

野火 RK3588 LubanCat 5 原理图

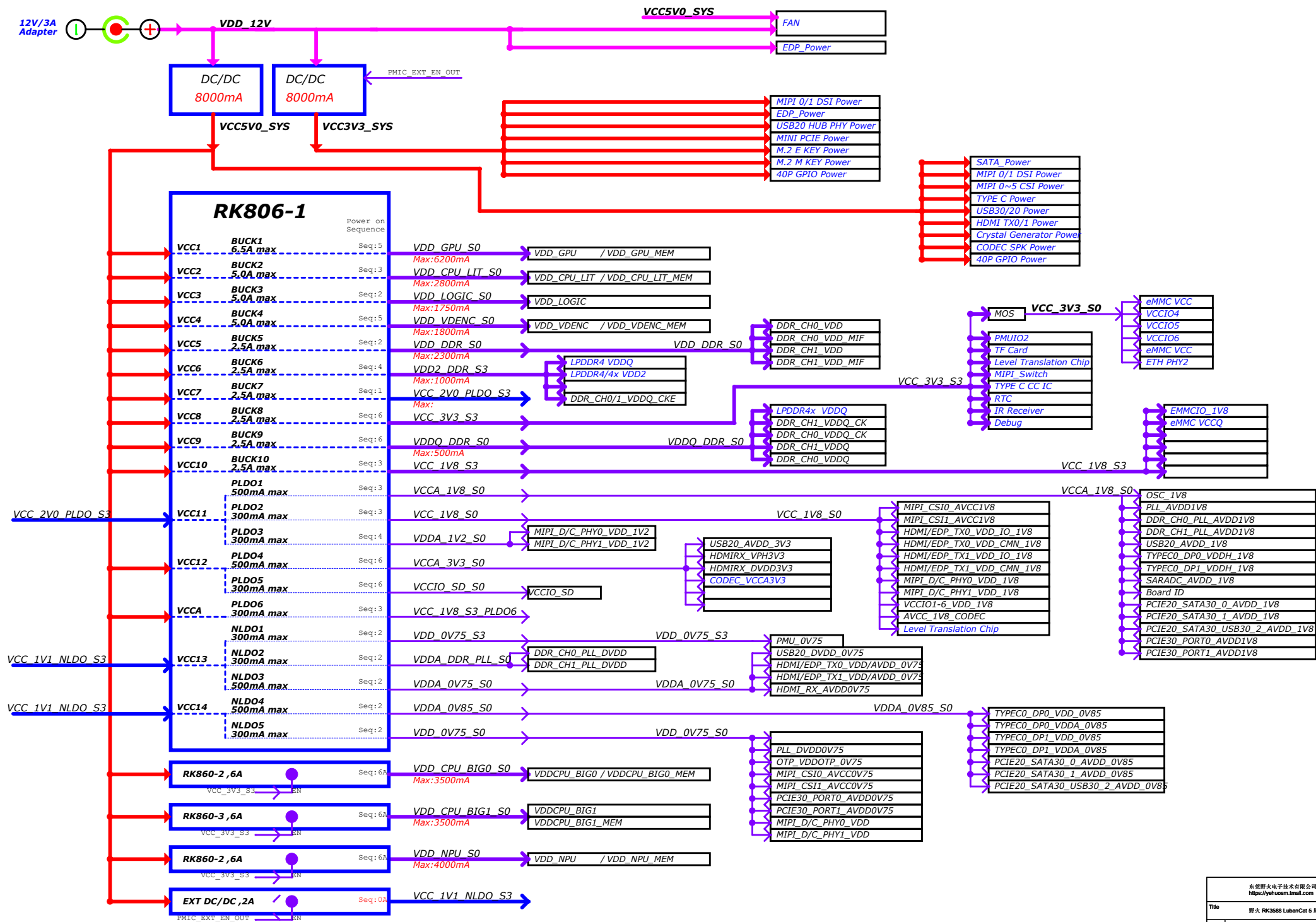
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Historic Version

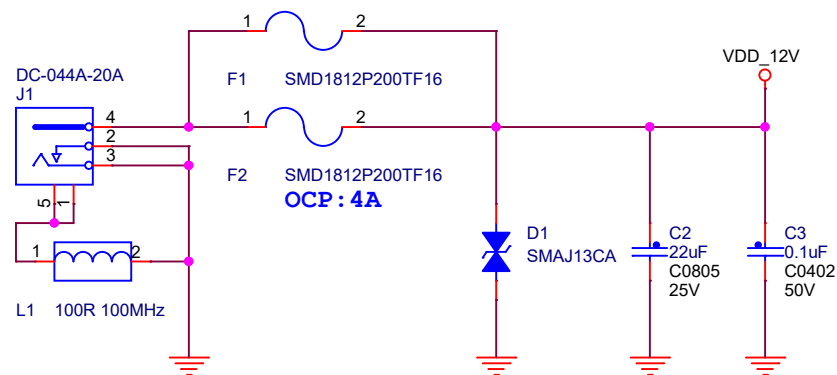
版本号	日期	设计	描述
V0.1	2023-02-09	ghs	初始版本, 开发阶段
V1.0	2023-11-10	ghs	正式版本
V1R0	2024-02-21	ghs	修正HDMI RX热拔插检测功能异常
V2R0	2024-04-10	ghs	调整U1, U2芯片的工作模式为PWM。 删除RTC_32K_IN信号, 将其引脚调整为FUSB302_INT信号 将LCD0_BL_PWM, LCD1_BL_PWM的引脚变更为GPIO0_C4, GPIO0_C6 将GPIO0_B7, GPIO0_C0的引脚变更为CAN0_TX_M0, CAN0_RX_M0 将GPIO4_B2, GPIO4_B3的引脚变更为CAN1_RX_M1, CAN1_TX_M1 将M2_E_KEY_nWDISABLE的引脚变更为I/O拓展芯片的GPIO6_A0 将EDP_BL_EN的引脚变更为I/O拓展芯片的GPIO6_A1 调整I/O拓展芯片的引脚及编号 调整40PIN排针接口, 使其兼容CAN接口。
V2R1	2024-11-27	ghs	将ETH_1增加二极管使其兼容瑞昱芯片, 更新时钟芯片为瑞星微

Power tree

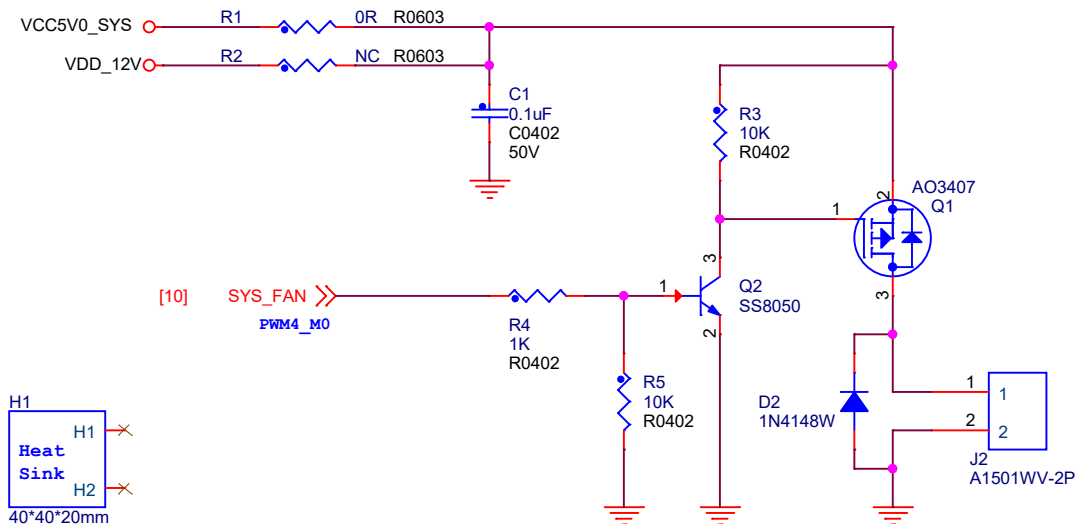


DC IN

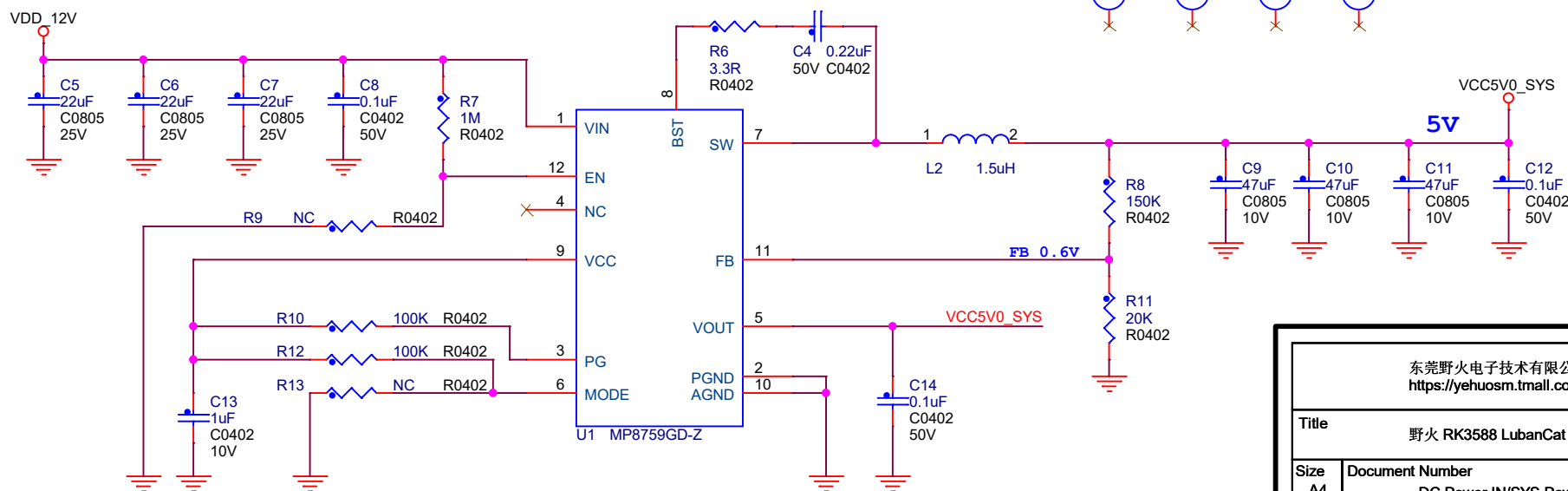
12V 3A



Active Cooling



VCC5V_SYS



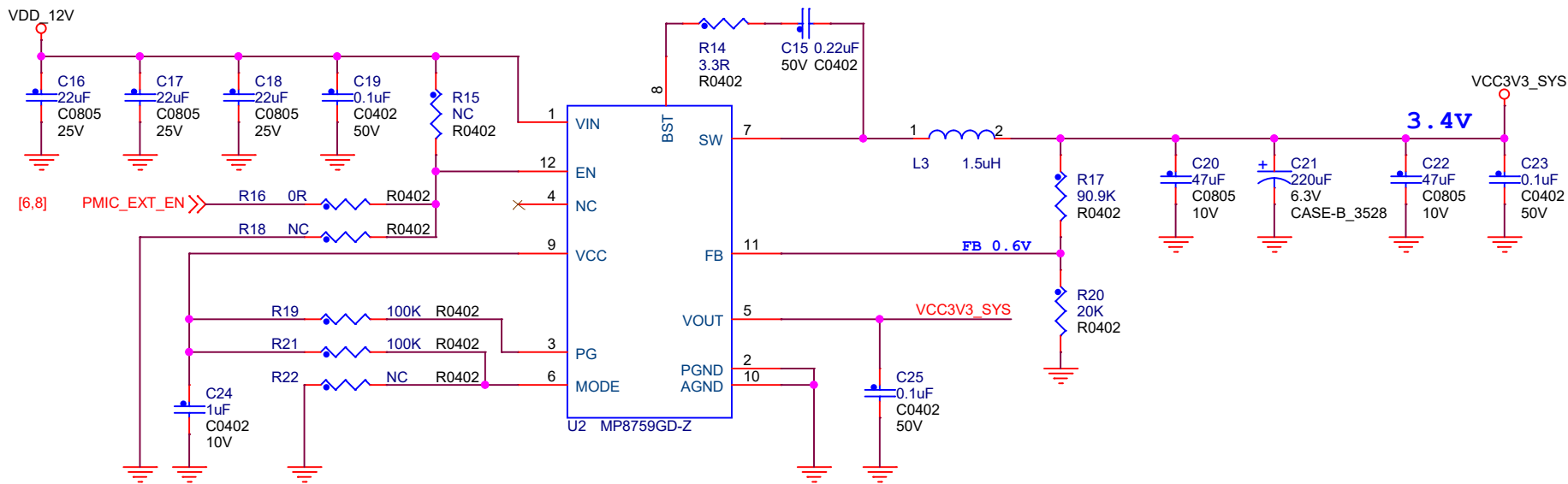
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Size A4	Document Number DC Power IN/SYS Power/FAN	Rev V2R1
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VCC3V3_SYS



Power_LED/SYS_LED



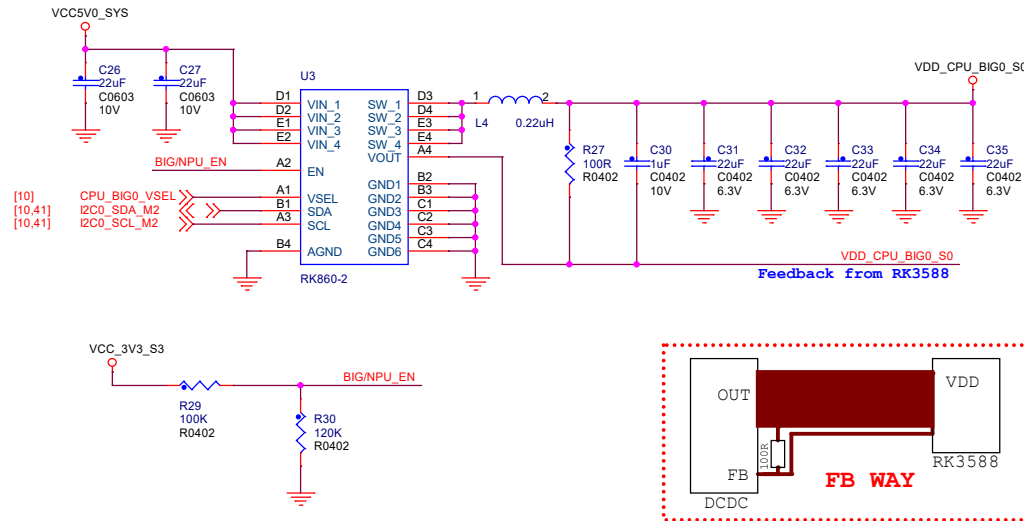
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Title 野火 RK3588 LubanCat 5 原理图

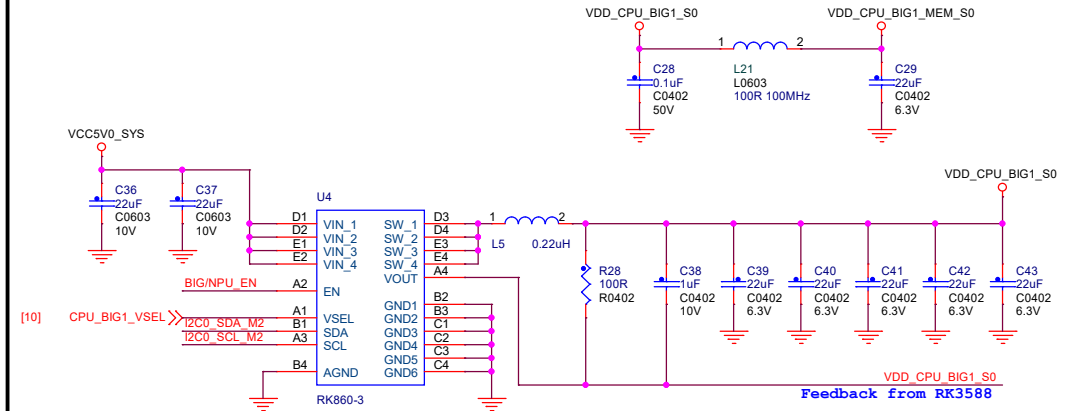
Size A4	Document Number SYS_Power/SYS_LED	Rev V2R1
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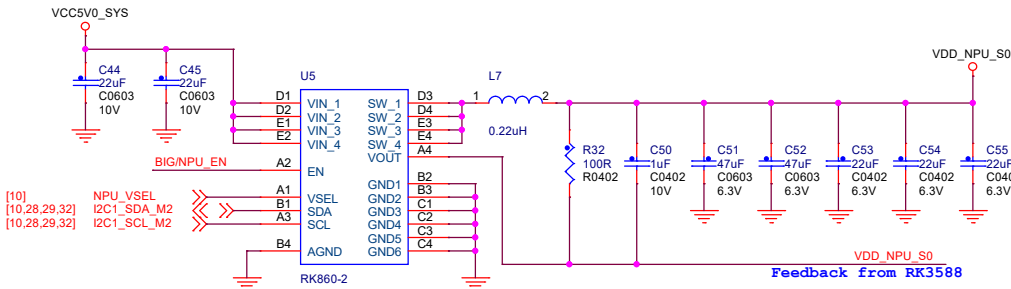
VDD_CPU_BIG0



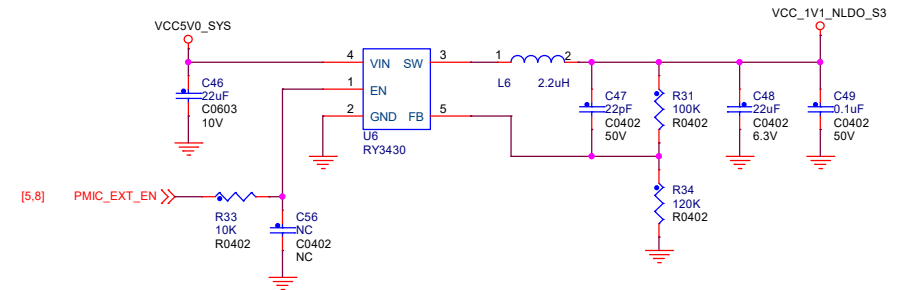
VDD_CPU_BIG1



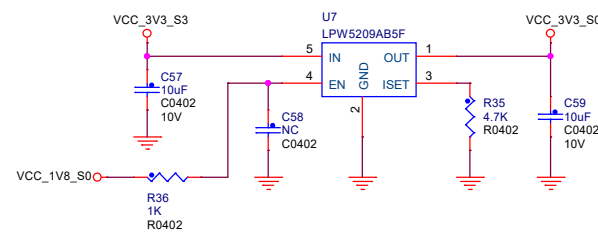
VDD_NPU



VCC_1V1_NLDO_S3



VCC_3V3_S0



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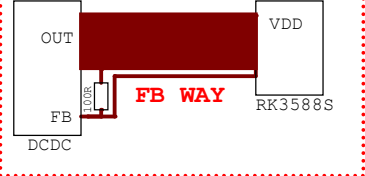
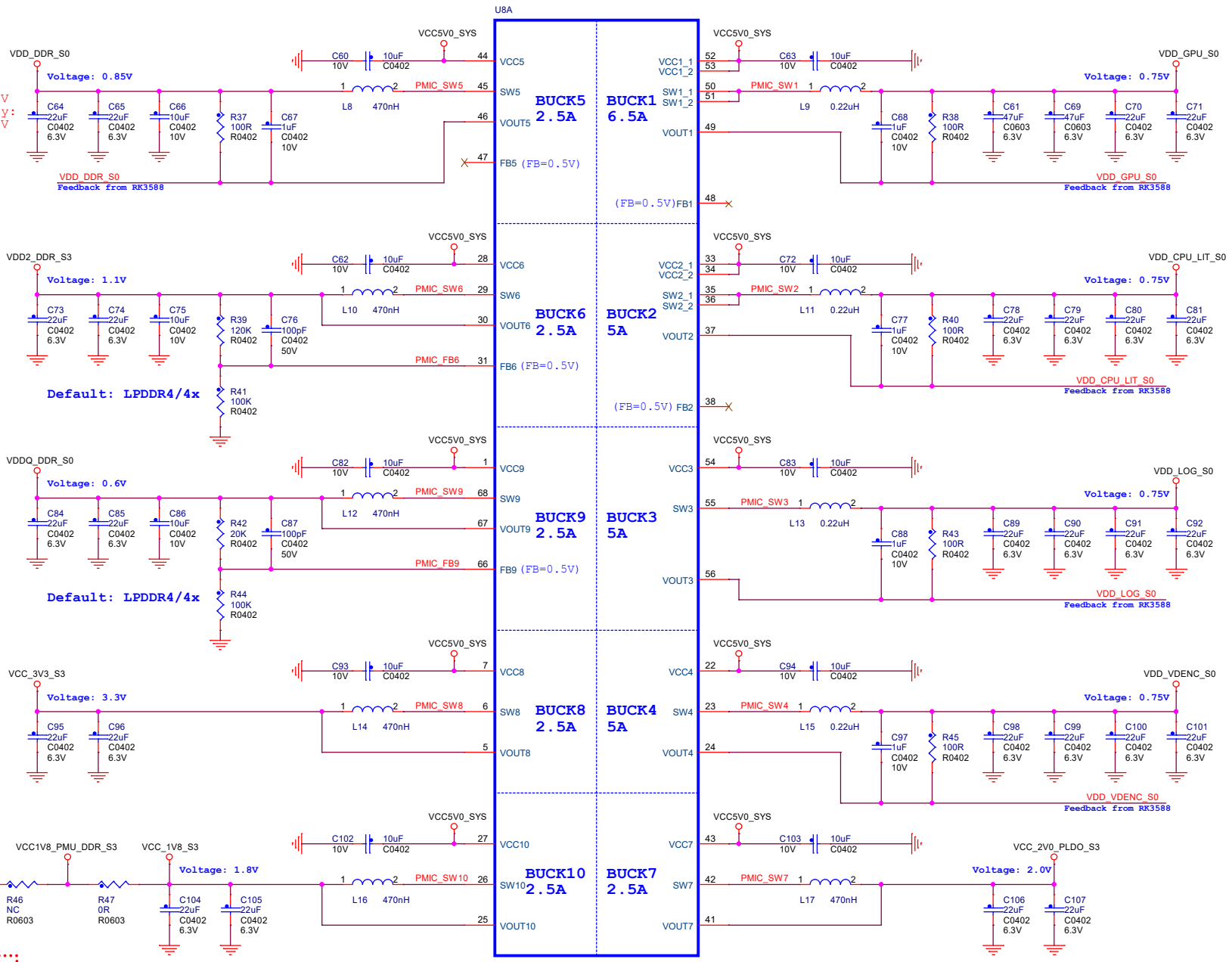
Title 野火 RK3588 LubanCat 5 原理图

