C - CERAMIC,CHIP
2203-005482	C309	C - CERAMIC,CHIP
2203-005482	C314	C - CERAMIC,CHIP
2203-005482	C318	C - CERAMIC,CHIP
2203-005482	C319	C - CERAMIC,CHIP
2203-005482	C406	C - CERAMIC,CHIP
2203-005482	C419	C - CERAMIC,CHIP
2203-005482	C502	C - CERAMIC,CHIP
2203-005482	C503	C - CERAMIC,CHIP
2203-005482	C505	C - CERAMIC,CHIP
2203-005482	C603	C - CERAMIC,CHIP
2203-005482	C606	C - CERAMIC,CHIP
2203-005482	C626	C - CERAMIC,CHIP
2203-006053	C304	C - CERAMIC,CHIP
2203-006093	C413	C - CERAMIC,CHIP
2203-006093	C501	C - CERAMIC,CHIP
2203-006137	C616	C - CERAMIC,CHIP
2203-006190	C222	C - CERAMIC,CHIP
2203-006190	C223	C - CERAMIC,CHIP
2203-006208	C401	C - CERAMIC,CHIP
2203-006208	C412	C - CERAMIC,CHIP
2203-006208	C414	C - CERAMIC,CHIP
2203-006208	C418	C - CERAMIC,CHIP
2203-006208	C422	C - CERAMIC,CHIP
2203-006208	C423	C - CERAMIC,CHIP
2203-006257	C408	C - CERAMIC,CHIP
2203-006257	C415	C - CERAMIC,CHIP
2203-006257	C416	C - CERAMIC,CHIP
2203-006257	C424	C - CERAMIC,CHIP
2203-006257	C425	C - CERAMIC,CHIP
2203-006257	C628	C - CERAMIC,CHIP
2203-006260	C122	C - CERAMIC,CHIP
2203-006324	C404	C - CERAMIC,CHIP
2203-006562	C200	C - CERAMIC,CHIP
2203-006562	C317	C - CERAMIC,CHIP
2203-006562	C402	C - CERAMIC,CHIP
2203-006562	C403	C - CERAMIC,CHIP



