


# RV1126\_RV1109\_USB\_AI\_Camera\_DEMO\_DDR3P216DD6\_V11\_20200706

## Main Functions Introduction

- 01) Power: Discrete power supply
- 02) DRAM: DDR3 4Gb x 2
- 03) ROM: eMMC 8GB/SPI nand 512MB
- 04) Support USB2.0 OTG
- 05) Support MIPI CSI RX
- 06) Support Motor Dricer Control
- 07) Support Option MIC Array
- 08) Support Debug

 瑞芯微电子		Rockchip Electronics Co., Ltd	
Project:	RV1126_RV1109 AI Camera		
File:	00.Cover Page		
Date:	Monday, July 06, 2020		Rev: V1.1
Designed by:	whb	Reviewed by:	Sheet: 1 of 28

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## Index and Notes

### 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

#### NOTE 2:

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

## Generate Bill of Materials

#### Header:

Item\tPart\tDescription\tPCB Footprint\tReference\tQuantity\tOption

#### Combined property string:

{Item}\t{Value}\t{Description}\t{PCB Footprint}\t{Reference}\t{Quantity}\t{Option}

## Graphic Description



Note

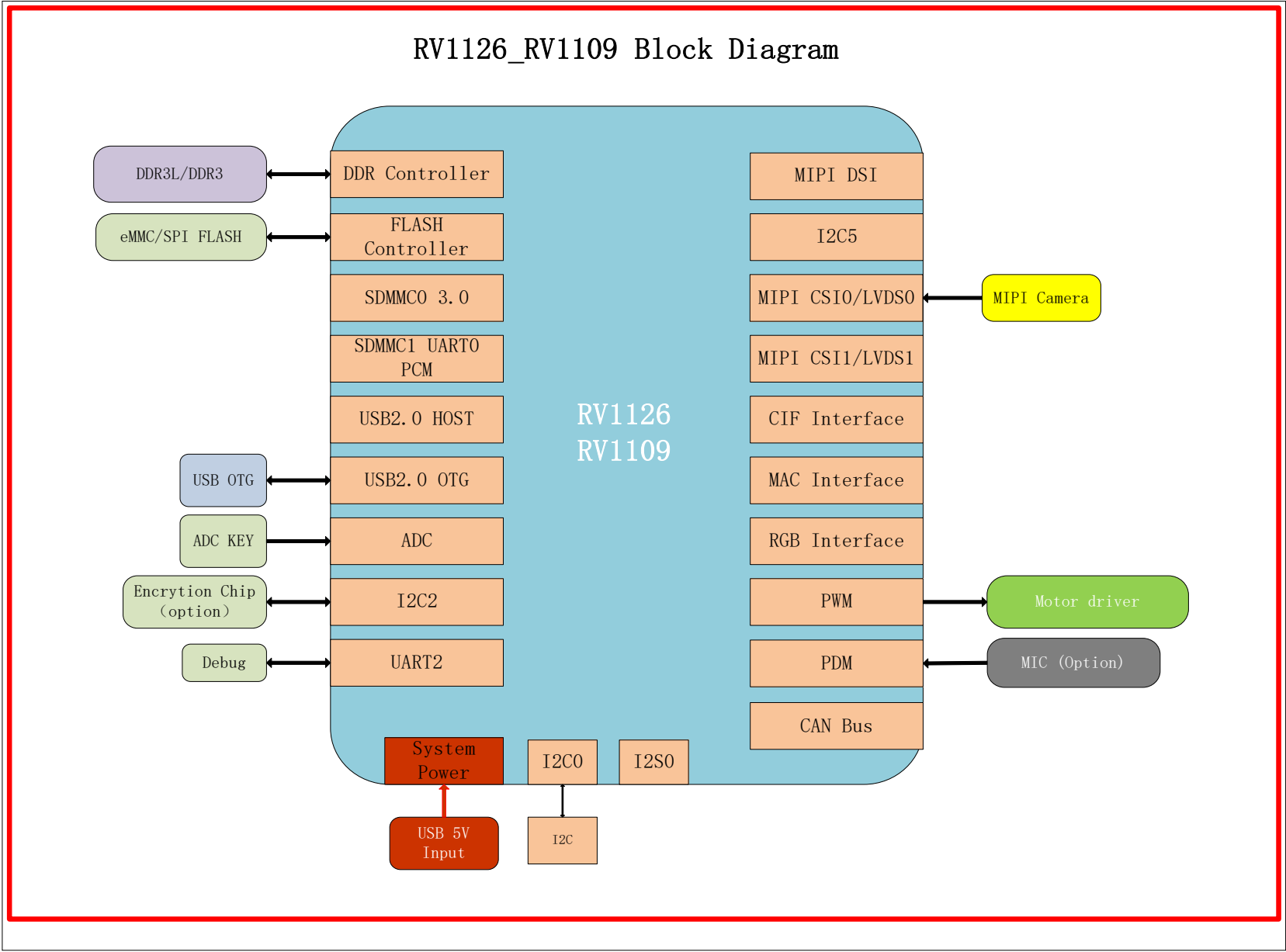


Option

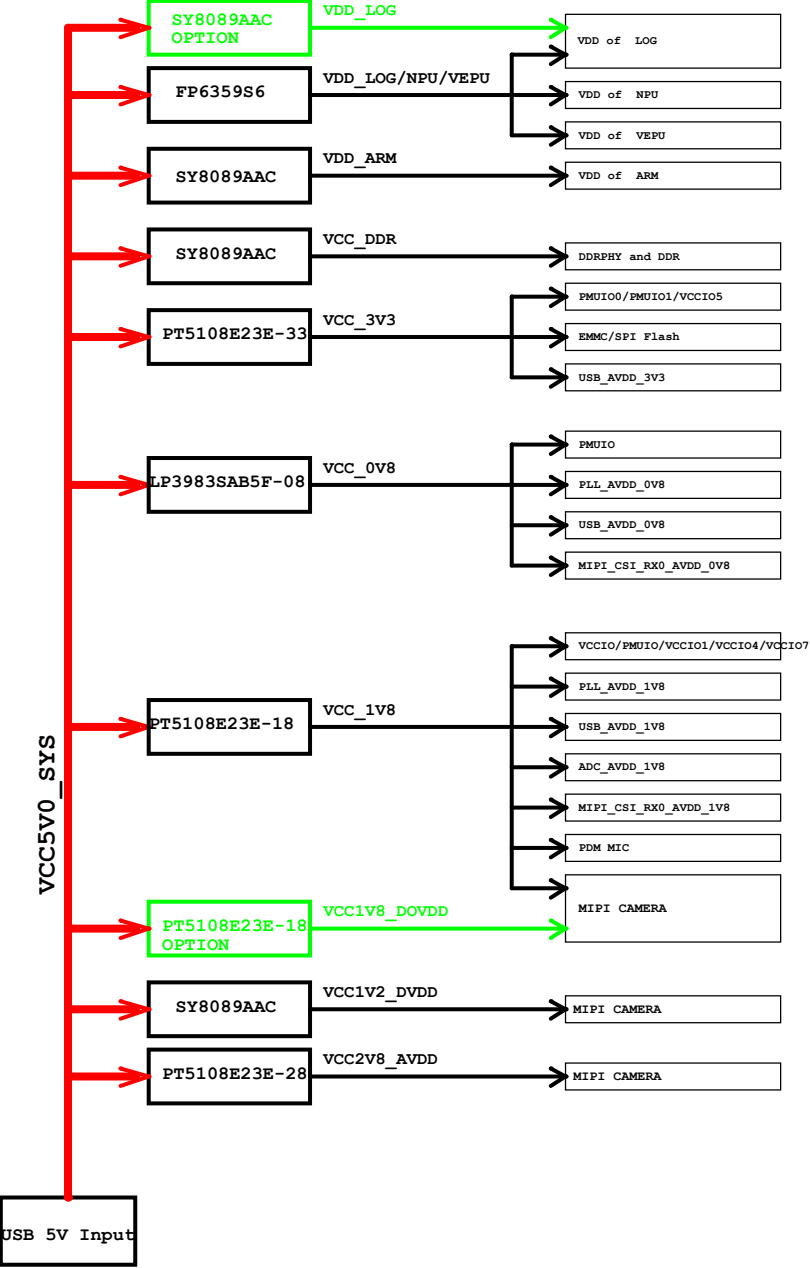


Description

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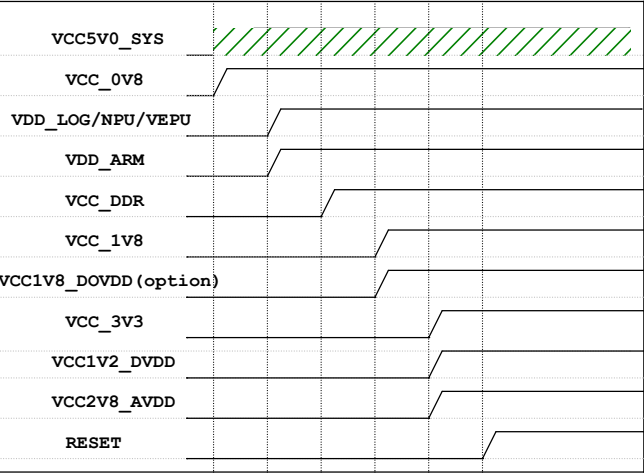


Power Diagram



Power-on Sequence

Power Name	PMIC Channel	Time Slot (step 6ms)	Default voltage	Supply Limit	Default ON/OFF	Sleep ON/OFF	Peak Current	Sleep Current
VCC_0V8	LDO	Slot: 1	0.8V	0.4A	ON	ON		
VDD_LOG/NPU/VEPU	BUCK	Slot: 2	0.825V	3.0A	ON	ON		
VDD_ARM	BUCK	Slot: 2	0.824V	2.0A	ON	ON		
VCC_DDR	BUCK	Slot: 3	1.35V	1.0A	ON	ON		
VCC_1V8	LDO	Slot: 4	1.8V	0.5A	ON	ON		
VCC1V8 DOVDD(option)	LDO	Slot: 4	1.8V	0.5A	ON	ON		
VCC_3V3	LDO	Slot: 5	3.3V	0.5A	ON	ON		
VCC1V2 DVDD	BUCK	Slot: 5	1.2V	1.0A	ON	ON		
VCC2V8 AVDD	LDO	Slot: 5	2.8V	0.5A	ON	ON		



# I2C MAP

**RV1126**  
**RV1109**

I2C0

I2C1

I2C1\_SCL  
I2C1\_SDA

Pull-up voltage:1.8V  
Rate: TBD

MIPI camera  
I2C add = TBD

I2C2

I2C2\_SCL  
I2C2\_SDA

Pull-up voltage:3.3V  
Rate: TBD

Encrytion Chip  
I2C add = TBD

M0

I2C3

M1

M2

M0

I2C4

M1

M0

I2C5\_SCL\_M0  
I2C5\_SDA\_M0

Pull-up voltage:3.3V  
Rate: TBD

MIC Array(Optional)  
I2C add = TBD

I2C5

M1

M2

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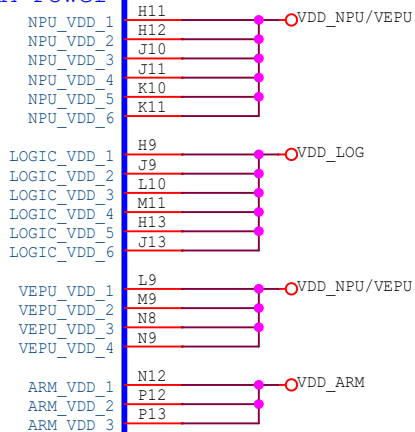
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File:	05.I2C MAP						
Date:	Monday, July 06, 2020				Rev:	V1.1	
Designed by:	whb	Reviewed by:		Sheet:	6	of 28	