Size A3	Document Number Power_Ext Discrete	Rev V2R1
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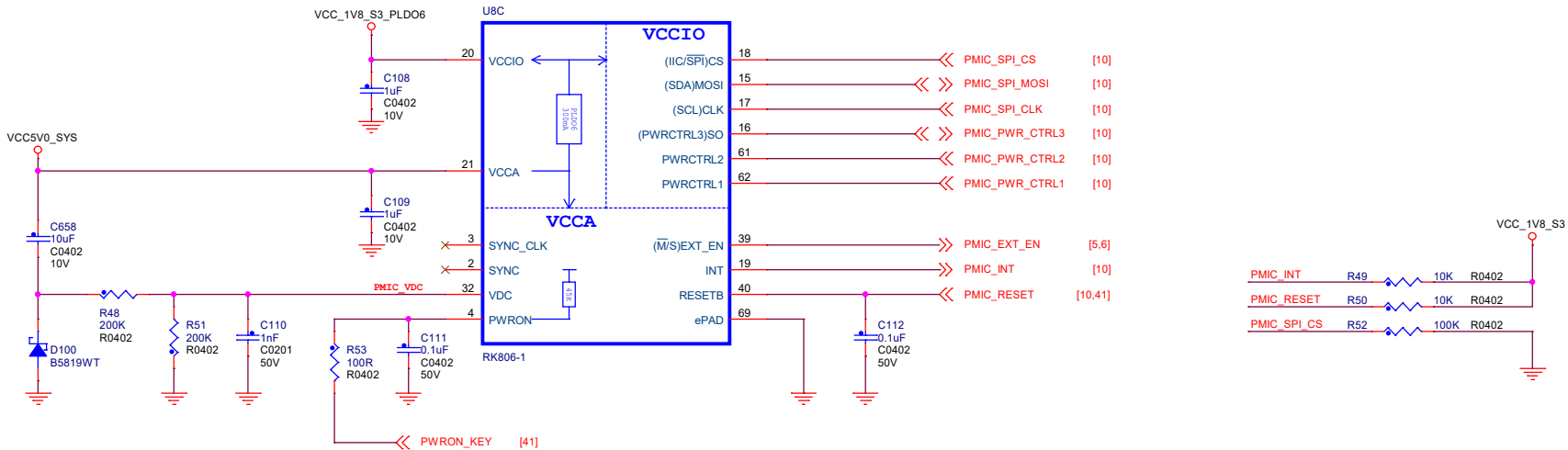
PMIC DC-DC

Default:0.85V
Low frequency:
0.85V-->0.75V

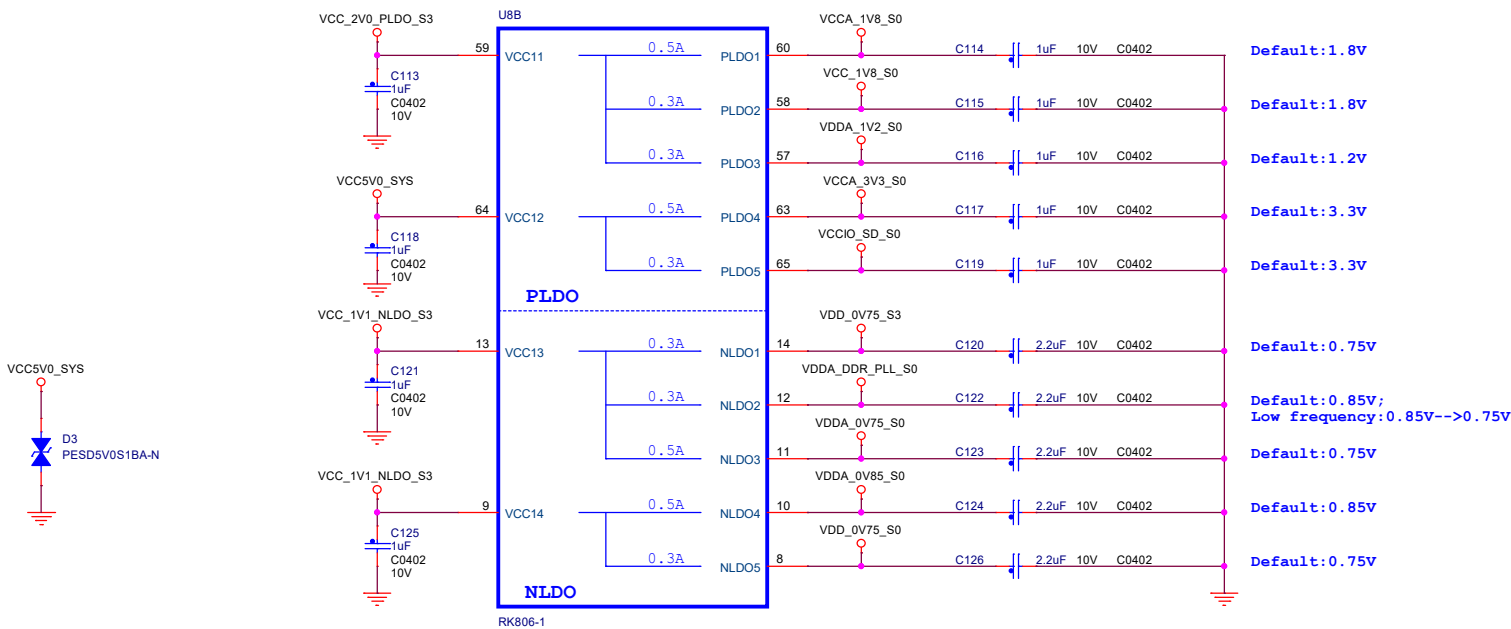


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Title 野火 RK3588 LubanCat 5 原理图			
Size A3	Document Number PMIC DC-DC	Rev V2R1	
Date: Friday, May 30, 2025		Sheet 7 of 41	

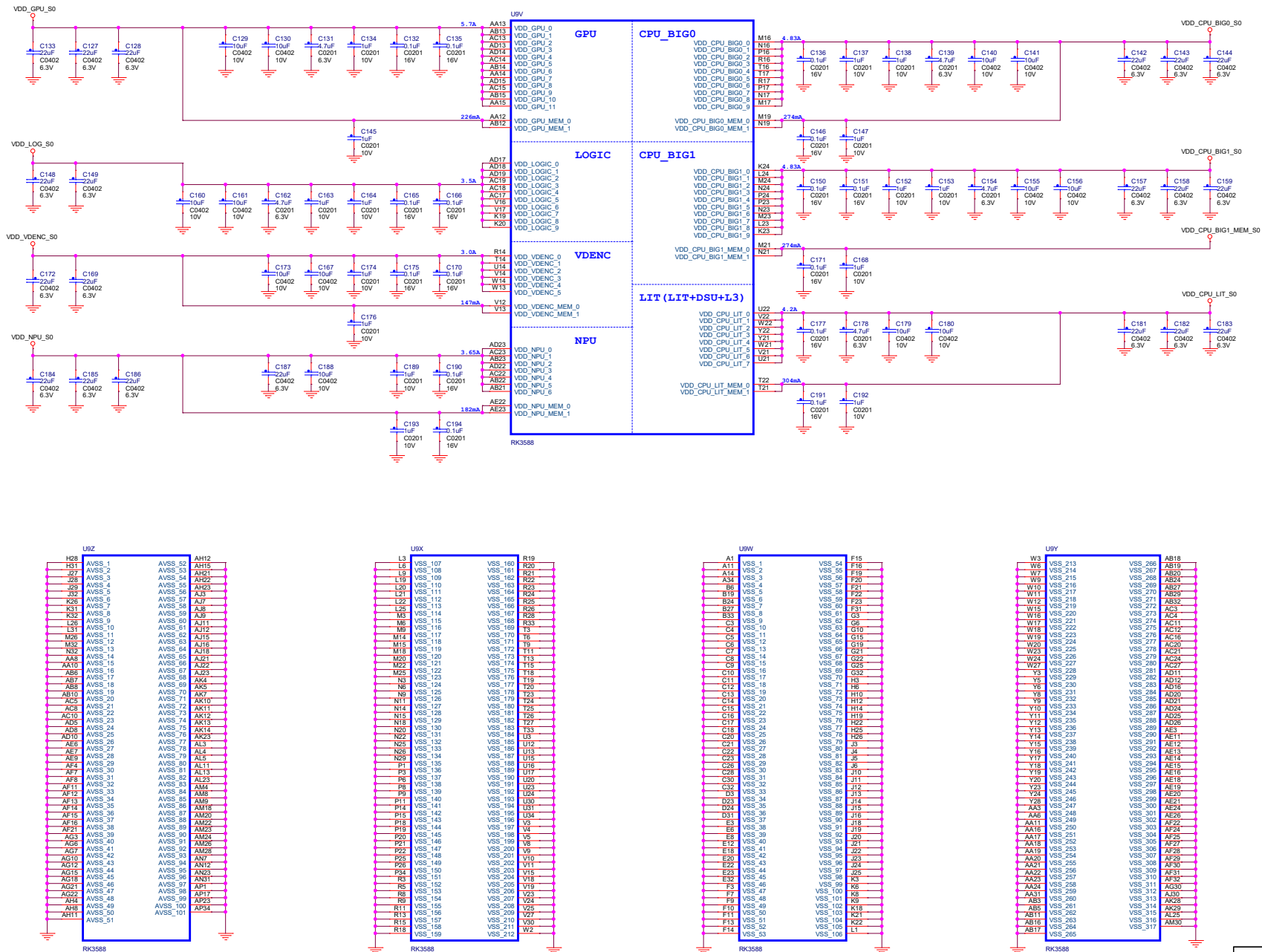
PMIC RK806-1 Managerment



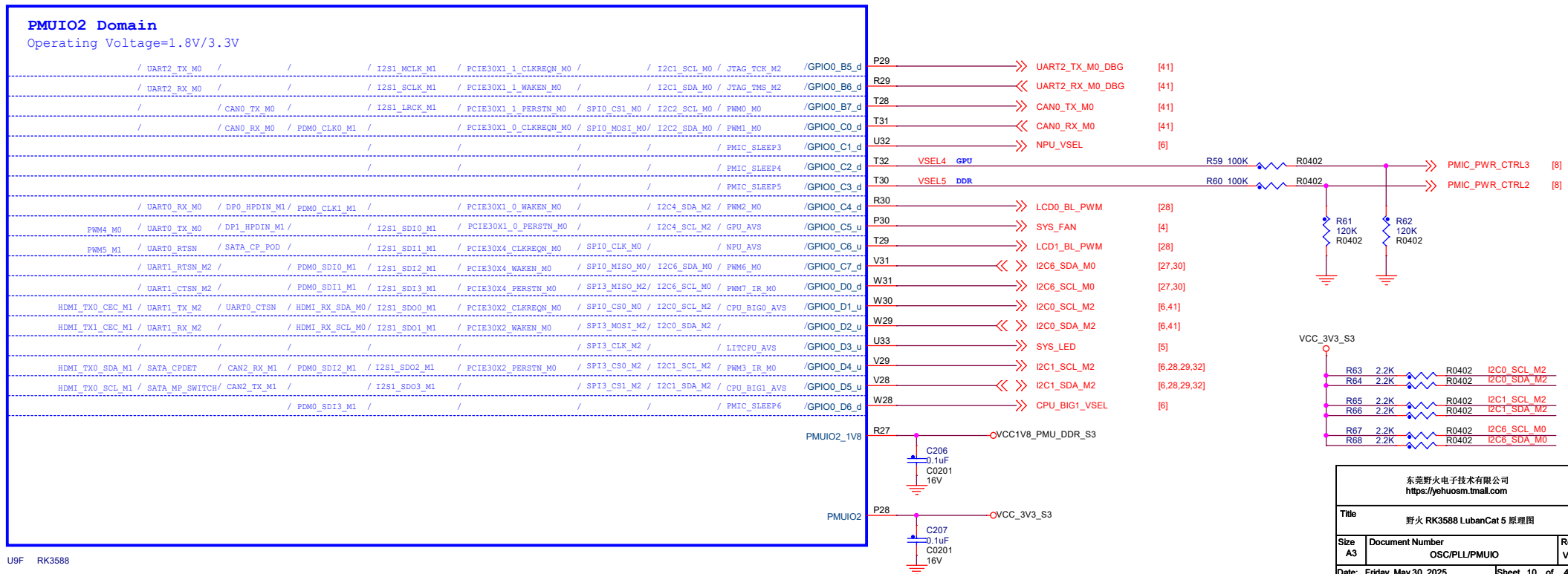
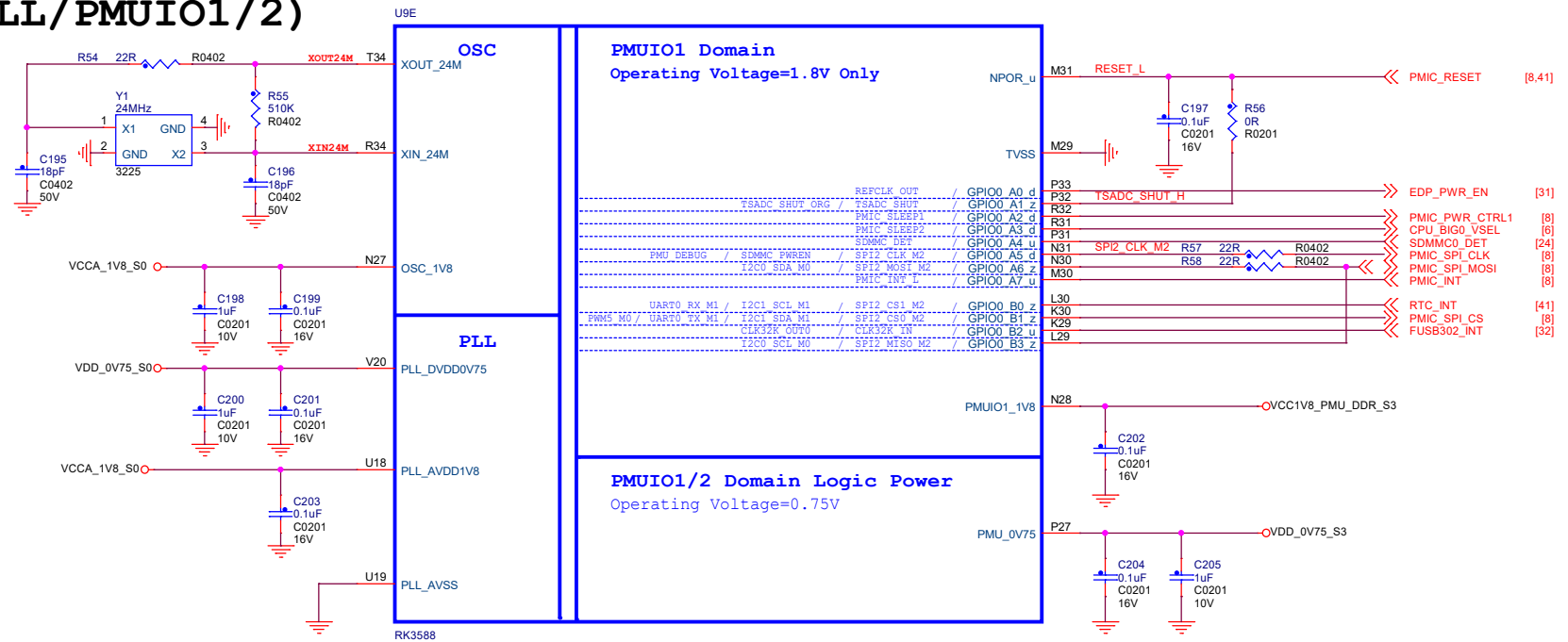
PMIC RK806-1 LDO



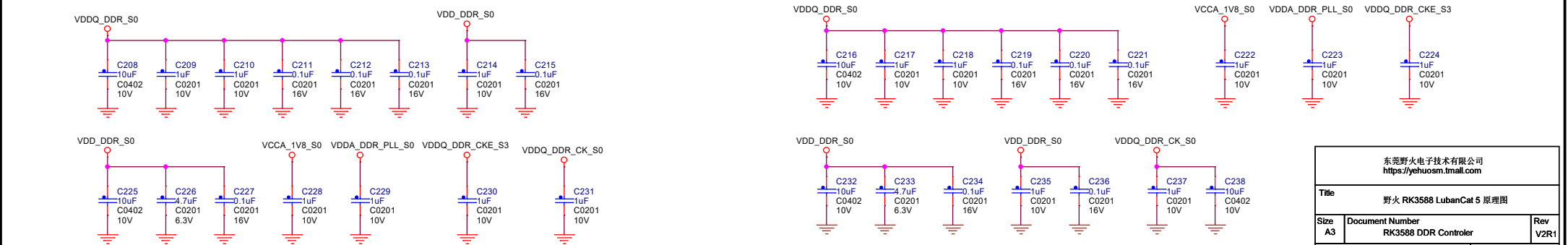
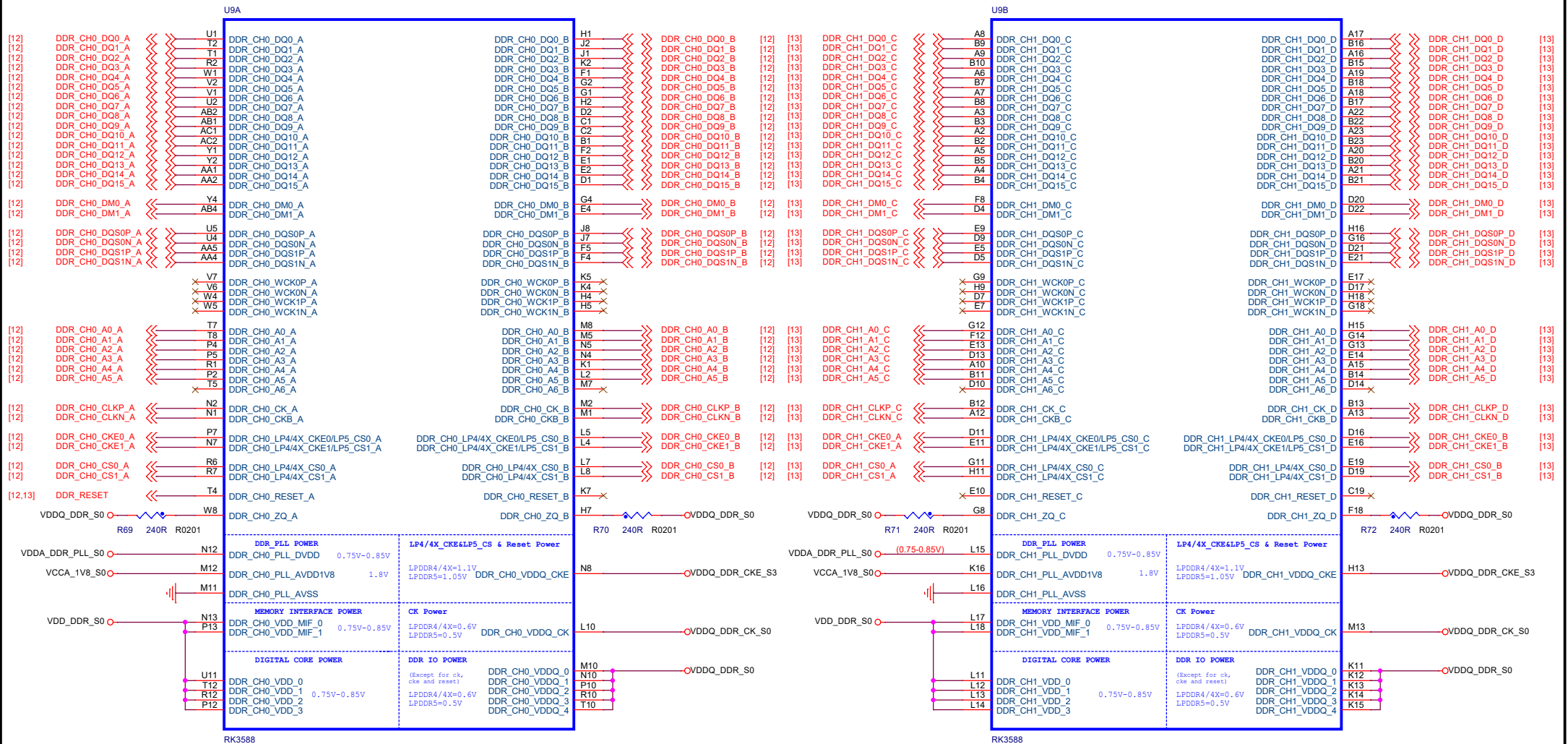
RK3588_V (POWER)



