

RK3399_Rock960_V1.0

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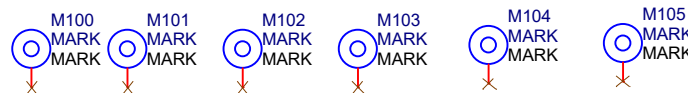
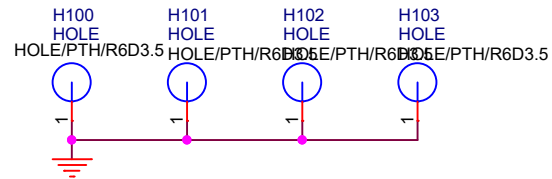
6 LAYERS PCB STACK é g PCB=1.6 mm

| | | |
|--------|------------------------|-------------------------------|
| TOP | Prepreg 1080*1 (75um) | Silkscreen 25um 1oz (35um) |
| GND1 | Prepreg 2116*1 (115um) | Hoz (18um) |
| POWER | Adjust Core 665um | Hoz (18um) |
| SIGNAL | Prepreg 2116*1 (115um) | Hoz (18um) |
| GND2 | Prepreg 1080*1 (75um) | Hoz (18um) |
| BOTTOM | | 1oz (35um) Silkscreen 25um |

Note:

器件参数说明

- 1: 如果 Value 为 DP, 说明不贴。
- 2: 如果 Option 有 DP, 说明预留先不贴。



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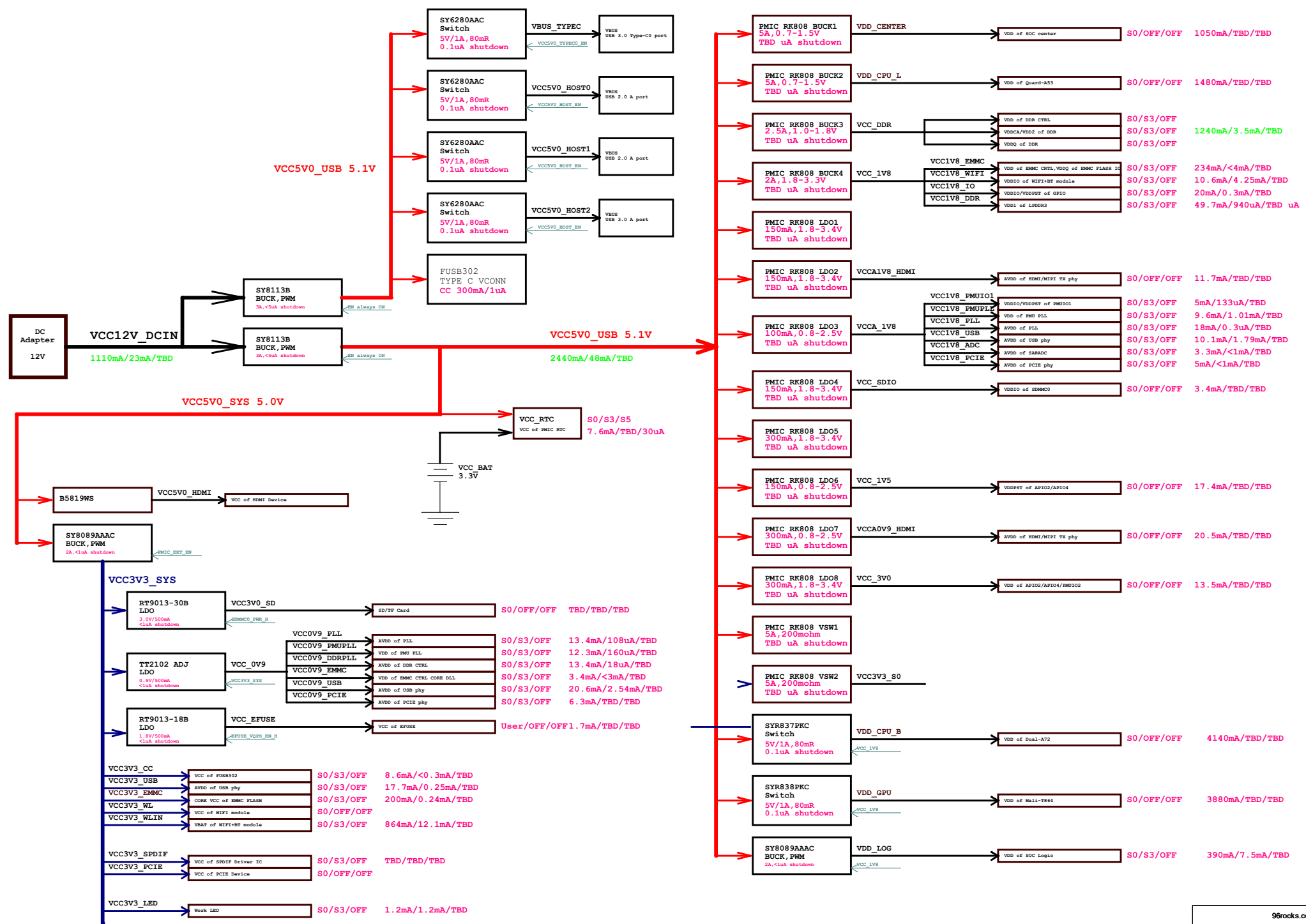
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Change List

| Version | Date | Author | Change Note | Approved |
|---------|--------|---------|---------------|----------|
| V1.0 | 201708 | Charlie | First edition | |
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RK3399 POWER DIAGRAM



I2C MAP

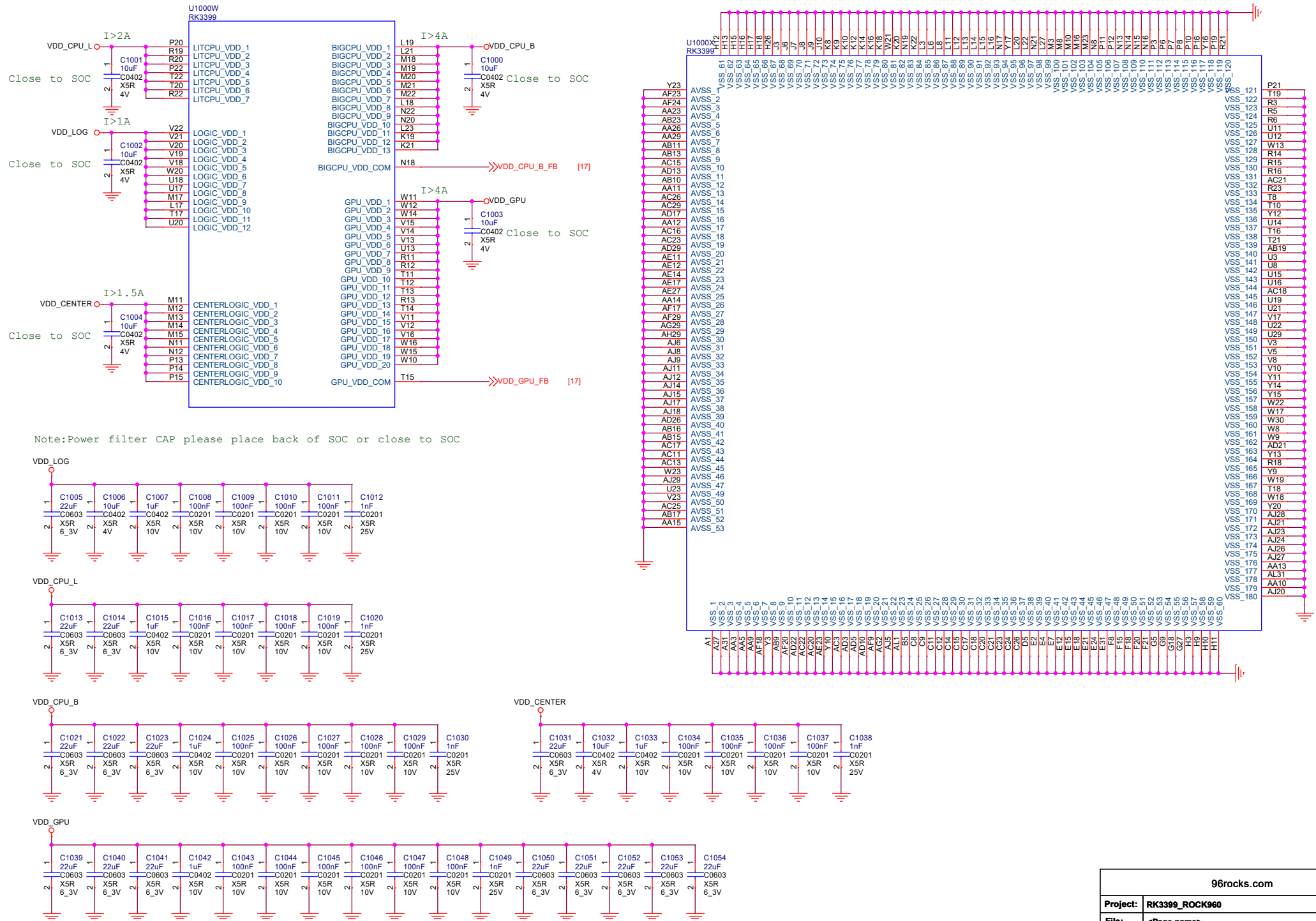
| Port | Pin name | Domain | Bus name | Pull-up voltage | Slave Device | Slave Addr (MS 7Bits) | Note | Slave Bus Capability |
|------|---|--------|------------------------------|-----------------|--------------------|-----------------------|----------------------|------------------------|
| I2C0 | GPIO1_B7/SPI3_RXD/I2C0_SDA 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 | |

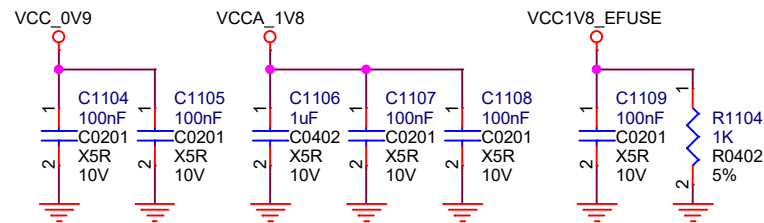
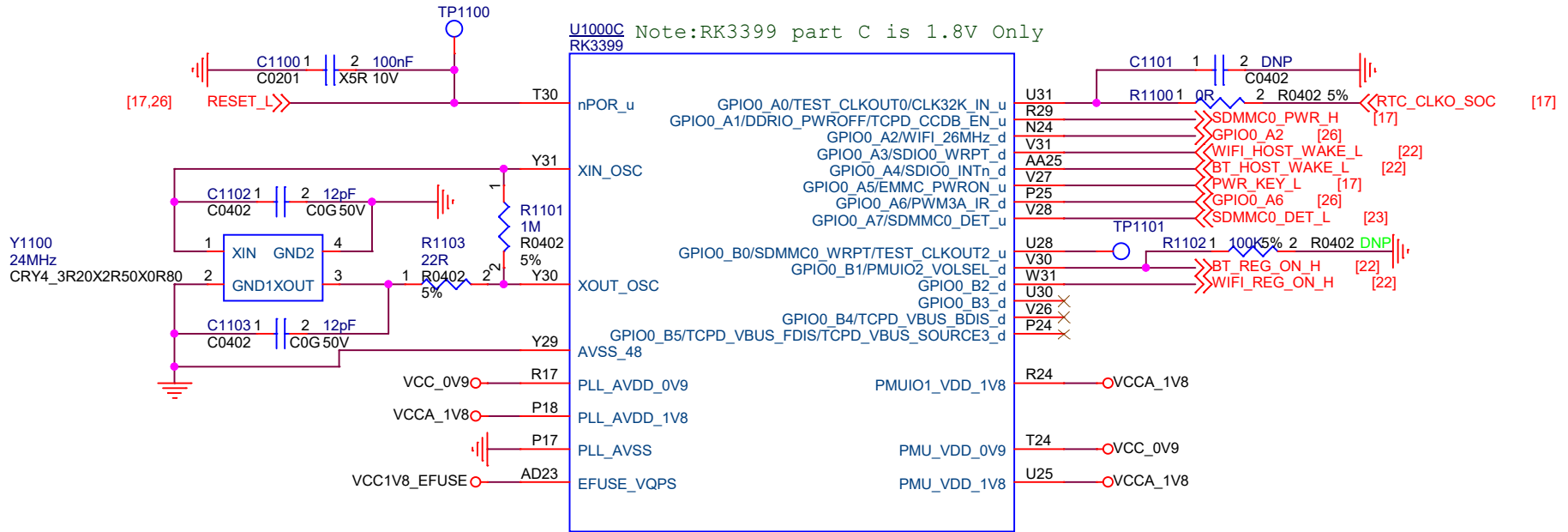
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Power Domain Map

