QSFP28 FPGA Mezzanine Card

Sheet Name(s)
[01] - Title Block
[02] - Block Diagram
[03] - FMCP_1&2
[04] - FMCP_3&4
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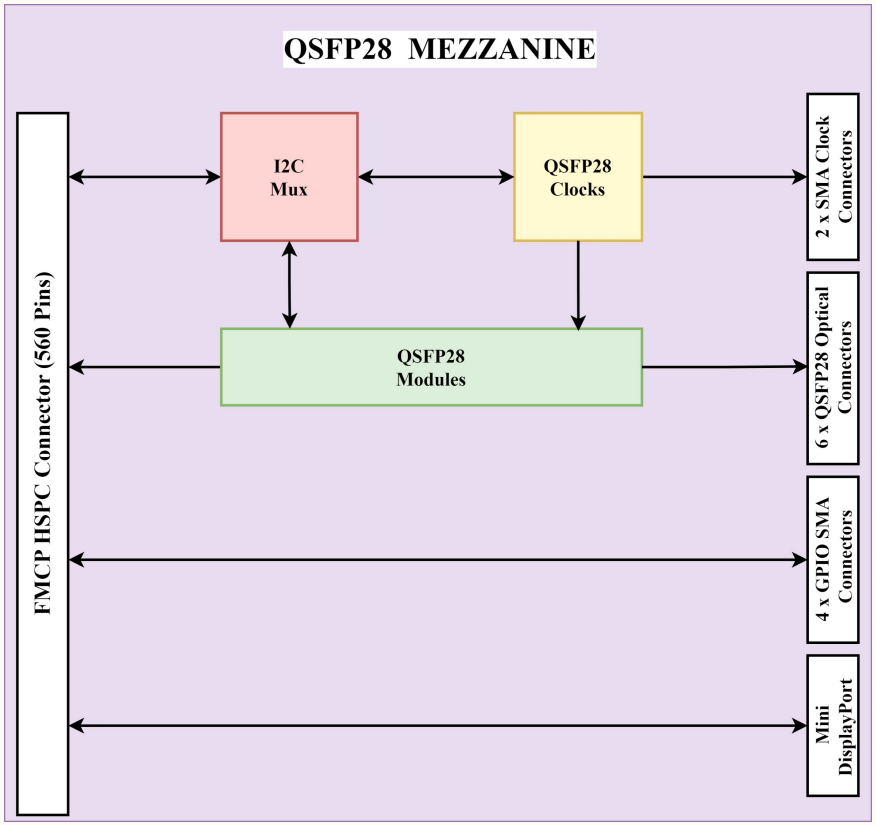
[09] - Mechanical

QSFP28 FPGA Mezzanine Card

Revision: 1.0

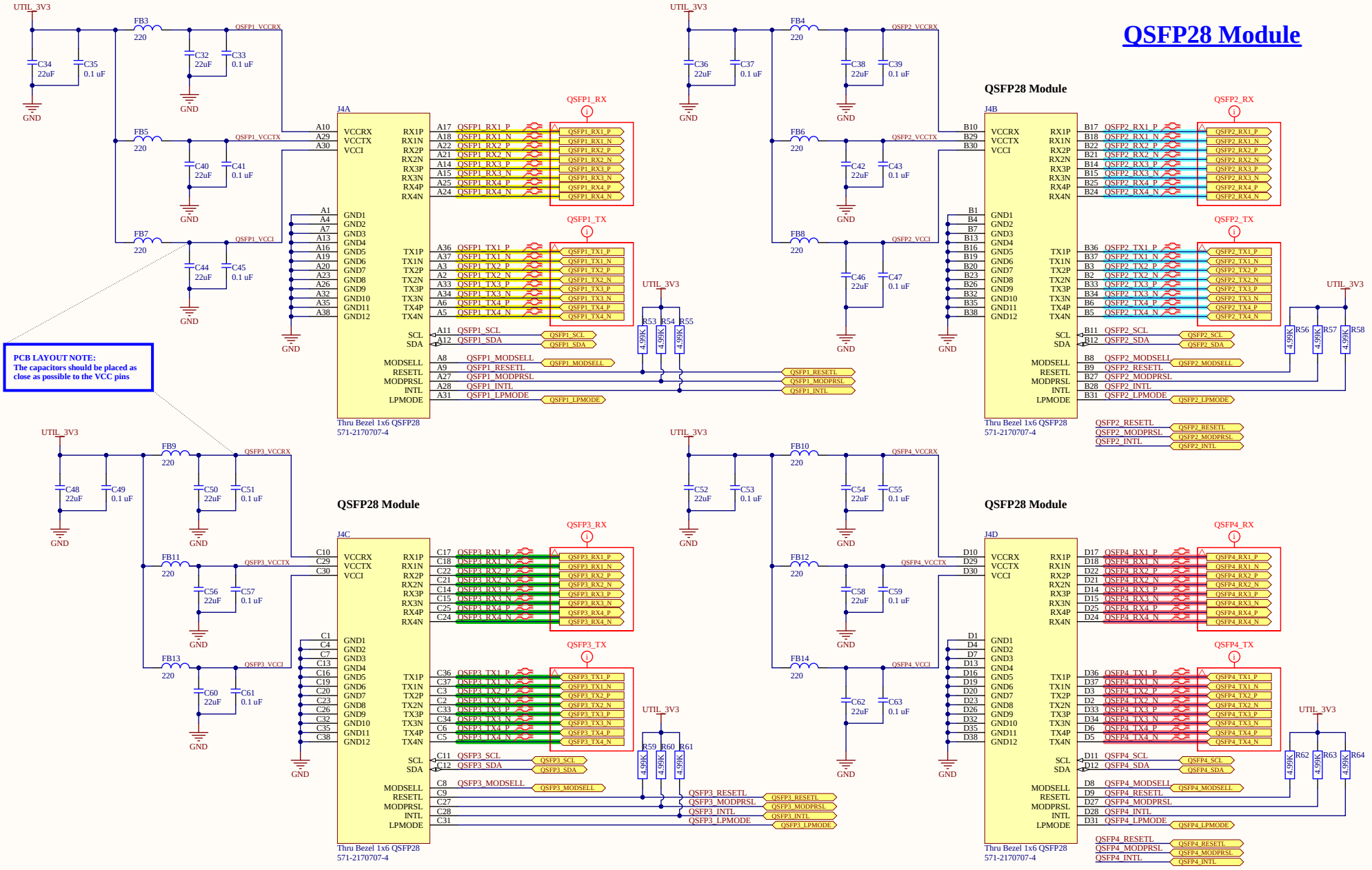
Project Title: *QSFP28 FPGA Mezzanine Card*			**Designed by:** Orcel Thys **Checked by:** *	
Sheet title: [01] - Title.SchDoc				
Size: *	**Number:** *	**Revision:** 0.1		
Date: 7/12/2024	**Time:** 11:55:25 AM	**Sheet:** 1 of 14	**BOM:** *	**Variant:** [No Variations]