IO Power Domain Map

IO Domain	IO Group	Support of IO Voltage		Default Actual assigned IO Domain Voltage			Notes
		1.8V	3.3V	Net Name of Power Supply	Power Source	Voltage	
PMUIO0	<i><b>GPIO0A</b></i>	✓	✓	VCC_3V3		3.3V	
PMUIO1	<i><b>GPIO0BC</b></i>	✓	✓	VCC_3V3		3.3V	
VCCIO1	<i><b>GPIO0CD/GPIO1A</b></i>	✓	✓	VCCIO_FLASH		1.8/3.3V	<i>GPIO0_B3/FLASH_VOL_SEL pin defined as a set pin for VCCIO1 voltage domain after power-on reset.It is pull-up for 1.8V</i>
VCCIO2	<i><b>GPIO1AB</b></i>	✓	✓	NC			
VCCIO3	<i><b>GPIO1BCD</b></i>	✓	✓	NC			
VCCIO4	<i><b>GPIO1D/GPIO2A</b></i>	✓	✓	VCC_1V8		1.8V	
VCCIO5	<i><b>GPIO2ABCD/GPIO3A</b></i>	✓	✓	VCC_3V3		3.3V	
VCCIO6	<i><b>GPIO3ABC</b></i>	✓	✓	NC			
VCCIO7	<i><b>GPIO3D/GPIO4A</b></i>	✓	✓	VCC_1V8		1.8V	

U1000N  
RV1126\_RV1109  
BGA409\_14R00X14R00X0R90

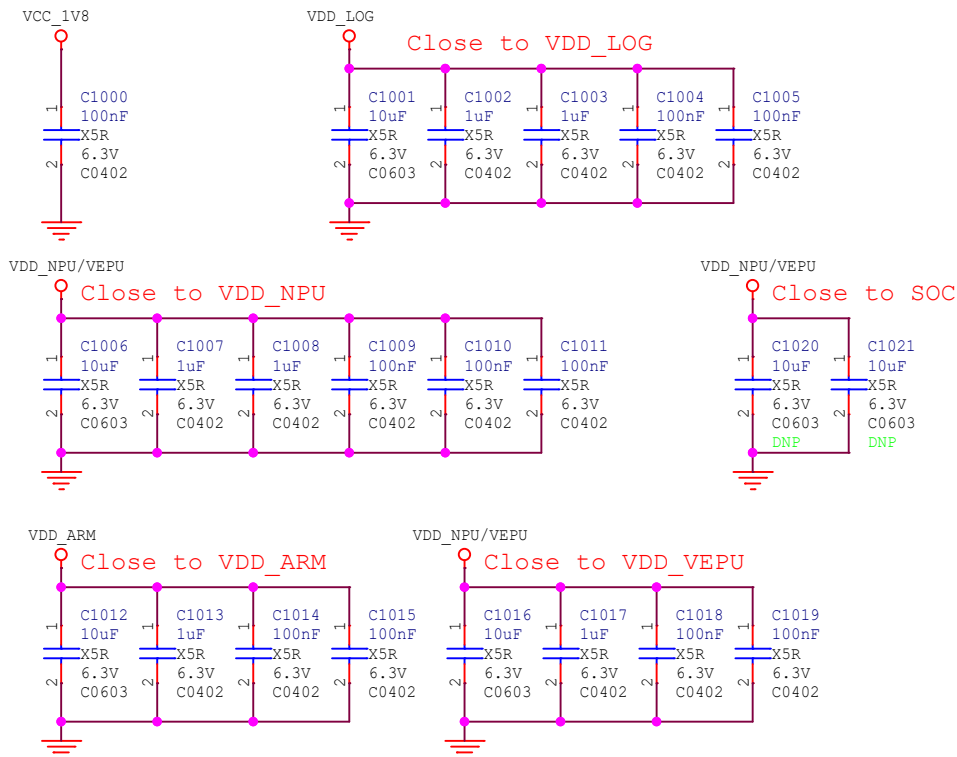
## NPU/LOGIC/VEPU/ARM Power



## Supply for VCCIO1~7 Power

VCCIO\_VDD\_1V8

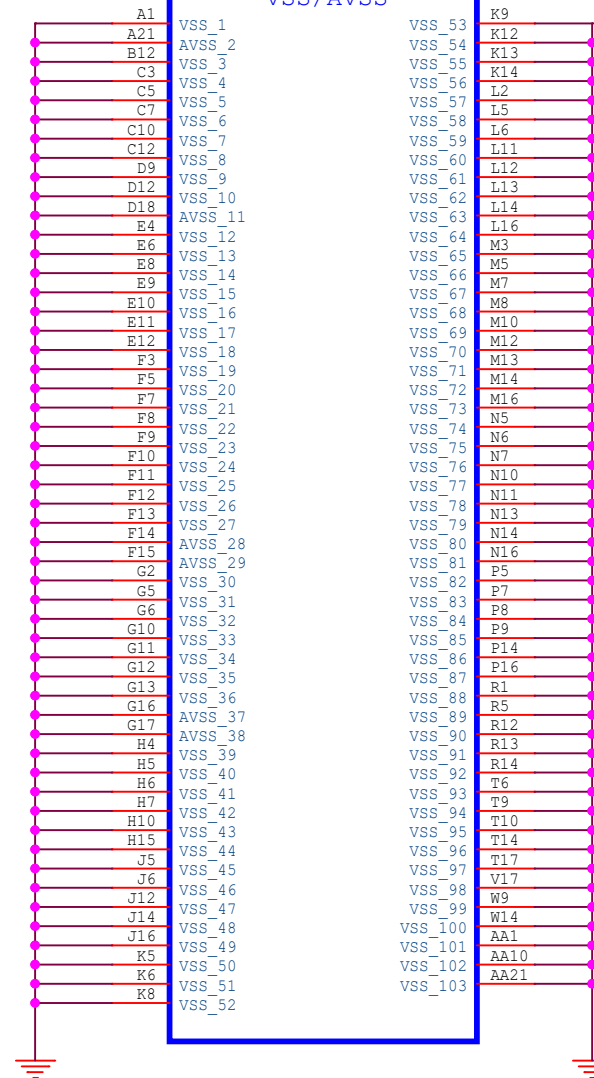
Close to VDD\_LOG



## GND

U1000O  
RV1126\_RV1109  
BGA409\_14R00X14R00X0R90

## VSS/AVSS



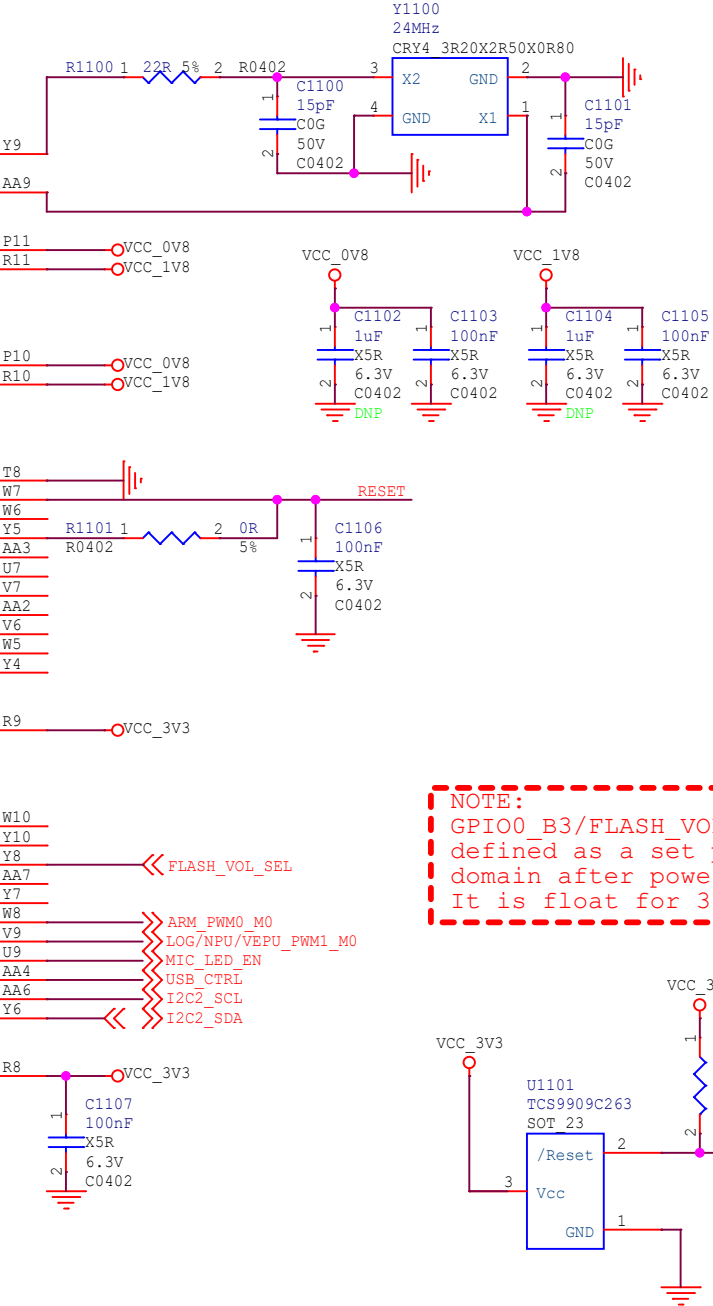
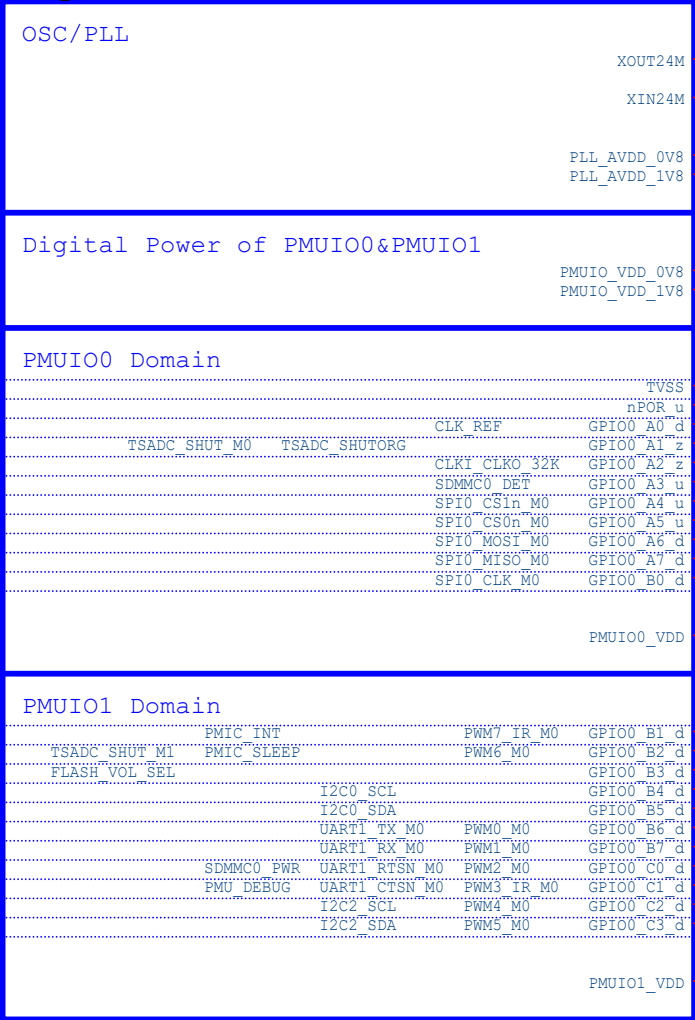
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Project:	RV1126_RV1109 AI Camera		
File:	10.RV1126/1109_Power/GND		
Date:	Monday, July 06, 2020	Rev:	V1.1
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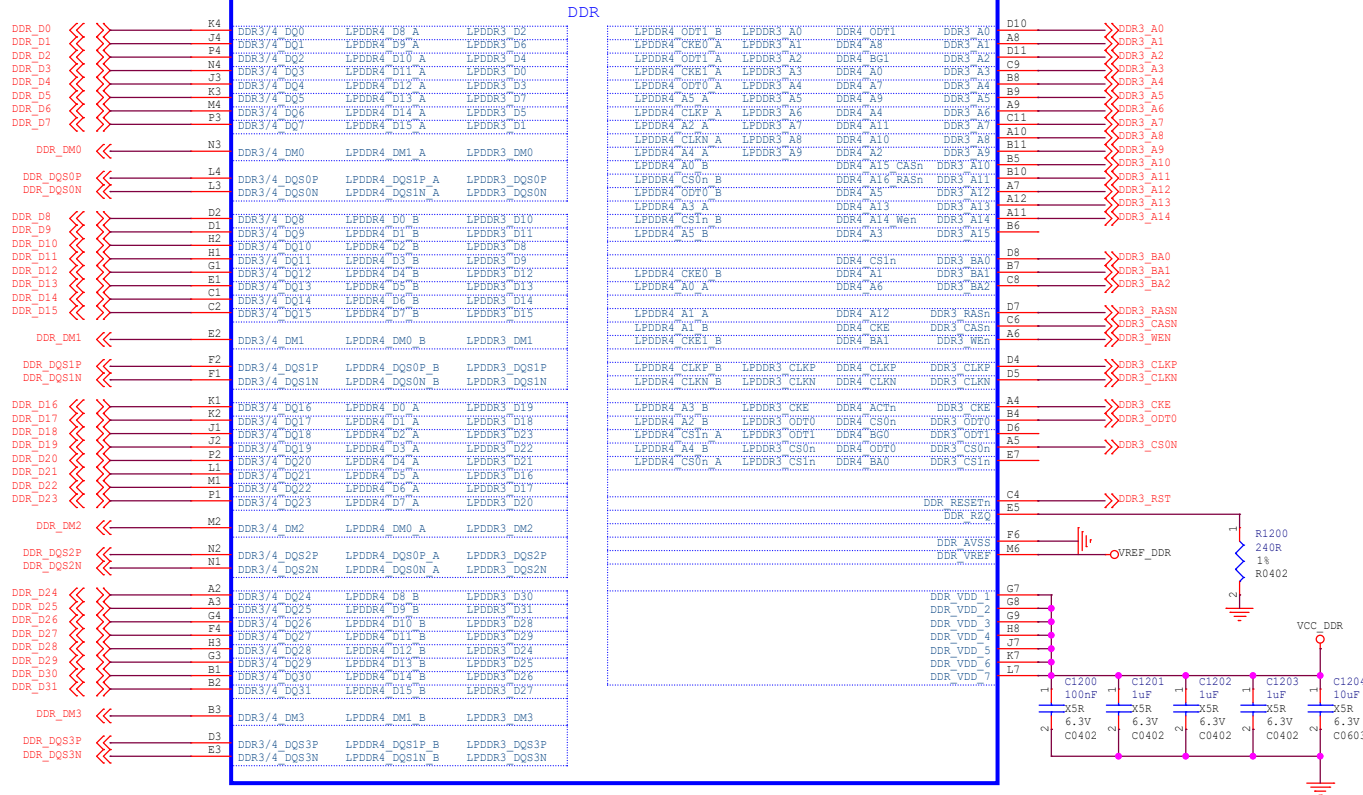
OSC/PLL/PMUIO

