

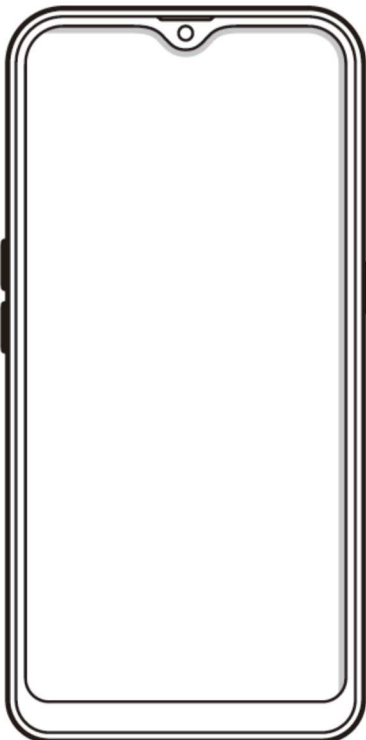
# SAMSUNG

## Mobile Device SM-A207F,A207M, A2070 Common

# SERVICE *Manual*

Mobile Device

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# SAMSUNG

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## 2. Specification

### 2-1. GSM General Specification

Item		GSM 850	EGSM 900	DCS1800	PCS1900
Freq. Band[MHz]		824~849	880~915	1710~1785	1850~1910
Uplink/Downlink		869~894	925~960	1805~1880	1930~1990
ARFCN range		128~251	0~124 & 975~1023	512~885	512~810
Tx/Rx spacing		45MHz	45MHz	95MHz	80MHz
Mod. Bit rate/ Bit Period		270.833kbps 3.692us	270.833kbps 3.692us	270.833kbps 3.692us	270.833kbps 3.692us
Time Slot Period/ Frame Period		576.9us 4.615ms	576.9us 4.615ms	576.9us 4.615ms	576.9us 4.615ms
Modulation	GSM/	GMSK/	GMSK/	GMSK/	GMSK/
	EGPRS	8PSK	8PSK	8PSK	8PSK
MS Power		33dBm~5dBm	33dBm~5dBm	30dBm~0dBm	30dBm~0dBm
Power Class		4(GMSK) E2(8PSK)	4(GMSK) E2(8PSK)	1(GMSK) E2(8PSK)	1(GMSK) E2(8PSK)
Sensitivity		-102dBm	-102dBm	-100dBm	-100dBm
TDMA Mux		8	8	8	8

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## 2. Specification

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### 2-2. GSM Tx Power Class

<b>TX Power control level</b>	<b>GSM850</b>	<b>TX Power control level</b>	<b>EGSM900</b>	<b>TX Power control level</b>	<b>DCS1800</b>	<b>TX Power control level</b>	<b>PCS1900</b>
5	33±2 dBm	5	33±2 dBm	0	30±3 dBm	0	30±3 dBm
6	31±2 dBm	6	31±2 dBm	1	28±3 dBm	1	28±3 dBm
7	29±2 dBm	7	29±2 dBm	2	26±3 dBm	2	26±3 dBm
8	27±2 dBm	8	27±2 dBm	3	24±3 dBm	3	24±3 dBm
9	25±2 dBm	9	25±2 dBm	4	22±3 dBm	4	22±3 dBm
10	23±2 dBm	10	23±2 dBm	5	20±3 dBm	5	20±3 dBm
11	21±2 dBm	11	21±2 dBm	6	18±3 dBm	6	18±3 dBm
12	19±2 dBm	12	19±2 dBm	7	16±3 dBm	7	16±3 dBm
13	17±2 dBm	13	17±2 dBm	8	14±3 dBm	8	14±3 dBm
14	15±2 dBm	14	15±2 dBm	9	12±4 dBm	9	12±4 dBm
15	13±2 dBm	15	13±2 dBm	10	10±4 dBm	10	10±4 dBm
16	11±3 dBm	16	11±3 dBm	11	8±4 dBm	11	8±4 dBm
17	9±3 dBm	17	9±3 dBm	12	6±4 dBm	12	6±4 dBm
18	7±3 dBm	18	7±3 dBm	13	4±4 dBm	13	4±4 dBm
19	5±3 dBm	19	5±3 dBm	14	2±5 dBm	14	2±5 dBm
-	-	-	-	15	0±5 dBm	15	0±5 dBm



## 2. Specification

### 2-3. WCDMA General Specification

	WCDMA2100(B1)	WCDMA1900(B2)	WCDMA850(B5)	WCDMA900(B8)	WCDMA1700(B4 LTE-ROW)
Freq. Band[MHz]	1920~1980	1850~1910	824~849	880~915	1710~1755
Uplink/Downlink	2110~2170	1930~1990	869~894	925~960	2110~2155
ARFCN range	UL: 9612~9888 DL: 10562~10838	UL: 9262~9538 DL: 9662~9938	UL: 4132~4233 DL: 4357~4458	UL: 2712~2868 DL: 2937~3088	UL: 1312~1513 DL: 1537~1738
Tx/Rx spacing	190MHz	80MHz	45MHz	45MHz	400MHz
Mod. Bit rate/ Bit Period	42.2Mbps(DL) 5.42Mbps(UL)	42.2Mbps(DL) 5.42Mbps(UL)	42.2Mbps(DL) 5.42Mbps(UL)	42.2Mbps(DL) 5.42Mbps(UL)	42.2Mbps(DL) 5.42Mbps(UL)
Time Slot Period/ Frame Period	WCDMA 10ms/0.667ms HSPA 2ms/0.667ms	WCDMA 10ms/0.667ms HSPA 2ms/0.667ms	WCDMA 10ms/0.667ms HSPA 2ms/0.667ms	WCDMA 10ms/0.667ms HSPA 2ms/0.667ms	WCDMA 10ms/0.667ms HSPA 2ms/0.667ms
Modulation	QPSK 16QAM 64QAM	QPSK 16QAM 64QAM	QPSK 16QAM 64QAM	QPSK 16QAM 64QAM	QPSK 16QAM 64QAM
MS Power (dBm)	25.7 ~ -49(↓)	25.7 ~ -49(↓)	25.7 ~ -49(↓)	25.7 ~ -49(↓)	25.7 ~ -49(↓)
Power Class	3(max+24dBm)	3(max+24dBm)	3(max+24dBm)	3(max+24dBm)	3(max+24dBm)
Sensitivity	dBm	dBm	dBm	dBm	dBm

## 2. Specification

### 2-4. LTE General Specification

	LTE Band1	LTE Band2	LTE Band3	LTE Band4 LTE_BA1	LTE Band5	LTE Band7
Freq. Band[MHz]	1920~1980	1850~1910	1710~1785	1710~1755	824~849	2500~2570
Uplink/Downlink	2110~2170	1930~1990	1805~1880	2110~2155	869~894	2620~2690
ARFCN range	UL:18000~18599 DL:0~599	UL:18600~19199 DL:600~1199	UL:19200~19949 DL:1200~1949	UL:19950~20399 DL:1950~2399	UL:20400~20649 DL:2400~2649	UL:20750~21449 DL:2750~3449
Tx/Rx spacing (MHz)	190	80	95	400	45	120
Channel Bandwidth (MHz)	5/10/15/20	1.4/3/5/10/15/20	1.4/3/5/10/15/20	1.4/3/5/10/15/20	1.4/3/5/10	5/10/15/20
Modulation	QPSK,16/64QAM 256QAM(DL only)	QPSK,16/64QAM 256QAM(DL only)	QPSK,16/64QAM 256QAM(DL only)	QPSK,16/64QAM 256QAM(DL only)	QPSK,16/64QAM 256QAM(DL only)	QPSK,16/64QAM 256QAM(DL only)
MS Power (dBm)	25.7~-39(↓)	25.7~-39(↓)	25.7~-39(↓)	25.7~-39(↓)	25.7~-39(↓)	25.7~-39(↓)
Sensitivity (QPSK, BW 10MHz) (dBm)						

## 2. Specification

	LTE Band8	LTE Band12 LTE_BA1	LTE Band13 LTE_BA1	LTE Band17 LTE_BA1	LTE Band20	LTE Band28
Freq. Band[MHz]	880~915	699~716	777~787 746~756	704-716	832-862	703-748
Uplink/Downlink	925~960	729~746		734-746	791-821	758-803
ARFCN range	UL:21450-21799 DL:3450-3799	UL:23010-23179 DL:5010-5179	UL:23180-23279 DL:5180-5279	UL:23730-23849 DL:5370-5849	UL:24150-24449 DL:6150-6449	UL:27210-27659 DL:9210-9659
Tx/Rx spacing (MHz)	45	30	31	30	41	55
Channel Bandwidth (MHz)	1.4/3/5/10	1.4/3/5/10	5/10	5/10	5/10/15/20	3/5/10/15/20
Modulation	QPSK,16/64QAM 256QAM(DL only)	QPSK,16/64QAM 256QAM(DL only)	QPSK,16/64QAM 256QAM(DL only)	QPSK,16/64QAM 256QAM(DL only)	QPSK,16/64QAM 256QAM(DL only)	QPSK,16/64QAM 256QAM(DL only)
MS Power (dBm)	25.7~-39(↓)	25.7~-39(↓)	25.7~-39(↓)	25.7~-39(↓)	25.7~-39(↓)	25.7~-39(↓)
Sensitivity (QPSK, BW 10MHz) (dBm)						

## 2. Specification

	LTE Band34 LTE-AA1	LTE Band38	LTE Band39 LTE-AA1	LTE Band40	LTE Band41	LTE Band66 LTE-BA1
Freq. Band[MHz] Uplink/Downlink	2010~2025	2570~2620	1880~1920	2300~2400	2496~2690	1710~1780 2110~2180
ARFCN range	UL/DL:36200 ~ 36349	UL/DL:37750 ~ 38249	UL/DL:38250 ~ 38649	UL/DL:38650 ~ 39649	UL/DL:39650 ~ 41589	UL:20750~21449 DL:2750~3449
Tx/Rx spacing (MHz)	0	0	0	0	0	400
Channel Bandwidth (MHz)	5/10/15	5/10/15/20	5/10/15/20	5/10/15/20	5/10/15/20	5/10/15/20
Modulation	QPSK,16/64QAM 256QAM(DL only)	QPSK,16/64QAM 256QAM(DL only)	QPSK,16/64QAM 256QAM(DL only)	QPSK,16/64QAM 256QAM(DL only)	QPSK,16/64QAM 256QAM(DL only)	QPSK,16/64QAM 256QAM(DL only)
MS Power (dBm)	24~-39(↓)	25.7~-39(↓)	25.7~-39(↓)	25.7~-39(↓)	25.7~-39(↓)	25.7~-39(↓)
Sensitivity (QPSK, BW 10MHz) (dBm)						

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## 2. Specification

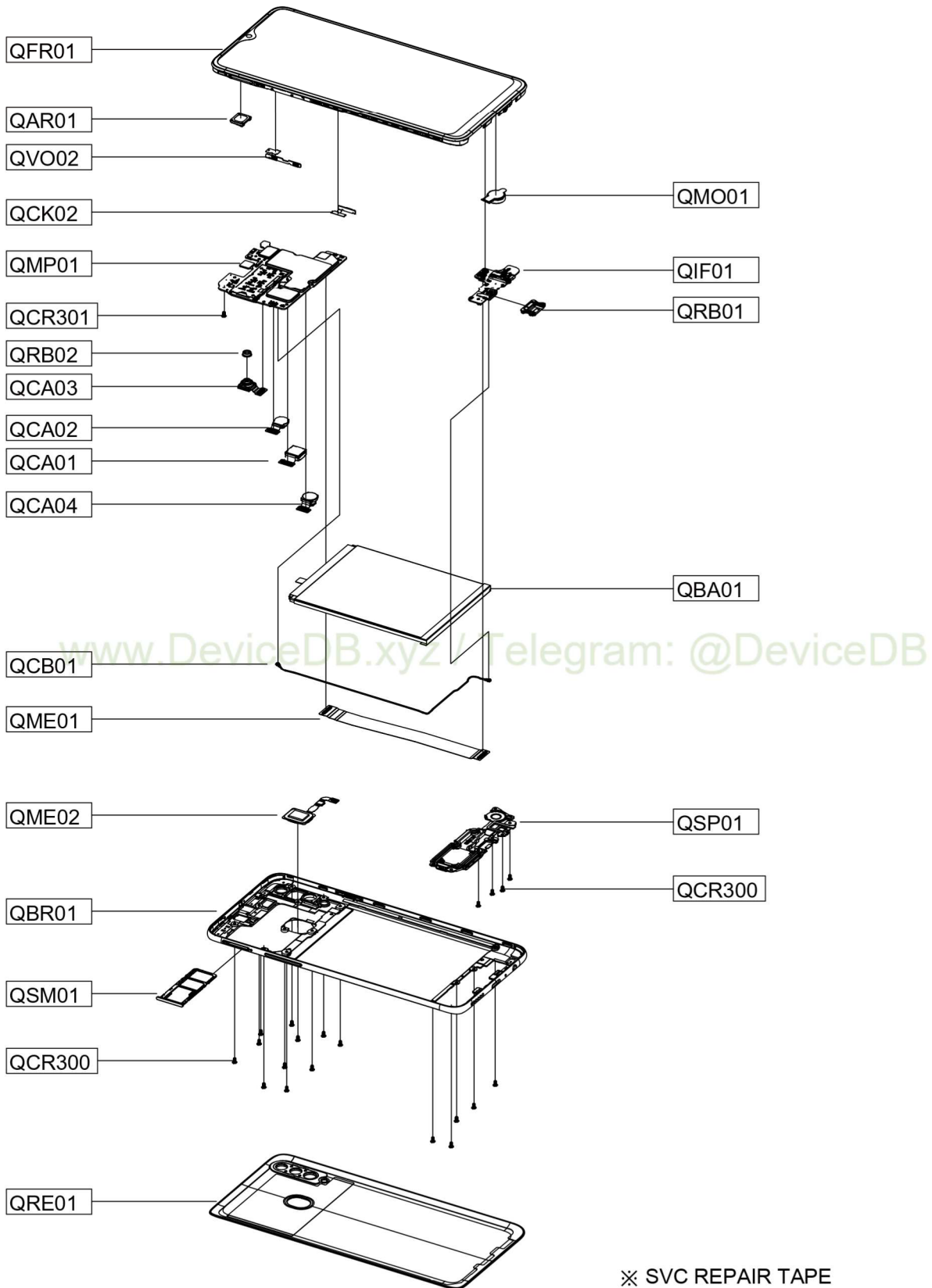
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### 2-5. TDSCDMA General Specification

