

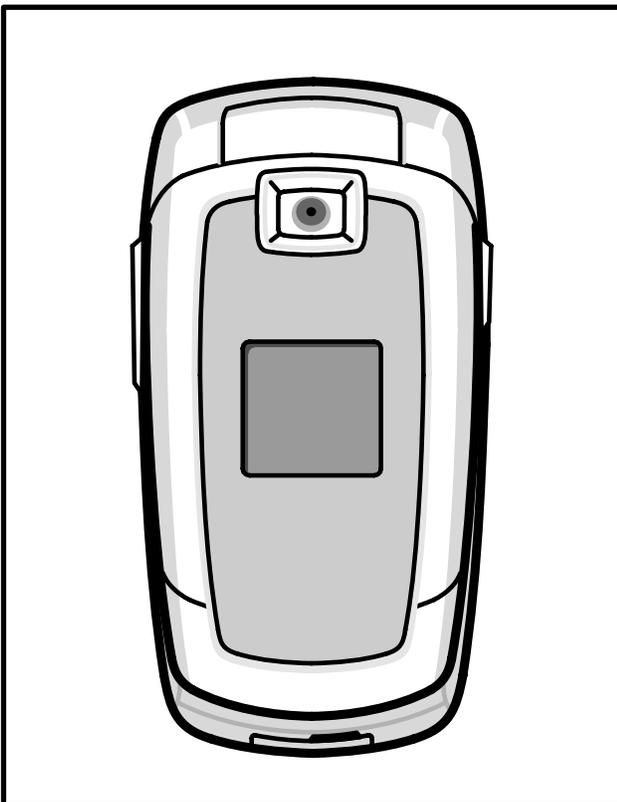
SAMSUNG

GSM TELEPHONE

SGH-X680

SERVICE *Manual*

GSM TELEPHONE



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11. 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	0.3 GMSK	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

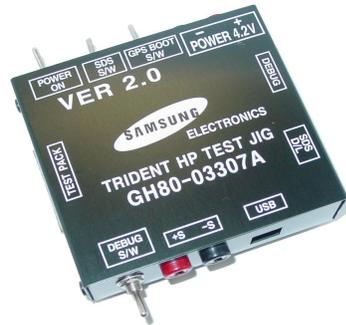
TX Power control level	GSM900	TX Power control level	DCS1800	TX Power control level	PCS1900
5	33±2 dBm	0	30±3 dBm	0	30±3 dBm
6	31±2 dBm	1	28±3 dBm	1	28±3 dBm
7	29±2 dBm	2	26±3 dBm	2	26±3 dBm
8	27±2 dBm	3	24±3 dBm	3	24±3 dBm
9	25±2 dBm	4	22±3 dBm	4	22±3 dBm
10	23±2 dBm	5	20±3 dBm	5	20±3 dBm
11	21±2 dBm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

- Camera and camcorder
- Music player
- Bluetooth
- Web browser
- Get personal with photo caller ID
- Name card
- Multimedia Message Service (MMS)
- Java
- Calendar
- Voice recorder
- Alarm

4. Array course control



Test Jig (GH80-03307A)



Test Cable (GH39-00369A)



RF Test Cable (GH39-00397A)

Software Downloading

4-1. Downloading Binary Files

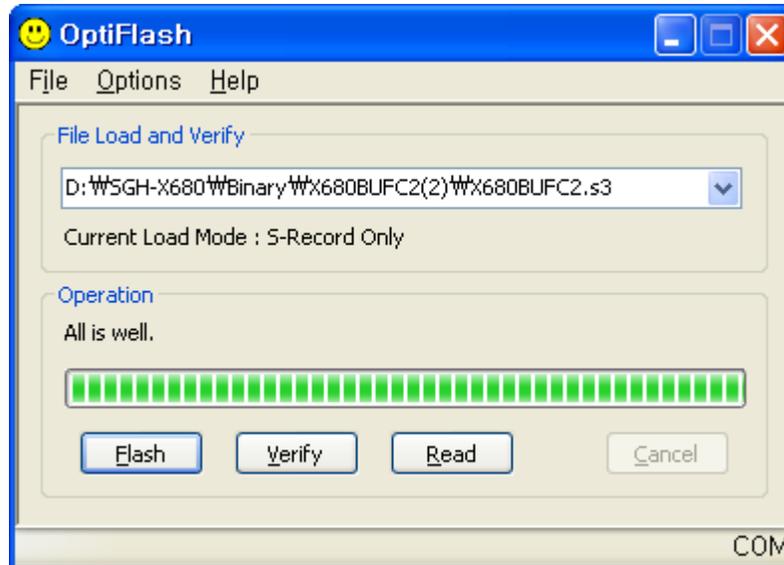
- Three binary files for downloading X680.
 - X680XXXXX.s3 : Main source code binary.

4-2. Pre-requisite for Downloading

- Downloader Program([OptiFlash.exe](#))
- X680 Mobile Phone
- Data Cable
- Binary files

4-3. S/W Downloader Program

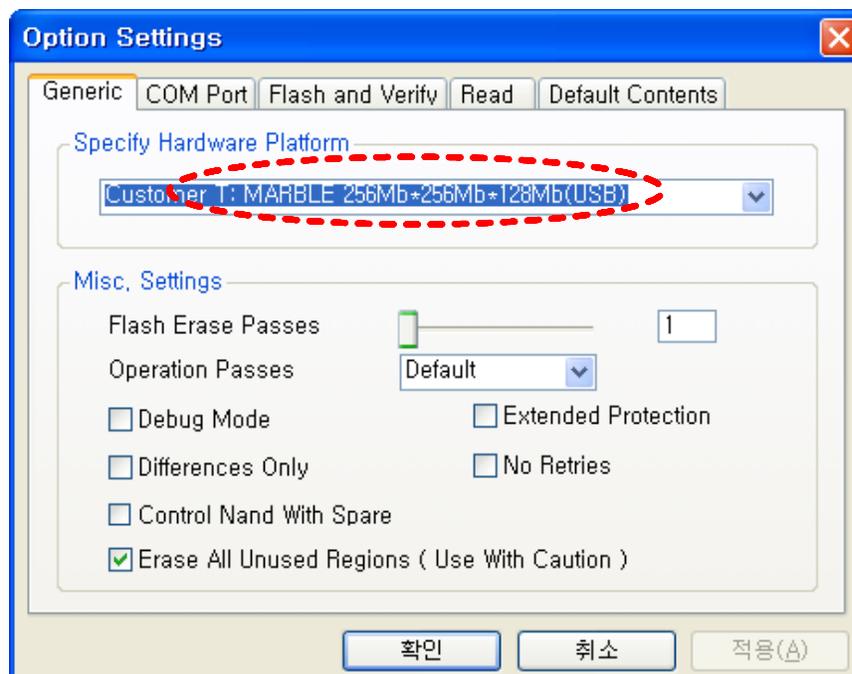
1. Load the binary download program by executing the "OptiFlash.exe"



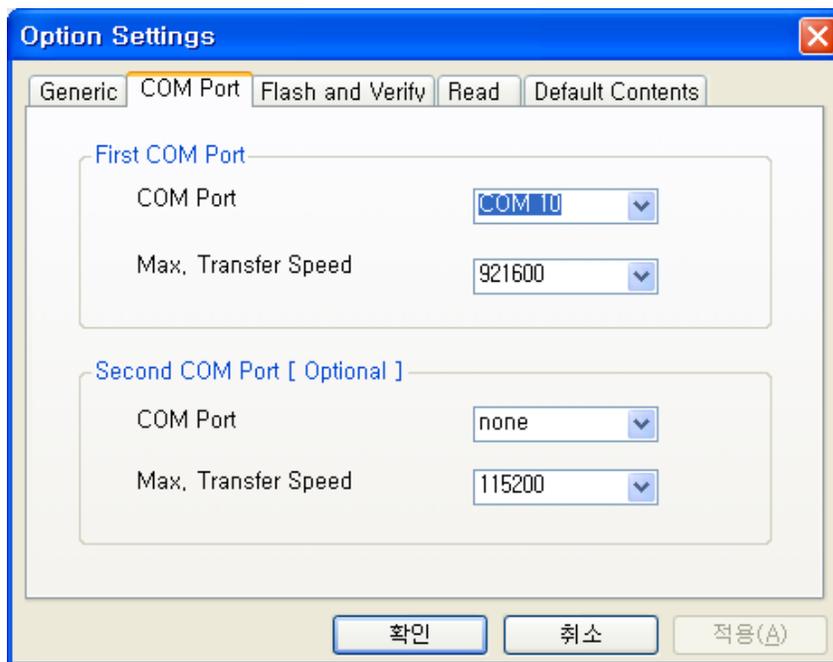
2. Select the "Options" -> "Settings" -> "Generic" -> "Specify hardware platform".

Choose hardware platform for the downloader file setting.

Set the everything else as the default values which are shown below



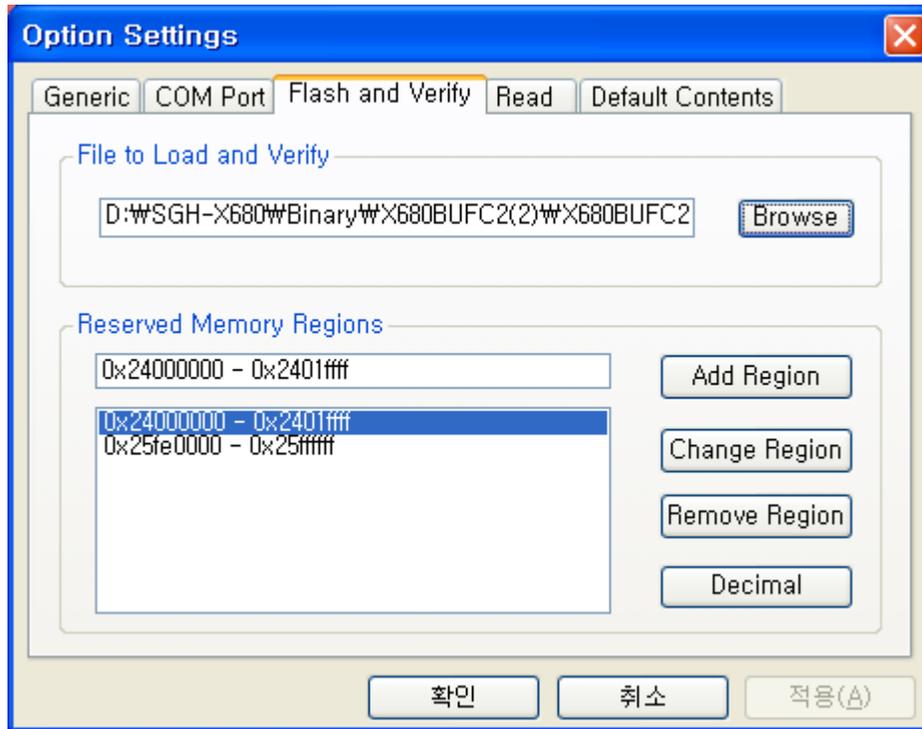
3. Select the **COM port** when the download cable is connected



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 "X680XXXX.s3", for the downloader binary setting.



Make sure that not to change the reserved memory regions.

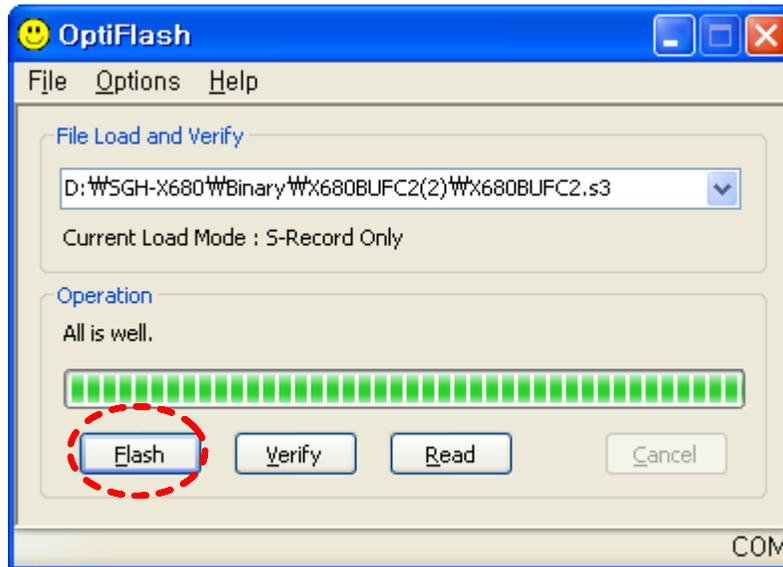
In case of X680 the reserved regions are :

-0x24000000 - 0x2401ffff

-0x25fe0000- 0x25ffffff

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. : 

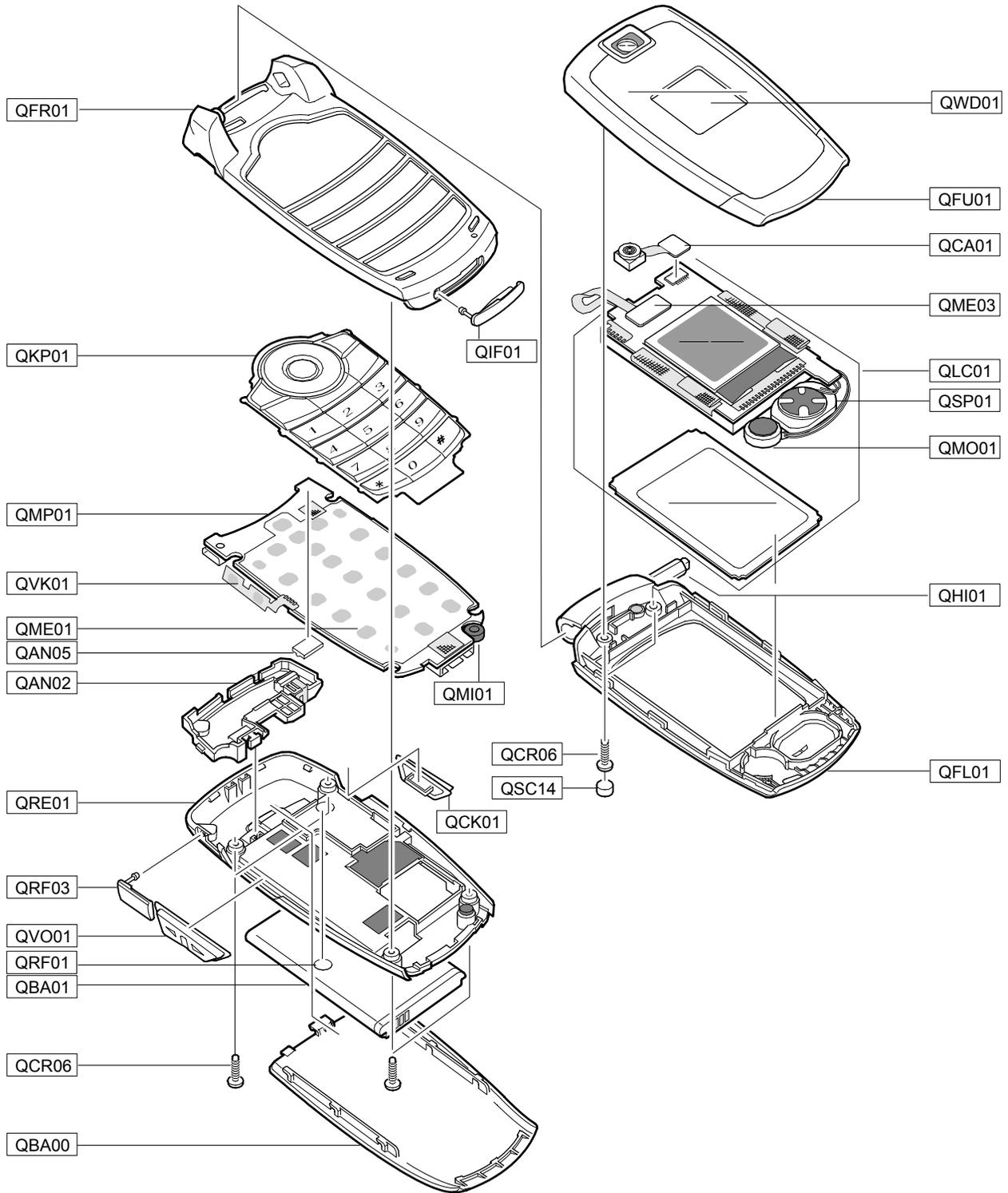
***#5002*8376263#** 

Full Reset : 