U1000K  
RV1126\_RV1109  
BGA409\_14R00X14R00X0R90

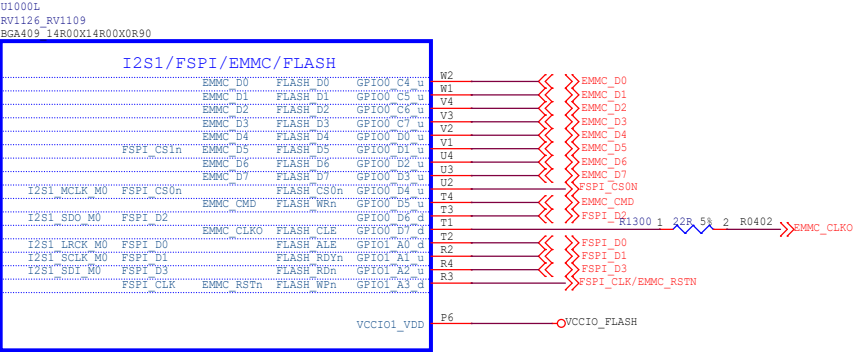


RESET IC

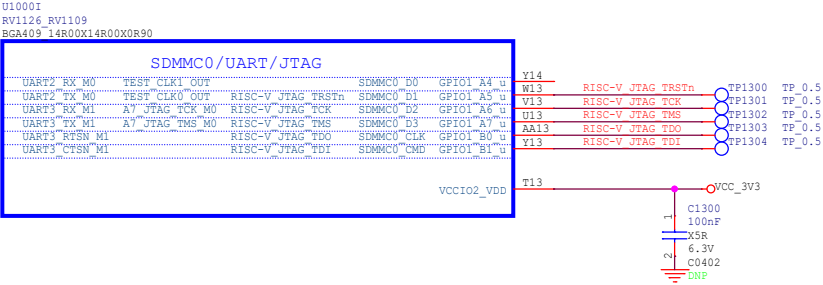
U1000A  
RV1126 RV1109  
BGA409 14R00X14R00X0R90



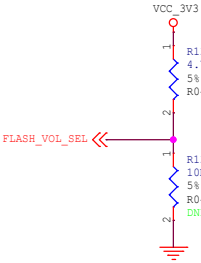
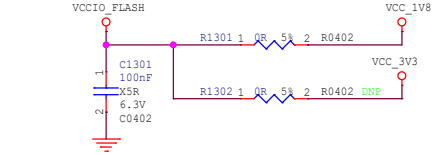
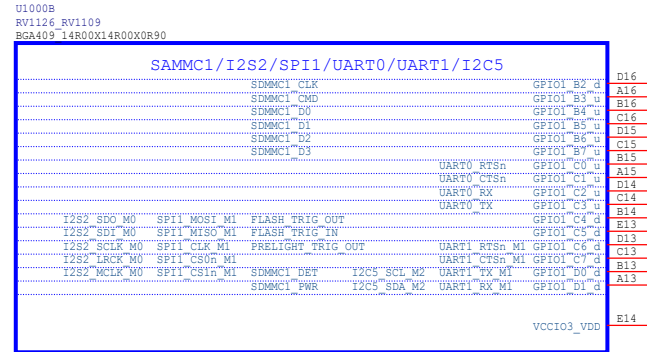
EMMC/FLASH



SDMMC0/JTAG



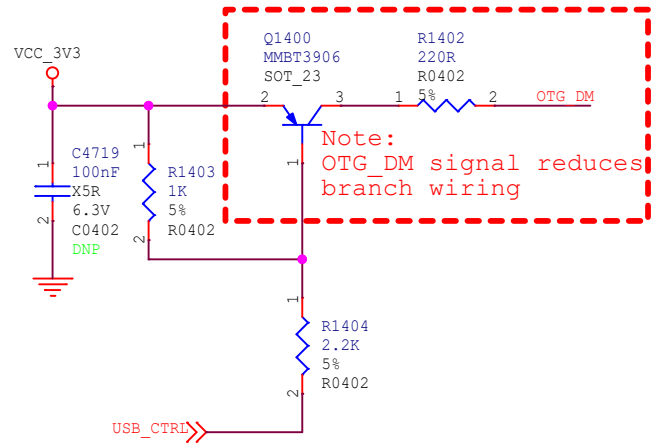
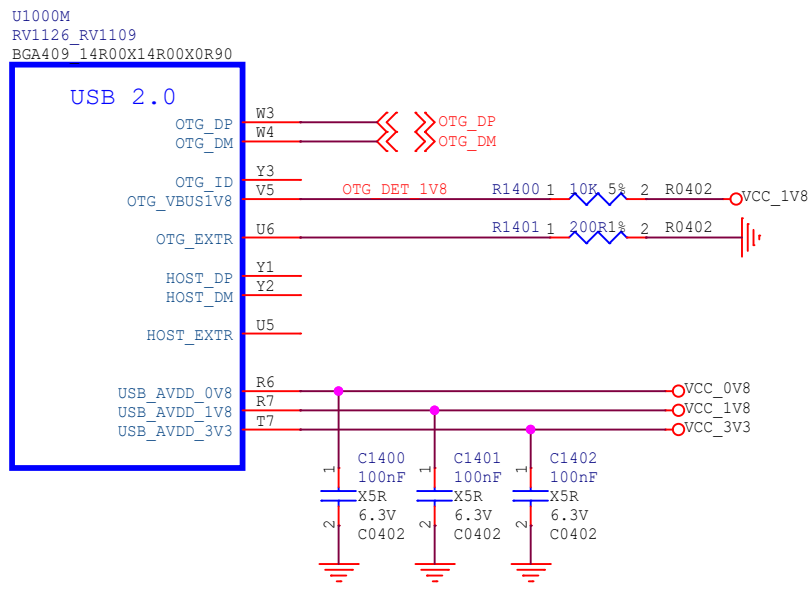
SDMMC1/UART/I2S2




NOTE:  
FLASH(VCCIO1) power domain IO supply configuration pin:

Condition	VCCIO1 (VCCIO_FLASH)
FLASH_VOL_SEL=0	3.3V
FLASH_VOL_SEL=1	1.8V Default

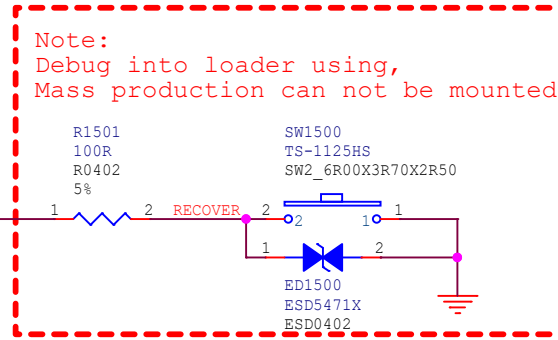
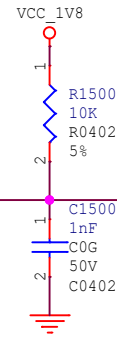
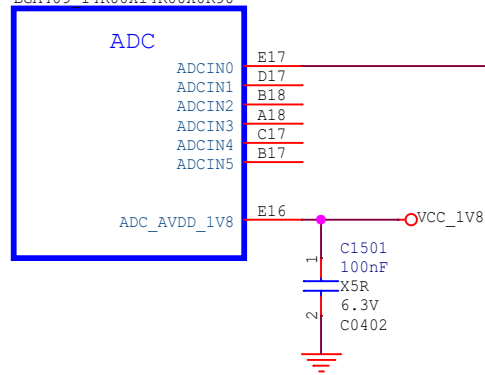
# USB Controller




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Project:	RV1126_RV1109 AI Camera		
File:	14.RV1126/1109_USB Controller		
Date:	Monday, July 06, 2020		Rev: V1.1
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# SARADC

U1000C  
RV1126\_RV1109  
BGA409\_14R00X14R00X0R90



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Project:	RV1126_RV1109 AI Camera		
File:	15.RV1126/1109_SARADC		
Date:	Monday, July 06, 2020		Rev: V1.1
Designed by:	whb	Reviewed by:	Sheet: 13 of 28

