SAMSUNG

GSM TELEPHONE
SGH-X495

SERVICE Manual

GSM TELEPHONE

CONTENTS

SAMSUNG
ELECTRONICS

Code No.: GH68-07423A
BASIC.

1. Specification

1-1. GSM General Specification

	GSM850 Phase 1	**DCS1800 Phase 1**	**PC1900 Phase 1**
Freq. Band[MHz] Uplink/Downlink	824~849 869~894	1710~1785 1805~1880	1850~1910 1930~1990
ARFCN range	128~251	512~885	512~810
Tx/Rx spacing	45MHz	95MHz	80MHz
Mod. Bit rate/ Bit Period	270.833kbps 3.692us	270.833kbps 3.692us	270.833kbps 3.692us
Time Slot Period/Frame Period	576.9us 4.615ms	576.9us 4.615ms	576.9us 4.615ms
Modulation	0.3GMSK	0.3GMSK	0.3GMSK
MS Power	33dBm~5dBm	30dBm~0dBm	30dBm~0dBm
Power Class	5pcl ~ 19pcl	0pcl ~ 15pcl	0pcl ~ 15pcl
Sensitivity	-102dBm	-100dBm	-100dBm
TDMA Mux	8	8	8
Cell Radius	35Km	2Km	2Km

1-2. GSM TX power class

TX Power control level	GSM850
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

2. Circuit Description

2-1. SGH-X495 RF Circuit Description

2-1-1. RX PART

- ASM(U100) → Switching Tx, Rx path for GSM850, DCS1800, PCS1900 by logic controlling.

- ASM Control Logic (U100) → Truth Table

	VC1	VC2	VC3
Tx Mode (GSM850)	H	L	L
Tx Mode (DCS1800/1900)	L	H	L
Rx Mode (GSM850)	L	L	L
Rx Mode (DCS1800)	L	L	L
Rx Mode (PCS1900)	L	L	H

- FILTER

To convert Electromagnetic Field Wave to Acoustic Wave and then pass the specific frequency band.

- GSM FILTER (F101) → For filtering the frequency band between 869 and 894 MHz
- DCS FILTER (F102) → For filtering the frequency band between 1805 and 1880 MHz.
- PCS FILTER (F100) → For filtering the frequency band between 1930 and 1990 MHz.

- 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.

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-X495

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-X495) 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.

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. YMU788 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 MP3, AAC, etc, in addition to ringing-melodies.

As a synthesis, YMU788 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 YMU788 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 YMU788 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 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, YMU788.

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).

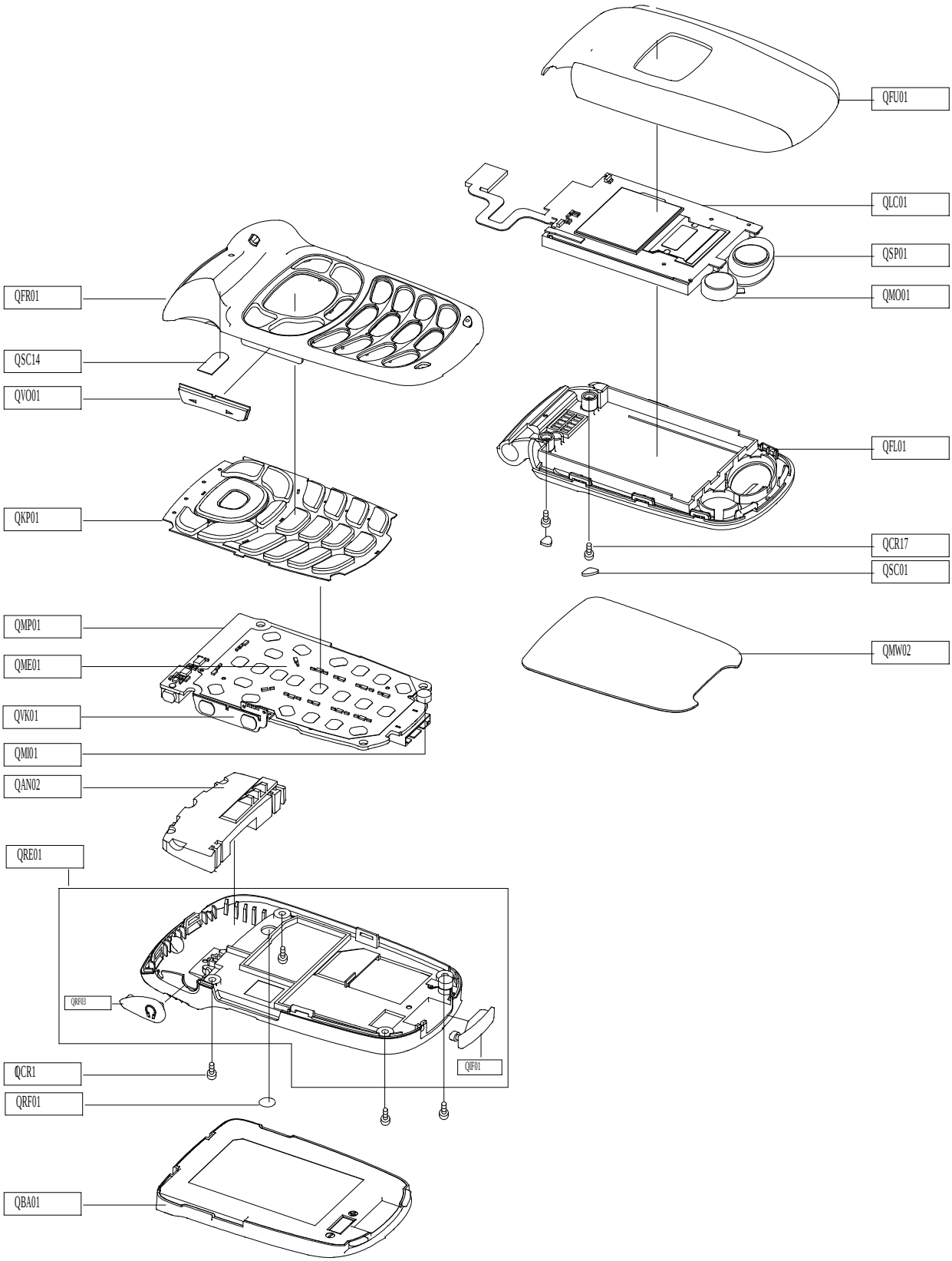
It has JTAG control pins(TDI/TDO/TCK) for ARM core and DSP core. It receives 13MHz clock in CKI pin from external TCXO. ADC(Analog to Digital Convertor) part receives the status of temperature, battery type and battery voltage.

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, YMU788.

3. Exploded View and Parts List

3-1. Exploded View

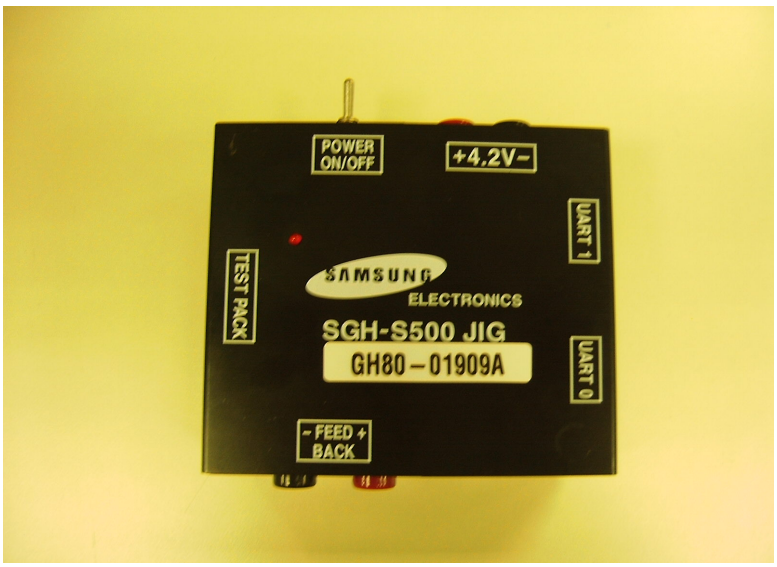


3-2. Parts List

Location NO.		Description	SEC CODE
QAN02		INTENNA-SGHX495;IAPT0GDP4020HA,SGH-X	GH42-00574A
QBA01		BATTERY-1000MAH,SIL,MAIN;BST471ASA,S	GH43-01788A
QCR11		SCREW-MACHINE;PH,+,M1.7,L4,ZPC(BLK),	6001-001654
QCR17		SCREW-MACHINE;CH,+,M1.7,L5,ZPC(BLK),	6001-001639
QFL01		MEC-FOLDER LOWER;SGH-X495,EU,-,-,-,-	GH75-06454A
QFR01		MEC-FRONT COVER;SGH-X495,EU,-,-,-,-,	GH75-06966B
QFU01		MEC-FOLDER UPPER;SGH-X495,T-MOBILE,-	GH75-06471B
QKP01		MEC-KEYPAD;SGH-X495,T-MOBILE,-,-,-,-	GH75-06617A
QLC01		LCD-SGH-X497 MODULE;UG-12R168-C,SGH-	GH07-00763A
QME01		UNIT-METAL DOME;SGH-X497,SSM5017P850	GH59-02046A
QMI01		MICROPHONE-ASSY-SGHX497;2,130~500uA,	GH30-00198A
QMO01		MOTOR DC-SGHZ130;DMJBRK20C,SGH-Z130,	GH31-00154D
QMP01		PBA MAIN-SGHX495;SGH-X495,TMB,USA,PB	GH92-02214A
QMW02		PCT-WINDOW MAIN;SGH-X495,ACRYLIC SHE	GH72-19918B
QRF01		MPR-RF SHEET;SGH-X495,PC SHEET 0.3T,	GH74-14435C
QSC01		MPR-SCREW SHEET;SGH-X495,PC SHEET 0.	GH74-13610B
QSC14		MPR-TAPE FRONT FPC;SGH-E330,3M 1352	GH74-08876A
QSP01		SPEAKER;0.5W,8ohm,89dB,800Hz,17X13mm	3001-001779
QVK01		UNIT-VOLUME KEY;SGH-X497,SSV5017P860	GH59-02053A
QVO01		MEC-VOLUME KEY;SGH-X495,T-MOBILE,-,-	GH75-07274B
QRE01		MEC-REAR COVER;SGH-X495,USA,-,-,-,-,	GH75-06959B
	QRF03	PMO-EAR COVER;SGH-X495,PC W91543+ELA	GH72-23535B
	QIF01	PMO-IF COVER;SGH-X495,PC G73797+ELAS	GH72-23556B
	QMI03	RMO-RUBBER MIC REAR;SGH-X497,CR RUBB	GH73-04847A

Description	SEC CODE
BAG PE;LDPE,T0.05,W120,L300,TRP,-,-	6902-000296
BAG PE;LDPE,T0.05,W80,L140,TRP,-,-1-	6902-000297
BAG PP;PP,T0.05,W140,L300,TRP,-,-1-P	6902-000377
LCD-SGHX497 MAIN;UG-12R168-B,SGH-X49	GH07-00707A
LCD-SGHX497 SUB;UG-09B125-A,SGH-X497	GH07-00708A
ADAPTOR-SGHR225 TAD;TAD037JBE,SGH-R2	GH44-00184G
UNIT-AWB SIM CARD;SGH-X105,87444394,	GH59-00943A
UNIT-EARPHONE;SGH-X475,AEP131SLE,-,E	GH59-01700A
LABEL(R)-WATER SOAK T_MOBILE;COMM,-,	GH68-05914A
LABEL(R)-T_MOBILE GUIDE;SGH-X475,-,M	GH68-06581A
LABEL(R)-MAIN(TMB);SGH-X495,TMB,POLY	GH68-06971A
MANUAL-USER;SGH-X495,TMB,ENGLISH,USA	GH68-06976A
MANUAL-USER;SGH-X495,TMB,SPANISH,USA	GH68-06977A
MANUAL-AGC GUIDE;SGH-X495,TMB,ENGLIS	GH68-06978A
MANUAL-ACTIVATION CARD;SGH-X495,TMB,	GH68-07399A
LABEL-DR;SGH-X495,-,PE,T1.5,45,11,SI	GH68-07547A
LABEL-RF;SGH-X495,-,ART,T0.2,42,38,S	GH68-07548A
LABEL(R)-UNIT IMEI(TMB);SGH-X495,TMB	GH68-07687A
CUSHION-SGHX495(UNIT CLAM);SGH-X495,	GH69-03058A
CUSHION-SGHX495(UP CLAM);SGH-X495,HI	GH69-03059A
CUSHION-SGHX495(LOW CLAM);SGH-X495,H	GH69-03060A
BOX(P)-SGHX495(IN/BOX_WALL);SGH-X495	GH69-03076B
BOX(P)-SGHX495(CLAM_MASTER);SGH-X495	GH69-03130A
BOX(P)-SGHX495(PATTION);SGH-X495,SC3	GH69-03132A
PMO-BATT LOCKER;SGH-X495,PC K2261,BL	GH72-19954B
PCT-WINDOW SUB;SGH-X495,ACRYIC SHEET	GH72-19964A
PMO-STOPPER;SGH-X495,POLY URETHANE,W	GH72-21517B
RMO-RUBBER TOP LCD A;SGH-X495,CR RUB	GH73-04923A
RMO-RUBBER TOP LCD B;SGH-X495,CR RUB	GH73-04924A
MPR-BOHO VINYL SUB(S-R);SGH-X495,STA	GH74-03429B
MPR-BOHO VINYL REAR;SGH-S342i,3M 418	GH74-12905A
MPR-TAPE WINDOW SUB;SGH-X495,TESA #4	GH74-13223A
MPR-BOHO VINYL IF;SGH-E720,#950,85X1	GH74-13606A
MPR-TAPE WINDOW MAIN;SGH-X495,3M 949	GH74-13608A
MPR-BOHO VINYL MAIN;SGH-X495,3M 4187	GH74-14431A
MPR-BOHO VINYL MAIN(S);SGH-X497,SP-1	GH74-14431B
MPR-BOHO VINYL SUB;SGH-X495,ST-5555,	GH74-14432A
MPR-TAPE EL;SPH-B1200,3M 851,5X3.5XT	GH74-14881A
MPR-TAPE PBA EMI;SGH-X495,GOLD PU T0	GH74-15484A
MPR-BOHO VINYL M/TMB(S);SGH-X495,STA	GH74-15517B
MPR-SPONGE MOTOR;SGH-X495,SRS,D8XT0.	GH74-15610A
MPR-SPONGE PBA;SGH-X495,SRS,38X64XT5	GH74-15911A
MPR-TAPE PBA A;SGH-X495,3M851,3X2XT0	GH74-16066A
MPR-BOHO VINYL SUB;SGH-X495,ST-5555,	GH74-17302A
AS-LCD PCB SVC;SGH-X497,LJ96-02137A,	GH81-01219A
A/S-LCD FPCB SVC;SGH-X497,POLYMIDE,2	GH81-01956A
PAA ETC-MANUAL;SGH-X495,TMB,USA,MANU	GH99-10352A

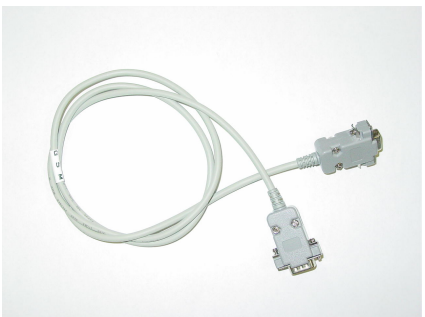
3-3. Test Jig (GH80-01909A)



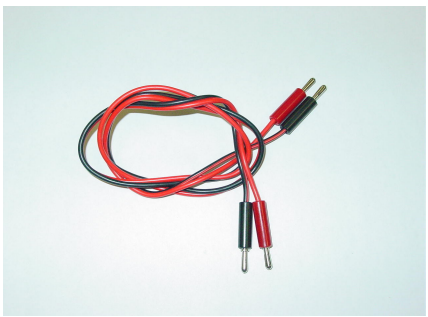
3-3-1. RF Test Cable (GH39-00283A)

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)

4. Electrical Parts List

Design LOC	Description	SEC CODE
BAT300	BATTERY	4302-001180
C101	C-CERAMIC,CHIP	2203-000278
C102	C-CERAMIC,CHIP	2203-000812
C103	C-CERAMIC,CHIP	2203-000854
C104	C-CERAMIC,CHIP	2203-000854
C105	C-CERAMIC,CHIP	2203-000278
C106	C-CERAMIC,CHIP	2203-000278
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C108	C-CERAMIC,CHIP	2203-005057
C109	C-CERAMIC,CHIP	2203-005482
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C111	C-CERAMIC,CHIP	2203-005482
C112	C-CERAMIC,CHIP	2203-000233
C113	C-CERAMIC,CHIP	2203-000233
C114	C-CERAMIC,CHIP	2203-005482
C115	C-CERAMIC,CHIP	2203-005057
C116	C-CERAMIC,CHIP	2203-005138
C117	C-CERAMIC,CHIP	2203-001383
C118	C-CERAMIC,CHIP	2203-000359
C119	C-CERAMIC,CHIP	2203-000696
C120	C-CERAMIC,CHIP	2203-000836
C121	C-CERAMIC,CHIP	2203-001101
C122	C-CERAMIC,CHIP	2203-005482
C123	C-CERAMIC,CHIP	2203-005057
C124	C-CERAMIC,CHIP	2203-006053
C125	C-CERAMIC,CHIP	2203-000438
C126	C-CERAMIC,CHIP	2203-000233
C127	C-TA,CHIP	2404-001239
C128	C-CERAMIC,CHIP	2203-006141
C129	C-CERAMIC,CHIP	2203-000438
C130	C-CERAMIC,CHIP	2203-006190
C132	C-CERAMIC,CHIP	2203-005503
C133	C-CERAMIC,CHIP	2203-000311
C134	C-CERAMIC,CHIP	2203-000233
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C141	C-CERAMIC,CHIP	2203-005482
C142	C-CERAMIC,CHIP	2203-005057
C143	C-CERAMIC,CHIP	2203-000233
C144	C-CERAMIC,CHIP	2203-000254
C145	C-CERAMIC,CHIP	2203-000438
C146	C-CERAMIC,CHIP	2203-000438
C147	C-CERAMIC,CHIP	2203-000438
C152	C-CERAMIC,CHIP	2203-000278
C153	C-CERAMIC,CHIP	2203-000278
C154	C-CERAMIC,CHIP	2203-000995
C155	C-CERAMIC,CHIP	2203-000995
C156	C-CERAMIC,CHIP	2203-000438
C157	C-CERAMIC,CHIP	2203-001239
C158	C-CERAMIC,CHIP	2203-001239
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C222	C-CERAMIC,CHIP	2203-006423
C223	C-CERAMIC,CHIP	2203-005482
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C225	C-CERAMIC,CHIP	2203-005482

Design LOC	Description	SEC CODE
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C302	C-CERAMIC,CHIP	2203-005482
C304	C-TA,CHIP	2404-001394
C305	C-CERAMIC,CHIP	2203-005482
C306	C-CERAMIC,CHIP	2203-005482
C307	C-TA,CHIP	2404-001374
C308	C-CERAMIC,CHIP	2203-006257
C309	C-CERAMIC,CHIP	2203-005482
C310	C-CERAMIC,CHIP	2203-006208
C311	C-TA,CHIP	2404-001225
C312	C-CERAMIC,CHIP	2203-005395
C313	C-CERAMIC,CHIP	2203-000386
C314	C-CERAMIC,CHIP	2203-005482
C315	C-CERAMIC,CHIP	2203-006257
C316	C-CERAMIC,CHIP	2203-000628
C317	C-CERAMIC,CHIP	2203-006562
C318	C-CERAMIC,CHIP	2203-000628
C319	C-CERAMIC,CHIP	2203-006562
C320	C-CERAMIC,CHIP	2203-006053
C321	C-CERAMIC,CHIP	2203-000885
C322	C-CERAMIC,CHIP	2203-006208
C323	C-CERAMIC,CHIP	2203-006324
C324	C-CERAMIC,CHIP	2203-000812
C325	C-CERAMIC,CHIP	2203-005065
C326	C-TA,CHIP	2404-001225
C327	C-TA,CHIP	2404-001225
C328	C-CERAMIC,CHIP	2203-005482
C329	C-CERAMIC,CHIP	2203-005482
C330	C-CERAMIC,CHIP	2203-005482
C332	C-CERAMIC,CHIP	2203-006257
C333	C-CERAMIC,CHIP	2203-006562
C334	C-CERAMIC,CHIP	2203-006208
C335	C-CERAMIC,CHIP	2203-006208
C336	C-CERAMIC,CHIP	2203-000679
C337	C-CERAMIC,CHIP	2203-006053
C338	C-CERAMIC,CHIP	2203-006208