	<b>TDSCDMA2010(A ) LTE-AA1</b>	<b>TDSCDMA1880(F) LTE-AA1</b>
Chip rate	1.28 Mcps	1.28 Mcps
OBW	1.6 MHz	1.6 MHz
Freq. Band[MHz] Uplink/Downlink	2010~2025	1880~1920
ARFCN range	10054~10121	9404~9596
Tx/Rx spacing (MHz)	0	0
MS Power (dBm)	25.7 ~ -48(↓)	25.7 ~ -48(↓)
Power Class	2(max+24dBm)	2(max+24dBm)
Sensitivity (dBm /1.28 MHz)		

## 4. Exploded View and Parts List

### 4-1. Cellular phone Exploded View



※ SVC REPAIR TAPE  
 QRT01, QRT02, QRT03, QRT04  
 QRT05, QRT06, QRT07, QRT08

## 4. Exploded View and Parts List

### 4-2. Cellular phone Parts list

Design LOC		Description	SEC CODE
QCR300		A/S-SCREW_M1.4_2.8,SVC	GH81-17504A
QBA01		A/S BATTERY-SCUD-WT-N6	GH81-17587A
QVO02		A/S-FPC_VOLUME KEY_SM-A207F	GH81-17771A
QCK02		A/S-FPC_POWER KEY_SM-A207F	GH81-17772A
QME01		A/S-FPCB_MAIN_SM-A207F	GH81-17773A
QFR01		A/S-SVC ASSY SMT-OCTA(E/BLK)SM-A207	GH81-17774A
QIF01		A/S-SVC SUB IF_PBA_SM-A207	GH81-17775A
QMP01		A/S-SVC PBA-MAIN(SKU1/NONE/DS)A207F/3_32	GH81-17777A
		A/S-SVC MAIN PBA(SKU1/CHNA/DS)A2070/4_64	GH81-17781A
		A/S-SVC MAIN PBA(SKU2/NONE/DS)A207M/3_32	GH81-17780A
QBR01		A/S-BRACKET_RED_SM-A207_COMMON	GH81-17789A
QCA01		A/S-REAR_CAMERA_13M_SM-A207_SVC	GH81-17793A
QCA02		A/S-REAR_CAMERA_5M_SM-A207_SVC	GH81-17794A
QCA03		A/S-FRONT_CAMERA_8M_SM-A207_SVC	GH81-17795A
QCA04		A/S-REAR_CAMERA_8M_SM-A207_SVC	GH81-17796A
QAR01		A/S-RECEIVER_SM-A207F,SVC	GH81-17797A
QSP01		A/S-SPEAKER_SM-A207F,SVC	GH81-17798A
QMO01		A/S-MOTOR_SM-A207F,SVC	GH81-17799A
QCR301		A/S-SCREW_CM1.4_2.5_2.5,SVC	GH81-17800A
QRB01		A/S-RUBBER_USB_SM-A207	GH81-17804A
QRB02		A/S-RUBBER_FRONT CAM_SM-A207	GH81-17805A
QCB01		A/S-COXIAL_CABLE_SM-A207F,SVC	GH81-17806A
QME02		A/S-FINGER_PRINT_MODULE_RED_SM-A207F	GH81-17807A
QSM01		A/S-SIM TRAY(RED)DUAL SIM_SM-A207	GH81-17816A
QRE01		A/S-REAR_COMM TYPE1-RED-DS_SM-A207F	GH81-17904A
		A/S-REAR_COMM TYPE1-RED-DS_SM-A2070	GH81-17785A
		A/S-REAR_COMM TYPE1-RED-DS_SM-A207M	GH81-17966A
QRT01		A/S-TAPE_MYLAR_POWER KEY_SM-A207	GH81-17801A
QRT02		A/S-TAPE_MYLAR_VOLUME KEY_SM-A207	GH81-17802A
QRT03		A/S-TAPE_PMU_FIBER OF SHIELD_SM-A207	GH81-17803A
QRT04		A/S-TAPE_BATTERY_SM-A207F	GH81-17811A
QRT05		A/S-TAPE_FINGER_SM-A207F	GH81-17812A
QRT06		A/S-TAPE_BACK GLASS_SM-A207F	GH81-17813A
QRT07		A/S-TAPE_CAM_DECO_SM-A207F	GH81-17814A
QRT08		A/S-TAPE_CAMERA ESD_SM-A207F	GH81-17815A

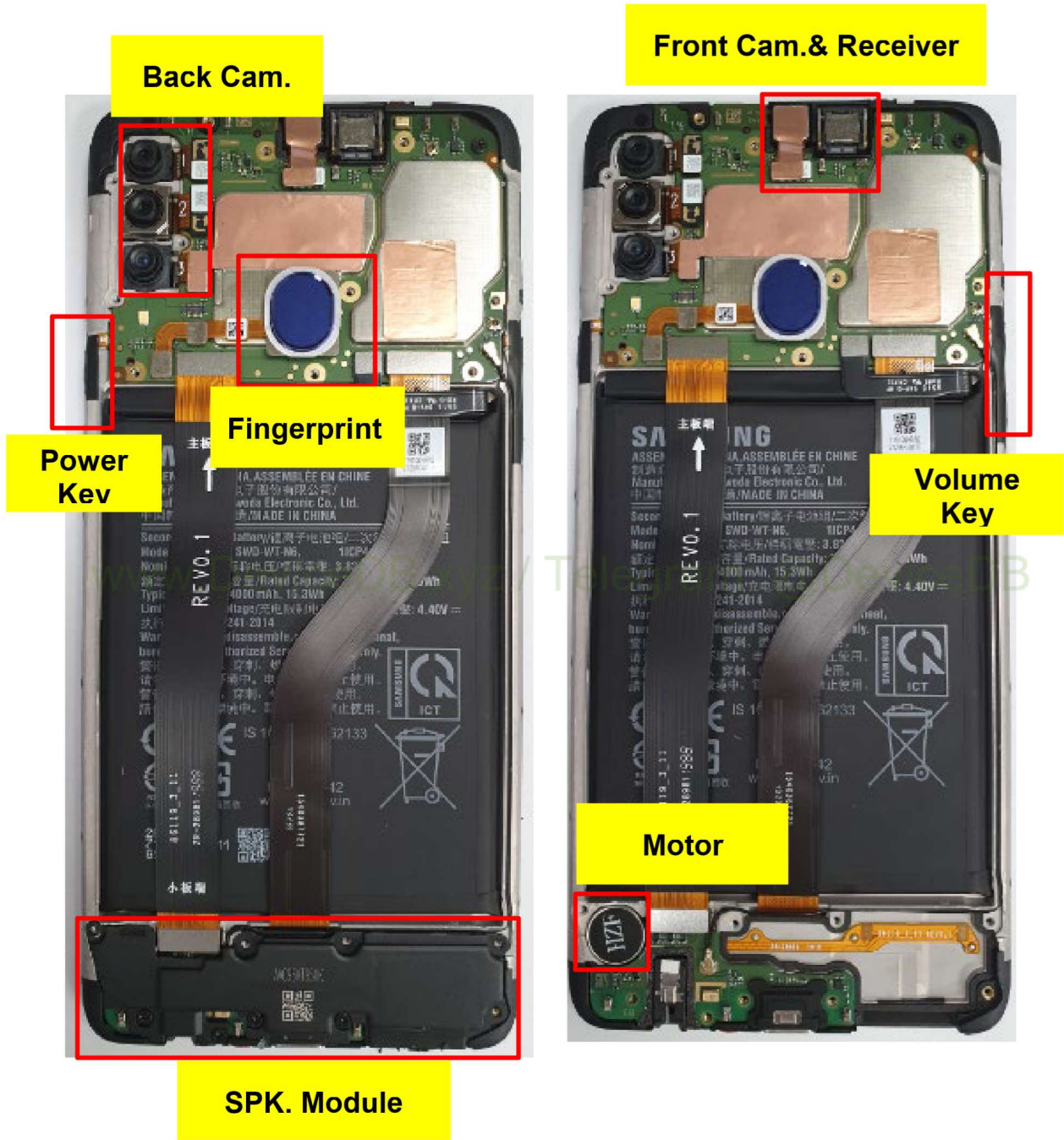


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## 7. Level 2 Repair

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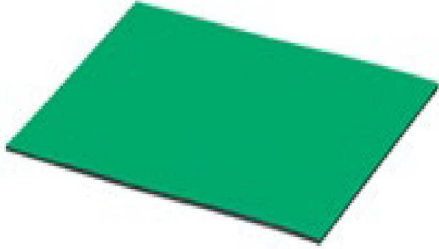
### 7-1. Components on the Rear Case





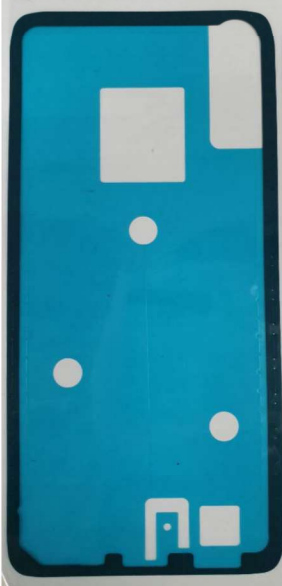
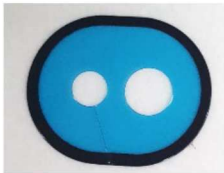
## 7. Level 2 Repair

### 7-2. Pre-requisite

	
<b>Tweezers/Disass'y Stick/Screw Driver</b>	<b>Anti-static Gloves</b>
	
<b>Anti-staticMat</b>	<b>AOD</b>
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<b>Ethyl Alcohol</b>	<b>Cotton Swab</b>

## 7. Level 2 Repair

### 7-3. Parts when replacement the battery after repair.

Parts Code	Parts Name	Image	Remarks
<b>GH81-17813A</b>	<b>Backglasstic TAPE</b>	 A blue rectangular adhesive tape with a black border, used for securing the back glass of a smartphone. It features a central square cutout and several circular holes.	<b>Left items must be changed to the new one in case of disassemble the Battery.</b>
<b>GH81-17812A</b>	<b>Fingerprint Sensor attachment Tape</b>	 A circular blue adhesive tape with a black border, used for attaching the fingerprint sensor. It has two white circular cutouts in the center.	

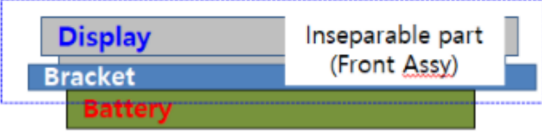
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## 7. Level 2 Repair

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### 7-4. Battery replacement

- 1) Do not reuse the battery.
- 2) Do not detach the battery from the bracket or display
  - If you detached battery, it has potential damage physically.
- 3) If you need to detach a battery from the bracket or display.
  - Make sure replace the battery with new one.

Type	Structure	Battery replace
 <p>The diagram illustrates the battery replacement structure. It shows three components: 'Display' (grey), 'Bracket' (blue), and 'Battery' (green). The 'Display' and 'Bracket' are grouped together and labeled as 'Inseparable part (Front Assy)'. The 'Battery' is positioned below the 'Bracket'. A red 'X' is placed over the 'Battery' label, indicating that it should not be reused.</p>	<p>Display and Bracket are not separated.</p> <p>Battery replacement is required when Front Assy component is defected.</p> <p>If the Front Assy is supplied without battery, please order battery together.</p> <p>※ Do not reuse the battery.</p>	<b>0</b>

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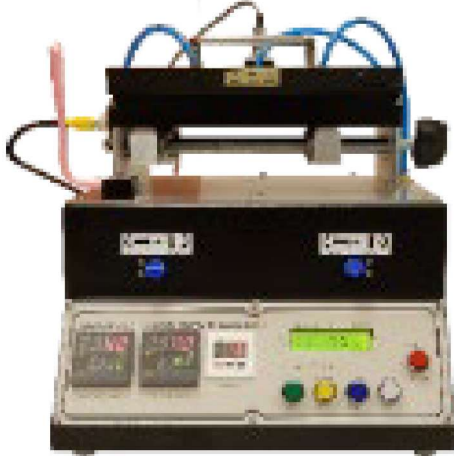
## 7. Level 2 Repair

### 7-5. Disassembly

1. Put the device in the AOD jig.

Set the AOD condition

- SOC 68%↓: Upper 70°C/ Lower 60 °C 5min
- SOC 68%↑: Upper 60°C/ Lower 60 °C 5min



2. Disassemble the Rear Cover using the AOD jig.



※Caution

1) Be care of scratch

※Caution

1) Be care of scratch

3. Remove all 16 points of screws and disassemble the frame.



※Caution

1) Be care of scratch

4. Disassemble SD Card SIM Tray from device.



※Caution

1) Be care of scratch



## 7. Level 2 Repair

5. Remove the battery cover from upper right to bottom side using disassemble jig.



6. Battery cover.



**※ Caution**

- 1) Be care of scratch
- 2) Be care of Rear and Finger print damage

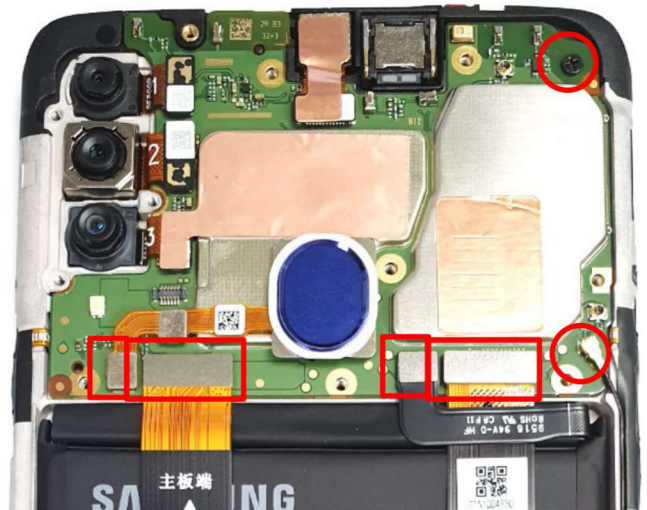
**※ Caution**

- 1) Be care of Rear damage

7. Remove 4 screws from BOX and coaxial cable and disassemble the SUB PBA.



8. Remove the coaxial cable and 1 screw And 4 points of FPCB.



**※ Caution**

- 1) Be care of several kinds of damage at PBA and FPCB.

