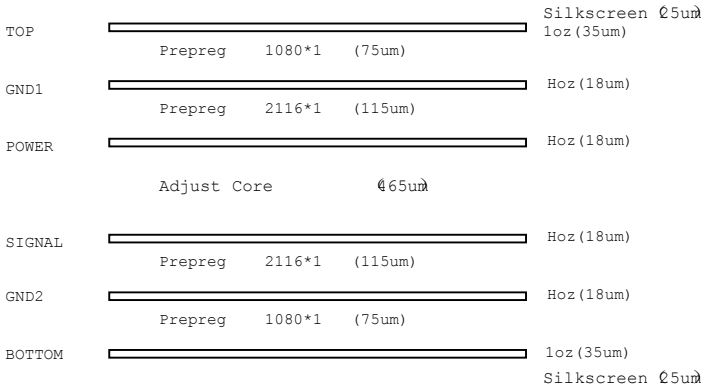
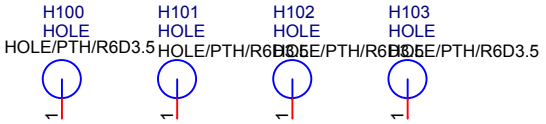
ROCK_Pi_4_Model_B_V1.3

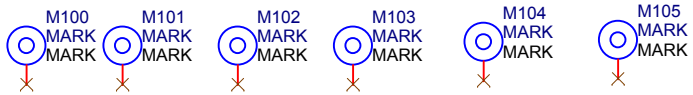
CONTENT INDEXING

6 LAYERS PCB STACK (PCB=1.6mm)



Note:
器件参数说明
1:如果Value为DNP,则此器件暂时不贴。
2:如果Option有DNP,则此器件预留先不贴。





Change List

Version	Date	Author	Change Note	Approved
V1.3	20180901	Charlie	V1.3 release.	

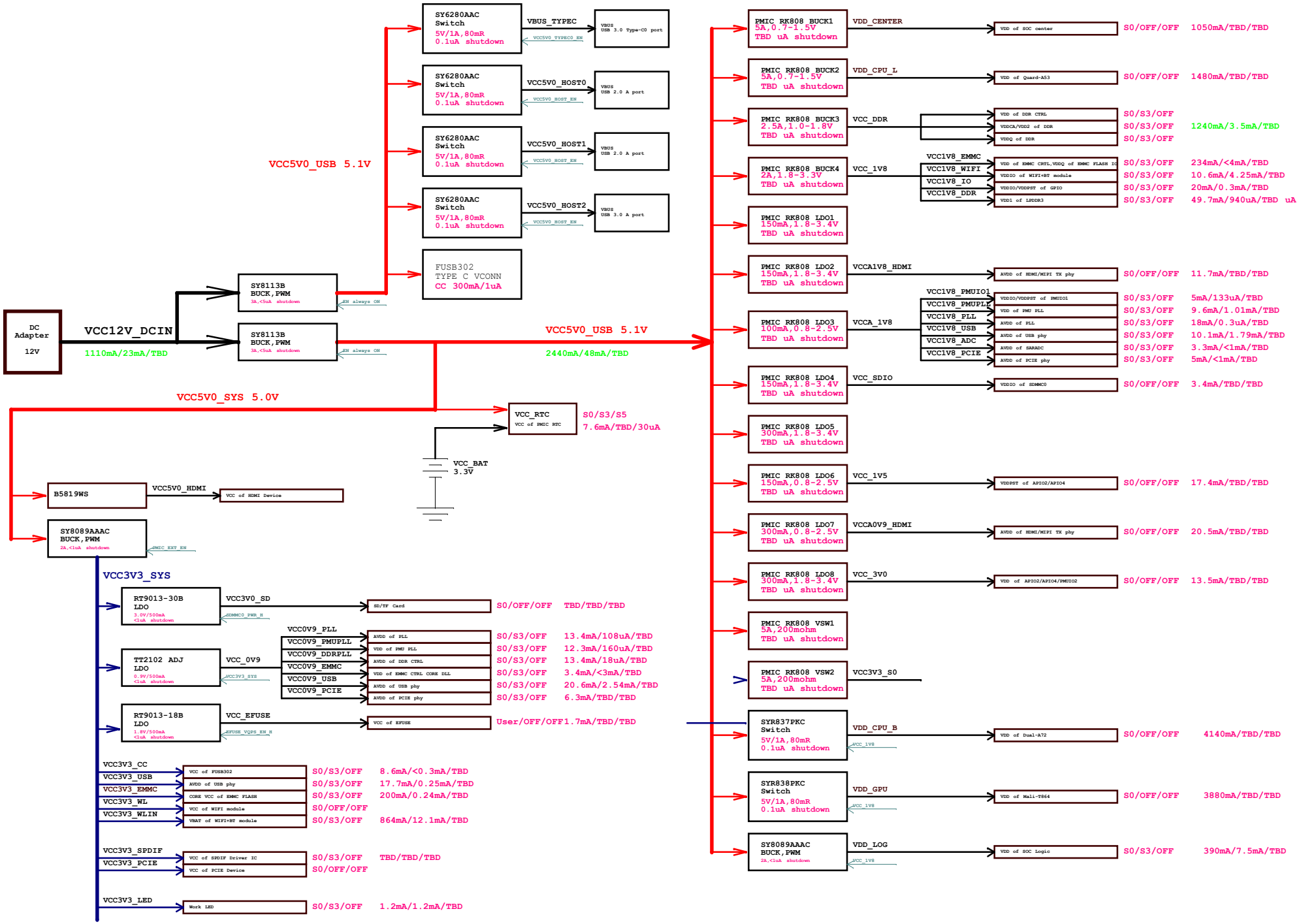
Power Domain Map

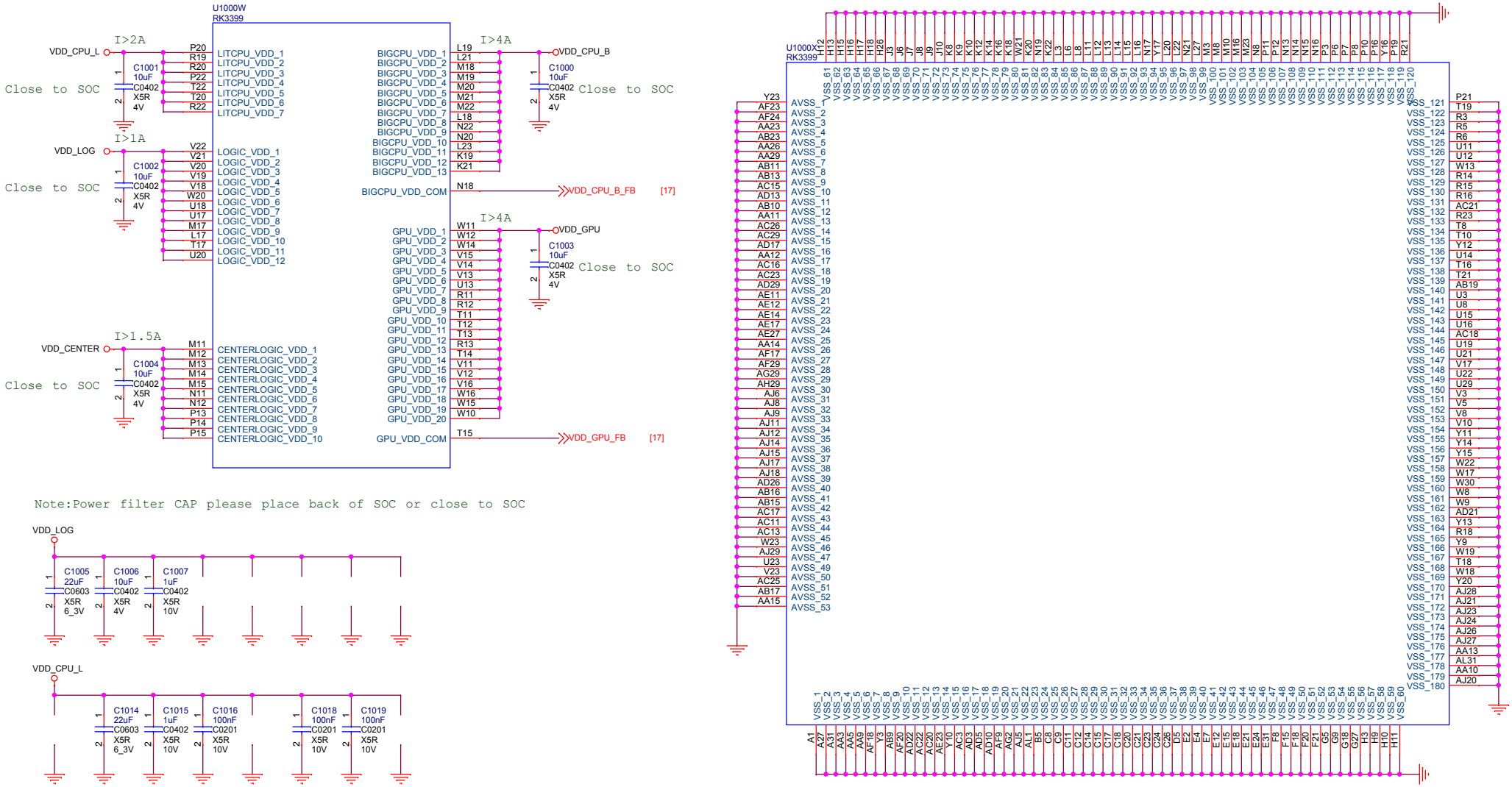
Part Port	Domain	Pin name in datasheet	I/O type	Power supply	Power source
Part C	PMUIO1	pmuio1_gpio0ab	1.8V only	VCCA_1V8	RK808-D VLDO3
Part E	PMUIO2	pmu1830_gpio1abcd	1.8V(Default) 3.0V	VCC_1V8	RK808-D Buck4
Part I	APIO1	gmac_gpio3abc	3.3V only	VCC_1V8 VCC3V3_SYS	RK808-D Buck4
Part L	APIO2	bt656_gpio2ab	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

