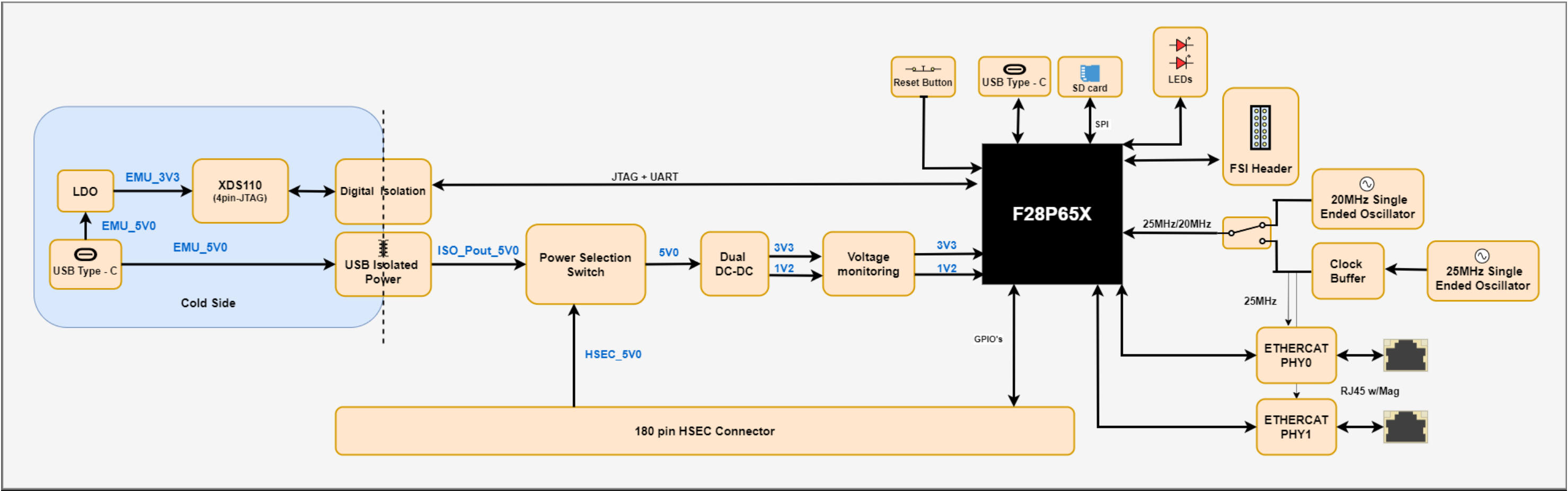
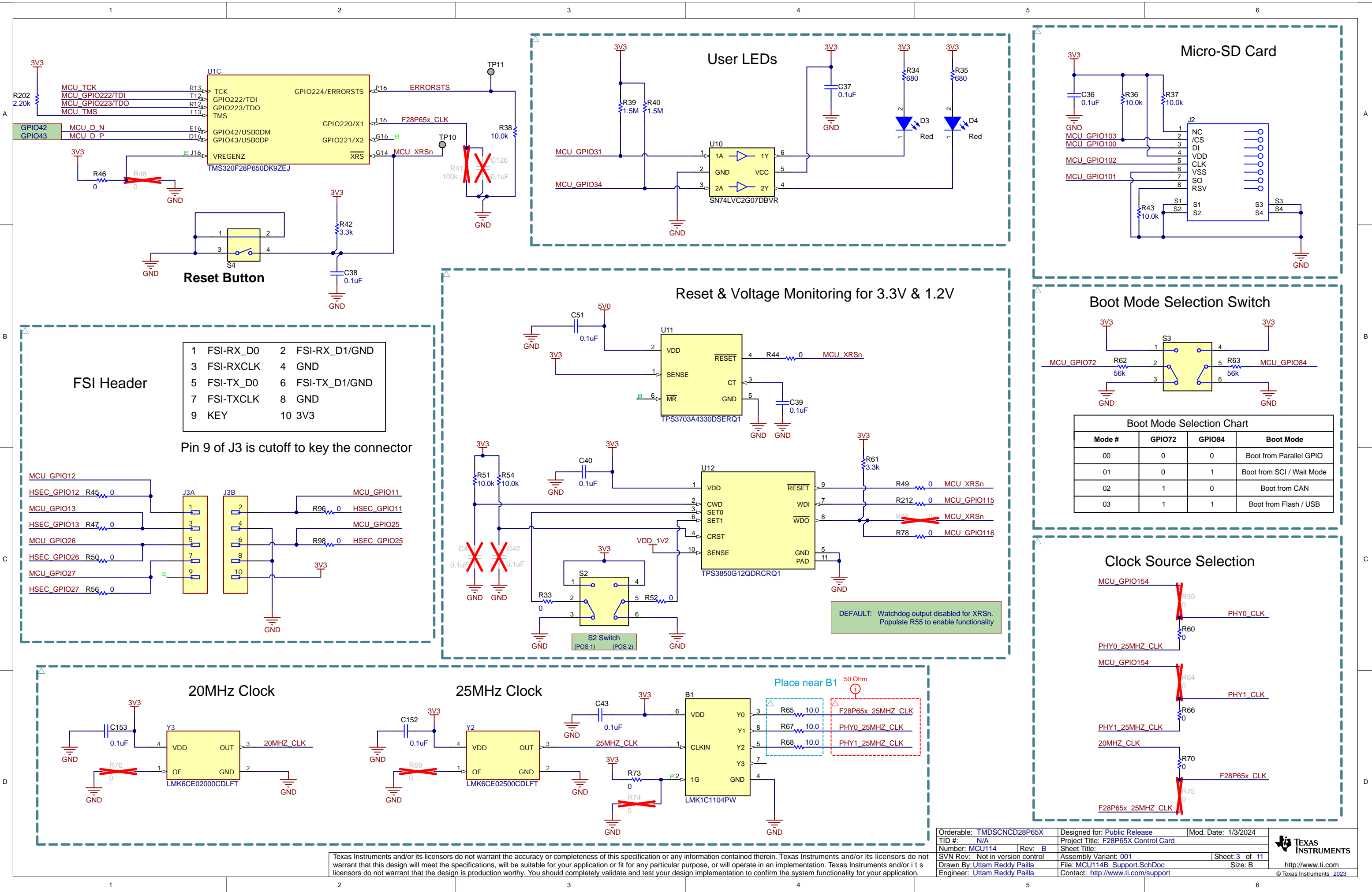


- 1) USB Differential Pairs - 90 Ohm
(A) XDS_D_P and XDS_D_N
(B) USB_D_P (GPIO42) and USB_D_N (GPIO43)
- 2) ADC Differential pair Impedance Matching - 50 Ohm
(A) HSEC_ADC even pins should match with HSEC_ADC + 1 pin(ie ADC-C2 should match with ADC-C3)