***2767*3855#**

5. Exploded View and Parts List

5-1. Cellular phone Exploded View



5-2. Cellular phone Parts list

Desgn LOC		Discription	SEC CODE
QAN02		INTENNA-SGHX680	GH42-00821A
QAN05		MEC-INTENNA CONTACT	GH75-08168A
QBA00		ASSY-COVER-BATTERY	GH98-00947A
QBA01		INNER BATTERY PACK-800MAH,BLK,	GH43-01850A
QCA01		UNIT-CAMERA	GH59-03068A
QCK01		PMO-CAM KEY	GH72-30786A
QCR06		SCREW-MACHINE	6001-001155
QKP01		ASSY-KEY-KEYPAD(SAA/XEF)	GH98-00948A
QLC01		MEA-LCD MODULE KIT	GH97-06016A
QME01		UNIT-METAL DOME	GH59-03140A
QME03		UNIT-CON TO CON	GH59-03139A
QMI01		MICROPHONE-ASSY-5.25MM	GH30-00177C
QMO01		MOTOR DC-SGHX680	GH31-00244A
QMP01		PBA MAIN-SGHX680	GH92-02702A
QRF01		MPR-COVER RF JACK SHEET	GH74-24164A
QSC14		RMO-CUSHION F/L SCREW CAP	GH73-07048A
QSP01		SPEAKER	3001-001955
QVK01		UNIT-VOLUME KEY	GH59-03141A
QVO01		PMO-VOL KEY	GH72-30785A
QRE01		ASSY-CASE-REAR SUB	GH98-00946A
	QRF03	PMO-COVER EARJACK	GH72-30784A
QFR01		ASSY-CASE-FRONT SUB	GH98-00943A
	QIF01	PMO-COVER IF	GH72-30750A
QFL01		ASSY ACCE-LOWER SUB	GH98-00944A
	QHI01	MEC-HINGE(CAN TYPE)	GH75-04662A
QFU01		ASSY-CASE-UPPER SUB	GH98-00945A
	QWD01	ASSY-COVER-DUAL WINDOW	GH98-01246A

Discription	SEC CODE
BAG PE	6902-000297
ADAPTOR-SGHN288 TAD	GH44-00184A
LABEL(P)-WATER SOAK	GH68-02026A
LABEL(P)-WATER SOAK	GH68-02026A
LABEL(R)-MAIN(EU)	GH68-10705A
MANUAL USERS-EU PORTUGUESE	GH68-10770A
MANUAL USERS-EU ENGLISH	GH68-10924A
BOX(P)-UNIT MAIN(EU)	GH69-03894A
CUSHION-CASE TA2 MA2	GH69-03895A
NPR-COVER LCD CON	GH71-06463A
RMO-RUBBER COVER FOLDER	GH73-07420A
MPR-BOHO VINYL LCD CONN	GH74-15350A
MPR-VINYL BOHO F/L A	GH74-23061A
MPR-VINYL BOHO F/U A	GH74-23062A
MPR-CUSHION CON COVER	GH74-23065A
MPR-TAPE HALL IC	GH74-23689A
MPR-TAPE VOL KEY FPCB	GH74-23690A
MPR-TAPE GASKET PCB	GH74-23691A
MPR-TAPE GASKET LCD A	GH74-23692A
MPR-CUSHION FORM GASKET LCD	GH74-23693A
MPR-TAPE DUST PREVENTION	GH74-23742A
MPR-CUSHION IF GASKET	GH74-24166A
MPR-SPONGE REAR GASKET	GH74-24196A
MPR-SPONGE REAR KEY	GH74-24543A
MPR-VINYL BOHO DUAL WINDOW TOP	GH74-24927A

6. Disassembly and Assembly instructions

6-1. Disassembly

1



1. Take to pieces screws of main rear (4 points)
2. Open IF COVER
3. Open EAR COVER

*** caution**

1. Do not scratch or damage at main rear.

2

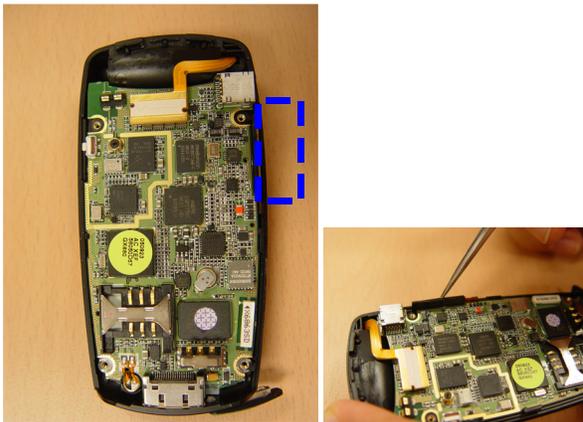


1. Disjoint the hooker at left and right portion of main rear, separating main rear referring figure.

*** caution**

1. Do not scratch or damage at main rear.

3



1. Separate LCD Connector.
2. Separate volume key FPCB from main front by tweezers.
3. Separate PBA from main front ass'y.
4. Separate keypad from main front ass'y

*** caution**

1. Do not damage at LCD connector and vloume key FPCB when separating.

4



1. Remove the front tape.
2. Push the hinge using a disassembly tool, separating main front from LCD Ass'y

*** caution**

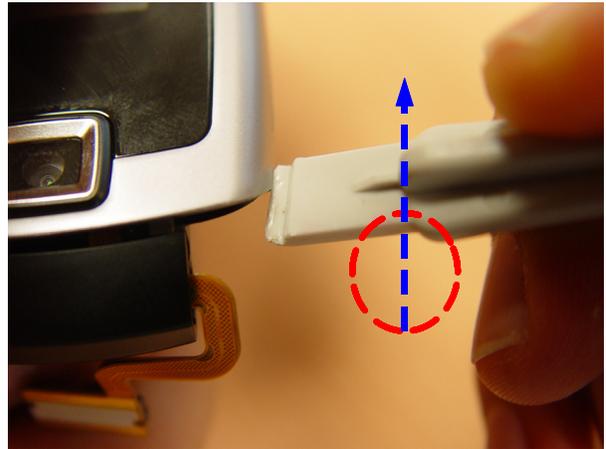
1. Do not scratch or damage at main front.
2. Handle with care LCD connector FPCB when separating.

5



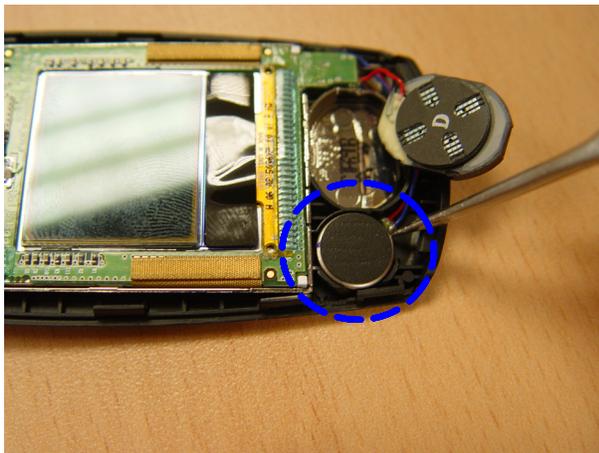
1. Remove the screw cap by tweezers.
 2. Take to pieces screws(2 Points)
- * caution**
1. Do not scratch or damage at LCD ass'y.
 2. Handle with care LCD connector FPCB.

6



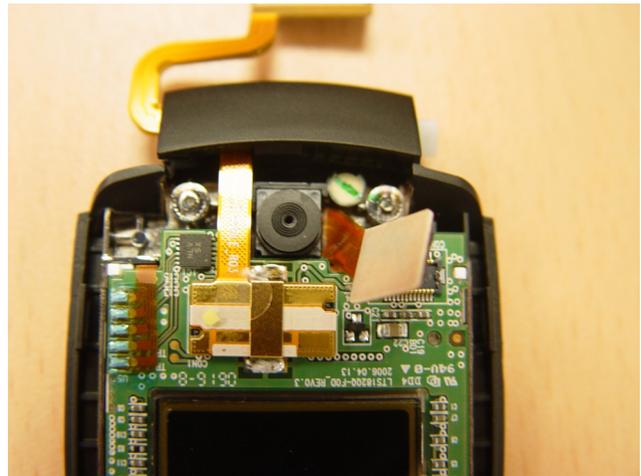
1. Separate folder upper from folder lower using a disassembly tool.
(Disjoint the hooker at left and right portion of LCD ass'y)
- * caution**
1. Do not scratch or damage at LCD ass'y.

7



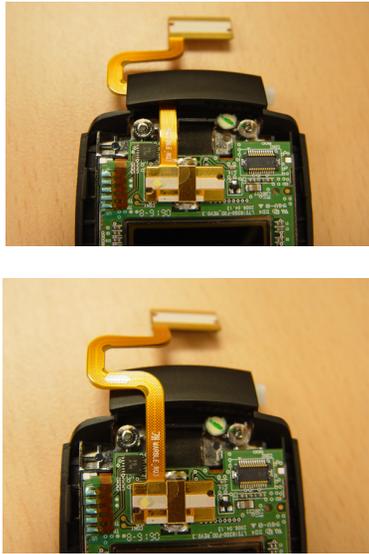
1. Separate the speaker firstly
 2. Separate the vibration motor by tweezers
- * caution**
1. Do not damage at speaker and motor wires.
 2. Handle with care speaker and motor.

8



1. Disjoint the camera connector and separate camera module from LCD lower.
- * caution**
1. Do not damage at camera FPCB.

9



1. Separate LCD connector FPCB from LCD lower.

*** caution**

1. Do not damage at LCD Connector and FPCB.

10



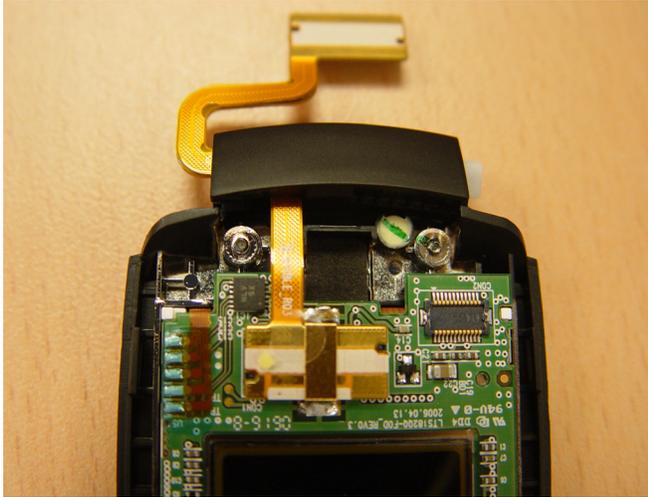
1. 1. Separate the LCD ass'y from LCD lower.

*** caution**

1. Handle with care LCD Module because attached LCD module on LCD lower by two-faced attaching tape.

6-2. Assembly

1

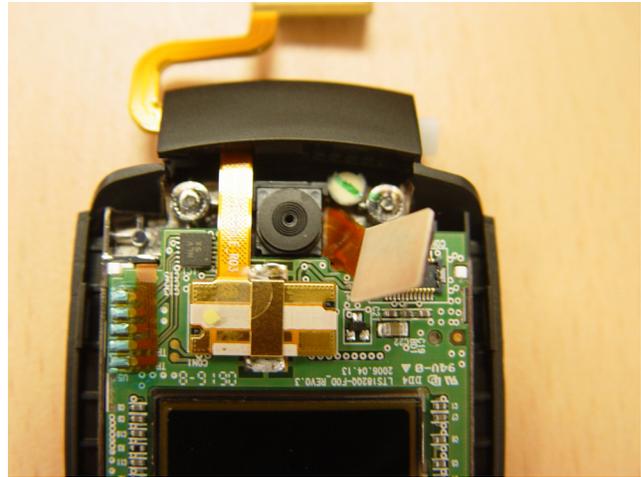


1. Assemble LCD module at LCD lower.
2. Insert LCD connector FPCB to hinge of LCD lower.

*** caution**

1. Do not damage at LCD connector FPCB when inserting

2

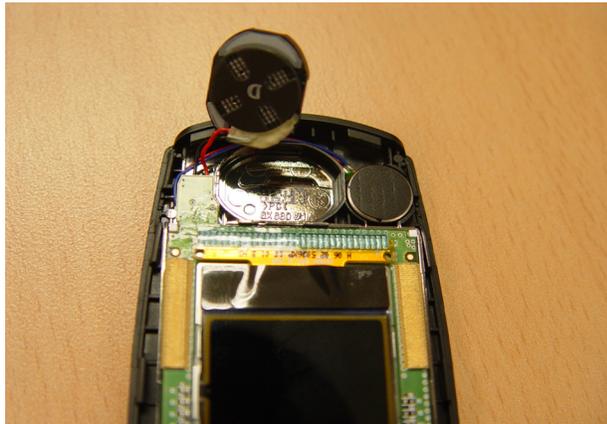


1. Assemble camera module at LCD lower.
2. Exactly insert the camera connector.

*** caution**

1. Do not damage at camera FPCB when inserting camera module in LCD Lower.

3



1. Assemble the vibration motor.
2. Assemble the speaker.

*** caution**

1. Arrange the motor wire after assembling the speaker.
2. First assemble the motor wire, next the speaker wire.

4



1. Assemble LCD upper and LCD lower. When Assembling, first you must assemble black deco part of LCD upper

*** caution**

1. Do not scratch or damage at LCD ass'y.

<p>5</p> 	<p>6</p> 
<p>1. Screw the LCD lower. 2. Insert to the screw cap. * caution 1. When screwing, Set a gauge of screwdriver 1.2 ± 0.2 Kgf.cm</p>	<p>1. Insert LCD Connector to main front and assemble LCD ass'y pushing the hinge. 2. Attach the front tape. * caution 1. Do not damage at LCD connector.</p>
<p>7</p> 	<p>8</p> 
<p>1. settle keypad on the front ass'y. * caution 1. Exactly settle keypad on the front ass'y at fixed hole.</p>	<p>1. Settle PBA on the front ass'y. 2. Attach the volume key. 3. Insert LCD connector to PBA exactly. * caution 1. When settling PBA, Do not bend or crack at hooker.</p>

9



1. Insert camera and volume key
2. Assemble rear case from part below

※ **caution**

1. Do not scratch or damage at main front and rear.

10



1. after hooking below, cover the rear case.
2. As figure 2, assemble rear case pushing the upper part.

