

8. Level 3 Repair

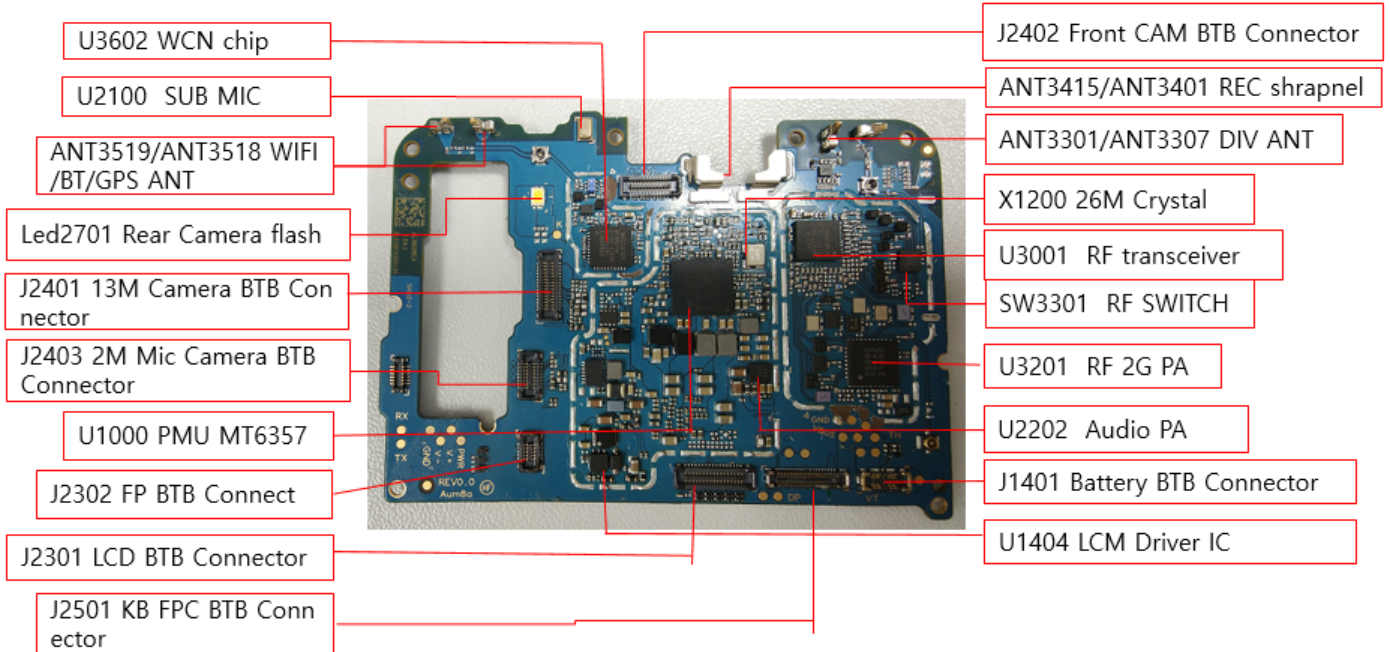
آموزش شماتیک و نقشه خوانی

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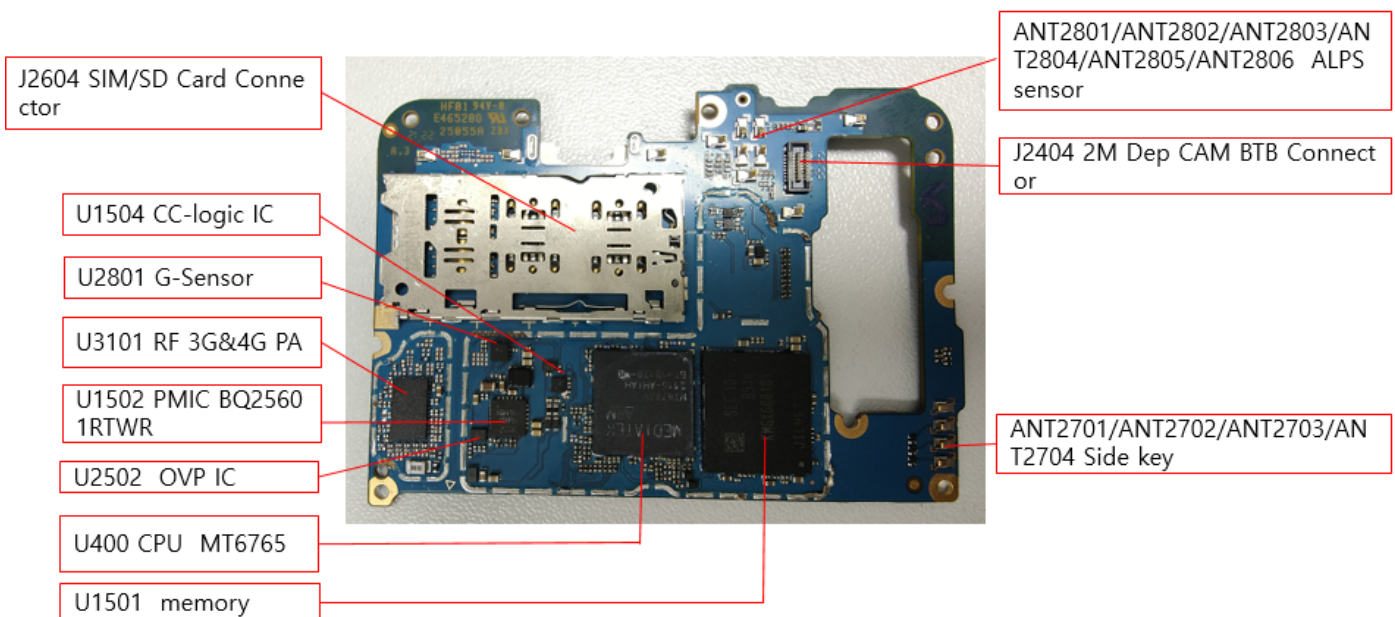
8-1. Components Layout

Mobile schematic training

PBA (Bottom)

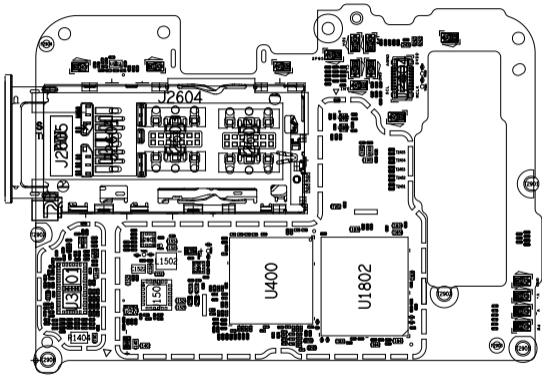


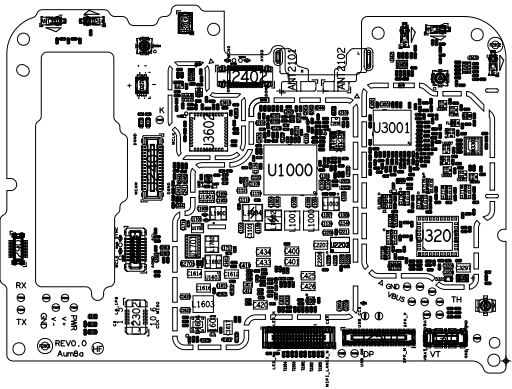
PBA (TOP)

