

5

4

3

2

1

# AM263P CC SIP

## PROC159B(002)

### TABLE OF CONTENTS

PAGE	CONTENTS
01	TABLE OF CONTENTS
02	REVISION HISTORY
03	SYSTEM BLOCK DIAGRAM
04	POWER FLOW DIAGRAM
05	POWER SEQUENCING
06	I2C TREE
07	GPIO_MAPPING_TABLE
08	POWER INPUT
09	PMIC
10	POWER SUPPLY #1
11	CURRENT MONITORING DEVICES
12	ETHERNET POWERS
13	SOC-POWER and GND
14	SOC-QSPI & OSPI INTERFACE
15	SOC-MMC0 INTERFACE
16	SOC-IO INTERFACES
17	SOC-JTAG, RESET and CLK
18	MCAN AND FSI MUX
19	SOC-PRU0 ICSS MII0, CPSW RGMII/MII Ethernet
20	SOC-PRU1 ICSS MII1 Ethernet
21	ICSS ETHERNET/HSEC MUXES
22	ICSS ON-BOARD/ADD-ON PHY & MII0/MII1 MUXES
23	CLOCKS AND LIN1
24	TEST AUTOMATION HEADER
25	BOOTMODE BUFFER AND SWITCH
26	XDS110 DEBUGGER
27	AUTOMATION SIGNALS BUFFER
28	LED DRIVER AND IO EXPANDER
29	SOC-ADC & DAC INTERFACE
30	ADC MUXES
31	HSEC CONNECTOR
32	RESET SWITCHES
33	CC EVM NOTES, HW and LABELS

Designed for T1 by Mistral Solutions Pvt Ltd



Title    TABLE OF CONTENTS		
Size	Variant Name = PROC159B(002)	Rev
C		B
Date:	Friday, March 21, 2025	Sheet    1    of    33

REVISION HISTORY

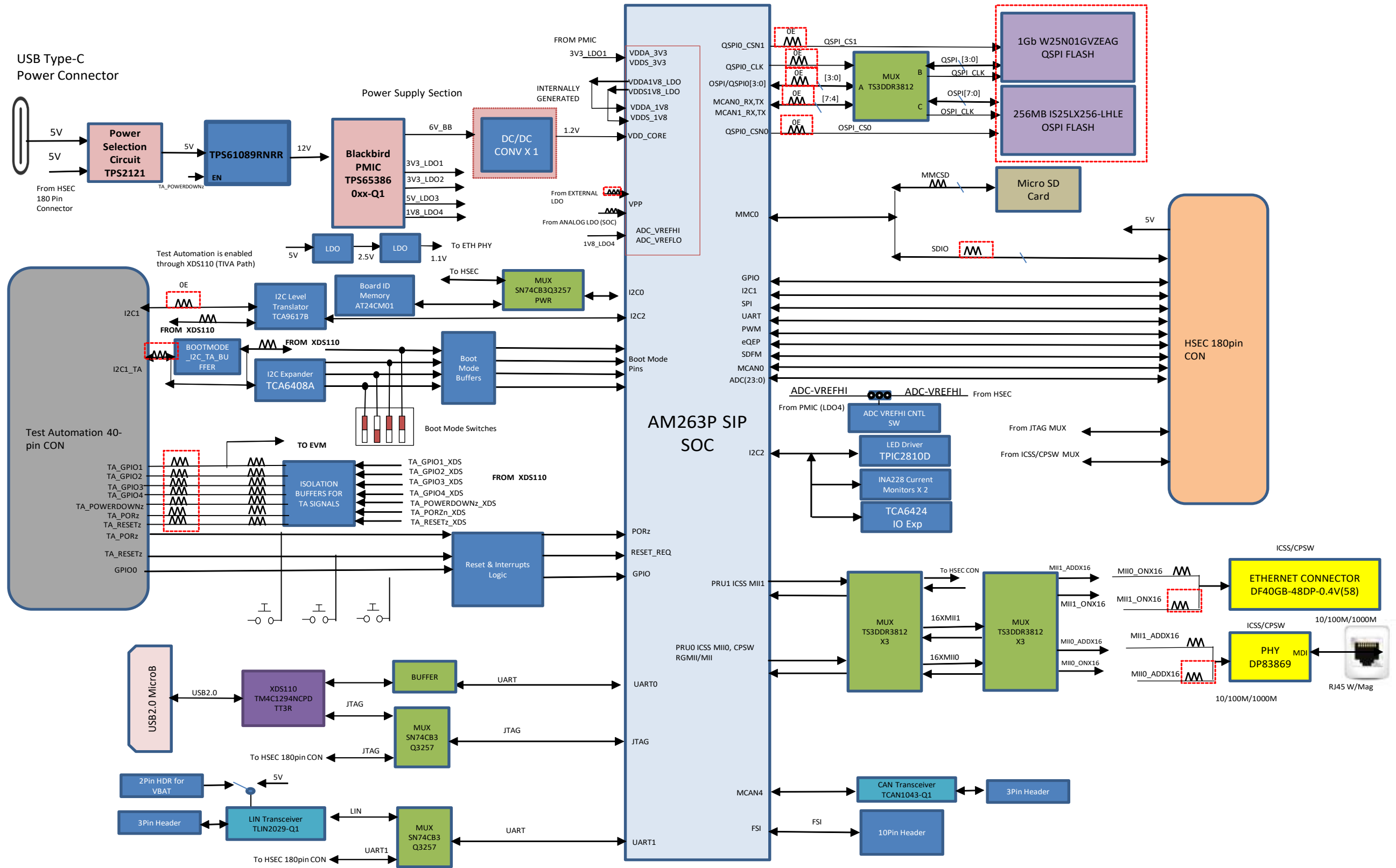
VER #	DATE	DESCRIPTION OF CHANGES	AUTHOR	REVIEWED BY	APPROVED BY
0.01	3 FEB 2025	Drafted from REV A Schematics. Changed Boost converter U5 with part# TPS61089RNRR and changed Q21 (OSPI Reset) from N Channel Fet to P channel FET. Changed U76 Standard PUSH PULL OUTPUT Buffer to OPEN DRAIN OUTPUT BUFFER	Mistral Design Team		
0.02	11 APR 2025	Updated System Block Diagram and SOC part number	Mistral Design Team		
0.03					
0.04					

Designed for T1 by Mistral Solutions Pvt Ltd



Title REVISION HISTORY		
Size	Variant Name = PROC159B(002)	Rev
C		B
Date:	Friday, April 11, 2025	Sheet 2 of 33

## SYSTEM BLOCK DIAGRAM



Designed for TI by Mistral Solutions Pvt Ltd

Title	SYSTEM BLOCK DGM
-------	------------------

Size

C	Variant Name = PROC159B(002)
---	------------------------------

Rev

Date: Friday, April 11, 2025

Sheet 3 of 33

of 33

## POWER SEQUENCE

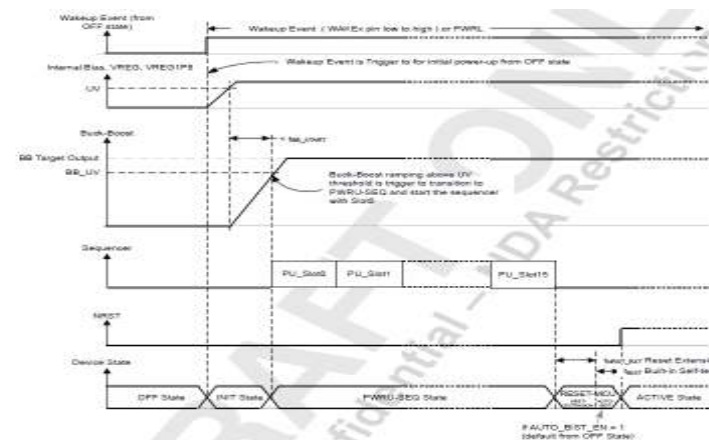
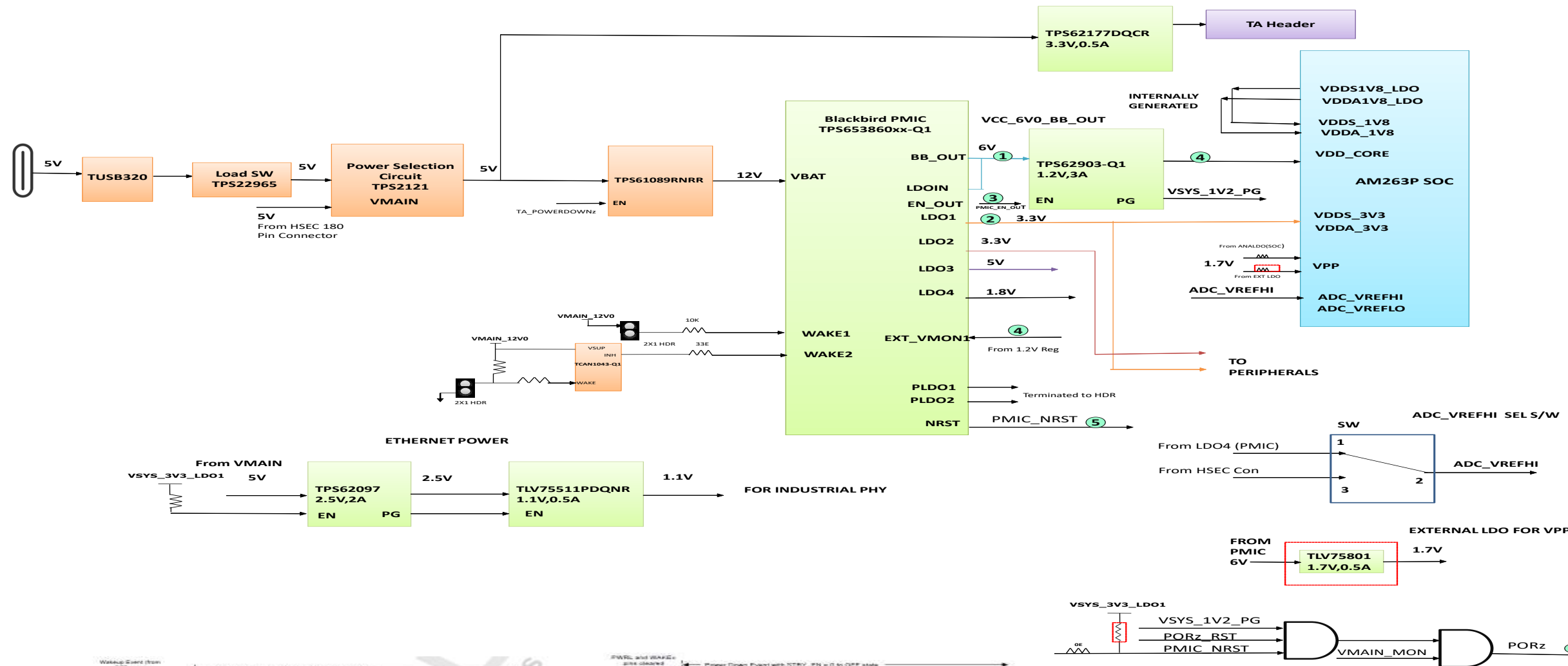


Figure 9-6. Power-Up from OFF state Example

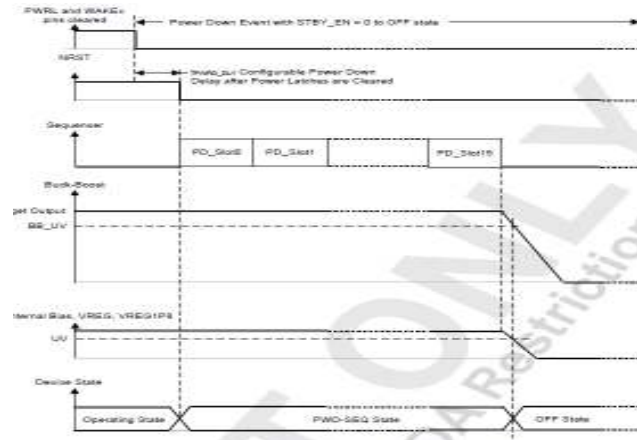
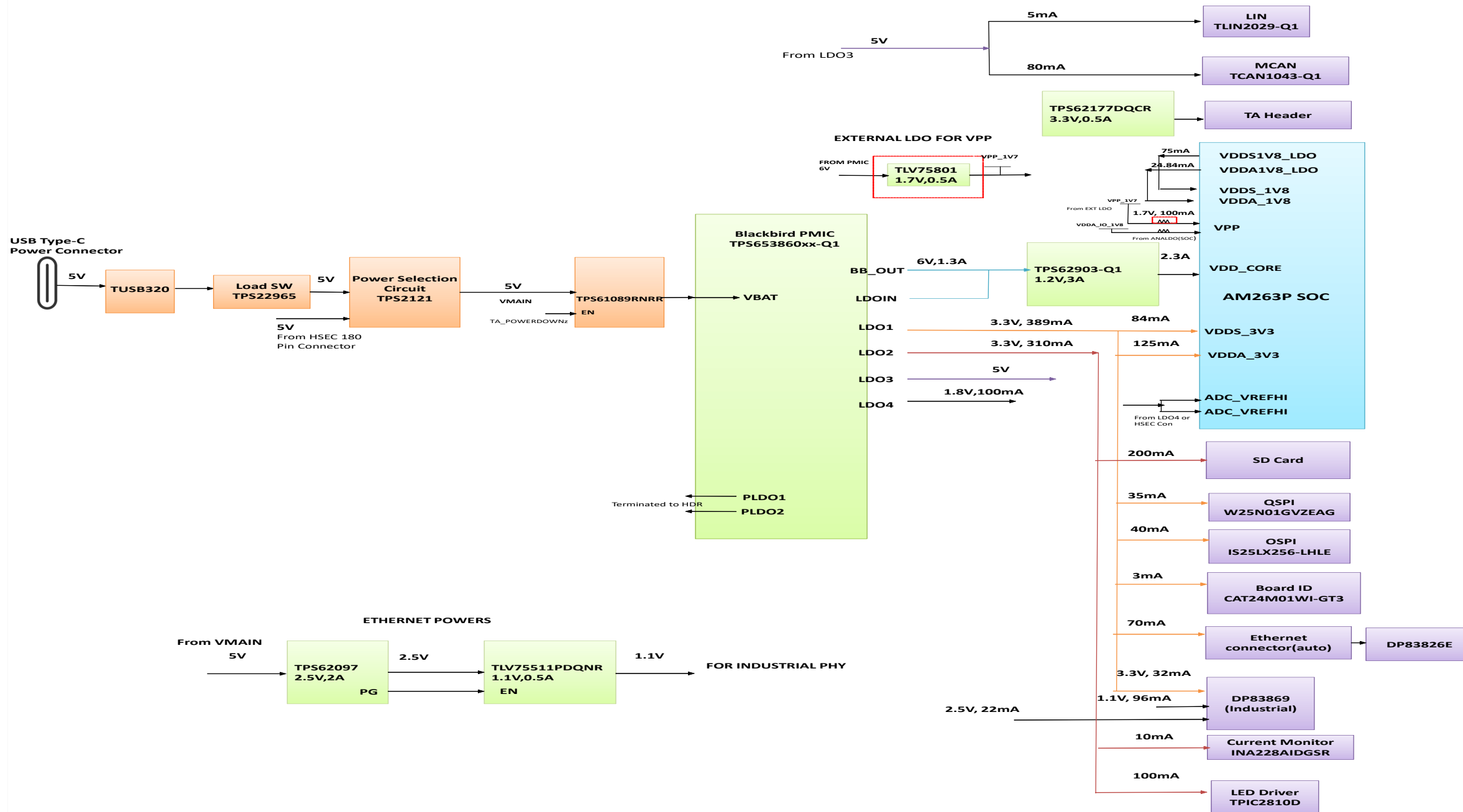
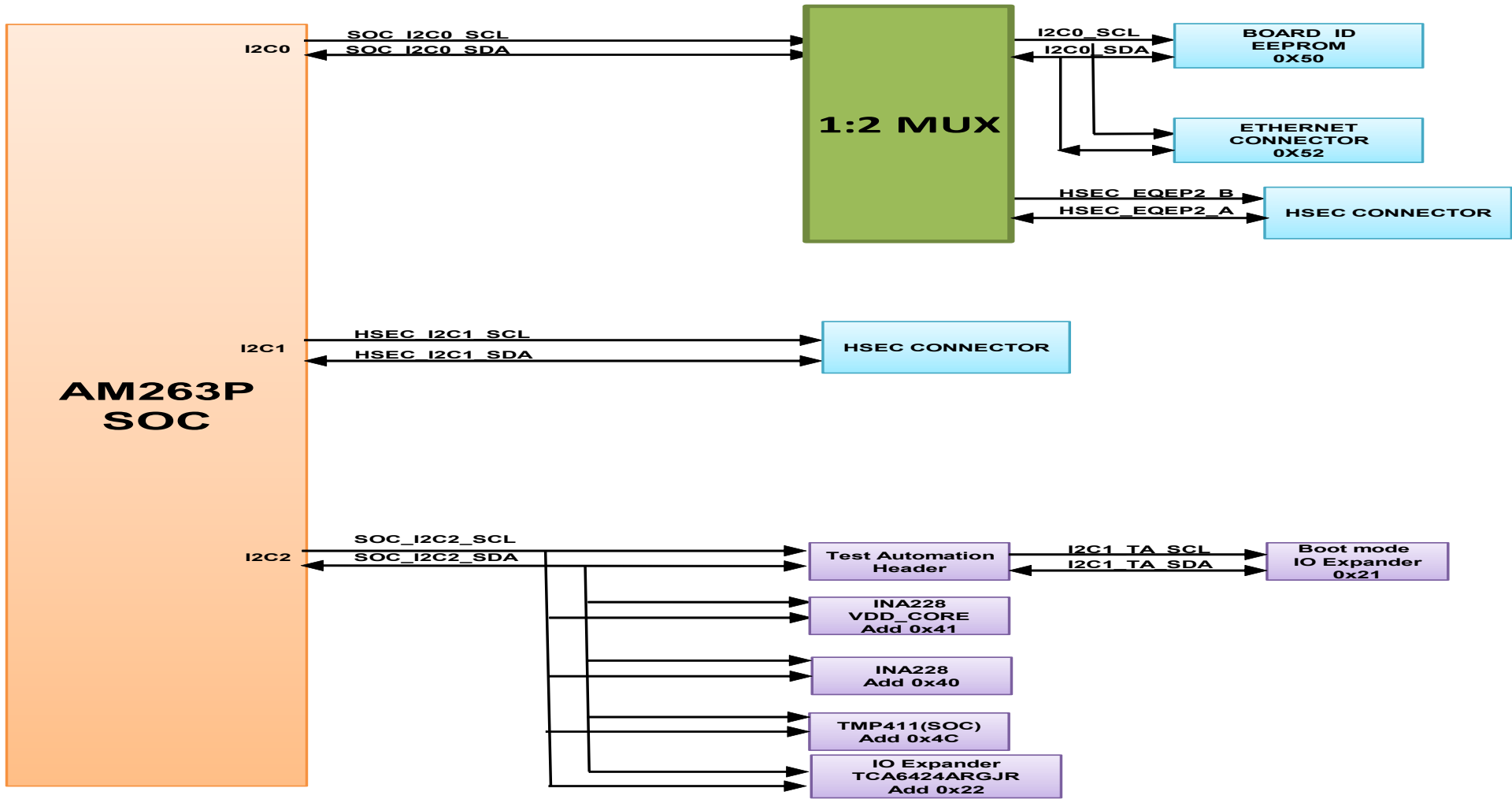


Figure 9-8. Power-Down to OFF state Example

## POWER FLOW DIAGRAM



I2C TREE DIAGRAM

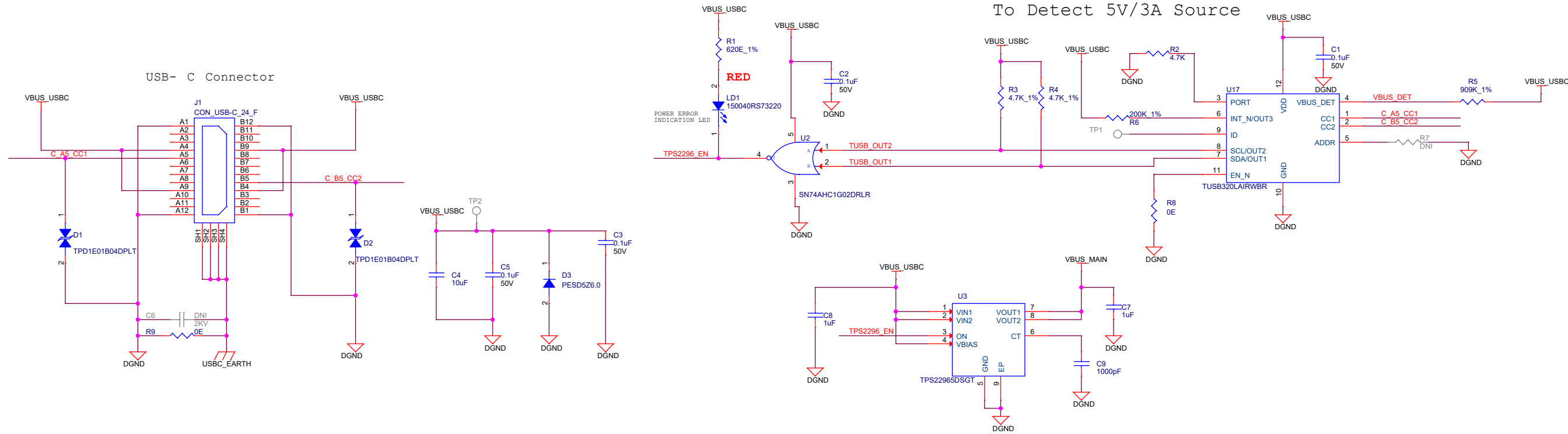


GPIO MAPPING TABLE

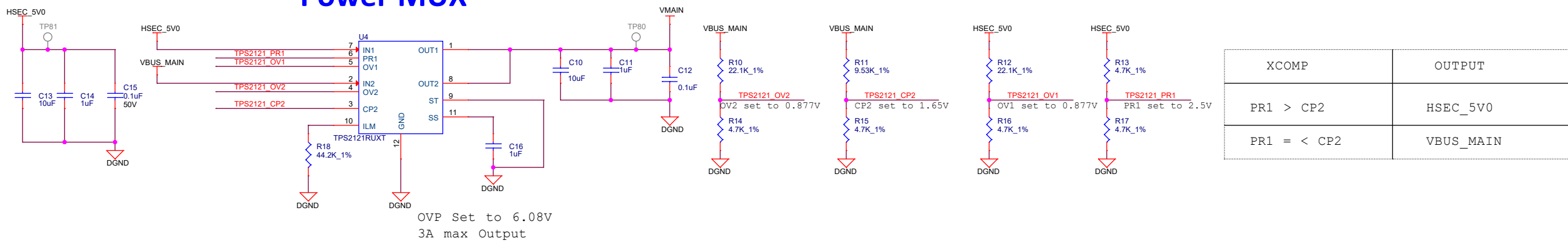
SI No.	GPIO DESCRIPTION	GPIO	Pin Name	FUNCTIONALITY	Net Name	ACTIVE STATE
1	Interrupt To SoC	GPIO21	LIN2_RXD	Interrupt	SOC_INTn	LOW
2	Interrupt To DP83826E/DP83TG720	GPIO67	EPWM12_A	Interrupt	ICSSM2_PWDN/INTn	LOW
3	User Defined LED	GPIO66	EPWM11_B	GPIO	USER_LED1	PREFERABLE
4	Interrupt To DP83869	GPIO68	EPWM12_B	Interrupt	ICSSM1_INT	LOW
5	User Defined LED	GPIO22	LIN2_TXD	GPIO	USER_LED0	PREFERABLE
6	Reset input to DP83869	GPIO35	RGMII1_TXC	Reset	GPIO_ICSSM1_RST	LOW
9	Reset input to Ethernet connector	GPIO36	RGMII1_TX_CTL	Reset	GPIO_ICSSM2_RST	LOW
10	Interrupt To SoC from PMIC	GPIO29	RGMII1_RXC	Interrupt	PMIC_INTn	LOW
11	Select line for OSPI and QSPI	GPIO37	RGMII1_TD0	Mux Selection	OSPI/QSPI_MUX_SEL	PREFERABLE
IO Expander 01						
13	Enable control to clock buffer		P01	Enable	CLK_BUF_EN	HIGH
14	Select line for ICSSM Ethernet/HSEC Mux (PRU1 signals)		P02	Mux Selection	ICSSM1_MUX_SEL	PREFERABLE
15	Select line for ICSSM ON-Board/ADD-ON PHY Mux		P03	Mux Selection	ICSSM2_MUX_SEL	PREFERABLE
16	Select line for MCAN and FSI MUX		P04	Mux Selection	FSI_MUX_SEL	PREFERABLE
17	Select line for ADC MUX 3		P05	Mux Selection	ADC3_MUX_SEL	PREFERABLE
18	Select line for ADC MUX 4		P06	Mux Selection	ADC4_MUX_SEL	PREFERABLE
19	Enable control to SD load switch		P07	Load SW Enable	GPIO_uSD_PWR_EN	HIGH
20	Select line for ADC MUX 5		P10	Mux Selection	ADC5_MUX_SEL	PREFERABLE
21	Select line for I2C0 MUX		P11	Mux Selection	I2C0_MUX_SEL	PREFERABLE
22	Select line for SPI1 MUX		P12	Mux Selection	SPI1_MUX_SEL	PREFERABLE
23	Select line for UART2 MUX		P13	MUX Selection	UART2_MUX_SEL	PREFERABLE
24	Enable control to 1.7V LDO		P14	LDO Enable	VPP_LDO_EN	PREFERABLE
25	Select line for LIN/UART MUX		P15	Mux Selection	LIN_MUX_SEL	PREFERABLE
26	Select line for ADC MUX 1		P16	Mux Selection	ADC1_MUX_SEL	PREFERABLE
27	Select line for ADC MUX 2		P17	Mux Selection	ADC2_MUX_SEL	PREFERABLE
28	GPIO to HSEC		P20	GPIO	HSEC_GPIO	PREFERABLE
29	Standby input to CAN tranciever		P21	GPIO	MCAN1_STB	HIGH
30	Select line for MDIO/MDC Mux sel 1		P22	Mux Selection	MDIO/MDC_MUX_SEL1	PREFERABLE
31	Select line for MDIO/MDC Mux sel 2		P23	Mux Selection	MDIO/MDC_MUX_SEL2	PREFERABLE
32	Select line for ICSSM Ethernet/HSEC Mux (PRU0 signals)		P24	Mux Selection	ICSSM0_MUX_SEL	PREFERABLE

