

SAMSUNG

GSM TELEPHONE

GT-S5230

SERVICE *Manual*

GSM TELEPHONE



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**SAMSUNG
ELECTRONICS**

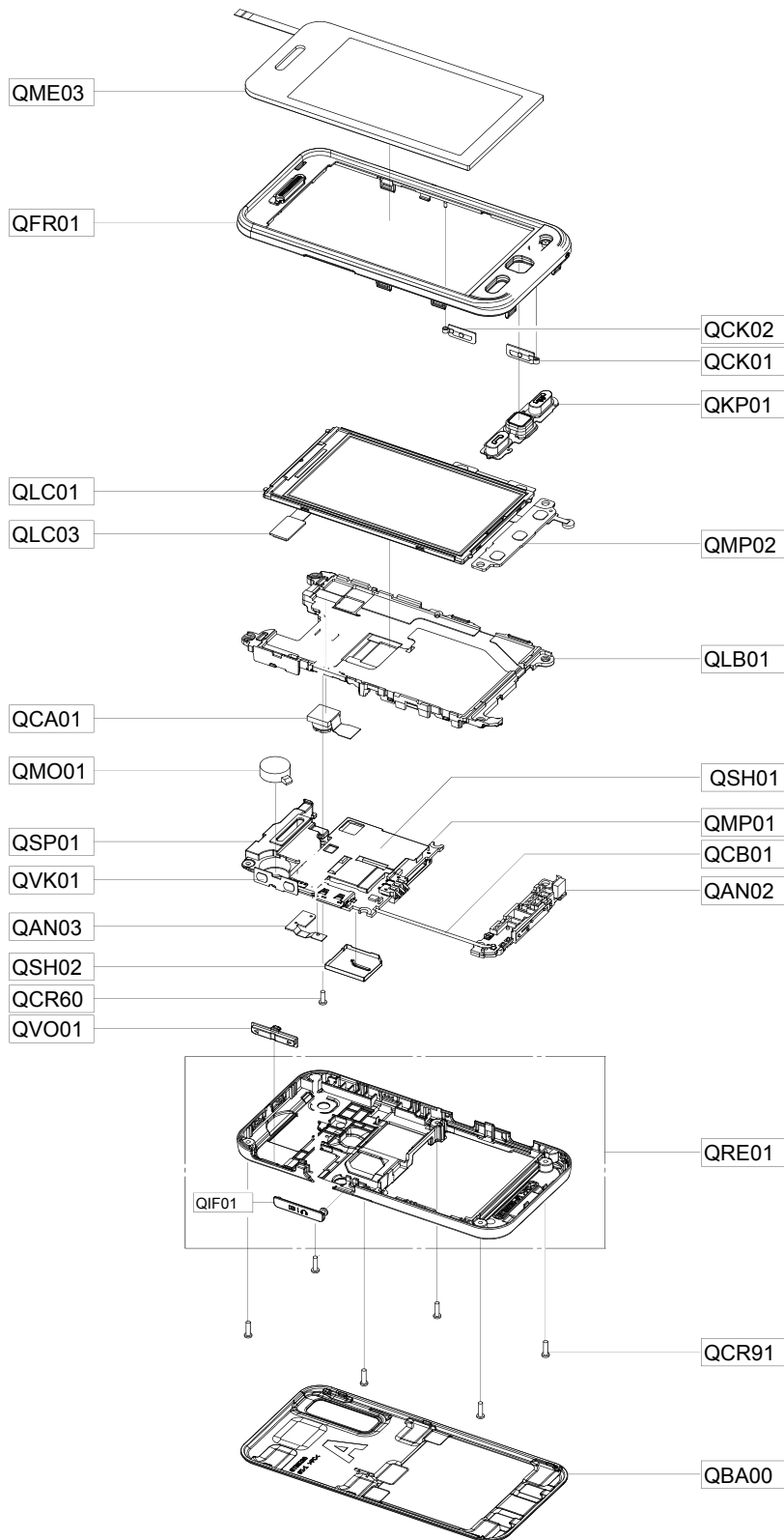


GSPN (Global Service Partner Network)

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

5. Exploded View and Parts List

5-1. Cellular phone Exploded View



2. Specification

2-1. GSM General Specification

	GSM900 Phase 1	GSM850 Phase 1	DCS1800 Phase 1	PCS1900
Freq. Band[MHz] Uplink/Downlink	880~915 925~960	824.2~848.8 869.2~893.8	1710~1785 1805~1880	1850~1910 1930~1990
ARFCN range	0~124 & 975~1023	128~251	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~5dBm	33dBm~5dBm	30dBm~0dBm	30dBm~0dBm
Power Class	5pcl ~ 19pcl	5pcl ~ 19pcl	0pcl ~ 15pcl	0pcl ~ 15pcl
Sensitivity	-102dBm	-102dBm	-100dBm	-100dBm
TDMA Mux	8	8	8	8
Cell Radius	35Km	35Km	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±3 dBm	0	30±3 dBm	0	30±3 dBm
6	31±3 dBm	1	28±3 dBm	1	28±3 dBm
7	29±3 dBm	2	26±3 dBm	2	26±3 dBm
8	27±3 dBm	3	24±3 dBm	3	24±3 dBm
9	25±3 dBm	4	22±3 dBm	4	22±3 dBm
10	23±3 dBm	5	20±3 dBm	5	20±3 dBm
11	21±3 dBm	6	18±3 dBm	6	18±3 dBm
12	19±3 dBm	7	16±3 dBm	7	16±3 dBm
13	17±3 dBm	8	14±3 dBm	8	14±3 dBm
14	15±3 dBm	9	12±4 dBm	9	12±4 dBm
15	13±3 dBm	10	10±4 dBm	10	10±4 dBm
16	11±5 dBm	11	8±4dBm	11	8±4dBm
17	9±5 dBm	12	6±4 dBm	12	6±4 dBm
18	7±5 dBm	13	4±4 dBm	13	4±4 dBm
19	5±5 dBm	14	2±5 dBm	14	2±5 dBm
		15	0±5 dBm	15	0±5 dBm

2-3. GSM EDGE TX power class**Only in Master**

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

3. Operation Instruction and Installation

Main Function

- 3.2 Mega Pixel Camera
- 3.0" WQVGA 262K TFT TOUCH SCREEN
- "TOUCH WIZ" Full Touch UI
- BlueTooth V2.1+EDR
- USB 2.0
- SMS/MMS/EMS (OMA v1.2)
- MP3/AMR/AAC/AAC+/e-AAC+/WMA
- Quad Band(EGSM900/DCS,PCS,EDGE)
- MicroSD Card Support
- External Memory
- FM Radio Support, Radio Data System
- Full Internet Browsing
- Accelerometer rotation
- Face Detection & Smile Shot

4. Array course control

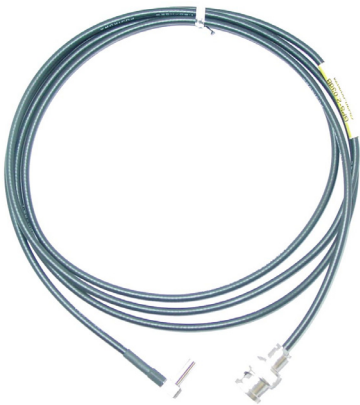
4-1. Software Adjustments



Test Jig (GH99-36900A)



Test Cable (GH39-01160A)



RF Test Cable (GH39-00985A)



Adapter (GH99-38251A)

4-2. Software Downloading

4-2-1. Pre-requisite for Downloading

- Downloader Program(**BCM213x1 Downloader v0.xx(D)**)
- Downloader Program(**Downloader V5.51 (ELY x.0)**)
- GT-S5230 Mobile Phone
- Data Cable

- BOOT file, BIN file, RC1 file, RC2 file, FFS file, Calset file

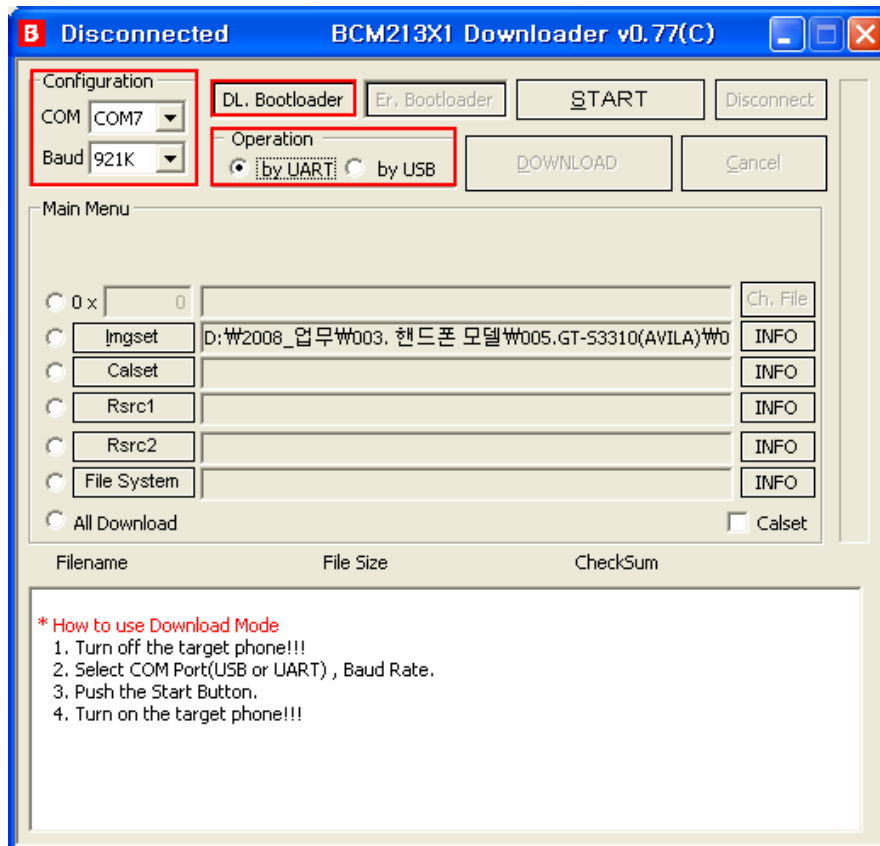
4-2-2. S/W Downloader Program

- Load the binary download program by executing the

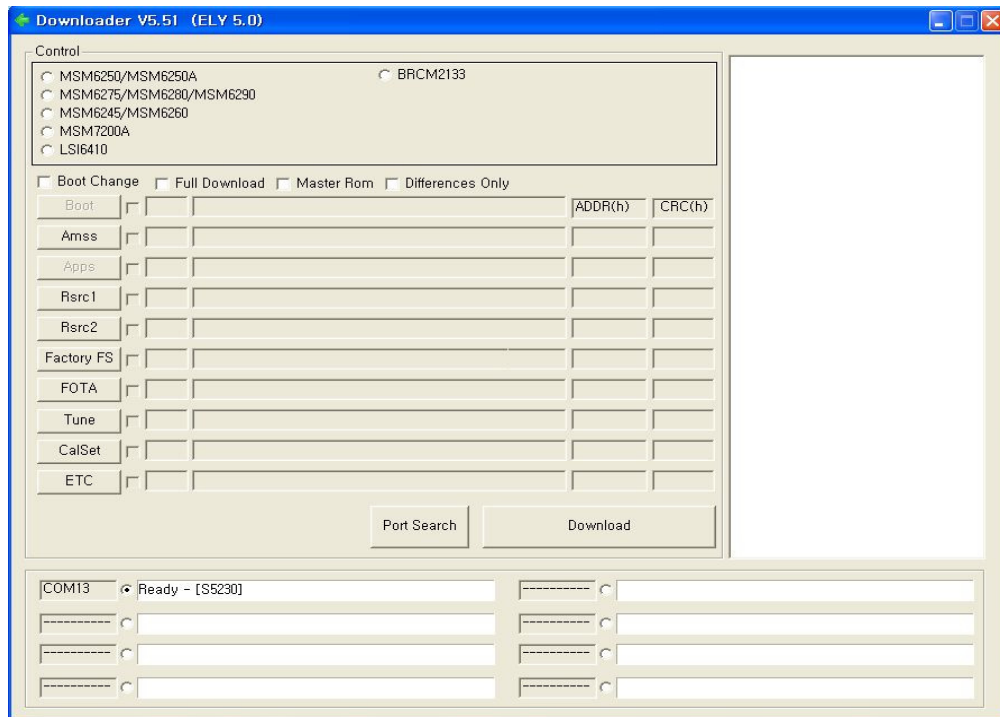
" BCM213x1 Downloader v0.xx(C) "

1. Select the connected serial port and the rate of speed.

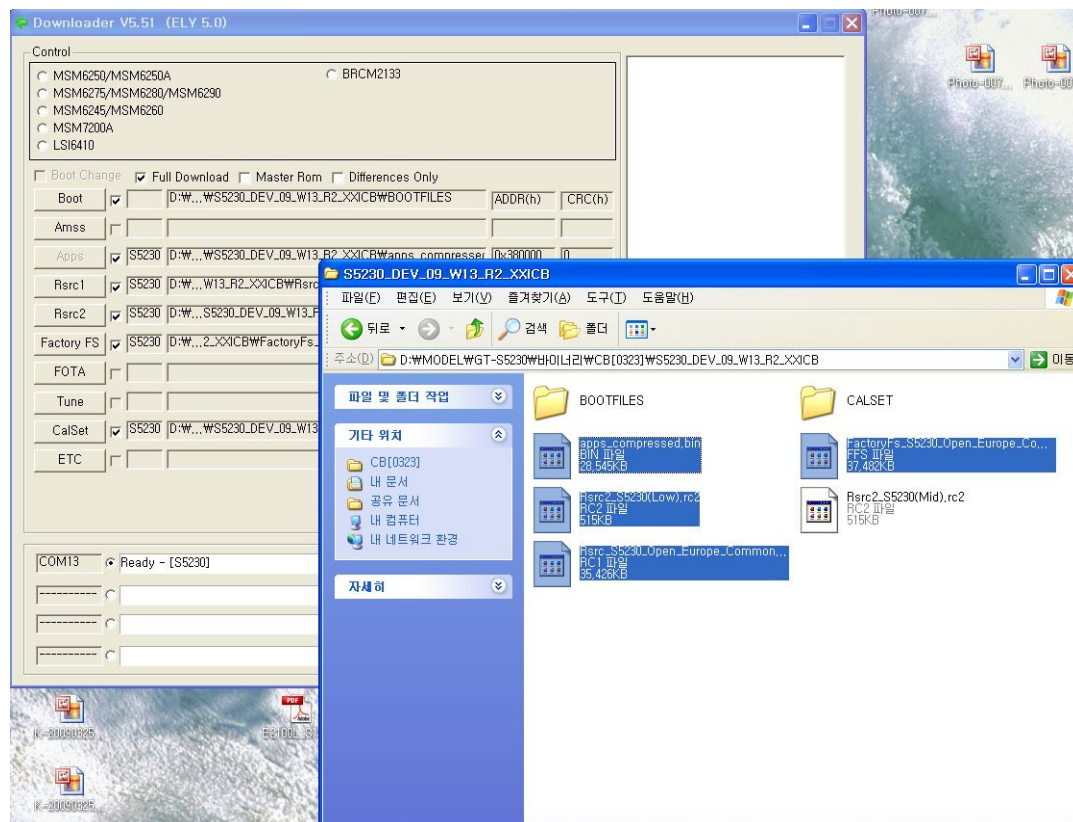
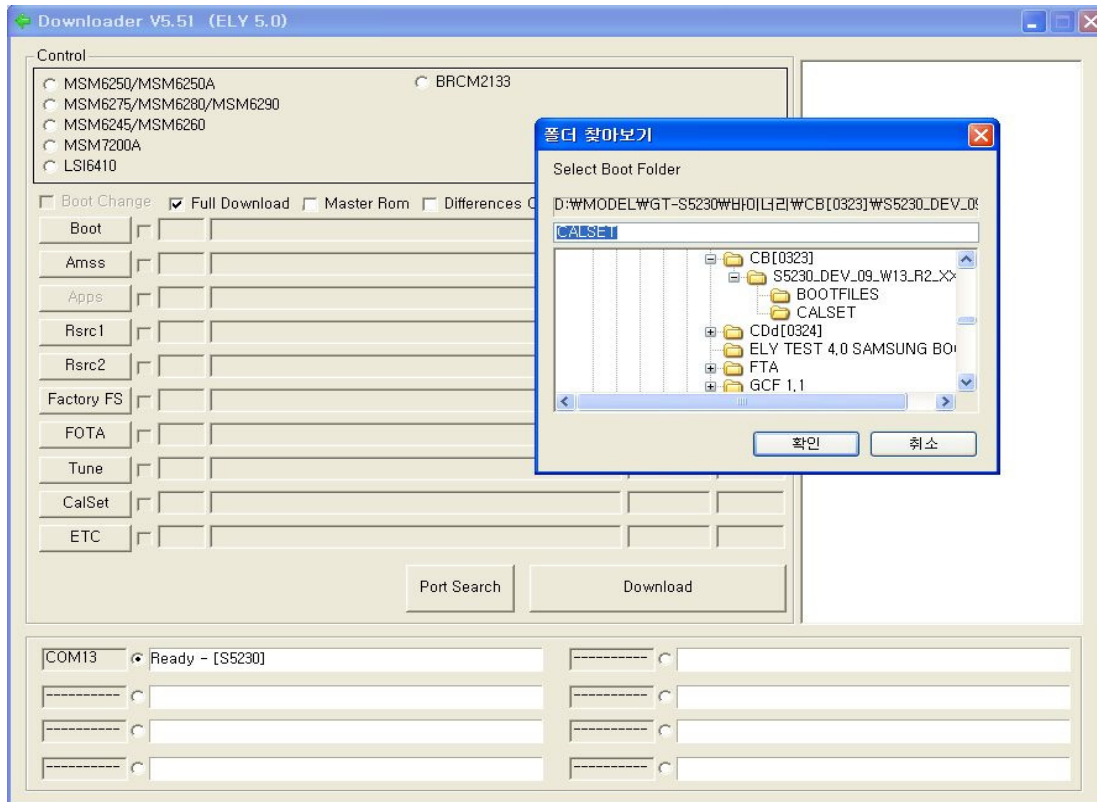
2. Select the check box, Connect cable to phone after Click **DL.Bootloader** Button.