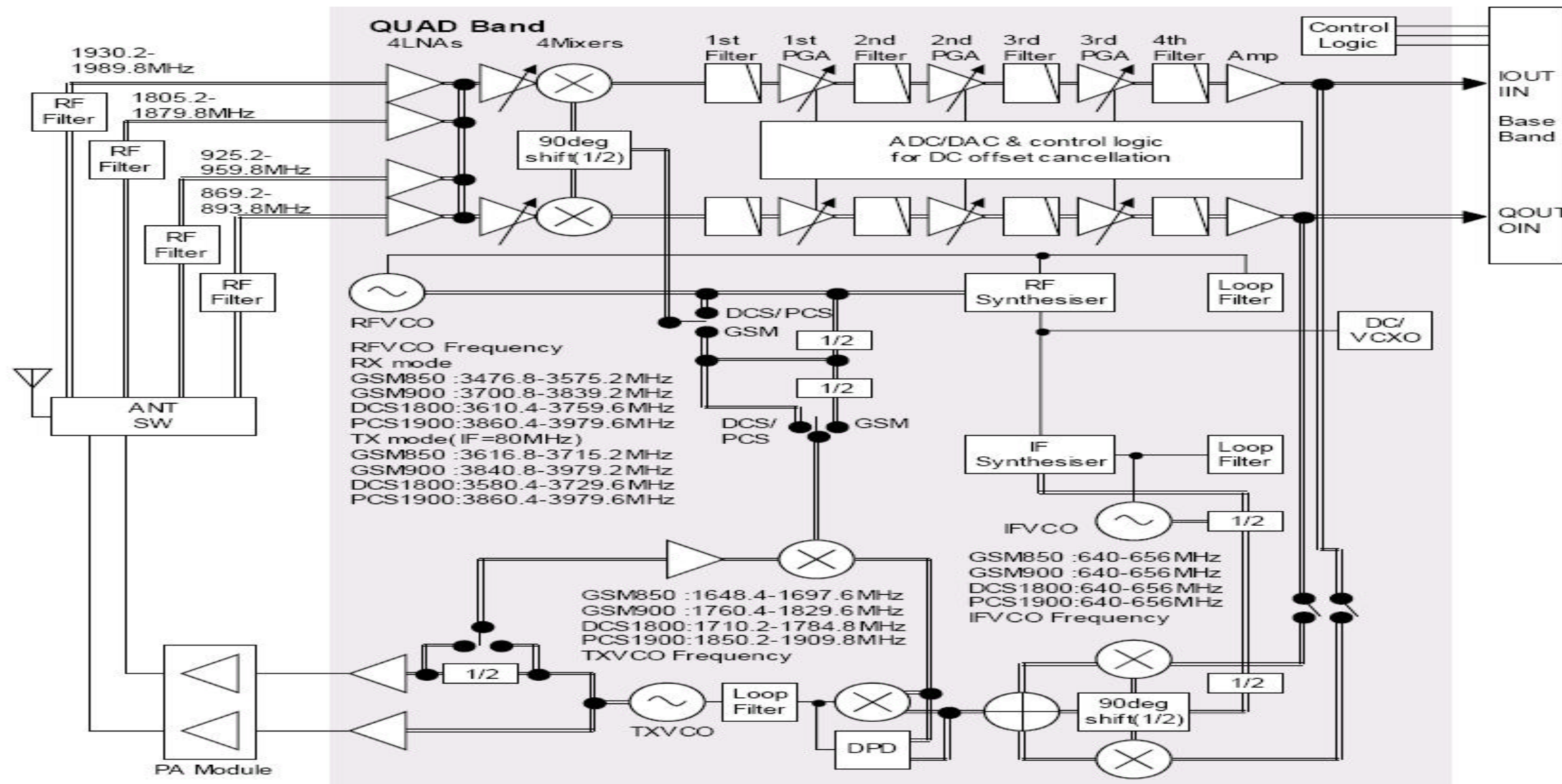
SEC CODE	Design LOC	Description
2203-006562	C506	C - CERAMIC,CHIP
2203-006562	C625	C - CERAMIC,CHIP
2203-006562	C700	C - CERAMIC,CHIP
2404-001348	C121	C - TA,CHIP
2404-001374	C124	C - TA,CHIP
2404-001374	C127	C - TA,CHIP
2404-001394	C410	C - TA,CHIP
2404-001394	C504	C - TA,CHIP
2404-001402	C600	C - TA,CHIP
2703-001231	L603	INDUCTOR - SMD
2703-001673	L604	INDUCTOR - SMD
2703-001752	L300	INDUCTOR - SMD
2703-002170	L110	INDUCTOR - SMD
2703-002206	L605	INDUCTOR - SMD
2703-002281	L112	INDUCTOR - SMD
2703-002314	L103	INDUCTOR - SMD
2703-002365	L104	INDUCTOR - SMD
2703-002365	L105	INDUCTOR - SMD
2703-002365	L108	INDUCTOR - SMD
2703-002365	L109	INDUCTOR - SMD
2703-002586	L101	INDUCTOR - SMD
2703-002596	L107	INDUCTOR - SMD
2703-002774	L401	INDUCTOR - SMD
2801-004373	OSC400	CRYSTAL - UNIT
2809-001293	U102	OSCILLATOR - VCTCXO
2901-001254	F100	FILTER - EMI SMD
2901-001286	F700	FILTER - EMI SMD
2901-001286	F701	FILTER - EMI SMD
2901-001286	F702	FILTER - EMI SMD
2901-001286	F703	FILTER - EMI SMD
2901-001286	F704	FILTER - EMI SMD
2901-001315	U501	FILTER - EMI SMD
2911-000007	MODULE1	FILTER
3301-001120	L400	CORE - FERRITE BEAD
3301-001438	L600	CORE - FERRITE BEAD
3301-001438	L601	CORE - FERRITE BEAD
3301-001534	L500	CORE - FERRITE BEAD
3301-001789	L200	CORE - FERRITE BEAD
3301-001789	R614	CORE - FERRITE BEAD
3705-001358	CN100	CONNECTOR - COAXIAL
3709-001229	SIM400	CONNECTOR - CARD EDGE
3710-001994	IFC500	CONNECTOR - SOCKET
3711-005880	BTC500	CONNECTOR - HEADER
3711-005918	CN700	CONNECTOR - HEADER
3722-002082	CN600	JACK - PHONE
4302-001180	C426	BATTERY
4709-001371	U301	RF - MODULE
GH13-00030A	U305	COMP - SMD
4202-001052	ANT300	C - CERAMIC,CHIP