## CIF Interface

U1000P  
RV1126\_RV1109  
BGA409\_14R00X14R00X0R90

### CIF/RGMII/I2S/PDM/UART/SPI/I2C

CIF_D0_M0		I2S0_SCLK_TX_M1	UART4_TX_M0	I2C3_SCL_M0	PWM8_M0	GPIO3_A4_d	R17
CIF_D1_M0	RGMII_CRS_M0	I2S0_LRCK_TX_M1	UART4_RX_M0	I2C3_SDA_M0	PWM9_M0	GPIO3_A5_d	T18
CIF_D2_M0	RGMII_COL_M0	I2S0_SD00_M1	UART5_TX_M0	CAN_RXD_M1	PWM10_M0	GPIO3_A6_d	P17
CIF_D3_M0	RGMII_RXD2_M0	I2S0_SD10_M1	UART5_RX_M0	CAN_TXD_M1	PWM11_IR_M0	GPIO3_A7_d	R18
CIF_D4_M0	RGMII_RXD3_M0	I2S0_MCLK_M1	UART5_RTSN_M0	I2C5_SCL_M1		GPIO3_B0_d	T19
CIF_D5_M0	RGMII_TXD2_M0	I2S0_SCLK_RX_M1	UART5_CTSN_M0	I2C5_SDA_M1		GPIO3_B1_d	T20
CIF_D6_M0	RGMII_TXD3_M0	I2S0_LRCK_RX_M1	UART4_RTSN_M0			GPIO3_B2_d	N17
CIF_D7_M0	RGMII_TXD0_M0	I2S0_SD01_SD13_M1	UART4_CTSN_M0			GPIO3_B3_d	R19
CIF_D8_M0	RGMII_TXD1_M0	I2S0_SD02_SD12_M1	SPI1_CS1n_M0			GPIO3_B4_d	T21
CIF_D9_M0	RGMII_TXEN_M0	I2S0_SD03_SD11_M1	SPI1_CS0n_M0			GPIO3_B5_d	N18
CIF_D10_M0	RGMII_RXD0_M0	PDM_SD12_M1	SPI1_MOSI_M0			GPIO3_B6_d	R20
CIF_D11_M0	RGMII_RXD1_M0	PDM_SD13_M1	SPI1_MISO_M0			GPIO3_B7_d	R21
CIF_D12_M0	RGMII_CLK_M0	PDM_CLK0_M1	SPI1_CLK_M0			GPIO3_C0_d	N19
CIF_D13_M0	RGMII_RX0V_M0	PDM_SD10_M1				GPIO3_C1_d	M17
CIF_D14_M0	RGMII_RX0V_M0	PDM_SD11_M1				GPIO3_C2_d	M18
CIF_D15_M0	RGMII_MDIO_M0	PDM_CLK1_M1				GPIO3_C3_d	N20
CIF_VSYNC_M0	RGMII_MDC_M0		UART3_RTSN_M0			GPIO3_C4_d	M19
CIF_CLKIN_M0	CLK_OUT_ETHERNET_M0		UART3_CTSN_M0			GPIO3_C5_d	P19
CIF_CLKOUT_F_M0	RGMII_TXCLK_M0		UART3_TX_M0			GPIO3_C6_d	P20
CIF_HSYNC_M0	RGMII_RXCLK_M0		UART3_RX_M0			GPIO3_C7_d	
VCCIO6_VDD							M15

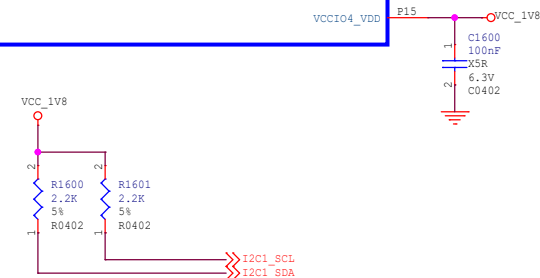
## I2C/SPI/MIPI-CLK

U1000G  
RV1126\_RV1109  
BGA409\_14R00X14R00X0R90

### SPI/I2C/I2S/UART/MIPI\_CLK

I2C1_SDA	UART4_RTSN_M2	GPIO1_B2_u	W19
I2C1_SCL	UART4_CTSN_M2	GPIO1_B3_u	V21
SPI0_CS1n_M1	I2S1_MCLK_M1	UART4_RX_M2	R20
SPI0_MOSI_M1	I2S1_SCLK_M1	I2C3_SCL_M2	V20
SPI0_MISO_M1	I2S1_LRCK_M1	I2C3_SDA_M2	V19
SPI0_CS0n_M1	I2S1_SDI_M1	UART5_TX_M2	U18
SPI0_CLK_M1	I2S1_SDO_M1	UART5_RX_M2	U19
MIPI_CSI_CLK1_UART5_RTSN_M2			U20
MIPI_CSI_CLK0_UART5_CTSN_M2			U21
GPIO2_A2_d			W21
GPIO2_A3_d			V21

I2C1\_SDA  
I2C1\_SCL  
MIPI\_RX0\_FDN  
CAMERA\_RST  
MIPI\_CSI\_CLK0



## MIPI-CSI Interface

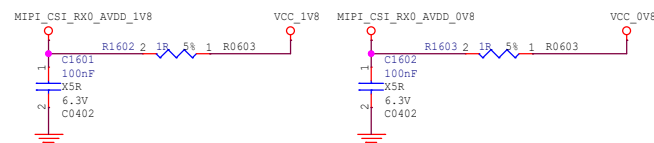
U1000H  
RV1126\_RV1109  
BGA409\_14R00X14R00X0R90

### MIPI CSI RX1

MIPI_CSI_RX1_D0P	LVDS1_RX0P	AA20
MIPI_CSI_RX1_D0N	LVDS1_RX0N	Y20
MIPI_CSI_RX1_D1P	LVDS1_RX1P	AA19
MIPI_CSI_RX1_D1N	LVDS1_RX1N	Y19
MIPI_CSI_RX1_D2P	LVDS1_RX2P	AA18
MIPI_CSI_RX1_D2N	LVDS1_RX2N	Y18
MIPI_CSI_RX1_D3P	LVDS1_RX3P	Y17
MIPI_CSI_RX1_D3N	LVDS1_RX3N	W17
MIPI_CSI_RX1_CLKP	LVDS1_CLKP	V18
MIPI_CSI_RX1_CLKN	LVDS1_CLKN	W18
MIPI_CSI_RX1_AVDD_0V8		R15
MIPI_CSI_RX1_AVDD_1V8		R16

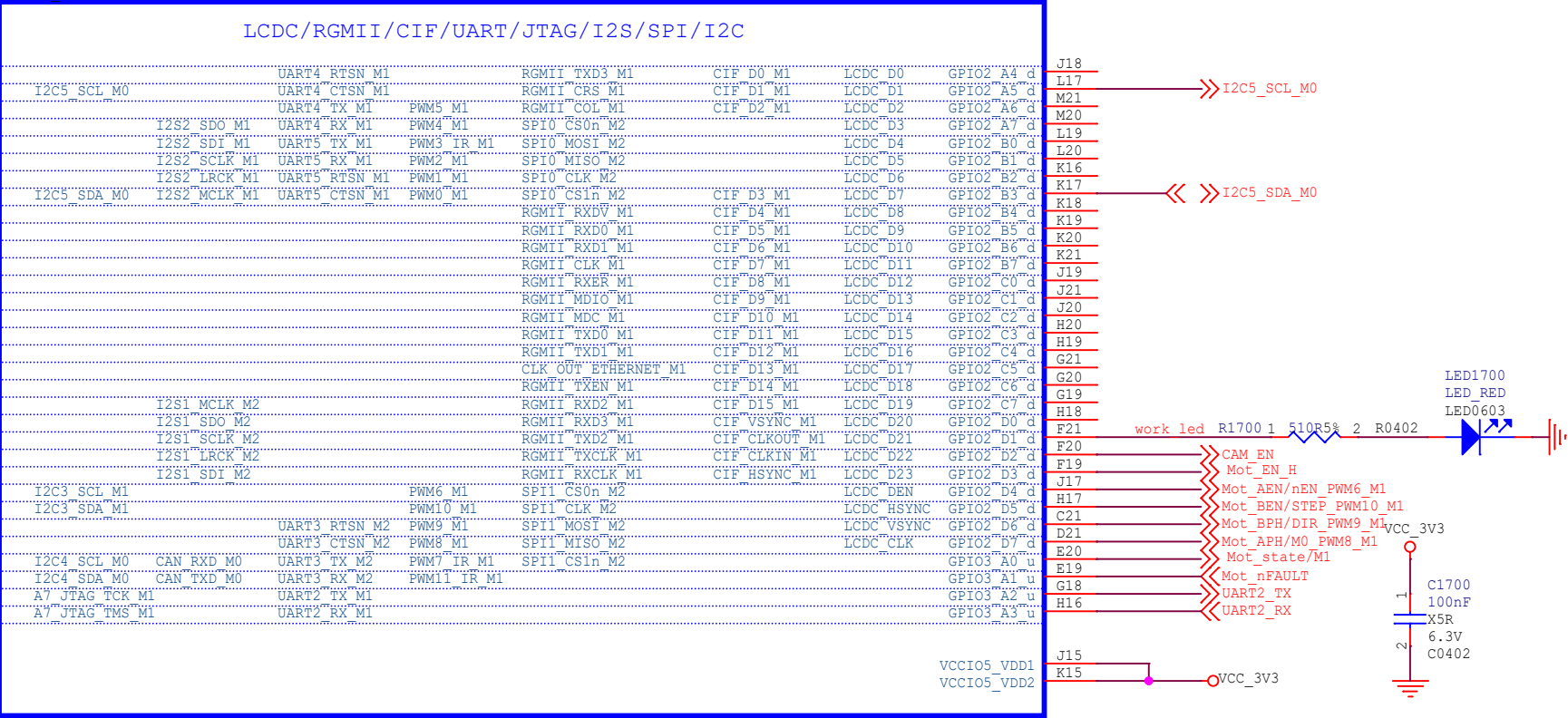
### MIPI CSI RX0

MIPI_CSI_RX0_D0P	LVDS0_RX0P	V16
MIPI_CSI_RX0_D0N	LVDS0_RX0N	U16
MIPI_CSI_RX0_D1P	LVDS0_RX1P	Y16
MIPI_CSI_RX0_D1N	LVDS0_RX1N	W16
MIPI_CSI_RX0_D2P	LVDS0_RX2P	W15
MIPI_CSI_RX0_D2N	LVDS0_RX2N	Y15
MIPI_CSI_RX0_D3P	LVDS0_RX3P	AA15
MIPI_CSI_RX0_D3N	LVDS0_RX3N	AA16
MIPI_CSI_RX0_CLKP	LVDS0_CLKP	U15
MIPI_CSI_RX0_CLKN	LVDS0_CLKN	V15
MIPI_CSI_RX0_AVDD_0V8		T15
MIPI_CSI_RX0_AVDD_1V8		T16



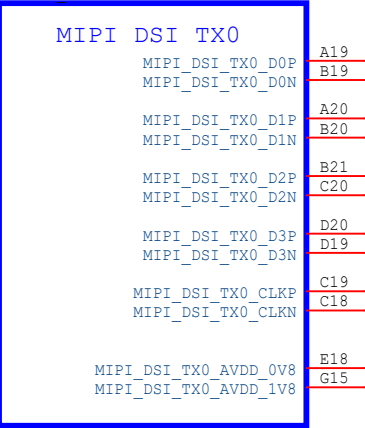
LCDC/RGMII/PWM

U1000E  
RV1126\_RV1109  
BGA409 14R00X14R00X0R90



MIPI-DSI Interface

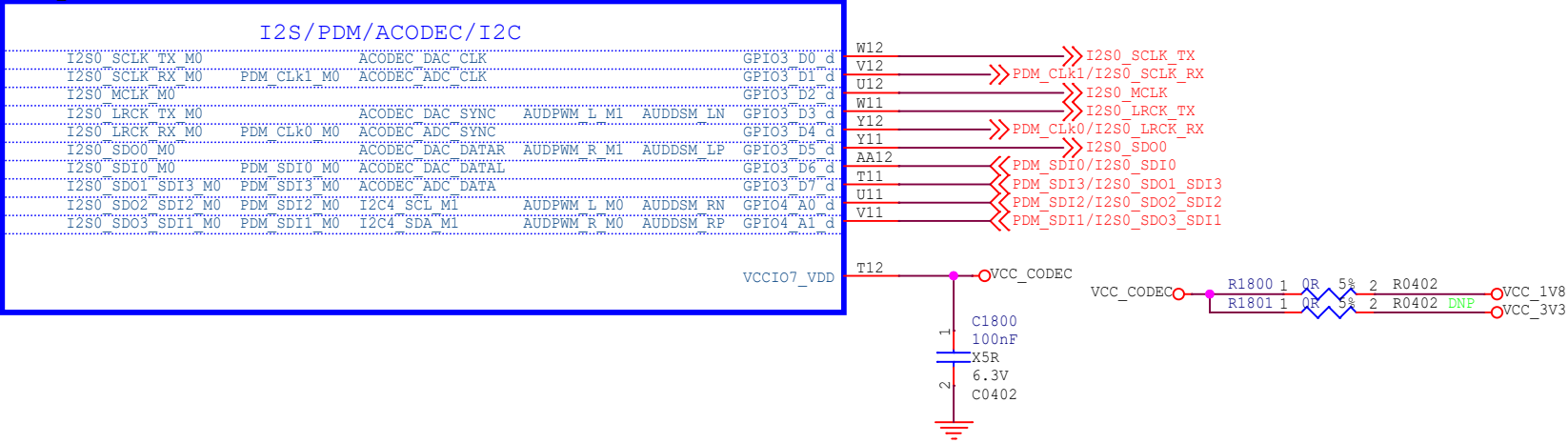
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RV1126\_RV1109  
BGA409 14R00X14R00X0R90



