

野火_EBF RK3588S BTB核心板

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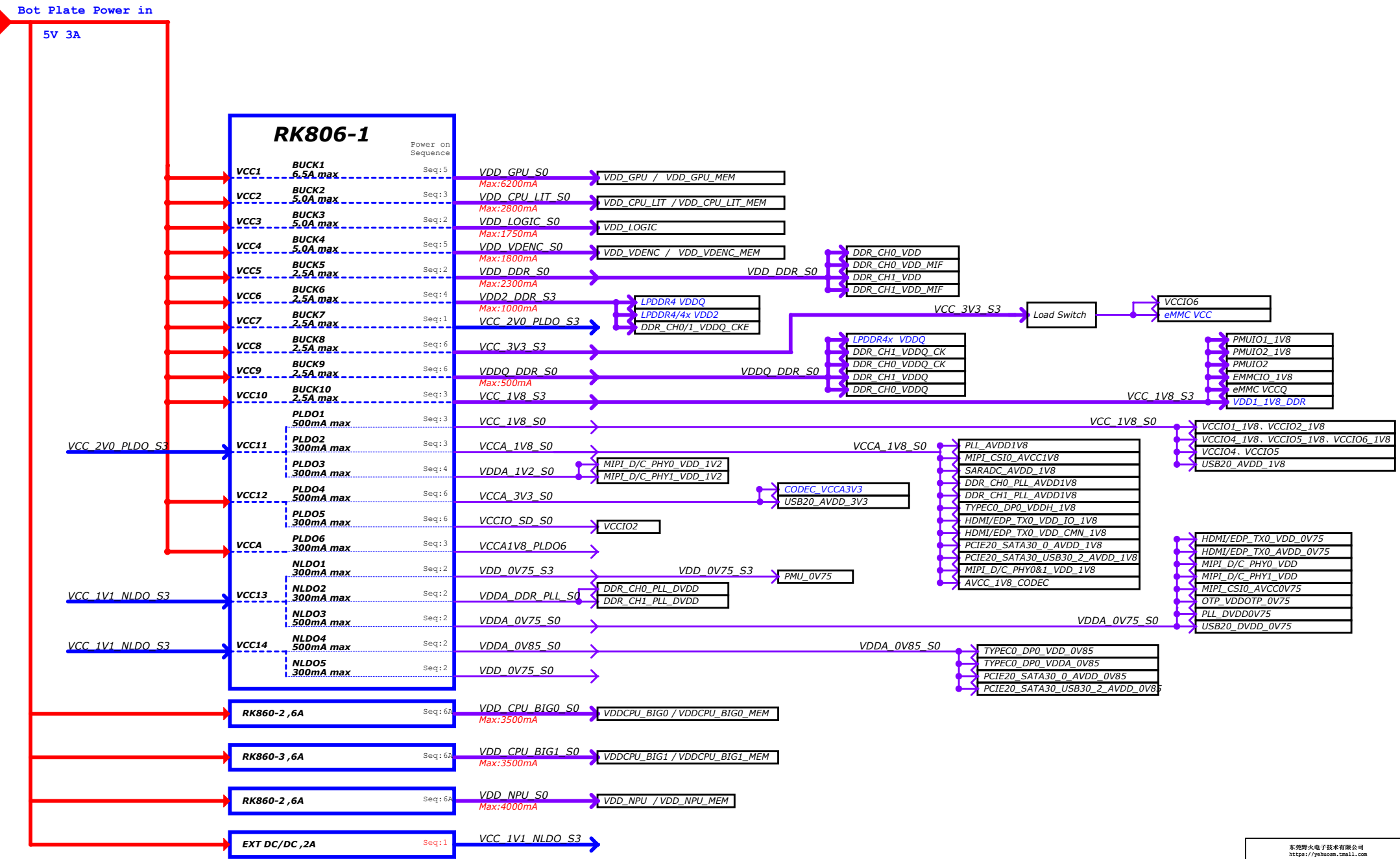
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历史版本

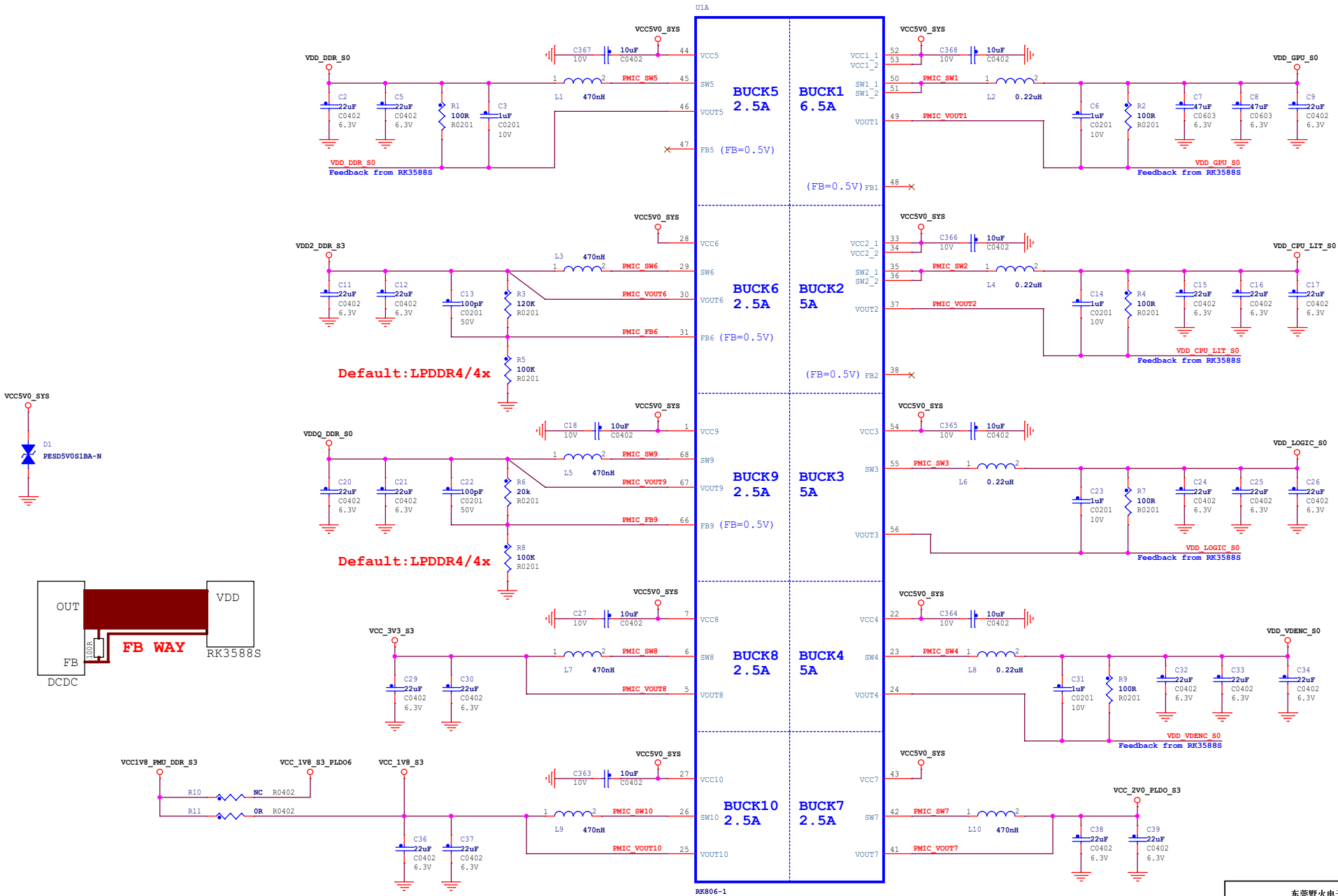
版本号	日期	设计	描述
V0R1	2023-10-12	ghs	初始版本, 开发阶段
V0R2	2024-08-14	ghs	更换支持更高速率的连接器
V0R3	2025-02-25	ghs	将GMAC1_TXCLK与GMAC1_TXEN调换线序 调整SDMMC引脚线序 更新SPI FLASH封装

