SP CARD

		Date	Signatue
Designed by :	LAVANYA.B		
Verified by :	NARESH N		
Aproved by :	NARESH N		

FALCONX ELECTRO TECHNOLOGIES PVT LTD

Title: Title

Size: A4 | Document Number: SP CARD | Rev: 1.0

Date: Tuesday, June 20, 2023 | Sheet 1 of 50

Index

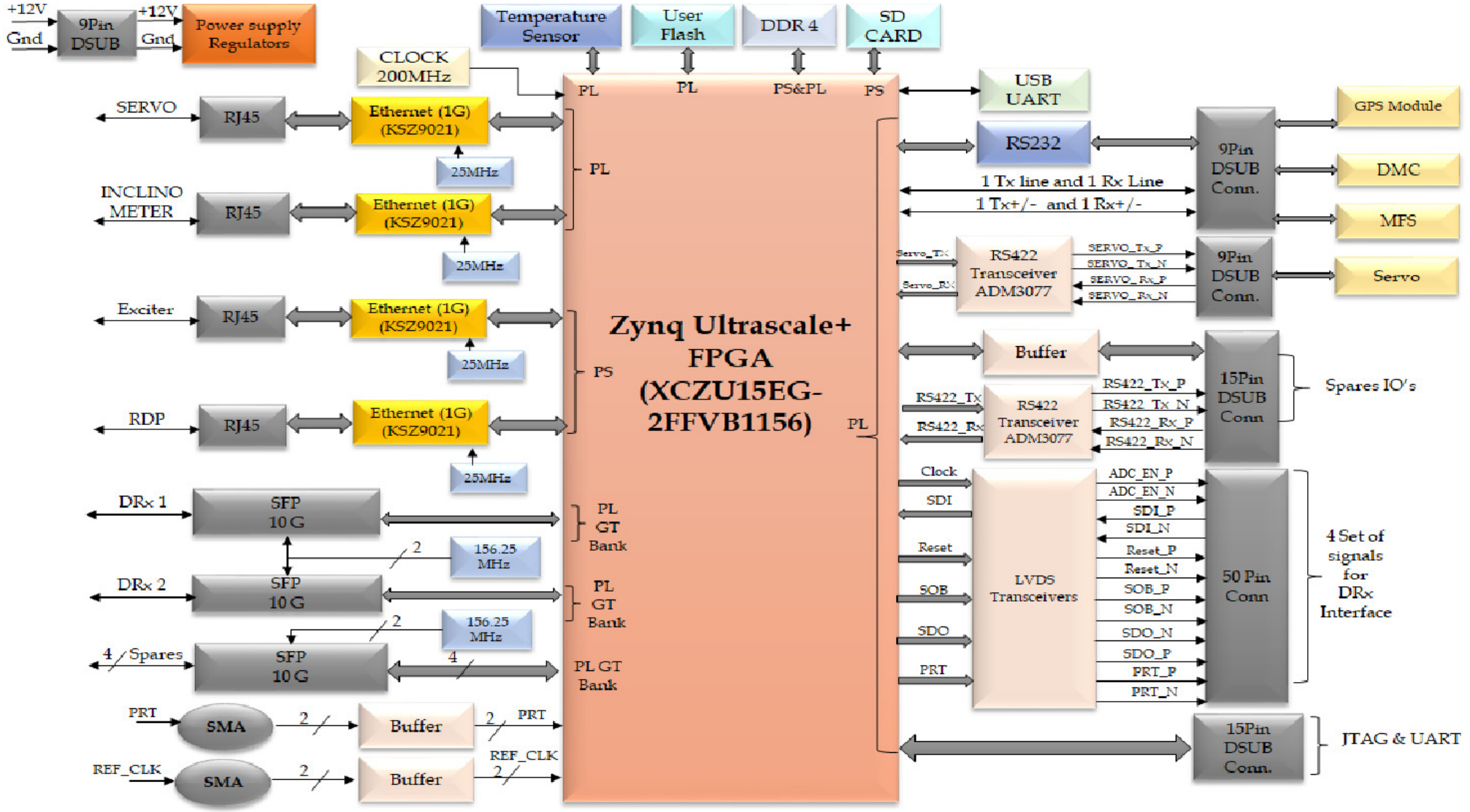
S.NO	DESCRIPTION	PAGE NO.
1	Block Diagram	
2	Connectors	
3	Power Supply	
4	Configuration - BootMode pins , JTAG	
5	User Flash & EEPROM	
6	PS UART	
7	SD CARD	
8	Sensor & RS422 & RS232 Ckt	
9	CONTROL SIGNALS	
10	LVDS Output Signals	
11	LVDS Input Signals	
12	Gigabit PHY	
13	SFP CLOCK	
14	FPGA BANK IO'S	

	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: Index
Verified by : NARESH N			Size: A4 | Document Number: SP CARD | Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 | Sheet 2 of 50

REV Change Record

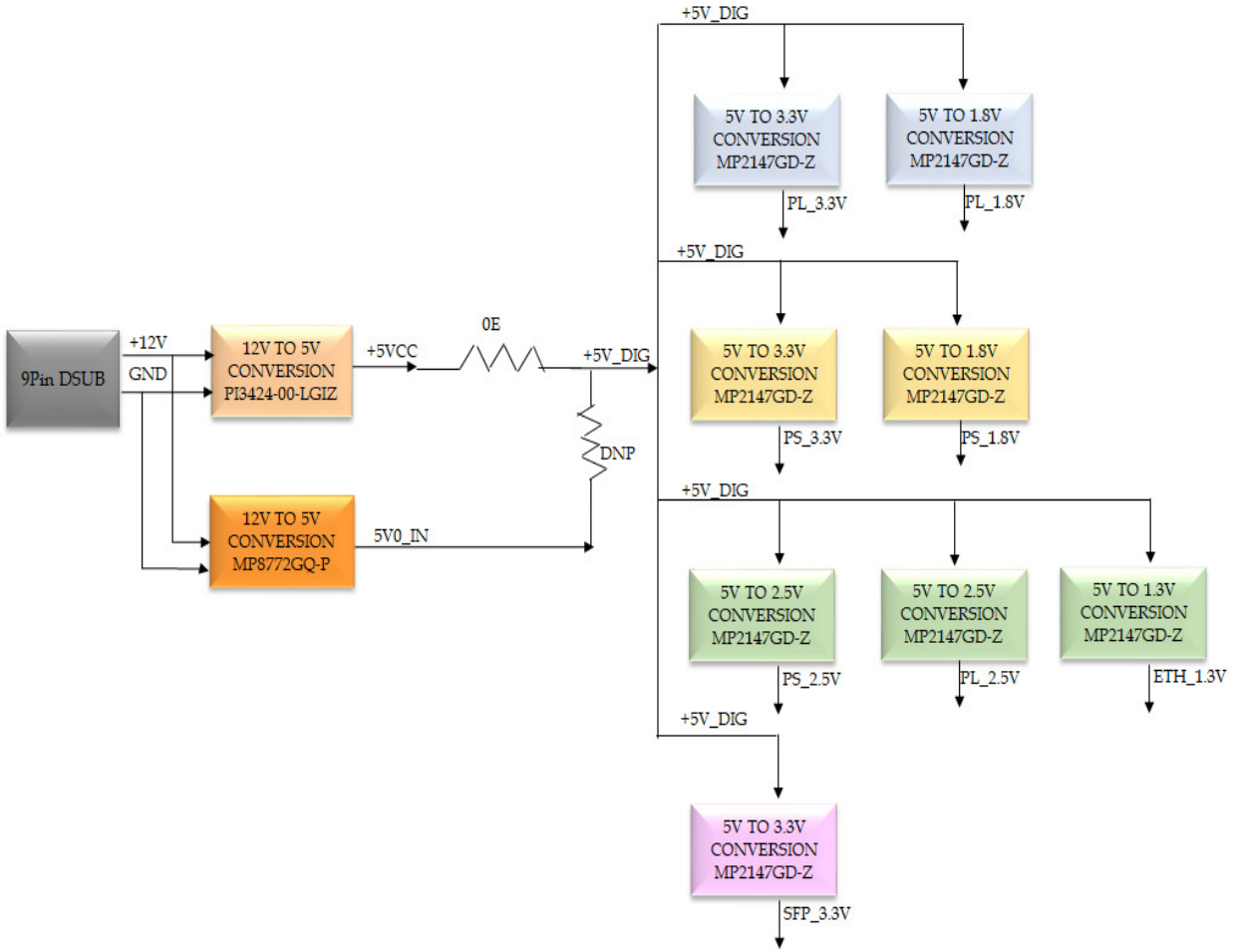
S.NO	DATE	REVISON.	BRIEF CHANGE

	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: Revision History
Verified by : NARESH N			Size: A4 | Document Number: SP CARD | Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 | Sheet 3 of 50

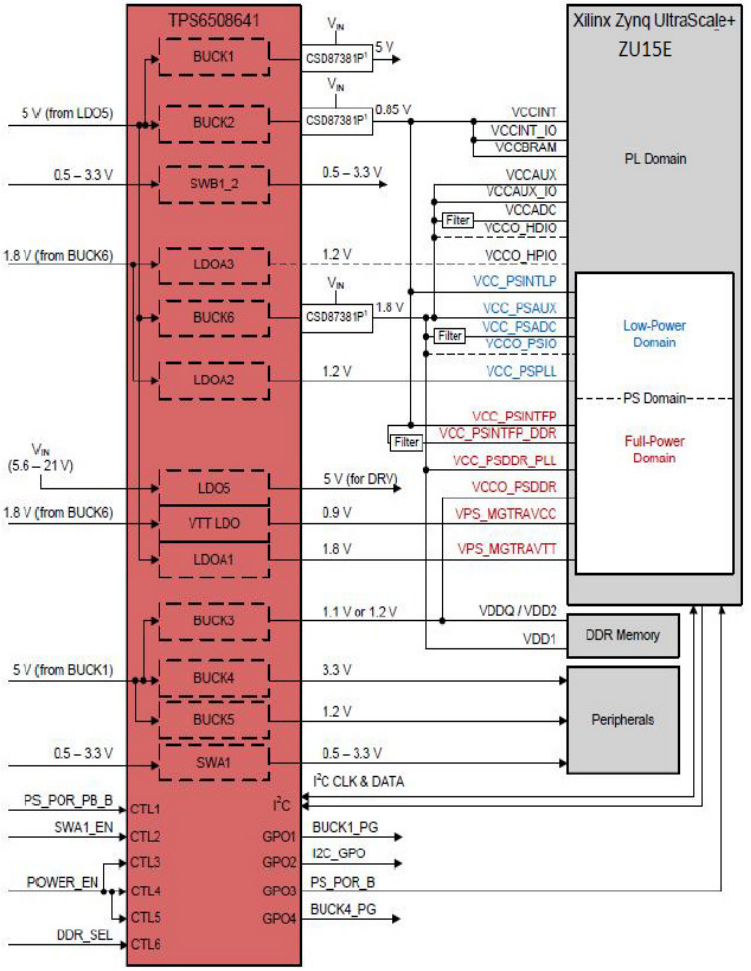


	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: Block Diagram
Verified by : NARESH N			Size: B — Document Number: SP CARD — Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 — Sheet 4 of 50

PERIPHERALS SUPPLY FLOW

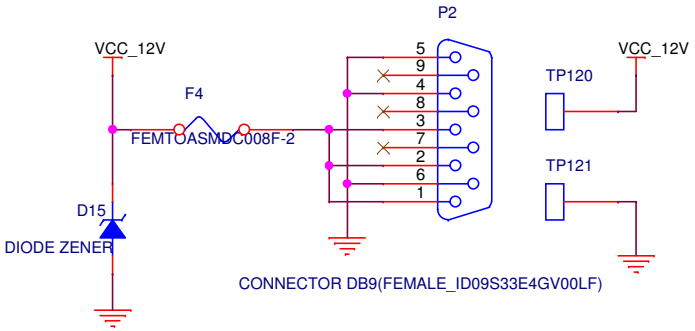


FPGA SUPPLY FLOW

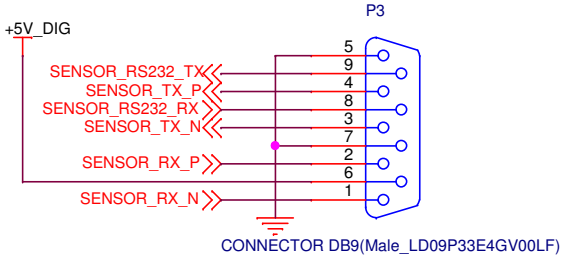


	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: Power Supply Flow Diagram
Verified by : NARESH N			Size: B — Document Number: SP CARD — Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 — Sheet 5 of 50

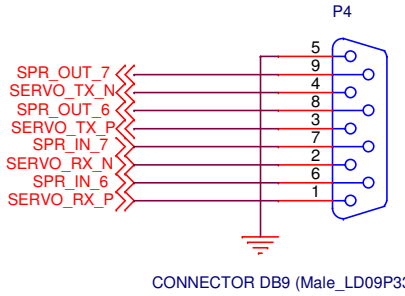
Power Supply Conn



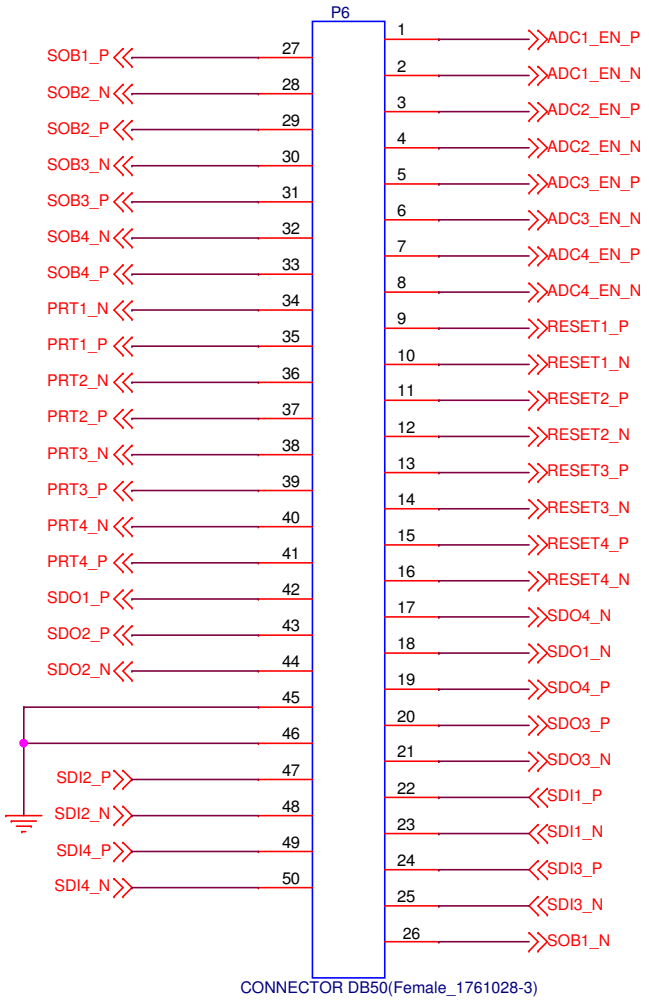
GPS,DMC,MFS Conn



SERVO Conn

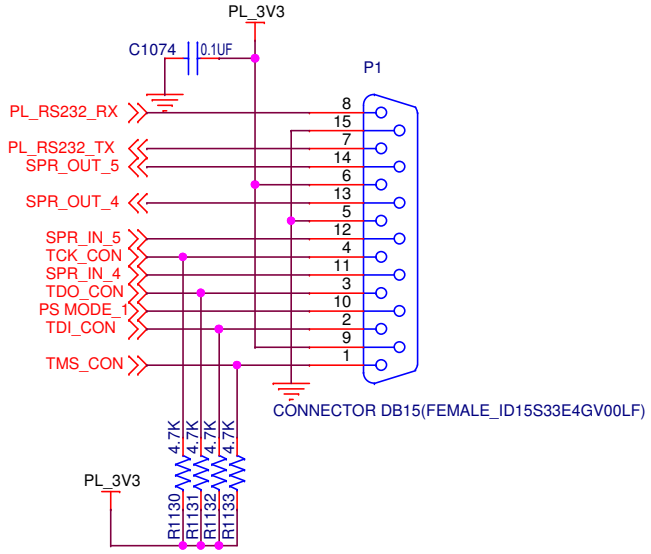


LVDS IO'S Conn

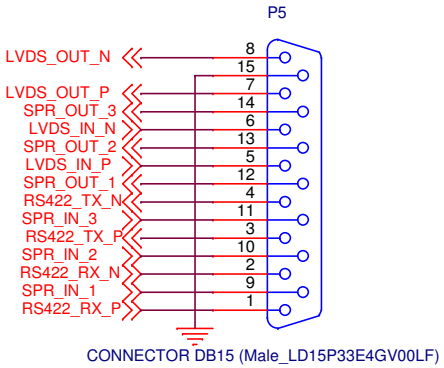


	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: Connectors - PS, Sensors, LVDS
Verified by : NARESH N			Size: A4 — Document Number: SP CARD — Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 — Sheet 6 of 50

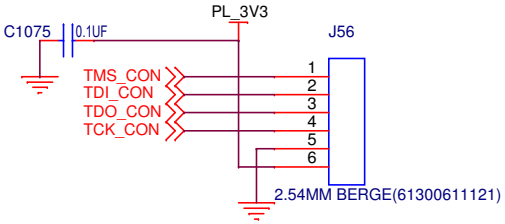
JTAG & UART Conn



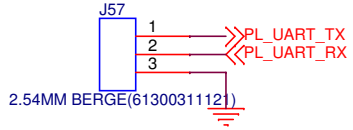
Spare IO'S Conn



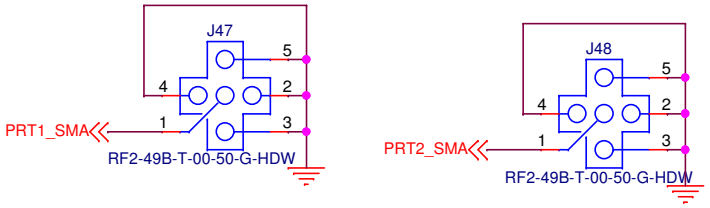
ON BOARD JTAG CONNECTOR



PL UART

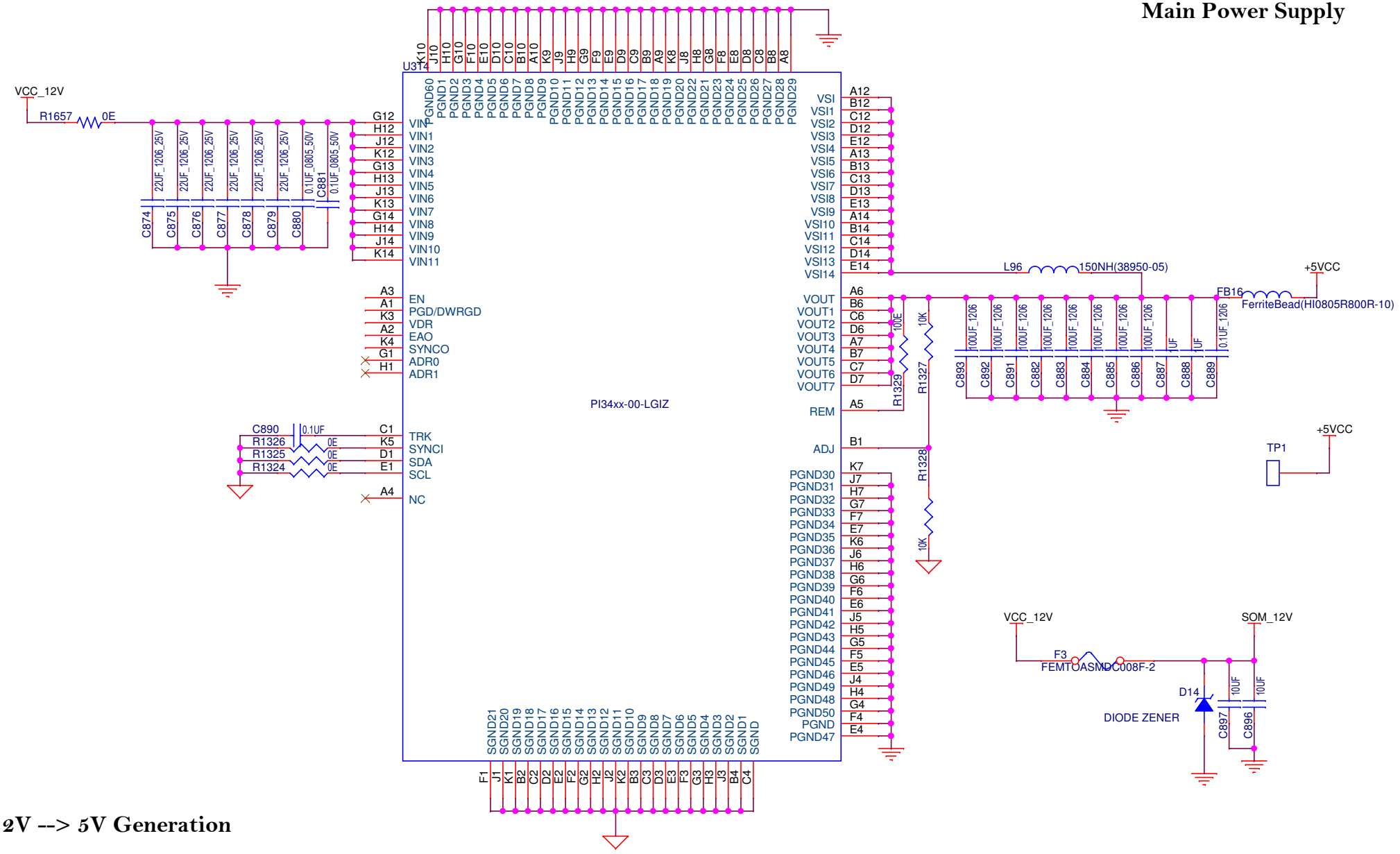


SMA CONNECTORS



	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: Connectors - JTAG , SMA , Spare IO
Verified by : NARESH N			Size: A4 — Document Number: SP CARD — Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 — Sheet 7 of 50