Block Diagram



Project Title: *QSFP28 FPGA Mezzanine Card*			**Designed by:** Orcel Thys	
Sheet title: [02] - Block_Diagram.SchDoc			**Checked by:** *	
Size: *	**Number:** *	**Revision:** 0.1		
Date: 7/12/2024	**Time:** 11:55:25 AM	**Sheet:** 2 of 14	**BOM:** *	**Variant:** [No Variations]

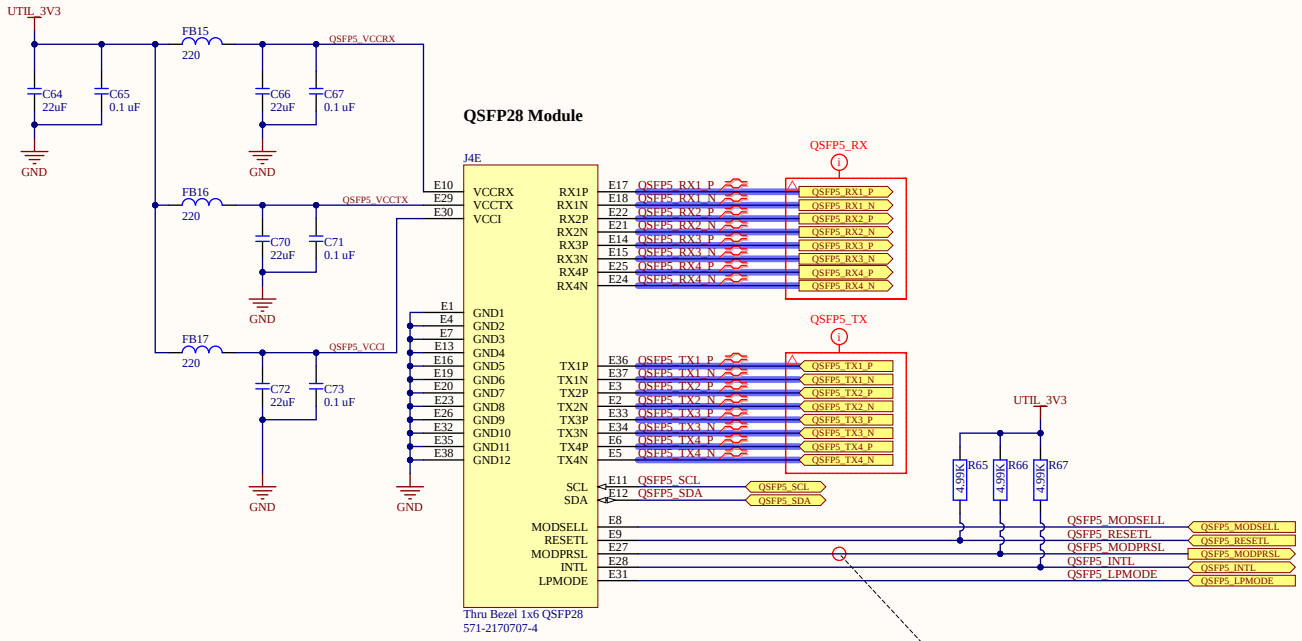
QSFP28 Module



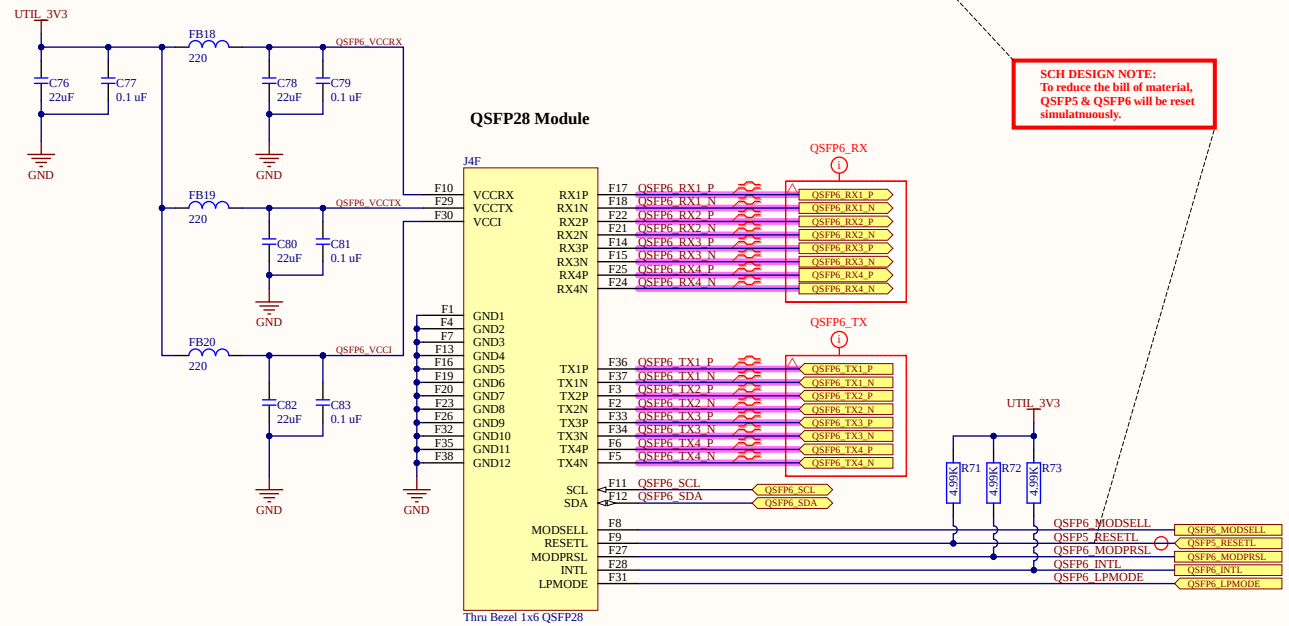
Project Title: *QSFP28 FPGA Mezzanine Card*				**Designed by:** Orcel Thys	
Sheet title: [07] - QSFP28_1.SchDoc				**Checked by:** *	
Size: *	**Number:** *	**Revision:** 0.1			
Date: 7/12/2024	**Time:** 11:55:26 AM	**Sheet:** 3 of 14	**BOM:** *	**Variant:** [No Variations]	