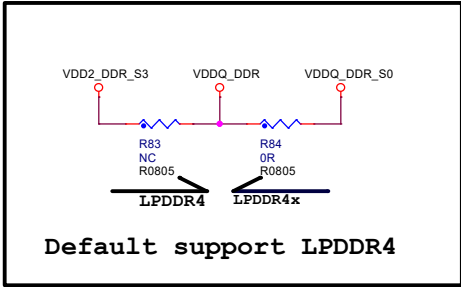
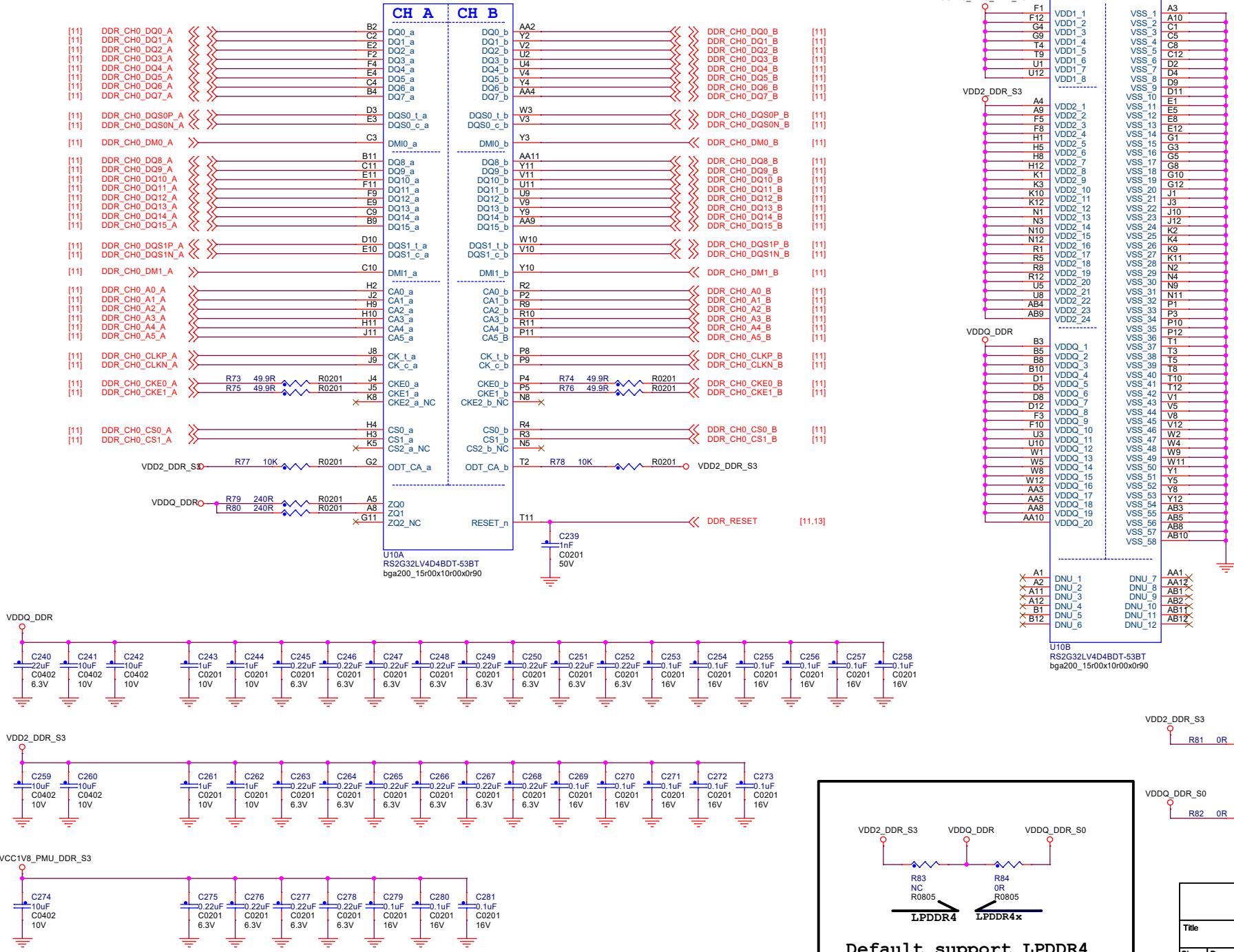
RK3588 E (OSC/PLL/PMUIO1/2)



RK3588 (DDR PHY)

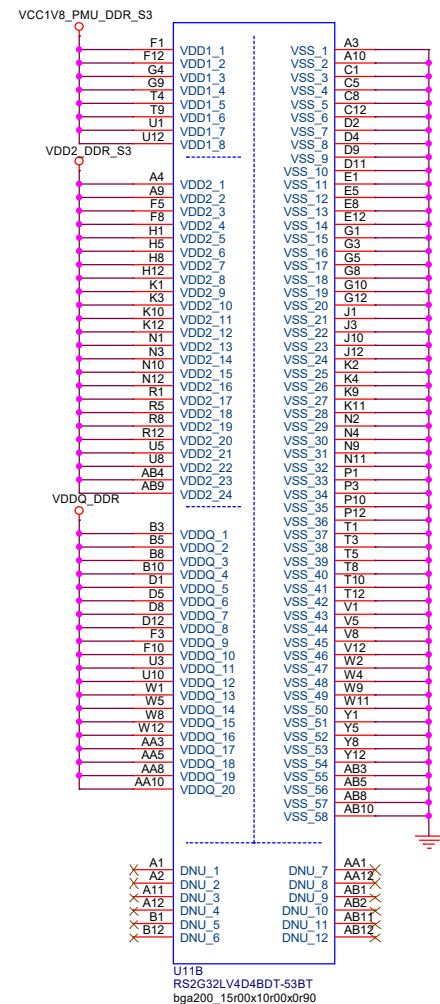
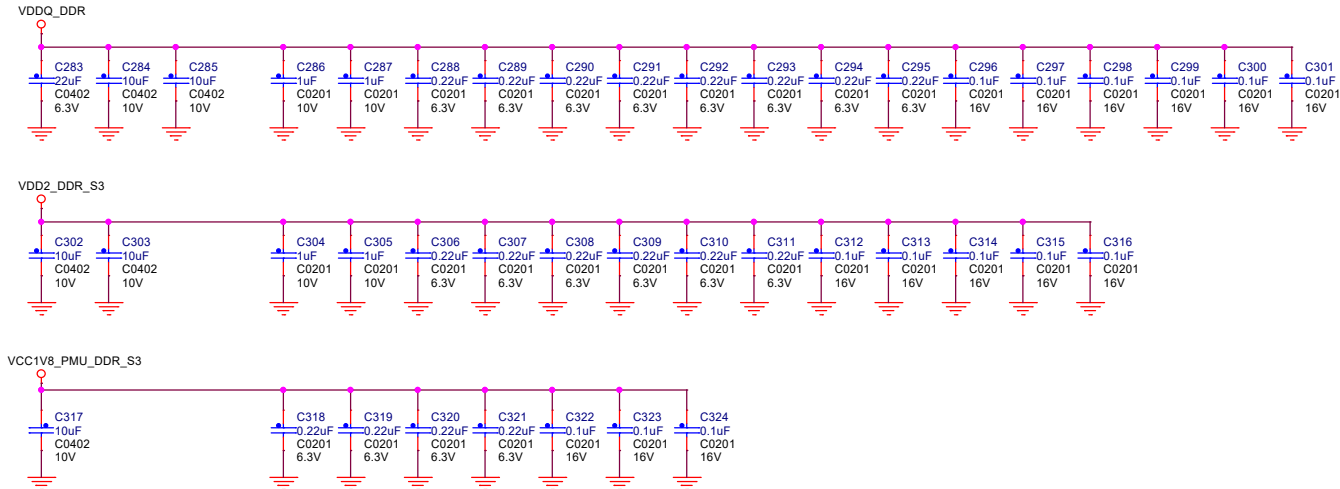


LPDDR4/4x_01

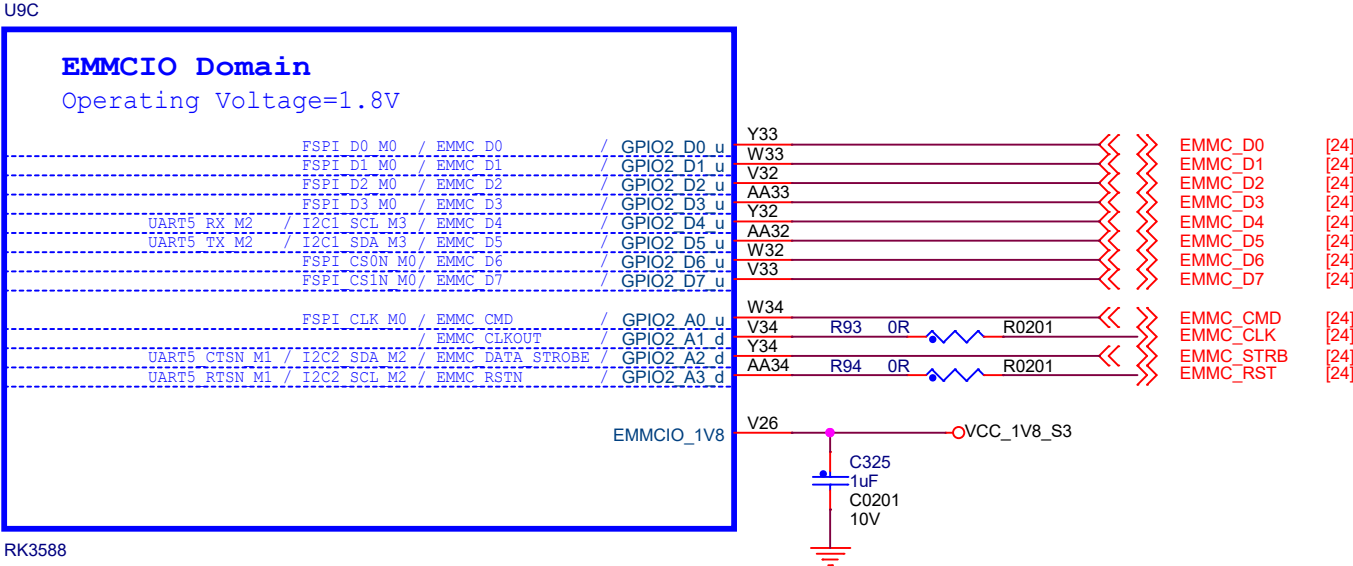


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Size A3	Document Number LPDDR4/4x_01	Rev V2R1
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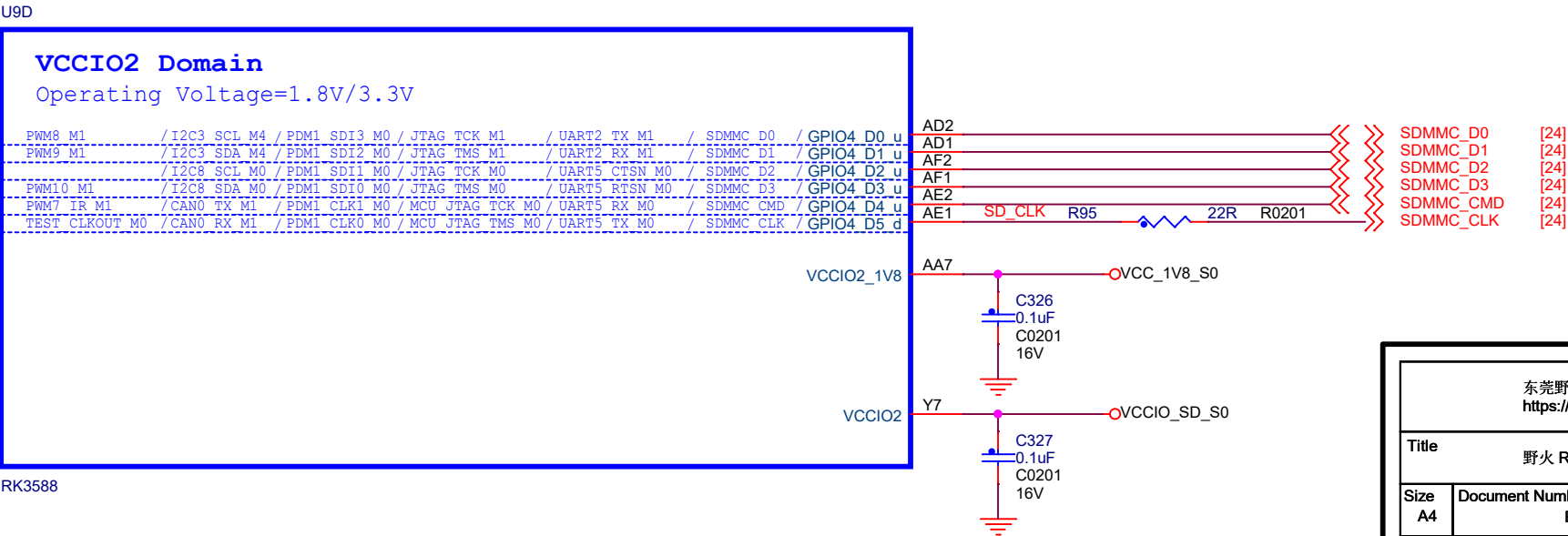
A



RK3588_C (EMMCIO Domain)



RK3588_D (VCCIO2 Domain)



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Title
野火 RK3588 LubanCat 5 原理图

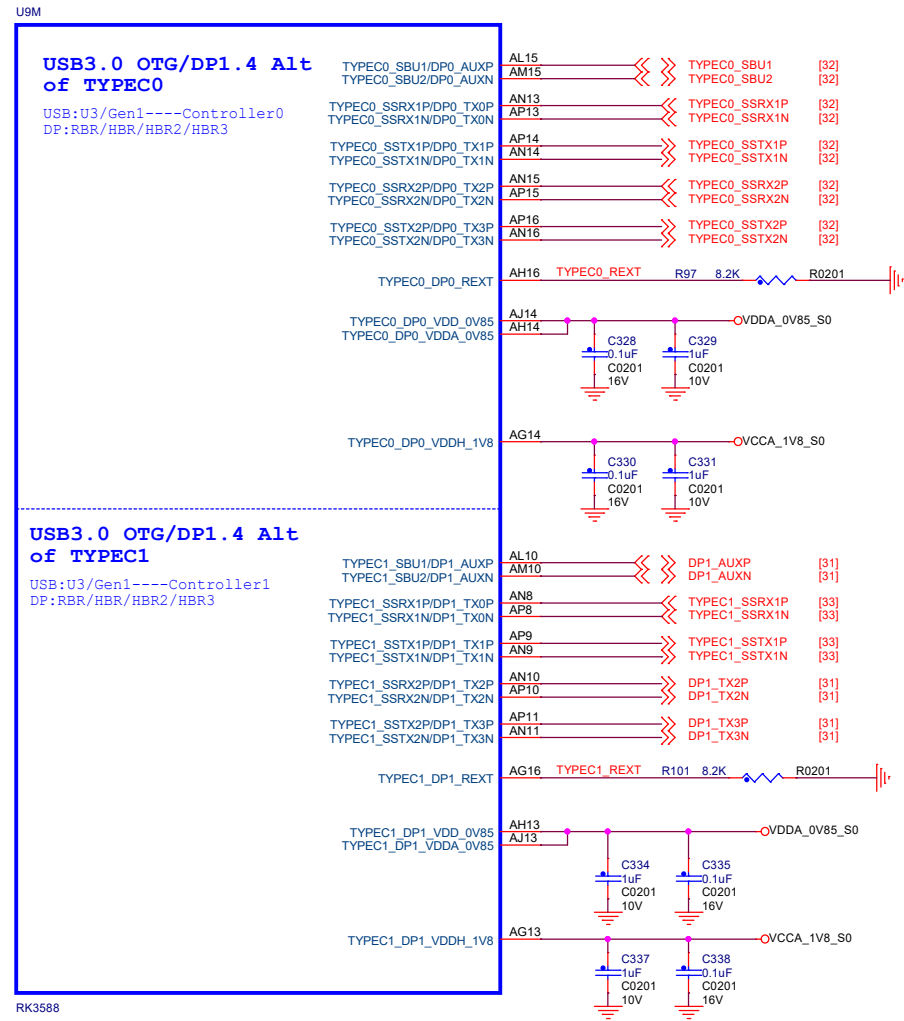
Size
A4

Document Number
EMMC/SD Controller

Rev
V2R1

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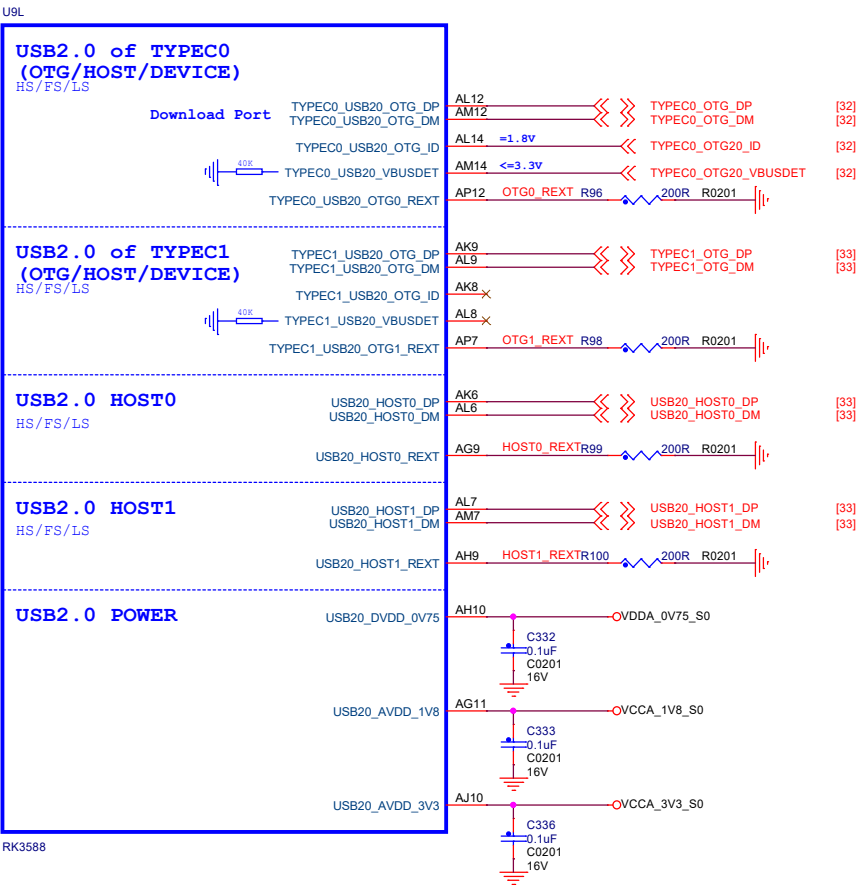
RK3588_M(TYPEC/DP)



USB30/DP1.4 Alt Mode Configuration

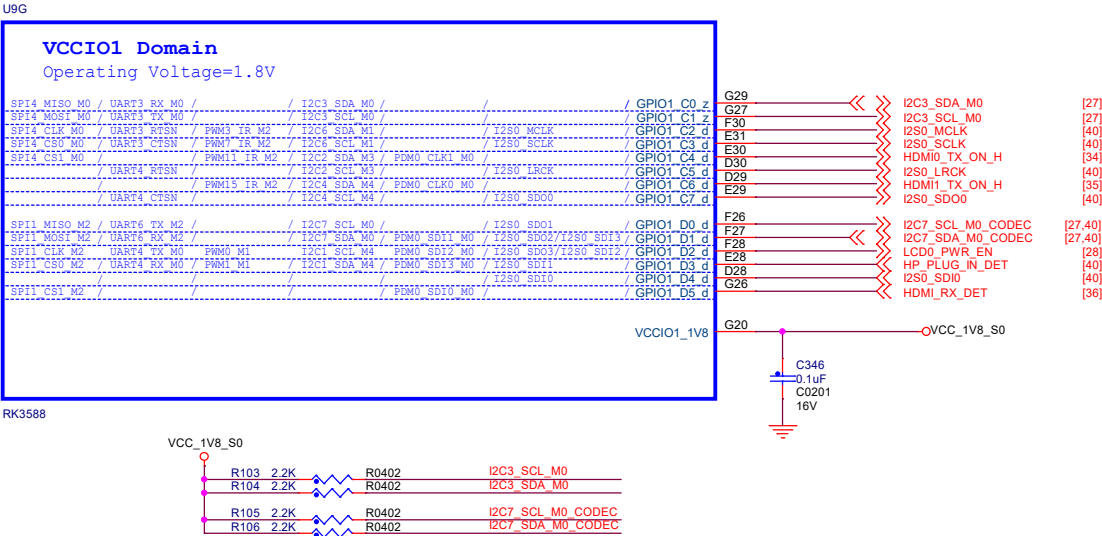
Option1	DP x4Lane	DP_TX_Lane0-3
Option2	USB30 x4Lane	DP_TX_Lane0-3
Option3	USB30X2Lane+DPX2Lane	USB30: Lane0 Lane1 DP: Lane2 Lane3
Option4	USB30X2Lane+DPX2Lane	USB30: Lane2 Lane3 DP: Lane0 Lane1

RK3588_L(USB2.0 HOST/OTG)

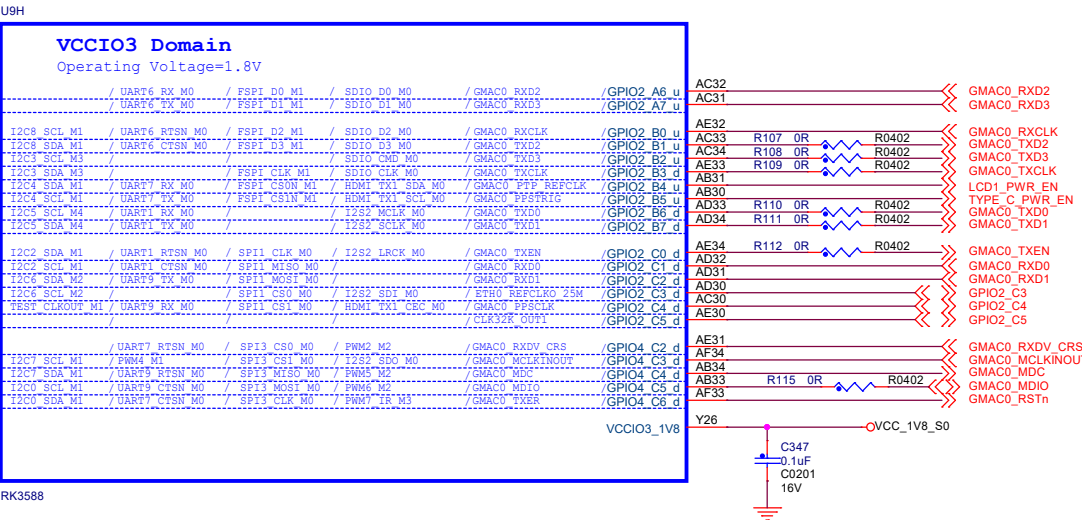


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Size A3	Document Number USB20/TYPE C/DP PHY	Rev V2R1
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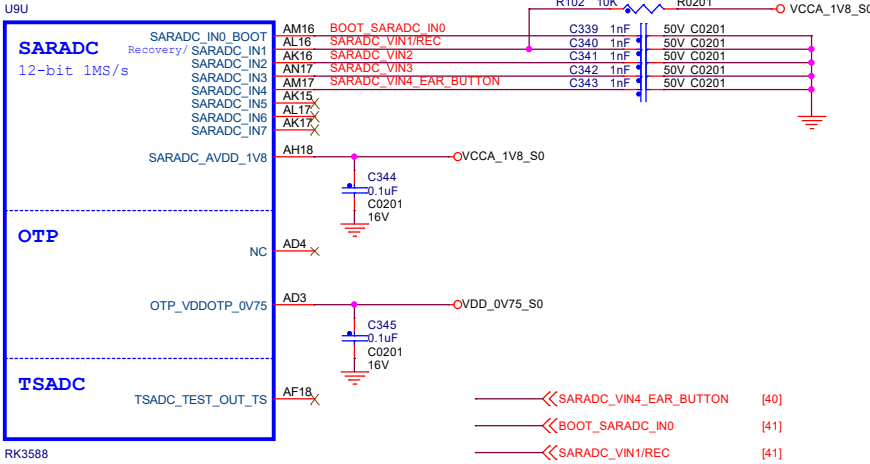
RK3588_G (VCCIO1 Domain)