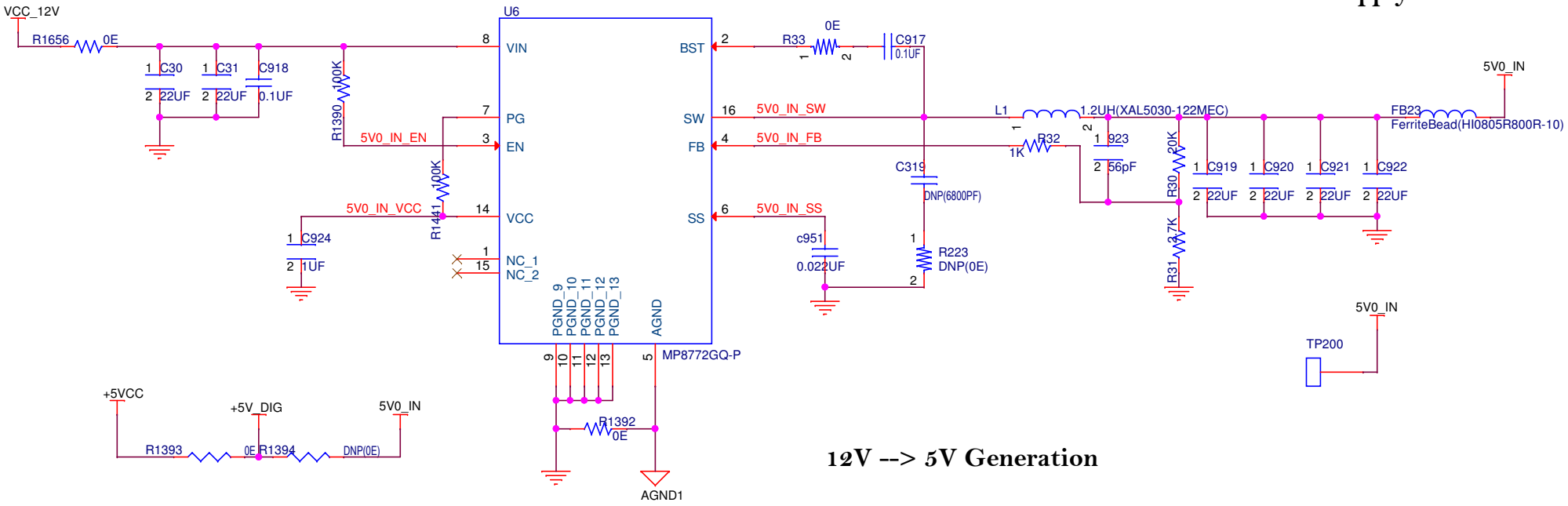
Main Power Supply



12V --> 5V Generation

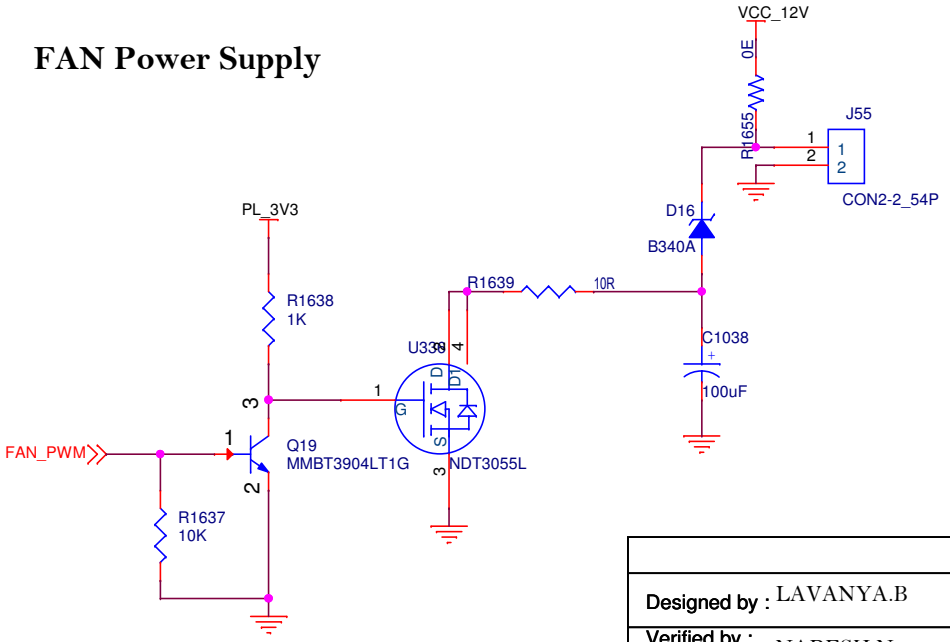
	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: Main Power Supply -1
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 8 of 50

Main Power Supply

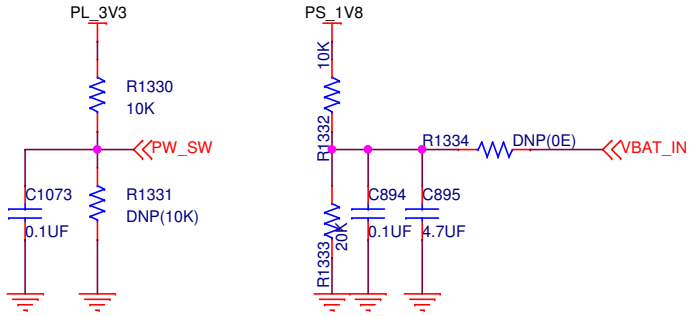


12V --> 5V Generation

FAN Power Supply



PW SW & VBAT



	Date	Signatue
Designed by : LAVANYA.B		
Verified by : NARESH N		
Aproved by : NARESH N		

FALCONX ELECTRO TECHNOLOGIES PVT LTD

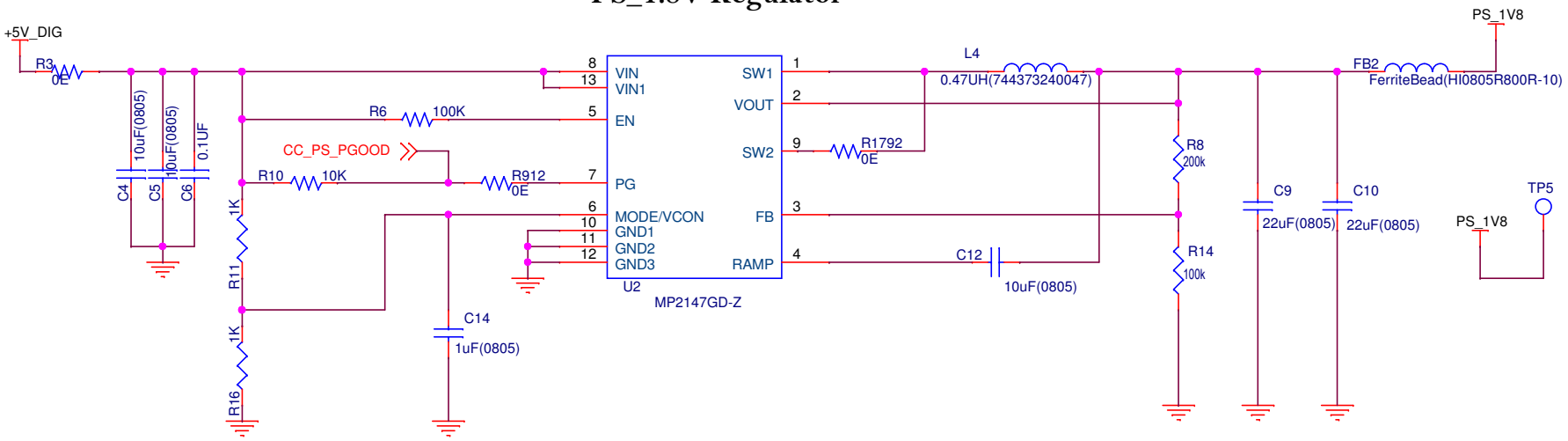
Title: Main Power Supply -2

Size: A4 | Document Number: SP CARD | Rev: 1.0

Date: Tuesday, June 20, 2023 | Sheet 9 of 50

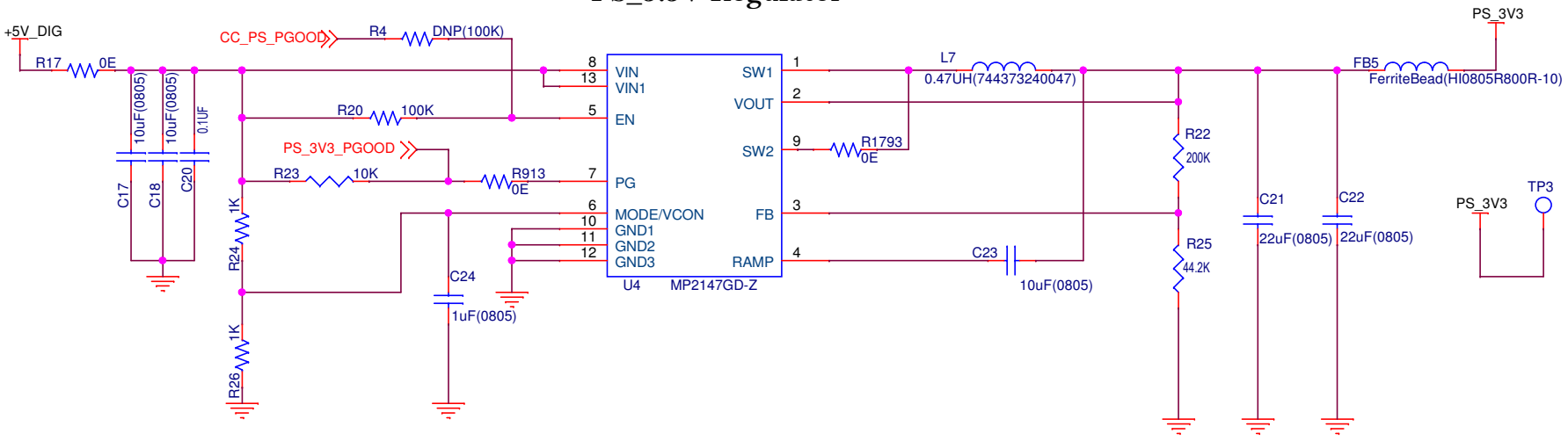
5V --> 1.8V Generation

PS_1.8V Regulator



5V --> 3.3V Generation

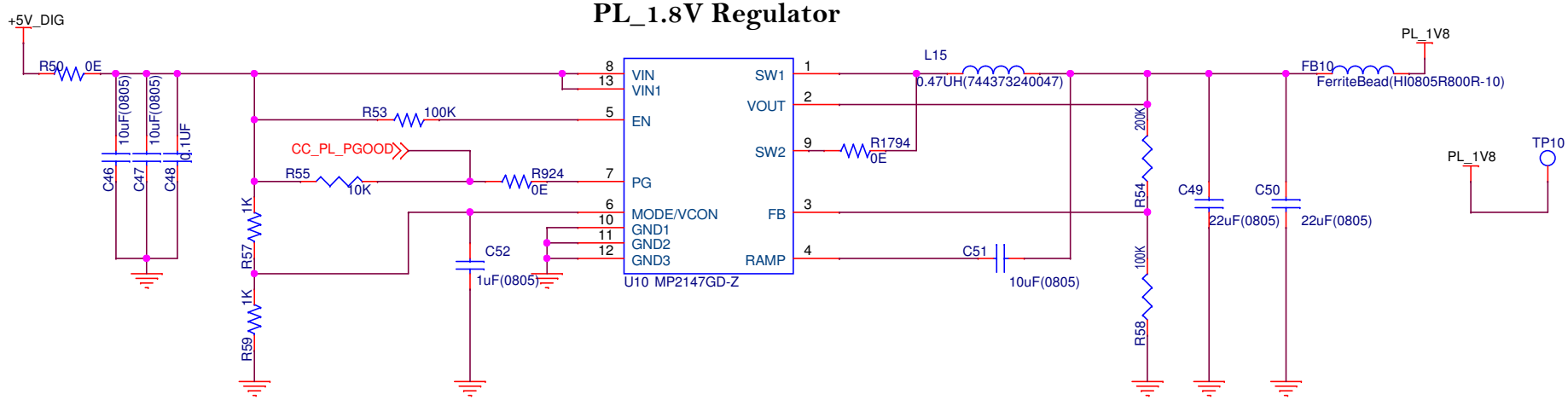
PS_3.3V Regulator



	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: PS Power Supply
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 10 of 50

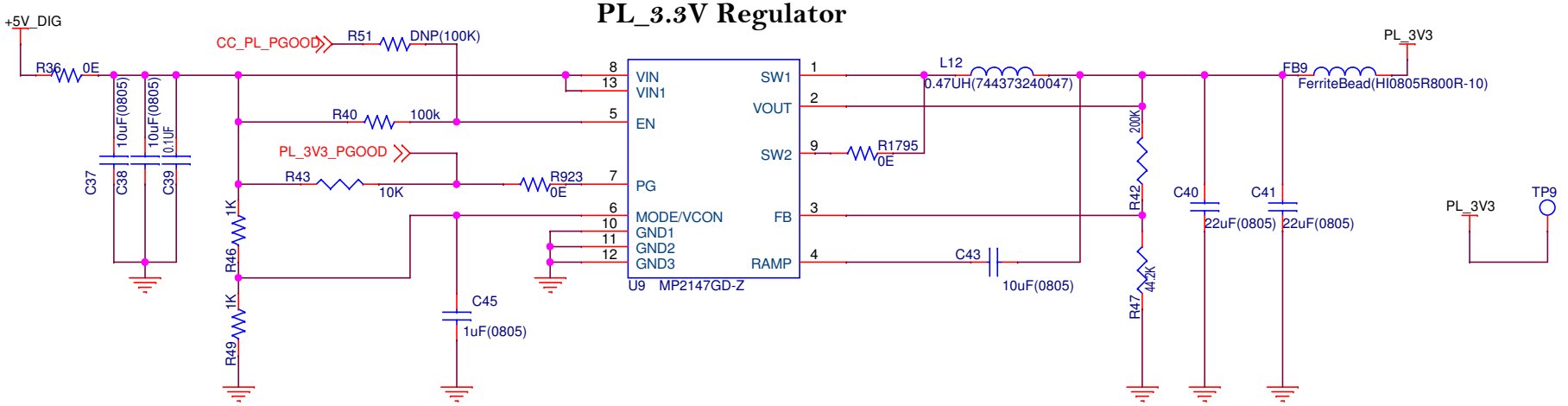
5V --> 1.8V Generation

PL_1.8V Regulator



5V --> 3.3V Generation

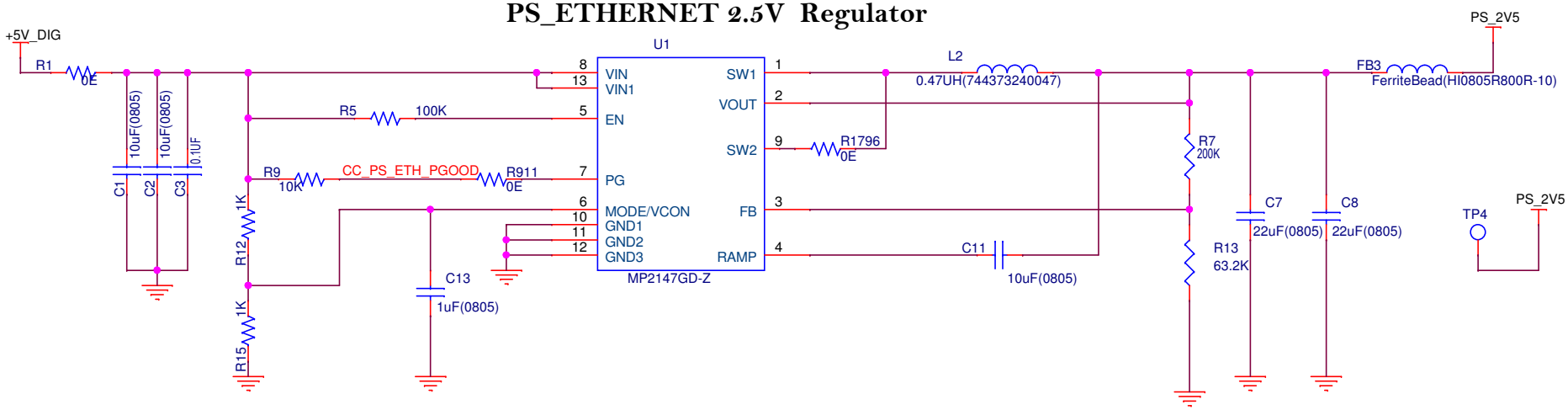
PL_3.3V Regulator



	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: PL Power Supply
Verified by : NARESH N			Size: A4 | Document Number: SP CARD | Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 | Sheet 11 of 50

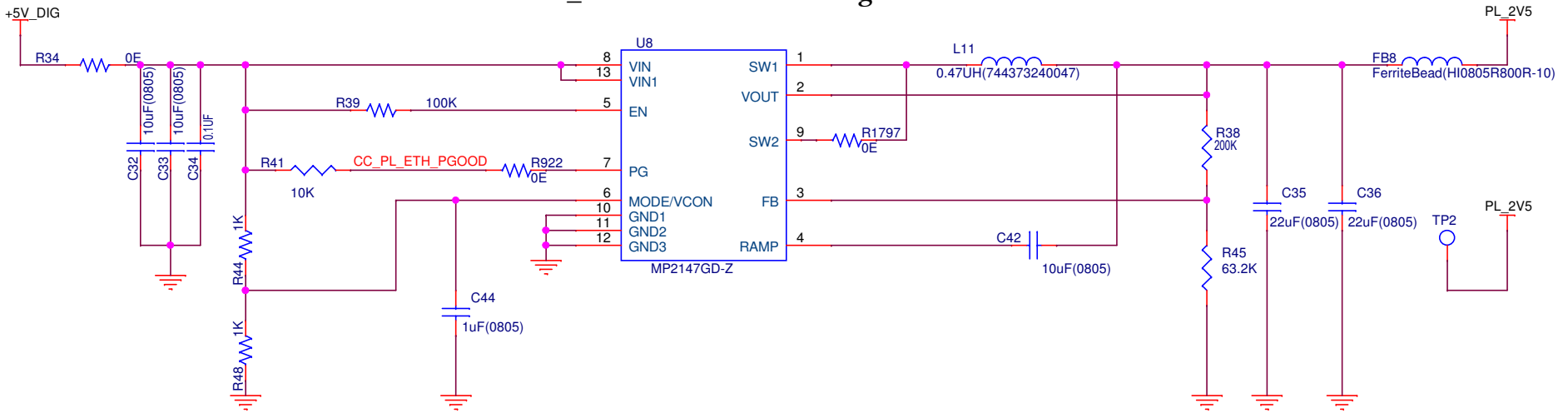
5V --> 2.5V Generation

PS_ETHERNET 2.5V Regulator



5V --> 2.5V Generation

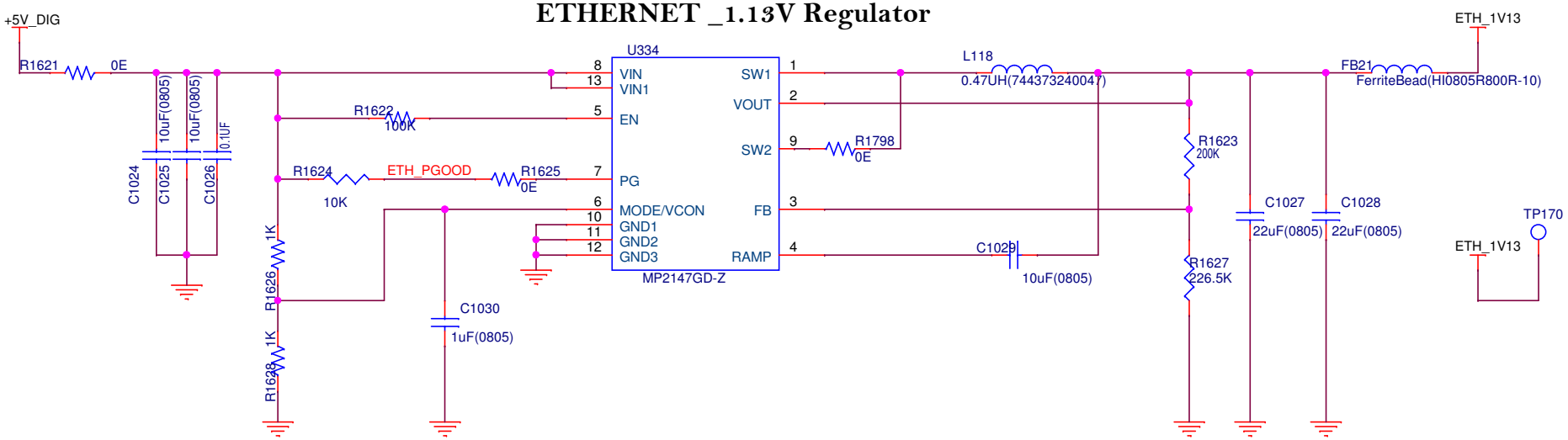
PL_ETHERNET 2.5V Regulator



	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: Ethernet Power Supply
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 12 of 50

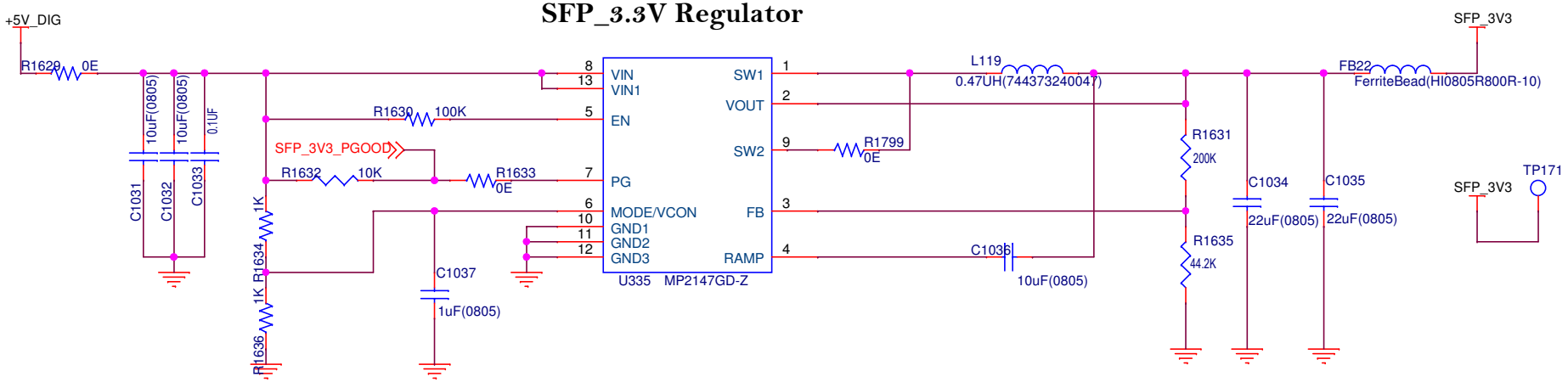
5V --> 1.13V Generation

ETHERNET _1.13V Regulator



5V --> 3.3V Generation

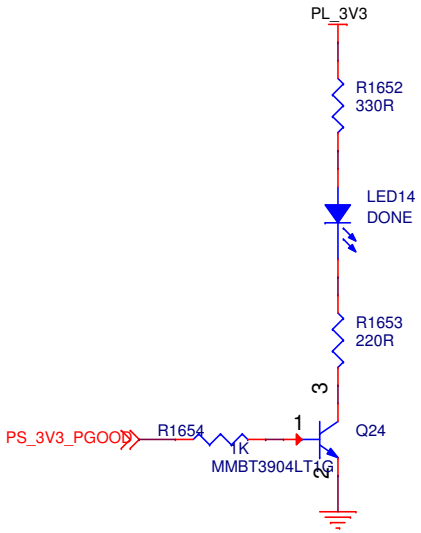
SFP_3.3V Regulator



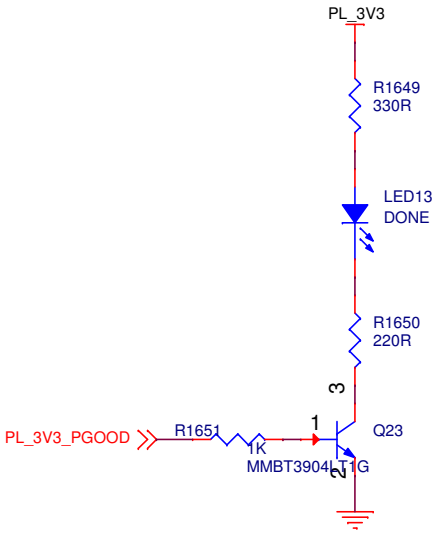
	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: Ehernet & SFP Power Supply
Verified by : NARESH N			Size: A4 — Document Number: SP CARD — Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 — Sheet 13 of 50

