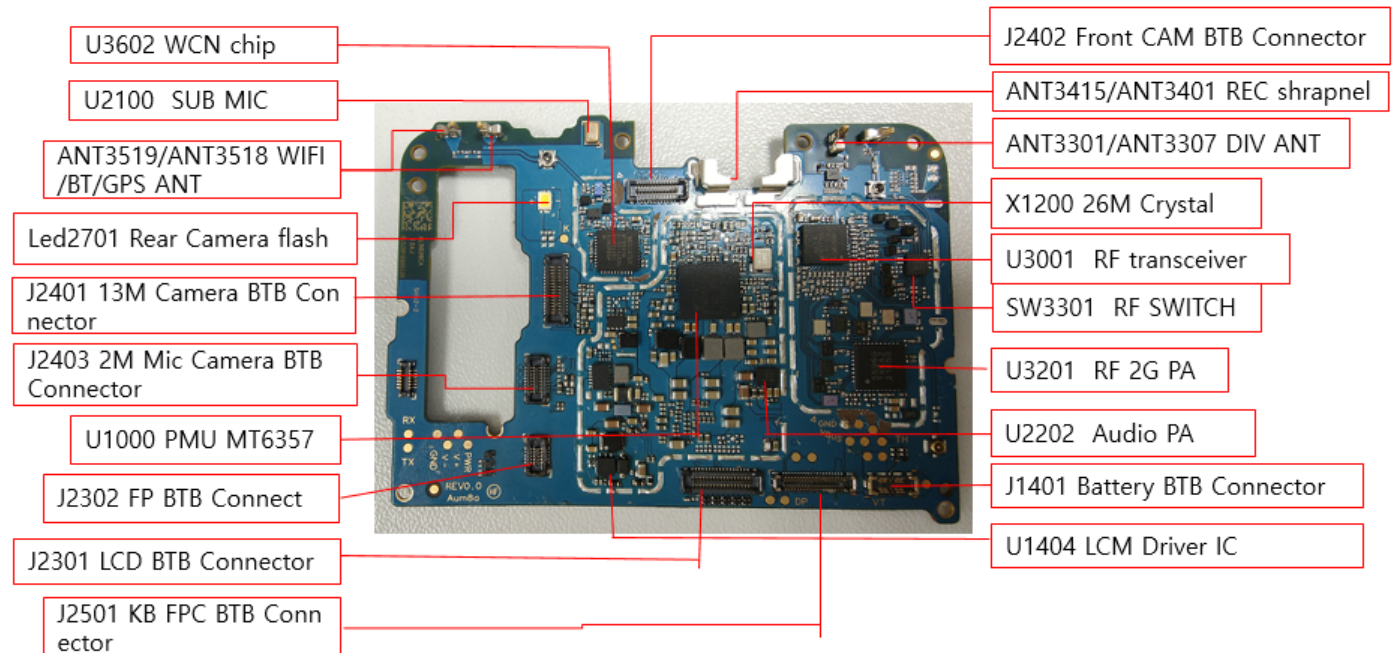


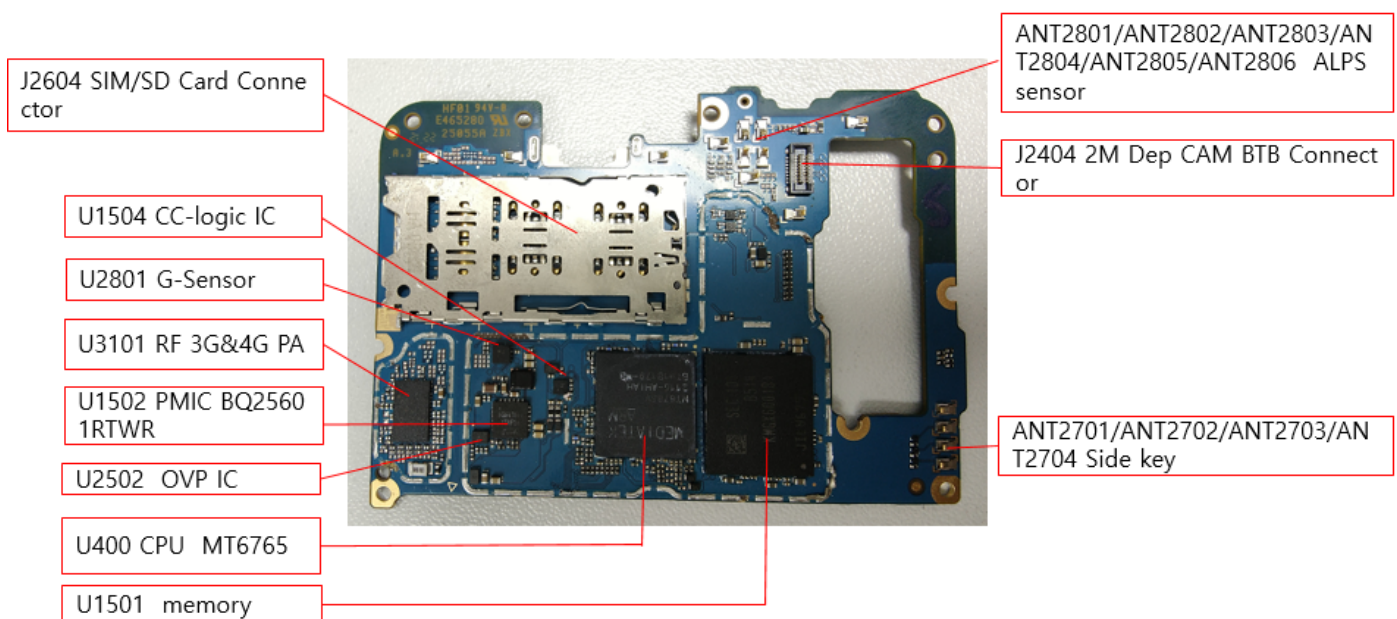
8. Level 3 Repair

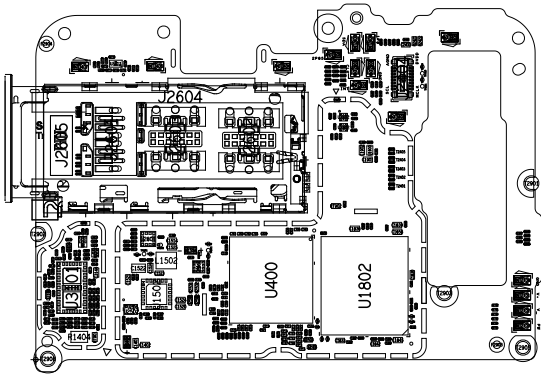
8-1. Components Layout

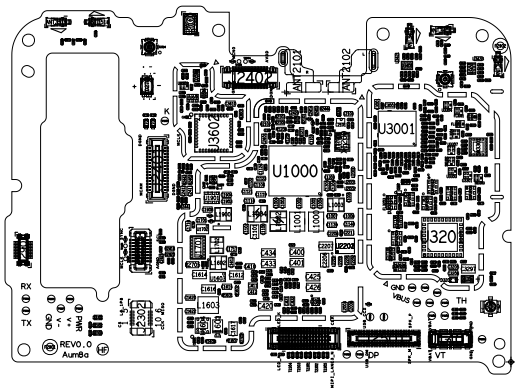
PBA (Bottom)

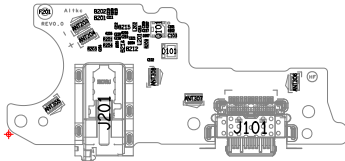


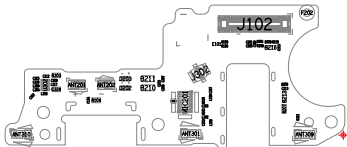
PBA (TOP)



