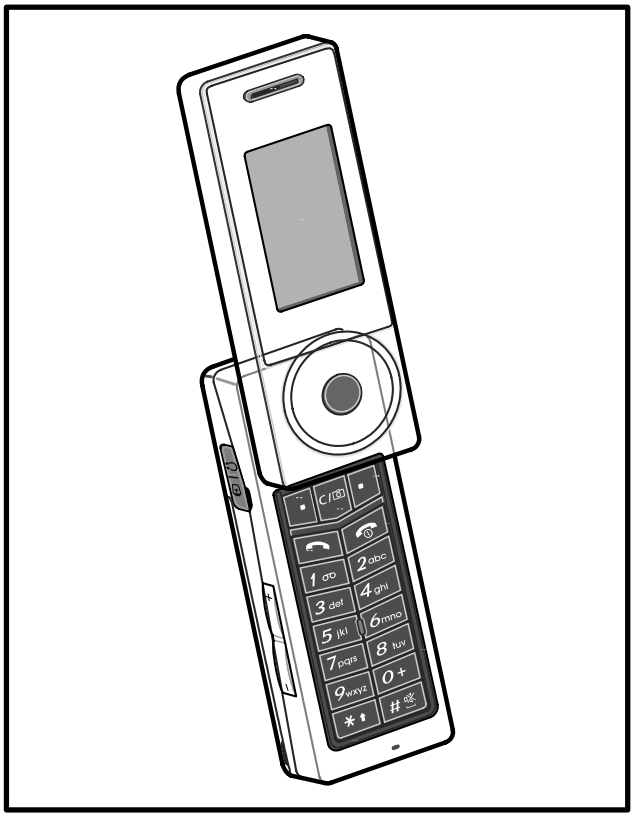
SAMSUNG

GSM TELEPHONE

SGH-X830

SERVICE Manual

GSM TELEPHONE



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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 disassembing 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.

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1-2. ESD(Electrostatically Sensitive Devices) Precaution

Several semiconductor may be damaged easilly by static electricity. Such parts are called by ESD(Electrostatically Sensitive Devices), for example IC,BGA chip etc. Read Precaution below. You can prevent from ESD damage by static electricity.

- Remove static electricity remained your body before you touch semiconductor or parts with semiconductor. There are ways that you touch an earthed place or wear static electricity prevention string on wrist.

- Use earthed soldering steel when you connect or disconnect ESD.

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

- Don't unpack until you set up ESD on product. Because most of ESD are packed by box and aluminum plate to have conductive power,they are prevented from static electricity.

- You must maintain electric contact between ESD and place due to be set up until ESD is connected completely to the proper place or a circuit board.

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2. Specification

2-1. GSM General Specification

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

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2-2. GSM TX power class

TX Power control level	GSM900
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

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3. Product Function

3-1. Main Function

- Camera and camcorder
- Music player
- Windows Media Player
- Bluetooth
- Web browser
- Offline mode
- Multimedia Message Service(MMS)
- SOS message
- Get personal with photo caller ID
- Name card
- Java
- Voice recorder

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4. Array course control

Test Jig (GH80-03307A)

Test Cable (GH39-00501A)

RF Test Cable (GH39-00397A)

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Software Downloading

4-1. Downloading Binary Files

- Three binary files for downloading X830.
  - X830XXYY.s3 : Main source code binary.

4-2. Pre-requsite for Downloading

- Downloader Program(OptiFlash.exe)
- X830 Mobile Phone
- Data Cable
- Binary files

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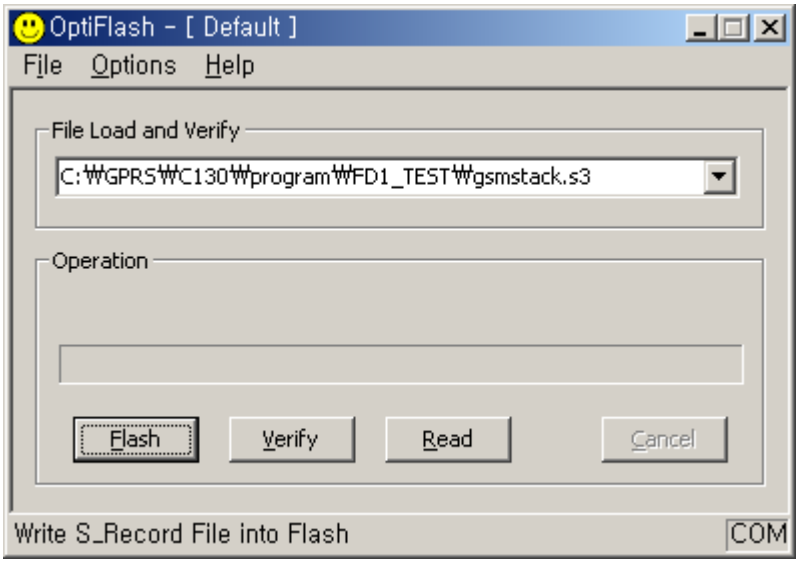
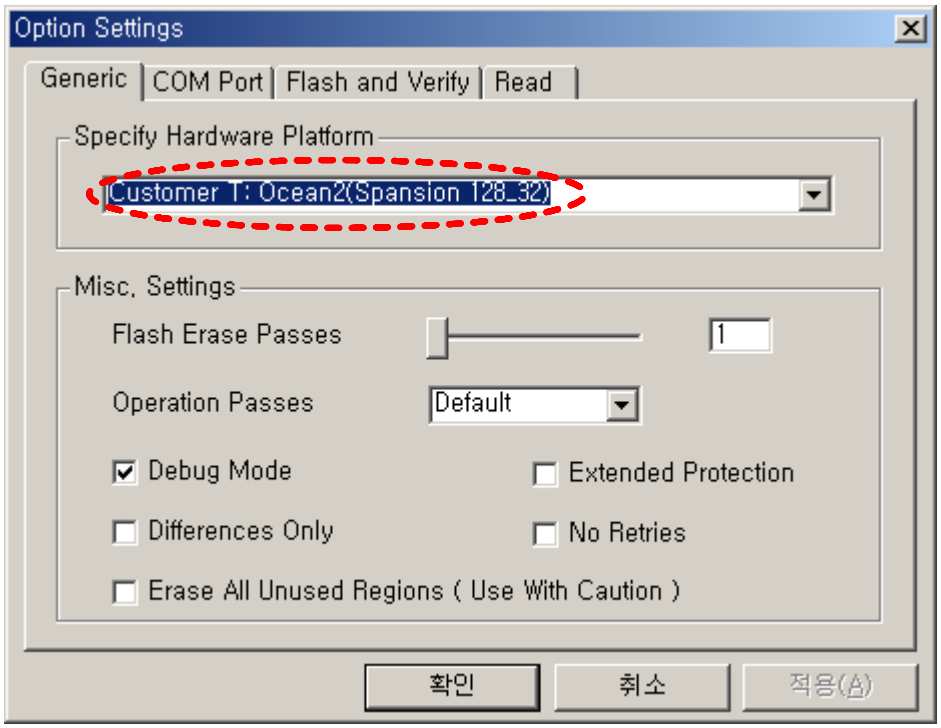
4-3. S/W Downloader Program

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



2. Select the **"Options" -> "Settings" -> "Generic" -> "Specify hardware platform"**.♪ Choose hardware platform for the downloader file setting.♪
Set the everything else as the default values which are shown below



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

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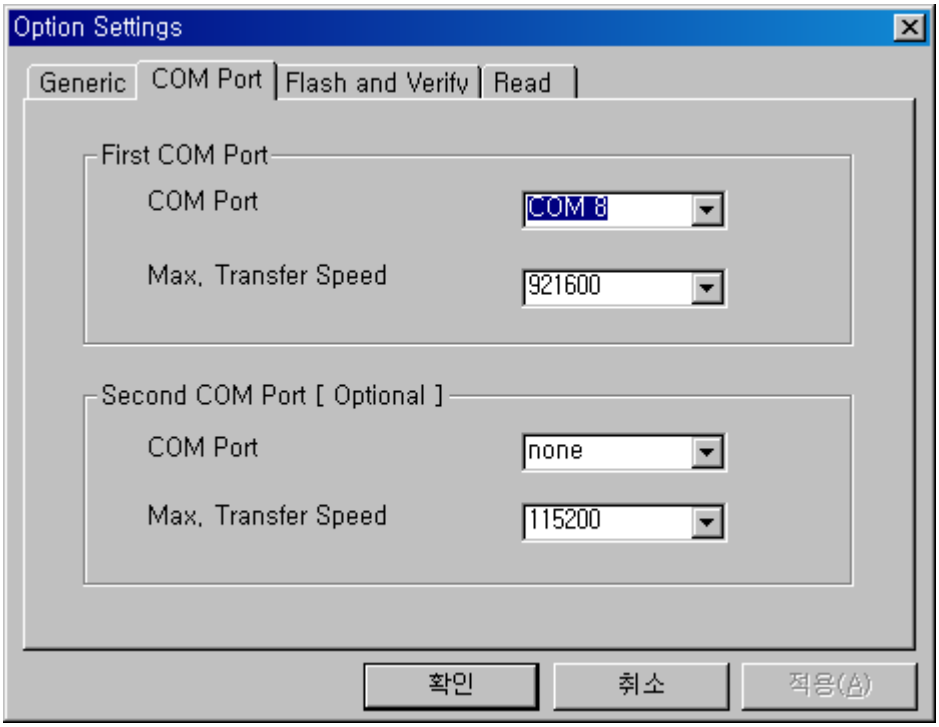

Up to twelve ports are supported. Additionally you can select the maximum transfer speed OptiFlash will use to communicate with the phone. However, OptiFlash will use a slower speed if either the PC's or the phone's serial hardware is incapable of handling the selected speed

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

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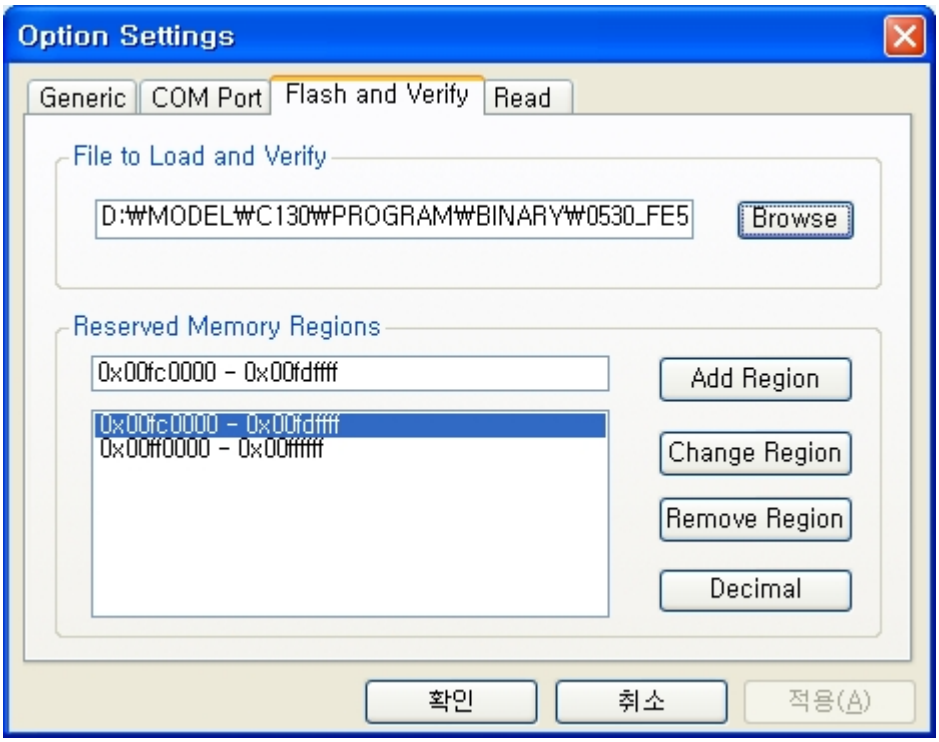
Set the directory path and choose the latest s/w binary, for example “XC30XXYY.s3”,♪for the downloader binary setting.



