

RK3399_ROCKPI4_V1.3

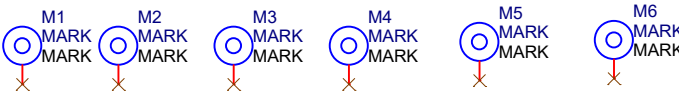
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6 LAYERS PCB STACK é g PCB=1 6 mèn

TOP		Silkscreen (25um)
	Prepreg 1080*1 (75um)	1oz (35um)
GND1		Hoz (18um)
	Prepreg 2116*1 (115um)	
POWER		Hoz (18um)
	Adjust Core 465um	
SIGNAL		Hoz (18um)
	Prepreg 2116*1 (115um)	
GND2		Hoz (18um)
	Prepreg 1080*1 (75um)	
BOTTOM		1oz (35um)
		Silkscreen (25um)

Note:
器 件 参 数 明
1: 如果Val ue为 D N P , 说 明 不 贴。
2: 如果Opti on有 D N P , 说 明 预 留 先 不 贴。

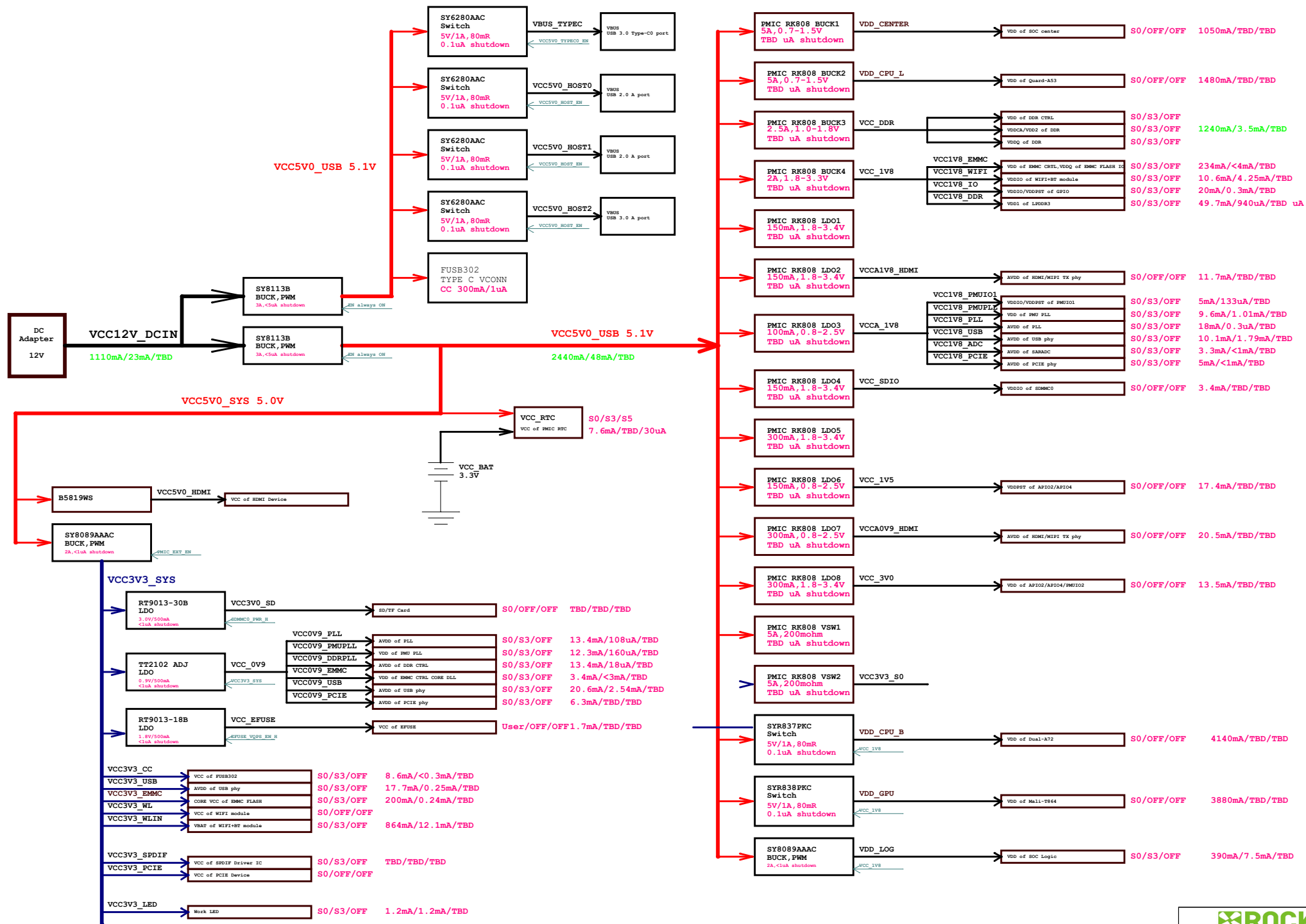


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Change List


Version	Date	Author	Change Note	Approved
V1.0	201708	Charlie	First edition	

RK3399 POWER DIAGRAM



I2C MAP

Port	Pin name	Domain	Bus name	Pull-up voltage	Slave Device	Slave Addr (MS 7Bits)	Note	Slave Bus Capability
I2C0	GPIO1_B7/SPI3_RXD/I2C0_SDA GPIO1_C0/SPI3_TXD/I2C0_SCL	PMUIO2	I2C_SDA_PMIC I2C_SCL_PMIC	VCC_1V8	Rockchip RK808	0x1b	PMIC	100kHz,400KHz
					SYR837PKC	0x40	DC-DC BUCK	100kHz,400KHz,3.4MHz
					SYR838PKC	0x41	DC-DC BUCK	100kHz,400KHz,3.4MHz
I2C1	GPIO4_A1/I2C1_SDA GPIO4_A2/I2C1_SCL	APIO5		VCC_1V8			Low Speed CONNECTOR	
I2C2	GPIO2_A0/VOP_D0/CIF_D0/I2C2_SDA GPIO2_A1/VOP_D1/CIF_D1/I2C2_SCL	APIO2		VCC_1V8			High Speed CONNECTOR	
I2C3	GPIO4_C0/I2C3_SDA/UART2B_RX GPIO4_C1/I2C3_SCL/UART2B_TX	APIO4	I2C_SDA_HDMI I2C_SCL_HDMI	VCC_3V0				
I2C4	GPIO1_B3/I2C4_SDA GPIO1_B4/I2C4_SCL	PMUIO2	I2C_SDA_MEMS I2C_SCL_MEMS	VCC_1V8	Fairchild FUSB302B	0x44,0x46	USB-TypeC Mux	100kHz,400KHz,1MHz
I2C5	GPIO3_B2/MAC_RXER/I2C5_SDA GPIO3_B3/MAC_CLK/I2C5_SCL	APIO1	Other pin function					
I2C6	GPIO2_B1/SPI2_RXD/CIF_HREF/I2C6_SDA GPIO2_B2/SPI2_TXD/CIF_CLKIN/I2C6_SCL	APIO2		VCC_1V8			Low Speed CONNECTOR	
I2C7	GPIO2_A7/VOP_D7/CIF_D7/I2C7_SDA GPIO2_B0/VOP_CLK/CIF_VSYNC/I2C7_SCL	APIO2		VCC_1V8			High Speed CONNECTOR	



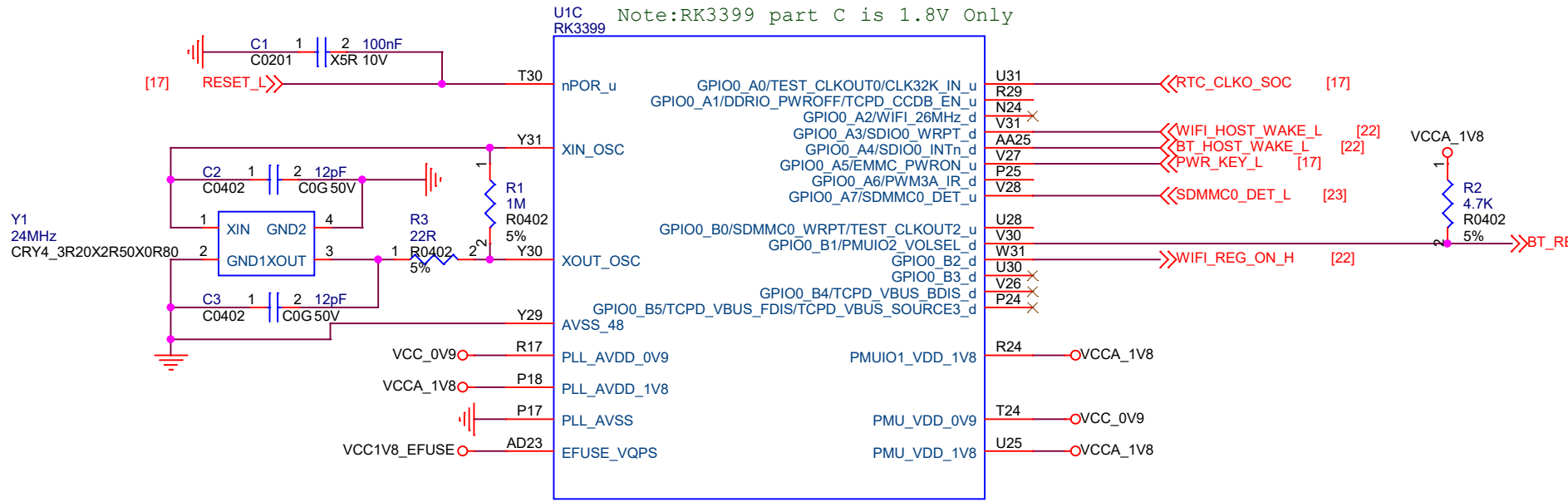
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Power Domain Map