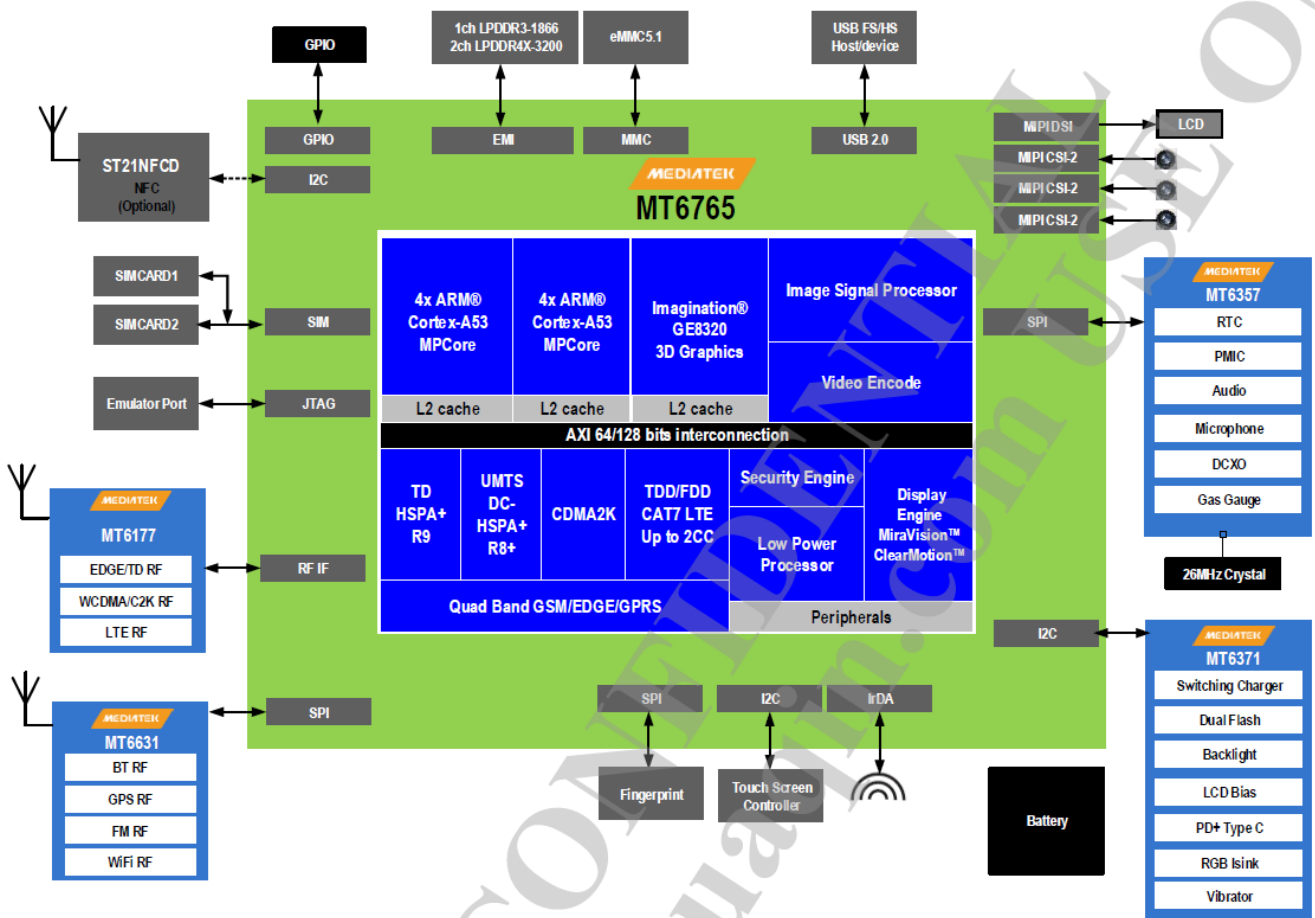




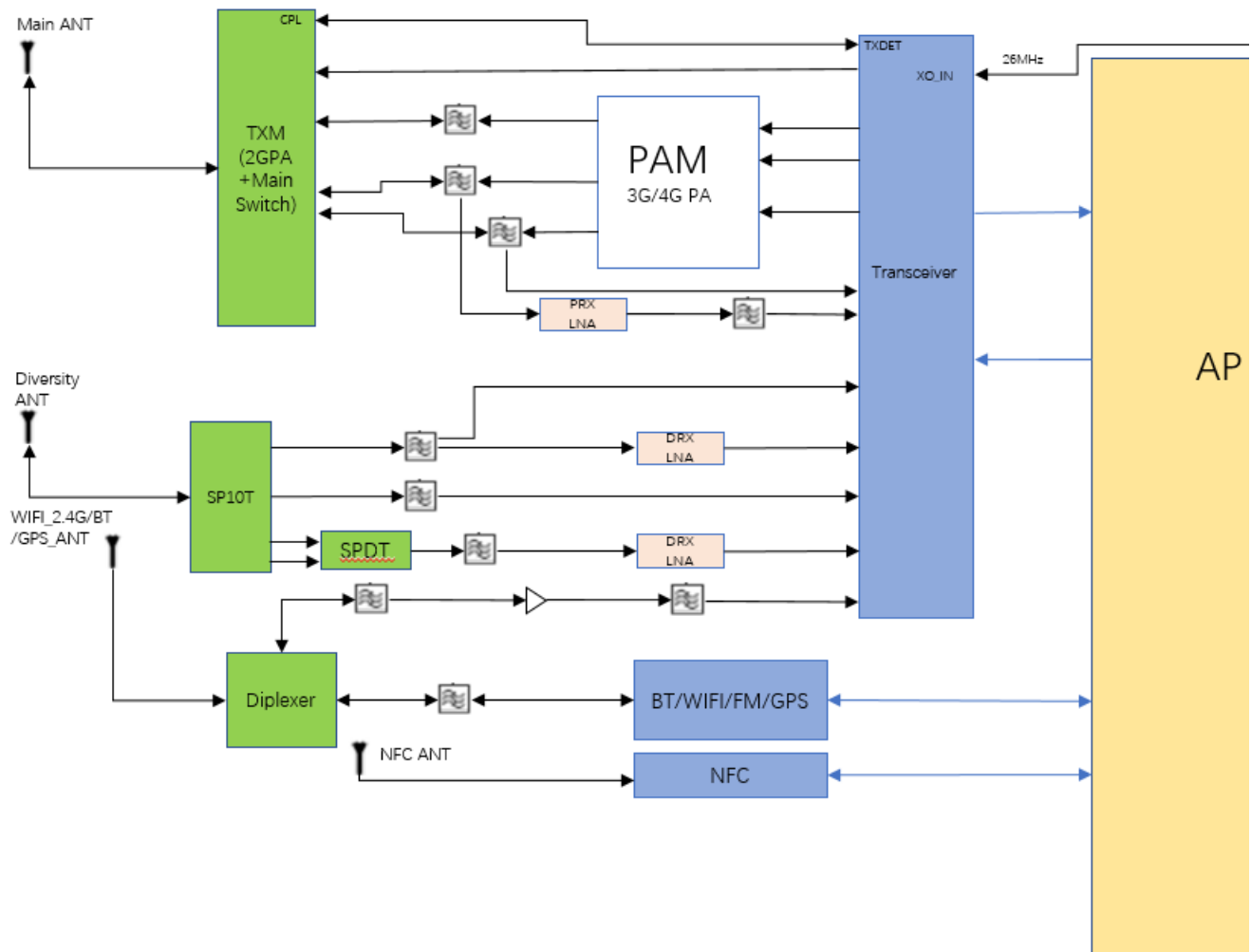




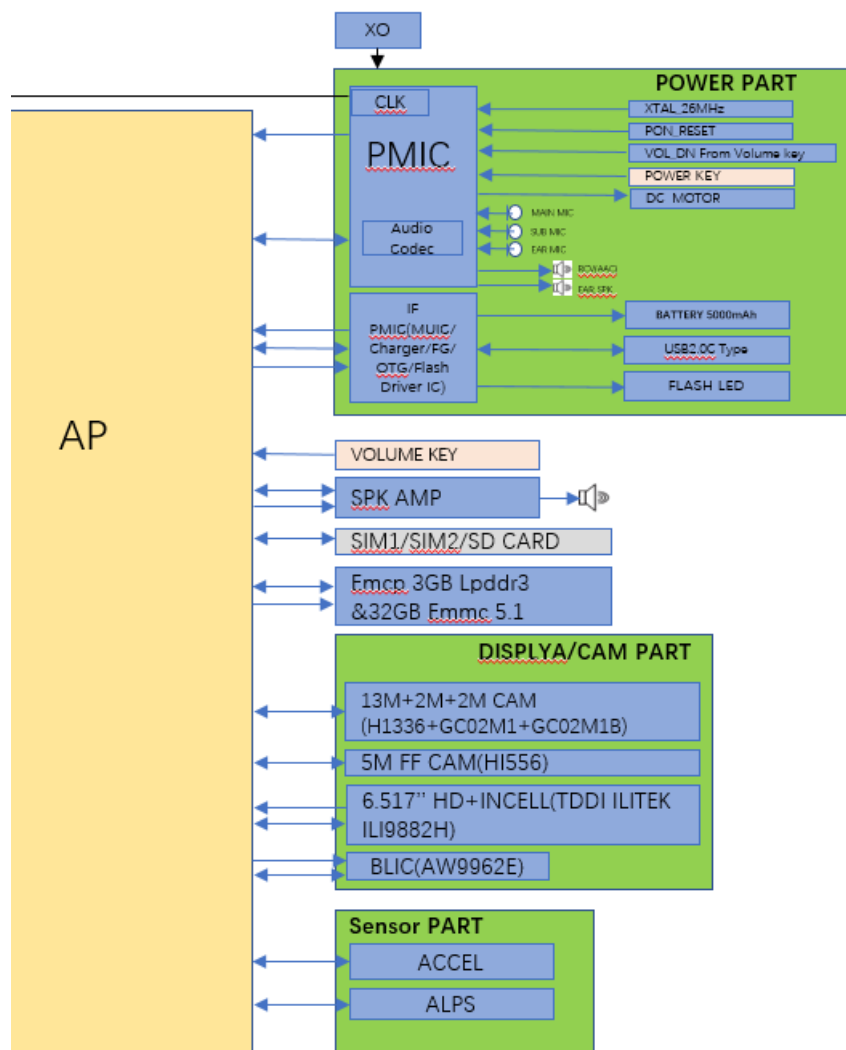
8. Level 3 Repair



8. Level 3 Repair

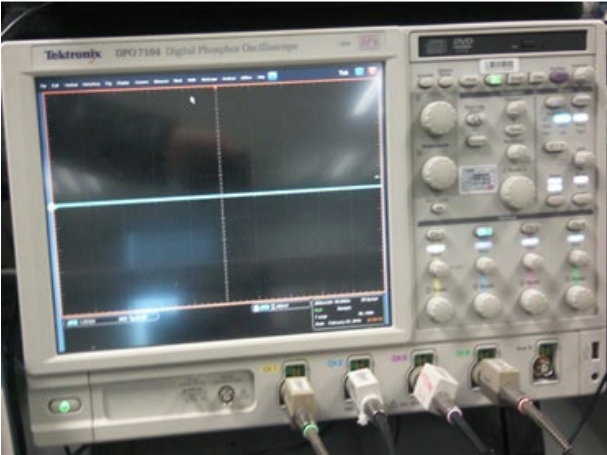
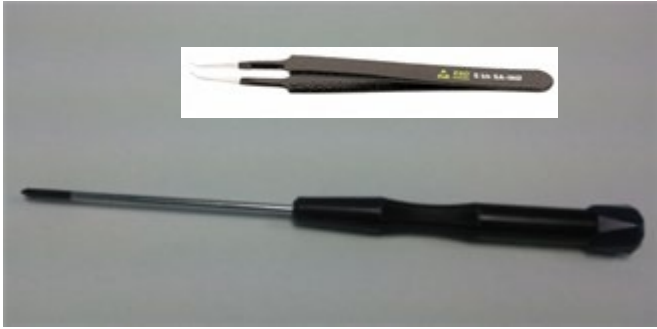
