

SAMSUNG

GSM TELEPHONE

SGH-C140

***SERVICE* Manual**

GSM TELEPHONE



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1. Specification

1-1. GSM General Specification

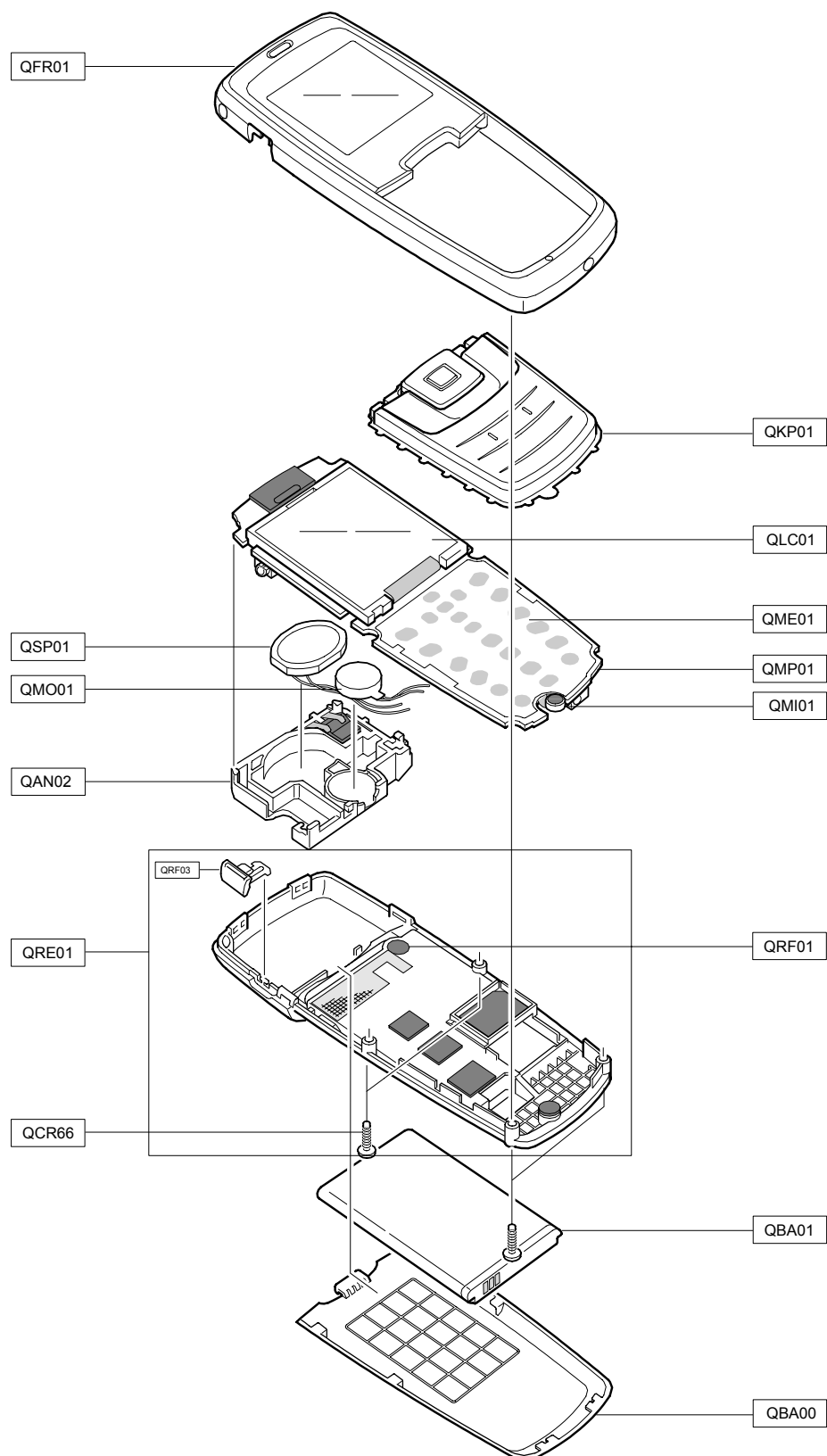
	EGSM 900 Phase 2	DCS1800 Phase 1
Freq. Band[MHz] Uplink/Downlink	880~915 925~960	1710~1785 1805~1880
ARFCN range	0~124 & 975~1023	512~885
Tx/Rx spacing	45 MHz	95 MHz
Mod. Bit rate/ Bit Period	270.833 kbps 3.692 us	270.833 kbps 3.692 us
Time Slot Period/Frame Period	576.9 us 4.615 ms	576.9 us 4.615 ms
Modulation	0.3 GMSK	0.3 GMSK
MS Power	33 dBm~5 dBm	30 dBm~0 dBm
Power Class	5 pcl ~ 19 pcl	0 pcl ~ 15 pcl
Sensitivity	-102 dBm	-100 dBm
TDMA Mux	8	8
Cell Radius	35 Km	2 Km

1-2. GSM Tx Power Class

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

2. Exploded View and Parts List

2-1. Cellular phone Exploded View



2-2. Cellular phone Parts list

Design LOC		Discription	SEC CODE
QAN02		ANTENNA-SGHC140	GH42-01048A
QBA00		PMO-COVER BATTERY	GH72-35803A
QBA01		INNER BATTERY PACK-800MAH,MAIN	GH43-02589A
QCR66		SCREW-MACHINE	6001-002047
QFR01		ASSY CASE-FRONT	GH98-03014A
QKP01		ASSY KEYPAD-(XEF/IAA)	GH98-03633A
QLC01		LCD-MAIN MODULE (SGHC140)	GH07-01030A
QME01		UNIT-DOME SHEET	GH59-03843A
QMI01		MICROPHONE-ASSY-SGH-C140	GH30-00333A
QMO01		MOTOR-DC	3101-001324
QMP01		PBA MAIN-SGHC140 (PBA MAIN)	GH92-03244A
QRF01		MPR-TAPE RF SHEET	GH74-28399A
QSP01		SPEAKER	3001-002074
QRE01		ASSY CASE-REAR	GH98-03015A
	QRF03	PMO-COVER EAR	GH72-35806A

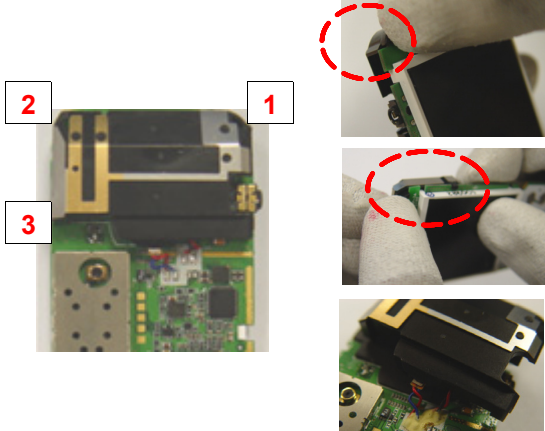
Discription	SEC CODE
BAG PE	6902-000634
ADAPTOR-SGHC140 DC JACK(EU_B	GH44-01597A
LABEL(P)-IMEI	GH68-01335D
LABEL(P)-WATER SOAK	GH68-02026A
LABEL(P)-WATER SOAK	GH68-02026A
MANUAL USERS-EU CZECH	GH68-13465A
LABEL(R)-MAIN(EU)	GH68-13489A
BOX(P)-UNIT MAIN(EU)	GH69-04914A
NPR-BRACKET LID	GH71-07160A
MPR-SPONGE SPK A	GH74-28347A
MPR-SPONGE SPK B	GH74-28350A
MPR-VINYL BOHO WINDOW	GH74-30206A

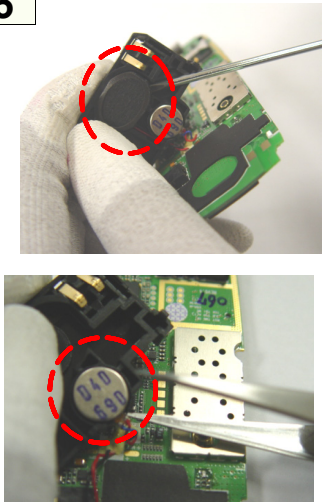
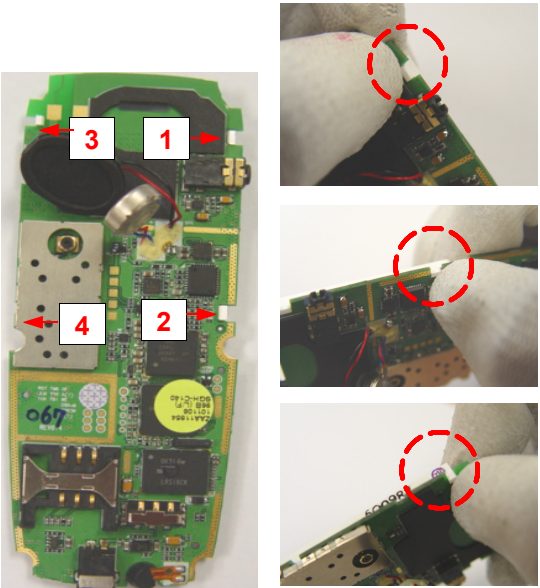
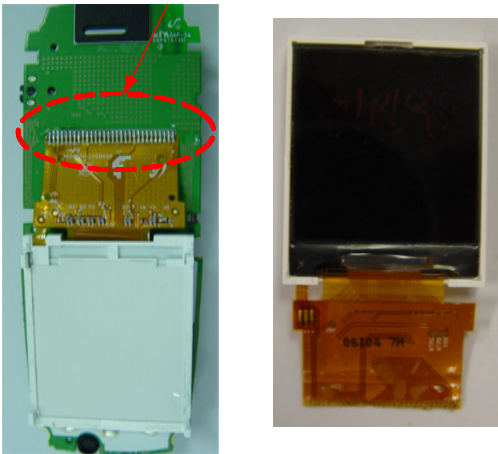
2-3. Assembly

1	2
1) Solder the motor, speaker and mike. * caution 1) Be care of the polarity of wires.	1) Attach the LCD module to the PBA. 2) Solder LCD module to the PBA. * caution 1) Be careful, the motor wire isn't down. 2) Be careful with the damages of FPCBS.
3	4
1) Assemble the LCD module. * caution 1) Be care of scratch and molding damage. 2) Keep the orders.	1) Put the Speaker into the Carrier. 2) Put the Motor into the Carrier. * caution 1) Be care of damage to the FPCBs. 2) Be care of scratch and molding damage.

5	6
1) Assemble the LCD module. ※ caution 1) Be care of scratch and molding damage. 2) Keep the orders.	1) Check the PBA ※ caution 1) Be care of scratch and molding damage.
7	8
1) Put the PBA to the FRONT ※ caution 1) Be care of scratch and molding damage.	1) Screw down 4 Points ※ caution 1) Be care of scratch and molding damage.

2-4. Disassembly

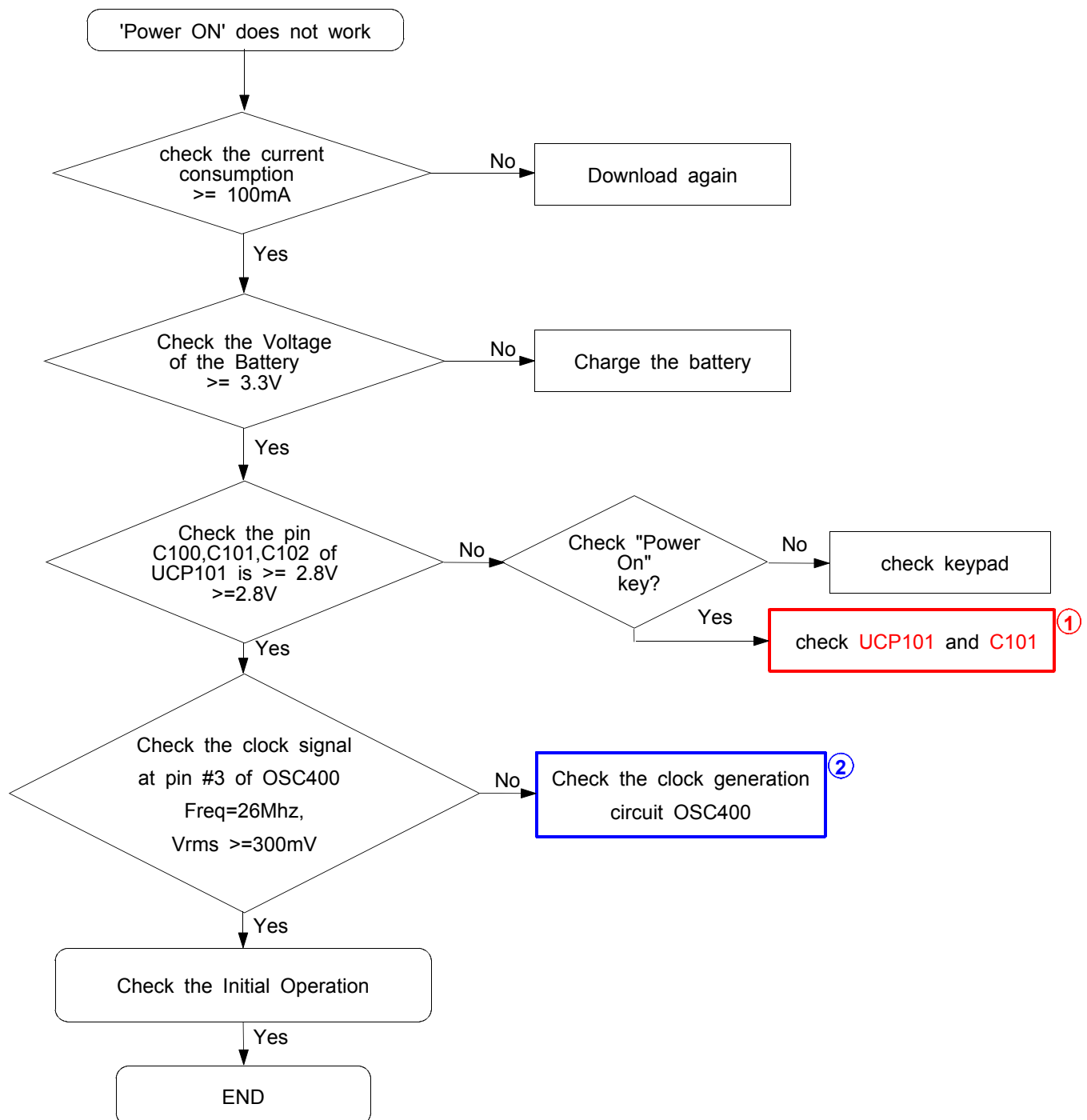
1 	2 
1) Unscrew the 4 points. 2) Separate the REAR from the FRONT using an assembly stick. ※ caution 1) Be care of scratch and molding damage.	1) Disassemble the FRONT from the PBA. ※ caution 1) Be care of scratch and molding damage. 2) Be care of damage to the PBA.
3  Check the MIC holder. It could be lost easily.	4 
1) Check the FRONT. ※ caution 1) Be care of scratch and molding damage.	1) Disassemble the Carrier from the PBA. ※ caution 1) Be care of damage to the wires. 2) Be care of scratch and molding damage.

