

SAMSUNG

GSM TELEPHONE

SGH-G810

SERVICE *Manual*

GSM TELEPHONE



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**SAMSUNG
ELECTRONICS**



GSPN (Global Service Partner Network)

Country	Web Site
North America	service.samsungportal.com
Latin America	latin.samsungportal.com
CIS	cis.samsungportal.com
Europe	europe.samsungportal.com
China	china.samsungportal.com
Asia	asia.samsungportal.com
Mideast & Africa	mea.samsungportal.com

2. Specification

2-1. GSM General Specification

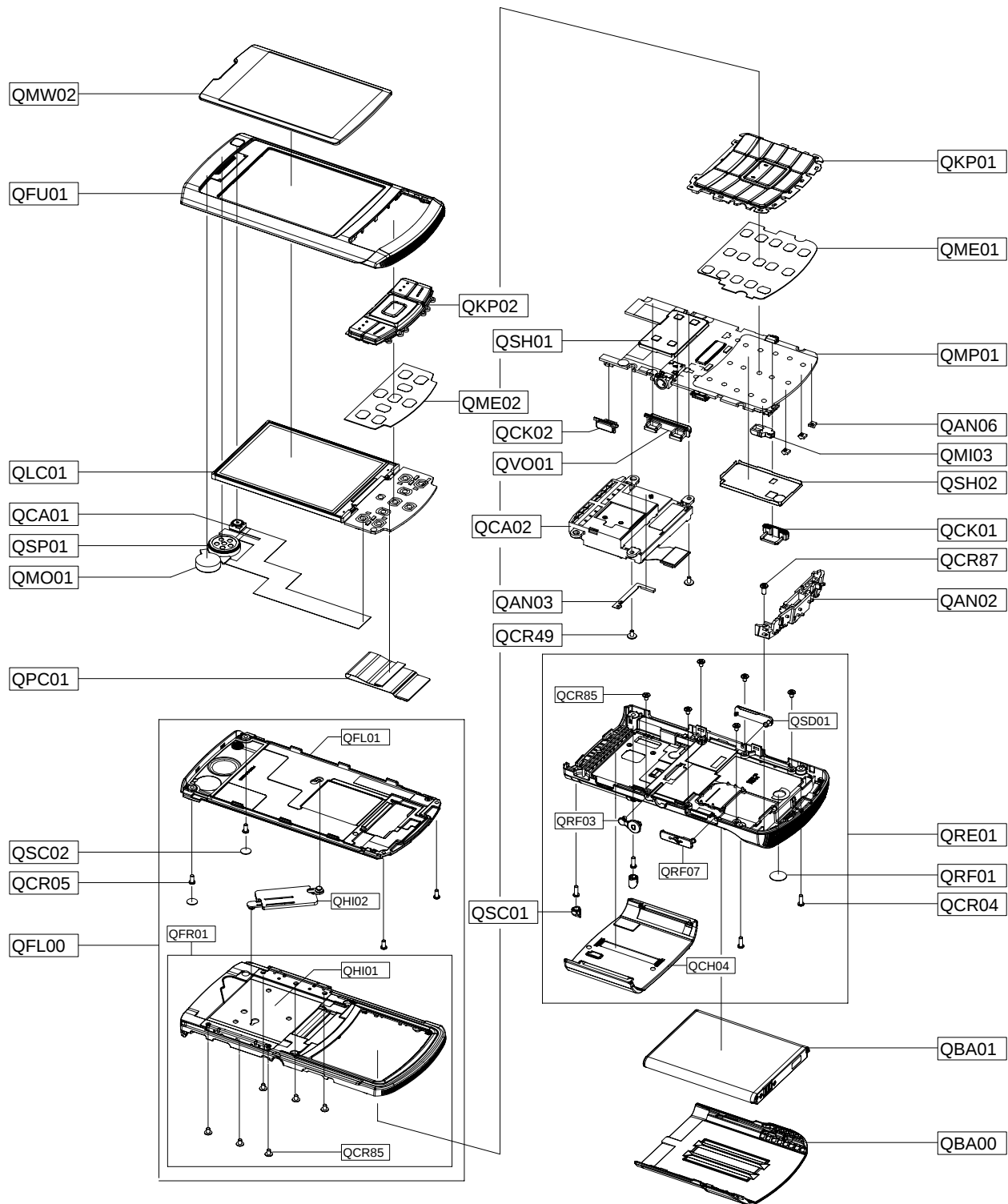
	EGSM 900	DCS 1800	PCS 1900	WCDMA 2100
Freq. Band[MHz] Uplink/Downlink	880~915 925~960	1710~1785 1805~1880	1850~1910 1930~1990	1920~1980 2110~2170
ARFCN range	0~124 & 975~1023	512~885	512~810	UL:9612~9888 DL:10562~10838
Tx/Rx spacing	10MHz	20MHz	20MHz	130MHz
Mod. Bit rate/ Bit Period	270.833kbps 3.692us	270.833kbps 3.692us	270.833kbps 3.692us	3.84Mcps (chip rate)
Time Slot Period/ Frame Period	576.9us 4.615ms	576.9us 4.615ms	576.9us 4.615ms	Frame length : 10ms Slot length : 0.667ms
Modulation	0.3GMSK	0.3GMSK	0.3GMSK	QPSK HPSK
MS Power	33dBm~5dBm	30dBm~0dBm	30dBm~0dBm	24dBm~-50dBm
Power Class	4 (max +33dBm)	1 (max +30dBm)	1 (max +30dBm)	3 (max +24dBm)
Sensitivity	-102dBm	-100dBm	-100dBm	-106.7dBm
TDMA Mux	8	8	8	
Cell Radius	35Km	2Km	2Km	2Km

2-2. GSM TX power class

TX Power control level	GSM850 GSM900	TX Power control level	DCS1800	TX Power control level	PCS1900
5	33±2 dBm	0	30±3 dBm	0	30±3 dBm
6	31±2 dBm	1	28±3 dBm	1	28±3 dBm
7	29±2 dBm	2	26±3 dBm	2	26±3 dBm
8	27±2 dBm	3	24±3 dBm	3	24±3 dBm
9	25±2 dBm	4	22±3 dBm	4	22±3 dBm
10	23±2 dBm	5	20±3 dBm	5	20±3 dBm
11	21±2 dBm	6	18±3 dBm	6	18±3 dBm
12	19±2 dBm	7	16±3 dBm	7	16±3 dBm
13	17±2 dBm	8	14±3 dBm	8	14±3 dBm
14	15±2 dBm	9	12±4 dBm	9	12±4 dBm
15	13±2 dBm	10	10±4 dBm	10	10±4 dBm
16	11±3 dBm	11	8±4 dBm	11	8±4 dBm
17	9±3 dBm	12	6±4 dBm	12	6±4 dBm
18	7±3 dBm	13	4±4 dBm	13	4±4 dBm
19	5±3 dBm	14	2±5 dBm	14	2±5 dBm
		15	0±5 dBm	15	0±5 dBm

5. Exploded View and Parts List

5-1. Cellular phone Exploded View



5-2. Cellular phone Parts list

Design LOC	Description	SEC CODE
QAN02	INTENNA-SGHG810	GH42-01377A
QAN03	INTENNA-SGHG810 BT & GPS	GH42-01378A
QAN06	ASSY RUBBER-ANTENNA	GH98-07824A
QBA00	PMO COVER-BATT V5	GH72-47985B
QBA01	INNER BATTERY PACK-1200MAH,BLK	GH43-02986A
QCA01	CAMERA MODULE-SGHG810(CIF)	GH59-05244A
QCA02	CAMERA MODULE-SGHG810(5M)	GH59-05248A
QCH04	ASSY COVER-CAMERA	GH98-06886B
QCK01	PMO KEY-CAMERA	GH72-45003B
QCK02	PMO KEY-POWER	GH72-45004B
QCR04	SCREW-MACHINE	6001-001479
QCR05	SCREW-MACHINE	6001-001478
QCR49	SCREW-MACHINE	6001-001823
QCR85	SCREW-MACHINE	6001-002097
QCR85	SCREW-MACHINE	6001-002097
QCR87	SCREW-TAPPING	6002-001412
QFL00	ASSY CASE-LOWER/FRONT	GH98-06715B
QFL01	ASSY CASE-LOWER	GH98-06712B
QFR01	ASSY CASE-FRONT	GH98-06713B
QFU01	ASSY CASE-UPPER	GH98-06711B
QHI01	ASSY HINGE-SLIDE BASE	GH98-07242A
QHI02	ASSY HINGE-PUSH ROD	GH98-08089A
QKP01	ASSY KEYPAD-MAIN(EU/GRY)	GH98-07244B
QKP02	ASSY KEYPAD-SUB(EU/GRY)	GH98-07245B
QLC01	LCD-MAIN LCD MODULE	GH07-01232A
QME01	KEY FPCB-M/DOME SHEET 15KEY	GH59-05125A
QME02	KEY FPCB-S/DOME SHEET 9KEY	GH59-05351A
QMI01	MICROPHONE-ASSY-SGHG810(SMD TY	GH30-00450A
QMI03	RMO RUBBER-MIC HOLDER V2	GH73-11597A
QMO01	MOTOR DC-SPH-B5000	GH31-00255B
QMP01	PBA MAIN-SGHG810	GH92-04240A
QMW02	PMO WINDOW-MAIN	GH72-45011A
QPC01	FPC-CON TO CON(G810)	GH41-02002A
QRE01	ASSY CASE-REAR	GH98-06714B
QRF01	TAPE-COVER RF	GH74-36681B
QRF03	PMO COVER-EAR	GH72-46031B
QRF07	PMO COVER-MINI USB V2	GH72-46762B
QSC01	PMO COVER-SCREW CAP	GH72-45916B
QSC02	TAPE-SCREW CAP LOWER	GH74-36693B
QSD01	PMO COVER-SD	GH72-43221B
QSH01	ASSY COVER-SHIELDCAN TOP	GH98-08431A
QSH02	ASSY COVER-BTM	GH98-08433A
QSP01	SPEAKER	3001-002299
QVO01	PMO KEY-VOLUME	GH72-45005B

7. Disassembly and Assembly Instructions

7-1. Disassembly

1

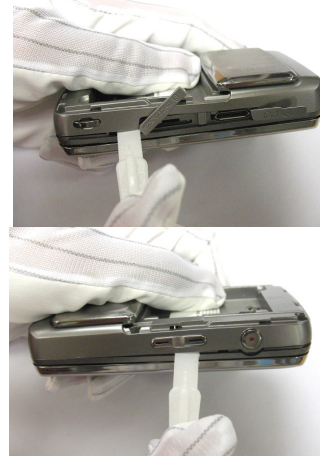
1) Remove 4 screw caps



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

2

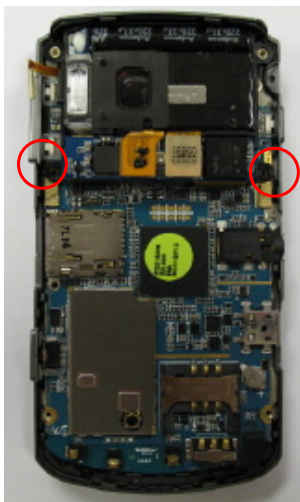
1) Make the space between rear cover and front cover using assembly stick.
2) And then widen space with hand and separate 2 parts



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

3

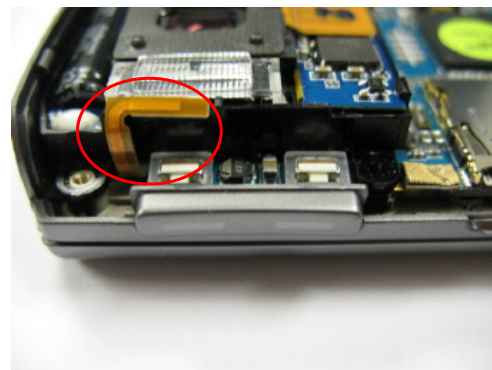
1) Remove 2 screw caps. (Red)



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

4

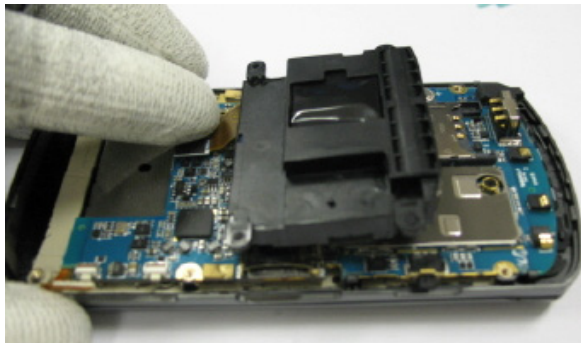
1) Separate BT module. (Red)



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

5

1) Open the Camera module connector



1) Be careful not to make scratch and molding damage!
2) FPCB 손상에 주의한다.

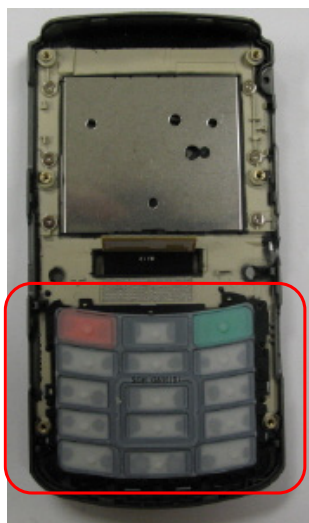
6

1) Separate PBA and Front ass'y



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

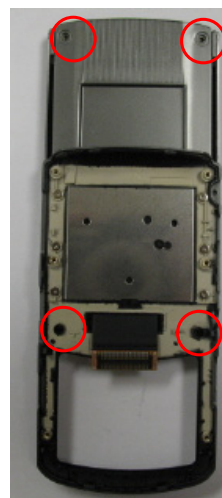
1)Separate keypad and front ass'y



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

8

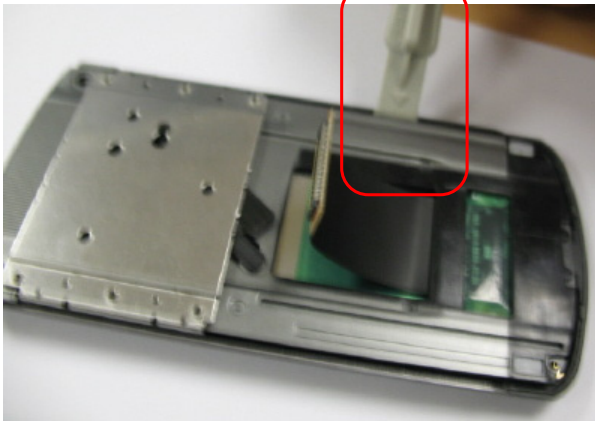
1)Remove 4 screws (red)



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

9

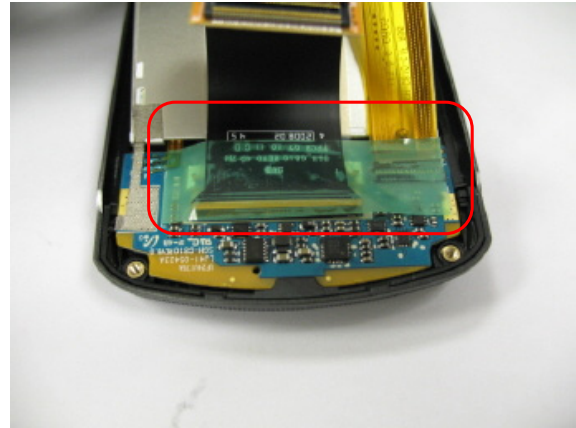
- 1) Make the space between slide upper and slide lower using assembly stick.
- 2) And then widen space with hand and separate 2 parts.



- 1) Be careful not to make scratch and molding damage!
- 2) Be careful not to make any scratch to the FPCB

10

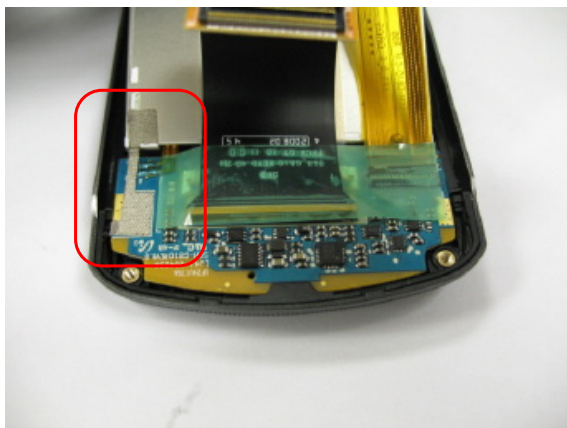
- 1) Remove the insulation tape.



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

11

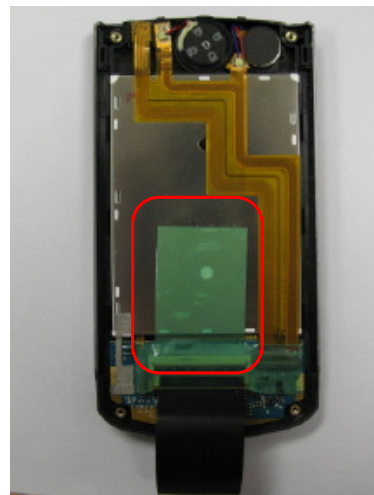
- 1) Remove EMI tape (red)



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

12

- 1) Remove insulation tape (red)



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

13

1)Separate LCD ass'y from slide upper

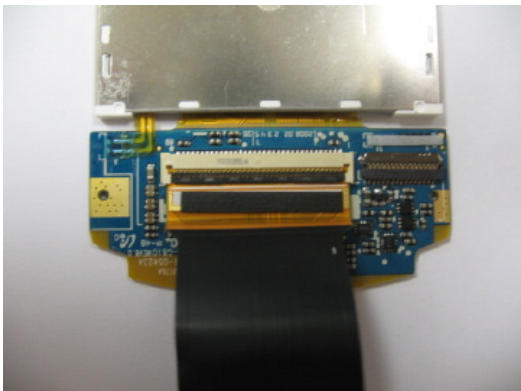


- 1) Be careful not to make scratch and molding damage!
- 2) Be careful not to make any scratch to the FPCB

7-2. Assembly

1

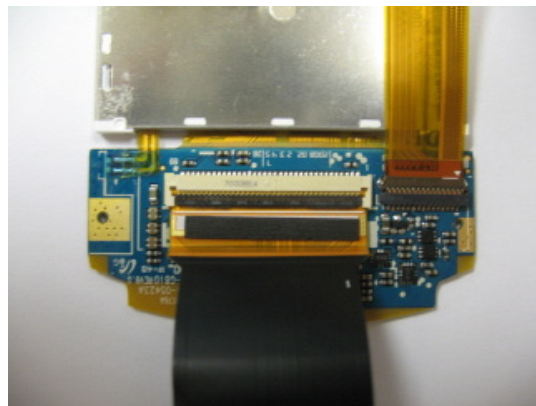
1) Combine FPCB to sub-PBA



- 1) Be careful not to make scratch and molding damage!
- 2) Be careful not to make any scratch to the FPCB

2

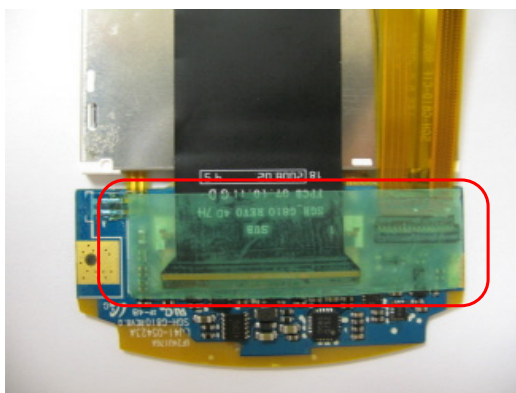
1) Combine CIF camera to the connector



- 1) Be careful not to make scratch and molding damage!
- 2) Please insert FPCB based on the silk guide line

3

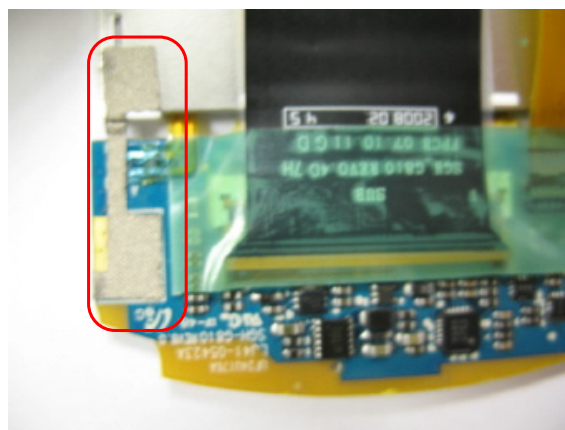
1) Put insulation tape on the pointed part



- 1) Be careful not to make scratch and molding damage!
- 2) Be careful not to make any scratch to the FPCB

4

1) Put EMI tape on the pointed part (red)



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

5

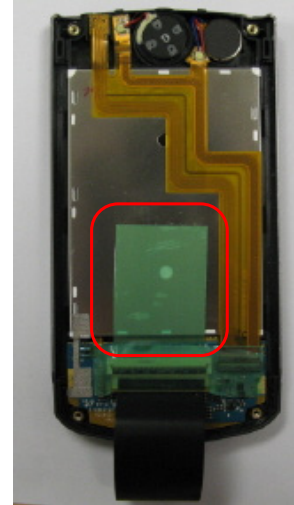
1) Put SUB KEYPAD on the upper case (red)



- 1) Be careful not to make scratch and molding damage!
- 2) Be careful not to make any scratch to the FPCB

6

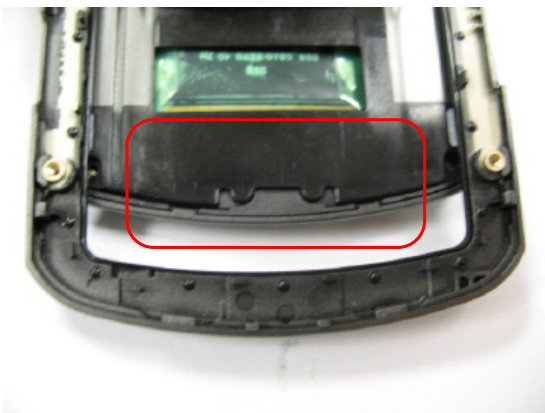
1) Put the sub PBA considering sub hook and put LCD to main window
 2) Attach insulation tape (red)



- 1) Attach the tape based on the besel guide line

7

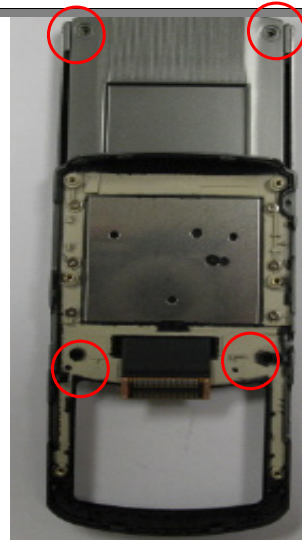
1) Combine slide upper and lower case.



- 1) Be careful not to make scratch and molding damage!
- 2) Put the lower part of lower case to the upper's hook, first. (red)

8

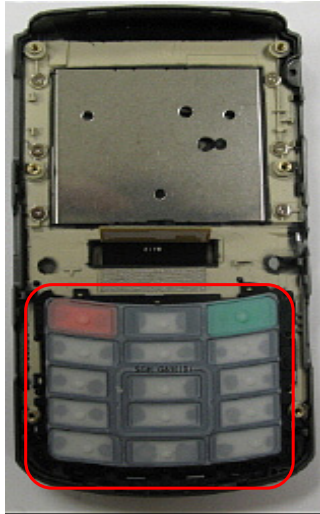
1) Fasten a screw at 4 points with driver after slide up



- 1) Be careful not to make scratch and molding damage!
- 2) Check the screw TORQUE (1.0~ 1.2 Kgf.Cm)

9

1) Put main keypad to the pointed area



- 1) Be careful not to make scratch and molding damage!
- 2) Check the screw torque (1.0~ 1.2 Kgf.Cm)

10

1) Combine slide FPCB and main PBA



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

11

1) Put the main-PBA on 4 screw hole



- 1) Be careful not to make scratch and molding damage!
- 2) Be careful to make sure that FPCB doesn't be separated from the main PBA

12

1) Combine camera connetor
2) Put the camera module to the front case



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

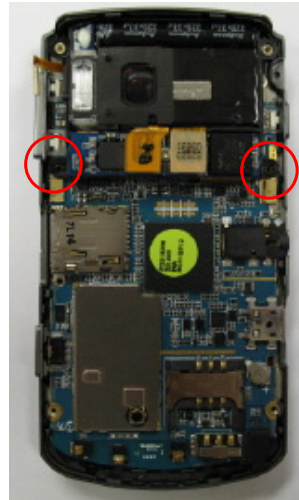
13

1) Attach BT antenna to the camera module



14

1) Fasten a screw at 2 points



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

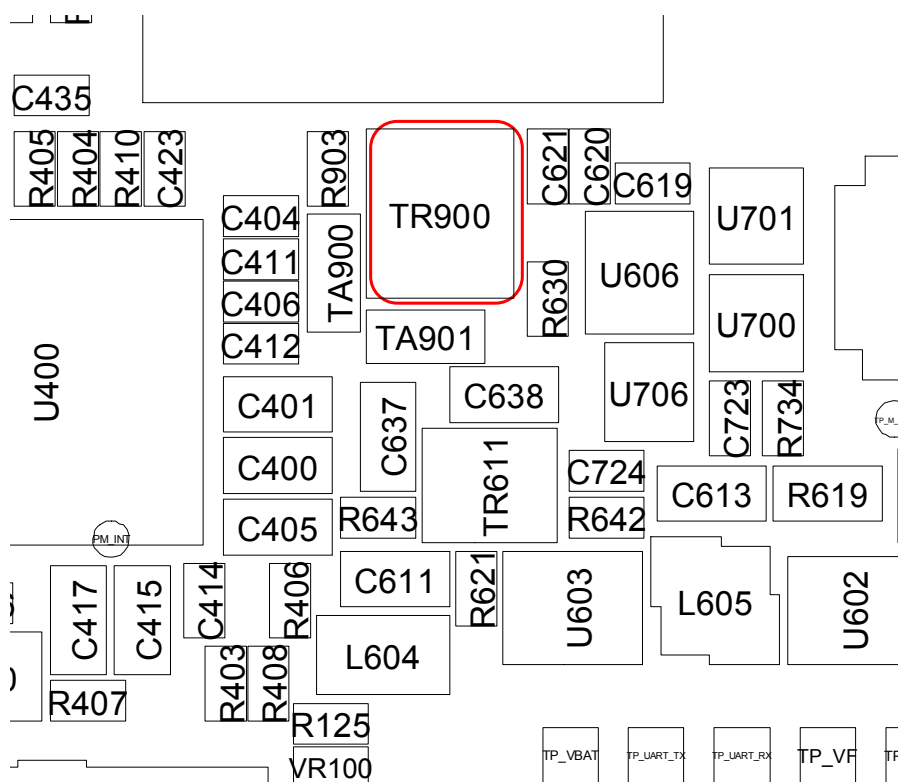
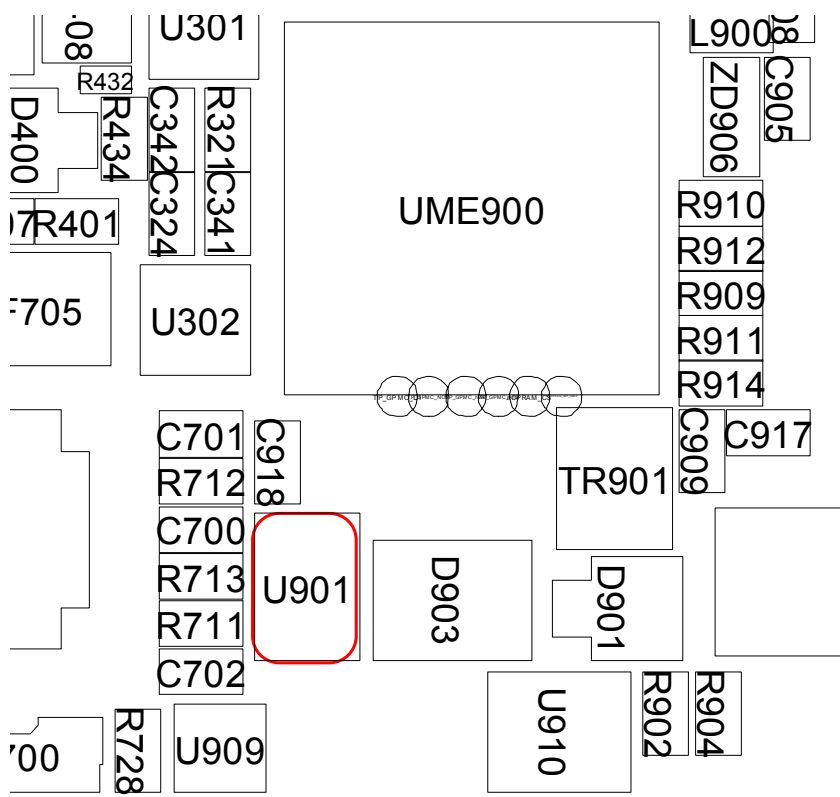
1) Be careful not to make scratch and molding damage!

15

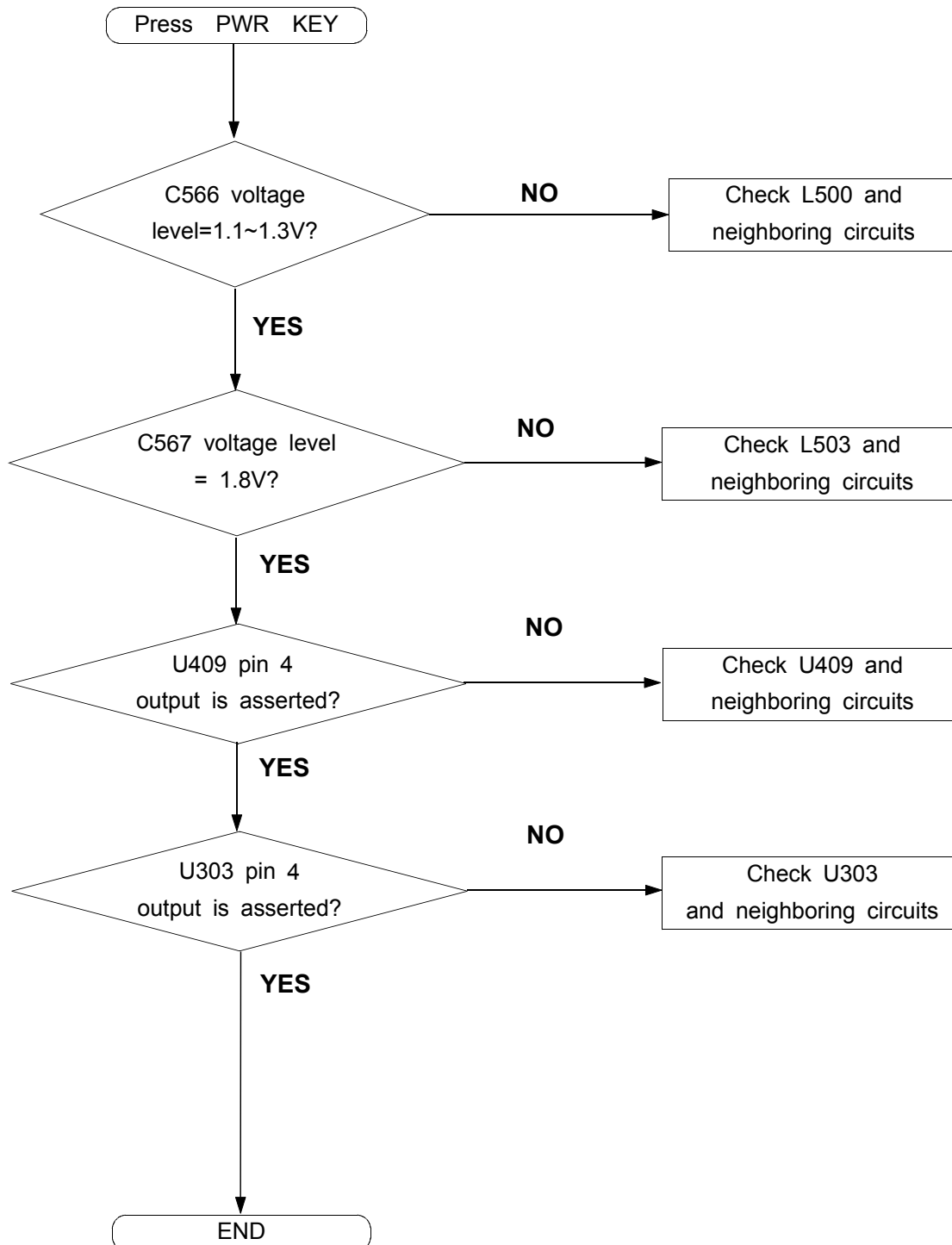
1) Put rear cover on the front ass'y
2) Fasten a screw at 4 points

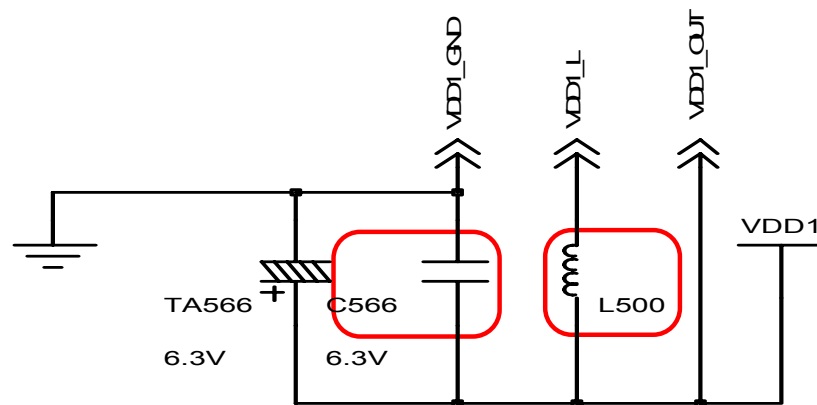
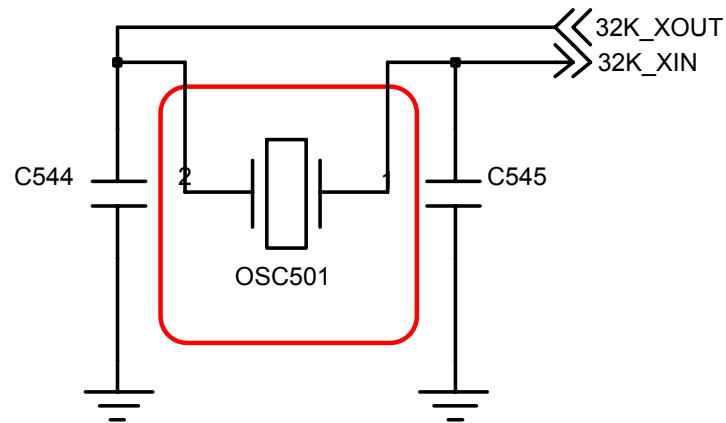


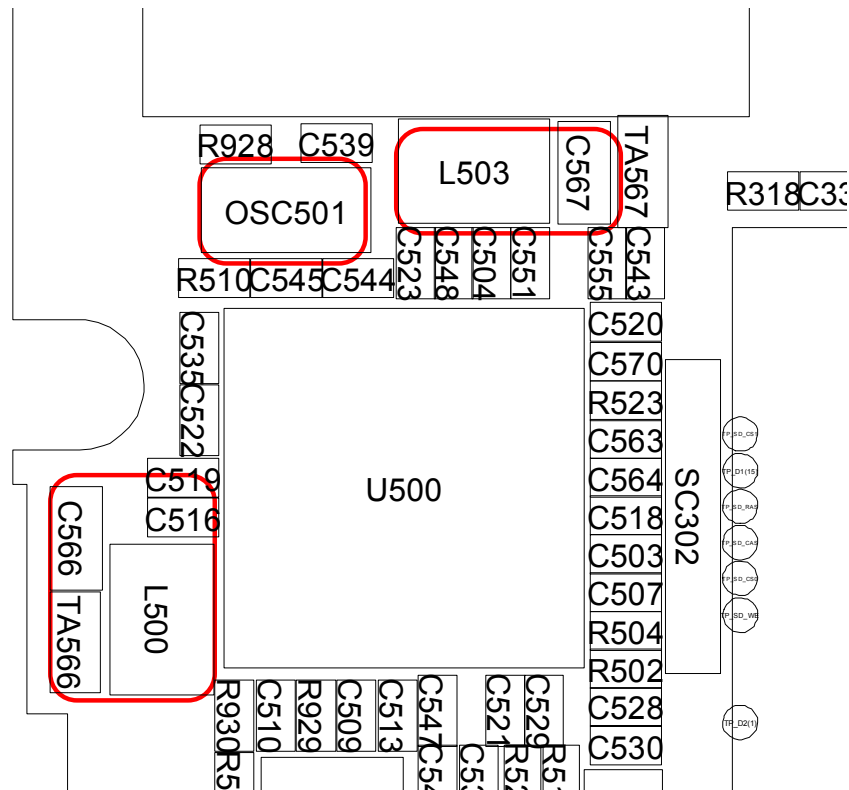
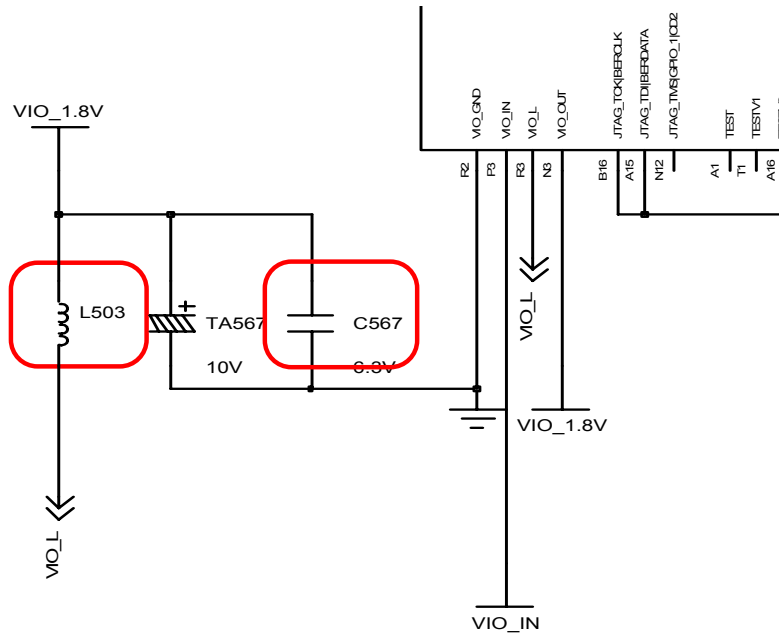
1) Be careful not to make scratch and molding damage!