Design LOC	Description	SEC CODE
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C402	C-CERAMIC,CHIP	2203-005482
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C412	C-CERAMIC,CHIP	2203-005482
C413	C-CERAMIC,CHIP	2203-000679
C415	C-CERAMIC,CHIP	2203-000489
C416	C-CERAMIC,CHIP	2203-000679
C418	C-CERAMIC,CHIP	2203-000278
C419	C-CERAMIC,CHIP	2203-006423
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C421	C-CERAMIC,CHIP	2203-000885
C422	C-CERAMIC,CHIP	2203-000254
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Design LOC	Description	SEC CODE
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C511	C-CERAMIC,CHIP	2203-000278
C513	C-CERAMIC,CHIP	2203-006562
C514	C-CERAMIC,CHIP	2203-006562
C515	C-CERAMIC,CHIP	2203-006562
CN300	CONNECTOR-CARD EDGE	3709-001355
CN502	CONNECTOR-SOCKET	3710-001611
CN503	CONNECTOR-HEADER	3711-005783
CON101	CONNECTOR-COAXIAL	3705-001358
EAR400	JACK-PHONE	3722-002067
F100	FILTER-SAW	2904-001571
F101	FILTER-SAW	2904-001580
F102	FILTER-SAW	2904-001570
HEA1	CONNECTOR-HEADER	3711-005728
L101	INDUCTOR-SMD	2703-002207
L102	INDUCTOR-SMD	2703-002199
L103	INDUCTOR-SMD	2703-002207
L104	INDUCTOR-SMD	2703-002203
L105	INDUCTOR-SMD	2703-002700
L106	INDUCTOR-SMD	2703-001726
L107	INDUCTOR-SMD	2703-002308
L108	INDUCTOR-SMD	2703-002700
L109	INDUCTOR-SMD	2703-002308
L110	INDUCTOR-SMD	2703-002308
L111	INDUCTOR-SMD	2703-002199
L112	INDUCTOR-SMD	2703-002368
L113	INDUCTOR-SMD	2703-002201
L114	INDUCTOR-SMD	2703-002368
L115	INDUCTOR-SMD	2703-002203
L116	INDUCTOR-SMD	2703-002368
L117	INDUCTOR-SMD	2703-001708
L300	CORE-FERRITE BEAD	3301-001105
L400	CORE-FERRITE BEAD	3301-001362

Design LOC	Description	SEC CODE
L401	CORE-FERRITE BEAD	3301-001362
L402	CORE-FERRITE BEAD	3301-001105
L403	CORE-FERRITE BEAD	3301-001105
L501	CORE-FERRITE BEAD	3301-001438
LED501	LED	0601-001790
LED502	LED	0601-001790
LED503	LED	0601-001790
LED504	LED	0601-001790
LED505	LED	0601-001790
LED506	LED	0601-001790
LED507	LED	0601-001790
LED508	LED	0601-001790
LED509	LED	0601-001790
LED510	LED	0601-001790
LED511	LED	0601-001790
LED512	LED	0601-001790
OSC100	OSCILLATOR-VCO	2806-001326
OSC101	OSCILLATOR-VCTCXO	2809-001281
Q100	TR-DIGITAL	0504-001151
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	2007-007528
R107	R-CHIP	2007-001288
R108	R-CHIP	2007-000171
R109	R-CHIP	2007-001329
R110	R-CHIP	2007-000144
R111	R-CHIP	2007-001308
R112	R-CHIP	2007-001308
R113	R-CHIP	2007-000566
R114	R-CHIP	2007-000148
R115	R-CHIP	2007-001288
R116	R-CHIP	2007-007311
R117	R-CHIP	2007-000566
R118	R-CHIP	2007-007699

Design LOC	Description	SEC CODE
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R120	R-CHIP	2007-001308
R121	R-CHIP	2007-001308
R122	R-CHIP	2007-000171
R123	R-CHIP	2007-000171
R125	R-CHIP	2007-008672
R126	R-CHIP	2007-001308
R127	R-CHIP	2007-000142
R128	R-CHIP	2007-000148
R129	R-CHIP	2007-000138
R130	R-CHIP	2007-008213
R131	R-CHIP	2007-008213
R132	R-CHIP	2007-008213
R133	R-CHIP	2007-008213
R134	R-CHIP	2007-000140
R135	R-CHIP	2007-000140
R136	R-CHIP	2007-000171
R200	R-CHIP	2007-000174
R201	R-CHIP	2007-008055
R204	R-CHIP	2007-000162
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R207	R-CHIP	2007-008055
R208	R-CHIP	2007-008052
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R210	R-CHIP	2007-008055
R211	R-CHIP	2007-007107
R212	R-CHIP	2007-007142
R213	R-CHIP	2007-007001
R214	R-CHIP	2007-007142
R215	R-CHIP	2007-001284
R216	R-CHIP	2007-000148
R217	R-CHIP	2007-001284
R218	R-CHIP	2007-000162
R219	R-CHIP	2007-000162
R220	R-CHIP	2007-007107
R221	R-CHIP	2007-007001

Design LOC	Description	SEC CODE
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R224	R-CHIP	2007-008588
R225	R-CHIP	2007-008542
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R228	R-CHIP	2007-008542
R300	R-CHIP	2007-000157
R301	R-CHIP	2007-000148
R302	R-CHIP	2007-007573
R303	R-CHIP	2007-007334
R304	R-CHIP	2007-008117
R305	R-CHIP	2007-000151
R306	R-CHIP	2007-007100
R400	R-CHIP	2007-002796
R401	R-CHIP	2007-000140
R402	R-CHIP	2007-000148
R403	R-CHIP	2007-008054
R404	R-CHIP	2007-000140
R405	R-CHIP	2007-008542
R406	R-CHIP	2007-008055
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R408	R-CHIP	2007-008055
R409	R-CHIP	2007-007334
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R413	R-CHIP	2007-007589
R414	R-CHIP	2007-007138
R415	R-CHIP	2007-007981
R416	R-CHIP	2007-007529
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R418	R-CHIP	2007-000138
R422	R-CHIP	2007-000138
R424	R-CHIP	2007-008542
R500	R-CHIP	2007-000162
R501	R-CHIP	2007-008055
R502	R-CHIP	2007-008531

Design LOC	Description	SEC CODE
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R505	R-CHIP	2007-008531
R506	R-CHIP	2007-008531
R507	R-CHIP	2007-000162
R508	R-CHIP	2007-008531
R510	R-CHIP	2007-001301
R511	R-CHIP	2007-001301
R512	R-CHIP	2007-001301
R513	R-CHIP	2007-001301
R514	R-CHIP	2007-001301
R515	R-CHIP	2007-001301
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R517	R-CHIP	2007-001301
R518	R-CHIP	2007-001301
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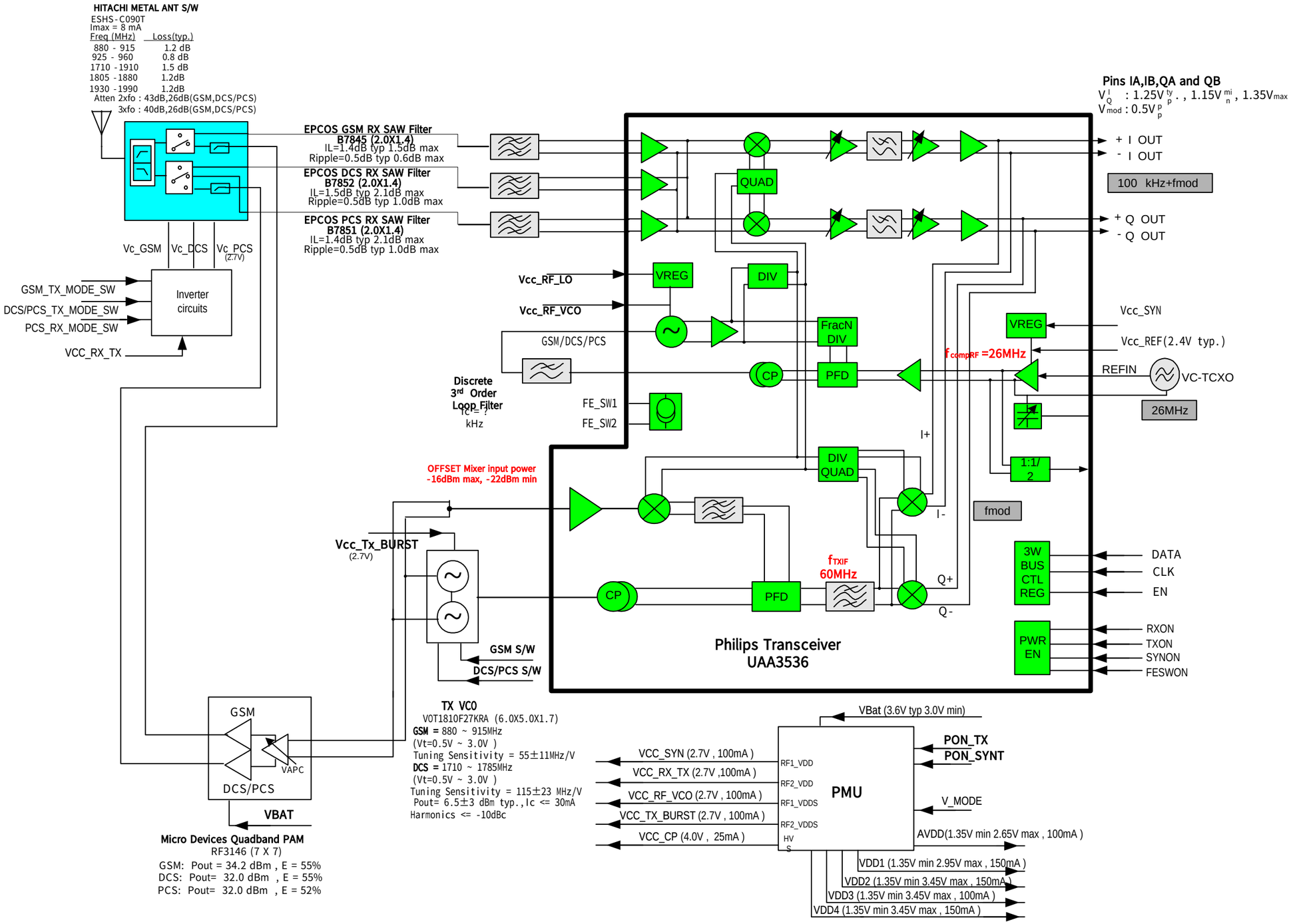
R541	R-CHIP	2007-009084
R542	R-CHIP	2007-009084
R543	R-CHIP	2007-009084
R544	R-CHIP	2007-009084
R545	R-CHIP	2007-009084
R546	R-CHIP	2007-009084

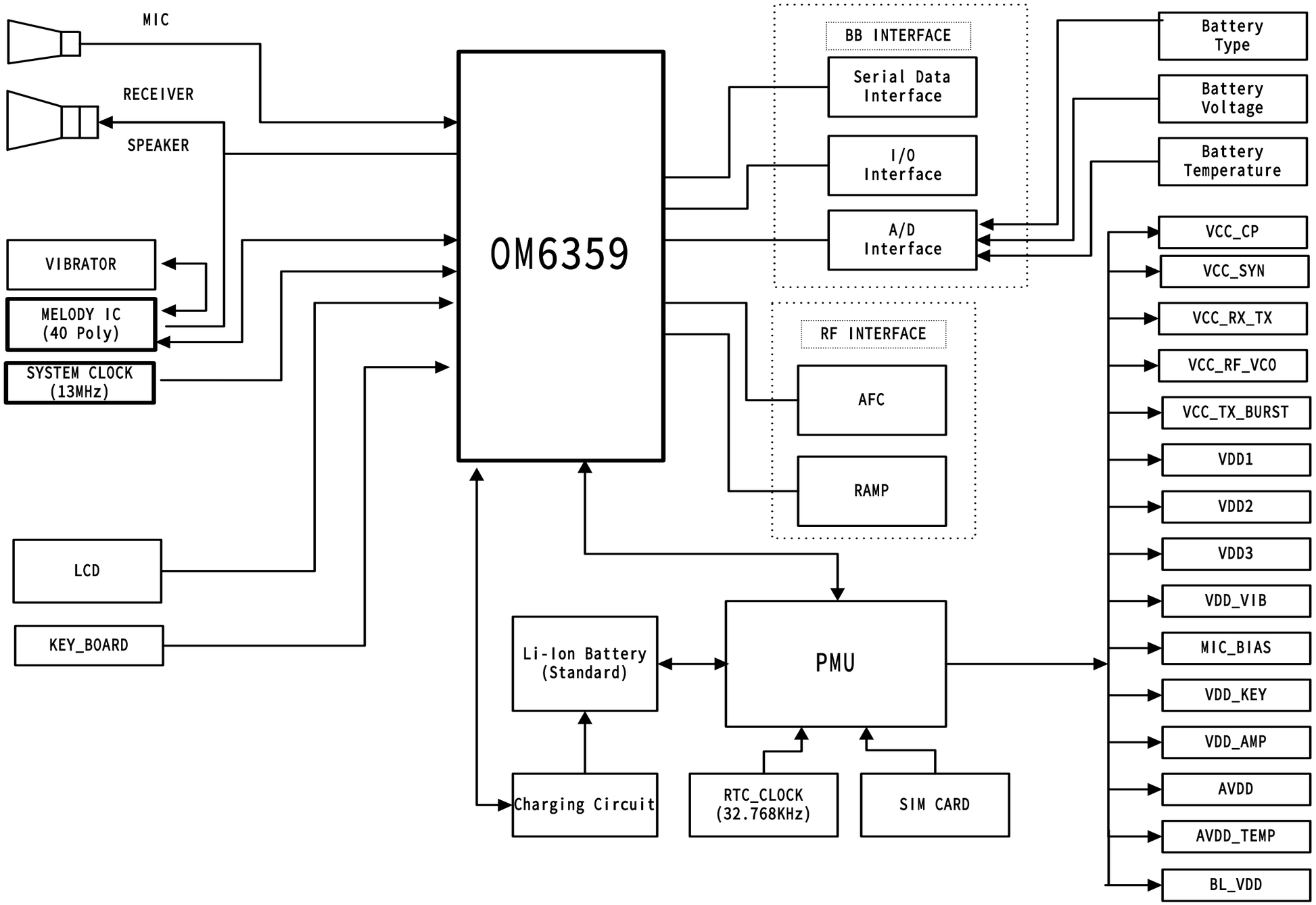
Design LOC	Description	SEC CODE
R547	R-CHIP	2007-000162
SW500	IC	1009-001010
TH200	THERMISTOR	1404-001221
TH501	VARISTOR	1405-001093
TH502	VARISTOR	1405-001093
TH503	VARISTOR	1405-001093
U100	FILTER-DUPLEXER	2909-001246
U101	IC	1205-002327
U102	IC	1201-002075
U201	IC	1108-000019
U202	IC	1205-002607
U300	IC	1203-003109
U301	DIODE-TVS	0406-001200
U302	IC	1205-002350
U303	IC	1203-003808
U401	IC	1202-001036
U402	IC	1001-001306
U404	TR-DIGITAL	0504-001100
U406	IC	1204-002461
U407	IC	1001-001231
U408	IC	0801-002237
U501	FILTER-EMI SMD	2901-001325
U502	IC	0801-002882
U503	FILTER-EMI SMD	2901-001246
U504	FILTER-EMI SMD	2901-001325
U506	FILTER-EMI SMD	2901-001325
U507	FILTER-EMI SMD	2901-001325
U508	IC	0801-002882
U510	IC	1205-002747
U511	IC	1205-002747
U512	IC	1205-002747
V401	DIODE-TVS	0406-001201
V402	DIODE-TVS	0406-001201
V501	VARISTOR	1405-001121
V502	VARISTOR	1405-001121
V504	VARISTOR	1405-001121
V505	VARISTOR	1405-001121

Design LOC	Description	SEC CODE
V506	VARISTOR	1405-001121
V507	VARISTOR	1405-001121
V509	VARISTOR	1405-001121
X300	CRYSTAL-UNIT	2801-004373
ZD300	DIODE-ZENER	0403-001427
ZD401	DIODE-TVS	0406-001201
ZD402	DIODE-TVS	0406-001197
ZD406	DIODE-TVS	0406-001201
ZD501	DIODE-ZENER	0403-001387
ZD502	DIODE-TVS	0406-001167
ZD503	DIODE-TVS	0406-001197
ZD504	DIODE-TVS	0406-001197

