Reference Schematic For RK1808

RK1808_EDGE_COMPUTING_REF_V10

PMIC: RK809-2 (5BUCK + 9LDO + Codec)
RAM: DDR3/L /LPDDR3
ROM: eMMC/SPI NOR + TF card
Interface: MIPI CSI/MIPI DSI/UART/SPI/CIF/BT1120/PCIE/USB3/Micro-SD

Rockchip Confidential

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File:	00.Cover Page		
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Note

NOTE 1:
Component parameter description

1. DNP stands for component not mounted temporarily
2. If Value or option is DNP, which means the area is reserved without being mounted
3. If Flash is compatible, please notice when eMMC is used, the option is that @eMMC is mounted, @Nand is not mounted when Nand is used, the option is that @Nand is mounted, @eMMC is not mounted

NOTE 2:
Please use our recommended components to avoid too many changes.For more informations about the second source,please refer to our AVL.

Note

Option

Description

Remind

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Project:	RK1808_REF_V10		
File:	01.Index		
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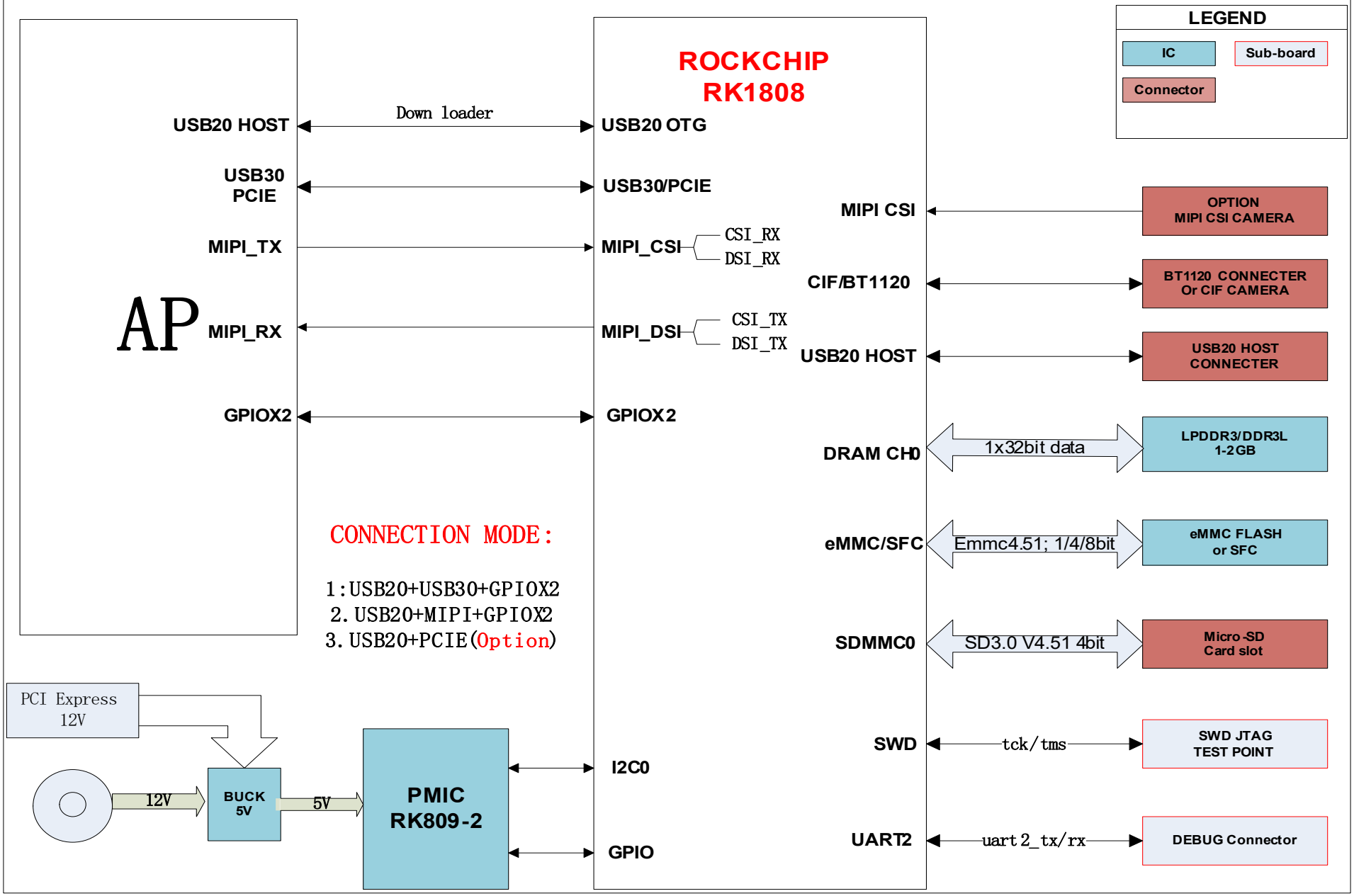
Version	Date	Author	Change List	Approved
V1.0	20181226	RZF	First edition for RK1808	chenw

RK1808 Edge Computing Diagram



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I2C MAP

Port	Pin name	Domain	Bus name	Pull-up voltage	Slave Device	Slave Addr (MS 7Bits)	Note	Slave Bus Capability
I2C0	I2C0_SCL_u I2C0_SDA_u	PMUIO2	I2C0_SCL_PMIC I2C0_SDA_PMIC	VCC_3V3	Rockchip RK809	0x20	PMIC	100kHz,400kHz
					TCS4525	0X1C	BUCK	100kHz,400kHz
I2C3	I2C3_SCL_u I2C3_SDA_u				OV5695 GC2145	OX36 0X3C	MIPI CAMERA CIF CAMERA	100kHz,400kHz
I2C4	I2C4_SCL_u I2C4_SDA_u	VCC_3V3		VCC_3V3			PCIE	100kHz,400kHz

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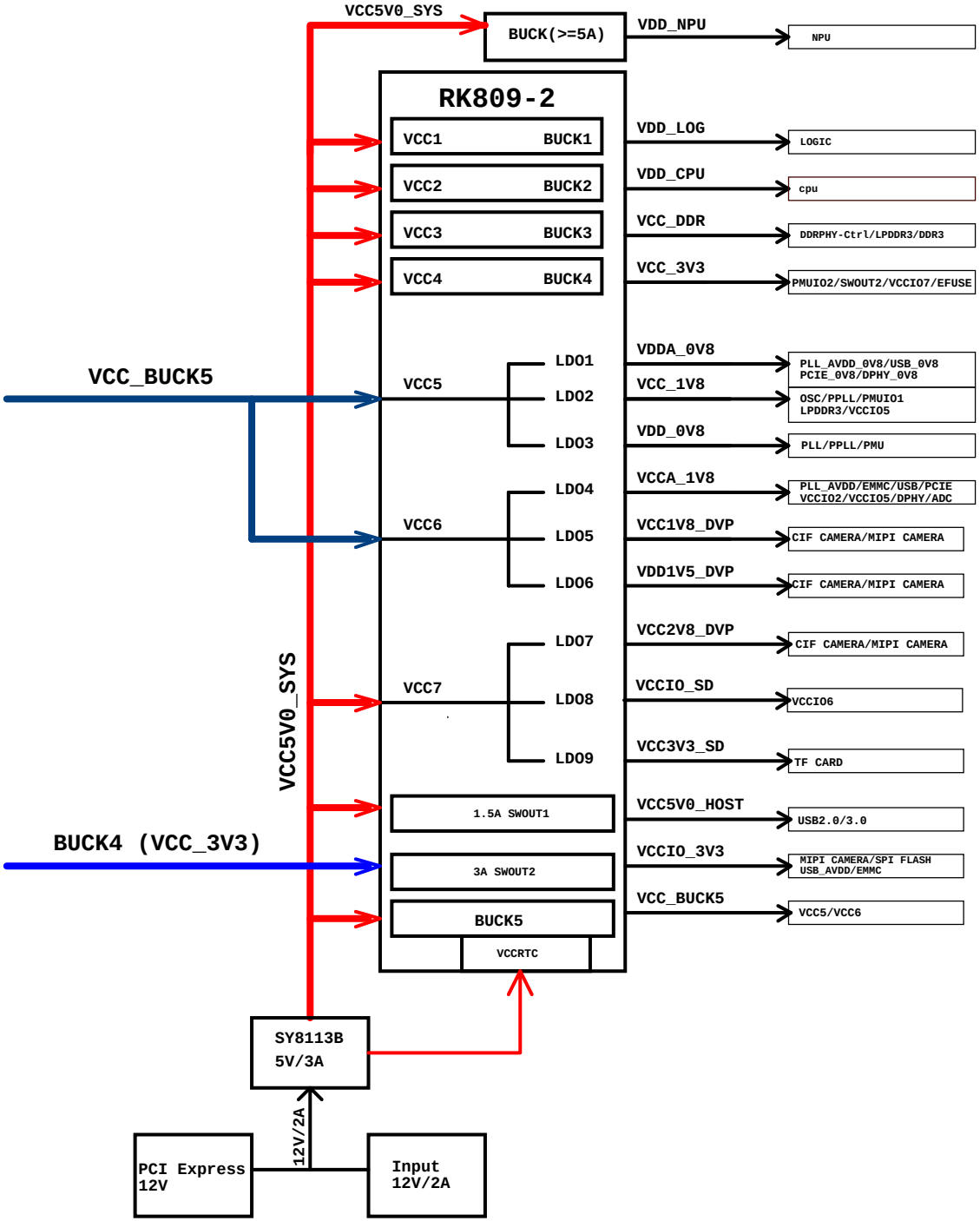
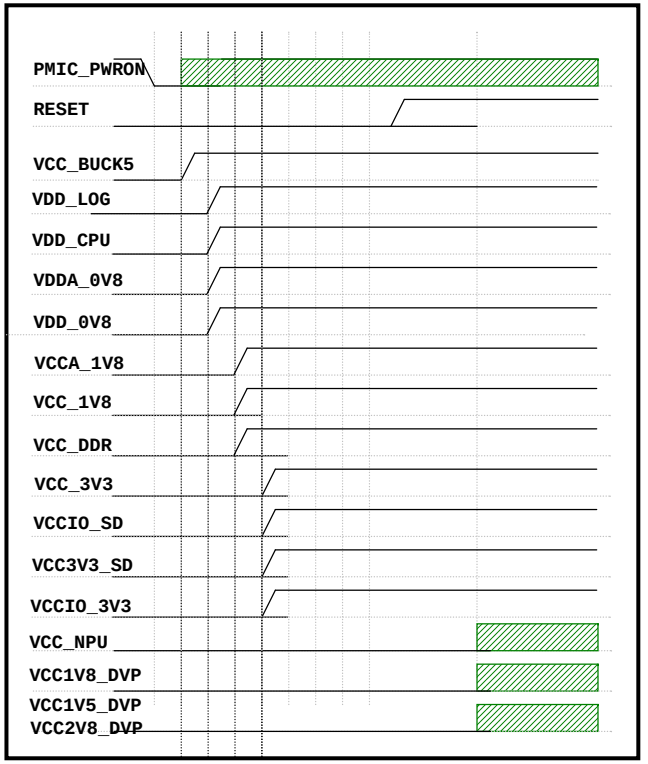
POWER DIAGRAM



RK809-2 Power-on Sequence

PowerName	PMIC Channel	Time Slot (step 2mS)	Default voltage	Supply Limit	Default ON/OFF	Sleep ON/OFF	Peak Current
VDD_NPU	EXTERNAL(>=5A)		1.05V	6A	OFF	OFF	4A
VDD_LOG	BUCK1	Slot:2	0.85V	2.5A	ON	OFF	1.25A
VDD_CPU	BUCK2	Slot:2	0.85V	2.5A	ON	OFF	750mA
VCC_DDR	BUCK3	Slot:3	FB=0.6V	1.5A	ON	ON	
VCC_3V3	BUCK4	Slot:4	3.3V	1.5A	ON	ON	
VCC_BUCK5	BUCK5	Slot:1	2.5V	2.5A	ON	ON	
VDDA_0V8	LDO1	Slot:2	0.8V	400mA	ON	OFF	
VCC_1V8	LDO2	Slot:3	1.8V	400mA	ON	ON	
VDD_0V8	LDO3	Slot:2	0.8V	100mA	ON	ON	
VCCA_1V8	LDO4	Slot:3	1.8V	400mA	ON	OFF	
VCC1V8_DVP	LDO5		1.8V	400mA	OFF	OFF	
VDD1V5_DVP	LDO6		1.5V	400mA	OFF	OFF	
VCC2V8_DVP	LDO7		2.8V	400mA	OFF	OFF	
VCCIO_SD	LDO8	Slot:4	3.3V	400mA	ON	OFF	
VCC3V3_SD	LDO9	Slot:4	3.3V	400mA	ON	OFF	
VCCIO_3V3	SWOUT2	Slot:4	3.3V	3A	ON	OFF	
VCC5V0_HOST	SWOUT1		5V	1.5A	OFF	OFF	
RESET	RESETB	Slot:10	OD				