RK3588_H (VCCIO3 Domain)



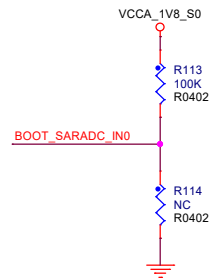
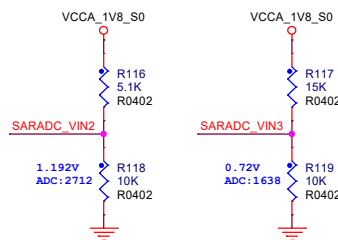
RK3588_U (SARADC/OTP)



BOOT MODE CONFIG

Item	Rup	Rdown	ADC	VOL	BOOT MODE
LEVEL1	DNP	100K	0	0V	USB (Maskrom mode)
LEVEL2	100K	20K	682	0.3V	SD Card-USB
LEVEL3	100K	51K	1365	0.6V	EMMC-USB
LEVEL4	100K	100K	2047	0.9V	FSPI M0-USB
LEVEL5	100K	200K	2730	1.2V	FSPI M1-USB
LEVEL6	100K	499K	3412	1.5V	FSPI M2-USB
LEVEL7	100K	DNP	4095	1.8V	FSPI_M2-FSPI_M1-FSPI_M0-EMMC-SD Card-USB

Board ID:0x0402



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Size A3	Document Number SARADC/1.8V GPIO	Rev V2R1
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RK3588_Q/R(MIPI_D/C_PHY0)



RK3588

RK3588_Q/R(MIPI_D/C_PHY1)



RK3588

About MIPI_D/C_PHY0_VDD Pin:

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

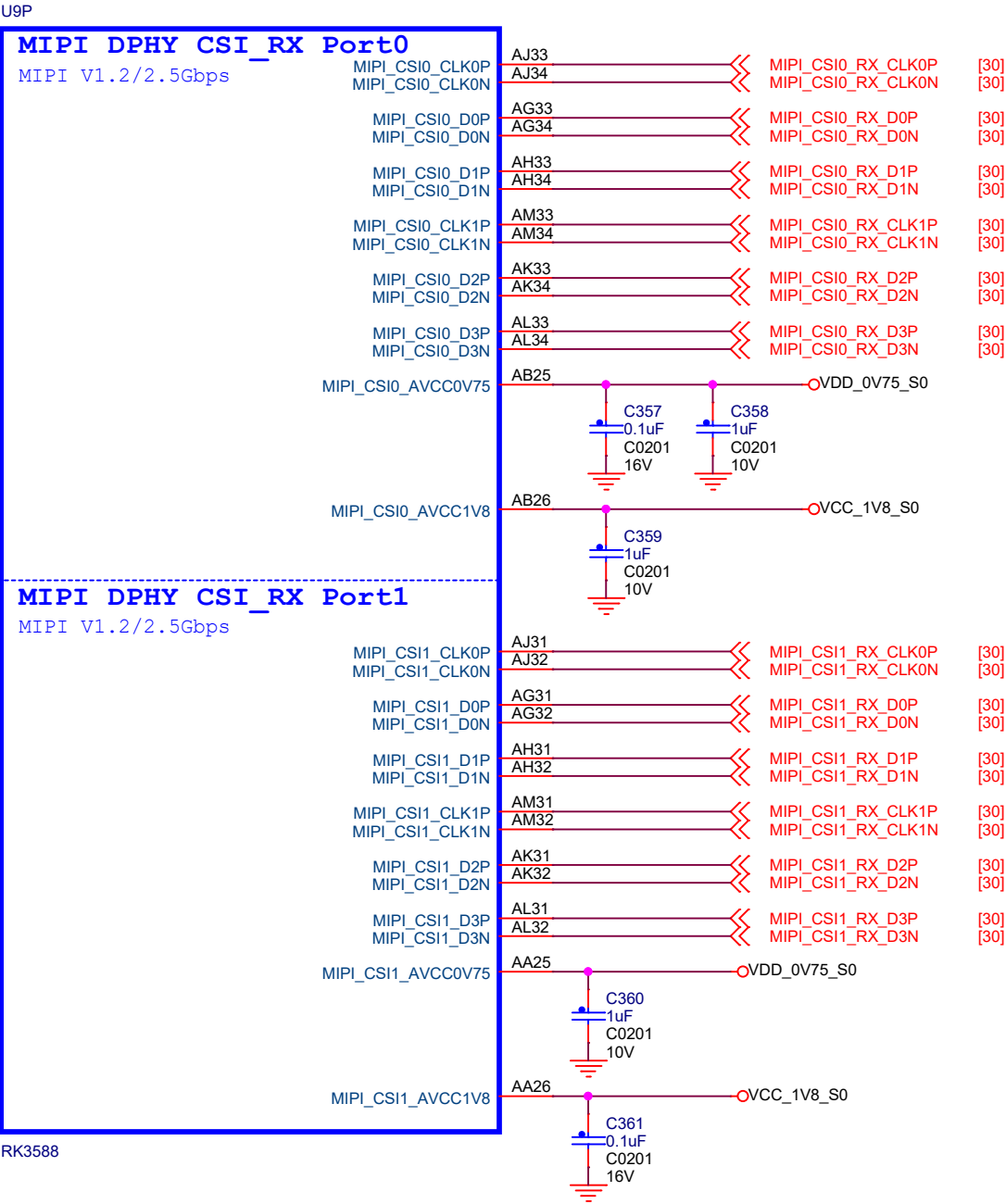
D-PHY 2.5Gbps & C-PHY 1.5Gsps 0.75V

Default: 0.75V

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Size A3	Document Number MIPI_D/C Interface	Rev V2R1
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RK3588_P (MIPI_DPHY_CSI_RX_PHY)

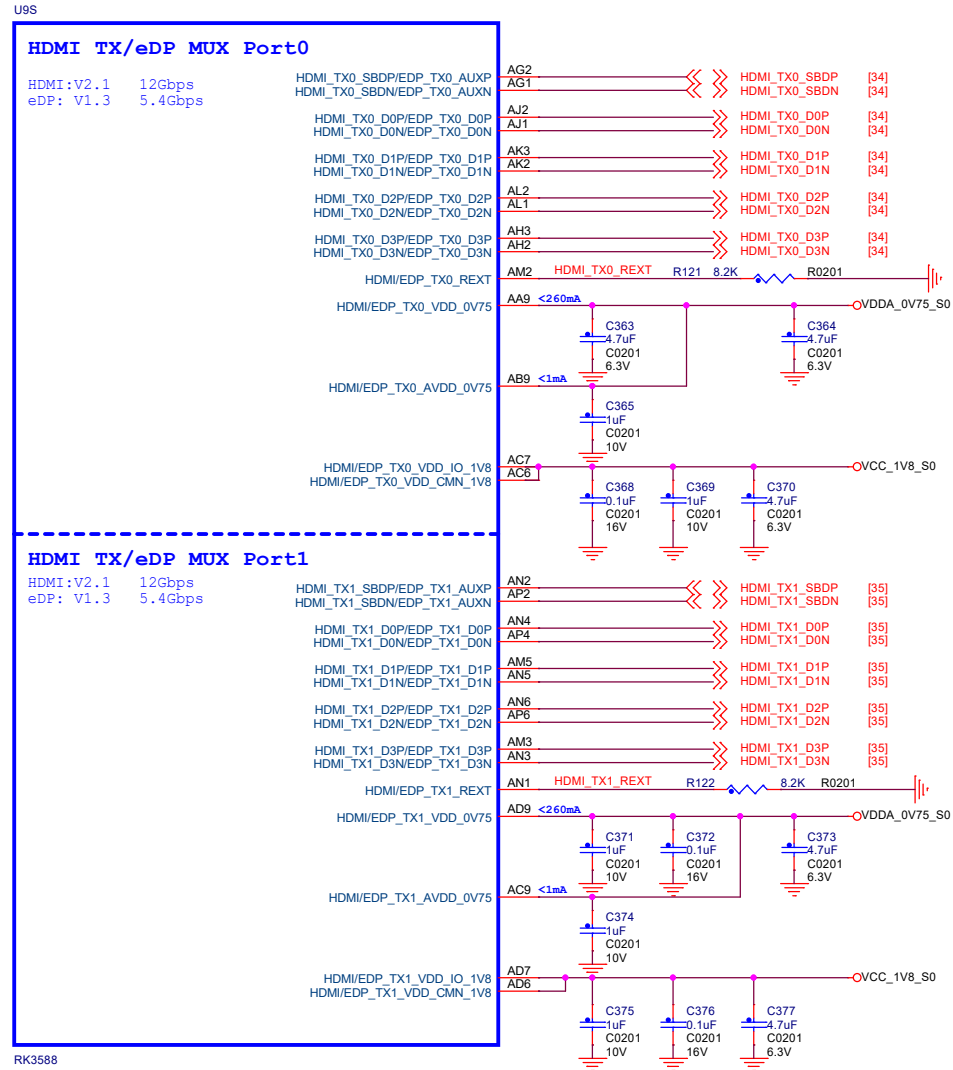


MIPI_CSI_RX Configuration

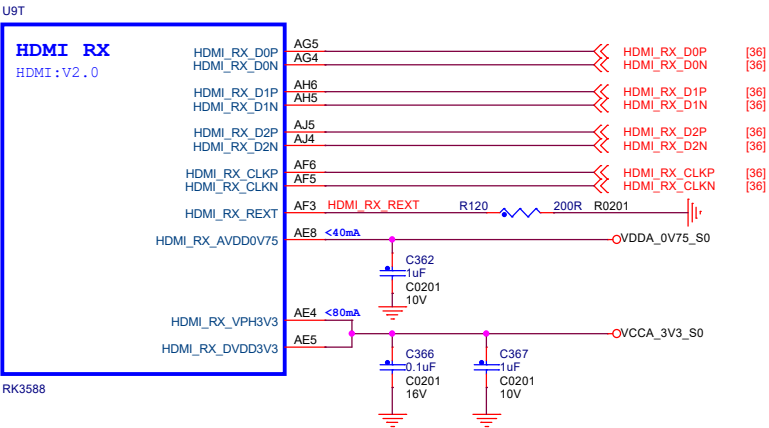
Option1	Sensor1 x4Lane	MIPI_CSI_RX_D0-3 MIPI_CSI_RX_CLK0
Option2	Sensor1 x2Lane	MIPI_CSI_RX_D0-1 MIPI_CSI_RX_CLK0
	+ Sensor2 x2Lane	MIPI_CSI_RX_D2-3 MIPI_CSI_RX_CLK1

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Size A4	Document Number MIPI CSI Interface	Rev V2R1
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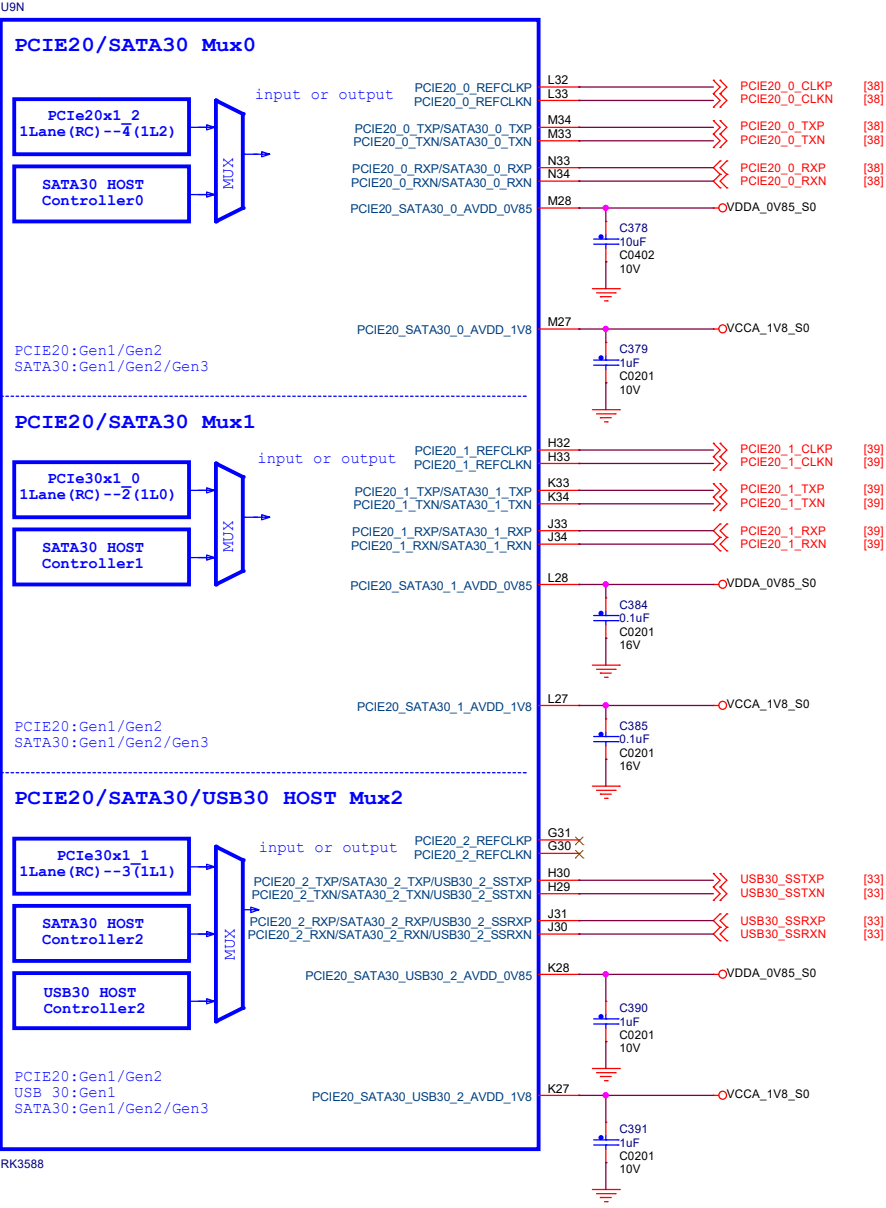
RK3588_S (HDMI2.1 TX)



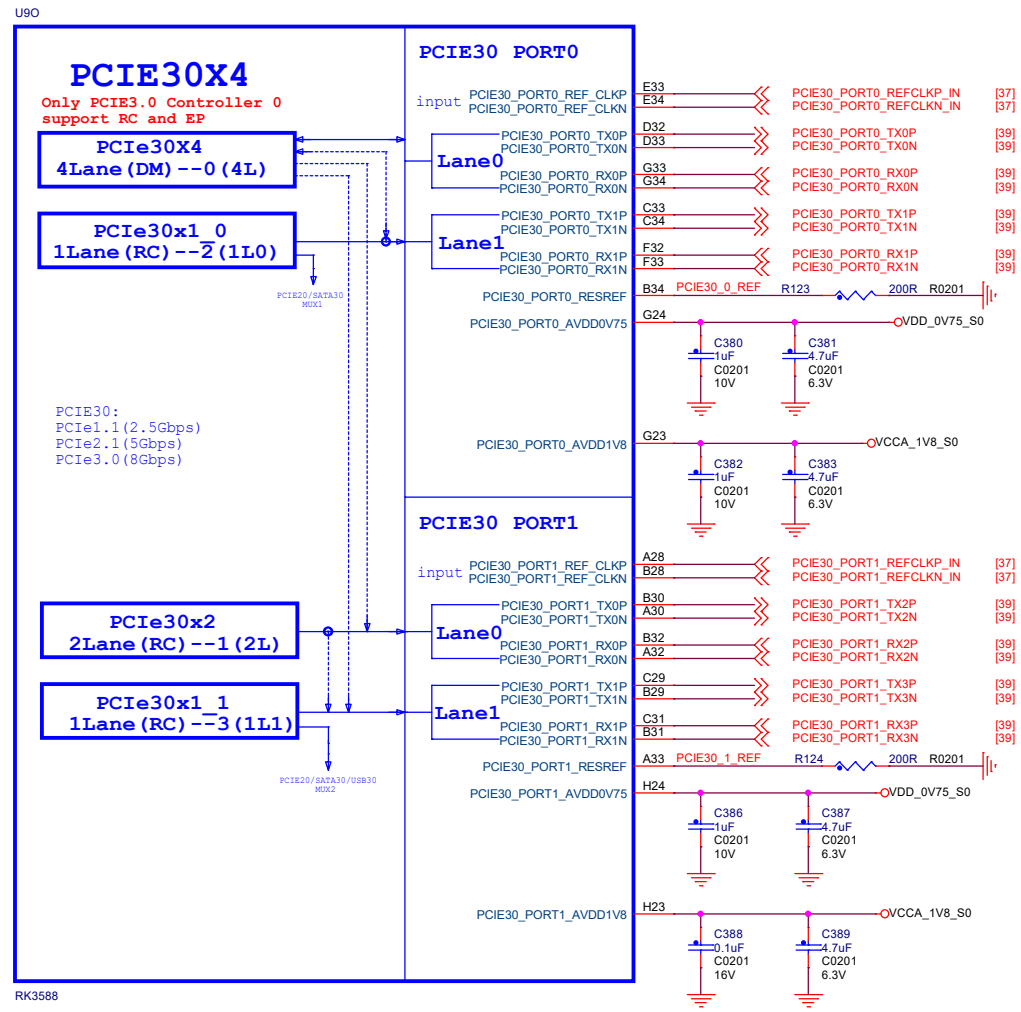
RK3588_T (HDMI20 RX)



RK3588_N (PCIE20)

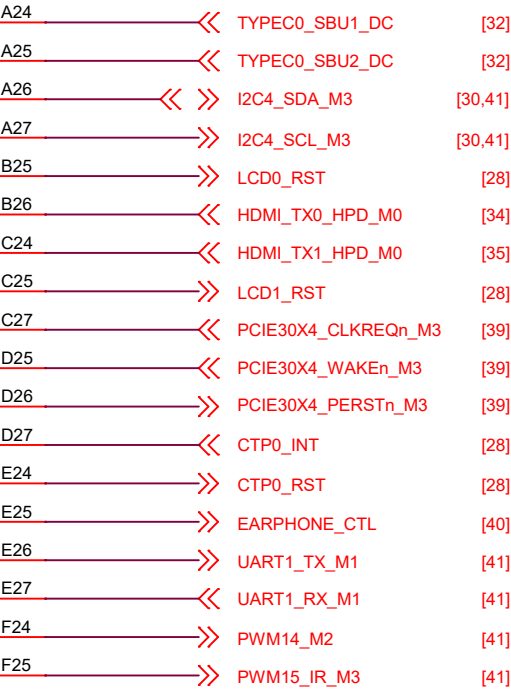
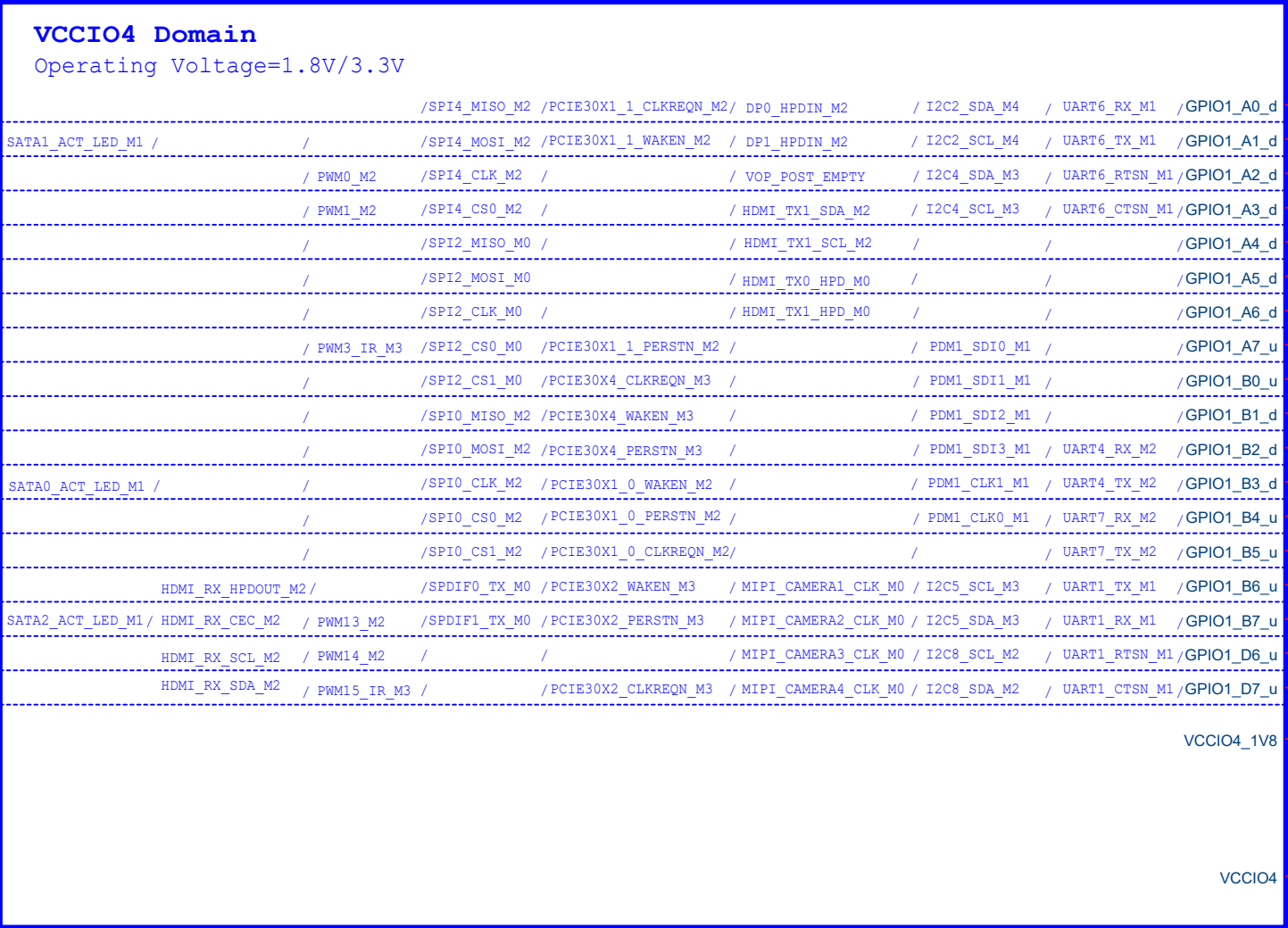