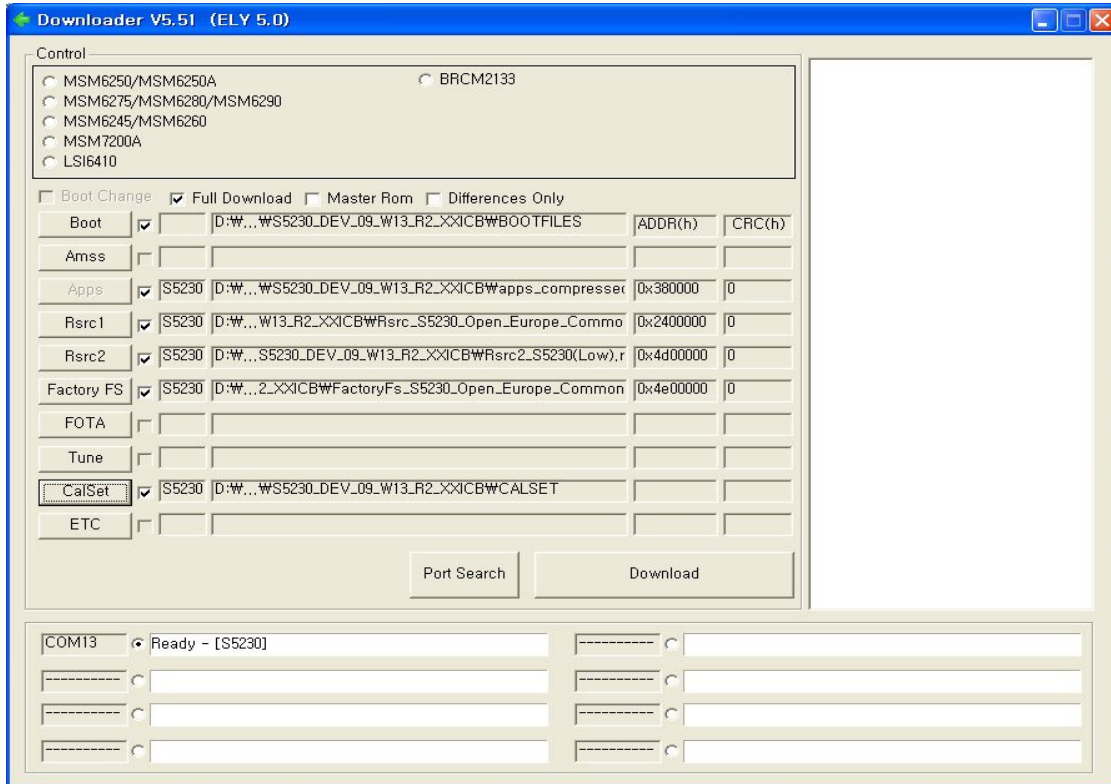
3. Execute the **Downloader V5.51 (ELY x.0)**, When Complete DL.Bootloader.
Click the "Port Search" button.



4. Check the "Full Download". and
Select the file(s) what you want to download
 - click 'Boot' to select a Boot folder.
 - drag in Bin, Rc1, Rc2, Ffs files
 - click 'calset' to select a Calset folder.



5. Check the All Download & Calset , Click the Download Botton,



6. Confirm the downloaded version name and etc. :

***#1234#**

Full Reset :

***0206*3855#**

10. Reference data

10-1. 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 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.

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.

6. MAIN Electrical Parts List

SEC CODE	Design LOC	Description
D301	0403-001749	DIODE-ZENER;PZU5.6B
ZD101,ZD102,ZD103	0404-001504	DIODE-SCHOTTKY;JDH2S01FS
ZD104	0404-001504	DIODE-SCHOTTKY;JDH2S01FS
D100	0406-001286	DIODE-TVS;PESD5V0L5UV
D101,D102,D303,D304	0406-001288	DIODE-TVS;PESD5V0S1UL
ZD301,ZD302	0406-001288	DIODE-TVS;PESD5V0S1UL
Q300	0502-001322	TR-POWER;PBSS301PD
U304	0801-003026	IC;NC7WZ86L8X
U200	0801-003130	IC;NC7SV17L6X
UME200	1108-000269	MEMORY;K522H1HACA-A060
U305	1201-002494	IC;TPA6201A1DRBR
PAM100	1201-002773	IC;SKY77344
U103	1201-002864	IC;MAX9877AERP-T
U301	1203-004604	IC;AAT3169IFO
U303	1203-005485	IC;MIC5365-3.0YMT
U300	1203-005562	IC;BCM59035C1IFB5G
U302	1203-005580	IC;MIC5365-1.8YMT
U104	1204-003026	IC;SI4709-B-GMR
U307	1205-003288	IC;TSC2007IYZGR
U106	1205-003754	IC;BCM2070B0KUBXG
UCP200	1205-003760	IC;BCM21332IFBG
U306	1209-001817	IC;BMA020
VR200	1404-001221	THERMISTOR;NCP15WB473J04RC
R210,R307	2007-000138	R-CHIP;RC1005J101CS
R113,R207	2007-000140	R-CHIP;RC1005J102CS
R204,R205	2007-000141	R-CHIP;RC1005J222CS
R208,R313,R314	2007-000143	R-CHIP;RC1005J472CS
R128,R209,R211,R212	2007-000144	R-CHIP;RC1005J512CS
R213	2007-000144	R-CHIP;RC1005J512CS
R138	2007-000151	R-CHIP;RC1005J153CS
R126,R127,R129,R130	2007-000157	R-CHIP;RC1005J473CS
R121,R122,R132,R140	2007-000162	R-CHIP;RC1005J104CS
R142,R223,R301	2007-000162	R-CHIP;RC1005J104CS
R124	2007-000165	R-CHIP;RC1005J204CS
R109,R115,R117	2007-000171	R-CHIP;WR0402X000JT
R137	2007-000172	R-CHIP;RC1005J100CS

Main Electrical Parts List

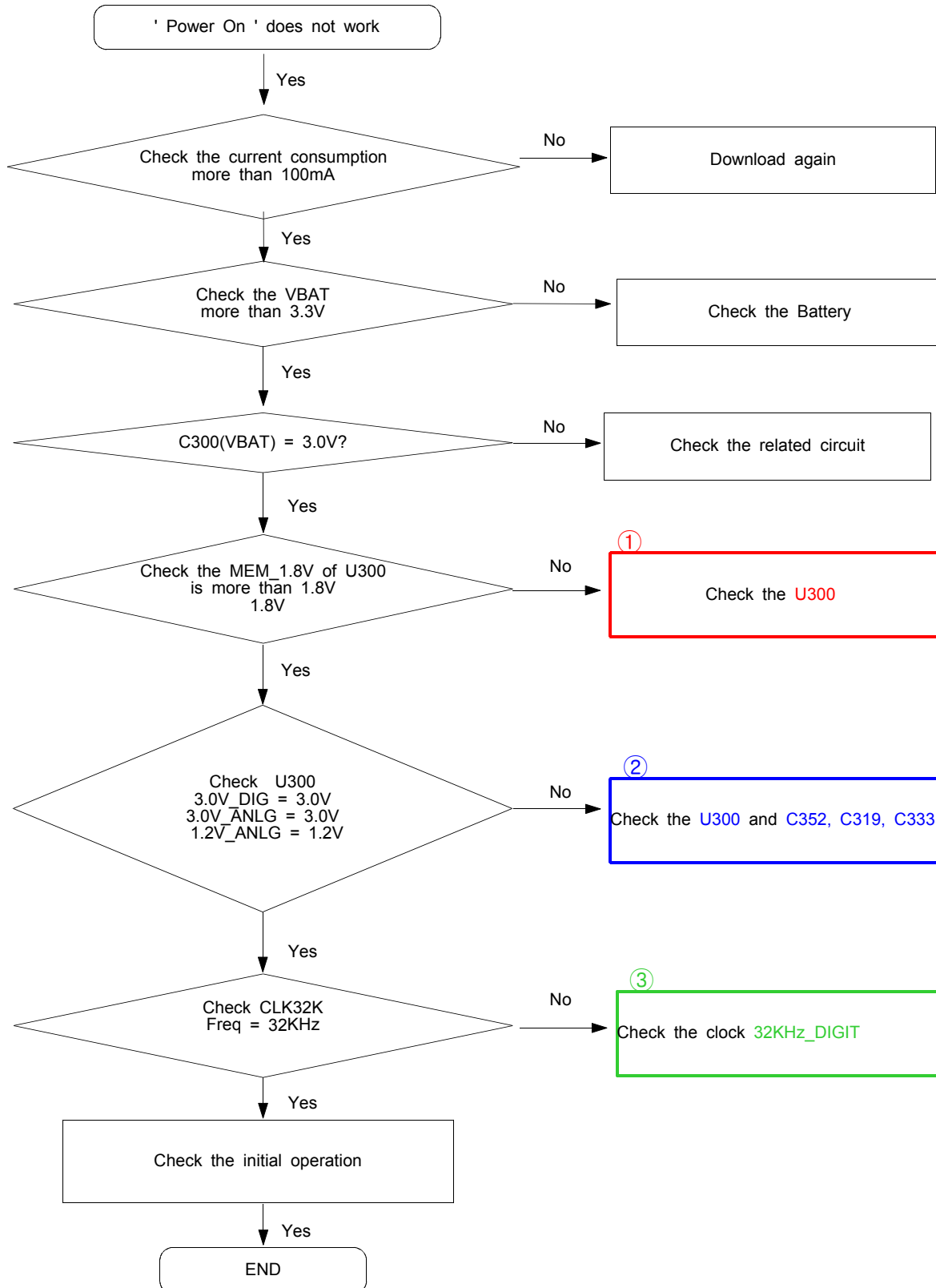
R111	2007-001301	R-CHIP;MCR01MZP5J680
R219,U311	2007-001319	R-CHIP;RC1005J122CS
R136	2007-001333	R-CHIP;MCR01MZP5J183
R125,R131	2007-002796	R-CHIP;MCR01MZP5J511
R118,R119	2007-003010	R-CHIP;RC1005J200CS
R206	2007-003014	R-CHIP;TSR16GJ244V
R105	2007-003018	R-CHIP;RMC16S-430J-TP
R304	2007-007100	R-CHIP;RK73K1ETP106J
R306,R312	2007-007107	R-CHIP;RC1005F1003CS
R310,R311	2007-007156	R-CHIP;RC1005J1ROCS
R114,R116	2007-007189	R-CHIP;TSR16GJ9R1V
R200	2007-007193	R-CHIP;TSR16GJ5R1V
R217	2007-007312	R-CHIP;MCR01MZP5F2002
R222	2007-007315	R-CHIP;MCR01MZP5F3901
R308,R309	2007-007489	R-CHIP;RK73H1ETP1503F
R123,R133,R134,R143	2007-007528	R-CHIP;RK73H1ETP1501F
R201,R202	2007-007981	R-CHIP;ERJ2RKF1803X
R305	2007-008275	R-CHIP;MCR01MZP5F303
R203	2007-008401	R-CHIP;RC1005F754CS
R302	2007-010071	R-CHIP;MCR10EZHFLR100
C179,C235	2203-000233	C-CERAMIC,CHIP;GRP1555C1H101J
C152,C157,C159,C315	2203-000254	C-CERAMIC,CHIP;GRP155R71C103K
C340	2203-000254	C-CERAMIC,CHIP;GRP155R71C103K
C151,C158	2203-000278	C-CERAMIC,CHIP;GRP1555C1H100D
C143,C148,C149,C153	2203-000386	C-CERAMIC,CHIP;GRP1555C1H150J
C154,C165,C167,C170	2203-000386	C-CERAMIC,CHIP;GRP1555C1H150J
C124,C218,C316,C317	2203-000425	C-CERAMIC,CHIP;GRP1555C1H180J
C130,C155,C168,C233	2203-000438	C-CERAMIC,CHIP;GRP155R71H102K
C166	2203-000466	C-CERAMIC,CHIP;GRP1555C1H1R0C
C338,C342	2203-000489	C-CERAMIC,CHIP;GRP155R71H222K
C227	2203-000679	C-CERAMIC,CHIP;GRP1555C1H270J
C116,C122,C127,C142	2203-000812	C-CERAMIC,CHIP;GRP1555C1H330J
C161	2203-000812	C-CERAMIC,CHIP;GRP1555C1H330J
C232	2203-000854	C-CERAMIC,CHIP;GRP1555C1H390J
C204,C215,C229	2203-000995	C-CERAMIC,CHIP;GRP1555C1H470J
C146,C147	2203-001072	C-CERAMIC,CHIP;GRP1555C1H560JD01E
C223	2203-001101	C-CERAMIC,CHIP;GRP155R71E682KA01E

C178,C180	2203-001153	C-CERAMIC,CHIP;GRP1555C1H680J
C128	2203-001221	C-CERAMIC,CHIP;GRP155R71H821KD01E
C119	2203-002668	C-CERAMIC,CHIP;C1005CG1H0R5BT
C343,C344	2203-003054	C-CERAMIC,CHIP;GRP1555C1H9R0C
C117	2203-005056	C-CERAMIC,CHIP;GRP1555C1H6R8CZ01E
R112	2203-005288	C-CERAMIC,CHIP;GRP1555C1H1R0BZ01E
C132	2203-005344	C-CERAMIC,CHIP;GRM155R71E223KA61D
C123,C144,C160,C163	2203-005482	C-CERAMIC,CHIP;GRP155R61A104KA01E
C171,C226,C236	2203-005482	C-CERAMIC,CHIP;GRP155R61A104KA01E
C131,C133,C174,C201	2203-006048	C-CERAMIC,CHIP;GRM155R71A104K
C202,C207,C209,C210	2203-006048	C-CERAMIC,CHIP;GRM155R71A104K
C211,C212,C213,C216	2203-006048	C-CERAMIC,CHIP;GRM155R71A104K
C336	2203-006048	C-CERAMIC,CHIP;GRM155R71A104K
C162,C320,C334	2203-006208	C-CERAMIC,CHIP;CM105X5R475M06AT
C134,C135,C136,C137	2203-006260	C-CERAMIC,CHIP;GRM155R61A224KE19E
C139,C140	2203-006260	C-CERAMIC,CHIP;GRM155R61A224KE19E
C304	2203-006324	C-CERAMIC,CHIP;GRM188R61A225KE19D
C310	2203-006348	C-CERAMIC,CHIP;CV105X5R105K25AT
C138,C141,C145,C172	2203-006399	C-CERAMIC,CHIP;GRM155R60J105KE19D
C175,C206,C208,C214	2203-006399	C-CERAMIC,CHIP;GRM155R60J105KE19D
C217,C230,C231,C305	2203-006399	C-CERAMIC,CHIP;GRM155R60J105KE19D
C309,C311,C313,C328	2203-006399	C-CERAMIC,CHIP;GRM155R60J105KE19D
C339,C341,C345,C346	2203-006399	C-CERAMIC,CHIP;GRM155R60J105KE19D
C347,C348,C349,C350	2203-006399	C-CERAMIC,CHIP;GRM155R60J105KE19D
C351	2203-006399	C-CERAMIC,CHIP;GRM155R60J105KE19D
C300,C301,C303,C312	2203-006562	C-CERAMIC,CHIP;CV05X5R105K10AH
C314,C323	2203-006562	C-CERAMIC,CHIP;CV05X5R105K10AH
C150,C164,C203,C205	2203-006872	C-CERAMIC,CHIP;GRM155R60J225ME15D
C219,C220,C222,C224	2203-006872	C-CERAMIC,CHIP;GRM155R60J225ME15D
C307,C308,C319,C321	2203-006872	C-CERAMIC,CHIP;GRM155R60J225ME15D
C322,C324,C325,C326	2203-006872	C-CERAMIC,CHIP;GRM155R60J225ME15D
C329,C332,C333,C352	2203-006872	C-CERAMIC,CHIP;GRM155R60J225ME15D
C327,C330	2203-006890	C-CERAMIC,CHIP;CV105X5R106M06AT
TA301	2404-001339	C-TA,CHIP;TEESVJ1A475M8R
TA102	2404-001377	C-TA,CHIP;F980J226MMA
TA100,TA101,TA300	2404-001381	C-TA,CHIP;F981A106MMA
TA302	2404-001430	C-TA,CHIP;TCSHL1A106MRAR