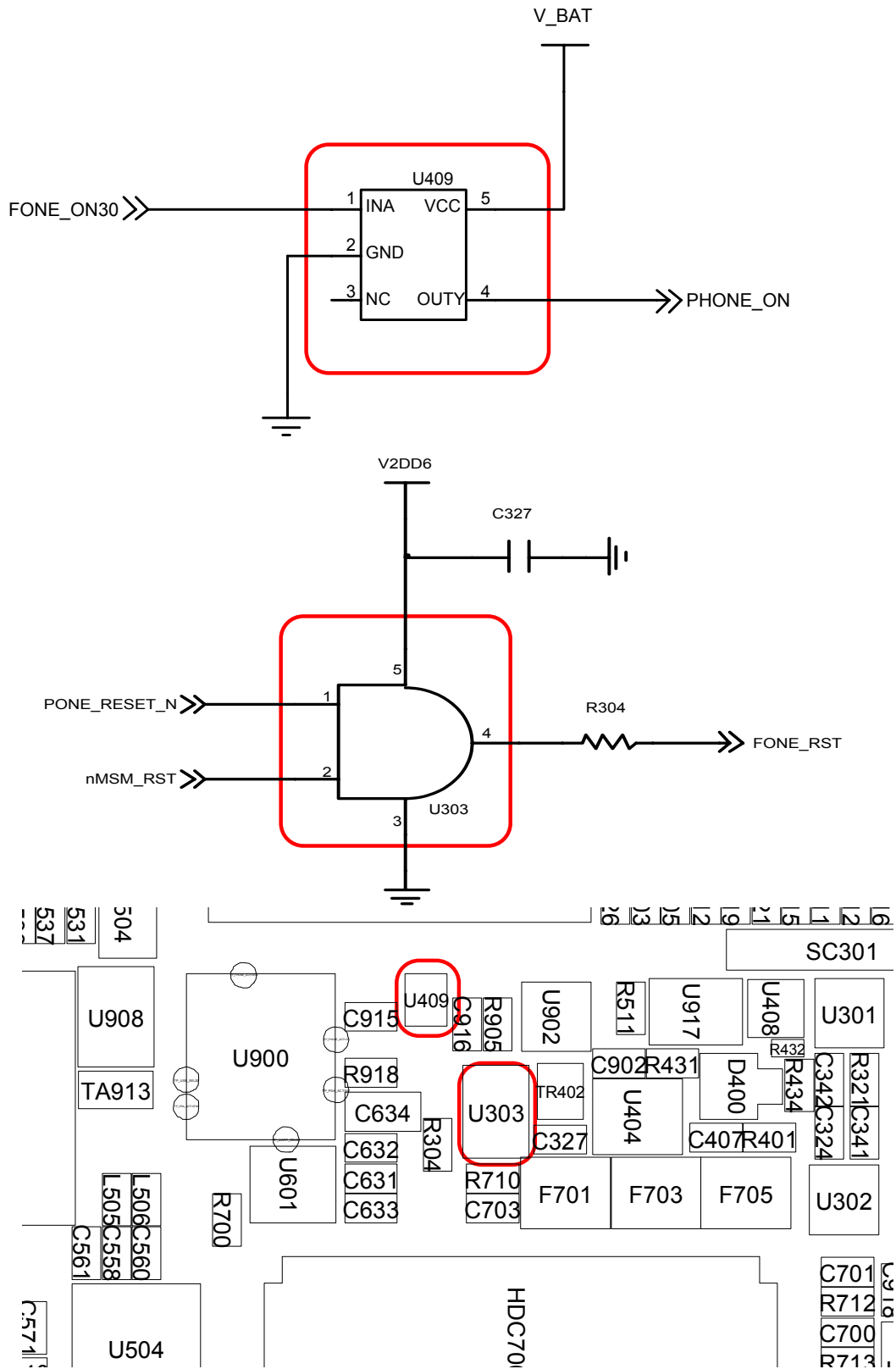


10-1-2 : Abnormal initial operation (Normal +4.0V voltage source)



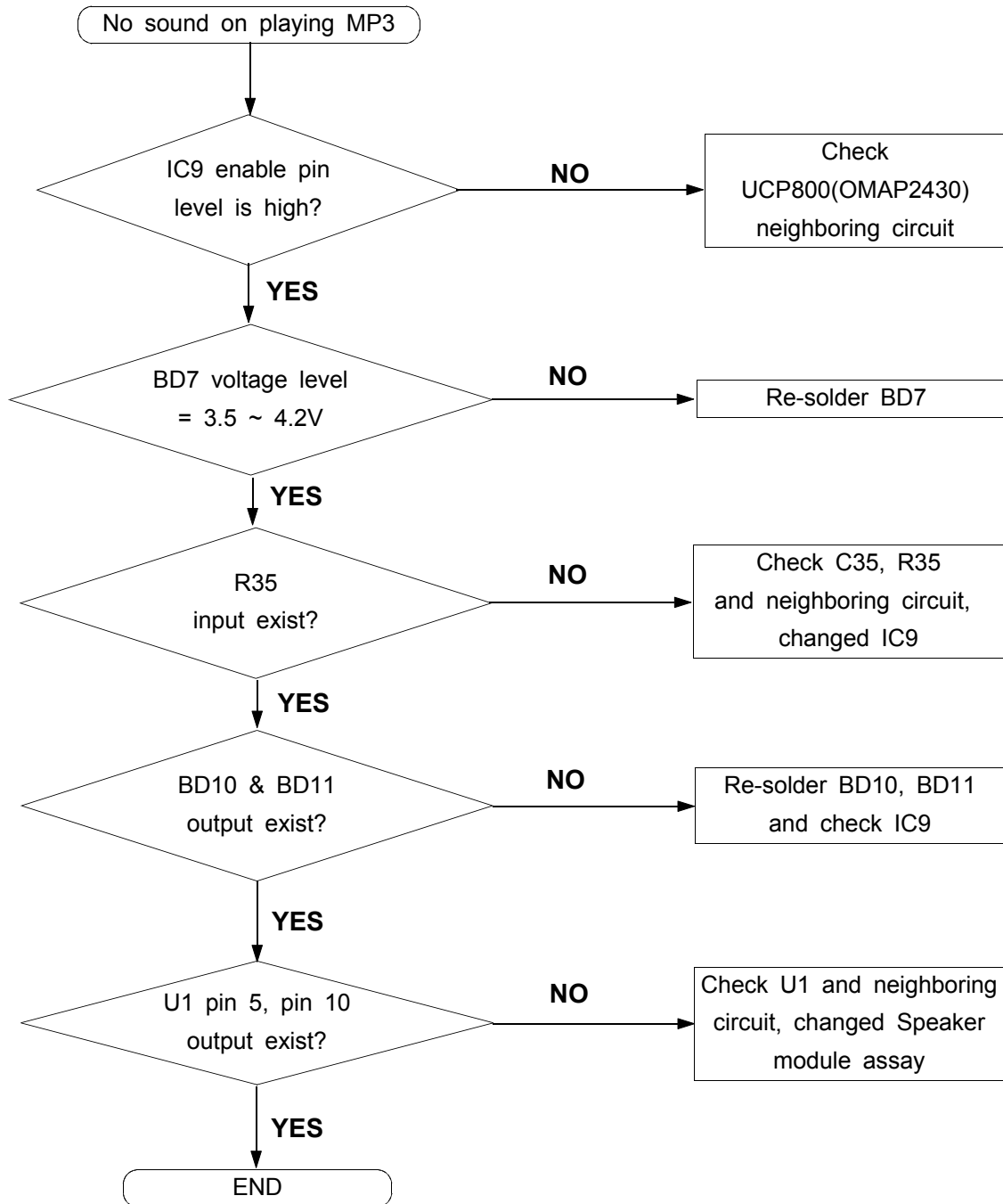


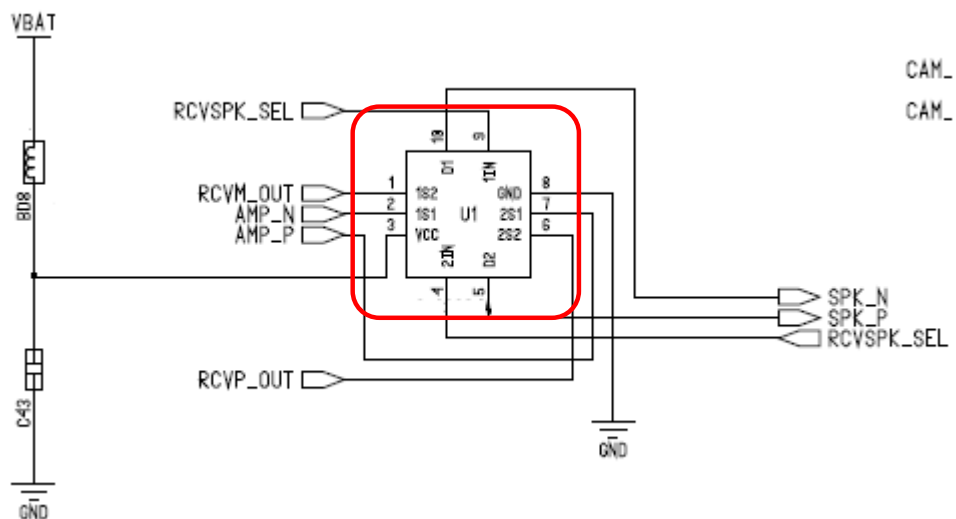
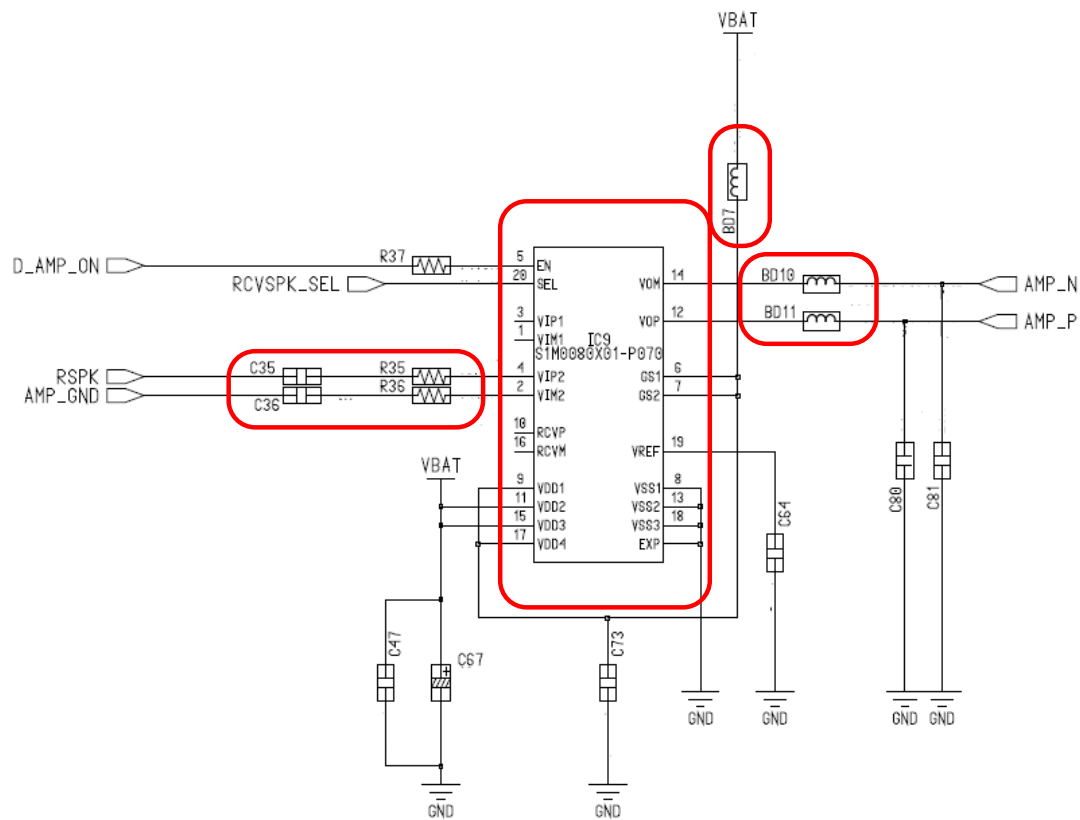


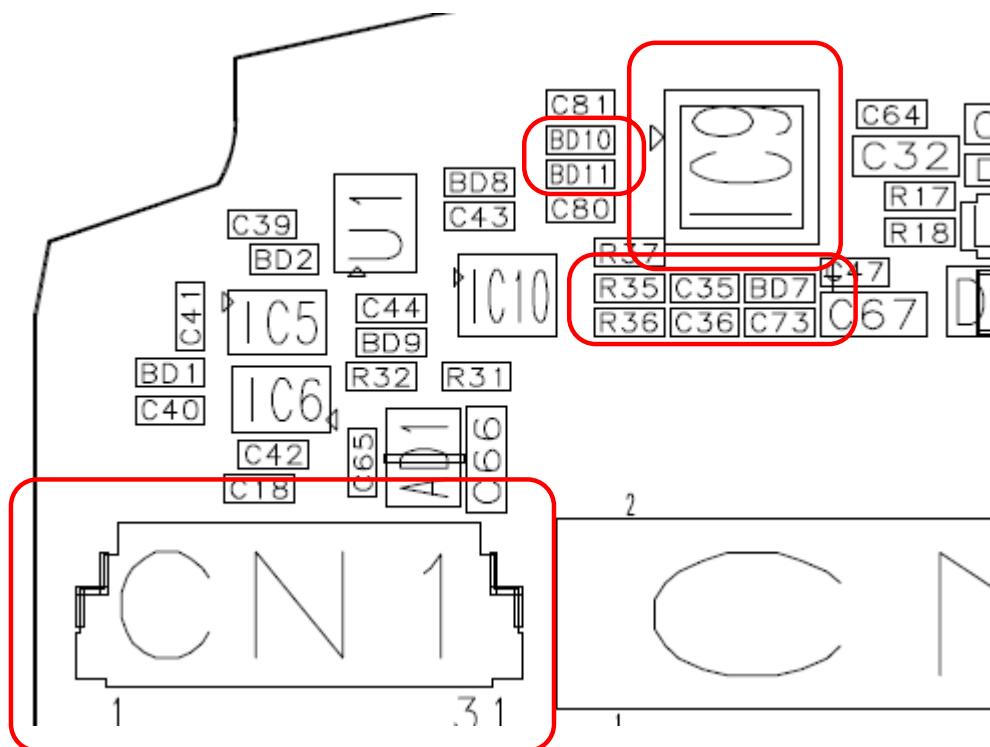
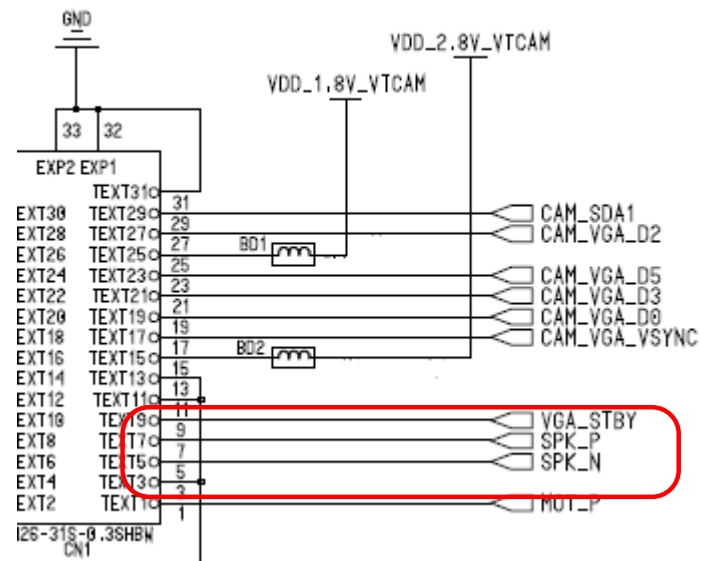


10-1-3 : Abnormal Sound operation

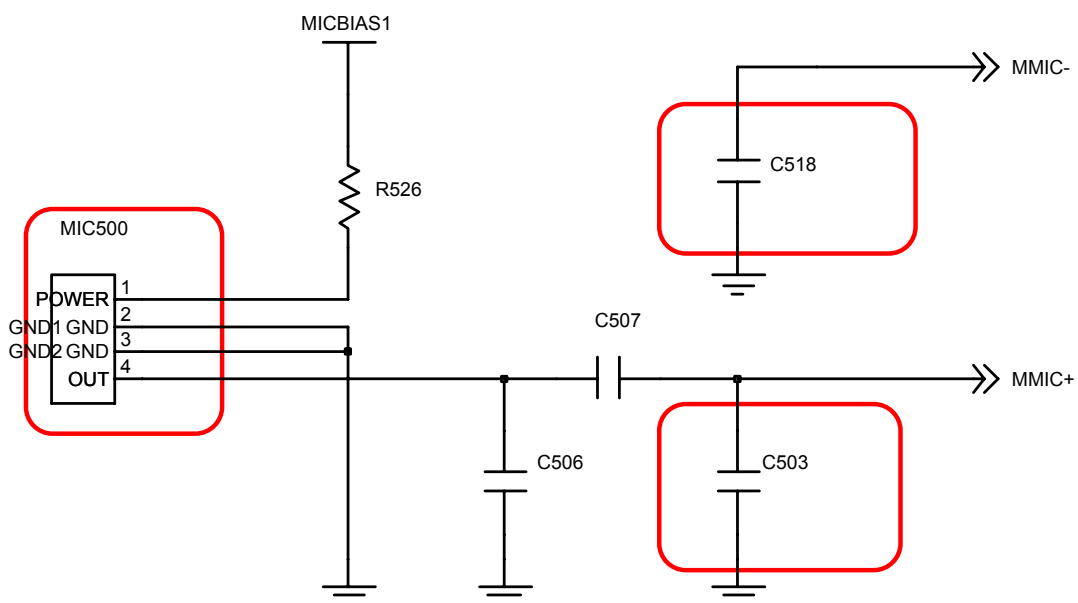
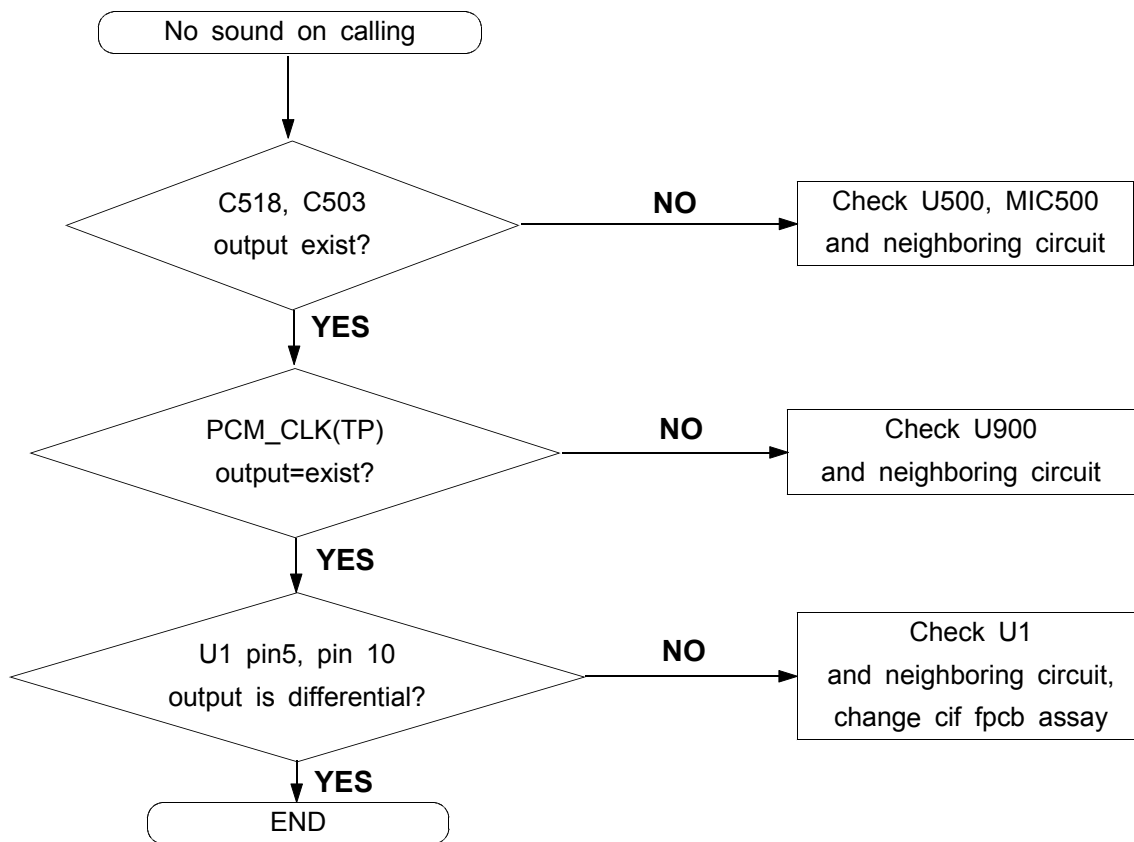
1) No Sound on Playing MP3

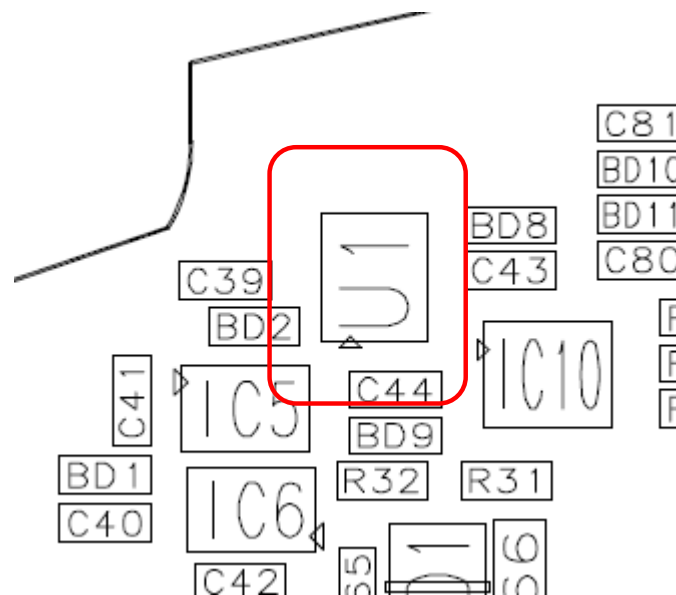
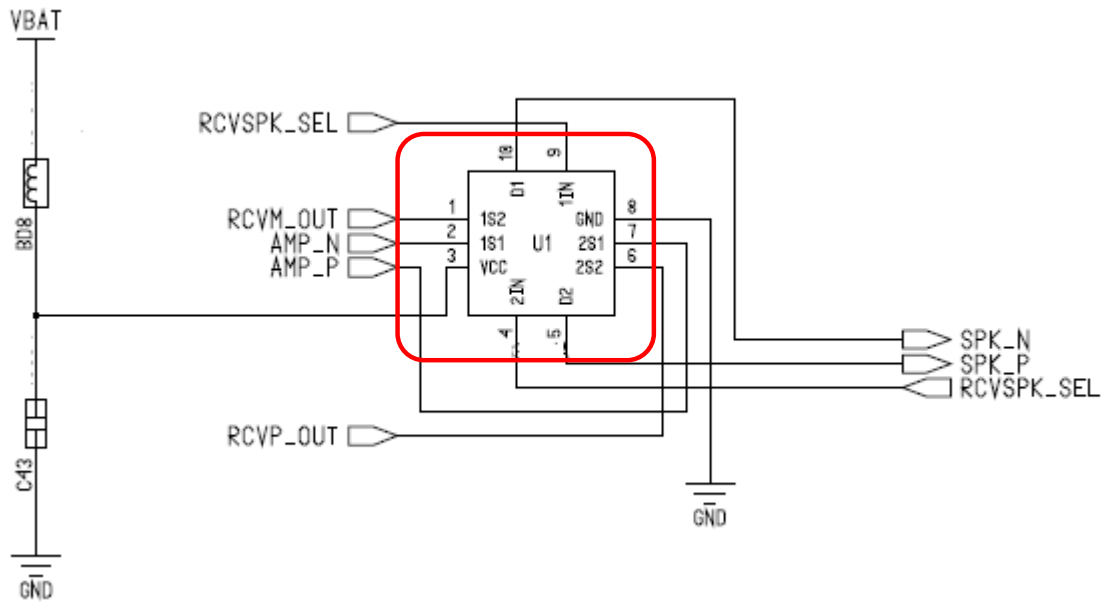
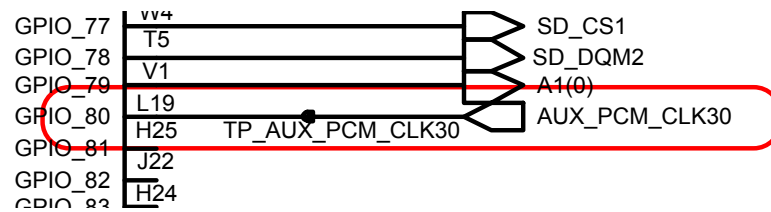


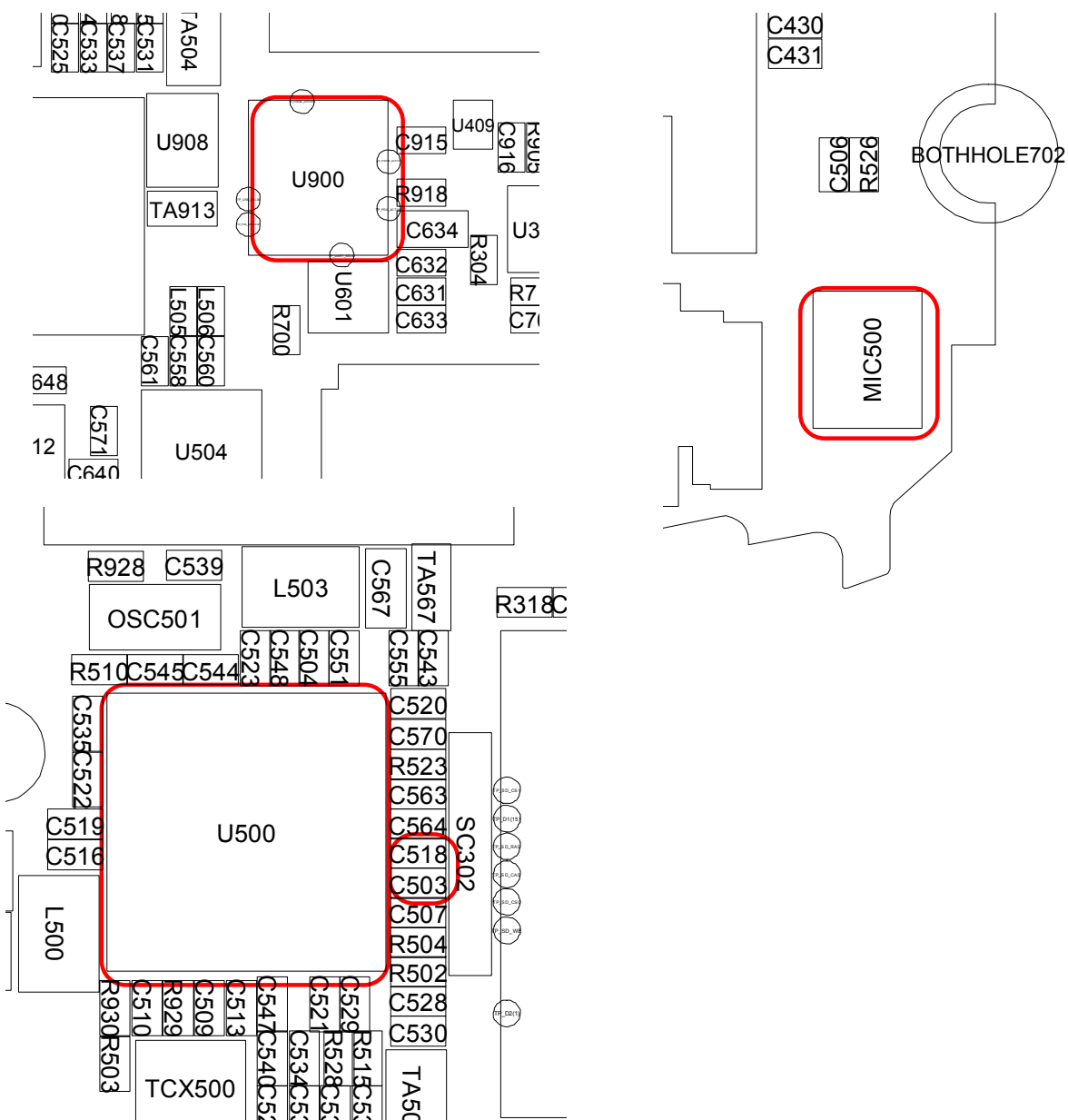


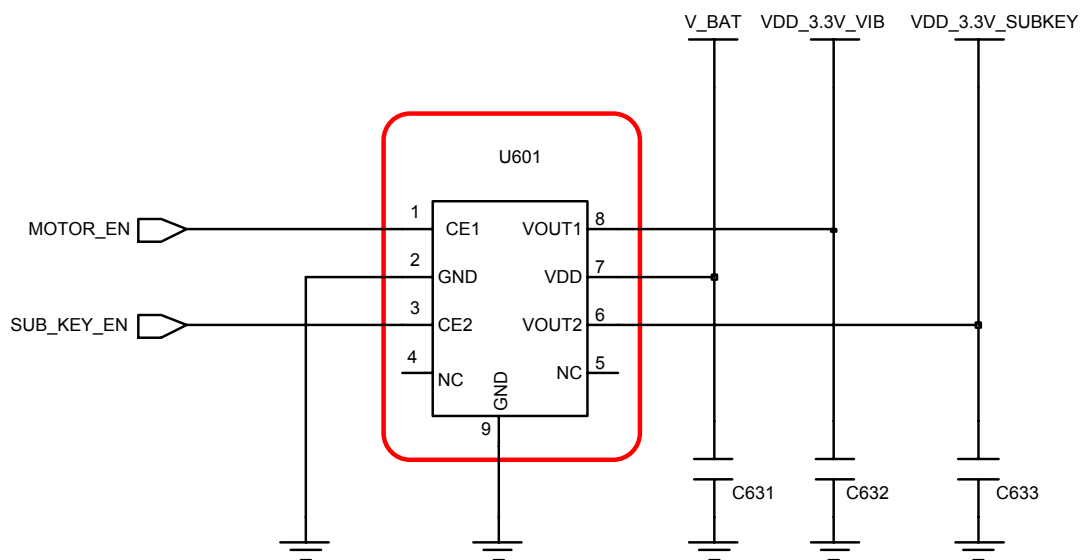
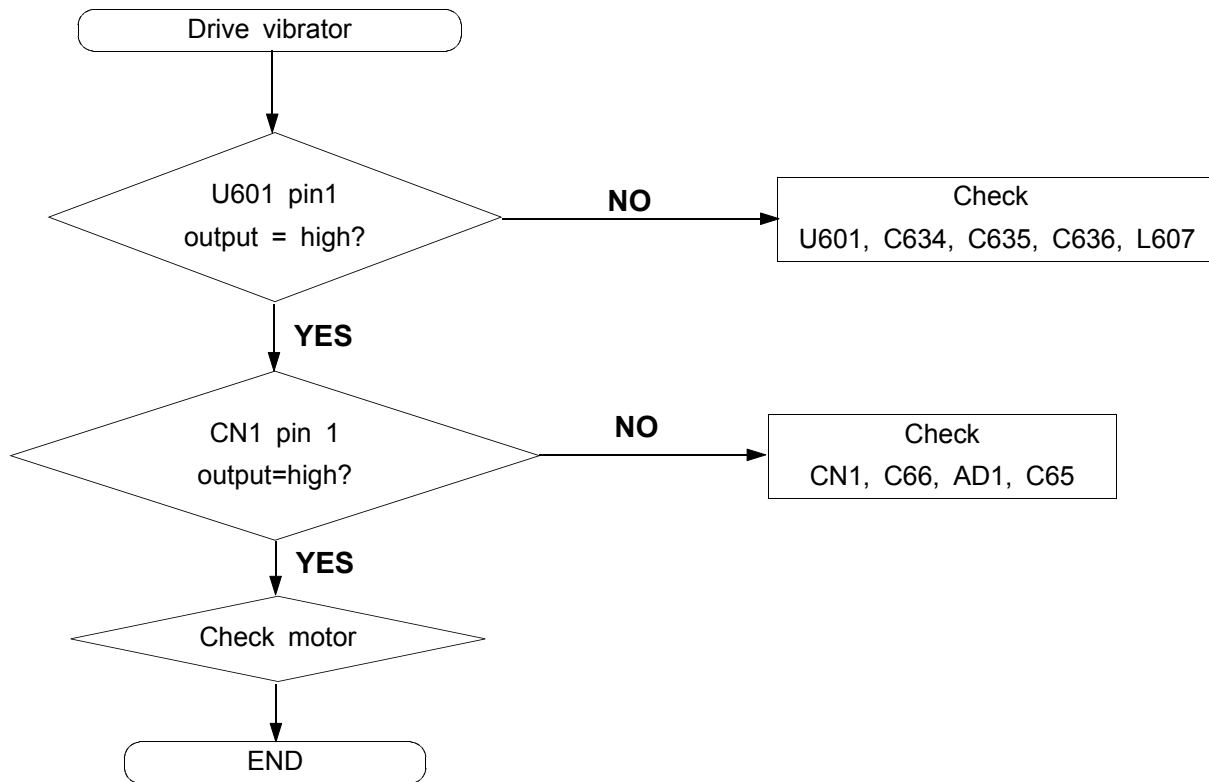