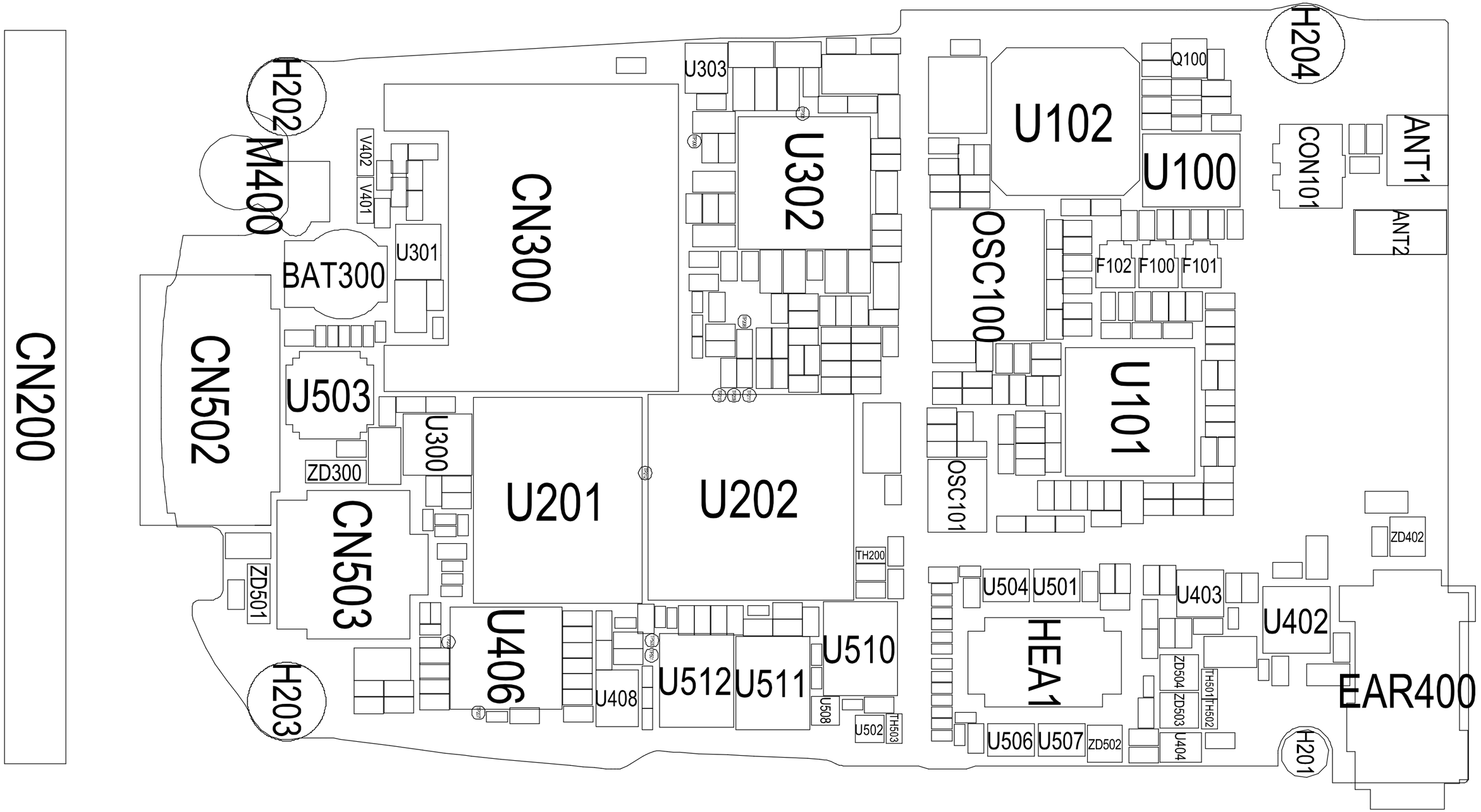
5-1. RF Solution Block Diagram



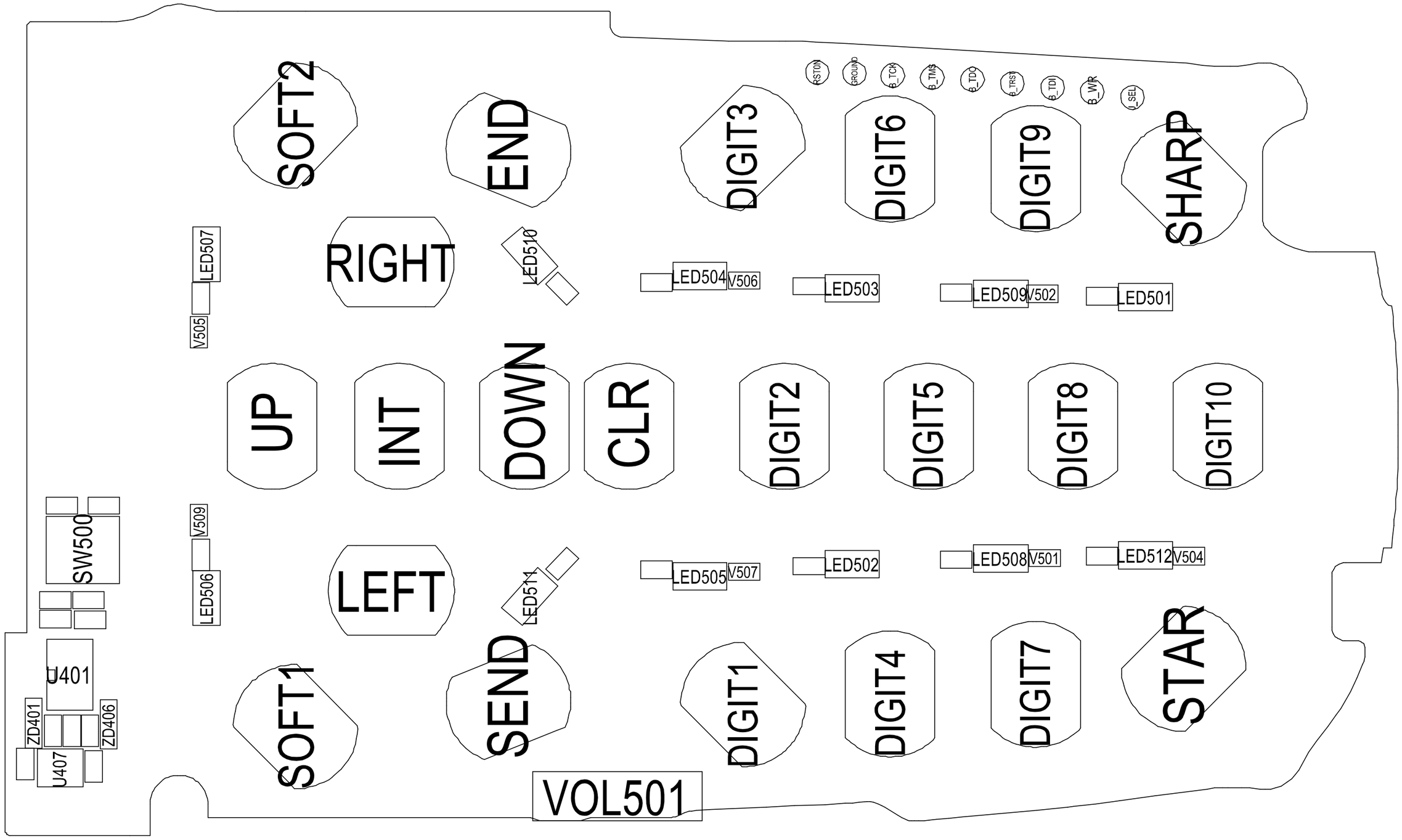
5-2. Base Band Solution Block Diagram



6-1. PCB Top Diagram

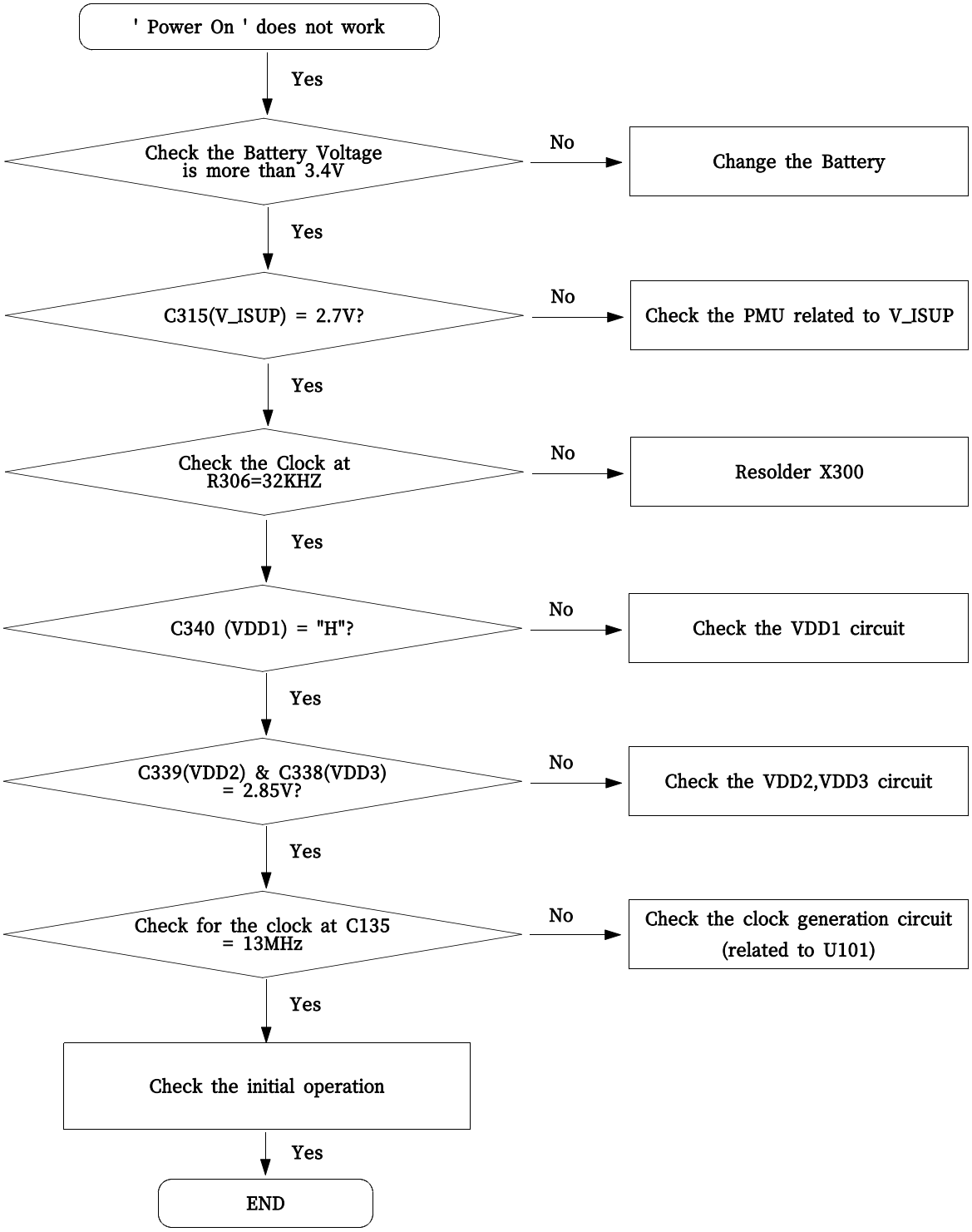


6-2. PCB Bottom Diagram

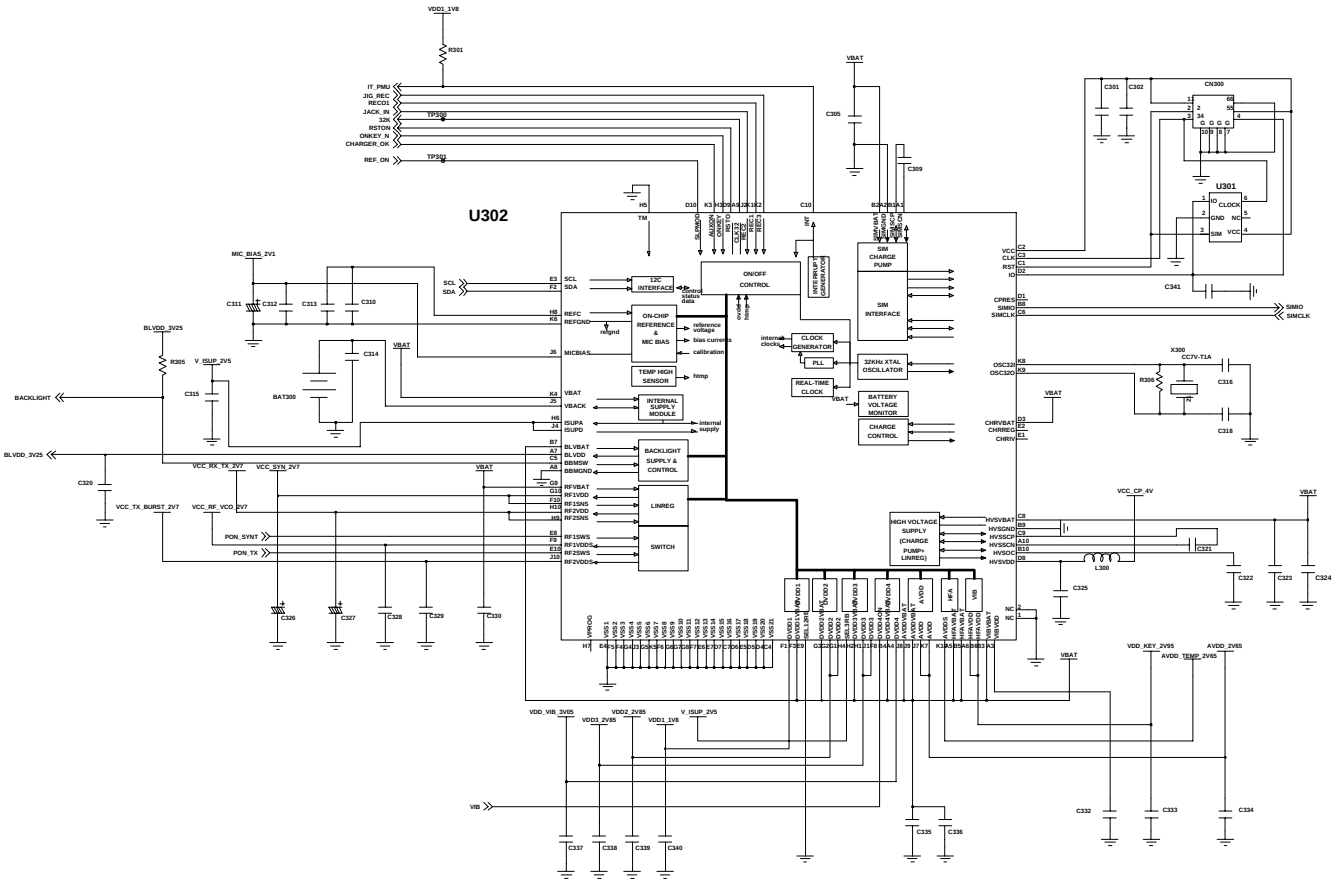


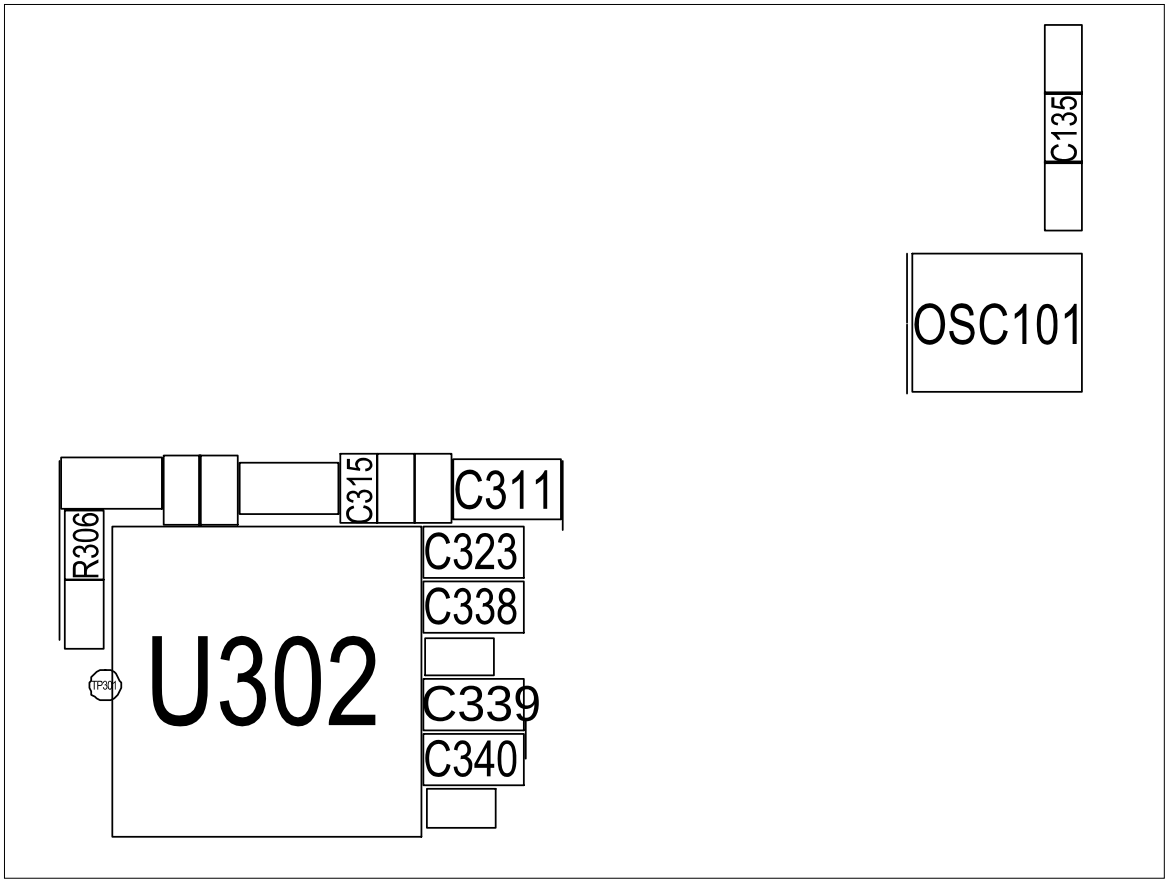
7. Flow Chart of Troubleshooting

7-1. Power On

