

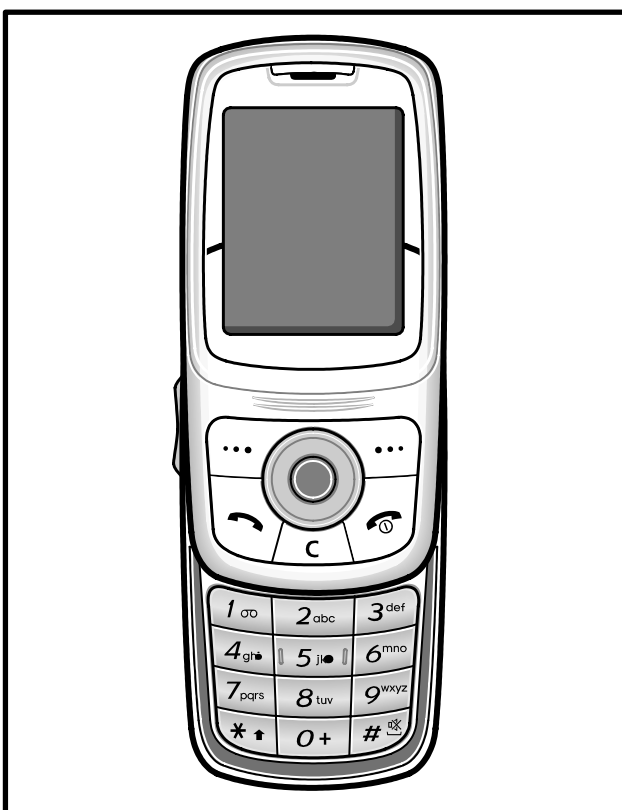
SAMSUNG

GSM TELEPHONE

SGH-X530

SERVICE *Manual*

GSM TELEPHONE



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10. Reference data

1. Safety Precautions

1-1. Repair Precaution

- Repair in Shield Box, during detailed tuning.
Take specially care of tuning or test,
because specipicty of cellular phone is sensitive for surrounding interference(RF noise).
- Be careful to use a kind of magnetic object or tool,
because performance of parts is damaged by the influence of manetic force.
- Surely use a standard screwdriver when you disassemble this product,
otherwise screw will be worn away.
- Use a thicken twisted wire when you measure level.
A thicken twisted wire has low resistance, therefore error of measurement is few.
- Repair after separate Test Pack and Set because for short danger (for example an overcurrent and furious flames of parts etc) when you repair board in condition of connecting Test Pack and tuning on.
- Take specially care of soldering, because Land of PCB is small and weak in heat.
- Surely tune on/off while using AC power plug, because a repair of battery charger is dangerous when tuning ON/OFF PBA and Connector after disassembling charger.
- Don't use as you pleases after change other material than replacement registered on SEC System.
Otherwise engineer in charge isn't charged with problem that you don't keep this rules.

1-2. ESD(Electrostatically Sensitive Devices) Precaution

Several semiconductor may be damaged easily by static electricity. Such parts are called by ESD(Electrostatically Sensitive Devices), for example IC,BGA chip etc. Read Precaution below. You can prevent from ESD damage by static electricity.

- Remove static electricity remained your body before you touch semiconductor or parts with semiconductor. There are ways that you touch an earthed place or wear static electricity prevention string on wrist.
- Use earthed soldering steel when you connect or disconnect ESD.
- Use soldering removing tool to break static electricity. , otherwise ESD will be damaged by static electricity.
- Don't unpack until you set up ESD on product. Because most of ESD are packed by box and aluminum plate to have conductive power,they are prevented from static electricity.
- You must maintain electric contact between ESD and place due to be set up until ESD is connected completely to the proper place or a circuit board.

2. Specification

2-1. 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	45 MHz	45 MHz	95 MHz	80 MHz
Mod. Bit rate/ Bit Period	270.833 kbps 3.692 us	270.833 kbps 3.692 us	270.833 kbps 3.692 us	270.833 kbps 3.692 us
Time Slot Period/Frame Period	576.9 us 4.615 ms	576.9 us 4.615 ms	576.9 us 4.615 ms	576.9 us 4.615 ms
Modulation	0.3GMSK	0.3 GMSK	0.3 GMSK	0.3 GMSK
MS Power	33 dBm~13 dBm	33 dBm~5 dBm	30 dBm~0 dBm	30 dBm~0 dBm
Power Class	5 pcl ~ 15 pcl	5 pcl ~ 19 pcl	0 pcl ~ 15 pcl	0 pcl ~ 15 pcl
Sensitivity	-102 dBm	-102 dBm	-100 dBm	-100 dBm
TDMA Mux	8	8	8	8
Cell Radius	35 Km	35 Km	2 Km	-

2-2. GSM Tx Power Class

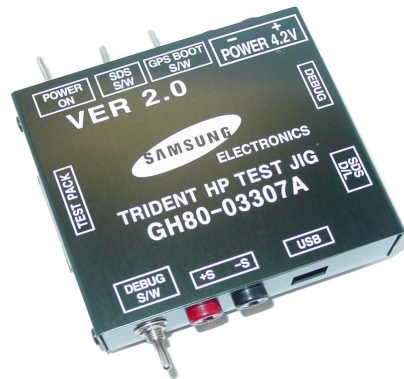
TX Power control level	GSM900	TX Power control level	DCS1800	TX Power control level	PCS1900
5	33±2 dBm	0	30±3 dBm	0	30±3 dBm
6	31±2 dBm	1	28±3 dBm	1	28±3 dBm
7	29±2 dBm	2	26±3 dBm	2	26±3 dBm
8	27±2 dBm	3	24±3 dBm	3	24±3 dBm
9	25±2 dBm	4	22±3 dBm	4	22±3 dBm
10	23±2 dBm	5	20±3 dBm	5	20±3 dBm
11	21±2 dBm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

3. Product Function

Main Function

- Speed dial
- SDN(Service Dialling Numbers)
- Network services
- Read SMS or MMS message
- Voicemail
- SOS messages

4. Array course control



Test Jig (GH80-03307A)



Test Cable (GH39-00127A)



RF Test Cable (GH39-00283A)

4-1. Downloading Binary Files (1)

- Swift Model firmware is composed of 2 files
- *.s3 : Main source code binary.

4-2. Prerequisite

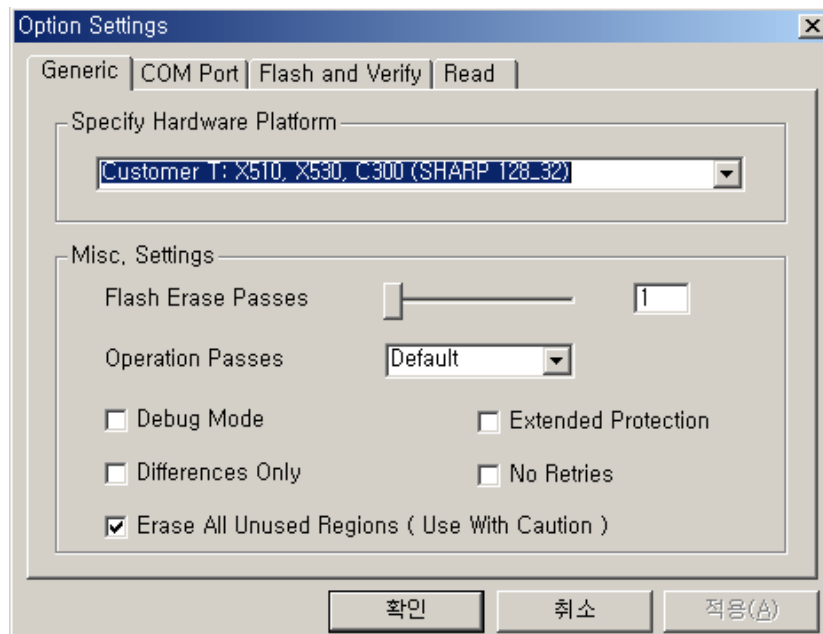
- Downloader program(Optiflash.exe)
- X530 Moblie Phone
- Data Cable
- Binary Files

4-3. S/W Downloader Program

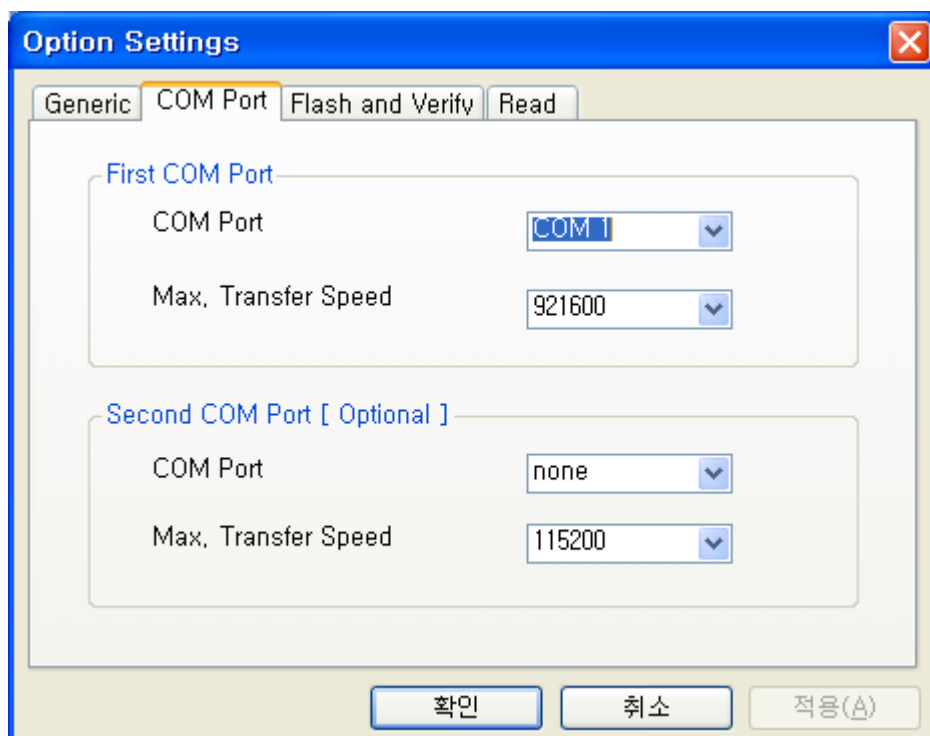
1. Load the binary download program by execution the "OptiFlash.exe"



2. Select the "Options" -> "Settings" -> "Generic" -> "Specify hardware platform".
Choose hardware platform for the downloader file setting.
Set the everything else as the default values which are shown below



3. Select the **COM port** where the download cable is connected

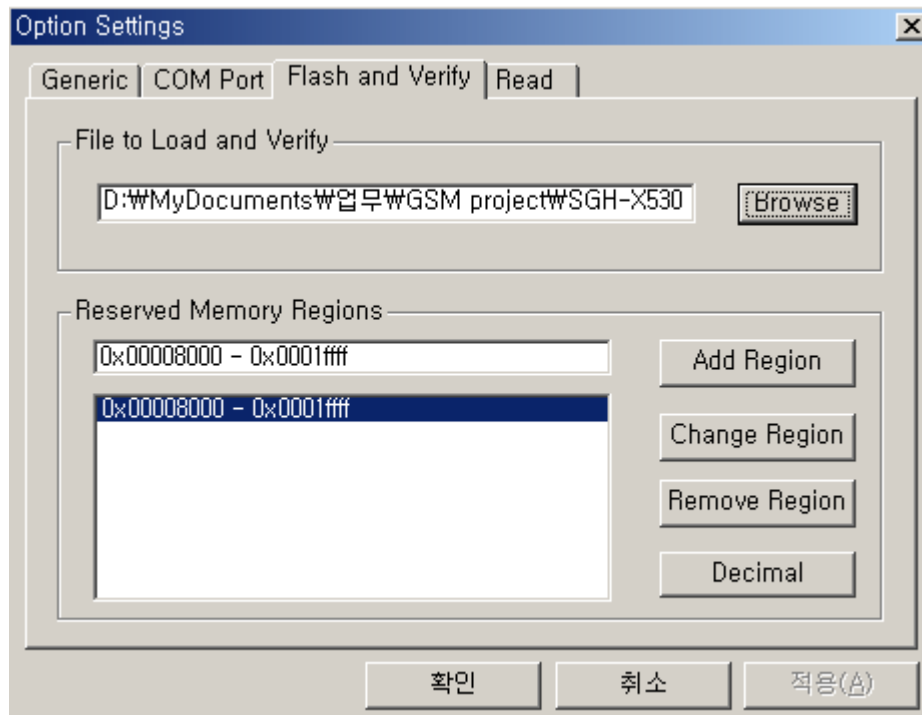


Only COM1 is supported. Additionally you can select the maximum transfer speed OptiFlash will use to communicate with the phone. However, Optiflash will use a slower speed if either the PC's or the phone's serial hardware is incapable of handling the selected speed.

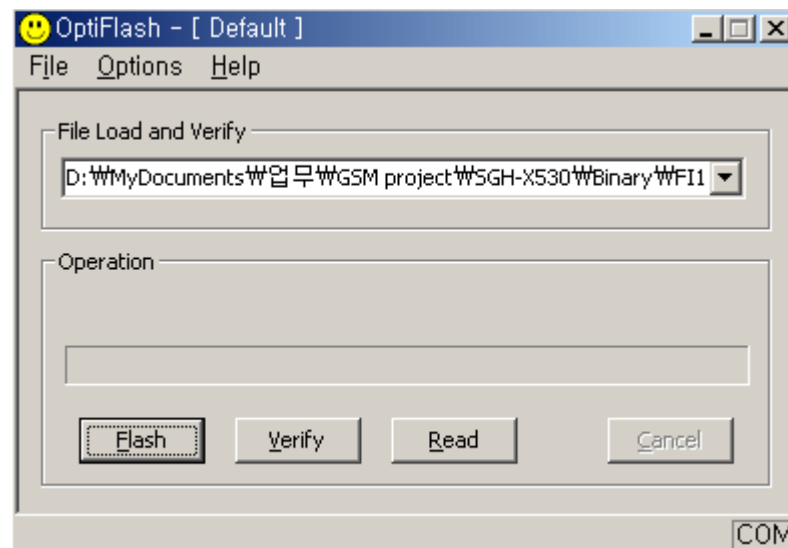
4. Select the "Flash&Verify" -> "Browse"

Set the directory path and choose the latest S/W binary, for example "gsmstack.s3", for the downloader binary setting.