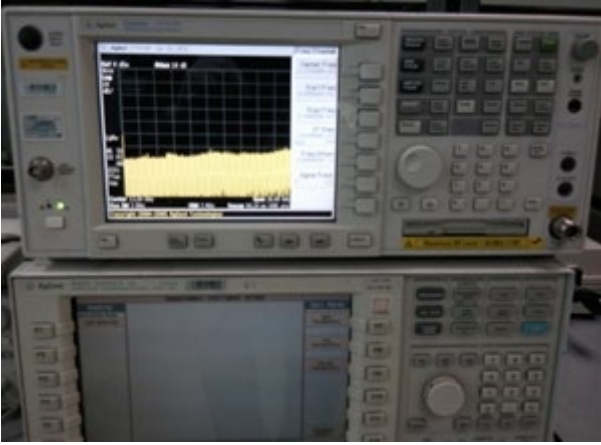


8. Level 3 Repair



8. Level 3 Repair

8-2. Flow chart of Troubleshooting.

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

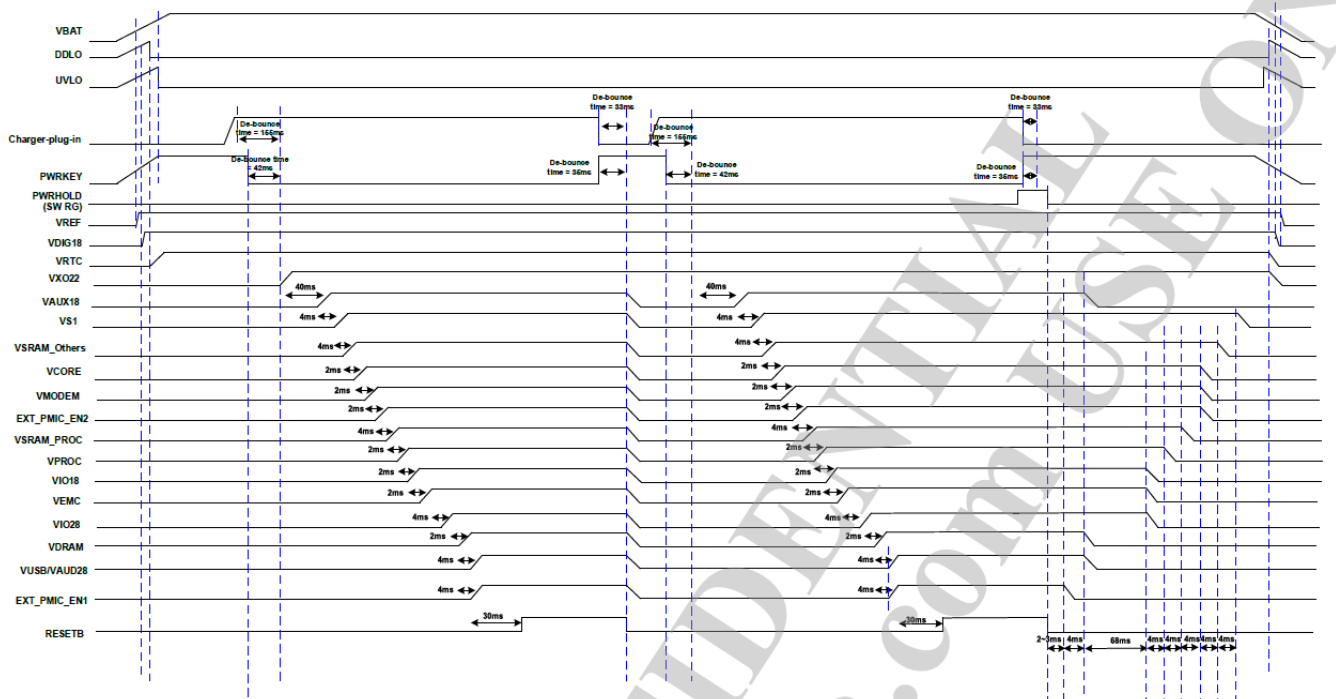
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8. Level 3 Repair