Voltage Translator

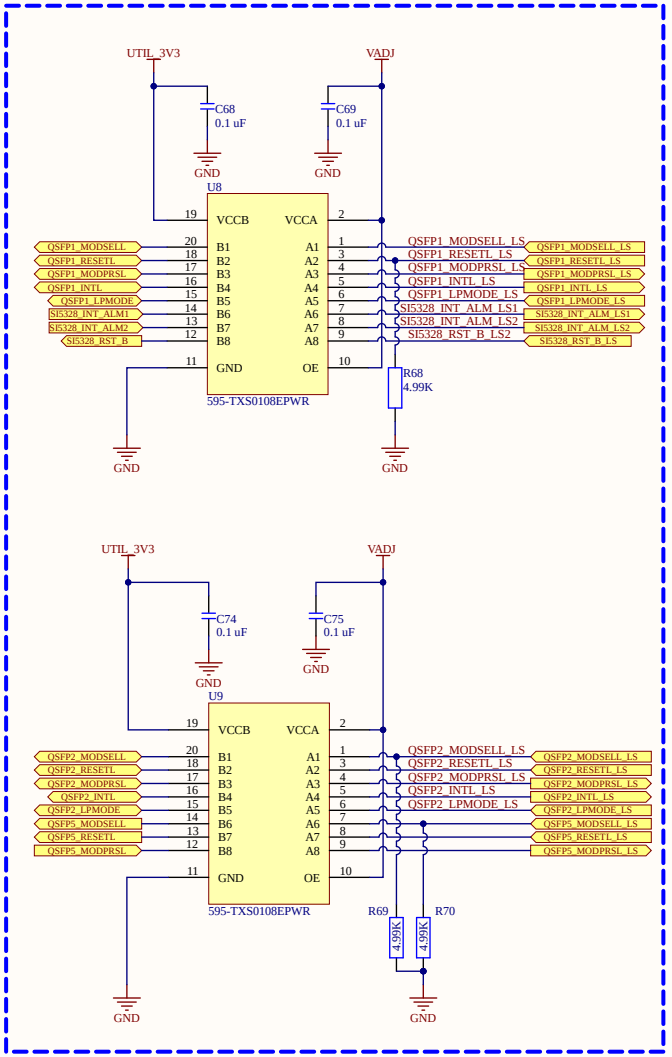
QSFP28 Module



QSFP28 Module

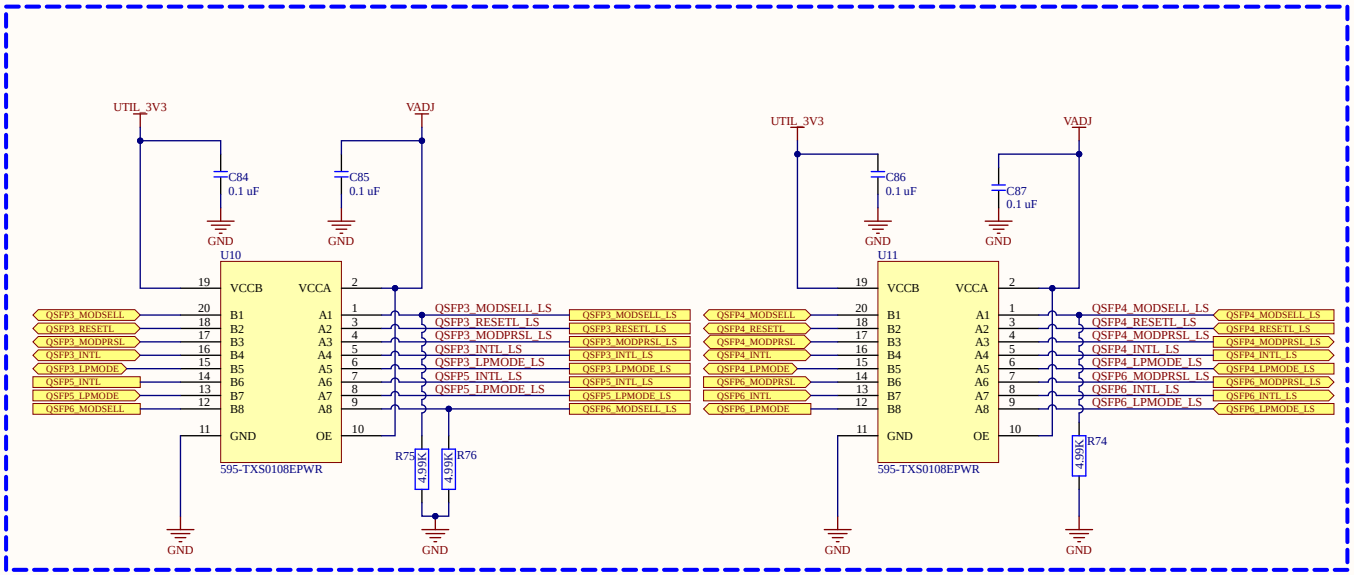


SCH DESIGN NOTE:
To reduce the bill of material, QSFP5 & QSFP6 will be reset simulatnuously.

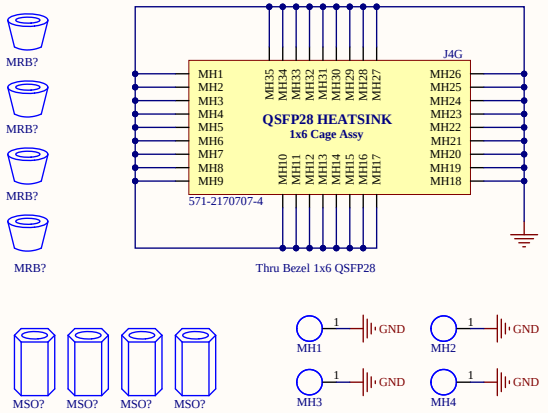


Project Title: *QSFP28 FPGA Mezzanine Card*				**Designed by:** Orcel Thys	
Sheet title: [08] - QSFP28_2.SchDoc				**Checked by:** *	
Size: *	**Number:** *	**Revision:** 0.1			
Date: 7/12/2024	**Time:** 11:55:26 AM	**Sheet:** 5 of 14	**BOM:** *	**Variant:** [No Variations]	