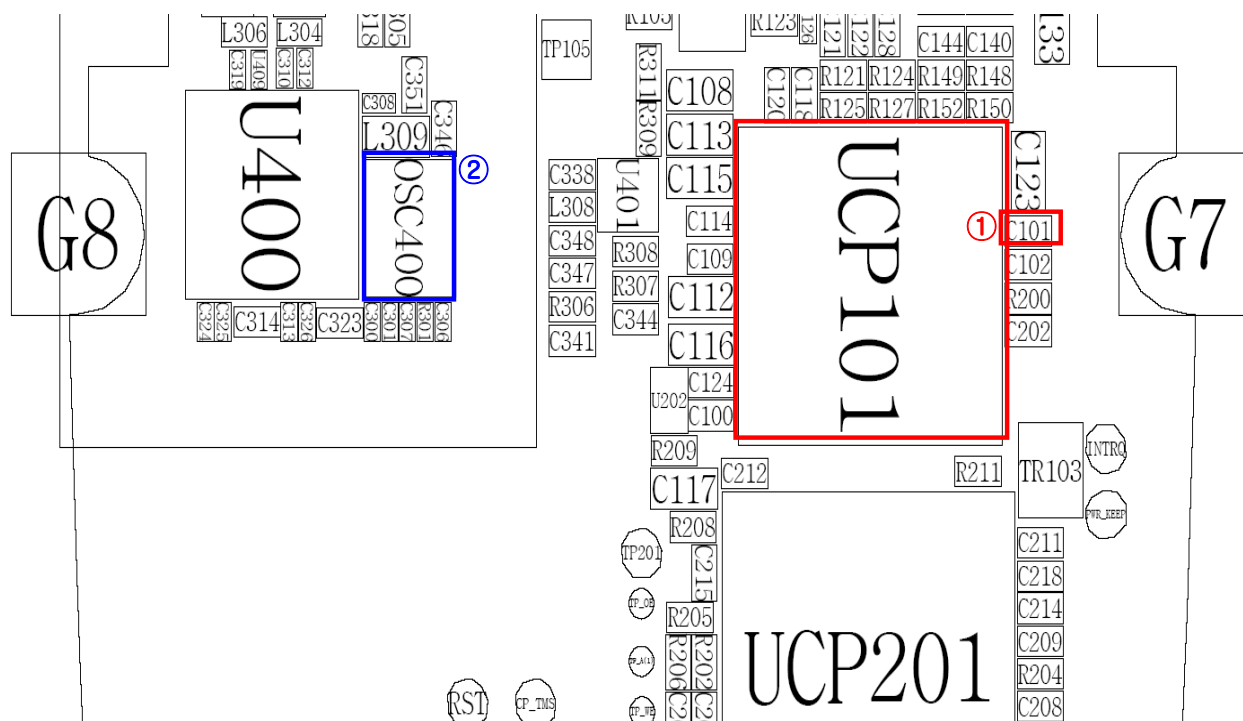
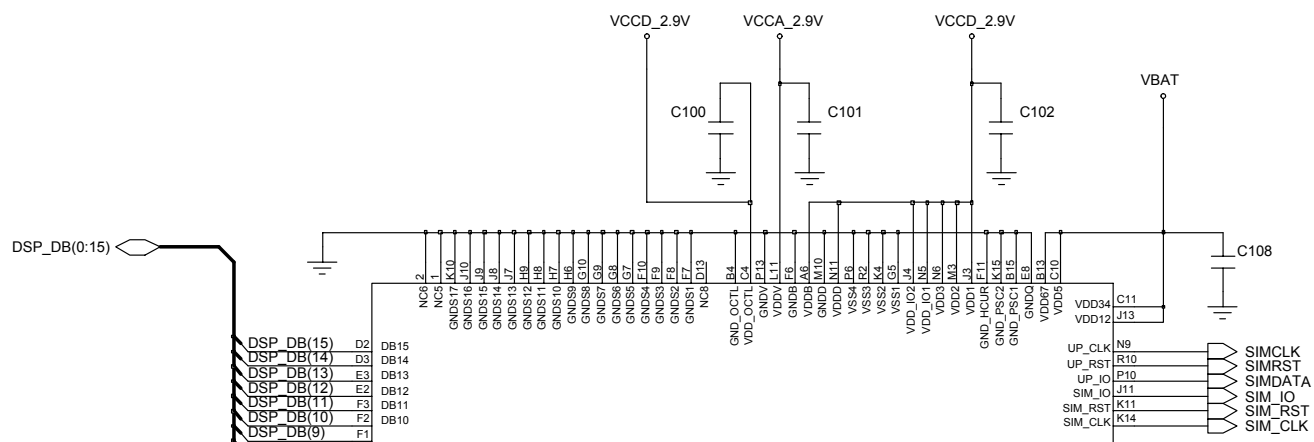
5 	6 
1) Detach the Speaker and Motor from the Carrier using tweezers. ※ caution 1) Be care of scratch and molding damage. 2) Be care of damage to the wires.	1) Disassemble the LCD module from the PBA ※ caution 1) Be care of scratch and molding damage. 2) Be care of damage to the LCD module.
7 Soldering Points 	
1) Solder the LCD FPCB to take the LCD out. ※ caution 1) Be care of scratch and molding damage. 2) Be care of damage to the LCD FPCB.	

3. Flow Chart of Troubleshooting

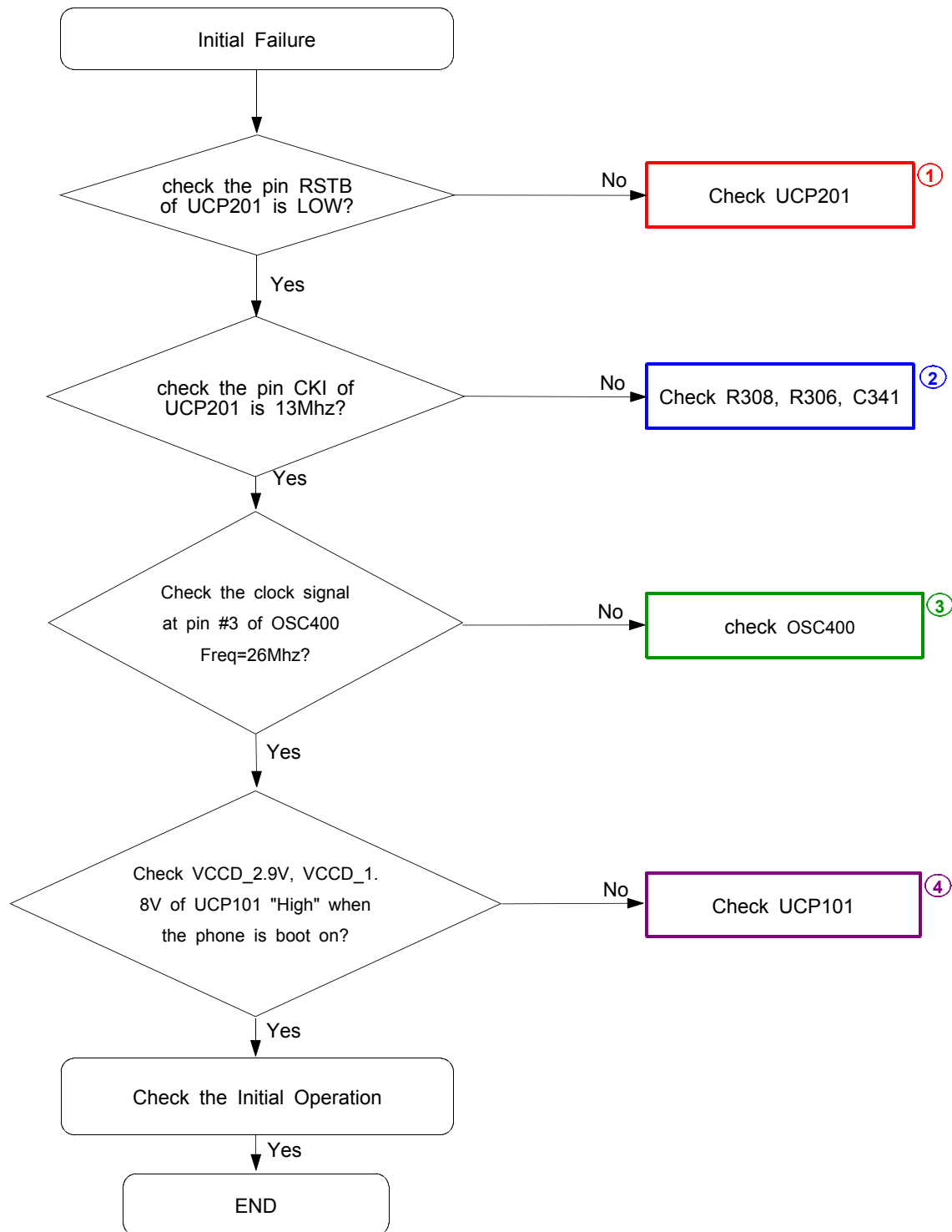
3-1. Baseband

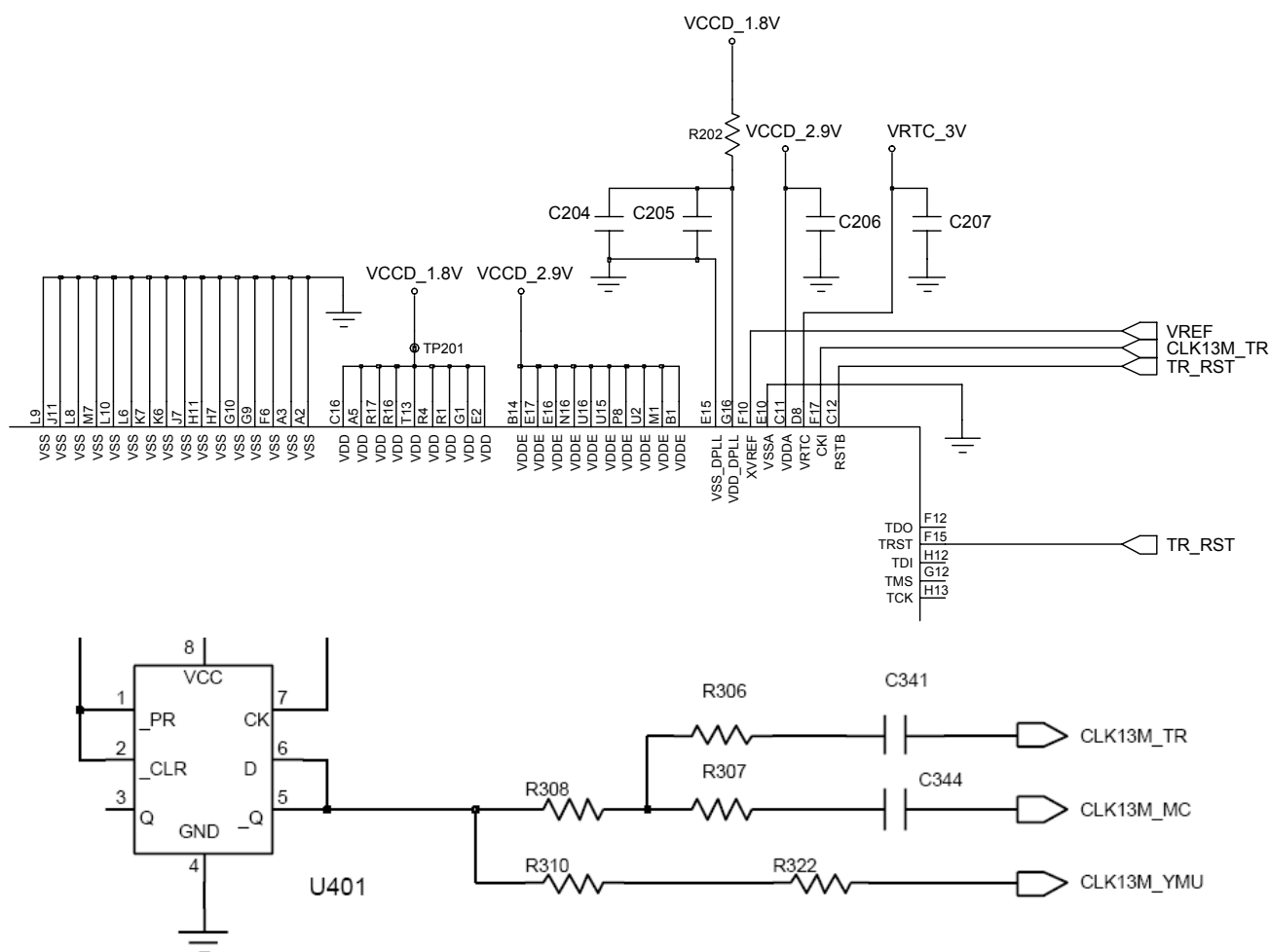
3-1-1. Power ON



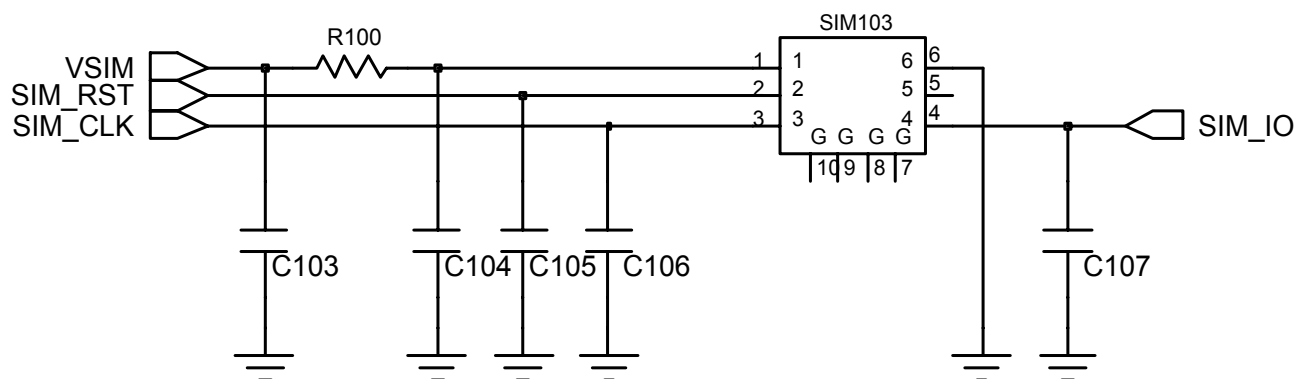
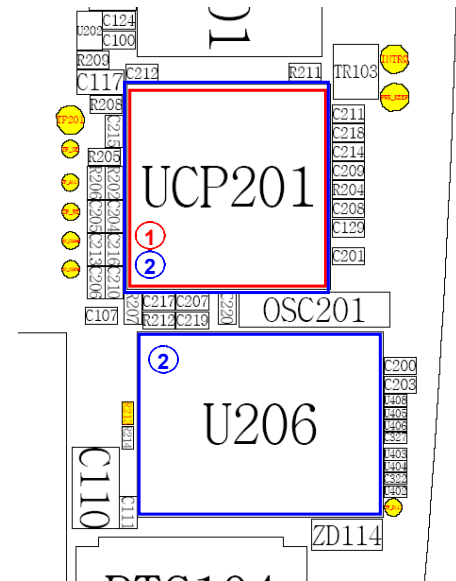
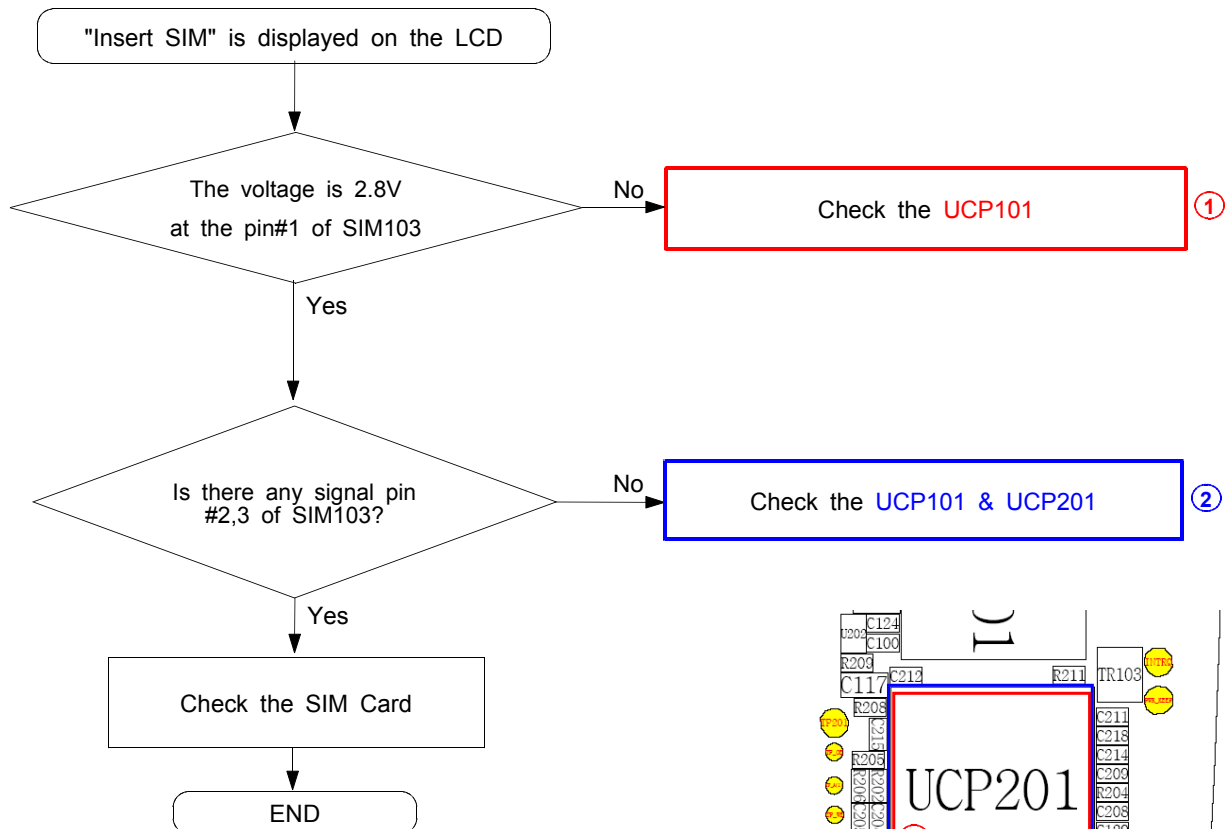


