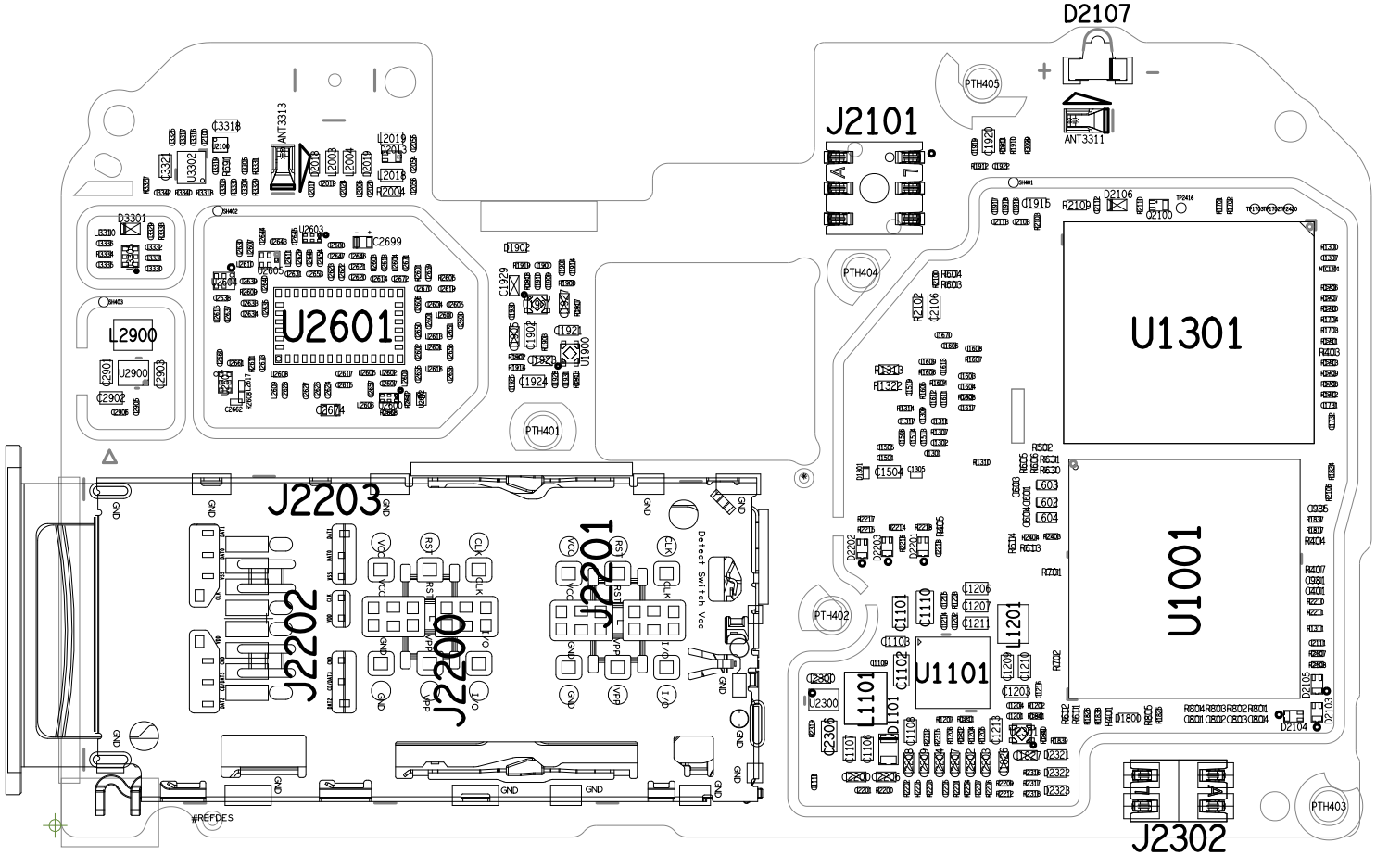

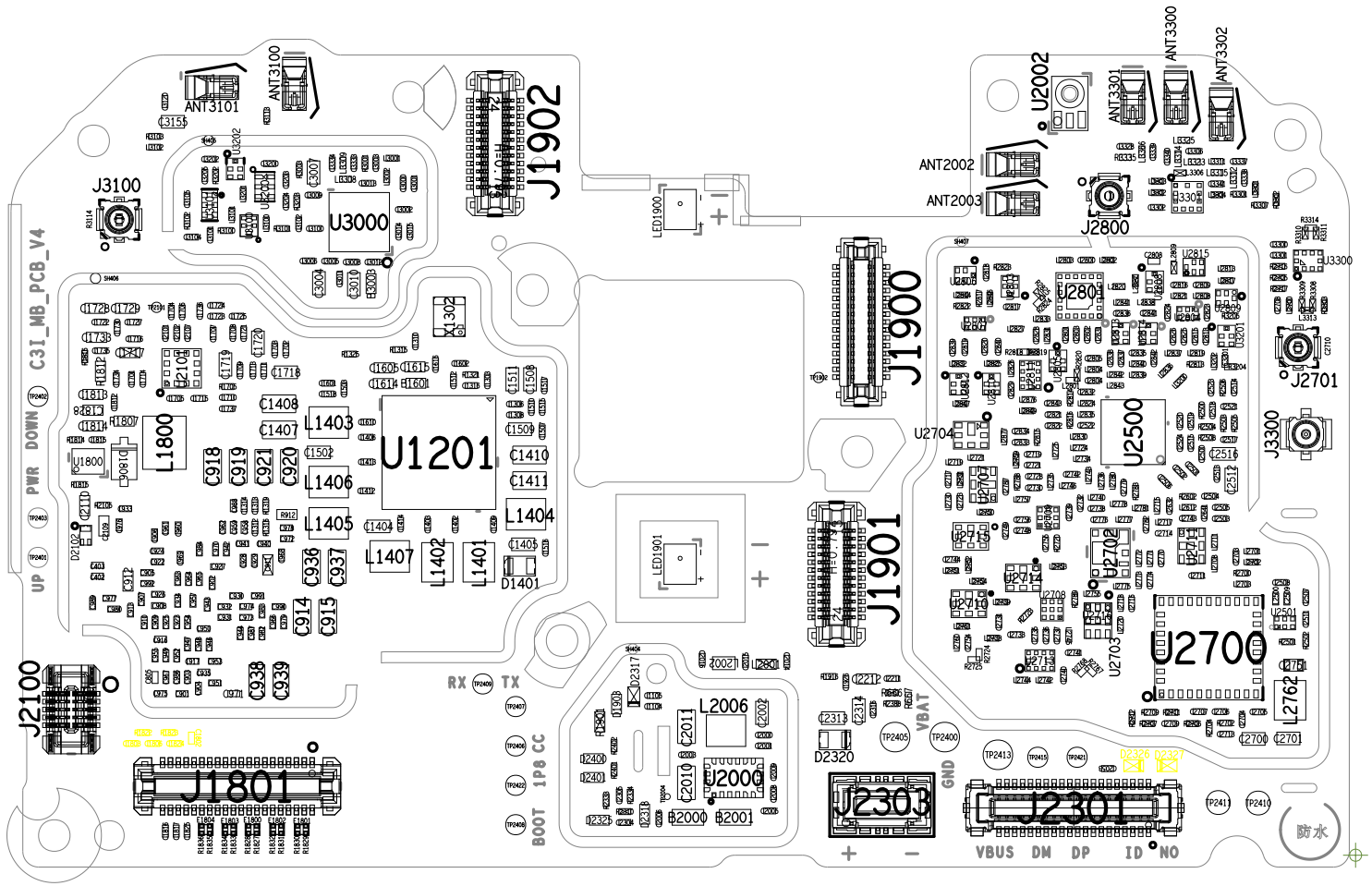

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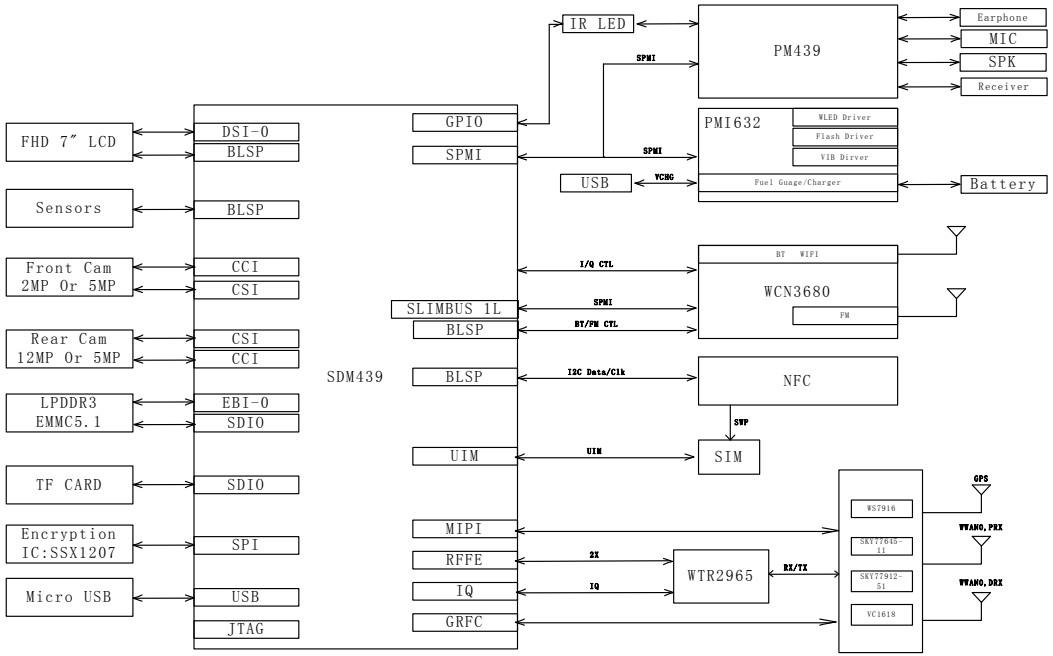

Block Diagram

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SDM439 GPIO Configuration For QRD439+PMI632

GPIO_0	NFC_SPI_ESE_MOSI	GPIO_41		GPIO_82	FM_DATA
GPIO_1	NFC_SPI_ESE_MISO	GPIO_42	ACCL_INT1	GPIO_83	BT_CTL
GPIO_2	NFC_SPI_CS_N_0	GPIO_43	ALSP_INT_N	GPIO_84	BT_DATA
GPIO_3	NFC_SPI_ESE_CLK	GPIO_44	MAG_DRDY_INT	GPIO_85	FP_SPI_MOSI
GPIO_4	QUP_UART_TX_2	GPIO_45	GYRO_INT	GPIO_86	FP_SPI_MISO
GPIO_5	QUP_UART_RX_2	GPIO_46		GPIO_87	FP_SPI_CS
GPIO_6	WSA_SMB_I2C_SDA	GPIO_47	SENSOR_SPI_CS2_N	GPIO_88	FP_SPI_CLK
GPIO_7	WSA_SMB_I2C_SCL	GPIO_48	FP_INT_N1	GPIO_89	
GPIO_8	TP_SPI_MOSI	GPIO_49	UIM_BATT_ALARM	GPIO_90	
GPIO_9	TP_SPI_MISO	GPIO_50		GPIO_91	KEY_VOL_UP_N
GPIO_10	TP_SPI_CS_SDA	GPIO_51	UIM1_DATA	GPIO_92	
GPIO_11	TP_SPI_CLK_SCL	GPIO_52	UIM1_CLK	GPIO_93	NFC_ESE_PWR_REQ
GPIO_12	WSA_INTR	GPIO_53	UIM1_RESET	GPIO_94	WSA_IO_DATA
GPIO_13	LCD_ID	GPIO_54	UIM1_PRESENT	GPIO_95	WSA_IO_CLK
GPIO_14	SENSOR_I2C_SDA	GPIO_55	UIM2_DATA	GPIO_96	WSA_EN
GPIO_15	SENSOR_I2C_SCL	GPIO_56	UIM2_CLK	GPIO_97	HomeKey_FP_INT
GPIO_16	NFC_DISABLE	GPIO_57	UIM2_RESET	GPIO_98	
GPIO_17	NFC_IRQ	GPIO_58	UIM2_PRESENT	GPIO_99	
GPIO_18	NFC_I2C_SDA	GPIO_59		GPIO_100	RFFE1_CLK
GPIO_19	NFC_I2C_SCL	GPIO_60	LCD0_RESET_N	GPIO_101	RFFE1_DATA
GPIO_20	SENSOR_SPI_MOSI	GPIO_61	SMB_INT	GPIO_102	RFFE2_CLK
GPIO_21	SENSOR_SPI_MISO	GPIO_62		GPIO_103	RFFE2_DATA
GPIO_22	SENSOR_SPI_CS0_N	GPIO_63		GPIO_104	
GPIO_23	SENSOR_SPI_CLK	GPIO_64	TP_RST_N	GPIO_105	
GPIO_24	LCD_TE0	GPIO_65	TP_INT_N	GPIO_106	
GPIO_25	WSA_MCLK	GPIO_66		GPIO_107	GRFC3_SEL
GPIO_26	CAM_MCLK0	GPIO_67	SDCARD_DET_N	GPIO_108	
GPIO_27	CAM_MCLK1	GPIO_68		GPIO_109	GRFC5_SEL
GPIO_28		GPIO_69	CDC_PDM_CLK	GPIO_110	GRFC6_SEL
GPIO_29	CAM_I2C_SDA0	GPIO_70	CDC_PDM_SYNC	GPIO_111	GRFC7_SEL
GPIO_30	CAM_I2C_SCL0	GPIO_71	CDC_PDM_TX	GPIO_112	GRFC8_SEL
GPIO_31	CAM_I2C_SDA1	GPIO_72	CDC_PDM_RX0	GPIO_113	GRFC9_SEL
GPIO_32	CAM_I2C_SCL1	GPIO_73	CDC_PDM_RX1	GPIO_114	GRFC10_SEL
GPIO_33		GPIO_74	CDC_PDM_RX2	GPIO_115	
GPIO_34	FLASH_STROBE_NOW	GPIO_75	BT_SSBI	GPIO_116	
GPIO_35	CAM_AVDD_LDO_EN	GPIO_76	WL_CMD_DATA_2	GPIO_117	
GPIO_36	MCAM_RST_N	GPIO_77	WL_CMD_DATA_1	GPIO_118	EXT_GPS_LNA_EN
GPIO_37	FORCE_USB_BOOT	GPIO_78	WL_CMD_DATA_0	GPIO_119	CH0_GSM_TX_PHASE_D0
GPIO_38	SCAM_RST_N	GPIO_79	WL_CMD_SET	GPIO_120	RFFE5_CLK
GPIO_39		GPIO_80	WL_CMD_CLK	GPIO_121	RFFE5_DATA
GPIO_40		GPIO_81	FM_SSBI	GPIO_122	
GPIO_123					
GPIO_124	FP_RESET				
GPIO_125					
GPIO_126					
GPIO_127					
GPIO_128					
GPIO_129					
GPIO_130	NFC_DWL_REQ				
GPIO_131					
GPIO_132	RCM_MARKER1				
GPIO_133	RCM_MARKER2				