※ **caution**

1. Do not damage at LCD connector.

11



1. screw the main rear.(4 points)

※ **caution**

1. Do not scratch and damage at main rear.

12

7. MAIN Electrical Parts List

SEC CODE	Design LOC	Discription	STATUS
4202-001154	ANT200	ANTENNA-CHIP	SA
GH71-06338A	ANT701	NPR-BRACKET ANT CONTACT	SA
GH71-06338A	ANT702	NPR-BRACKET ANT CONTACT	SA
4302-001158	BAT101	BATTERY-LI(2ND)	SA
3711-006228	BTC600	HEADER-BATTERY	SA
2203-000254	C100	C-CER,CHIP	SA
2203-000254	C101	C-CER,CHIP	SA
2203-005061	C102	C-CER,CHIP	SA
2203-006377	C103	C-CER,CHIP	SA
2203-006681	C104	C-CER,CHIP	SA
2203-005061	C106	C-CER,CHIP	SA
2203-005061	C107	C-CER,CHIP	SA
2203-006108	C108	C-CER,CHIP	SA
2203-000278	C109	C-CER,CHIP	SA
2203-000812	C110	C-CER,CHIP	SA
2203-000278	C111	C-CER,CHIP	SA
2203-000233	C112	C-CER,CHIP	SA
2203-006348	C113	C-CER,CHIP	SA
2203-006348	C114	C-CER,CHIP	SA
2203-006348	C116	C-CER,CHIP	SA
2203-006348	C117	C-CER,CHIP	SA
2203-005061	C118	C-CER,CHIP	SA
2203-006348	C119	C-CER,CHIP	SA
2203-000254	C120	C-CER,CHIP	SA
2203-001405	C121	C-CER,CHIP	SA
2203-001405	C122	C-CER,CHIP	SA
2203-005061	C123	C-CER,CHIP	SA
2203-006825	C124	C-CER,CHIP	SA
2203-000233	C125	C-CER,CHIP	SA
2203-006348	C127	C-CER,CHIP	SA
2203-006260	C128	C-CER,CHIP	SA
2203-006825	C129	C-CER,CHIP	SA
2203-006048	C200	C-CER,CHIP	SA
2203-006048	C201	C-CER,CHIP	SA
2203-000254	C202	C-CER,CHIP	SA
2203-000254	C203	C-CER,CHIP	SA
2203-006048	C204	C-CER,CHIP	SA
2203-006048	C205	C-CER,CHIP	SA
2203-000254	C206	C-CER,CHIP	SA
2203-000254	C207	C-CER,CHIP	SA
2203-001405	C208	C-CER,CHIP	SA
2203-006562	C209	C-CER,CHIP	SA
2203-006562	C210	C-CER,CHIP	SA

Exploded View and Parts List

SEC CODE	Design LOC	Discription	STATUS
2203-005503	C211	C-CER,CHIP	SA
2203-006048	C212	C-CER,CHIP	SA
2203-006562	C213	C-CER,CHIP	SA
2203-006048	C214	C-CER,CHIP	SA
2203-006048	C215	C-CER,CHIP	SA
2007-000157	C216	R-CHIP	SA
2203-005061	C217	C-CER,CHIP	SA
2203-006348	C218	C-CER,CHIP	SA
2203-000330	C219	C-CER,CHIP	SA
2203-000330	C220	C-CER,CHIP	SA
2203-005061	C221	C-CER,CHIP	SA
2203-005061	C222	C-CER,CHIP	SA
2203-006260	C223	C-CER,CHIP	SA
2203-000438	C224	C-CER,CHIP	SA
2203-006825	C225	C-CER,CHIP	SA
2203-006562	C300	C-CER,CHIP	SA
2203-000254	C302	C-CER,CHIP	SA
2203-006048	C303	C-CER,CHIP	SA
2203-000254	C304	C-CER,CHIP	SA
2203-006048	C305	C-CER,CHIP	SA
2203-006048	C306	C-CER,CHIP	SA
2203-000254	C307	C-CER,CHIP	SA
2203-006048	C308	C-CER,CHIP	SA
2203-006048	C309	C-CER,CHIP	SA
2203-006048	C310	C-CER,CHIP	SA
2203-006562	C311	C-CER,CHIP	SA
2203-006048	C312	C-CER,CHIP	SA
2203-006048	C313	C-CER,CHIP	SA
2203-000386	C314	C-CER,CHIP	SA
2203-000386	C315	C-CER,CHIP	SA
2203-000812	C400	C-CER,CHIP	SA
2203-006562	C401	C-CER,CHIP	SA
2203-000812	C402	C-CER,CHIP	SA
2203-000254	C403	C-CER,CHIP	SA
2203-000254	C404	C-CER,CHIP	SA
2203-000812	C405	C-CER,CHIP	SA
2203-000812	C406	C-CER,CHIP	SA
2203-000812	C407	C-CER,CHIP	SA
2203-006348	C408	C-CER,CHIP	SA
2203-005061	C409	C-CER,CHIP	SA
2203-000812	C411	C-CER,CHIP	SA
2203-000628	C412	C-CER,CHIP	SA
2203-005061	C413	C-CER,CHIP	SA

SEC CODE	Design LOC	Discription	STATUS
2203-006824	C414	C-CER,CHIP	SA
2203-005061	C415	C-CER,CHIP	SA
2203-005061	C417	C-CER,CHIP	SA
2203-005061	C418	C-CER,CHIP	SA
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Exploded View and Parts List

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2703-002586	L704	INDUCTOR-SMD	SA
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2703-002700	L706	INDUCTOR-SMD	SA
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2703-002369	L709	INDUCTOR-SMD	SA
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Exploded View and Parts List

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Exploded View and Parts List

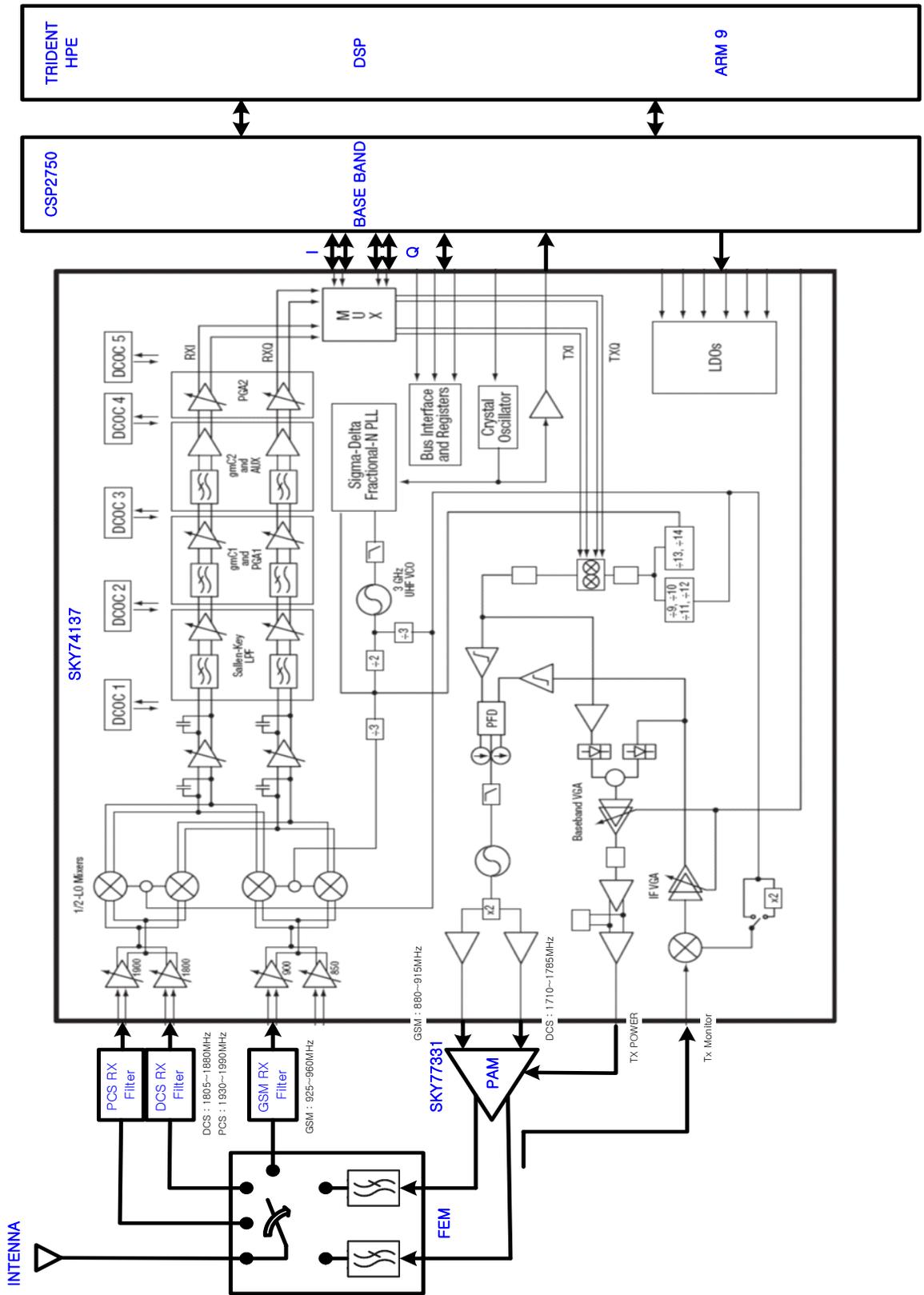
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3709-001451	SIM101	CONNECTOR-CARD EDGE	SA
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2404-001406	TA602	C-TA,CHIP	SA
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1404-001165	TH101	THERMISTOR-NTC	SA
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1203-003663	U106	IC-BATTERY	SA
0801-002529	U109	IC-CMOS LOGIC	SA
1205-002272	U202	IC-TRANSCEIVER	SA
4709-001374	U203	BLUETOOTH MODULE	SA
1009-001024	U204	IC-HALL EFFECT S/W	SA
1203-003432	U205	IC-POSI.FIXED REG.	SA
GH13-00036A	U302	IC ASIC-SGHX670	SA
1203-003585	U303	IC-POSI.FIXED REG.	SA
0801-002975	U304	IC-CMOS LOGIC	SA
1201-002240	U401	IC-AUDIO AMP	SA
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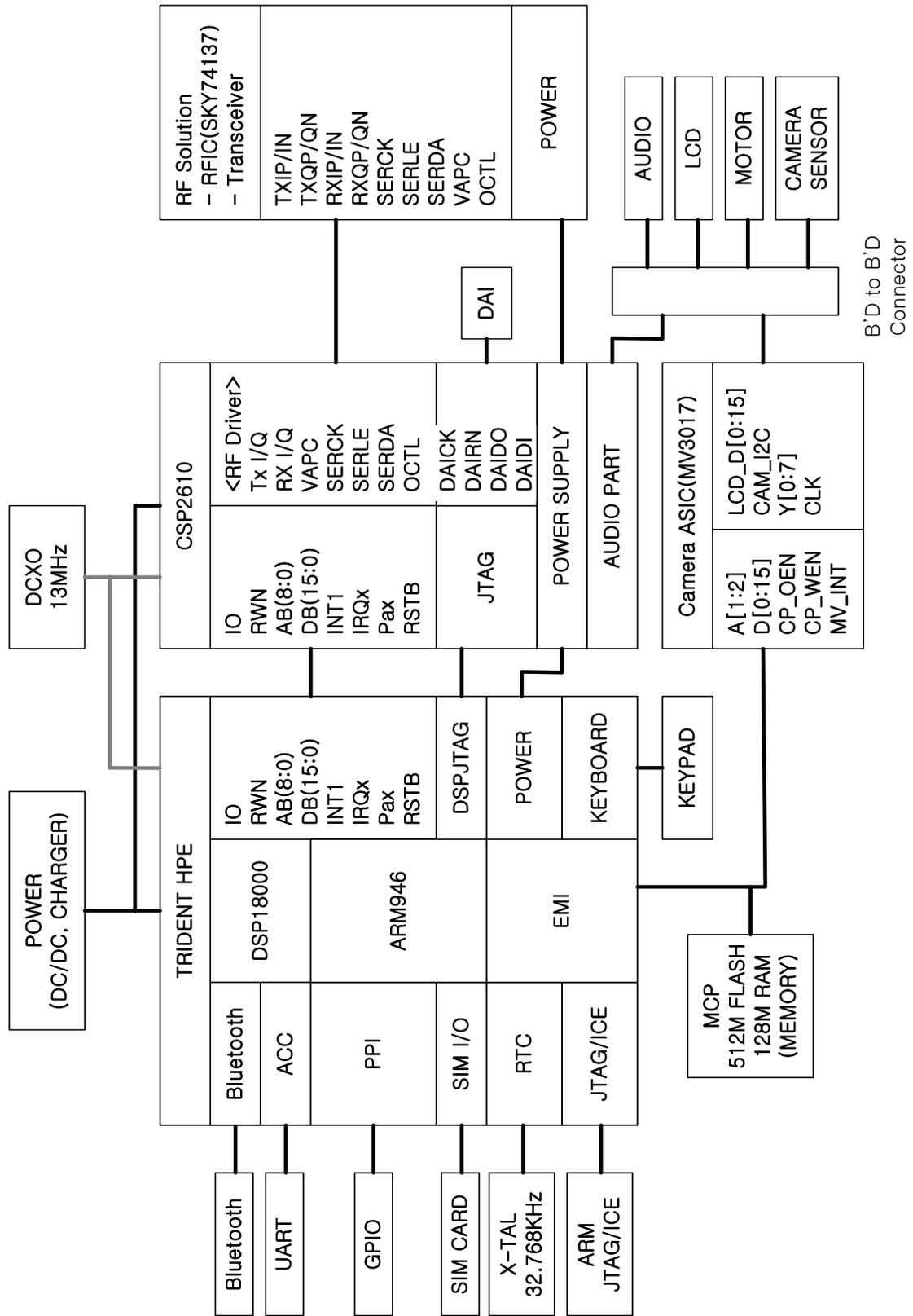
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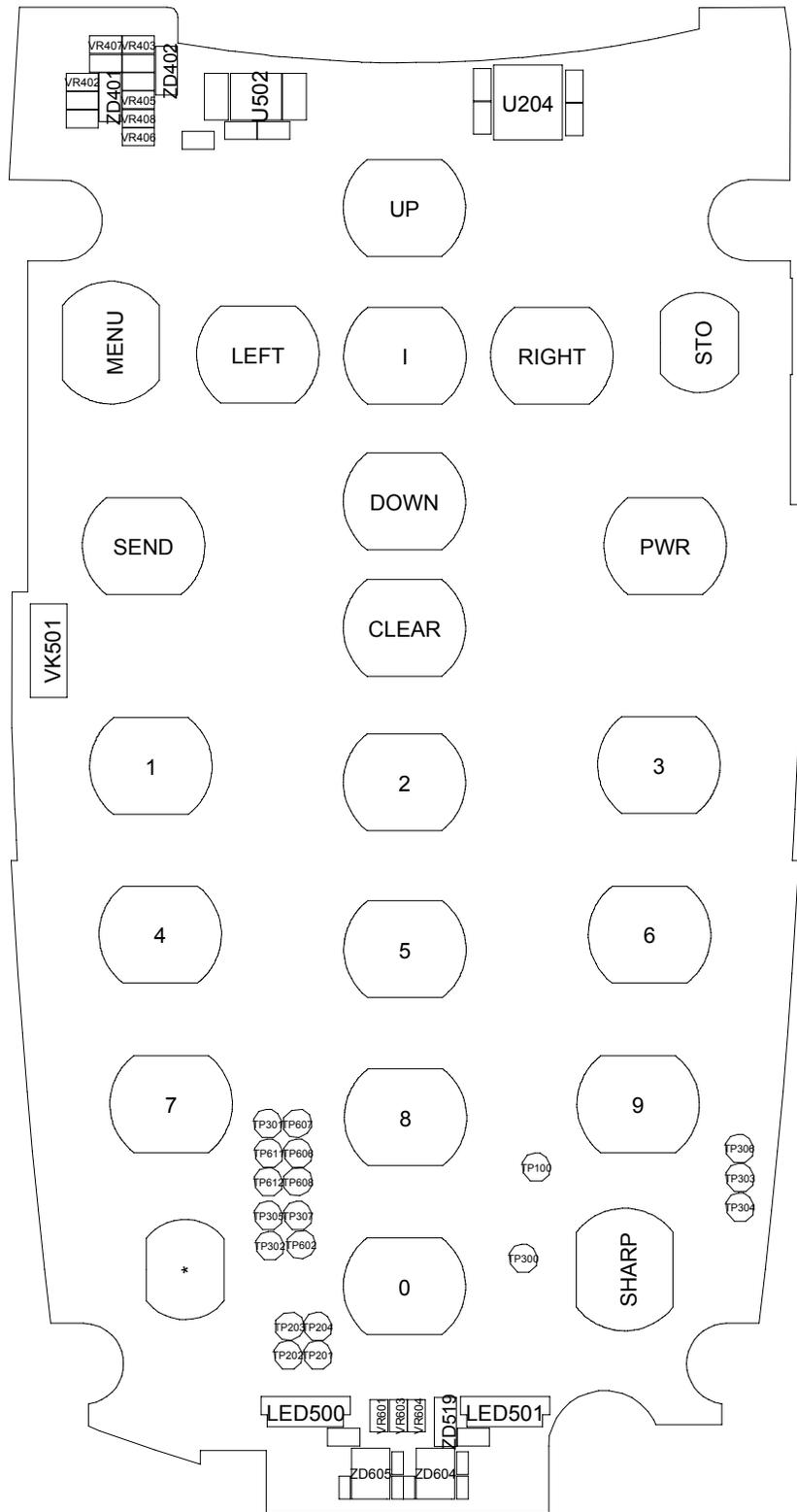
8. Block Diagrams