3-1-2. Initial



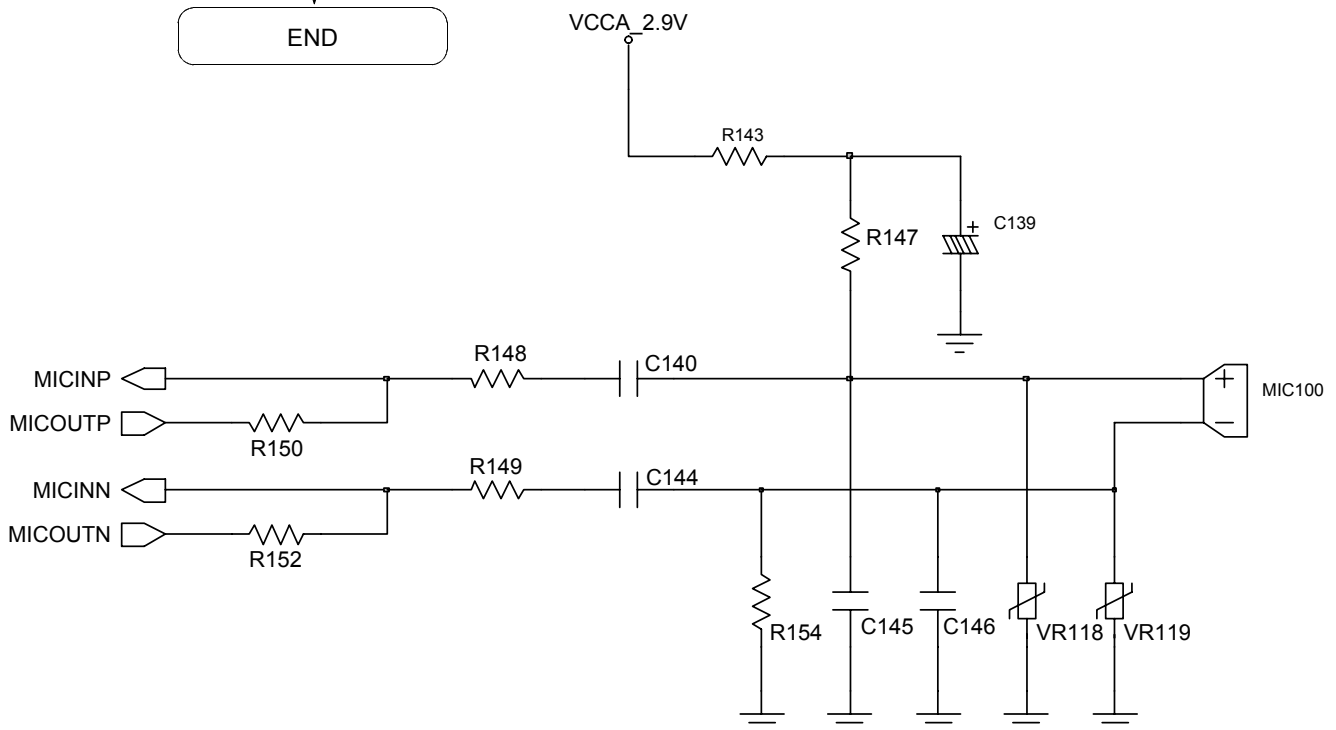
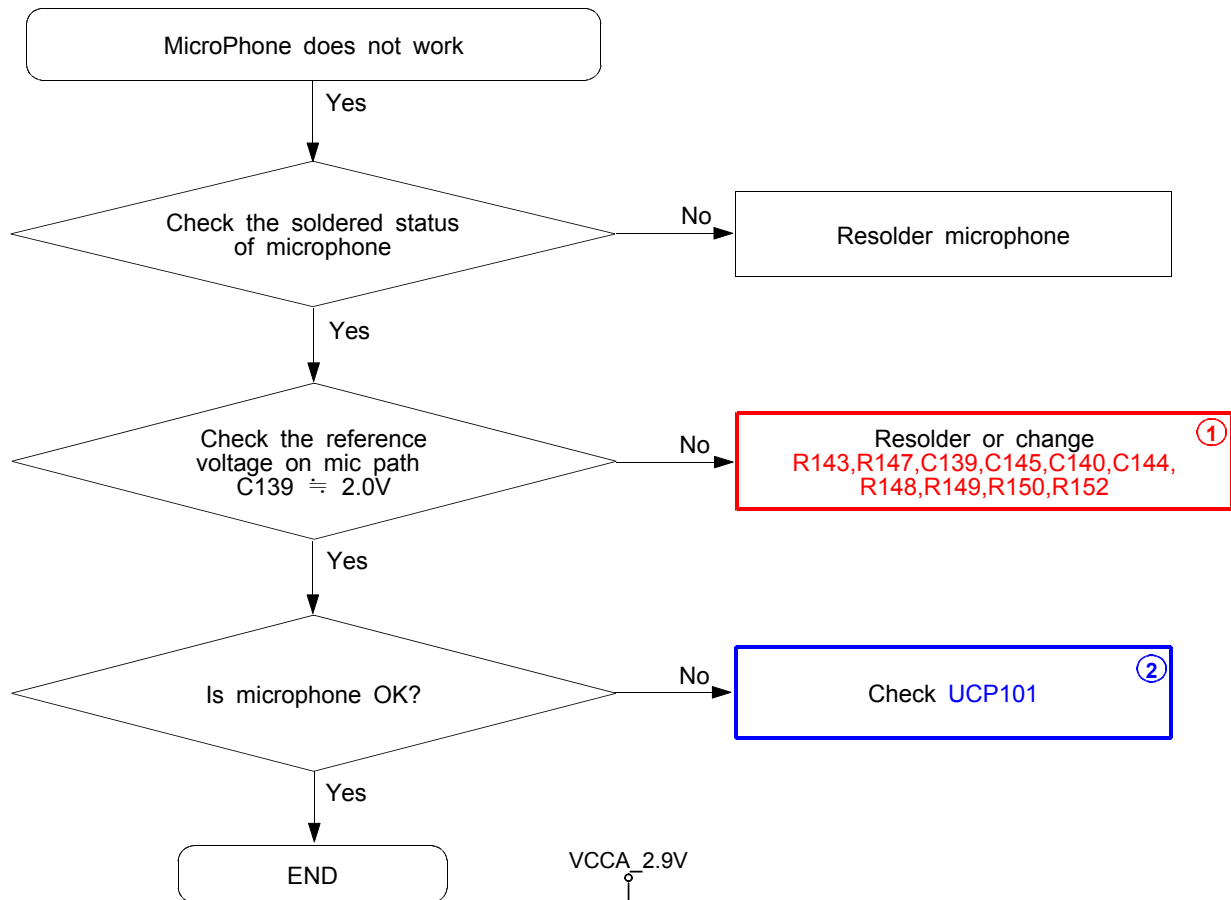


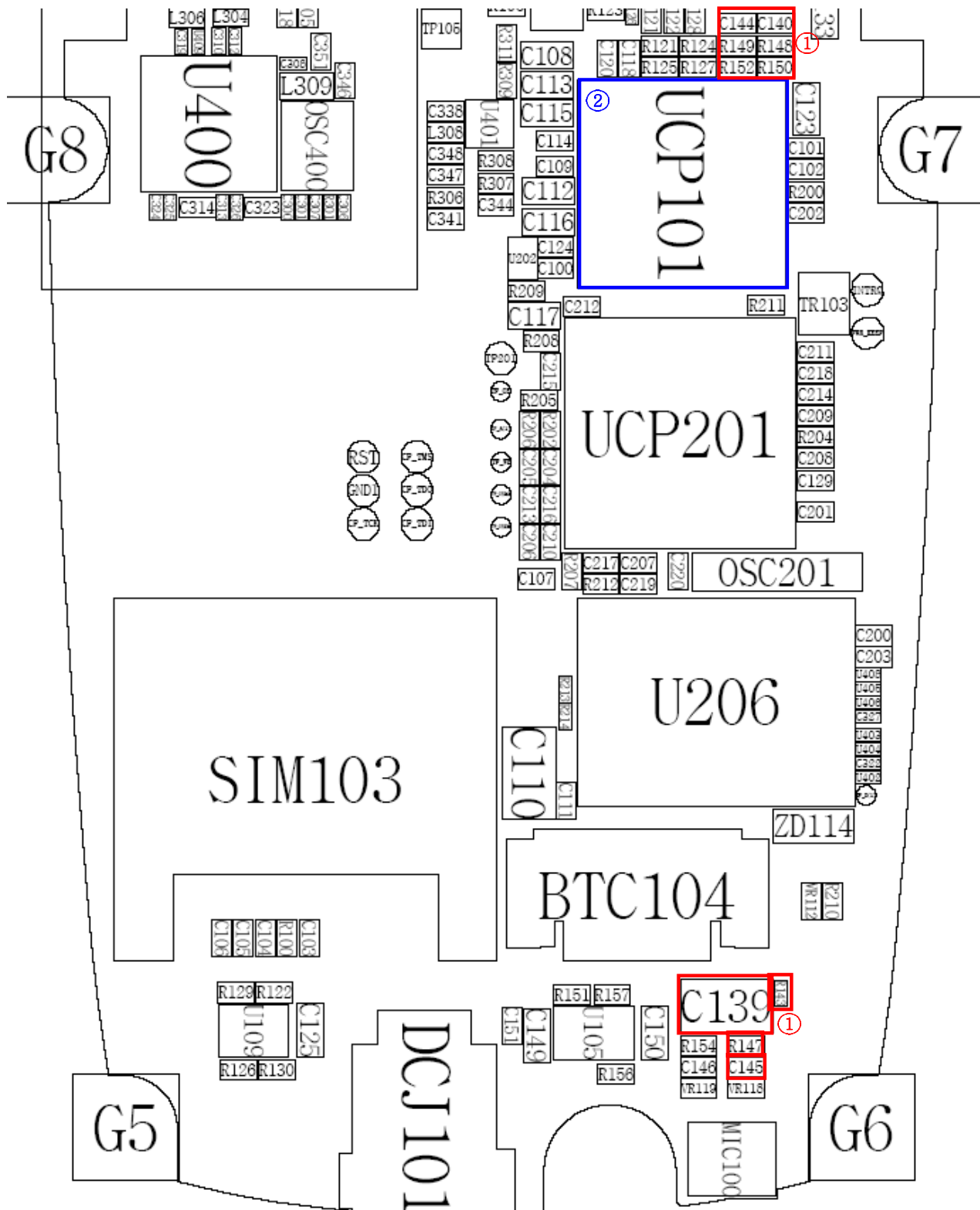
3-1-3. Sim Part



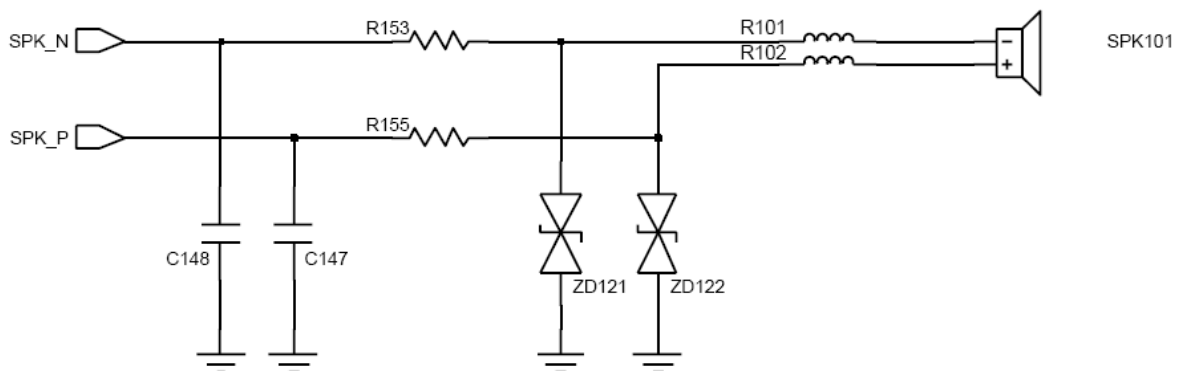
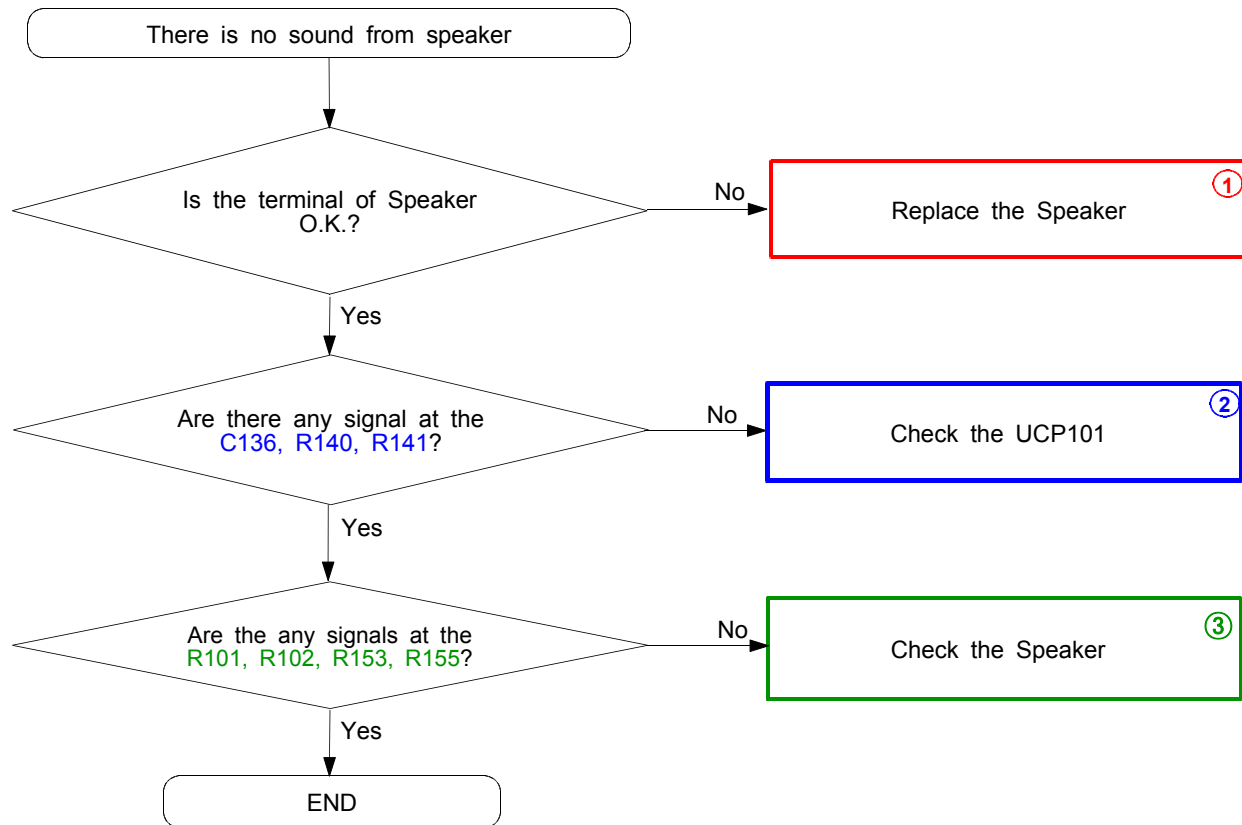
3-1-4. Microphone Part