## USB-C Power

Configured as UFP MODE  
To Detect 5V/3A Source

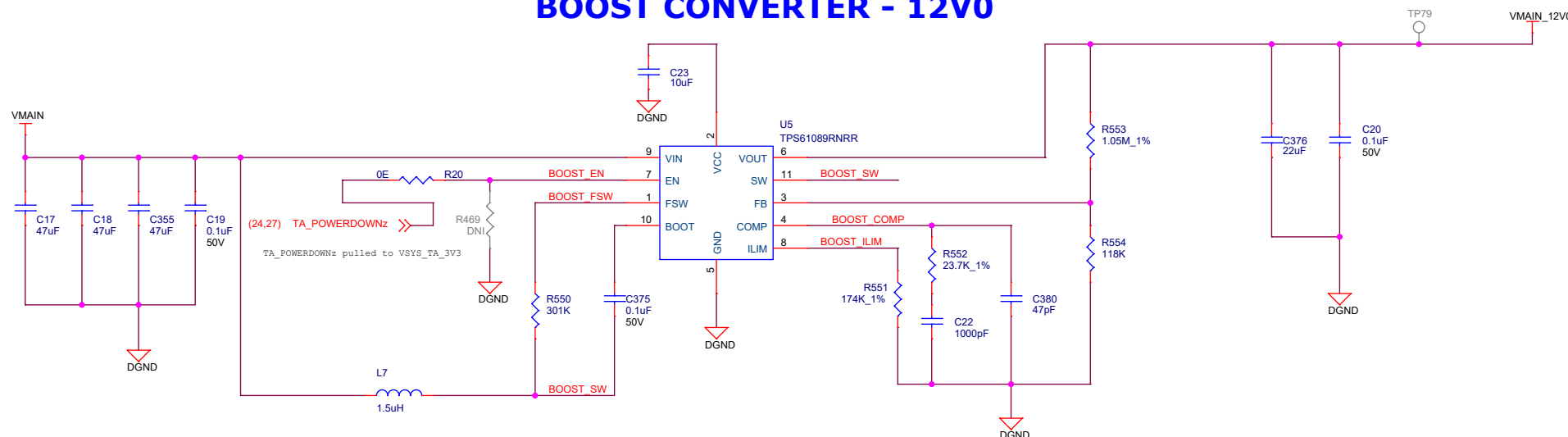


## Power MUX



**Designed as per reference sch**

## BOOST CONVERTER - 12V0



Designed for TI by Mistral Solutions Pvt Ltd



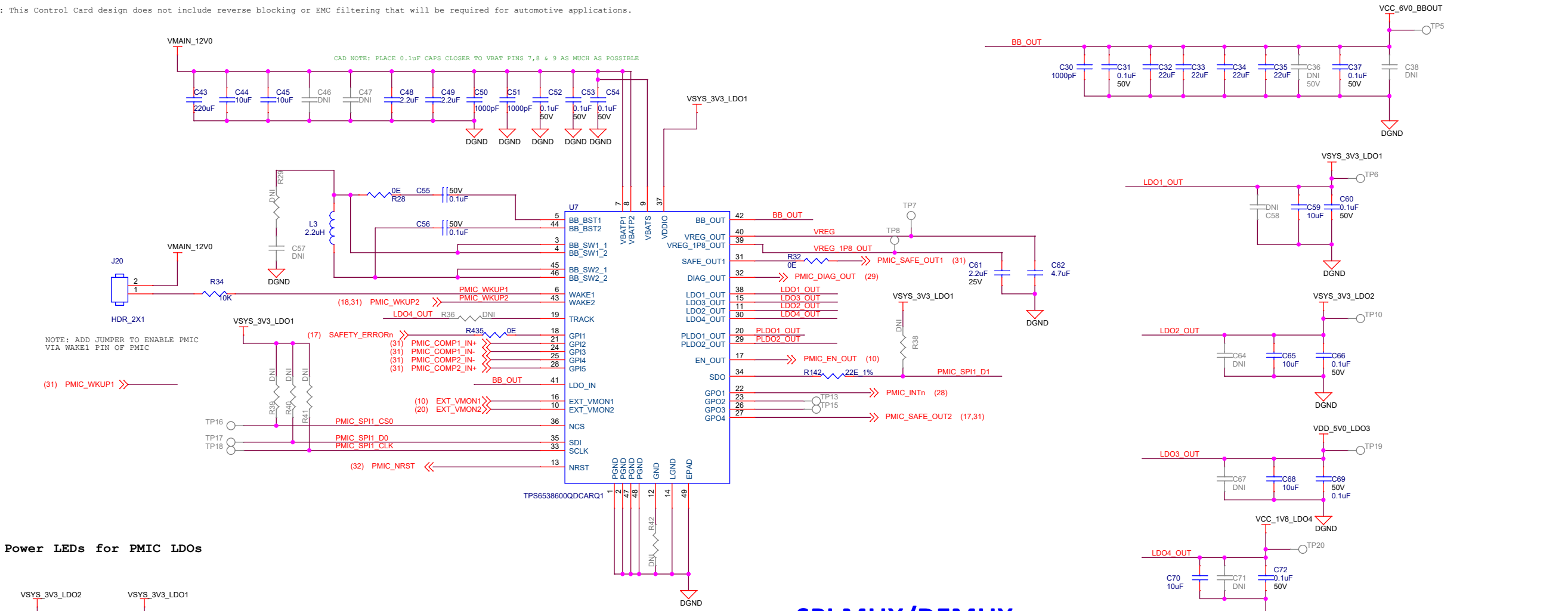
Title	USB-C POWER
-------	-------------

Size	Variant Name = PROC159B(002)	Rev
C		B
Date: Friday, April 11, 2025	Sheet 8 of 33	

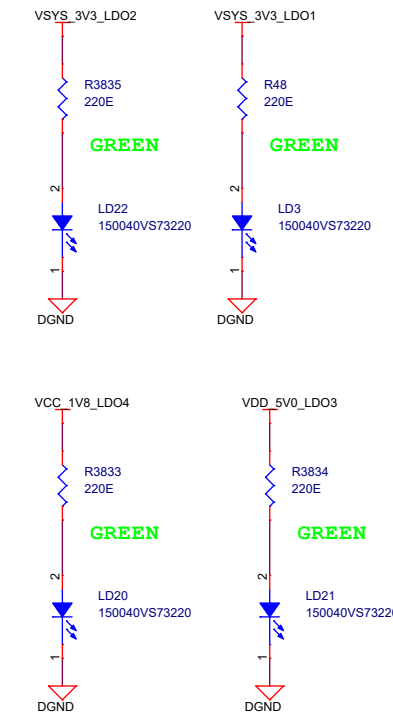


# BLACKBIRD PMIC

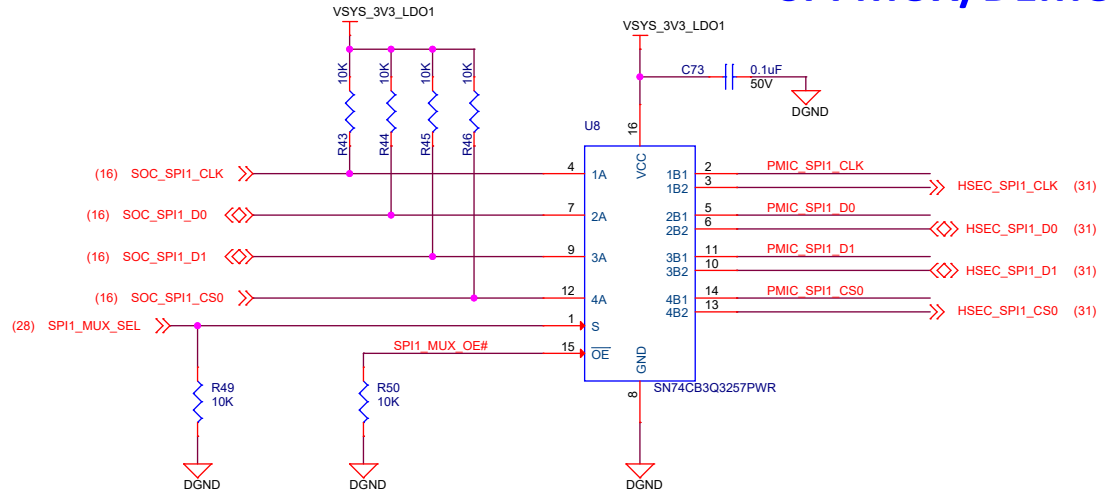
NOTE: This Control Card design does not include reverse blocking or EMC filtering that will be required for automotive applications.



## Power LEDs for PMIC LDOs



## SPI MUX/DEMUX



SPI1 - 1:2 MUX		
SEL	CONDITION	FUNCTION
LOW	PMIC SELECTED	A-->B1 port
HIGH	HSEC SPI1 selected	A-->B2 port

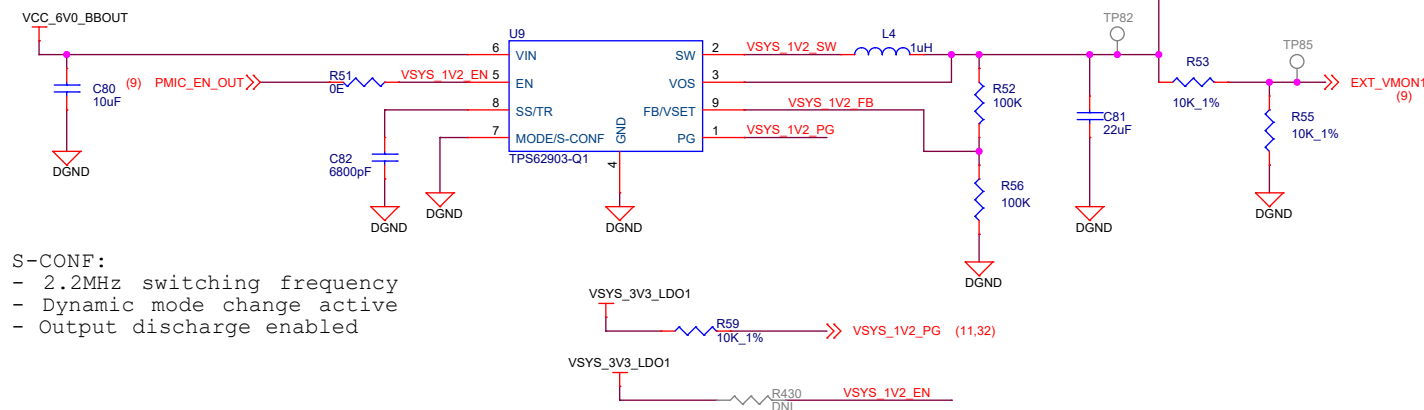
Designed for T1 by Mistral Solutions Pvt Ltd



Title BLACKBIRD PMIC		
Size	Variant Name = PROC159B(002)	Rev
C		B
Date:	Thursday, February 13, 2025	Sheet 9 of 33

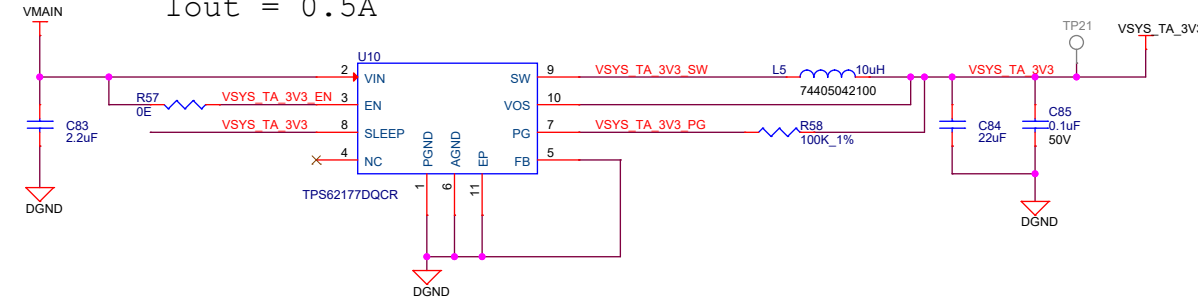
# Power Supply #1

## 1.2V Generation



```
S-CONF:
- 2.2MHz switching frequency
- Dynamic mode change active
- Output discharge enabled
```

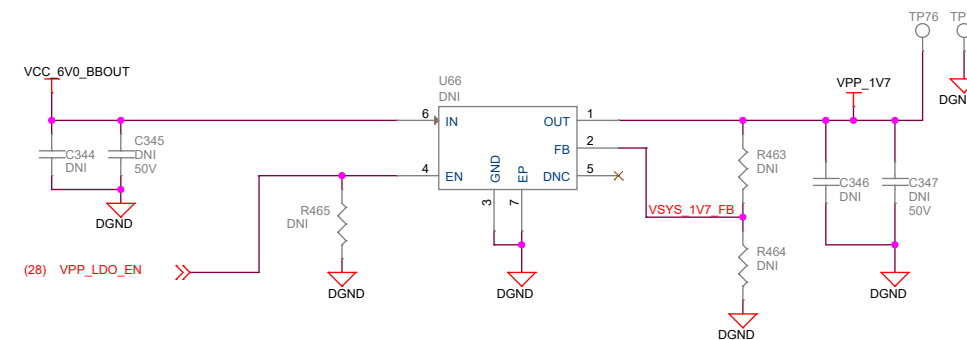
## Test Automation Header Supply

TPS62177 3.3V BUCK REGULATOR  
Vout = 3.3V  
Iout = 0.5A

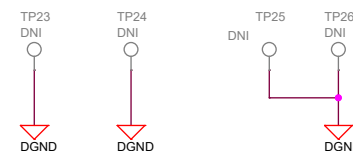
## 1.7V VPP Generation

TLV75801  
Vout=1.7V  
Iout = .5A

Place testpoints with  
100mils spacing to  
insert external jumper



### Ground Test Point



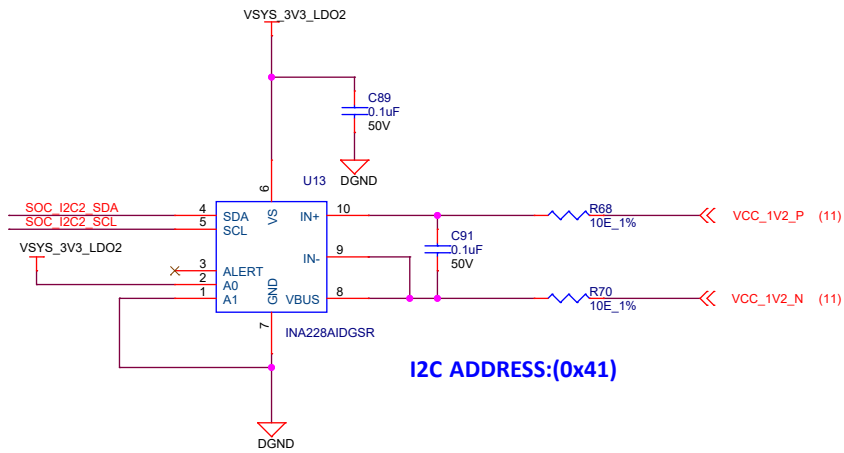
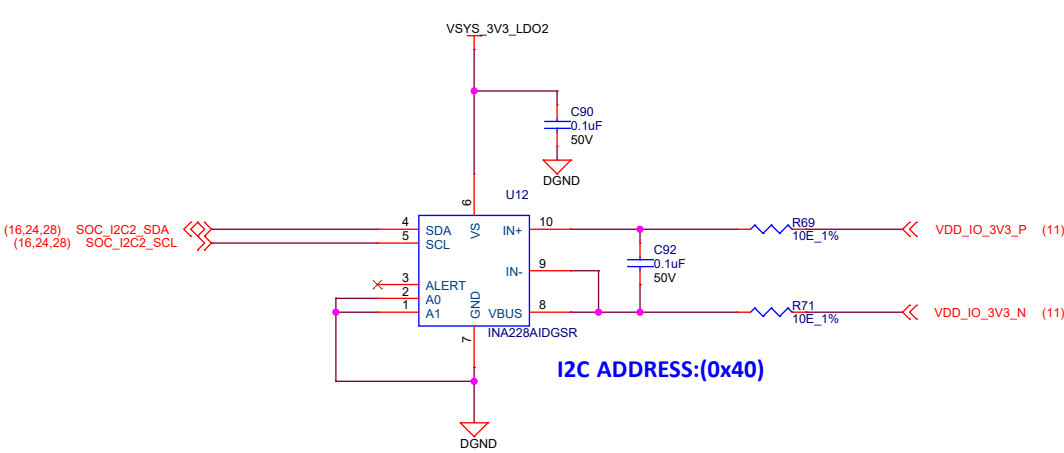
Designed for TI by Mistral Solutions Pvt Ltd



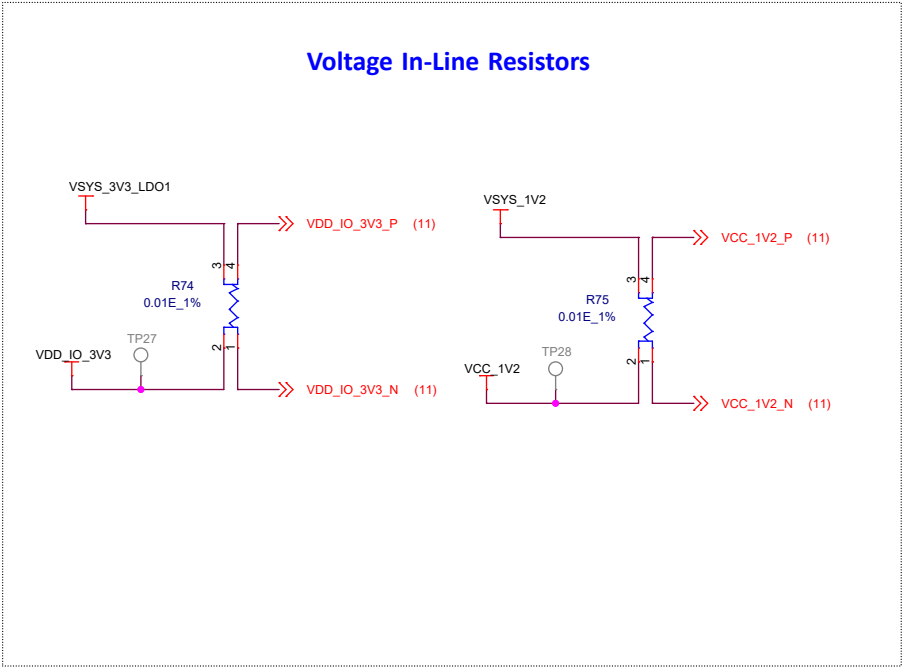
Title	POWER SUPPLY #1
-------	-----------------

Size	Variant Name = PROC159B(002)	Rev
C		B
Date:	Thursday, February 13, 2025	Sheet 10 of 33

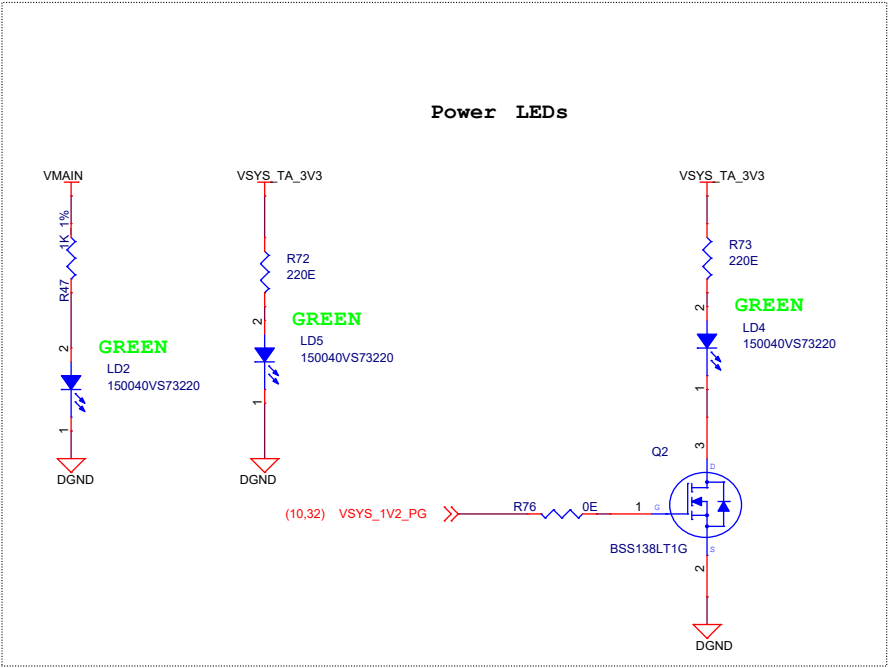
Current Monitors



Voltage In-Line Resistors



Power LEDs



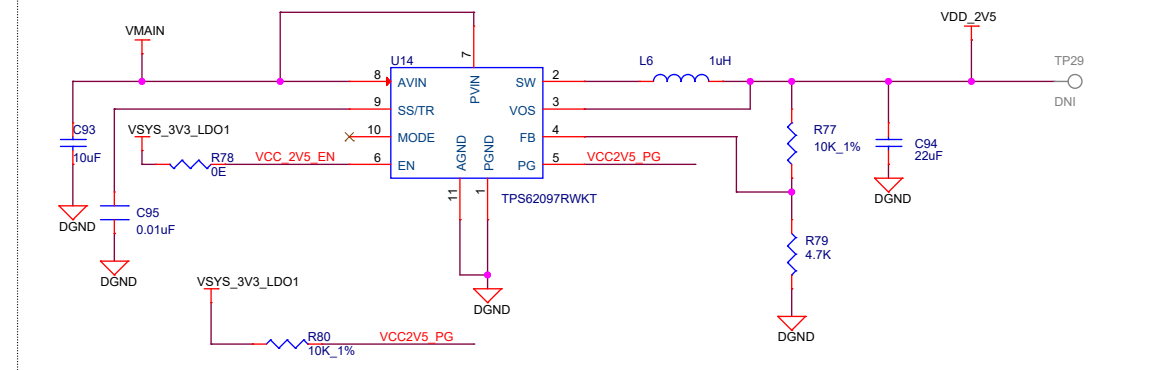
Designed for T1 by Mistral Solutions Pvt Ltd