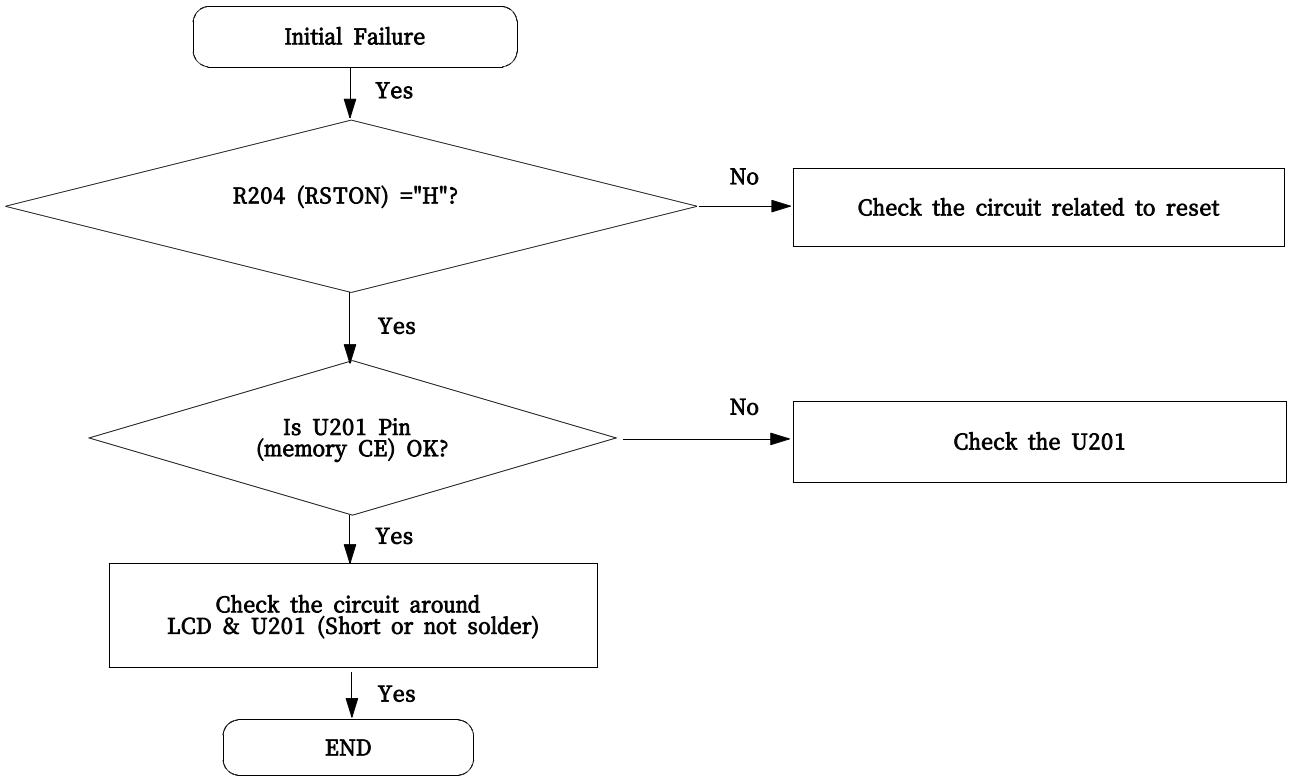


Power On

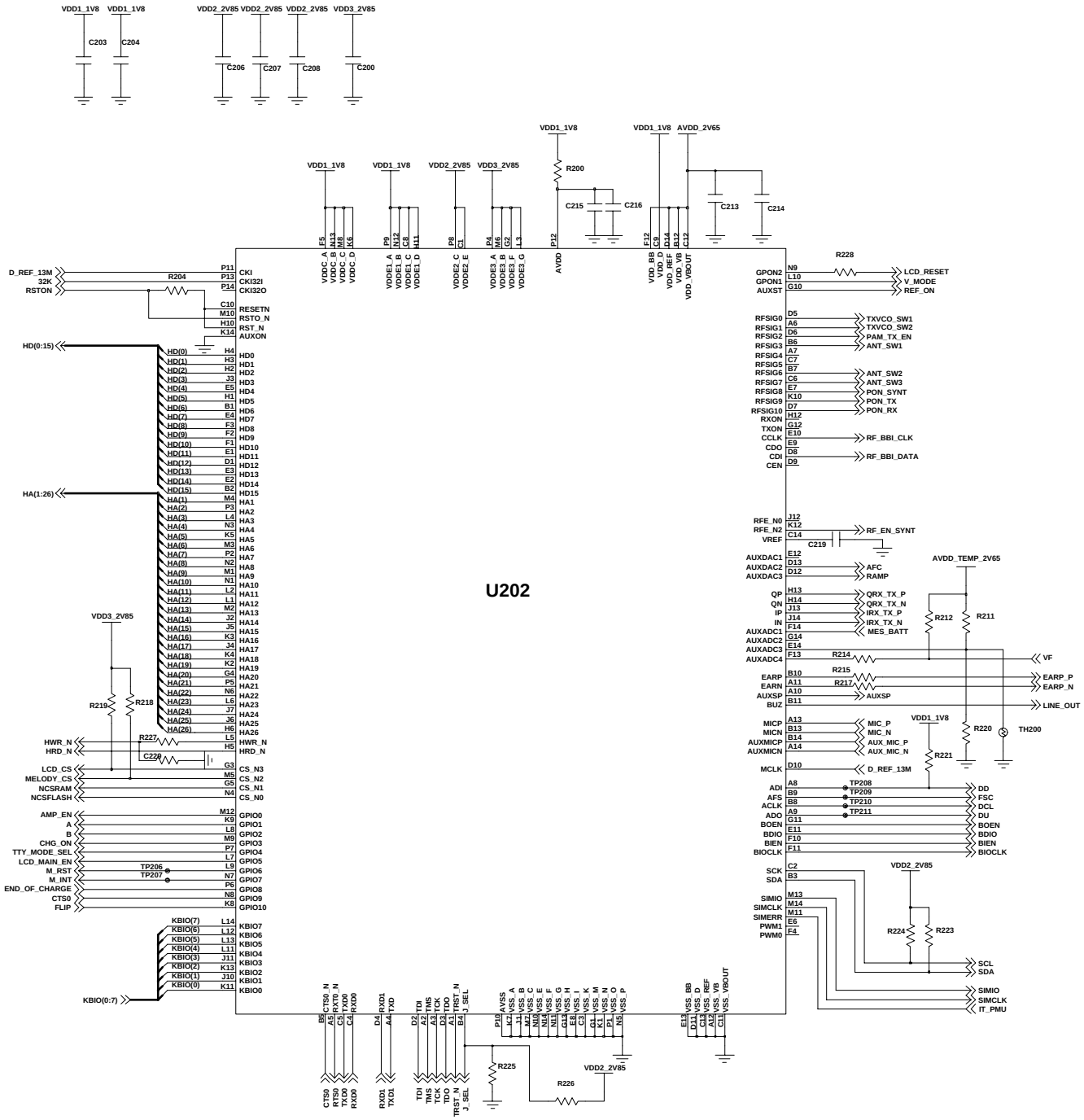


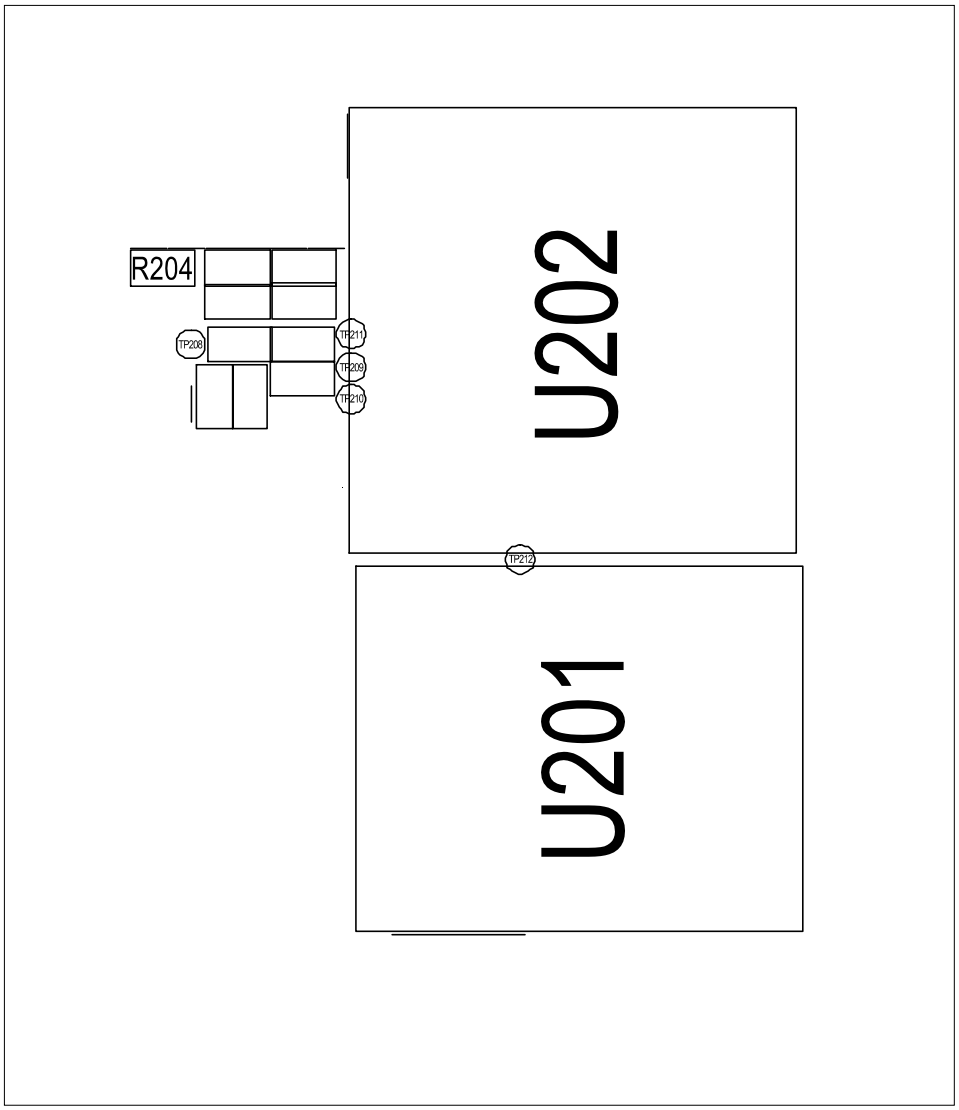


7-2. Initial

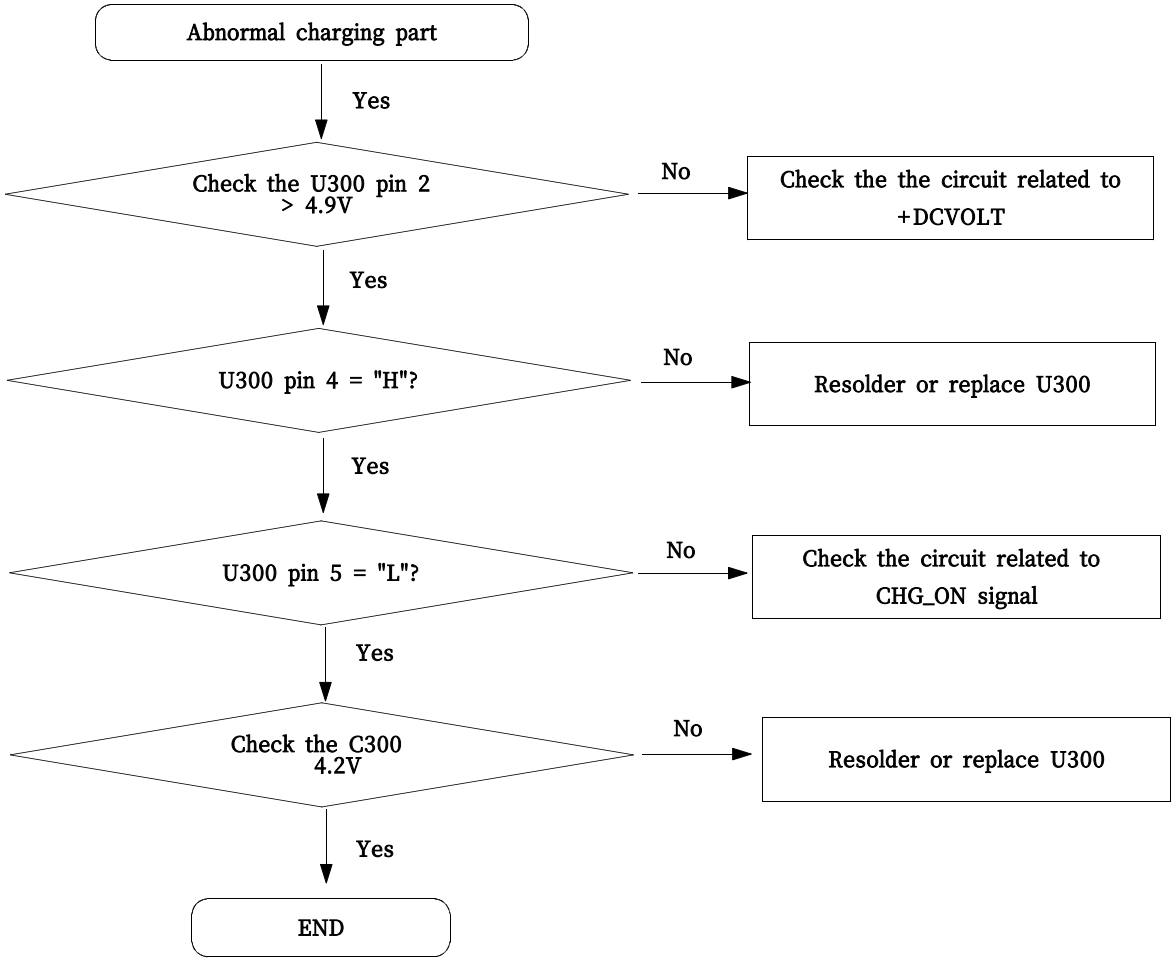


Initial

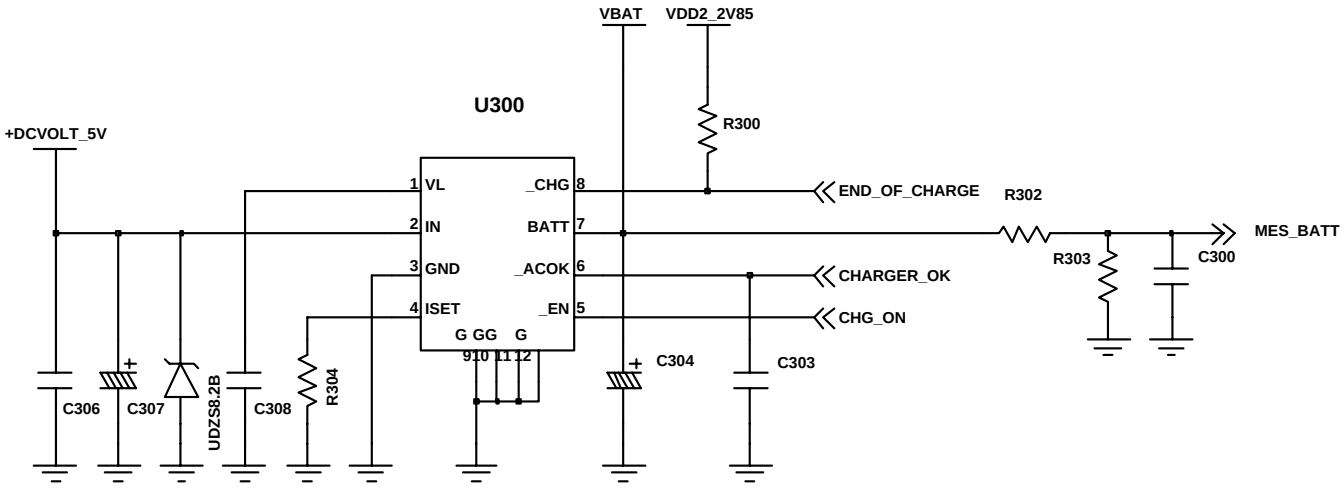




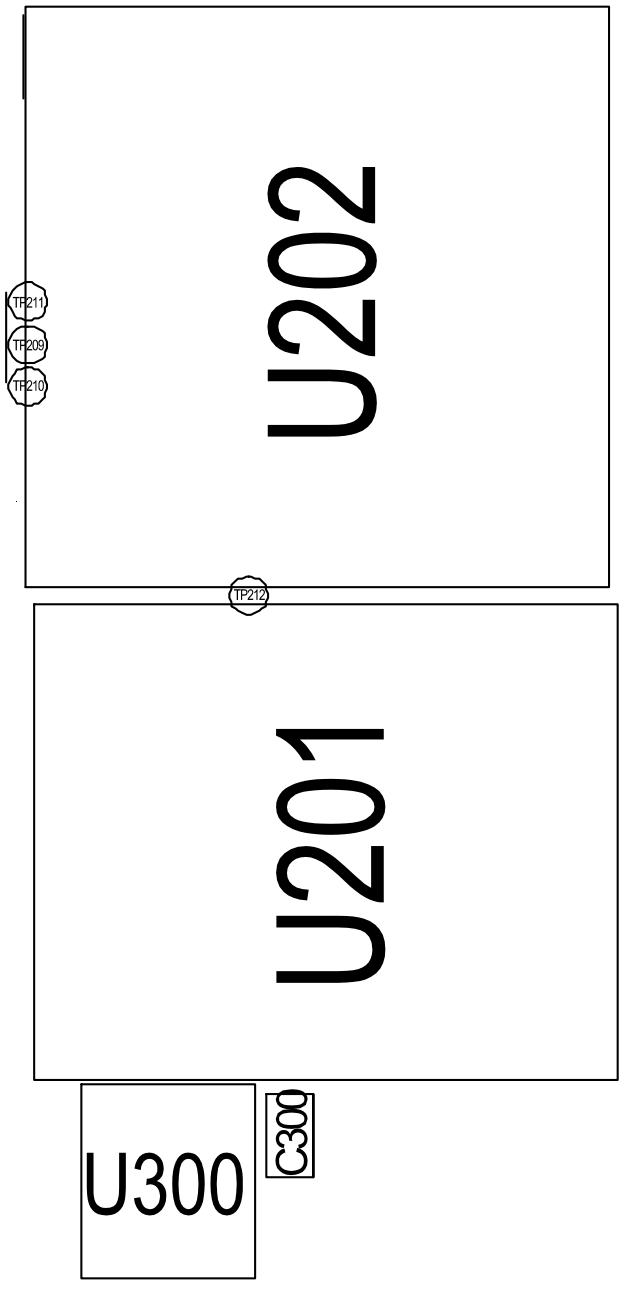
7-3. Charging Part



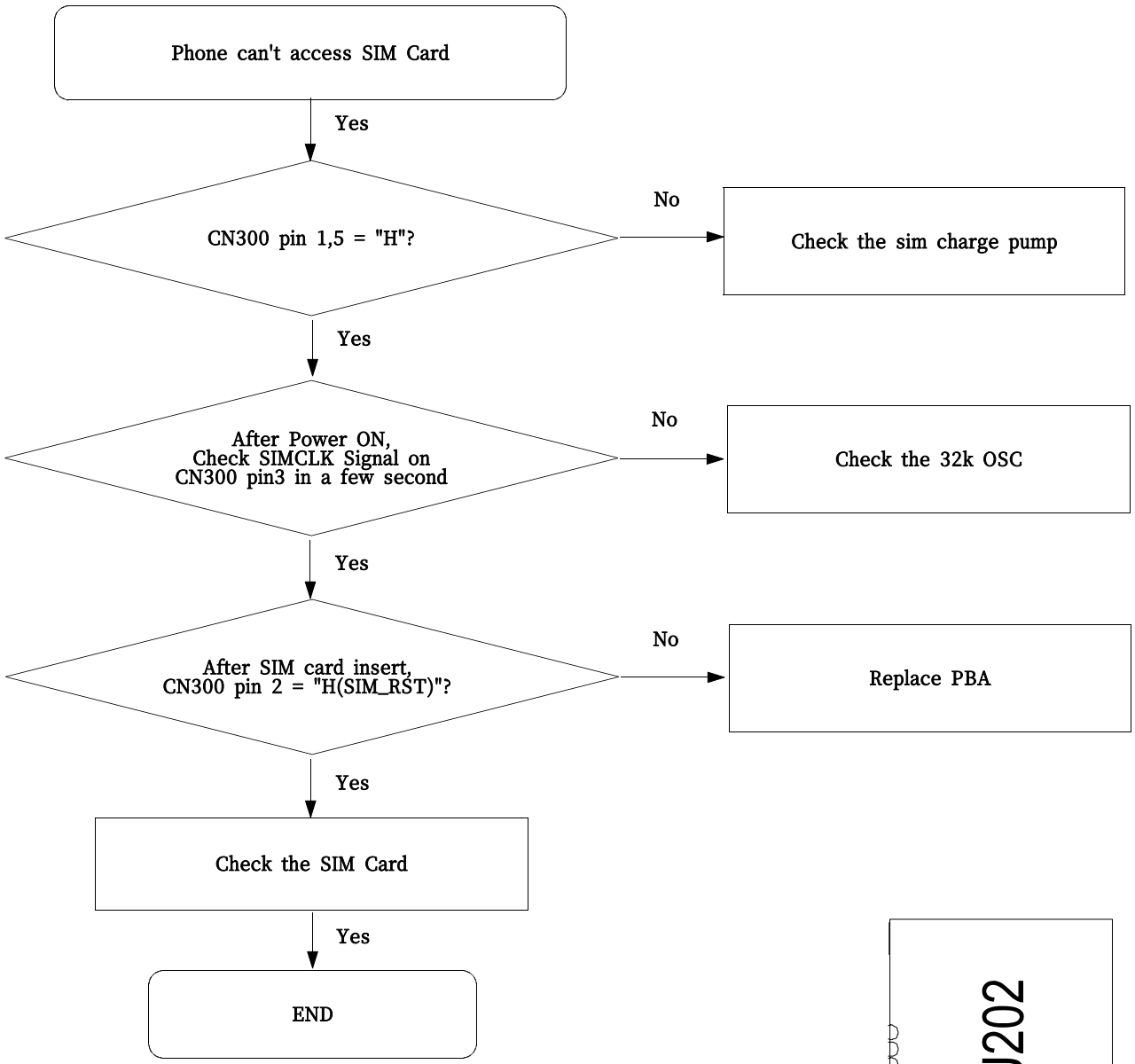
Charging

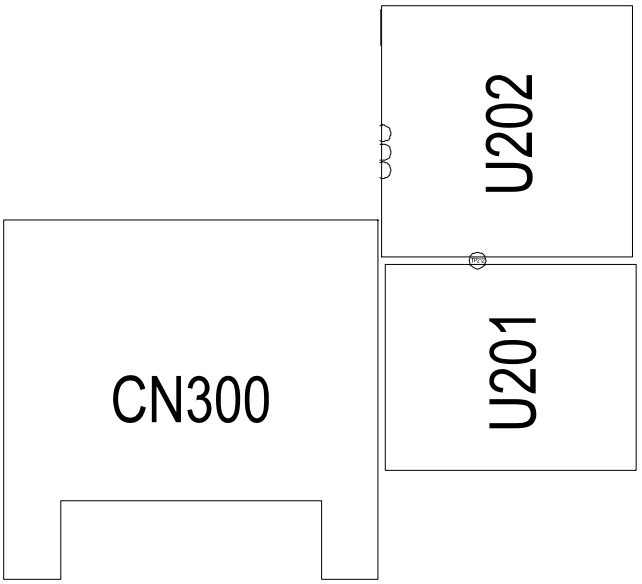