**※ Caution**

- 1) Be care of scratch

## 7. Level 2 Repair

9. Remove the Main PBA and others.



10. Put ethyl alcohol into the outside of battery with clean swab and slightly tilt the front case to soak alcohol inside enough.



**※ Caution**

- 1) Be care of several kinds of damage at PBA and FPCB.

**※ Caution**

- 1) Do NOT use any sharp tools. (disassembly stick, knife, any plastic or tweezers).

11. Lift battery using battery disassembly vacuum.



13. Remove all residues of tapes and Motor, RCV, Power & volume keys.





# 7. Level 2 Repair

## 7-6. Assembly

1. Attach the battery tapes.



2. Attach the battery and press it using your hands.



※ Caution

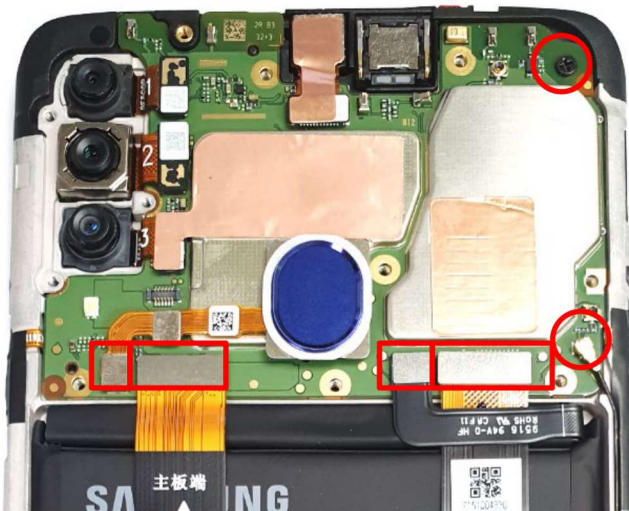
1) Be care of tapes damage

※ Caution

1) Be care of battery damage.

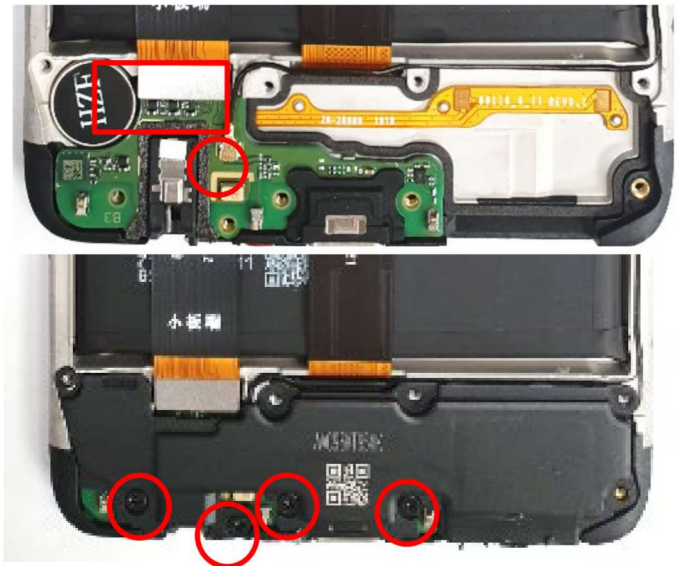
3. Assemble the main PBA on the bracket and connect all connectors firmly and then tighten 1 screw.

※ Screw torque: 0.7 kgf



4. Assemble the SUB PBA and connect all connectors firmly and SPK box and than tighten 4 screws.

※ Screw torque: 0.7kgf



※ Caution

1) Be care of FPCB damage.

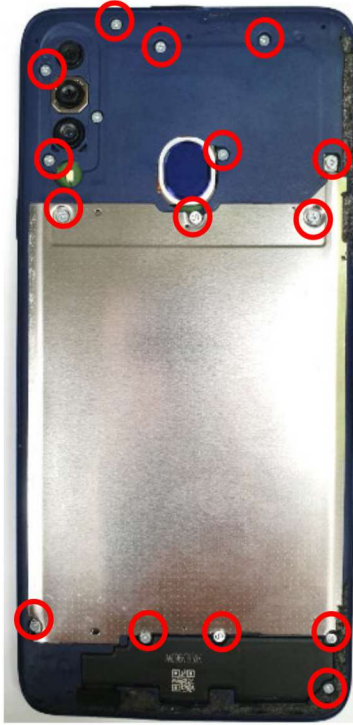
※ Caution

1) Be care of damage.

## 7. Level 2 Repair

5. Assemble the Battery cover and tighten 16 screws.

※ Screw torque: 0.7kgf



6. Attach the rear cover tape.



※ Caution

1) Be care of rear cover damage

※ Caution

1) Be care of scratch and REAR damage

7. Remove the rear cover tape and assemble the rear cover. Press the outside of Rear cover with thumbs enough.



8. Press rear cover.

- Pressing force : 1 N
- Pressing time : 1 minute



※ Caution

1) Be care of scratch and REAR damage

※ Caution

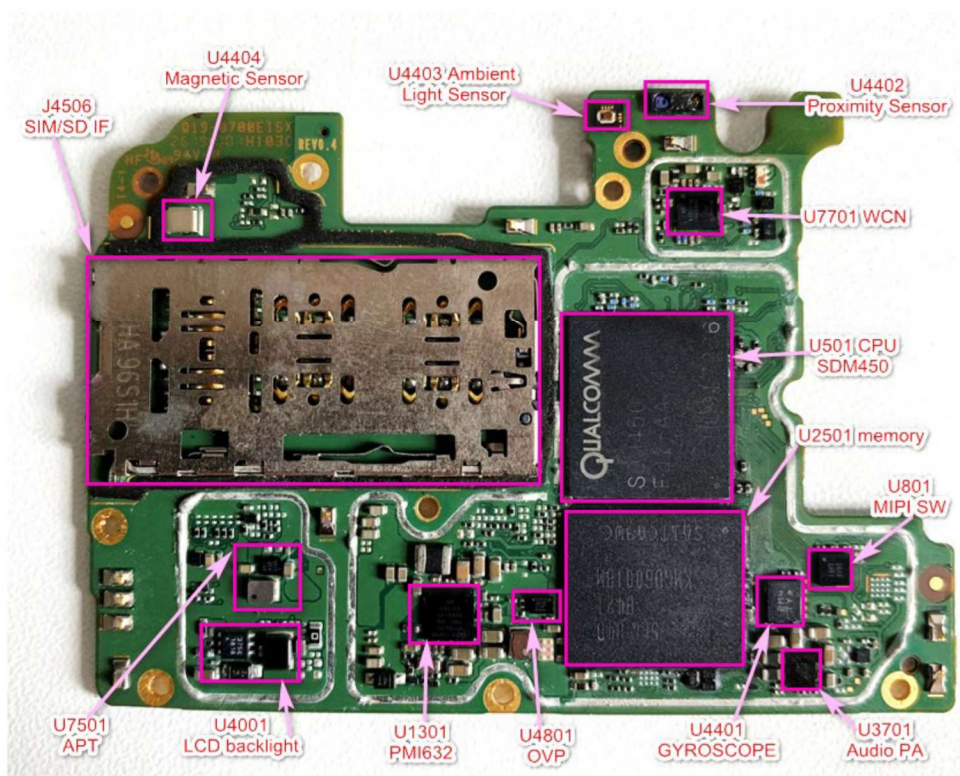
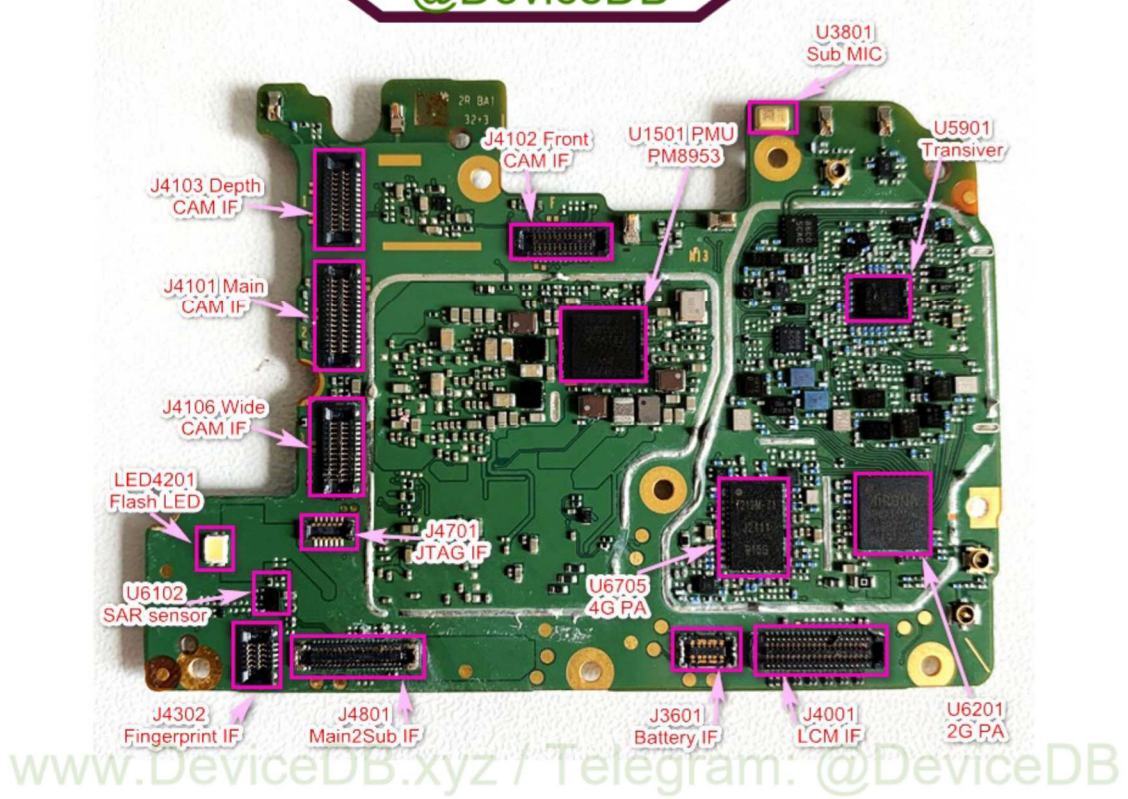
1) Be care of scratch and REAR damage



## 8. Level 3 Repair

### 8-1. Components Layout

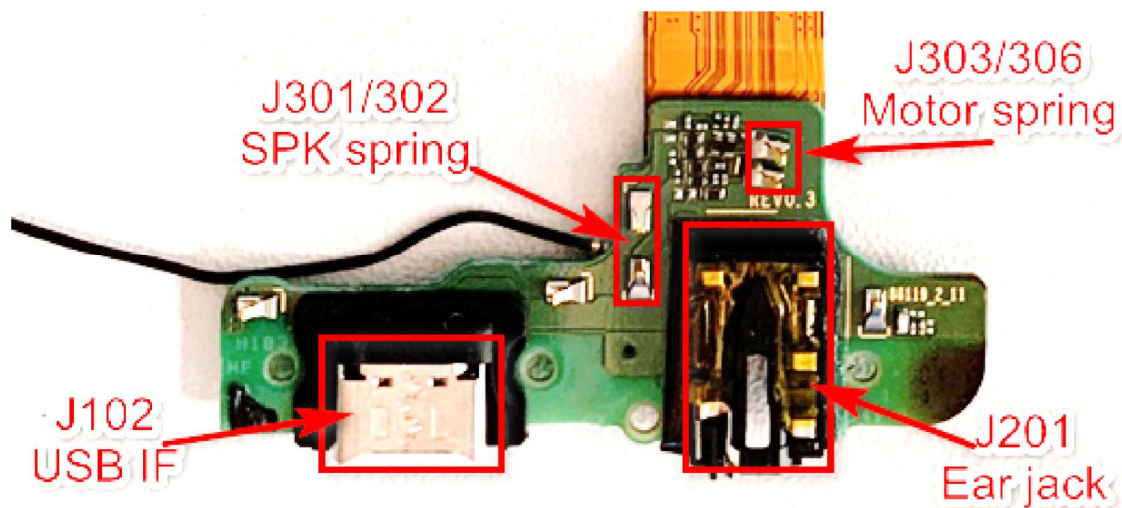
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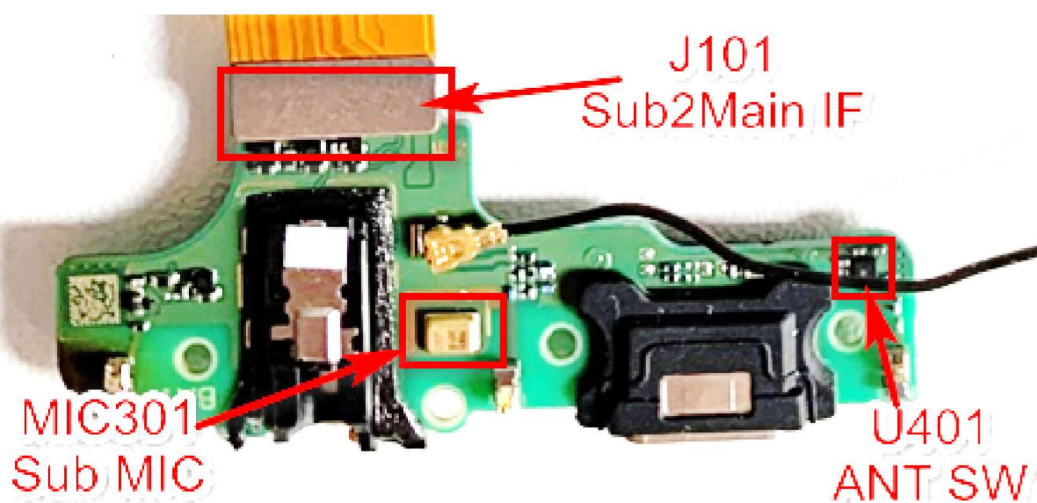
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## 8. Level 3 Repair