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	

RK3399 POWER DIAGRAM




U1000W
RK3399
VDD_CPU_L
I>2A
C1001 10uF C0402 X5R 4V
Close to SOC
LITCPU_VDD_1
LITCPU_VDD_2
LITCPU_VDD_3
LITCPU_VDD_4
LITCPU_VDD_5
LITCPU_VDD_6
LITCPU_VDD_7
VDD_LOG
I>1A
C1002 10uF C0402 X5R 4V
Close to SOC
LOGIC_VDD_1
LOGIC_VDD_2
LOGIC_VDD_3
LOGIC_VDD_4
LOGIC_VDD_5
LOGIC_VDD_6
LOGIC_VDD_7
LOGIC_VDD_8
LOGIC_VDD_9
LOGIC_VDD_10
LOGIC_VDD_11
LOGIC_VDD_12
VDD_CENTER
I>1.5A
C1004 10uF C0402 X5R 4V
Close to SOC
CENTERLOGIC_VDD_1
CENTERLOGIC_VDD_2
CENTERLOGIC_VDD_3
CENTERLOGIC_VDD_4
CENTERLOGIC_VDD_5
CENTERLOGIC_VDD_6
CENTERLOGIC_VDD_7
CENTERLOGIC_VDD_8
CENTERLOGIC_VDD_9
CENTERLOGIC_VDD_10
BIGCPU_VDD_1
BIGCPU_VDD_2
BIGCPU_VDD_3
BIGCPU_VDD_4
BIGCPU_VDD_5
BIGCPU_VDD_6
BIGCPU_VDD_7
BIGCPU_VDD_8
BIGCPU_VDD_9
BIGCPU_VDD_10
BIGCPU_VDD_11
BIGCPU_VDD_12
BIGCPU_VDD_13
BIGCPU_VDD_COM
I>4A
VDD_CPU_B
C1000 10uF C0402 X5R 4V
Close to SOC
VDD_CPU_B_FB [17]
I>4A
VDD_GPU
C1003 10uF C0402 X5R 4V
Close to SOC
GPU_VDD_1
GPU_VDD_2
GPU_VDD_3
GPU_VDD_4
GPU_VDD_5
GPU_VDD_6
GPU_VDD_7
GPU_VDD_8
GPU_VDD_9
GPU_VDD_10
GPU_VDD_11
GPU_VDD_12
GPU_VDD_13
GPU_VDD_14
GPU_VDD_15
GPU_VDD_16
GPU_VDD_17
GPU_VDD_18
GPU_VDD_19
GPU_VDD_20
GPU_VDD_COM
VDD_GPU_FB [17]
U1000X
RK3399
AVSS_1
AVSS_2
AVSS_3
AVSS_4
AVSS_5
AVSS_6
AVSS_7
AVSS_8
AVSS_9
AVSS_10
AVSS_11
AVSS_12
AVSS_13
AVSS_14
AVSS_15
AVSS_16
AVSS_17
AVSS_18
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AVSS_22
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AVSS_30
AVSS_31
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AVSS_37
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AVSS_40
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VSS_164
VSS_165
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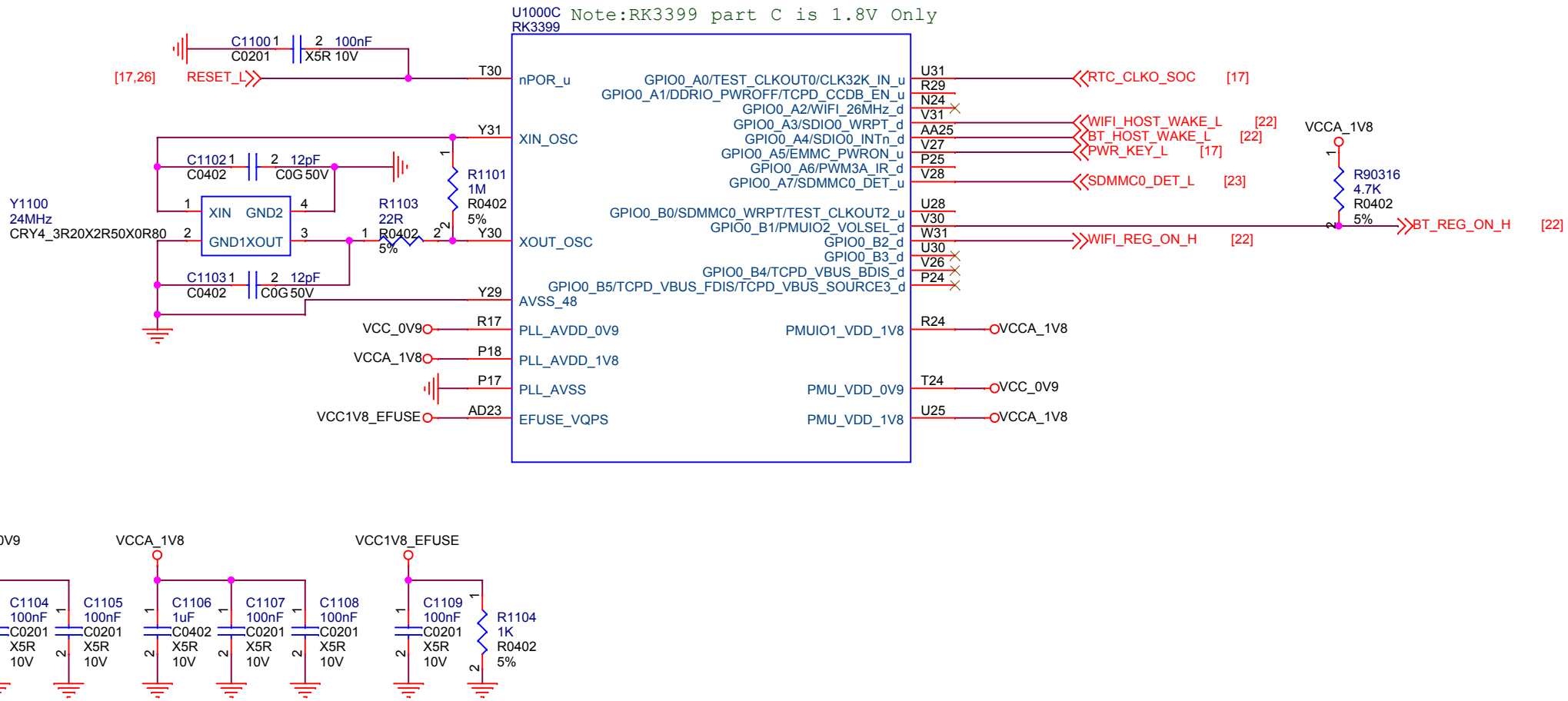
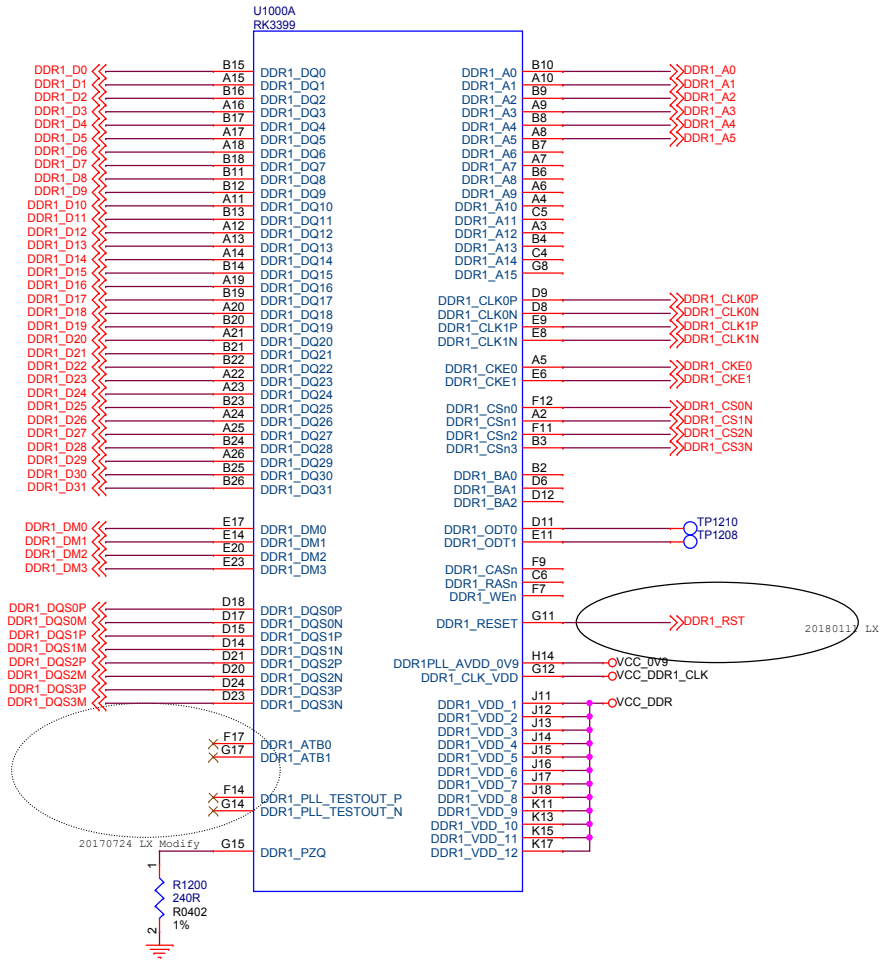
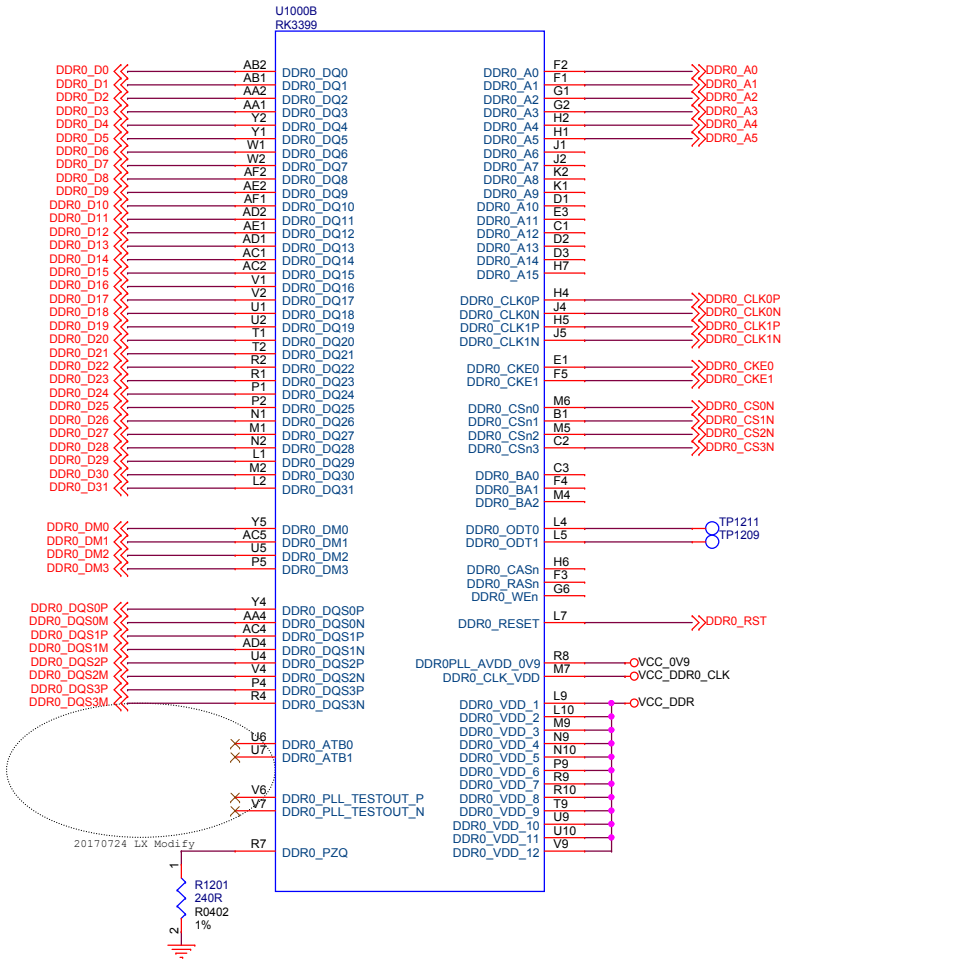
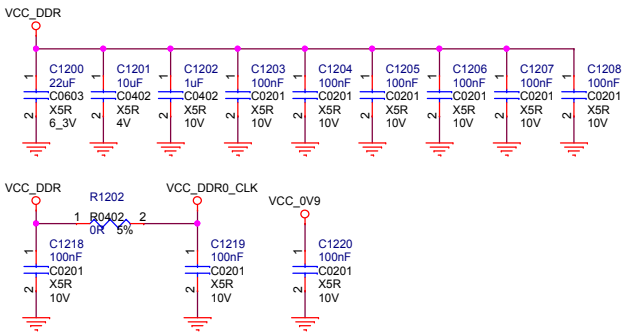
VSS_167
VSS_168
VSS_169
VSS_170
VSS_171
VSS_172
VSS_173
VSS_174
VSS_175
VSS_176
VSS_177
VSS_178
VSS_179
VSS_180
Note:Power filter CAP please place back of SOC or close to SOC
VDD_LOG
C1005 22uF C0603 X5R 6_3V
C1006 10uF C0402 X5R 4V
C1007 1uF C0402 X5R 10V
VDD_CPU_L
C1014 22uF C0603 X5R 6_3V
C1015 1uF C0402 X5R 10V
C1016 100nF C0201 X5R 10V
C1018 100nF C0201 X5R 10V
C1019 100nF C0201 X5R 10V
VDD_CPU_B
C1022 22uF C0603 X5R 6_3V
C1023 22uF C0603 X5R 6_3V
C1024 1uF C0402 X5R 10V
C1030 1nF C0201 X5R 25V
VDD_CENTER
C1031 22uF C0603 X5R 6_3V
C1032 10uF C0402 X5R 4V
C1033 1uF C0402 X5R 10V
C1034 100nF C0201 X5R 10V
C1036 100nF C0201 X5R 10V
VDD_GPU
C1042 1uF C0402 X5R 10V
C1048 100nF C0201 X5R 10V
C1050 22uF C0603 X5R 6_3V
C1051 22uF C0603 X5R 6_3V
C1052 22uF C0603 X5R 6_3V
C1053 22uF C0603 X5R 6_3V


U1000C
RK3399
Note:RK3399 part C is 1.8V Only
C1100 1 2 100nF
C0201 X5R 10V
[17,26] RESET_L
T30 nPOR_u
Y31 XIN_OSC
C1102 1 2 12pF
C0402 C0G 50V
Y1100
24MHz
CRY4_3R20X2R50X0R80
XIN GND2
GND1 XOUT
R1103
22R
R0402
5%
R1101
1M
R0402
5%
Y30 XOUT_OSC
C1103 1 2 12pF
C0402 C0G 50V
Y29 AVSS_48
VCC_0V9 R17 PLL_AVDD_0V9
VCCA_1V8 P18 PLL_AVDD_1V8
P17 PLL_AVSS
VCC1V8_EFUSE AD23 EFUSE_VQPS
GPIO0_A0/TEST_CLKOUT0/CLK32K_IN_u U31
GPIO0_A1/DDRIO_PWROFF/TCPD_CCDB_EN_u R29
GPIO0_A2/WIFI_26MHz_d N24
GPIO0_A3/SDIO0_WRPT_d V31
GPIO0_A4/SDIO0_INTn_d AA25
GPIO0_A5/EMMC_PWRON_u V27
GPIO0_A6/PWM3A_IR_d P25
GPIO0_A7/SDMMC0_DET_u V28
GPIO0_B0/SDMMC0_WRPT/TEST_CLKOUT2_u U28
GPIO0_B1/PMUIO2_VOLSEL_d V30
GPIO0_B2_d W31
GPIO0_B3_d U30
GPIO0_B4/TCPD_VBUS_BDIS_d V26
GPIO0_B5/TCPD_VBUS_FDIS/TCPD_VBUS_SOURCE3_d P24
PMUIO1_VDD_1V8 R24
PMU_VDD_0V9 T24
PMU_VDD_1V8 U25
RTC_CLKO_SOC [17]
WIFI_HOST_WAKE_L [22]
BT_HOST_WAKE_L [22]
PWR_KEY_L [17]
SDMMC0_DET_L [23]
WIFI_REG_ON_H [22]
VCCA_1V8
R90316
4.7K
R0402
5%
BT_REG_ON_H [22]
VCC_0V9
VCCA_1V8
VCC1V8_EFUSE
C1104 100nF C0201 X5R 10V
C1105 100nF C0201 X5R 10V
C1106 1uF C0402 X5R 10V
C1107 100nF C0201 X5R 10V
C1108 100nF C0201 X5R 10V
C1109 100nF C0201 X5R 10V
R1104 1K R0402 5%

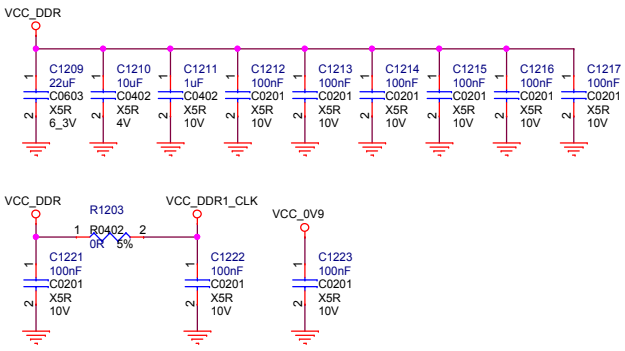


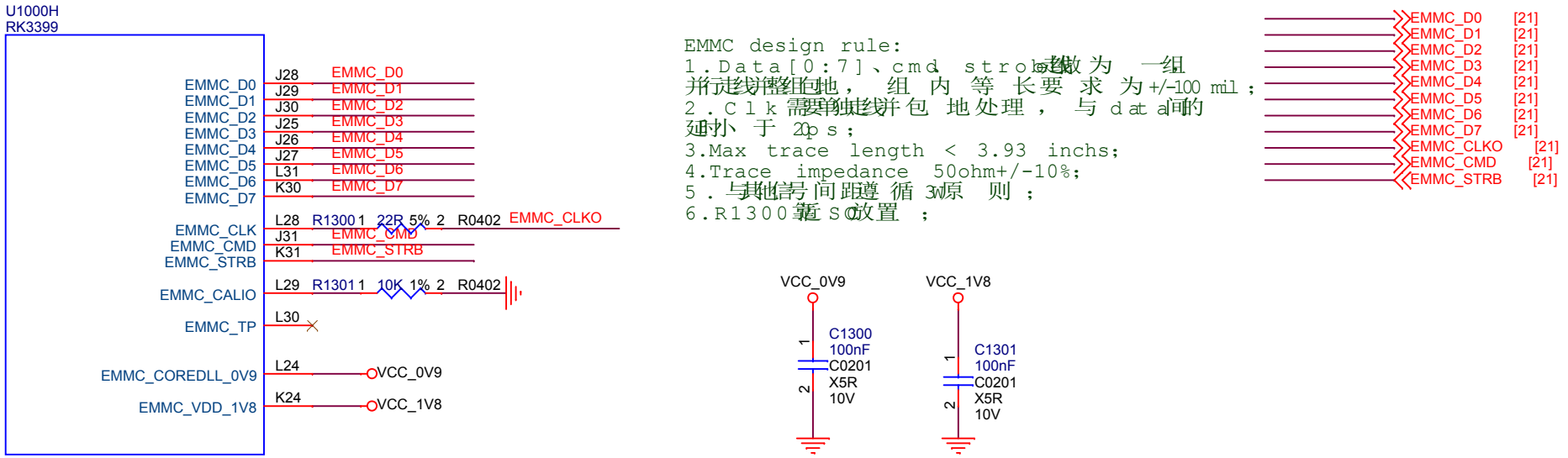


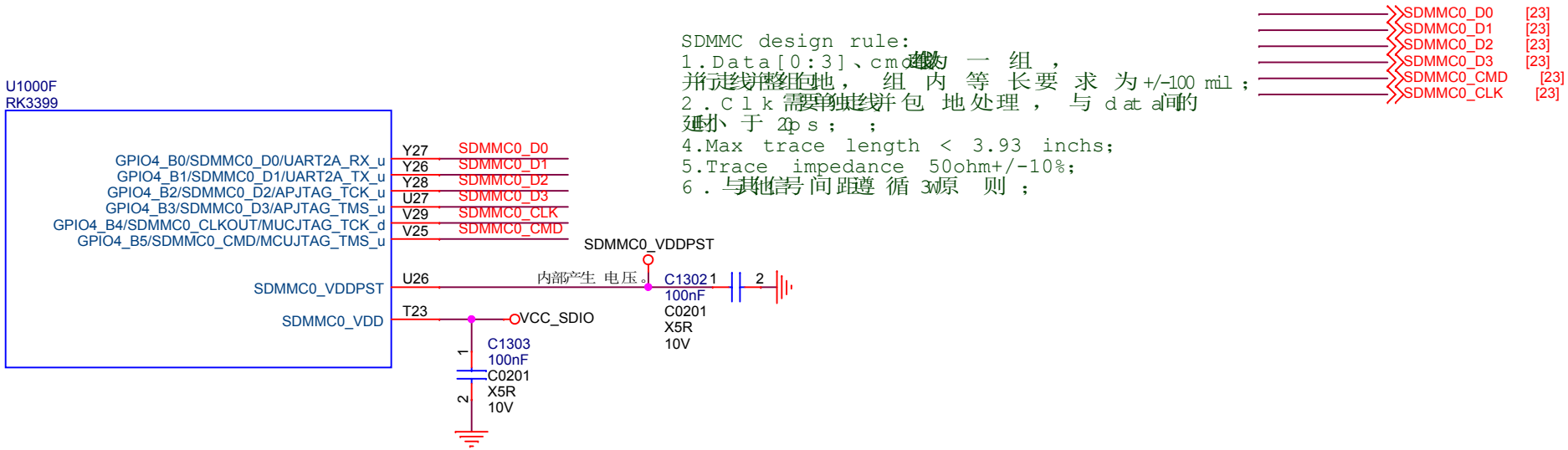
DDR FILTER Note:R1202 cannot be deleted

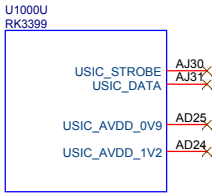


DDR FILTER Note:R1203 cannot be deleted

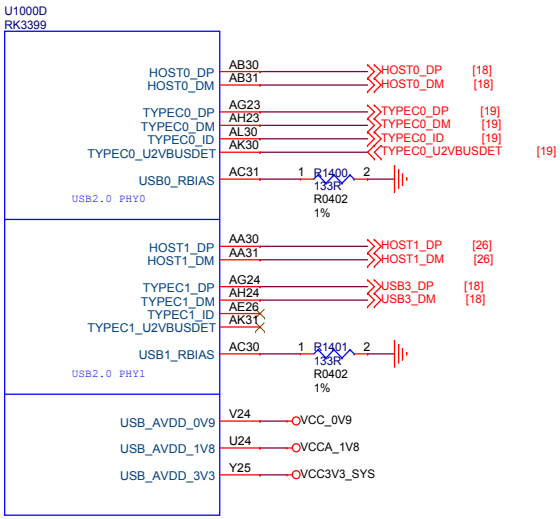


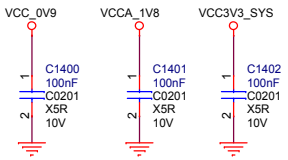

U1000H
RK3399
EMMC_D0
EMMC_D1
EMMC_D2
EMMC_D3
EMMC_D4
EMMC_D5
EMMC_D6
EMMC_D7
EMMC_CLK
EMMC_CMD
EMMC_STRB
EMMC_CALIO
EMMC_TP
EMMC_COREDLL_0V9
EMMC_VDD_1V8
J28 EMMC_D0
J29 EMMC_D1
J30 EMMC_D2
J25 EMMC_D3
J26 EMMC_D4
J27 EMMC_D5
L31 EMMC_D6
K30 EMMC_D7
L28 R1300 1 22R 5% 2 R0402 EMMC_CLKO
J31 EMMC_CMD
K31 EMMC_STRB
L29 R1301 1 10K 1% 2 R0402
L30
L24 VCC_0V9
K24 VCC_1V8
EMMC design rule:
1.Data[0:7]、cmd、strobe线数为一组
并走线时整组包地，组内等长要求为+/-100 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 inchs;
4.Trace impedance 50ohm+/-10%;
5.与其他信号间跟遵循3W原则；
6.R1300靠近SOC放置；
VCC_0V9
C1300
100nF
C0201
X5R
10V
VCC_1V8
C1301
100nF
C0201
X5R
10V
EMMC_D0 [21]
EMMC_D1 [21]
EMMC_D2 [21]
EMMC_D3 [21]
EMMC_D4 [21]
EMMC_D5 [21]
EMMC_D6 [21]
EMMC_D7 [21]
EMMC_CLKO [21]
EMMC_CMD [21]
EMMC_STRB [21]


