SAMSUNG

GSM TELEPHONE

SGH-E350E

SERVICE Manual

GSM TELEPHONE

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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	-

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1-2. GSM TX power class

TX Power control level	GSM900
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

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2. Circuit Description

2-1. SGH-E350E RF Circuit Description

2-1-1. RX PART

- **FRONT END MODULE**(ANTENNA SWITCH MODULE + RX SAW FILTER) (U101)
  → Switching Tx, Rx path for GSM900, DCS1800 and PCS1900 by logic controlling.

- **FRONT END MODULE Control Logic** (U101) → Truth Table

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

- **VC-TCXO (U101)**

  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 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 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.

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2-2. Baseband Circuit description of SGH-E350E

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 U305, LCD_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".

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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(U606) 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(U607). A magnet under LCD enables EM-1681-FT.

2-2-4. EMI ESD Filter(F501,F502)

This system uses the EMI ESD filter, F501,F502 to protect noise from IF CONNECTOR part.

2-2-5. 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.

2-2-6. 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 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.

2-2-8. Memory(U303)

This system uses Samsung's memory, KAP17SG00A. The KAP17SG00A is a Multi Chip Package Memory which combines 256Mbit Synchronous Burst Multi Bank NOR Flash Memory and two 512Mbit OneNAND Flash and 128Mbit Synchronous Burst UtRAM.

It has 16 bit data line, HD[1~16] which is connected to PCF5213EL1 and MV3018SAQ, 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.

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2-2-9. PCF5213EL1(U200)

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.

2-2-10. TCO-5871U(26MHz)(U101)

This system uses the 26MHz TCXO, TCO-5871U, Toyocom. 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(MV3018SAQ)(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.

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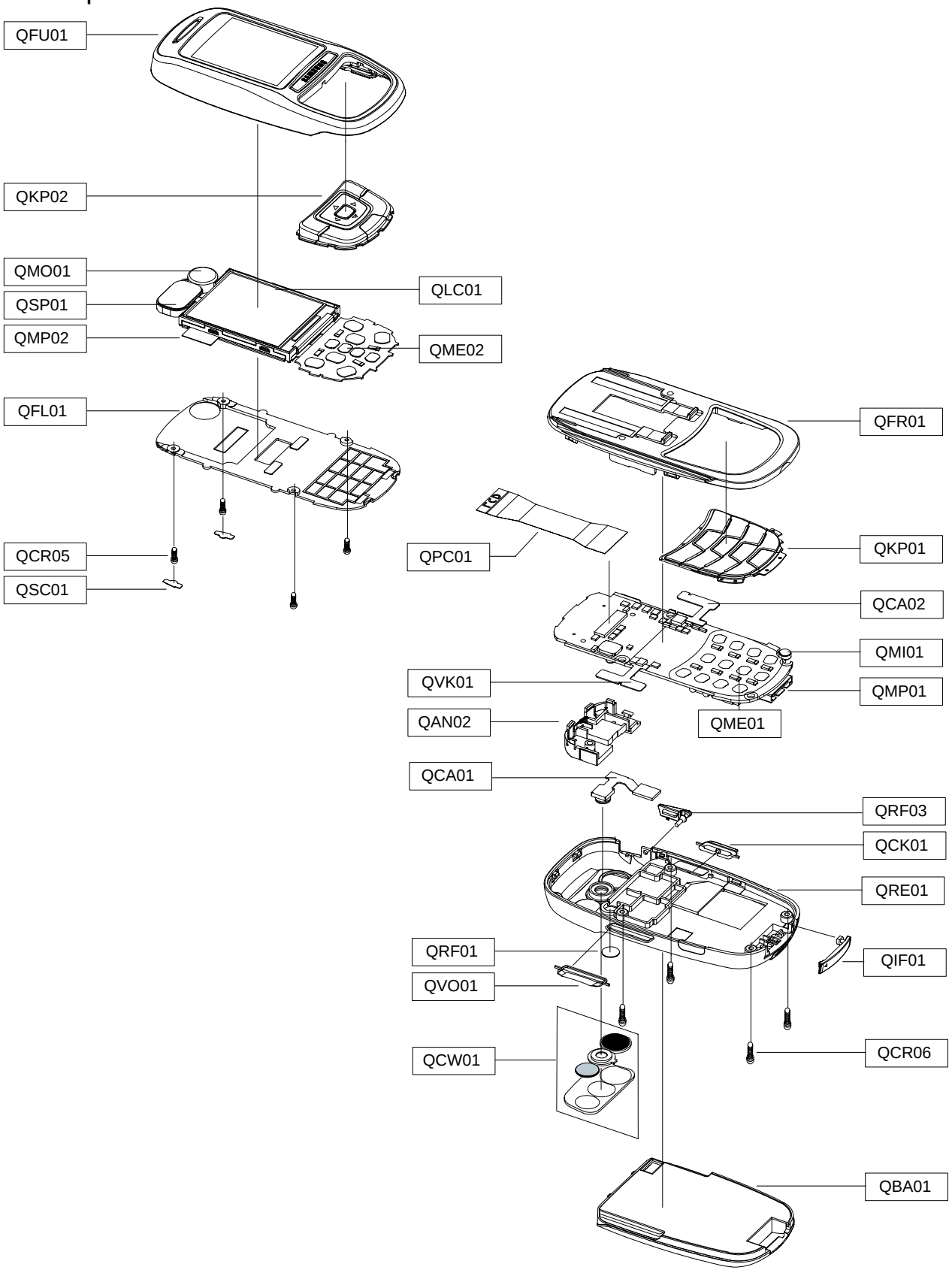
3. Exploded View and Parts List

3-1. Exploded View



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3-2. Parts List

Location NO.		Description	SEC CODE
QAN02		INTENNA-SGHE350;EWPADF013A,SGH-E350,	GH42-00592A
QBA01		BATTERY-800MAH,B SIL,ORA,M;BST4208SO	GH43-01920C
QCA01		UNIT-CAMERA;SGH-E350,MOMBH150G1A,-,E	GH59-02179A
QCA02		UNIT-CAMERA KEY;SGH-E350,SGH-E350 C/	GH59-02183A
QCR05		SCREW-MACHINE;PH,+,M1.4,L3,ZPC(BLK),	6001-001478
QCR06		SCREW-MACHINE;PH(PI2.5),+,M1.4,L3.5,	6001-001155
QCW01		MEC-CAMERA WINDOW;SGH-E350,EU,-,-,-,	GH75-07339A
QFL01		MEC-SLIDE LOWER;SGH-E350,EU,-,-,-,-,	GH75-07260A
QFR01		MEC-FRONT COVER;SGH-E350,EU,-,-,-,-,	GH75-07261A
QFU01		MEC-SLIDE UPPER;SGH-E350,EU,-,-,-,-,	GH75-07259A
QIF01		PMO-IF COVER;SGH-E350,PC(G6656)+URET	GH72-20661A
QKP01		MEC-KEYPAD MAIN;SGH-E350,EU,-,-,-,-,	GH75-07285A
QKP02		MEC-KEYPAD SUB;SGH-E350,EU,-,-,-,-,B	GH75-07284A
QLC01		LCD-SGHE350;LTS166QQ-F02,SGH-E350,12	GH07-00729A
QME01		UNIT-METAL DOME(MAIN);SGH-E350,SGH-E	GH59-02182A
QME02		UNIT-METAL DOME(SUB);SGH-E350,SGH-E3	GH59-02181A
QMI01		MICROPHONE-ASSY-SGHE350;1,130to500uA	GH30-00203A
QMO01		MOTOR DC-SGHE350;JHV-10A1-F13,SGH-E3	GH31-00176A
QMP01		PBA MAIN-SGHE350EDGE;SCH-E350,TINY,E	GH92-02179A
QMP02		PBA SUB-SGHE350;SGH-E350,TINY,EU,PBA	GH92-02206A
QPC01		PCB-FPCB CABLE;SGH-E350,POLYIMIDE,3L	GH41-00882A
QRE01		MEC-REAR COVER(FTM);SGH-E350E,FTM,-,	GH75-07332A
	QVO01	PMO-VOLUME KEY;SGH-E350,ABS+URETHAN,	GH72-20665A
	QCK01	PMO-CAMERA KEY;SGH-E350,ABS+URETHAN,	GH72-20666A
QRF01		MPR-SHEET RF COVER;SGH-E350,PC SHEET	GH74-16395A
QRF03		PMO-EAR COVER V2;SGH-E350,PC(G71770C	GH72-22634A
QSC01		MPR-SLIDE/L SCREW SHEET;SGH-E350,PC	GH74-16356A
QSP01		SPEAKER;0.7W,8ohmohm,122dB±2dB,850H	3001-001782
QVK01		UNIT-VOLUME KEY;SGH-E350,SGH-E350 V/	GH59-02180A

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Description	SEC CODE
BAG PE;LDPE,T0.05,W80,L180,TRP,-,-	6902-000634
ADAPTOR-TAD;TAD137ESE,SGH-P100,-,110	GH44-00482A
UNIT-EARPHONE;SGH-Z107,EM-SS650E-ST,	GH59-01713A
LABEL(P)-WATER SOAK;COMM,NORGE,100G,	GH68-02026A
MANUAL-WEEE CARD;COMM,SEC,ENGLISH,UN	GH68-07013A
LABEL(R)-MAIN(EU);SGH-E350,EU,POLYES	GH68-07204A
MANUAL-USER;SGH-E350E,FTM,FRENCH,FRA	GH68-07302A
MANUAL-QSG;SGH-E350E,FTA,FRENCH,FRAN	GH68-07320A
CUSHION-CASE(1-2);SGH-E350,PULP,T0.8	GH69-03012A
BOX(P)-UINIT(ORANGE);SGH-E350,SC300+	GH69-03026A
PMO-BATT LOCKER;SGH-E350,PC(G6656),S	GH72-20662A
RMO-RUBBER BGA 1;SGH-E350,CR RUBBER,	GH73-05089A
RMO-RUBBER BGA 2;SGH-E350,CR RUBBER,	GH73-05090A
RMO-RUBBER BGA 3;SGH-E350,CR RUBBER,	GH73-05091A
MPR-TAPE SUB FPCB;SGH-E350,3M 851,28	GH74-16170A
MPR-TAPE LCD FPCB CONN;SGH-E350,3M 8	GH74-16171A
MPR-TAPE MAIN FPCB BASE;SGH-E350,PET	GH74-16218A
MPR-TAPE MAIN FPCB;SGH-E350,3M 851,2	GH74-16219A
MPR-BOHO VINYL U/WIN;SGH-E350,3M 418	GH74-16358A
MPR-BOHO VINYL SUB KEY;SGH-E350,3M 4	GH74-16359A
MPR-TAPE EMI LCD R;SGH-E350,EMI TPAE	GH74-16368A
MPR-TAPE EMI LCD L;SGH-E350,EMI TPAE	GH74-16369A
MPR-TAPE EMI MAIN PCB;SGH-E350,EMI T	GH74-16370A
MPR-TAPE EMI SUB PCB TOP;SGH-E350,EM	GH74-16371A
MPR-TAPE SUB PCB BOT;SGH-E350,3M 851	GH74-16373A
MPR-TAPE MAIN PCB A;SGH-E350,3M 851,	GH74-16787A
MEC-HANGER;SGH-Z500,TMN,STRAP,-,BLK,	GH75-03673H

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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)

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4. Electrical Parts List

Design LOC	Description	SEC CODE
BTC500	CONNECTOR-BATTERY	3711-005829
C100	INDUCTOR-SMD	2703-002368
C102	C-CER,CHIP	2203-000679
C103	C-CER,CHIP	2203-005281
C105	C-CER,CHIP	2203-000386
C108	C-CER,CHIP	2203-000628
C109	C-TA,CHIP	2404-001312
C110	C-CER,CHIP	2203-006399
C111	C-CER,CHIP	2203-000233
C113	C-CER,CHIP	2203-005446
C114	C-CER,CHIP	2203-001385
C115	C-CER,CHIP	2203-001385
C117	C-CER,CHIP	2203-000530
C119	C-CER,CHIP	2203-000995
C121	C-CER,CHIP	2203-000233
C122	C-CER,CHIP	2203-000233
C124	C-CER,CHIP	2203-000278
C125	C-CER,CHIP	2203-006190
C126	C-CER,CHIP	2203-000233
C129	C-CER,CHIP	2203-000278
C131	C-CER,CHIP	2203-002668
C133	C-CER,CHIP	2203-000628
C134	C-CER,CHIP	2203-000278
C135	C-CER,CHIP	2203-000278
C136	C-CER,CHIP	2203-000425
C137	C-CER,CHIP	2203-000425
C138	C-CER,CHIP	2203-000386
C139	C-CER,CHIP	2203-000386
C140	C-CER,CHIP	2203-000386
C141	C-CER,CHIP	2203-000386
C142	C-CER,CHIP	2203-000278
C200	C-CER,CHIP	2203-006208
C201	C-CER,CHIP	2203-000254
C202	C-CER,CHIP	2203-005482
C203	C-CER,CHIP	2203-005482
C204	C-CER,CHIP	2203-000812
C205	C-CER,CHIP	2203-005482
C206	C-CER,CHIP	2203-000254
C207	C-CER,CHIP	2203-005482
C208	C-CER,CHIP	2203-000254
C209	C-CER,CHIP	2203-005482
C210	C-CER,CHIP	2203-000812
C211	C-CER,CHIP	2203-005482
C212	C-CER,CHIP	2203-006399
C213	C-CER,CHIP	2203-006399

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Design LOC	Description	SEC CODE
C214	C-CER,CHIP	2203-006399
C216	C-CER,CHIP	2203-005482
C300	C-CER,CHIP	2203-000233
C301	C-CER,CHIP	2203-000679
C302	C-CER,CHIP	2203-005482
C303	C-TA,CHIP	2404-001225
C304	C-CER,CHIP	2203-000438
C305	C-CER,CHIP	2203-005482
C306	C-CER,CHIP	2203-006257
C307	C-CER,CHIP	2203-006257
C308	C-CER,CHIP	2203-005482
C309	C-CER,CHIP	2203-005482
C310	C-CER,CHIP	2203-006208
C311	C-CER,CHIP	2203-005512
C312	C-CER,CHIP	2203-005482
C313	C-CER,CHIP	2203-002525
C314	C-CER,CHIP	2203-005482
C315	C-CER,CHIP	2203-005480
C316	C-CER,CHIP	2203-000725
C317	C-CER,CHIP	2203-005482
C318	C-CER,CHIP	2203-000438
C319	C-CER,CHIP	2203-006257
C320	C-CER,CHIP	2203-003054
C321	C-CER,CHIP	2203-000438
C322	C-CER,CHIP	2203-006257
C323	C-CER,CHIP	2203-005482
C400	C-CER,CHIP	2203-006399
C401	C-CER,CHIP	2203-006257
C402	C-CER,CHIP	2203-006090
C403	C-TA,CHIP	2404-001225
C404	C-CER,CHIP	2203-005482
C405	C-CER,CHIP	2203-000550
C406	C-CER,CHIP	2203-006257
C407	C-CER,CHIP	2203-000233
C408	C-CER,CHIP	2203-000550
C409	C-TA,CHIP	2404-001352
C410	C-CER,CHIP	2203-000254
C411	C-TA,CHIP	2404-001225
C412	C-CER,CHIP	2203-006399
C413	C-TA,CHIP	2404-001225
C414	C-CER,CHIP	2203-006257
C415	C-CER,CHIP	2203-006257
C416	C-CER,CHIP	2203-006208
C417	C-CER,CHIP	2203-005482
C420	C-CER,CHIP	2203-006208

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Design LOC	Description	SEC CODE
C421	C-CER,CHIP	2203-006208
C422	C-CER,CHIP	2203-006257
C423	C-CER,CHIP	2203-001153
C501	C-CER,CHIP	2203-005482
C502	C-TA,CHIP	2404-001268
C503	C-CER,CHIP	2203-005482
C504	C-CER,CHIP	2203-005482
C505	C-CER,CHIP	2203-006053
C506	C-CER,CHIP	2203-000311
C600	C-CER,CHIP	2203-000278
C601	C-CER,CHIP	2203-000278
C603	C-CER,CHIP	2203-005482
C604	C-CER,CHIP	2203-005482
C606	C-CER,CHIP	2203-005056
C609	C-CER,CHIP	2203-005482
C611	C-CER,CHIP	2203-000278
C612	C-CER,CHIP	2203-002443
C613	C-CER,CHIP	2203-005482
C614	C-CER,CHIP	2203-000278
C616	C-CER,CHIP	2203-005056
C617	C-CER,CHIP	2203-000254
C619	C-CER,CHIP	2203-000278
C620	C-CER,CHIP	2203-006399
C621	C-CER,CHIP	2203-003054
C622	C-CER,CHIP	2203-006257
C623	C-CER,CHIP	2203-006137
C624	C-CER,CHIP	2203-005482
C625	C-CER,CHIP	2203-005482
C626	C-CER,CHIP	2203-000278
C627	C-CER,CHIP	2203-000438
C629	C-CER,CHIP	2203-003054
C630	C-CER,CHIP	2203-006190
C631	C-CER,CHIP	2203-006091
C700	C-CER,CHIP	2203-000812
C701	C-CER,CHIP	2203-000812
C703	C-CER,CHIP	2203-005482
C704	C-CER,CHIP	2203-000233
C706	C-CER,CHIP	2203-005482
C708	C-CER,CHIP	2203-006257
C709	C-CER,CHIP	2203-006257
C711	C-CER,CHIP	2203-006201
C712	C-CER,CHIP	2203-005482
C713	C-CER,CHIP	2203-000254
C715	C-CER,CHIP	2203-005482
C716	C-CER,CHIP	2203-005482

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Design LOC	Description	SEC CODE
C717	C-CER,CHIP	2203-006257
C718	C-CER,CHIP	2203-006257
C719	C-CER,CHIP	2203-005482
C720	C-CER,CHIP	2203-006257
C721	C-CER,CHIP	2203-006201
C722	C-CER,CHIP	2203-000254
C723	C-CER,CHIP	2203-005480
CN100	CONNECTOR-COAXIAL	3705-001355
CN700	CONNECTOR-FPC/FFC/PIC	3708-001966
CN701	CONNECTOR-HEADER	3711-005801
D703	DIODE-TVS	0406-001203
D704	DIODE-TVS	0406-001203
D705	DIODE-TVS	0406-001203
D706	DIODE-TVS	0406-001203
D707	DIODE-TVS	0406-001203
F100	FILTER-EMI SMD	2901-001254
F105	FILTER-SAW	2904-001553
F500	FILTER-EMI SMD	2901-001283
F501	FILTER-EMI/ESD	2901-001322
F502	FILTER-EMI/ESD	2901-001322
F700	FILTER-EMI/ESD	2901-001319
F701	FILTER-EMI/ESD	2901-001319
F702	FILTER-EMI/ESD	2901-001319
F703	FILTER-EMI/ESD	2901-001319
F704	FILTER-EMI/ESD	2901-001319
F705	FILTER-EMI/ESD	2901-001319
IFC500	CONNECTOR-INTERFACE	3710-001611
L100	R-CHIP	2007-000171
L101	R-CHIP	2007-000171
L102	INDUCTOR-SMD	2703-001722
L104	INDUCTOR-SMD	2703-001722
L105	INDUCTOR-SMD	2703-001723
L107	INDUCTOR-SMD	2703-002281
L108	INDUCTOR-SMD	2703-001734
L109	INDUCTOR-SMD	2703-002268
L110	INDUCTOR-SMD	2703-002636
L111	INDUCTOR-SMD	2703-001747
L400	BEAD-SMD	3301-001120
L600	BEAD-SMD	3301-001534
L700	BEAD-SMD	3301-001729
L701	BEAD-SMD	3301-001729
LED600	LED	0601-002055
LED601	LED	0601-002055
LED602	LED	0601-002055
LED603	LED	0601-002055

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Design LOC	Description	SEC CODE
LED604	LED	0601-002055
LED605	LED	0601-002055
LED606	LED	0601-002055
LED607	LED	0601-002055
OSC400	CRYSTAL-SMD	2801-004373
R100	R-CHIP	2007-000171
R101	R-CHIP	2007-000148
R102	R-CHIP	2007-000172
R103	R-CHIP	2007-000566
R106	R-CHIP	2007-000171
R107	R-CHIP	2007-003001
R108	R-CHIP	2007-000932
R109	R-CHIP	2007-000932
R110	R-CHIP	2007-000140
R111	R-CHIP	2007-000171
R112	R-CHIP	2007-000171
R113	R-CHIP	2007-000171
R114	R-CHIP	2007-000171
R115	R-CHIP	2007-000566
R116	R-CHIP	2007-001288
R117	R-CHIP	2007-001313
R118	R-CHIP	2007-001313
R201	R-CHIP	2007-000148
R202	R-CHIP	2007-000171
R204	R-CHIP	2007-000242
R205	R-CHIP	2007-000242
R206	R-CHIP	2007-000162
R207	R-CHIP	2007-000162
R208	R-CHIP	2007-000162
R209	R-CHIP	2007-000162
R210	R-CHIP	2007-000143
R211	R-CHIP	2007-000148
R212	R-CHIP	2007-007001
R300	R-CHIP	2007-000171
R301	R-CHIP	2007-001325
R302	R-CHIP	2007-000148
R304	R-CHIP	2007-000831
R305	R-CHIP	2007-000151
R306	R-CHIP	2007-000162
R307	R-CHIP	2007-000143
R308	R-CHIP	2007-000143
R309	R-CHIP	2007-000148
R310	R-CHIP	2007-000171
R311	R-CHIP	2007-000162
R312	R-CHIP	2007-000839

