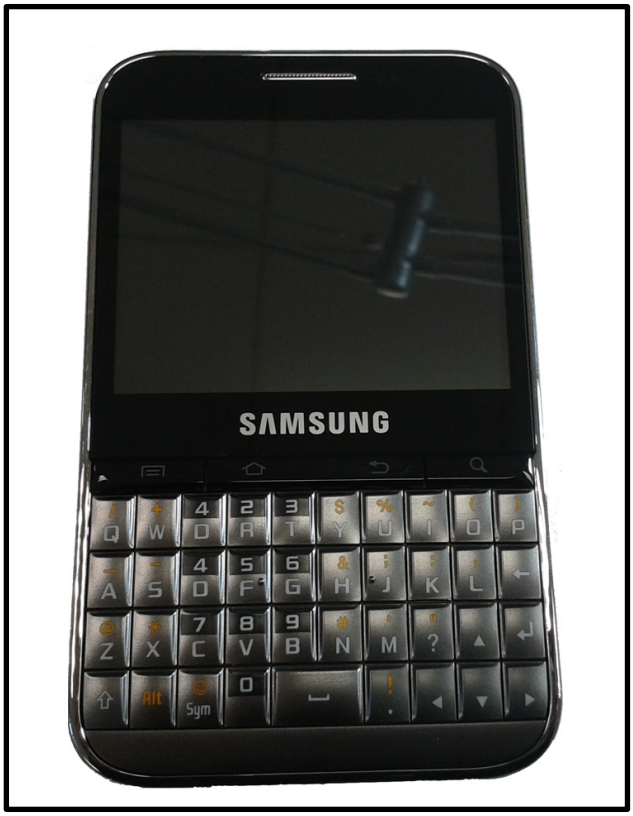
GSM TELEPHONE

GT-B7510

SERVICE Manual

GSM TELEPHONE



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SAMSUNG
ELECTRONICS

2011. 02. Rev.1.0

2. Specification

2-1. GSM General Specification

	GSM850 Phase 1	EGSM 900 Phase 2	DCS1800 Phase 1	PCS1900	WCDMA 2100	WCDMA900
Freq. Band[MHz] Uplink/Downlink	824~849 869~894	880~915 925~960	1710~1785 1805~1880	1850~1910 1930~1990	1922~1977 2112~2167	880~915 925~960
ARFCN range	128~251	0~124 & 975~1023	512~885	512~810	UL:9612~9888DL:10562~10838	UL:2712~2863,DL:2937~ 3088
Tx/Rx spacing	45MHz	45MHz	95MHz	80MHz	190MHz	45MHz
Mod. Bit rate/ Bit Period	270.833kbps 3.692us	270.833kbps 3.692us	270.833kbps 3.692us	270.833kbps 3.692us	3.84Mcps	3.84Mcps
Time Slot Period/Frame Period	576.9us 4.615ms	576.9us 4.615ms	576.9us 4.615ms	576.9us 4.615ms	FrameLength: 10ms Slotlength: 0.667ms	FrameLength: 10ms Slotlength: 0.667ms
Modulation	0.3GMSK	0.3GMSK	0.3GMSK	0.3GMSK	QPSKHQPSK	QPSKHQPSK
MS Power	33dBm~5dBm	33dBm~5dBm	30dBm~0dBm	30dBm~0dBm	24dBm~-50dBm	24dBm~-50dBm
Power Class	5pcl ~ 19pcl	5pcl ~ 19pcl	0pcl ~ 15pcl	0pcl ~ 15pcl	3(max+24dBm)	3(max+24dBm)
Sensitivity	-102dBm	-102dBm	-100dBm	-100dBm	-106.7dBm	-106.7dBm
TDMA Mux	8	8	8	8	8	8
Cell Radius	35Km	35Km	2Km	2Km	2Km	2Km

2-2. GSM Tx Power Class

TX Power control level	GSM850
5	33±2 dBm
6	31±2 dBm
7	29±2 dBm
8	27±2 dBm
9	25±2 dBm
10	23±2 dBm
11	21±2 dBm
12	19±2 dBm
13	17±2 dBm
14	15±2 dBm
15	13±2 dBm
16	11±3 dBm
17	9±3dBm
18	7±3 dBm
19	5±3 dBm

TX Power control level	EGSM900
5	33±2 dBm
6	31±2 dBm
7	29±2 dBm
8	27±2 dBm
9	25±2 dBm
10	23±2 dBm
11	21±2 dBm
12	19±2 dBm
13	17±2 dBm
14	15±2 dBm
15	13±2 dBm
16	11±3 dBm
17	9±3dBm
18	7±3 dBm
19	5±3 dBm

TX Power control level	DCS1800
0	30±3 dBm
1	28±3 dBm
2	26±3 dBm
3	24±3 dBm
4	22±3 dBm
5	20±3 dBm
6	18±3 dBm
7	16±3 dBm
8	14±3 dBm
9	12±4 dBm
10	10±4 dBm
11	8±4 dBm
12	6±4 dBm
13	4±4 dBm
14	2±5 dBm
15	0±5 dBm

TX Power control level	PCS1900
0	30±3 dBm
1	28±3 dBm
2	26±3 dBm
3	24±3 dBm
4	22±3 dBm
5	20±3 dBm
6	18±3 dBm
7	16±3 dBm
8	14±3 dBm
9	12±4 dBm
10	10±4 dBm
11	8±4 dBm
12	6±4 dBm
13	4±4 dBm
14	2±5 dBm
15	0±5 dBm

3. Operation Instruction and Installation

Main Function

- GoogleAndroid OS 2.2 Froyo
- Size: 108.6x66.7x10.65
- Band : GSM QUAD BAND GSM850/900/1800/1900 (Release : R99)
- BAND : HSDPA 7.2M B1/B8
- 3 Mega pixel AF Camera, 1/5" CMOS
- LCD: 2.8" LQVGA TFT
- 1350mA standard Battery
- 3.5pi Earjack/ Earphone
- Micro USB/ Power, Data
- Wi-Fi 802.11b/g/n
- Bluetooth v3.0
- USB v2.0 High Speed,
- A-GPS
- FM w/RDS
- input : QWERTY Key, C-Type single TSP
- Audio : mp3, ogg, aac, mid, xmf, rtttl, imy, rtx, ota, amr, wav, mxmf
- Image : bmp, gif, jpg, png, wbmp, agif
- Video : MPEG4, H.263, H.264, 3gp, mp4
- B/B: MSM7227 turbo 800M
- PMIC: MAX8899
- Tranceiver: RTR6285
- PAM: SKY77554(2G)
- RF7201(3G Dual)
- Intenna : Carrier type
- LCD: 2.8" LQVGA TFT
- MEMORY: 4G+3G

6. Level 1 Repair

6-1. S/W Download

6-1-1. Pre-requsite for S/W Downloading

- GT-B7510 Mobile Phone
- Battery
- USB cable
- JIG BOX (GH99-36900A)
- RF Test Cable (GH39-00985A)
- JIG Cable (GH39-01339A)
- Adapter (GH99-38251A)
- Downloader Program(**Odin Multi Downloader v4.38**)
- Binary files
- PC (Windows XP, 7)

★ **The settings for download.**

6-1-2. S/W Downloader Program

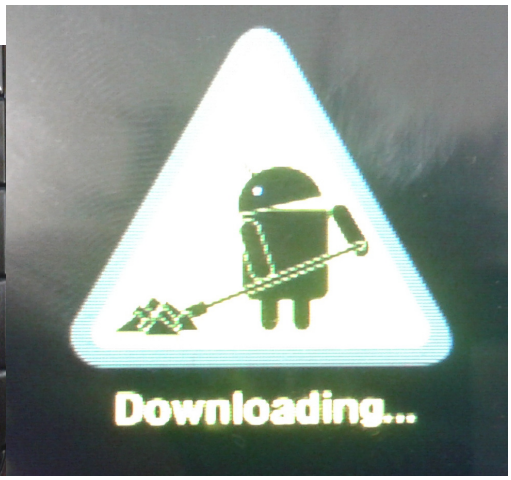
1. Execute the binary download program, which is "Odin Multi Downloader v4.38".

2. Load the files of OPS, BOOT, PHONE, PDS, CSC from the folder that you saved binary files. (CLICK the each Naming Button and select the file)

-OPS : OPS file
-BOOT : APBOOT_...
-phone : MODEM_...
-PDA : CODE_...
-CSC : CSC_...

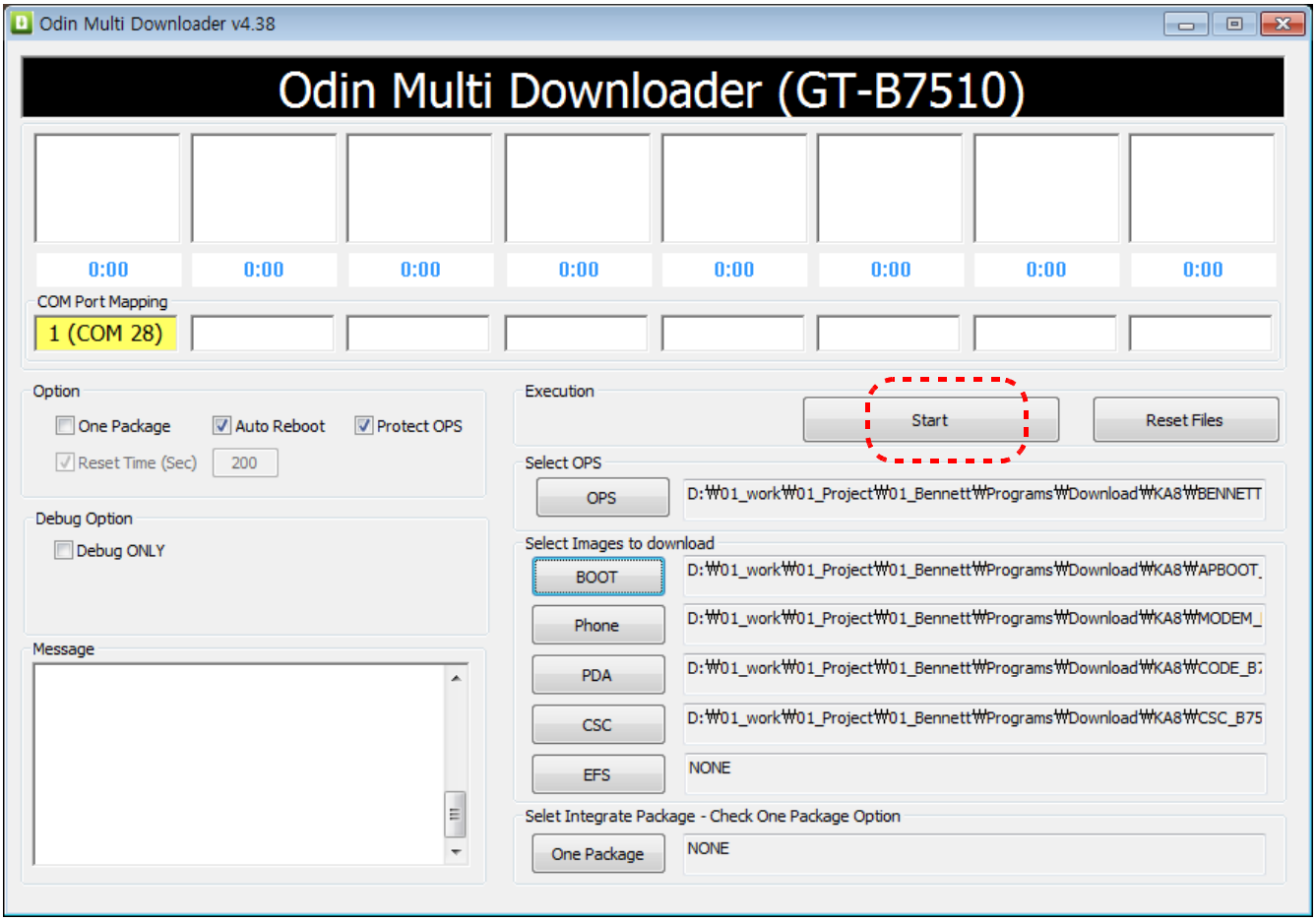
3. Turn On the Mobile with push 'Q' Button to enter the Download mode and check the Download Logo on LCD

< QWERTY Key Pad >



<Download Logo>

4. Click the Start button when a port is ready



5. After downloading finished successfully, there is a "PASS" message.

6. Check the binary version using key streaming, "*#1234#".

9. Reference Abbreviate

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

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 magnetic 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.

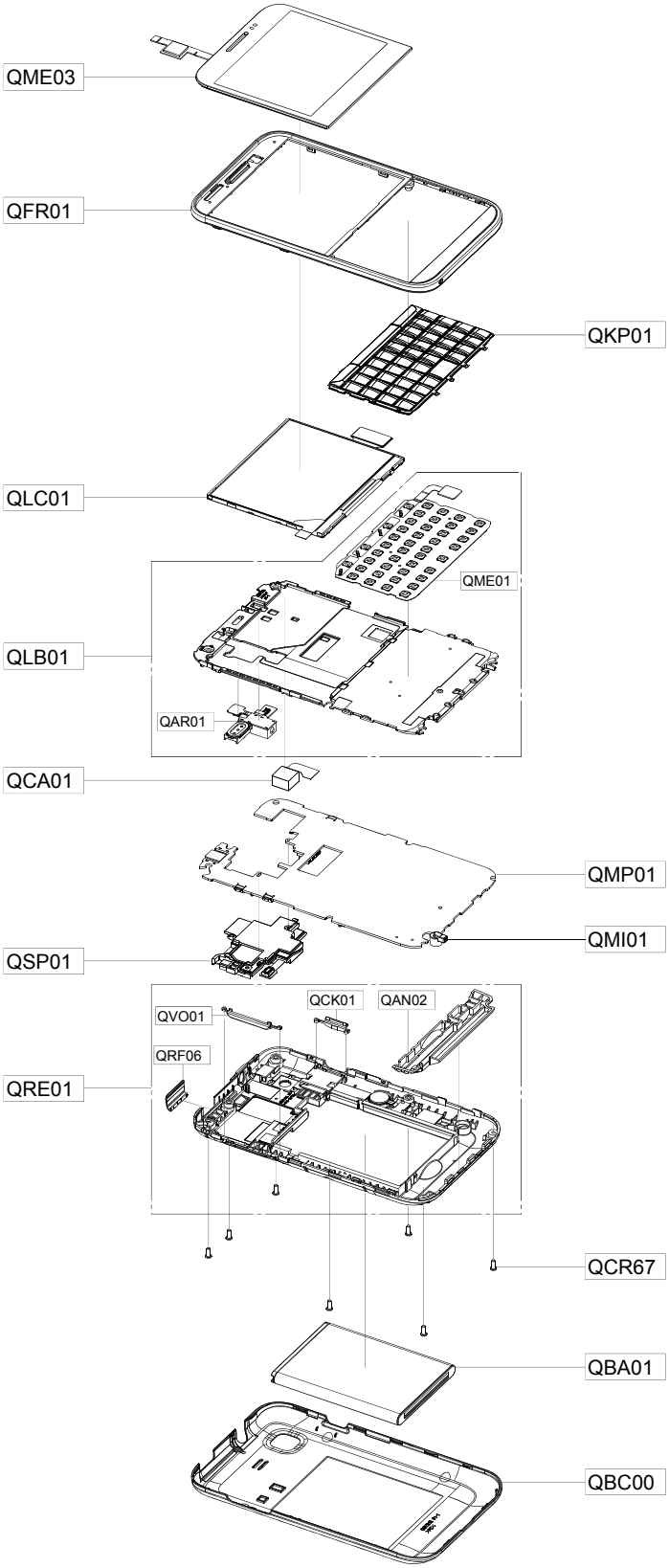
- Use soldering removing tool to break static electricity. , otherwise ESD will be damaged by static electricity.

- 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.

4. Exploded View and Parts List

4-1. Cellular phone Exploded View



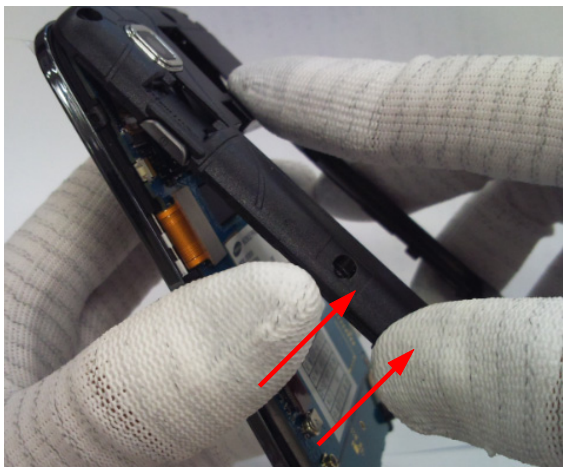
4-2. Cellular phone Parts list

Design LOC		Description	SEC CODE
QCR67		SCREW-MACHINE	6001-002083
QMI01		MICROPHONE-ASSY-GT-B7510	GH30-00722A
QBA01		INNER BATTERY PACK-EB494358VU,GT-S5830,L	GH43-03504A
QSP01		MODULE-SPK+SIM S/C	GH59-10724A
QME03		TOUCH/PANEL-GT-B7510	GH59-10728A
QMP01		A/S ASSY-PBAMAIN(COMM)GT-B7510	GH82-05631A
QLC01		ELA MODULE-LCD MODULE(GT-B7510)	GH96-05085A
QCA01		ASSY CAMERA-3M AF MODULE(GT-B7510	GH96-05091A
QFR01		ASSY CASE-FRONT	GH98-18418A
QBC00		ASSY COVER-BATT	GH98-18420A
QKP01		ASSY KEYPAD-QWERTY	GH98-18421A
QLB01		ASSY BRACKET-LCD	GH98-18430A
	QME01	KEY FPCB-QWERTY KEY(GT-B7510)	GH59-10713A
	QAR01	ASSY ETC-RCV&EAR JACK ASSY	GH59-10737A
QRE01		ASSY CASE-REAR	GH98-18419A
	QAN02	INTENNA-GTB7510 MAIN	GH42-02892A
	QRF06	PMO COVER-DC USB	GH72-61733A
	QCK01	PMO KEY-POWER HOLD	GH72-61734A
	QVO01	PMO KEY-VOLUME	GH72-61735A

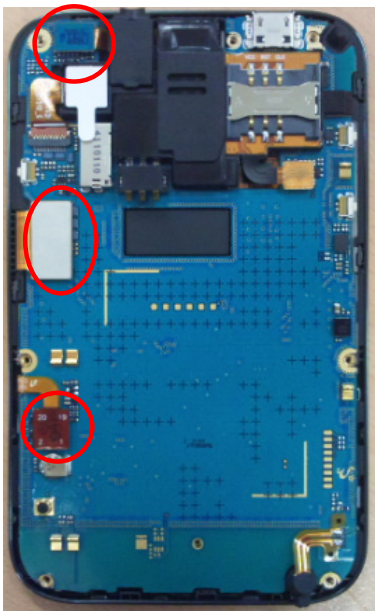
7. Level 2 Repair

7-1. Disassembly and Assembly Instructions

7-1-1. Disassembly

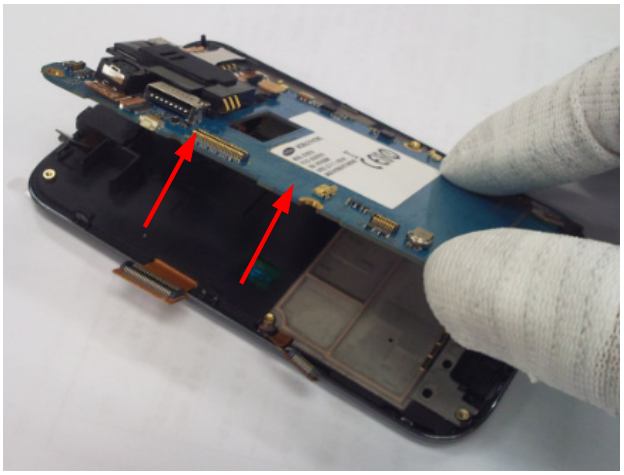
1 Release Screw 7 Point at REAR 	2 Disjoint Hook on the bottom of the REAR 
1) Be careful not to make scratch and molding damage!	1) Be careful not to make scratch and molding damage!
3 Disjoint hook on the both side of the REAR 	4 Disassemble REAR 
1) Push out REAR to both side.	1) Detach Power Key FPCB and Cammera Key FPCB. 2) Be careful not to damage to FPCB (Use tweezer!)

5	Disassemble FPCB.



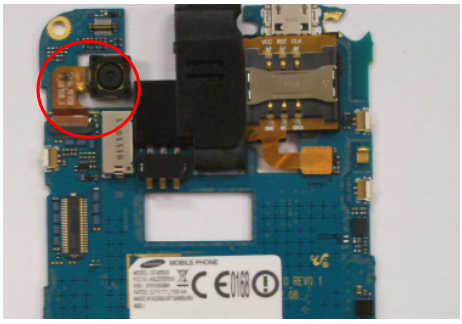
1) Detach Earjack/LCD/Qwerty key FPCB.(3point)

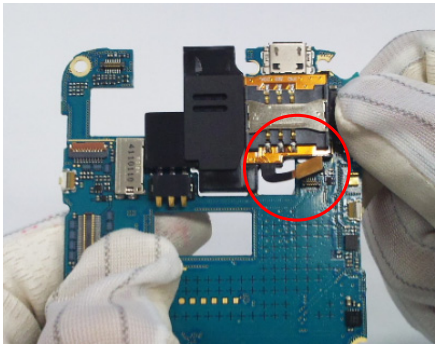
6	Disassemble Main PBA from the FRONT Ass'y



1) Hold up Main PBA from left.