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Project:	RV1126_RV1109 AI Camera		
File:	17.RV1126/1109_VideoOutput		
Date:	Monday, July 06, 2020	Rev:	V1.1
Designed by:	whb	Reviewed by:	
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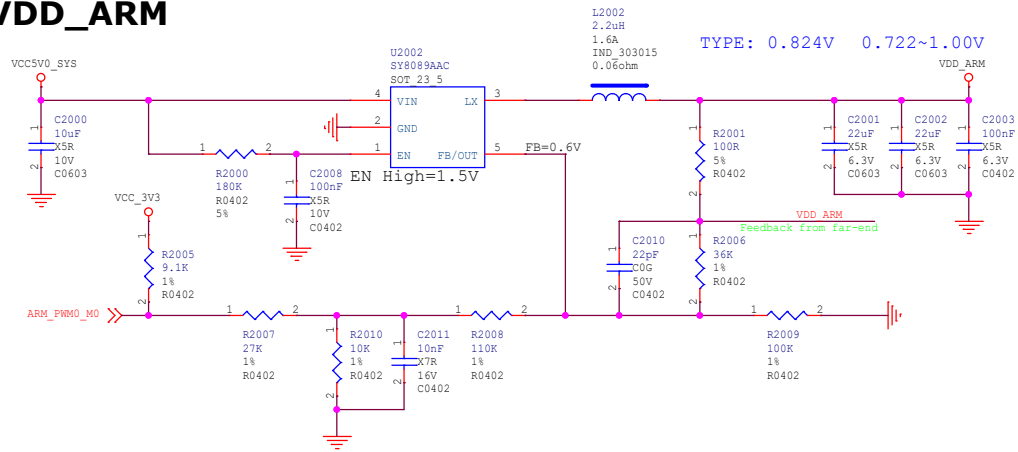
# Audio Interface

