Revision History

Version	Date	By	Change Dscription	Approved
V1.0	2022-08-10	yhg	1:Revision preliminary version	
V2.0	2024-7-19	yhg	1:modify the FB resistors of U6 and U7 2:modify J9502 SIM+TF pad 3:modify J8700 4G module positioning hole 4:NC R94	

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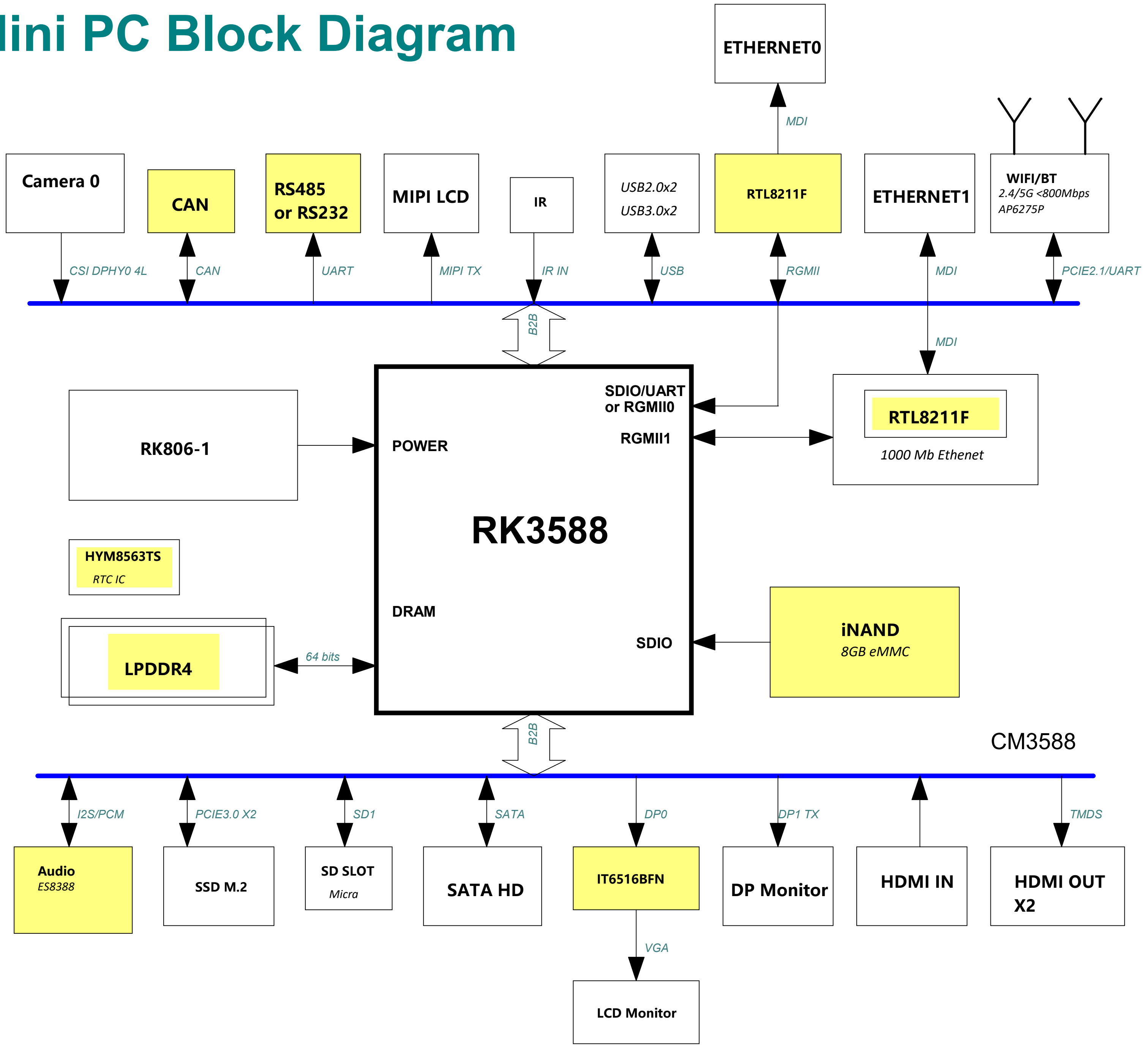
Title: Revision History

Size	Document Number	Drawn	Rev
A4	SBC3588	yhg	2

Date: Friday, July 19, 2024 Sheet 1 of 23

Mini PC Block Diagram



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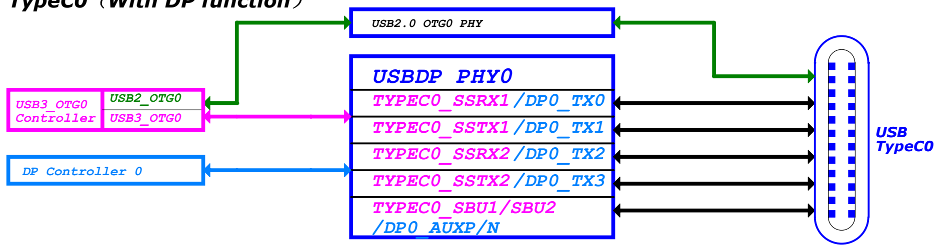
Title	block diagram		
Size C	Document Number SBC3588	Drawn yhg	Rev 2
Date:	Friday, July 19, 2024	Sheet 2	of 23

USB Controller Configure Table

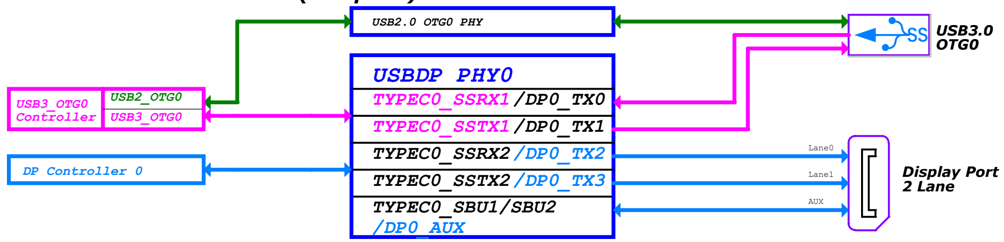
Controller Name	Pin Name	Type-C Function	DPx4Lane Function		USB30 OTG+DPx2Lane Function		USB20 OTG+DPx2Lane Function		USB20 OTG+DPx4Lane Function	
			OPTION1	OPTION2	OPTION1	OPTION2	OPTION1	OPTION2	OPTION1	OPTION2
USB30 OTG0 Device or Host	TYPEC0_SBU1/DP0_AUXP TYPEC0_SBU2/DP0_AUXN	TYPEC0_SBU1 TYPEC0_SBU2	DP0_AUXP DP0_AUXN	DP0_AUXP DP0_AUXN	DP0_AUXP DP0_AUXN	DP0_AUXP DP0_AUXN	DP0_AUXP DP0_AUXN	DP0_AUXP DP0_AUXN	DP0_AUXP DP0_AUXN	DP0_AUXP DP0_AUXN
	TYPEC0_SSRX1P/DP0_TX0P TYPEC0_SSRX1N/DP0_TX0N	TYPEC0_SSRX1P TYPEC0_SSRX1N	DP0_TX0P DP0_TX0N	DP0_TX2P DP0_TX2N	TYPEC0_SSRX1P TYPEC0_SSRX1N	DP0_TX0P DP0_TX0N	DP0_TX0P DP0_TX0N		DP0_TX0P DP0_TX0N	DP0_TX2P DP0_TX2N
	TYPEC0_SSTX1P/DP0_TX1P TYPEC0_SSTX1N/DP0_TX1N	TYPEC0_SSTX1P TYPEC0_SSTX1N	DP0_TX1P DP0_TX1N	DP0_TX3P DP0_TX3N	TYPEC0_SSTX1P TYPEC0_SSTX1N	DP0_TX1P DP0_TX1N	DP0_TX1P DP0_TX1N		DP0_TX1P DP0_TX1N	DP0_TX3P DP0_TX3N
	TYPEC0_SSRX2P/DP0_TX2P TYPEC0_SSRX2N/DP0_TX2N	TYPEC0_SSRX2P TYPEC0_SSRX2N	DP0_TX2P DP0_TX2N	DP0_TX0P DP0_TX0N	DP0_TX2P DP0_TX2N	TYPEC0_SSRX2P TYPEC0_SSRX2N		DP0_TX2P DP0_TX2N	DP0_TX2P DP0_TX2N	DP0_TX0P DP0_TX0N
	TYPEC0_SSTX2P/DP0_TX3P TYPEC0_SSTX2N/DP0_TX3N	TYPEC0_SSTX2P TYPEC0_SSTX2N	DP0_TX3P DP0_TX3N	DP0_TX1P DP0_TX1N	DP0_TX3P DP0_TX3N	TYPEC0_SSTX2P TYPEC0_SSTX2N		DP0_TX3P DP0_TX3N	DP0_TX3P DP0_TX3N	DP0_TX1P DP0_TX1N
USB20 OTG0 Device or Host	TYPEC0_USB20_OTG_DP TYPEC0_USB20_OTG_DM	TYPEC0_USB20_OTG_DP TYPEC0_USB20_OTG_DM			TYPEC0_USB20_OTG_DP TYPEC0_USB20_OTG_DM	TYPEC0_USB20_OTG_DP TYPEC0_USB20_OTG_DM	TYPEC0_USB20_OTG_DP TYPEC0_USB20_OTG_DM	TYPEC0_USB20_OTG_DP TYPEC0_USB20_OTG_DM	TYPEC0_USB20_OTG_DP TYPEC0_USB20_OTG_DM	TYPEC0_USB20_OTG_DP TYPEC0_USB20_OTG_DM
USB30 OTG1 Device or Host	TYPEC1_SBU1/DP1_AUXP TYPEC1_SBU2/DP1_AUXN	TYPEC1_SBU1 TYPEC1_SBU2	DP1_AUXP DP1_AUXN	DP1_AUXP DP1_AUXN	DP1_AUXP DP1_AUXN	DP1_AUXP DP1_AUXN	DP1_AUXP DP1_AUXN	DP1_AUXP DP1_AUXN	DP1_AUXP DP1_AUXN	DP1_AUXP DP1_AUXN
	TYPEC1_SSRX1P/DP1_TX0P TYPEC1_SSRX1N/DP1_TX0N	TYPEC1_SSRX1P TYPEC1_SSRX1N	DP1_TX0P DP1_TX0N	DP1_TX2P DP1_TX2N	TYPEC1_SSRX1P TYPEC1_SSRX1N	DP1_TX0P DP1_TX0N	DP1_TX0P DP1_TX0N		DP1_TX0P DP1_TX0N	DP1_TX2P DP1_TX2N
	TYPEC1_SSTX1P/DP1_TX1P TYPEC1_SSTX1N/DP1_TX1N	TYPEC1_SSTX1P TYPEC1_SSTX1N	DP1_TX1P DP1_TX1N	DP1_TX3P DP1_TX3N	TYPEC1_SSTX1P TYPEC1_SSTX1N	DP1_TX1P DP1_TX1N	DP1_TX1P DP1_TX1N		DP1_TX1P DP1_TX1N	DP1_TX3P DP1_TX3N
	TYPEC1_SSRX2P/DP1_TX2P TYPEC1_SSRX2N/DP1_TX2N	TYPEC1_SSRX2P TYPEC1_SSRX2N	DP1_TX2P DP1_TX2N	DP1_TX0P DP1_TX0N	DP1_TX2P DP1_TX2N	TYPEC1_SSRX2P TYPEC1_SSRX2N		DP1_TX2P DP1_TX2N	DP1_TX2P DP1_TX2N	DP1_TX0P DP1_TX0N
	TYPEC1_SSTX2P/DP1_TX3P TYPEC1_SSTX2N/DP1_TX3N	TYPEC1_SSTX2P TYPEC1_SSTX2N	DP1_TX3P DP1_TX3N	DP1_TX1P DP1_TX1N	DP1_TX3P DP1_TX3N	TYPEC1_SSTX2P TYPEC1_SSTX2N		DP1_TX3P DP1_TX3N	DP1_TX3P DP1_TX3N	DP0_TX1P DP0_TX1N
USB20 OTG1 Device or Host	TYPEC1_USB20_OTG_DP TYPEC1_USB20_OTG_DM	TYPEC1_USB20_OTG_DP TYPEC1_USB20_OTG_DM			TYPEC1_USB20_OTG_DP TYPEC1_USB20_OTG_DM	TYPEC1_USB20_OTG_DP TYPEC1_USB20_OTG_DM	TYPEC1_USB20_OTG_DP TYPEC1_USB20_OTG_DM	TYPEC1_USB20_OTG_DP TYPEC1_USB20_OTG_DM	TYPEC1_USB20_OTG_DP TYPEC1_USB20_OTG_DM	TYPEC1_USB20_OTG_DP TYPEC1_USB20_OTG_DM
			OPTION1 USB30 HOST		OPTION2 USB30 HOST	OPTION3 USB30 HOST				
USB30 HOST2	PCIE20_2_TXP/SATA30_2_TXP/USB30_2_SSTXP PCIE20_2_TXN/SATA30_2_TXN/USB30_2_SSTXN		USB30_2_SSTXP USB30_2_SSTXN		USB30_2_SSTXP USB30_2_SSTXN	USB30_2_SSTXP USB30_2_SSTXN				
	PCIE20_2_RXP/SATA30_2_RXP/USB30_2_SSRXP PCIE20_2_RXN/SATA30_2_RXN/USB30_2_SSRXN		USB30_2_SSRXP USB30_2_SSRXN		USB30_2_SSRXP USB30_2_SSRXN	USB30_2_SSRXP USB30_2_SSRXN				
USB20 HOST0	USB20_HOST0_DP USB20_HOST0_DM		USB20_HOST0_DP USB20_HOST0_DM							
USB20 HOST1	USB20_HOST1_DP USB20_HOST1_DM				USB20_HOST1_DP USB20_HOST1_DM					
						TYPEC1_USB20_OTG_DP TYPEC1_USB20_OTG_DM				