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Design LOC	Description	SEC CODE
R313	R-CHIP	2007-000148
R314	R-CHIP	2007-007014
R315	R-CHIP	2007-001303
R316	R-CHIP	2007-007014
R317	R-CHIP	2007-001303
R319	R-CHIP	2007-000171
R400	R-CHIP	2007-007100
R401	R-CHIP	2007-000171
R402	R-CHIP	2007-000171
R403	R-CHIP	2007-000162
R404	R-CHIP	2007-000171
R405	R-CHIP	2007-000171
R406	R-CHIP	2007-001316
R500	R-CHIP	2007-000758
R501	R-CHIP	2007-000162
R502	R-CHIP	2007-000758
R503	R-CHIP	2007-007107
R504	R-CHIP	2007-000148
R507	R-CHIP	2007-000137
R508	R-CHIP	2007-007573
R509	R-CHIP	2007-000162
R510	R-CHIP	2007-007334
R511	R-CHIP	2007-000156
R512	R-CHIP	2007-007489
R513	R-CHIP	2007-000170
R514	R-CHIP	2007-000170
R517	R-CHIP	2007-000138
R518	R-CHIP	2007-000138
R520	R-CHIP	2007-000171
R600	R-CHIP	2007-000137
R602	R-CHIP	2007-000137
R603	R-CHIP	2007-001316
R604	R-CHIP	2007-000831
R605	R-CHIP	2007-000162
R606	R-CHIP	2007-007573
R607	R-CHIP	2007-000162
R608	R-CHIP	2007-000162
R609	R-CHIP	2007-000162
R610	R-CHIP	2007-007480
R611	R-CHIP	2007-007009
R612	R-CHIP	2007-007009
R613	R-CHIP	2007-007009
R614	R-CHIP	2007-007009
R615	R-CHIP	2007-007009
R616	R-CHIP	2007-007009

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Design LOC	Description	SEC CODE
R617	R-CHIP	2007-000162
R618	R-CHIP	2007-007009
R619	R-CHIP	2007-007009
R700	R-CHIP	2007-007791
R706	R-CHIP	2007-007013
R707	R-CHIP	2007-000162
R708	R-CHIP	2007-000162
R714	R-CHIP	2007-000171
SIM400	CONNECTOR-CARD EDGE	3709-001355
U101	OSCILLATOR-VCTCXO	2809-001294
U300	IC-MELODY	1204-002161
U301	PHOTO-IRDA	0604-001291
U302	IC-CMOS LOGIC	0801-002958
U303	IC-MCP	1108-000018
U305	IC ASIC-SCHN480	GH13-00029A
U400	IC-POWER SUPERVISOR	1203-003568
U402	IC-DC/DC CONVERTER	1203-003545
U503	IC-BATTERY	1203-003742
U504	TR-DIGITAL	0504-001151
U600	IC-VOLTAGE COMP.	1202-001068
U607	IC-HALL EFFECT S/W	1009-001020
U700	IC-DC/DC CONVERTER	1203-003321
U701	IC-POSI.FIXED REG.	1203-003432
U703	IC-CMOS LOGIC	0801-002970
U714	R-CHIP	2007-000152
U716	C-TA,CHIP	2404-001225
U717	C-CER,CHIP	2203-003054
U718	FILTER-EMI/ESD	2901-001319
V400	VARISTOR	1405-001082
V500	THERMISTOR-NTC	1404-001221
V601	VARISTOR	1405-001082
V602	VARISTOR	1405-001082
V603	VARISTOR	1405-001110
V604	VARISTOR	1405-001110
ZD500	DIODE-ZENER	0403-001547
ZD501	DIODE-ZENER	0403-001427
ZD601	DIODE-TVS	0406-001104
ZD701	DIODE-TVS	0406-001104
ZD702	DIODE-TVS	0406-001104

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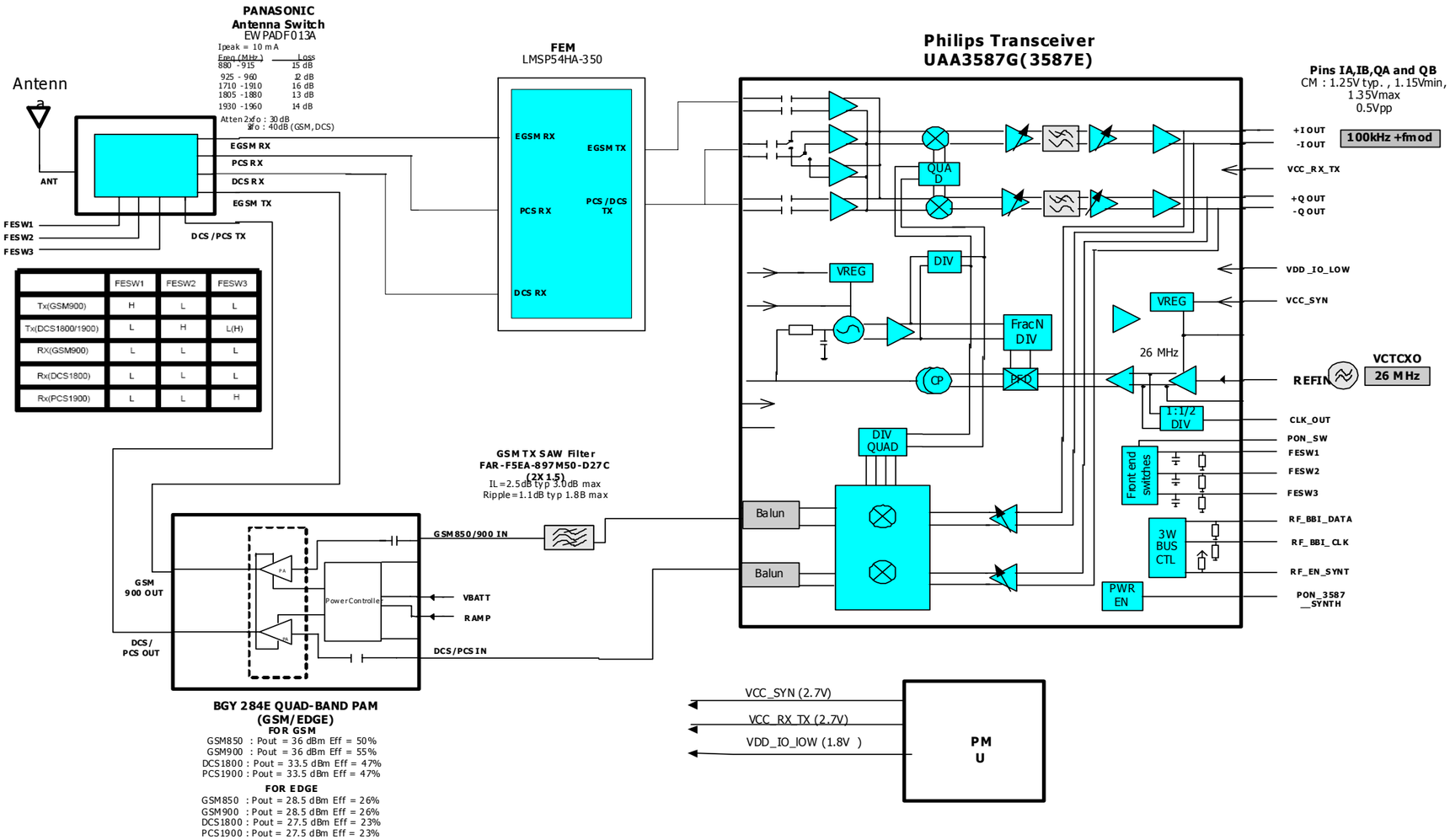
5. Block Diagrams

5-1. RF Solution Block Diagram



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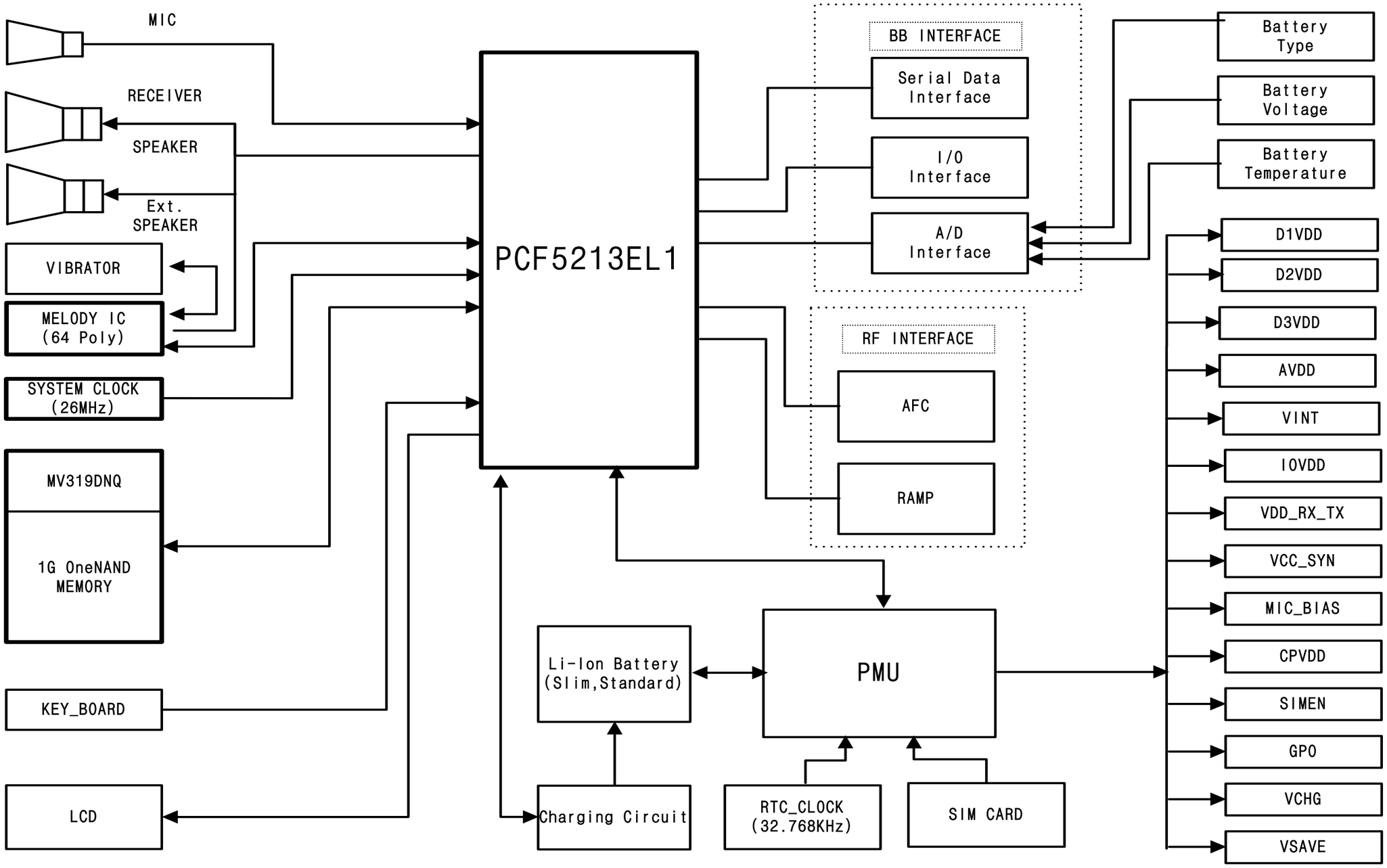
5-2. Base Band Solution Block Diagram



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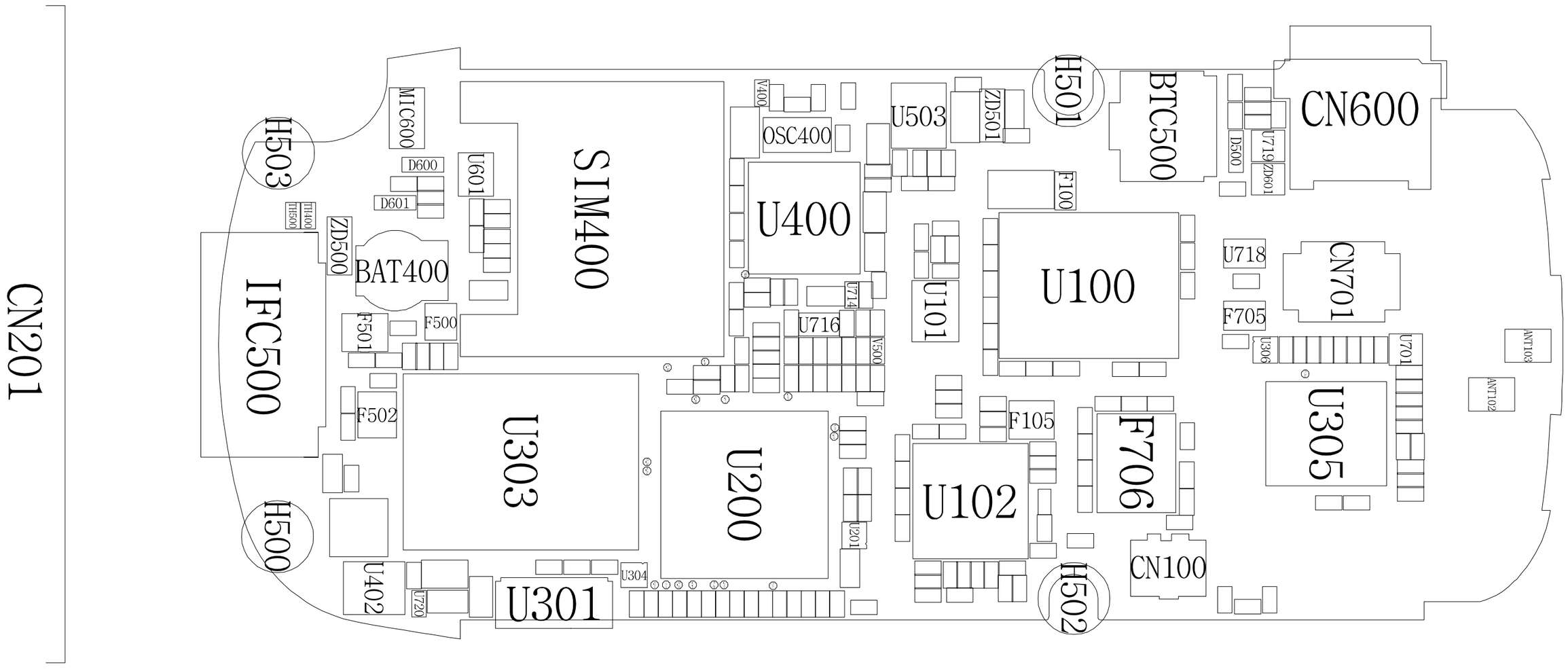
6-1. MAIN PCB Top Diagram



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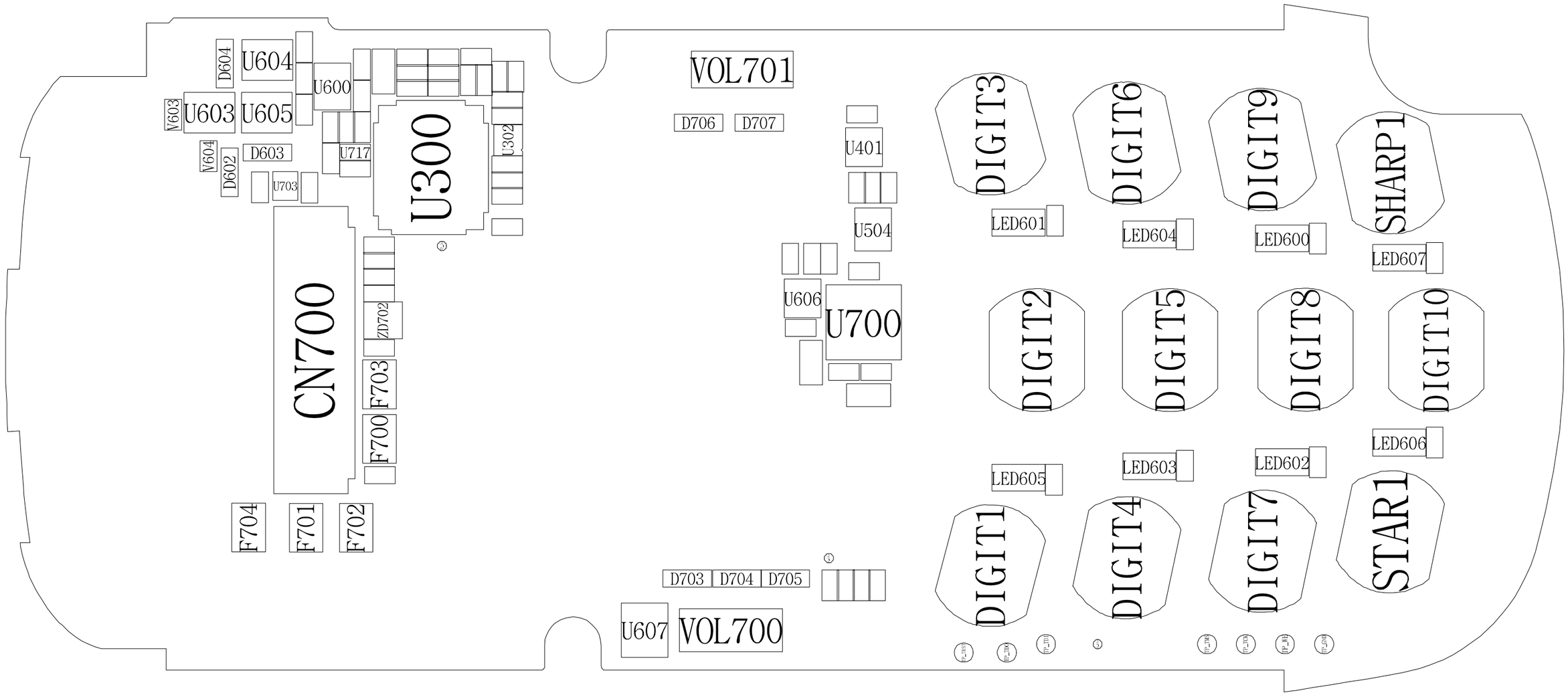
6-2. MAIN PCB Bottom Diagram



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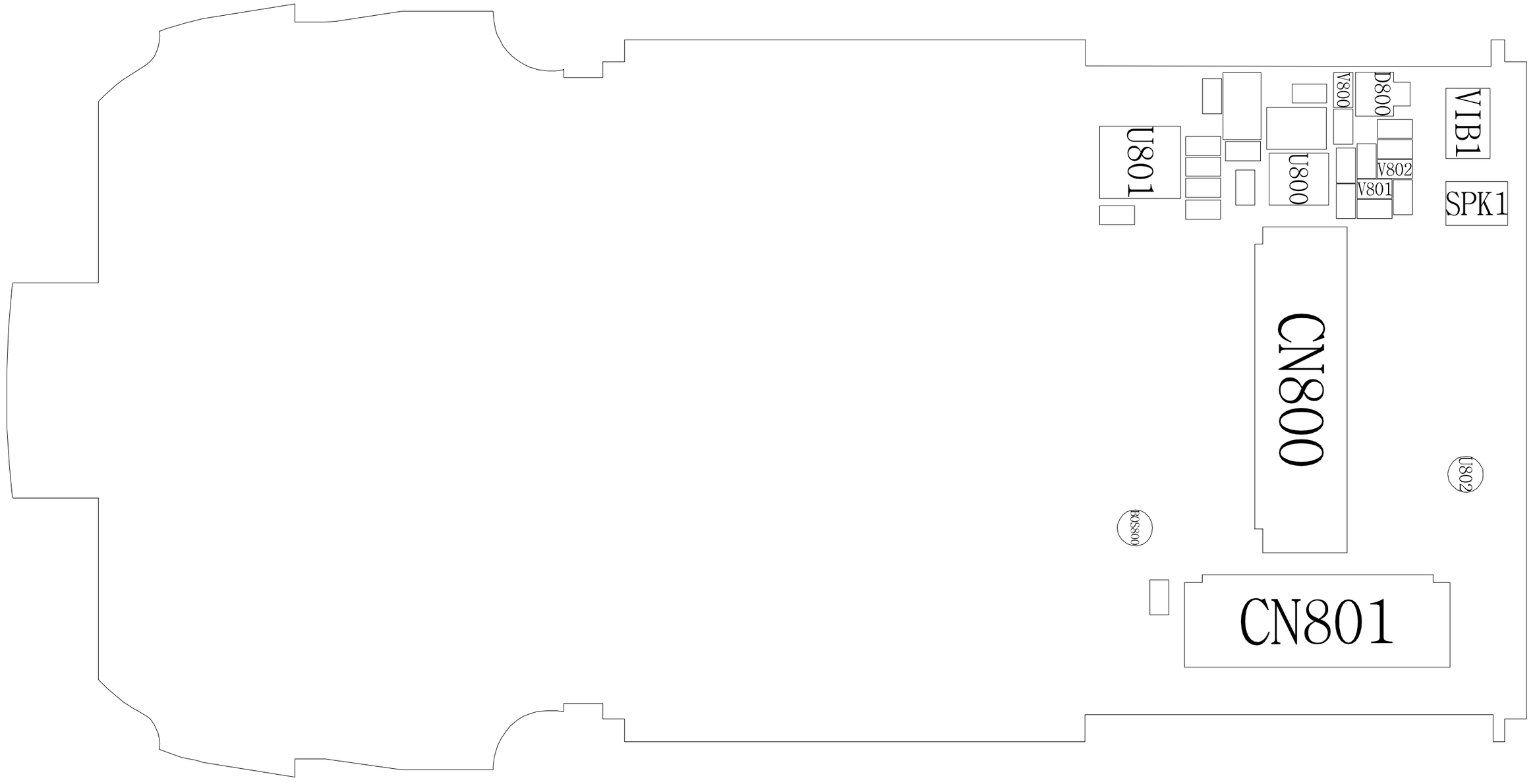
6-3. SUB PCB Top Diagram