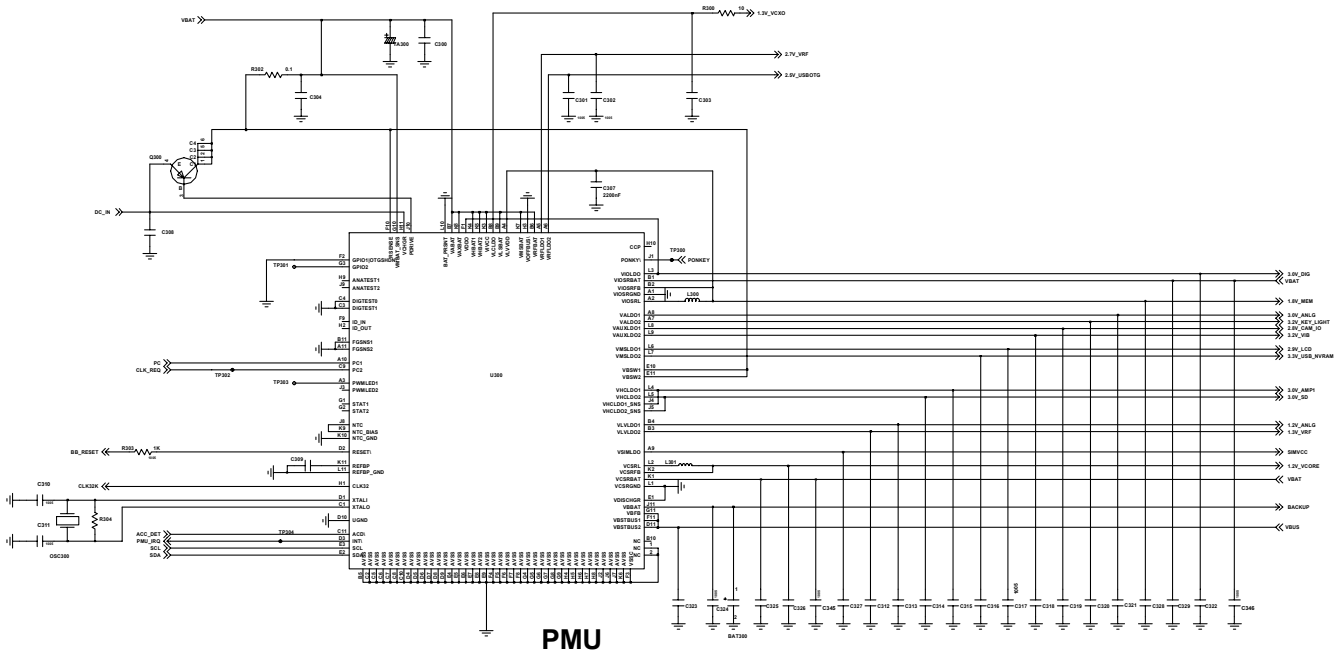
L109,L113	2703-001729	INDUCTOR-SMD;LL1005-FH1N8S
L119,L123	2703-001748	INDUCTOR-SMD;LL1005-FH5N6S
L132,L133	2703-002201	INDUCTOR-SMD;CIH05T33NJNC
C112,L104,L107	2703-002203	INDUCTOR-SMD;CIH05T15NJNC
C118	2703-002204	INDUCTOR-SMD;CIH05T22NJNC
L115,L117	2703-002206	INDUCTOR-SMD;CIH05T39NJNC
L103,L108,L110,L112	2703-002208	INDUCTOR-SMD;CIH05T2N2SNC
L101	2703-002267	INDUCTOR-SMD;CIH05T4N7SNC
L105	2703-002314	INDUCTOR-SMD;CIH05T47NJNC
L120,L122	2703-002551	INDUCTOR-SMD;LQW15AN33NH00D
L114,L118	2703-003145	INDUCTOR-SMD;LQW15AN5N1B00D
L134	2703-003476	INDUCTOR-SMD;LQG15HSR27J02D
L300,L301	2703-003545	INDUCTOR-SMD;LQM2MPN2R2NG0
OSC300	2801-004373	CRYSTAL-UNIT;CC7V-T1A
OSC200	2801-004815	CRYSTAL-UNIT;FCX05-LFHF
F301,F302,F303	2901-001451	FILTER-EMI SMD;ICVE10054E250R500FR
F101	2901-001544	FILTER-EMI SMD;AMLV-14S-03Q-012-300F
F100	2909-001312	FILTER-DUPLEXER;LCB10B2450K3
U100	2911-000123	FILTER;LMSP43NA-794
L125,L126	3301-001438	CORE-FERRITE BEAD;BLM15BB750SN1D
L136,L200,L201	3301-001659	CORE-FERRITE BEAD;BLM15AG601SN1
L127,L129	3301-001729	CORE-FERRITE BEAD;BLM15AG102SN1D
L302,L303	3301-001756	CORE-FERRITE BEAD;BLM15HG102SN1D
L128,L131	3301-001812	CORE-FERRITE BEAD;BLM15HD102SN1
L124	3301-001970	CORE-FERRITE BEAD;BLM15BA330SN1
RFS100	3705-001448	CONNECTOR-COAXIAL;20369-001E
RFS101	3705-001503	CONNECTOR-COAXIAL;KMS-560
CN300	3708-002211	CONNECTOR-FPC/FFC/PIC;FF12-21A-R12BN-D3
CD100	3709-001465	CONNECTOR-CARD EDGE;NDTF-6S8M-311
IFC100	3710-002681	CONNECTOR-SOCKET;HY20-AB0360
HEA301	3711-006028	CONNECTOR-HEADER;14-5805-040-000-829
BTC300	3711-006924	CONNECTOR-HEADER;2005-03-242
BAT300	4302-001181	BATTERY;ML414RU2-TT36-TP1

9. Flow Chart of Troubleshooting

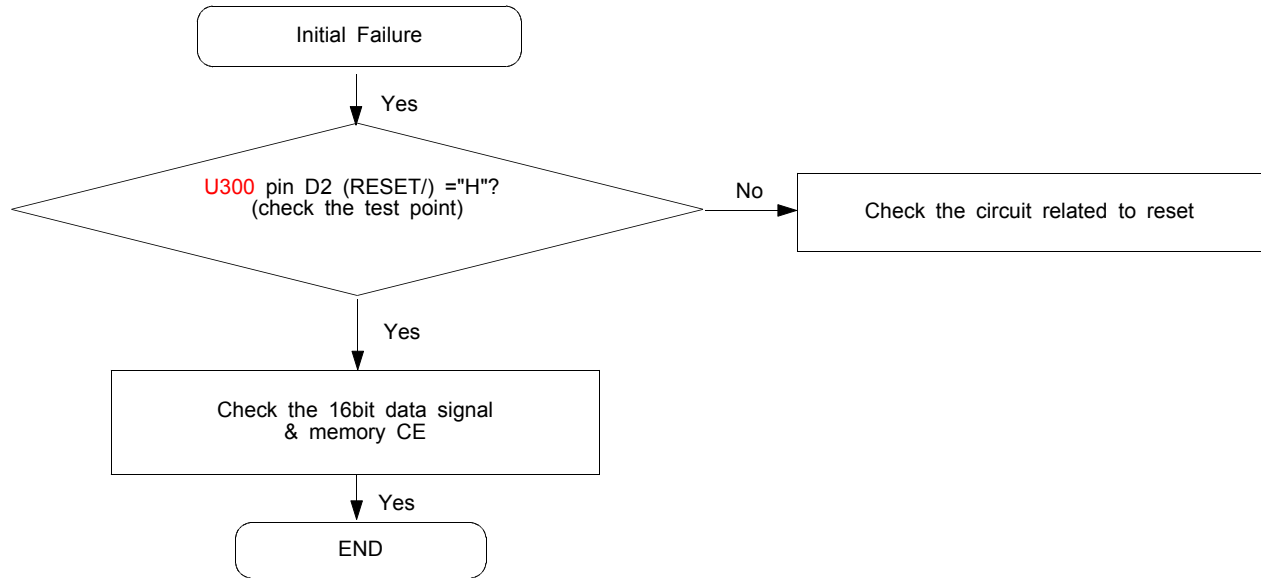
9-1. Power On

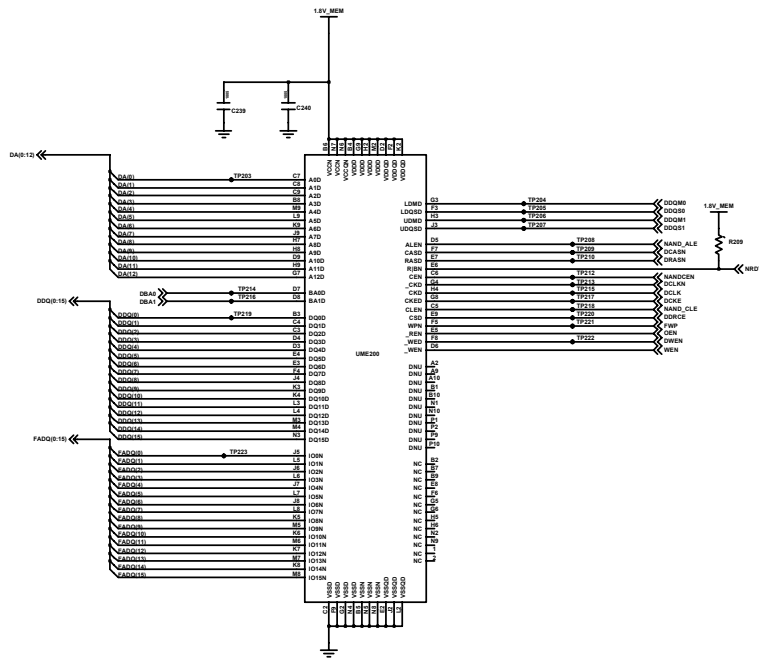


Flow Chart of Troubleshooting

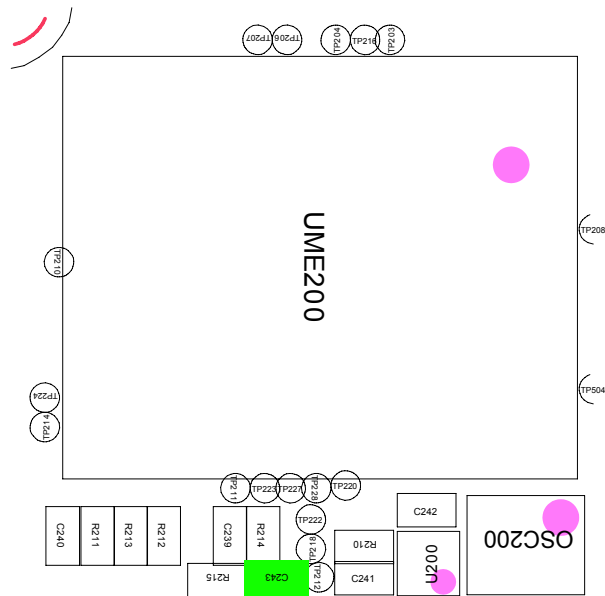


9-2. Initial

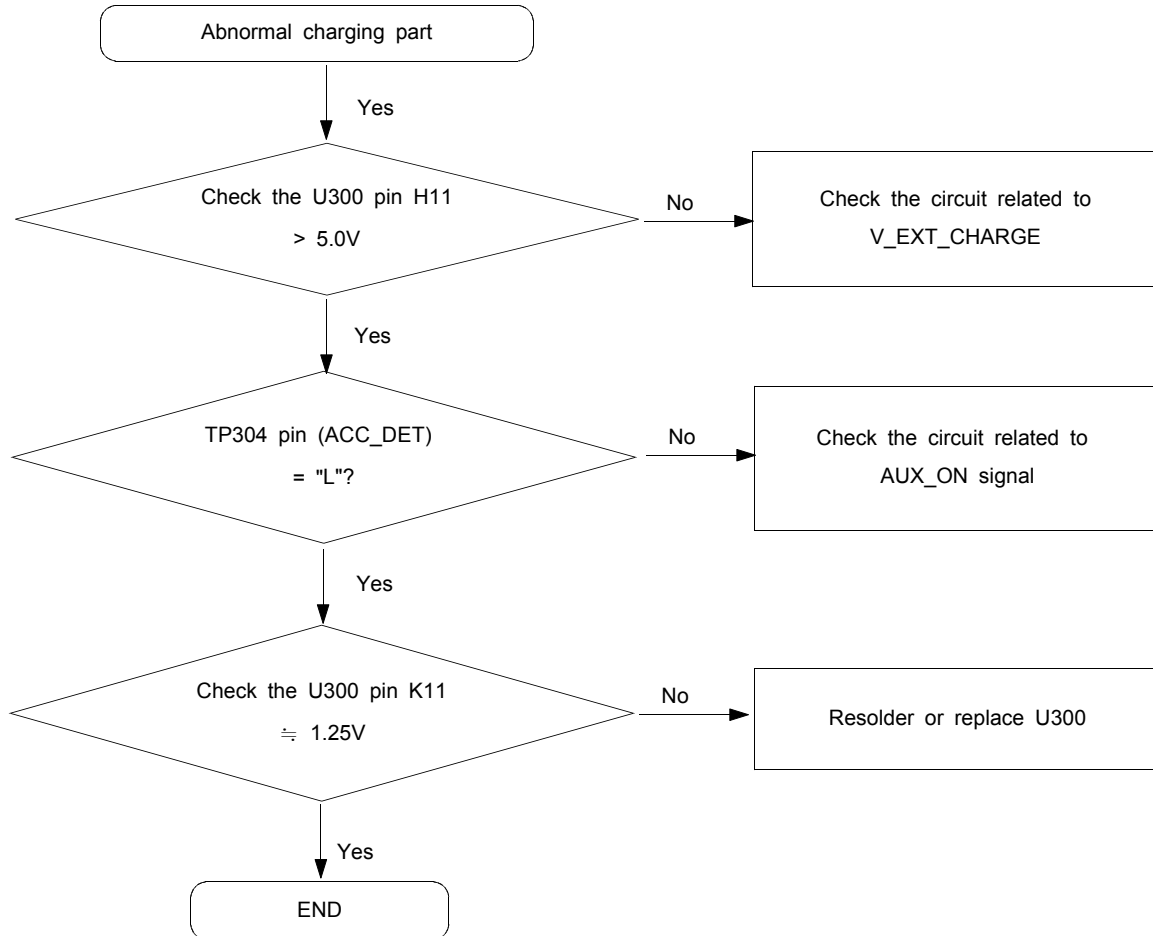




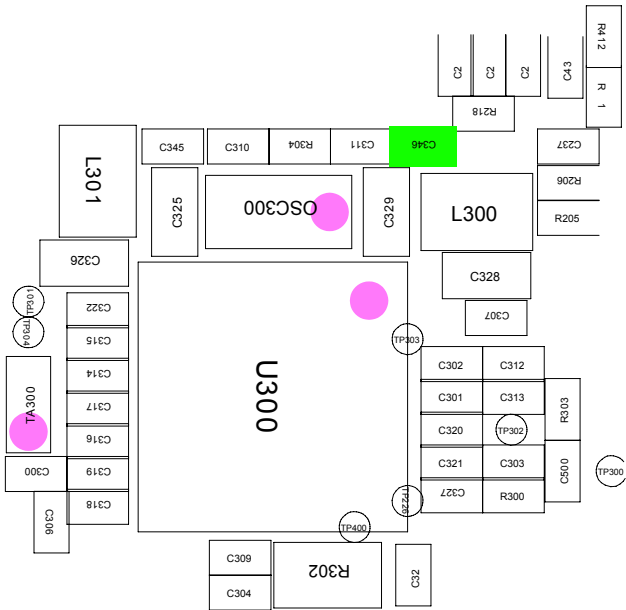
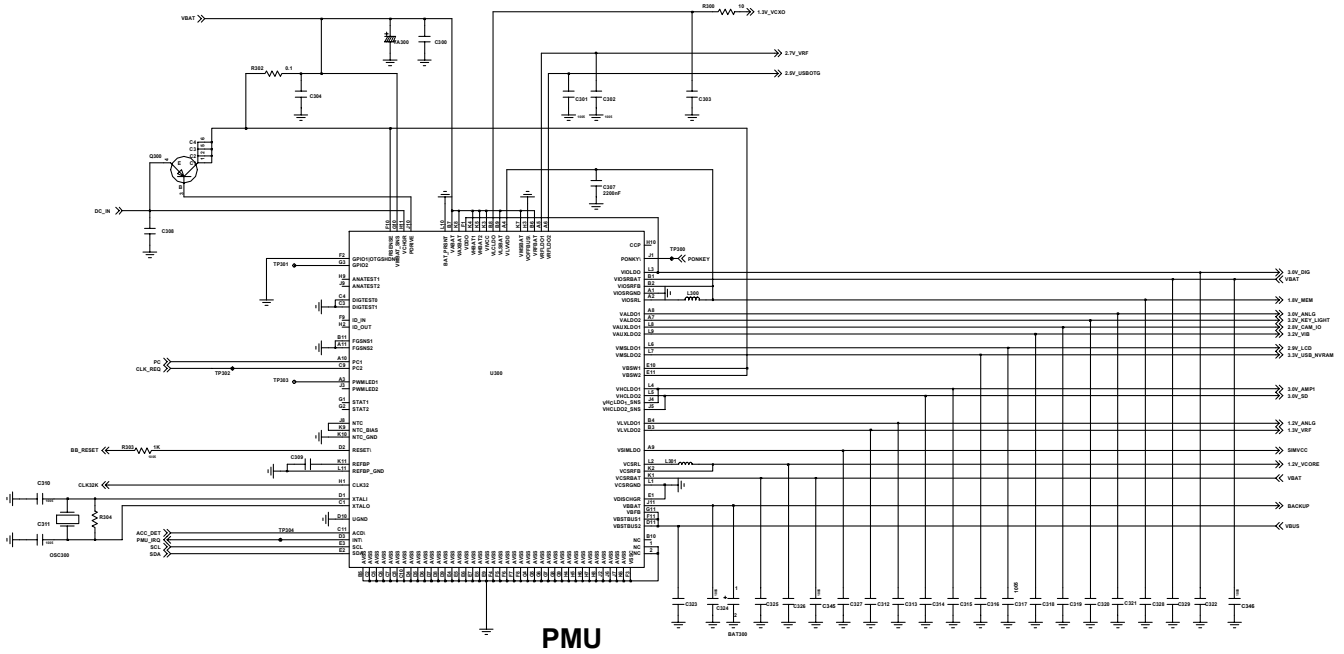
**MEMORY(Large Block NAND)
(1Gb NAND + 512Mb DDRAM)**



