

**SAMSUNG**

# GSM TELEPHONE

## SGH-E490

# ***SERVICE*** *Manual*

### GSM TELEPHONE



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## 10. Product Function

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# 1. Specification

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## 1-1. GSM General Specification

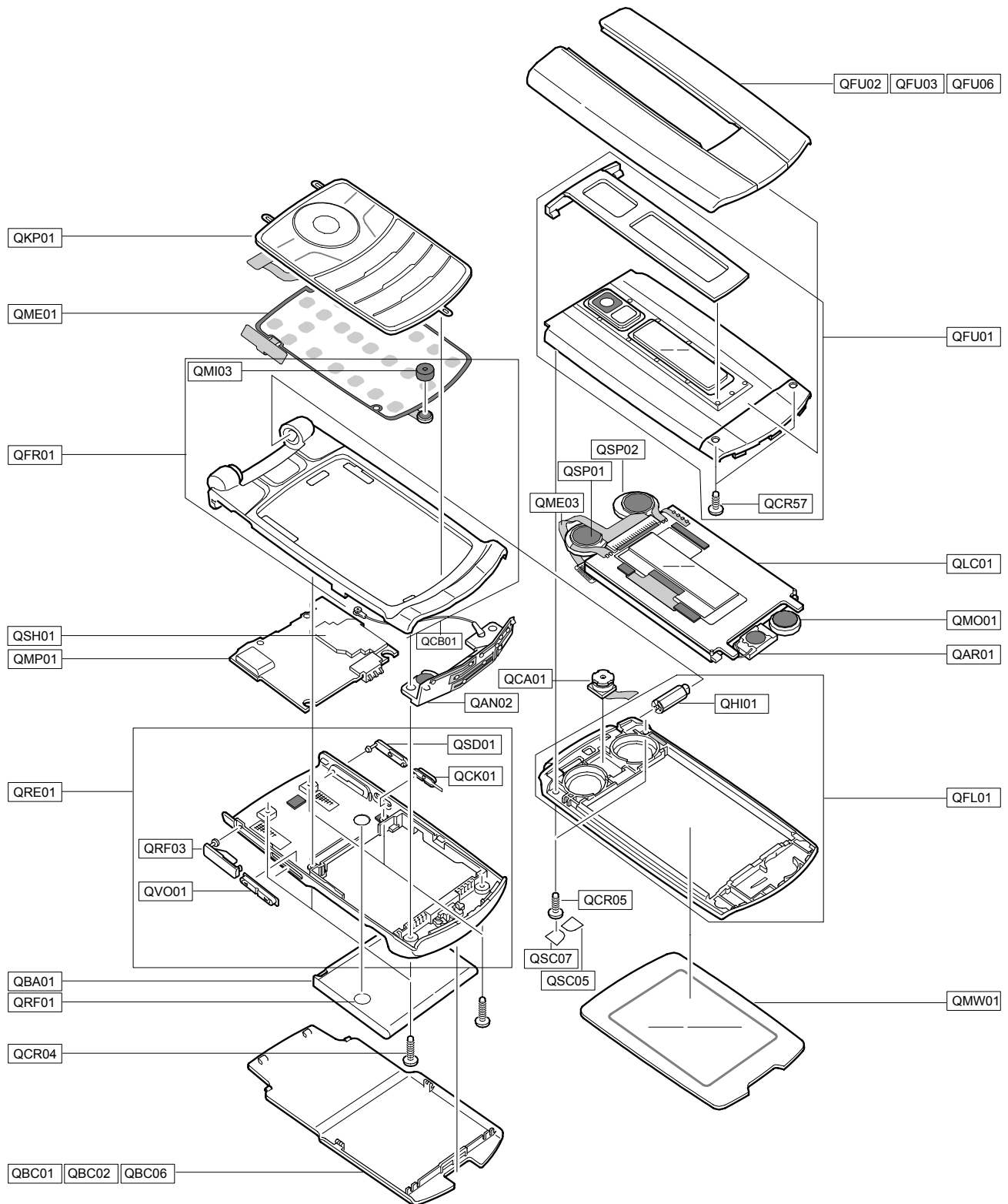
	GSM900 Phase 1	EGSM 900 Phase 2	DCS1800 Phase 1	PCS1900
Freq. Band[MHz] Uplink/Downlink	890~915 935~960	880~915 925~960	1710~1785 1805~1880	1850~1910 1930~1990
ARFCN range	1~124	0~124 & 975~1023	512~885	512~810
Tx/Rx spacing	45MHz	45MHz	95MHz	80MHz
Mod. Bit rate/ Bit Period	270.833kbps 3.692us	270.833kbps 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	576.9us 4.615ms
Modulation	0.3GMSK	0.3GMSK	0.3GMSK	0.3GMSK
MS Power	33dBm~13dBm	33dBm~5dBm	30dBm~0dBm	30dBm~0dBm
Power Class	5pcl ~ 15pcl	5pcl ~ 19pcl	0pcl ~ 15pcl	0pcl ~ 15pcl
Sensitivity	-102dBm	-102dBm	-100dBm	-100dBm
TDMA Mux	8	8	8	8
Cell Radius	35Km	35Km	2Km	-

## 1-2. 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

## 2. Exploded View and Parts List

### 2-1. Cellular phone Exploded View



## 2-2. Cellular phone Parts list

Design LOC		Discription	SEC CODE
QAN02		INTENNA-SGHE490	GH42-01029A
QAR01		AUDIO-RECEIVER	3009-001236
QBA01		INNER BATTERY PACK-800MAH_BLK_	GH43-02371A
QBC01		ASSY COVER-BATT_RED	GH98-03814A
QBC02		ASSY COVER-BATT_PNK	GH98-03814B
QBC06		ASSY COVER-BATT_WHT	GH98-03814F
QCA01		UNIT-SGHE490 CAMERA	GH59-03625A
QCB01		COAXIAL CABLE-SGHE490 ANT CABL	GH39-00674A
QCR04		SCREW-MACHINE	6001-001479
QCR04		SCREW-MACHINE	6001-001479
QCR05		SCREW-MACHINE	6001-001478
QFU02		ASSY CASE-UPPER B_RED	GH98-02202A
QFU03		ASSY CASE-UPPER B_PNK	GH98-02202B
QFU06		ASSY CASE-UPPER B_WHT	GH98-02202F
QKP01		ASSY KEYPAD-(OPEN/BLK)	GH98-02648A
QLC01		ELA UNIT-SGHE490 LCD MODULE	GH96-02257A
QME01		UNIT-SGHE490 KEY PBA	GH59-03674A
QME03		UNIT-SGHE490 CON TO CON	GH59-03787A
QMO01		MOTOR DC-SGHE490	GH31-00280A
QMP01		PBA MAIN-SGH-E490	GH92-03069A
QMW01		ASSY COVER-MAIN WINDOW	GH98-03252A
QRF01		MPR-TAPE RF COVER	GH74-26671A
QSC05		MPR-TAPE LOWER R	GH74-26668A
QSC06		MPR-TAPE LOWER L	GH74-26669A
QSH01		IPR-SHEILD COVER	GH70-01860A
QSP01		SPEAKER_yellow	3001-002071
QSP02		SPEAKER_Blue	3001-002080
QFR01		ASSY CASE-FRONT	GH98-02199A
	QMI03	ASSY COVER-MIC HOLDER	GH98-03236A
QFL01		ASSY CASE-LOWER	GH98-02200A

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	QHI01	ASSY-HINGE-FOLDER	GH98-01290A
QFU01		ASSY CASE-UPPER A	GH98-02201A
	QCR57	SCREW-MACHINE	6001-002001
QRE01		ASSY CASE-REAR	GH98-02215A
	QCK01	PMO-CAMERA KEY	GH72-36437A
	QRF03	PMO-COVER EAR JACK	GH72-34107A
	QSD01	PMO-MICRO SD COVER	GH72-36594A
	QVO01	PMO-KEY VOLUME	GH72-34110A



SEC CODE	Design LOC	Discription
GH42-01029A	QAN02	INTENNA-SGHE490
3009-001236	QAR01	AUDIO-RECEIVER
GH43-02371A	QBA01	INNER BATTERY PACK-800MAH_BLK_
GH98-03814A	QBC01	ASSY COVER-BATT
GH98-03814B	QBC02	ASSY COVER-BATT
GH98-03814F	QBC03	ASSY COVER-BATT
GH59-03625A	QCA01	UNIT-SGHE490 CAMERA
GH39-00674A	QCB01	COAXIAL CABLE-SGHE490 ANT CABL
GH72-36437A	QCK01	PMO-CAMERA KEY
6001-001479	QCR04	SCREW-MACHINE
6001-001479	QCR04	SCREW-MACHINE
6001-001478	QCR05	SCREW-MACHINE
6001-002001	QCR57	SCREW-MACHINE
GH98-02200A	QFL01	ASSY CASE-LOWER
GH98-02199A	QFR01	ASSY CASE-FRONT
GH98-02201A	QFU01	ASSY CASE-UPPER A
GH98-02202A	QFU02	ASSY CASE-UPPER B
GH98-02202B	QFU03	ASSY CASE-UPPER B
GH98-02202F	QFU04	ASSY CASE-UPPER B
GH98-01290A	QHI01	ASSY-HINGE-FOLDER
GH98-02648A	QKP01	ASSY KEYPAD-(OPEN/BLK)
GH96-02257A	QLC01	ELA UNIT-SGHE490 LCD MODULE
GH59-03674A	QME01	UNIT-SGHE490 KEY PBA
GH59-03787A	QME03	UNIT-SGHE490 CON TO CON
GH98-03236A	QMI03	ASSY COVER-MIC HOLDER
GH31-00280A	QMO01	MOTOR DC-SGHE490
GH92-03069A	QMP01	PBA MAIN-SGH-E490
GH98-03252A	QMW01	ASSY COVER-MAIN WINDOW
GH98-02215A	QRE01	ASSY CASE-REAR
GH74-26671A	QRF01	MPR-TAPE RF COVER
GH72-34107A	QRF03	PMO-COVER EAR JACK
GH74-26668A	QSC05	MPR-TAPE LOWER R
GH74-26669A	QSC06	MPR-TAPE LOWER L
GH72-36594A	QSD01	PMO-MICRO SD COVER
GH70-01860A	QSH01	IPR-SHEILD COVER
3001-002071	QSP01	SPEAKER
3001-002080	QSP02	SPEAKER
GH72-34110A	QVO01	PMO-KEY VOLUME

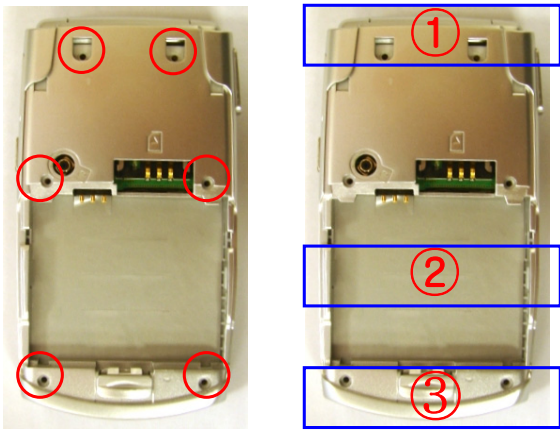
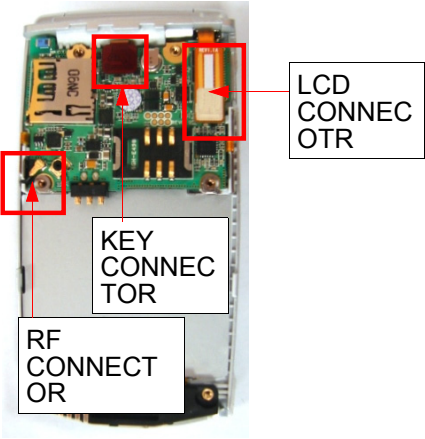
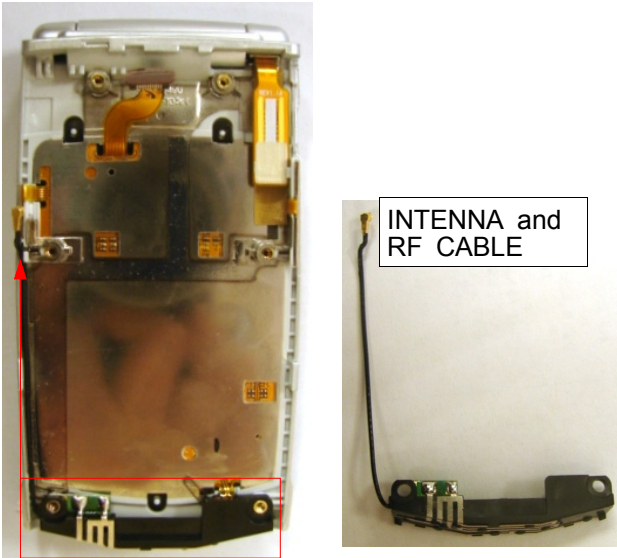
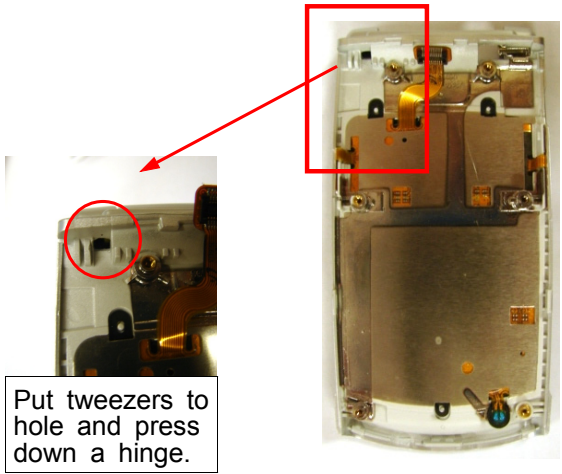
GH39-00444B		CBF INTERFACE-DATA LINK CABLE
GH44-01361B		ADAPTOR-SGHE690,SIL,EU,A_TYPE
GH59-03883B		UNIT-EARPHONE,SGHE490,SIL,B-TY
GH99-21303V		PAA MAIN-SGHE490(AUT)
6902-000297		BAG PE
GG68-10705A		LABEL(P)-MASTER SEAL
GH68-00518B		LABEL(P)-UNIT SEAL
GH68-01335D		LABEL(P)-IMEI
GH68-11617A		LABEL(P)-MASTER SHIPPING
GH68-13218A		LABEL(R)-MAIN(EU)
GH69-04149A		BOX(P)-MASTER MAIN
GH69-04788A		BOX(P)-UNIT MAIN(EU)
GH69-05039A		CUSHION-CASE(AUT_NEW)
GH99-21304A		PAA ETC-SGHE490 AUT
6801-001089		CARD GUIDE
6801-001501		CARD-WARRANTY
GH46-00358A		S/W CD-SGHE490 PC STUDIO II 2.
GH68-07013A		MANUAL-WEEE CARD
GH68-13018A		MANUAL USERS-EU FRENCH
GH68-13219A		MANUAL USERS-EU ITALIAN
GH68-13220A		MANUAL USERS-EU GERMAN
GH91-02171A		ASSY BASIC-SGHE490(LS/OPEN)
GH68-02026A		LABEL(P)-WATER SOAK
GH73-08605A		RMO-RUBBER PBA A
GH73-08606A		RMO-RUBBER PBA B
GH74-28709A		MPR-GASK TAPE
GH73-09056A		RMO-RUBBER INTENNA
GH73-09072A		RMO-RUBBER PBA C
GH97-06285A		MEA FRONT-COVER E490(OPEN)
GH74-26663A		MPR-FRONT LABEL
GH74-29017A		MPR-INSU TAPE

GH74-29057A		MPR-GASK TAPE
GH07-01008A		LCD-SUB SGHE490
GH07-01024A		LCD-MODULE SGHE490
GH59-03665A		UNIT-SGHE490 BLU
GH74-13804A		MPR-REMOVE TAPE LCD
GH74-17926A		MPR-TAPE LED
GH74-19756A		CONE-TAPE SUB LCD INSUL
GH74-27509A		MPR-TAPE
GH74-27511A		MPR-INSU TAPE
GH74-28410A		MPR-INSU TAPE
GH59-03646A		UNIT-SGHE490 LCD MAIN PBA
GH59-03652A		UNIT-SGHE490 LCD IF PBA
GH72-34087A		PMO-HINGE SHAFT
GH72-35057A		PMO-CASE FRONT V2
GH81-02376A		INSERT-M1.4_TYPE B
GH73-08503A		RMO-RUBBER MIC HOLDER
GH74-28949A		MPR-TAPE MIC
GH71-07209A		NDC-DECO HINGE
GH74-29844A		MPR-GASK TAPE
GH70-01779A		IPR-DECO EAR V2
GH70-01845A		IPR-MAGNETIC
GH72-35046A		PMO-CASE LOWER V2
GH74-28144A		MPR-TAPE EAR PIECE
GH74-28400A		MPR-TAPE MAGNETIC
GH74-29725A		MPR-TAPE RCV HOLE
GH73-09178A		RMO-RUBBER LOWER
GH74-26586A		MPR-SPONGE CAMERA
GH74-26665A		MPR-TAPE UPPER DUMMY
GH74-28513A		MPR-TAPE CAMERA DECO
GH71-07148A		NDC-FOLDER UPPER
GH72-36555A		PMO-FOLDER UPPER BOTTOM

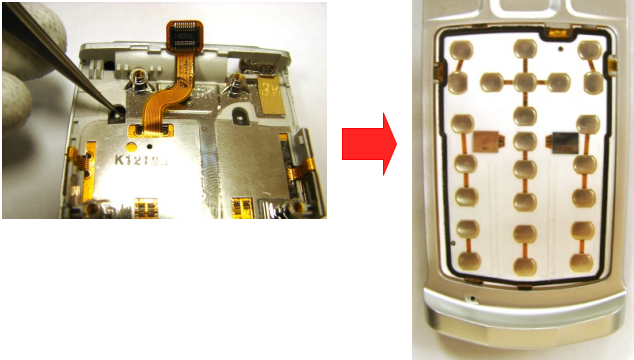
GH81-02348A		INSERT-M1.4_TYPE A
GH72-34090A		PMO-CASE UPPER DECO
GH72-34091A		PMO-DECO CAMERA
GH72-34092A		PMO-COVER CAMERA WINDOW
GH72-34093A		PMO-COVER SUB WINDOW
GH74-26587A		MPR-SPONGE SUB WINDOW
GH74-28515A		MPR-VINYL BOHO SUB
GH74-28762A		MPR-VINYL BOHO UPPER DUMMY
GH72-34094A		PMO-CASE UPPER B
GH72-34095A		PMO-BRACKET CHANGE
GH74-26666A		MPR-TAPE CHANGE DUMY
GH72-34104A		PMO-COVER MAIN WINDOW
GH74-26667A		MPR-TAPE MAIN WINDOW
GH73-08862A		RMO-RUBBER LCD A
GH73-08863A		RMO-RUBBER LCD B
GH73-08864A		RMO-RUBBER LCD C
GH74-28337A		MPR-TAPE
GH74-29015A		MPR-GASK TAPE
GH74-29852A		MPR-GASK TAPE LDI
GH74-30474A		MPR-GASK TAPE
GH74-30475A		MPR-INSU TAPE LCD A
GH74-30493A		MPR-GASK TAPE
GH74-30539A		MPR-INSU TAPE LCD B
GH74-30540A		MPR-INSU TAPE LCD C
GH74-30542A		MPR-VINYL BOHO AUTO
GH68-02026A		LABEL(P)-WATER SOAK
GH74-28143A		MPR-SPONGE KEY CON
GH74-29014A		MPR-GASK TAPE
GH61-00292A		SPRING ETC-BATT LOCKER
GH72-36593A		PMO-REAR COVER
GH72-36595A		PMO-BATT LOCKER

GH74-16438A		MPR-F/C FIX TAPE
GH74-28950A		MPR-TAPE GASK
GH74-29850A		MPR-TAPE REAR HOLE R
GH73-09143A		RMO-RUBBER CONTACT
GH72-34094B		PMO-CASE UPPER B
GH72-34095A		PMO-BRACKET CHANGE
GH74-26666A		MPR-TAPE CHANGE DUMY
GH74-30541A		MPR-VINYL BOHO UPPER B
GH72-34094F		PMO-CASE UPPER B
GH72-34095A		PMO-BRACKET CHANGE
GH74-26666A		MPR-TAPE CHANGE DUMY
GH74-30541A		MPR-VINYL BOHO UPPER B
GH74-30543A		MPR-VINYL BOHO MAIN
GH72-36722A		PMO-BATT COVER V4
GH74-28760A		MPR-VINYL BOHO COVER
GH74-30396A		MPR-TAPE GATE
GH72-36722B		PMO-BATT COVER V4
GH74-28760A		MPR-VINYL BOHO COVER
GH74-30396B		MPR-TAPE GATE