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Project:	RK1808_REF_V10		
File:	05.Power diagram and Sequence		
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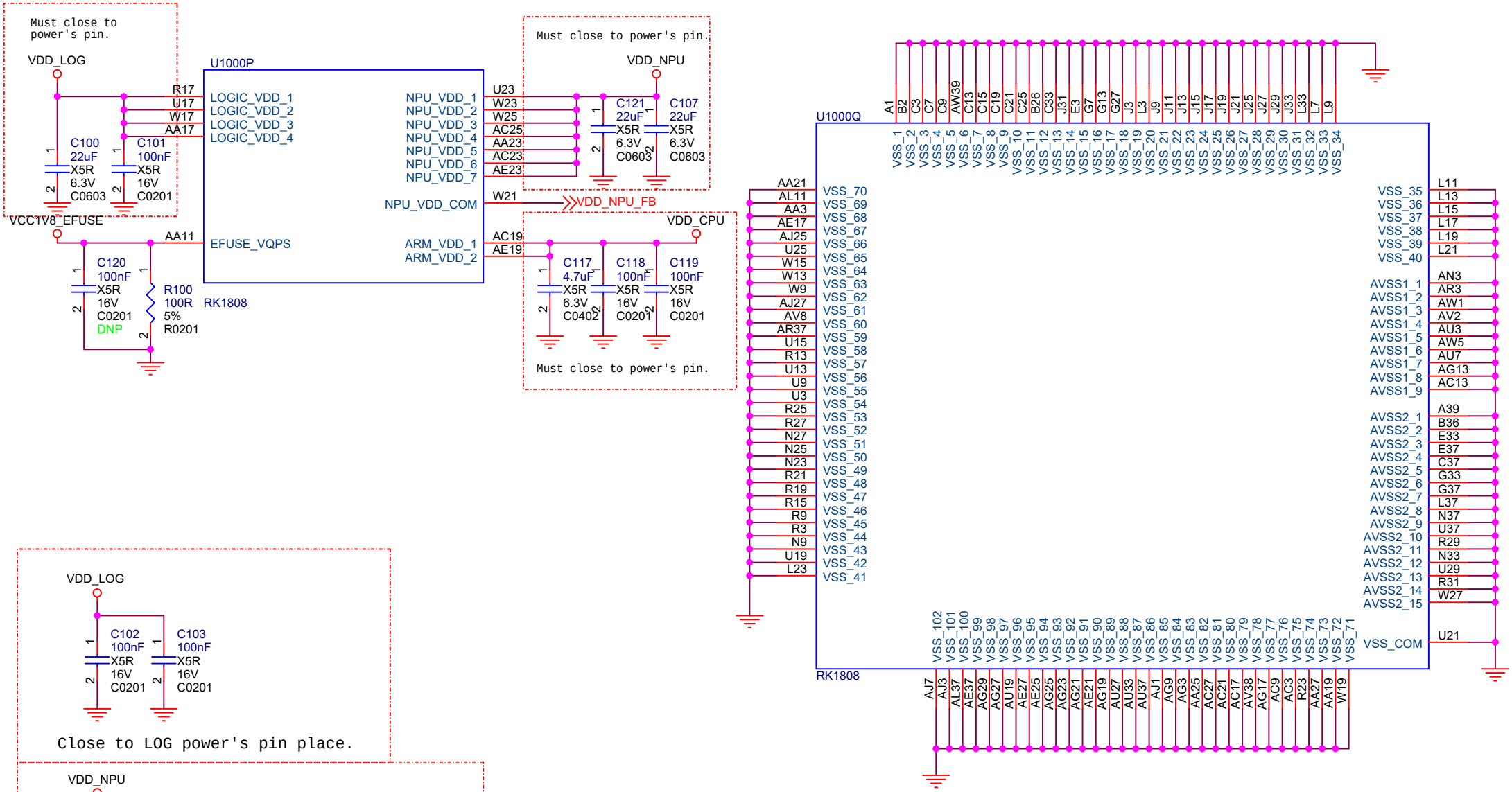
RK1808 Power



Rockchip 瑞芯微电子	Fuzhou Rockchip Electronics		
Project:	RK1808_REF_V10		
File:	10.RK1808 Power		
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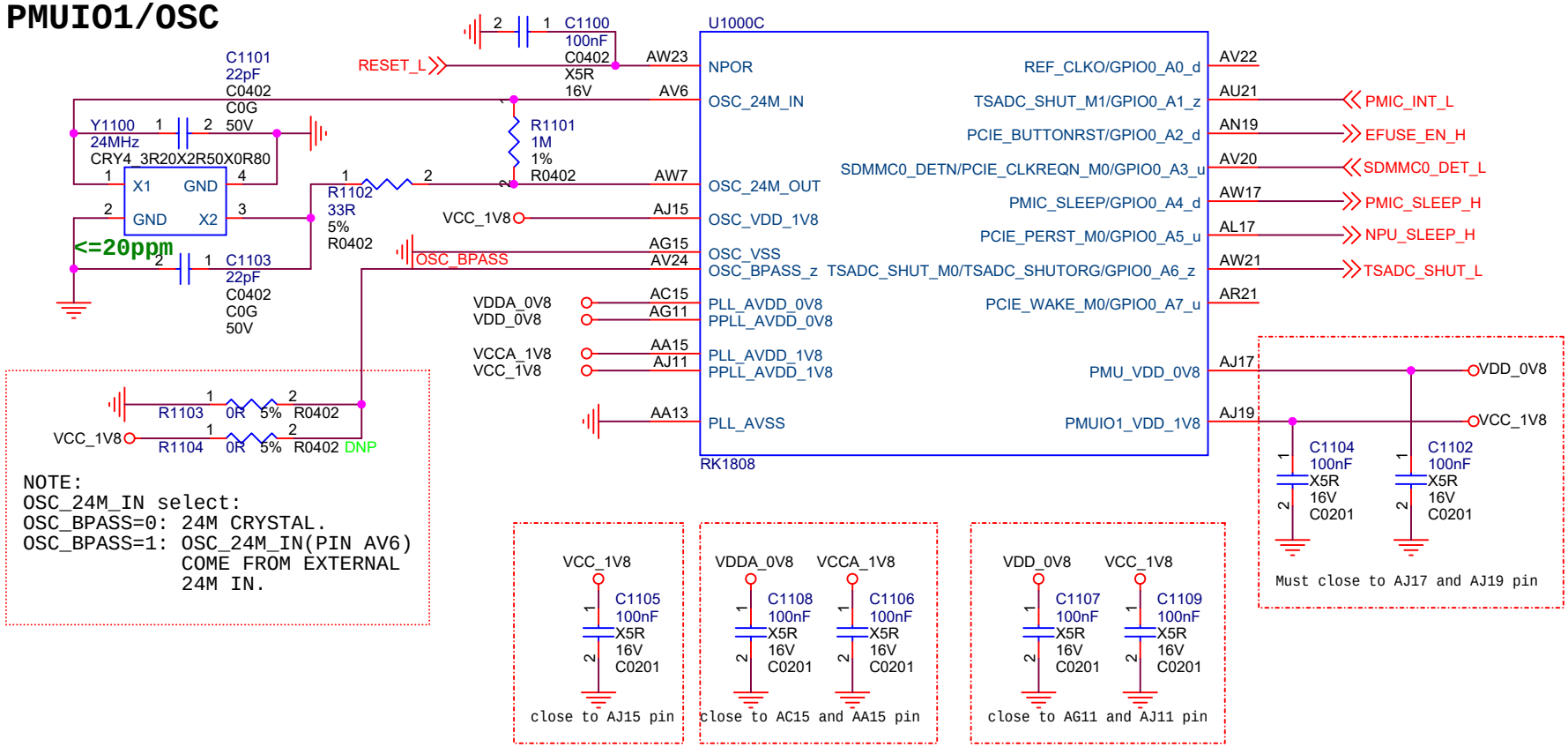
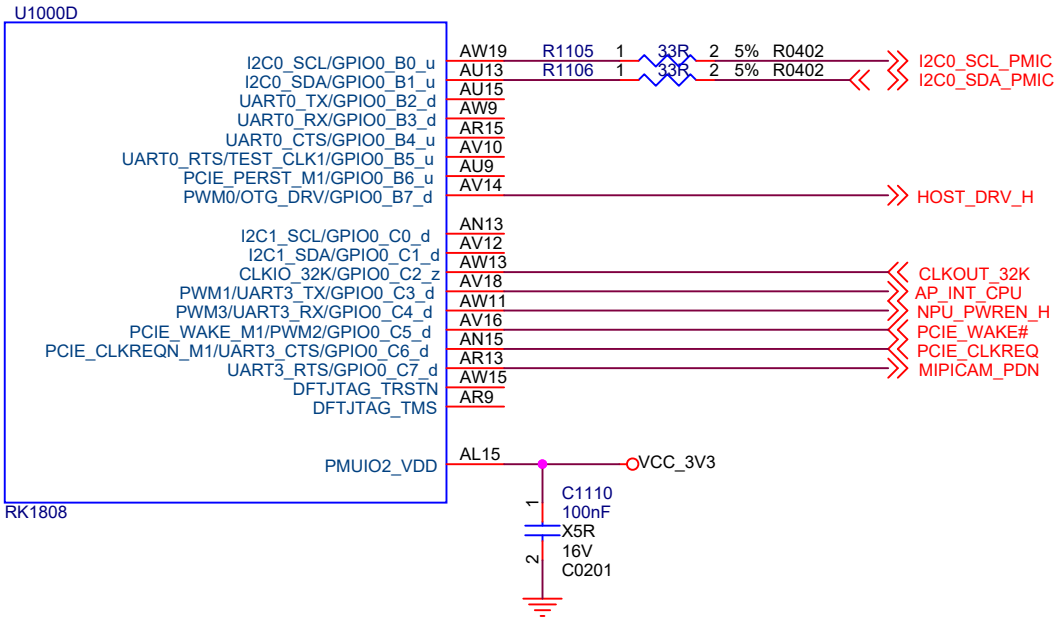
PMUIO1/OSC



PMUIO2



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Project:	RK1808_REF_V10		
File:	11.RK1808 OSC/PMUIO1/PMUIO2		
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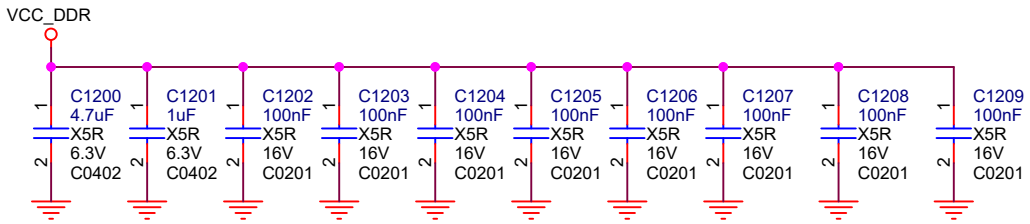
DDR Controller

LPDDR3/LPDDR2	DDR3
A0	A9
A1	A14
A2	A13
A3	A11
A4	A2
A5	A4
A6	A3
A7	A6
A8	A5
A9	A1
	A0
	A7
	CASB
	A8
	ODT0
	BA1
	RASB
	CSB0
	BA2
	A12
	BA0
	WEB
CK	CK
CKB	CKB
CKE	CKE
CSB0	A10
CSB1	CSB1
ODT0	A15
ODT1	ODT1
	RESETN



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Project:	RK1808_REF_V10		
File:	12.RK1808 DDR Controller		
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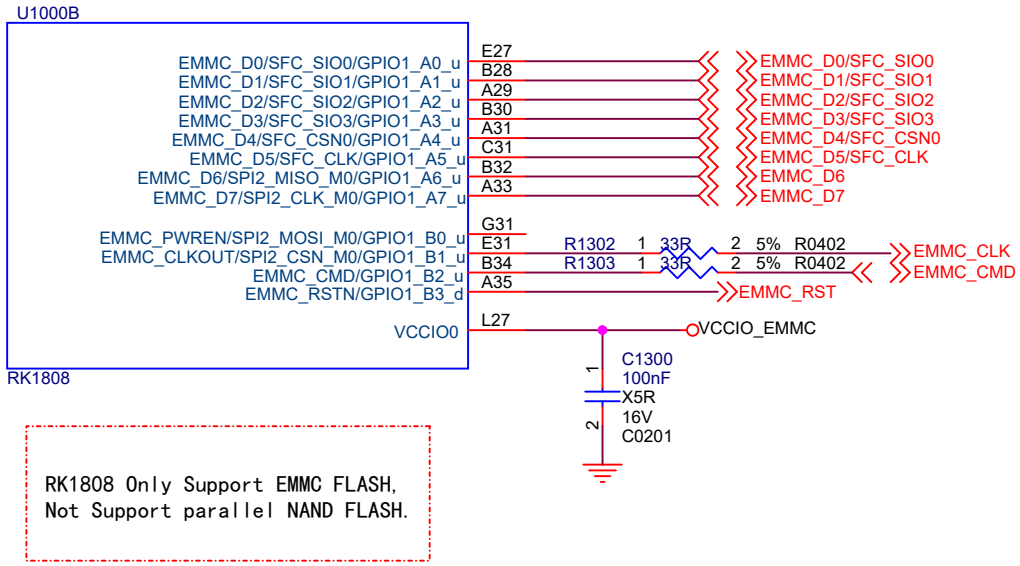
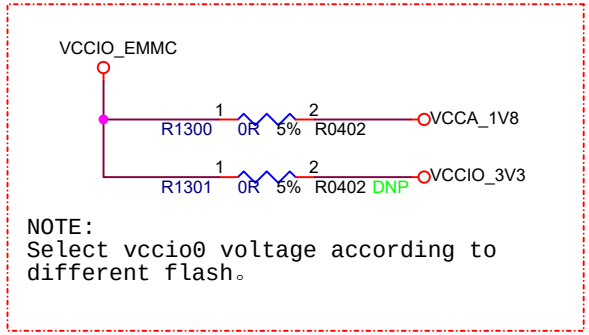
EMMC/SFC Controller