PMI632 GPIO/MPP Configuration

GPIO_1	CONNECTOR_THERMAL	GPIO_5	FLASH_STROBE_NOW
GPIO_2	SMB_PARALLEL_CHG_EN	GPIO_6	NEBULA_PWM
GPIO_3	SKIN_THEREMAL	GPIO_7	SMB_VCHG_P
GPIO_4	SMB_THEREMAL	GPIO_8	SMB_VCHG_M

PM439 GPIO/MPP Configuration

GPIO_1		MPP_1	VDD_PX_BIAS_MPP_1
GPIO_2	NFC_CLK_REQ		
GPIO_3	UIM_BATT_ALARM	MPP_3	VREF_DAC_MPP_3
GPIO_4	WLED_EN	MPP_4	QUIET_THERM_TP_LED_K
GPIO_5			
GPIO_6			
GPIO_7			
GPIO_8	LCM_BL_PWM		

GPIO
TABLE

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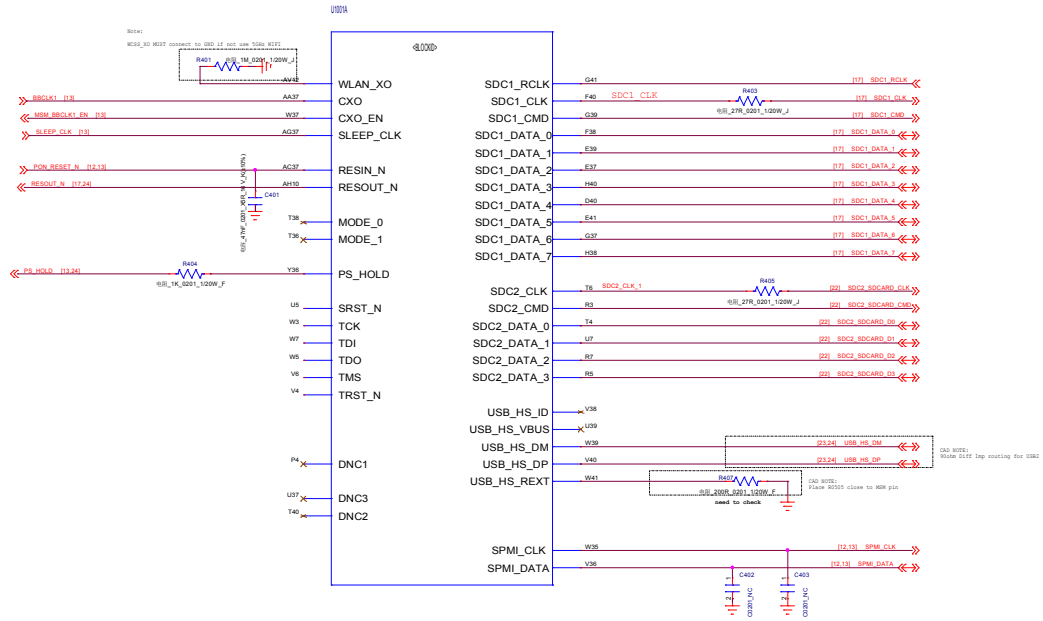

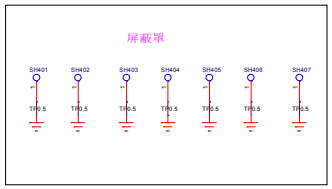

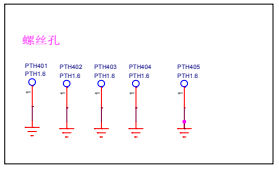

SDM439
Control

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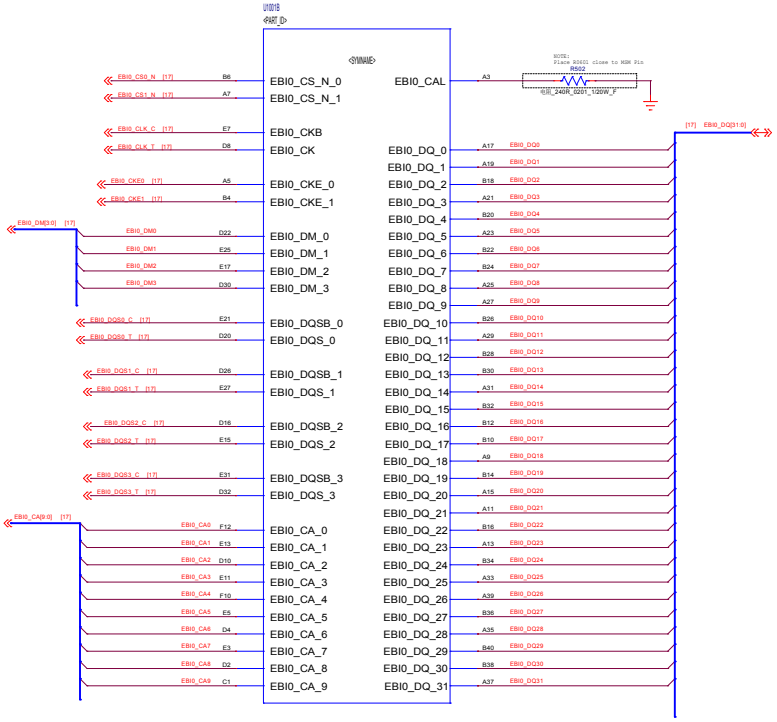

SDM439 EBI

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NOTE:
Asterisks (*) indicate modem power management (MPM) wake-up pins

GPIO_37	FORCED USB BOOT
GPIO_3	MDDI DISABLE
GPIO_63	APPS BOOT FROM ROM
GPIO_111	BOOT_CONFIG[1]
GPIO_112	BOOT_CONFIG[2]
GPIO_88	BOOT_CONFIG[3]

BOOT_CONFIG[3:1]	BOOT_CONFIG
0b000	SDC1 -> SDC2 -> USB2.0
0b001	SDC2 -> SDC1-> USB2.0
0b010	SDC1-> USB2.0
0b011	USB2.0

Default Boot Config (0b000) is SDC1(eMMC)

FM_LNA_EN由GPIO87调整到GPIO89

cap_int由GPIO48调整到GPIO46

cap_int

I2C PULL-UP RESISTORS

SENSORS

CAMERAS

TOUCHSCREEN

LCD Backlight Driver

Smart PA/LCD BIAS

NOTE:
Ensure SW sets these GPIOs (Sensor, CTP and
Camera I2C bus) to inout pull down when the peripherals
are powered off to eliminate leakage.

SDM439
GPIO

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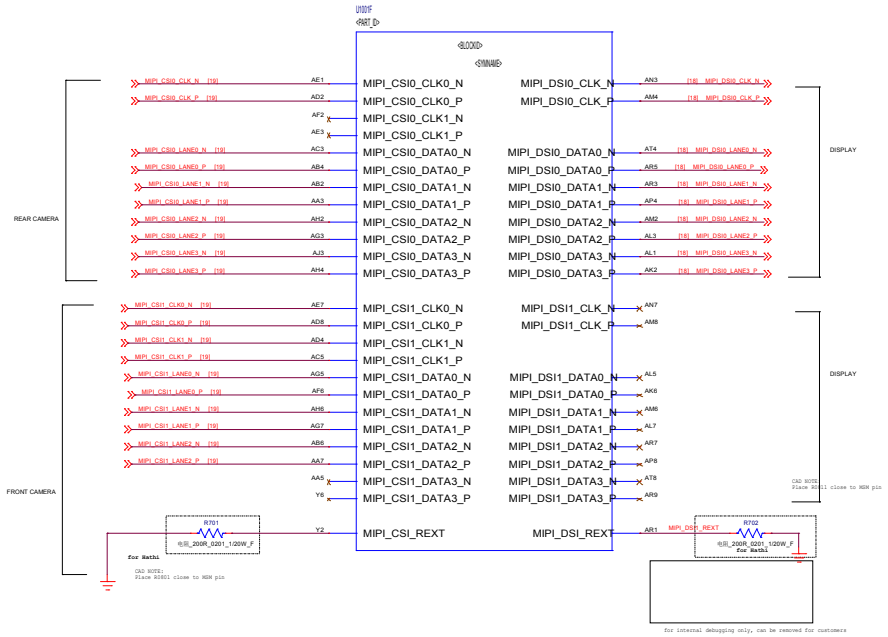

SDM439 MIPI

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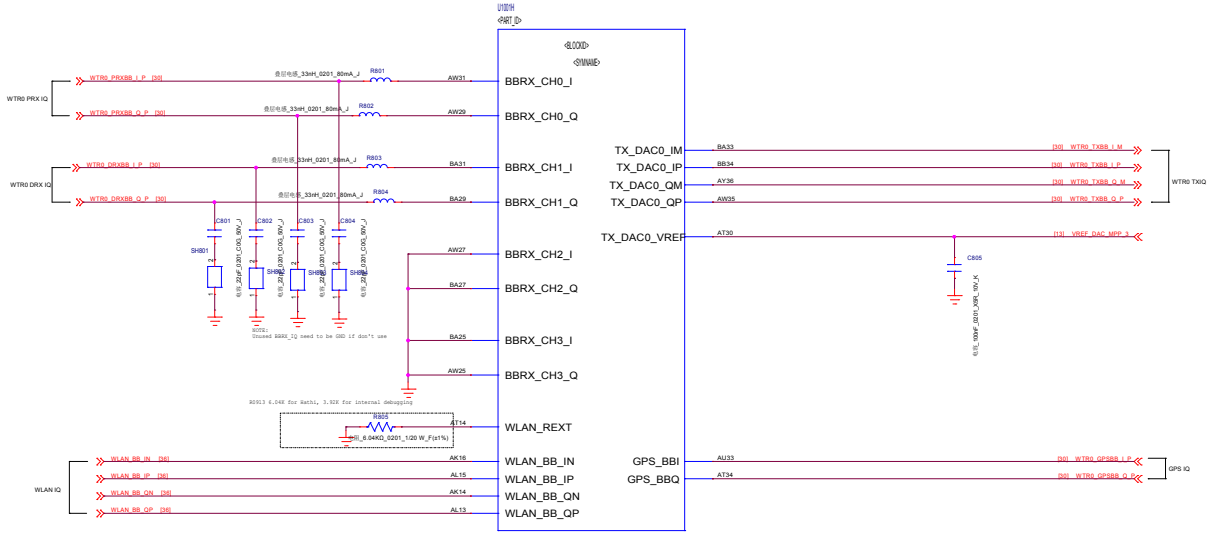

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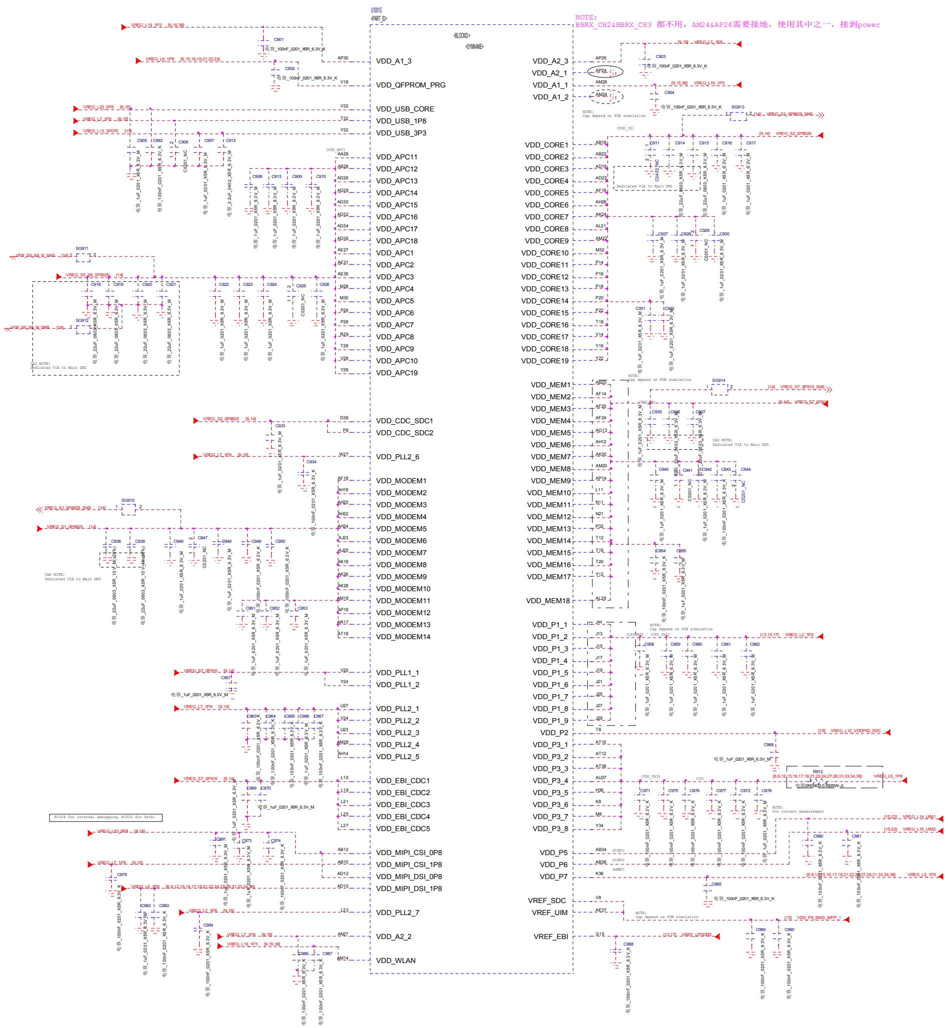