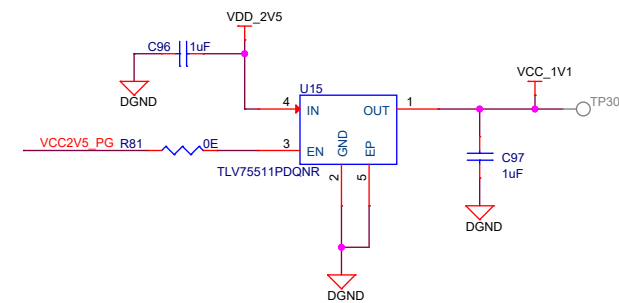
Title CURRENT MONITORING DEVICES		
Size	Variant Name = PROC159B(002)	Rev
C		B
Date:	Thursday, February 13, 2025	Sheet 11 of 33

## Ethernet Powers

## 2.5V ETHERNET PHY POWER SUPPLY

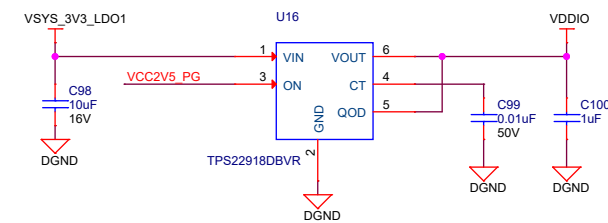


1.1V, 0.5AMPS SUPPLY



FOR INDUS PHY

## Load Switch



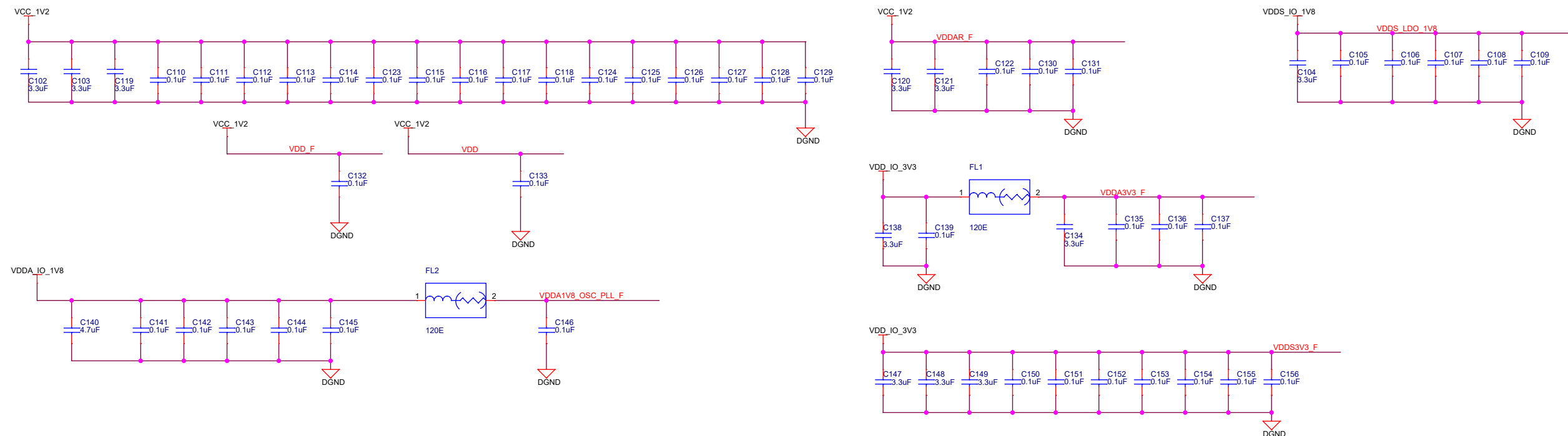
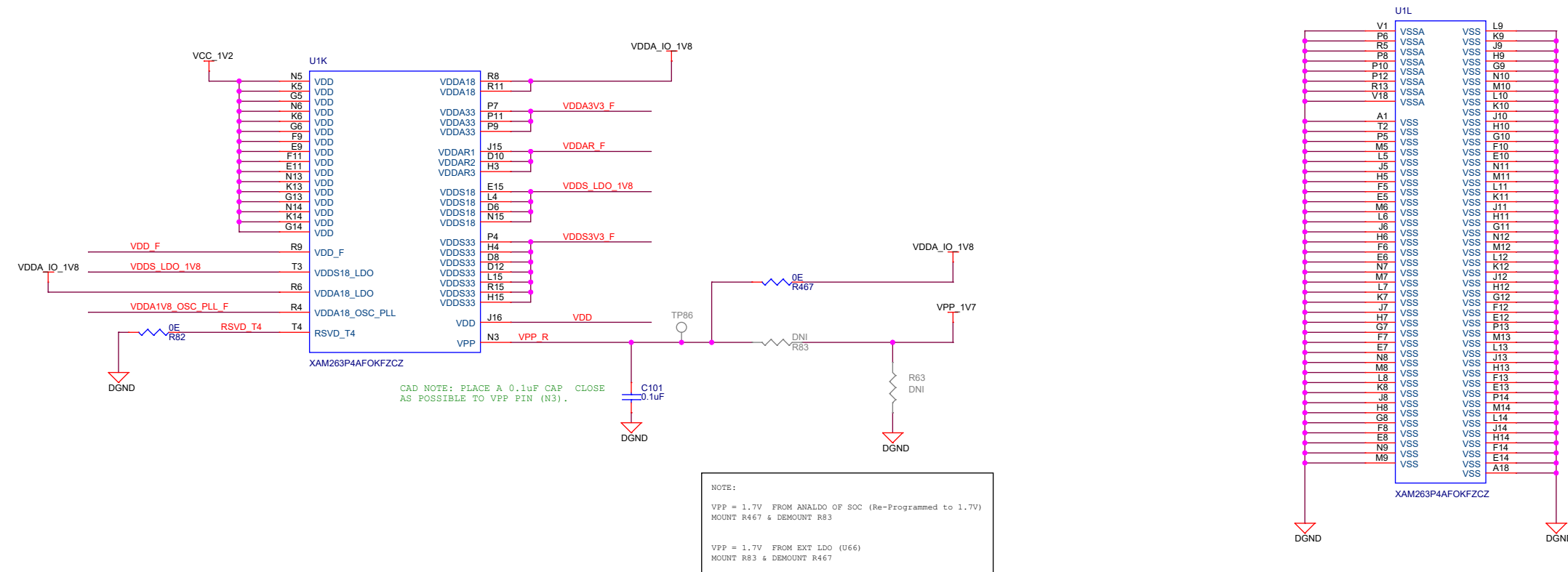
Designed for TI by Mistral Solutions Pvt Ltd



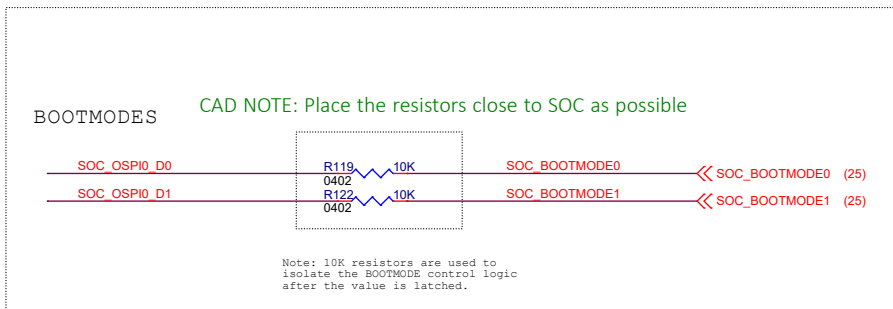
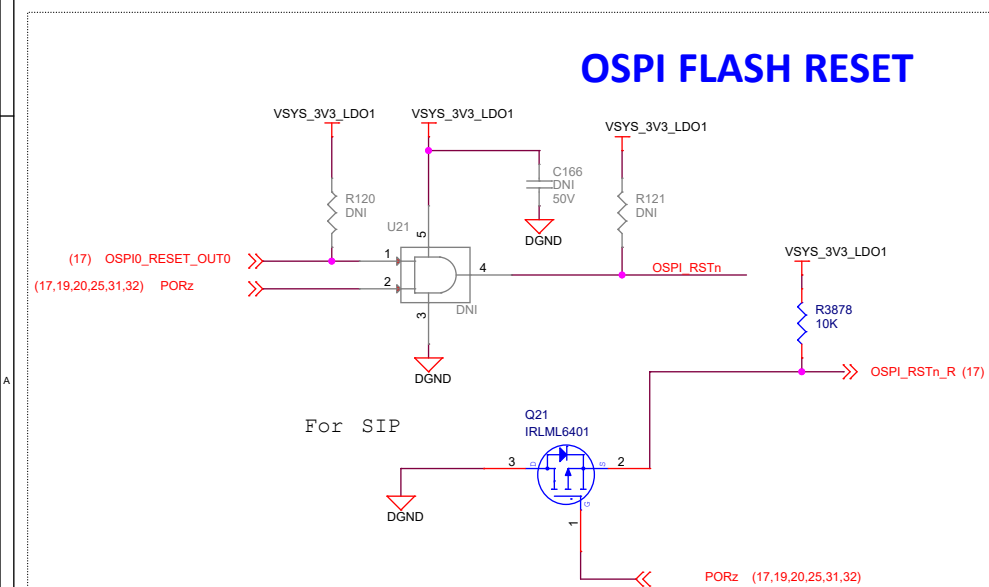
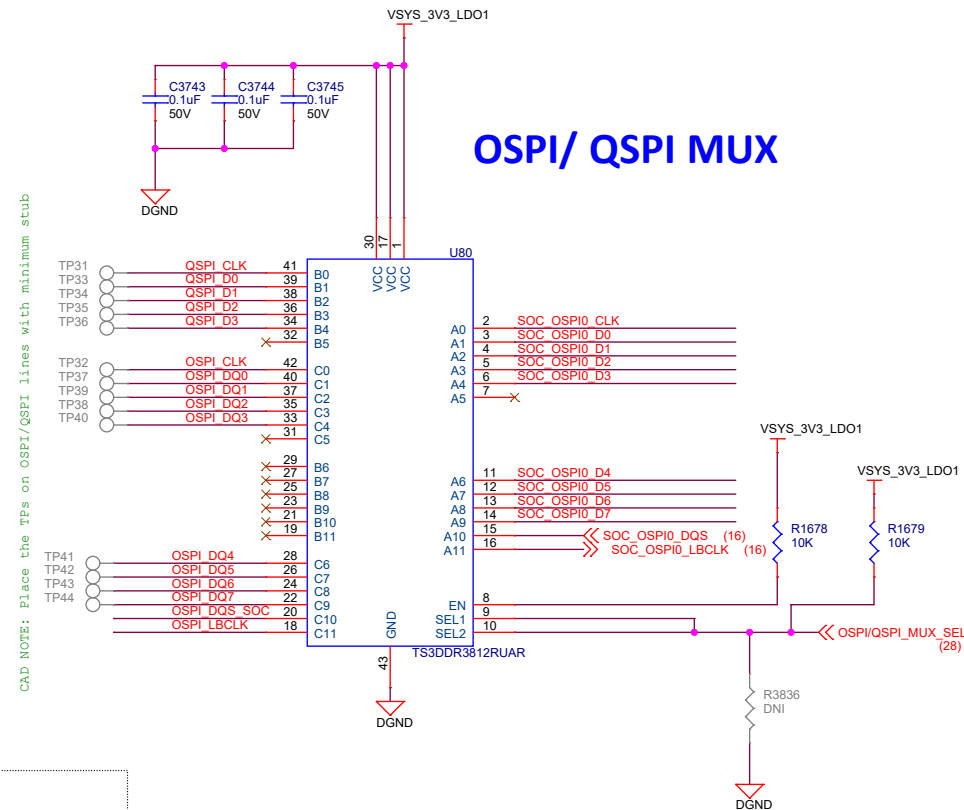
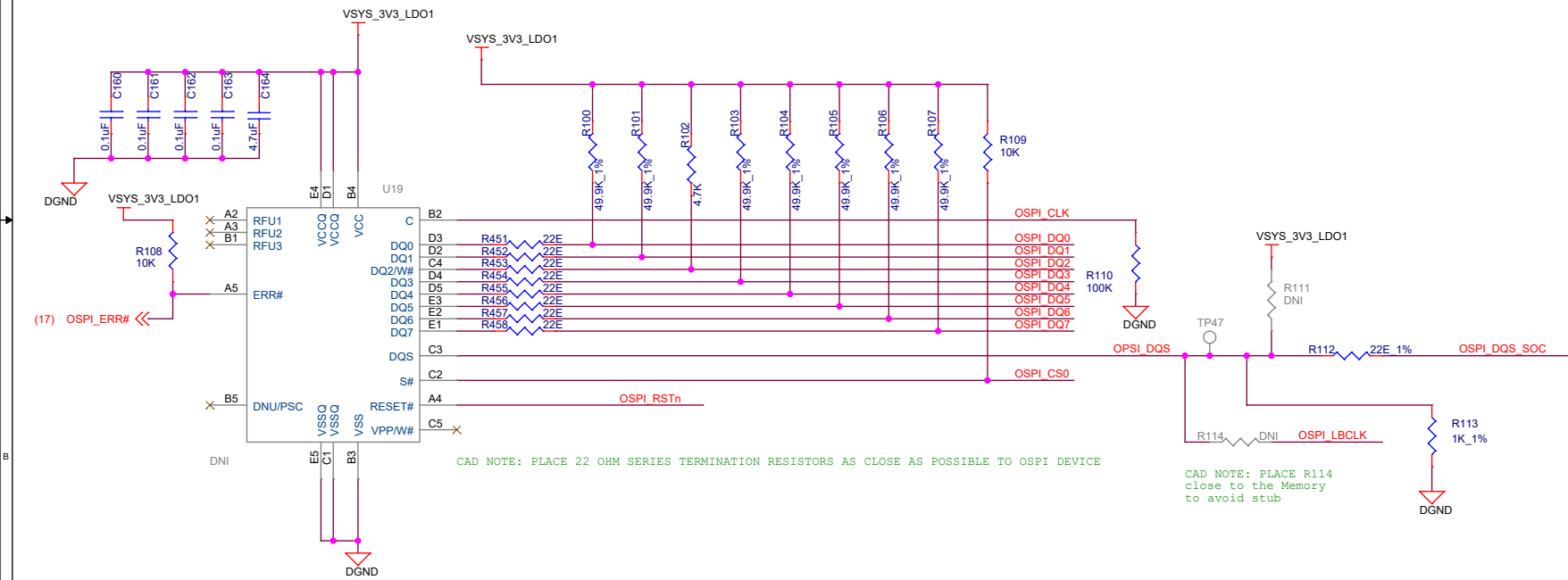
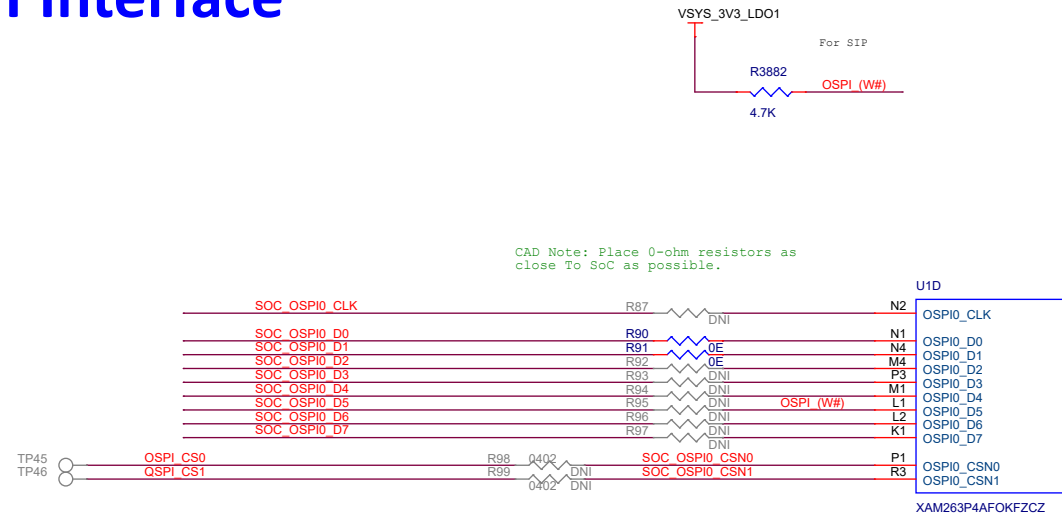
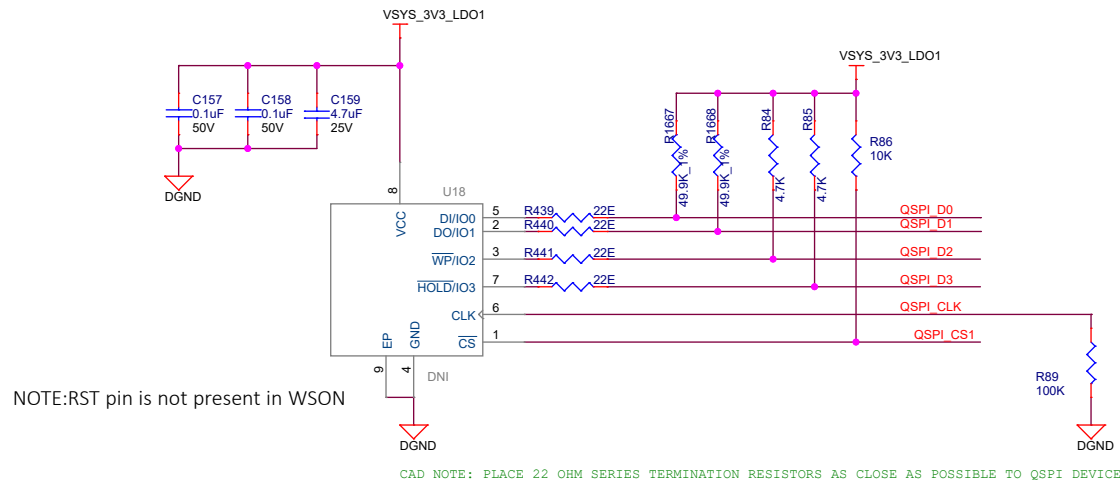
Title	ETHERNET POWERS
-------	-----------------

Size	Variant Name = PROC159B(002)	Rev
C		B
Date:	Thursday, February 13, 2025	Sheet 12 of 33

## SOC-POWER and GND

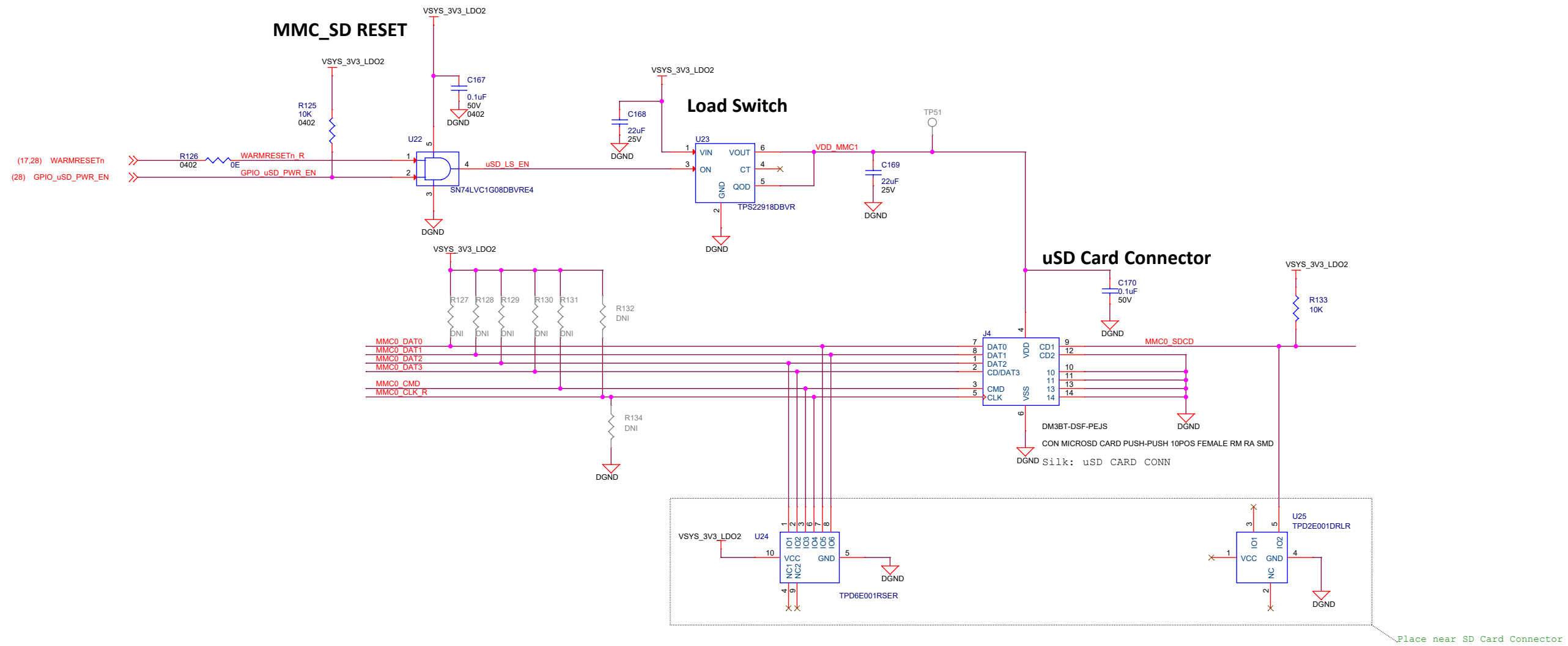
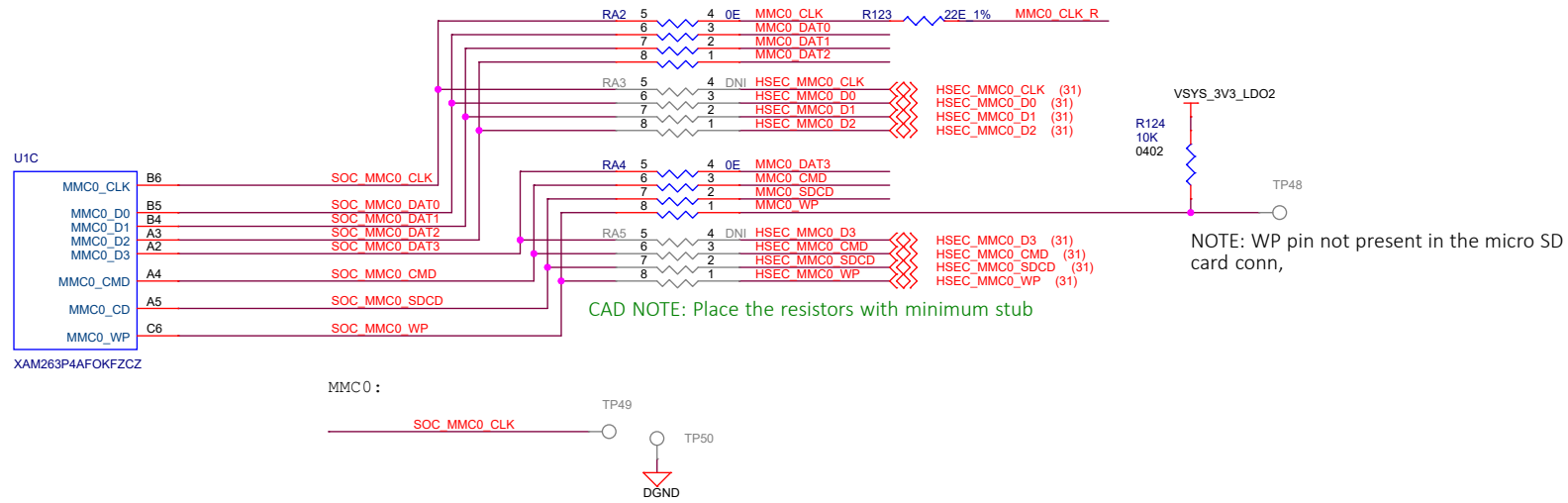