RK3588_O (PCIE30)

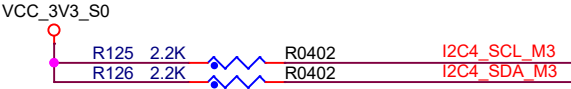


RK3588_I (VCCIO4 Domain)

U9I

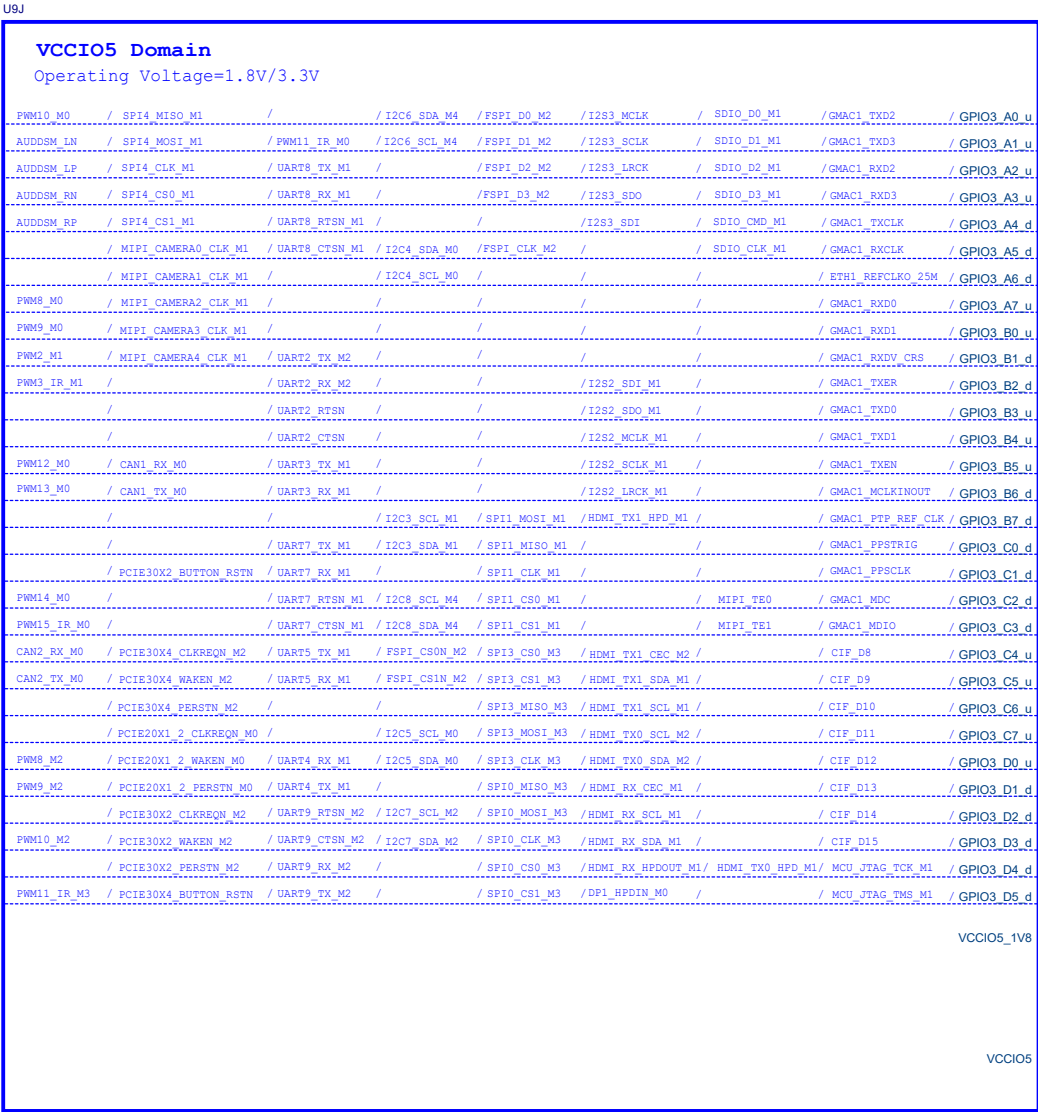


RK3588

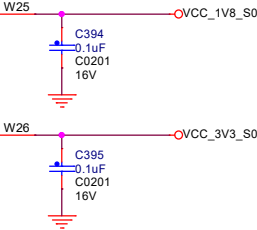
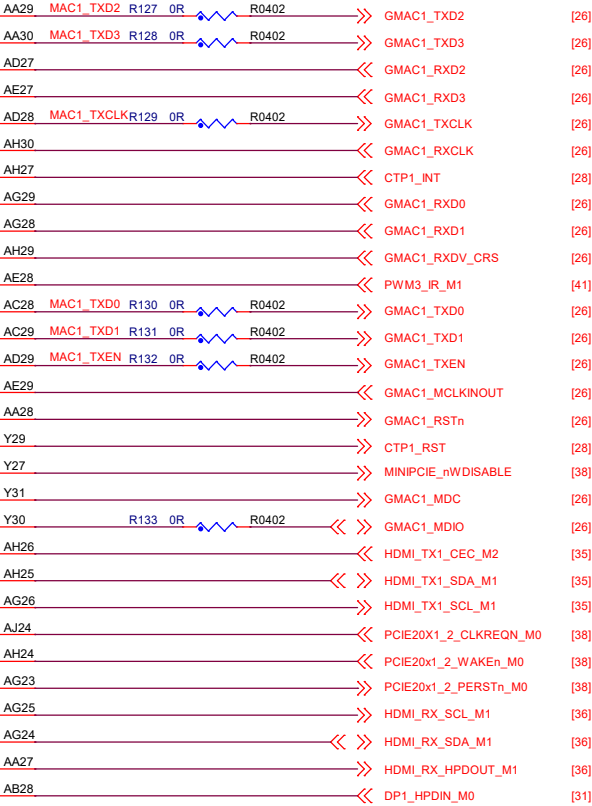


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Title 野火 RK3588 LubanCat 5 原理图		
Size A4	Document Number VCCIO 4 Interface	Rev V2R1
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RK3588_J(VCCIO5 Domain)



RK3588



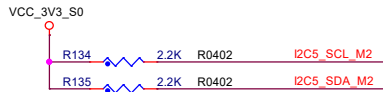
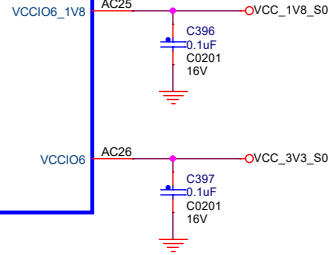
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Size A3	Document Number VCCIO 5 Interface	Rev V2R1
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RK3588_K (VCCIO6 Domain)

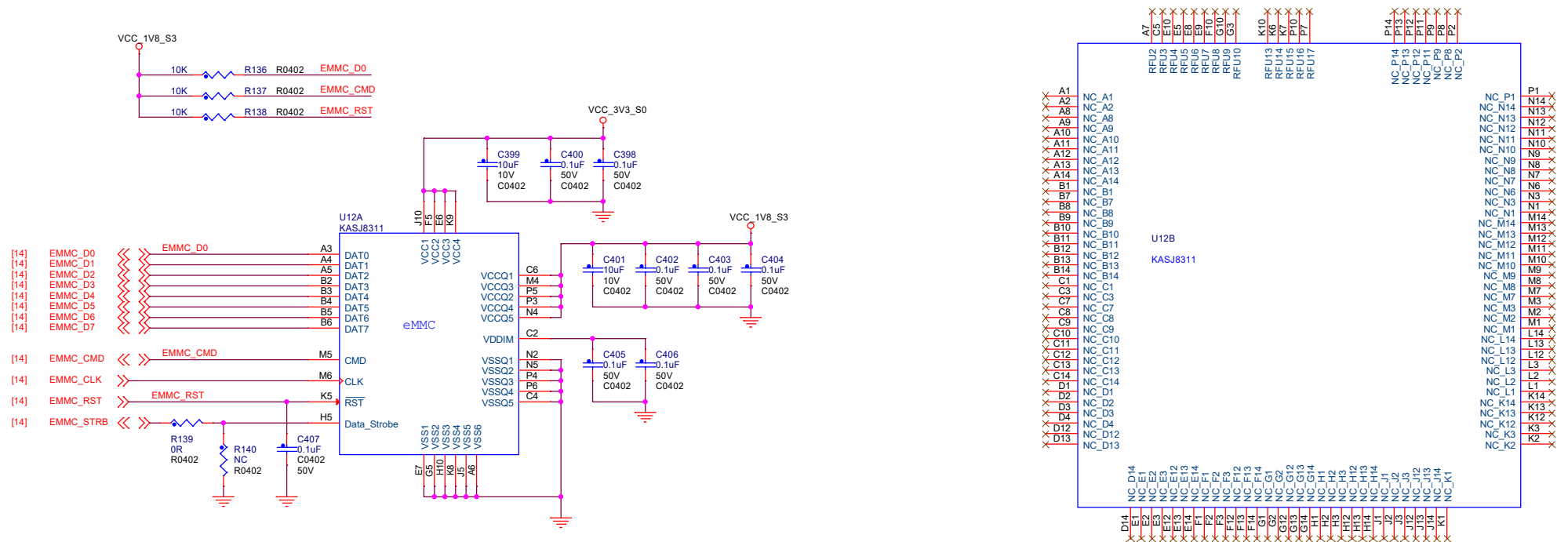
U9K

VCCIO6 Domain
Operating Voltage=1.8V/3.3V

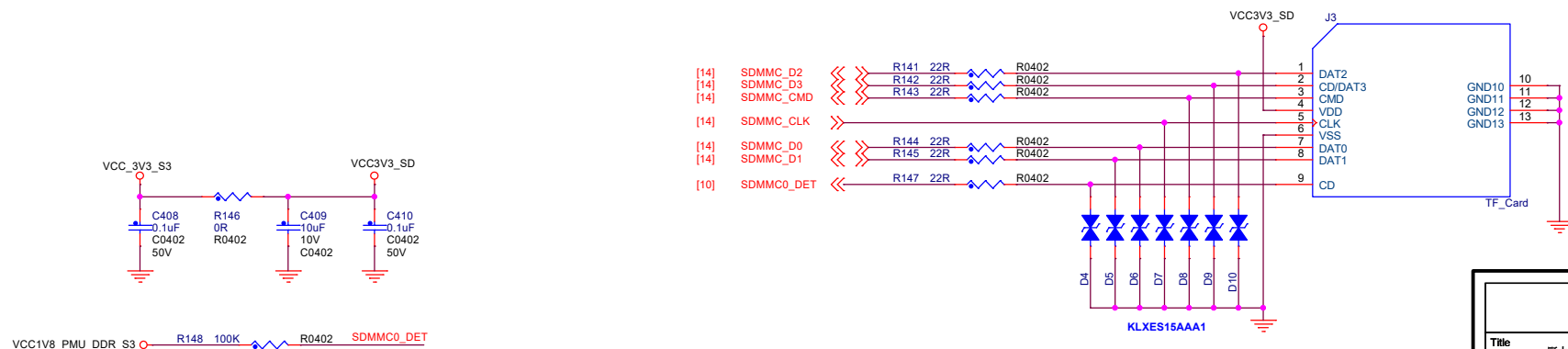
										AK30			SPI0_MISO_M1	[41]
										AL30			SPI0_MOSI_M1	[41]
										AM29			SPI0_CLK_M1	[41]
										AL29			PCIE30X1_0_CLKREQN_M1	[39]
										AL28			PCIE30X1_0_WAKEN_M1	[39]
										AK27			PCIE30X1_0_PERSTN_M1	[39]
										AL27			I2C5_SCL_M2	[27,28,29]
										AM27			I2C5_SDA_M2	[27,28,29]
										AK26			CAM0_PWDN	[29]
										AL24			CAM0_nRST	[29]
										AK25			CAN1_RX_M1	[41]
										AM25			CAN1_TX_M1	[41]
										AL26			EDP_BL_PWM	[31]
										AJ26			HDMI_RX_CEC_M0	[36]
										AJ27			PWM13_M1	[41]
										AJ28			HDMI_TX0_SCL_M0	[34]
										AJ25			HDMI_TX0_SDA_M0	[34]
										AK24			HDMI_TX0_CEC_M0	[34]