Part Port	Domain	Pin name in datasheet	I/O type	Power supply	Power source
Part C	PMUIO1	pmuiol_gpio0ab	1.8V only	VCCA_1V8	RK808-D VLDO3
Part E	PMUIO2	pmul830_gpio1abcd	1.8V (Default) 3.0V	VCC_1V8	RK808-D Buck4
Part I	APIO1	gmac_gpio3abc	3.3V only	VCC_1V8 VCC3V3_SYS	RK808-D Buck4
Part L	APIO2	bt656_gpio2ab	1.8V (Default) 3.0V	VCC_1V8	RK808-D VLDO3
Part G	APIO3	wifi/bt_gpio2cd	1.8V only	VCC_1V8	RK808-D Buck4
Part K	APIO4	gpio1830_gpio4cd	1.8V 3.0V (Default)	VCC_1V5 VCC_3V0	RK808-D VLDO6 RK808-D VLDO8
Part J	APIO5	audio_gpio3d_gpio4a	1.8V (Default) 3.0V	VCC_1V8	RK808-D Buck4
Part F	SDMMC0	sdmmc_gpio4b	1.8V 3.0V (Default)	VCC_SDIO	RK808-D VLDO4

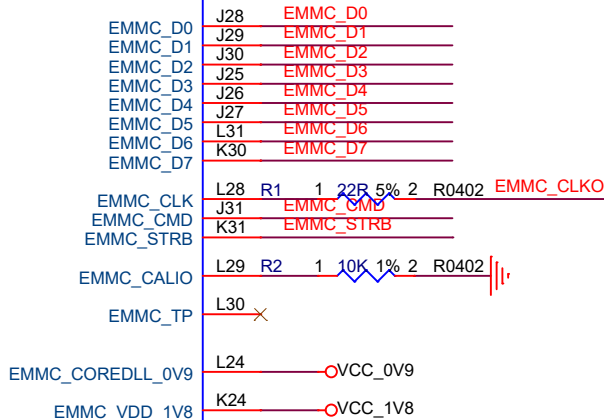


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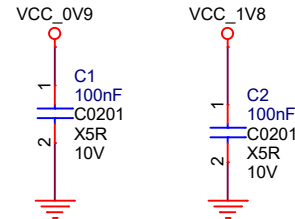
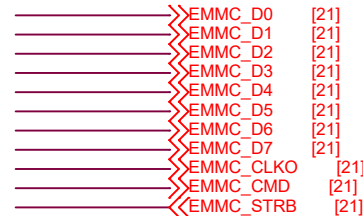


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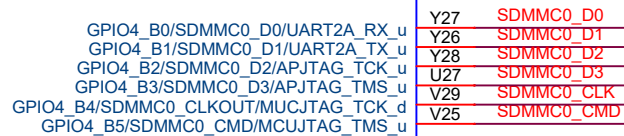
U1H
RK3399



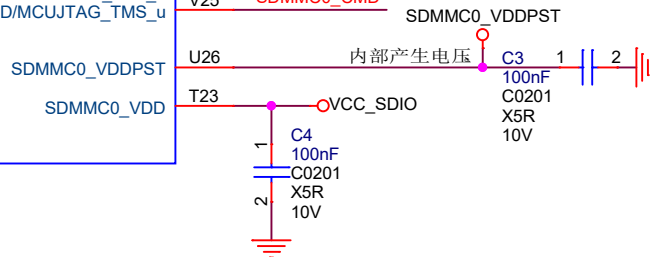
EMMC design rule:
1. Data[0:7], cmd strobe 为一组
并行走线包地, 组内等长要求为 $\pm 100\text{mil}$;
2. Clk 需要单独走线并包地处理, 与 data 间的
延时小于 20ps ;
3. Max trace length < 3.93 inches;
4. Trace impedance $50\text{ohm} \pm 10\%$;
5. 与其他信号间距遵循 3W 原则
6. R1300 靠近 S 放置



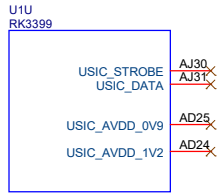
U1F
RK3399



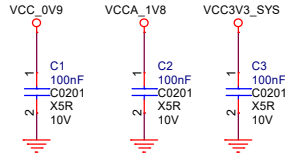
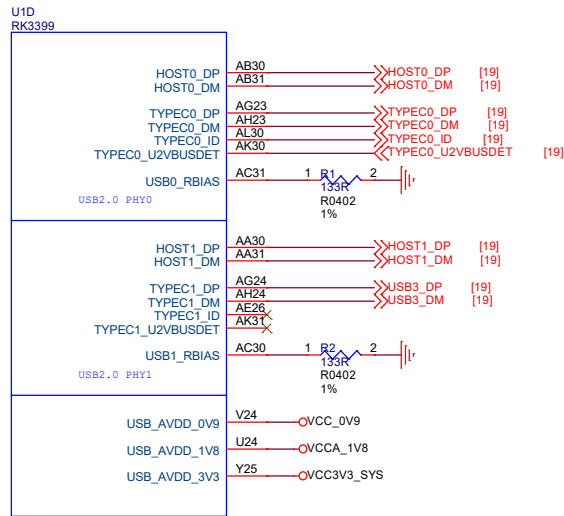
SDMMC design rule:
1. Data[0:3], cmd 为一组,
并行走线包地, 组内等长要求为 $\pm 100\text{mil}$;
2. Clk 需要单独走线并包地处理, 与 data 间的
延时小于 20ps ;;
4. Max trace length < 3.93 inches;
5. Trace impedance $50\text{ohm} \pm 10\%$;
6. 与其他信号间距遵循 3W 原则



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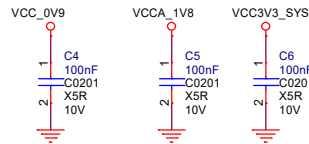
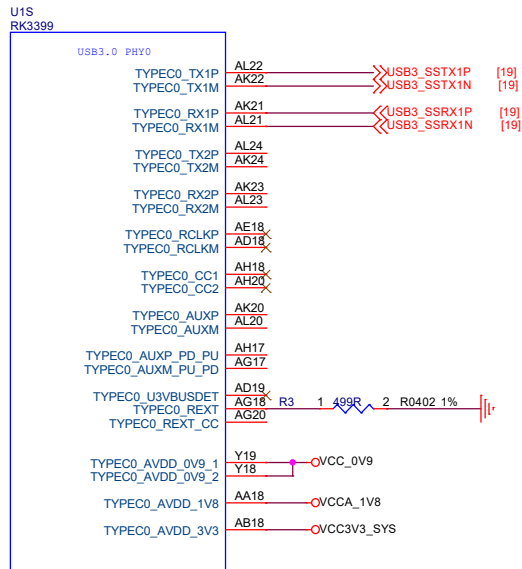
USB2.0



USB2.0 design rule:

- 1.Max intra-pair skew < 4 ps;
- 2.Max trace length < 6 inches;
- 3.Max allowed via < 6;
- 4.Trace impedance 90ohm+/-10%;
5. 与其他信号 间距遵循3W 原则

USB3.0

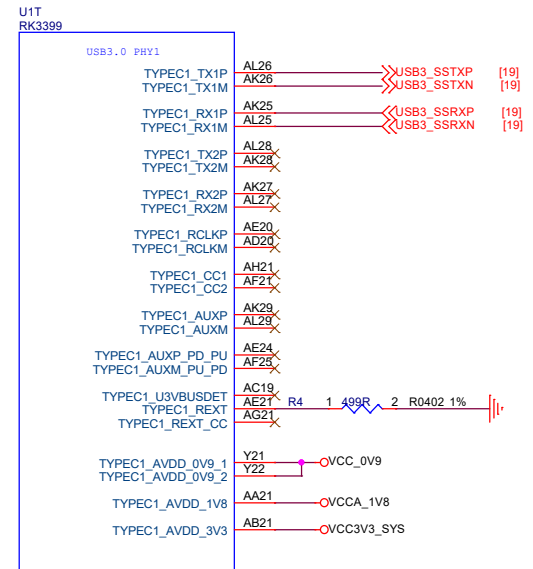


USB3.0 design rule:

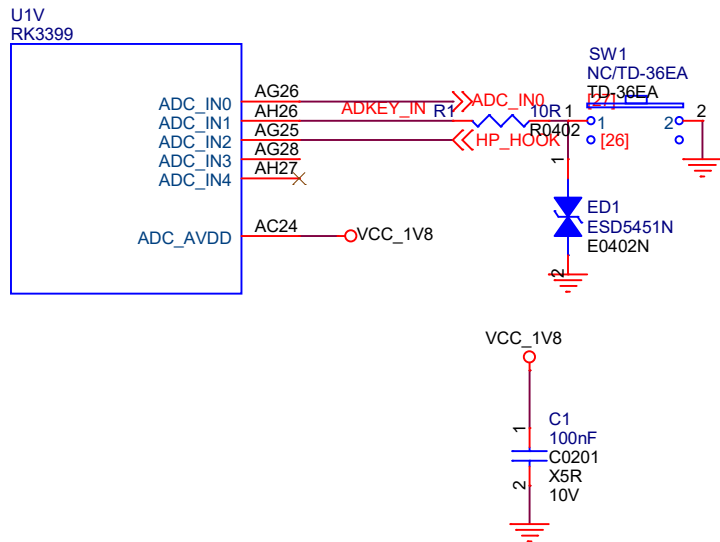
- 1.Max intra-pair skew < 4 ps;
- 2.Max length skew between TX and RX < 1.6 n8;
- 3.Max trace length < 6 inches;
- 4.Max allowed via < 4;
- 5.Trace impedance 90ohm+/-10%;
6. 与其他信号 间距遵循3W 原则

DP design rule:

- 1.Max intra-pair skew < 4 ps;
- 2.Max trace length < 6 inches;
- 3.Max allowed via < 4;
- 4.Trace impedance 90ohm+/-10%;
5. 与其他信号 间距遵循3W 原则

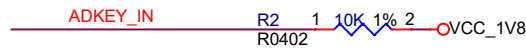


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KEY BAORD

Note:
系统上电时，如果ADKEY_IN电压为0V，
则RK3399进入Recovery模式。
量时R1503,SW1500,ED1501不用贴片



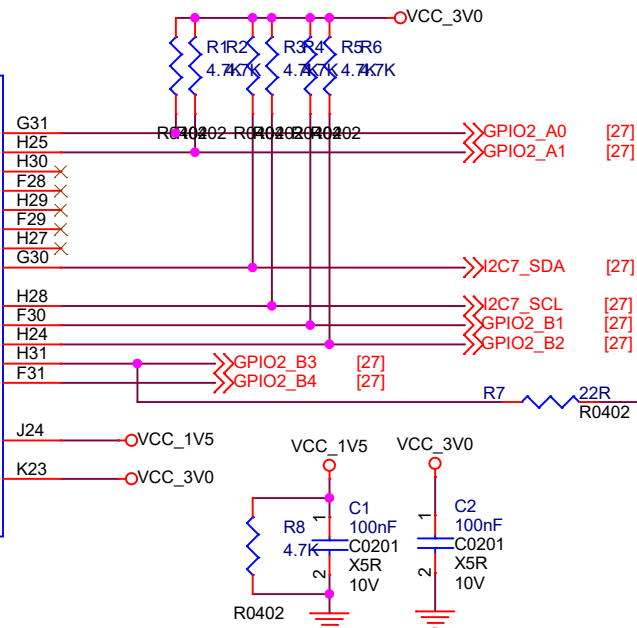
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U1L
RK3399

GPIO2_A0/VOP_D0/CIF_D0/I2C2_SDA_u
GPIO2_A1/VOP_D1/CIF_D1/I2C2_SCL_u
GPIO2_A2/VOP_D2/CIF_D2_d
GPIO2_A3/VOP_D3/CIF_D3_d
GPIO2_A4/VOP_D4/CIF_D4_d
GPIO2_A5/VOP_D5/CIF_D5_d
GPIO2_A6/VOP_D6/CIF_D6_d
GPIO2_A7/VOP_D7/CIF_D7/I2C7_SDA_u
GPIO2_B0/VOP_CLK/CIF_VSYNC/I2C7_SCL_u
GPIO2_B1/SPI2_RXD/CIF_HREF/I2C6_SDA_u
GPIO2_B2/SPI2_TXD/CIF_CLKIN/I2C6_SCL_u
GPIO2_B3/SPI2_CLK/VOP_DEN/CIF_CLKOUTA_u
GPIO2_B4/SPI2_CSn0_u

APIO2_VDDPST

APIO2_VDD



U1R
RK3399

MIPI_RX0_D0P AK15
MIPI_RX0_D0N AL15
MIPI_RX0_D1P AK14
MIPI_RX0_D1N AL14
MIPI_RX0_CLKP AK13
MIPI_RX0_CLKN AL13
MIPI_RX0_D2P AK12
MIPI_RX0_D2N AL12
MIPI_RX0_D3P AK11
MIPI_RX0_D3N AL11
MIPI_RX0_REXT AF14
MIPI_RX0_AVDD_1V8 AB14

U1P
RK3399

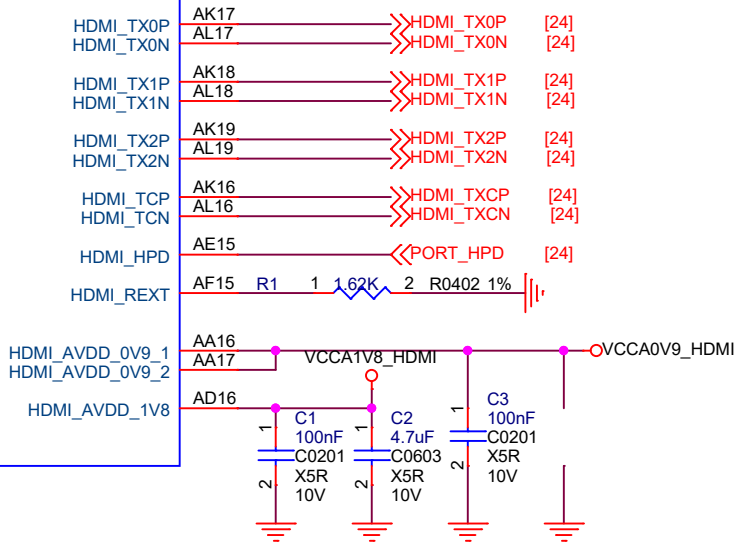
MIPI_TX1/RX1_D0P AK6
MIPI_TX1/RX1_D0N AL6
MIPI_TX1/RX1_D1P AK7
MIPI_TX1/RX1_D1N AL7
MIPI_TX1/RX1_CLKP AK8
MIPI_TX1/RX1_CLKN AL8
MIPI_TX1/RX1_D2P AK9
MIPI_TX1/RX1_D2N AL9
MIPI_TX1/RX1_D3P AK10
MIPI_TX1/RX1_D3N AL10
MIPI_TX1/RX1_REXT AF11
MIPI_TX1/RX1_AVDD_1V8 AC10

Dual
MIPI
Right



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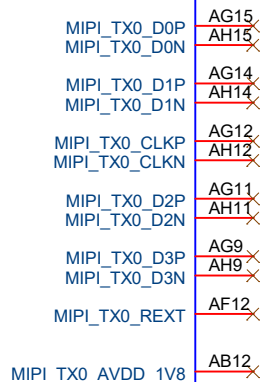
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RK3399



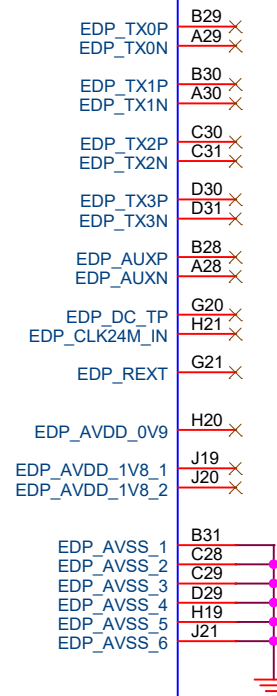
HDMI design rule:

- 1.Max intra-pair skew < 4 ps;
- 2.Max length skew between clk and data < 80 ps;
- 3.Max trace length < 9.8 inches;
- 4.Max allowed via < 4;
- 5.Trace impedance 100ohm+/-10%;
6. 与其他信号 间距遵循3W 原则

U1Q
RK3399



U1M
RK3399



eDP design rule:

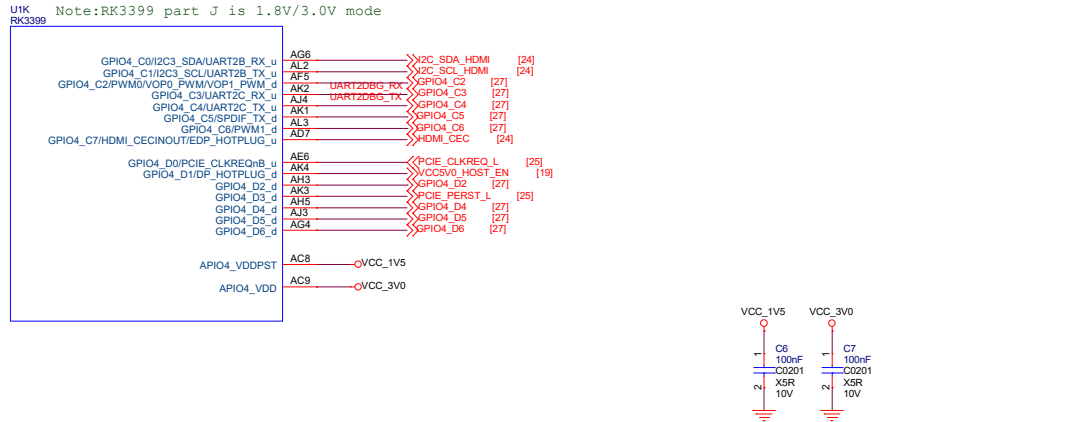
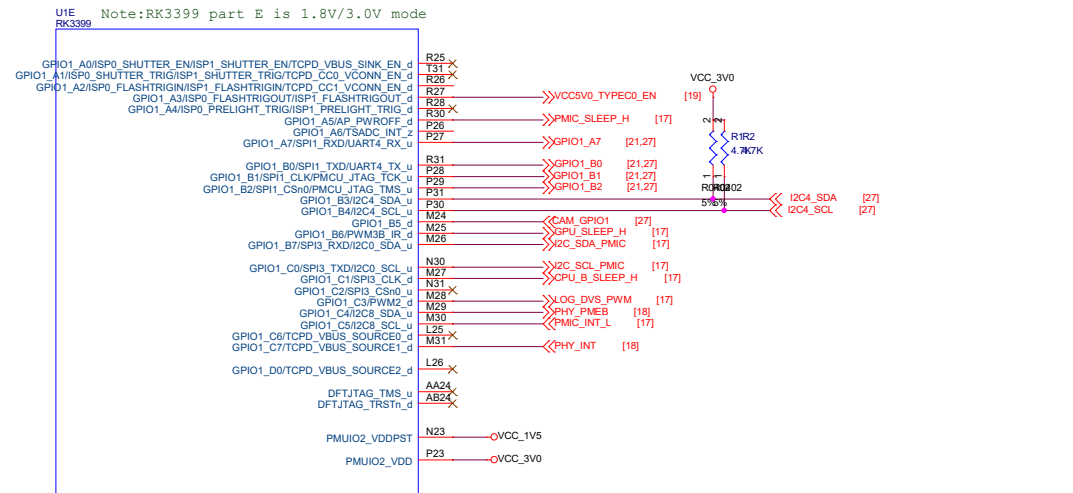
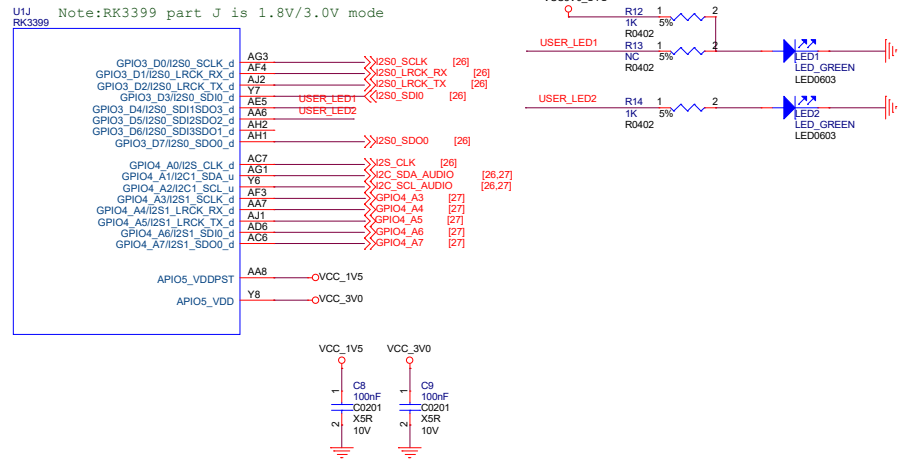
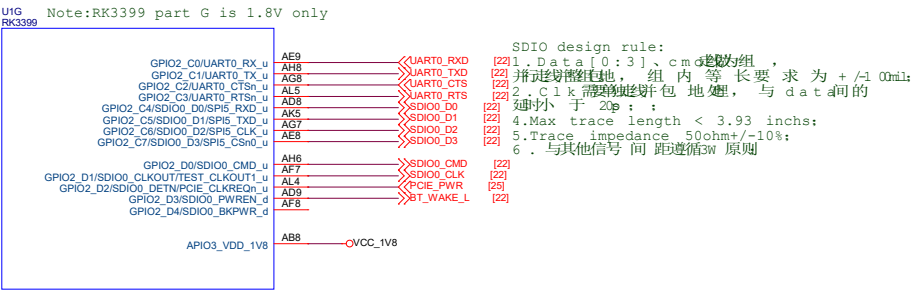
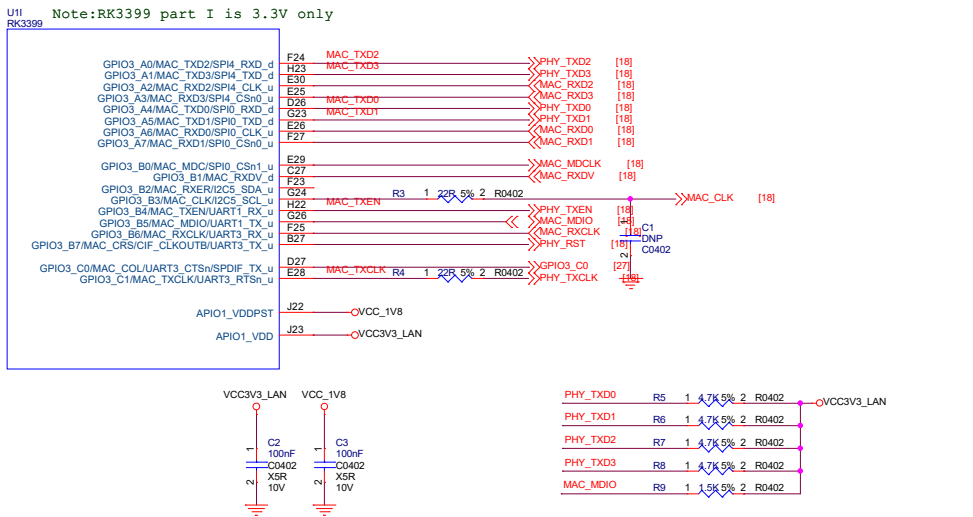
- 1.Max intra-pair skew < 4 ps;
- 2.Max trace length < 6 inches;
- 3.Max allowed via < 4;
- 4.Trace impedance 90ohm+/-10%;
5. 与其他信号 间距遵循3W 原则

MIPI design rule:

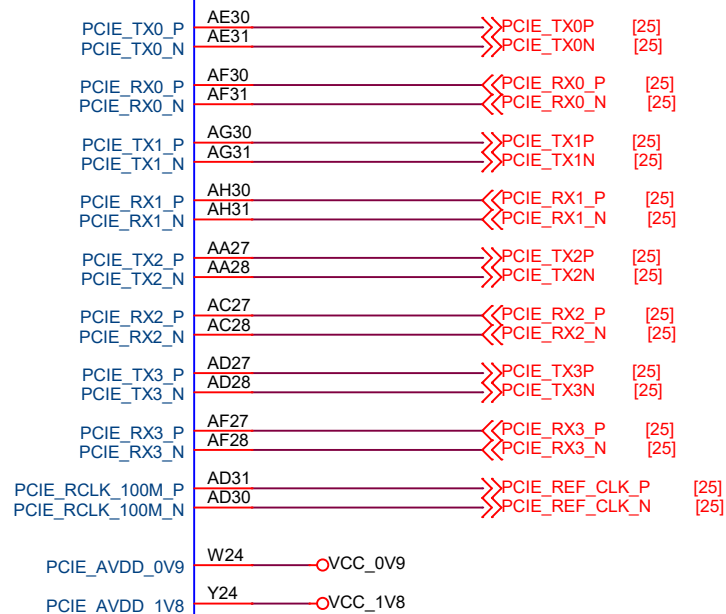
- 1.Max intra-pair skew < 4 ps;
- 2.Max length skew between clk and data < 7ps;
- 3.Max trace length < 7.2 inches;
- 4.Max allowed via < 4;
- 5.Trace impedance 100ohm+/-10%;
6. 与其他信号 间距遵循3W 原则



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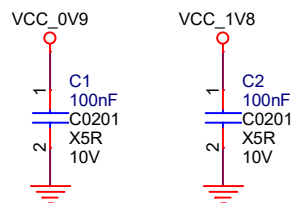


U10
RK3399



PCIE design rule:

1. Max intra-pair skew < 4ps;
2. Max inter-pair skew < 1.6 ns;
3. Max trace length < 14 inches;
4. Max allowed via < 4;
5. Trace impedance 100ohm+/-10%;
6. 与其他信号 间距遵循3W 原则



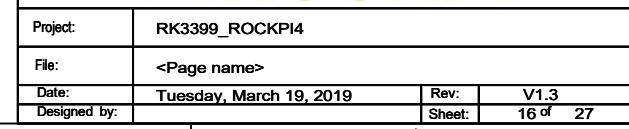
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DC IN&SYSTEM Power