< SGH-X680 Block Diagram - RF Part >



< SGH-X680 Block Diagram - Base Band Part >

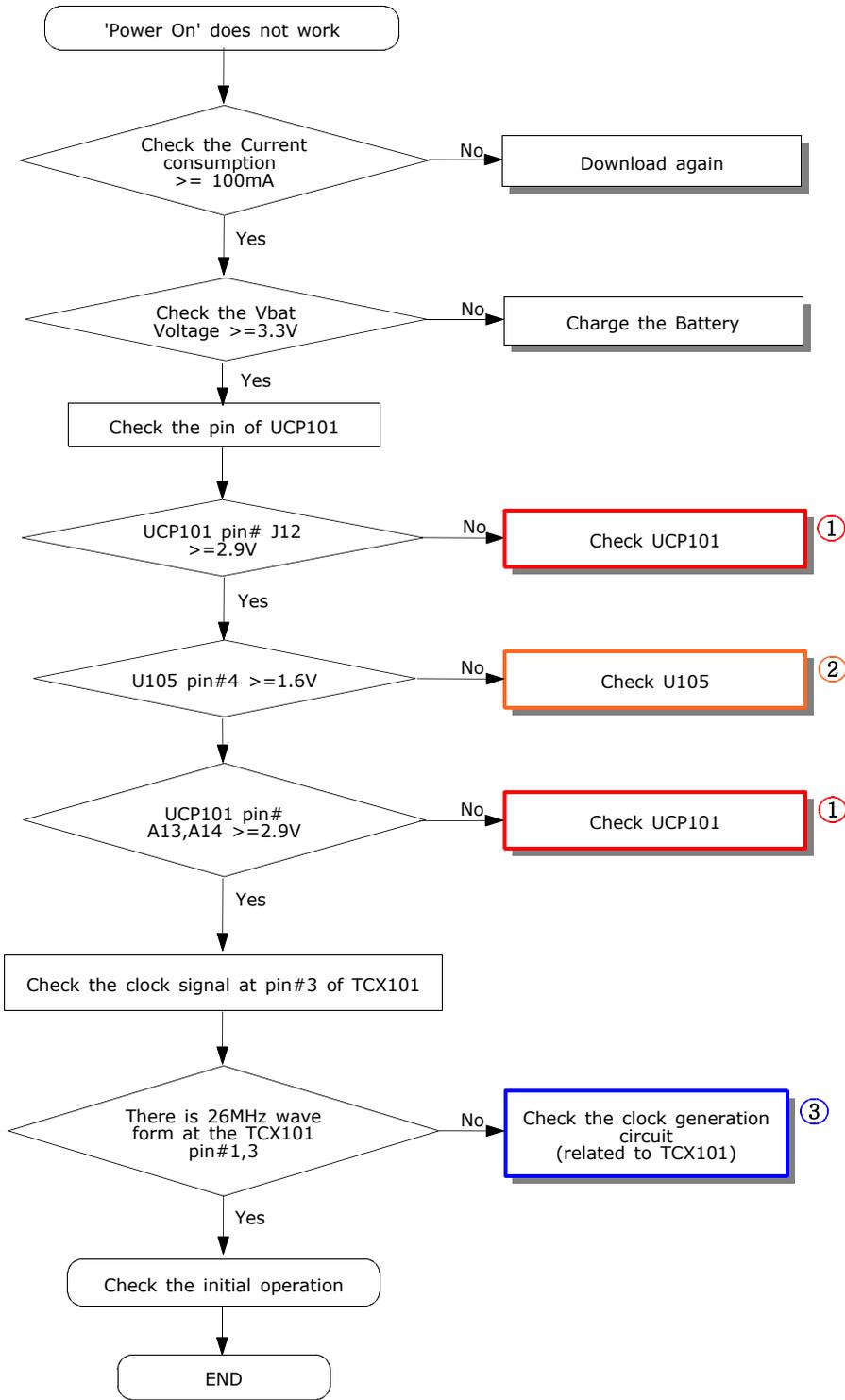




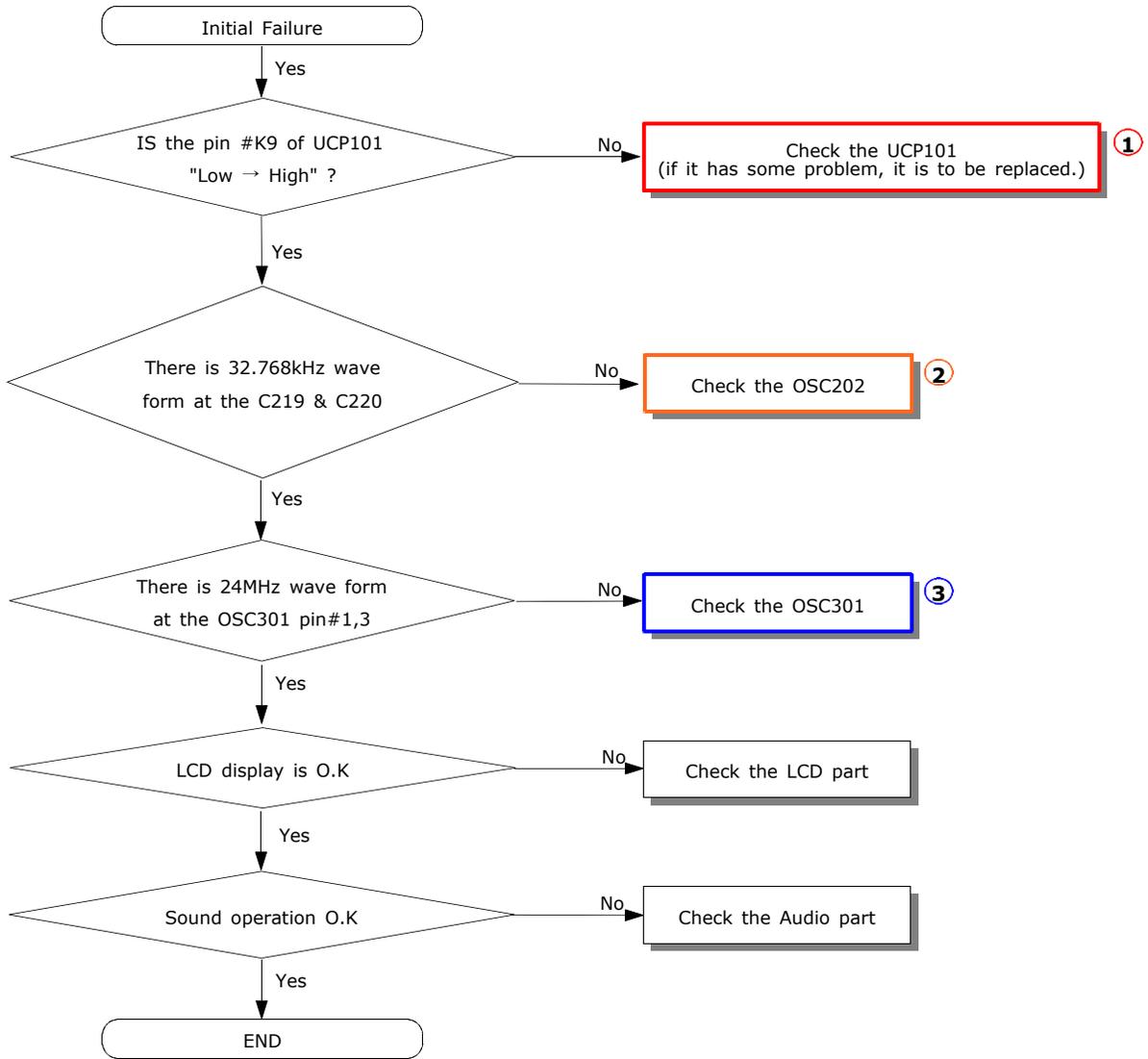
10. Flow Chart of Troubleshooting

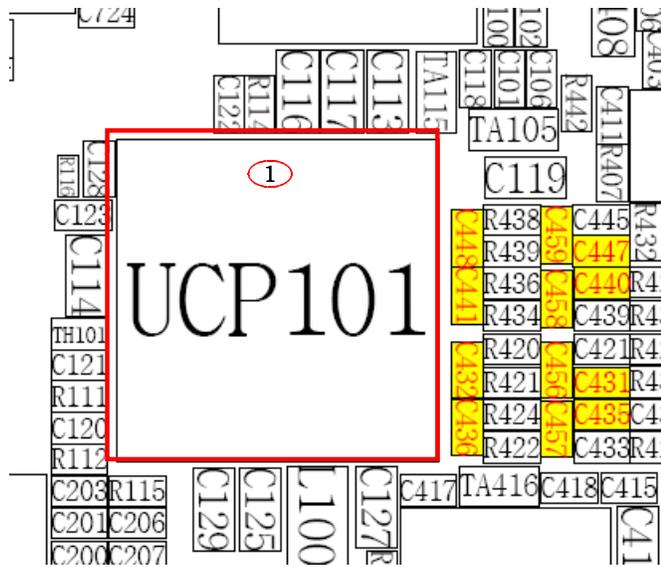
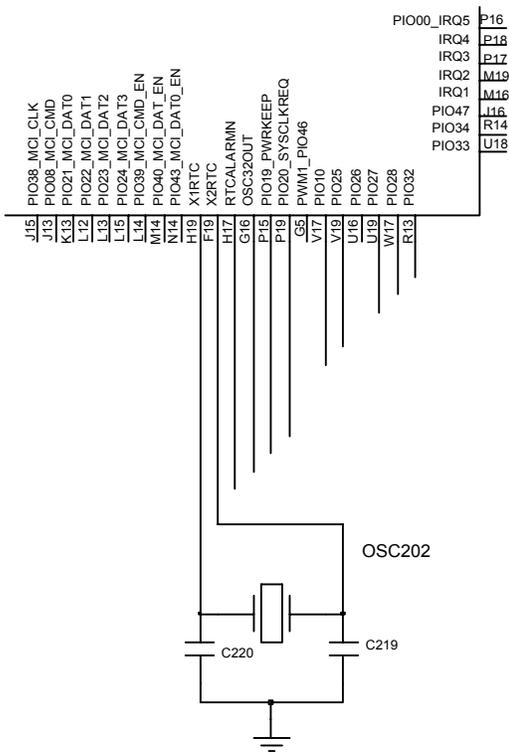
10-1 BASEBAND

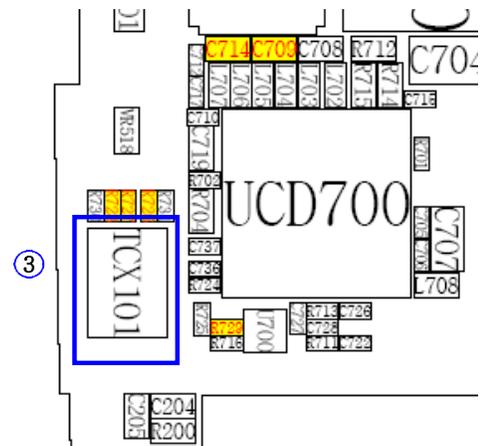
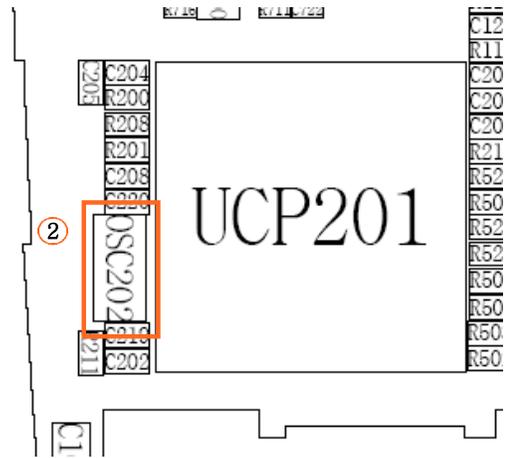
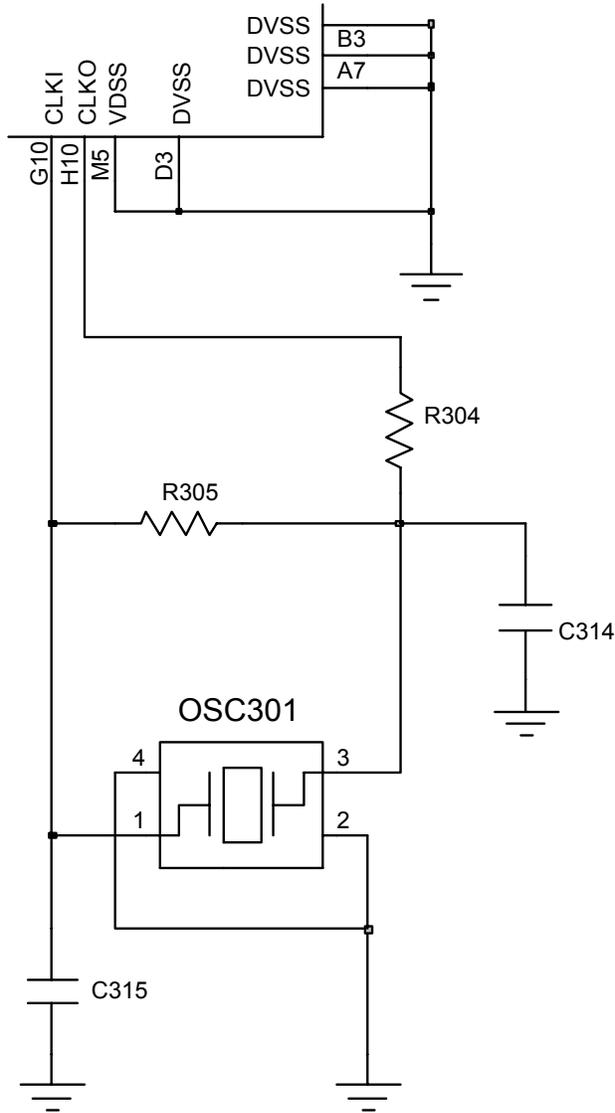
10-1-1. Power ON