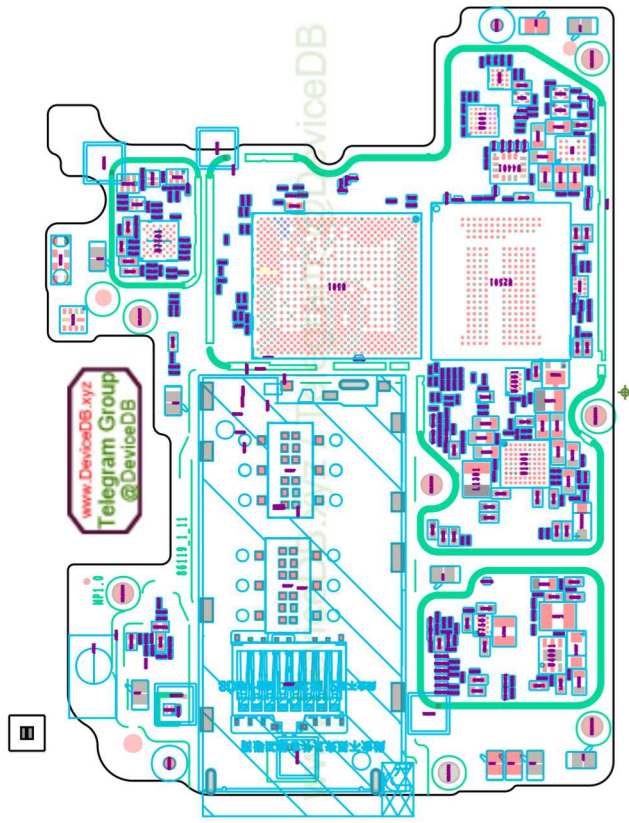
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ART FILM - AA

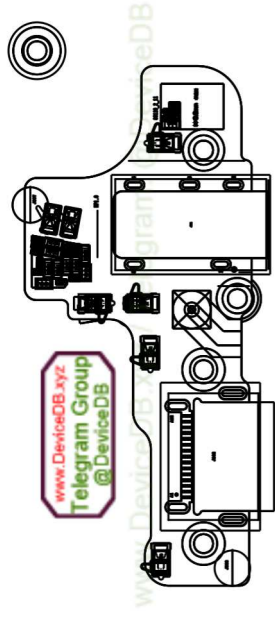


ART FILM - AA



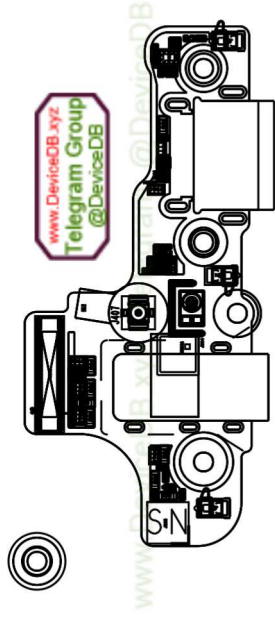


ART FILM - 08\_adt



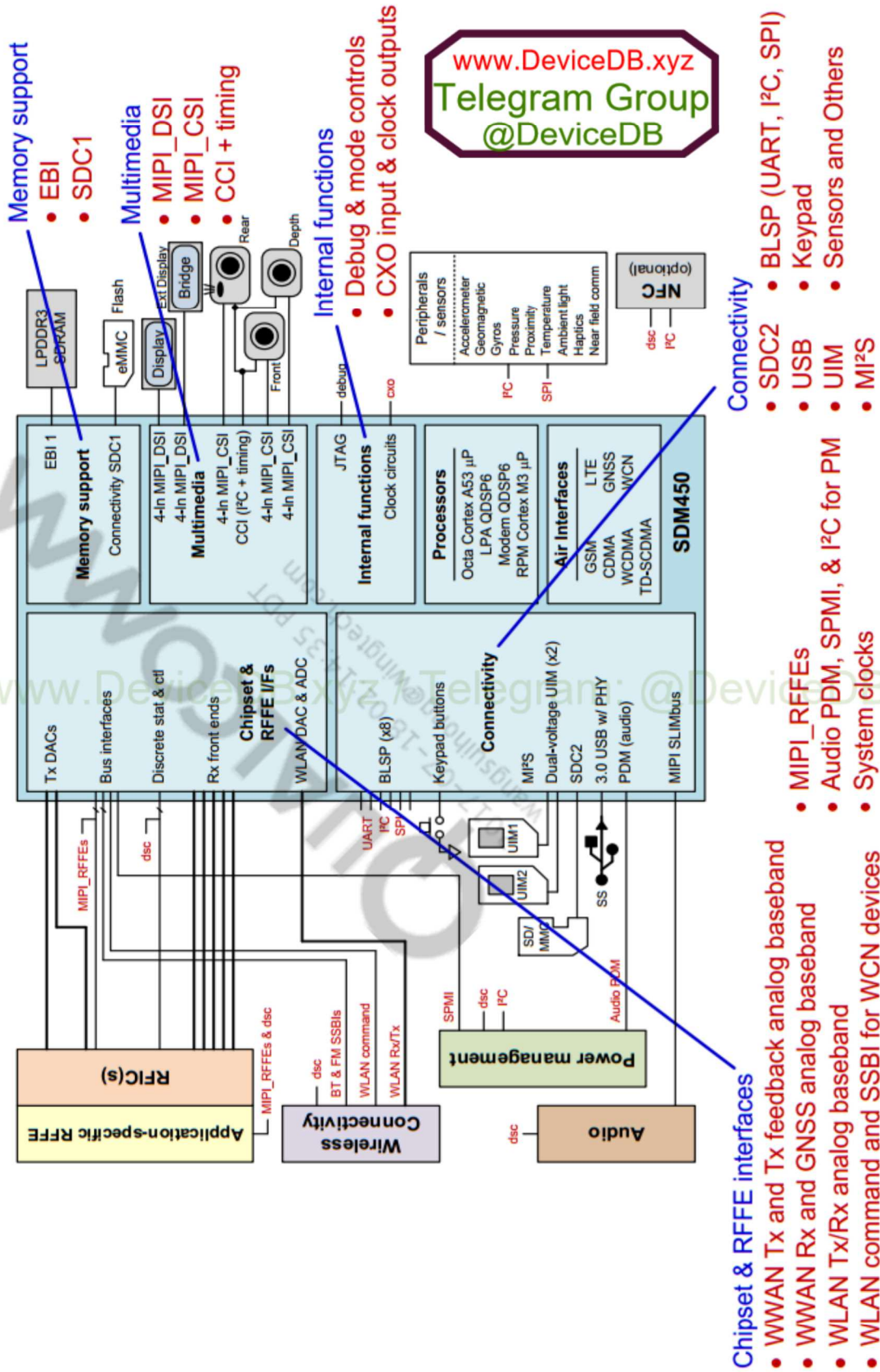
ART FILM - 08\_adt

ART FILM - 09\_adb

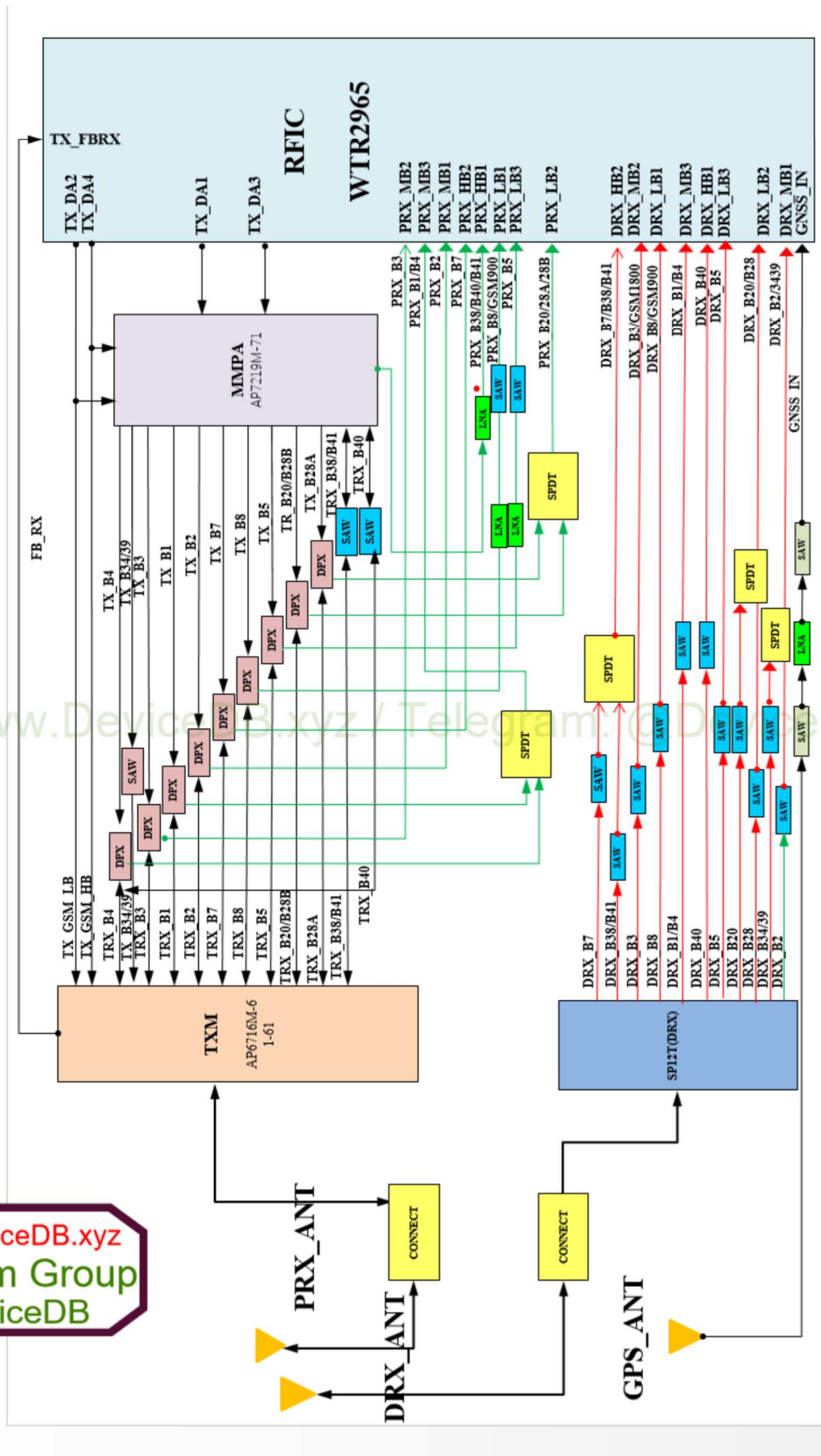


ART FILM - 09\_adb

# 8. Level 3 Repair



# 8. Level 3 Repair

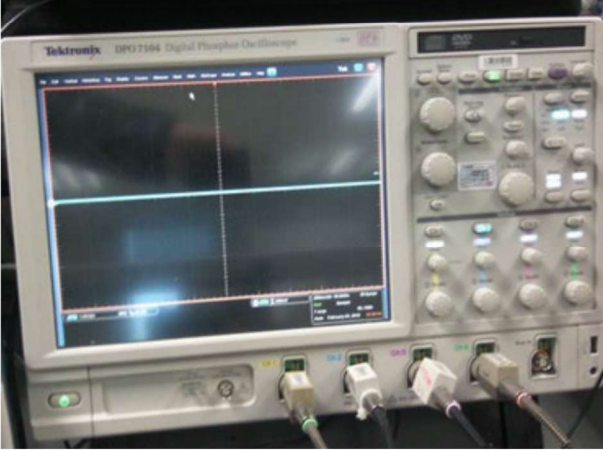


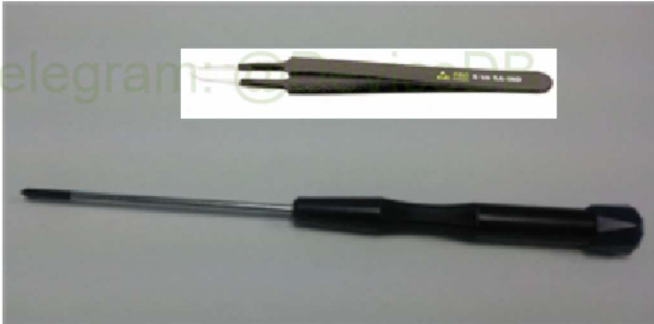
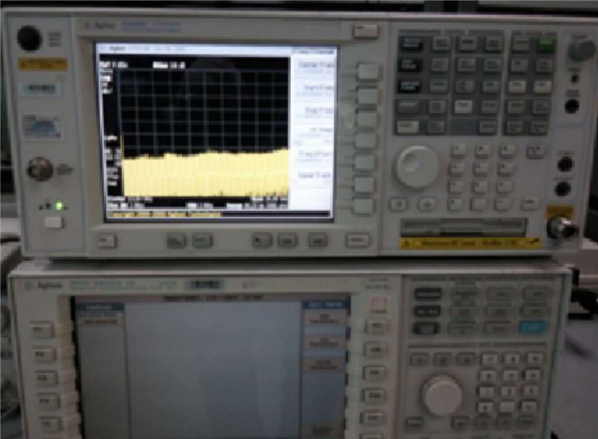