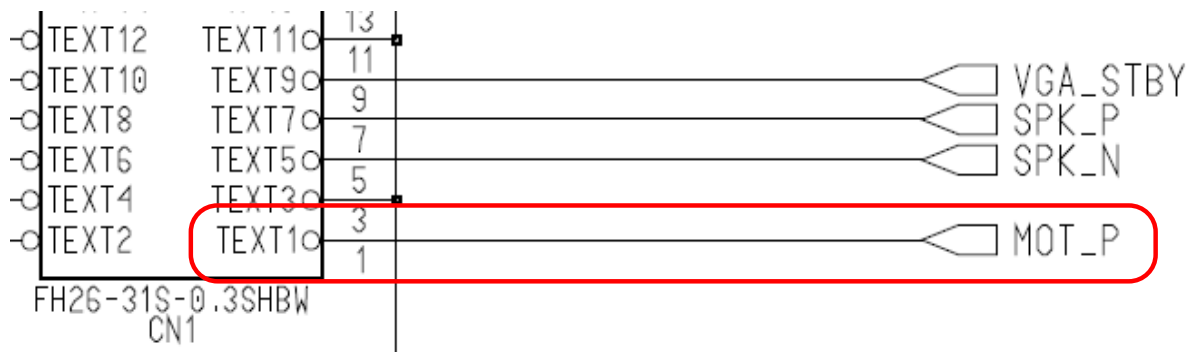
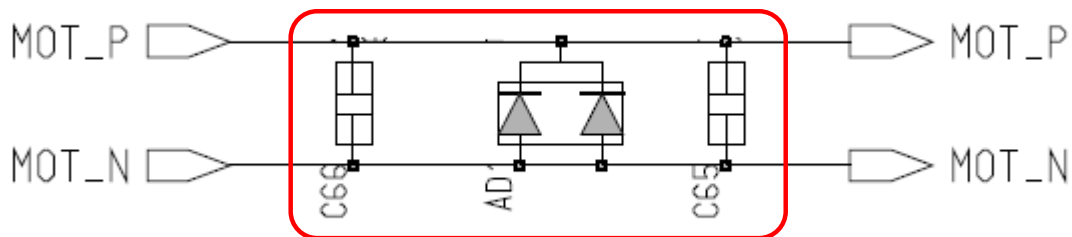
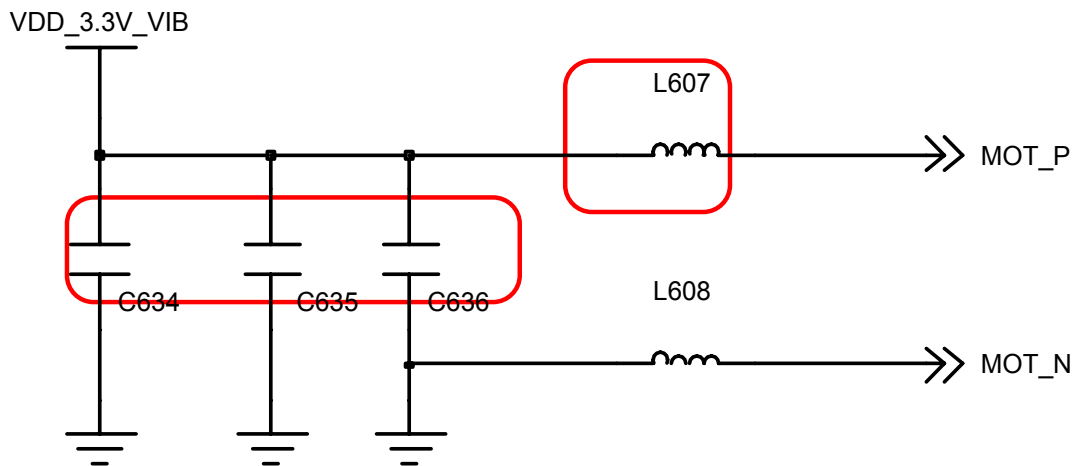
2) No Sound on Calling

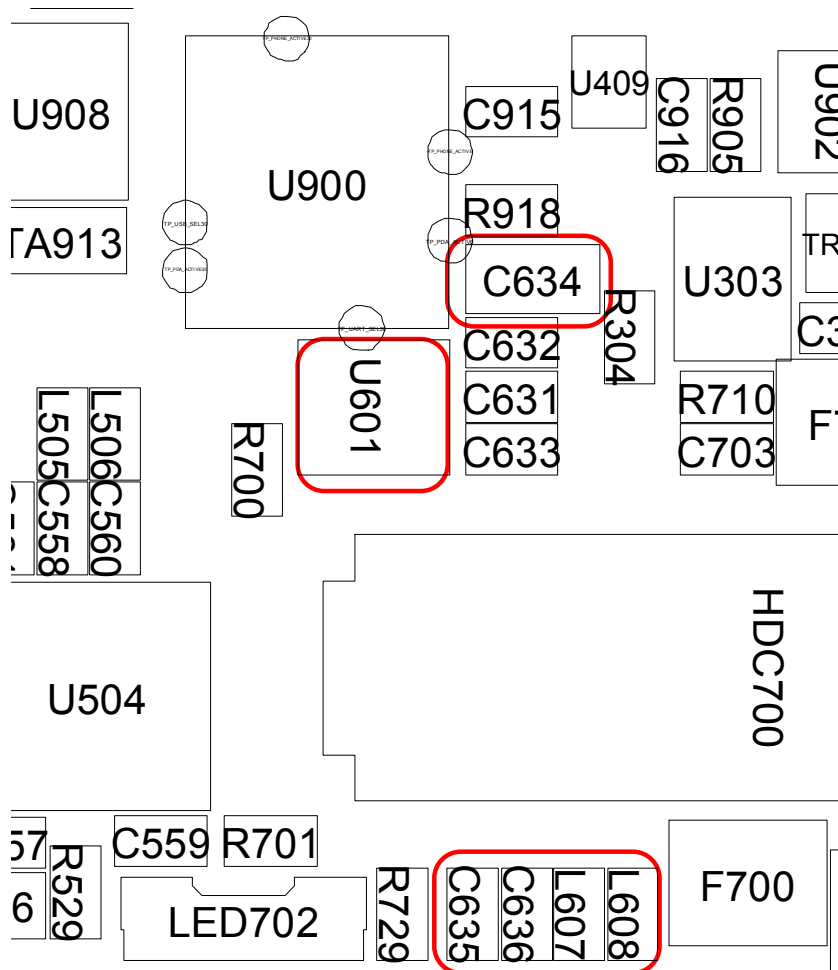
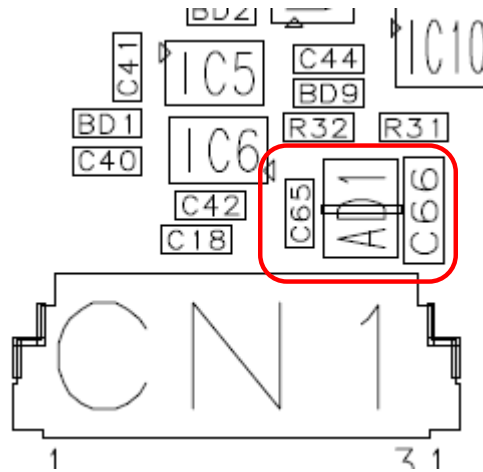




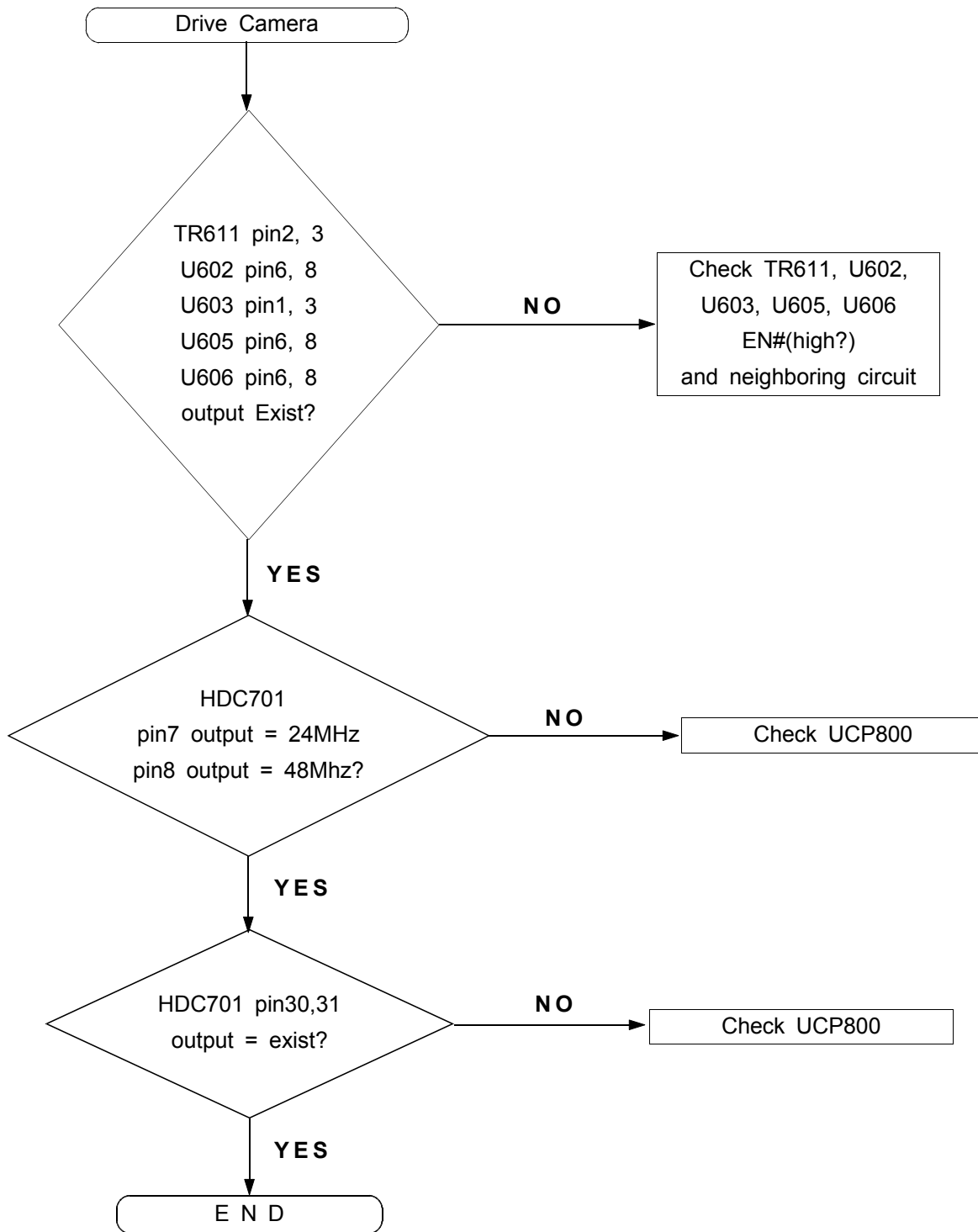


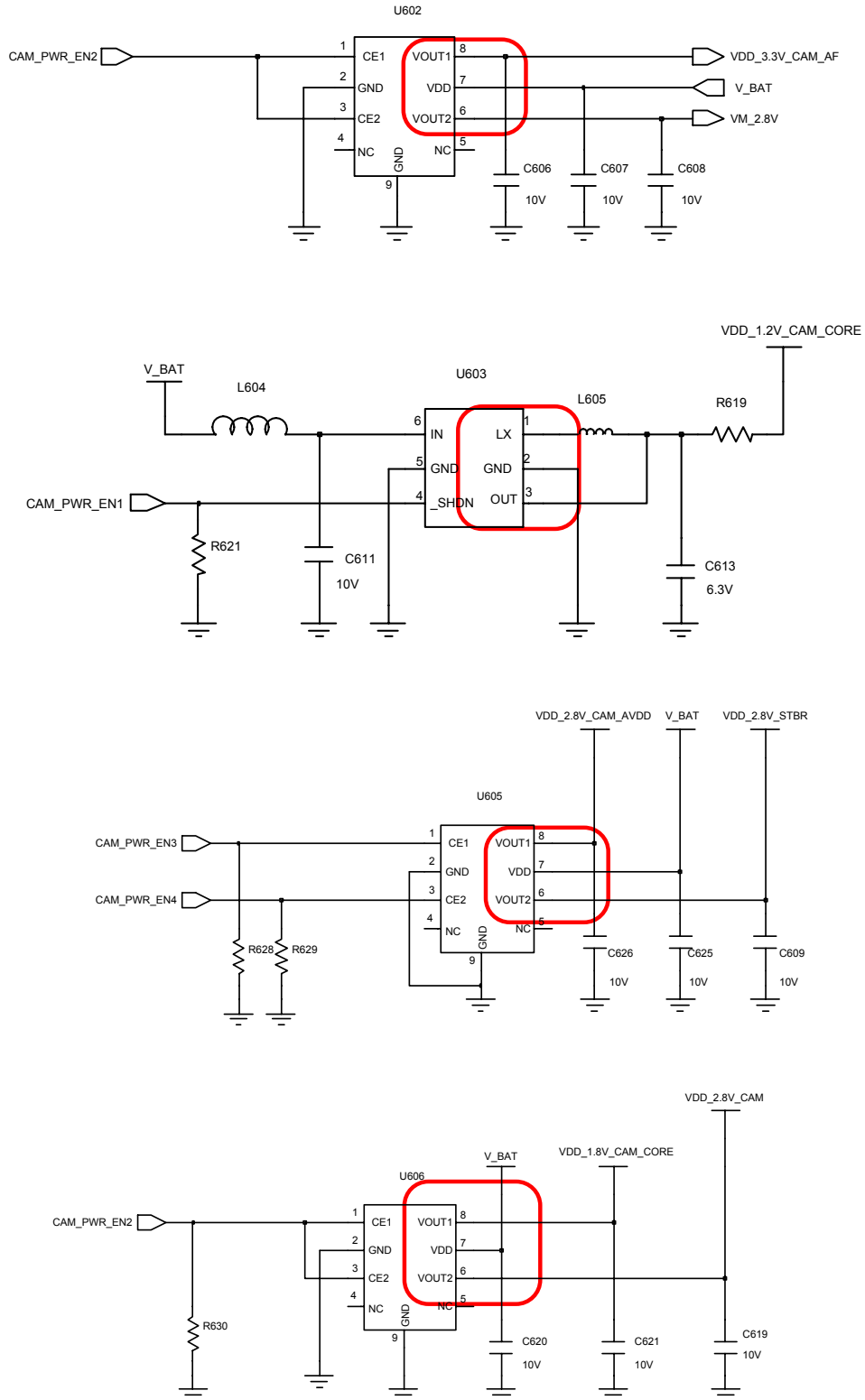
10-1-4 : Abnormal Vibrator operation

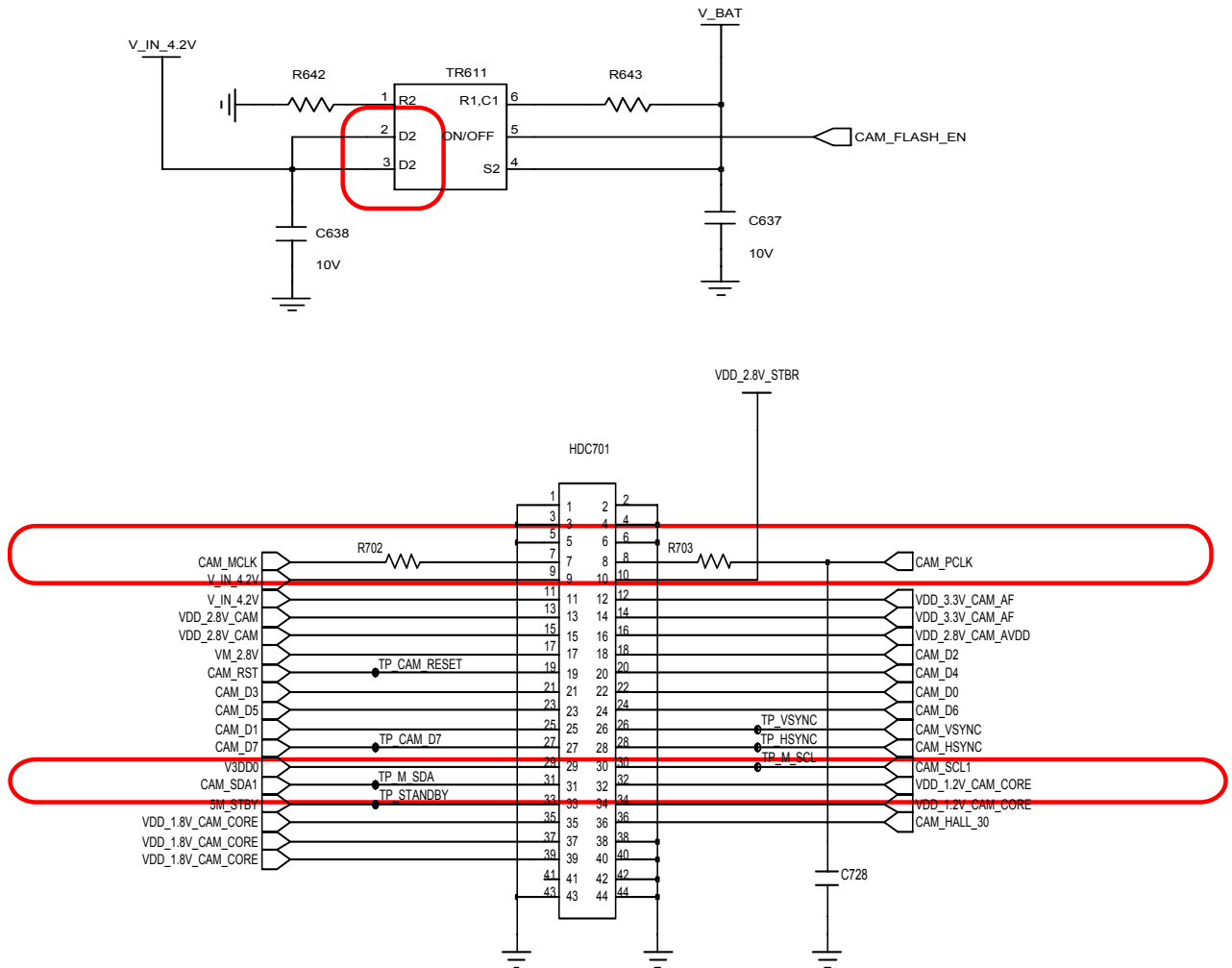




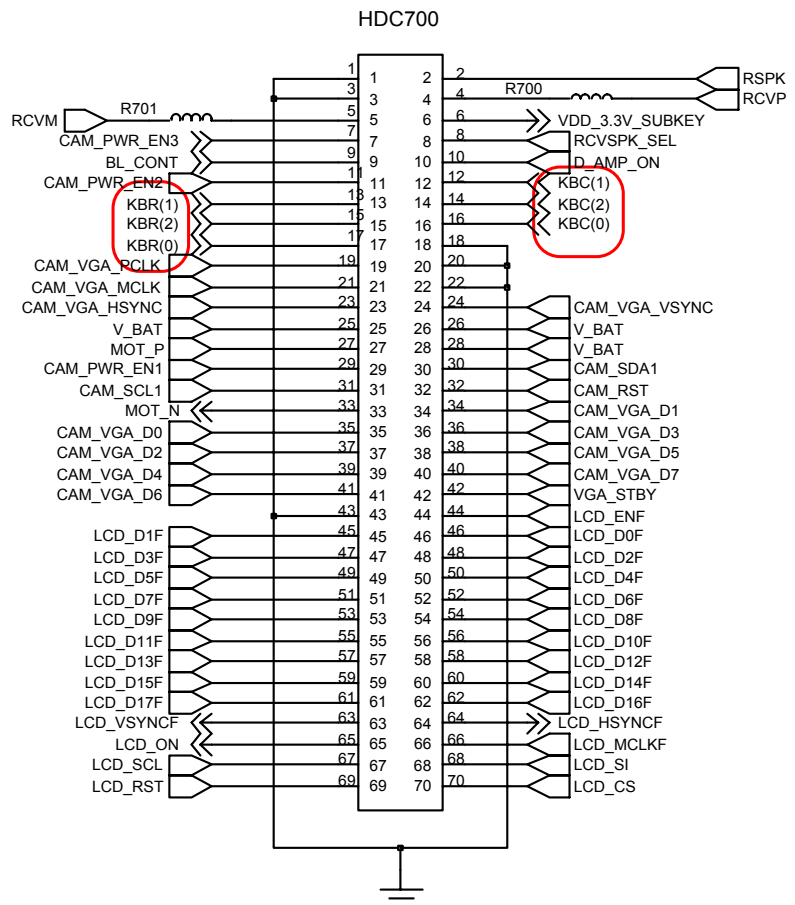
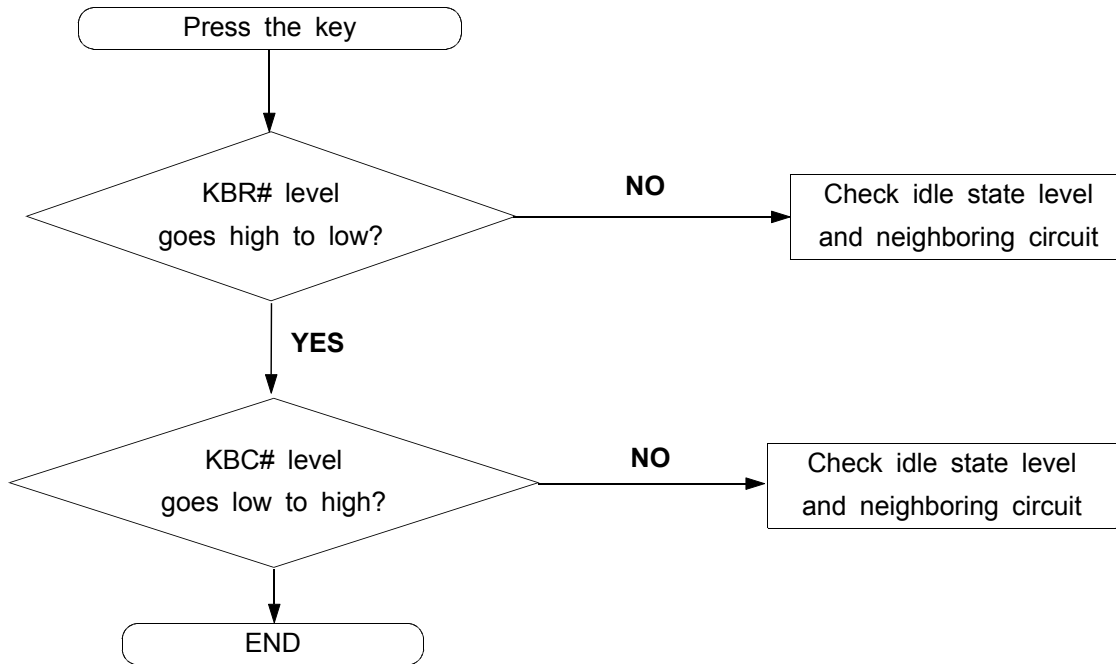
10-1-5 : Abnormal Camera operation



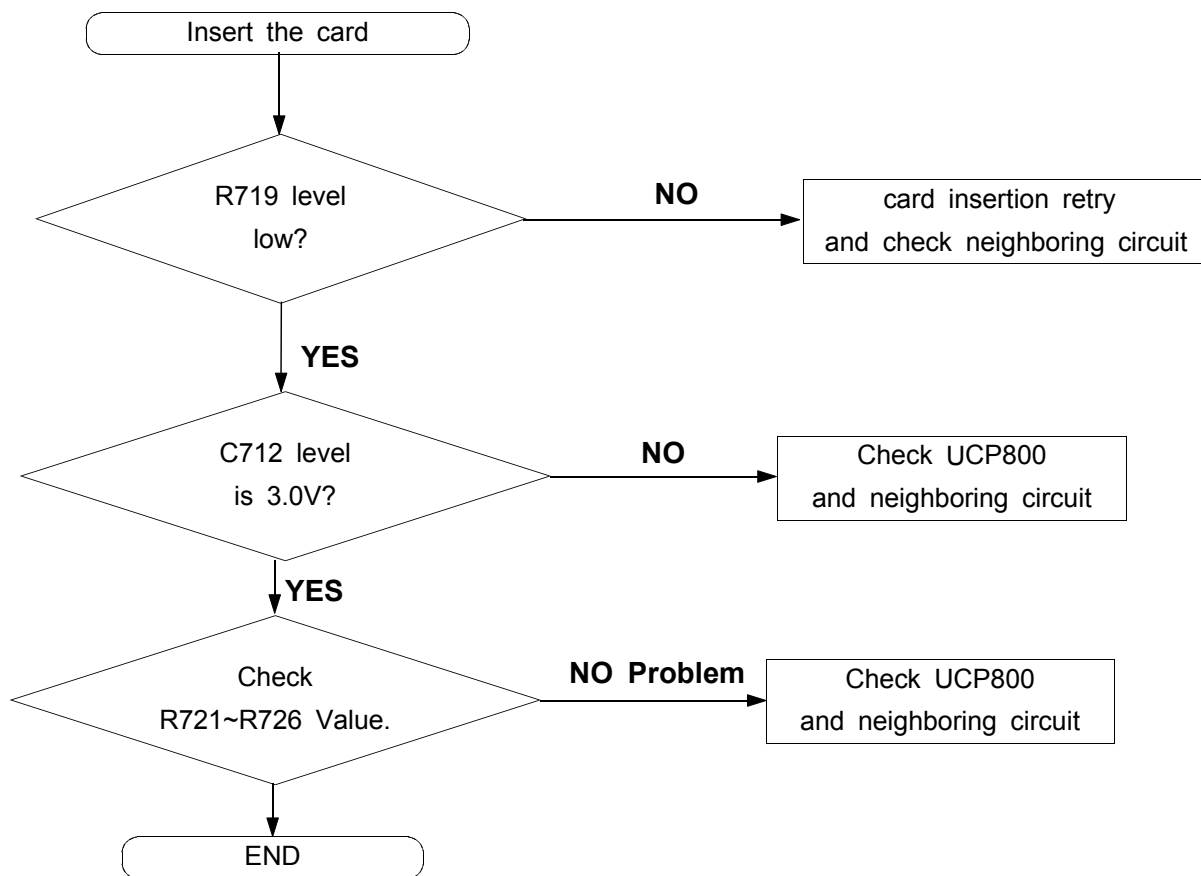


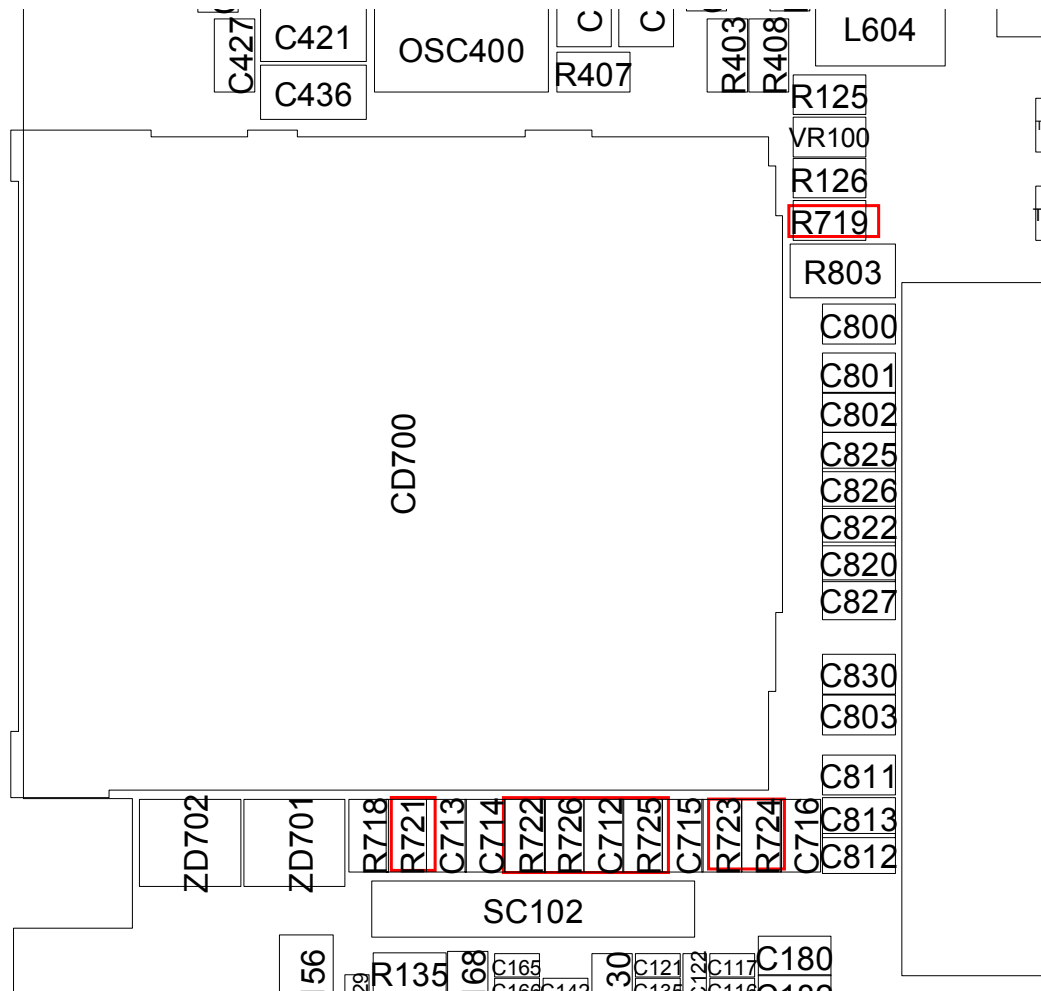
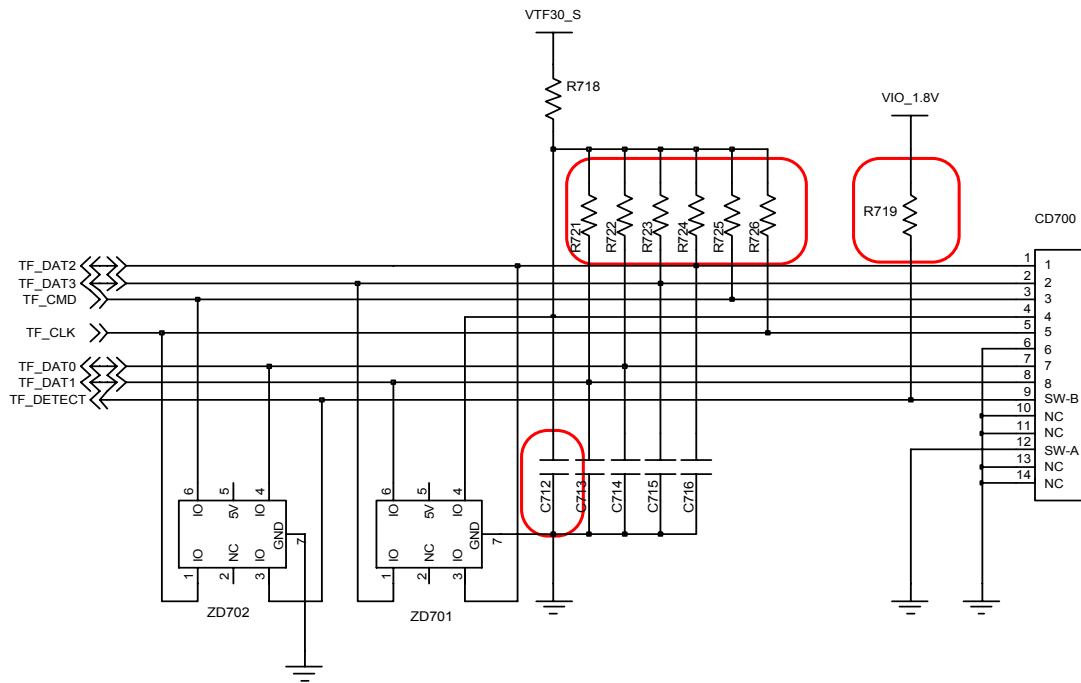