The schematic illustrates the power management for the RK3399 ROCKPI4, specifically the DC input and system power sections. Key components and connections include:

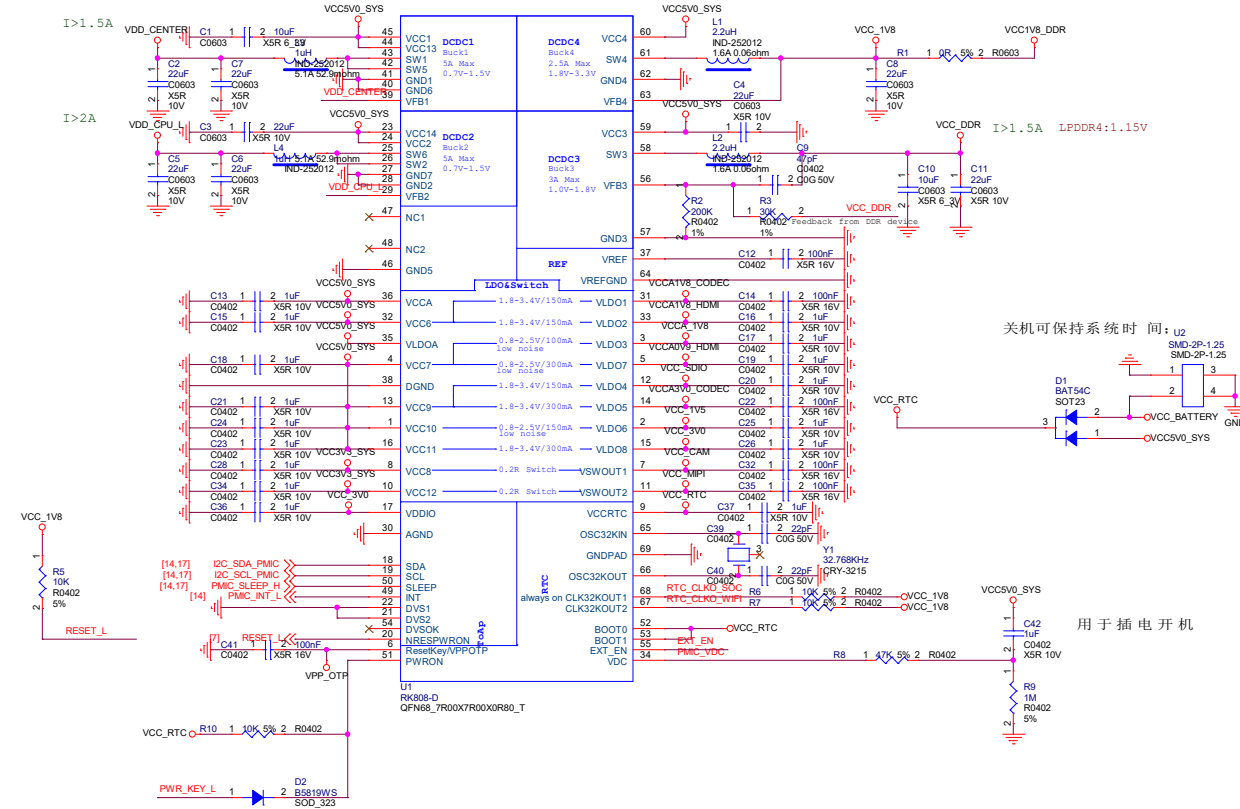
- USB Type-C Connector (J1):** Connects to the system via a USB Type-C to micro-USB adapter (U1).
- USB Type-C to micro-USB Adapter (U1):** A USB Type-C to micro-USB adapter (U1) is used to interface the USB Type-C connector with the micro-USB connector.
- USB Type-C to micro-USB Adapter (U2):** A USB Type-C to micro-USB adapter (U2) is used to interface the USB Type-C connector with the micro-USB connector.
- Resistors (R1, R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13):** Various resistors are used for current limiting and signal conditioning.
- Capacitors (C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12):** Capacitors are used for decoupling and filtering.
- Microcontroller (U3):** A microcontroller (U3) is used to manage the power flow.

The schematic is titled "DC IN&SYSTEM Power" and is part of a larger project for the RK3399 ROCKPI4.

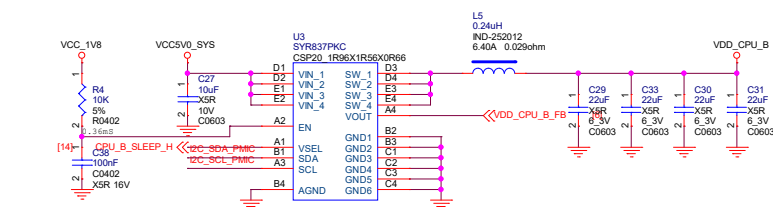


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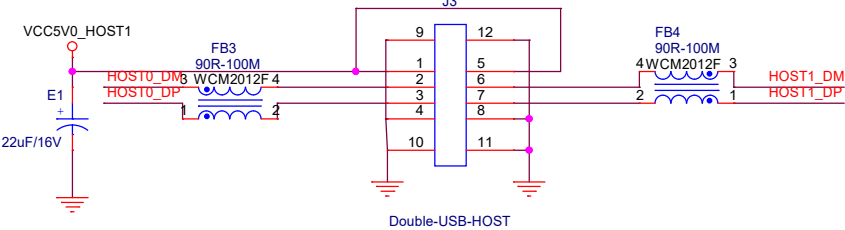
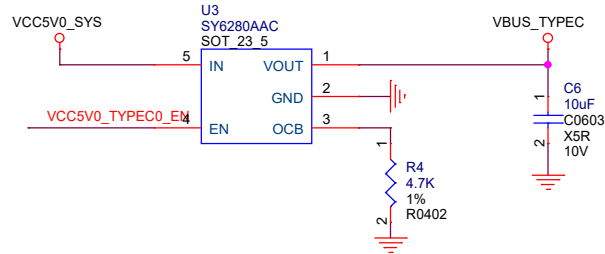
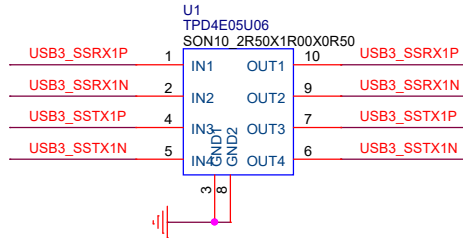
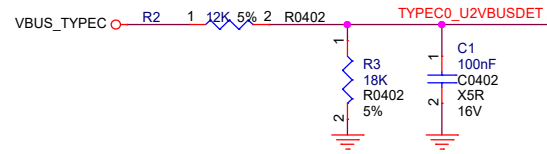
PMIC



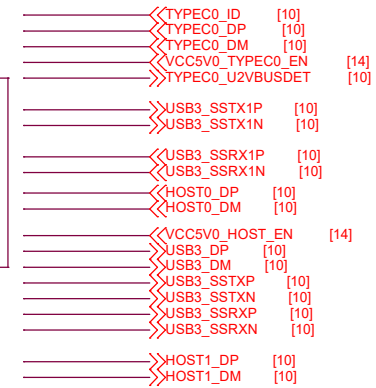
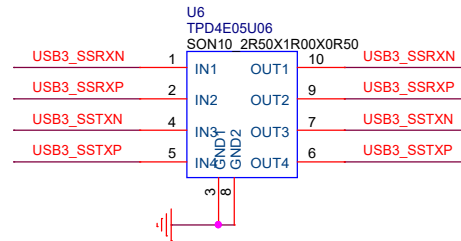
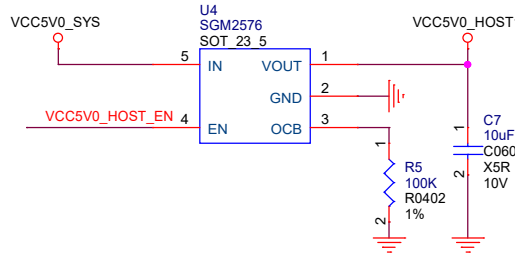
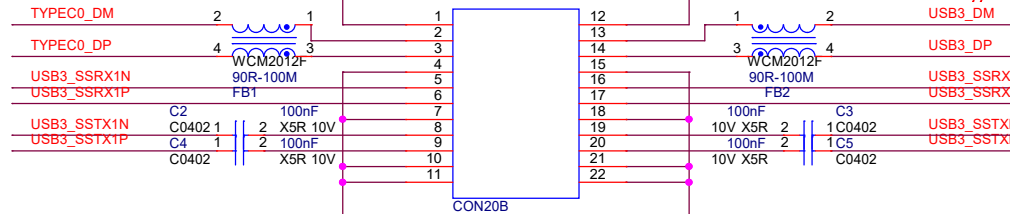
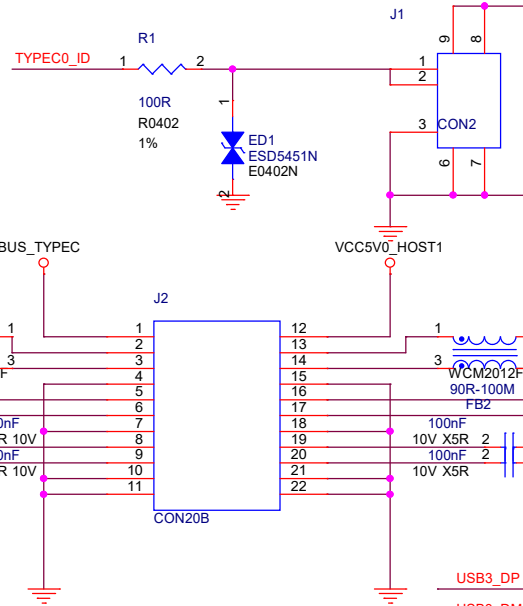
VDD_CPU_B power



