SAMSUNG

GSM TELEPHONE
SGH-X620

SERVICE Manual

GSM TELEPHONE

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BASIC.

1. Specification

1-1. GSM General Specification

	GSM900 Phase 1	**DCS1800 Phase 1**	**PC1900 Phase 1**
Freq. Band[MHz] Uplink/Downlink	890~915 935~960	1710~1785 1805~1880	1850~1910 1930~1990
ARFCN range	1~124	512~885	512~810
Tx/Rx spacing	45MHz	95MHz	80MHz
Mod. Bit rate/ Bit Period	270.833kbps 3.692us	270.833kbps 3.692us	270.833kbps 3.692us
Time Slot Period/Frame Period	576.9us 4.615ms	576.9us 4.615ms	576.9us 4.615ms
Modulation	0.3GMSK	0.3GMSK	0.3GMSK
MS Power	33dBm~5dBm	30dBm~0dBm	30dBm~0dBm
Power Class	5pcl ~ 19pcl	0pcl ~ 15pcl	0pcl ~ 15pcl
Sensitivity	-102dBm	-100dBm	-100dBm
TDMA Mux	8	8	8
Cell Radius	35Km	2Km	2Km

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1-2. GSM TX power class

TX Power control level	GSM900
5	33±2 dBm
6	31±2 dBm
7	29±2 dBm
8	27±2 dBm
9	25±2 dBm
10	23±2 dBm
11	21±2 dBm
12	19±2 dBm
13	17±2 dBm
14	15±2 dBm
15	13±2 dBm
16	11±3 dBm
17	9±3dBm
18	7±3 dBm
19	5±3 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-X620 RF Circuit Description

2-1-1. RX PART

- ASM(U100) → Switching Tx, Rx path for GSM900, DCS1800, PCS1900 by logic controlling.

- ASM Control Logic (U100) → Truth Table

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

- VC-TCXO (OSC101)

This module generates the 26MHz reference clock to drive the logic and RF. After division by two a reference clock of 13MHz is supplied to the other parts of the system through the pin CLKOUT. After additional process, the reference clock applies to the U100 Rx IQ demodulator and Tx IQ modulator. And then, the oscillator is controlled by serial data to select channel and use fast lock mode for GPRS high class operation.

- Transceiver (U101)

The receiver front-end which amplifies the GSM, DCS aerial signal, converts the chosen channel down to a low IF signal of 100 kHz. The first stages are symmetrical low noise amplifiers (LNAs). The LNAs are followed by an IQ down mixer. It consists of two mixers in parallel but driven by quadrature out of phase LO signals. The In phase (I) and Quadrature phase (Q) IF signals are low pass filtered to provide protection from high frequency offset interferes. The low IF I and Q signals are then fed into the channel filter. The front-end low IF I and Q outputs enter the integrated bandpass channel filter with provision for five 8 dB gain steps in front of the filter.

2-1-2. TX PART

I and Q baseband signals are applied to the IQ modulator that shifts the modulation spectrum up to the transmit IF. It is designed for low harmonic distortion, low carrier leakage and high image rejection to keep the phase error as small as possible.

The modulator is loaded at its IF output by an integrated low pass filter that suppress unwanted spurs prior to get into the phase detector. The clock drive is generated by division of the RFLO signal provided for the transmit offset mixer. Baseband IQ signal fed into offset PLL, this function is included inside of U101 chip. OSC100 chip generates modulator signal which power level is about 6.5dBm and fed into Power Amplifier(U102). The PA output power and power ramping are well controlled by Auto Power Control circuit. We use offset PLL below table.

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Modulation Spectrum	200kHz offset 30 kHz bandwidth	GSM	-35dBc
		DCS	-35dBc
	400kHz offset 30 kHz bandwidth	GSM	-66dBc
		DCS	-65dBc
	600kHz ~ 1.8MHz offset 30 kHz bandwidth	GSM	-75dBc
		DCS	-68dBc

2-2. Baseband Circuit description of SGH-X620

2-2-1. PCF50601

- Power Management

Ten 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, 3.0VSIMs, 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 PCF50601 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-X620) use PWM control to contrast the backlight brightness.

- Clock Generator

The Clock Generator (CG) generates all clocks for internal and external usage. The 32768 Hz crystal oscillator provides an accurate low clock frequency for the PCF50601 and other circuitry.

2-2-2. LCD Connector

LCD is consisted of main LCD(color 65K UFB LCD) and sub LCD (B/W LCD).
Chip select signals LCD_MAIN_CS and LCD_SUB_CS, can enable Each LCD. BACKLIGHT signal enables white LED of main LCD. "LCD_RESET" signal initiates the reset process of the LCD.
16-bit data lines(HD(0)~HD(15)) transfers data and commands to LCD. Data and commands use "HA(1)" signal. If this signal is low, inputs to LCD are commands. If it is high, inputs to LCD are data.

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The signal which informs the state of LCD is whether input or output, is required. But in this system, there is no input state from LCD. So only "HA(1)" signal is used to indicate write data or command to LCD. Power signals for LCD are "VBAT and "VDD3".

"SPK_P" and "SPK_N" are used for audio speaker containing voice or melody. And "VDD_VIB" from PCF50601 enables the motor.

2-2-3. Key

This is consisted of key interface pins among OM6359, KBIO(0:7). These signals compose the matrix. Result of matrix informs the key status to key interface in the OM6359. Power on/off key is separated from the matrix. So power on/off signal is connected with PCF50601 to enable PCF50601. Twelve key LEDs are use the "VDD_KEY" as supply voltage. "FLIP" informs the status of folder (open or closed) to the OM6359. This uses the hall effect IC, A321ELH-SAMSUNG. A magnet under main LCD enables A321ELH-SAMSUNG.

2-2-4. EMI ESD Filter

This system uses the EMI ESD filter, EMIF09 to protect noise from IF CONNECTOR part.

2-2-5. IF connetor

It is 18-pin connector. They are designed to use VBAT, V_EXT_CHARGE, TXD0, RXD0, RTS0, CTS0, JIG_REC, CHARGER_OK, RXD1, TXD1, AUX_MIC, AUX_SPK and GND. They connected to power supply IC, microprocessor and signal processor IC.

2-2-6. Battery Charge Management

A complete constant-current/constant-voltage linear charger is used for single cell lithium-ion batteries.
If TA connected to phone, "+DCVOLT" 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

EARP_P and EARP_N from OM6359 are connected to the main speaker. MIC_P and MIC_N are connected to the main MIC. YMU762 is a synthesizer LSI for mobile phones. It is a LSI as an input/output device for sound sources, which is the mobile phones, such as AAC, in addition to ringing-melodies.

As a synthesis, YMU762 is equipped 32 voices with different tones. Since the device is capable of simultaneously generating up to synchronous with the play of the FM synthesizer, various sampled voices can be used as sound effects. Since the play data of YMU762 are interpreted at anytime through FIFO, the length of the data(playing period) is not limited, so the device can flexibly support application such as incoming call melody music distribution service.

The hardware sequencer built in this device allows playing of the complex music without giving excessive load to the CPU of the portable telephones.

For the purpose of enabling YMU762 to demonstrate its full capabilities, Yamaha purpose to use "SMAF:Synthetic music Mobile Application Format" as a data distribution format that is compatible with multimedia. Since the SMAF takes a structure that sets importance on the synchronization between sound and images, various contents can be written into it including incoming call melody with words that can be used for training karaoke, and commercial channel that combines

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texts, images and sounds, and others. The hardware sequencer of YMU788 directly interprets and plays blocks relevant to synthesis (playing music and reproducing ADPCM with FM synthesizer) that are included in data distributed in SMAF.

2-2-8. Memory

Signals in the OM6359 enable two memories. They use two volt supply voltage, VDD3 in the PCF50601 & VDD_1.9V with a LDO. This system uses Intel's memory, RD38F3050LOZTQ0. It is consisted of 128M bits flash NOR memory and 64M bits SRAM. It has 16 bit data line, HD[0~15] which is connected to OM6359. It has 26 bit address lines, HA[1~26]. NCSFLASH & NCSRAM signals are chip select. Writing process, HWR_N is low and it enables writing process to flash memory and SRAM. During reading process, HRD_N is low and it enables reading process to flash memory and SRAM. Reading or writing procedure is processed after HWR_N or HRD_N is enabled.

2-2-9. OM6359

OM6359 is consisted of ARM core and DSP core. It has 8x1Kword on-chip program/data RAM, 55 Kwords on-chip program ROM in the DSP. It has 4K*32bits ROM and 2K*32bits RAM in the ARM core. DSP is consisted of KBS, JTAG, EMI and UART. ARM core is consisted of EMI, PIC(Programmable Interrupt Controller), reset/power/clock unit, DMA controller, TIC(Test Interface Controller), peripheral bridge, PPI, SSI(Synchronous Serial Interface), ACC(Asynchronous communications controllers), timer, ADC, RTC(Real-Time Clock) and keyboard interface. KBIO(0:7), address lines of DSP core and HD[0~15]. HA[1~26], address lines of ARM core and HD[0~15], data lines of ARM core are connected to memory and YMU762.

NCSRAM, NCSFLASH in the ARM core are connected to each memory. HWR_N and HRD_N control the process of memory. External IRQ(Interrupt ReQuest) signals from each units, such as, PMU need the compatible process. KBIO[0~7] receive the status from key and RXD0/TXD0 are used for the communication using data link cable(DEBUG_DTR/RTS/TXD/RXD/CTS/DSR).

It has JTAG control pins(TDI/TDO/TCK) for ARM core and DSP core. It receives 13MHz clock in CKI pin from external TCXO. ADC(Analog to Digital Convertor) part receives the status of temperature, battery type and battery voltage.

2-2-10. TOH2600DGI4KRA(26MHz)

This system uses the 26MHz TCXO, TOH2600DGI4KRA, SEM. AFC control signal from OM6359 controls frequency from 26MHz x-tal. The clock output frequency of UAA3536 is 13MHz. This clock is connected to OM6359, YMU762.

2-2-11. FM Radio(TEA5761)

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

The radio is completely adjustment free and does only require a minimum of small and low cost external components. The radio can tune the European-, US- and Japan FM bands.

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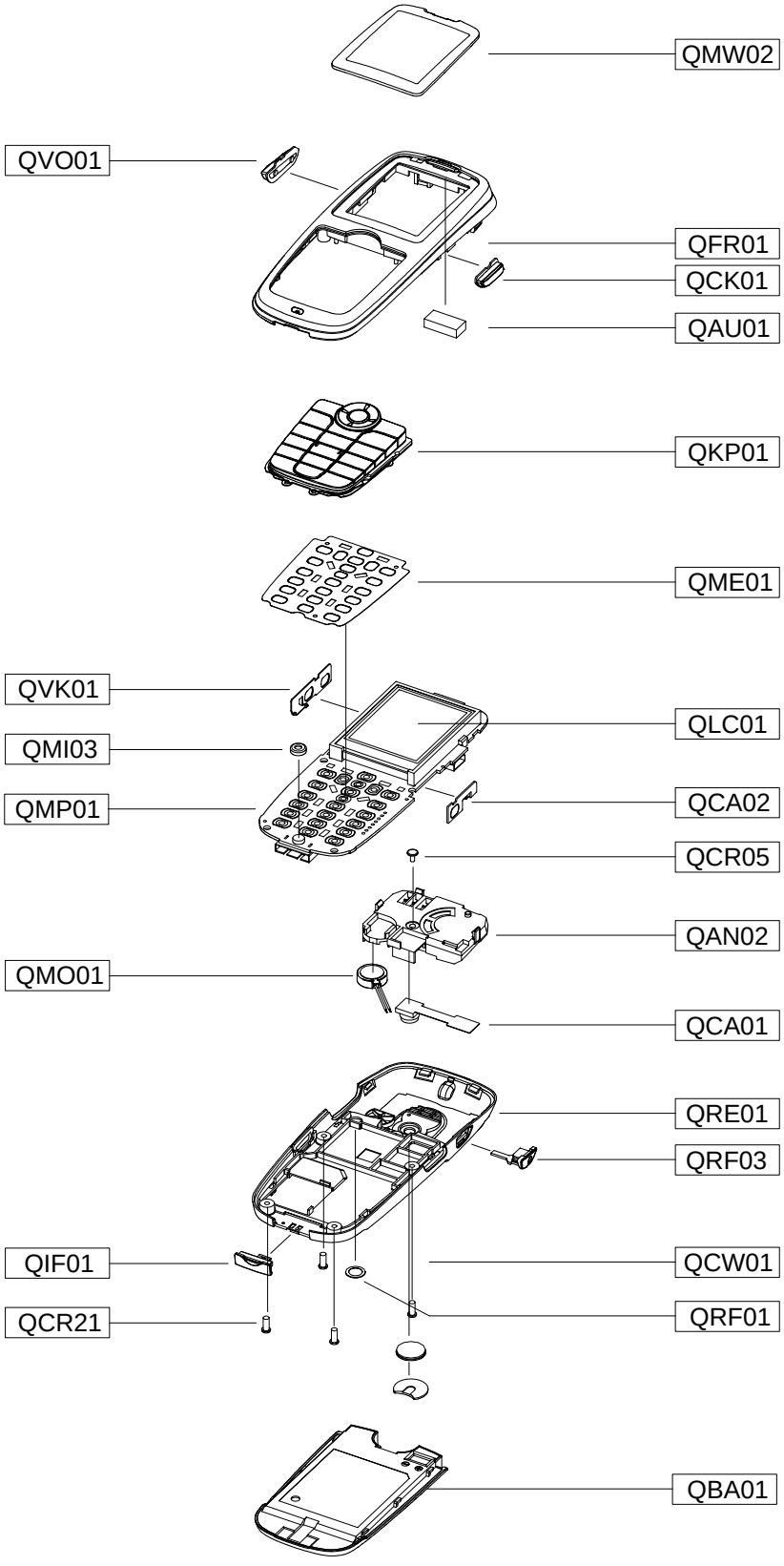
3. Exploded View and Parts List

3-1. Exploded View



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3-2. Parts List

Location No		Description	Sec Code
QAN02		INTENNA-SGHX620;J90-OY505-F01P01,SGH	GH42-00573A
QAU01		AUDIO-RECEIVER;32ohm,96dB±2dB,12.5X	3009-001100
QBA01		BATTERY-800MAH,DK/SILVE,EU,M;BST4138	GH43-02007A
QCA01		UNIT-CAMERA;SGH-X620,MOMFH150G1A,-,E	GH59-02115A
QCA02		UNIT-CAMERA KEY;SGH-X620,SSC4018P087	GH59-02111A
QCK01		MEC-CAMERA KEY;SGH-X620,EU,-,-,-,-,S	GH75-07456A
QCR05		SCREW-MACHINE;PH,+,M1.4,L3,ZPC(BLK),	6001-001478
QCR21		SCREW-MACHINE;BH(1.0),+,M1.7,L3.5,BL	6001-001507
QFR01		MEC-FRONT CASE;SGH-X620,EU,-,-,-,-,S	GH75-06379A
QIF01		PMO-IF COVER;SGH-X620,PC+ELASTOMER,D	GH72-22325A
QKP01		MEC-KEYPAD;SGH-X620,EU,-,-,-,-,BLK,-	GH75-06380A
QLC01		LCD-SGHX620 LCD;LTS166QQ-F01-0,SGH-X	GH07-00705A
QME01		UNIT-METAL DOME;SGH-X620,SSM5017P800	GH59-02112A
QMI03		RMO-RUBBER MIC;SGH-X620,CR-RUBBER,P5	GH73-04169A
QMO01		MOTOR DC-SGHX620;JHV-10A1-C9S,SGH-X6	GH31-00179A
QMP01		PBA MAIN-SGHX620;SGH-X620,ERA,EU,PBA	GH92-02048A
QMW02		PCT-MAIN WINDOW;SGH-X620,ACRYL,TRP,4	GH72-19752A
QRF01		MPR-RF COVER;SGH-X620,PC SHEET,P6.6X	GH74-13087A
QVK01		UNIT-VOLUME KEY;SGH-X620,SSV4018P088	GH59-02113A
QVO01		MEC-VOLUME KEY;SGH-X620,EU,-,-,-,-,S	GH75-07455A
QRE01		MEC-REAR CASE;SGH-X620,EU,-,-,-,-,SI	GH75-06383A
	QRF03	PMO-EAR JACK COVER;SGH-X620,PC+ELAST	GH72-21956A
QCW01		MEC-CAMER WINDOW;SGH-X620,EU,-,-,-,-	GH75-07587A

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Description	Sec Code
BAG PE;LDPE,T0.05,W80,L180,TRP,-,-	6902-000634
ADAPTOR-SGHD500 BLK;TAD137EBE,SGH-D5	GH44-00954A
UNIT-EARPHONE;SGH-C230,EM-SS550E-STB	GH59-02166A
LABEL(P)-WATER SOAK;COMM,NORGE,100G,	GH68-02026A
MANUAL-WEEE CARD;COMM,SEC,ENGLISH,UN	GH68-07013A
LABEL(R)-SGHX620(EU);SGH-E335,TMB,PO	GH68-07405A
MANUAL-USER;SGH-X620,XET,ITALIAN,ITA	GH68-07612A
CUSHION-CASE(1-2_NEW);SGH-X620,PULP,	GH69-02994A
BOX(P)-SGHX620(EU);SGH-X620,SC300+S1	GH69-03067A
ICT-MIRROR;SGH-X620,STS,P10.52,1.1,-	GH70-00404A
PMO-BATTER LOCKER;SGH-X620,PC,D/SIL,	GH72-21963A
MPR-BOHO VINYL C/WIN B;SGH-X620,SP30	GH74-15524A
MPR-TAPE INSULATION PCB;SGH-X620,3M8	GH74-16995A
MPR-BOHO VINYL M/WIN;SGH-X620,SP100,	GH74-16997A
MPR-TAPE INTENNA CAMERA;SGH-X620,TES	GH74-16999A
MPR-TAPE INSULATE CAMERA;SGH-X620,3M	GH74-17225A
MPR-TAPE INSULATE VOLUME;SGH-X620,3M	GH74-17226A
MPR-BOHO VINYL M/WIN A;SGH-X620,ST-5	GH74-17308A
MPR-BOHO VINYL CAM WIN A;SGH-X620,ST	GH74-17309A

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3-3. Test Jig (GH80-01909A)

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

3-3-2. Test Cable (GH39-00217A)

3-3-3. Serial Cable

3-3-4. Power Supply Cable

3-3-5. DATA CABLE (GH39-00219A)

3-3-6. TA (GH44-00184G)

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4. Electrical Parts List

Design LOC	Description	SEC CODE
BAT300	BATTERY-LI(2ND)	4302-001180
BAT500	CONNECTOR-BATTERY	3711-005829
C101	C-CER,CHIP	2203-000278
C102	C-CER,CHIP	2203-000278
C103	C-CER,CHIP	2203-000278
C105	C-CER,CHIP	2203-000812
C107	C-CER,CHIP	2203-000854
C108	C-CER,CHIP	2203-000854
C109	C-CER,CHIP	2203-005057
C110	C-CER,CHIP	2203-005482
C111	C-CER,CHIP	2203-000628
C112	C-CER,CHIP	2203-000628
C113	C-CER,CHIP	2203-005057
C114	C-CER,CHIP	2203-005482
C115	C-CER,CHIP	2203-002668
C118	C-CER,CHIP	2203-000233
C119	C-CER,CHIP	2203-000233
C120	C-CER,CHIP	2203-005482
C121	C-CER,CHIP	2203-005057
C122	C-CER,CHIP	2203-005138
C124	C-FILM,SMD-PPS	2301-001213
C125	C-CER,CHIP	2203-000359
C126	C-FILM,SMD-PPS	2301-001197
C127	C-CER,CHIP	2203-005482
C128	C-CER,CHIP	2203-005057
C129	C-CER,CHIP	2203-006053
C130	C-CER,CHIP	2203-000438
C131	C-CER,CHIP	2203-006190
C132	C-CER,CHIP	2203-000438
C133	C-CER,CHIP	2203-006190
C134	C-CER,CHIP	2203-000438
C135	C-TA,CHIP	2404-001239
C136	C-CER,CHIP	2203-000233
C138	C-CER,CHIP	2203-005503
C139	C-CER,CHIP	2203-000311
C140	C-CER,CHIP	2203-000233
C141	C-CER,CHIP	2203-000438
C142	C-CER,CHIP	2203-000254
C143	C-CER,CHIP	2203-000438
C144	C-CER,CHIP	2203-001153
C145	C-CER,CHIP	2203-000550
C146	C-CER,CHIP	2203-005480
C147	C-CER,CHIP	2203-005482
C148	C-CER,CHIP	2203-005057
C149	C-CER,CHIP	2203-000278
C150	C-CER,CHIP	2203-005482
C151	C-CER,CHIP	2203-000679
C152	C-CER,CHIP	2203-000278
C153	C-CER,CHIP	2203-000233
C154	C-CER,CHIP	2203-000254

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Design LOC	Description	SEC CODE
C155	C-CER,CHIP	2203-000311
C156	C-CER,CHIP	2203-000311
C157	C-CER,CHIP	2203-000311
C158	C-CER,CHIP	2203-000311
C159	C-CER,CHIP	2203-002668
C200	C-CER,CHIP	2203-005061
C201	C-CER,CHIP	2203-005061
C202	C-CER,CHIP	2203-005061
C203	C-CER,CHIP	2203-005061
C204	C-CER,CHIP	2203-000254
C205	C-CER,CHIP	2203-005061
C206	C-CER,CHIP	2203-005061
C207	C-CER,CHIP	2203-000254
C208	C-CER,CHIP	2203-000254
C209	C-CER,CHIP	2203-000643
C210	C-CER,CHIP	2203-000233
C211	C-CER,CHIP	2203-005482
C212	C-CER,CHIP	2203-005482
C213	C-CER,CHIP	2203-000854
C214	C-CER,CHIP	2203-006141
C215	C-CER,CHIP	2203-005482
C217	C-CER,CHIP	2203-006053
C218	C-CER,CHIP	2203-005482
C219	C-CER,CHIP	2203-005482
C220	C-CER,CHIP	2203-005061
C221	C-CER,CHIP	2203-005061
C222	C-CER,CHIP	2203-005061
C223	C-CER,CHIP	2203-005061
C224	C-CER,CHIP	2203-005061
C225	C-CER,CHIP	2203-000254
C226	C-CER,CHIP	2203-005061
C227	C-CER,CHIP	2203-005061
C228	C-CER,CHIP	2203-005482
C300	C-CER,CHIP	2203-006208
C301	C-CER,CHIP	2203-005482
C302	C-CER,CHIP	2203-006208
C303	C-CER,CHIP	2203-005482
C304	C-CER,CHIP	2203-005482
C307	C-CER,CHIP	2203-006257
C308	C-CER,CHIP	2203-005571
C309	C-CER,CHIP	2203-006208
C310	C-CER,CHIP	2203-005395
C311	C-TA,CHIP	2404-001225
C312	C-CER,CHIP	2203-000386
C313	C-CER,CHIP	2203-000425
C314	C-CER,CHIP	2203-006257
C315	C-CER,CHIP	2203-005482
C316	C-CER,CHIP	2203-006053
C317	C-CER,CHIP	2203-000425
C318	C-CER,CHIP	2203-006208