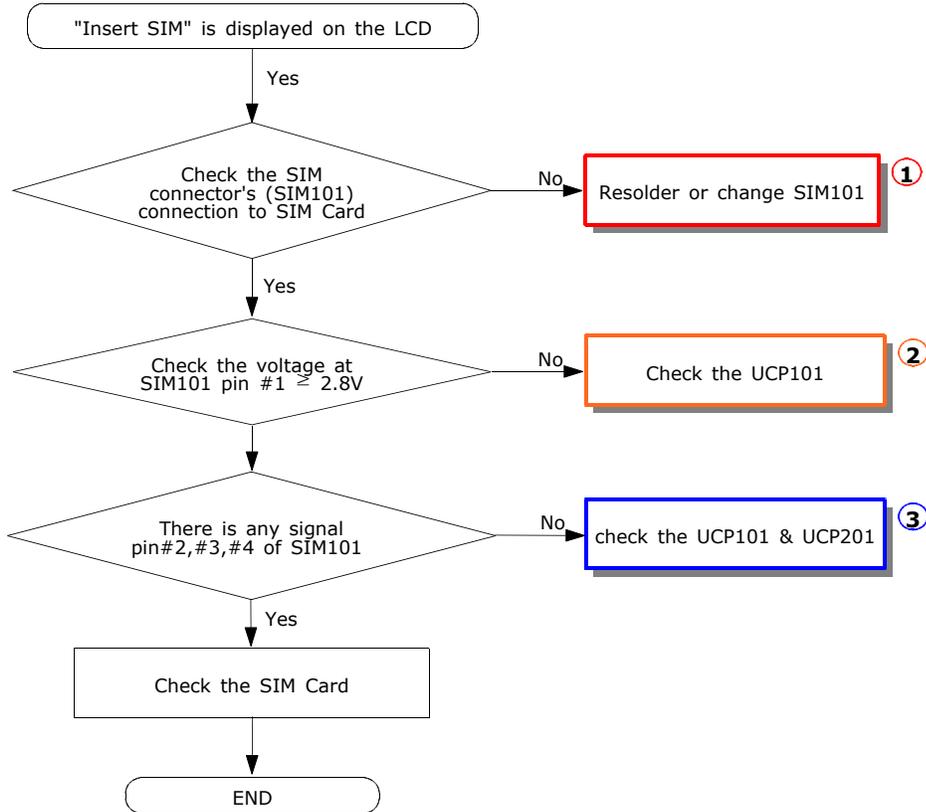
10-2-2. Initial

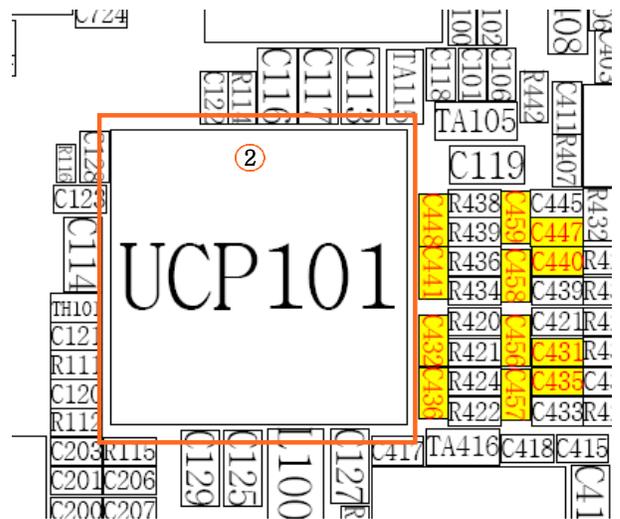
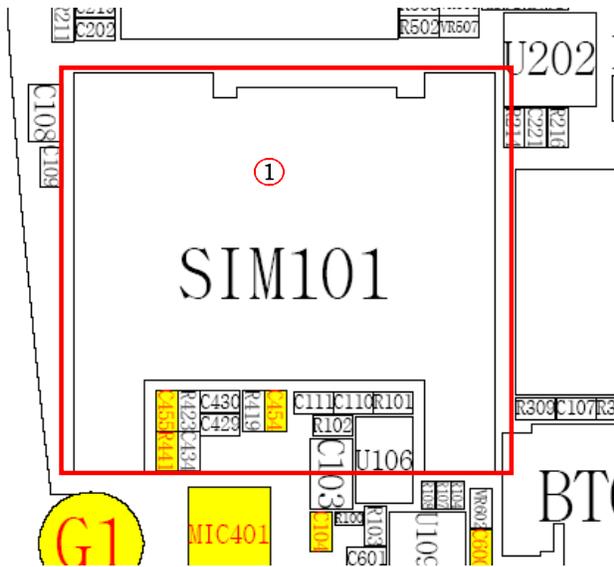
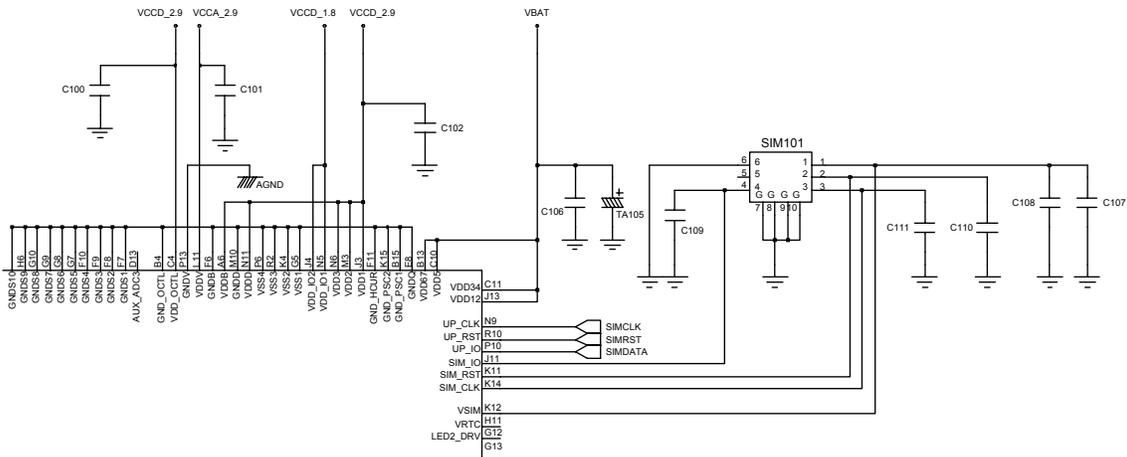




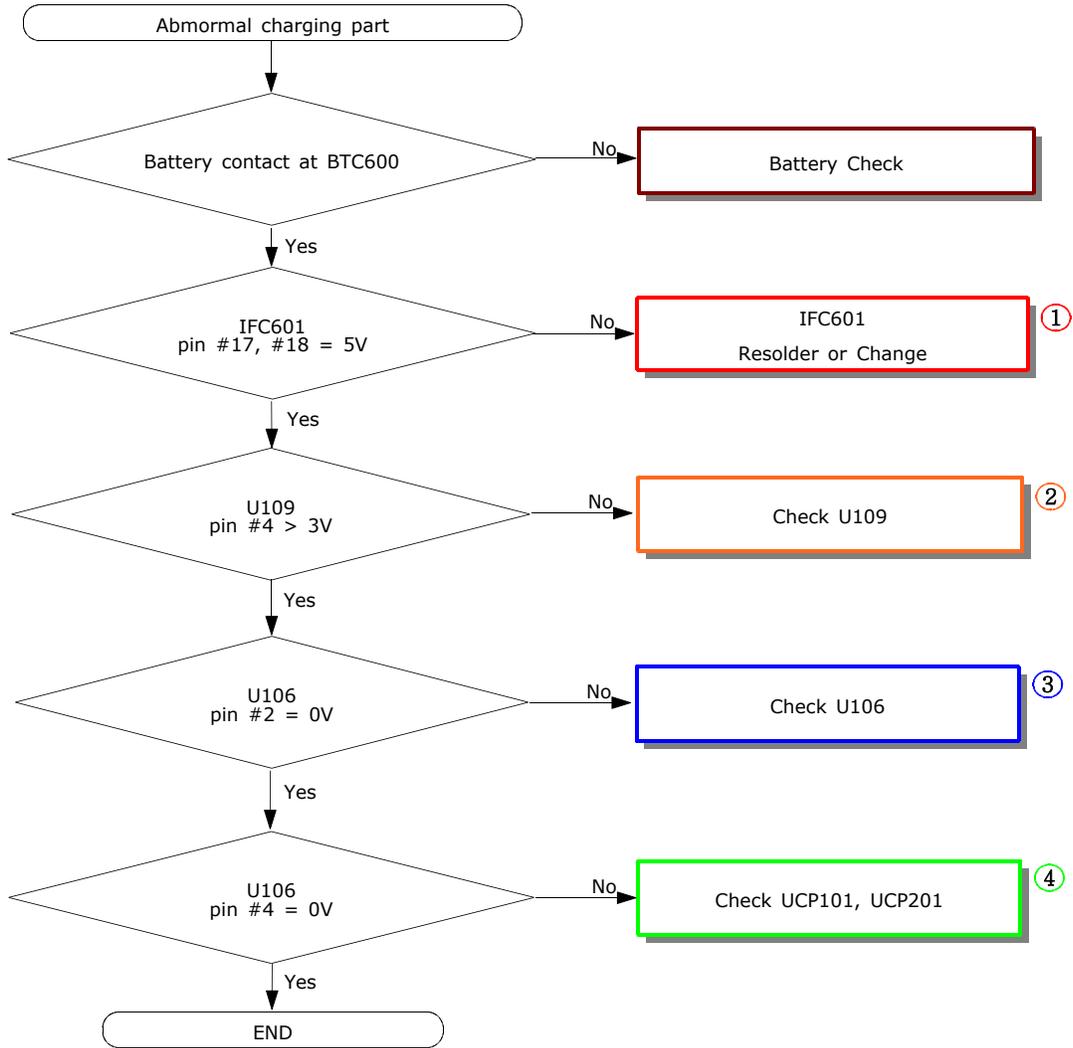


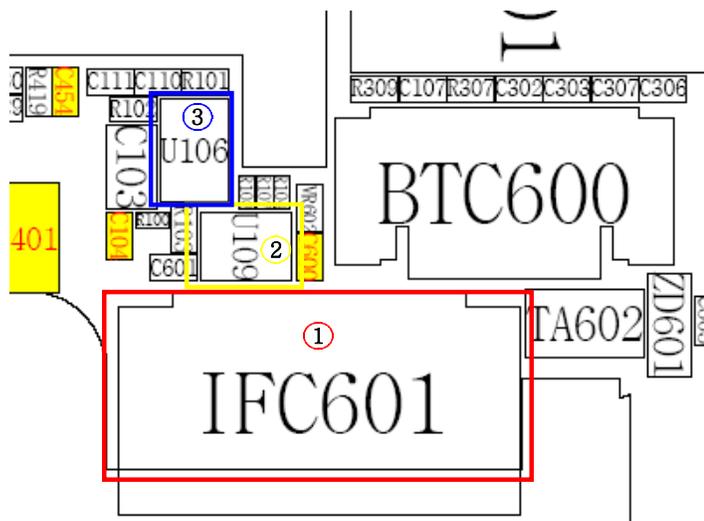
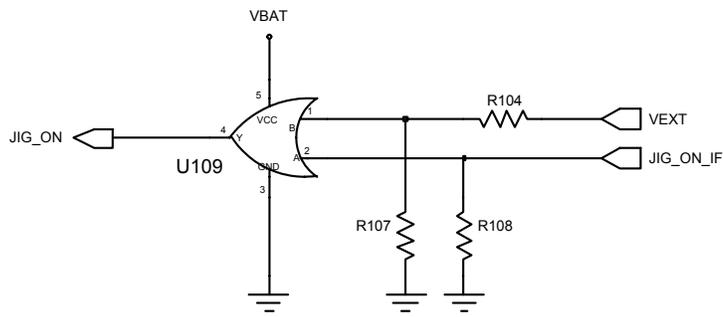
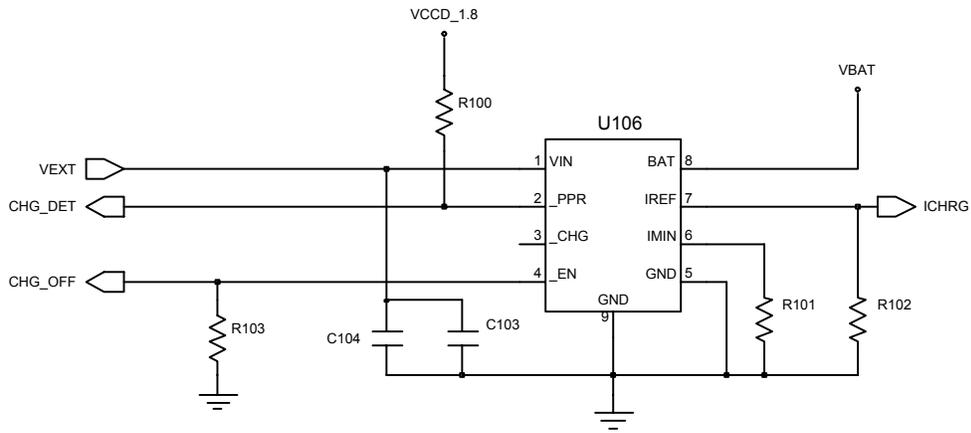
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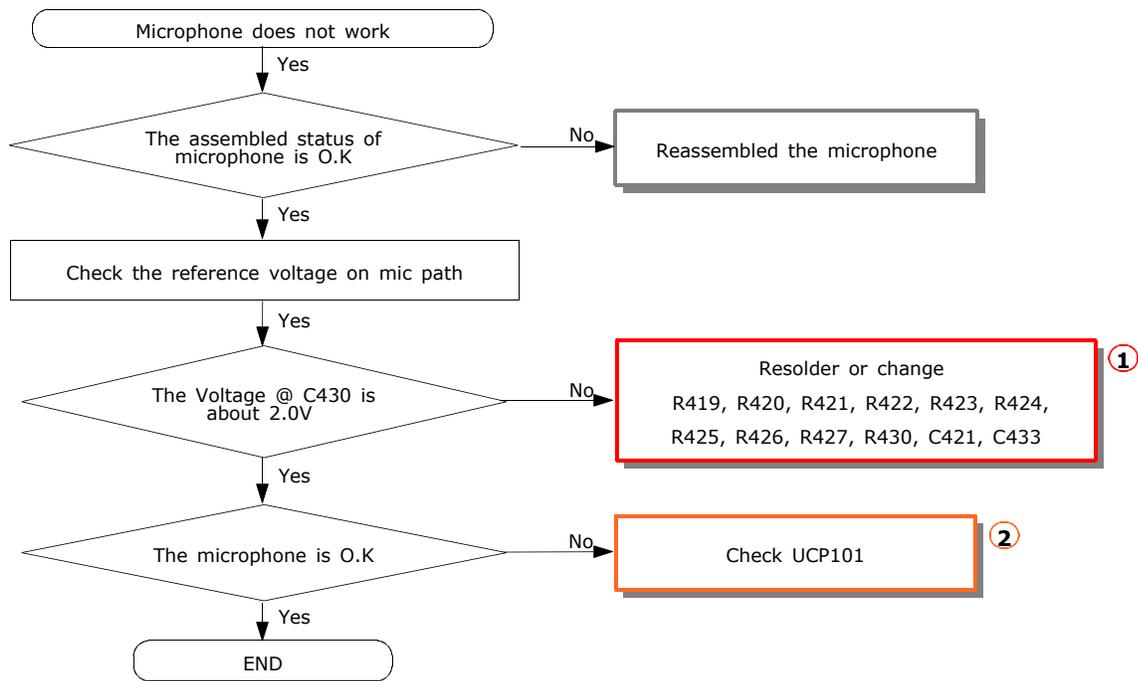