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## 8. Level 3 Repair

### 8-3. Flow chart of Troubleshooting.

	
<p>Oscilloscope</p>	<p>Digital Multimeter</p>
	
<p>Power Supply</p>	<p>+ driver, ESD Safe Tweezer</p>
	
<p>8960 &amp; Spectrum Analyzer</p>	<p>Soldering iron</p>

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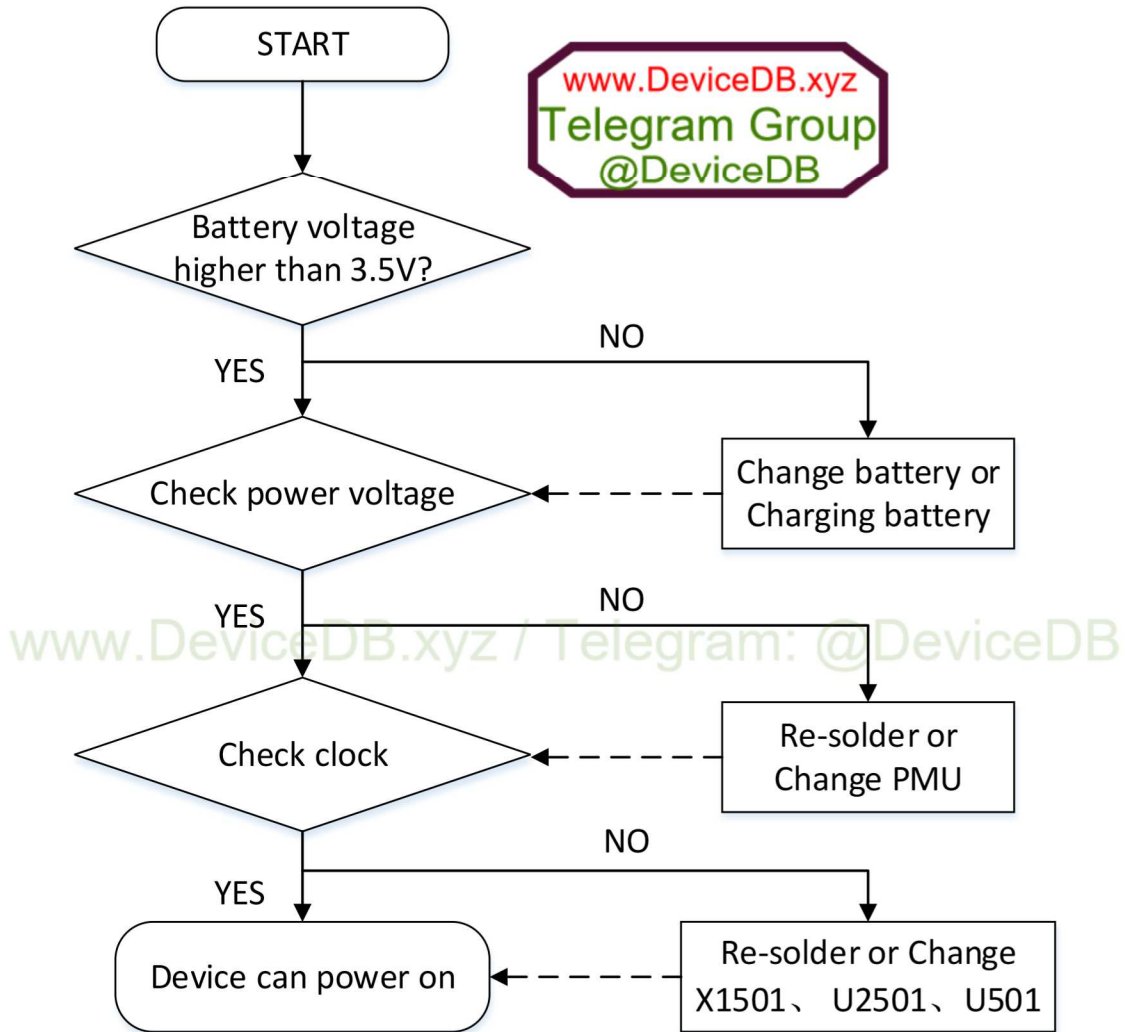
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## 8. Level 3 Repair

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### 8-4-1. Power On

: Checking Power signal (Battery connector, PMU, Clock)



## 8. Level 3 Repair

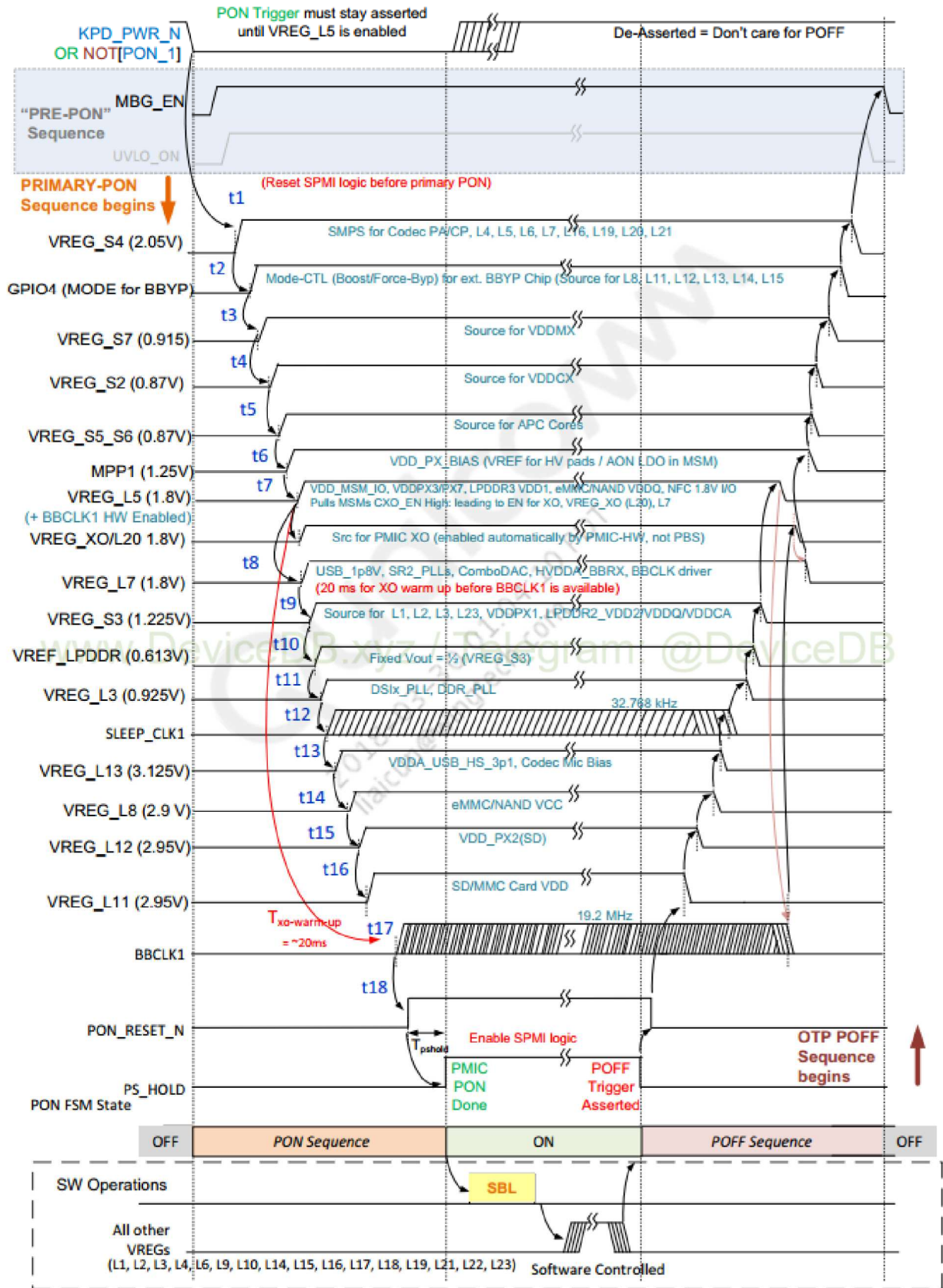


Fig. PM8953 power-on sequence

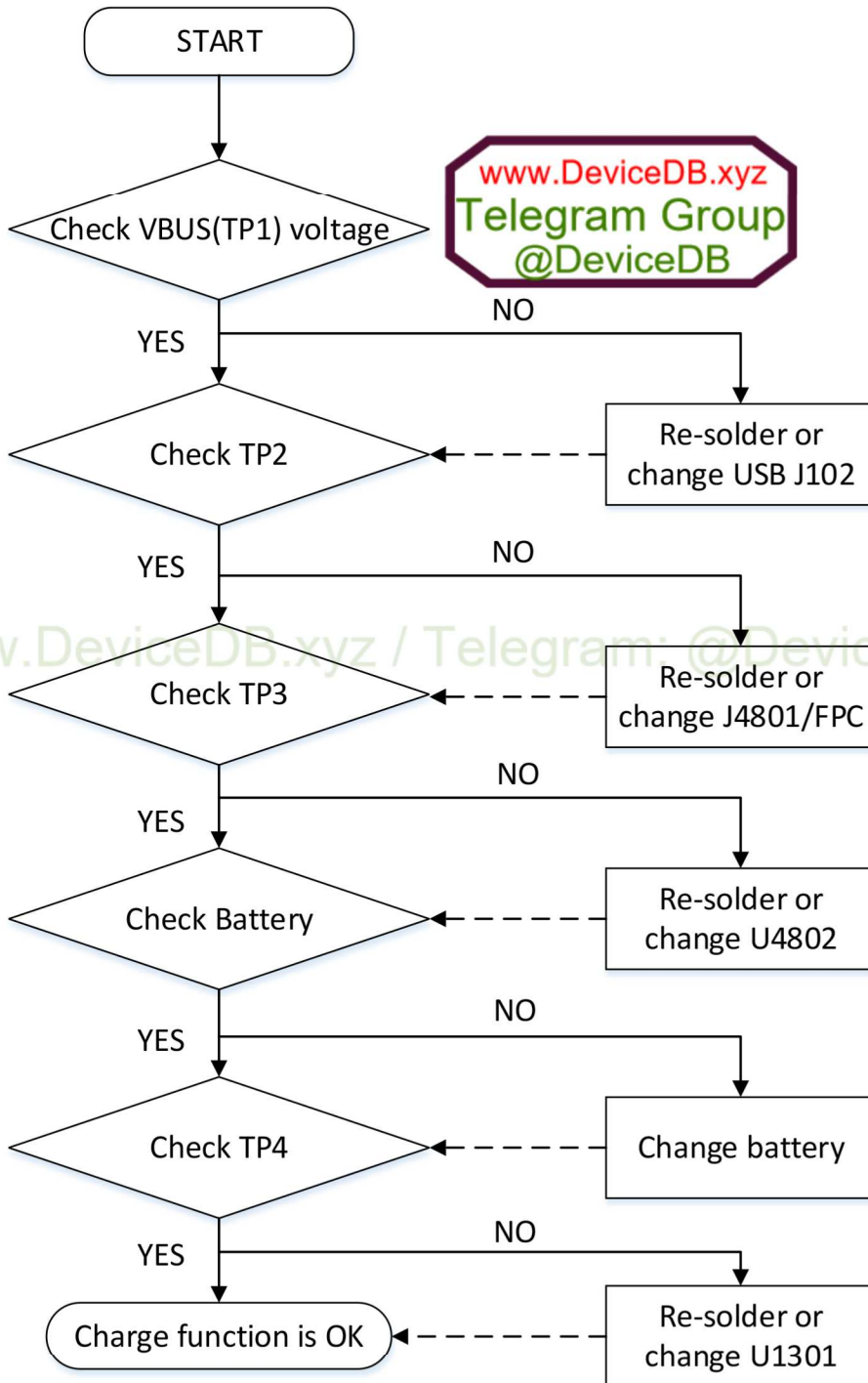
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## 8. Level 3 Repair

### 8-4-2. Charging

: The charging controlled by PMU chip PMI632 (U1301)

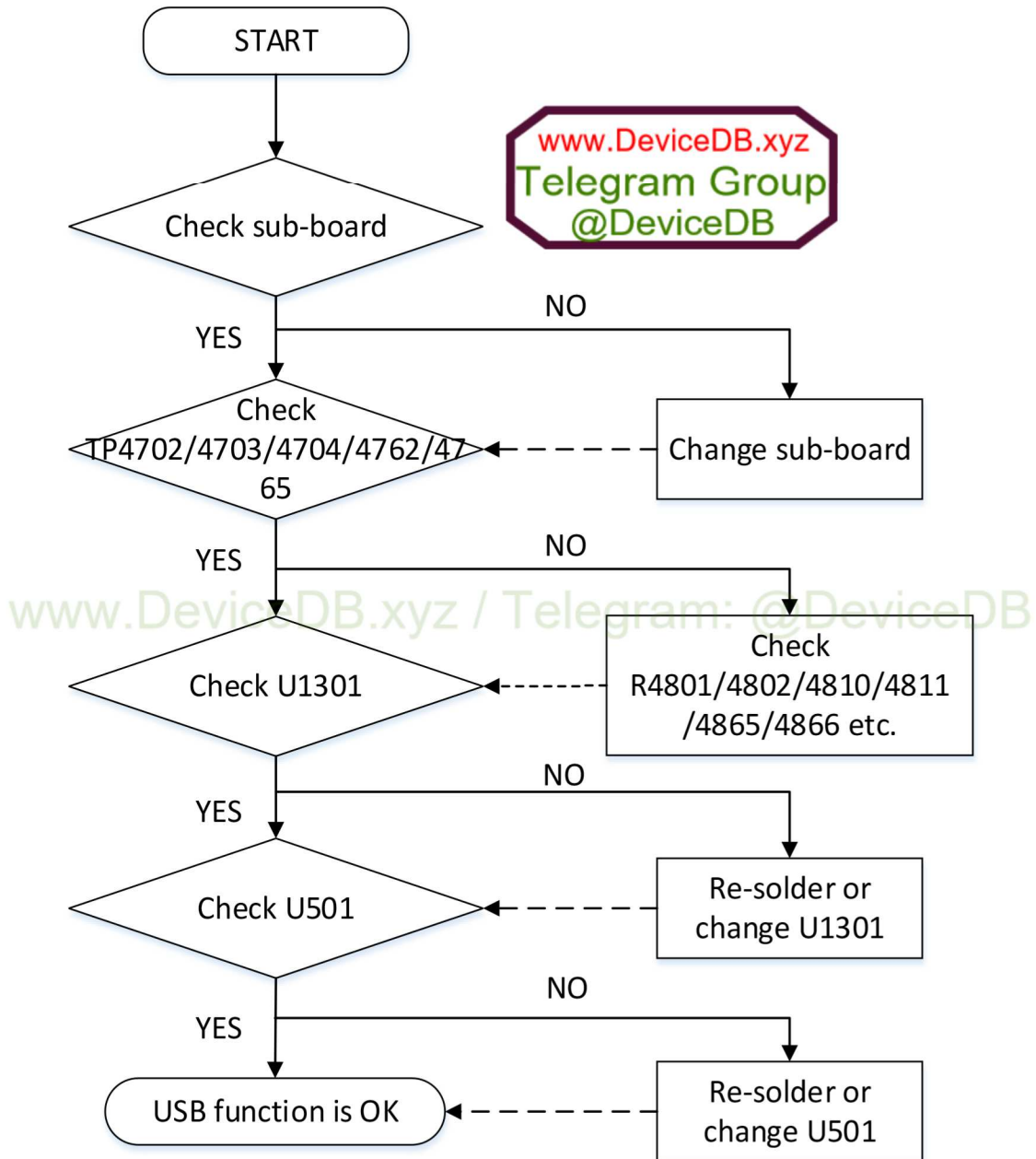




## 8. Level 3 Repair

### 8-4-3. USB

: I/O connector is used as the USB port.