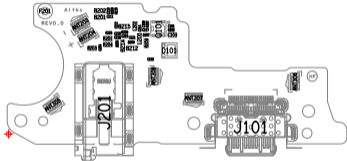


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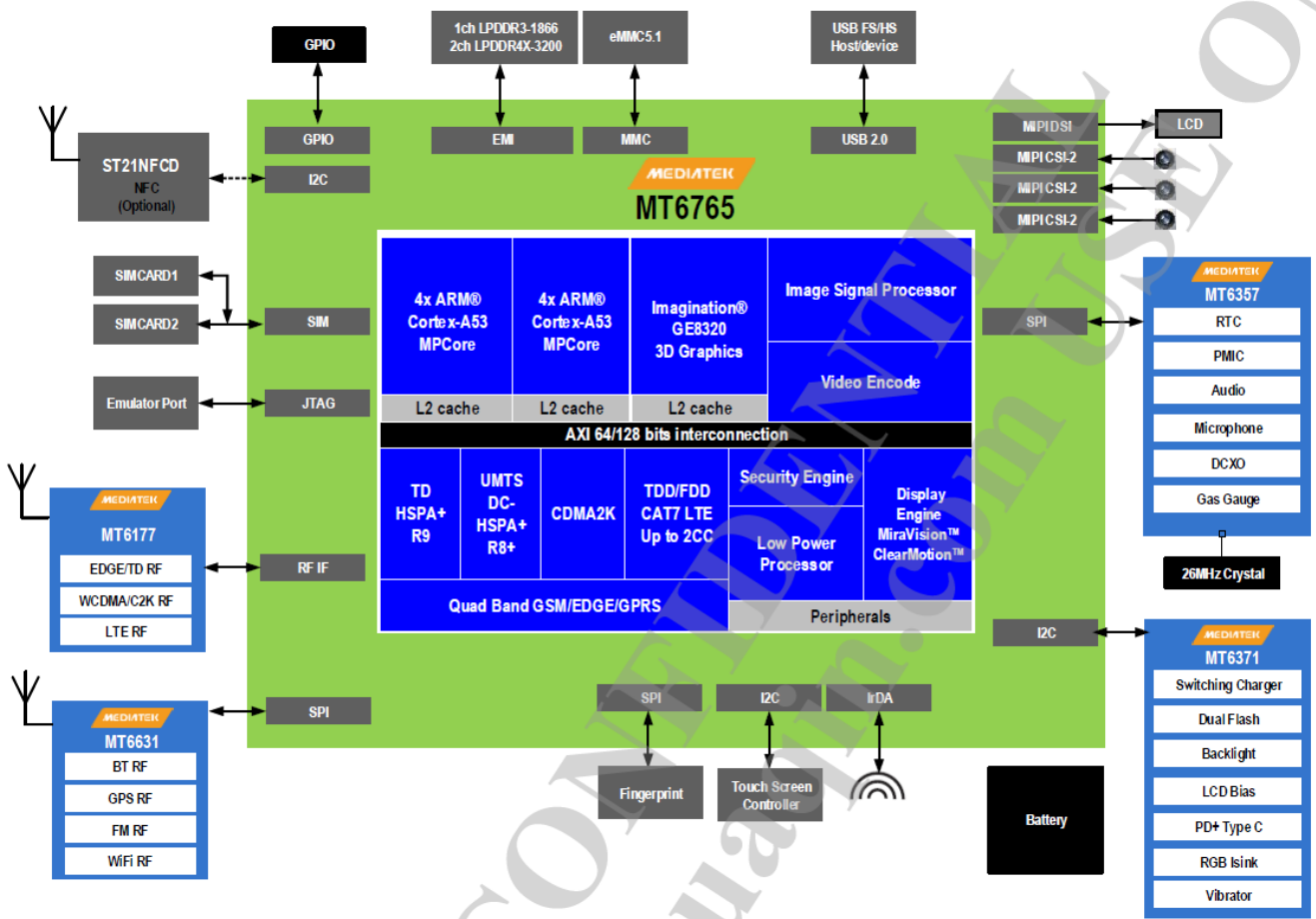




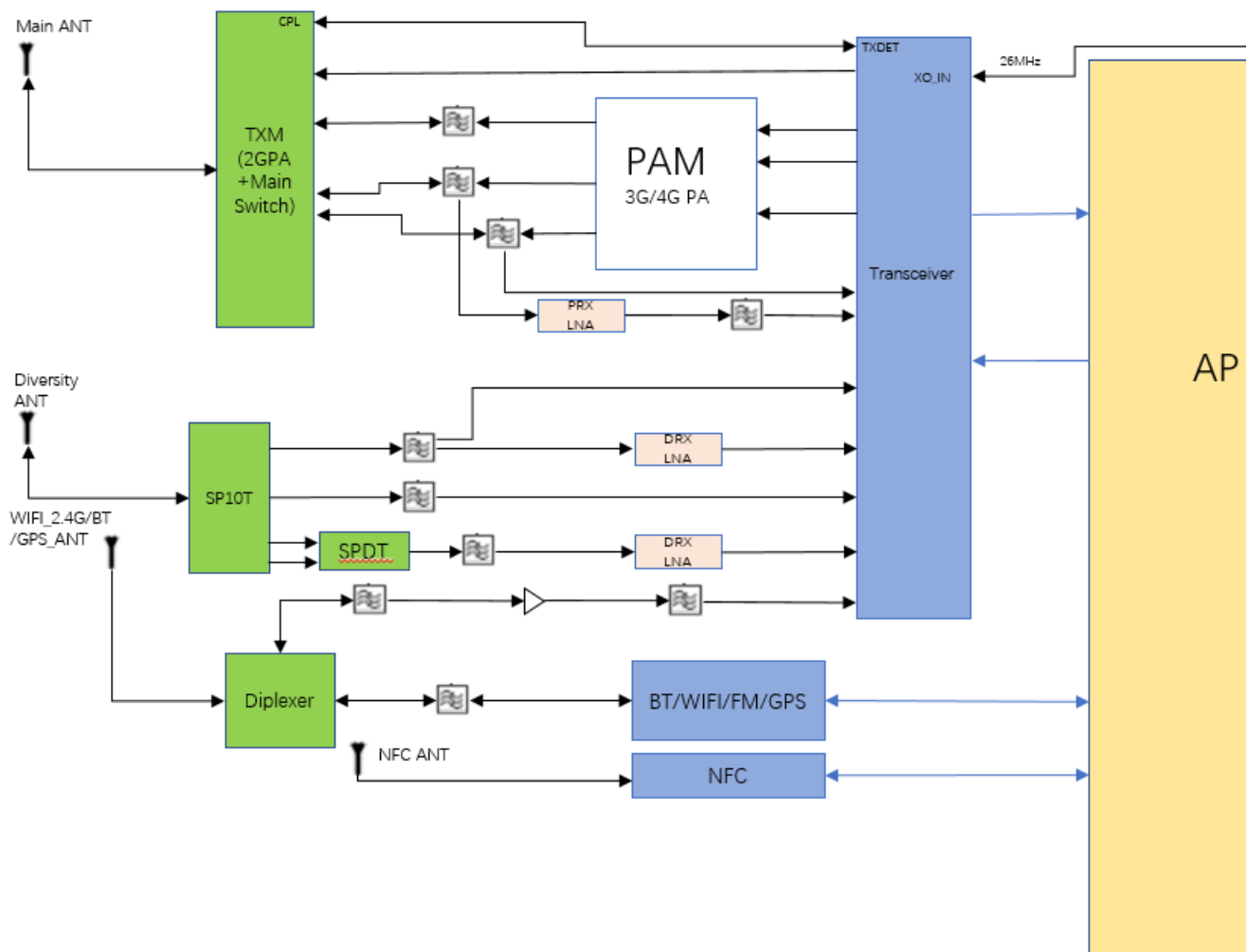




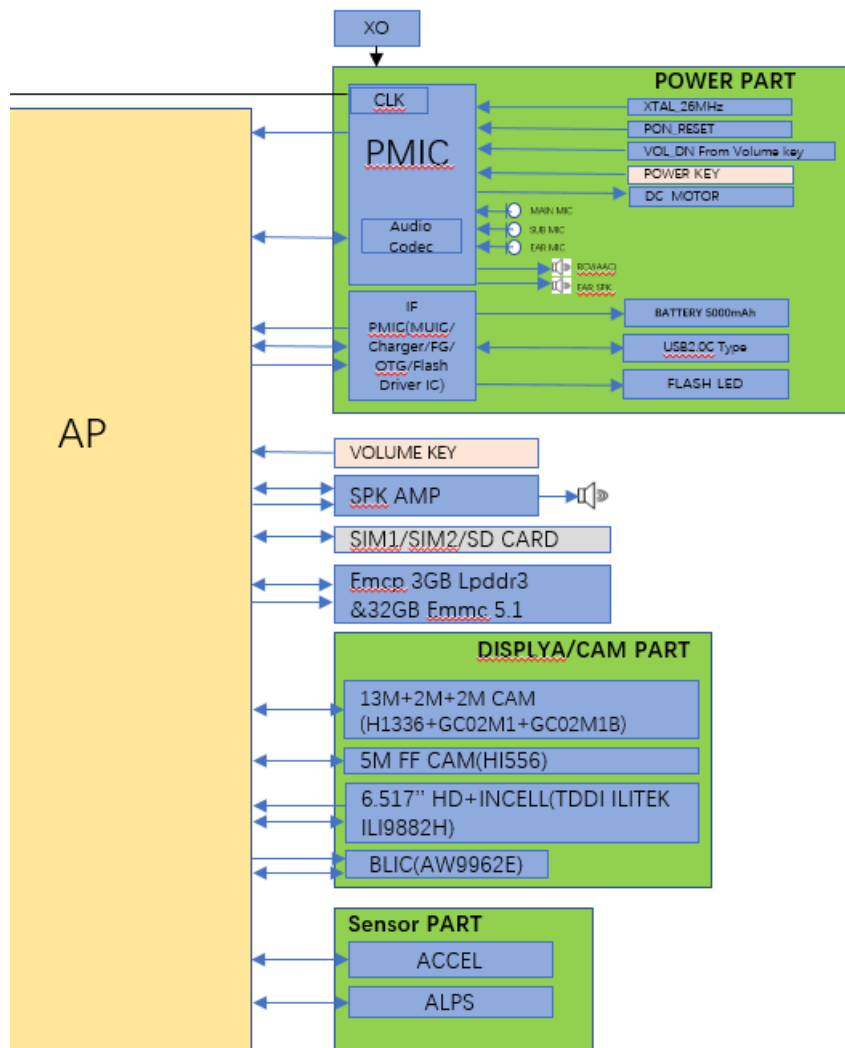
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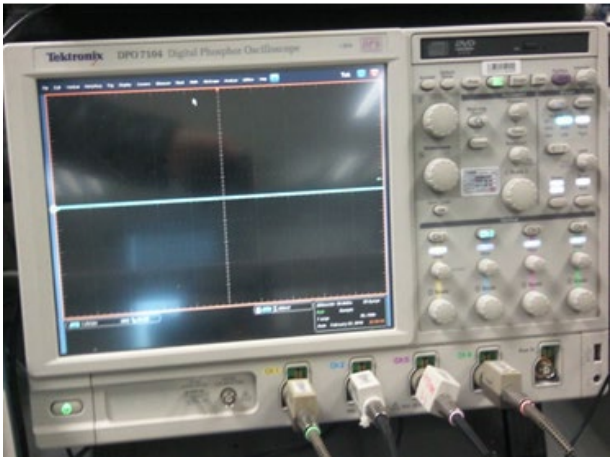