10-1-7 : Abnormal 3X4 KEY operation

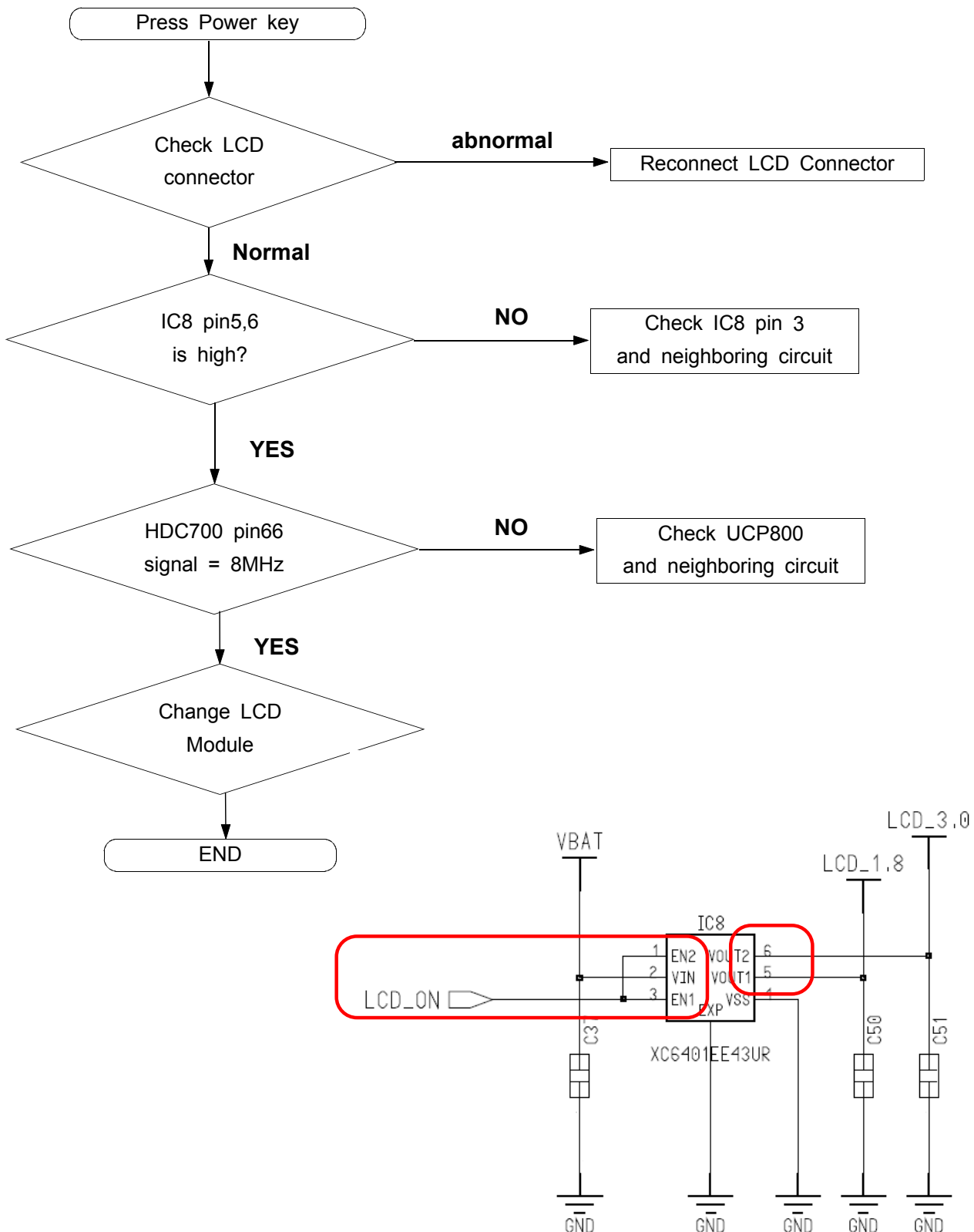


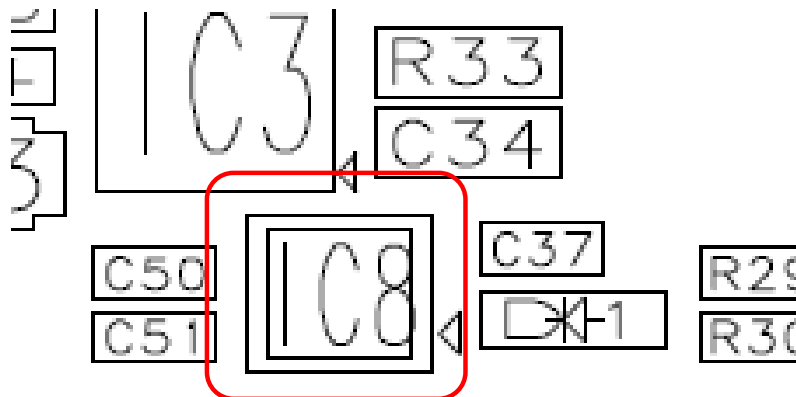
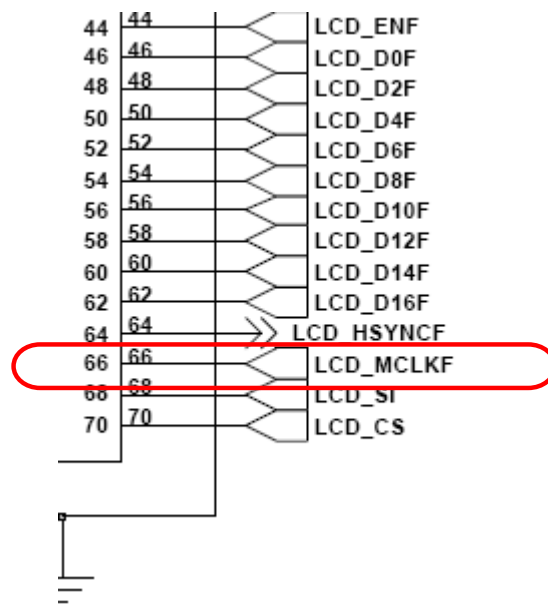
10-1-8 : Abnormal micro-SD operation



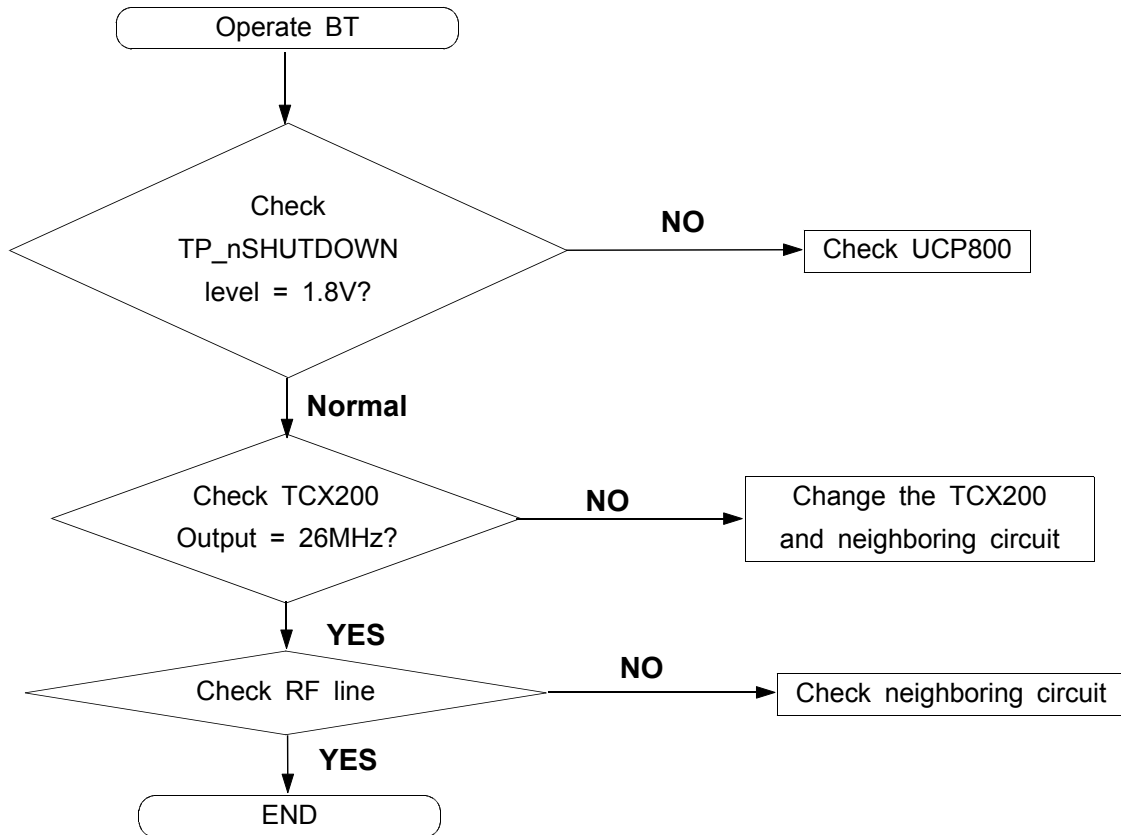


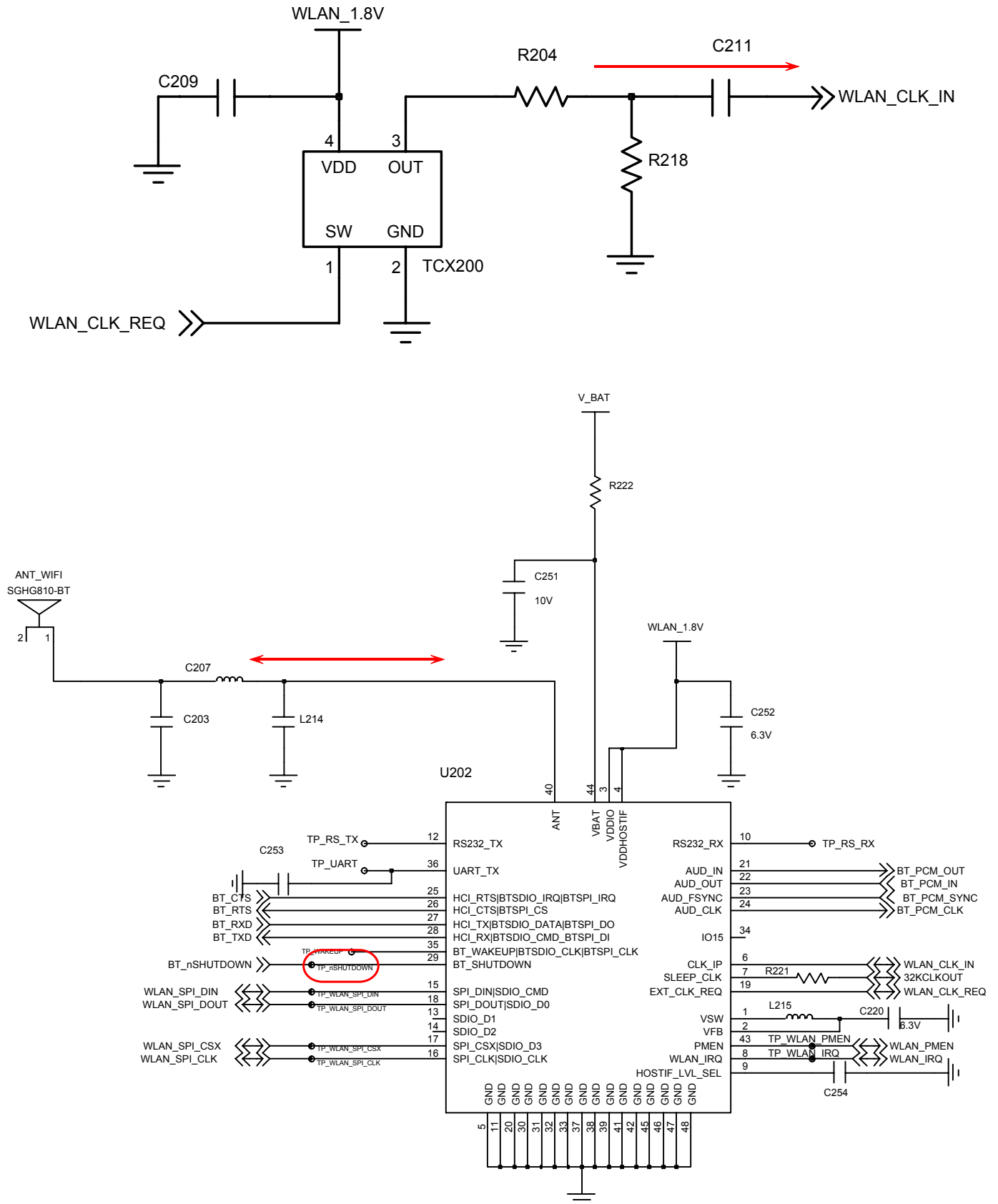
10-1-9 : Abnormal LCD operation

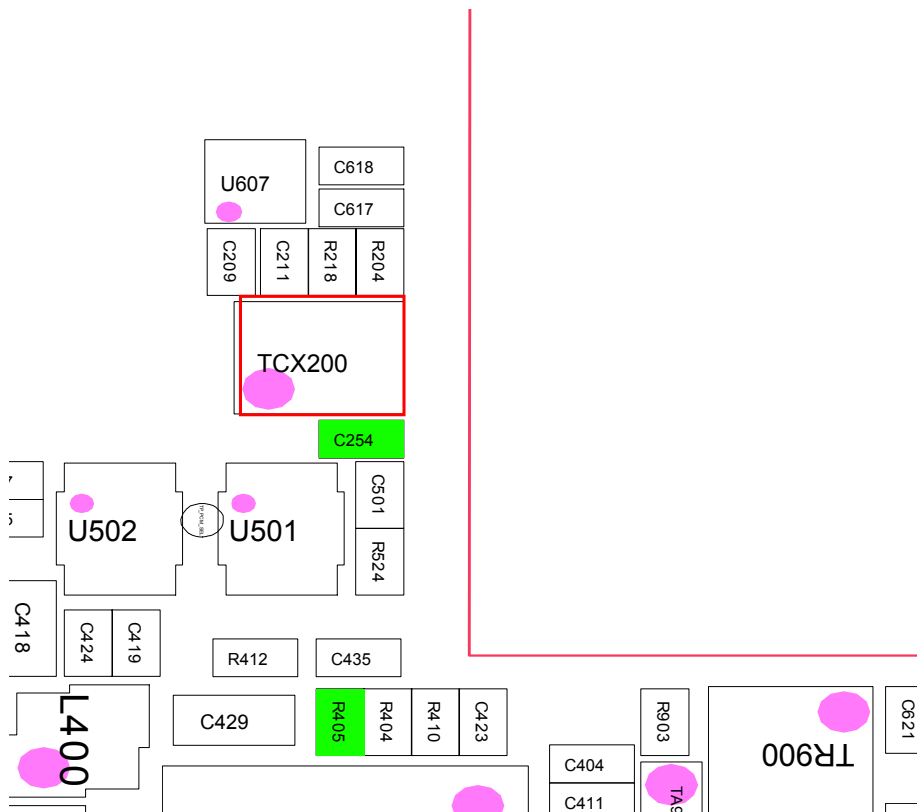
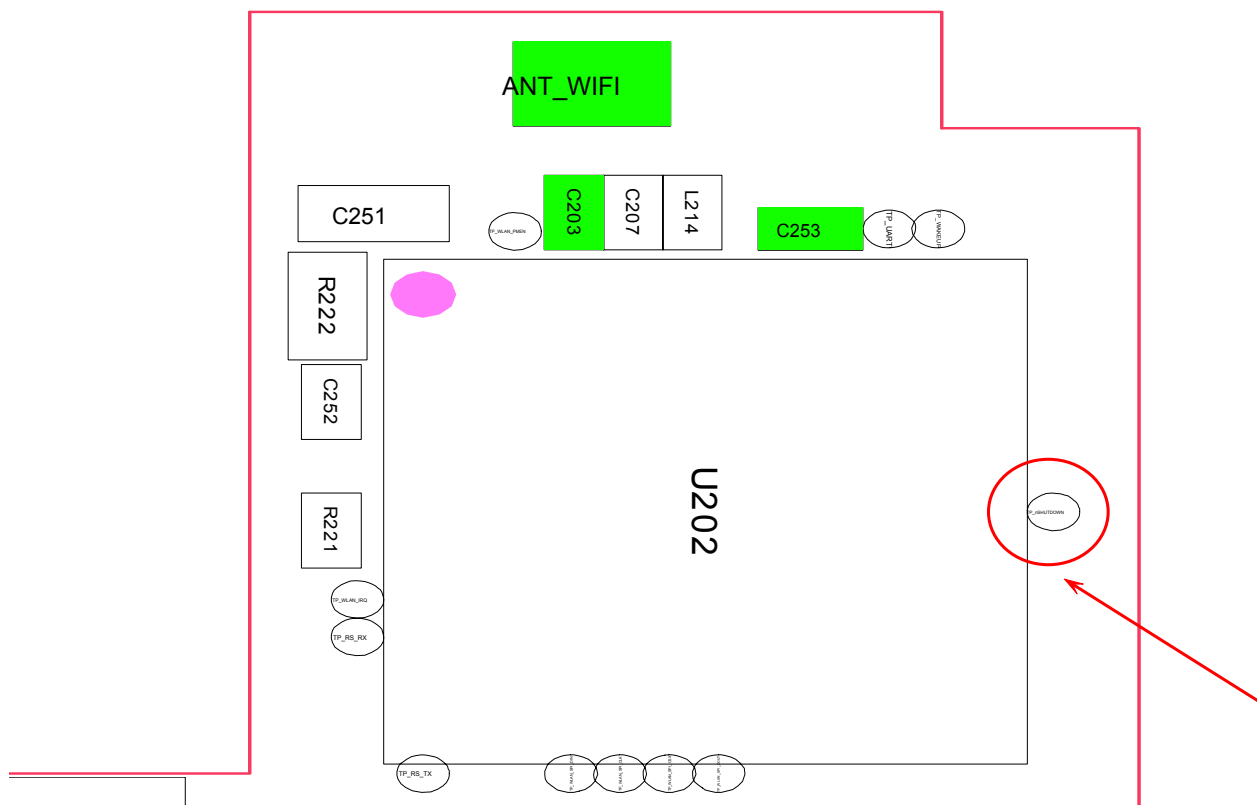




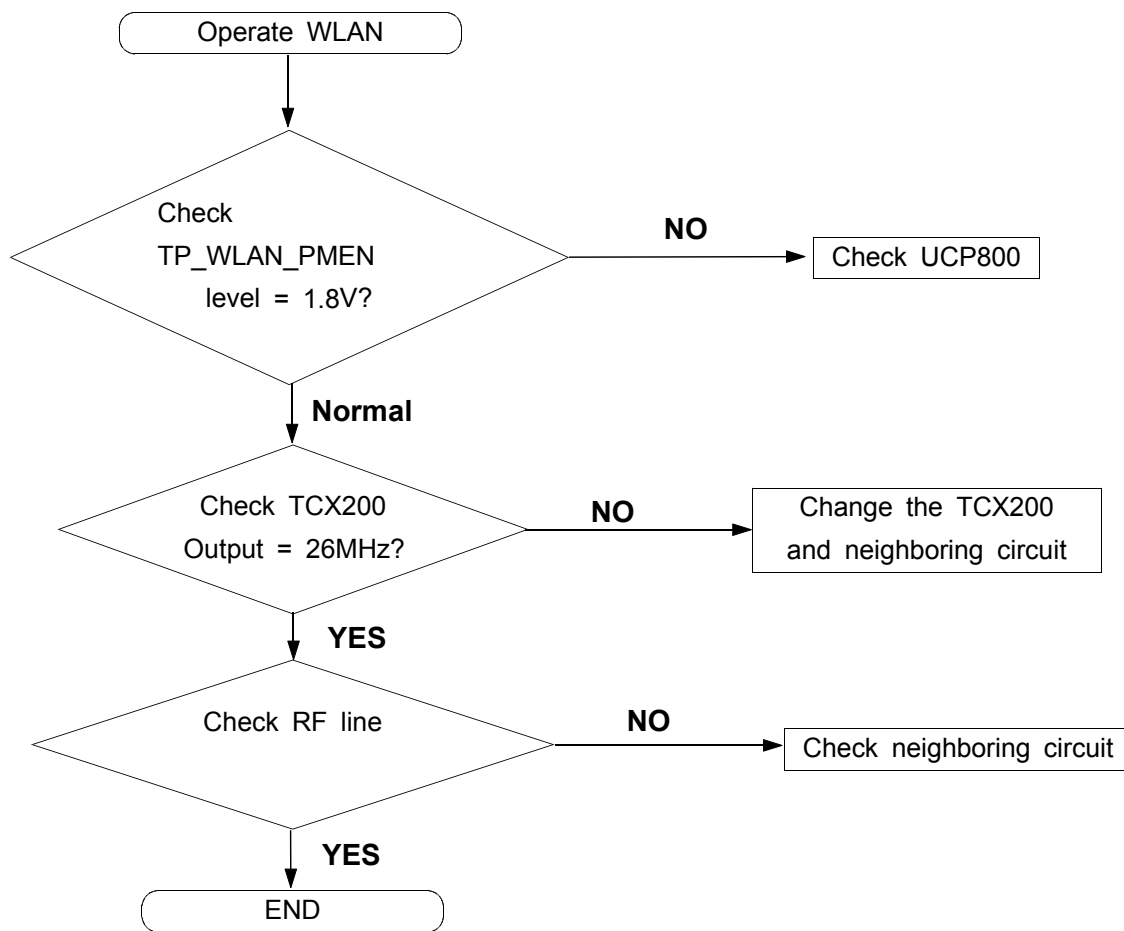
10-2. BT TX/RX

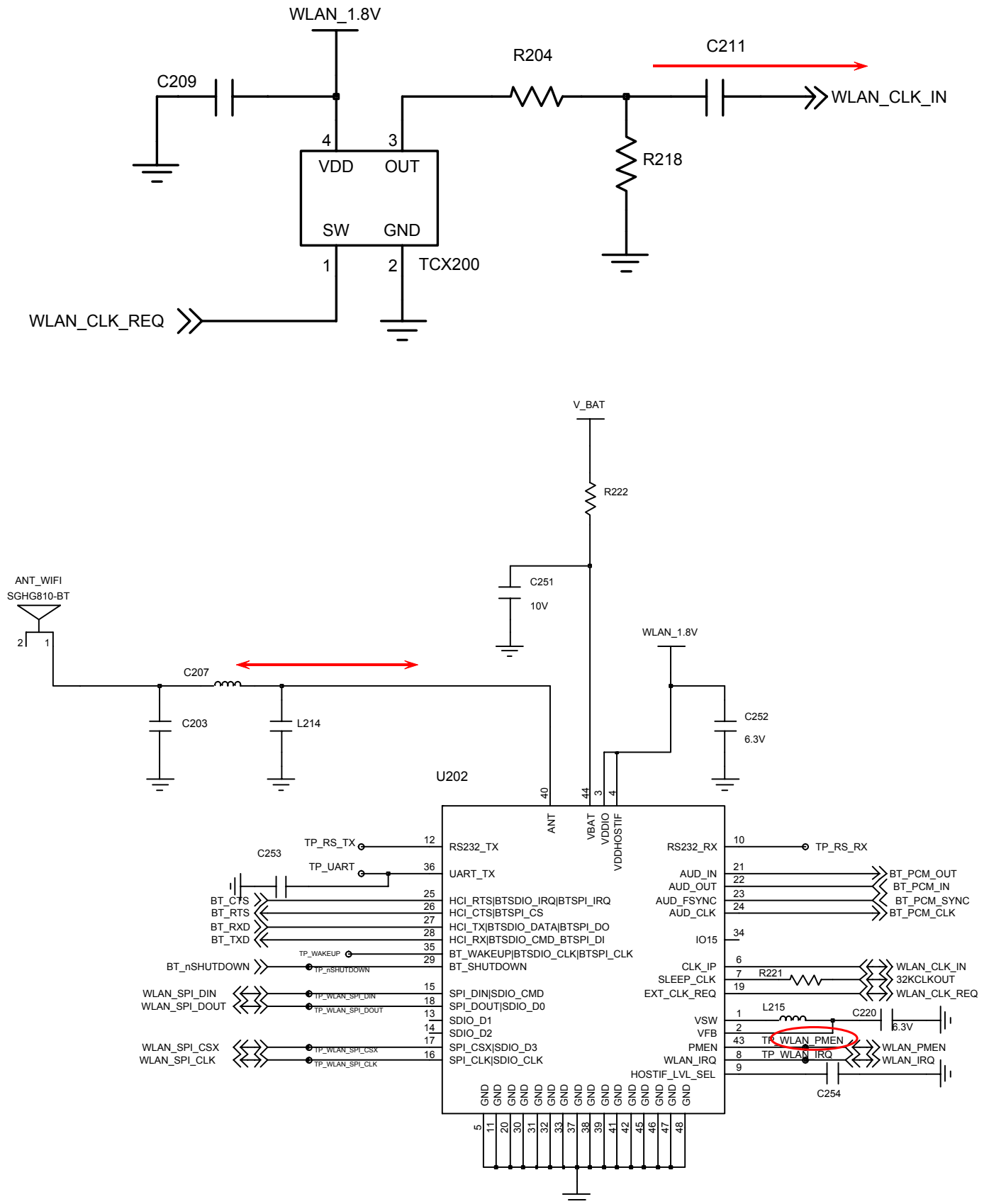


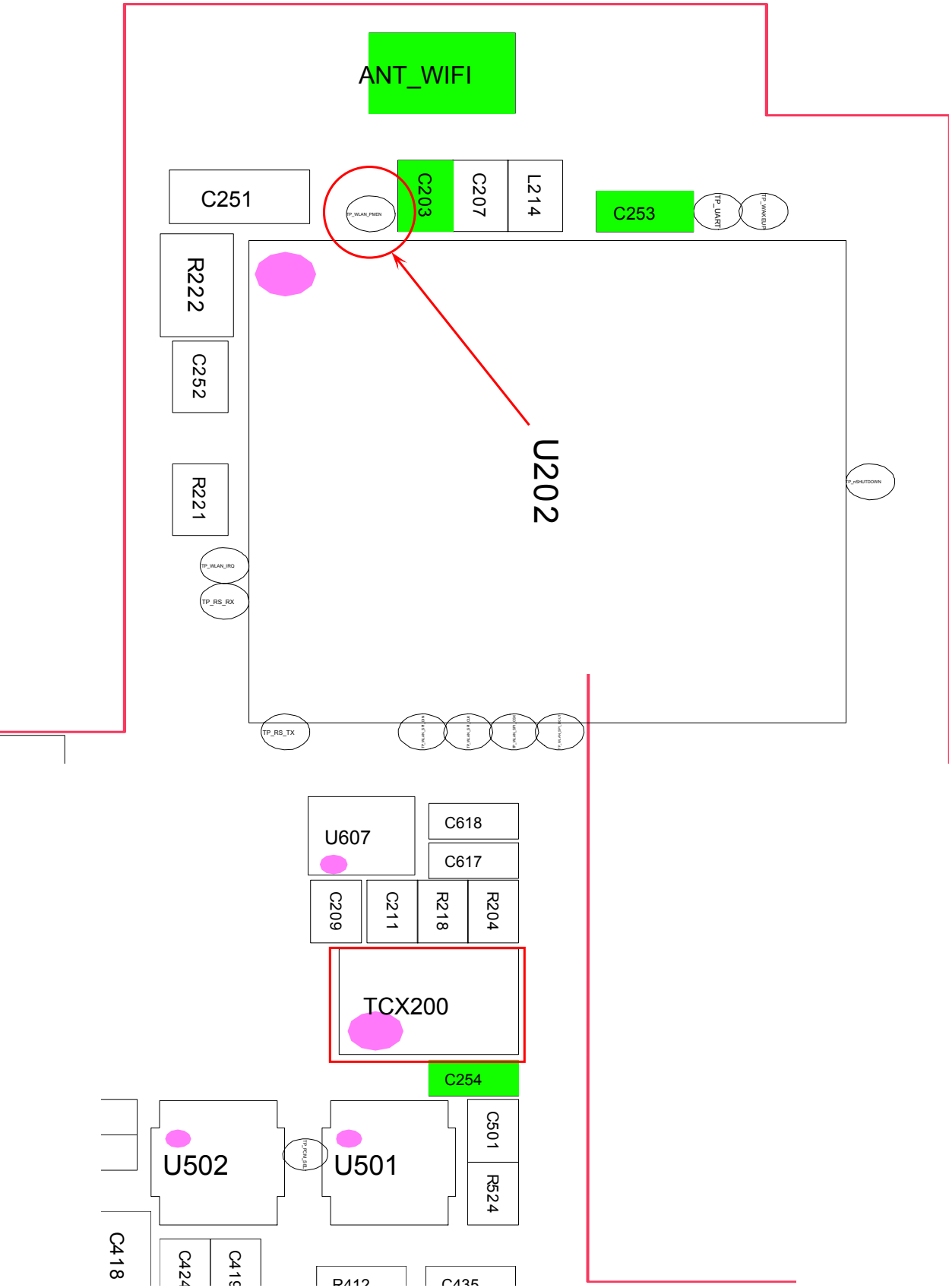




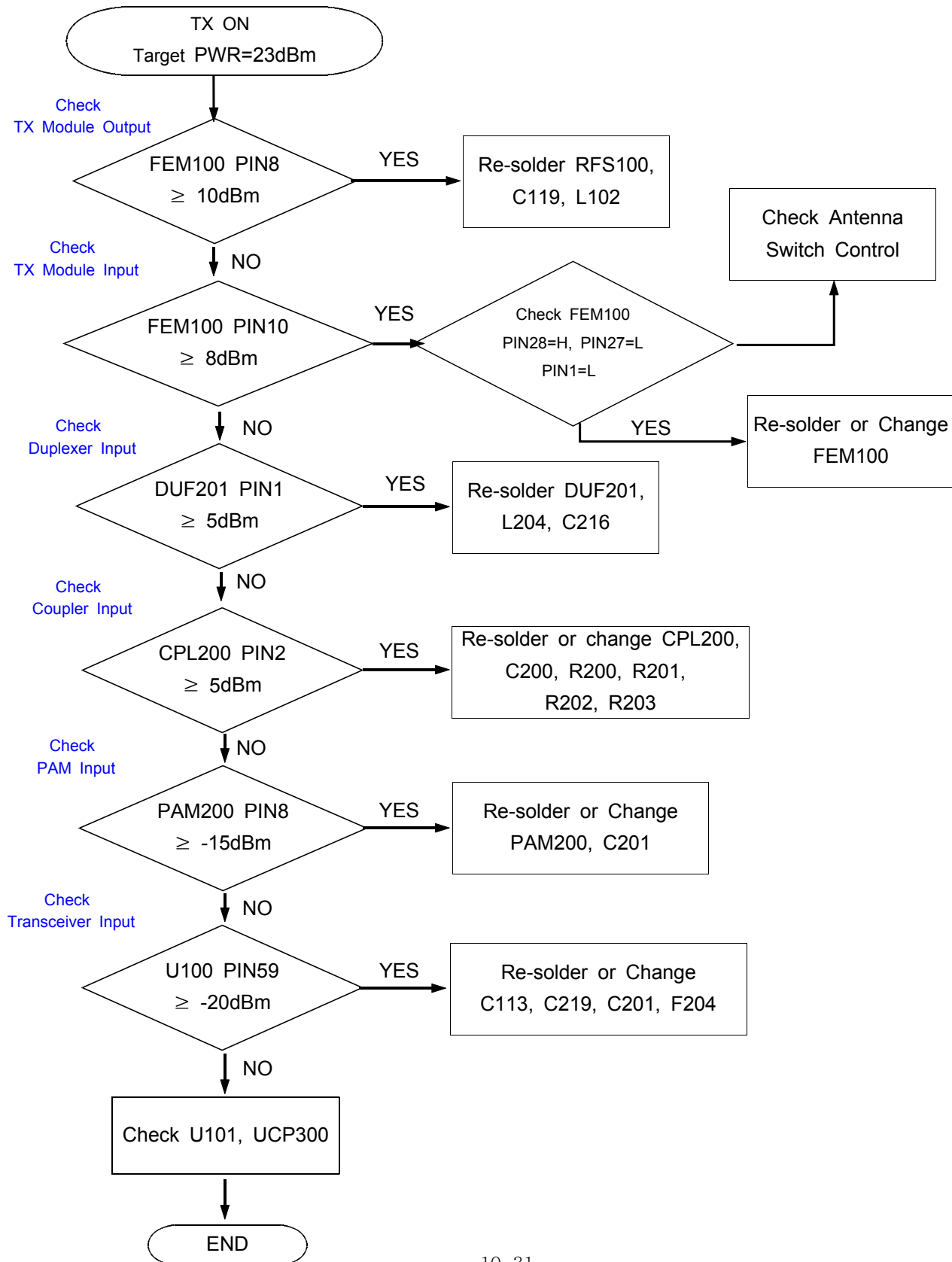
10-3. WLAN TX/RX

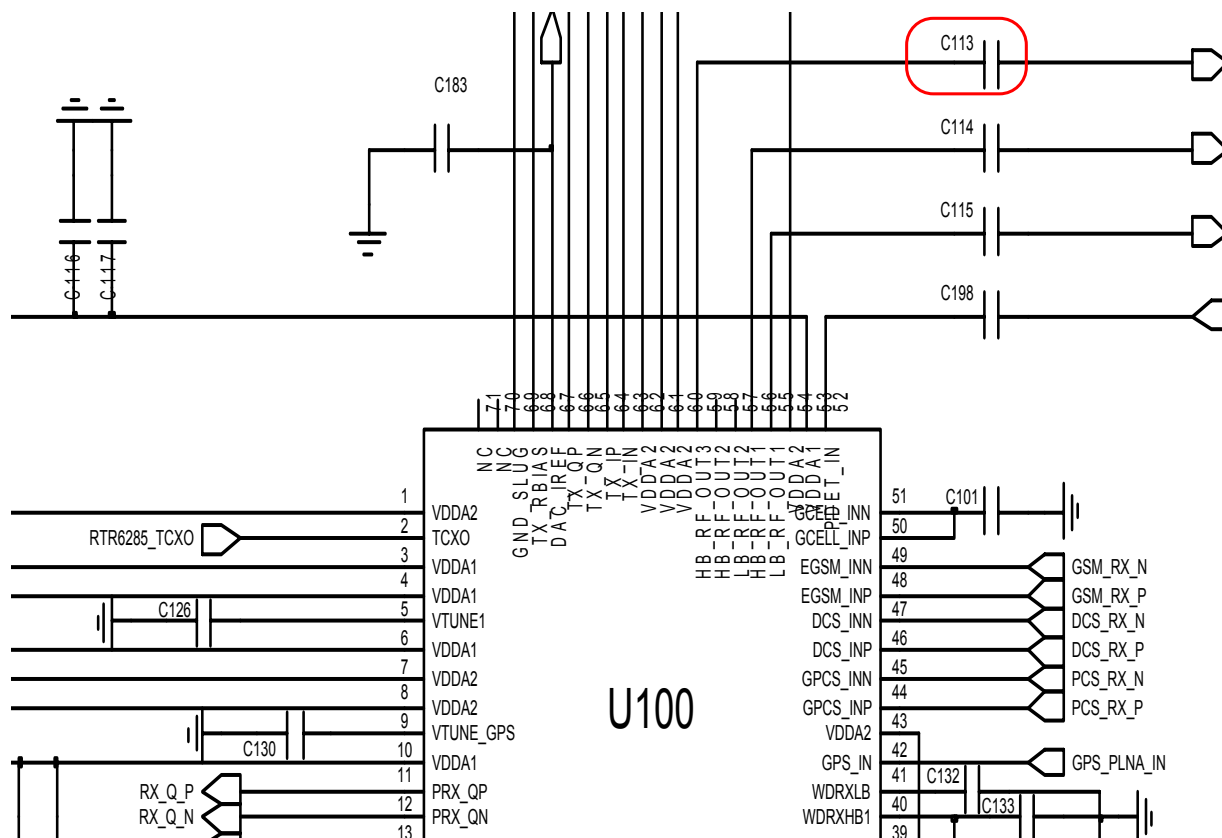
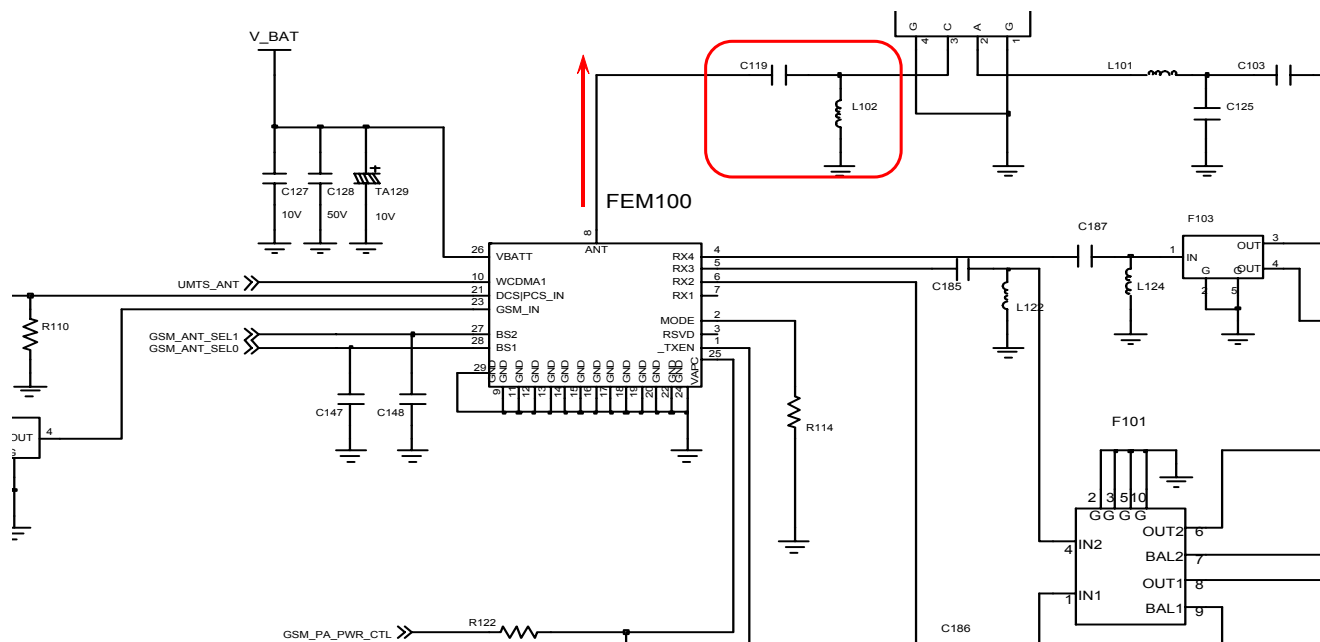