SDM439
POWER1

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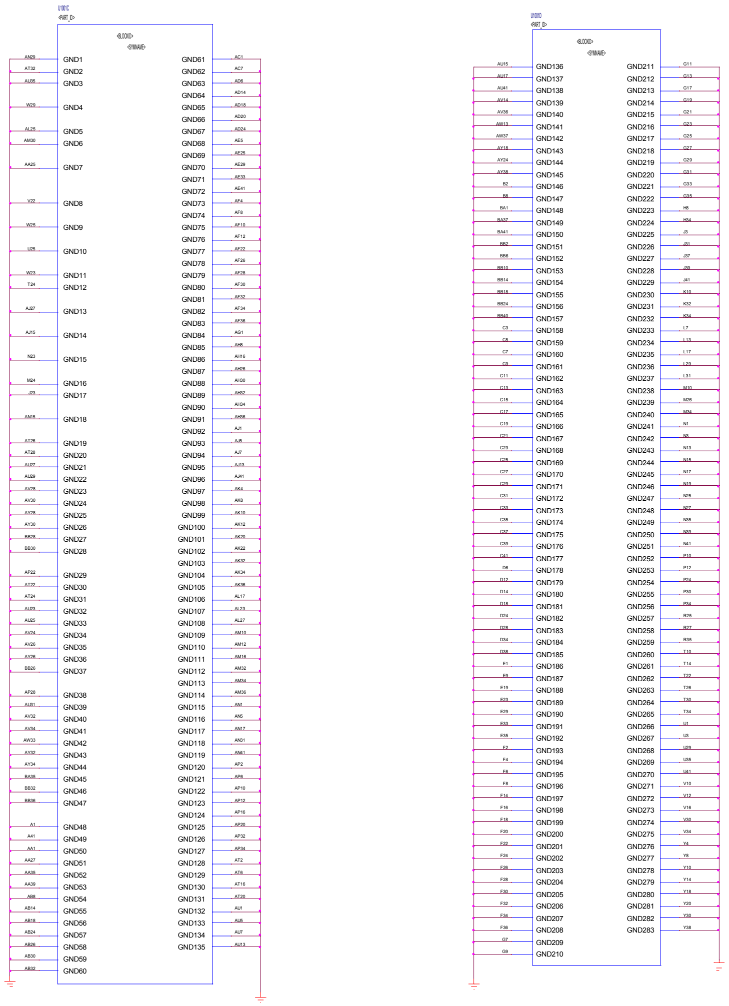

SDM439
GND

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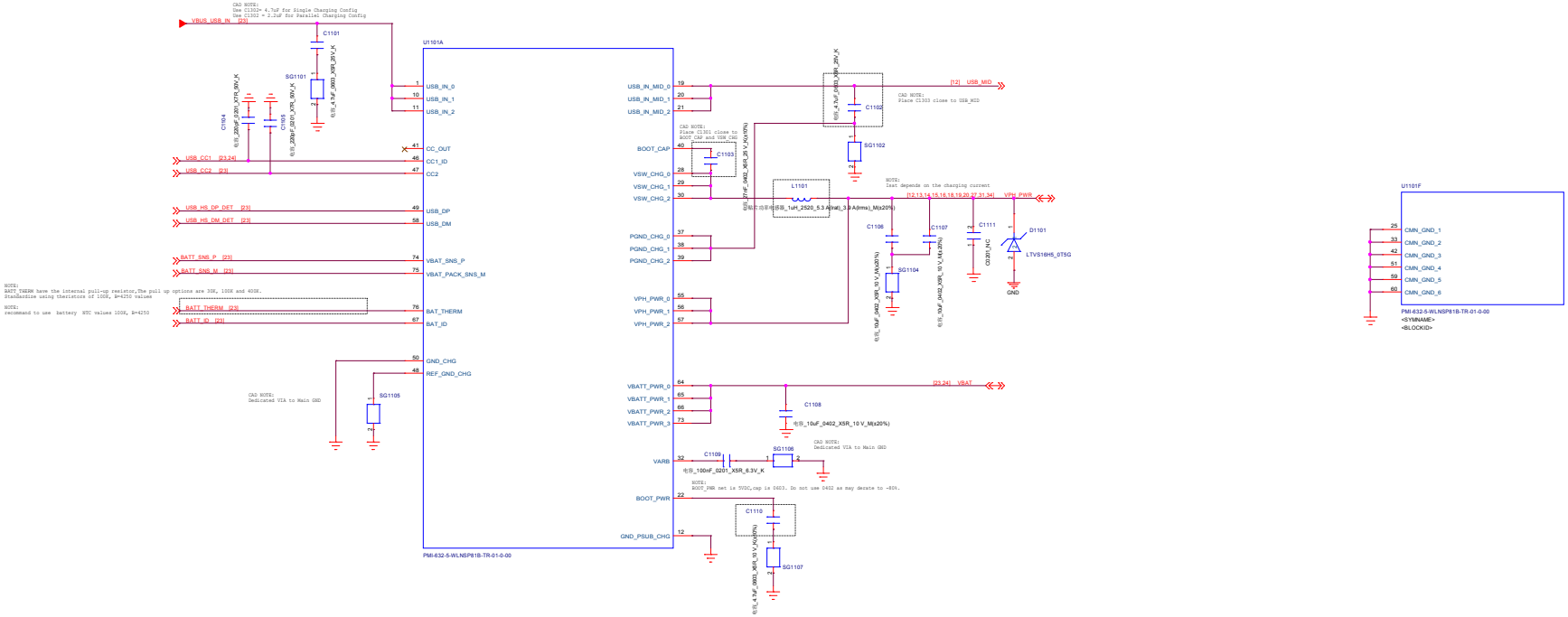

PMI632
Charger

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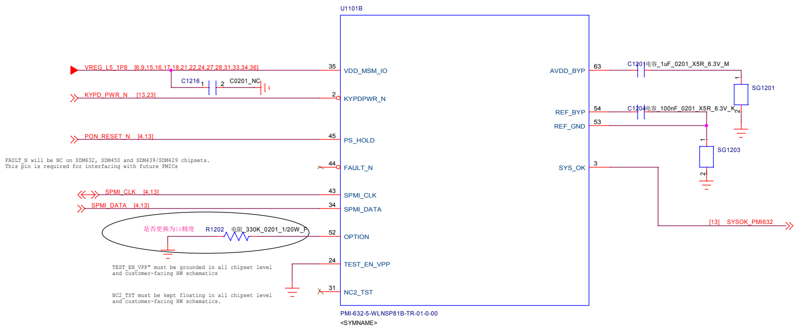
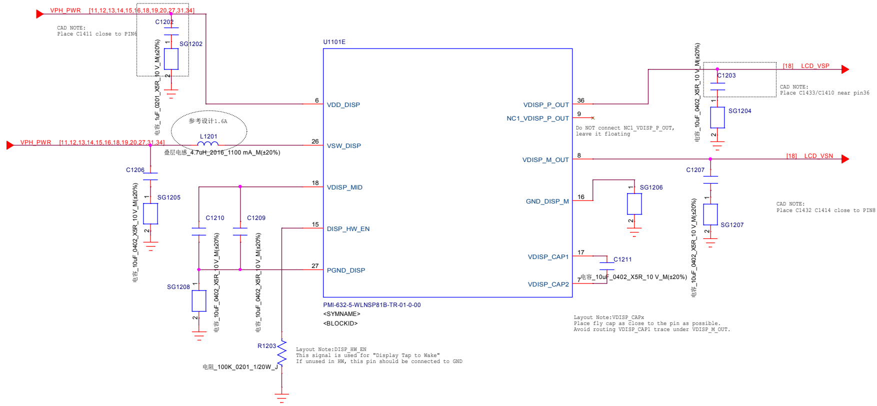
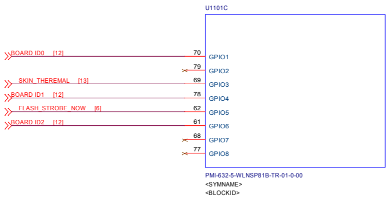


PON Configuration (OPTION PIN)	PD Resistance
SPMI, uUSB	1K
I2C, uUSB	22K
I2C, TypeC	510K
SPMI, TypeC	1M

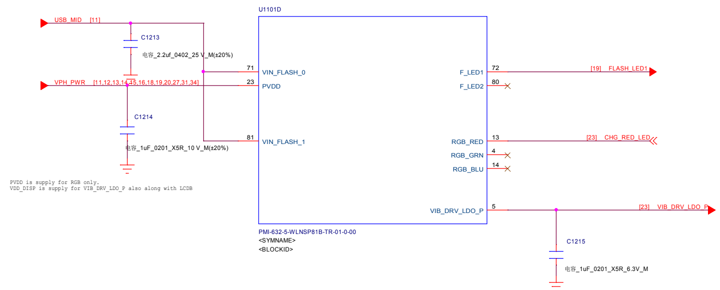
PON CONFIGURATIONS

PON Configuration	Option resistor range
SPMI, Micro USB, FMB_DIS	R = (Ground, 1K, 1.2K, 1.5K, 1.8K, and 2.2K)
SPMI, Micro USB, FMB_EN	R = (3.3K, 3.9K, 4.7K, and 5.6K)
I2C, Micro USB, FMB_DIS	R = (8.2K, 10K, 12K, and 15K)
I2C, Micro USB, FMB_EN	R = (22K, 27K, 33K, and 39K)
I2C, Type-C, FMB_DIS	R = (56K, 68K, 82K, and 100K)
I2C, Type-C, FMB_EN	R = (150K, 180K, and 220K)
SPMI, Type-C, FMB_DIS	R = (330K, 390K, and 470K)
SPMI, Type-C, FMB_EN	R = (820K, 1M, 1.2M, and Open)





GPIO#	GPIO Function
GPIO1_AMUX (MV)	FMB1 (Output mode) / TypeC_CONN_THERM_SNS / MSM/eMMC THERM
GPIO2 (MV)	SMB_EN / HRLED (SINK required - Fixed 10mA)
GPIO3_AMUX (MV)	Skin_Therm_Sns / FLASH_THERM_SNS / VSYNC
GPIO4_AMUX (MV)	SMB_THERM_SNS / Flash_Strobe
GPIO5 (LV)	I2C_IRQ (Output) / FMB2 (Output) /Flash_Strobe
GPIO6 (LV)	WLED_PWM / CLK_IN_19M2
GPIO7_AMUX (LV)	SMB_VCHG_P / VSYNC
GPIO8_AMUX (LV)	FMB2 (Output) / SMB_VHG_M



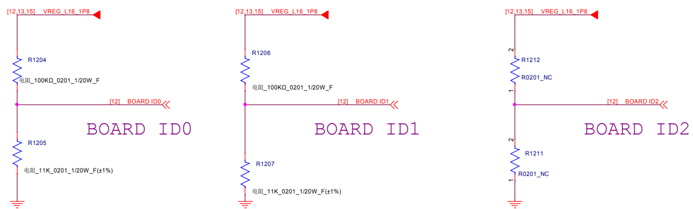
客户指定电阻选型

11K	0.1（比例）
17.8K	0.15
24.9K	0.2
33.2K	0.25
43.2K	0.3
53.6K	0.35
66.5K	0.4
82K	0.45
100K	0.5
121K	0.55
150K	0.6
187K	0.65
232K	0.7
300K	0.75
402K	0.8
562K	0.85
909K	0.9

BOARD ID0用于项目区分

BOARD ID1用于配置区分

BOARD ID2暂未使用



PMI632 Control/Interface

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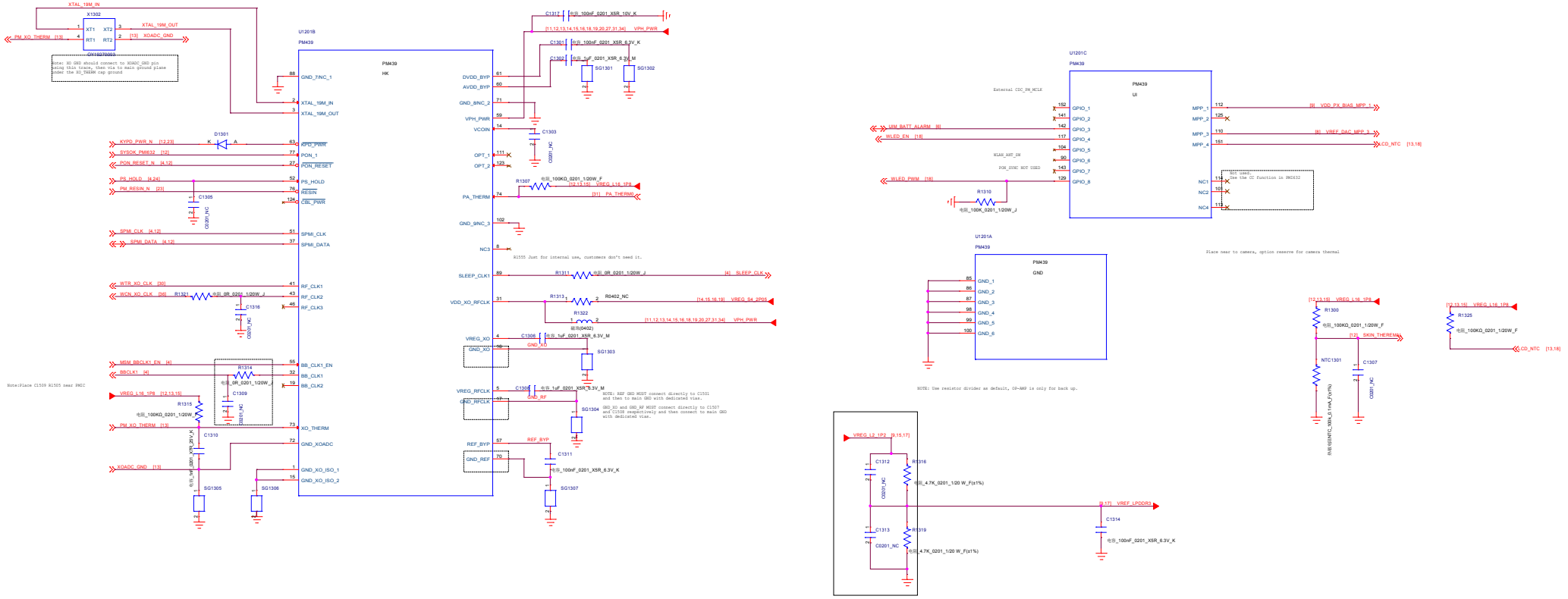