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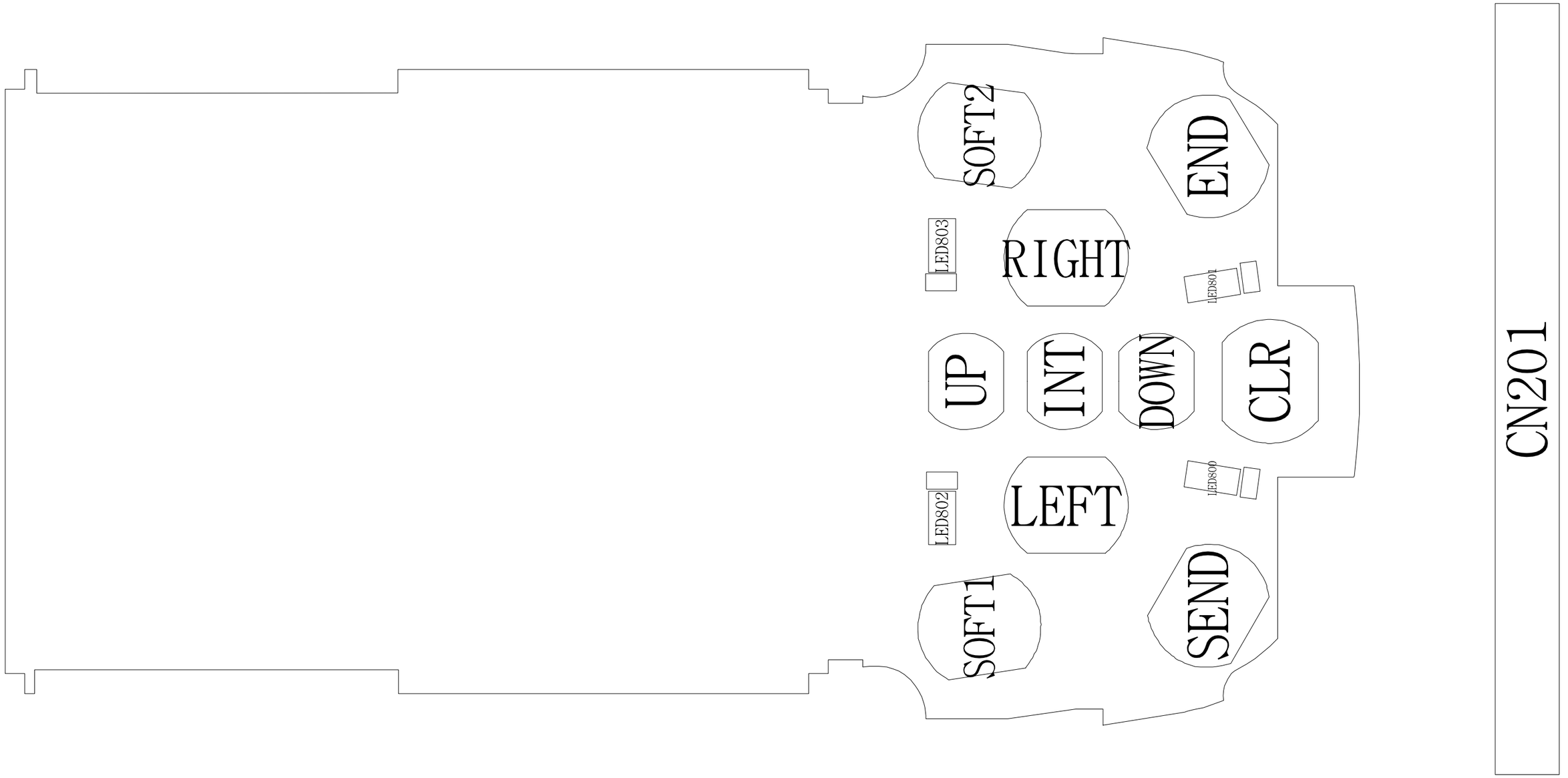
6-4. SUB PCB Bottom Diagram



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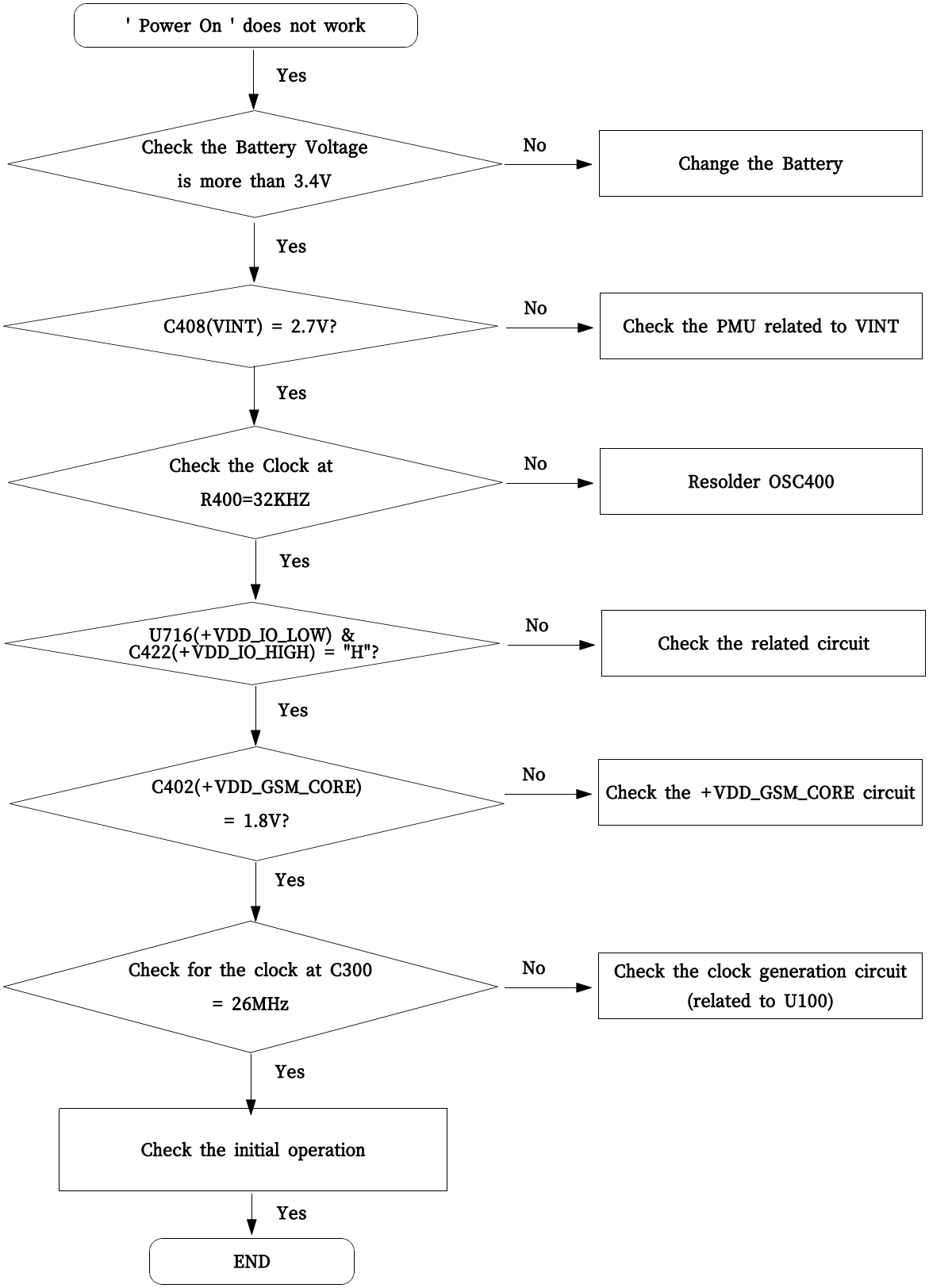
7. Flow Chart of Troubleshooting

7-1. Power On



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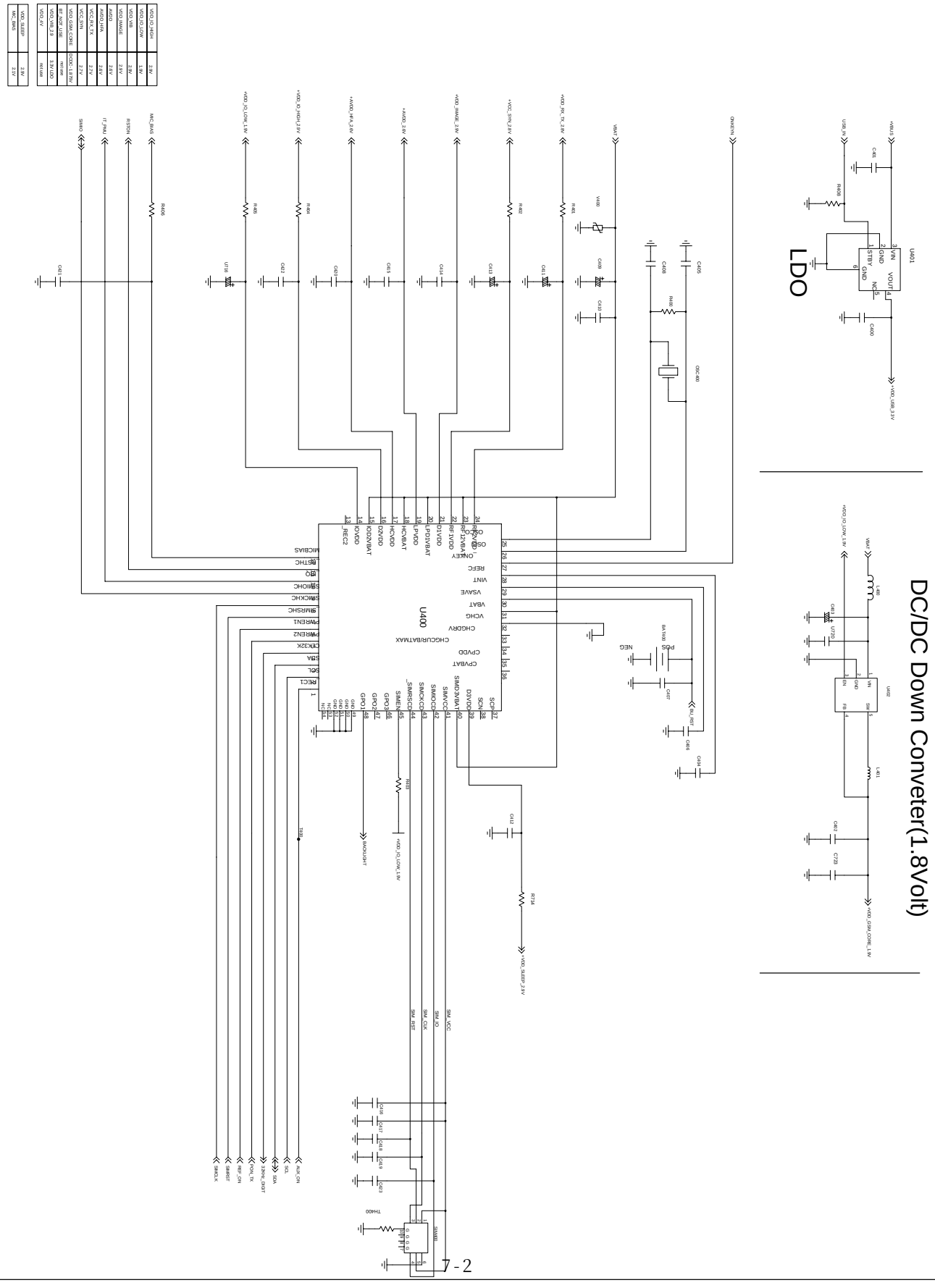

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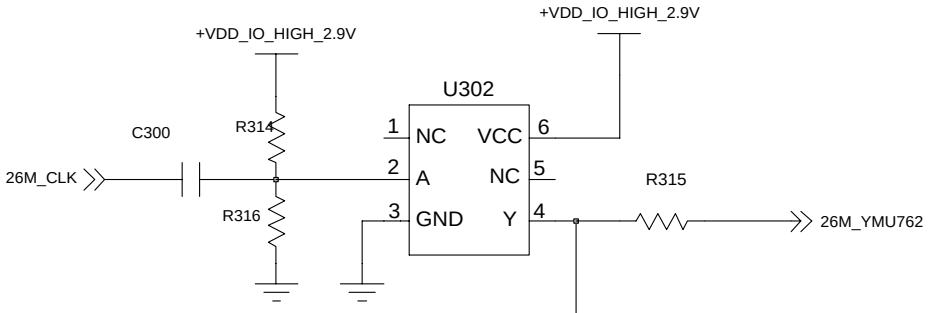

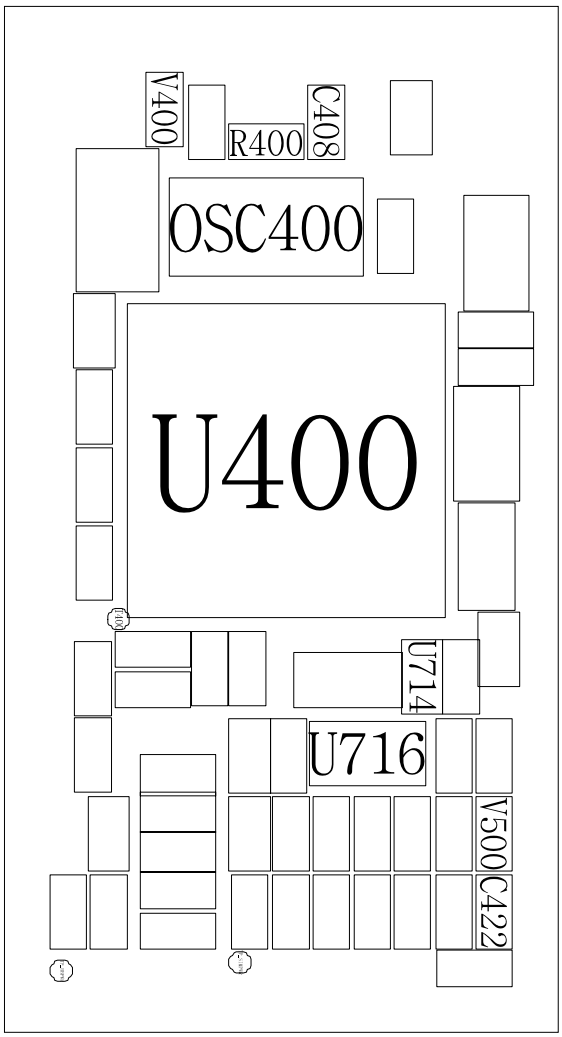

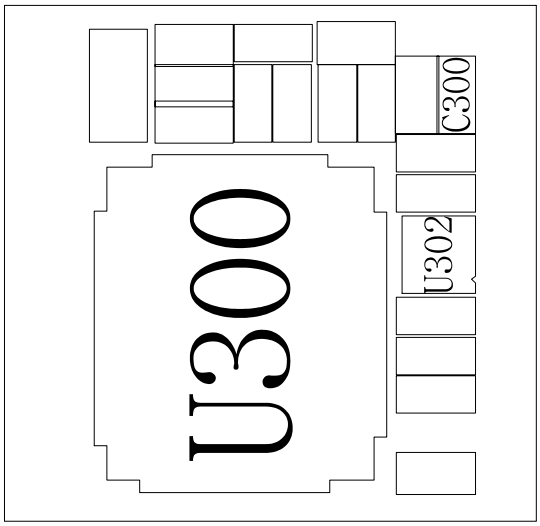

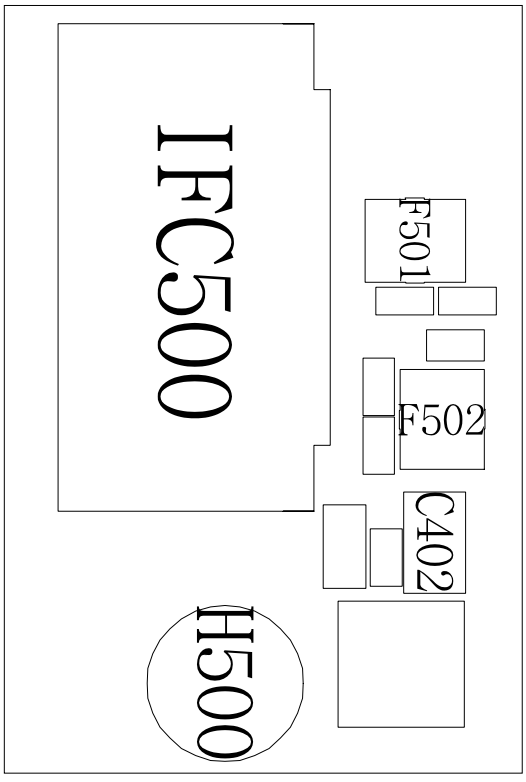

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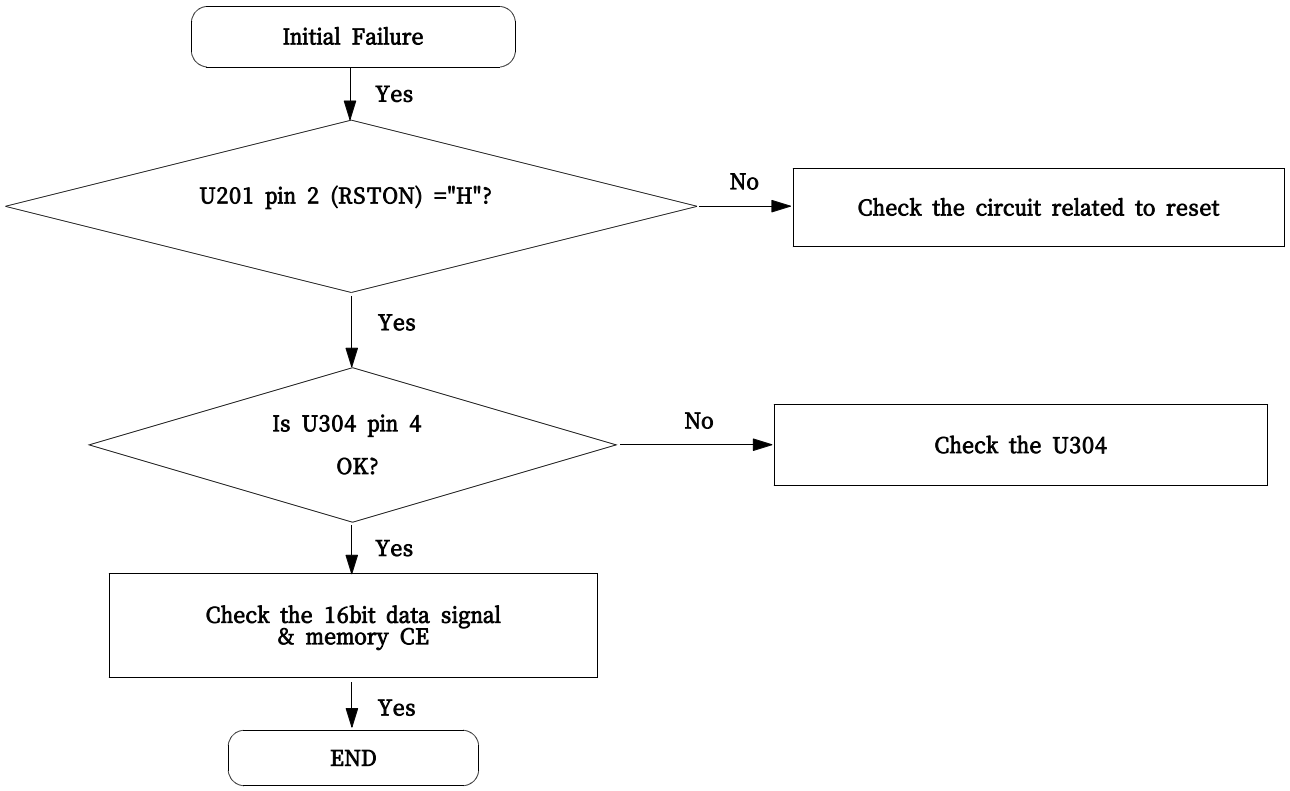
7-2. Initial