## SOC - QSPI & OSPI Interface



SEL 1 & 2	CONDITION	FUNCTION
LOW	QSPI SELECTED	A-->B port
HIGH	OSPI selected	A-->C port

# SOC- MMC0 Interface

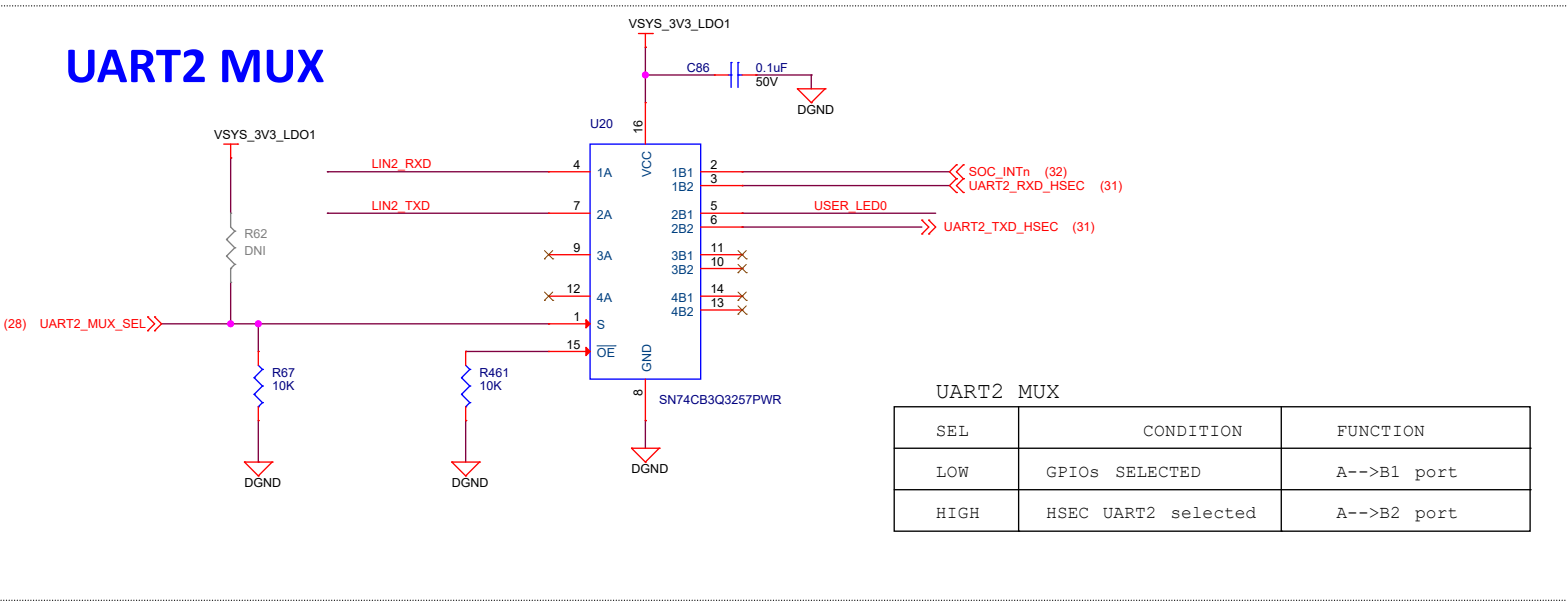
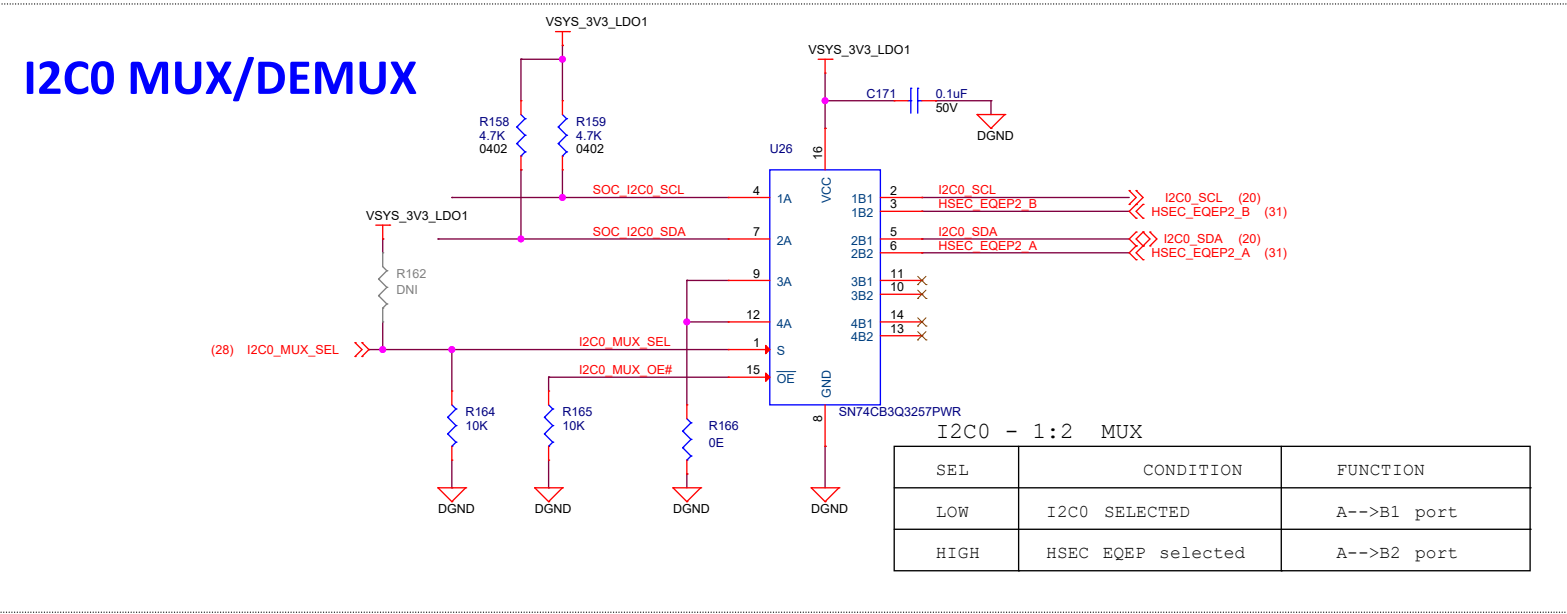
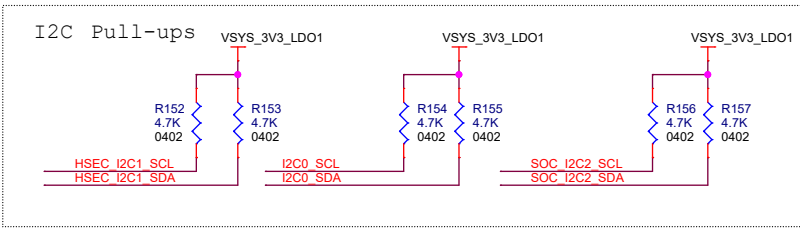
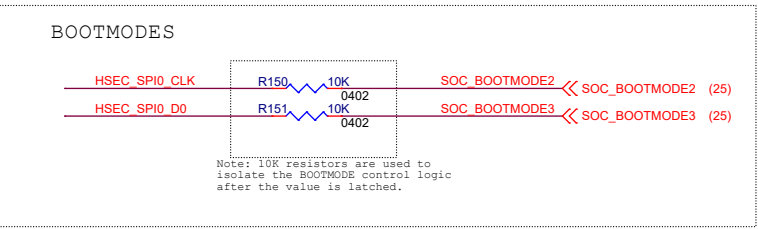
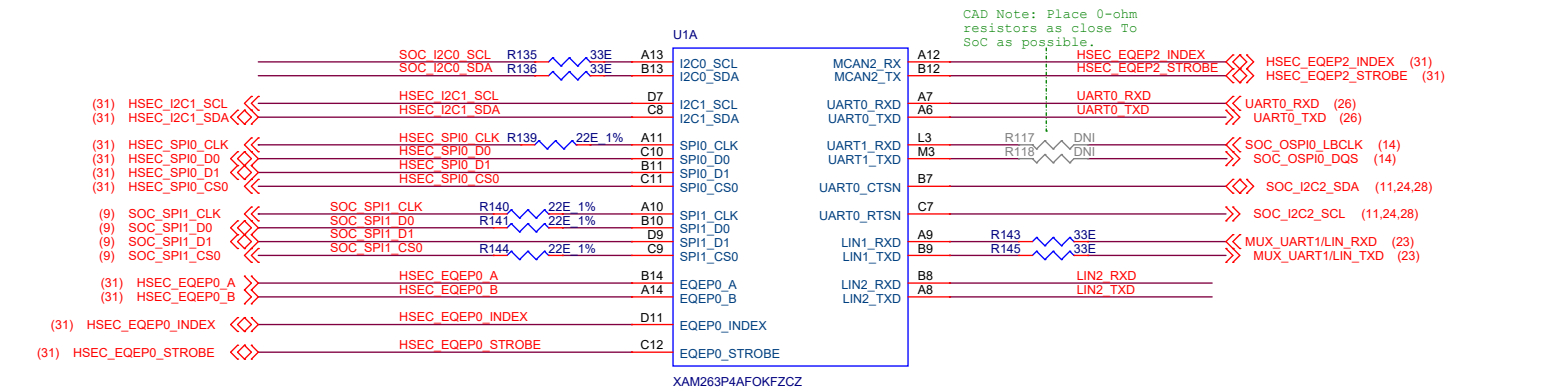


Designed for T1 by Mistral Solutions Pvt Ltd

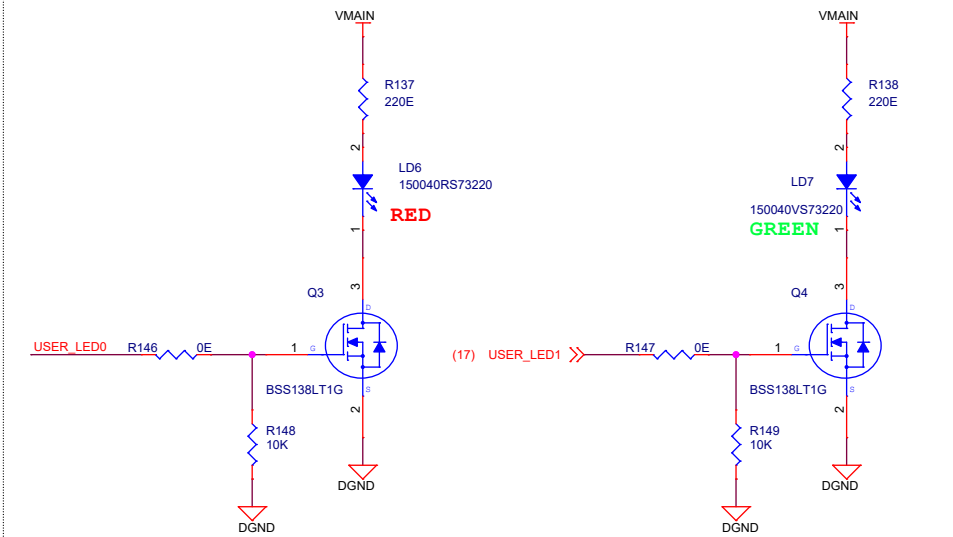


Title			SOC- MMC0 Interface		
Size					Rev
	Variant Name = PROC159B(002)				B
Date:	Friday, April 11, 2025	Sheet	15	of	33

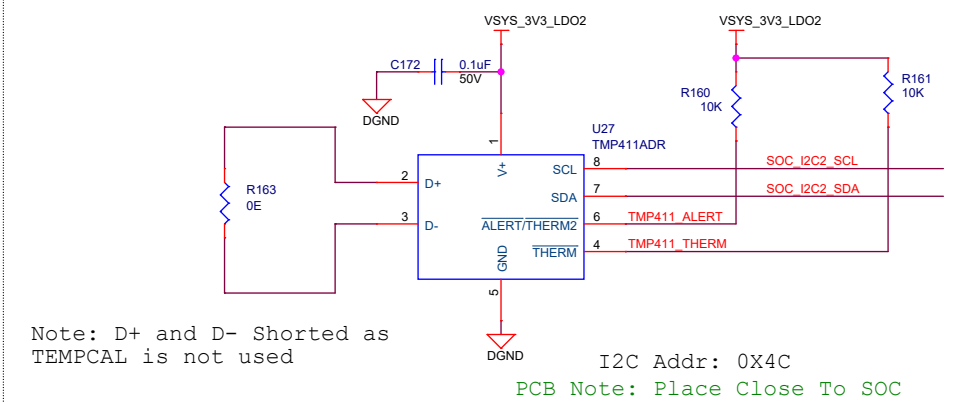
SOC-IO Interfaces



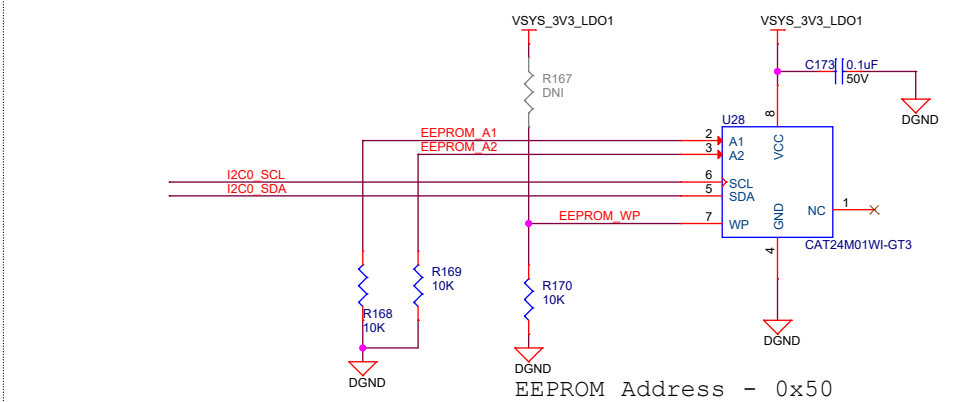
USER LEDs



Temperature Sensor

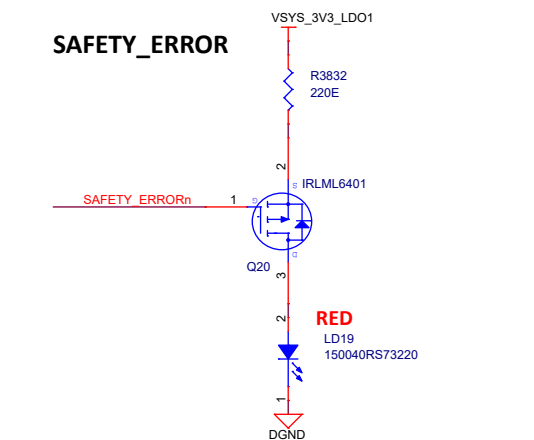
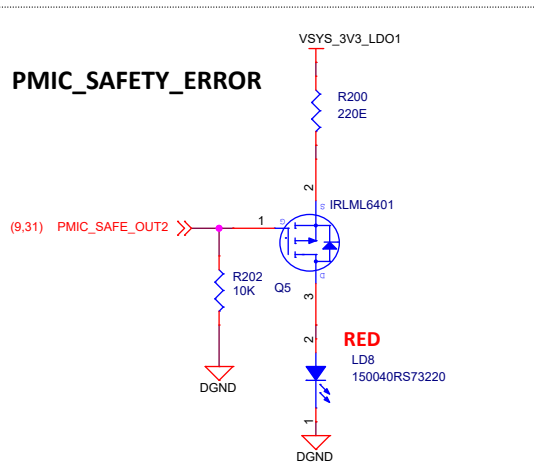
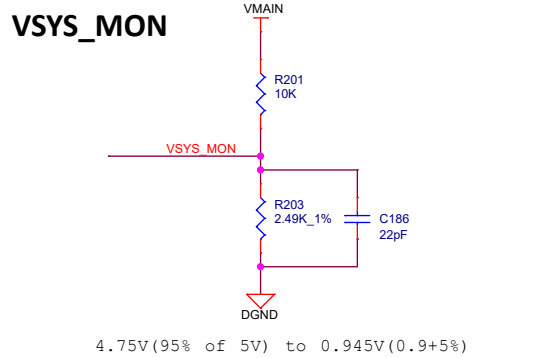
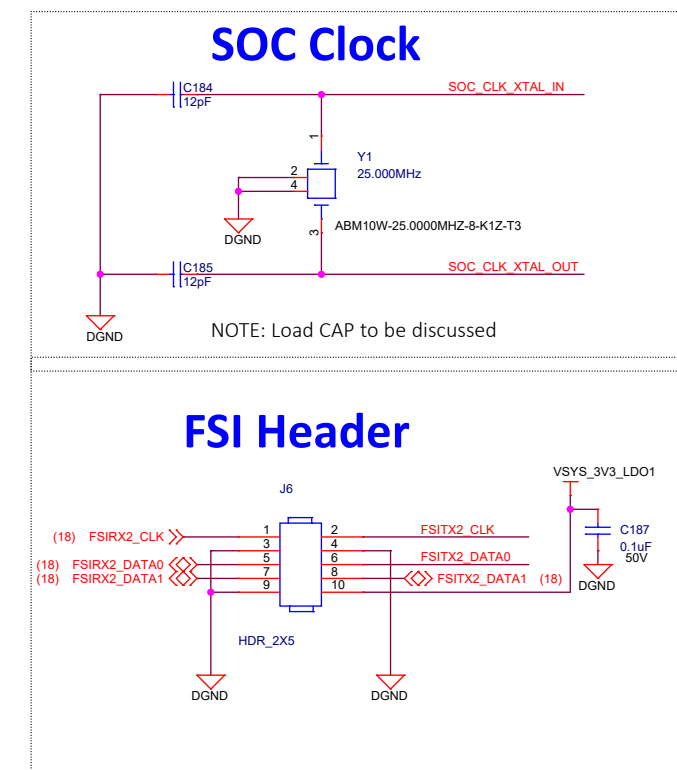
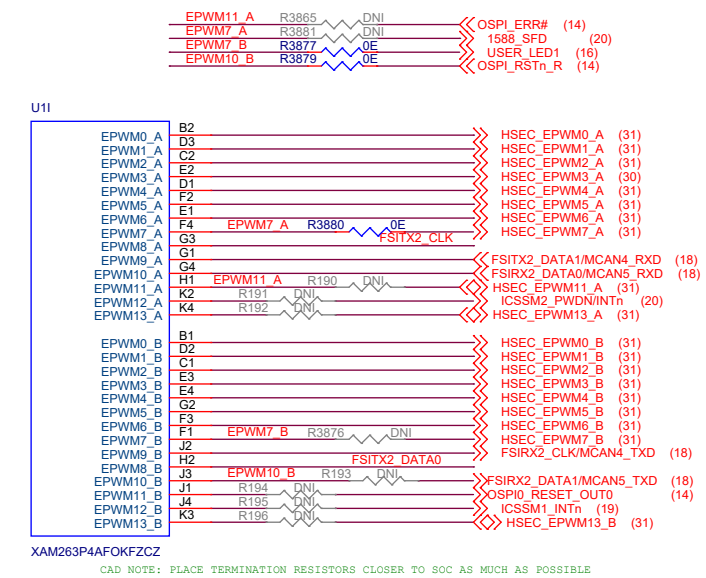
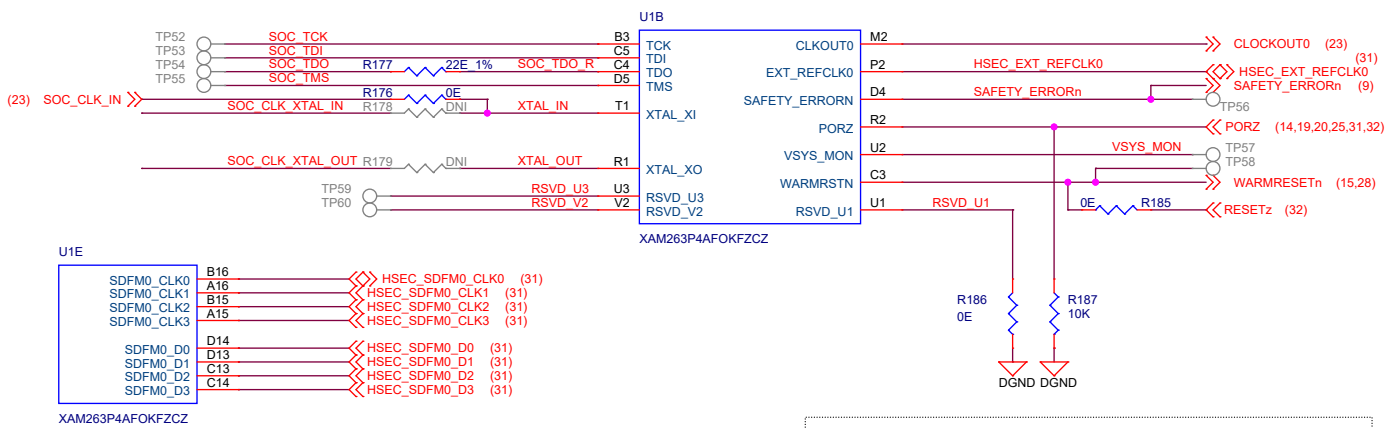