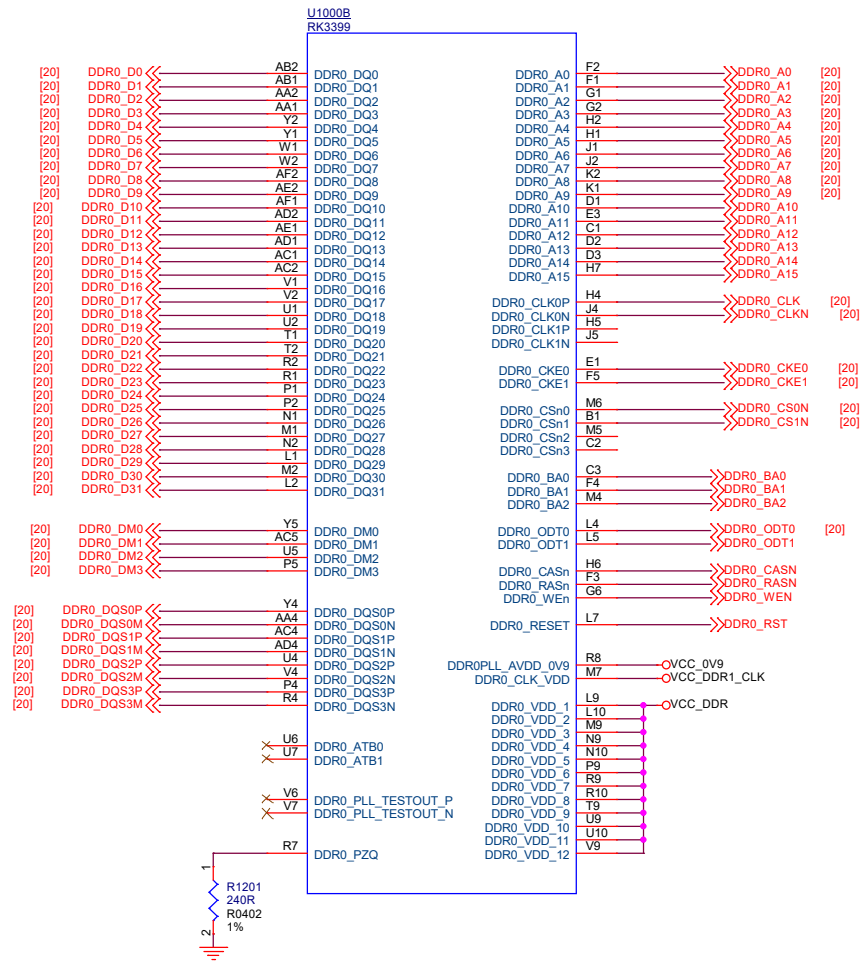
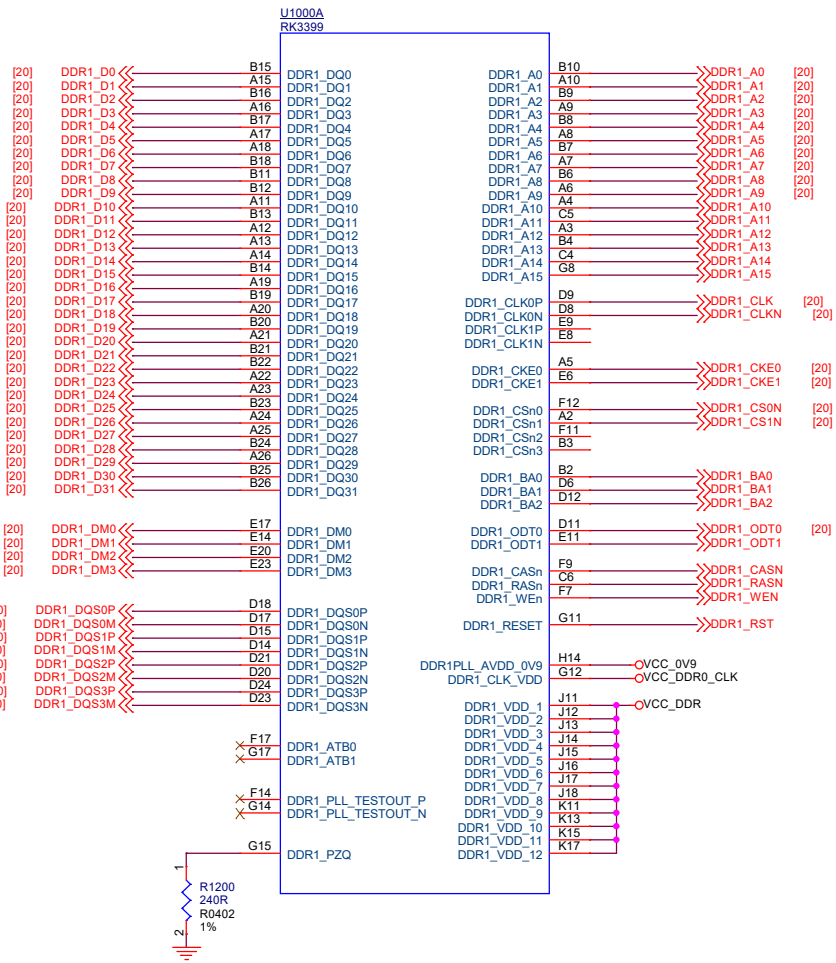
| Part Port | Domain | Pin name in datasheet | I/O type | Power supply | Power source |
|-----------|--------|-----------------------|------------------------|-----------------------|--------------------------------|
| Part C | PMUIO1 | pmuiol_gpio0ab | 1.8V only | VCCA_1V8 | RK808-D VLDO3 |
| Part E | PMUIO2 | pmu1830_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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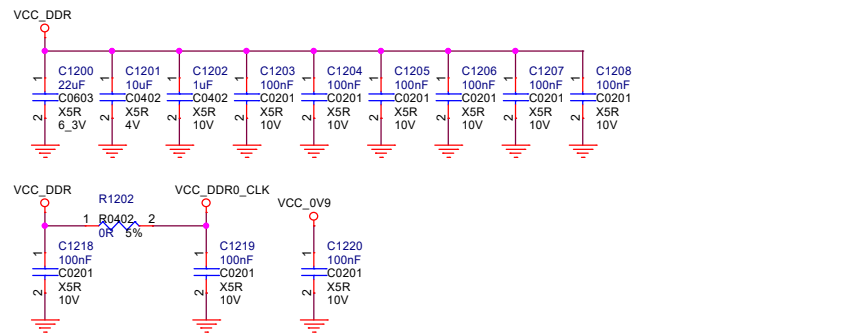




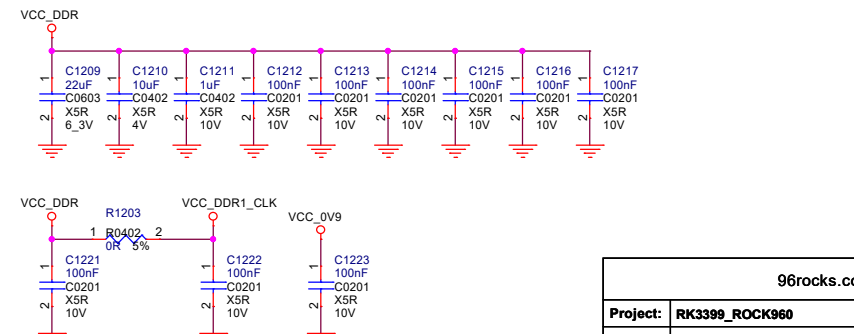
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DDR FILTER Note:R1202 cannot be deleted

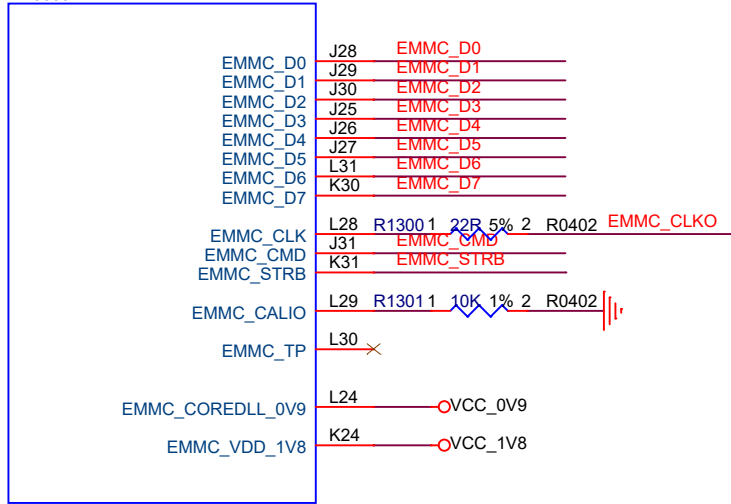


DDR FILTER Note:R1203 cannot be deleted



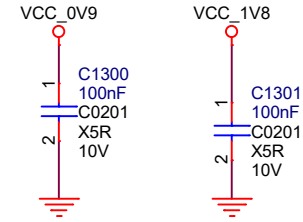
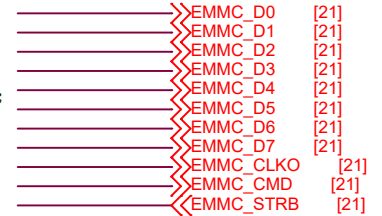
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U1000H
RK3399

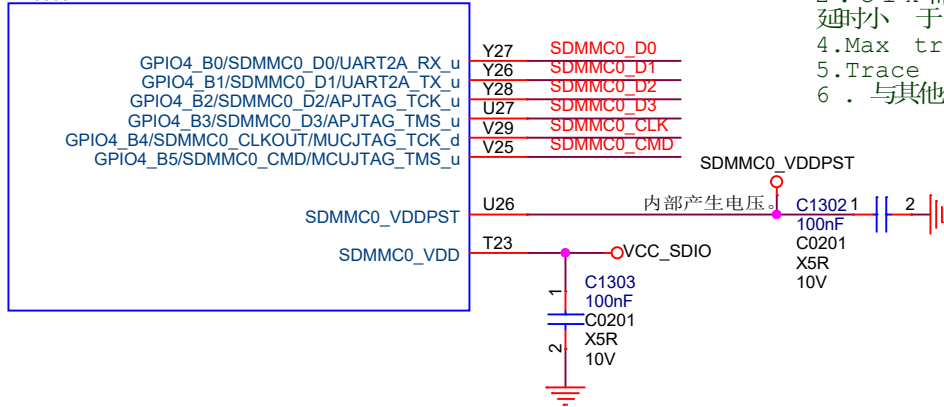


EMMC design rule:

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

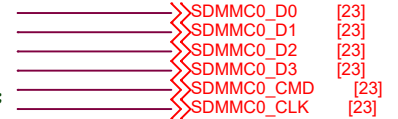


U1000F
RK3399

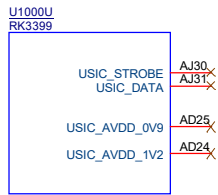


SDMMC design rule:

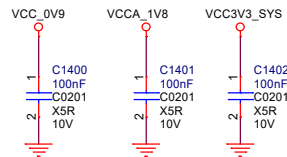
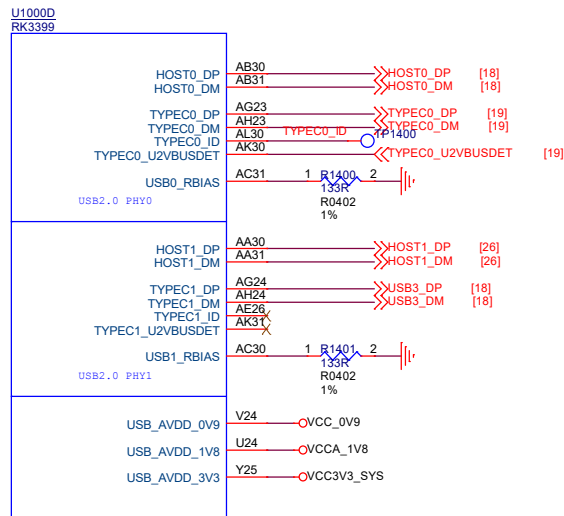
1. Data[0:3]、cmd 为一组，并走线到地，组内等长要求为 $\pm 100\text{mil}$;
2. Clk 需要单独包地处理，与 data 间的延时小于 20ps;
4. Max trace length < 3.93 inches;
5. Trace impedance 50ohm $\pm 10\%$;
6. 与其他信号间距遵循 3w 原则;



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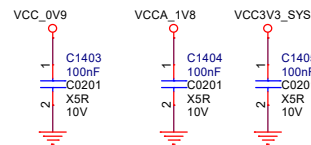
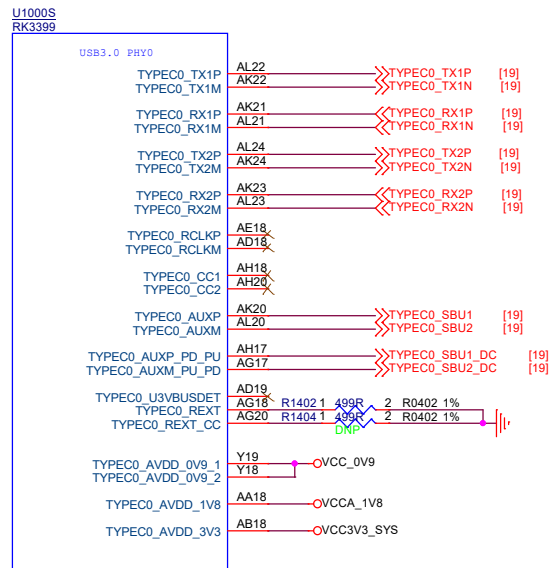


USB2.0



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



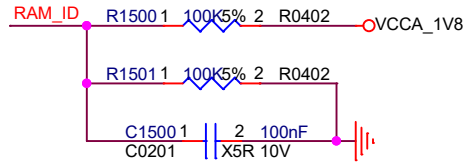
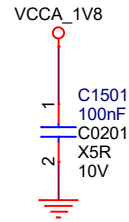
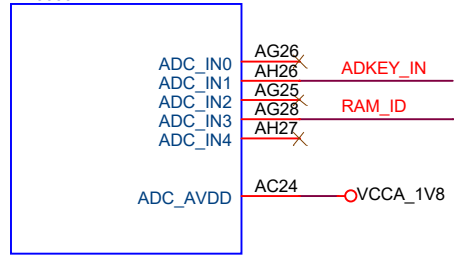
USB3.0 design rule:
 1.Max intra-pair skew < 4 ps;
 2.Max length skew between TX and RX < 1.6 nS;
 3.Max trace length < 6 inches;
 4.Max allowed via < 4;
 5.Trace impedance 90ohm+/-10%;
 6. 与其他信号间 距遵 循3W原则;

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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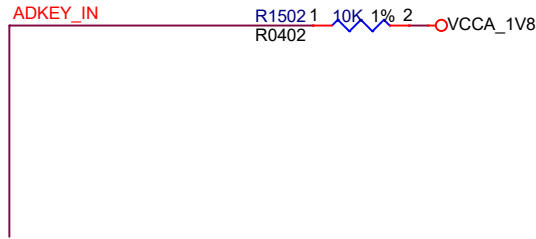
U1000V
RK3399



| | RAM ID | R1501 PU | R1502 PD |
|------------|--------|----------|----------|
| DDR3/DDR3L | 0.6V | 200K | 100K |
| LPDDR3 | 0.112V | 150K | 10K |
| LPDDR4 | 1.5V | 100K | 499K |

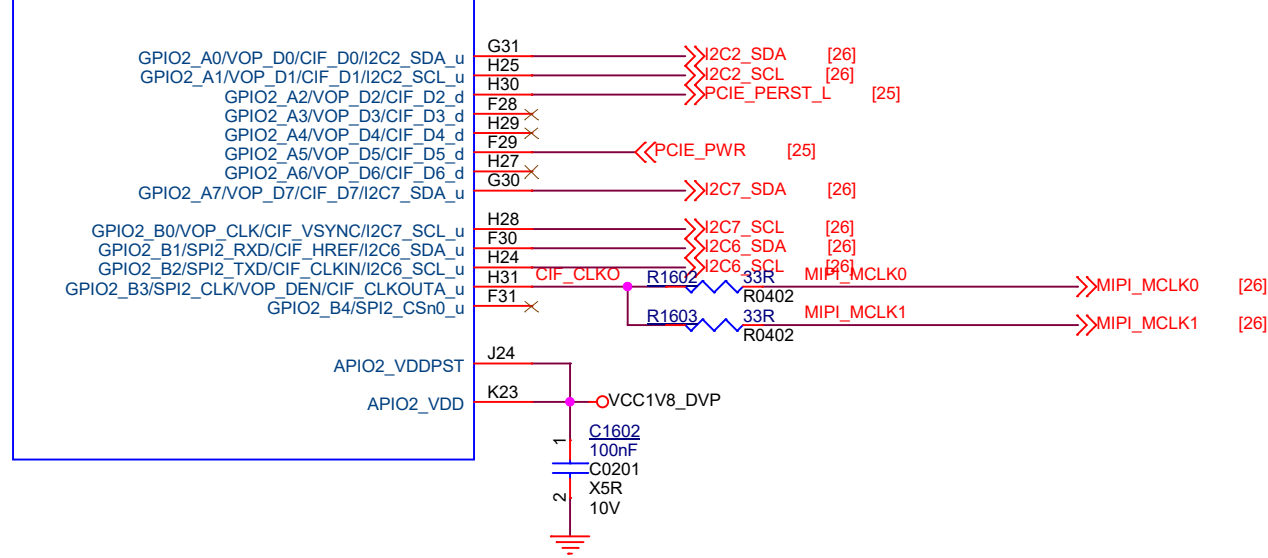
KEY BAORD

Note:
 系统上电时，如果 ADKEY_IN 电平为 0V，
 则 RK3399 进入 Recovery 模式。
 量时 R1503, SW1500, ED1 不用贴片。

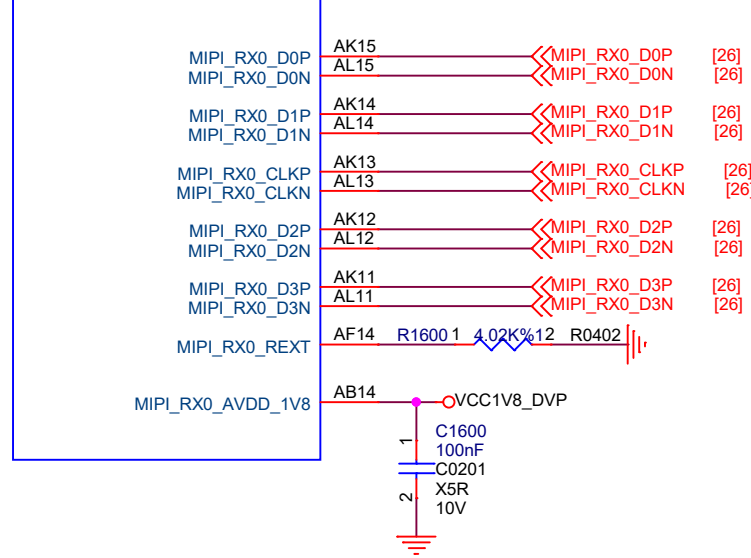


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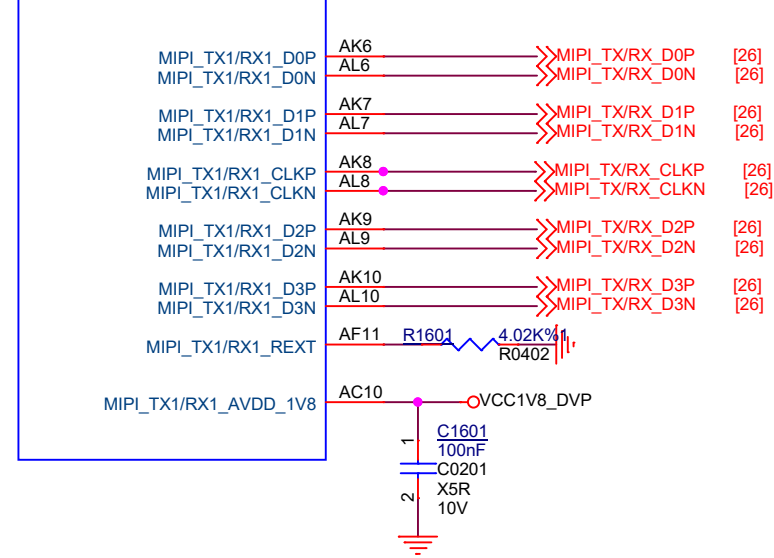
U1000L
RK3399



U1000R
RK3399



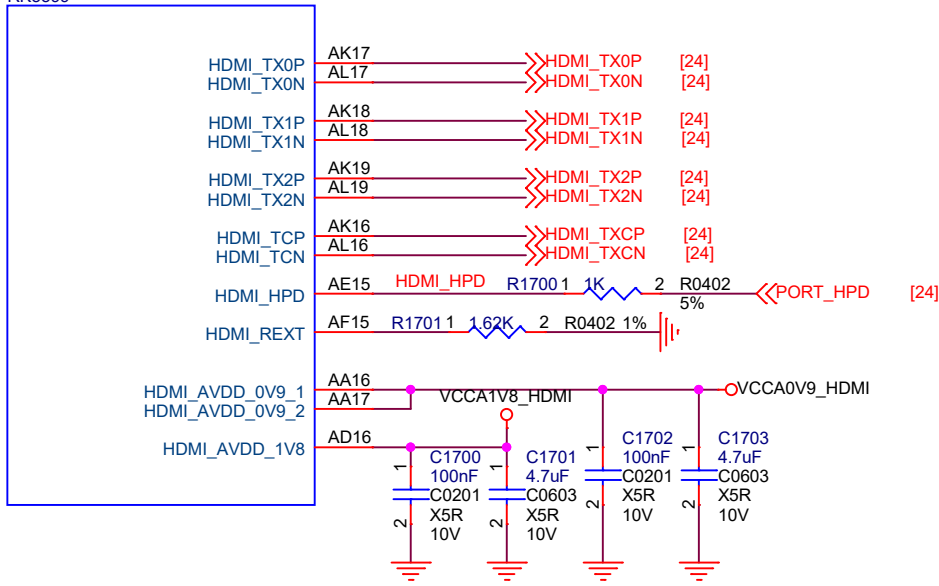
U1000P
RK3399



Dual
MIPI
Right

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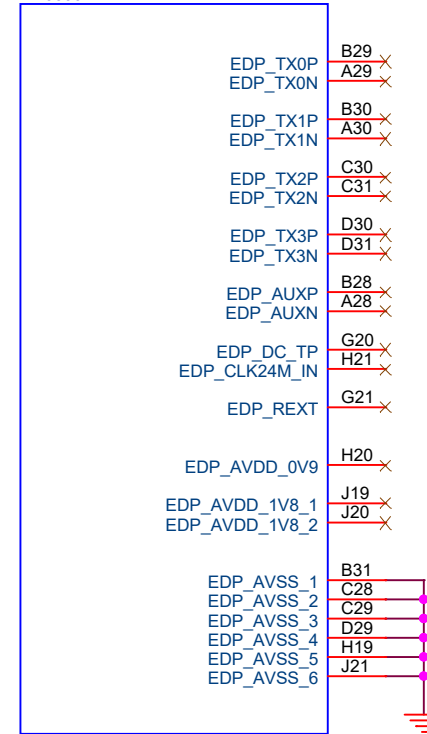
U1000N
RK3399