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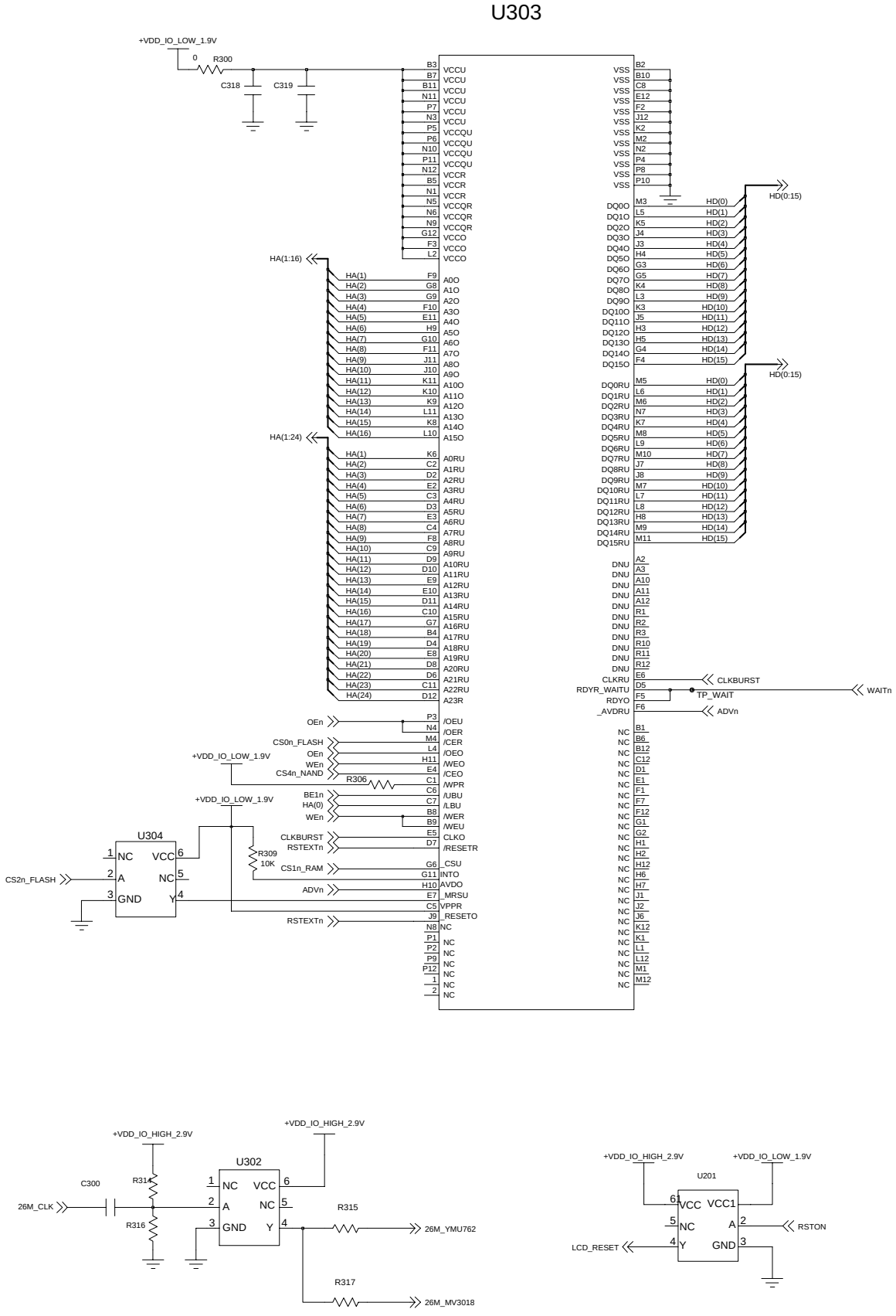

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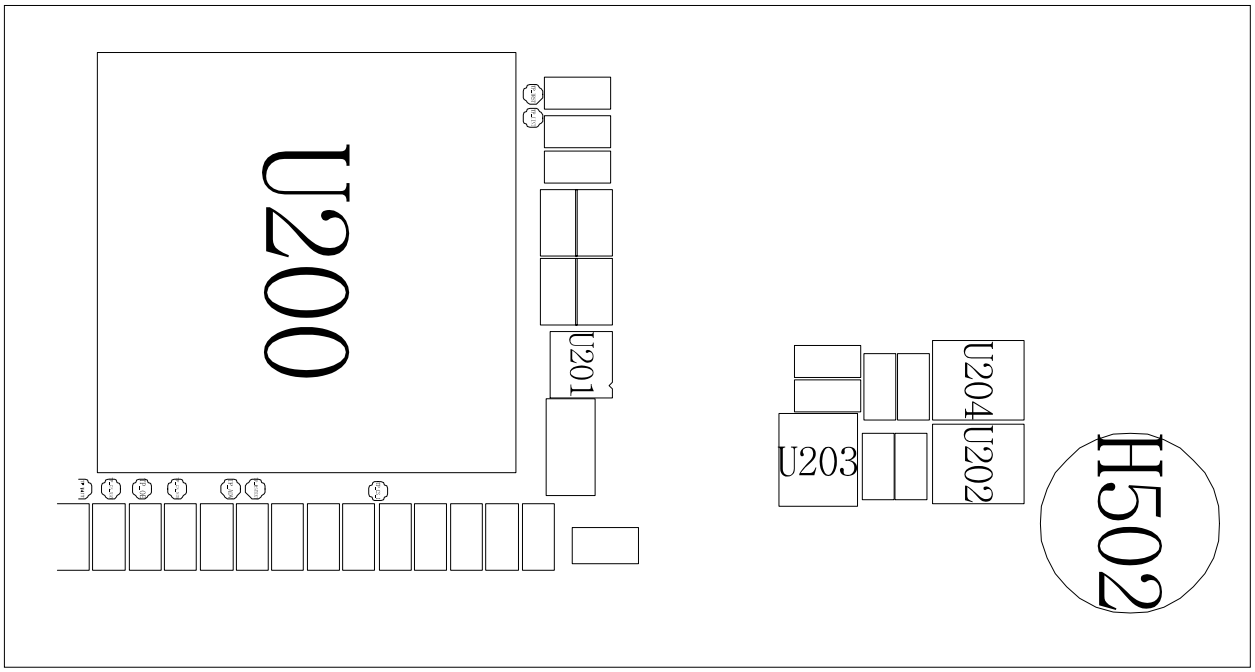

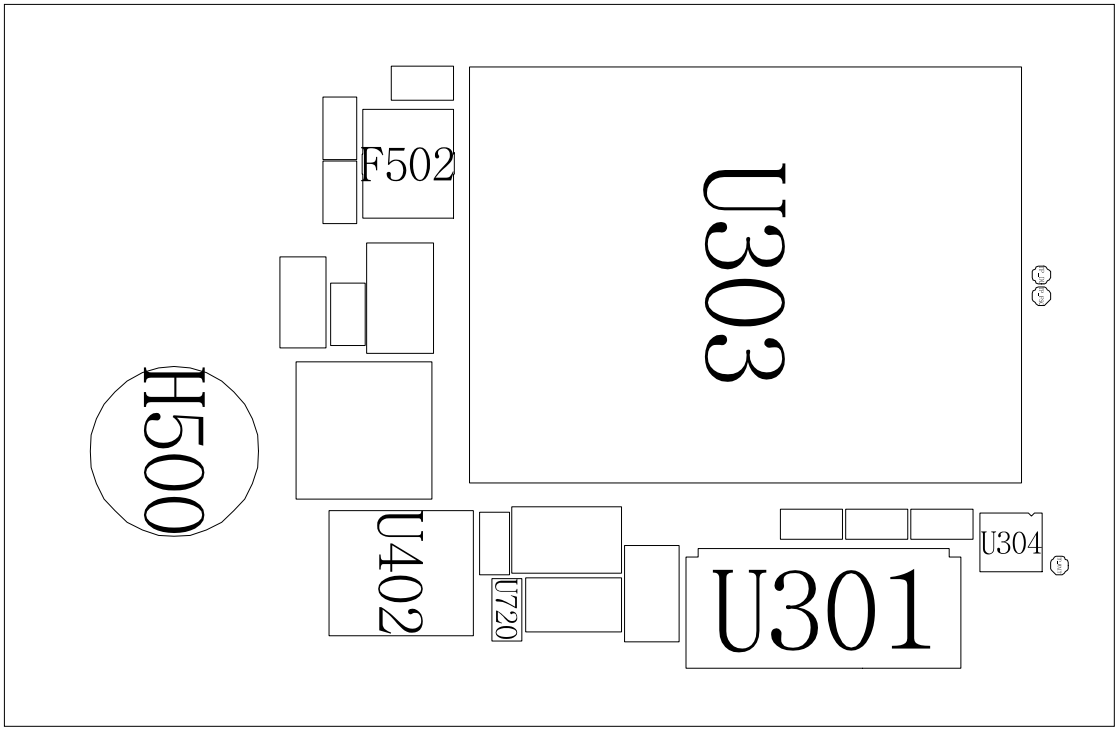

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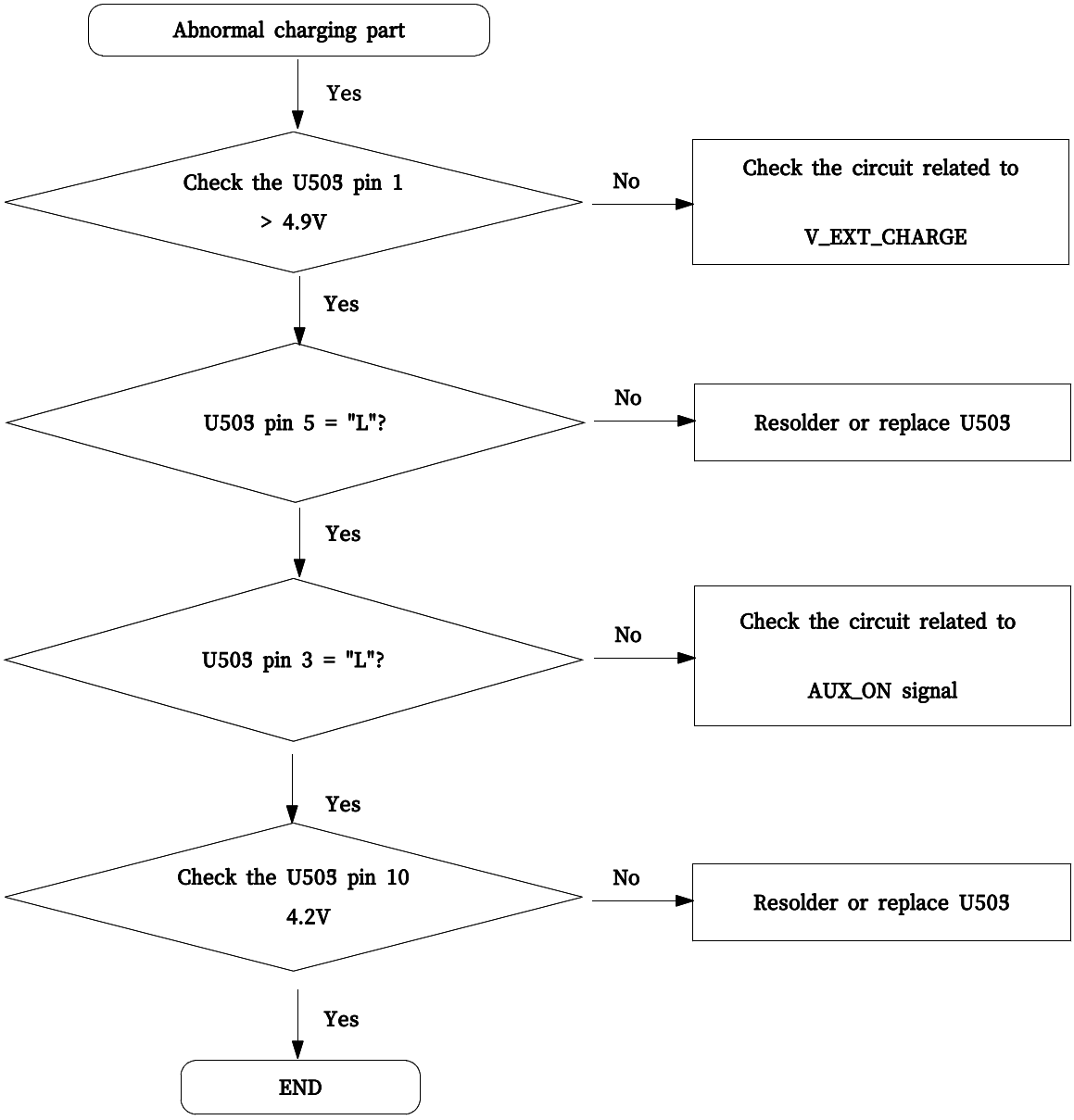
7-3. Charging Part



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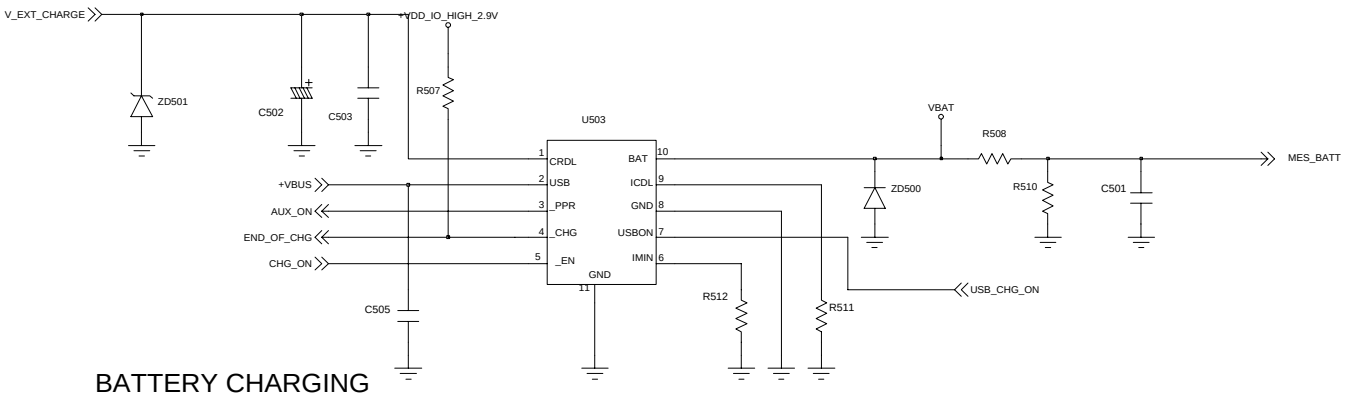
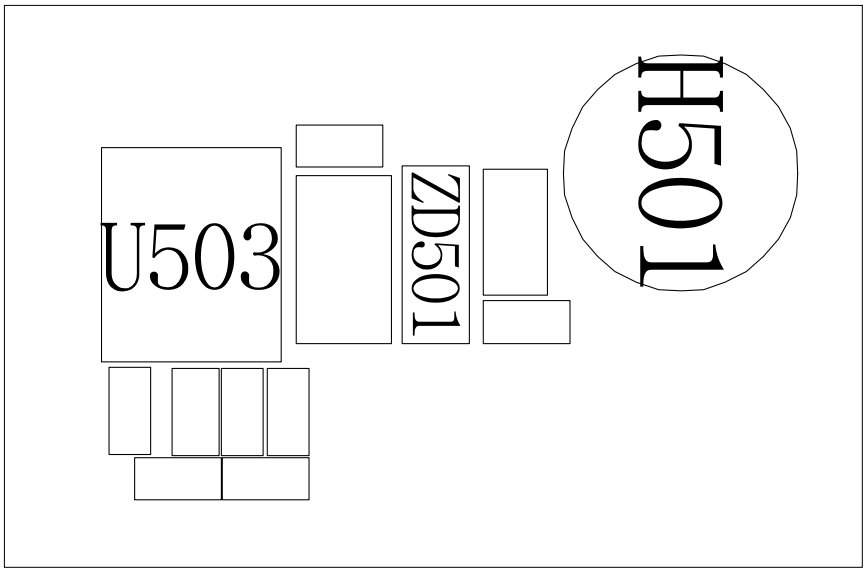


BATTERY CHARGING



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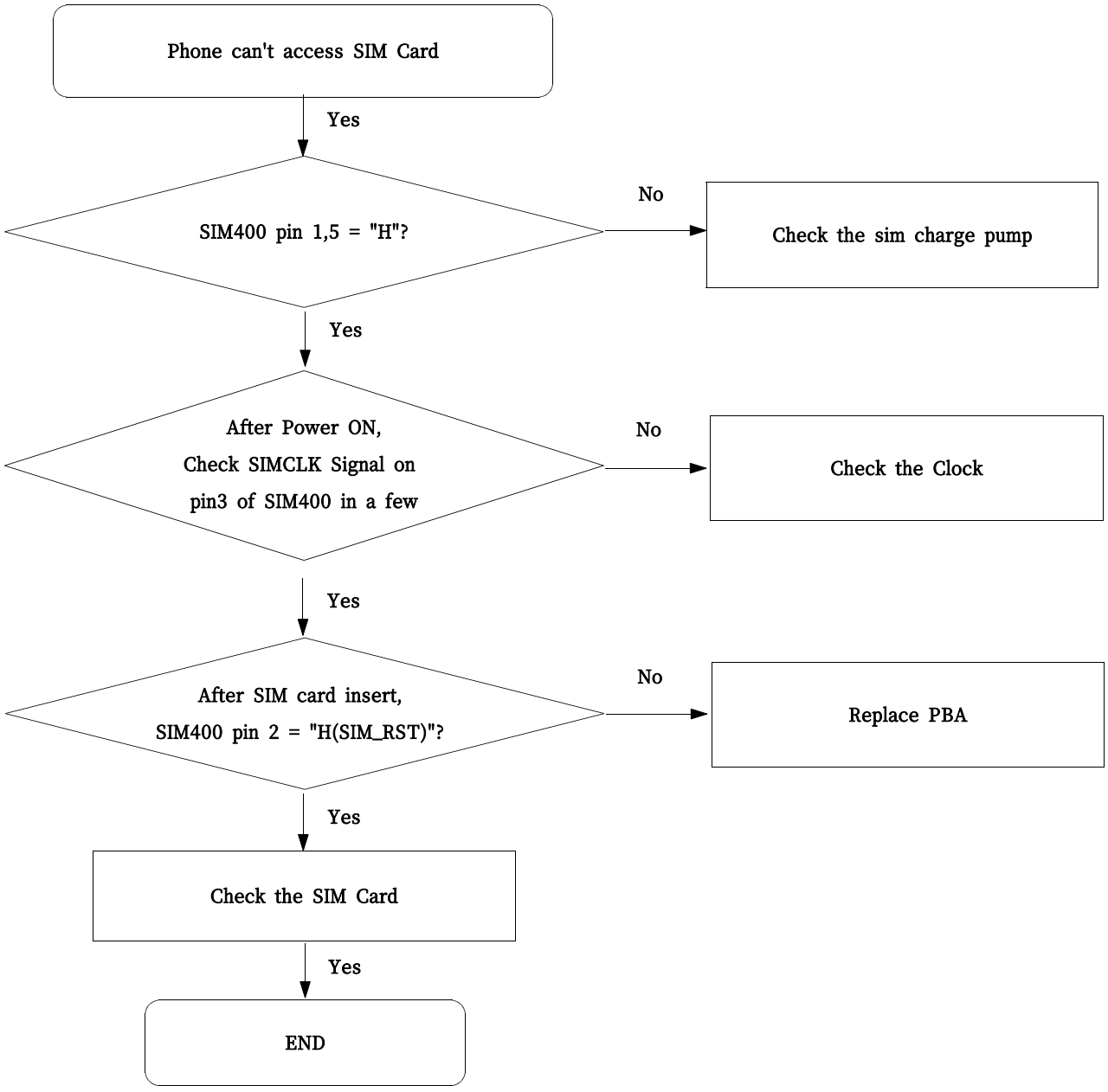
7-4. Sim Part



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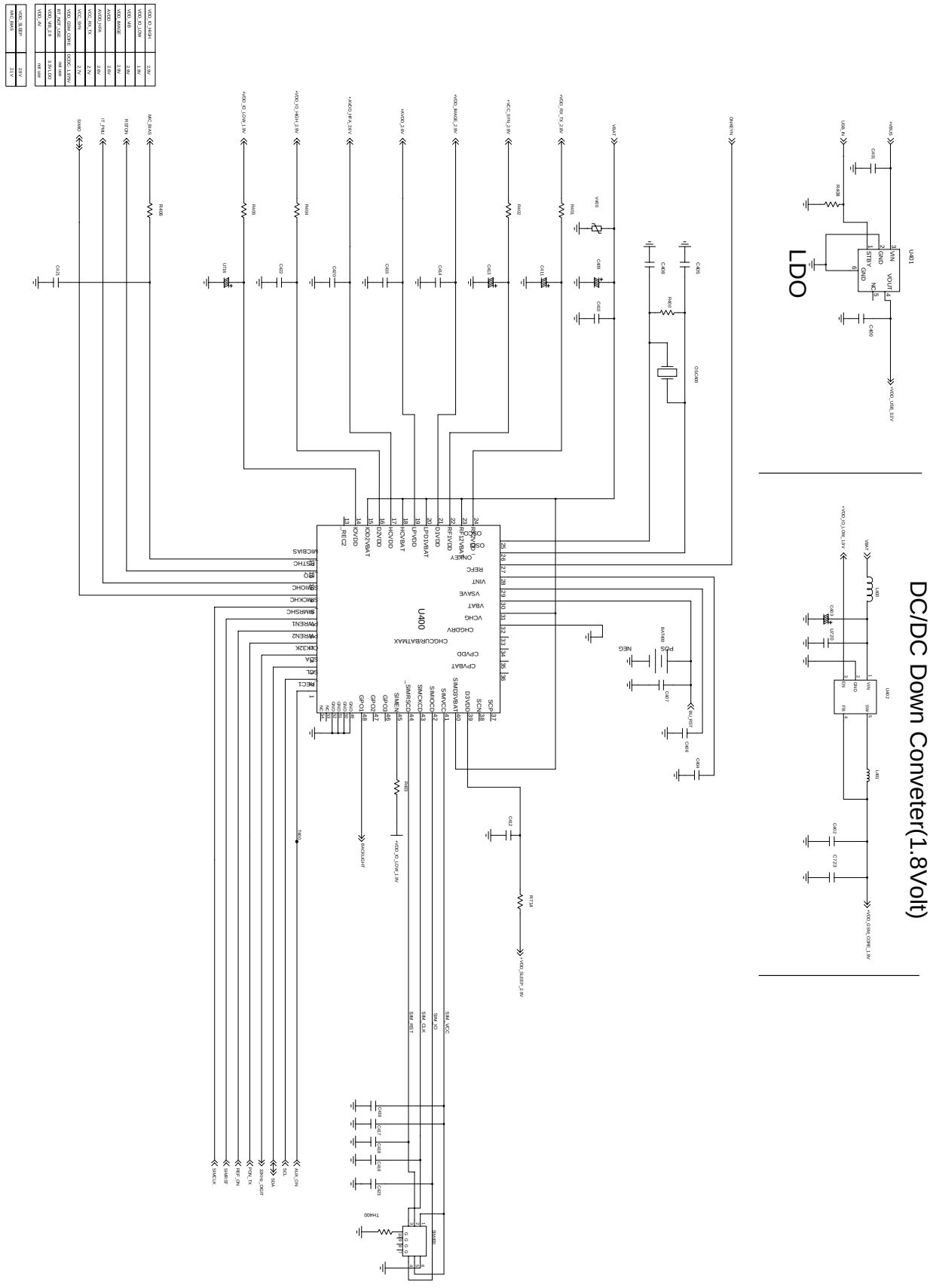