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Design LOC	Description	SEC CODE
C319	C-CER,CHIP	2203-000885
C320	C-CER,CHIP	2203-006208
C321	C-CER,CHIP	2203-006208
C322	C-CER,CHIP	2203-005065
C323	C-TA,CHIP	2404-001225
C324	C-CER,CHIP	2203-006208
C325	C-CER,CHIP	2203-005482
C326	C-CER,CHIP	2203-005482
C327	C-CER,CHIP	2203-005482
C328	C-CER,CHIP	2203-006208
C329	C-TA,CHIP	2404-001101
C330	C-TA,CHIP	2404-001086
C331	C-CER,CHIP	2203-006053
C332	C-CER,CHIP	2203-006208
C333	C-CER,CHIP	2203-006399
C334	C-CER,CHIP	2203-006208
C335	C-CER,CHIP	2203-000679
C336	C-CER,CHIP	2203-006053
C337	C-CER,CHIP	2203-006208
C338	C-CER,CHIP	2203-006208
C339	C-CER,CHIP	2203-006053
C340	C-CER,CHIP	2203-005482
C341	C-TA,CHIP	2404-001374
C342	C-TA,CHIP	2404-001381
C344	C-CER,CHIP	2203-006090
C345	C-CER,CHIP	2203-006201
C346	C-CER,CHIP	2203-006053
C347	C-CER,CHIP	2203-006201
C348	C-CER,CHIP	2203-006201
C349	C-TA,CHIP	2404-001225
C350	C-CER,CHIP	2203-006201
C351	C-CER,CHIP	2203-005482
C352	C-CER,CHIP	2203-006208
C353	C-CER,CHIP	2203-006208
C354	C-CER,CHIP	2203-006208
C400	C-TA,CHIP	2404-001352
C401	C-CER,CHIP	2203-005482
C407	C-CER,CHIP	2203-000885
C408	C-CER,CHIP	2203-000885
C409	C-TA,CHIP	2404-001348
C417	C-CER,CHIP	2203-005061
C418	C-CER,CHIP	2203-000995
C419	C-CER,CHIP	2203-000679
C421	C-CER,CHIP	2203-000854
C422	C-CER,CHIP	2203-000995
C423	C-CER,CHIP	2203-000679
C424	C-CER,CHIP	2203-000679
C426	C-CER,CHIP	2203-000679
C427	C-CER,CHIP	2203-005061
C428	C-CER,CHIP	2203-000386

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Design LOC	Description	SEC CODE
C429	C-CER,CHIP	2203-000812
C430	C-CER,CHIP	2203-000425
C432	C-CER,CHIP	2203-000679
C433	C-CER,CHIP	2203-000679
C435	C-CER,CHIP	2203-000425
C436	C-CER,CHIP	2203-005482
C444	C-CER,CHIP	2203-006053
C445	C-CER,CHIP	2203-006208
C449	C-CER,CHIP	2203-000679
C450	C-TA,CHIP	2404-001352
C451	C-CER,CHIP	2203-005061
C452	C-CER,CHIP	2203-000854
C453	C-CER,CHIP	2203-005061
C454	C-CER,CHIP	2203-000679
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C456	C-CER,CHIP	2203-005061
C457	C-CER,CHIP	2203-000885
C458	C-CER,CHIP	2203-000885
C500	C-CER,CHIP	2203-003054
C501	C-CER,CHIP	2203-005061
C502	C-CER,CHIP	2203-006141
C503	C-TA,CHIP	2404-001225
C504	C-CER,CHIP	2203-006141
C505	C-CER,CHIP	2203-000233
C506	C-CER,CHIP	2203-005482
C507	C-CER,CHIP	2203-000679
C508	C-CER,CHIP	2203-000725
C509	C-CER,CHIP	2203-005482
C510	C-CER,CHIP	2203-006141
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C512	C-CER,CHIP	2203-005482
C513	C-CER,CHIP	2203-000438
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C516	C-CER,CHIP	2203-002759
C517	C-CER,CHIP	2203-005482
C518	C-TA,CHIP	2404-001225
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C520	C-CER,CHIP	2203-000254
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C522	C-CER,CHIP	2203-000359
C523	C-CER,CHIP	2203-005480
C524	C-CER,CHIP	2203-001239
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C527	C-CER,CHIP	2203-005480
C528	C-CER,CHIP	2203-006399
C529	C-CER,CHIP	2203-005482
C530	C-CER,CHIP	2203-005480
C531	C-CER,CHIP	2203-005482
C532	C-CER,CHIP	2203-000254

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Design LOC	Description	SEC CODE
C534	C-TA,CHIP	2404-001239
C535	C-CER,CHIP	2203-005482
C536	C-CER,CHIP	2203-006260
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C538	C-CER,CHIP	2203-006260
C539	C-CER,CHIP	2203-006257
C540	C-TA,CHIP	2404-001088
C541	C-CER,CHIP	2203-001153
C545	C-CER,CHIP	2203-001033
C546	C-CER,CHIP	2203-001033
C548	C-CER,CHIP	2203-000359
CN100	CONNECTOR-COAXIAL	3705-001358
CN300	CONNECTOR-CAR EDGE	3709-001355
CN400	JACK-EAR PHONE	3722-002010
CN500	CONNECTOR-INTERFACE	3710-001611
CN501	CONNECTOR-HEADER	3711-005643
CN502	CONNECTOR-SOCKET	3710-001105
F500	FILTER-SAW	1405-001158
F501	FILTER-SAW	1405-001158
F502	FILTER-SAW	1405-001158
F503	FILTER-SAW	1405-001158
F504	FILTER-EMI/ESD	2901-001322
F505	FILTER-EMI/ESD	2901-001322
F506	FILTER-EMI/ESD	2901-001322
F507	FILTER-EMI/ESD	2901-001322
F508	FILTER-EMI/ESD	2901-001322
L104	INDUCTOR-SMD	2703-002204
L107	INDUCTOR-SMD	2703-002170
L109	INDUCTOR-SMD	2703-002201
L112	INDUCTOR-SMD	2703-002201
L113	INDUCTOR-SMD	2703-002201
L115	INDUCTOR-SMD	2703-002170
L118	INDUCTOR-SMD	2703-002314
L119	INDUCTOR-SMD	2703-002368
L120	INDUCTOR-SMD	2703-002176
L121	INDUCTOR-SMD	2703-002176
L301	CORE-RERRITE	3301-001105
L302	INDUCTOR-SMD	2703-002714
L401	INDUCTOR-SMD	2703-001231
L402	INDUCTOR-SMD	2703-002314
L403	INDUCTOR-SMD	2703-002314
L404	INDUCTOR-SMD	2703-001259
L405	INDUCTOR-SMD	2703-001259
L501	CORE-RERRITE	3301-001105
L503	INDUCTOR-SMD	2703-001673
L504	INDUCTOR-SMD	2703-002206
L505	INDUCTOR-SMD	3301-001756
L506	INDUCTOR-SMD	3301-001756
L507	INDUCTOR-SMD	3301-001756
LED400	LED	0601-001819

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Design LOC	Description	SEC CODE
LED401	LED	0601-001819
LED402	LED	0601-001819
LED403	LED	0601-001819
LED404	LED	0601-001819
LED405	LED	0601-001819
LED406	LED	0601-001819
LED407	LED	0601-001819
LED408	LED	0601-001819
LED409	LED	0601-001819
MIC400	MIC-CONDENSOR	3003-001107
OSC100	OSCILLATOR-VCO	2806-001341
OSC101	OSCILLATOR-VCTCXO	2809-001281
Q100	TR-DIGITAL	0504-001151
Q101	TR-DIGITAL	0504-001151
Q102	TR-DIGITAL	0504-001151
Q400	IC-RELAY DRIVER	1003-001440
R100	R-CHIP	2007-000171
R101	R-CHIP	2007-000162
R102	R-CHIP	2007-000162
R103	R-CHIP	2007-000162
R104	R-CHIP	2007-007148
R105	R-CHIP	2007-000141
R106	R-CHIP	2007-000140
R107	R-CHIP	2007-001288
R108	R-CHIP	2007-001308
R109	R-CHIP	2007-001308
R110	R-CHIP	2007-000566
R111	R-CHIP	2007-001329
R112	R-CHIP	2007-000144
R113	R-CHIP	2007-001288
R114	R-CHIP	2007-007311
R115	R-CHIP	2007-000148
R116	R-CHIP	2007-001308
R117	R-CHIP	2007-001308
R118	R-CHIP	2007-000566
R119	R-CHIP	2007-007699
R120	R-CHIP	2007-007699
R121	R-CHIP	2007-000171
R123	R-CHIP	2007-008672
R124	R-CHIP	2007-000142
R125	R-CHIP	2007-000148
R126	R-CHIP	2007-001308
R127	R-CHIP	2007-007306
R128	R-CHIP	2007-000140
R129	R-CHIP	2007-007314
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R131	R-CHIP	2007-007314
R132	R-CHIP	2007-007314
R133	R-CHIP	2007-000140
R134	R-CHIP	2007-000171

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Design LOC	Description	SEC CODE
R135	R-CHIP	2007-000171
R200	R-CHIP	2007-000174
R201	R-CHIP	2007-007014
R202	R-CHIP	2007-001313
R203	R-CHIP	2007-007014
R204	R-CHIP	2007-000171
R205	R-CHIP	2007-000162
R207	R-CHIP	2007-007107
R208	R-CHIP	2007-007142
R209	R-CHIP	2007-007107
R210	R-CHIP	2007-007142
R211	R-CHIP	2007-000162
R213	R-CHIP	2007-000162
R214	R-CHIP	2007-007001
R215	R-CHIP	2007-000162
R216	R-CHIP	2007-000162
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R218	R-CHIP	2007-000162
R219	R-CHIP	2007-000143
R220	R-CHIP	2007-000141
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R222	R-CHIP	2007-000162
R223	R-CHIP	2007-000162
R224	R-CHIP	2007-000162
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R301	R-CHIP	2007-000162
R302	R-CHIP	2007-007100
R305	R-CHIP	2007-000148
R310	R-CHIP	2007-000140
R311	R-CHIP	2007-003001
R312	R-CHIP	2007-000151
R313	R-CHIP	2007-000157
R314	R-CHIP	2007-007311
R315	R-CHIP	2007-000162
R316	R-CHIP	2007-007489
R317	R-CHIP	2007-007573
R318	R-CHIP	2007-007334
R402	R-CHIP	2007-007014
R403	R-CHIP	2007-007014
R408	R-CHIP	2007-003030
R409	R-CHIP	2007-003030
R410	R-CHIP	2007-002970
R411	R-CHIP	2007-002970
R412	R-CHIP	2007-002970
R413	R-CHIP	2007-002970
R414	R-CHIP	2007-002970
R415	R-CHIP	2007-002970
R416	R-CHIP	2007-002796
R417	R-CHIP	2007-000140
R418	R-CHIP	2007-000148

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Design LOC	Description	SEC CODE
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R420	R-CHIP	2007-002796
R423	R-CHIP	2007-007573
R424	R-CHIP	2007-007529
R426	R-CHIP	2007-001339
R427	R-CHIP	2007-007107
R428	R-CHIP	2007-007107
R430	R-CHIP	2007-001317
R431	R-CHIP	2007-002970
R432	R-CHIP	2007-002970
R433	R-CHIP	2007-002796
R434	R-CHIP	2007-000140
R436	R-CHIP	2007-000148
R438	R-CHIP	2007-000140
R439	R-CHIP	2007-002796
R440	R-CHIP	2007-007014
R441	R-CHIP	2007-007014
R500	R-CHIP	2007-000162
R501	R-CHIP	2007-000162
R503	R-CHIP	2007-000143
R504	R-CHIP	2007-000143
R507	R-CHIP	2007-000162
R509	R-CHIP	2007-000148
R510	R-CHIP	2007-007014
R511	R-CHIP	2007-007014
R512	R-CHIP	2007-001313
R514	R-CHIP	2007-000162
R515	R-CHIP	2007-001325
R517	R-CHIP	2007-007132
R518	R-CHIP	2007-007308
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R524	R-CHIP	2007-007107
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R536	R-CHIP	2007-000171
R545	R-CHIP	2007-000171
R546	R-CHIP	2007-008531
R547	R-CHIP	2007-008531
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R549	R-CHIP	2007-008531
R550	R-CHIP	2007-008531
R551	R-CHIP	2007-008531
R552	R-CHIP	2007-000171
TH200	THERMISTOR-NTC	1404-001221
U100	FILTER-ASM	2911-000008
U101	IC-TRANSCEIVER	1205-002327
U102	IC-POWER AMP	1201-002075

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Design LOC	Description	SEC CODE
U200	IC ASIC-SCHN480	GH13-00029A
U201	IC-CMOS LOGIC	0801-002237
U202	IC-COMM	1205-002558
U203	IC-MEMORY	1108-000019
U300	PHOTO-IRDA	0604-001261
U302	IC-DC/DC	1203-003328
U303	IC-BATTERY	1203-003663
U304	IC-POSI.FIXED REG	1203-003432
U305	IC-CONTROLLER	1205-002350
U306	IC-POSI.FIXED REG	1203-003489
U307	IC-POSI.FIXED REG	1203-003523
U400	IC-AUDIO AMP	1201-002240
U402	TR-DIGITAL	0504-001100
U403	IC-VOLTAGE COMP	1202-001068
U406	IC-POSI.FIXED REG	1203-003563
U500	FILTER-EMI/ESD	2901-001246
U501	IC-FM RADIO	1201-002238
U502	IC MELODY	1204-002161
U503	IC-DEMODULATOR	1204-002398
U504	C-CER,CHIP	2203-000628
U505	C-CER,CHIP	2203-005061
U507	C-CER,CHIP	2203-000812
U510	IC-CMOS LOGIC	1001-001306
U511	R-CHIP	2007-000162
U512	IC-CMOS LOGIC	0801-002237
V401	VARISTOR	1405-001121
V402	VARISTOR	1405-001121
V403	VARISTOR	1405-001121
V404	VARISTOR	1405-001121
V405	VARISTOR	1405-001121
V406	VARISTOR	1405-001082
V407	VARISTOR	1405-001082
V408	VARISTOR	1405-001082
V409	VARISTOR	1405-001082
V410	VARISTOR	1405-001082
V411	VARISTOR	1405-001082
V412	VARISTOR	1405-001082
X300	CRYSTAL-SMD	2801-004373
ZD300	DIODE-ZENER	0403-001446
ZD301	DIODE-ZENER	0403-001427
ZD400	DIODE-TVS	0406-001201
ZD402	DIODE-TVS	0406-001121
ZD403	DIODE-TVS	0406-001190
ZD404	DIODE-TVS	0406-001190
ZD405	DIODE-TVS	0406-001201
ZD500	DIODE-ZENER	0403-001387

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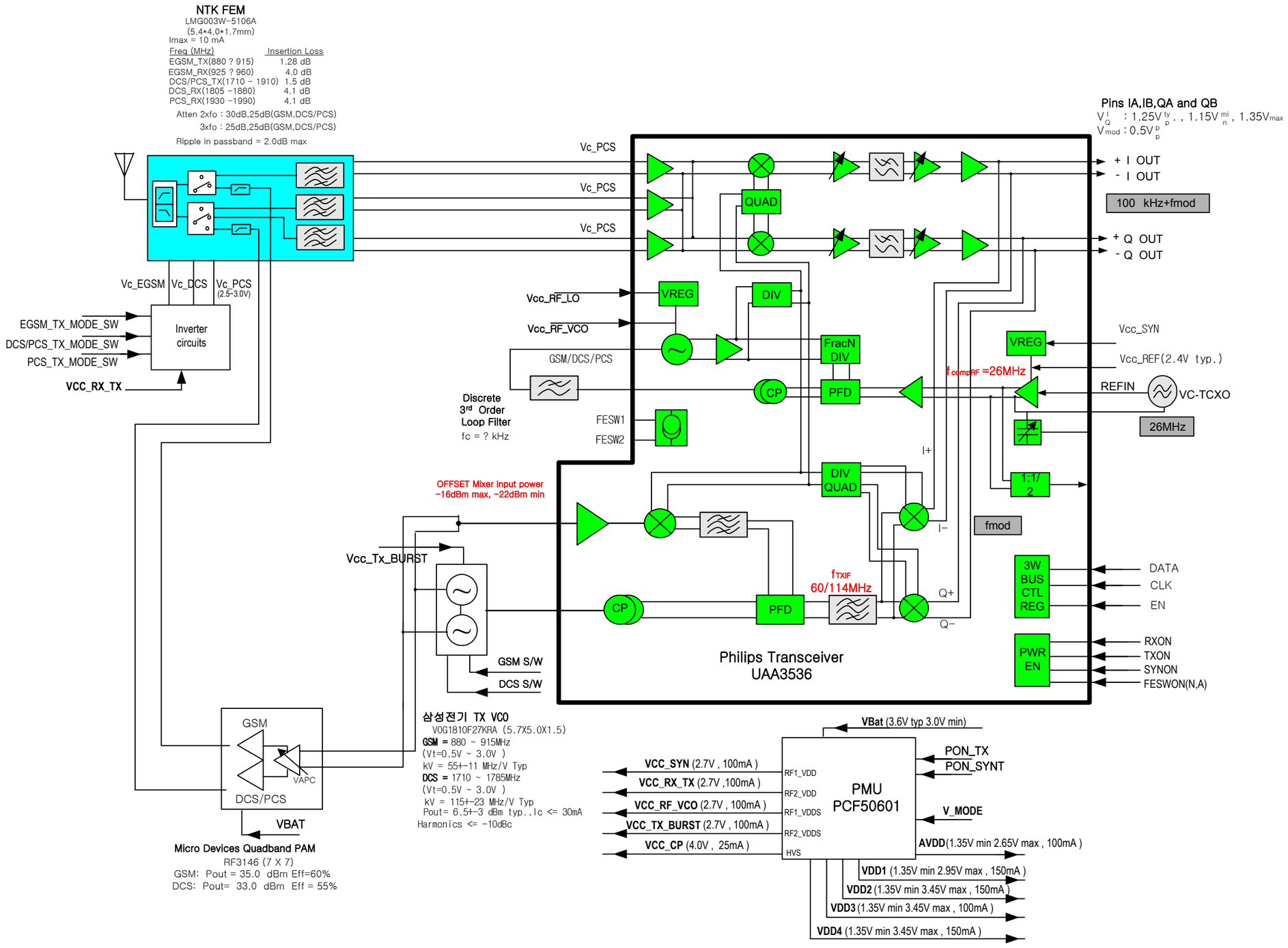
5. Block Diagrams

5-1. RF Solution Block Diagram



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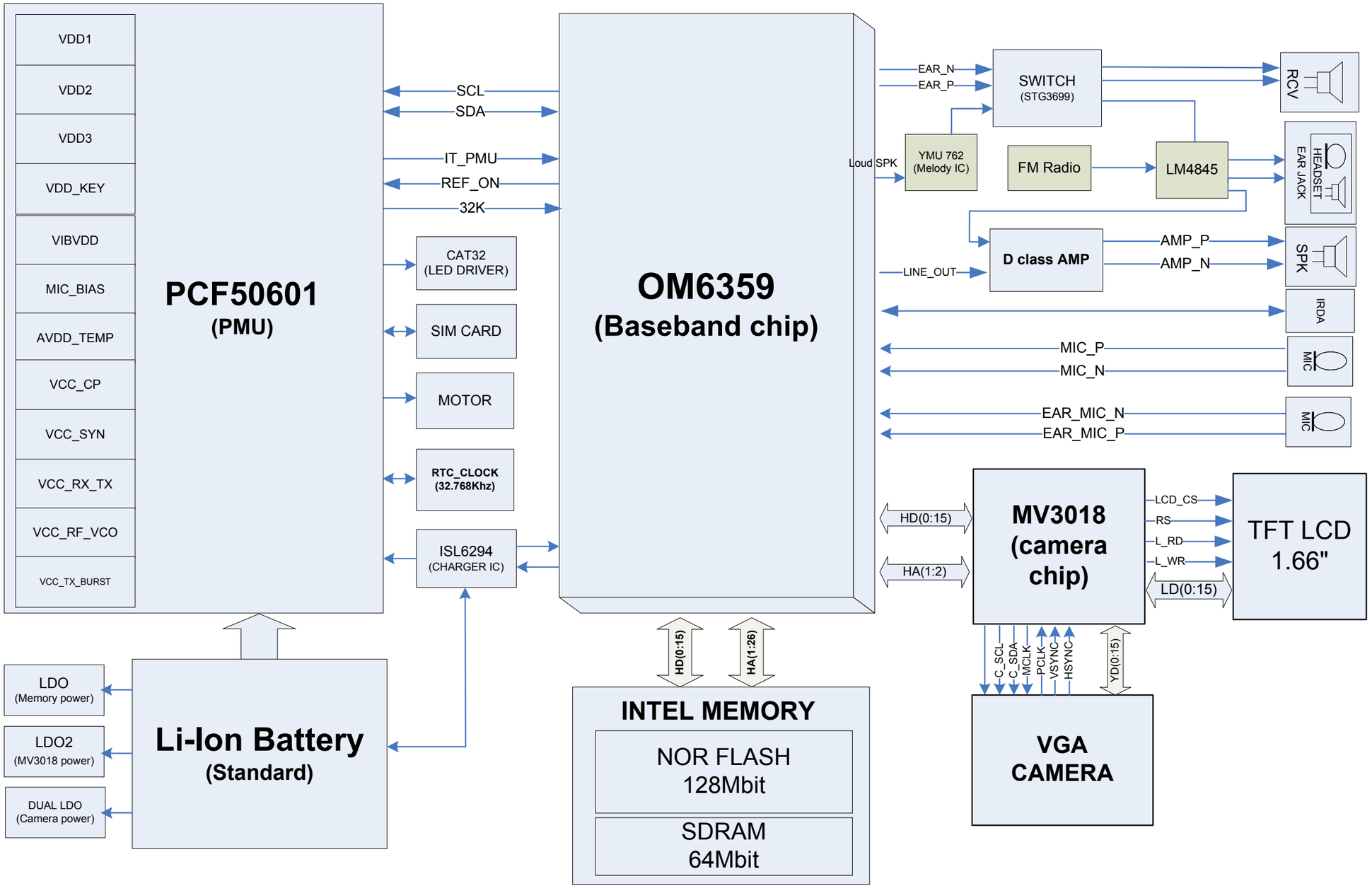
5-2. Base Band Solution Block Diagram