Supply LED Indications

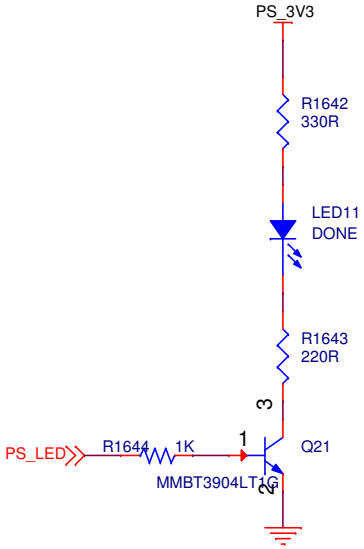
PL Supply



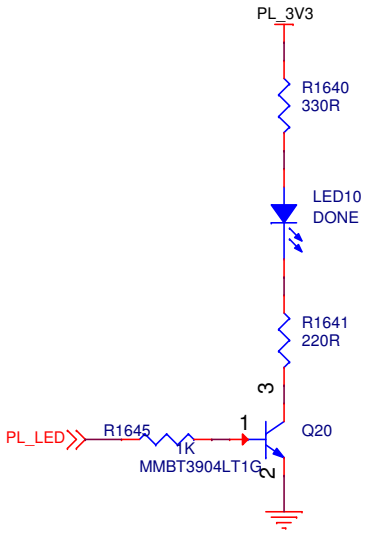
PL Supply



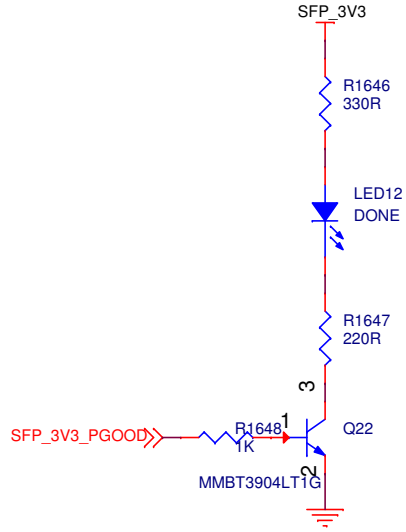
FPGA PS Bank

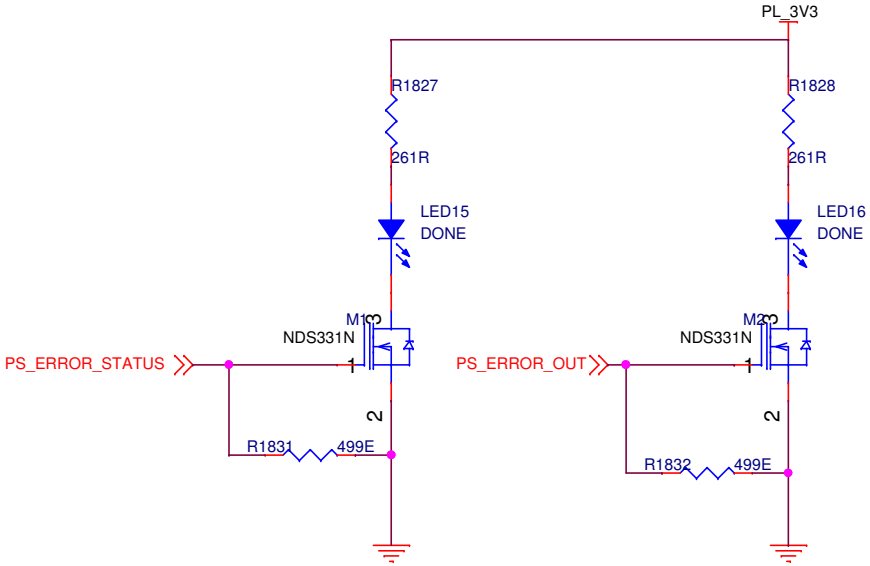


FPGA PL Bank



SFP SUPPLY





	Date	Signatue
Designed by : LAVANYA.B		
Verified by : NARESH N		
Aproved by : NARESH N		

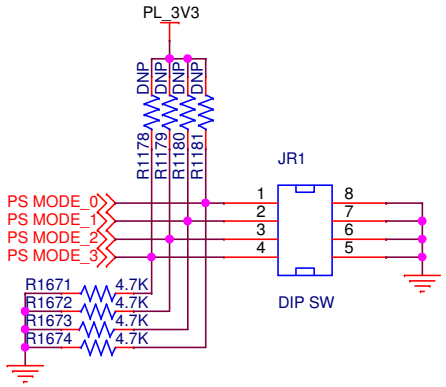
FALCONX ELECTRO TECHNOLOGIES PVT LTD

Title: Supply LED Indications

Size: A4 | Document Number: SP CARD | Rev: 1.0

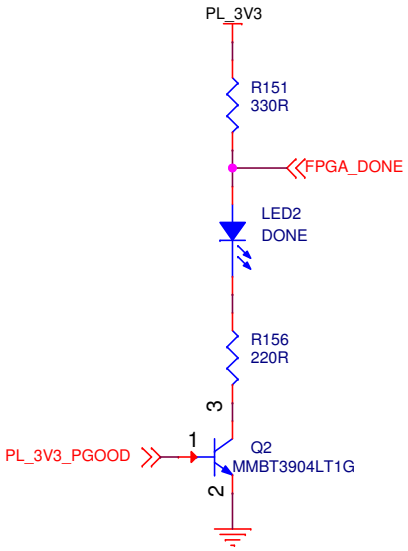
Date: Tuesday, June 20, 2023 | Sheet 14 of 50

Mode Selection

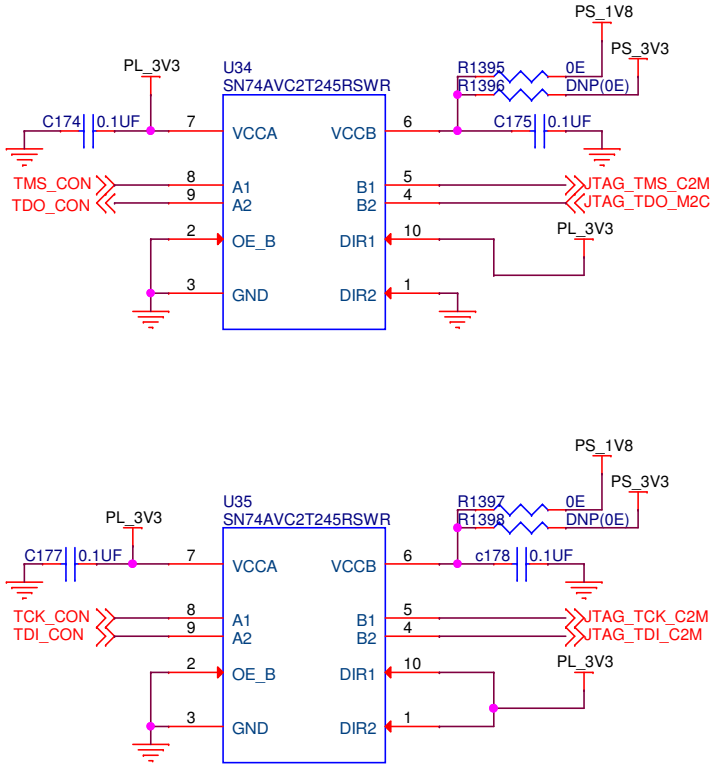


MODE[3:0]	BOOT MODE
0000	PS JTAG
0001	Quad_SPI(24b)
0010	Quad_SPI(32b)
0011	SD0(2.0)
0100	NAND
0101	SD1(2.0)
0110	eMMC(1.8V)
0111	SD1 LS(3.0)
1000	PJTAG(MIO #0)
1001	PJTAG(MIO #1)
1110	USB0(2.0)

FPGA Done LED

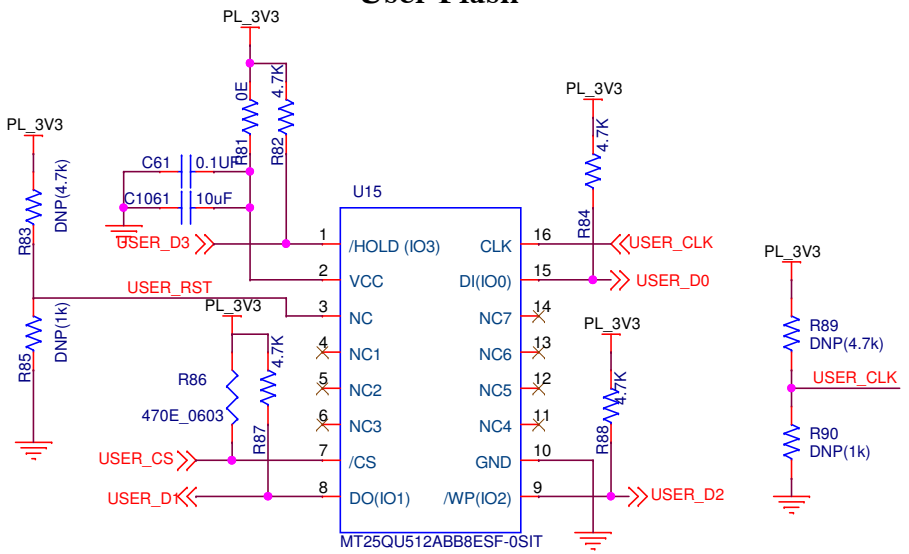


JTAG Buffers

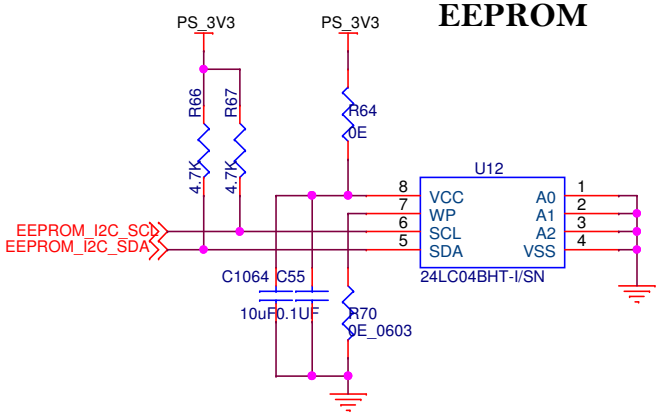


	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: CONFIGURATION
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 15 of 50

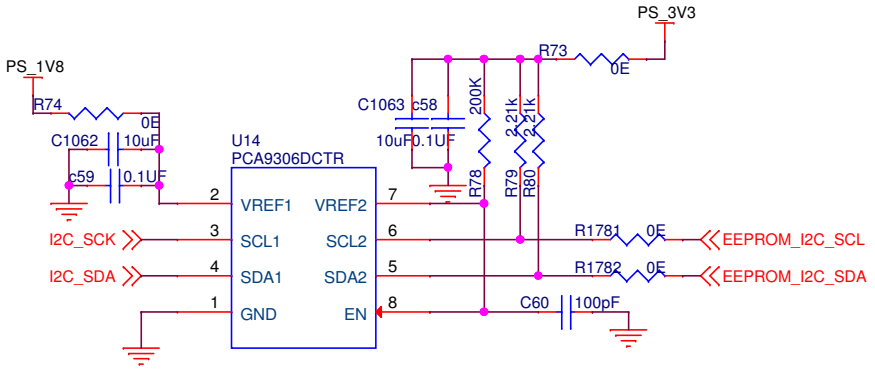
User Flash



EEPROM

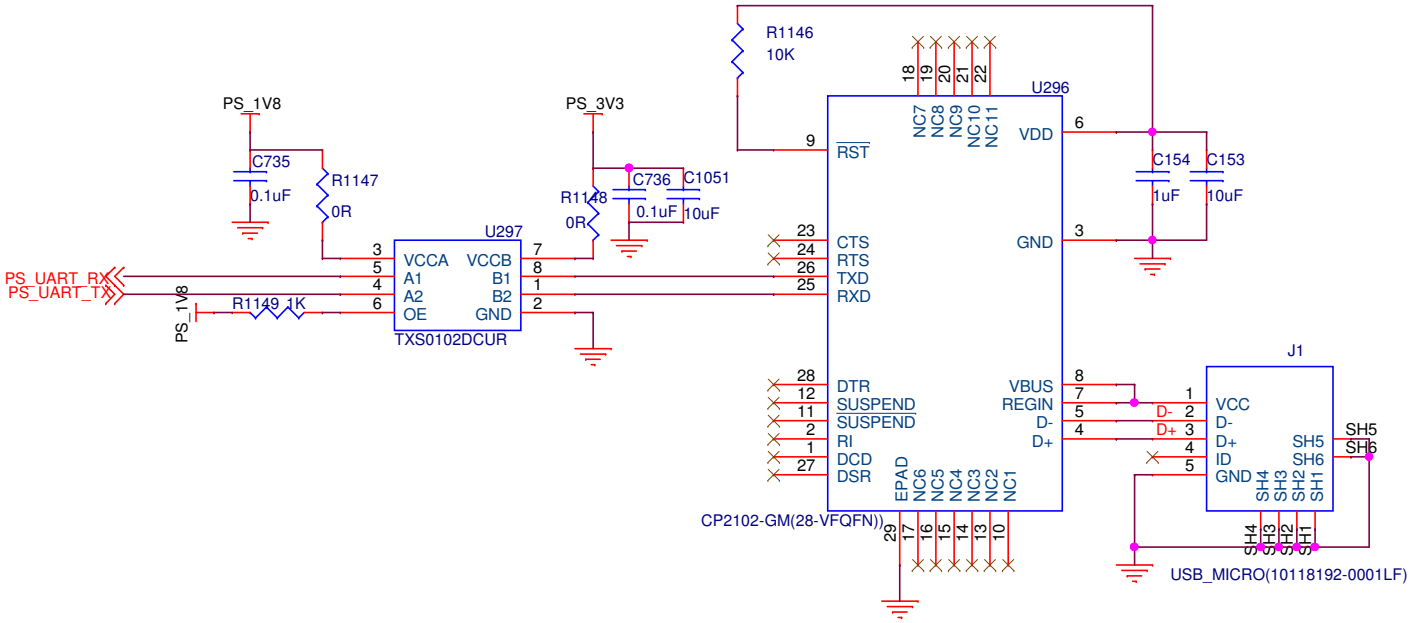


Level Shifter



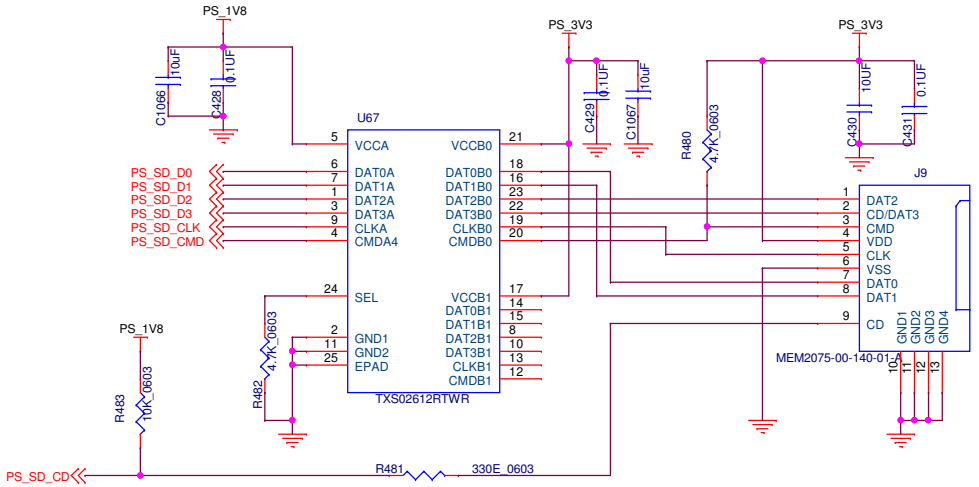
	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: User Flash & EEPROM
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 16 of 50

PS USB UART



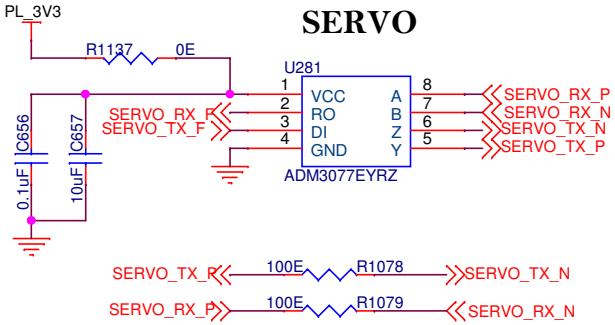
	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: PS UART
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 17 of 50

SD Card

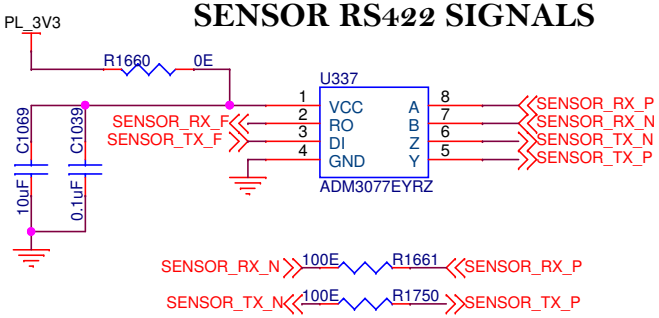


		Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD	
Designed by :	LAVANYA.B			Title: SD CARD	
Verified by :	NARESH N			Size: B	Document Number: SP CARD
Aproved by :	NARESH N			Rev: 1.0	
				Date: Tuesday, June 20, 2023	Sheet 18 of 50

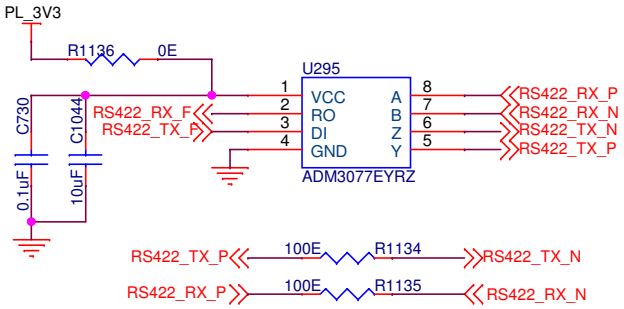
SERVO



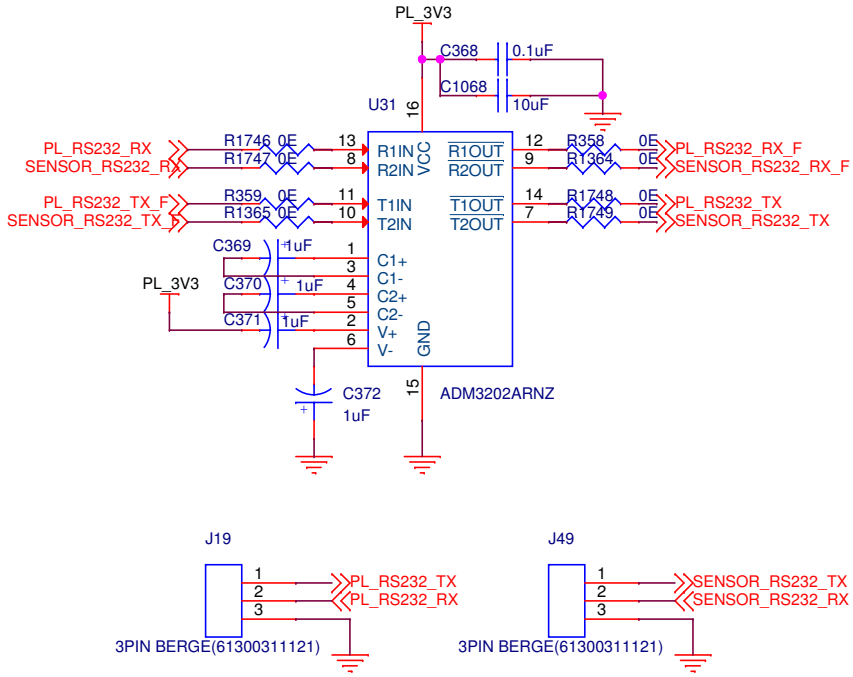
SENSOR RS422 SIGNALS



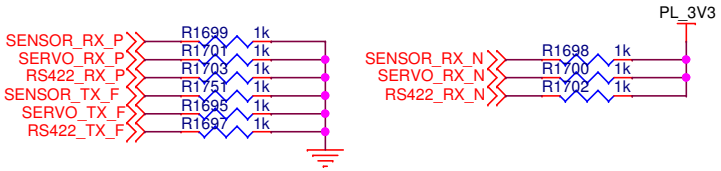
RS422 SIGNALS



PL RS232 & SENSOR RS232

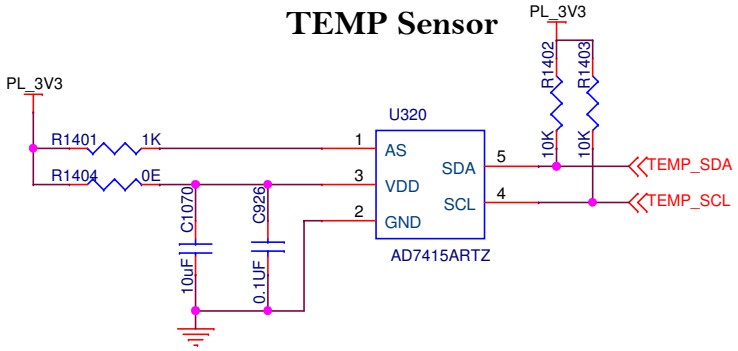


DEFAULT CONDITIONS

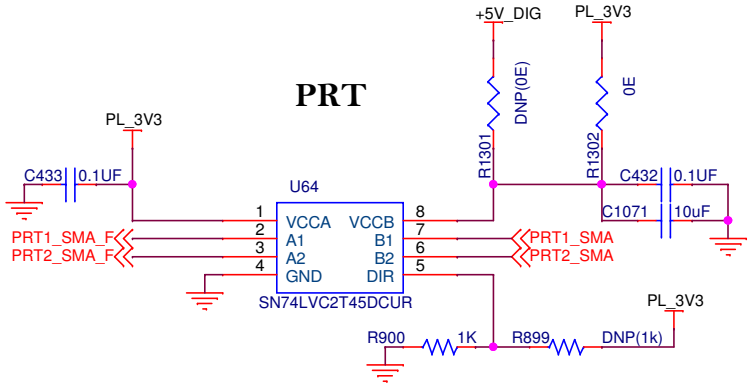


	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: Sensor & RS422 & RS232 Ckts
Verified by : NARESH N			Size: A4 — Document Number: SP CARD — Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 — Sheet 19 of 50