PM439
Control/Interface

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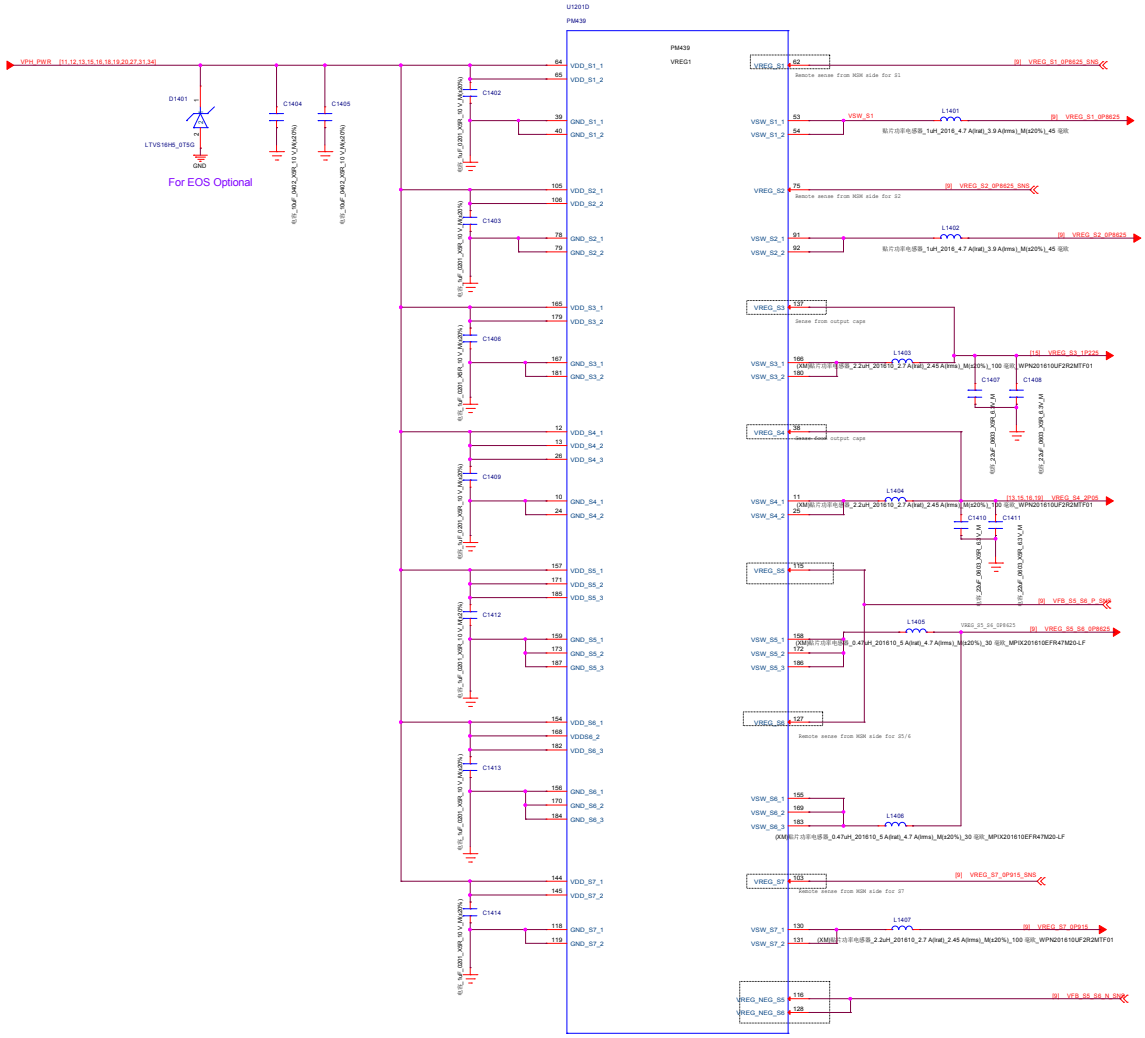

PM439 SMPS

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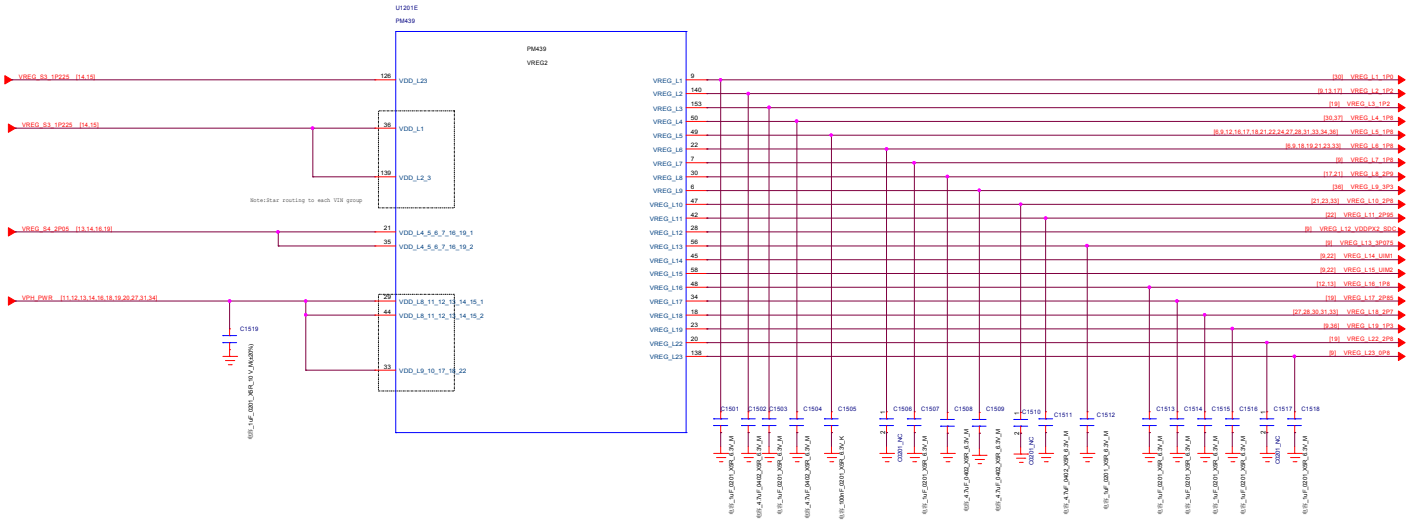

Table 3-6 PM439 regulators and their intended uses for SDM439/SDM429 when paired with PMI632

Function	Circuit type	Default voltage (V) [1]	Specified range (V) [2] (SDM439/SDM429)	Programmable range (V)	Rated current (mA)	Default on	Expected use (SDM439/SDM429)
S1	SMPS	0.744	0.4–1.14	0.32–2.04	3000	N	MSM modem
S2	SMPS	0.744	0.4–1.14	0.32–2.04	4000	Y	MSM core and graphics
S3	SMPS	1.28	1.2–1.25	0.32–2.04	2000	Y	MIPI CSI, and DSI. Low-voltage LDOs (1, 2, 3, and 23)
S4	SMPS	2.04	1.8–2.04	0.32–2.04	2000	Y	High-voltage LDOs (4, 5, 6, 7, 16, and 19)
S5	SMPS	0.735	0.4–1.14	0.350–1.355	3750	Y	MSM applications processor
S6	SMPS	0.735	0.4–1.14	0.350–1.355	3750	Y	MSM applications processor
S7	SMPS	0.752	0.4–1.14	0.32–2.04	2000	Y	MSM VDD memory rail (VDDMX)
L1	NMOS LDO	1.0 [3]	1.0 [3]	0.375–1.5375	600	N	RFICs
L2	NMOS LDO	1.2	1.2	0.375–1.5375	1200	Y	VREF generator for LPDDR3
L3	NMOS LDO	1.2	1.2	0.375–1.5375	600	N	Camera digital
L4	PMOS LDO	1.800	1.800	1.750–3.3375	450	N	RFICs and GPS eLNA
L5 [4]	PMOS LDO	1.800	1.800	1.750–3.3375	600	Y	Most digital I/Os, MSM pad groups 3 and 7, LPDDR, and eMMC
L6	PMOS LDO	1.800	1.800	1.750–3.3375	300	N	MSM QFPROM, camera, touchscreen, display, and sensors
L7	PMOS LDO	1.800	1.800	1.750–3.3375	300	Y	MSM analog, USB and PLLs, WCN XO, and PM baseband clock driver
L8	PMOS LDO	2.900	2.900	1.750–3.3375	600	Y	eMMC
L9	PMOS LDO	V_{out} = 3.3 V for VBAT > 3.575 V; V_{out} = 3 V for VBAT < 3.575 V	3.000–3.300	1.750–3.3375	600	N	WCN
L10	PMOS LDO	3.0	3.0	1.750–3.3375	150	N	Sensors and touchscreen
L11 [5]	PMOS LDO	2.950	2.950	1.750–3.3375	800	Y	Micro SD

Table 3-6 PM439 regulators and their intended uses for SDM439/SDM429 when paired with PMI632 (cont.)

Function	Circuit type	Default voltage (V) [1]	Specified range (V) [2] (SDM439/SDM429)	Programmable range (V)	Rated current (mA)	Default on	Expected use (SDM439/SDM429)
L12 [4]	PMOS LDO	2.950	1.800/2.950	1.750–3.3375	50	Y	MSM pad group 2
L13	PMOS LDO	3.075	3.075	1.750–3.3375	150	Y	MSM USB and PMIC and external codec audio
L14 [5]	PMOS LDO	1.800	1.800	1.750–3.3375	50	N	MSM pad group 5, dual-voltage UIM1, and NFC
L15 [5]	PMOS LDO	1.800	1.800	1.750–3.3375	50	N	MSM pad group 6 and dual-voltage UIM2
L16	PMOS LDO	1.800	1.800	1.750–3.3375	5	N	PMIC HKADC
L17	PMOS LDO	2.850	2.850	1.750–3.3375	300	N	Camera and display
L18	PMOS LDO	2.700	2.700	1.750–3.3375	150	N	QTI RF front-end
L19	NMOS LDO	1.350	1.350	0.375–1.5375	600	N	MSM analog, WCN, and WGR
L20	Low-noise LDO	1.7625	1.7625	1.74–3.3375	5	Y	PMIC XO circuits
L21	Low-noise LDO	1.7625	1.7625	1.74–3.3375	5	N	PMIC RF clock buffers
L22	PMOS LDO	2.800	2.800	1.750–3.3375	150	N	Camera: analog
L23	NMOS LDO	0.8	0.8	0.375–1.5375	600	Y	MIPI CSI, DSI, and USB

1. All regulators have default voltage settings, whether or not they default on; the voltage and state depends upon the programmable boot sequencer (PBS) configuration.
2. The specified voltage range is the programmed range for which performance is guaranteed to meet all specifications.
   For usage outside this range, submit a case to QTI for approval.
   NOTE: LDO-rated current specifications are only valid while maintaining their specified headroom.
3. LDO1 DC accuracy will be 2% at trimmed voltage (1.05 V) and 3% for other settings. Software configures this LDO1 to 1 V, hence 3% DC accuracy must be factored in.
4. L5 powers internal circuits and limited to 1.8 V operation; its programmed voltage should not be changed, and it should not be turned off.
5. L11, L14, and L15, as well as all PMOS LDOs have OCP.

PM439
LDO

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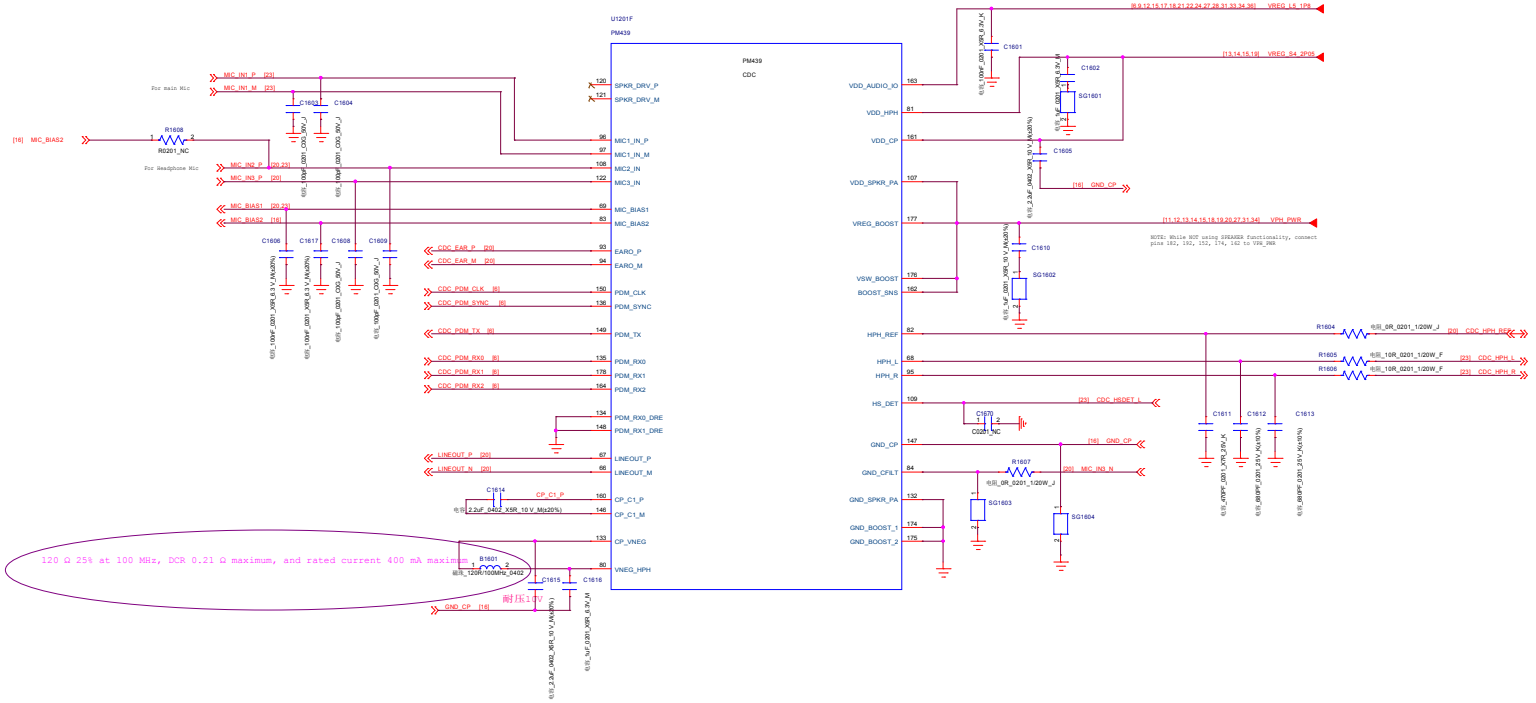
SCHEMATIC, CCA, 84MM, QRD439_2-4-2, EVT1.0