U1000J  
RV1126 RV1109  
BGA409\_14R00X14R00X0R90

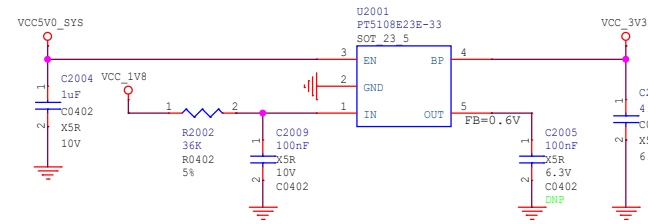




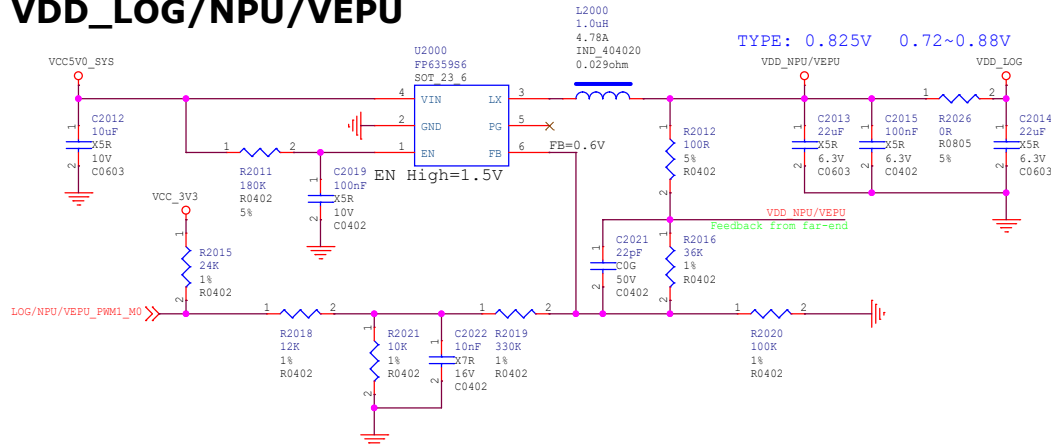
## VDD\_ARM



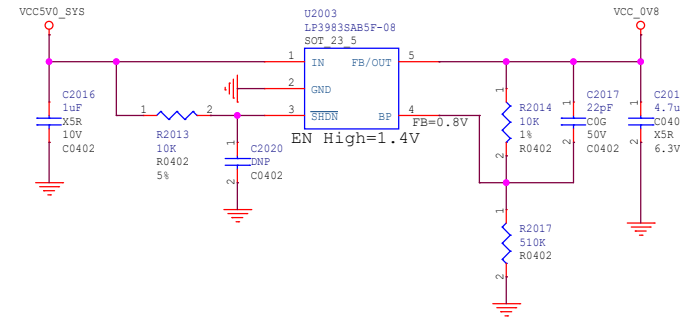
## VCC\_3V3



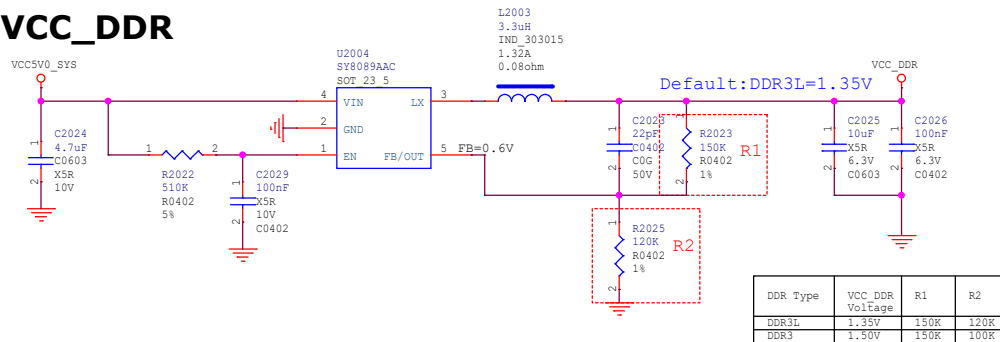
## VDD\_LOG/NPU/VEPU



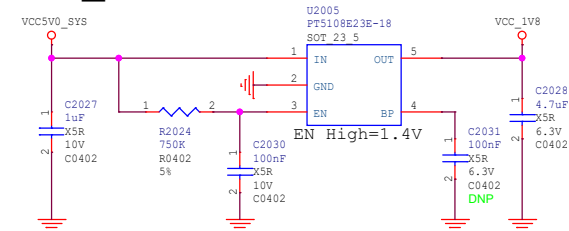
## VCC\_0V8



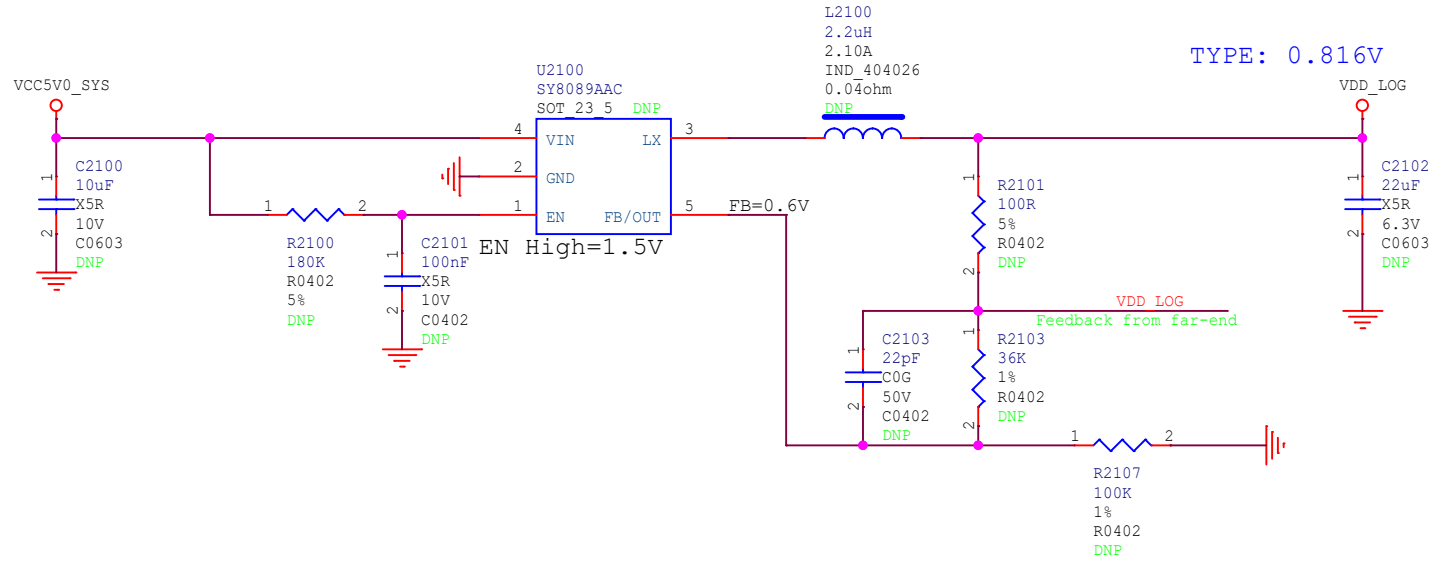
## VCC\_DDR



## VCC\_1V8

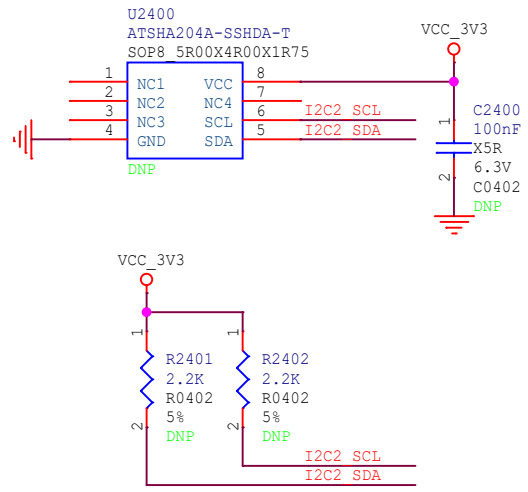


# VDD\_LOG



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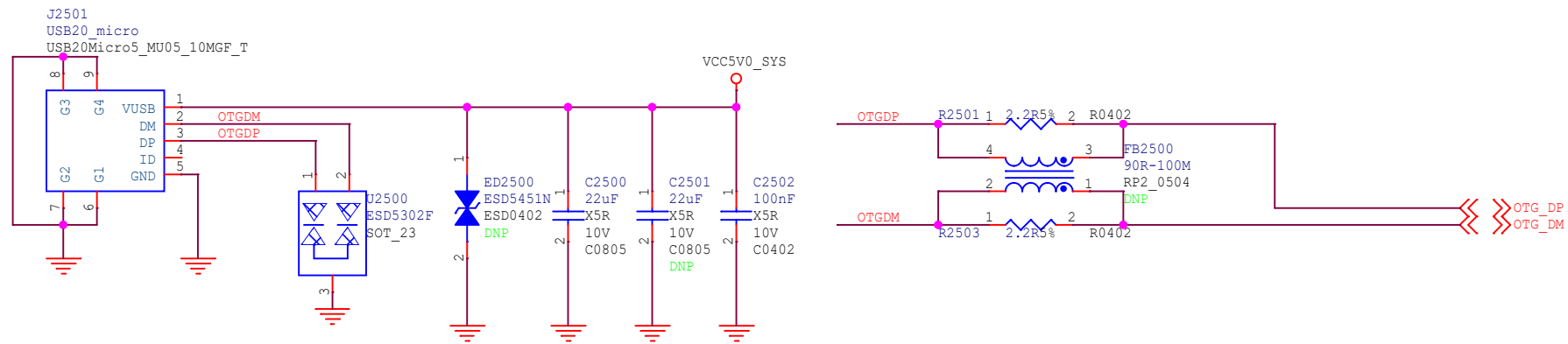
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File:	21.Power_SYS		
Date:	Monday, July 06, 2020		Rev: V1.1
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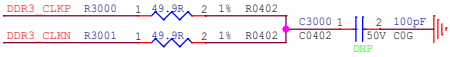
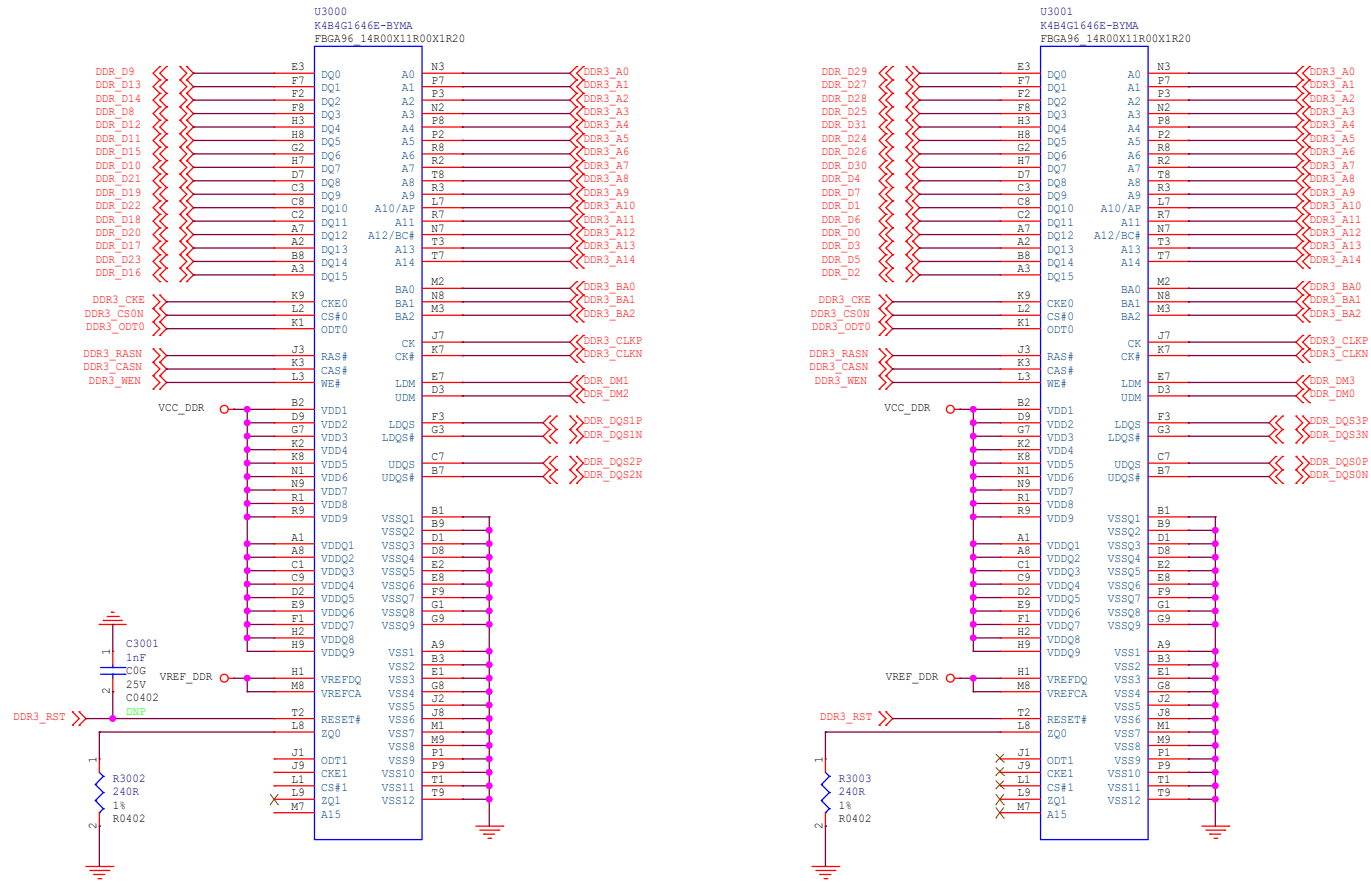
I2C2\_SDA << >>  
I2C2\_SCL << >>

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Project:	RV1126_RV1109 AI Camera		
File:	24.Encrytion Chip		
Date:	Monday, July 06, 2020		Rev: V1.1
Designed by:	whb	Reviewed by:	Sheet: 19 of 28

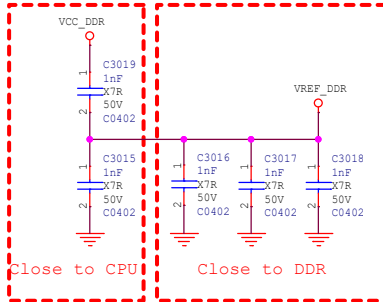
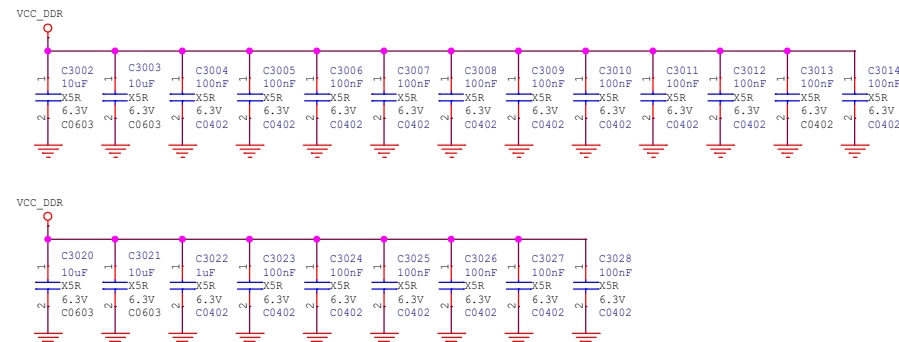
## USB2.0 OTG



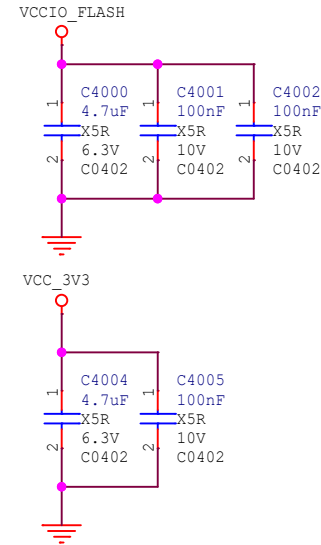
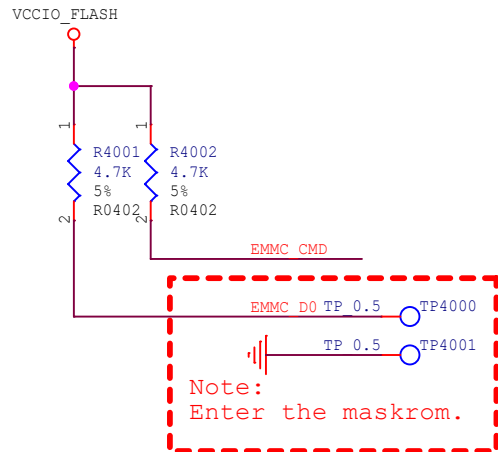
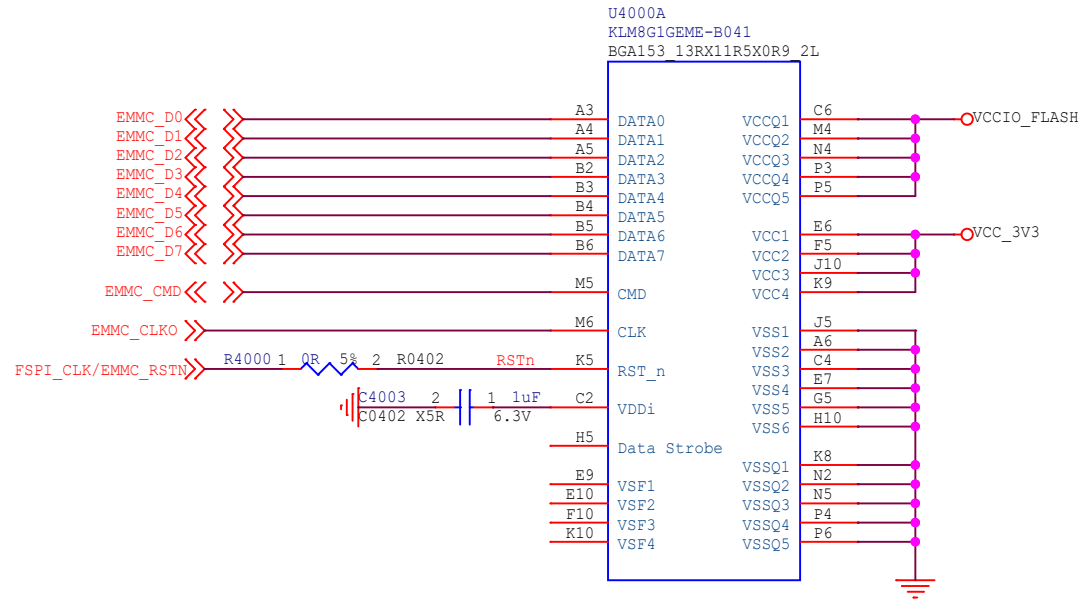
DDR3/DDR3L 2x16bit



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



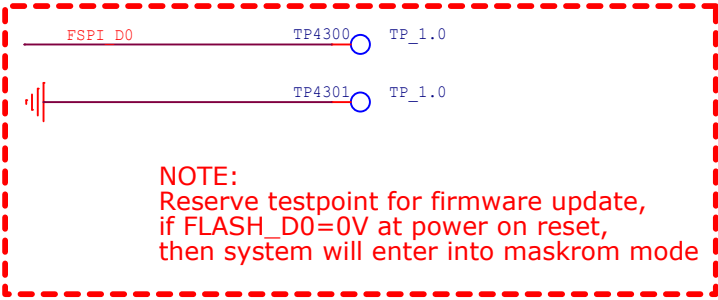
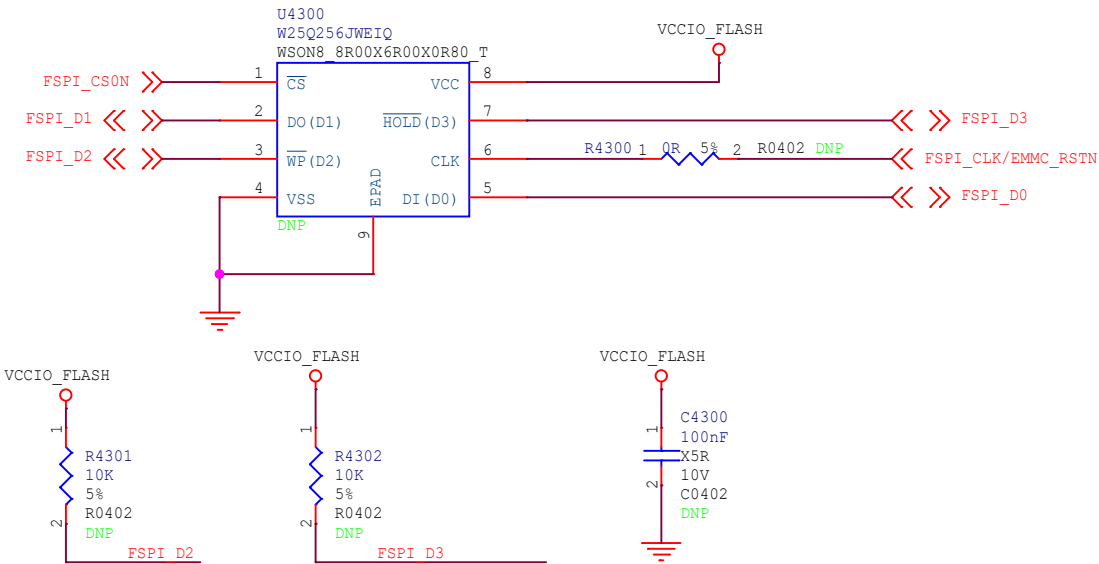
# eMMC