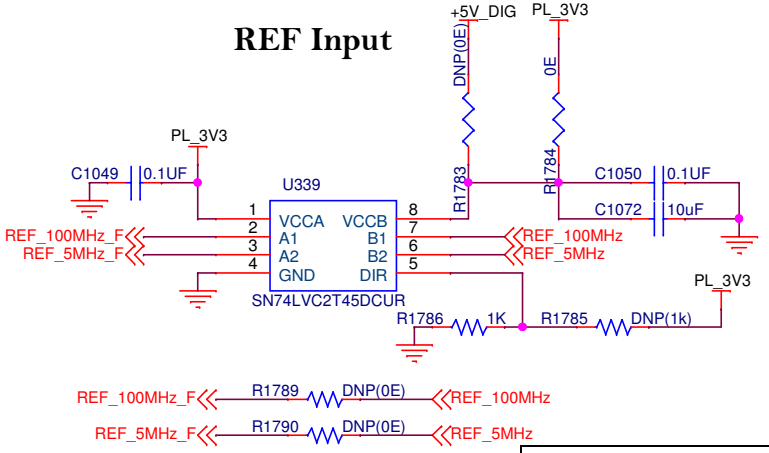
TEMP Sensor



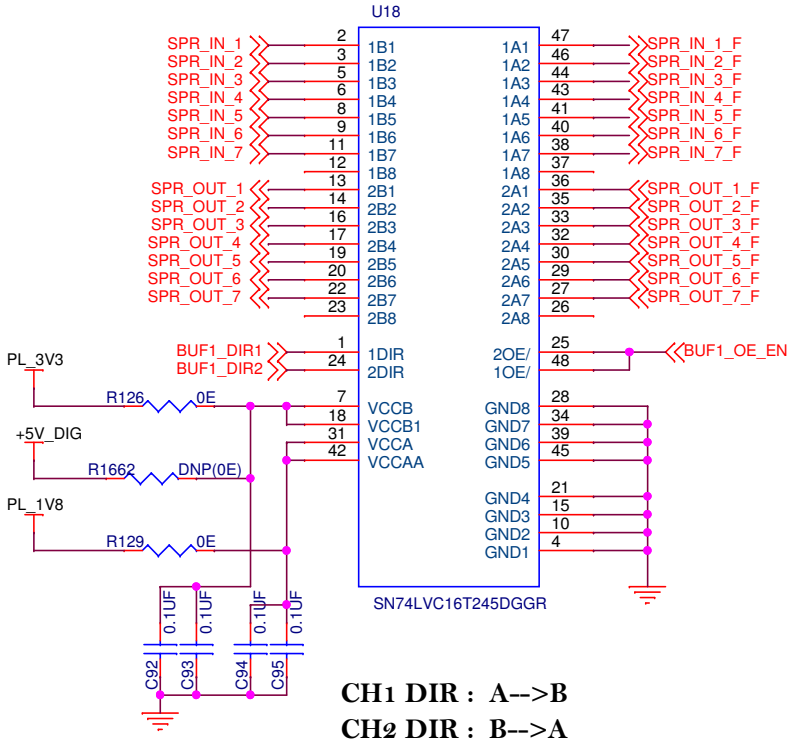
PRT



REF Input

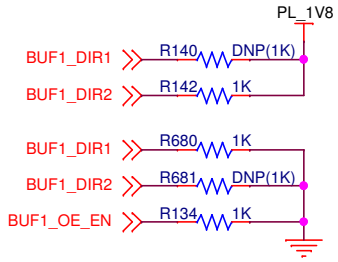


Spare IO Signals

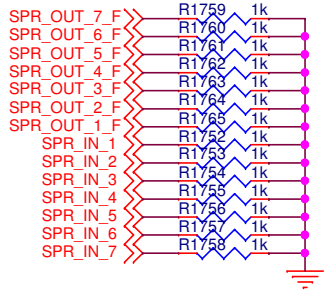


CH1 DIR : A-->B

CH2 DIR : B-->A

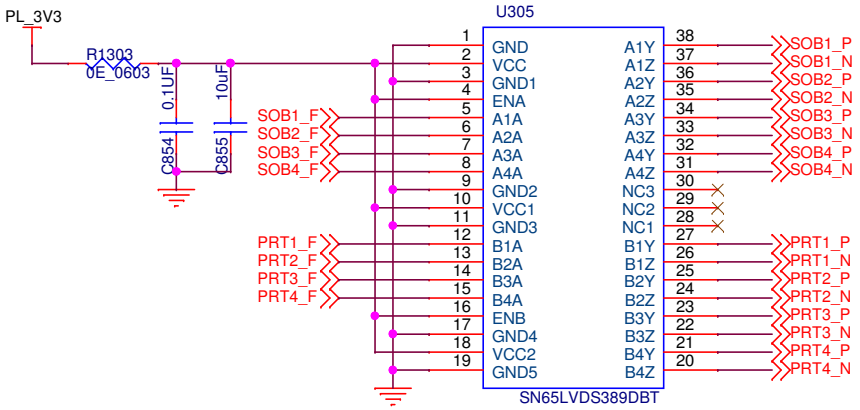


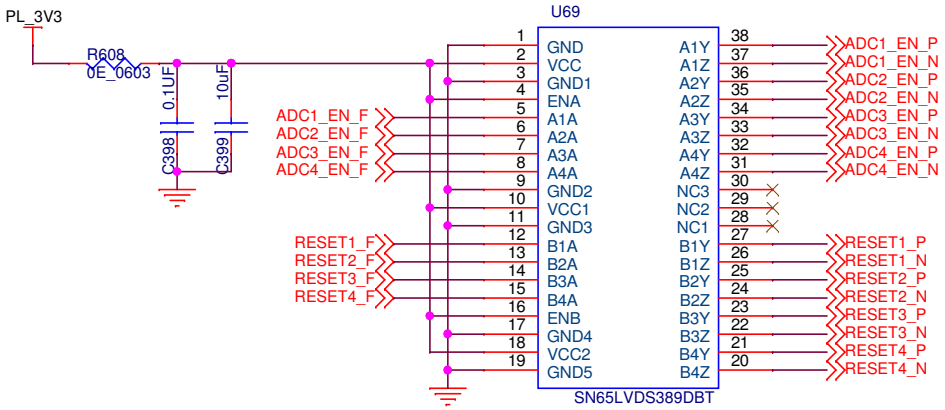
DEFAULT CONDITIONS

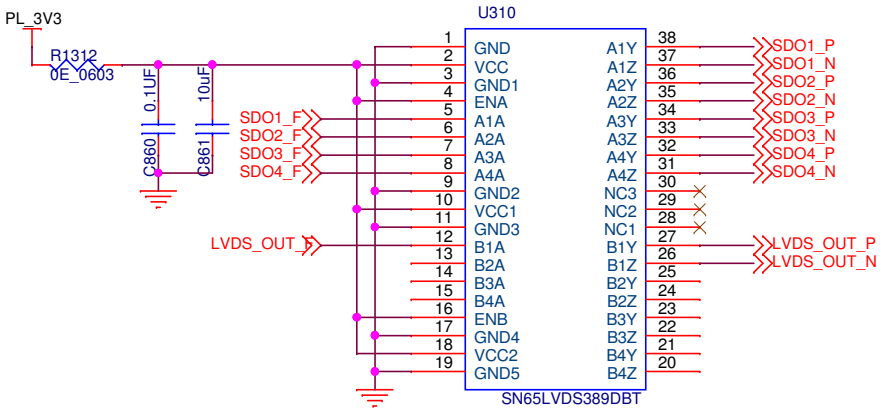


	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: CONTROL SIGNALS
Verified by : NARESH N			Size: A4 — Document Number: SP CARD — Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 — Sheet 20 of 50

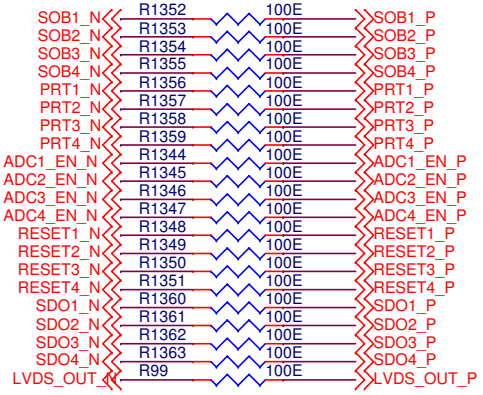
LVDS Output Signals



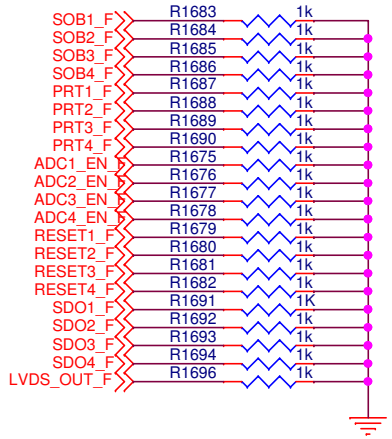




Termination Resistors

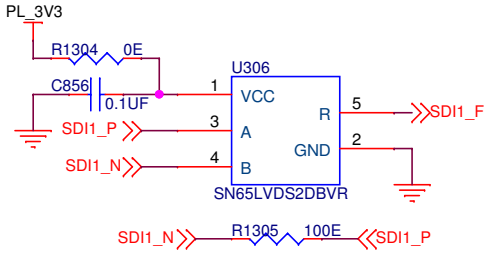


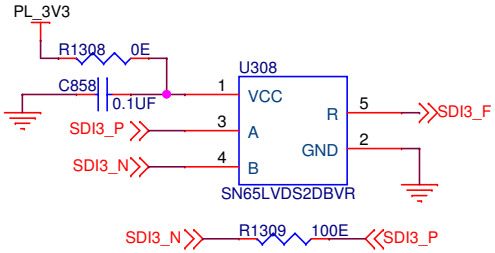
Default Conditions

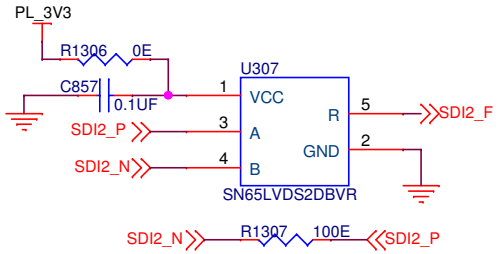


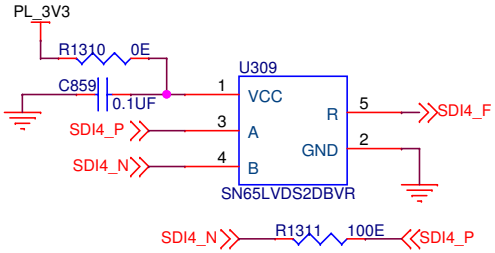
	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: LVDS Output Signals
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 21 of 50

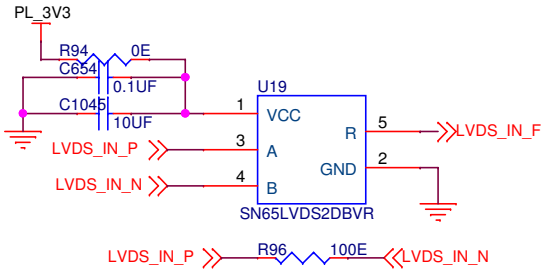
LVDS Input Signals



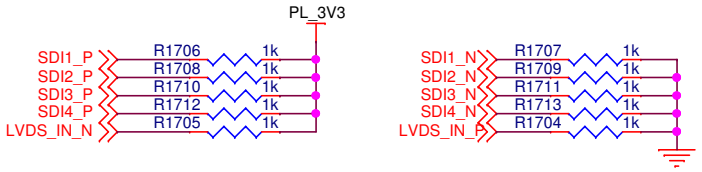






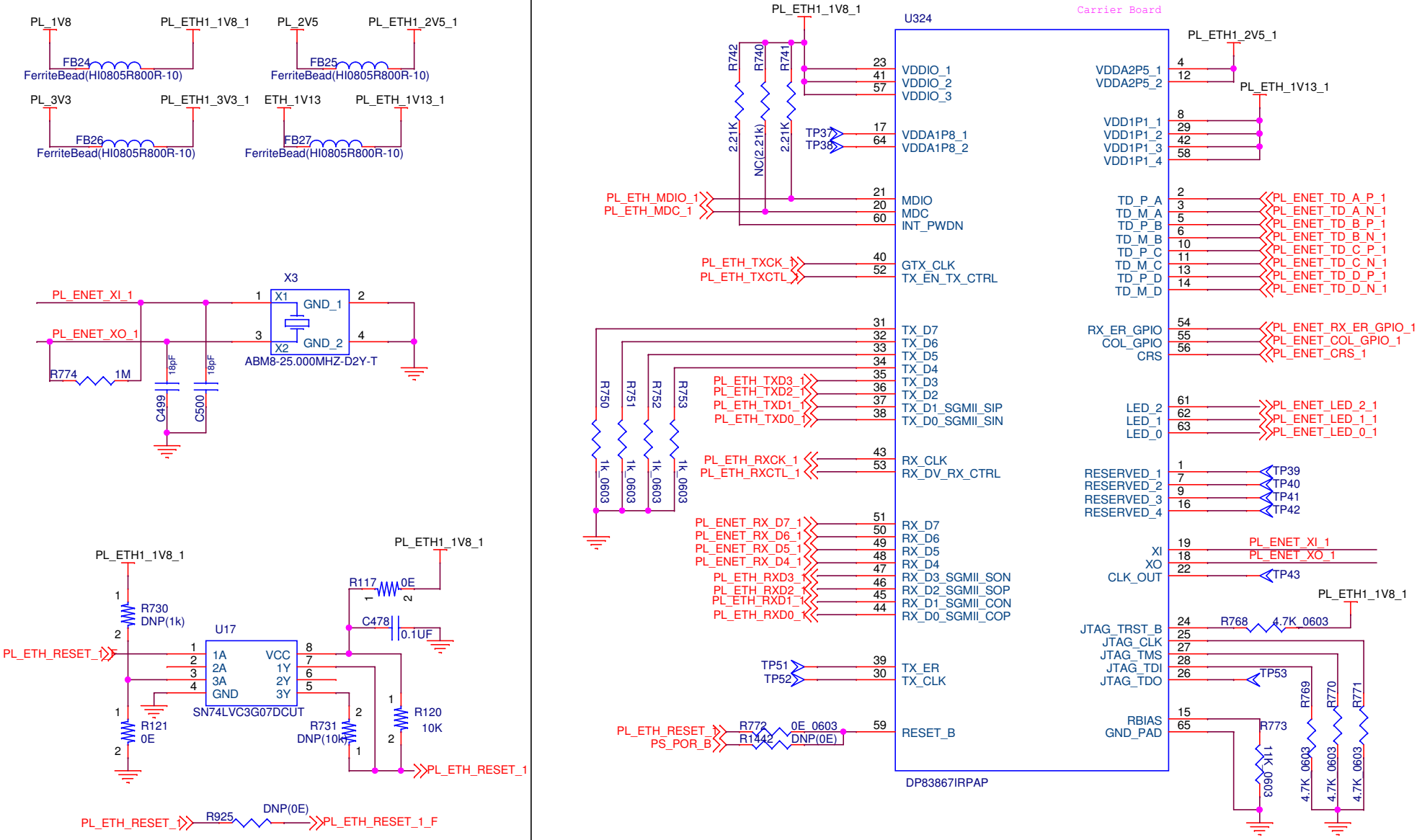


Default Conditions



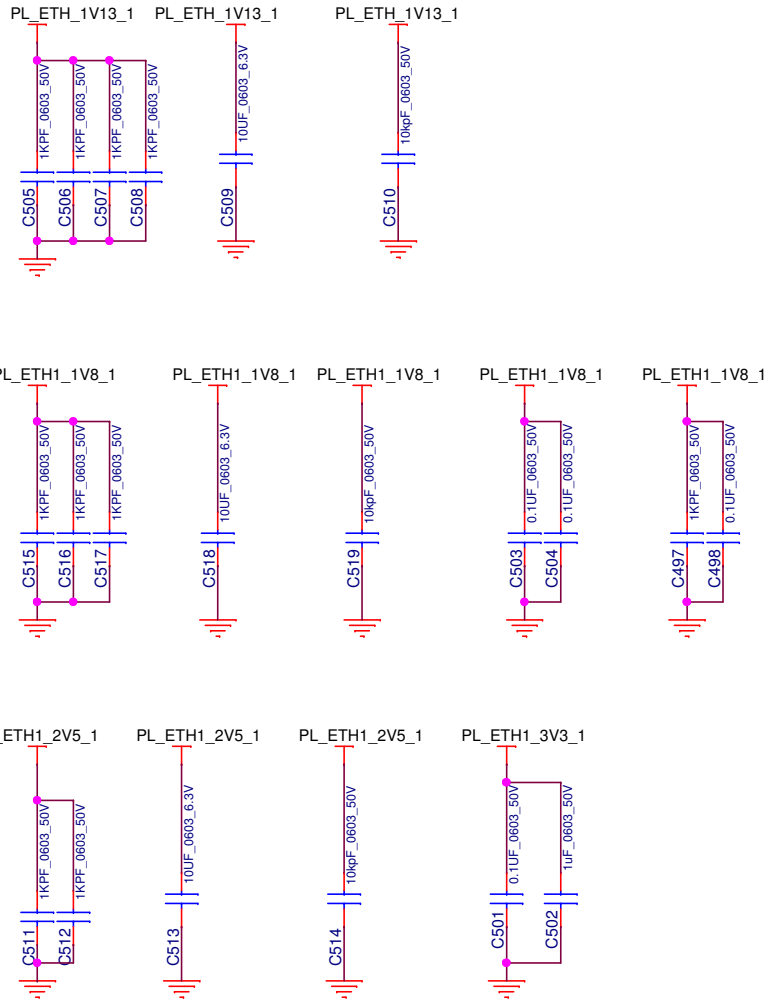
	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: LVDS Input Signals
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 22 of 50

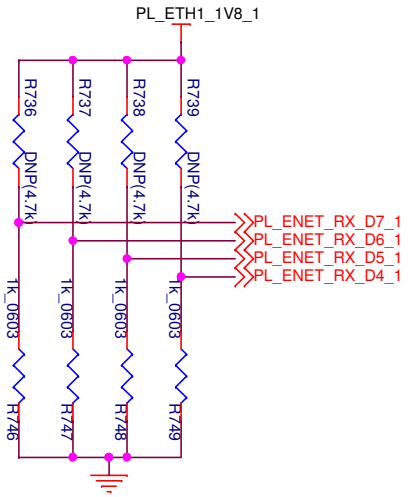
PL Ethernet 1

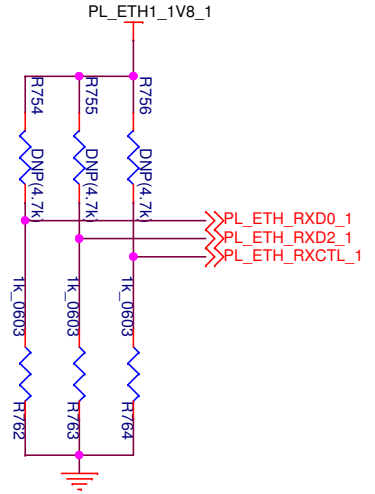


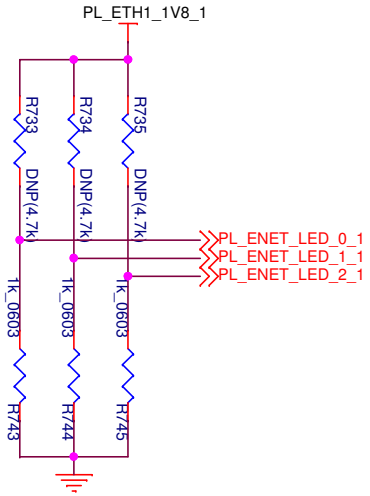
	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: PL Gigabit PHY1 CKT
Verified by : NARESH N			Size: A4 — Document Number: SP CARD — Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 — Sheet 23 of 50