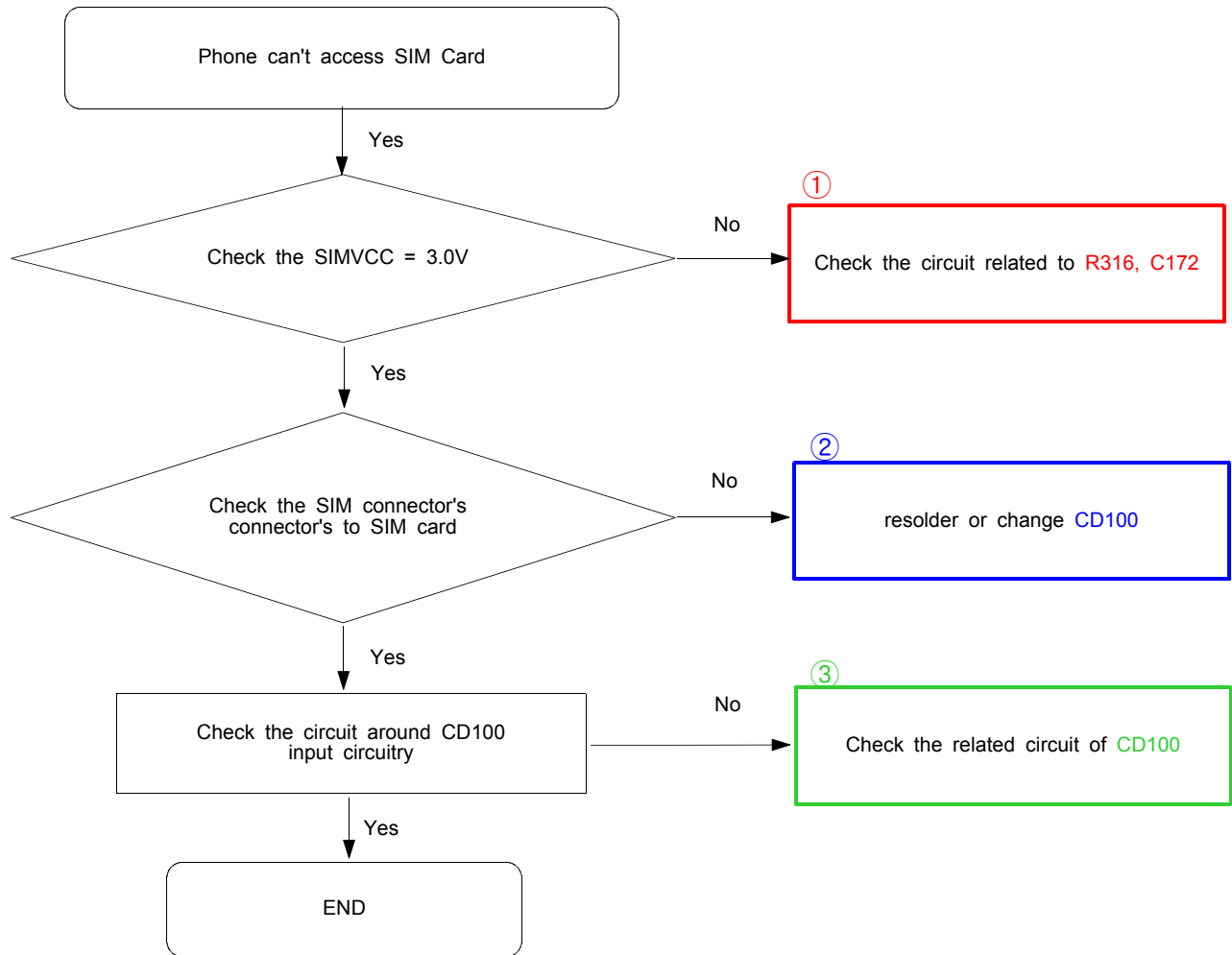
9-3. Charging Part

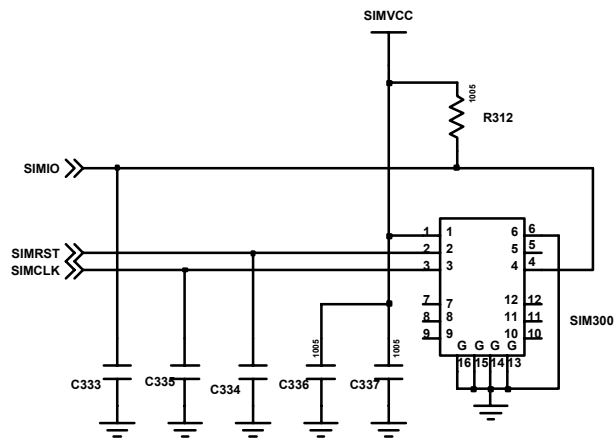


Flow Chart of Troubleshooting



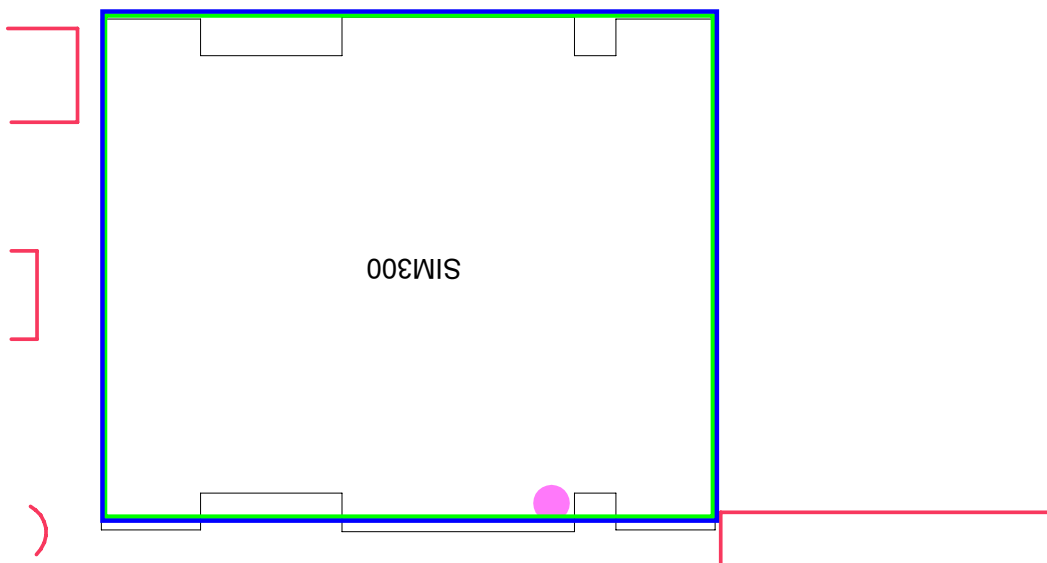
9-4. Sim Part



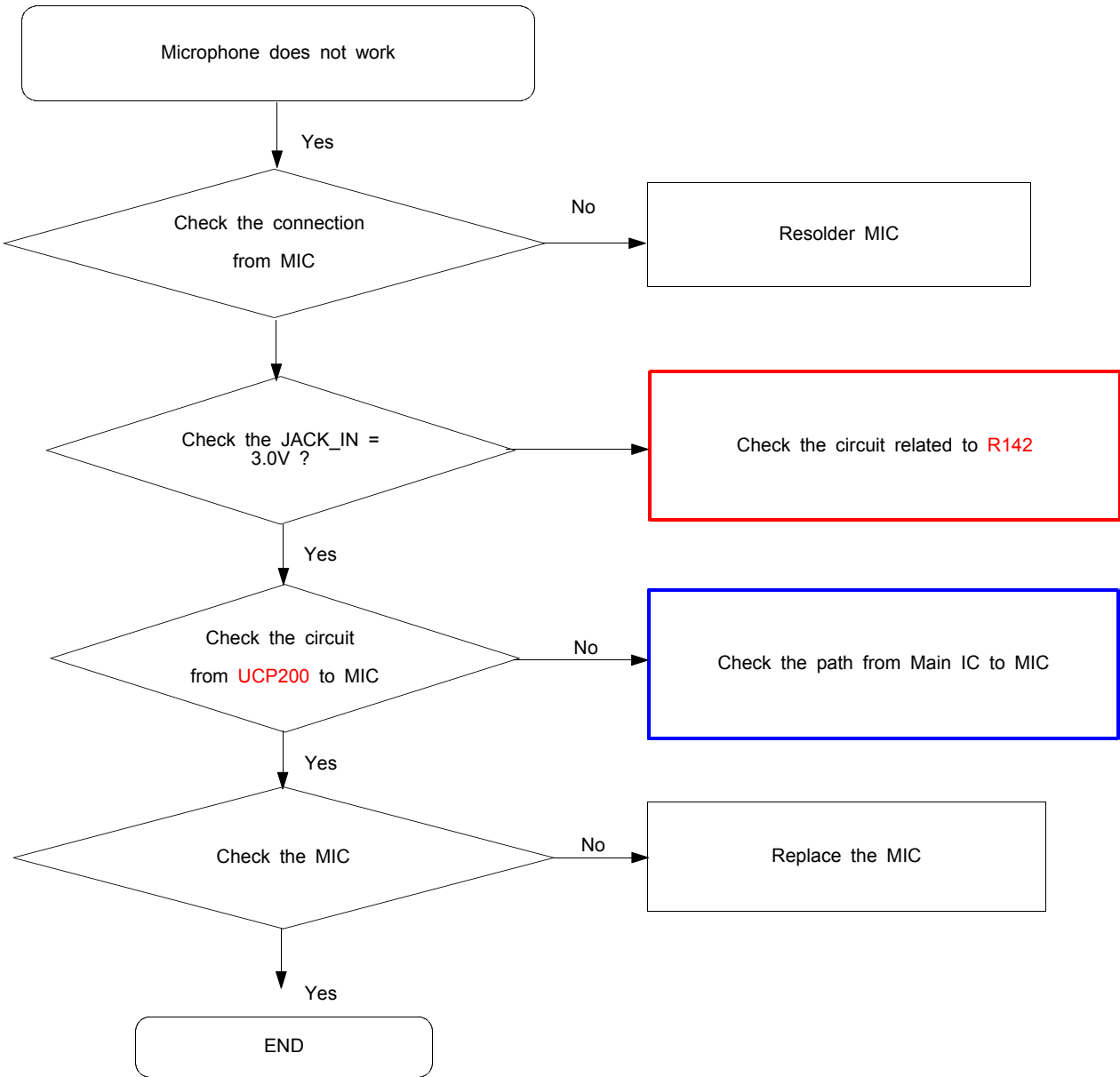


SIM CONNECTOR

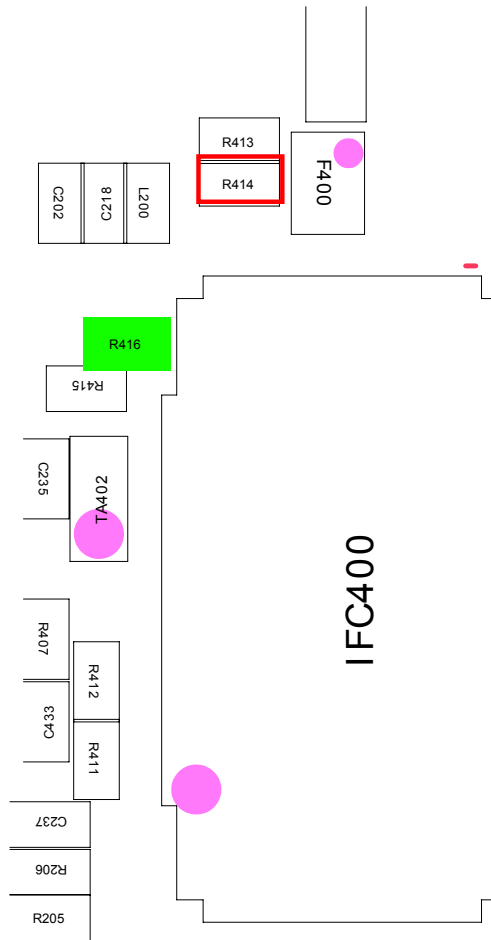
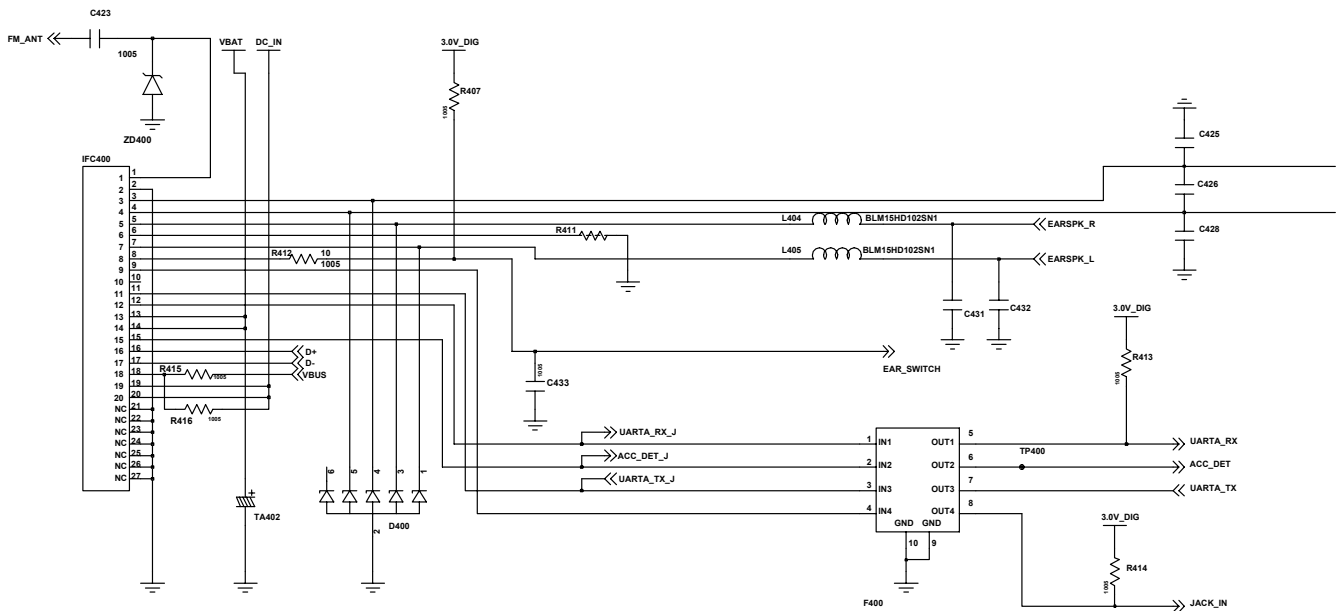
C102	C423	00K0Z			
R222	C334	C335	R312	C336	C337