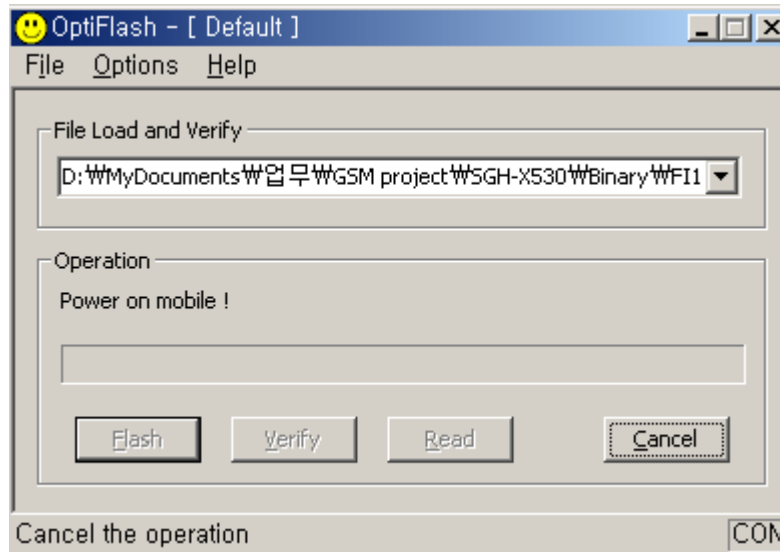
And Check "Reserved Memory Regions" - **0x00008000 - 0x0001ffff**



5. 1st. Press "Flash".



2nd. Turn on Power of mobile



6. When downloading is finished successfully, there is a “All is well” message.

7. After finishing downloading, Certain memory resets should be done to guarantee the normal performance.

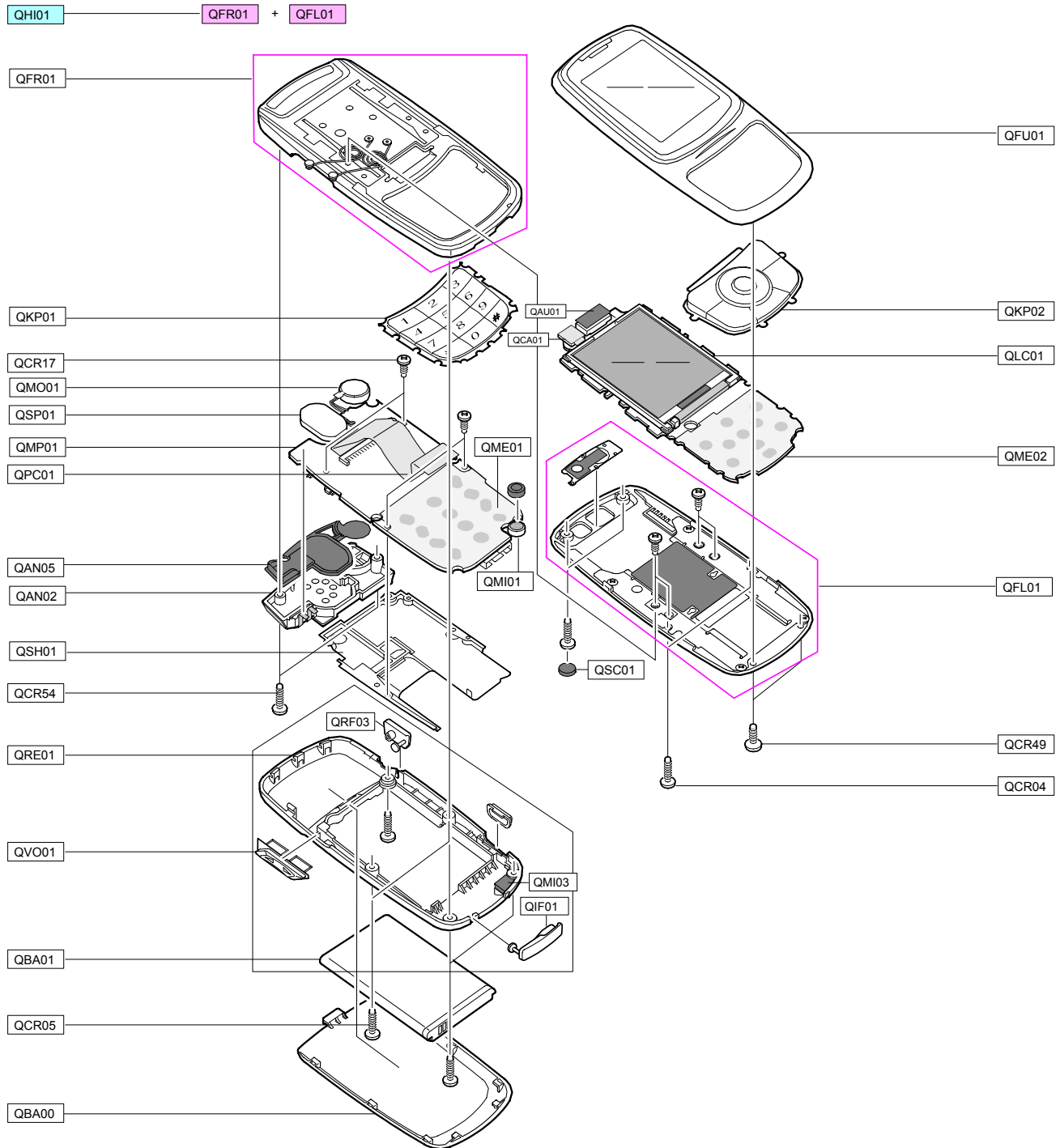
8. Confirm the downloaded version name by key-string(***#1234#**)

Memory reset will be done by pressing the following key-strings.

Full Reset : “***2767*3855#**” will reboot the phone automatically.

5. Exploded View and Parts List

5-1. Cellular phone Exploded View

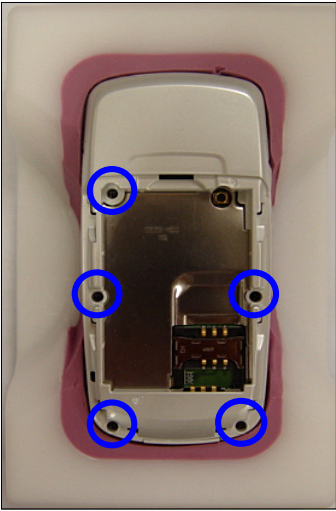
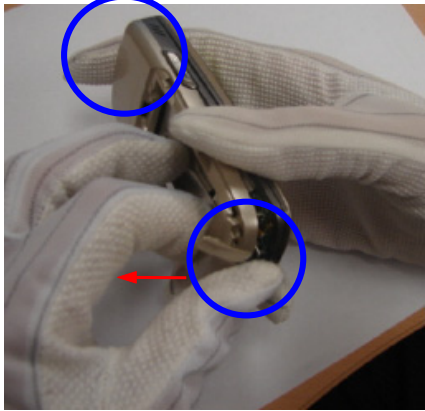
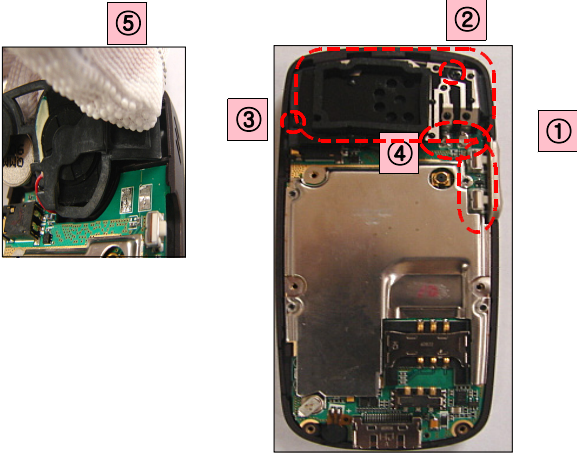
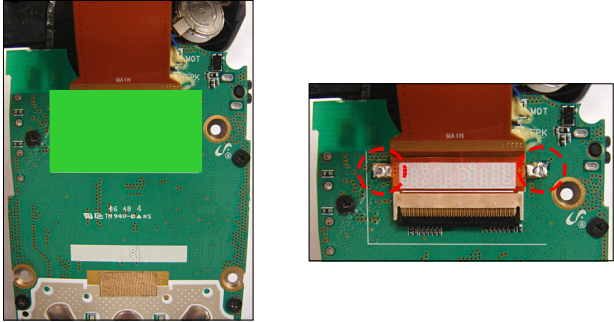


5-2. Cellular phone Parts list

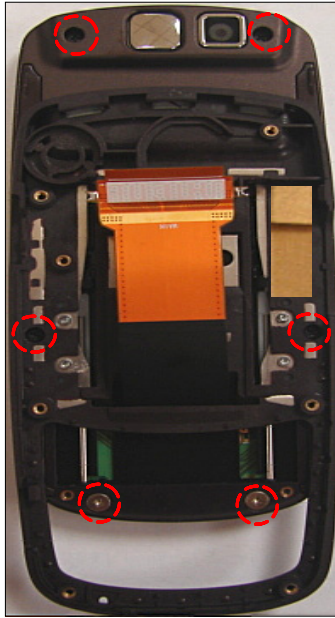
Design LOC		Discription	SEC CODE
QAN02		INTENNA-SGHX530	GH42-00995A
QAN05		ASSY RUBBER-INTENNA	GH98-02741A
QAU01		AUDIO-RECEIVER	3009-001243
QBA00		PMO-COVER BATT	GH72-34196A
QBA01		INNER BATTERY PACK-800MAH,MAIN	GH43-02589A
QCA01		UNIT-CAMERA	GH59-03701A
QCR04		SCREW-MACHINE	6001-001479
QCR05		SCREW-MACHINE	6001-001478
QCR17		SCREW-MACHINE	6001-001460
QCR49		SCREW-MACHINE	6001-001823
QCR54		SCREW-MACHINE	6001-001645
QFU01		ASSY COVER-SLIDE UPPER	GH98-02234A
QKP01		ASSY KEYPAD-MAIN(OPEN/BRN)	GH98-02239A
QKP02		ASSY KEYPAD-SUB(OPEN/BRN)	GH98-02238A
QLC01		ELA UNIT-SGHX530 LCD MODULE	GH96-02314A
QME01		UNIT-DOME SHEET (MAIN KEY)	GH59-03675A
QME02		UNIT-DOME SHEET (NAVI KEY)	GH59-03682A
QMI01		MICROPHONE-ASSY-SGHX530	GH30-00320A
QMO01		MOTOR DC-SPHV8400	GH31-00187A
QMP01		PBA MAIN-SGHX530S (PBA MAIN)	GH92-03125A
QPC01		MEA-SLIDE FPCB KIT	GH97-06774A
QSC01		RMO-RUBBER SCREW	GH73-08015A
QSH03		ASSY BRACKET-SHIELD REAR	GH98-02241A
QSP01		SPEAKER	3001-002075
QVO01		PMO-KEY VOLUME	GH72-34195A
QHI01		ASSY HINGE	GH98-02235A
	QFL01	ASSY COVER-SLIDE LOWER	GH98-02236A
	QFR01	ASSY COVER-FRONT	GH98-02237A
QRE01		ASSY COVER-REAR	GH98-02240A
	QIF01	PMO-COVER IF	GH72-34193A
	QMI03	RMO-RUBBER MIC	GH73-08289A
	QRF03	PMO-COVER EAR JACK	GH72-34192A

Discription	SEC CODE
BAG PE	6902-000297
ADAPTOR-SCHN391 HUTCHSON	GH44-00745A
UNIT-EARPHONE	GH59-01694A
LABEL(P)-IMEI	GH68-01335D
LABEL(P)-WATER SOAK	GH68-02026A
LABEL(P)-WATER SOAK	GH68-02026A
MANUAL USERS-EU ENGLISH	GH68-12661A
LABEL(R)-MAIN((XSA)	GH68-13025D
BOX(P)-UNIT MAIN(SEA_2)	GH69-04689K
RMO-RUBBER MIC HOLDER	GH73-08016A
RMO-RUBBER BGA A	GH73-08526A
RMO-RUBBER BGA B	GH73-08527A
RMO-RUBBER BGA C	GH73-08528A
RMO-RUBBER BGA D	GH73-08529A
MPR-REMOVE TAPE LCD	GH74-13804A
MPR-TAPE LCD SHORT	GH74-19768A
MPR-GASKET LCD SIDE	GH74-24930A
MPR-VINYL BOHO CAMERA LENS	GH74-25648A
MPR-TAPE	GH74-26727A
MPR-TAPE	GH74-26727A
MPR-SPONGE CAM	GH74-28219A
MPR-INSU TAPE	GH74-28241A
MPR-INSU TAPE LCD PCB	GH74-28645A
MPR-INSU TAPE MAIN PCB	GH74-28646A
MPR-TAPE ELEC ESD	GH74-28649A
MPR-VINYL BOHO WINDOW	GH74-28851A
MPR-TAPE BGA B	GH74-28856A
MPR-TAPE MAIN FPCB HOLD	GH74-28942A
MPR-SPONGE PCB	GH74-28944A
MPR-ELEC TAPE PCB A	GH74-28946A
MPR-VINYL BOHO FRONT	GH74-29101A

5-3. Disassembly

1 	2 
1) Disjoint the REAR Screw of 5 Points. ※ caution 1) Be careful for scratch	1) Disjoint REAR's lower locker and remove REAR case just like a picture below. ※ caution 1) Be careful for scratch
3 	4 
1) Disjoint VOL KEY with tweezers. 2) Disjoint an INTENNA SCREW. 3) Disjoint an INTENNA SCREW. 4) Remove an INTENA. 5) Disjoint SPEAKER RUBBER, MOTOR and SPEAKER with tweezers ※ caution 1) Be careful for the damage on the WIRE or RUBBER.	1) Remove the green tape on the FPCB 2) Disjoint the FPCB by DESOLDERING. ※ caution 1) Be careful for the FPCB's crack

5



1) Disjoin 6 screws.

※ **caution**

1) Be careful for scratch

2) Using the '+' screw driver.

6

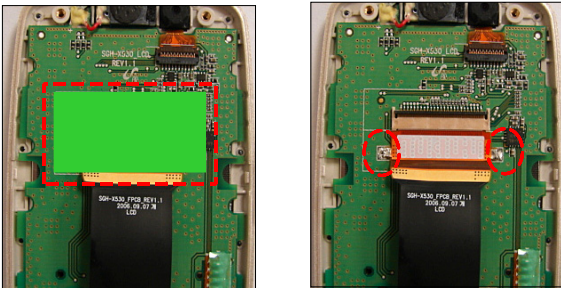


1) Disjoin HINGE ASSY like the picture below.

※ **caution**

1) Be careful FPCB's crumpling.