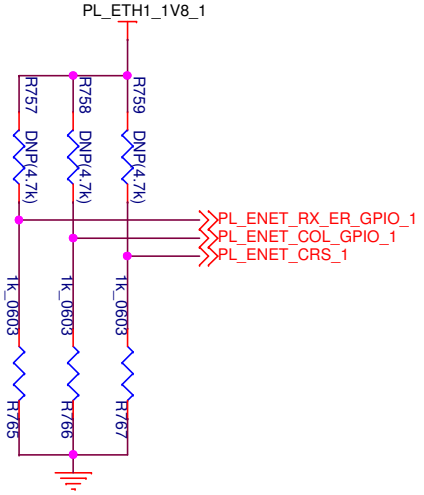
PL Ethernet1 Decaps







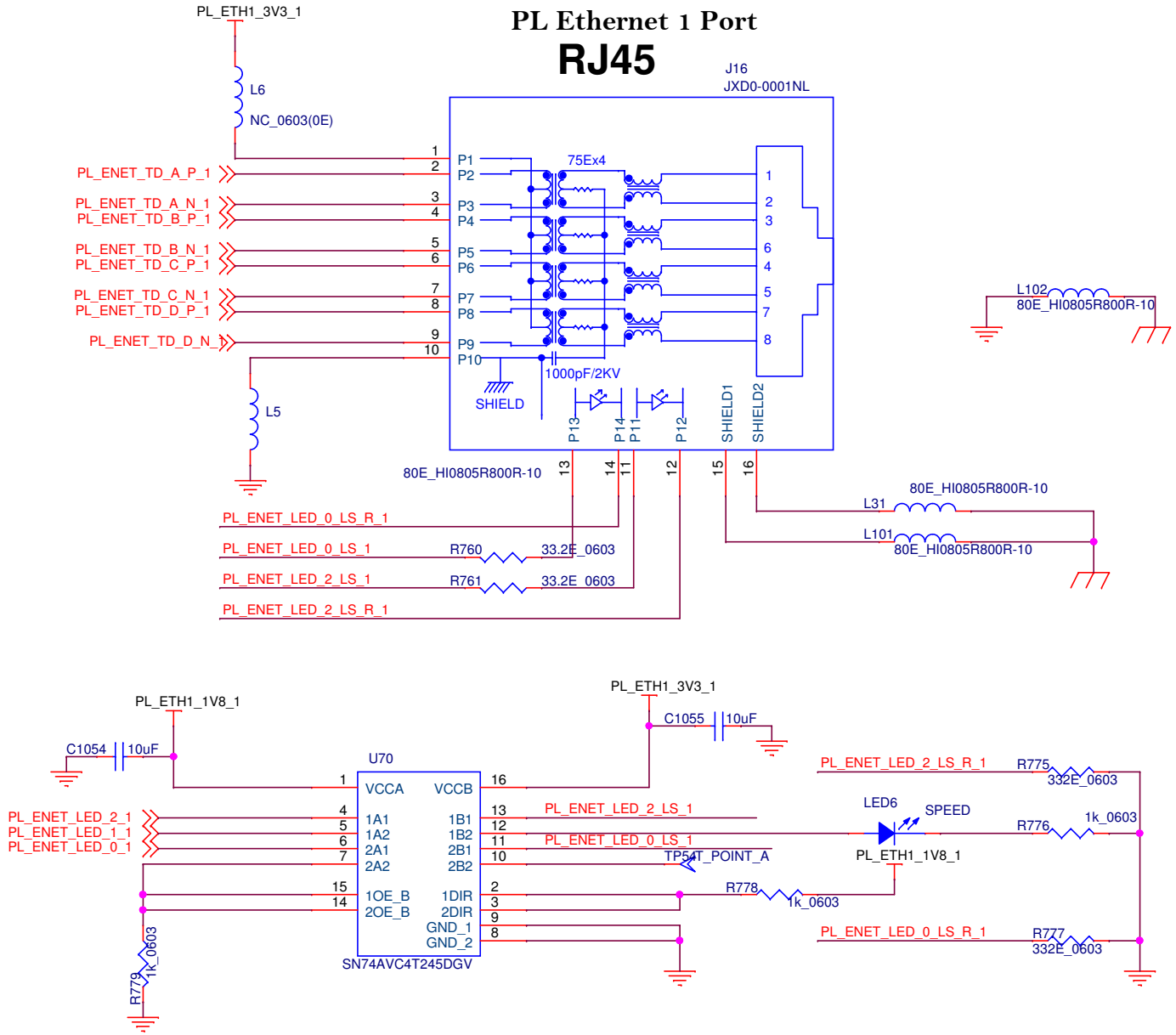




	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: PL Gigabit PHY1 Decaps
Verified by : NARESH N			Size: A4 — Document Number: SP CARD — Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 — Sheet 24 of 50

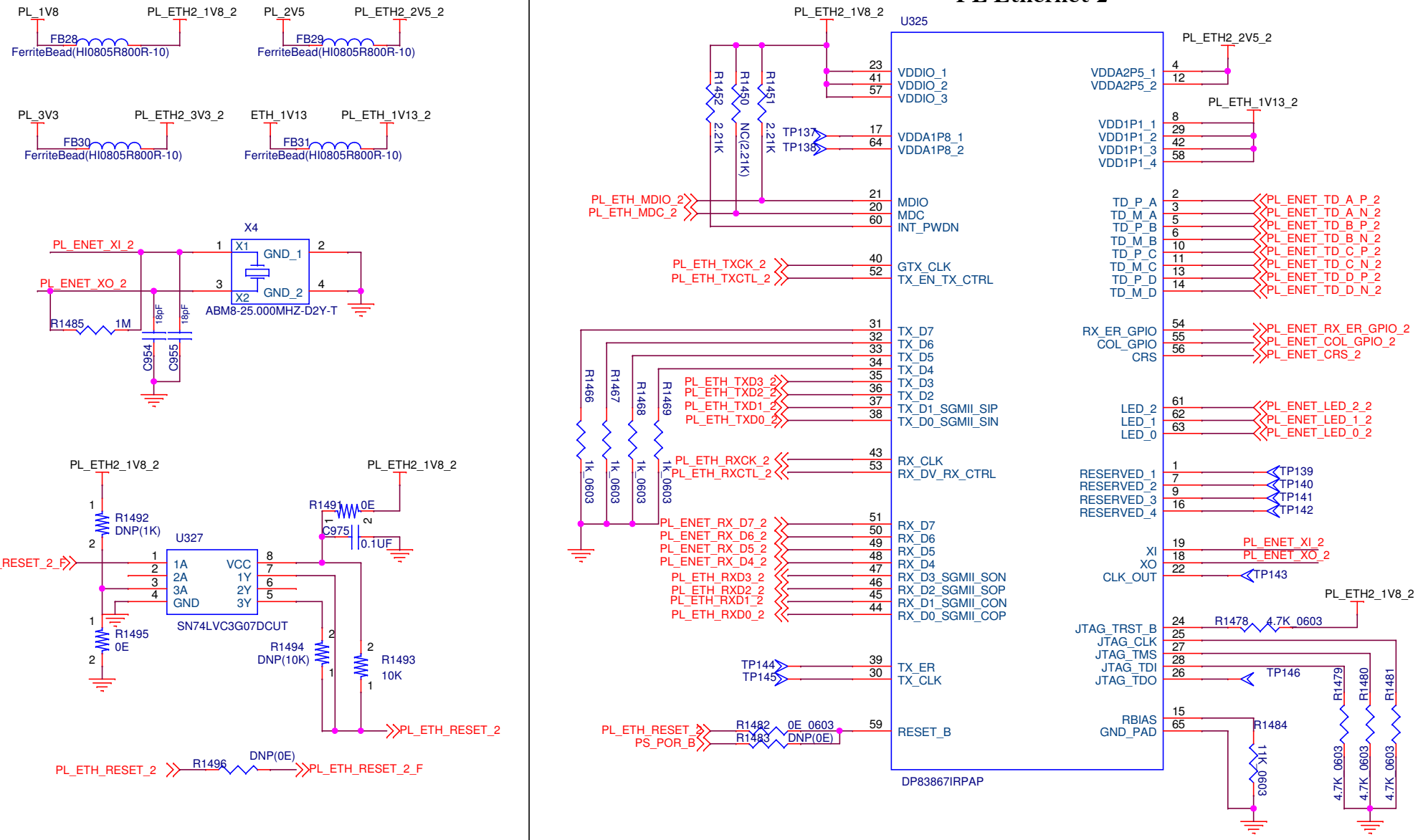
PL Ethernet 1 Port

RJ45



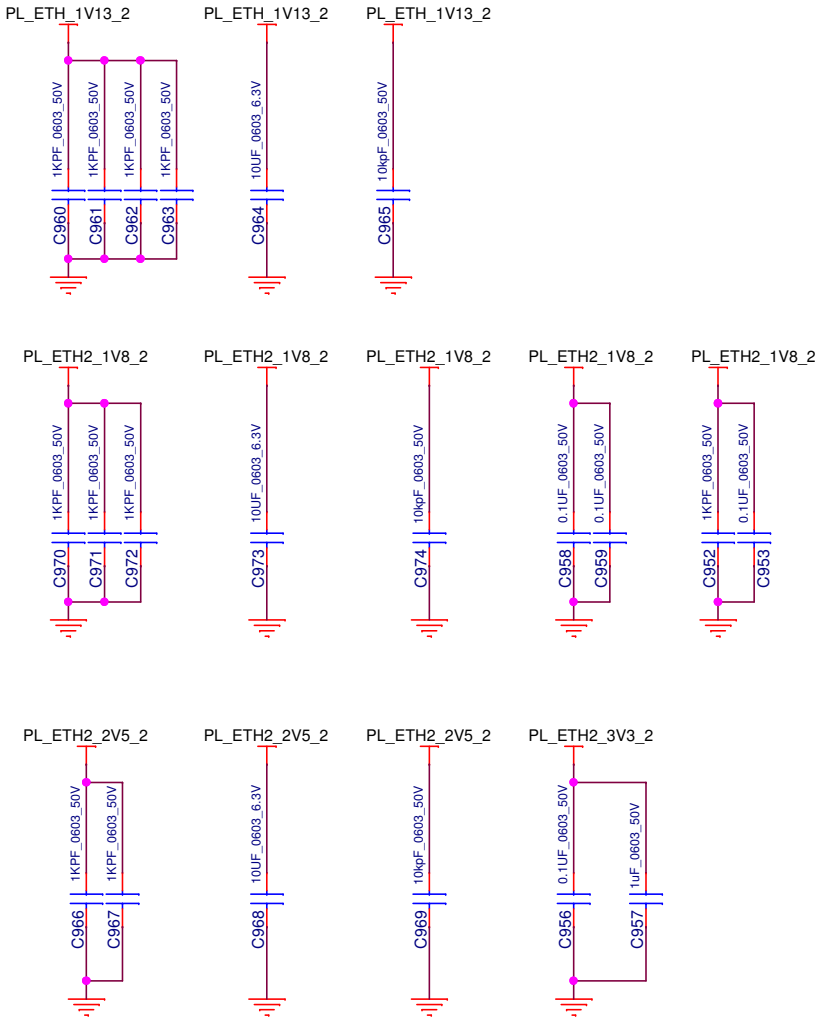
	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: PL Gigabit PHY1 RJ45 Jack
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 25 of 50

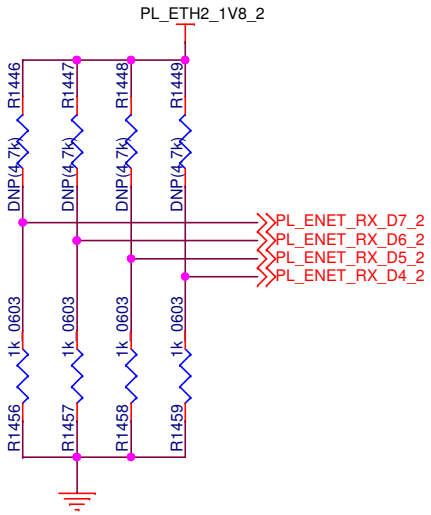
PL Ethernet 2

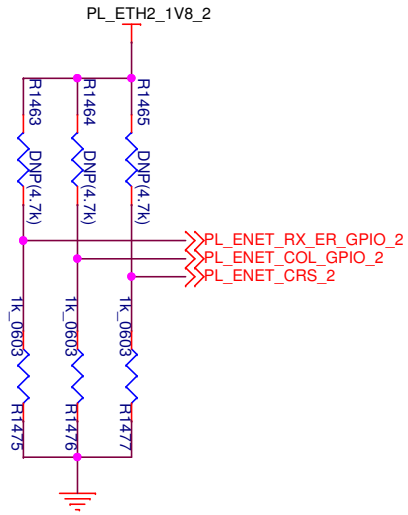


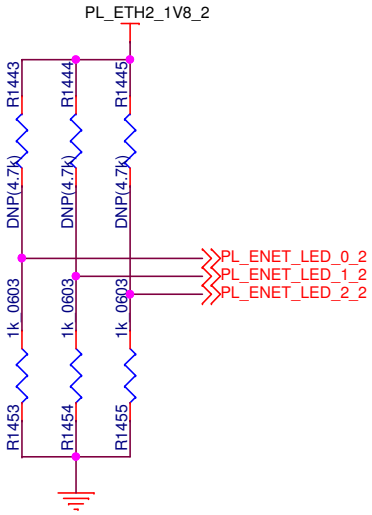
	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: PL Gigabit PHY2
Verified by : NARESH N			Size: A4 — Document Number: SP CARD — Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 — Sheet 26 of 50

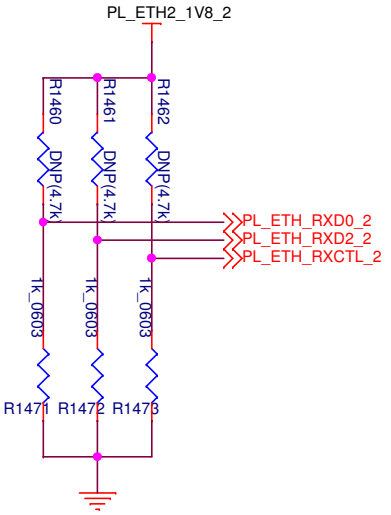
PL Ethernet2 Decaps







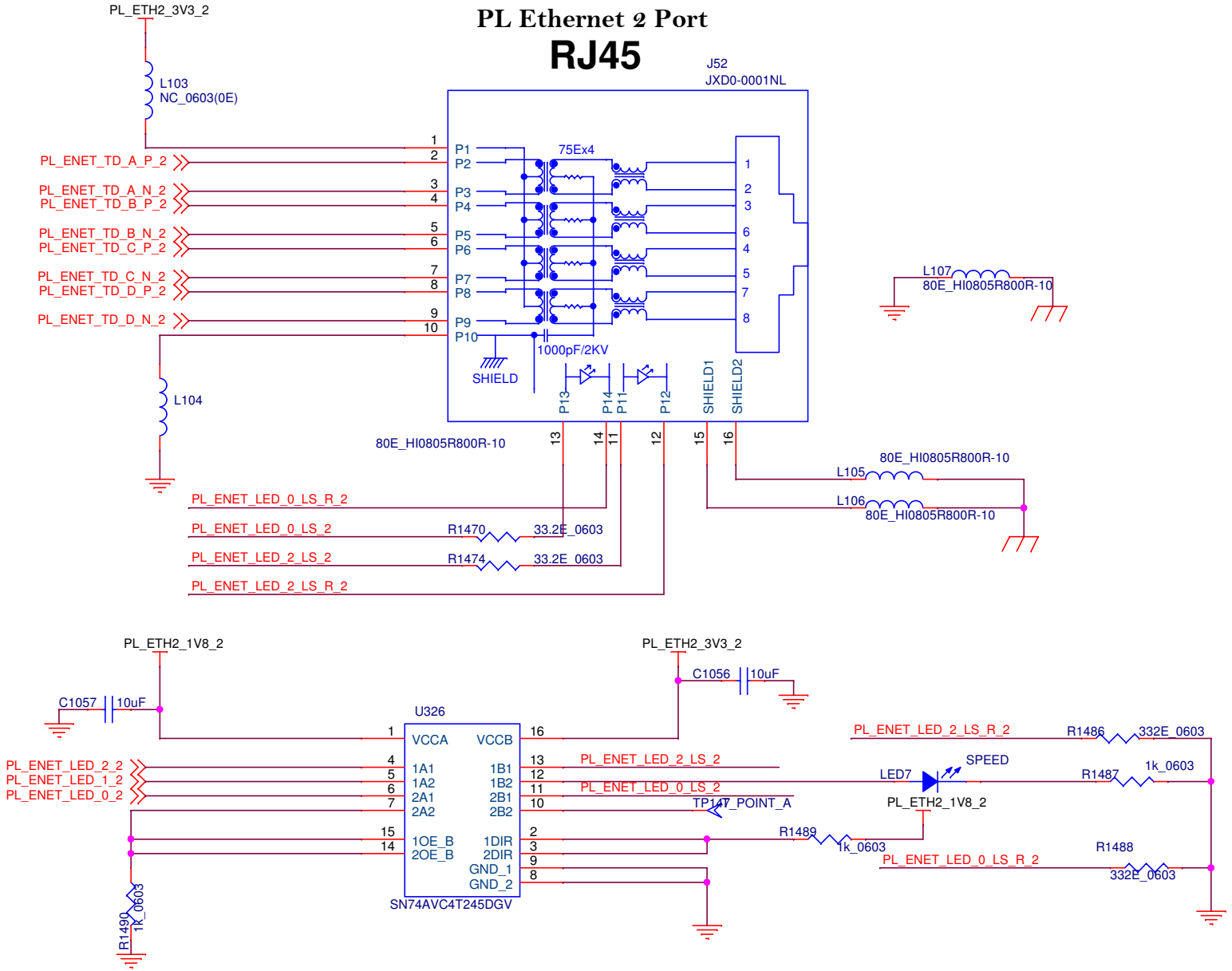




	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: PL Gigabit PHY2 Decaps
Verified by : NARESH N			Size: A4 — Document Number: SP CARD — Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 — Sheet 27 of 50

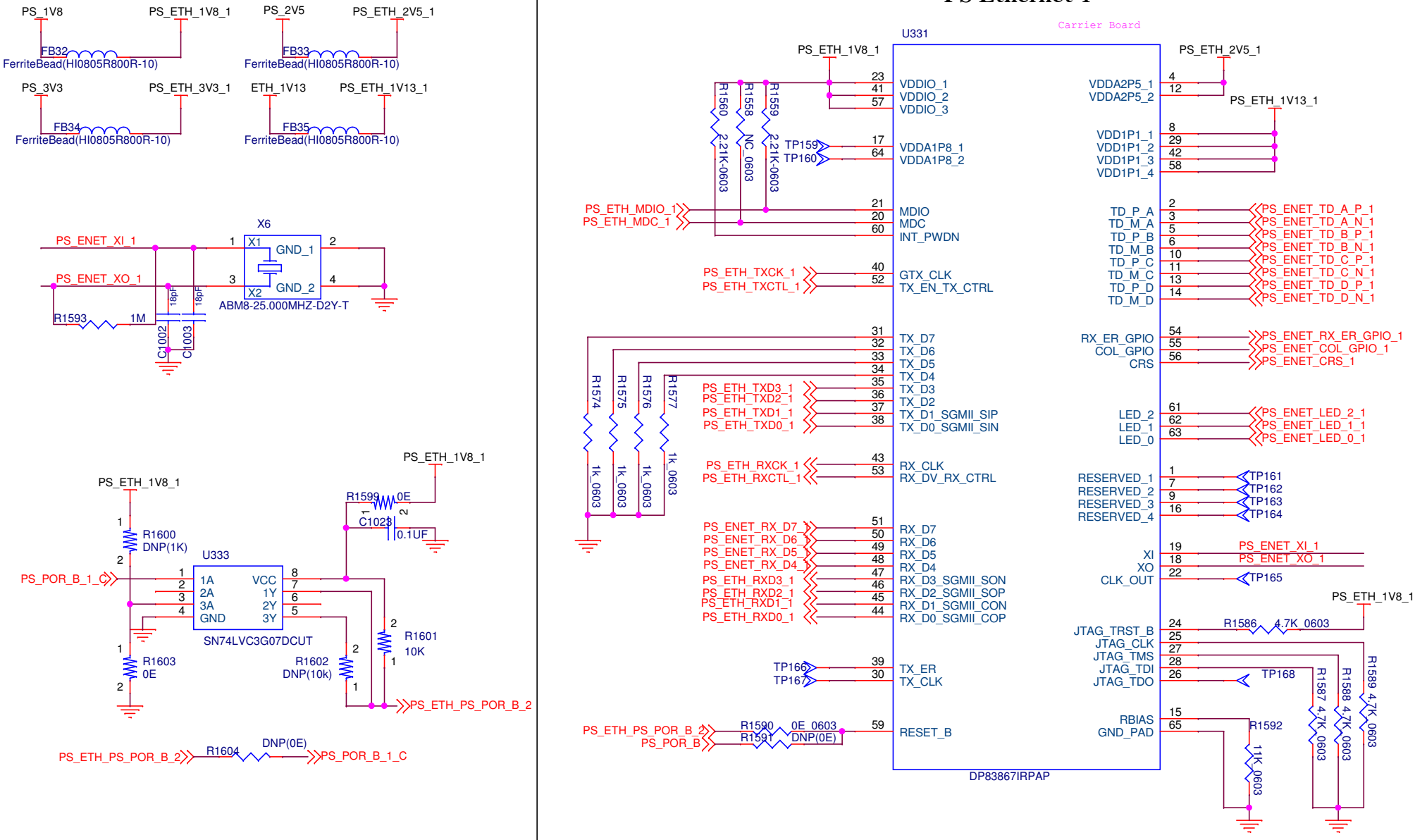
PL Ethernet 2 Port

RJ45



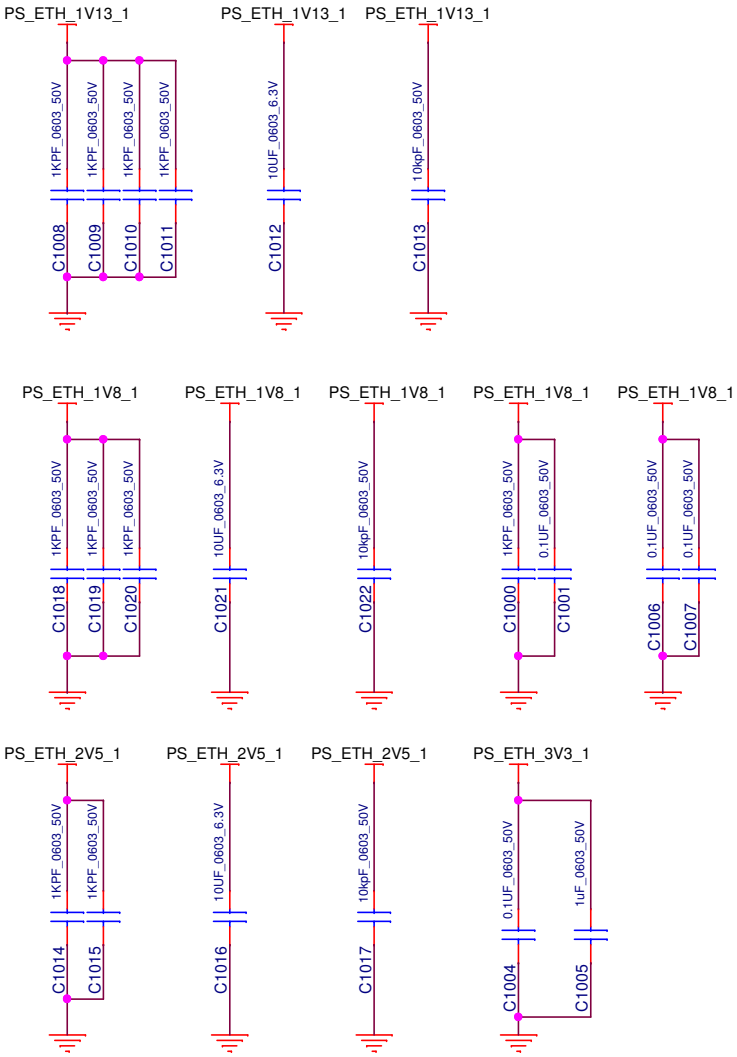
	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: PL Gigabit PHY2 RJ45 Jack
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 28 of 50