U1000F
RK3399
GPIO4_B0/SDMMC0_D0/UART2A_RX_u
GPIO4_B1/SDMMC0_D1/UART2A_TX_u
GPIO4_B2/SDMMC0_D2/APJTAG_TCK_u
GPIO4_B3/SDMMC0_D3/APJTAG_TMS_u
GPIO4_B4/SDMMC0_CLKOUT/MUCJTAG_TCK_d
GPIO4_B5/SDMMC0_CMD/MCUJTAG_TMS_u
SDMMC0_VDDPST
SDMMC0_VDD
Y27 SDMMC0_D0
Y26 SDMMC0_D1
Y28 SDMMC0_D2
U27 SDMMC0_D3
V29 SDMMC0_CLK
V25 SDMMC0_CMD
U26
T23 VCC_SDIO
SDMMC0_VDDPST
内部产生电压。
C1302 1 2
100nF
C0201
X5R
10V
C1303
100nF
C0201
X5R
10V
SDMMC design rule:
1.Data[0:3]、cmd线数为一组，
并走线时整组包地，组内等长要求为+/-100 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 inchs;
5.Trace impedance 50ohm+/-10%;
6.与其他信号间跟遵循3W原则；
SDMMC0_D0 [23]
SDMMC0_D1 [23]
SDMMC0_D2 [23]
SDMMC0_D3 [23]
SDMMC0_CMD [23]
SDMMC0_CLK [23]



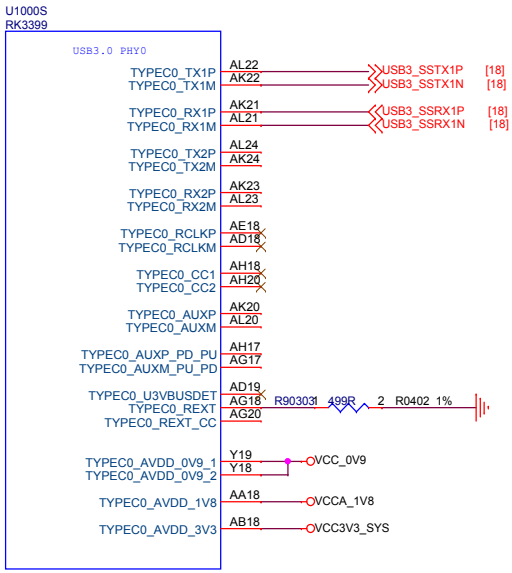
USB2.0

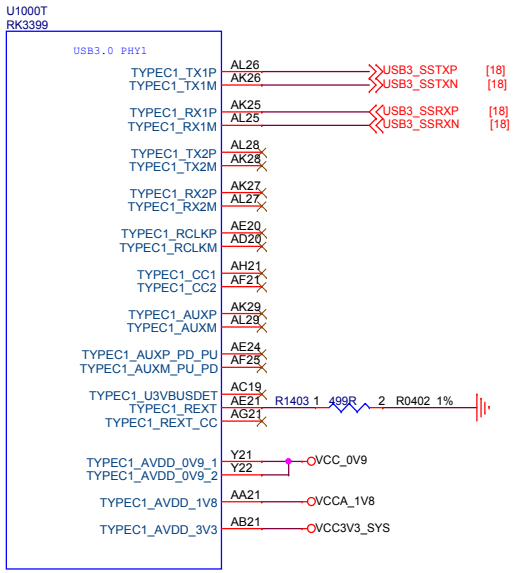


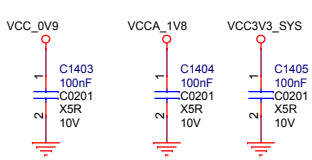


USB2.0 design rule:
1.Max intra-pair skew < 4 ps;
2.Max trace length < 6 inchs;
3.Max allowed via < 6;
4.Trace impedance 90ohm+/-10%;
5．与其他信号间距遵循3W原则；

USB3.0

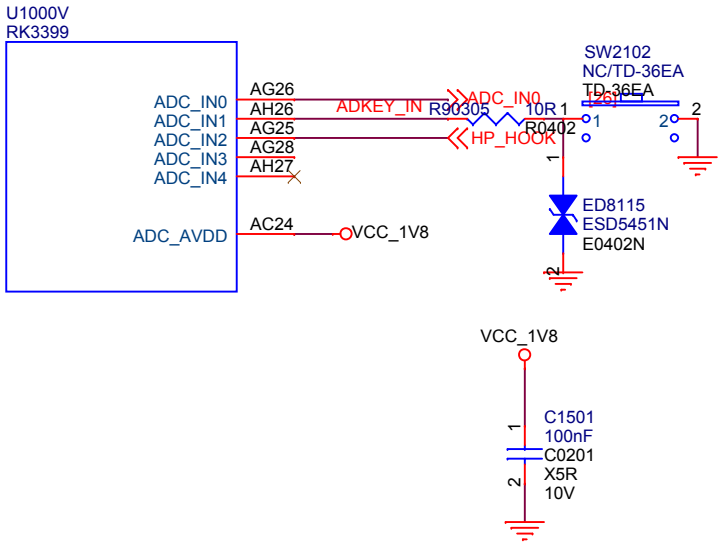






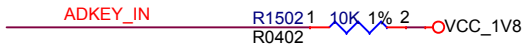
USB3.0 design rule:
1.Max intra-pair skew < 4 ps;
2.Max length skew between TX and RX < 1.6 ns;
3.Max trace length < 6 inchs;
4.Max allowed via < 4;
5.Trace impedance 90ohm+/-10%;
6．与其他信号间距遵循3W原则；

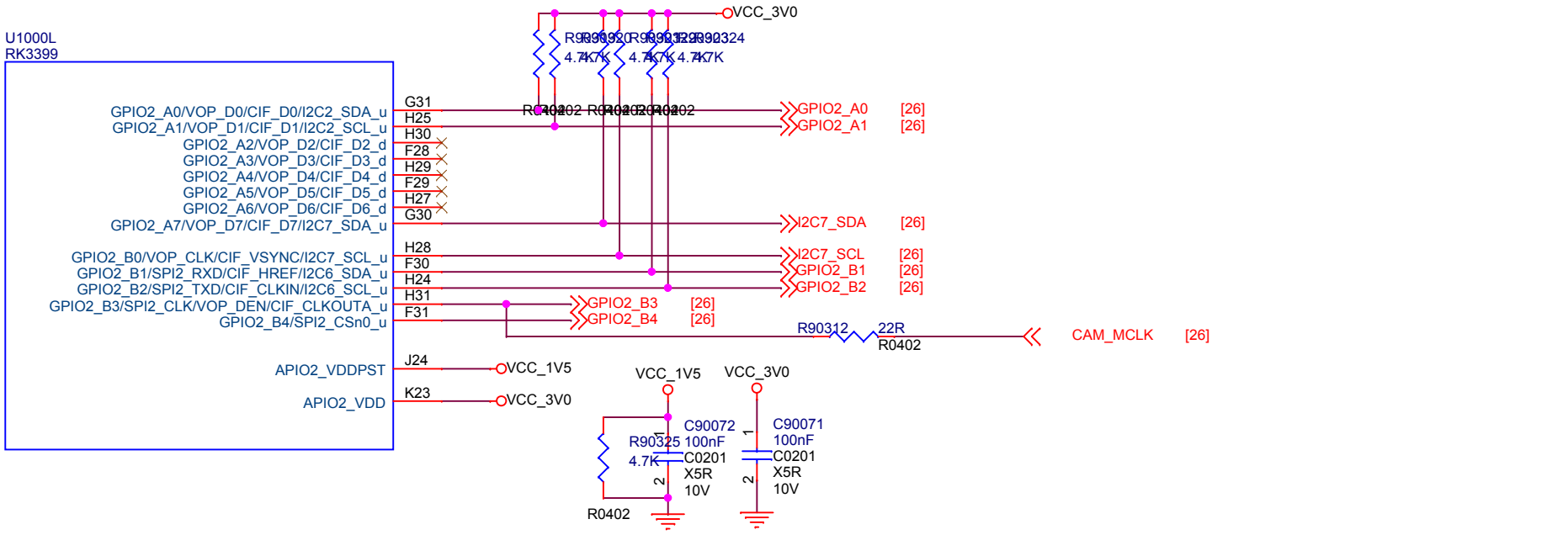
DP design rule:
1.Max intra-pair skew < 4 ps;
2.Max trace length < 6 inchs;
3.Max allowed via < 4;
4.Trace impedance 90ohm+/-10%;
5．与其他信号间距遵循3W原则；

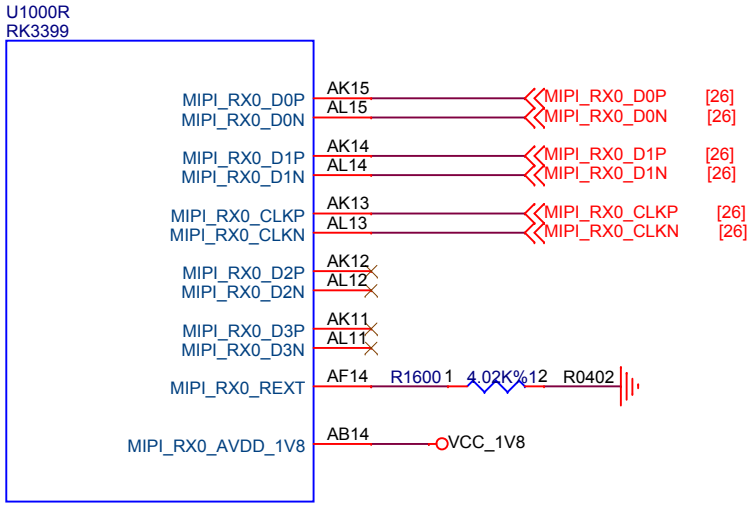


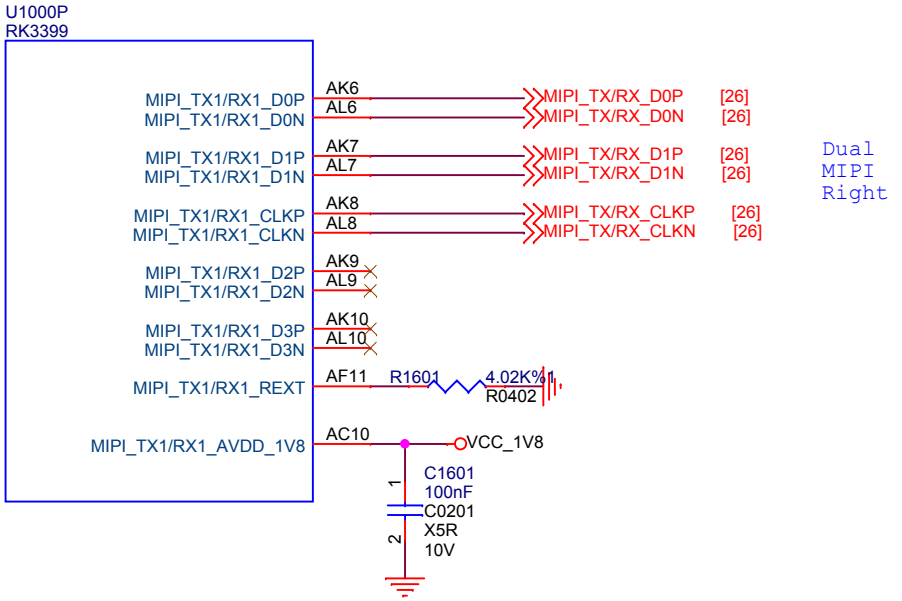
KEY BAORD

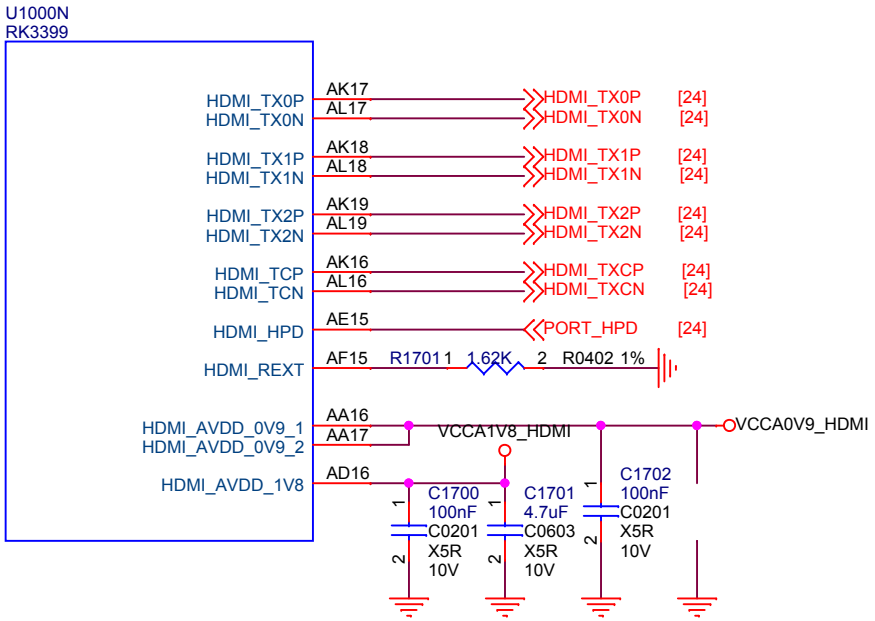
Note:
系统时，如果ADKEY_IN电平为0V，
则RK3399进入Recovery模式；
量产时R1503,SW1500,ED1500可以不用贴片；



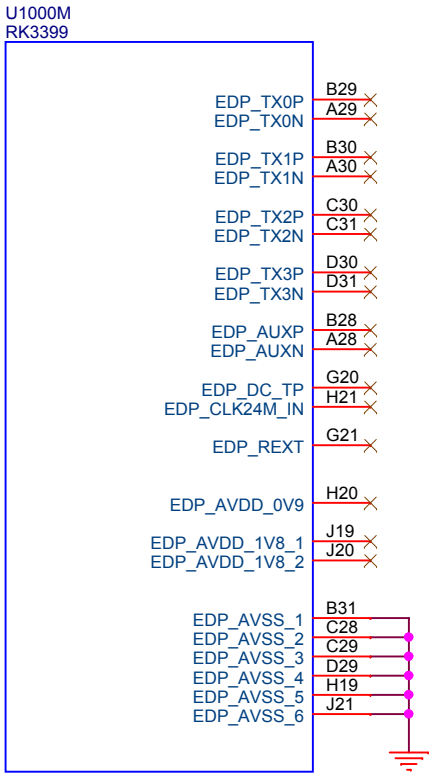

U1000L
RK3399
VCC_3V0
4.7K
GPIO2_A0/VOP_D0/CIF_D0/I2C2_SDA_u
GPIO2_A1/VOP_D1/CIF_D1/I2C2_SCL_u
GPIO2_A2/VOP_D2/CIF_D2_d
GPIO2_A3/VOP_D3/CIF_D3_d
GPIO2_A4/VOP_D4/CIF_D4_d
GPIO2_A5/VOP_D5/CIF_D5_d
GPIO2_A6/VOP_D6/CIF_D6_d
GPIO2_A7/VOP_D7/CIF_D7/I2C7_SDA_u
GPIO2_B0/VOP_CLK/CIF_VSYNC/I2C7_SCL_u
GPIO2_B1/SPI2_RXD/CIF_HREF/I2C6_SDA_u
GPIO2_B2/SPI2_TXD/CIF_CLKIN/I2C6_SCL_u
GPIO2_B3/SPI2_CLK/VOP_DEN/CIF_CLKOUTA_u
GPIO2_B4/SPI2_CSn0_u
G31
H25
H30
F28
H29
F29
H27
G30
H28
F30
H24
H31
F31
GPIO2_A0 [26]
GPIO2_A1 [26]
I2C7_SDA [26]
I2C7_SCL [26]
GPIO2_B1 [26]
GPIO2_B2 [26]
GPIO2_B3 [26]
GPIO2_B4 [26]
R90312 22R
R0402
CAM_MCLK [26]
APIO2_VDDPST
APIO2_VDD
J24
K23
VCC_1V5
VCC_3V0
VCC_1V5
VCC_3V0
R90325 4.7K
C90072 100nF C0201 X5R 10V
C90071 100nF C0201 X5R 10V
R0402