7



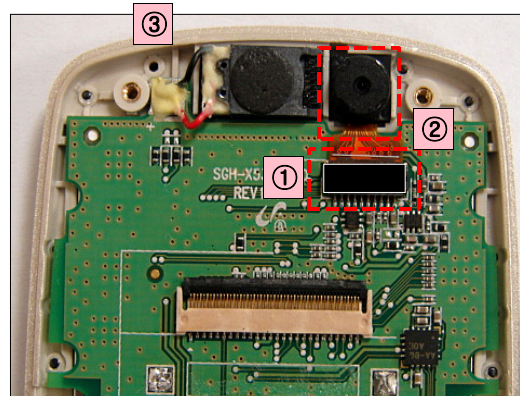
1) Remove the green tape from the FPCB

2) Disjoin the FPCB with DESOLDERING.

※ **caution**

1) Be careful for the FPCB's crack

8



1),2) First, Remove the Black tape, and then disjoin the CAM from connector.

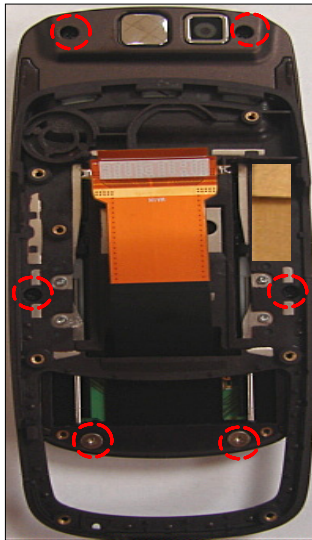
3) Take off the receiver from the Upper plastic.

※ **caution**

1) Be careful for the Cammera's crack.

5 1	6 2 ① ②
1) Put the NAVI key like the picture below. ※ caution 1) Put the hole of NAVY key to UPPER	1) Put the receiver and the SUB PBA. 2) Insert the CAMERA, and then put up the SPONGE along the edge of connector ※ caution 1) Check the fabrication status of RCV & CAM 2) Be careful for the CAM FPCB's crack.
3 ① ②	4
1) Fold the FPCB like the picture below. 2) Insert the LCD FPCB to the CONNECTOR, SOLDERING 2 points and then put the green TAPE. ※ caution 1) Be careful for scratch 2) Be careful for the FPCB's crack	1) Insert the MAIN FPCB like the picture below. ※ caution 1) Be careful for the FPCB's crack

5



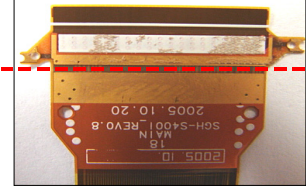
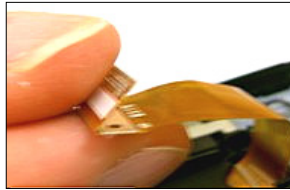
1) Joint the 6 screws with the slide stopping JIG.

※ **caution**

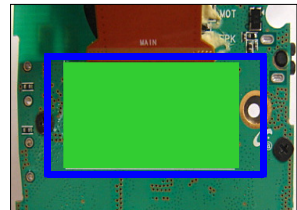
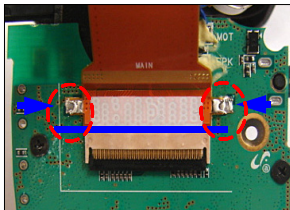
1) Fix the slide tightly.

6

①



②



1) Fold the FPCB like the picture below.

2) Insert the LCD FPCB to the CONNECTOR

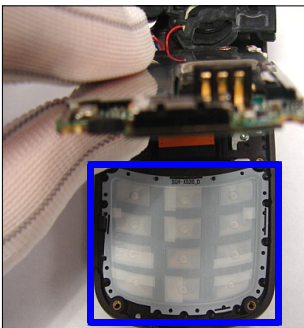
along the SILK LINE, SOLDERING 2 points and then put the green TAPE.

※ **caution**

1) Be careful for the FPCB's crack

7

①



②



1) Put the NAVY key like the picture below.

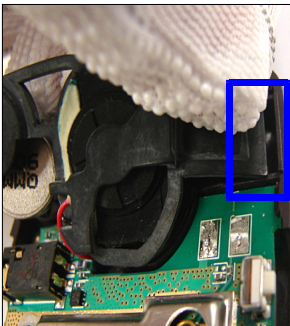
2) Put the PBA first, and then MOT, SPK.

※ **caution**

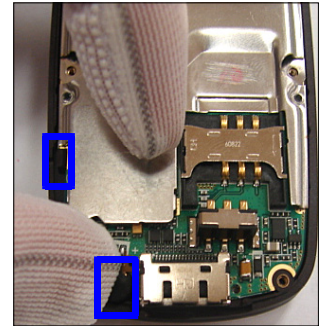
1) Be careful the wire.

8

①



②



1) Insert the SPK RUBBER like the picture below.

2) Lock the PBA on the left side HOOK and then put the MIC.

※ **caution**

1) Be careful the rubber's folding.

9

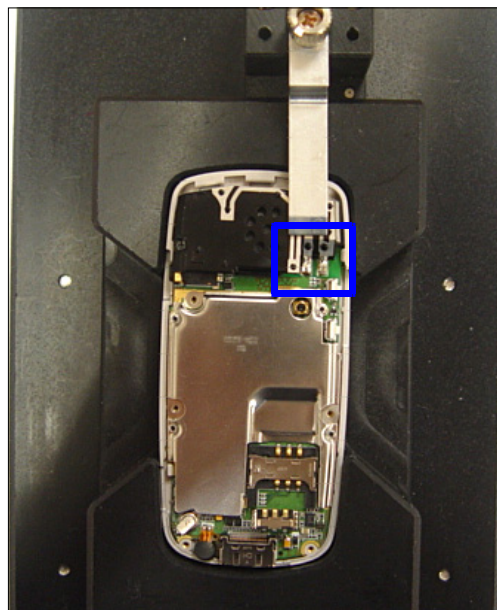


1) Joint the 2 screws with the screw JIG.

*** caution**

1) Be careful for the damage to INTENNA pattern.

10

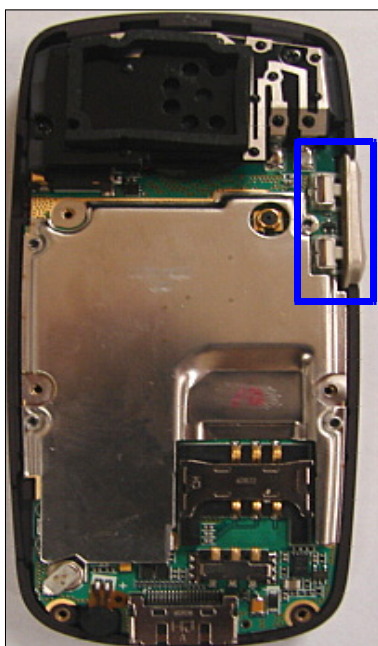


1) Soldering the Intenna pads.

*** caution**

1) Be careful for the damage of plastic.

11



1) Insert the VOL KEY.

*** caution**

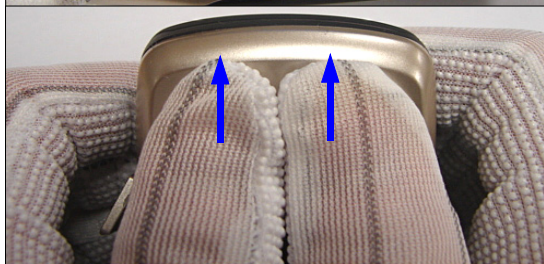
1) Be careful for the damage of plastic.

12

①



②



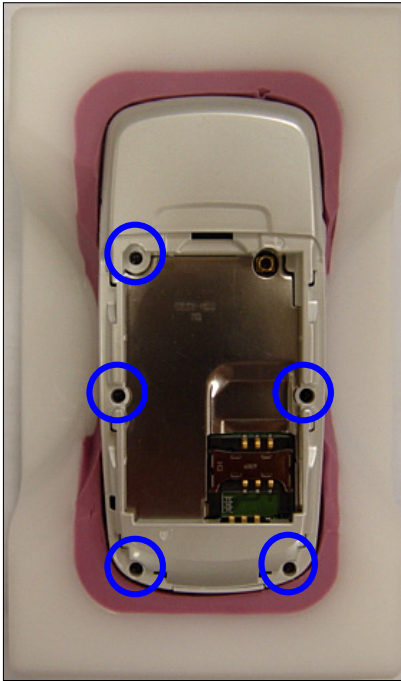
1) Joint the lower REAR plastic first.

2) Push the upper REAR plastic like the picture below until hearing the locking sound.

*** caution**

1) Be careful for the damage of plastic.

13



1) Joint 5 screws with the prop.

※ **caution**

1) Be careful for the damage of plastic.

6. MAIN Electrical Parts List

SEC CODE	Design LOC	Discription	SEC CODE
0401-001141	D300	DIODE-SWITCHING	SA
0403-001547	D101	DIODE-ZENER	SA
0406-001197	ZD100	DIODE-TVS	SA
0406-001197	ZD101	DIODE-TVS	SA
0406-001197	ZD301	DIODE-TVS	SA
0406-001201	ZD302	DIODE-TVS	SA
0406-001260	D200	DIODE-TVS	SA
0501-000225	TR302	TR-SMALL SIGNAL	SA
0504-000168	TR300	TR-DIGITAL	SA
0601-001819	LED200	LED	SA
0601-001819	LED201	LED	SA
0601-001819	LED202	LED	SA
0601-001819	LED203	LED	SA
0601-001819	LED204	LED	SA
0601-001819	LED205	LED	SA
0601-001819	LED206	LED	SA
0601-001819	LED207	LED	SA
0601-001819	LED208	LED	SA
0601-001819	LED209	LED	SA
0601-001819	LED210	LED	SA
0601-001819	LED211	LED	SA
0604-001306	IRDA	PHOTO-IRDA	SA
0801-002529	U104	IC-CMOS LOGIC	SA
1009-001027	U200	IC-HALL EFFECT S/W	SA
1108-000010	UME200	IC-MCP	SA
1201-002278	U100	IC-POWER AMP	SA
1203-003304	UCP300	IC-POWER SUPERVISOR	SA
1203-003663	U103	IC-BATTERY	SA
1204-001811	U300	IC-MELODY	SA
1205-003116	U101	IC-TRANSCIEVER	SA
1209-001712	U201	IC-SENSOR	SA
1405-001082	V100	VARISTOR	SA
1405-001082	V102	VARISTOR	SA
1405-001082	V103	VARISTOR	SA
1405-001082	V205	VARISTOR	SA
1405-001082	V206	VARISTOR	SA
1405-001082	V306	VARISTOR	SA