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Power tree



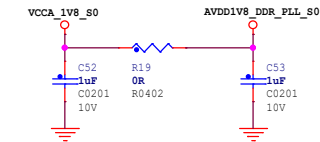
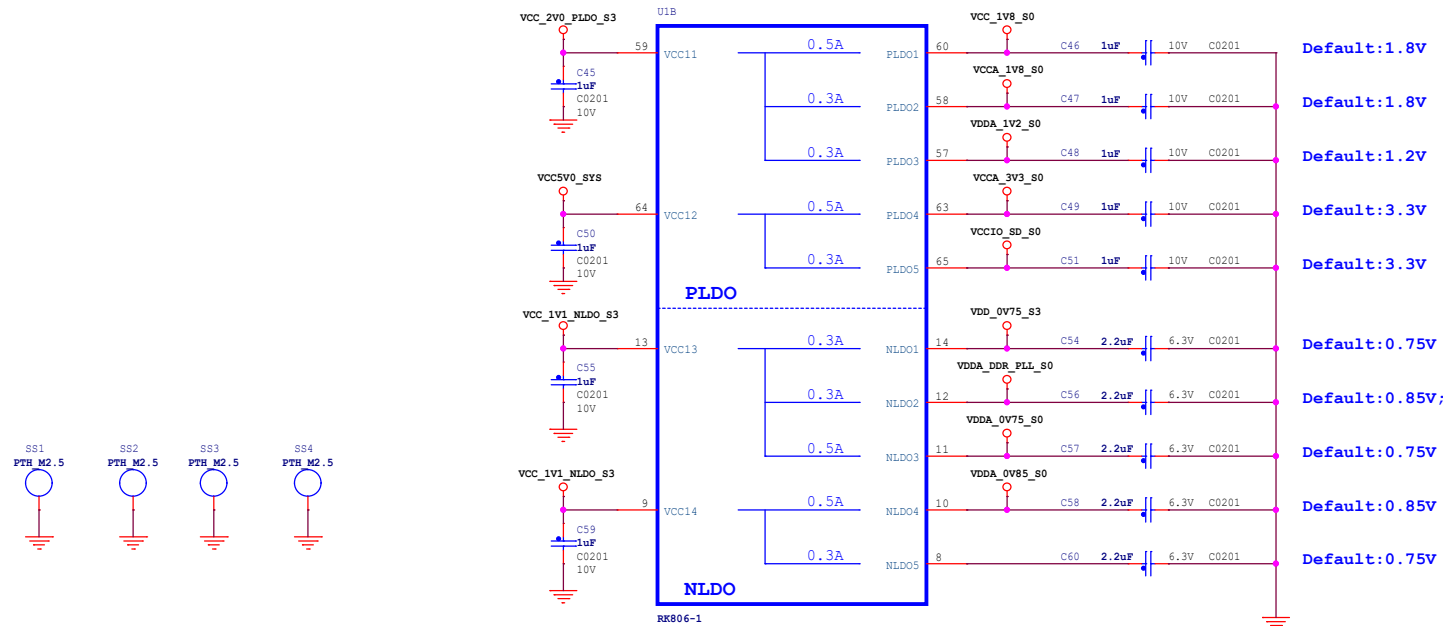
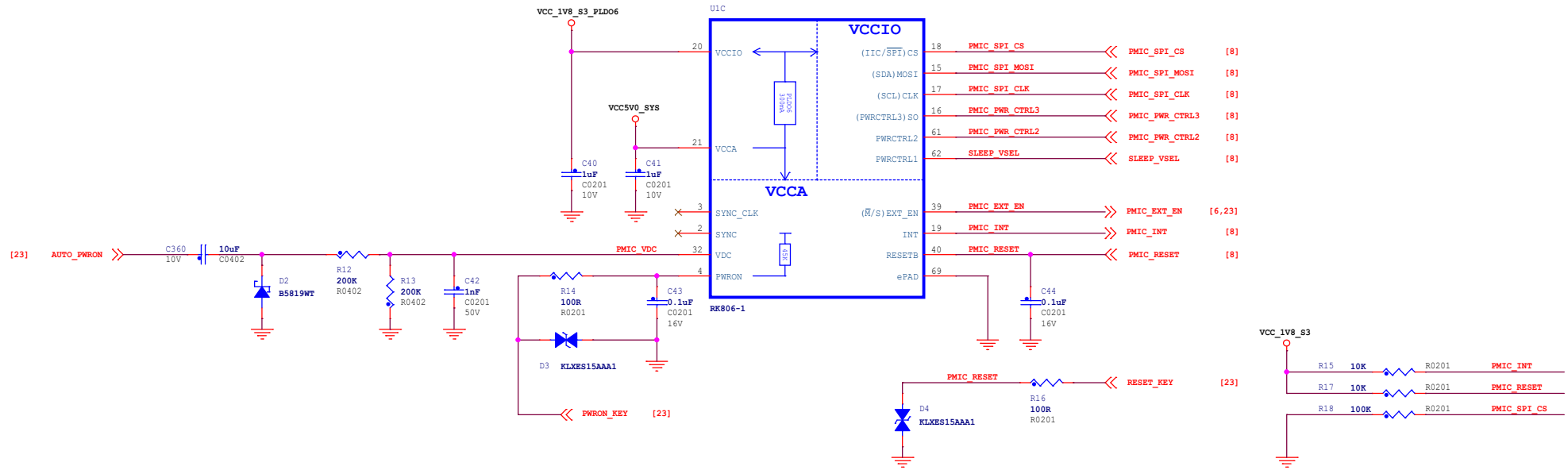
PMIC DC-DC



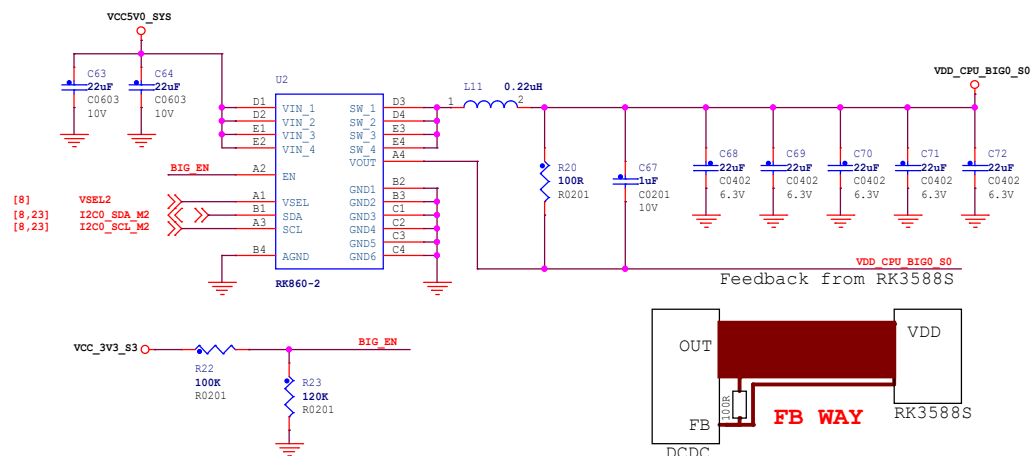
RK806-1

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Size A3	Document Number PMIC DC-DC	Rev V0R3
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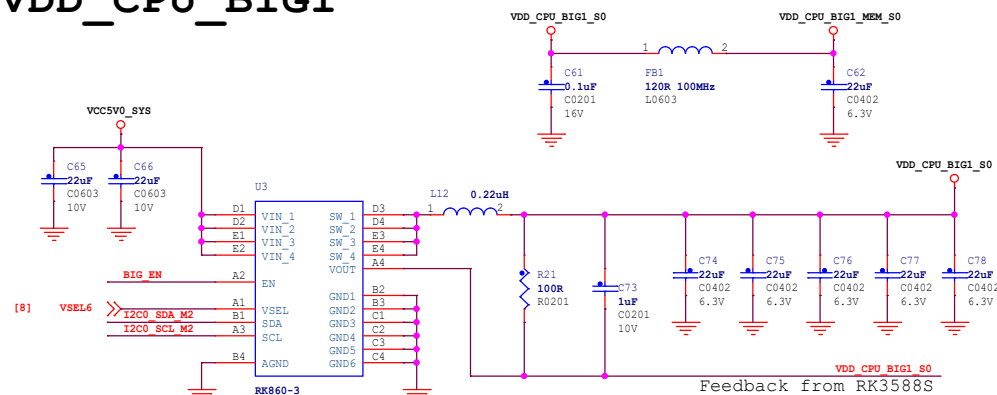
PMIC LDO