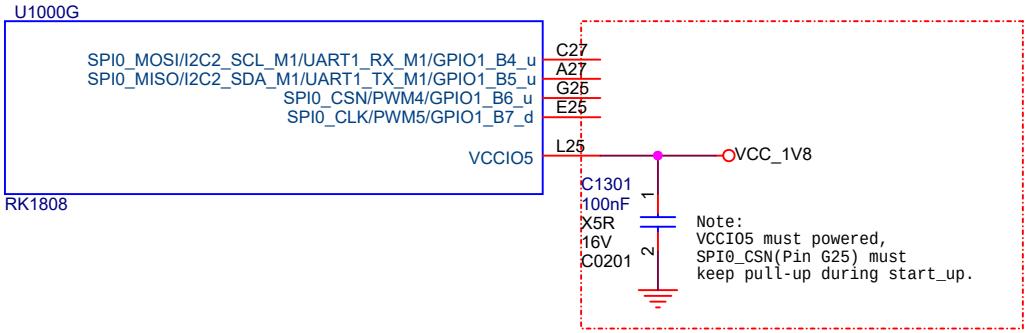


RK1808 Only Support EMMC FLASH,
Not Support parallel NAND FLASH.



NOTE:
Select vccio0 voltage according to different flash。

SPI0 Controller



Note:
VCCIO5 must powered,
SPI0_CSN(Pin G25) must
keep pull-up during start_up.

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File:	13.RK1808 EMMC /SPI0 Controller		
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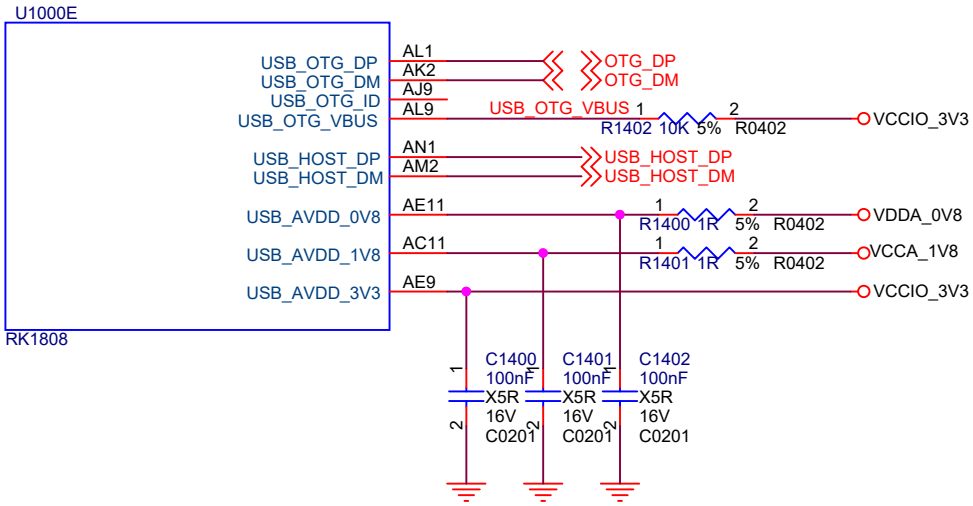
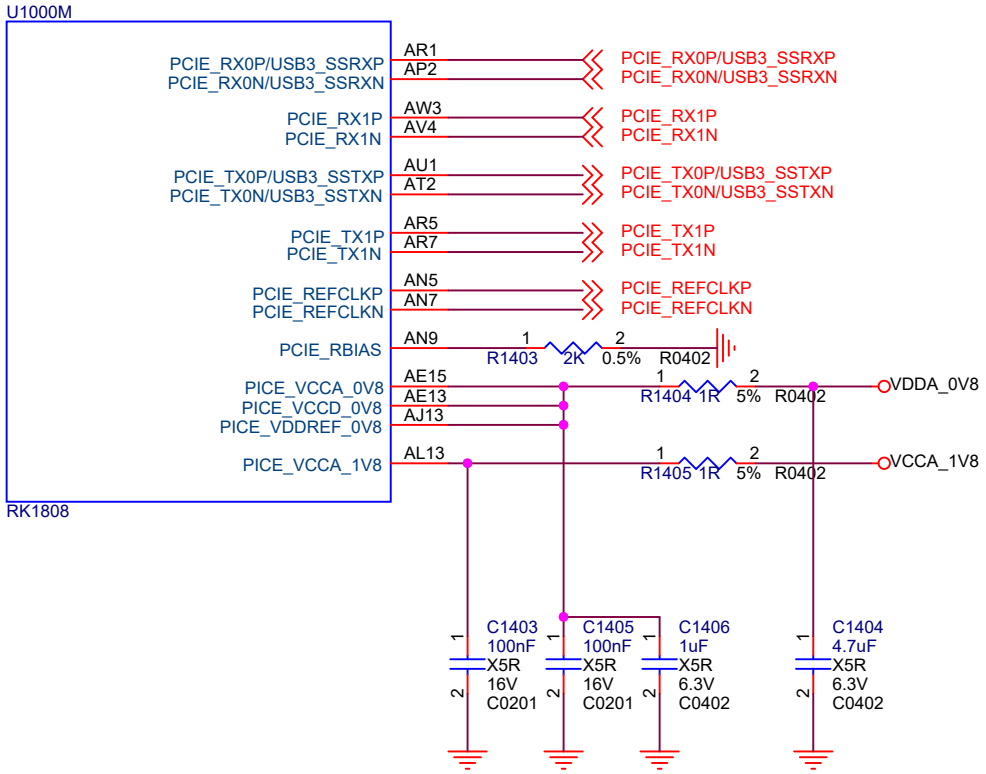
USB Controller



PCIE Controller



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Project:	RK1808_REF_V10		
File:	14.RK1808 USB/PCIE Controller		
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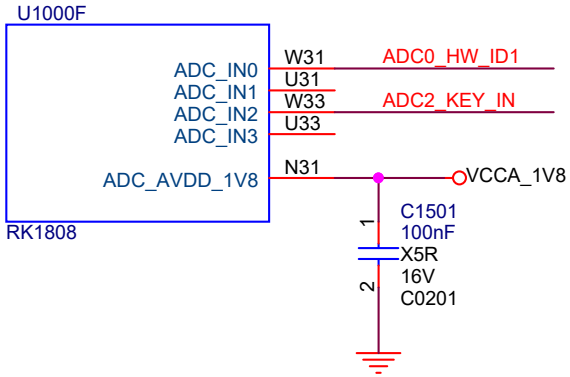
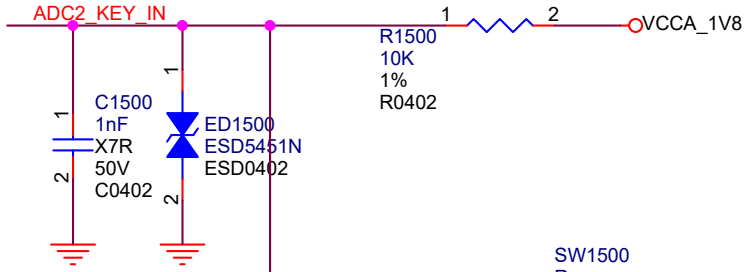
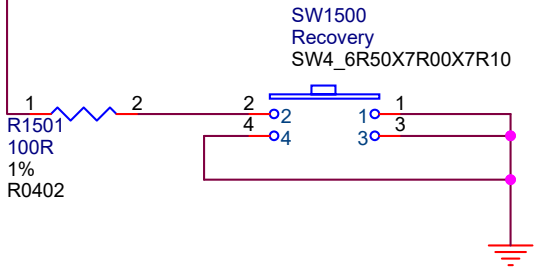
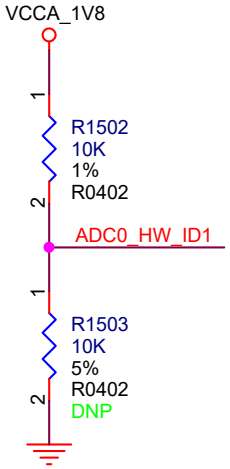
SARADC









Rev	Vadc	Stuff
V10	1.8V	R1502=10K,R1503=NC
V20	0.9V	R1502=R1503=10K
V30	0V	R1502=NC,R1503=10K

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Project:	RK1808_REF_V10		
File:	15.RK1808 SARADC		
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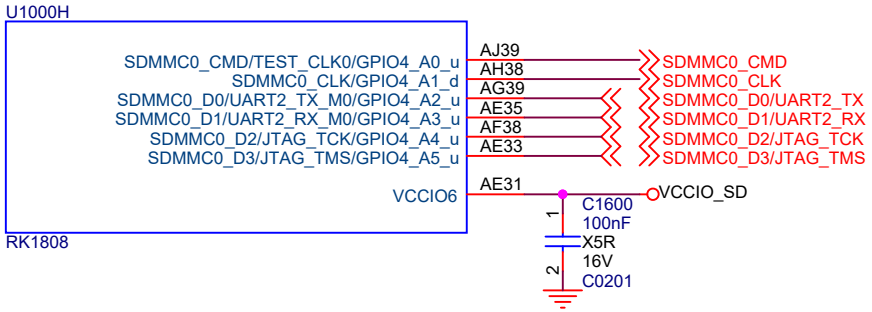
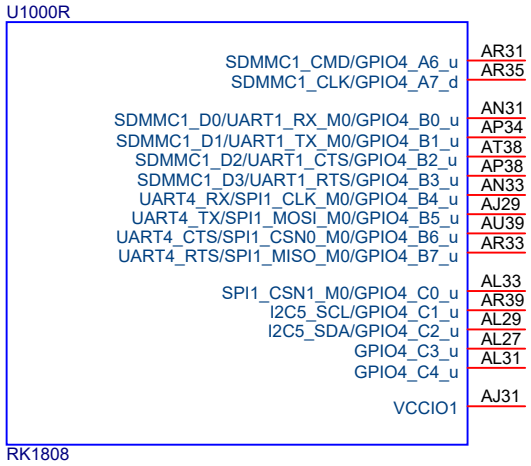
SDMMC0 Controller



→ For Micro-SD(TF) card

SDMMC1 Controller



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Project:	RK1808_REF_V10		
File:	16.RK1808 SDMMC0/SDMMC1		
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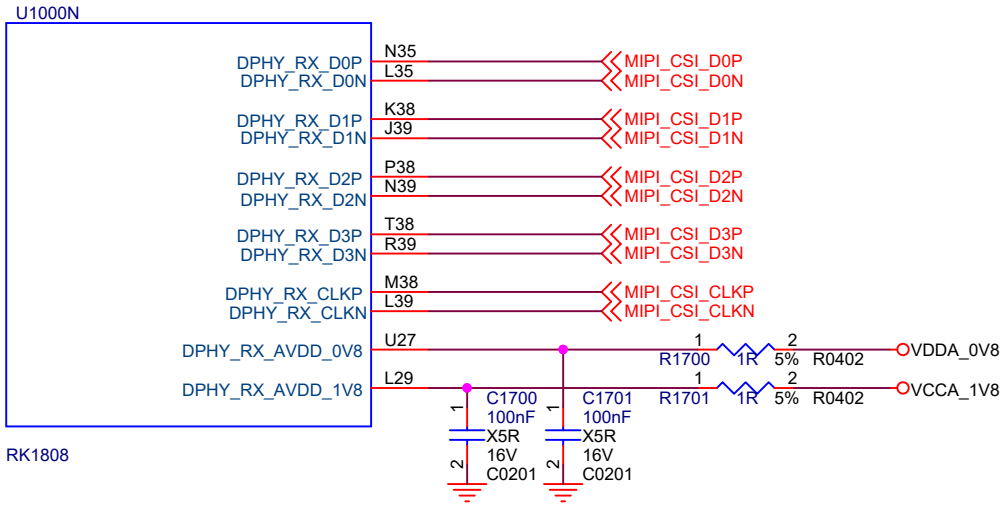
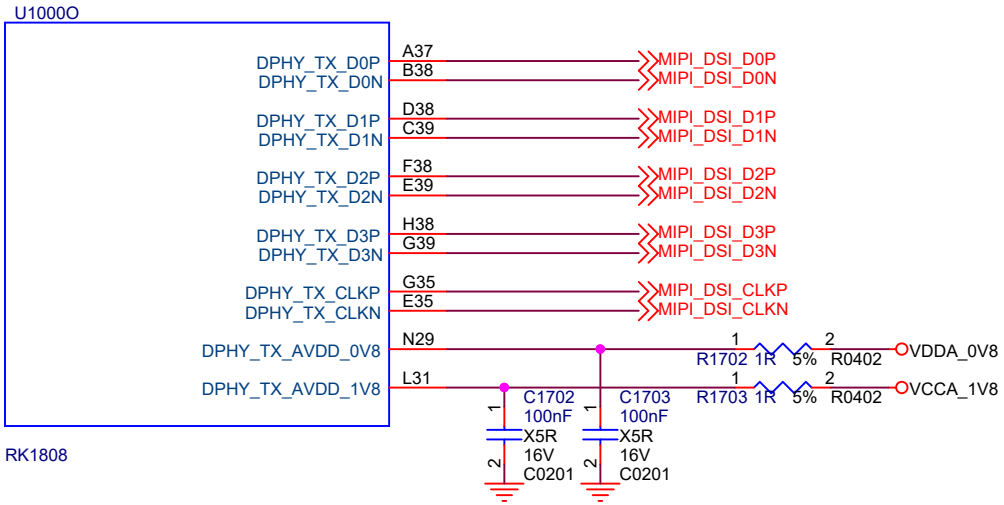
MIPI CSI Controller