U1000R
RK3399
MIPI_RX0_D0P
MIPI_RX0_D0N
MIPI_RX0_D1P
MIPI_RX0_D1N
MIPI_RX0_CLKP
MIPI_RX0_CLKN
MIPI_RX0_D2P
MIPI_RX0_D2N
MIPI_RX0_D3P
MIPI_RX0_D3N
MIPI_RX0_REXT
MIPI_RX0_AVDD_1V8
AK15
AL15
AK14
AL14
AK13
AL13
AK12
AL12
AK11
AL11
AF14
AB14
MIPI_RX0_D0P [26]
MIPI_RX0_D0N [26]
MIPI_RX0_D1P [26]
MIPI_RX0_D1N [26]
MIPI_RX0_CLKP [26]
MIPI_RX0_CLKN [26]
R1600 4.02K%12 R0402
VCC_1V8

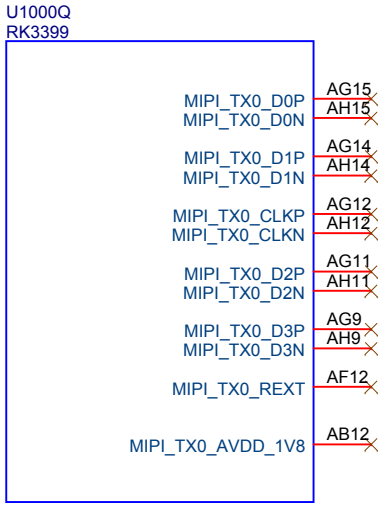

U1000P
RK3399
MIPI_TX1/RX1_D0P
MIPI_TX1/RX1_D0N
MIPI_TX1/RX1_D1P
MIPI_TX1/RX1_D1N
MIPI_TX1/RX1_CLKP
MIPI_TX1/RX1_CLKN
MIPI_TX1/RX1_D2P
MIPI_TX1/RX1_D2N
MIPI_TX1/RX1_D3P
MIPI_TX1/RX1_D3N
MIPI_TX1/RX1_REXT
MIPI_TX1/RX1_AVDD_1V8
AK6
AL6
AK7
AL7
AK8
AL8
AK9
AL9
AK10
AL10
AF11
AC10
MIPI_TX/RX_D0P [26]
MIPI_TX/RX_D0N [26]
MIPI_TX/RX_D1P [26]
MIPI_TX/RX_D1N [26]
MIPI_TX/RX_CLKP [26]
MIPI_TX/RX_CLKN [26]
R1601 4.02K%1
R0402
VCC_1V8
C1601 100nF C0201 X5R 10V
Dual MIPI Right



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 inchs;
4.Max allowed via < 4;
5.Trace impedance 100ohm+/-10%;
6 . 与其他信号 间 距遵 循 3W原 则 ;



eDP design rule:
1.Max intra-pair skew < 4 ps;
2.Max trace length < 6 inchs;
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 inchs;
4.Max allowed via < 4;
5.Trace impedance 100ohm+/-10%;
6 . 与其他信号 间 距遵 循 3W原 则 ;

U1000I Note:RK3399 part I is 3.3V only
RK3399

GPIO3_A0/MAC_TXD2/SPI4_RXD_d F24 MAC_TXD2
GPIO3_A1/MAC_TXD3/SPI4_TXD_d H23 MAC_TXD3
GPIO3_A2/MAC_RXD2/SPI4_CLK_u E30 PHY_TXD2
GPIO3_A3/MAC_RXD3/SPI4_CSn0_u E25 PHY_TXD3
GPIO3_A4/MAC_TXD0/SPI0_RXD_d D26 MAC_RXD2
GPIO3_A5/MAC_TXD1/SPI0_TXD_d G23 MAC_TXD0
GPIO3_A6/MAC_RXD0/SPI0_CLK_u E26 PHY_TXD0
GPIO3_A7/MAC_RXD1/SPI0_CSn0_u F27 PHY_TXD1
MAC_RXD0
MAC_RXD1

GPIO3_B0/MAC_MDC/SPI0_CSn1_u E29 MAC_MDCLK
GPIO3_B1/MAC_RXDV_d C27 MAC_RXDV
GPIO3_B2/MAC_RXER/I2C5_SDA_u F23
GPIO3_B3/MAC_CLK/I2C5_SCL_u G24 R1806 1 22R 5% 2 R0402 MAC_CLK
GPIO3_B4/MAC_TXEN/UART1_RX_u H22 MAC_TXEN
GPIO3_B5/MAC_MDIO/UART1_TX_u G26 PHY_TXEN
GPIO3_B6/MAC_RXCLK/UART3_RX_u F25 MAC_MDIO
GPIO3_B7/MAC_CRS/CIF_CLKOUTB/UART3_TX_u B27 MAC_RXCLK
PHY_RST
C1800 DNP C0402

GPIO3_C0/MAC_COL/UART3_CTSn/SPDIF_TX_u D27 GPIO3_C0 [26]
GPIO3_C1/MAC_TXCLK/UART3_RTSn_u E28 MAC_TXCLK R1807 1 22R 5% 2 R0402 PHY_TXCLK

APIO1_VDDPST J22 VCC_1V8
APIO1_VDD J23 VCC3V3_LAN

VCC3V3_LAN VCC_1V8
C1801 100nF C0402 X5R 10V
C1802 100nF C0402 X5R 10V

PHY_TXD0 R1809 1 4.7K 5% 2 R0402 VCC3V3_LAN
PHY_TXD1 R1810 1 4.7K 5% 2 R0402
PHY_TXD2 R1811 1 4.7K 5% 2 R0402
PHY_TXD3 R1812 1 4.7K 5% 2 R0402
MAC_MDIO R1814 1 1.5K 5% 2 R0402

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

GPIO1_A0/ISP0_SHUTTER_EN/ISP1_SHUTTER_EN/TCPD_VBUS_SINK_EN_d R25
GPIO1_A1/ISP0_SHUTTER_TRIG/ISP1_SHUTTER_TRIG/TCPD_CC0_VCONN_EN_d T31
GPIO1_A2/ISP0_FLASHTRIGIN/ISP1_FLASHTRIGIN/TCPD_CC1_VCONN_EN_d R26
GPIO1_A3/ISP0_FLASHTRIGOUT/ISP1_FLASHTRIGOUT_d R27 VCC5V0_TYPEC0_EN [19]
GPIO1_A4/ISP0_PRELIGHT_TRIG/ISP1_PRELIGHT_TRIG_d R28
GPIO1_A5/AP_PWROFF_d R30 PMIC_SLEEP_H [17]
GPIO1_A6/TSADC_INT_z P26
GPIO1_A7/SPI1_RXD/UART4_RX_u P27 GPIO1_A7 [26]

GPIO1_B0/SPI1_TXD/UART4_TX_u R31
GPIO1_B1/SPI1_CLK/PMCU_JTAG_TCK_u P28 GPIO1_B0 [26]
GPIO1_B2/SPI1_CSn0/PMCU_JTAG_TMS_u P29 GPIO1_B1 [26]
GPIO1_B3/I2C4_SDA_u P31 GPIO1_B2 [26]
GPIO1_B4/I2C4_SCL_u P30
M24 I2C4_SDA [26]
GPIO1_B5_d M25 I2C4_SCL [26]
GPIO1_B6/PWM3B_IR_d M26 CAM_GPIO1 [26]
GPIO1_B7/SPI3_RXD/I2C0_SDA_u GPU_SLEEP_H [17]
I2C_SDA_PMIC [17]

GPIO1_C0/SPI3_TXD/I2C0_SCL_u N30 I2C_SCL_PMIC [17]
GPIO1_C1/SPI3_CLK_d M27 CPU_B_SLEEP_H [17]
GPIO1_C2/SPI3_CSn0_u N31
GPIO1_C3/PWM2_d M28 LOG_DVS_PWM [17]
GPIO1_C4/I2C8_SDA_u M29 PHY_PMEB
GPIO1_C5/I2C8_SCL_u M30 PMIC_INT_L [17]
GPIO1_C6/TCPD_VBUS_SOURCE0_d L25
GPIO1_C7/TCPD_VBUS_SOURCE1_d M31 PHY_INT

GPIO1_D0/TCPD_VBUS_SOURCE2_d L26

DFTJTAG_TMS_u AA24
DFTJTAG_TRSTn_d AB24

PMUIO2_VDDPST N23 VCC_1V5
PMUIO2_VDD P23 VCC_3V0

VCC_3V0
R9[illegible]218 4.7K
R9[illegible]402 5% 4.7K

I2C_SDA_PMIC R1815 1 2.2K 5% 2 R0402 VCC_3V0
I2C_SCL_PMIC R1816 1 2.2K 5% 2 R0402

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

VCC_1V5 VCC_3V0
C1803 100nF C0201 X5R 10V
C90021 100nF C0201 X5R 10V

U1000G Note:RK3399 part G is 1.8V only
RK3399

GPIO2_C0/UART0_RX_u AE9 UART0_RXD [22]
GPIO2_C1/UART0_TX_u AH8 UART0_TXD [22]
GPIO2_C2/UART0_CTSn_u AG8 UART0_CTS [22]
GPIO2_C3/UART0_RTSn_u AL5 UART0_RTS [22]
GPIO2_C4/SDIO0_D0/SPI5_RXD_u AD8 SDIO0_D0 [22]
GPIO2_C5/SDIO0_D1/SPI5_TXD_u AK5 SDIO0_D1 [22]
GPIO2_C6/SDIO0_D2/SPI5_CLK_u AG7 SDIO0_D2 [22]
GPIO2_C7/SDIO0_D3/SPI5_CSn0_u AE8 SDIO0_D3 [22]

GPIO2_D0/SDIO0_CMD_u AH6 SDIO0_CMD [22]
GPIO2_D1/SDIO0_CLKOUT/TEST_CLKOUT1_u AF7 SDIO0_CLK [22]
GPIO2_D2/SDIO0_DETN/PCIE_CLKREQn_u AL4 PCIE_PWR [25]
GPIO2_D3/SDIO0_PWREN_d AD9 BT_WAKE_L [22]
GPIO2_D4/SDIO0_BKPWR_d AF8

APIO3_VDD_1V8 AB8 VCC_1V8

SDIO design rule:
1.Data[0:3]、cmd组为一组，并成组包地，组内等长要求为+/-100 mil；
2.Clk需要单独包地处理，与data间的延迟小于2ps；
4.Max trace length < 3.93 inchs;
5.Trace impedance 50ohm+/-10%;
6.与其他信号间距遵循3W原则；

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

GPIO3_D0/I2S0_SCLK_d AG3 I2S0_SCLK [26]
GPIO3_D1/I2S0_LRCK_RX_d AF4 I2S0_LRCK_RX [26]
GPIO3_D2/I2S0_LRCK_TX_d AJ2 I2S0_LRCK_TX [26]
GPIO3_D3/I2S0_SDI0_d Y7 I2S0_SDI0 [26]
GPIO3_D4/I2S0_SDI1SDO3_d AE5 USER_LED1
GPIO3_D5/I2S0_SDI2SDO2_d AA6 USER_LED2
GPIO3_D6/I2S0_SDI3SDO1_d AH2
GPIO3_D7/I2S0_SDO0_d AH1 I2S0_SDO0 [26]

GPIO4_A0/I2S_CLK_d AC7 I2S_CLK [26]
GPIO4_A1/I2C1_SDA_u AG1 I2C_SDA_AUDIO [26]
GPIO4_A2/I2C1_SCL_u Y6 I2C_SCL_AUDIO [26]
GPIO4_A3/I2S1_SCLK_d AF3 GPIO4_A3 [26]
GPIO4_A4/I2S1_LRCK_RX_d AA7 GPIO4_A4 [26]
GPIO4_A5/I2S1_LRCK_TX_d AJ1 GPIO4_A5 [26]
GPIO4_A6/I2S1_SDI0_d AD6 GPIO4_A6 [26]
GPIO4_A7/I2S1_SDO0_d AC6 GPIO4_A7 [26]

APIO5_VDDPST AA8 VCC_1V5
APIO5_VDD Y8 VCC_3V0

VCC5V0_SYS
R1823 1 1K 5% R0402 2 USER_LED1
R1821 1 NC 5% R0402 2 LED704 LED_GREEN LED0603
R1822 1 1K 5% R0402 2 USER_LED2
LED705 LED_GREEN LED0603

VCC_1V5 VCC_3V0
C90022 100nF C0201 X5R 10V
C90023 100nF C0201 X5R 10V

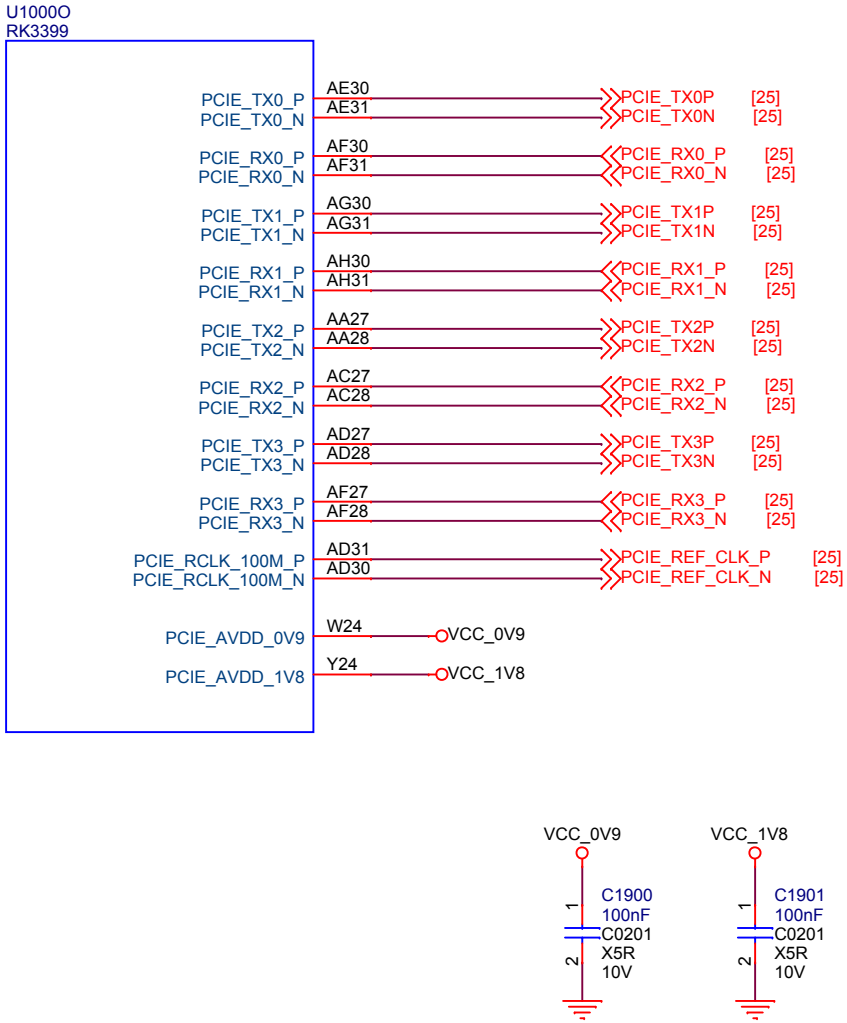
U1000K Note:RK3399 part J is 1.8V/3.0V mode
RK3399