## 2-3. Disassembly

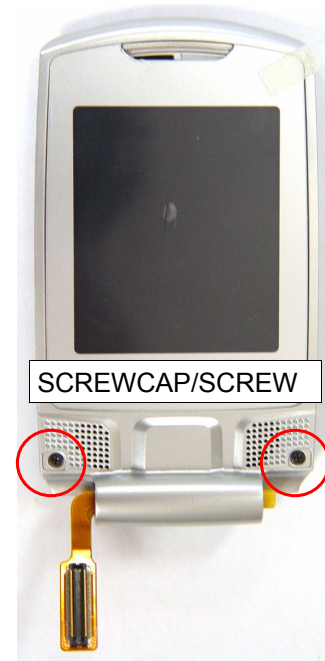
<p><b>1</b></p> 	<p><b>2</b></p> 
<ol style="list-style-type: none"> <li>1. Release SCREW 6 POINT at Rear.</li> <li>2. Disjoint HOOK from up to down. (Consult Picture 1.)</li> </ol> <p>※ <b>caution</b></p> <ol style="list-style-type: none"> <li>1. Be careful Hook damage when you Disjoint a REAR.</li> </ol>	<ol style="list-style-type: none"> <li>1. Disjoint LCD CONNECTOR, KEY CONNECTOR.</li> <li>2. Remove RF CONNECTOR.</li> <li>3. Separate PBA from FRONT.</li> </ol> <p>※ <b>caution</b></p> <ol style="list-style-type: none"> <li>1. When separate PBA, do not use too much power.</li> <li>2. Be careful a Connector damage when you remove RF Connector</li> </ol>
<p><b>3</b></p> 	<p><b>4</b></p> 
<ol style="list-style-type: none"> <li>1. Take off a FRONT LABEL.</li> <li>2. Separate Antenna and RF cable from Unit.</li> </ol>	<ol style="list-style-type: none"> <li>1. Put tweezers to Front hole and Press down a Hinge.</li> <li>2. Separate FRONT and FOLDER ASS'Y during doing NO.1.</li> </ol> <p>※ <b>caution</b></p> <ol style="list-style-type: none"> <li>1. Beware that you do not damage LCD F-PCB.</li> <li>2. Be careful that you do not make scratch when you press down a Hinge.</li> </ol>

5



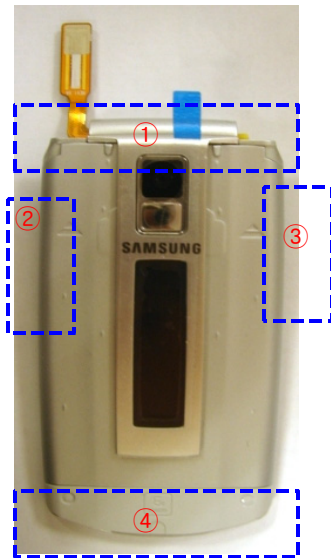
1. Separate KEYPAD using tweezers.
  2. After remove SIDEKEY from FRONT RIB, separate KEY F-PCB from FRONT.
- ※ **caution**
1. Do not make scratch when you using tweezers.
  2. Beware that you do not damage KEY F-PCB.

6



1. Remove SCREW CAP using tweezers.(2POINT)
  2. Release SCREW.
- ※ **caution**
1. Do not make scratch when you using tweezers.

7



1. Separate UPPER from LOWER.
    - Release a HOOK which locate upside.
- ※ **caution**
1. Be careful Hook damage when you disjoint a REAR.


8



1. DONE

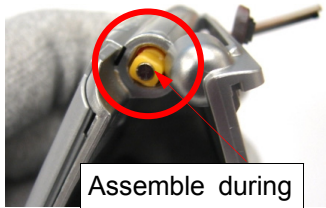


## 2-4. Assembly

<p><b>1</b></p>  <p>Arrange Wire.</p> <p>Put SPKs and a CAM.</p> <p>Put MOT, CAM, SPK.</p>	<p><b>2</b></p>  <p>FOLDER UPPER</p>
<ol style="list-style-type: none"> <li>1. Put LCD ASS'Y to LOWER.</li> <li>2. Put MOT, RECEIVER, CAM, SPK.</li> <li>3. Arrange a F-PCB to a groove.</li> </ol> <p>※ <b>caution</b></p> <ol style="list-style-type: none"> <li>1. Beware that you do not leave any dirty thing on LCD (dust, fingerprint and etc.).</li> <li>2. Arrange MOT, RECEIVER WIRE not to be interfered with other components.</li> </ol>	<ol style="list-style-type: none"> <li>1. Join UPPER to LOWER.(Refer to the Picture)</li> </ol> <p>※ <b>caution</b></p> <ol style="list-style-type: none"> <li>1. Be sure that UPPER is hooked on LOWER</li> </ol>
<p><b>3</b></p>  <p>SCREW(2POINT)</p> <p>SCREW CAP</p>	<p><b>4</b></p>  <p>KEY F-PCB GUIDE HOLE</p>
<ol style="list-style-type: none"> <li>1. Drive SCREWS to LOWER. (M1.4*L3 2 POINT)</li> <li>2. Attach SCREW CAP.</li> </ol> <p>※ <b>caution</b></p> <ol style="list-style-type: none"> <li>1. Check Right and Left. The shape is different.</li> </ol> <p>Left      Right</p>	<ol style="list-style-type: none"> <li>1. Attach KEY F-PCB to FRONT. Insertion order (VOL KEY → MIC → KEY CON. → CAM KEY)</li> <li>2. Set KEY PAD on KEY F-PCB.</li> </ol> <p>※ <b>caution</b></p> <ol style="list-style-type: none"> <li>1. Beware that you do not damage KEY F-PCB.</li> <li>2. Be careful that you do not make scratch when you assemble a Hinge.</li> <li>3. Check folder Tension and F-PBC connected with accuracy.</li> </ol>



5



Assemble during  
pressing a hinge.



1. Insert F-PCB to hole of FRONT.
2. Assemble while pressing the hinge.
3. Open and close a folder 2~3 times to Check there is a problem or not.

※ **caution**

1. Beware that you do not damage F-PCB when you insert F-PCB to hole of FRONT
2. Check KEY F-PCB GUIDE HOLE is in conformity with FRONT.

6

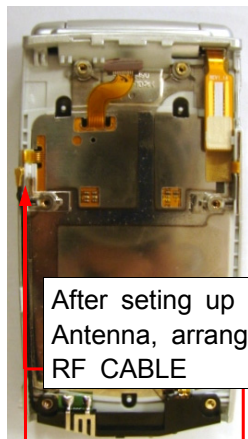


1. Slip on CHANGEABLE COVER.

※ **caution**

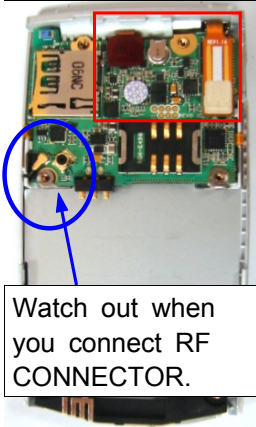
1. After slipping on CHANGEABLE COVER, check a gap exist or not.

7



After setting up  
Antenna, arrange  
RF CABLE

Connect KEY, LCD  
CONNECTOR



Watch out when  
you connect RF  
CONNECTOR.

1. Set up Antenna at FRONT (including RF CABLE).
2. Set a PBA.
3. Remove dust using AIR GUN and then connect KEY, LCD CONNECTOR.
4. Connect RF CONNECTOR.
5. Attach FRONT LABEL.

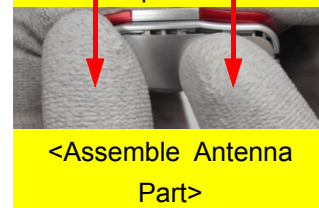
※ **caution**

1. Beware that you do not damage F-PCB.
2. Be careful that you do not make scratch when you assemble a Hinge.
3. Check folder Tension and F-PCB connected with accuracy.
4. Check RF CABLE connected with accuracy.

8



<Assemble REAR from  
upside>

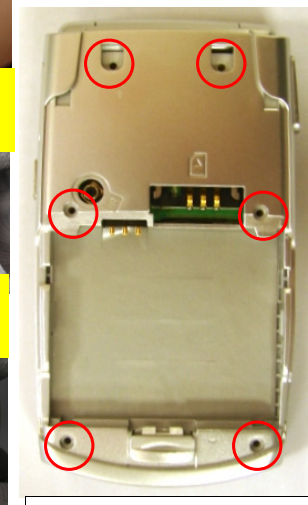


<Assemble Antenna  
Part>



<Assemble both sides  
Hook of REAR >

DONE



Drive SCREW : 6  
POINT (M1.4\*L4)

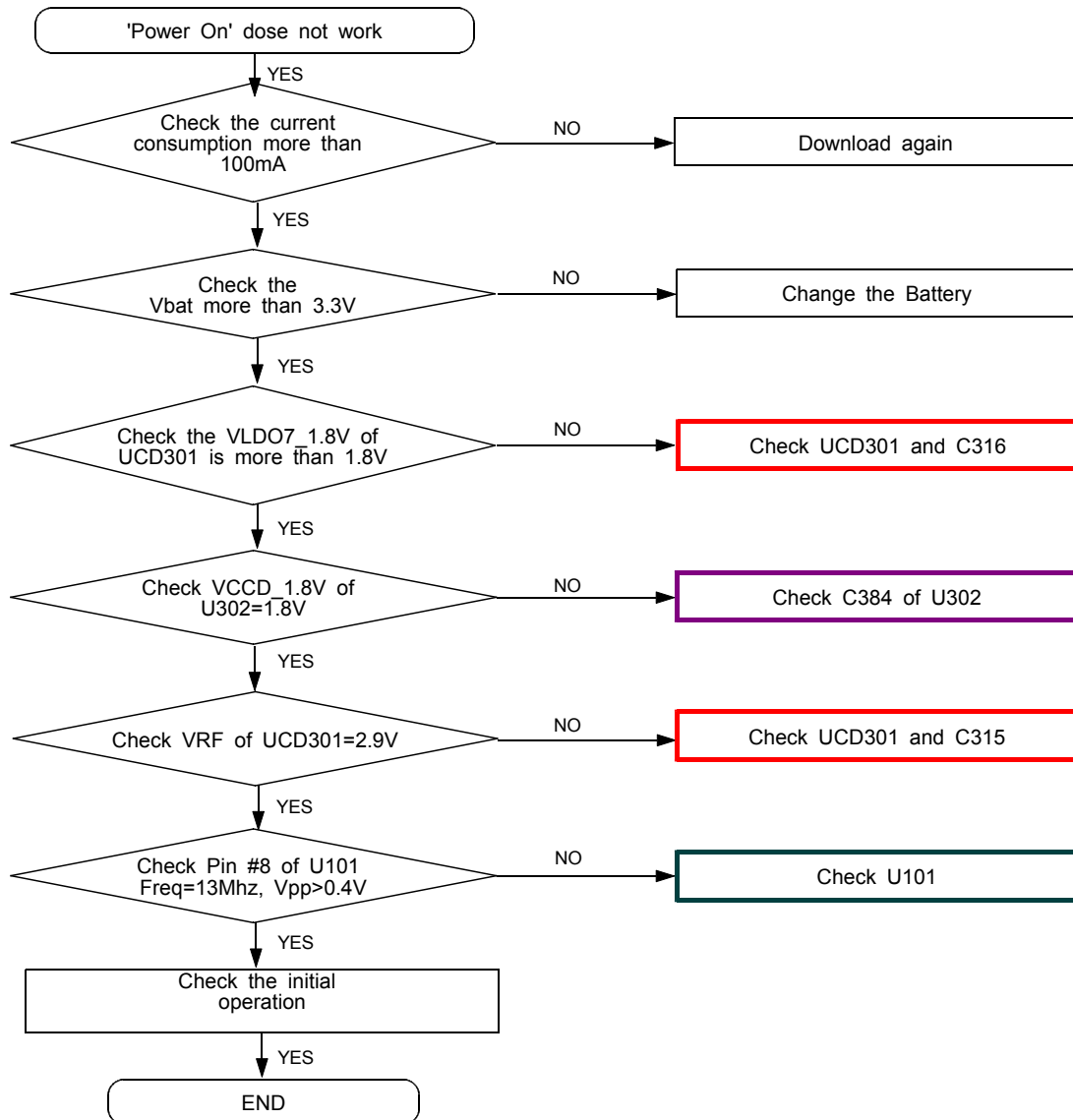
※ **caution**

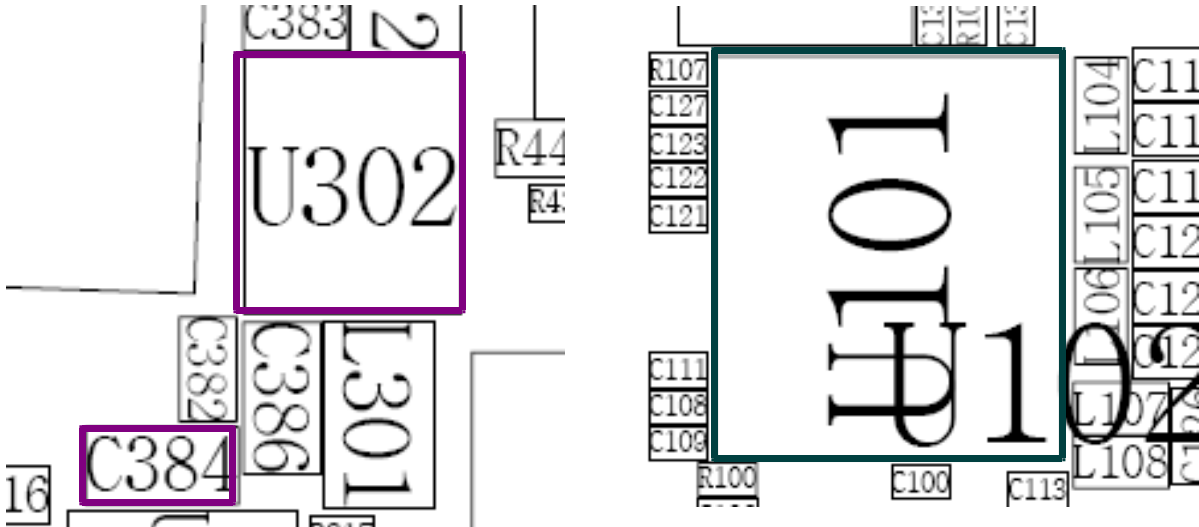
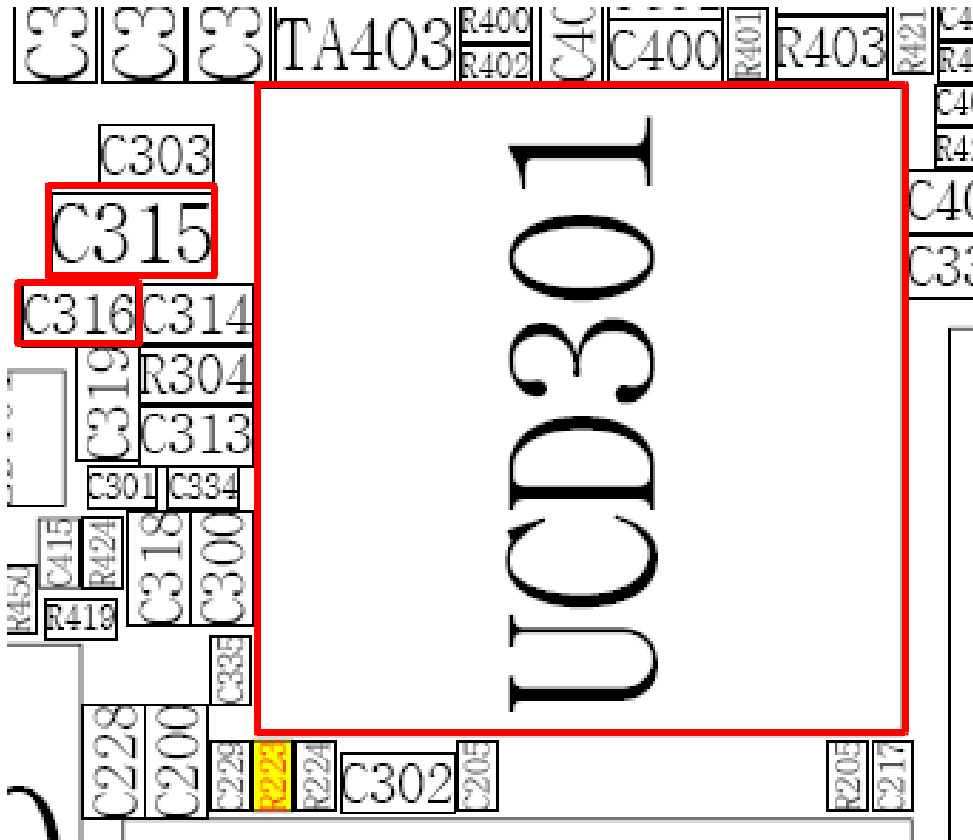
1. Be careful that you do not damage SIDE F-PCB when assembling a REAR. (A F-PCB can be interfered with SIDE KEY of REAR)
2. Press Antenna part horizontally.
3. Check GAP is exist after finish assembly.

### 3. Chart of Troubleshooting

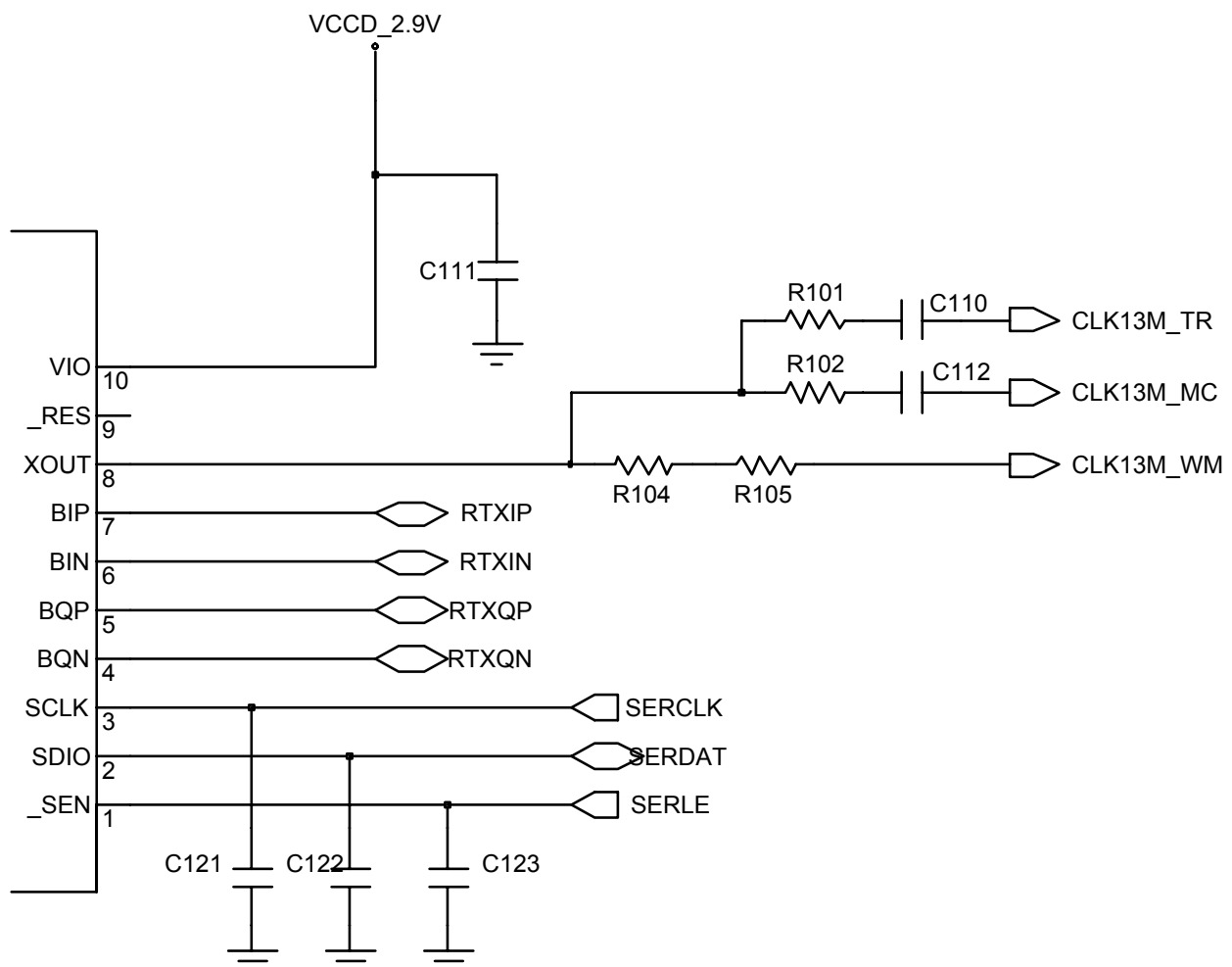
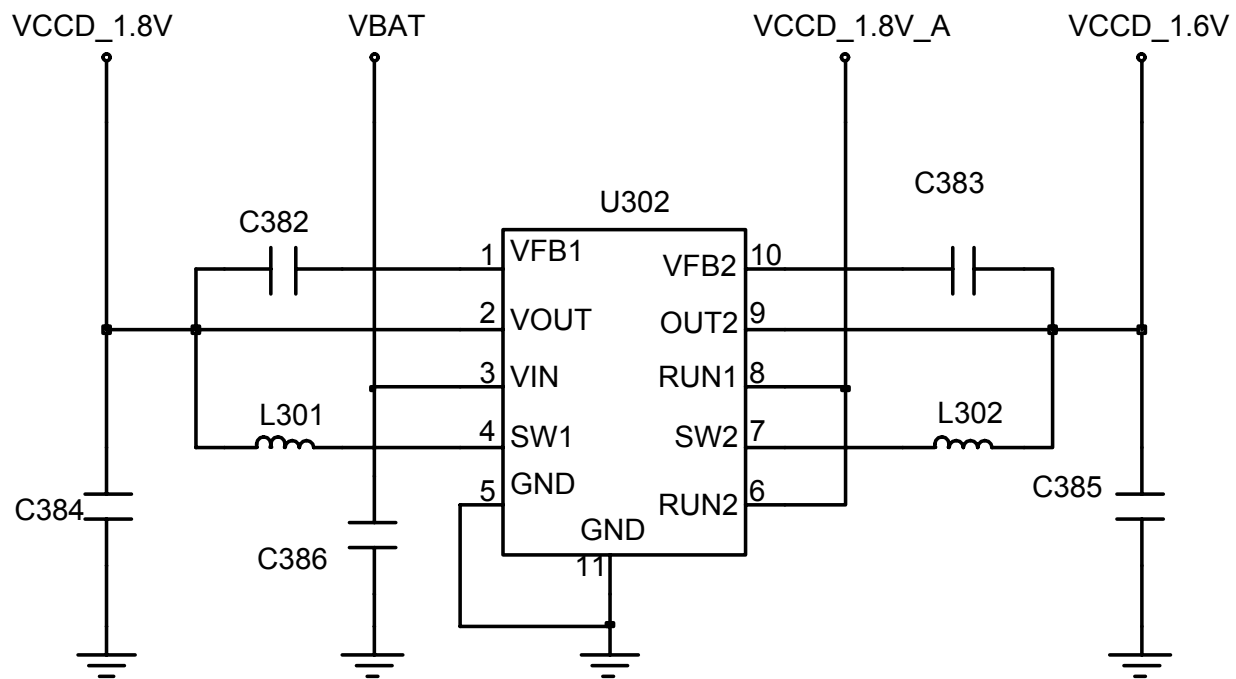
#### 3-1.Baseband