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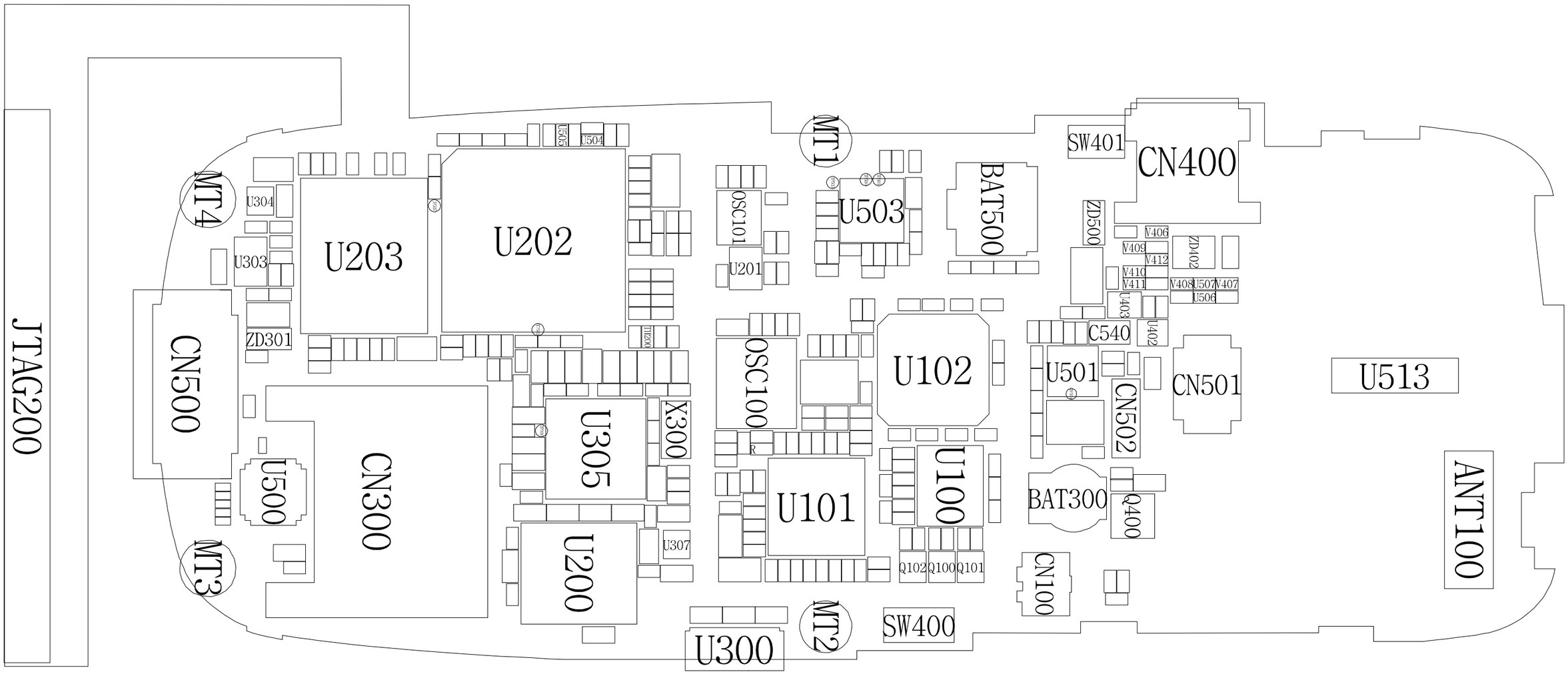
6. PCB Diagrams

6-1. PCB Top Diagram



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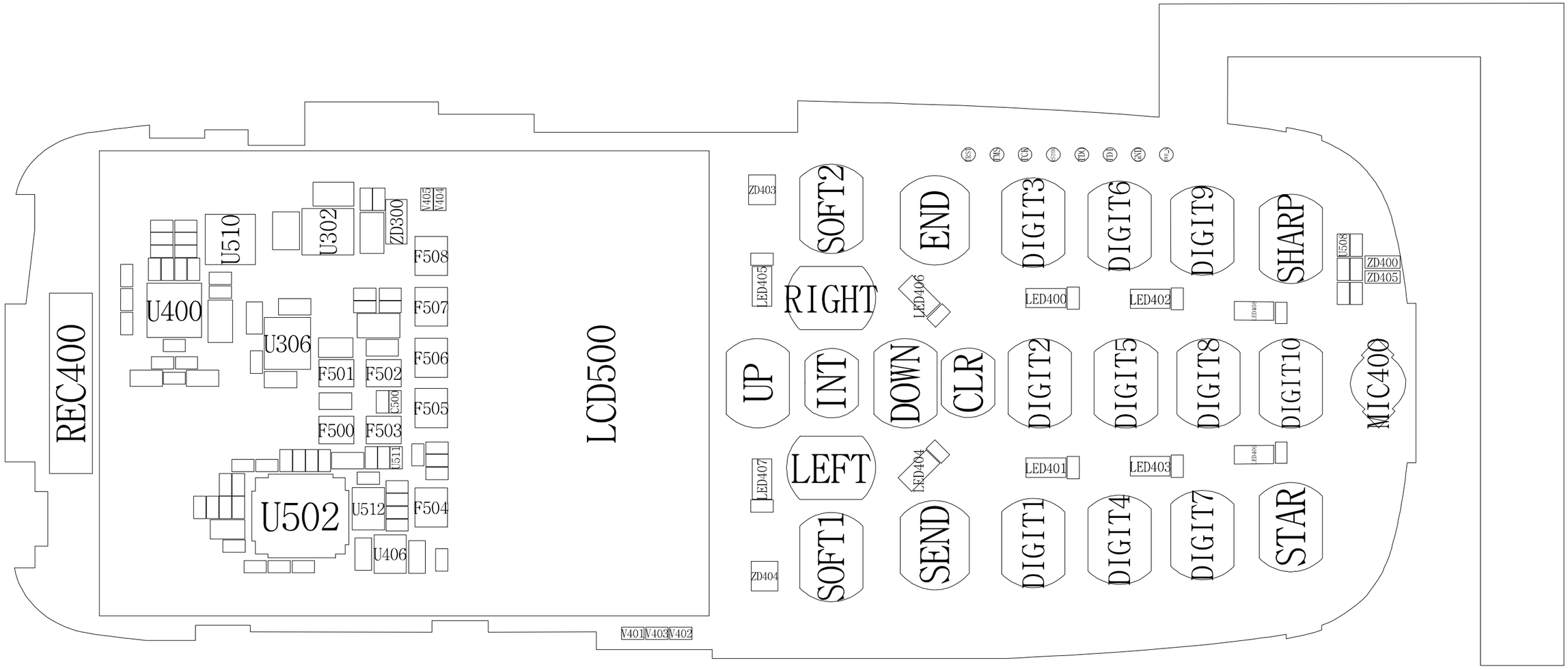
6-2. PCB Bottom Diagram



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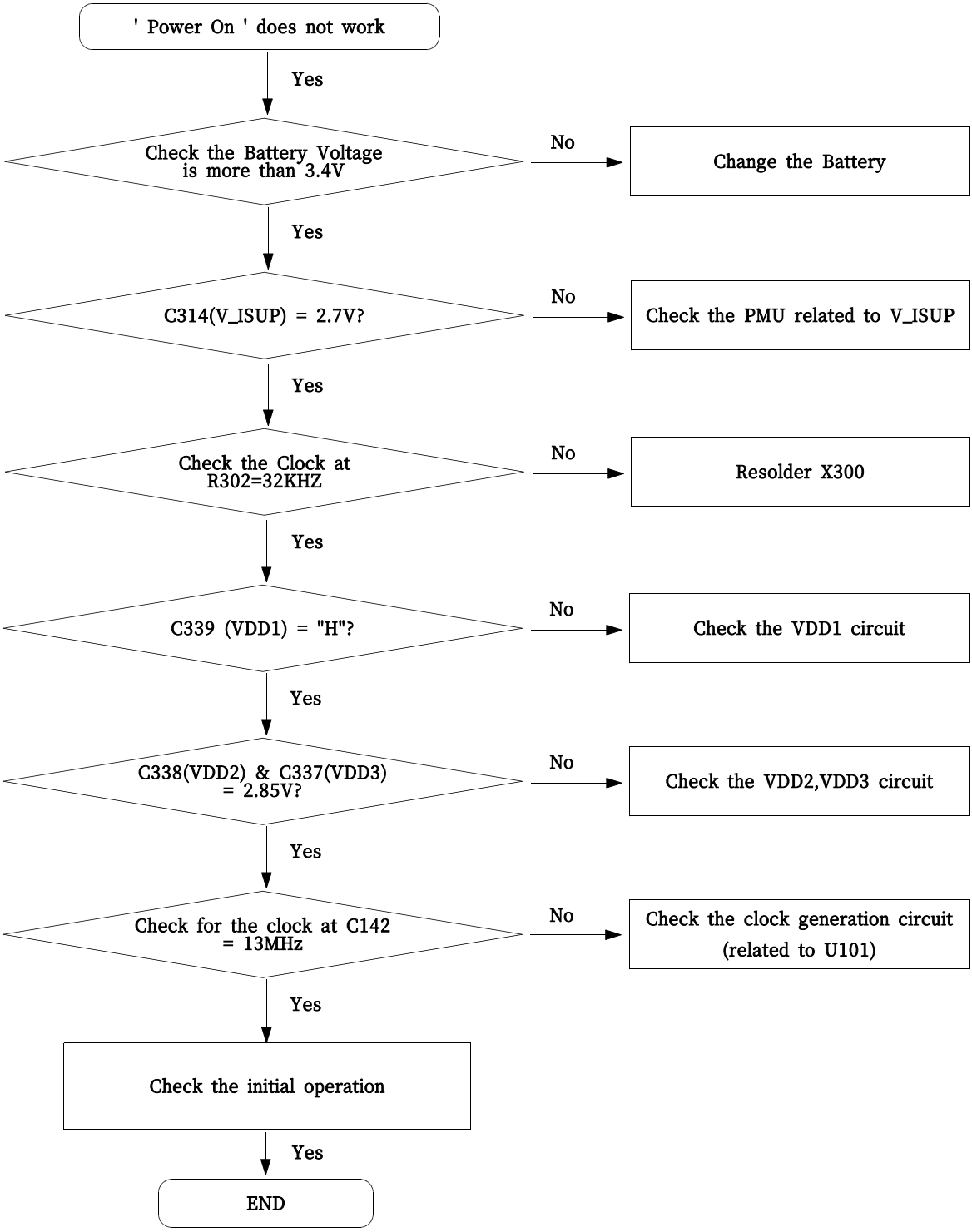
7. Flow Chart of Troubleshooting

7-1. Power On



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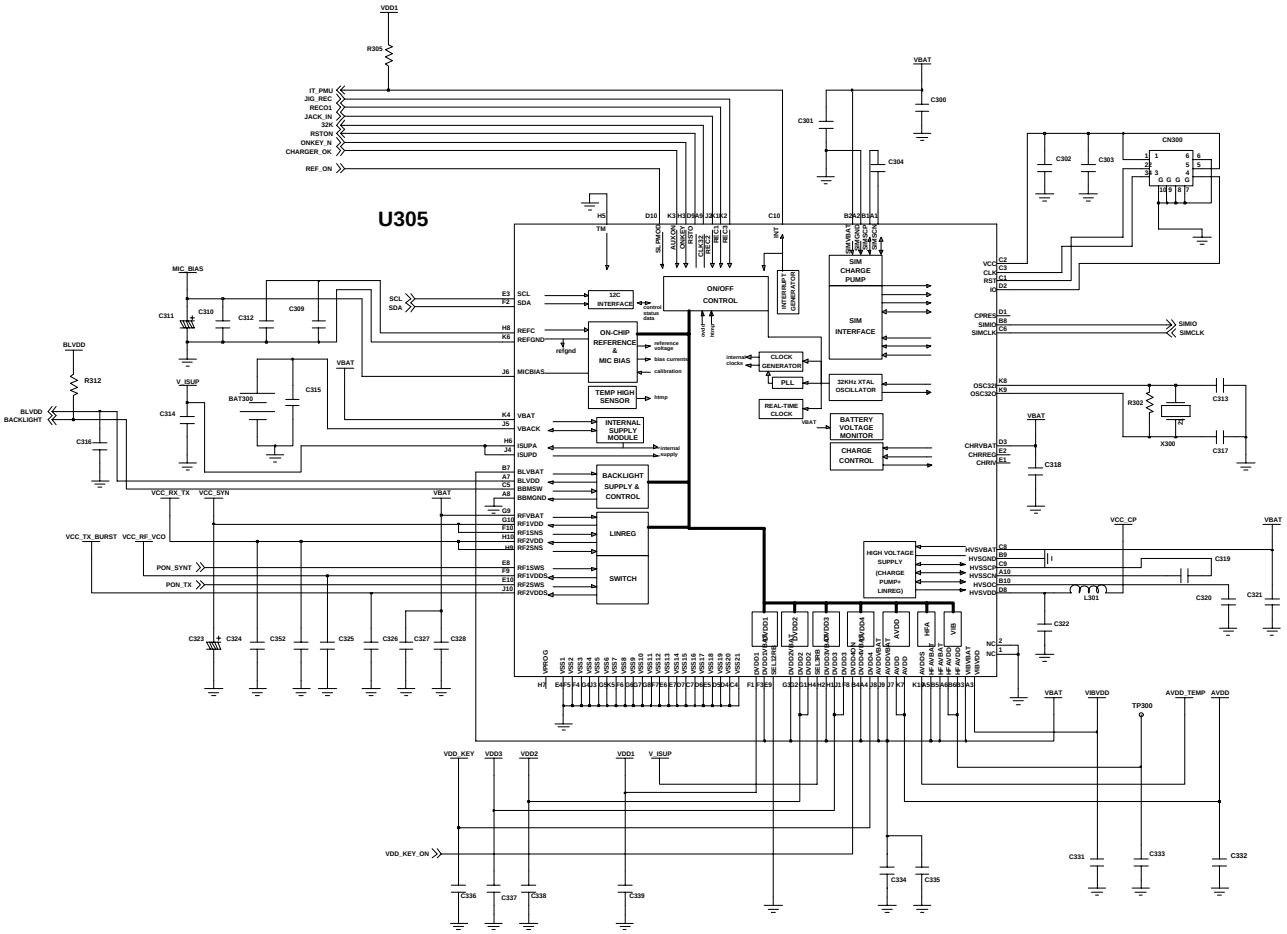
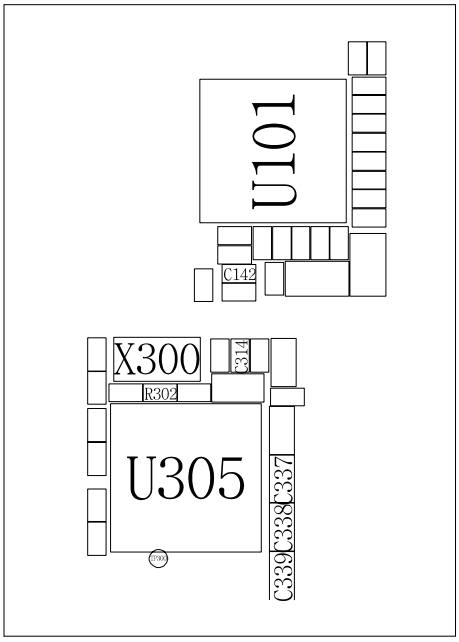
Power On



POWER MANAGERMENT UNIT(PMU IC)



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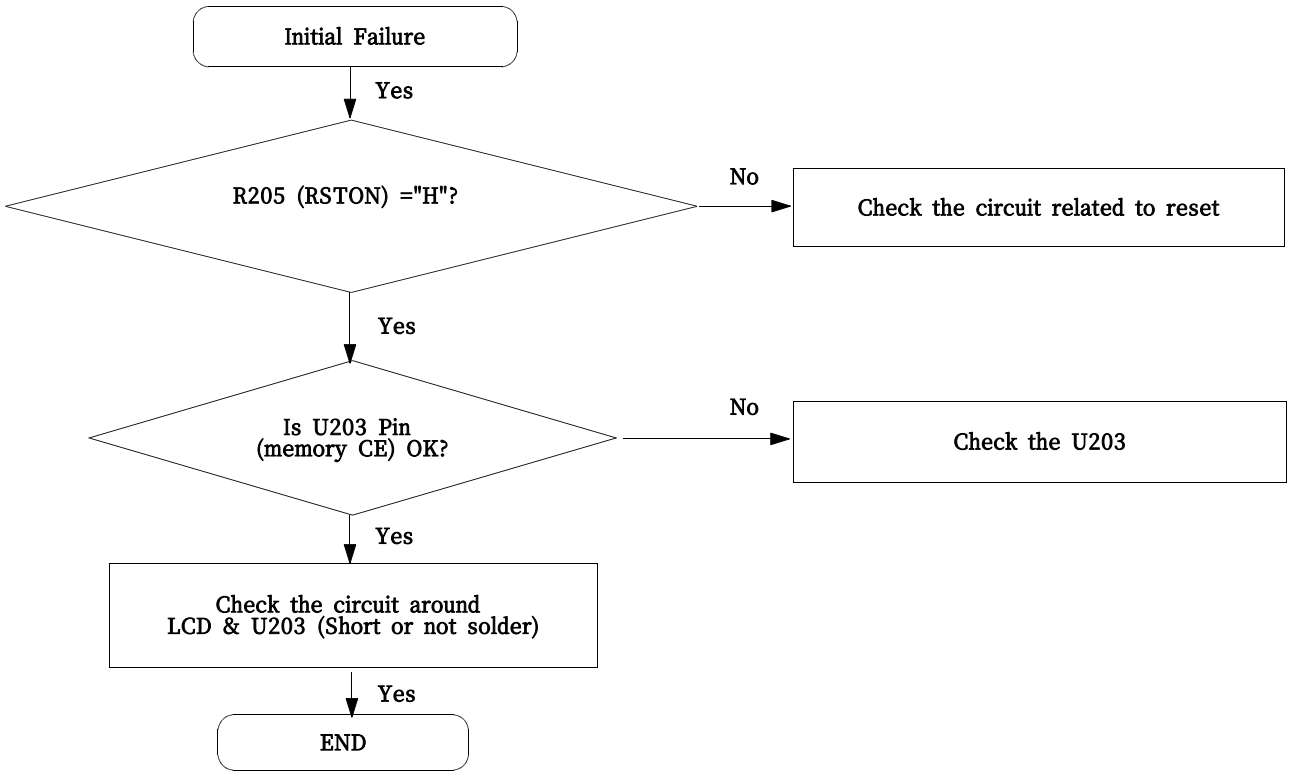
7-2. Initial



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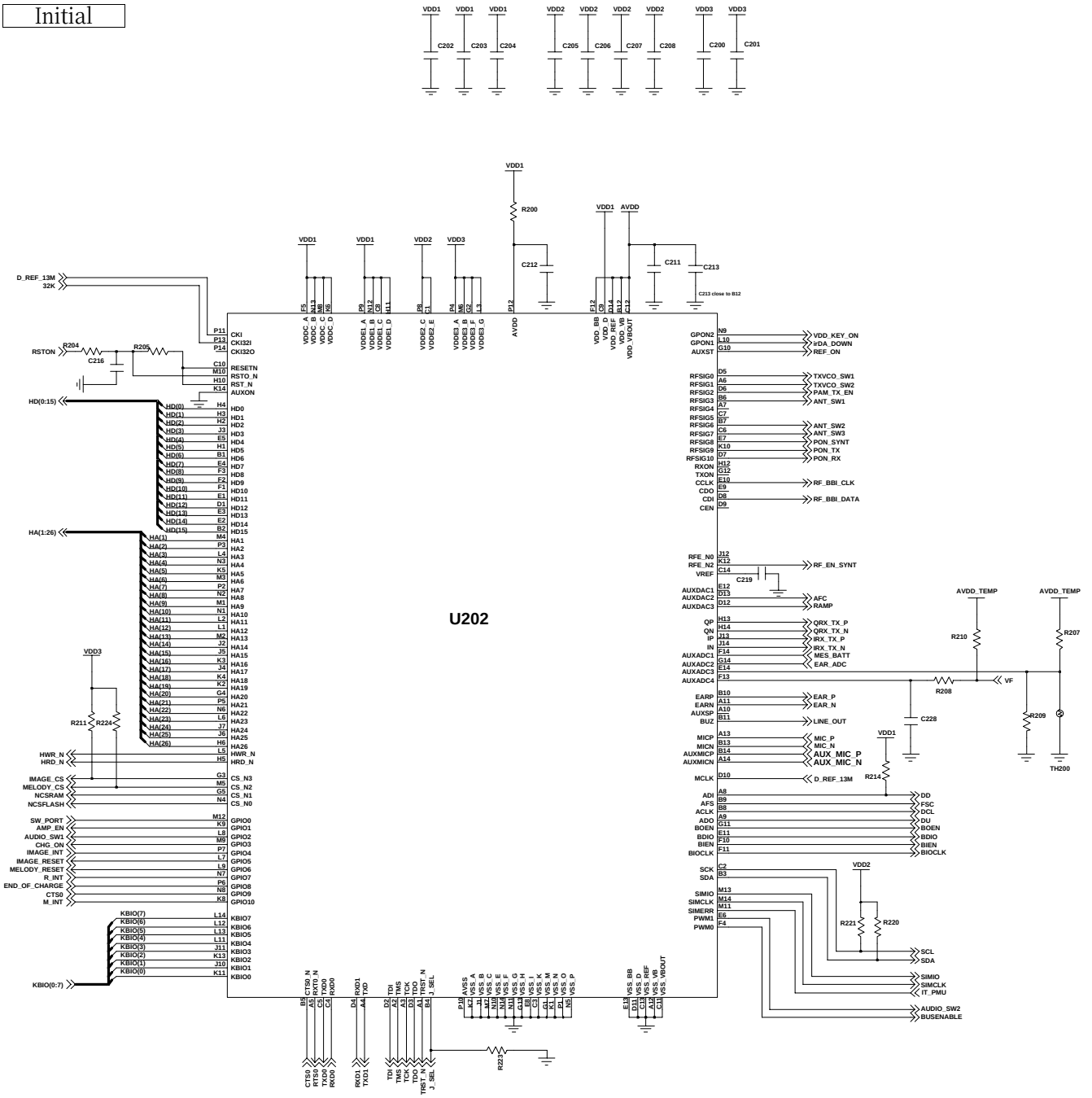
Initial



SYSOL3 GPRS MODEM

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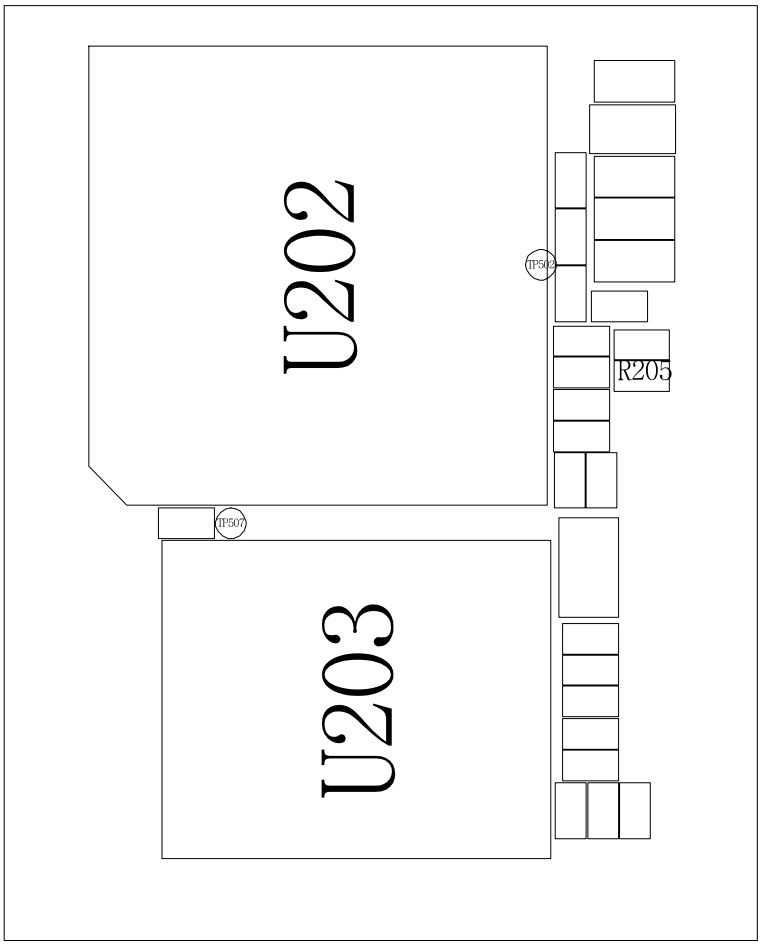