MIPI DSI Controller



Fuzhou Rockchip Electronics			
Project:	RK1808_REF_V10		
File:	17.RK1808 MIPI DSI/CSI		
Date:	Thursday, January 03, 2019	Rev:	V1.0
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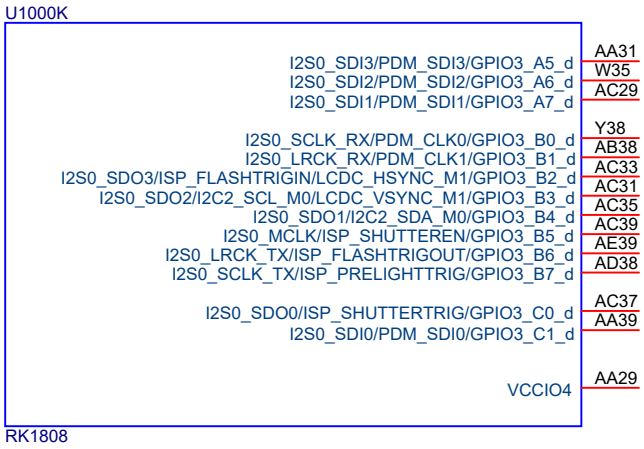
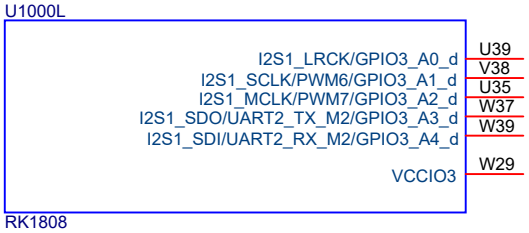
I2S0 Controller



I2S1 Controller



Rockchip 瑞芯微电子 Fuzhou Rockchip Electronics			
Project:	RK1808_REF_V10		
File:	18.RK1808 I2S0/I2S1		
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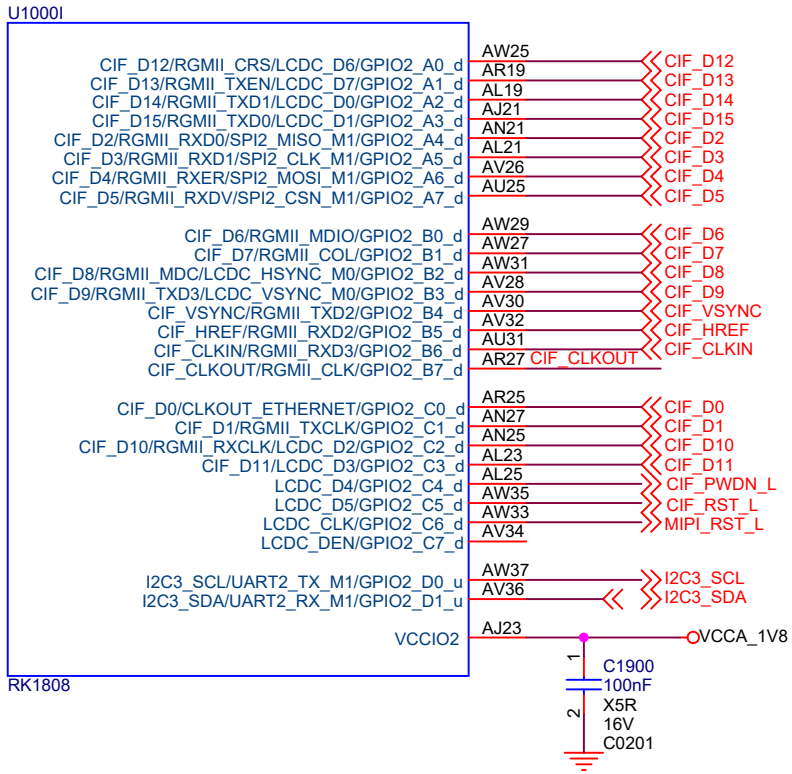
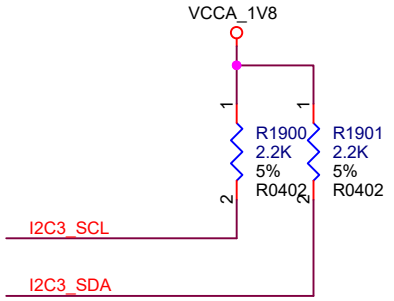
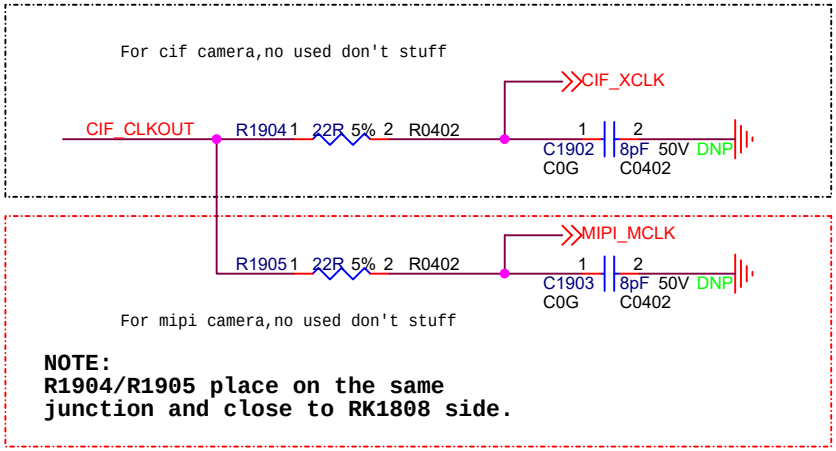
CIF/RGMII/LCDC Controller



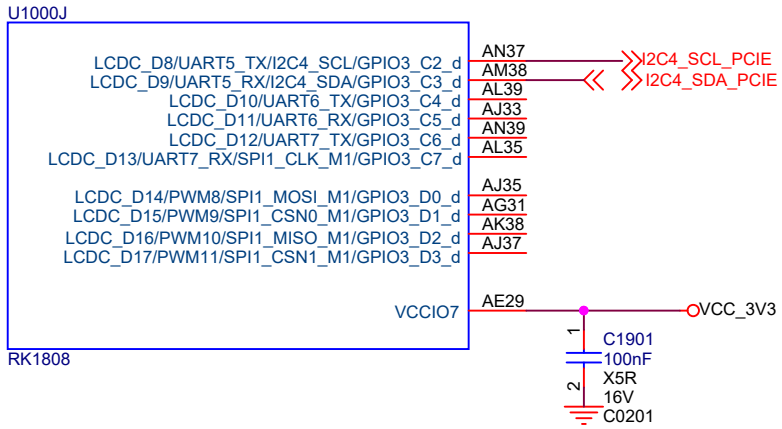


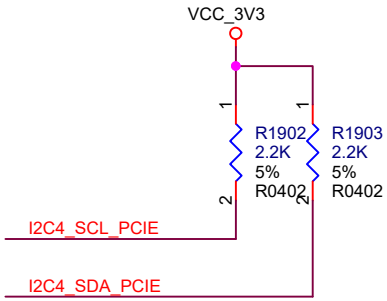
NOTE:
RGMII\CIF\LCDC\GPIO: Only used one function at the same time



NOTE:
R1904/R1905 place on the same junction and close to RK1808 side.

LCDC Controller





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Project:	RK1808_REF_V10		
File:	19.RK1808 RGMII/LCDC/CIF/BT1120		
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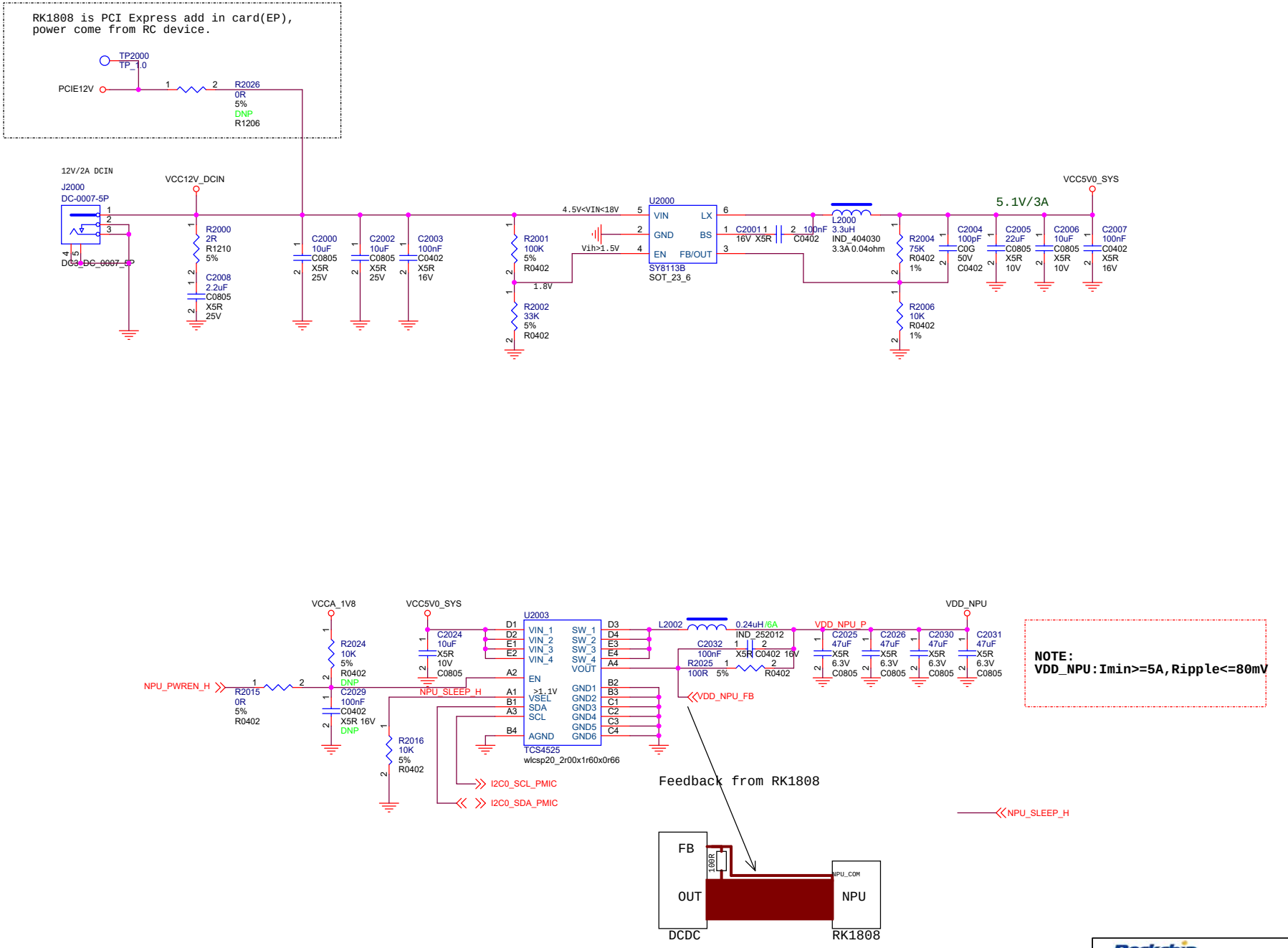
DC IN&SYSTEM Power