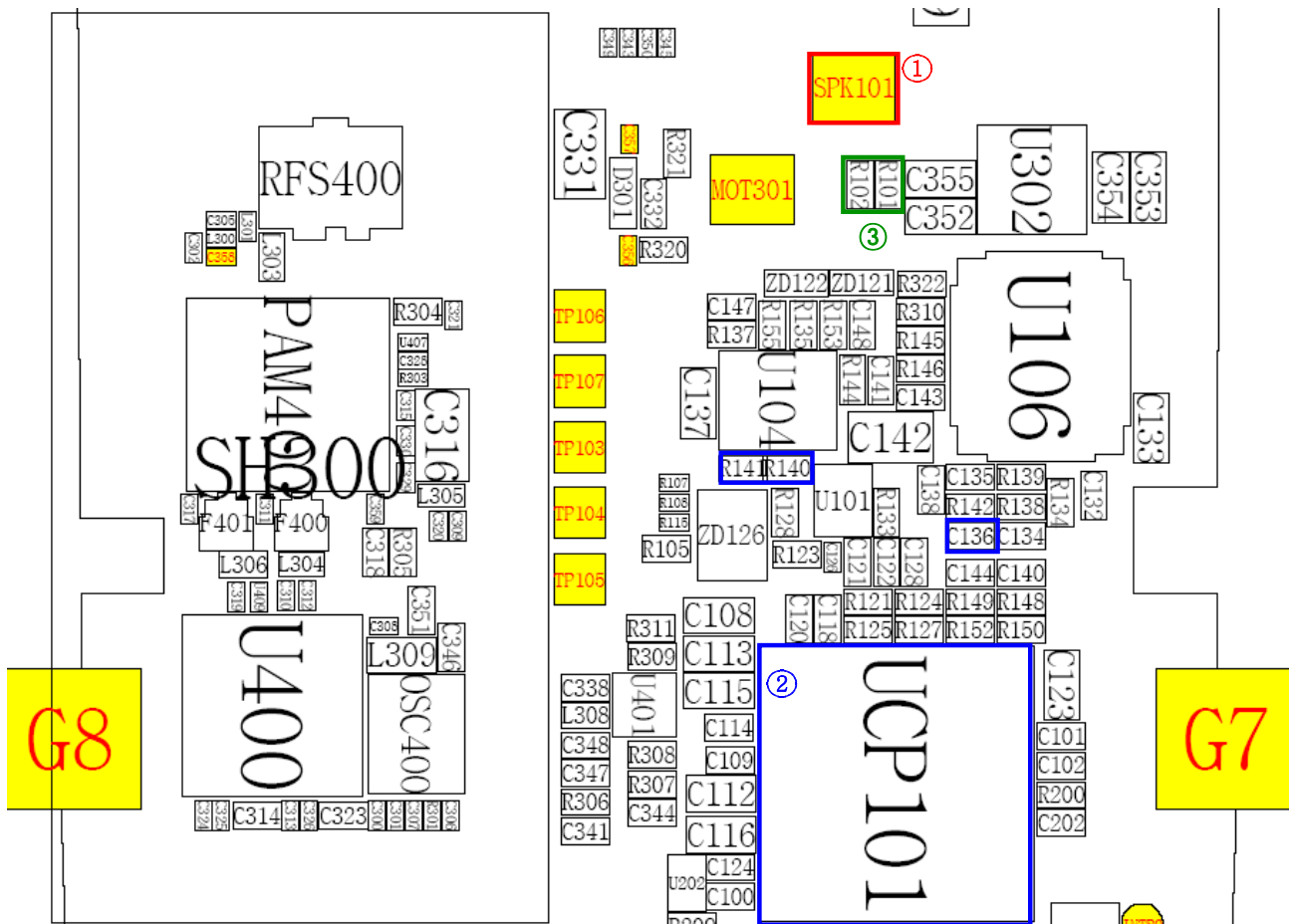
* Call with Sim before testing.