##### 3-1-1. Power ON

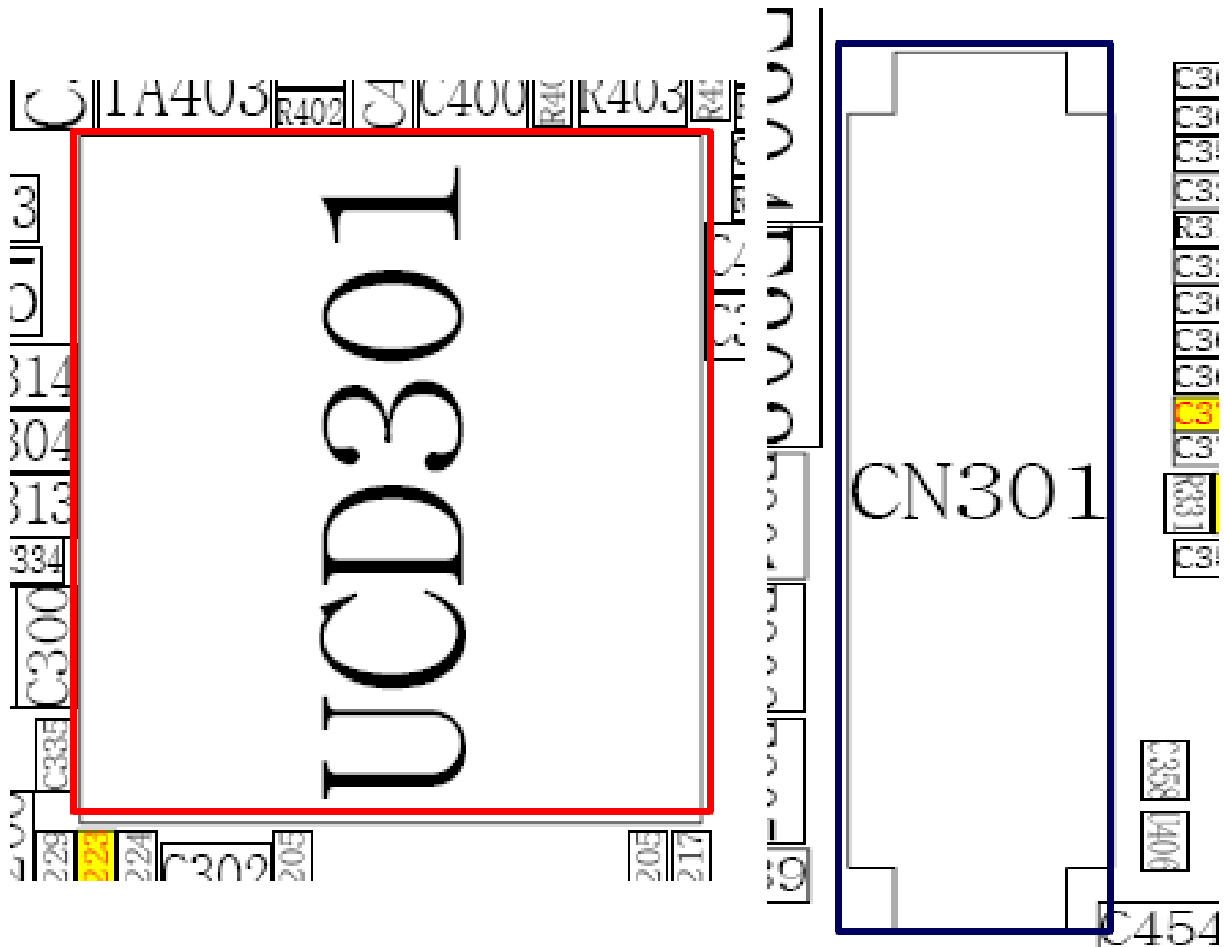
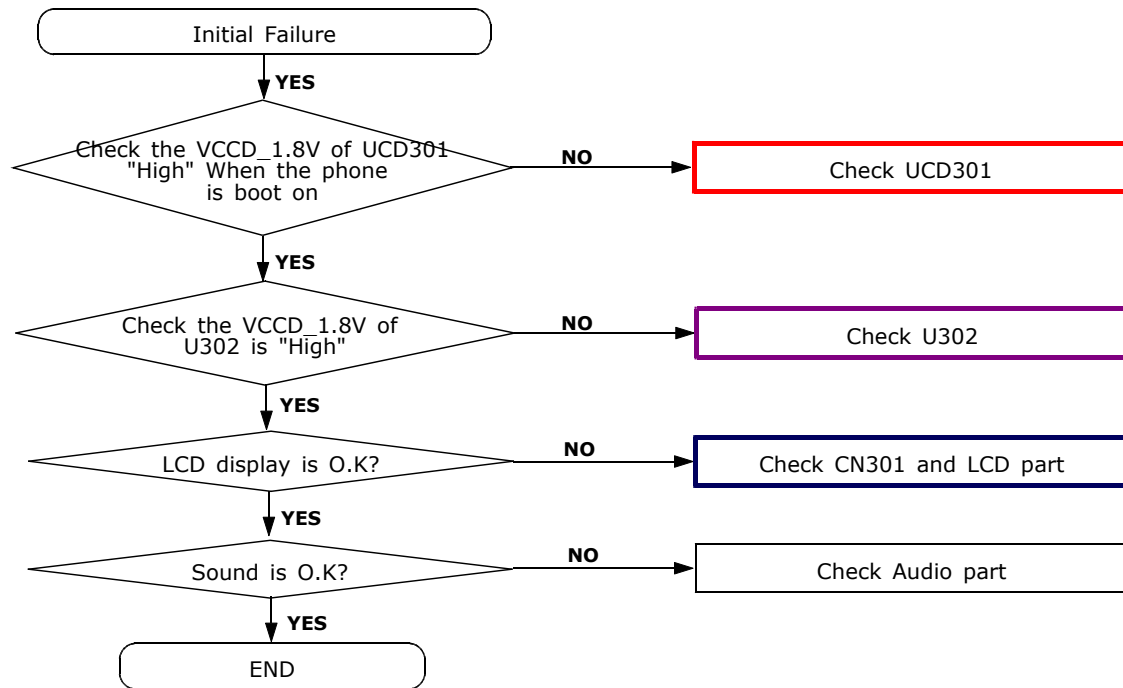






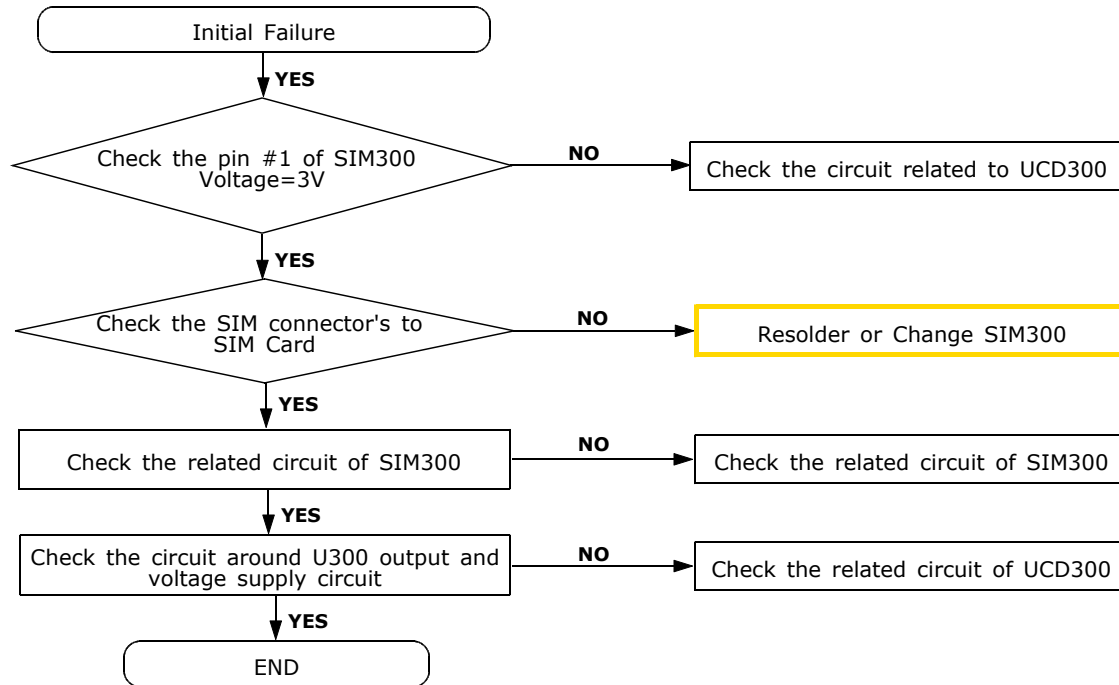


### 3-1-2. System Initial

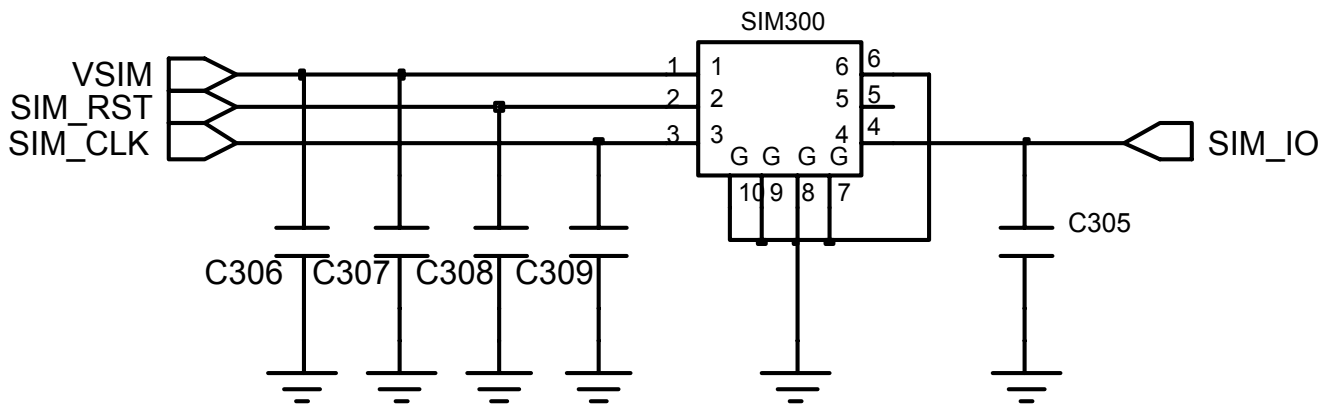
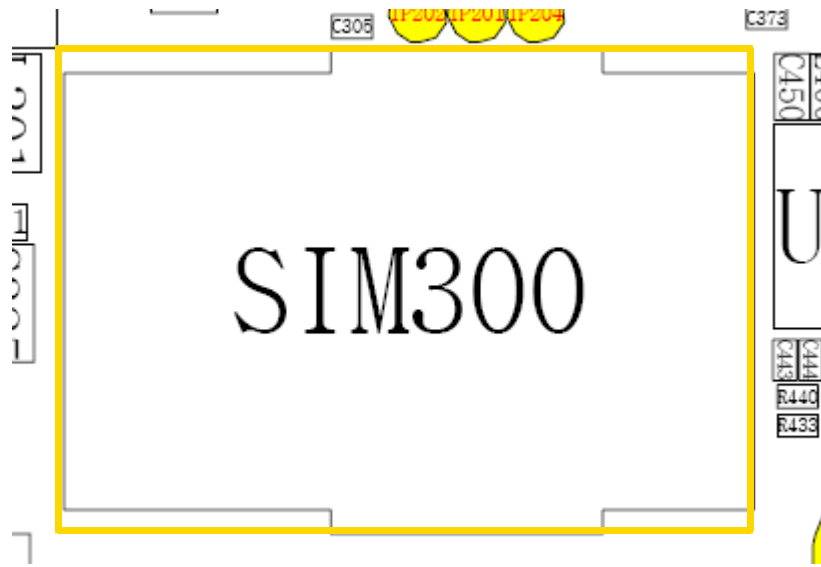




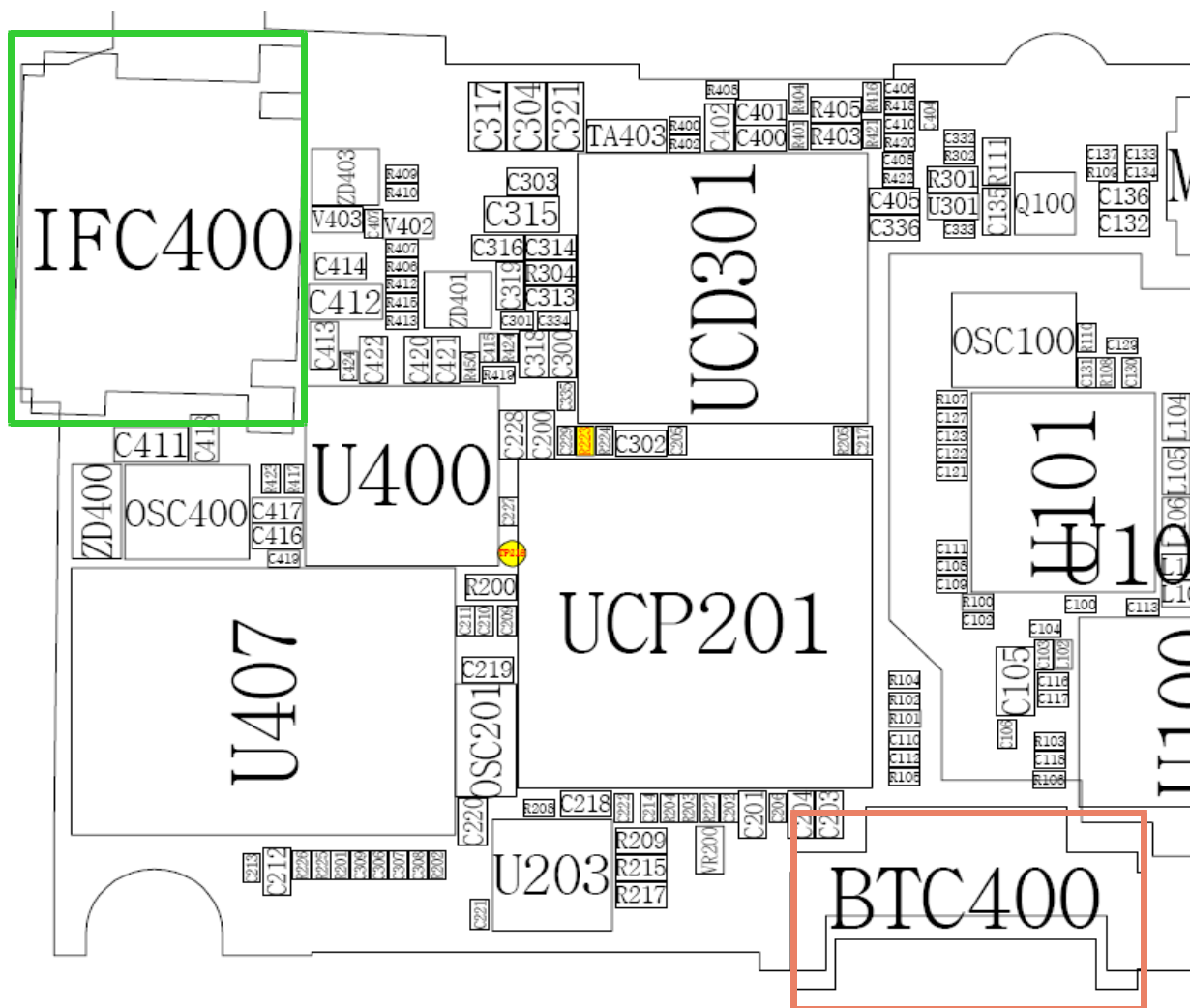
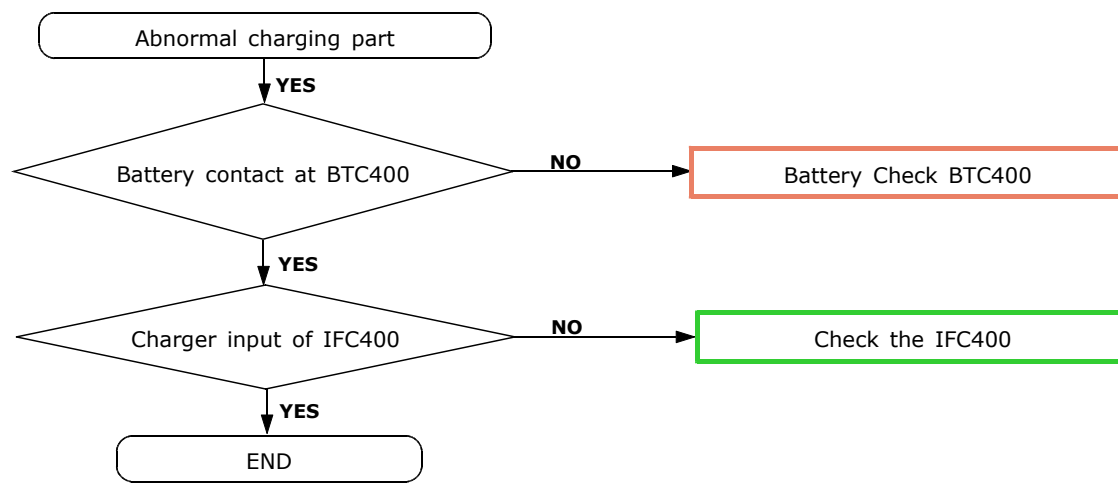
### 3-1-3. SIM Part