Make sure that not to change the reserved memory regions.♪

In case of C130 the reserved regions are :♪

-0x00fc0000 – 0x00ffffff♪

5. Click “**OK**” button then press “**Flash**”.♪

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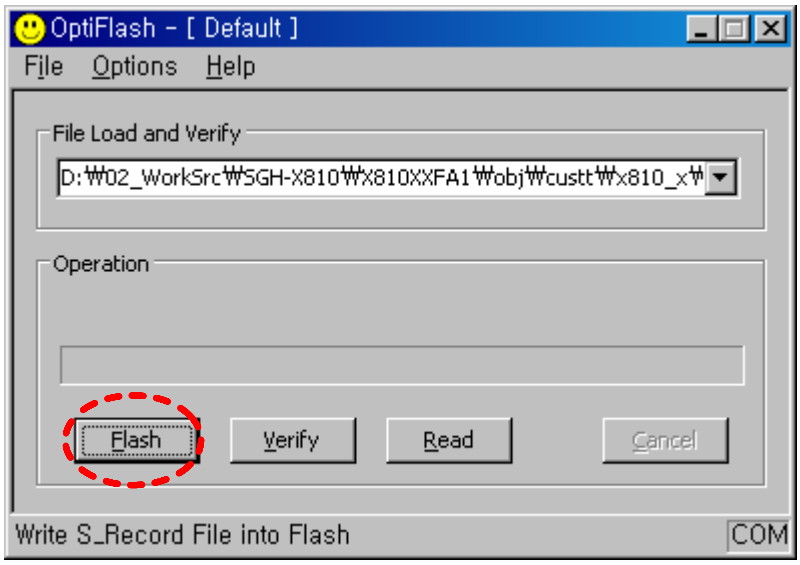
(Before pressing ‘Flash’ button, push the button **‘*’and ‘END’ at the same time**. Then press ‘Flash’.)♪

Downloader will upload the binary file as below for the downloading. ♪



6. When downloading is finished successfully, there is a “All is well” message. ♪

7. After finishing downloading, Certain memory resets should be done to guarantee the normal performance.♪

8. Confirm the downloaded version name and etc. :♪

***#1234#♪**

Full Reset : ♪

***2767*3855#**

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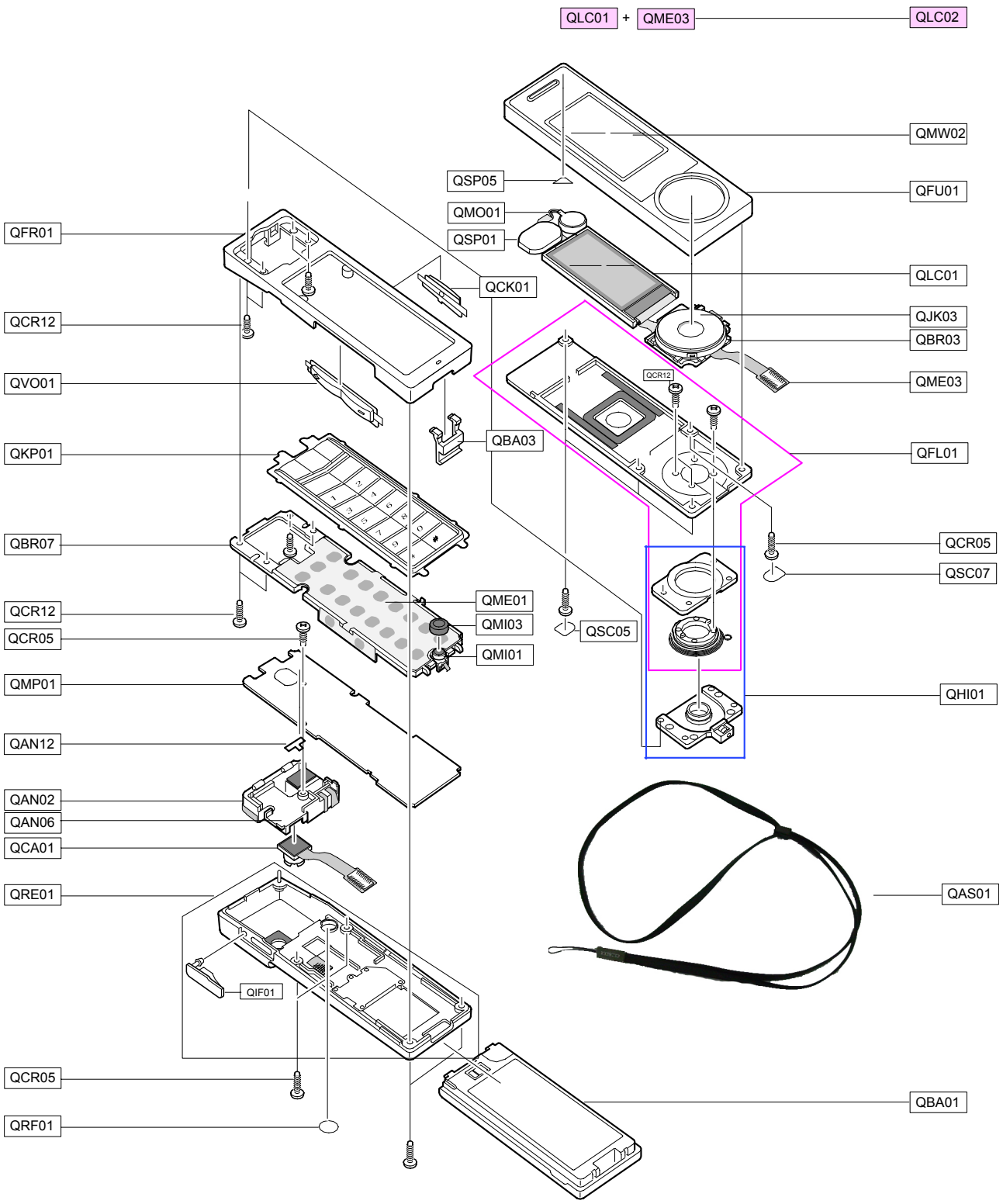
5. Exploded View and Parts List

5-1. Cellular phone Exploded View



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5-2. Cellular phone Parts list

Design LOC		Discription	SEC CODE
QAN02		INTENNA-SGH-X830	GH42-00922A
QAN06		ASSY-COVER-INTENNA	GH98-00875A
QAN12		ASSY-CUSHION-INTENNA CONTACT R	GH98-00966A
QAS01		ASSY ACCE-NECKLACE	GH98-02257B
QBA01		BATTERY-700MAH,PNK,ENG,M	GH43-02512E
QBA03		PMO-LOCKER BATT	GH72-30502E
QBR03		ASSY ACCE-BRACKET NAVI KEY	GH98-01857A
QBR07		ASSY-BRACKET-FRONT	GH98-00876A
QCA01		UNIT-CAMERA MODULE	GH59-03287A
QCK01		PMO-KEY MP3	GH72-30509A
QCR05		SCREW-MACHINE	6001-001478
QCR05		SCREW-MACHINE	6001-001478
QCR05		SCREW-MACHINE	6001-001478
QCR12		SCREW-MACHINE	6001-001530
QFR01		ASSY-CASE-FRONT	GH98-00871A
QFU01		ASSY ACCE-SWING UPPER	GH98-00872E
QJK03		UNIT-JOG KEY(PNK)	GH59-03383D
QKP01		ASSY KEYPAD-(XET/CI)	GH98-00877E
QMI03		RMO-RUBBER MIC 2	GH73-08467A
QMO01		MOTOR DC-SGHE360	GH31-00198A
QMP01		PBA MAIN-SGH X830	GH92-02741A
QMW02		PMO-COVER MAIN WINDOW	GH72-30514E
QRF01		MPR-TAPE RF	GH74-22776E
QSC05		MPR-TAPE-FOLDER SCREW CAP TOP	GH74-22770B
QSC07		MPR-TAPE FOLDER SCREW CAP BTM	GH74-22771B
QSP01		SPEAKER	3001-002004
QSP05		ASSY RUBBER-CUSHION SPK HOLE	GH98-02029A
QVO01		PMO-KEY VOLUME	GH72-30508A
QME01		UNIT-KEY FPCB	GH59-03266A
	QMI01	AS-MIC SVC	GH81-06075A
QRE01		ASSY ACCE-REAR	GH98-00874E
	QIF01	PMO-COVER EAR IF	GH72-30507E
QFL01		ASSY ACCE-SWING LOWER	GH98-00873B
	QCR12	SCREW-MACHINE	6001-001530
	QHI01	ASSY ACCE-HINGE	GH98-00931A
QLC02		ELA UNIT-SGHX830 LCD MODULE	GH96-02253A
	QLC01	LCD-MAIN	GH07-00828A
	QME03	UNIT-LCD FPCB	GH59-03267A

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Discription	SEC CODE
BAG PE	6902-000297
CBF INTERFACE-DATA LINK CABLE	GH39-00444B
CBF INTERFACE-MIC CABLE(SIL)	GH39-00625C
ADAPTOR-SGHD800 TA(UK)	GH44-01131B
S/W CD-SAMSUNG PC STUDIO 3.1,	GH46-00306A
UNIT-EARPHONE(SIL)	GH59-03407B
LABEL(P)-IMEI	GH68-01335D
LABEL(P)-WATER SOAK	GH68-02026A
LABEL(P)-WATER SOAK	GH68-02026A
MANUAL USERS-EU ENGLISH	GH68-11877A
LABEL(R)-MAIN(EU)	GH68-12395A
LABEL(R)-INTENNA BLACK	GH68-12788A
BOX(P)-UNIT MAIN(XEU)	GH69-04449E
CUSHION-CASE-UK	GH69-04451A
MPR-TAPE MAIN WINDOW	GH74-22761A
MPR-CUSHION MOTOR	GH74-22766A
MPR-TAPE LCD BTM MASKING	GH74-22777A
MPR-TAPE MASKING LCD	GH74-23786A
MPR-TAPE MASKING NAVI CONN	GH74-23787A
MPR-TAPE MASKING MAIN KEY CONN	GH74-23788A
MPR-TAPE MAIN KEY FPCB	GH74-23797A
MPR-TAPE MASKING SM LCD	GH74-24546A
MPR-TAPE PCB CONDUCT	GH74-25841A
MPR-SPONGE HINGE CONTACT	GH74-25842A
MPR-INSU TAPE	GH74-28788A
MPR-VINYL BOHO WINDOW	GH74-28953A

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6. MAIN Electrical Parts List

SEC CODE	Design LOC	Discription	STATUS
0403-001446	ZD301	DIODE-ZENER	SA
0403-001446	ZD506	DIODE-ZENER	SA
0403-001547	D603	DIODE-ZENER	SA
0403-001547	D604	DIODE-ZENER	SA
0404-001172	D101	DIODE-SCHOTTKY	SA
0406-001190	D601	DIODE-TVS	SA
0406-001201	ZD505	DIODE-TVS	SA
0406-001208	ZD503	DIODE-TVS	SA
0406-001208	ZD504	DIODE-TVS	SA
0406-001239	D609	DIODE-TVS	SA
0406-001254	D606	DIODE-TVS	SA
0406-001254	D607	DIODE-TVS	SA
0406-001254	D608	DIODE-TVS	SA
0406-001254	V401	DIODE-TVS	SA
0406-001254	V402	DIODE-TVS	SA
0504-000168	Q101	TR-DIGITAL	SA
0801-002237	U304	IC-CMOS LOGIC	SA
0801-002529	U102	IC-CMOS LOGIC	SA
0801-002958	U702	IC-CMOS LOGIC	SA
0801-003121	U602	IC-CMOS LOGIC	SA
1001-001371	U403	IC-ANALOG SWITCH	SA
1001-001401	U603	IC-ANALOG SWITCH	SA
1107-001609	UME307	IC-FLASH MEMORY	SA
1108-000068	UME202	IC-MCP	SA
1201-002233	PAM404	IC-AUDIO AMP	SA
1201-002368	PAM700	IC-POWER AMP	SA
1203-003328	U502	IC-DC/DC CONVERTER	SA
1203-003432	U113	IC-POSI.FIXED REG.	SA
1203-003432	U301	IC-POSI.FIXED REG.	SA
1203-003730	U503	IC-POSI.FIXED REG.	SA
1203-003742	U110	IC-BATTERY	SA
1203-003754	U303	IC-POSI.FIXED REG.	SA
1203-003973	U300	IC-POSI.FIXED REG.	SA
1203-004119	CPU100	IC-POWER SUPERVISOR	SA
1203-004135	U311	IC-POSI.FIXED REG.	SA
1203-004161	U310	IC-DC/DC CONVERTER	SA
1203-004164	U112	IC-DC/DC CONVERTER	SA

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SEC CODE	Design LOC	Discription	STATUS
1203-004355	U302	IC-MULTI REG.	SA
1203-004377	U312	IC-MULTI REG.	SA
1205-002272	U601	IC-TRANSCEIVER	SA
1205-002944	U701	IC-TRANSCEIVER	SA
1205-002946	UCD405	IC-CODEC	SA
1404-001165	TH101	THERMISTOR-NTC	SA
1405-001082	D605	VARISTOR	SA
1405-001082	V400	VARISTOR	SA
1405-001082	V503	VARISTOR	SA
1405-001082	V603	VARISTOR	SA
1405-001108	V202	VARISTOR	SA
1405-001108	ZD501	VARISTOR	SA
1405-001108	ZD502	VARISTOR	SA
1405-001161	VR500	VARISTOR	SA
1405-001161	VR501	VARISTOR	SA
1405-001161	VR502	VARISTOR	SA
2007-000138	R323	R-CHIP	SA
2007-000139	R608	R-CHIP	SA
2007-000139	R611	R-CHIP	SA
2007-000139	R702	R-CHIP	SA
2007-000139	R725	R-CHIP	SA
2007-000140	R504	R-CHIP	SA
2007-000157	R407	R-CHIP	SA
2007-000162	R617	R-CHIP	SA
2007-000170	R338	R-CHIP	SA
2007-000170	R401	R-CHIP	SA
2007-000170	R402	R-CHIP	SA
2007-000171	F401	R-CHIP	SA
2007-000171	F500	R-CHIP	SA
2007-000171	L709	R-CHIP	SA
2007-000171	L712	R-CHIP	SA
2007-000171	R403	R-CHIP	SA
2007-001119	R412	R-CHIP	SA
2007-001290	R337	R-CHIP	SA
2007-001290	R610	R-CHIP	SA
2007-001290	R612	R-CHIP	SA
2007-001290	R700	R-CHIP	SA

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SEC CODE	Design LOC	Discription	STATUS
2007-003010	R420	R-CHIP	SA
2007-003010	R425	R-CHIP	SA
2007-007014	R321	R-CHIP	SA
2007-007014	R322	R-CHIP	SA
2007-007134	R707	R-CHIP	SA
2007-007136	R114	R-CHIP	SA
2007-007142	R415	R-CHIP	SA
2007-007142	R418	R-CHIP	SA
2007-007142	R431	R-CHIP	SA
2007-007142	R435	R-CHIP	SA
2007-007308	R111	R-CHIP	SA
2007-007314	R112	R-CHIP	SA
2007-007468	R120	R-CHIP	SA
2007-007468	R391	R-CHIP	SA
2007-007528	R413	R-CHIP	SA
2007-007528	R414	R-CHIP	SA
2007-007528	R430	R-CHIP	SA
2007-007528	R614	R-CHIP	SA
2007-007588	R429	R-CHIP	SA
2007-007590	R416	R-CHIP	SA
2007-007590	R419	R-CHIP	SA
2007-007590	R428	R-CHIP	SA
2007-007590	R439	R-CHIP	SA
2007-007698	R531	R-CHIP	SA
2007-007741	R101	R-CHIP	SA
2007-007741	R704	R-CHIP	SA
2007-007798	R432	R-CHIP	SA
2007-007798	R436	R-CHIP	SA
2007-008043	R471	R-CHIP	SA
2007-008043	R472	R-CHIP	SA
2007-008044	R506	R-CHIP	SA
2007-008044	R507	R-CHIP	SA
2007-008044	R508	R-CHIP	SA
2007-008044	R509	R-CHIP	SA
2007-008044	R510	R-CHIP	SA
2007-008044	R512	R-CHIP	SA
2007-008044	R513	R-CHIP	SA