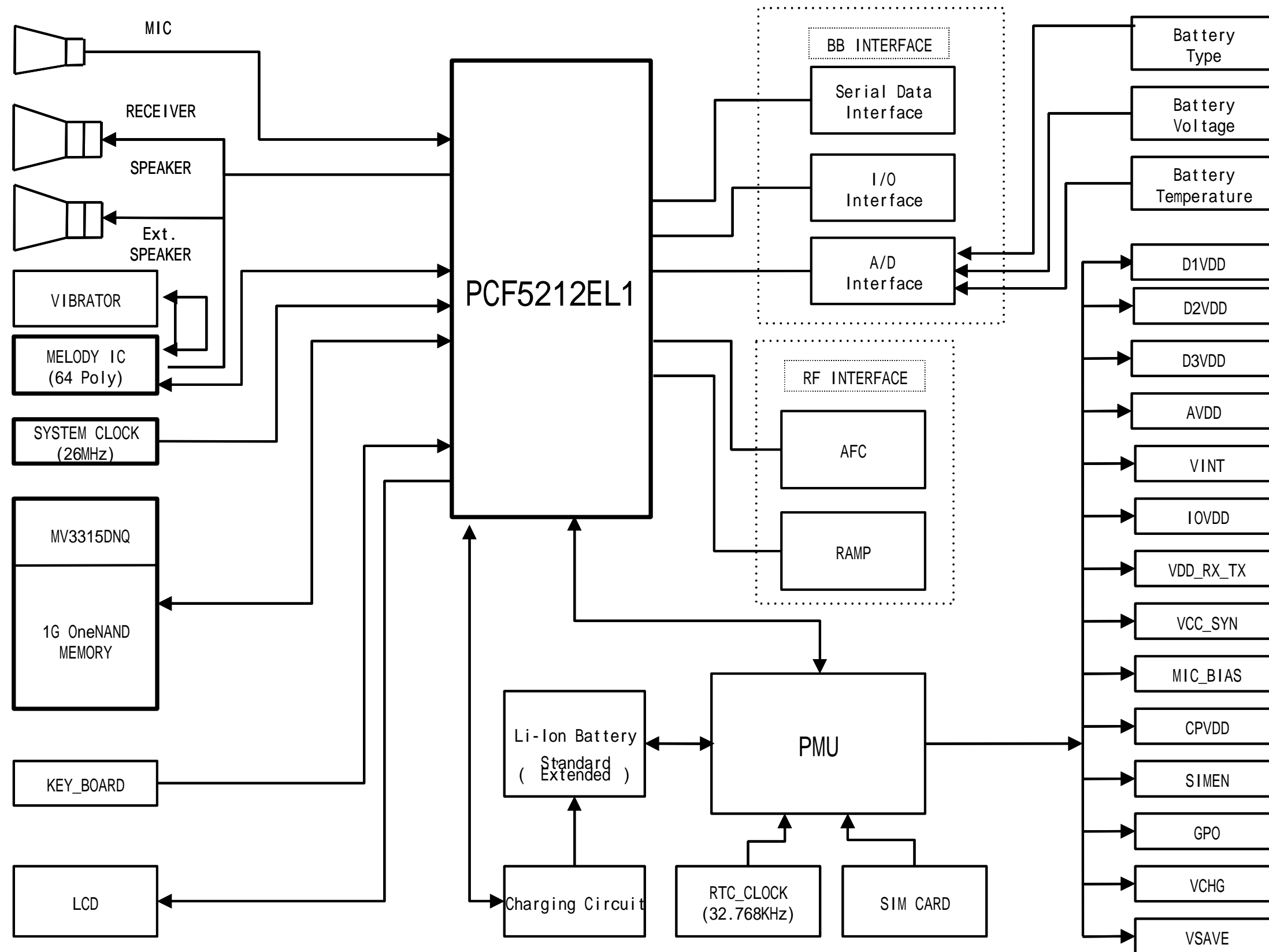
## 5. Block Diagrams

### 5-1. RF Solution Block Diagram

**Block Diagram**