7	Disassemble Module from PBA.

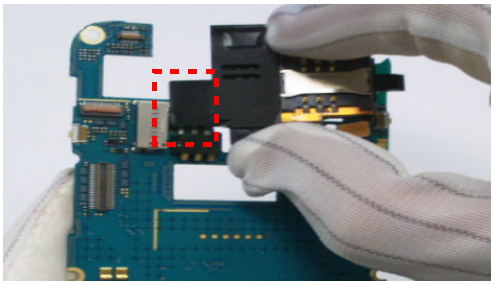
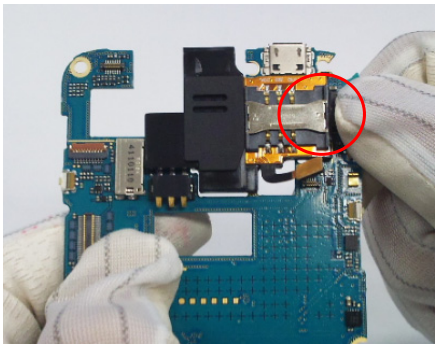
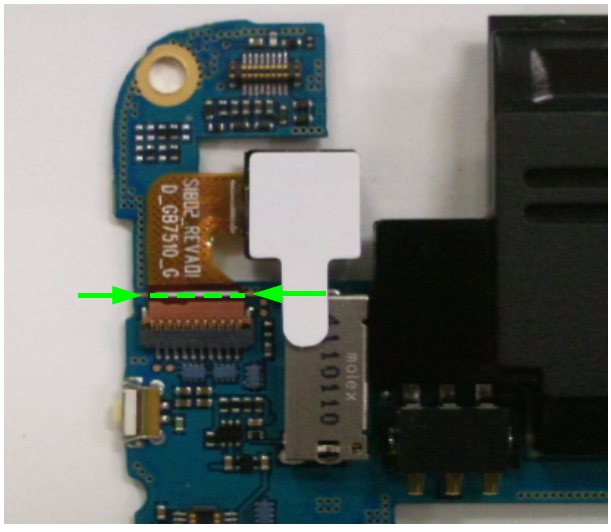
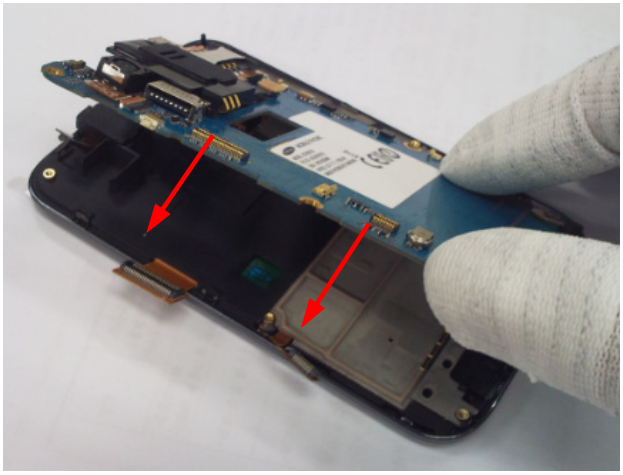




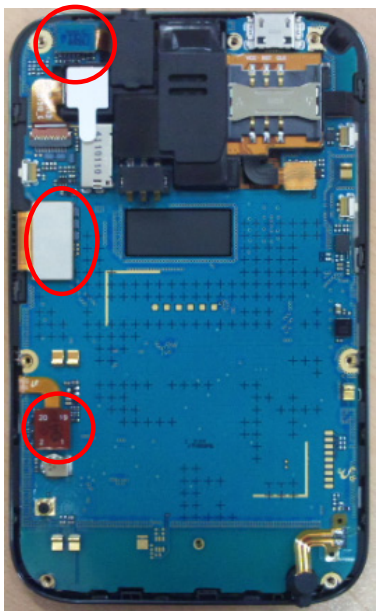
1) Disassemble Cammera Module from PBA.
2) Disassemble SPK Module from PBA.

8	Complete disassembly.

7-1-1. Assembly

1 Set a PBA and FRONT Ass'y. 	2 Assemble SPK module.  
	1) Assemble left hook first. 2) Assemble right hook.
3 Assemble Camera module 	4 Assemble PBA on FRONT Ass'y. 
1) Assemble fiting to silk line	

5	Assemble PBA on FRONT Ass'y.



1) Assemble Earjack/LCD/Qwerty key FPCB.(3point).
2) Be careful not to damage to FPCB.

6	Assemble FRONT Ass'y on REAR.

1) Assemble matching location from earjack of rear upper

7	Assemble FRONT Ass'y on REAR.

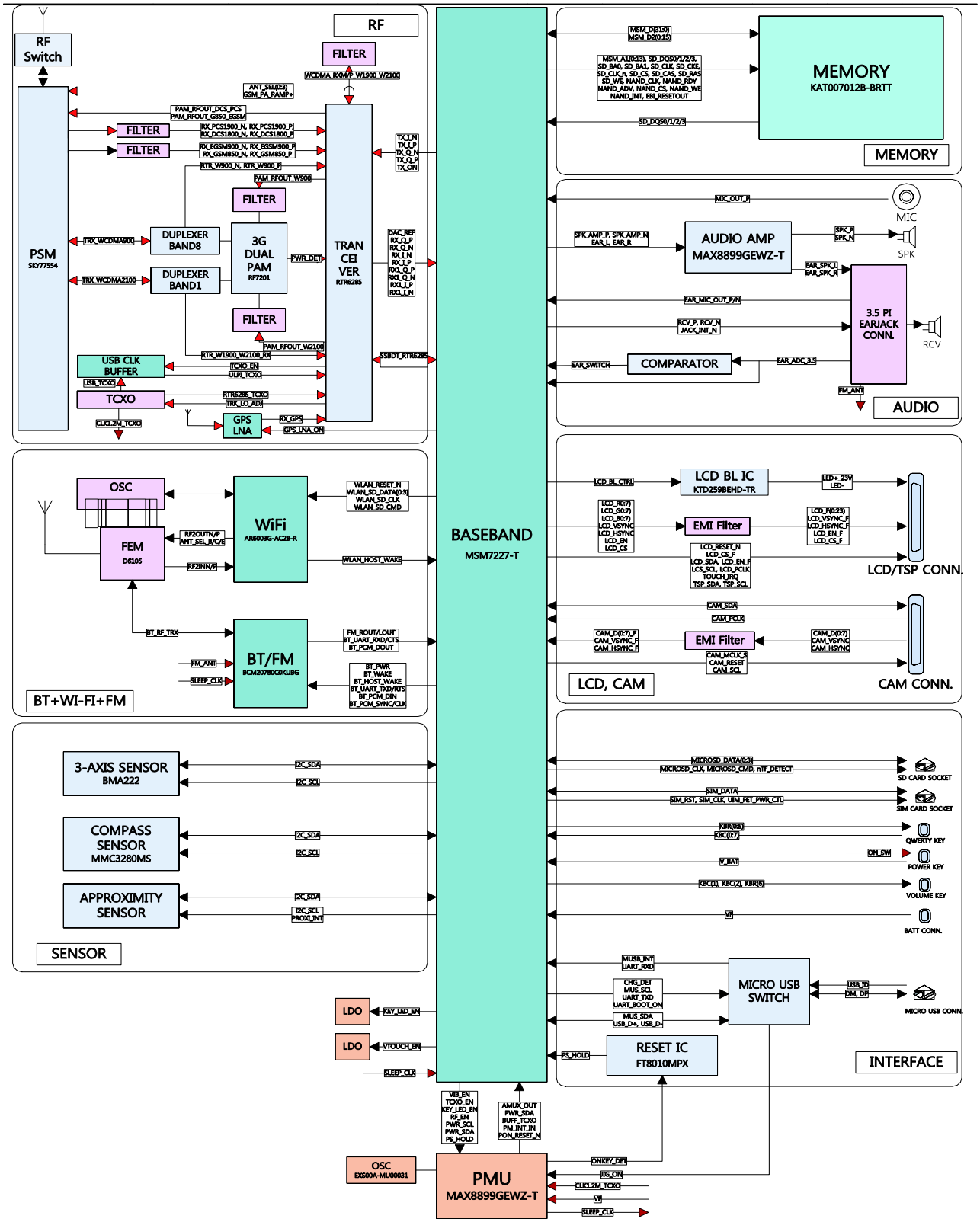
1) Be careful not to make scratch and molding damage!