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;

U1000M
RK3399



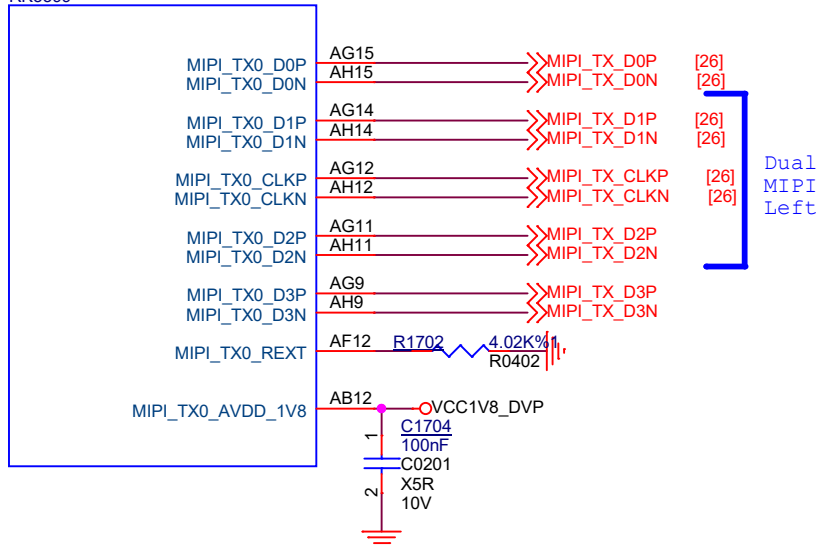
eDP design rule:

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:

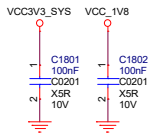
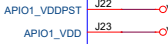
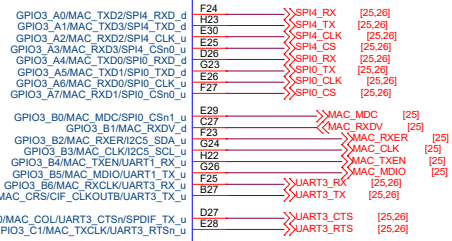
1. Max intra-pair skew < 4 ps;
2. Max length skew between clk and data < 7ps;
3. Max trace length < 7.2 inches;
4. Max allowed via < 4;
5. Trace impedance 100ohm+/-10%;
6. 与其他信号间距遵循3w原则;

U1000Q
RK3399

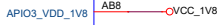
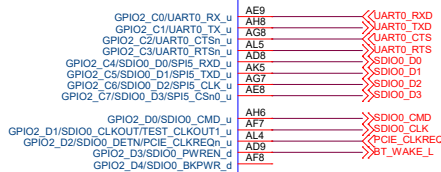


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U1000I Note:RK3399 part I is 3.3V only
RK3399

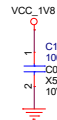
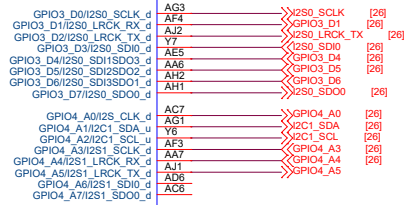


U1000G Note:RK3399 part G is 1.8V only
RK3399

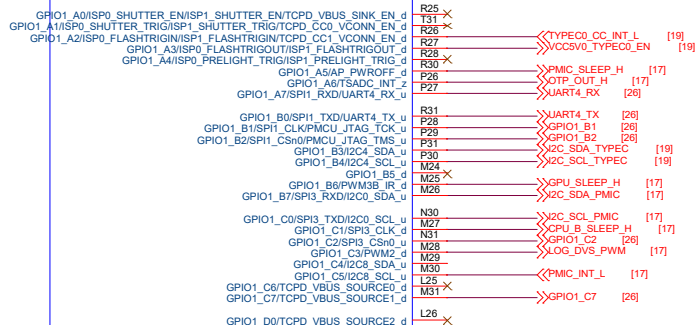


SDIO design rule:
1. Data[0:3].cm 为一组，
并连到同一地，组内等长要求为 +/- 0.1mm;
2. Clk 需单独包地处理，与 data 间的
延时小于 20ps;
3. Max trace length < 3.93 inches;
4. Trace impedance 50ohm +/- 10%;
5. 与其他信号间 间距 遵循 3原则;

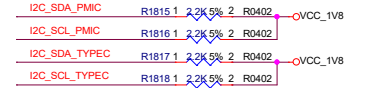
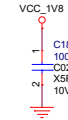
U1000J Note:RK3399 part J is 1.8V/3.0V mode
RK3399



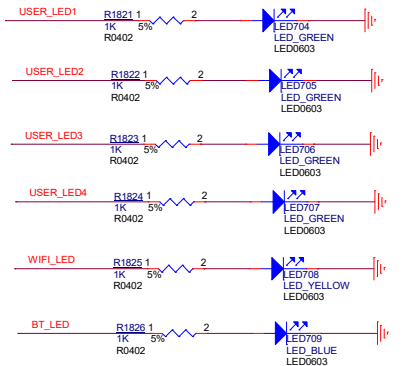
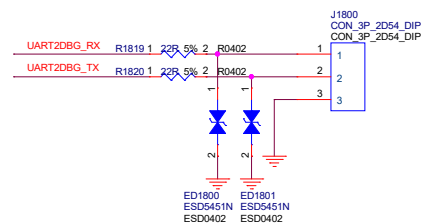
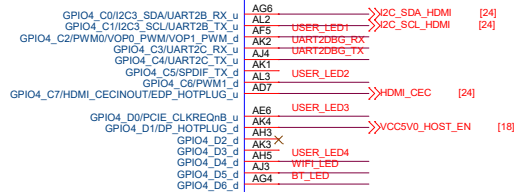
U1000E Note:RK3399 part E is 1.8V/3.0V mode
RK3399



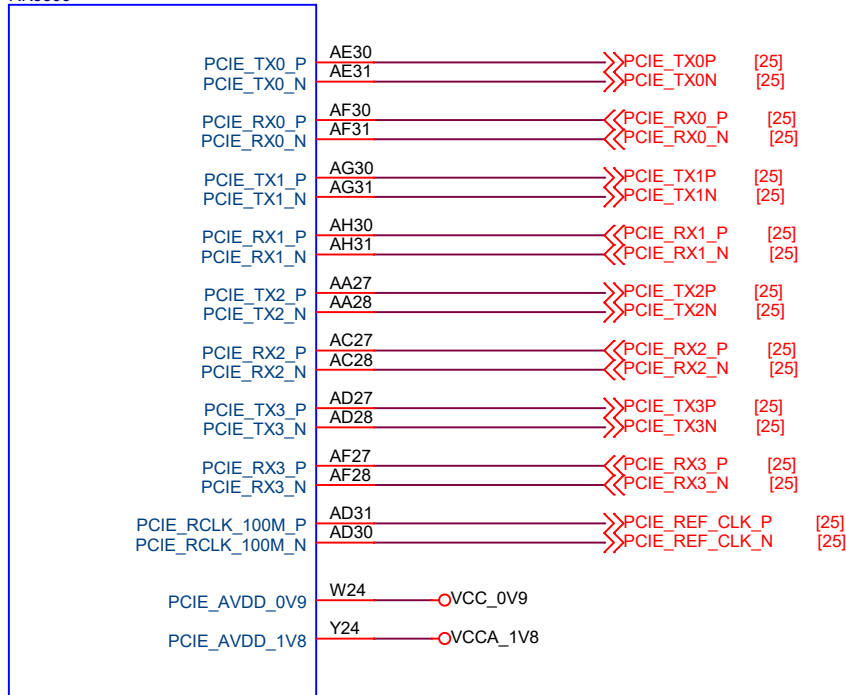
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|-----------|--|
| 1.8V Only | VDDPST=VDDIO=1.8V |
| 3.3V Only | VDDPST=1.8V, VDDIO=3.3V |
| other | 3.0V mode: VDDPST=1.5V, VDDIO=3.0V 1.8V mode: VDDPST=1.8V, VDDIO=1.8V |



U1000K Note:RK3399 part J is 1.8V/3.0V mode
RK3399

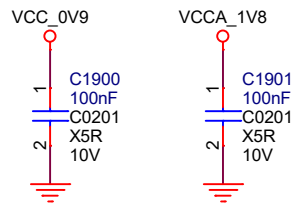


U1000O
RK3399



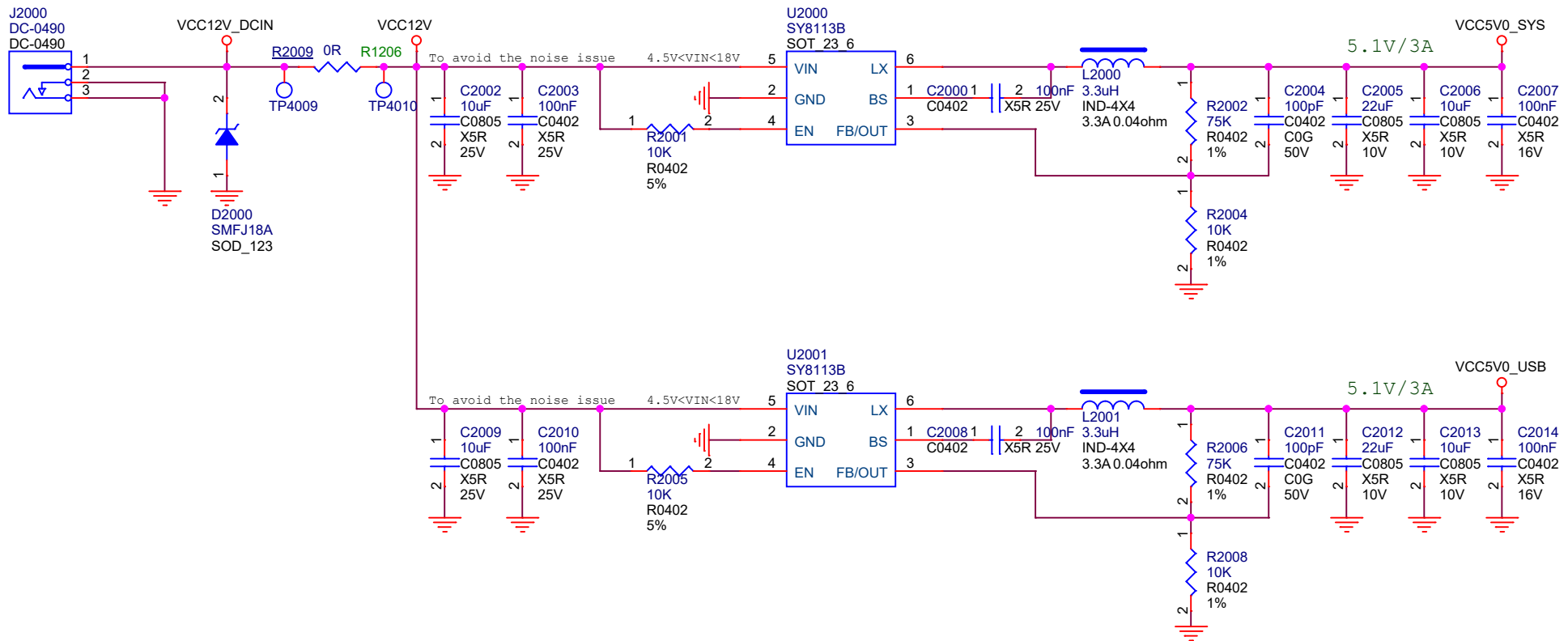
PCIE design rule:

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;



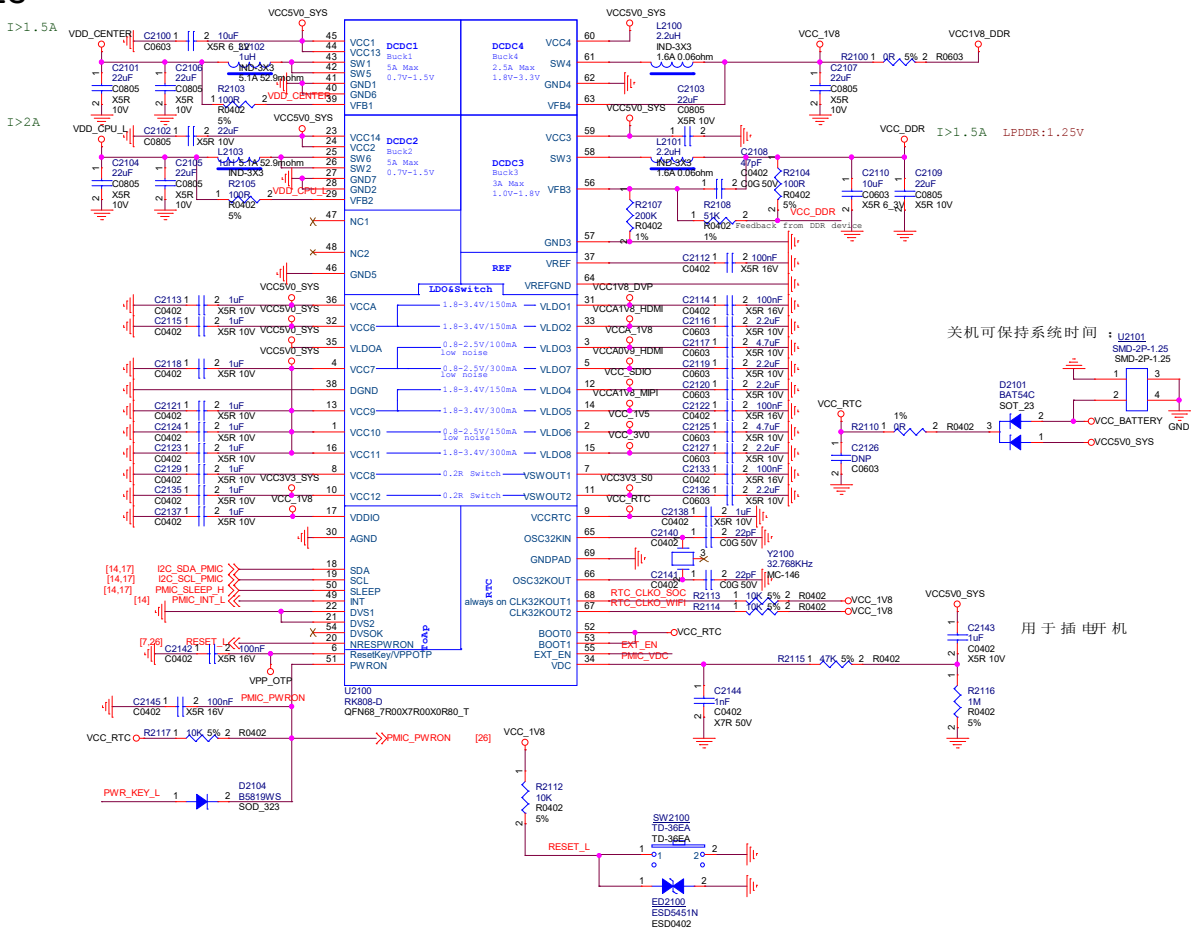
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DC IN&SYSTEM Power

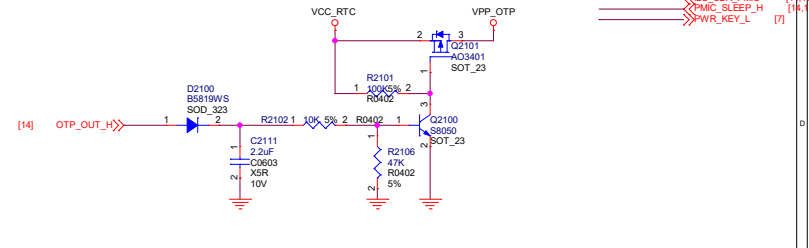


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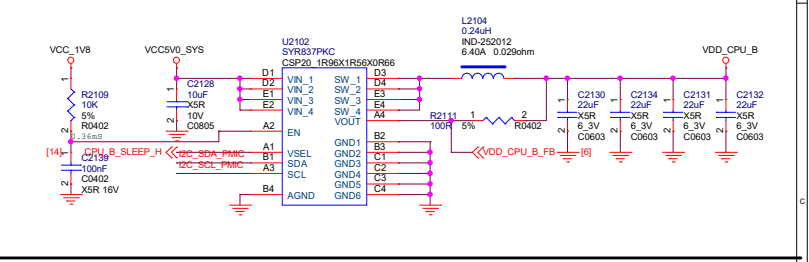
PMIC