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Project:	RK1808_REF_V10		
File:	20.Power DC IN		
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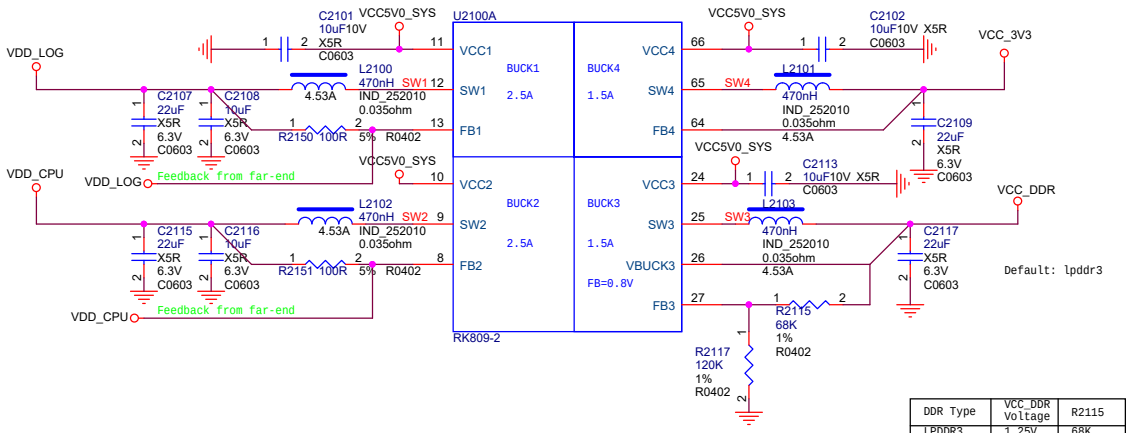
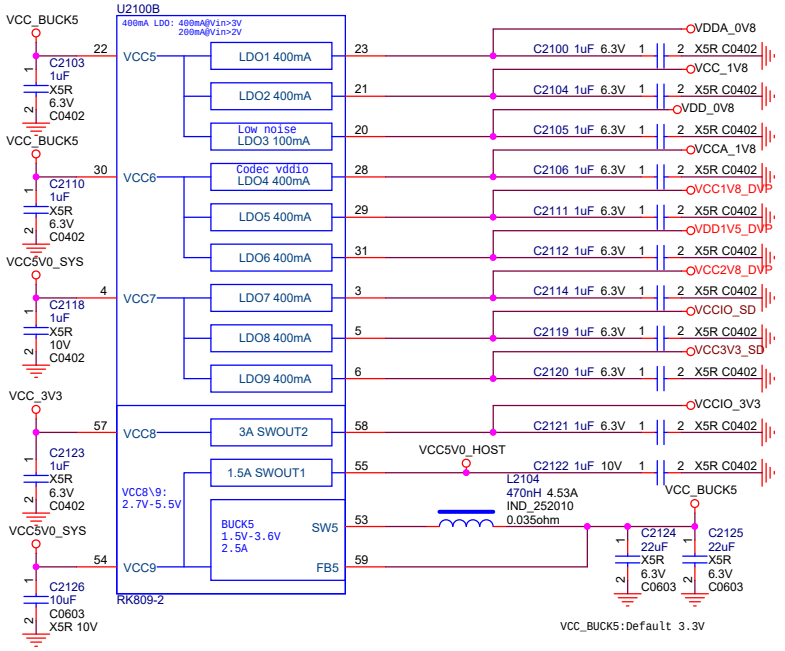
PMIC RK809-2 DCDC

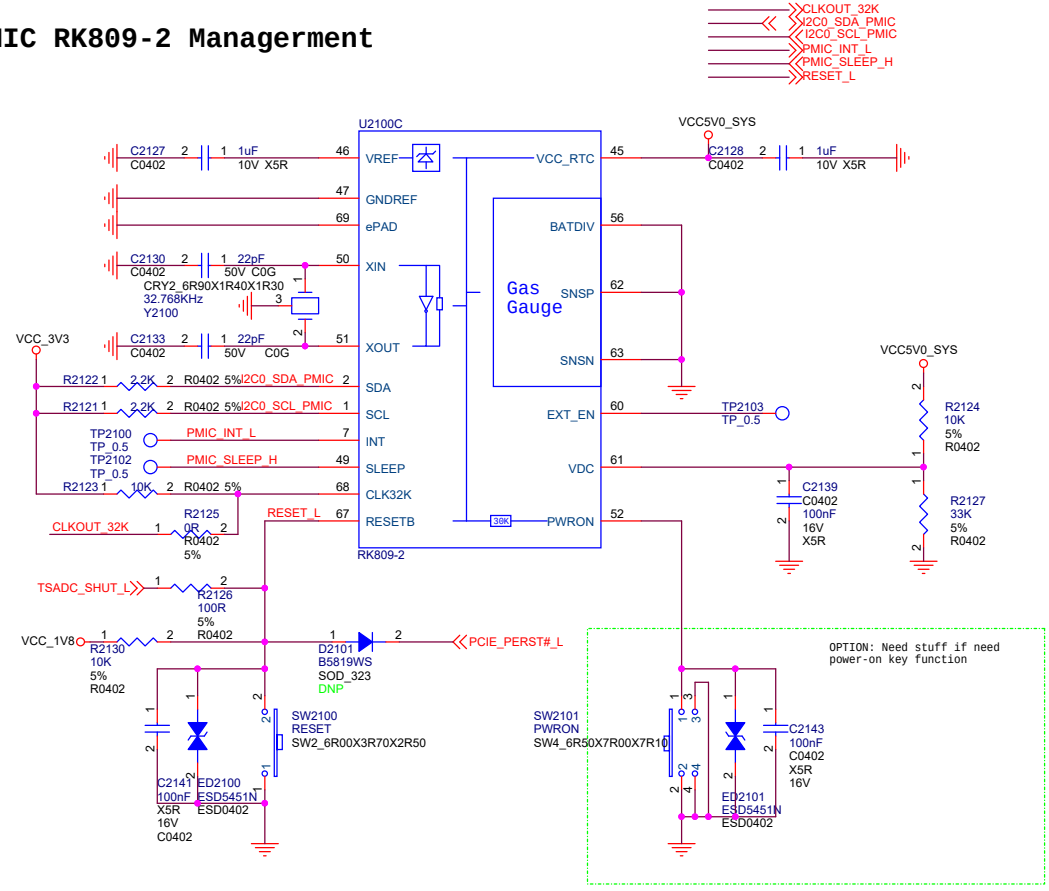


DDR Type	VCC_DDR Voltage	R2115
LPDDR3	1.25V	68K
DDR3L	1.35V	82K
DDR3	1.53V	110K

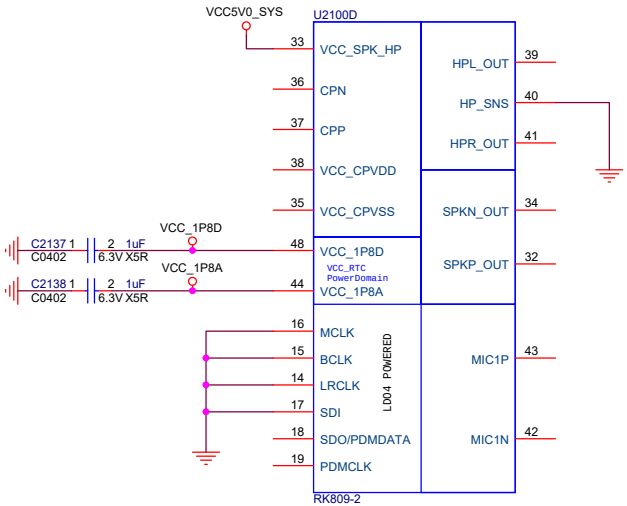
PMIC RK809-2 LDO



PMIC RK809-2 Managerment



PMIC RK809-2 CODEC



Rockchip 瑞芯微电子	Fuzhou Rockchip Electronics		
Project:	RK1808_REF_V10		
File:	21:Power PMIC RK809-2		
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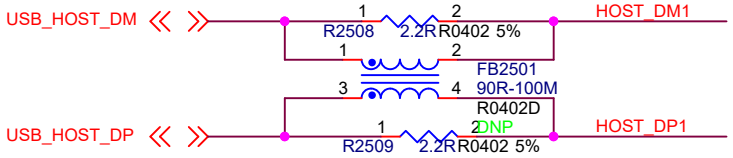
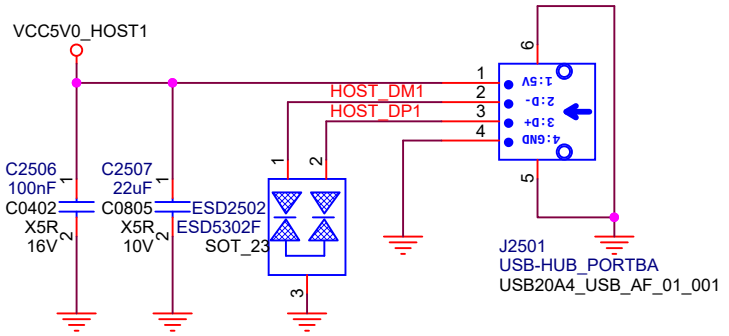
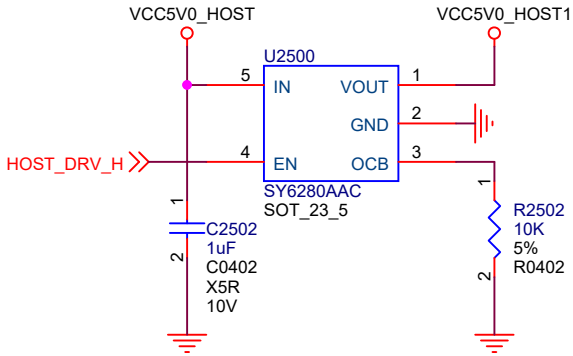
USB20 HOST

Option

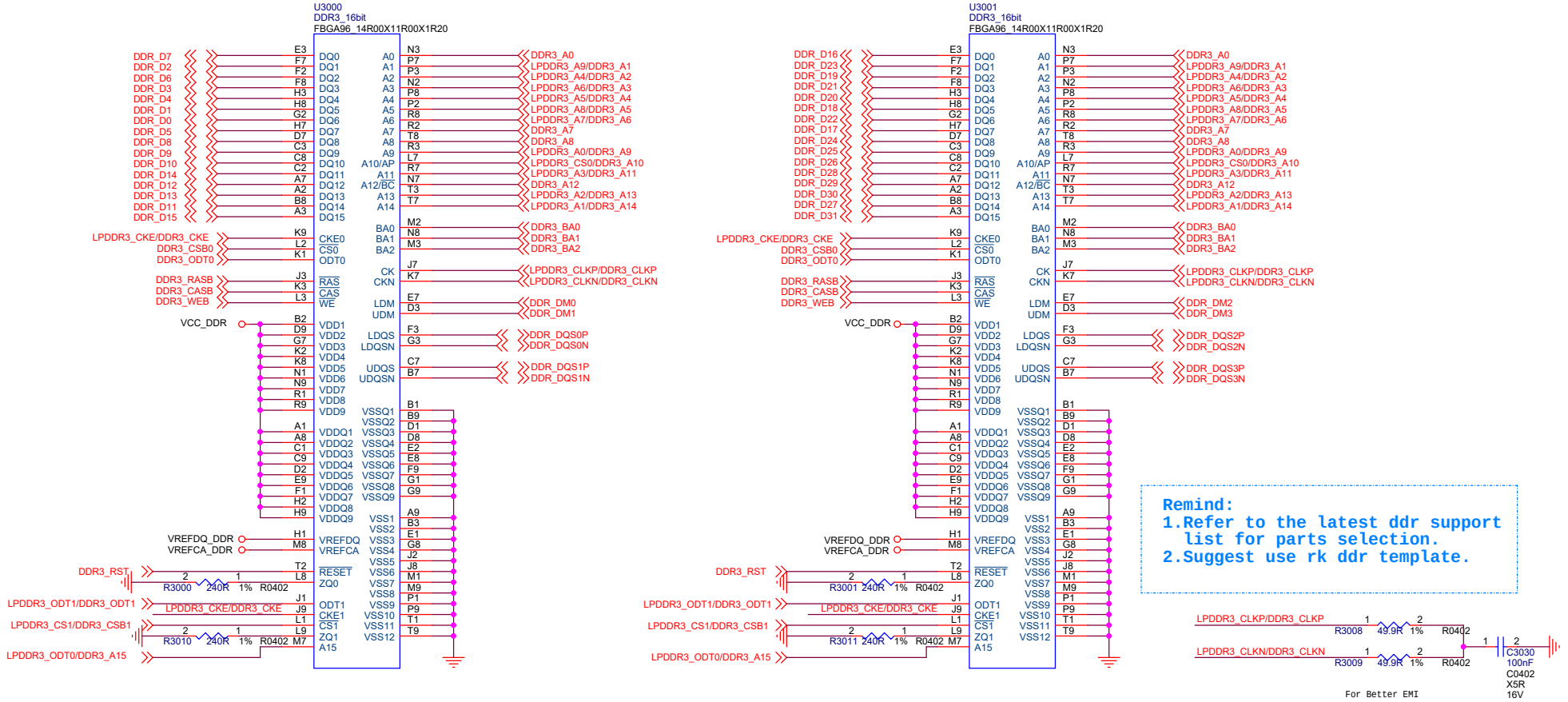




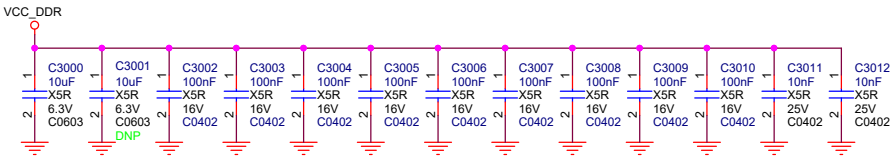


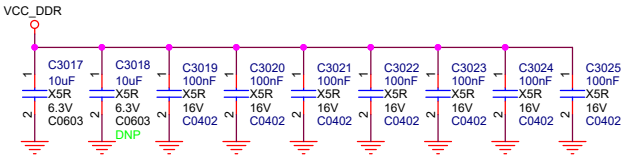
Rockchip 瑞芯微电子	Fuzhou Rockchip Electronics		
Project:	RK1808_REF_V10		
File:	25.USB2.0 HOST		
Date:	Thursday, January 03, 2019	Rev:	V1.0
Designed by:	Rzf	Sheet:	25 of 98