10-1-4. Charging Part

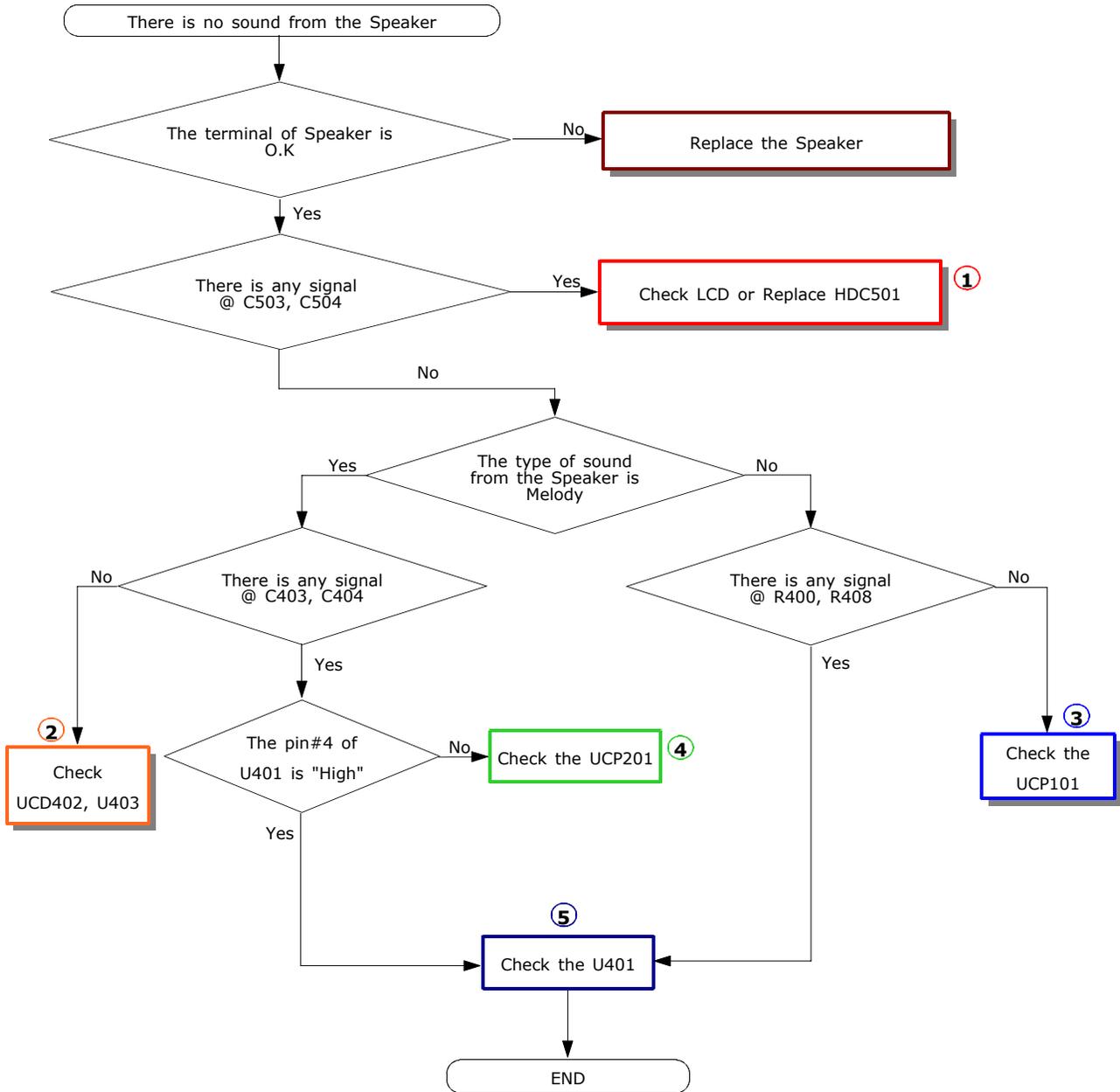


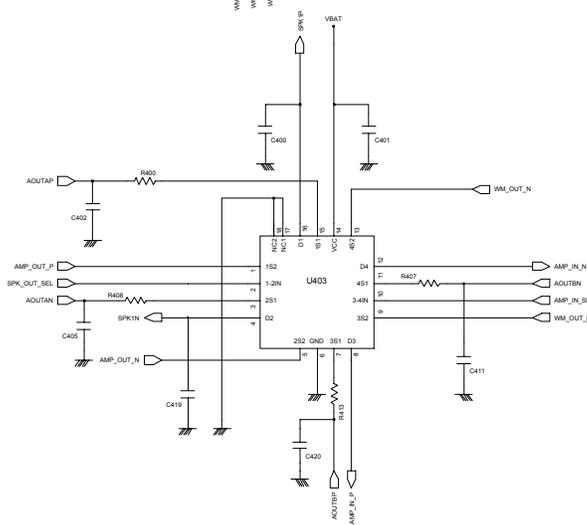
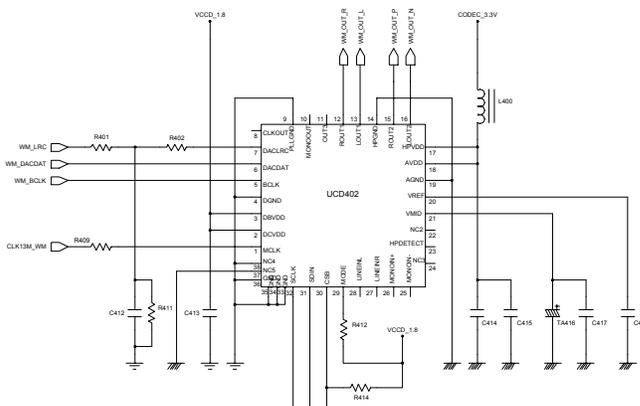
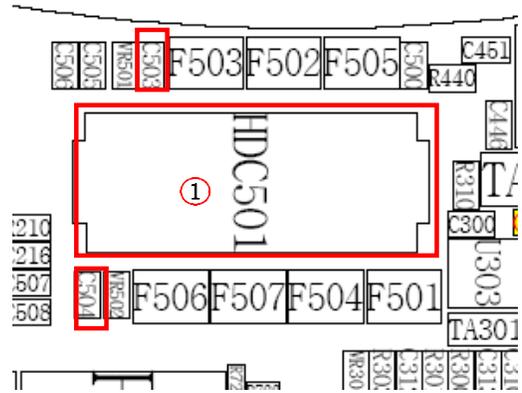
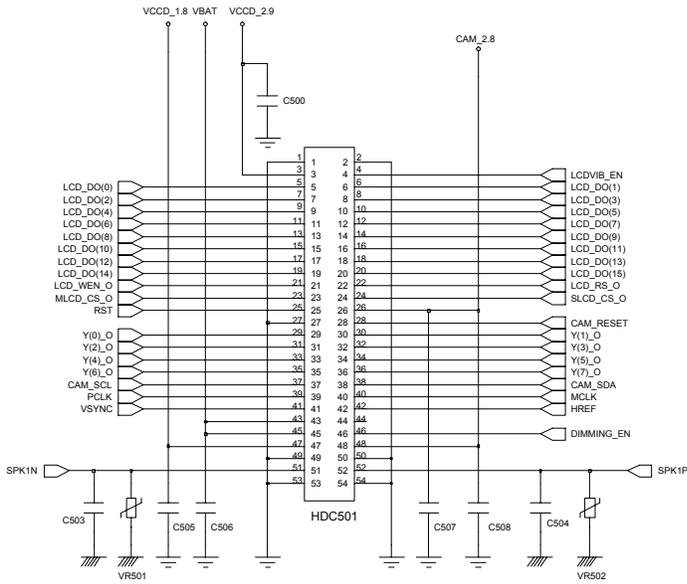


10-1-5. Microphone Part

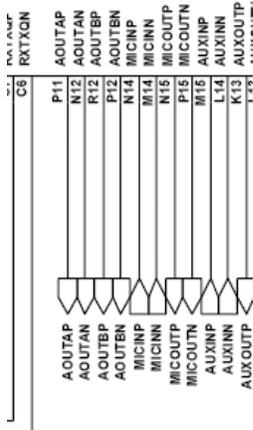


10-1-6. Speaker Part

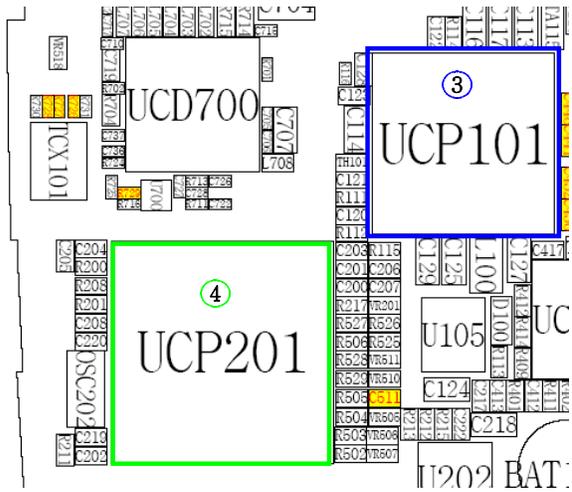
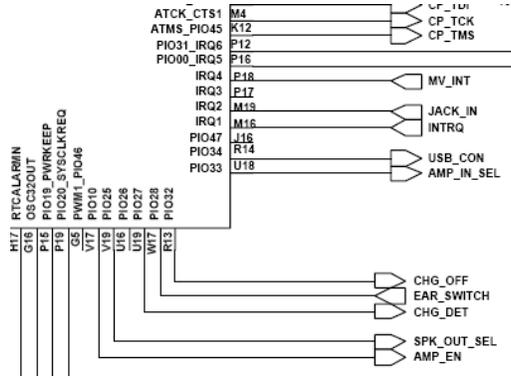




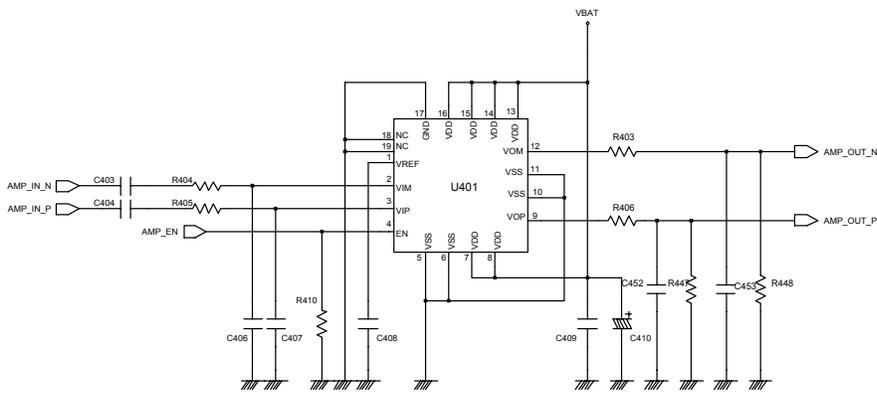
UCP101



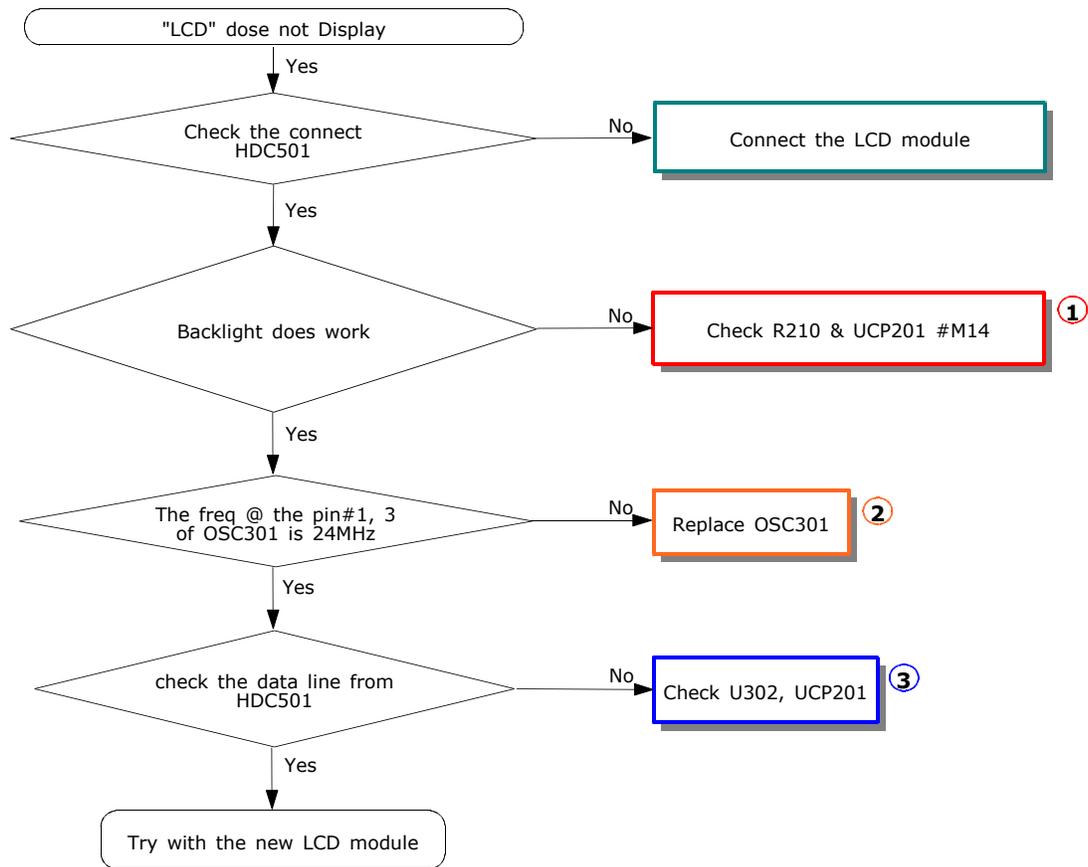
UCP201



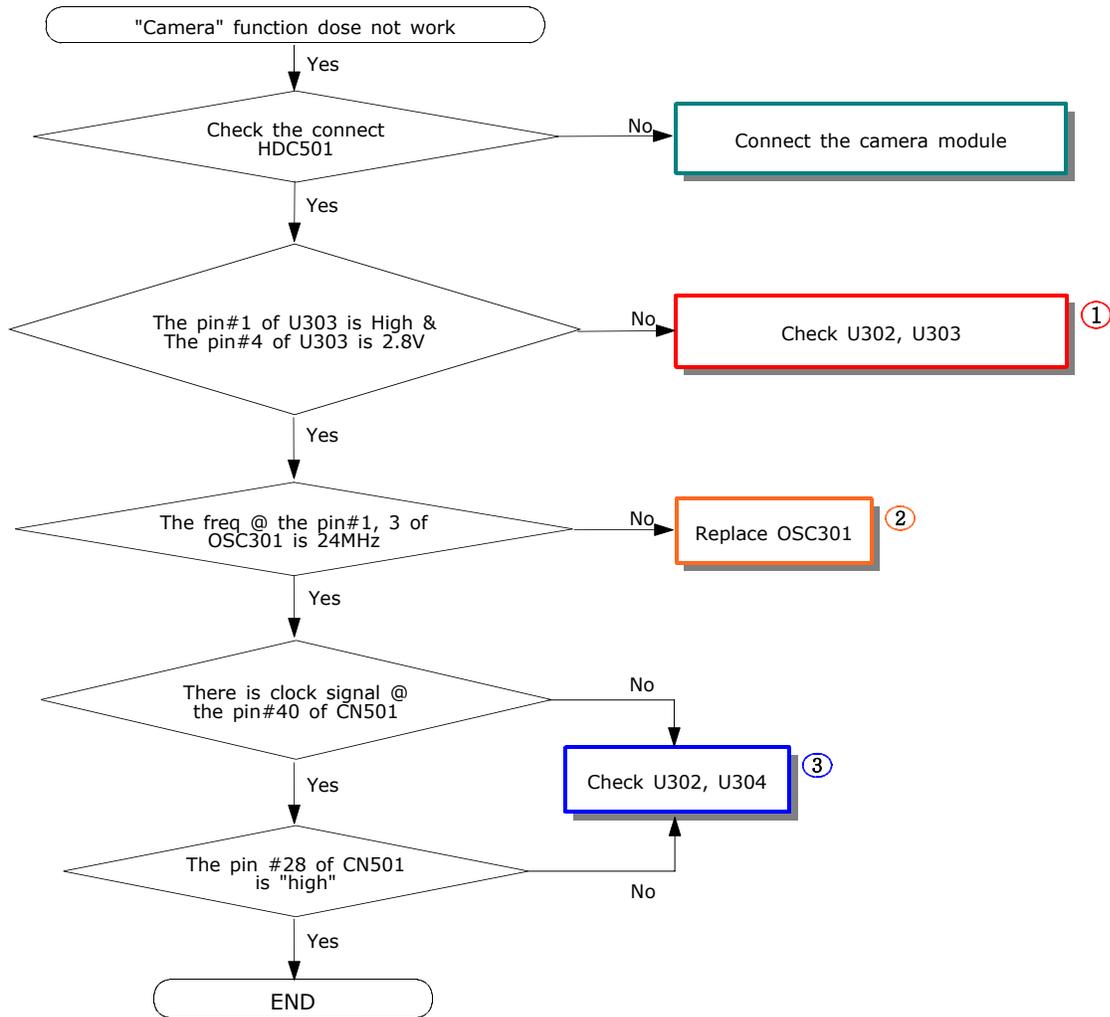
U401 (SAPA1D1)