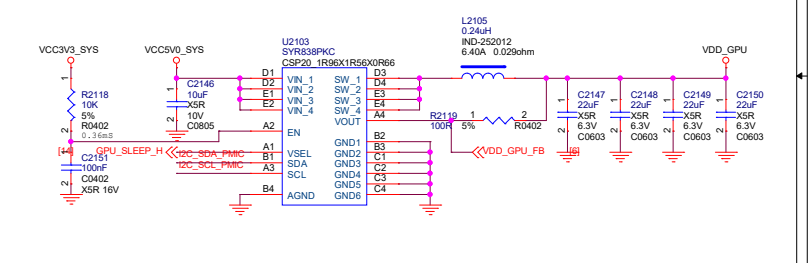
Over-temperature Protection



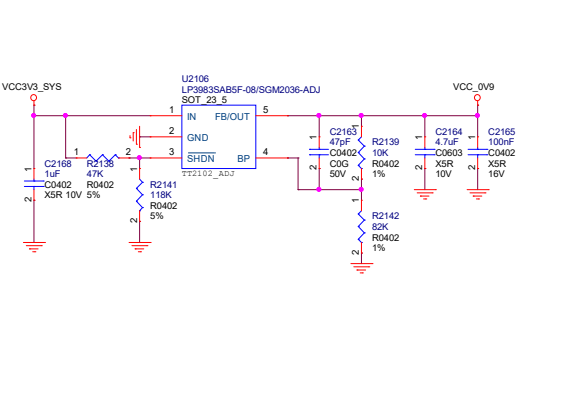
VDD_CPU_B power



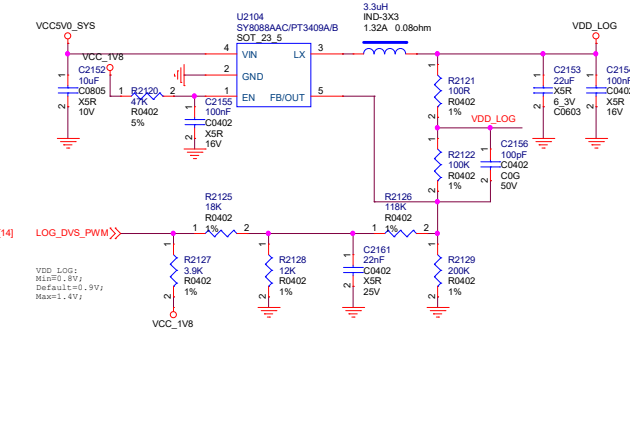
VDD_GPU power



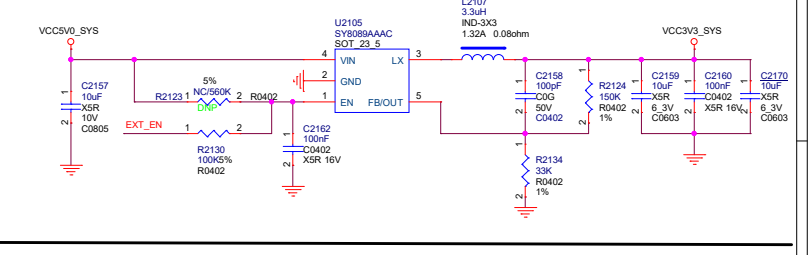
VCC_0V9 power



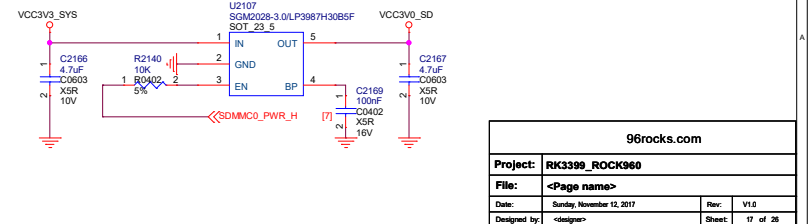
VDD_LOG power



VCC3V3_SYS power

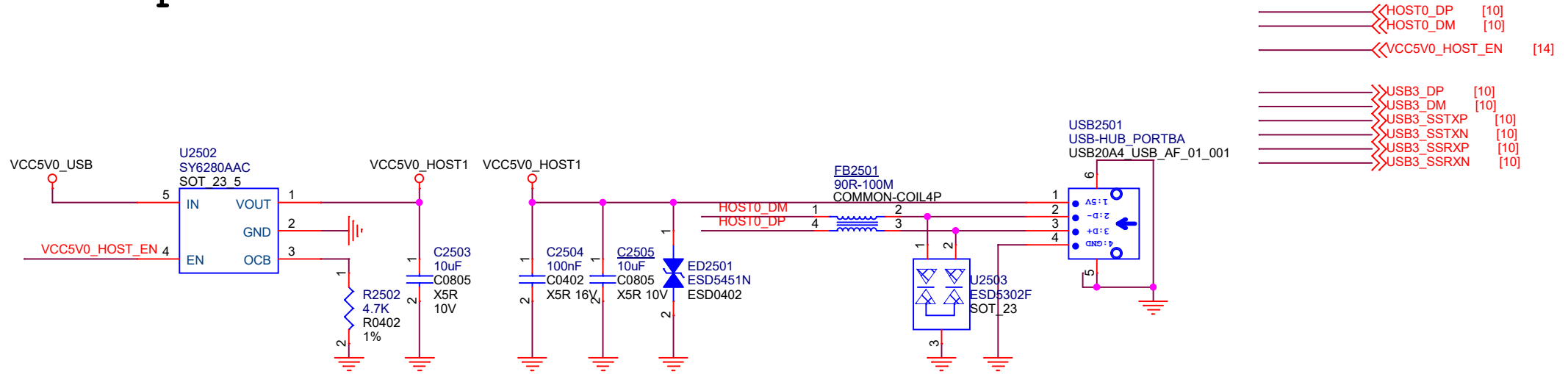


VCC3V0_SD power

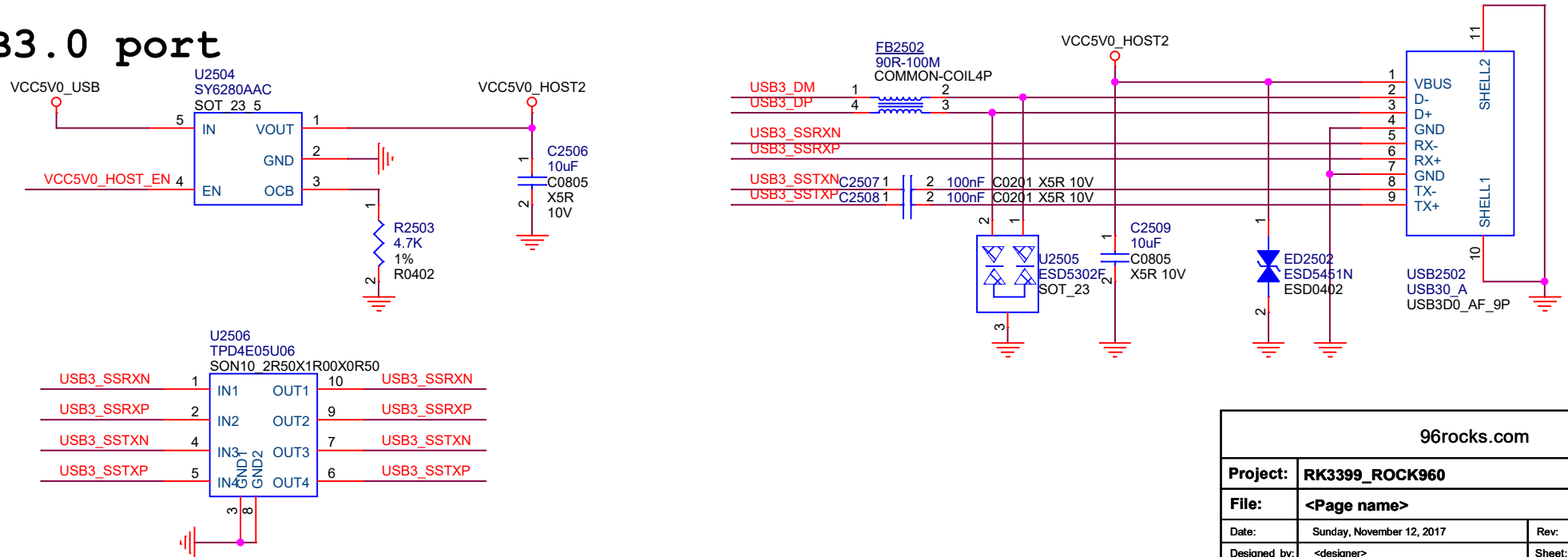


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USB2.0 port

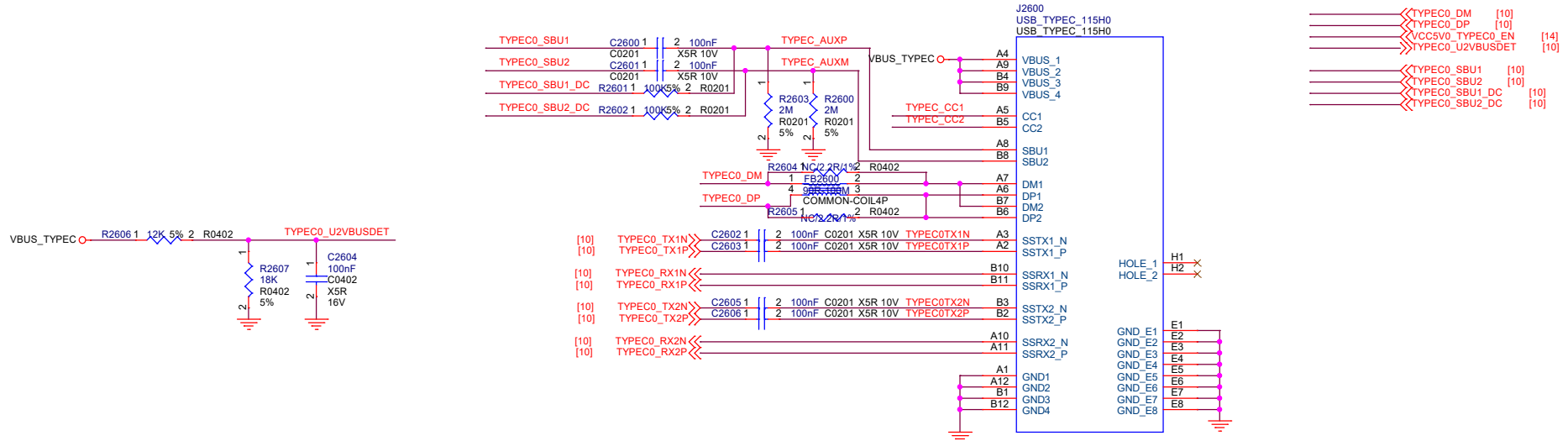


USB3.0 port

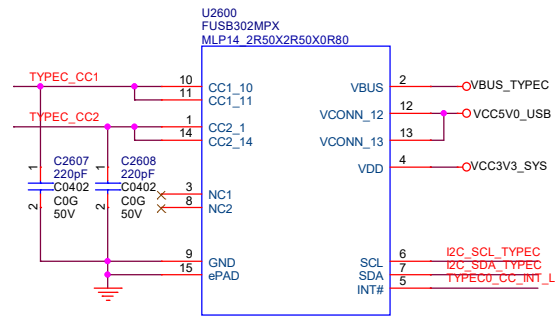


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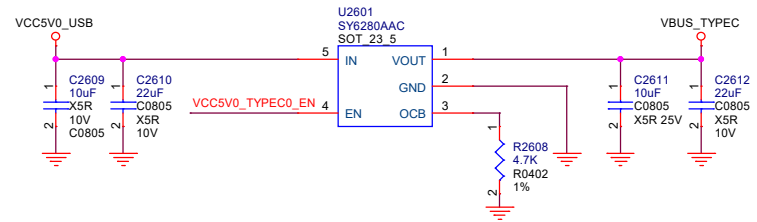
USB Type-C port



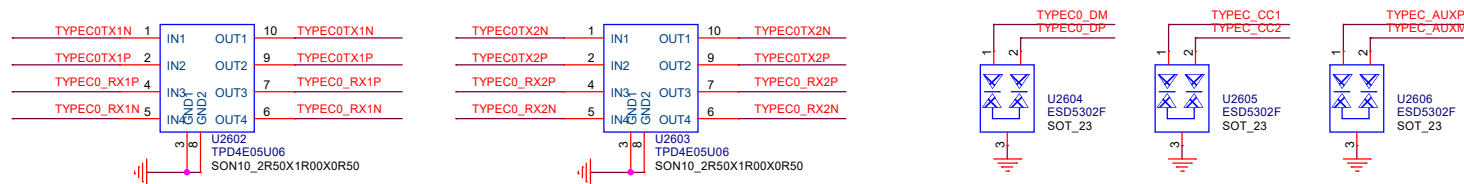
CC CTRL



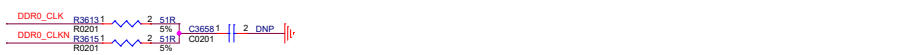
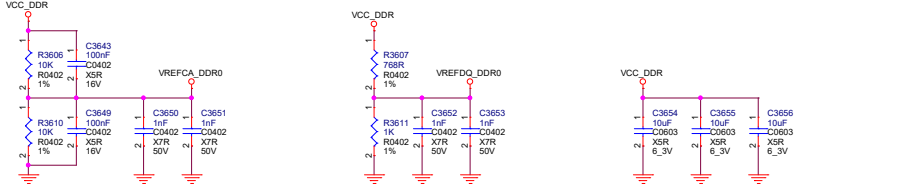
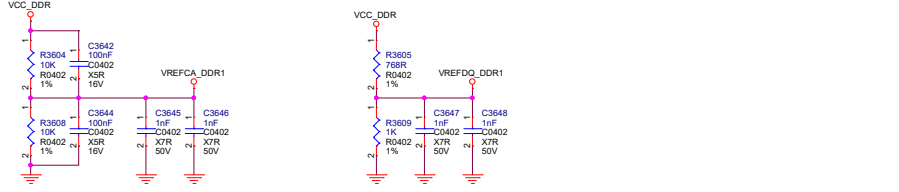
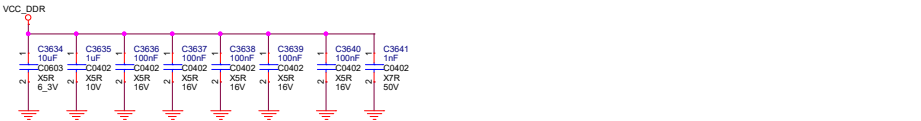
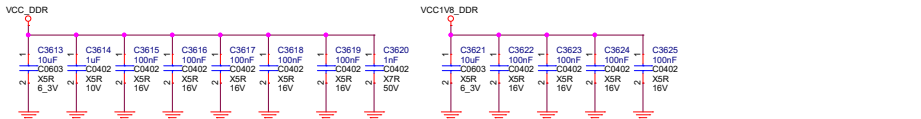
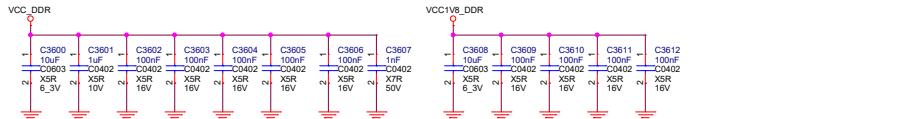
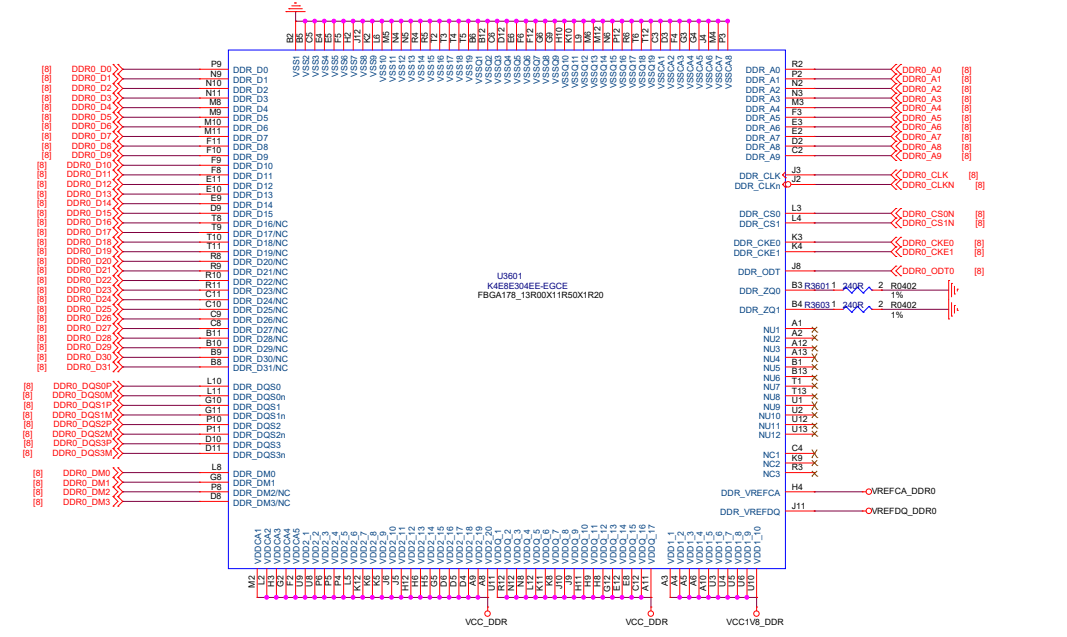
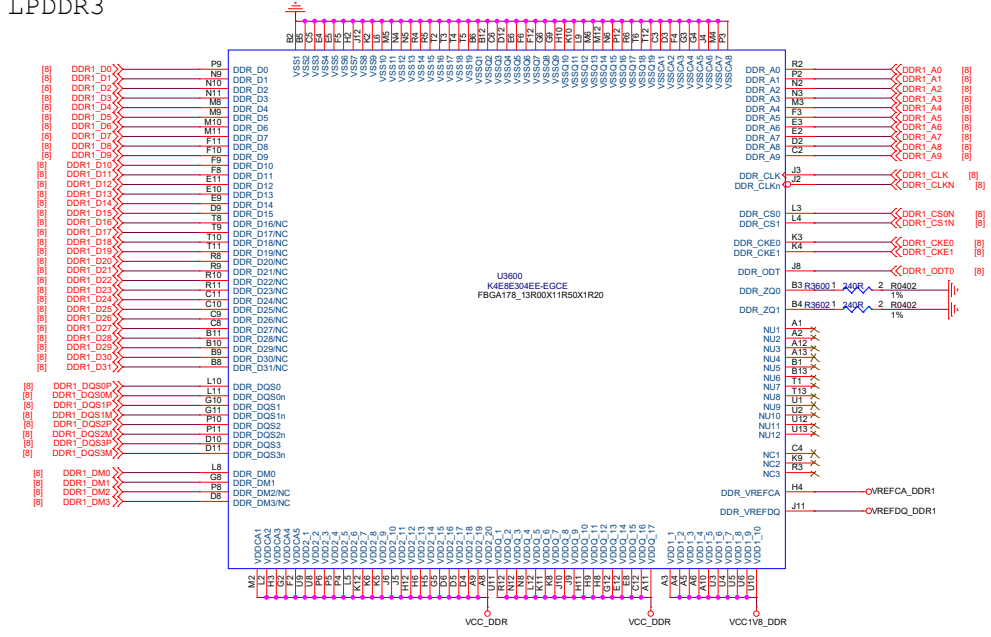
Limit switch