EMMC FLASH

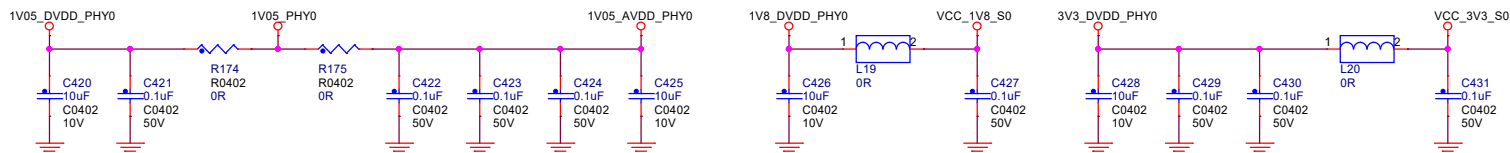


Micro SD Card



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PHY Address : 001

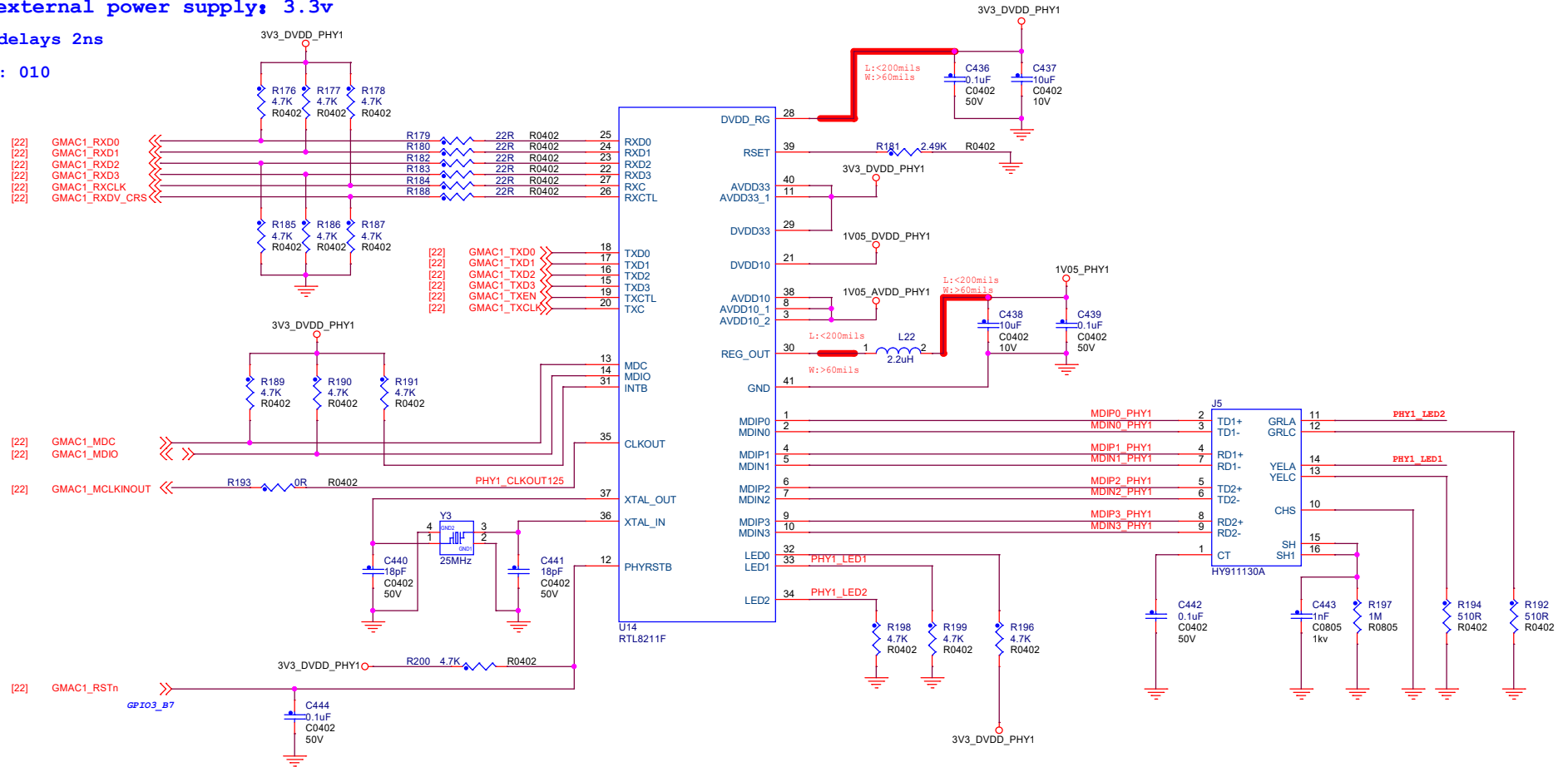


ETH_0

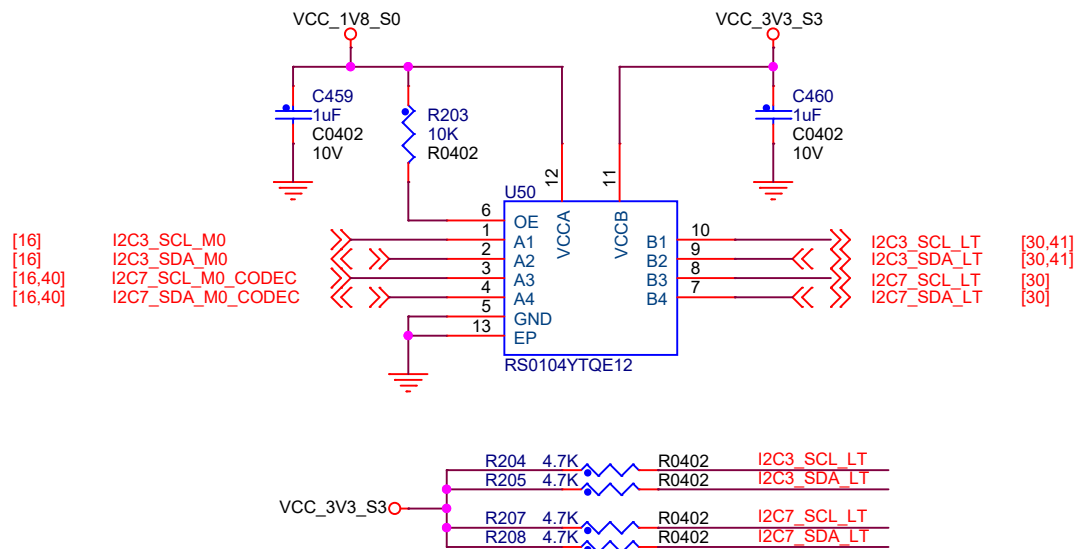
IO Use an external power supply: 3.3v

TXC / RXC : delays 2ns

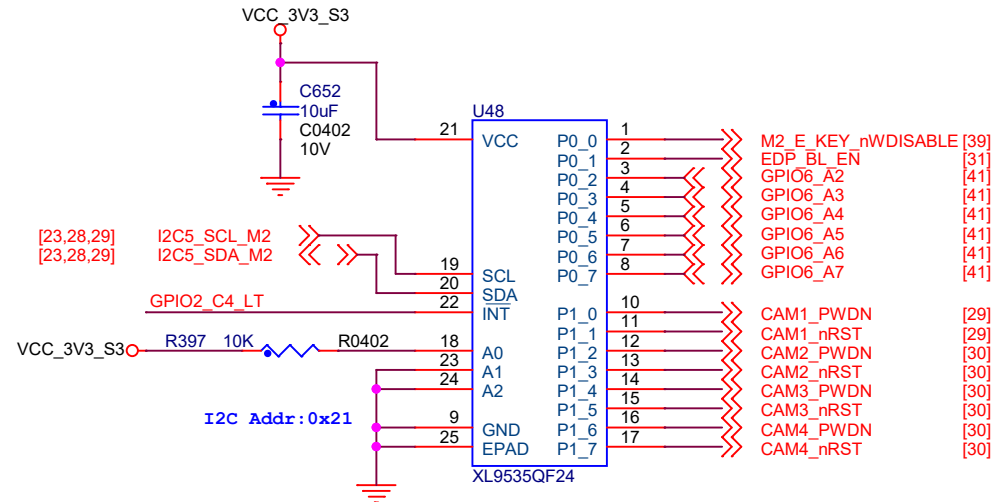
PHY Address : 010



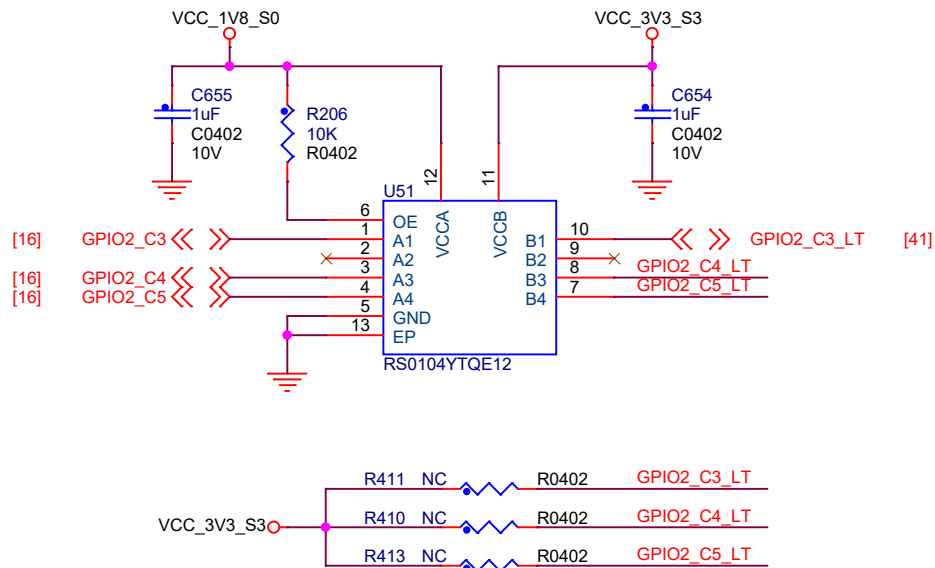
I2C Level Translation



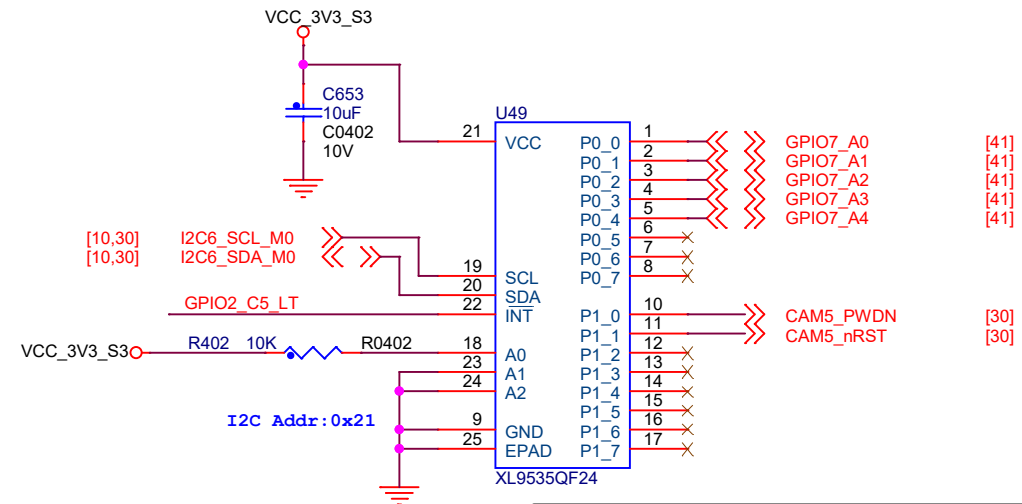
I/O Expand GPIO6



GPIO Level Translation



I/O Expand GPIO7



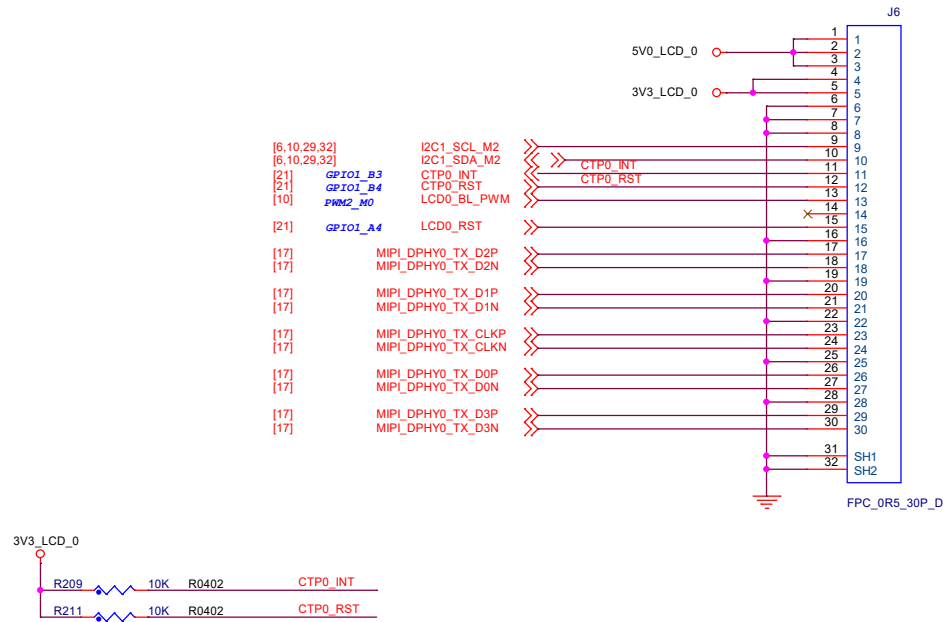
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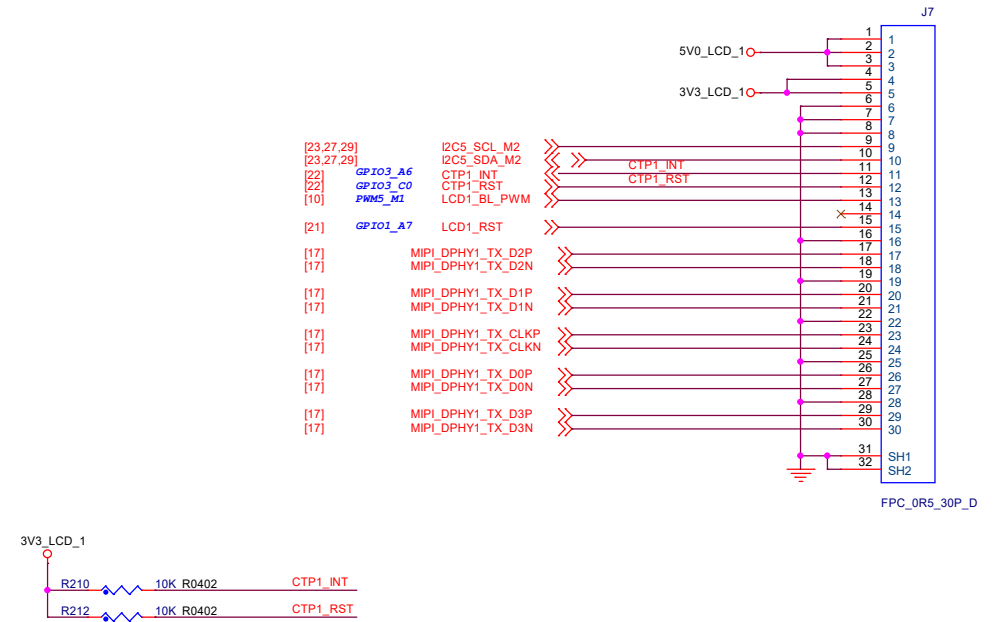
Size A4	Document Number I2C/GPIO Level Translation	Rev V2R1
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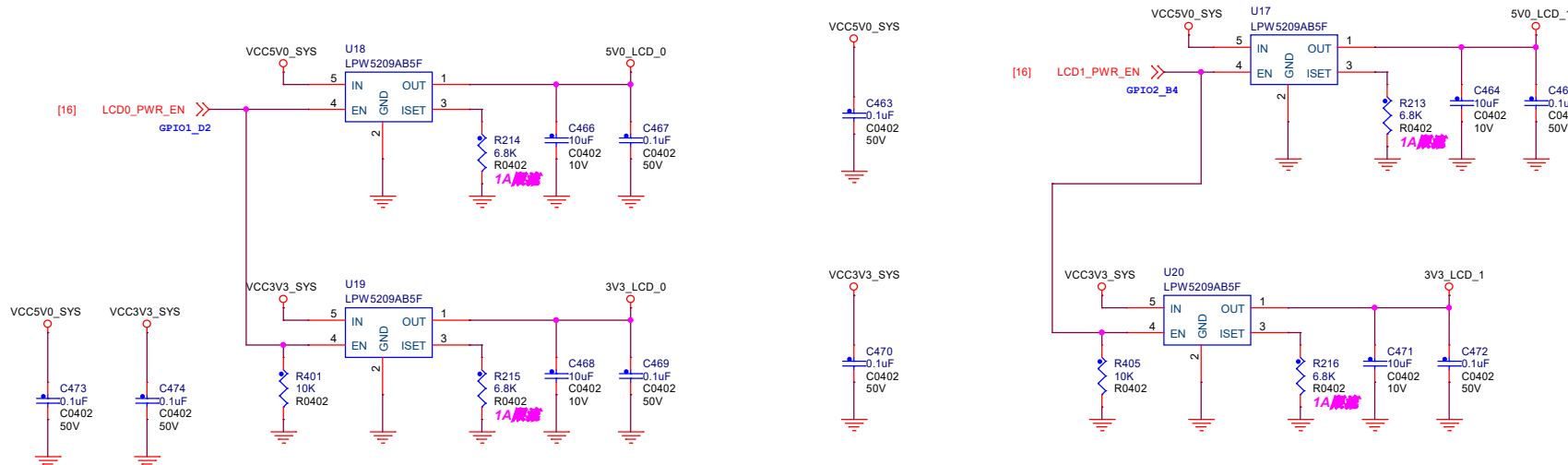
MIPI_DSI_TX0 PORT



MIPI_DSI_TX1 PORT

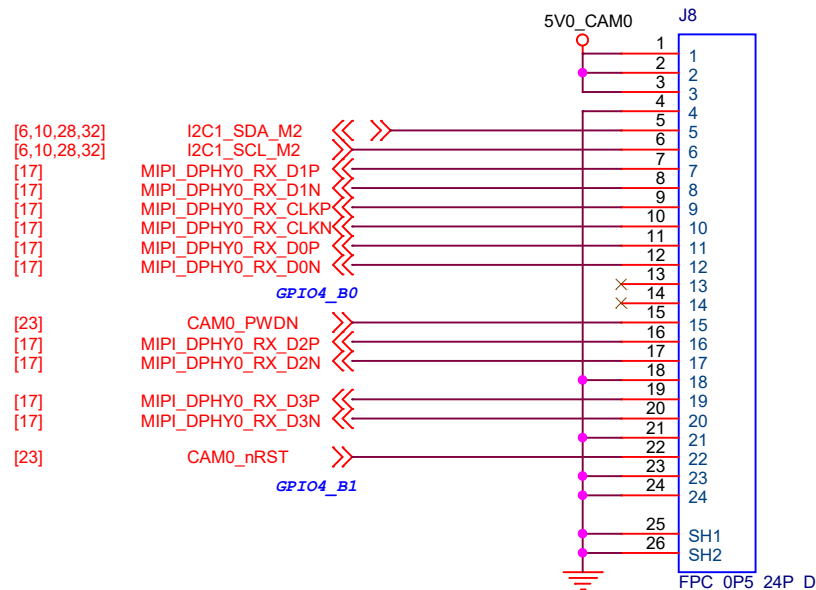


MIPI DSI Power

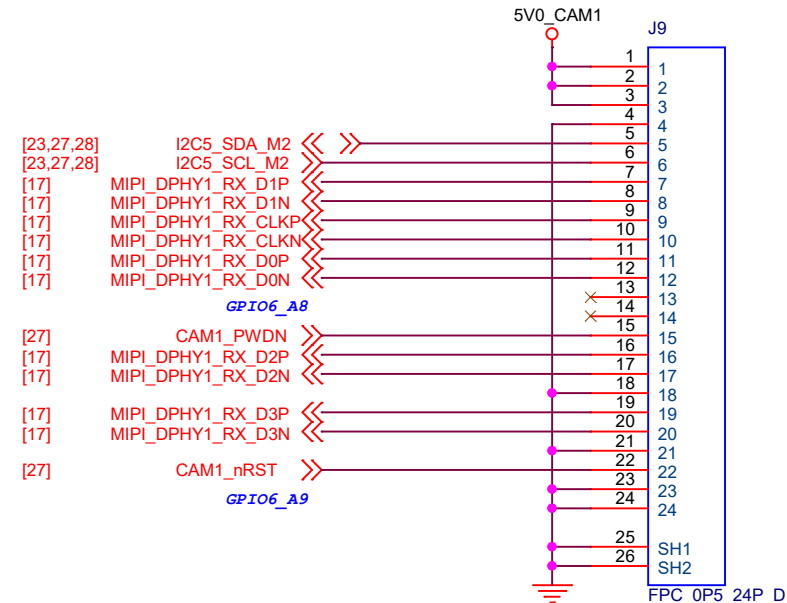


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Title 野火 RK3588 LubanCat 5 原理图		
Size A3	Document Number MIPI DSI PORT	Rev V2R1
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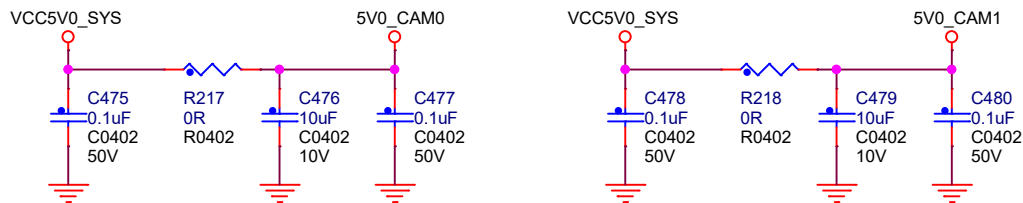
MIPI CSI 0 PORT



MIPI CSI 1 PORT



MIPI CSI Power



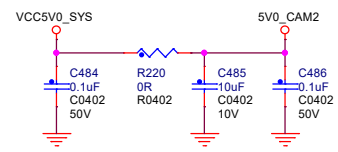
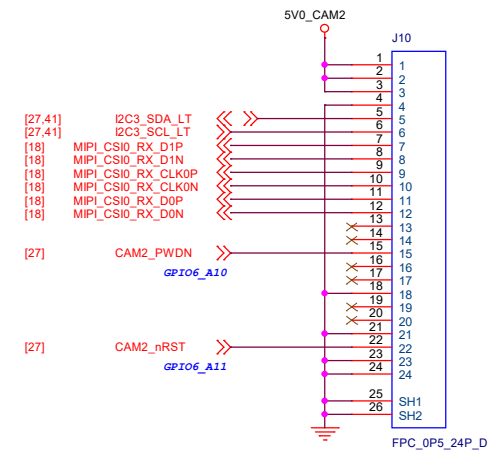
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Title
野火 RK3588 LubanCat 5 原理图

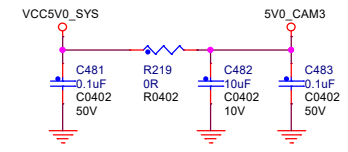
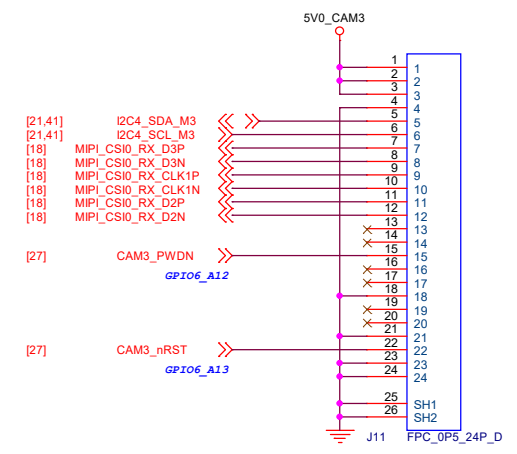
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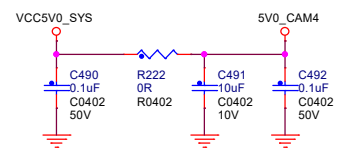
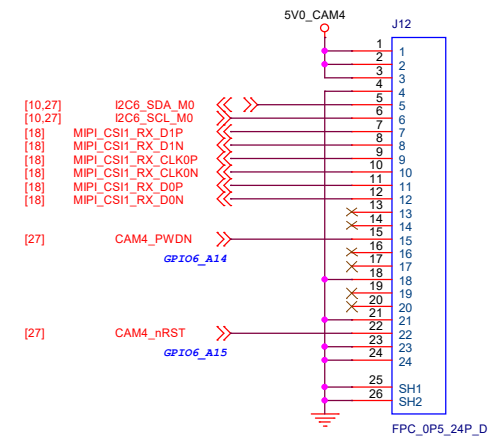
MIPI_CSI2_PORT



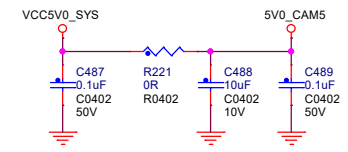
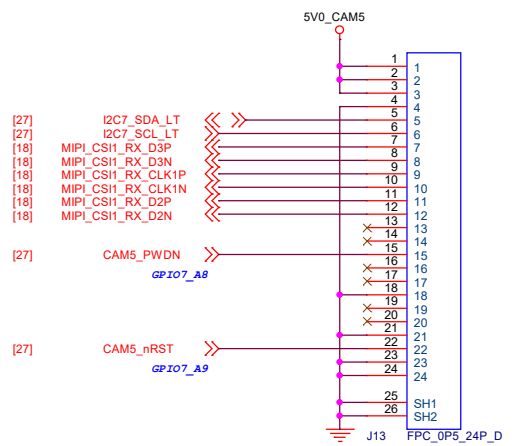
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MIPI_CSI4_PORT

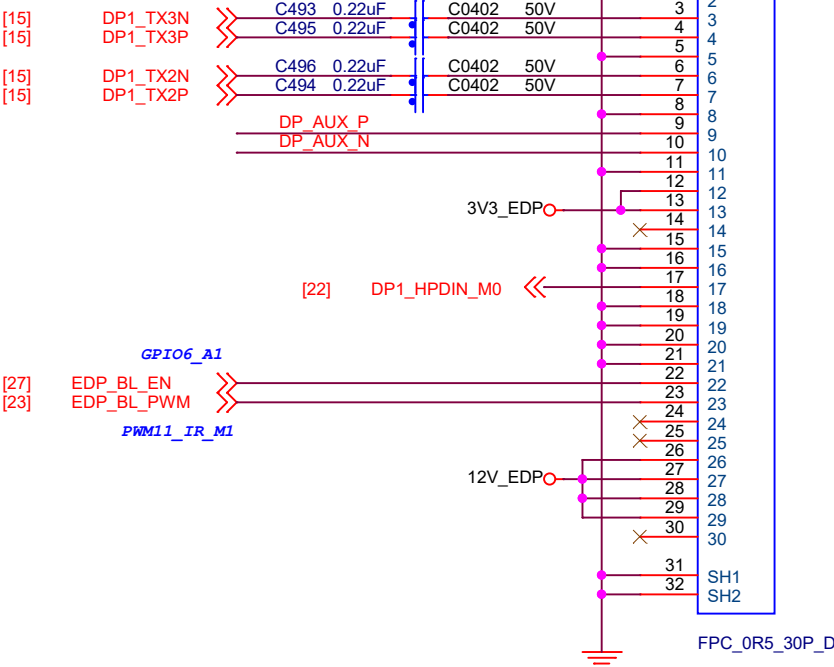
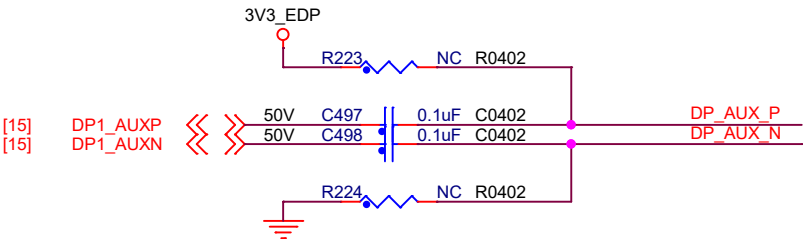


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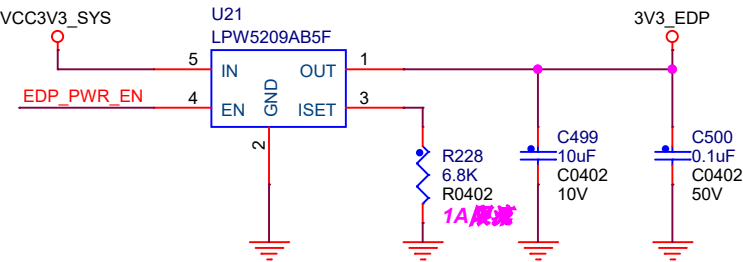
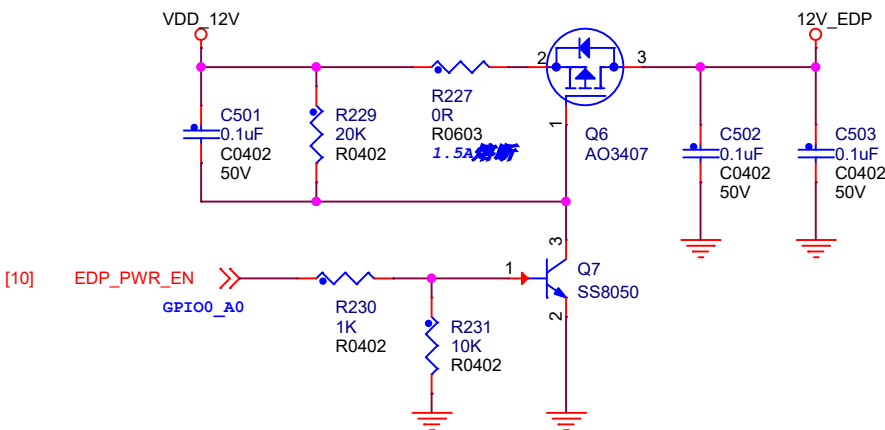