CHARGER IC

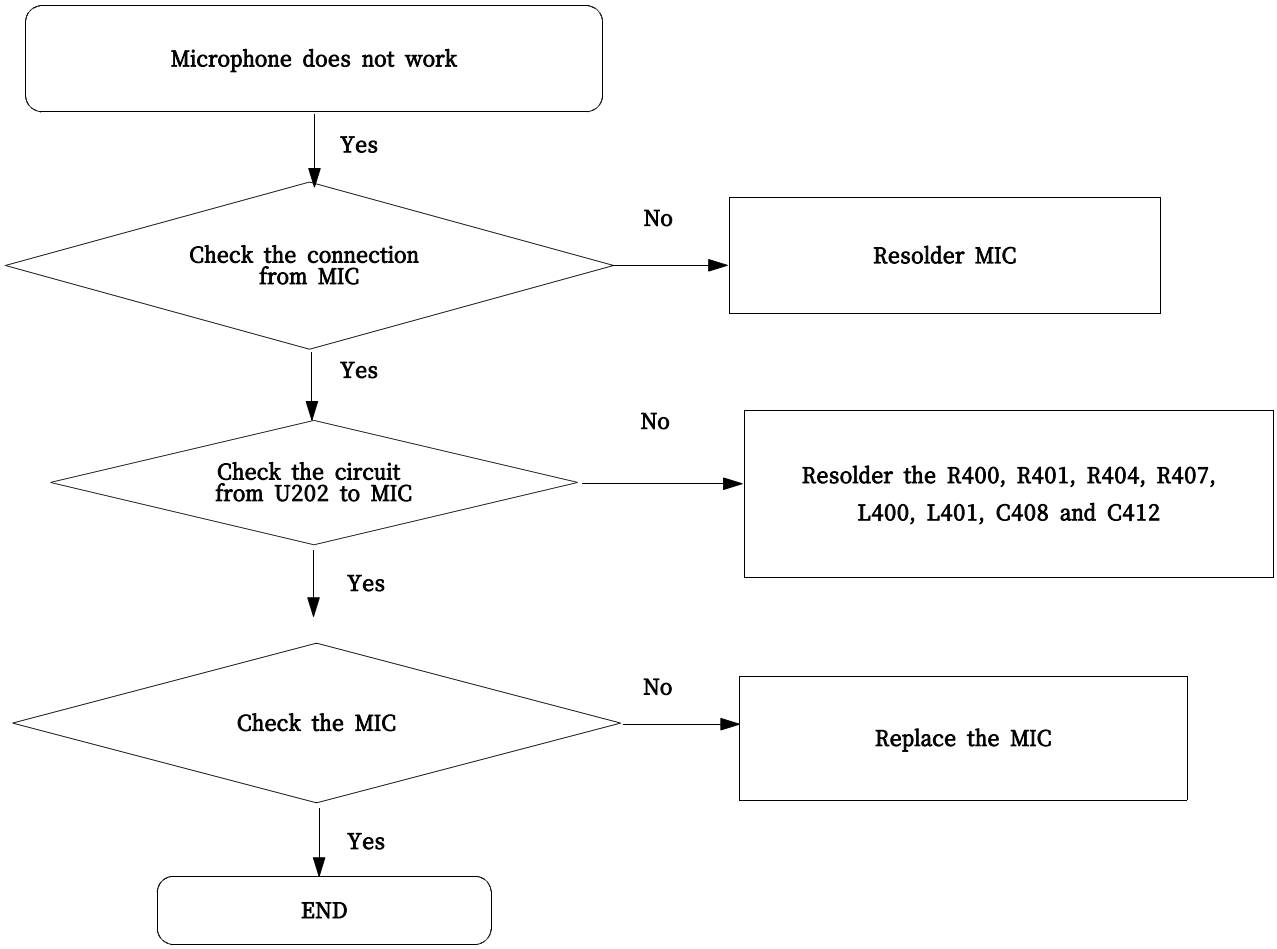


7-4. Sim Part



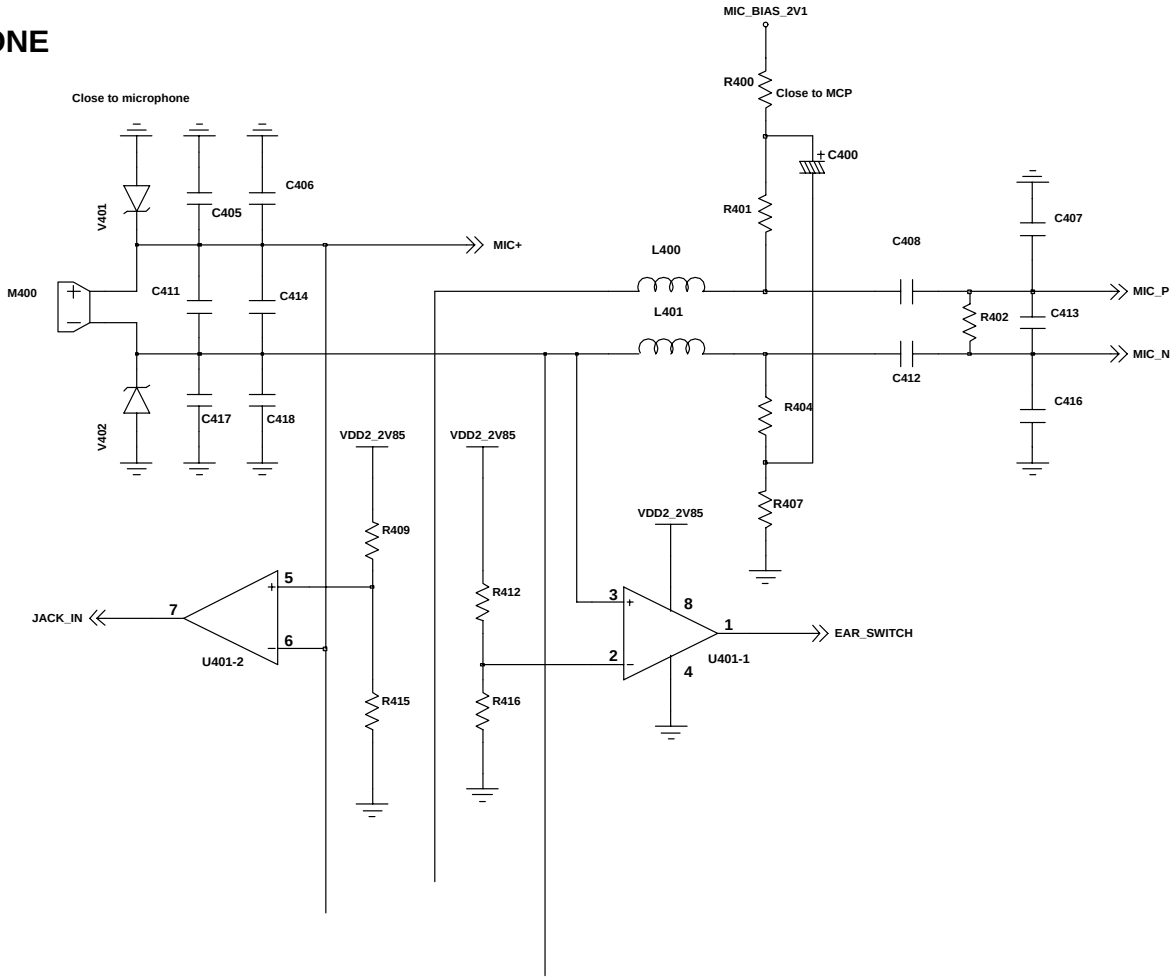


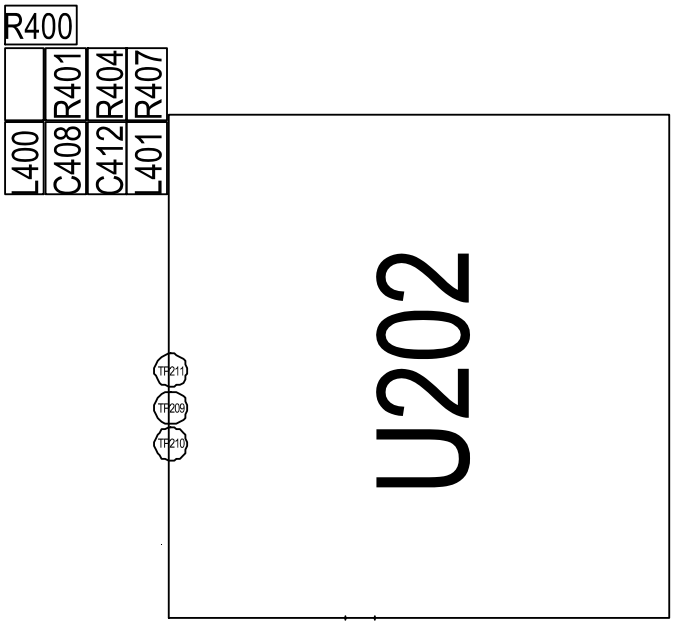
7-5. Microphone Part



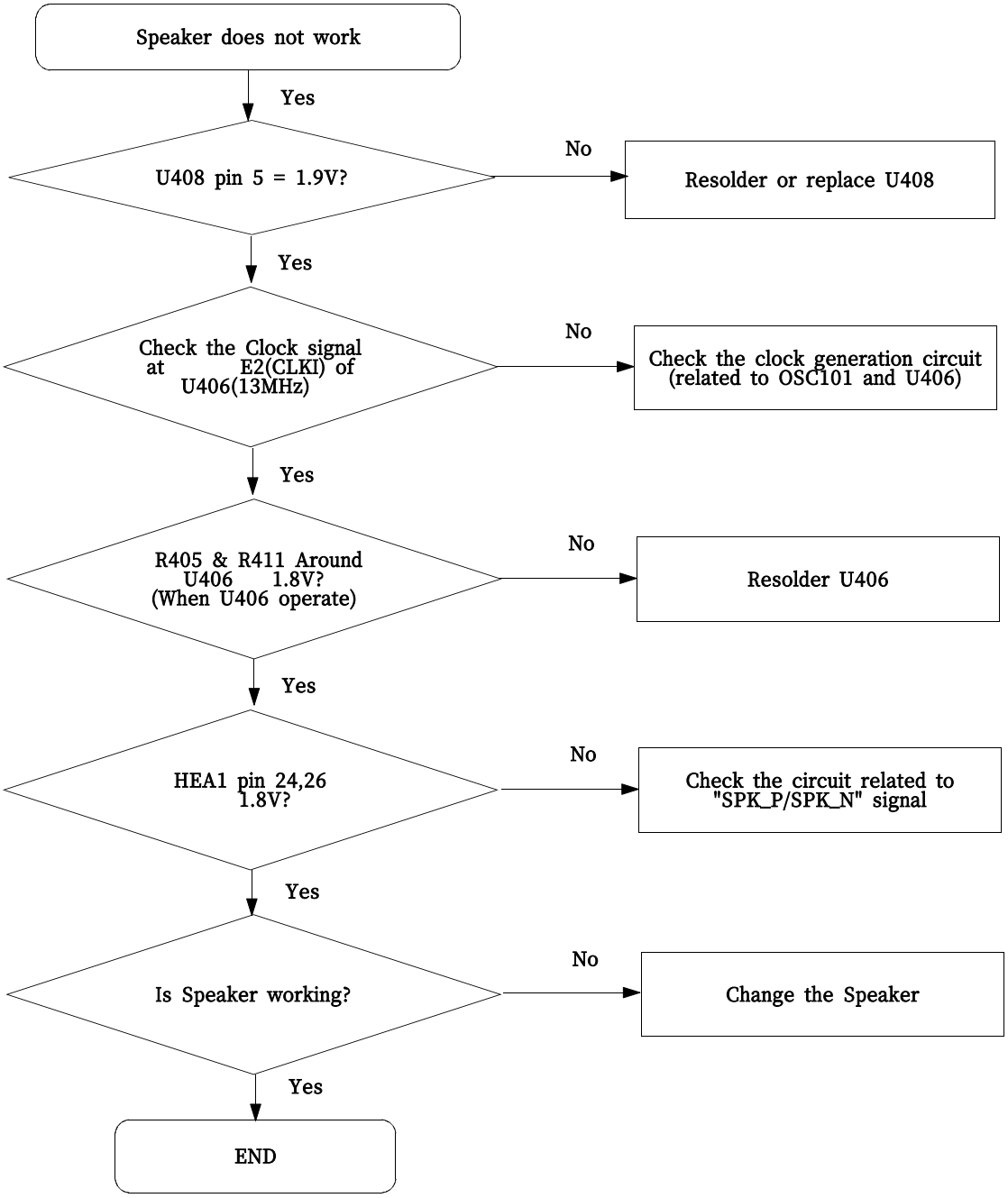
Microphone

MICROPHONE

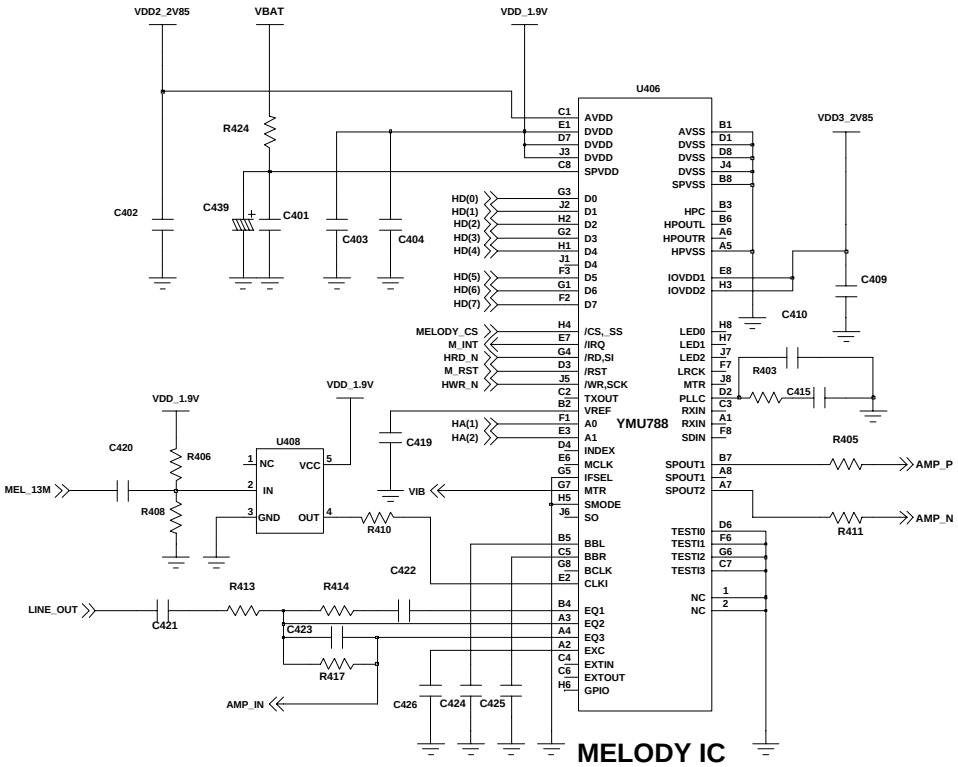


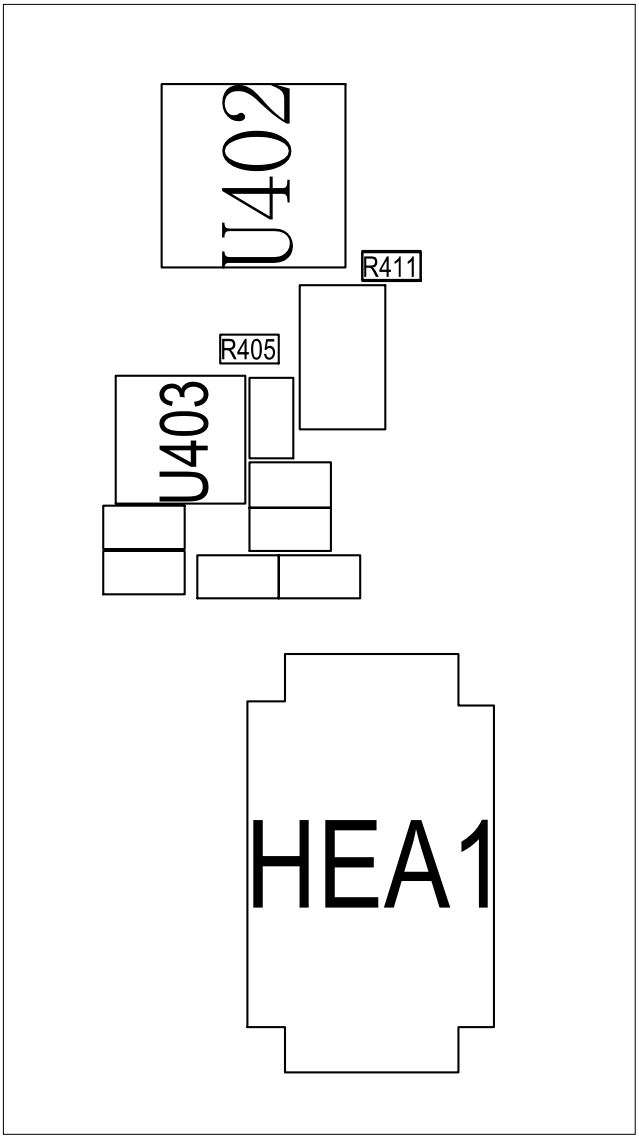


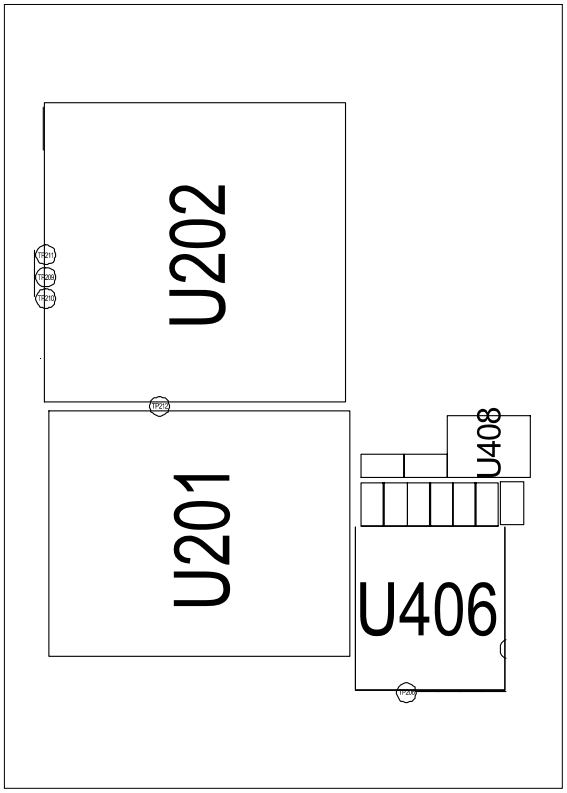
7-6. Speaker Part(Melody)