Board ID EEPROM

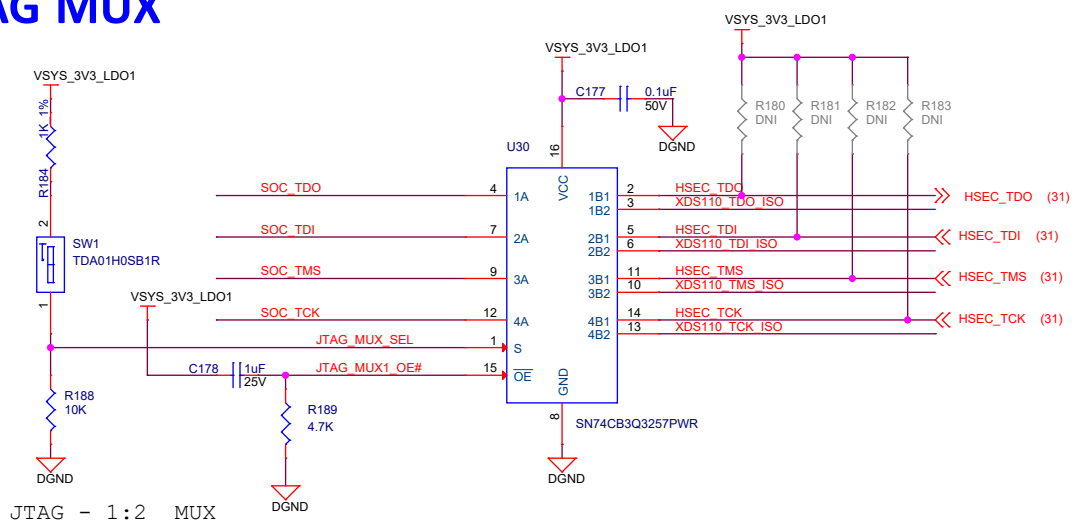




## SOC JTAG, RESET and CLKS

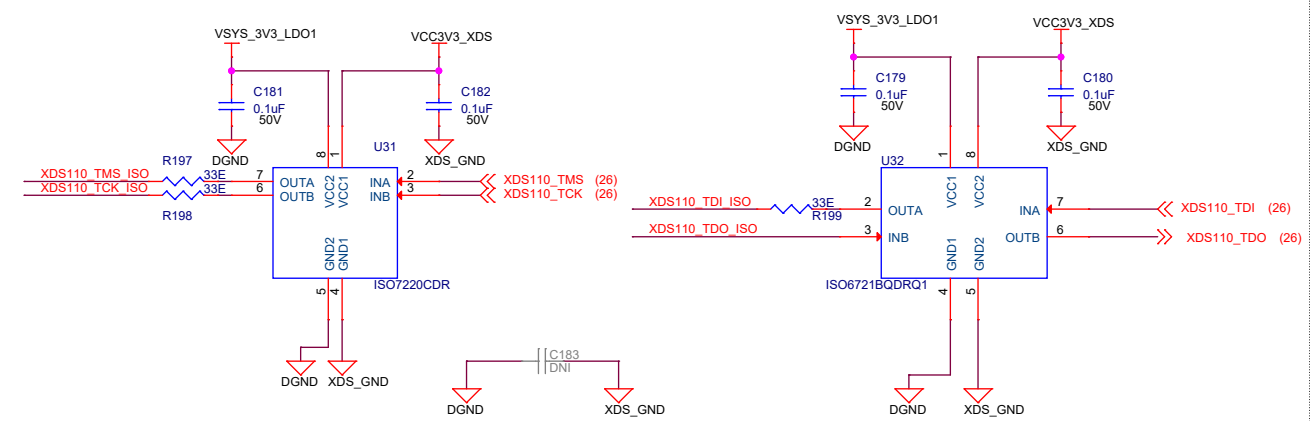


## JTAG MUX

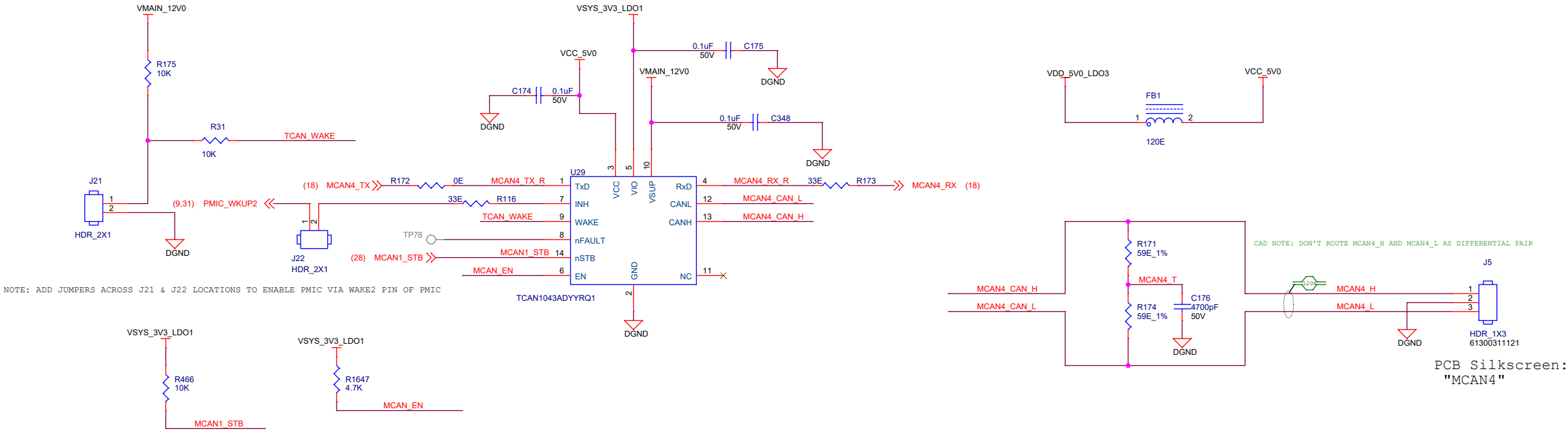


JTAG - 1:2 MUX		DGND
SW1.1	CONDITION	FUNCTION
LOW	HSEC EMU selected	A-->B1 port [EXTERNAL EMU]
HIGH	XDS110 selected	A-->B2 port [ON Board EMU]

## ISOLATION FOR XDS110

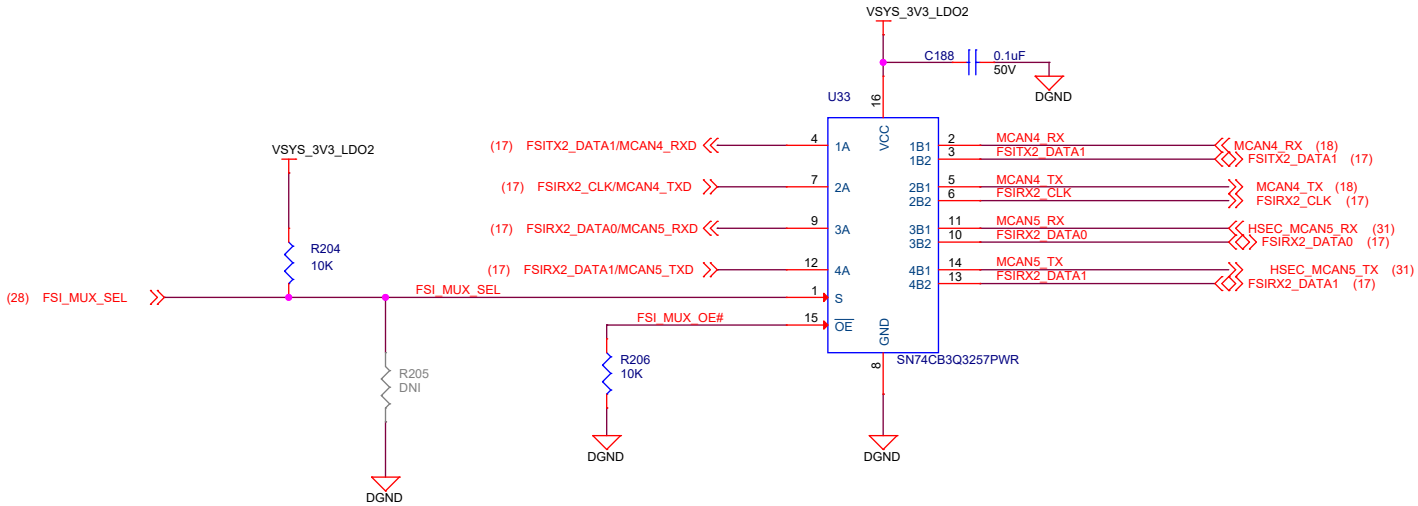


MCAN Interface



PCB Silkscreen:  
"MCAN4"

MCAN AND FSI MUX



FSI MUX

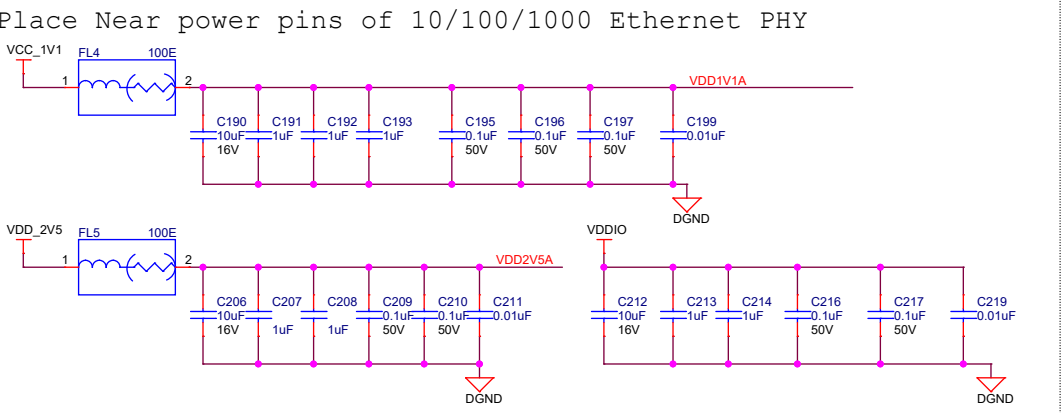
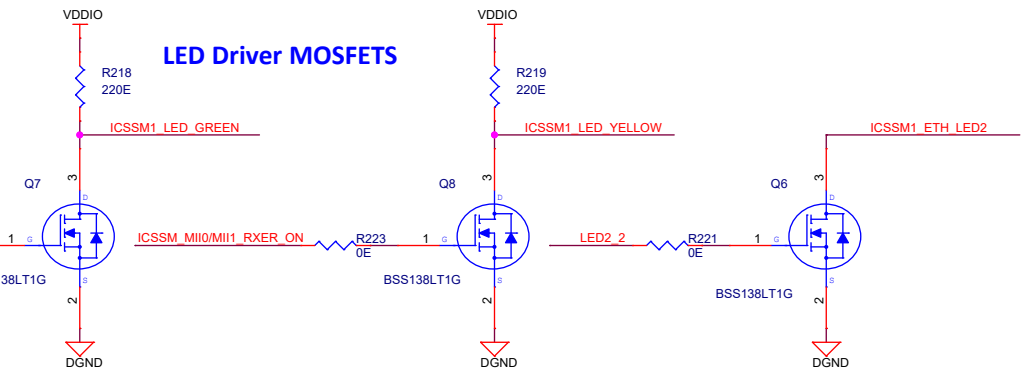
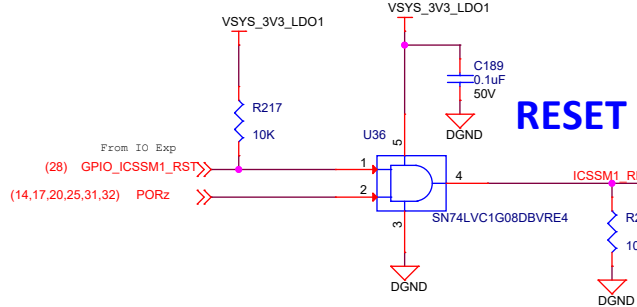
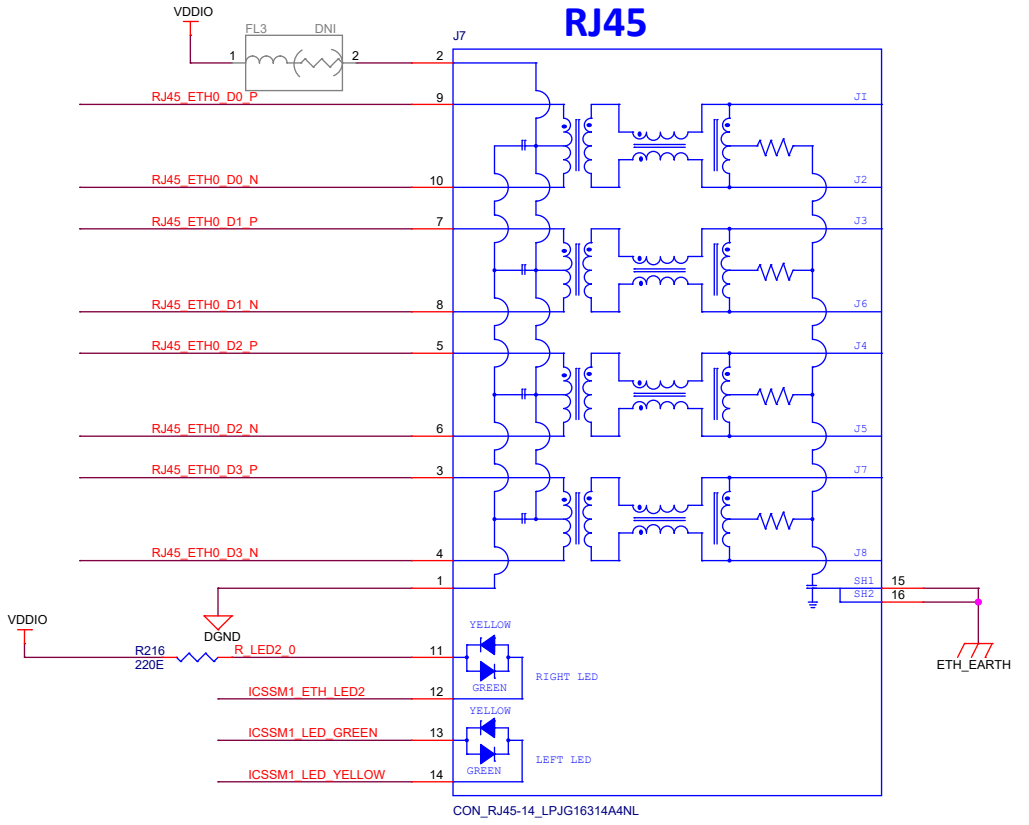
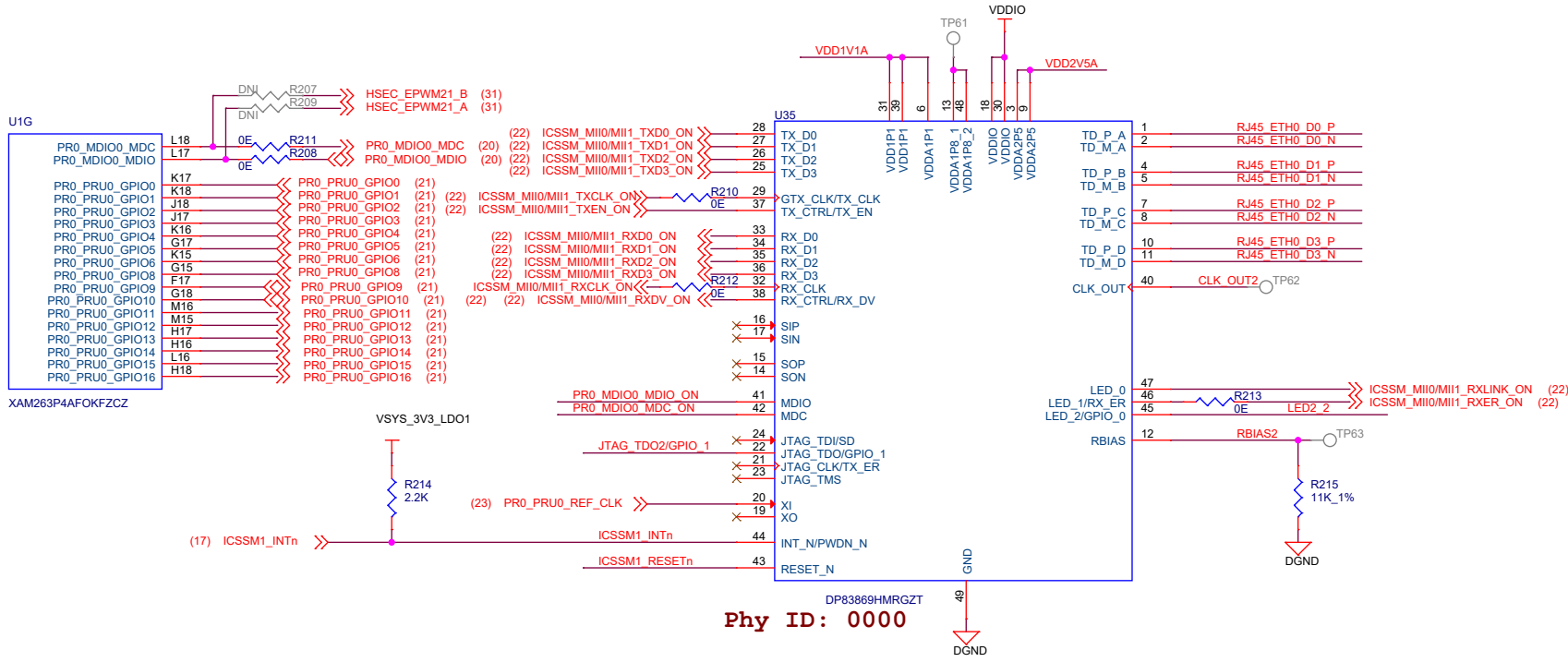
SEL	CONDITION	FUNCTION
LOW	MCAN for CAN & HSEC SELECTED	A-->B1 port
HIGH	FSI SELECTED	A-->B2 port

Designed for T1 by Mistral Solutions Pvt Ltd

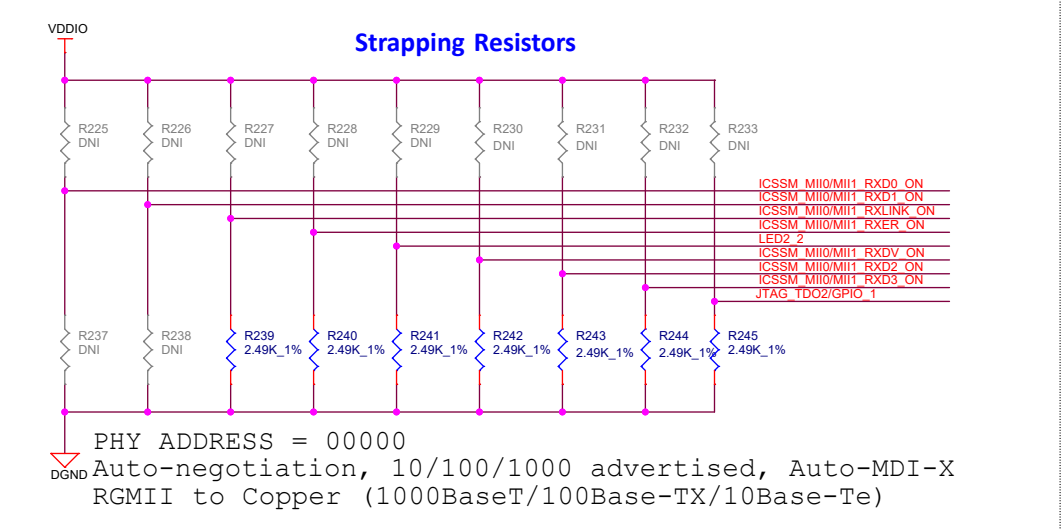
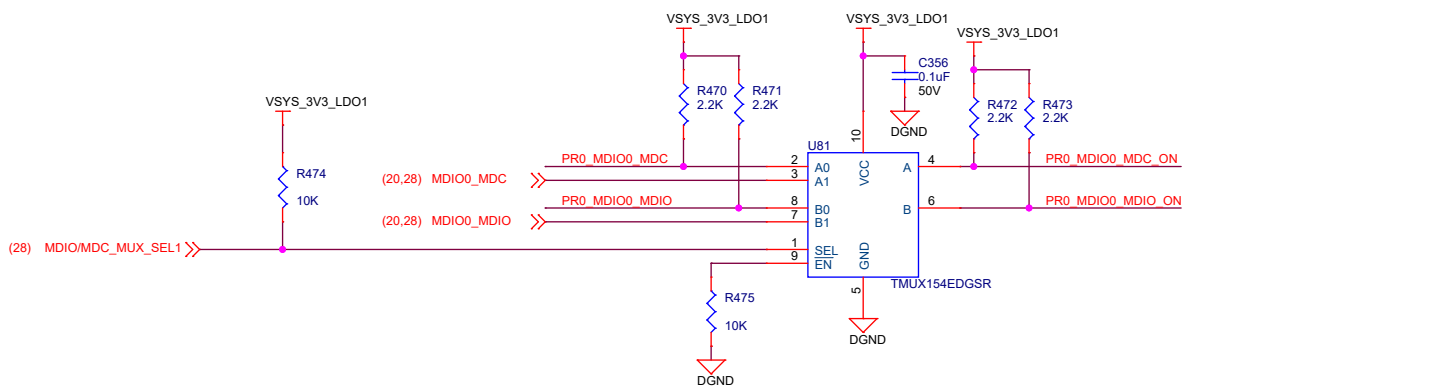


Title    MCAN AND FSI MUX		
Size	Variant Name = PROC159B(002)	Rev
C		B
Date:	Thursday, February 13, 2025	Sheet   18   of   33

PRU0 ICSS MII0, CPSW RGMII/MII Ethernet



MDIO/MDC MUX FOR ON-BOARD PHY

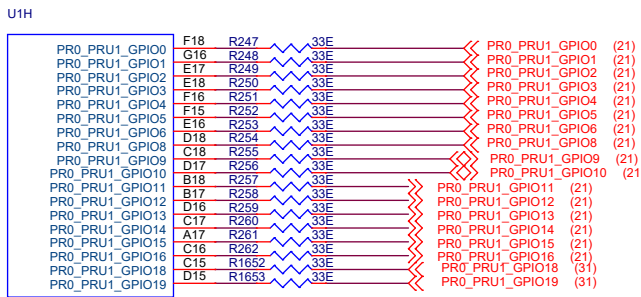


Designed for T1 by Mistral Solutions Pvt Ltd



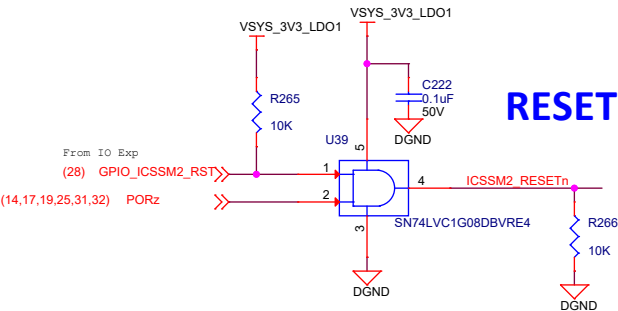
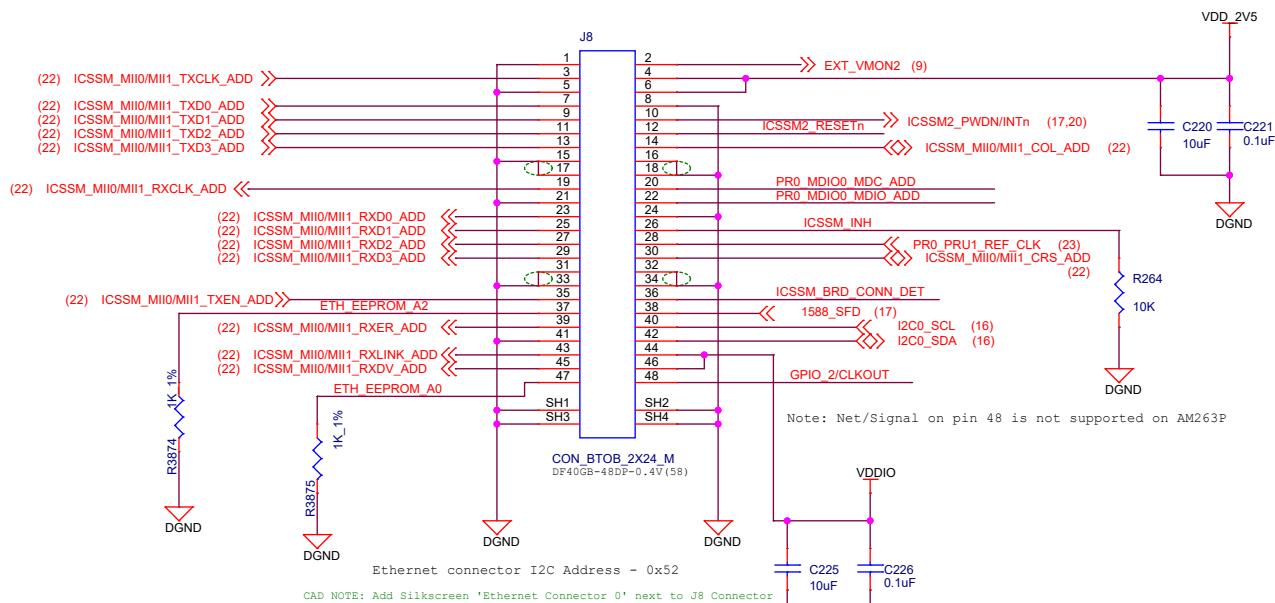
Title			SOC-ICSS DP8386(Indus)	
Size				Rev
C	Variant Name = PROC159B(002)			B
Date:	Friday, April 11, 2025	Sheet	19 of 33	