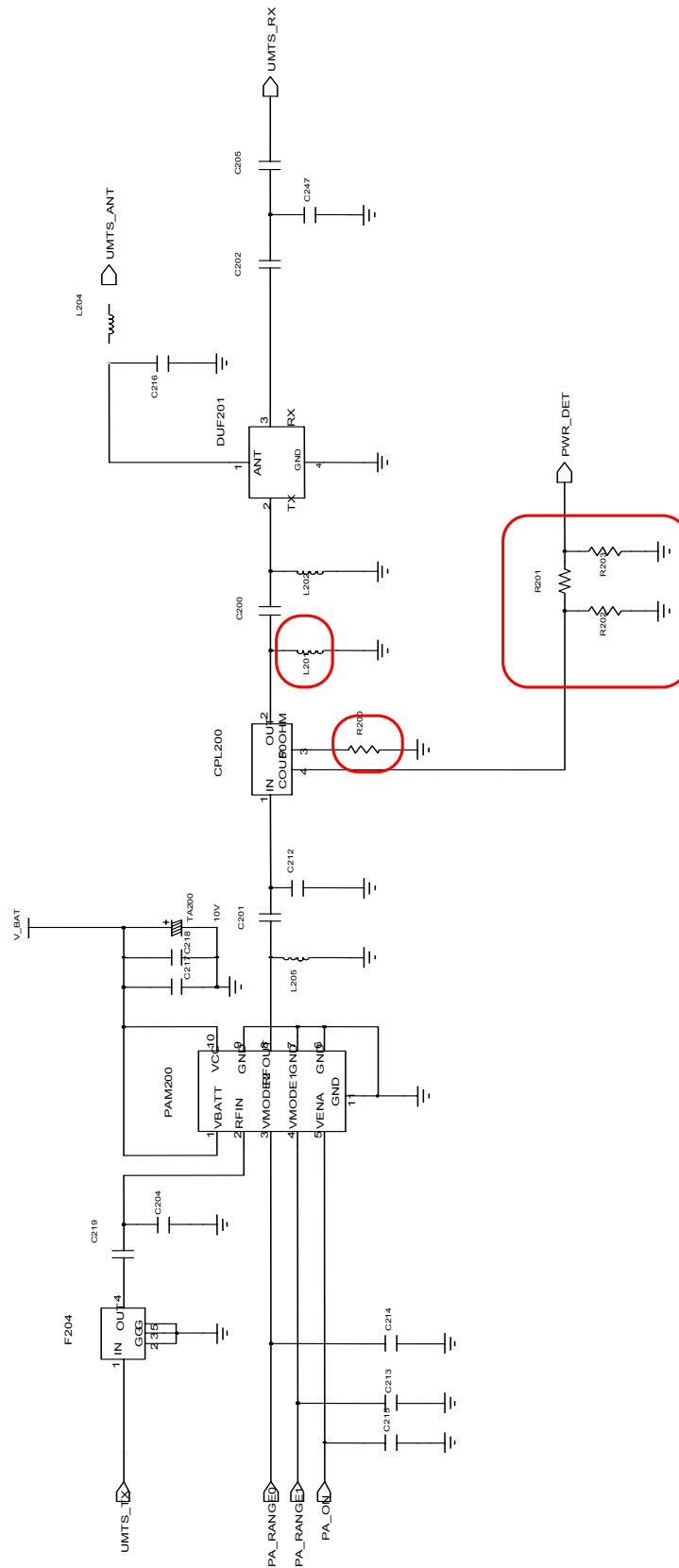


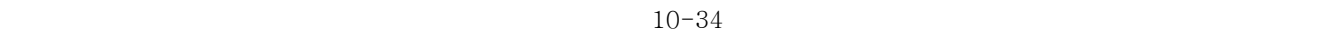


10-4. WCDMA TX

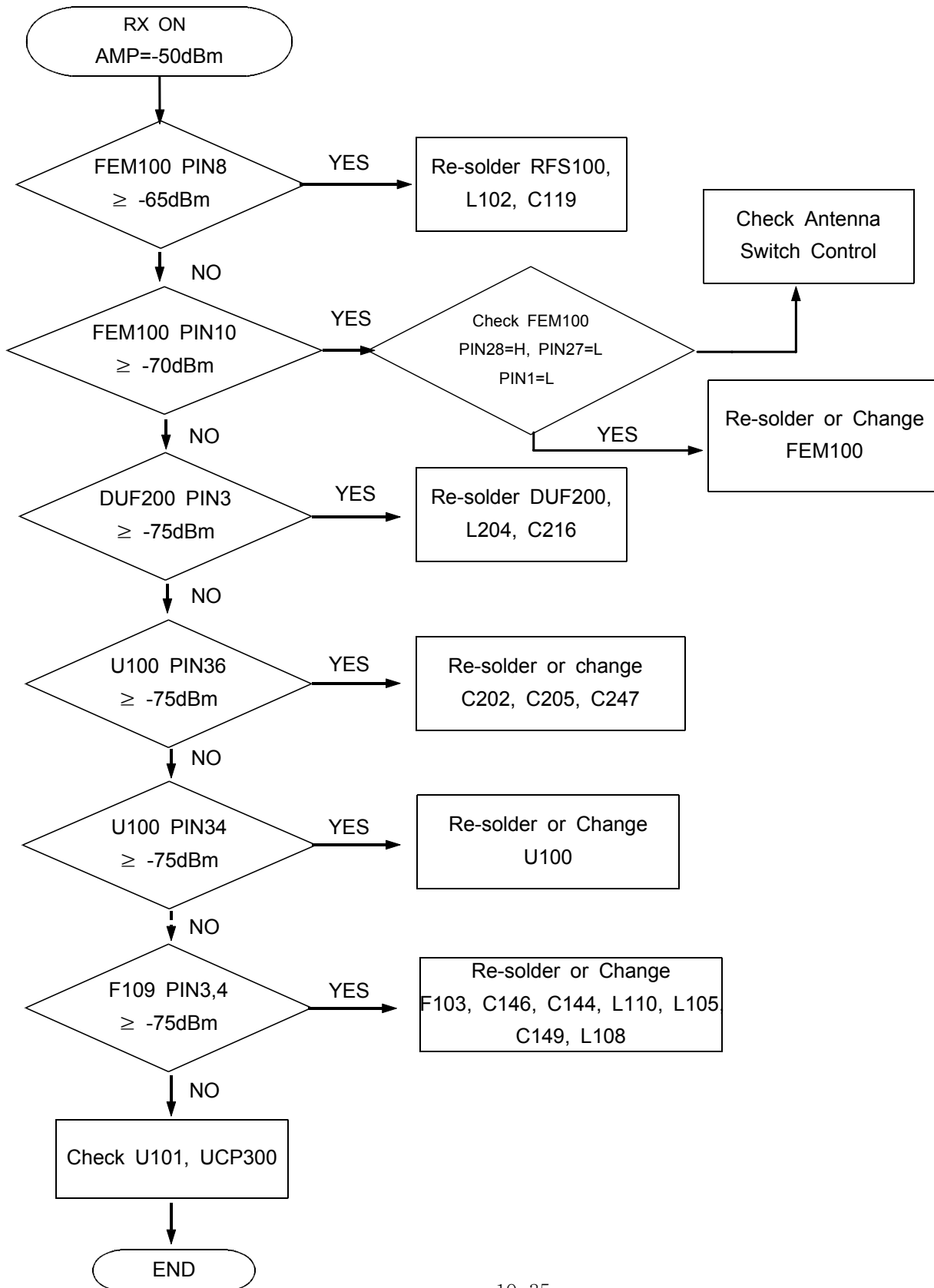


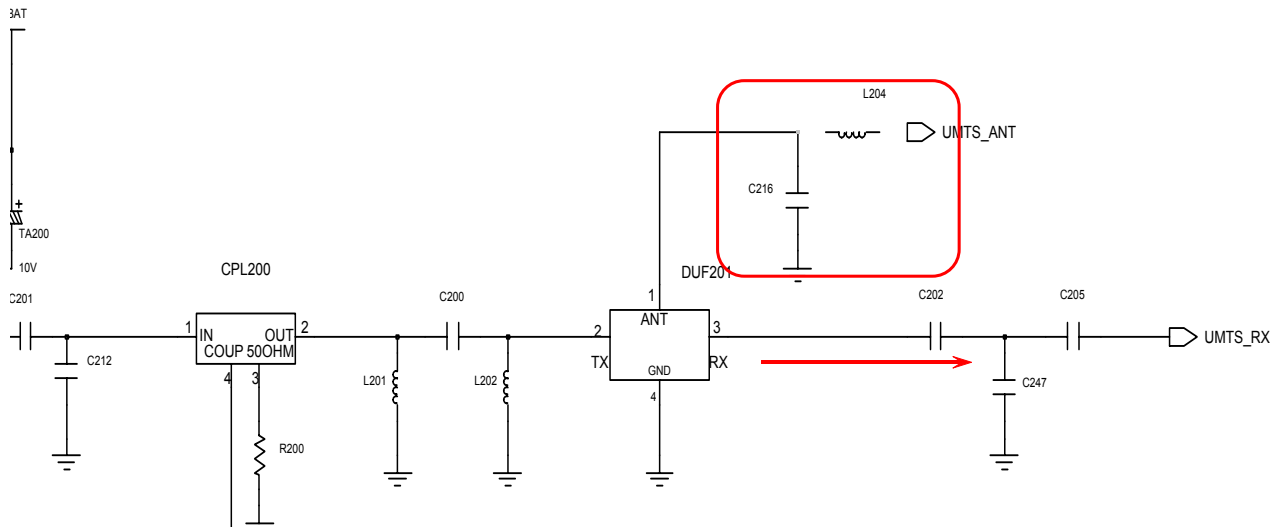
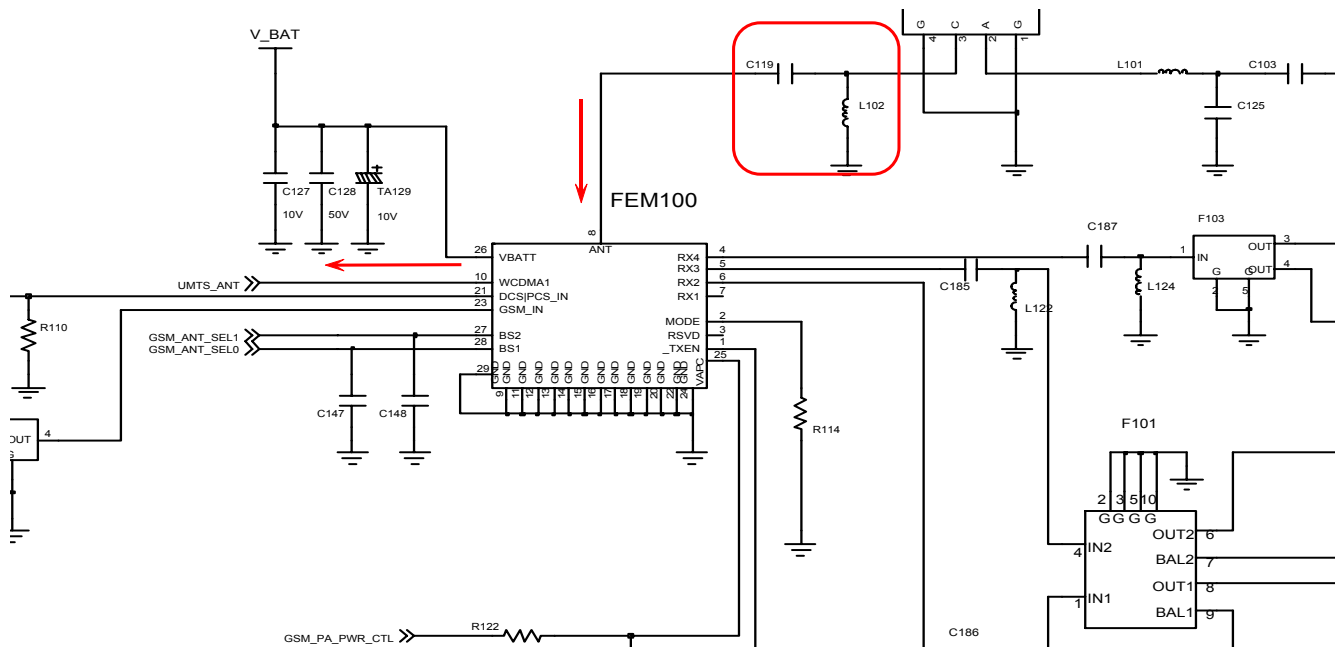