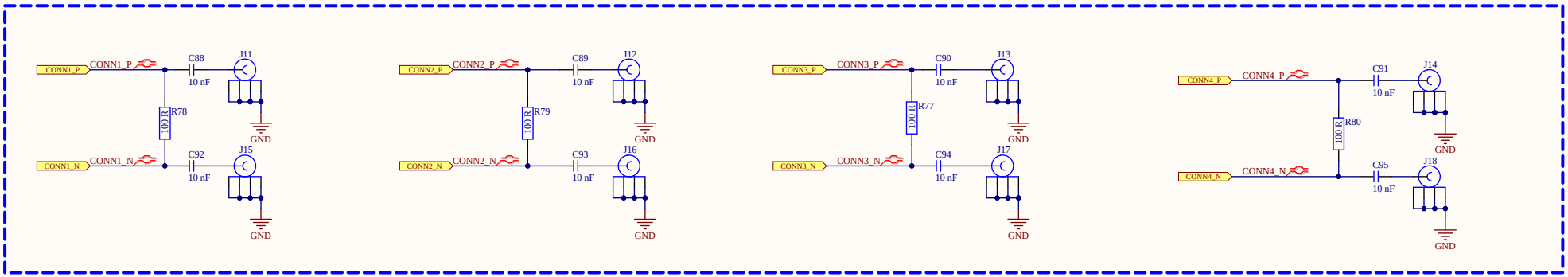
Voltage Translator



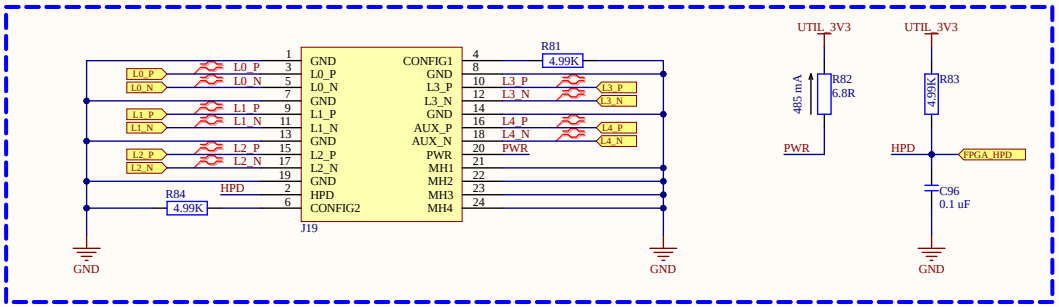
Mechanical



SMA Connectors



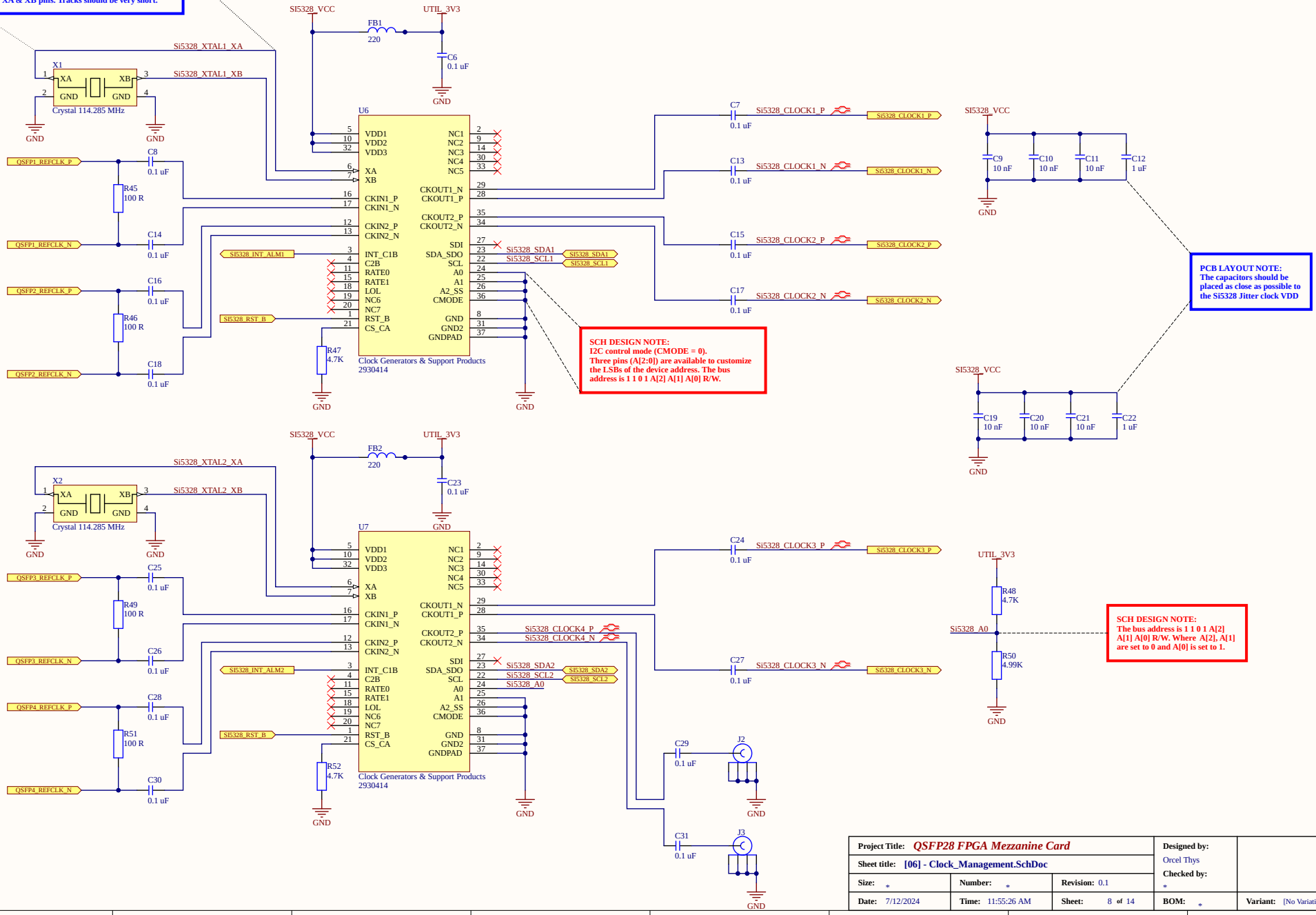
Mini DisplayPort



Project Title: *QSFP28 FPGA Mezzanine Card*				**Designed by:** Orcel Thys	
Sheet title: [09] - Mechanical.SchDoc				**Checked by:** *	
Size: *	**Number:** *	**Revision:** 0.1			
Date: 7/12/2024	**Time:** 11:55:26 AM	**Sheet:** 6 of 14	**BOM:** *	**Variant:** [No Variations]	

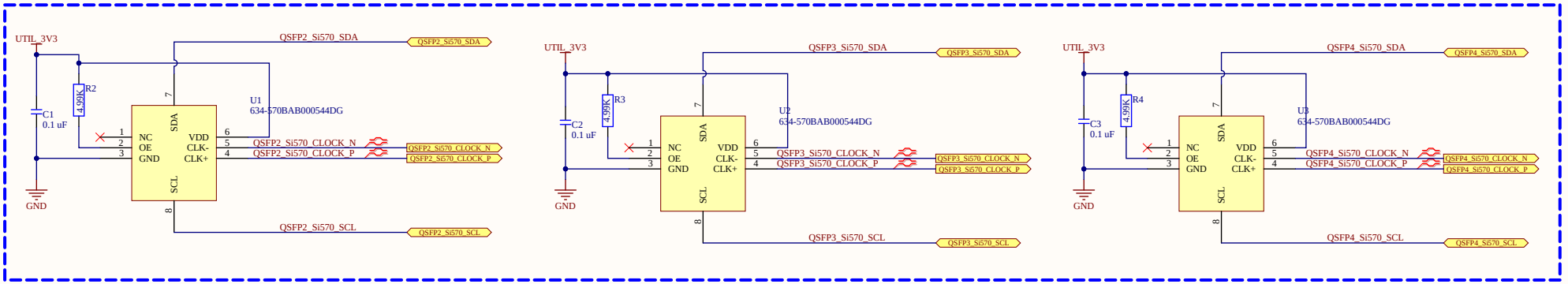
Clock generator

PCB LAYOUT NOTE:
The crystal should be placed as close as possible to the XA & XB pins. Tracks should be very short.