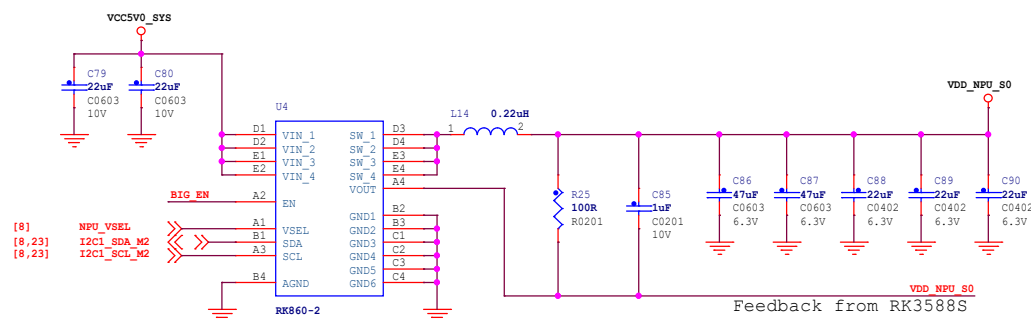
VDD_CPU_BIG0



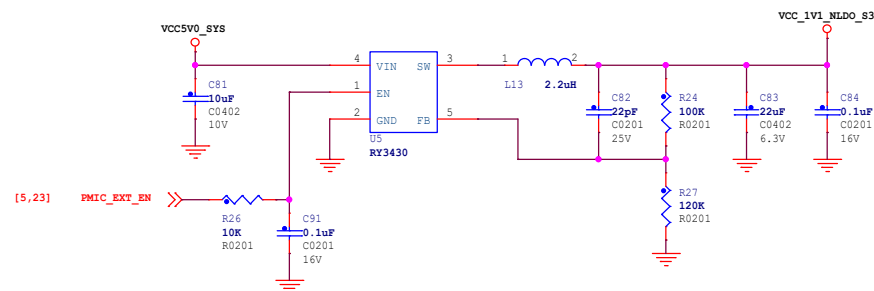
VDD_CPU_BIG1



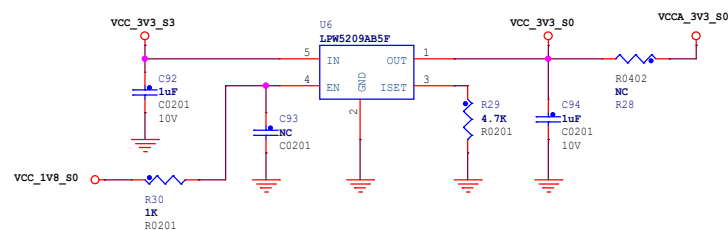
VDD_NPU



VCC_1V1_NLDO



VCC_3V3_S0



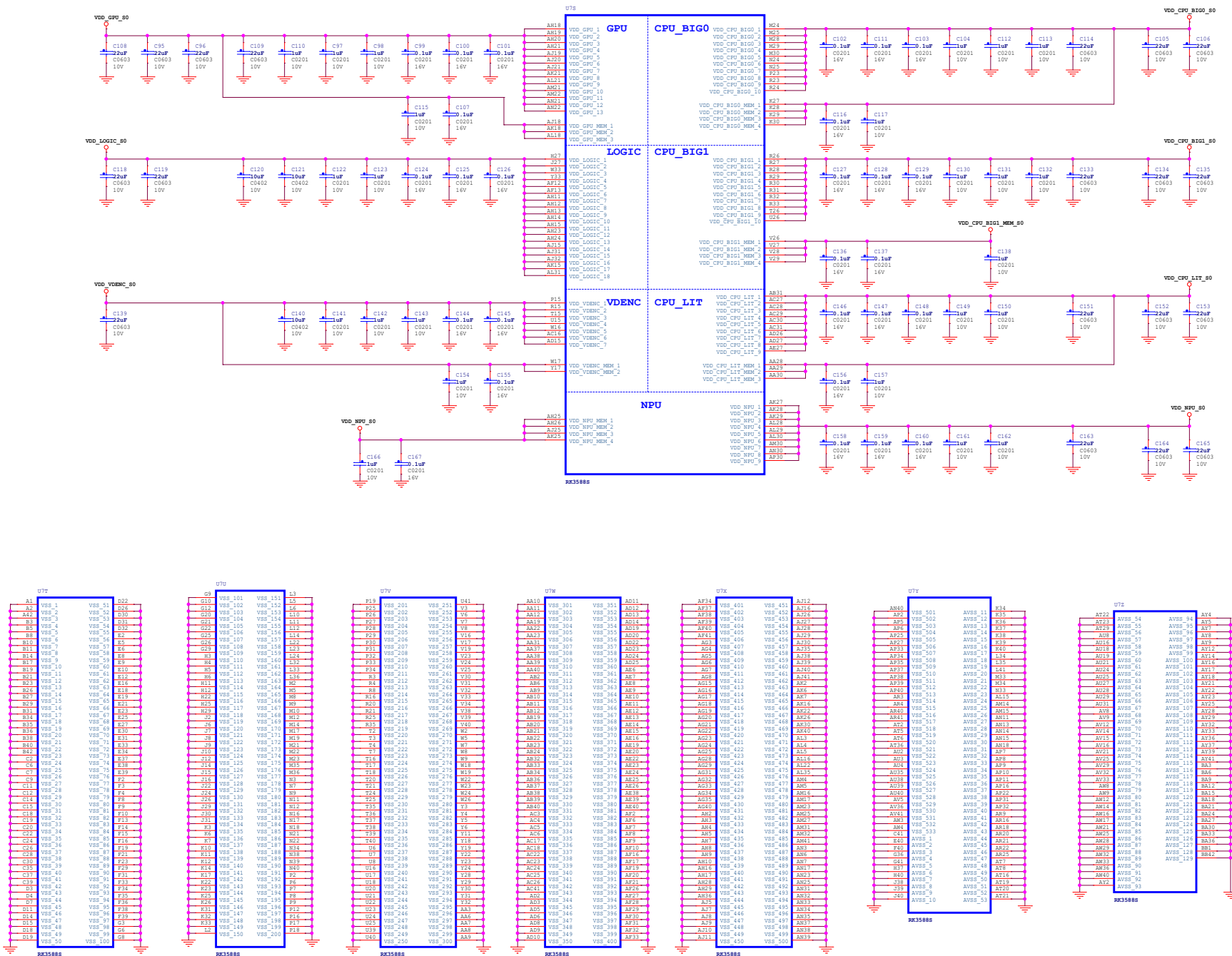
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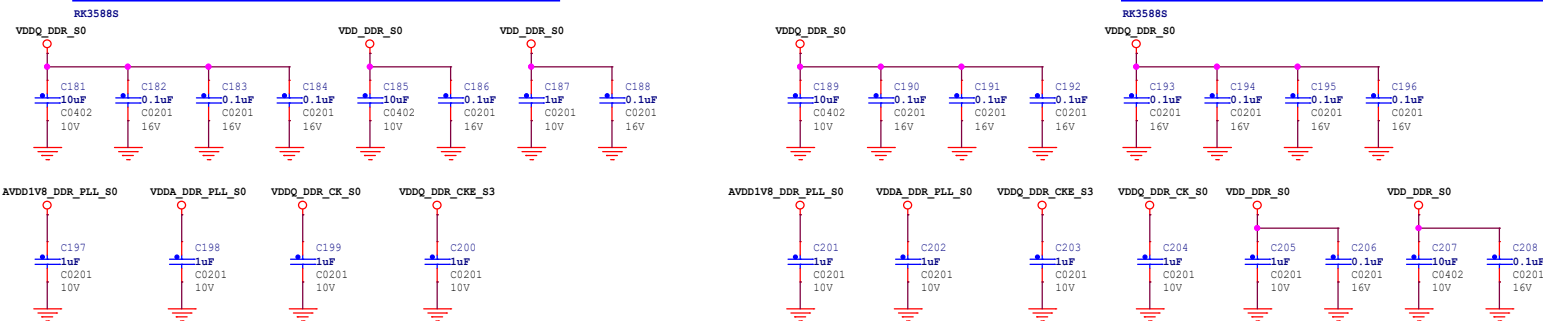
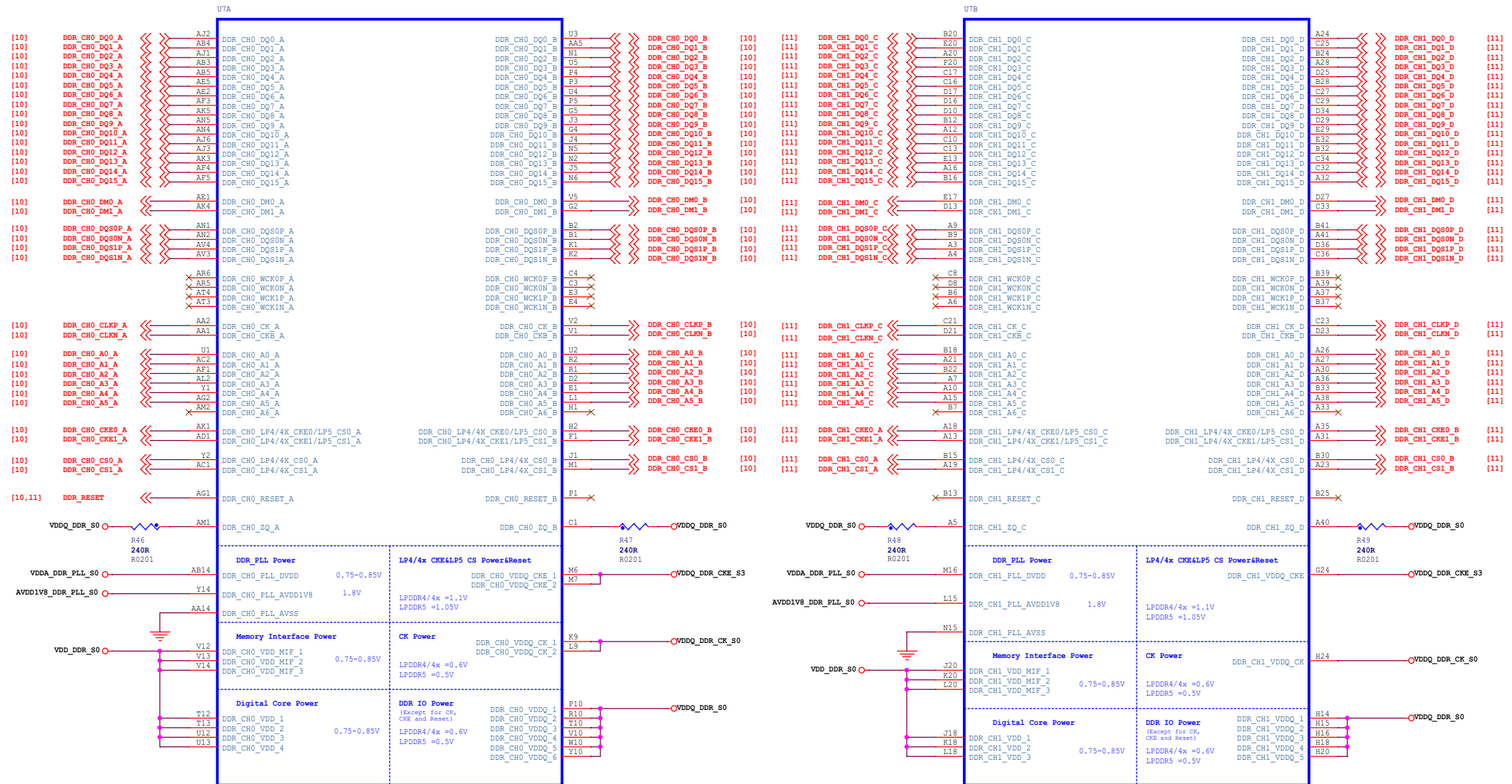
Size A3 Document Number Power Other Rev V0R3