Note:
DP Lane swap enable
0:Lane0/1/2/3 TxData mapping to Lane0/1/2/3_TXDP/N
1:Lane0/1/2/3 TxData mapping to Lane2/3/0/1_TXDP/N

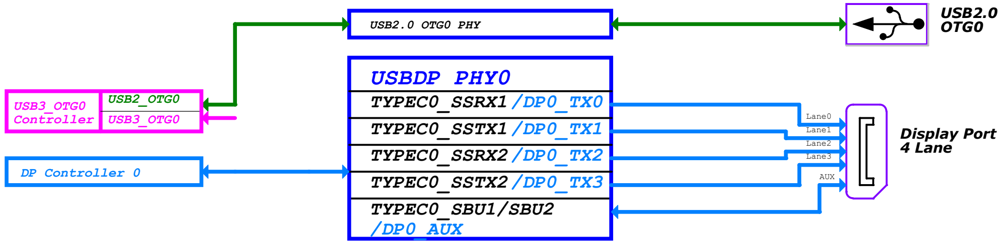
Config0:
TypeC0（With DP function）



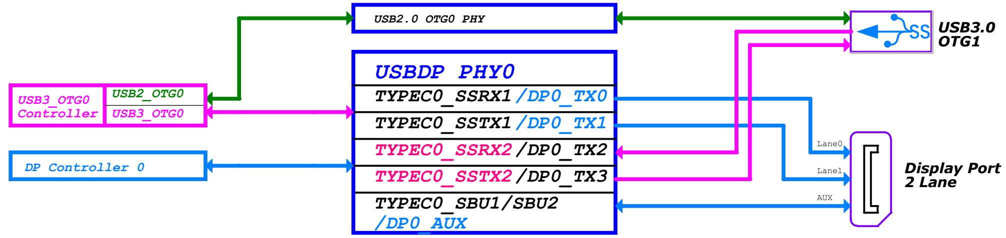
Config3:
USB3.0 OTG0 + DP0 2Lane(Swap ON)



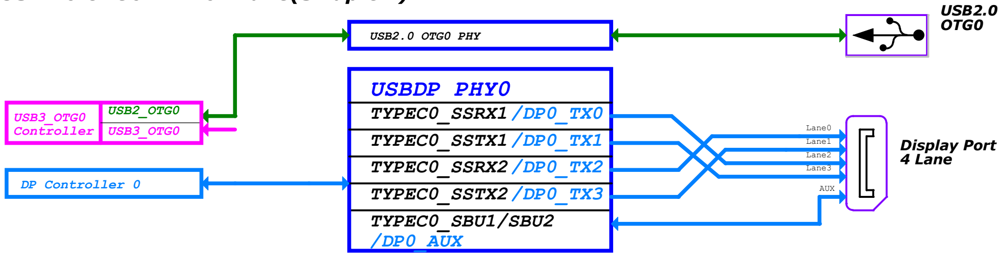
Config1:
USB2.0 OTG0 + DP0 4Lane(Swap OFF)

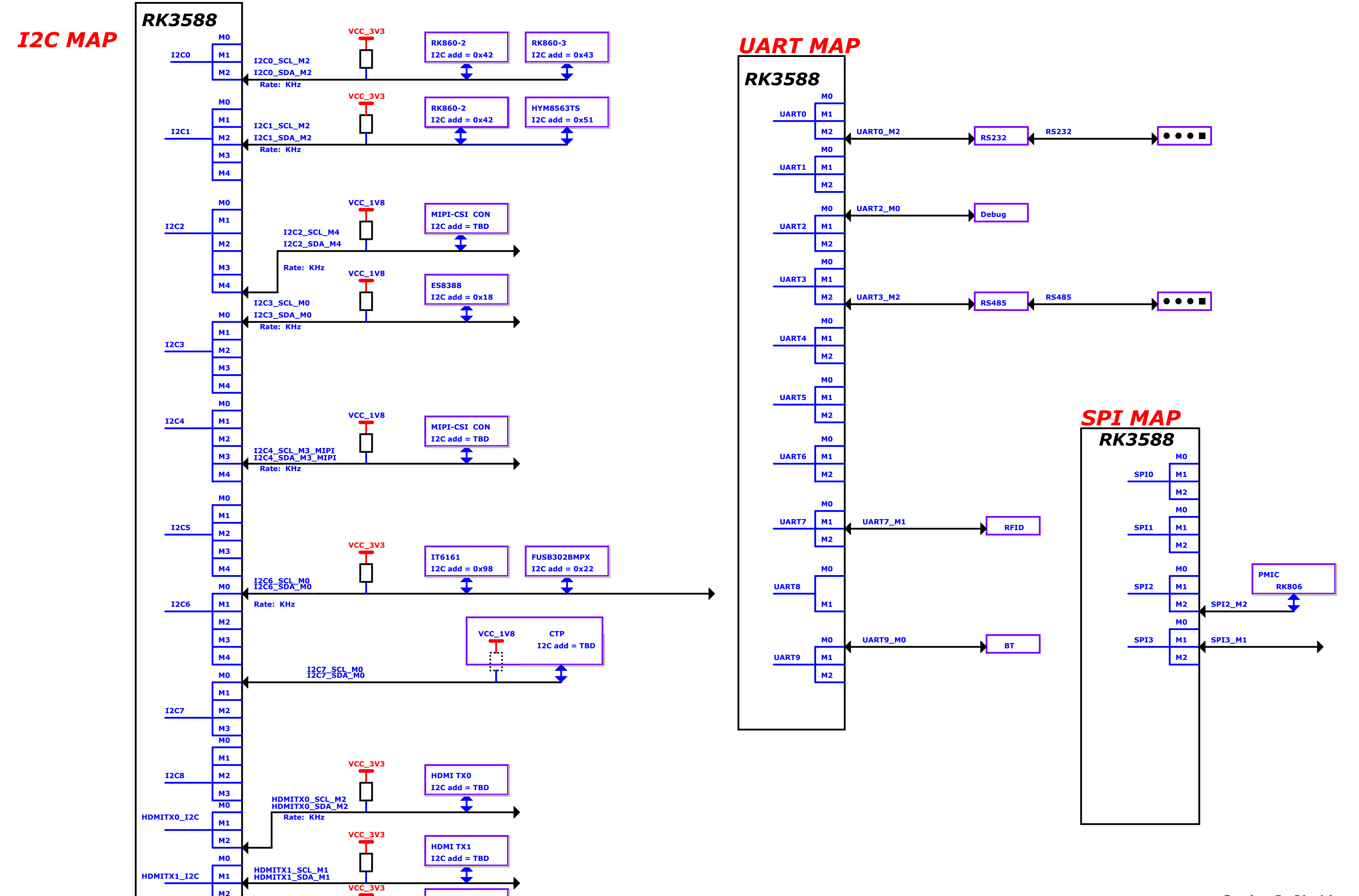


Config4:
USB3.0 OTG0 + DP0 2Lane(Swap OFF)



Config2:
USB2.0 OTG0 + DP0 4Lane(Swap ON)





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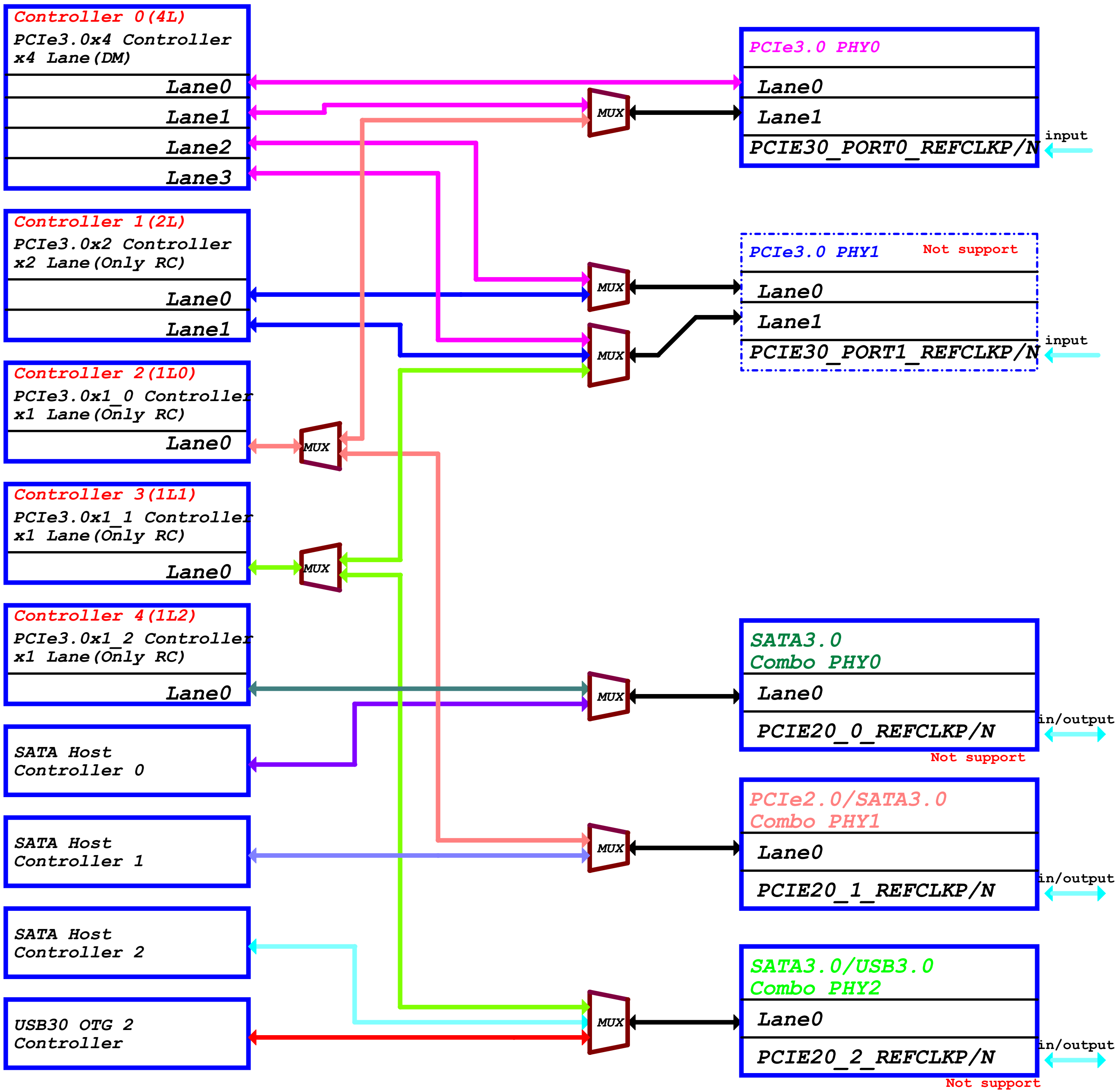
Date: Friday, July 19, 2024		Sheet 4 of 23	