U4000B	KLM8G1GEME-B041	BGA153_13RX11R5X0R9	A7	E5	E8	G3	G10	K6	K7	P7	P10
A2	NC2		RF01	NC196	P14						
A8	NC8		RF02	NC195	P13						
A9	NC9		RF03	NC194	P12						
A10	NC10		RF04	NC193	P11						
A11	NC11		RF05	NC191	P8						
A12	NC12		RF06	NC190	P2						
A13	NC13		RF07	NC184	P1						
A14	NC14		RF08	NC183							
B1	NC15		RF09	NC182	N14						
B7	NC21			NC181	N13						
B8	NC22			NC180	N12						
B9	NC23			NC179	N11						
B10	NC24			NC178	N10						
B11	NC25			NC177	N9						
B12	NC26			NC176	N8						
B13	NC27			NC175	N7						
B14	NC28			NC174	N6						
				NC171	N3						
				NC169	N1						
C1	NC29										
C3	NC31			NC168	M14						
				NC167	M13						
C7	NC35			NC166	M12						
C8	NC36			NC165	M11						
C9	NC37			NC164	M10						
C10	NC38			NC163	M9						
C11	NC39			NC162	M8						
C12	NC40			NC161	M7						
C13	NC41			NC157	M3						
C14	NC42			NC156	M2						
				NC155	M1						
D1	NC43										
D2	NC44										
D3	NC45			NC154	L14						
D4	NC46			NC153	L13						
D12	NC54			NC152	L12						
D13	NC55			NC143	L3						
D14	NC56			NC142	L2						
				NC141	L1						
E1	NC57										
E2	NC58			NC140	K14						
E3	NC59			NC139	K13						
E12	NC68			NC138	K12						
E13	NC69			NC129	K3						
E14	NC70			NC128	K2						
				NC127	K1						
F1	NC71										
F2	NC72										
F3	NC73			NC126	J14						
F12	NC82			NC125	J13						
F13	NC83			NC124	J12						
F14	NC84			NC115	J3						
				NC114	J2						
G1	NC85			NC113	J1						
G2	NC86										
G12	NC96			NC112	H14						
G13	NC97			NC111	H13						
G14	NC98			NC110	H12						
				NC101	H3						
				NC100	H2						
					H1						

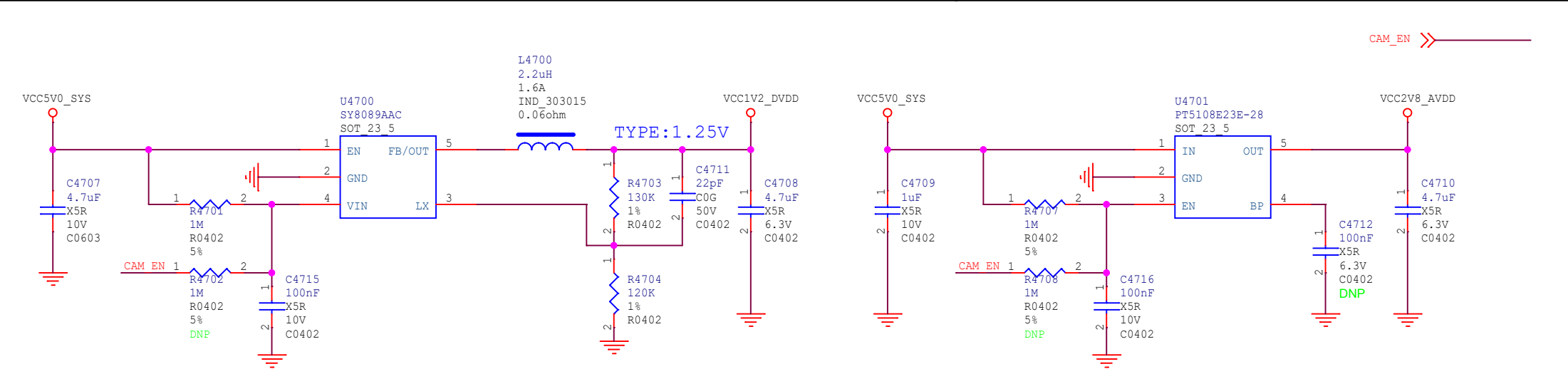
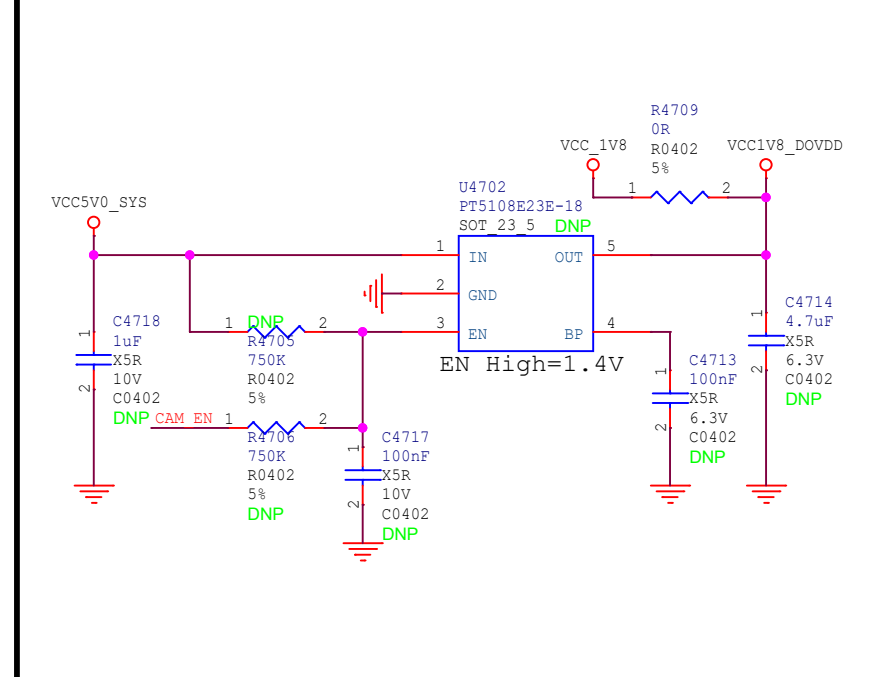
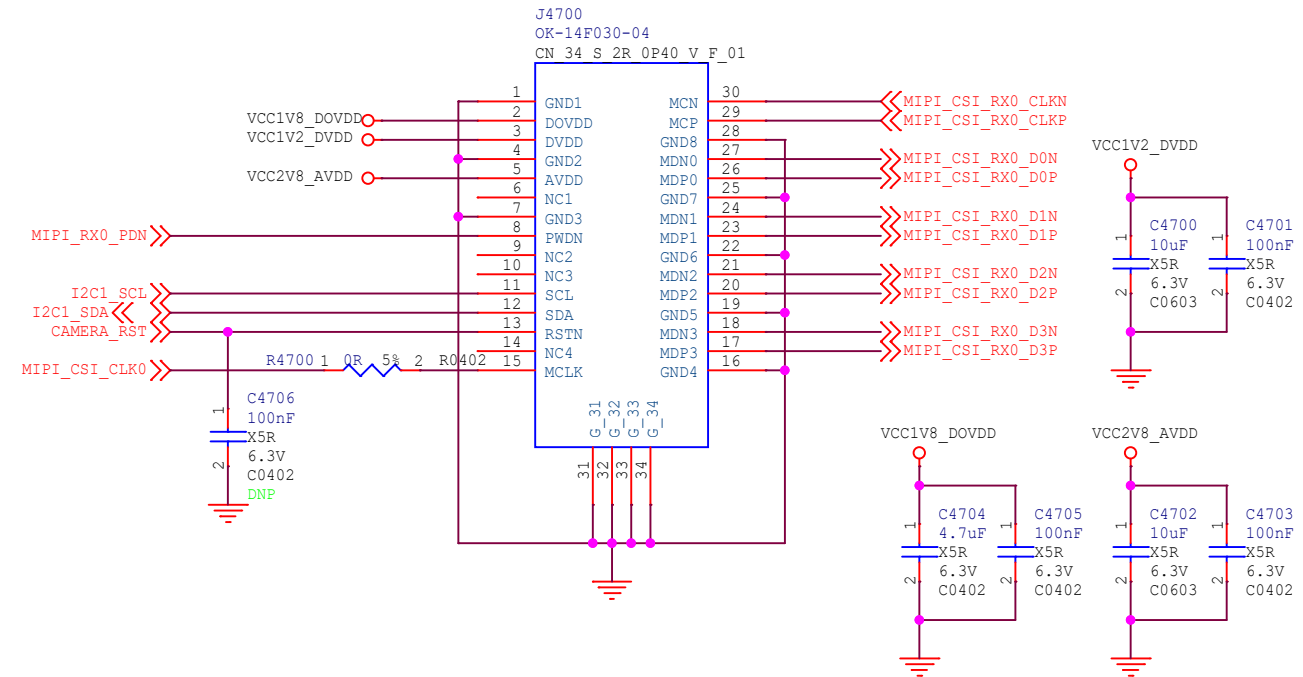
# SPI Flash

NOTE:  
Refer to the latest AVL for parts selection.




 瑞芯微电子		Rockchip Electronics Co., Ltd	
Project:	RV1126_RV1109 AI Camera		
File:	43.Flash-SPI Flash(option)		
Date:	Monday, July 06, 2020		Rev: V1.1
Designed by:	whb	Reviewed by:	Sheet: 23 of 28

MIPI-CSI\_RX0 Interface



Note:  
The power-on timing needs to be adjusted according to the actual camera module used  
Default power-on timing:  
VCC1V8\_D0VDD-->VCC1V2\_DVDD/VCC2V8\_AVDD

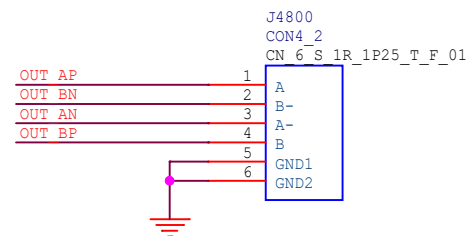
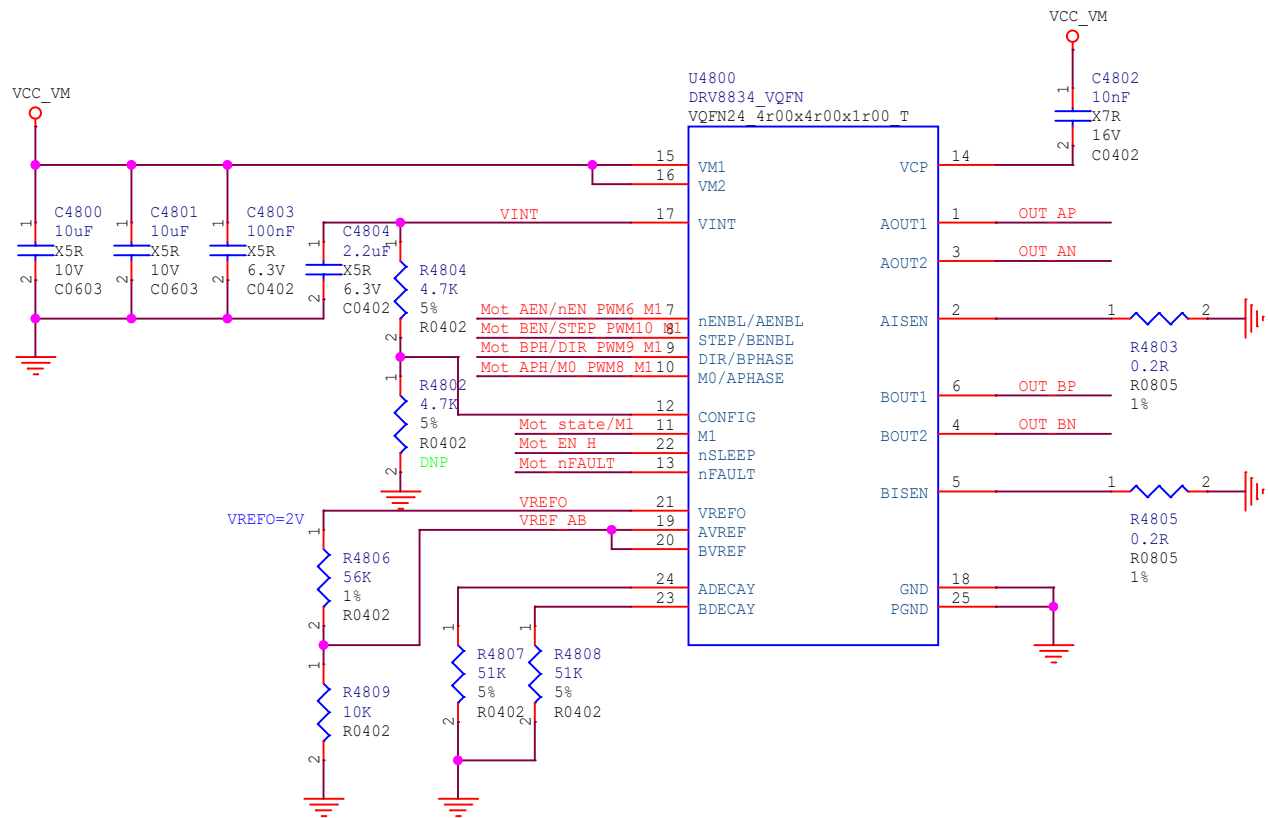
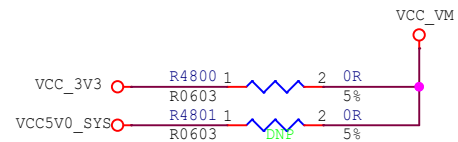
 Rockchip Electronics Co., Ltd	
Project:	RV1126_RV1109 AI Camera
File:	47.VI-Camera_MIPI-CSI
Date:	Friday, July 10, 2020
Designed by:	whb
Reviewed by:	
Rev:	V1.1
Sheet:	24 of 28