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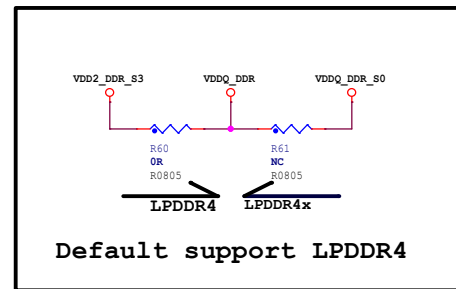
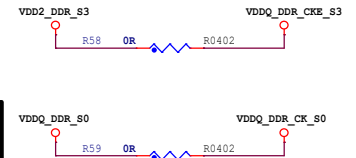
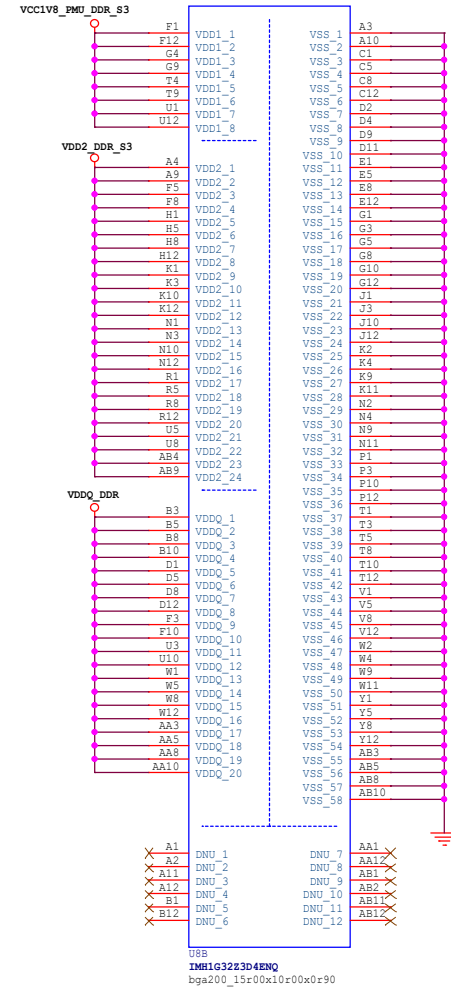
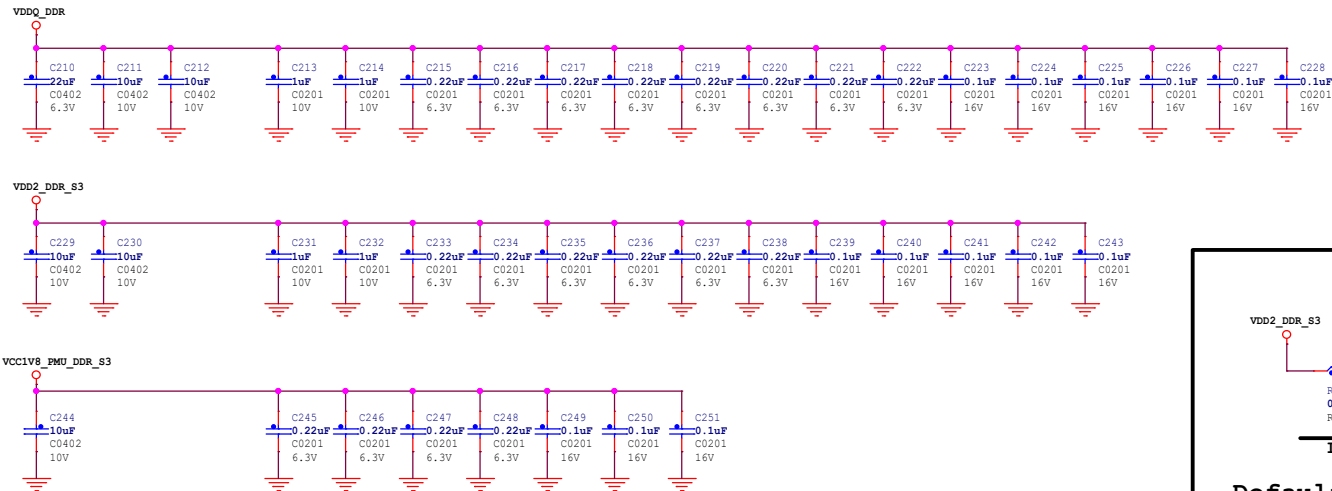
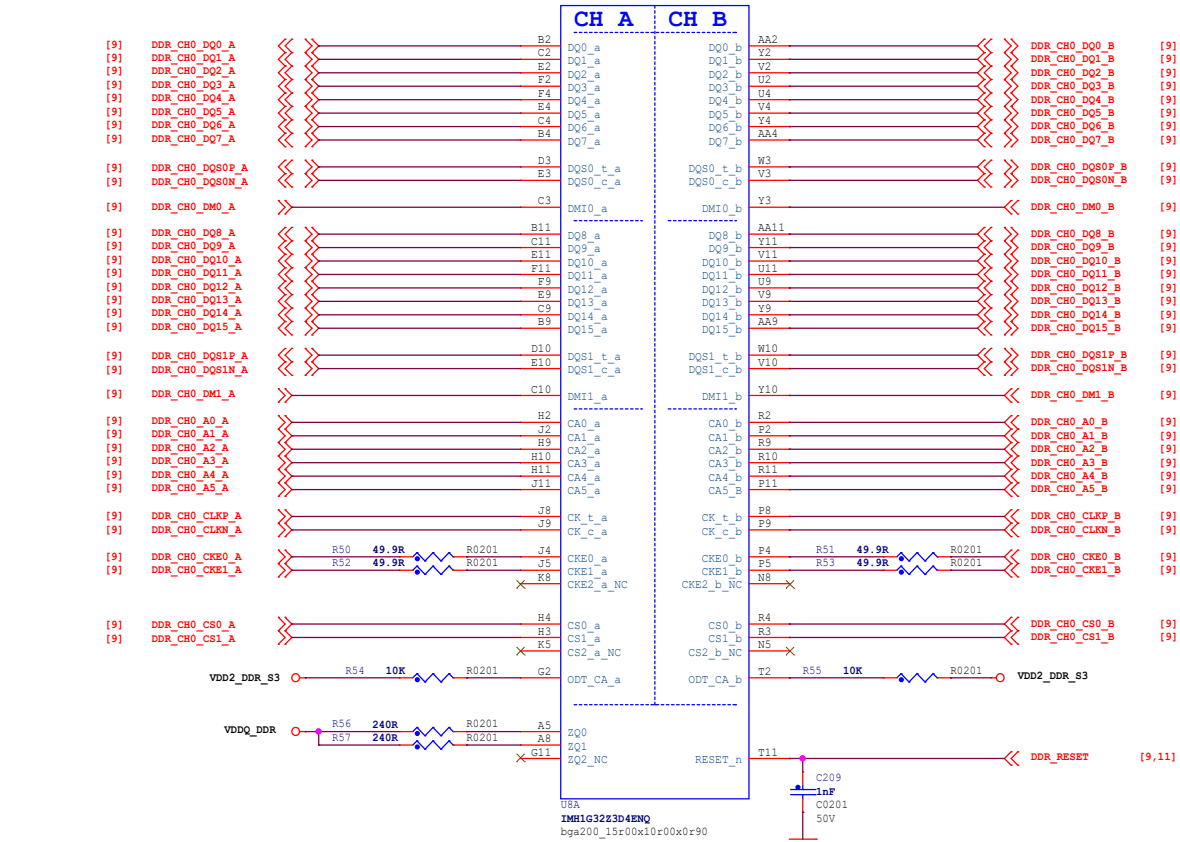
RK3588S (Power & Gnd)



RK3588S (DDR PHY)



LPDDR4/4x_01

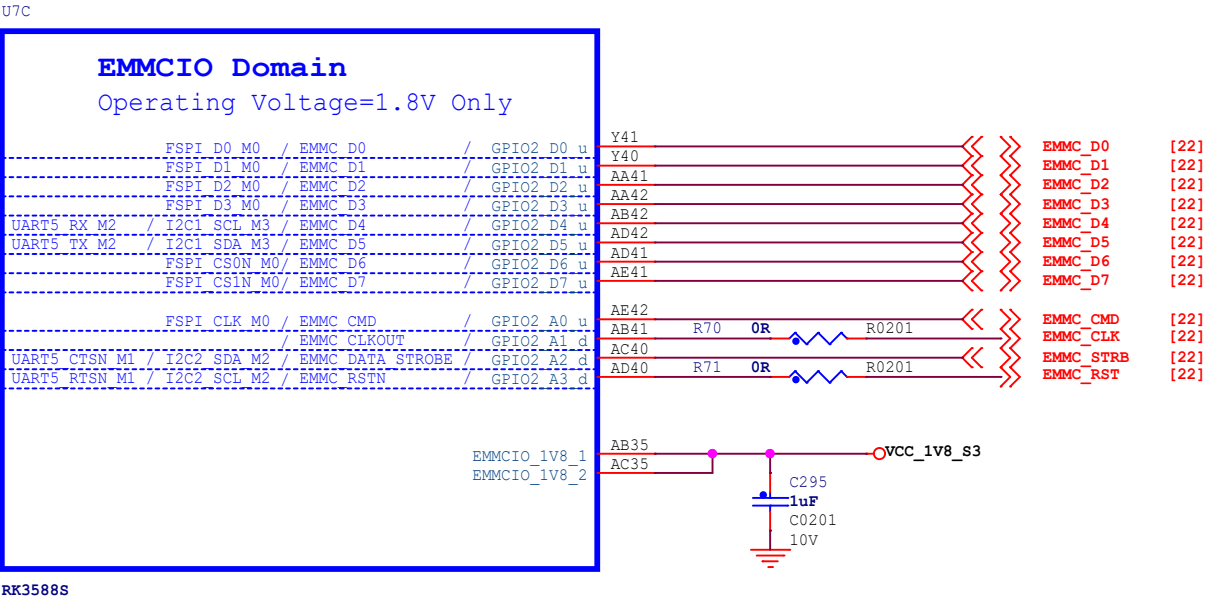


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Title 野火_EBF RK3588S BTB核心板			
Size A3	Document Number LPDDR4/4x_01		Rev V0R3
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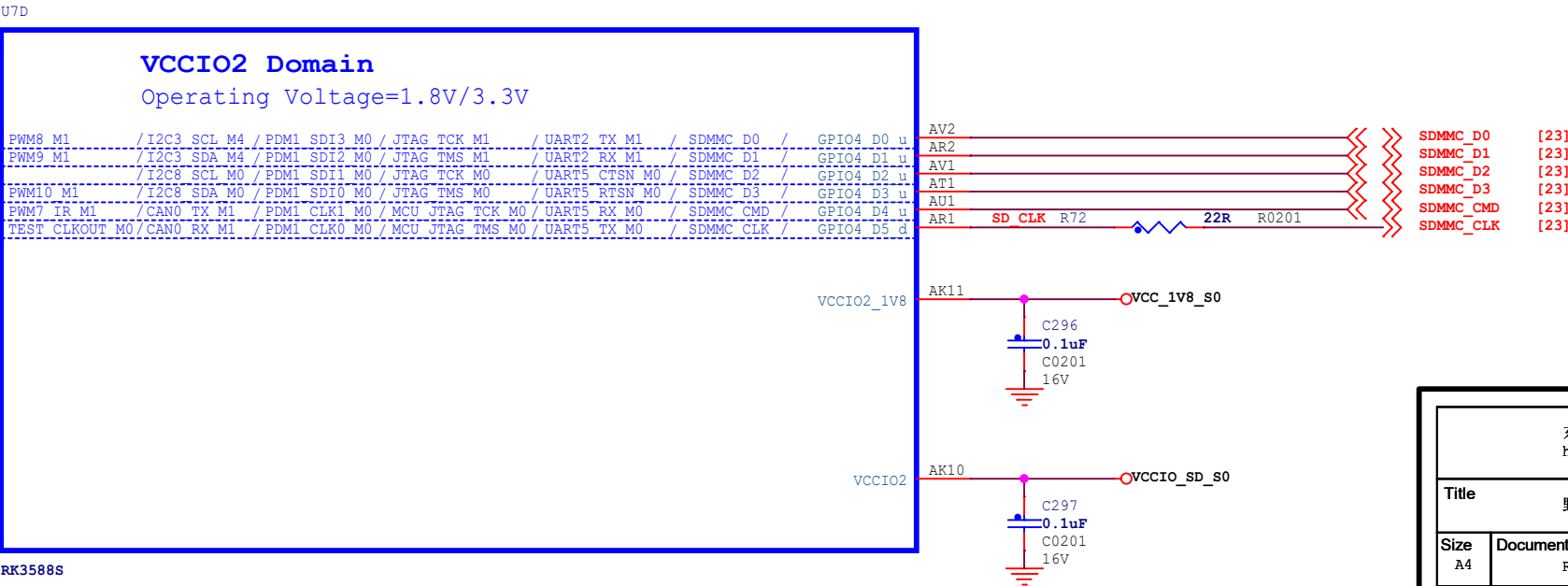
A



RK3588S (EMMCIO Domain)



RK3588S (VCCIO2 Domain)



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Title
野火_EBF RK3588S BTB核心板

Size
A4

Document Number
RK3588S EMMC/SD Controller

Rev
V0R3

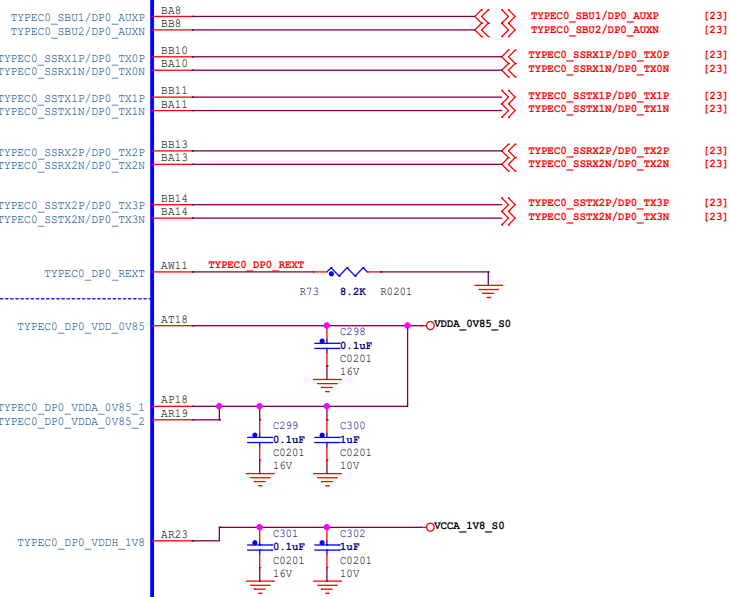
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RK3588S (USB3.0/DP1.4)