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SEC CODE	Design LOC	Discription	STATUS
2007-008044	R514	R-CHIP	SA
2007-008044	R516	R-CHIP	SA
2007-008044	R520	R-CHIP	SA
2007-008044	R521	R-CHIP	SA
2007-008044	R523	R-CHIP	SA
2007-008044	R525	R-CHIP	SA
2007-008044	R527	R-CHIP	SA
2007-008044	R532	R-CHIP	SA
2007-008044	R560	R-CHIP	SA
2007-008045	R357	R-CHIP	SA
2007-008045	R515	R-CHIP	SA
2007-008045	R609	R-CHIP	SA
2007-008045	R713	R-CHIP	SA
2007-008045	R719	R-CHIP	SA
2007-008049	R561	R-CHIP	SA
2007-008052	R257	R-CHIP	SA
2007-008052	R258	R-CHIP	SA
2007-008055	R115	R-CHIP	SA
2007-008055	R116	R-CHIP	SA
2007-008055	R117	R-CHIP	SA
2007-008055	R143	R-CHIP	SA
2007-008055	R215	R-CHIP	SA
2007-008055	R230	R-CHIP	SA
2007-008055	R250	R-CHIP	SA
2007-008055	R254	R-CHIP	SA
2007-008055	R255	R-CHIP	SA
2007-008055	R393	R-CHIP	SA
2007-008055	R601	R-CHIP	SA
2007-008055	R621	R-CHIP	SA
2007-008275	R104	R-CHIP	SA
2007-008419	R102	R-CHIP	SA
2007-008419	R129	R-CHIP	SA
2007-008419	R602	R-CHIP	SA
2007-008419	R603	R-CHIP	SA
2007-008419	R604	R-CHIP	SA
2007-008419	R615	R-CHIP	SA
2007-008419	R627	R-CHIP	SA

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SEC CODE	Design LOC	Discription	STATUS
2007-008483	R141	R-CHIP	SA
2007-008483	R145	R-CHIP	SA
2007-008483	R146	R-CHIP	SA
2007-008483	R233	R-CHIP	SA
2007-008483	R242	R-CHIP	SA
2007-008483	R308	R-CHIP	SA
2007-008483	R311	R-CHIP	SA
2007-008483	R555	R-CHIP	SA
2007-008483	R556	R-CHIP	SA
2007-008483	R557	R-CHIP	SA
2007-008483	R562	R-CHIP	SA
2007-008483	R578	R-CHIP	SA
2007-008483	R579	R-CHIP	SA
2007-008483	R606	R-CHIP	SA
2007-008483	R613	R-CHIP	SA
2007-008516	R202	R-CHIP	SA
2007-008516	R355	R-CHIP	SA
2007-008516	R363	R-CHIP	SA
2007-008516	R390	R-CHIP	SA
2007-008516	R462	R-CHIP	SA
2007-008516	R518	R-CHIP	SA
2007-008516	R710	R-CHIP	SA
2007-008531	R533	R-CHIP	SA
2007-008531	R717	R-CHIP	SA
2007-008542	R103	R-CHIP	SA
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2007-008542	R201	R-CHIP	SA
2007-008542	R203	R-CHIP	SA
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2007-008542	R315	R-CHIP	SA

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2007-008588	R307	R-CHIP	SA
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2007-008588	R371	R-CHIP	SA
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2007-008808	R559	R-CHIP	SA
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2007-009160	R392	R-CHIP	SA
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2007-009170	R605	R-CHIP	SA
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2203-006260	C383	C-CER,CHIP	SA

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2203-006348	C602	C-CER,CHIP	SA
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2203-006423	C704	C-CER,CHIP	SA
2203-006423	C711	C-CER,CHIP	SA
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2203-006466	C108	C-CER,CHIP	SA
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2203-006562	C551	C-CER,CHIP	SA
2203-006562	C574	C-CER,CHIP	SA

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2203-006636	C552	C-CER,CHIP	SA
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2203-006648	C601	C-CER,CHIP	SA
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2404-001381	C411	C-TA,CHIP	SA
2404-001381	C427	C-TA,CHIP	SA

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2404-001381	C496	C-TA,CHIP	SA
2404-001381	C501	C-TA,CHIP	SA
2404-001381	C504	C-TA,CHIP	SA
2404-001381	C537	C-TA,CHIP	SA
2404-001381	C550	C-TA,CHIP	SA
2404-001381	C570	C-TA,CHIP	SA
2404-001397	C604	C-TA,CHIP	SA
2703-001178	L711	INDUCTOR-SMD	SA
2703-001747	L706	INDUCTOR-SMD	SA
2703-001747	L707	INDUCTOR-SMD	SA
2703-001748	L704	INDUCTOR-SMD	SA
2703-001748	L705	INDUCTOR-SMD	SA
2703-001750	L722	INDUCTOR-SMD	SA
2703-002199	C701	INDUCTOR-SMD	SA
2703-002597	L702	INDUCTOR-SMD	SA
2703-002597	L703	INDUCTOR-SMD	SA
2703-002714	L503	INDUCTOR-SMD	SA
2703-002734	L101	INDUCTOR-SMD	SA
2703-002734	L102	INDUCTOR-SMD	SA
2703-002910	L700	INDUCTOR-SMD	SA
2703-003097	L300	INDUCTOR-SMD	SA
2801-004458	OSC302	CRYSTAL-SMD	SA
2801-004466	OSC202	CRYSTAL-SMD	SA
2809-001293	TCX700	OSCILLATOR-VCTCXO	SA
2911-000056	DUF700	DUPLEXER-FEM	SA
3301-001208	L701	BEAD-SMD	SA
3301-001534	L401	BEAD-SMD	SA
3301-001534	L402	BEAD-SMD	SA
3301-001729	L400	BEAD-SMD	SA
3705-001358	RFS701	CONNECTOR-COAXIAL	SA
3708-002211	SLC502	CONNECTOR-FPC/FFC/PIC	SA
3709-001384	SIM101	CONNECTOR-CARD EDGE	SA

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SEC CODE	Design LOC	Discription	STATUS
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3711-005581	HDC500	HEADER-BOARD TO BOARD	SNA
3711-005643	HDC501	HEADER-BOARD TO BOARD	SA
3711-005980	BTC603	HEADER-BATTERY	SA
4202-001202	ANT104	ANTENNA-CHIP	SA
4302-001158	BAT101	BATTERY-LI(2ND)	SA
4709-001451	CPL103	BLUETOOTH MODULE	SA
GH09-00044A	CPU201	IC MICOM	SA
GH13-00039A	CPU313	IC ASIC-SGHX830	SA
GH71-06031A	ANT701	NPR-INTENNA CONTACT	SNA
GH71-06031A	ANT702	NPR-INTENNA CONTACT	SNA

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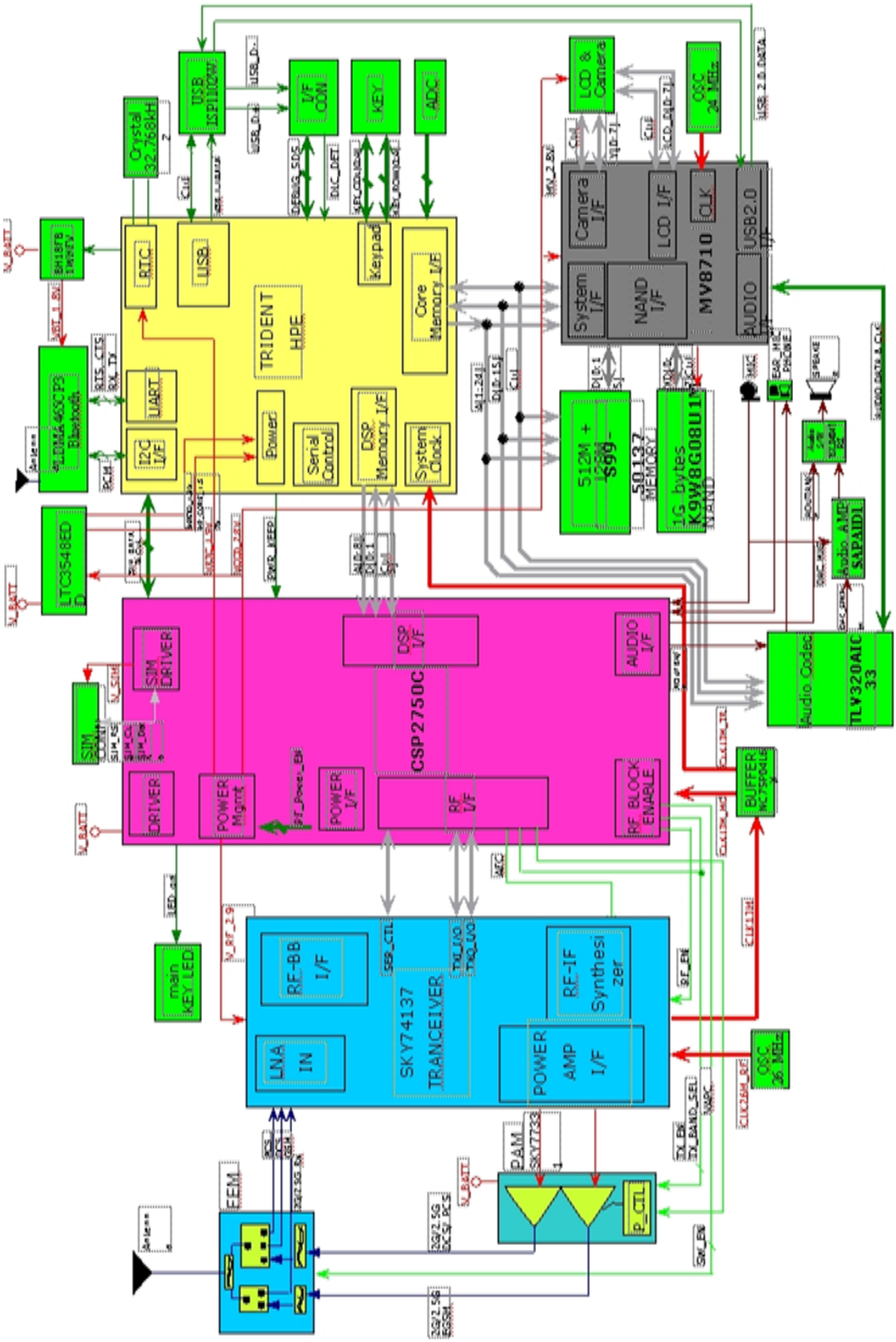
7. Block Diagrams



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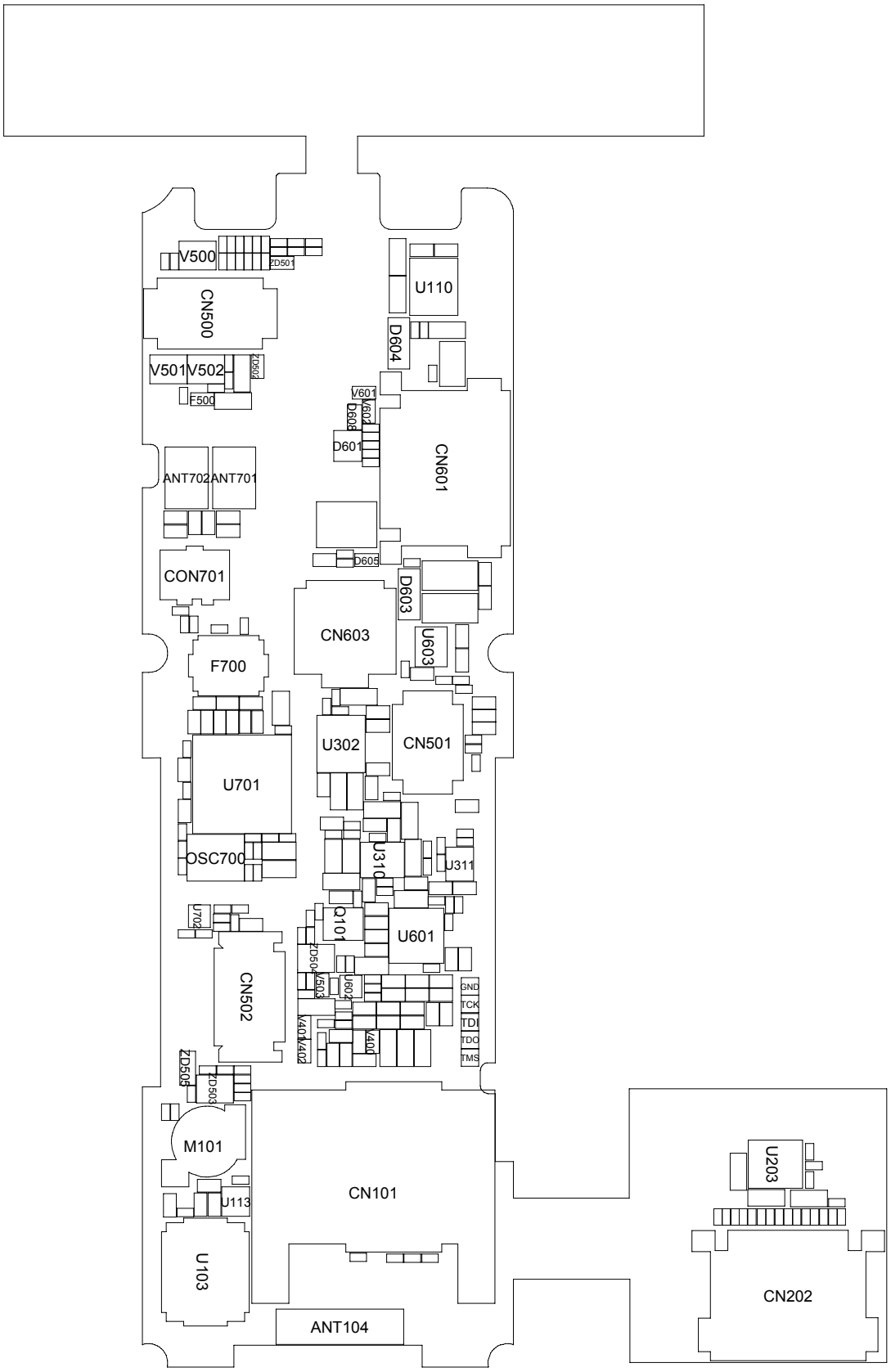
8. PCB Diagrams