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Title 野火 RK3588 LubanCat 5 原理图		
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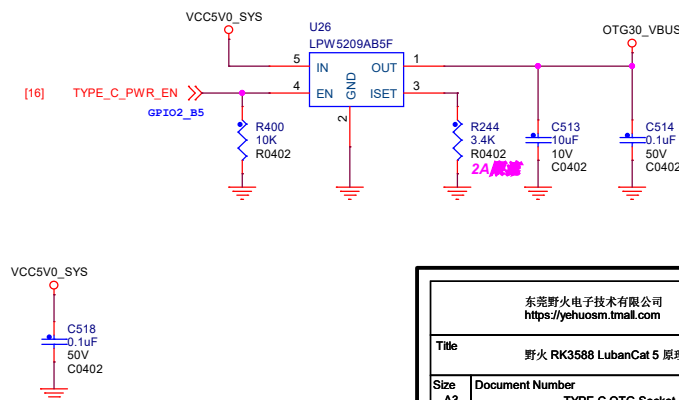
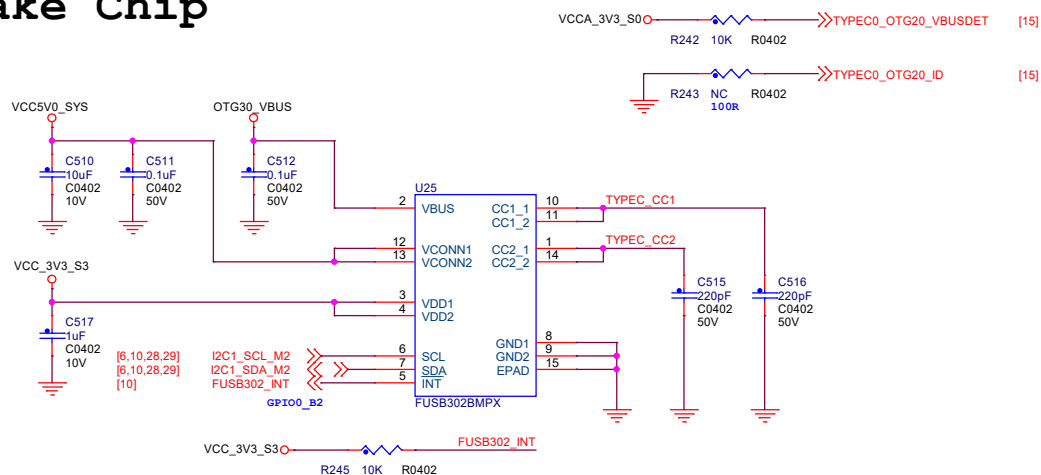
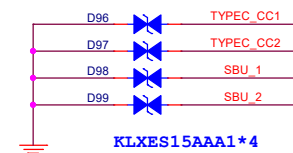
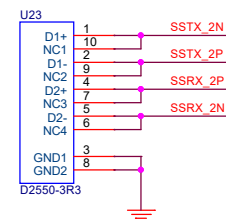
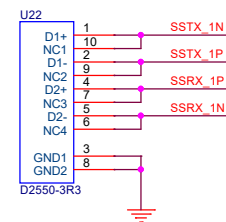
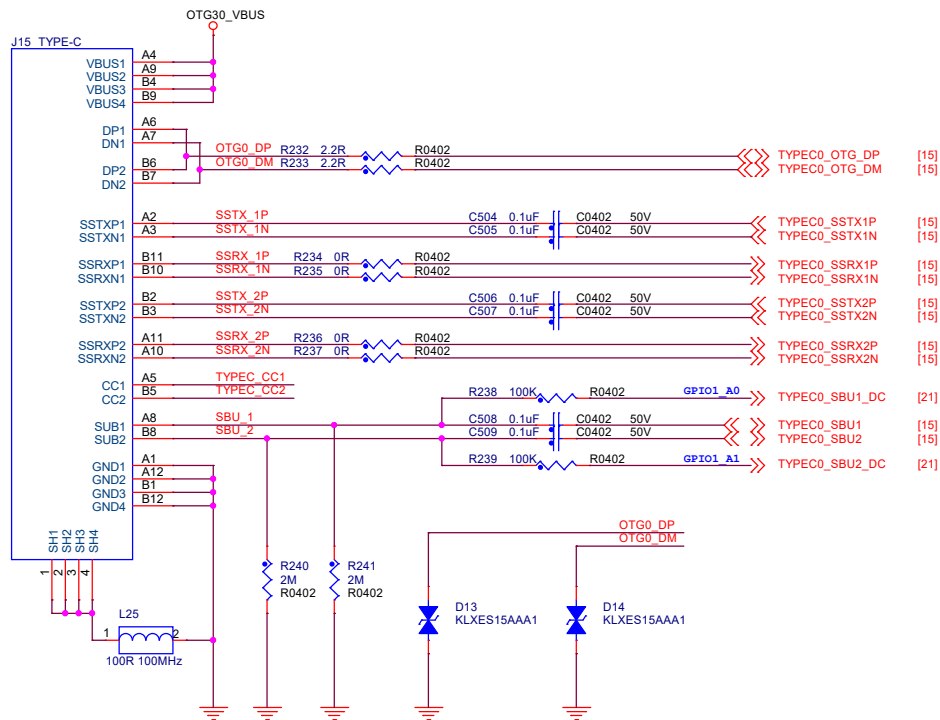
eDP1.3 PORT



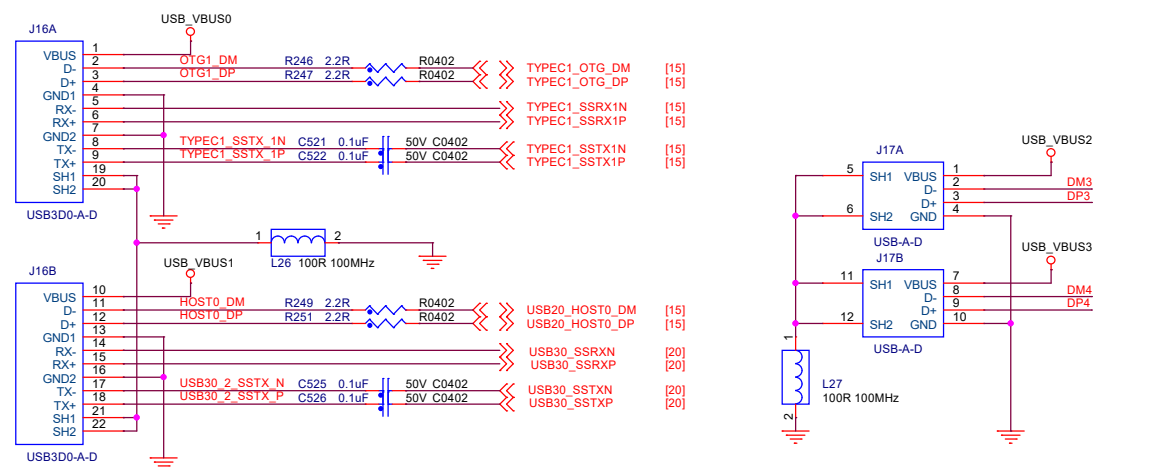
EDP Power



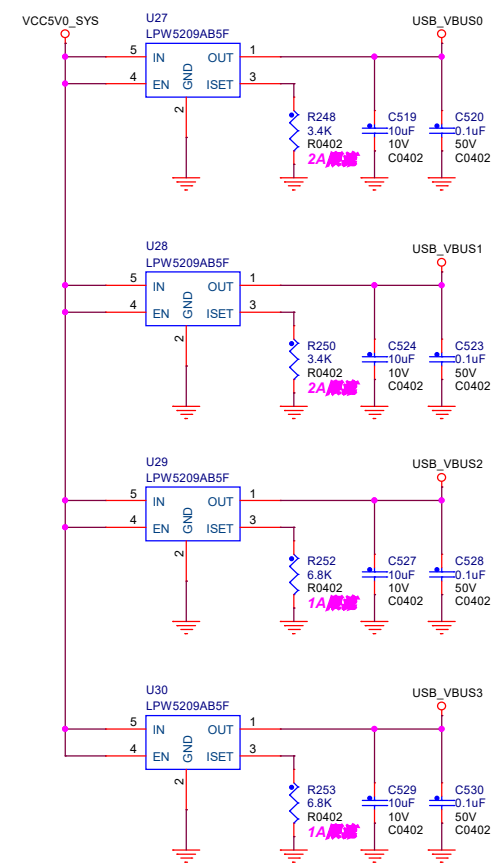
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Title 野火 RK3588 LubanCat 5 原理图		
Size A4	Document Number eDP_1.3_PORT	Rev V2R1
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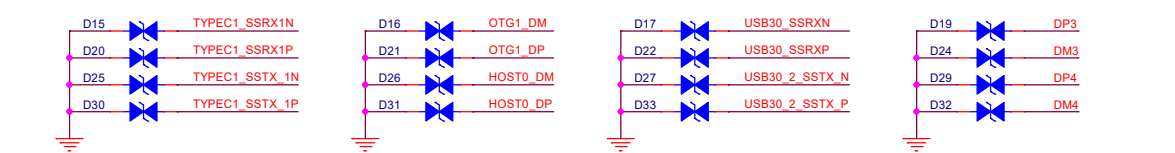
USB 3.0 HOST x2
USB 2.0 HOST x2



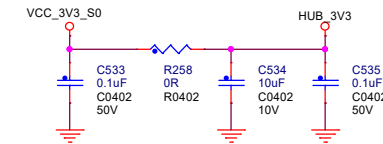
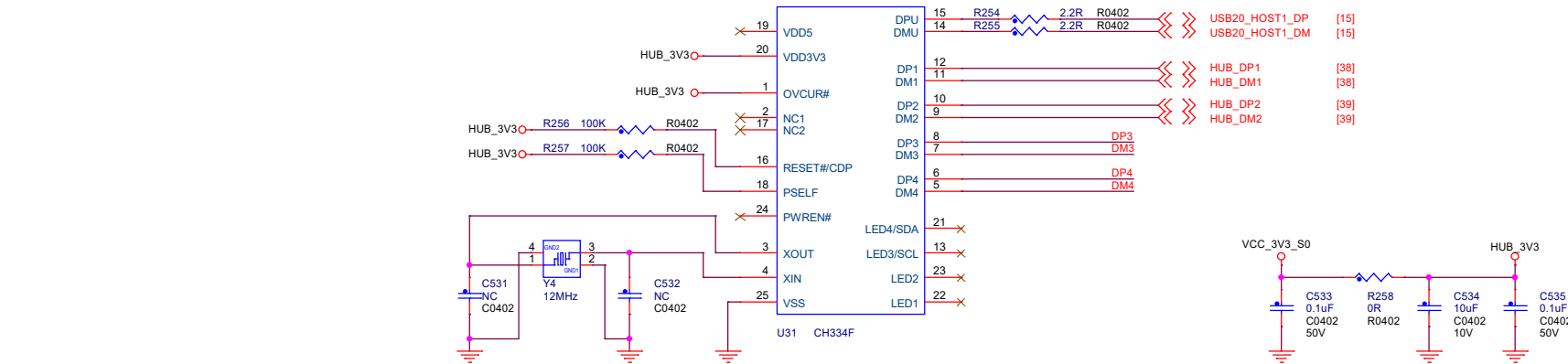
USB POWER



ESD
KLXES15AAA1*16

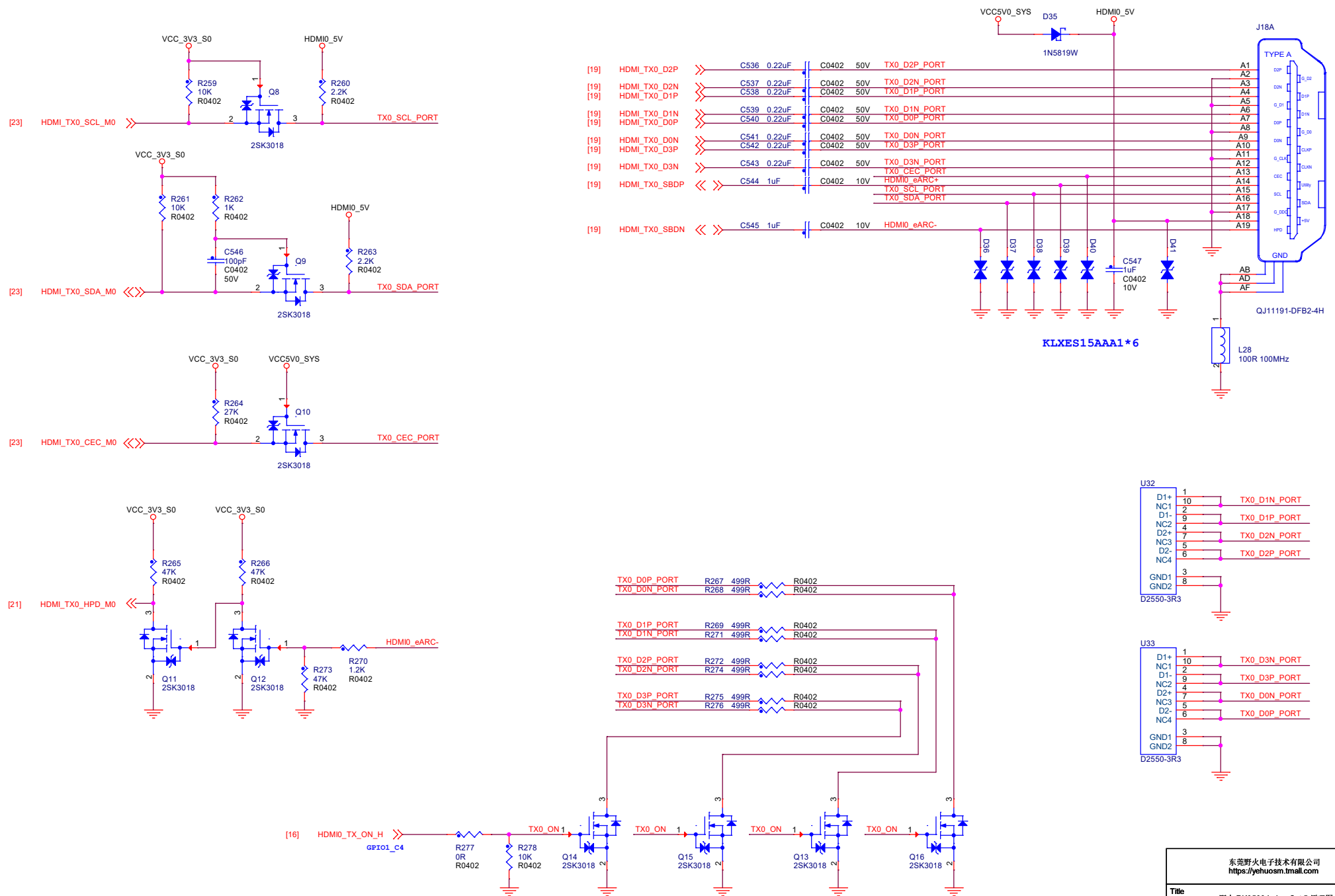


USB20 HUB PHY



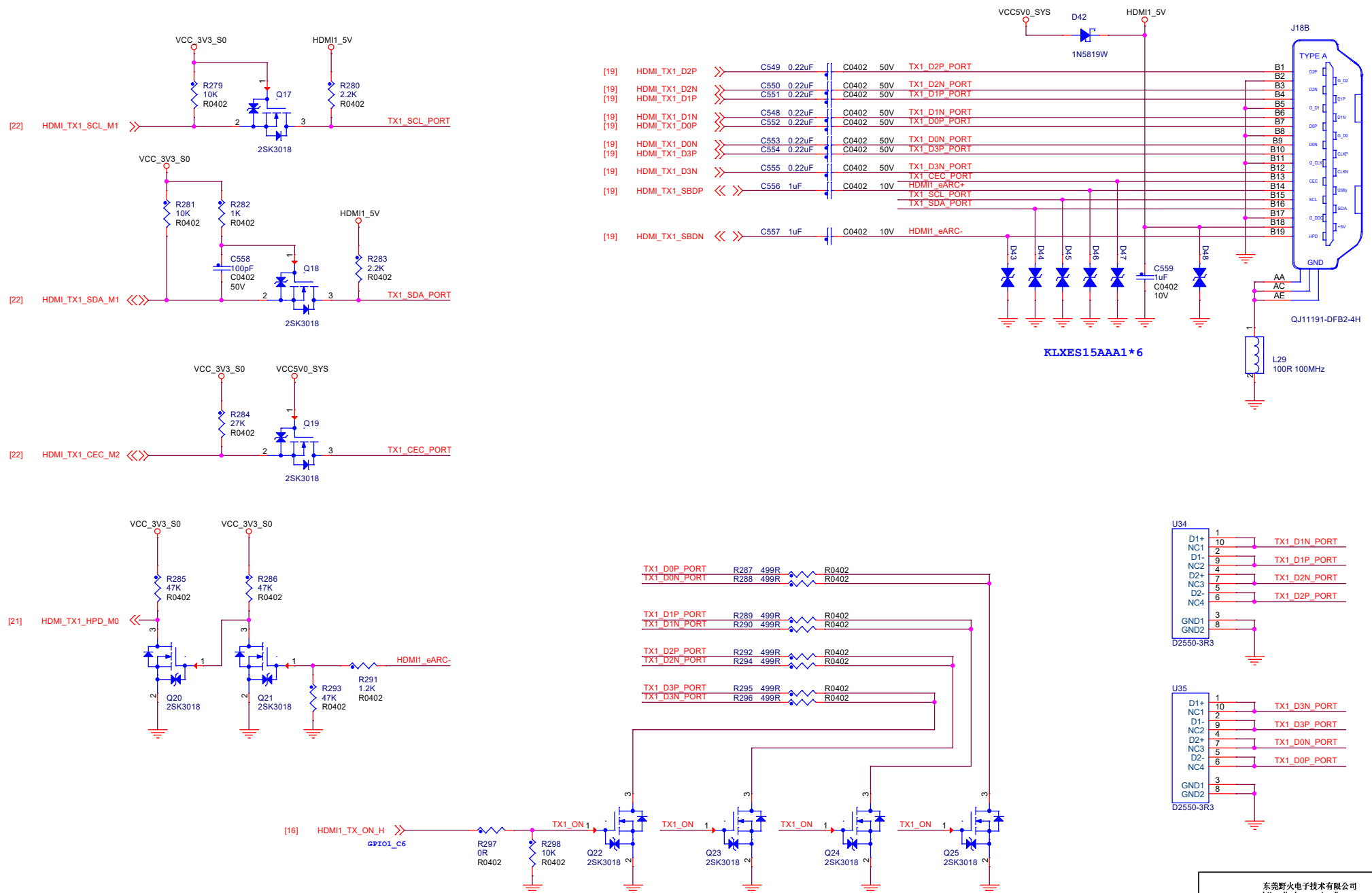
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野火 RK3588 LubanCat 5 原理图		
Size	Document Number	Rev
A3	USB30/USB20/SATA30_PORT	V2R1
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HDMI2.1 PORT



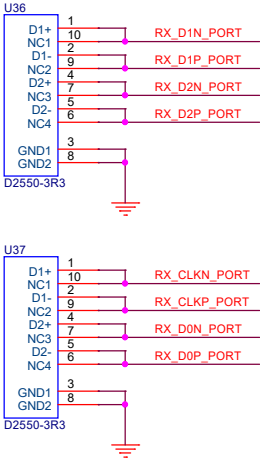
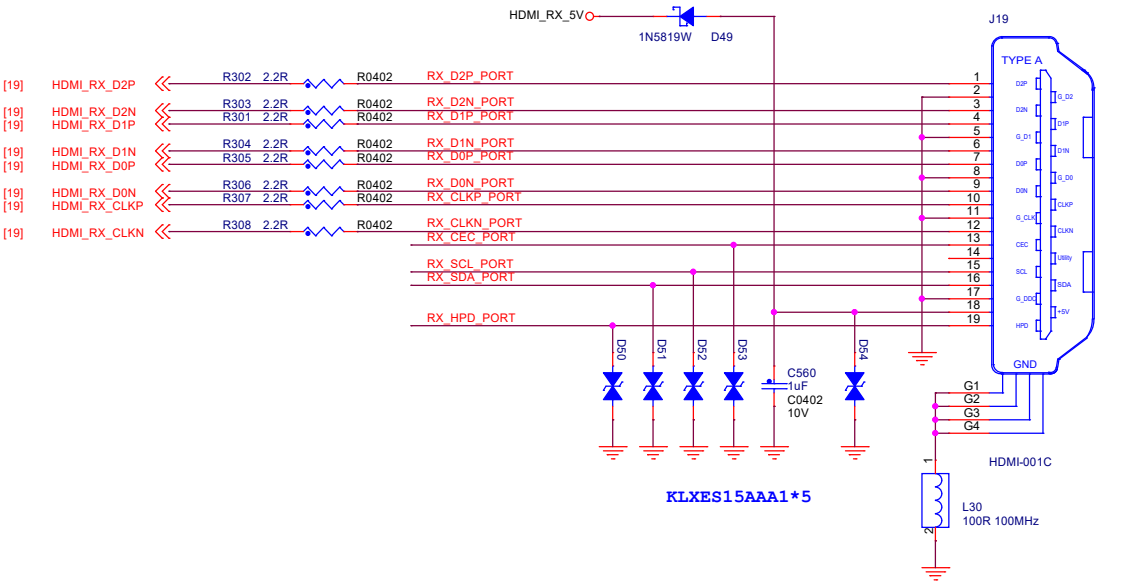
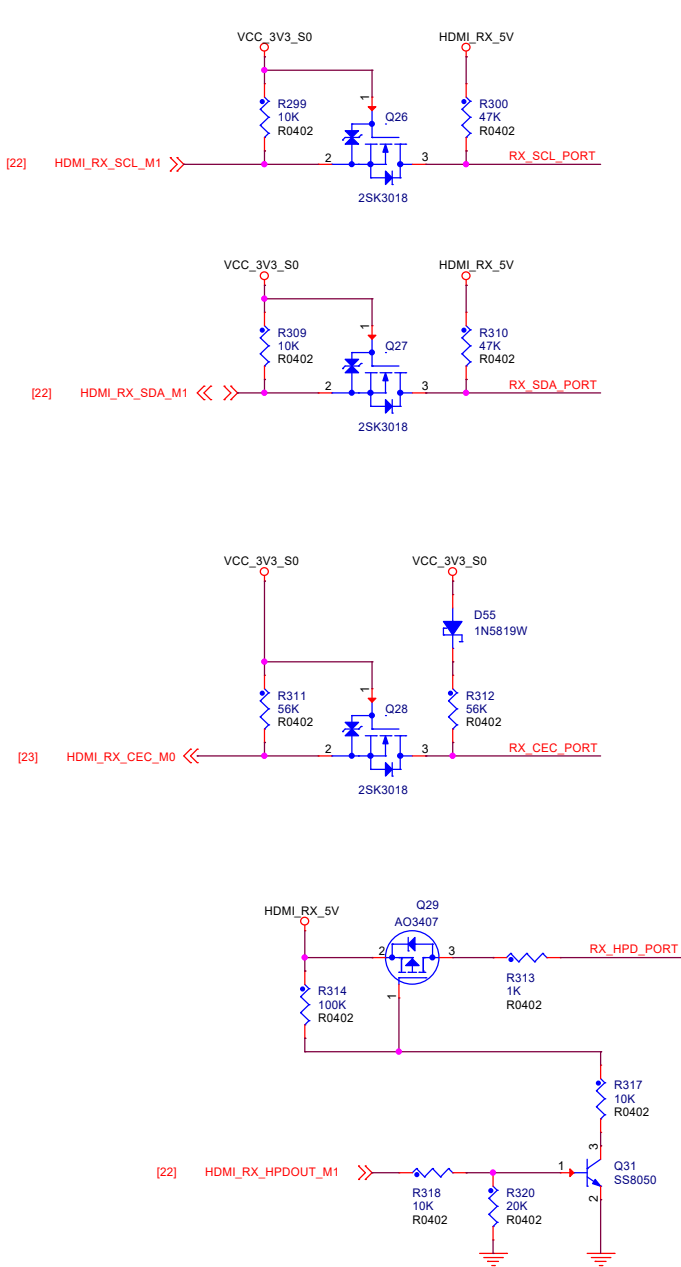
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Title 野火 RK3588 LubanCat 5 原理图			
Size A3	Document Number HDMI TX 0 PORT		Rev V2R1
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HDMI2.1 PORT