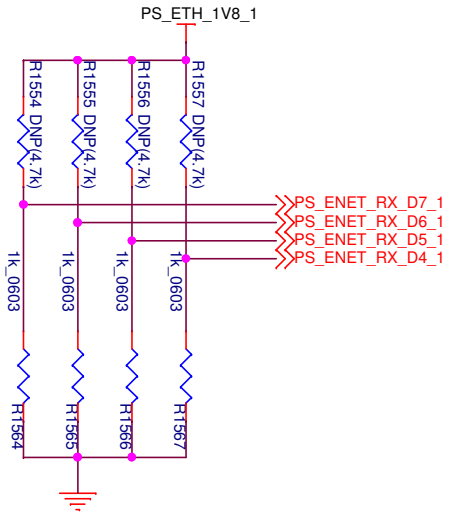
PS Ethernet 1

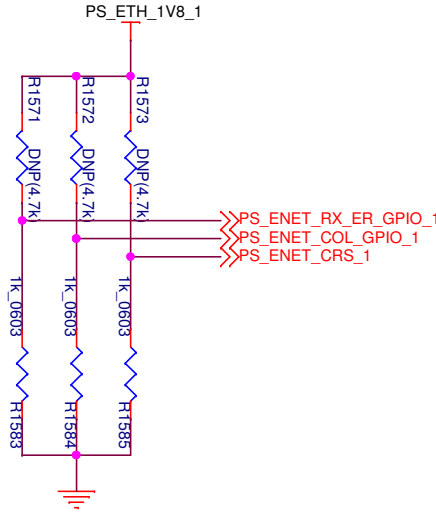


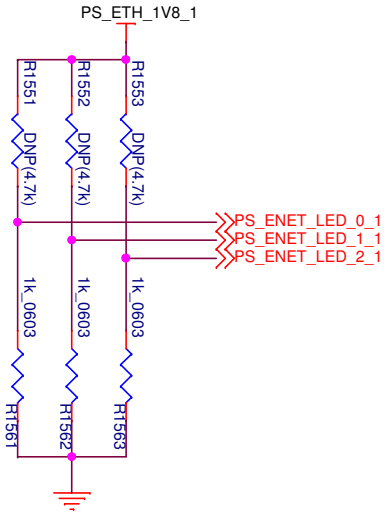
	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: PS Gigabit PHY1 CKT
Verified by : NARESH N			Size: A4 — Document Number: SP CARD — Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 — Sheet 29 of 50

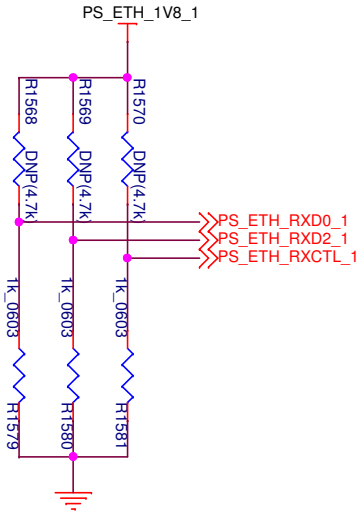
PS Ethernet1 Decaps







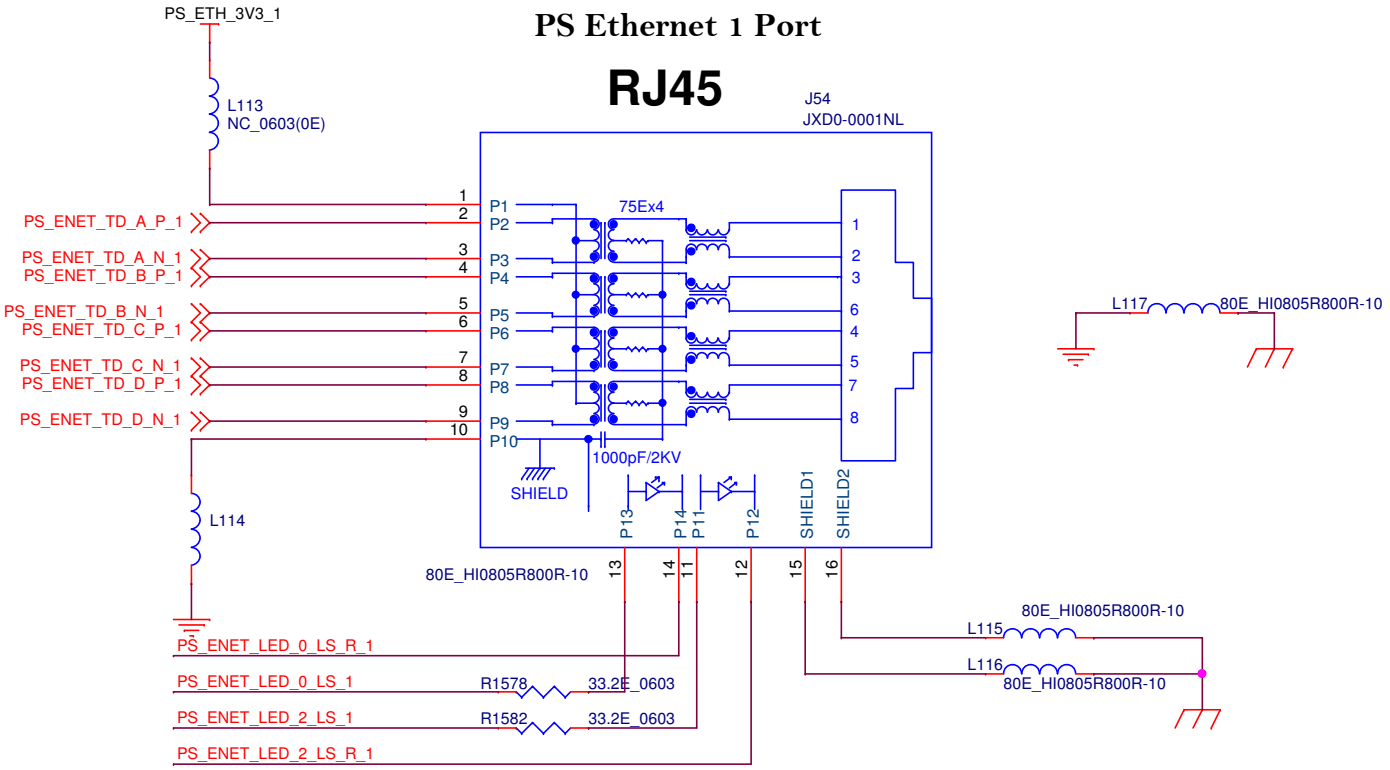


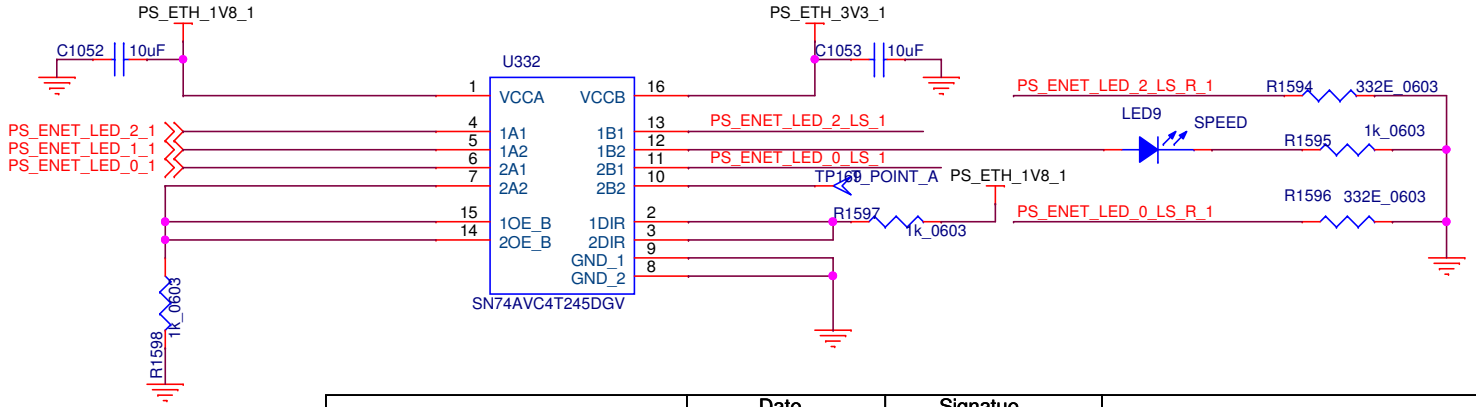


	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: PS Gigabit PHY1 Decaps
Verified by : NARESH N			Size: A4 — Document Number: SP CARD — Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 — Sheet 30 of 50

PS Ethernet 1 Port

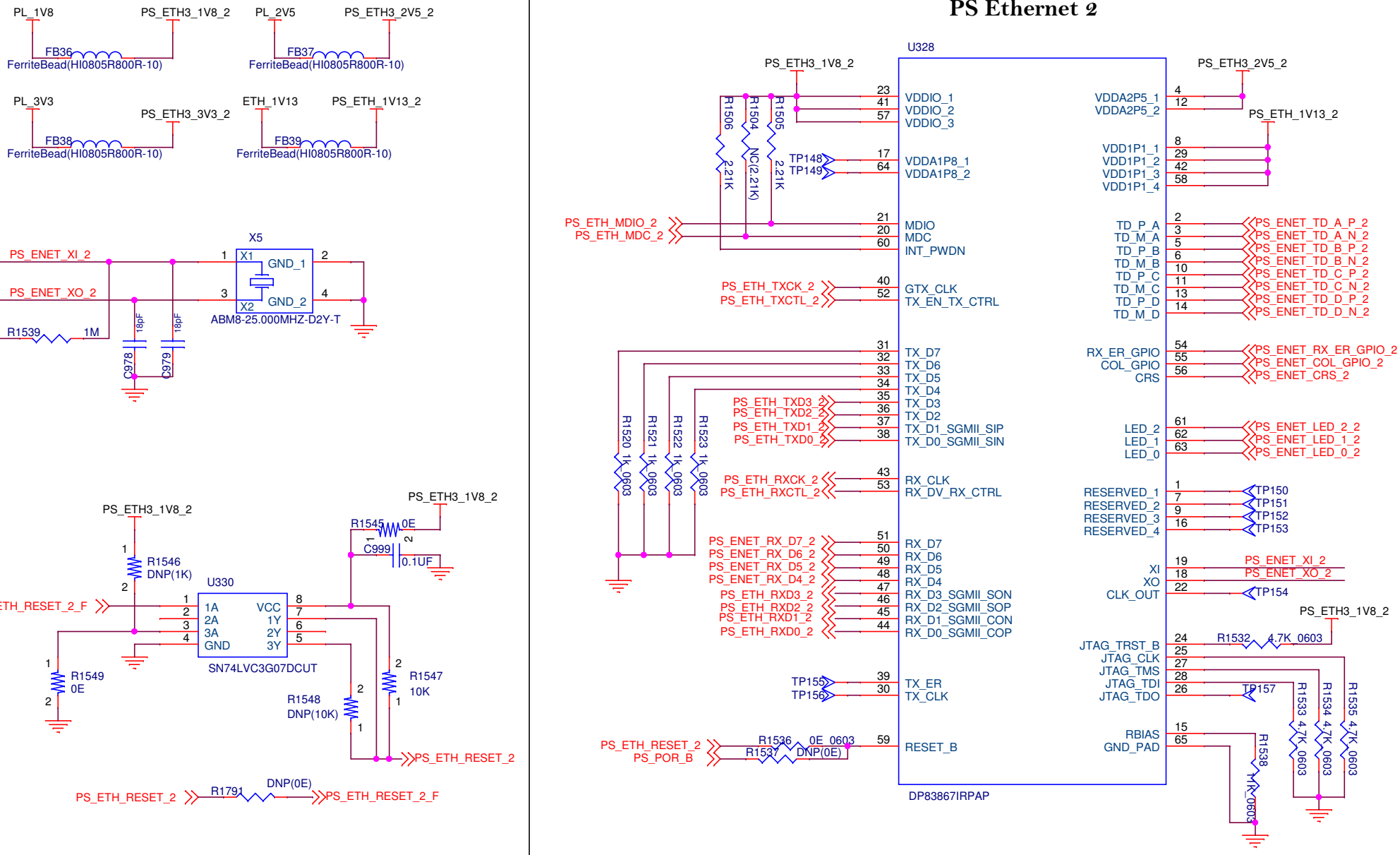
RJ45





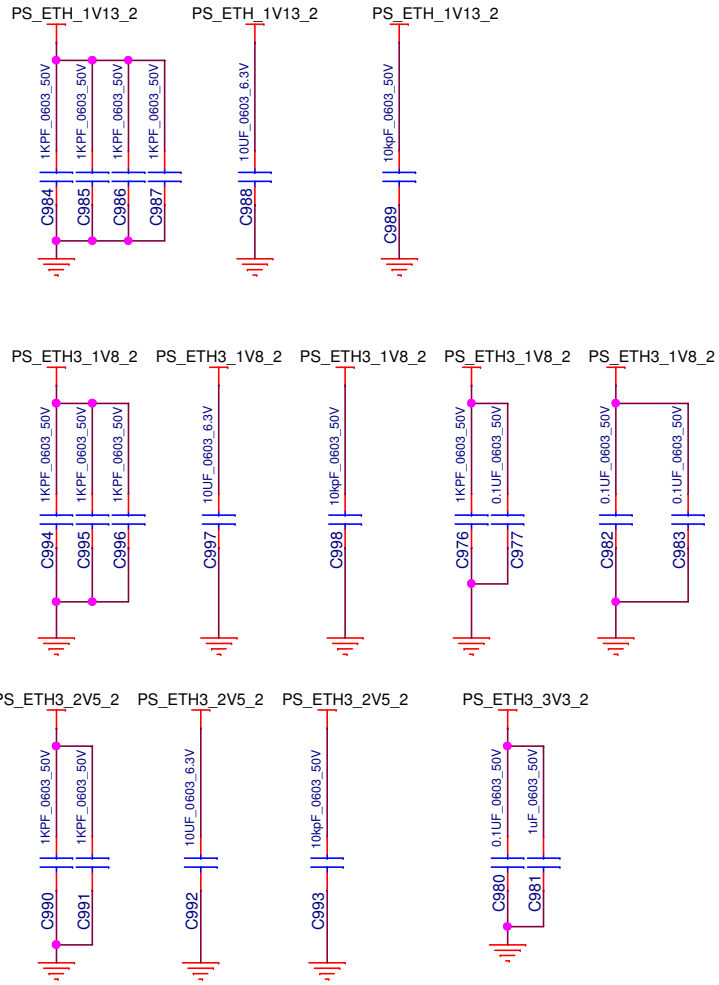
	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: PS Gigabit PHY1 RJ45 Jack
Verified by : NARESH N			Size: A4 — Document Number: SP CARD — Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 — Sheet 31 of 50

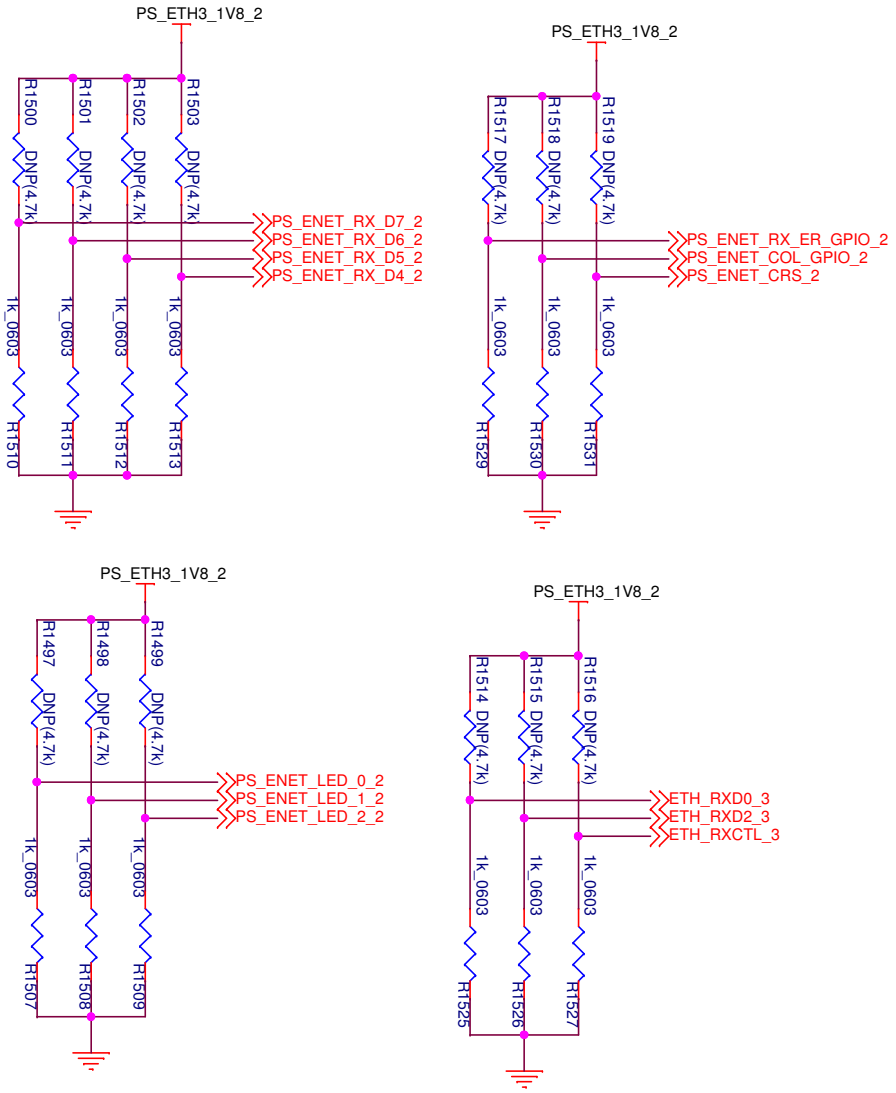
PS Ethernet 2



	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: PS Gigabit PHY2 CKT
Verified by : NARESH N			Size: A4 — Document Number: SP CARD — Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 — Sheet 32 of 50

PS Ethernet 2 Decaps

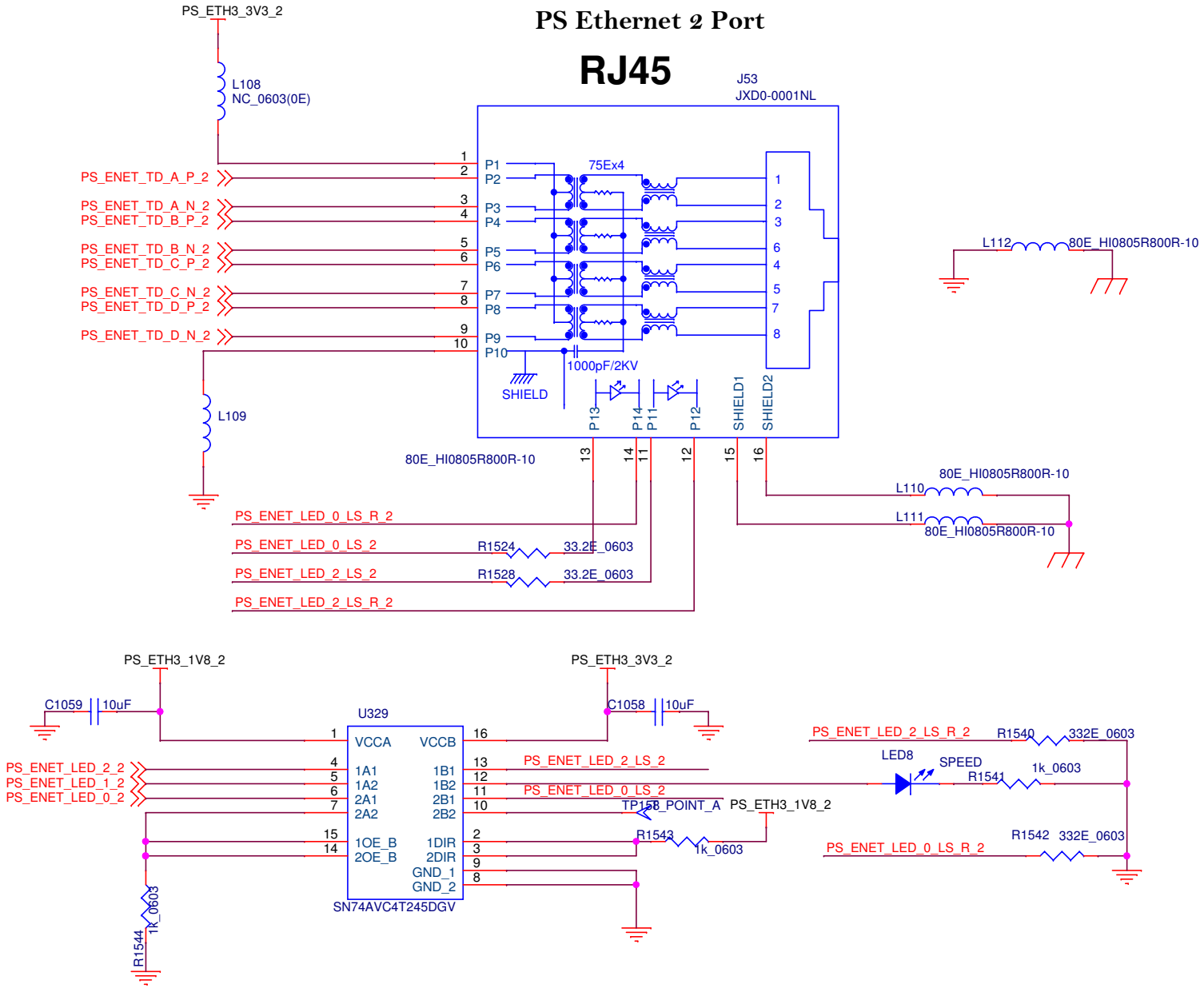




	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD	
Designed by : LAVANYA.B			Title: PS Gigabit PHY1 Decaps	
Verified by : NARESH N			Size: A4	Document Number: SP CARD — Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023	Sheet 33 of 50

