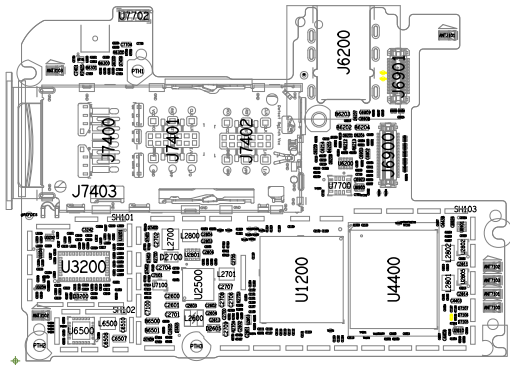
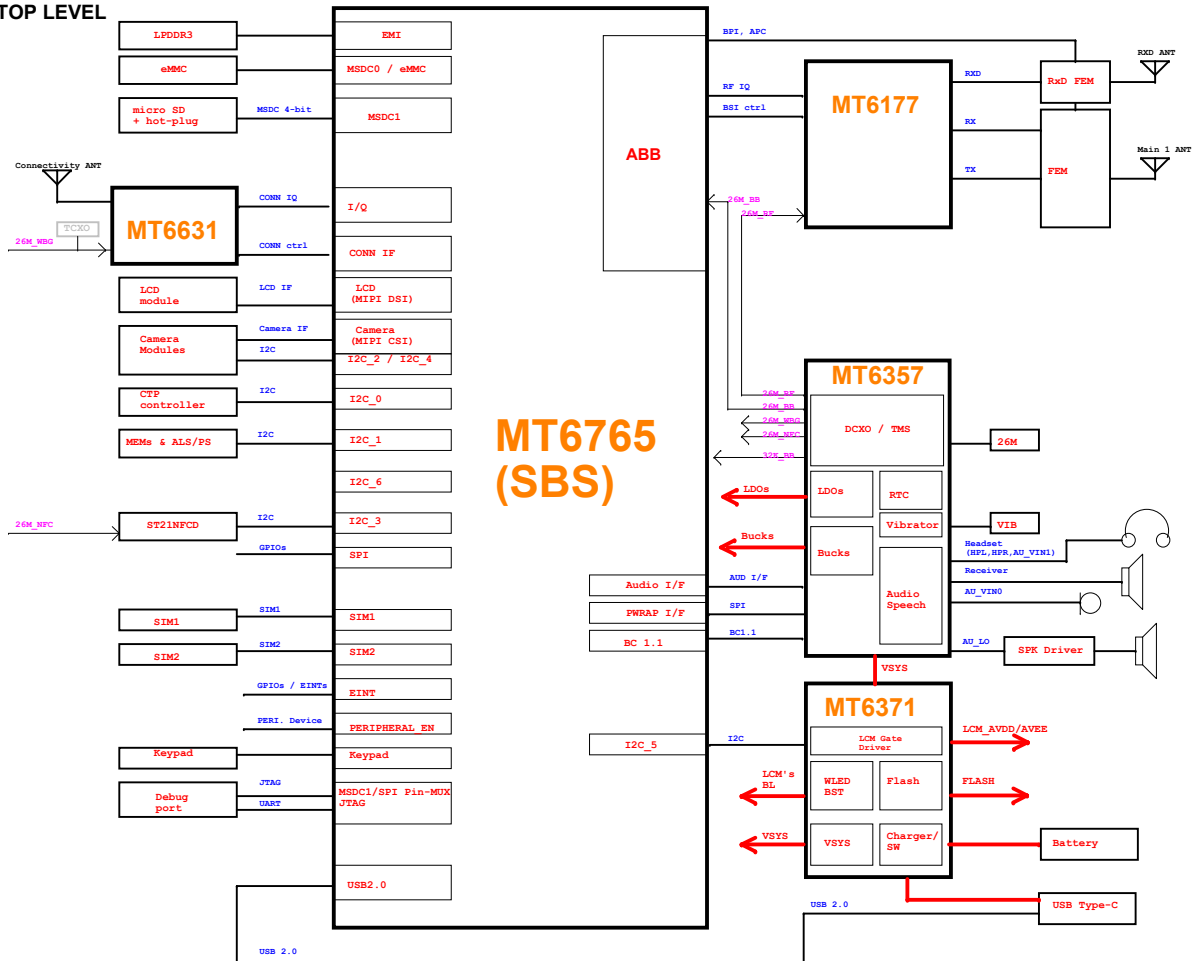


## VIETMOBILE.VN





Project : MT6765 LPDDR3  
REF\_SCH TOP LEVEL



华勤通讯 Huaqin Telecom Technology Com., Ltd		
Title 01_Block_Diagram		
Size D	Project F9_MB_V1	Rev V1
Date: Friday, October 19, 2018	Sheet 1 of 99	

I2C	Sub SYS	Function	Part Number	I2C Spec.	I2C Slave Address / Write / Read (7-bit mode)	
I2C-0	AP	Cap Touch controller	GT1151	400 Kbps	0x5D	Write:0xBA / Read:0xBB
I2C-1 (I3C)	AP Sensor Hub	Magnetic Sensor	AK09918C	400 Kbps	0x0C	Write:0x18 / Read:0x19
		Ambient Light Sensor Proximity Sensor	CM36558	400 Kbps	0x51	Write:0xA2 / Read:0xA3
		Pressure Sensor	BMP280	400 Kbps	0x77	Write:0xEE / Read:0xEF
I2C-2 (I3C)	AP	Rear Camera	IMX230	400 Kbps	0x1A	Write:0x34 / Read:0x35
			EEPROM	400 Kbps	0x50	Write:0xA0 / Read:0xA1
			AF driver	400 Kbps	0x0C	Write:0x18 / Read:0x19
I2C-3	AP	Audio Smart PA	RT5510	400 Kbps	0x34	Write:0x68 / Read:0x69
		NFC	ST21NFCD	400 Kbps	0x08	Write:0x10 / Read:0x11
I2C-4 (I3C)	AP	Front Camera	S5K217	400 Kbps	0x2D	Write:0x5A / Read:0x5B
			EEPROM	400 Kbps	0x52	Write:0xA4 / Read:0xA5
I2C-5	AP	Sub-PMIC	MT6371 PMU	3.4 Mbps	0x34	Write:0x68 / Read:0x69
			MT6371 PD	3.4 Mbps	0x4E	Write:0x9C / Read:0x9D
I2C-6	AP					

Note : I2C Spec. : Standard mode (100 kbps) and Fast mode (400 kbps), Fast mode Plus (1 Mbps) and High-speed mode (3.4 Mbps)