PCIe/SATA Connecter Diagram



PCIe Controller Configure Table

Controller Name	Data & Clk Lane Configure			Control GPIO & Power Pin
	OPTION	CLK LANE	DATA LANE	
PCIE30X4 RC & EP	OPTION1	PCIE30_PORT0_REF_CLKP PCIE30_PORT0_REF_CLKN	PCIE30_PORT0_TX0 PCIE30_PORT0_RX0	PCIE30X4_CLKREQ_M* PCIE30X4_WAKEN_M* PCIE30X4_PERSTN_M* PCIE30X4_BUTTON_RSTN
	OPTION2	PCIE30_PORT0_REF_CLKP PCIE30_PORT0_REF_CLKN	PCIE30_PORT0_TX0 PCIE30_PORT0_RX0 PCIE30_PORT0_TX1 PCIE30_PORT0_RX1	
	OPTION3	PCIE30_PORT0_REF_CLKP PCIE30_PORT0_REF_CLKN PCIE30_PORT1_REF_CLKP PCIE30_PORT1_REF_CLKN	PCIE30_PORT0_TX0 PCIE30_PORT1_TX0 PCIE30_PORT0_RX0 PCIE30_PORT1_RX0 PCIE30_PORT0_TX1 PCIE30_PORT1_TX1 PCIE30_PORT0_RX1 PCIE30_PORT1_RX1	
PCIE30X2 RC	OPTION1	PCIE30_PORT1_REF_CLKP PCIE30_PORT1_REF_CLKN	PCIE30_PORT1_TX0 PCIE30_PORT1_RX0	PCIE30X2_CLKREQ_M* PCIE30X2_WAKEN_M* PCIE30X2_PERSTN_M* PCIE30X2_BUTTON_RSTN
	OPTION2	PCIE30_PORT1_REF_CLKP PCIE30_PORT1_REF_CLKN	PCIE30_PORT1_TX0 PCIE30_PORT1_RX0 PCIE30_PORT1_TX1 PCIE30_PORT1_RX1	
PCIE30X1_0 RC	OPTION1	PCIE30_PORT0_REF_CLKP PCIE30_PORT0_REF_CLKN	PCIE30_PORT0_TX1 PCIE30_PORT0_RX1	PCIE30X1_0_CLKREQ_M* PCIE30X1_0_WAKEN_M* PCIE30X1_0_PERSTN_M* PCIE30X1_0_BUTTON_RSTN
	OPTION2	PCIE20_1_REFCLKP PCIE20_1_REFCLKN	PCIE20_1_TXP PCIE20_1_RXP PCIE20_1_TXN PCIE20_1_RXN	
PCIE30X1_1 RC	OPTION1	PCIE30_PORT1_REF_CLKP PCIE30_PORT1_REF_CLKN	PCIE30_PORT1_TX1 PCIE30_PORT1_RX1	PCIE30X1_1_CLKREQ_M* PCIE30X1_1_WAKEN_M* PCIE30X1_1_PERSTN_M* PCIE30X1_1_BUTTON_RSTN
	OPTION2	PCIE20_2_REFCLKP PCIE20_2_REFCLKN	PCIE20_2_TXP PCIE20_2_RXP PCIE20_2_TXN PCIE20_2_RXN	
PCIE20X1_2 RC	OPTION1	PCIE20_0_REFCLKP PCIE20_0_REFCLKN	PCIE20_0_TXP PCIE20_0_RXP PCIE20_0_TXN PCIE20_0_RXN	PCIE20X1_2_CLKREQ_M* PCIE20X1_2_WAKEN_M* PCIE20X1_2_PERSTN_M* PCIE20X1_2_BUTTON_RSTN

Note:
PCIE30_PORT*_REF_CLKP/N is input gpio

PCIE20_*_REFCLKP/N is output or input gpio

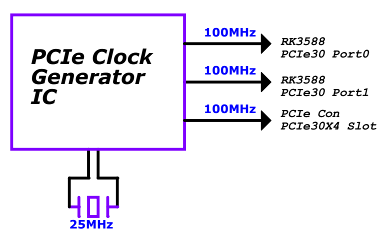
Note:
M*=Mean to M0 or M1,It's the same source,Just multiplex to M0 or M1, So,Only use one at the same time.

PCIe/SATA Function Combination

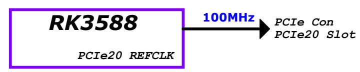
Function Combination

Function / Item	PCIEX4	PCIEX2	PCIEX1	SATA
Option1	1(DM)	0	3(RC)	0
Option2	1(DM)	0	2(RC)	1
Option3	1(DM)	0	1(RC)	2
Option4	1(DM)	0	0	3
Option5	0	1(DM)+1(RC)	3(RC)	0
Option6	0	1(DM)+1(RC)	2(RC)	1
Option7	0	1(DM)+1(RC)	1(RC)	2
Option8	0	1(DM)+1(RC)	0	3
Option9	0	1(DM)	4(RC)	1
Option10	0	1(DM)	3(RC)	2
Option11	0	1(DM)	2(RC)	3
Option12	0	0	1(DM)+4(RC)	2
Option13	0	0	1(DM)+3(RC)	3

PCIe3.0 REFCLK



PCIe2.0 REFCLK



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Title	PCIE Fun Map		
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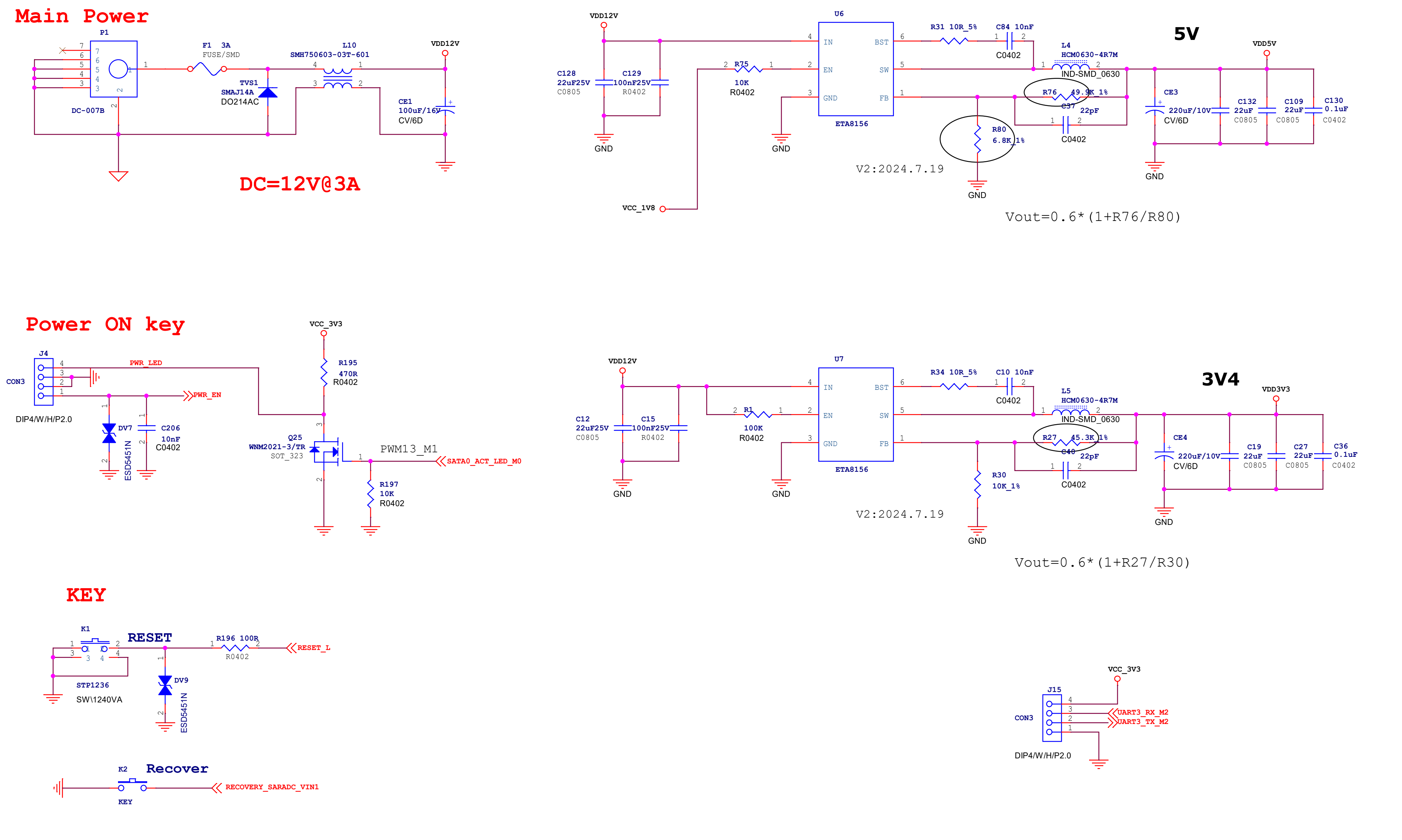
Date: Friday, July 19, 2024		Sheet 5 of 23	



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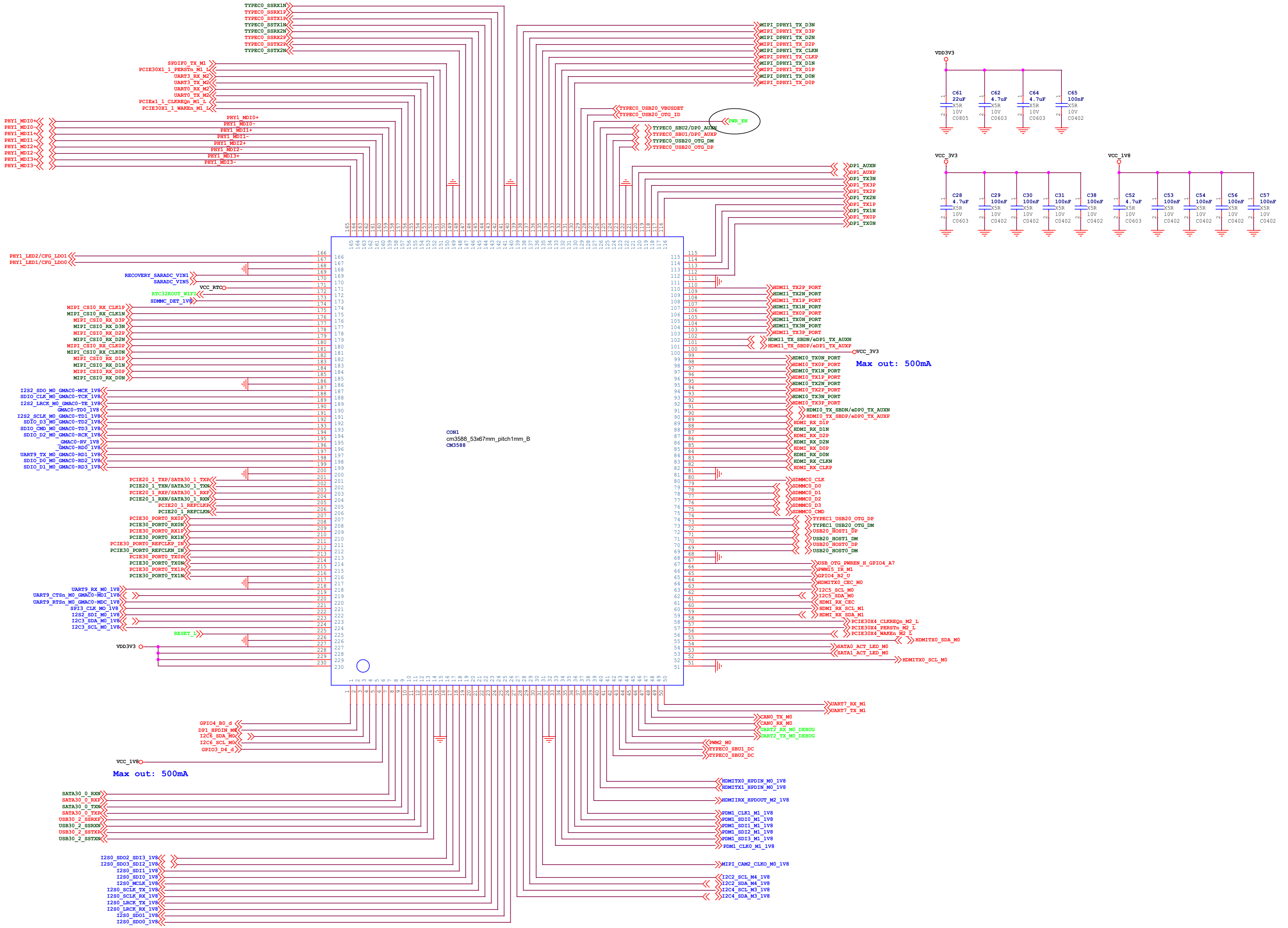
Title	Power/KEY/IR		
Size: Custom	Document Number: SBC3588	Drawn: yhg	Rev: 2
Date: Saturday, July 20, 2024		Sheet 6 of 23	