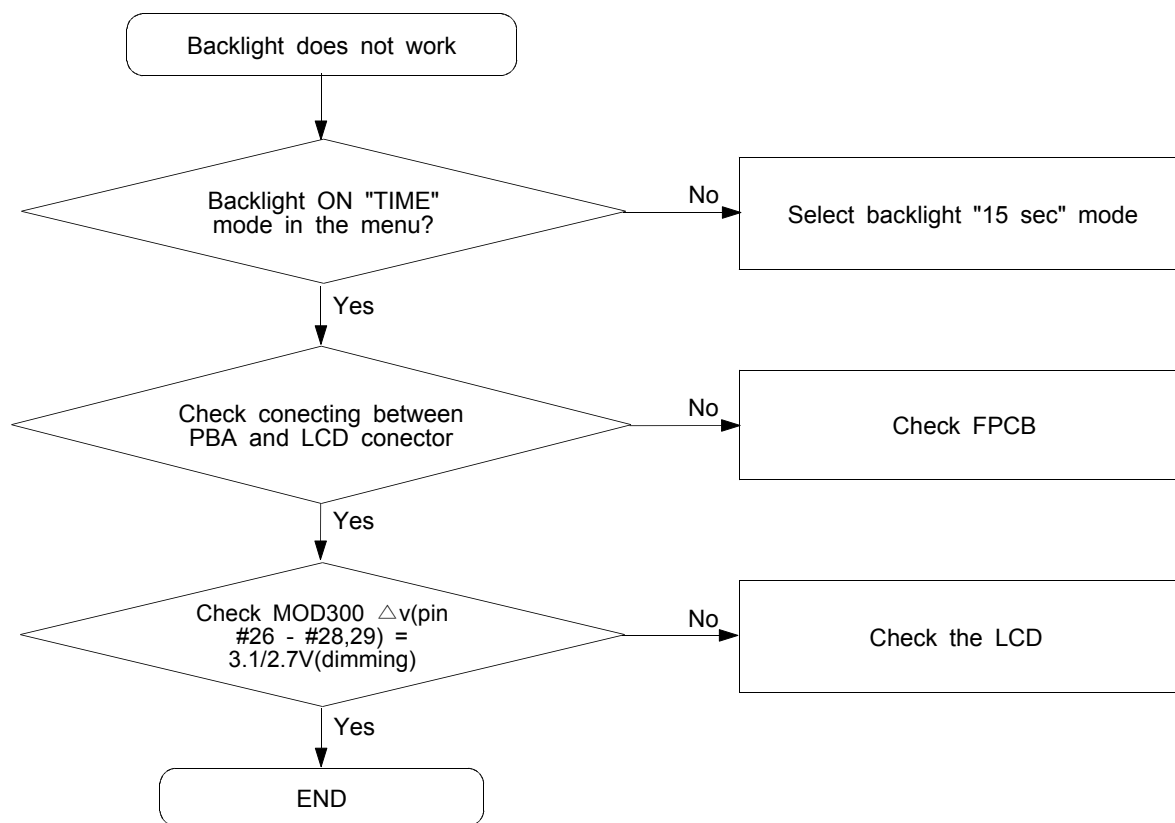


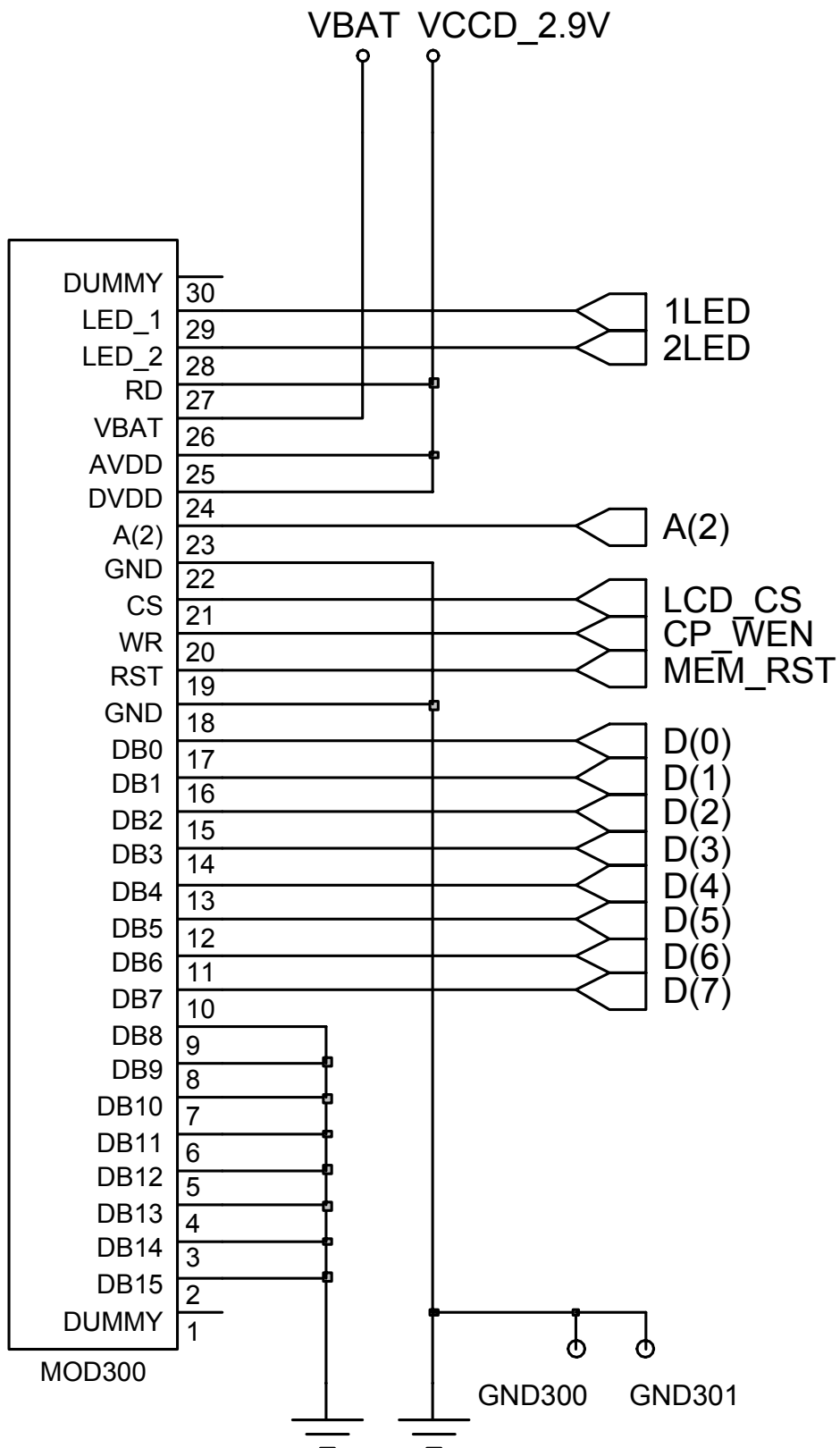
3-1-5. Speaker Part





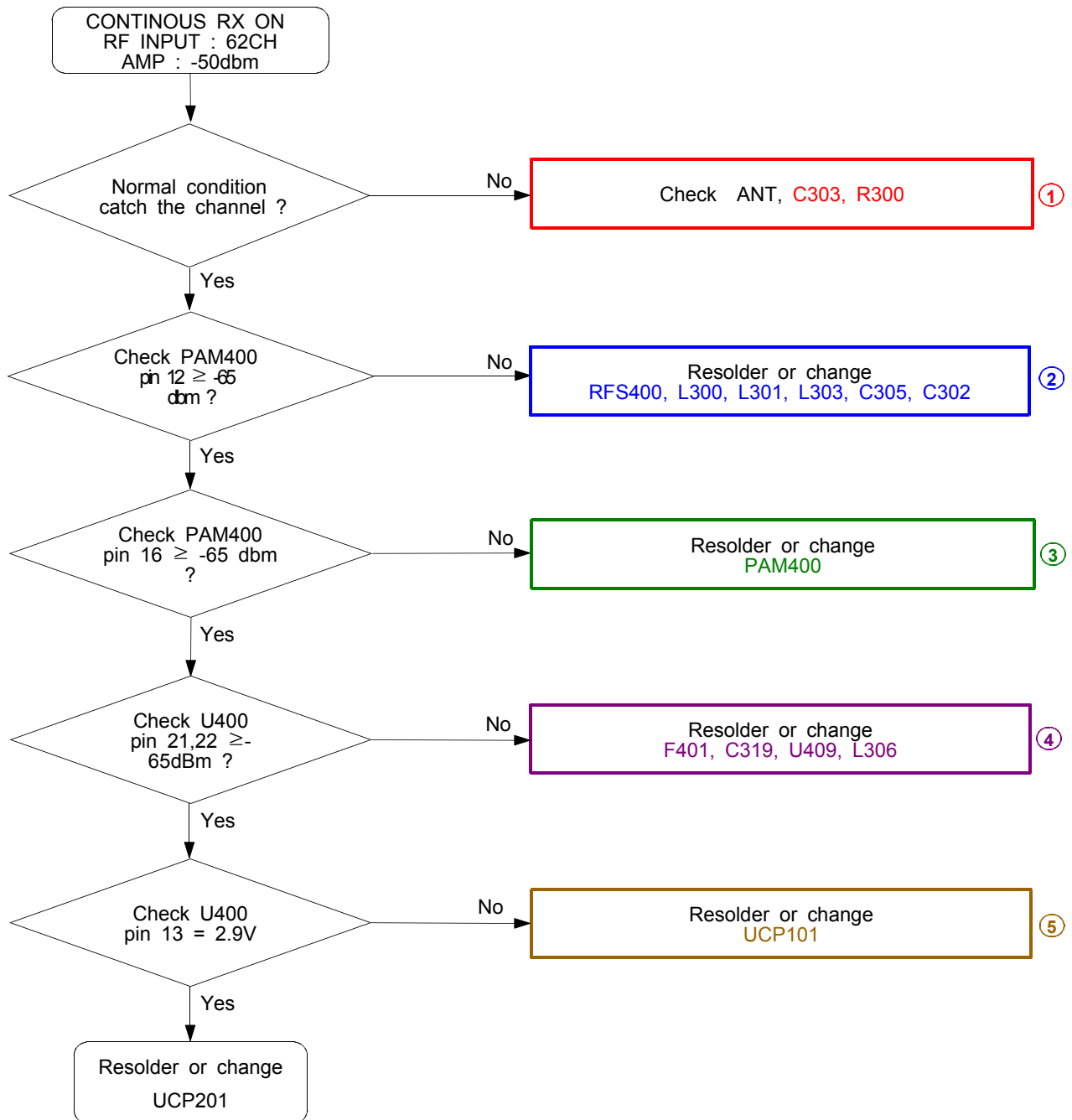
3-1-6. LCD backlight

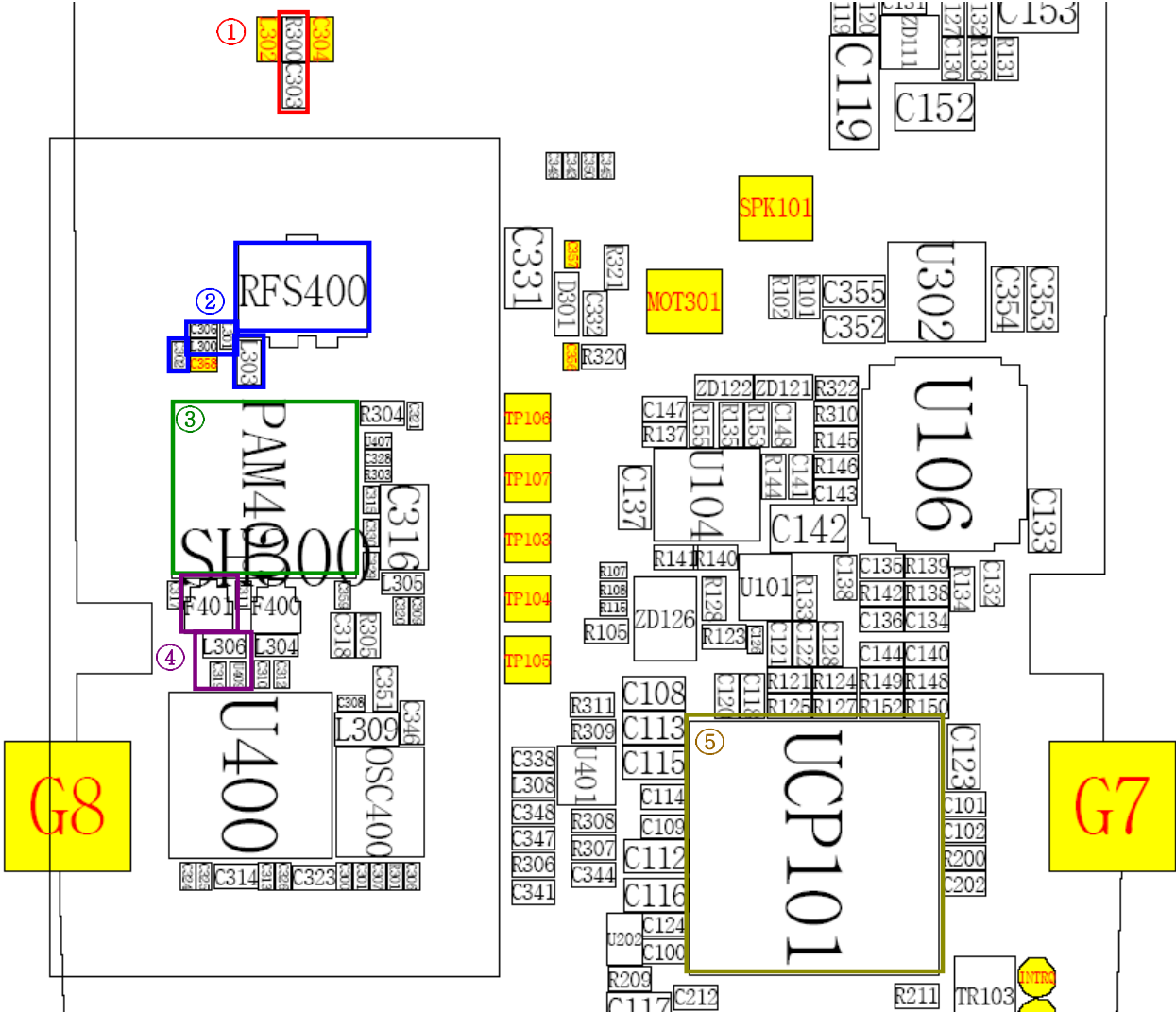




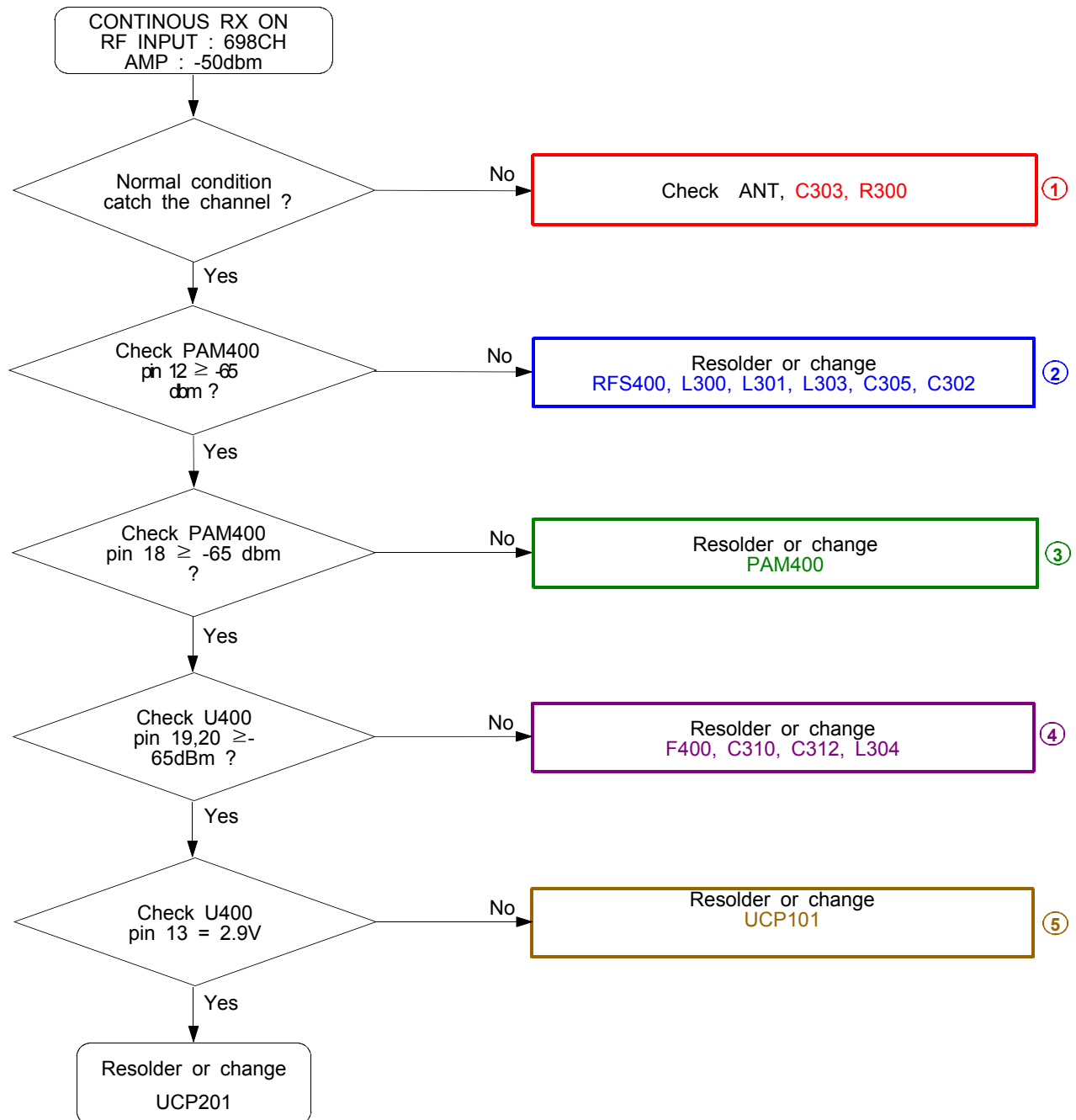
3-2. RF

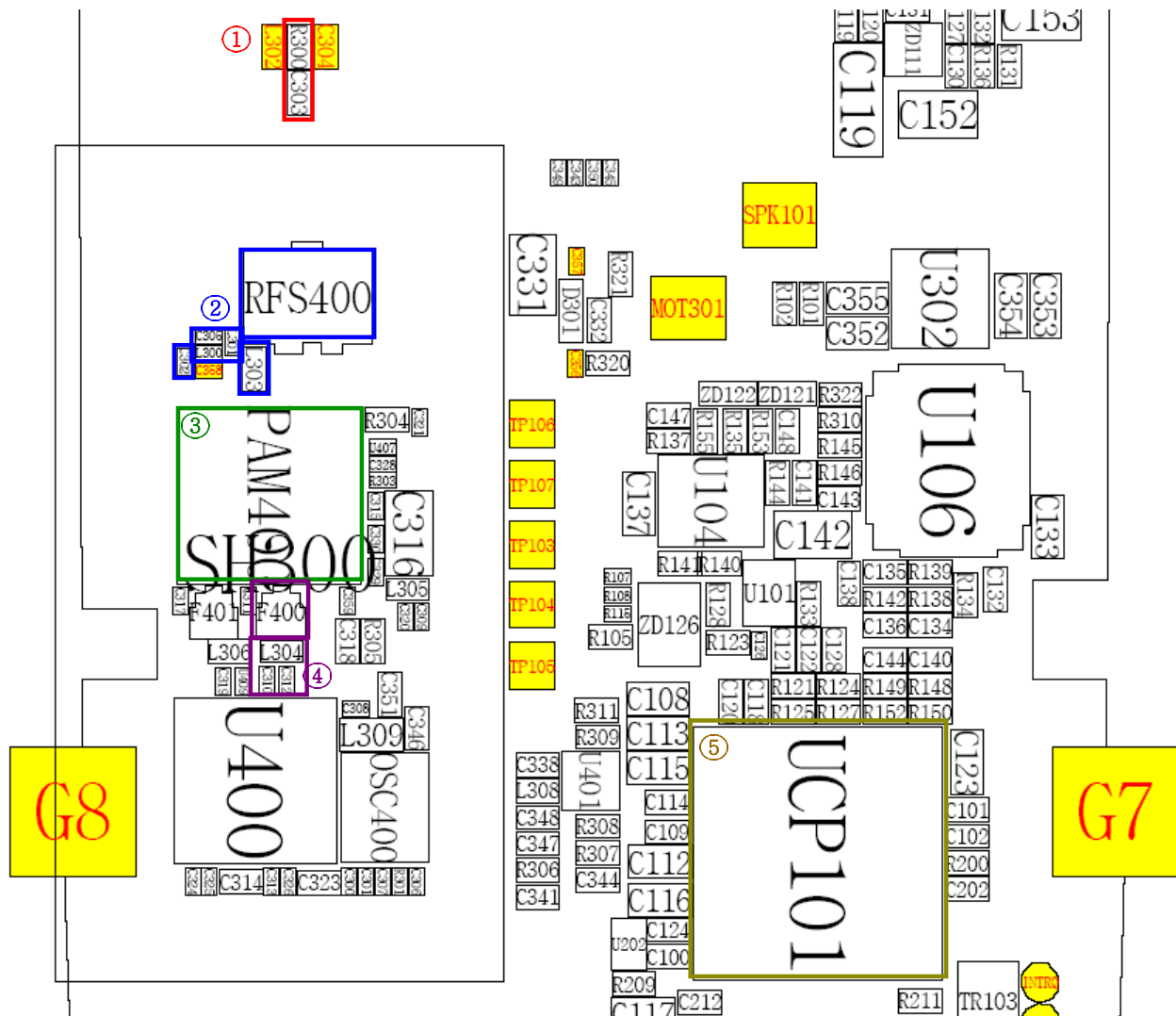
3-2-1. GSM Rx

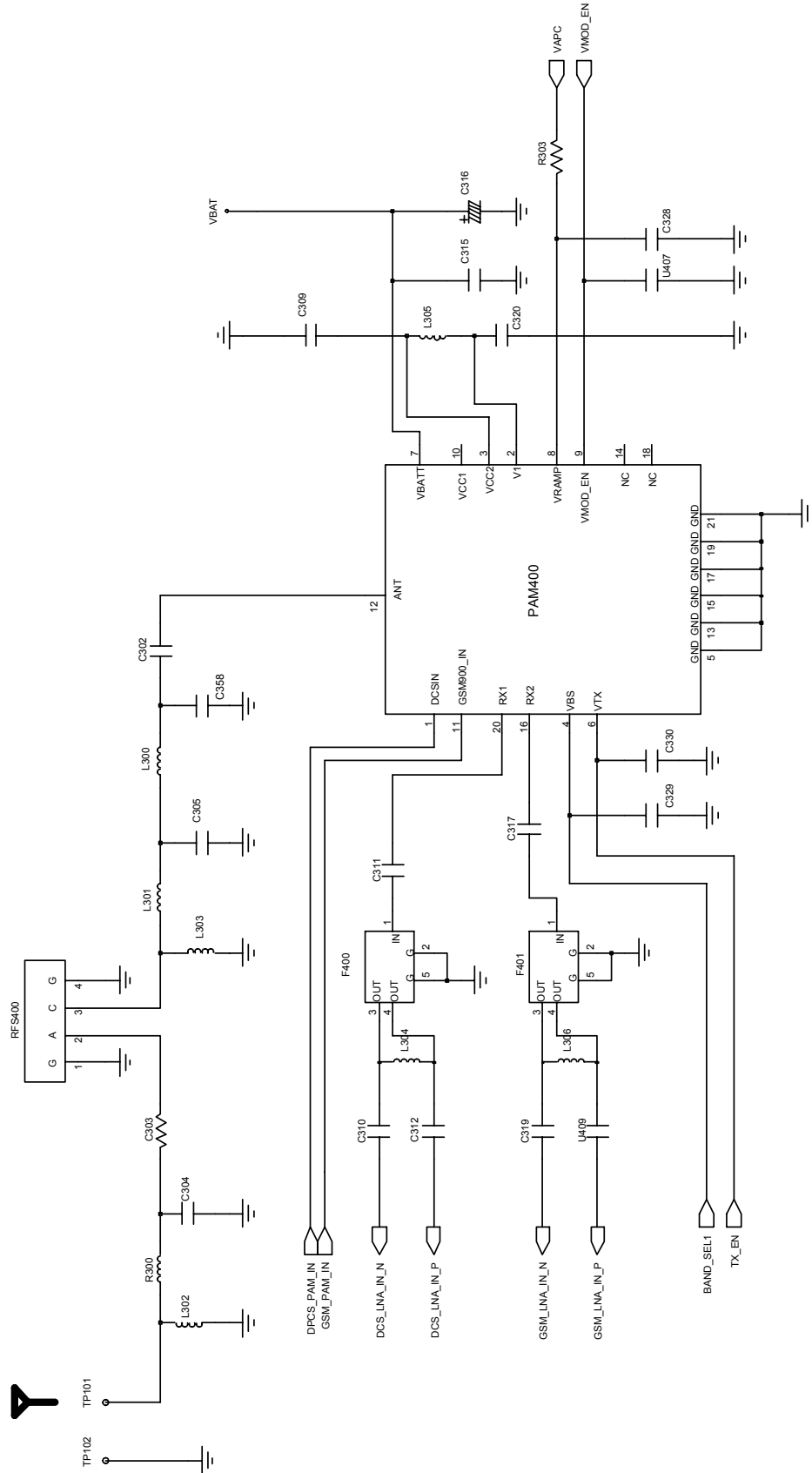


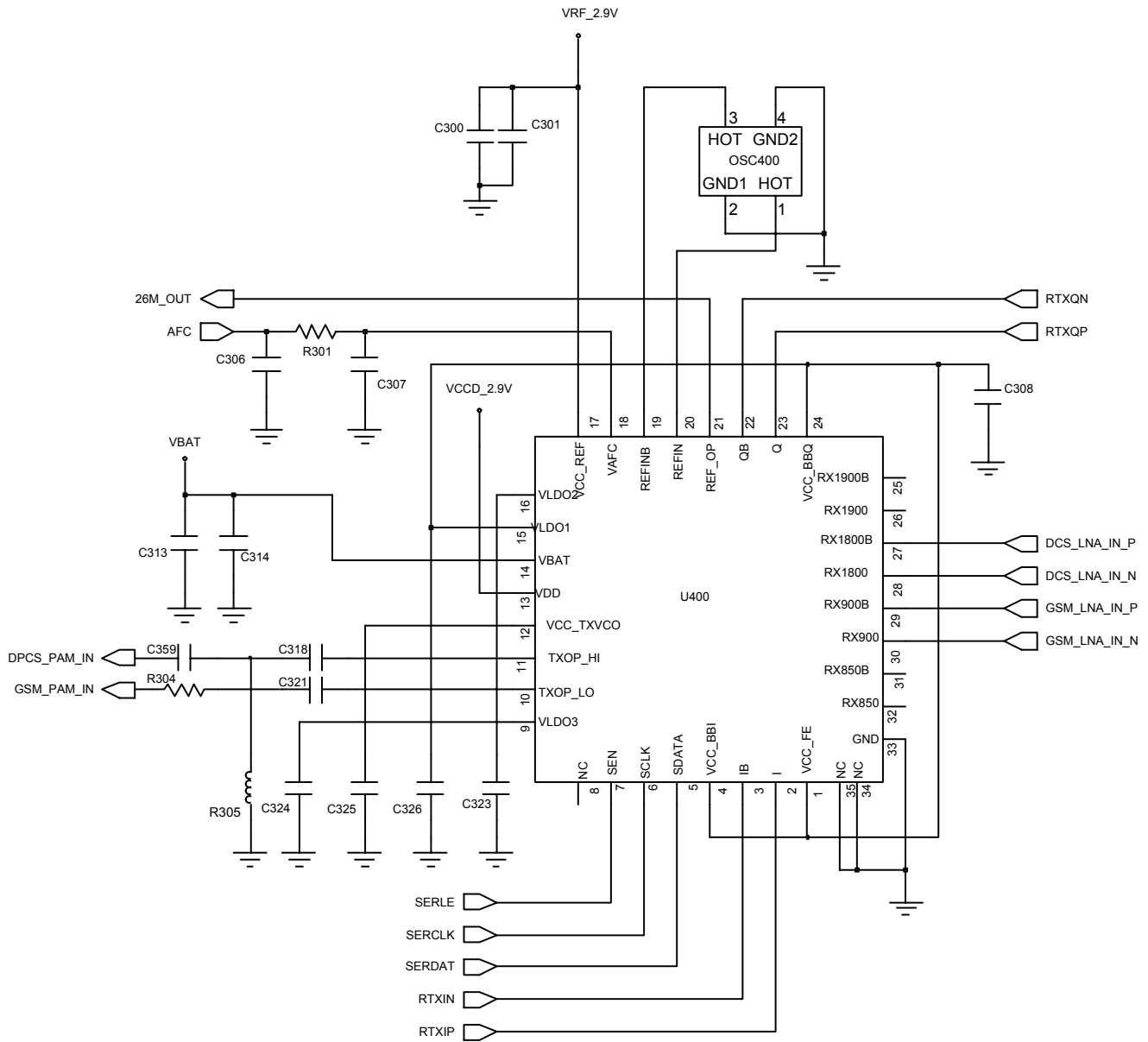


3-2-2. DCS Rx

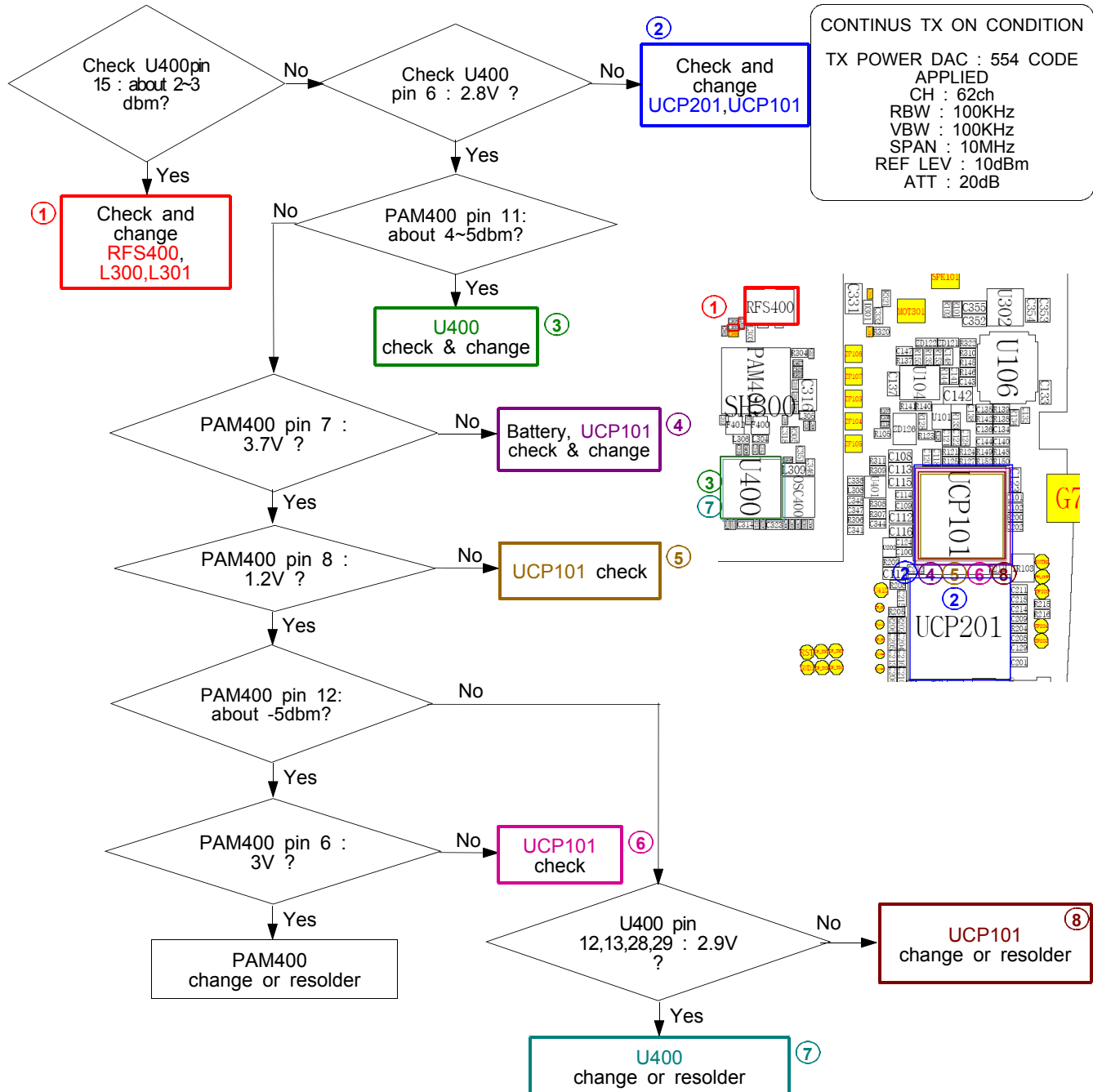




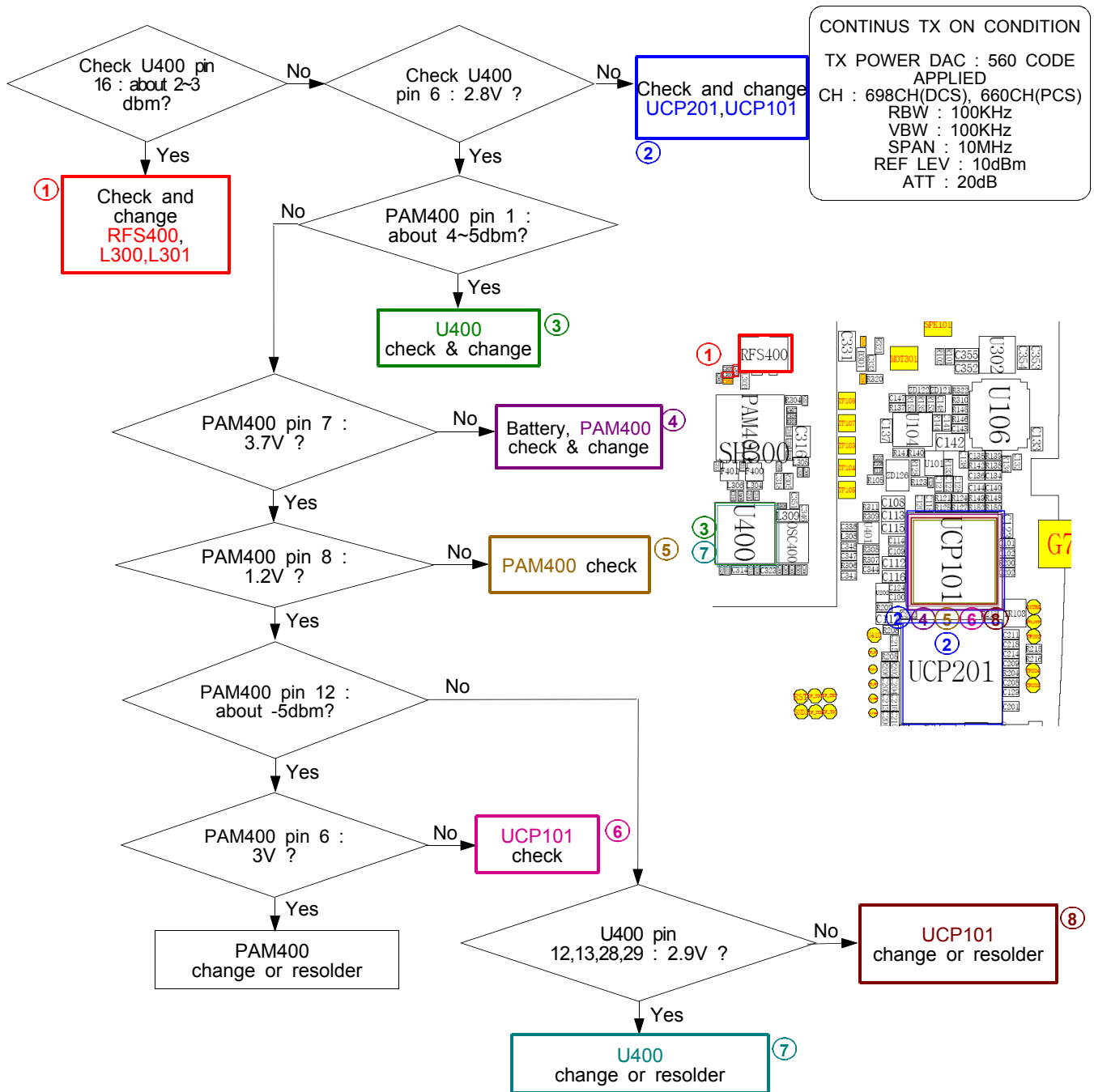




3-2-3. GSM Tx



3-2-4. DCS Tx



4. Array course control



Test Jig (GH80-00865A)