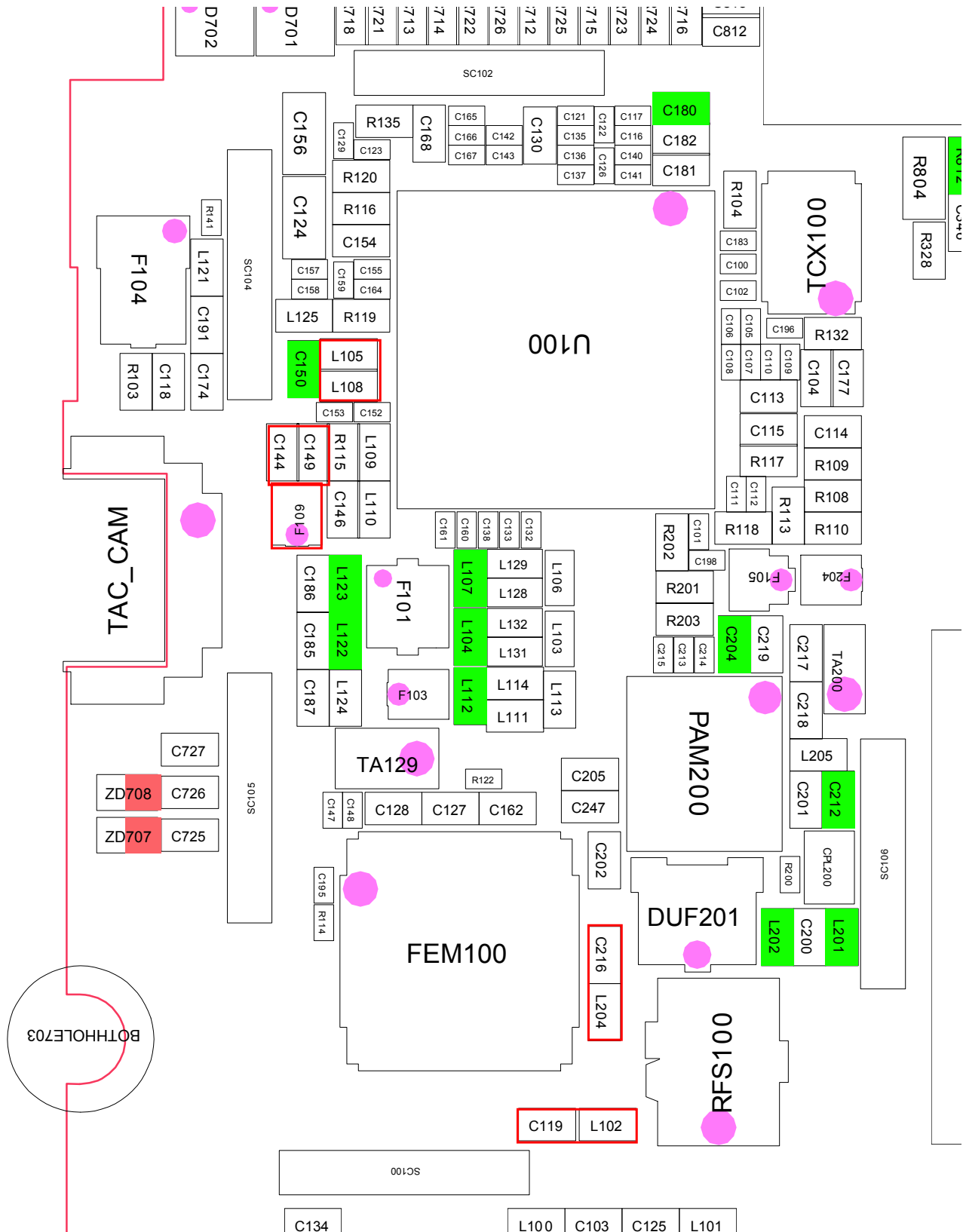




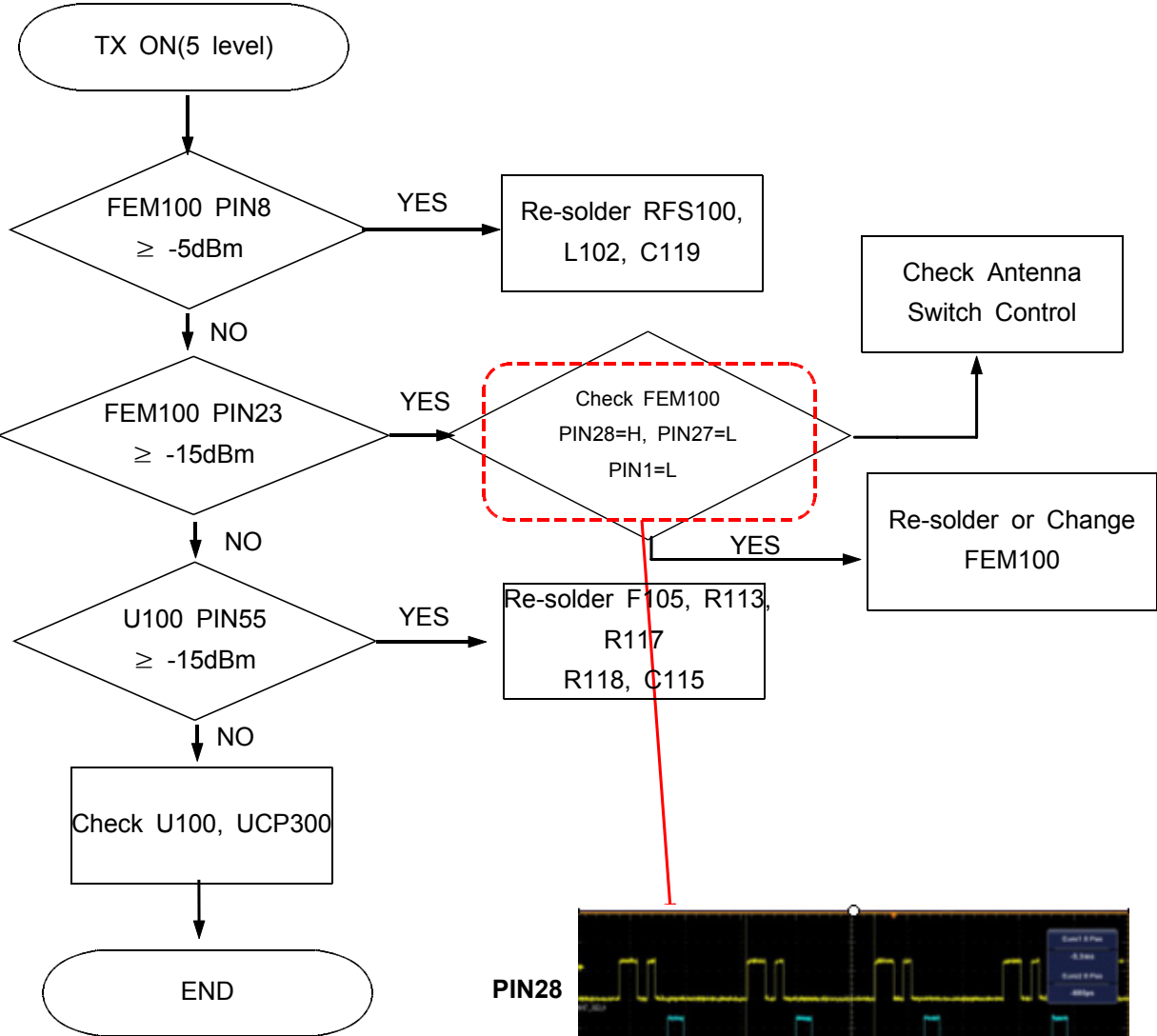
10-5. WCDMA RX



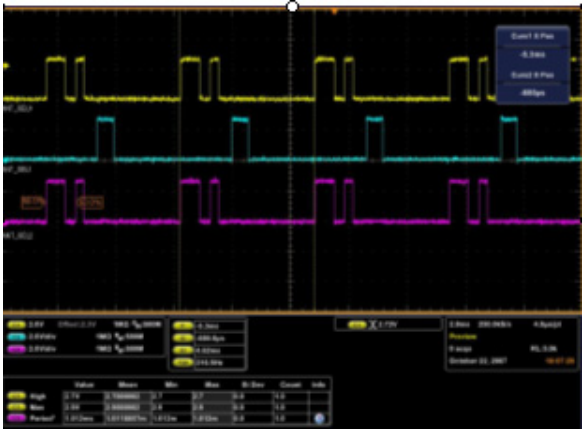


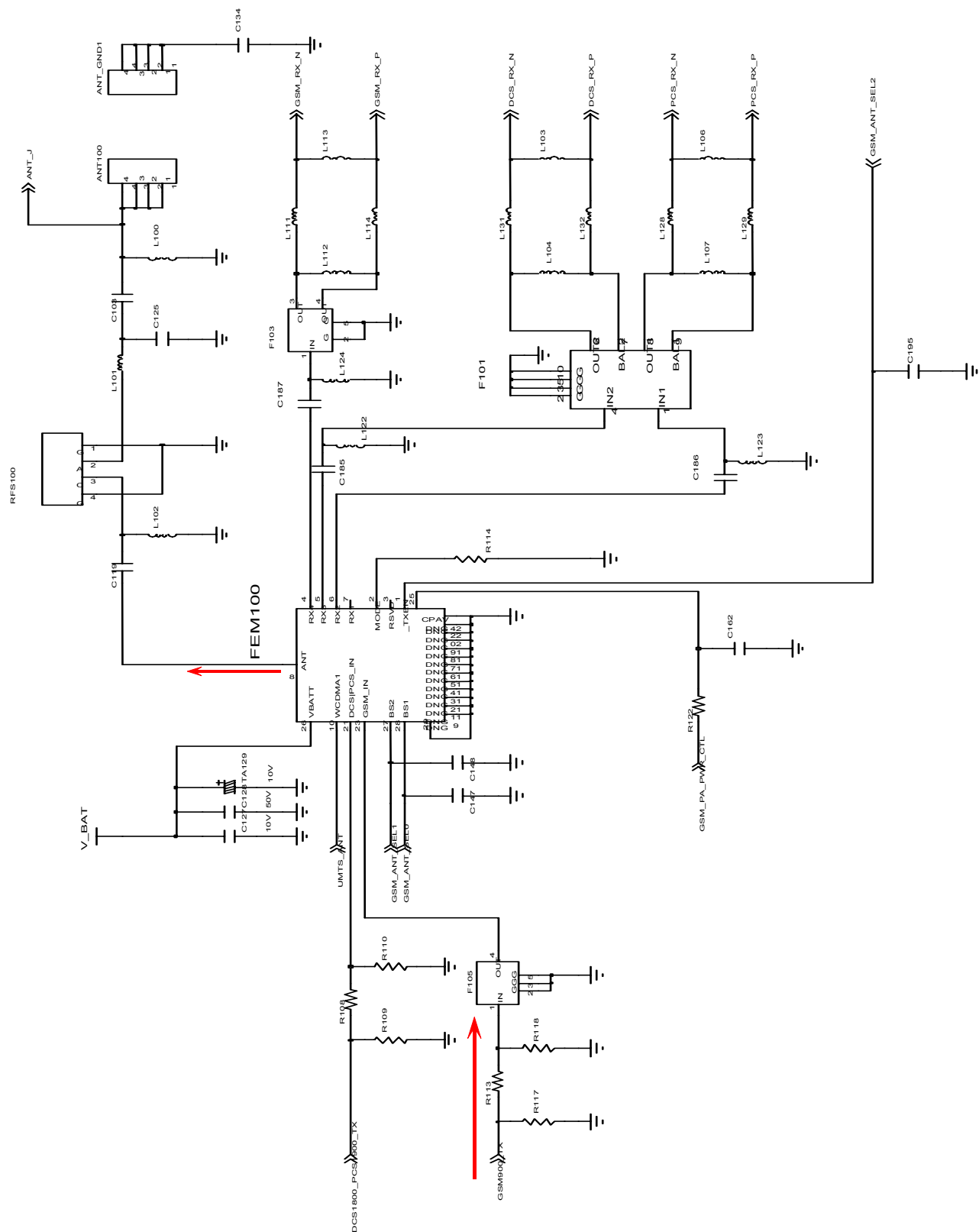


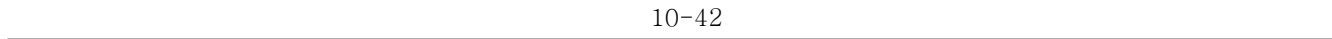
10-6. EGSM TX



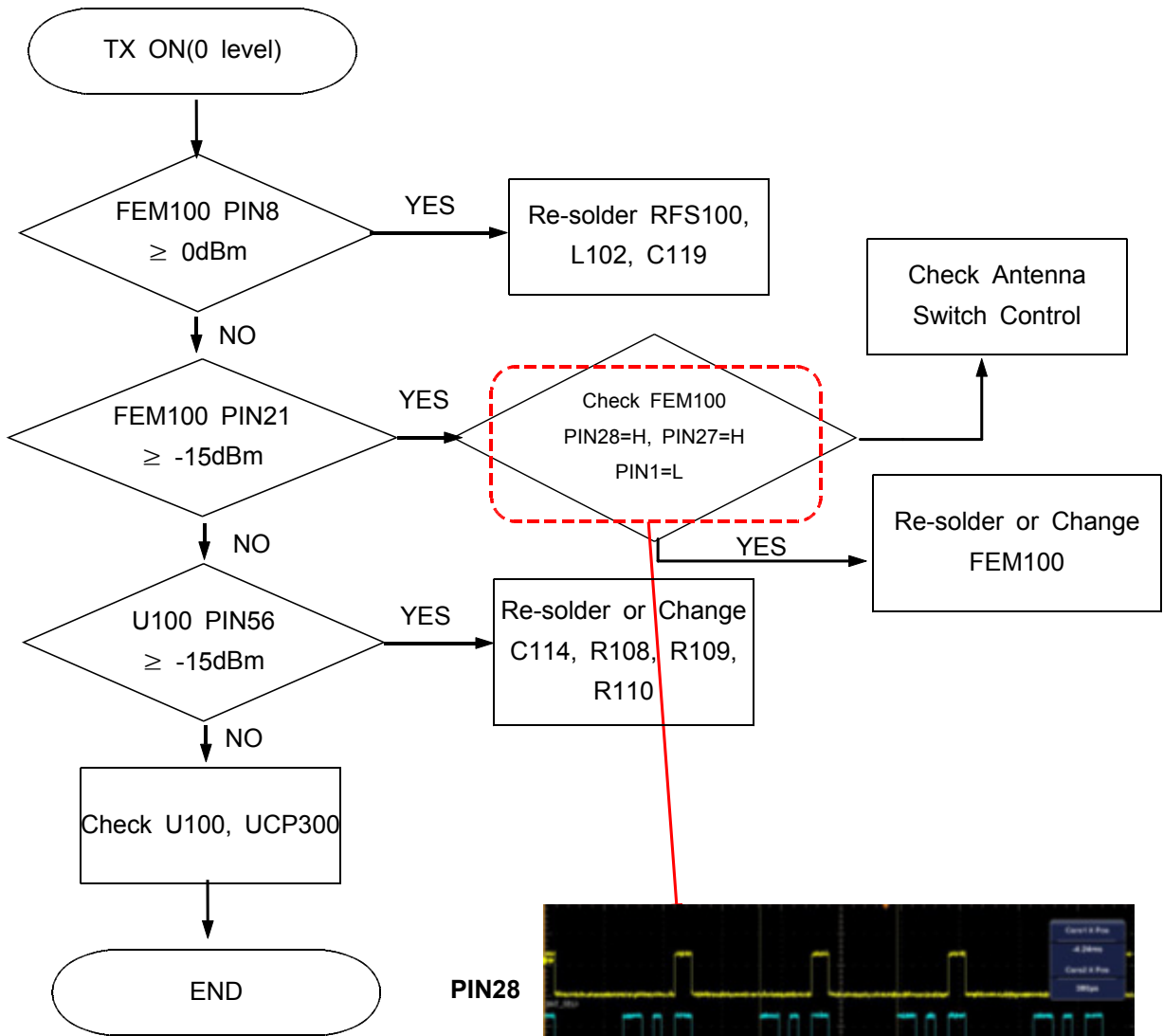
PIN28
PIN27
PIN1



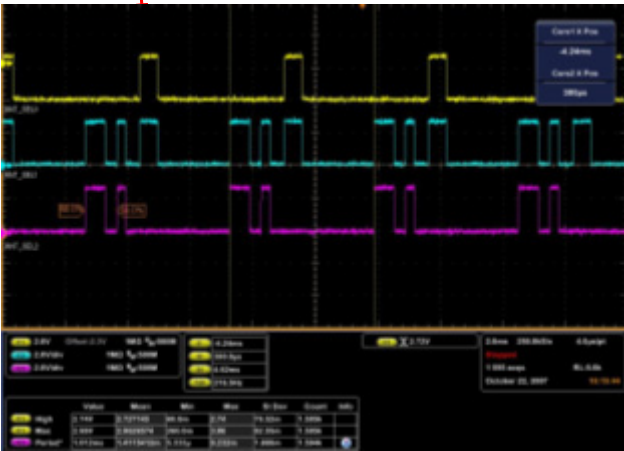


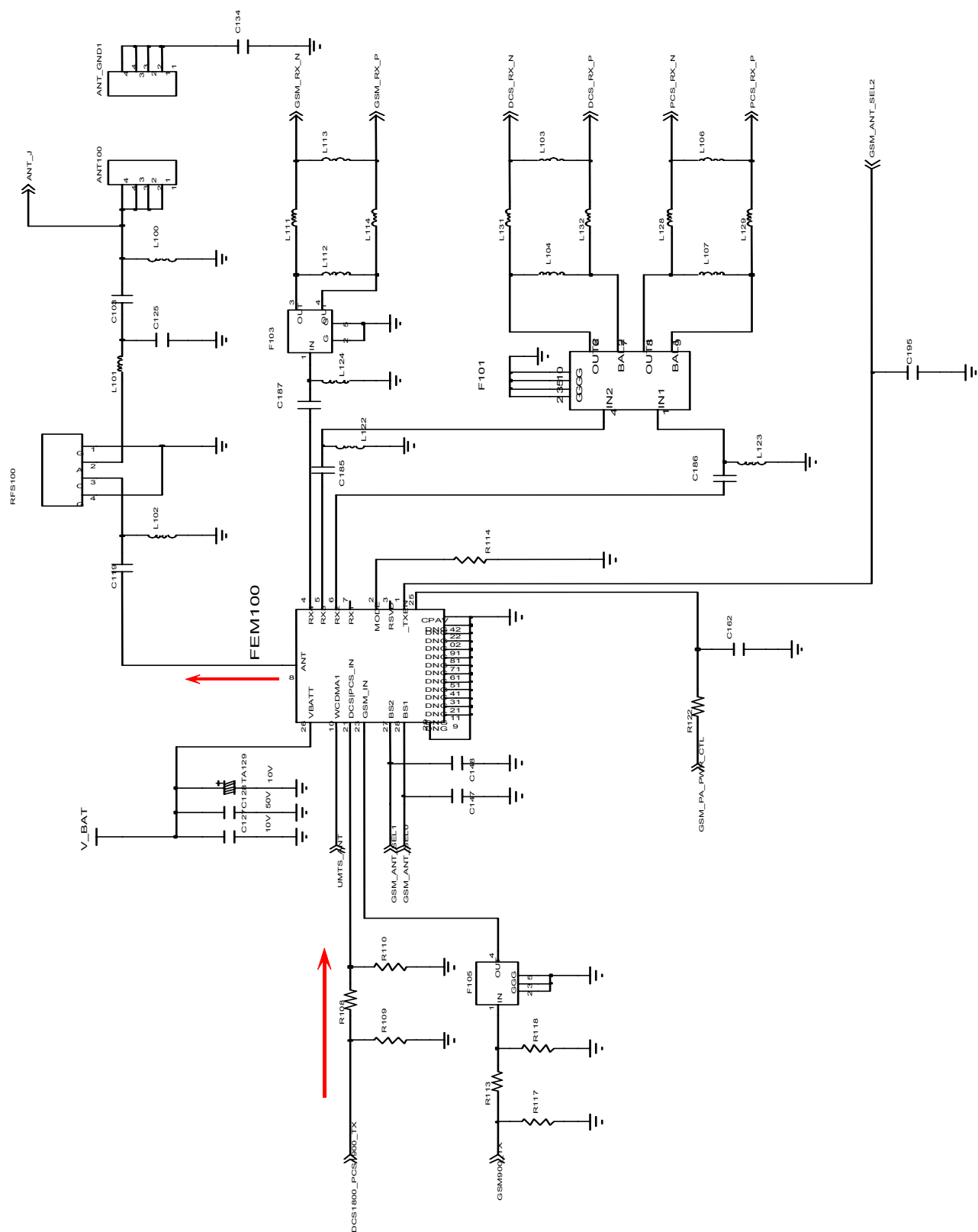


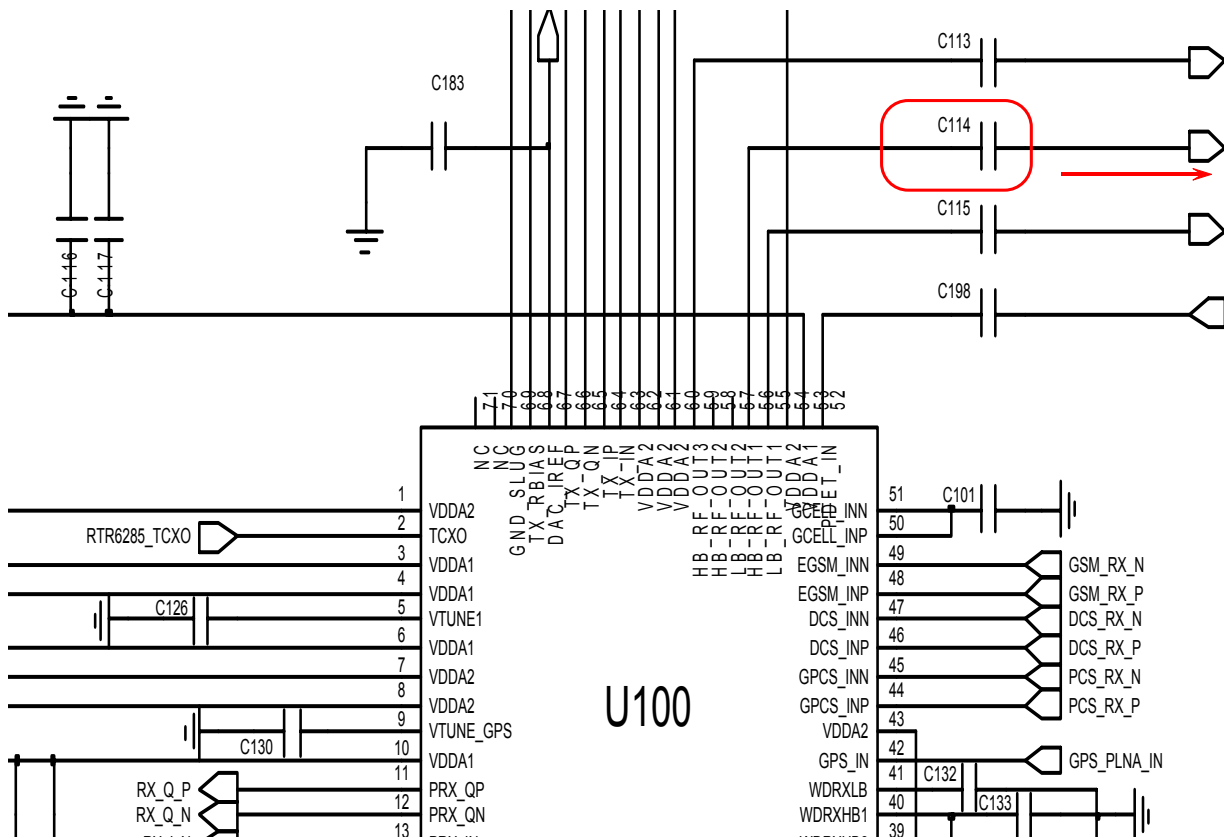
10-7. DCS/PCS TX

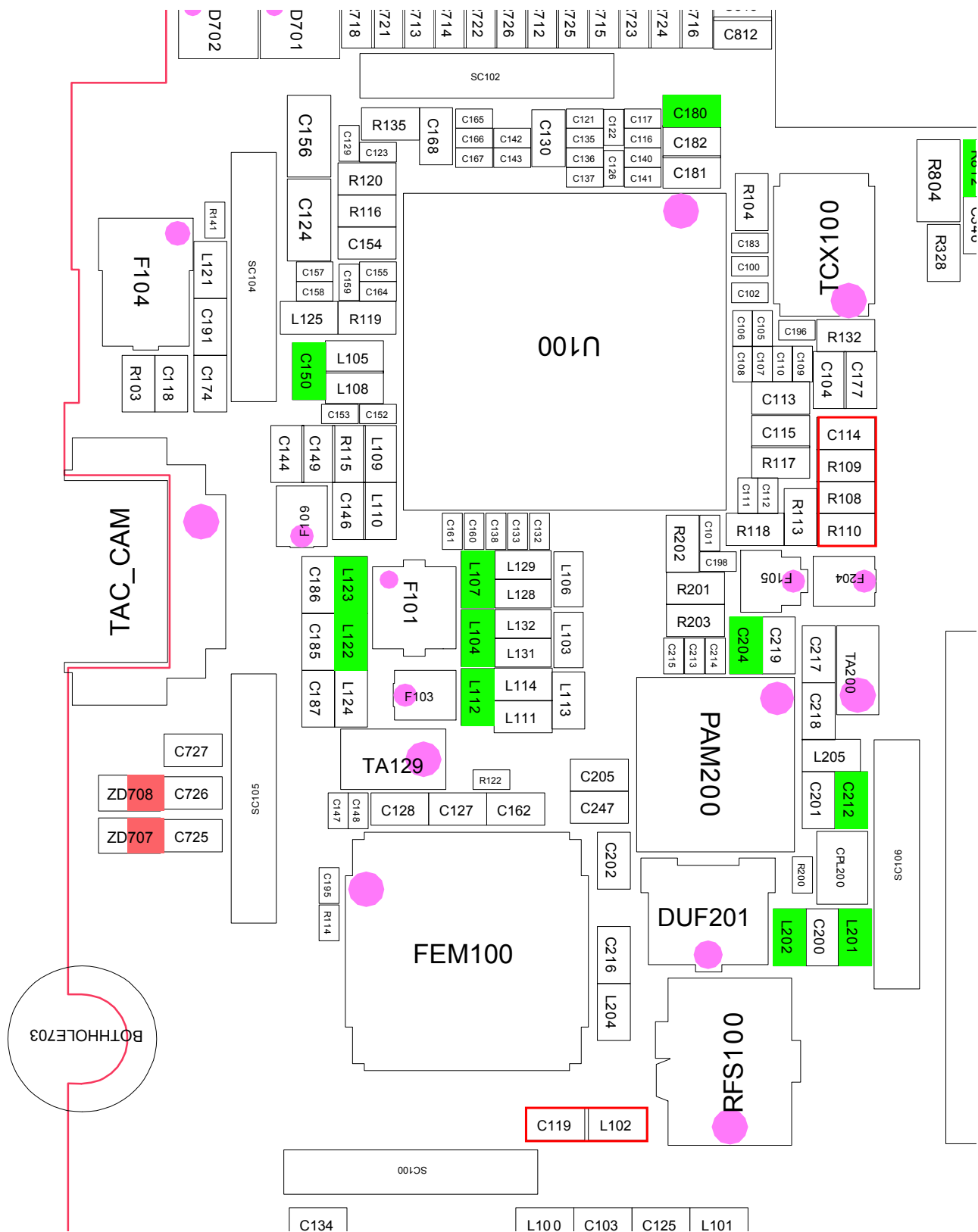


PIN28
PIN27
PIN1

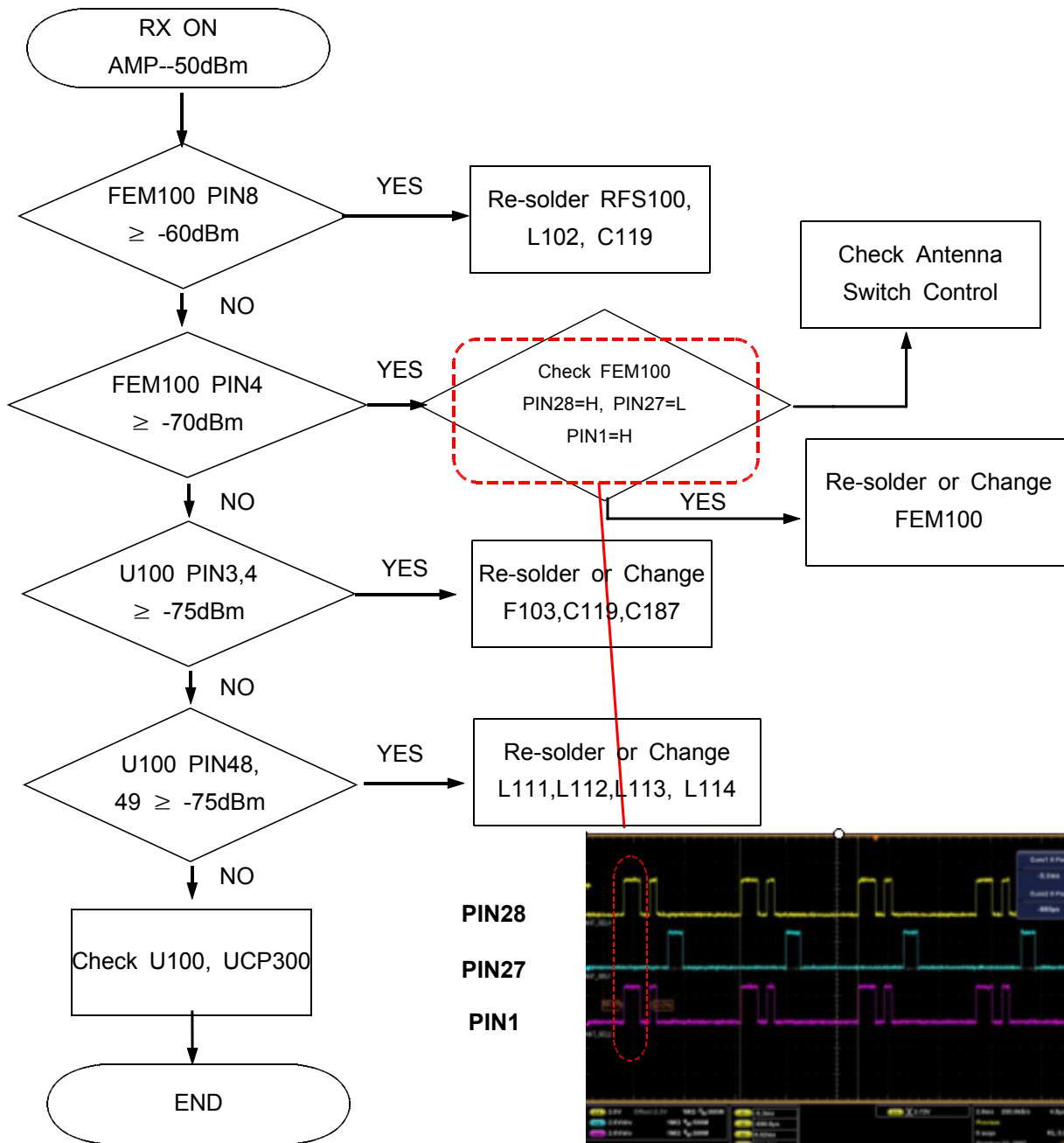


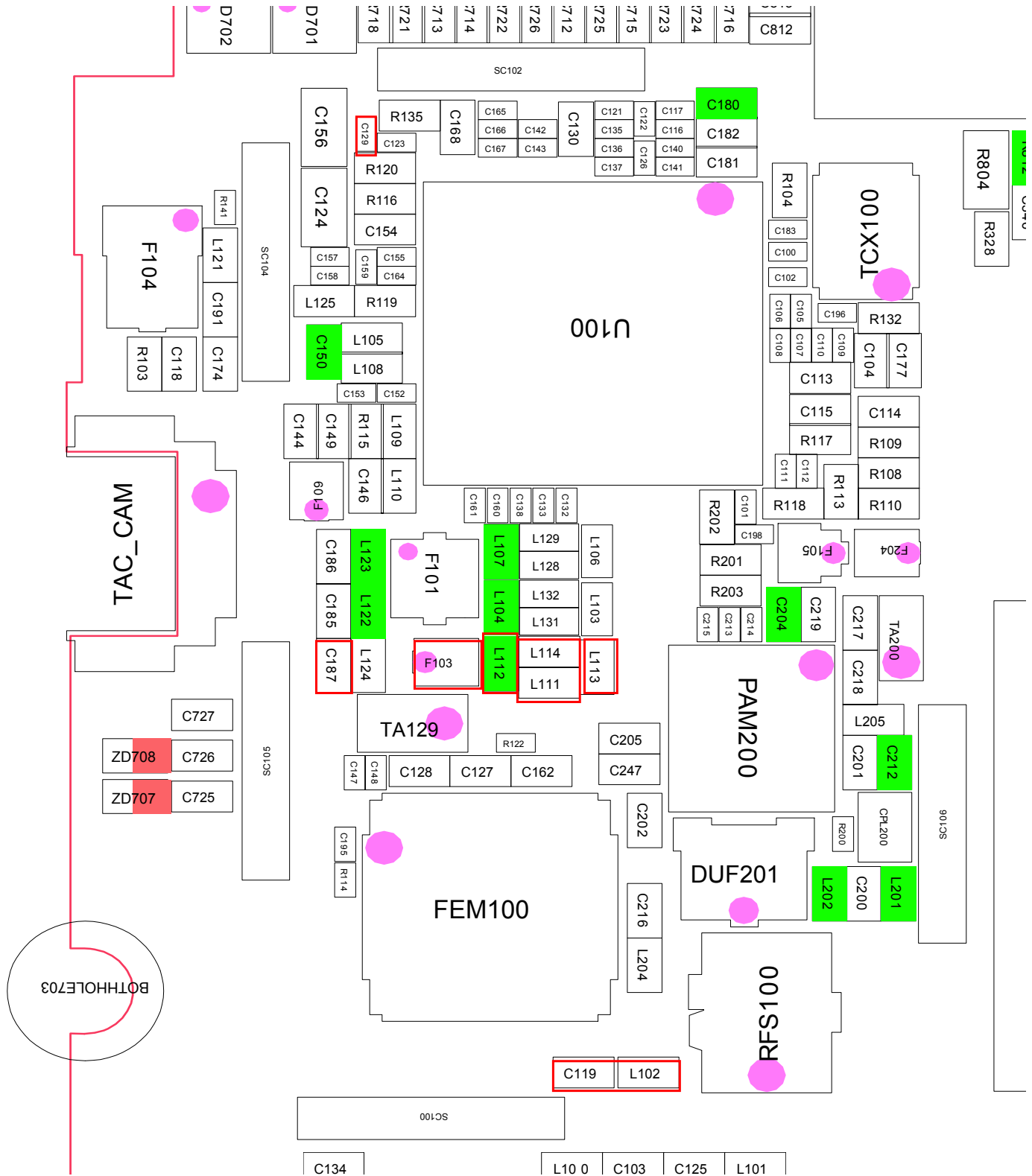




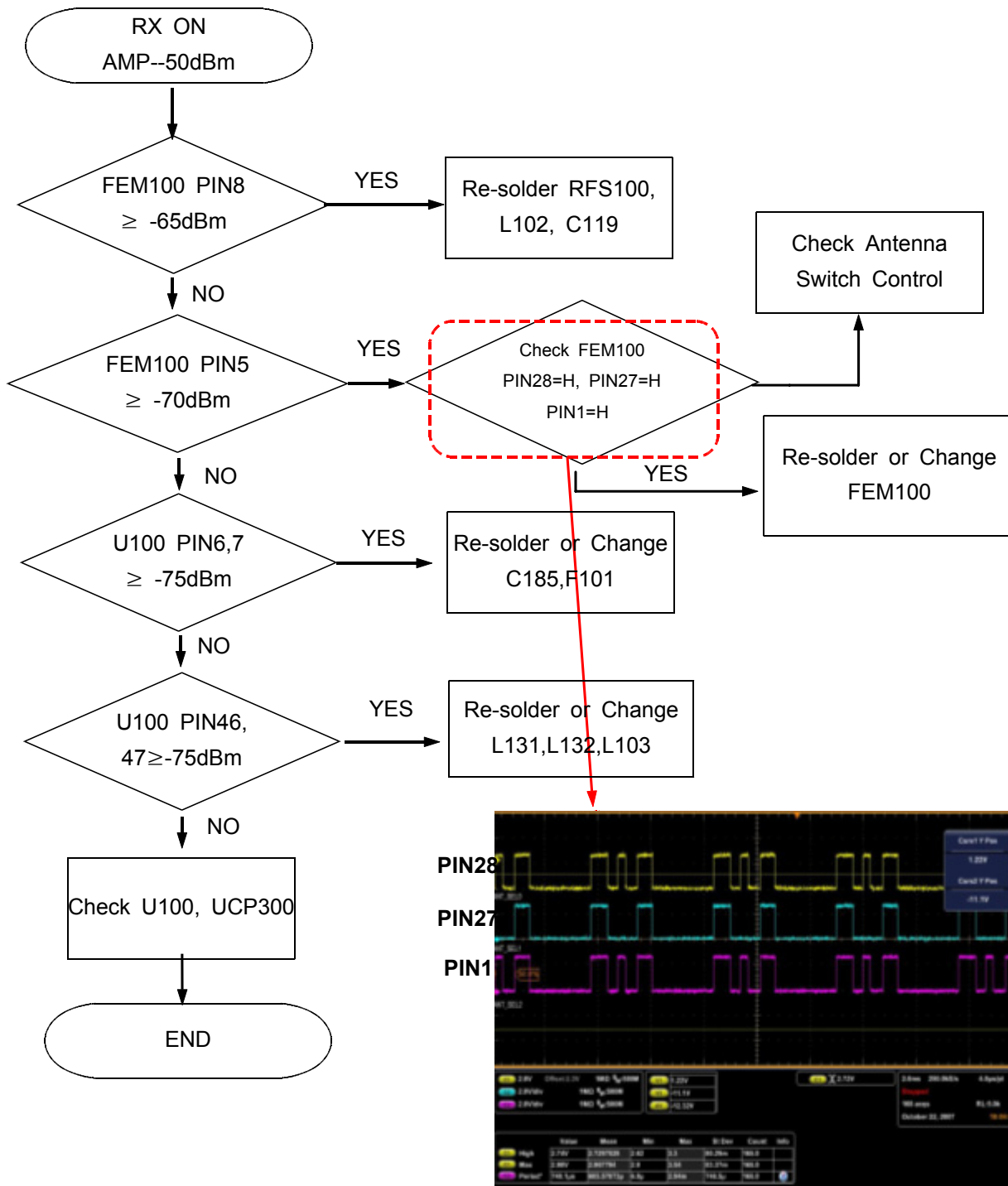


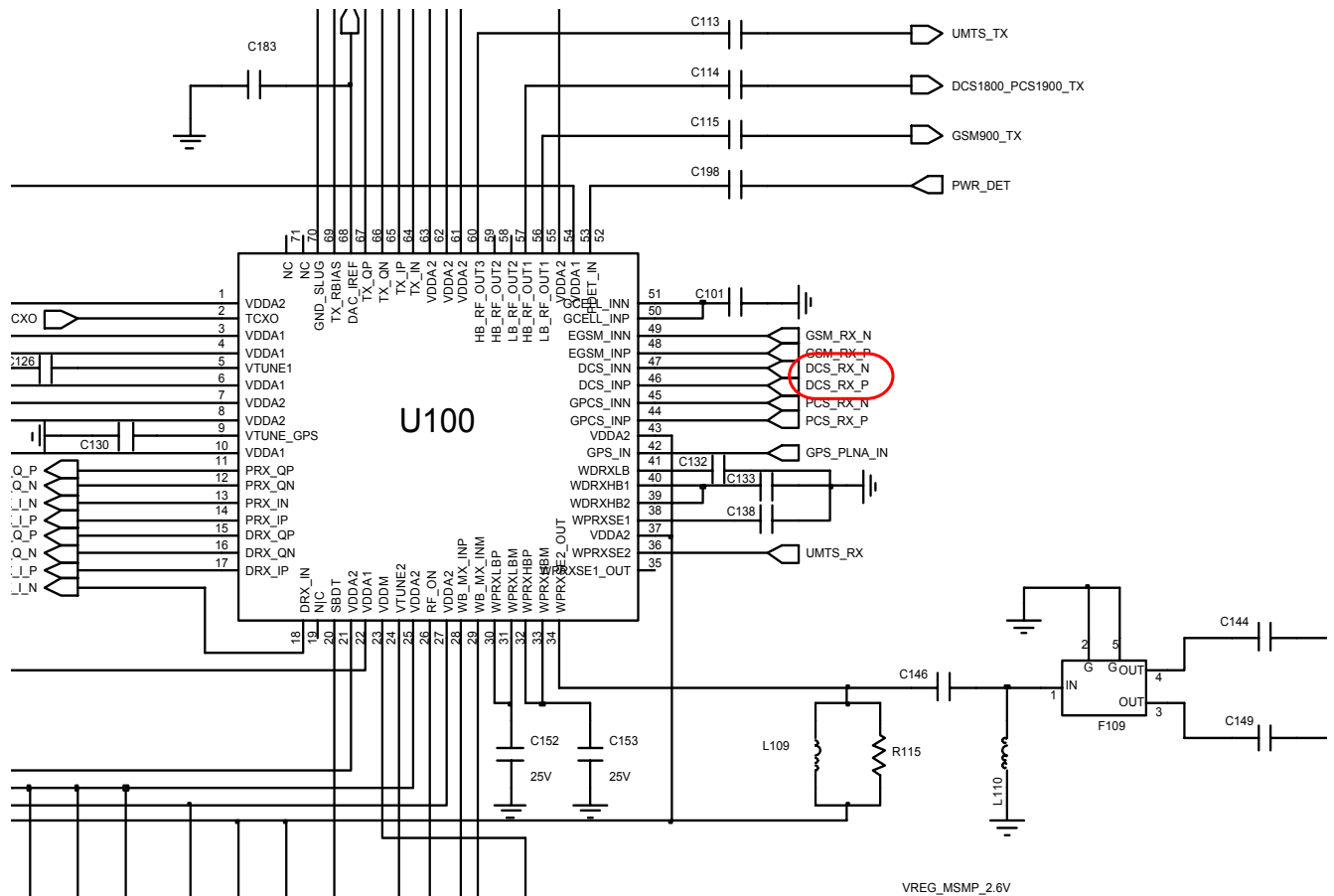
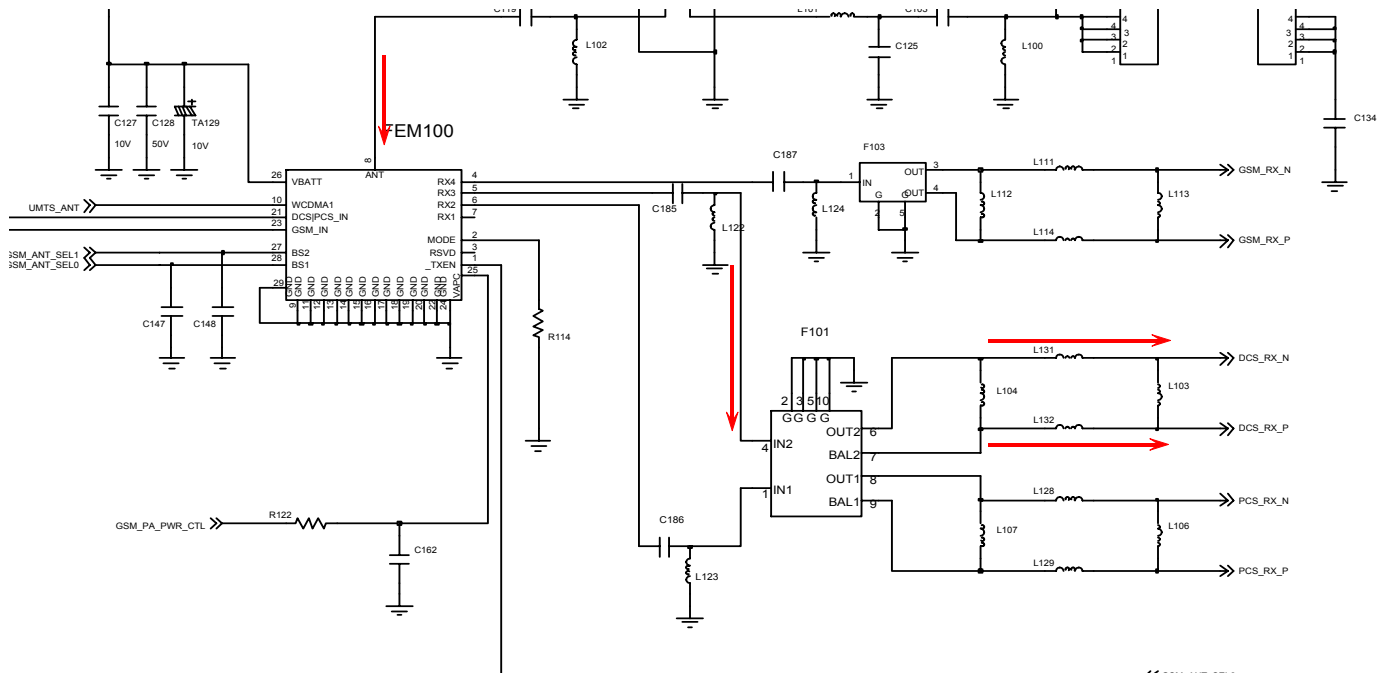
10-8. EGSM RX