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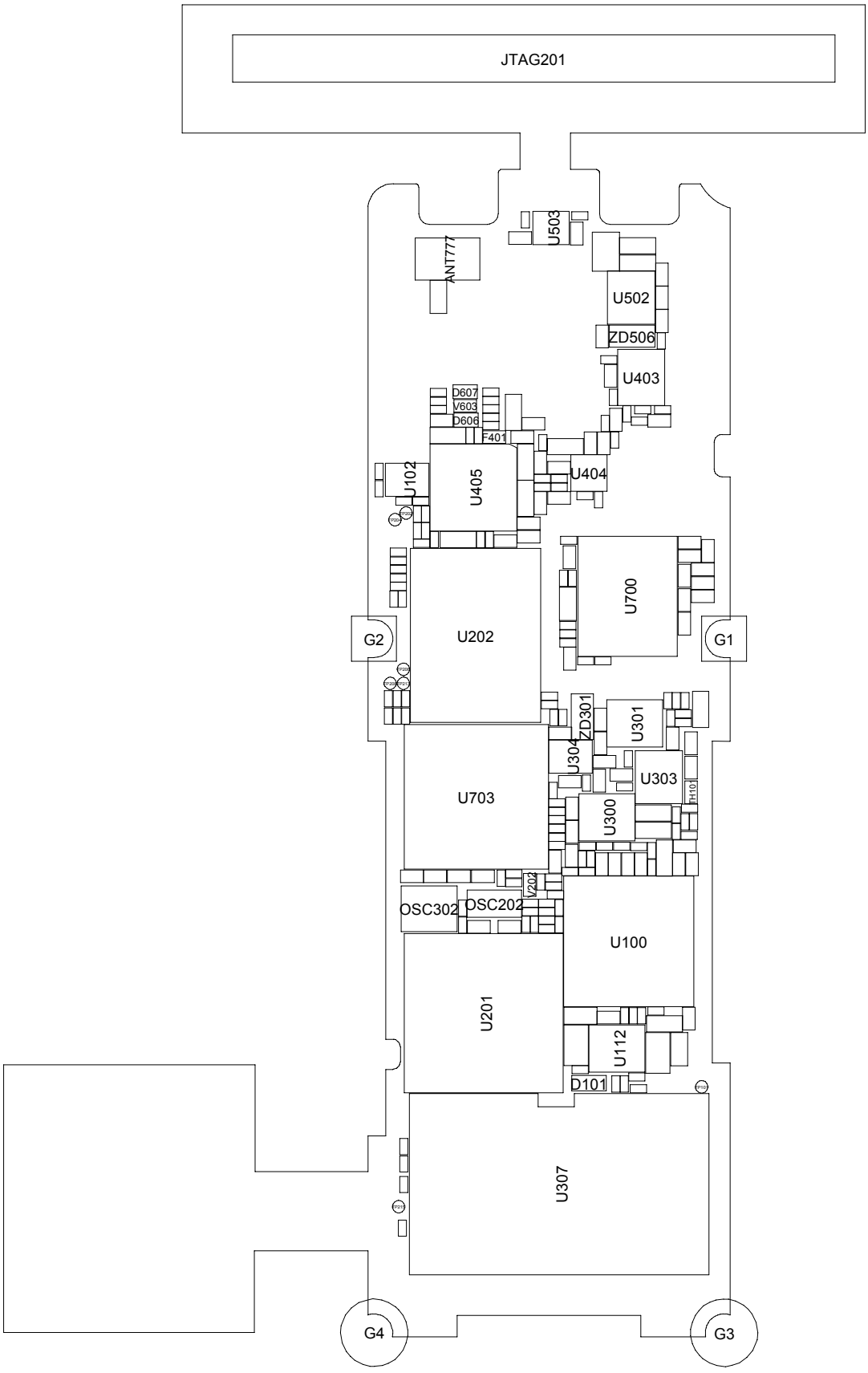

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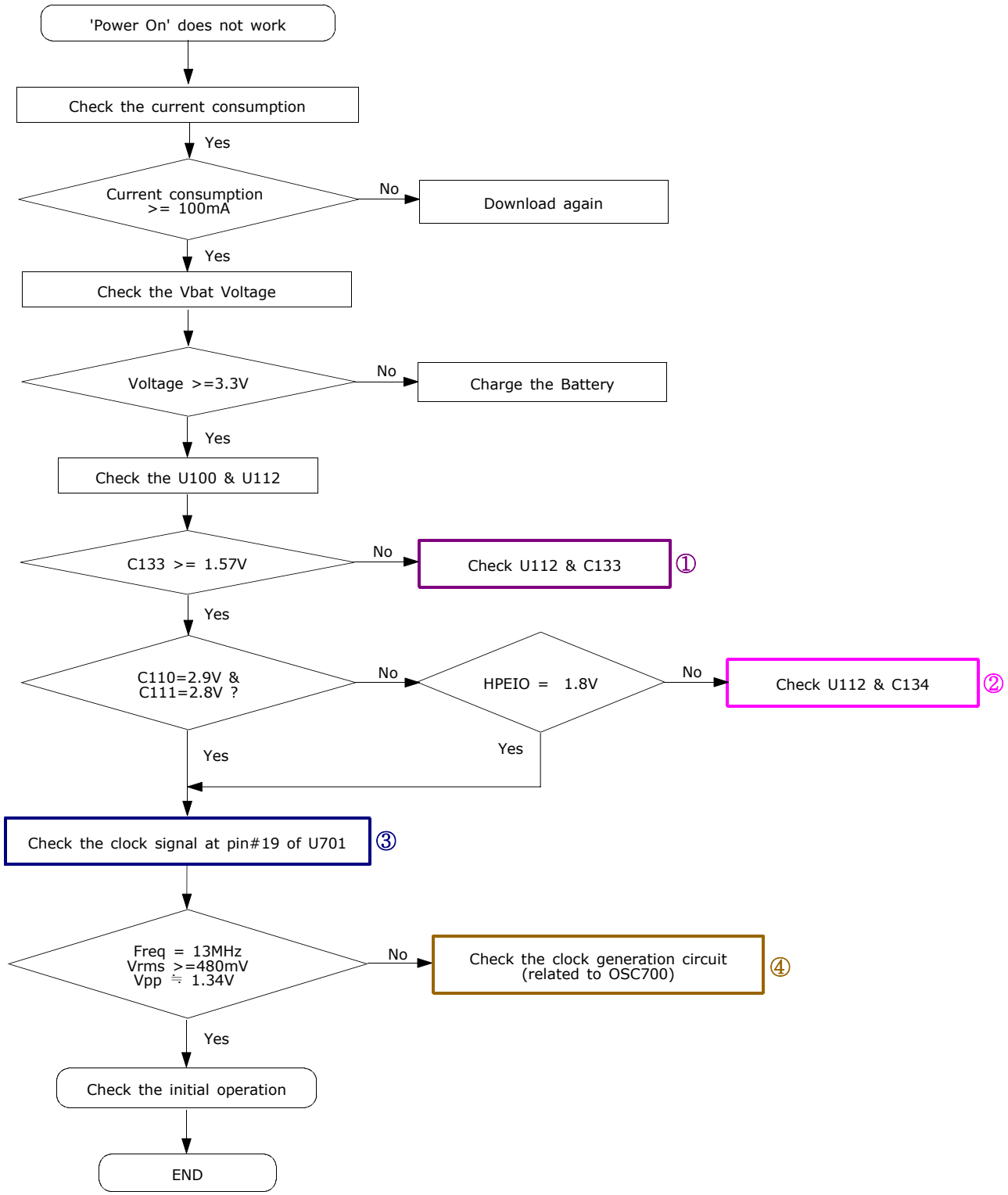
9. Flow Chart of Troubleshooting

9-1.Baseband

9-1-1. Power ON



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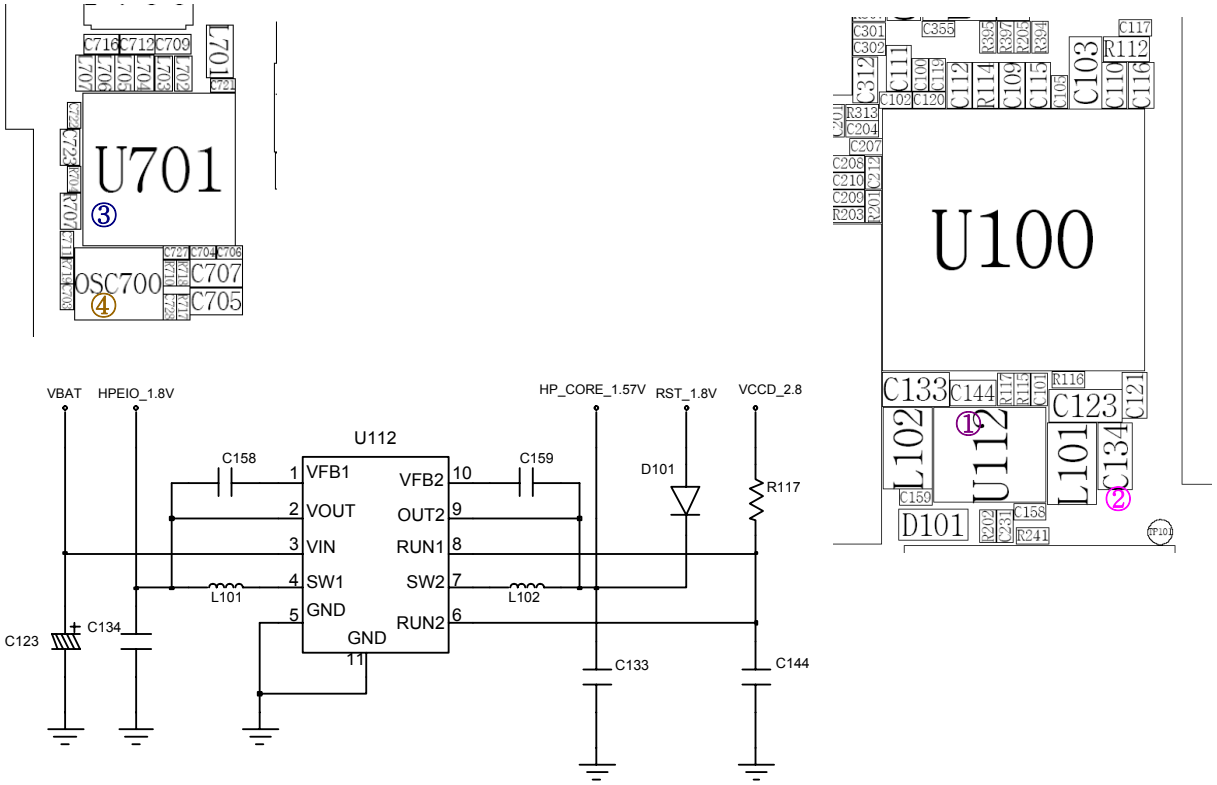