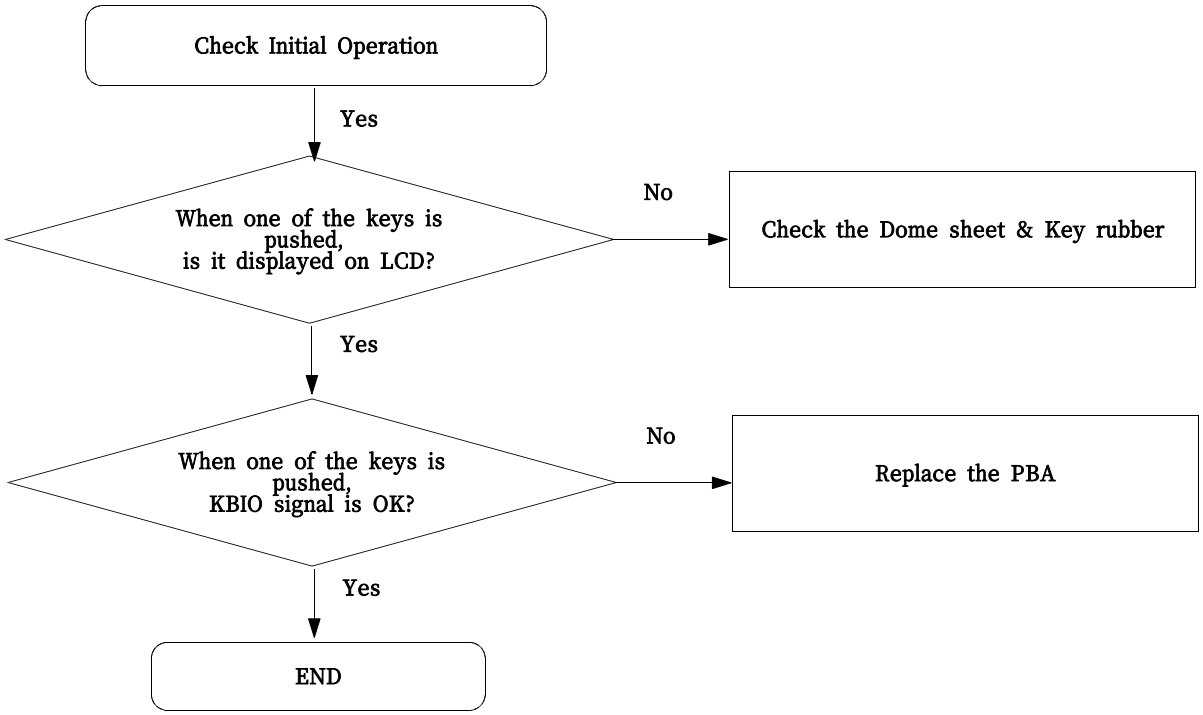
Speaker



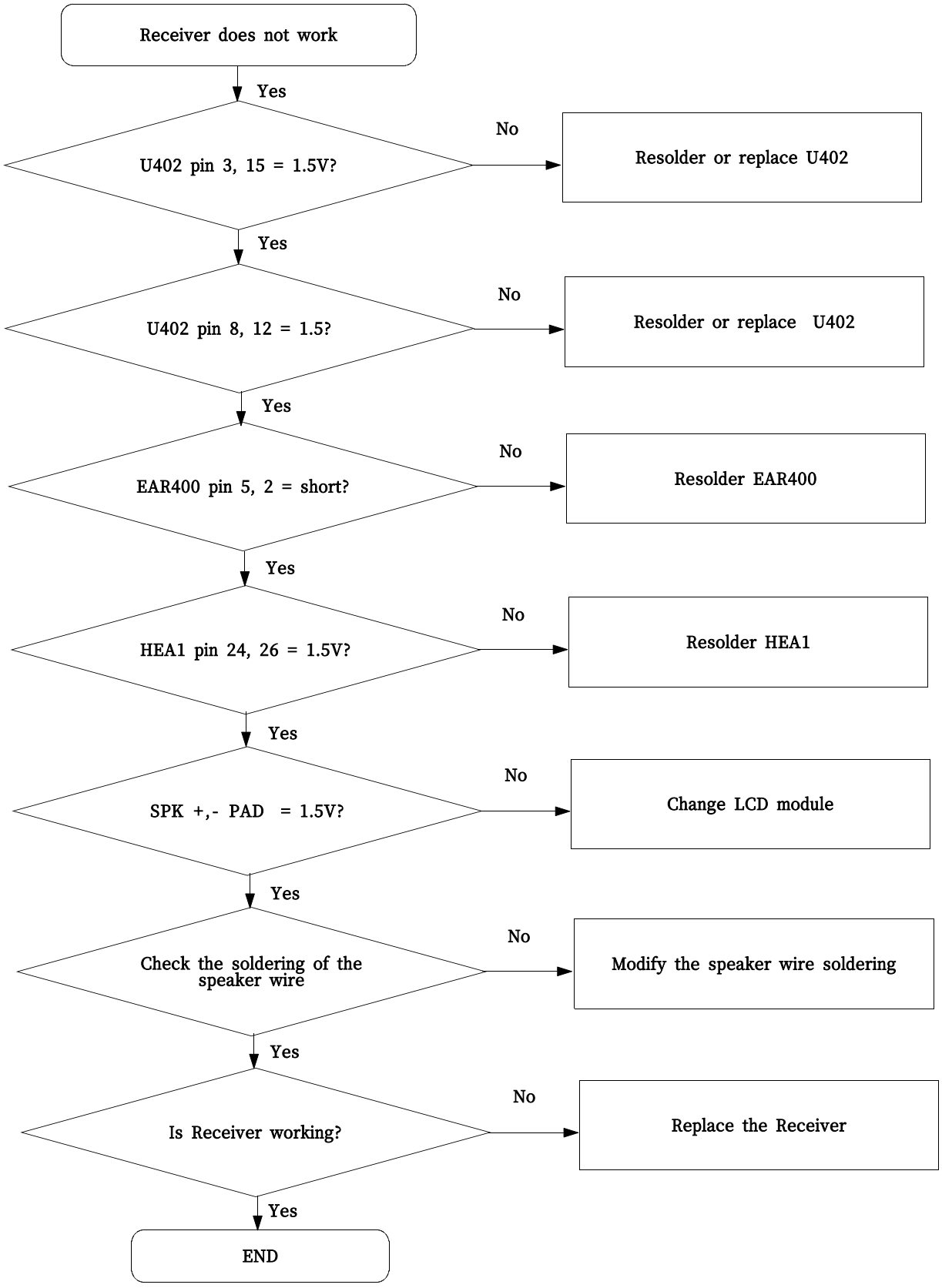


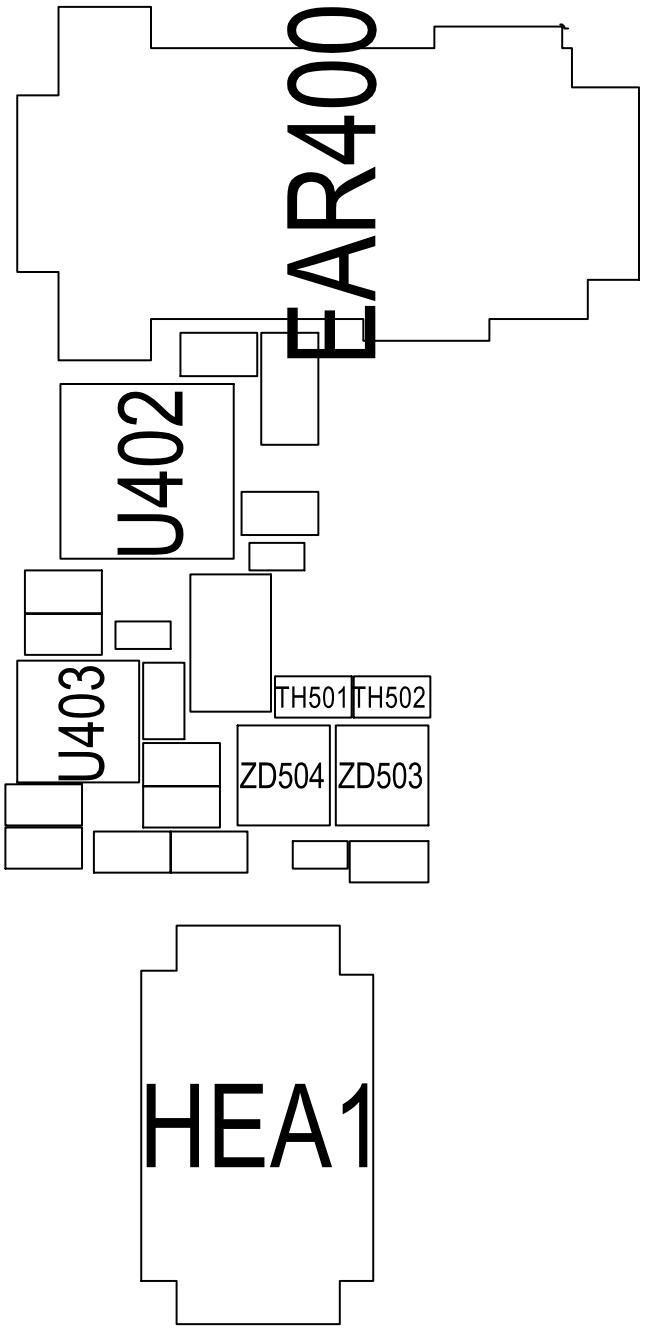


7-7. Key Data Input

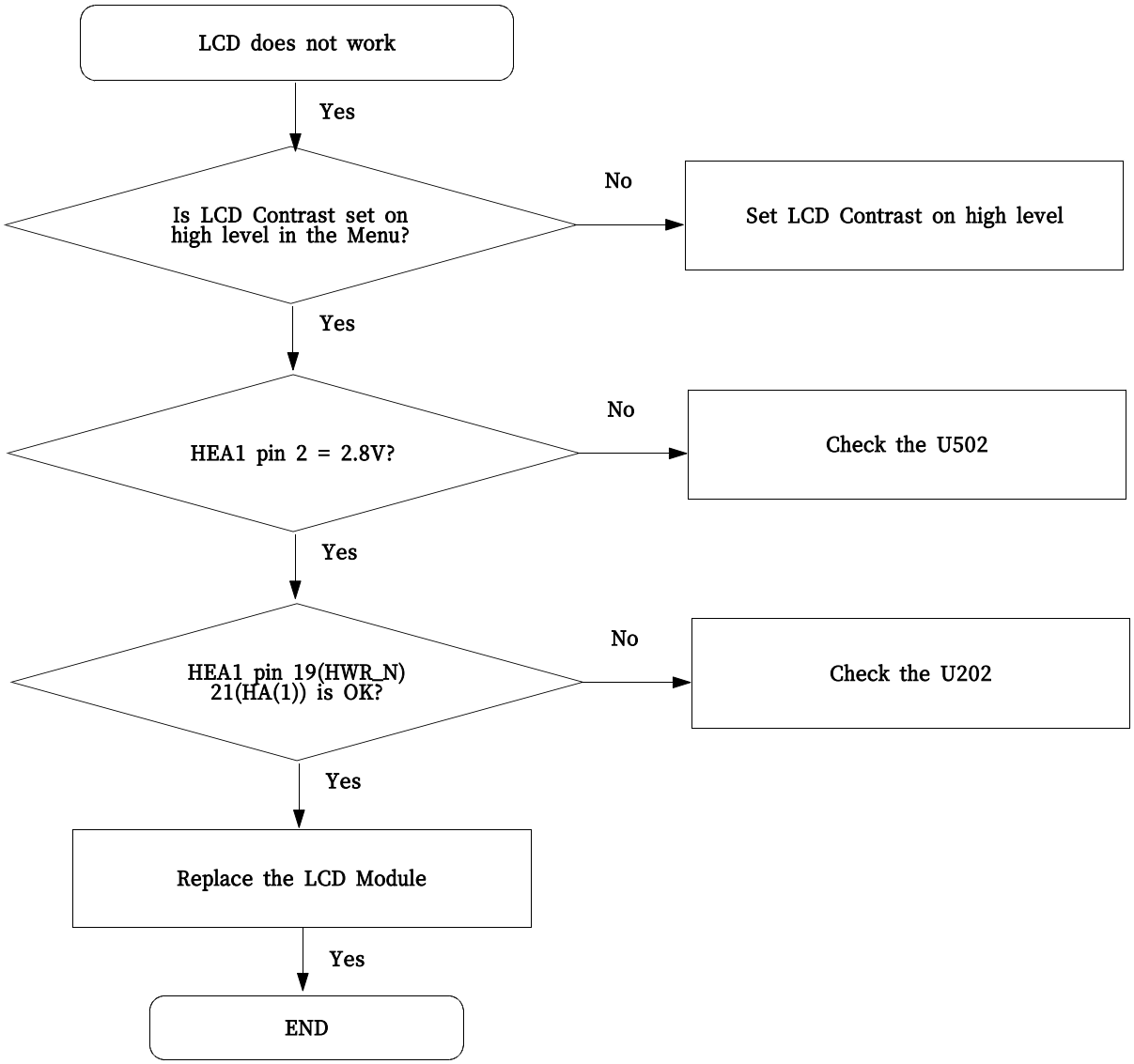


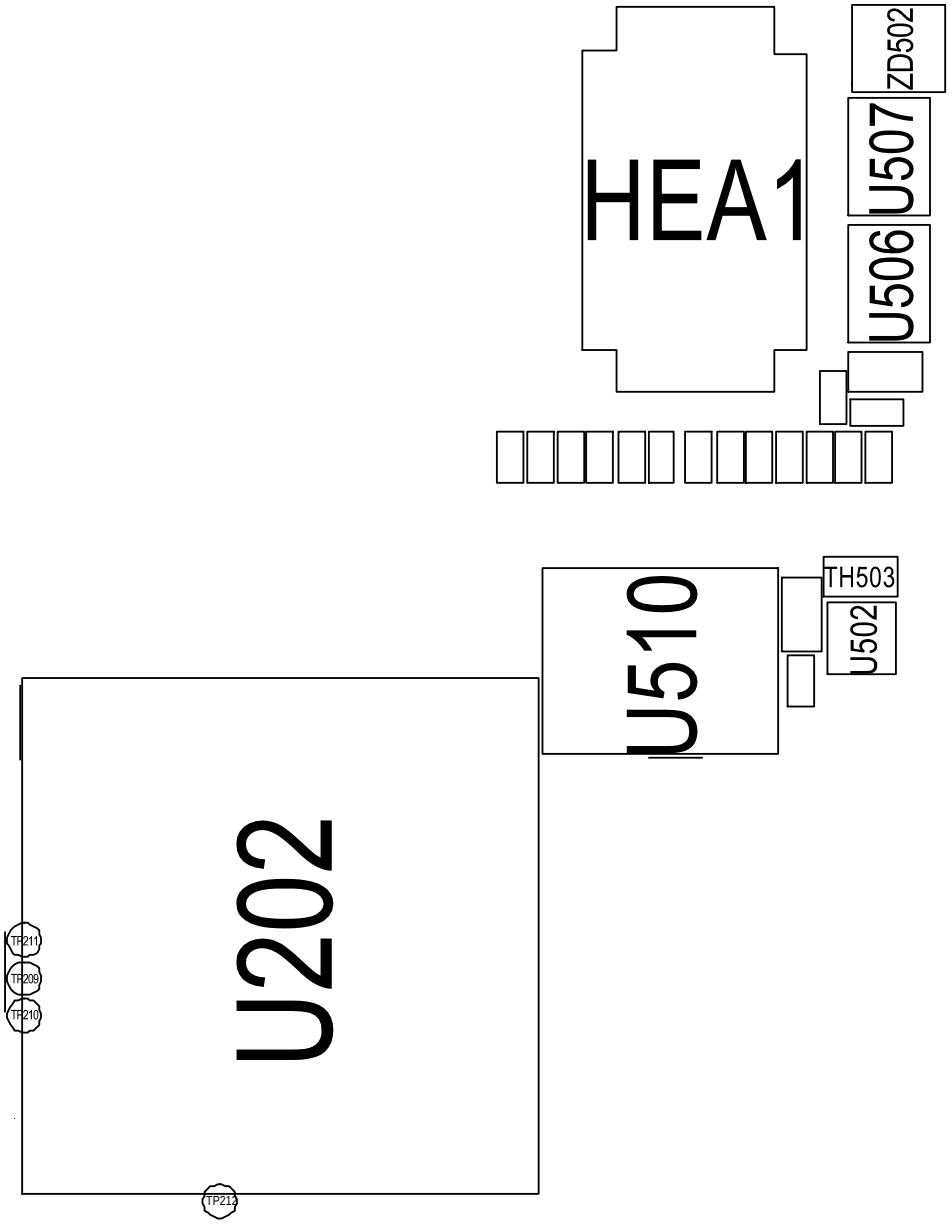
7-8. Receiver Part



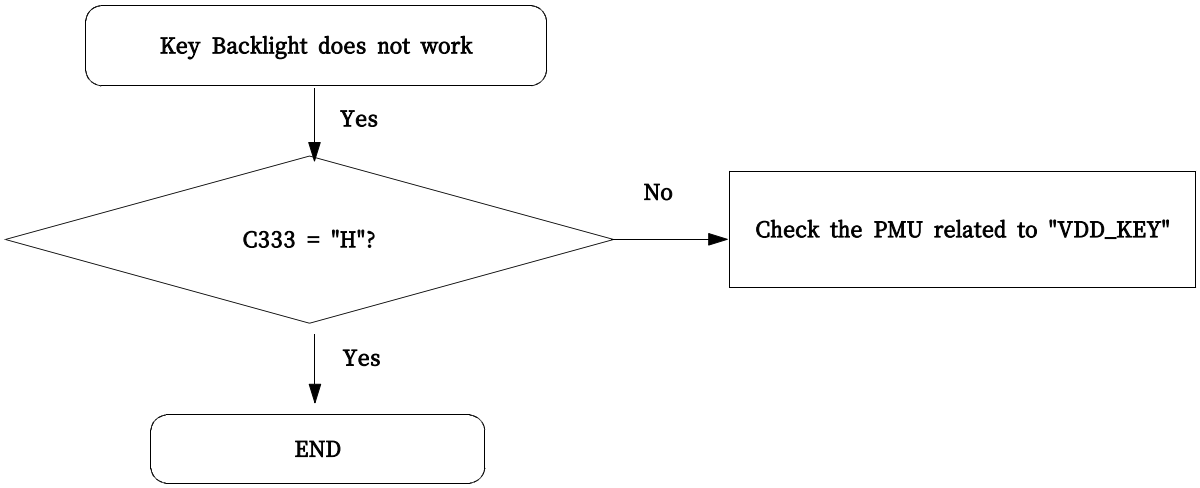


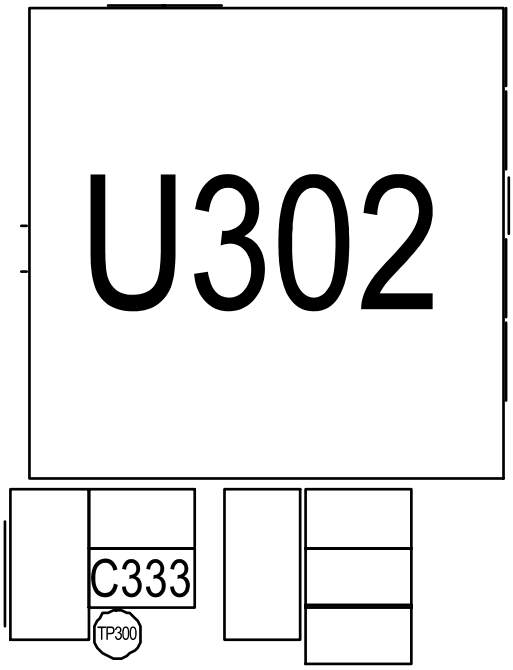
7-9. LCD Part (for Color Main)