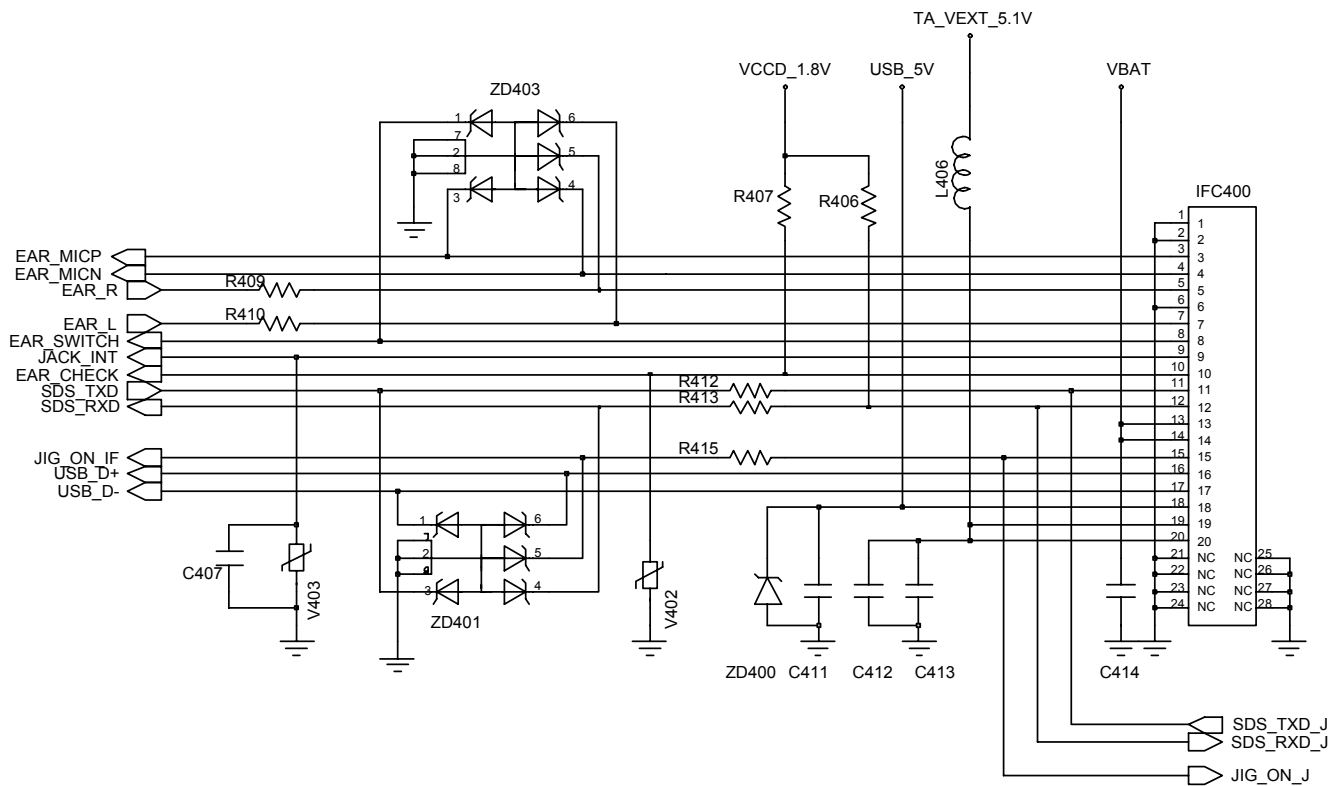
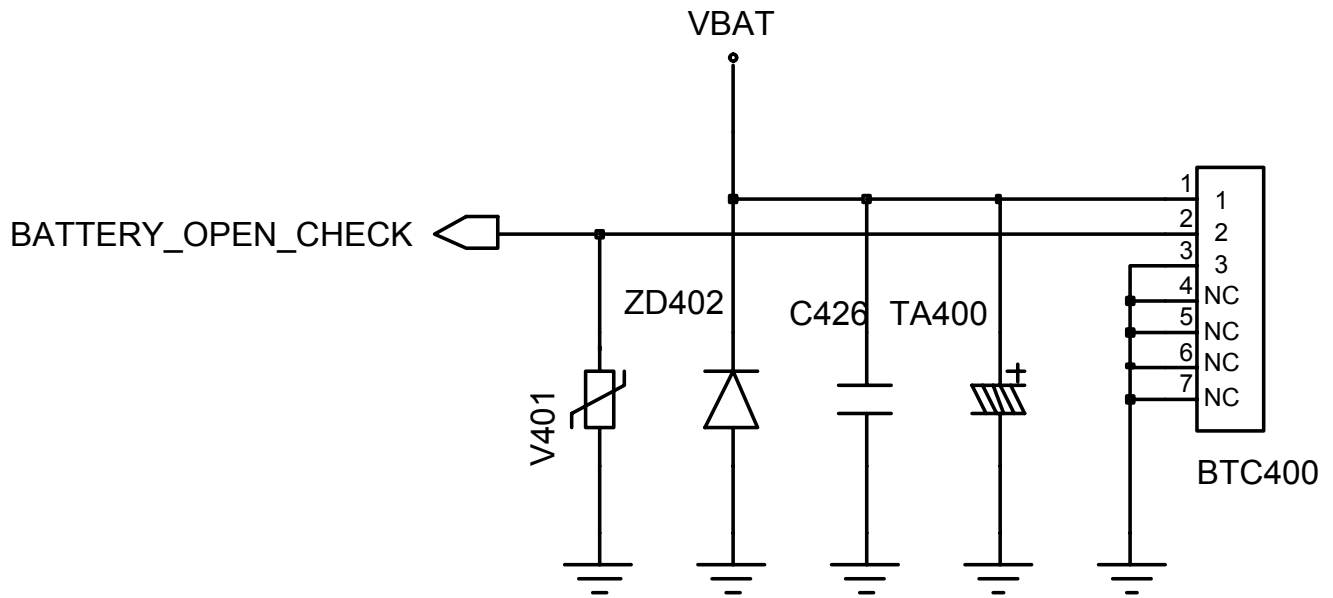