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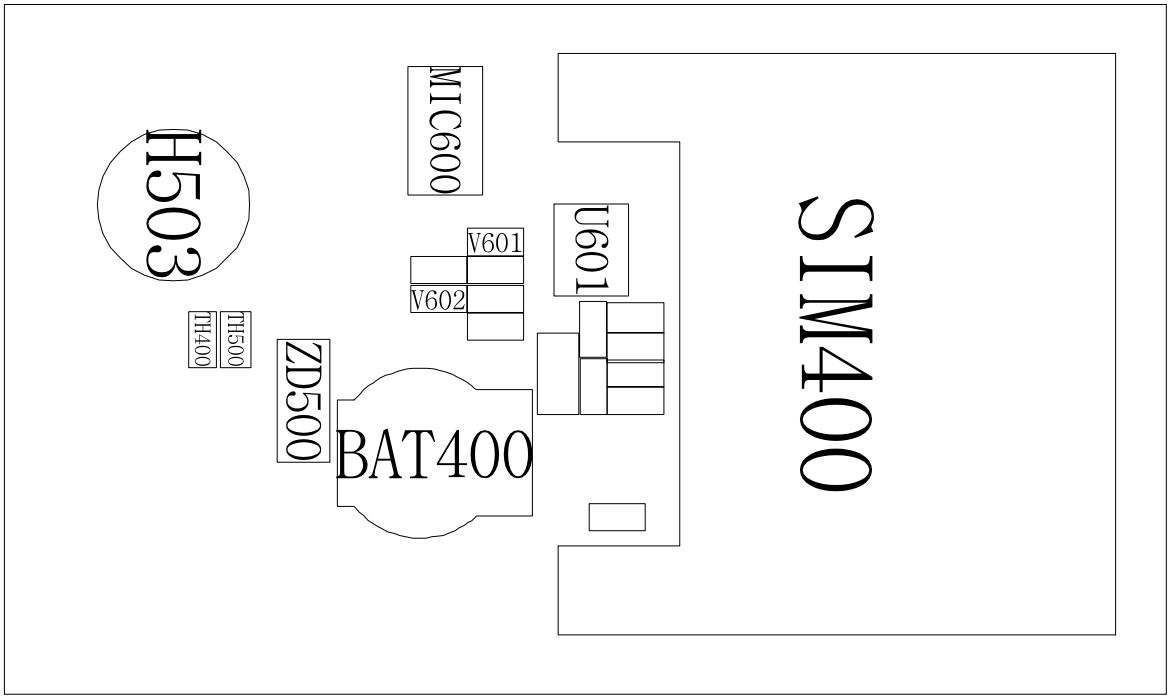

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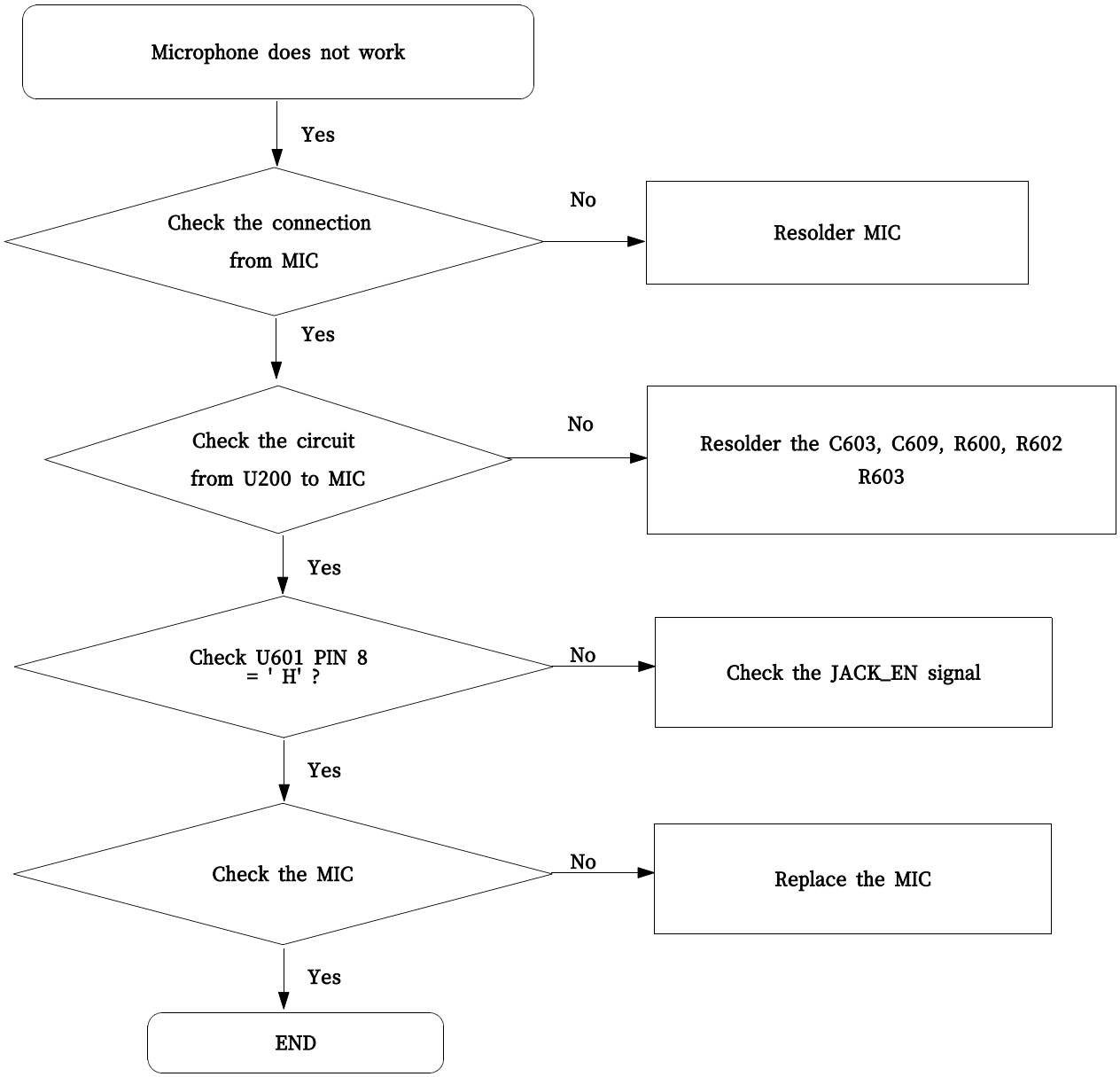
7-5. Microphone Part



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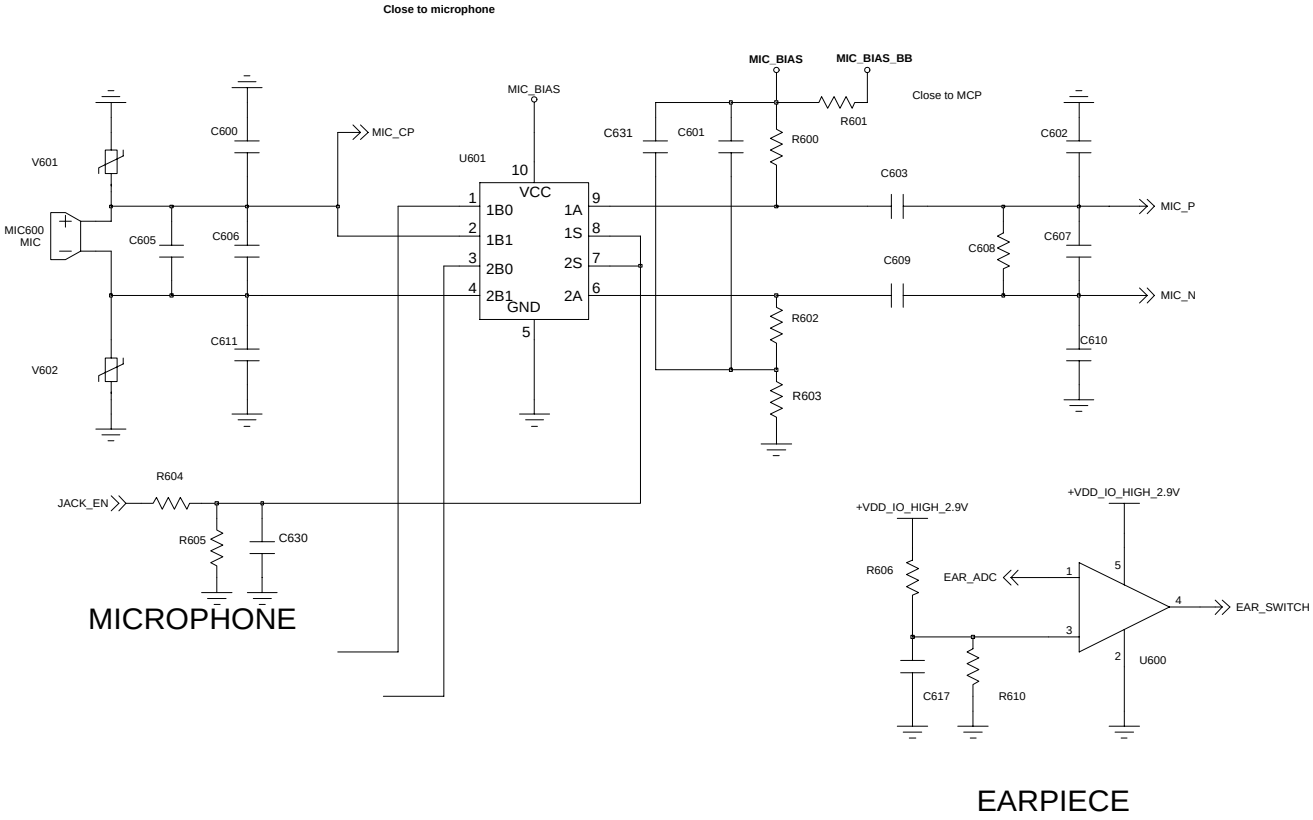

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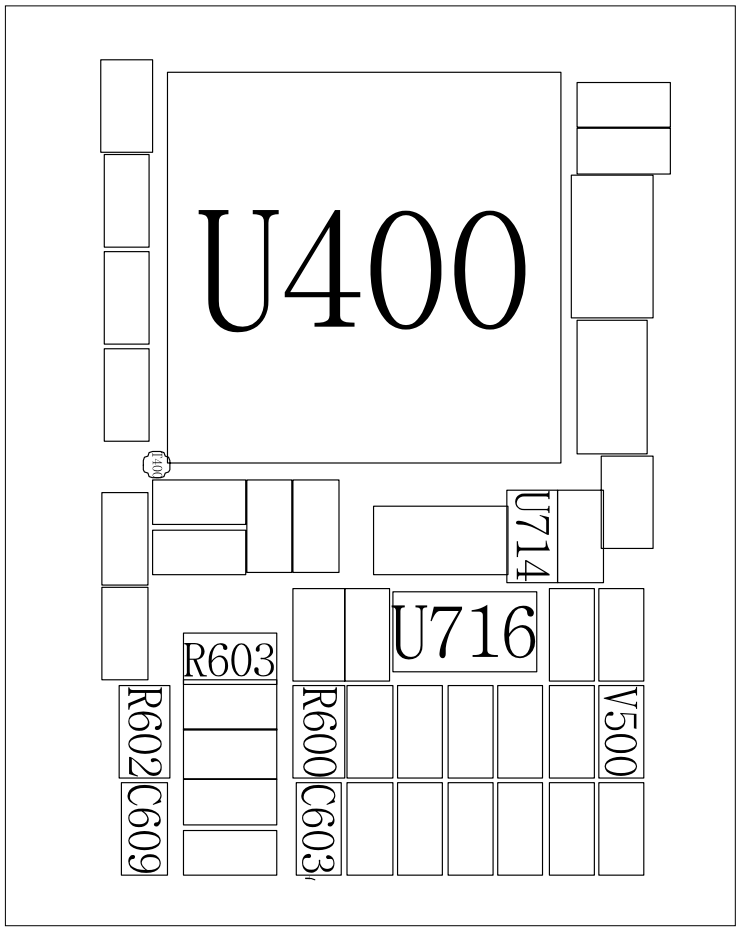

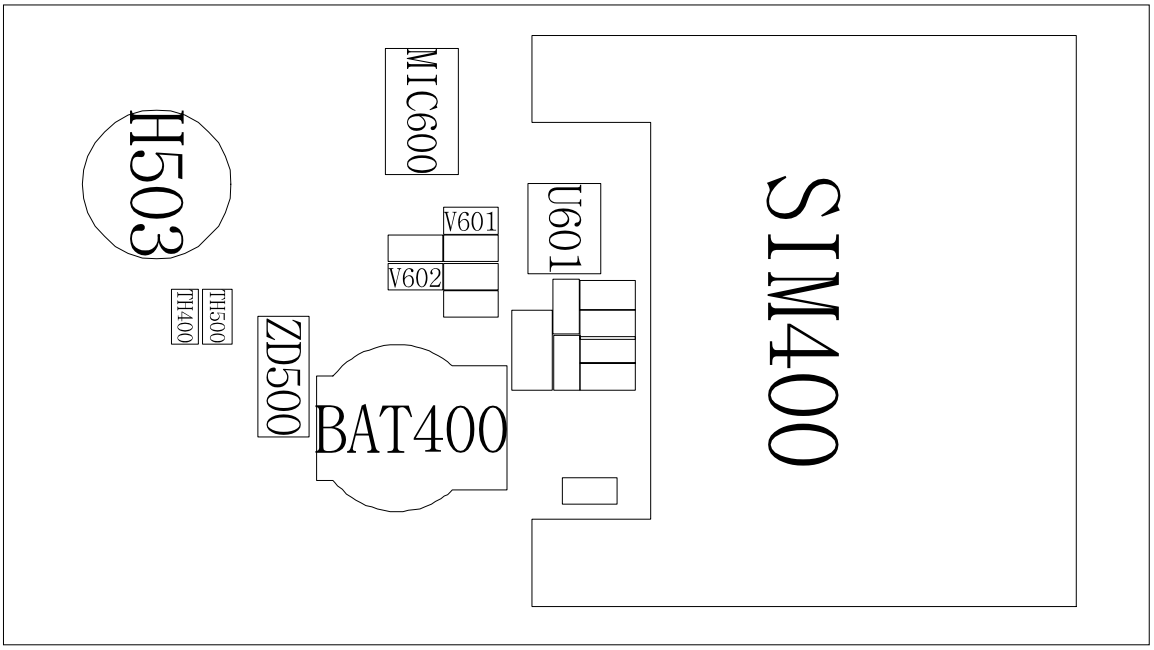

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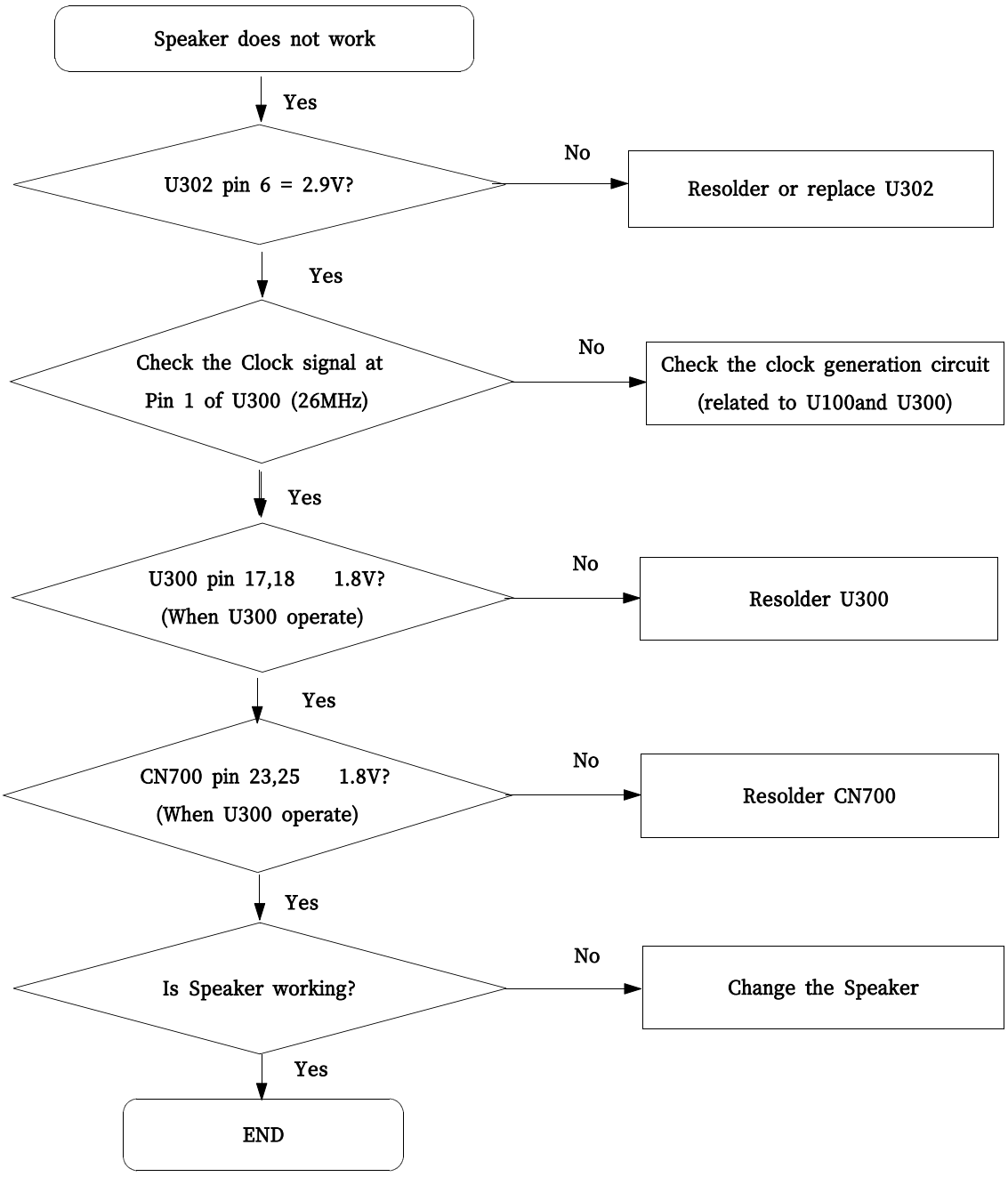
7-6. Speaker Part(Melody)



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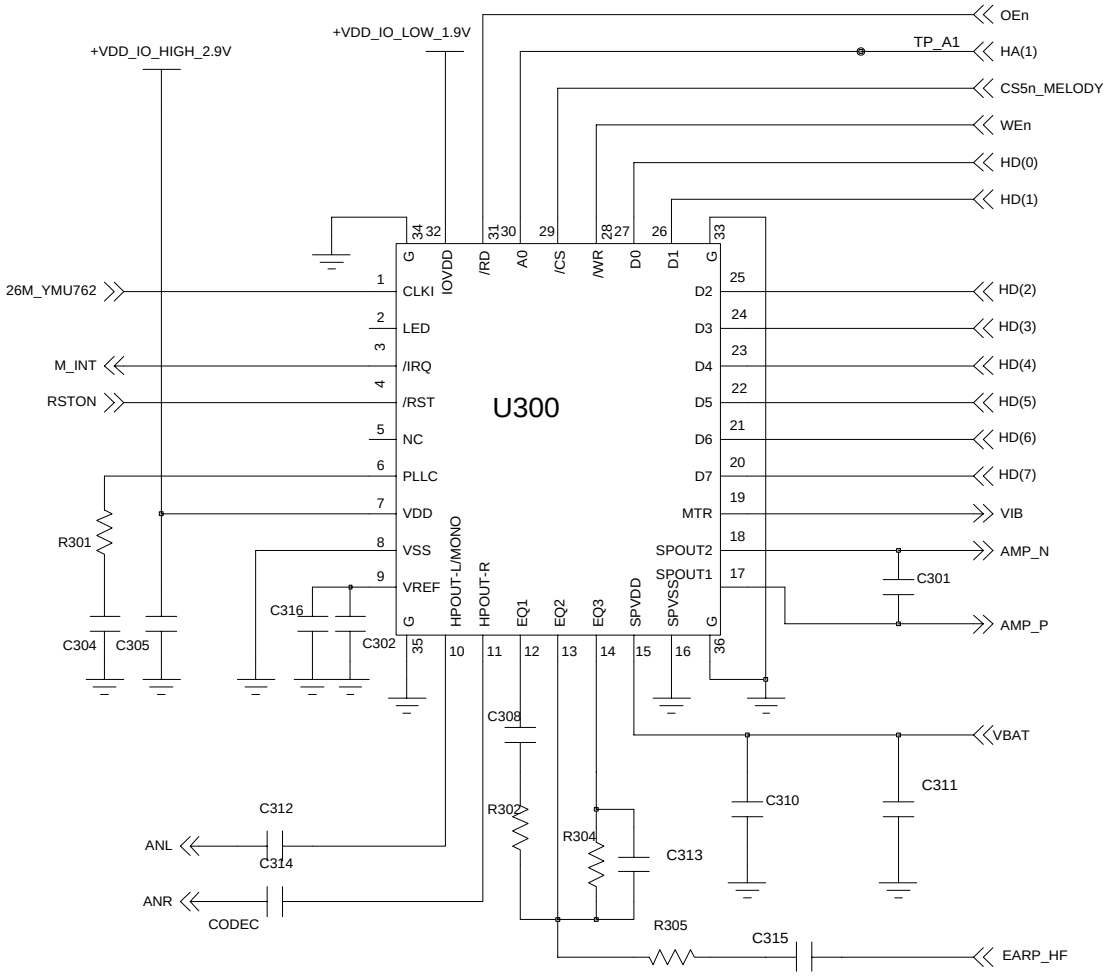
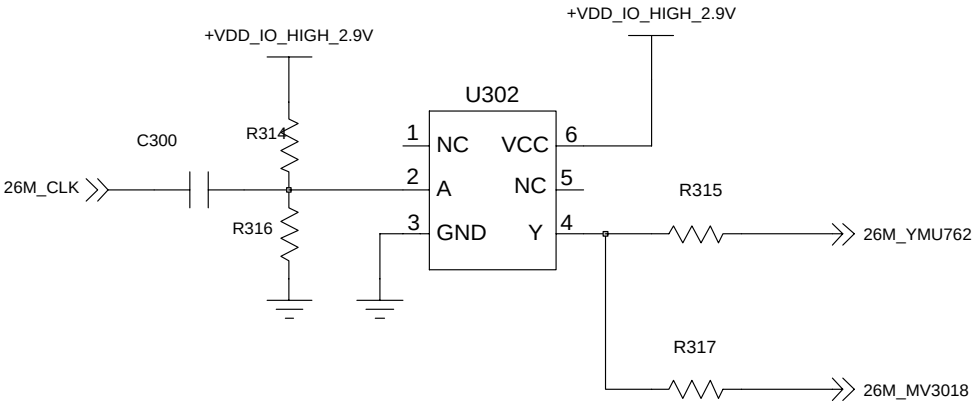