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Title 02\_I2C\_ID\_Overview

Size C Project F9\_MB\_V1

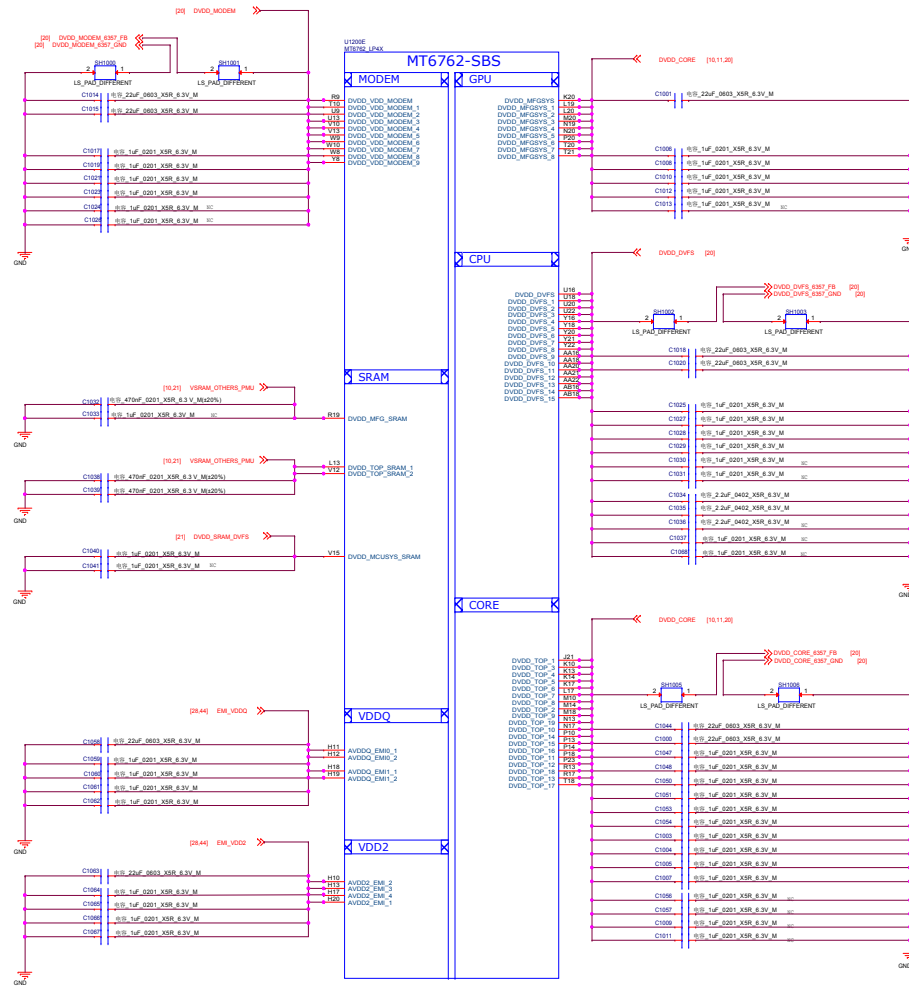
Rev V1

Date: Friday, October 19, 2018

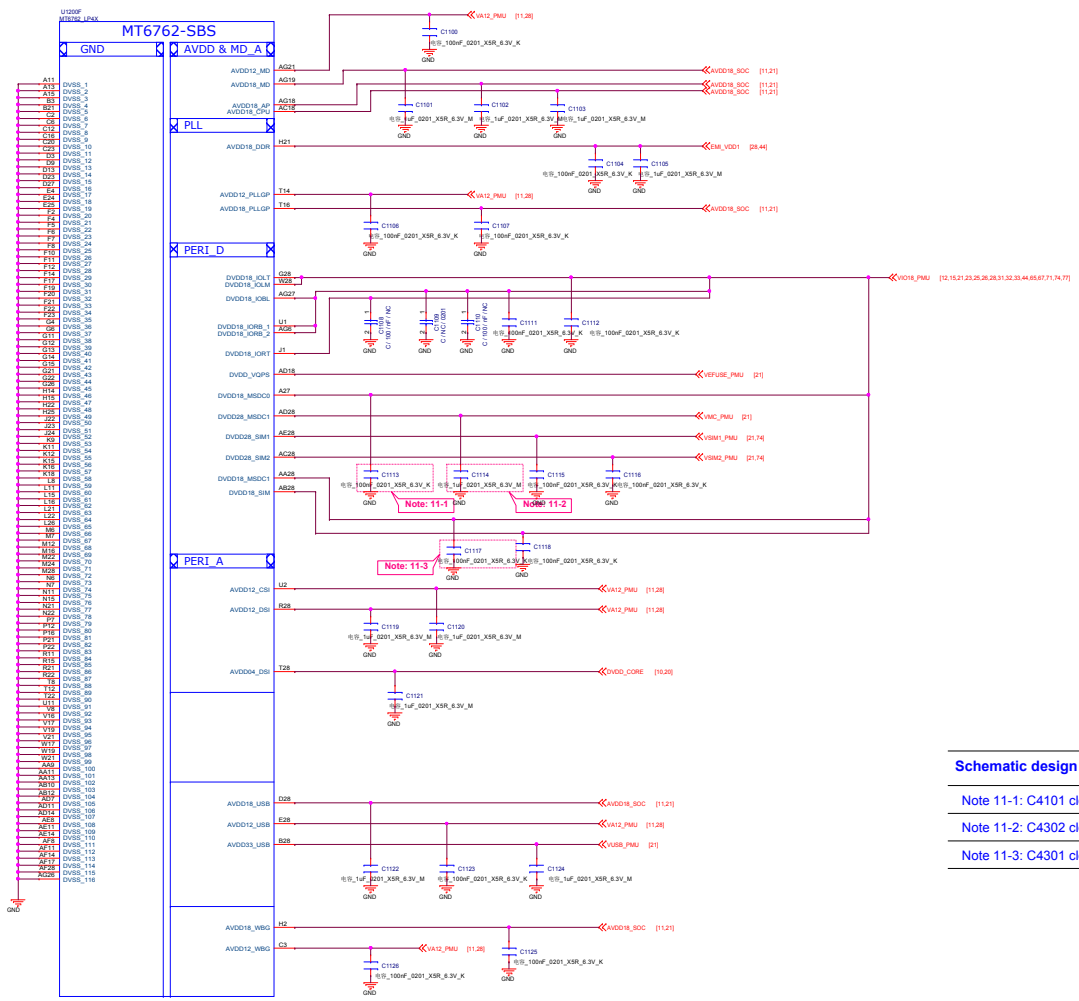
Sheet 2 of 99

Date	Category	Item
2017.11.24 (V0.1)	Page 05	V0.1 Release
2017.12.7 (V0.2)	Page 11	Change power of AVDD18_DDR(H21) from VIO18_PMU to EMI_VDD1, connecting EMI_VDD1 to SH2102 in star connection
	Page 12	Add Note 12-5
	Page 21	Add SH2102 for star connection among EMI_VDD1, AVDD18_SOC, and VIO18_PMU
	Page 22	1. Change C2304 from C / 1 / uF / 10V to C / 1 / uF / 6.3V 2. Change R2301 from R / 1.5 / K to R / 7.5 / K 3. Update Note 22-5
	Page 44	1. To enhance LPDDR3 power off sequence, change C4422 from 0.1uF to 2.2uF, and change C4423 from 0.1uF to 1uF 2. Change VDD1 power of eMCP from VIO18_PMU to EMI_VDD1, fulfilling power rail in star connection
Page 51	1. Add 2nd source plan for U5004 2. Add Note 51-3 and Note 51-4	

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Title 05_Change_Notice		
Size C	Project F9_MB_V1	Rev v1
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Title 10_BB_POWER_PDN			
Size D	Project	F9_MB_V1	Rev V1
Date:	Friday, October 19, 2018	Sheet	10 of 99



Schematic design notice of "11\_BB\_POWER\_IO" page.

Note 11-1: C4101 closed DVDD18\_MSDC0 150mil

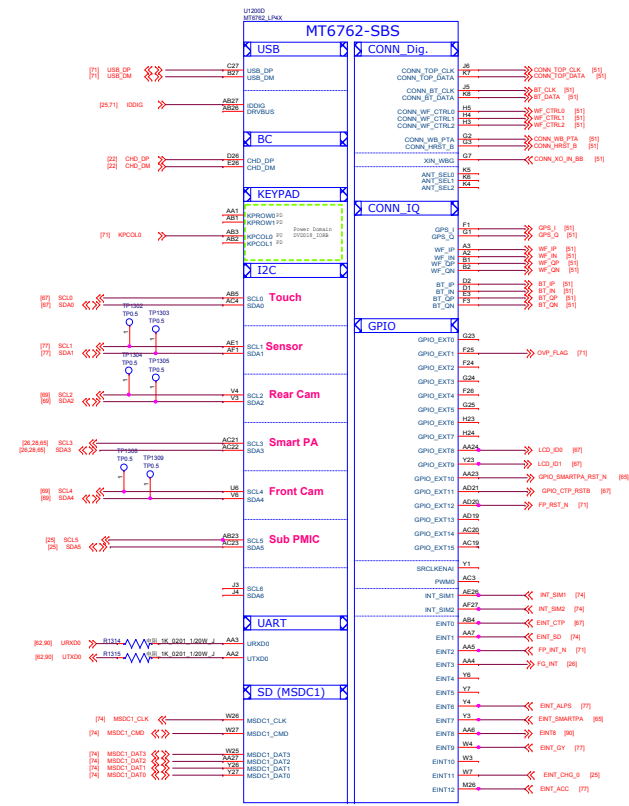
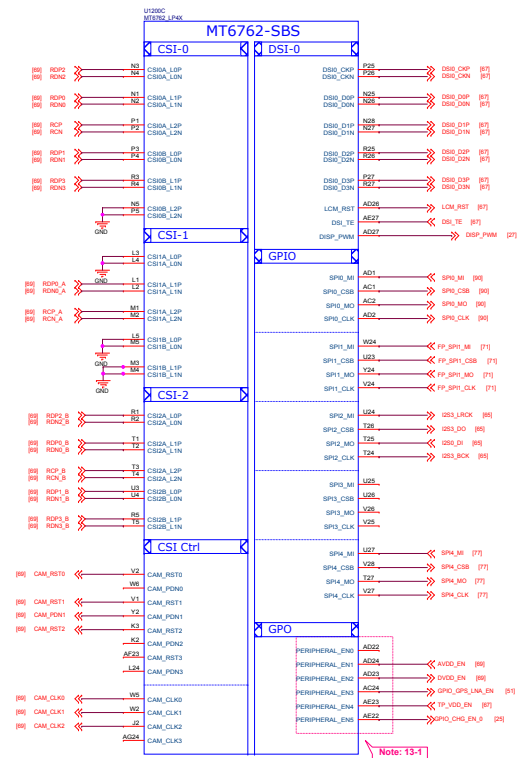
Note 11-2: C4302 closed DVDD28\_MSDC1 150mil

Note 11-3: C4301 closed DVDD18\_MSDC1 150mil

华勤通讯 Huaqin Telecom Technology Com., Ltd		
Title 11_BB_POWER_IO		
Size D	Project F9_MB_V1	Rev v1
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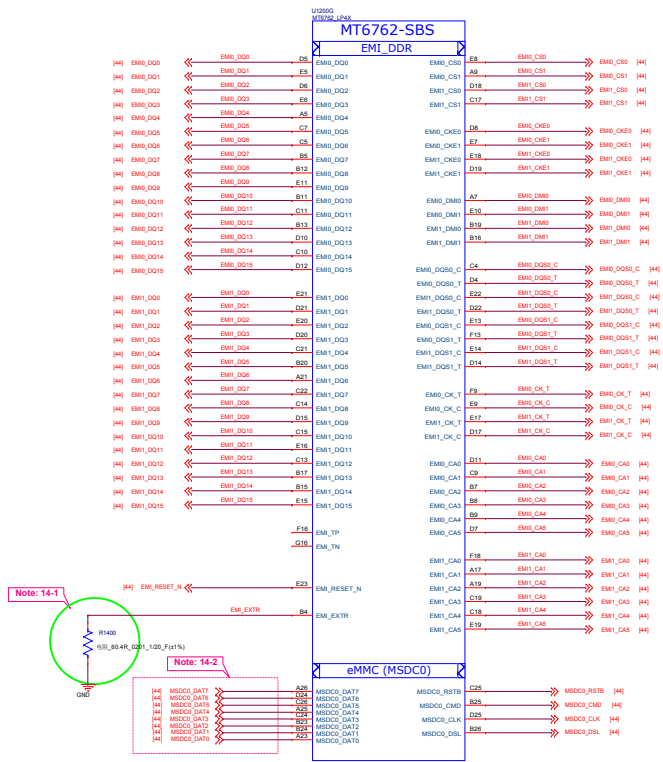




**Schematic design notice of "13\_BB\_2" page.**

Note 13-1: The enable pin of acoustic or optoelectronic devices (e.g. SPK AMP/Backlight/Charger OCP/OVP) suggest to use Peripheral\_EN[0:5]. If use other GPIOs as enable pin, suggest to reserve 0201 NC to GND

华勤通讯 Huaqin Telecom Technology Com.,Ltd		
Title 13_BB_2		
Size D	Project F9_MB_V1	Rev V1
Date: Friday, October 19, 2018	Sheet 13 of 99	

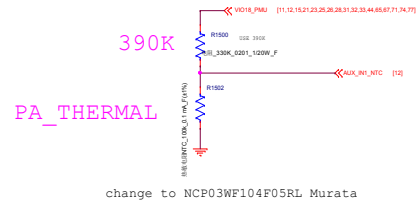
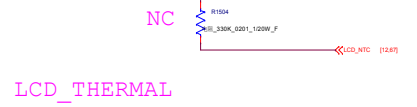


Note: 14-1  
R4001

Note: 14-2  
R4002

华勤通讯 Huaqin Telecom Technology Com., Ltd		
Title 14_BB_3		
Size D	Project F9_MB_V1	Rev V1
Date: Friday, October 19, 2018	Sheet 14 of 99	

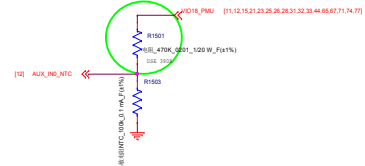
Schematic design notice of "14\_BB\_3" page.  
 Note 14-1: R4001 please select 60.4 ohm (1%) resistor  
 Note 14-2: Please check eMCP LP3 and eMCP LP4X pin mux



**Thermistor to sense RF PA temperature**

1. NTC1502 must close to LTE Band 7 PA or the hottest PA -2mm.
2. The distance is the shortest distance from package edge to edge.

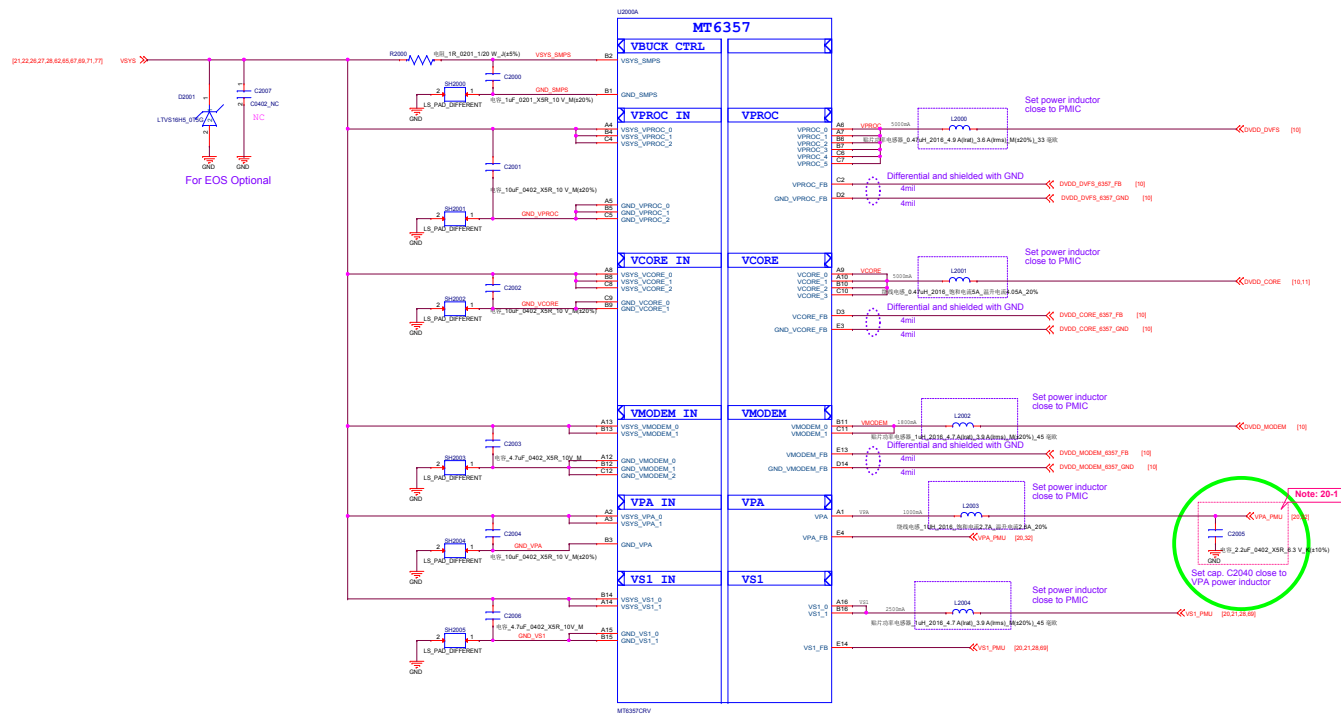
**Thermistor / To sense board level temperature**



**Thermistor to sense AP temperature**

1. NTC1501 must keep a distance about 6-8 mm away from AP and far from other heat sources 10 mm at least.
2. The distance is the shortest distance from package edge to edge.