8-3-1. Power On

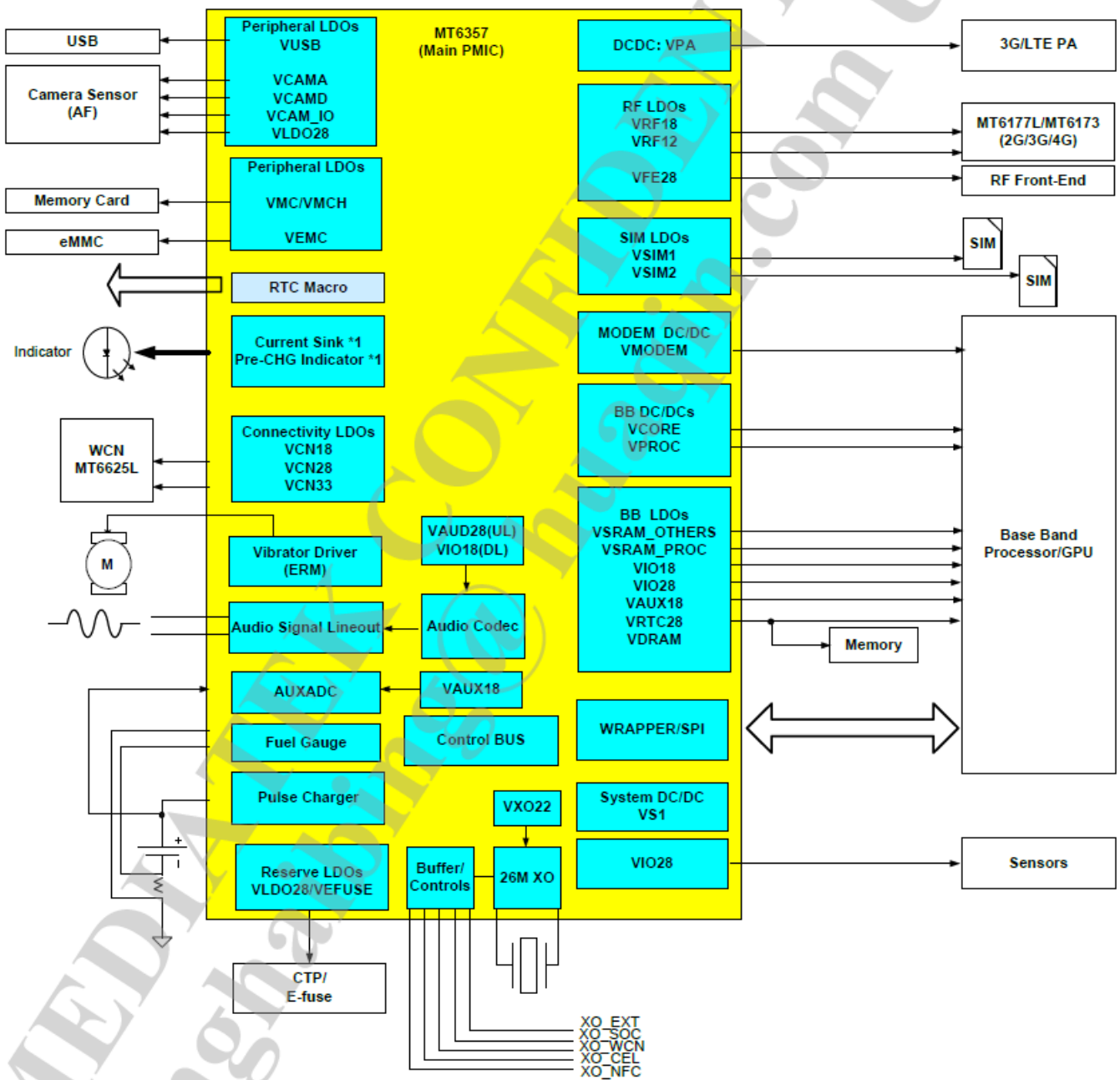
■ Checking Power signal (Battery connector, PMU, Clock)

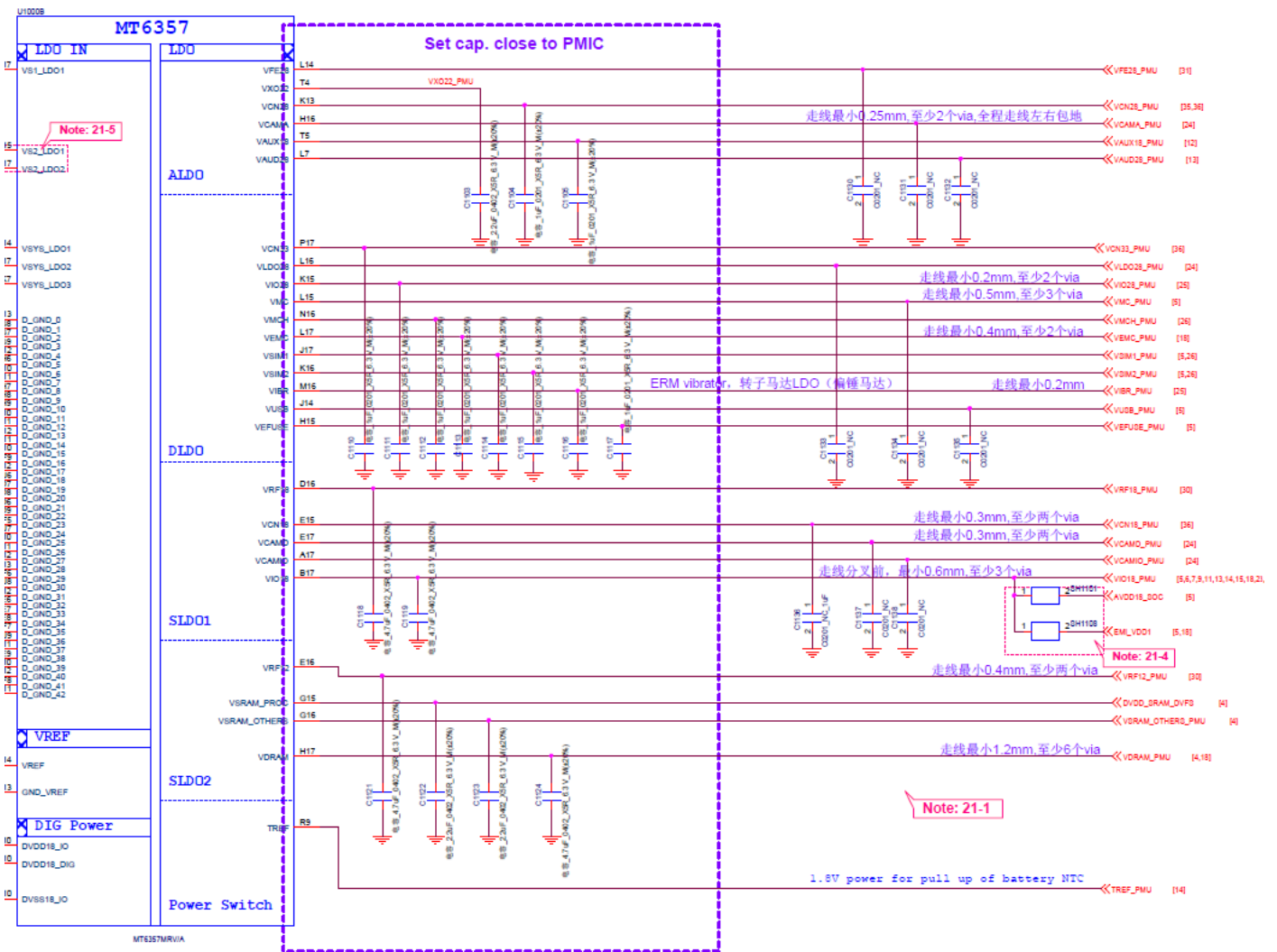


Note: Those timings are typical values; timing variation is $\pm 20\%$ (Charger-plug-in/out related delay timing variation is $\pm 40\%$).