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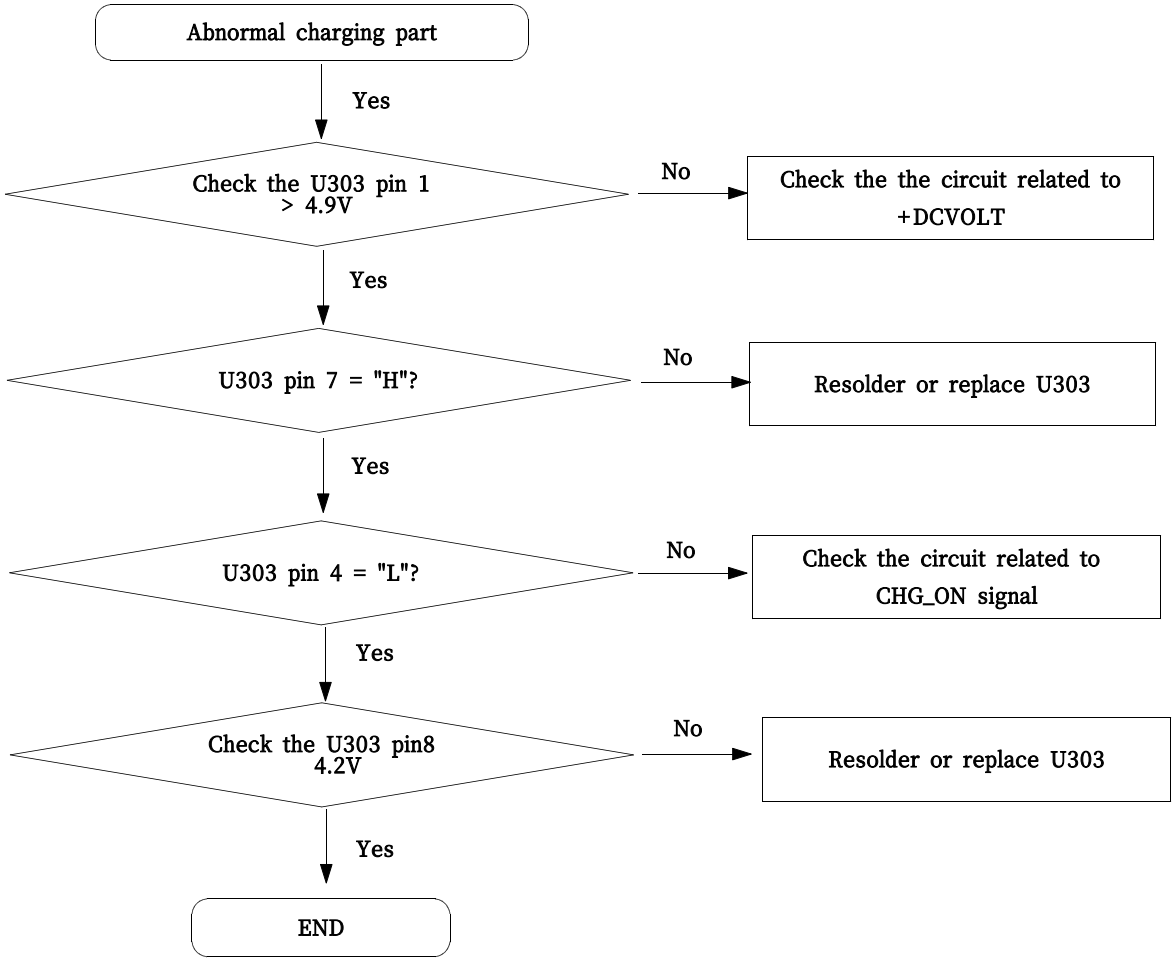
7-3. Charging Part



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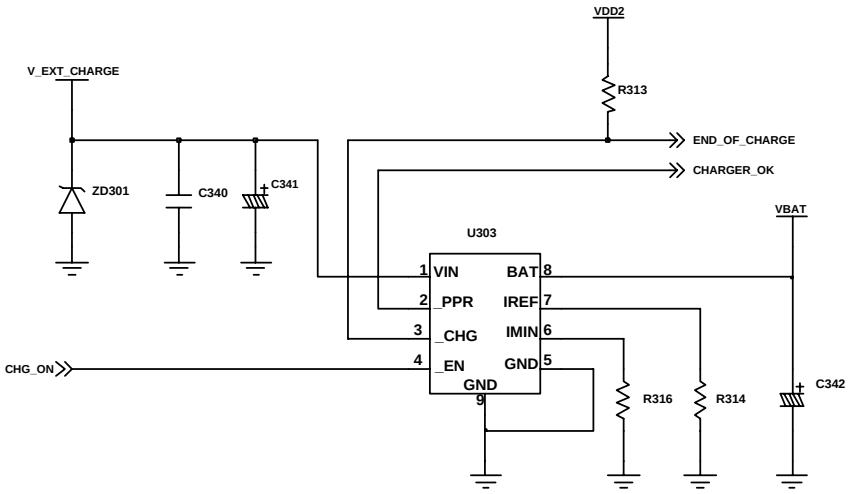
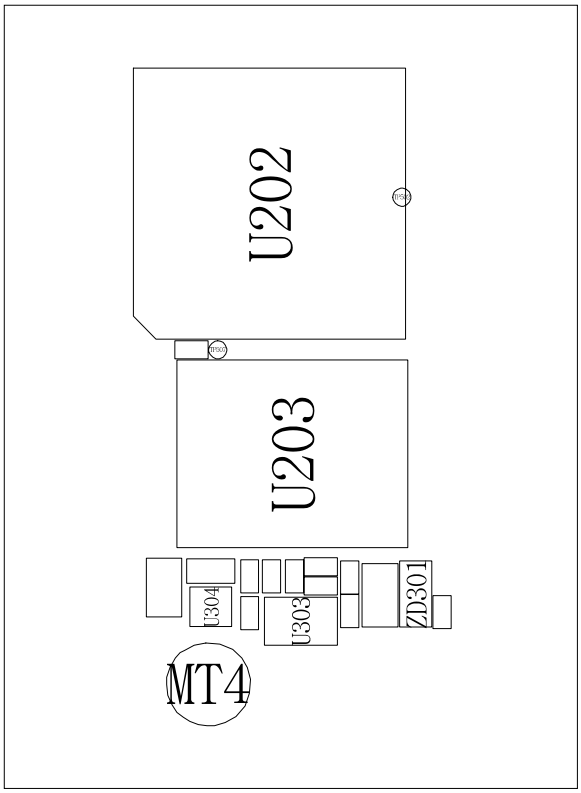
Charging



CHARGER IC



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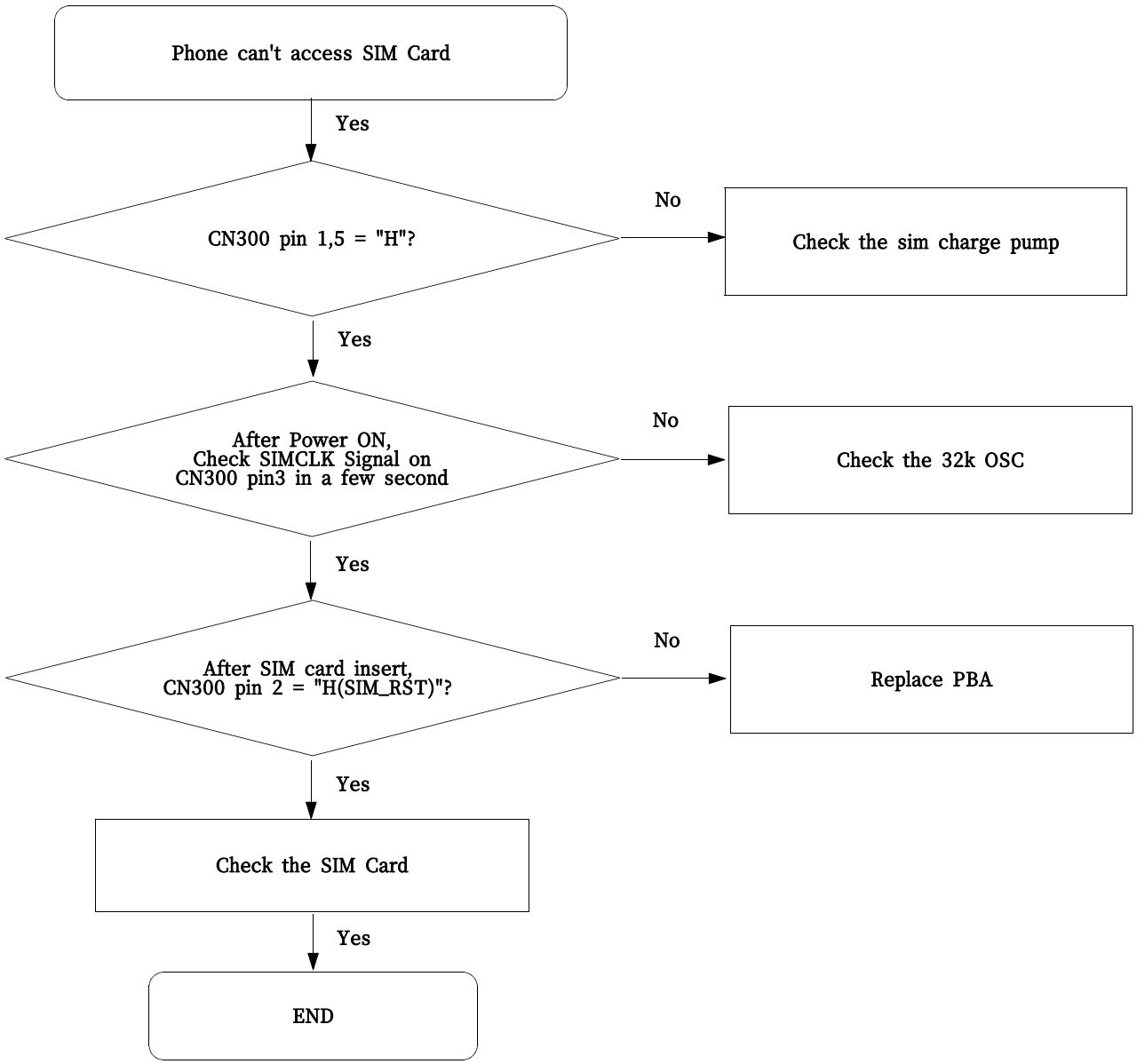
7-4. Sim Part



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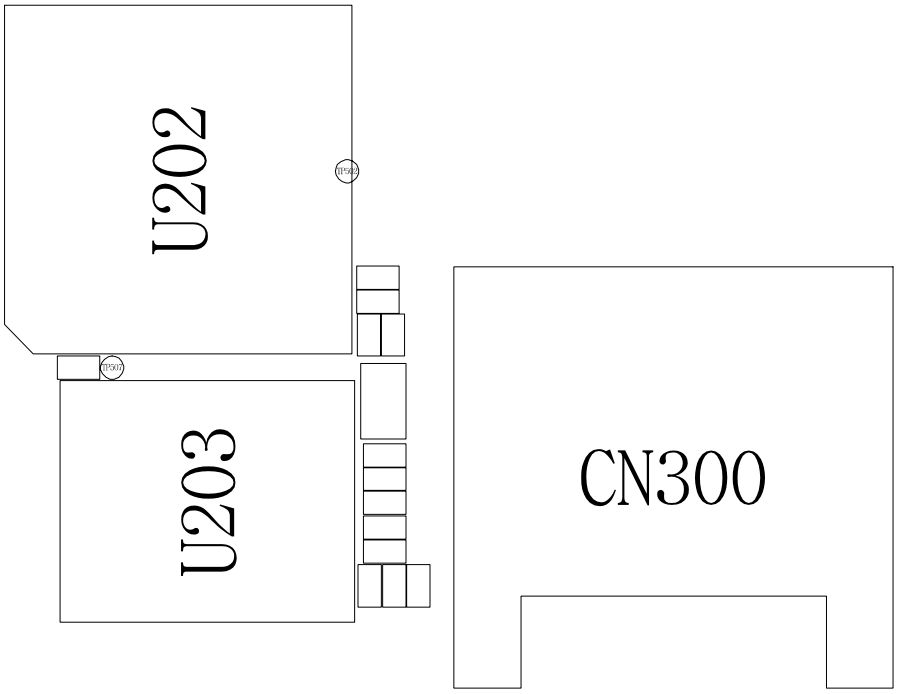

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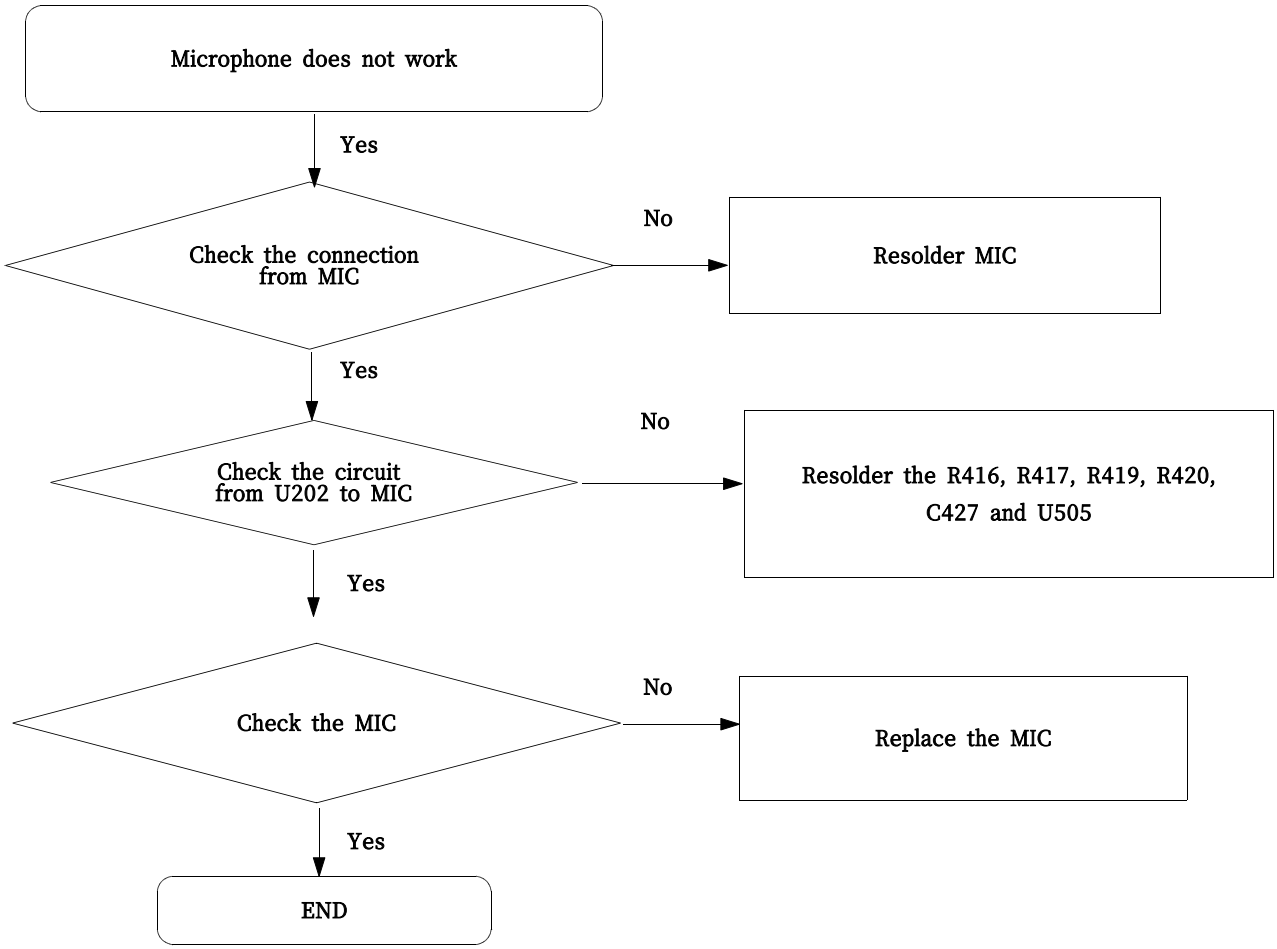
7-5. Microphone Part



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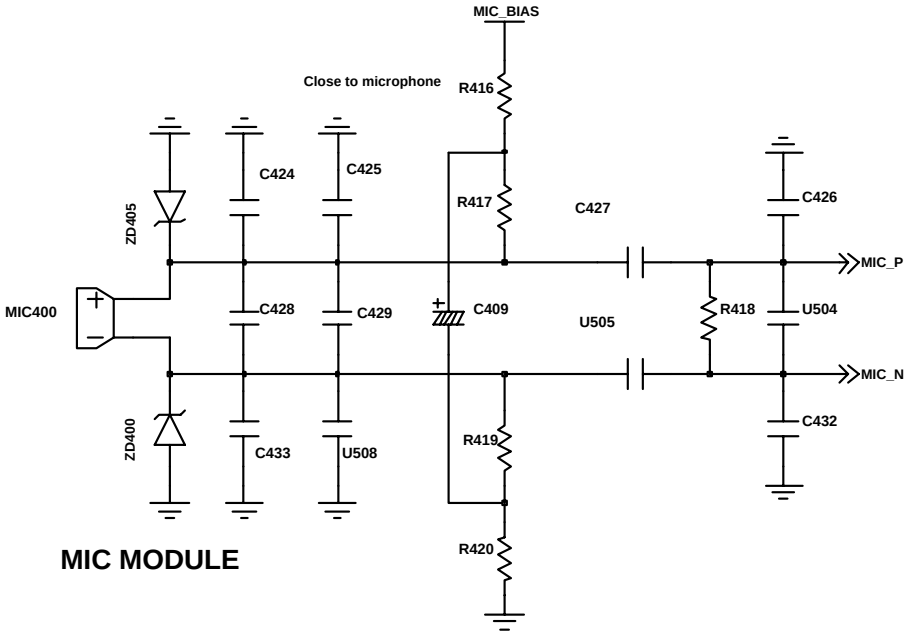
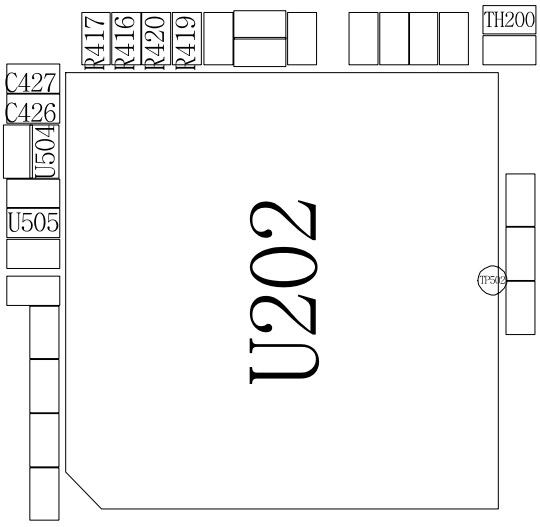
Microphone



MIC MODULE



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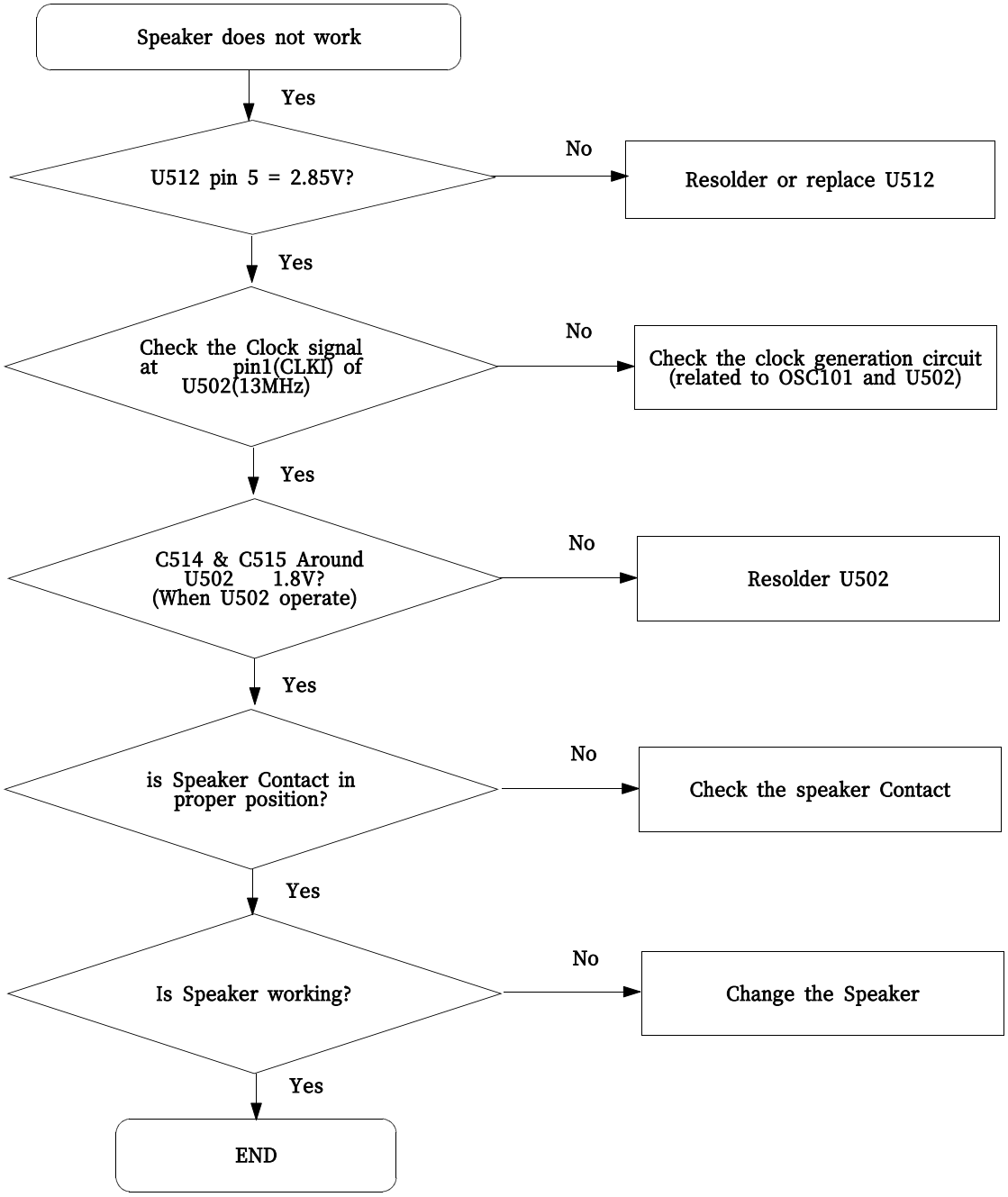
7-6. Speaker Part(Melody)