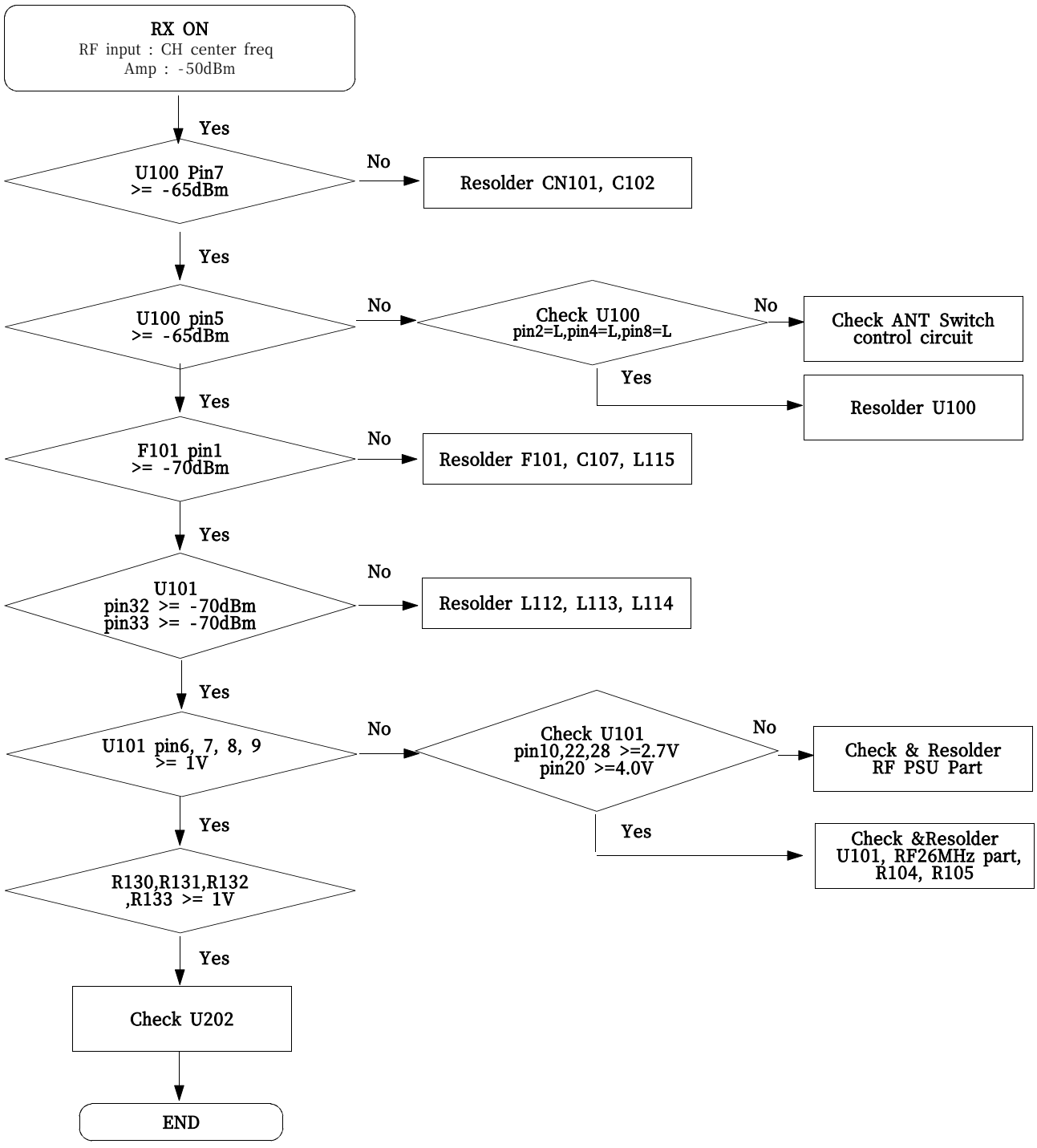


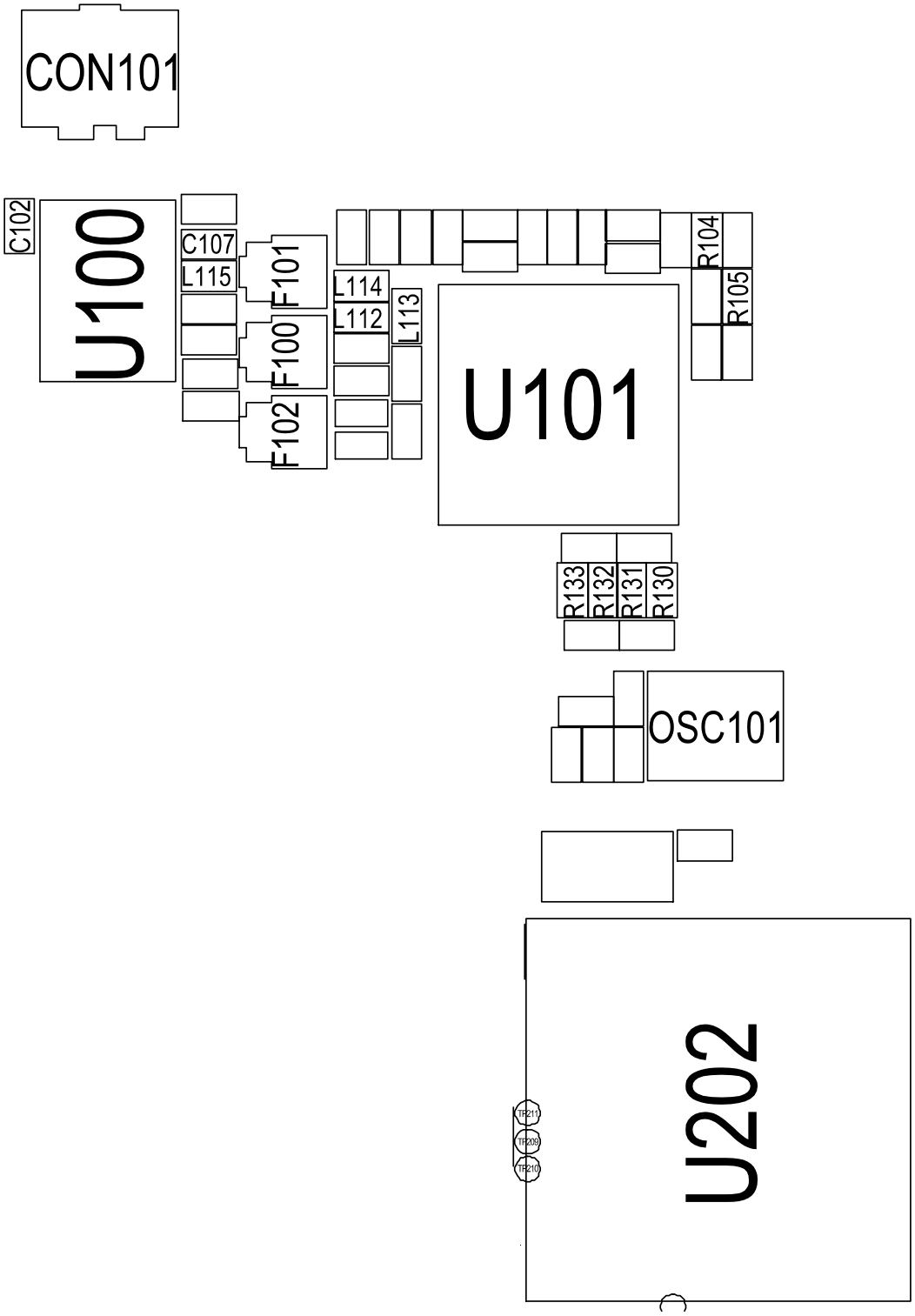
7-10. Key Back Light



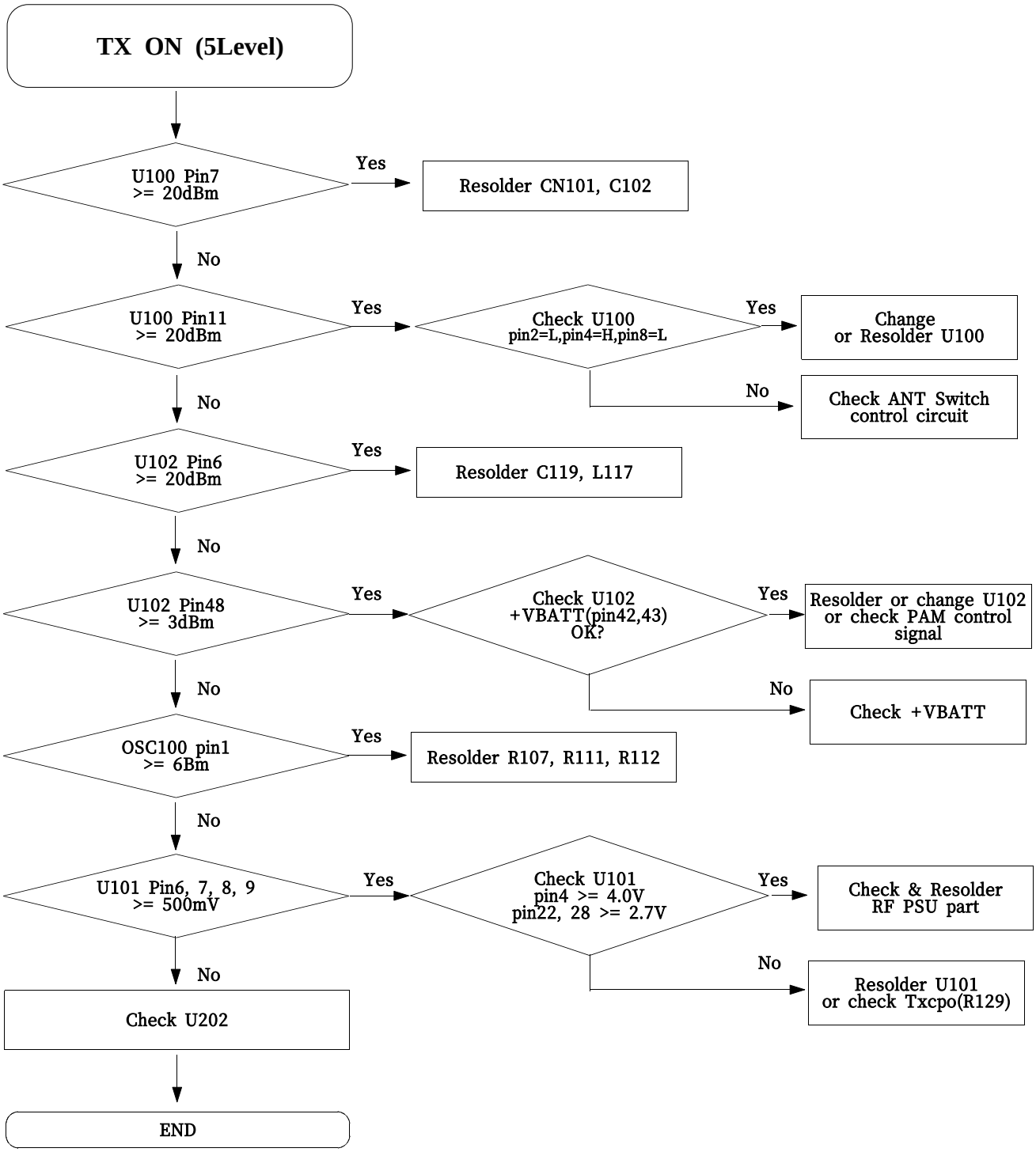


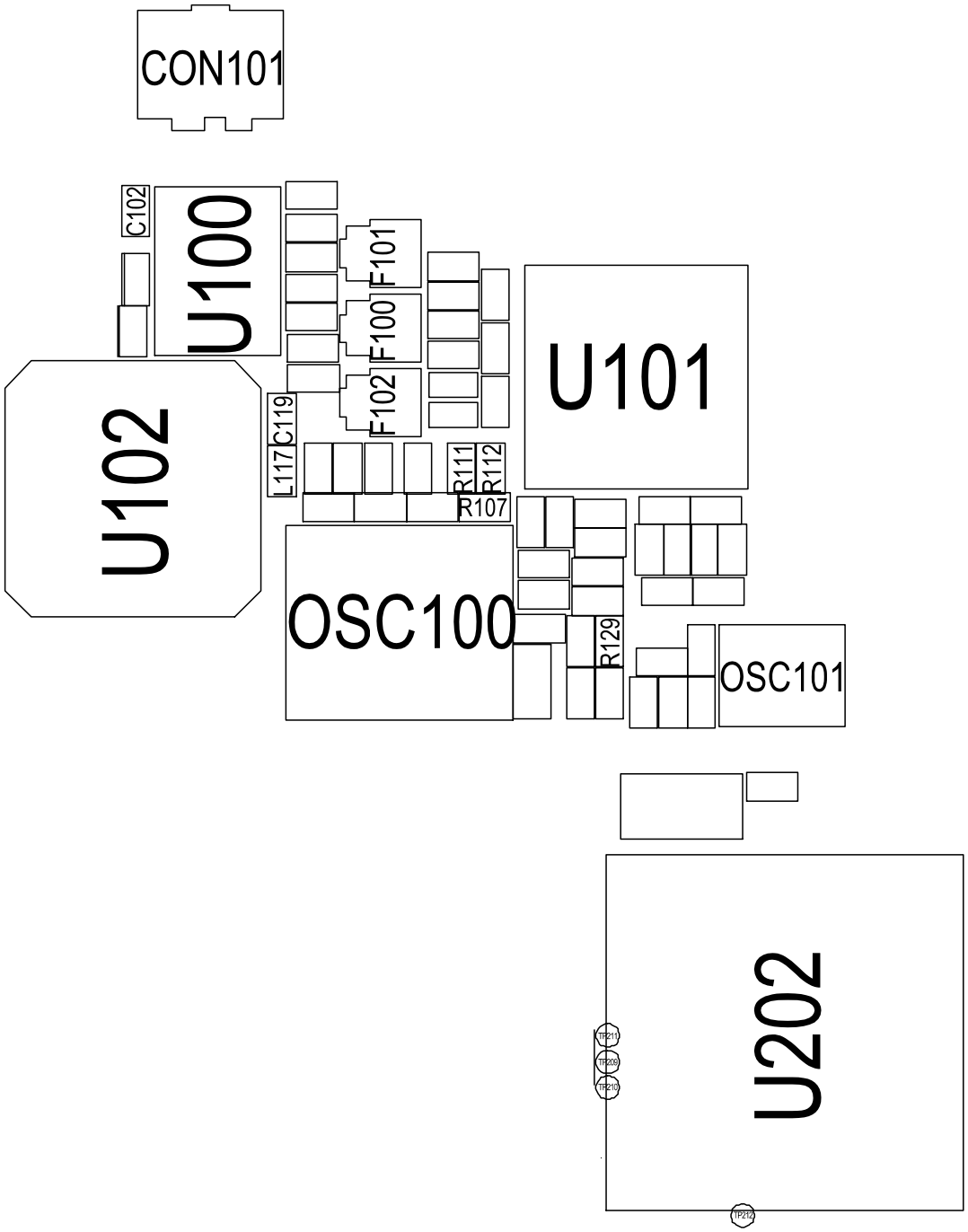
7-11. GSM Receiver



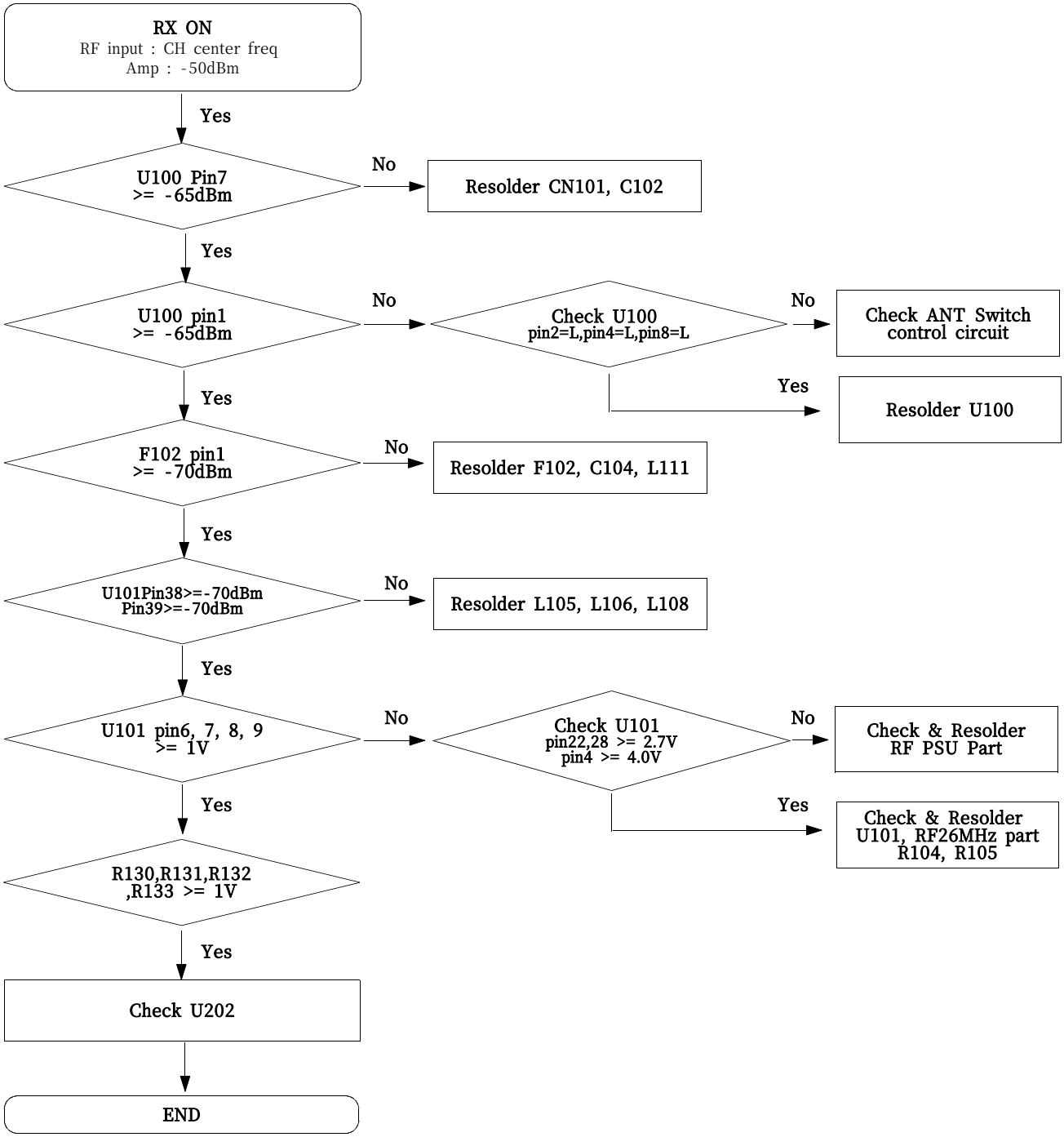


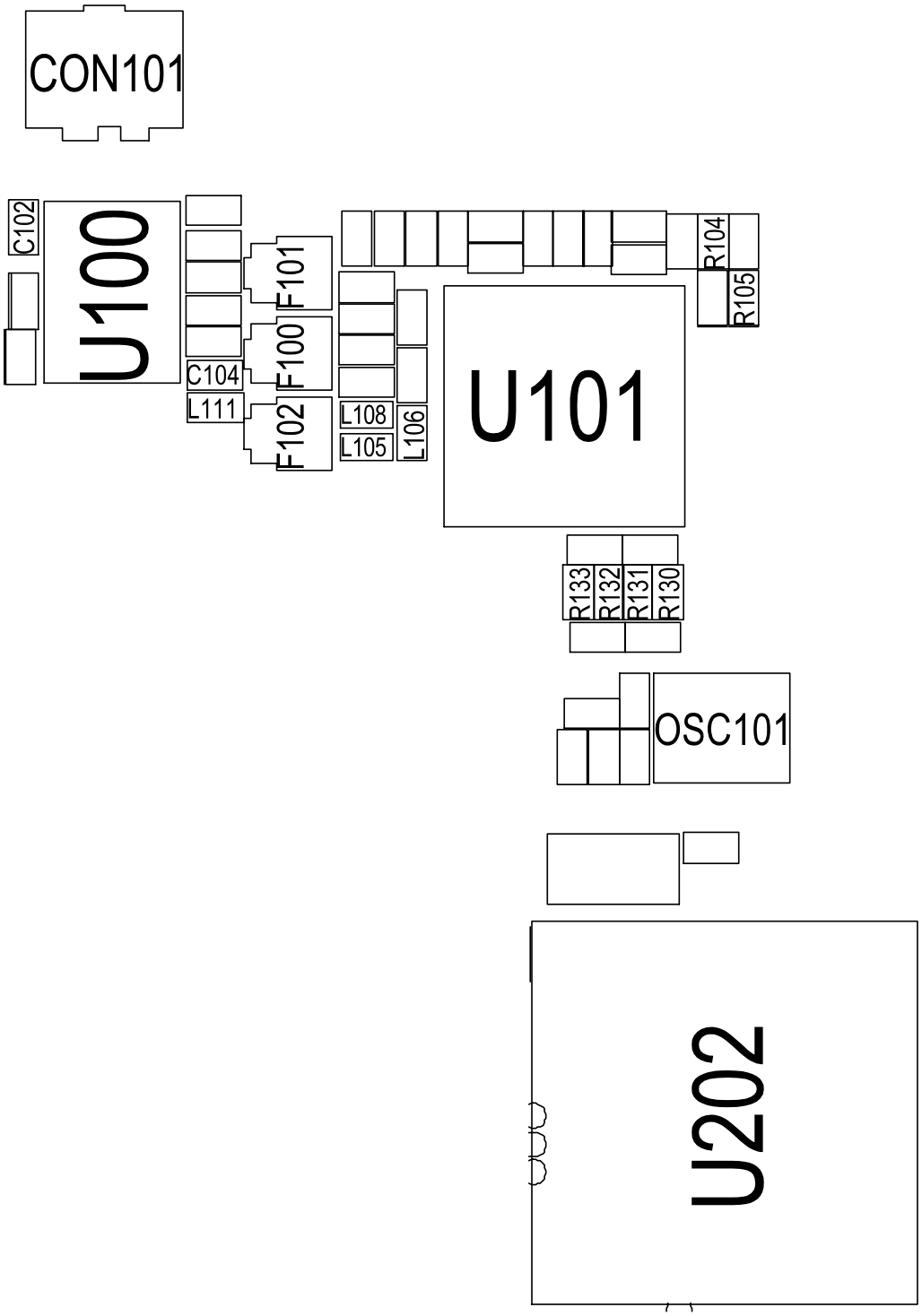
7-12. GSM Transmitterv



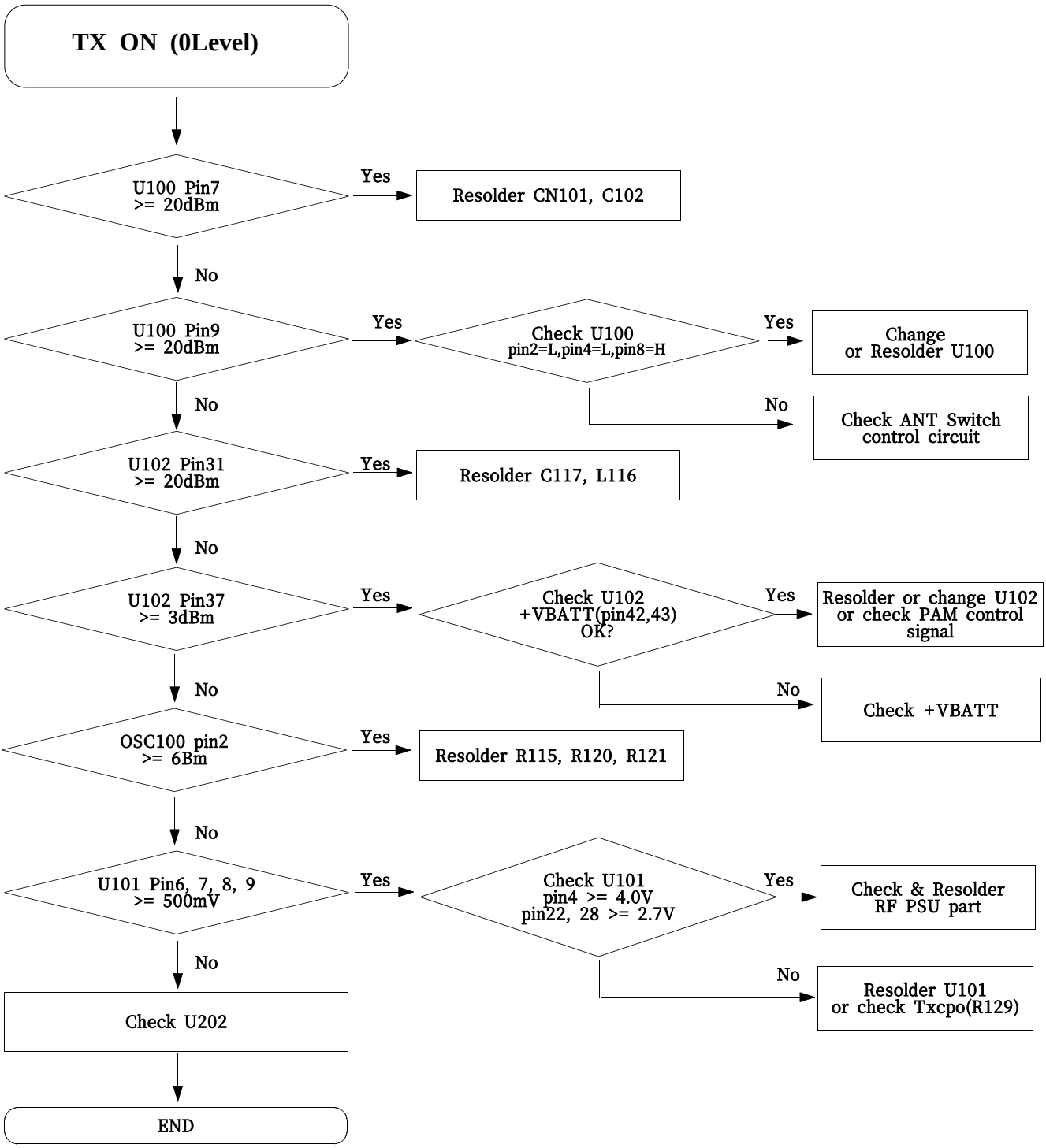


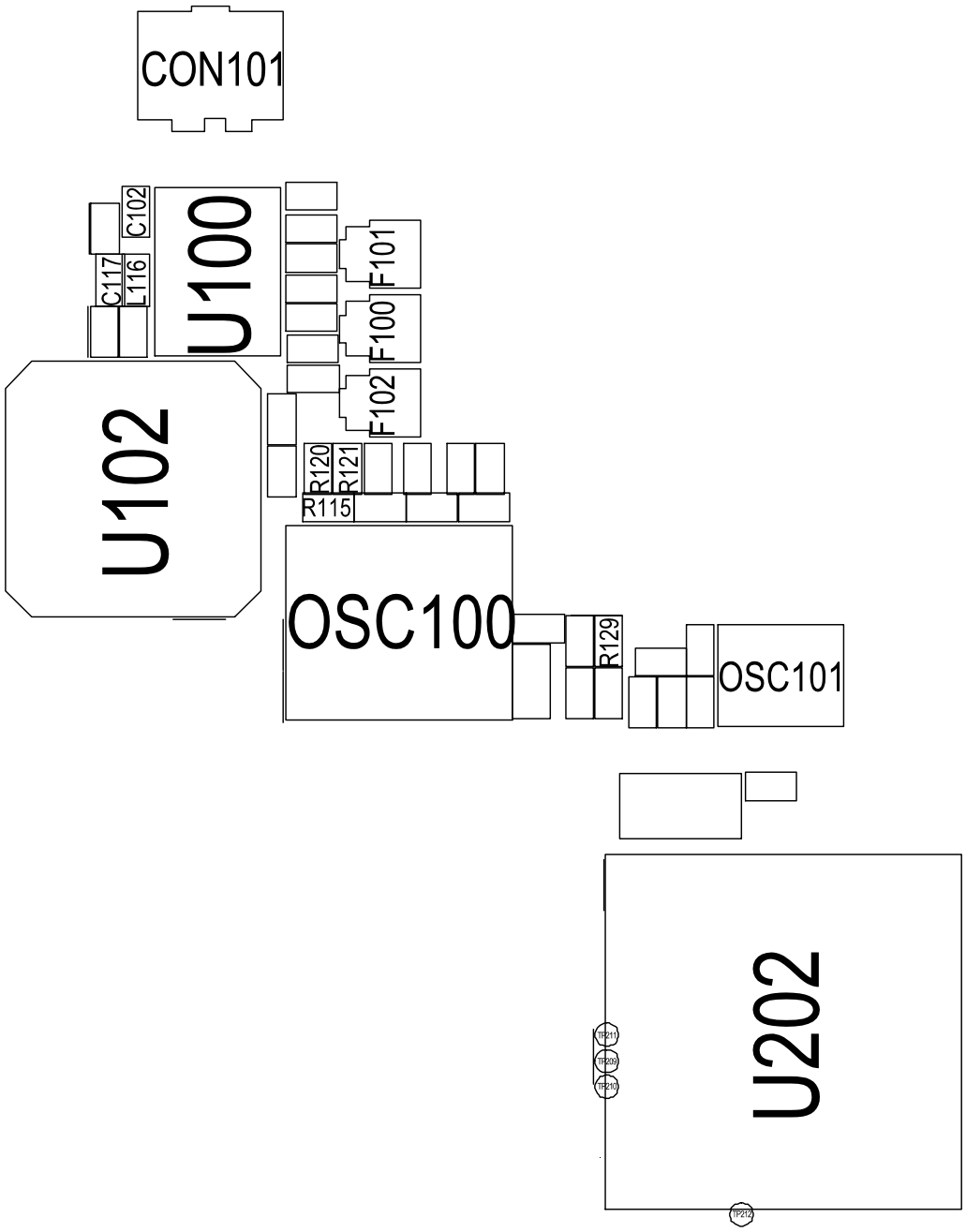