(B) MCU_ADC even pins should match with MCU_ADC + 1 pin(ie MCU_ADC-A0 should match with MCU_ADC-A1)
- 3) ETHERCAT Differential pairs - 100 Ohm
(A) TD_P and TD_N
(B) RD_P and RD_N
- 4) CLK Paths - 50 Ohm
(A) F28P65x_25MHz_CLK
(B) PHY0_25MHz_CLK and PHY1_25MHz_CLK

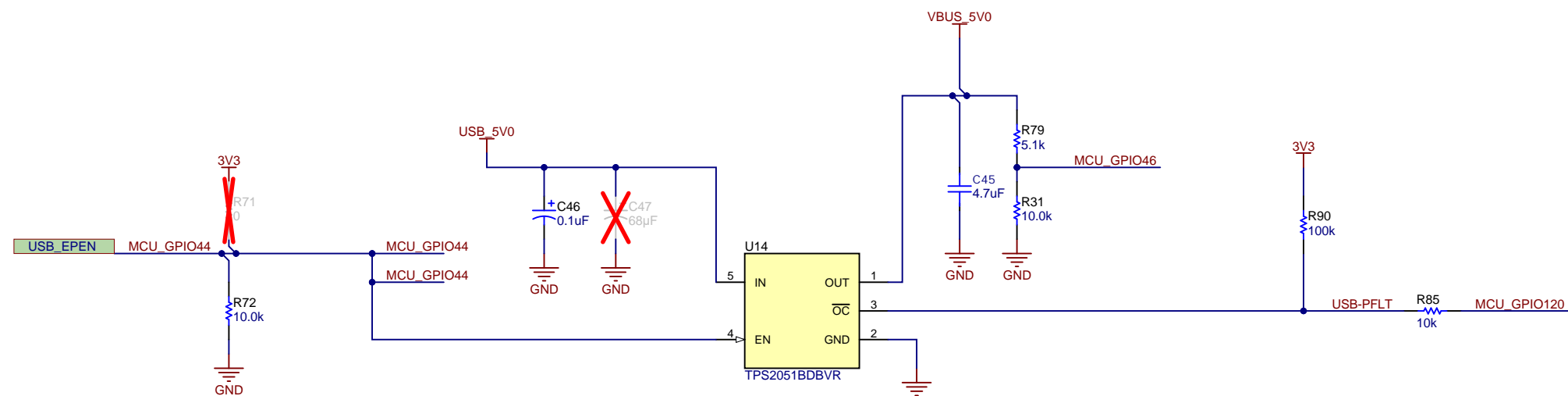
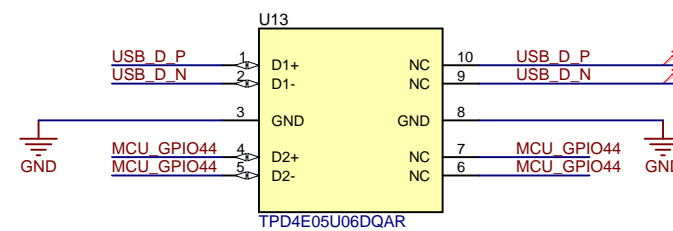
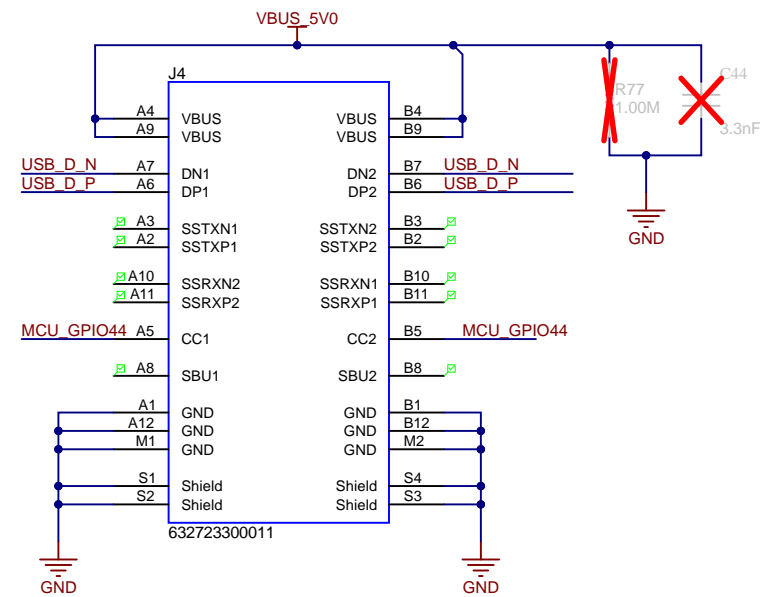
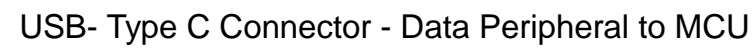