8	Drive Screws at 6 points

1) Drive Screws at 6 points with torque
1.1 +/- 0.1 Kgf/㎠

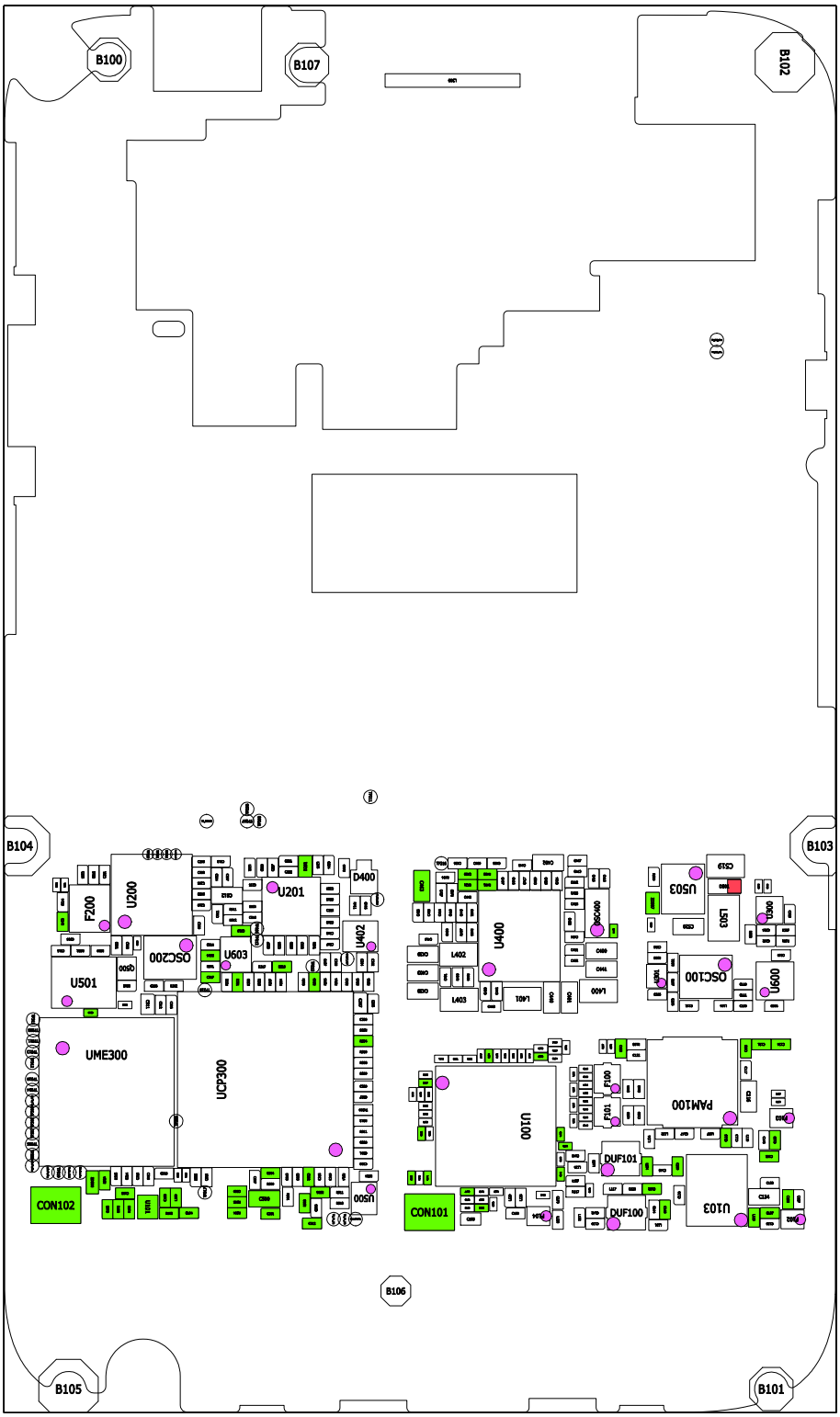
8. Level 3 Repair

8-1. Block Diagram

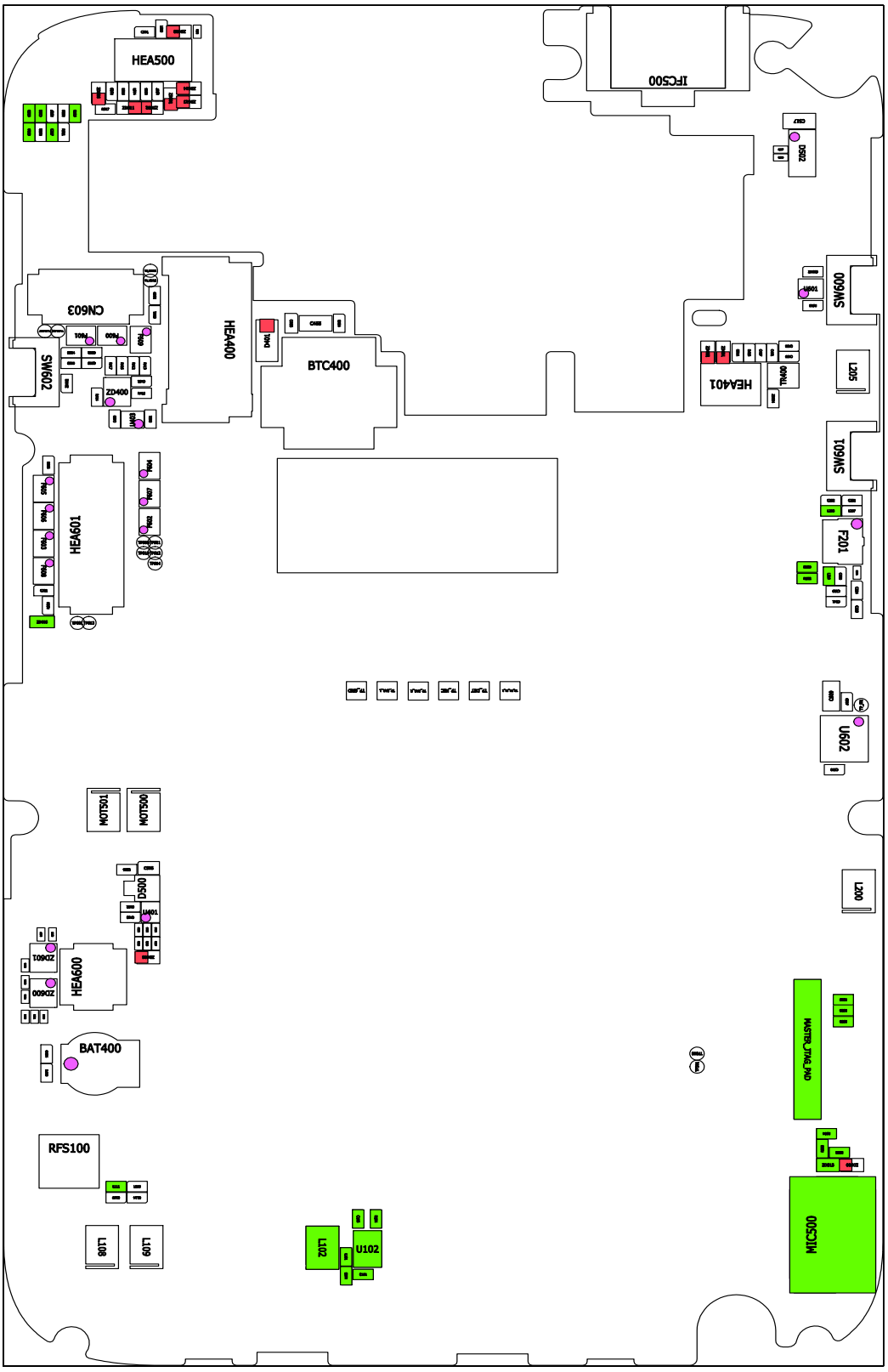


8-2. PCB Diagrams

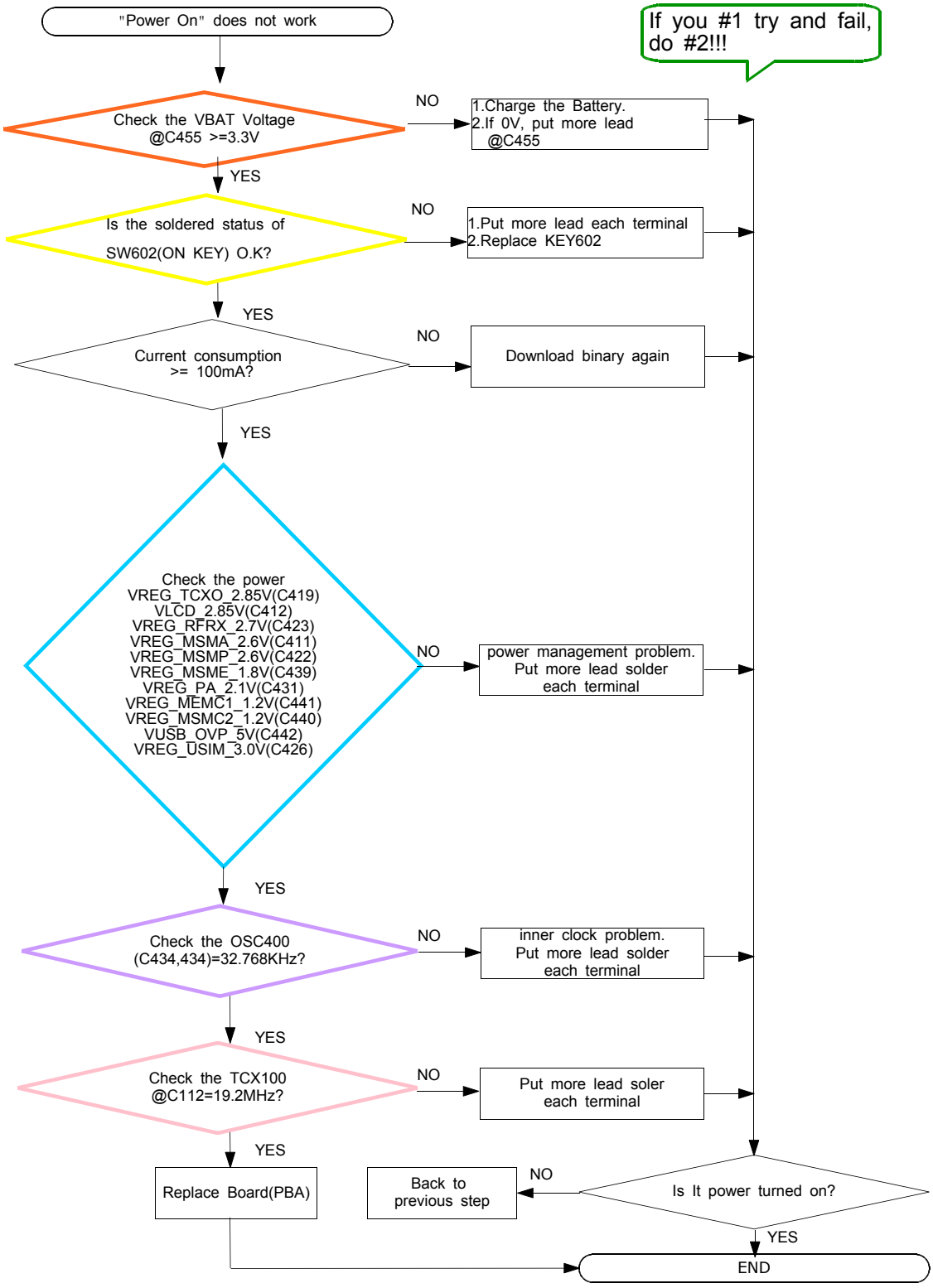
8-2-1. Top

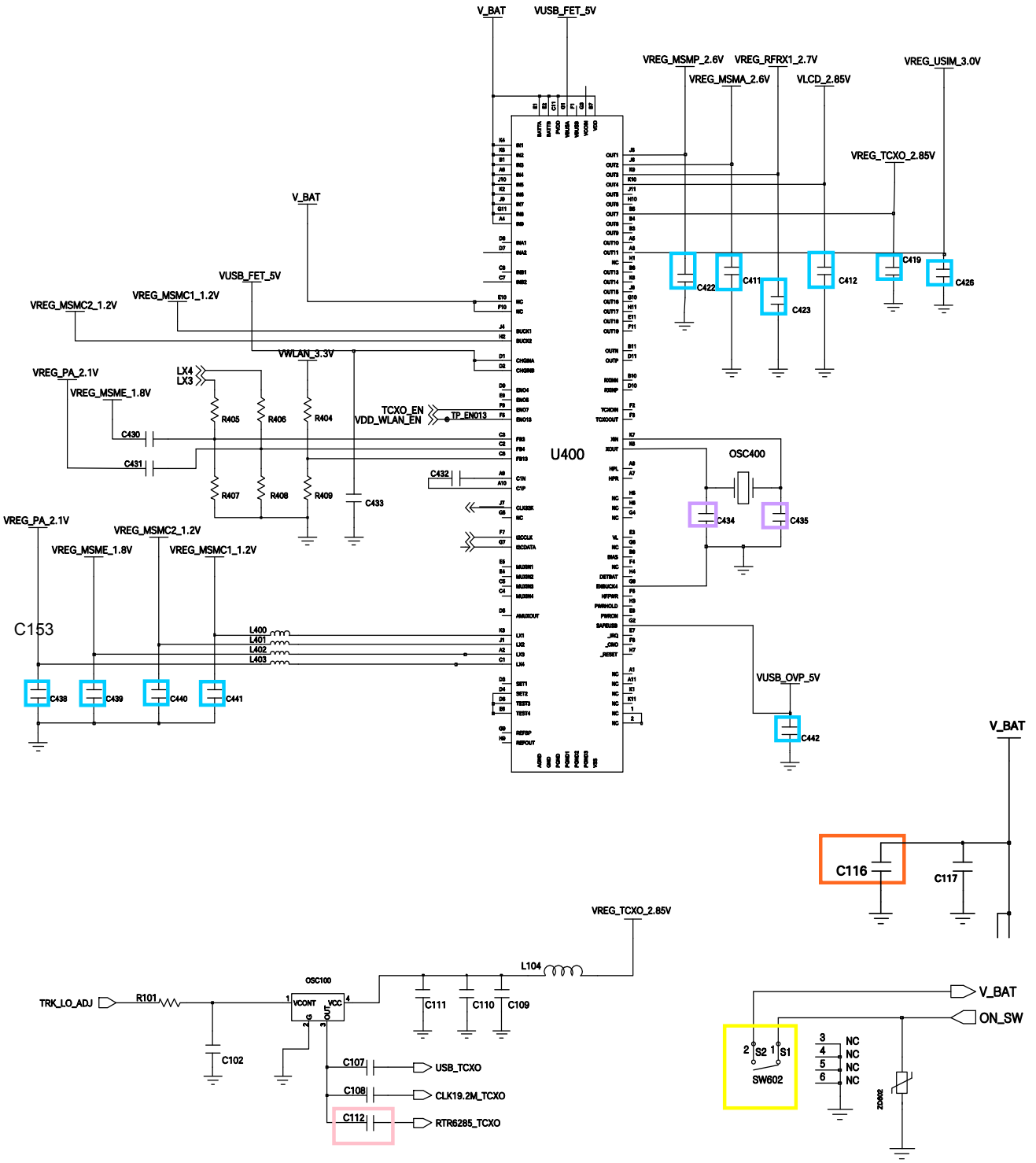


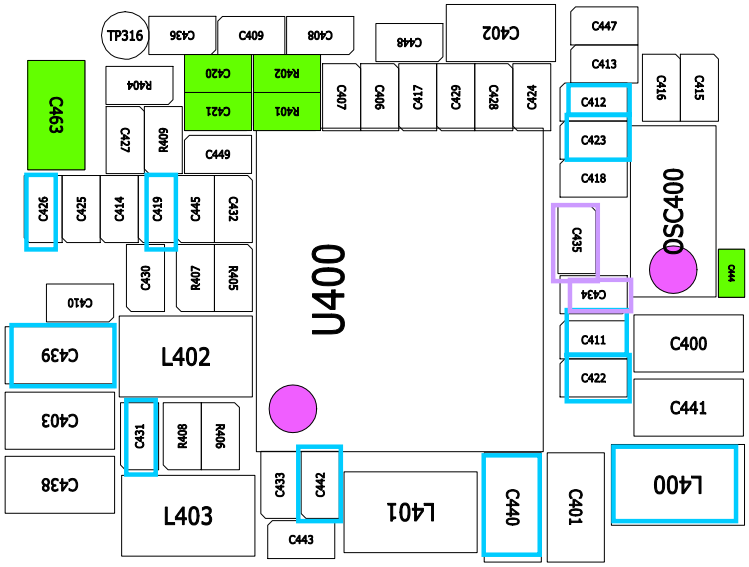
8-2-2. Bottom

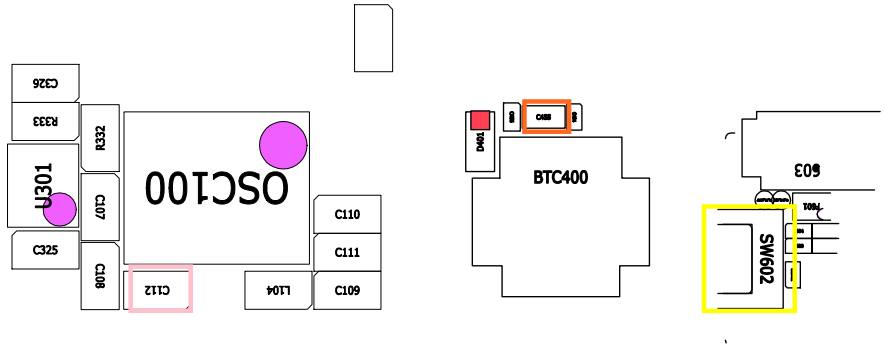


8-3-1. Power On

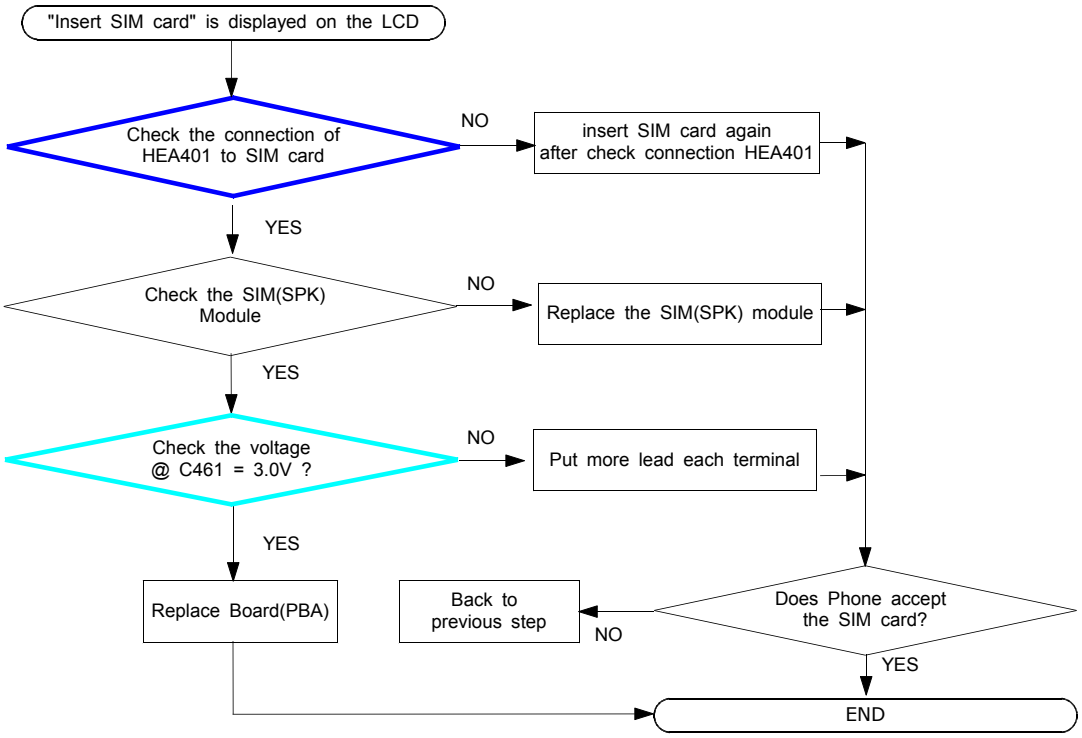


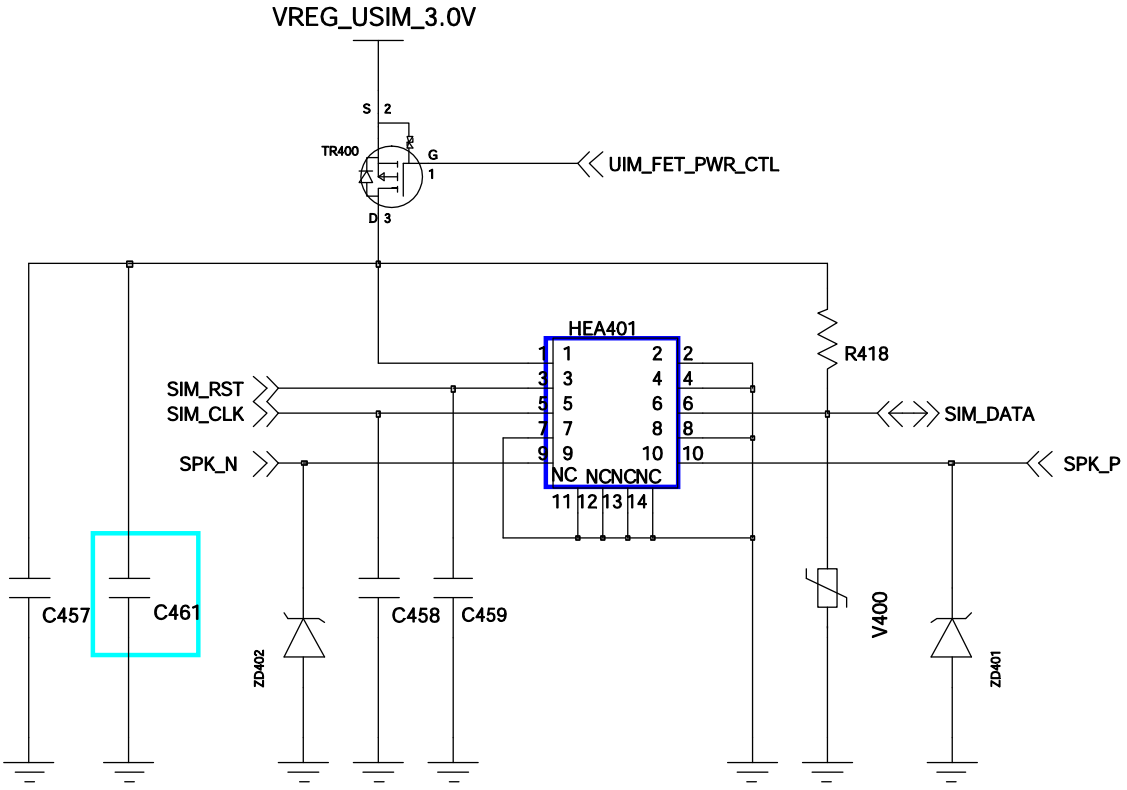


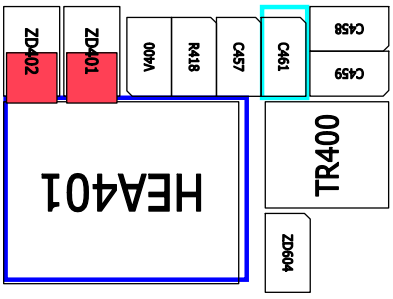




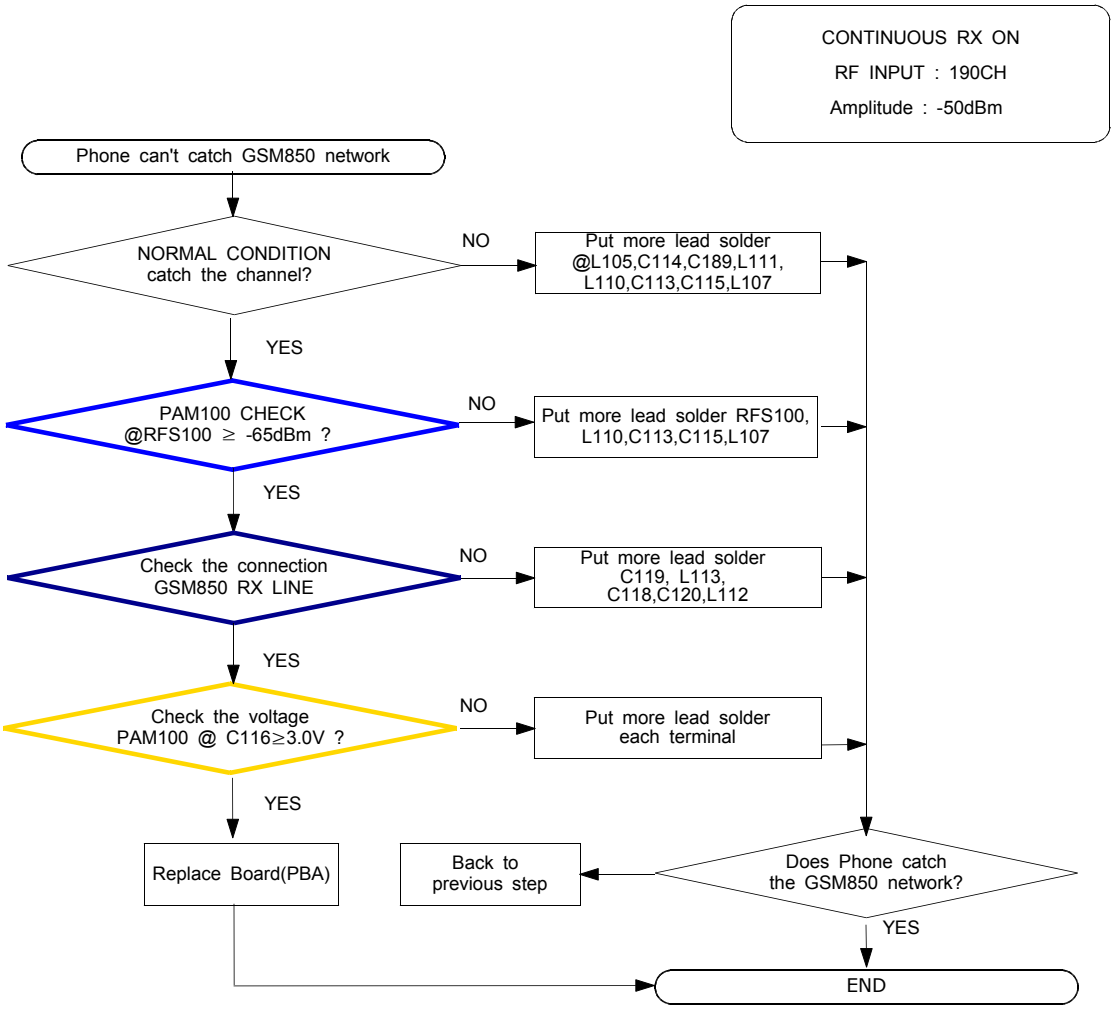