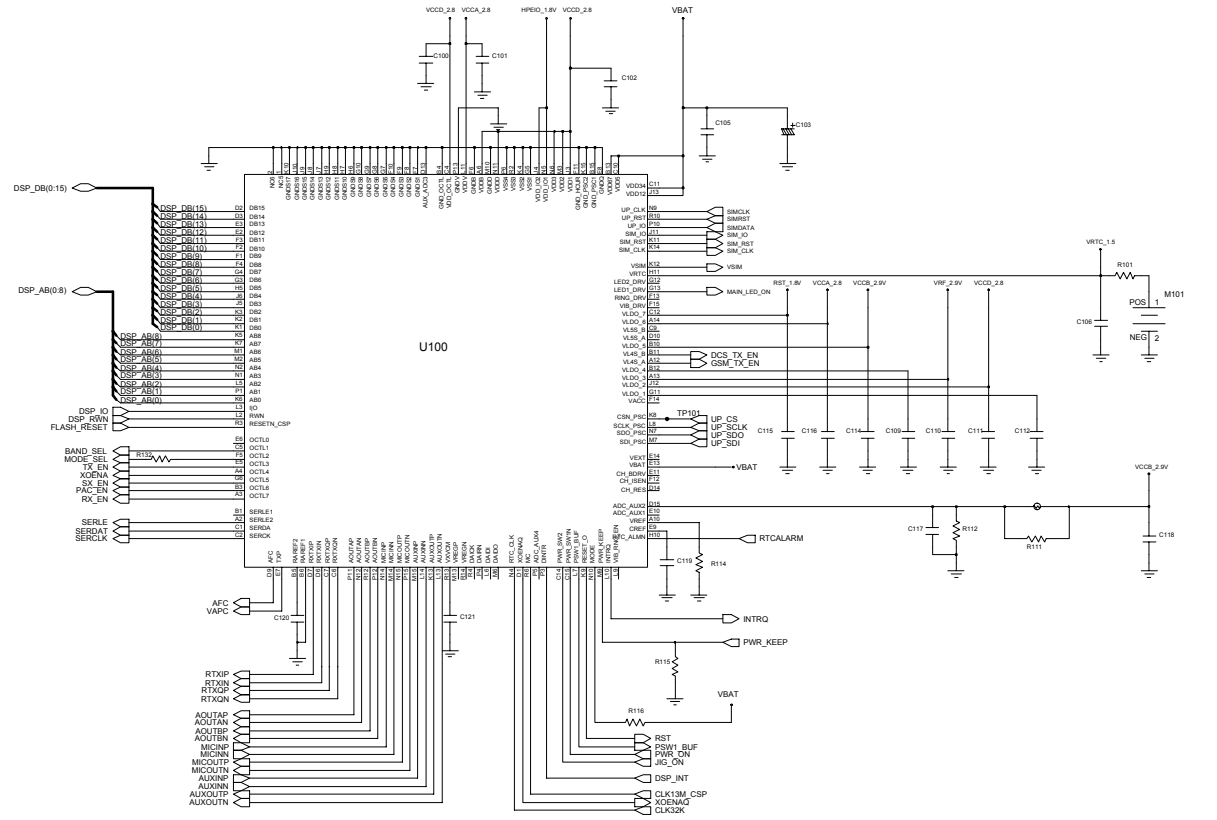

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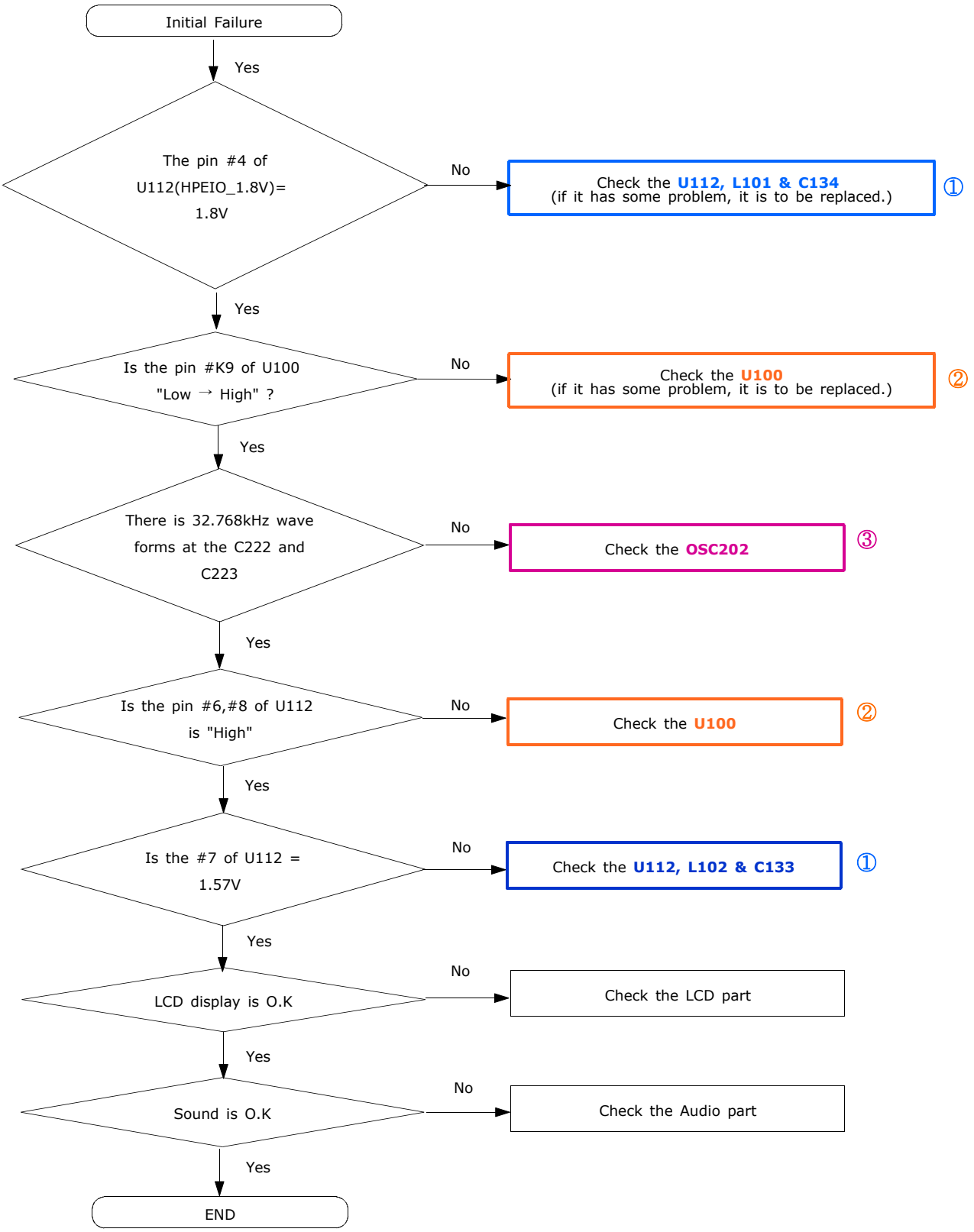
9-1-2. Initial



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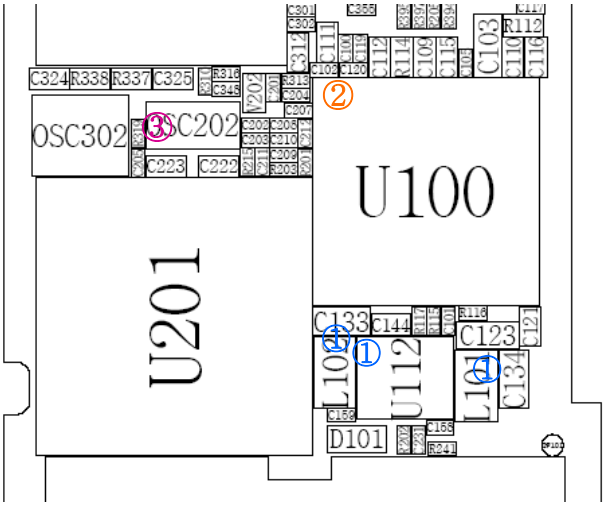

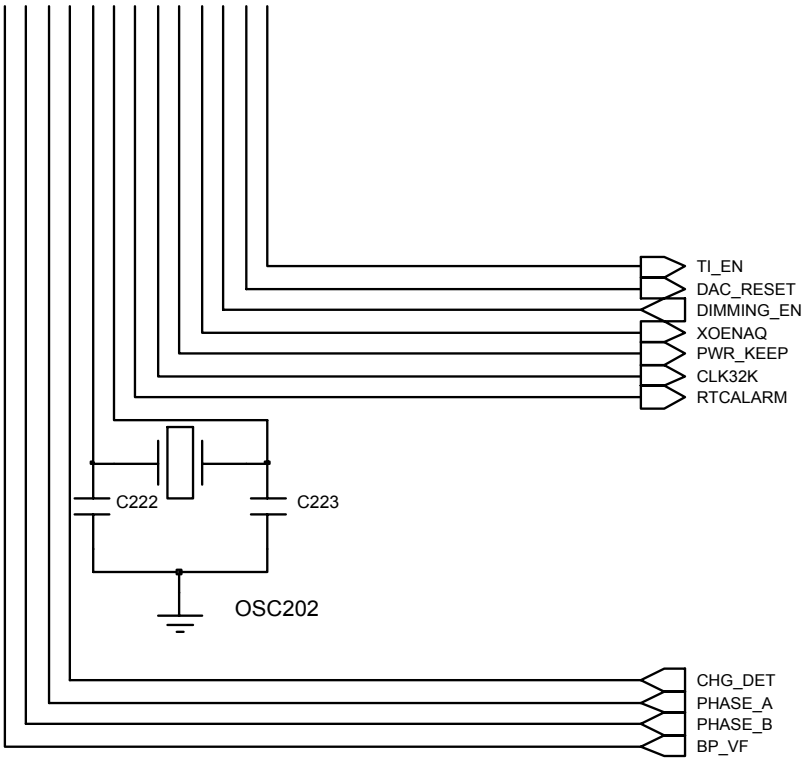

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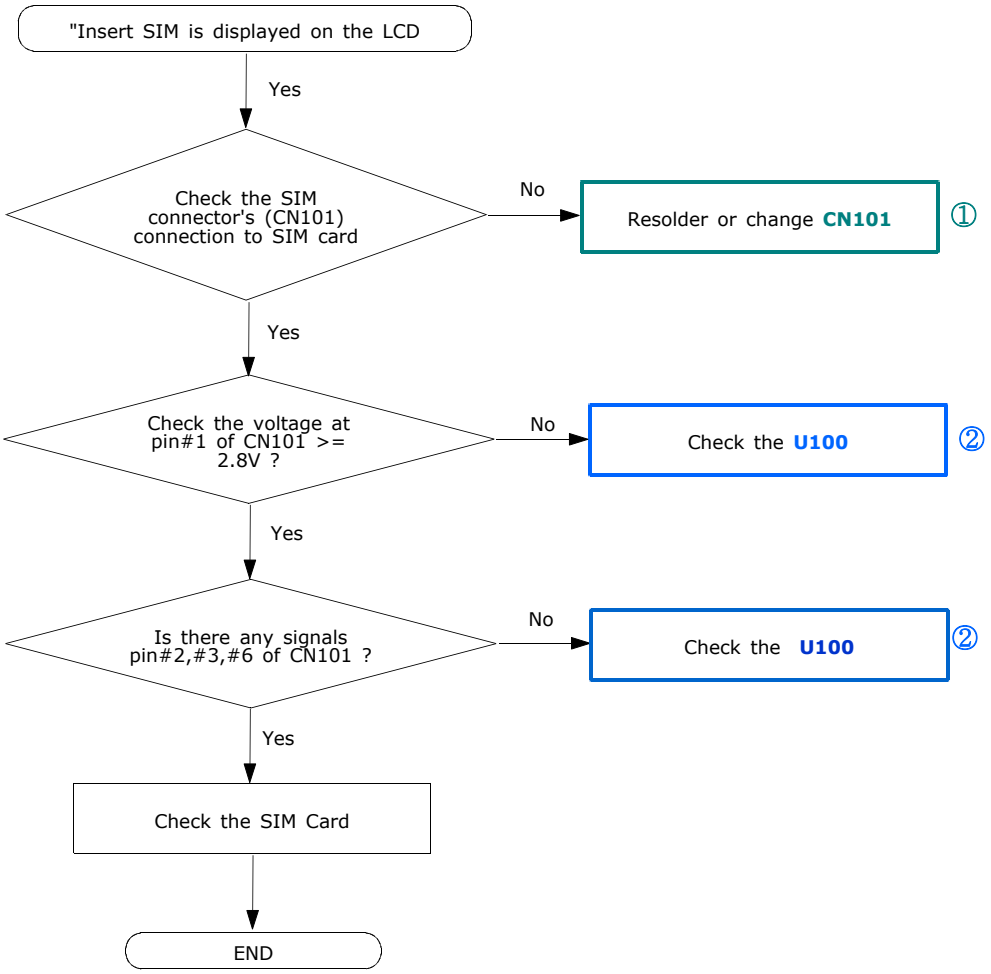
9-1-3. Sim Part



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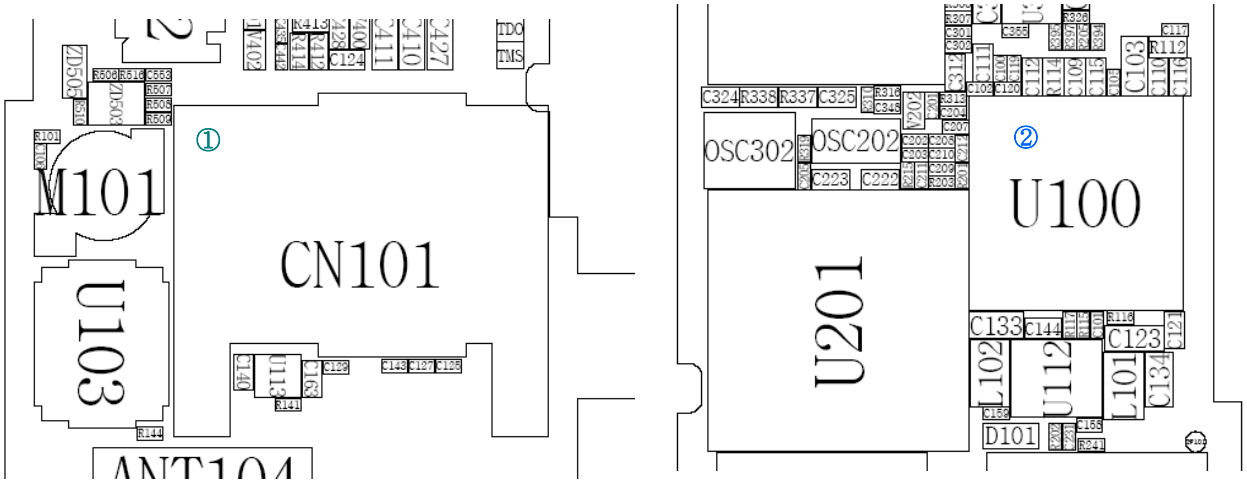