UTL

USB 3.0 OTG of TYPEC0 /DP1.4 ALT
USB:U3/Gen1
DP:RBR/HBR/HBR2/HBR3

POWER



RK3588S

USB30/DP1.4 Alt Mode Configuration

Option1	DP x4Lane	DP_TX_Lane0-3
Option2	TYPEPEC x4Lane	SSTX 1P/1N SSTX 2P/2N SSRX 1P/1N SSRX 2P/2N
Option3	USB30X2Lane+DPX2Lane	USB30:SSTX 1P/1N SSRX 1P/1N DP:Lane2 Lane3
Option4	USB30X2Lane+DPX2Lane	USB30:SSTX 2P/2N SSRX 2P/2N DP:Lane0 Lane1

RK3588S (USB2.0)

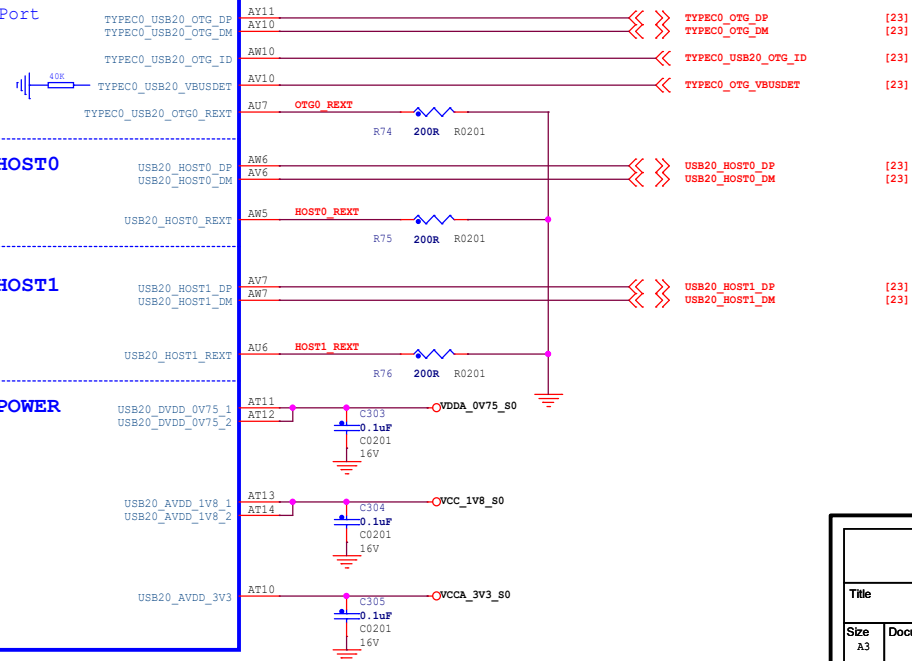
UTK

USB2.0 OTG of TYPEC0
HS/FS/LS
Download Port

USB2.0 HOST0
HS/FS/LS

USB2.0 HOST1
HS/FS/LS

USB2.0 POWER



RK3588S

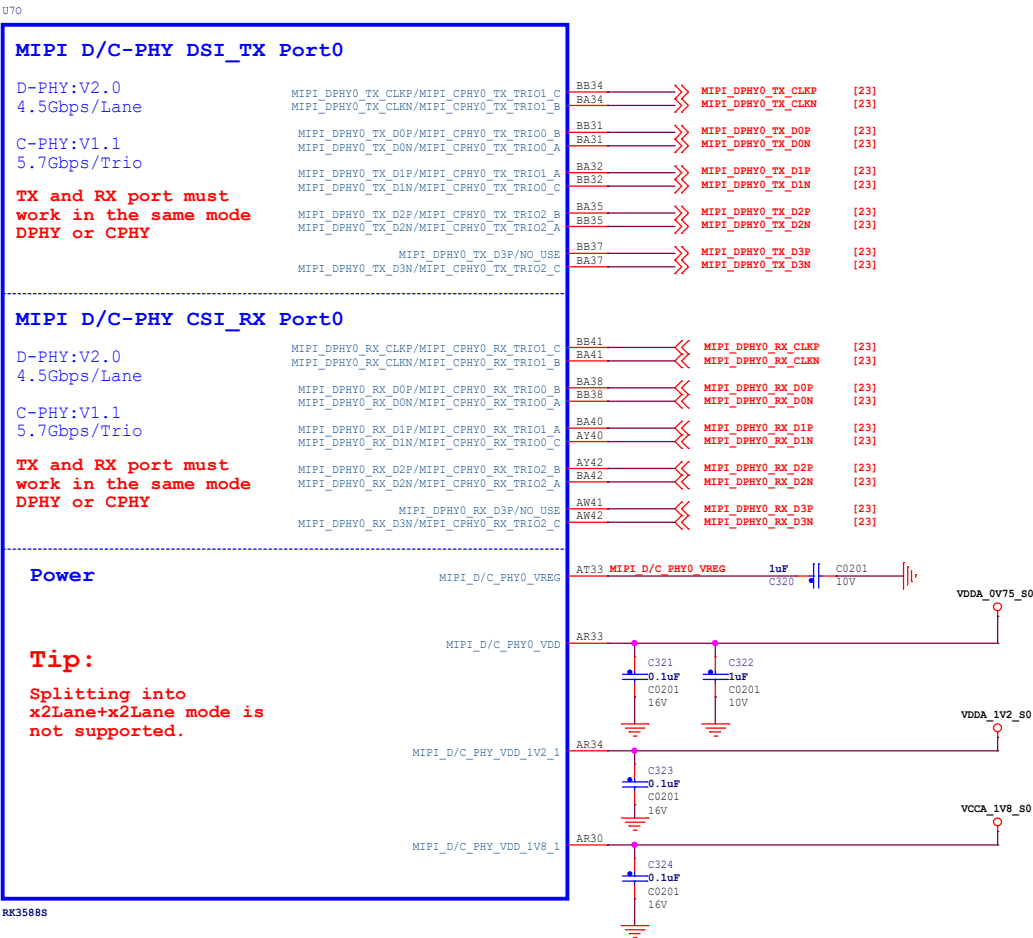
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SizeA3Document NumberUSB20/USB30/DP PHYRevV0R3

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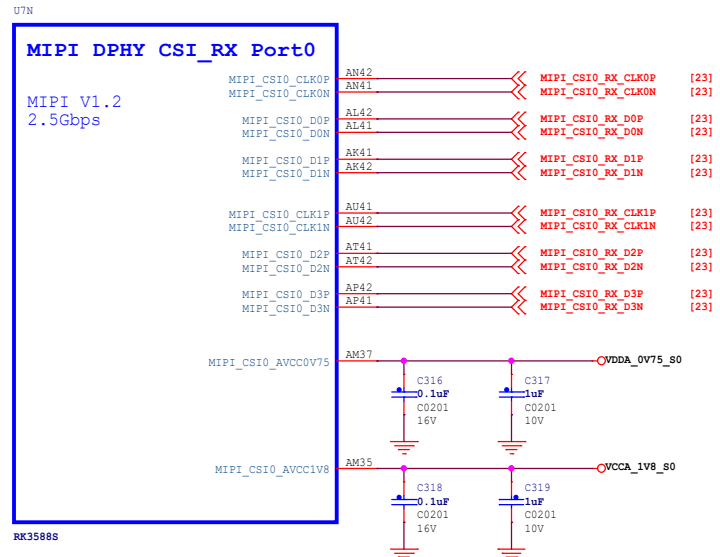
RK3588S (MIPI_D/C PHY0)



About MIPI_D/C_PHY0_VDD Pin:

D-PHY 4.5Gbps & C-PHY 2.5Gsps 0.85V
D-PHY 2.5Gbps & C-PHY 1.5Gsps 0.75V
Default: 0.75V

RK3588S (MIPI_DPHY CSI0 RX)



Option1	Sensor1 x4Lane	MIPI_CSI_RX_D0-3 MIPI_CSI_RX_CLK0
Option2	Sensor1 x2Lane + Sensor2 x2Lane	MIPI_CSI_RX_D0-1 MIPI_CSI_RX_CLK0 MIPI_CSI_RX_D2-3 MIPI_CSI_RX_CLK1

RK3588S (MIPI_D/C PHY1)

U7P

MIPI D/C-PHY DSI_TX Port1

D-PHY:V2.0
4.5Gbps/Lane

C-PHY:V1.1
5.7Gbps/Trio

TX and RX port must
work in the same mode
DPHY or CPHY

MIPI_DPHY1_TX_CLKP/MIPI_CPHY1_TX_TRIO1_C
MIPI_DPHY1_TX_CLKN/MIPI_CPHY1_TX_TRIO1_B

MIPI_DPHY1_TX_D0P/MIPI_CPHY1_TX_TRIO0_B
MIPI_DPHY1_TX_D0N/MIPI_CPHY1_TX_TRIO0_A

MIPI_DPHY1_TX_D1P/MIPI_CPHY1_TX_TRIO1_A
MIPI_DPHY1_TX_D1N/MIPI_CPHY1_TX_TRIO0_C

MIPI_DPHY1_TX_D2P/MIPI_CPHY1_TX_TRIO2_B
MIPI_DPHY1_TX_D2N/MIPI_CPHY1_TX_TRIO2_A

MIPI_DPHY1_TX_D3P/NO USE
MIPI_DPHY1_TX_D3N/MIPI_CPHY1_TX_TRIO2_C



MIPI D/C-PHY CSI_RX Port1

D-PHY:V2.0
4.5Gbps/Lane

C-PHY:V1.1
5.7Gbps/Trio

TX and RX port must
work in the same mode
DPHY or CPHY

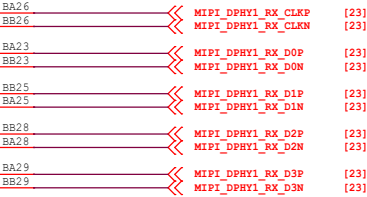
MIPI_DPHY1_RX_CLKP/MIPI_CPHY1_RX_TRIO1_C
MIPI_DPHY1_RX_CLKN/MIPI_CPHY1_RX_TRIO1_B

MIPI_DPHY1_RX_D0P/MIPI_CPHY1_RX_TRIO0_B
MIPI_DPHY1_RX_D0N/MIPI_CPHY1_RX_TRIO0_A

MIPI_DPHY1_RX_D1P/MIPI_CPHY1_RX_TRIO1_A
MIPI_DPHY1_RX_D1N/MIPI_CPHY1_RX_TRIO0_C

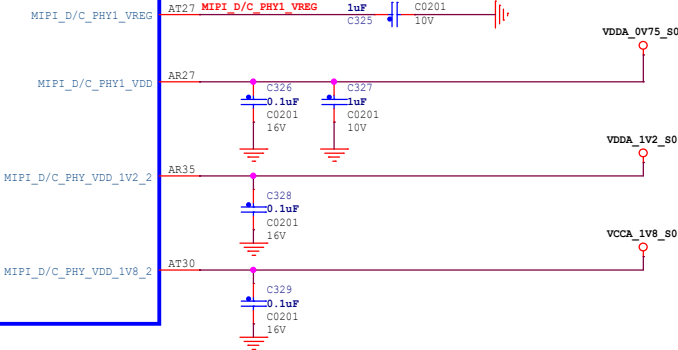
MIPI_DPHY1_RX_D2P/MIPI_CPHY1_RX_TRIO2_B
MIPI_DPHY1_RX_D2N/MIPI_CPHY1_RX_TRIO2_A

MIPI_DPHY1_RX_D3P/NO USE
MIPI_DPHY1_RX_D3N/MIPI_CPHY1_RX_TRIO2_C



Power

Tip:
Splitting into
x2Lane+x2Lane mode is
not supported.