Size	Sheet Name	Rev
D	LD20-PF623	A

Date: Thursday, June 27, 2019 Sheet 15 of 33



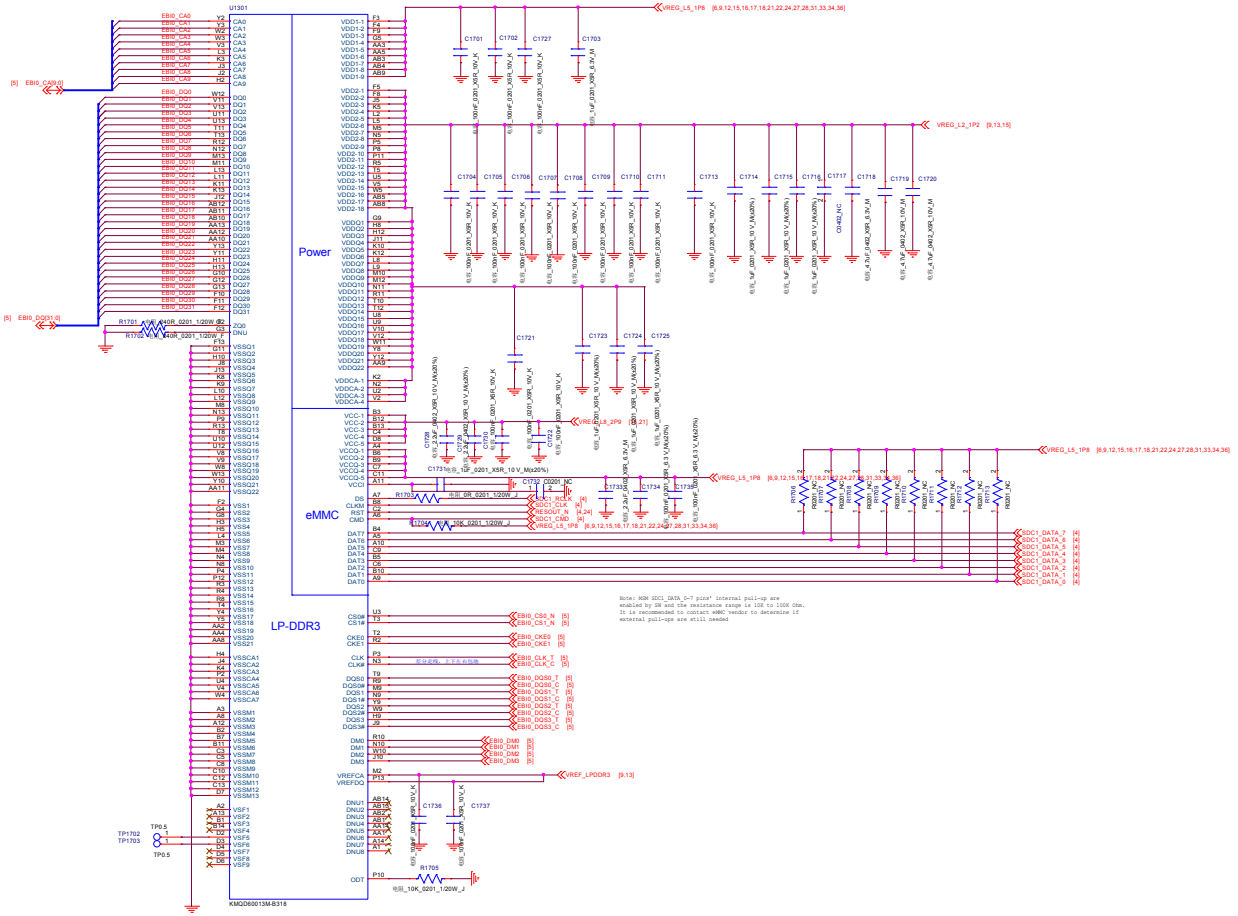
PM439 CODEC/Audio PA

QUALCOMM Technologies,Inc.
5775 Morehouse Drive
San Diego, CA 92121-1714
U.S.A.

Title
SCHEMATIC, CCA, WAN, QRD439_2-4-2, EVT1.0

Size	Sheet Name	Rev
D	LD28-PRE23	A

Date: Thursday, June 27, 2019 Sheet 18 of 33



MEMORY(LPDDR3+EMMC V5.1)

QUALCOMM Technologies,Inc.
5775 Morehouse Drive
San Diego, CA 92121-1714
U.S.A.

Title
SCHEMATIC, CCA, MAIN, QRD439_2-4-2, EVT1.0

Size	Sheet Name	Rev
D	LD28-PRE23	A

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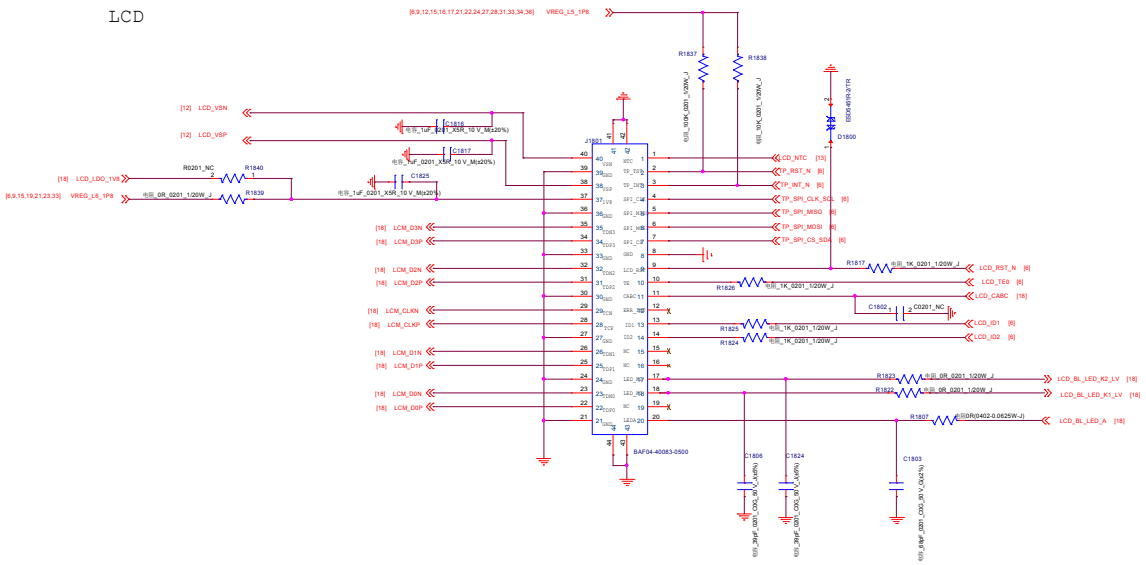
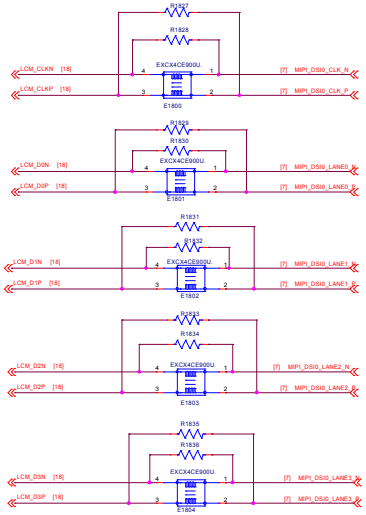
LCD

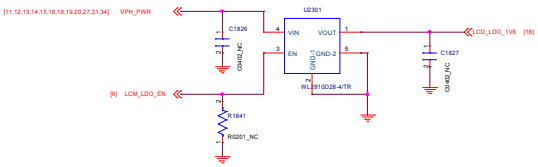




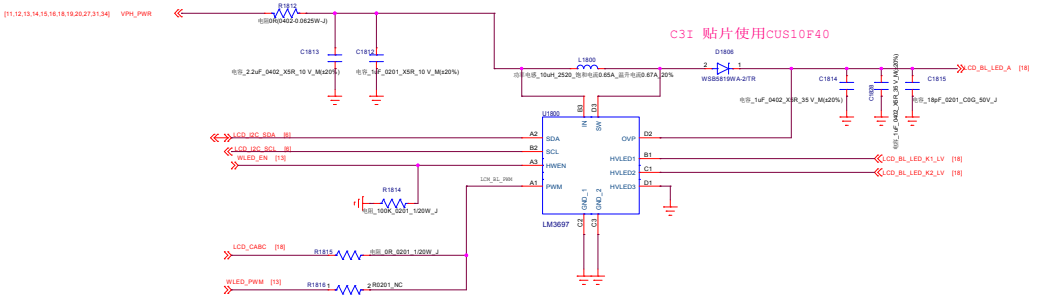
厂家	I2C ADDRESS	SENSOR IC
RTD	0X 36---0110110	RTD3136
TI	0X 36---0110110	LM3697

CAP tolerance above 50V!!!

NC 预留 1.8V



LCD-BACKLIGHT

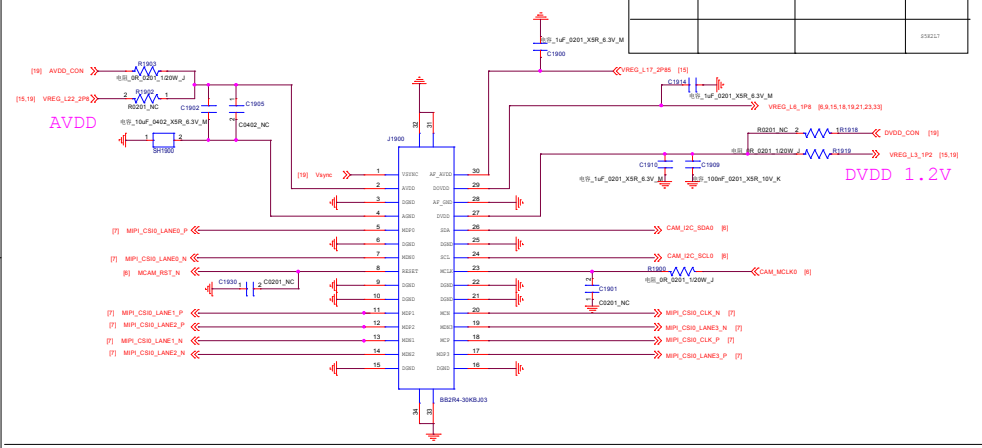


LCD backlight

File	Aws_MB_V1		
Size D	Document Number <Doc>		Rev V1.A
Date: Thursday, June 27, 2019	Sheet 18 of 33		

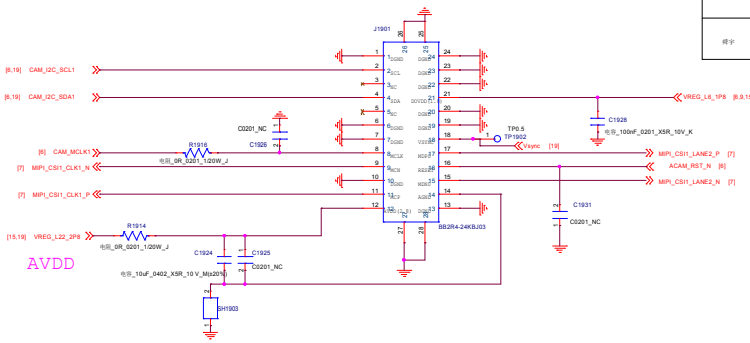
Main MONO Camera 12M

厂家	I2C READ	I2C WRITE	SENSOR IC
后钕微	0X 21	0X 20	ima363
后钕微	0X 21	0X 20	ima486
			8582L7



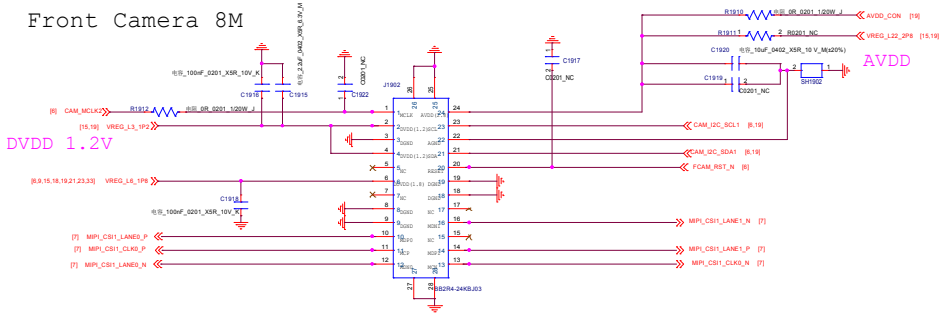
AUX Camera 2M 公用F9 pin定义

厂家	I2C READ	I2C WRITE	SENSOR IC
后钕微	0X 7A	0X 7A	OV02A10-GA4A
舜宇	0X 2F	0X 2E	GC2375

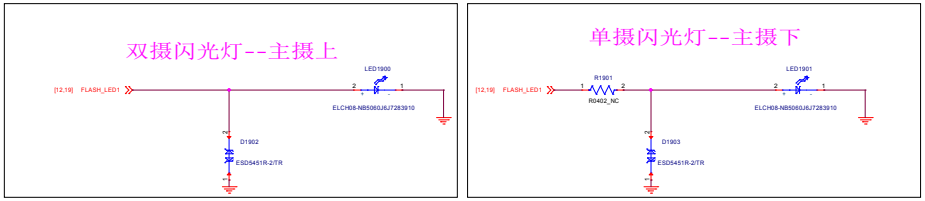


厂家	I2C READ	I2C WRITE	IC
后钕微	0X 6D	0X 6C	OV8856

Front Camera 8M

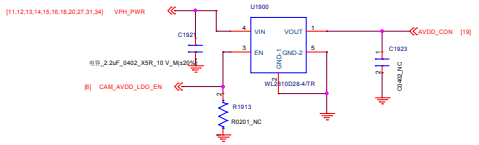


Rear Camera Flash FH15B



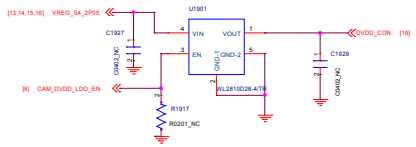
C3I-- 双摄贴此AVDD LDO

贴片使用WL2820D28-4/TR DFN1x1-4L



贴片使用WL2820D105-4/TR DFN1x1-4L

此部分硬件做预留，印度版IC imx363和s5k217，贴1.05V LDO



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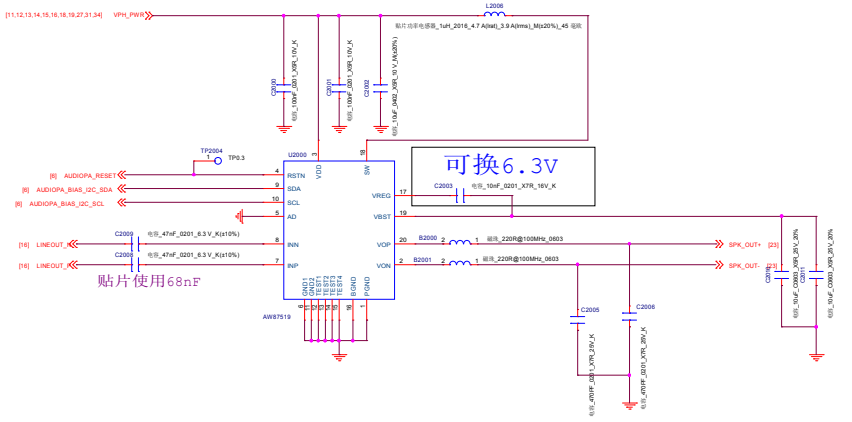
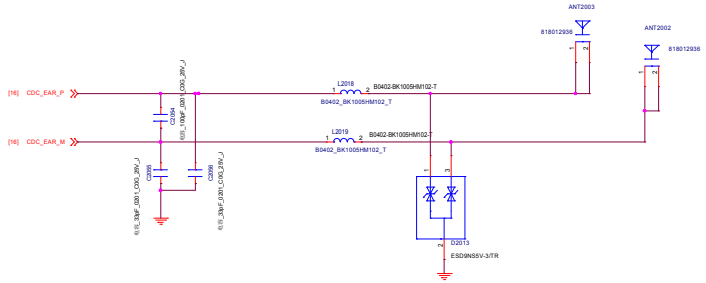
Size: D	Document Number: <Doc>		Rev: V1.0
Date: Thursday, June 27, 2019	Sheet 19 of 33		