8-3-2. SIM part





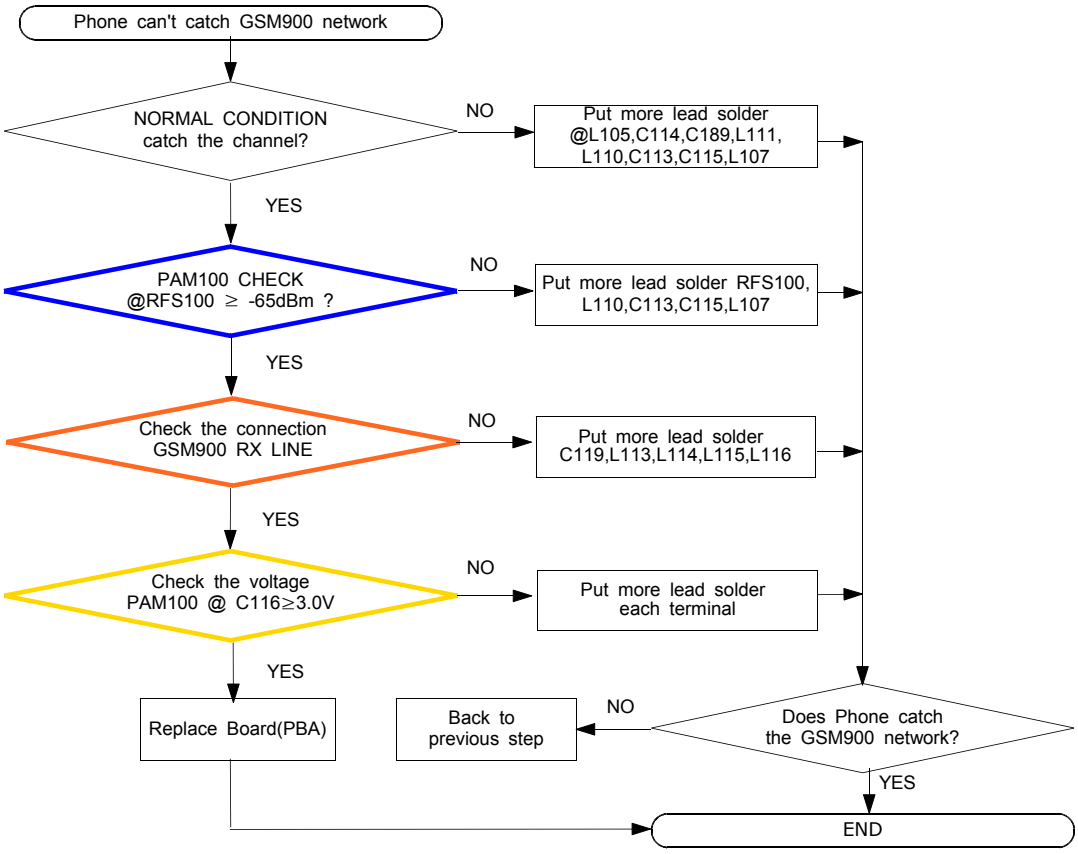


8-3-3. GSM850 RX



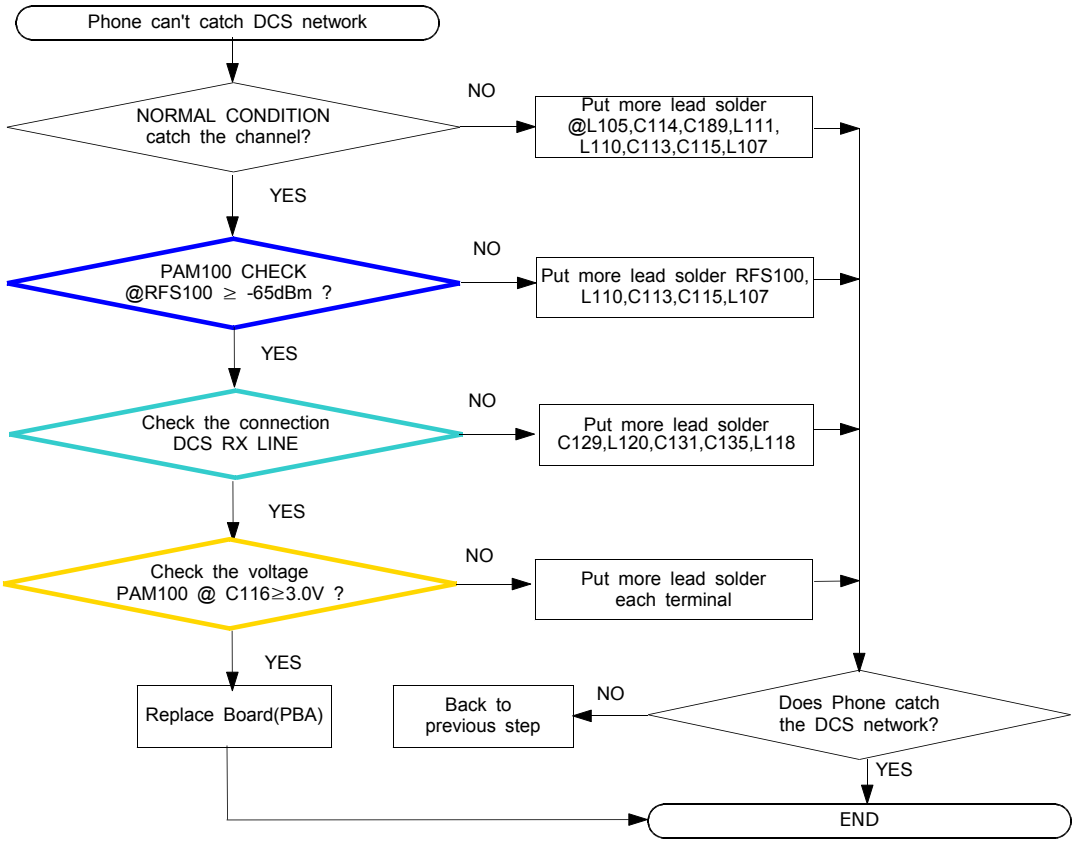
8-3-4. GSM900 RX

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



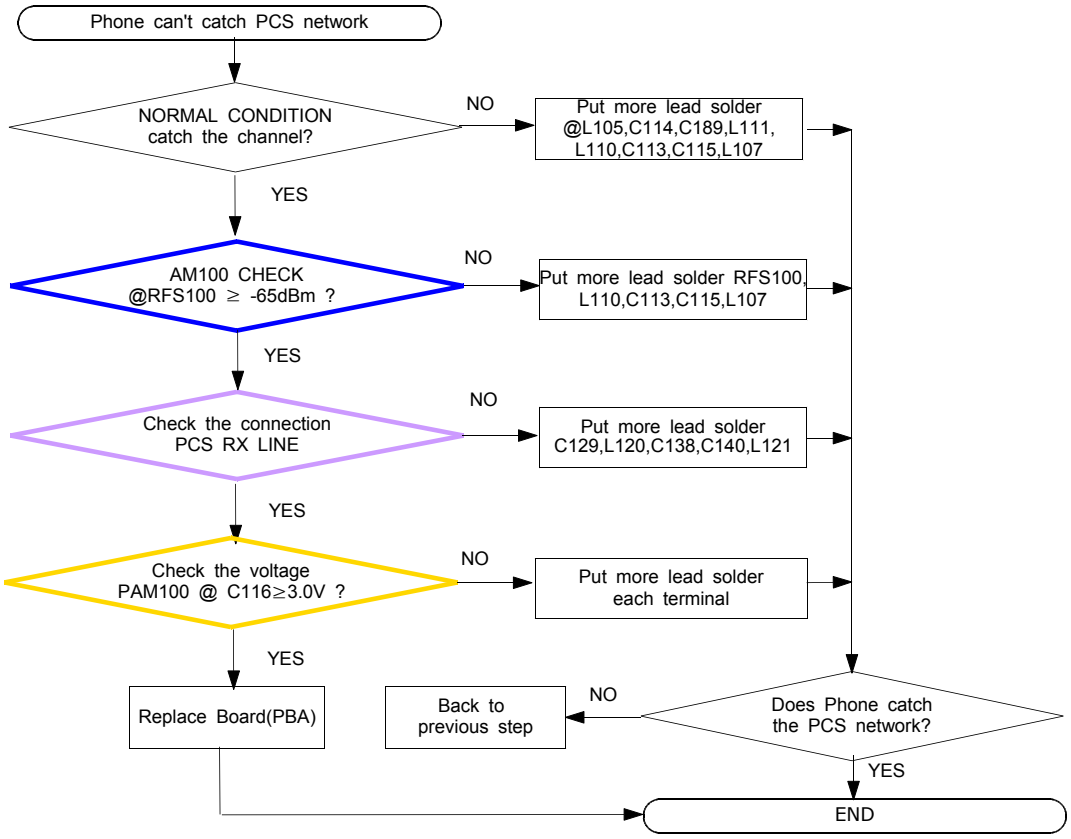
8-3-5. DCS RX

CONTINUOUS RX ON
RF INPUT : 698CH
Amplitude : -50dBm



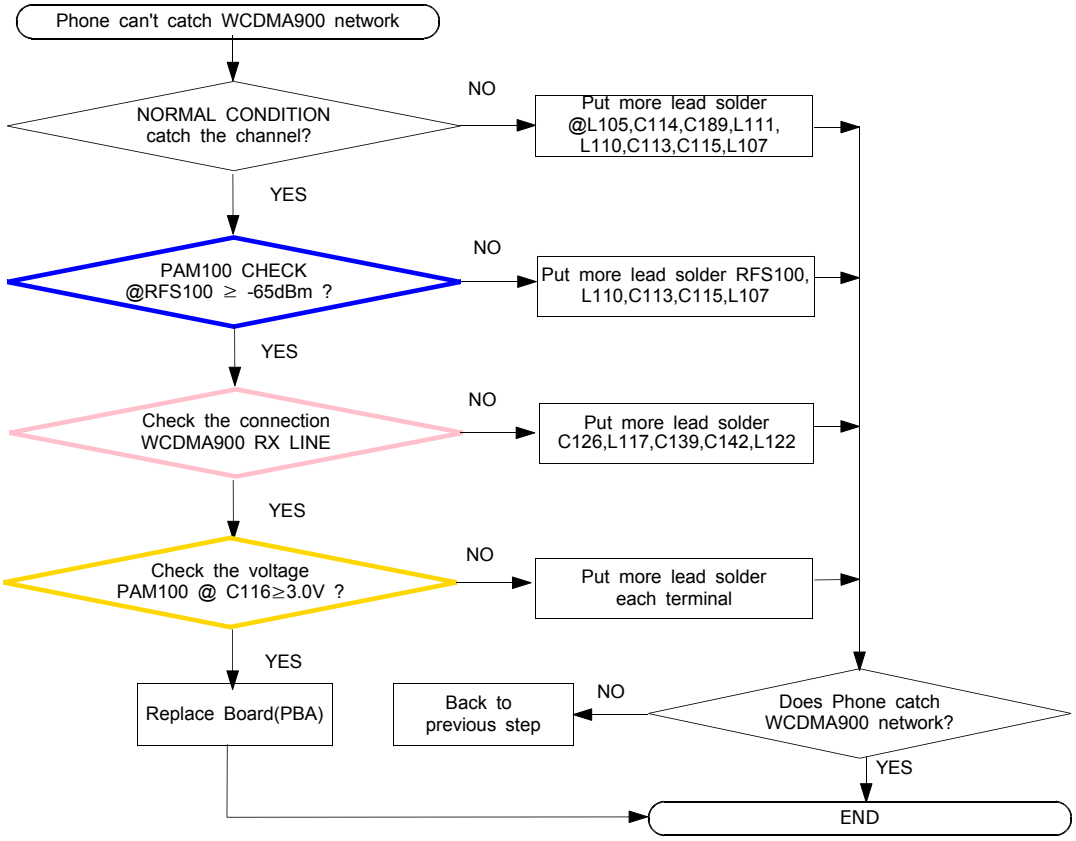
8-3-6. PCS RX

CONTINUOUS RX ON
RF INPUT : 644CH
Amplitude : -50dBm



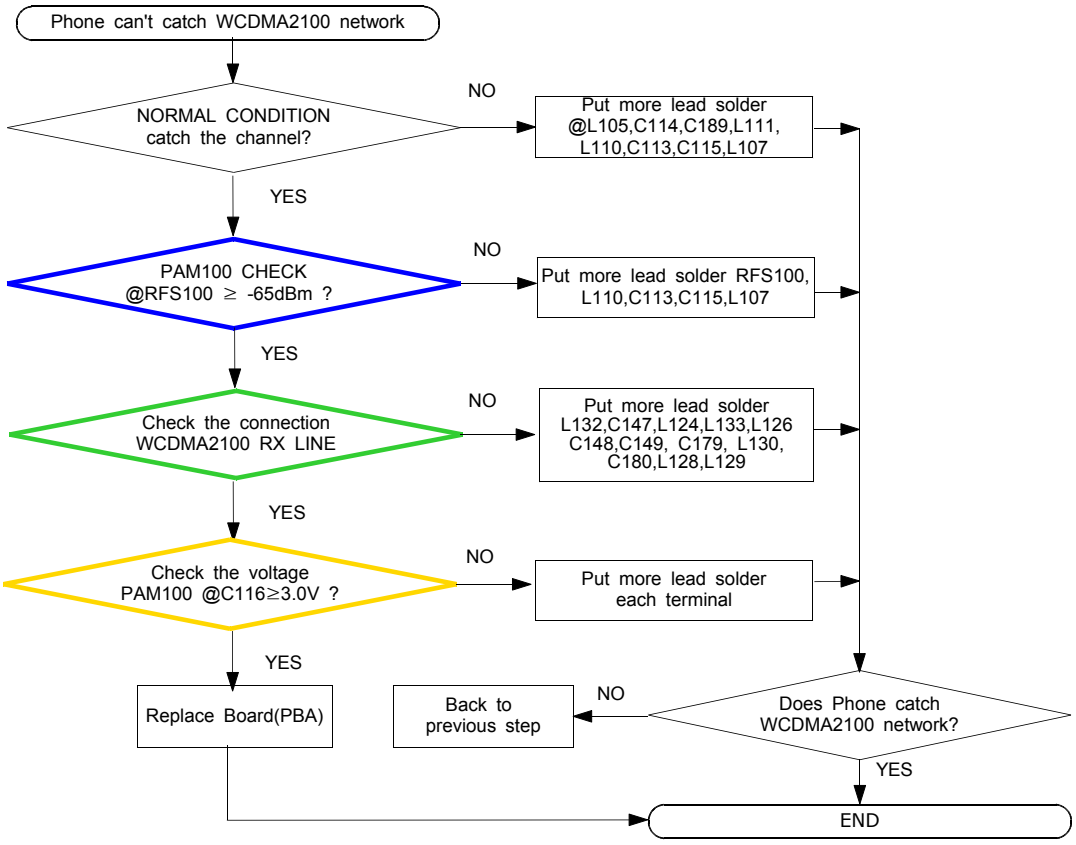
8-3-7. WCDMA Band 8 RX

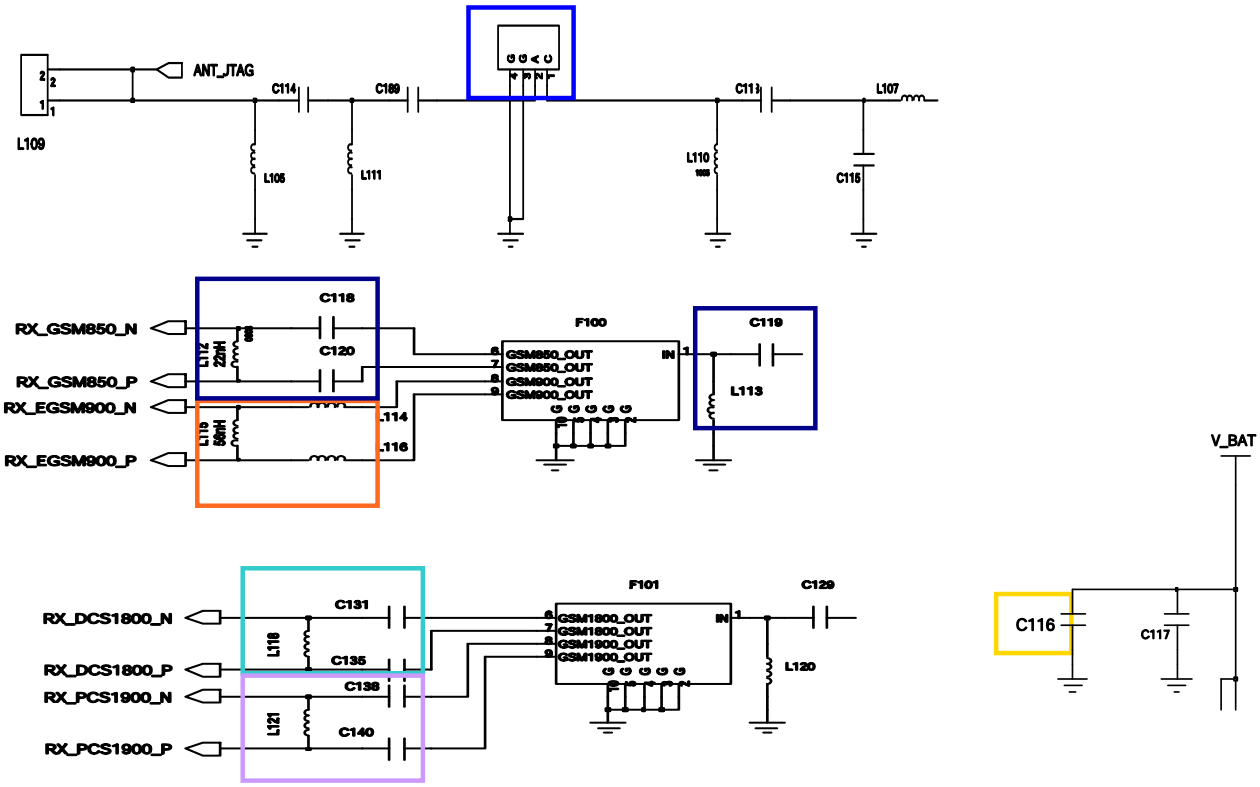
CONTINUOUS RX ON
RF INPUT : 10700CH
Amplitude : -50dBm