SEC CODE	Design LOC	Discription	SEC CODE
1405-001082	V307	VARISTOR	SA
1405-001082	V308	VARISTOR	SA
1405-001082	V309	VARISTOR	SA
1405-001082	V310	VARISTOR	SA
1405-001177	V101	VARISTOR	SA
1405-001177	V200	VARISTOR	SA
1405-001177	V201	VARISTOR	SA
1405-001177	V202	VARISTOR	SA
1405-001177	V203	VARISTOR	SA
1405-001177	V204	VARISTOR	SA
1405-001177	V207	VARISTOR	SA
1405-001177	V208	VARISTOR	SA
1405-001177	V209	VARISTOR	SA
1405-001177	V210	VARISTOR	SA
2007-000070	R335	R-CHIP	SA
2007-000140	R120	R-CHIP	SA
2007-000140	R316	R-CHIP	SA
2007-000144	R301	R-CHIP	SA
2007-000148	R307	R-CHIP	SA
2007-000148	R312	R-CHIP	SA
2007-000148	R330	R-CHIP	SA
2007-000148	R331	R-CHIP	SA
2007-000157	R205	R-CHIP	SA
2007-000157	R209	R-CHIP	SA
2007-000160	R320	R-CHIP	SA
2007-000161	R306	R-CHIP	SA
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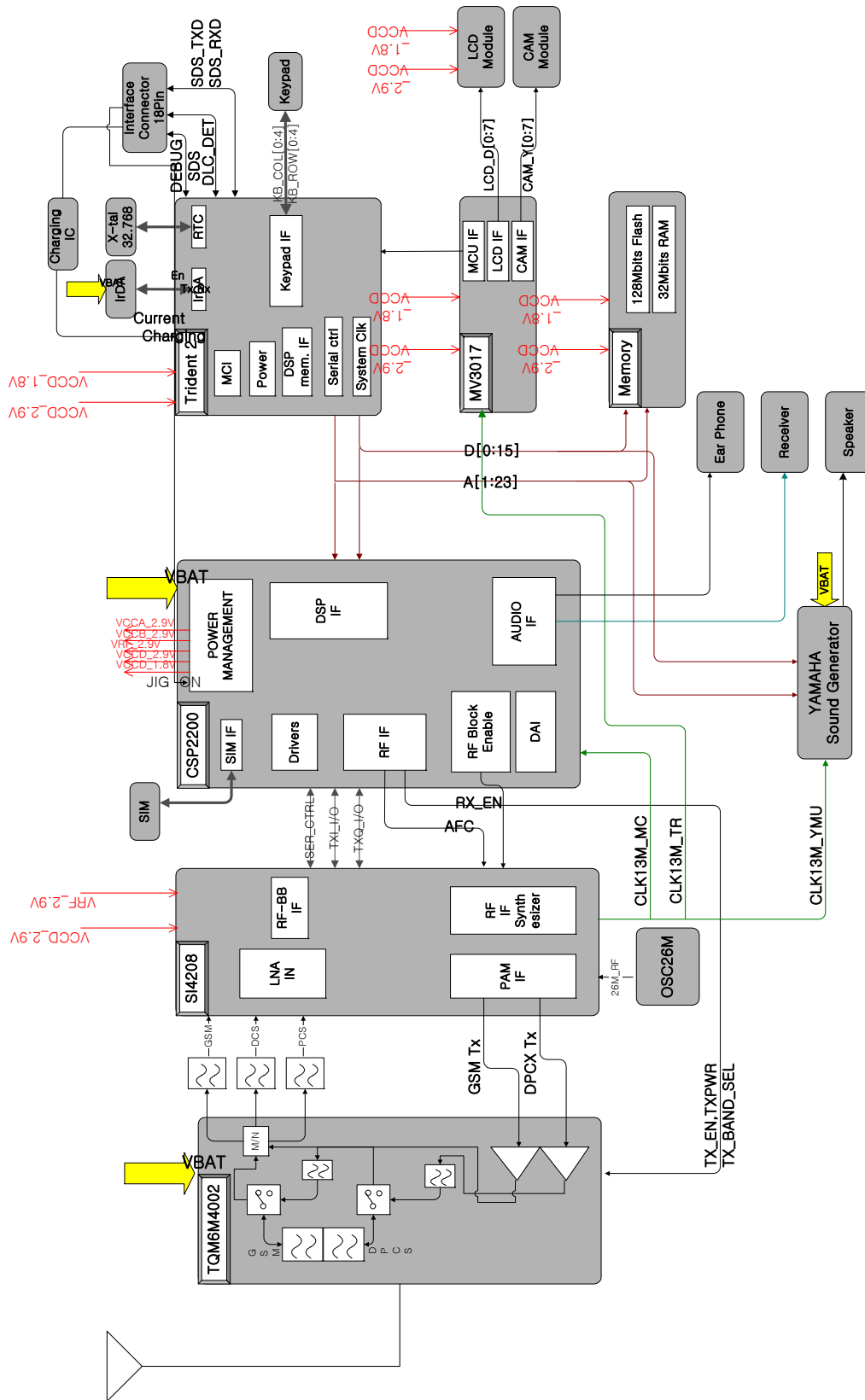
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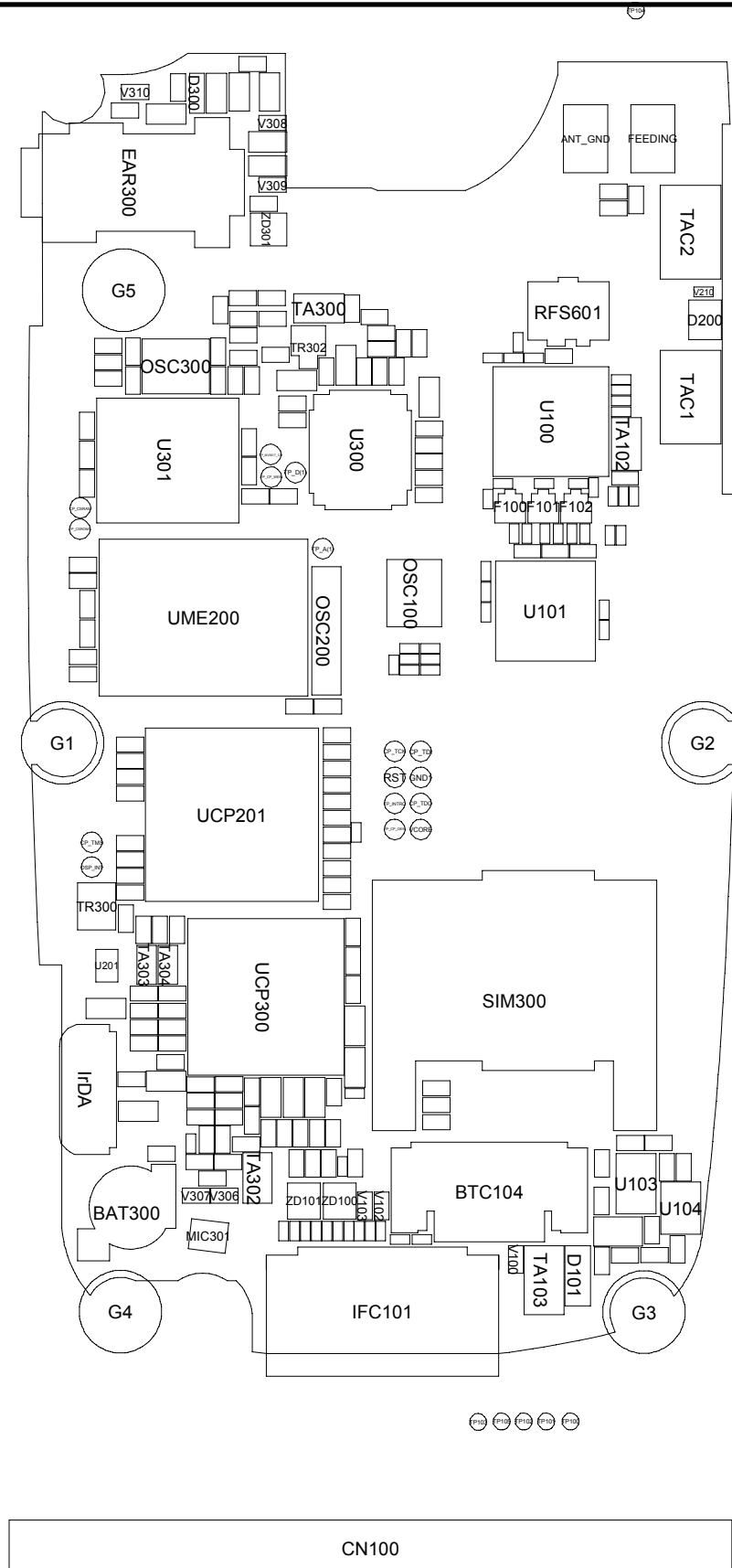
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2904-001599	F101	FILTER-SAW	SA
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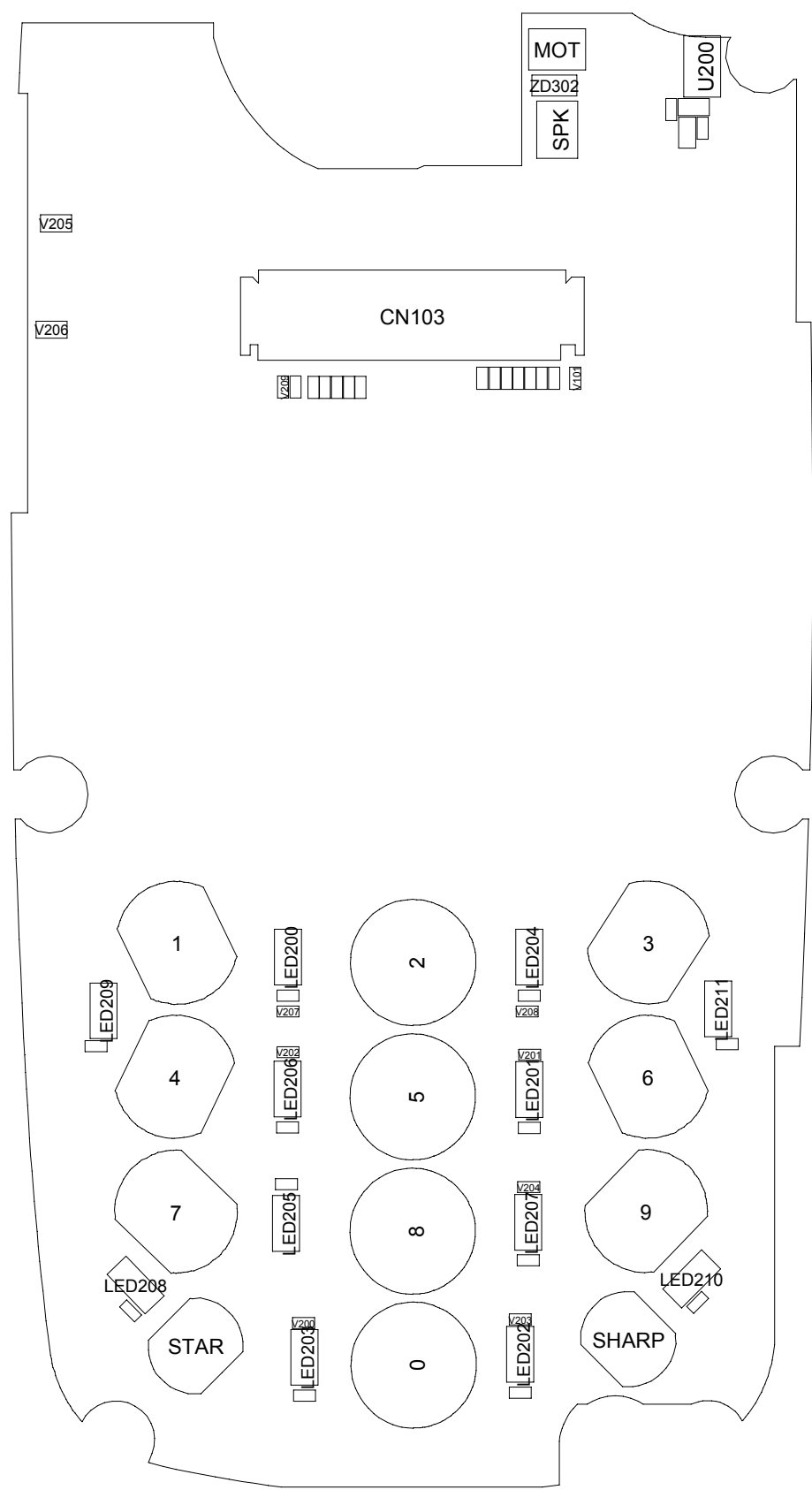
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3404-001152	TAC2	SWITCH-TACT	SA
3705-001358	RFS601	CONNECTOR-COAXIAL	SA
3708-002278	CN103	CONNECTOR-FPC/FFC/PIC	SA
3709-001384	SIM300	CONNECTOR-CARD EDGE	SA
3710-001611	IFC101	CONNECTOR-INTERFACE	SA
3711-006228	BTC104	HEADER-BATTERY	SA
3722-002067	EAR300	JACK-EAR PHONE	SA
4302-001130	BAT300	BATTERY-LI(2ND)	SA
GH09-00036A	UCP201	IC MICOM-SGHX480	SA
GH13-00036A	U301	IC ASIC-SGHX670	SA