Start up voltage sequence diagram

8. Level 3 Repair





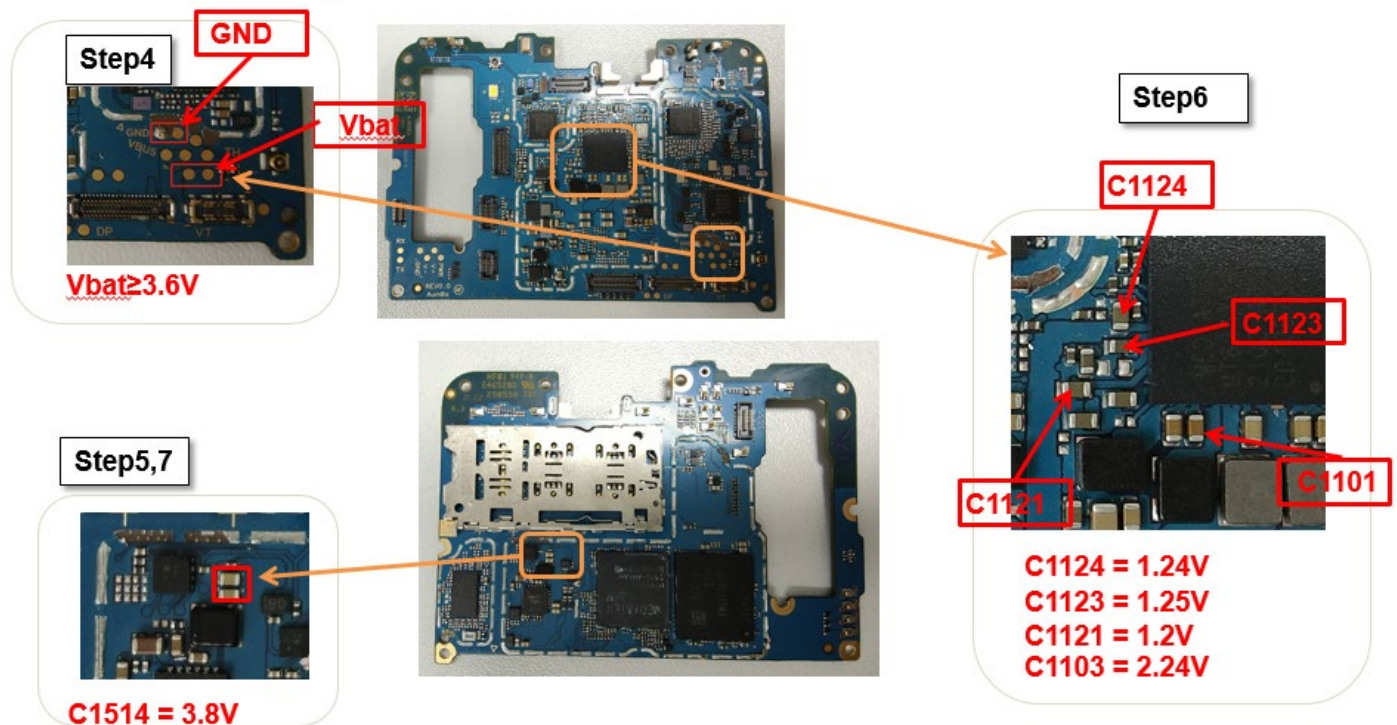
VREG_LD0 schematic diagram

8. Level 3 Repair

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, c ontinue charging
		No	Go to the step 4
4	Check the voltage level at Vbat and GND these t wo 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 c15 14 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=1.25 V, C1121=1.2V, 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')