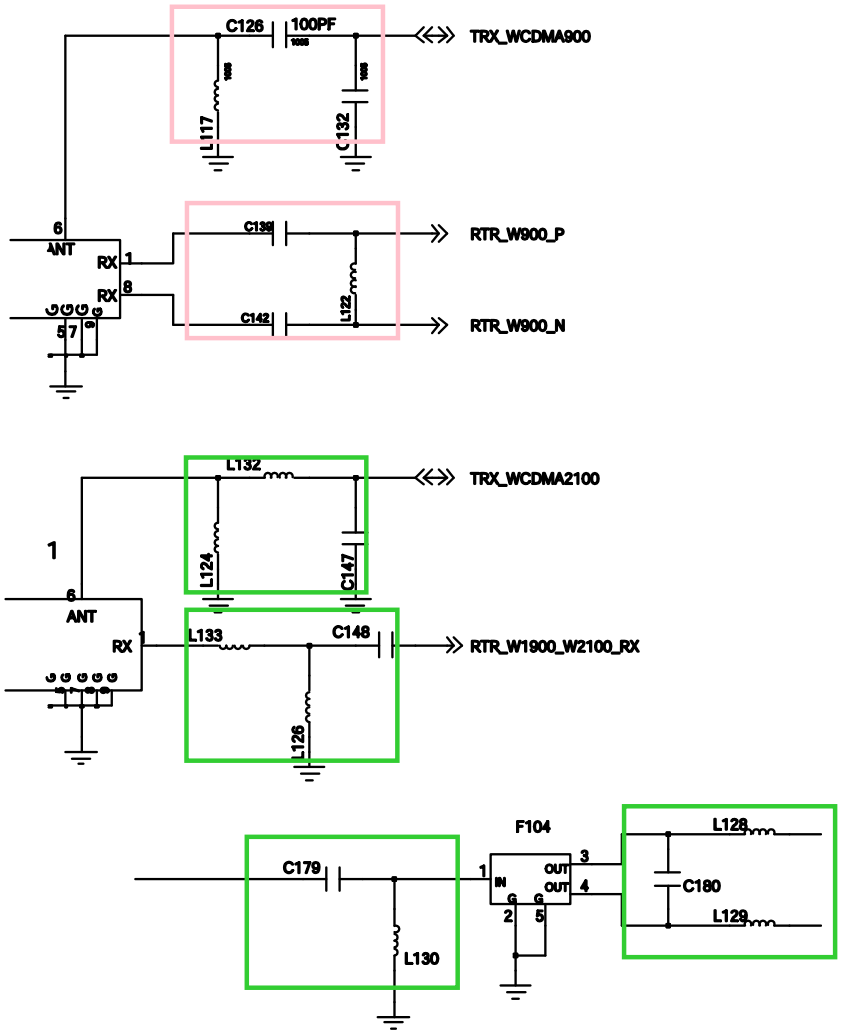


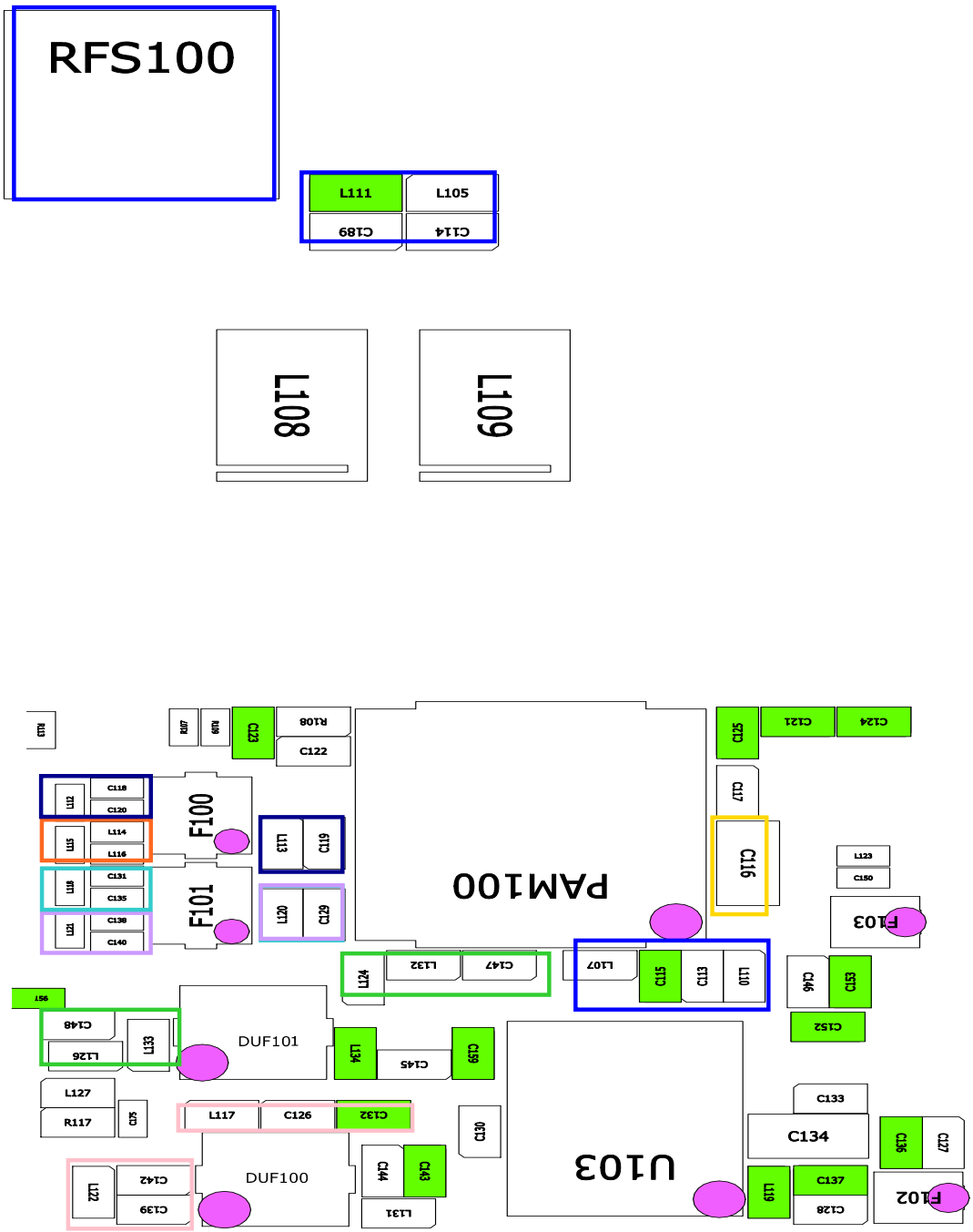
8-3-8. WCDMA Band 1 RX

CONTINUOUS RX ON
RF INPUT : 10700CH
Amplitude : -50dBm

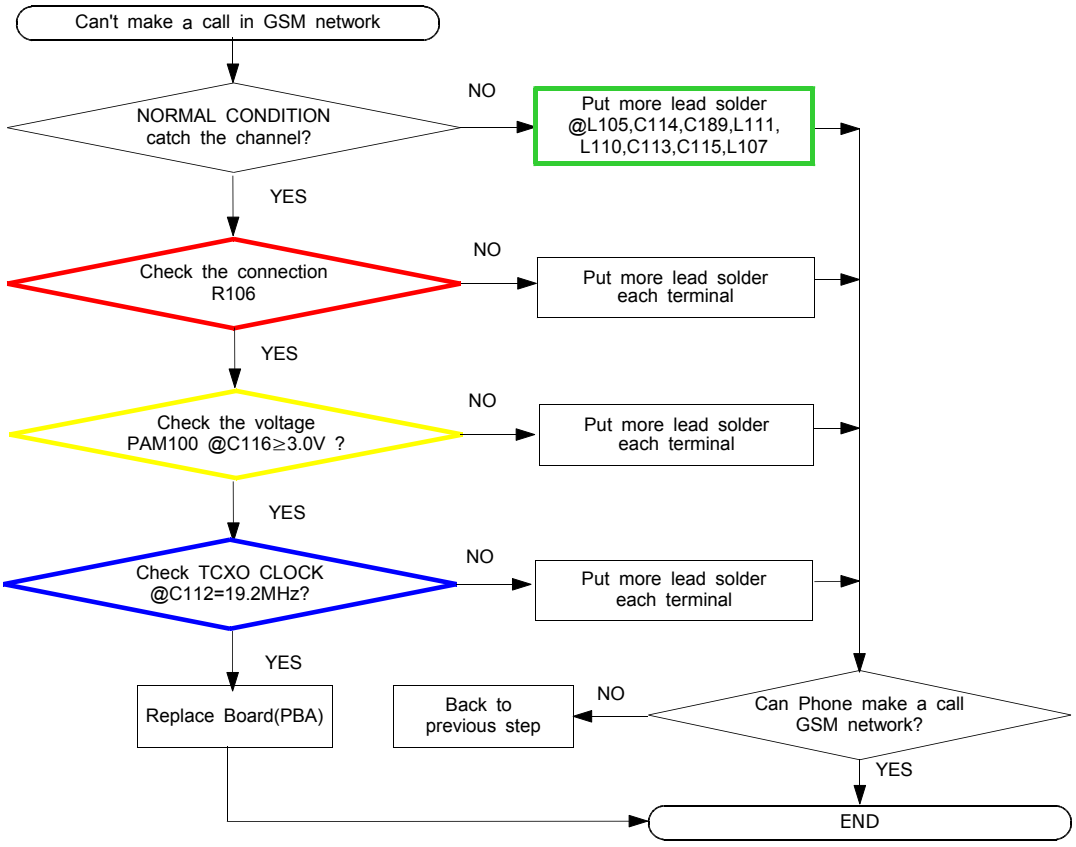




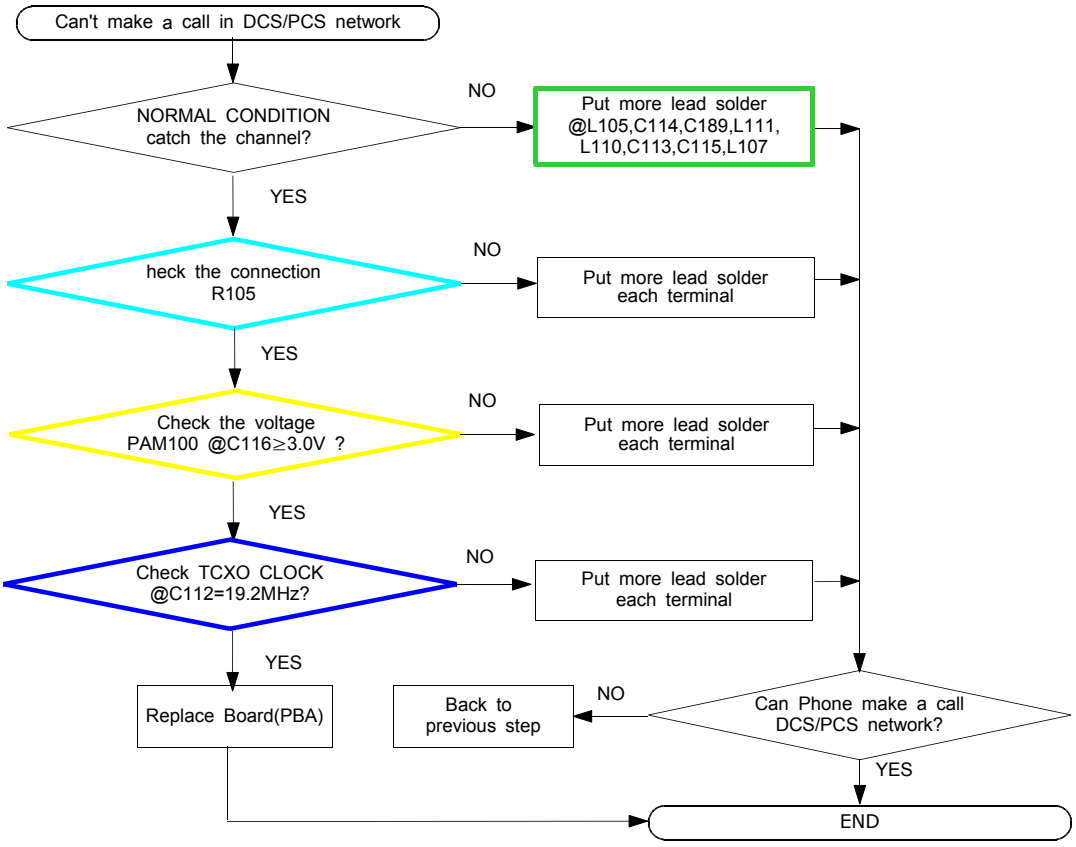




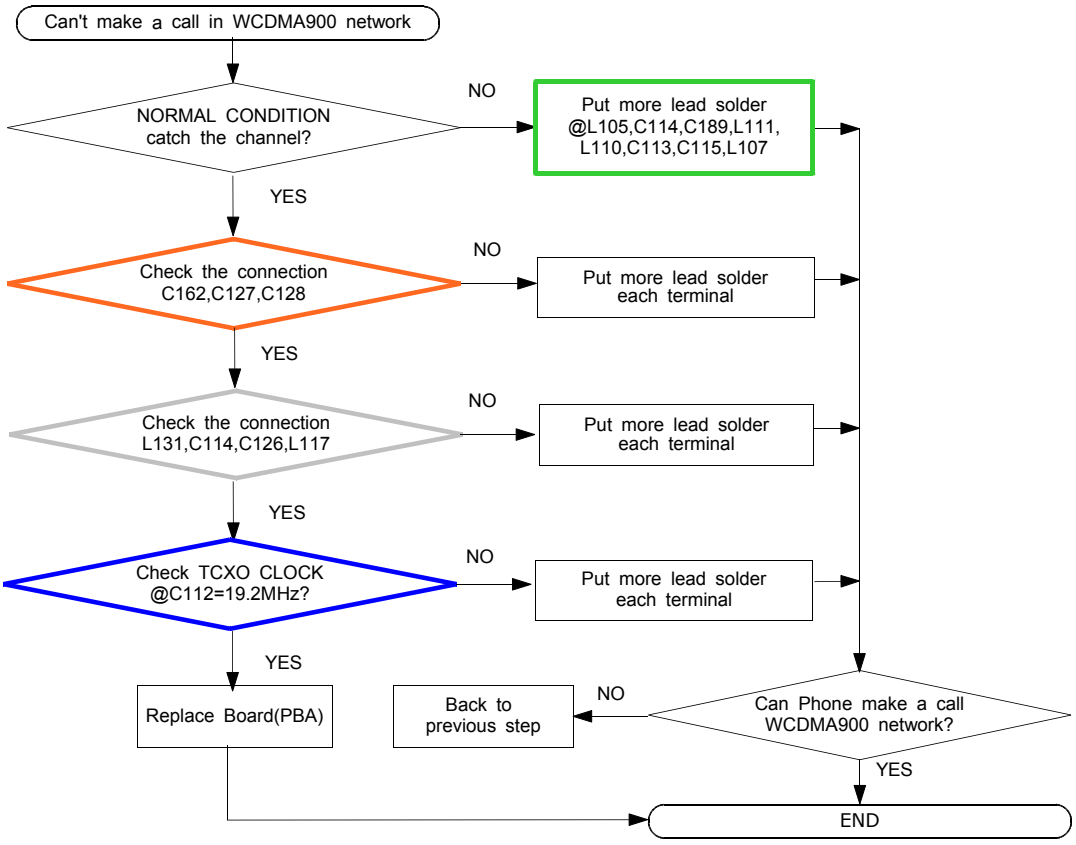
8-3-9. GSM850/900 TX



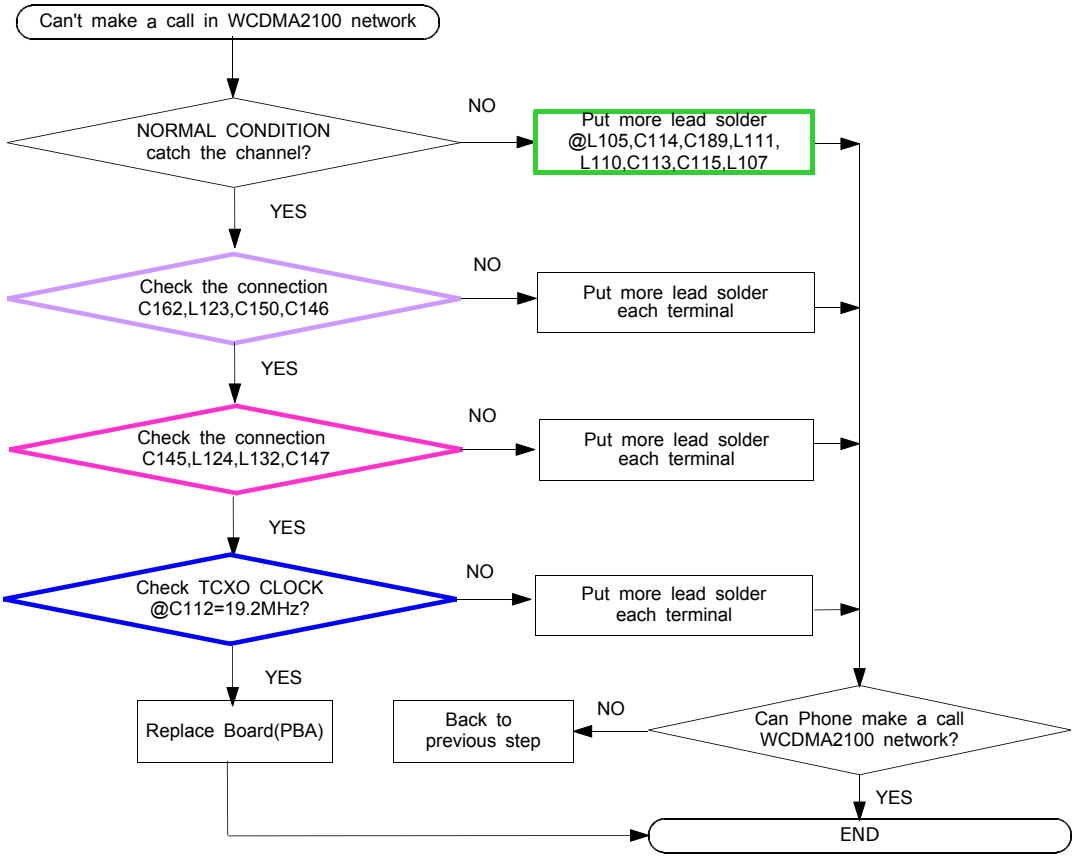
8-3-10. DCS/ PCS TX

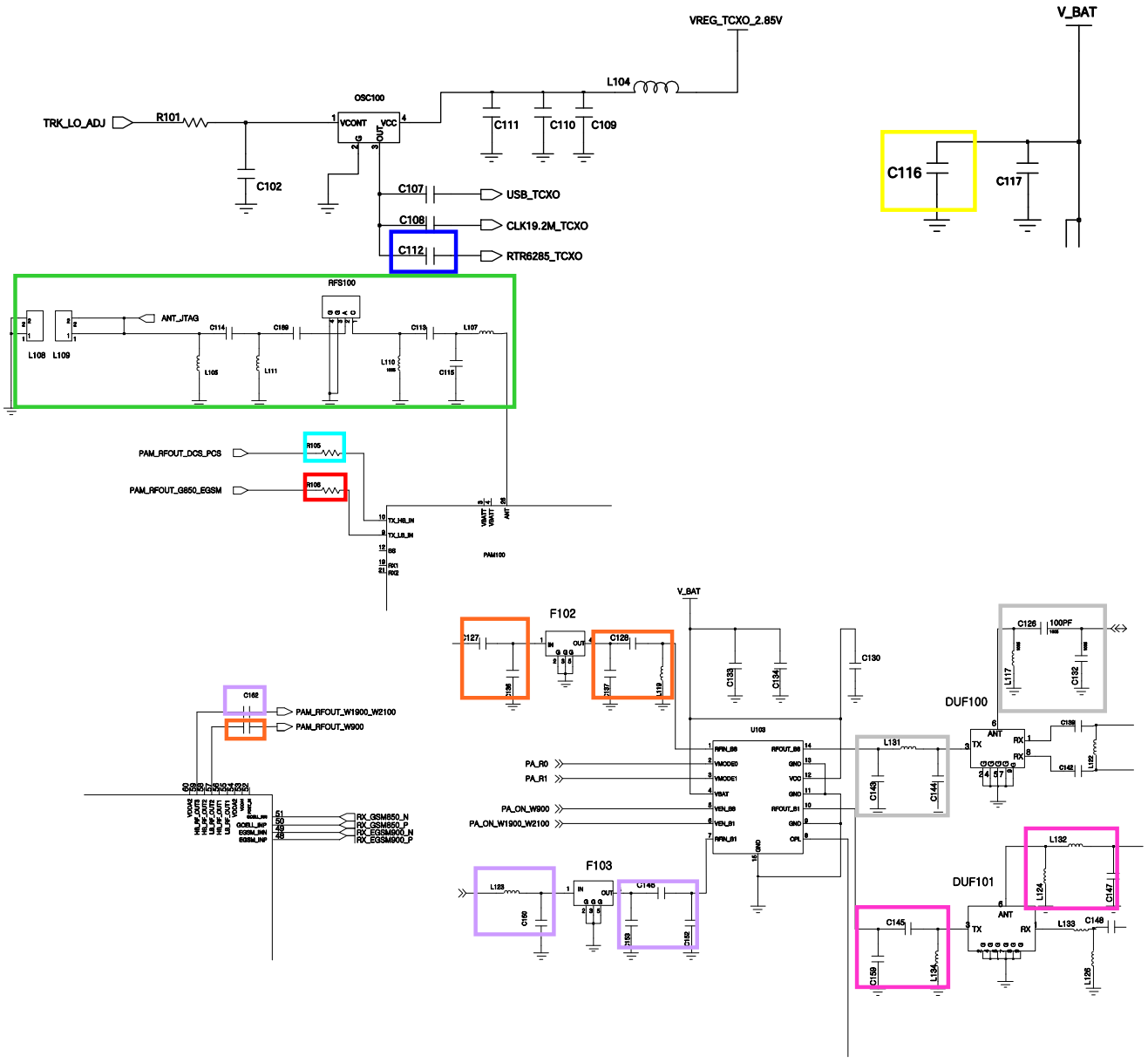


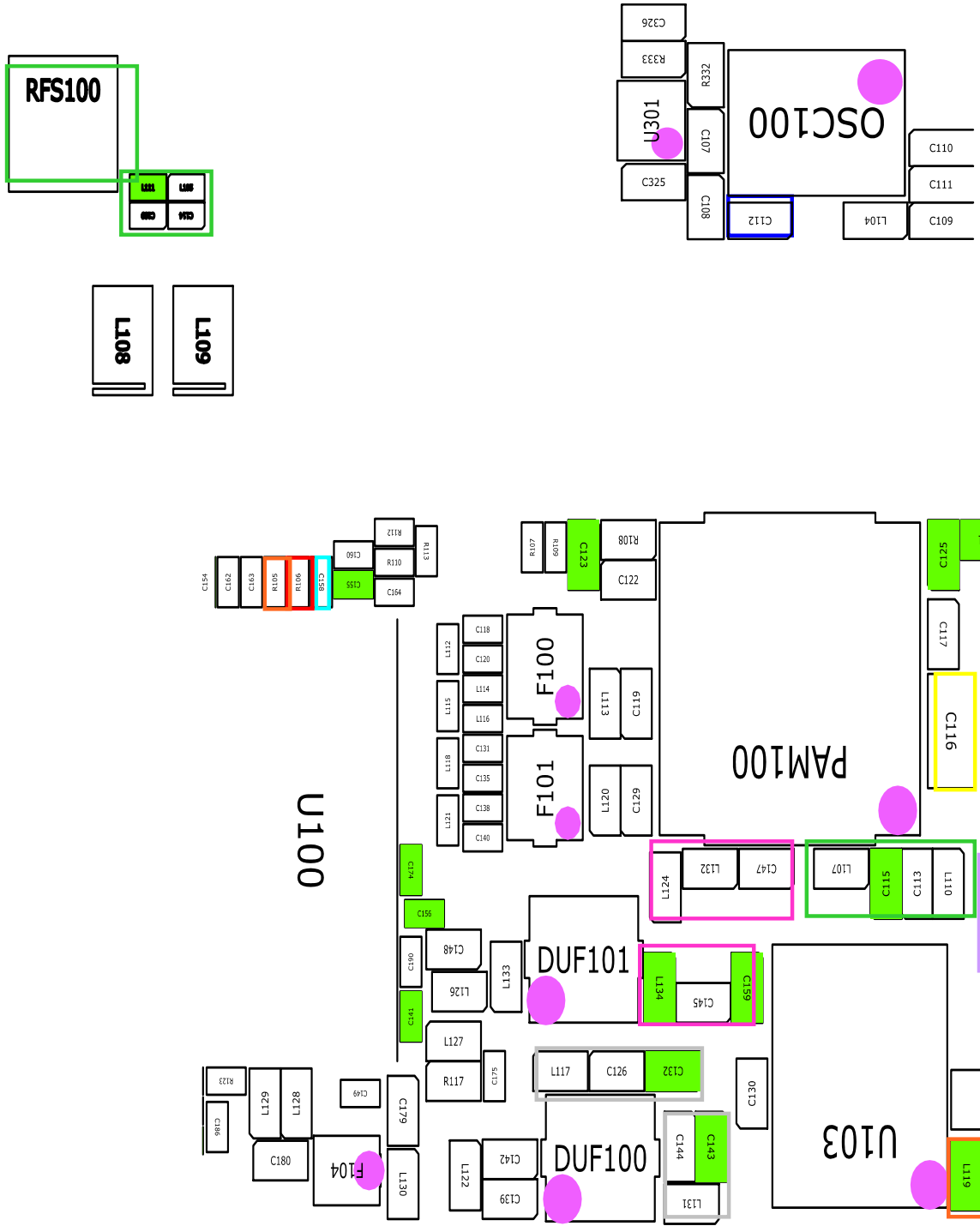
8-3-11. WCDMA BAND 8 TX



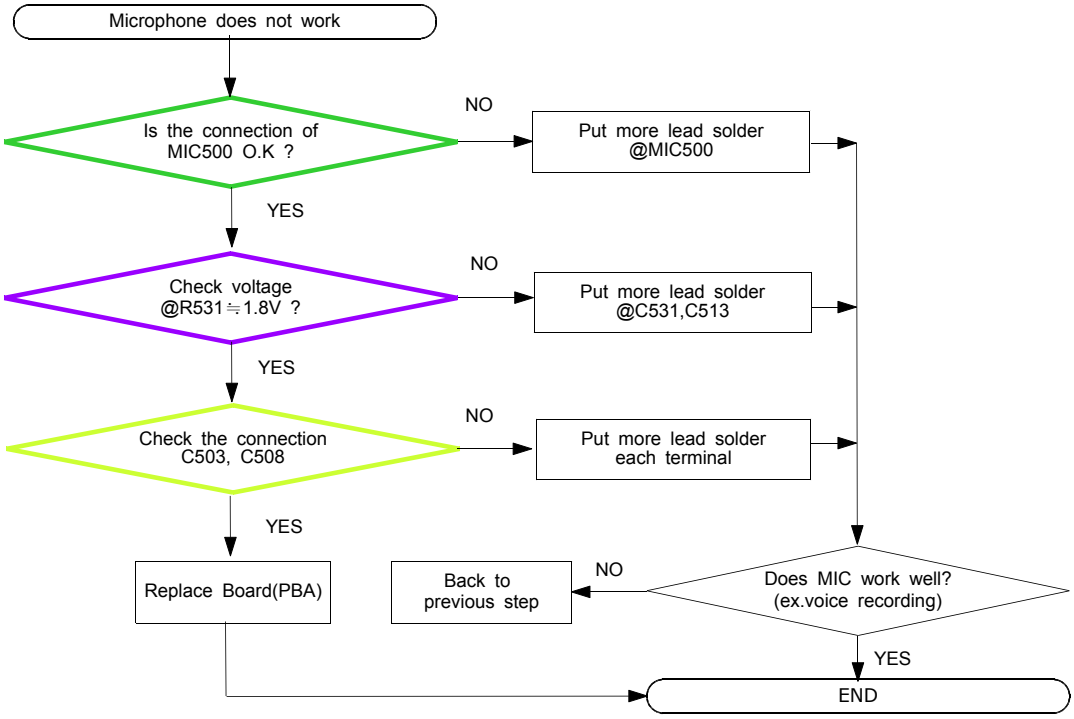
8-3-12. WCDMA BAND 1 TX

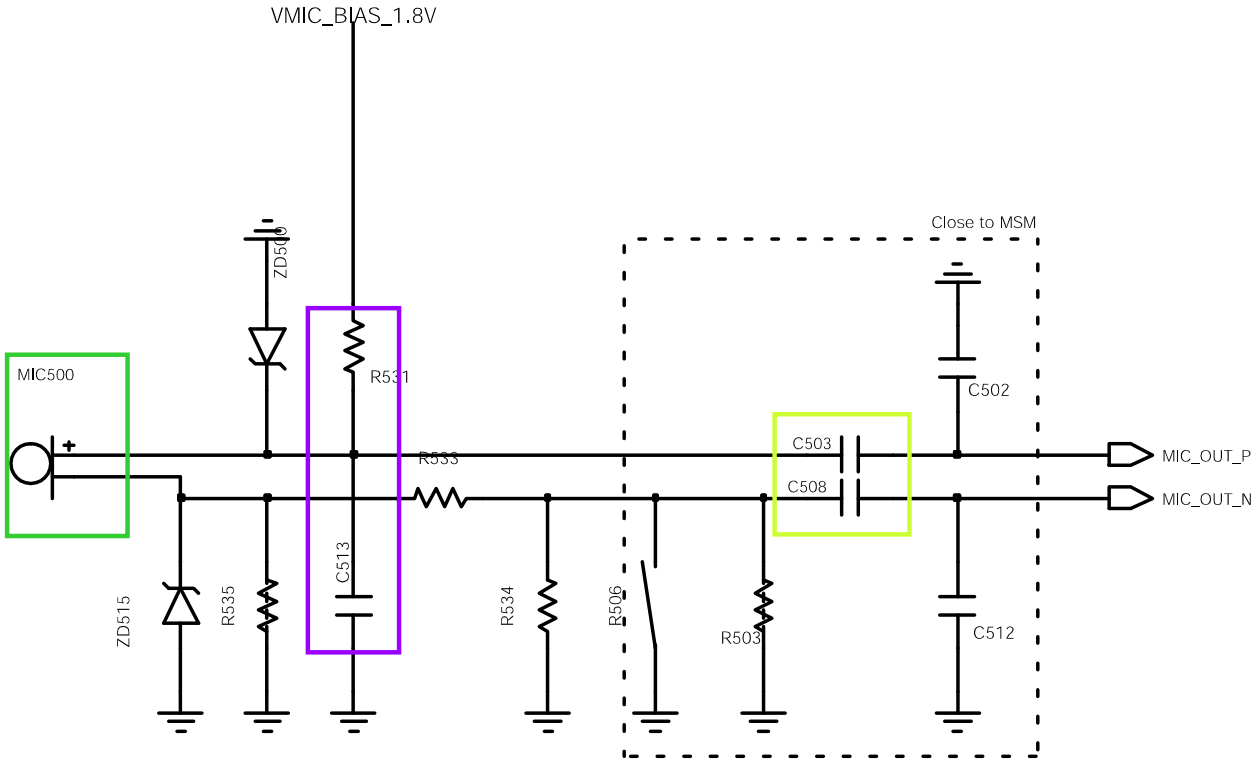


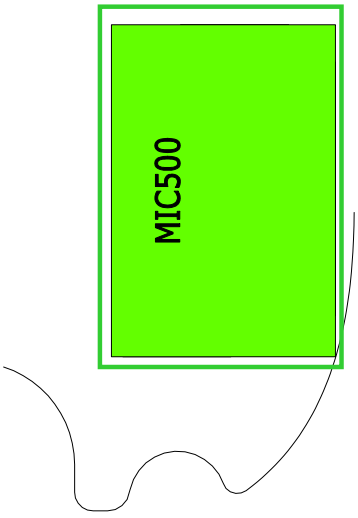


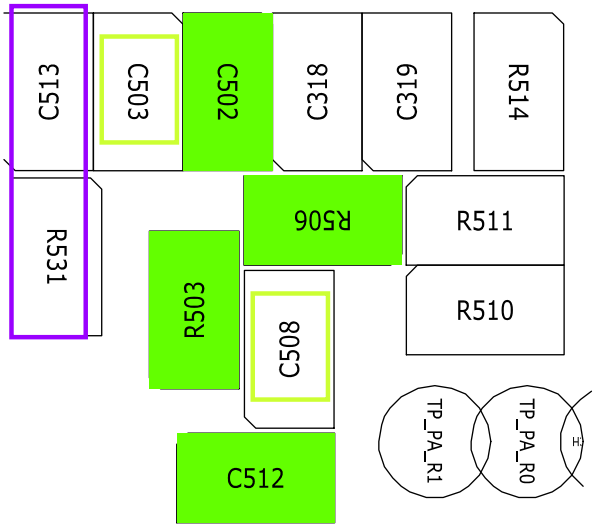


8-3-13. Microphone

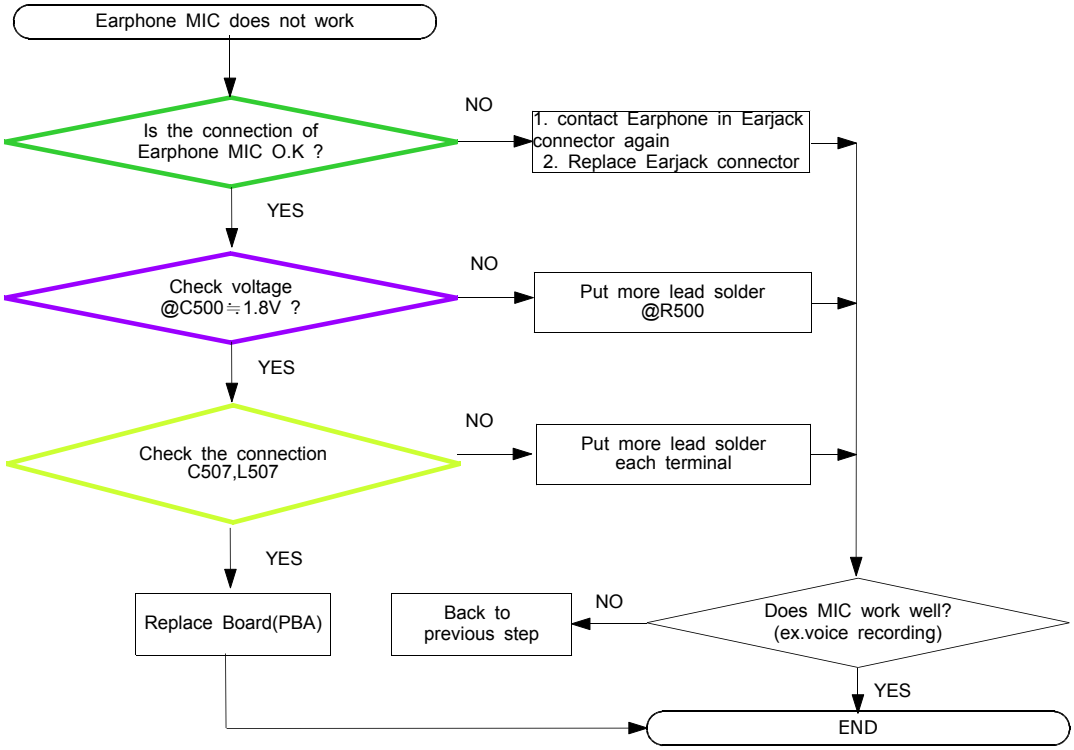


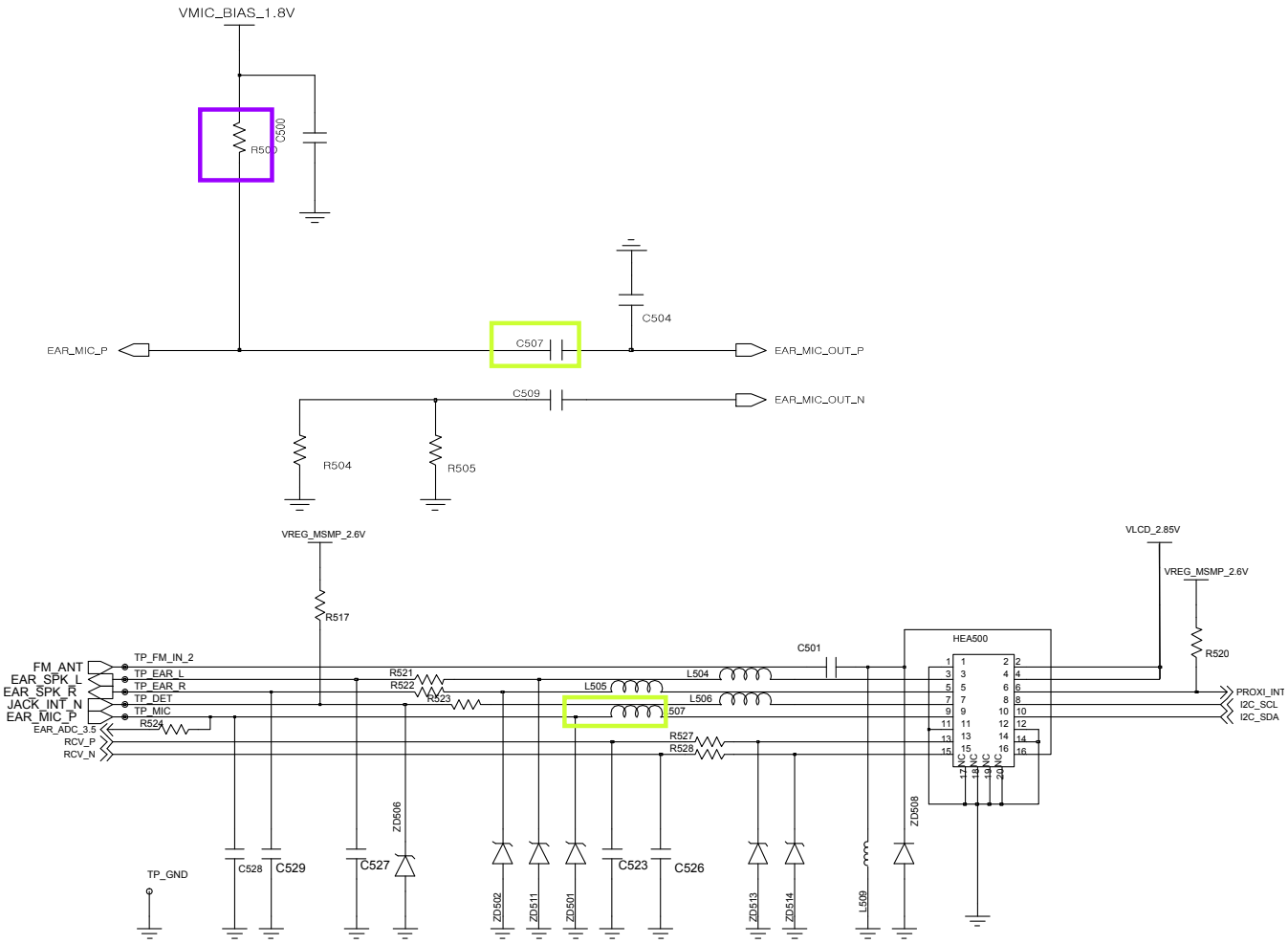