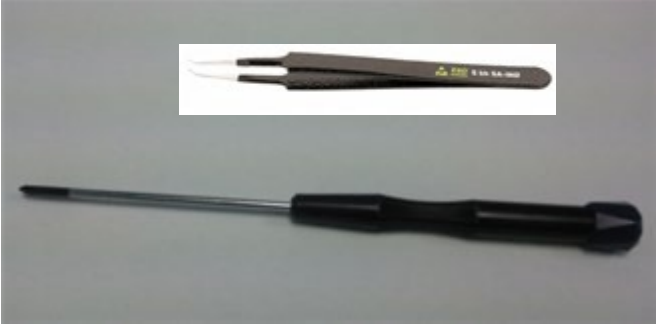
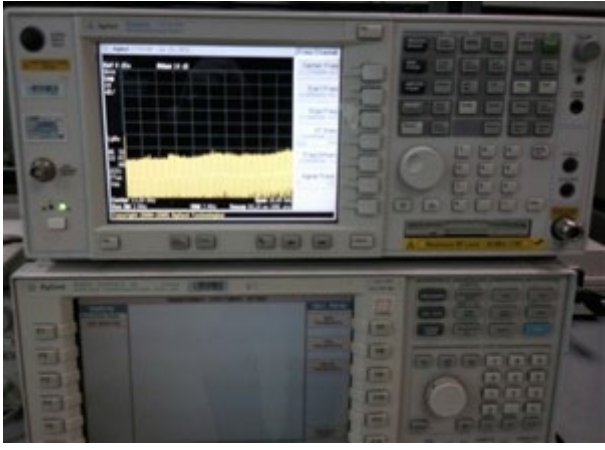



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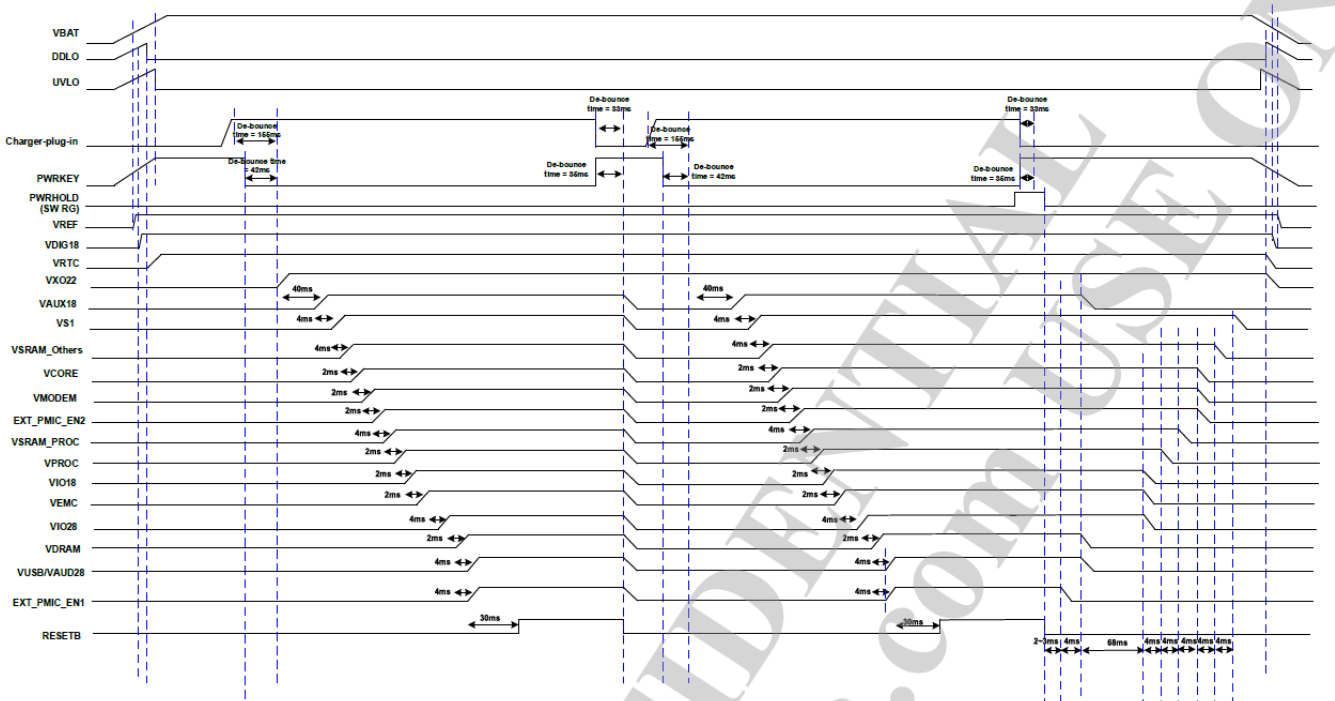
8-2. Flow chart of Troubleshooting.

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

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8-3-1. Power On

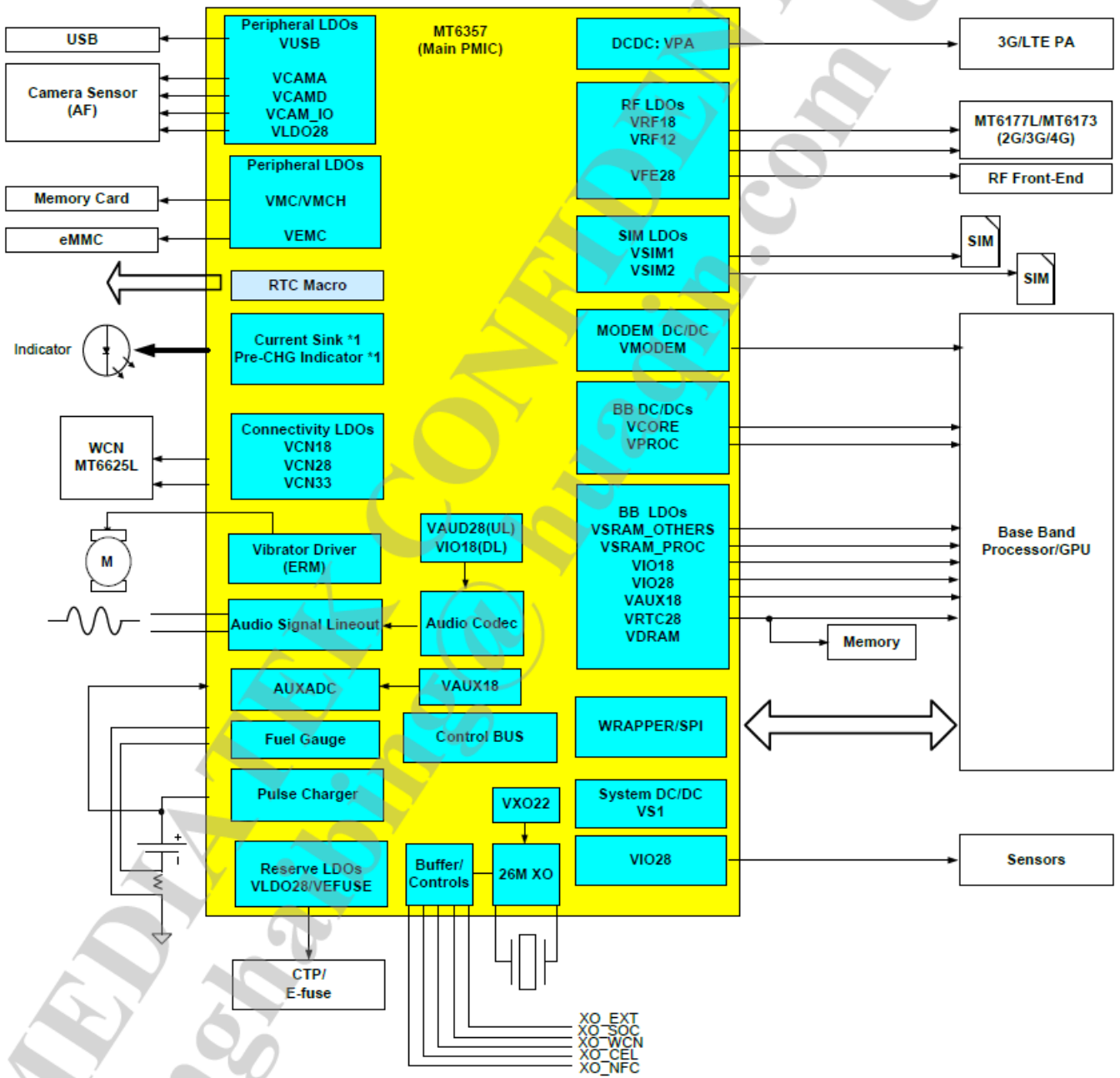
■ Checking Power signal (Battery connector, PMU, Clock)