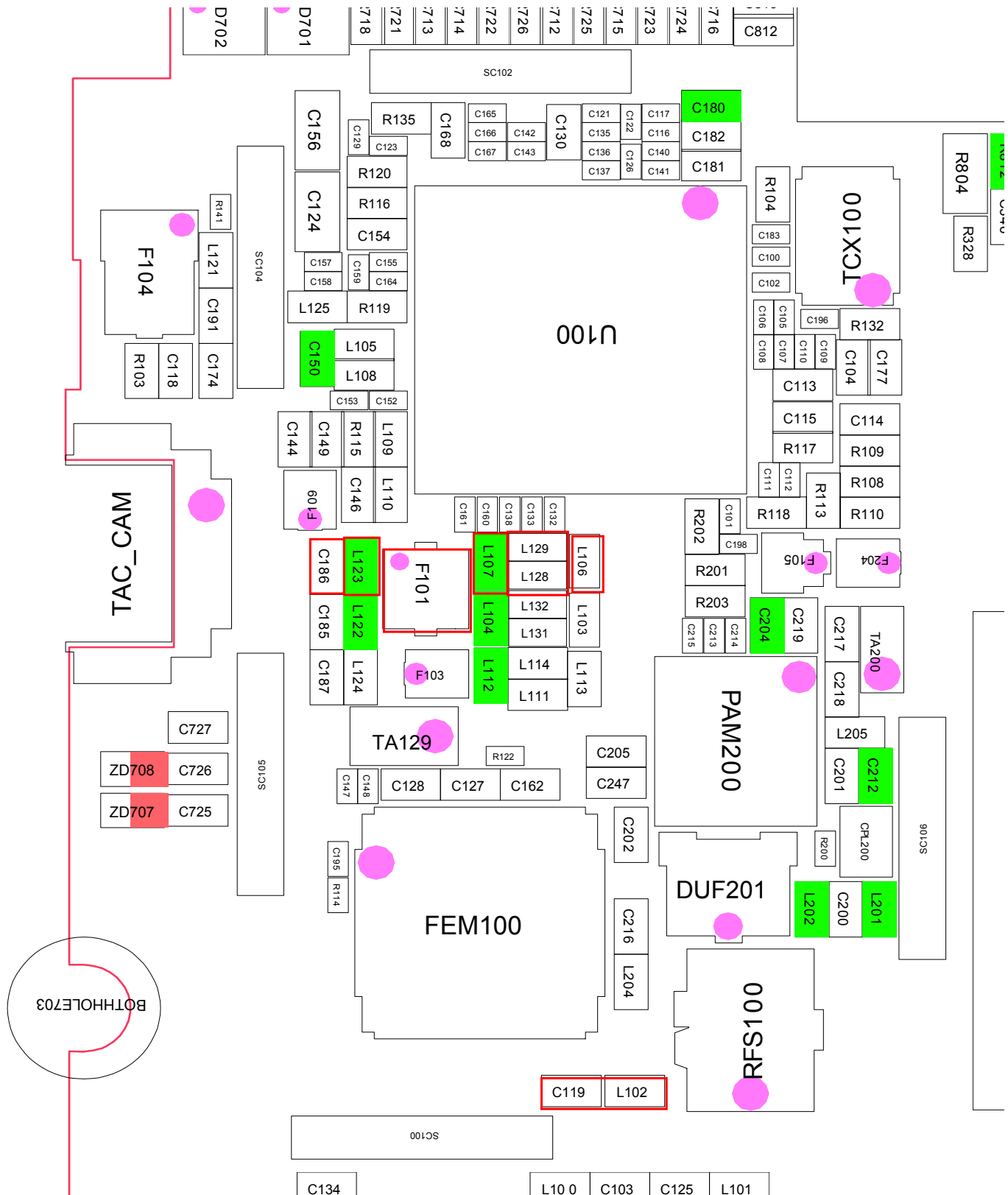




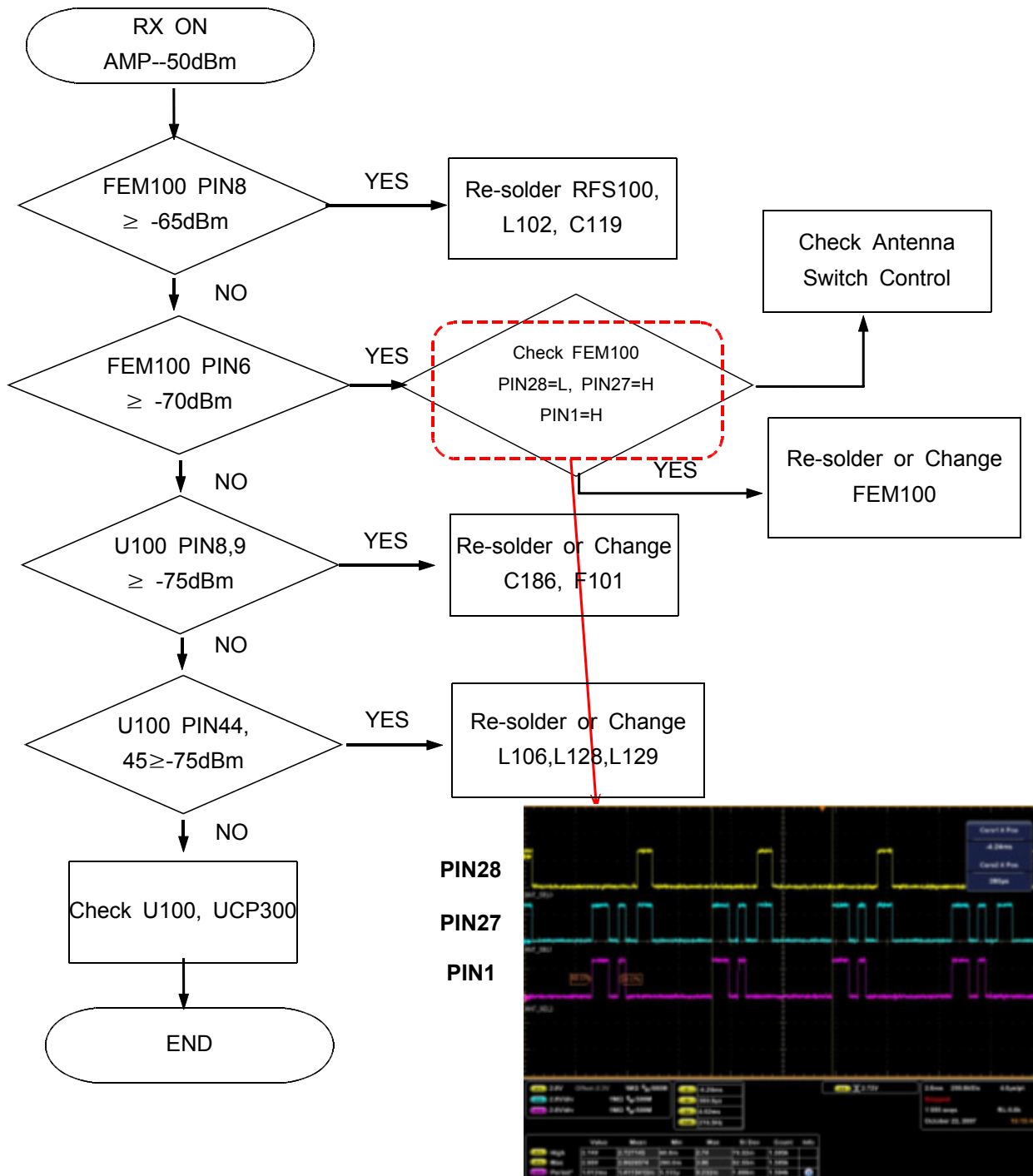
10-9. DCS RX

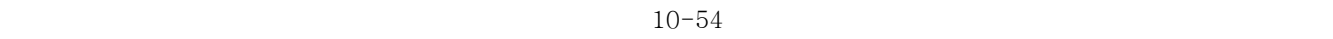




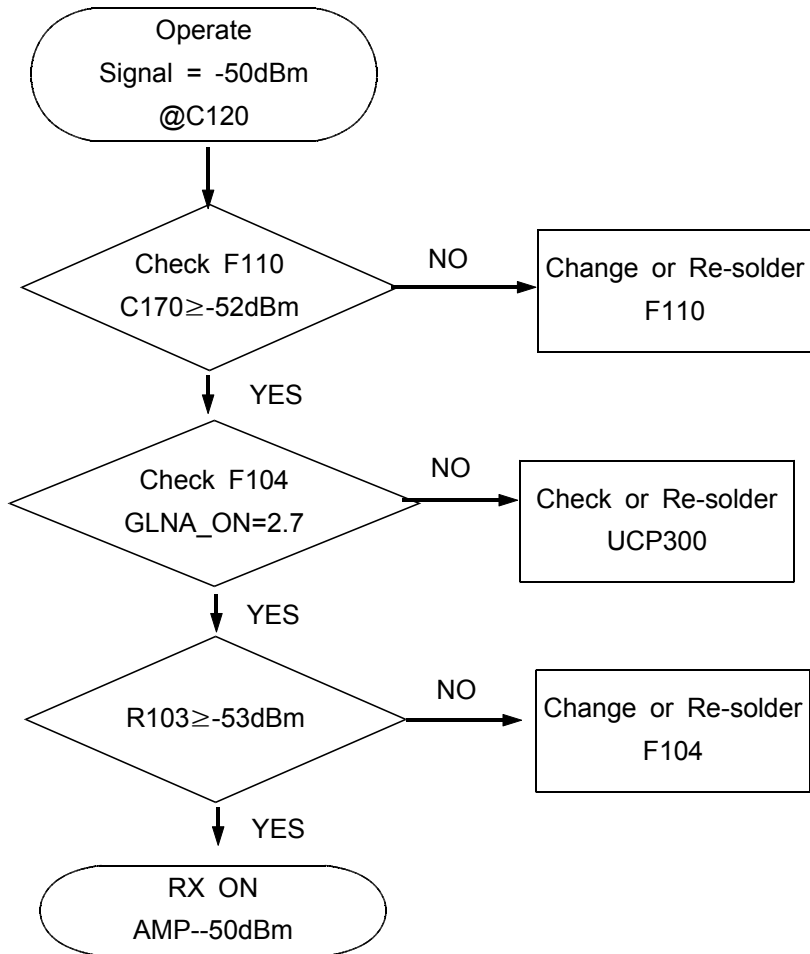


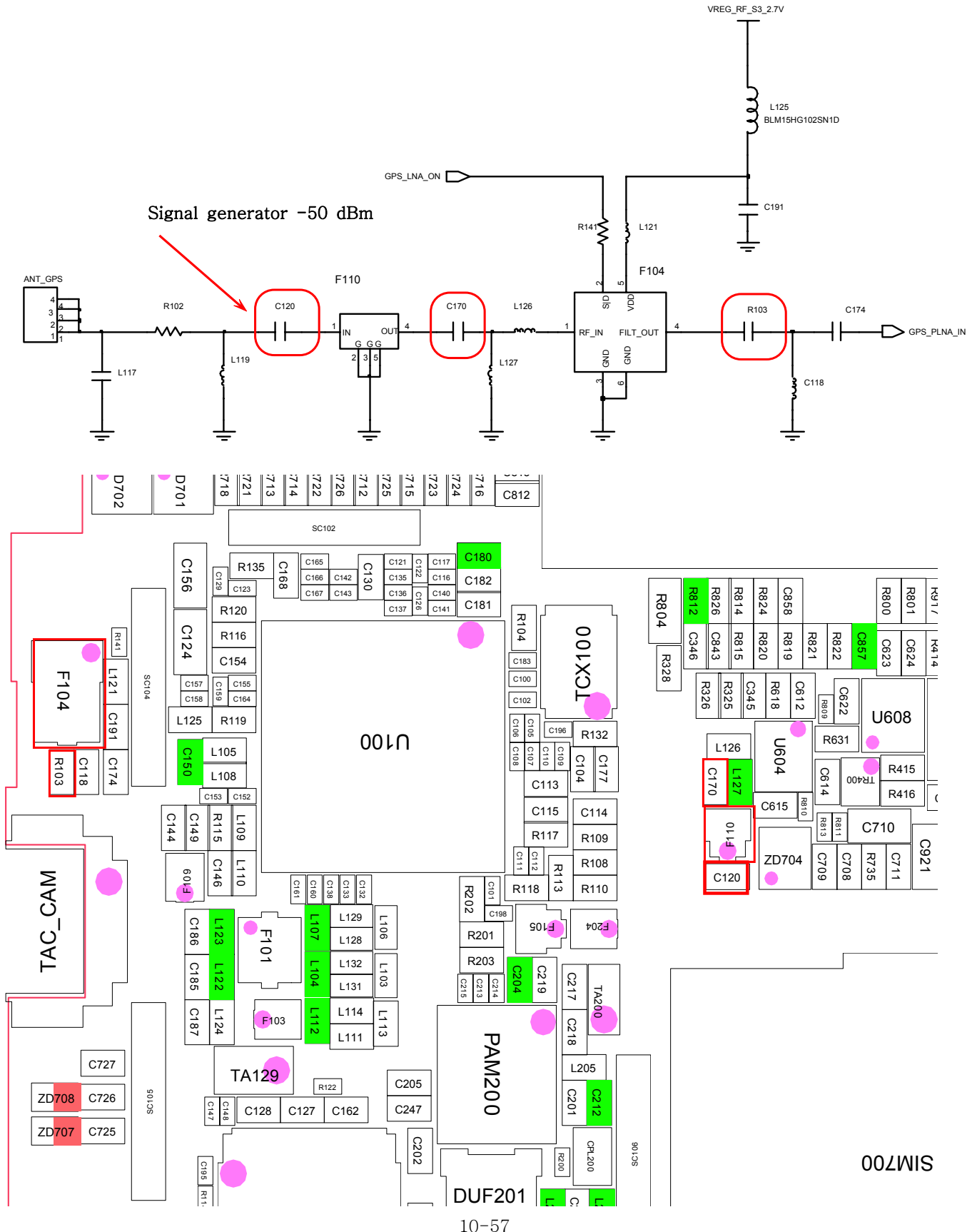
10-10. PCS RX





10-11. GPS RX





4. Array course control

4-1. Software Adjustments

- There is 2 set to download the binary image into your device.

[First set]



1. JIG BOX (UMTS TEST JIG; GH80-03308A)
2. USB Cable : JIG to PC
3. Test Cable : JIG to BENU (0.4M:GH39-01091A, 1.5M: GH39-01093A)
4. Power Cable : JIG to power supply
5. Serial Cable : JIG to PC
6. Power Supply
7. Rf Cable : Scotch to Agilent 8960 or CMU200 (GH39-00397A)

[Second Set]



USB Data Link Cable : BENU to PC (GH39-00922A)

Standard Battery for BENU (GH43-02986A)

4-2. Software Download

4-2-1. Pre-requisite for Download

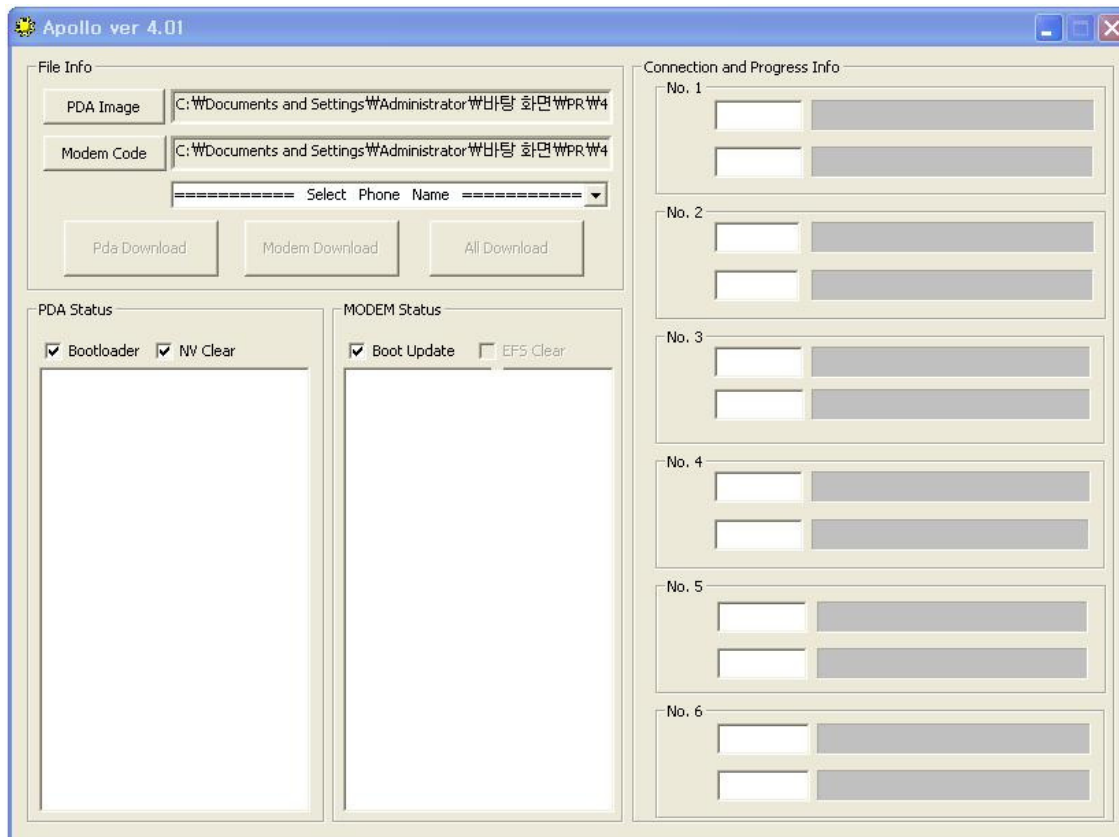
SGH - G810 Mobile Device

Apollo v4.3.exe : Downloader Application for SGH-G810

USB Download Driver : SS60_Downloader_Driver.zip

Rom Image : PDA(*.IMG), MODEM(*.BIN) images

Equipment set for Download.



4-2-2. Concepts & cautions.

You can download PDA or MODEM separately. But We are always recommended to download both at the same time using same version of rom image.

To download an image, the phone need to be set to a proper download mode.

There are 3 download modes.

PDA download : Hold 1, 4 keys and power on -> Blue screen with some information.

MODEM download : Hold 7, * keys and power on -> Blinking "MODEM DOWNLOAD"
on blue screen

All download : Hold 4, 7 keys and power on -> Blinking "ALL DOWNLOAD" on blue screen

For PDA image download, the phone shows download progress on the screen

For MODEM image download, the phone shows RGBW/B Screen.

For All download mode, MODEM image is downloaded first and then PDA downloading starts.

After downloading PDA, the phone will be reboot.

Do NOT interrupt downloading process or the phone will be damaged. You would be unable to boot up the phone or to re-flash the phone. Let it finish downloading process even though you are flashing wrong images.

4-2-3. USB Driver installation for PDA

Execution Apollo.exe.

SGH-G810 connect to the Host computer using download equipment set.

Hold “1+4” key and insert power supplied test cable when use equipment set 1
or Hold “1+4” key and press power on key when use equipment set 2.

Install PDA side driver.

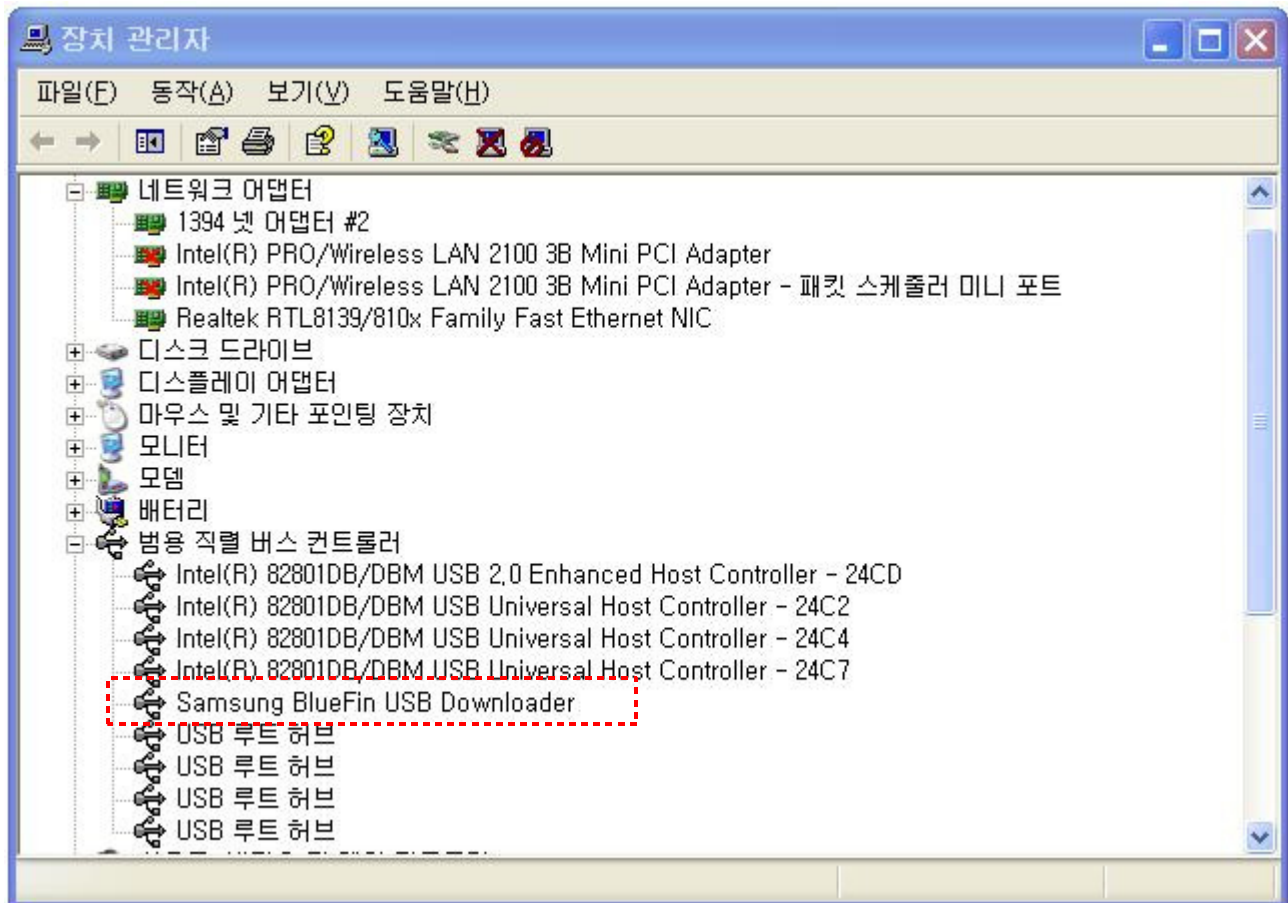
Follow New H/W Installation Manager.

Select ‘IBootHostUSB.inf’ file under ‘i550_Apollo_Drivers\PDA_driver’ folder when Windows asks for new h/w driver. It is safe to choose “Yes” for the warning window.
Confirm “[SAMSUNG BlueFin USB Downloader](#)” Installed.

Refer to Next Page.

**** If Windows doesn't ask for USB driver, it means USB driver installation was failed before. Open Hardware Manager then delete devices with ? or ! mark then try again. If it doesn't work, you need to right click on the device then try Driver Update.**

After installing PDA driver, Apollo shows the connection status if it is installed properly.



4-2-4. USB Driver installation for MODEM

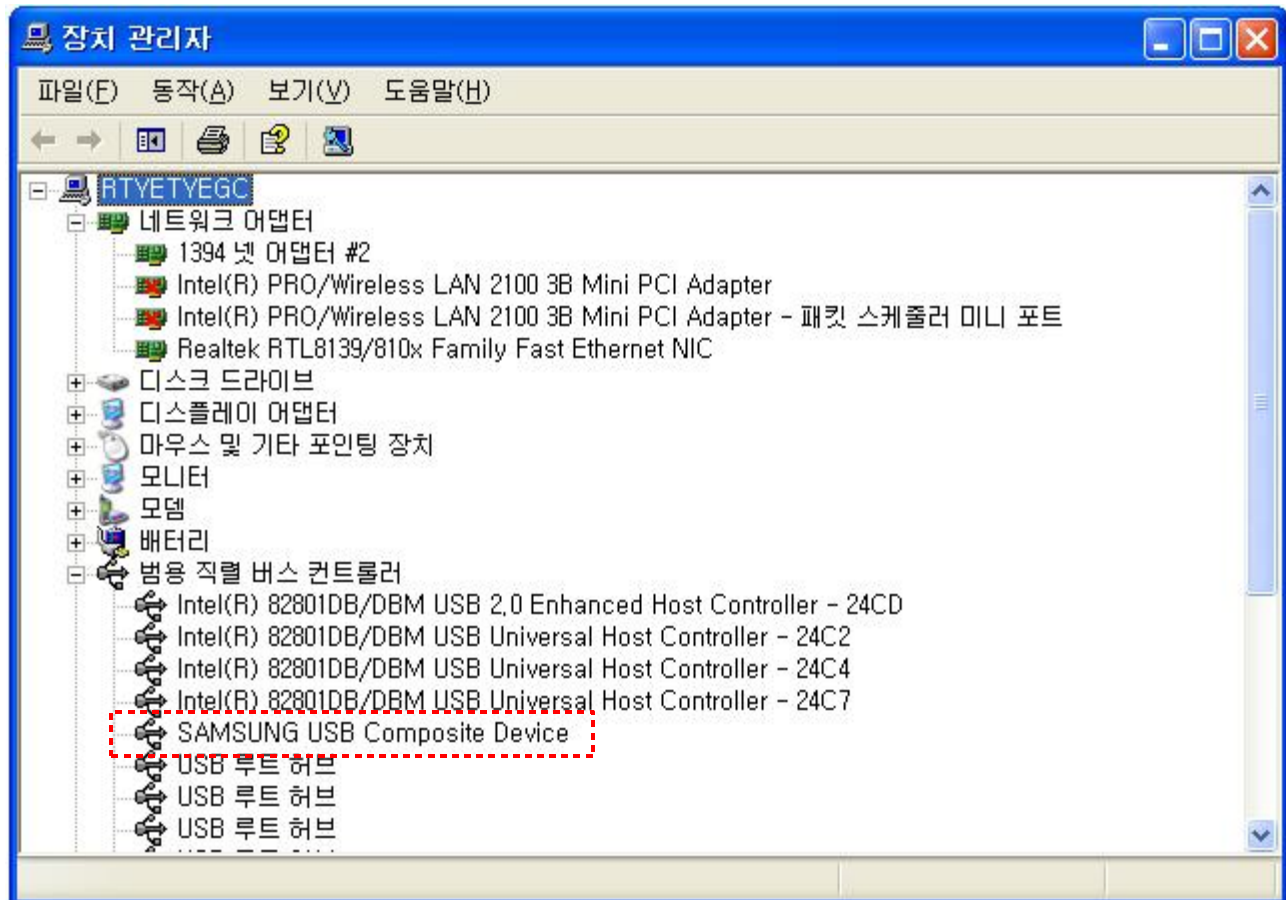
Hold “7 + **” key and insert power supplied test cable when use equipment set 1 or

Hold “7+ **” key and press power on key when use equipment set 2.

Install Modem side driver.

Execute ‘Setup.exe’file under ‘i450_Apollo_Drivers\PHONE_driver’ folder when Windows asks for new h/w driver.

Confirm “SAMSUNG USB Composite Device” Installed.



4-2-5. USB Driver installation

1. After installing PDA driver, Apollo shows the connection status if it is installed properly.



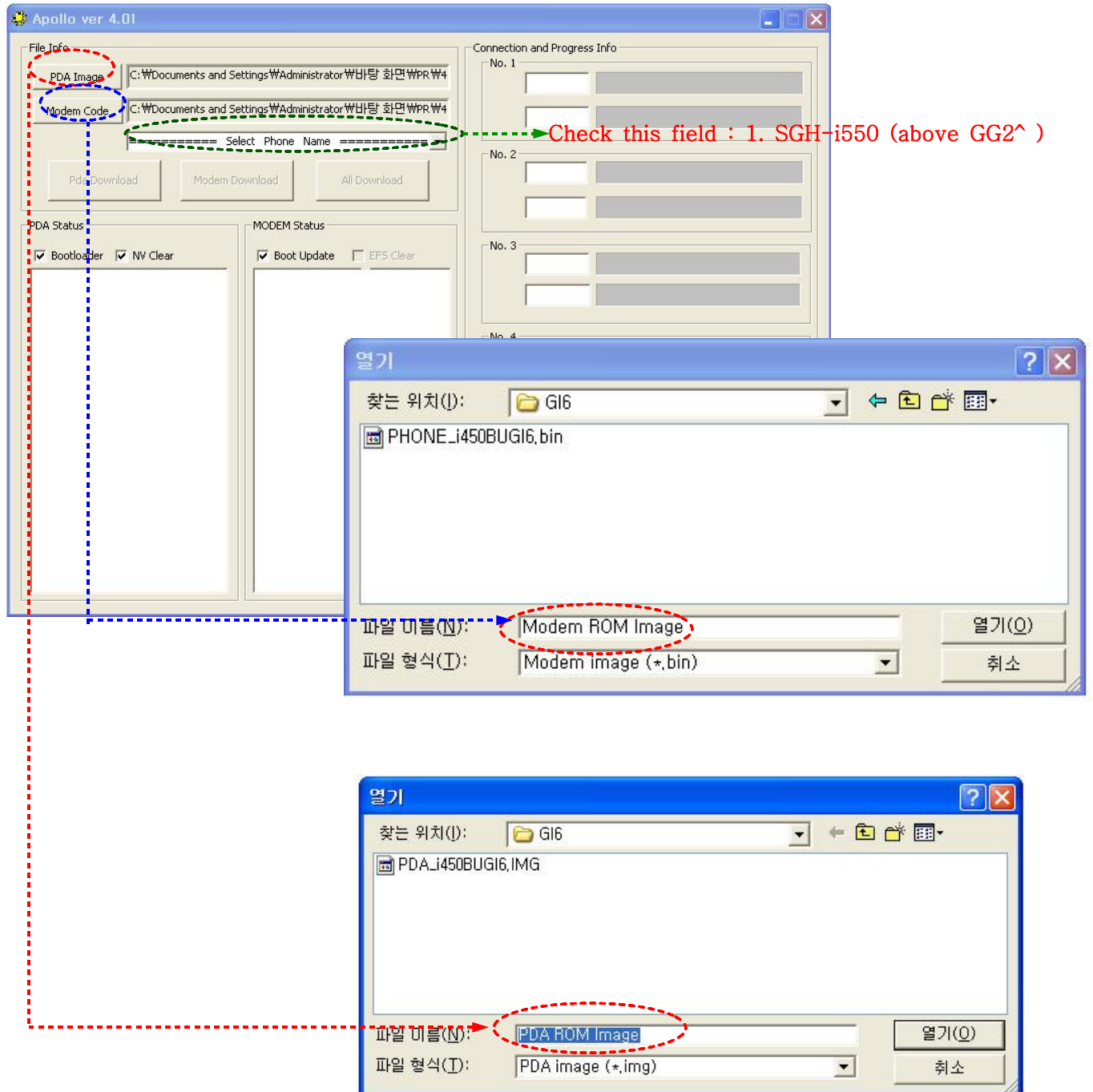
2. After installing MODEM driver, Apollo shows the connection status if it is installed properly.



4-2-6. Download the image using APOLLO

Execution Apollo.exe.

Select a Rom Image to download



Select the proper check option .

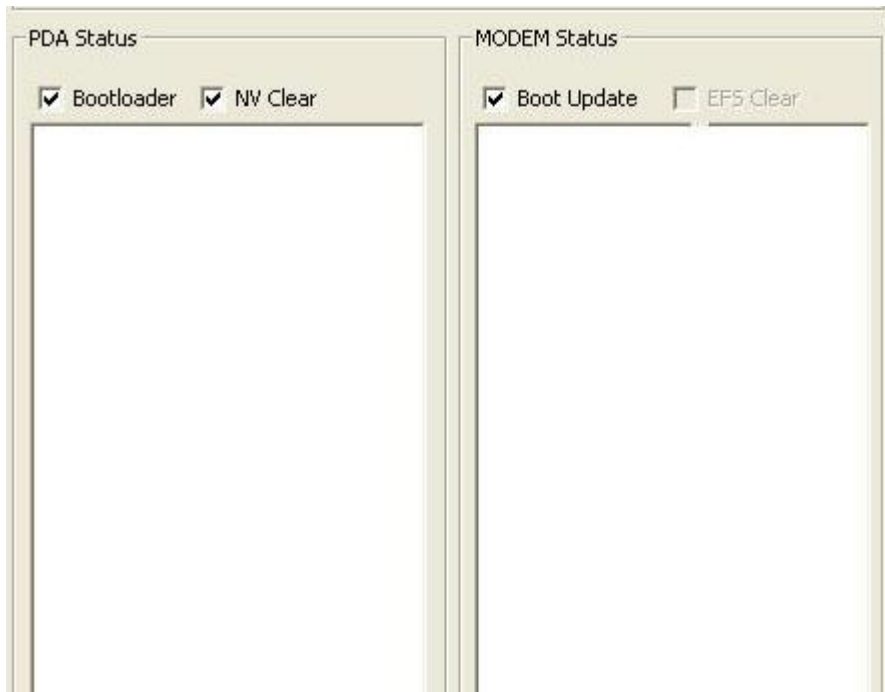
PDA status

- Bootloader : Update PDA Bootloader section.
- NV Clear : IMEI section erase.

You can see following message when you click this option

MODEM Status

- Boot Update : Update Modem Bootloader section.

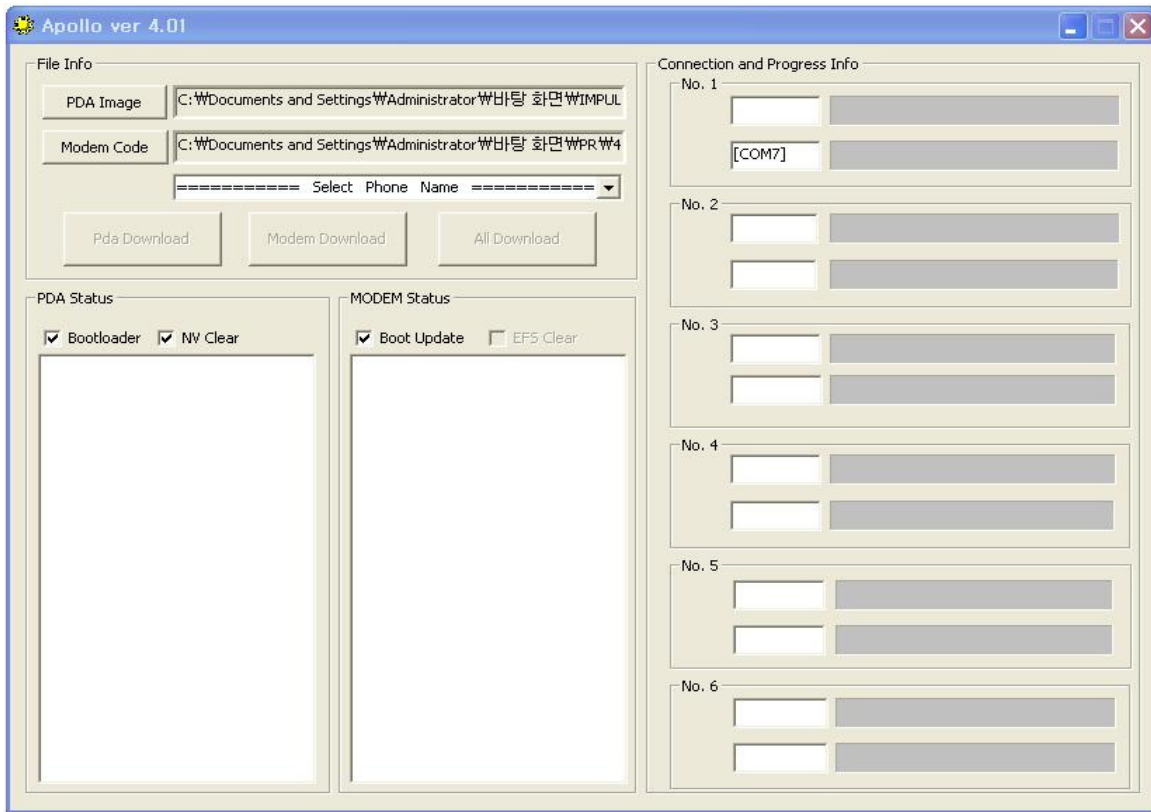


Make sure that phone and host computer connection, click proper download button.

PDA download : Hold 1, 4 keys and power on -> Blue screen with some information.

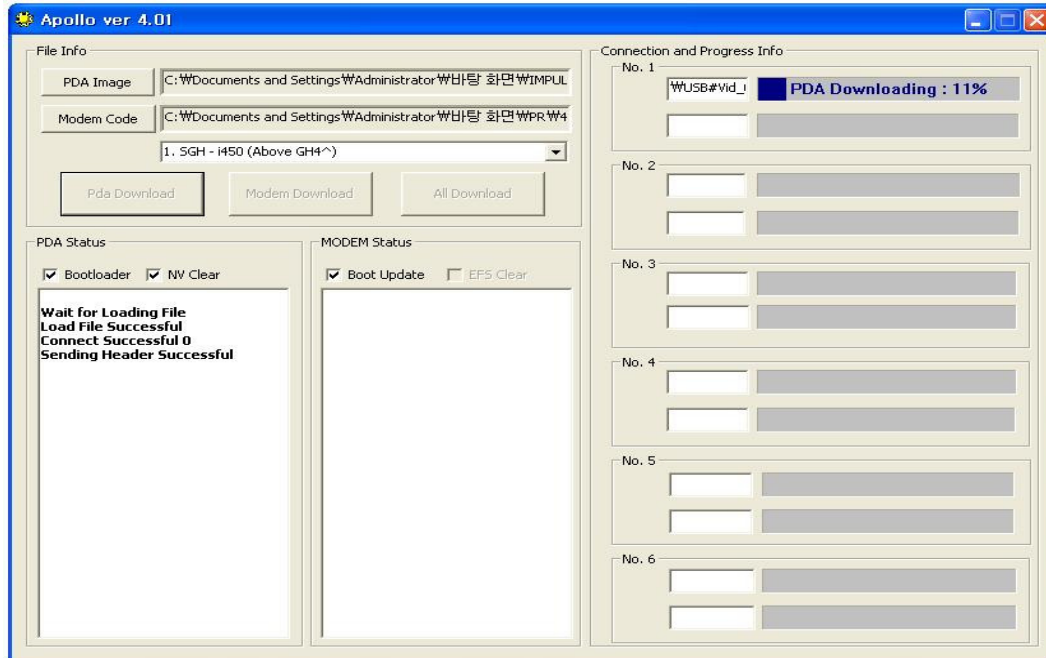
MODEM download : Hold 7, * keys and power on -> Blinking "MODEM DOWNLOAD" on blue screen

All download : Hold 4, 7 keys and power on -> Blinking "ALL DOWNLOAD" on blue screen



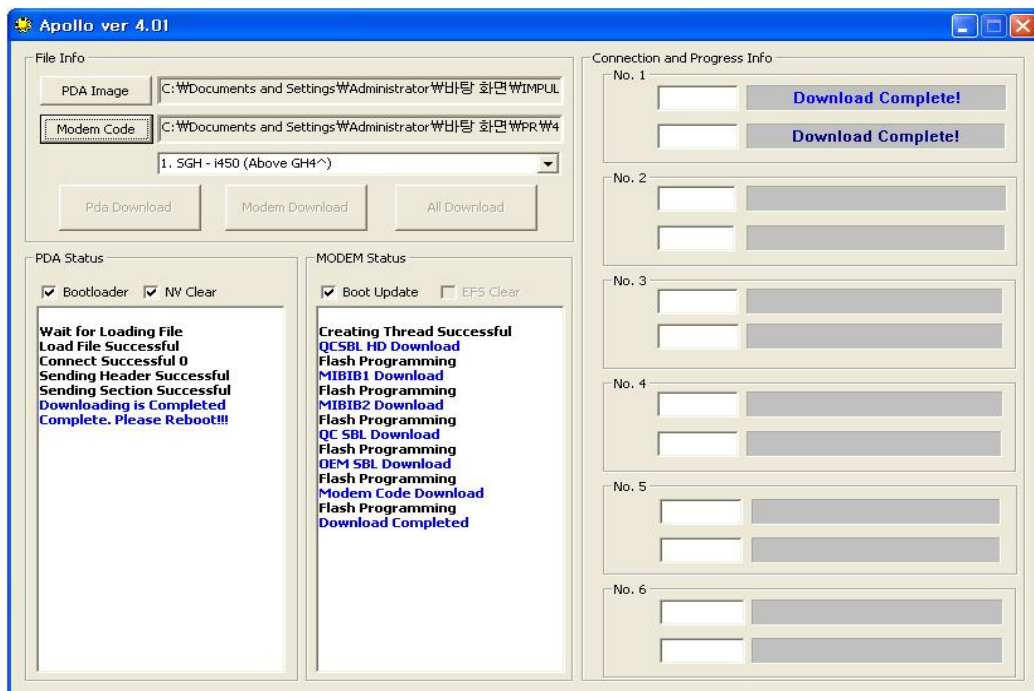
Do NOT interrupt downloading process.