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Title 15_BB_AUXADC_Thermal		
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**Schematic design notice of "20\_POWER\_MT6357\_Buck"**

Note 20-1: C2040, please choose 0402 size

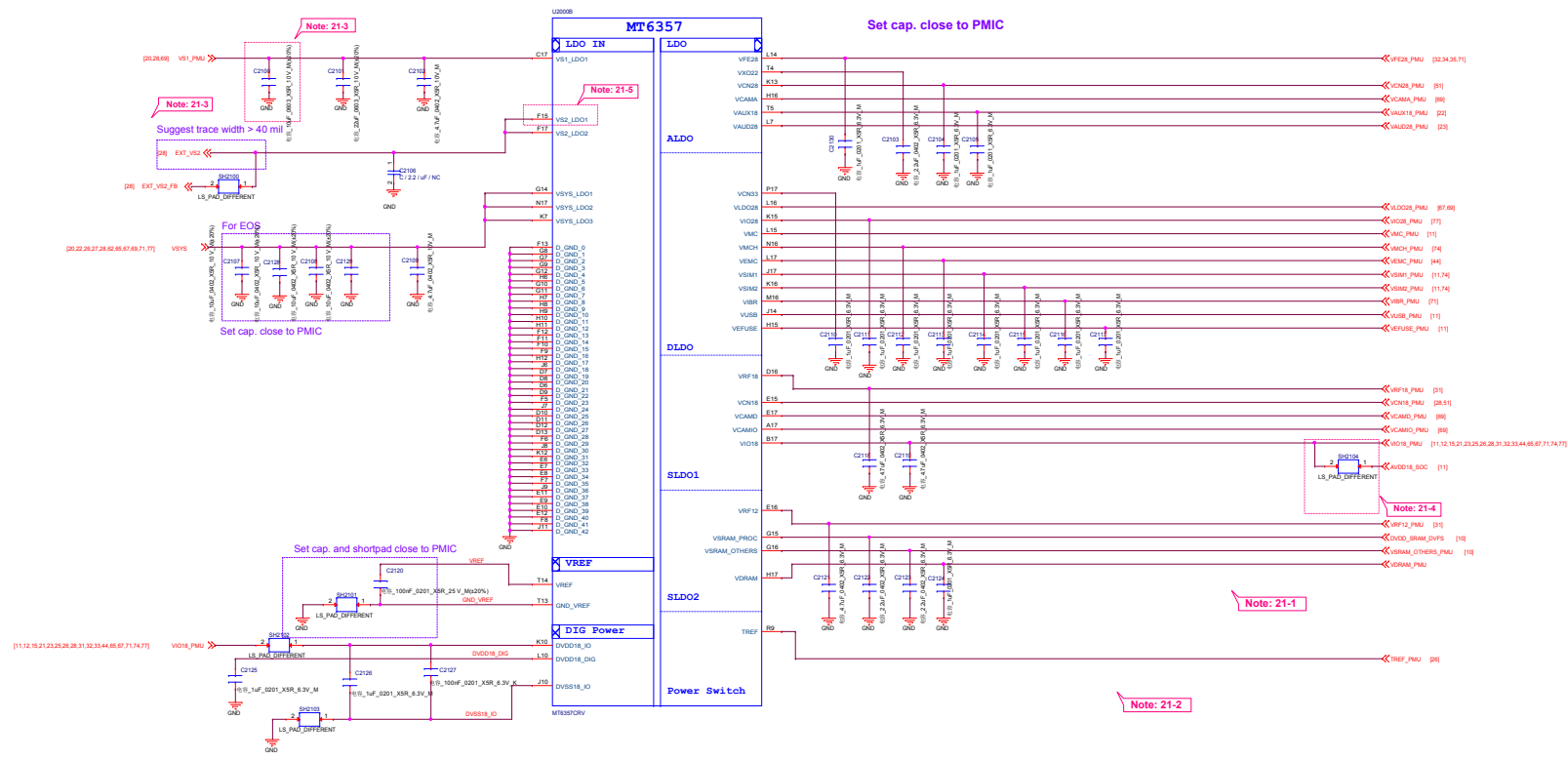
Note 20-2: PMIC Part number notice for MT6765/62/61 platform

MTK Platform	PMIC
MT6765 / 62	MT6357 CRV
MT6761	MT6357 MRV

华勤通讯 Huaqin Telecom Technology Com., Ltd		
Title 20_POWER_MT6357_Buck		
Size D	Project F9_MB_V1	Rev V1
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# MT6356 LDO output

Input Power	Power Name	Output Voltage (V)	Output Current	Default Voltage
LDO from VBAT	VFE28	2.8	40mA	2.8V
	VXO28	2.24	25mA	2.24V
	VCN28	2.8	40mA	2.8V
	VCAMA	1.8/2.5/2.8	200mA	2.8V
	VAUX18	1.8	20mA	1.8V
	VAUD28	2.8	50mA	2.8V
	VBI28	2.8	1mA	2.8V
	VCN33	3.3/3.4/3.5/3.6	800mA	3.3V
	VLD028	2.8/3.0	360mA	2.8V
	VIO28	2.8	200mA	2.8V
	VNC	1.86/2.9/3.0/3.3	200mA	3.0V
	VNCH	2.9/3.0/3.3	800mA	3.0V
VEMC	2.9/3.0/3.3	800mA	3.3V	
VSIM1	1.7/1.8/1.86/2.76/3.0/3.1	200mA	1.86V	
VSIM2	1.7/1.8/1.86/2.76/3.0/3.1	200mA	1.86V	
VEBR	1.2/1.3/1.5/1.8/2.0/2.8/3.0/3.3	200mA	2.8V	
VUSB	3.07	50mA	3.07V	
LDO from VS1	VRF18	1.81	450mA	1.81V
	VMIPI	1.71/1.8/1.84	300mA	3.0V
	VCN18	1.8	200mA	1.8V
	VCAMD	1/1.05/1.1/1.2/1.3/1.5/1.8	600mA	1.2V
	VIO18	1.8	1200mA	1.8V
	VRF12	1.2	200mA	1.2V
LDO from VS2	VAL2	1.2	300mA	1.2V
	VSRAM_PROC	0.6-1.31	400mA	1.1V
	VSRAM_OTHERS	0.6-1.31	200mA	0.9V
	VSRAM_GPU	0.6-1.31	100mA	1.0V
VDRAM	1.12/1.24	400mA	1.24V	



1. "Typical Cap" defined in design notice is the minimum cap. to LDO Out.  
 2. NC cap can move to application, if (PCB L<20mH, PCB R<0.2 ohm)  
 => value and placement of Cap, please refer design notice

### Schematic design notice of "21\_POWER\_MT6357\_LDO"

Note 21-1: If these power trace can meet LDO layout constraint, these CAP can be NC or removed. Please refer to MT6357 design notice.

Note 21-2: Output cap range please follow MT6357CRV LDO design notice

Note 21-3: Ext Buck BOM option

	Ext. buck option	
	w/ EXT VS2 Buck	w/o EXT VS2 Buck
C2104	10uF	22uF
R2851	0-ohm , 0603	NC
R2852	NC	0-ohm , 0603

Note 21-4: Please set SH2101 and SH2102 close to C2141, making star connection among VIO18\_PMU, AVDD18\_SOC, and EM1\_VDD1 near to LDO cap. C2141  
 Please also refer to MT6357 design notice for further detail design information

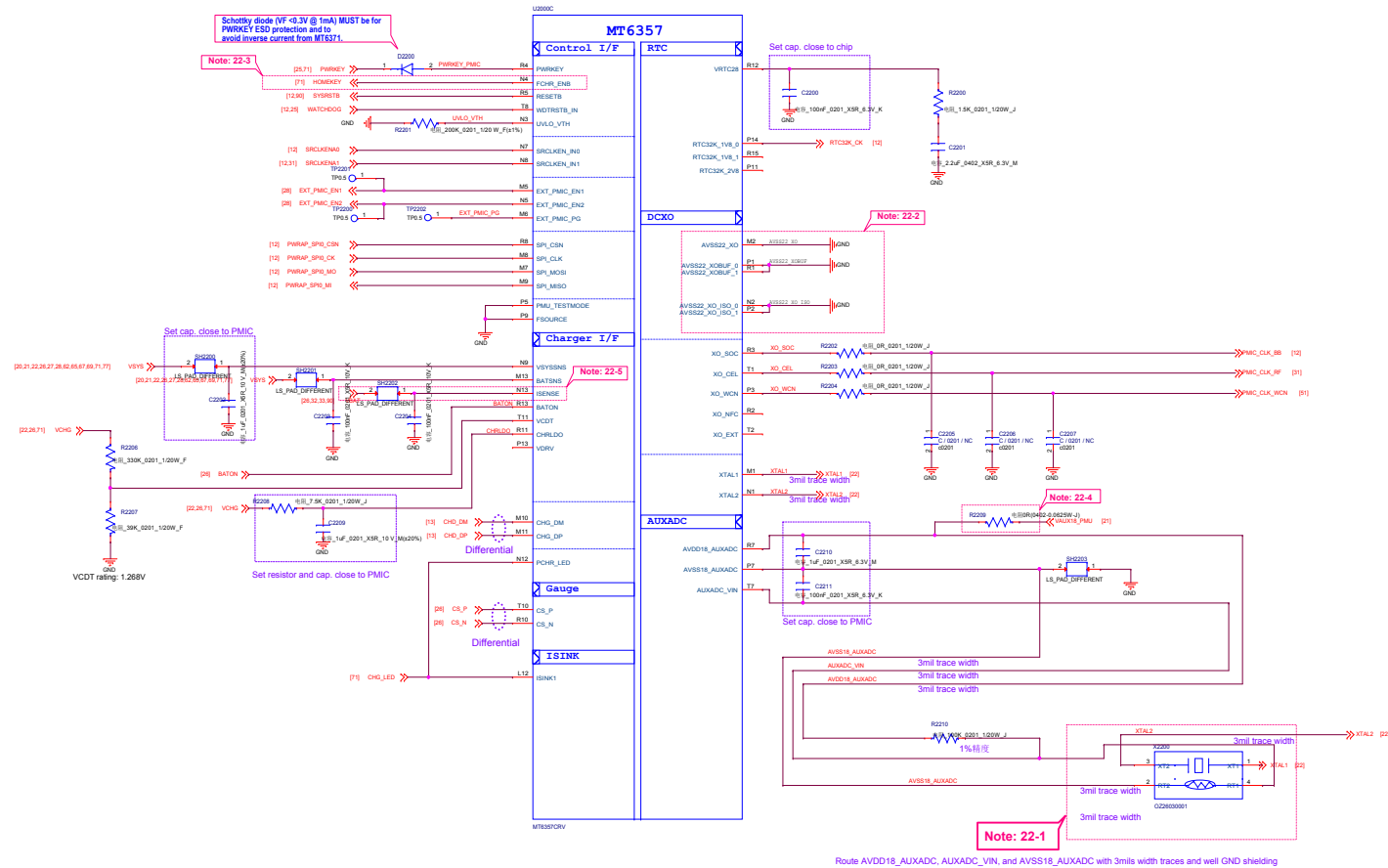
Note 21-5: Please connect VS2\_LDO1(F15) to VS1\_PMU if voltage applied to VCAMD(E17) >= 1.3 V