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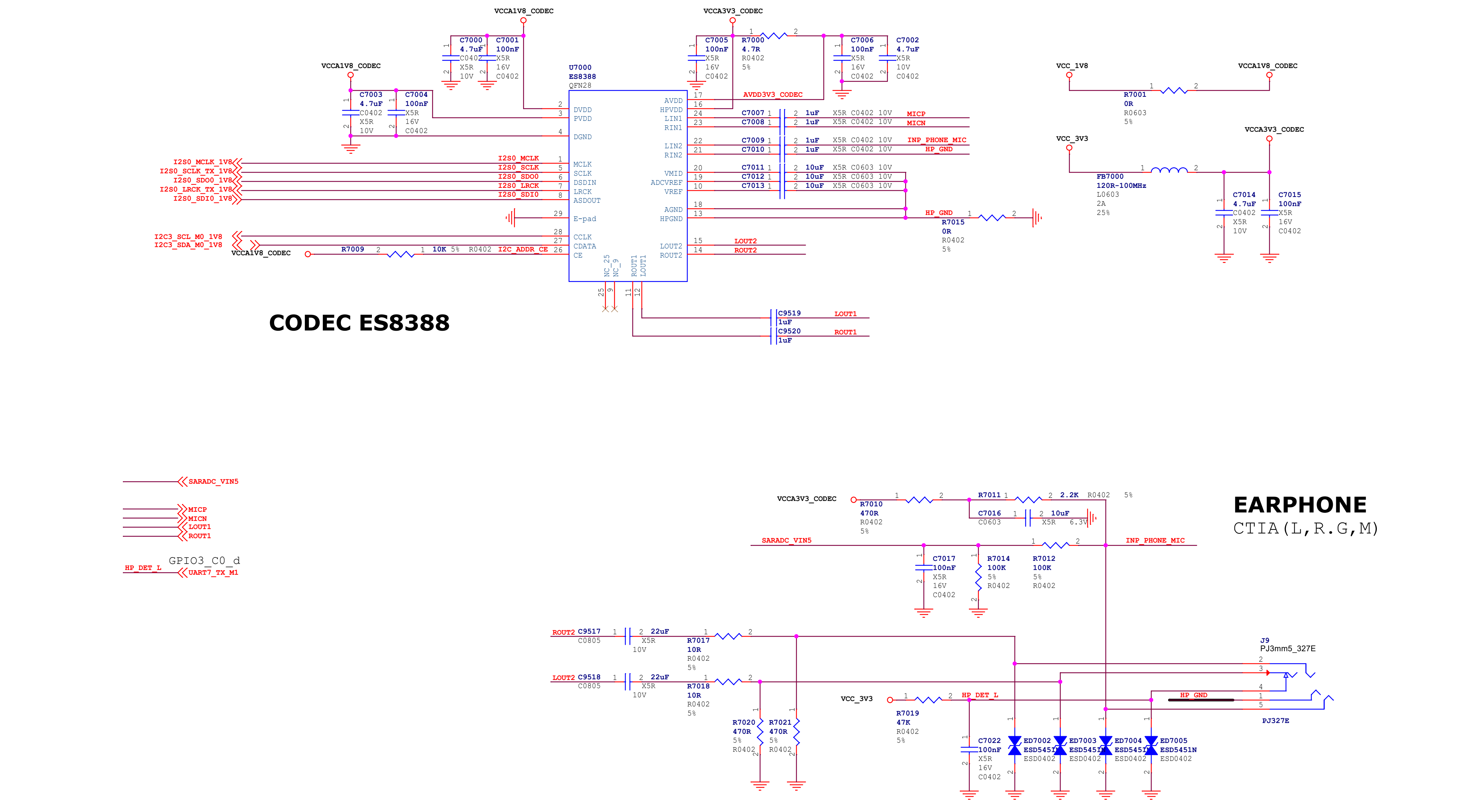
Title	SOM Interface		
Size A2	Document Number SBC3588	Drawn yhg	Rev 2
Date: Friday, July 19, 2024		Sheet 7 of 23	



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Title: Audio Codec/SPDIFO			
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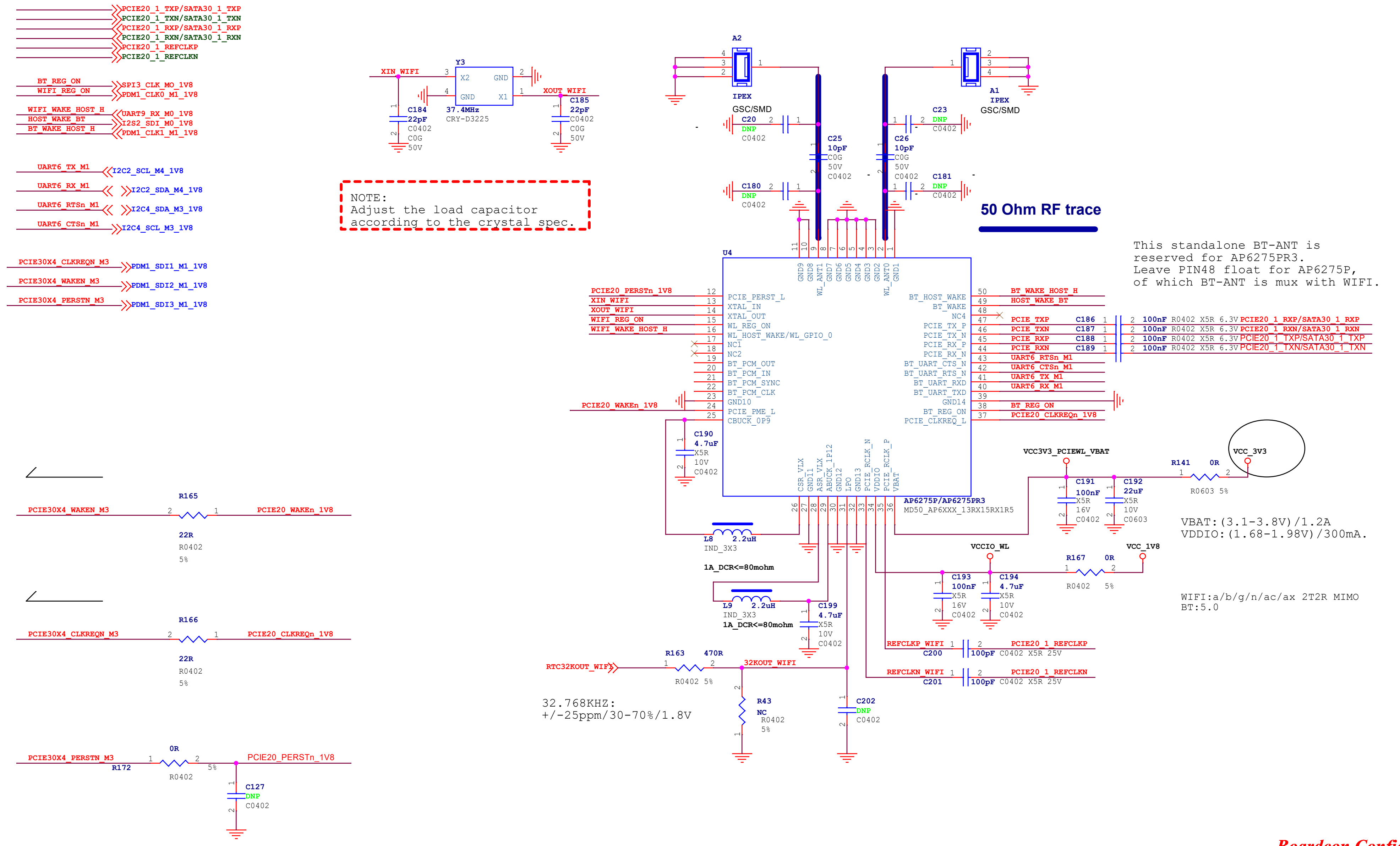
Date: Friday, July 19, 2024		Sheet 8 of 23	

PCIe WIFI6/BT Module-2T2R



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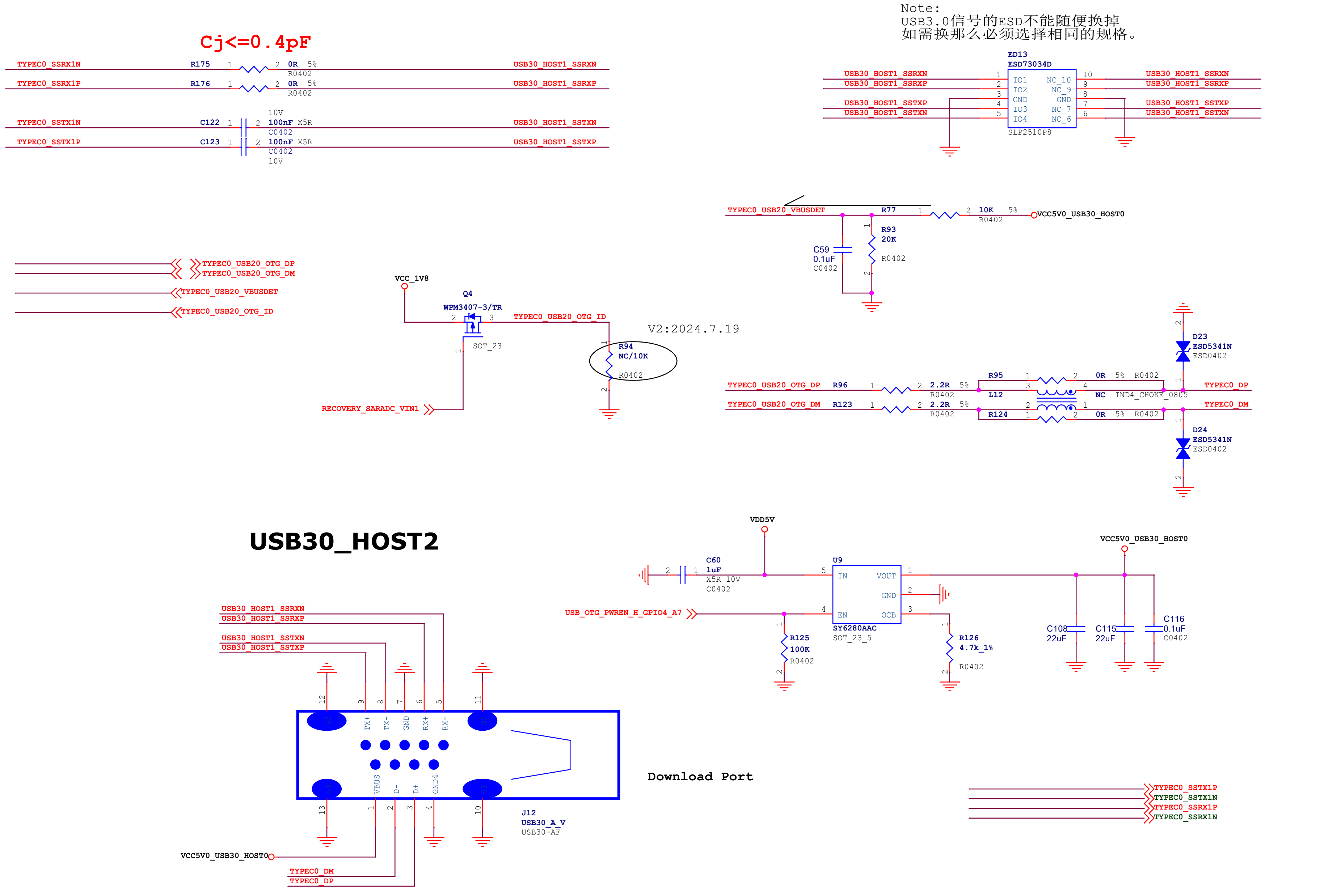
Title: WIFI/BT-PCIE_2T2R			
Size: A3	Document Number: SBC3588	Drawn: yhg	Rev: 2
Date: Friday, July 19, 2024		Sheet 9 of 23	