7-13. DCS Receiver



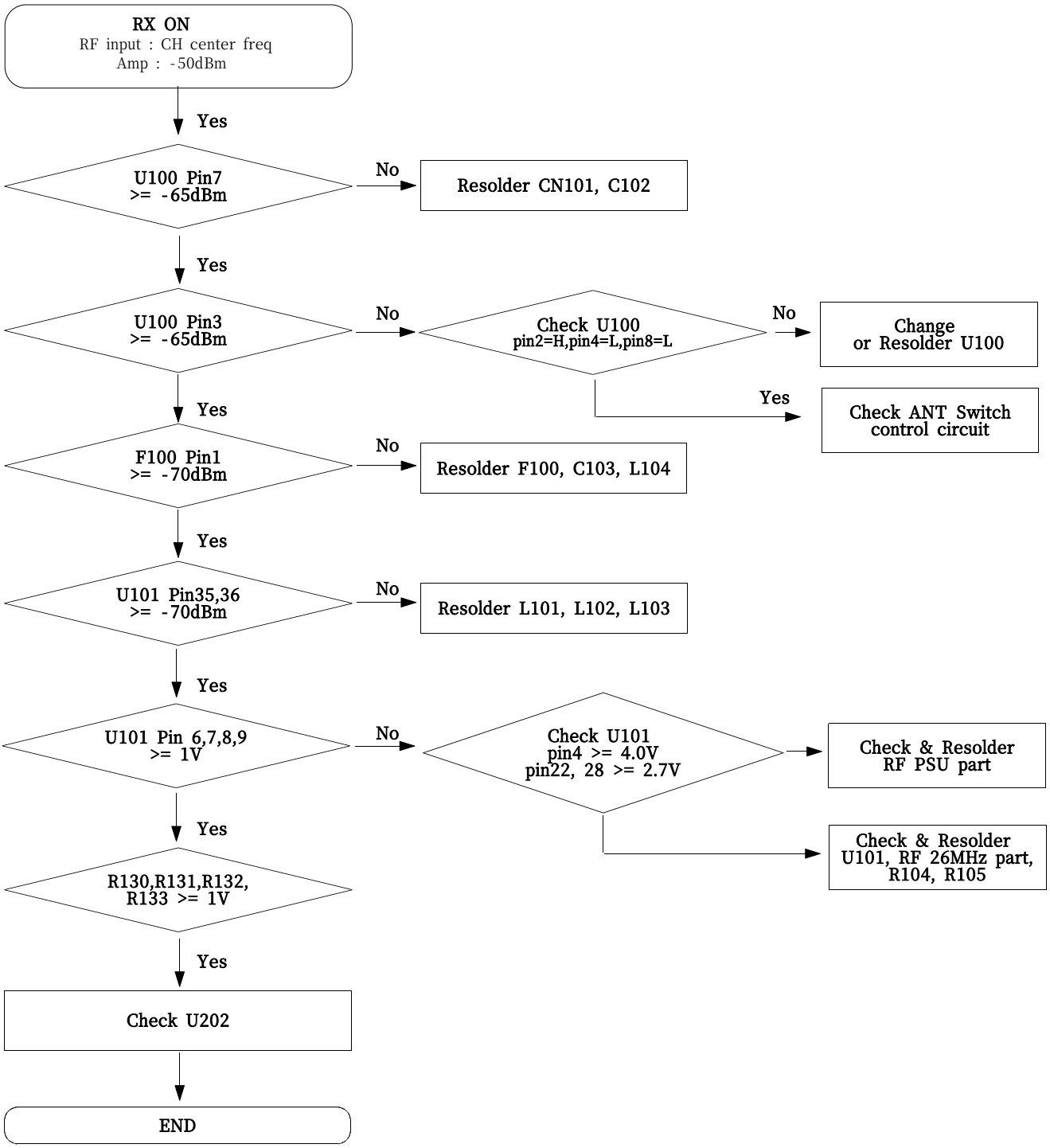


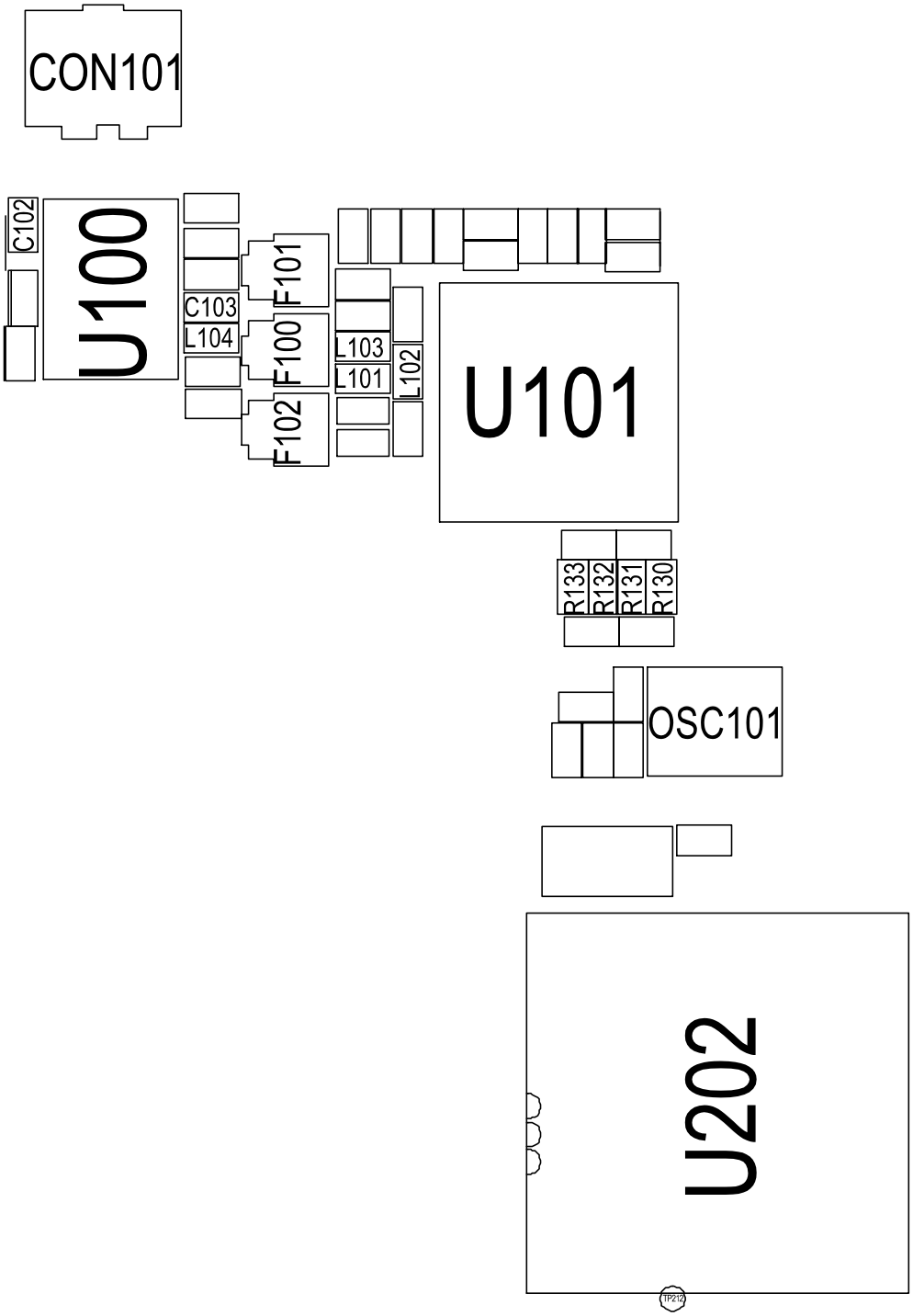
7-14. DCS Transmitter



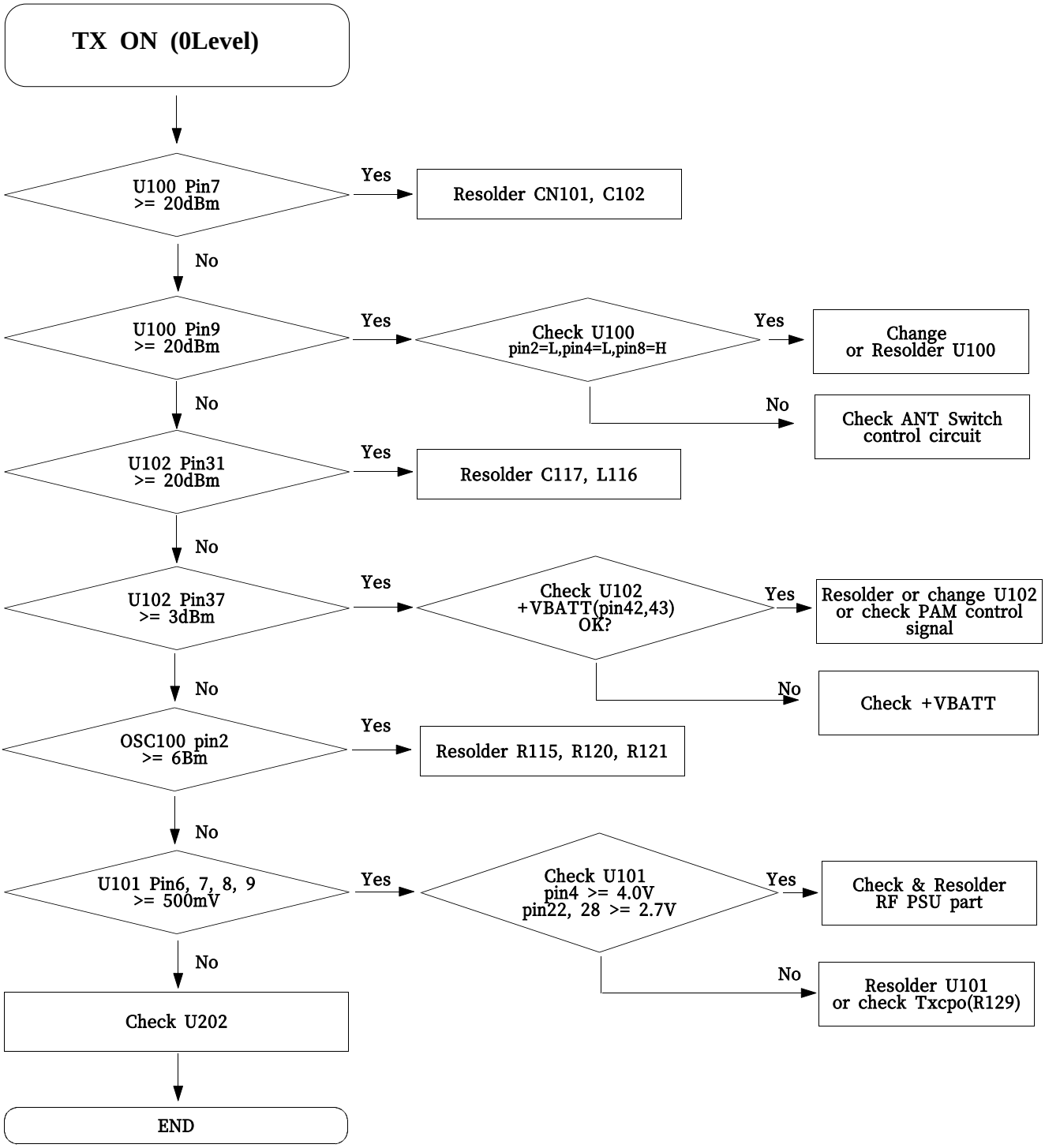


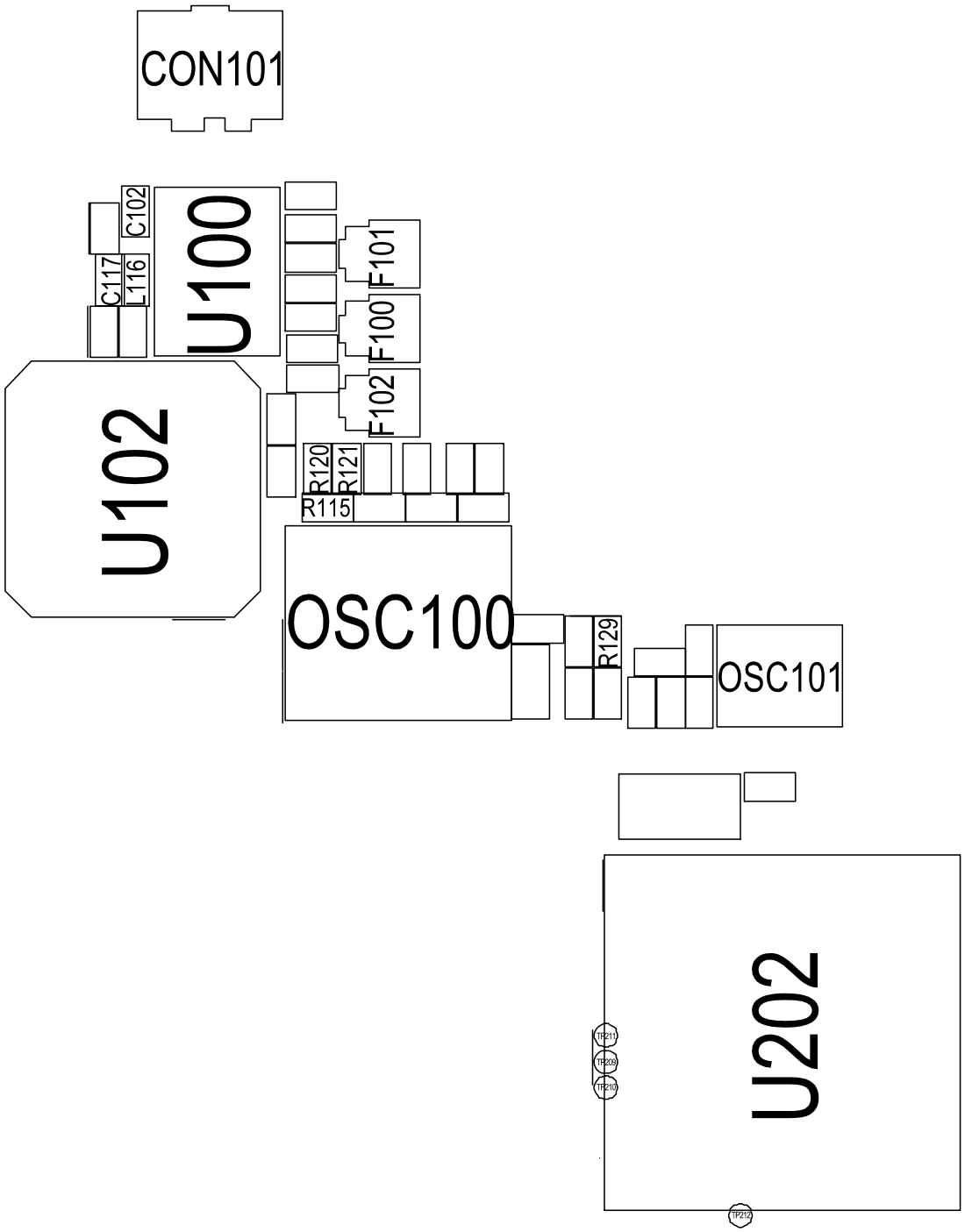
7-15. PCS Receiver



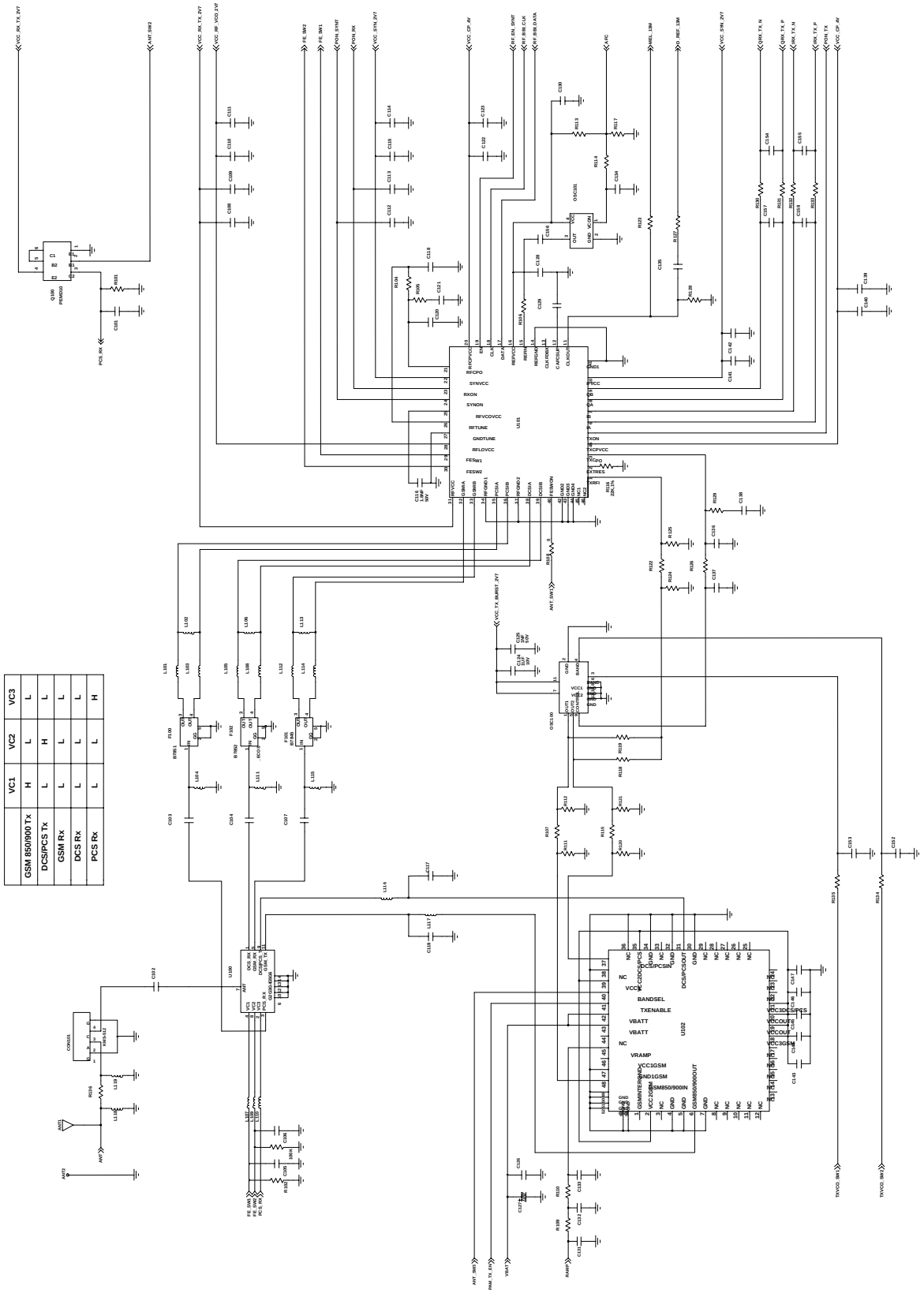


7-16. PCS Transmitter





Transmitter & Receiver



	VC1	VC2	VC3
GSM 850/900 Tx	H	L	L
DCS/PCS Tx	L	H	L
GSM Rx	L	L	L
DCS Rx	L	L	L
PCS Rx	L	L	H