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Title 21\_POWER\_MT6357\_LDO

Size D	Project F9_MB_V1	Rev V1
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Date: Friday, October 19, 2018 Sheet 21 of 99



**Schematic design notice of "22\_POWER\_MT6357-IF"**

- Note 22-1: Please implement 2520 & 2016 Size TMS PCB co-layout. Please refer to MT6765\_MT6357 Co-Clock Design Notice for co-layout guide.
- Note 22-2: 1. Please Connect P1 and R1 ball first and then to GND  
2. Please Connect P2 and N2 ball first and then to GND  
3. Please connect DCXO GND to main GND by independent L1-2 GND via.; DO NOT connect it through L1 GND
- Note 22-3: Let floating if disable HOMEKEY function
- Note 22-4: Please follow MT6765\_MT6357 Co-Clock Design Notice for Layout guide of VAUX18, then R8101 can use 0 ohm to replace BEAD.

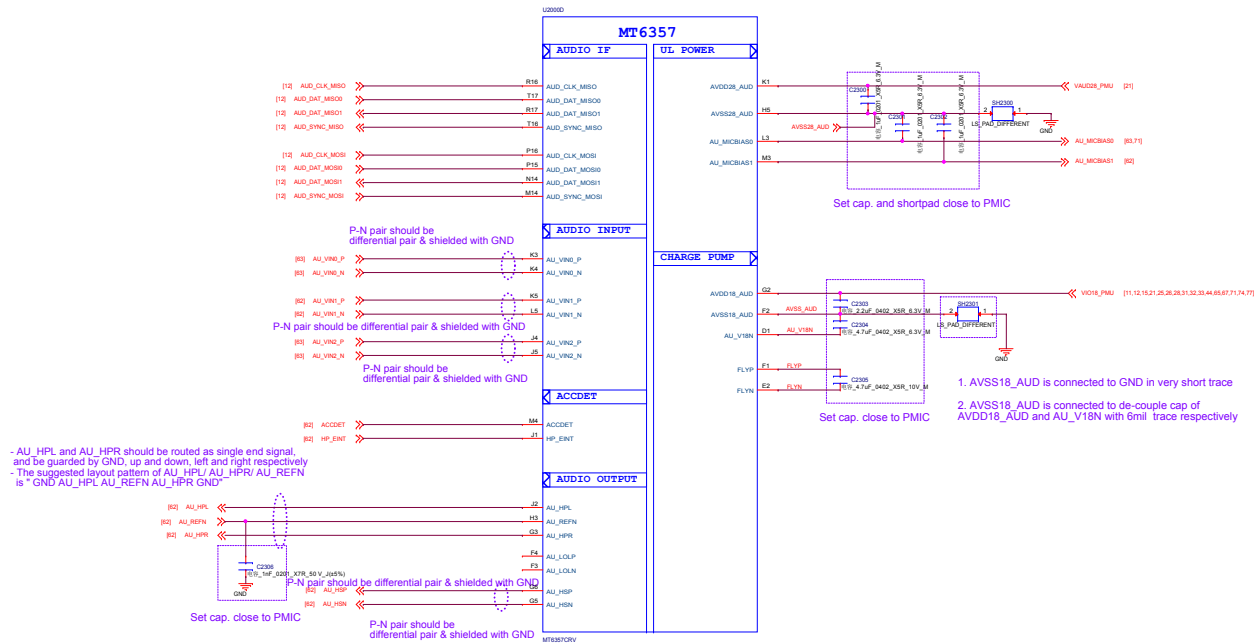
Note 22-5: Please connect to battery connector

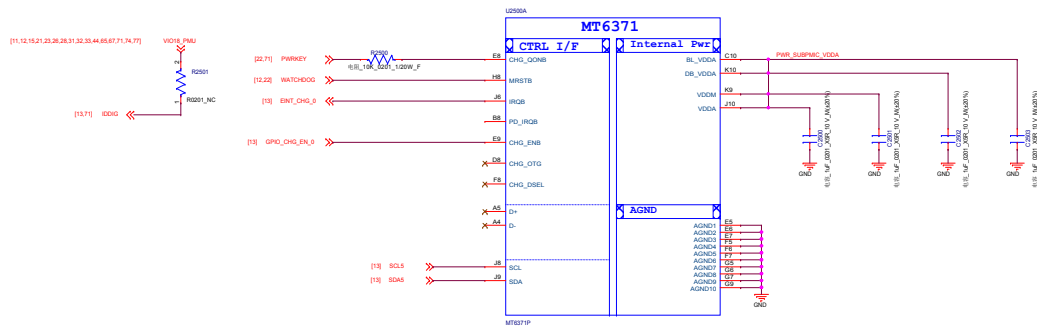
华勤通讯 Huaqin Telecom Technology Com., Ltd

Title 22\_POWER\_MT6357\_IF

Size D	Project F9_MB_V1	Rev V1
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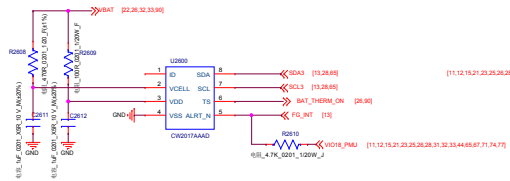
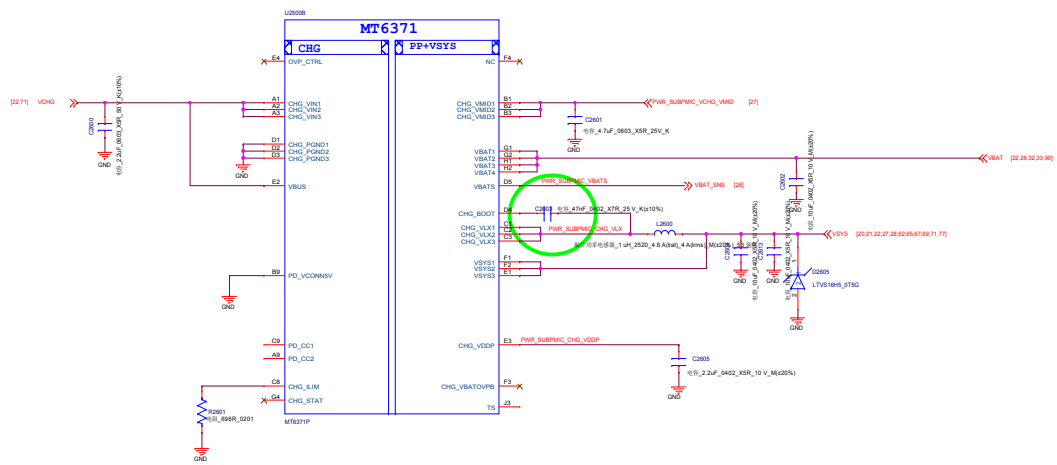
Date: Friday, October 19, 2018 Sheet 22 of 99



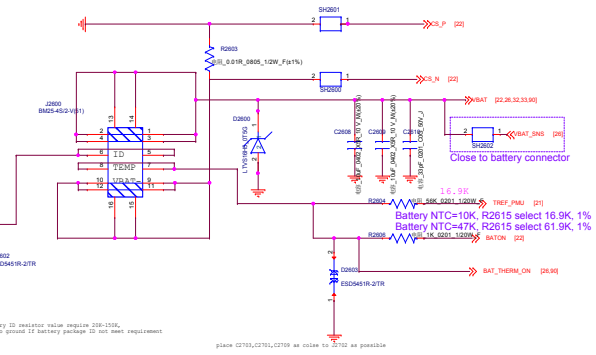


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Title 25_POWER_SubPMIC-General		
Size D	Project F9_MB_V1	Rev V1
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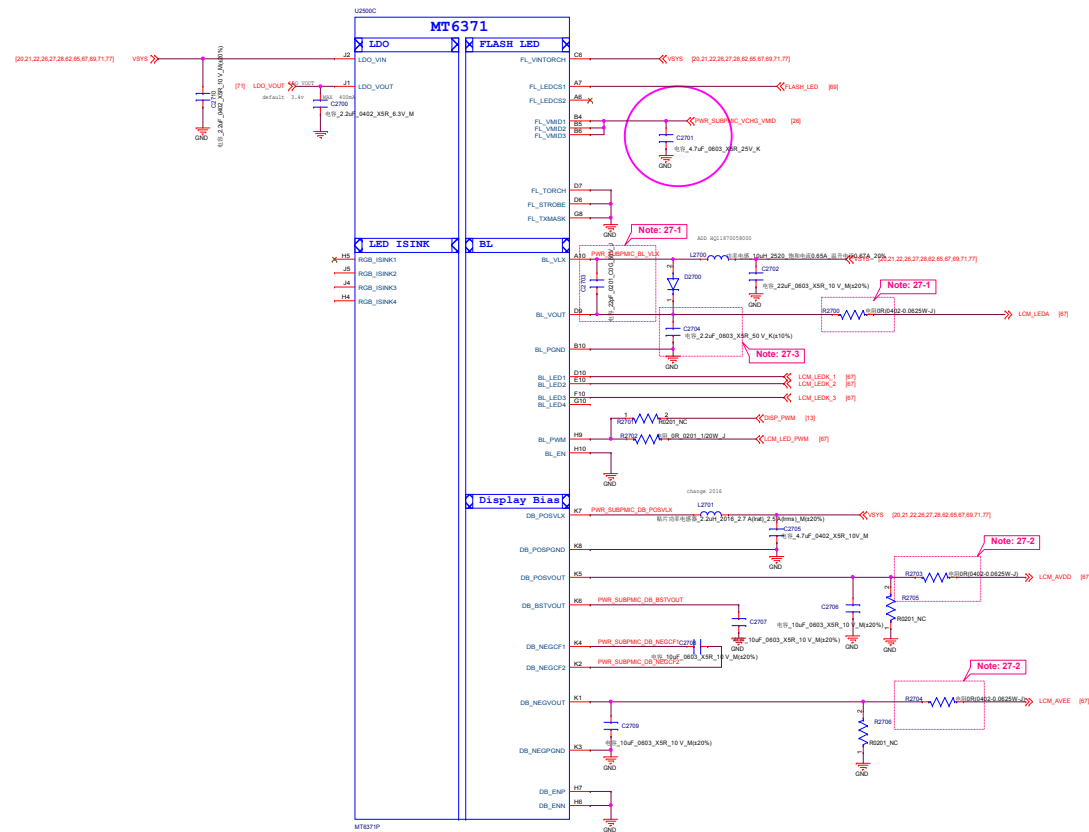
### Battery Connector