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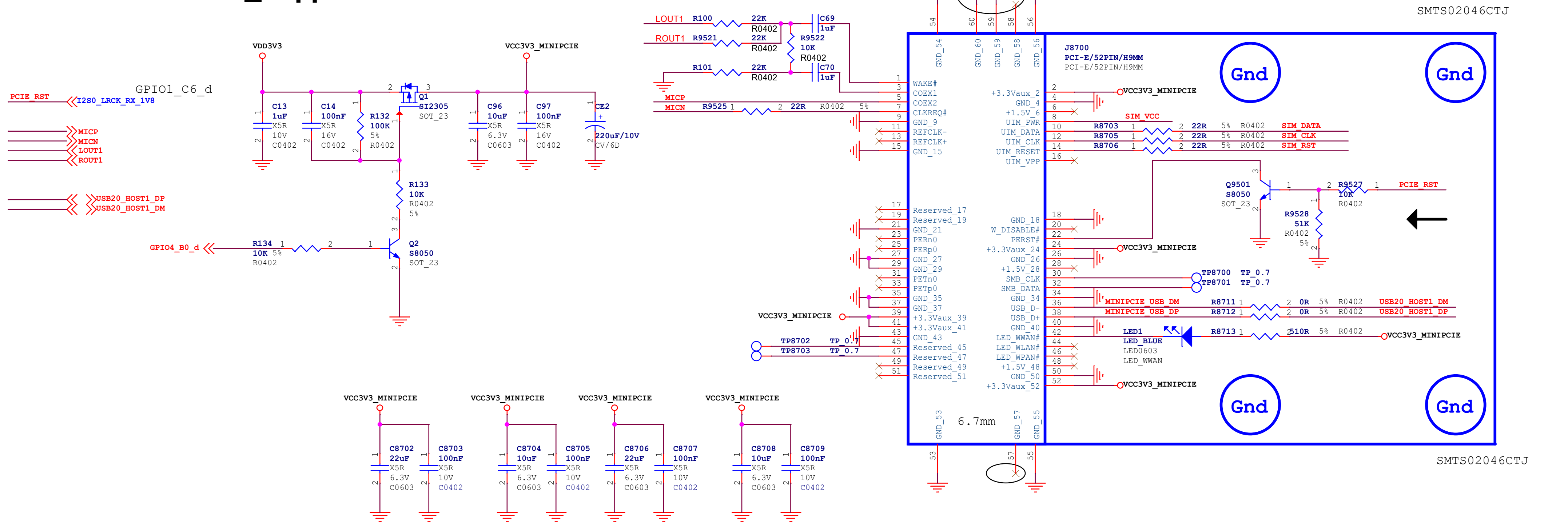
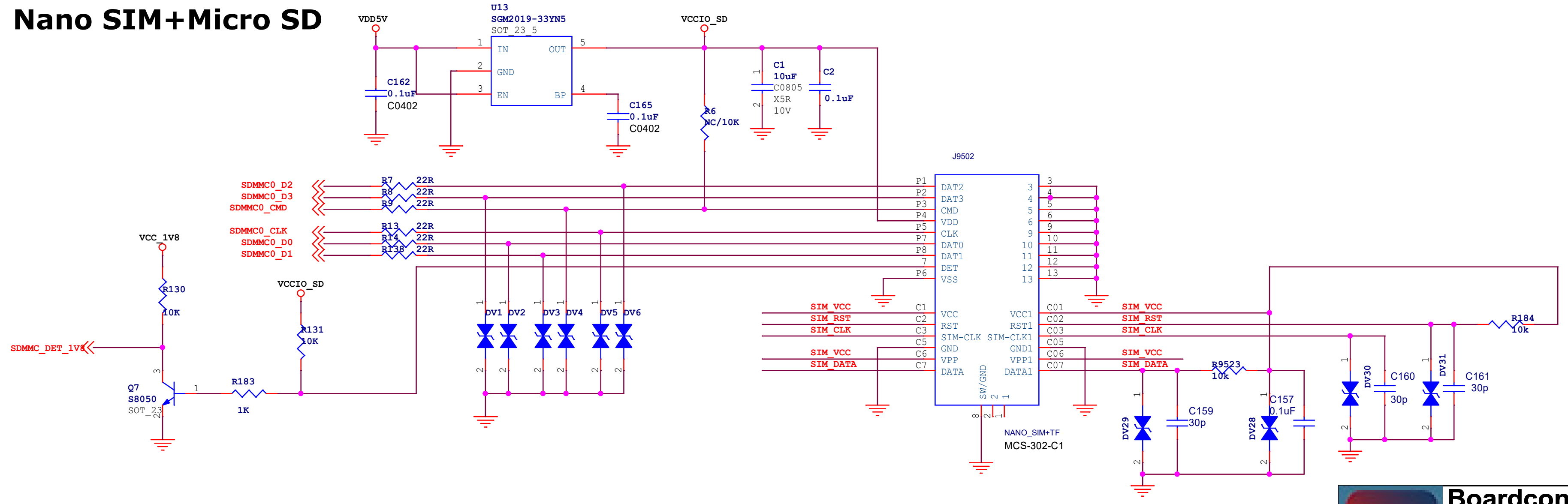
Size A3	Document Number **SBC3588**	Drawn yhg	Rev 2
Date: Friday, July 19, 2024		Sheet 10 of 23	

MiniPCIe2.0 Slot_Support 4G module



Nano SIM+Micro SD



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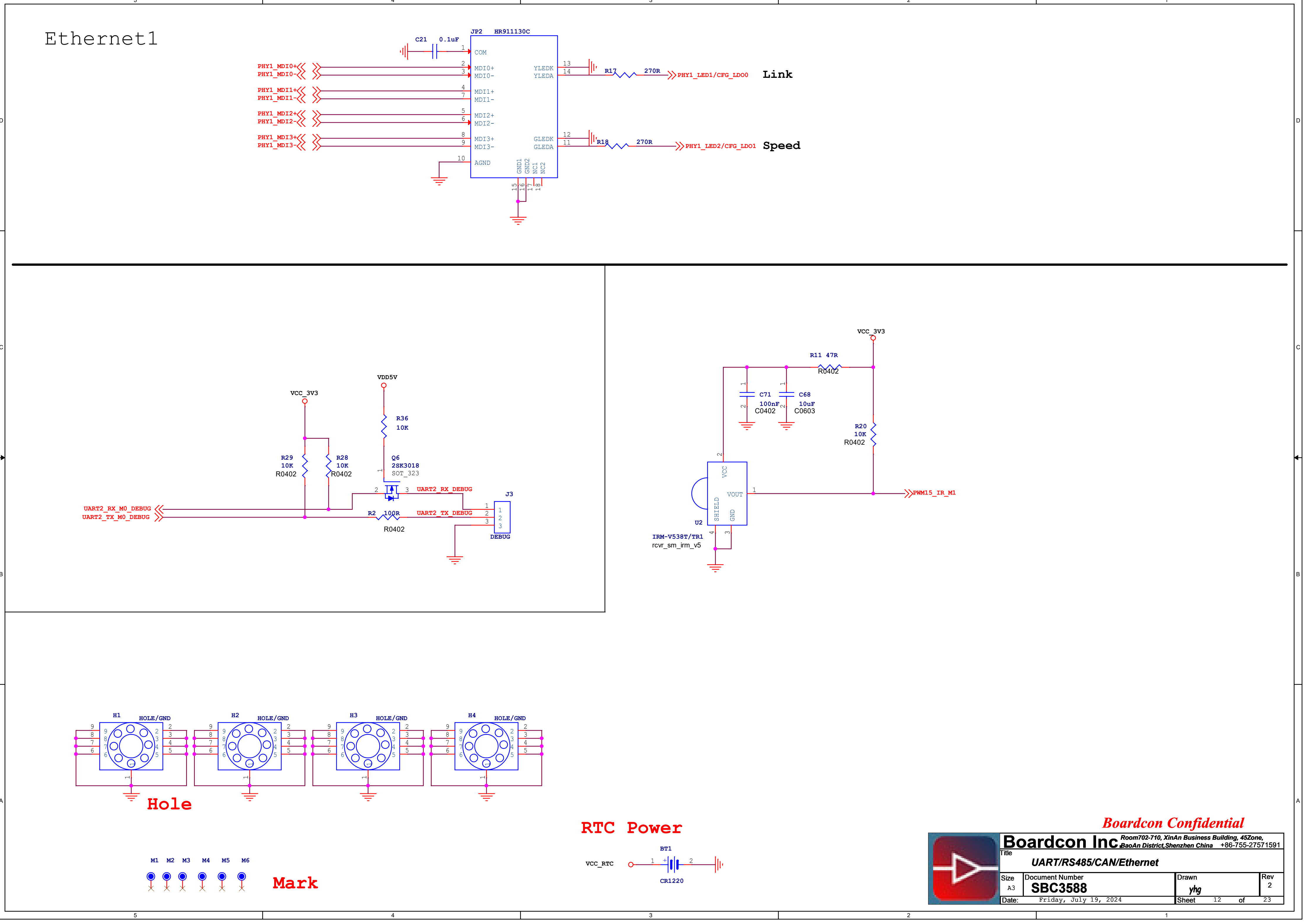
Size A3	Document Number SBC3588	Drawn yhg	Rev 2
Date: Friday, July 19, 2024		Sheet 11 of 23	



Ethernet1
C21 0.1uF
JP2 HR911130C
COM
MDI0+
MDI0-
MDI1+
MDI1-
MDI2+
MDI2-
MDI3+
MDI3-
AGND
YLEDK
YLEDA
GLEDK
GLEDA
GND1 GND2 NC1 NC2
PHY1_MDI0+
PHY1_MDI0-
PHY1_MDI1+
PHY1_MDI1-
PHY1_MDI2+
PHY1_MDI2-
PHY1_MDI3+
PHY1_MDI3-
R17 270R
PHY1_LED1/CFG_LDO0
Link
R18 270R
PHY1_LED2/CFG_LDO1
Speed
VCC_3V3
VDD5V
R36 10K
R29 10K R0402
R28 10K R0402
Q6 2SK3018 SOT_323
UART2_RX_DEBUG
UART2_TX_DEBUG
UART2_RX_M0_DEBUG
UART2_TX_M0_DEBUG
R2 100R R0402
J3
DEBUG
VCC_3V3
R11 47R R0402
C71 100nF C0402
C68 10uF C0603
R20 10K R0402
VCC
VOUT
SHIELD
GND
U2
IRM-V538T/TR1
rcvr_sm_irm_v5
PWM15_IR_M1
H1 HOLE/GND
H2 HOLE/GND
H3 HOLE/GND
H4 HOLE/GND
Hole
RTC Power
BT1
VCC_RTC
CR1220
M1 M2 M3 M4 M5 M6
Mark
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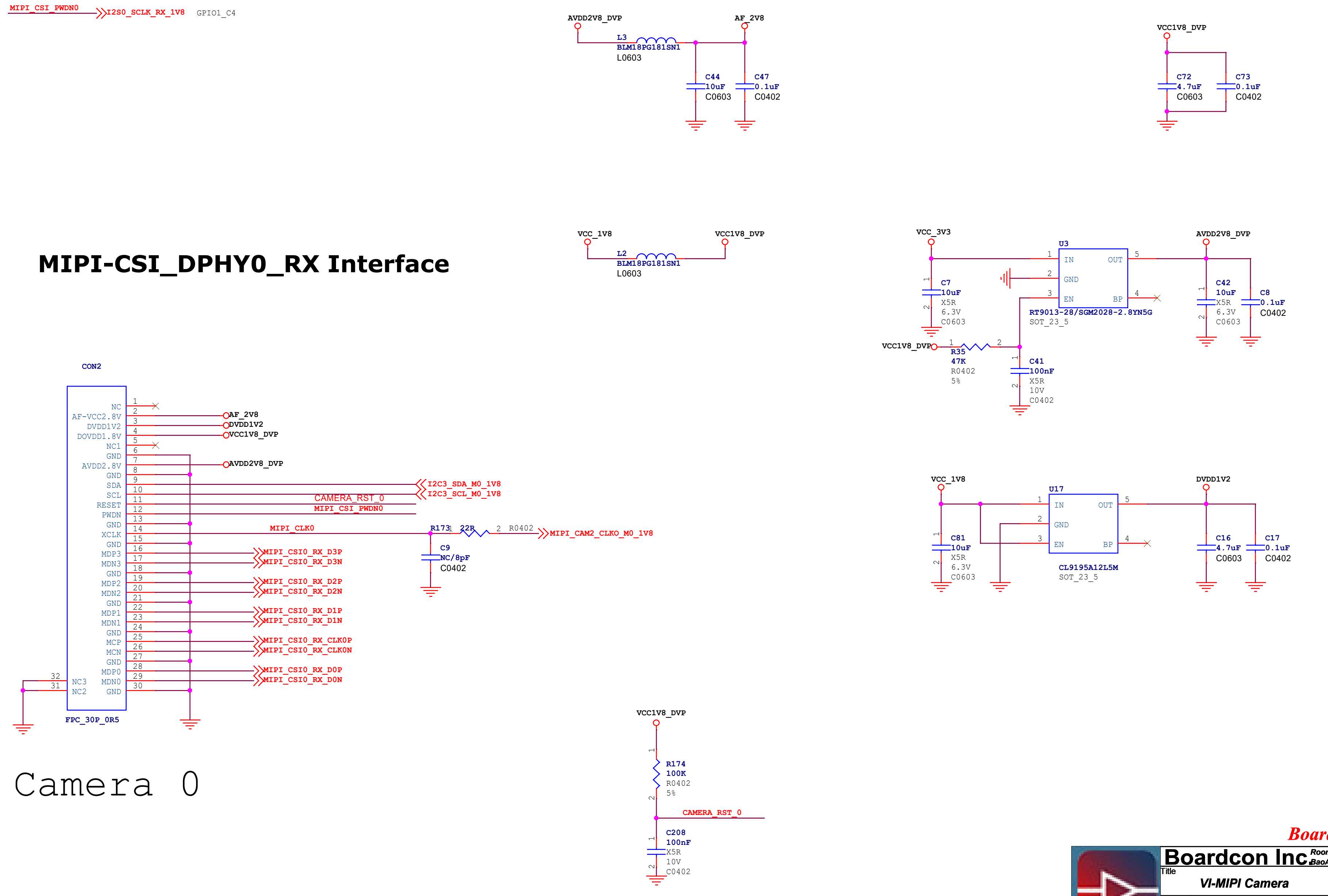
Title
UART/RS485/CAN/Ethernet
Size A3
Document Number SBC3588
Drawn yhg
Rev 2
Date: Friday, July 19, 2024
Sheet 12 of 23