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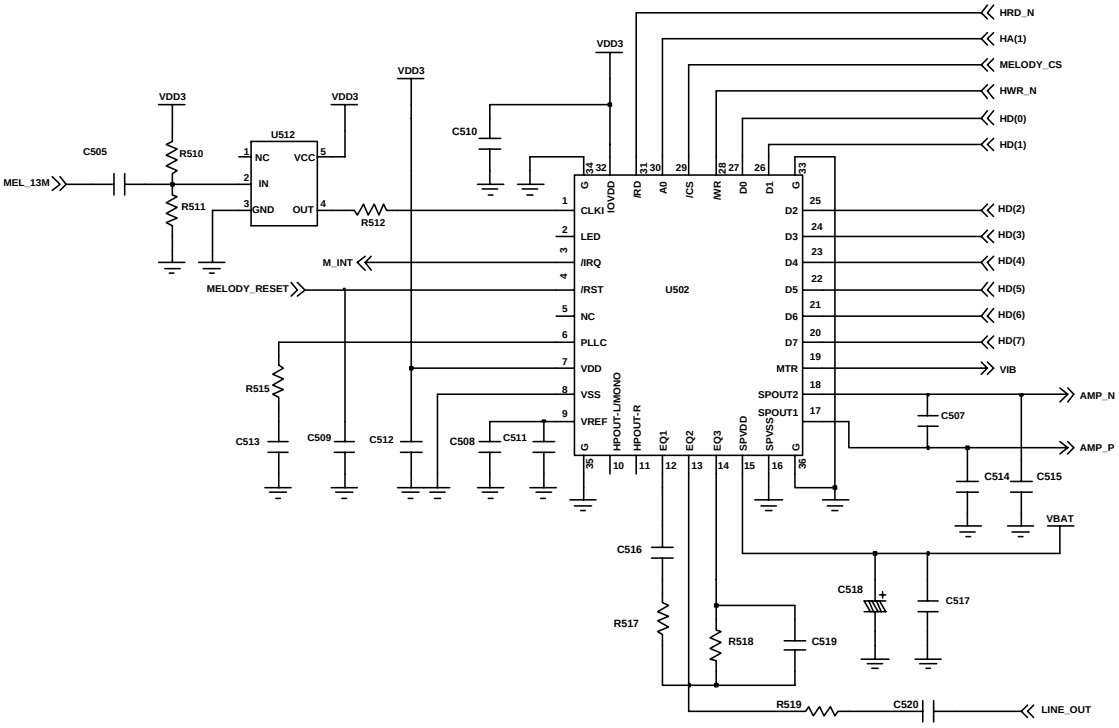
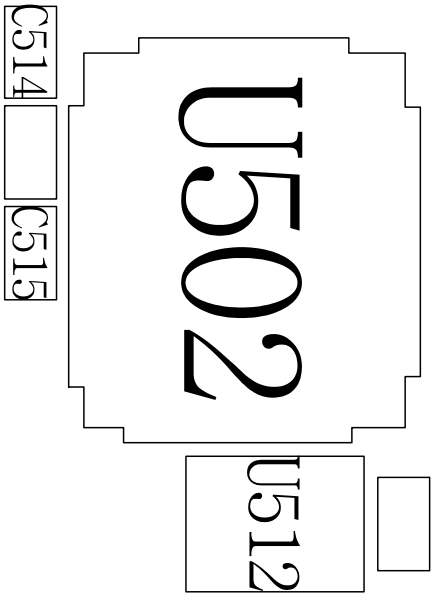
Speaker



MELODY IC



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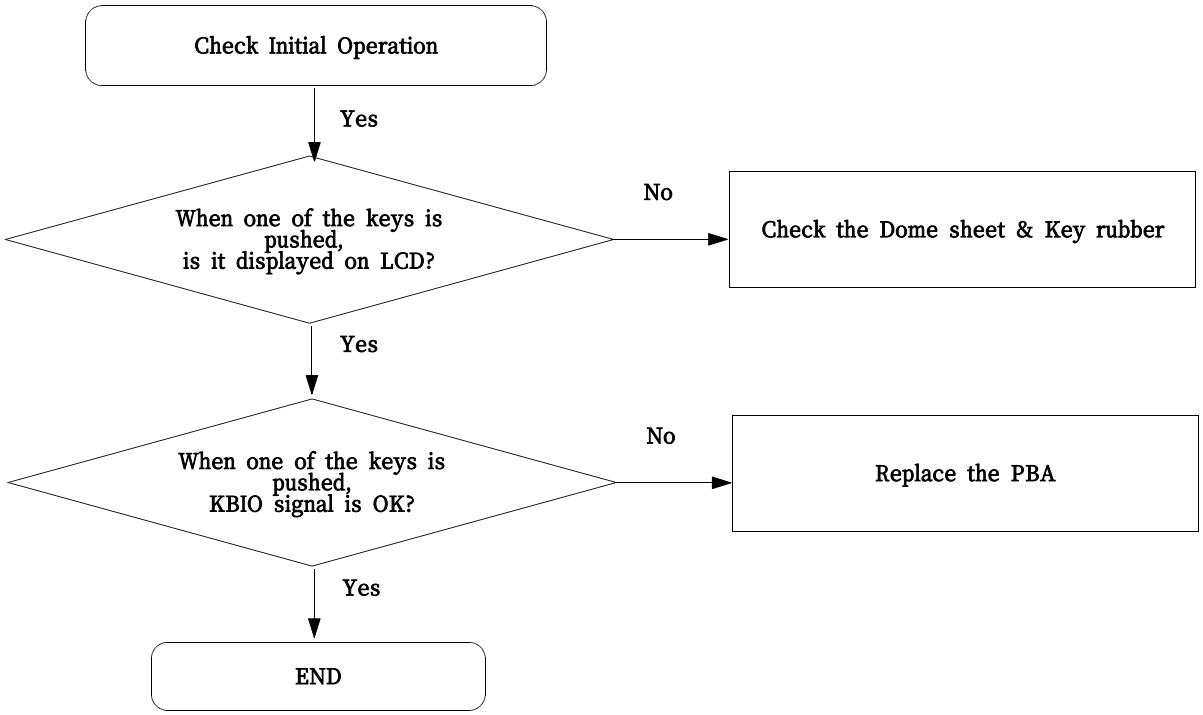
7-7. Key Data Input



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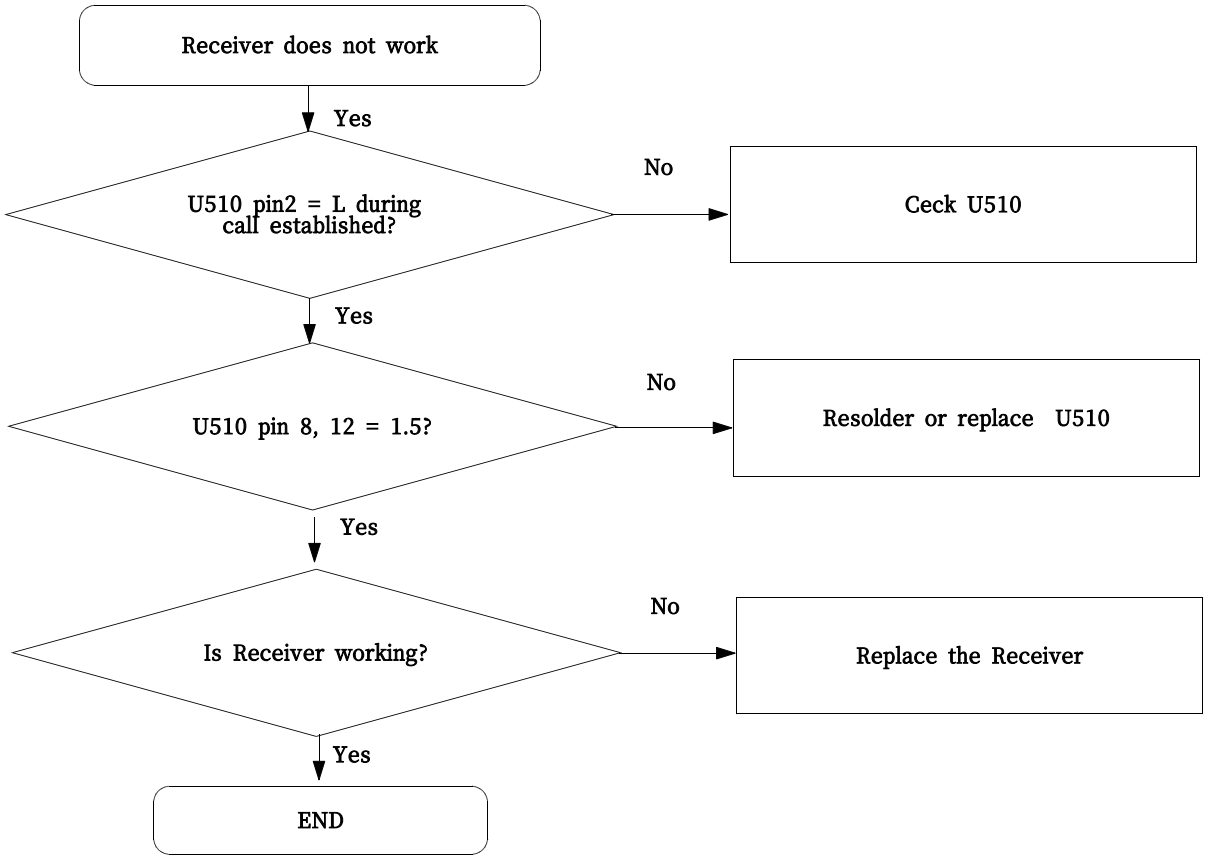
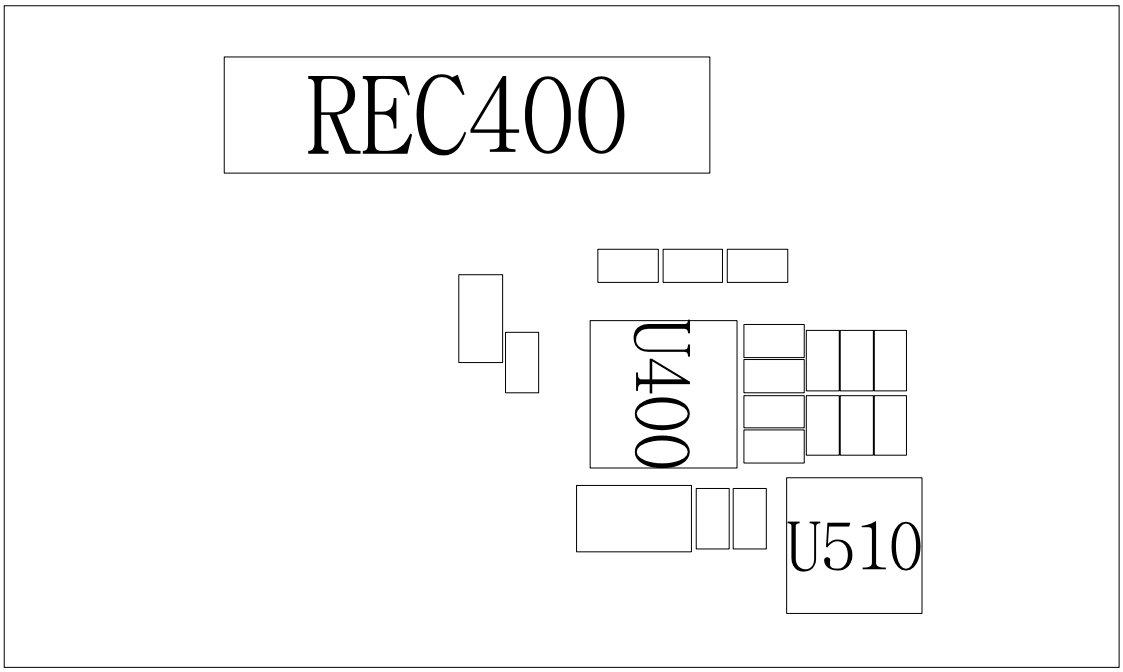
7-8. Receiver Part





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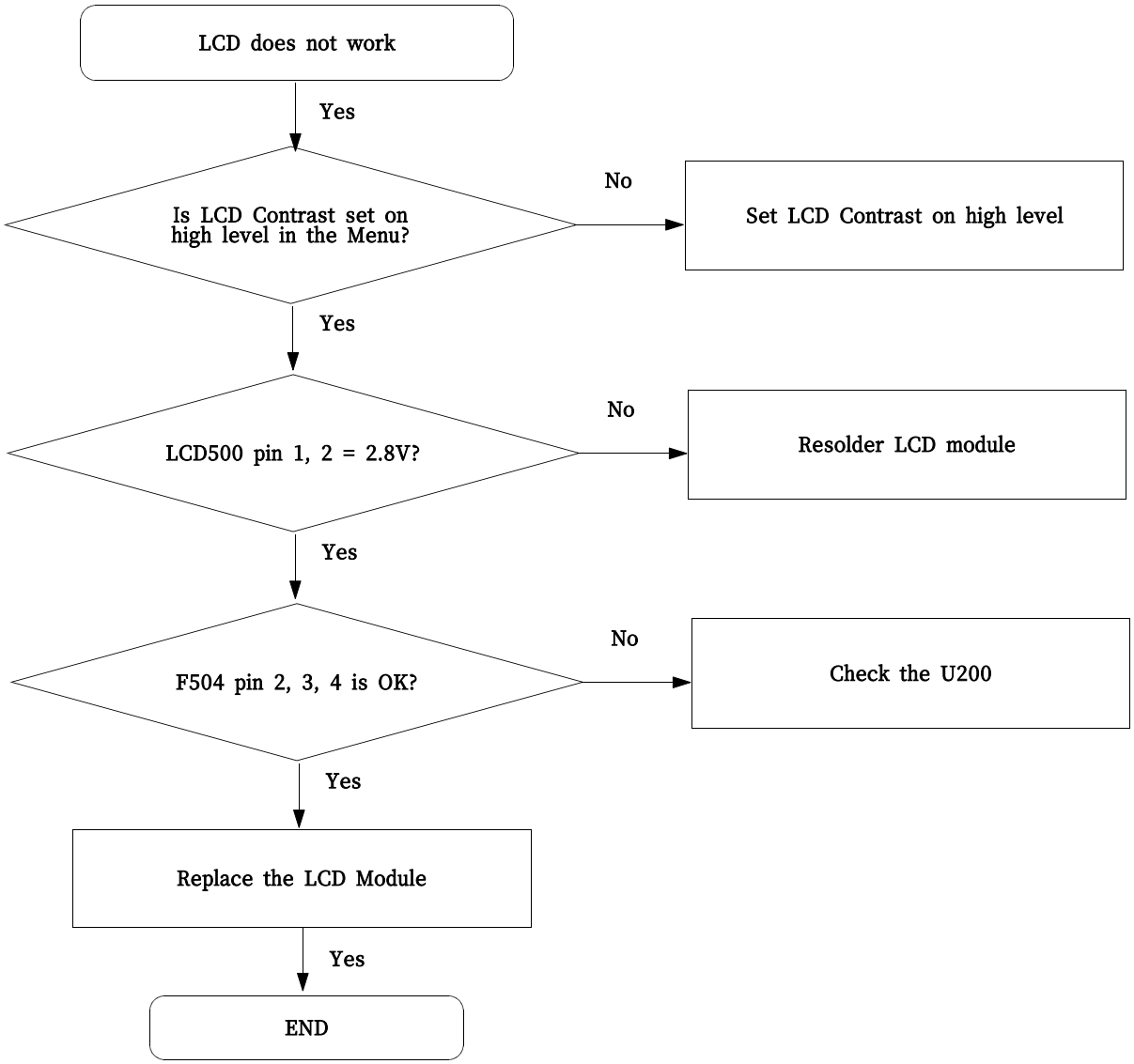
7-9. LCD Part (for Color Main)



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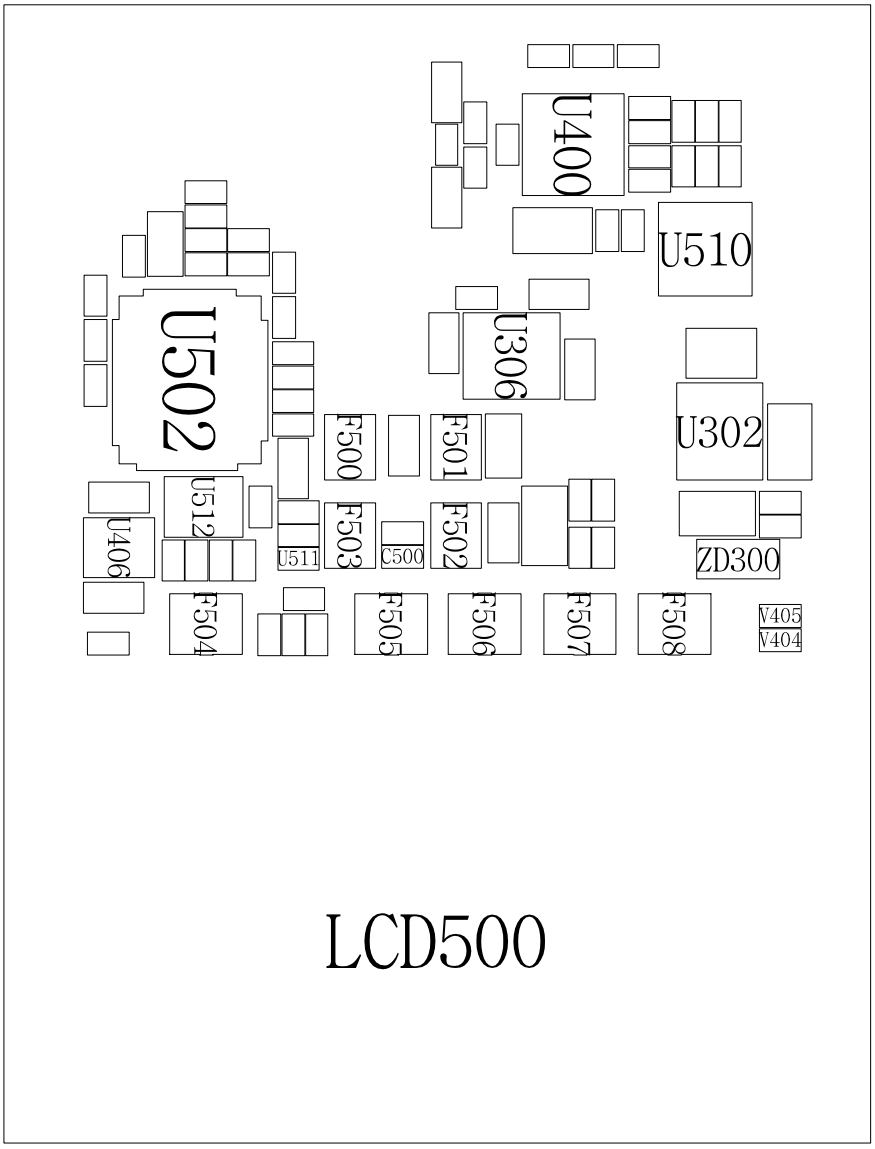

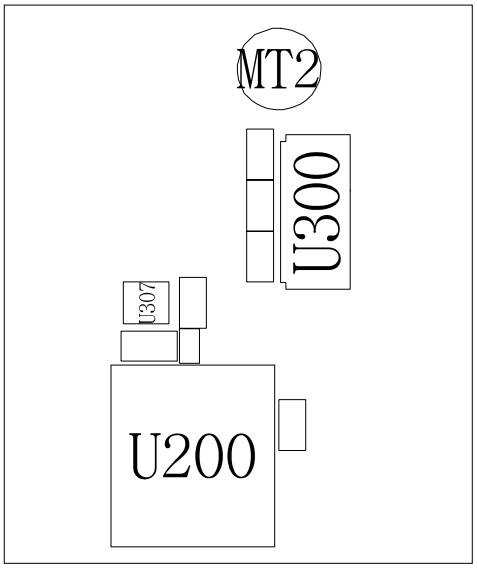

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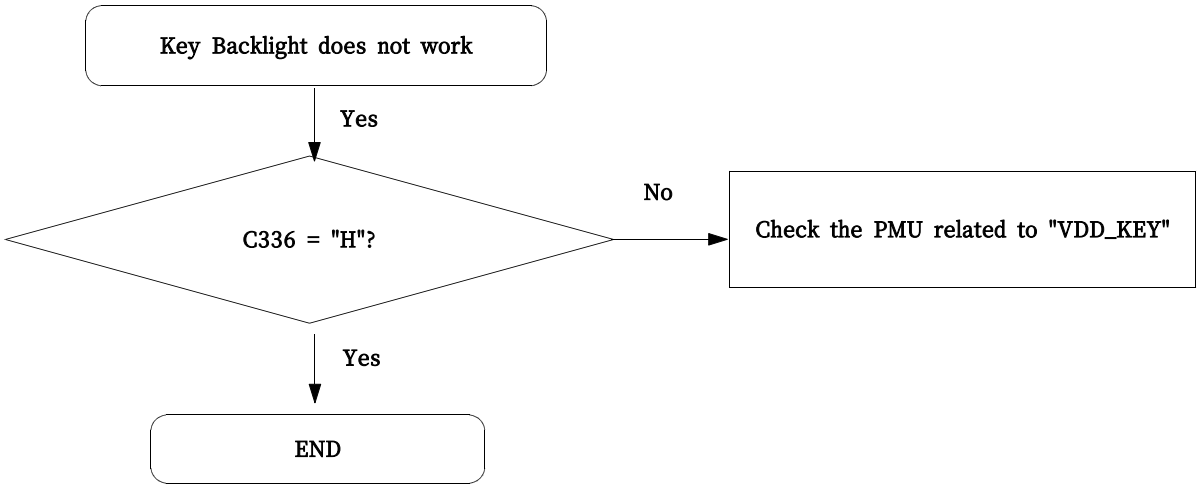
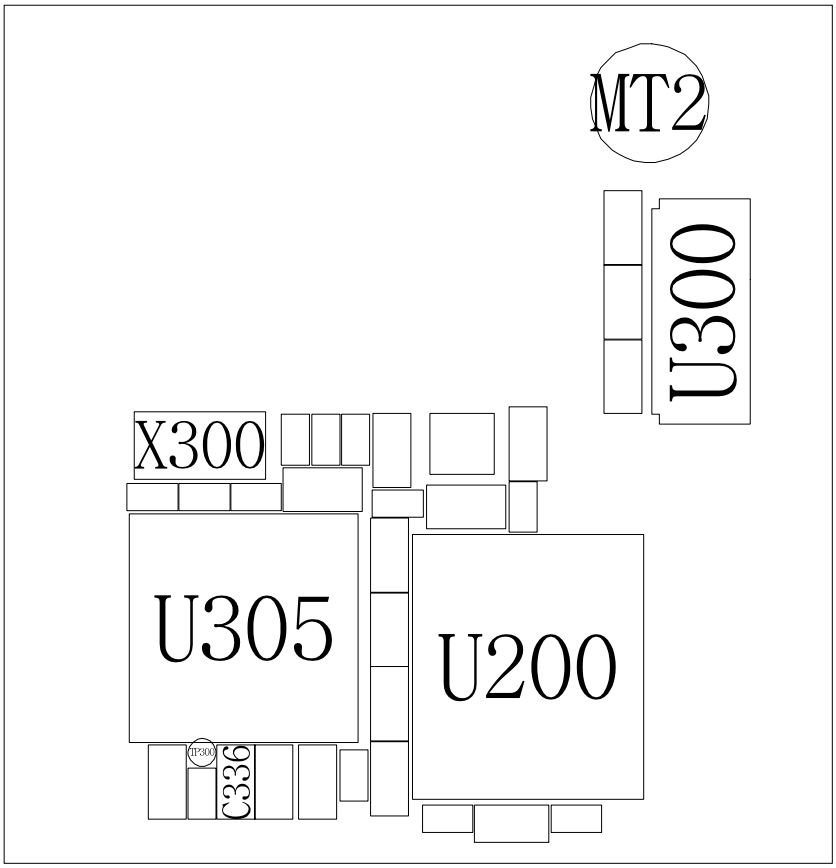
7-10. Key Back Light