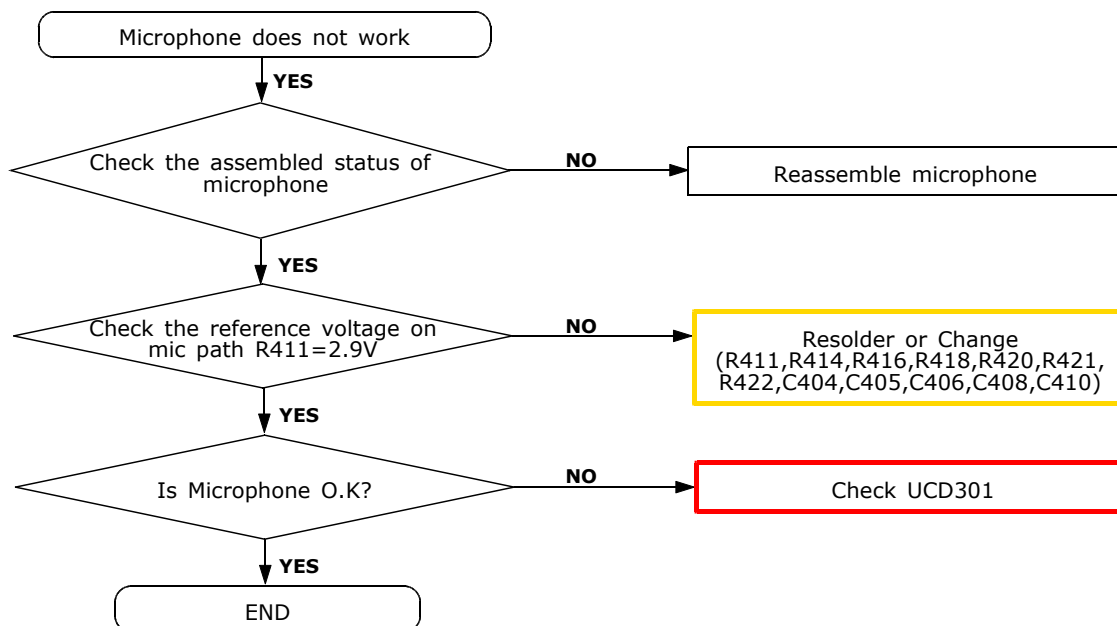


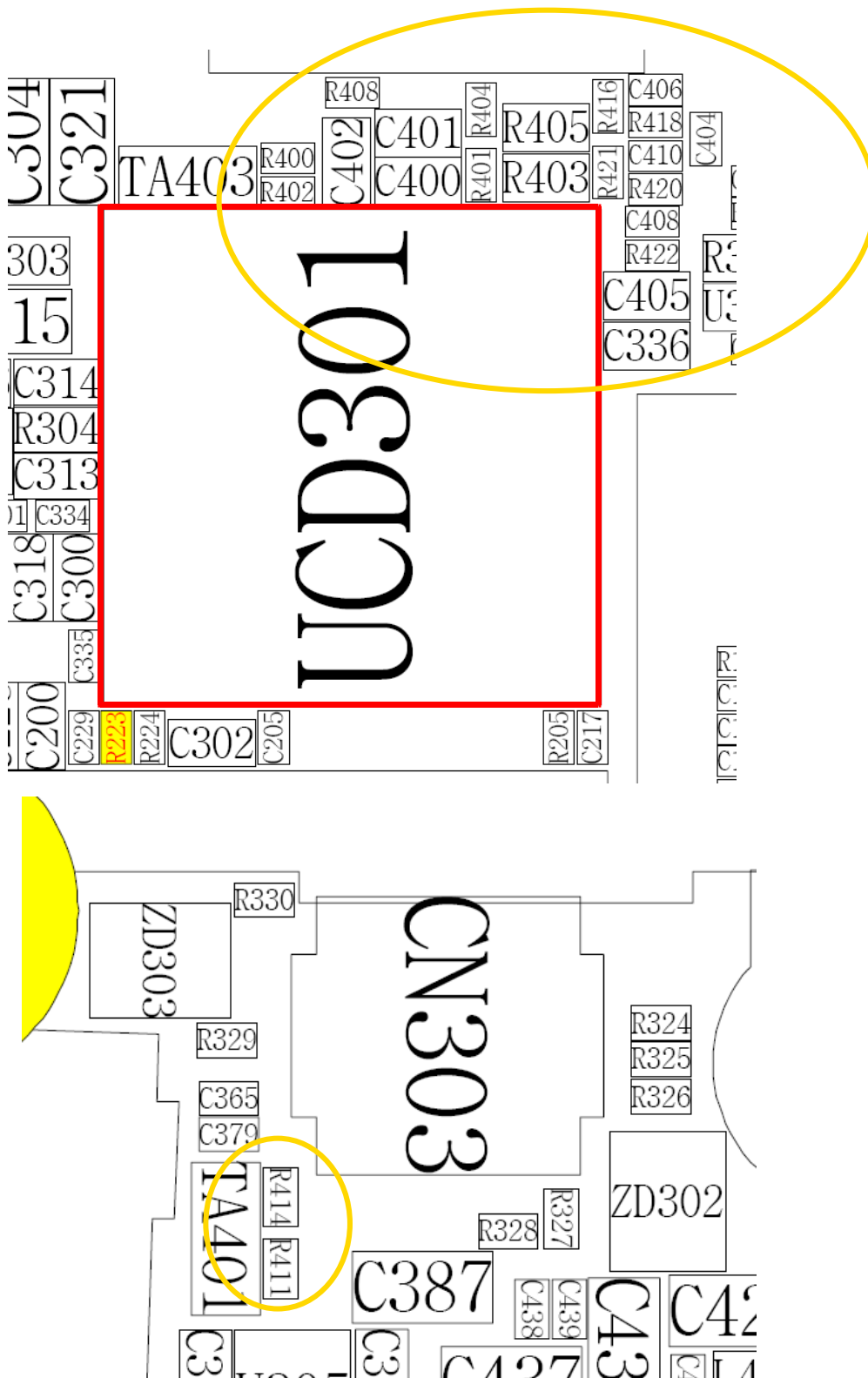
### 3-1-4. Charging Part

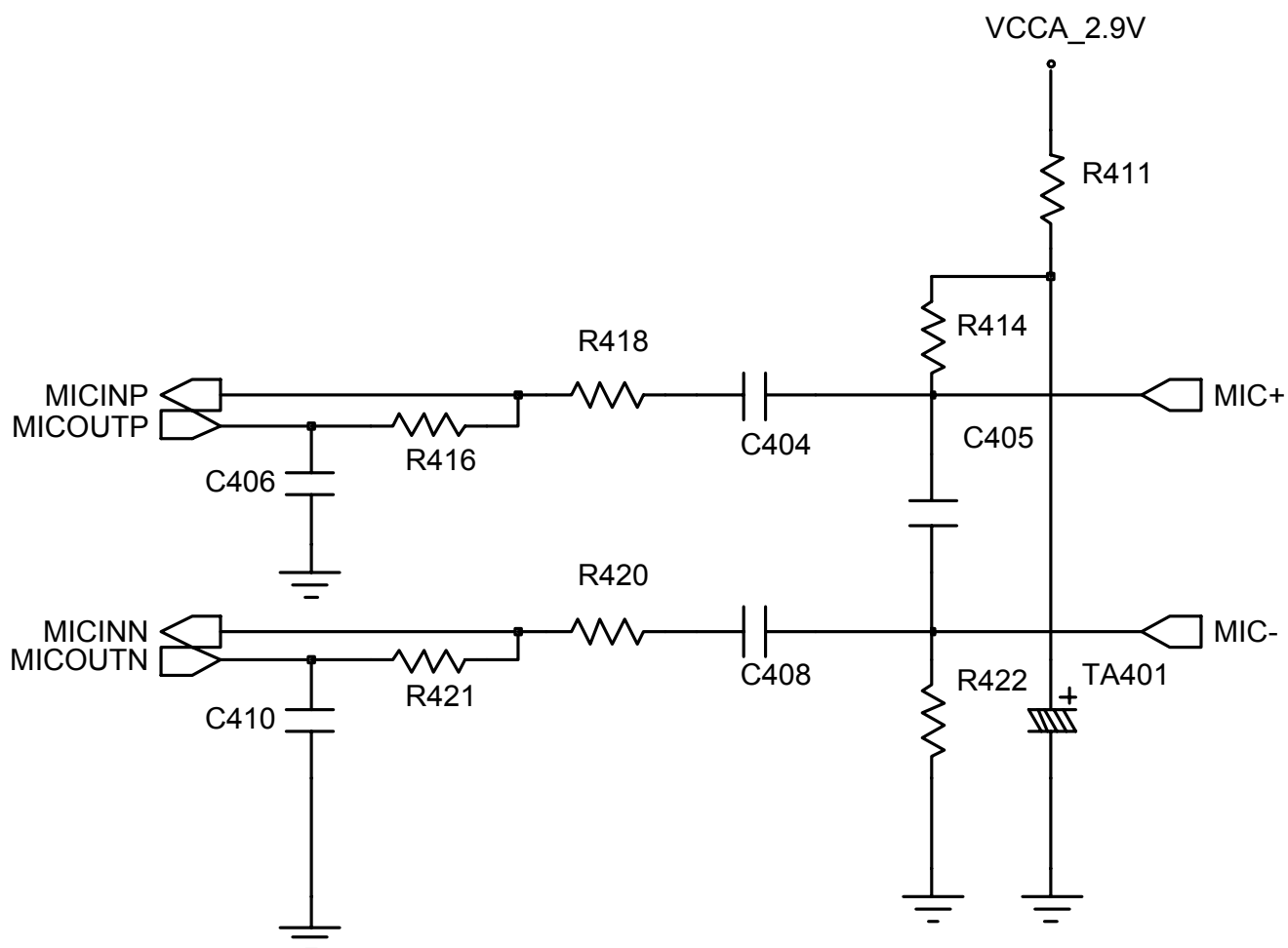




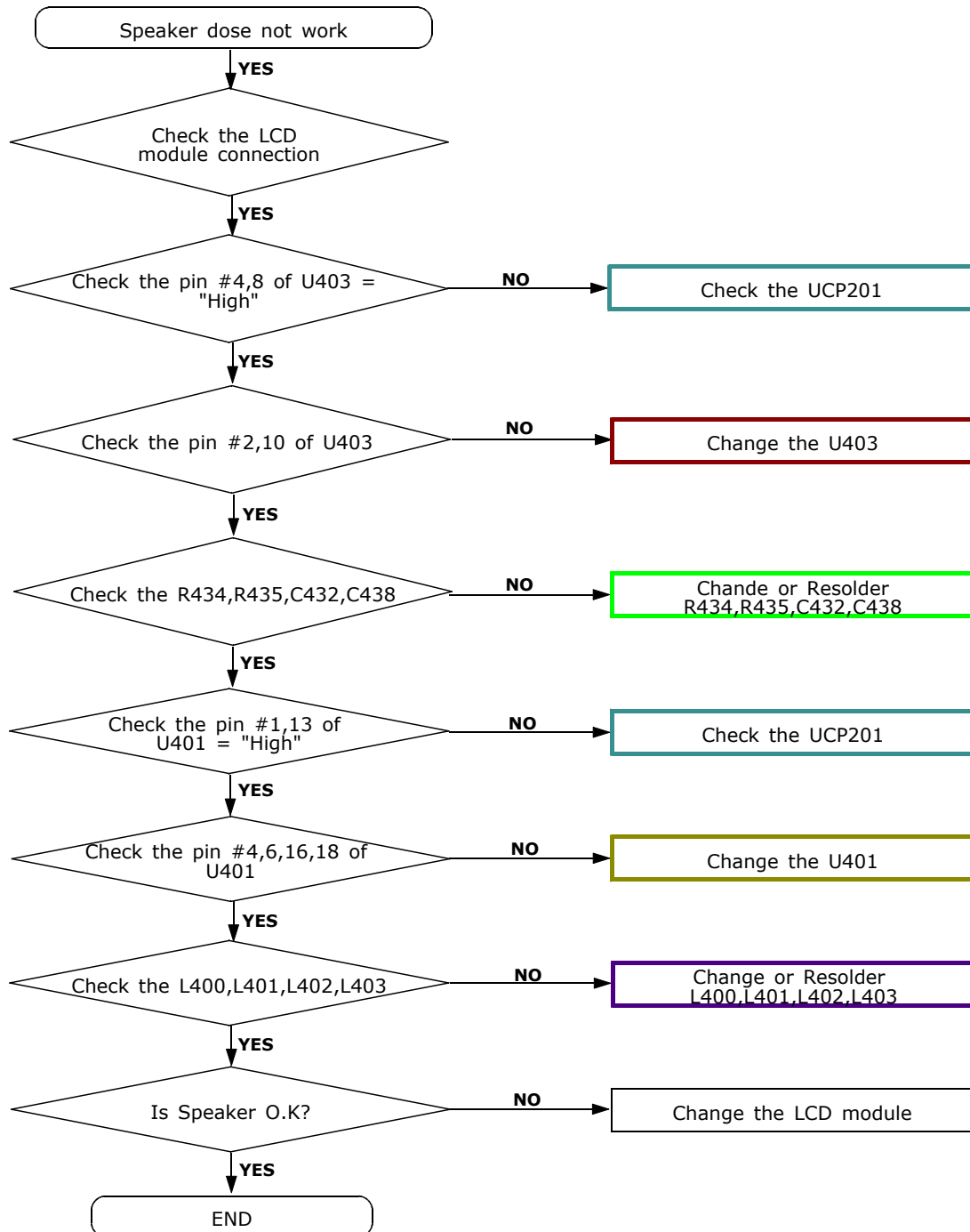
### 3-1-5. Microphone Part

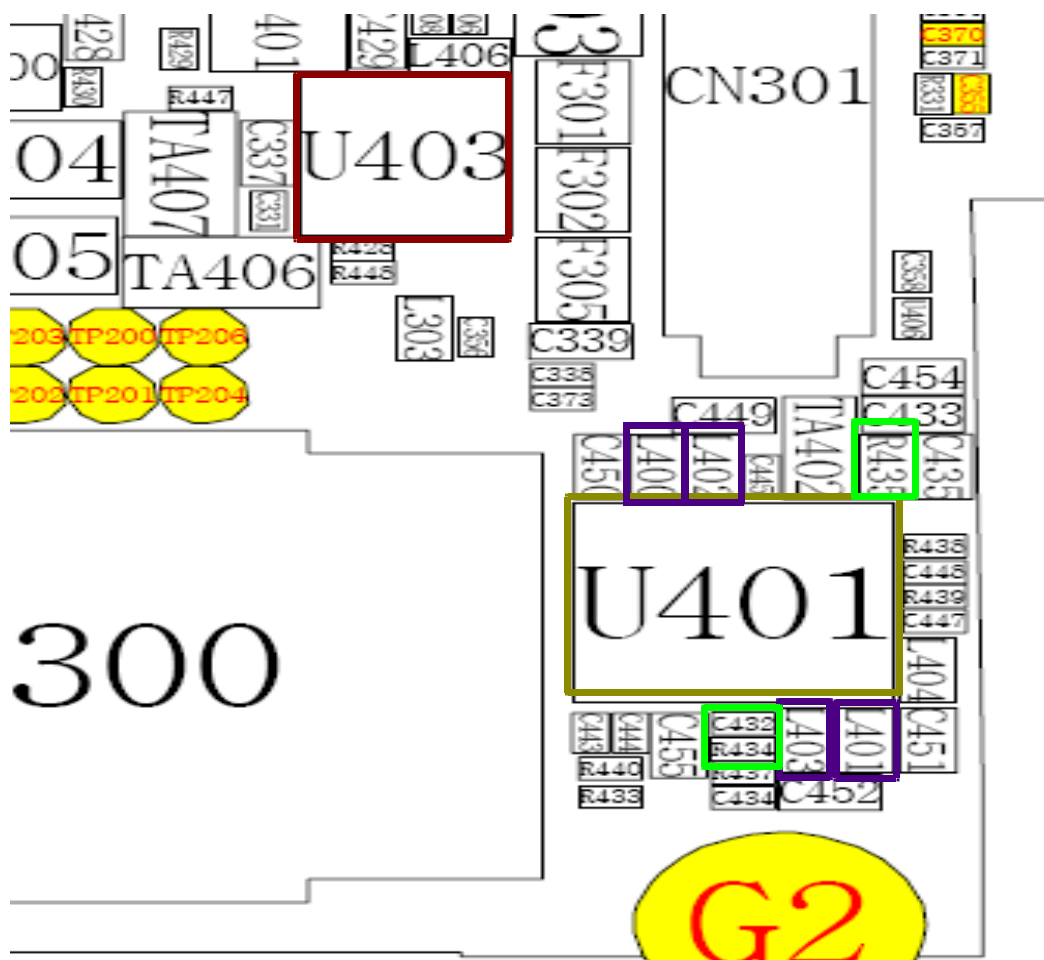
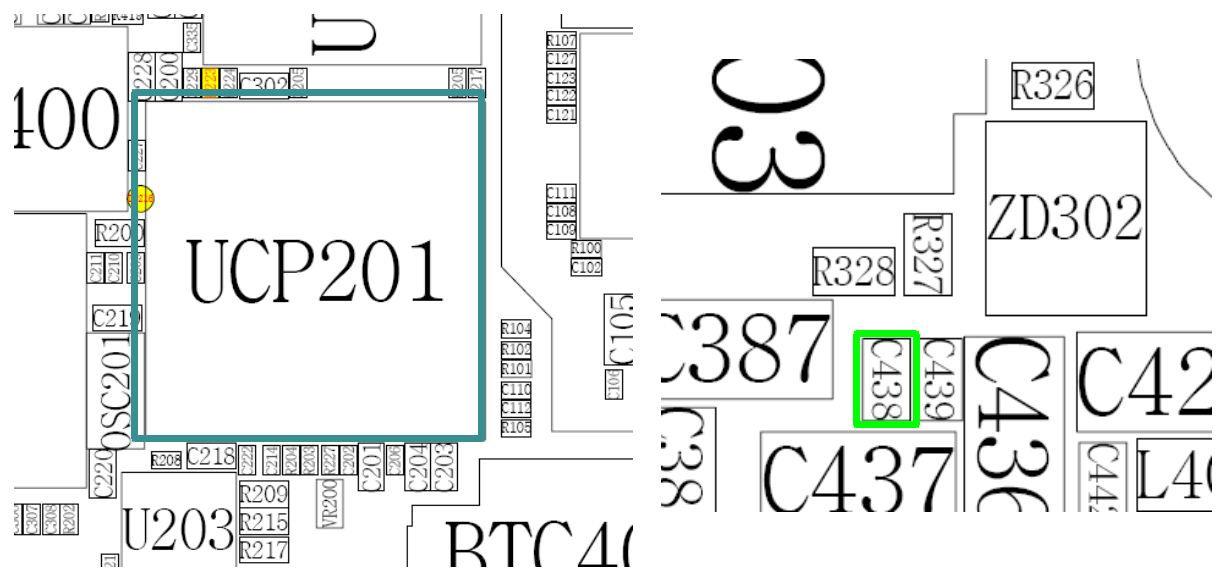






### 3-1-6. Speaker Part

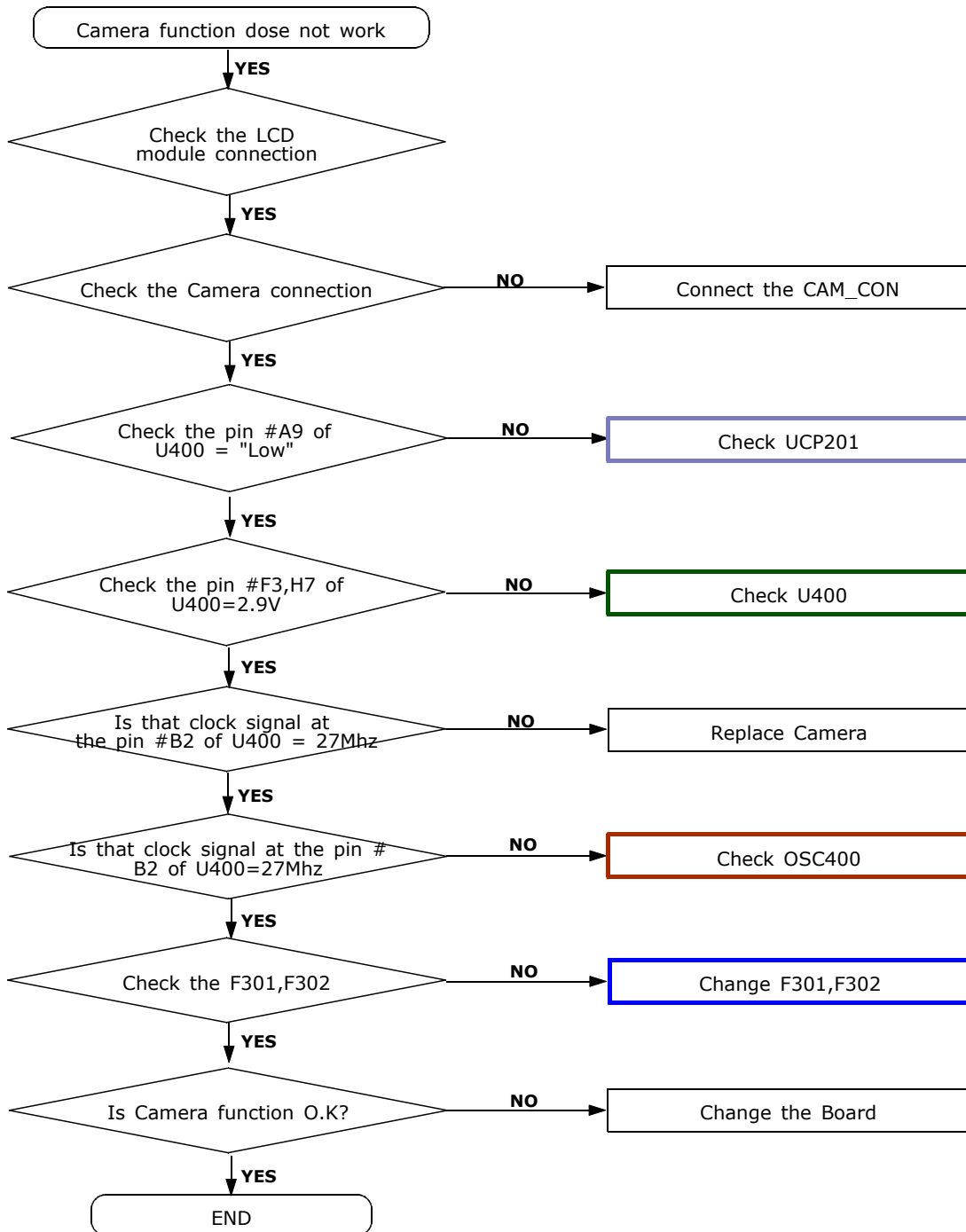


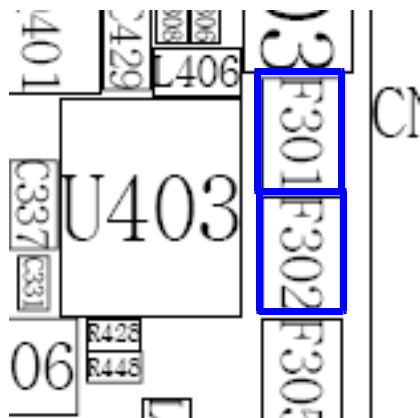
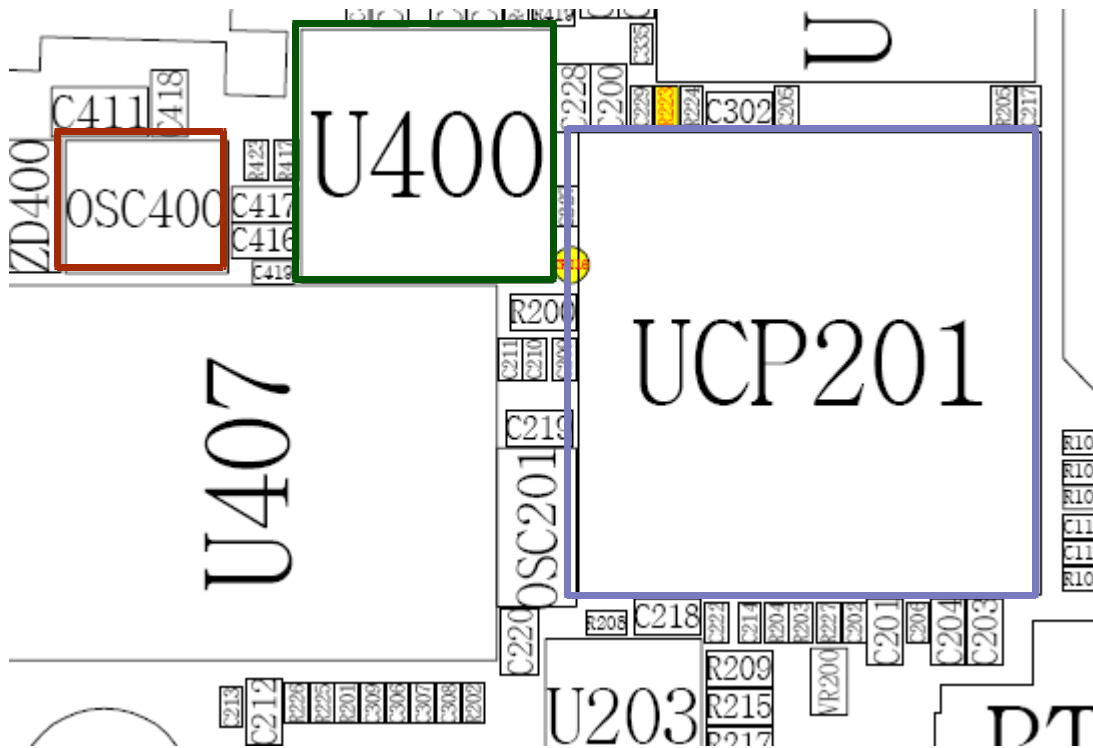


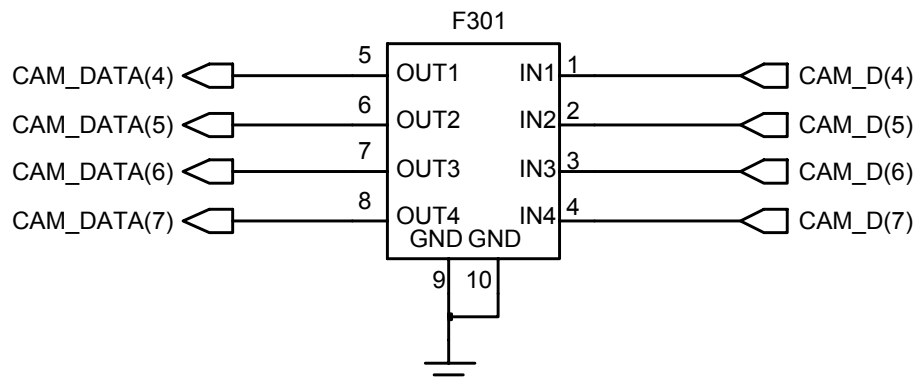
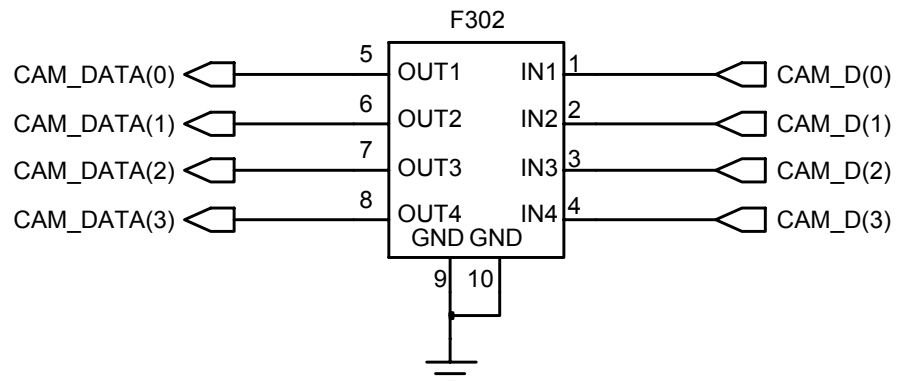
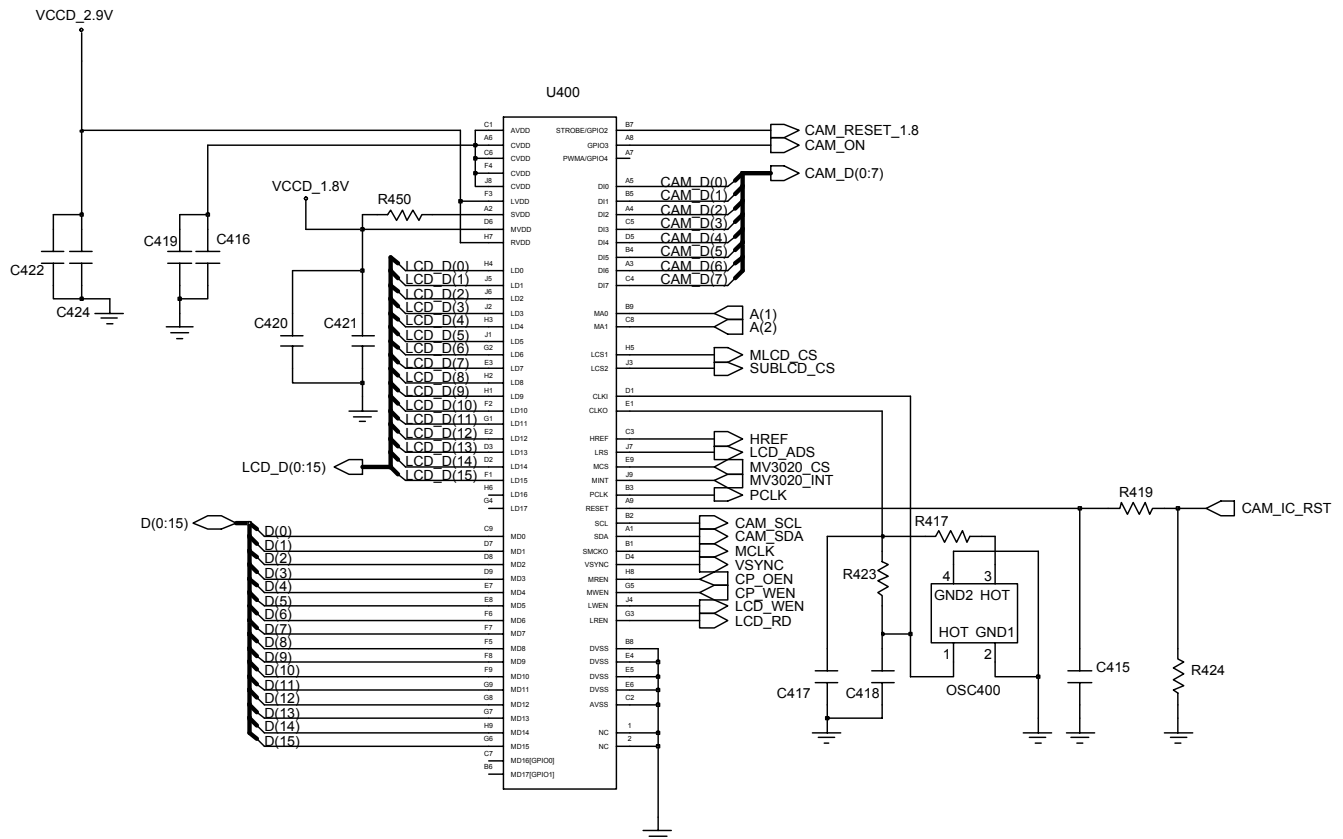