MIPI Camera

MIPI-CSI_DPHY0_RX Interface



Camera 0

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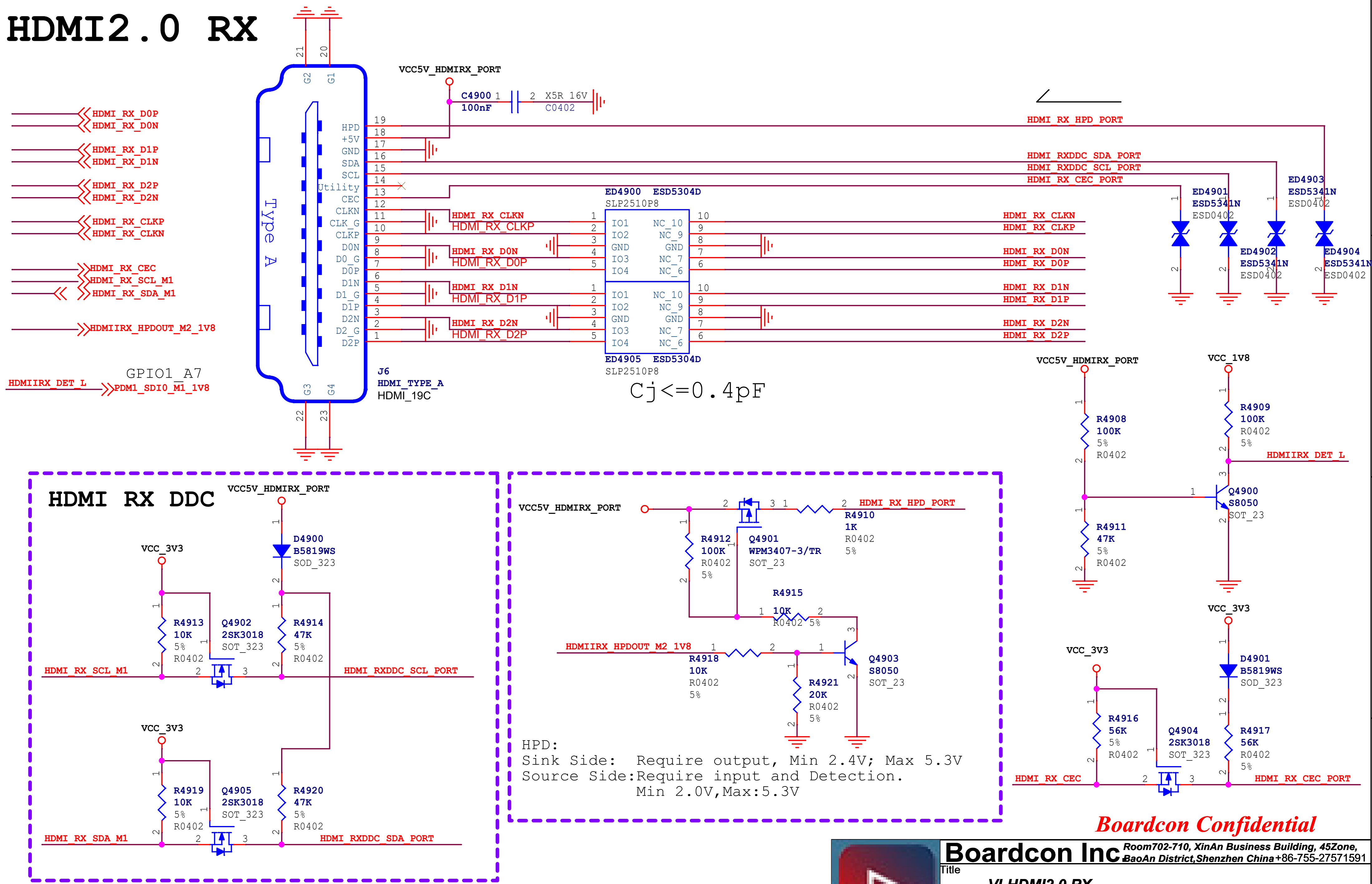
Title	VI-MIPI Camera		
Size A3	Document Number SBC3588	Drawn yhg	Rev 2
Date: Friday, July 19, 2024		Sheet 13 of 23	

HDMI2.0 RX



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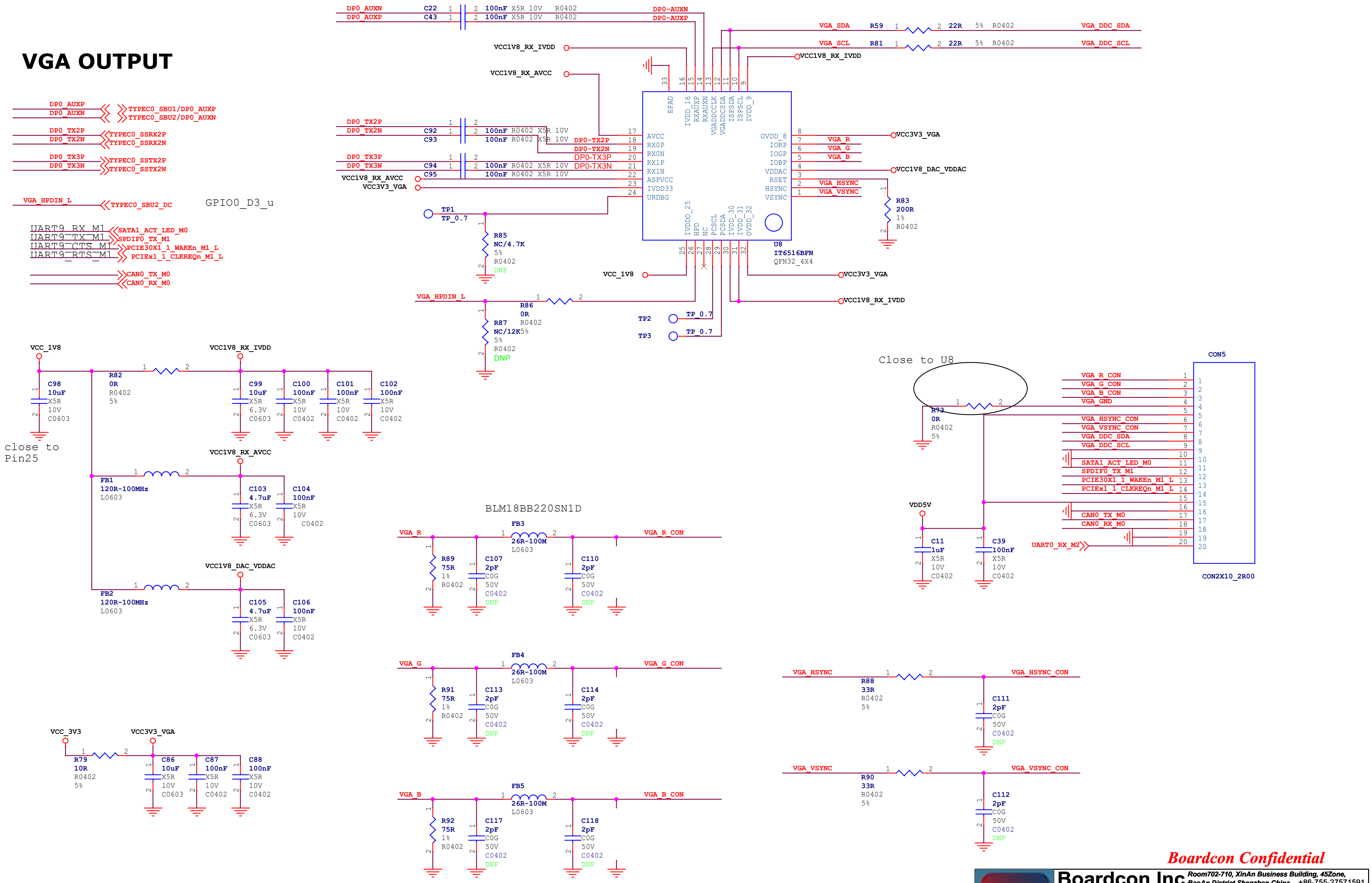
Title	VI-HDMI2.0 RX		
Size A4	Document Number SBC3588	Drawn yhg	Rev 2
Date: Friday, July 19, 2024		Sheet 14 of 23	

VGA OUTPUT



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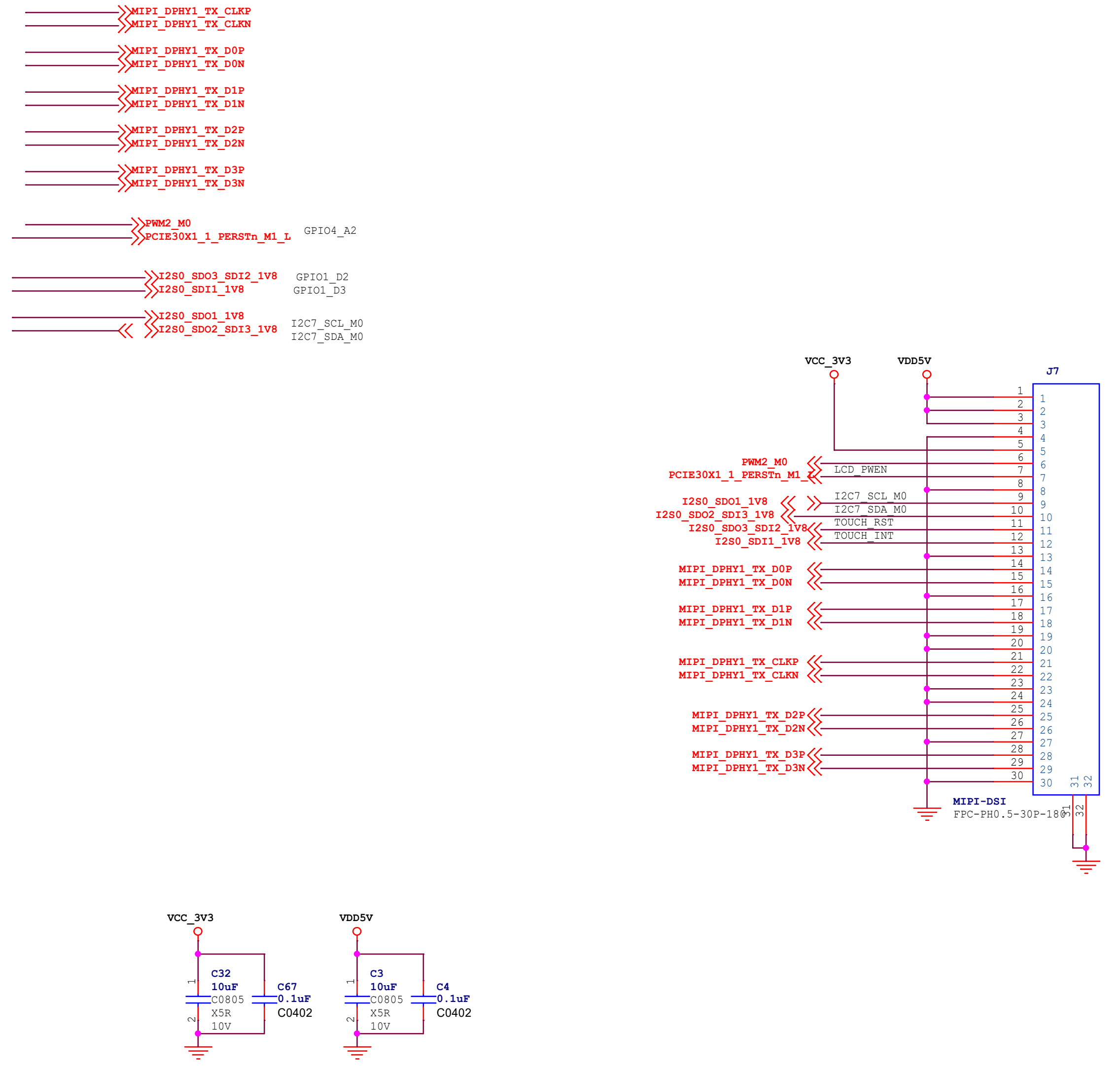
Title	VO-VGA Output		
Size A3	Document Number SBC3588	Drawn yhg	Rev 2
Date: Friday, July 19, 2024		Sheet 15 of 23	