Test Cable (GH39-00743A)



RF Test Cable (GH39-00397A)

Software Downloadin

4-1. Downloading Binary Files

- Three binary files for downloading C140.
 - C140XXYY.s3 : Main source code binary.

4-2. Pre-requisite for Downloading

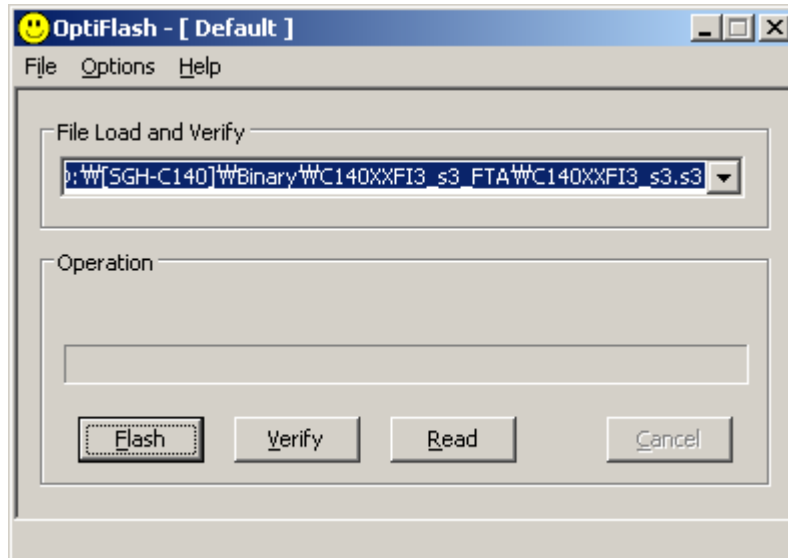
- Downloader Program([OptiFlash.exe](#))
- C140 Mobile Phone
- Data Cable
 - How to connect C140 data cable



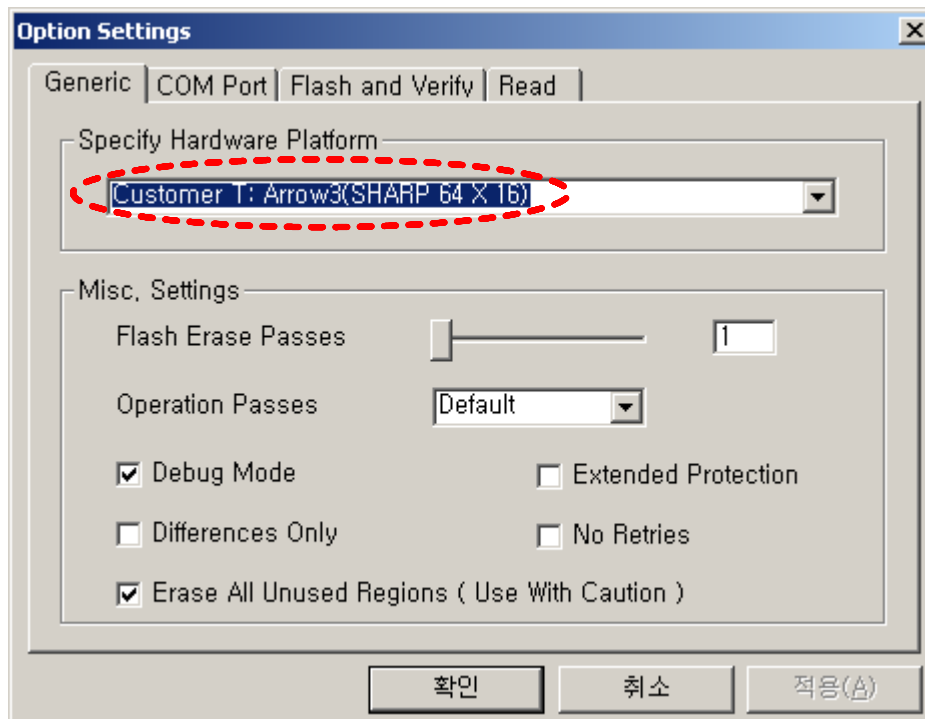
- Binary files

4-3. S/W Downloader Program

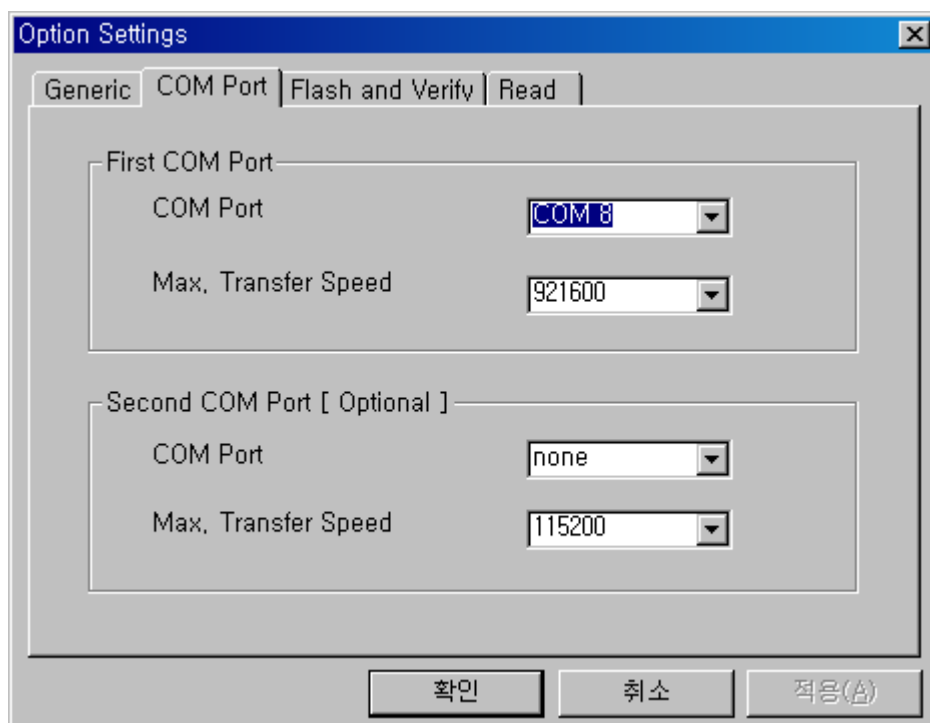
1. Load the binary download program by executing the “**OptiFlash.exe**”