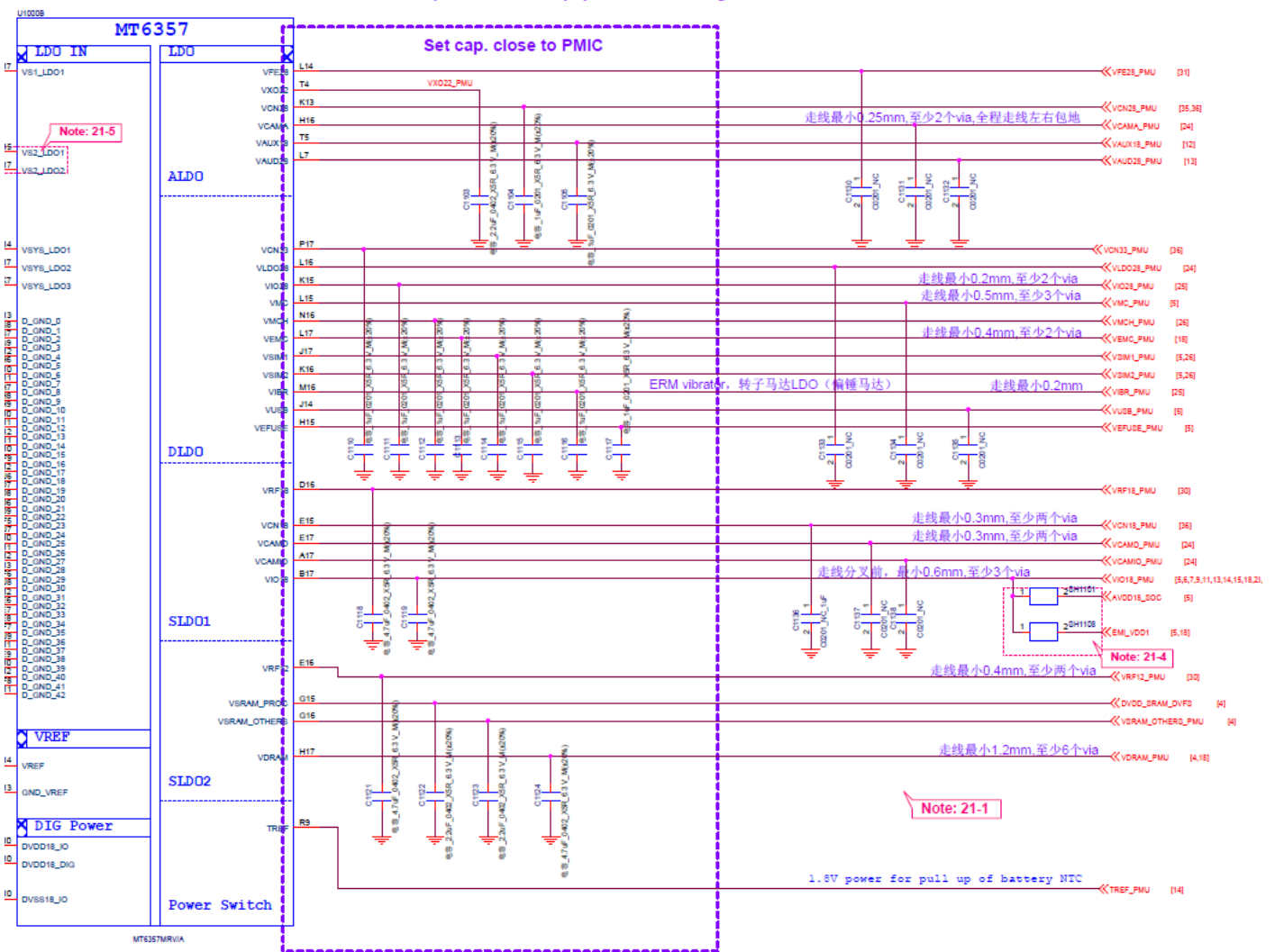
Note: Those timings are typical values; timing variation is $\pm 20\%$ (Charger-plug-in/out related delay timing variation is $\pm 40\%$).

Start up voltage sequence diagram

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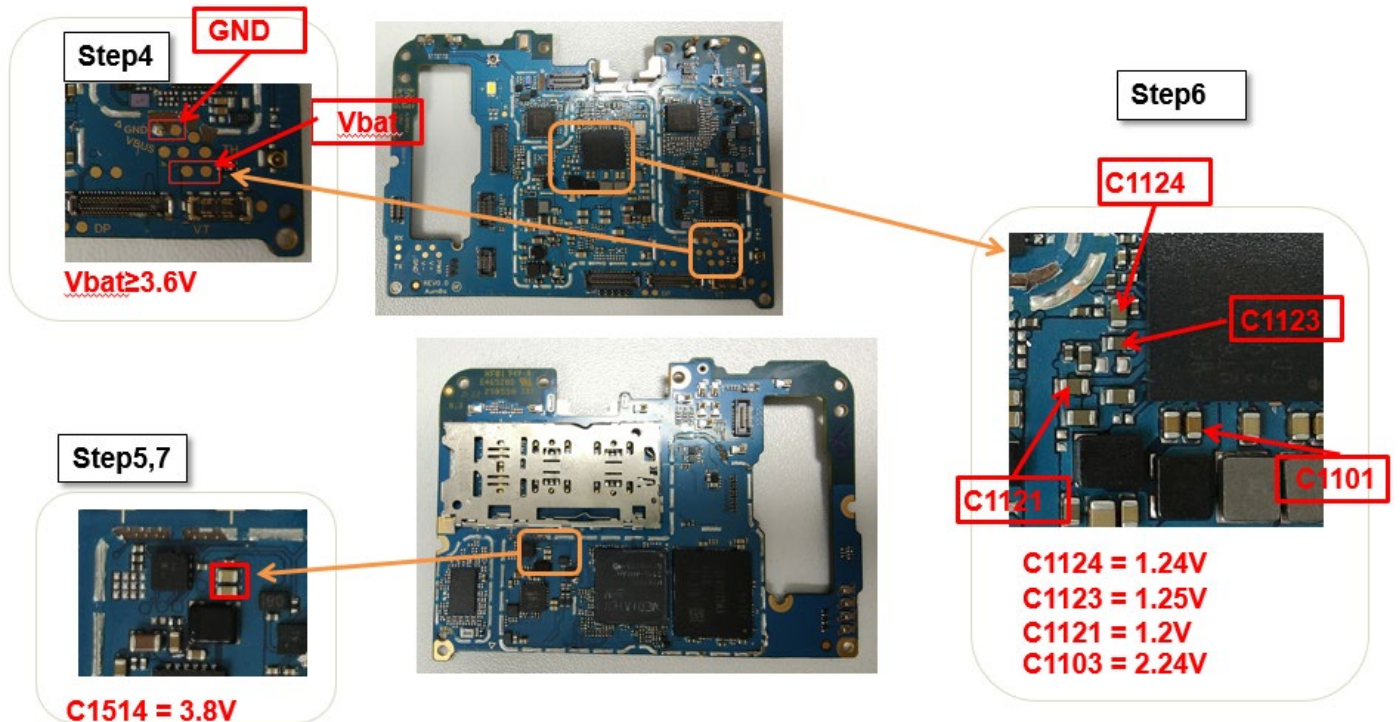
VREG_LDO schematic diagram

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No Power

Step	Check point	Result value	Defect point
1	Confirm the defect symptom. (Do not confuse the screen problem.)	-	-
2	Check the Power button working physically	Normal	Go to the step 3
		Get Stuck / Sticky	Cleaning, Reassembly
3	Can USB charge normally ?	Yes	Go to the step 3.1
		No	Replace the battery
3.1	Can start the machine normally after charging ?	Yes	Cell phone under voltage, continue charging
		No	Go to the step 4
4	Check the voltage level at Vbat and GND these two points is greater than 3.8V	Yes	Go to the step 5
		No	Replace the battery
5	Check whether the voltage at both ends of c1514 capacitor is greater than 3.8V	Yes	Go to the step 6
		No	Go to the step 7
6	Check the output voltage of U1000, C1123=1.25V, C1124=1.24V, C1103=2.24V	If the output voltage is not normal, Change the U1000	
7	Check the output voltage of U1502. C1514=3.8V(Consider voltage margin $\pm 10\%$)	If the output voltage is not normal, Change the U1502	

No Power (cont')