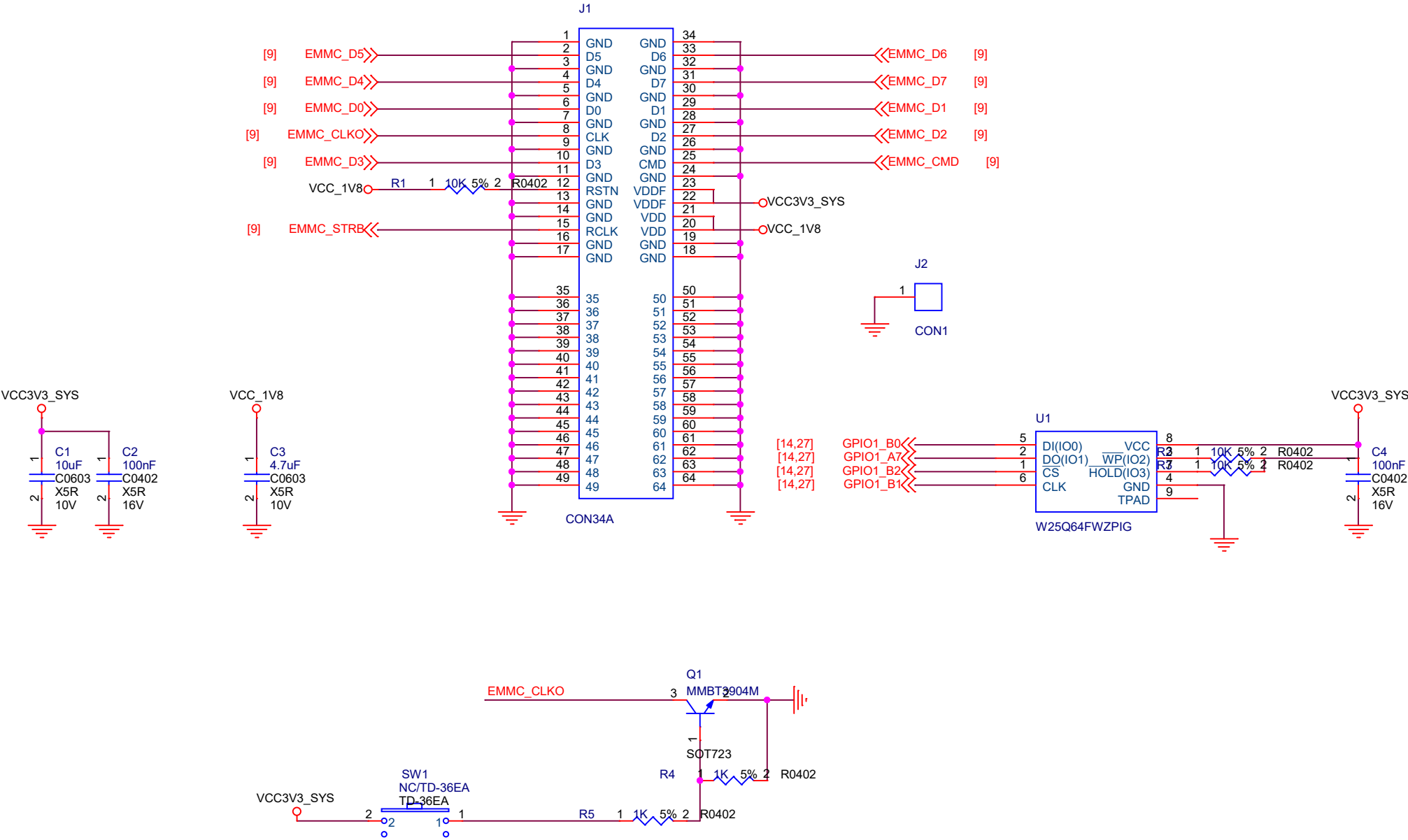
USB3.0 OTG port

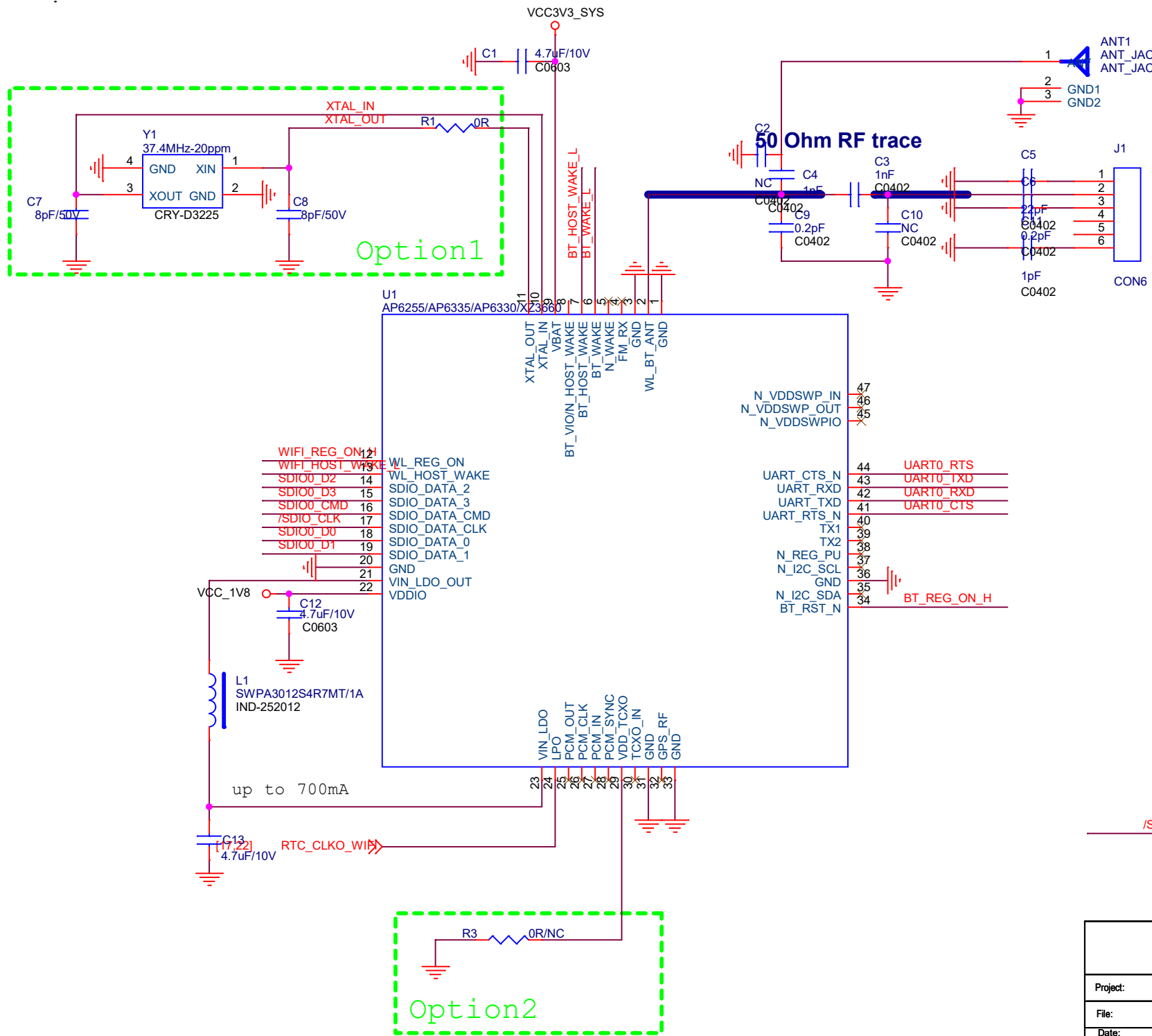


Double-USB-HOST




eMMC FLASH





- SDIO0_D0 [14]
- SDIO0_D1 [14]
- SDIO0_D2 [14]
- SDIO0_D3 [14]
- SDIO0_CMD [14]
- SDIO0_CLK [14]
- UART0_RTS [14]
- UART0_TXD [14]
- UART0_RXD [14]
- UART0_CTS [14]
- BT_HOST_WAKE_L [7]
- BT_WAKE_L [14]
- BT_REG_ON_H [7]
- WIFI_REG_ON_H [7]
- WIFI_HOST_WAKE_L [17,22]
- RTC_CLKO_WIFI [17,22]