MELODY IC



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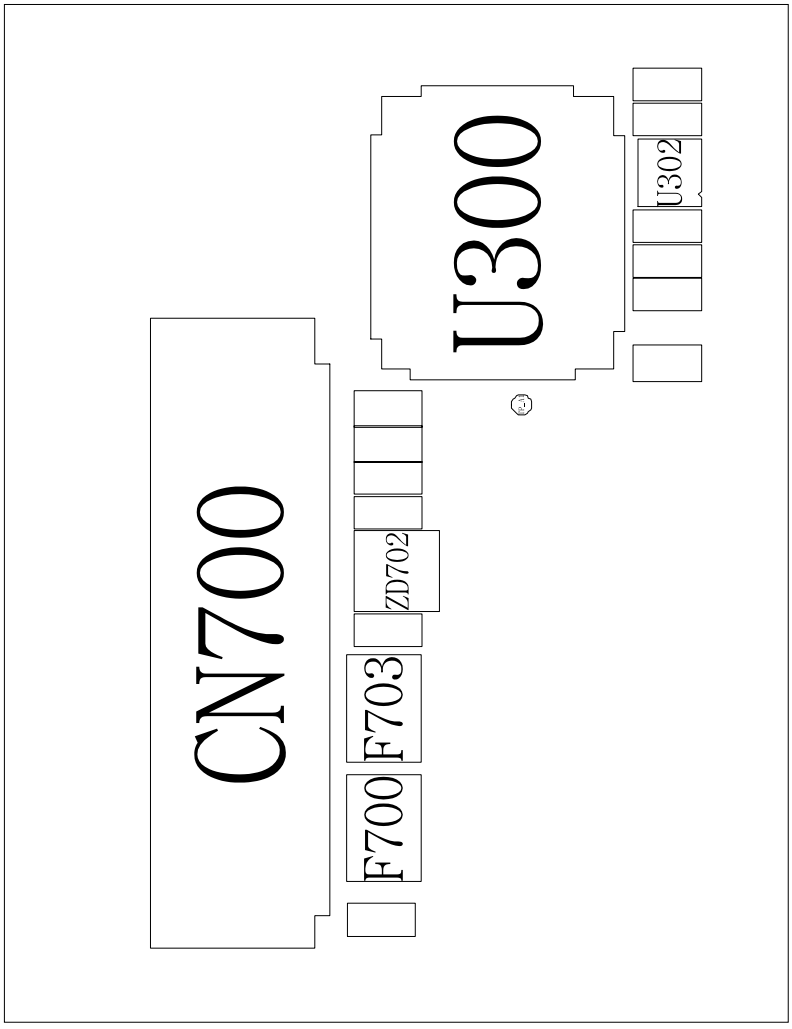

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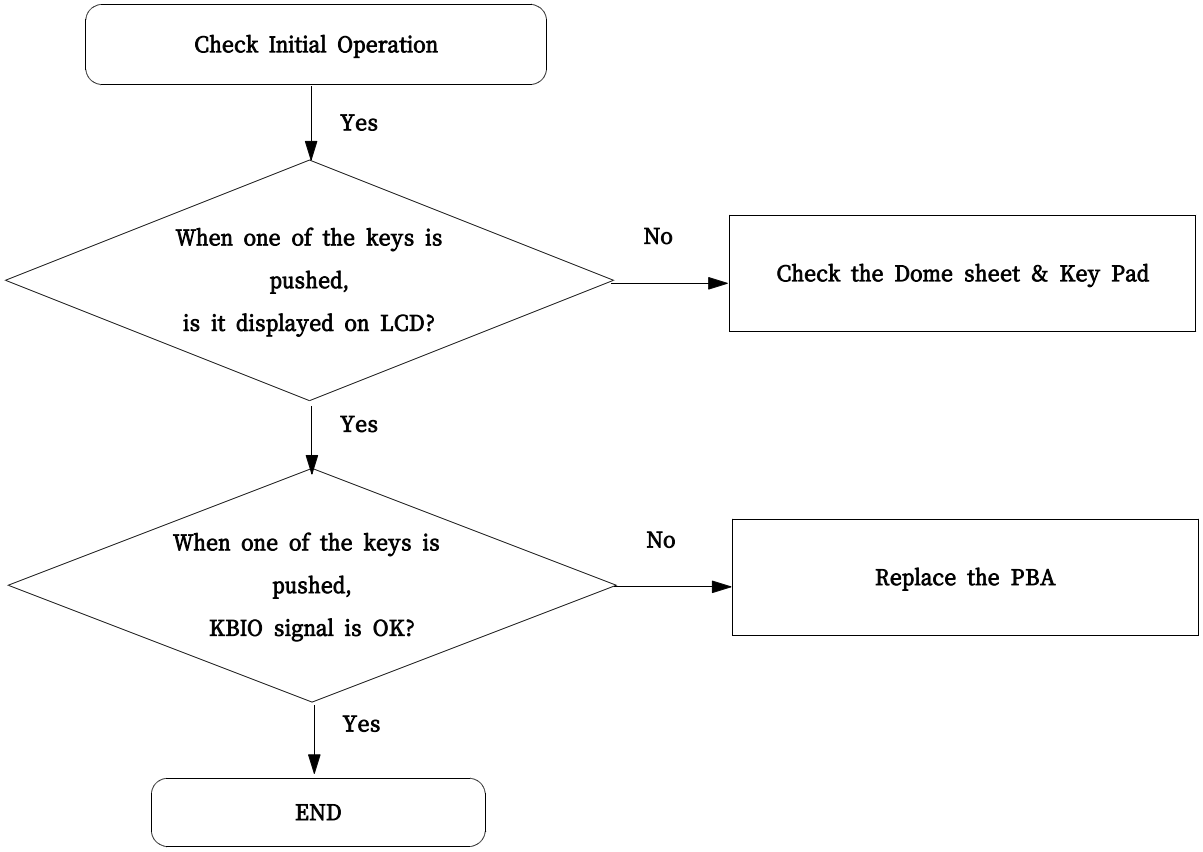
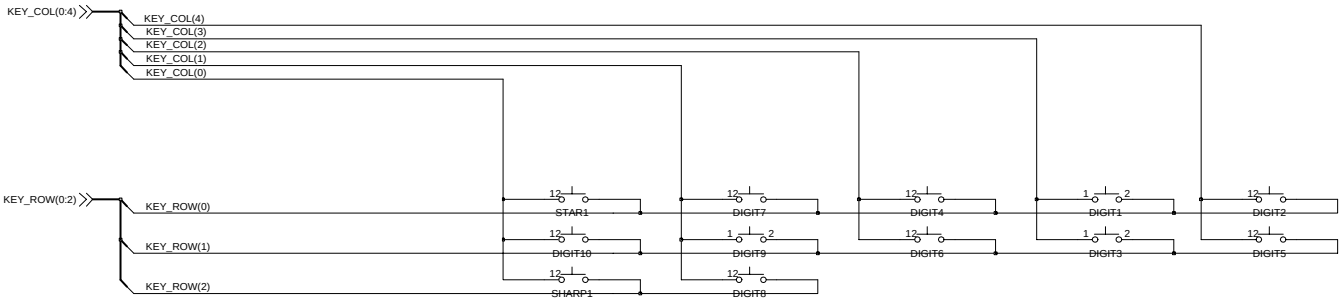
7-7. Key Data Input





KEY_MAP

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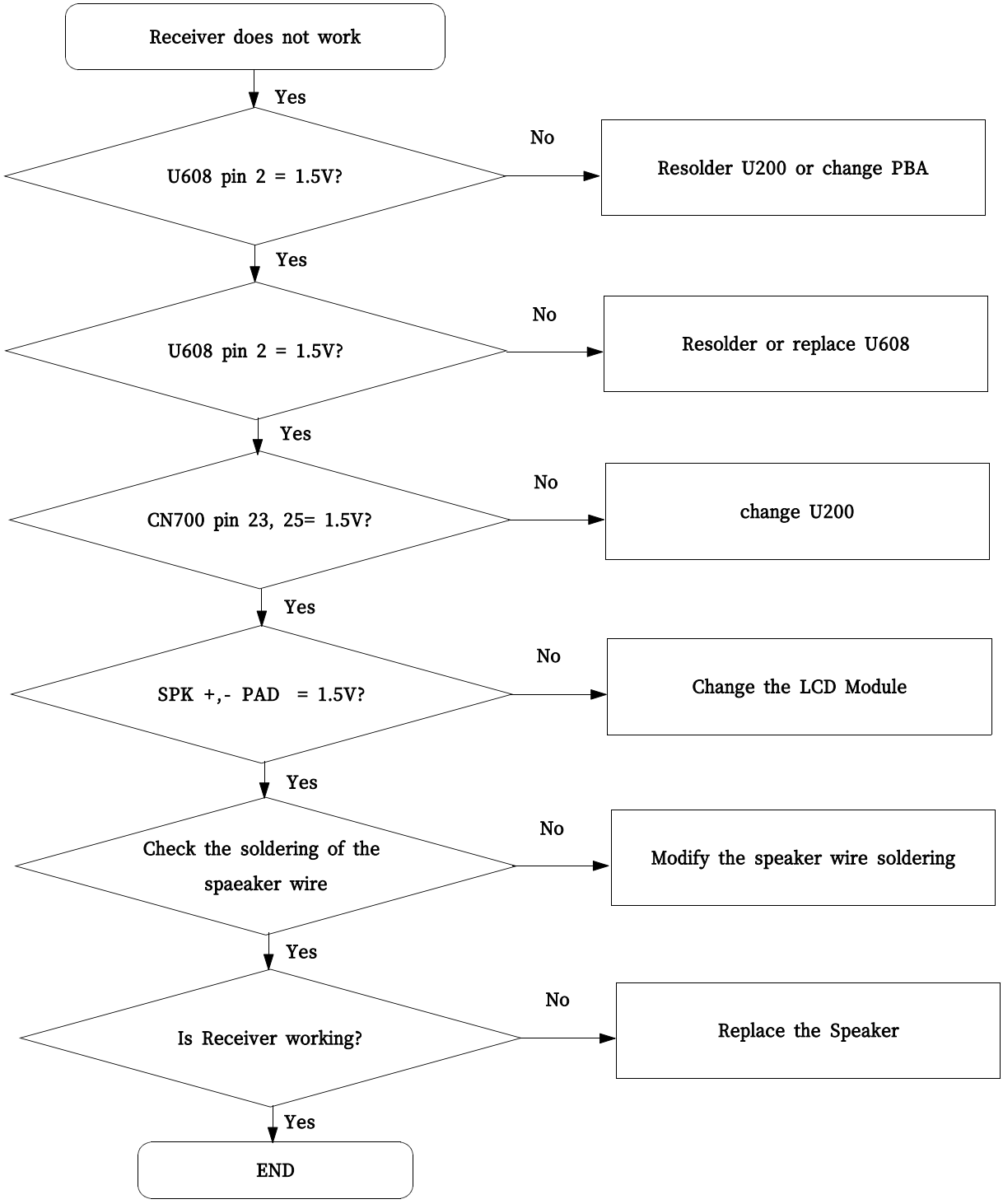
7-8. Receiver Part



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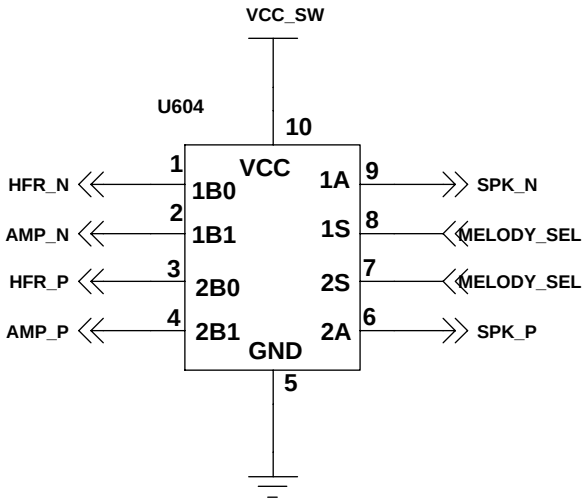

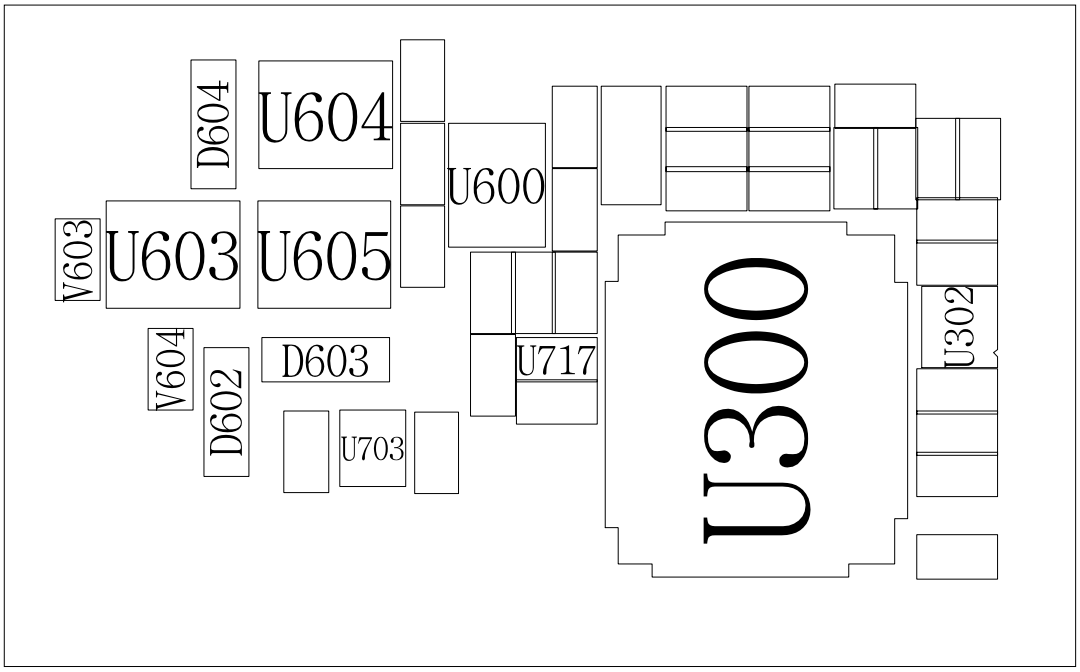

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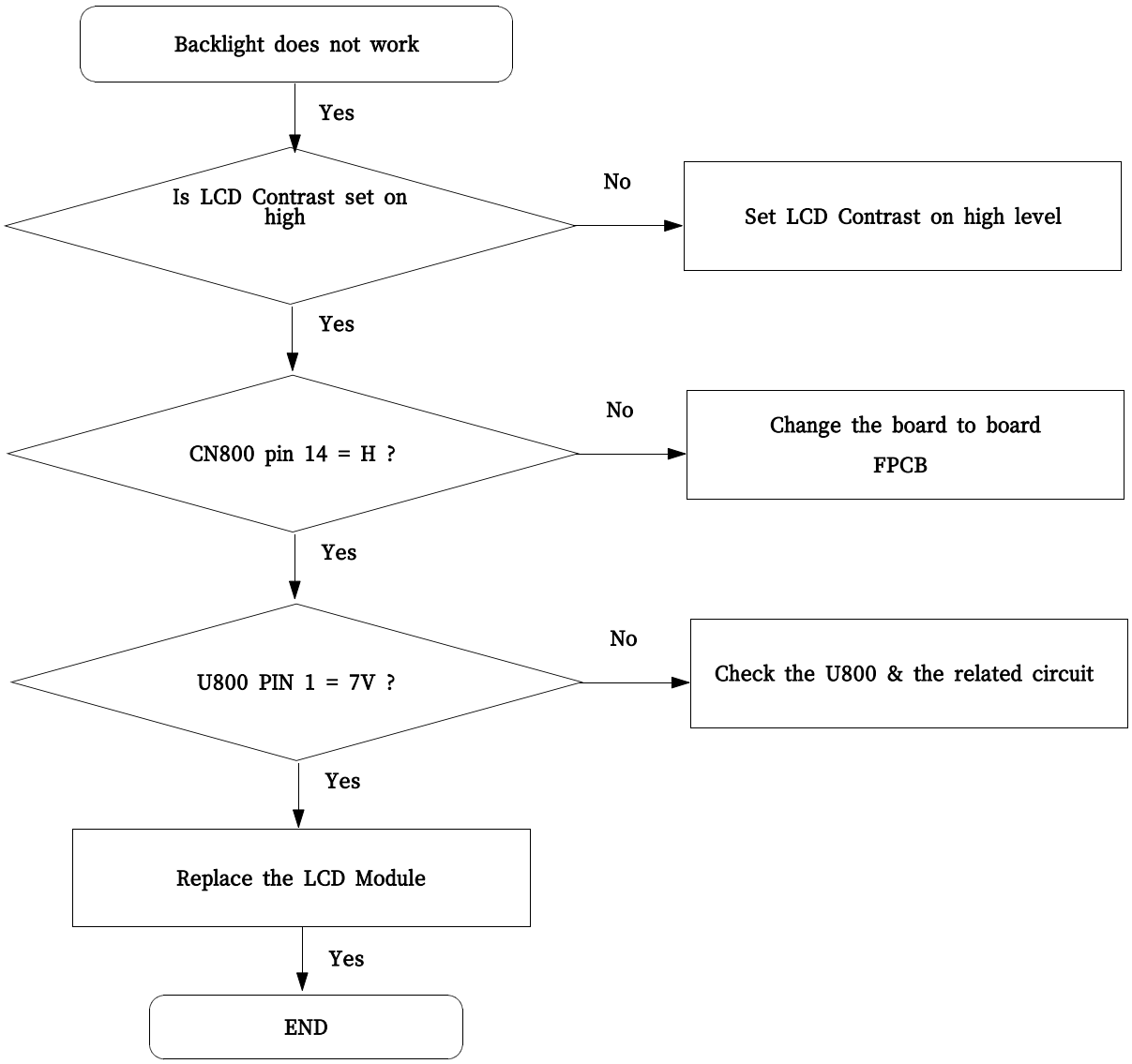
7-9. Back Light (for Color Main LCD)