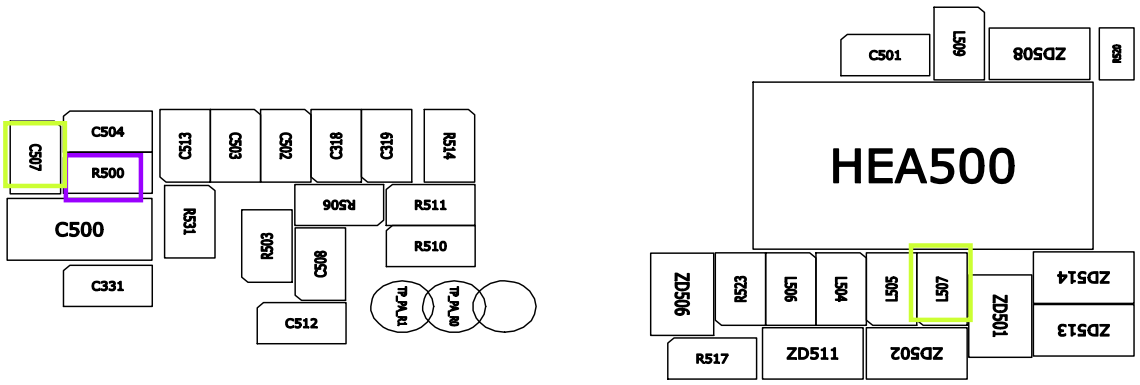




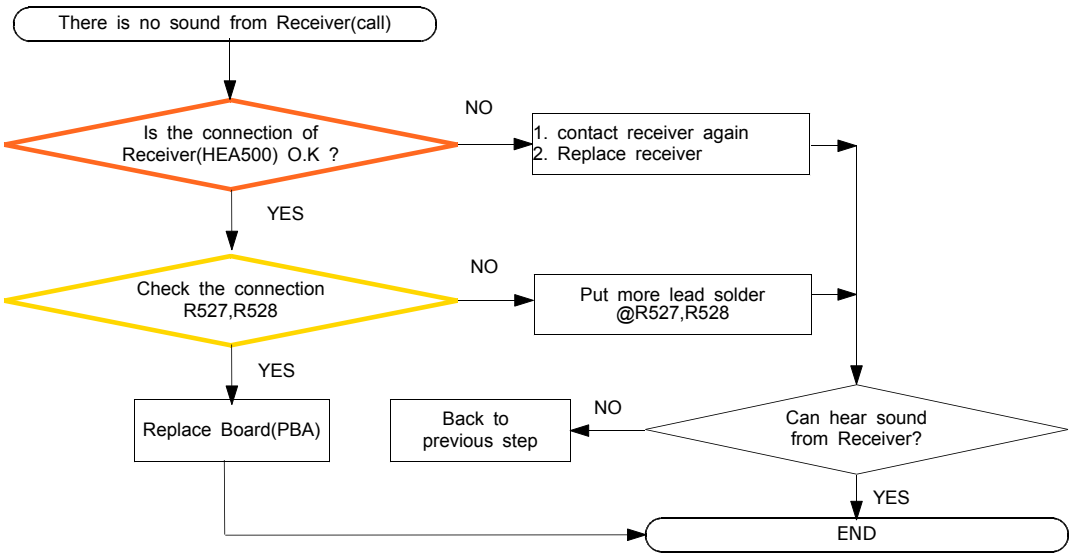
8-3-14. Earphone MIC

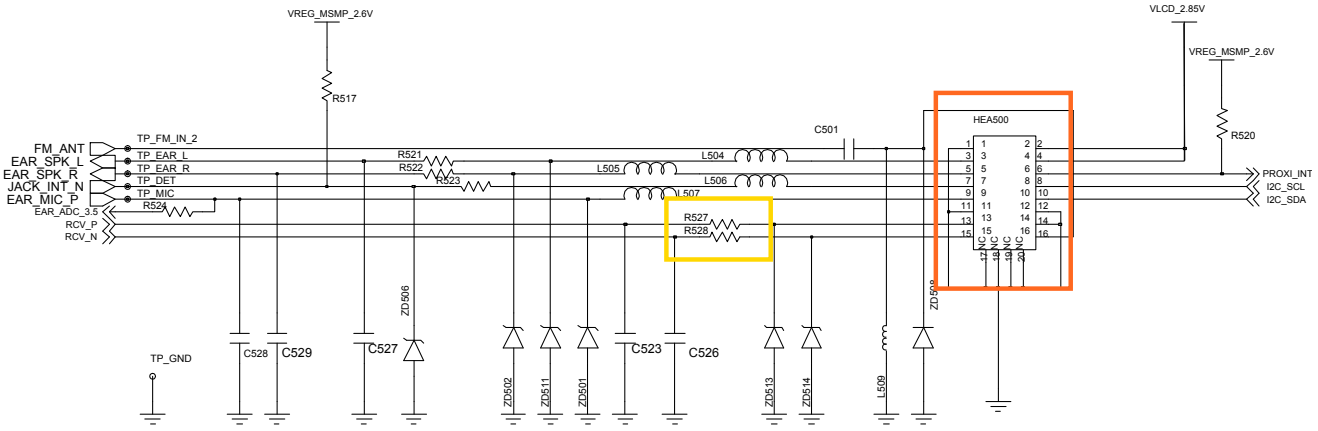


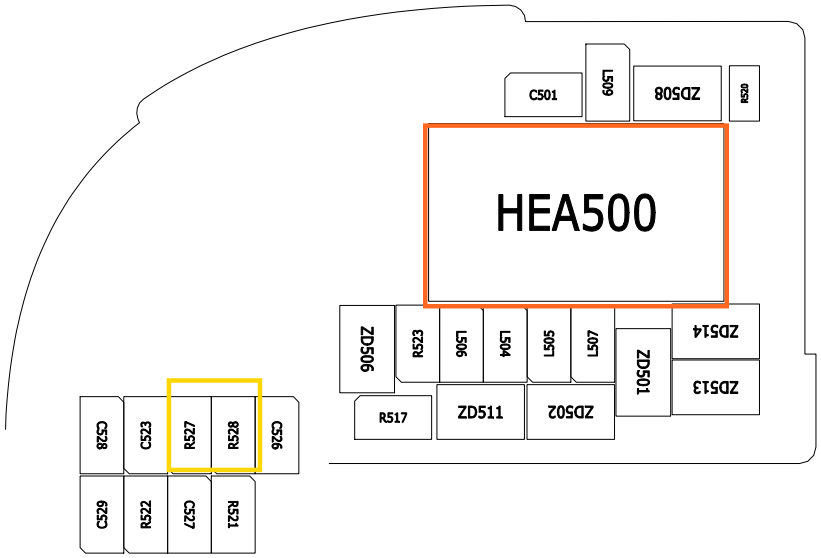




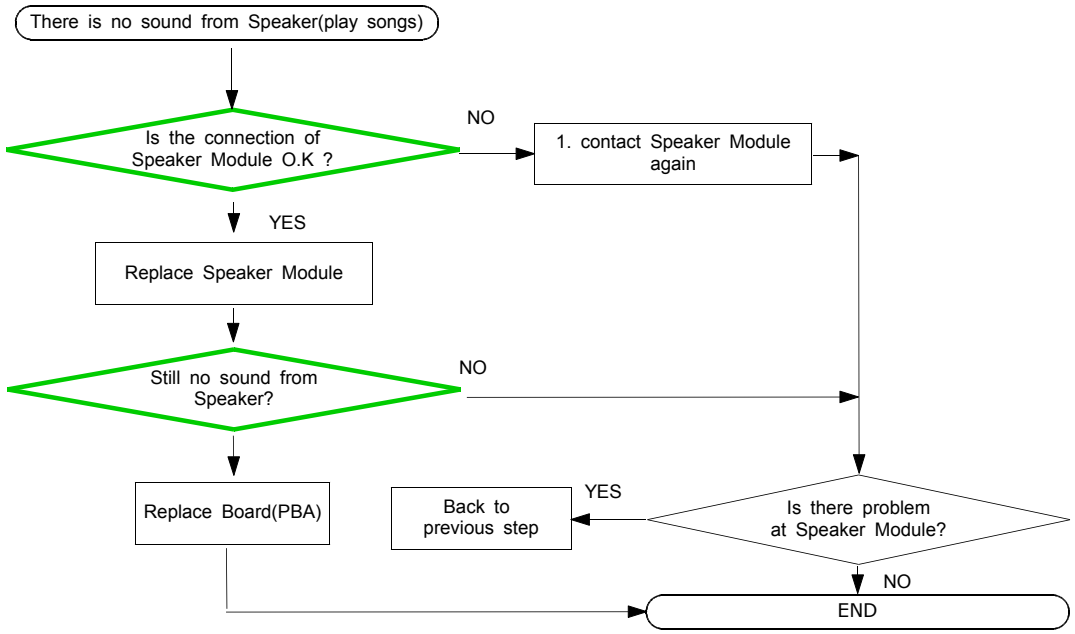
8-3-15. Receiver

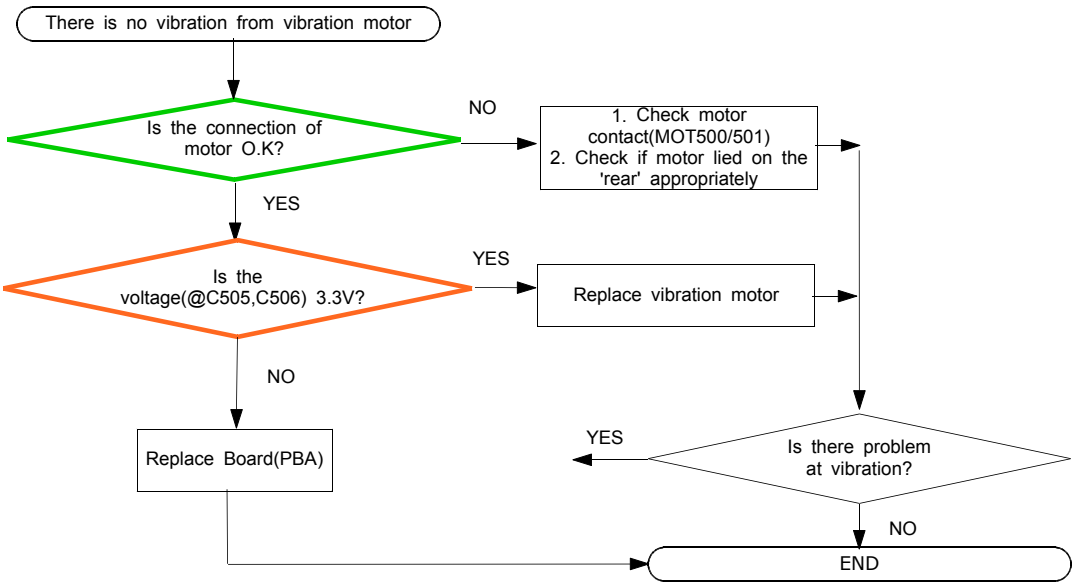


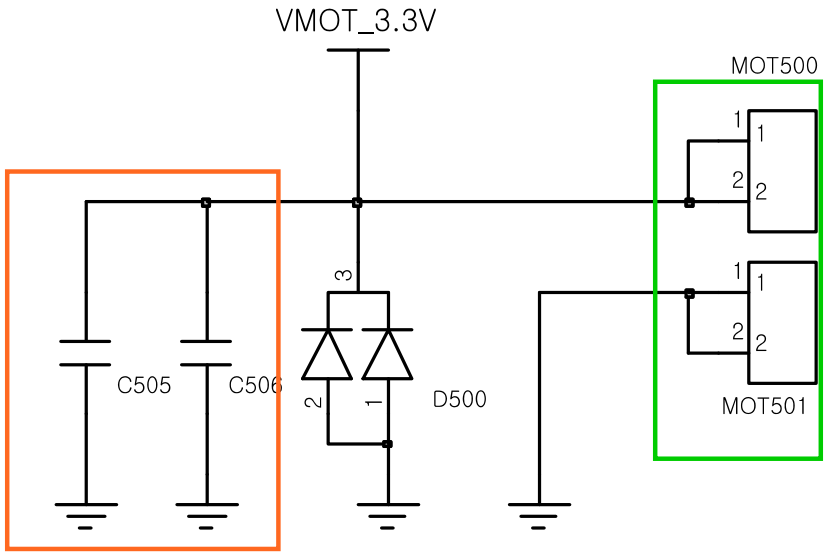


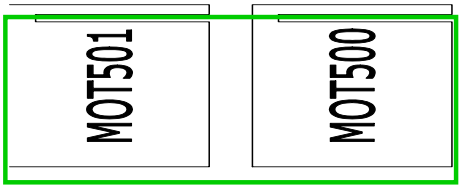


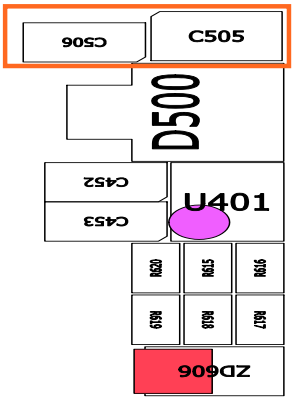
8-3-16. Speaker, Motor





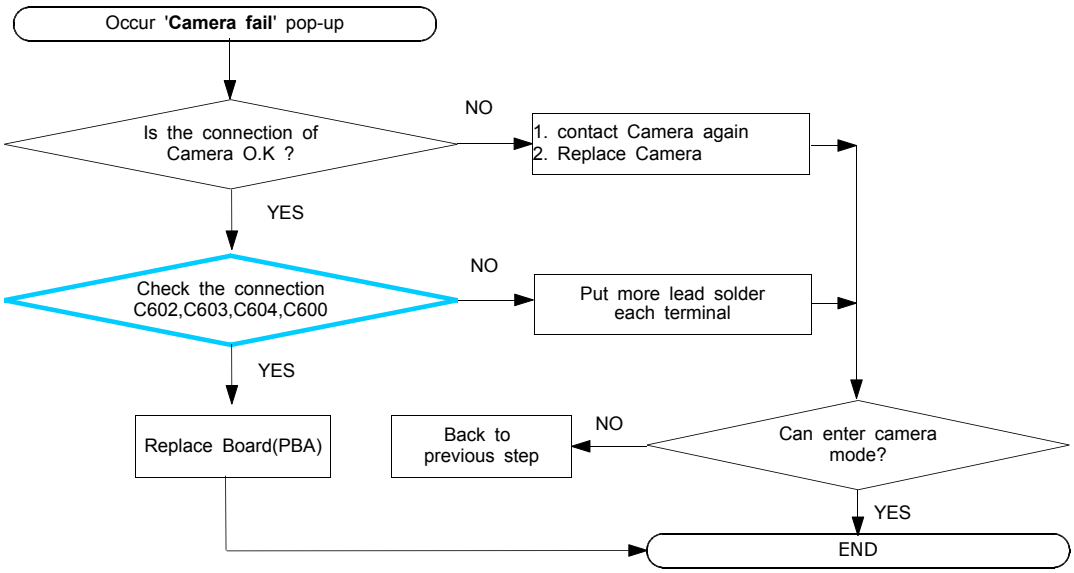




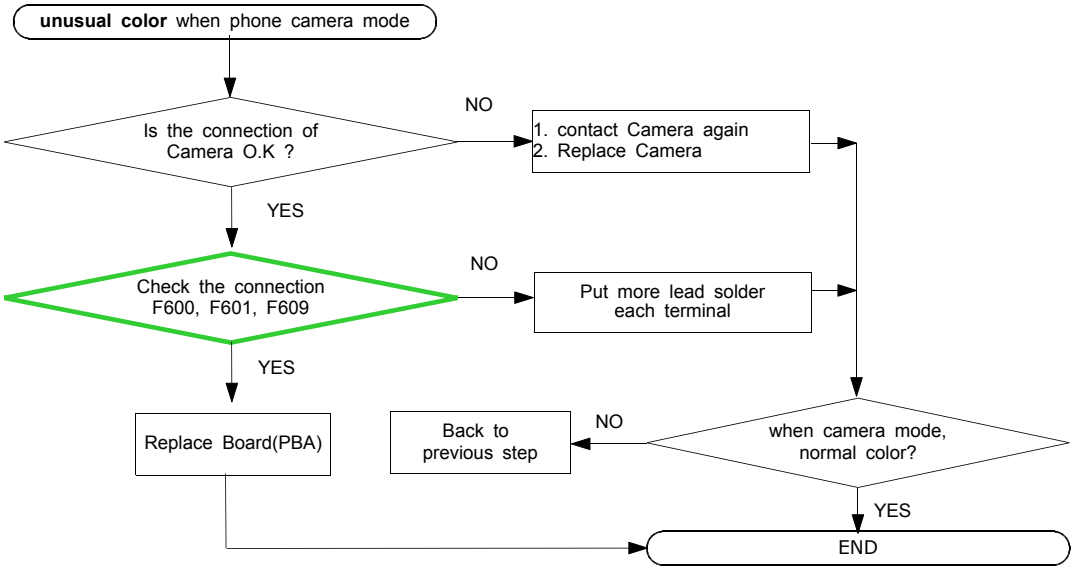


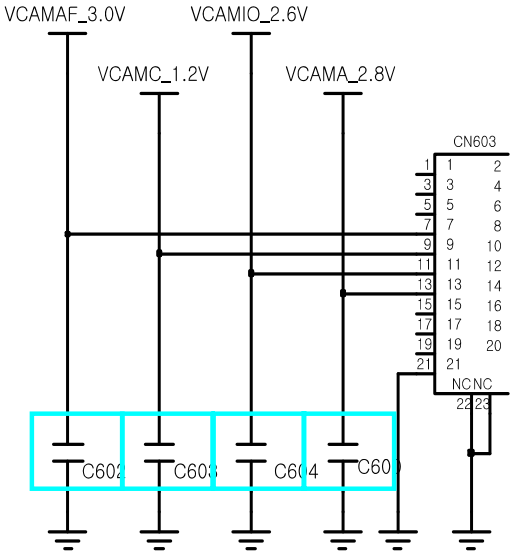
8-3-17. Camera

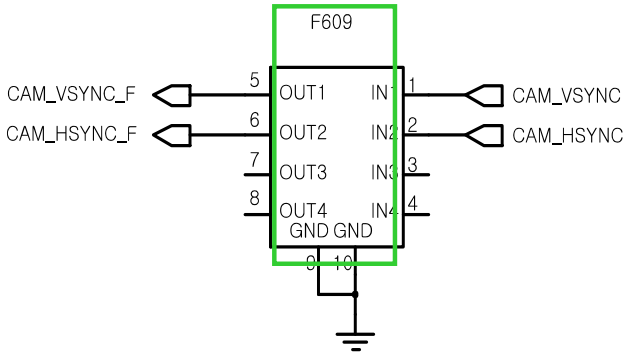
CASE 1

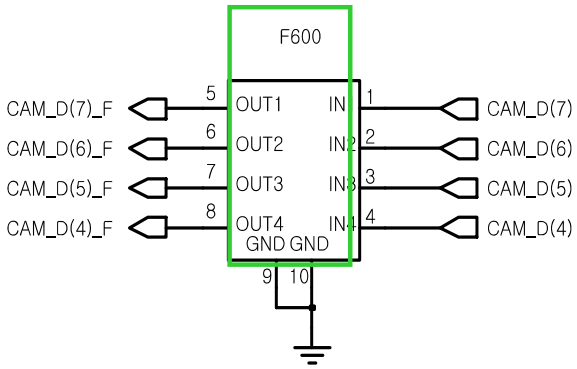


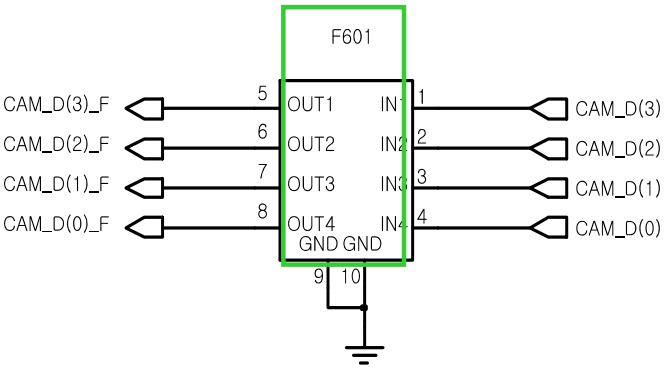
CASE 2

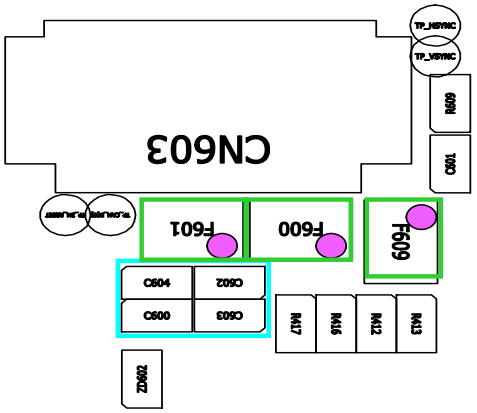




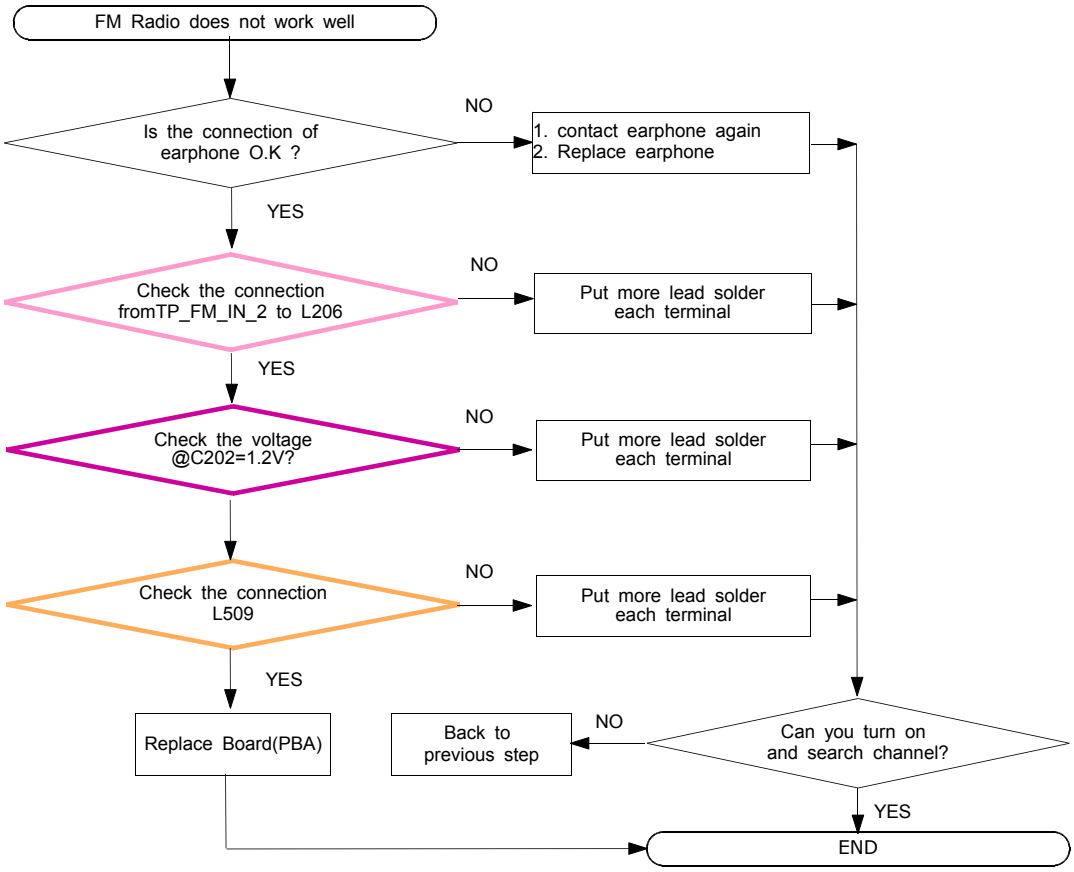