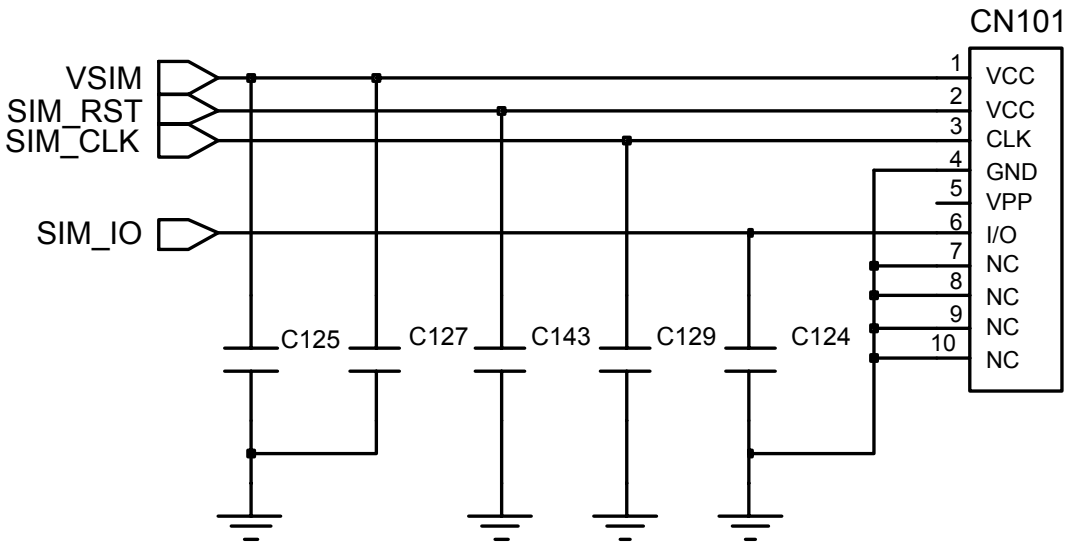

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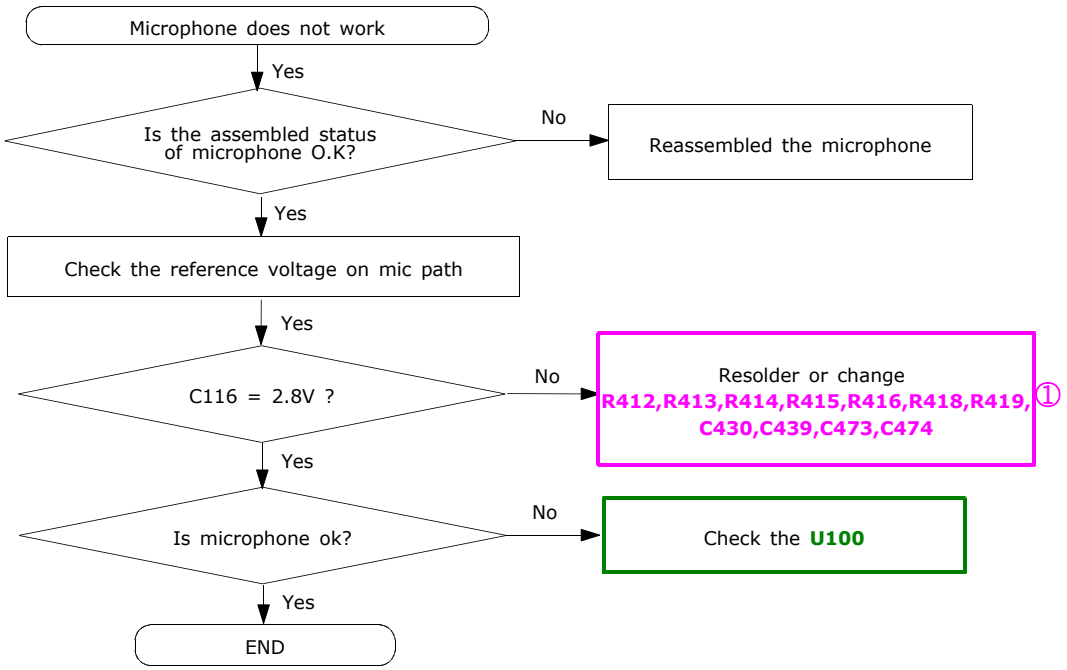
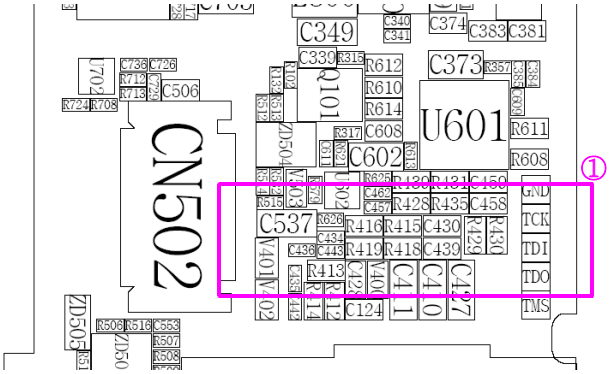
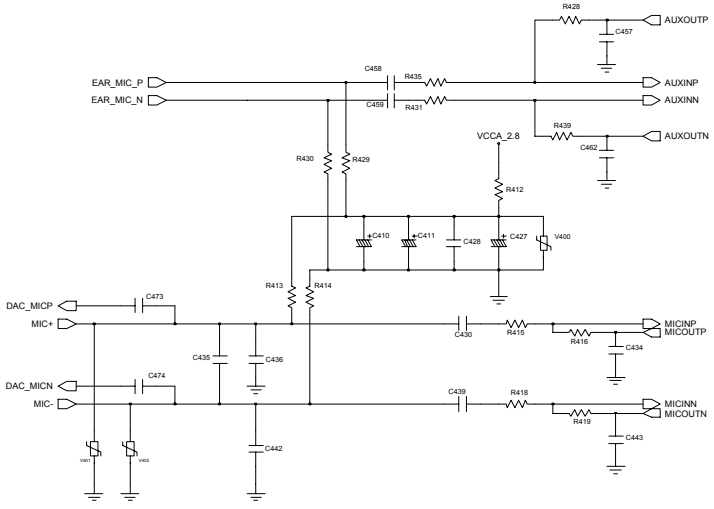
9-1-4. Microphone Part







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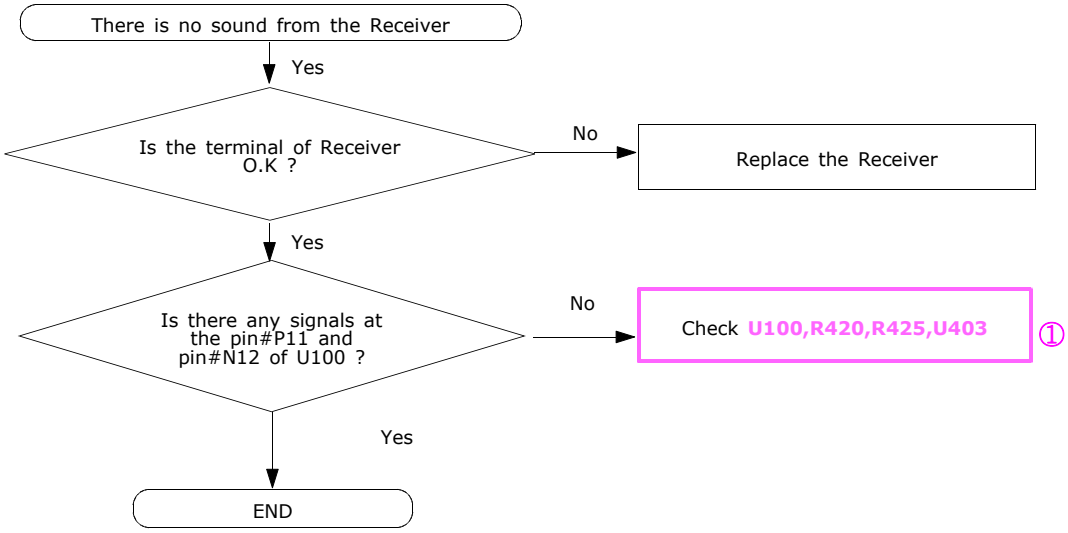

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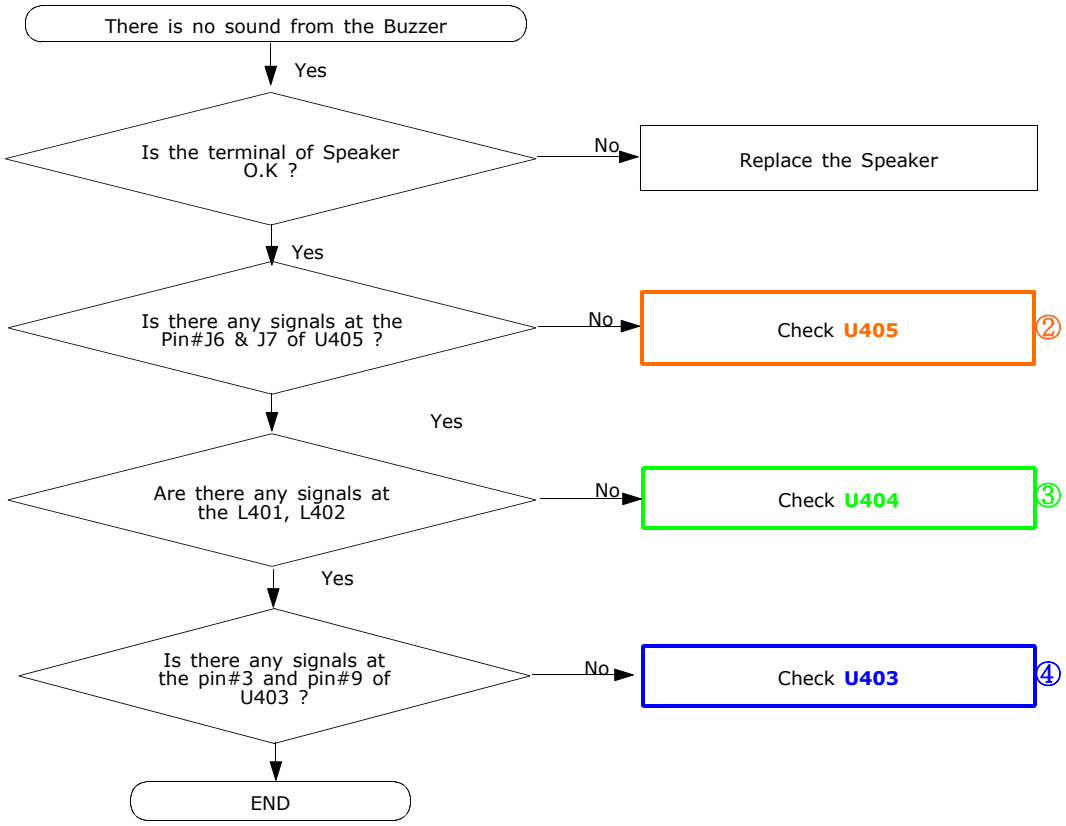

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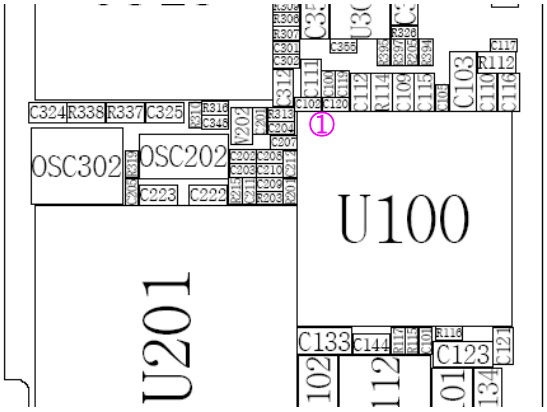