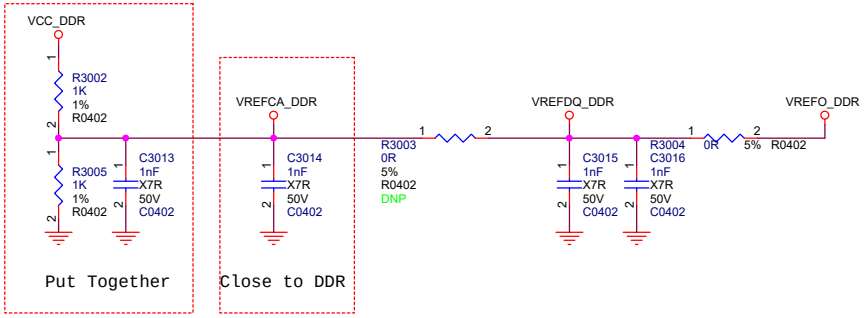
DDR3/DDR3L 2x16bit



Note:
All the Power filter capacitors should be placed close to the power pins of DDR3



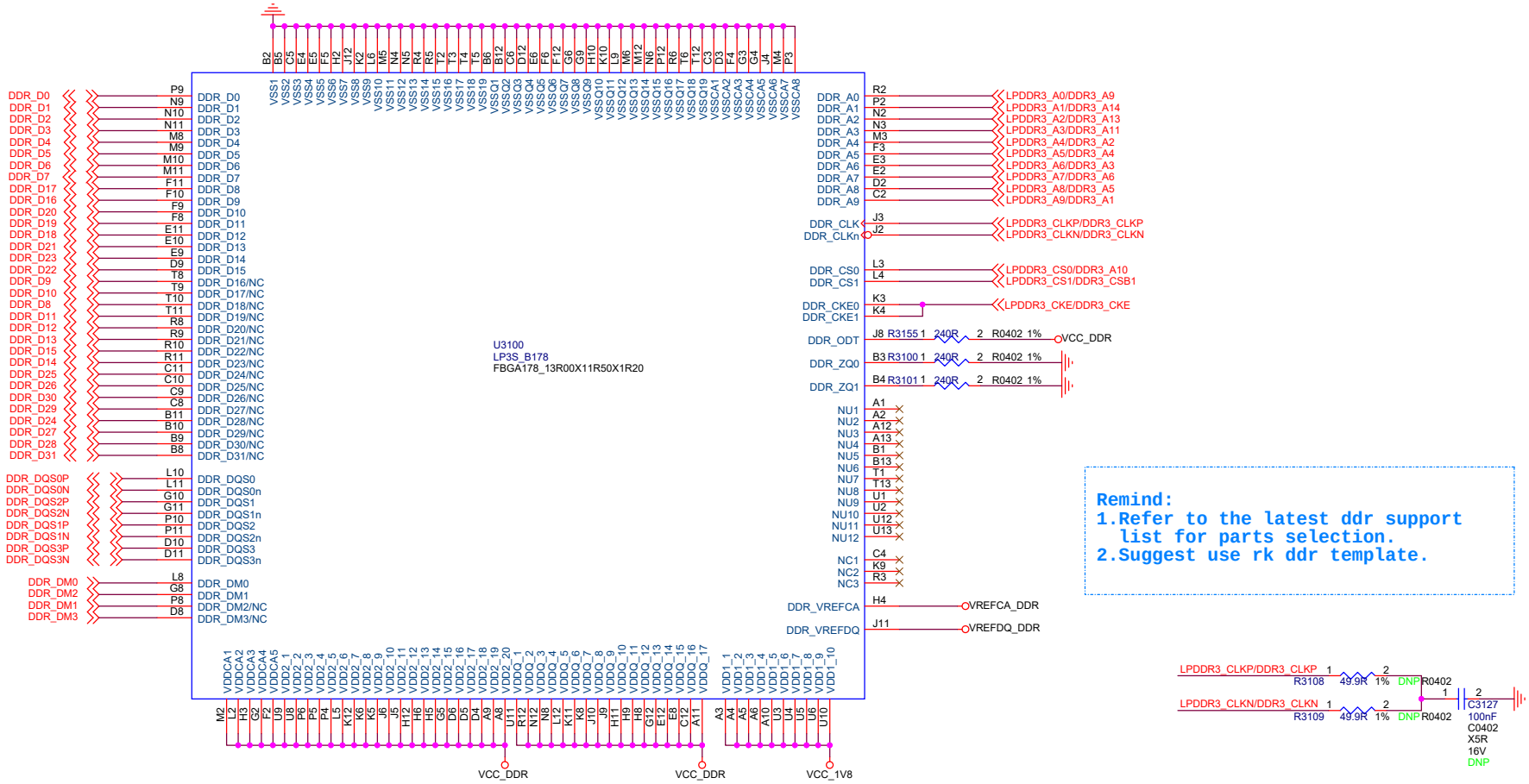




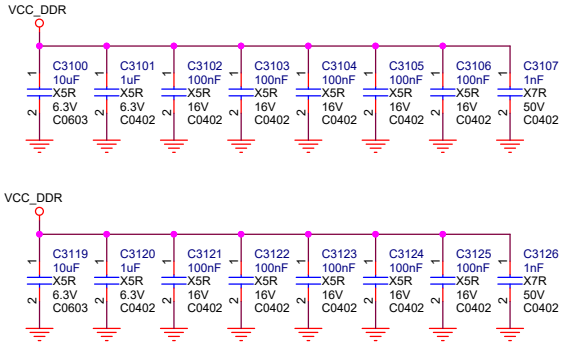
R3004=NC,R3003 need stuff.
R3004=0R,R3003=DNP.(Default)
Vrefo_DDR POWER will shut off if VDD_LOG power shut off.

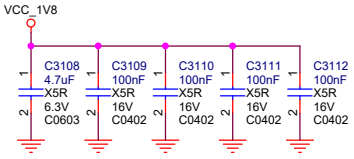
Rockchip 瑞芯微电子	Fuzhou Rockchip Electronics		
Project:	RK1808_REF_V10		
File:	RAM DDR3 4x16bit		
Date:	Thursday, January 03, 2019	Rev:	V1.0
Designed by:	Rzf	Sheet:	30 of 98

LPDDR3 1x32bit

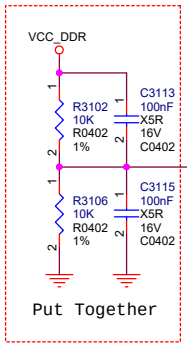


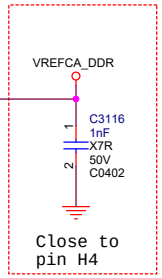
Remind:
1. Refer to the latest ddr support list for parts selection.
2. Suggest use rk ddr template.

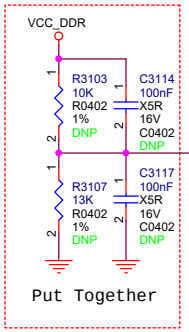


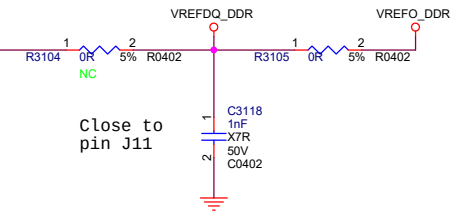


Note:
All the power filter capacitors should be placed close to the power pins of LPDDR3







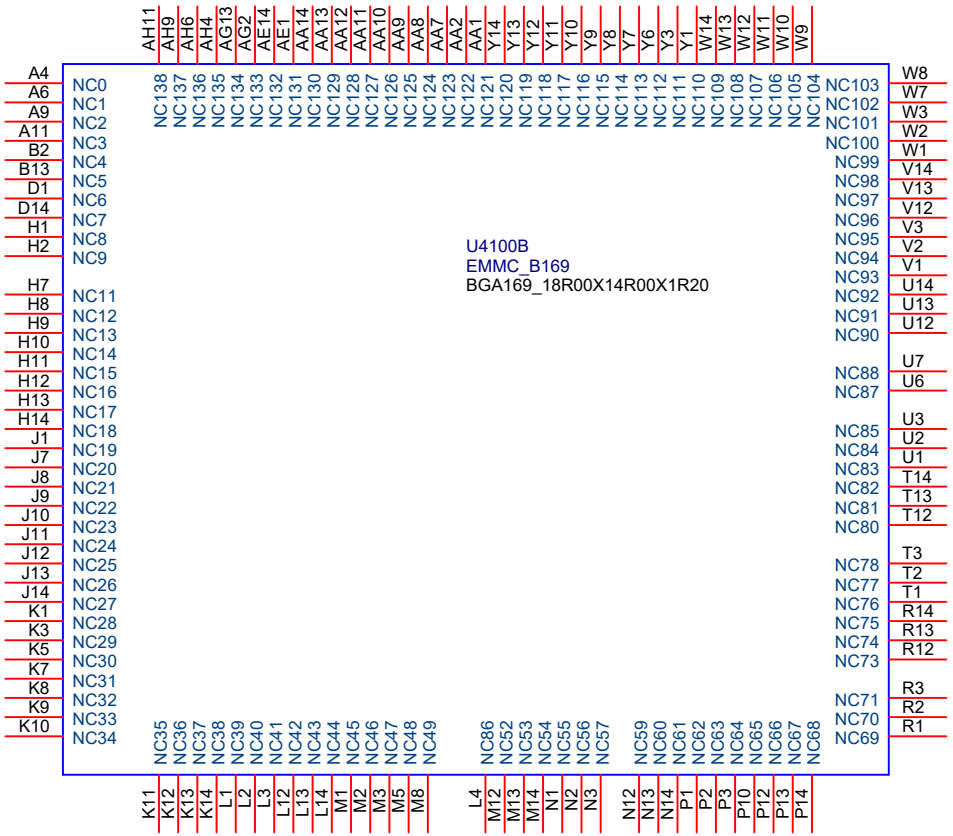


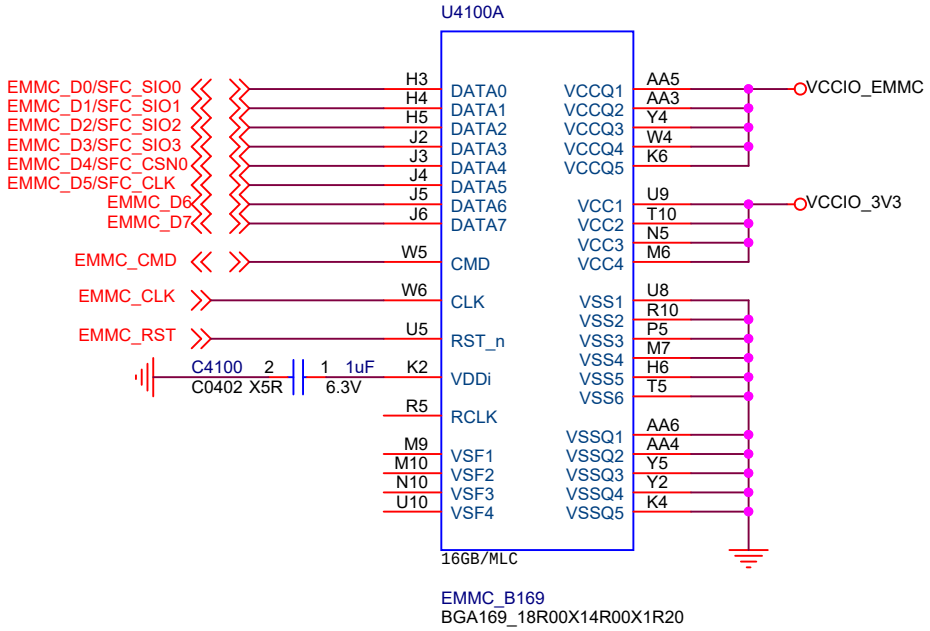
Note:
Vih=VCC
Vil=VCC*Ron/(Ron+Rodt)
VREFDQ_DDR=(Vih+Vil)/2

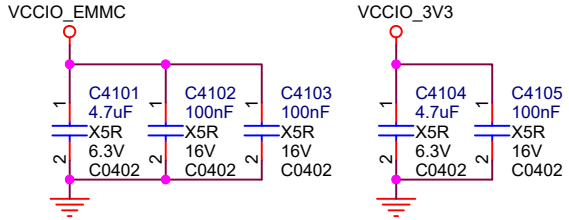
eg:VCC=1.2V,Ron=34ohm,Rodt=240ohm
so,Vih=1.2V,Vil=0.149V,VREFDQ_DDR=0.674V

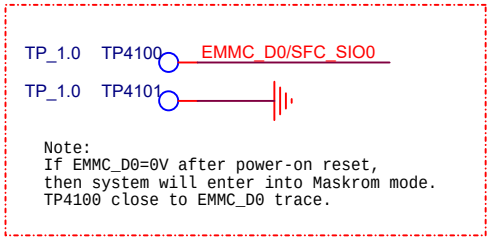
Rockchip 瑞芯微电子	Fuzhou Rockchip Electronics		
Project:	RK1808_REF_V10		
File:	31.RAM LPDDR3 1x32bit		
Date:	Thursday, January 03, 2019	Rev:	V1.0
Designed by:	Rzf	Sheet:	31 of 98

eMMC









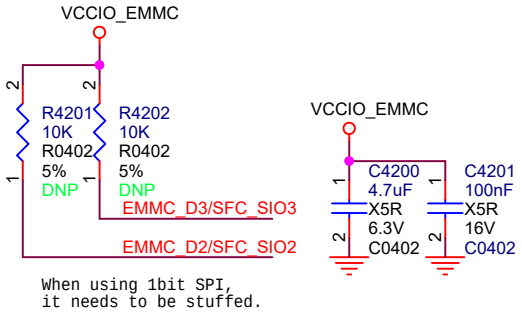
Remind: Refer to the latest eMMC Support List for parts selection.