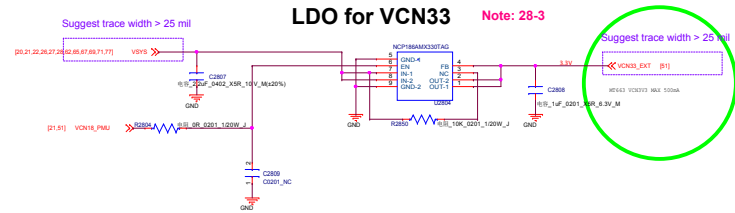
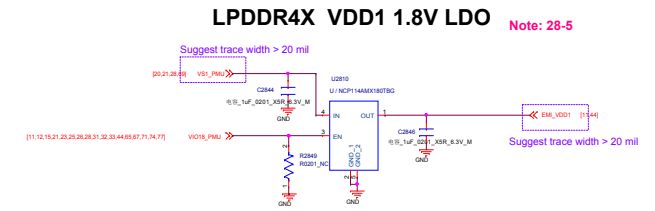
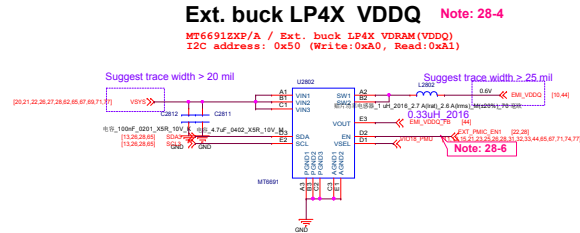
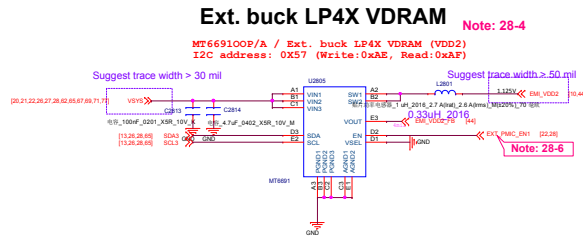
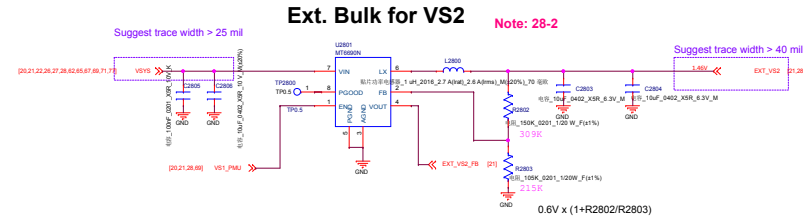
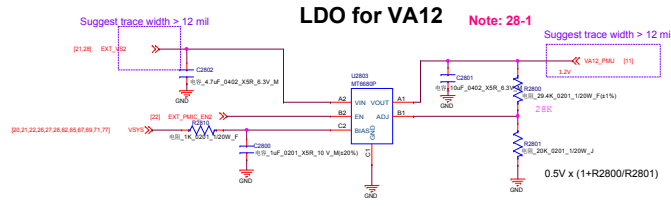
[Schematic design notice of "26\\_POWER\\_SubPMIC-Charger + PP" page.](#)

Note 26-1: For better ESD or surge performance we need choose suitable device for system protection. Please refer to [Surge device selection guide V2.0] provide by MTK.

华勤通讯 Huaqin Telecom Technology Com.,Ltd			
Title 26_POWER_SubPMIC-Charger+CONN			
Size D	Project F9_MB_V1	Rev V1	
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Title 27_POWER_SubPMIC-HV powers		
Size D	Project F9_MB_V1	Rev V1
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**Schematic design notice of "28\_POWER\_ThirdParty-Power"**

- Note 28-1: VA12 Layout placement please close to AP
- Note 28-2: VS2 Buck Layout placement please close to PMIC MT6357
- Note 28-3: VCN33 LDO Layout placement please close to MT6631
- Note 28-4: MT6691ZXP/A and MT6691OOP/A Buck Layout Placement please close to LPDDR4X
- Note 28-5: U2810 LDO Layout Placement Please close to LPDDR4X VDD1 power ball
- Note 28-6: For EML\_VDD2\_FB and EML\_VDDQ\_FB, please follow MMD rule

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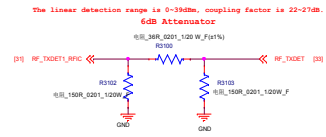
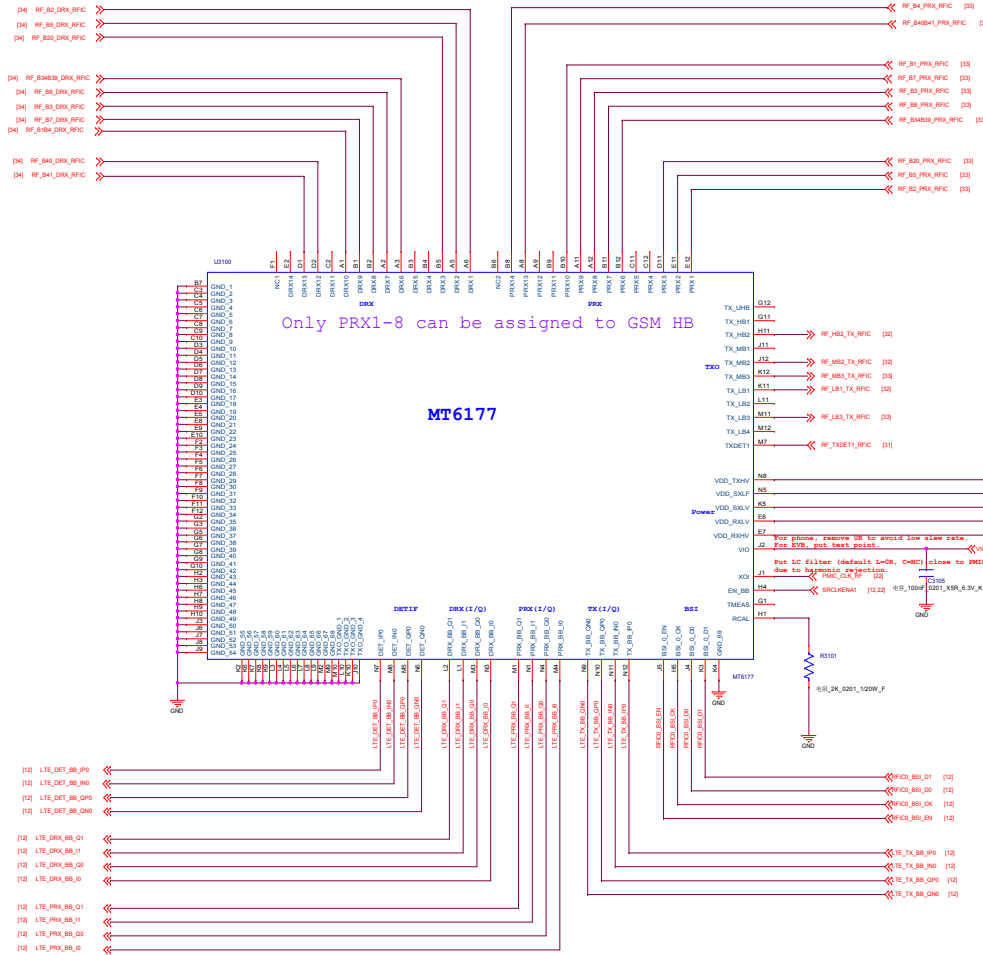
Title 28\_POWER\_ThirdParty\_Powers

Size	Project	Rev
D	F9_MB_V1	v1

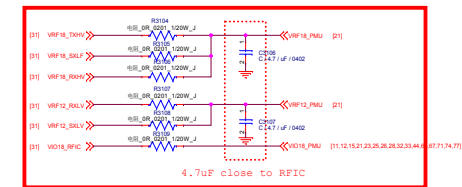
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# Attenuator for Detector

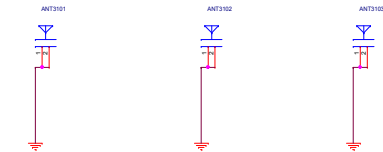
## Transceiver



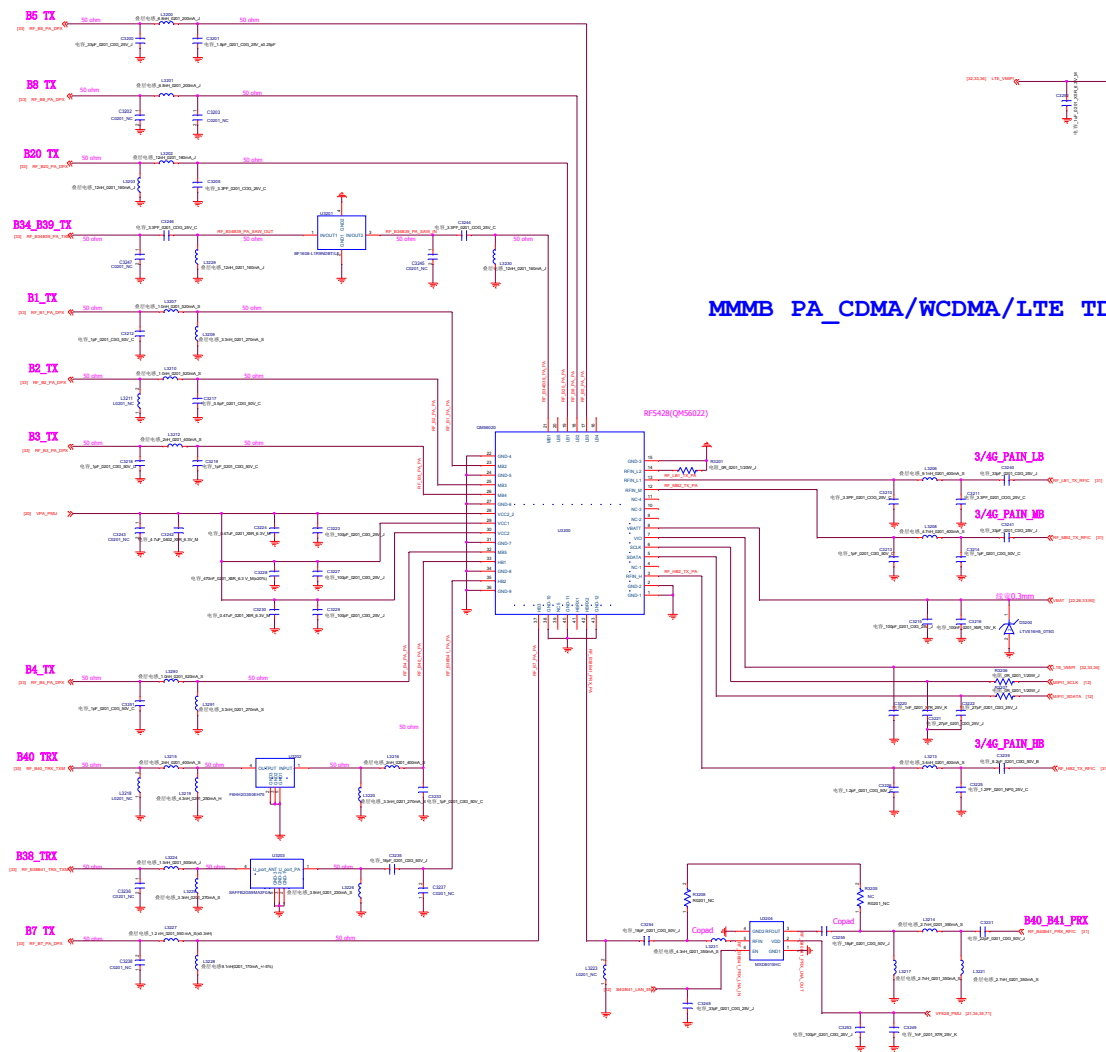
## Power For MT6177



**GND**



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Title 31_RF_MT6177_Pin_Out		
Size D	Project F9_MB_V1	Rev v1
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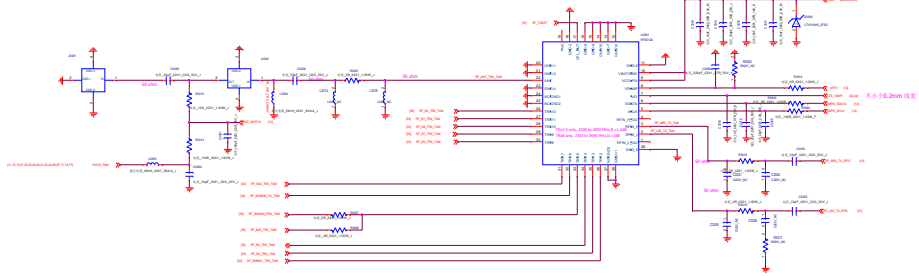
Title 32\_RF\_MT6177\_RF\_TX