## PRU1 ICSS MII1 Ethernet

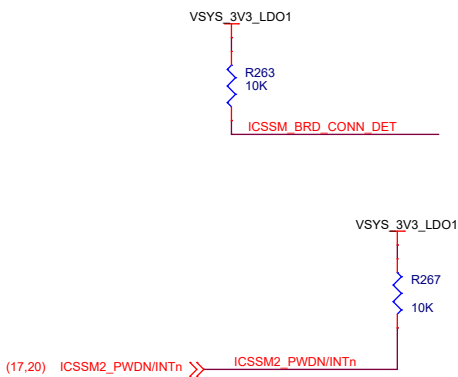
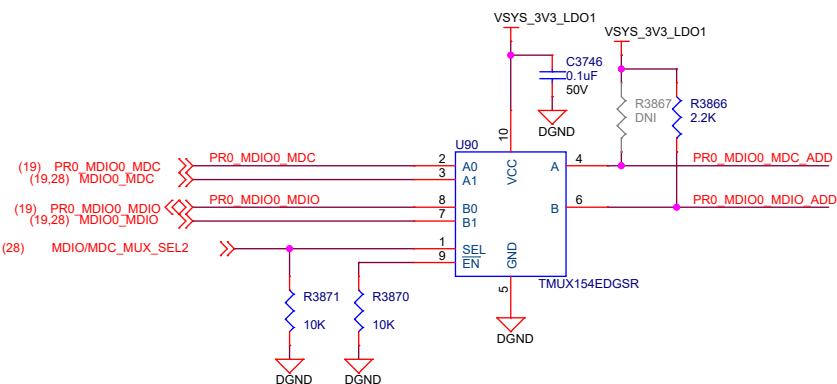


XAM263P4AFOKFZCZ

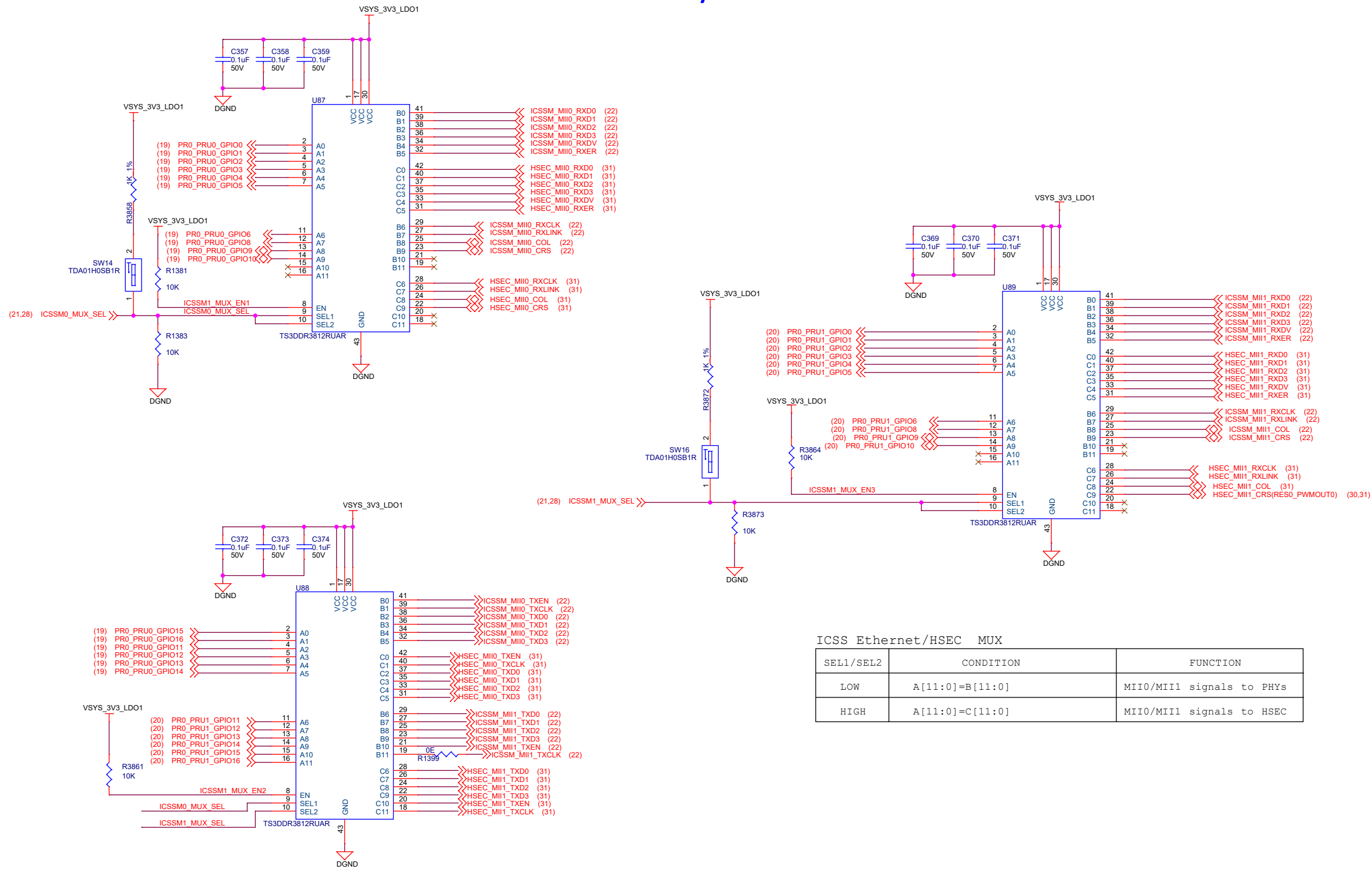
CAD NOTE: Place the resistors close to SoC with minimum stub



## MDIO/MDC MUX FOR ADD-ON BOARD CONN



ICSS Ethernet/HSEC MUX



ICSS Ethernet/HSEC MUX

SEL1/SEL2	CONDITION	FUNCTION
LOW	A[11:0]=B[11:0]	MII0/MII1 signals to PHYs
HIGH	A[11:0]=C[11:0]	MII0/MII1 signals to HSEC

Designed for T1 by Mistral Solutions Pvt Ltd



Title ICSS ETHERNET /HSEC MUXES

Size Variant Name = PROC159B(002)

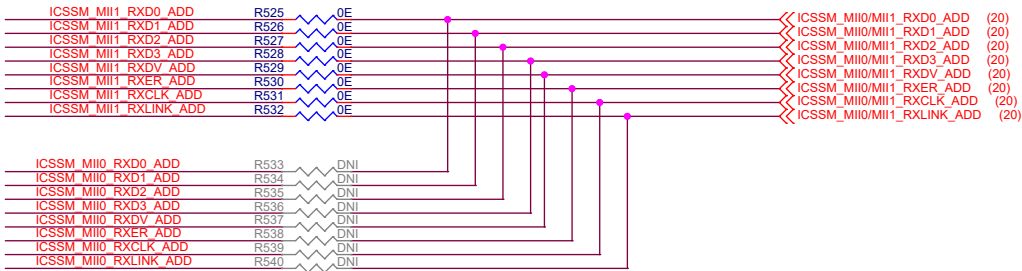
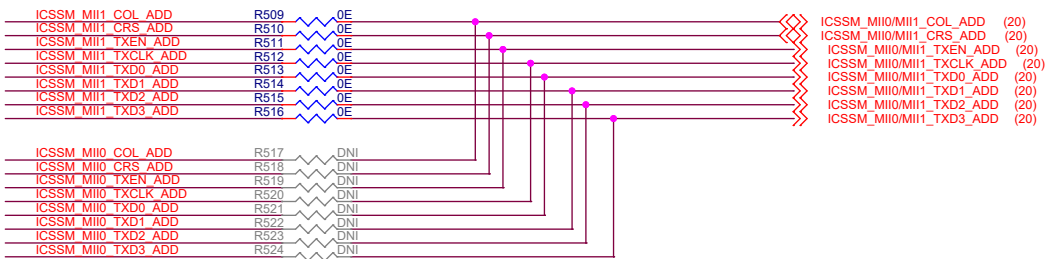
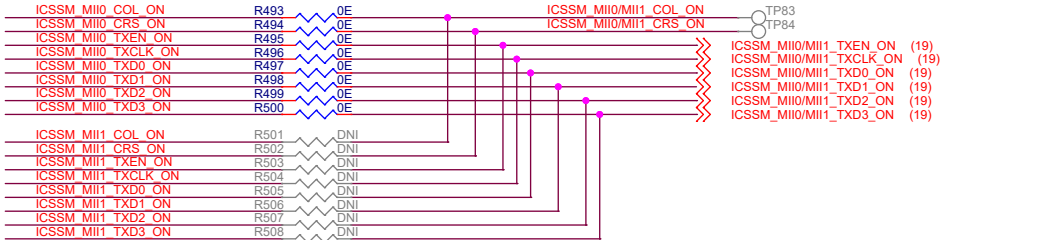
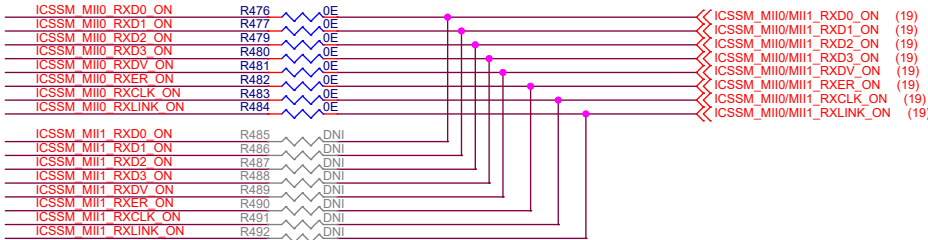
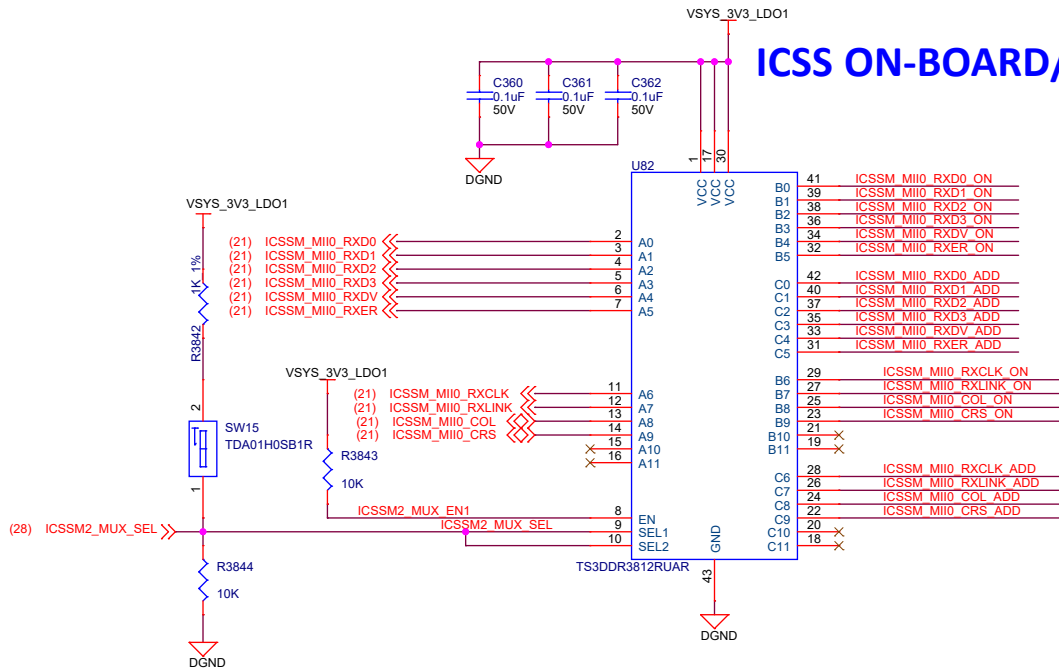
Rev

B

Date: Thursday, February 13, 2025 Sheet 21 of 33

## ICSS ON-BOARD/ADD-ON PHY MUX

## ICSS MII0/MII1 - RESISTOR MUX



CAD NOTE: Place the resistors with minimum stub

### ICSS MII0/MII1 - RESISTOR MUX

MODE	FUNCTION
Populate R476 to R484, R493 to R500, R509 to R516, R525 to R532 resistors (Default)	MII0 -> On-board PHY MII1 -> Add-on Board connector
Populate R485 to 492, R501 to R508, R517 to R524, R533 to R540 resistors	MII0 -> Add-on Board connector MII1 -> On-board PHY

### ICSS ON-BOARD/ADD-ON PHY MUX

SEL1/SEL2	CONDITION	FUNCTION
LOW	A[11:0]=B[11:0]	MII0 signals to ON-BOARD PHY MII1 signals to ADD-ON BOARD
HIGH	A[11:0]=C[11:0]	MII0 signals to ADD-ON BOARD MII1 signals to ON-BOARD PHY

Designed for T1 by Mistral Solutions Pvt Ltd



Title ICSS ON-BOARD/ADD-ON PHY & MII0/MII1 MUXES

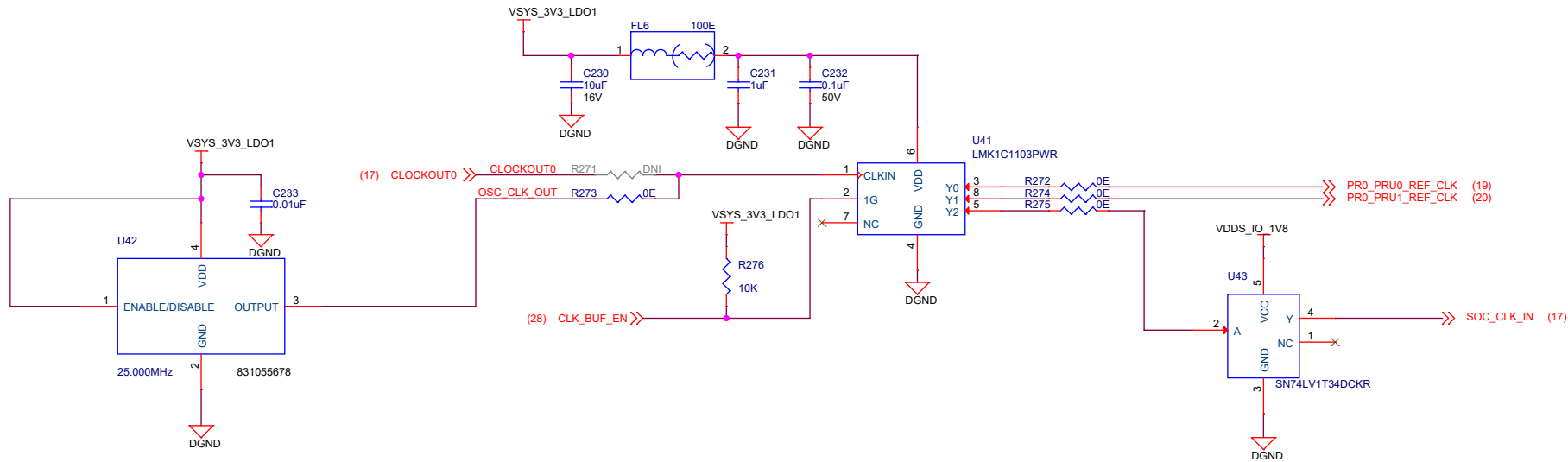
Size  
C Variant Name = PROC159B(002)

Rev  
B

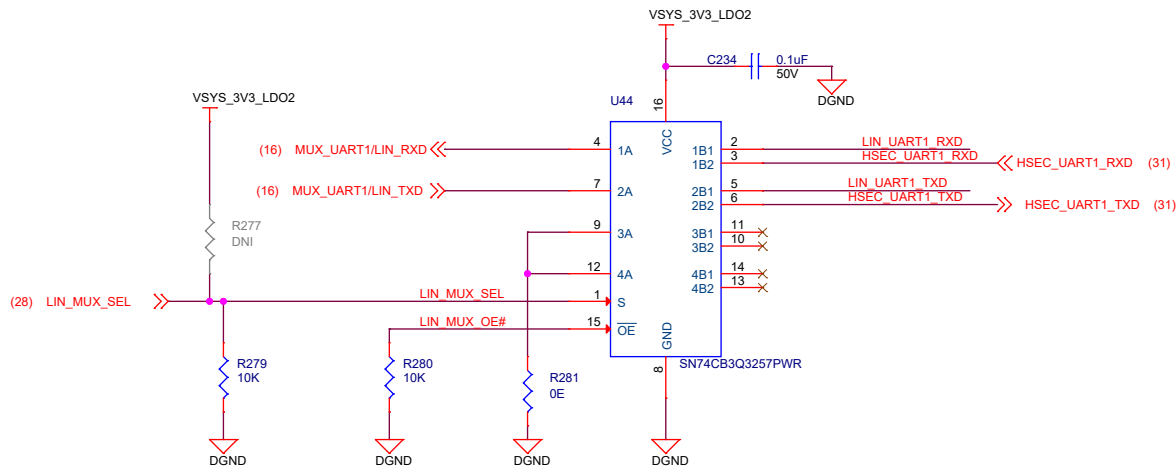
Date: Thursday, February 13, 2025 Sheet 22 of 33



CLOCKS



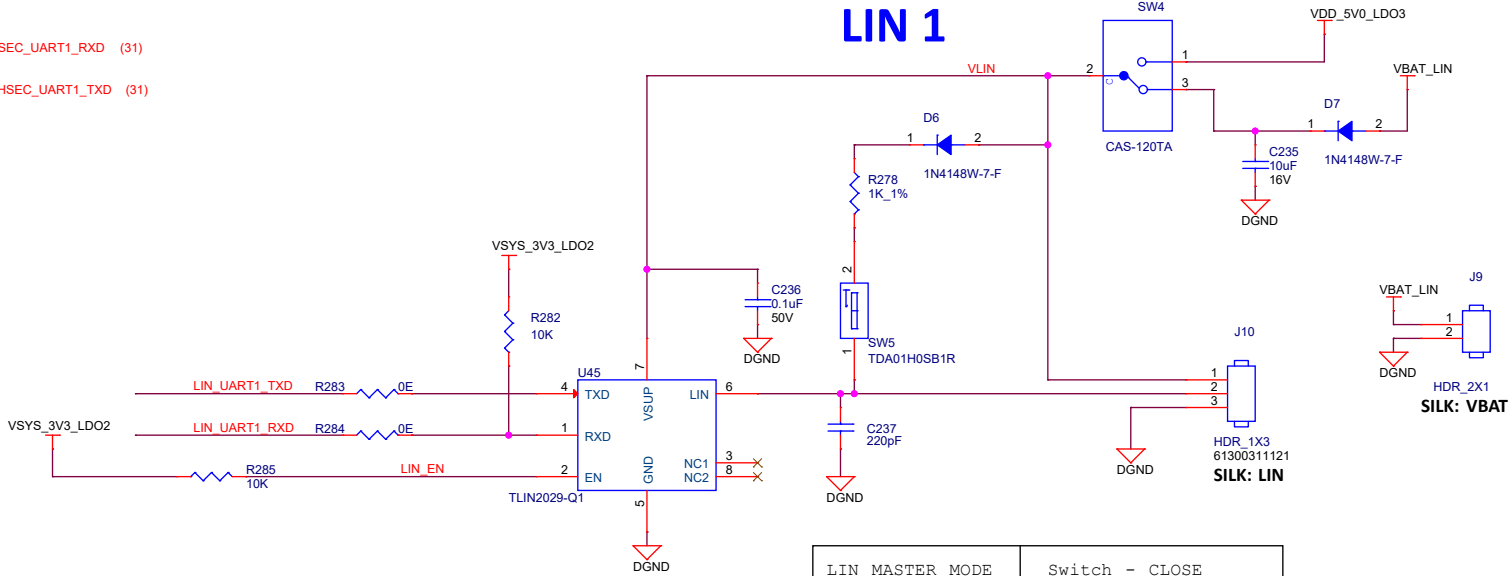
LIN MUX/DEMUX



I2C0 - 1:2 MUX

SEL	CONDITION	FUNCTION
LOW	LIN SELECTED	A-->B1 port
HIGH	HSEC UART selected	A-->B2 port

LIN 1



LIN MASTER MODE	Switch - CLOSE
LIN SLAVE MODE	Switch - OPEN

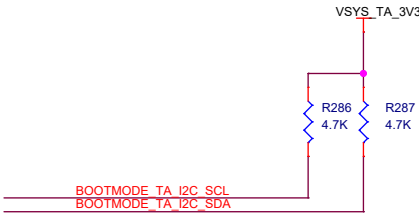
Designed for T1 by Mistral Solutions Pvt Ltd



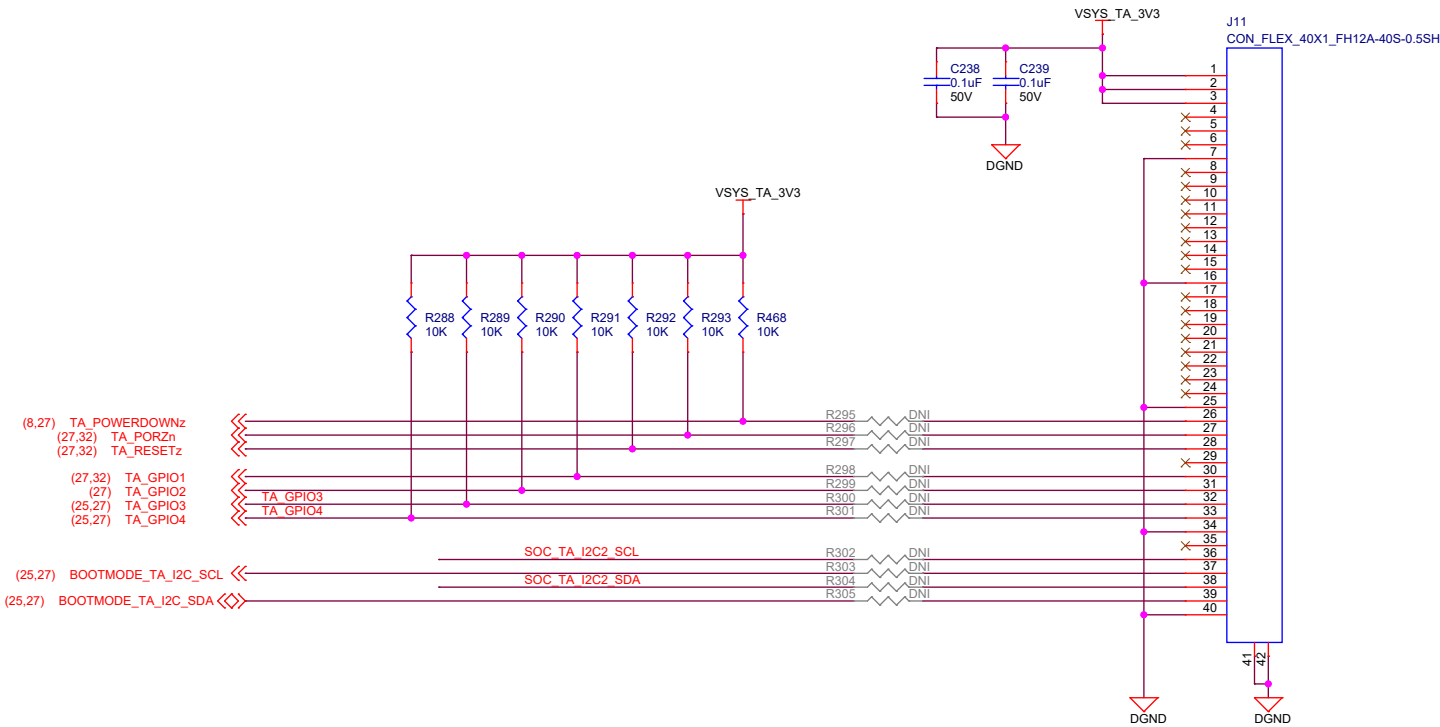
Title    CLOCKS AND LIN1		
Size	Variant Name = PROC159B(002)	Rev
C		B
Date:	Thursday, February 13, 2025	Sheet    23    of    33