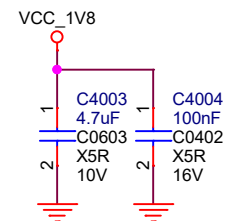
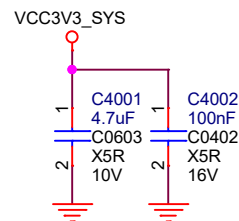
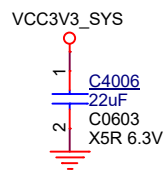
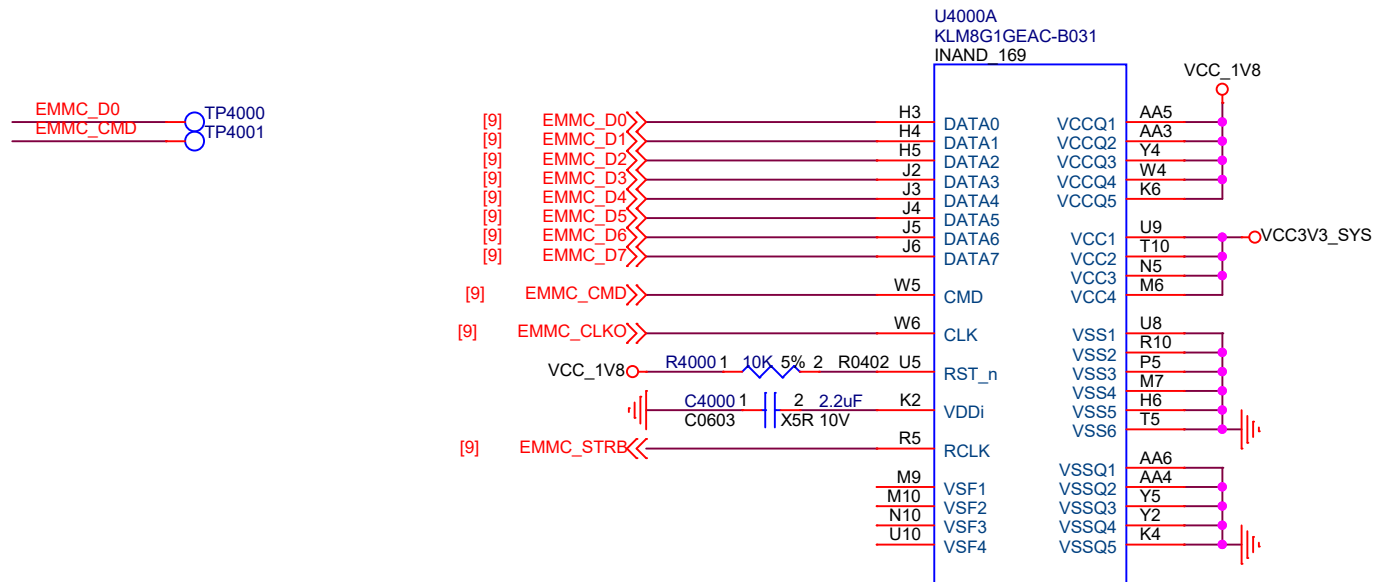
ESD



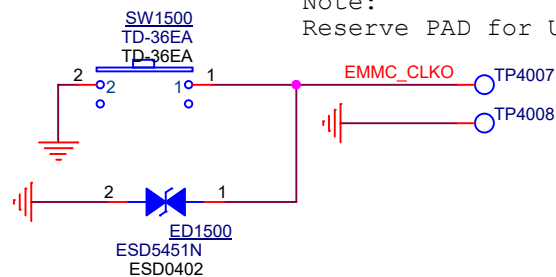
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eMMC FLASH

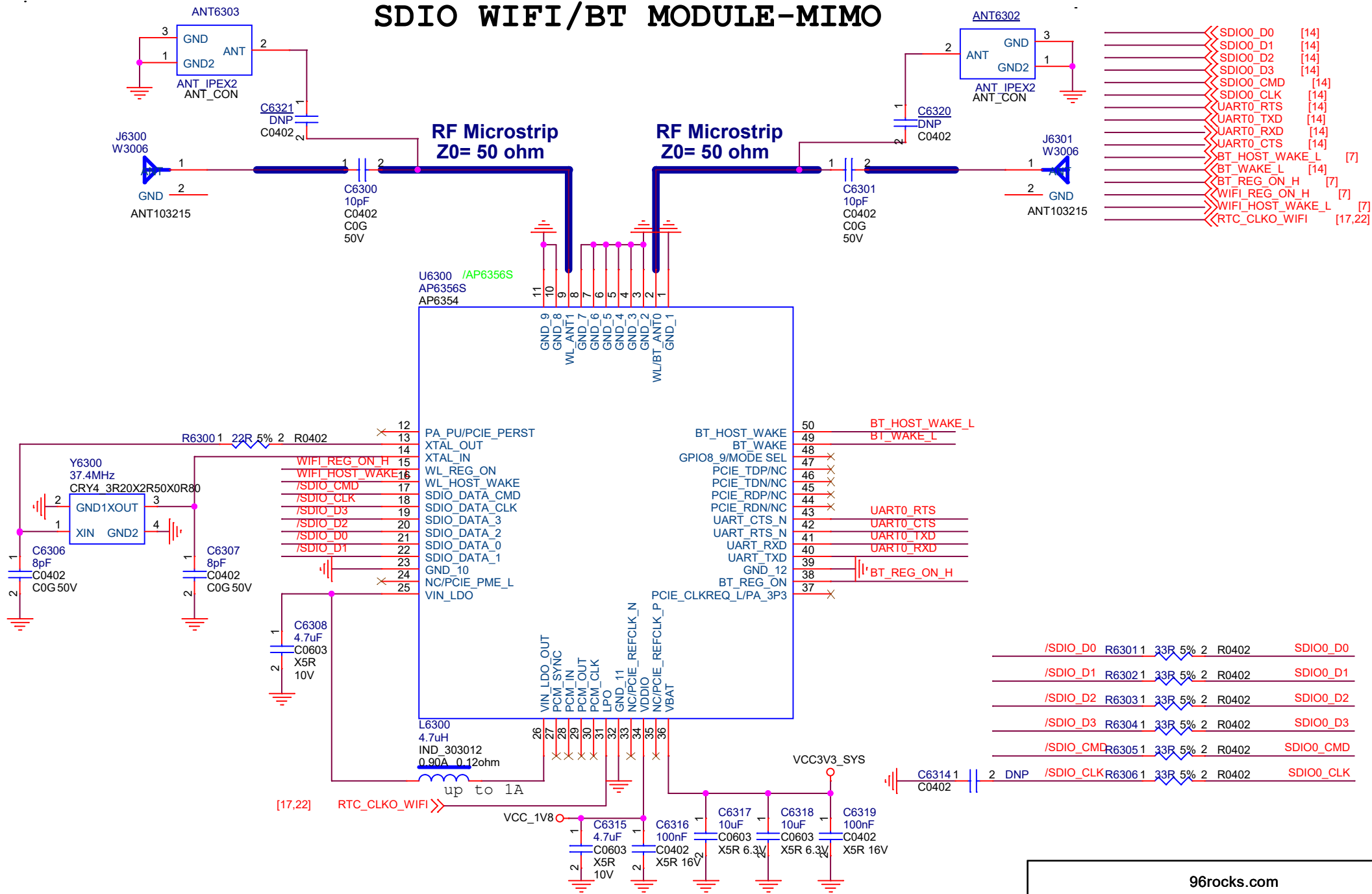


Note:
Reserve PAD for Update.



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SDIO WIFI/BT MODULE-MIMO

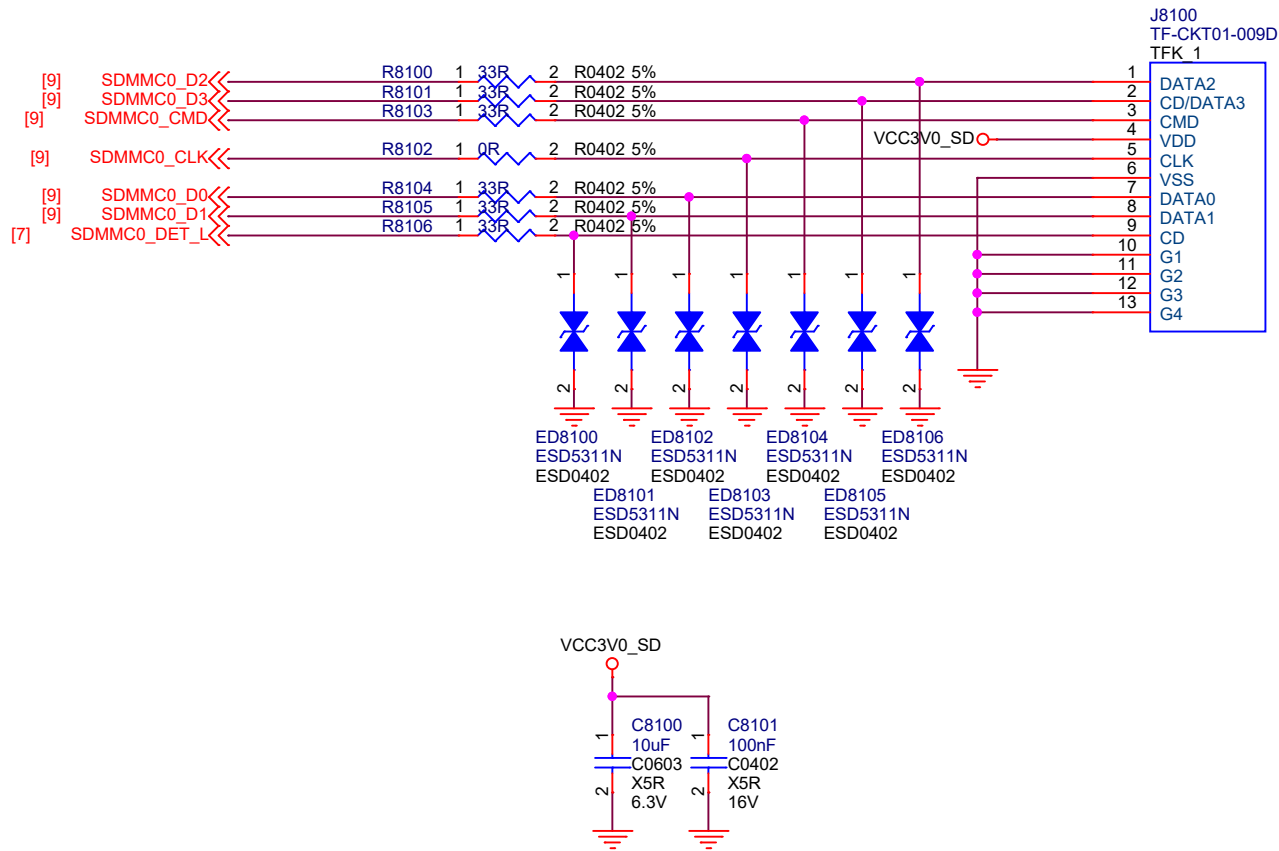


- SDIO0_D0 [14]
- SDIO0_D1 [14]
- SDIO0_D2 [14]
- SDIO0_D3 [14]
- SDIO0_CMD [14]
- SDIO0_CLK [14]
- UART0_RTS [14]
- UART0_TXD [14]
- UART0_RXD [14]
- UART0_CTS [14]
- BT_HOST_WAKE_L [7]
- BT_WAKE_L [14]
- BT_REG_ON_H [7]
- WIFI_REG_ON_H [7]
- WIFI_HOST_WAKE_L [7]
- RTC_CLKO_WIFI [17,22]