AUDIO PA

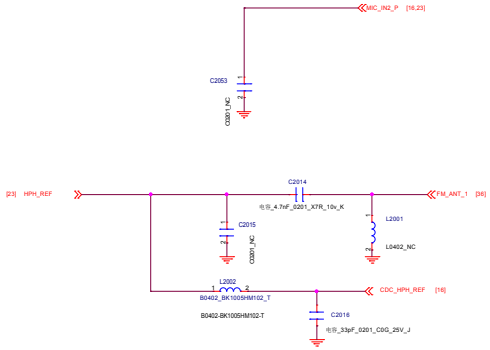
厂家	I2C ADDRESS
AW87519 AD接GND	0X58=1011000



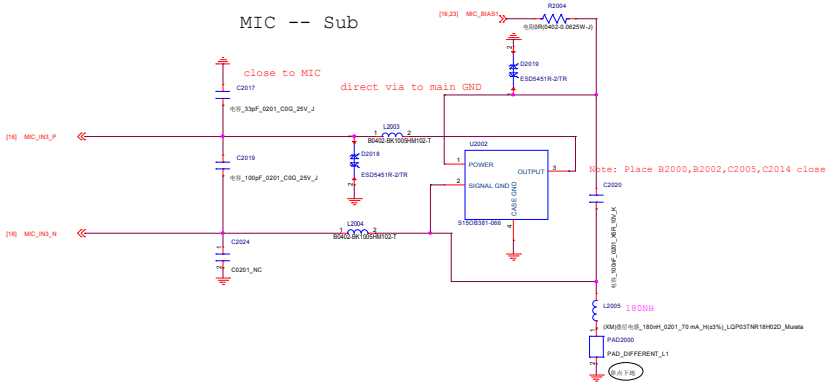
RECEIVER



American Standard EARPHONE



MIC -- Sub



Title	Ares_MB_V1		
Size D	Document Number <Doc>		Rev V1.0
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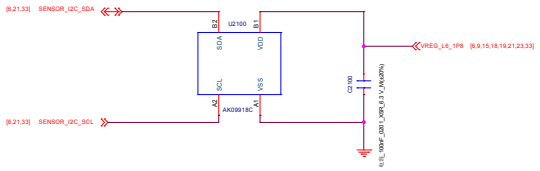
Note: Place B2000,B2002,C2005,C2014 close to headset jack connector

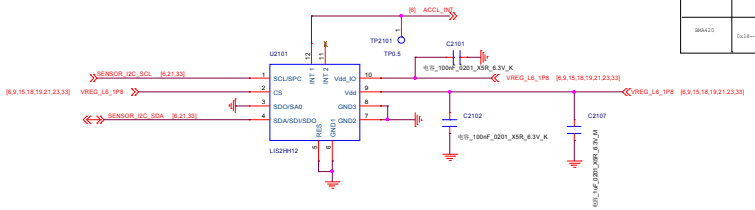
E-compass

厂家	I2C ADDRESS
AKD9918C	0Ch---0001100



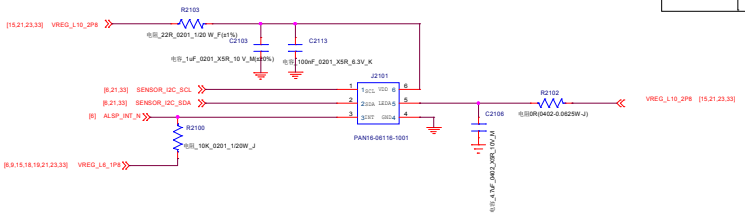
A sensor

厂家	I2C ADDRESS	
	SDO(GND)	SDO(Vdd)
LIS2HH12	0x1E---0011110b	0x1F---0011101b
BMA420	0x18---00011000	0x19---00011001

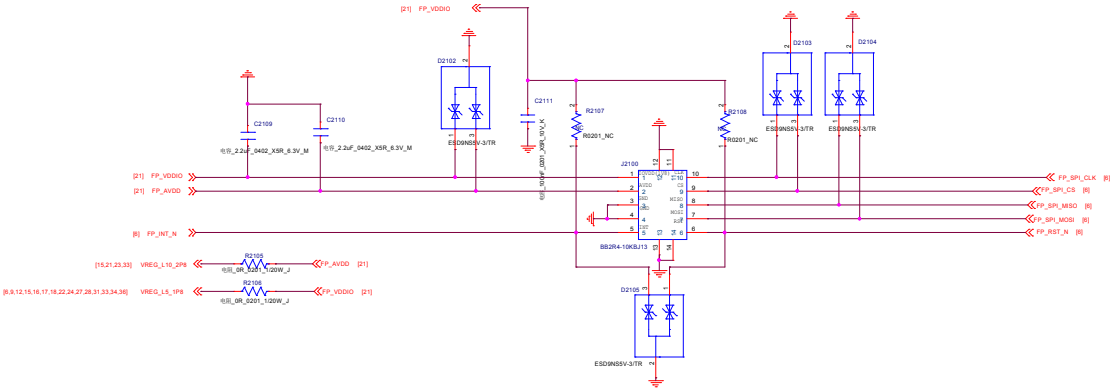


ALS PS LTR2568

厂家	I2C ADDRESS
LTR-2568ALS-WA	0x23---0100011

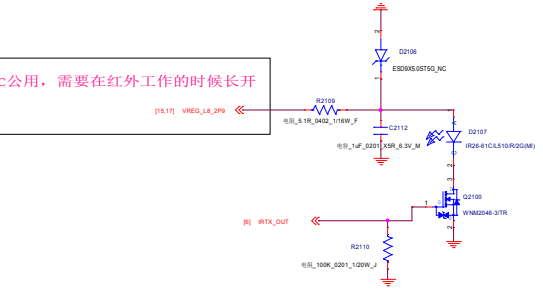


Finger Print



IR

此路电与memory的VCC公用，需要在红外工作的时候长开



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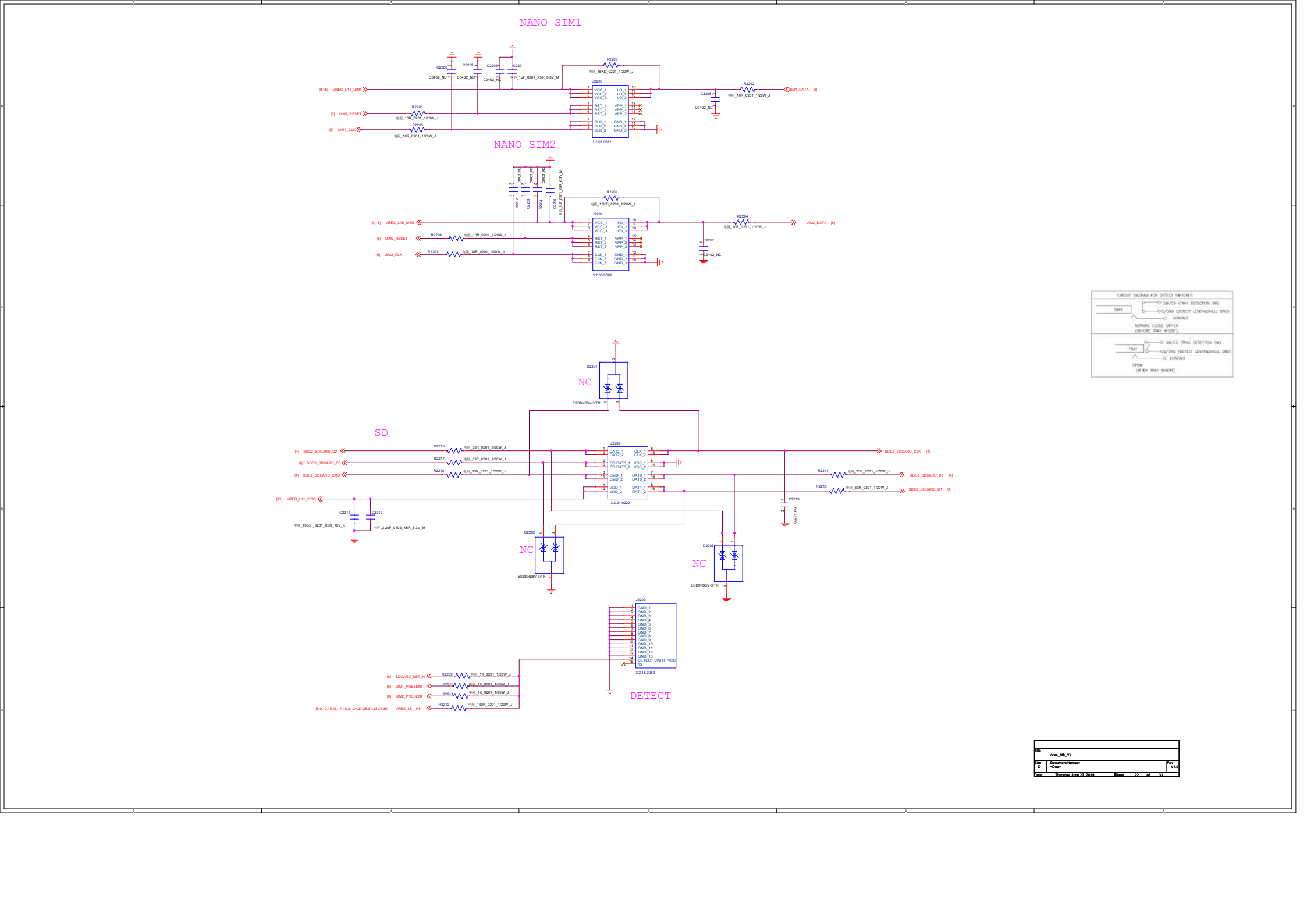
Size: D	Document Number: <Doc>		Rev: V1.0
Date: Thursday, June 27, 2019	Sheet 21 of 33		


NANO SIM1
C2208
C2209
C2210
C2201
C0402_NC
C0402_NC
C0402_NC
电阻_1uF_0201_X5R_6.3V_M
R2200
电阻_15KΩ_0201_1/20W_J
J2200
VCC_1
VCC_2
VCC_3
I/O_1
I/O_2
I/O_3
RST_1
RST_2
RST_3
VPP_1
VPP_2
VPP_3
CLK_1
CLK_2
CLK_3
GND_1
GND_2
GND_3
3.2.03.0582
[9,15] VREG_L14_UIM1
[6] UIM1_RESET
[6] UIM1_CLK
R2203
电阻_10R_0201_1/20W_J
R2205
电阻_10R_0201_1/20W_J
R2202
电阻_10R_0201_1/20W_J
C2206
C0402_NC
UIM1_DATA [6]
NANO SIM2
C2202
C2203
C2204
C2205
C0402_NC
C0402_NC
C0402_NC
电阻_1uF_0201_X5R_6.3V_M
R2201
电阻_15KΩ_0201_1/20W_J
J2201
3.2.03.0582
[9,15] VREG_L15_UIM2
[6] UIM2_RESET
[6] UIM2_CLK
R2206
电阻_10R_0201_1/20W_J
R2207
电阻_10R_0201_1/20W_J
R2204
电阻_10R_0201_1/20W_J
C2207
C0402_NC
UIM2_DATA [6]
CIRCUIT DIAGRAM FOR DETECT SWITCHES
TRAY
SW/CD (TRAY DETECTION SW)
CS/GND (DETECT LEVER&SHELL GND)
CONTACT
NORMAL CLOSE SWITCH
(BEFORE TRAY INSERT)
OPEN
(AFTER TRAY INSERT)
SD
D2201
NC
ESD9N5SV-3/TR
J2202
3.2.04.0220
[4] SDC2_SDCARD_D2
[4] SDC2_SDCARD_D3
[4] SDC2_SDCARD_CMD
[15] VREG_L11_2P95
R2216
R2217
R2218
电阻_33R_0201_1/20W_J
C2211
C2212
电容_100nF_0201_X5R_10V_K
电容_2.2uF_0402_X5R_6.3V_M
SDC2_SDCARD_CLK [4]
R2214
R2215
SDC2_SDCARD_D0 [4]
SDC2_SDCARD_D1 [4]
C2218
C0201_NC
D2202
NC
ESD9N5SV-3/TR
D2203
NC
ESD9N5SV-3/TR
J2203
3.2.16.0069
DETECT
[6] SDCARD_DET_N
[6] UIM1_PRESENT
[6] UIM2_PRESENT
[6,9,12,15,16,17,18,21,24,27,28,31,33,34,36] VREG_L5_1P8
R2209
R2210
R2211
R2212
电阻_1K_0201_1/20W_J
电阻_100K_0201_1/20W_J
Title
Ares_MB_V1
Size D
Document Number
<Doc>
Rev V1.0
Date: Thursday, June 27, 2019
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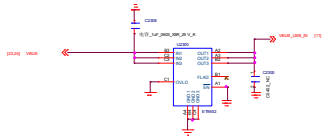
OVP 6.8V ET9552L

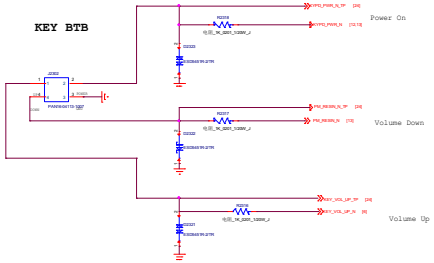
OVP 10.5V ET9552



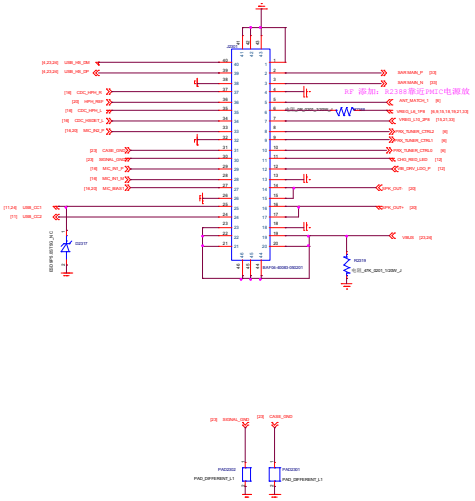
$V_{IN\_OVLO} = V_{OVLO\_TH} * (1+R1/R2)$

Note: V_{OVLO_TH}= 1.2V(TYP.)