About MIPI_D/C_PHY0_VDD Pin:

D-PHY 4.5Gbps & C-PHY 2.5Gsps 0.85V

D-PHY 2.5Gbps & C-PHY 1.5Gsps 0.75V

Default: 0.75V

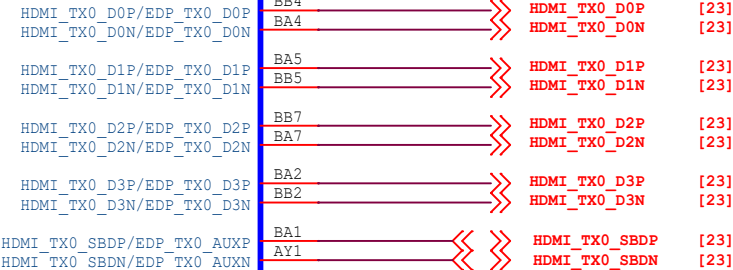
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RK3588S (HDMI2.1 TX/eDP1.3 TX)

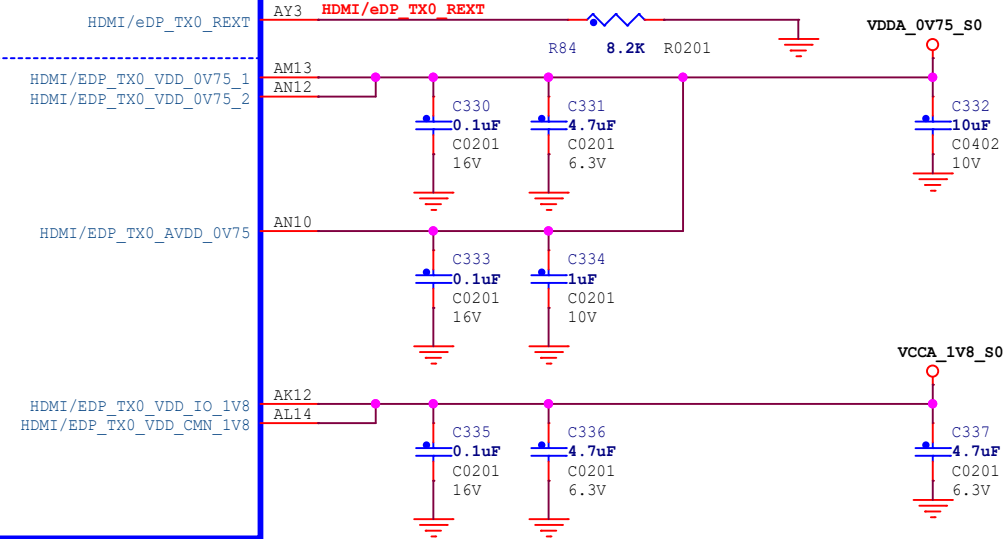
U7Q

HDMI TX/eDP1.3 MUX Port0

HDMI:V2.1 12Gbps
eDP: V1.3 5.4Gbps



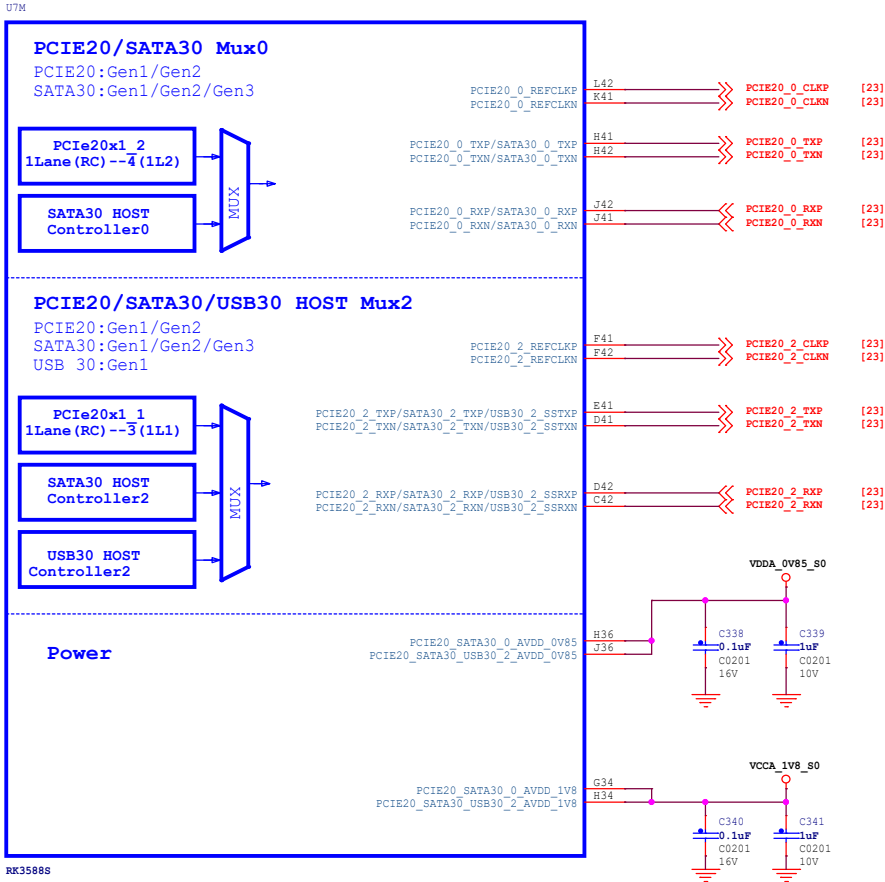
POWER



RK3588S

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RK3588S (PCIE20/SATA30/USB30)



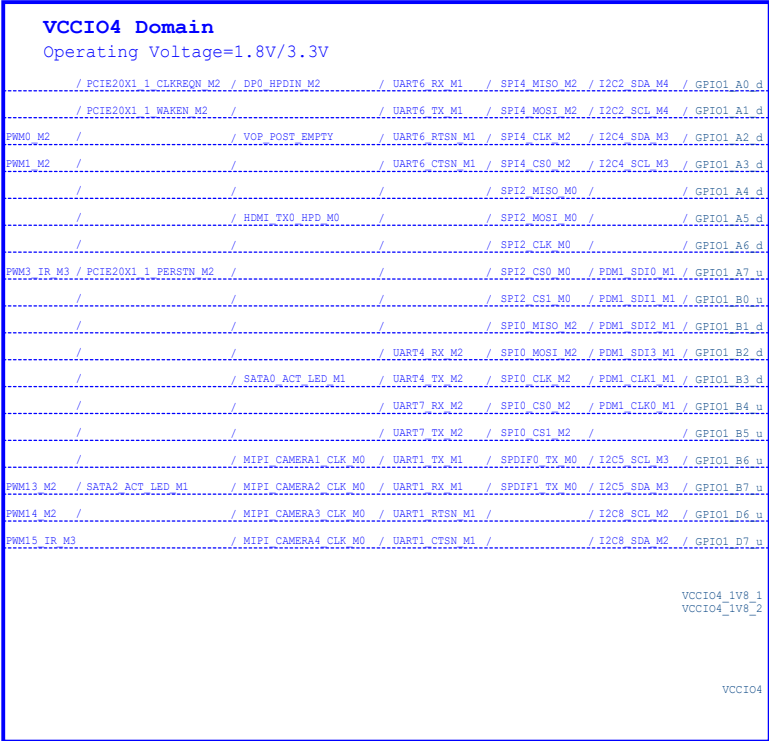
PCIE2.0 PHY

Controller Name	Data & Clk Lane Configure		Control GPIO
	CLK LANE	DATA LANE	
PCIE20X1_1 RC	PCIE20_2_REFCLKP PCIE20_2_REFCLKN	PCIE20_2_TX PCIE20_2_RX	PCIE20X1_1_CLKREQ_M* PCIE20X1_1_WAKEN_M* PCIE20X1_1_PERSTN_M* PCIE20X1_1_BUTTON_RSTN
PCIE20X1_2 RC	PCIE20_0_REFCLKP PCIE20_0_REFCLKN	PCIE20_0_TX PCIE20_0_RX	PCIE20X1_2_CLKREQ_M* PCIE20X1_2_WAKEN_M* PCIE20X1_2_PERSTN_M* PCIE20X1_2_BUTTON_RSTN

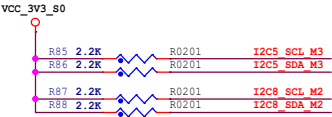
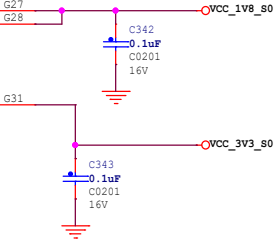
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Size A3	Document Number PCIE2/SATA3/USB3 PHY	Rev V0R3
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RK3588S (VCCIO4 Domain)