- /SDIO_D0 R6301 1 33R 5% 2 R0402 SDIO0_D0
- /SDIO_D1 R6302 1 33R 5% 2 R0402 SDIO0_D1
- /SDIO_D2 R6303 1 33R 5% 2 R0402 SDIO0_D2
- /SDIO_D3 R6304 1 33R 5% 2 R0402 SDIO0_D3
- /SDIO_CMD R6305 1 33R 5% 2 R0402 SDIO0_CMD
- /SDIO_CLK R6306 1 33R 5% 2 R0402 SDIO0_CLK

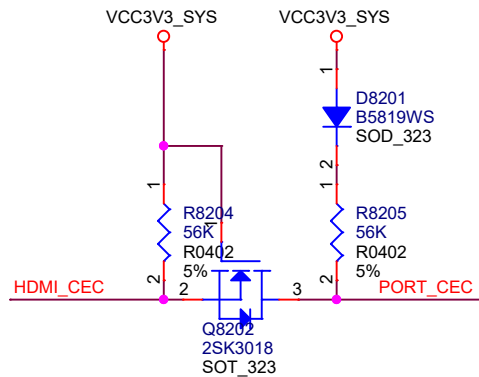
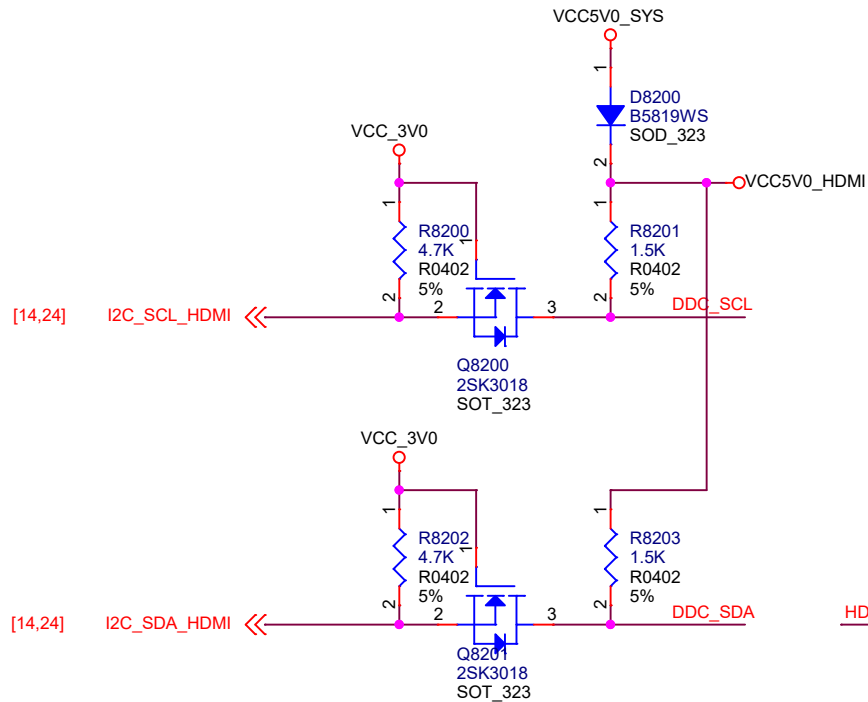
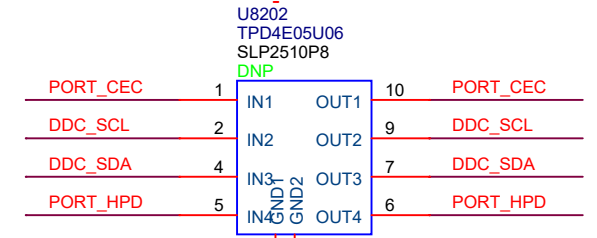
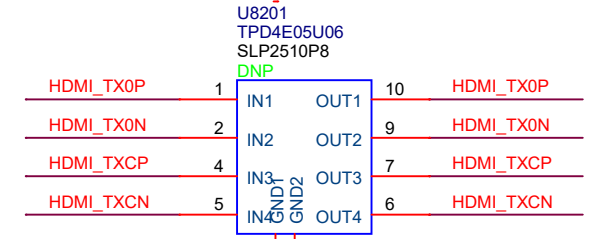
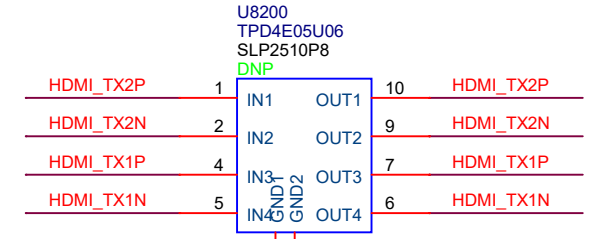
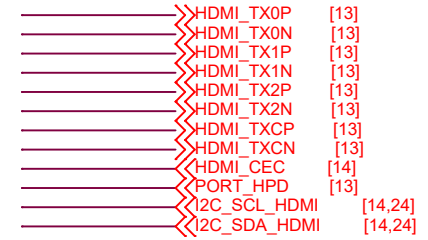
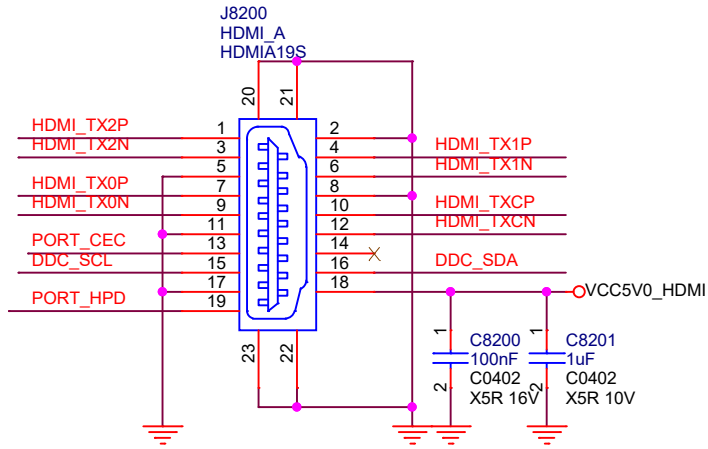
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TF CARD



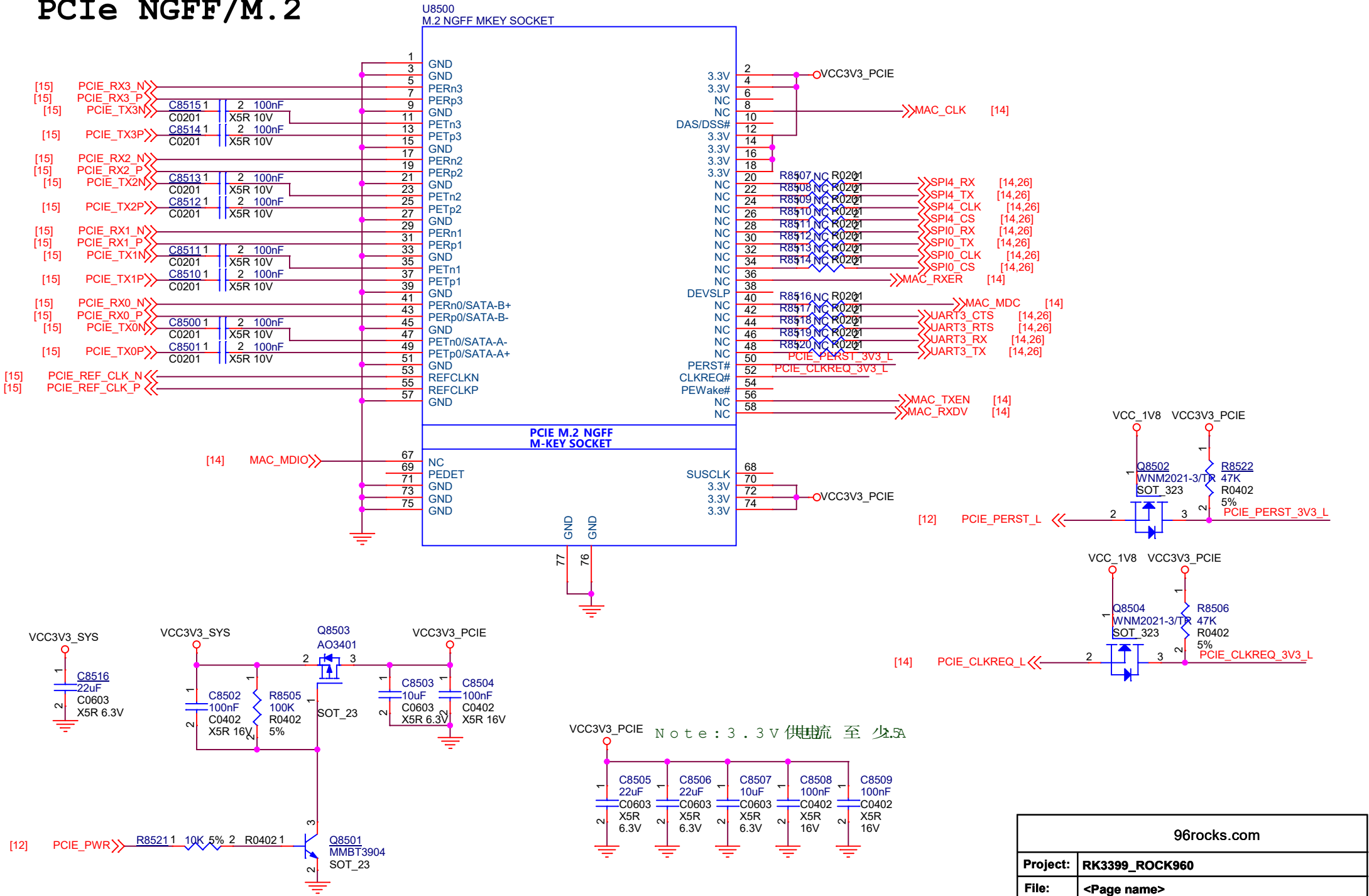
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HDMI Output



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PCIe NGFF/M.2



Note: 3.3V 供电电流至少 5A

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注意：
带电压 VCCB >= VCA。