10-1-7. LCD



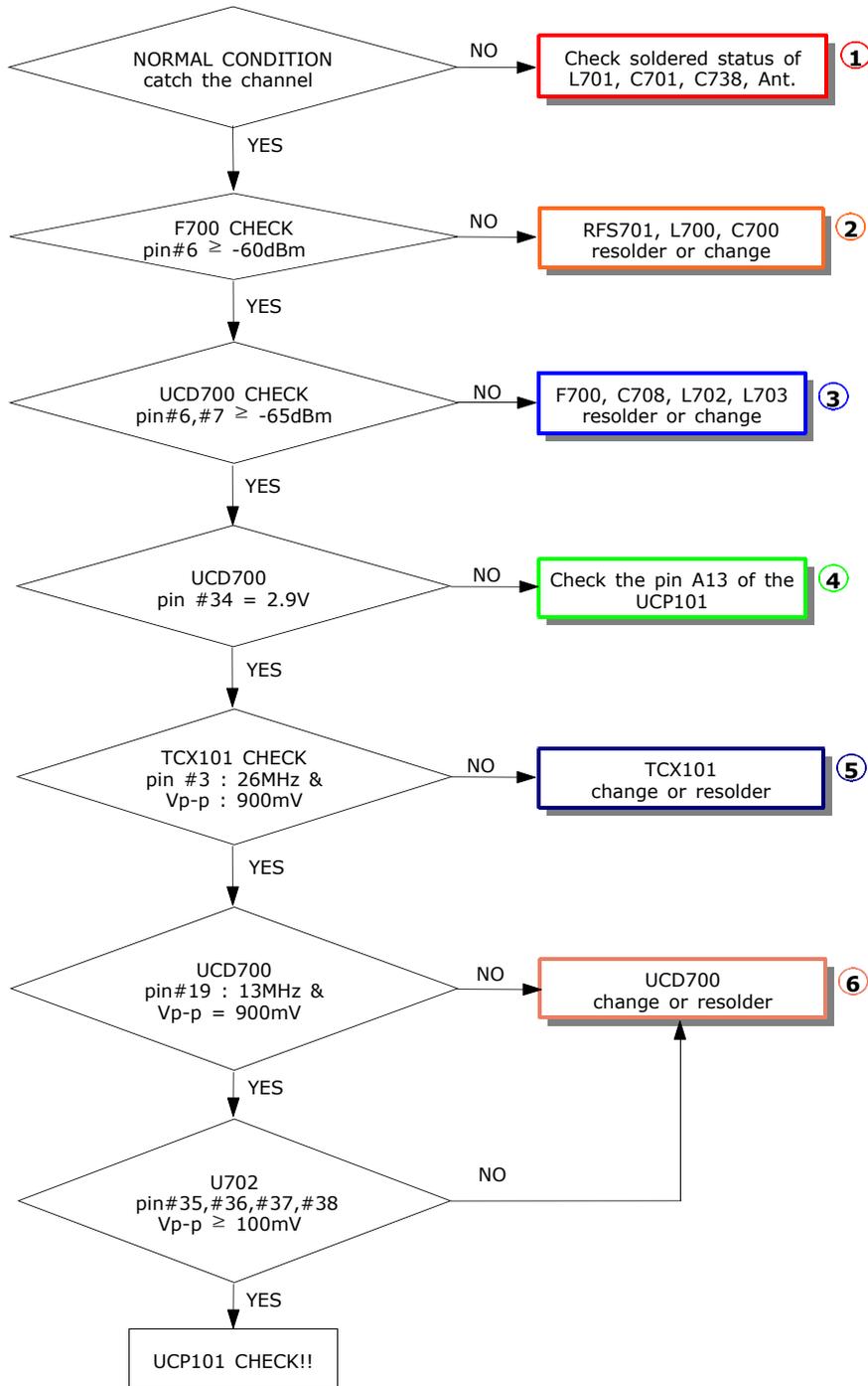
10-1-8. Camera



10-2. RF

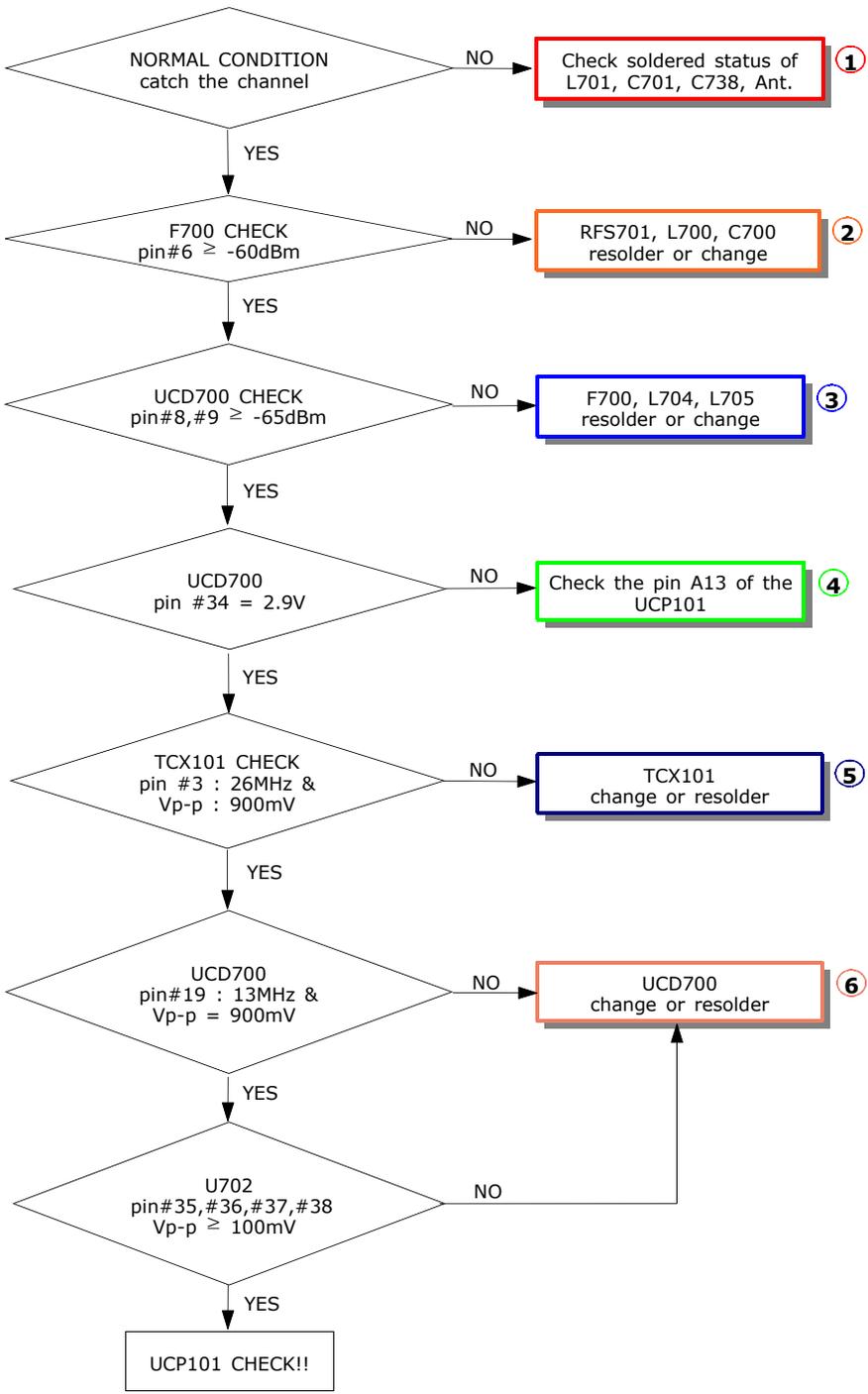
10-2-1. EGSM Receiver

CONTINUOUS RX ON
RF INPUT : 62CH
AMP : -50dBm



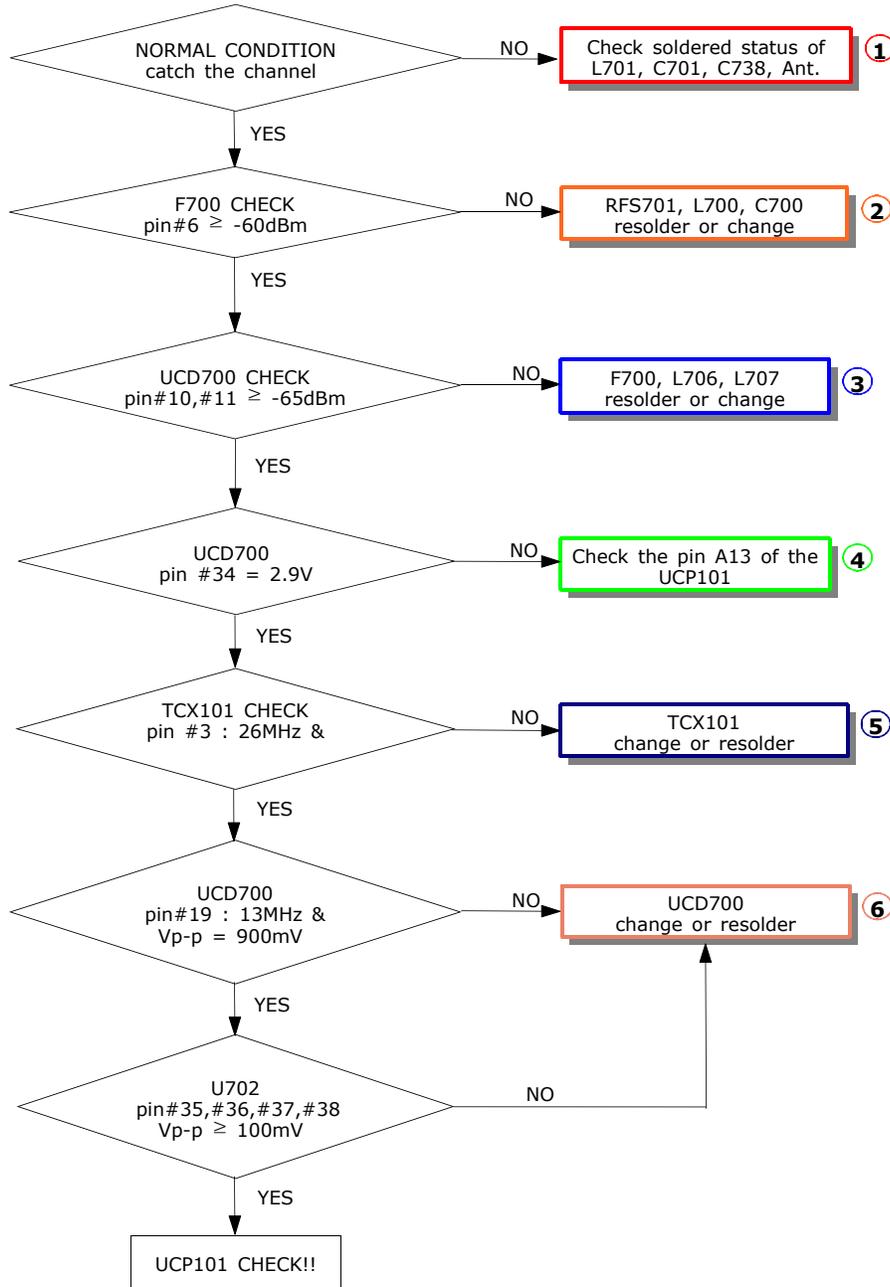
10-2-2. DCS Receiver

CONTINUOUS RX ON
RF INPUT : 660CH
AMP : -50dBm



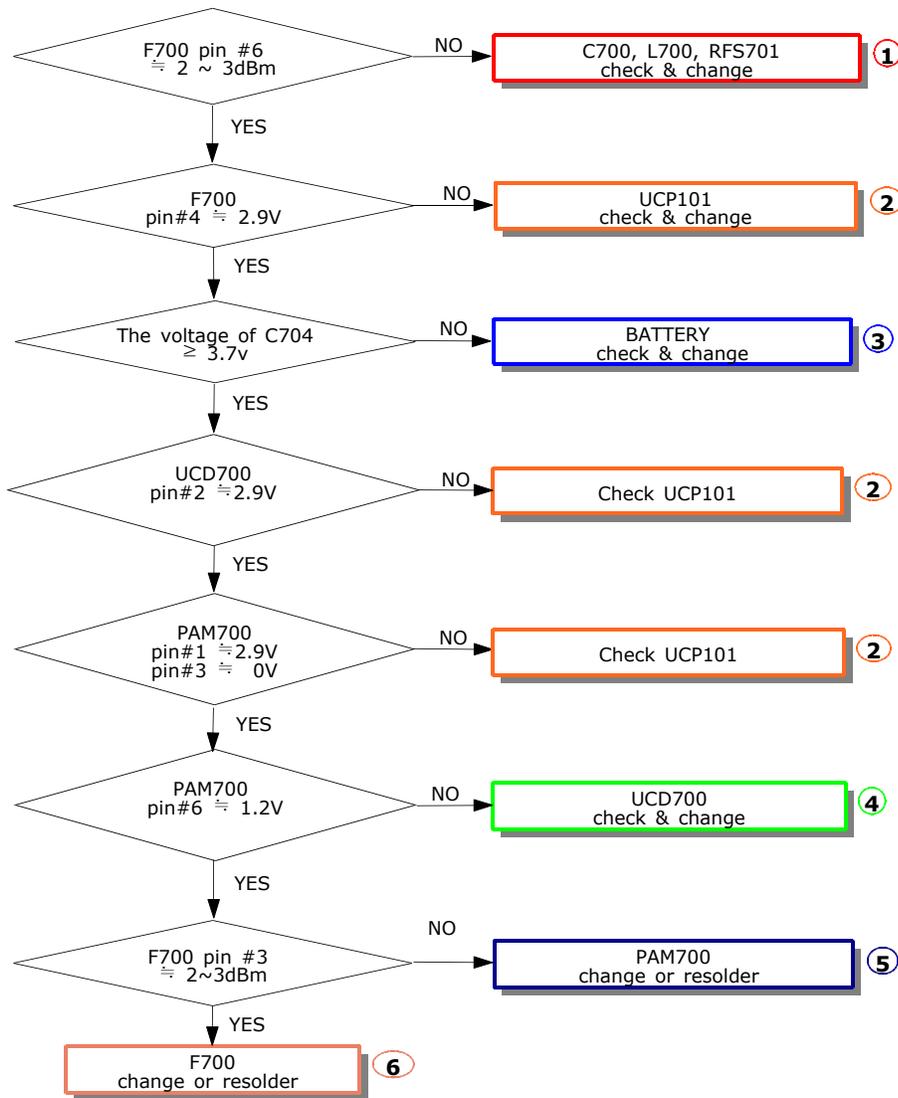
10-2-3. PCS Receiver

CONTINUOUS RX ON
RF INPUT : 660CH
AMP : -50dBm

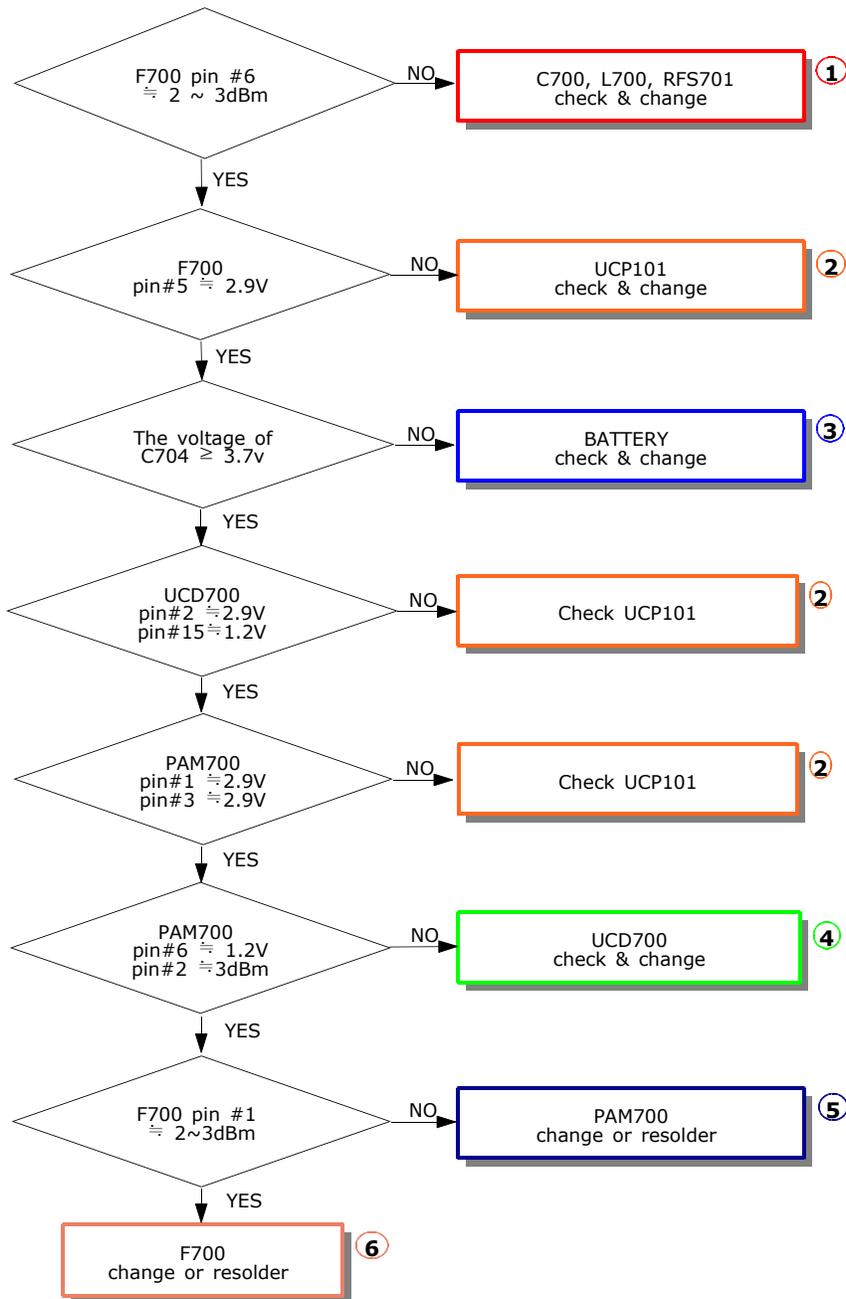


10-2-4. GSM Transmitter

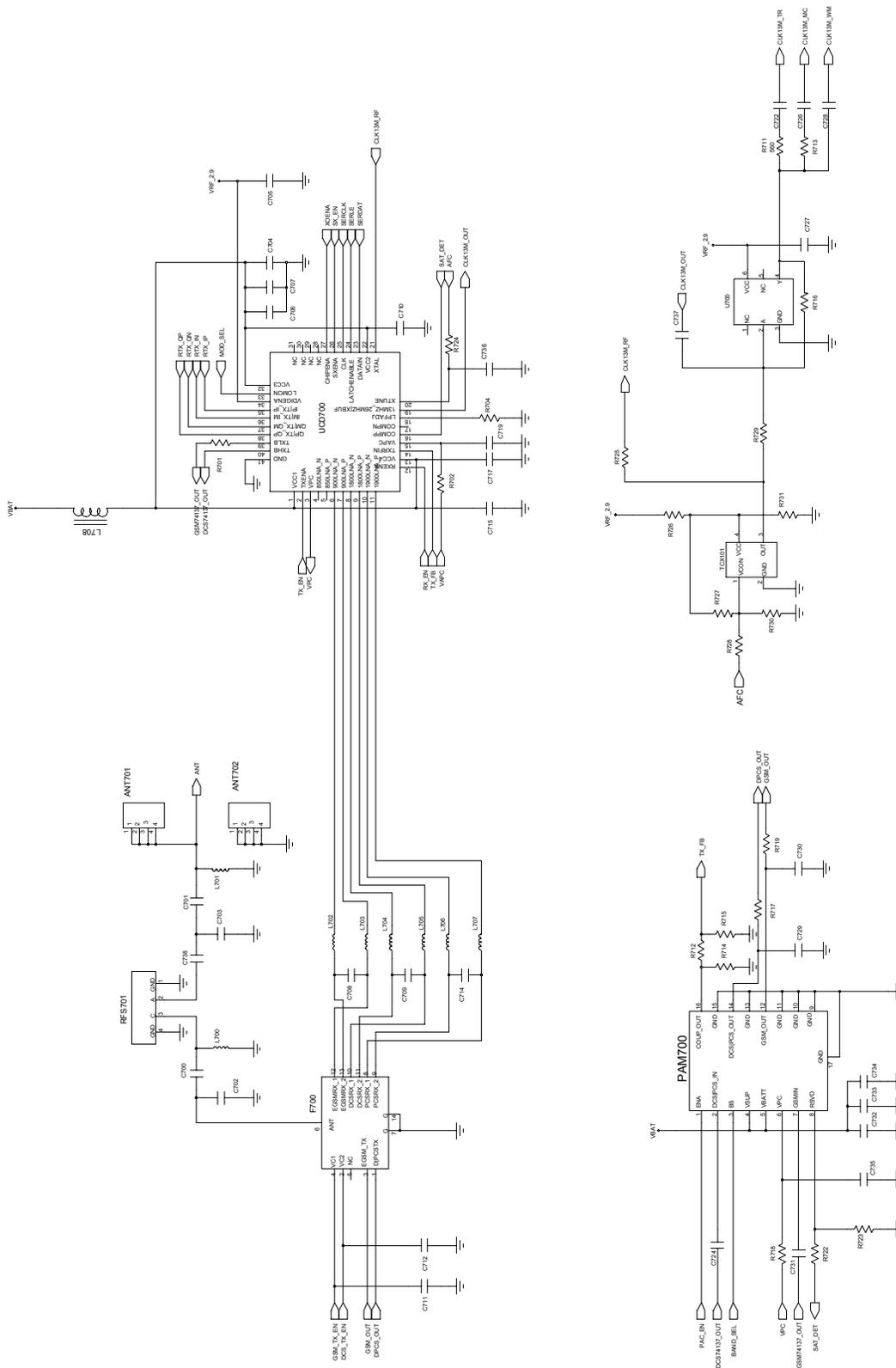
CONTINUOUS TX ON CONDITION
 TX POWER DAC: 500 CODE
 APPLIED
 CH : 30