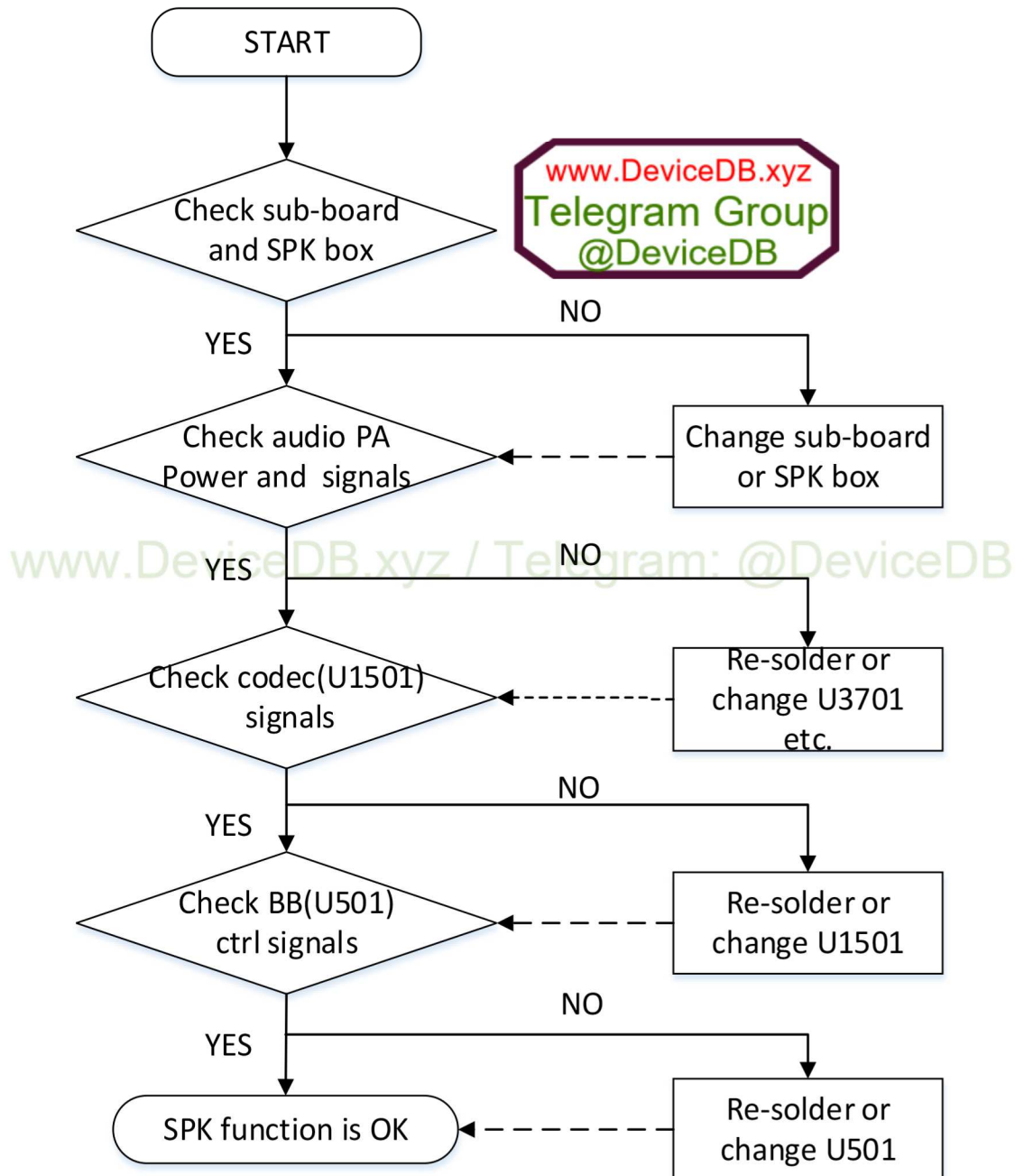
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## 8. Level 3 Repair

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### 8-4-4. Audio\_speaker

: The Speaker control signals are generated by BBIC SDM450(U0501) and Audio PA AW87329(U3701). The ICs and other related components should be checked.



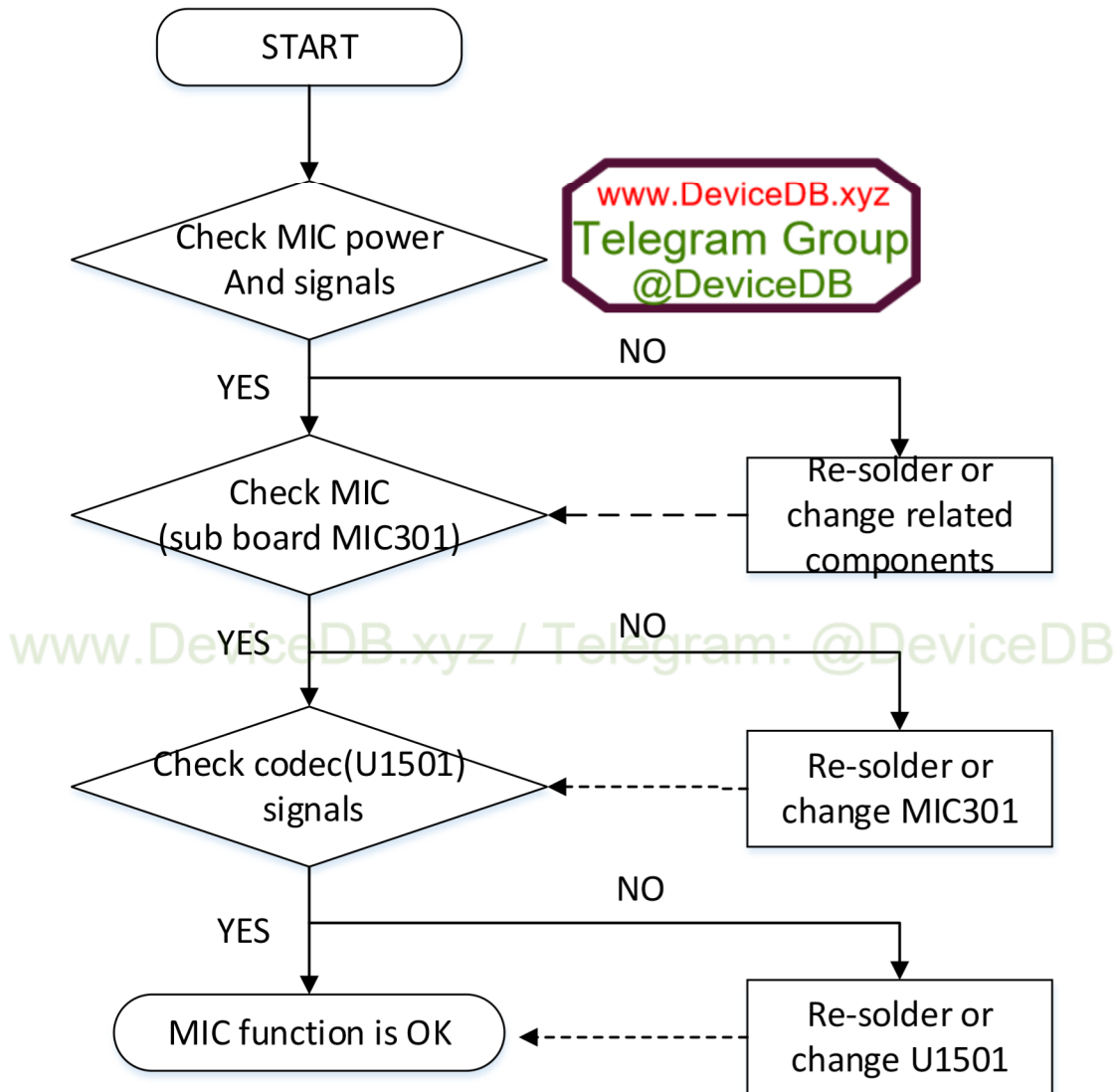
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## 8. Level 3 Repair

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### 8-4-5. Audio\_Main MIC

: The MIC control signals are generated by PMU chip PM8953 (U1501), the PMIC, the MIC and other related components should be checked.



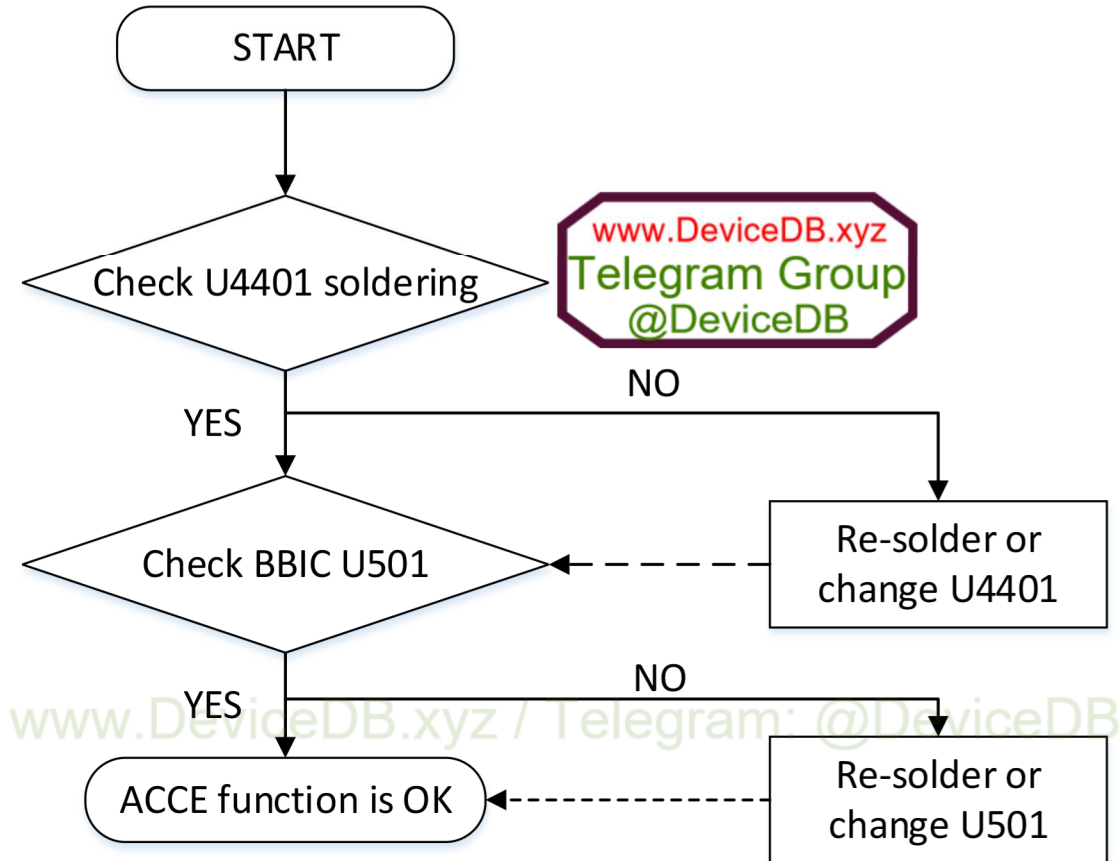
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## 8. Level 3 Repair

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### 8-4-6. Accelerometer sensor

: The 3G-Accelerometer sensor is calibrated by using SW algorithm.