8. Level 3 Repair

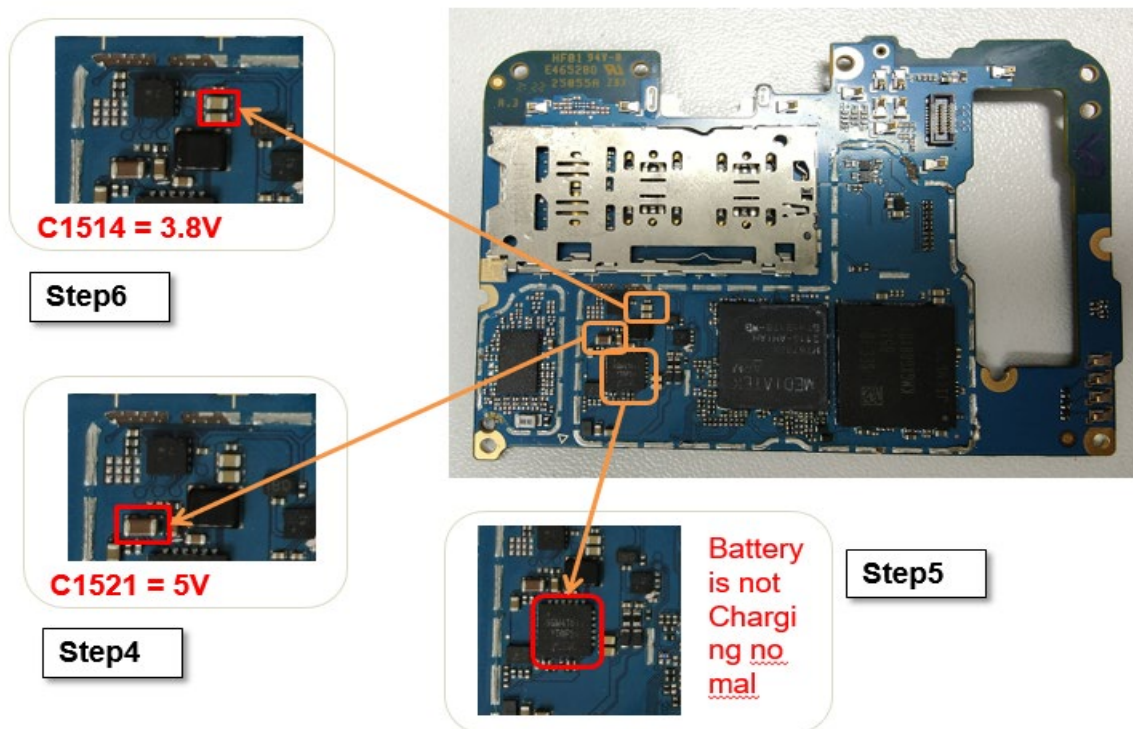
8-3-2. Charging

- 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	

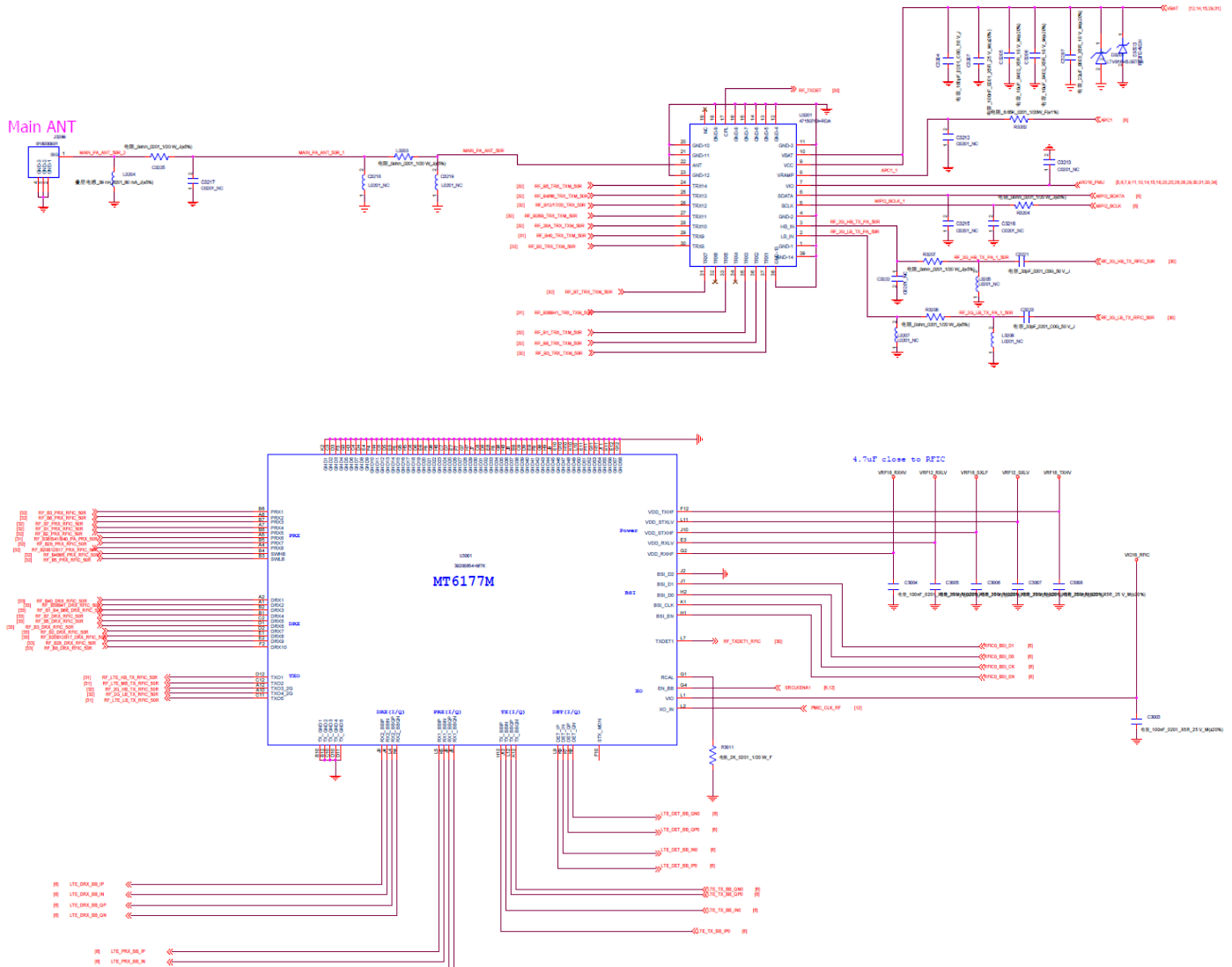
No Charging



8. Level 3 Repair

8-3-3. call problem

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

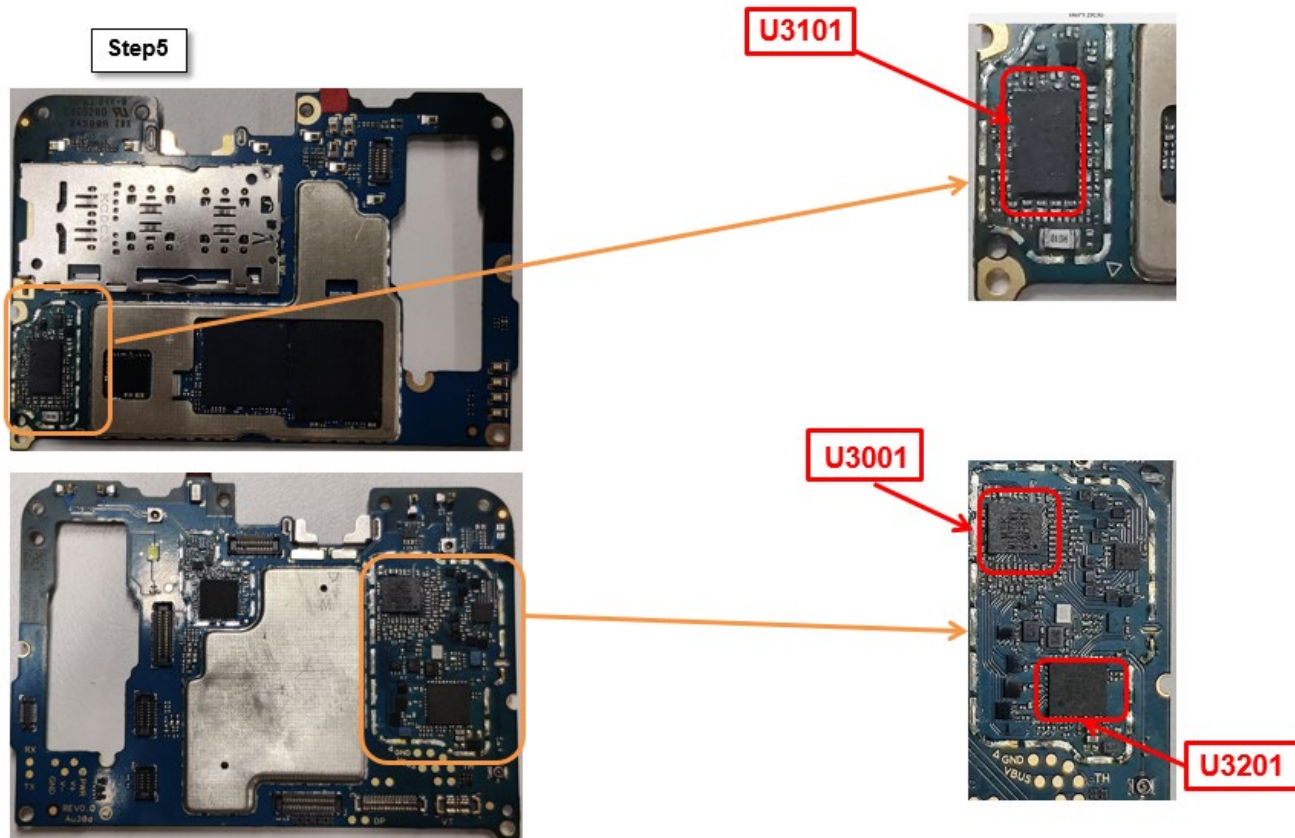


8. Level 3 Repair

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



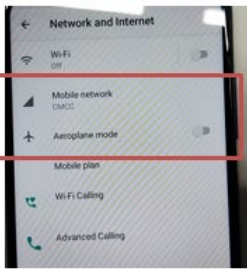
8. Level 3 Repair

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 device <u>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) TRANSCEIVER(U3001) TXM(U3201) PA(U3101) DUP3201,DUP3203,DUP3204 etc.	Abnormal	MMMB(PAM1000) TRANSCIEIVER(U2012)
		Normal	CP(Call Processor) (U400) PMIC(U1501)

Call Problem

Step2,3 **CHECK SETTINGS**



Step4



Signal strength
Same value compare to normal device.

Step4



Coaxial cable
(connect Main Ant. with PBA)

ANT. Contact (for main RF)

Step5

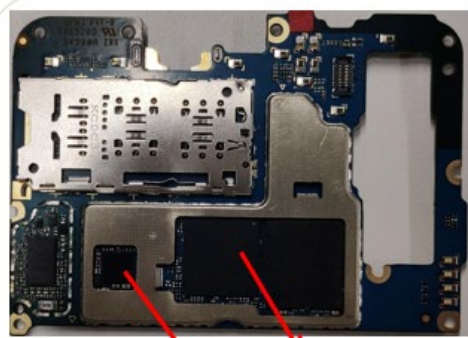


Step4 **Diversity ANTENNA contact**

8. Level 3 Repair

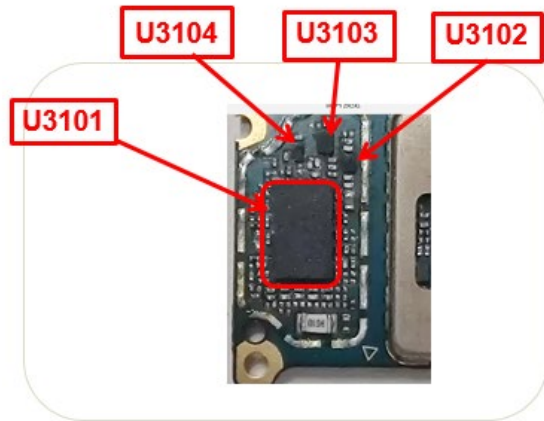
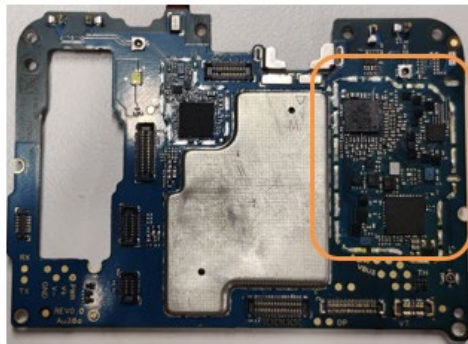
Call Problem