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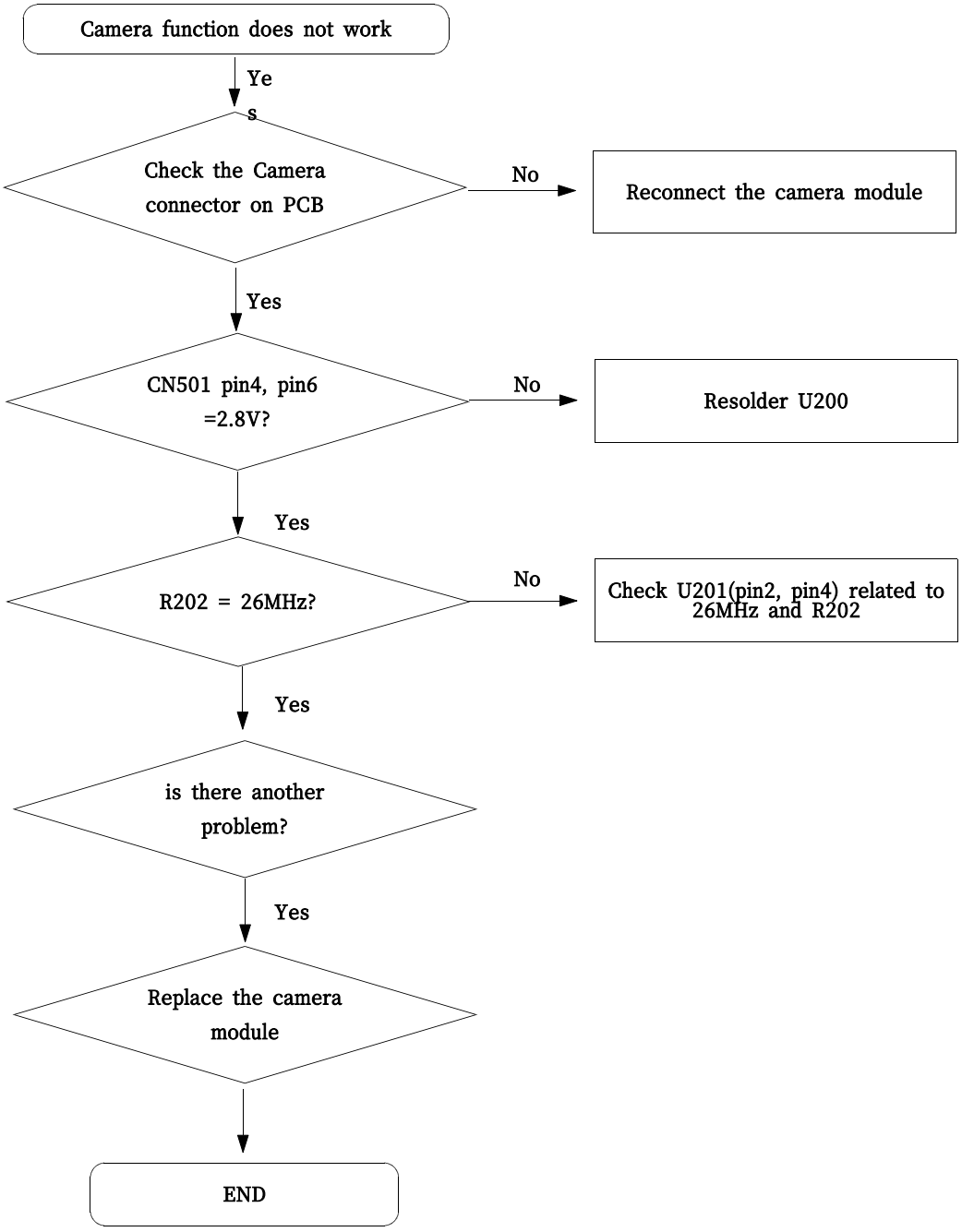
7-11. Camera part



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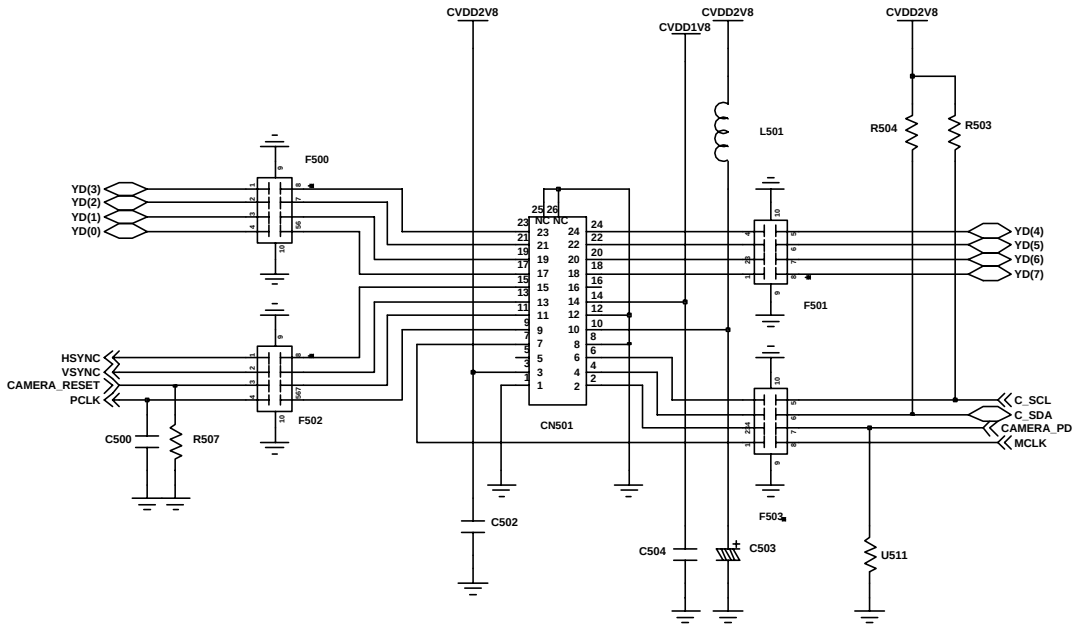
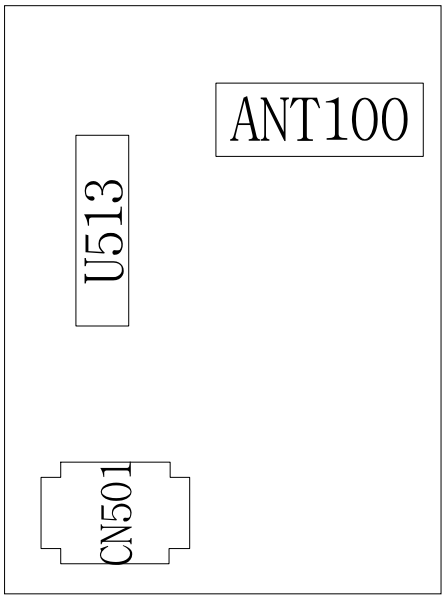
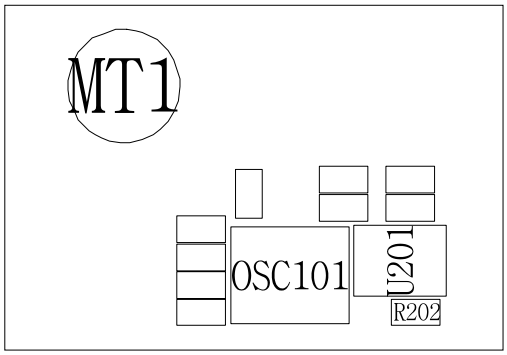
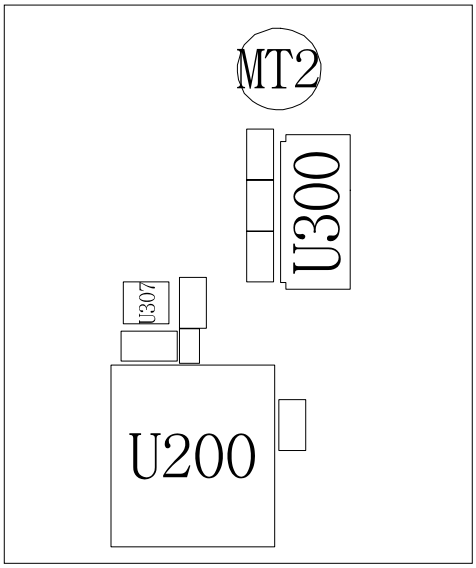


SEMCO CAMERA(AU60E)







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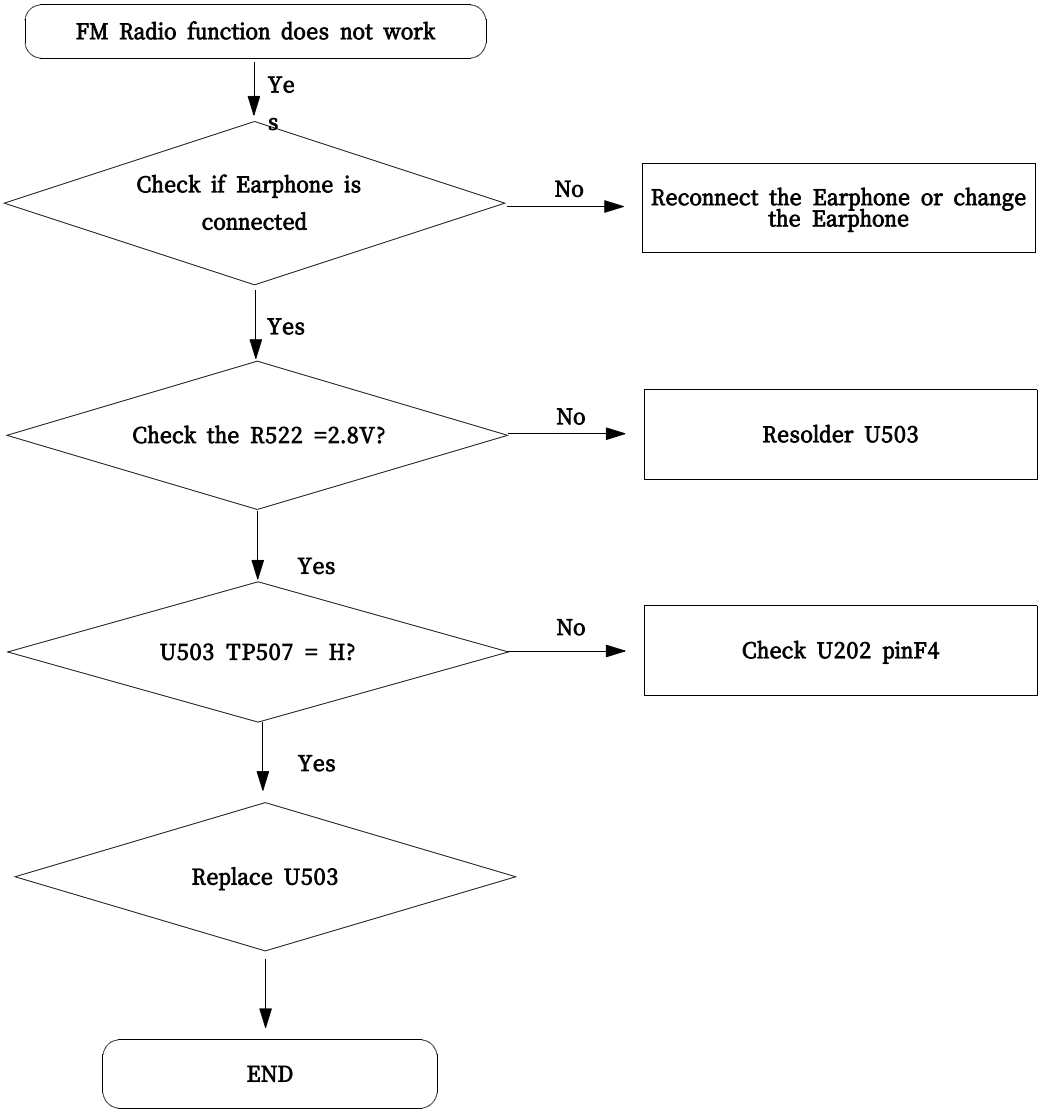
7-12. FM Radio part



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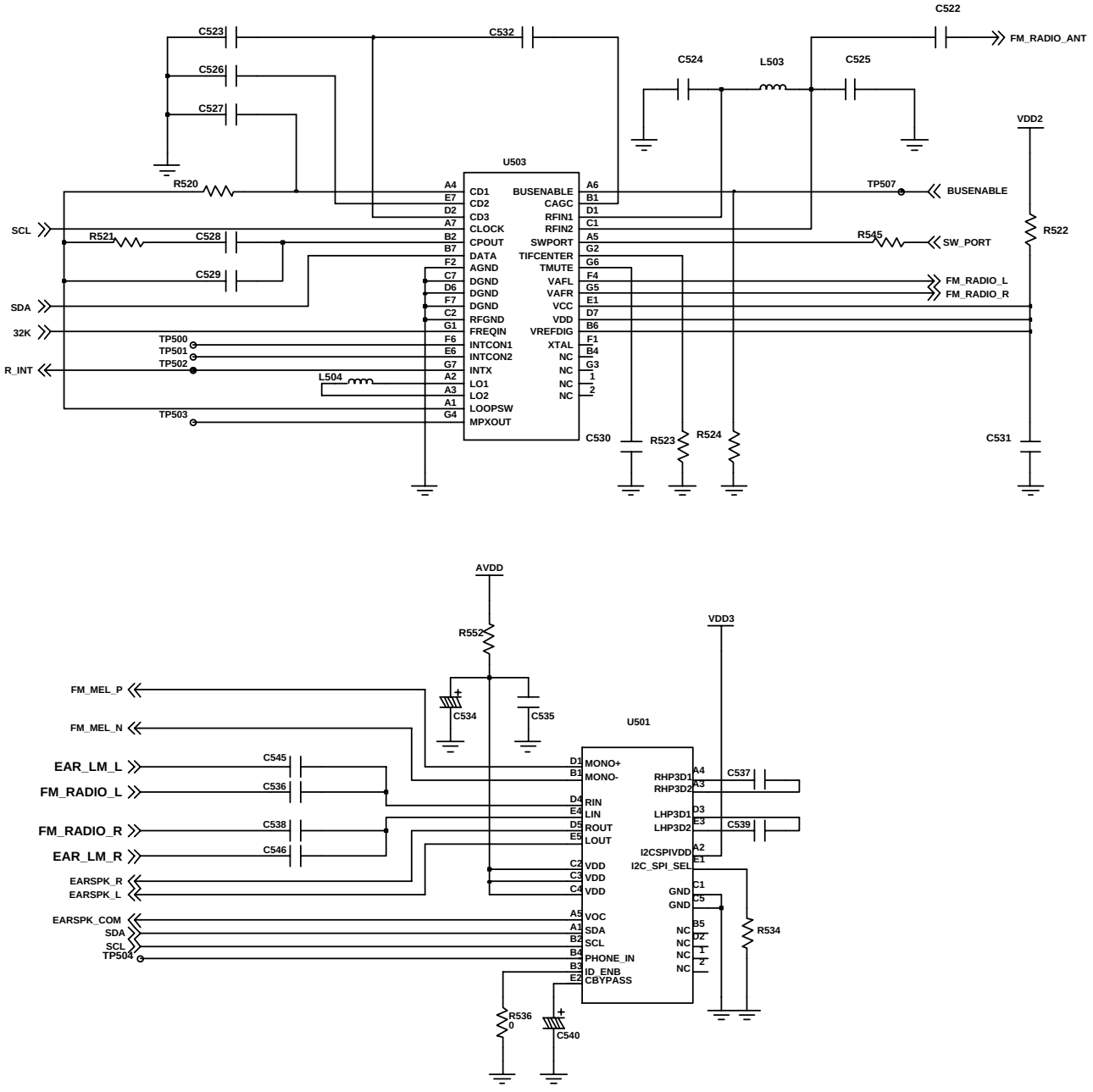

FM RADIO

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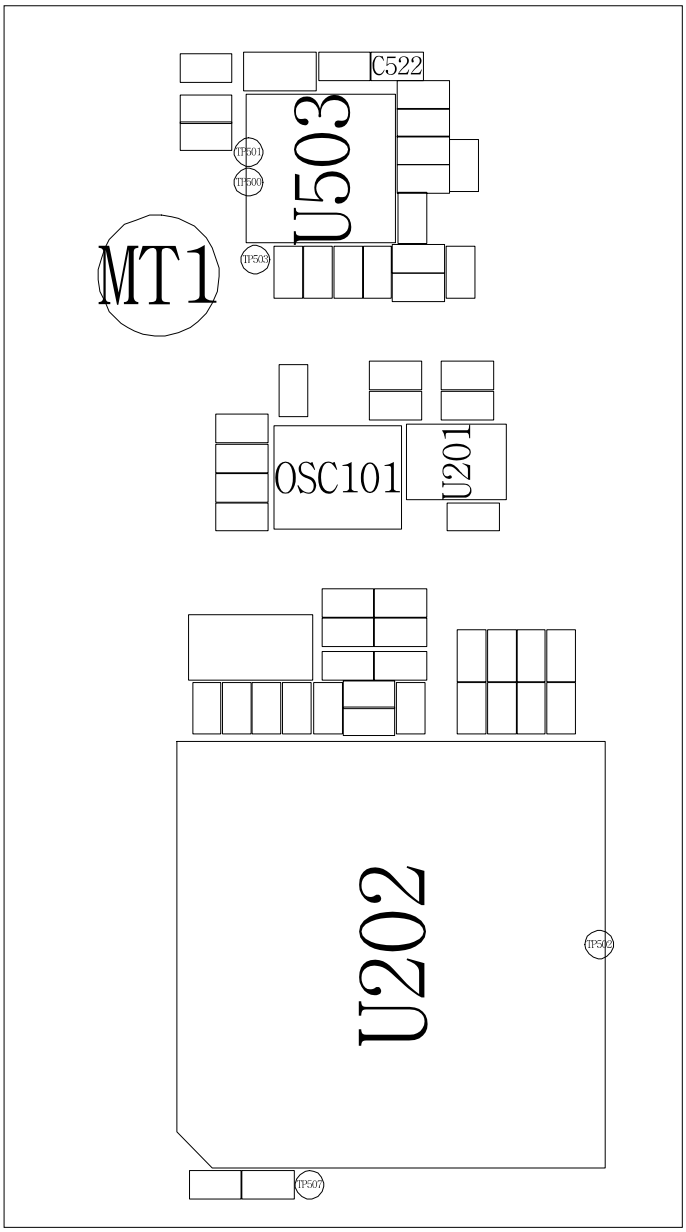

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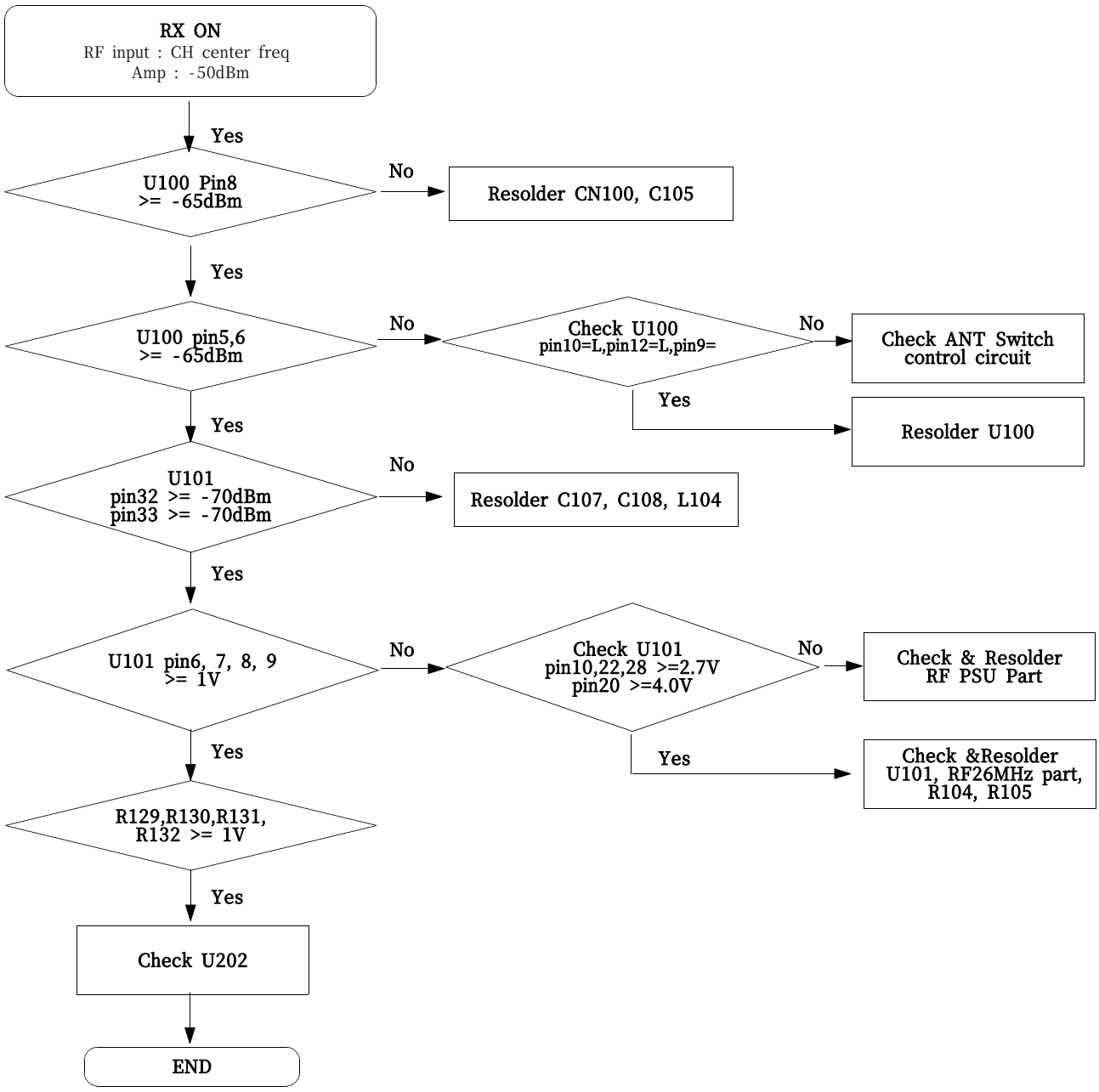
7-13. GSM Receiver