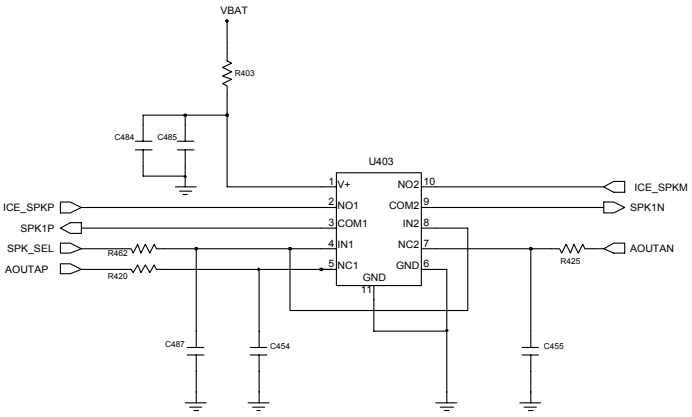

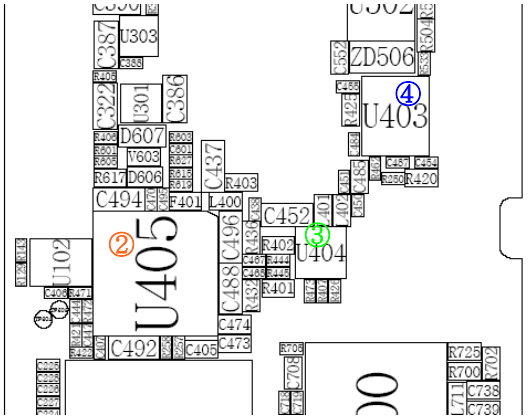

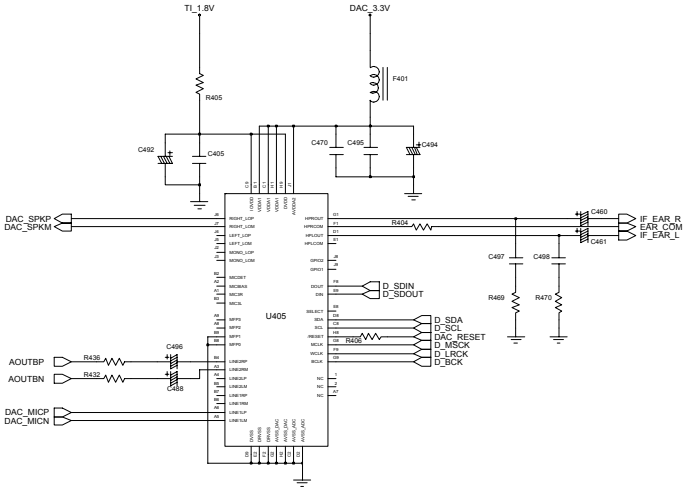

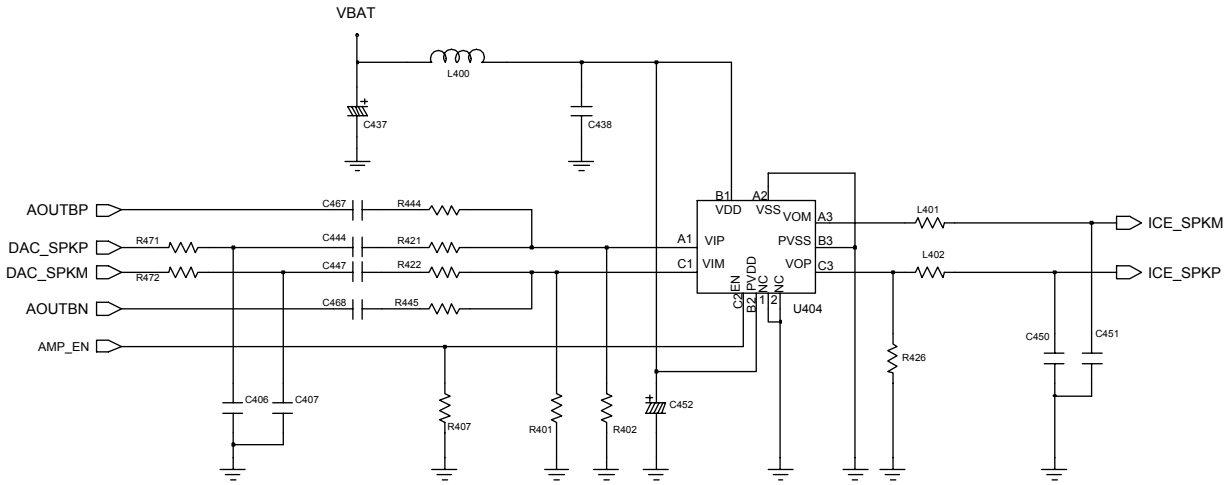

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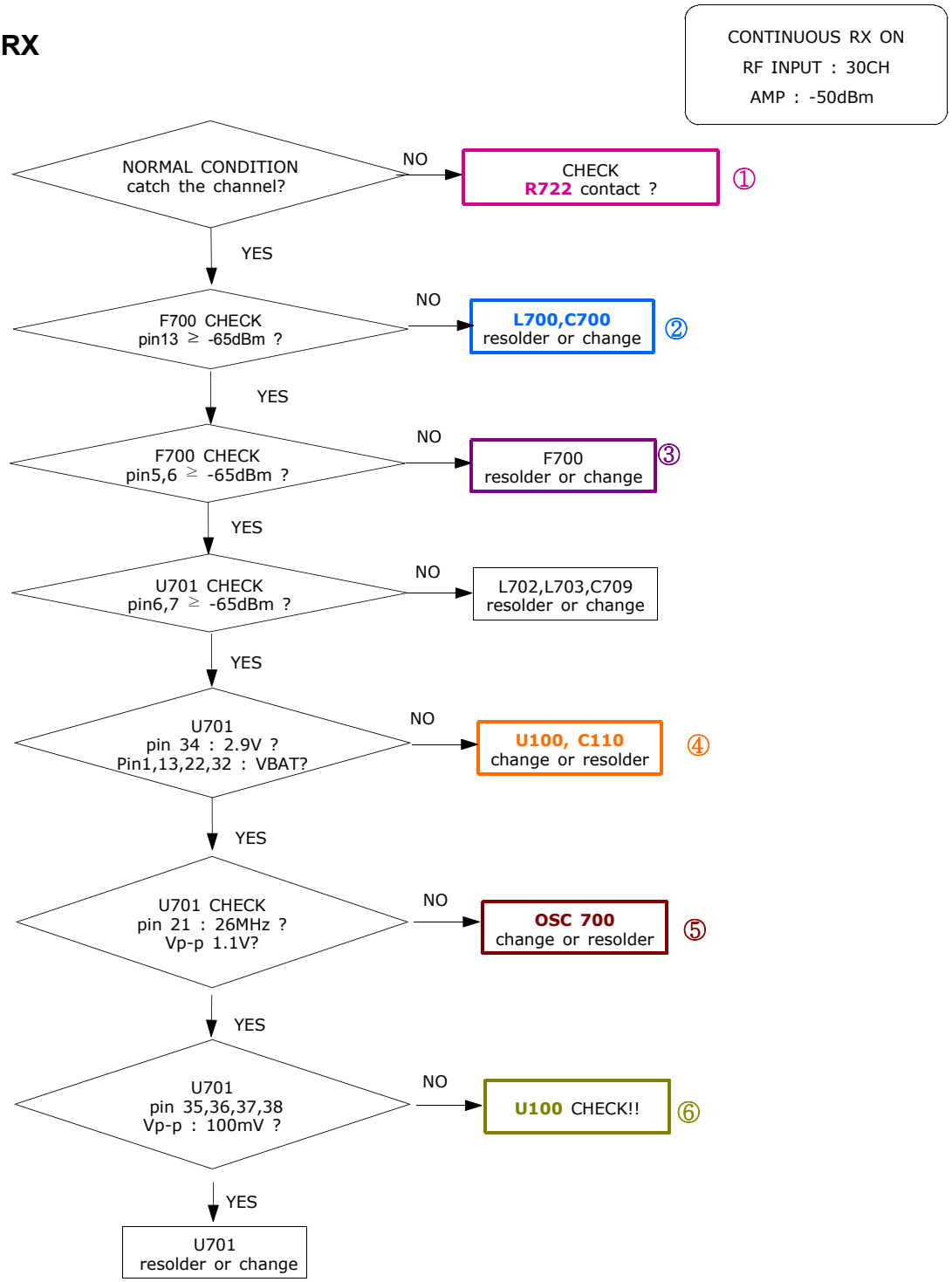
9-2.RF

9-2-1. EGSM RX



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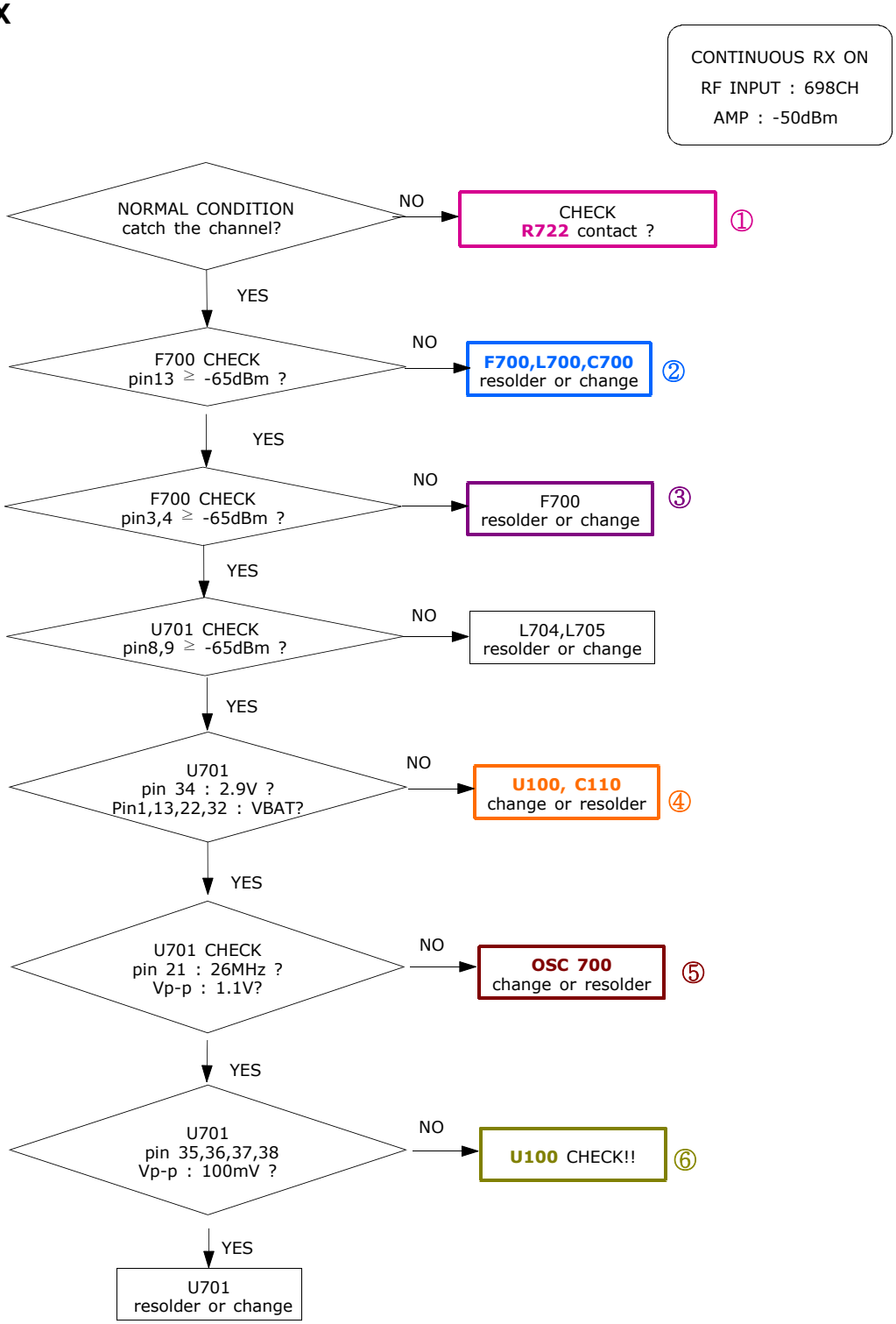

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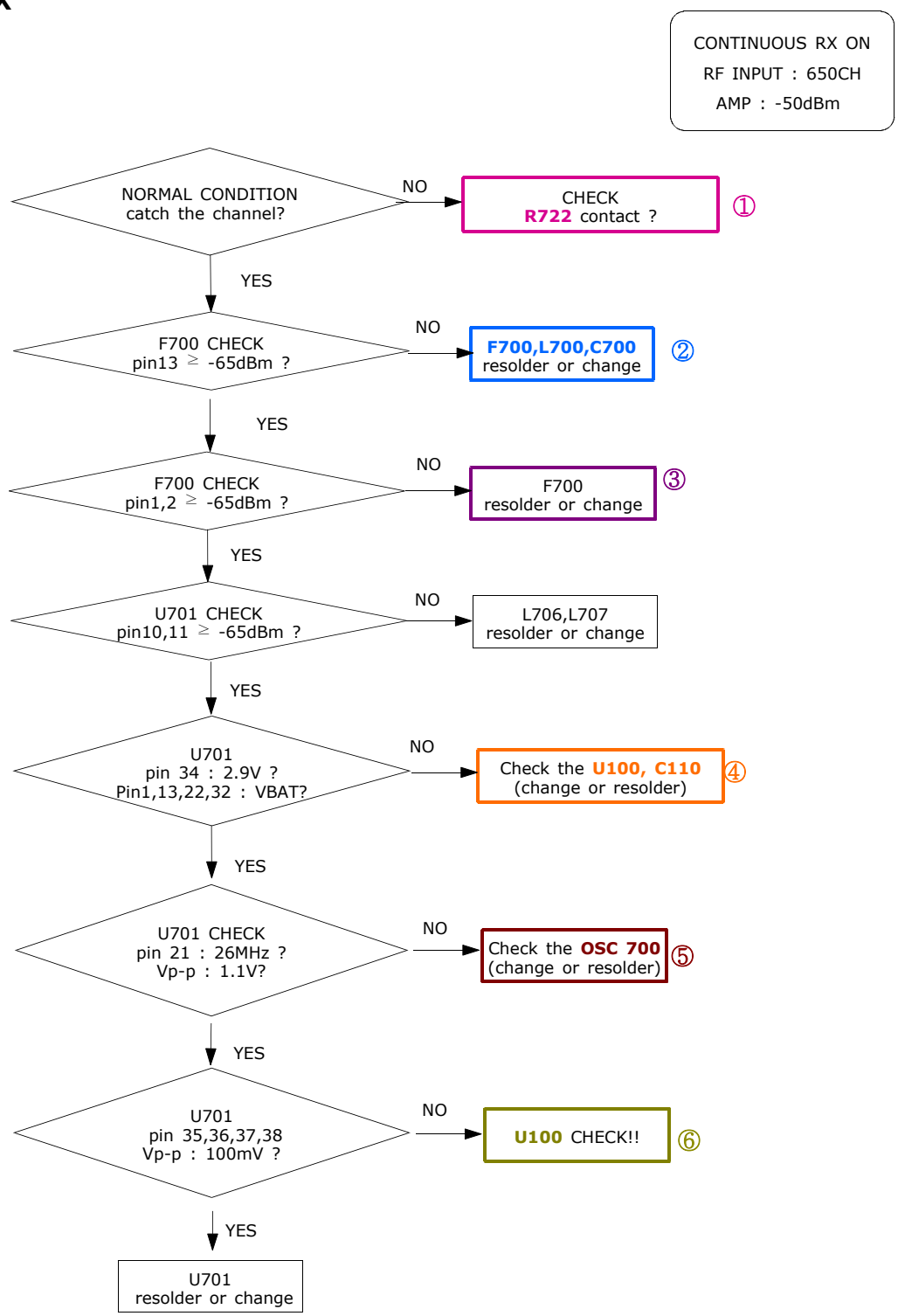

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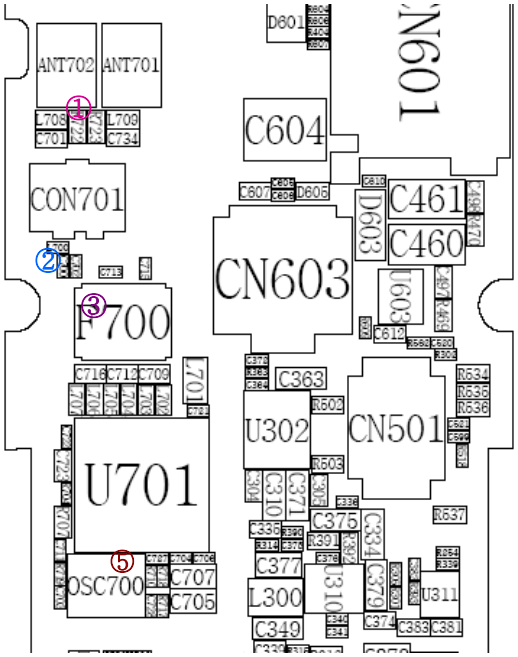