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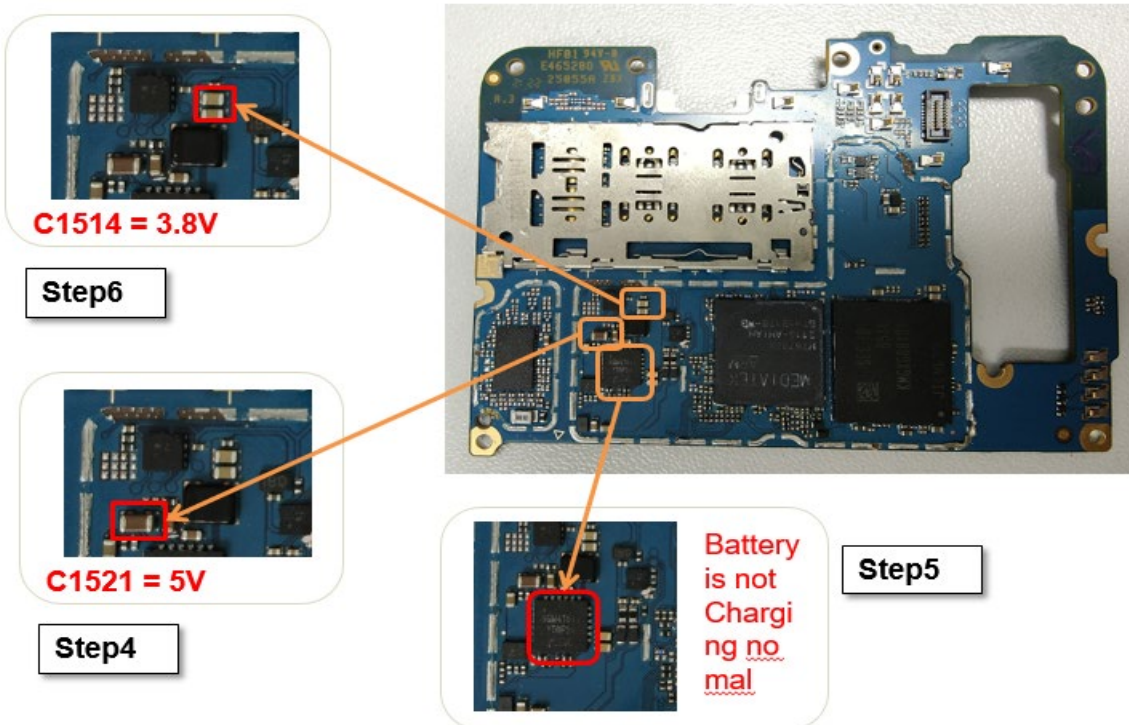
8-3-2. Charging

- The charging controlled by PMU chip MT6357 (U1000) , PMIC chip (U1502) and OVP chip U2502,

No Charging

Step	Check point	Result value	Defect point
1	Confirm the defect symptom	-	-
2	Replace a battery.	Solved	Go to the step 2.1
		Not solved	Go to the step 3
2.1	Charge the customer battery during 5min at least.	Solved	Totally discharged battery
		Not solved	Go to the step 3
3	Disassemble and check I/F connector visually	Dust	Clean I/F connector
		Damage	Replace I/F connector
		Normal	Go to the step 4
4	Check the VBUS_USB_IN(C1521)=5V	C1521 = 5V	Go to the step 6
		If not the correct value	Replace U2502
5	Battery is Charging <u>normal</u>	No	Replace U1502
6	Check whether the voltage at both ends of c1514 capacitor is greater than 3.8V	If the output voltage is not normal, Change the U1502	

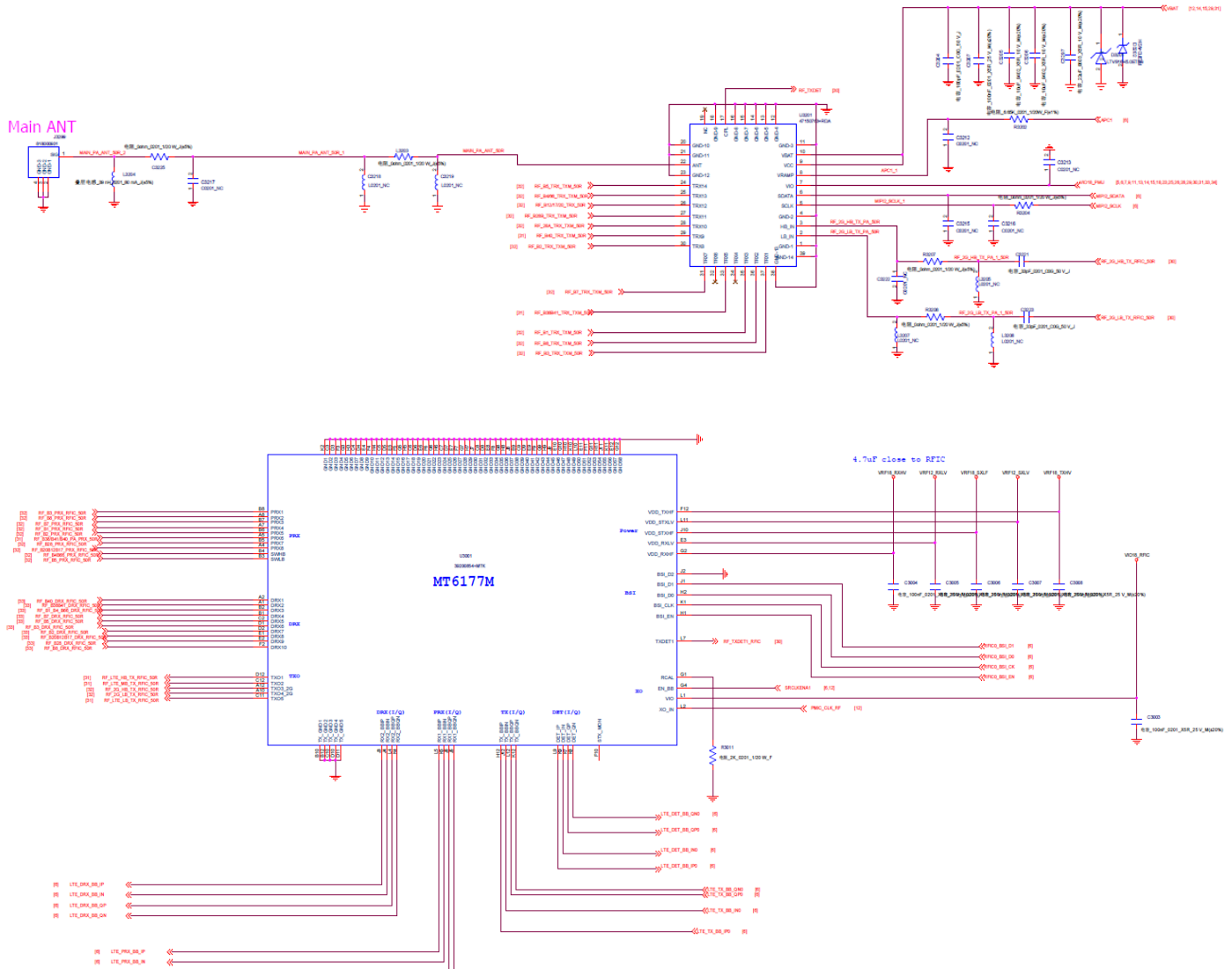
No Charging



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8-3-3. call problem

- The main RF chips are mt6177m (u3001), L / M / h PA (u3101, u3201)

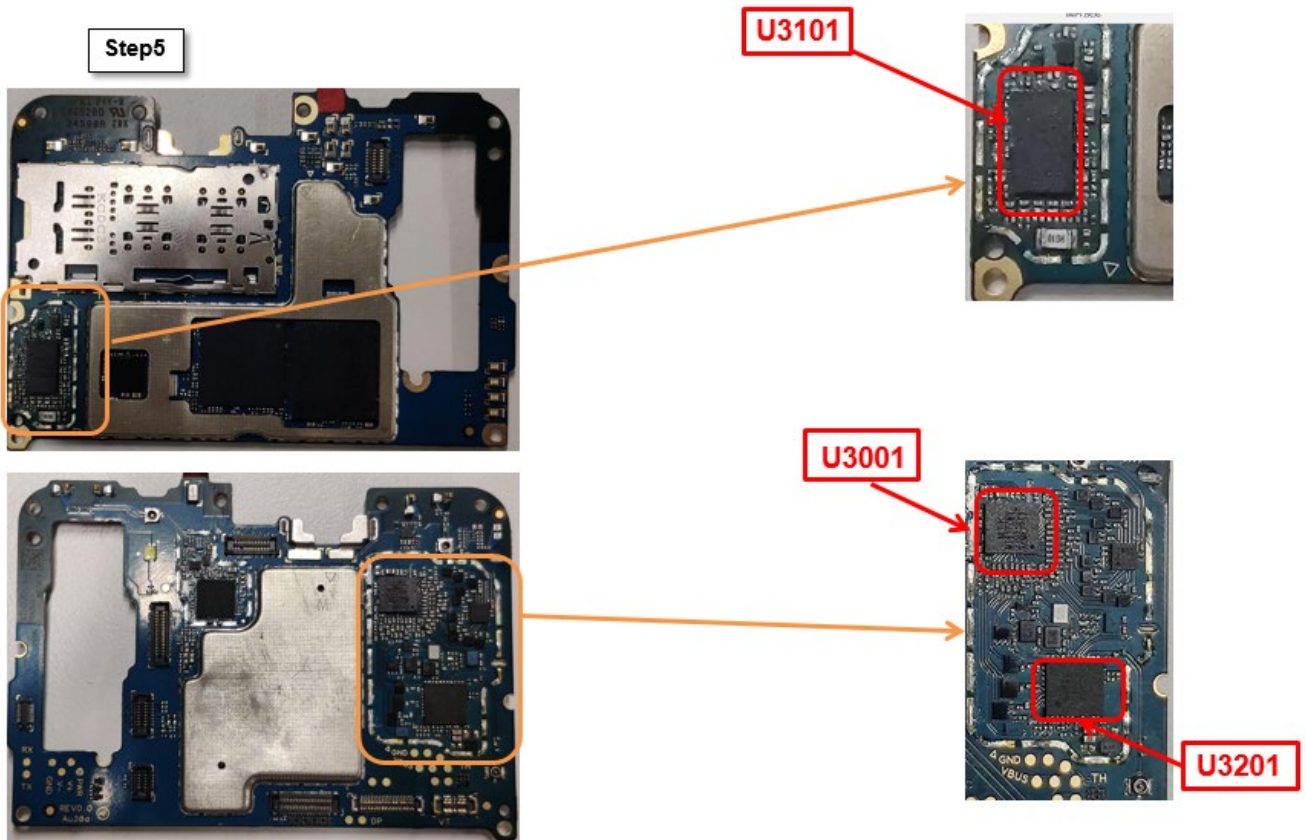


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Call Problem (with RF test equipment)