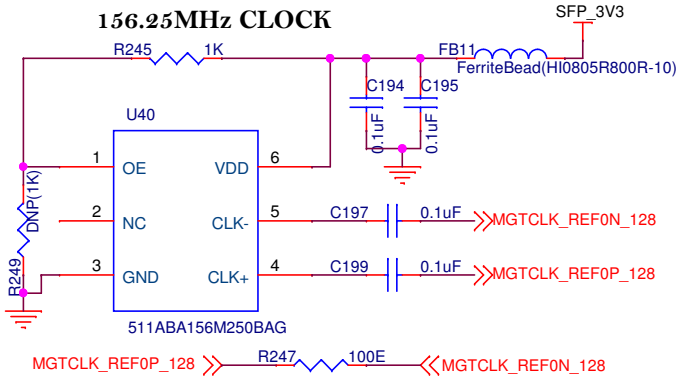
PS Ethernet 2 Port

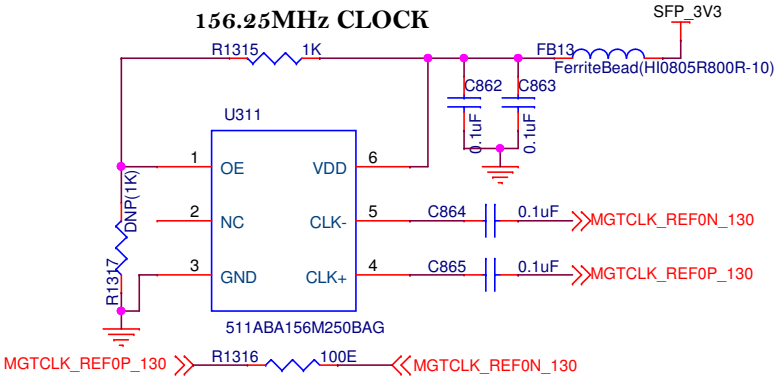
RJ45

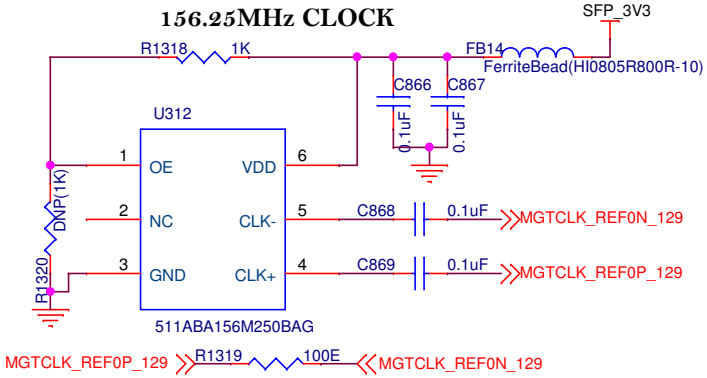


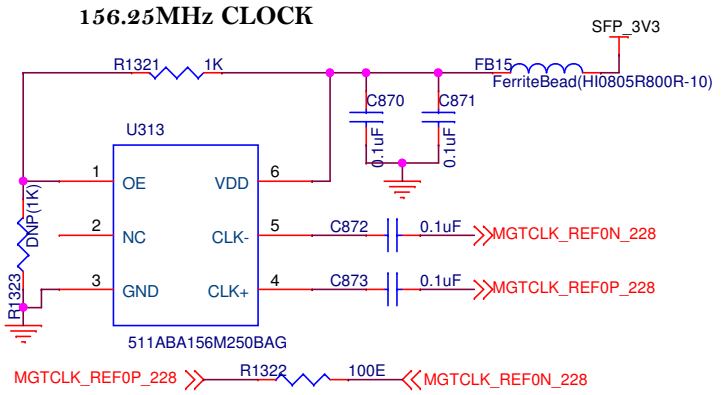
	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: PS Gigabit PHY2 RJ45 Jack
Verified by : NARESH N			Size: A4 — Document Number: SP CARD — Rev: 1.0
Aproved by NARESH N			Date: Tuesday, June 20, 2023 — Sheet 34 of 50

SFP CLOCK CKT



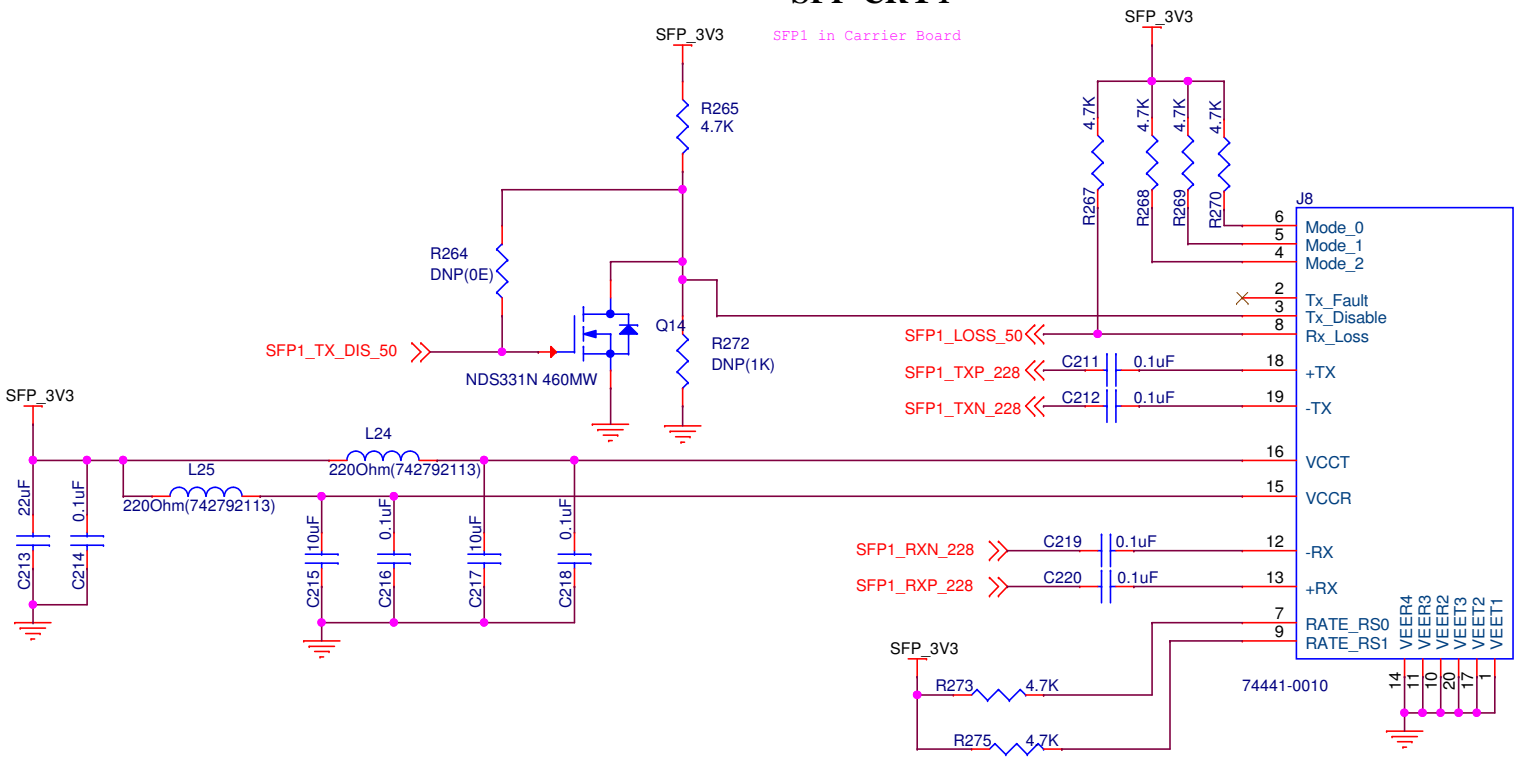


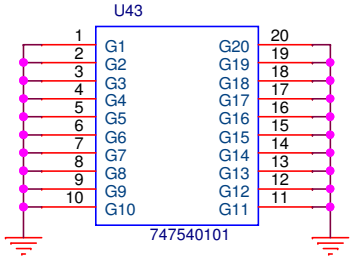




	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: SFP CLOCK
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 35 of 50

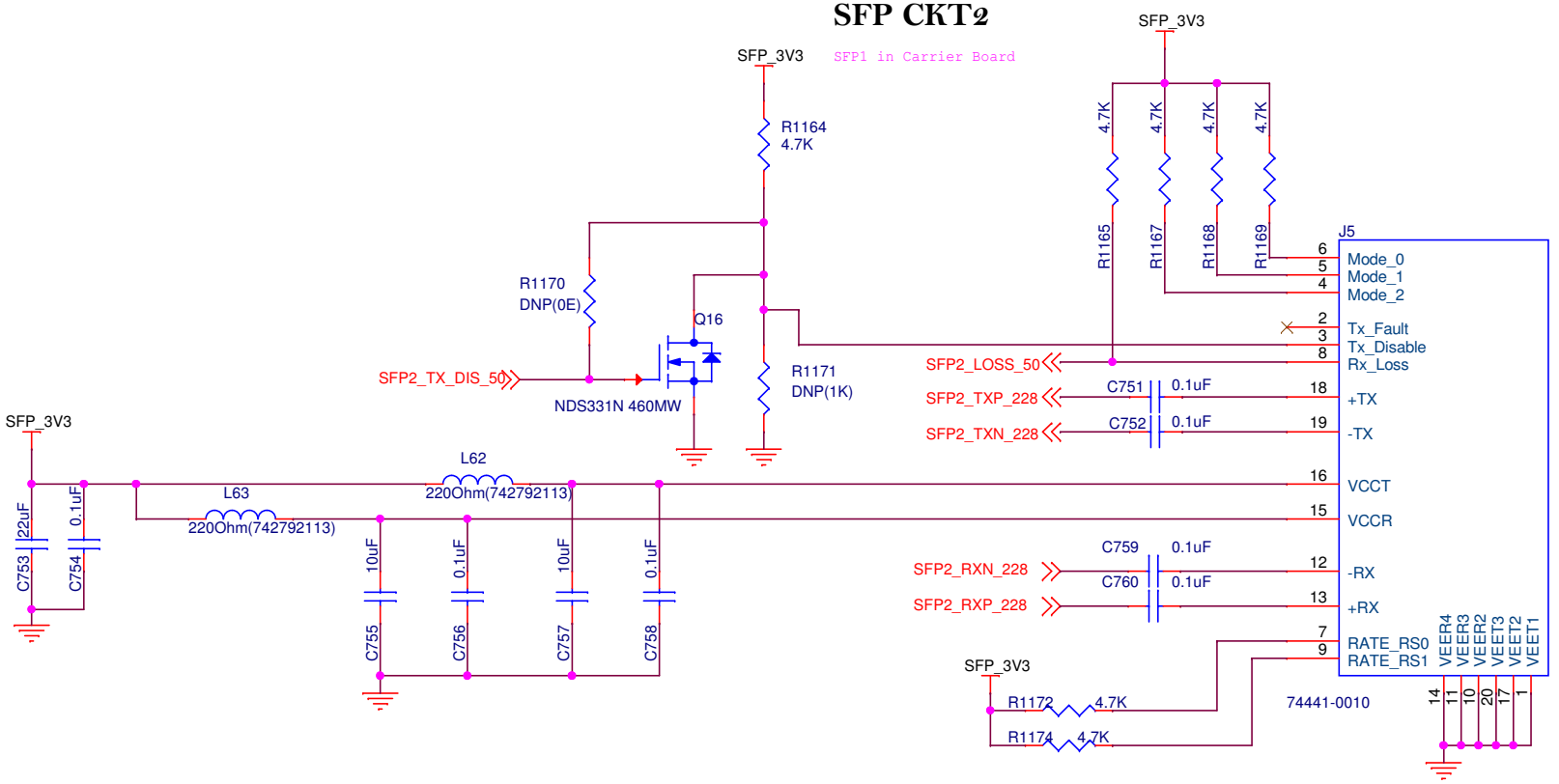
SFP CKT1

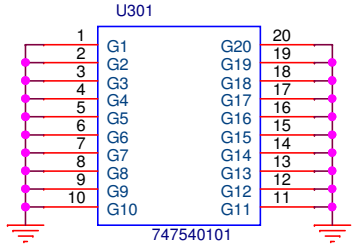




	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: SFP CKT
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 36 of 50

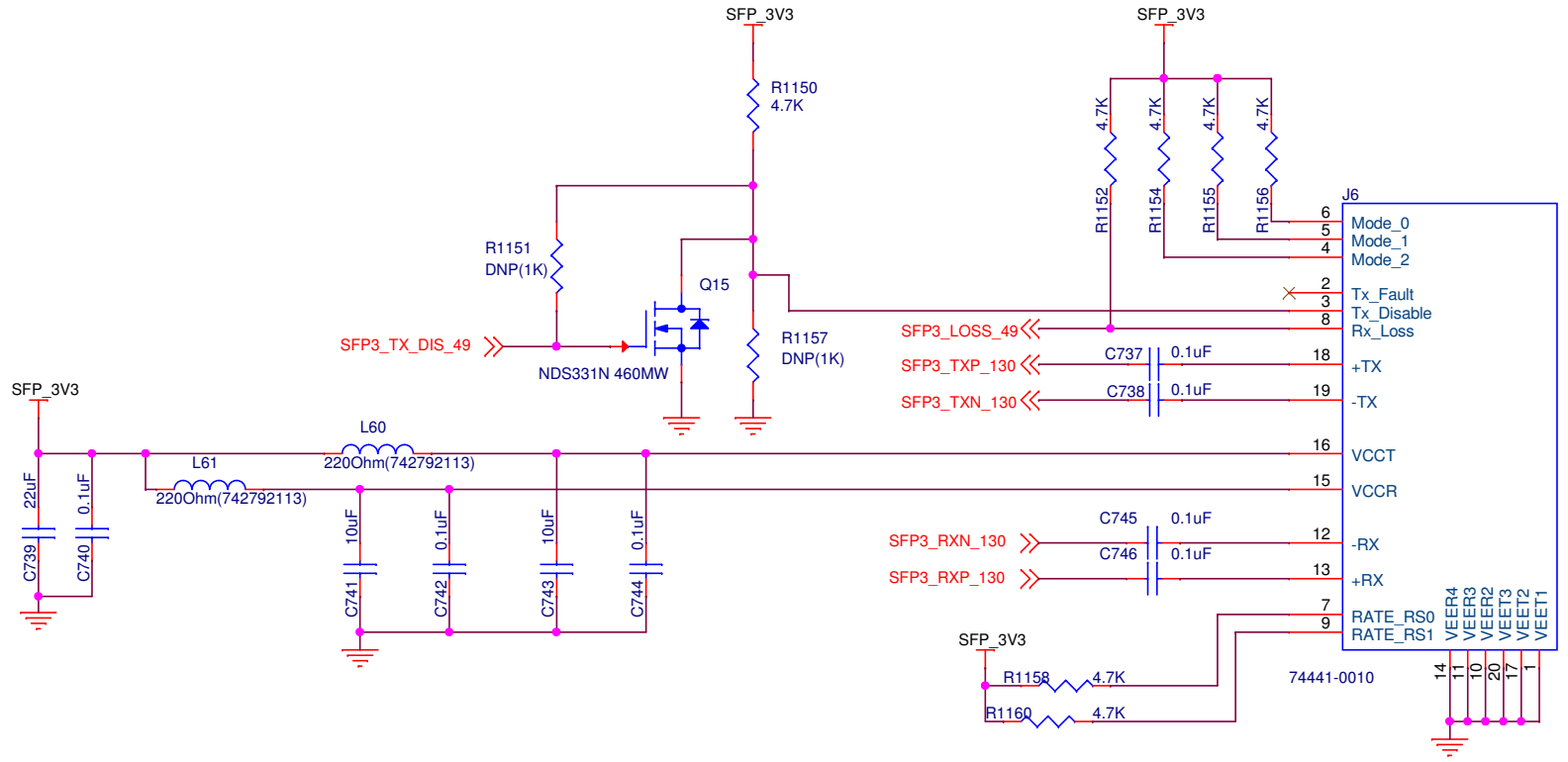
SFP CKT2

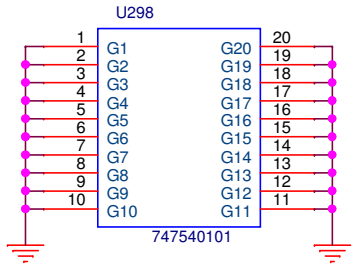




	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: SFP CKT
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 37 of 50

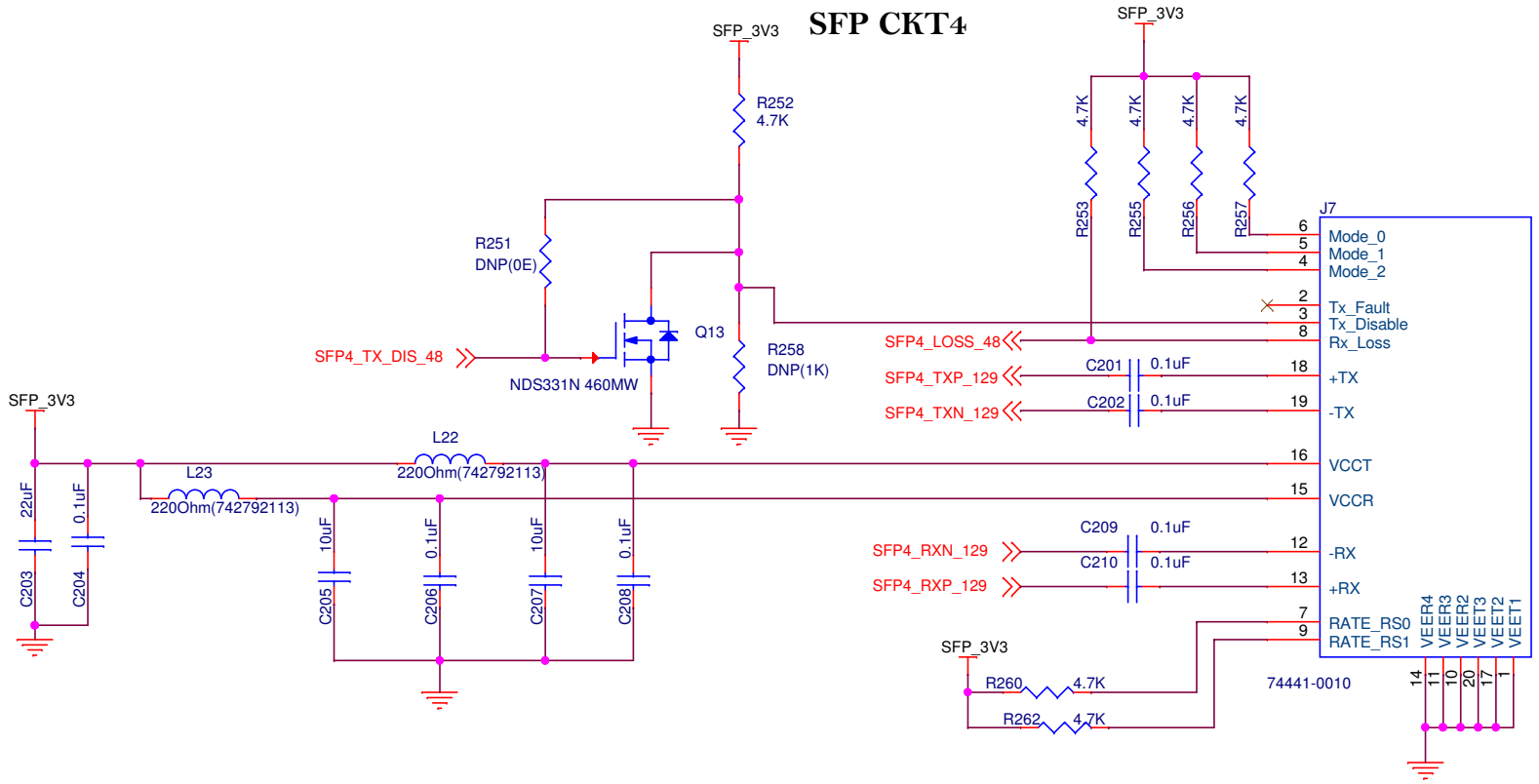
SFP CKT3

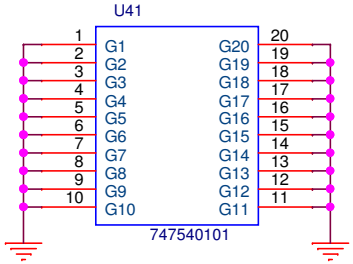




	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: SFP CKT
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 38 of 50