U7H



RK3588S



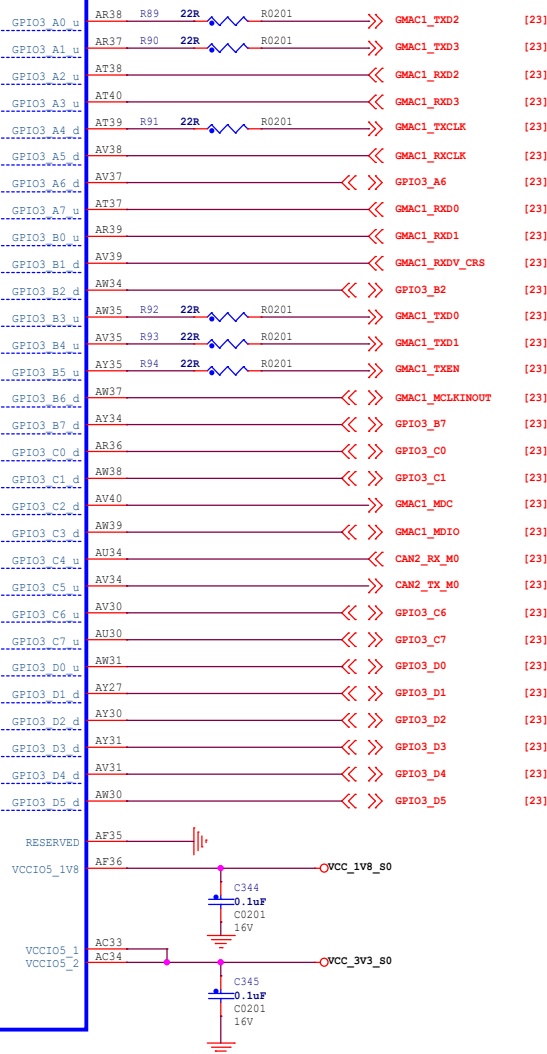
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Size A3	Document Number VCCIO4 GPIO	Rev V0R3
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U7I

Operating Voltage=1.8V/3.3V

/ PWM10 M0	/ SPI4 M0 M1	/ I2C6 SDA M4	/ GMAC1 TXD2	/ I283 MCLK	/ FSPI D0 M2	/ SDIO D0 M1	/ GPIO3 A0	
AUDDSM LN	/ PWM11 IR M0	/ SPI4 MOSI M1	/ I2C6 SCL M4	/ GMAC1 TXD3	/ I283 SCLK	/ FSPI D1 M2	/ SDIO D1 M1	/ GPIO3 A1
AUDDSM LP	/ UART8 TX M1	/ SPI4 CLK M1	/	/ GMAC1 RXD2	/ I283 LRCK	/ FSPI D2 M2	/ SDIO D2 M1	/ GPIO3 A2
AUDDSM RN	/ UART8 RX M1	/ SPI4 CS0 M1	/	/ GMAC1 RXD3	/ I283 SDO	/ FSPI D3 M2	/ SDIO D3 M1	/ GPIO3 A3
AUDDSM RP	/ UART8 RTSN M1	/ SPI4 CS1 M1	/	/ GMAC1 TXCLK	/ I283 SDI	/	/ SDIO CMD M1	/ GPIO3 A4
/ UART8 CTSN M1	/	/	/ I2C4 SDA M0	/ GMAC1 RXCLK	/ FSPI CLK M2	/ MIPI CAMERA0 CLK M1	/ SDIO CLK M1	/ GPIO3 A5
/	/	/	/ I2C4 SCL M0	/ ETH1 REFCLK0 25M	/	/ MIPI CAMERA1 CLK M1	/	/ GPIO3 A6
/	/	/	/	/ GMAC1 RXD0	/	/ MIPI CAMERA2 CLK M1	/ PWM8 M0	/ GPIO3 A7
/	/	/	/	/ GMAC1 RXD1	/	/ MIPI CAMERA3 CLK M1	/ PWM9 M0	/ GPIO3 B0
/ UART2 TX M2	/	/	/	/ GMAC1 RXDV CRS	/	/ MIPI CAMERA4 CLK M1	/ PWM2 M1	/ GPIO3 B1
/ UART2 RX M2	/	/	/	/ GMAC1 TXER	/ I282 SDI M1	/	/ PWM3 IR M1	/ GPIO3 B2
/ UART2 RTSN	/	/	/	/ GMAC1 TXD0	/ I282 SDO M1	/	/	/ GPIO3 B3
/ UART2 CTSN	/	/	/	/ GMAC1 TXD1	/ I282 MCLK M1	/	/	/ GPIO3 B4
/ UART3 TX M1	/	/	/ CAN1 RX M0	/ GMAC1 TXEN	/ I282 SCLK M1	/	/ PWM12 M0	/ GPIO3 B5
/ UART3 RX M1	/	/	/ CAN1 TX M0	/ GMAC1 MCLKINOUT	/ I282 LRCK M1	/	/ PWM13 M0	/ GPIO3 B6
/	/	/	/ SPI1 MOSI M1	/ I2C3 SCL M1	/ GMAC1 PTP REF CLK	/	/	/ GPIO3 B7
/ UART7 TX M1	/ SPI1 MISO M1	/ I2C3 SDA M1	/ GMAC1 PPSTRIG	/	/	/	/	/ GPIO3 C0
/ UART7 RX M1	/ SPI1 CLK M1	/	/	/ GMAC1 PPSCLK	/	/	/	/ GPIO3 C1
/ UART7 RTSN M1	/ SPI1 CS0 M1	/ I2C8 SCL M4	/ GMAC1 MDC	/	/ MIPI TE0	/ PWM14 M0	/	/ GPIO3 C2
/ UART7 CTSN M1	/ SPI1 CS1 M1	/ I2C8 SDA M4	/ GMAC1 MDIO	/	/ MIPI TE1	/ PWM15 IR M0	/	/ GPIO3 C3
/ UART5 TX M1	/ SPI3 CS0 M3	/ CAN2 RX M0	/ CIF D8	/	/ FSPI CS0N M2	/	/	/ GPIO3 C4
/ UART5 RX M1	/ SPI3 CS1 M3	/ CAN2 TX M0	/ CIF D9	/	/ FSPI CS1N M2	/	/	/ GPIO3 C5
/	/ SPI3 MISO M3	/	/ CIF D10	/	/	/	/	/ GPIO3 C6
/	/	/ SPI3 MOSI M3	/ I2C5 SCL M0	/ CIF D11	/ PCIE20X1 2 CLKREQN M0	/ HDMI TX0 SCL M2	/	/ GPIO3 C7
/ UART4 RX M1	/ SPI3 CLK M3	/ I2C5 SDA M0	/ CIF D12	/ PCIE20X1 2 WAKEN M0	/ HDMI TX0 SDA M2	/ PWM8 M2	/	/ GPIO3 D0
/ UART4 TX M1	/ SPI0 MISO M3	/	/ CIF D13	/ PCIE20X1 2 PERSTN M0	/	/ PWM9 M2	/	/ GPIO3 D1
/ UART9 RTSN M2	/ SPI0 MOSI M3	/ I2C7 SCL M2	/ CIF D14	/	/	/	/	/ GPIO3 D2
/ UART9 CTSN M2	/ SPI0 CLK M3	/ I2C7 SDA M2	/ CIF D15	/	/	/ PWM10 M2	/	/ GPIO3 D3
/ UART5 RX M2	/ SPI0 CS0 M3	/	/ MCU JTAG TCK M1	/	/	/ HDMI TX0 HPD M1	/	/ GPIO3 D4
/ UART5 TX M2	/ SPI0 CS1 M3	/	/ MCU JTAG TMS M1	/	/	/	/ PWM11 IR M3	/ GPIO3 D5

BK3588S



RK3588S (VCCIO6 Domain)

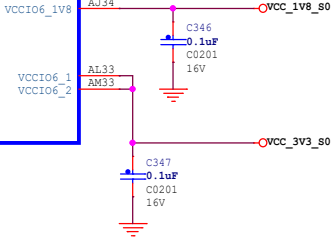
U7J

VCCIO6 Domain

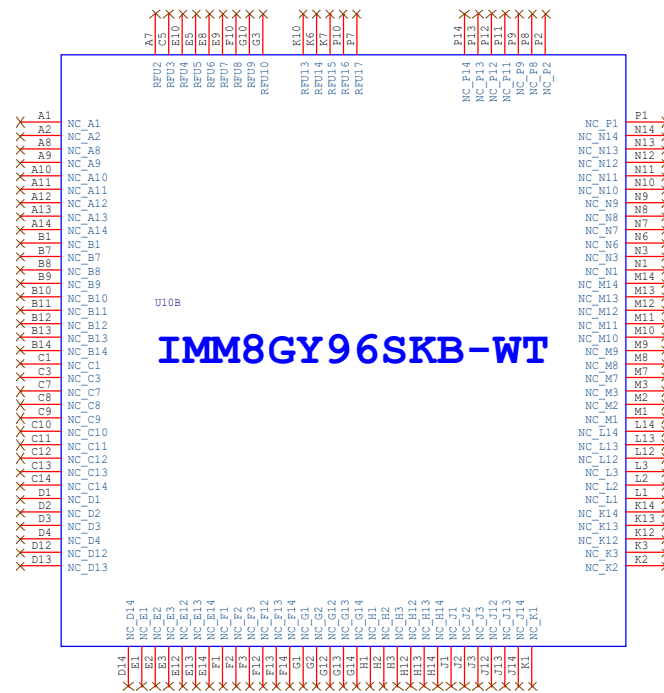
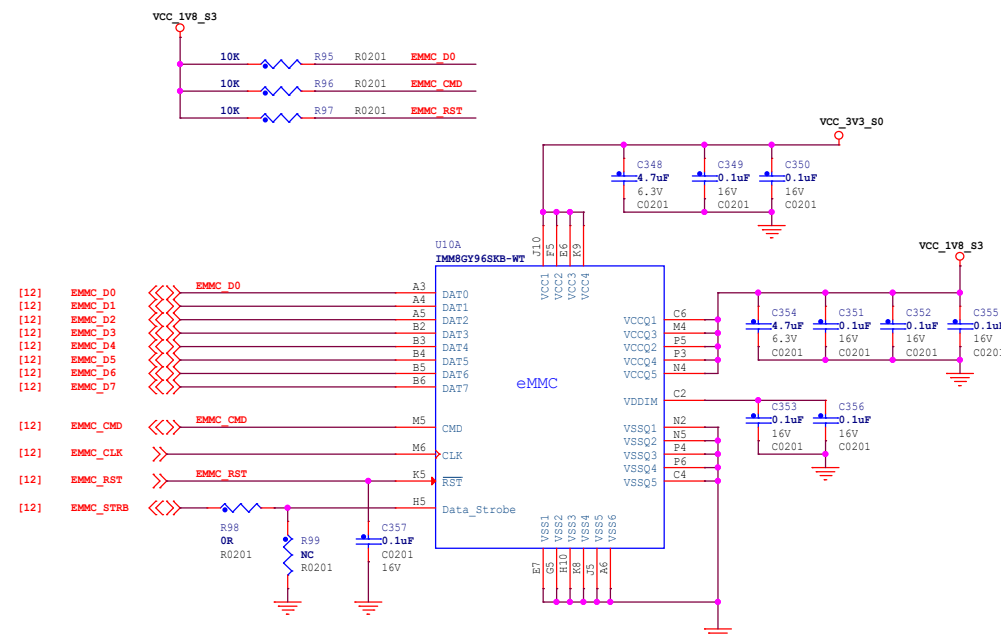
Operating Voltage=1.8V/3.3V