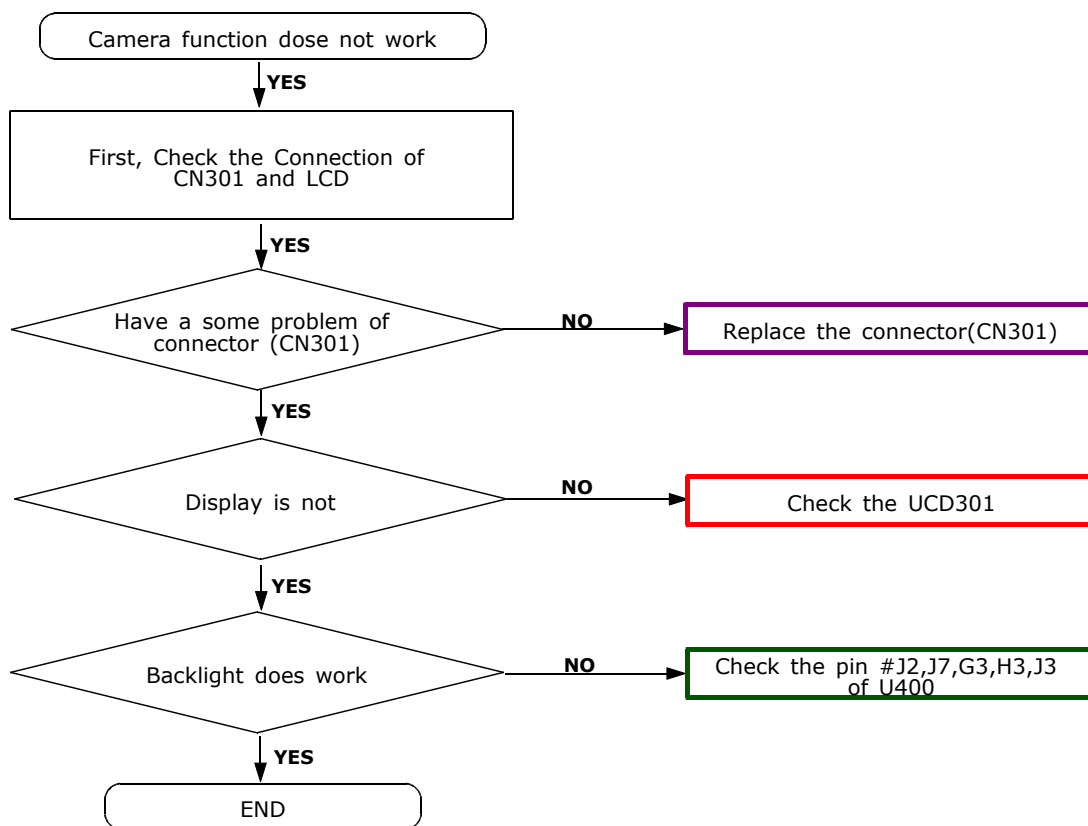
### 3-1-7. Camera Part



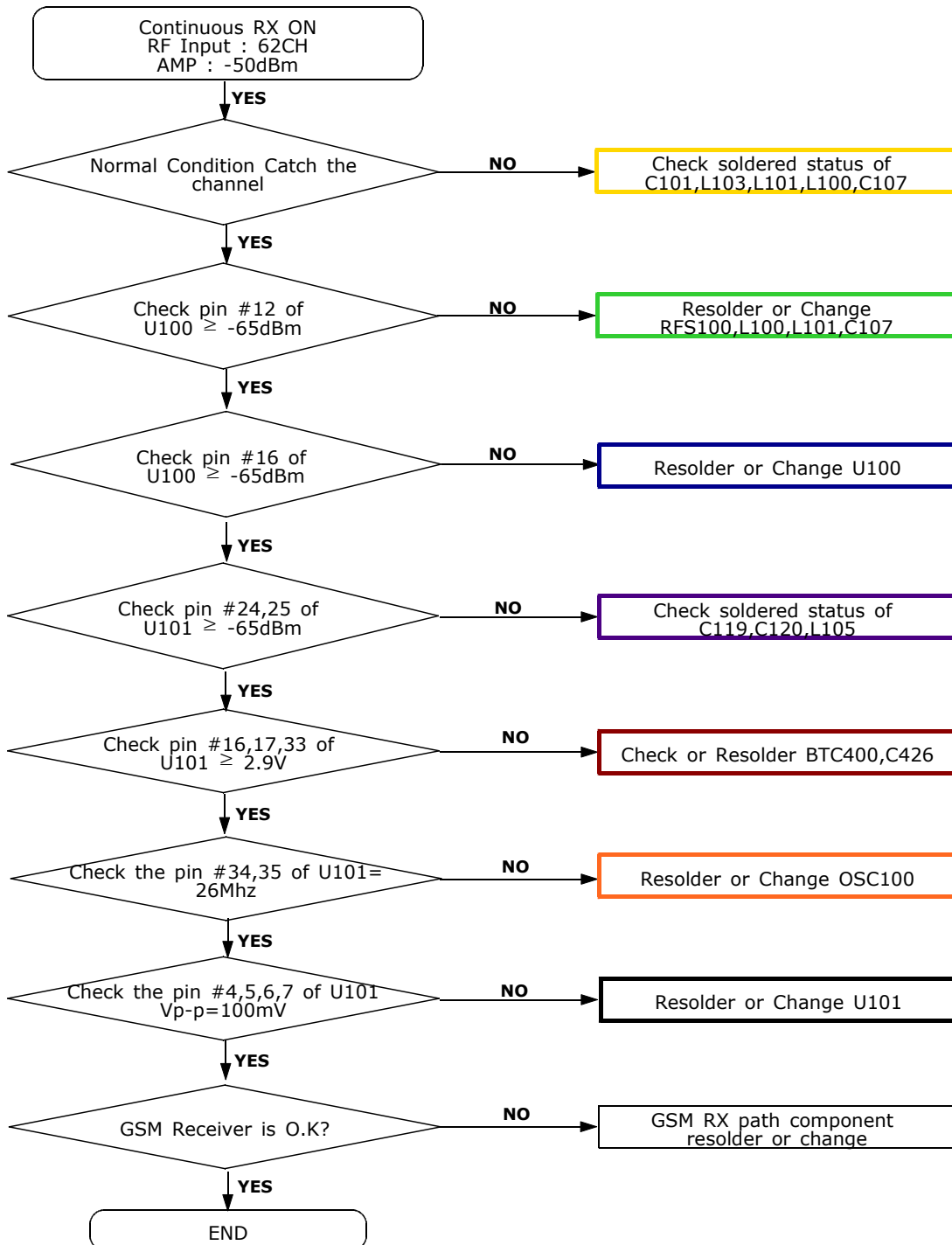




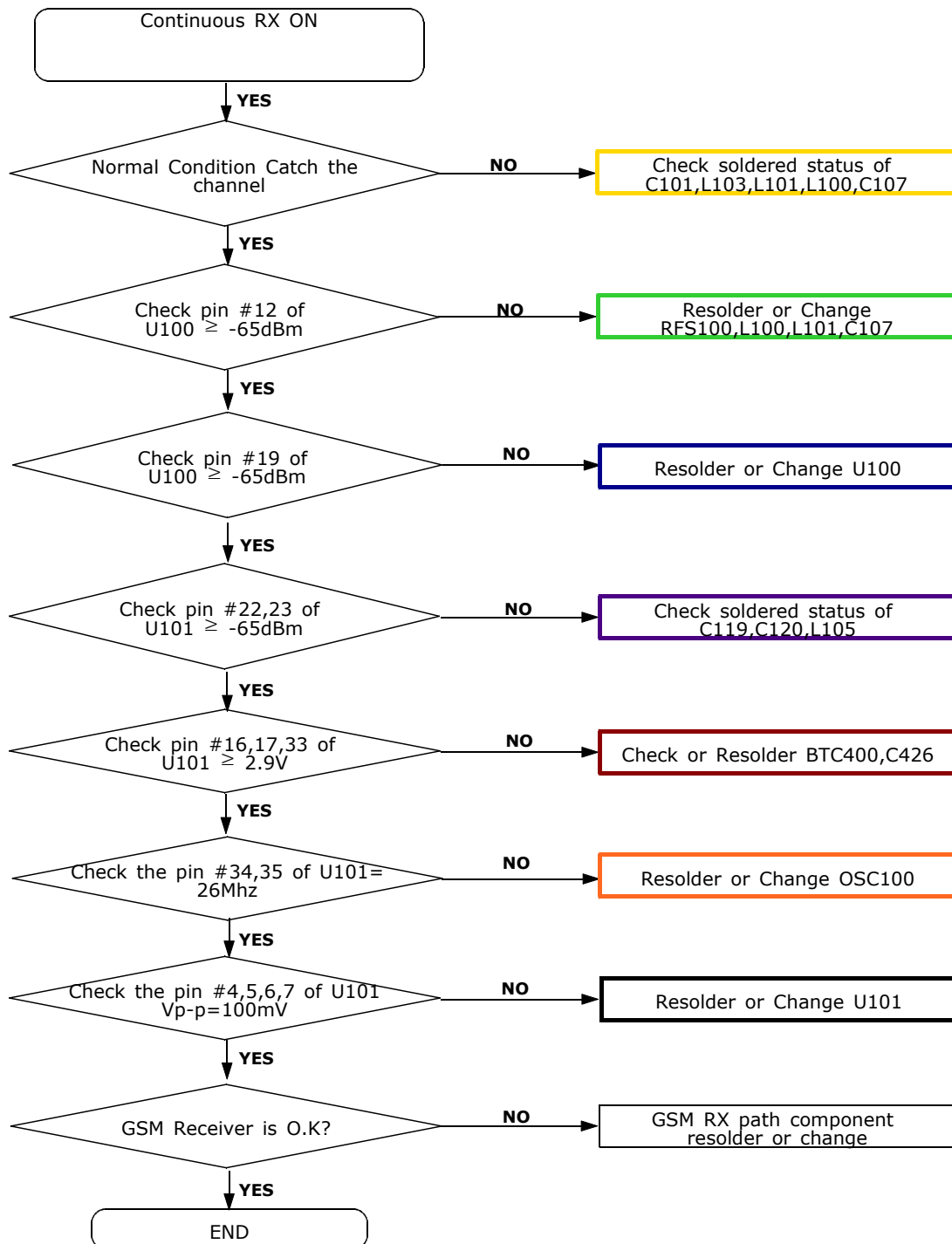
### 3-1-8. LCD





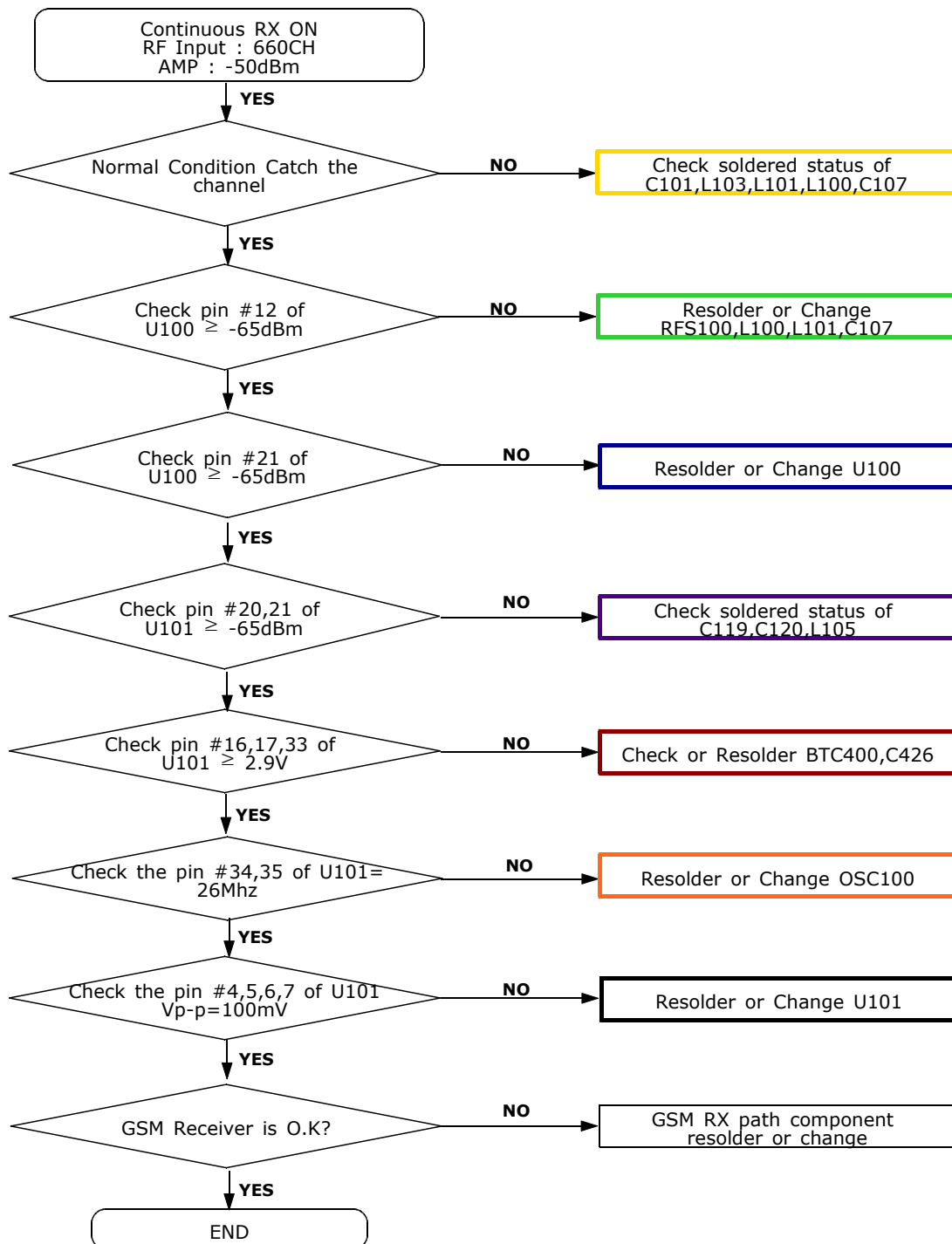
**3-2.RF****3-2-1. EGSM Rx**

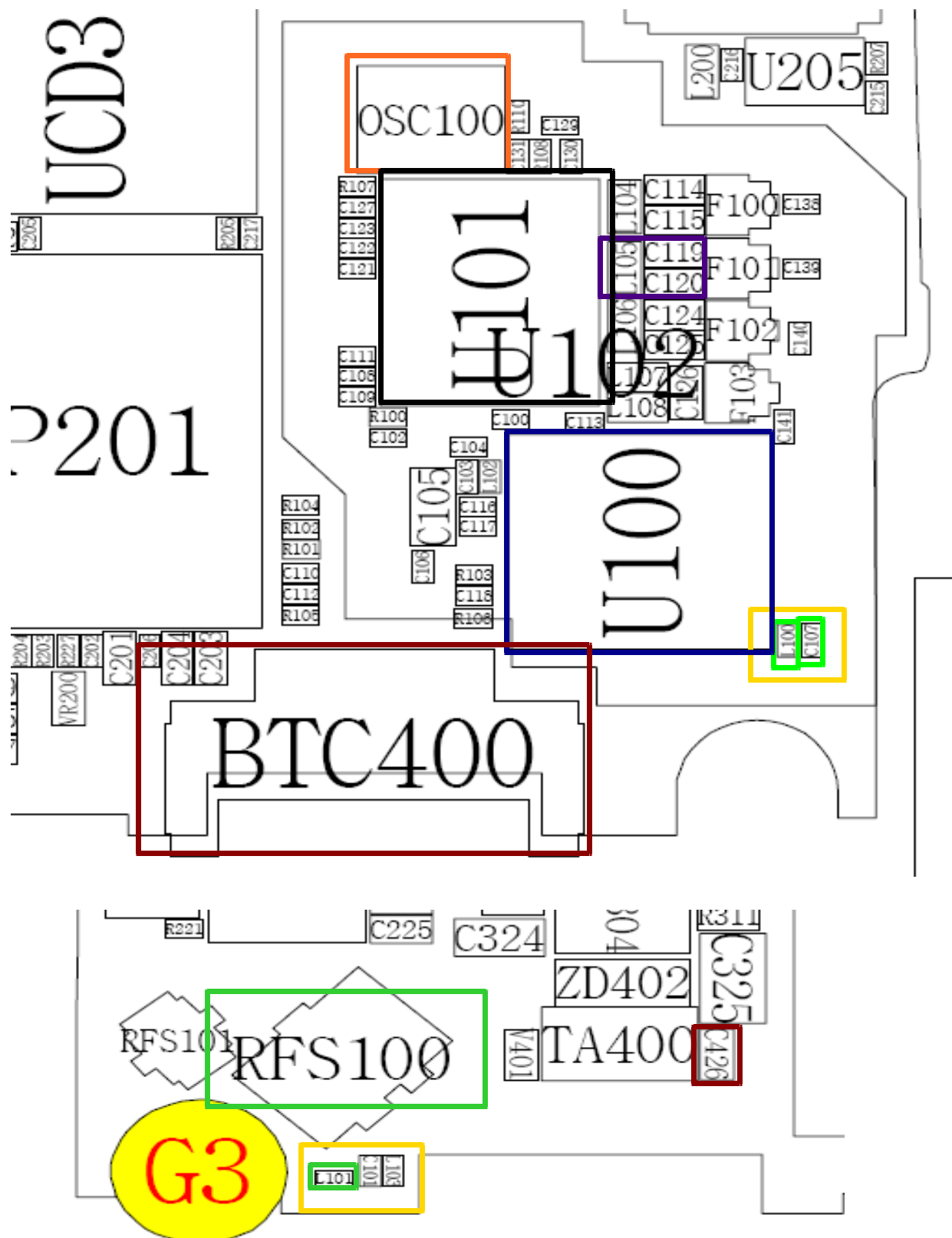
## 3-2-2. DCS Rx



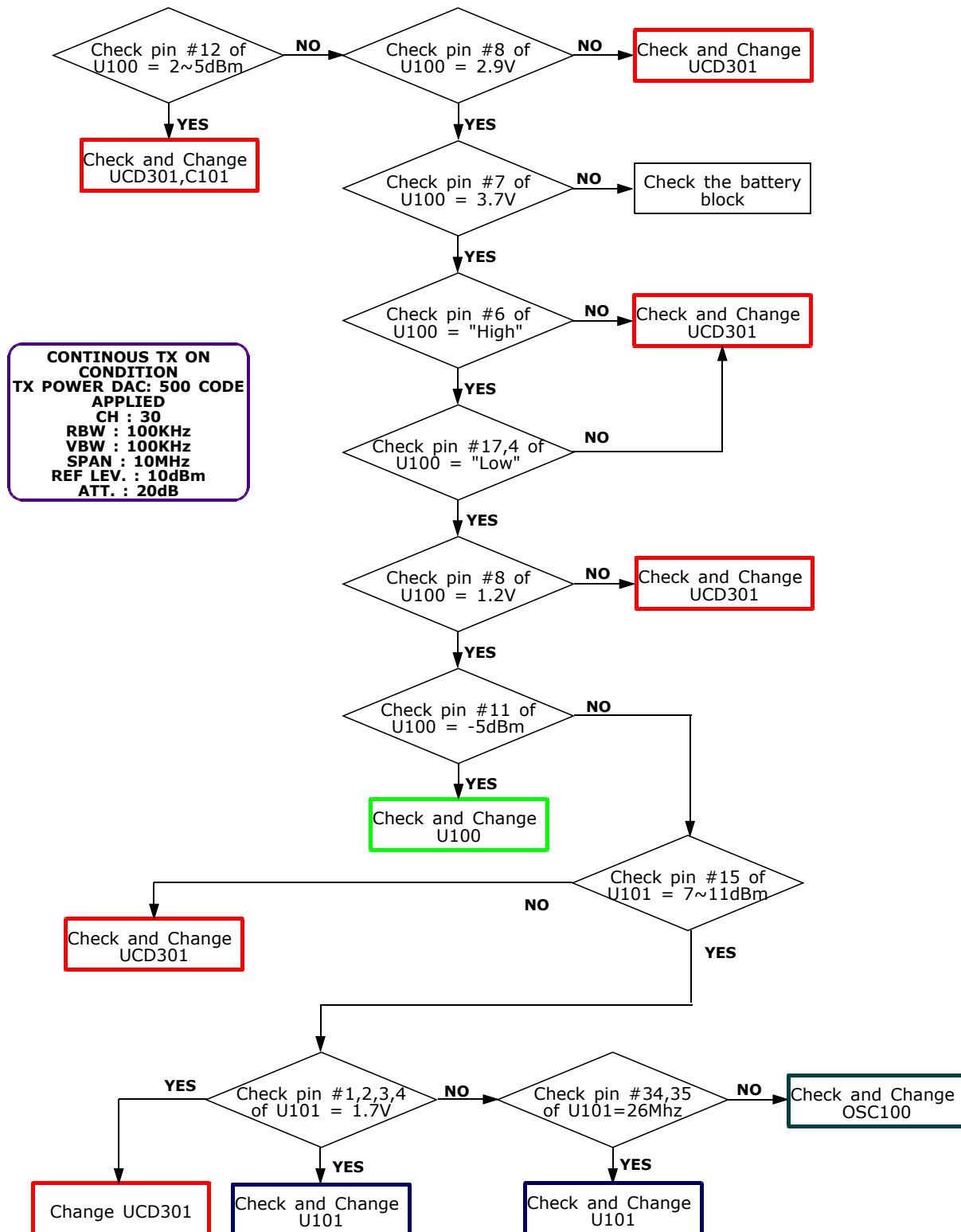


### 3-2-3. PCS Rx

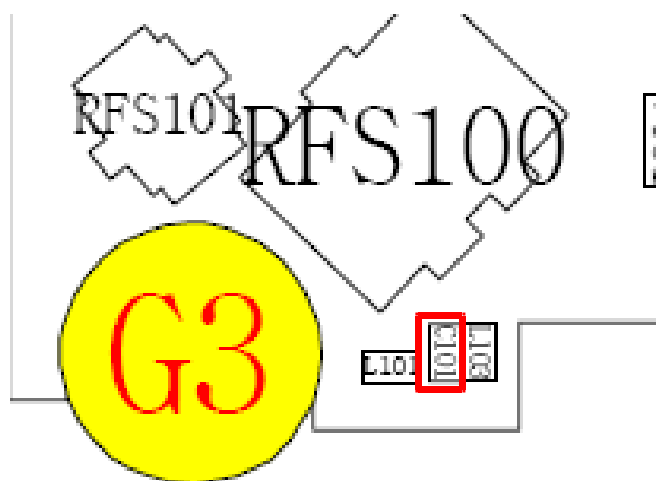
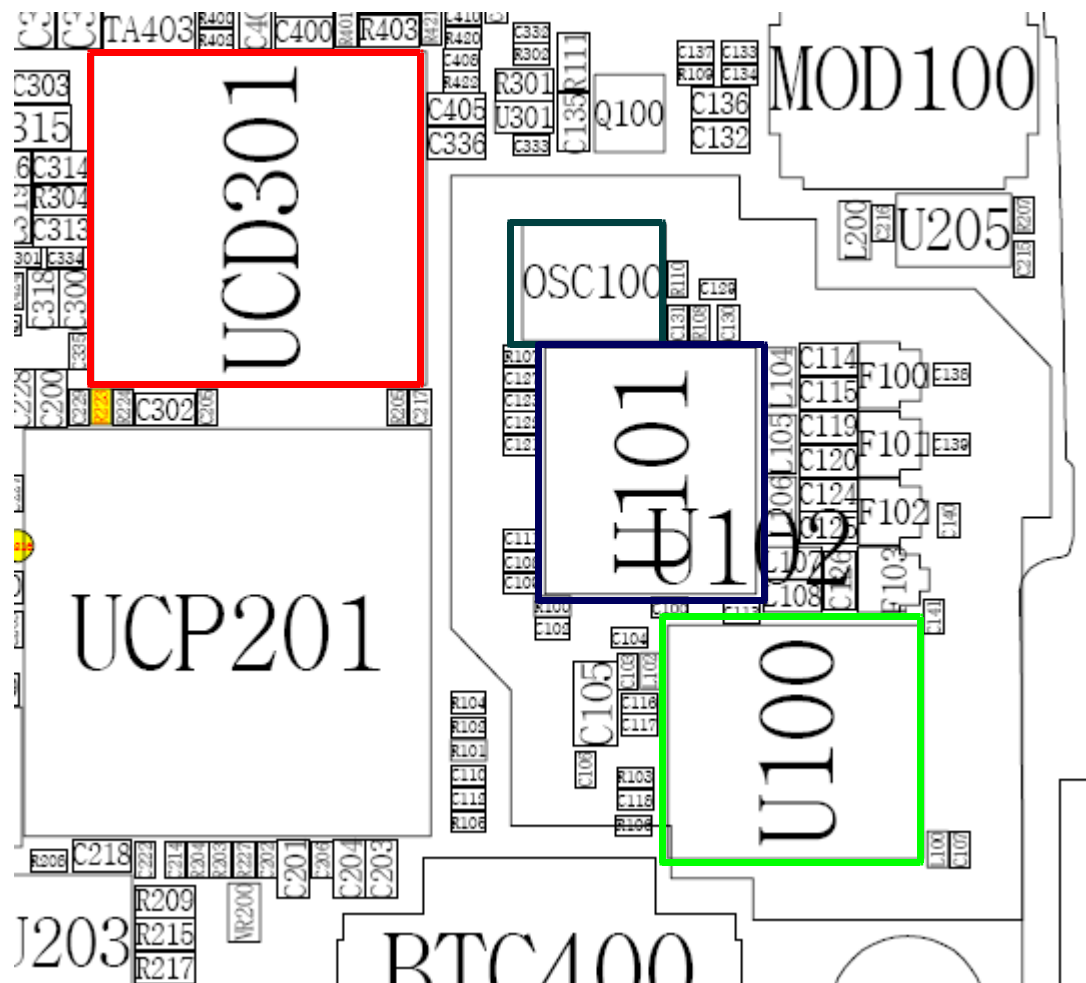