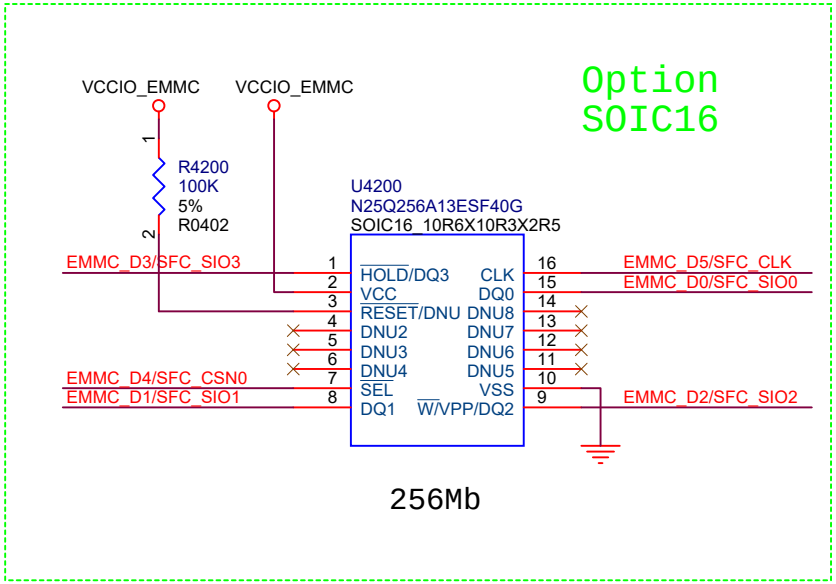
Fuzhou Rockchip Electronics			
Project:	RK1808_REF_V10		
File:	41.EMMC		
Date:	Thursday, January 03, 2019	Rev:	V1.0
Designed by:	Rzf	Sheet:	41 of 98

EMMC_D0/SFC_SIO0
EMMC_D1/SFC_SIO1
EMMC_D2/SFC_SIO2
EMMC_D3/SFC_SIO3
EMMC_D4/SFC_CSN0
EMMC_D5/SFC_CLK

SPI NOR Flash

Reserved for minimal system.

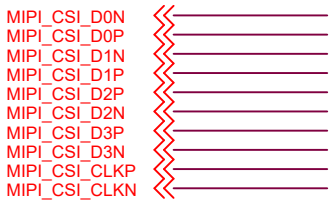


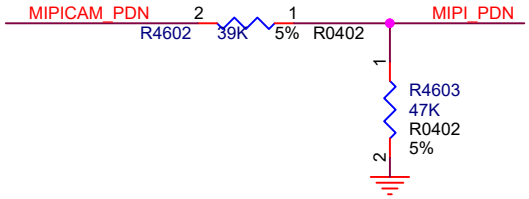


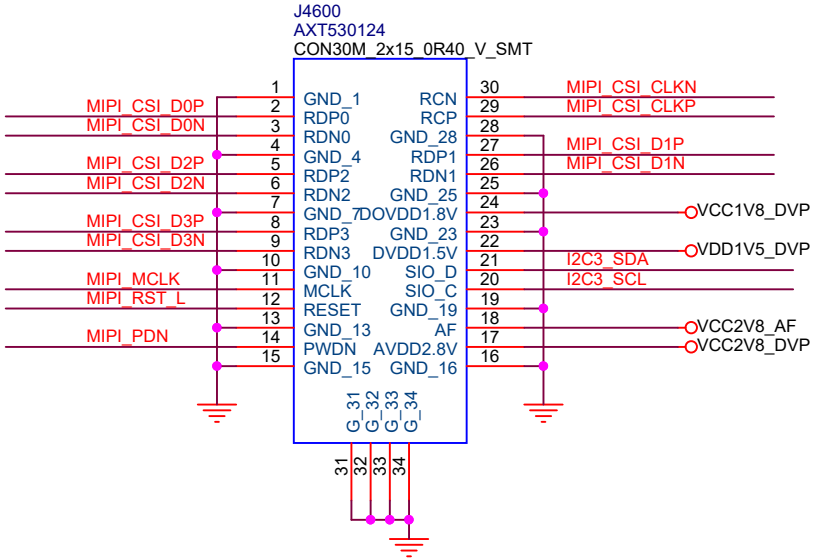
Rockchip 瑞芯微电子	Fuzhou Rockchip Electronics		
Project:	RK1808_REF_V10		
File:	42.SPI Flash		
Date:	Thursday, January 03, 2019	Rev:	V1.0
Designed by:	Rzf	Sheet:	42 of 98

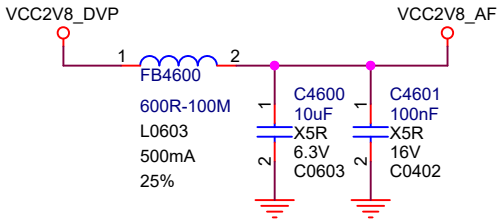
MIPI Camera

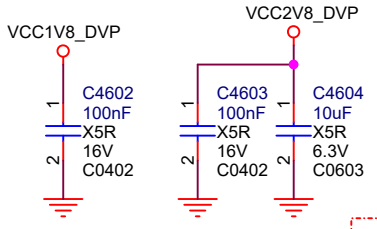
Option



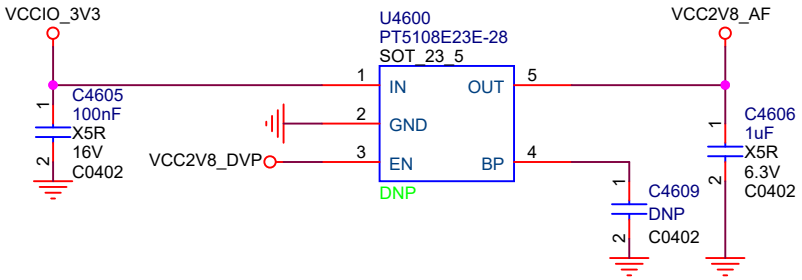


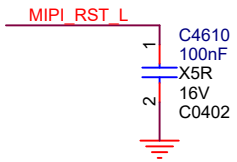


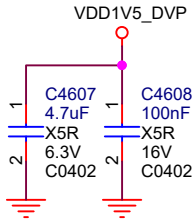




NOTE:
Adopt connection mode option2, mipi camera can't be used.



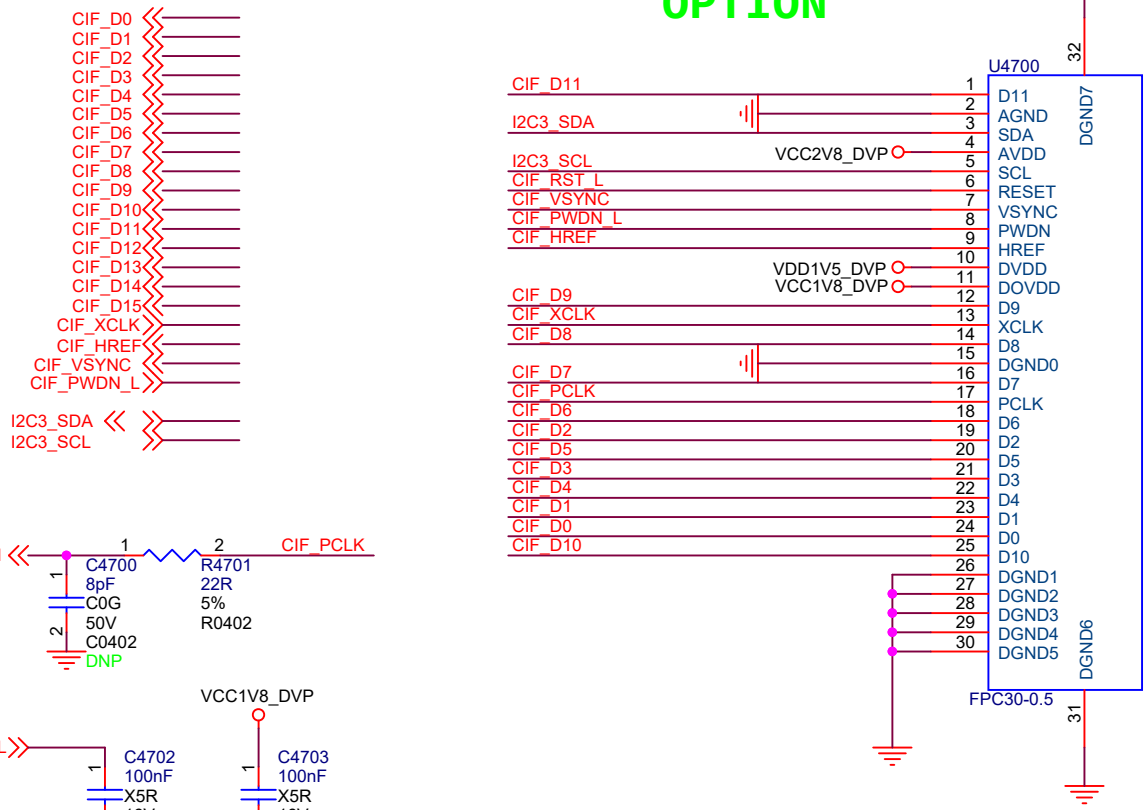




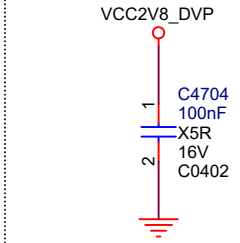
Rockchip 瑞芯微电子	Fuzhou Rockchip Electronics		
Project:	RK1808_REF_V10		
File:	46.MIPI Camera		
Date:	Thursday, January 03, 2019	Rev:	V1.0
Designed by:	Rzf	Sheet:	46 of 98

SENSOR:IMX323/ AR0230

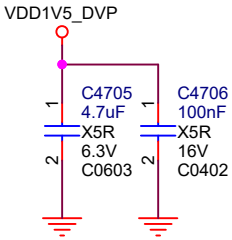
CIF CAM OPTION



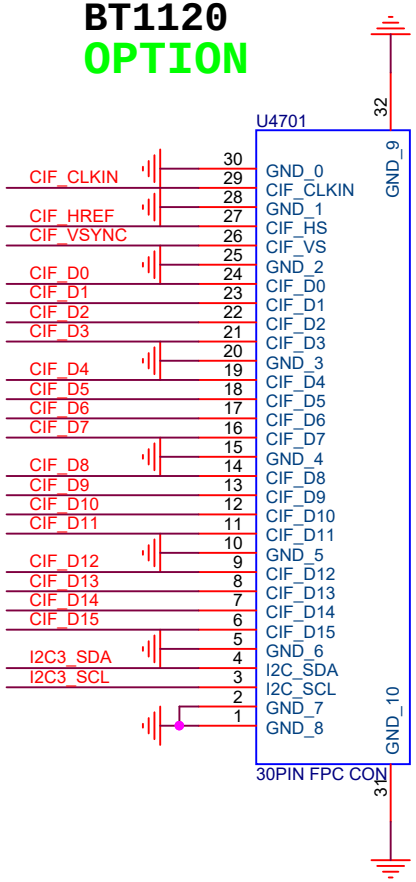
Adjust the voltage according to the sensor used