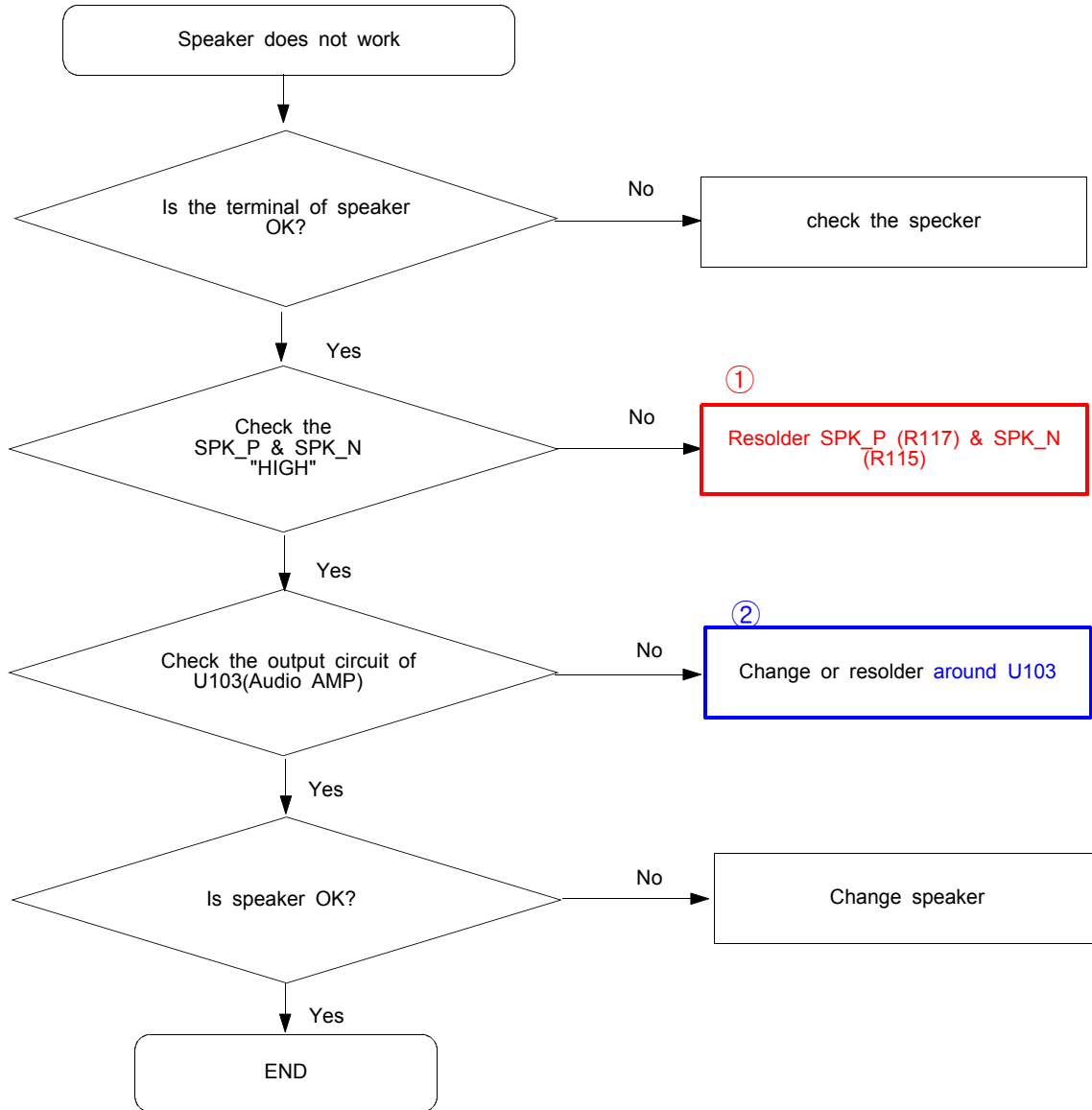
9-5. Microphone Part

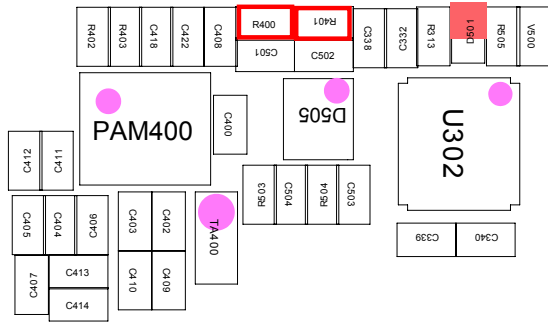
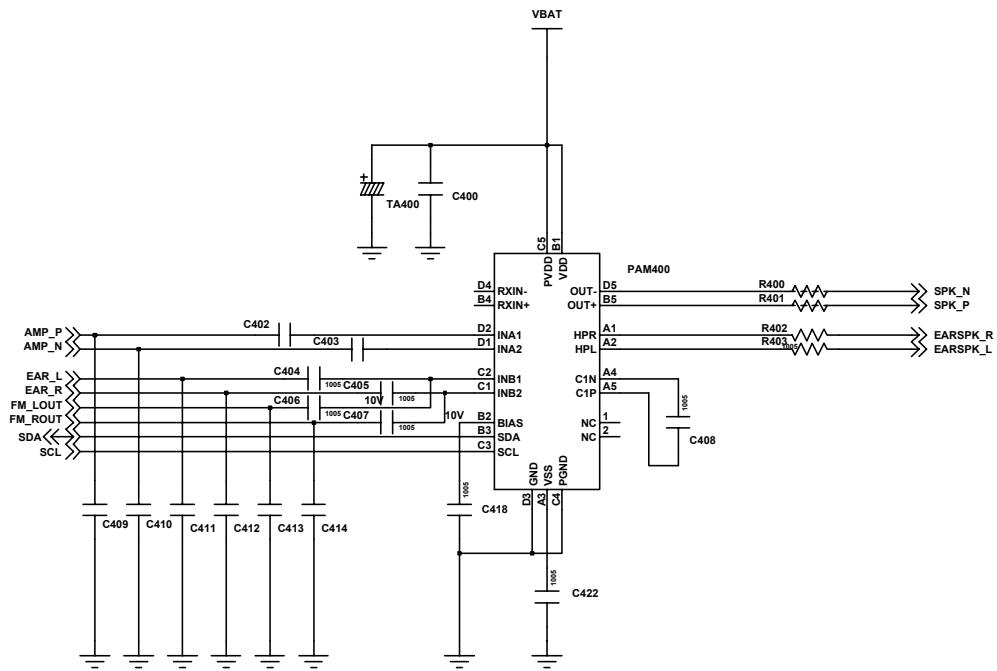


Flow Chart of Troubleshooting

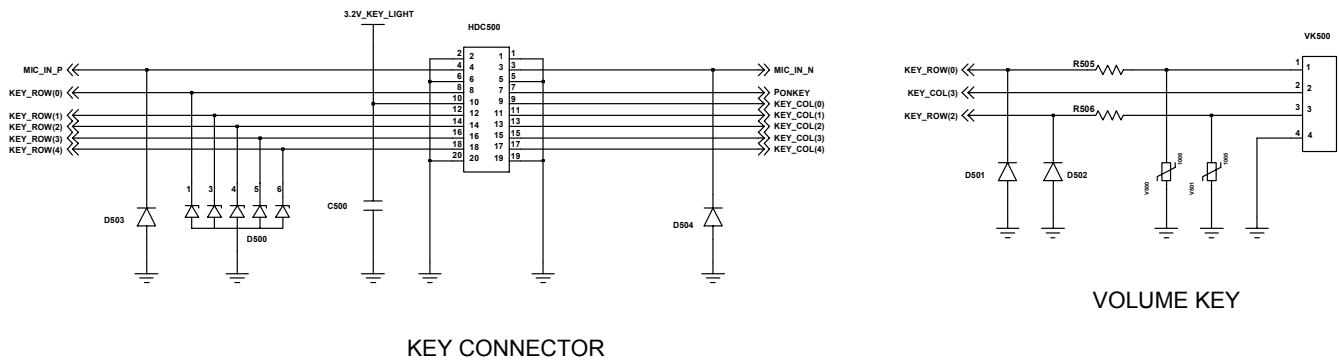
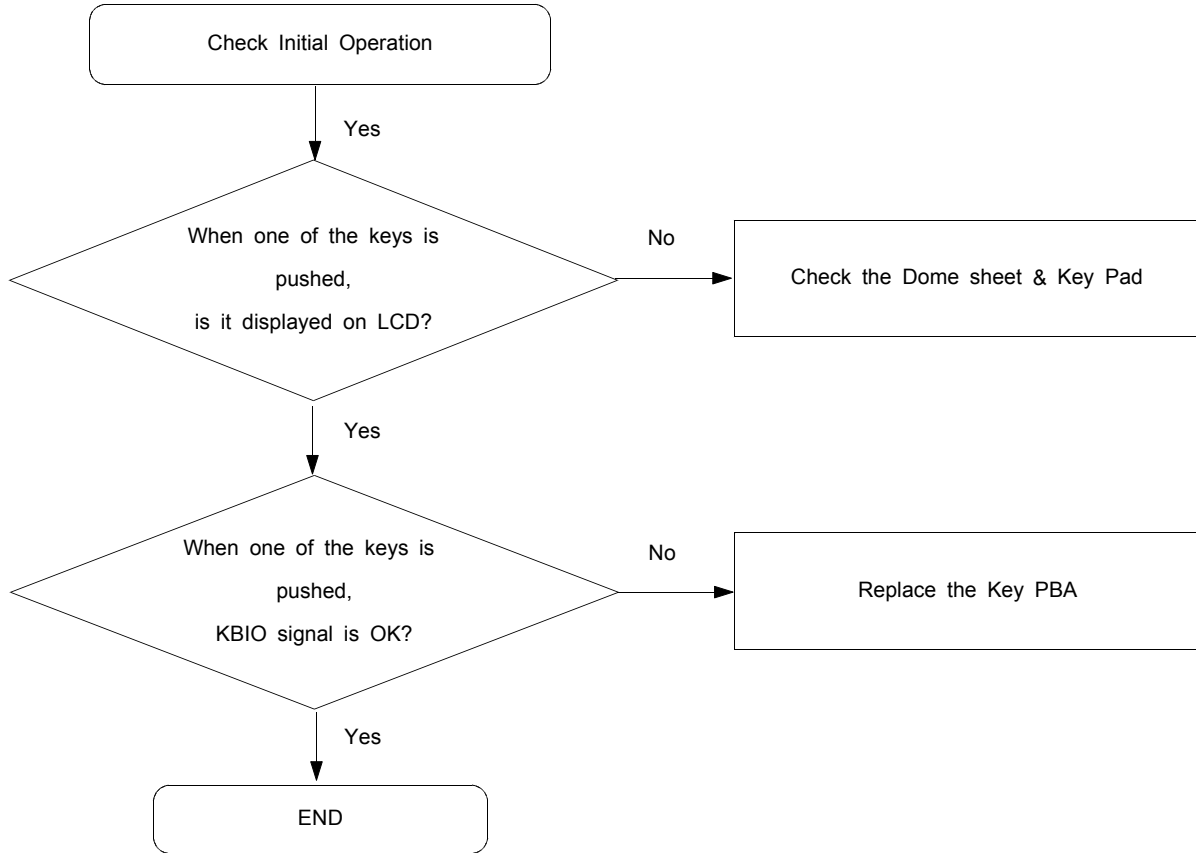


9-6. Speaker Part(Melody)

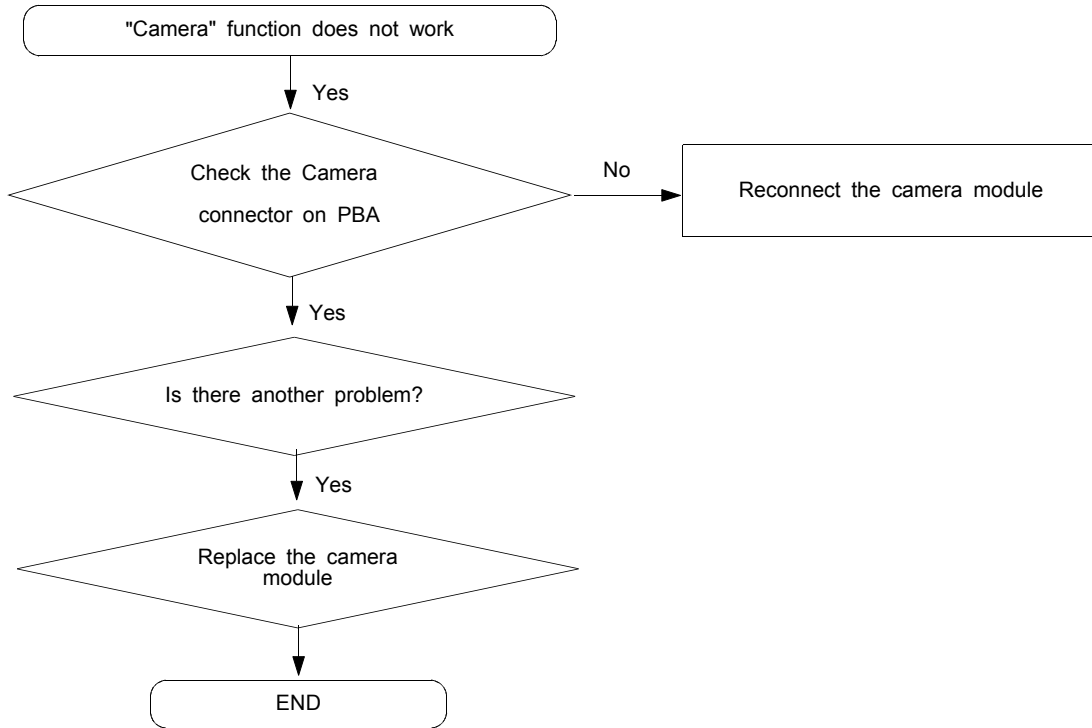




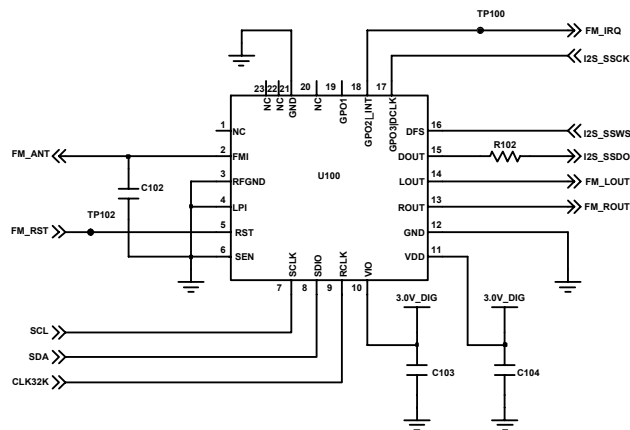
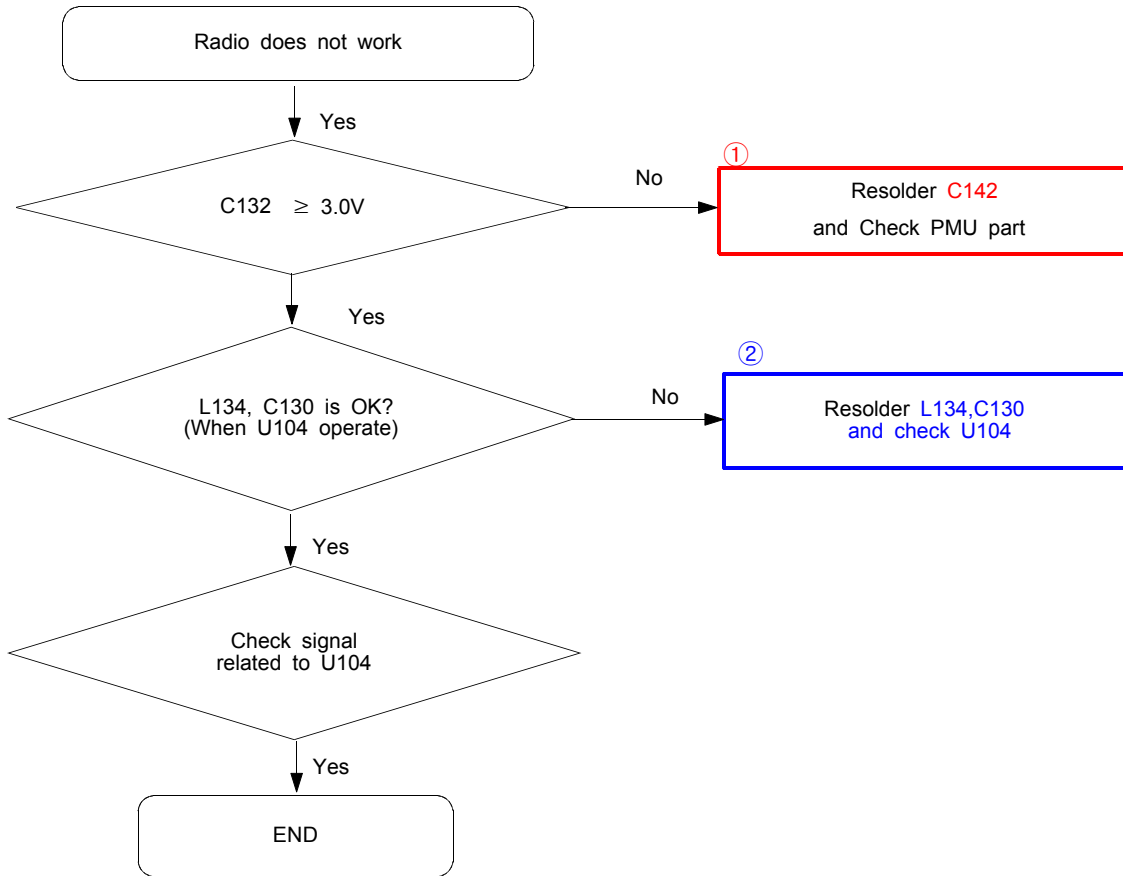
9-7. Key Data Input