 RBW : 100KHz
 VBW : 100KHz
 SPAN : 10MHz
 REF LEV. : 10dBm
 ATT. : 20dB

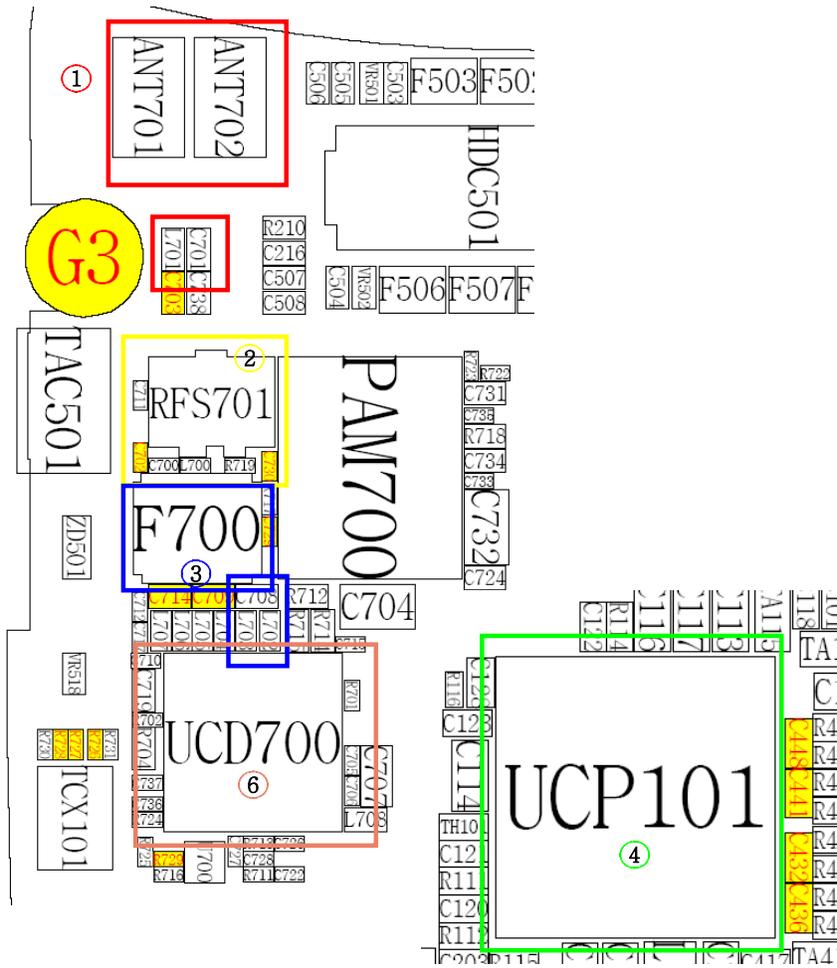


10-2-5. DCS/PCS Transmitter

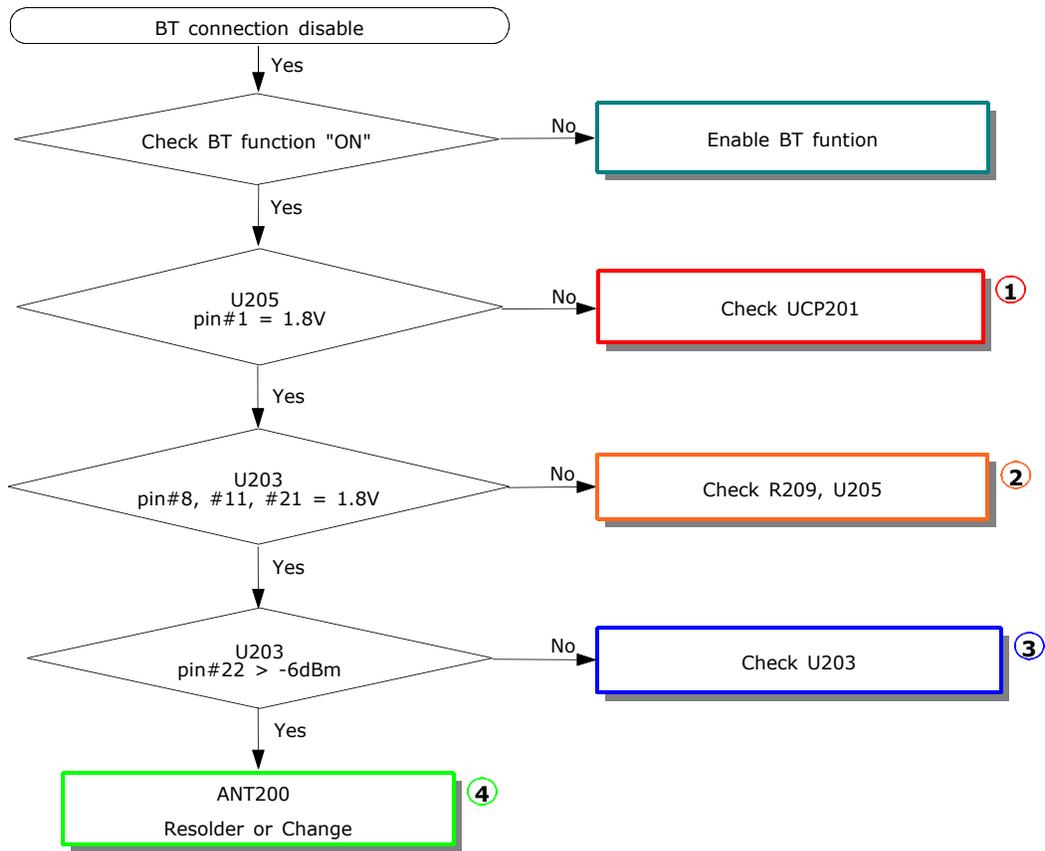


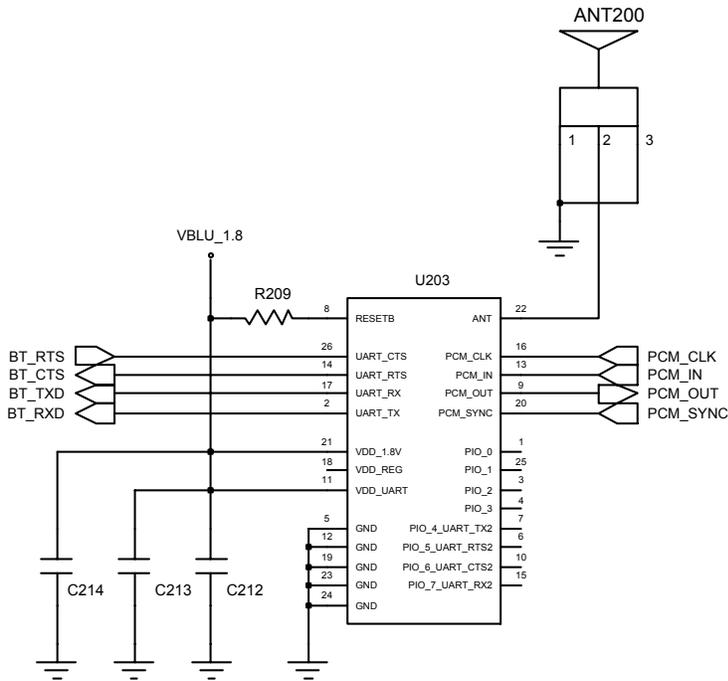
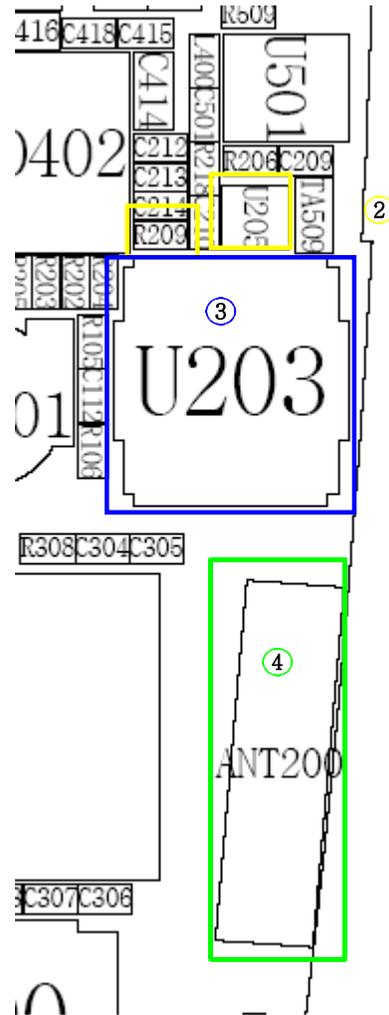
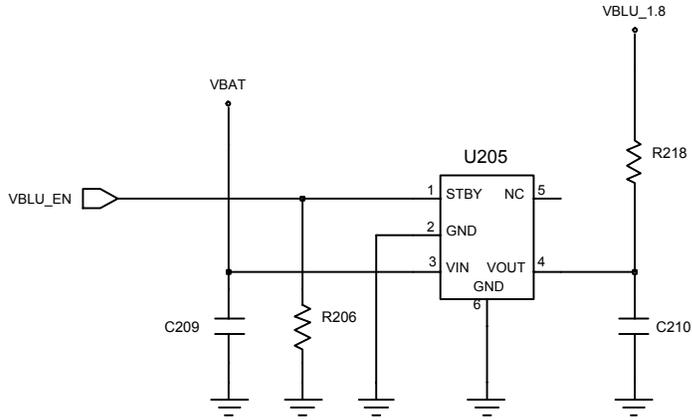
CONTINOUS TX ON CONDITION
TX POWER DAC: 500 CODE
APPLIED
CH : 660
RBW : 100KHz
VBW : 100KHz
SPAN : 10MHz
REF LEV. : 10dBm
ATT. : 20dB





10-2-6. Bluetooth Part





11. Reference data

11-1. 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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