Adjust the voltage according to the sensor used



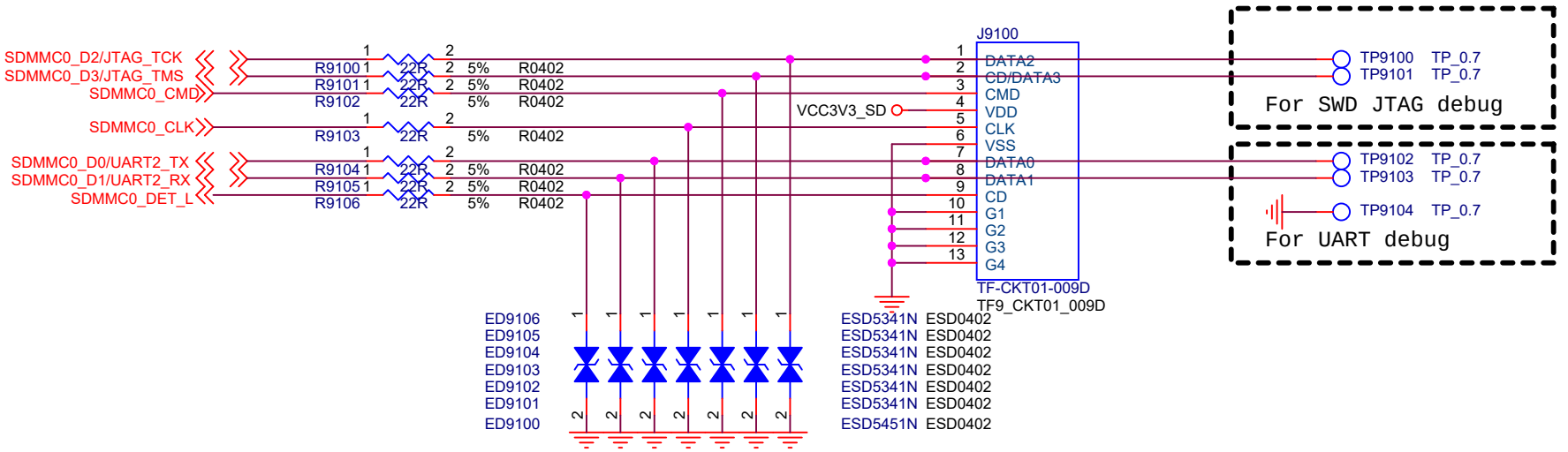
BT1120 OPTION

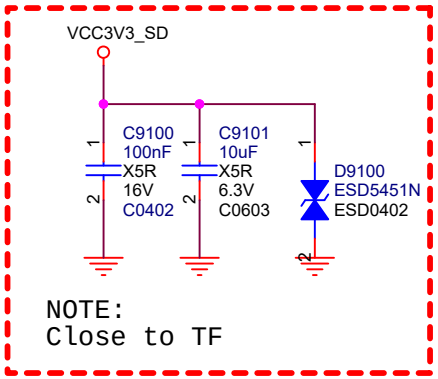


NOTE:
CIF and BT1120 bus, Only used one function at the same time.
Can be deleted if no need cif and bt1120.

Rockchip 瑞芯微电子	Fuzhou Rockchip Electronics		
Project:	RK1808_REF_V10		
File:	47.CIF Camera/BT1120 interface		
Date:	Thursday, January 03, 2019	Rev:	V1.0
Designed by:	Rzf	Sheet:	47 of 98

TF Card

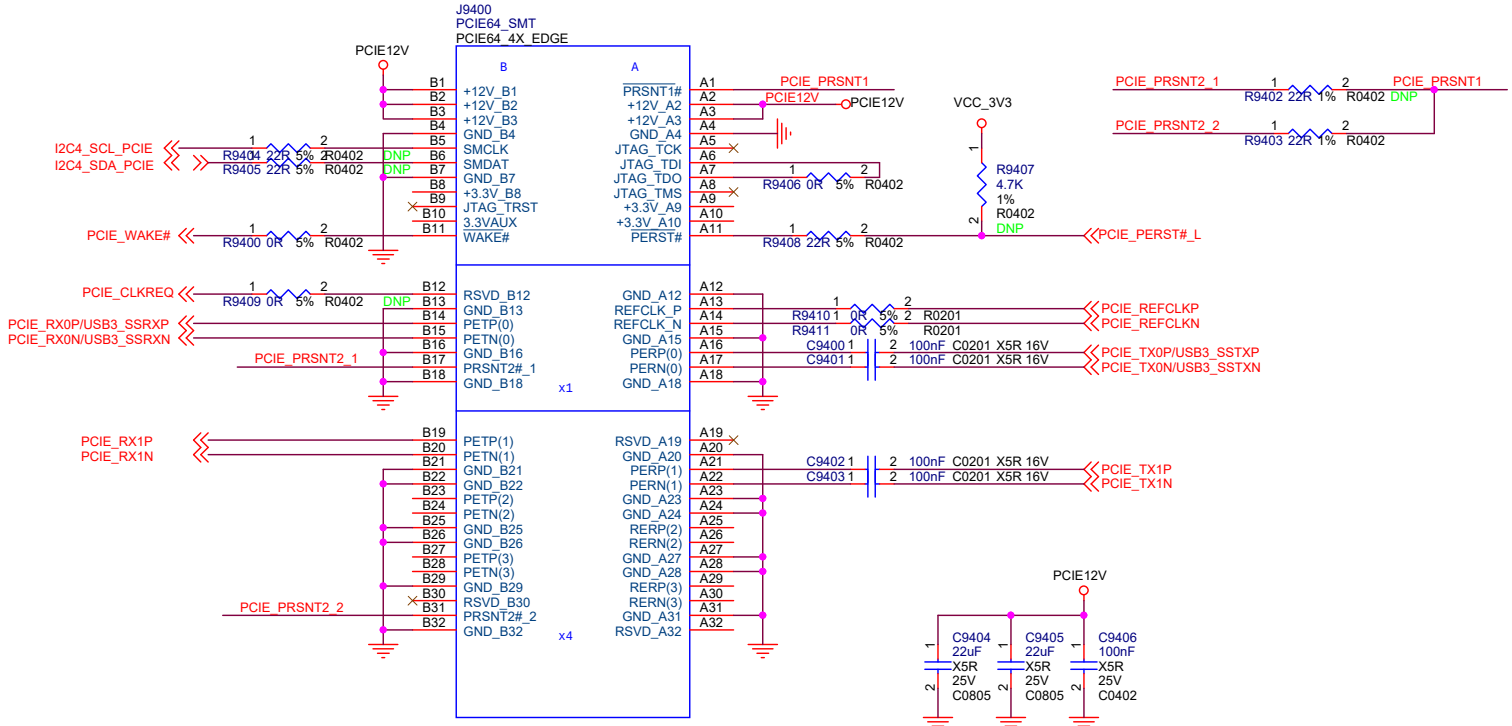




Rockchip 瑞芯微电子	Fuzhou Rockchip Electronics		
Project:	RK1808_REF_V10		
File:	91.TF Card		
Date:	Thursday, January 03, 2019	Rev:	V1.0
Designed by:	Rzf	Sheet:	91 of 98

PCI.Express

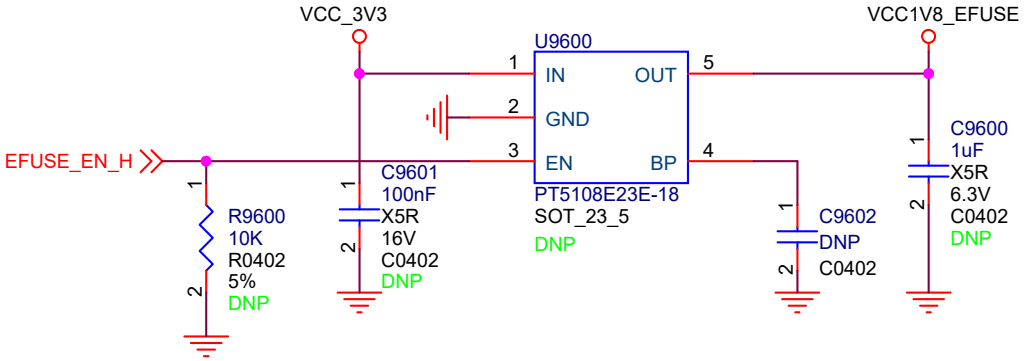
PCIE EP CONNECTOR OPTION3



Rockchip 瑞芯微电子	Fuzhou Rockchip Electronics		
Project:	RK1808_REF_V10		
File:	94.PCIEX4 slave		
Date:	Thursday, January 03, 2019	Rev:	V1.0
Designed by:	Rzf	Sheet:	94 of 98

Efuse

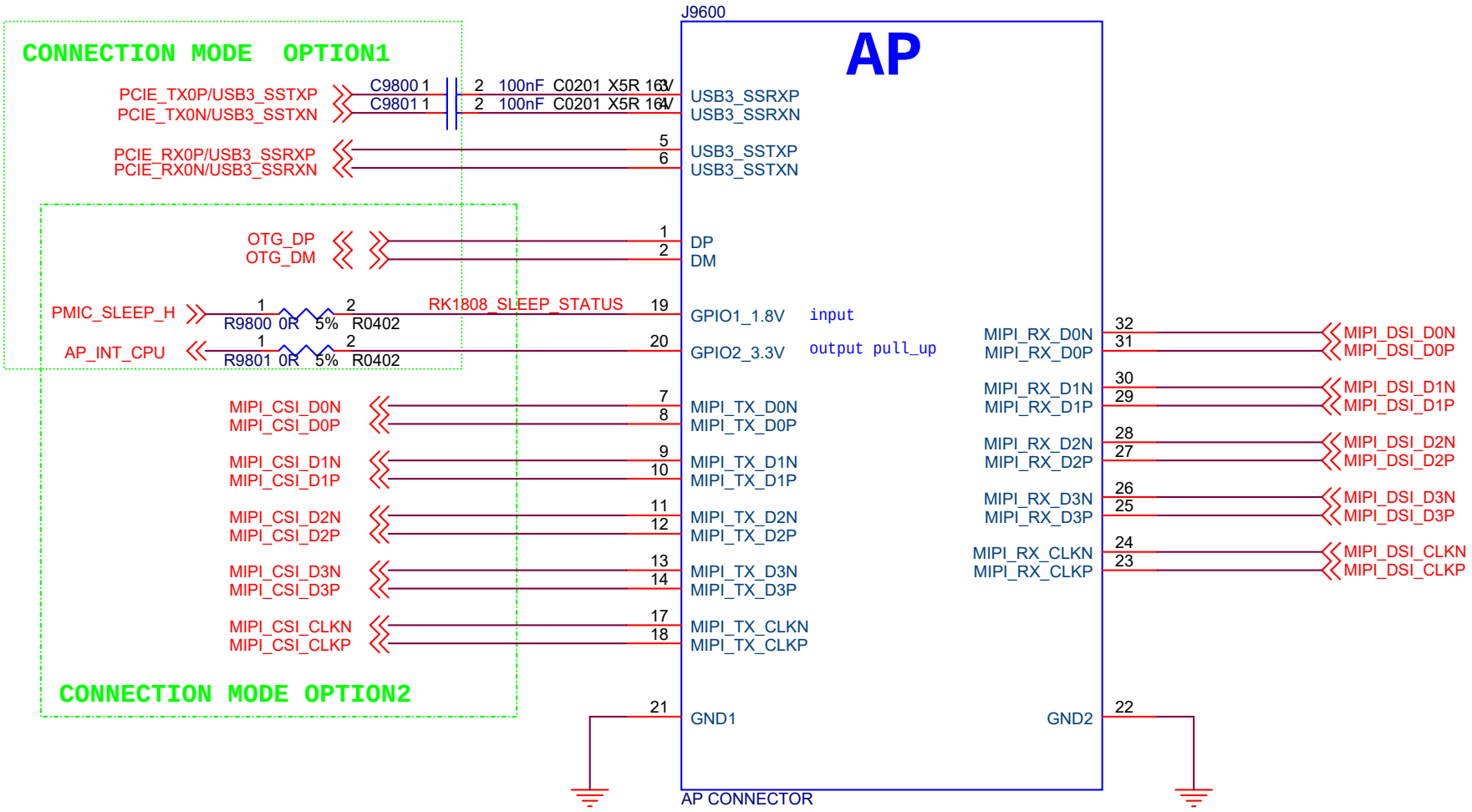
OPTION



OPTION:

If don't need efuse,
the Option can be removed

Rockchip 瑞芯微电子	Fuzhou Rockchip Electronics		
Project:	**RK1808_REF_V10**		
File:	**96.EFUSE**		
Date:	Thursday, January 03, 2019	Rev:	V1.0
Designed by:	Rzf	Sheet:	96 of 98



NOTE:
CONNECTION MODE:
1:USB20+USB30+GPIOX2(option1) Default
2.USB20+MIPI+GPIOX2(option2)
3.USB20+PCIE+GPIO(Option3)

USB20 OTG for down load,
USB30\MIPI\PCIE for transfer
large data; Gpio for detect sleep
status and int generation detect.

Rockchip 瑞芯微电子	Fuzhou Rockchip Electronics		
Project:	**RK1808_REF_V10**		
File:	**98.AP CONNECTOR**		
Date:	Thursday, January 03, 2019	Rev:	V1.0
Designed by:	Rzf	Sheet:	98 of 98