9-8. Camera part

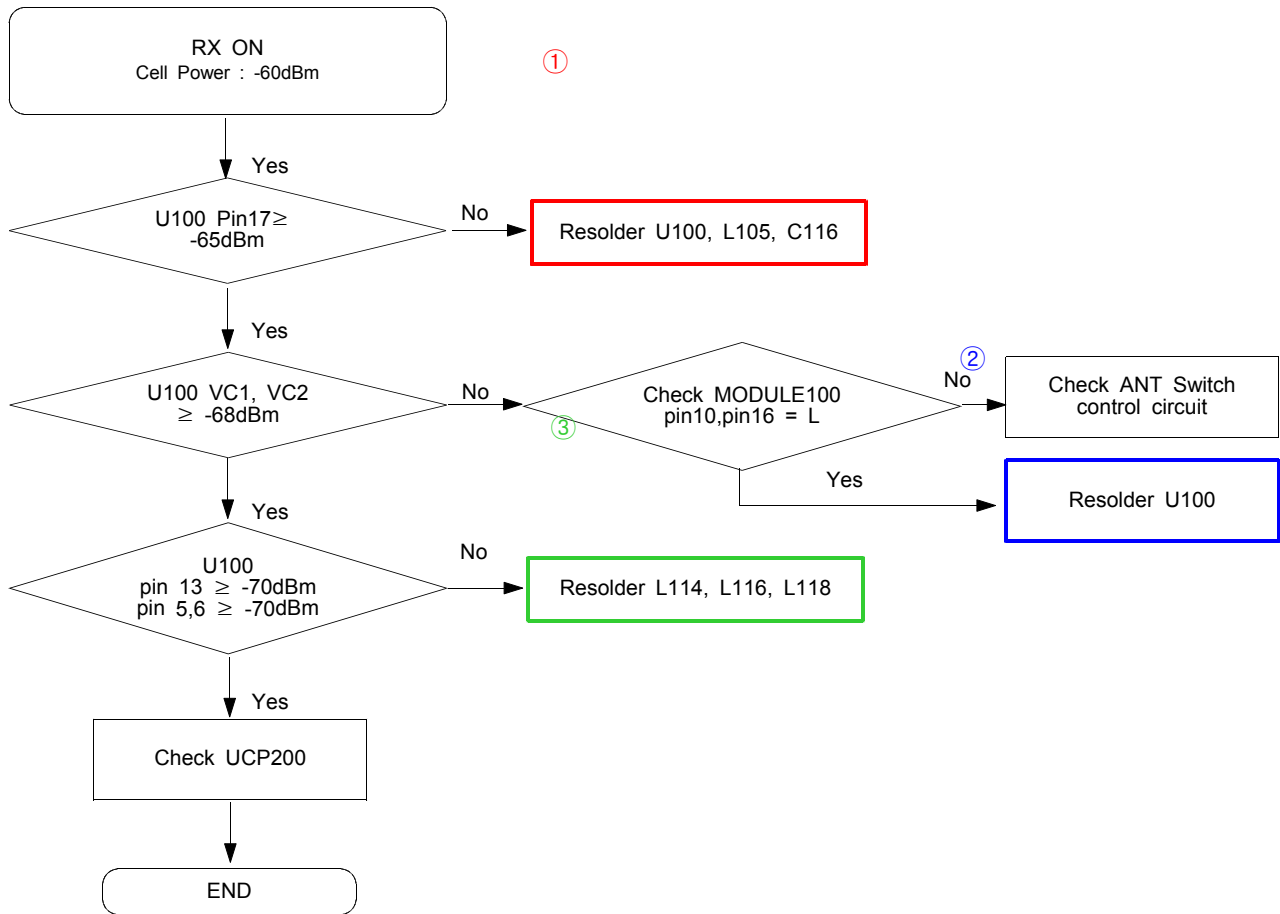


9-9. Radio part

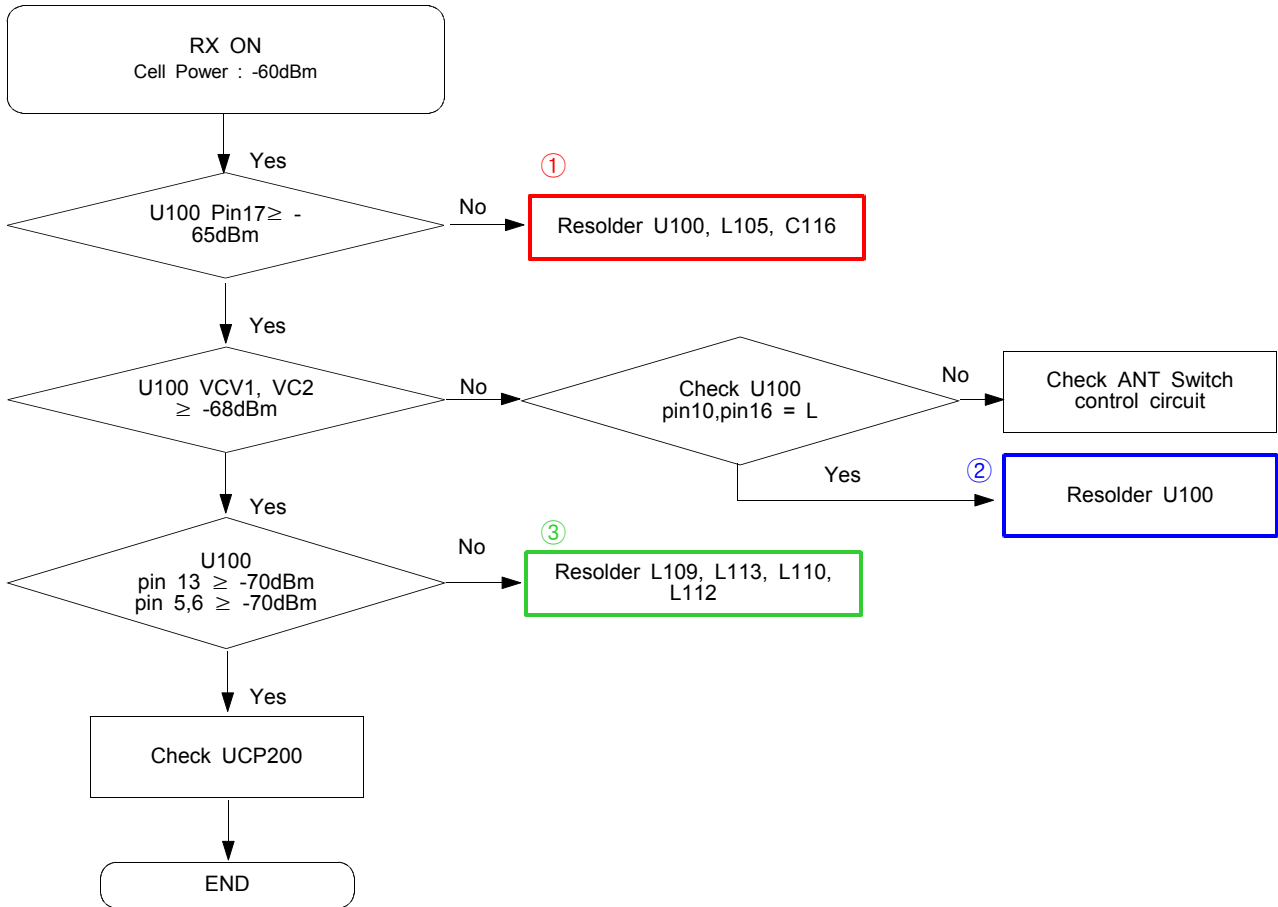


FM RADIO

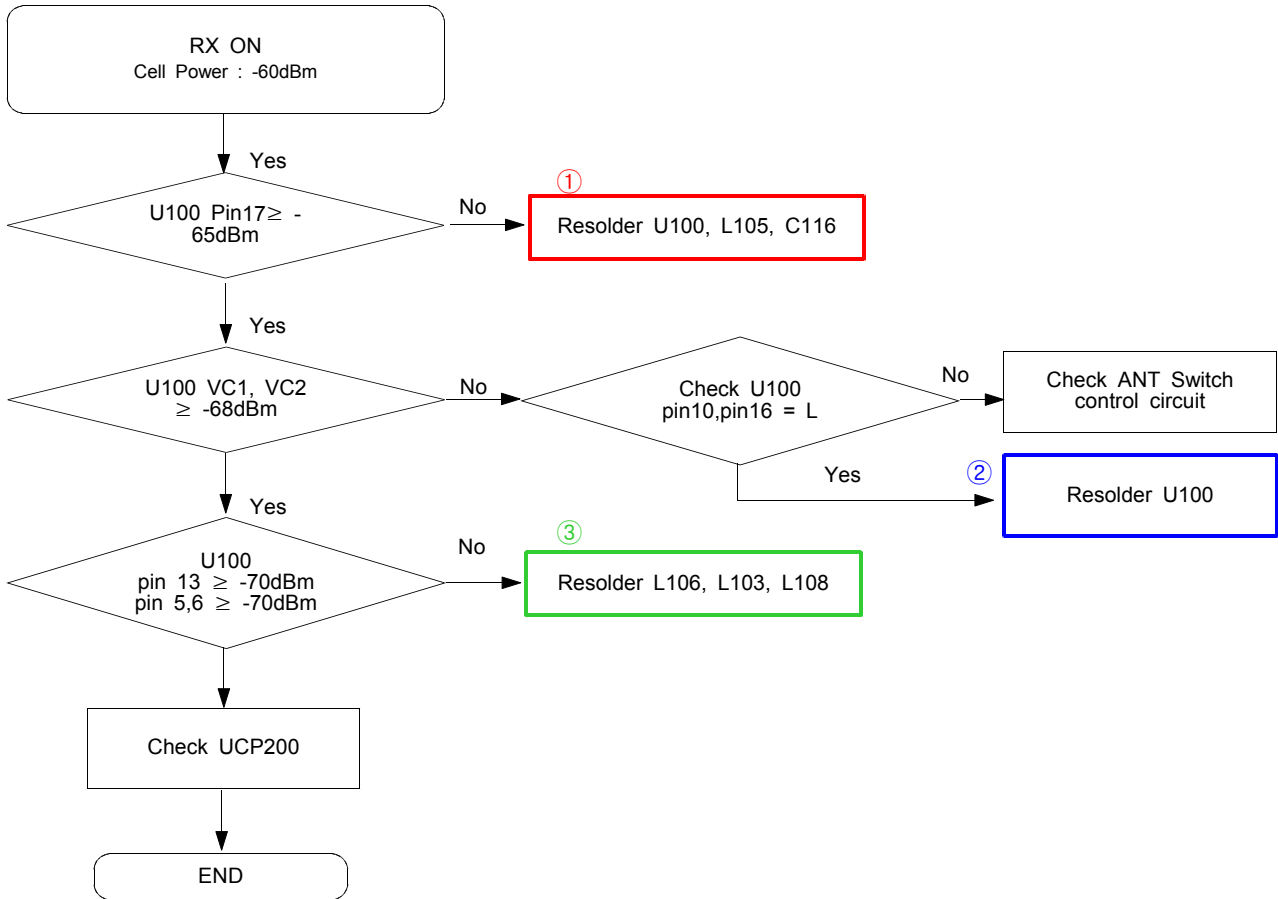
9-10. GSM Receiver



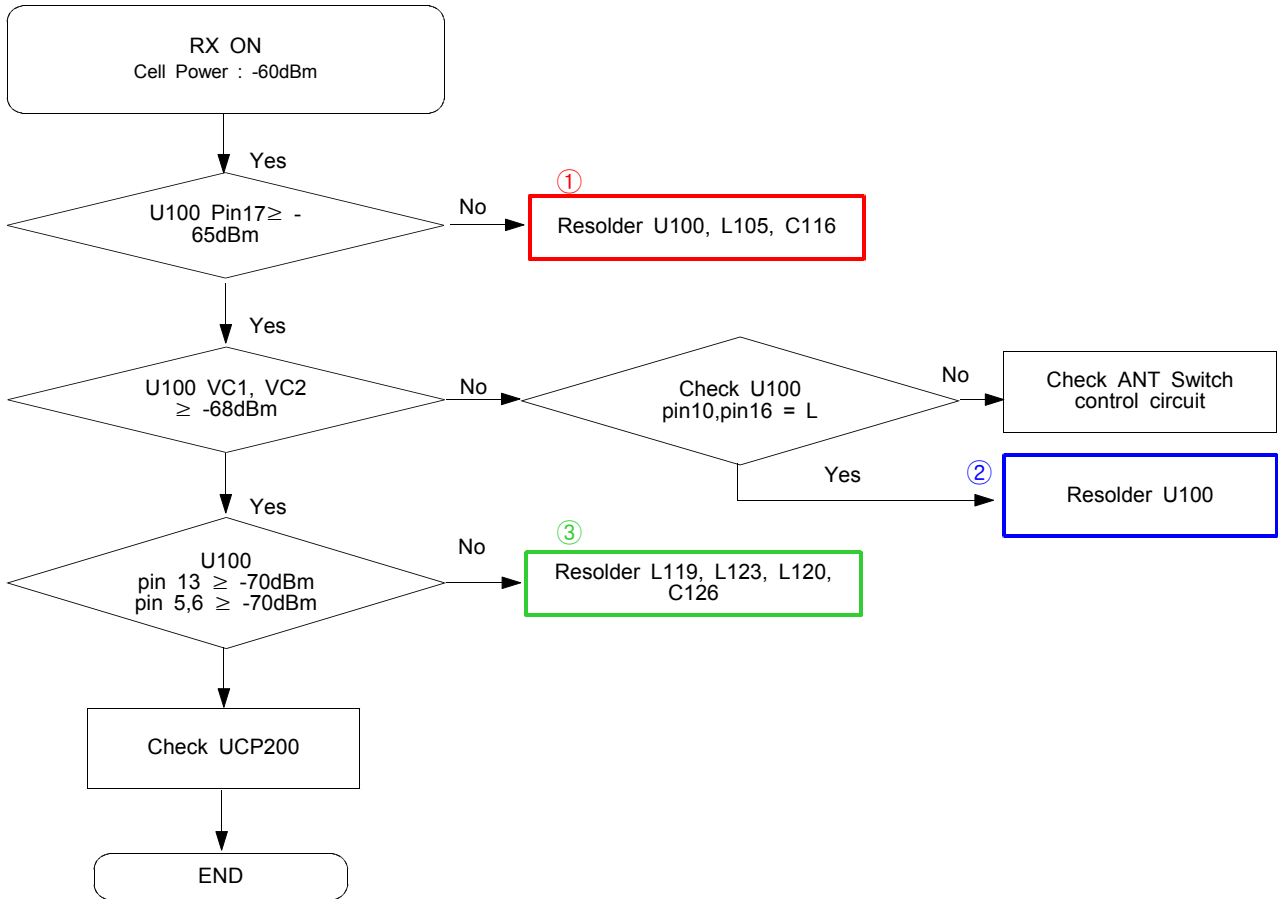
9-11. DCS Receiver

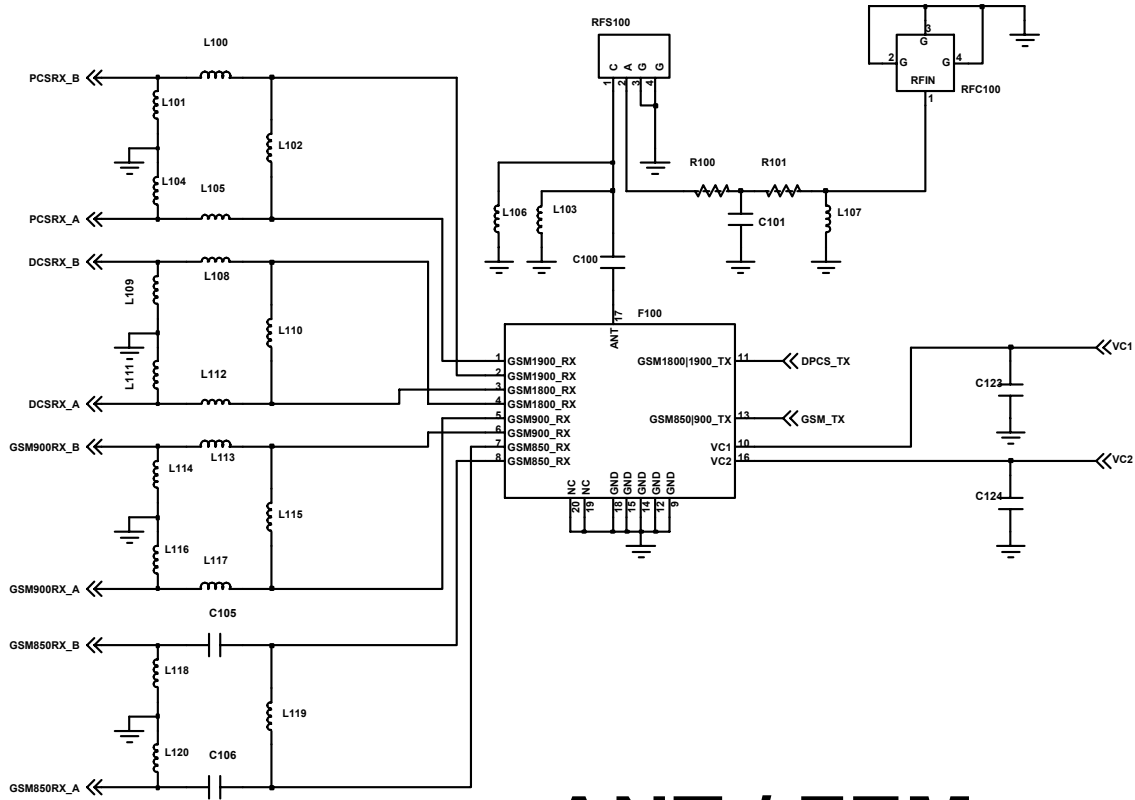


9-12. PCS Receiver

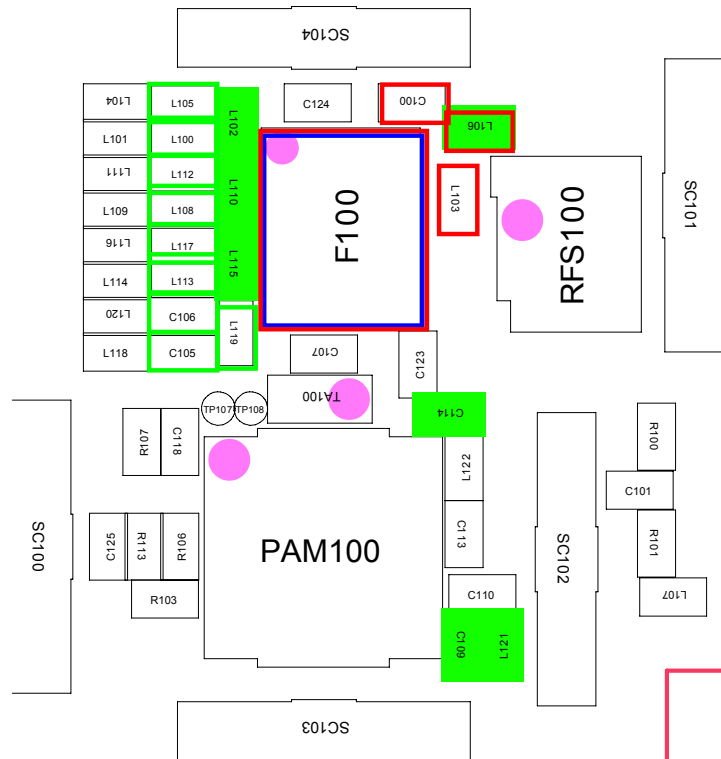


9-13. GSM850 Receiver

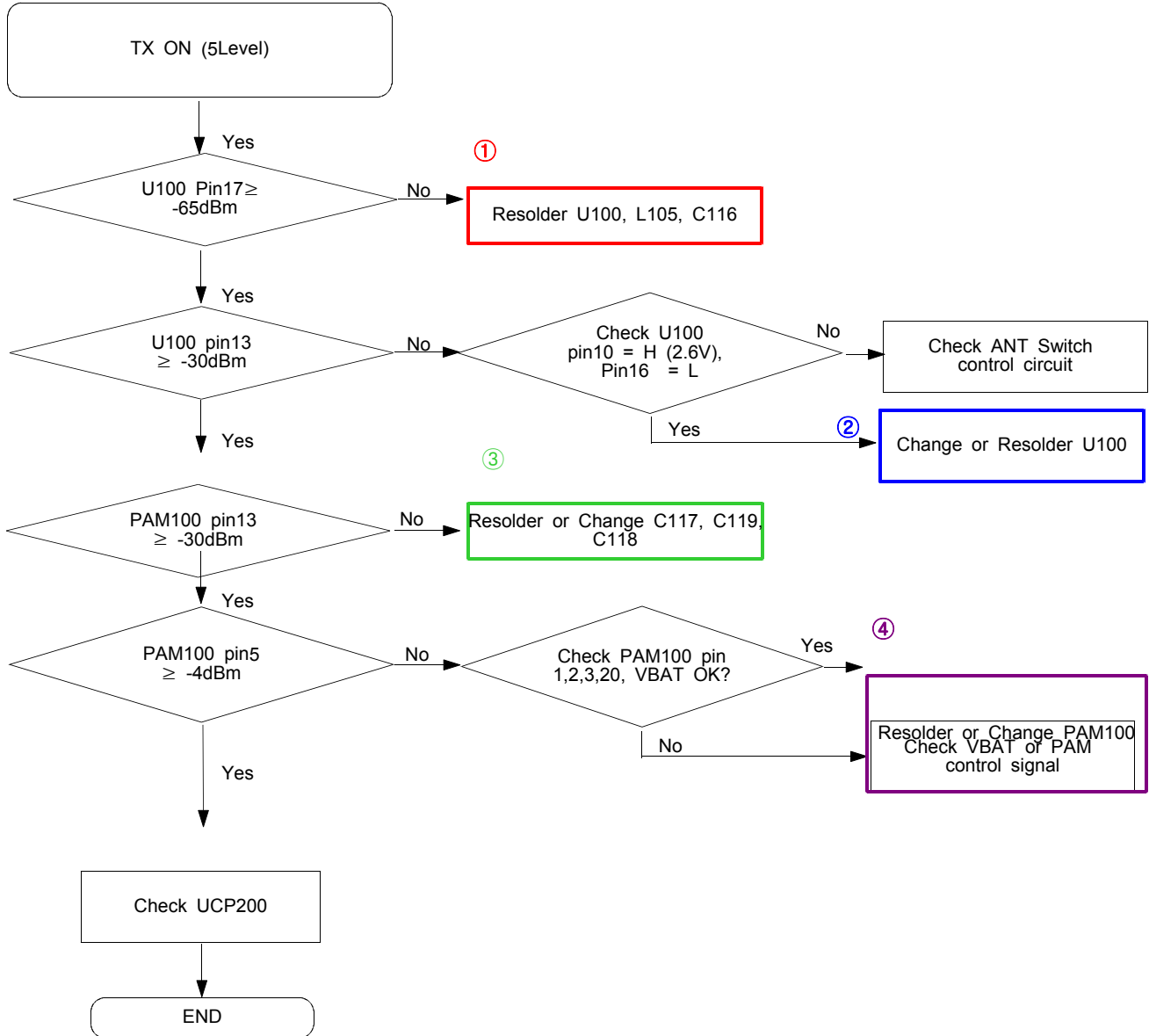




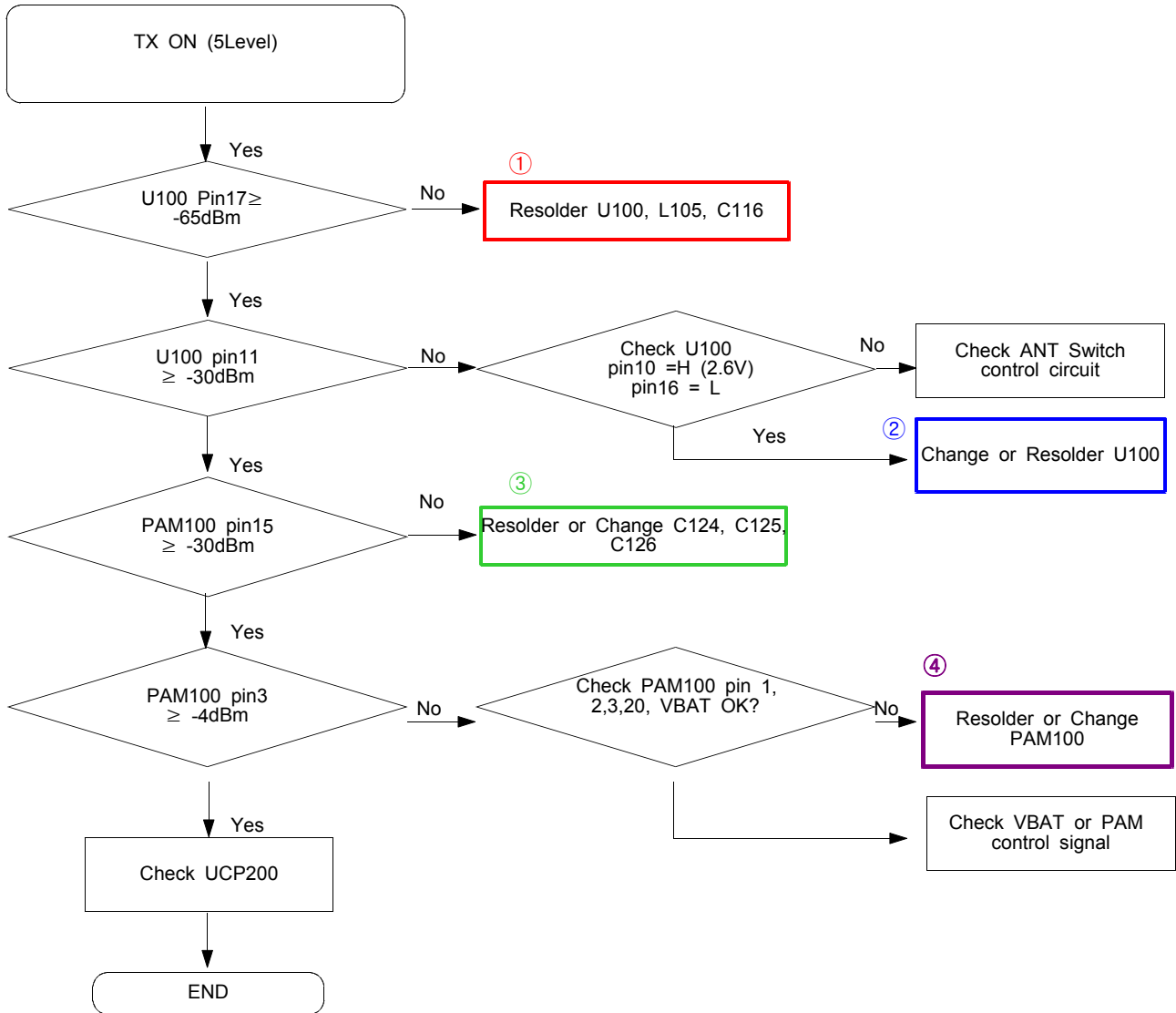
ANT / FEM

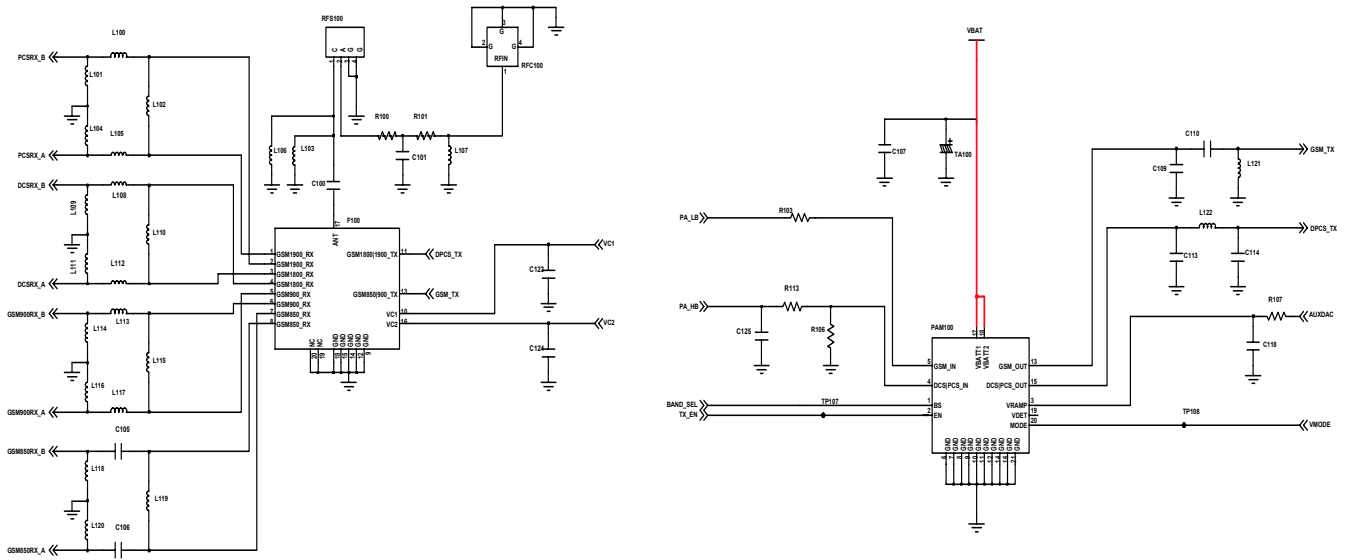


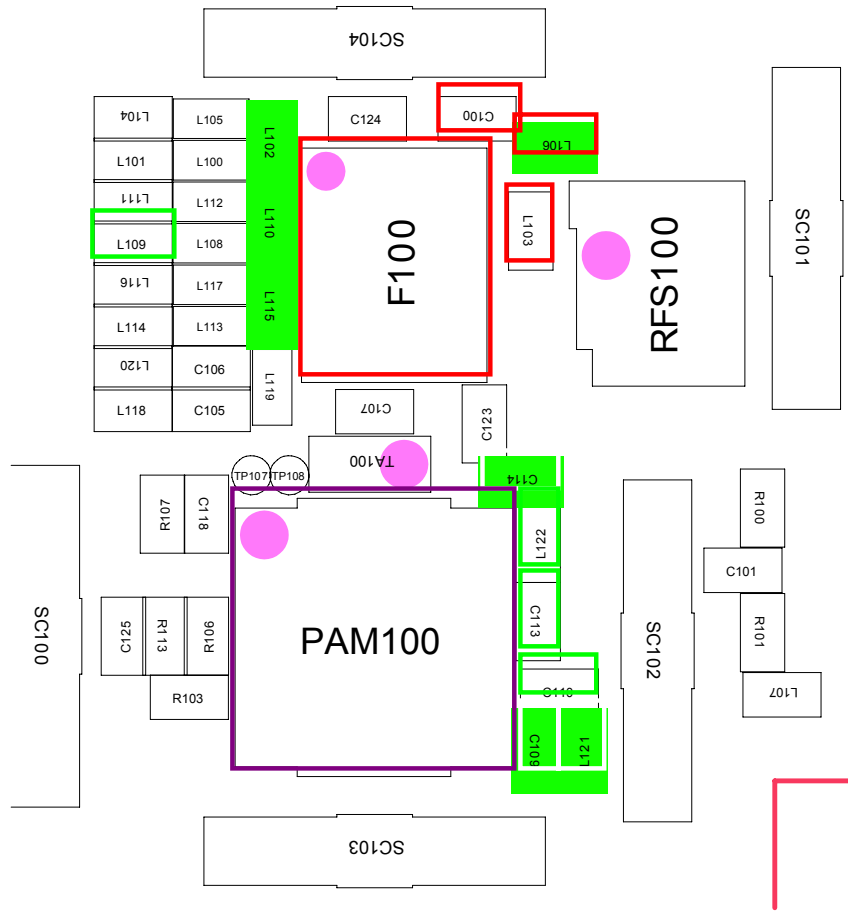
9-14. GSM850/900 Transmitter



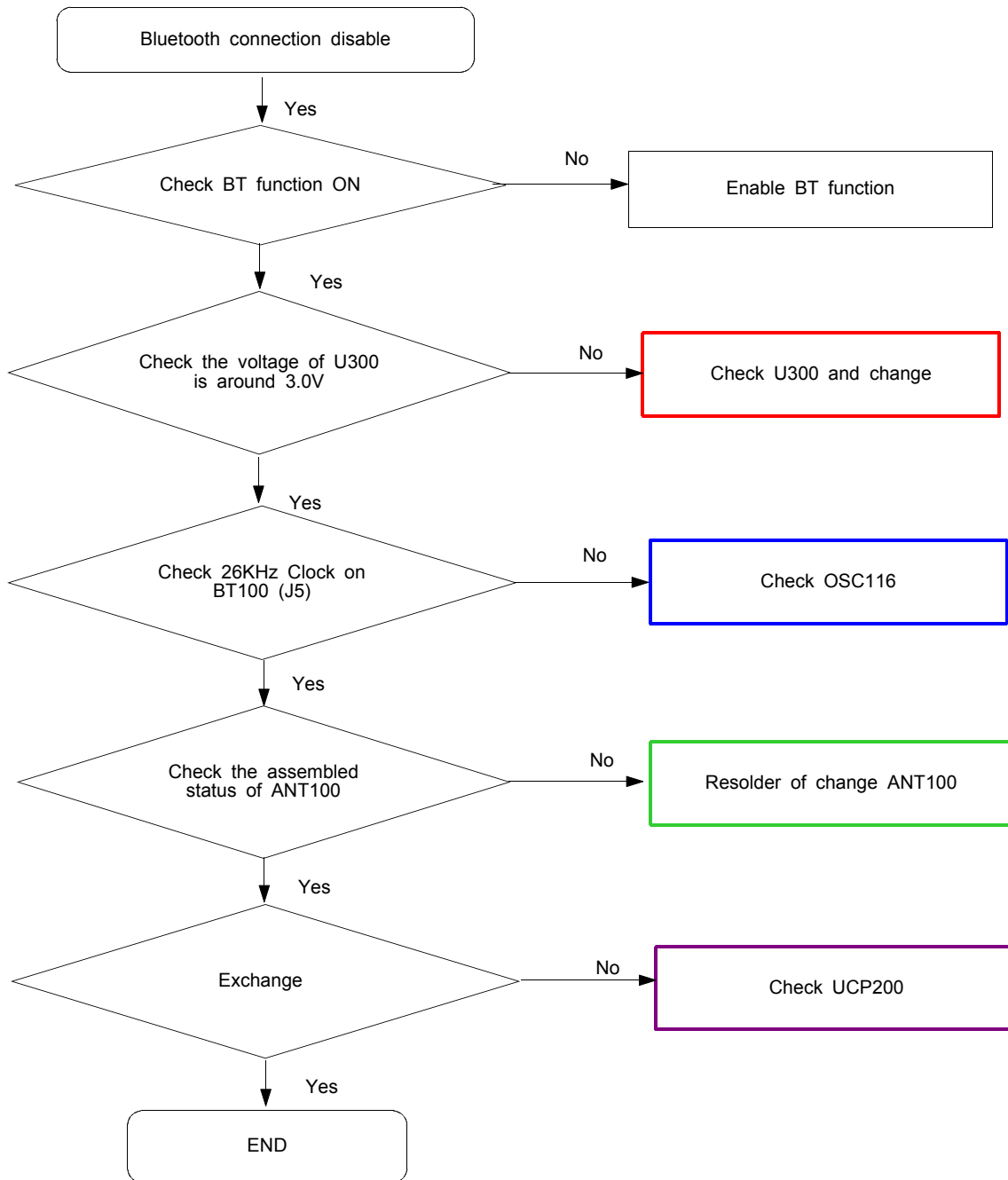
9-15. DCS/PCS Transmitter

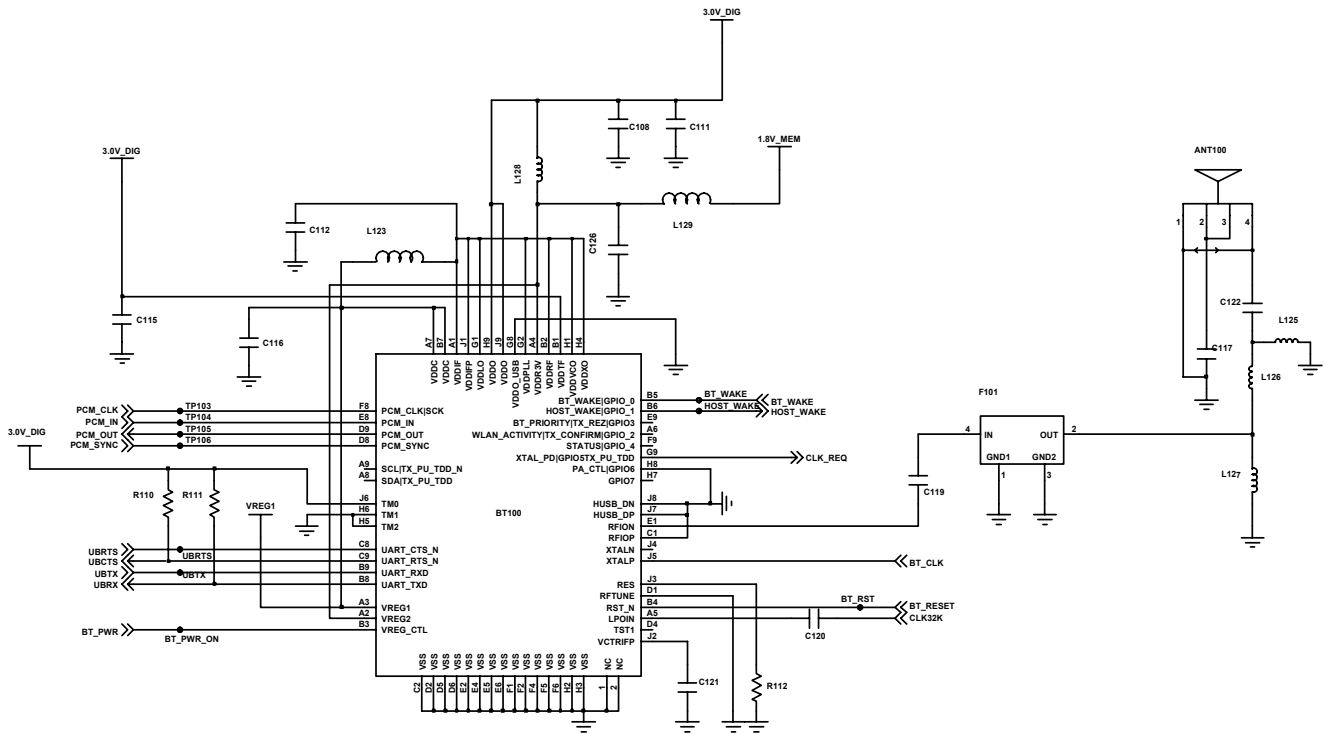