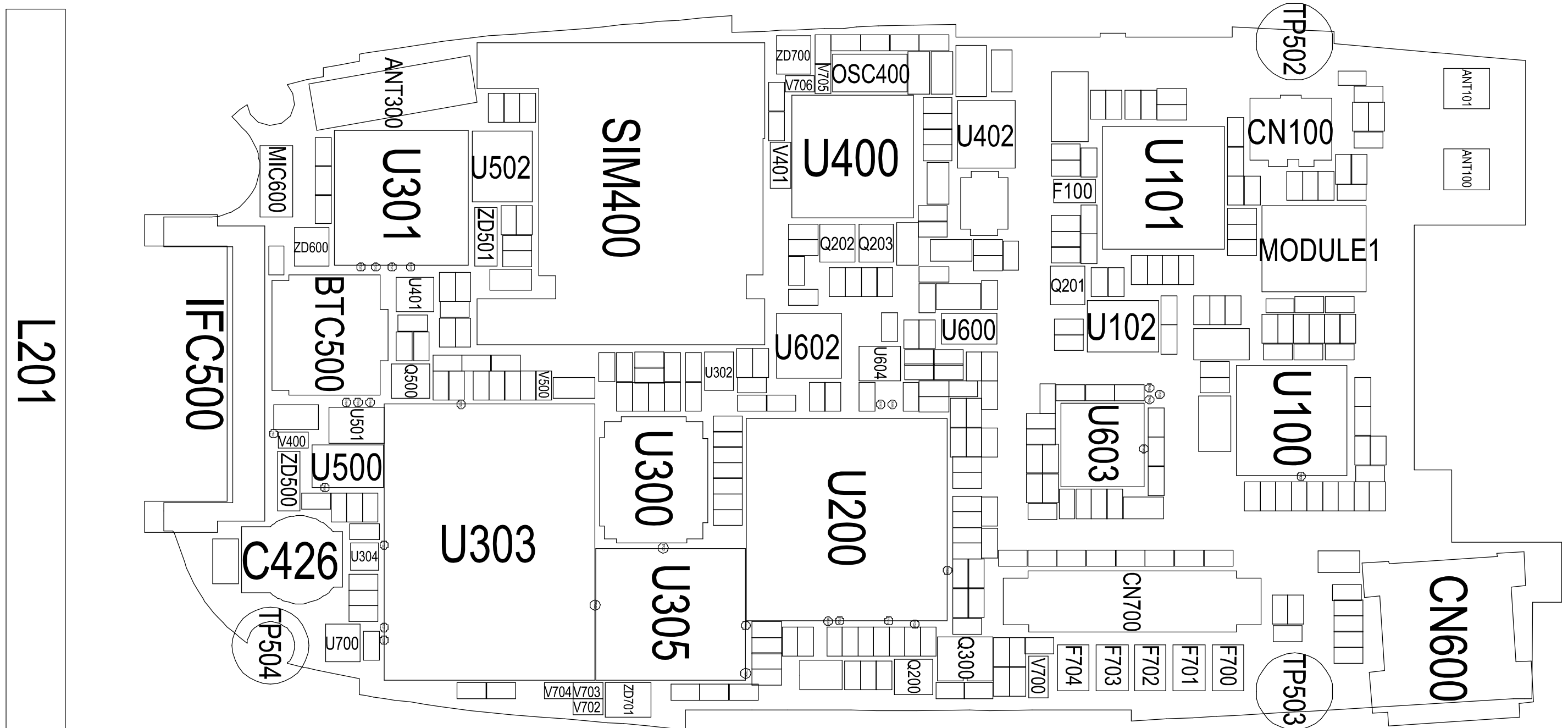


5-2. Base Band Solution Block Diagram



## 6. PCB Diagrams

### 6-1. PCB Top Diagram



6-2. PCB Bottom Diagram