GPIO4_C0/I2C3_SDA/UART2B_RX_u AG6 I2C_SDA_HDMI [24]
GPIO4_C1/I2C3_SCL/UART2B_TX_u AL2 I2C_SCL_HDMI [24]
GPIO4_C2/PWM0/VOP0_PWM/VOP1_PWM_d AF5 GPIO4_C2 [26]
GPIO4_C3/UART2C_RX_u AK2 UART2DBG_RX GPIO4_C3 [26]
GPIO4_C4/UART2C_TX_u AJ4 UART2DBG_TX GPIO4_C4 [26]
GPIO4_C5/SPDIF_TX_d AK1 GPIO4_C5 [26]
GPIO4_C6/PWM1_d AL3 GPIO4_C6 [26]
GPIO4_C7/HDMI_CECINOUT/EDP_HOTPLUG_u AD7 HDMI_CEC [24]

GPIO4_D0/PCIE_CLKREQnB_u AE6 PCIE_CLKREQ_L [25]
GPIO4_D1/DP_HOTPLUG_d AK4 VCC5V0_HOST_EN [18]
GPIO4_D2_d AH3 GPIO4_D2 [26]
GPIO4_D3_d AK3 PCIE_PERST_L [25]
GPIO4_D4_d AH5 GPIO4_D4 [26]
GPIO4_D5_d AJ3 GPIO4_D5 [26]
GPIO4_D6_d AG4 GPIO4_D6 [26]

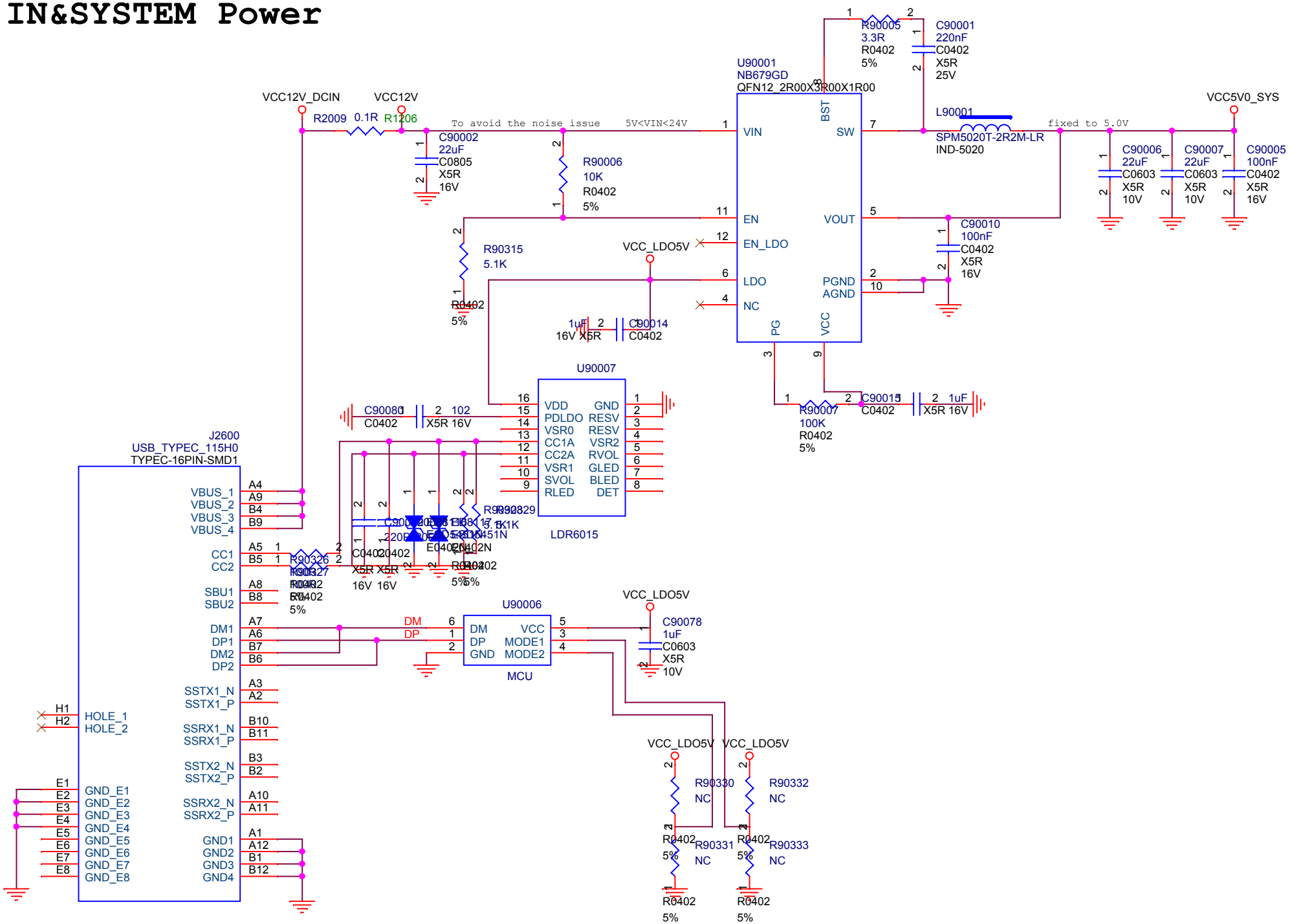
APIO4_VDDPST AC8 VCC_1V5
APIO4_VDD AC9 VCC_3V0

VCC_1V5 VCC_3V0
C1806 100nF C0201 X5R 10V
C1807 100nF C0201 X5R 10V

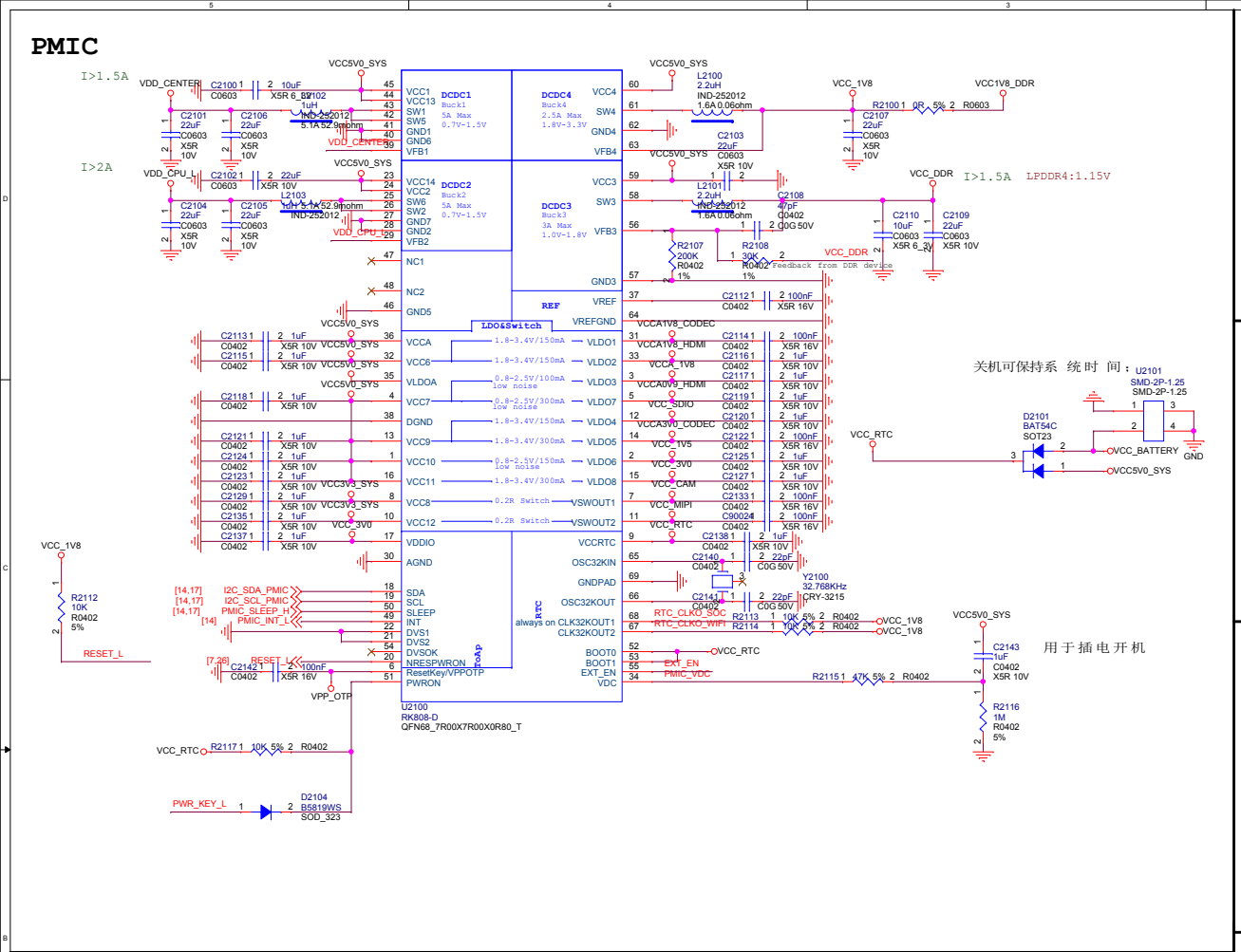


PCIE design rule:
1.Max intra-pair skew < 4ps;
2.Max inter-pair skew < 1.6 ns;
3.Max trace length < 14 inchs;
4.Max allowed via < 4;
5.Trace impedance 100ohm+/-10%;
6 . 与其他信号间距遵循3W原则；