7. Block Diagrams



8. PCB Diagrams

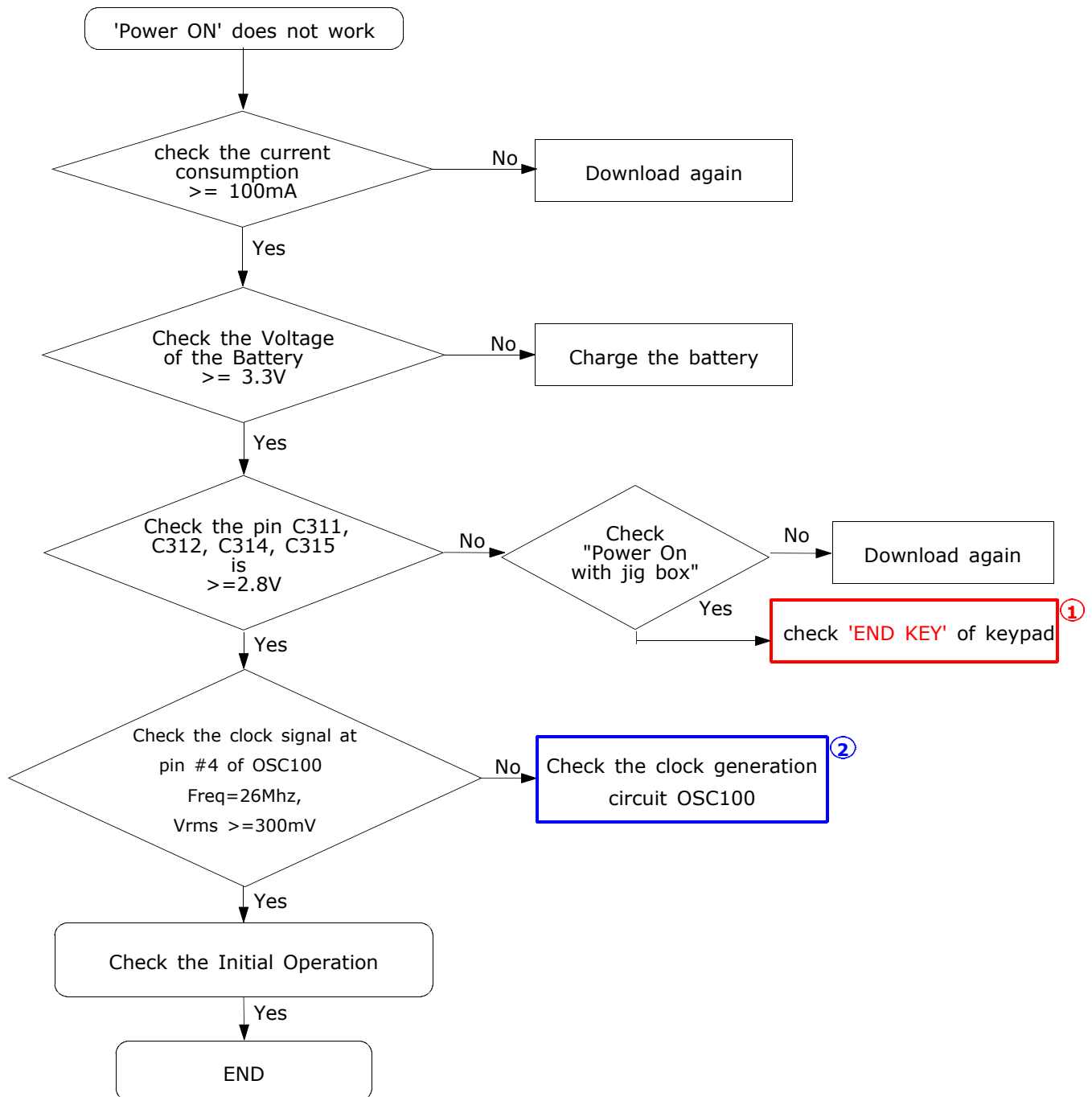


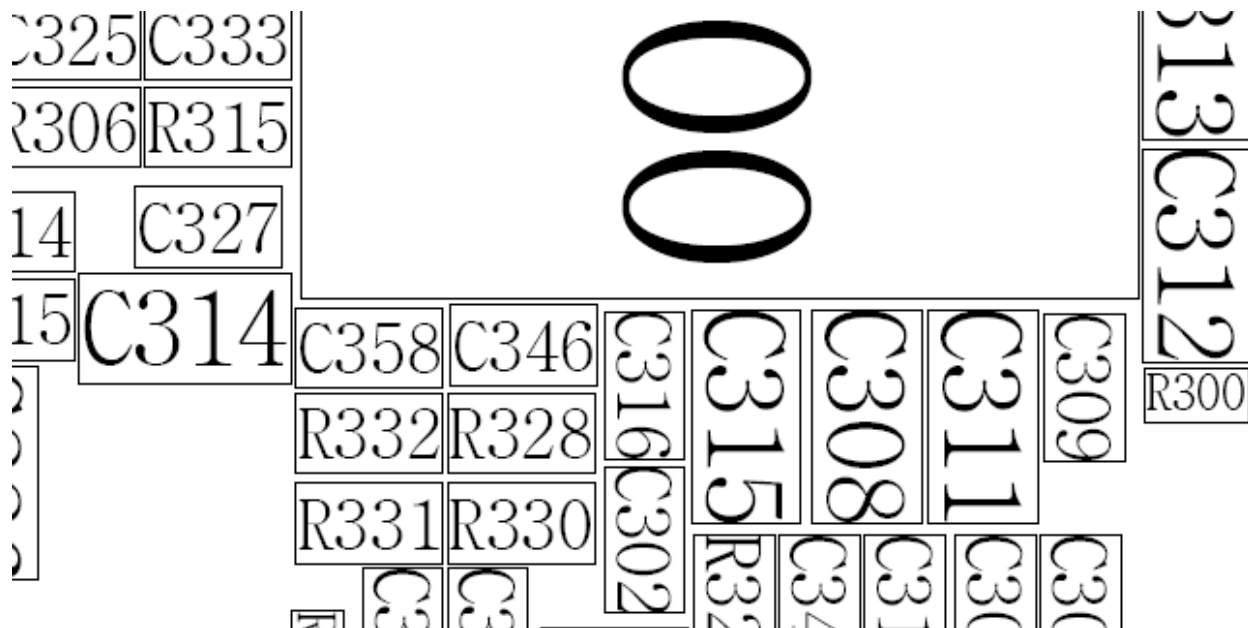
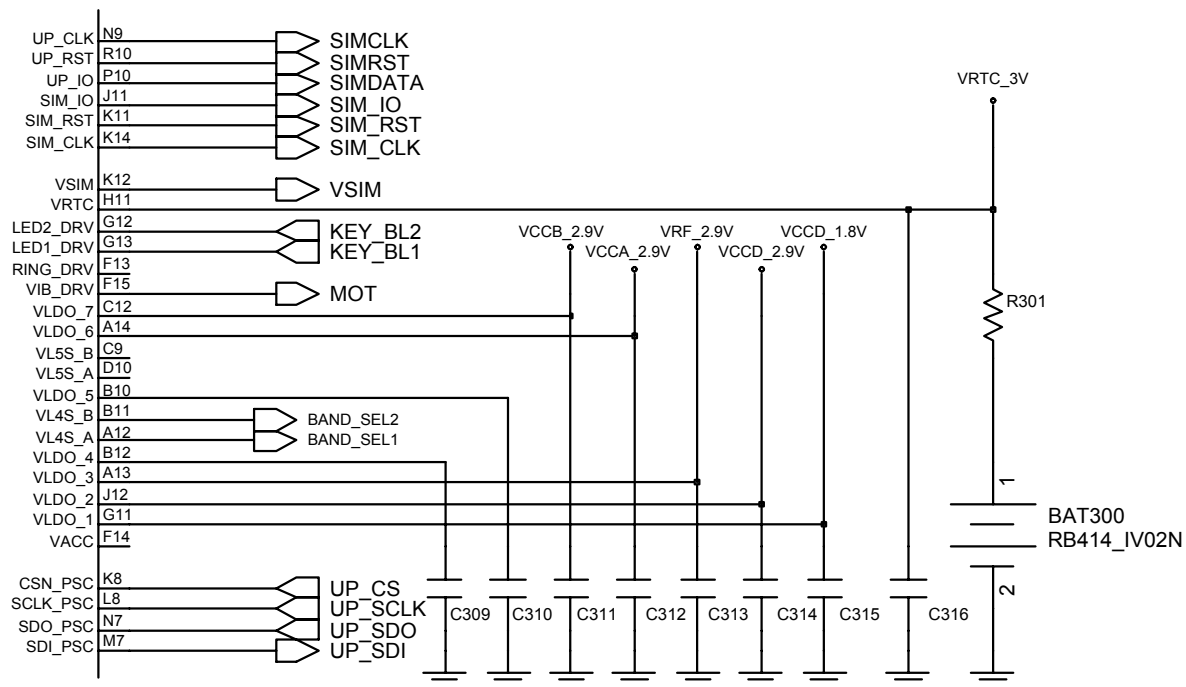


9. Flow Chart of Troubleshooting

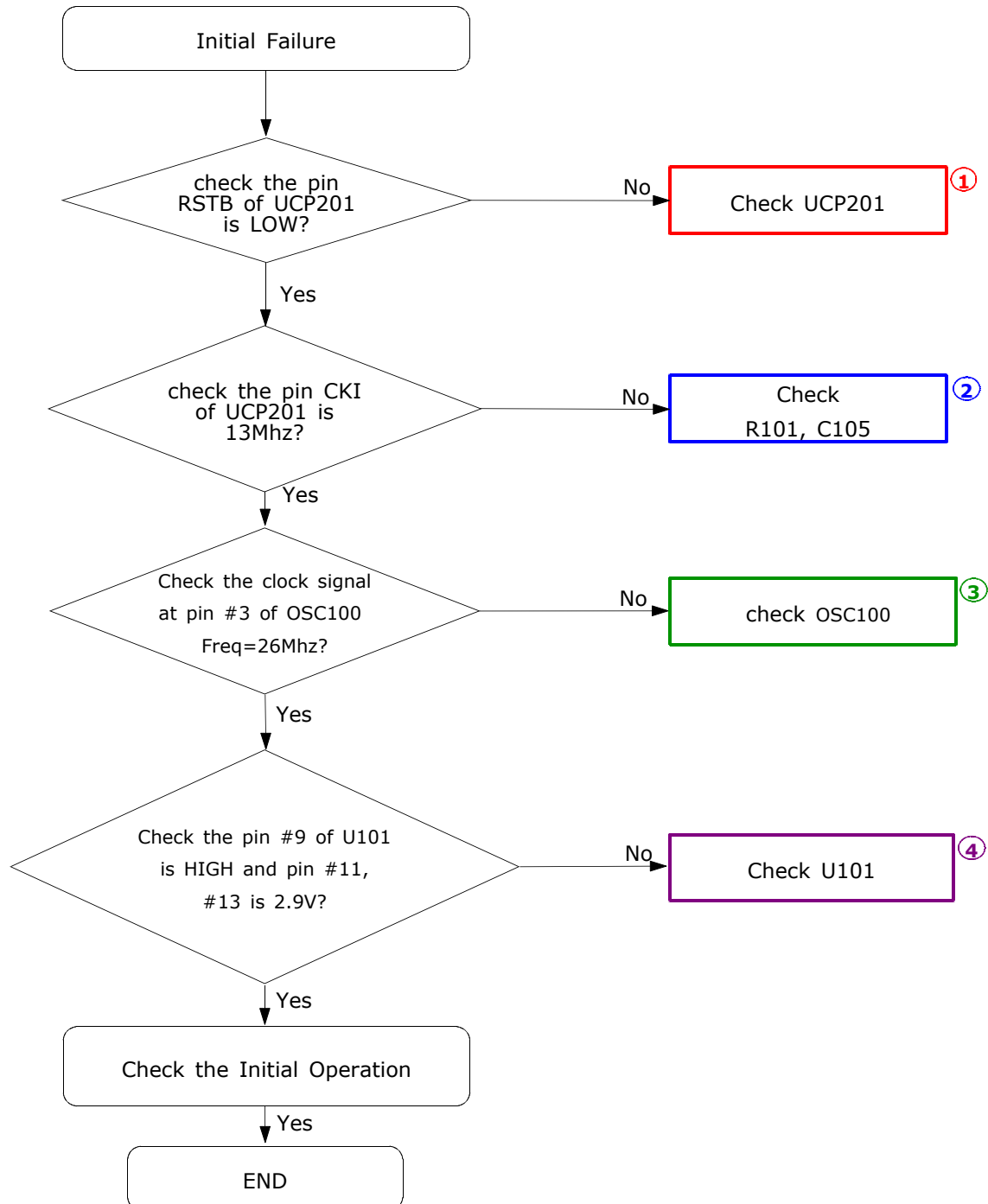
9-1. Baseband

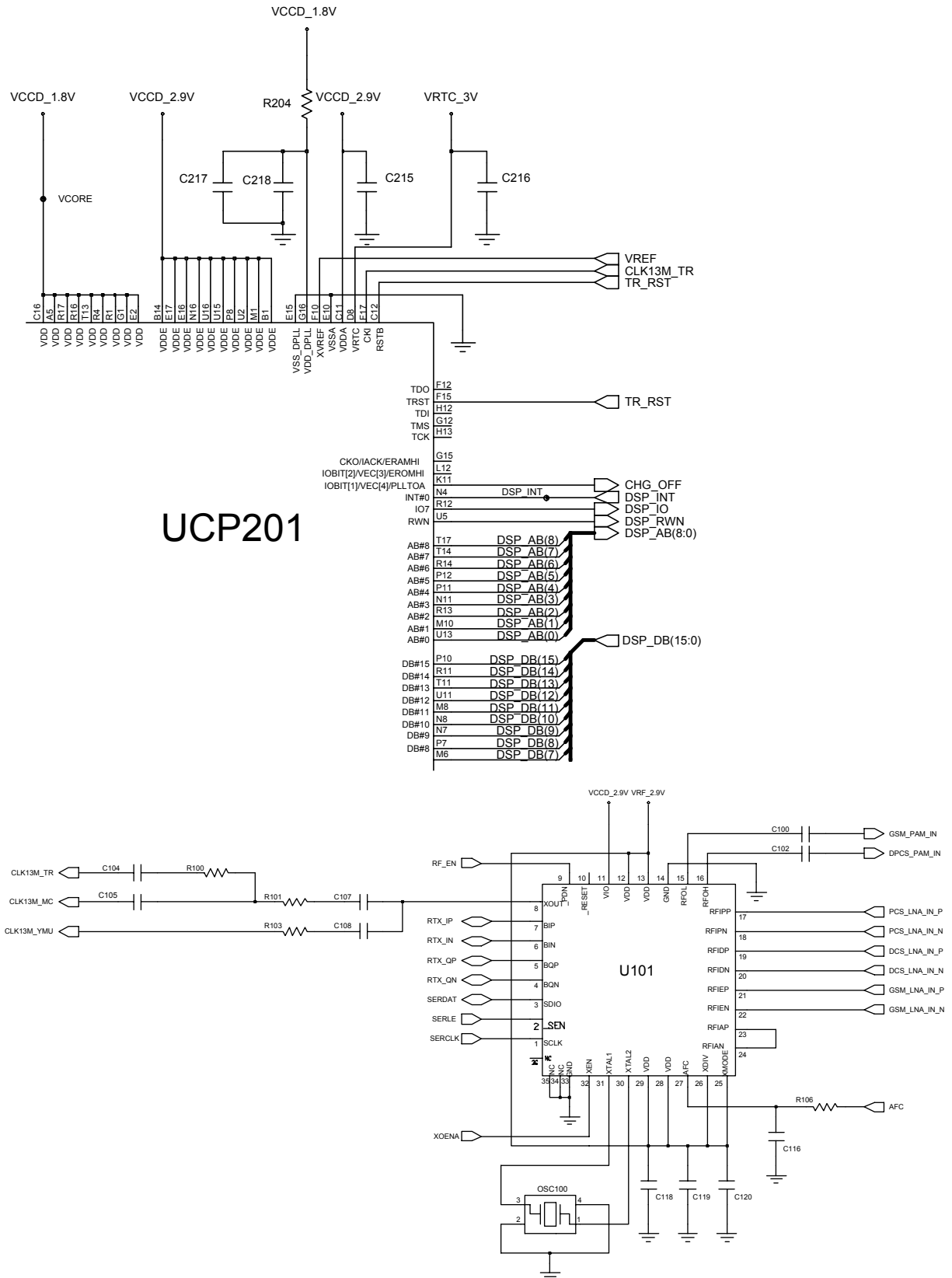
9-1-1. Power ON



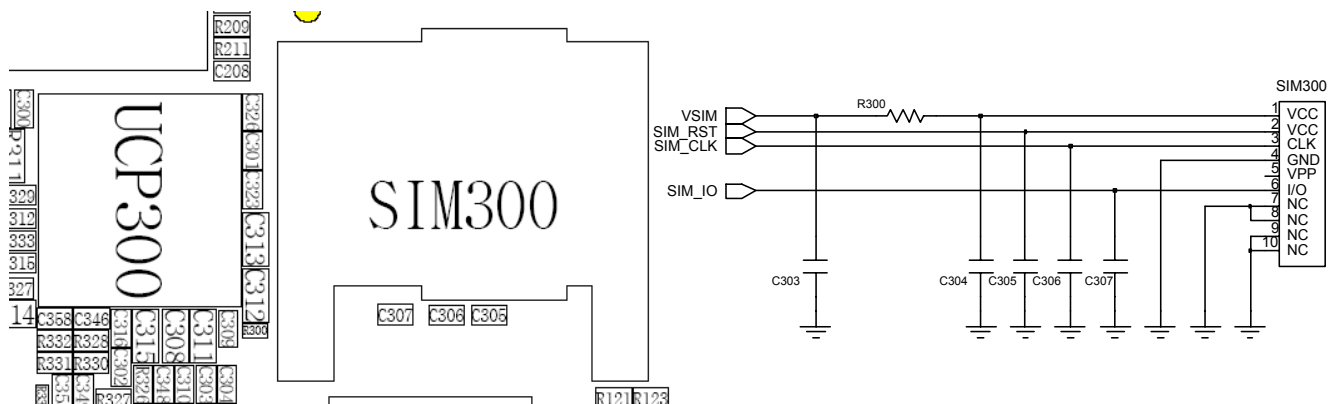
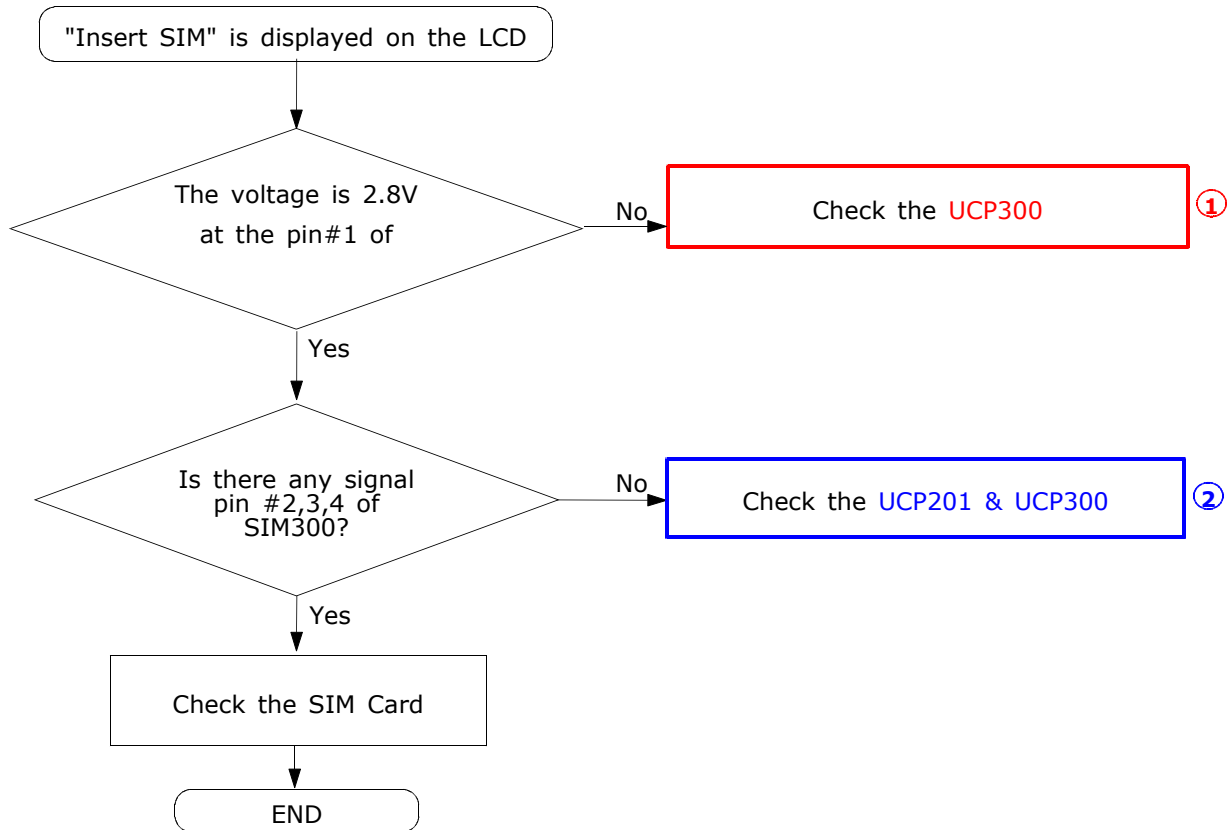