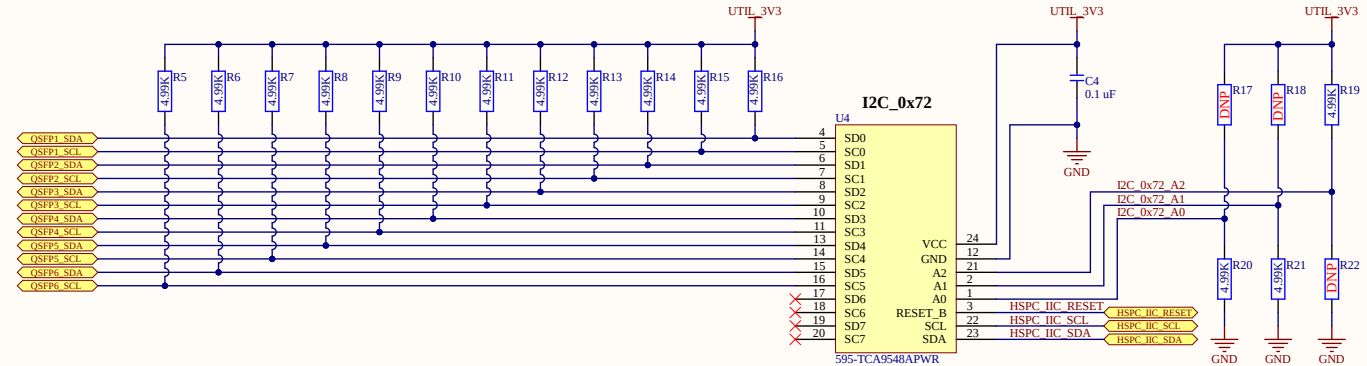


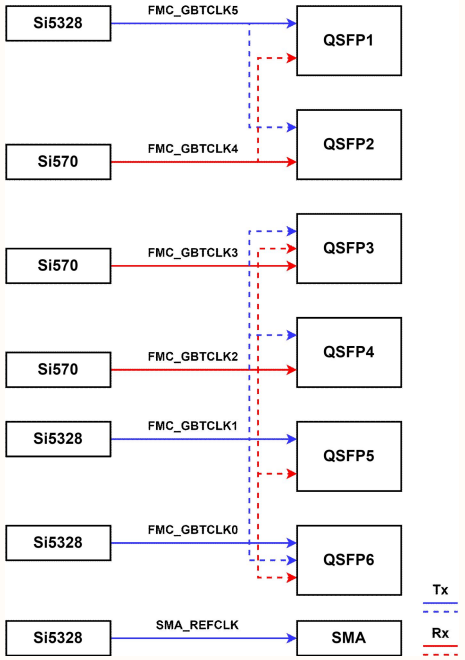
Project Title: *QSFP28 FPGA Mezzanine Card*				**Designed by:** Orcel Thys	
Sheet title: [06] - Clock_Management.SchDoc				**Checked by:** *	
Size: *	**Number:** *	**Revision:** 0.1			
Date: 7/12/2024	**Time:** 11:55:26 AM	**Sheet:** 8 of 14	**BOM:** *	**Variant:** [No Variations]	