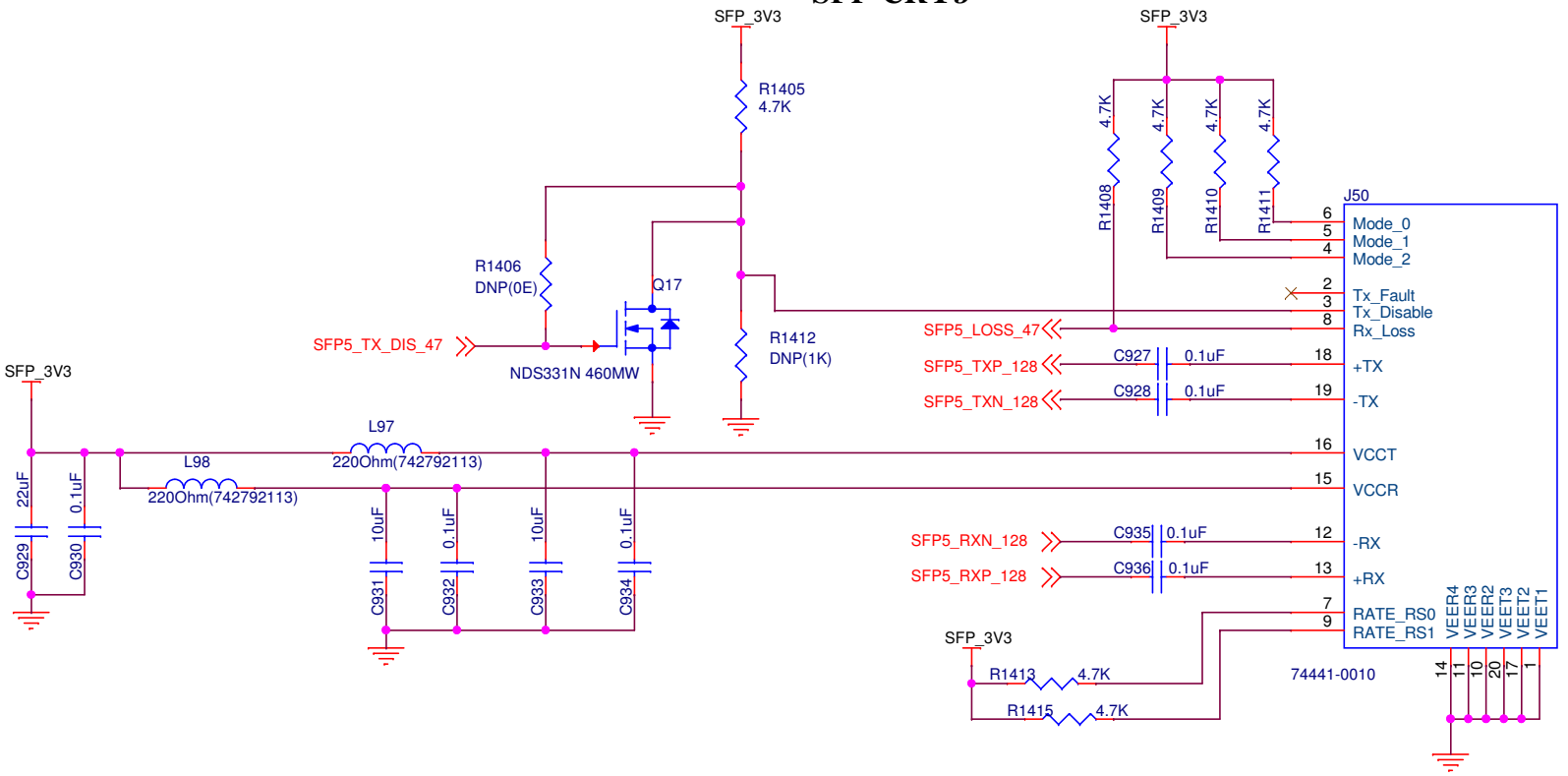
SFP CKT4

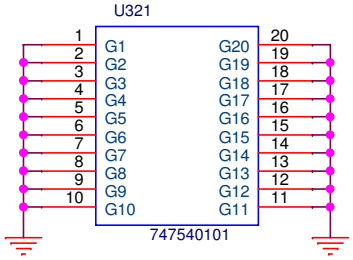




	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: SFP CKT
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 39 of 50

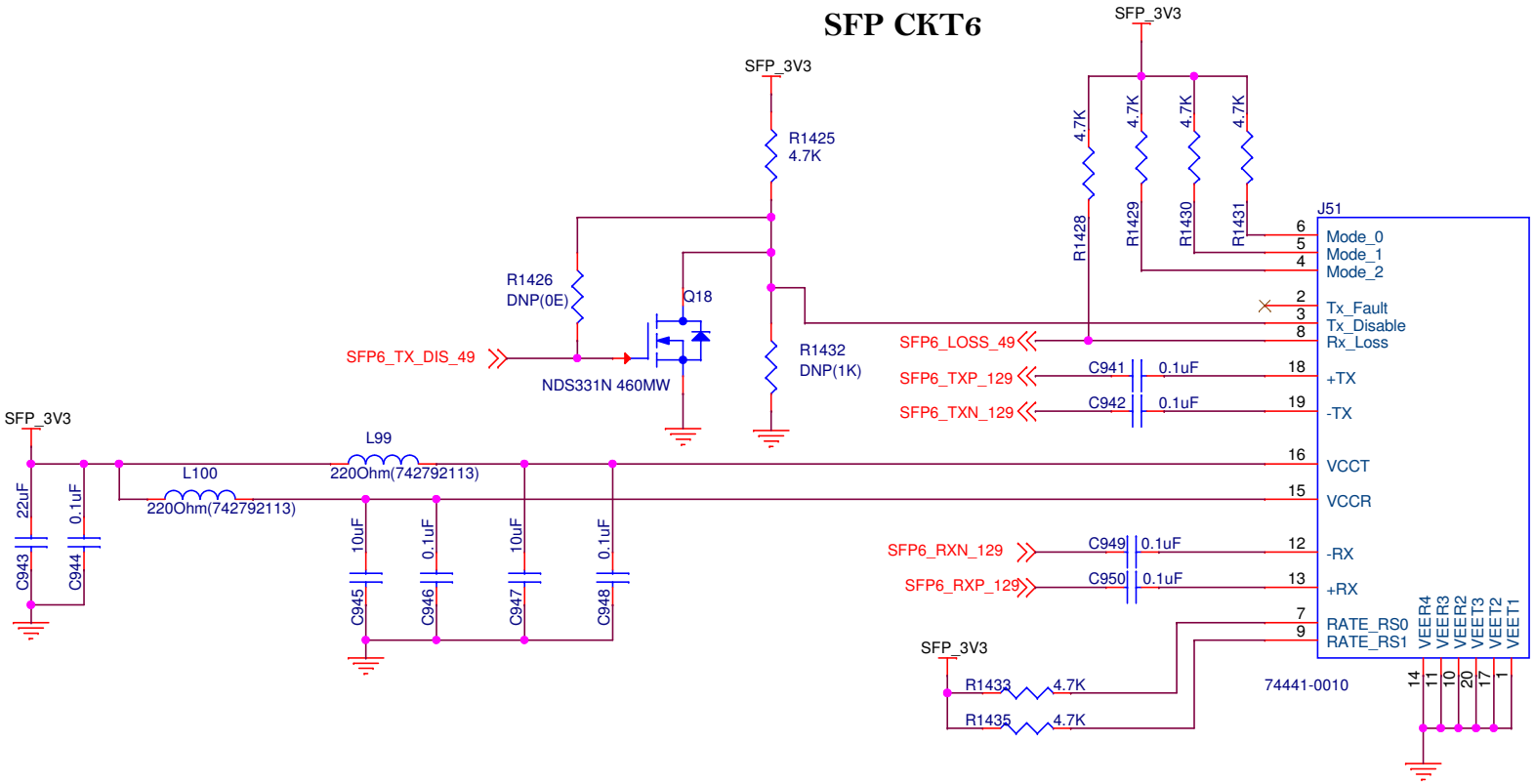
SFP CKT5

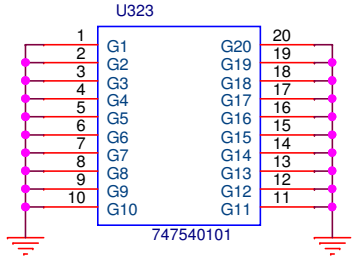




	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: SFP CKT
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 40 of 50

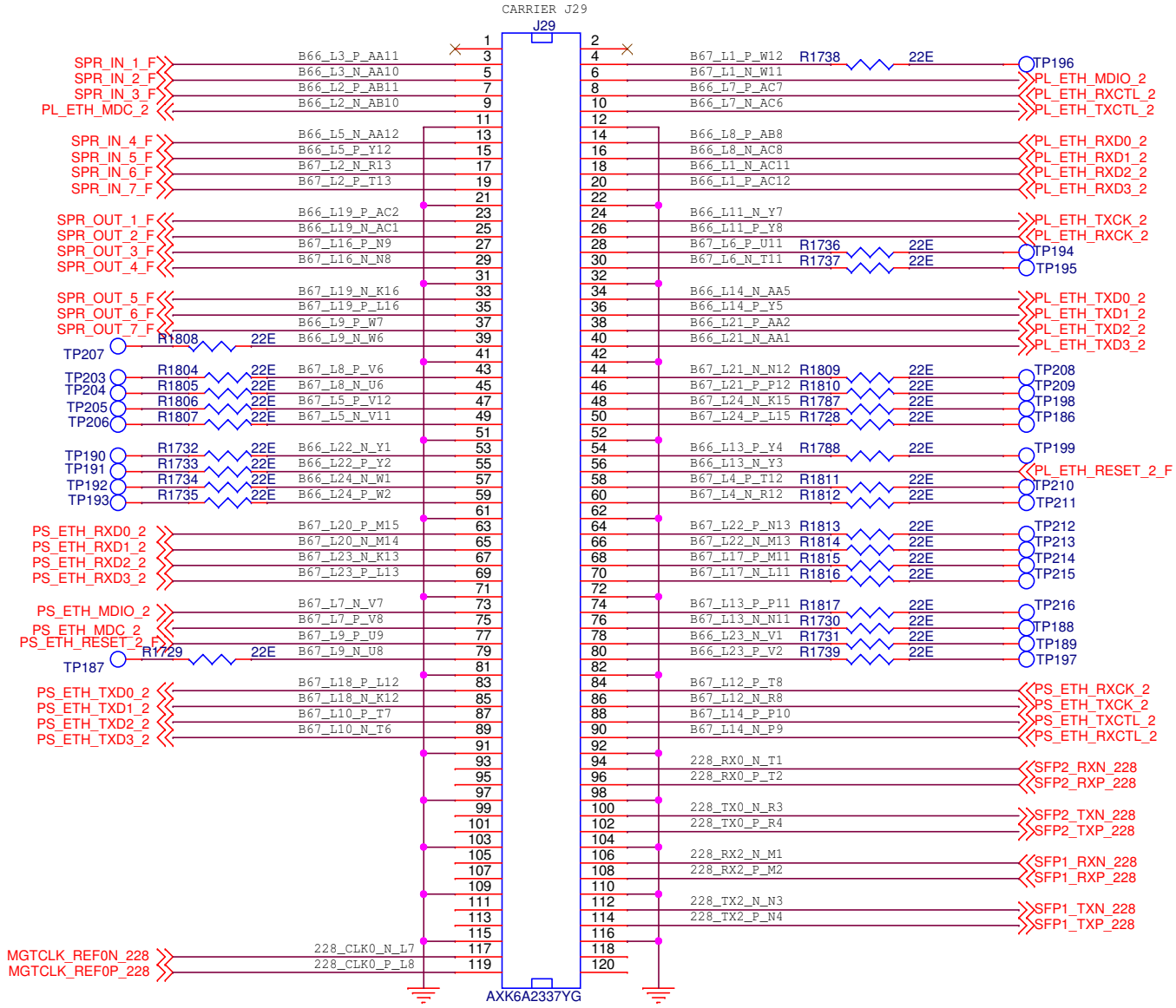
SFP CKT6



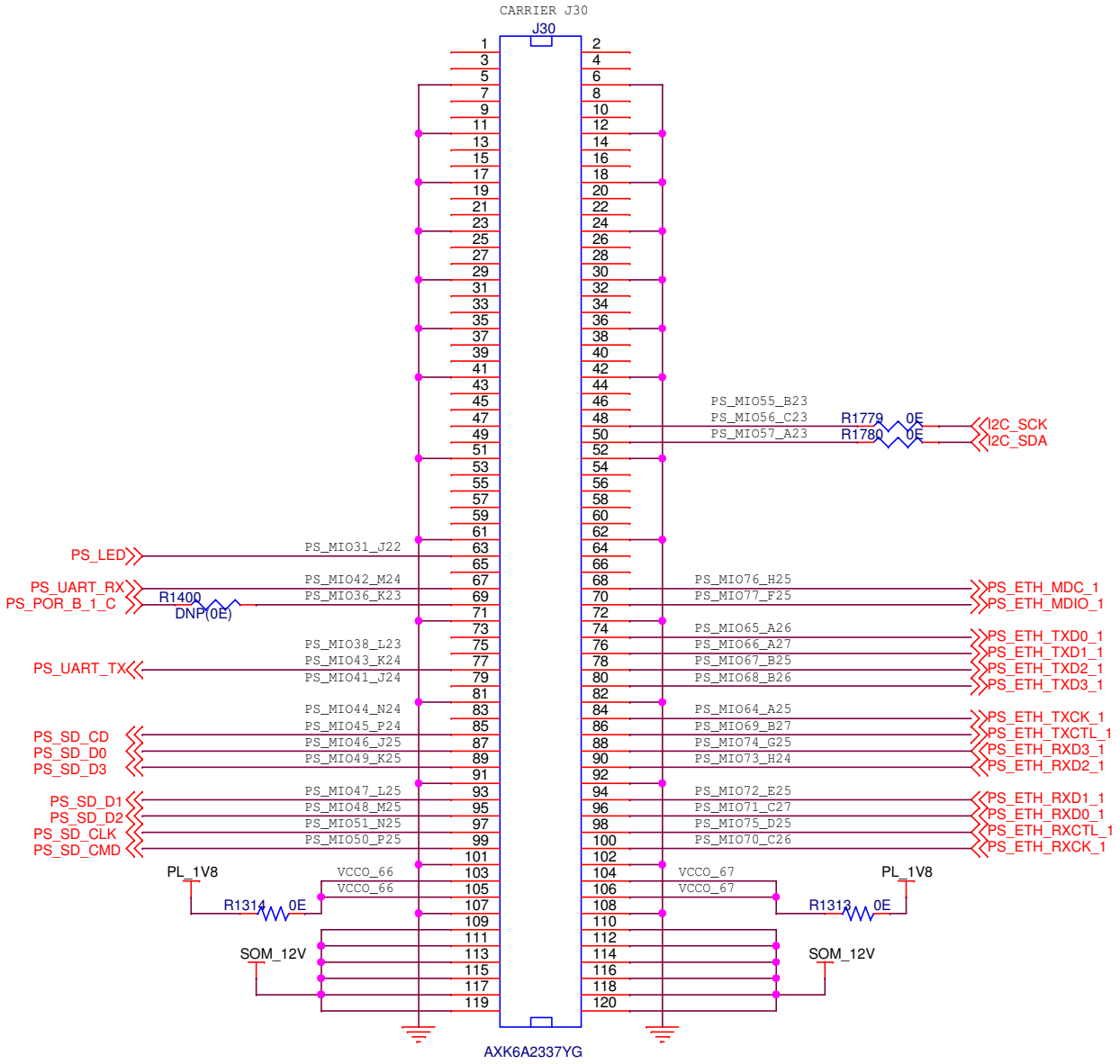


	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: SFP CKT
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 41 of 50

B44,B50 is 3.3V IOs
B67,B66 is 1.8V(Default) IOs

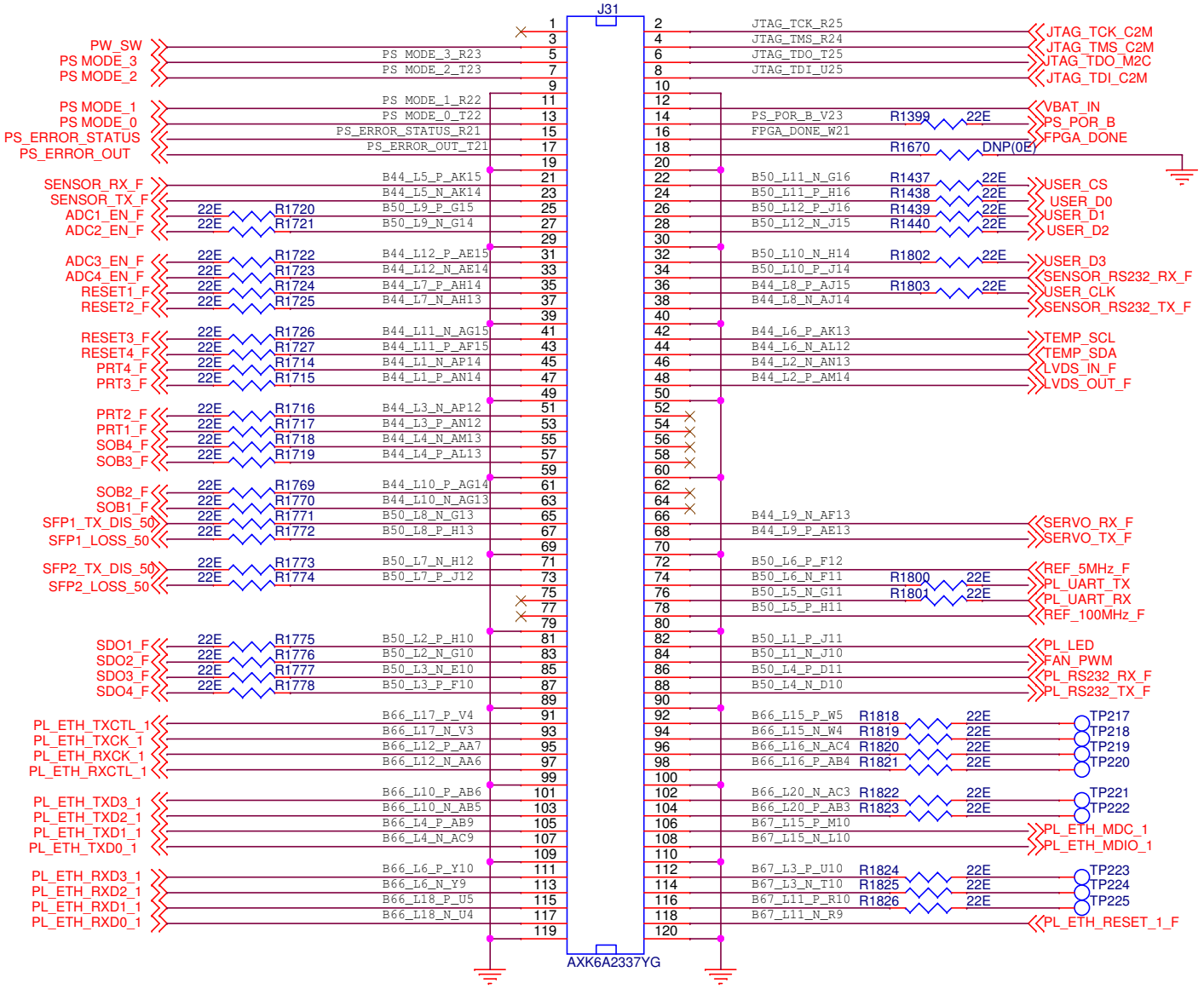


	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: FPGA BANK IO'S
Verified by : NARESH N			Size: A4 — Document Number: SP CARD — Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 — Sheet 42 of 50



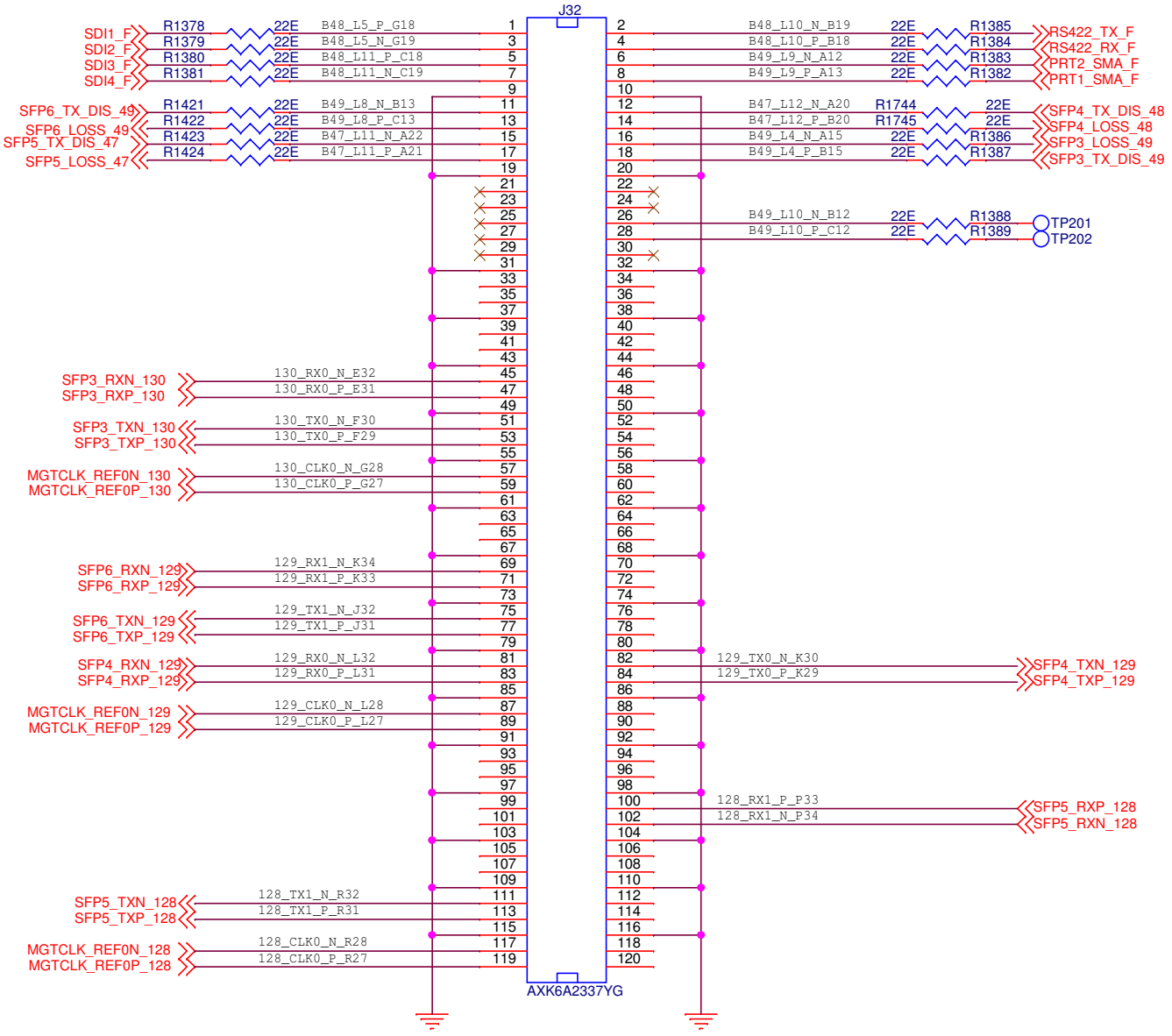
	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: FPGA BANK IO'S
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 43 of 50

B44,B50 is 3.3V IOs
B67,B66 is 1.8V(Default) IOs
CARRIER J31



	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: FPGA BANK IO'S
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 44 of 50

B48,B49 is 3.3V IO
128,129,130 is PL GTX Transceivers
CARRIER J32



	Date	Signatue	FALCONX ELECTRO TECHNOLOGIES PVT LTD
Designed by : LAVANYA.B			Title: FPGA BANK IO'S
Verified by : NARESH N			Size: A4 · Document Number: SP CARD · Rev: 1.0
Aproved by : NARESH N			Date: Tuesday, June 20, 2023 · Sheet 45 of 50