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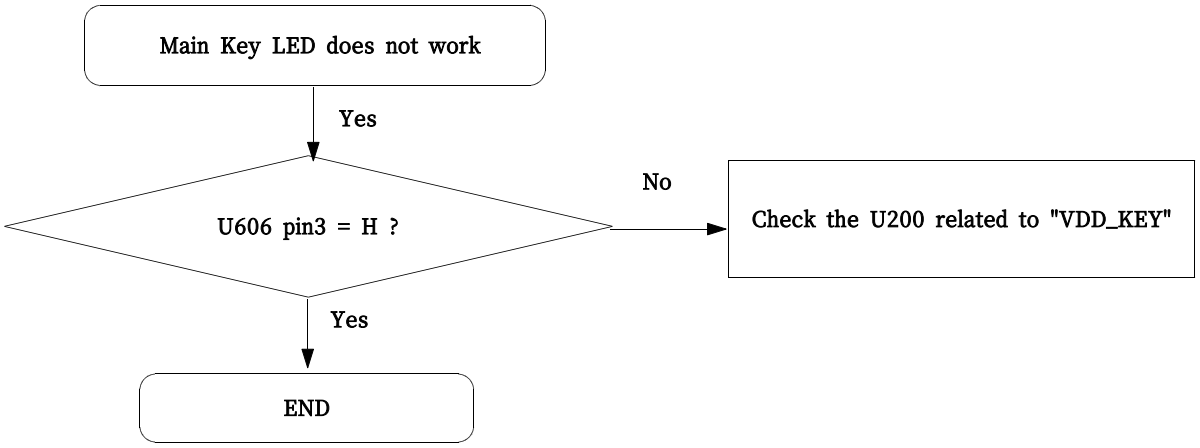
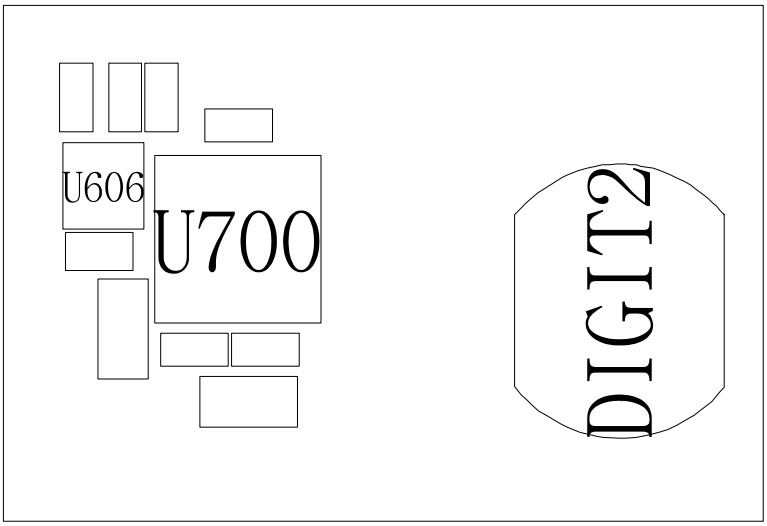
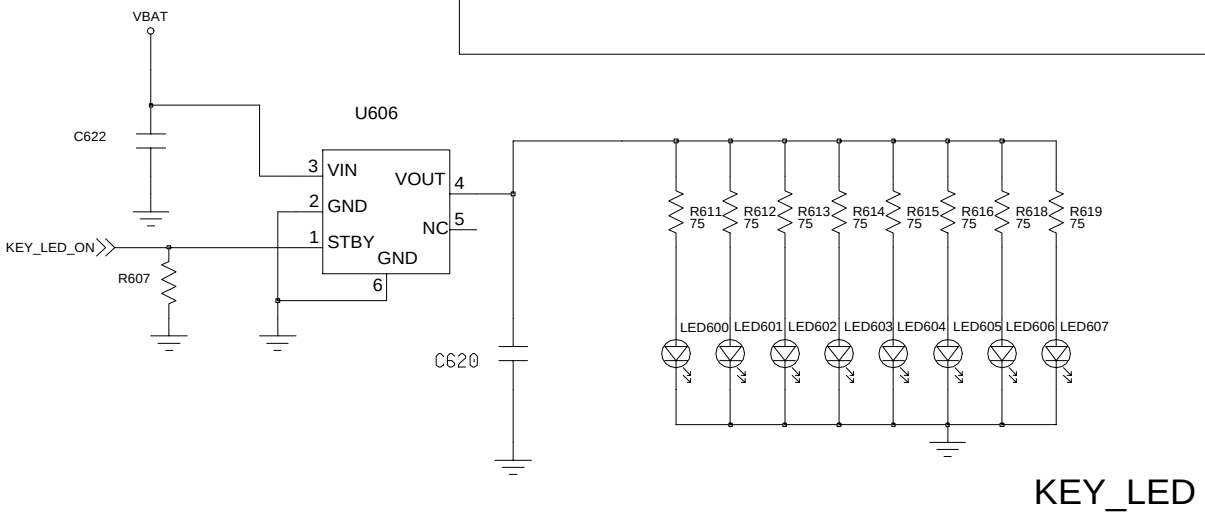
7-10. Key Back Light







KEY_LED

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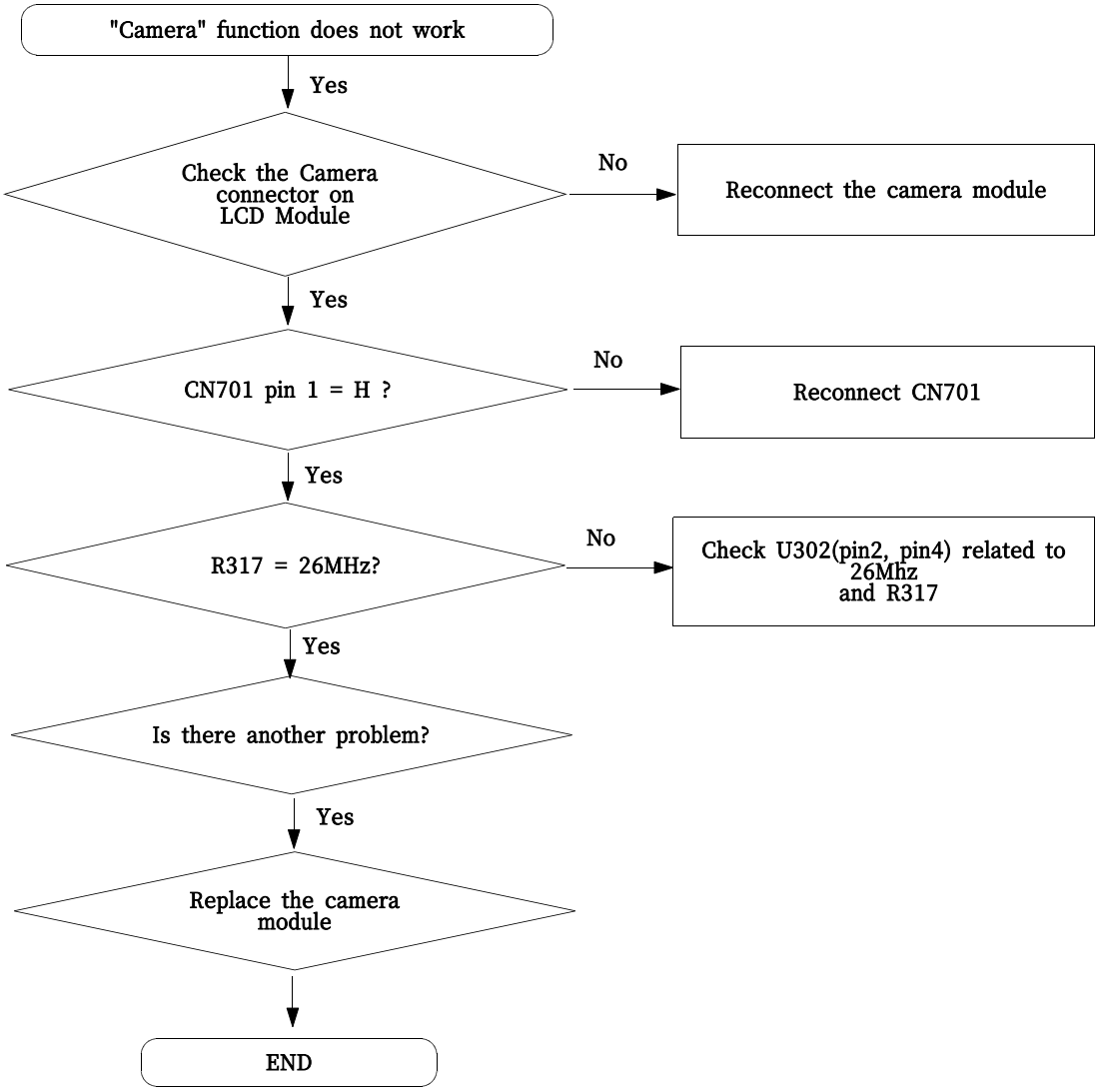
7-11. Camera part



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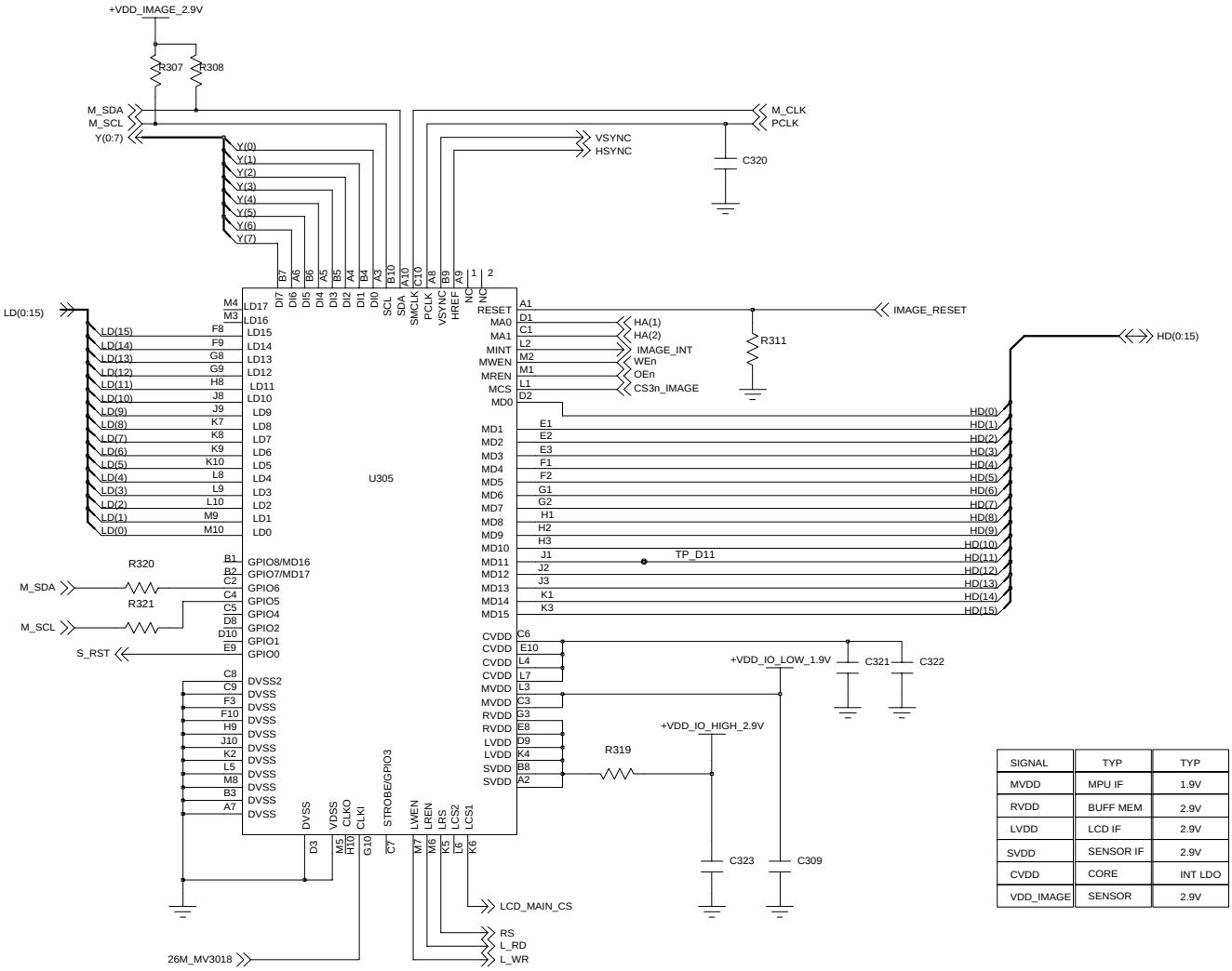
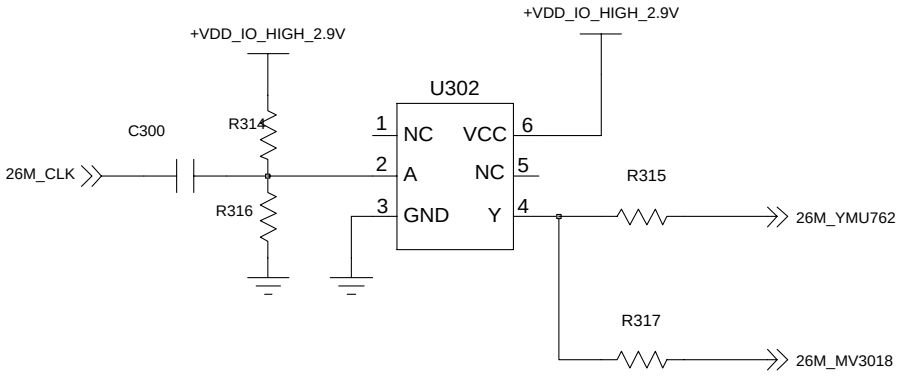


SIGNAL	TYP	TYP
MVDD	MPU IF	1.9V
RVDD	BUFF MEM	2.9V
LVDD	LCD IF	2.9V
SVDD	SENSOR IF	2.9V
CVDD	CORE	INT LDO
VDD_IMAGE	SENSOR	2.9V

IMAGE_DSP



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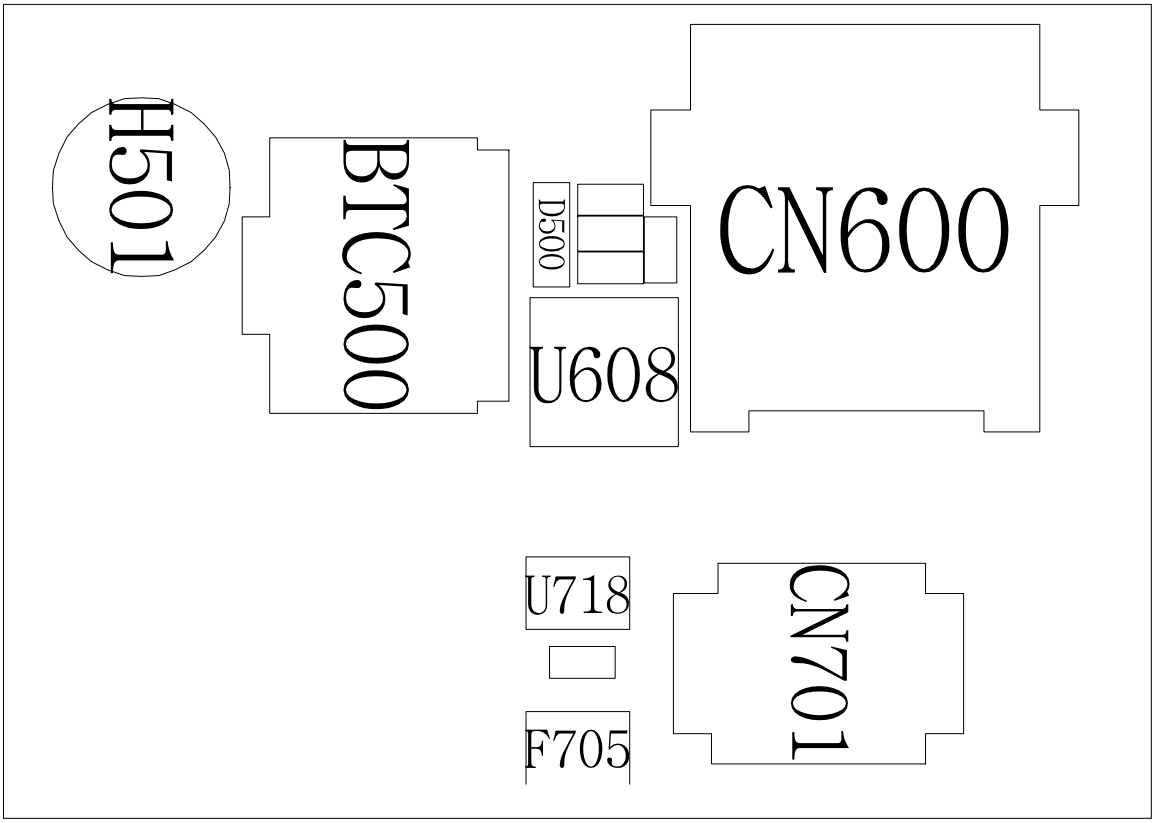

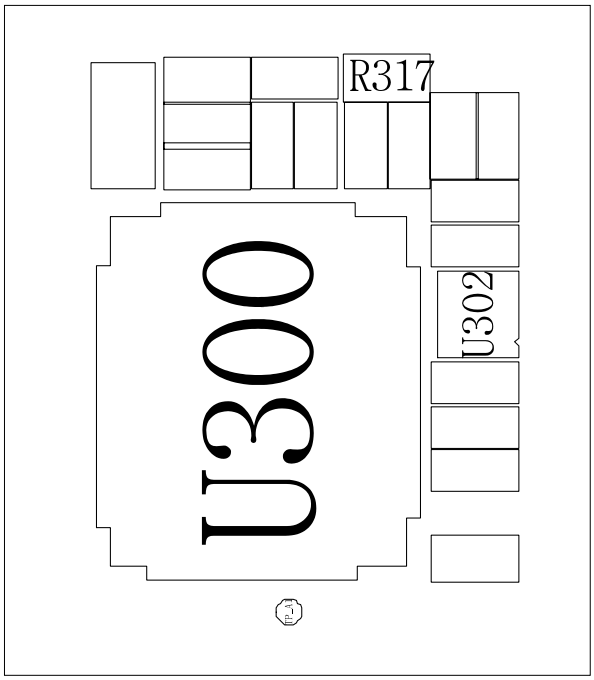

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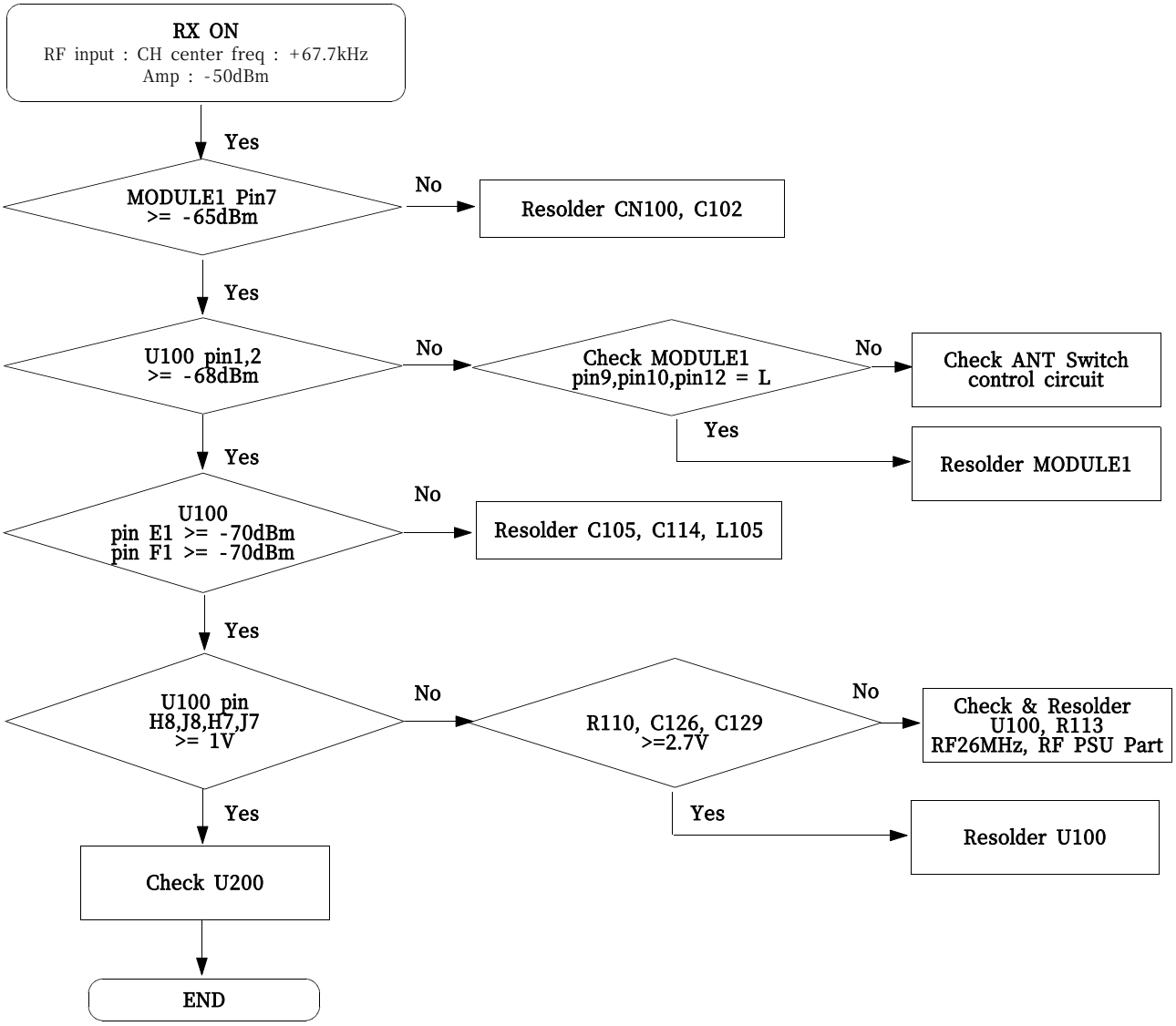
7-12. GSM Receiver