Jitter Attenuator



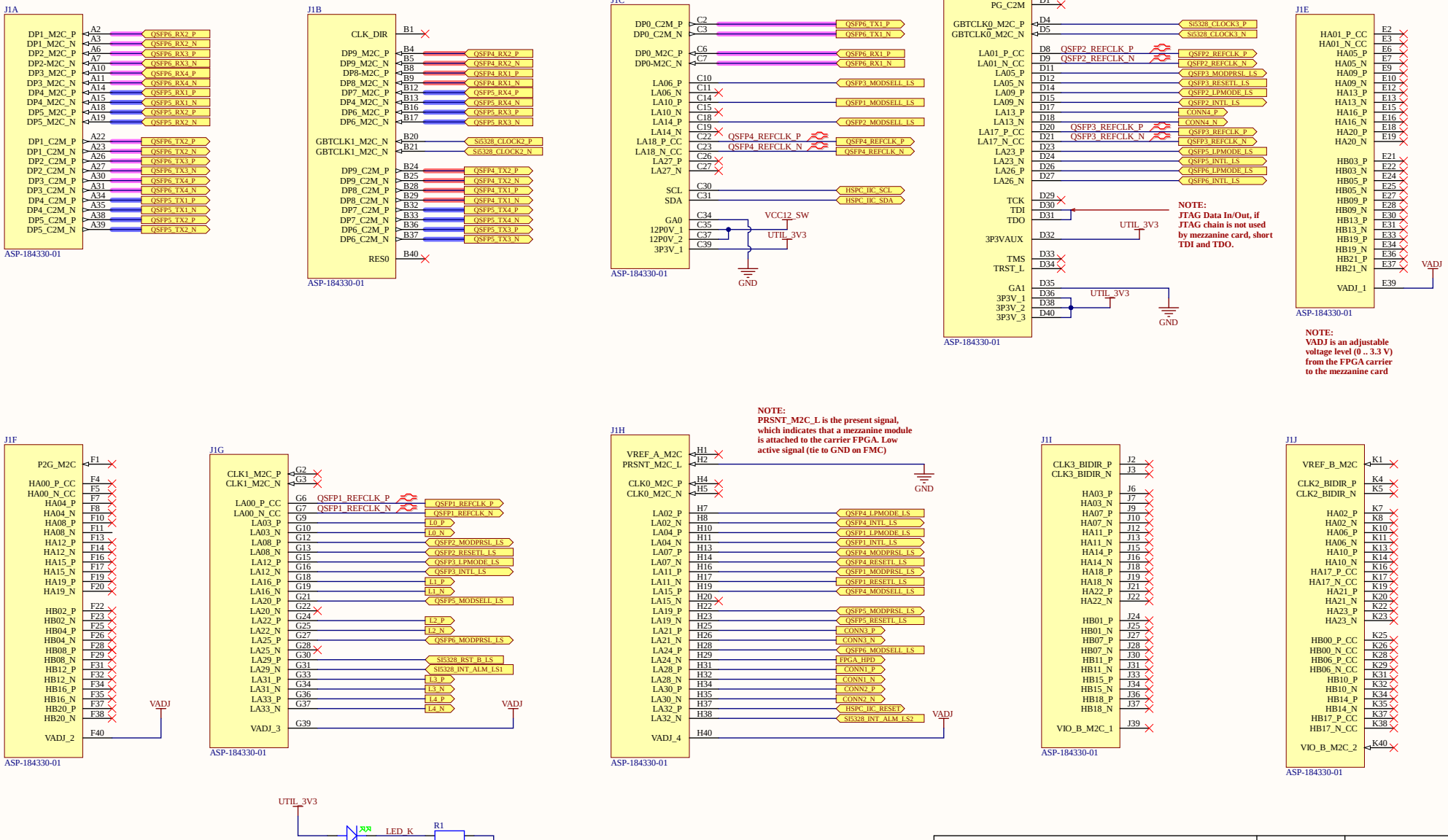
I2C Multiplexer





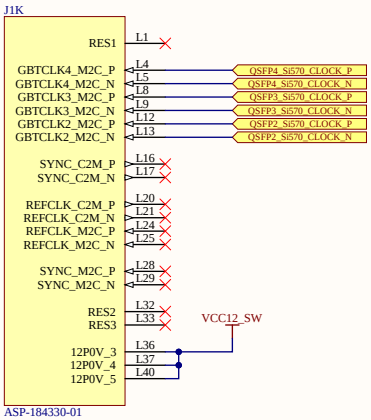
Project Title: *QSFP28 FPGA Mezzanine Card*				**Designed by:** Orcel Thys	
Sheet title: [05] - I2C.SchDoc				**Checked by:** *	
Size: *	**Number:** *	**Revision:** 0.1			
Date: 7/12/2024	**Time:** 11:55:26 AM	**Sheet:** 9 of 14		**BOM:** *	**Variant:** [No Variations]

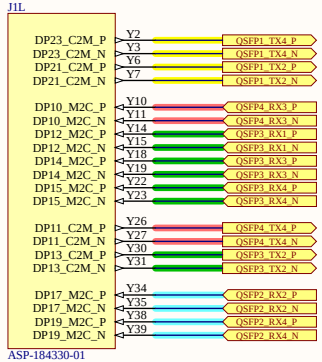
FMC connector (HSPC1&2)

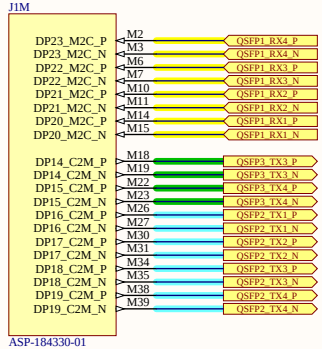


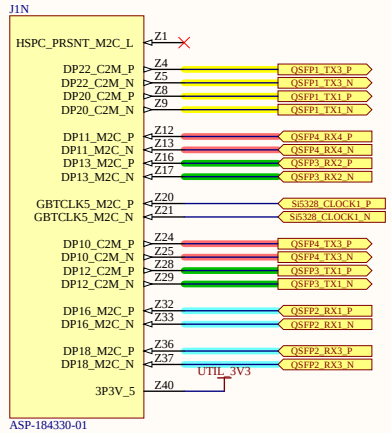
Project Title: *QSFP28 FPGA Mezzanine Card*		**Designed by:** Orcel Thys	