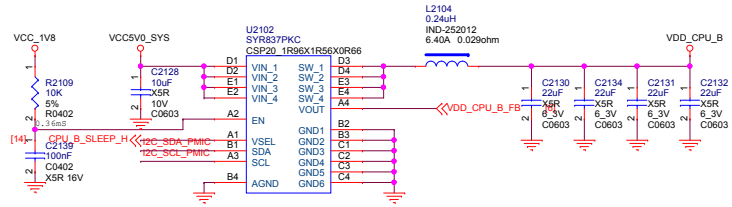
DC IN&SYSTEM Power



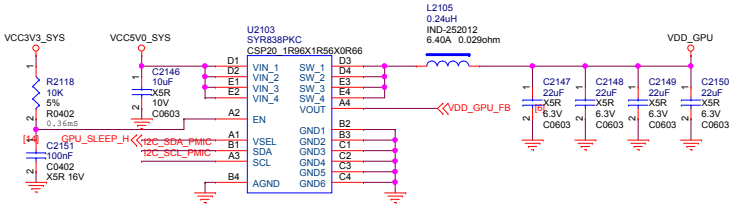
PMIC



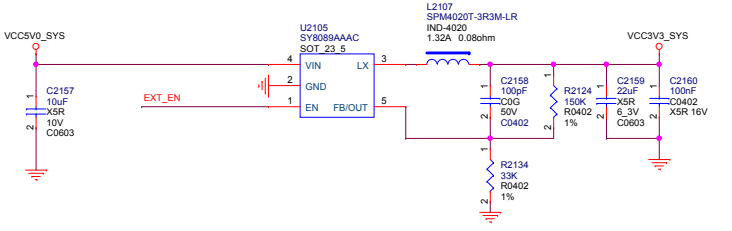
VDD_CPU_B power



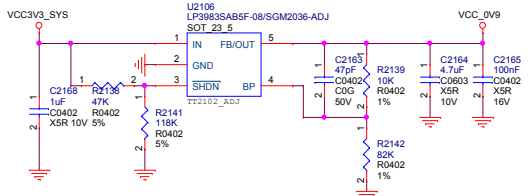
VDD_GPU power



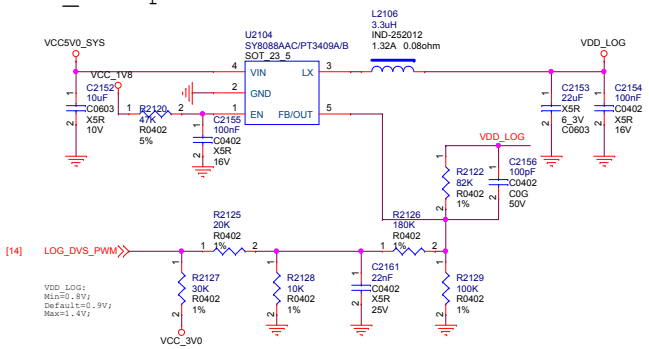
VCC3V3_SYS power



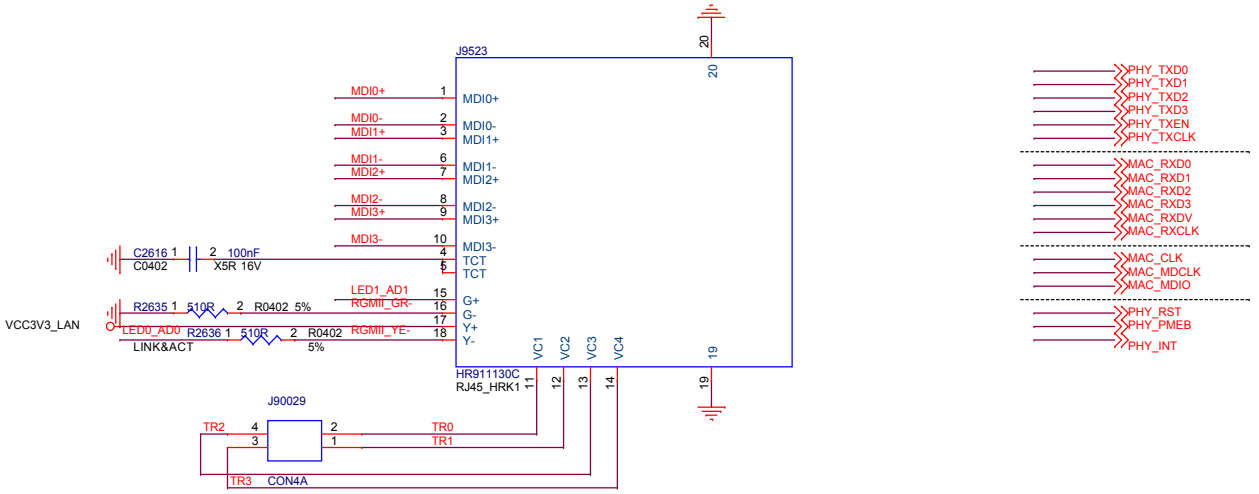
VCC_0V9 power

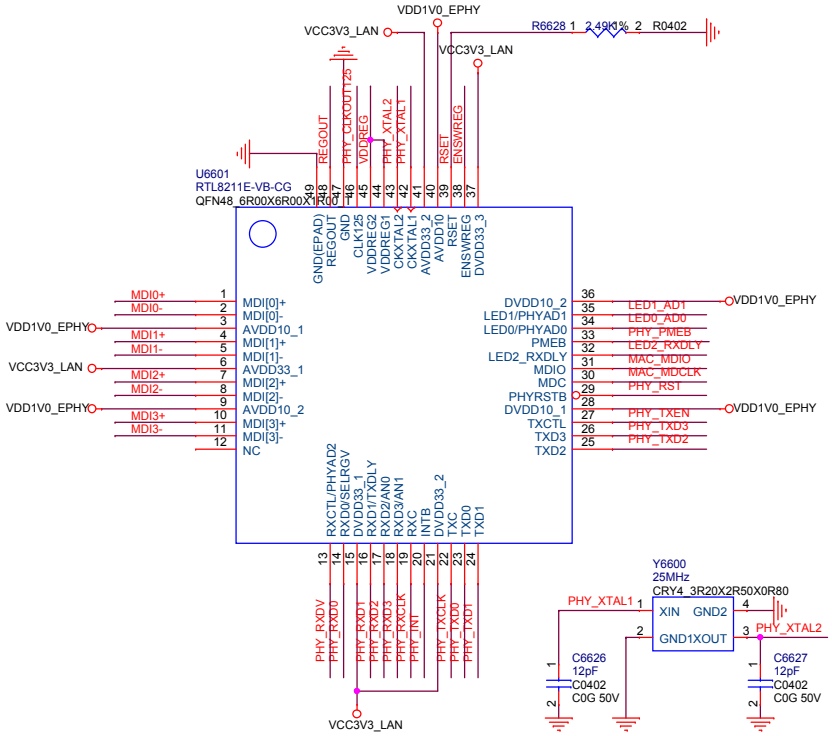


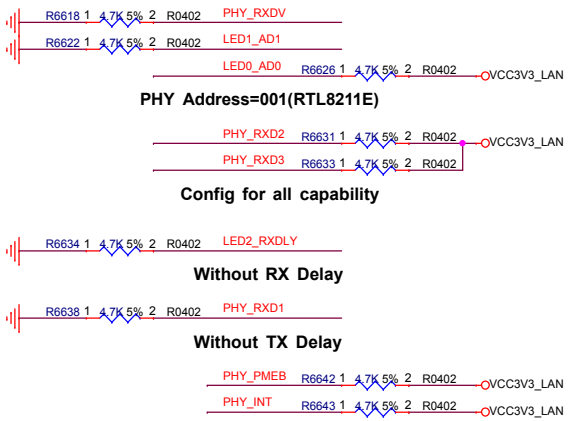
VDD_LOG power

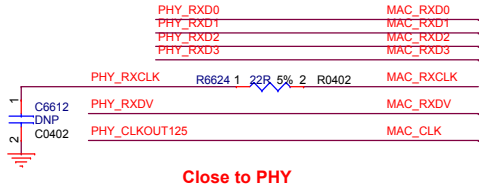


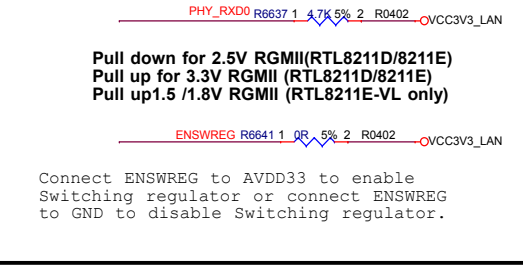
GMAC 10/100/1000 RGMII Ethernet PHY

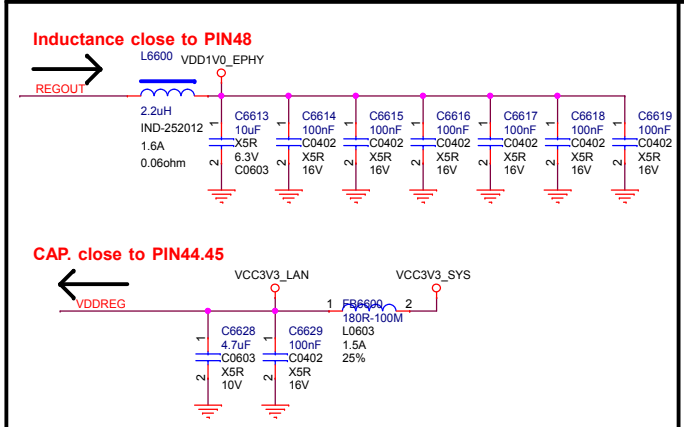


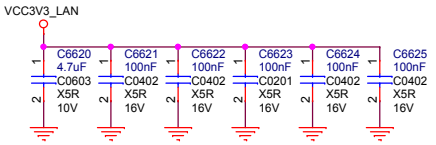




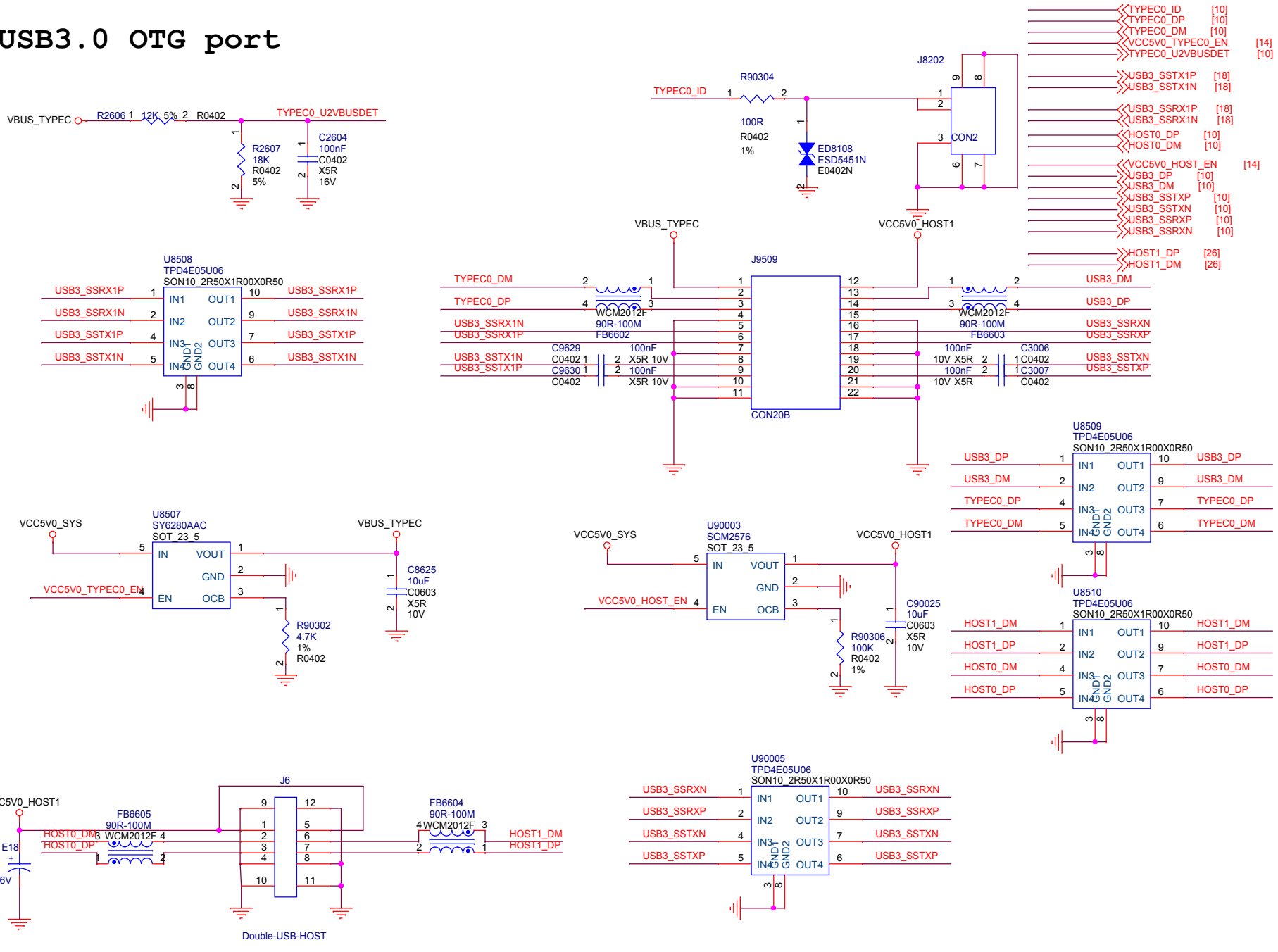


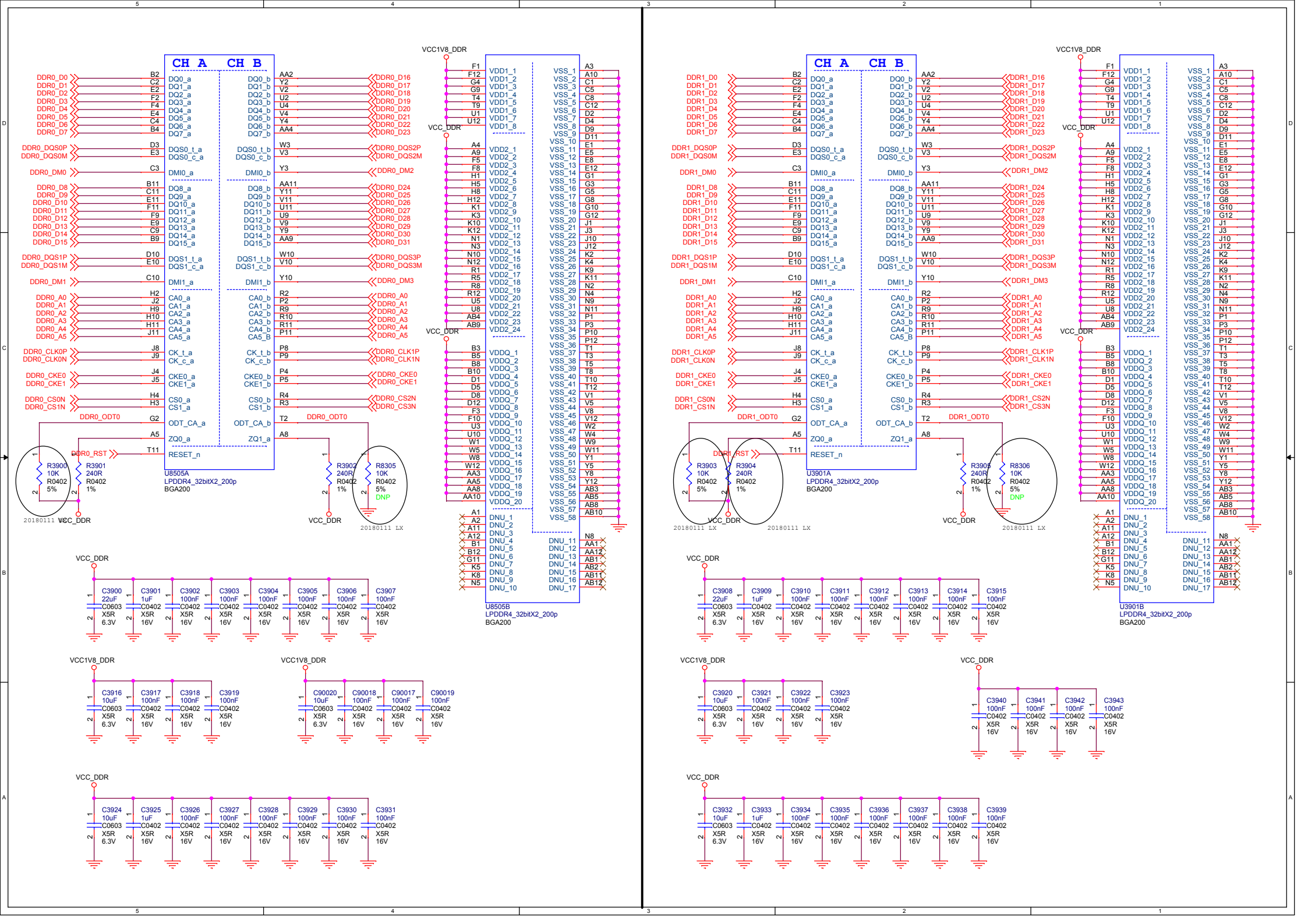




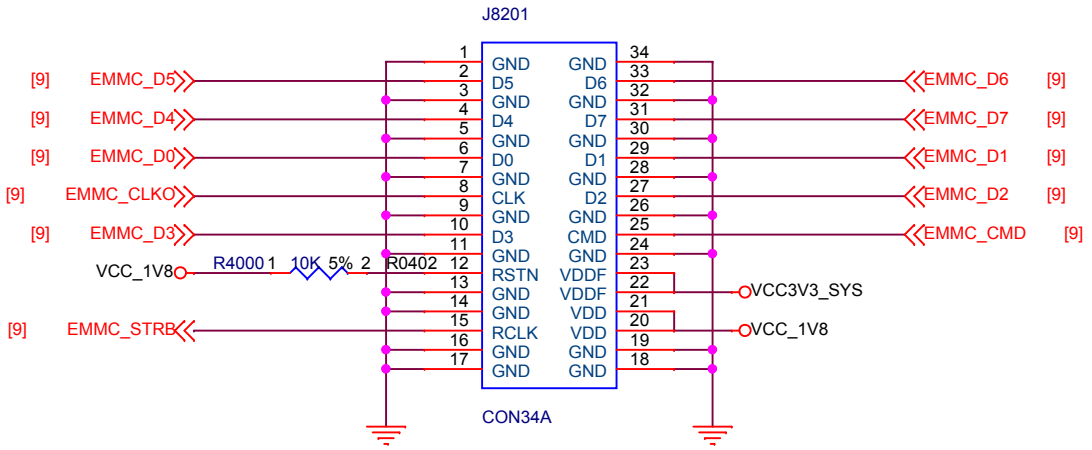


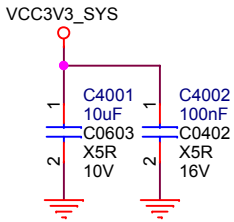
USB3.0 OTG port

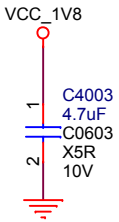


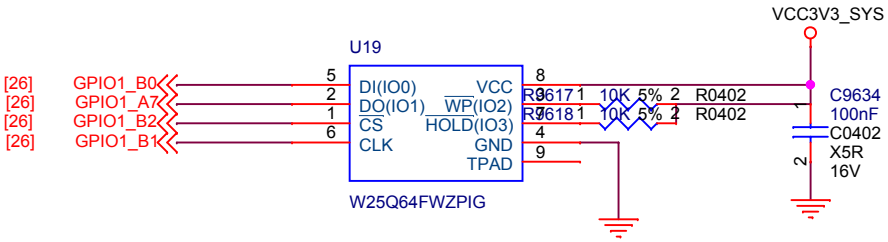

CH A
CH B
U8505A
LPDDR4_32bitX2_200p
BGA200
U8505B
LPDDR4_32bitX2_200p
BGA200
U3901A
LPDDR4_32bitX2_200p
BGA200
U3901B
LPDDR4_32bitX2_200p
BGA200
VCC1V8_DDR
VCC_DDR
DDR0_ODT0
DDR0_RST
DDR1_ODT0
DDR1_RST
R3900 10K R0402 5%
R3901 240R R0402 1%
R3902 240R R0402 1%
R8305 10K R0402 5% DNP
R3903 10K R0402 5%
R3904 240R R0402 1%
R3905 240R R0402 1%
R8306 10K R0402 5% DNP
20180111 LX
C3900 22uF C0603 X5R 6.3V
C3901 1uF C0402 X5R 16V
C3902 100nF C0402 X5R 16V
C3903 100nF C0402 X5R 16V
C3904 100nF C0402 X5R 16V
C3905 100nF C0402 X5R 16V
C3906 100nF C0402 X5R 16V
C3907 100nF C0402 X5R 16V
C3908 22uF C0603 X5R 6.3V
C3909 1uF C0402 X5R 16V
C3910 100nF C0402 X5R 16V
C3911 100nF C0402 X5R 16V
C3912 100nF C0402 X5R 16V
C3913 100nF C0402 X5R 16V
C3914 100nF C0402 X5R 16V
C3915 100nF C0402 X5R 16V
C3916 10uF C0603 X5R 6.3V
C3917 100nF C0402 X5R 16V
C3918 100nF C0402 X5R 16V
C3919 100nF C0402 X5R 16V
C90020 10uF C0603 X5R 6.3V
C90018 100nF C0402 X5R 16V
C90017 100nF C0402 X5R 16V
C90019 100nF C0402 X5R 16V
C3920 10uF C0603 X5R 6.3V
C3921 100nF C0402 X5R 16V
C3922 100nF C0402 X5R 16V
C3923 100nF C0402 X5R 16V
C3940 100nF C0402 X5R 16V
C3941 100nF C0402 X5R 16V
C3942 100nF C0402 X5R 16V
C3943 100nF C0402 X5R 16V
C3924 10uF C0603 X5R 6.3V
C3925 1uF C0402 X5R 16V
C3926 100nF C0402 X5R 16V
C3927 100nF C0402 X5R 16V
C3928 100nF C0402 X5R 16V
C3929 100nF C0402 X5R 16V
C3930 100nF C0402 X5R 16V
C3931 100nF C0402 X5R 16V
C3932 10uF C0603 X5R 6.3V
C3933 1uF C0402 X5R 16V
C3934 100nF C0402 X5R 16V
C3935 100nF C0402 X5R 16V
C3936 100nF C0402 X5R 16V
C3937 100nF C0402 X5R 16V
C3938 100nF C0402 X5R 16V
C3939 100nF C0402 X5R 16V