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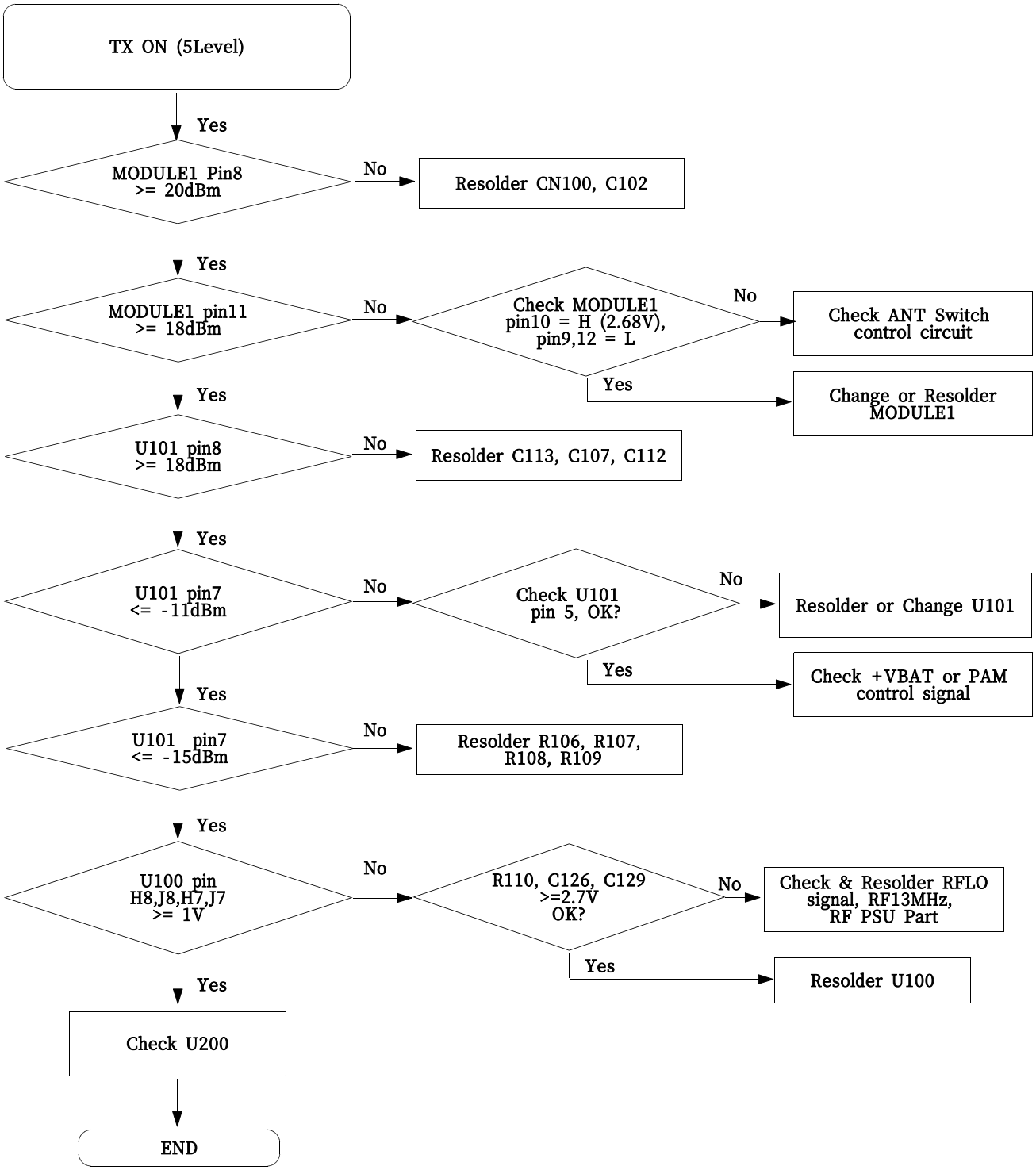
7-13. GSM Transmitter



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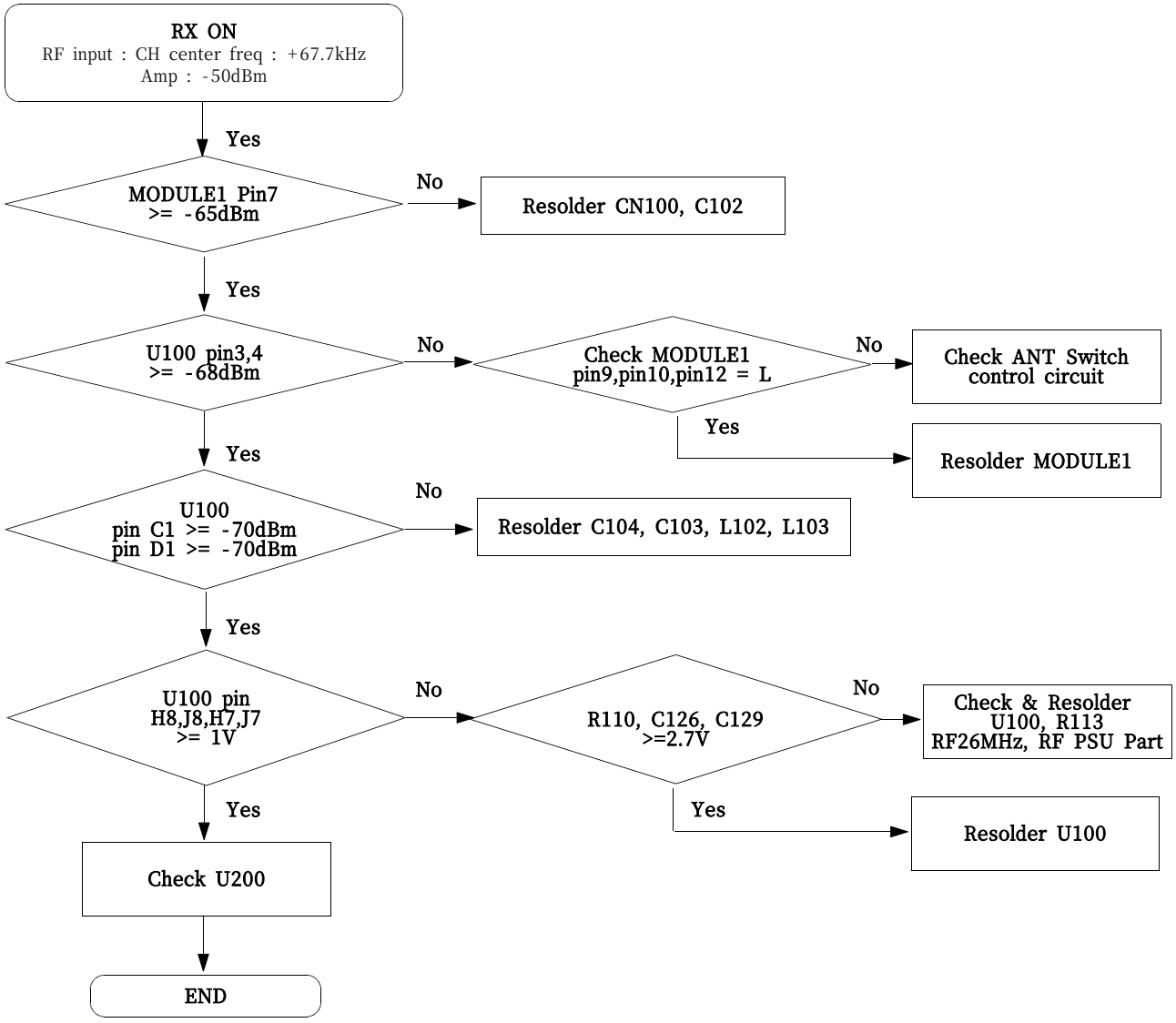
7-14. DCS Receiver



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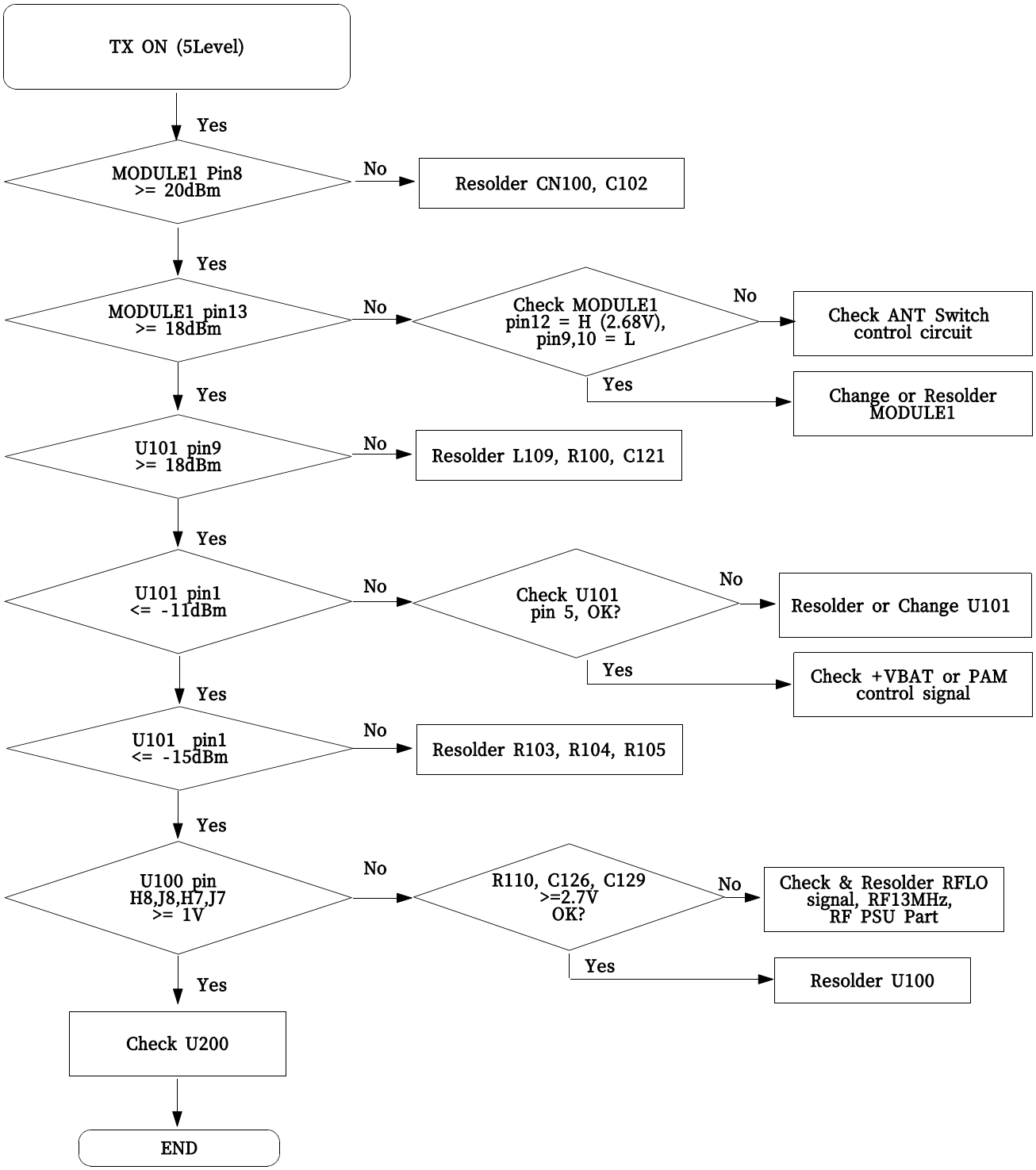
7-15. DCS Transmitter



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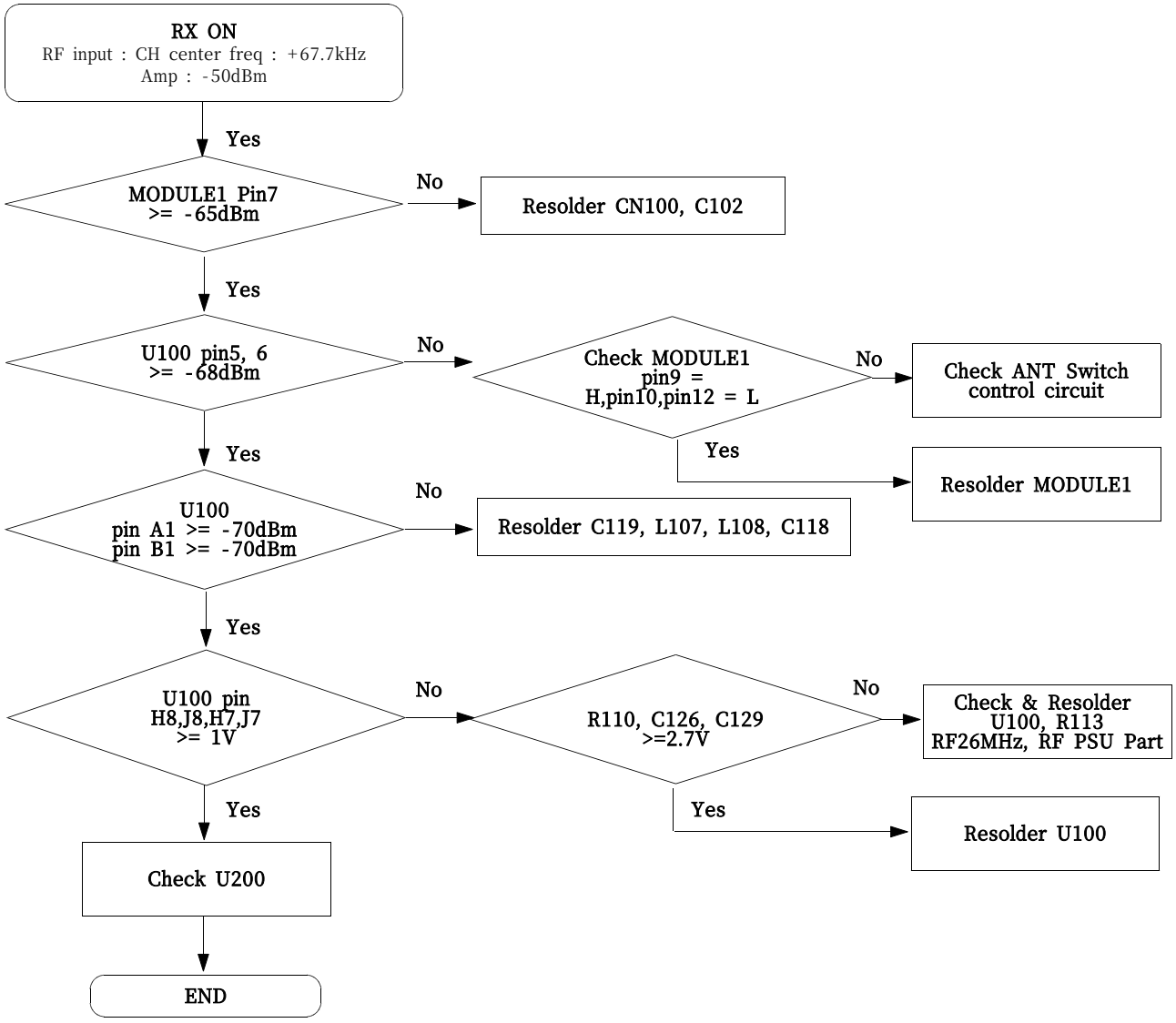
7-16. PCS Receiver



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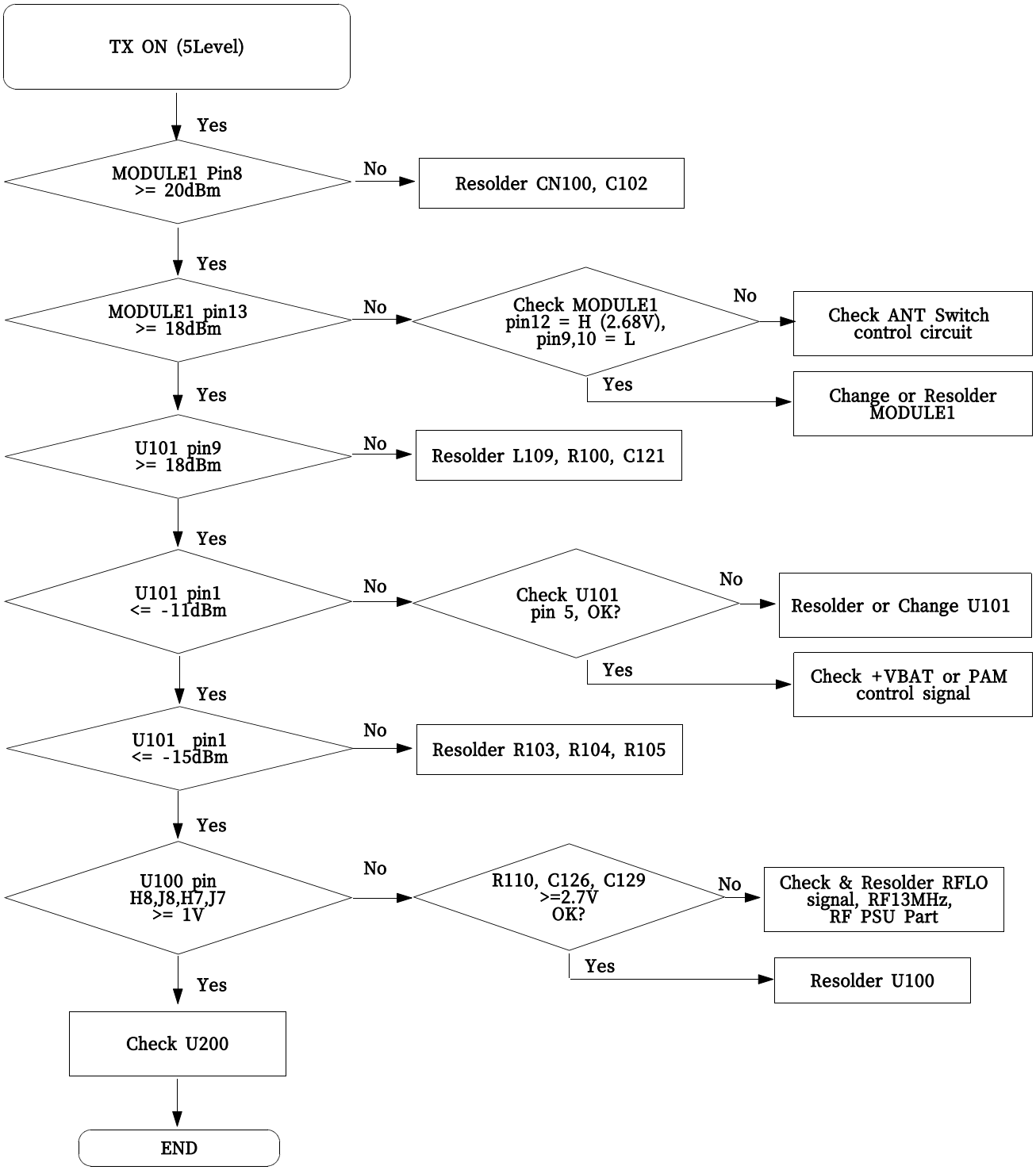
7-17. PCS Transmitter



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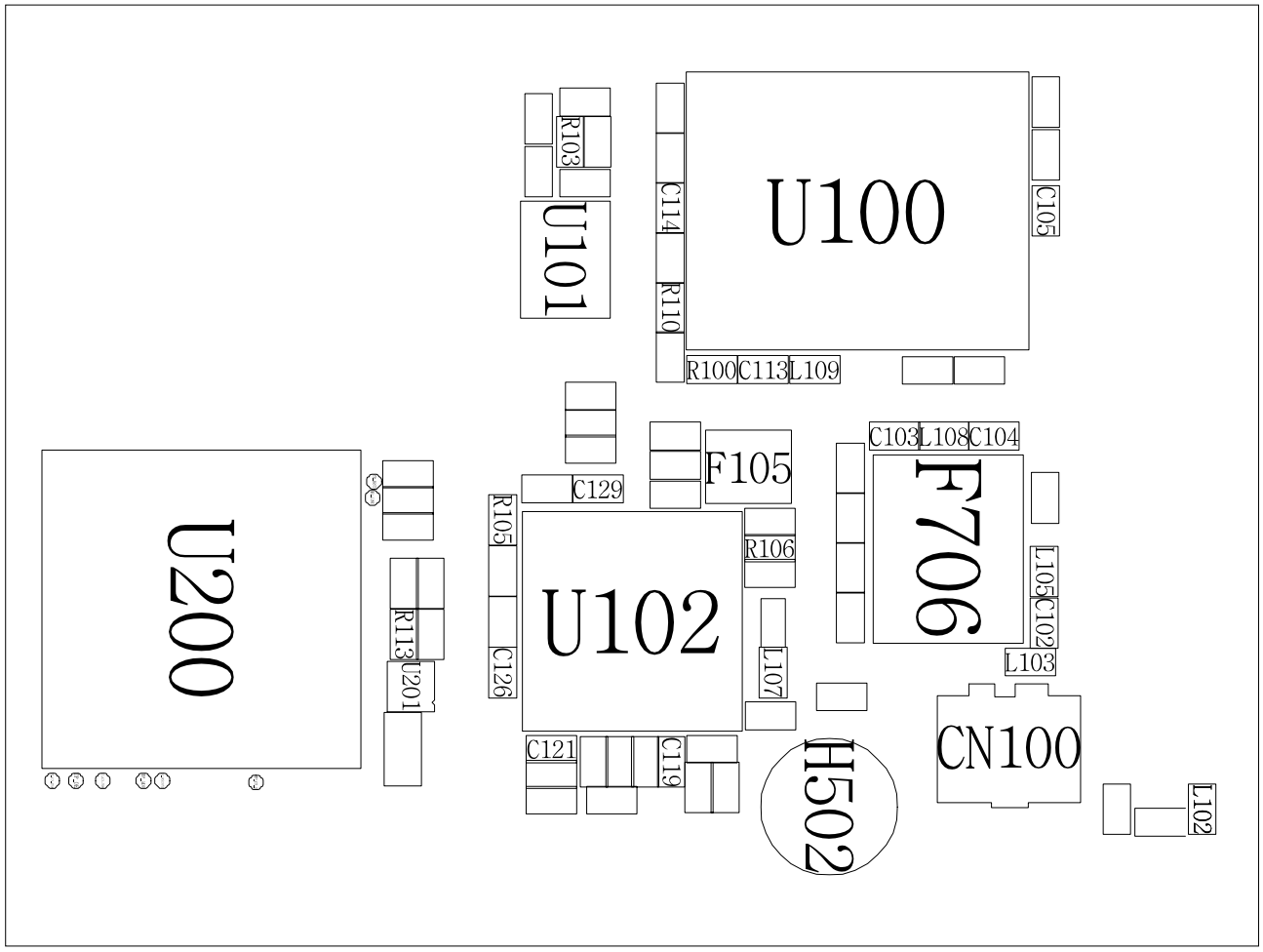

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