Step	Check point	Result value		Defect point
1	Confirm the defect symptom	-		-
2	RF radiation test	Pass		Network or Settings
		Fail		Go to the next step
3	RF calibration	Pass		Go to the step 4
		Fail		Go to the step 5
4	RF radiation test	Pass		Repaired
		Fail		Except PBA (Coaxial cable, Antenna, Shielding condition)
5	A type of failure	TX	2G	TXM(U3201) TRANSCEIVER(U3001)
			3G/LTE	PA(U3101) TXM(U3201) TRANSCEIVER(U3001)
		RX	2G	TRANSCEIVER(U3001) TXM(U3201)
			3G/LTE	TRANSCEIVER(U3001) TXM(U3201)

Call Problem



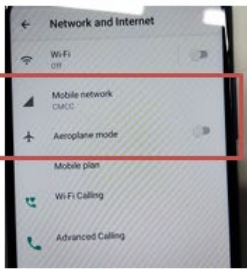
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Call Problem (without RF test equipment)


Step	Check point	Result value	Defect point
1	Confirm the defect symptom	-	-
2	Check the settings (airplane mode, Mobile networks)	Abnormal	Settings
		Normal	Go to the next step
3	Check the signal strength of the <u>device Settings->About phone->SIM status->Signal strength.</u> (Compare to normal device)	Abnormal	Go to the next step
		Normal	Network
4	Check the RF parts except PBA. (Coaxial cable, Antenna, Shielding condition, etc..)	Broken, dust, corrosion	RF parts
		Loose fitting	Connection
		Normal	Go to the next step
5	Check the status visually(crack, missing, Corrosion..etc) of RF components. (compare to normal PBA)	Abnormal	MMMB(PAM1000) TRANSCEIVER(U2012)
		Normal	CP(Call Processor) (U400) PMIC(U1501)
	TRANSCEIVER(U3001) TXM(U3201) PA(U3101) DUP3201,DUP3203,DUP3204 etc.		

Call Problem

Step2,3 CHECK SETTINGS

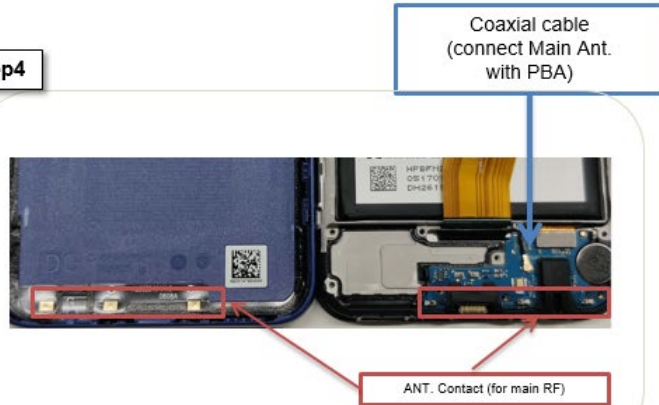


Step4

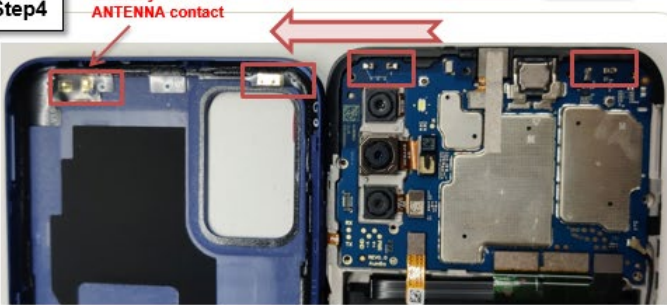


Signal strength Same value compare to normal device.

Step4



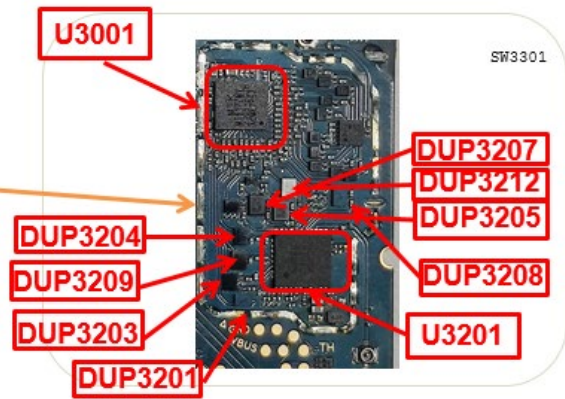
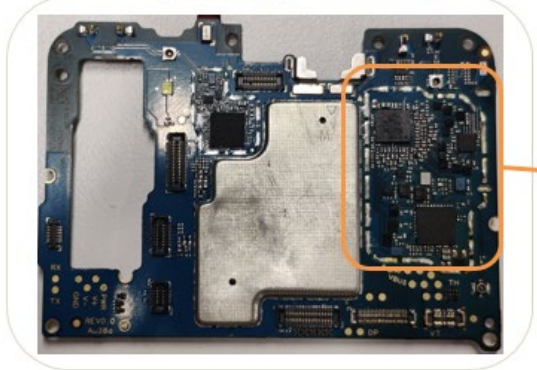
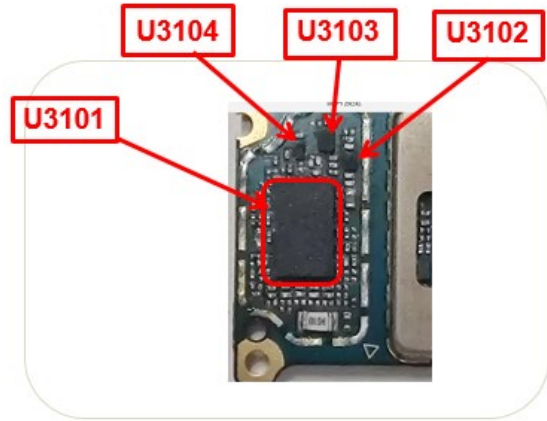
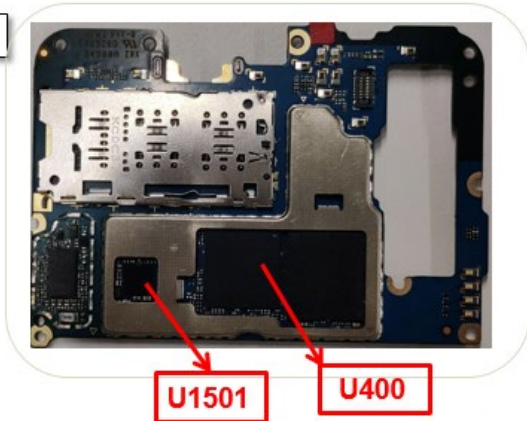
Step5



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Call Problem

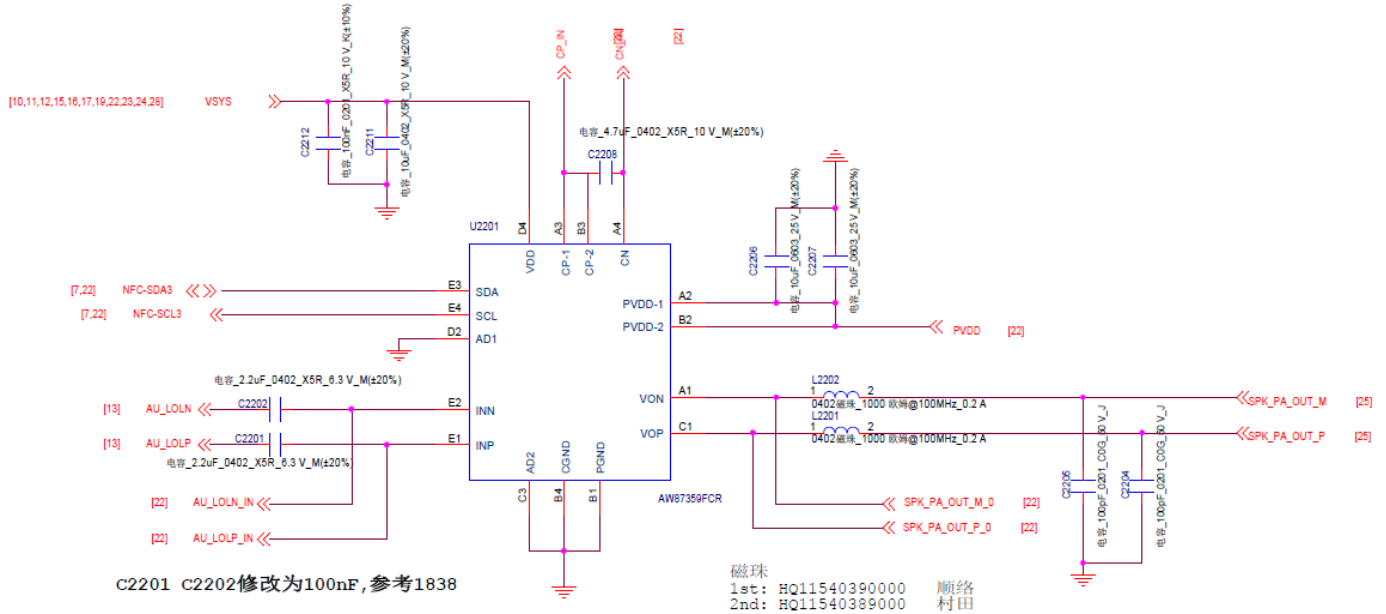
Step5



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8-3-4. Sound Problem

- The Speaker control signals are generated by chip U2203 , the chip and the speaker are to be checked out.