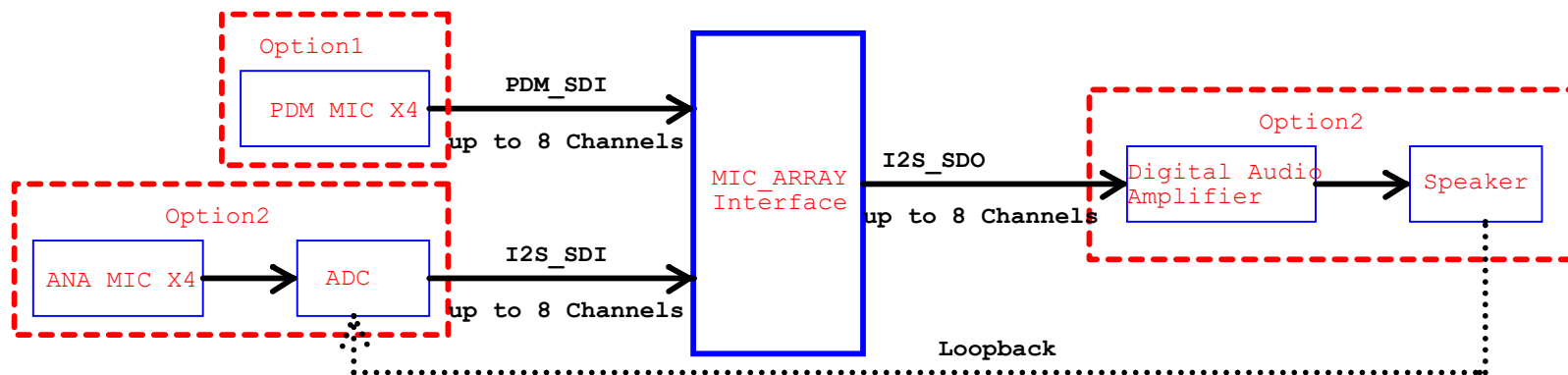
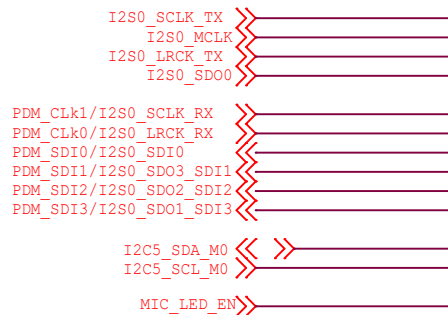


```

Mot_AEN/nEN_PWM6_M1
Mot_BEN/STEP_PWM10_M1
Mot_BPH/DIR_PWM9_M1
Mot_APH/M0_PWM8_M1
    Mot_state/M1
        Mot_EN_H
        Mot_nFAULT

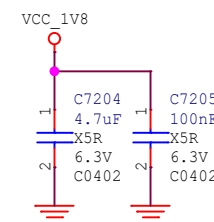
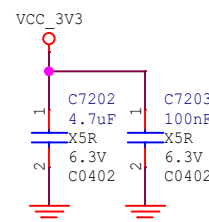
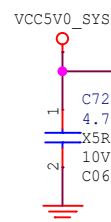
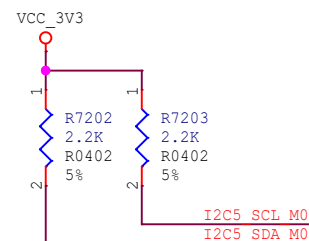
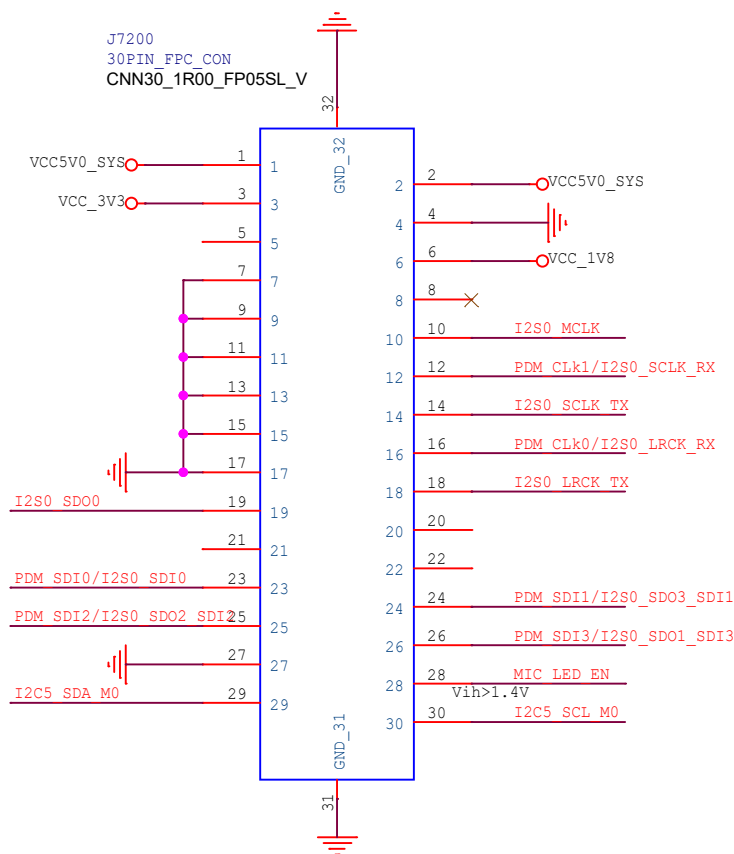
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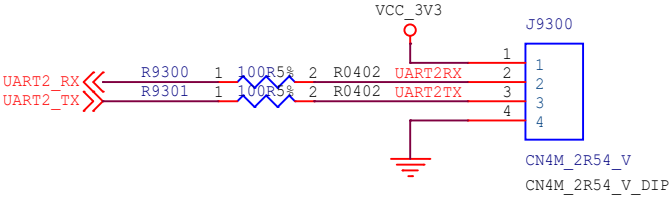
NOTE:  
MIC support mode PDM or I2S


## MIC\_ARRAY Interface

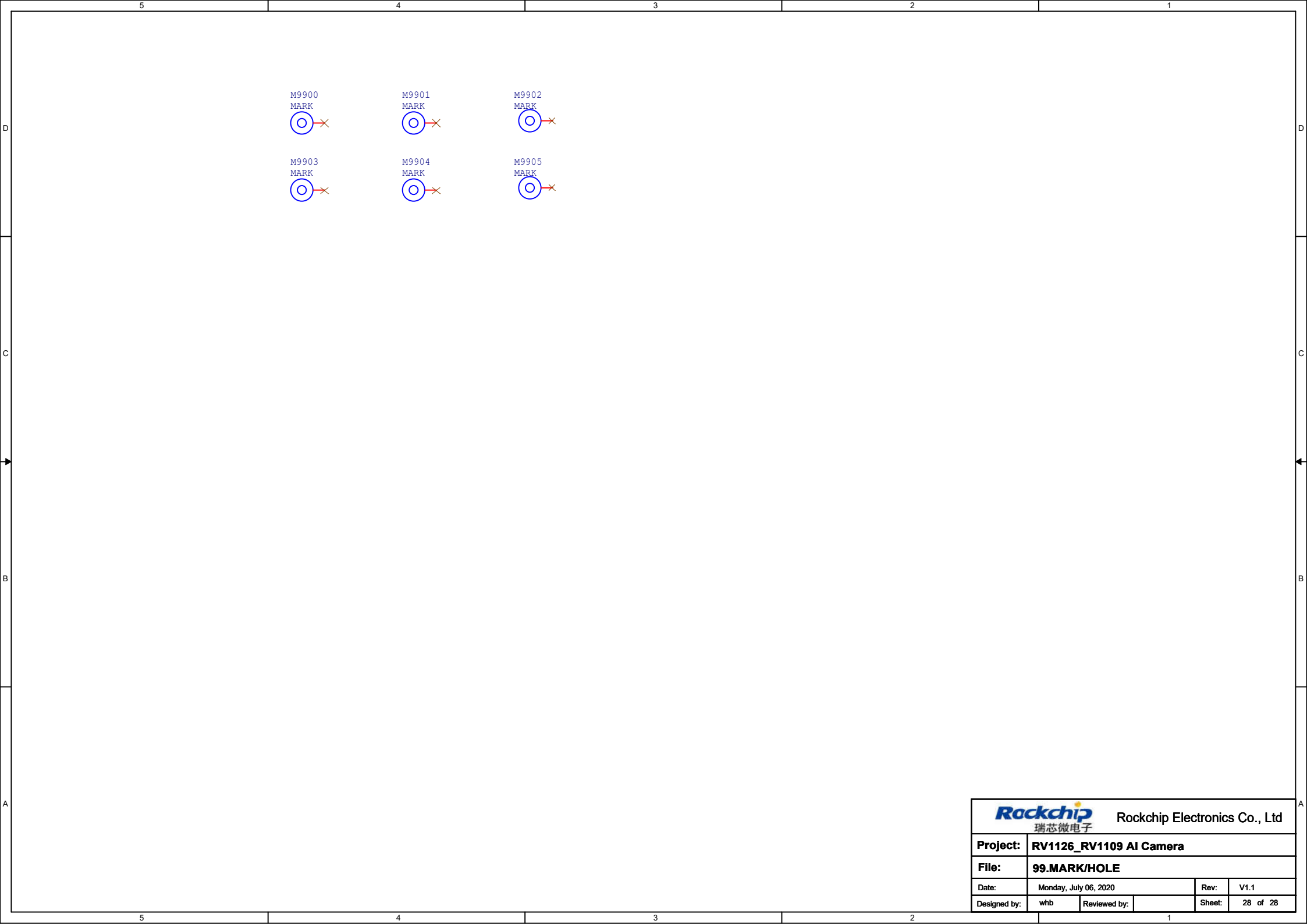



 瑞芯微电子		Rockchip Electronics Co., Ltd	
Project:	RV1126_RV1109 AI Camera		
File:	72.MIC Array Interface(option)		
Date:	Wednesday, July 15, 2020		Rev: V1.1
Designed by:	whb	Reviewed by:	Sheet: 26 of 28

# Debug UART2



 瑞芯微电子		Rockchip Electronics Co., Ltd	
Project:	RV1126_RV1109 AI Camera		
File:	93.Debug		
Date:	Monday, July 06, 2020		Rev: V1.1
Designed by:	whb	Reviewed by:	Sheet: 27 of 28



<div><div><div>Rockchip Electronics Co., Ltd</div></div></div>				
Project:	RV1126_RV1109 AI Camera			
File:	99.MARK/HOLE			
Date:	Monday, July 06, 2020		Rev:	V1.1
Designed by:	whb	Reviewed by:		Sheet: 28 of 28