Size	Project	Rev
E	F9_MB_V1	v1

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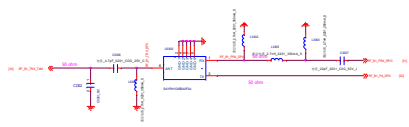
### MAIN\_ANT

### TXM\_GSM

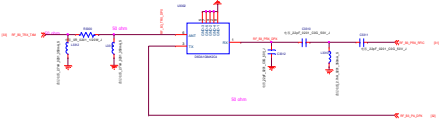


### TRX\_MB

#### B1TRX



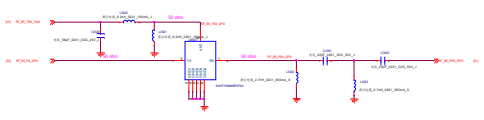
#### B3 TRX



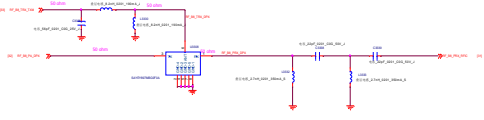
### TRX\_LB

#### TRX\_LB

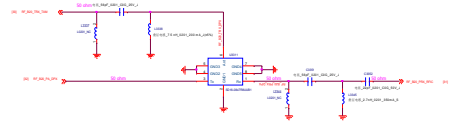
#### B5 TRX



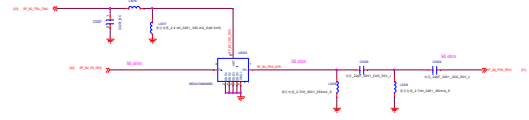
#### B8 TRX



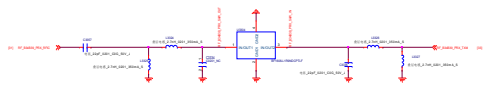
#### B20 TRX



#### B2 TRX

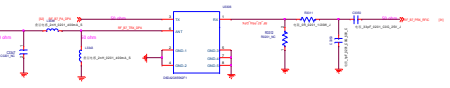


#### B34 B39 TRX

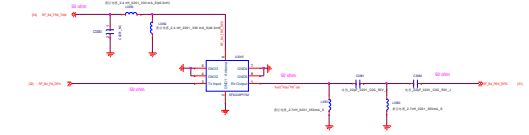


### TRX\_HB

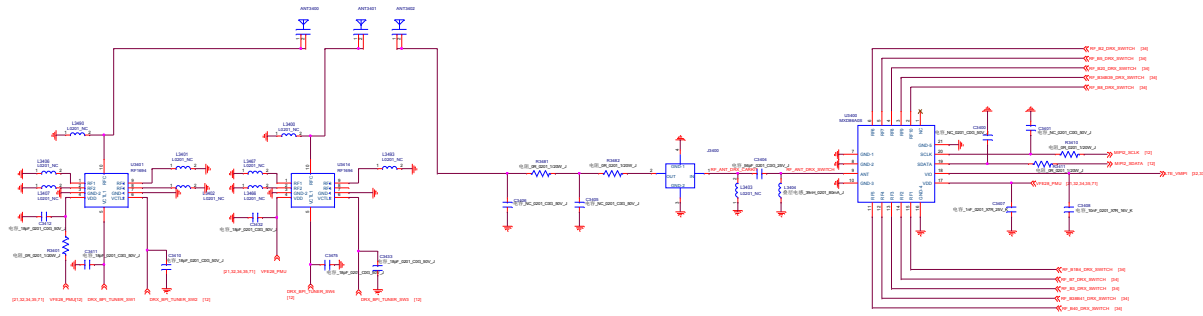
#### B7 TRX



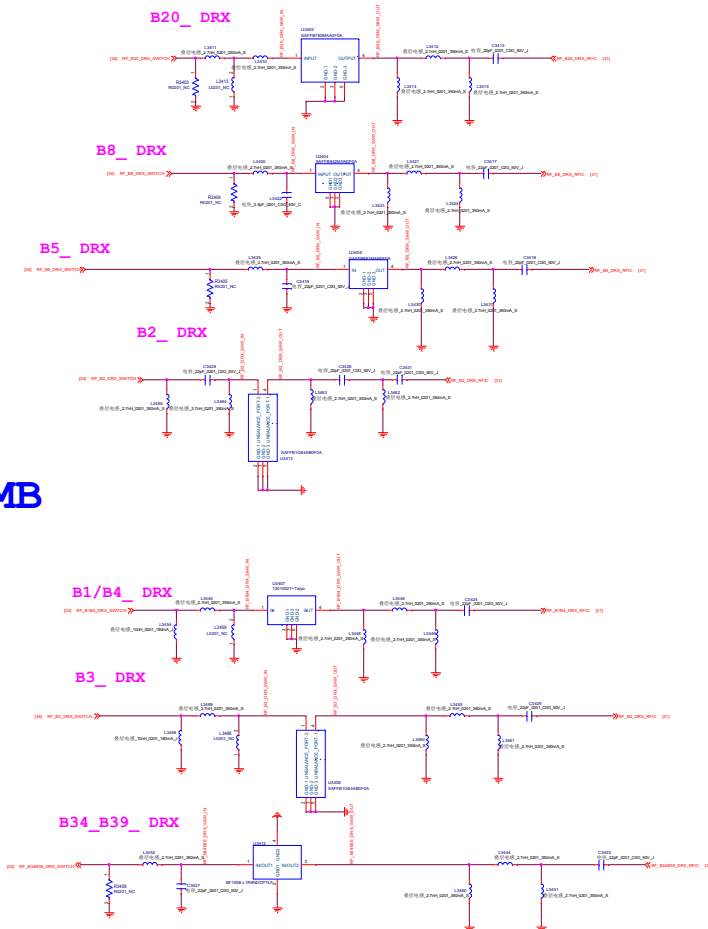
#### B4 TRX



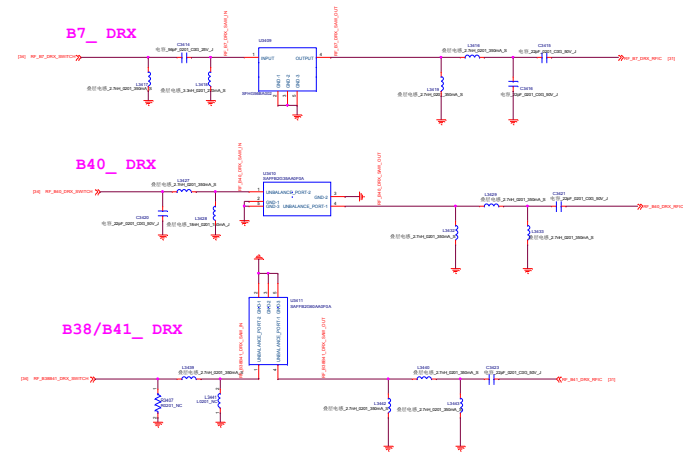
# DIV\_ANT



# DIV\_LB



# DIV\_HB



# DIV\_MB

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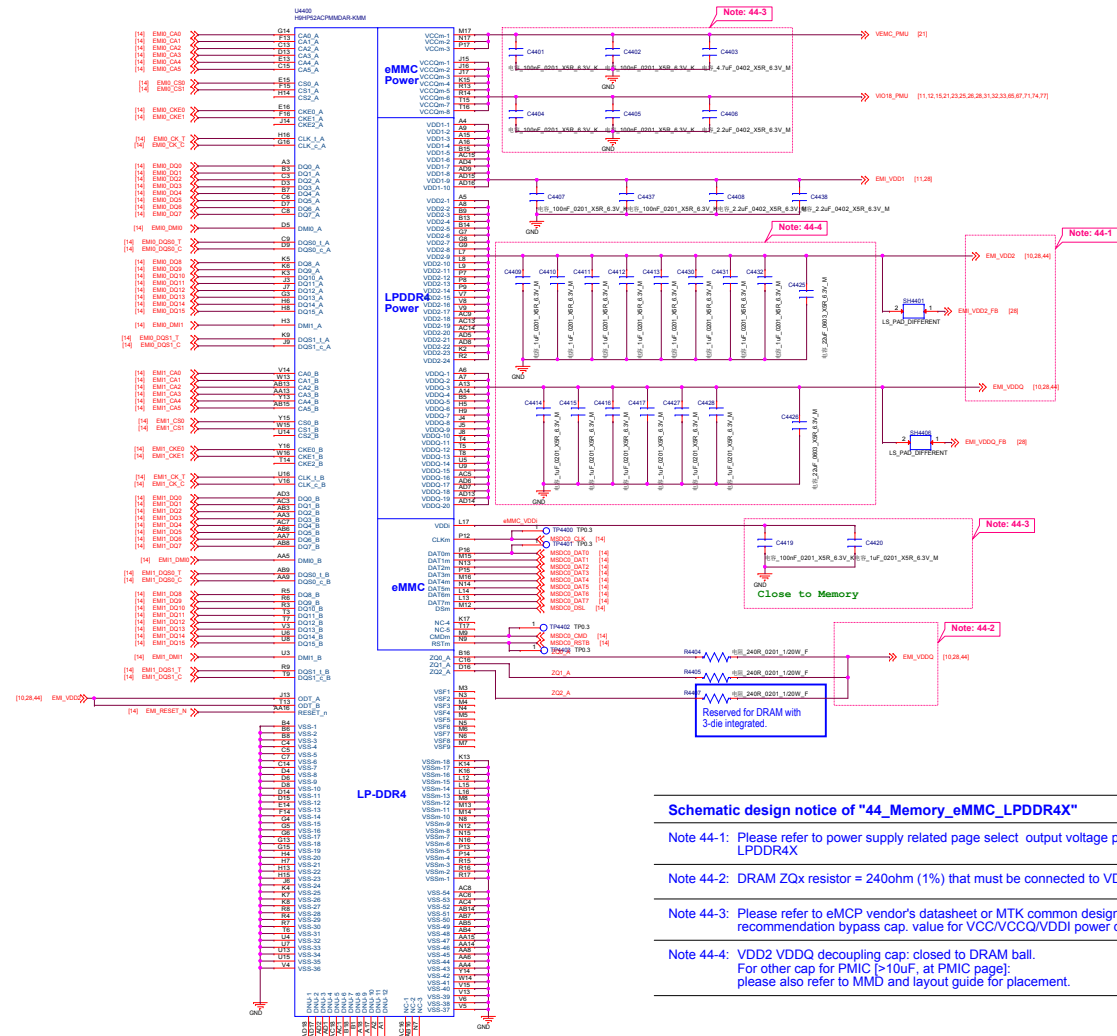
Title 34\_RF\_MT6177\_RF\_DRX