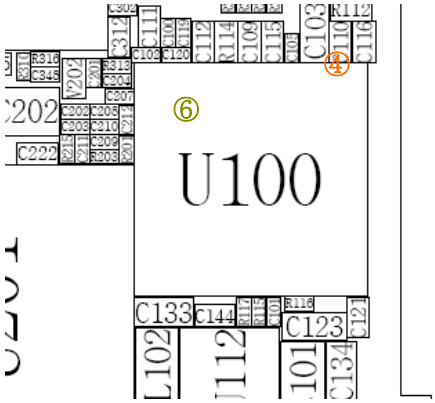

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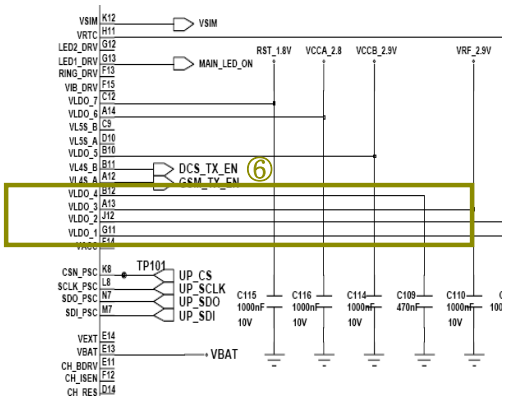

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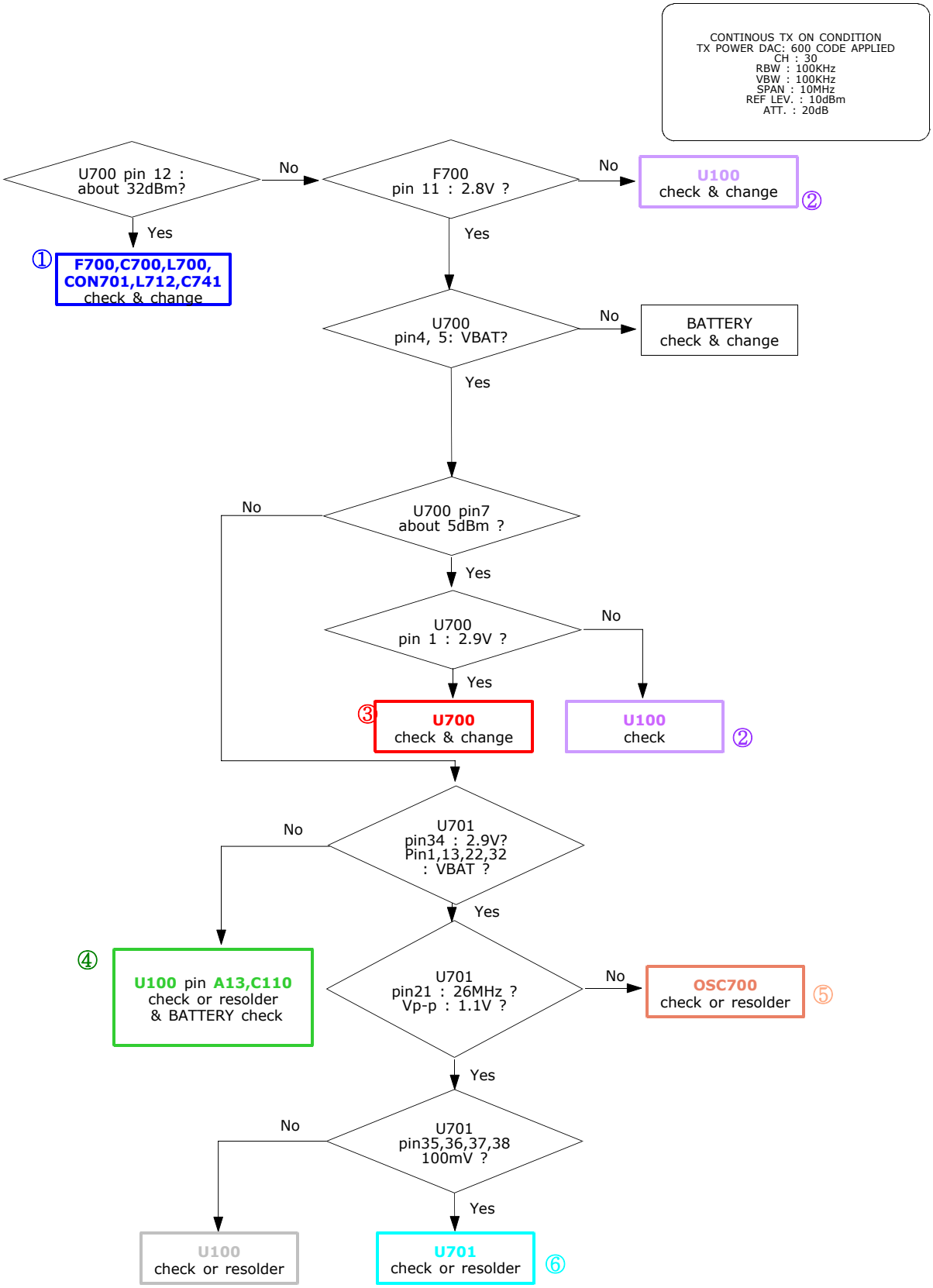
9-2-4. EGSM TX



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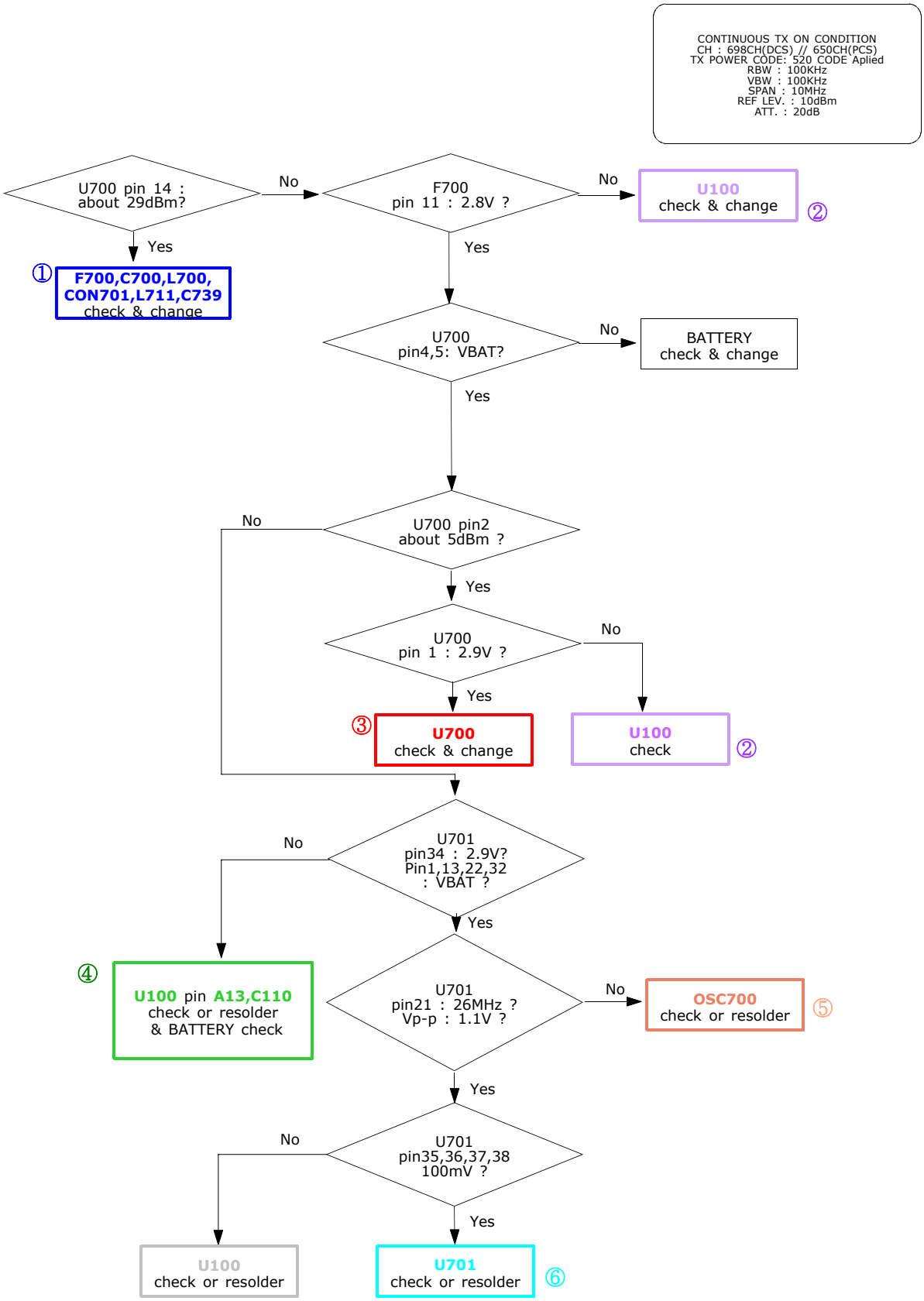
9-2-5. DCS//PCS TX



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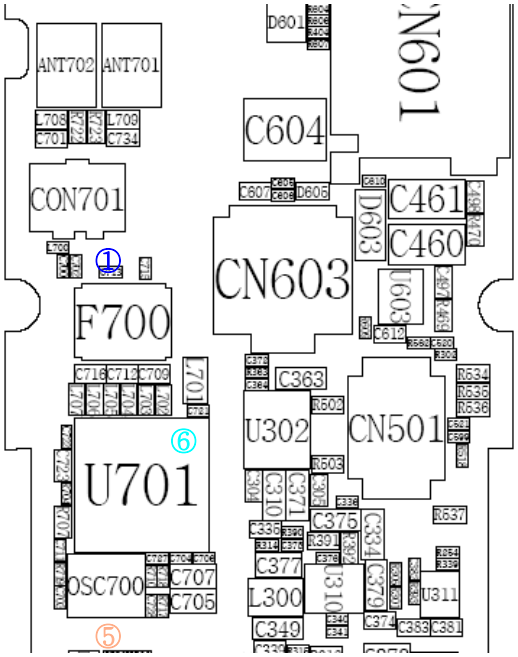

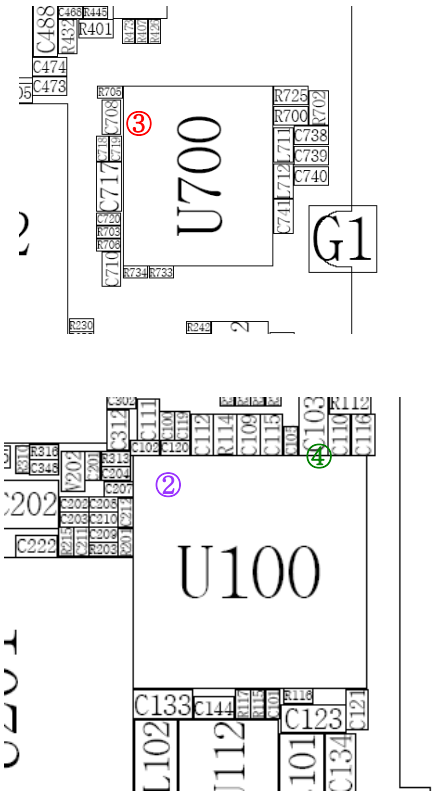

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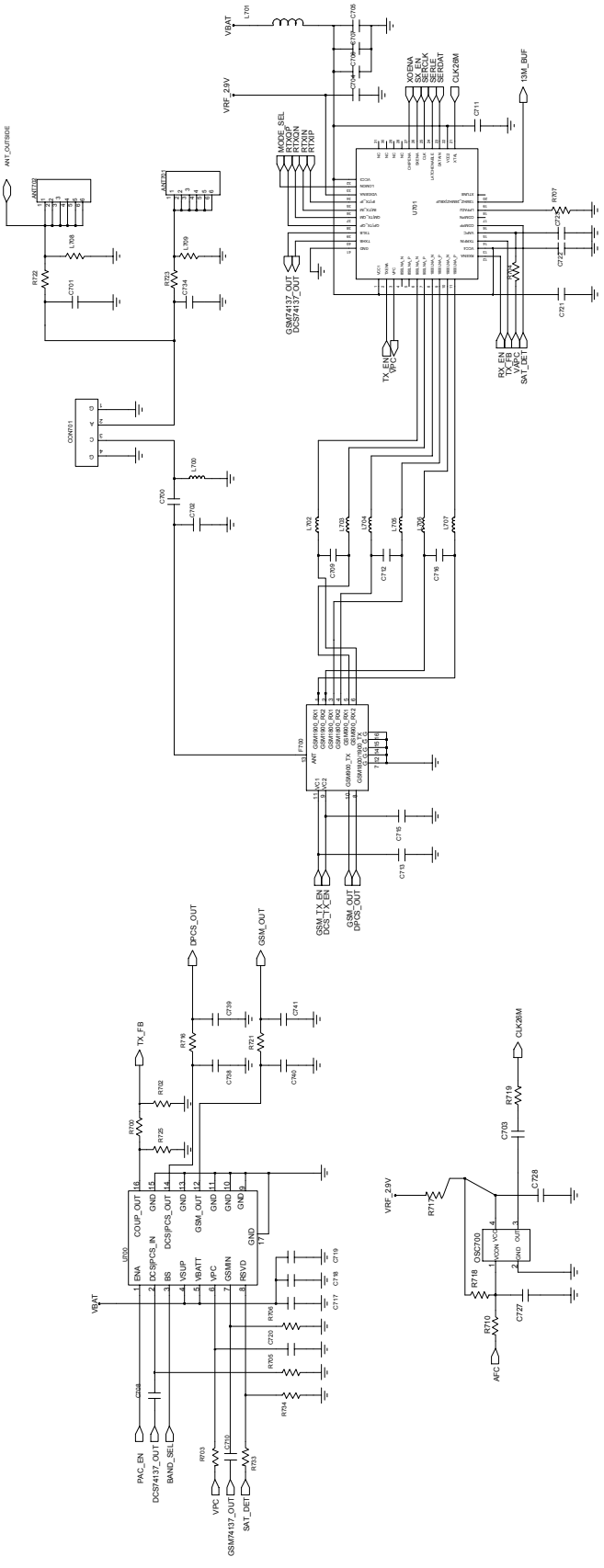

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10. Reference data

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

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