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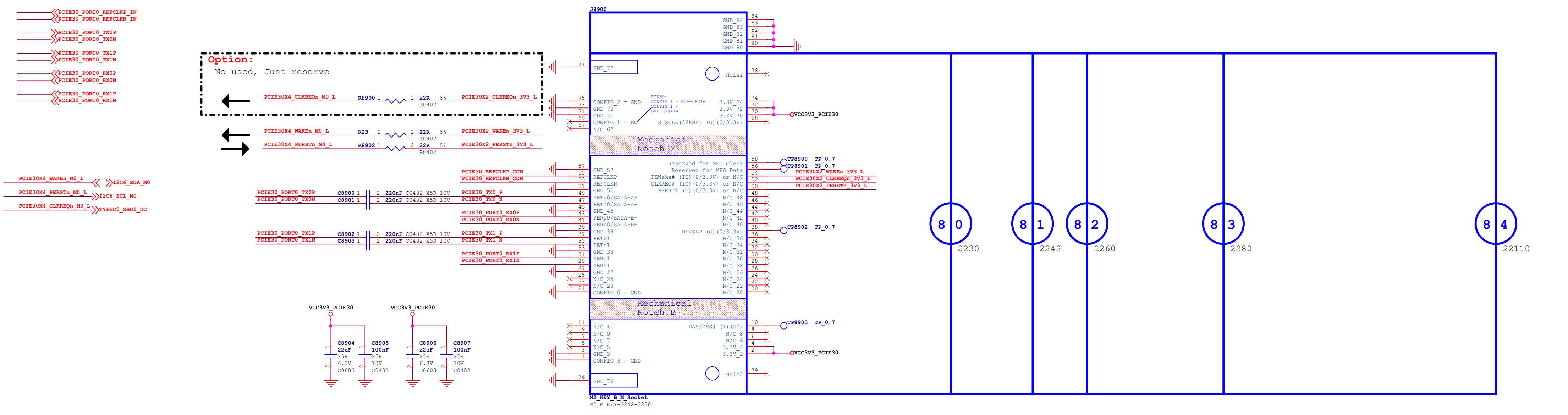
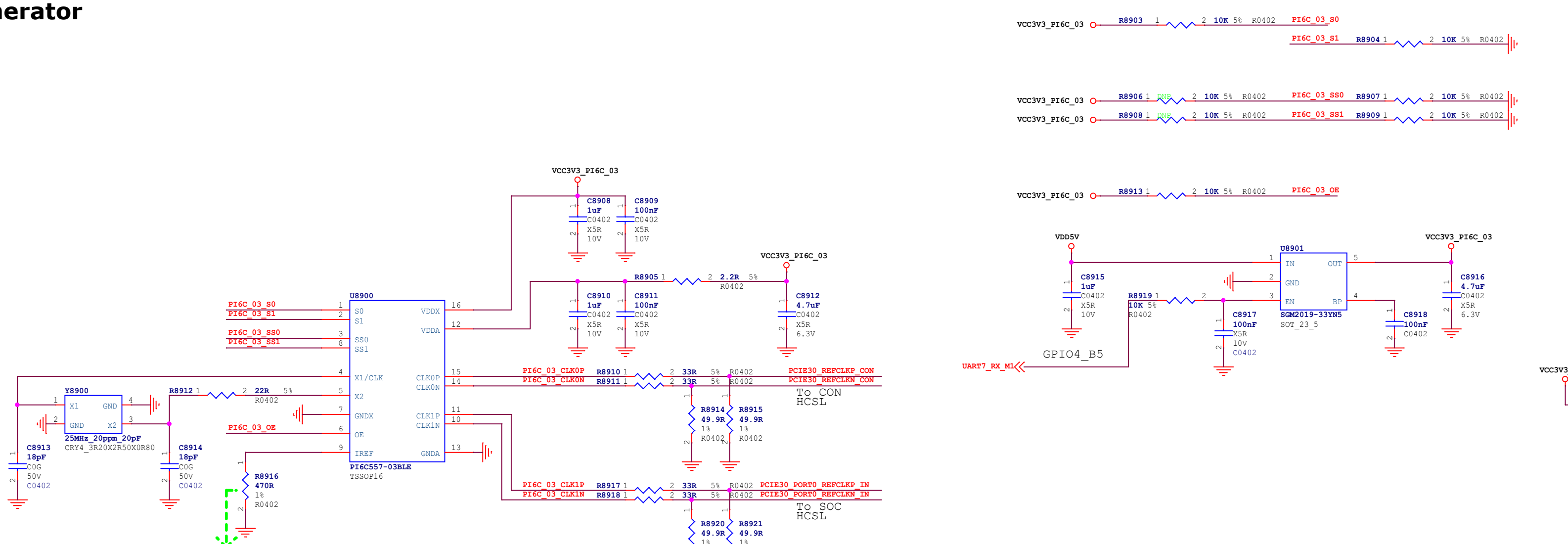
Size A3	Document Number SBC3588	Drawn yhg	Rev 2
Date: Friday, July 19, 2024		Sheet 16 of 23	

M.2_PCIe3.0 x 2Lanes

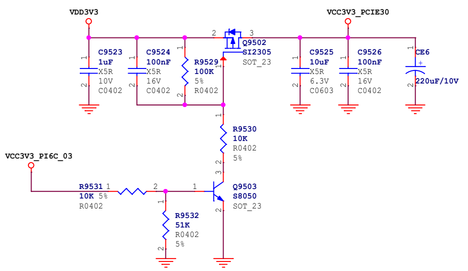


Crystal Generator



PI6C_S1	PI6C_S0	Out Freq
0	1	100MHz

PI6C_SS1	PI6C_SS0	Spread %
0	0	No Spread
0	1	-0.5
1	0	-1.0
1	1	No Spread



If board target trace impedance is 50ohm
then R = 475ohm providing an IREF of 2.32 mA .
The output current (IOH) is 6 * IREF .
6x2.32X50=696mV

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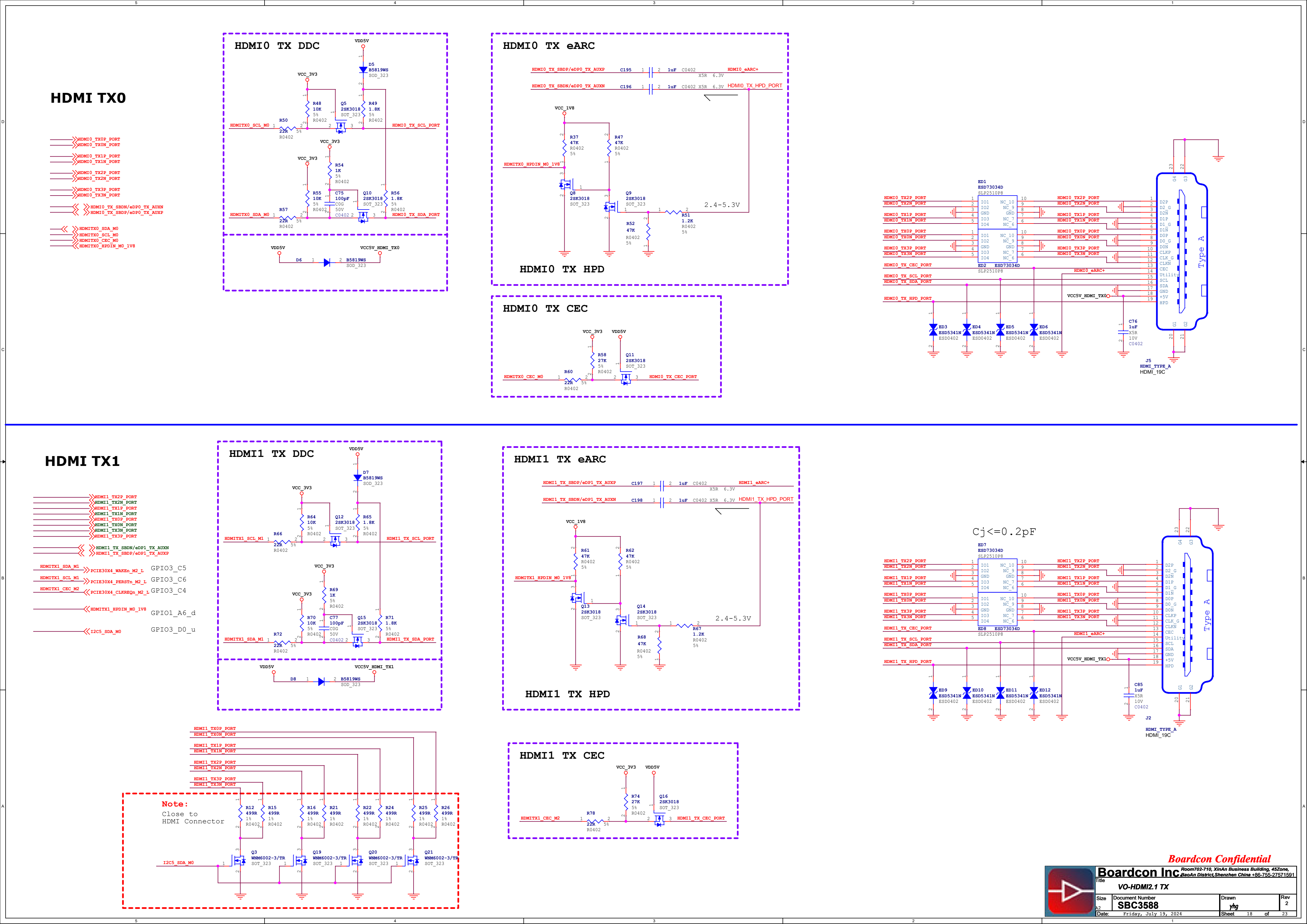
Title: PCIE-M.2/SATA

Size: A2 | Document Number: SBC3588 | Drawn: yhg | Rev: 2

Date: Friday, July 19, 2024 | Sheet 17 of 23


HDMI TX0
HDMI0 TX DDC
HDMI0 TX eARC
HDMI0 TX HPD
HDMI0 TX CEC
2.4-5.3V
Type A
HDMI TX1
HDMI1 TX DDC
HDMI1 TX eARC
HDMI1 TX HPD
HDMI1 TX CEC
Cj<=0.2pF
GPIO3_C5
GPIO3_C6
GPIO3_C4
GPIO1_A6_d
GPIO3_D0_u
Note:
Close to
HDMI Connector
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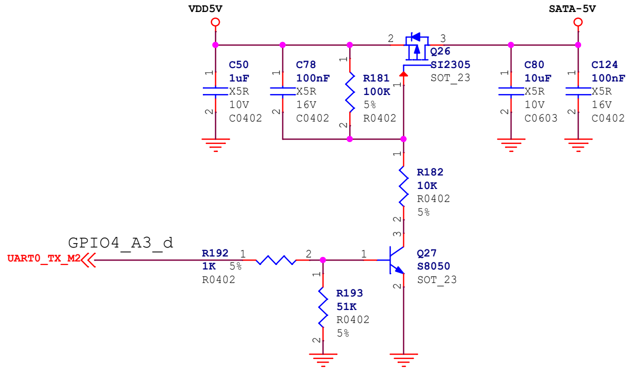
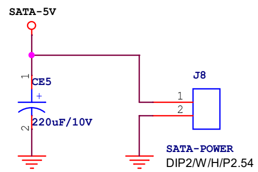
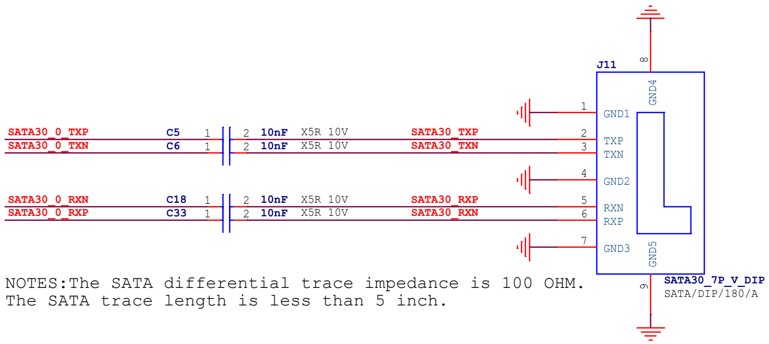
Title
VO-HDMI2.1 TX
Size
Document Number
SBC3588
Drawn
yhg
Rev
2
Date: Friday, July 19, 2024
Sheet 18 of 23

SATA



SATA POWER





NOTES:The SATA differential trace impedance is 100 OHM.
The SATA trace length is less than 5 inch.