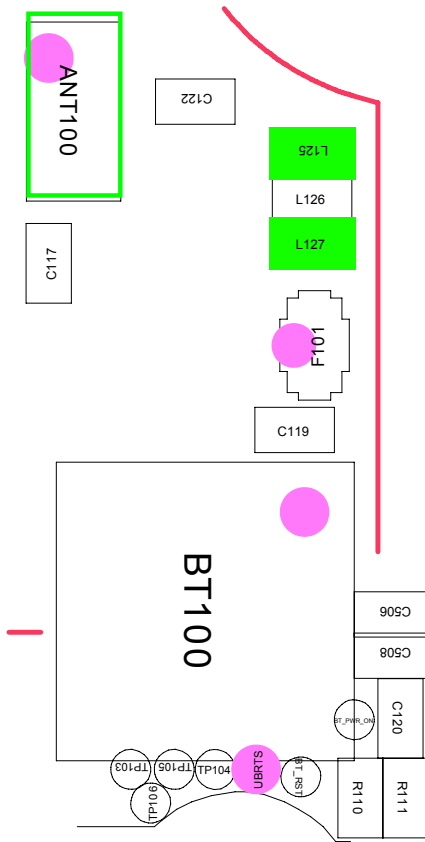






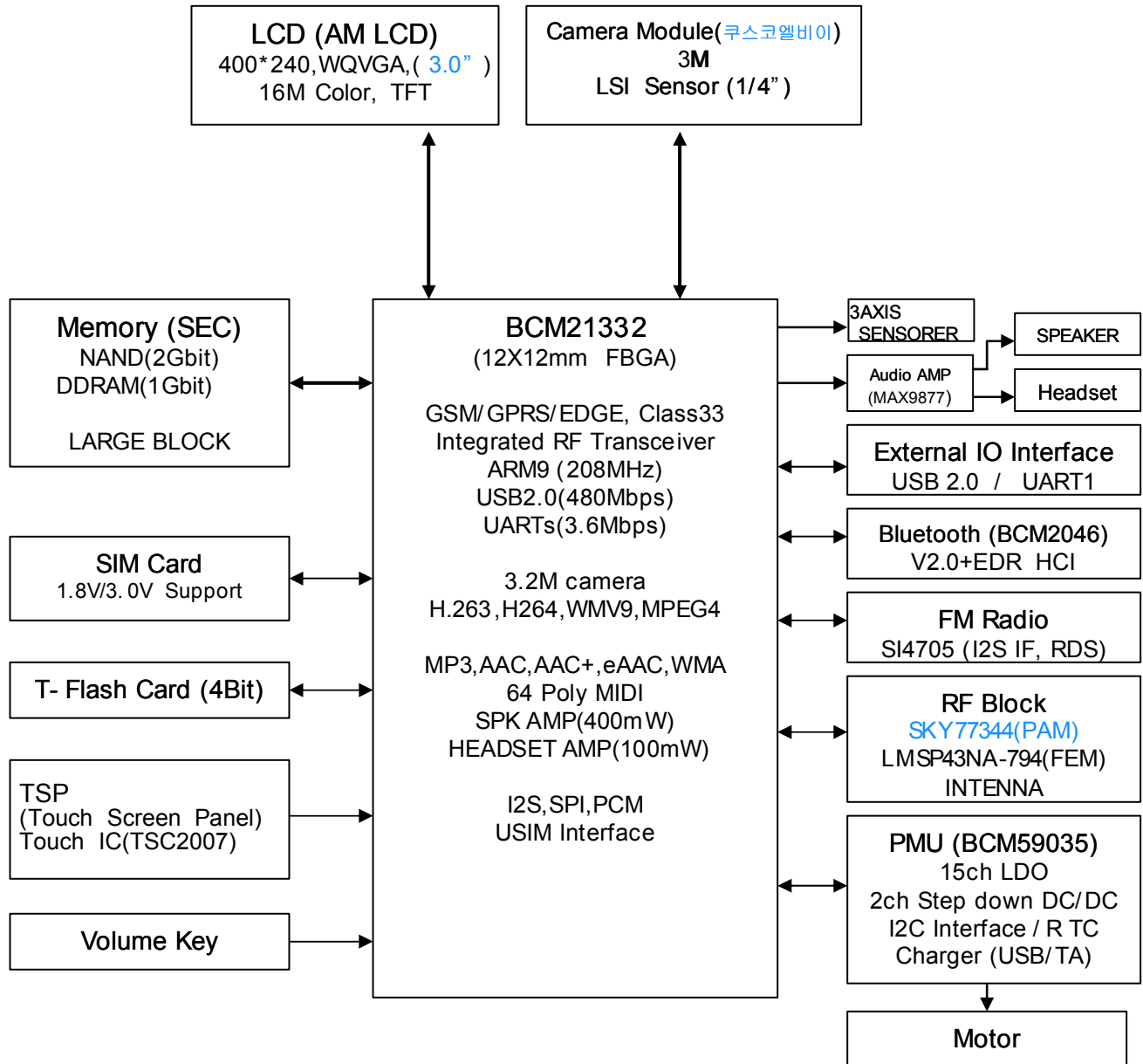
9-18 Bluetooth part



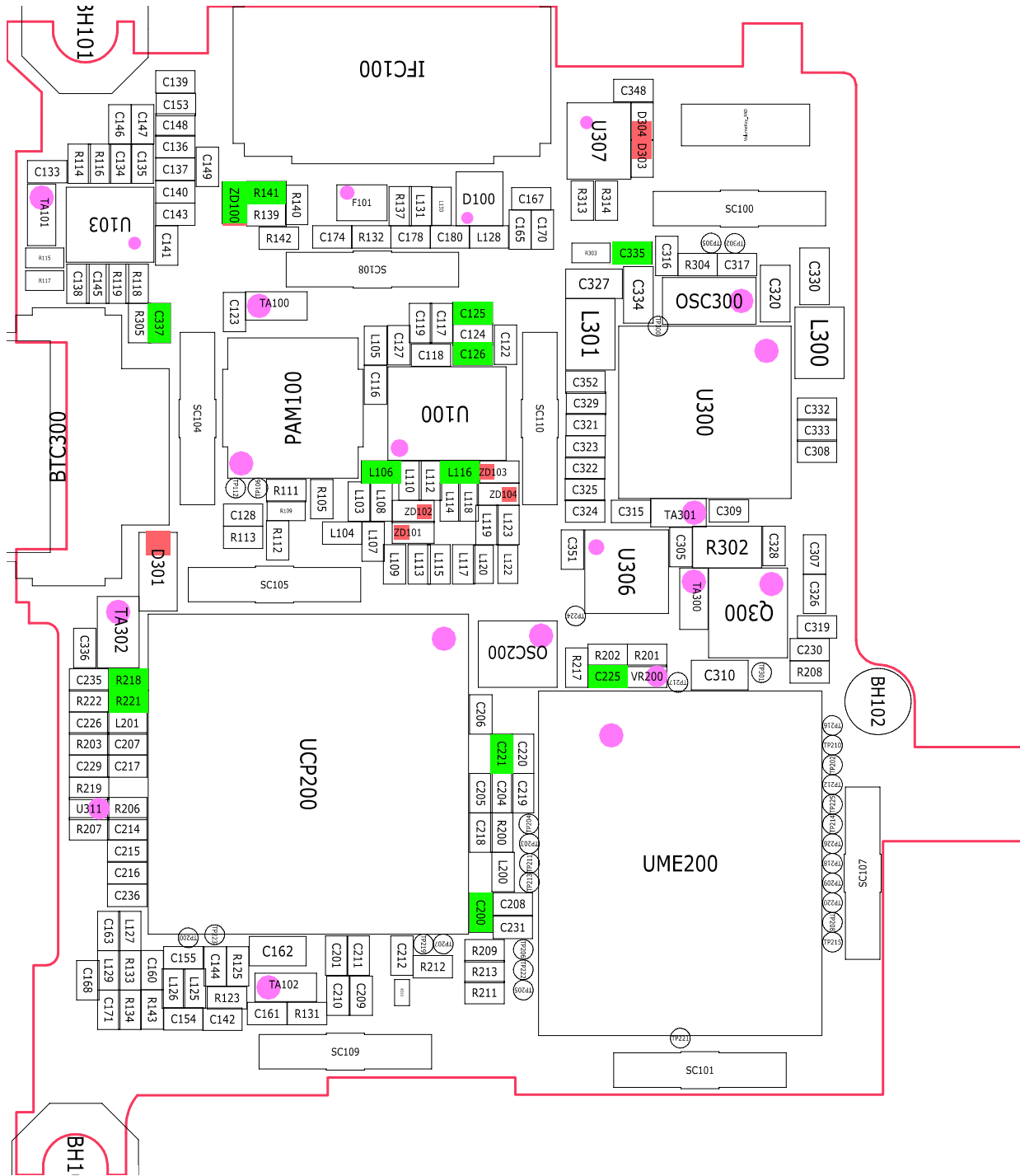


7. Block Diagrams

BB & RF PART (ONE CHIP MODULE)



8-2. Bottom



- This Document can not be used without Samsung's authorization -

5-2. Cellular phone Parts list : GT-S5230DIAXEZ

Design LOC	Description	SEC CODE
QAN02	INTENNA-MAIN (GT-S5230)	GH42-02003A
QAN03	INTENNA-BT (GT-S5230)	GH42-02041A
QBC00	ASSY COVER-BATTERY EU	GH98-13721C
QCA01	ASSY CAMERA-3M MODULE(GT-S5230)	GH96-03801A
QCB01	CBF COAXIAL CABLE-SCH-W450	GH39-01027A
QCK01	PMO KEY-CAMERA EVA	GH72-54573A
QCK02	PMO KEY-HOLD	GH72-54583C
QCR101	SCREW-MACHINE	6001-002005
QCR91	SCREW-MACHINE	6001-002260