TEST AUTOMATION HEADER

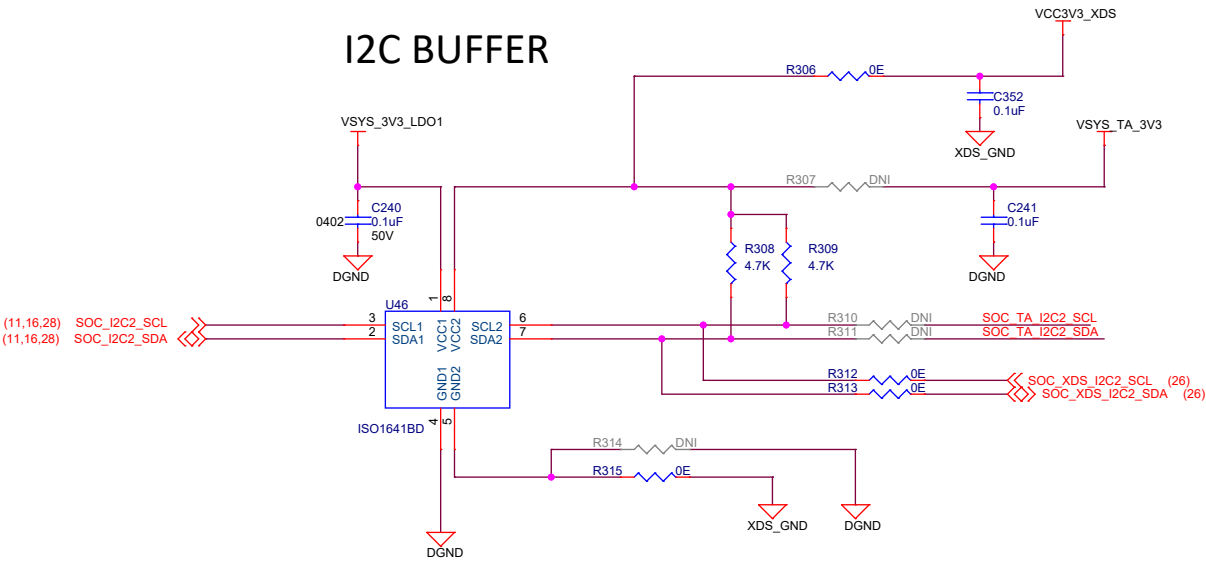
I2C Pull Ups



AUTOMATION INTERFACE  
Cable : Parlex-050R40-76B, .5mm 3"



I2C BUFFER



TA Configuration  
Mount : R307,R310,R311,R314  
Demount : R306,R312,R313,R315

TEST AUTOMATION GPIO MAPPING

SIGNAL NAME	DESCRIPTION	Direction WRT CTRL	Internal/ External PU/PD states
TA_POWERDOWN	Used to Power down the system	OUTPUT	External Pullup
TA_PORZn	Used to Reset the SoC PORz	OUTPUT	External Pullup
TA_RESETz	SoC Warmreset	OUTPUT	External Pullup
TA_GPIO1	Interrupt to SOC	OUTPUT	External Pullup
TA_GPIO3	Used to Enable the BOOTMODE Buffer	OUTPUT	External Pullup
TA_GPIO4	Used Reset Bootmode IO Exp	OUTPUT	External Pullup

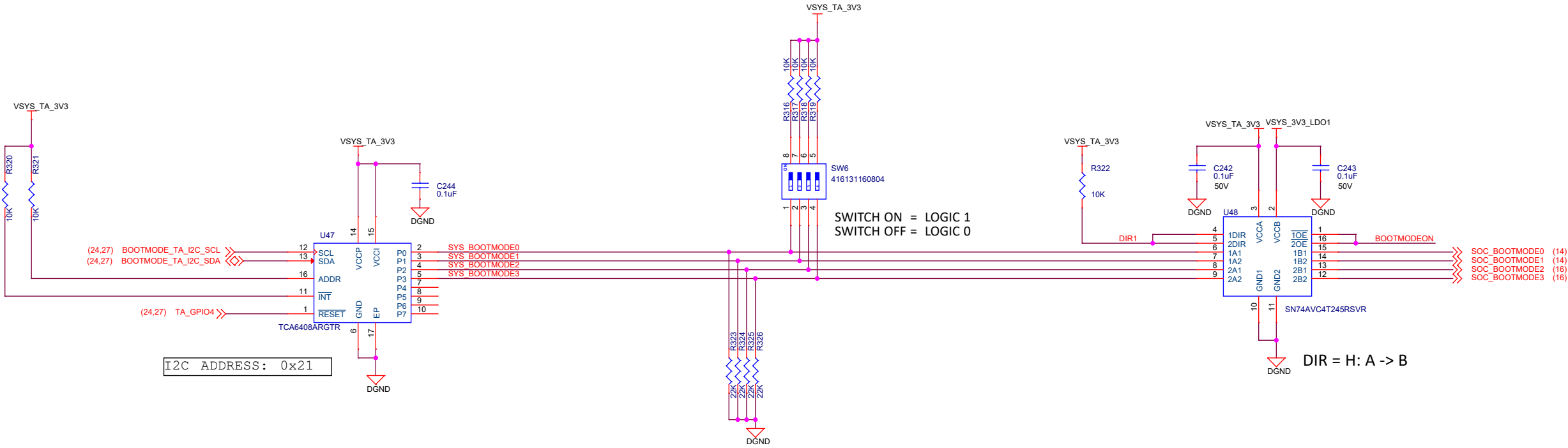
Designed for T1 by Mistral Solutions Pvt Ltd



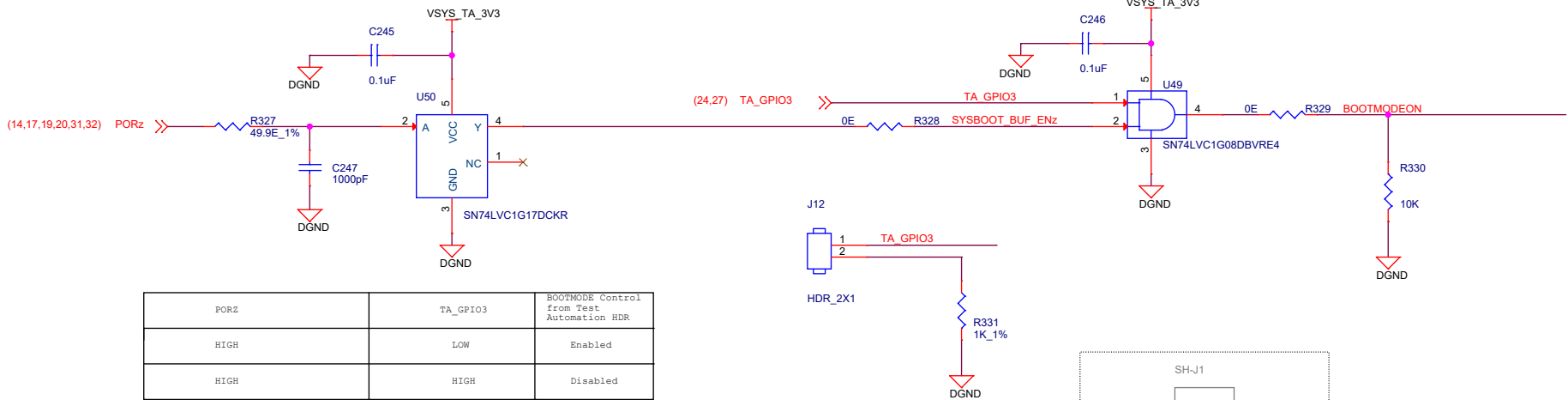
Title    TEST AUTOMATION HEADER		
Size	Variant Name = PROC159B(002)	Rev
C		B
Date:	Thursday, February 13, 2025	Sheet    24    of    33



BOOTMODE BUFFER AND SWITCH



I2C ADDRESS: 0x21



PORz	TA_GPIO3	BOOTMODE Control from Test Automation HDR
HIGH	LOW	Enabled
HIGH	HIGH	Disabled

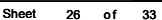
Designed for T1 by Mistral Solutions Pvt Ltd



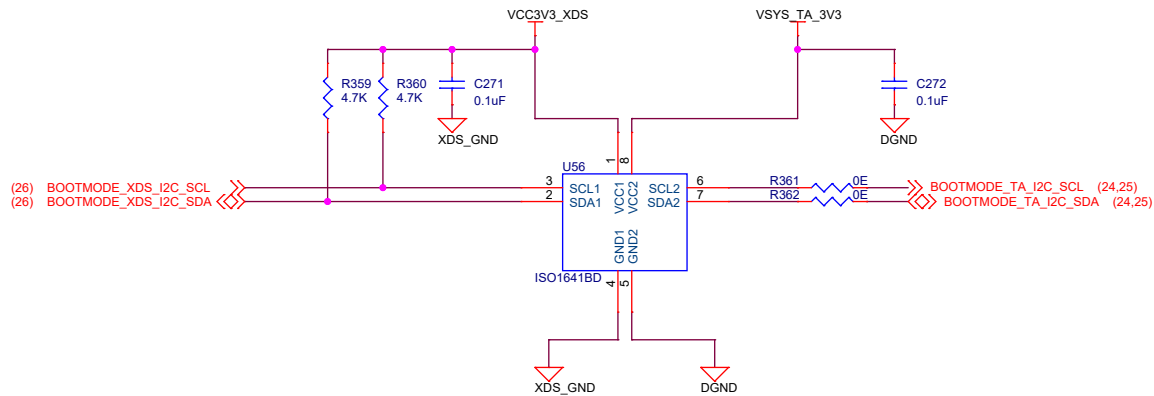
Title BOOTMODE BUFFER AND SWITCH

Size	Variant Name = PROC159B(002)	Rev
C		B
Date:	Thursday, February 13, 2025	Sheet 25 of 33

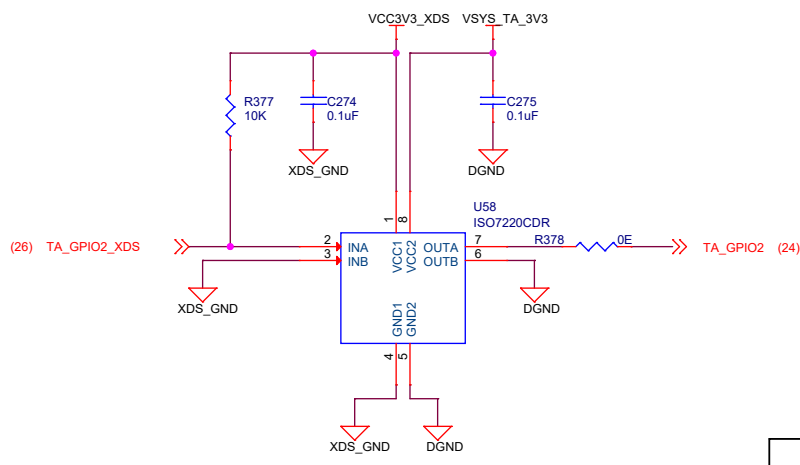
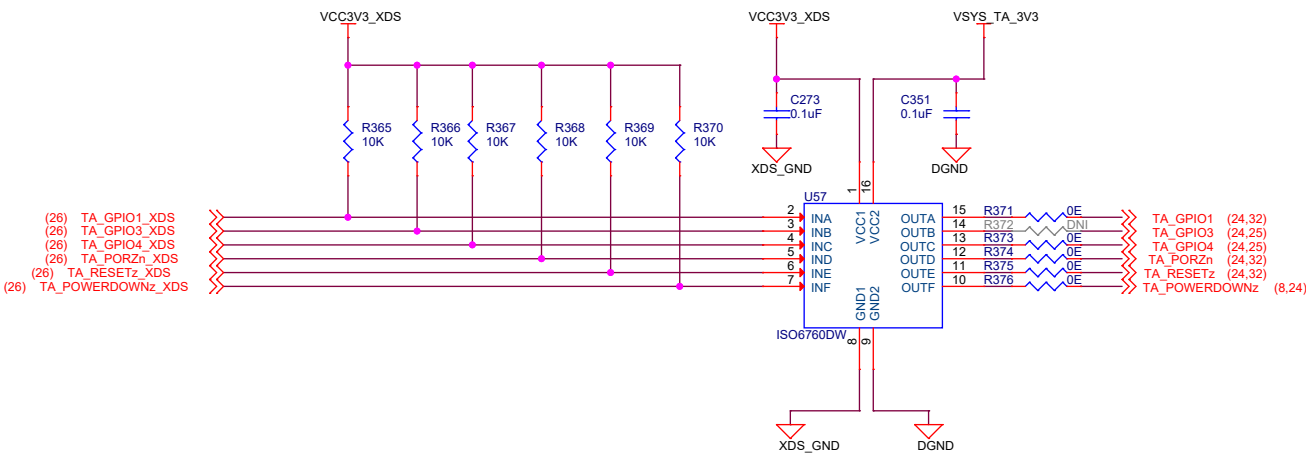
# XDS110 DEBUGGER



BOOTMODE\_I2C\_TA BUFFER



ISOLATION BUFFERS FOR TA SIGNALS

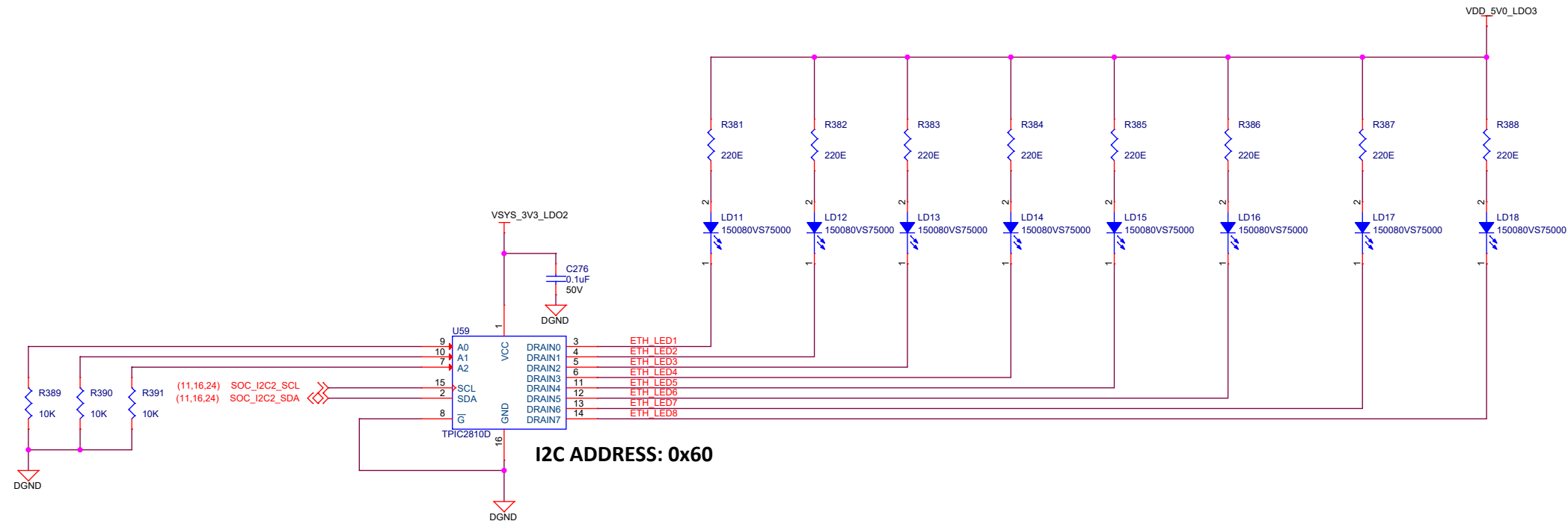


Designed for T1 by Mistral Solutions Pvt Ltd

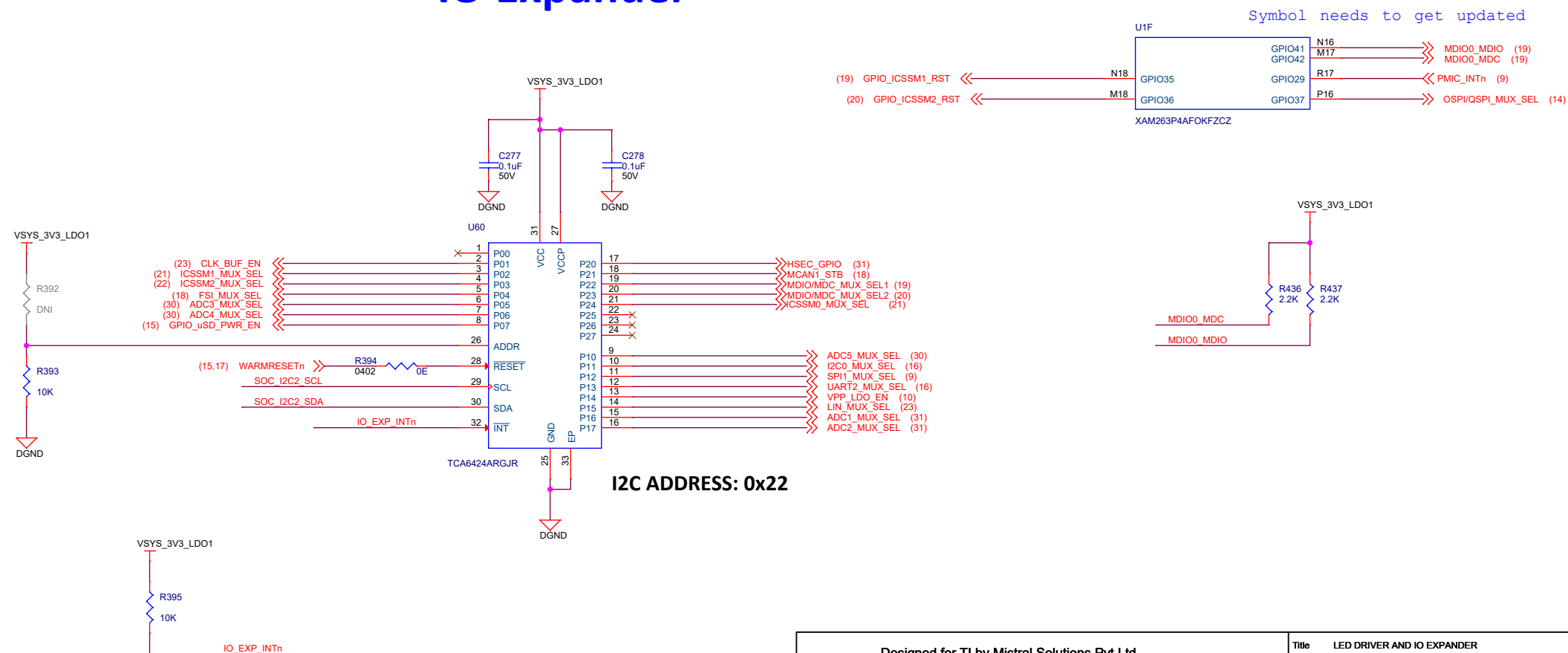


Title    AUTOMATION SIGNALS BUFFER		
Size	Variant Name = PROC159B(002)	Rev
C		B
Date:	Thursday, February 13, 2025	Sheet    27    of    33

# LED Driver

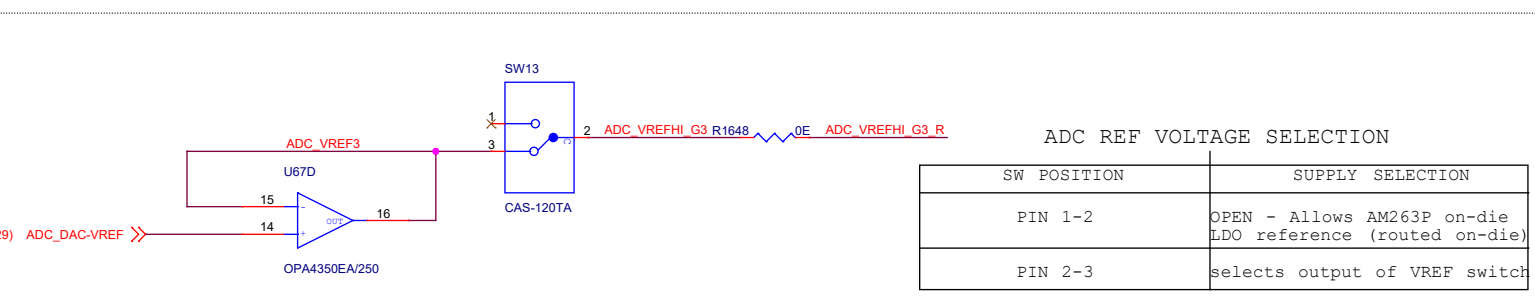
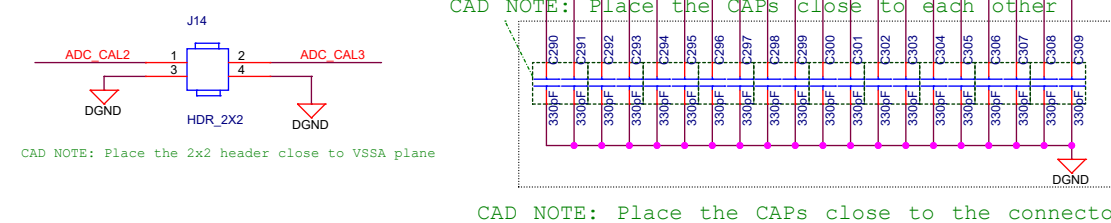
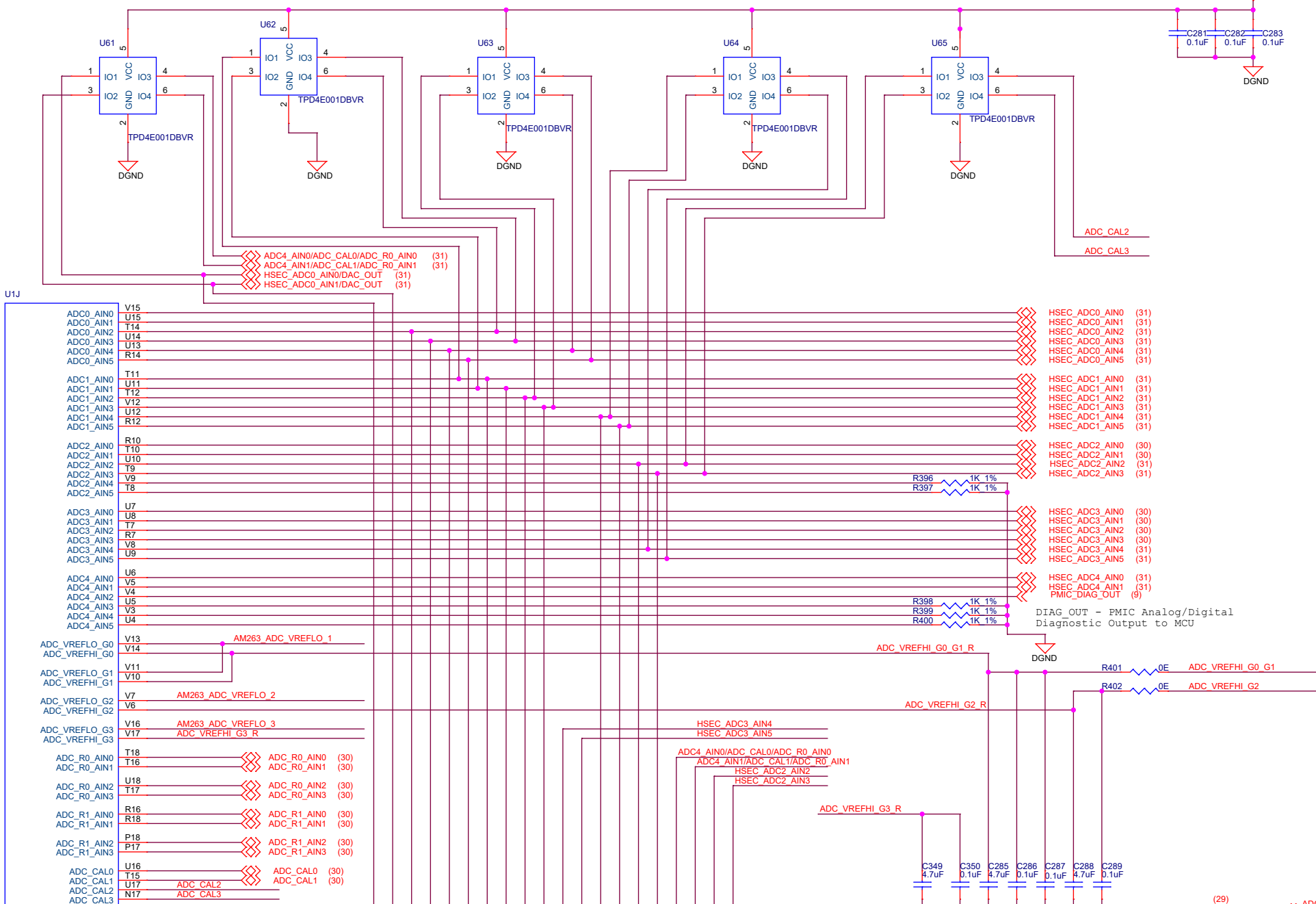