Step5



U1501

U400

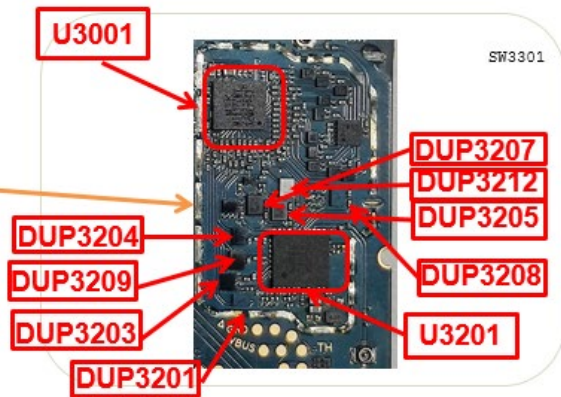


U3101

U3104

U3103

U3102



U3001

DUP3204

DUP3209

DUP3203

DUP3201

DUP3207

DUP3212

DUP3205

DUP3208

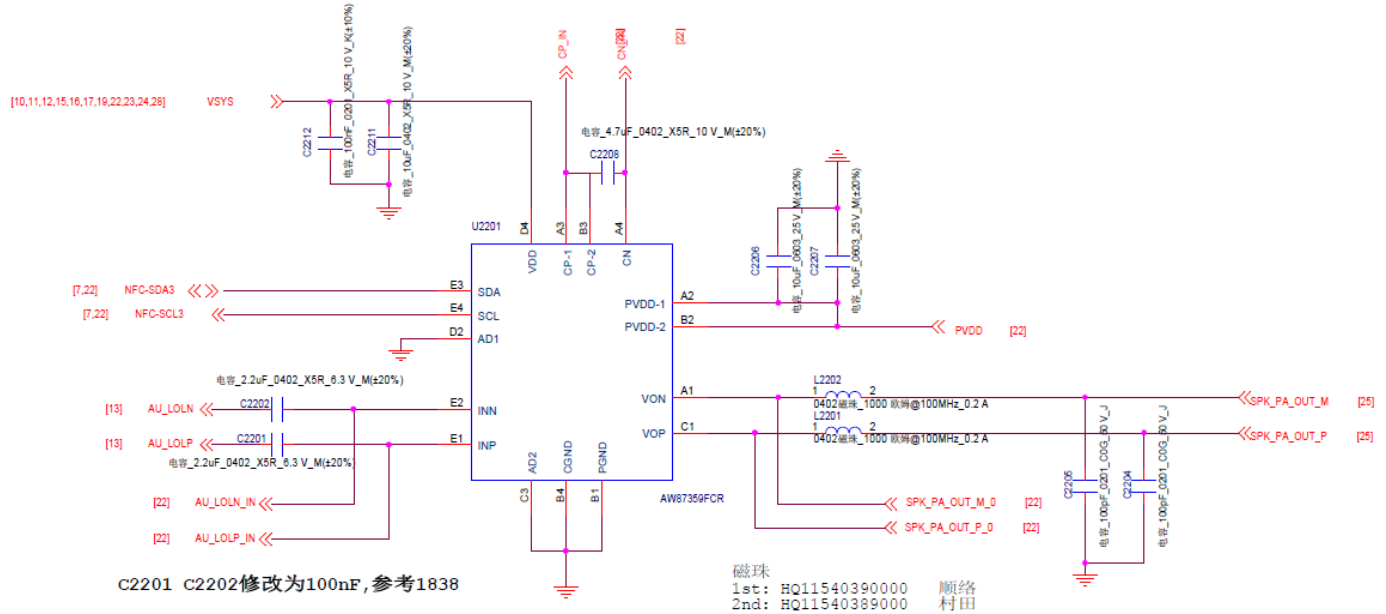
U3201

SW3301

8. Level 3 Repair

8-3-4. Sound Problem

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

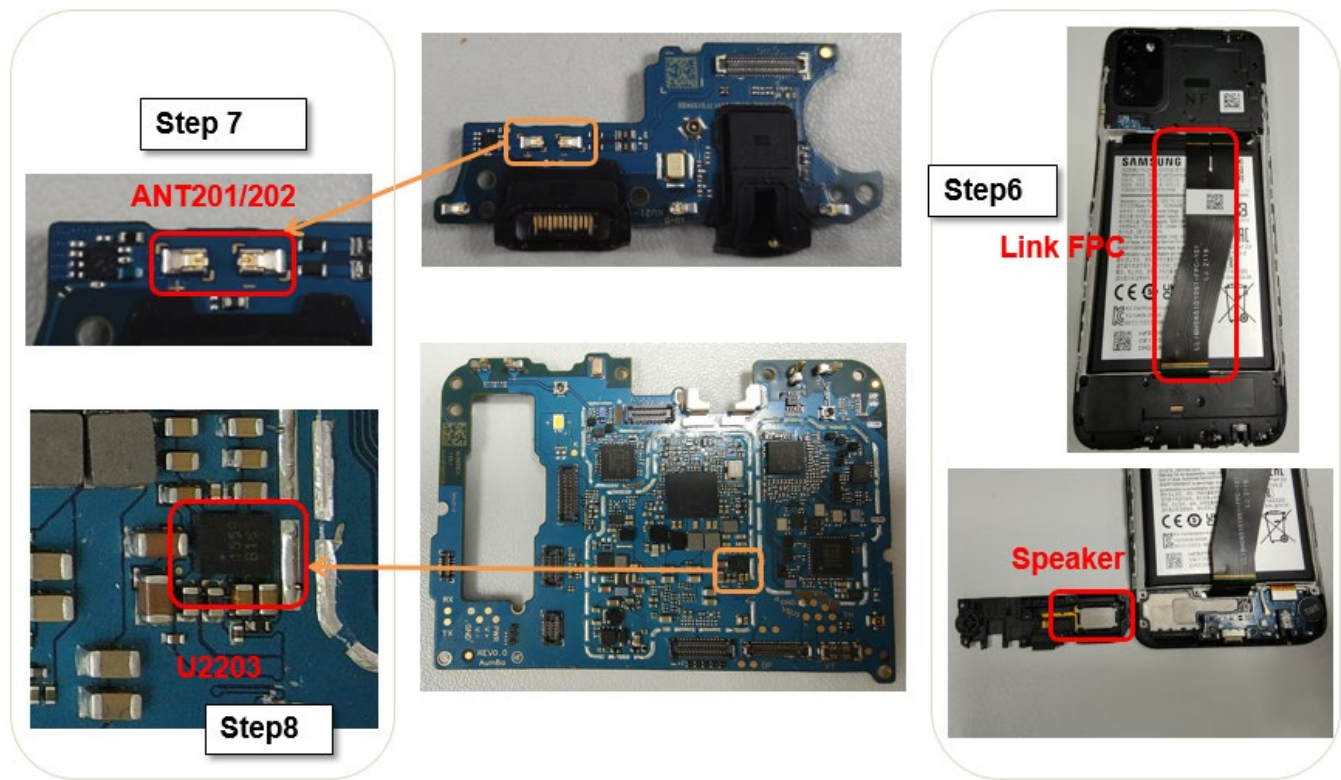


Sound Problem

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

8. Level 3 Repair

Sound Problem



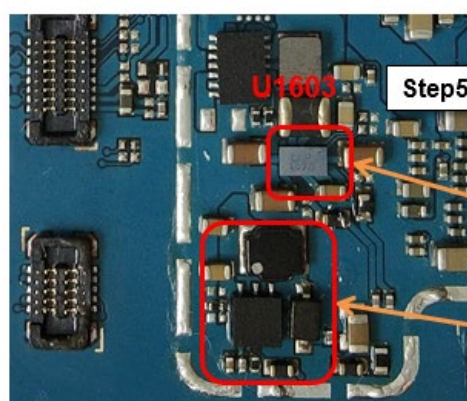
8-3-5. Display Problem

8. Level 3 Repair

Display Problem

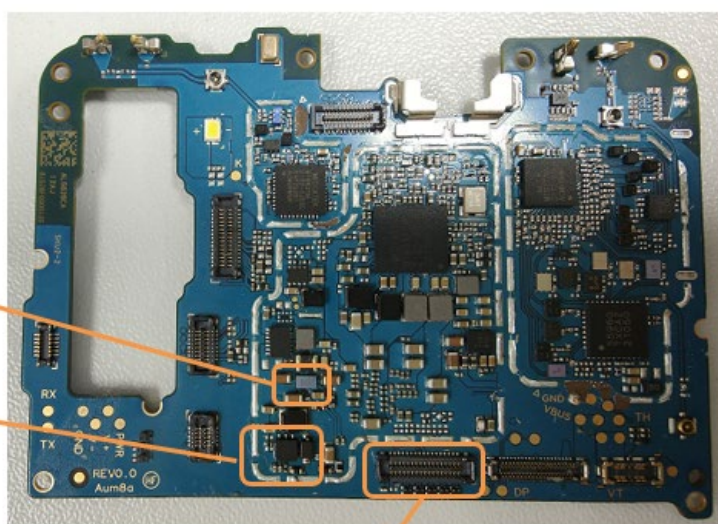
Step	Check point	Result value	Defect point
1	Confirm the defect symptom	-	-
2	Check the LCD connector (J2301)	Broken, dust, corrosion	LCD connector (J2301)
		Loose fitting	Connection
		Normal	Go to the next step
3	Replace the LCD	Solved	LCD
		Not solved	Go to the next step
4	Connect a LCD, and display 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_LED A = 22V (C1617) LCD_LED K = 0.2 (R1608)	No	Replace the U1604, L1603, D1601
		Yes	Replace the Display module