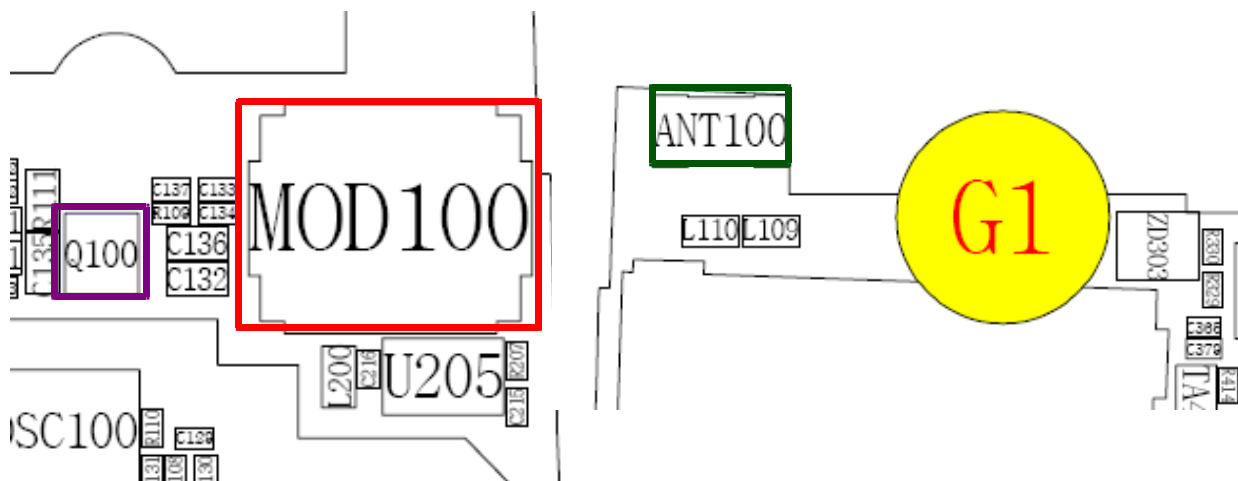
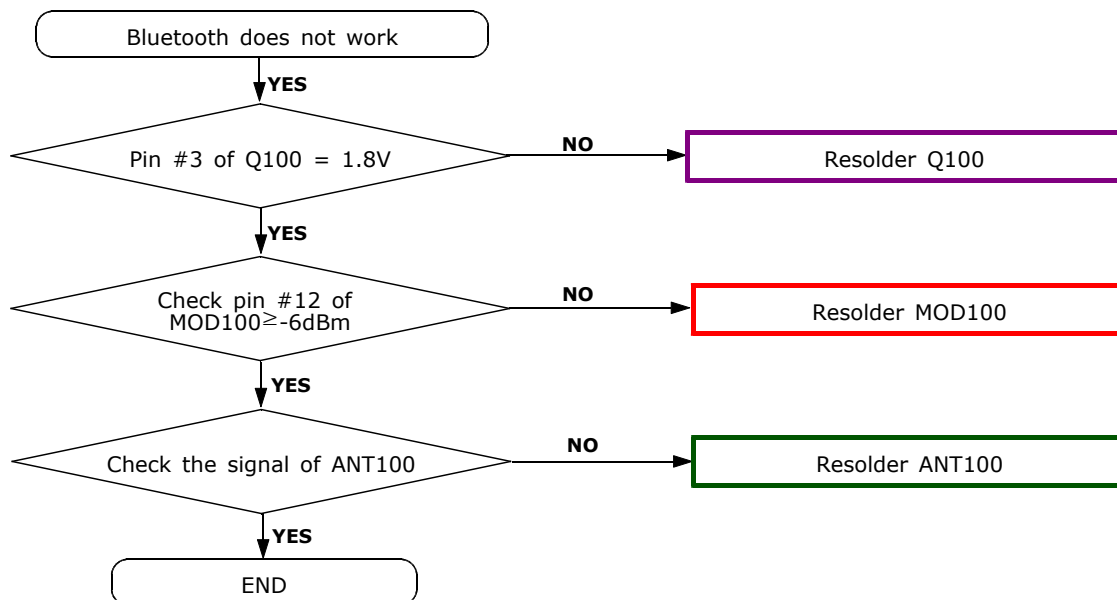
## 3-2-4. EGSM Tx

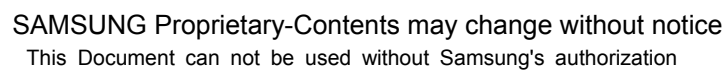






### 3-2-6. BLUETOOTH

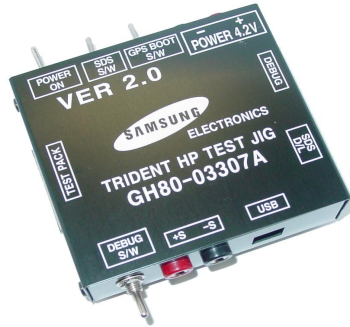




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## 4. Array course control

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**Test Jig (GH80-03307A)**



**Test Cable (GH39-00484A)**



**RF Test Cable (GH39-00397A)**



## **Software Downloading**

### **4-1. Downloading Binary Files**

- Three binary files for downloading E900.
  - E490XXYY.s3 : Main source code binary.

### **4-2. Pre-requisite for Downloading**

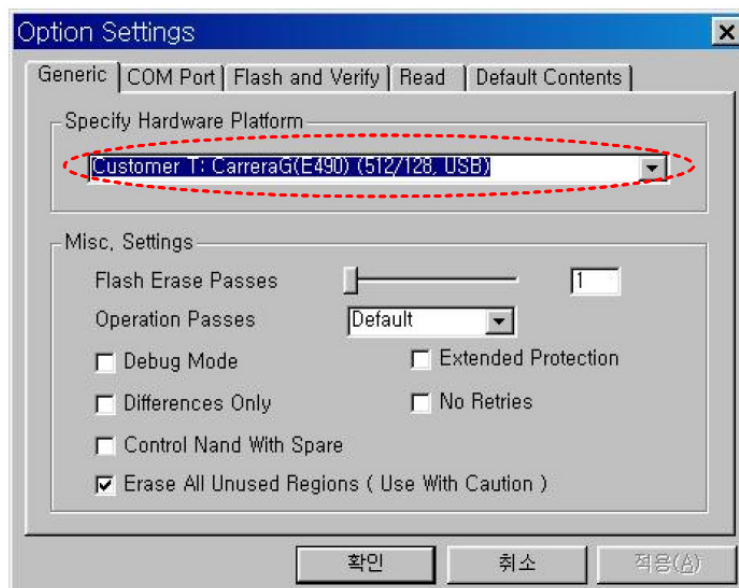
- Downloader Program([OptiFlash.exe](#))
- E490 Mobile Phone
- Data Cable
- Binary files

### 4-3. S/W Downloader Program

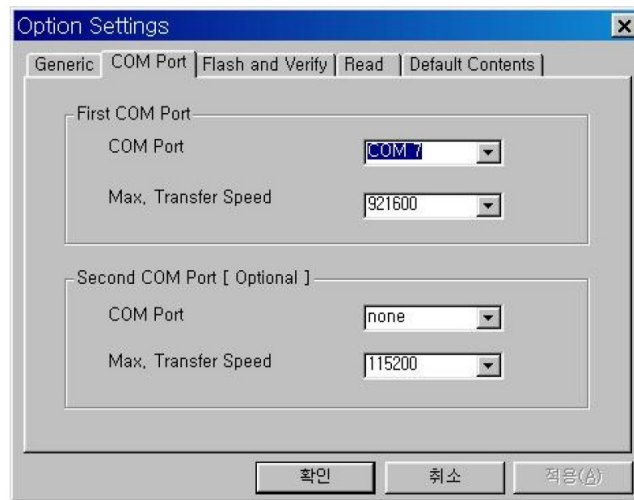
1. Load the binary download program by executing the “**OptiFlash.exe**”



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

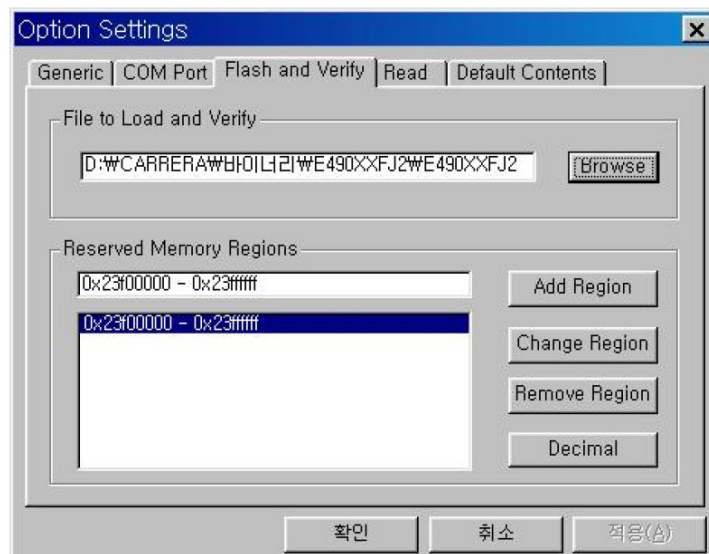


Up to twelve ports are supported. Additionally you can select the maximum transfer speed OptiFlash will use to communicate with the phone. However, OptiFlash will use a slower speed if either the PC's or the phone's serial hardware is incapable of handling the selected speed

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

Set the directory path and choose the latest s/w binary, for example "X810XXYY.s3", for the downloader binary setting.

"



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. :

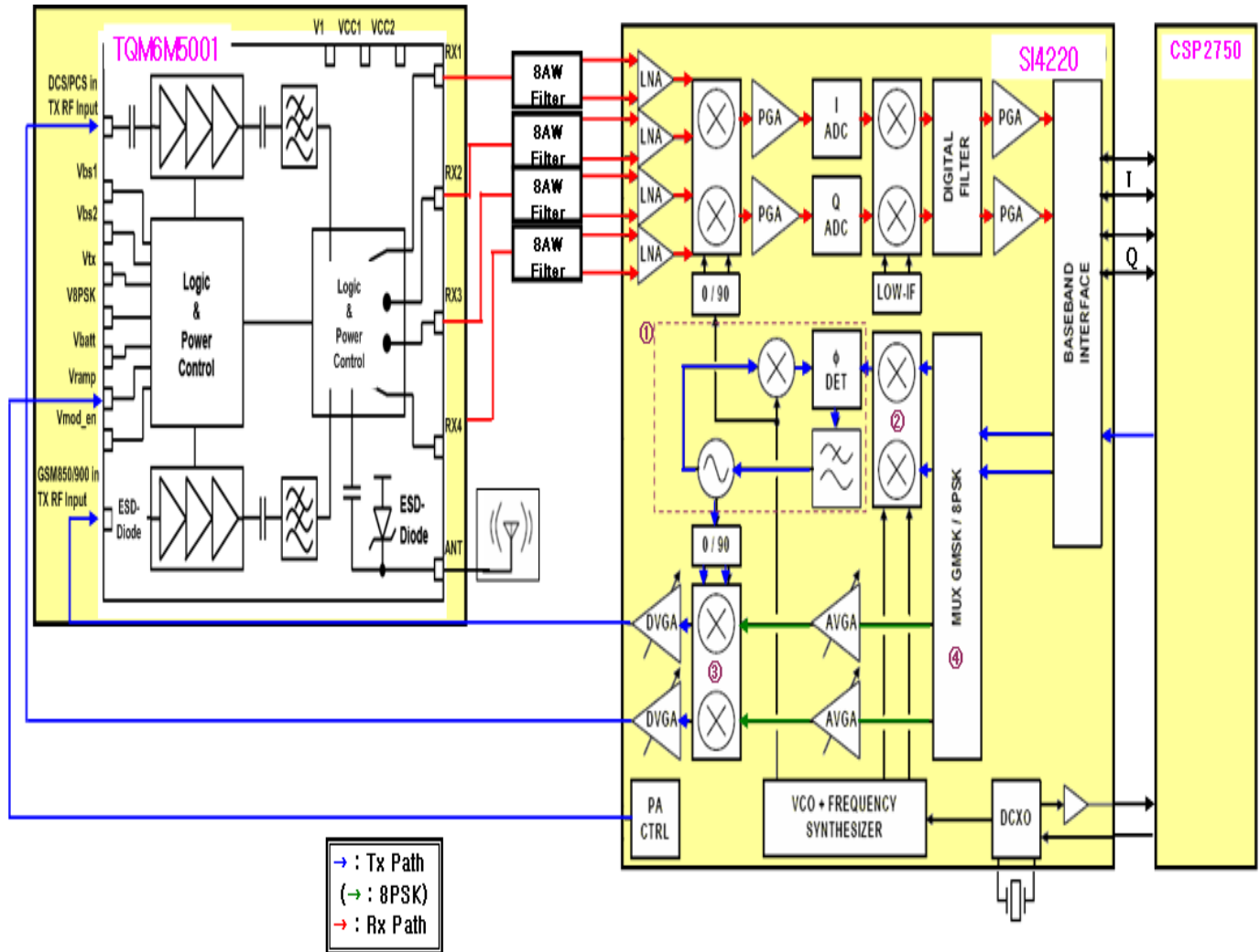
**\*#1234#**

Full Reset :

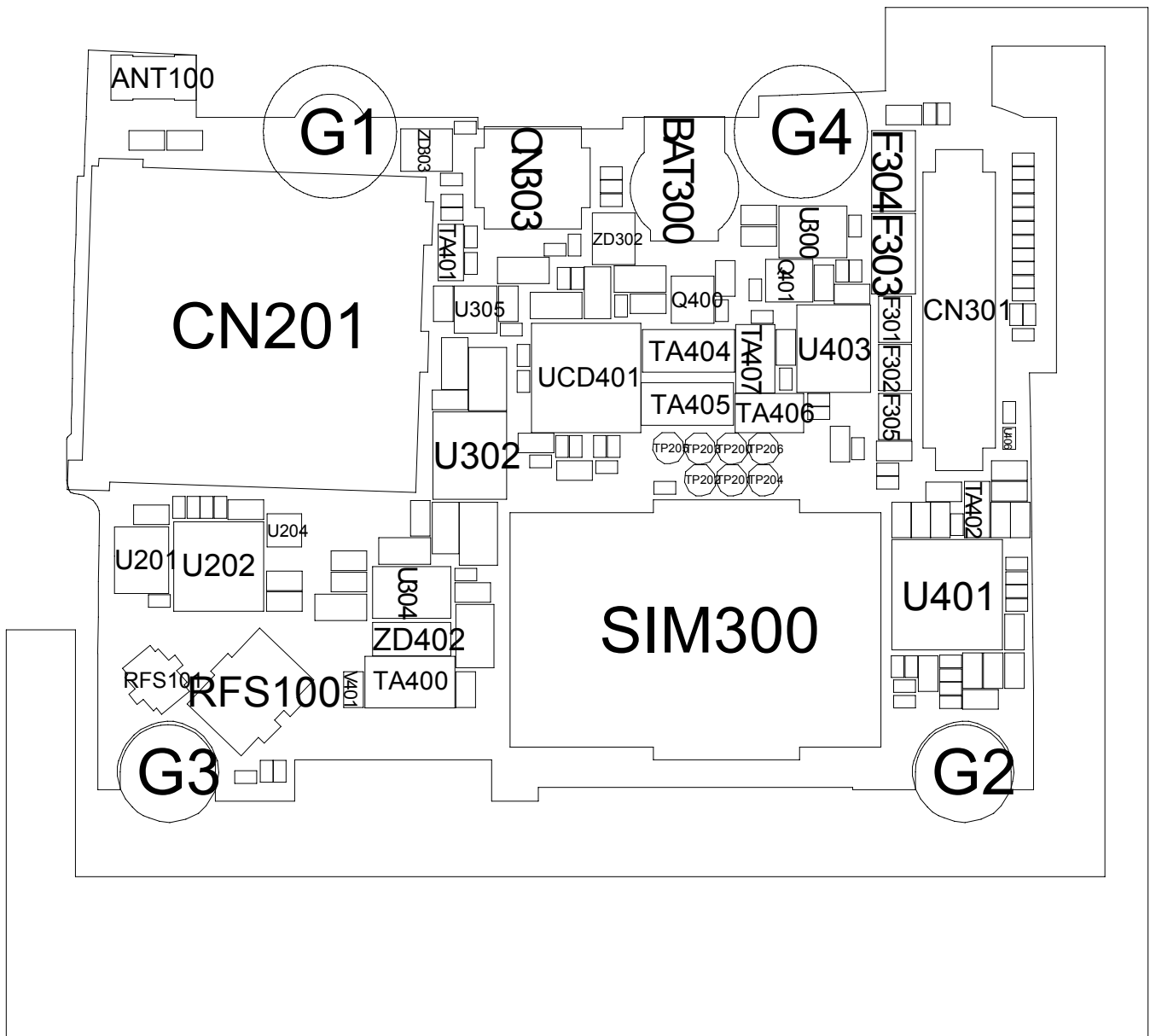
**\*2767\*3855#**

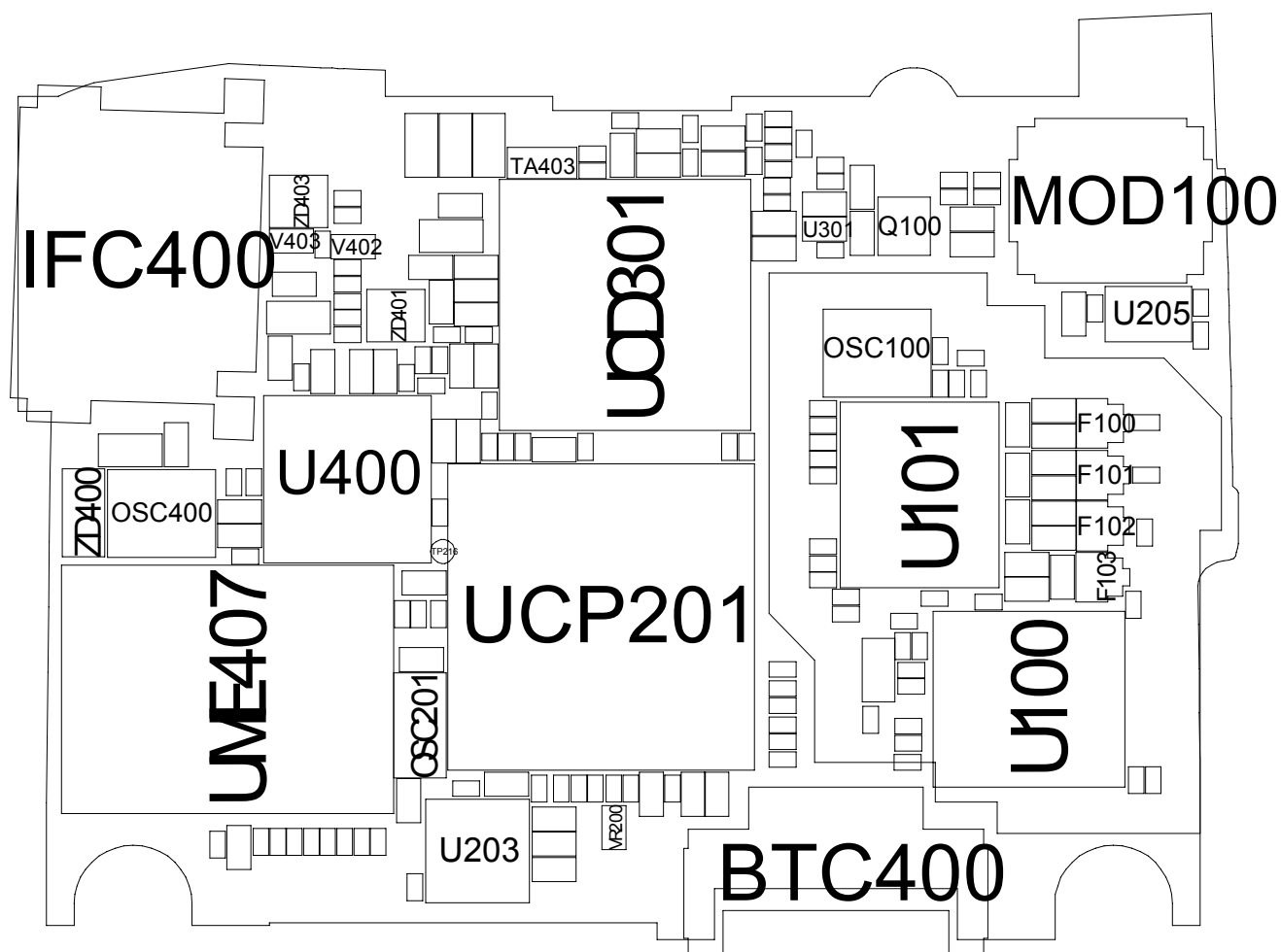
## 5. Block Diagrams





## 6. PCB Diagrams







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## 7. MAIN Electrical Parts List