Size E Project F9\_MB\_V1

Rev v1

Date: Friday, October 19, 2018

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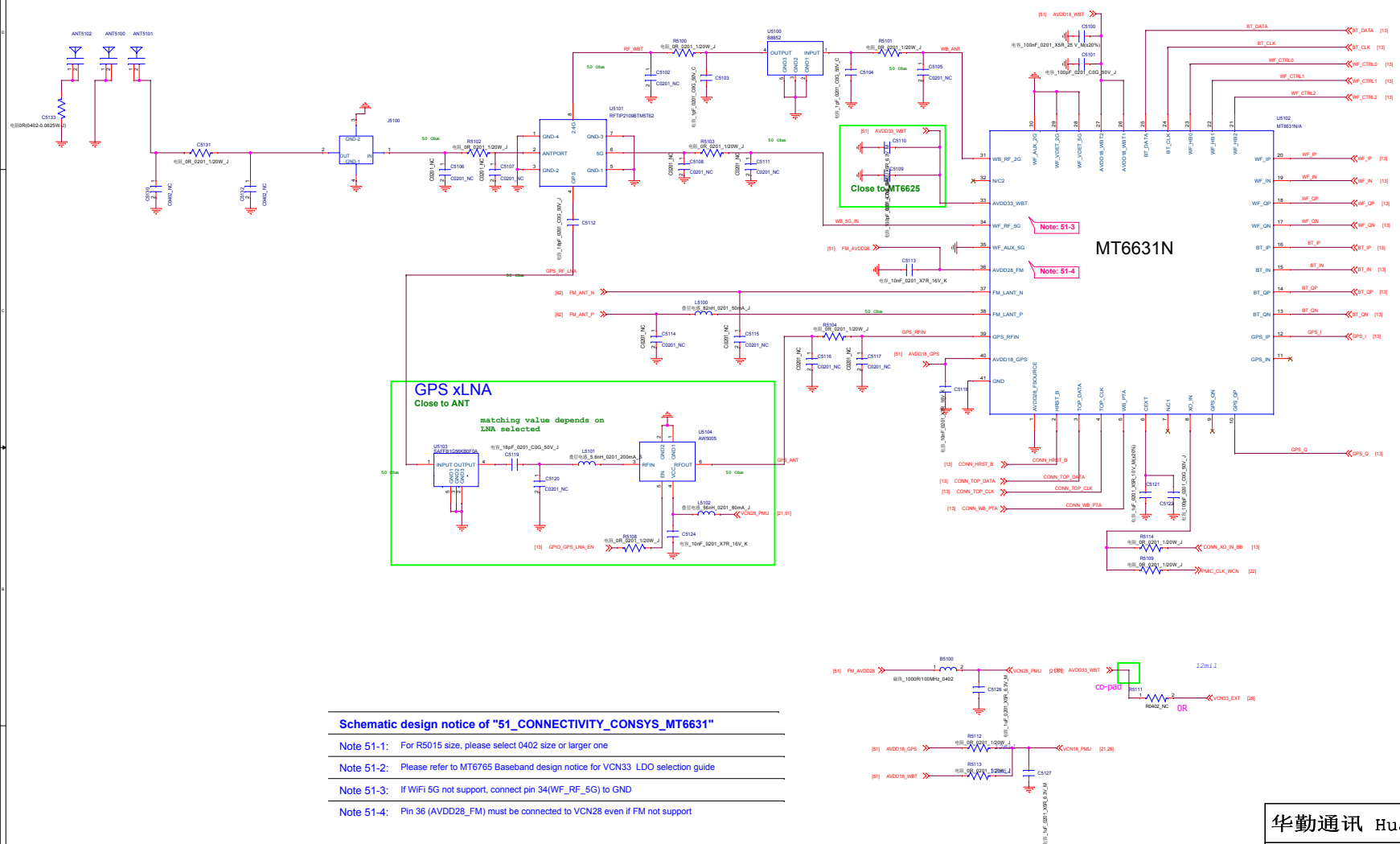


**Schematic design notice of "44\_Memory\_eMMC\_LPDDR4"**

- Note 44-1: Please refer to power supply related page select output voltage properly for LPDDR4X
- Note 44-2: DRAM ZQx resistor = 240ohm (1%) that must be connected to VDDQ.
- Note 44-3: Please refer to eMMC vendor's datasheet or MTK common design notice to get the recommendation bypass cap. value for VCC/VCCQ/VDDI power domains of eMMC.
- Note 44-4: VDD2 VDDQ decoupling cap: closed to DRAM ball. For other cap for PMIC (>10uF, at PMIC page) please also refer to MMD and layout guide for placement.

华勤通讯 Huaqin Telecom Technology Com.,Ltd		
Title 44_Memory_eMMC_LPDDR4		
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**Schematic design notice of "51\_CONNECTIVITY\_CONSYS\_MT6631"**

Note 51-1: For R5015 size, please select 0402 size or larger one

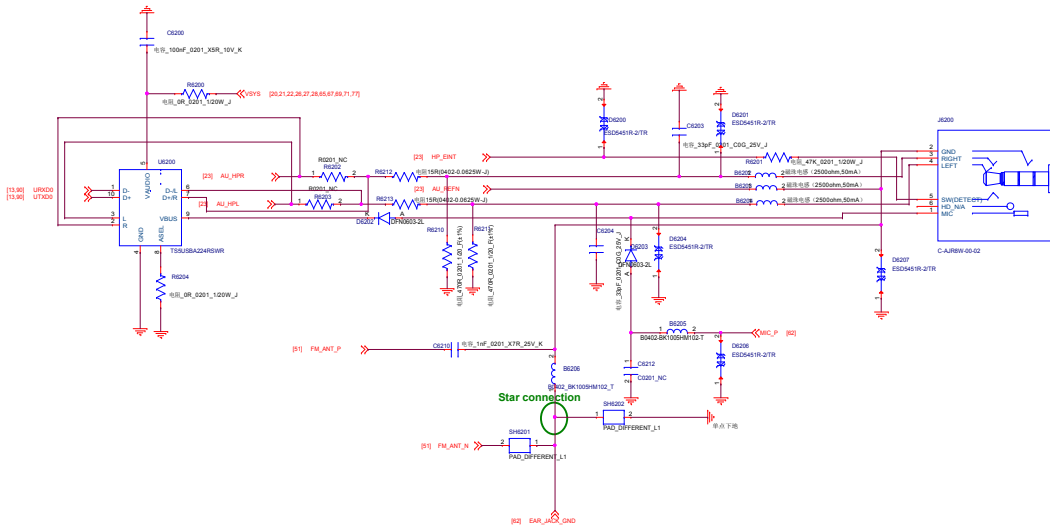
Note 51-2: Please refer to MT6765 Baseband design notice for VCN33\_LDO selection guide

Note 51-3: If WiFi 5G not support, connect pin 34(WF\_RF\_5G) to GND

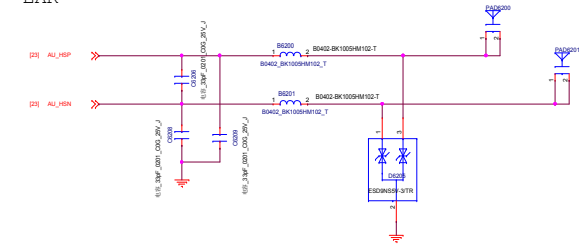
Note 51-4: Pin 36 (AVDD28\_FM) must be connected to VCN28 even if FM not support

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Title 51_CONNECTIVITY_CONSYS_MT6631		
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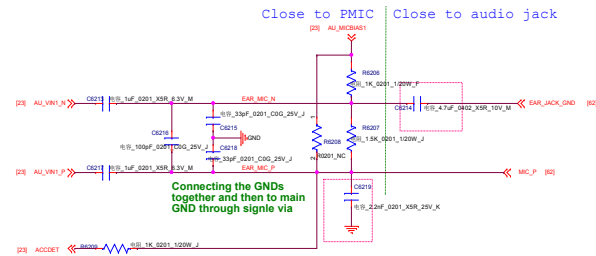
# AUDIO JACK



# EAR

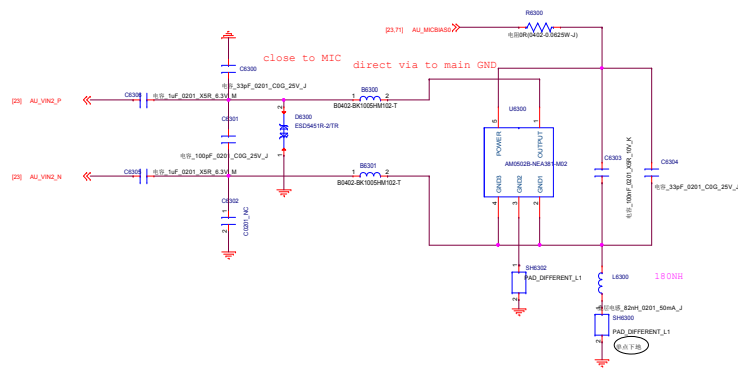


# Earphone Microphone



华勤通讯 Huaqin Telecom Technology Com., Ltd		
Title 62_PERI_AUDIO_IO		
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MIC -- Sub

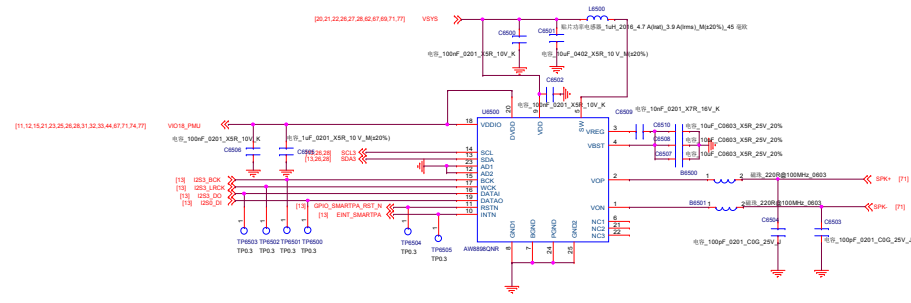


MIC -- Main



华勤通讯 Huaqin Telecom Technology Com., Ltd		
Title 63_PERI_AUDIO_IO2(2 AMIC)		
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AUDIO PA

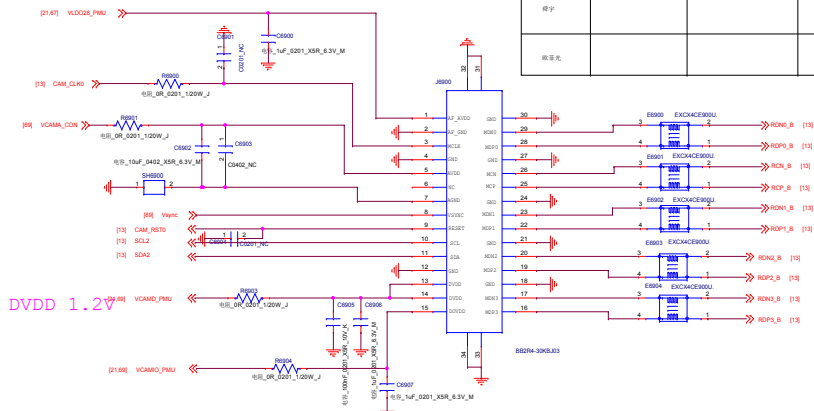


华勤通讯 Huaqin Telecom Technology Com.,Ltd		
Title 65_PERI_SPEAKER_AMP		
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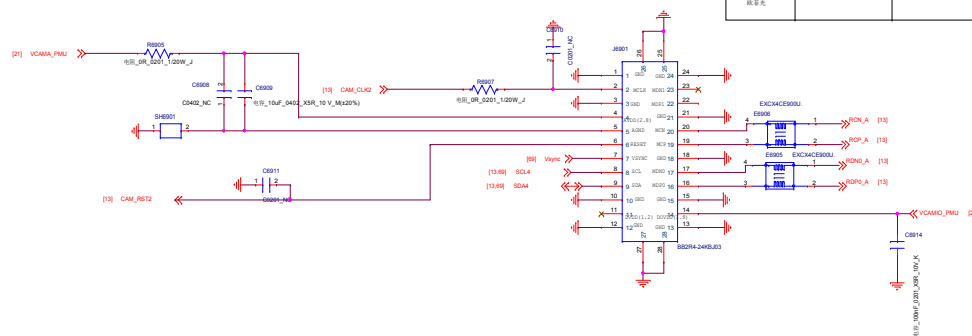
### Main MONO Camera 12M