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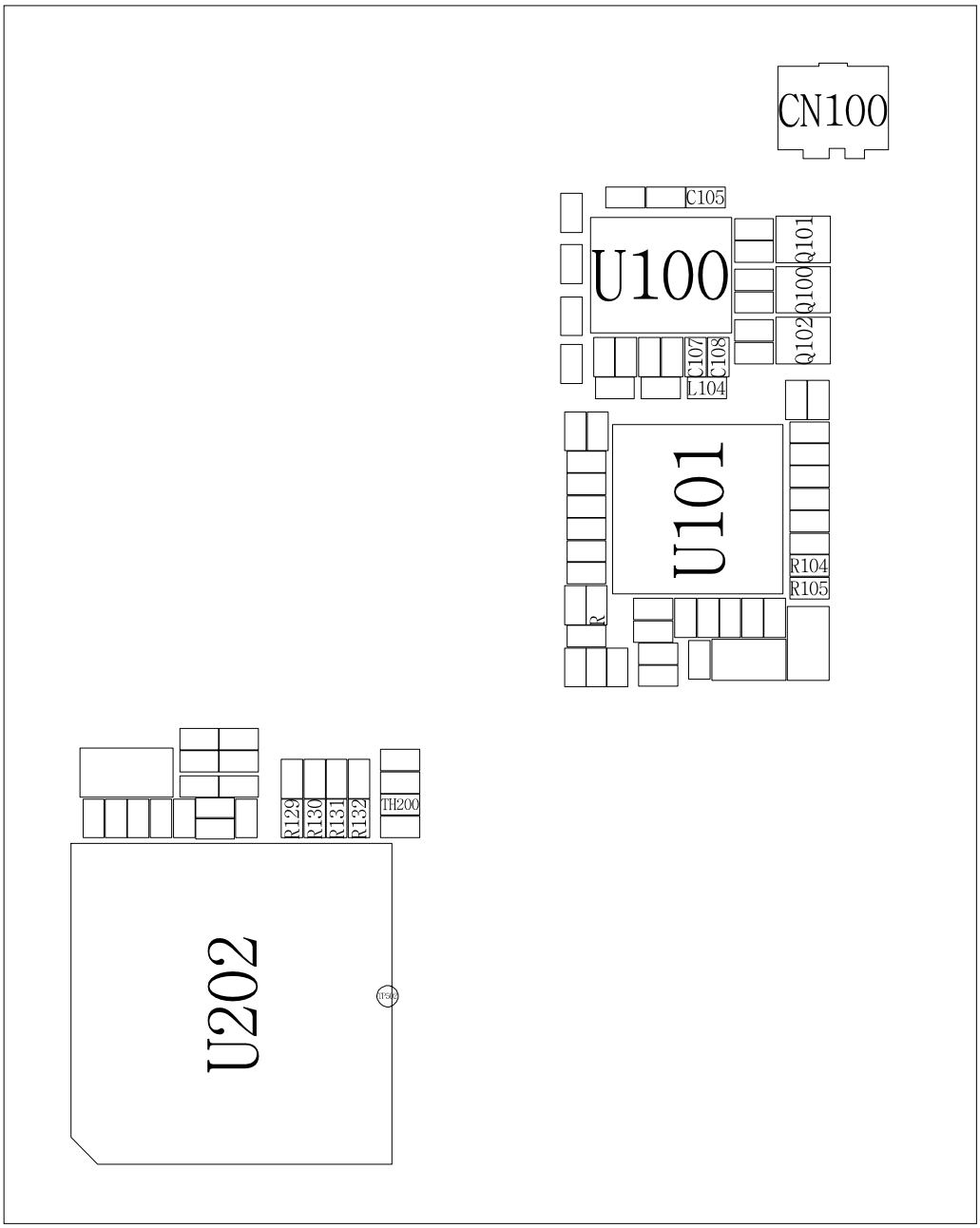

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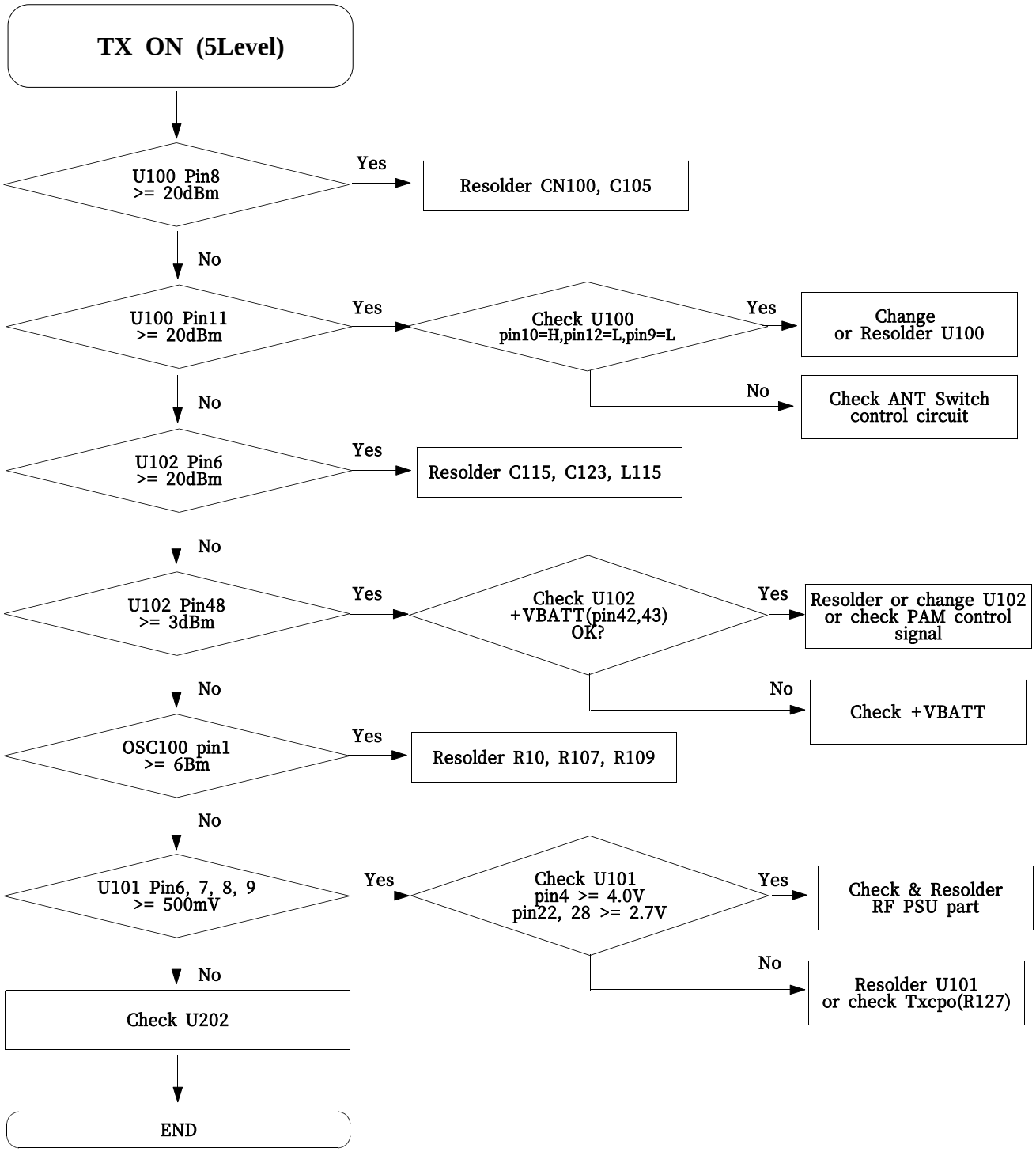
7-14. GSM Transmitter



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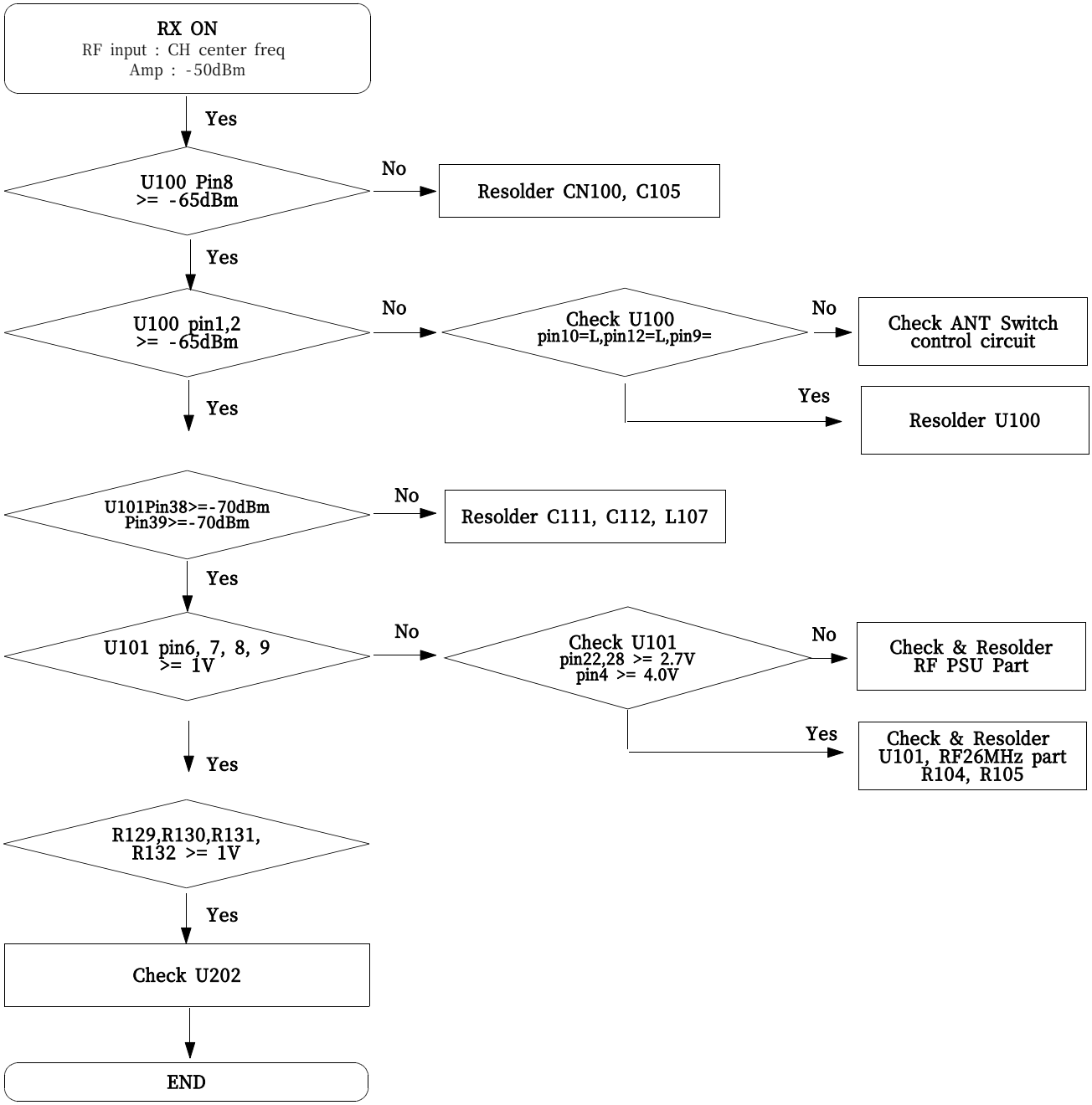
7-15. DCS Receiver



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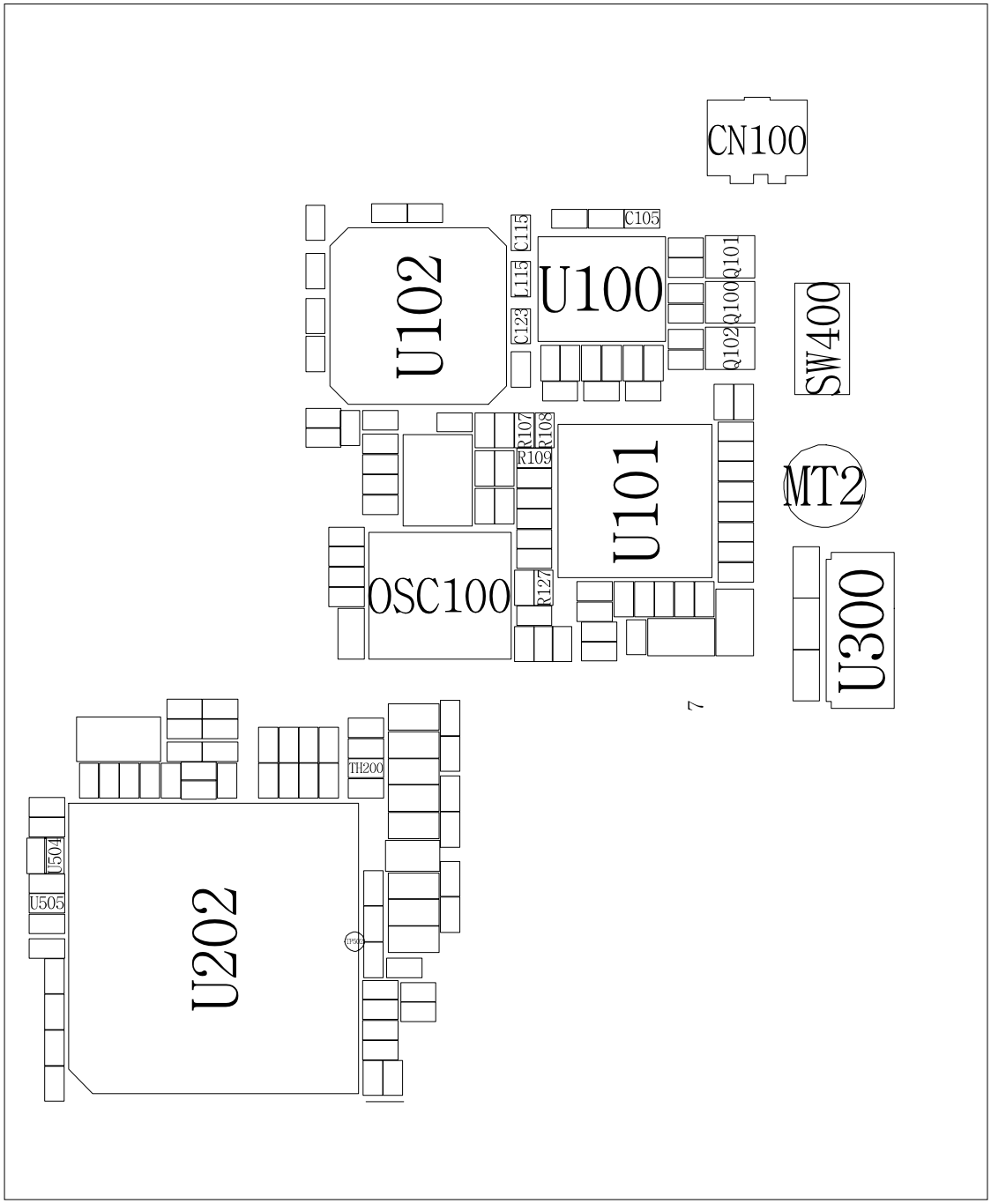

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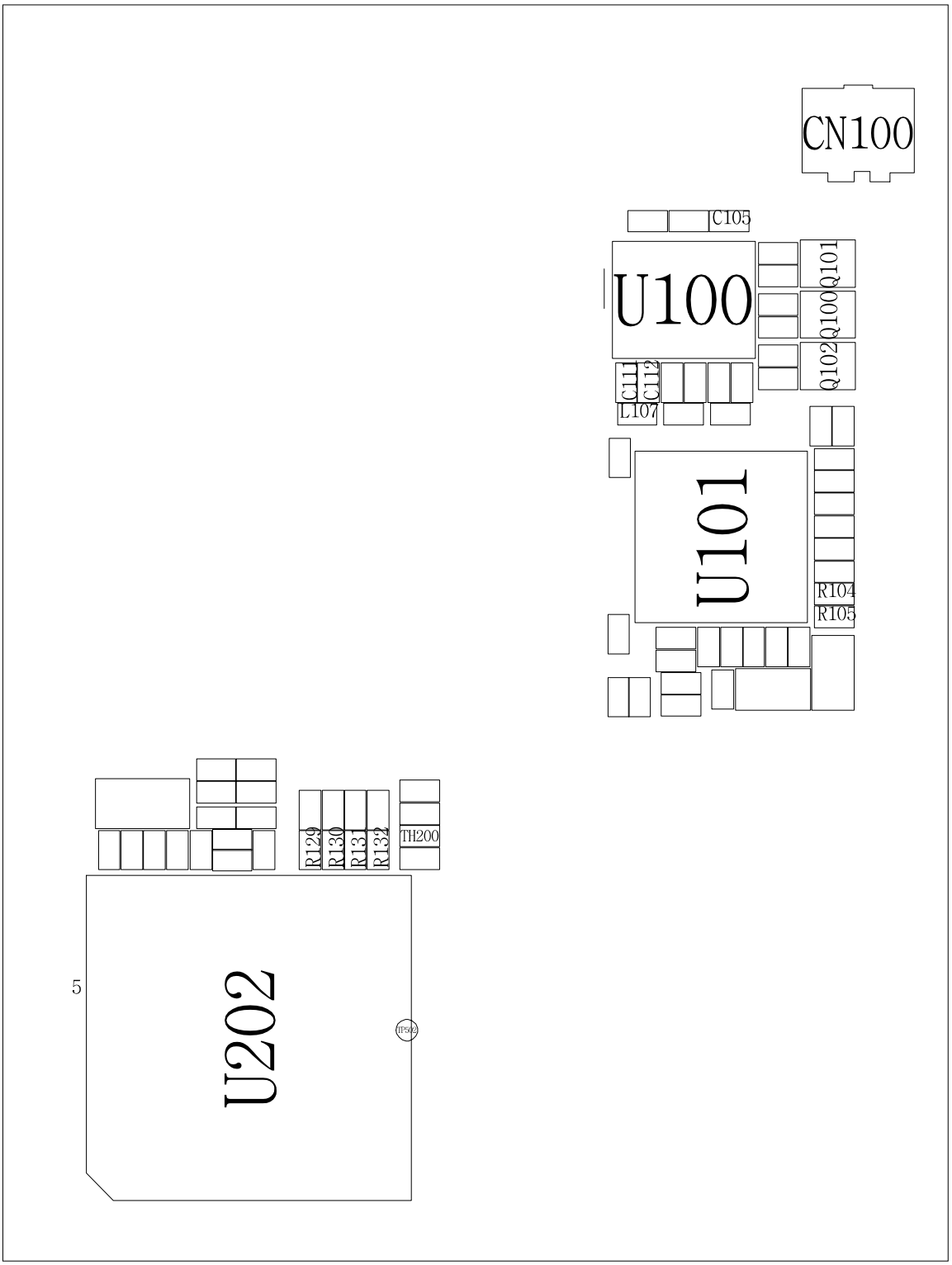

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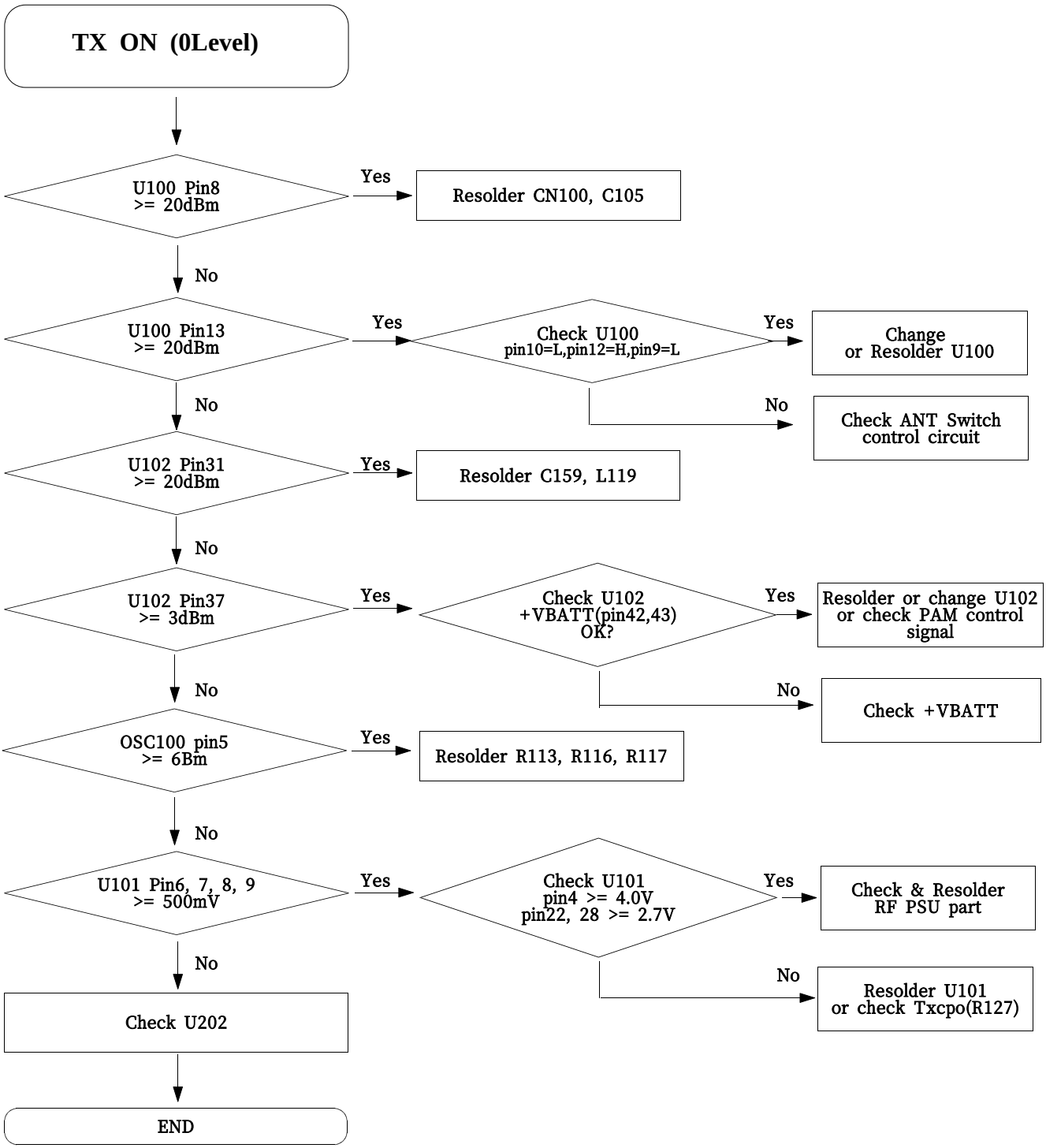
7-16. DCS Transmitter