9-1-2. Initial



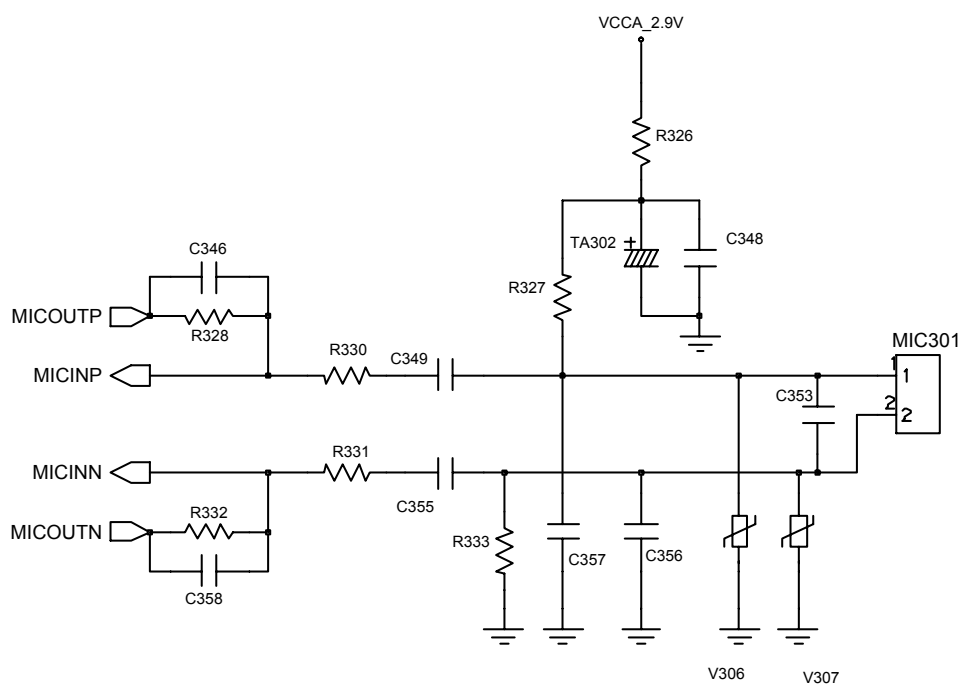
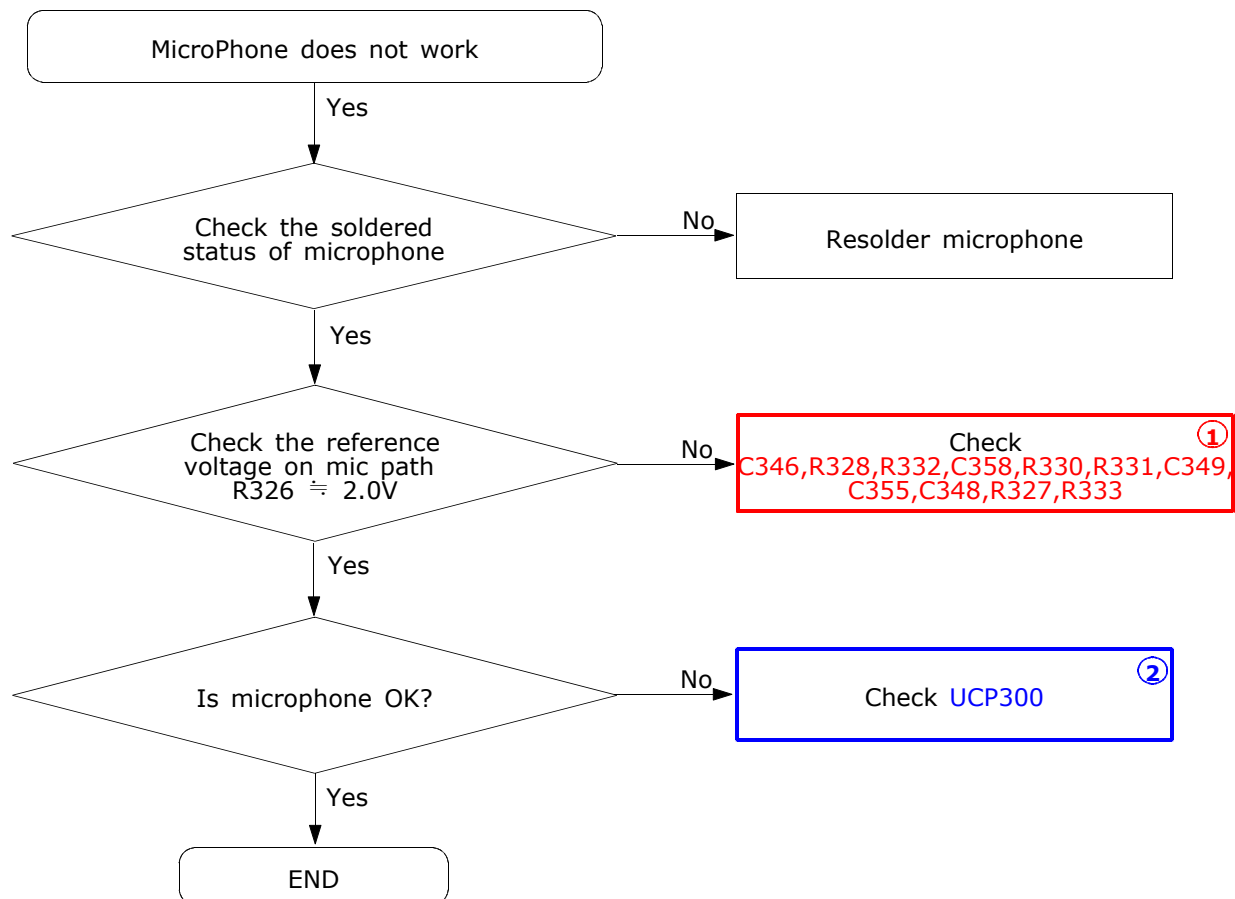


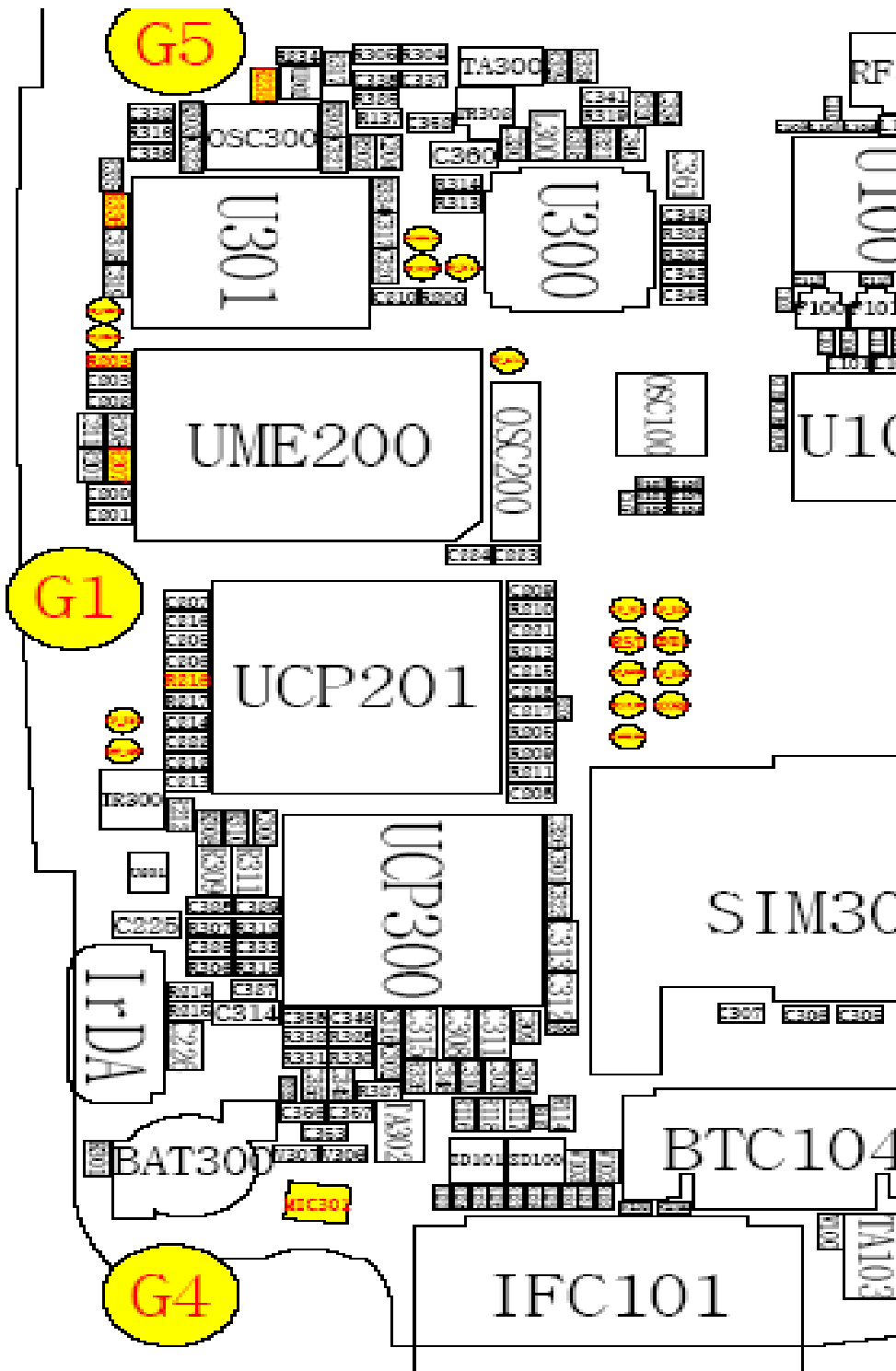
9-1-3. Sim Part



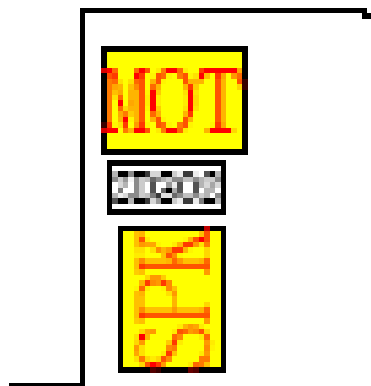
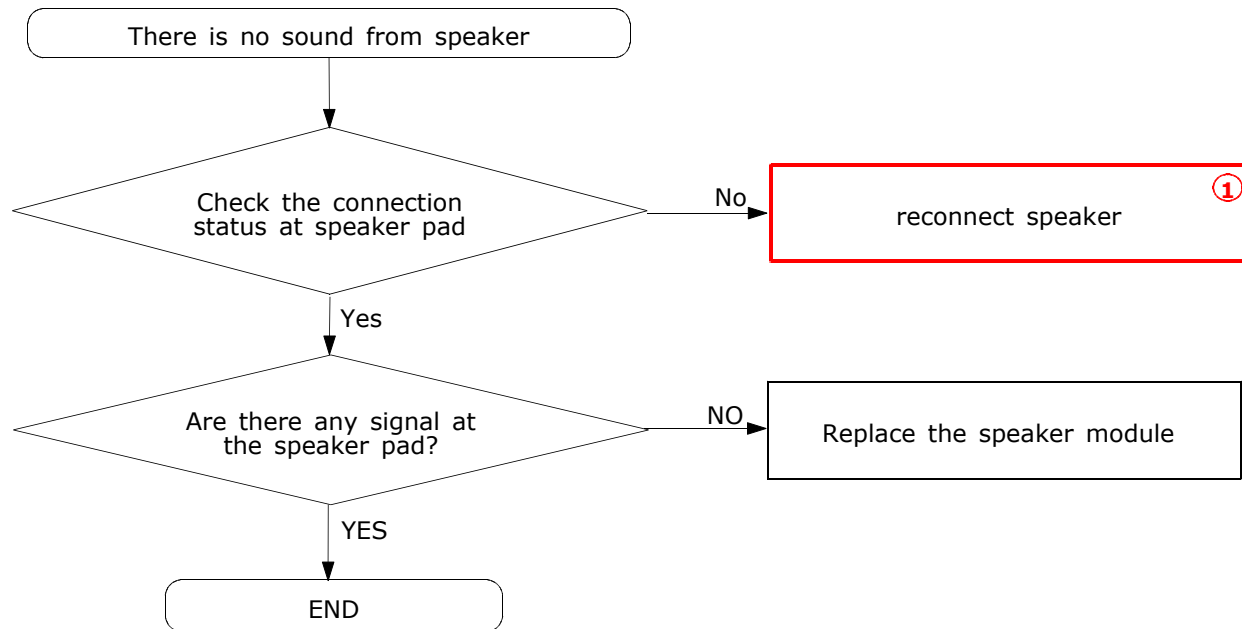
9-1-4. Microphone Part

* Call with Sim before testing.