Sheet title: [03] - FMCP_1&2.SchDoc		**Checked by:** *	
Size: *	**Number:** *	**Revision:** 0.1	
Date: 7/12/2024	**Time:** 11:55:27 AM	**Sheet:** 10 of 14	**BOM:** *	**Variant:** [No Variations]

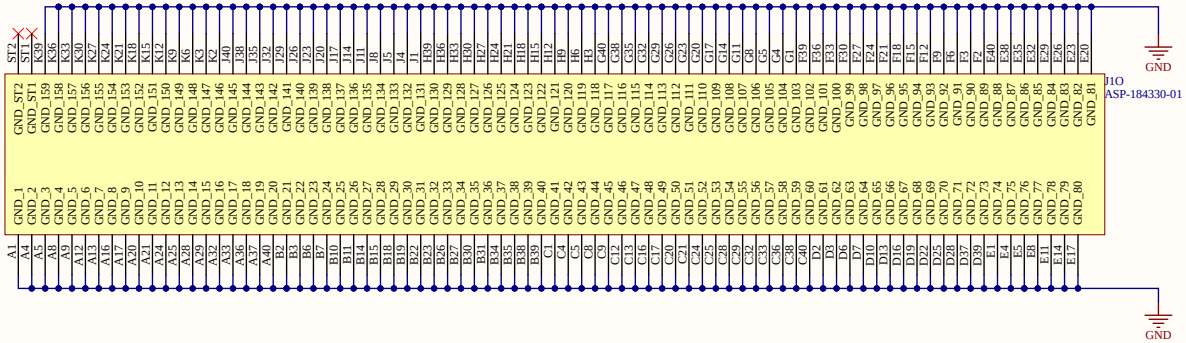
FMC connector (HSPC2)

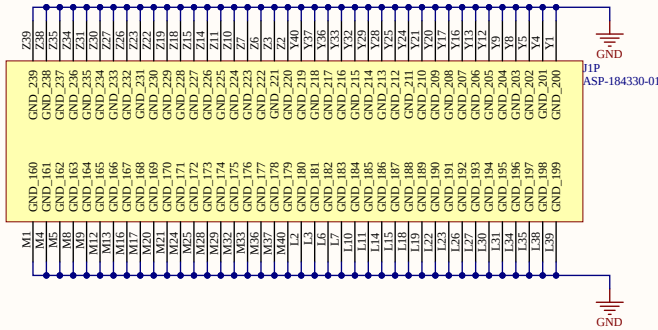












Project Title: *QSFP28 FPGA Mezzanine Card*			**Designed by:** Orcel Thys
Sheet title: [04] - FMCP_3&4.SchDoc			**Checked by:** *
Size: *	**Number:** *	**Revision:** 0.1	
Date: 7/12/2024	**Time:** 11:55:27 AM	**Sheet:** 11 of 14	**BOM:** * **Variant:** [No Variations]