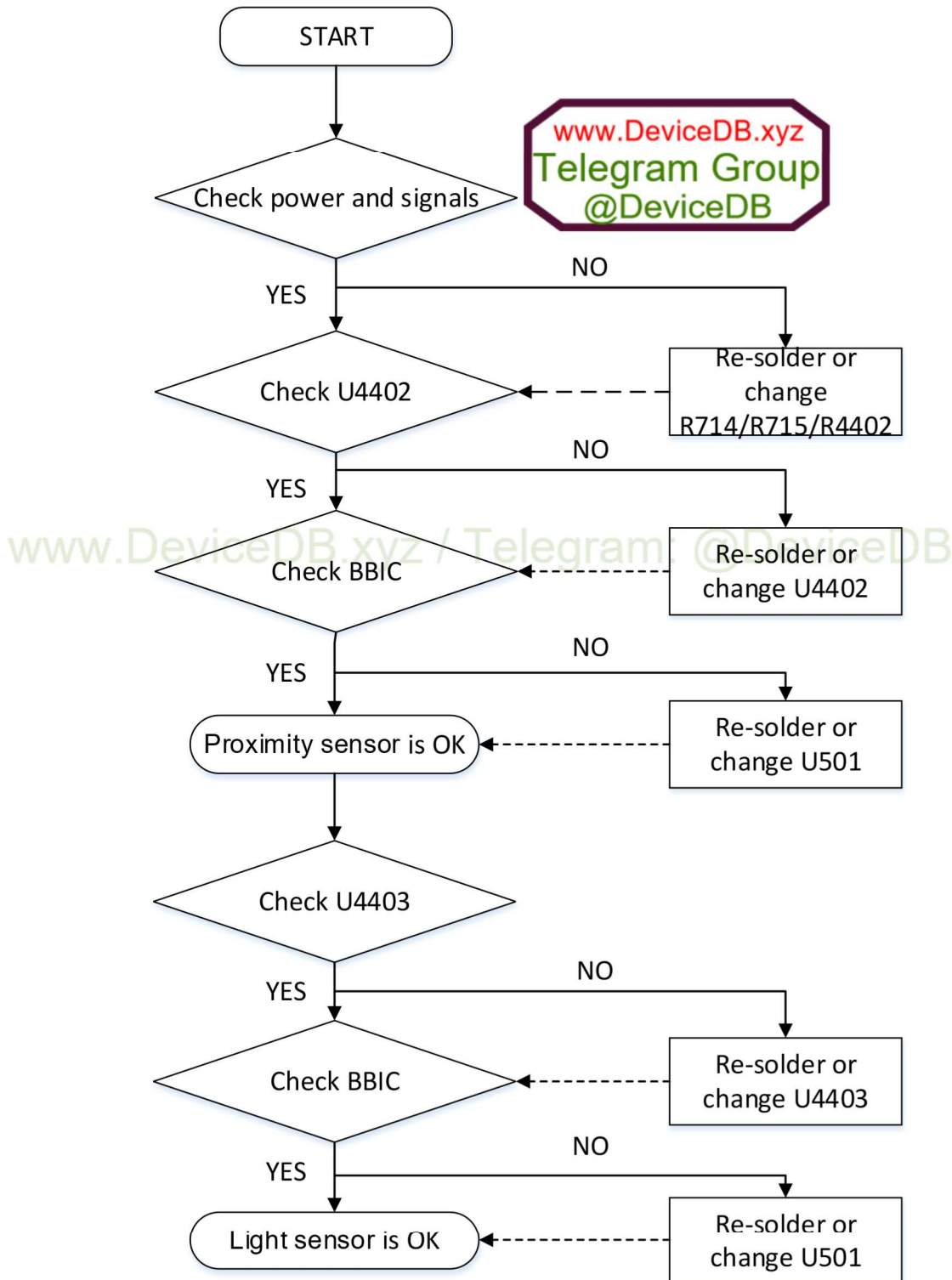




## 8. Level 3 Repair

### 8-4-7. Proximity and light sensor

: Proximity and Light Sensor is worked as below: Control the screen's on/off operation automatically while making phone calls, and adjust the screen brightness according to ambient light.



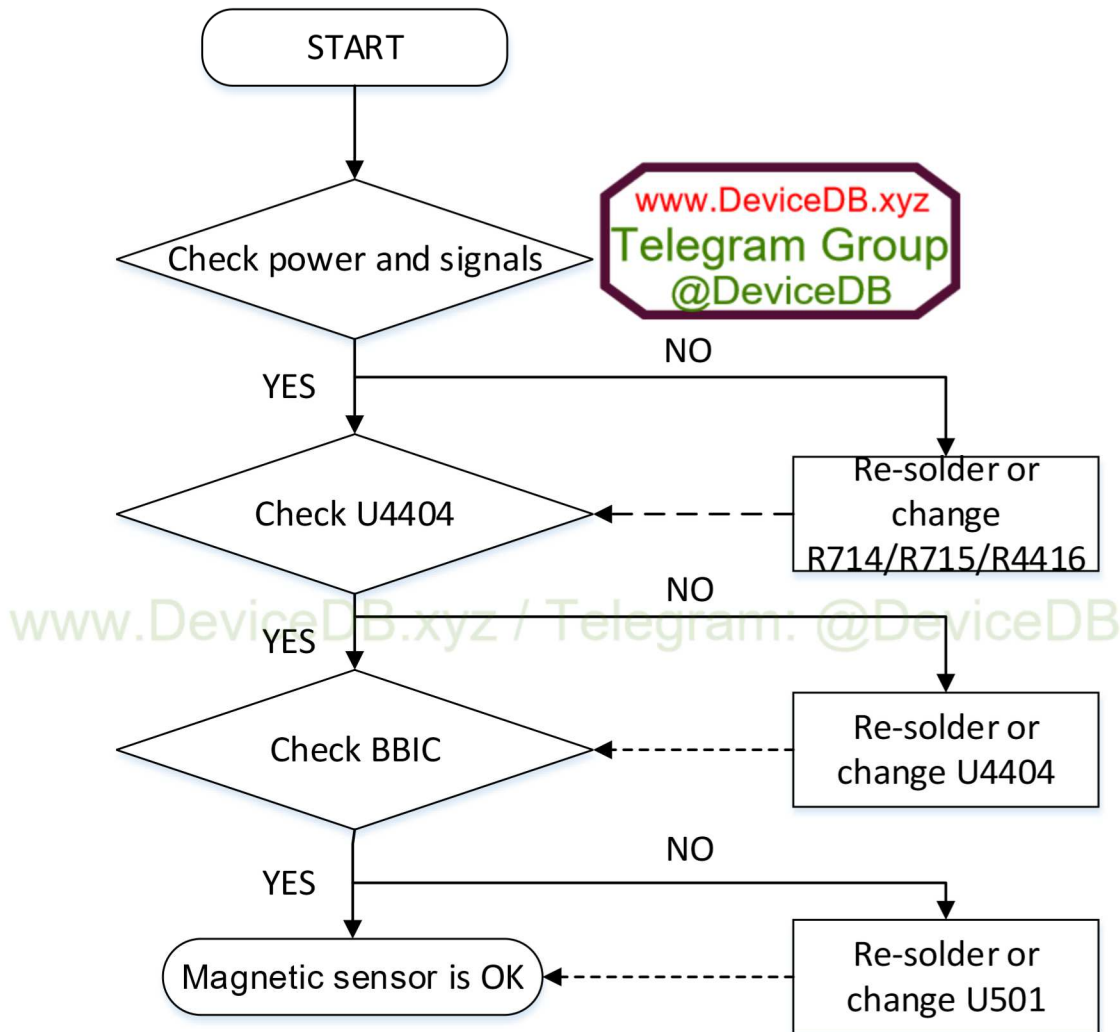
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## 8. Level 3 Repair

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### 8-4-8. Magnetic Sensor

: Magnetic Sensor is usually used for compass and the control signals are generated by SDM450



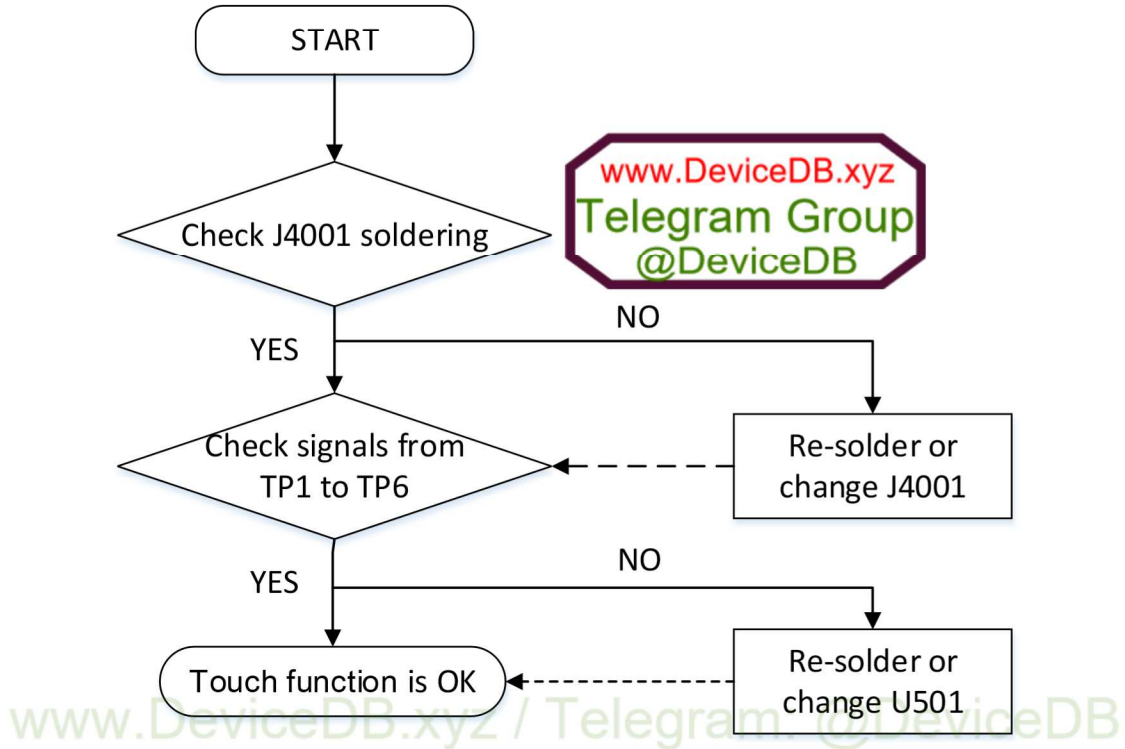
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## 8. Level 3 Repair

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### 8-4-9. TOUCH SCREEN

: The Touch control signals are generated by SDM450. It is assembled with LCD.



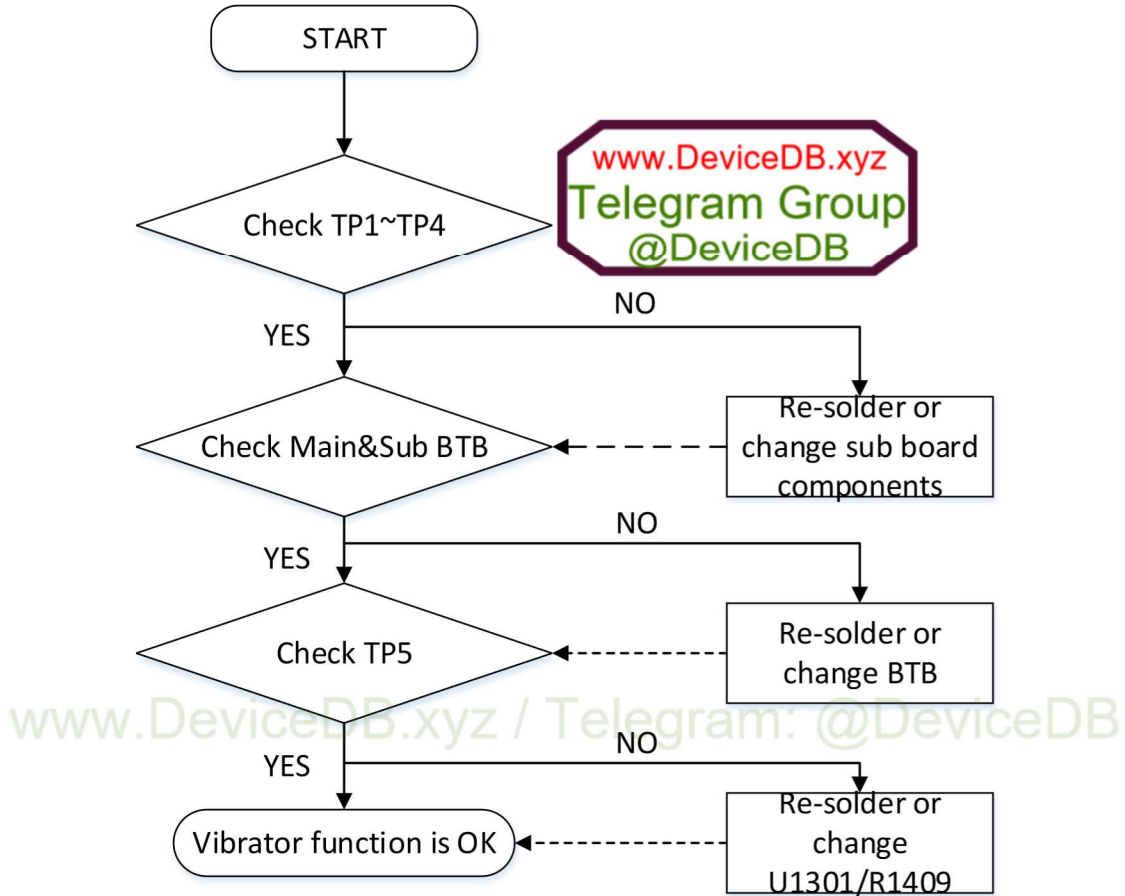
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## 8. Level 3 Repair

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### 8-4-10. Vibrator

: The Vibrator control signals are generated by PMI632.