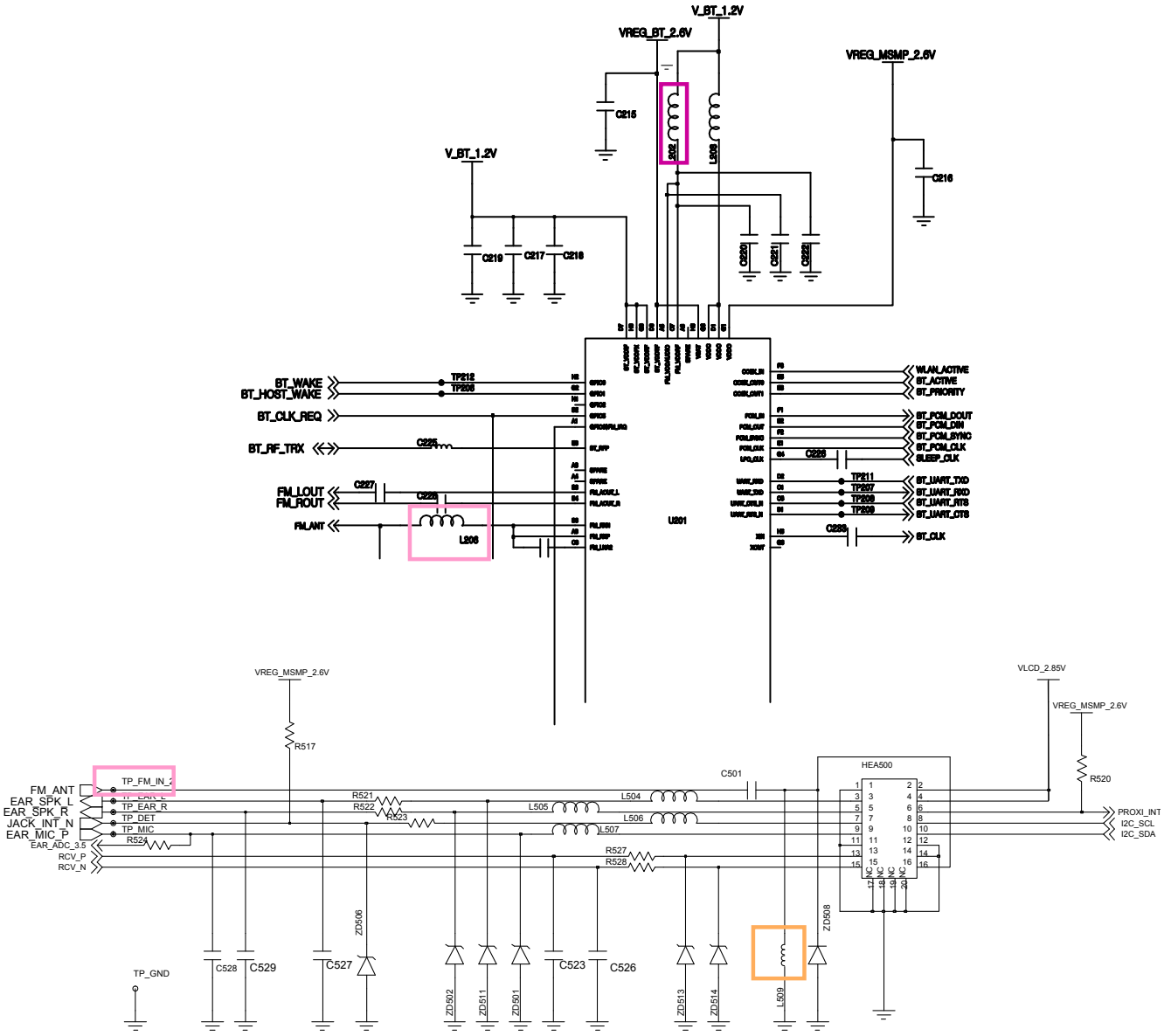


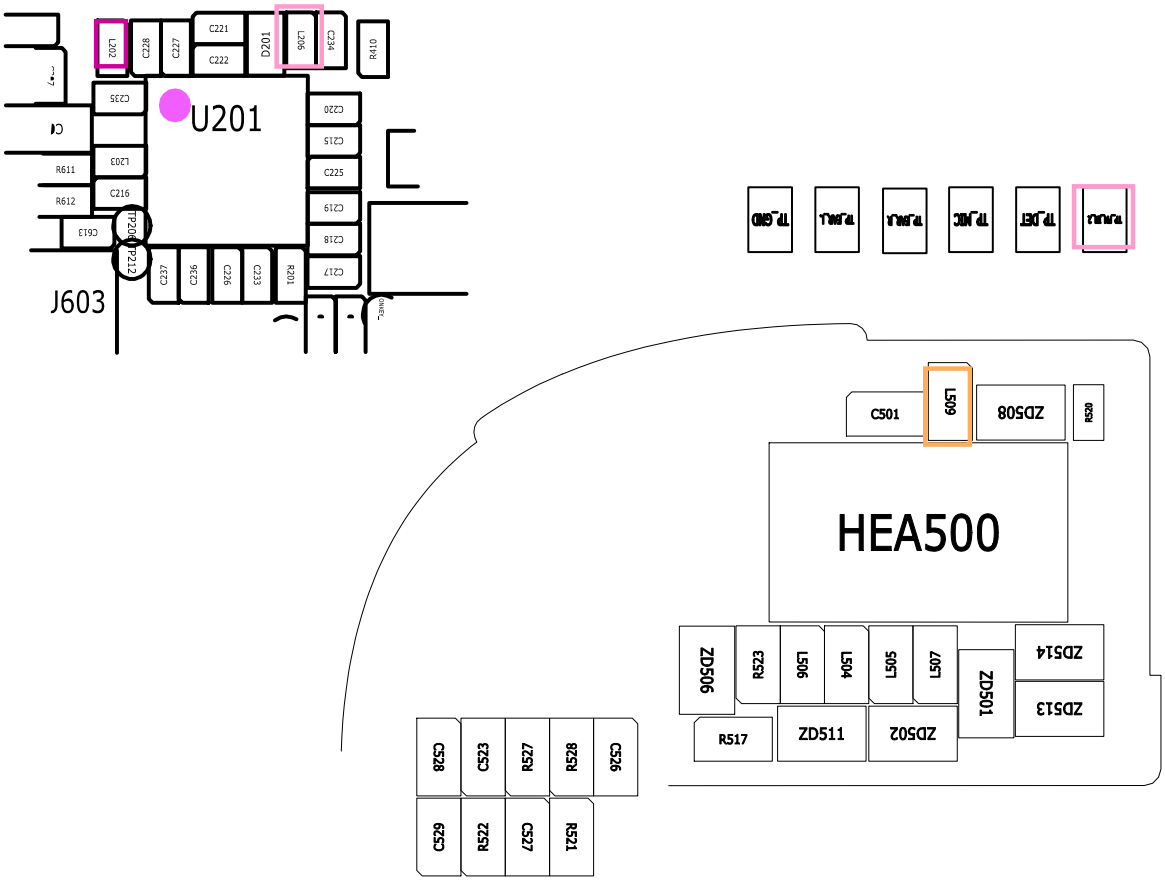




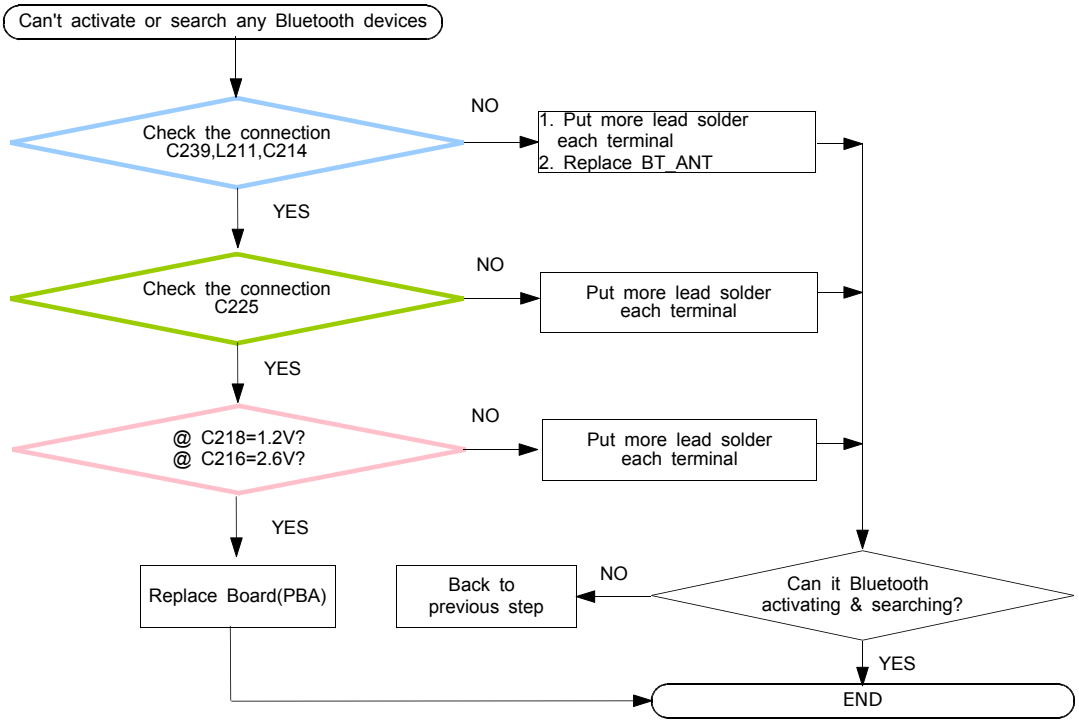
8-3-18. FM radio

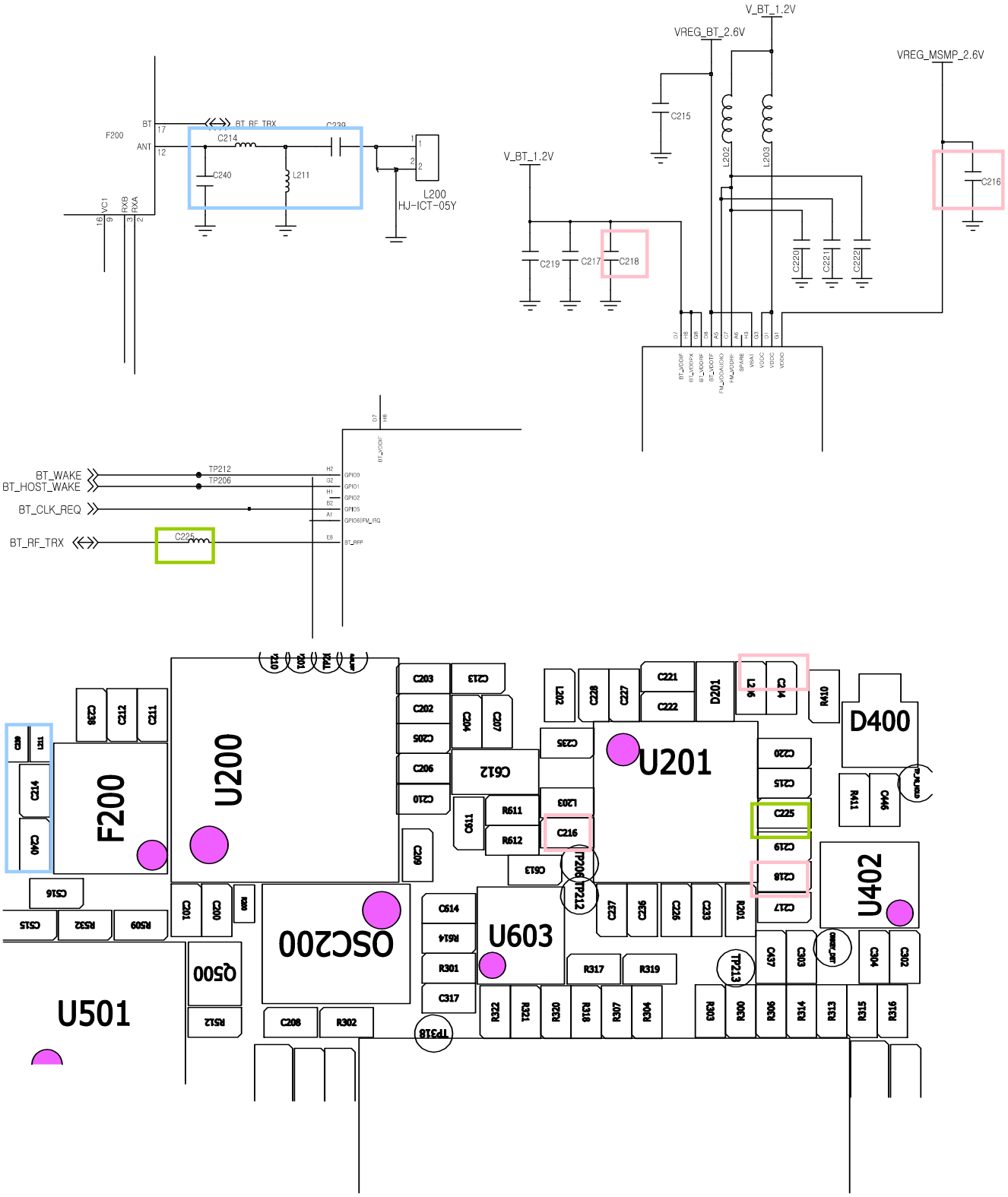




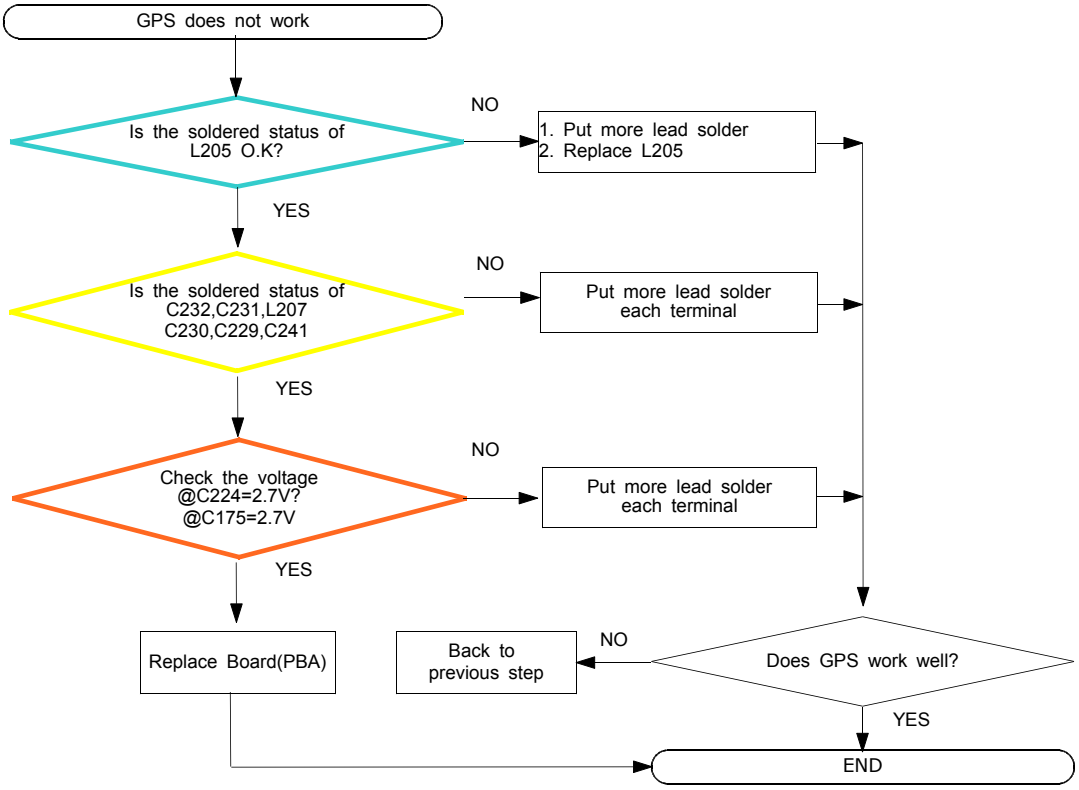


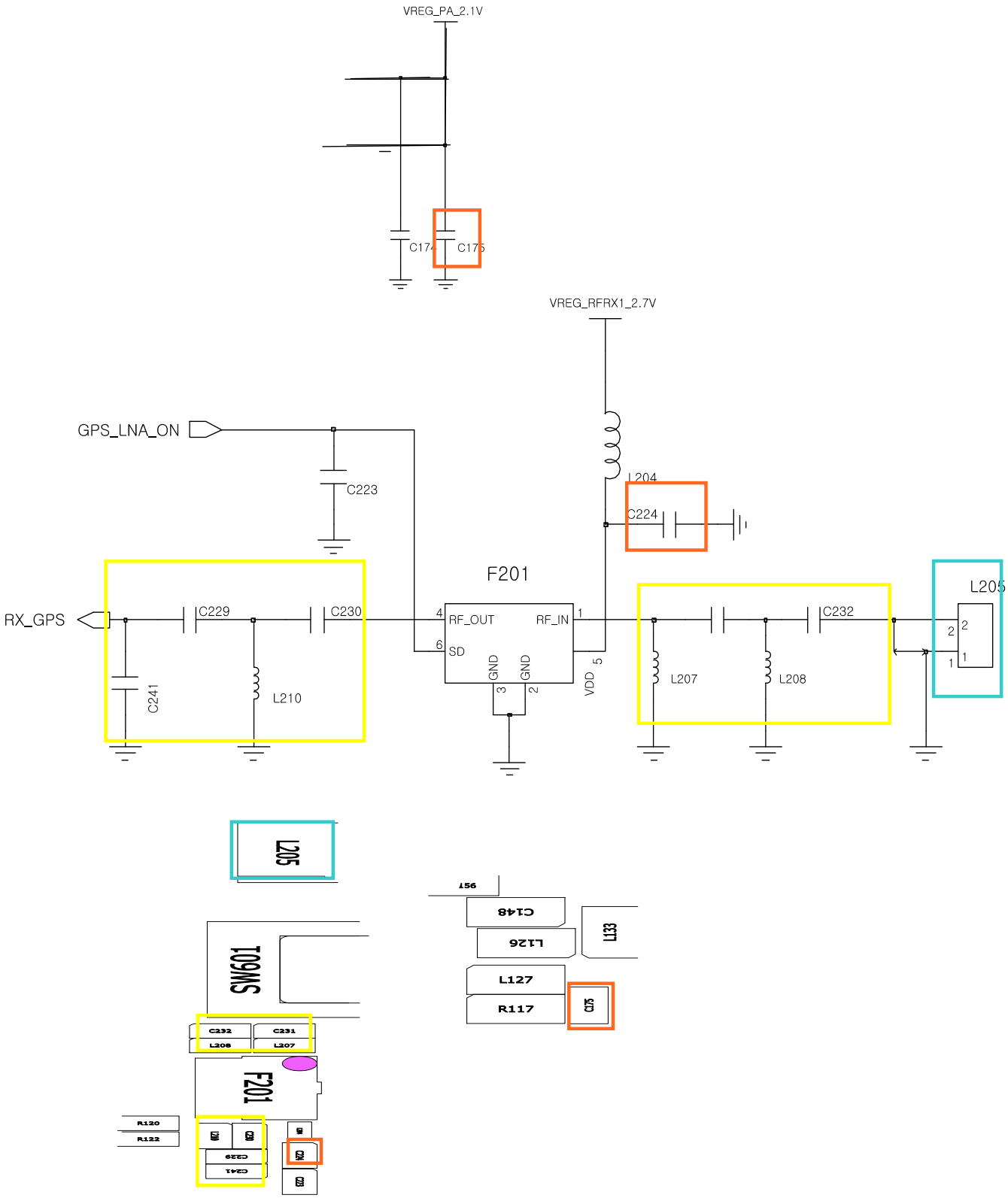
8-3-19. Bluetooth



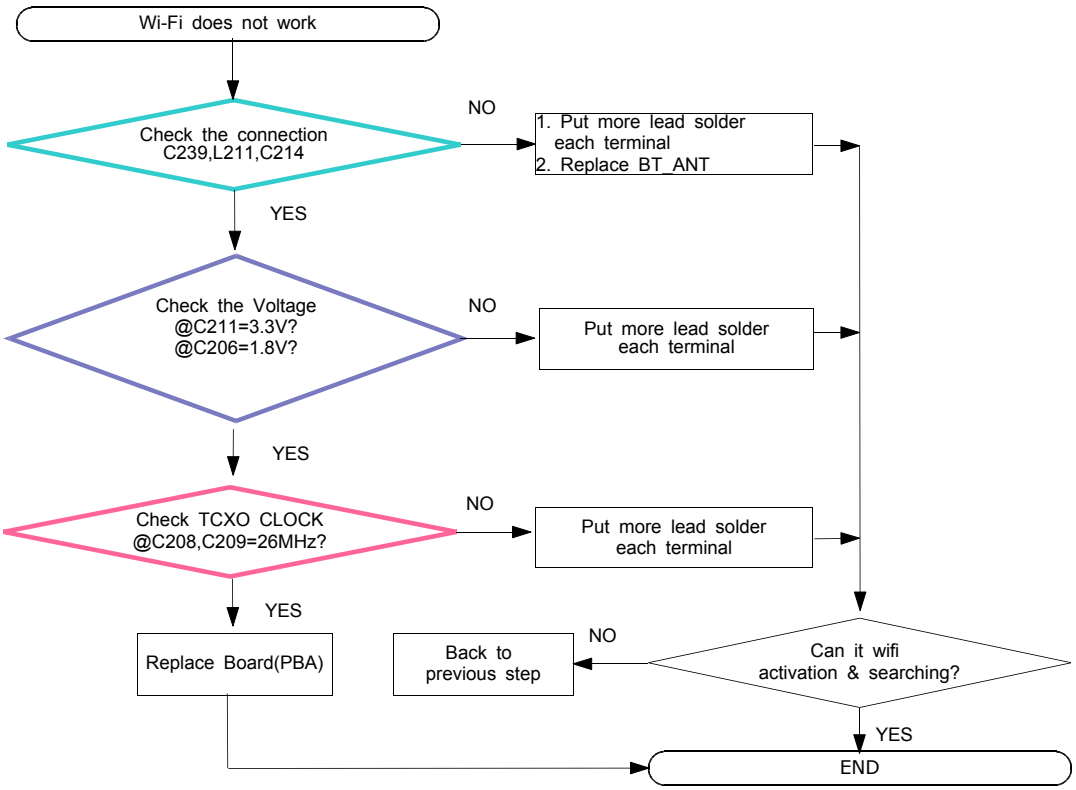


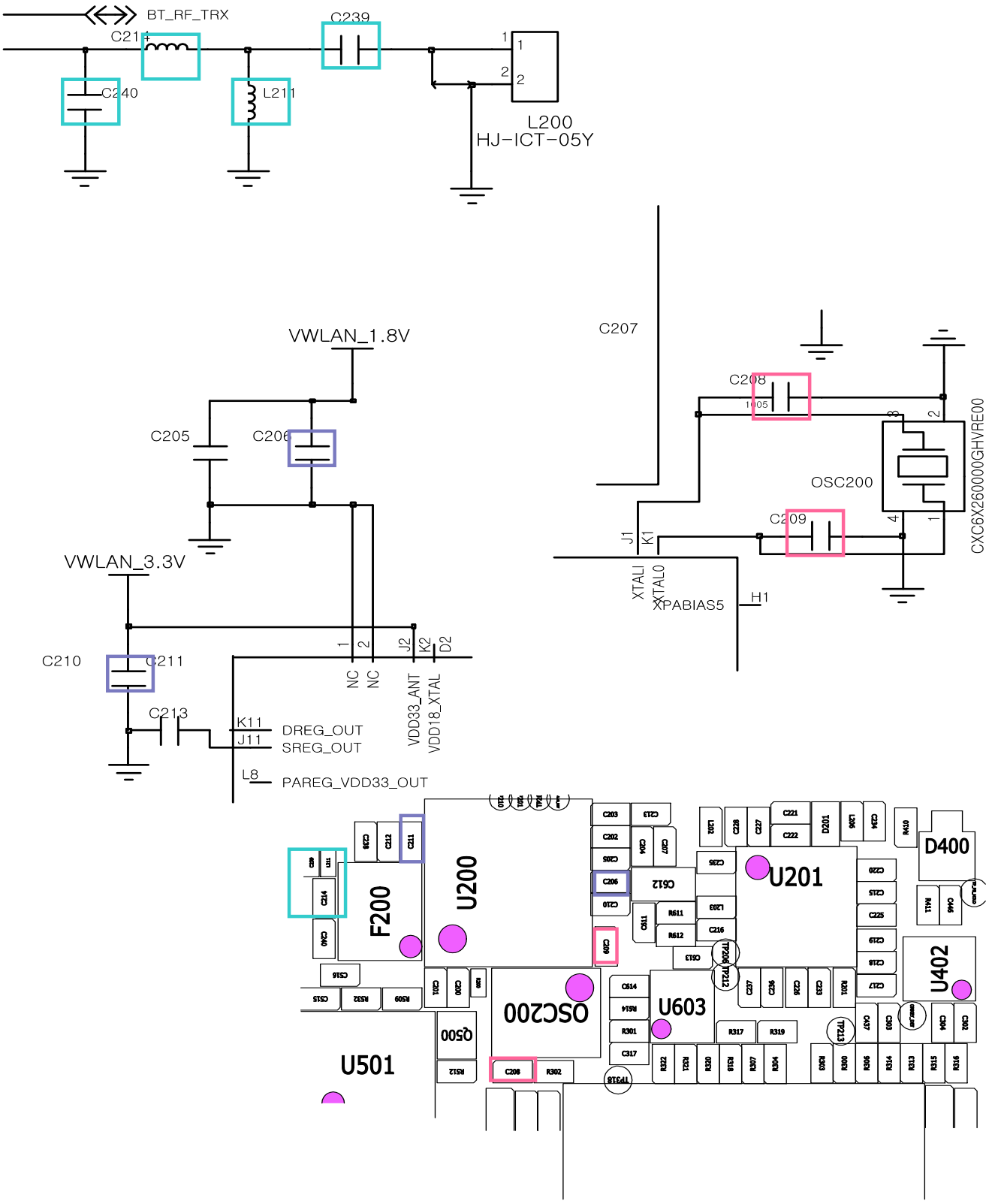
8-3-20. GPS



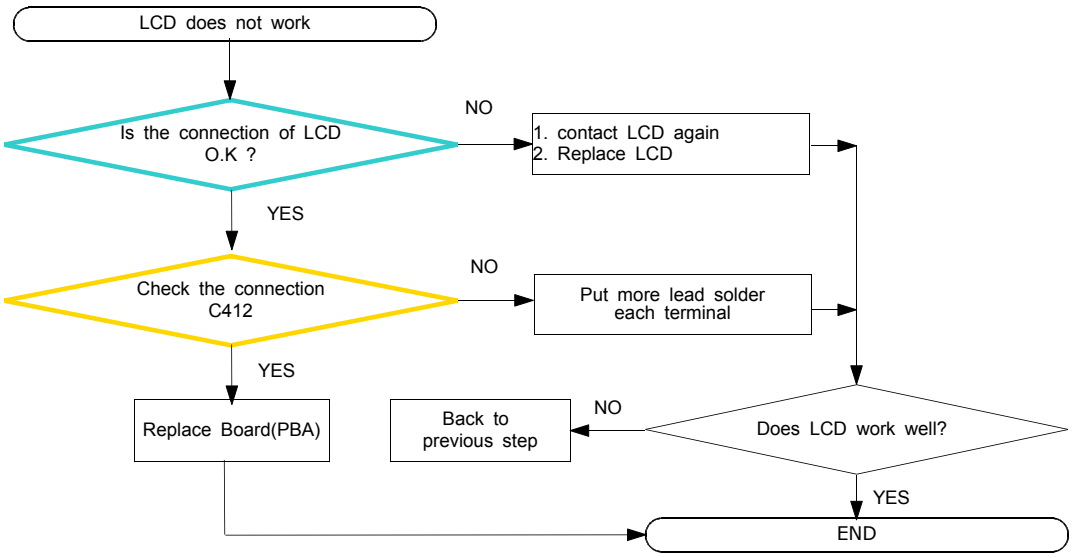


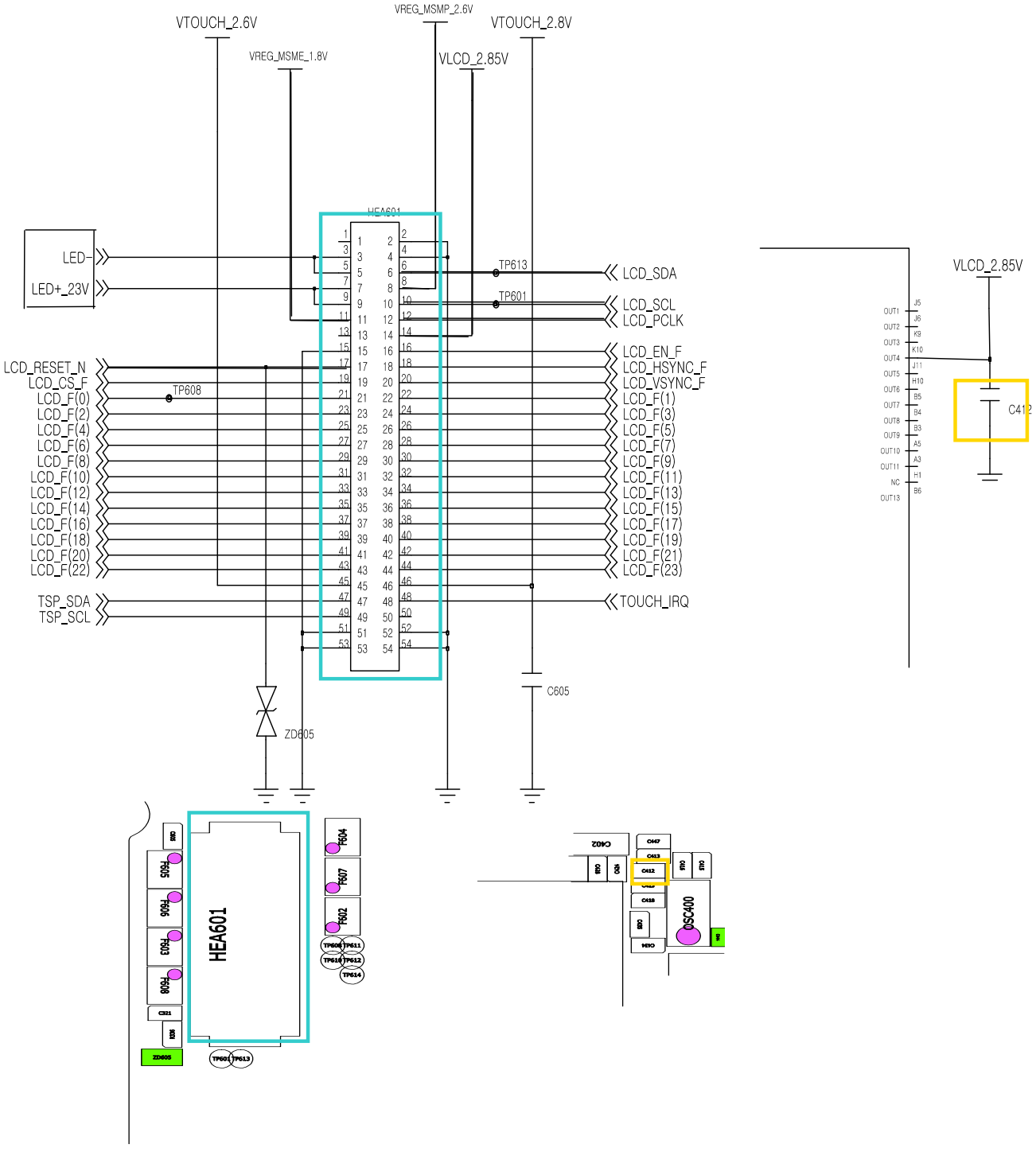
8-3-21. Wi-Fi Rx/ Tx





8-3-22. LCD



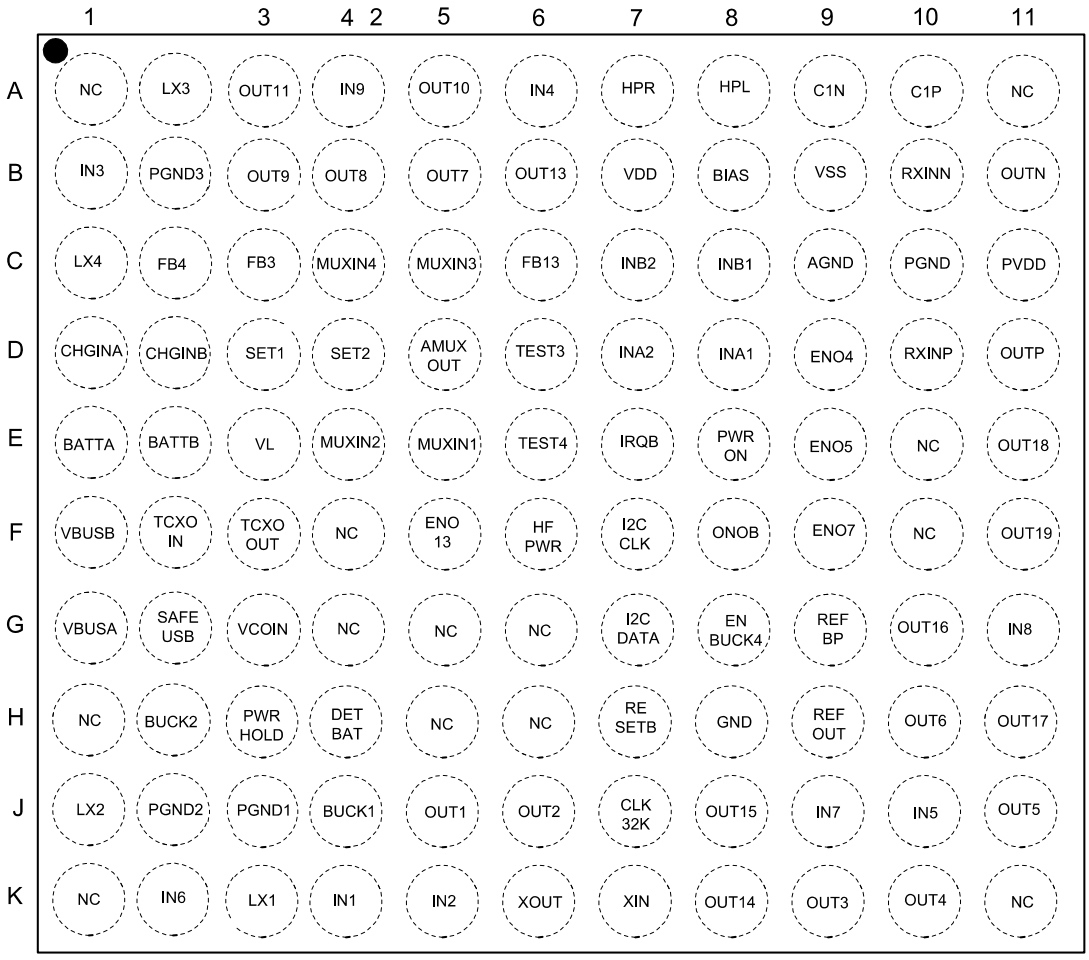


8-4. Schematic Diagram

- NC Point

U400

<TOP VIEW>



11 x 10 WLP 0.5mm Pin Pitch
5.8mm by 5.1mm

UME300

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
A	DNU	DNU	NC	VSSo	VCCo	VSSQd	VDDQd	VDDQd	VSSQd	VSSd	VDDd	VSSQd	DNU	DNU