Comment	Description	Designator	Footprint	LibRef	Quantity
0.1 uF	Cap 0402 0.1 uF 50 V ±10 % Tolerance X7R Surface Mount Multilayer Ceramic Capacitor	C1, C2, C3, C4, C5, C6, C7, C8, C13, C14, C15, C16, C17, C18, C23, C24, C25, C26, C27, C28, C29, C30, C31, C33, C35, C37, C39, C41, C43, C45, C47, C49, C51, C53, C55, C57, C59, C61, C63, C65, C67, C68, C69, C71, C73, C74, C75, C77, C79, C81, C83, C84, C85, C86, C87, C96	C0402	UMK105B7104KV-FR	56
10 nF	Cap Multilayer Ceramic Capacitors MLCC - SMD/SMT 25volts 10000pF X7R 10%	C9, C10, C11, C19, C20, C21, C38, C89, C90, C91, C92, C93, C94, C95	C0402	C0402C103K3RACTU	14
1 uF	Cap Ceramic 1uF 25V X7R 10% Pad SMD 0603 125°C T/R	C12, C22	C0603	C0603C105K3RACTU	2
22uF	Cap Series 0805 22 uF 35 V ±20 % Tolerance X5R SMT Multilayer Ceramic Capacitor	C32, C34, C36, C38, C40, C42, C44, C46, C48, C50, C52, C54, C56, C58, C60, C62, C64, C66, C70, C72, C76, C78, C80, C82	C2012	C2012X5R1V226M125AC	24
GREEN LED	Green 0603 1.6 x 0.8 mm 160° Diffused 18 mcd 2.2 V PCB Chip Surface Mount LED	DS1	LX0603GW-TR	SML-LX0603GW-TR	1
220	0603 220Ω ±25% DCR=0.050Ω 2.2A	FB1, FB2, FB3, FB4, FB5, FB6, FB7, FB8, FB9, FB10, FB11, FB12, FB13, FB14, FB15, FB16, FB17, FB18, FB19, FB20	BEADC1608X75N	MPZ1608S221ATA00	20
FMCP HSPC	Male Conn Open Pin Field Array PIN 560 POS 1.27mm Solder ST Top Entry SMD	J1	SAMTEC_ASP-184330-01	ASP-184330-01	1
SMA-J-P-H_ST-EM1	RF Connectors / Coaxial Connectors 6 GHz, 50 Ohm SMA Jack or Plug, Cable Connector	J2, J3, J11, J12, J13, J14, J15, J16, J17, J18	SAMTEC_SMA-J-P-H-ST-EM1	SMA-J-P-H-ST-EM1	10
Thru Bezel 1x6 QSFP28	Cage Assy, 1X6, QSFP28, Spring, Hs	J4	TE_2170707-4	2170707-4	1
Mini DisplayPort	Conn Display Port RCP 20 POS 1mm Solder RA SMD 20 Terminal 1 Port T/R	J19	Mini DP_2129320-3	47272-0029	1
Mountimg Hole	MOUNTING HOLE 125 HOLE 250 PAD	MH1, MH2, MH3, MH4	MH_250H125	MH_250H125	4
4.7K	RES Thick Film 0402 4.7K Ohm 1% 1/10W ±100ppm/°C Molded SMD Punched Carrier T/R	R1, R47, R48, R52	R0402	ERJ-2RKF4701X	4
4.99K	RES SMD 4.99K OHM 1% 1/10W 0402	R2, R3, R4, R5, R6, R7, R8, R9, R10, R11, R12, R13, R14, R15, R16, R17, R18, R19, R20, R21, R22, R23, R24, R25, R26, R27, R28, R29, R30, R31, R32, R33, R34, R35, R36, R37, R38, R39, R40, R41, R42, R43, R44, R50, R53, R54, R55, R56, R57, R58, R59, R60, R61, R62, R63, R64, R65, R66, R67, R68, R69, R70, R71, R72, R73, R74, R75, R76, R81, R83, R84	R0402	ERJ-2RKF4991X	71
100 R	RES Thick Film 0402 100 Ohm 1% 1/10W 100ppm/C Molded SMD Punched Carrier T/R	R45, R46, R49, R51, R77, R78, R79, R80	R0402	ERJ-2RKF1000X	8
6.8R	SMD Chip Resistor, 6.8 Ohm, ± 1%, 1.5 W, 2512 [6332 Metric], Thick Film, High Power Pulse Proof	R82	RESC6331X70N	CRCW2512R80FKEGHP	1
SI570	10 MHZ TO 810 MHZ I2C PROG 0x5D, 156.25MHz DEFAULT	U1, U2, U3	SI570	570BAB000544DG	3
8-Channels I2C switch	IC I2C SW 8CH W/RESET 24TSSOP	U4, U5	SOP_65P640X120-24N	TCA9548APWR	2
Clock Generators & Support Products	Synchronous Ethernet Jitter Attenuating Clock Multiplier Single 0.008 MHz to 710 MHz 36-Pin QFN	U6, U7	QFN_50P600X600X90-37N-D	SI5328B-C-GM	2
8-bit voltage translator	IC 8BIT NON-INV TRANSLTR 20TSSOP	U8, U9, U10, U11	SOP_65P640X120-20N	TXS0108EPWR	4
Crystal 114.285 MHz	ABM8 Series 114.285 MHz ±20ppm 18pF -40 to +85 °C Ultra Miniature Ceramic Crysta	X1, X2	ABM8	ABM8-166-114.285MHZ-T2	2