厂家	12C 88A0	12C M317E	ID
型号			
版本号			



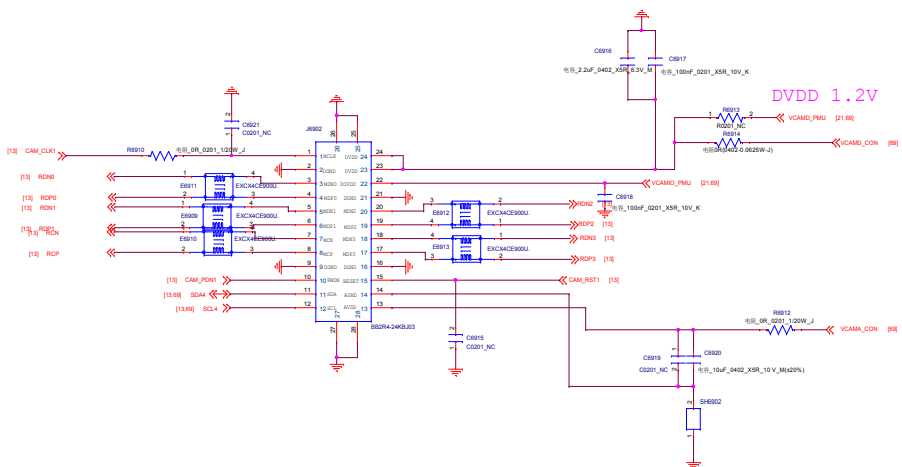
### AUX Camera 2M

厂家	12C 88A0	12C M317E	ID
型号			
版本号			

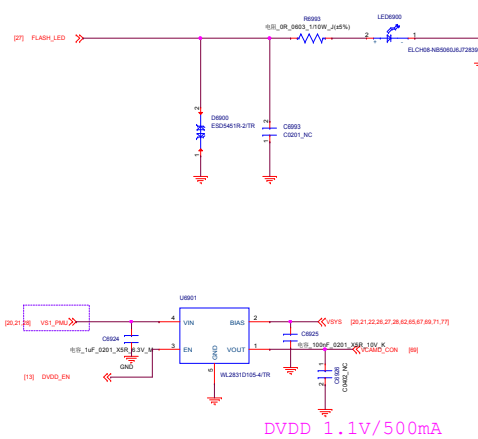


### Front Camera - 5M

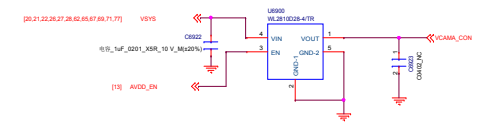
厂家	12C 88A0	12C M317E	ID
型号			
版本号			



### Rear Camera Flash



### AVDD LDO



华勤通讯 Huaqin Telecom Technology Com., Ltd

Title 69\_PERI\_CAMERA

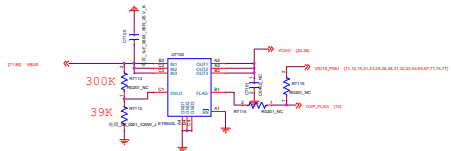
Size D Project F9\_MB\_V1

Rev v1

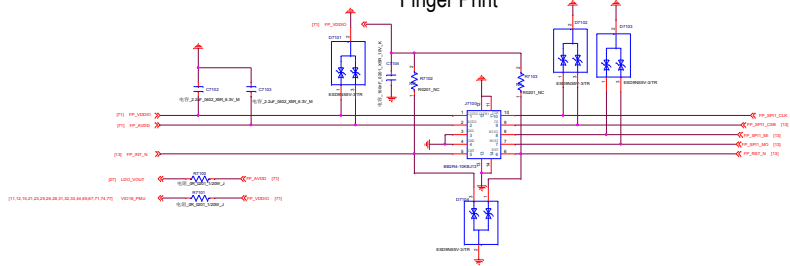
Date: Friday, October 19, 2018

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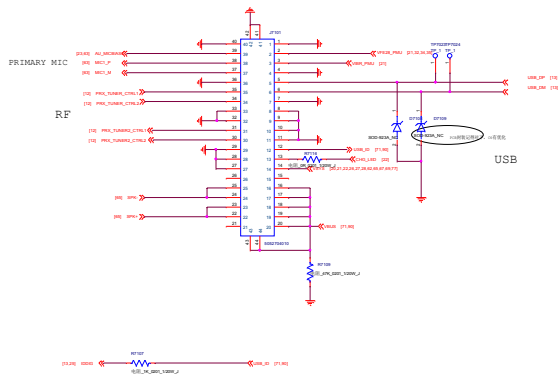
OVP 10.5V



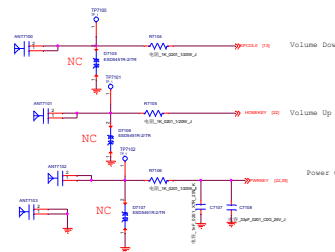
### Finger Print



### BTB Connector



### KEY BTB



Signal	Description
KPCOLO	Volume Down
HOMEKEY	Volume Up
POWERKEY	POWER_ON

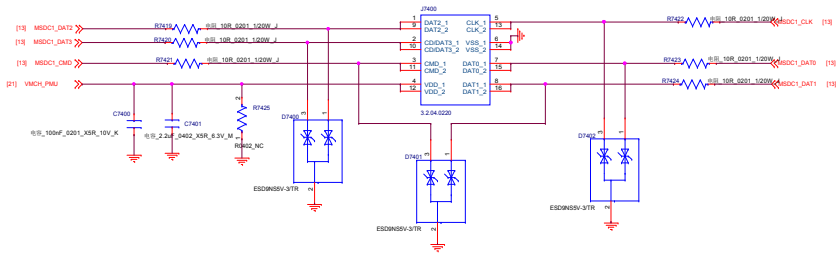
华勤通讯 Huaqin Telecom Technology Com.,Ltd

Title 71\_PERI\_KEY\_BTb\_OVP\_FP

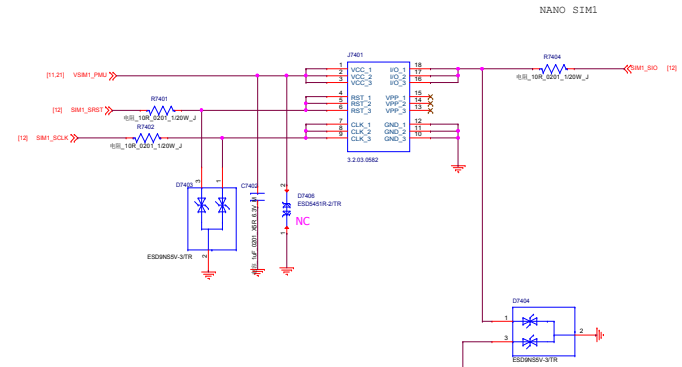
Size E Project F9\_MB\_V1 Rev v1

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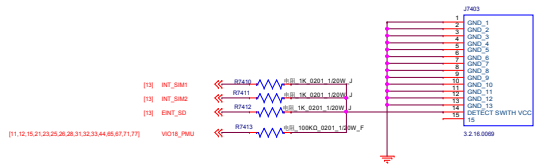
SDC2



SIM1

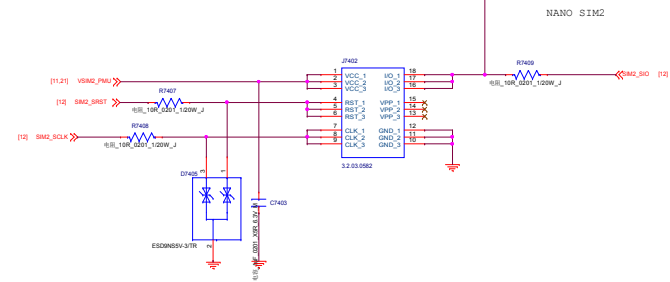


SD\_SIM\_DET



EINT DEAFULT LOW  
 plug in int H  
 plug OUT int L

SIM2



[Schematic design notice of "46\\_MEMORY\\_SD Card" page.](#)

Note 46-1: For better ESD performance, please select suitable components for system protection.

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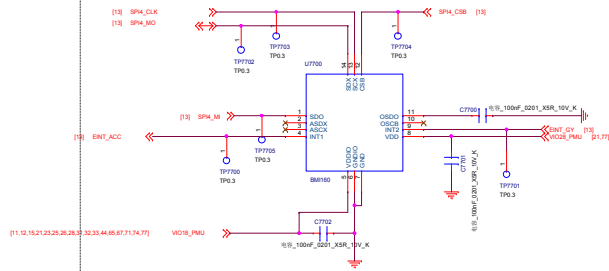
Title 74\_PERI\_SIM&SD Card

Size D	Project F9_MB_V1	Rev v1
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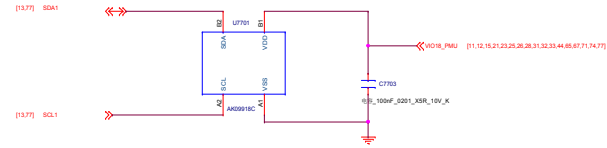


### Gyro+A sensor



厂家	IOE ADDRESS
BM150	0x68

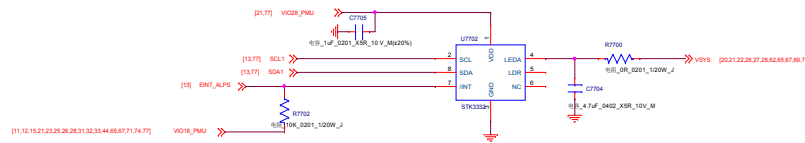
### E-compass



厂家	IOE ADDRESS
AMS5883L	0ch

### ALS PS

厂家	IOE ADDRESS

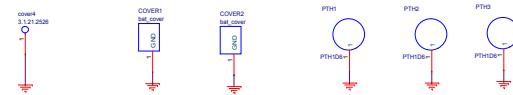
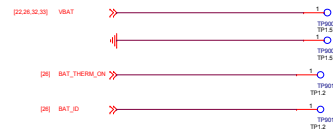
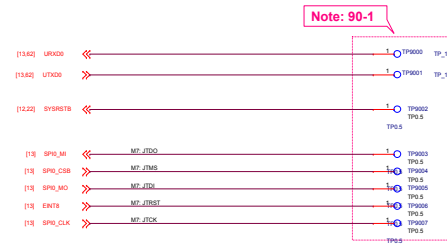


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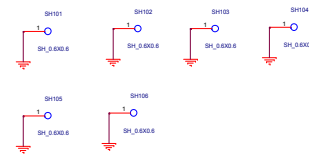
Title 77\_PERI\_SENSORS\_MEMs\_ALS/PS

Size	Project	Rev
D	F9_MB_V1	V1

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屏蔽罩



华勤通讯 Huaqin Telecom Technology Com., Ltd		
Title 90_DEBUG_IO		
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