Display Problem



Step6 U1604

Step5



J2301

Step2

8. Level 3 Repair

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				DVSS		DVSS		DVSS		EMIO_DQ8		EMIO_DQ15		EMIO_DQ33		MSDC0_DATA4		MSDC0_DATA2	MSDC0_DATA7	DVDD1_8_MSD_C0	NC	A	
B	WF_OP	WF_Q	DVSS	EMIO_EX_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_DATA6	MSDC0_DATA8	MSDC0_CMD	MSDC0_DSL	MSDC0_USB_D_M	AVDD1_3_USB	B	
C			DVSS	AVDD1_2_VBNC		EMIO_CA6		EMIO_CA2		NC	EMIO_DQ18	EMIO_DQ17	DVSS	EMIO_DQ0	EMIO_DQ2	EMIO_DQ1		EMIO_DQ1	EMIO_DQ11	EMIO_DQ14	DVSS	EMIO_DQ10	EMIO_DQ29		MSDC0_DATA3	MSDC0_RSTB	MSDC0_DATA0	USB_D_P	C	
D	BT_IN	BT_IP	DVSS	NC	EMIO_CA5	EMIO_CA3	NC	EMIO_CK0	DVSS	EMIO_DQ16	NC	EMIO_DQ19		DVSS	EMIO_DQ50	EMIO_DQ5		EMIO_DQ51		NC	EMIO_DQ12	EMIO_DQ24	EMIO_DQ27	DVSS	MSDC0_DATA1	MSDC0_CLK	MSDC0_CHD_P	DVSS	AVDD1_8_VBNC	D
E			BT_OP	DVSS	EMIO_CA8	EMIO_CA7	EMIO_CK1	EMIO_CK3_N	EMIO_CK_C	EMIO_DQ2	EMIO_DQ23			DVSS	EMIO_DQ52	EMIO_DQ50	EMIO_DQ3	EMIO_DQ6	EMIO_DQ51	EMIO_DQ9	EMIO_DQ13	EMIO_DQ25	EMIO_DQ1	NC	DVSS	DVSS	CHD_M	SYSRST	AVDD1_2_USB	E
F	GPS_I	DVSS	BT_QIN	DVSS	DVSS	DVSS	DVSS	DVSS	EMIO_CK3_T	DVSS	DVSS	DVSS		DVSS	EMIO_DQ52			REF_E_M	DVSS	EMIO_DQ10	DVSS	DVSS	DVSS	DVSS	DVSS	GPIO_E_XT2	GPIO_E_XT1	GPIO_E_XT4	TESTMODE	F
G	GPS_Q	CONN_WB_PT	CONN_HRST				XIN_WBG				DVSS	DVSS	DVSS	DVSS	DVSS	DVSS	NC							GPIO_E_XT0	GPIO_E_XT3	GPIO_E_XT5	DVSS	AUX1_5_NOC_M	AVDD1_8_VBNC	G
H		AVDD1_8_VBNC	CONN_WF_CT	CONN_WF_CT	CONN_WF_CT					AVDD2_EMI	AVDD0_EMI	AVDD0_EMI	AVDD2_EMI	DVSS	DVSS			AVDD2_EMI	AVDD1_EMI	AVDD0_EMI	AVDD2_EMI	AVDD1_B_DDR	DVSS	GPIO_E_XT6	GPIO_E_XT7	DVSS	RTD32_K_CK	AUX1_5_NOC_M	NC	H
J	DVDD1_8_IORT	CAM_C_LK2	SCL6	SDA6	CONN_BT_CLK	CONN_TOP_CK																	DVDD_TOP	DVSS	DVSS	DVSS	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	J
K		CAM_P_DN2	CAM_R_ST2	ANT_S_E12	ANT_S_E10	ANT_S_E11	CONN_BT_DA	CONN_BT_DA	DVSS	DVDD_TOP		DVSS	DVDD_TOP	DVDD_TOP	DVSS	DVSS	DVDD_TOP	DVSS	DVSS							AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	K
L	CS1A_L1P	CS1A_L1N	CS1A_L1P	CS1A_L1N	CS1A_L1P								DVDD_TOP	DVDD_TOP	DVSS	DVSS	DVDD_TOP	DVSS	DVSS							AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	L
M	CS1A_L2P	CS1A_L2N	CS1A_L2P	CS1A_L2N	CS1A_L2P	DVSS	DVSS				DVDD_TOP		DVSS	DVDD_TOP				DVDD_TOP								AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	M
N	CS1A_L1P	CS1A_L1N	CS1A_L1P	CS1A_L1N	CS1A_L2P	DVSS	DVSS						DVDD_TOP	DVDD_TOP				DVDD_TOP								AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	N
P	CS1A_L2P	CS1A_L2N	CS1A_L2P	CS1A_L2N	CS1A_L2N						DVDD_TOP		DVSS	DVDD_TOP	DVDD_TOP				DVDD_TOP							AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	P
R	CS1A_L1P	CS1A_L1N	CS1A_L1P	CS1A_L1N	CS1A_L1P						DVDD_VDDO_MODE							DVDD_TOP								AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	R
T	CS1A_L2P	CS1A_L2N	CS1A_L2P	CS1A_L2N	CS1A_L2N						DVDD_VDDO_MODE							DVDD_TOP								AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	T
U	DVDD1_8_IORB	AVDD1_2_CSI	CS1B_L1P	CS1B_L1N	CS1B_L1P	SCL4					DVDD_VDDO_MODE							DVDD_VDDO_MODE								AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	U
V	CAM_R_ST1	CAM_R_ST0	SDA2	SCL2	SDA4						DVDD_VDDO_MODE							DVDD_VDDO_MODE								AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	V
W		CAM_C_LK1	EINT10	EINT9	CAM_C_LK0	CAM_P_DN0	EINT11				DVDD_VDDO_MODE							DVDD_VDDO_MODE								AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	W
Y	SRCLK_NA1	CAM_P_DN1	EINT7	EINT6	EINT8	EINT5	EINT4	EINT3	EINT2	EINT1								DVDD_VDDO_MODE								AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	Y
AA	KPRO_WG	UTXD0	URXD0	EINT3	EINT2	EINT1												DVDD_VDDO_MODE								AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AA
AB	KPRO_W1	KPCOL_1	KPCOL_0	EINT0	SCL0	CDM5P_5A												DVDD_VDDO_MODE								AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AB
AC	SPI0_C_S8	SPI0_M_O	PWM0	SDA0	CDM5P_5A	BPI_BU_S7												DVDD_VDDO_MODE								AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AC
AD	SPI0_M_I	SPI0_C_LK	BPI_PA_VMO	BPI_PA_VMO	BPI_PA_VMO	BPI_PA_VMO												DVDD_VDDO_MODE								AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AD
AE	SCL1	BPI_PA_VM1	BPI_PA_VM1	BPI_PA_VM1	BPI_PA_VM1	BPI_PA_VM1												DVDD_VDDO_MODE								AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AE
AF	SDA1	BPI_PA_VM1	BPI_PA_VM1	BPI_PA_VM1	BPI_PA_VM1	BPI_PA_VM1												DVDD_VDDO_MODE								AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AF
AG	NC	BPI_PA_VM1	BPI_PA_VM1	BPI_PA_VM1	BPI_PA_VM1	BPI_PA_VM1												DVDD_VDDO_MODE								AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AUX1_5_NOC_M	AG
	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		