QFR01	ASSY CASE-FRONT	GH98-11970C
QIF01	PMO COVER-IF	GH72-54582C
QKP01	ASSY KEYPAD-(EU/SWEET PINK)	GH98-11972C
QLB01	ASSY BRACKET-LCD	GH98-12528A
QLC01	ELA MODULE-3.0" WQVGA GT-S5230 TFT ASSY	GH96-03865A
QLC03	ASSY ETC-LCD FPCB(GT-S5230)	GH59-07300A
QME03	TOUCH/PANEL-GT_S5230(EU S/PNK)	GH59-07302C
QMO01	MOTOR DC-SCHC250	GH31-00323A
QMP01	A/S ASSY-PBA MAIN(GT-S5230 SVC)	GH82-03617A
QMP02	KEY FPCB-SUB KEY PBA(GT-S5230)	GH59-07301A
QRE01	ASSY CASE-REAR	GH98-11971C
QSH01	ASSY COVER-SHIELD CAN TOP	GH98-13258A
QSH02	ICT SHIELD-CAN BTM	GH70-04837A
QSP01	MODULE-SPEAKER (GT-S5230)	GH59-07536A
QVK01	KEY FPCB-VOLUME KEY(GT-S5230)	GH59-07298A
QVO01	PMO KEY-VOLUME	GH72-54584C

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