# IO Expander



# SOC- ADC & DAC Interface

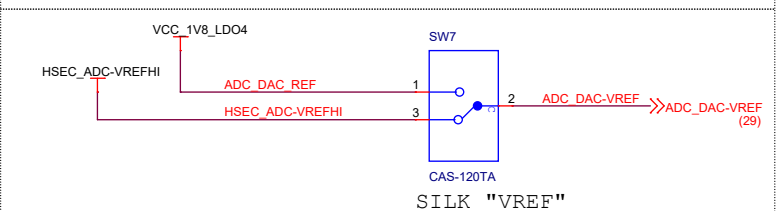
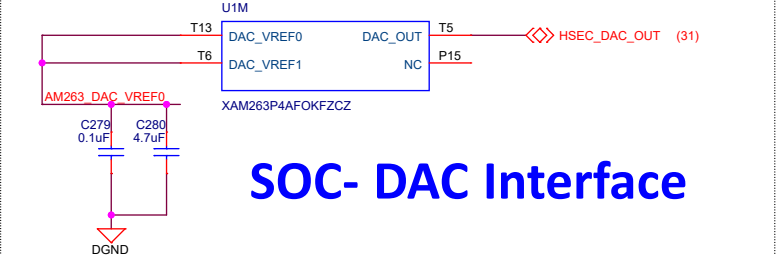
CAD NOTE: Place the ESDs close to connector



ADC REF VOLTAGE SELECTION

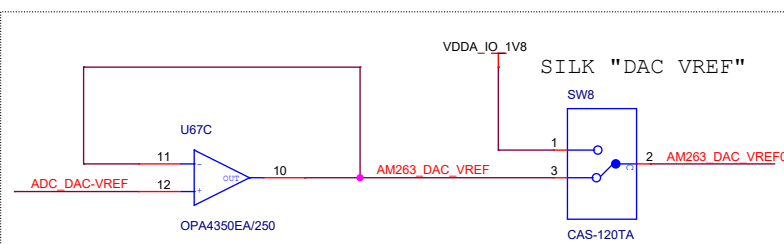
SW POSITION	SUPPLY SELECTION
PIN 1-2	OPEN - Allows AM263P on-die LDO reference (routed on-die)
PIN 2-3	selects output of VREF switch

## SOC- DAC Interface



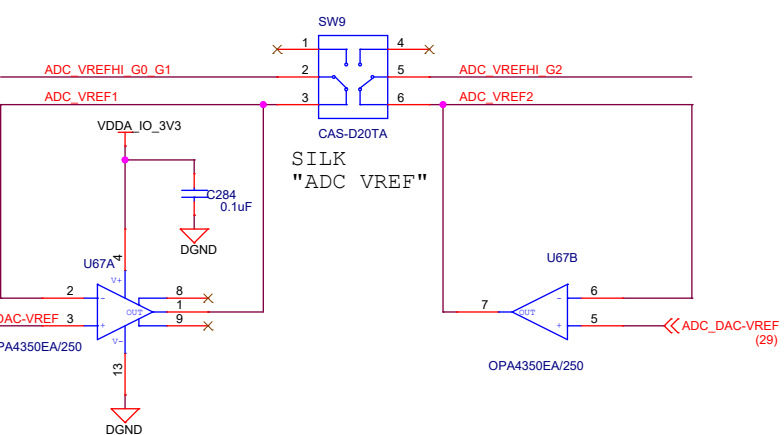
REF VOLTAGE SELECTION

SW POSITION	SUPPLY SELECTION
PIN 1-2	ON BOARD REF IS SELECTED
PIN 2-3	HSEC SUPPLY IS SELECTED



DAC REF VOLTAGE SELECTION

SW POSITION	SUPPLY SELECTION
PIN 1-2	Allows AM263P on-die LDO reference (Routed n PCB)
PIN 2-3	selects output of VREF switch



ADC REF VOLTAGE SELECTION

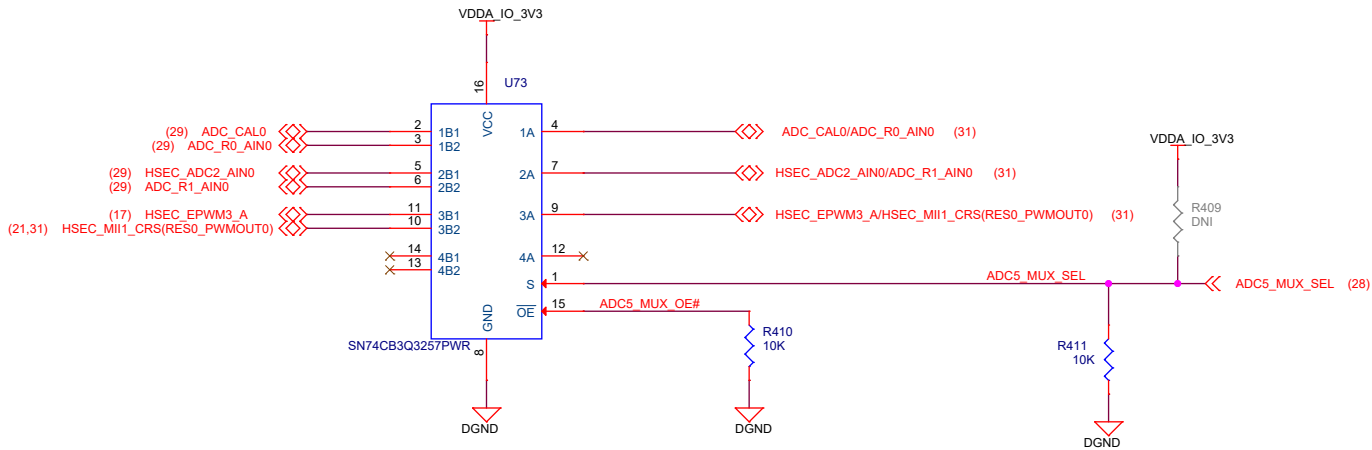
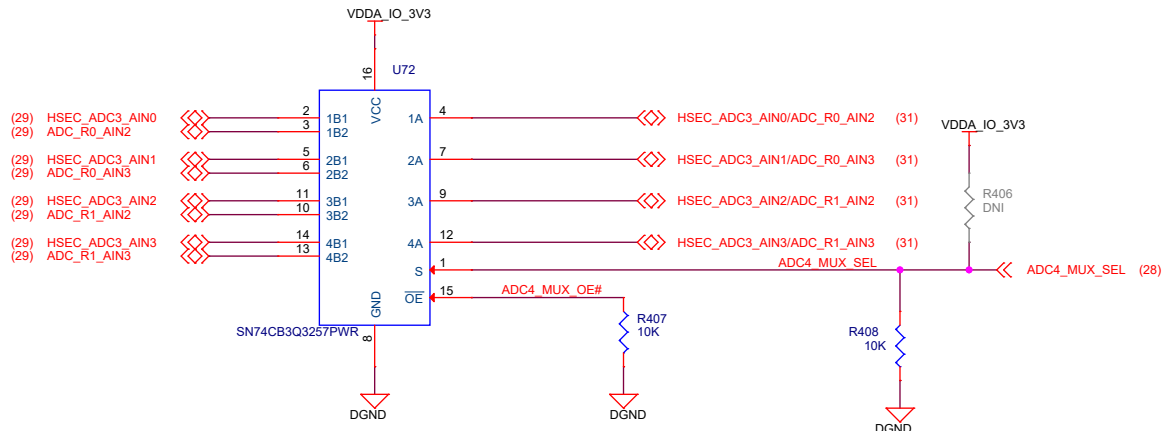
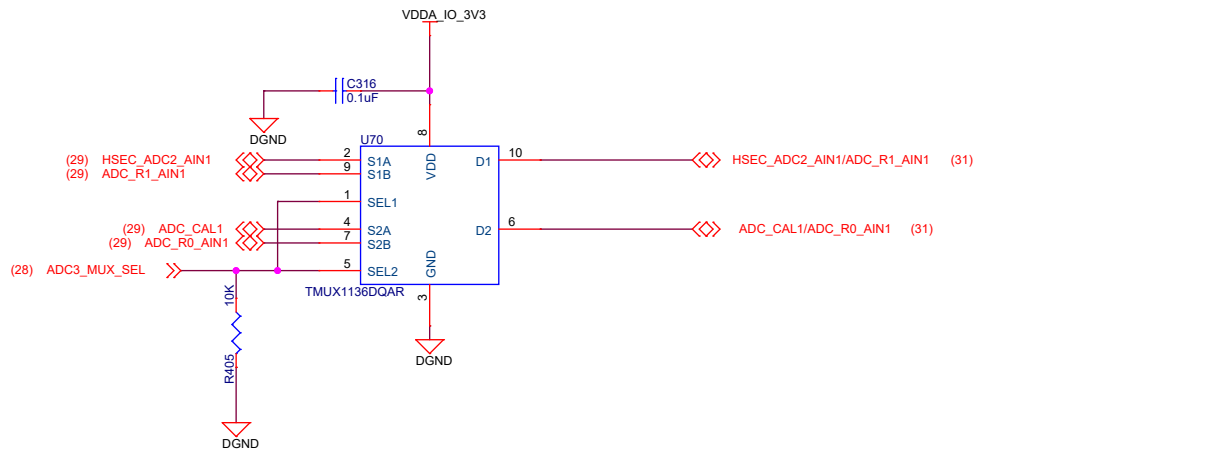
SW POSITION	SUPPLY SELECTION
PIN 1-2	OPEN - Allows AM263P on-die LDO reference (routed on-die)
PIN 2-3	selects output of VREF switch
PIN 4-5	OPEN - Allows AM263P on-die LDO reference (routed on-die)
PIN 5-6	selects output of VREF switch

Designed for T1 by Mistral Solutions Pvt Ltd

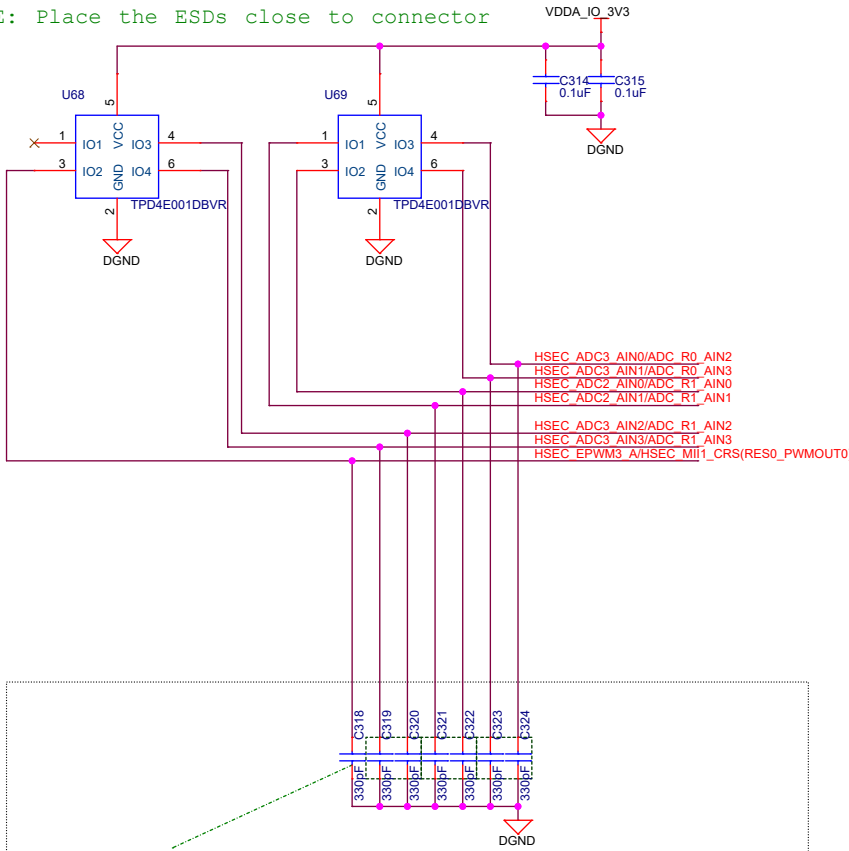


Title SOC-ADC INTERFACE		
Size	Variant Name = PROC159B(002)	Rev
C		B
Date:	Friday, April 11, 2025	Sheet 29 of 33

ADC MUXES



CAD NOTE: Place the ESDs close to connector



CAD NOTE: Place the CAPs close to each other

CAD NOTE: Place the CAPs close to connector

Designed for T1 by Mistral Solutions Pvt Ltd



Title ADC MUXES

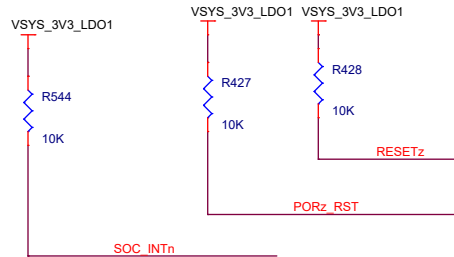
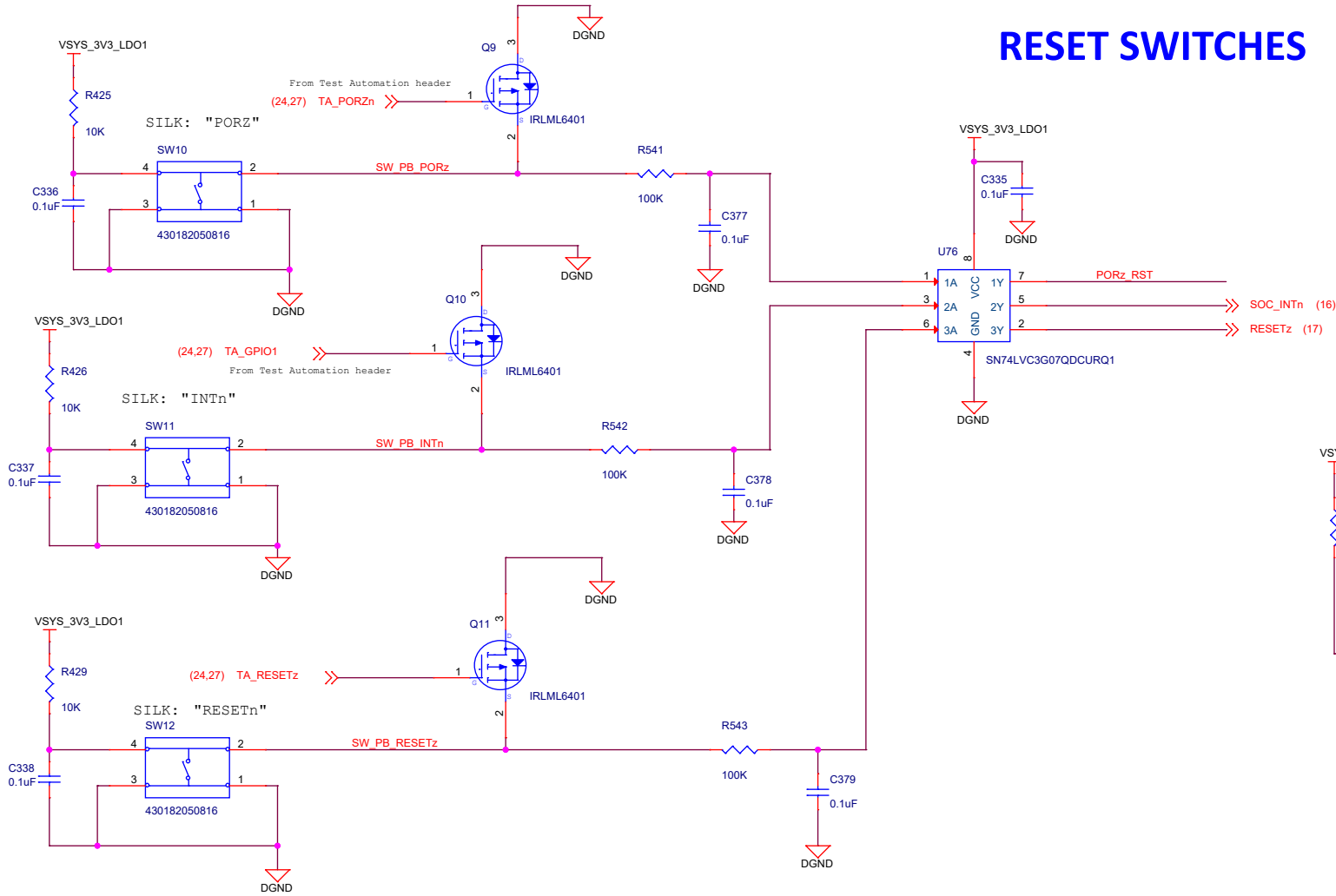
Size Variant Name = PROC159B(002)

Rev

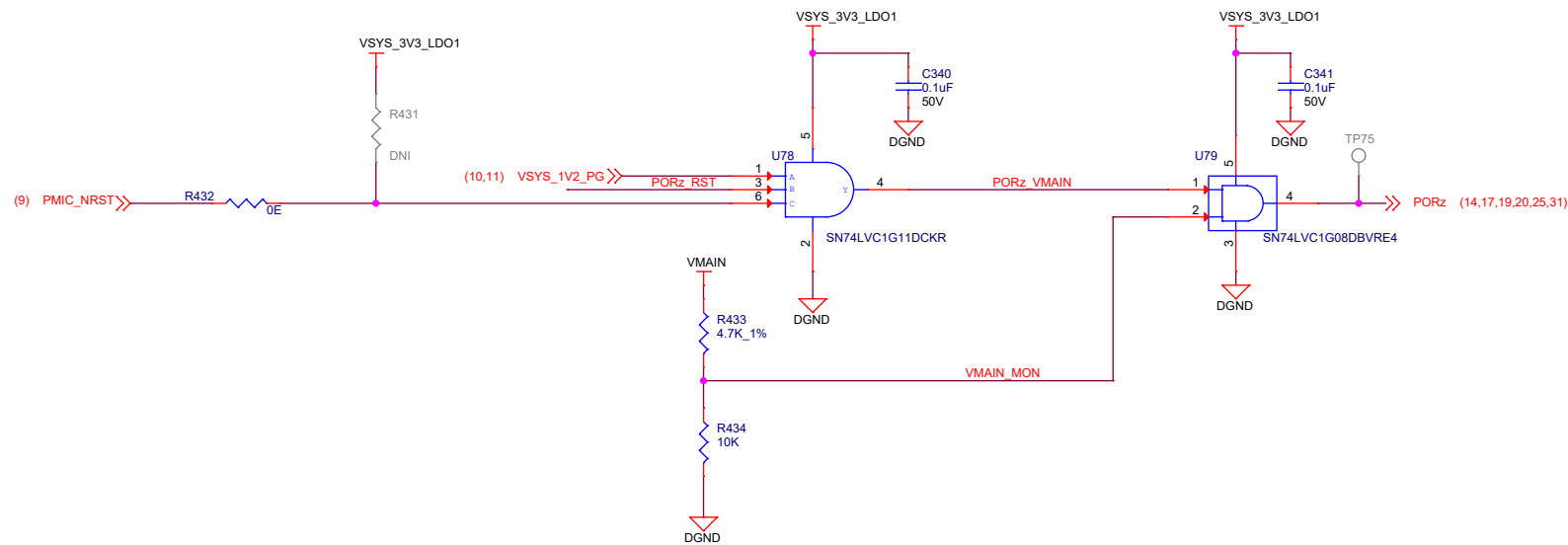
Date: Thursday, February 13, 2025 Sheet 30 of 33



# RESET SWITCHES



# PORz



Designed for T1 by Mistral Solutions Pvt Ltd



Title    RESET SWITCHES		
Size	Variant Name = PROC159B(002)	Rev
C		B
Date:	Thursday, February 13, 2025	Sheet    32    of    33



# EVM Development & Evaluation test circuitry

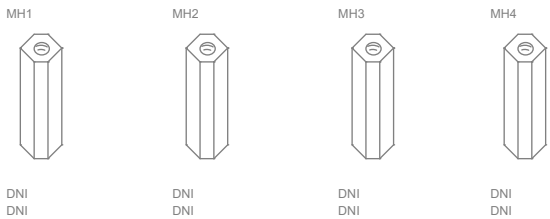
(TI EVM Only)

## NOTES, HW & LABELS

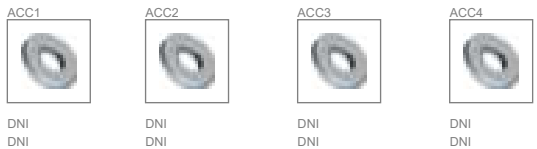
### ASSEMBLY NOTES

1. All MSL components should be baked as per JEDEC standard.
2. PCB should be baked at 120 degree for 8 hours.
3. Board assembly must comply with workmanship standards. IPC-A-610 Class 2, unless otherwise specified.
4. These assemblies are ESD sensitive, ESD precautions shall be observed.
5. These assemblies must be clean and free from flux and all contaminants. Use of no clean flux is not acceptable.
6. Provide serial numbers to the assembled boards for identification.
7. The assembled board are wrapped in ESD Covers(individual) and packed securely before shipment.

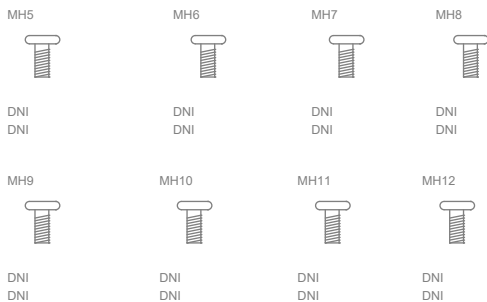
### STANDOFFS



### WASHER'S



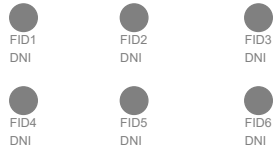
### SCREWS



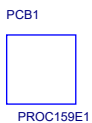
### RUBBER FEET



### FIDUCIALS



### BARE PCB



SH-J2

SPC02SYAN

SH-J2 Shall be mounted on J20 to enable the PMIC VIA WAKE1 PIN OF PMIC

SH-J3

SPC02SYAN

SH-J3 Shall be mounted on J22 to enable the PMIC VIA WAKE2 PIN OF PMIC

SH-J4

SPC02SYAN

SH-J4 Shall be mounted on J21 to enable the TCAN WAKE

### LOGOs

PCB  
LOGO  
DNI  
Texas Instruments

PCB  
LOGO  
DNI  
For Evaluation only; not FCC approved for resale

PCB  
LOGO  
DNI  
WEEE Mark

PCB  
LOGO  
DNI  
CE Mark

PCB  
LOGO  
DNI  
High Temperature

### LABELS

Board Serial No.



Assembly Revision.



EVM Orderable No.



### Orderable Part Numbers

Variant	Label Text
001	TMDSCNCD263P
002	TMDSCNCD263P-SIP

Designed for TI by Mistral Solutions Pvt Ltd



Title CC EVM NOTES,HW &LABELS

Size

C

Variant Name = PROC159B(002)

Rev

B

Date:

Thursday, February 13, 2025

Sheet

33

of

33