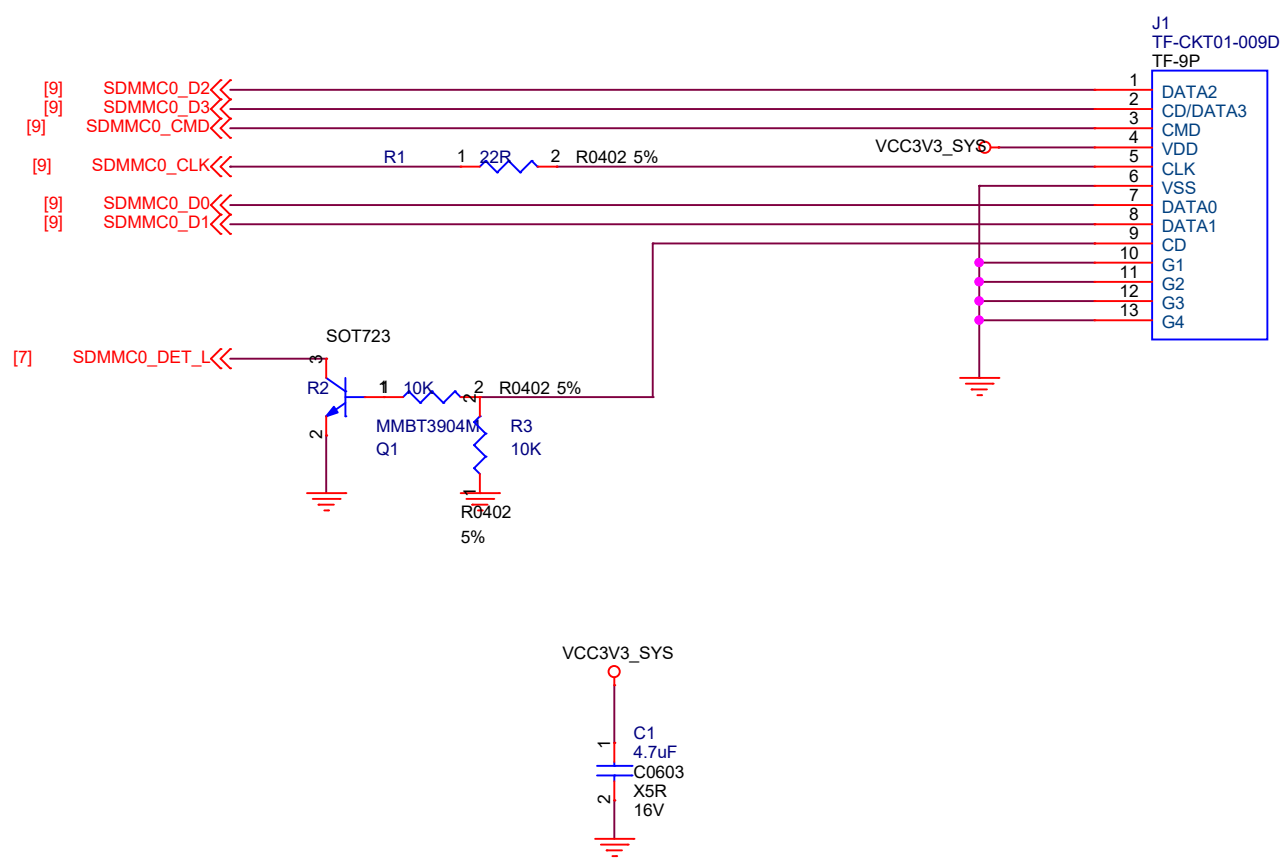
/SDIO_CLKR2 1 33R 5% 2 R0402 SDIO0_CLK



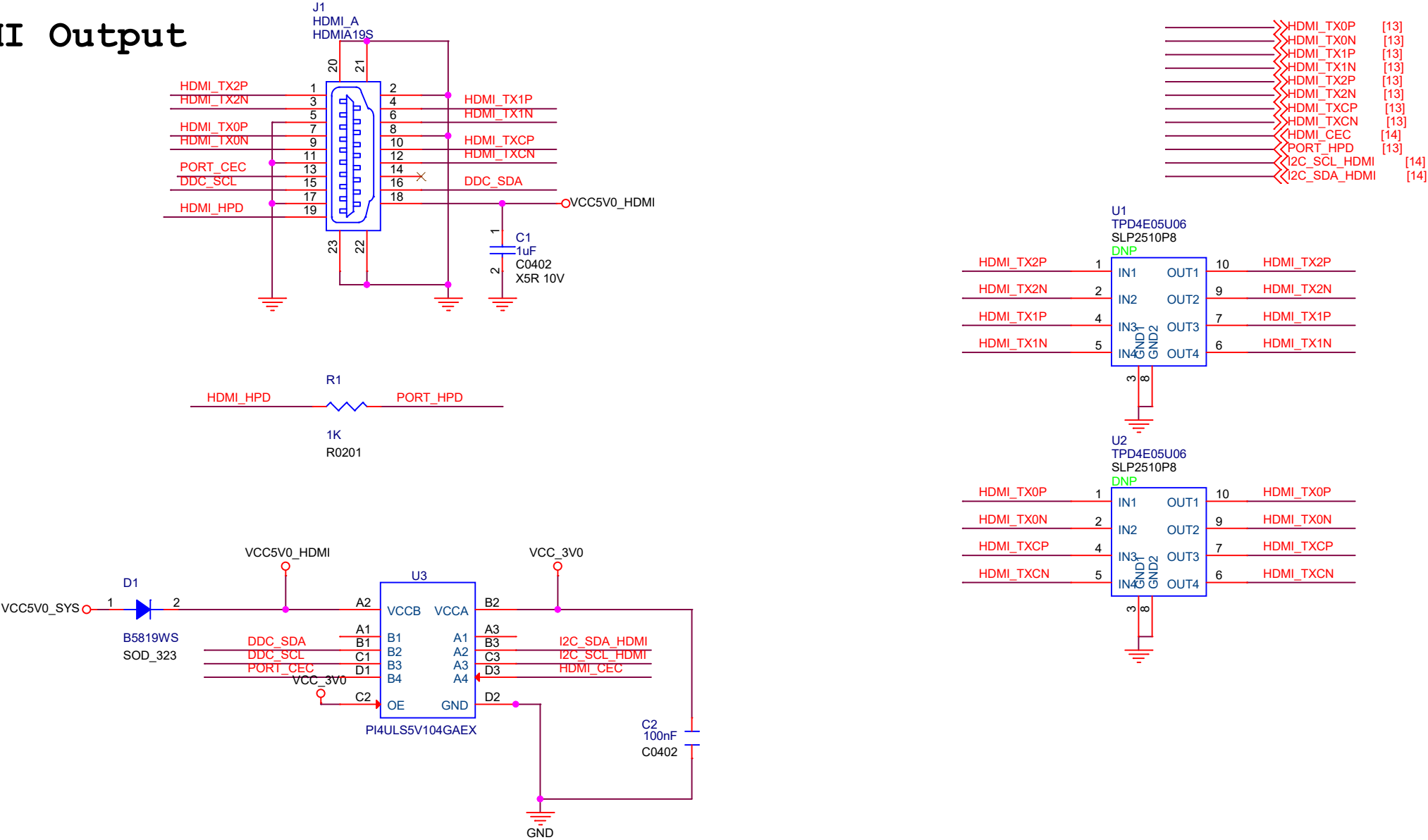
ROCKPI

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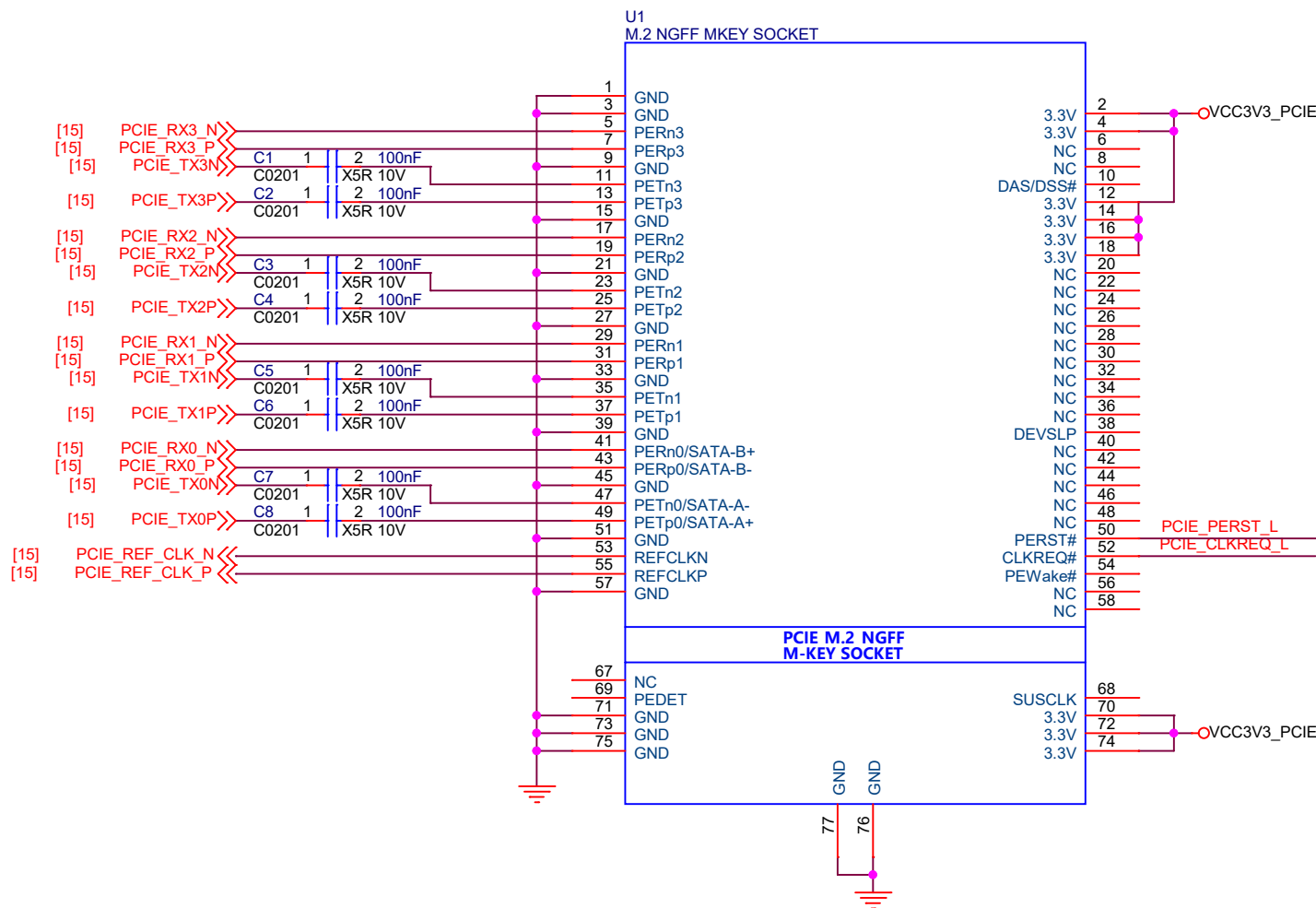
TF CARD



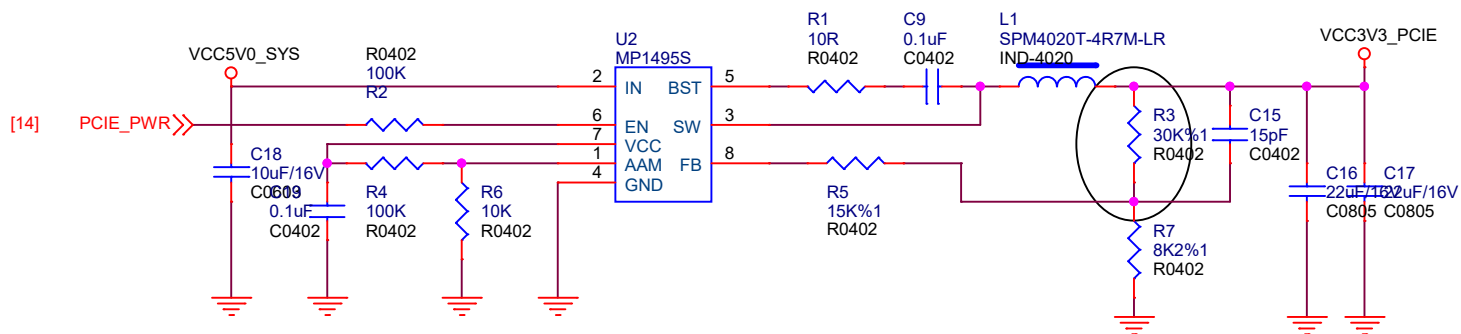
HDMI Output



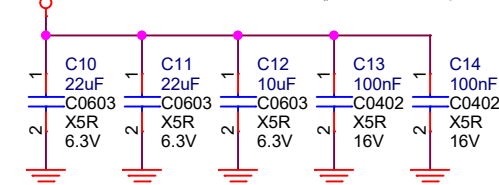
PCIe NGFF/M.2



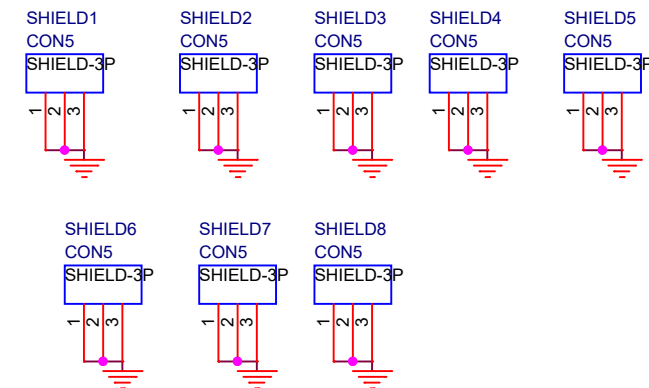