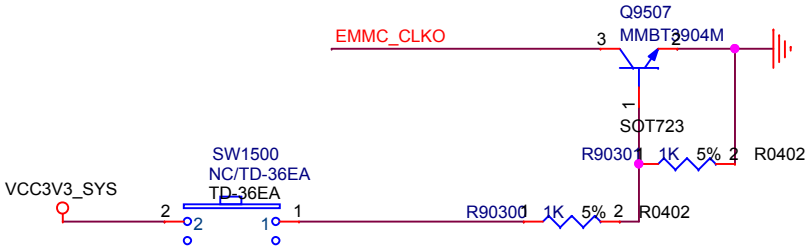
eMMC FLASH

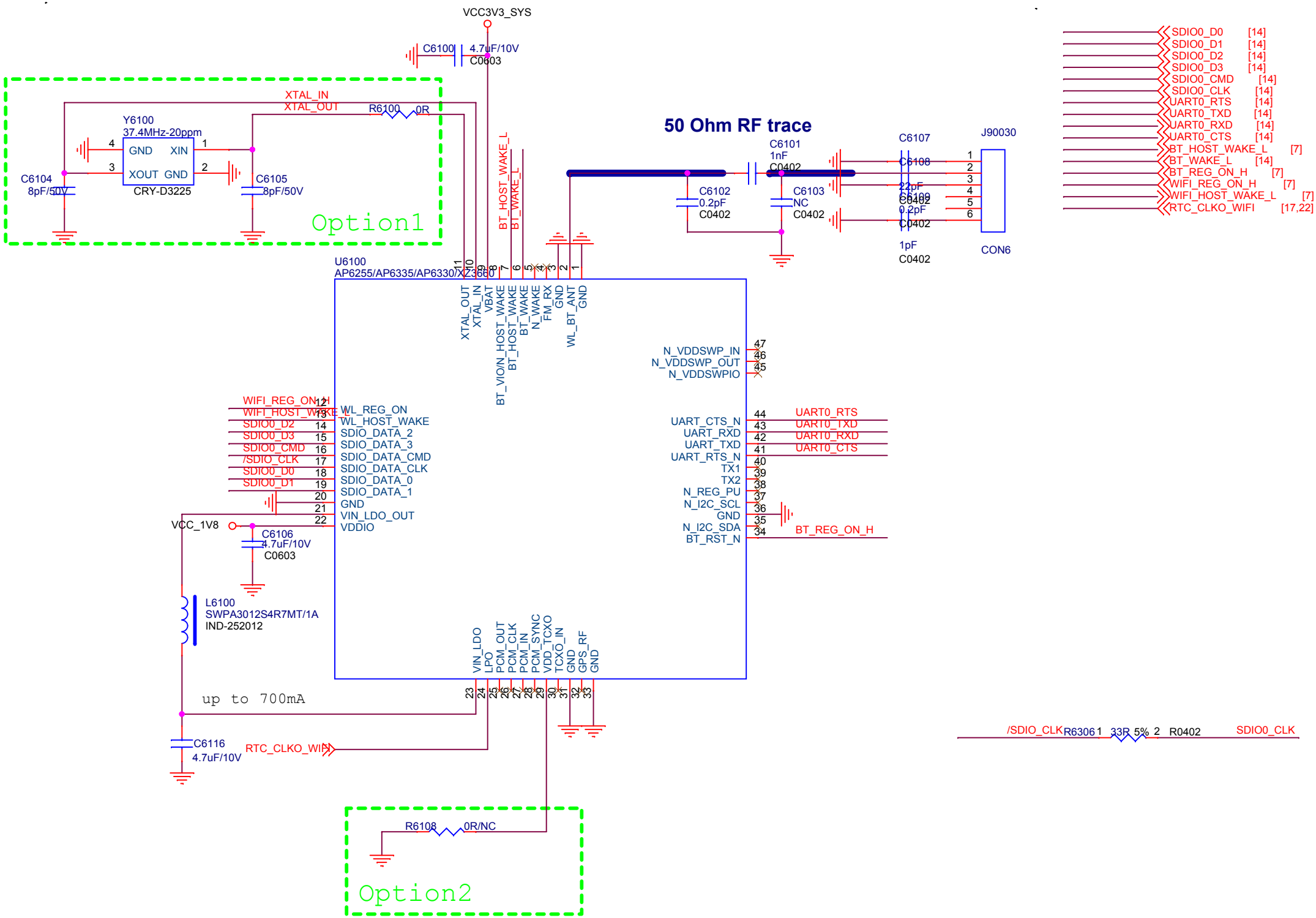

J8201
[9] EMMC_D5
[9] EMMC_D4
[9] EMMC_D0
[9] EMMC_CLKO
[9] EMMC_D3
VCC_1V8
R4000 10K 5% R0402
[9] EMMC_STRB
GND D5 GND D4 GND D0 GND CLK GND D3 GND RSTN GND GND RCLK GND GND
GND D6 GND D7 GND D1 GND D2 GND CMD GND VDDF VDDF VDD VDD GND GND
EMMC_D6 [9]
EMMC_D7 [9]
EMMC_D1 [9]
EMMC_D2 [9]
EMMC_CMD [9]
VCC3V3_SYS
VCC_1V8
CON34A


VCC3V3_SYS
C4001 10uF C0603 X5R 10V
C4002 100nF C0402 X5R 16V

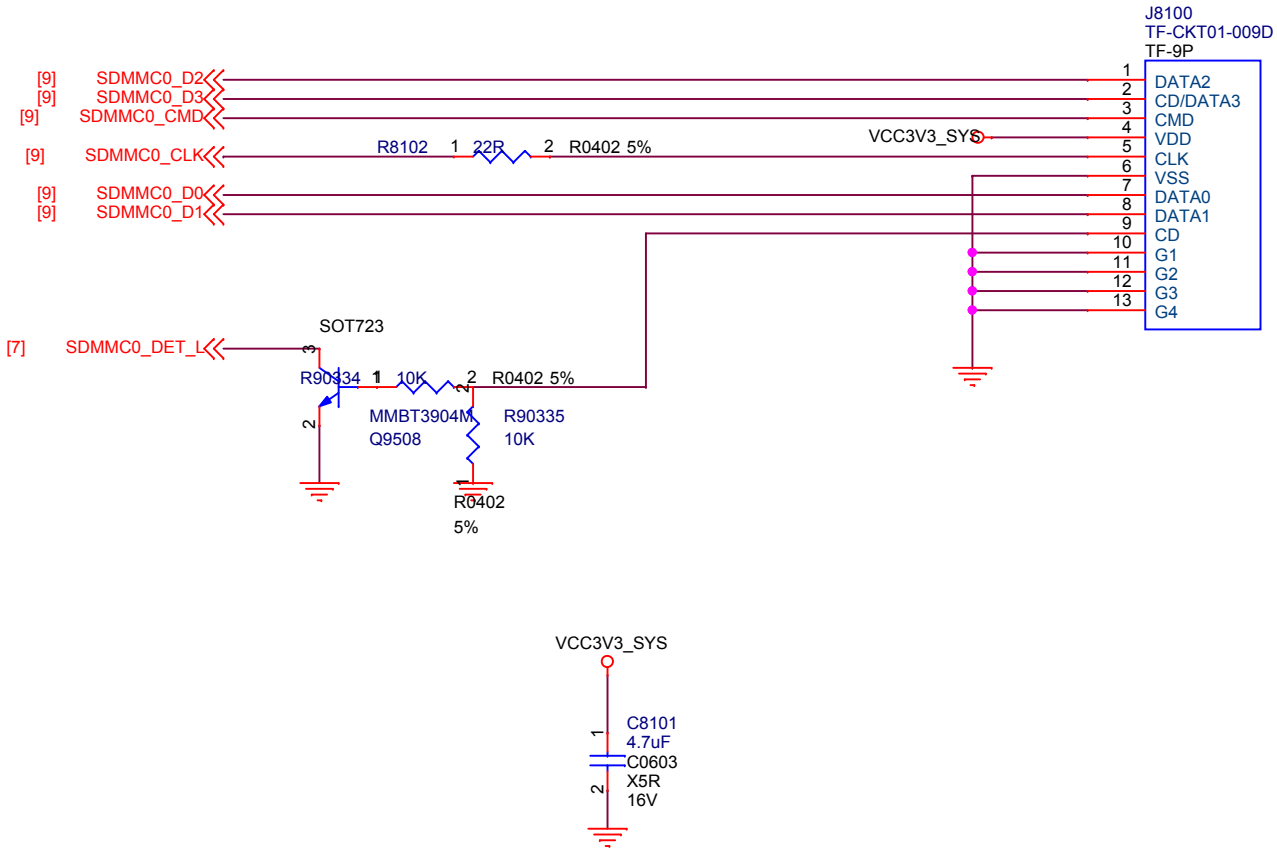

VCC_1V8
C4003 4.7uF C0603 X5R 10V


U19
[26] GPIO1_B0
[26] GPIO1_A7
[26] GPIO1_B2
[26] GPIO1_B1
DI(IO0) DO(IO1) CS CLK
VCC WP(IO2) HOLD(IO3) GND TPAD
R9617 10K 5% R0402
R9618 10K 5% R0402
VCC3V3_SYS
C9634 100nF C0402 X5R 16V
W25Q64FWZPIG


EMMC_CLKO
Q9507
MMBT3904M
SOT723
R90301 1K 5% R0402
SW1500
NC/TD-36EA
TD-36EA
VCC3V3_SYS
R90300 1K 5% R0402

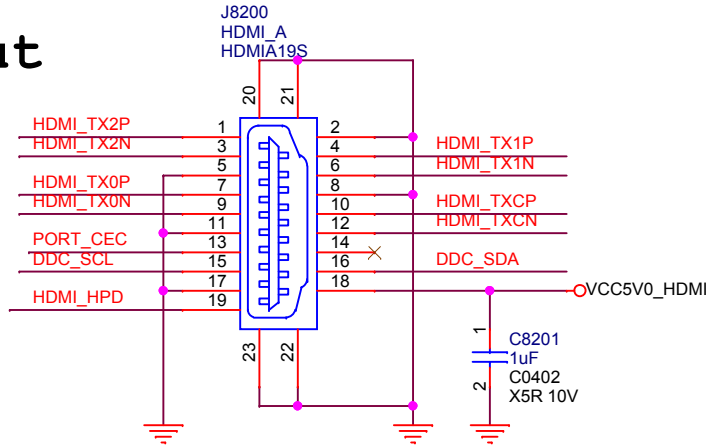

VCC3V3_SYS
C6100 4.7uF/10V C0603
XTAL_IN
XTAL_OUT
R6100 0R
Y6100
37.4MHz-20ppm
GND XIN
XOUT GND
CRY-D3225
C6104 8pF/50V
C6105 8pF/50V
Option1
50 Ohm RF trace
C6101 1nF C0402
C6102 0.2pF C0402
C6103 NC C0402
C6107
C6108 22pF C0402
C6109 0.2pF C0402
1pF C0402
J90030
CON6
U6100
AP6255/AP6335/AP6330/XZ3600
XTAL_OUT
XTAL_IN
VBAT
BT_VIO/N_HOST_WAKE
BT_HOST_WAKE
BT_WAKE
N_WAKE
FM_RX
GND
WL_BT_ANT
GND
BT_HOST_WAKE_L
BT_WAKE_L
N_VDDSWP_IN
N_VDDSWP_OUT
N_VDDSWPIO
WIFI_REG_ON_H
WIFI_HOST_WAKE_L
SDIO0_D2
SDIO0_D3
SDIO0_CMD
/SDIO_CLK
SDIO0_D0
SDIO0_D1
WL_REG_ON
WL_HOST_WAKE
SDIO_DATA_2
SDIO_DATA_3
SDIO_DATA_CMD
SDIO_DATA_CLK
SDIO_DATA_0
SDIO_DATA_1
GND
VIN_LDO_OUT
VDDIO
UART_CTS_N
UART_RXD
UART_TXD
UART_RTS_N
TX1
TX2
N_REG_PU
N_I2C_SCL
GND
N_I2C_SDA
BT_RST_N
UART0_RTS
UART0_TXD
UART0_RXD
UART0_CTS
BT_REG_ON_H
VCC_1V8
C6106 4.7uF/10V C0603
L6100
SWPA3012S4R7MT/1A
IND-252012
VIN_LDO
LPO
PCM_OUT
PCM_CLK
PCM_IN
PCM_SYNC
VDD_TCXO
TCXO_IN
GND
GPS_RF
GND
up to 700mA
C6116 4.7uF/10V
RTC_CLKO_WIFI
R6108 0R/NC
Option2
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_CLK R6306 33R 5% R0402 SDIO0_CLK

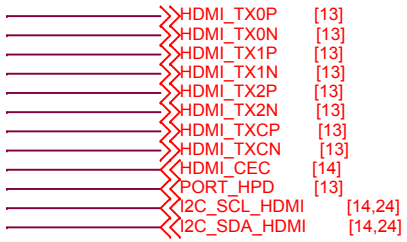
TF CARD

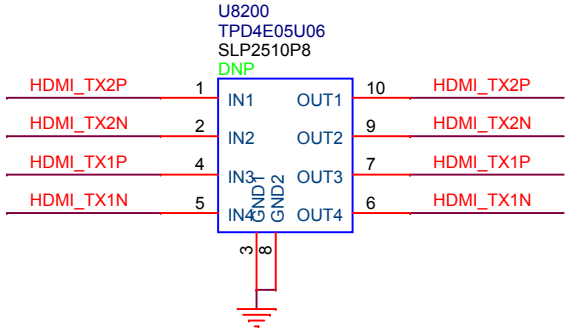

J8100
TF-CKT01-009D
TF-9P
[9] SDMMC0_D2
[9] SDMMC0_D3
[9] SDMMC0_CMD
[9] SDMMC0_CLK
[9] SDMMC0_D0
[9] SDMMC0_D1
[7] SDMMC0_DET_L
R8102 1 22R 2 R0402 5%
VCC3V3_SYS
SOT723
R90334 1 10K 2 R0402 5%
MMBT3904M
Q9508
R90335
10K
R0402
5%
1 DATA2
2 CD/DATA3
3 CMD
4 VDD
5 CLK
6 VSS
7 DATA0
8 DATA1
9 CD
10 G1
11 G2
12 G3
13 G4

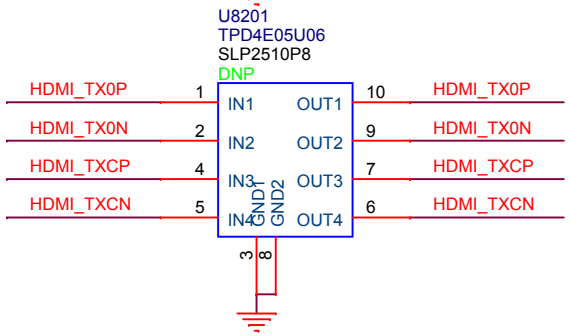
VCC3V3_SYS
C8101
4.7uF
C0603
X5R
16V

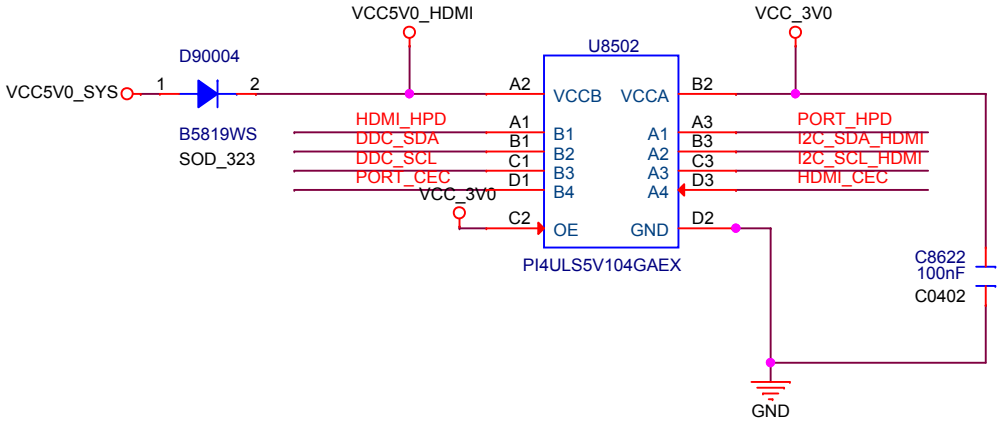
HDMI Output


J8200
HDMI_A
HDMIA19S
HDMI_TX2P
HDMI_TX2N
HDMI_TX0P
HDMI_TX0N
PORT_CEC
DDC_SCL
HDMI_HPD
HDMI_TX1P
HDMI_TX1N
HDMI_TXCP
HDMI_TXCN
DDC_SDA
VCC5V0_HDMI
C8201
1uF
C0402
X5R 10V