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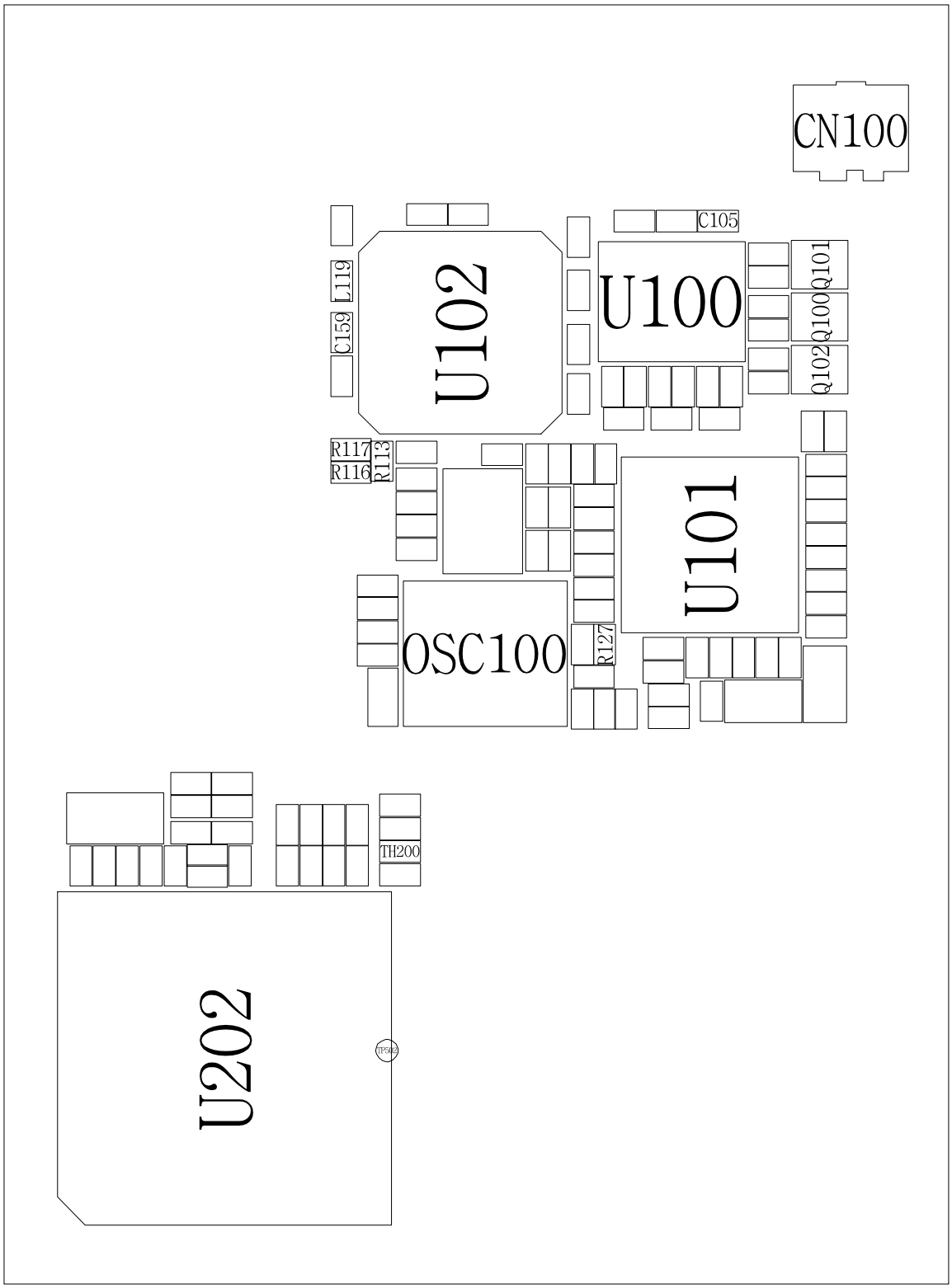

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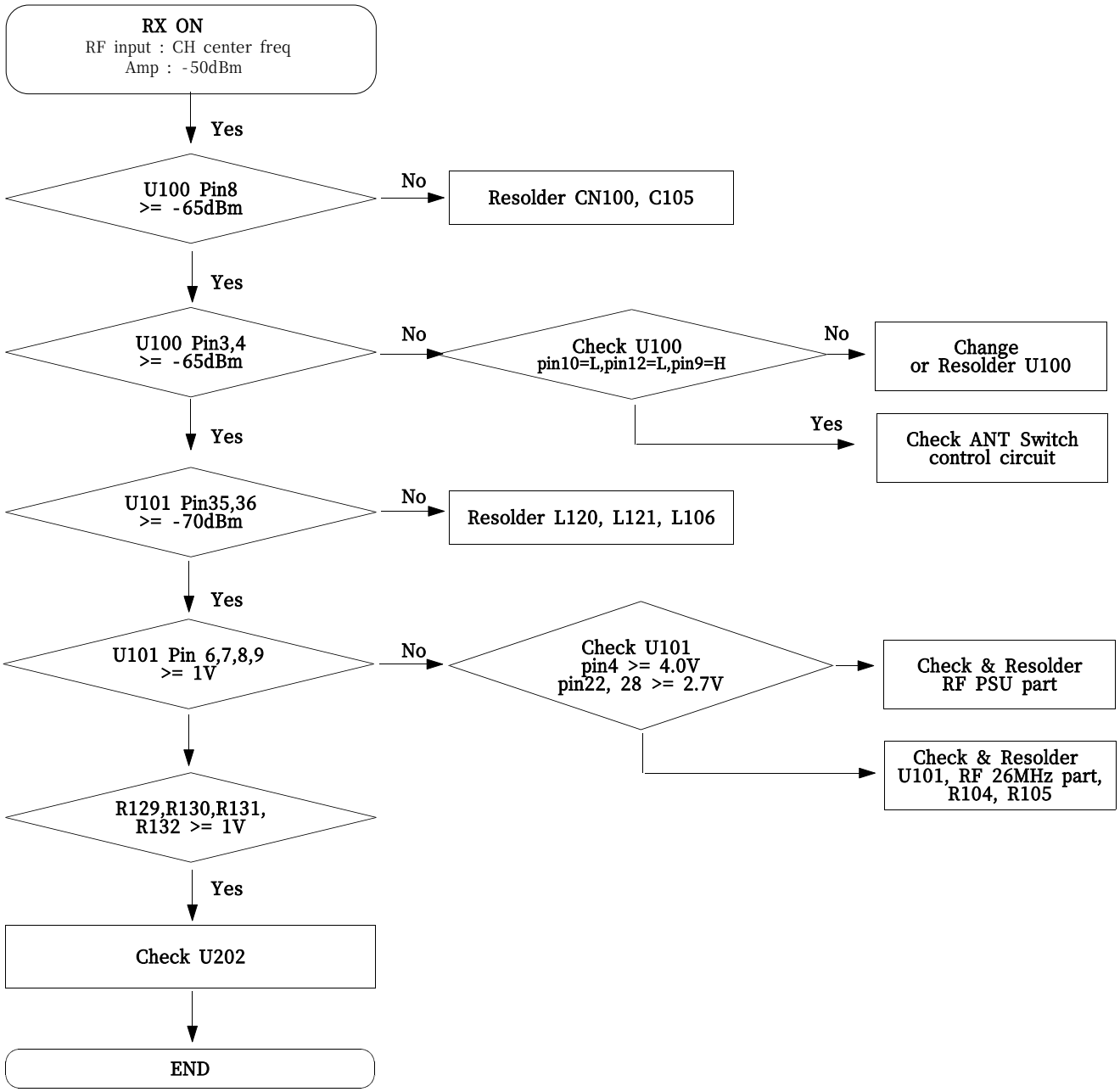
7-17. PCS Receiver



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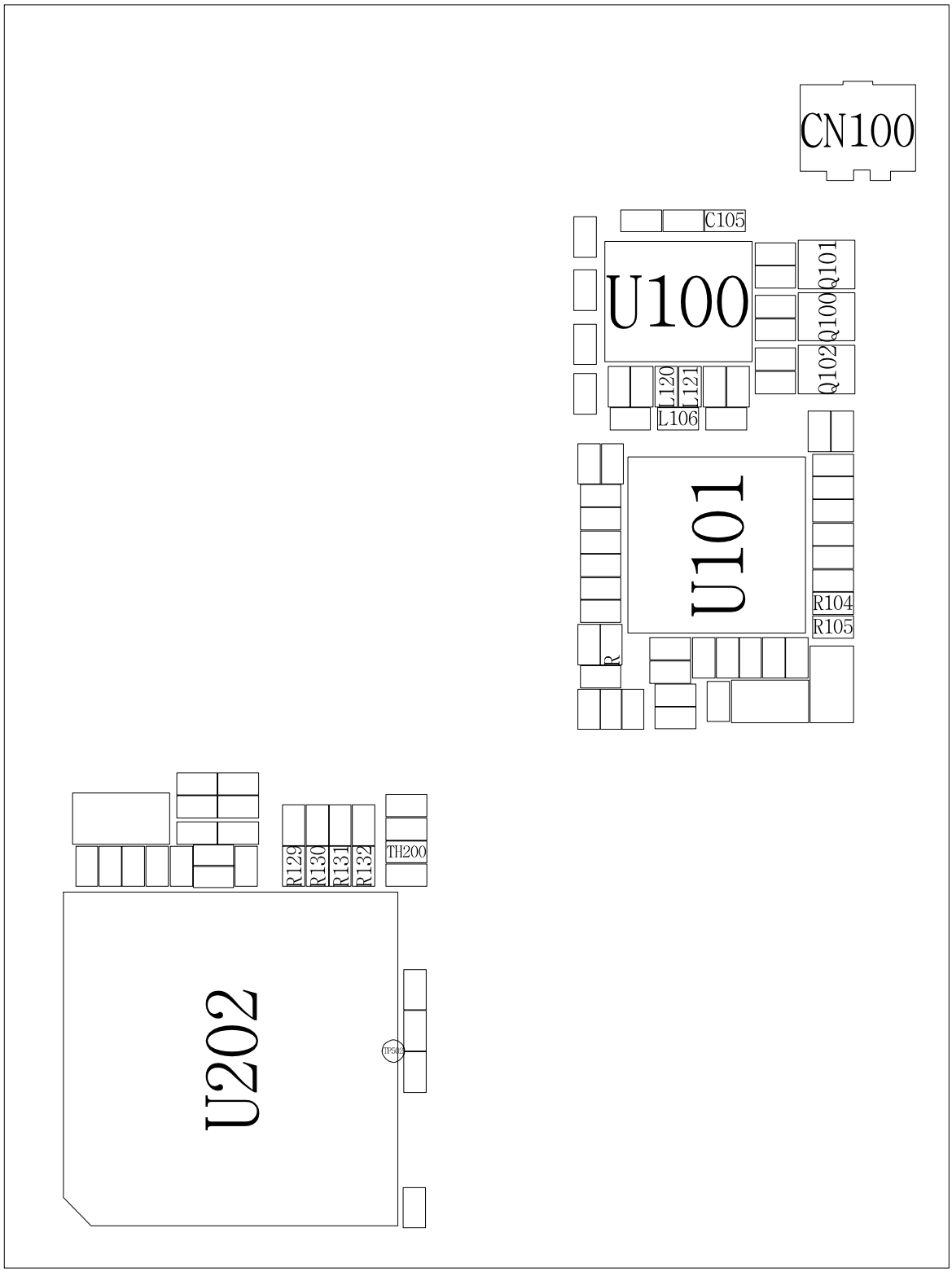

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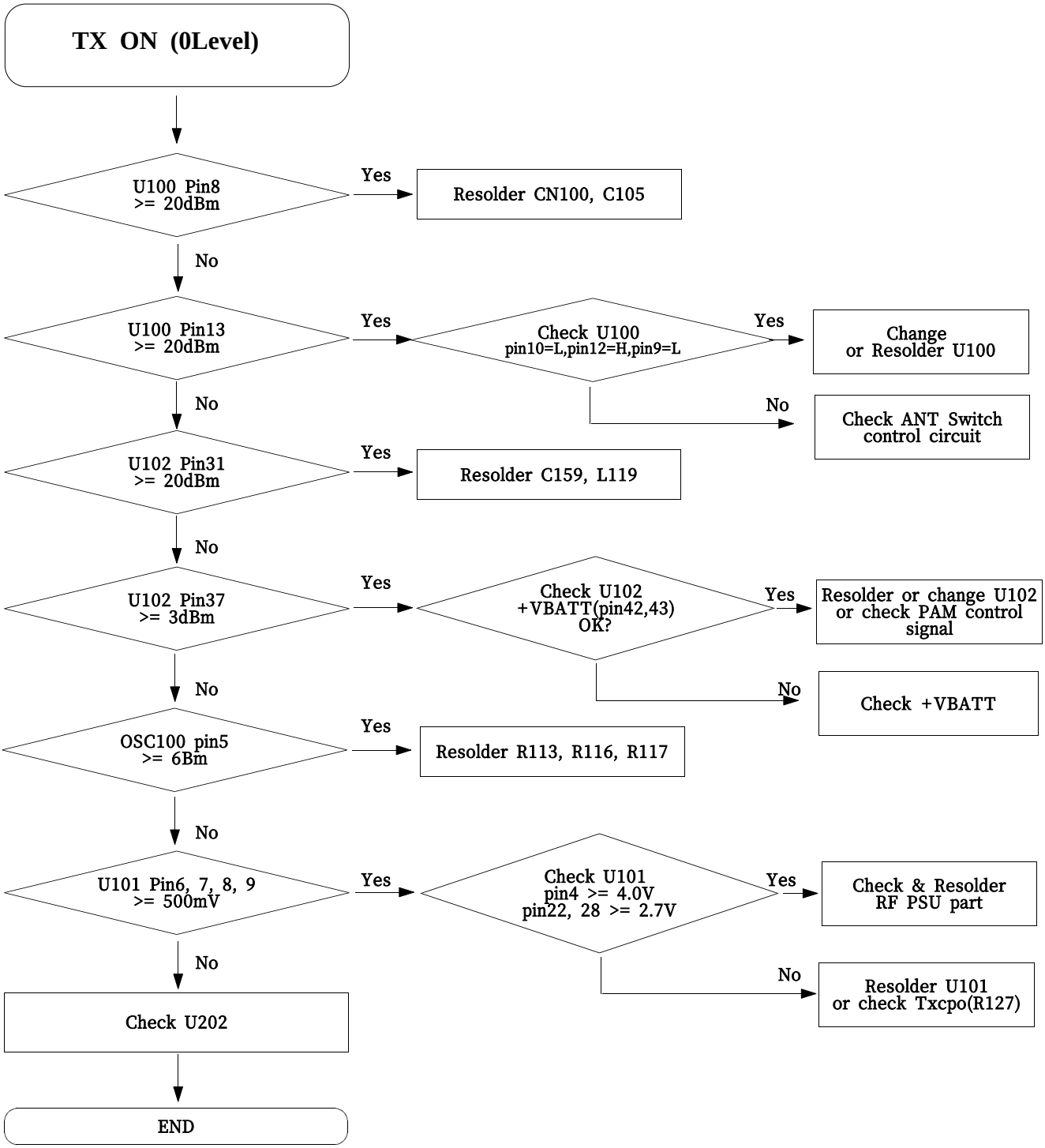
7-18. PCS Transmitter



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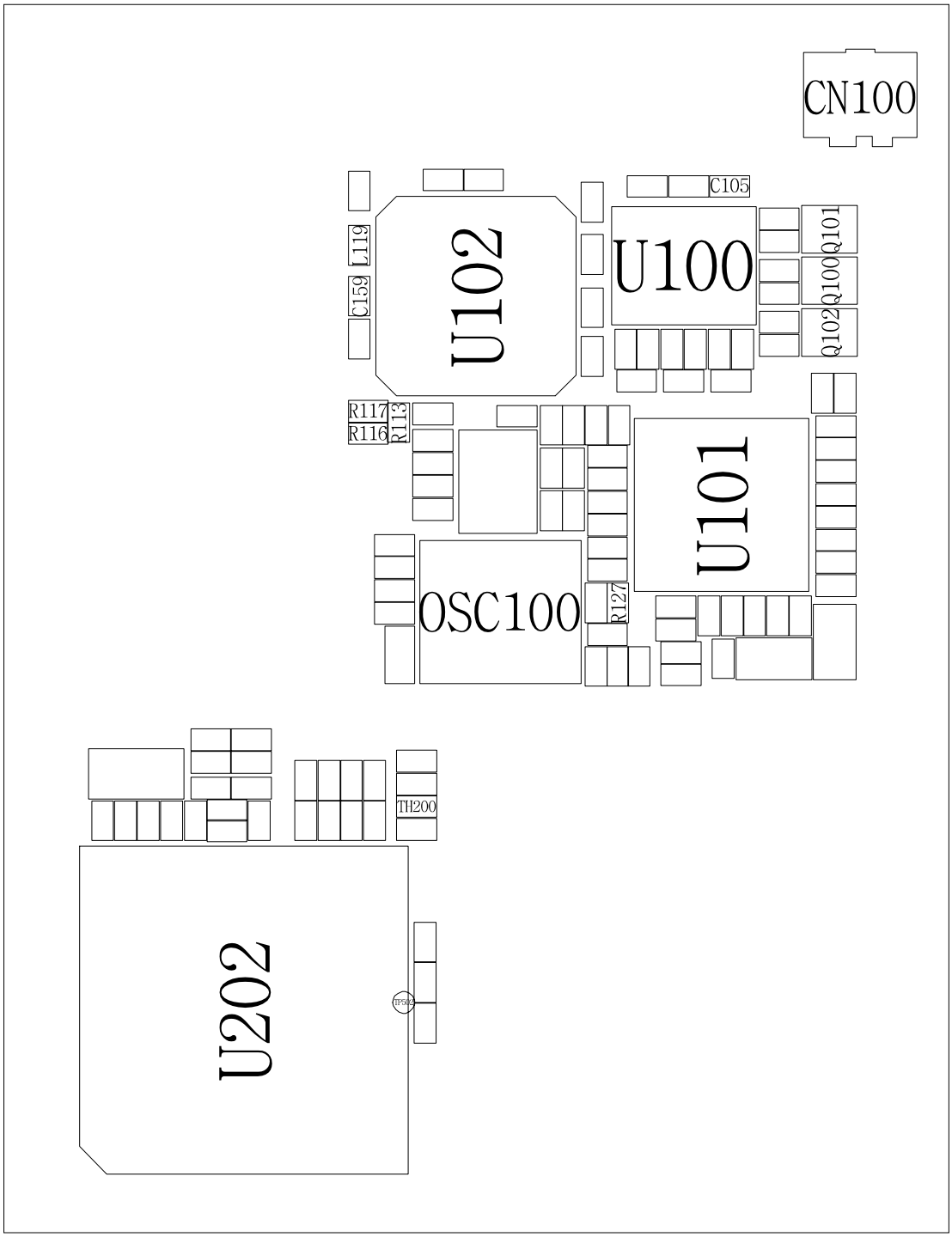

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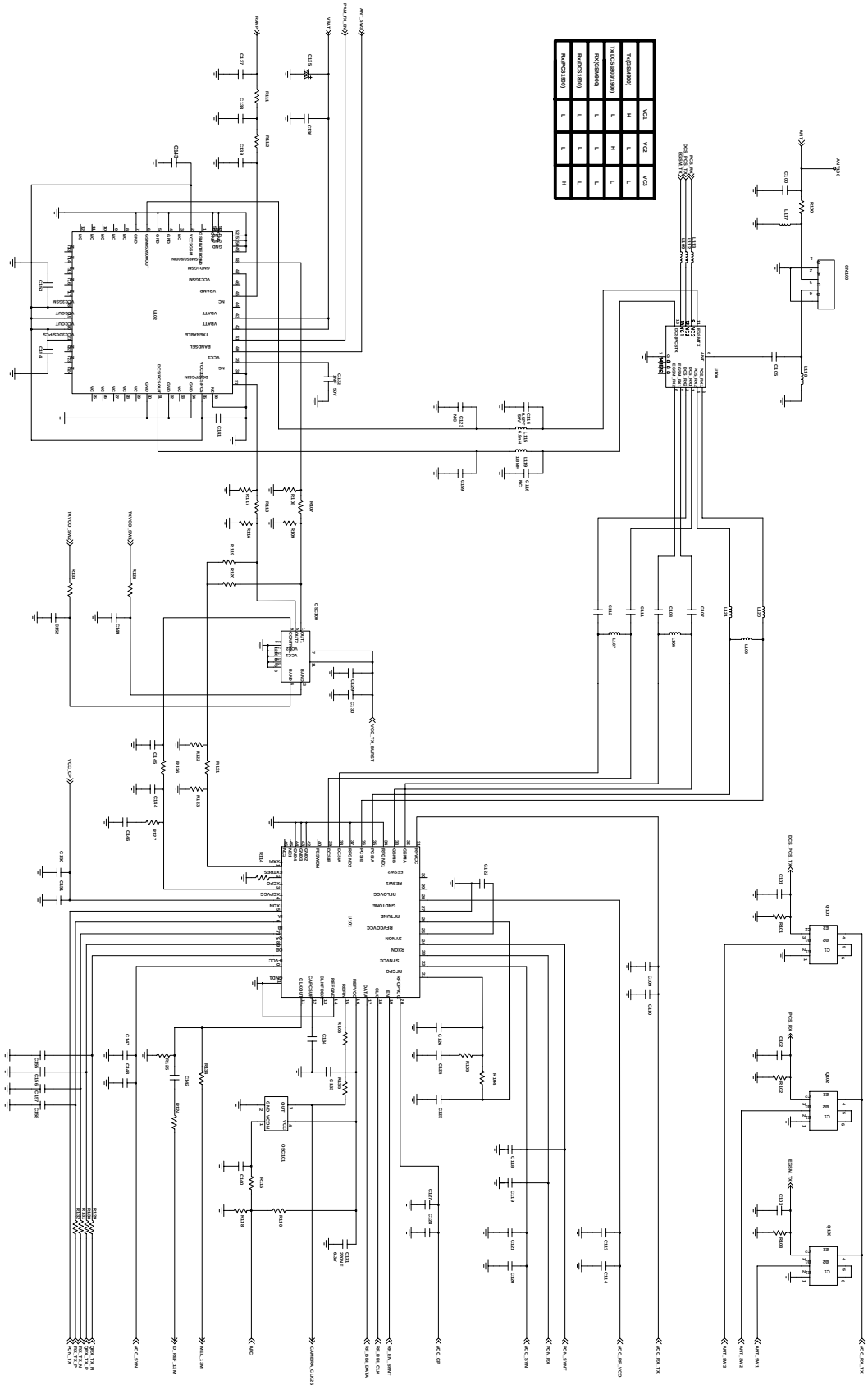
Transmitter & Receiver



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