B	DNU	VSSo	/OEo	NC	/RPo	/WEo	DQS3d	DQ31d	DQ29d	DQ20d	DQ30d	DQ27d	VDDQd	DNU
C	VSSd	NC	/WEd	/AVDo	/CEo	RDYo	DQ22d	DQ16d	DQ21d	DQ28d	DQ26d	DQ17d	DM2d	VDDQd
D	VDDd	/CS0d	BA0d	A1 Index								DQ25d	DM3d	VSSQd
E	/CS1d	/RASd	A2d		VCCo	NC	NC	INTo	NC	NC		DQ24d	DQ23d	DQS2d
F	/CASd	A12d	A0d		CLKo					NC		DQ19d	DQ18d	VSSQd
G	CKE0d	A9d	BA1d		VSSo					NC		VDDd	VDDQd	CKd
H	VDDd	A11d	A7d		ADQ8o					ADQ15o		VSSd	VDDQd	/CKd
J	A4d	VSSd	A5d		ADQ9o					ADQ14o		DQS1d	DM0d	VSSQd
K	A6d	A10d	A3d		ADQ10o	ADQ11o	VCCQo	VSSo	ADQ12o	ADQ13o		DQ10d	DM1d	DQ12d
L	A13d	A8d	A1d									DQ13d	DQ15d	VSSQd
M	VSSd	VDDd	NC	ADQ5o	ADQ2o	ADQ0o	DQ14d	DQ11d	DQ1d	DQ5d	DQ4d	DQ6d	DQ8d	VDDQd
N	DNU	VCCQo	CKE1d	ADQ6o	ADQ3o	VSSQd	DQ3d	DQ9d	DQ0d	DQ7d	DQ2d	DQS0d	VDDQd	DNU
P	DNU	DNU	VSSo	ADQ7o	ADQ4o	ADQ1o	VDDQd	VDDQd	VSSQd	VSSd	VDDd	VSSQd	DNU	DNU

153 FBGA: Top View (Ball Down)