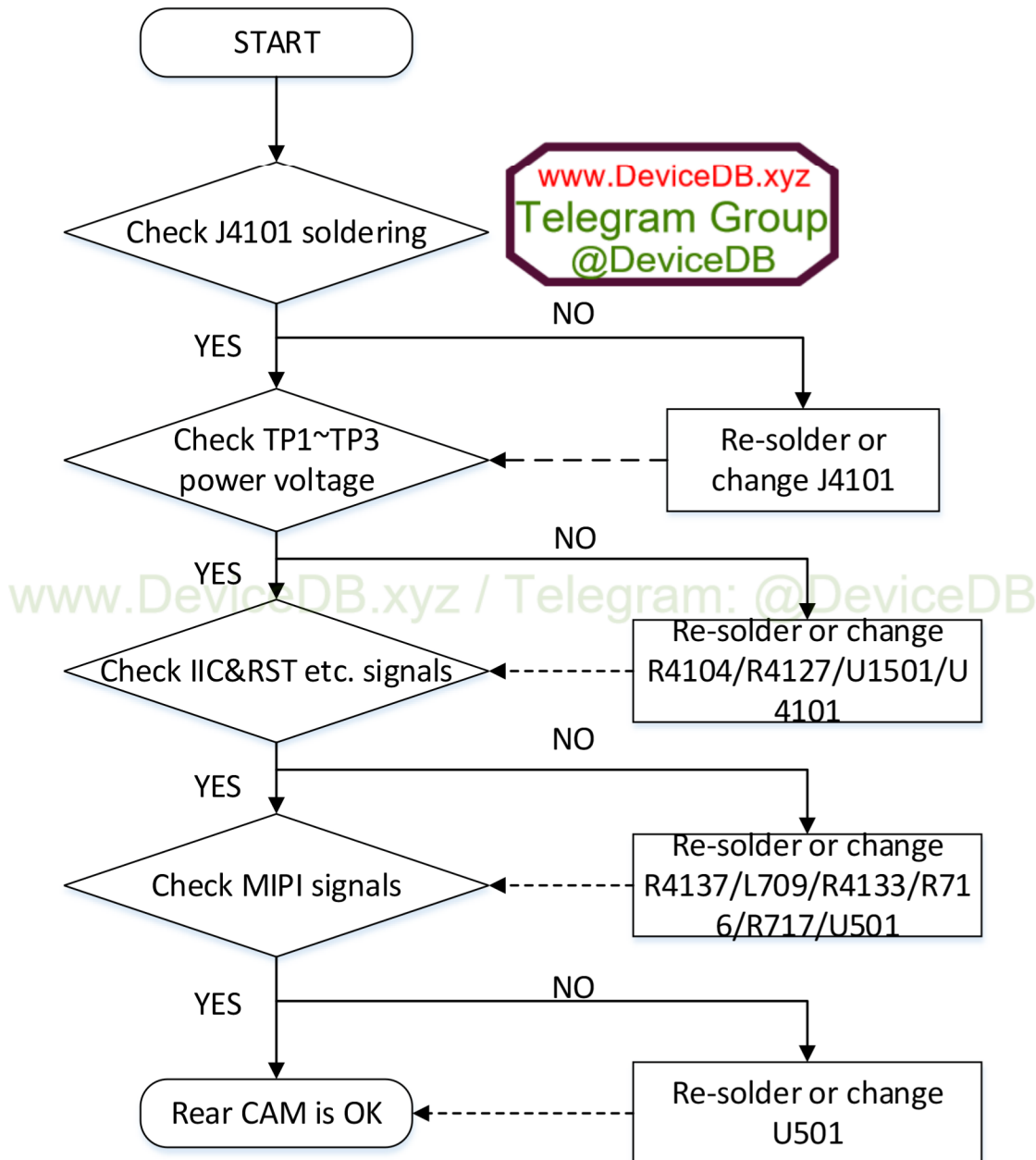
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## 8. Level 3 Repair

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### 8-4-11. Rear Camera

: The camera control signals are generated by SDM450. Other cameras' analysis methods refer to the rear camera.





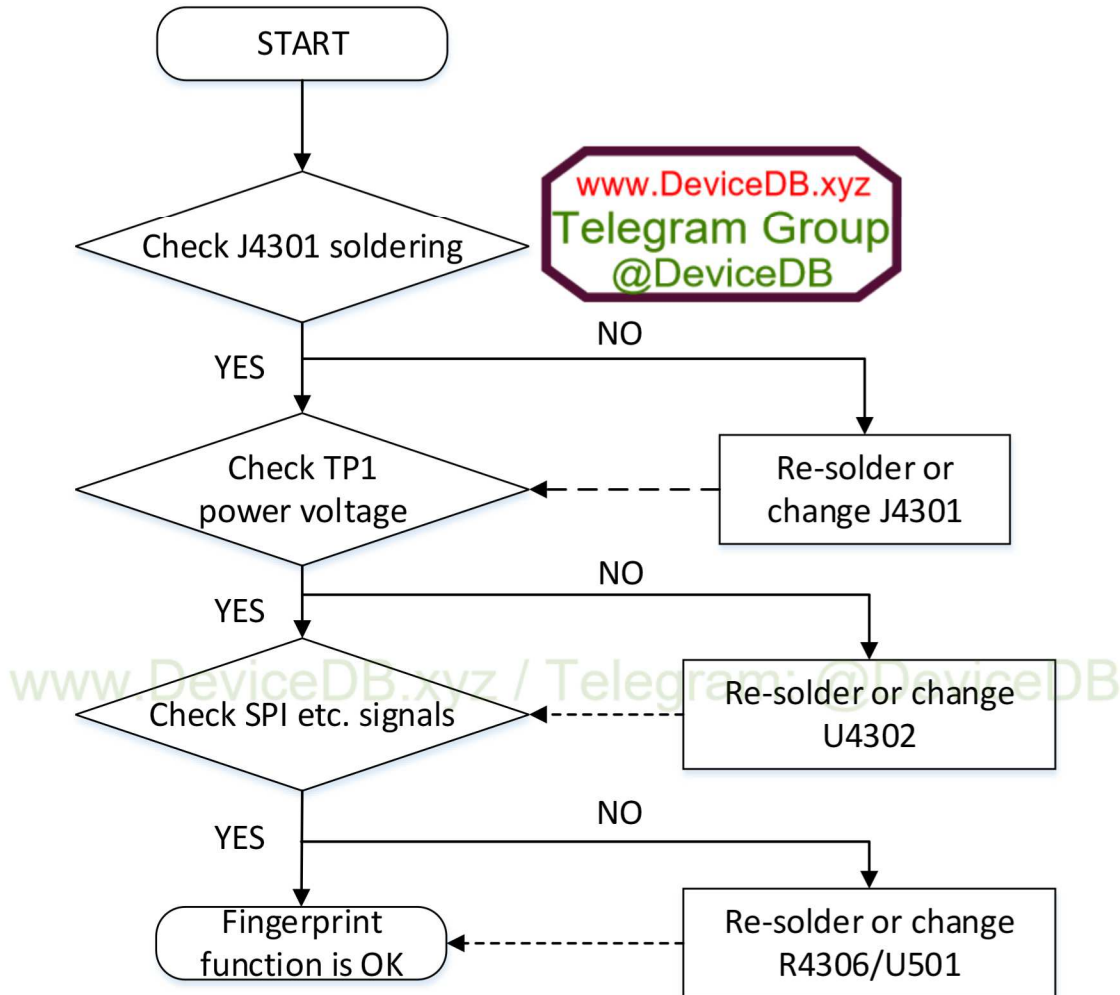
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## 8. Level 3 Repair

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### 8-4-12. Fingerprint

: The Fingerprint control signals are generated by SDM450.



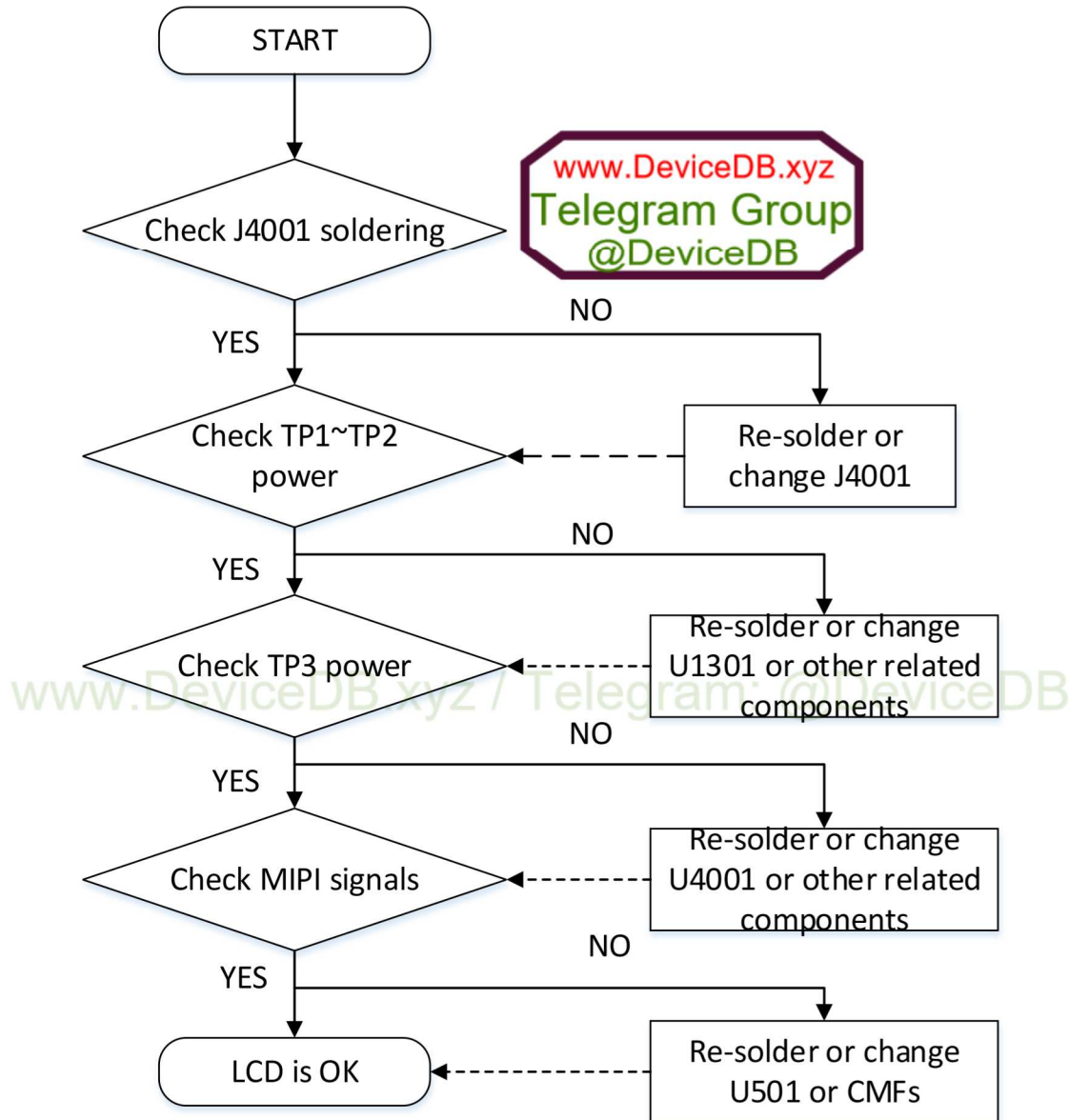
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## 8. Level 3 Repair

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### 8-4-13. LCD

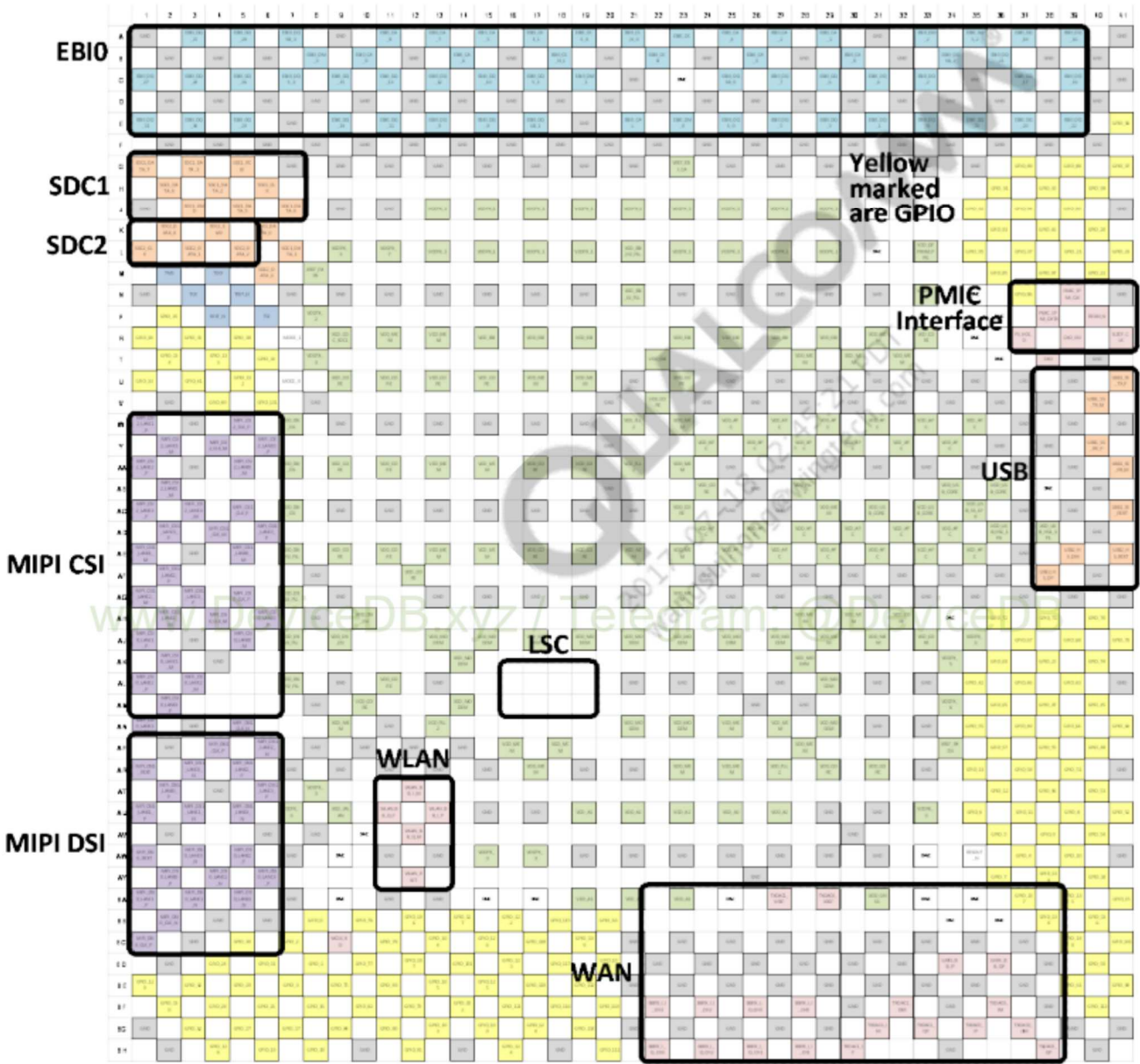
: The LCD control signals are generated by SDM450.



# 8. Level 3 Repair

## 8-5. Service Schematics

- U501\_SDM450\_BB chip IC , Digital Baseband Processor(Top)



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