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



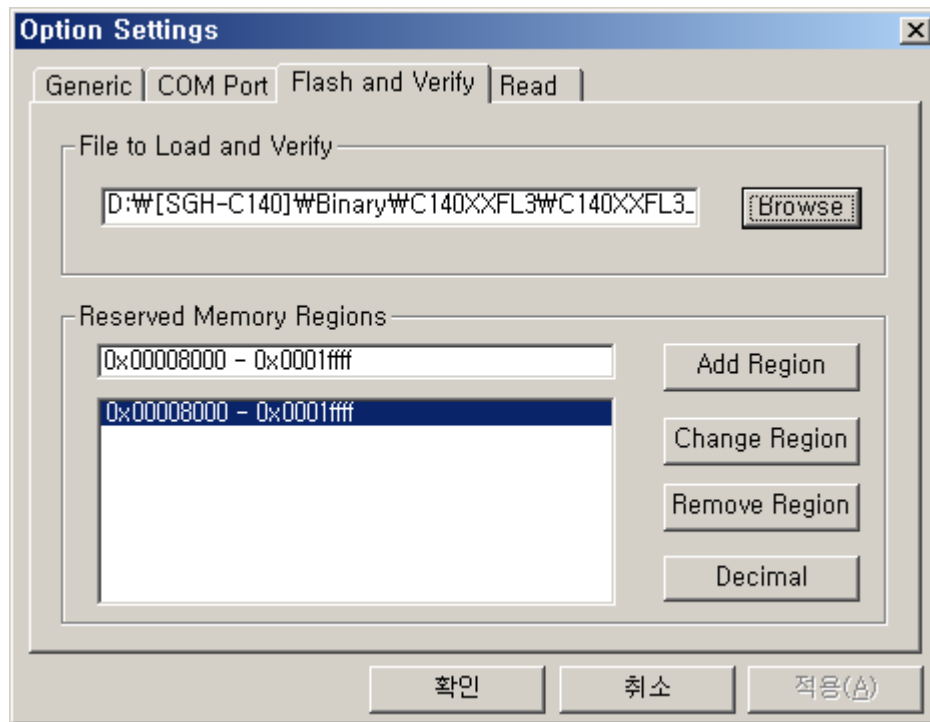
3. Select the **COM port** when the download cable is connected



Up to twelve ports are 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 “C140XXYY.s3”, for the downloader binary setting.



Make sure that not to change the reserved memory regions.

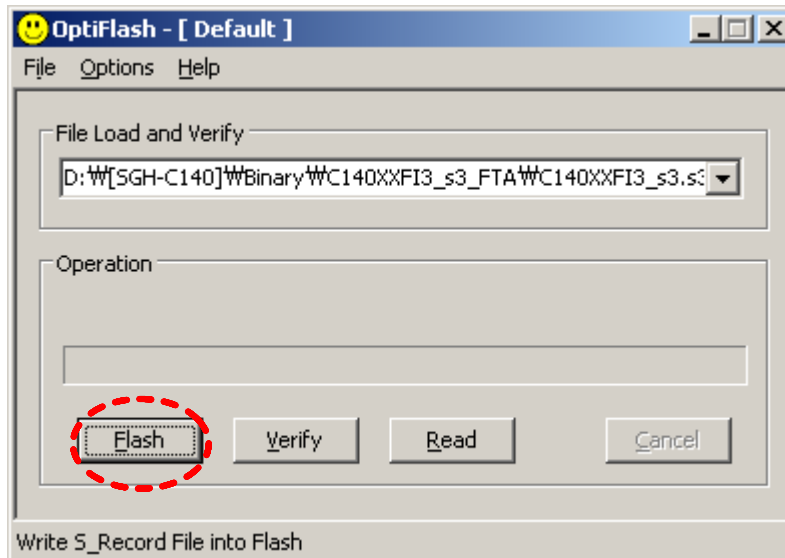
In case of C140 the reserved memory regions are :

-0x00008000 – 0x0001ffff

5. Click “OK” button then press “Flash”.

(Before pressing ‘Flash’ button, push the button “*” and ‘END’ at the same time. Then press ‘Flash’.)

Downloader will upload the binary file as below for the downloading.



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.

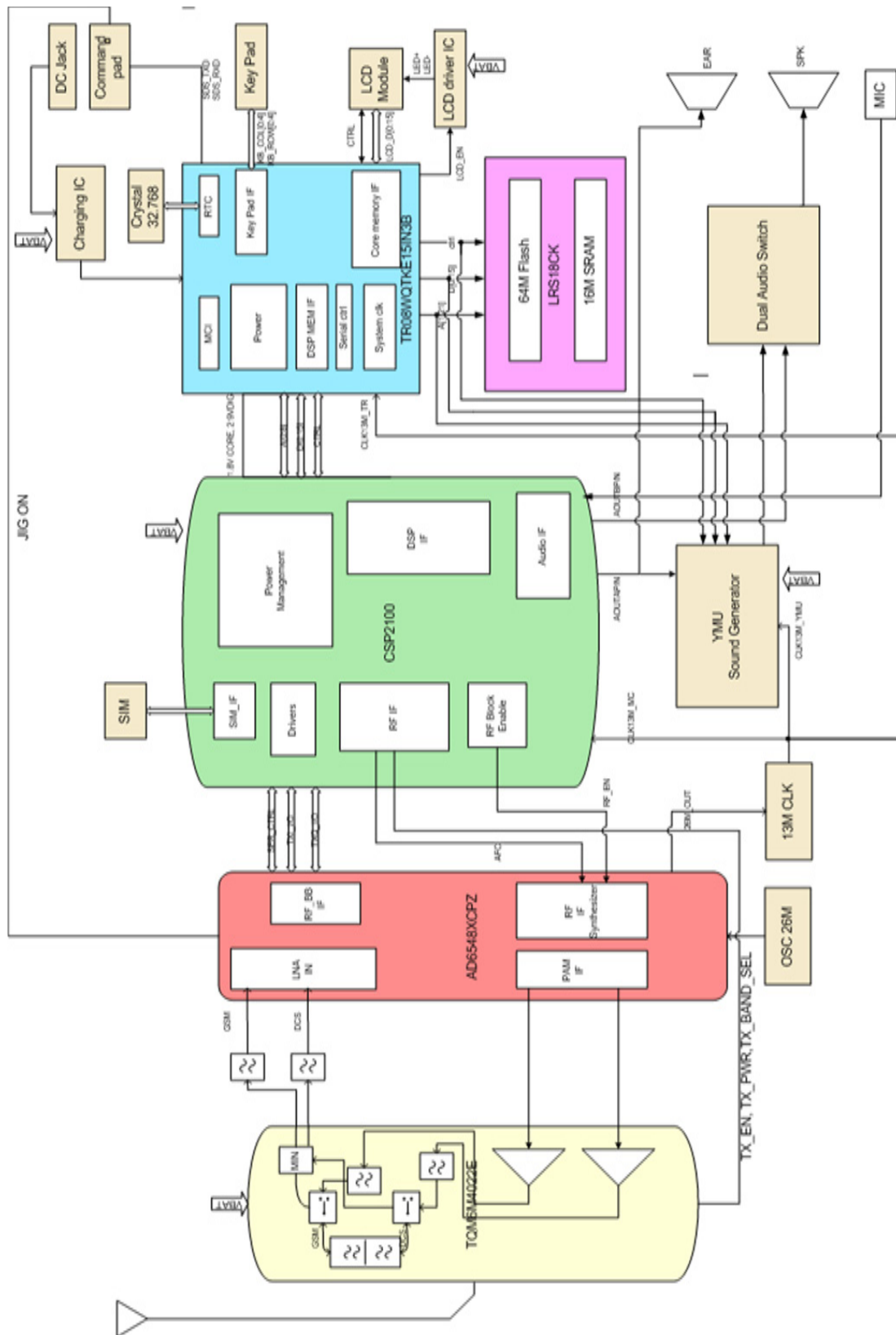
8. Confirm the downloaded version name and etc. :

***#1111#**

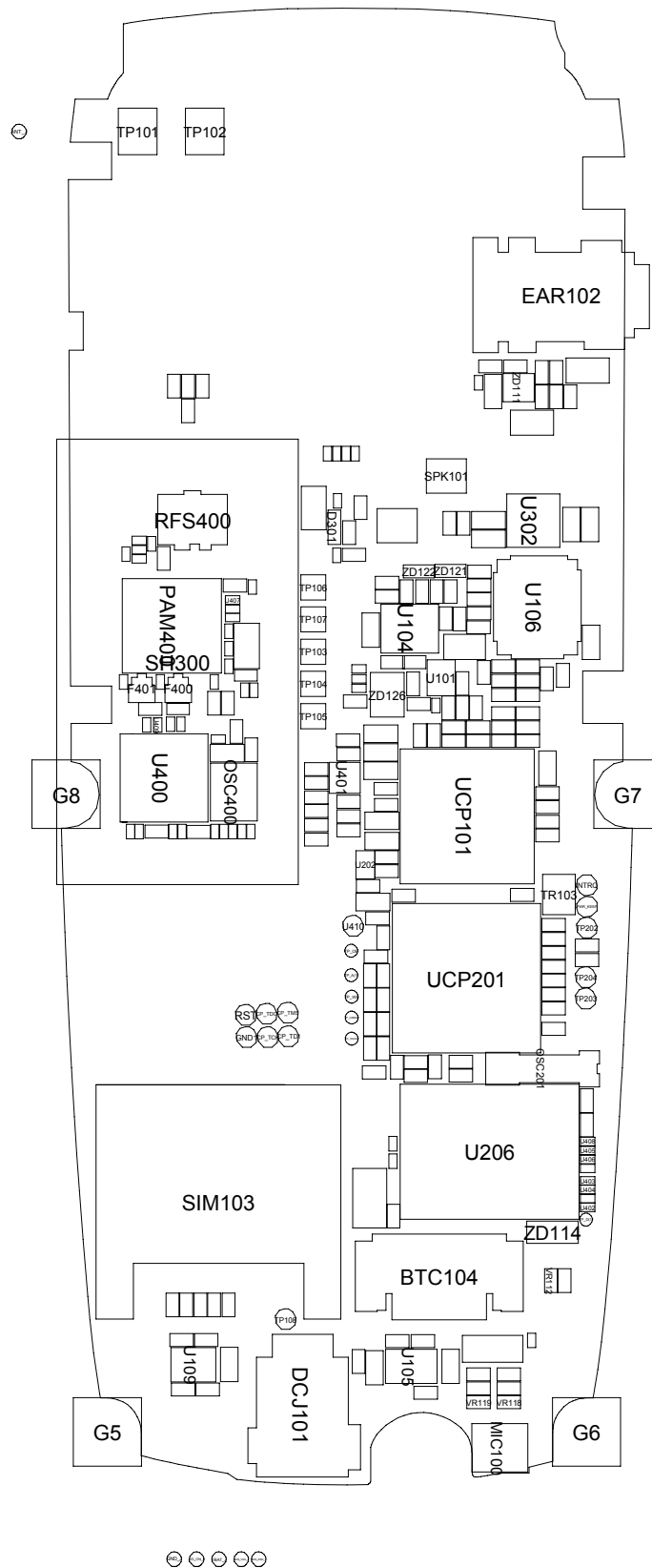
Full Reset :