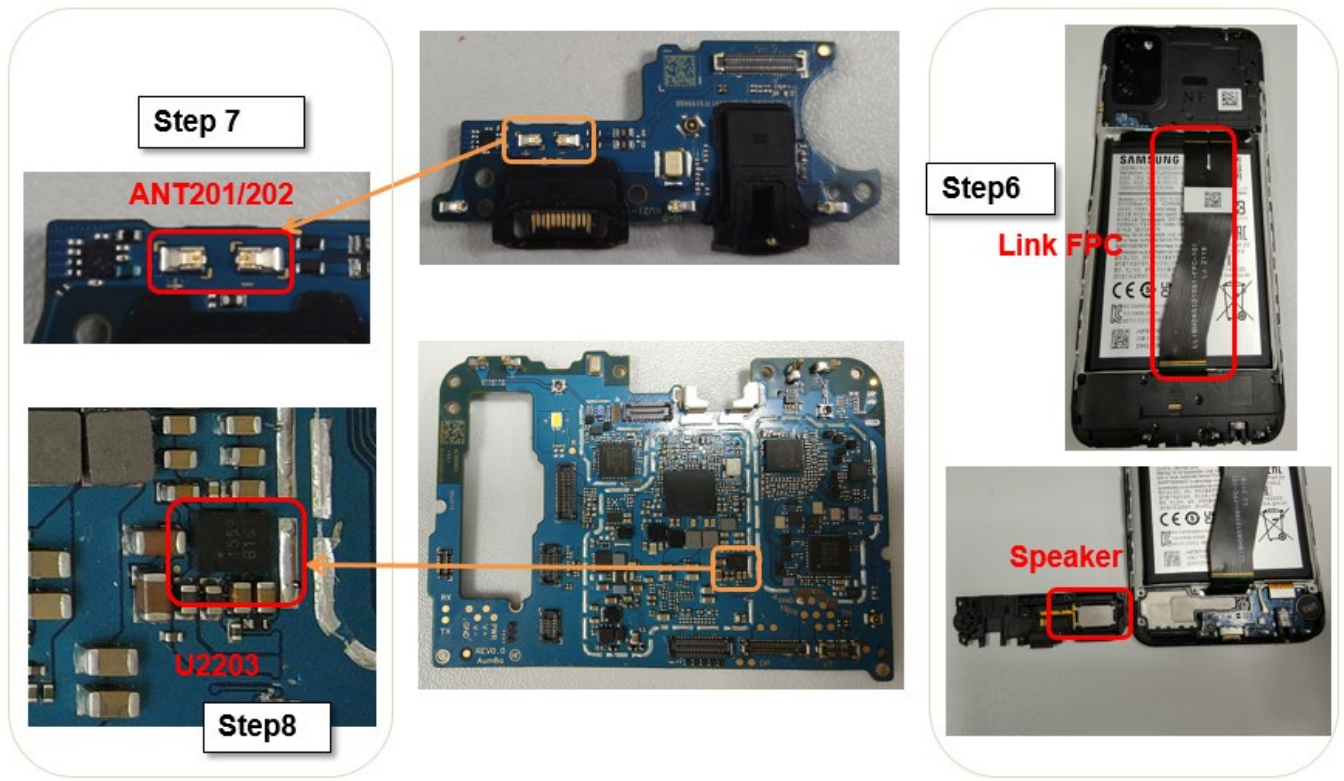


Sound Problem

Step.	Check point	Result value	Defect point
1	Confirm the defect symptom.	-	-
2	*#88*# → speaker	No sound	Go to the next step
		Normal	S/W or Settings
3	Replace the speaker, and also replace the Assy case-rear to use a new speaker tape.	Solved	speaker
		Not solved	Go to the next step
4	Activate the speaker path. (*#0*# → Speaker)	-	-
5	Check C-clips of Sub PBA ANT201,ANT202	normal	Go to step 6
		defect	Replace C-Clip
6	Check the PWM output at ANT201	Yes	Go to step 7
		No	Replace Link FPCB
7	Check the PWM output at ANT201	Yes	Go to step 8
		No	Replace SUB PBA
8	Check the PWM output at U2203	Yes	Replace speaker module
		No	Replace U2203 on MAIN PCB

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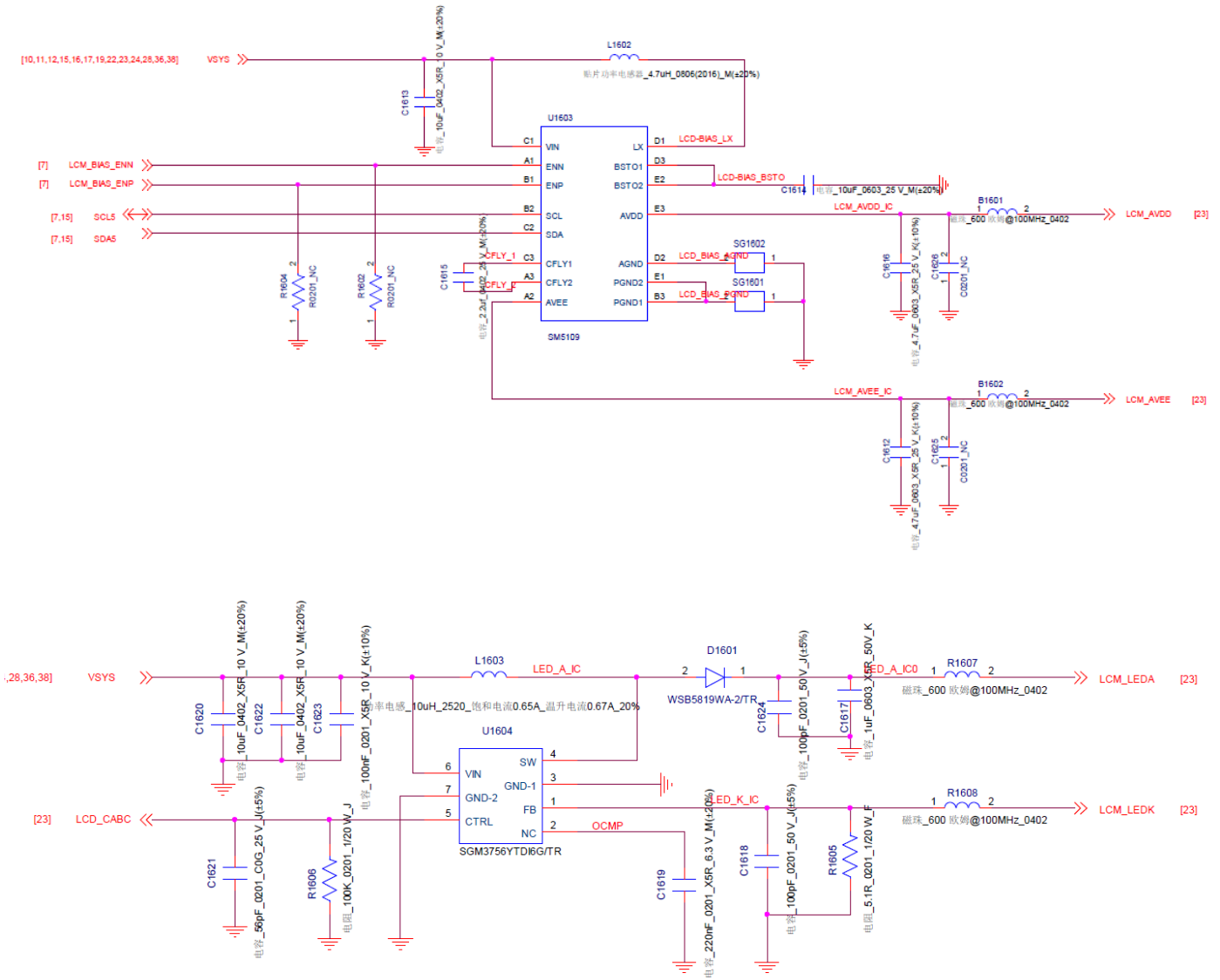
Sound Problem