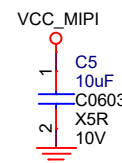
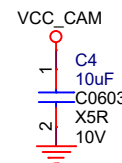
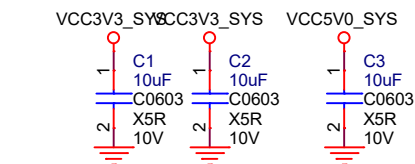
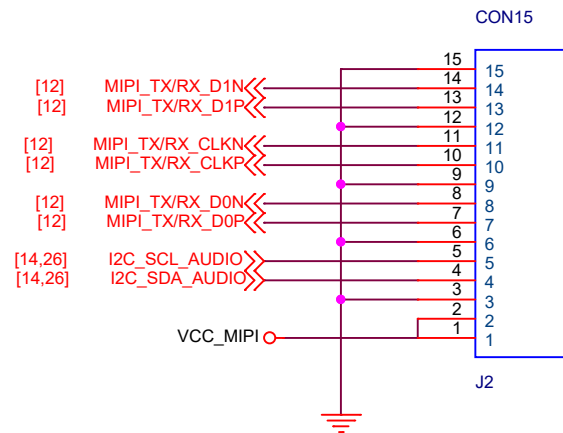
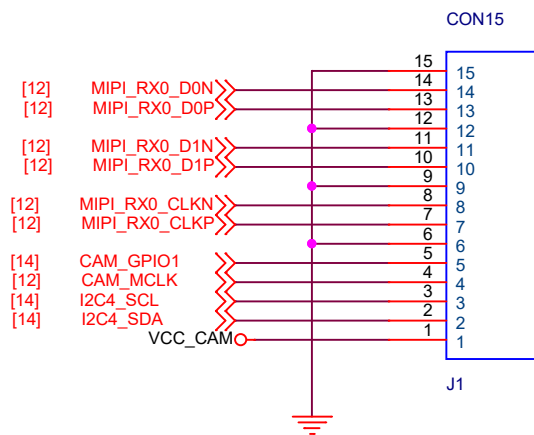
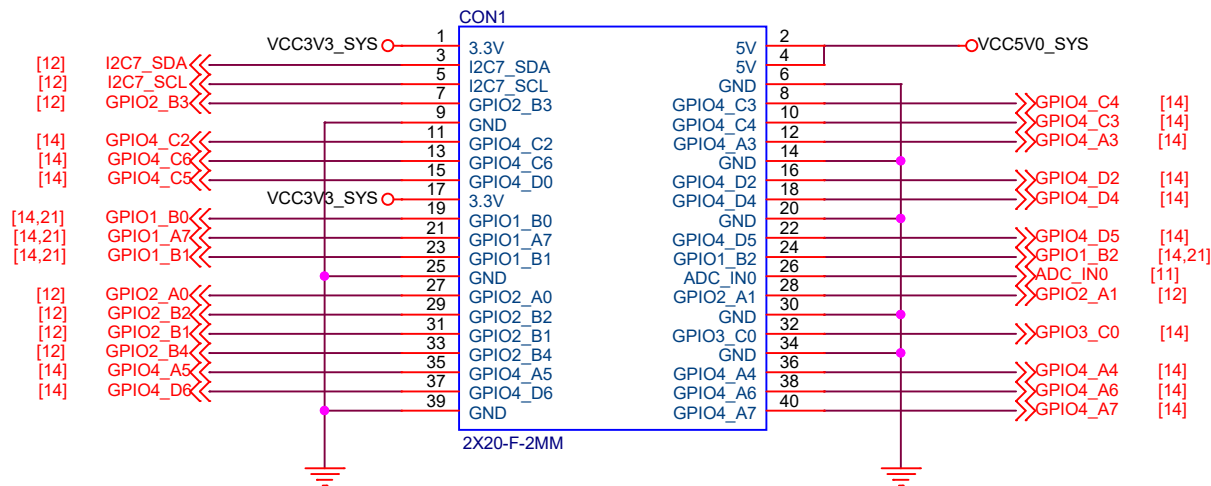
[14] PCIe_PERST_L
[14] PCIe_CLKREQ_L



VCC3V3_PCIE Note: 3.3V 电流至少 5A



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