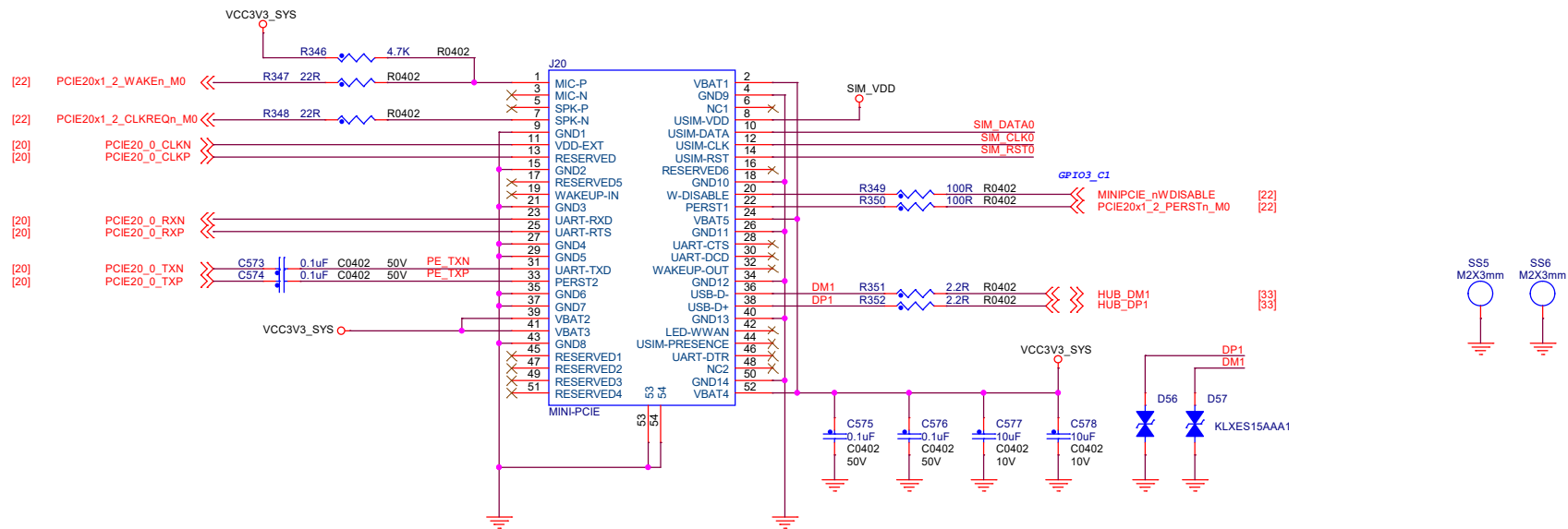


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Title 野火 RK3588 LubanCat 5 原理图		
Size A3	Document Number HDMI TX 1 PORT	Rev V2R1
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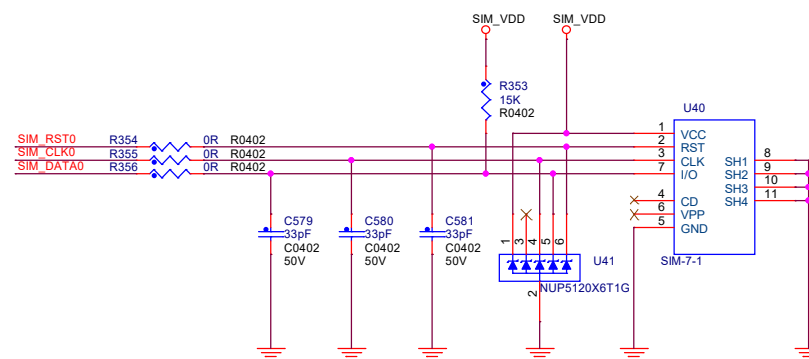
HDMI2.0 RX PORT



MINI PCIE

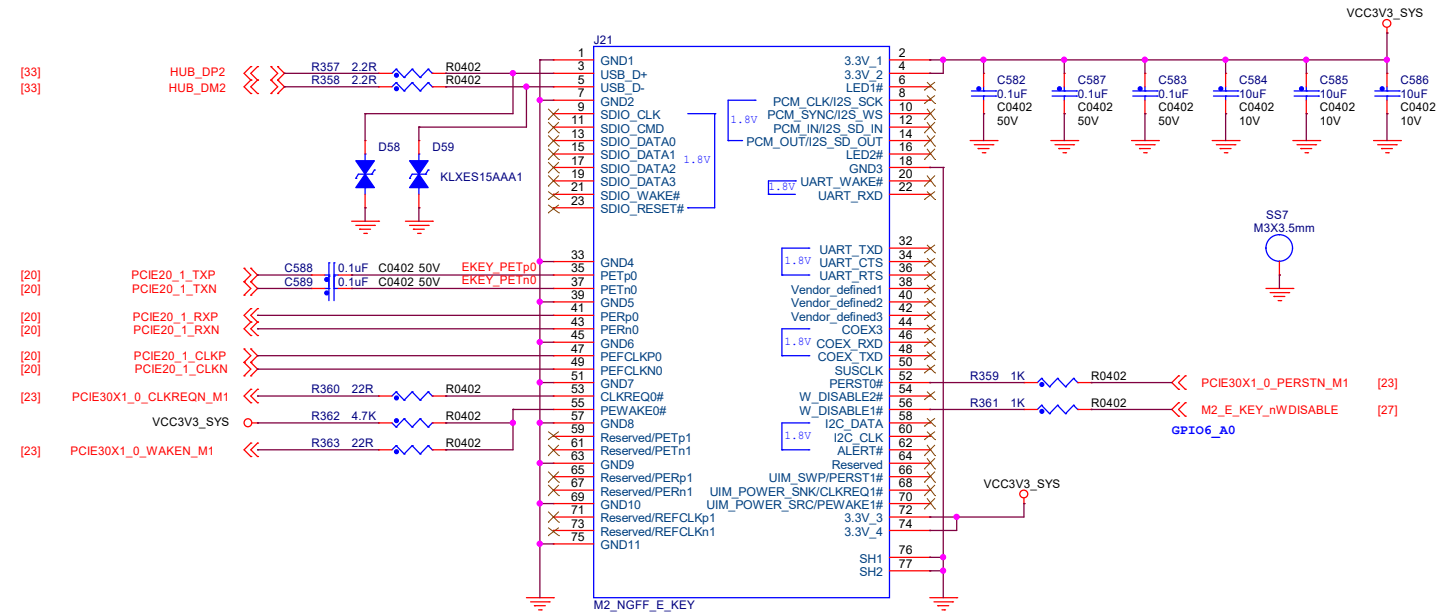


SIM CARD

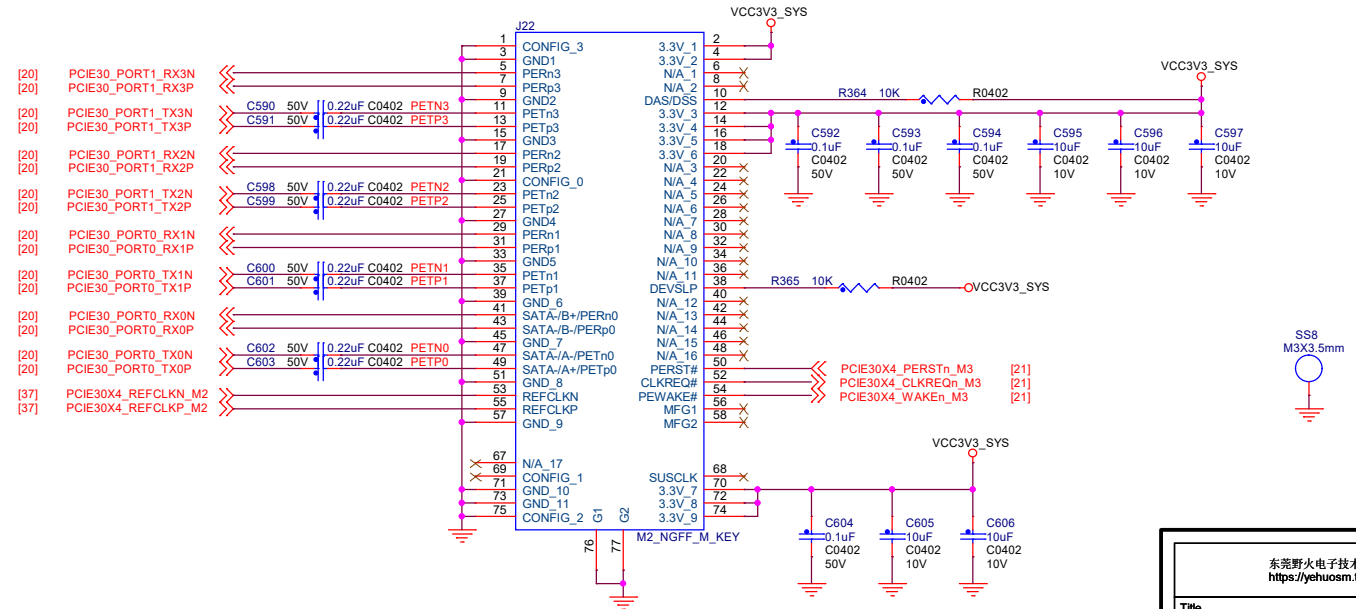


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PCIE2.0 x 1Lanes E-KEY WLAN



PCIE3.0 x 4Lanes m.2 SSD



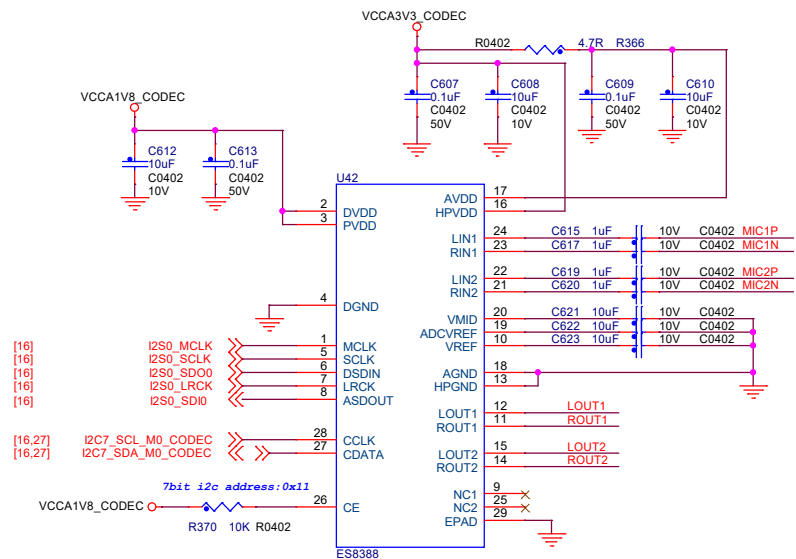
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Title: 野火 RK3588 LubanCat 5 原理图

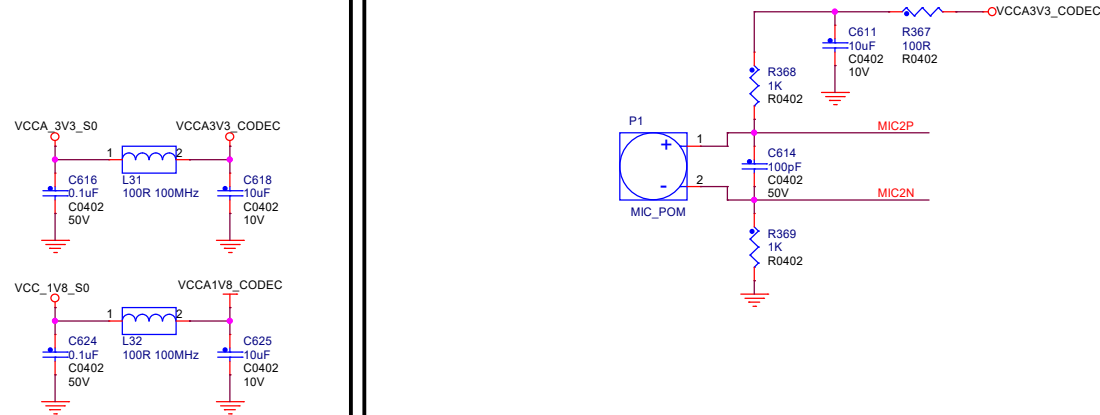
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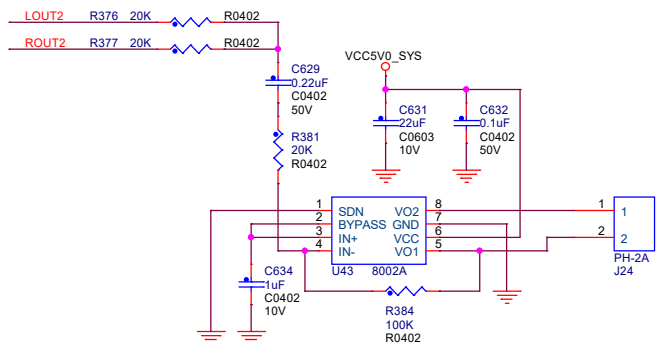
ES8388 CODEC



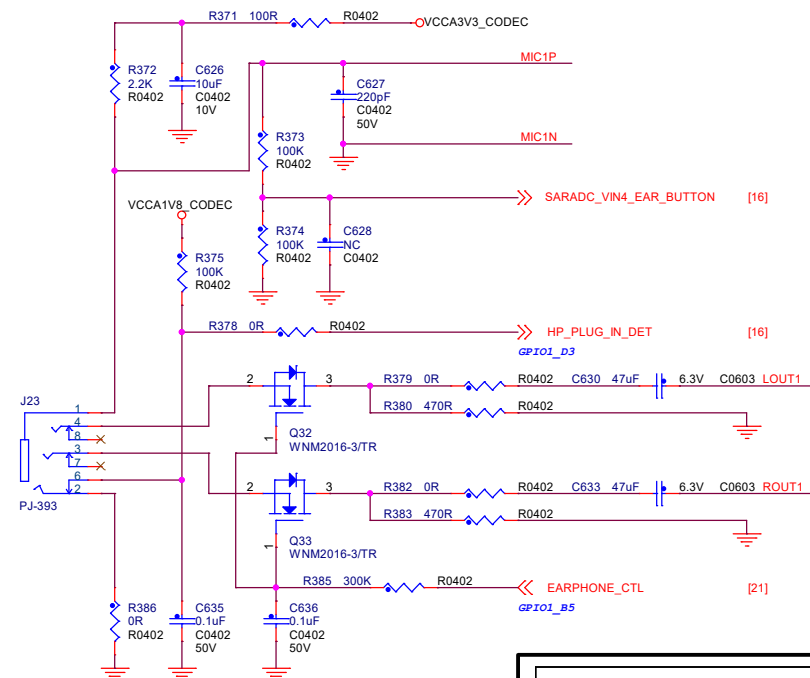
MIC



SPK

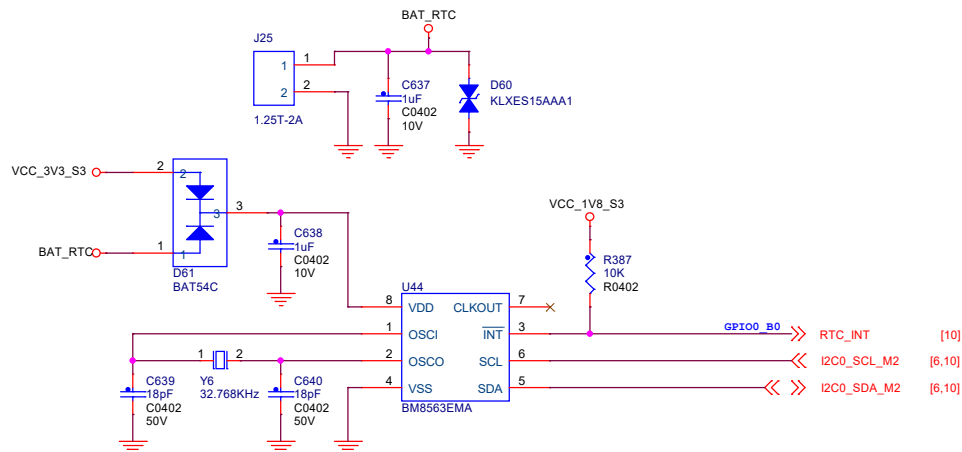


EarPhone

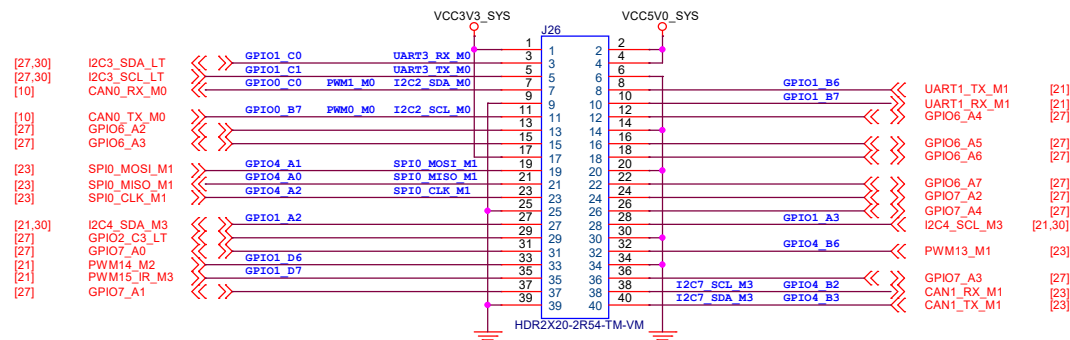


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Size A3	Document Number CODEC/EarPhone/MIC/SPK	Rev V2R1
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RTC

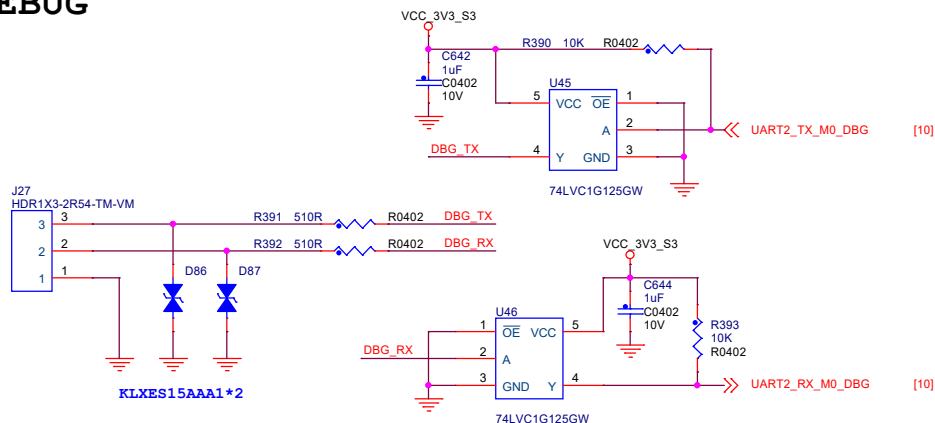


40Pin GPIO

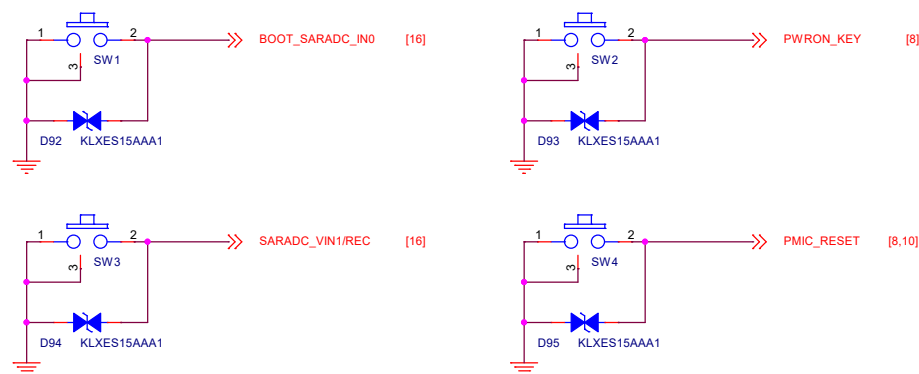


Only Support 3V3 I/O

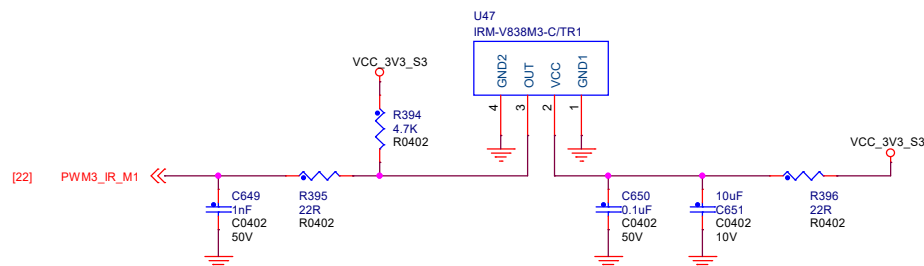
DEBUG



KEY



IR INPUT



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Title 野火 RK3588 LubanCat 5 原理图		
Size A3	Document Number 32K_OSC/DEBUG/40P_IO/KEY	Rev V2R1
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