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8-3-5. Display Problem

- The LCD control signals are generated by U1603, U1604

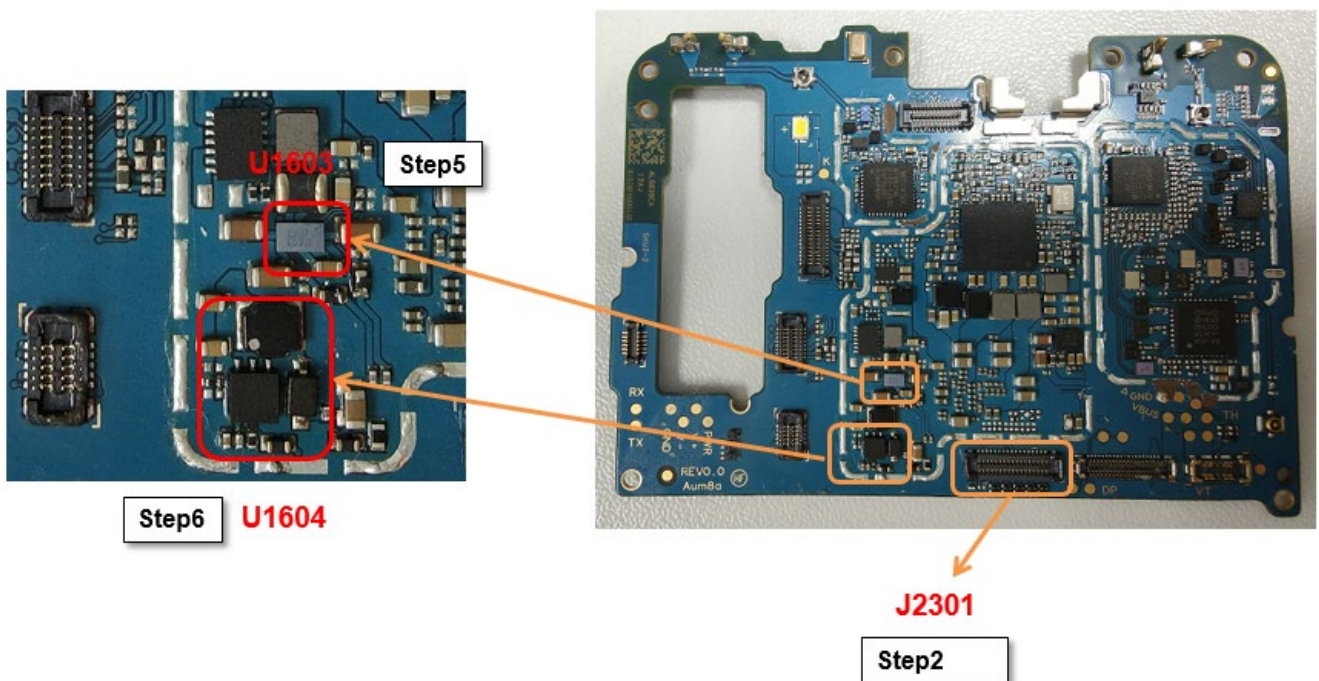


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Display Problem

Step	Check point	Result value	Defect point
1	Confirm the defect symptom	-	-
2	Check the LCD connector (J2301)	Broken, dust, corrosion	LCD connector (J2301)
		Loose fitting	Connection
		Normal	Go to the next step
3	Replace the LCD	Solved	LCD
		Not solved	Go to the next step
4	Connect a LCD, and display on with a power supply (power supply voltage : 4.0V)	-	-
5	Check LCM_AVDD = 6.0V (C1616) LCM_AVEE = -6.0V (C1612)	No	Replace the U1603
		Yes	Go to step 6
6	Check LCD_LEDA = 22V (C1617) LCD_LEDK= 0.2(R1608)	No	Replace the U1604, L1603, D1601
		Yes	Replace the Display module

Display Problem



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8-4. Service Schematics

U400_MT6765_BB chip IC , Digital Baseband Processor(Top)

558	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28									
A	NC	WF_IN	WF_IP		EMIO_CA9		NC		EMIO_CS0_N		DVSS		DVSS		DVSS		EMIO_D08		EMIO_DQ15		EMIO_DQ31		MSDC0_DAT4		MSDC0_DAT2		MSDC0_DAT7	DVDD1_8_MSD	NC	A							
B	WF_OP	WF_QN	DVSS	EMLEX_TR	EMIO_CA4		EMIO_CA1	EMIO_CA0	NC		EMIO_DQ21	EMIO_DQ22	EMIO_DQ20		EMIO_DQ4	EMIO_DQ0	EMIO_DQ17		EMIO_DQ13		EMIO_DQ28	DVSS		MSDC0_DAT5		MSDC0_CMD	MSDC0_DSL	USB_D_M	AVDD1_3_USB	B							
C		DVSS	AVDD1_2_WBG	NC	EMIO_CA6		DVSS	EMIO_CA2		NC	EMIO_DQ18	EMIO_DQ17	DVSS	EMIO_DQ2	EMIO_DQ1	DVSS	EMIO_DQ11	EMIO_DQ10	EMIO_DQ14		DVSS	EMIO_DQ29		MSDC0_DAT3		MSDC0_RSTB	MSDC0_USB_D_P		C								
D	BT_IN	BT_IP	DVSS	NC	EMIO_CA5		EMIO_CA3	EMIO_CKED		EMIO_DQ16	NC	EMIO_DQ19		EMIO_DQ50	EMIO_DQ5		EMIO_DQ51		NC	EMIO_DQ12		EMIO_DQ24		EMIO_DQ27		EMIO_DQ53	MSDC0_CLK	CHD_D_P	DVSS	AVDD1_8_USB	D						
E			BT_OP	DVSS	EMIO_CA8		EMIO_CA7	EMIO_CKE1		EMIO_CS1_N	EMIO_CK_C	EMIO_DQ2	EMIO_DQ23		EMIO_DQ52	EMIO_DQ50		EMIO_DQ51		EMIO_DQ6		EMIO_DQ6		EMIO_DQ13	EMIO_DQ25	EMIO_DQ29	EMIO_DQ53_C	NC	DVSS	DVSS	CHD_P_M	SYSRST	AVDD1_2_USB	E			
F	GPS_L	DVSS	BT_CN	DVSS	DVSS	DVSS	DVSS	DVSS		EMIO_CK_T	DVSS	DVSS	DVSS		EMIO_DQ52_T	DVSS		PREF_M		DVSS	EMIO_DQ10	DVSS	DVSS	DVSS	DVSS	DVSS	DVSS	DVSS	DVSS	GPIO_E_XT2	GPIO_E_XT1	GPIO_E_XT4	TESTM_ODE		F		
G	GPS_Q	CONN_WB_PT_A	CONN_HRST_B	DVSS				XIN_W_BG							DVSS	DVSS	DVSS	DVSS	NC				DVSS	DVSS	GPIO_E_XT0	GPIO_E_XT3	GPIO_E_XT5		DVSS	GPIO_E_XT6	GPIO_E_XT7		AVDD1_8_USB	G			
H		AVDD1_8_WBG	CONN_WF_CT_R12	CONN_WF_CT_R11	CONN_WF_CT_R10																															H	
J	DVDD1_8_IORT	CAM_C_LK2	SCL6	SDA6	CONN_BT_CLK		CONN_TOP_C_A																													J	
K		CAM_P_DN2	CAM_R_ST2	ANT_S_E12	ANT_S_E10	ANT_S_E11	CONN_TOP_D_ATA	CONN_BT_DA_TA		DVSS	DVDD_TOP	DVSS	DVSS	DVDD_TOP	DVSS	DVSS	DVDD_TOP	DVSS	DVSS	DVDD_TOP																	K
L	CS11A_L1P	CS11A_L1N	CS11A_L1D	CS11A_L1N	CS11B_L1D																																L
M	CS11A_L2P	CS11A_L2N	CS11B_L2P	CS11B_L2N	CS11B_L2D																																M
N	CS10A_L1P	CS10A_L1N	CS10A_L1D	CS10A_L1N	CS10B_L2P																																N
P	CS10A_L2P	CS10A_L2N	CS10B_L1D	CS10B_L1N	CS10B_L2N																																P
R	CS12A_L1P	CS12A_L1N	CS10B_L1D	CS10B_L1N	CS10B_L2P																																R
T	CS12A_L1P	CS12A_L1N	CS12A_L2P	CS12A_L2N	CS12B_L1D																																T
U	AVDD1_8_IORB	AVDD1_2_CS1	CS10B_L1D	CS10B_L1N			SCL4																													U	
V	CAM_R_ST1	CAM_R_ST0	SDA2	SCL2			SDA4																													V	
W		CAM_C_LK1	EINT10	EINT9	CAM_C_LK0	CAM_P_DN0	EINT11																														W
Y	SRLCKE_NA1	CAM_P_DN1	EINT7	EINT6			EINT4	EINT5																												Y	
AA	KPRO_WG	UTXD0	URXD0	EINT3	EINT2		EINT8	EINT1																												AA	
AB	KPRO_W1	KPCOL_1	KPCOL_0	EINT0	SCL0		CDMSR_5A																													AB	
AC	SPI0_C_SB	SPI0_M_O	PWM0	SDA0	CDMSR_5A		BPI_BU_S7																													AC	
AD	SPI0_M_I	SPI0_C_LK	BPI_PA_VMO	BPI_PA_S11_CK_ATO	BPI_PA_S11_CK_BTO		BPI_PA_S11_CK_CTO																														AD
AE	SCL1	BPI_PA_VM1	BPI_PA_VM0	BPI_PA_S10_CK_A	BPI_PA_S10_CK_B		BPI_PA_S10_CK_C																														AE
AF	SDA1	BPI_PA_S1	BPI_PA_S2	BPI_PA_S3	BPI_PA_S4		BPI_PA_S5																														AF
AG	NC	BPI_PA_S4	BPI_PA_S5	BPI_PA_S6			DVDD1_8_IORB																													AG	