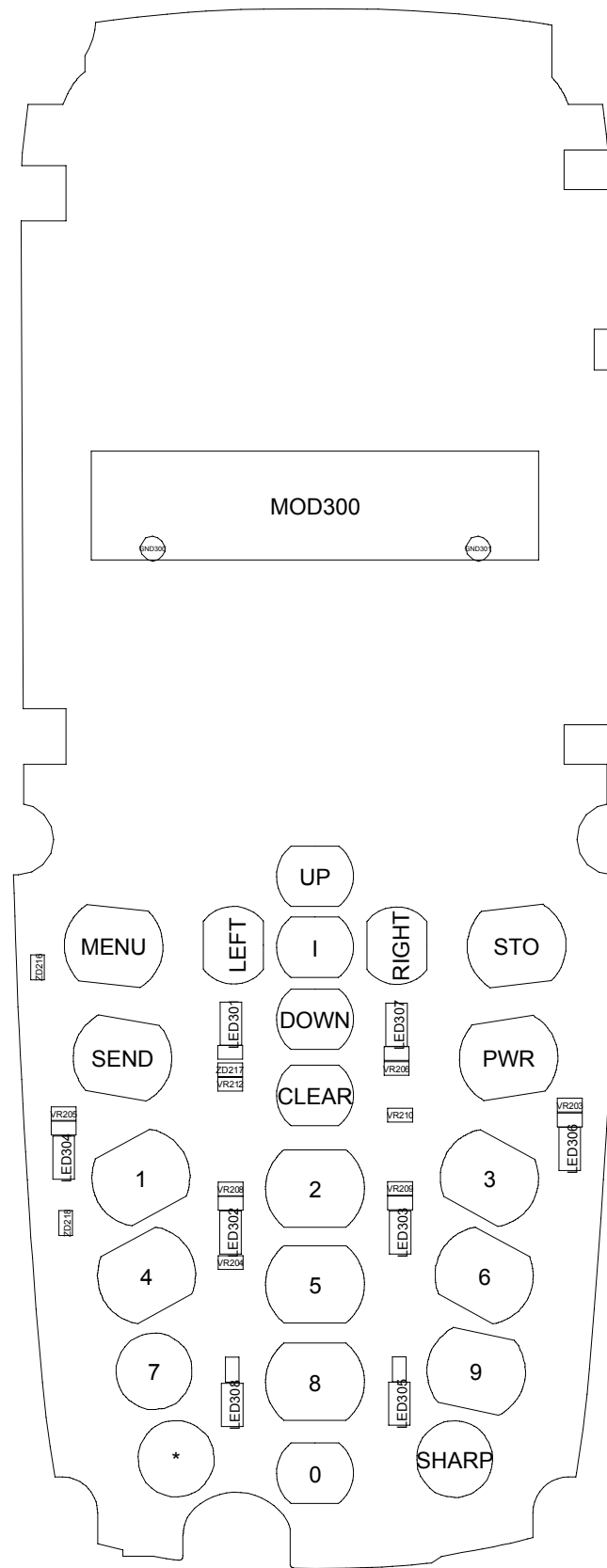
***2767*3855#**

5. Block Diagrams



6. PCB Diagrams





7. MAIN Electrical Parts List

SEC CODE	Design LOC	Discription	STATUS
0401-001141	D301	DIODE-SWITCHING	SA
0403-001547	ZD114	DIODE-ZENER	SA
0406-001083	ZD126	DIODE-TVS	SA
0406-001190	ZD111	DIODE-TVS	SA
0406-001210	ZD121	DIODE-TVS	SA
0406-001210	ZD122	DIODE-TVS	SA
0504-000168	TR103	TR-DIGITAL	SA
0601-001819	LED301	LED	SA
0601-001819	LED302	LED	SA
0601-001819	LED303	LED	SA
0601-001819	LED304	LED	SA
0601-001819	LED305	LED	SA
0601-001819	LED306	LED	SA
0601-001819	LED307	LED	SA
0601-001819	LED308	LED	SA
0801-002529	U109	IC-CMOS LOGIC	SA
0801-003013	U401	IC-CMOS LOGIC	SA
1001-001371	U104	IC-ANALOG SWITCH	SA
1108-000095	U206	IC-MCP	SA
1201-002364	PAM400	IC-POWER AMP	SA
1202-001068	U101	IC-VOLTAGE COMP.	SA
1203-003663	U105	IC-BATTERY	SA
1203-003897	UCP101	IC-POWER SUPERVISOR	SA
1203-004051	U302	IC-DC/DC CONVERTER	SA
1204-001811	U106	IC-MELODY	SA
1205-003098	U400	IC-TRANSCEIVER	SA
1209-001712	U202	IC-SENSOR	SA
1405-001082	VR112	VARISTOR	SA
1405-001082	VR118	VARISTOR	SA
1405-001082	VR119	VARISTOR	SA
1405-001082	VR203	VARISTOR	SA
1405-001082	VR204	VARISTOR	SA
1405-001082	VR205	VARISTOR	SA
1405-001082	VR206	VARISTOR	SA
1405-001082	VR208	VARISTOR	SA
1405-001082	VR209	VARISTOR	SA
1405-001082	VR210	VARISTOR	SA

SEC CODE	Design LOC	Discription	STATUS
1405-001082	VR212	VARISTOR	SA
1405-001082	ZD216	VARISTOR	SA
1405-001082	ZD217	VARISTOR	SA
1405-001082	ZD218	VARISTOR	SA
2007-000139	R119	R-CHIP	SA
2007-000148	R121	R-CHIP	SA
2007-000148	R124	R-CHIP	SA
2007-000148	R148	R-CHIP	SA
2007-000148	R149	R-CHIP	SA
2007-000157	R144	R-CHIP	SA
2007-000157	R206	R-CHIP	SA
2007-000160	R142	R-CHIP	SA
2007-000161	R125	R-CHIP	SA
2007-000161	R127	R-CHIP	SA
2007-000162	R126	R-CHIP	SA
2007-000162	R128	R-CHIP	SA
2007-000162	R129	R-CHIP	SA
2007-000162	R151	R-CHIP	SA
2007-000162	R205	R-CHIP	SA
2007-000162	R208	R-CHIP	SA
2007-000162	R210	R-CHIP	SA
2007-000162	R211	R-CHIP	SA
2007-000163	R150	R-CHIP	SA
2007-000163	R152	R-CHIP	SA
2007-000164	R134	R-CHIP	SA
2007-000170	R209	R-CHIP	SA
2007-000170	R309	R-CHIP	SA
2007-000170	R311	R-CHIP	SA
2007-000171	C303	R-CHIP	SA
2007-000171	R135	R-CHIP	SA
2007-000171	R137	R-CHIP	SA
2007-000171	R153	R-CHIP	SA
2007-000171	R155	R-CHIP	SA
2007-000171	R308	R-CHIP	SA
2007-000171	R320	R-CHIP	SA
2007-000171	R321	R-CHIP	SA
2007-000171	R322	R-CHIP	SA

SEC CODE	Design LOC	Discription	STATUS
2007-000172	R122	R-CHIP	SA
2007-000172	R200	R-CHIP	SA
2007-000172	R204	R-CHIP	SA
2007-000172	R312	R-CHIP	SA
2007-000172	R313	R-CHIP	SA
2007-000172	R314	R-CHIP	SA
2007-000172	R315	R-CHIP	SA
2007-000172	R316	R-CHIP	SA
2007-000172	R317	R-CHIP	SA
2007-000172	R318	R-CHIP	SA
2007-000172	R319	R-CHIP	SA
2007-000242	R120	R-CHIP	SA
2007-000242	R133	R-CHIP	SA
2007-000242	R147	R-CHIP	SA
2007-000242	R154	R-CHIP	SA
2007-000566	R105	R-CHIP	SA
2007-000566	R215	R-CHIP	SA
2007-000566	R216	R-CHIP	SA
2007-000775	R138	R-CHIP	SA
2007-000775	R139	R-CHIP	SA
2007-000775	R145	R-CHIP	SA
2007-001244	R123	R-CHIP	SA
2007-001284	R100	R-CHIP	SA
2007-001284	R202	R-CHIP	SA
2007-001307	R310	R-CHIP	SA
2007-001308	R307	R-CHIP	SA
2007-001323	R136	R-CHIP	SA
2007-001325	R146	R-CHIP	SA
2007-001339	R130	R-CHIP	SA
2007-002797	R306	R-CHIP	SA
2007-002965	R131	R-CHIP	SA
2007-002965	R132	R-CHIP	SA
2007-002965	R140	R-CHIP	SA
2007-002965	R141	R-CHIP	SA
2007-002965	R304	R-CHIP	SA
2007-007741	R301	R-CHIP	SA
2007-008137	R157	R-CHIP	SA

SEC CODE	Design LOC	Discription	STATUS
2007-008403	R207	R-CHIP	SA
2007-008403	R212	R-CHIP	SA
2007-008419	R107	R-CHIP	SA
2007-008419	R108	R-CHIP	SA
2007-008419	R115	R-CHIP	SA
2007-008516	R303	R-CHIP	SA
2007-008542	R214	R-CHIP	SA
2007-008579	R143	R-CHIP	SA
2007-009160	R156	R-CHIP	SA
2203-000233	C101	C-CER,CHIP	SA
2203-000233	C218	C-CER,CHIP	SA
2203-000254	C100	C-CER,CHIP	SA
2203-000254	C136	C-CER,CHIP	SA
2203-000254	C202	C-CER,CHIP	SA
2203-000254	C205	C-CER,CHIP	SA
2203-000254	C208	C-CER,CHIP	SA
2203-000254	C209	C-CER,CHIP	SA
2203-000254	C210	C-CER,CHIP	SA
2203-000254	C212	C-CER,CHIP	SA
2203-000254	C214	C-CER,CHIP	SA
2203-000359	C145	C-CER,CHIP	SA
2203-000359	C146	C-CER,CHIP	SA
2203-000386	C341	C-CER,CHIP	SA
2203-000438	C141	C-CER,CHIP	SA
2203-000438	C346	C-CER,CHIP	SA
2203-000466	C318	C-CER,CHIP	SA
2203-000627	C219	C-CER,CHIP	SNA
2203-000627	C220	C-CER,CHIP	SNA
2203-000627	C351	C-CER,CHIP	SNA
2203-000654	C134	C-CER,CHIP	SA
2203-000679	C204	C-CER,CHIP	SA
2203-000812	C105	C-CER,CHIP	SA
2203-000812	C106	C-CER,CHIP	SA
2203-000812	C347	C-CER,CHIP	SA
2203-000940	C103	C-CER,CHIP	SA
2203-000995	C107	C-CER,CHIP	SA
2203-000995	C128	C-CER,CHIP	SA

SEC CODE	Design LOC	Discription	STATUS
2203-000995	C131	C-CER,CHIP	SA
2203-001405	C135	C-CER,CHIP	SA
2203-001412	C344	C-CER,CHIP	SA
2203-002487	C147	C-CER,CHIP	SA
2203-002487	C148	C-CER,CHIP	SA
2203-002709	C332	C-CER,CHIP	SA
2203-005344	C120	C-CER,CHIP	SA
2203-005344	C129	C-CER,CHIP	SA
2203-005344	C207	C-CER,CHIP	SA
2203-005482	C338	C-CER,CHIP	SA
2203-005482	C348	C-CER,CHIP	SA
2203-005682	C322	C-CER,CHIP	SA
2203-005682	C327	C-CER,CHIP	SA
2203-005682	C329	C-CER,CHIP	SA
2203-005682	C330	C-CER,CHIP	SA
2203-005682	C343	C-CER,CHIP	SA
2203-005682	C345	C-CER,CHIP	SA
2203-005682	C349	C-CER,CHIP	SA
2203-005682	C350	C-CER,CHIP	SA
2203-005682	U402	C-CER,CHIP	SA
2203-005682	U403	C-CER,CHIP	SA
2203-005682	U404	C-CER,CHIP	SA
2203-005682	U405	C-CER,CHIP	SA
2203-005682	U406	C-CER,CHIP	SA
2203-005682	U407	C-CER,CHIP	SA
2203-005682	U408	C-CER,CHIP	SA
2203-005683	C310	C-CER,CHIP	SA
2203-005683	C312	C-CER,CHIP	SA
2203-005719	C300	C-CER,CHIP	SA
2203-005719	C306	C-CER,CHIP	SA
2203-005719	C308	C-CER,CHIP	SA
2203-005719	C319	C-CER,CHIP	SA
2203-005719	U409	C-CER,CHIP	SA
2203-005736	C311	C-CER,CHIP	SA
2203-005736	C317	C-CER,CHIP	SA
2203-005736	C328	C-CER,CHIP	SA
2203-005777	C359	C-CER,CHIP	SA

SEC CODE	Design LOC	Discription	STATUS
2203-005819	C123	C-CER,CHIP	SA
2203-005819	C125	C-CER,CHIP	SA
2203-005819	C352	C-CER,CHIP	SA
2203-005819	C353	C-CER,CHIP	SA
2203-005819	C354	C-CER,CHIP	SA
2203-005819	C355	C-CER,CHIP	SA
2203-006048	C102	C-CER,CHIP	SA
2203-006048	C111	C-CER,CHIP	SA
2203-006048	C118	C-CER,CHIP	SA
2203-006048	C121	C-CER,CHIP	SA
2203-006048	C122	C-CER,CHIP	SA
2203-006048	C124	C-CER,CHIP	SA
2203-006048	C132	C-CER,CHIP	SA
2203-006048	C138	C-CER,CHIP	SA
2203-006048	C140	C-CER,CHIP	SA
2203-006048	C143	C-CER,CHIP	SA
2203-006048	C144	C-CER,CHIP	SA
2203-006048	C200	C-CER,CHIP	SA
2203-006048	C201	C-CER,CHIP	SA
2203-006048	C203	C-CER,CHIP	SA
2203-006048	C206	C-CER,CHIP	SA
2203-006048	C211	C-CER,CHIP	SA
2203-006048	C213	C-CER,CHIP	SA
2203-006048	C215	C-CER,CHIP	SA
2203-006048	C216	C-CER,CHIP	SA
2203-006048	C217	C-CER,CHIP	SA
2203-006194	C307	C-CER,CHIP	SA
2203-006194	C309	C-CER,CHIP	SA
2203-006194	C313	C-CER,CHIP	SA
2203-006257	C104	C-CER,CHIP	SA
2203-006257	C109	C-CER,CHIP	SA
2203-006260	C323	C-CER,CHIP	SA
2203-006318	C305	C-CER,CHIP	SA
2203-006324	C108	C-CER,CHIP	SA
2203-006324	C137	C-CER,CHIP	SA
2203-006348	C112	C-CER,CHIP	SA
2203-006348	C113	C-CER,CHIP	SA

SEC CODE	Design LOC	Discription	STATUS
2203-006348	C115	C-CER,CHIP	SA
2203-006348	C116	C-CER,CHIP	SA
2203-006348	C117	C-CER,CHIP	SA
2203-006348	C149	C-CER,CHIP	SA
2203-006361	C142	C-CER,CHIP	SA
2203-006423	C126	C-CER,CHIP	SA
2203-006423	C301	C-CER,CHIP	SA
2203-006423	C315	C-CER,CHIP	SA
2203-006423	C320	C-CER,CHIP	SA
2203-006423	C325	C-CER,CHIP	SA
2203-006423	C326	C-CER,CHIP	SA
2203-006462	C324	C-CER,CHIP	SA
2203-006556	C302	C-CER,CHIP	SA
2203-006556	C321	C-CER,CHIP	SA
2203-006562	C127	C-CER,CHIP	SA
2203-006562	C130	C-CER,CHIP	SA
2203-006626	C314	C-CER,CHIP	SA
2203-006681	C114	C-CER,CHIP	SA
2203-006681	C151	C-CER,CHIP	SA
2203-006824	C133	C-CER,CHIP	SA
2203-006824	C150	C-CER,CHIP	SA
2404-001105	C152	C-TA,CHIP	SA
2404-001105	C153	C-TA,CHIP	SA
2404-001336	C119	C-TA,CHIP	SA
2404-001336	C139	C-TA,CHIP	SA
2404-001374	C316	C-TA,CHIP	SA
2404-001406	C110	C-TA,CHIP	SA
2404-001430	C331	C-TA,CHIP	SA
2703-001236	L309	INDUCTOR-SMD	SA
2703-001747	R305	INDUCTOR-SMD	SA
2703-001750	R300	INDUCTOR-SMD	SA
2703-002200	L306	INDUCTOR-SMD	SA
2703-002200	R101	INDUCTOR-SMD	SA
2703-002200	R102	INDUCTOR-SMD	SA
2703-002313	L303	INDUCTOR-SMD	SA
2703-002484	L304	INDUCTOR-SMD	SA
2703-002558	L305	INDUCTOR-SMD	SA

SEC CODE	Design LOC	Discription	STATUS
2703-002917	L300	INDUCTOR-SMD	SA
2703-002917	L301	INDUCTOR-SMD	SA
2801-004353	OSC201	CRYSTAL-SMD	SA
2801-004587	OSC400	CRYSTAL-SMD	SA
2904-001592	F401	FILTER-SAW	SA
2904-001599	F400	FILTER-SAW	SA
3301-001534	L308	BEAD-SMD	SA
3705-001358	RFS400	CONNECTOR-COAXIAL	SA
3709-001336	SIM103	CONNECTOR-CARD EDGE	SA
3711-006084	BTC104	HEADER-BATTERY	SA
3722-001876	DCJ101	JACK-DC POWER	SA
3722-002249	EAR102	JACK-EAR PHONE	SA
GH09-00039A	UCP201	IC MICOM	SA
GH71-07161A	SH300	NPR-BRACKET FRAME	SA

8. Reference data

8-1. 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

9. Safety Precautions

9-1. Repair Precaution

- Repair in Shield Box, during detailed tuning.
Take specially care of tuning or test,
because specipcty 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.

9-2. 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.

10. Product Function

Main Function

- Network services
- SMS & SOS message
- Voicemail
- Web browser
- Calendar, Calculator, Speed dial, etc...
- SDN(Service Dialling Numbers)

**SAMSUNG
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