KEY BTB

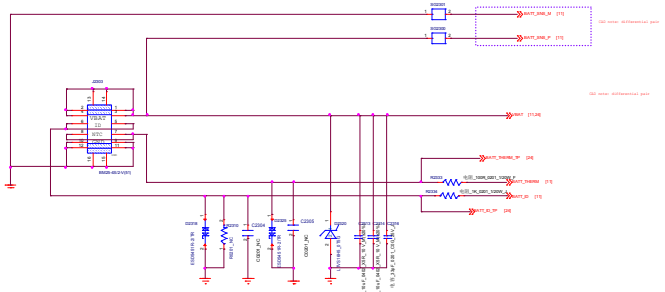


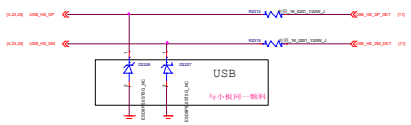
MAIN FPC BTB



Signal	Description
KEY_VOL_UP_N	Volume Up
PM_RESIN_N	Volume Down
KYPD_PWR_N	PWER_ON
KEY_AI	XIAOMI AI

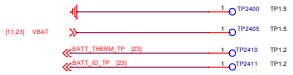
Battery Conector





Test Points

VBAT TEST POINT



KEY TEST point

UART TEST point

USB TEST POINT

Force USB boot

CC TEST POINT

Company: Huaqin			
Block Title	Test Points		
Project	<Doc>	Rev	1.0
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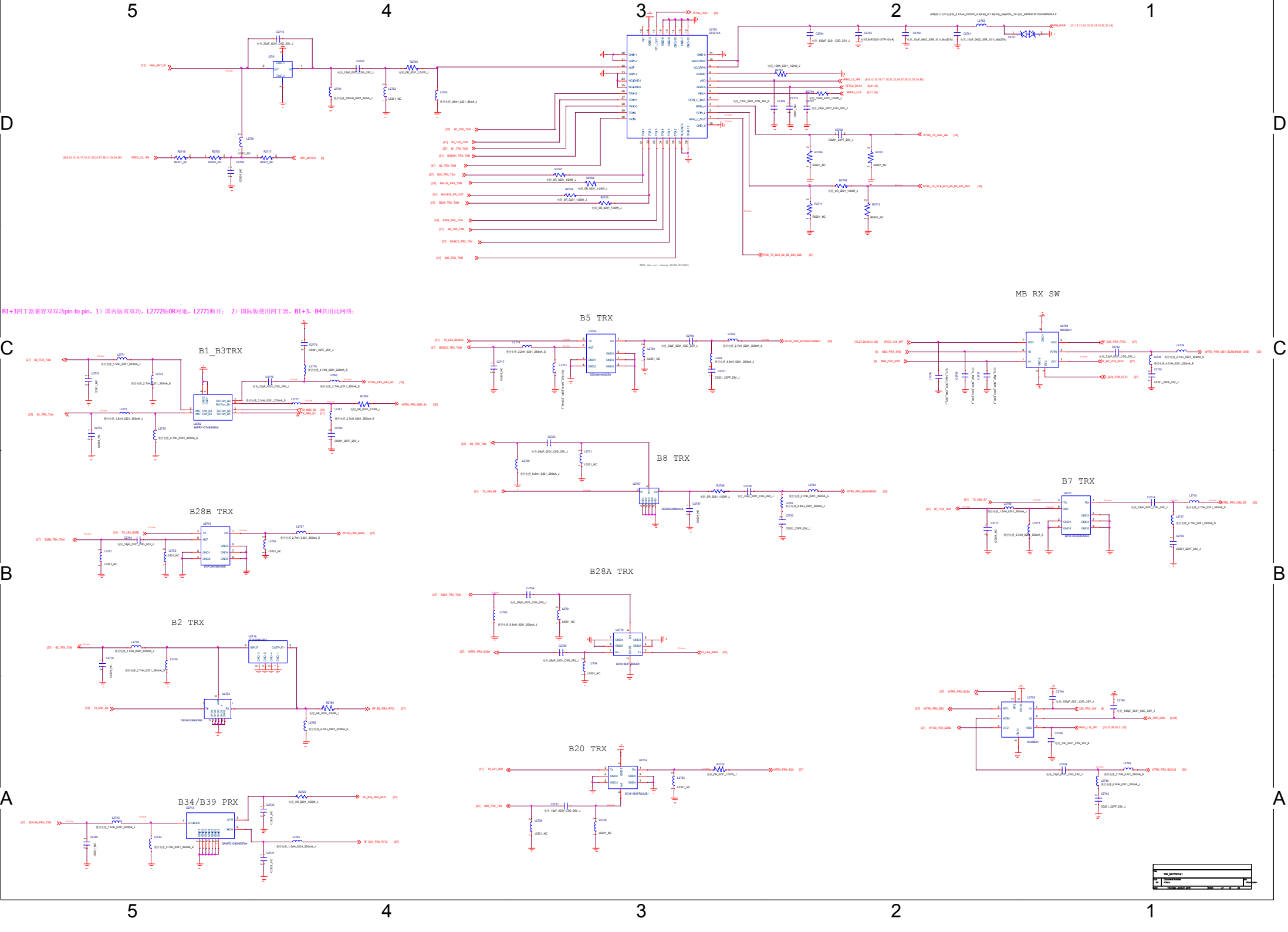
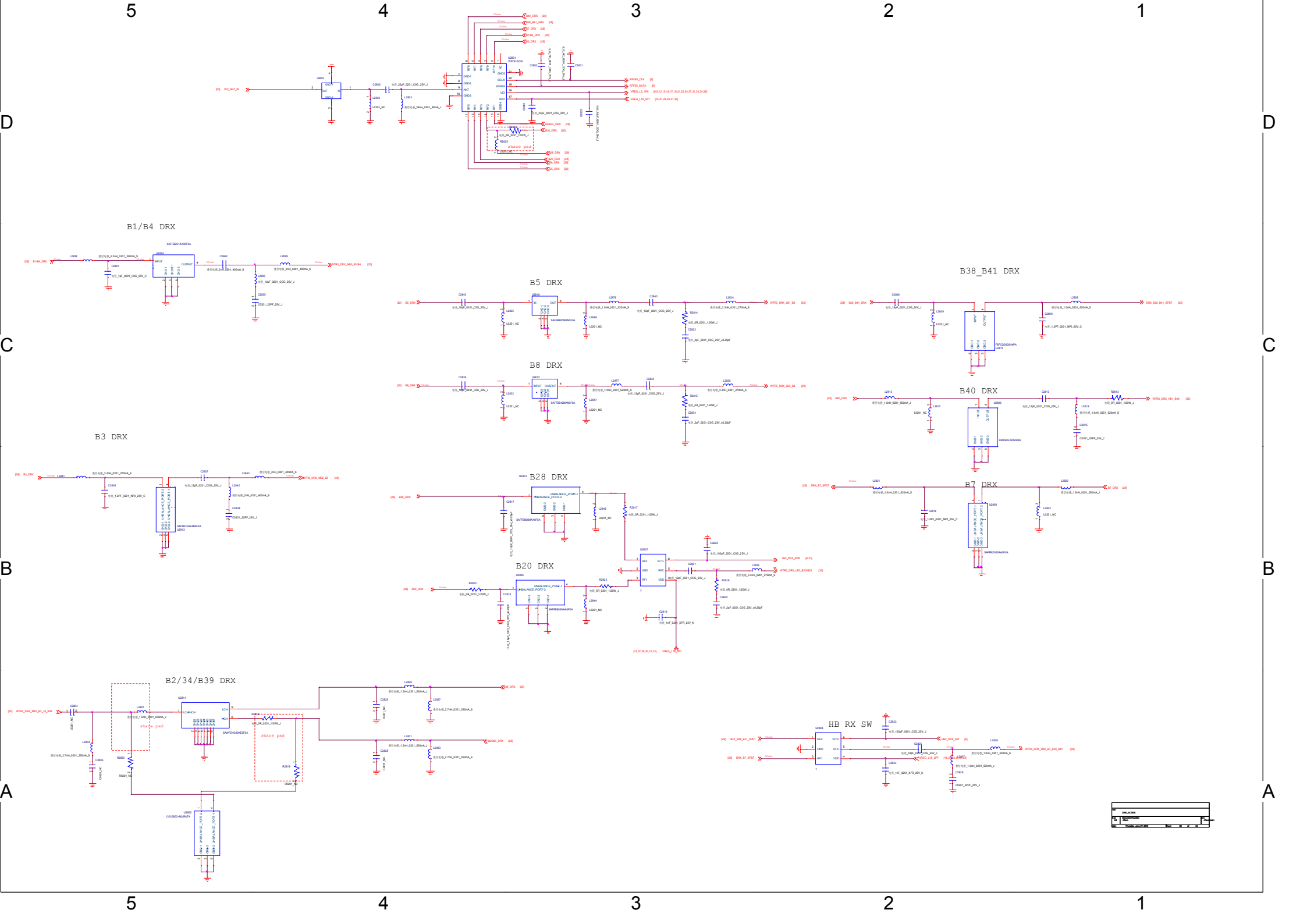
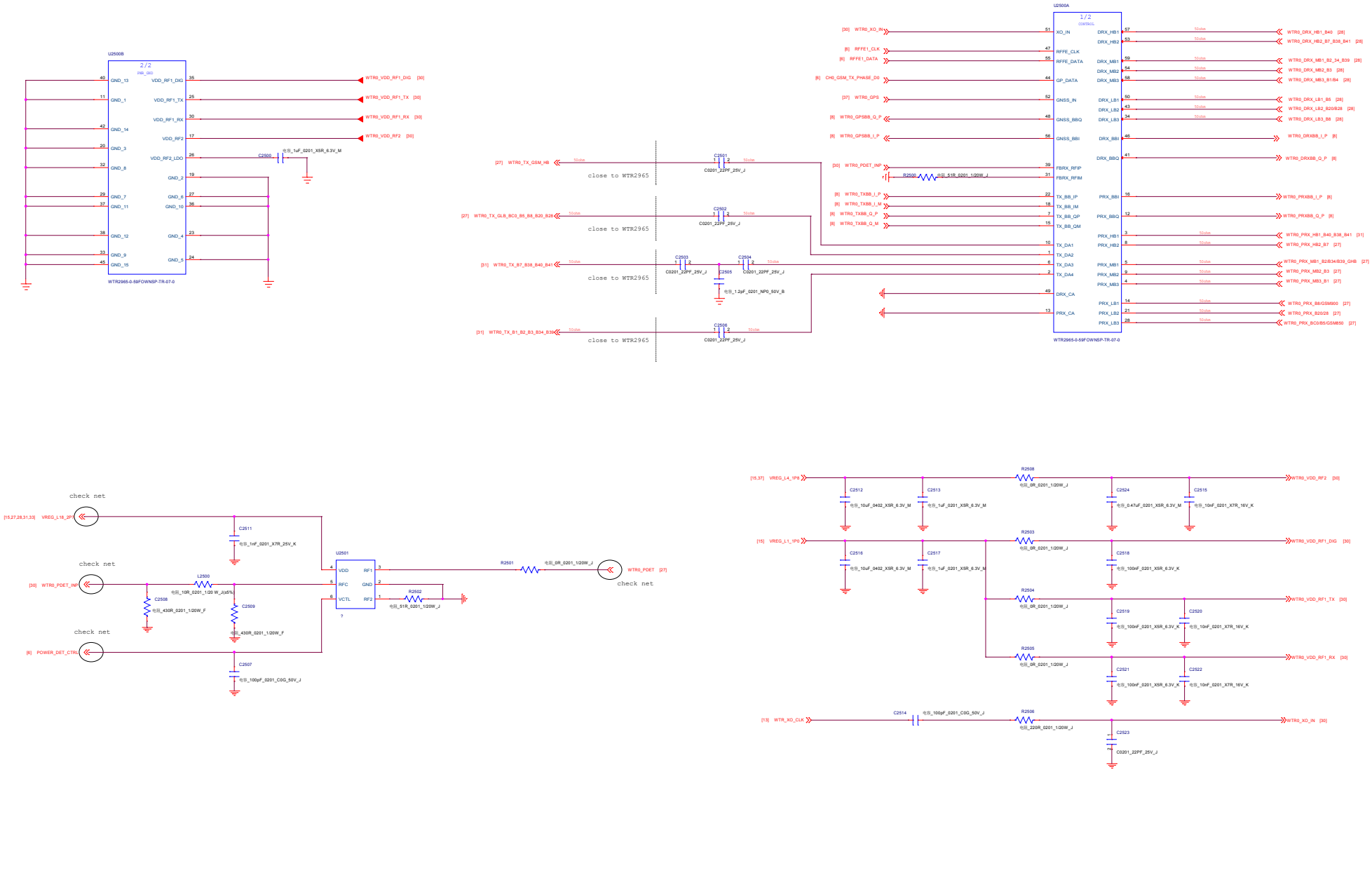

5
4
3
2
1
D
C
B
A
B1+3四工器兼容双双功pin to pin，1）国内版双双功，L2772贴0R对地，L2771断开； 2）国际版使用四工器，B1+3，B4共用此网络；
B1_B3TRX
B5 TRX
MB RX SW
B8 TRX
B7 TRX
B28B TRX
B28A TRX
B2 TRX
B20 TRX
B34/B39 PRX