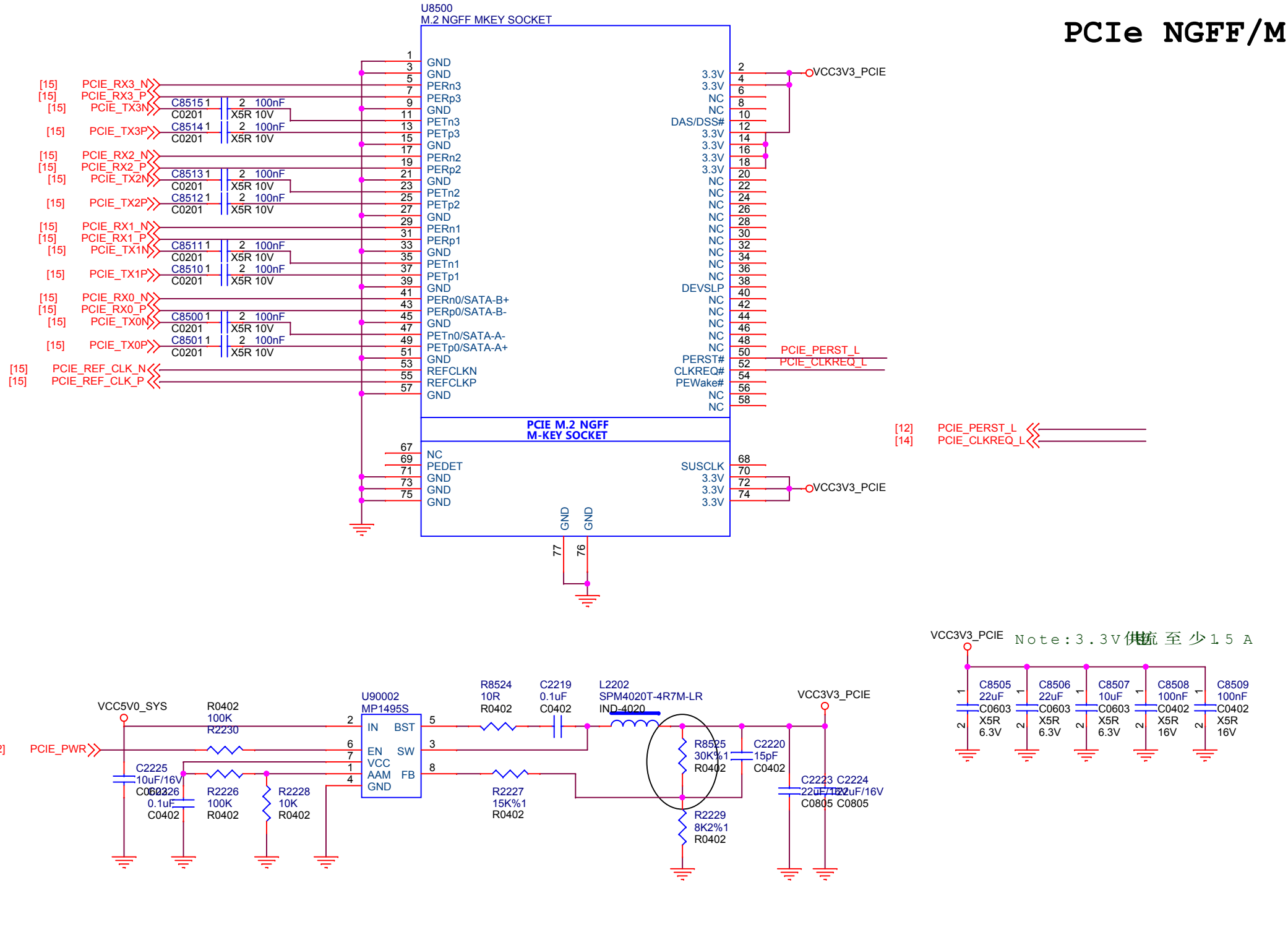

HDMI_TX0P [13]
HDMI_TX0N [13]
HDMI_TX1P [13]
HDMI_TX1N [13]
HDMI_TX2P [13]
HDMI_TX2N [13]
HDMI_TXCP [13]
HDMI_TXCN [13]
HDMI_CEC [14]
PORT_HPD [13]
I2C_SCL_HDMI [14,24]
I2C_SDA_HDMI [14,24]

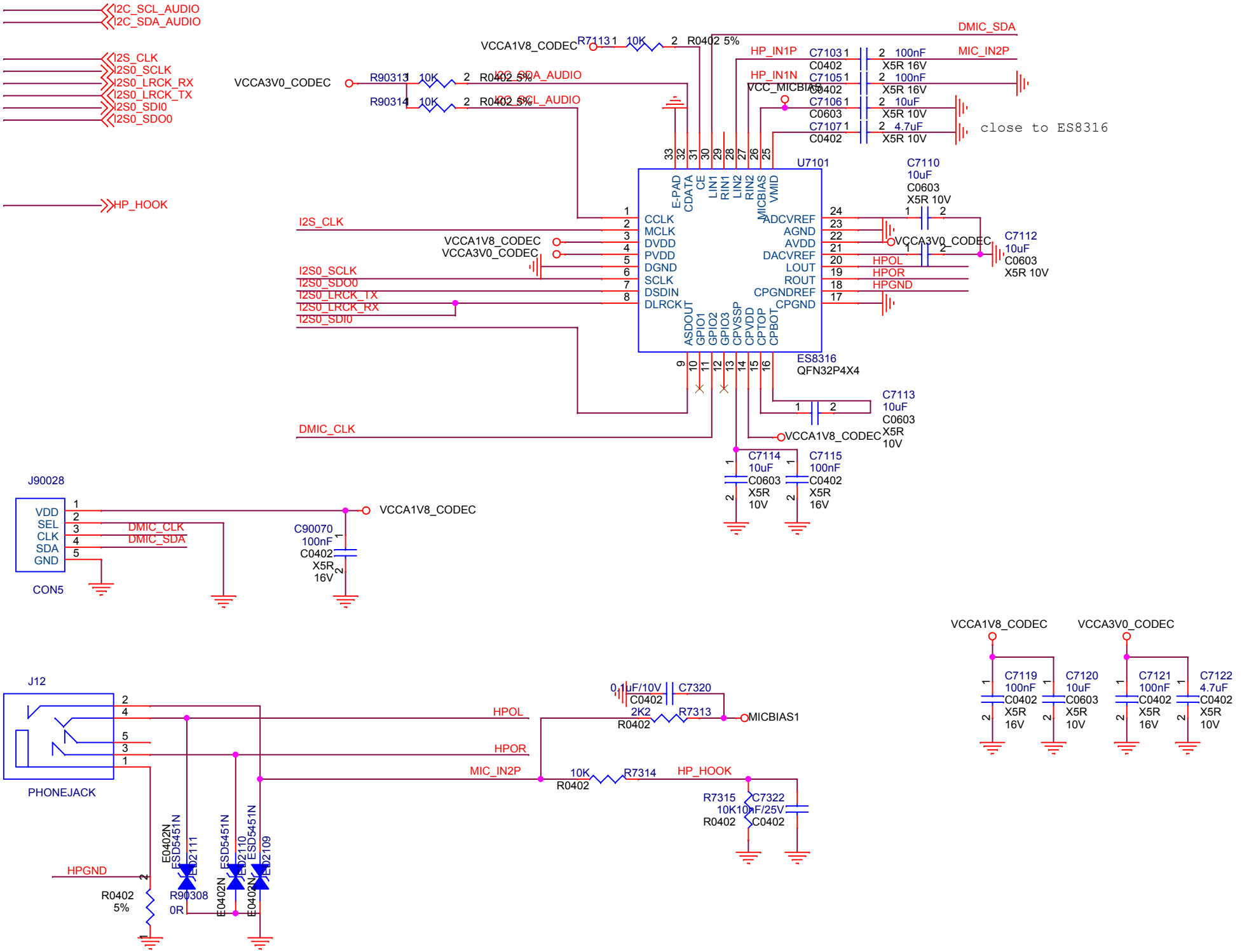

U8200
TPD4E05U06
SLP2510P8
DNP
HDMI_TX2P
HDMI_TX2N
HDMI_TX1P
HDMI_TX1N
IN1
IN2
IN3
IN4
OUT1
OUT2
OUT3
OUT4
GND1
GND2

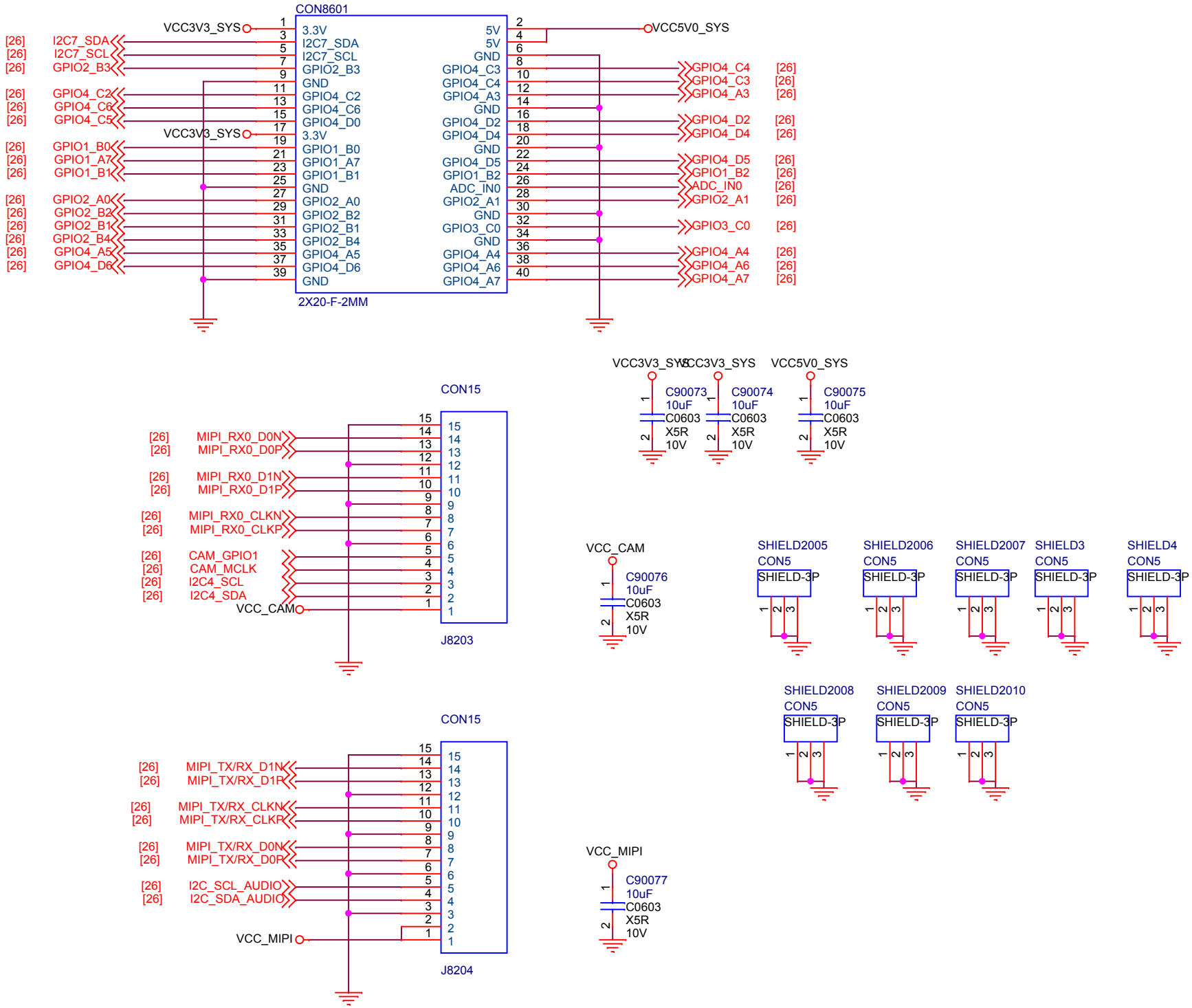

U8201
TPD4E05U06
SLP2510P8
DNP
HDMI_TX0P
HDMI_TX0N
HDMI_TXCP
HDMI_TXCN
IN1
IN2
IN3
IN4
OUT1
OUT2
OUT3
OUT4
GND1
GND2


VCC5V0_HDMI
VCC_3V0
D90004
VCC5V0_SYS
B5819WS
SOD_323
U8502
VCCB
VCCA
OE
GND
PI4ULS5V104GAEX
HDMI_HPD
DDC_SDA
DDC_SCL
PORT_CEC
PORT_HPD
I2C_SDA_HDMI
I2C_SCL_HDMI
HDMI_CEC
C8622
100nF
C0402
GND

PCIe NGFF/M.2


U8500
M.2 NGFF MKEY SOCKET
PCIE M.2 NGFF
M-KEY SOCKET
PCIE_RX3_N
PCIE_RX3_P
PCIE_TX3N
PCIE_TX3P
PCIE_RX2_N
PCIE_RX2_P
PCIE_TX2N
PCIE_TX2P
PCIE_RX1_N
PCIE_RX1_P
PCIE_TX1N
PCIE_TX1P
PCIE_RX0_N
PCIE_RX0_P
PCIE_TX0N
PCIE_TX0P
PCIE_REF_CLK_N
PCIE_REF_CLK_P
C8515 C8514 C8513 C8512 C8511 C8510 C8500 C8501
C0201 X5R 10V 100nF
VCC3V3_PCIE
PCIE_PERST_L
PCIE_CLKREQ_L
[12] PCIE_PERST_L
[14] PCIE_CLKREQ_L
U90002
MP1495S
VCC5V0_SYS
R0402
100K
R2230
PCIE_PWR
C2225
10uF/16V
C0603
R2226
100K
R0402
0.1uF
C0402
R2228
10K
R0402
R8524
10R
R0402
C2219
0.1uF
C0402
L2202
SPM4020T-4R7M-LR
IND-4020
R2227
15K%1
R0402
R8525
30K%1
R0402
C2220
15pF
C0402
R2229
8K2%1
R0402
C2223 C2224
22uF/16V
C0805 C0805
VCC3V3_PCIE
Note:3.3V供电流至少1.5A
C8505 C8506 C8507 C8508 C8509
22uF 22uF 10uF 100nF 100nF
C0603 C0603 C0603 C0402 C0402
X5R 6.3V X5R 6.3V X5R 6.3V X5R 16V X5R 16V


I2C_SCL_AUDIO
I2C_SDA_AUDIO
I2S_CLK
I2S0_SCLK
I2S0_LRCK_RX
I2S0_LRCK_TX
I2S0_SDI0
I2S0_SDO0
HP_HOOK
VCCA1V8_CODEC
VCCA3V0_CODEC
R7113 10K
R90313 10K
R90314 10K
R0402 5%
DMIC_SDA
HP_IN1P
HP_IN1N
VCC_MICBIAS
MIC_IN2P
C7103 100nF C0402 X5R 16V
C7105 100nF C0402 X5R 16V
C7106 10uF C0603 X5R 10V
C7107 4.7uF C0402 X5R 10V
close to ES8316
U7101
E-PAD
CDATA
CE
LIN1
RIN1
LIN2
RIN2
MICBIAS
VMID
CCLK
MCLK
DVDD
PVDD
DGND
SCLK
DSDIN
DLRCK
ASDOUT
GPIO1
GPIO2
GPIO3
CPVSSP
CPVDD
CPTOP
CPBOT
ADCVREF
AGND
AVDD
DACVREF
LOUT
ROUT
CPGNDREF
CPGND
HPOL
HPOR
HPGND
ES8316
QFN32P4X4
C7110 10uF C0603 X5R 10V
C7112 10uF C0603 X5R 10V
C7113 10uF C0603 X5R 10V
C7114 10uF C0603 X5R 10V
C7115 100nF C0402 X5R 16V
J90028
VDD
SEL
CLK
SDA
GND
CON5
C90070 100nF C0402 X5R 16V
J12
PHONEJACK
0.1uF/10V C7320 C0402
2K2 R0402 R7313
MICBIAS1
10K R0402 R7314
R7315 10K R0402
C7322 10nF/25V C0402
E0402N ESD5451N LED2111
E0402N ESD5451N LED2110
E0402N ESD5451N LED2109
R90308 0R
R0402 5%
C7119 100nF C0402 X5R 16V
C7120 10uF C0603 X5R 10V
C7121 100nF C0402 X5R 16V
C7122 4.7uF C0402 X5R 10V


CON8601
2X20-F-2MM
VCC3V3_SYS
VCC5V0_SYS
I2C7_SDA
I2C7_SCL
GPIO2_B3
GPIO4_C2
GPIO4_C6
GPIO4_C5
GPIO1_B0
GPIO1_A7
GPIO1_B1
GPIO2_A0
GPIO2_B2
GPIO2_B1
GPIO2_B4
GPIO4_A5
GPIO4_D6
GPIO4_C4
GPIO4_C3
GPIO4_A3
GPIO4_D2
GPIO4_D4
GPIO4_D5
GPIO1_B2
ADC_IN0
GPIO2_A1
GPIO3_C0
GPIO4_A4
GPIO4_A6
GPIO4_A7
CON15
J8203
MIPI_RX0_D0N
MIPI_RX0_D0P
MIPI_RX0_D1N
MIPI_RX0_D1P
MIPI_RX0_CLKN
MIPI_RX0_CLKP
CAM_GPIO1
CAM_MCLK
I2C4_SCL
I2C4_SDA
VCC_CAM
CON15
J8204
MIPI_TX/RX_D1N
MIPI_TX/RX_D1P
MIPI_TX/RX_CLKN
MIPI_TX/RX_CLKP
MIPI_TX/RX_D0N
MIPI_TX/RX_D0P
I2C_SCL_AUDIO
I2C_SDA_AUDIO
VCC_MIPI
C90073
C90074
C90075
C90076
C90077
10uF
C0603
X5R
10V
SHIELD2005
SHIELD2006
SHIELD2007
SHIELD3
SHIELD4
SHIELD2008
SHIELD2009
SHIELD2010
CON5
SHIELD-3P