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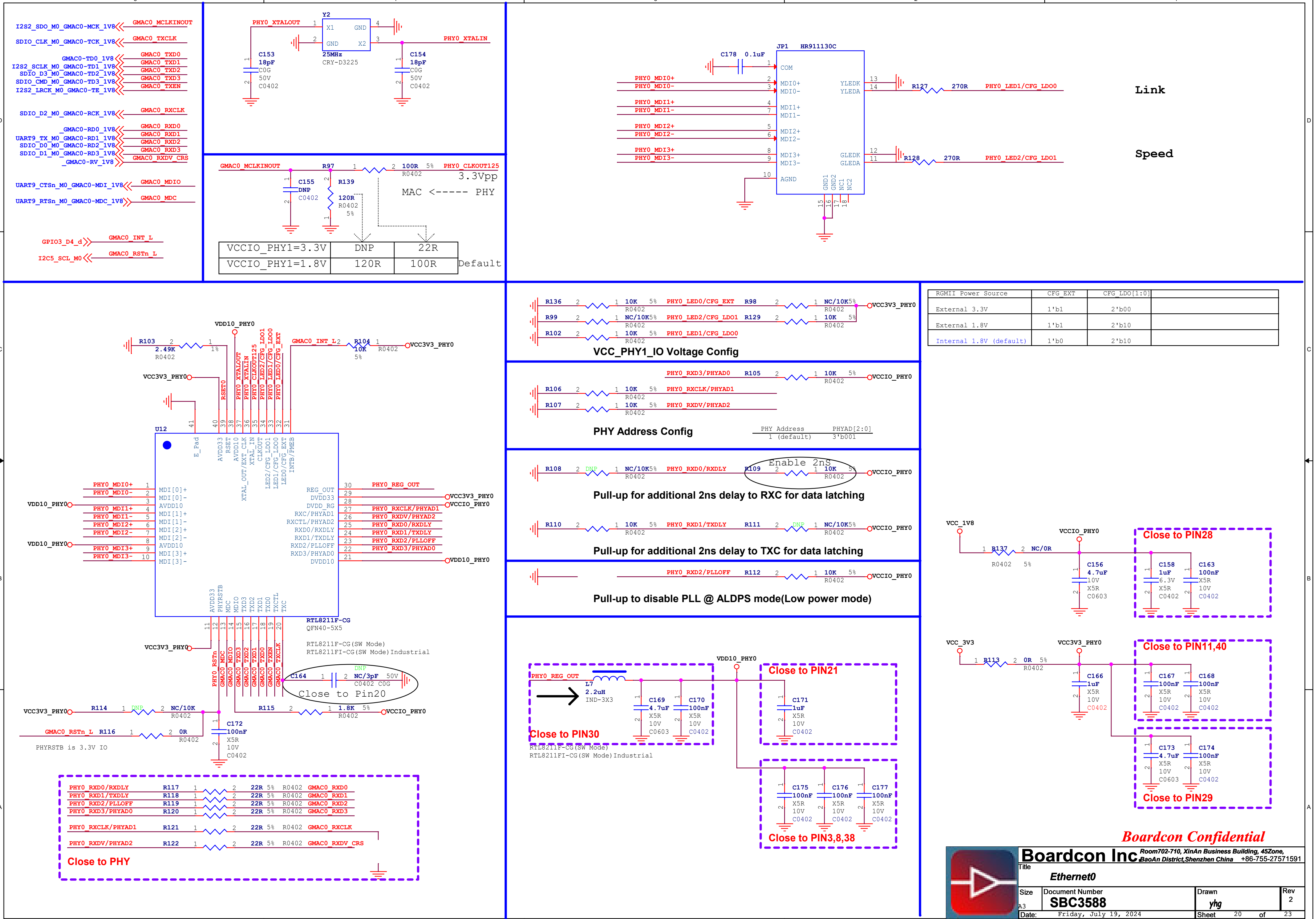
Title	SATA3.0		
Size A3	Document Number SBC3588	Drawn yhg	Rev 2
Date:	Friday, July 19, 2024	Sheet 19 of 23	



RGMII Power Source	CFG_EXT	CFG_LDO[1:0]
External 3.3V	1'b1	2'b00
External 1.8V	1'b1	2'b10
Internal 1.8V (default)	1'b0	2'b10

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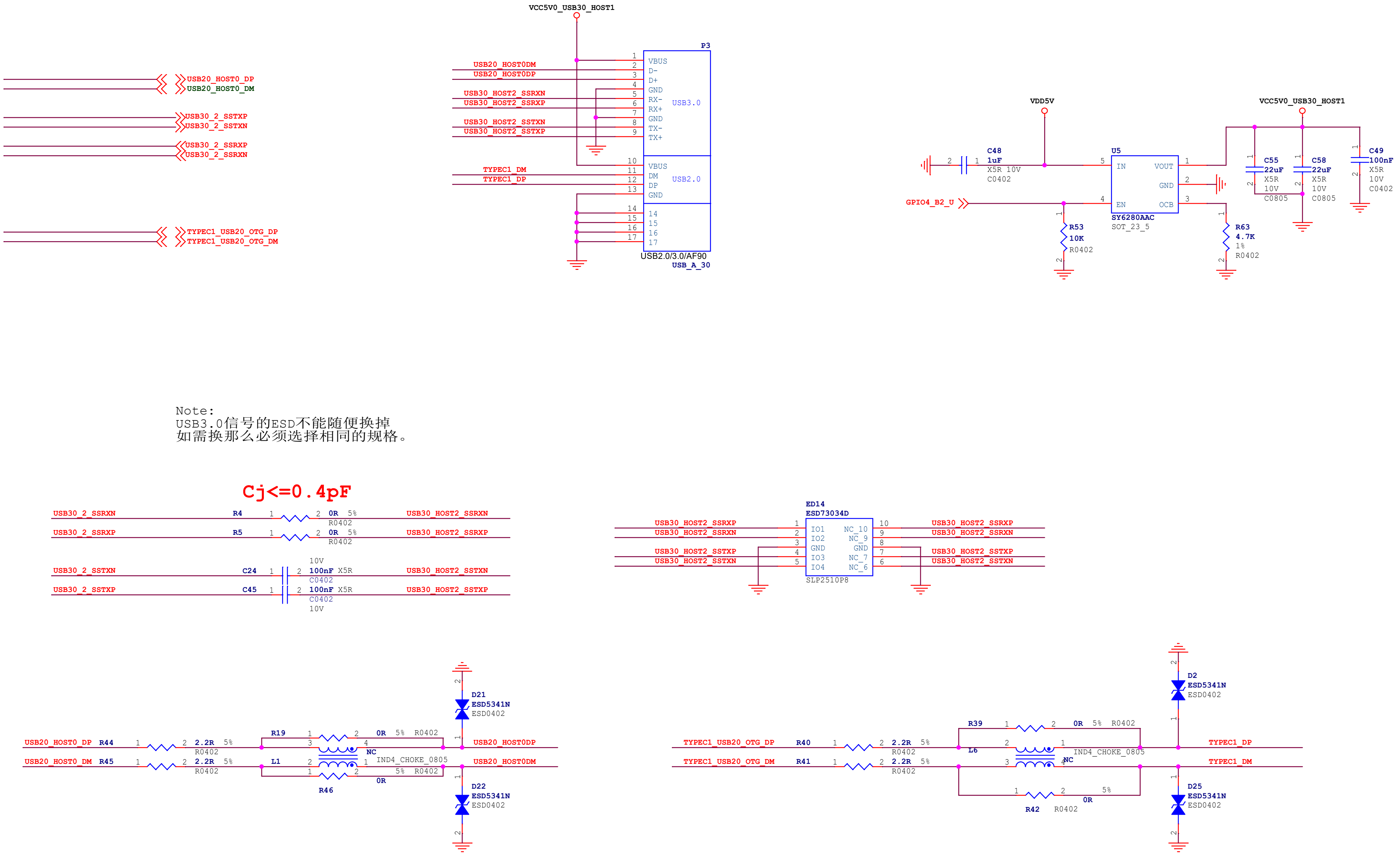
Title	Ethernet0		
Size A3	Document Number SBC3588	Drawn yhg	Rev 2
Date: Friday, July 19, 2024		Sheet 20 of 23	

USB30+USB2.0



Note:
USB3.0信号的ESD不能随便换掉
如需换那么必须选择相同的规格。

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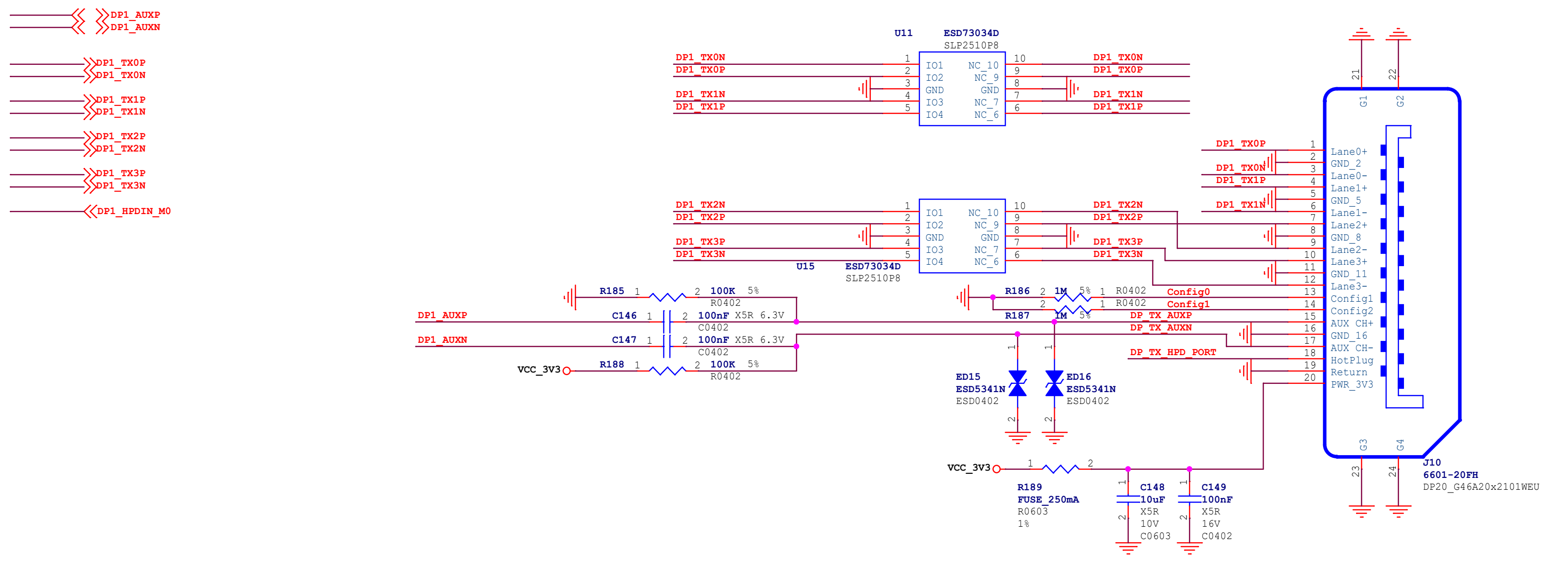
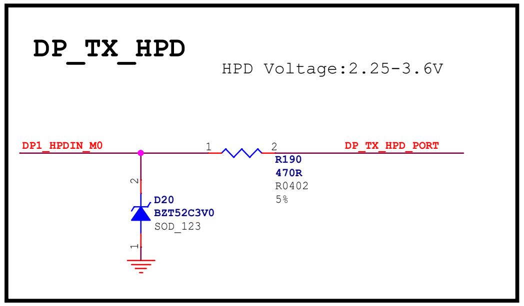
Title: USB3.0/USB2.0

Size	Document Number	Drawn	Rev
A3	SBC3588	yhg	2

Date: Friday, July 19, 2024 Sheet 21 of 23

DisplayPort TX





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Title	VO-DP TX		
Size A3	Document Number SBC3588	Drawn yhg	Rev 2
Date: Friday, July 19, 2024		Sheet 22 of 23	