- Pda download time: About 1 min.
- Modem download time : About 2 min.
- All download time: About 3 min.



Confirm Download Complete.

- SGH-G810 will be reboot when PDA download complete.



4-2-7. Troubleshooting

Unable to install USB driver.

Try another Download equipment

Try another SGH-G810.

Consult to R&D team.

Download stops in the middle.

Close and launch Apollo again then try again.

Check the battery is charged enough.

Download doesn't start

Check the connection between Apollo and a SGH-G810.

Check the image that is not damaged.

Select an image and download again.

Phone doesn't boot up after downloading.

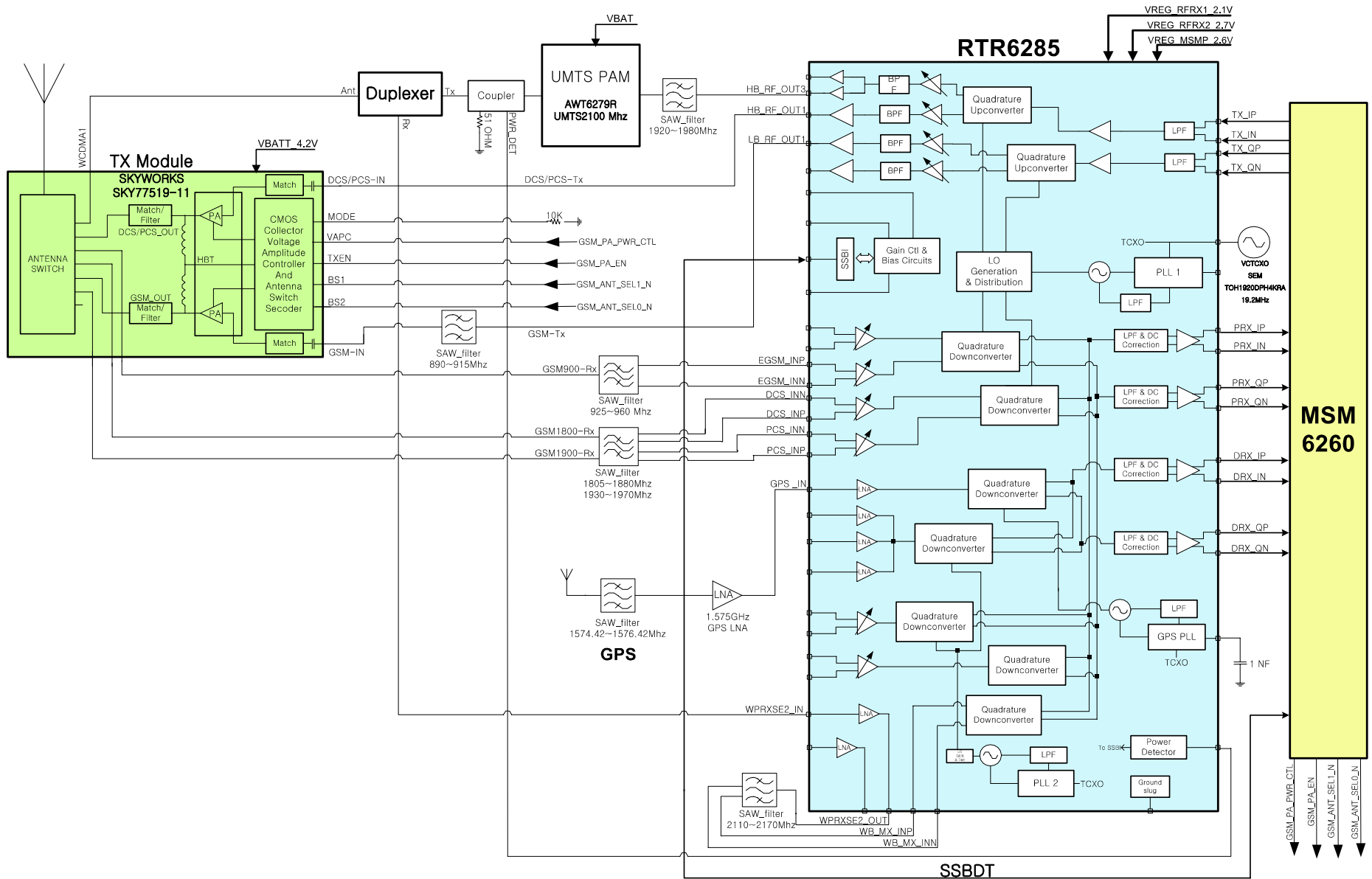
Check the release version of PDA and MODEM. They should be same.

Make sure that rom image, and then try to download.

8-1. Base Band Solution Block Diagram



8-2. RF Solution Block Diagram



6. MAIN Electrical Parts List

SEC CODE	Design LOC	Discription
0403-001547	D700	DIODE-ZENER
0406-001150	ZD906	DIODE-TVS
0406-001201	ZD700	DIODE-TVS
0406-001254	ZD703	DIODE-TVS
0406-001254	ZD706	DIODE-TVS
0406-001254	ZD707	DIODE-TVS
0406-001254	ZD708	DIODE-TVS
0406-001254	ZD710	DIODE-TVS
0406-001254	ZD711	DIODE-TVS
0406-001256	ZD701	DIODE-TVS
0406-001256	ZD702	DIODE-TVS
0406-001256	ZD704	DIODE-TVS
0406-001267	ZD601	DIODE-TVS
0406-001267	ZD602	DIODE-TVS
0406-001267	ZD603	DIODE-TVS
0406-001267	ZD604	DIODE-TVS
0407-001002	D400	DIODE-ARRAY
0407-001002	D901	DIODE-ARRAY
0407-001007	D903	DIODE-ARRAY
0504-000168	TR901	TR-DIGITAL
0504-001113	TR400	TR-DIGITAL
0504-001113	TR402	TR-DIGITAL
0505-001165	TR900	FET-SILICON
0505-001570	TR611	FET-SILICON
0601-002268	LED700	LED
0601-002268	LED702	LED
0801-002294	U303	IC-CMOS LOGIC
0801-002294	U901	IC-CMOS LOGIC
0801-002294	U917	IC-CMOS LOGIC
0801-002321	U900	IC-CMOS LOGIC
0801-003012	U902	IC-CMOS LOGIC
0801-003013	U301	IC-CMOS LOGIC
0801-003052	U302	IC-CMOS LOGIC
0801-003065	U409	IC-CMOS LOGIC
0801-003124	U408	IC-CMOS LOGIC
0801-003205	U909	IC-CMOS LOGIC

SEC CODE	Design LOC	Discription
0904-002227	UCP800	IC-DSP
1001-001336	U906	IC-ANALOG SWITCH
1001-001394	U609	IC-ANALOG SWITCH
1001-001461	U501	IC-ANALOG SWITCH
1001-001461	U502	IC-ANALOG SWITCH
1001-001483	U700	IC-ANALOG SWITCH
1001-001483	U701	IC-ANALOG SWITCH
1001-001483	U702	IC-ANALOG SWITCH
1001-001483	U703	IC-ANALOG SWITCH
1001-001483	U704	IC-ANALOG SWITCH
1001-001483	U705	IC-ANALOG SWITCH
1001-001489	U907	IC-ANALOG SWITCH
1009-001024	U903	IC-HALL EFFECT S/W
1106-001511	UME900	IC-SRAM
1108-000127	UME300	IC-MCP
1108-000135	UME800	IC-MCP
1201-002531	PAM200	IC-POWER AMP
1201-002570	FEM100	IC-POWER AMP
1201-002581	F104	IC-RF AMP
1201-002610	U504	IC-AUDIO AMP
1202-001079	U610	IC-VOLTAGE COMP.
1202-001079	U912	IC-VOLTAGE COMP.
1203-002716	U910	IC-VOL. DETECTOR
1203-003432	U607	IC-POSI.FIXED REG.
1203-003737	U706	IC-POSI.FIXED REG.
1203-004330	U601	IC-MULTI REG.
1203-004330	U608	IC-MULTI REG.
1203-004339	U602	IC-MULTI REG.
1203-004340	U606	IC-MULTI REG.
1203-004430	U404	IC-VOL. DETECTOR
1203-004524	U605	IC-MULTI REG.
1203-004548	U603	IC-DC/DC CONVERTER
1203-004607	U604	IC-MULTI REG.
1203-004621	U500	IC-POWER SUPERVISOR
1203-004728	U612	IC-POSI.FIXED REG.
1203-004763	U911	IC-VOL. DETECTOR

SEC CODE	Design LOC	Discription
1203-004778	U400	IC-POWER SUPERVISOR
1203-004838	U401	IC-BATTERY
1204-002746	U101	IC-TUNER
1205-003281	UCP300	IC-MODEM
1205-003297	U100	IC-TRANSCIEVER
1205-003467	U908	IC-SWITCH
1404-001221	VR100	THERMISTOR-NTC
2007-000070	R222	R-CHIP
2007-000070	R619	R-CHIP
2007-000070	R803	R-CHIP
2007-000070	R804	R-CHIP
2007-000070	R805	R-CHIP
2007-000137	R321	R-CHIP
2007-000138	R109	R-CHIP
2007-000138	R110	R-CHIP
2007-000138	R132	R-CHIP
2007-000138	R524	R-CHIP
2007-000138	R525	R-CHIP
2007-000138	R601	R-CHIP
2007-000138	R734	R-CHIP
2007-000138	R923	R-CHIP
2007-000138	R924	R-CHIP
2007-000140	R115	R-CHIP
2007-000141	R434	R-CHIP
2007-000143	R502	R-CHIP
2007-000143	R504	R-CHIP
2007-000148	R218	R-CHIP
2007-000148	R311	R-CHIP
2007-000148	R313	R-CHIP
2007-000148	R316	R-CHIP
2007-000148	R319	R-CHIP
2007-000148	R410	R-CHIP
2007-000148	R643	R-CHIP
2007-000148	R725	R-CHIP
2007-000157	R412	R-CHIP
2007-000157	R721	R-CHIP

SEC CODE	Design LOC	Discription
2007-000157	R722	R-CHIP
2007-000157	R723	R-CHIP
2007-000157	R724	R-CHIP
2007-000159	R917	R-CHIP
2007-000162	R129	R-CHIP
2007-000162	R130	R-CHIP
2007-000162	R131	R-CHIP
2007-000162	R325	R-CHIP
2007-000162	R326	R-CHIP
2007-000162	R413	R-CHIP
2007-000162	R414	R-CHIP
2007-000162	R503	R-CHIP
2007-000162	R507	R-CHIP
2007-000162	R511	R-CHIP
2007-000162	R523	R-CHIP
2007-000162	R529	R-CHIP
2007-000162	R621	R-CHIP
2007-000162	R628	R-CHIP
2007-000162	R629	R-CHIP
2007-000162	R630	R-CHIP
2007-000162	R631	R-CHIP
2007-000162	R648	R-CHIP
2007-000162	R719	R-CHIP
2007-000162	R726	R-CHIP
2007-000162	R905	R-CHIP
2007-000162	R909	R-CHIP
2007-000162	R910	R-CHIP
2007-000162	R911	R-CHIP
2007-000162	R912	R-CHIP
2007-000162	R913	R-CHIP
2007-000162	R914	R-CHIP
2007-000162	R915	R-CHIP
2007-000162	R922	R-CHIP
2007-000162	U916	R-CHIP
2007-000164	R908	R-CHIP
2007-000165	R401	R-CHIP

SEC CODE	Design LOC	Discription
2007-000169	R602	R-CHIP
2007-000169	U913	R-CHIP
2007-000170	R302	R-CHIP
2007-000170	R636	R-CHIP
2007-000170	R639	R-CHIP
2007-000170	R903	R-CHIP
2007-000170	R925	R-CHIP
2007-000171	R102	R-CHIP
2007-000171	R120	R-CHIP
2007-000171	R135	R-CHIP
2007-000171	R221	R-CHIP
2007-000171	R318	R-CHIP
2007-000171	R404	R-CHIP
2007-000171	R526	R-CHIP
2007-000171	R618	R-CHIP
2007-000171	R642	R-CHIP
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2007-000171	R825	R-CHIP
2007-000171	R826	R-CHIP
2007-000171	R902	R-CHIP
2007-000171	R918	R-CHIP
2007-000171	U915	R-CHIP
2007-000171	U918	R-CHIP
2007-001119	R417	R-CHIP
2007-001119	R528	R-CHIP
2007-001285	R116	R-CHIP
2007-001285	R119	R-CHIP
2007-001290	R322	R-CHIP
2007-001292	R304	R-CHIP
2007-001298	R113	R-CHIP
2007-001298	R328	R-CHIP

SEC CODE	Design LOC	Discription
2007-001298	R407	R-CHIP
2007-001298	R510	R-CHIP
2007-001305	R117	R-CHIP
2007-001305	R118	R-CHIP
2007-002965	R728	R-CHIP
2007-002965	R729	R-CHIP
2007-007009	R201	R-CHIP
2007-007014	R406	R-CHIP
2007-007014	R408	R-CHIP
2007-007107	R125	R-CHIP
2007-007107	R126	R-CHIP
2007-007137	R204	R-CHIP
2007-007306	R202	R-CHIP
2007-007306	R203	R-CHIP
2007-007306	R710	R-CHIP
2007-007306	R711	R-CHIP
2007-007306	R712	R-CHIP
2007-007306	R713	R-CHIP
2007-007306	R824	R-CHIP
2007-007309	R104	R-CHIP
2007-007309	R735	R-CHIP
2007-007315	R814	R-CHIP
2007-007316	R305	R-CHIP
2007-007317	R800	R-CHIP
2007-007317	R801	R-CHIP
2007-007318	R815	R-CHIP
2007-007318	R820	R-CHIP
2007-007321	R108	R-CHIP
2007-007468	R403	R-CHIP
2007-007528	R515	R-CHIP
2007-007698	R411	R-CHIP
2007-007698	R416	R-CHIP
2007-007741	R141	R-CHIP
2007-008015	R646	R-CHIP
2007-008015	R647	R-CHIP
2007-008015	R819	R-CHIP

SEC CODE	Design LOC	Discription
2007-008052	R809	R-CHIP
2007-008052	R810	R-CHIP
2007-008052	R811	R-CHIP
2007-008052	R813	R-CHIP
2007-008055	R432	R-CHIP
2007-008117	R415	R-CHIP
2007-008516	R114	R-CHIP
2007-008588	R122	R-CHIP
2007-008806	R200	R-CHIP
2007-009084	R640	R-CHIP
2203-000233	C115	C-CER,CHIP
2203-000233	C134	C-CER,CHIP
2203-000233	C175	C-CER,CHIP
2203-000233	C419	C-CER,CHIP
2203-000233	C422	C-CER,CHIP
2203-000233	C427	C-CER,CHIP
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2203-000254	C182	C-CER,CHIP
2203-000254	C304	C-CER,CHIP
2203-000254	C305	C-CER,CHIP
2203-000254	C307	C-CER,CHIP
2203-000254	C311	C-CER,CHIP
2203-000254	C312	C-CER,CHIP
2203-000254	C313	C-CER,CHIP
2203-000254	C706	C-CER,CHIP
2203-000254	C826	C-CER,CHIP
2203-000278	C191	C-CER,CHIP
2203-000278	C531	C-CER,CHIP
2203-000278	C544	C-CER,CHIP
2203-000278	C629	C-CER,CHIP
2203-000278	C630	C-CER,CHIP
2203-000330	C185	C-CER,CHIP
2203-000330	C186	C-CER,CHIP
2203-000330	C425	C-CER,CHIP
2203-000330	C545	C-CER,CHIP

SEC CODE	Design LOC	Discription
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2203-000386	C726	C-CER,CHIP
2203-000386	C727	C-CER,CHIP
2203-000425	C120	C-CER,CHIP
2203-000438	C130	C-CER,CHIP
2203-000438	C181	C-CER,CHIP
2203-000489	C338	C-CER,CHIP
2203-000627	C113	C-CER,CHIP
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2203-000627	C170	C-CER,CHIP
2203-000812	C119	C-CER,CHIP
2203-000812	C187	C-CER,CHIP
2203-000812	C200	C-CER,CHIP
2203-000812	C202	C-CER,CHIP
2203-000812	C219	C-CER,CHIP
2203-000812	C343	C-CER,CHIP
2203-000812	C412	C-CER,CHIP
2203-000812	C424	C-CER,CHIP
2203-000812	C533	C-CER,CHIP
2203-000812	C707	C-CER,CHIP
2203-000812	C708	C-CER,CHIP
2203-000812	C709	C-CER,CHIP
2203-000812	C713	C-CER,CHIP
2203-000812	C714	C-CER,CHIP
2203-000812	C715	C-CER,CHIP
2203-000812	C716	C-CER,CHIP
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2203-000812	C828	C-CER,CHIP
2203-000995	C128	C-CER,CHIP
2203-000995	C346	C-CER,CHIP
2203-000995	C537	C-CER,CHIP

SEC CODE	Design LOC	Discription
2203-001017	C103	C-CER,CHIP
2203-001072	C146	C-CER,CHIP
2203-001124	C211	C-CER,CHIP
2203-001153	C162	C-CER,CHIP
2203-001153	C205	C-CER,CHIP
2203-001153	C217	C-CER,CHIP
2203-001383	C216	C-CER,CHIP
2203-001383	L214	C-CER,CHIP
2203-002709	C209	C-CER,CHIP
2203-002709	C525	C-CER,CHIP
2203-005050	C125	C-CER,CHIP
2203-005288	C247	C-CER,CHIP
2203-005444	C144	C-CER,CHIP
2203-005444	C149	C-CER,CHIP
2203-005444	C201	C-CER,CHIP
2203-005444	C646	C-CER,CHIP
2203-005444	L117	C-CER,CHIP
2203-005446	C174	C-CER,CHIP
2203-005446	R103	C-CER,CHIP
2203-005480	C341	C-CER,CHIP
2203-005482	C104	C-CER,CHIP
2203-005482	C127	C-CER,CHIP
2203-005482	C154	C-CER,CHIP
2203-005482	C168	C-CER,CHIP
2203-005482	C176	C-CER,CHIP
2203-005482	C178	C-CER,CHIP
2203-005482	C193	C-CER,CHIP
2203-005482	C194	C-CER,CHIP
2203-005482	C197	C-CER,CHIP
2203-005482	C218	C-CER,CHIP
2203-005482	C303	C-CER,CHIP
2203-005482	C306	C-CER,CHIP
2203-005482	C308	C-CER,CHIP
2203-005482	C314	C-CER,CHIP
2203-005482	C315	C-CER,CHIP
2203-005482	C331	C-CER,CHIP

SEC CODE	Design LOC	Discription
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2203-005482	C335	C-CER,CHIP
2203-005482	C339	C-CER,CHIP
2203-005482	C340	C-CER,CHIP
2203-005482	C342	C-CER,CHIP
2203-005482	C345	C-CER,CHIP
2203-005482	C404	C-CER,CHIP
2203-005482	C406	C-CER,CHIP
2203-005482	C411	C-CER,CHIP
2203-005482	C414	C-CER,CHIP
2203-005482	C501	C-CER,CHIP
2203-005482	C510	C-CER,CHIP
2203-005482	C527	C-CER,CHIP
2203-005482	C563	C-CER,CHIP
2203-005482	C564	C-CER,CHIP
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2203-005482	C635	C-CER,CHIP
2203-005482	C640	C-CER,CHIP
2203-005482	C711	C-CER,CHIP
2203-005482	C801	C-CER,CHIP
2203-005482	C802	C-CER,CHIP
2203-005482	C812	C-CER,CHIP
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2203-005482	C822	C-CER,CHIP
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2203-005482	C824	C-CER,CHIP
2203-005482	C825	C-CER,CHIP
2203-005482	C831	C-CER,CHIP
2203-005482	C832	C-CER,CHIP
2203-005482	C841	C-CER,CHIP
2203-005482	C847	C-CER,CHIP
2203-005482	C849	C-CER,CHIP
2203-005482	C856	C-CER,CHIP
2203-005482	C902	C-CER,CHIP
2203-005482	C904	C-CER,CHIP
2203-005482	C905	C-CER,CHIP

SEC CODE	Design LOC	Discription
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2203-005482	C908	C-CER,CHIP
2203-005482	C909	C-CER,CHIP
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2203-005482	C911	C-CER,CHIP
2203-005482	C914	C-CER,CHIP
2203-005682	C147	C-CER,CHIP
2203-005682	C148	C-CER,CHIP
2203-005682	C195	C-CER,CHIP
2203-005682	C198	C-CER,CHIP
2203-005725	C101	C-CER,CHIP
2203-005725	C106	C-CER,CHIP
2203-005725	C108	C-CER,CHIP
2203-005725	C110	C-CER,CHIP
2203-005725	C112	C-CER,CHIP
2203-005725	C117	C-CER,CHIP
2203-005725	C122	C-CER,CHIP
2203-005725	C132	C-CER,CHIP
2203-005725	C133	C-CER,CHIP
2203-005725	C138	C-CER,CHIP
2203-005725	C141	C-CER,CHIP
2203-005725	C143	C-CER,CHIP
2203-005725	C152	C-CER,CHIP
2203-005725	C153	C-CER,CHIP
2203-005725	C155	C-CER,CHIP
2203-005725	C165	C-CER,CHIP
2203-005725	C213	C-CER,CHIP
2203-005725	C214	C-CER,CHIP
2203-005727	C183	C-CER,CHIP
2203-005732	C100	C-CER,CHIP
2203-005732	C102	C-CER,CHIP
2203-005736	C123	C-CER,CHIP
2203-005736	C135	C-CER,CHIP
2203-005736	C137	C-CER,CHIP
2203-005736	C157	C-CER,CHIP
2203-005736	C159	C-CER,CHIP

SEC CODE	Design LOC	Discription
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2203-005736	C166	C-CER,CHIP
2203-005736	C215	C-CER,CHIP
2203-006048	C705	C-CER,CHIP
2203-006137	C407	C-CER,CHIP
2203-006208	C613	C-CER,CHIP
2203-006208	C634	C-CER,CHIP
2203-006208	C710	C-CER,CHIP
2203-006260	C636	C-CER,CHIP
2203-006324	C251	C-CER,CHIP
2203-006324	C405	C-CER,CHIP
2203-006324	C429	C-CER,CHIP
2203-006324	C611	C-CER,CHIP
2203-006324	C637	C-CER,CHIP
2203-006348	C921	C-CER,CHIP
2203-006399	C845	C-CER,CHIP
2203-006423	C105	C-CER,CHIP
2203-006423	C107	C-CER,CHIP
2203-006423	C109	C-CER,CHIP
2203-006423	C111	C-CER,CHIP
2203-006423	C116	C-CER,CHIP
2203-006423	C129	C-CER,CHIP
2203-006423	C136	C-CER,CHIP
2203-006423	C158	C-CER,CHIP
2203-006423	C160	C-CER,CHIP
2203-006423	C167	C-CER,CHIP
2203-006474	C220	C-CER,CHIP
2203-006562	C184	C-CER,CHIP
2203-006562	C302	C-CER,CHIP
2203-006562	C309	C-CER,CHIP
2203-006562	C310	C-CER,CHIP
2203-006562	C316	C-CER,CHIP
2203-006562	C320	C-CER,CHIP
2203-006562	C321	C-CER,CHIP
2203-006562	C322	C-CER,CHIP
2203-006562	C324	C-CER,CHIP

SEC CODE	Design LOC	Discription
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2203-006562	C326	C-CER,CHIP
2203-006562	C327	C-CER,CHIP
2203-006562	C328	C-CER,CHIP
2203-006562	C336	C-CER,CHIP
2203-006562	C430	C-CER,CHIP
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2203-006562	C504	C-CER,CHIP
2203-006562	C509	C-CER,CHIP
2203-006562	C513	C-CER,CHIP
2203-006562	C515	C-CER,CHIP
2203-006562	C516	C-CER,CHIP
2203-006562	C519	C-CER,CHIP
2203-006562	C520	C-CER,CHIP
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2203-006562	C522	C-CER,CHIP
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2203-006562	C528	C-CER,CHIP
2203-006562	C529	C-CER,CHIP
2203-006562	C530	C-CER,CHIP
2203-006562	C535	C-CER,CHIP
2203-006562	C539	C-CER,CHIP
2203-006562	C543	C-CER,CHIP
2203-006562	C547	C-CER,CHIP
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2203-006562	C557	C-CER,CHIP
2203-006562	C558	C-CER,CHIP
2203-006562	C559	C-CER,CHIP
2203-006562	C560	C-CER,CHIP
2203-006562	C561	C-CER,CHIP
2203-006562	C570	C-CER,CHIP
2203-006562	C606	C-CER,CHIP

SEC CODE	Design LOC	Discription
2203-006562	C607	C-CER,CHIP
2203-006562	C608	C-CER,CHIP
2203-006562	C609	C-CER,CHIP
2203-006562	C612	C-CER,CHIP
2203-006562	C617	C-CER,CHIP
2203-006562	C618	C-CER,CHIP
2203-006562	C619	C-CER,CHIP
2203-006562	C620	C-CER,CHIP
2203-006562	C621	C-CER,CHIP
2203-006562	C622	C-CER,CHIP
2203-006562	C623	C-CER,CHIP
2203-006562	C624	C-CER,CHIP
2203-006562	C625	C-CER,CHIP
2203-006562	C626	C-CER,CHIP
2203-006562	C631	C-CER,CHIP
2203-006562	C632	C-CER,CHIP
2203-006562	C633	C-CER,CHIP
2203-006562	C639	C-CER,CHIP
2203-006562	C641	C-CER,CHIP
2203-006562	C712	C-CER,CHIP
2203-006562	C723	C-CER,CHIP
2203-006562	C724	C-CER,CHIP
2203-006562	C800	C-CER,CHIP
2203-006562	C803	C-CER,CHIP
2203-006562	C811	C-CER,CHIP
2203-006562	C820	C-CER,CHIP
2203-006562	C821	C-CER,CHIP
2203-006562	C830	C-CER,CHIP
2203-006562	C843	C-CER,CHIP
2203-006562	C846	C-CER,CHIP
2203-006562	C848	C-CER,CHIP
2203-006562	C858	C-CER,CHIP
2203-006562	C915	C-CER,CHIP
2203-006562	C916	C-CER,CHIP
2203-006562	C917	C-CER,CHIP
2203-006562	C918	C-CER,CHIP

SEC CODE	Design LOC	Discription
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2203-006681	C534	C-CER,CHIP
2203-006681	C540	C-CER,CHIP
2203-006824	C124	C-CER,CHIP
2203-006824	C156	C-CER,CHIP
2203-006824	C301	C-CER,CHIP
2203-006824	C400	C-CER,CHIP
2203-006824	C401	C-CER,CHIP
2203-006824	C415	C-CER,CHIP
2203-006824	C417	C-CER,CHIP
2203-006824	C418	C-CER,CHIP
2203-006824	C638	C-CER,CHIP
2203-006838	C252	C-CER,CHIP
2203-006838	C416	C-CER,CHIP
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2203-006838	C423	C-CER,CHIP
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2203-006838	C819	C-CER,CHIP
2203-006838	C850	C-CER,CHIP
2203-006839	C121	C-CER,CHIP
2203-006839	C140	C-CER,CHIP
2203-006839	C142	C-CER,CHIP
2203-006839	C318	C-CER,CHIP
2203-006839	C319	C-CER,CHIP
2203-006872	C317	C-CER,CHIP
2203-006890	C300	C-CER,CHIP
2203-006890	C421	C-CER,CHIP
2203-006890	C434	C-CER,CHIP
2203-006890	C436	C-CER,CHIP
2203-006890	C566	C-CER,CHIP
2203-006890	C567	C-CER,CHIP
2203-006979	C126	C-CER,CHIP

SEC CODE	Design LOC	Discription
2203-006979	C164	C-CER,CHIP
2203-006979	C196	C-CER,CHIP
2203-007195	C508	C-CER,CHIP
2203-007195	C511	C-CER,CHIP
2404-001225	TA566	C-TA,CHIP
2404-001339	TA913	C-TA,CHIP
2404-001381	TA200	C-TA,CHIP
2404-001381	TA501	C-TA,CHIP
2404-001381	TA505	C-TA,CHIP
2404-001381	TA506	C-TA,CHIP
2404-001381	TA567	C-TA,CHIP
2404-001381	TA704	C-TA,CHIP
2404-001381	TA900	C-TA,CHIP
2404-001381	TA901	C-TA,CHIP
2404-001484	TA504	C-TA,CHIP
2404-001506	TA129	C-TA,CHIP
2703-002170	L121	INDUCTOR-SMD
2703-002199	L110	INDUCTOR-SMD
2703-002202	L205	INDUCTOR-SMD
2703-002204	L111	INDUCTOR-SMD
2703-002204	L114	INDUCTOR-SMD
2703-002204	L124	INDUCTOR-SMD
2703-002205	C118	INDUCTOR-SMD
2703-002205	L100	INDUCTOR-SMD
2703-002206	L113	INDUCTOR-SMD
2703-002208	L101	INDUCTOR-SMD
2703-002208	L109	INDUCTOR-SMD
2703-002208	L126	INDUCTOR-SMD
2703-002208	L204	INDUCTOR-SMD
2703-002308	L607	INDUCTOR-SMD
2703-002308	L608	INDUCTOR-SMD
2703-002314	L102	INDUCTOR-SMD
2703-002314	R700	INDUCTOR-SMD
2703-002314	R701	INDUCTOR-SMD
2703-002367	C207	INDUCTOR-SMD
2703-002367	L105	INDUCTOR-SMD

SEC CODE	Design LOC	Discription
2703-002367	L108	INDUCTOR-SMD
2703-002608	L128	INDUCTOR-SMD
2703-002608	L129	INDUCTOR-SMD
2703-002608	L131	INDUCTOR-SMD
2703-002608	L132	INDUCTOR-SMD
2703-002612	L103	INDUCTOR-SMD
2703-002612	L106	INDUCTOR-SMD
2703-002782	L215	INDUCTOR-SMD
2703-002866	L605	INDUCTOR-SMD
2703-002872	L400	INDUCTOR-SMD
2703-002872	L401	INDUCTOR-SMD
2703-002872	L402	INDUCTOR-SMD
2703-003347	L500	INDUCTOR-SMD
2703-003347	L503	INDUCTOR-SMD
2703-003347	L609	INDUCTOR-SMD
2801-004339	OSC400	CRYSTAL-SMD
2801-004466	OSC501	CRYSTAL-SMD
2804-001748	TCX500	OSCILLATOR-CLOCK
2804-001762	TCX200	OSCILLATOR-CLOCK
2809-001324	TCX100	OSCILLATOR-VCTCXO
2901-001324	F700	FILTER-EMI/ESD
2901-001324	F701	FILTER-EMI/ESD
2901-001324	F703	FILTER-EMI/ESD
2901-001324	F704	FILTER-EMI/ESD
2901-001324	F705	FILTER-EMI/ESD
2904-001628	F103	FILTER-SAW
2904-001658	F204	FILTER-SAW
2904-001702	F109	FILTER-SAW
2904-001703	F105	FILTER-SAW
2904-001716	F101	FILTER-SAW
2904-001759	F110	FILTER-SAW
2910-000027	DUF201	DUPLEXER-SAW
3301-001120	L604	BEAD-SMD
3301-001342	L900	BEAD-SMD
3301-001756	L125	BEAD-SMD
3301-001885	L505	BEAD-SMD

SEC CODE	Design LOC	Discription
3301-001885	L506	BEAD-SMD
3301-001885	L610	BEAD-SMD
3301-001885	L611	BEAD-SMD
3301-001917	L600	BEAD-SMD
3301-001917	L601	BEAD-SMD
3301-001917	L602	BEAD-SMD
3404-001303	TAC_DOWN	SWITCH-TACT
3404-001303	TAC_ON	SWITCH-TACT
3404-001303	TAC_UP	SWITCH-TACT
3404-001320	TAC_CAM	SWITCH-TACT
3705-001421	RFS100	CONNECTOR-COAXIAL
3709-001384	SIM700	CONNECTOR-CARD EDGE
3709-001464	CD700	CONNECTOR-CARD EDGE
3711-006023	HDC700	HEADER-BOARD TO BOARD
3711-006141	HDC701	HEADER-BOARD TO BOARD
3711-006228	BTC700	HEADER-BATTERY
3722-002643	IFC700	JACK-USB
3722-002658	EAR600	JACK-EAR PHONE
4302-001130	BAT400	BATTERY-LI(2ND)
4709-001399	CPL200	COUPLER-DIRECTION
4709-001559	U202	W-LAN MODULE
GH30-00450A	MIC500	MICROPHONE-ASSY-SGHG810(SMD TYPE)
GH41-01937A		PCB-SGHG810 MAIN
GH70-02640A	SC100	ICT SHIELD-CAN CLIP
GH70-02640A	SC102	ICT SHIELD-CAN CLIP
GH70-02640A	SC104	ICT SHIELD-CAN CLIP
GH70-02640A	SC105	ICT SHIELD-CAN CLIP
GH70-02640A	SC106	ICT SHIELD-CAN CLIP
GH70-02640A	SC301	ICT SHIELD-CAN CLIP
GH70-02640A	SC302	ICT SHIELD-CAN CLIP
GH70-02640A	SC303	ICT SHIELD-CAN CLIP
GH70-02640A	SC304	ICT SHIELD-CAN CLIP
GH71-07624A	ANT100	NPR CONTACT-ANTENNA
GH71-07624A	ANT_GND1	NPR CONTACT-ANTENNA
GH71-07624A	ANT_GPS	NPR CONTACT-ANTENNA

Please consult the GSPN website (Samsung Portal) for the most recent version of the product's part list.

3. Product Function

Main Function

- HSDPA/UMTS, EDGE, GPRS
- WLAN 802.11 b/g
- Bluetooth v2.0 + EDR
- USB v2.0 HS compatible
- Camera 5 Mega x 3 Optical Zooming and camcorder
- FM Radio
- Instant Messaging capability
- E-mail
- Featured applications provide alarms, calendar, calculator, record audio, converter, timer, stopwatch, and world time.
- File viewer (MS office, PDF)
- Multimedia Message Service (MMS)
- Multimedia capability (with included Media player)
- Photo caller ID
- Speakerphone capability
- WEB/WAP browser (HTMS, xHTML, WML)

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

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.

9. PCB Diagrams

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