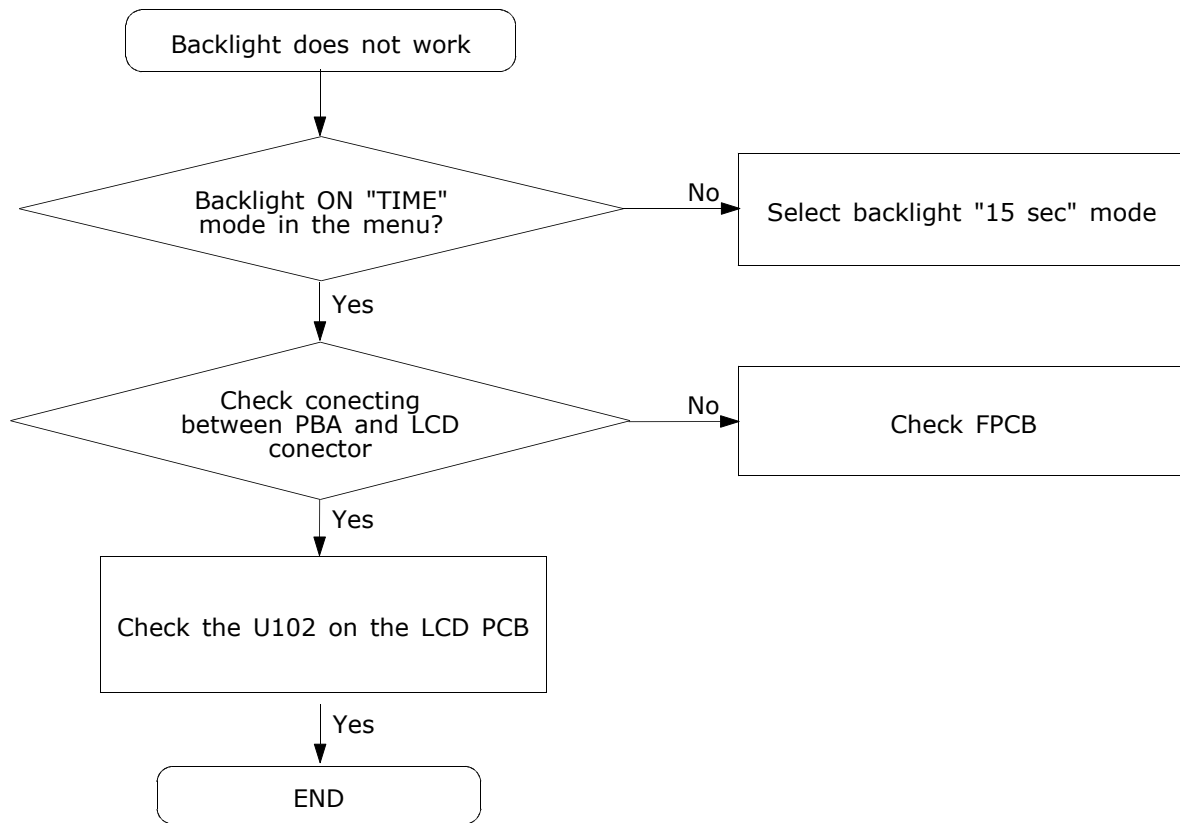




9-1-5. Speaker Part

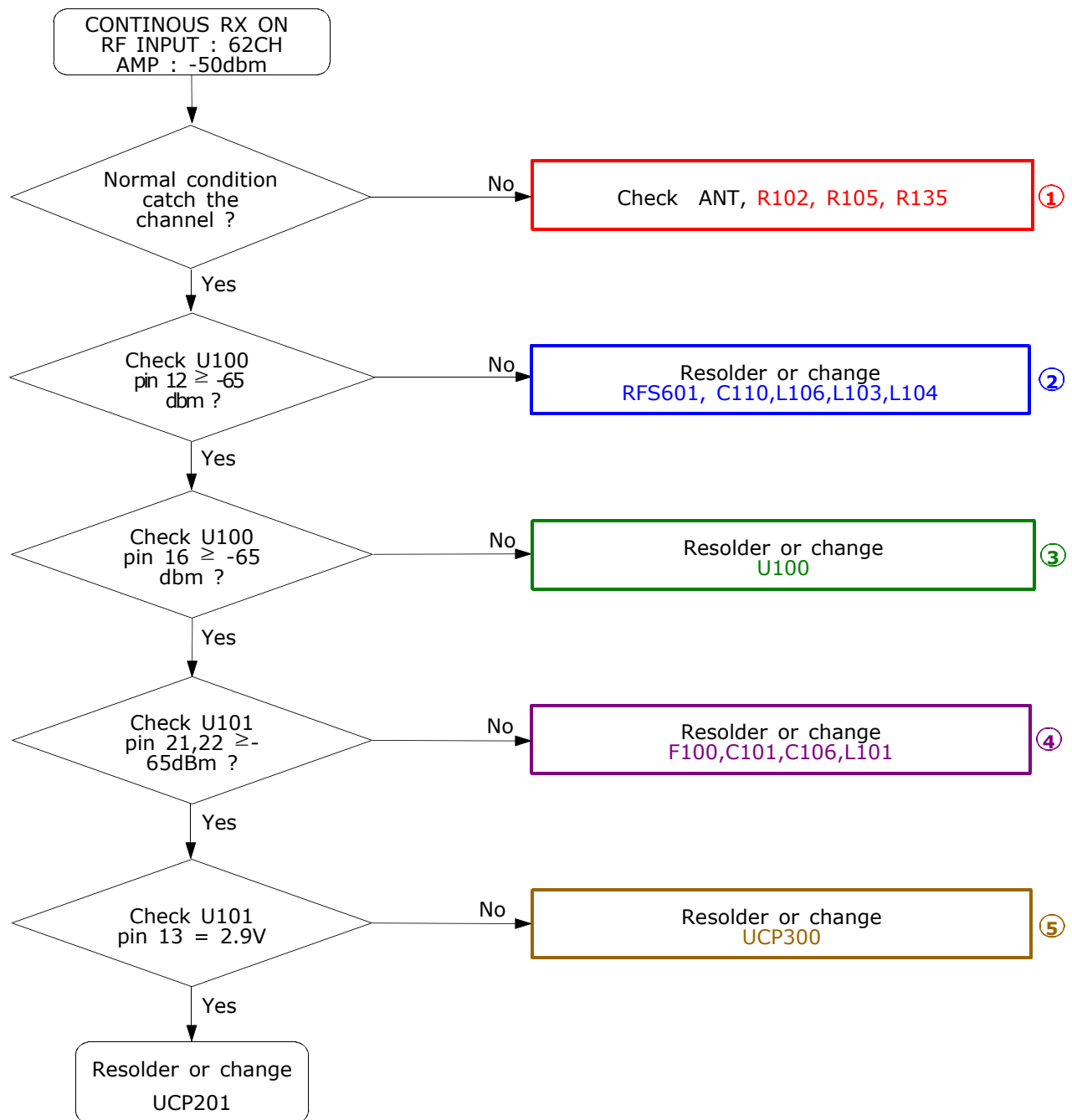


9-1-6. LCD backlight

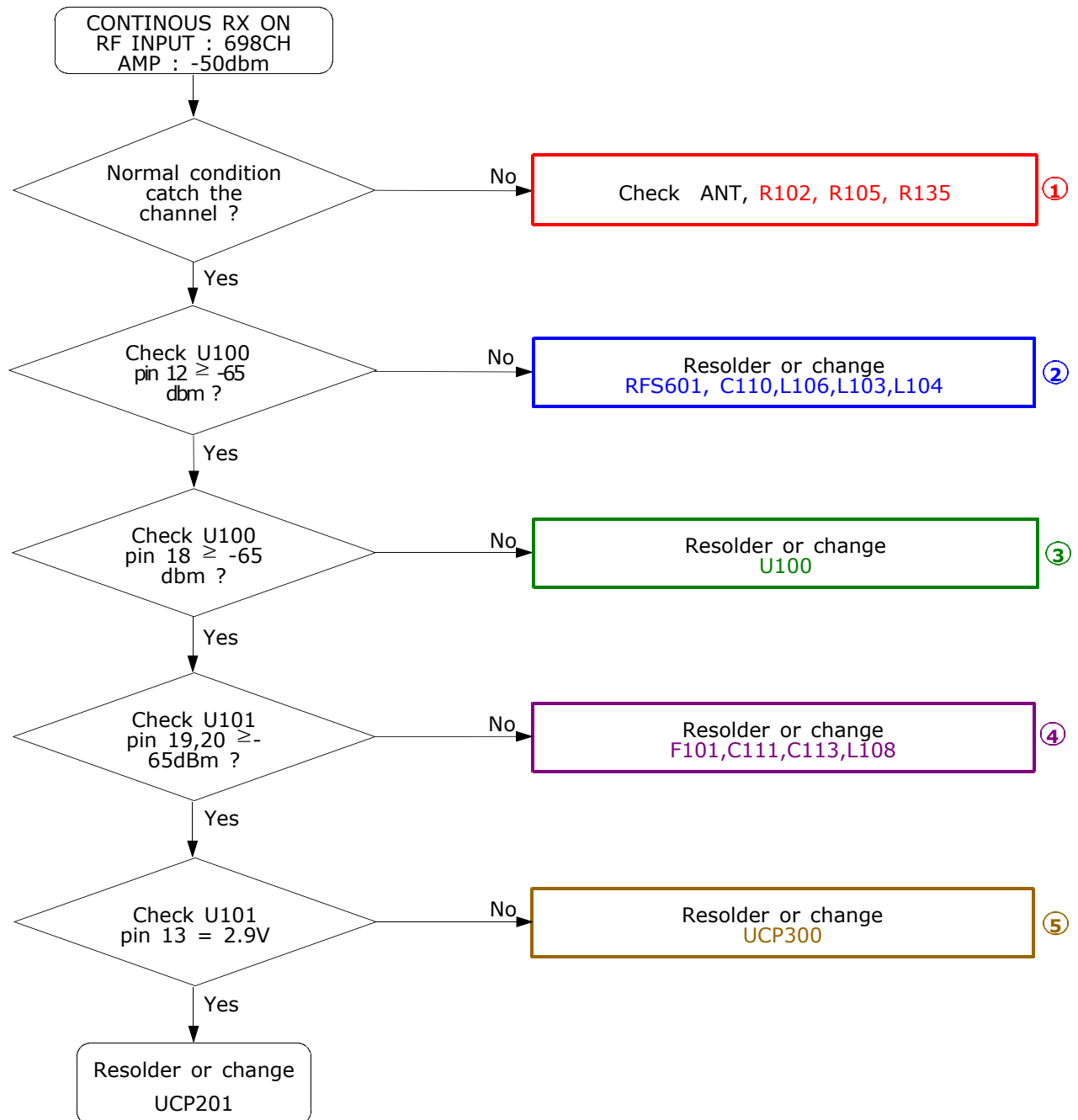


9-2. RF

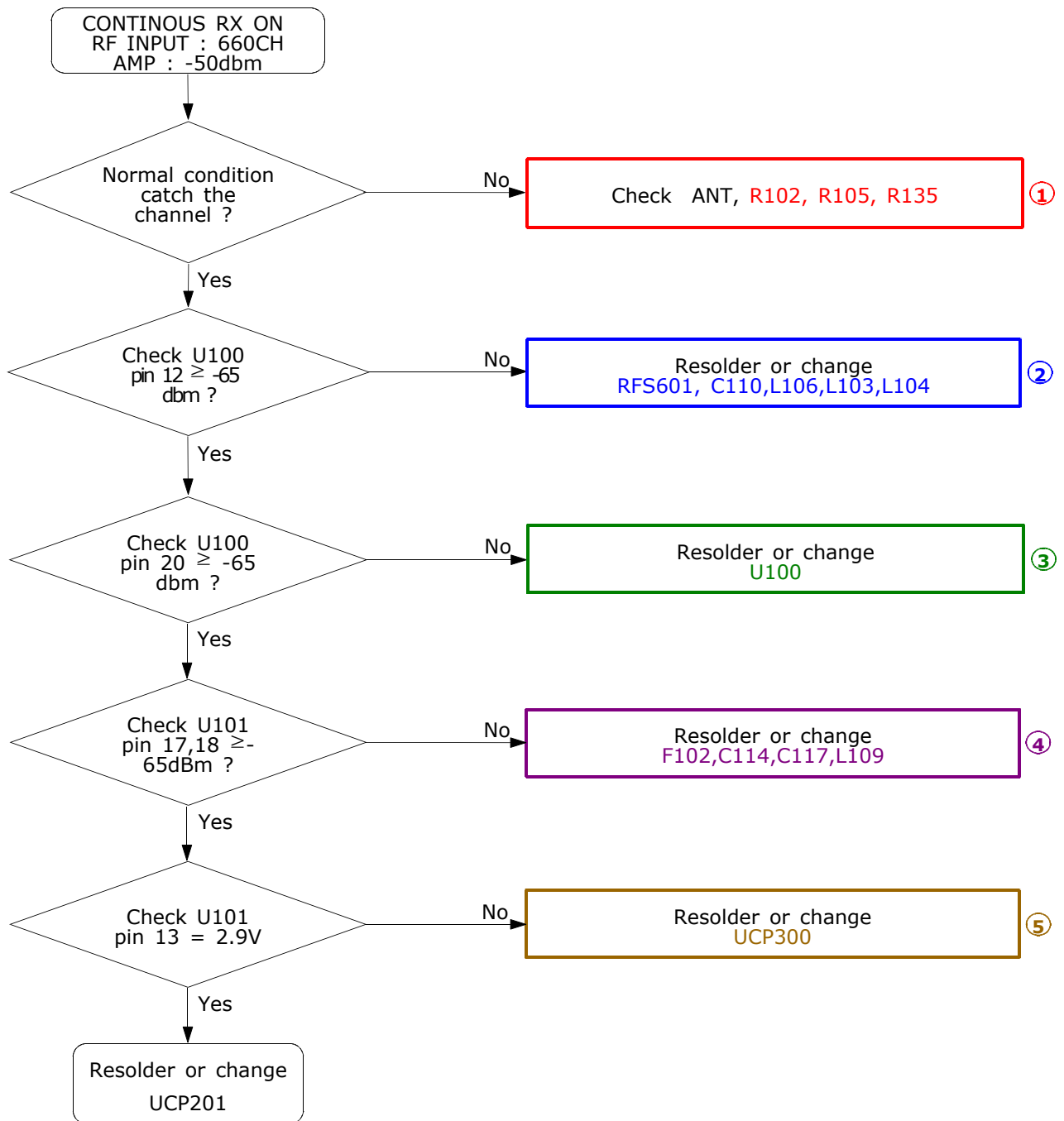
9-2-1. GSM Rx

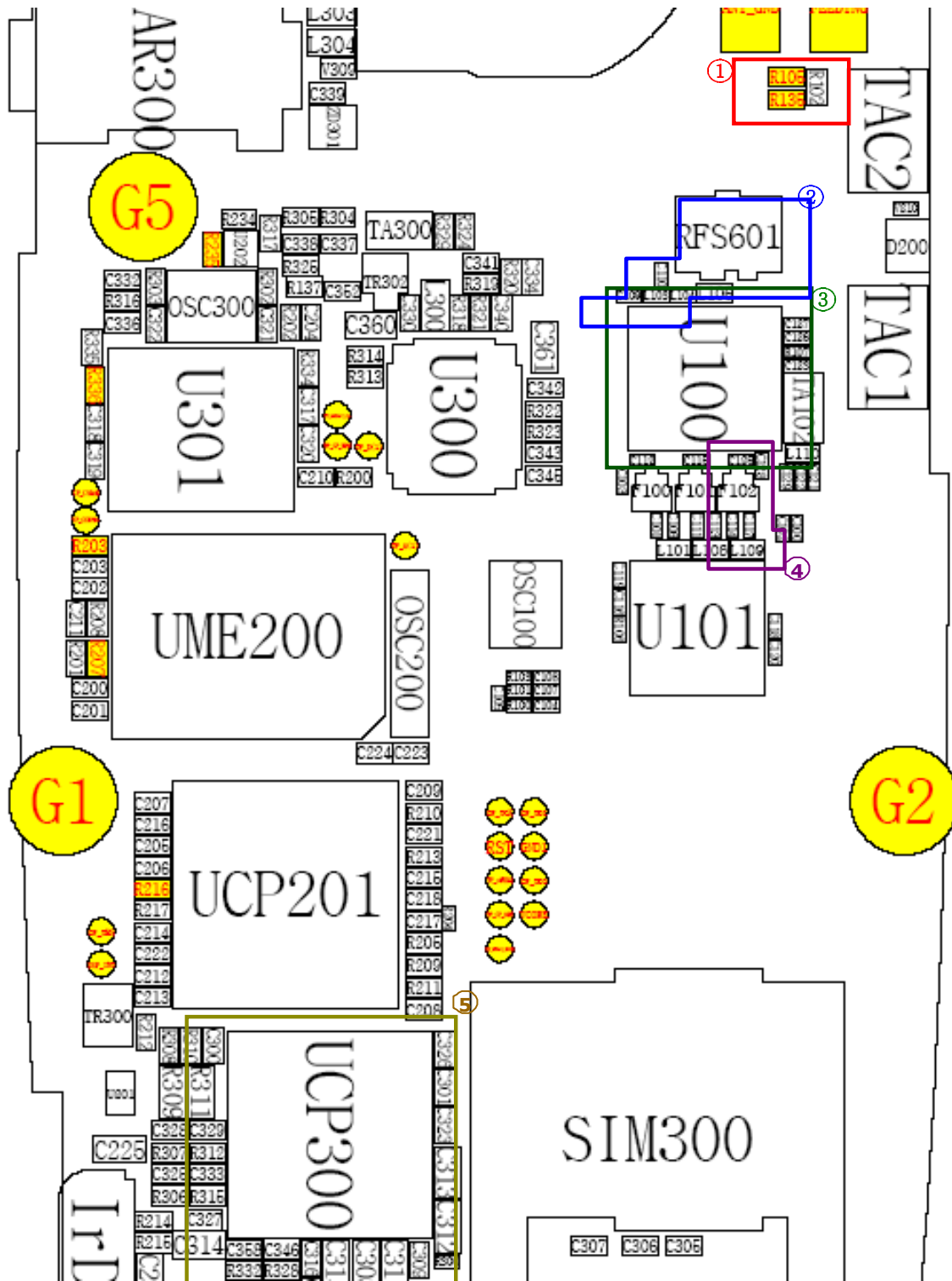


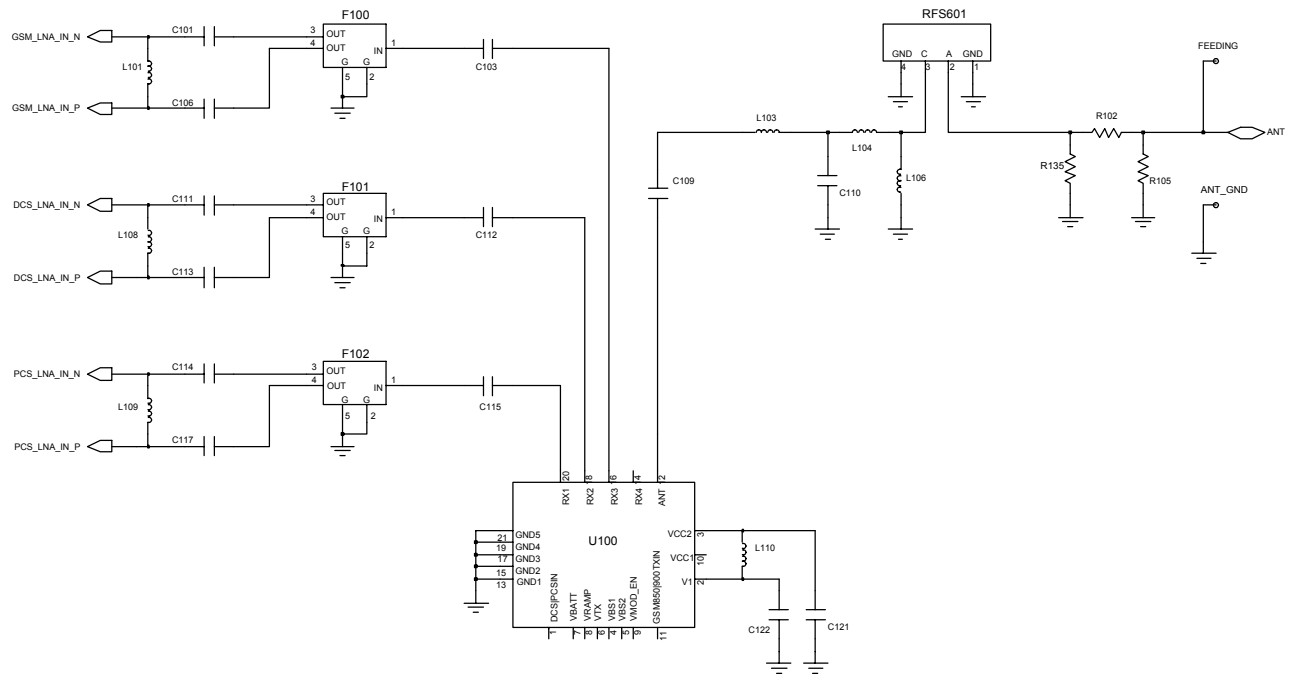
9-2-2. DCS Rx



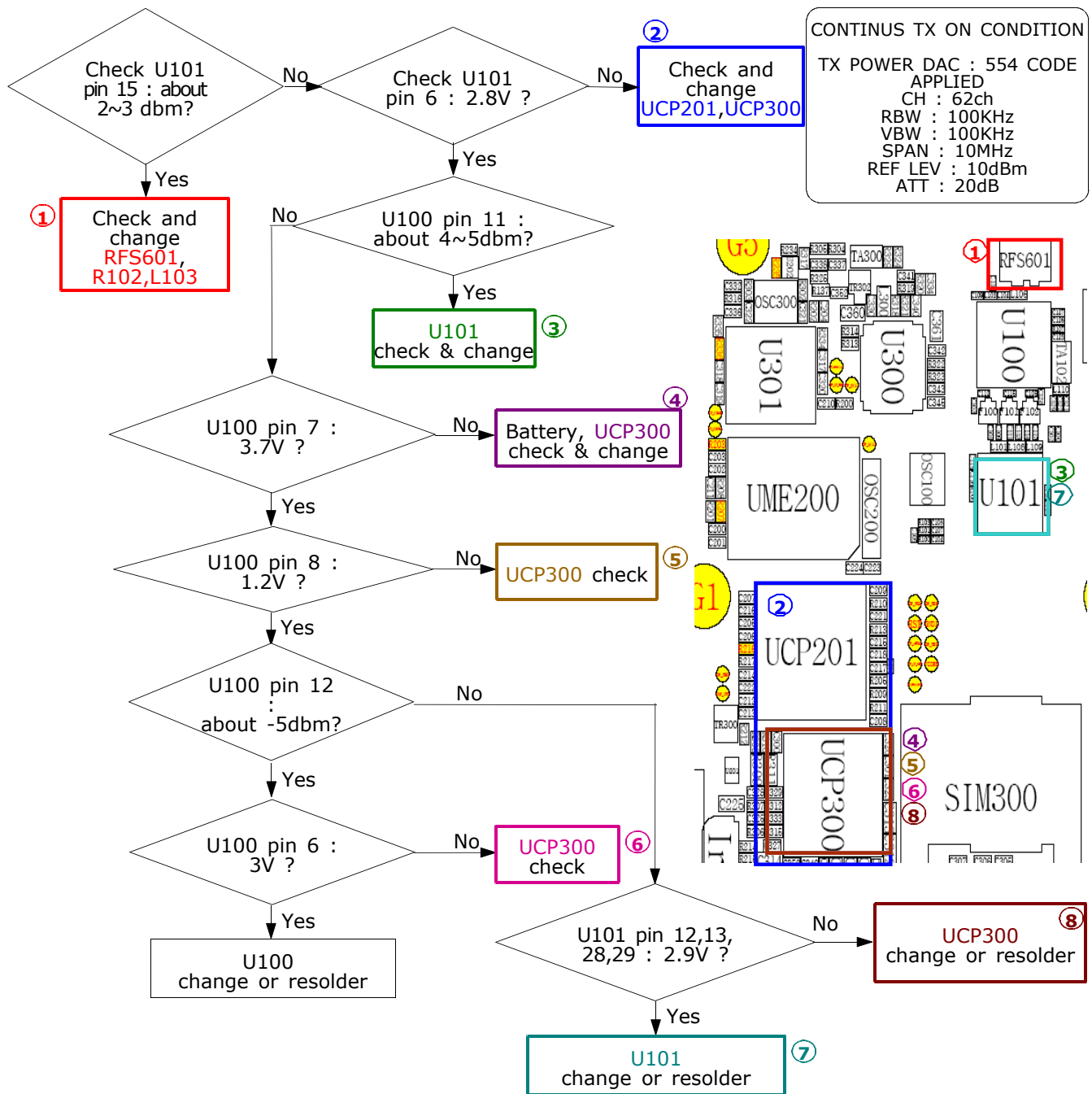
9-2-3. PCS Rx



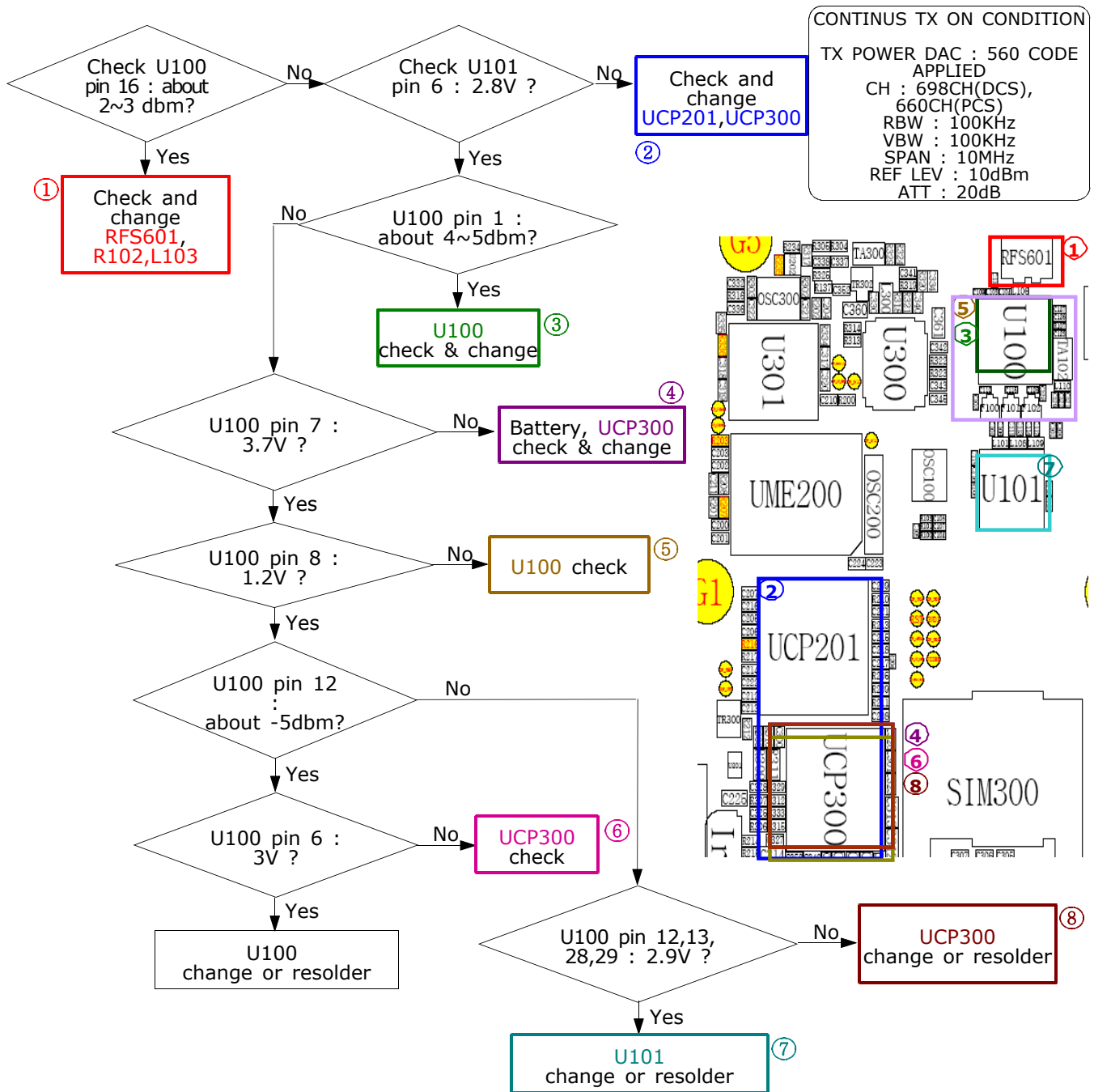




9-2-4. GSM Tx



9-2-5. DCS/PCS Tx



10. Reference data

10-1. Reference Abbreviate

AAC: Advanced Audio Coding.

AVC : Advanced Video Coding.

BER : Bit Error Rate

BPSK: Binary Phase Shift Keying

CA : Conditional Access

CDM : Code Division Multiplexing

C/I : Carrier to Interference

DMB : Digital Multimedia Broadcasting

EN : European Standard

ES : Elementary Stream

ETSI: European Telecommunications Standards Institute

MPEG: Moving Picture Experts Group

PN : Pseudo-random Noise

PS : Pilot Symbol

QPSK: Quadrature Phase Shift Keying

RS : Reed-Solomon

SI : Service Information

TDM : Time Division Multiplexing

TS : Transport Stream

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