B1/B4 DRX
B5 DRX
B38_B41 DRX
B8 DRX
B40 DRX
B3 DRX
B28 DRX
B7 DRX
B20 DRX
B2/34/B39 DRX
HB RX SW



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Size	Document Number		Rev
Custom	<Doc>		<RevCode>
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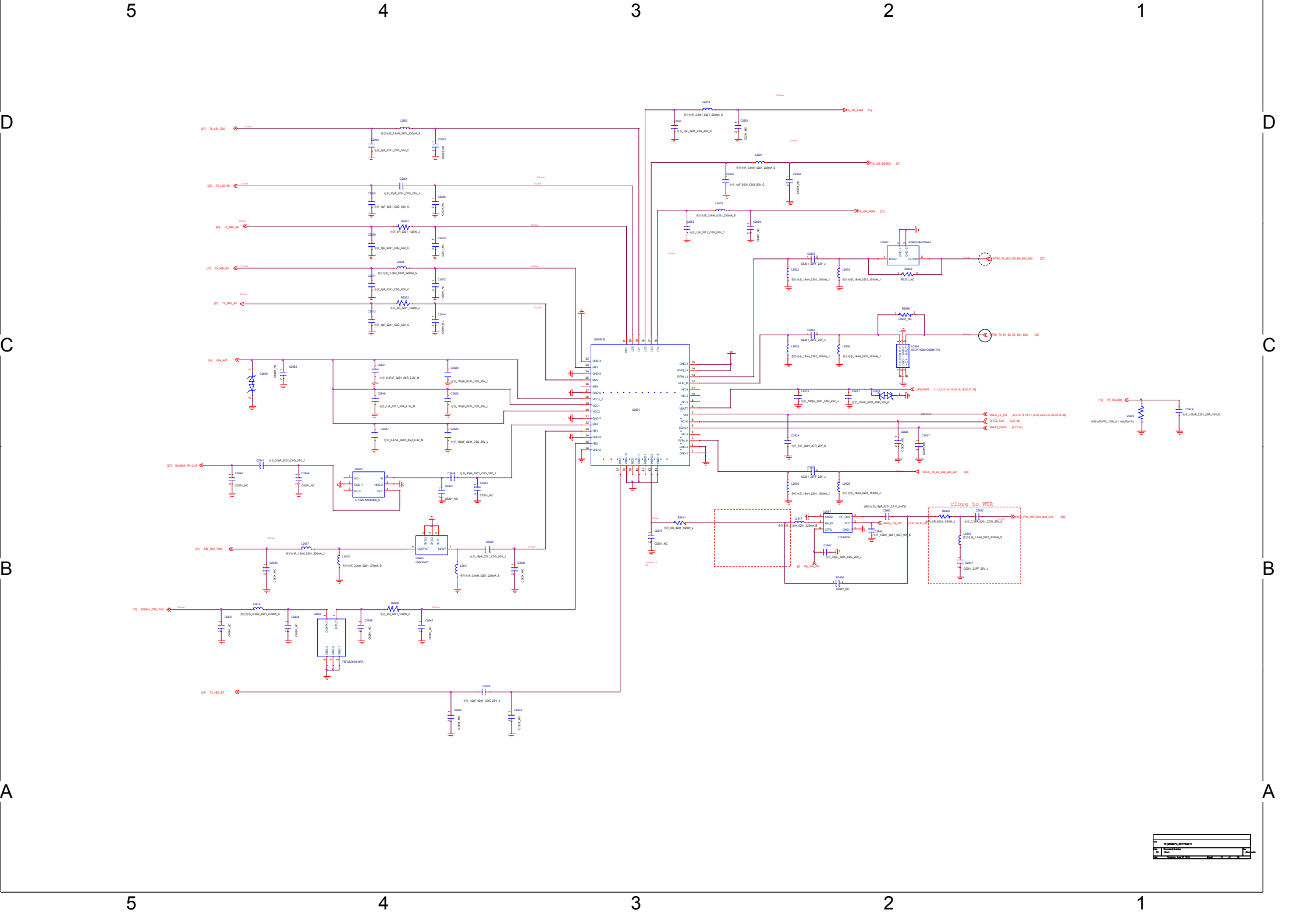
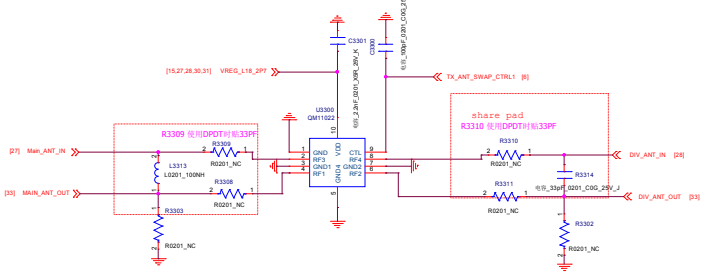
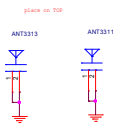
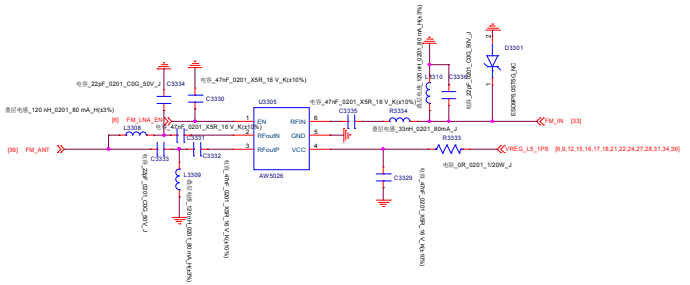

close to WTR

DPDT SWITCH

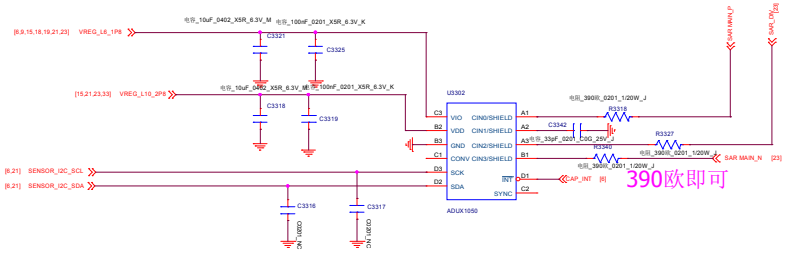






Main ANT

SAR Sensor



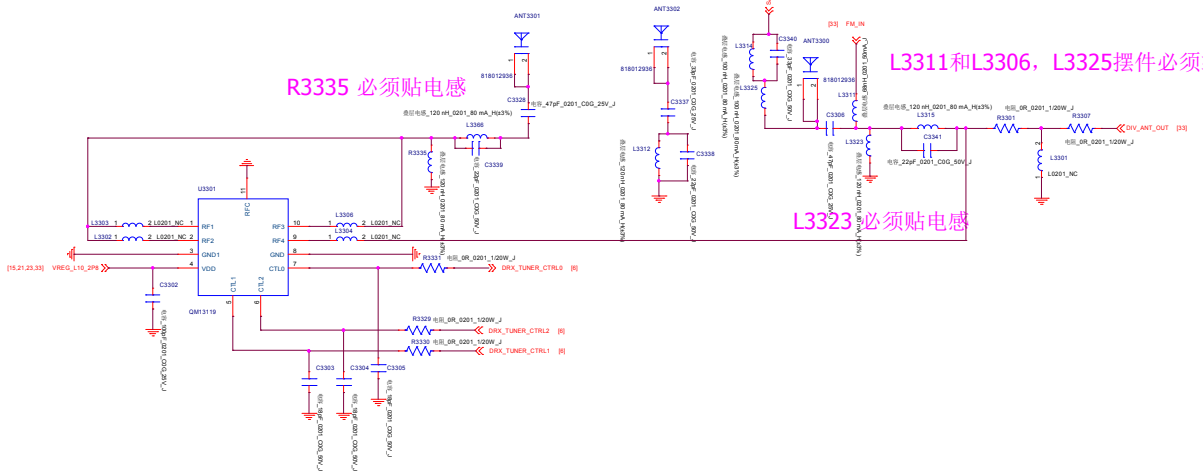
390欧即可

DIV ANT

R3335 必须贴电感

L3311和L3306，L3325摆件必须靠近弹片

L3323必须贴电感



Change List

QUALCOMM Technologies,Inc.
5775 Morehouse Drive
San Diego, CA 92121-1714
U.S.A.

Title SCHEMATIC, CCA, MAIN, QRD438_2-4-2, EVT1.0

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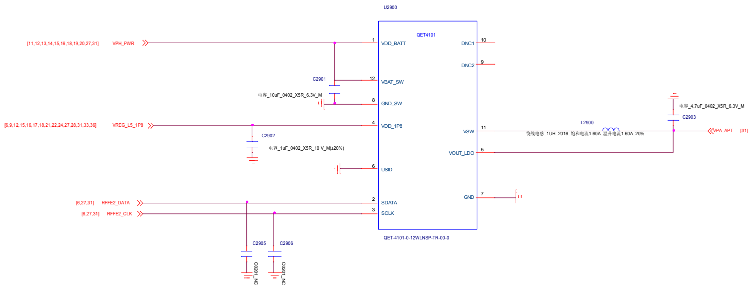
A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QET4101
[11,12,13,14,15,16,18,19,20,27,31]
VPH_PWR
1
VDD_BATT
C2901
12
VBAT_SW
电容_10uF_0402_X5R_6.3V_M
8
GND_SW
[6,9,12,15,16,17,18,21,22,24,27,28,31,33,36]
VREG_L5_1P8
4
VDD_1P8
C2902
电容_1uF_0402_X5R_10 V_M(±20%)
6
USID
[6,27,31]
RFFE2_DATA
2
SDATA
[6,27,31]
RFFE2_CLK
3
SCLK
C2905
C2906
C0201_NC
C0201_NC
QET-4101-0-12WLNSP-TR-00-0
10
DNC1
9
DNC2
11
VSW
5
VOUT_LDO
7
GND
L2900
绕线电感_1UH_2016_饱和电流1.60A_温升电流1.60A_20%
电容_4.7uF_0402_X5R_6.3V_M
C2903
VPA_APT
[31]

A

1

Title	QET4101		
Size A0	Document Number <Doc>		Rev <RevCode>
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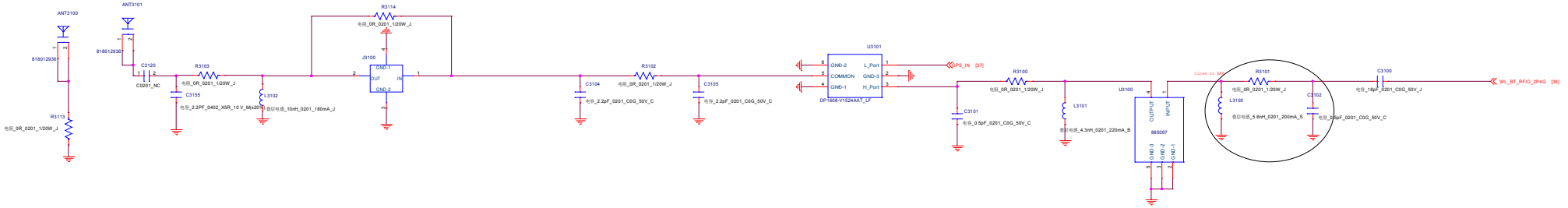

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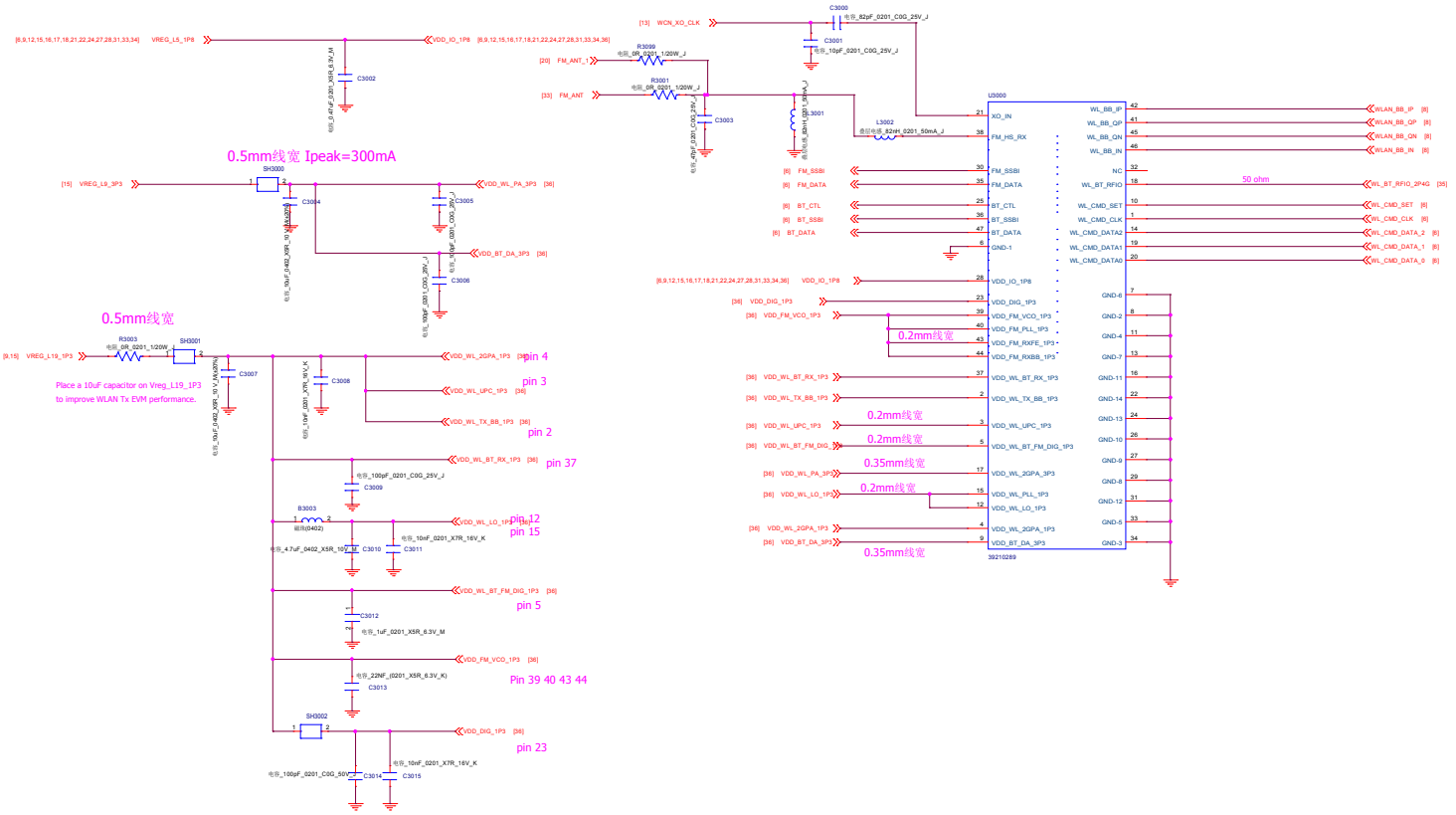

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