BT1120 D0	/ CIF D0	/	/ I2S1 MCLK M0	/ UART9 RTSN M1	/ SPI0 MISO M1	/	/ PCIE20X1 1 CLKREQN M1	/ GPIO4 A0 d	AV19	»»	GPIO4_A0	[23]
BT1120 D1	/ CIF D1	/	/ I2S1 SCLK M0	/ UART9 CTSN M1	/ SPI0 MOSI M1	/	/ PCIE20X1 1 WAKEN M1	/ GPIO4 A1 d	AW18	»»	GPIO4_A1	[23]
BT1120 D2	/ CIF D2	/	/ I2S1 LRCK M0	/	/ SPI0 CLK M1	/	/ PCIE20X1 1 PERSTN M1	/ GPIO4 A2 d	AV26	»»	GPIO4_A2	[23]
BT1120 D3	/ CIF D3	/	/	/ UART0 TX M2	/	/	/	/ GPIO4 A3 d	AY19	»»	GPIO4_A3	[23]
BT1120 D4	/ CIF D4	/	/	/ UART0 RX M2	/ SPI2 MISO M1	/ I2C3 SCL M2	/	/ GPIO4 A4 d	AW19	»»	GPIO4_A4	[23]
BT1120 D5	/ CIF D5	/	/ I2S1 SDIO M0	/ UART3 TX M2	/ SPI2 MOSI M1	/ I2C3 SDA M2	/	/ GPIO4 A5 d	AU15	»»	GPIO4_A5	[23]
BT1120 D6	/ CIF D6	/	/ I2S1 SDI1 M0	/ UART3 RX M2	/ SPI2 CLK M1	/ I2C5 SCL M2	/	/ GPIO4 A6 d	AV18	»»	GPIO4_A6	[23]
BT1120 D7	/ CIF D7	/	/ I2S1 SDI2 M0	/	/ SPI2 CS0 M1	/ I2C5 SDA M2	/	/ GPIO4 A7 d	AW26	»»	GPIO4_A7	[23]
BT1120 CLKOUT	/ CIF CLKIN	/	/ I2S1 SDI3 M0	/ UART8 TX M0	/ SPI2 CS1 M1	/ I2C6 SDA M3	/	/ GPIO4 B0 d	AW27	»»	GPIO4_B0	[23]
SPDIF1 TX M1	/ MIPI CAMERA0 CLK M0	/ SATA2 ACT LED M0	/ I2S1 SDO0 M0	/ UART8 RX M0	/ SPI0 CS1 M1	/ I2C6 SCL M3	/	/ GPIO4 B1 u	AU22	»»	GPIO4_B1	[23]
CAN1 RX M1	/ BT1120 D8	/ CIF HREF	/ PWM14 M1	/ I2S1 SDO1 M0	/ UART8 RTSN M0	/ SPI0 CS0 M1	/ I2C7 SCL M3	/ PCIE20X1 1 BUTTON RSTN	AT15	»»	CAN1_RX_M1	[23]
CAN1 TX M1	/ BT1120 D9	/ CIF VSYNC	/ PWM15 TR M1	/ I2S1 SDO2 M0	/ UART8 CTSN M0	/	/ I2C7 SDA M3	/ PCIE20X1 2 BUTTON RSTN	AV23	»»	CAN1_TX_M1	[23]
BT1120 D10	/ CIF CLKOUT	/ PWM11 TR M1	/ I2S1 SDO3 M0	/ UART9 TX M1	/	/ DP0 HPDIN M0	/ SPDIF0 TX M1	/ GPIO4 B4 u	AV27	»»	GPIO4_B4	[23]
BT1120 D11	/	/ PWM12 M1	/	/ UART9 RX M1	/ SPI3 MISO M1	/	/	/ GPIO4 B5 d	AU23	»»	GPIO4_B5	[23]
BT1120 D12	/	/ PWM13 M1	/	/	/ SPI3 MOSI M1	/ I2C5 SCL M1	/ SATA0 ACT LED M0	/ GPIO4 B6 d	AW22	»»	GPIO4_B6	[23]
BT1120 D13	/	/	/ HDMI TX0 SCL M0	/	/ SPI3 CLK M1	/ I2C5 SDA M1	/ PCIE20X1 2 CLKREQN M1	/ GPIO4 B7 u	AV22	»»	HDMI_TX0_SCL_M0	[23]
BT1120 D14	/	/	/ HDMI TX0 SDA M0	/	/ SPI3 CS0 M1	/ I2C8 SCL M3	/ PCIE20X1 2 WAKEN M1	/ GPIO4 C0 u	AW23	»»	HDMI_TX0_SDA_M0	[23]
BT1120 D15	/ SPDIF1 TX M2	/ PWM6 M1	/ HDMI TX0 CEC M0	/	/ SPI3 CS1 M1	/ I2C8 SDA M3	/ PCIE20X1 2 PERSTN M1	/ GPIO4 C1 d	AY26	»»	HDMI_TX0_CEC_M0	[23]

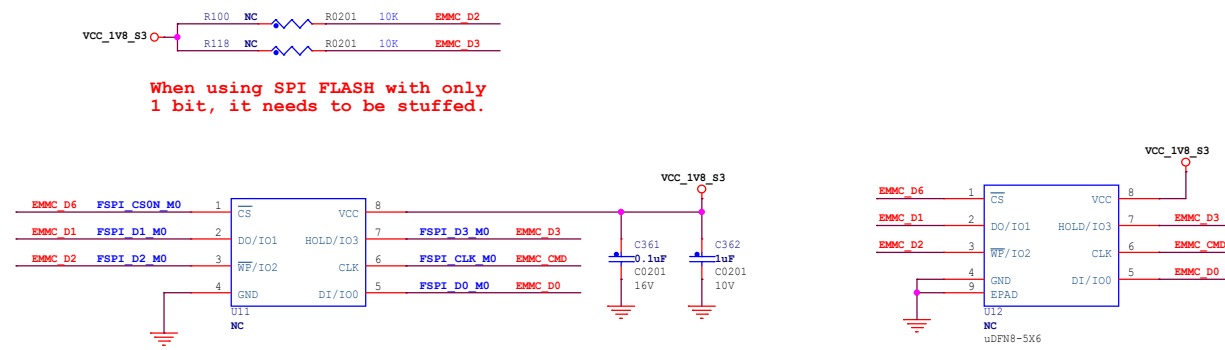
Note:
BT1120 Only Support Output



EMMC FLASH



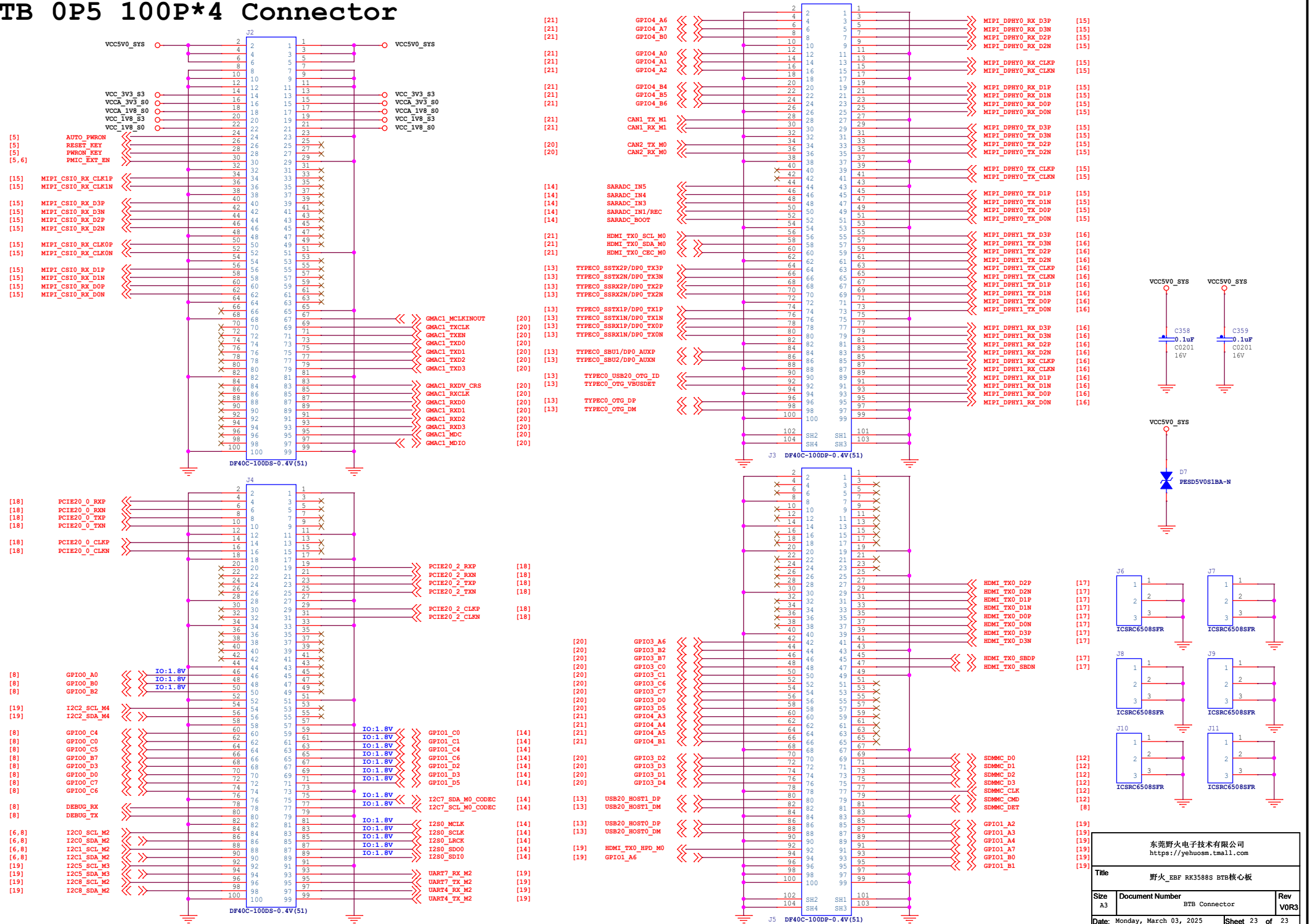
SPI Flash



When using SPI FLASH with only 1 bit, it needs to be stuffed.

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BTB 0P5 100P*4 Connector



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