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SEC CODE	Design LOC	Discription	STATUS
4202-001172	ANT100	ANTENNA-CHIP	SA
4302-001184	BAT300	BATTERY-LI(2ND)	SA
3711-006299	BTC400	HEADER-BATTERY	SA
2203-006305	C100	C-CER,CHIP	SA
2203-005717	C101	C-CER,CHIP	SA
2203-005806	C102	C-CER,CHIP	SNA
2203-006194	C103	C-CER,CHIP	SA
2203-006423	C104	C-CER,CHIP	SA
2203-006825	C105	C-CER,CHIP	SA
2203-006423	C106	C-CER,CHIP	SA
2203-005777	C107	C-CER,CHIP	SA
2203-006423	C108	C-CER,CHIP	SA
2203-006648	C109	C-CER,CHIP	SA
2203-005682	C110	C-CER,CHIP	SA
2203-006648	C111	C-CER,CHIP	SA
2203-005736	C112	C-CER,CHIP	SA
2203-005682	C113	C-CER,CHIP	SA
2203-005234	C114	C-CER,CHIP	SA
2203-005234	C115	C-CER,CHIP	SA
2203-005682	C116	C-CER,CHIP	SA
2203-005682	C117	C-CER,CHIP	SA
2203-006556	C118	C-CER,CHIP	SA
2203-005234	C119	C-CER,CHIP	SA
2203-005234	C120	C-CER,CHIP	SA
2203-005682	C121	C-CER,CHIP	SA
2203-005682	C122	C-CER,CHIP	SA
2203-005682	C123	C-CER,CHIP	SA
2203-005234	C124	C-CER,CHIP	SA
2203-005234	C125	C-CER,CHIP	SA
2203-005288	C126	C-CER,CHIP	SA
2203-005682	C127	C-CER,CHIP	SA
2203-006194	C129	C-CER,CHIP	SA
2203-006423	C130	C-CER,CHIP	SA
2203-006423	C131	C-CER,CHIP	SA
2203-006562	C132	C-CER,CHIP	SA
2203-006423	C133	C-CER,CHIP	SA
2203-006423	C134	C-CER,CHIP	SA

SEC CODE	Design LOC	Discription	STATUS
2203-006562	C135	C-CER,CHIP	SA
2203-006562	C136	C-CER,CHIP	SA
2203-006423	C137	C-CER,CHIP	SA
2203-005736	C138	C-CER,CHIP	SA
2203-005736	C139	C-CER,CHIP	SA
2203-005736	C140	C-CER,CHIP	SA
2203-005736	C141	C-CER,CHIP	SA
2203-000254	C200	C-CER,CHIP	SA
2203-006838	C201	C-CER,CHIP	SA
2203-006194	C202	C-CER,CHIP	SA
2203-005482	C203	C-CER,CHIP	SA
2203-005482	C204	C-CER,CHIP	SA
2203-006194	C205	C-CER,CHIP	SA
2203-006194	C206	C-CER,CHIP	SA
2203-006648	C209	C-CER,CHIP	SA
2203-006194	C210	C-CER,CHIP	SA
2203-006194	C211	C-CER,CHIP	SA
2203-000254	C212	C-CER,CHIP	SA
2203-006423	C213	C-CER,CHIP	SA
2203-006194	C214	C-CER,CHIP	SA
2203-006556	C215	C-CER,CHIP	SA
2203-006423	C216	C-CER,CHIP	SA
2203-006194	C217	C-CER,CHIP	SA
2203-005482	C218	C-CER,CHIP	SA
2203-000330	C219	C-CER,CHIP	SA
2203-000330	C220	C-CER,CHIP	SA
2203-006423	C221	C-CER,CHIP	SA
2203-006423	C222	C-CER,CHIP	SA
2203-005482	C223	C-CER,CHIP	SA
2203-005482	C224	C-CER,CHIP	SA
2203-005482	C225	C-CER,CHIP	SA
2203-006562	C226	C-CER,CHIP	SA
2203-006423	C227	C-CER,CHIP	SA
2203-000254	C228	C-CER,CHIP	SA
2203-006423	C229	C-CER,CHIP	SA
2203-001153	C300	C-CER,CHIP	SA
2203-006423	C301	C-CER,CHIP	SA

SEC CODE	Design LOC	Discription	STATUS
2203-005482	C302	C-CER,CHIP	SA
2203-001072	C303	C-CER,CHIP	SA
2203-006324	C304	C-CER,CHIP	SA
2203-005682	C305	C-CER,CHIP	SA
2203-006121	C306	C-CER,CHIP	SA
2203-006423	C307	C-CER,CHIP	SA
2203-005682	C308	C-CER,CHIP	SA
2203-005682	C309	C-CER,CHIP	SA
2203-000233	C312	C-CER,CHIP	SA
2203-006562	C313	C-CER,CHIP	SA
2203-006260	C314	C-CER,CHIP	SA
2203-006824	C315	C-CER,CHIP	SA
2203-006562	C316	C-CER,CHIP	SA
2203-006824	C317	C-CER,CHIP	SA
2203-006562	C318	C-CER,CHIP	SA
2203-006562	C319	C-CER,CHIP	SA
2203-006324	C321	C-CER,CHIP	SA
2203-006423	C322	C-CER,CHIP	SA
2203-006708	C324	C-CER,CHIP	SA
2203-006885	C325	C-CER,CHIP	SA
2203-005682	C328	C-CER,CHIP	SA
2203-005682	C331	C-CER,CHIP	SA
2203-006194	C332	C-CER,CHIP	SA
2203-006648	C333	C-CER,CHIP	SA
2203-006648	C334	C-CER,CHIP	SA
2203-006423	C335	C-CER,CHIP	SA
2203-006562	C336	C-CER,CHIP	SA
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2203-005683	C356	C-CER,CHIP	SA
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2203-005682	C358	C-CER,CHIP	SA
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2203-005682	C360	C-CER,CHIP	SA

SEC CODE	Design LOC	Discription	STATUS
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2203-006562	C363	C-CER,CHIP	SA
2203-005682	C365	C-CER,CHIP	SA
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2203-005682	C368	C-CER,CHIP	SA
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2203-005682	C373	C-CER,CHIP	SA
2203-005682	C379	C-CER,CHIP	SA
2203-006562	C381	C-CER,CHIP	SA
2203-002443	C382	C-CER,CHIP	SA
2203-002443	C383	C-CER,CHIP	SA
2203-006825	C384	C-CER,CHIP	SA
2203-006825	C385	C-CER,CHIP	SA
2203-006825	C386	C-CER,CHIP	SA
2203-006824	C387	C-CER,CHIP	SA
2203-006260	C400	C-CER,CHIP	SA
2203-006260	C401	C-CER,CHIP	SA
2203-000812	C402	C-CER,CHIP	SA
2203-006647	C404	C-CER,CHIP	SA
2203-000812	C405	C-CER,CHIP	SA
2203-005682	C406	C-CER,CHIP	SA
2203-006648	C407	C-CER,CHIP	SA
2203-006647	C408	C-CER,CHIP	SA
2203-005682	C410	C-CER,CHIP	SA
2203-006348	C411	C-CER,CHIP	SA
2203-006466	C412	C-CER,CHIP	SA
2203-006681	C413	C-CER,CHIP	SA
2203-006562	C414	C-CER,CHIP	SA
2203-006194	C415	C-CER,CHIP	SA
2203-006562	C416	C-CER,CHIP	SA
2203-000627	C417	C-CER,CHIP	SNA
2203-000627	C418	C-CER,CHIP	SNA
2203-006423	C419	C-CER,CHIP	SA
2203-005482	C420	C-CER,CHIP	SA
2203-006562	C421	C-CER,CHIP	SA

SEC CODE	Design LOC	Discription	STATUS
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2203-006423	C424	C-CER,CHIP	SA
2203-002709	C426	C-CER,CHIP	SA
2203-006824	C427	C-CER,CHIP	SA
2203-006562	C428	C-CER,CHIP	SA
2203-006562	C429	C-CER,CHIP	SA
2203-006840	C432	C-CER,CHIP	SA
2203-006585	C433	C-CER,CHIP	SA
2203-006648	C434	C-CER,CHIP	SA
2203-005344	C435	C-CER,CHIP	SA
2203-006824	C436	C-CER,CHIP	SA
2203-006824	C437	C-CER,CHIP	SA
2203-006423	C438	C-CER,CHIP	SA
2203-006423	C439	C-CER,CHIP	SA
2203-006423	C440	C-CER,CHIP	SA
2203-006423	C441	C-CER,CHIP	SA
2203-006423	C442	C-CER,CHIP	SA
2203-006647	C443	C-CER,CHIP	SA
2203-006462	C444	C-CER,CHIP	SA
2203-006423	C445	C-CER,CHIP	SA
2203-006462	C447	C-CER,CHIP	SA
2203-006647	C448	C-CER,CHIP	SA
2203-000438	C449	C-CER,CHIP	SA
2203-000438	C450	C-CER,CHIP	SA
2203-000438	C451	C-CER,CHIP	SA
2203-000438	C452	C-CER,CHIP	SA
2203-000627	C453	C-CER,CHIP	SNA
2203-006626	C454	C-CER,CHIP	SA
2203-006626	C455	C-CER,CHIP	SA
3709-001344	CN201	CONNECTOR-CARD EDGE	SA
3711-006278	CN301	HEADER-BOARD TO BOARD	SA
3711-005345	CN303	HEADER-BOARD TO BOARD	SA
2904-001602	F100	FILTER-SAW	SA
2904-001628	F101	FILTER-SAW	SA
2904-001604	F102	FILTER-SAW	SNA
2904-001600	F103	FILTER-SAW	SA
2901-001422	F301	FILTER-EMI SMD	SA

SEC CODE	Design LOC	Discription	STATUS
2901-001422	F302	FILTER-EMI SMD	SA
2901-001429	F303	FILTER-EMI SMD	SA
2901-001429	F304	FILTER-EMI SMD	SA
2901-001423	F305	FILTER-EMI SMD	SA
3710-002306	IFC400	SOCKET-INTERFACE	SA
2703-002917	L100	INDUCTOR-SMD	SA
2703-002917	L101	INDUCTOR-SMD	SA
2703-002900	L102	INDUCTOR-SMD	SA
2703-002910	L103	INDUCTOR-SMD	SA
2703-002202	L104	INDUCTOR-SMD	SA
2703-002202	L105	INDUCTOR-SMD	SA
2703-002268	L106	INDUCTOR-SMD	SA
2703-001748	L107	INDUCTOR-SMD	SA
2703-001748	L108	INDUCTOR-SMD	SA
2703-002205	L109	INDUCTOR-SMD	SA
2703-002365	L110	INDUCTOR-SMD	SA
3301-001342	L200	BEAD-SMD	SA
2703-002734	L301	INDUCTOR-SMD	SA
2703-002749	L302	INDUCTOR-SMD	SA
3301-001809	L303	BEAD-SMD	SA
3301-001534	L400	BEAD-SMD	SA
3301-001534	L401	BEAD-SMD	SA
3301-001534	L402	BEAD-SMD	SA
3301-001534	L403	BEAD-SMD	SA
3301-001534	L404	BEAD-SMD	SA
3301-001534	L405	BEAD-SMD	SA
3301-001879	L406	BEAD-SMD	SA
4709-001451	MOD100	BLUETOOTH MODULE	SA
2801-004455	OSC100	CRYSTAL-SMD	SA
2801-004339	OSC201	CRYSTAL-SMD	SA
2801-004340	OSC400	CRYSTAL-SMD	SA
1203-003688	Q100	IC-POSIFIXED REG.	SA
1203-003737	Q400	IC-POSIFIXED REG.	SA
1203-003737	Q401	IC-POSIFIXED REG.	SA
2007-008056	R100	R-CHIP	SA
2007-008548	R101	R-CHIP	SA
2007-008048	R102	R-CHIP	SA

SEC CODE	Design LOC	Discription	STATUS
2007-008516	R103	R-CHIP	SA
2007-008542	R104	R-CHIP	SA
2007-008542	R105	R-CHIP	SA
2007-008542	R106	R-CHIP	SA
2007-008542	R107	R-CHIP	SA
2007-008516	R108	R-CHIP	SA
2007-008483	R109	R-CHIP	SA
2007-008542	R110	R-CHIP	SA
2007-000157	R111	R-CHIP	SA
2007-001284	R200	R-CHIP	SA
2007-008516	R201	R-CHIP	SA
2007-008516	R202	R-CHIP	SA
2007-008516	R203	R-CHIP	SA
2007-008531	R204	R-CHIP	SA
2007-008531	R205	R-CHIP	SA
2007-008055	R207	R-CHIP	SA
2007-008483	R208	R-CHIP	SA
2007-000242	R209	R-CHIP	SA
2007-001292	R215	R-CHIP	SA
2007-001292	R217	R-CHIP	SA
2007-008483	R218	R-CHIP	SA
2007-008483	R219	R-CHIP	SA
2007-008483	R220	R-CHIP	SA
2007-008486	R221	R-CHIP	SA
2007-008483	R222	R-CHIP	SA
2007-008055	R224	R-CHIP	SA
2007-008516	R225	R-CHIP	SA
2007-008542	R226	R-CHIP	SA
2007-008542	R227	R-CHIP	SA
2007-001323	R300	R-CHIP	SA
2007-000775	R301	R-CHIP	SA
2007-009167	R302	R-CHIP	SA
2007-007316	R304	R-CHIP	SA
2007-008055	R306	R-CHIP	SA
2007-009170	R308	R-CHIP	SA
2007-008483	R309	R-CHIP	SA
2007-000162	R311	R-CHIP	SA

SEC CODE	Design LOC	Discription	STATUS
2007-007311	R315	R-CHIP	SA
2007-007489	R316	R-CHIP	SA
2007-008483	R317	R-CHIP	SA
2007-008055	R319	R-CHIP	SA
2007-008483	R322	R-CHIP	SA
2007-008040	R324	R-CHIP	SA
2007-008040	R325	R-CHIP	SA
2007-008040	R326	R-CHIP	SA
2007-008040	R327	R-CHIP	SA
2007-008040	R328	R-CHIP	SA
2007-008040	R329	R-CHIP	SA
2007-008040	R330	R-CHIP	SA
2007-008542	R331	R-CHIP	SA
2007-008544	R400	R-CHIP	SA
2007-007741	R401	R-CHIP	SA
2007-008588	R402	R-CHIP	SA
2007-007468	R403	R-CHIP	SA
2007-007741	R404	R-CHIP	SA
2007-007468	R405	R-CHIP	SA
2007-008483	R406	R-CHIP	SA
2007-008055	R407	R-CHIP	SA
2007-008590	R408	R-CHIP	SNA
2007-009315	R409	R-CHIP	SA
2007-009315	R410	R-CHIP	SA
2007-008544	R411	R-CHIP	SA
2007-008419	R412	R-CHIP	SA
2007-008419	R413	R-CHIP	SA
2007-008588	R414	R-CHIP	SA
2007-008419	R415	R-CHIP	SA
2007-009157	R416	R-CHIP	SA
2007-009115	R417	R-CHIP	SA
2007-007741	R418	R-CHIP	SA
2007-008531	R419	R-CHIP	SA
2007-007741	R420	R-CHIP	SA
2007-009157	R421	R-CHIP	SA
2007-008590	R422	R-CHIP	SNA
2007-009084	R423	R-CHIP	SA



SEC CODE	Design LOC	Discription	STATUS
2007-009166	R424	R-CHIP	SA
2007-008054	R428	R-CHIP	SA
2007-008483	R429	R-CHIP	SA
2007-008483	R430	R-CHIP	SA
2007-008516	R431	R-CHIP	SA
2007-008516	R432	R-CHIP	SA
2007-008800	R433	R-CHIP	SA
2007-008800	R434	R-CHIP	SA
2007-007312	R435	R-CHIP	SA
2007-008419	R436	R-CHIP	SA
2007-008800	R437	R-CHIP	SA
2007-008800	R438	R-CHIP	SA
2007-007741	R439	R-CHIP	SA
2007-007741	R440	R-CHIP	SA
2007-000147	R443	R-CHIP	SA
2007-008045	R444	R-CHIP	SA
2007-008049	R445	R-CHIP	SA
2007-008516	R446	R-CHIP	SA
2007-008040	R447	R-CHIP	SA
2007-008040	R448	R-CHIP	SA
2007-008542	R450	R-CHIP	SA
3705-001358	RFS100	CONNECTOR-COAXIAL	SA
3705-001448	RFS101	CONNECTOR-COAXIAL	SA
3709-001391	SIM300	CONNECTOR-CARD EDGE	SA
2404-001406	TA400	C-TA,CHIP	SA
2404-001381	TA401	C-TA,CHIP	SA
2404-001381	TA402	C-TA,CHIP	SA
2404-001381	TA403	C-TA,CHIP	SA
2404-001478	TA404	C-TA,CHIP	SA
2404-001478	TA405	C-TA,CHIP	SA
2404-001352	TA406	C-TA,CHIP	SA
2404-001352	TA407	C-TA,CHIP	SA
1201-002457	U100	IC-POWER AMP	SA
1205-003093	U101	IC-TRANSCEIVER	SA
GH71-07065A	U102	NPR-SHEILD FRAME	SA
0406-001200	U201	DIODE-TVS	SA
1203-003789	U202	IC-POWER SUPERVISOR	SA

SEC CODE	Design LOC	Discription	STATUS
1205-002272	U203	IC-TRANSCEIVER	SA
0801-002958	U204	IC-CMOS LOGIC	SA
1009-001018	U205	IC-HALL EFFECT S/W	SA
0801-002529	U300	IC-CMOS LOGIC	SA
1404-001165	U301	THERMISTOR-NTC	SA
1203-004164	U302	IC-DC/DC CONVERTER	SA
1203-003663	U304	IC-BATTERY	SA
1203-003737	U305	IC-POS.FIXED REG.	SA
GH13-00044A	U400	IC ASIC-SGHE490	SA
1201-002241	U401	IC-AUDIO AMP	SA
1001-001371	U403	IC-ANALOG SWITCH	SA
2203-005682	U406	C-CER,CHIP	SA
1203-004119	UCD301	IC-POWER SUPERVISOR	SA
1002-001497	UCD401	IC-D/A CONVERTER	SA
GH09-00044A	UCP201	IC MICOM	SA
1108-000046	UME407	IC-MCP	SA
1405-001082	V401	VARISTOR	SA
1405-001082	V402	VARISTOR	SA
1405-001082	V403	VARISTOR	SA
1405-001082	VR200	VARISTOR	SA
0406-001167	ZD302	DIODE-TVS	SA
0406-001167	ZD303	DIODE-TVS	SA
0403-001411	ZD400	DIODE-ZENER	SA
0406-001190	ZD401	DIODE-TVS	SA
0403-001547	ZD402	DIODE-ZENER	SA
0406-001190	ZD403	DIODE-TVS	SA

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## 8. Reference data

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### 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

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## 9. Safety Precautions

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### 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.

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## 10. Product Function

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### Main Function

- Camera and camcorder
- Music player
- Java
- Offline mode
- Bluetooth
- Web browser
- Multimedia Message Service(MMS)
- Name card
- Alarm
- Voice recorder
- Organiser

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