Revision History				
Rev	ECN #	Approved Date	Approved by	Notes
E1	N/A	September 12, 2022	UR	Original engineering release
E2	N/A	April 8, 2023	UR	Refer Errata section in the TMDSCNCD28P65X controlCARD Information Guide
A	N/A	June 7, 2023	UR	Cosmetic changes to PCB silk screen
B	N/A	January 2, 2024	UR	Initial F28P650DK9 has ADC issues resolved



Power to the MCU is either supported by the USB-C on the left or the HSEC 180 pin.



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Switch Truth Table		
MCU_GPIO44 STATUS	DESCRIPTION	USB_MODE
1 (HIGH)	UB_CC1 & USB_CC2 are pulled up	Host mode - DFP
0 (LOW)	UB_CC1 & USB_CC2 are strongly pulled down	Device mode - UFP (DEFAULT)

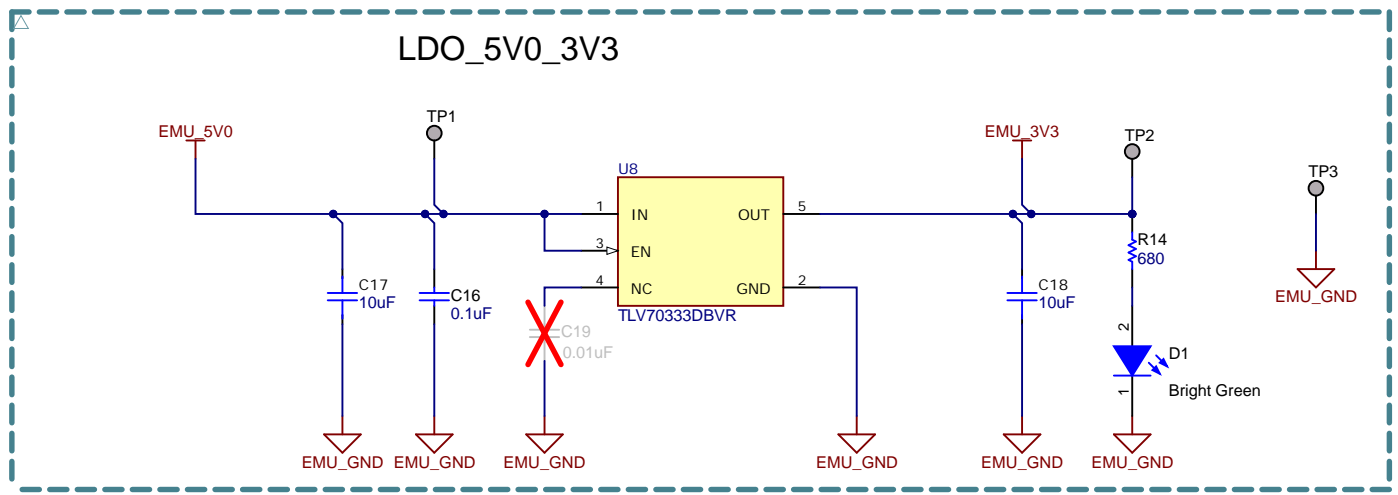
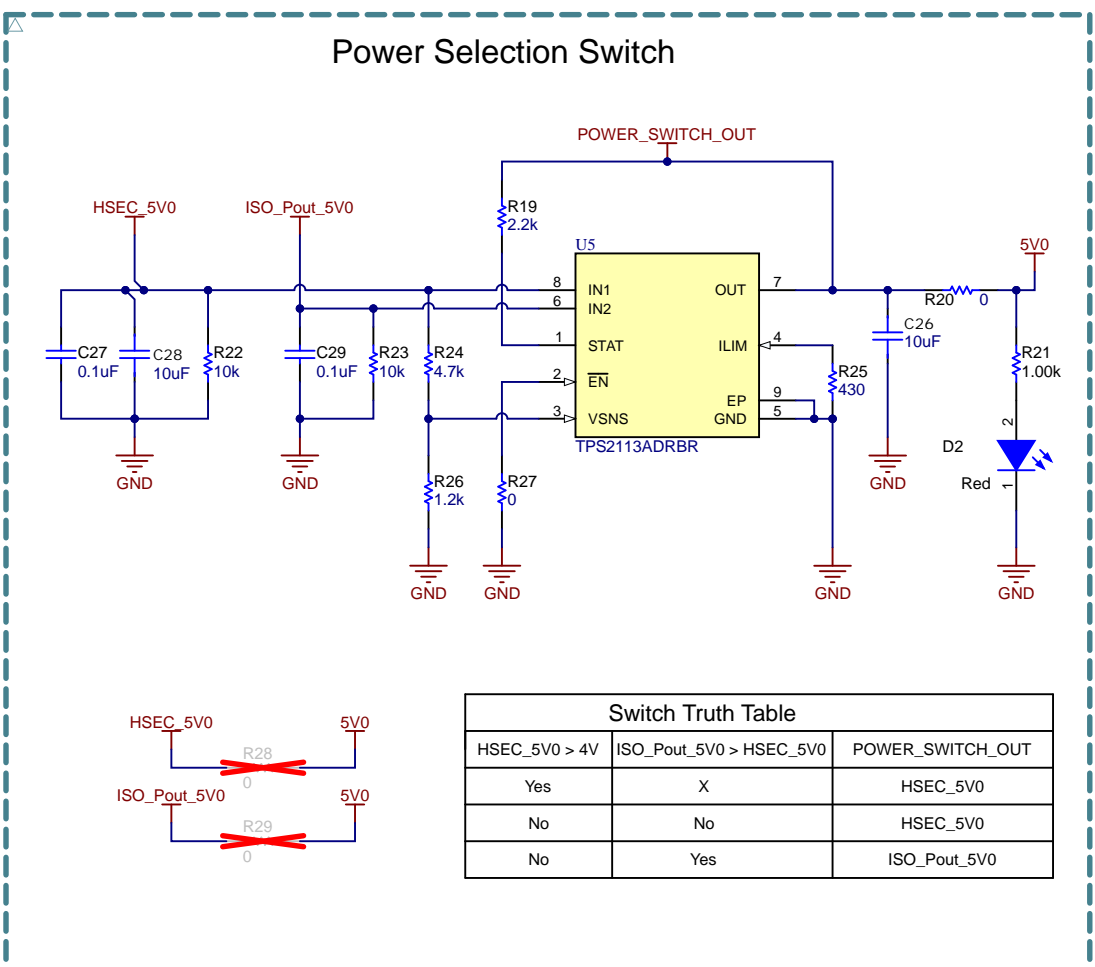
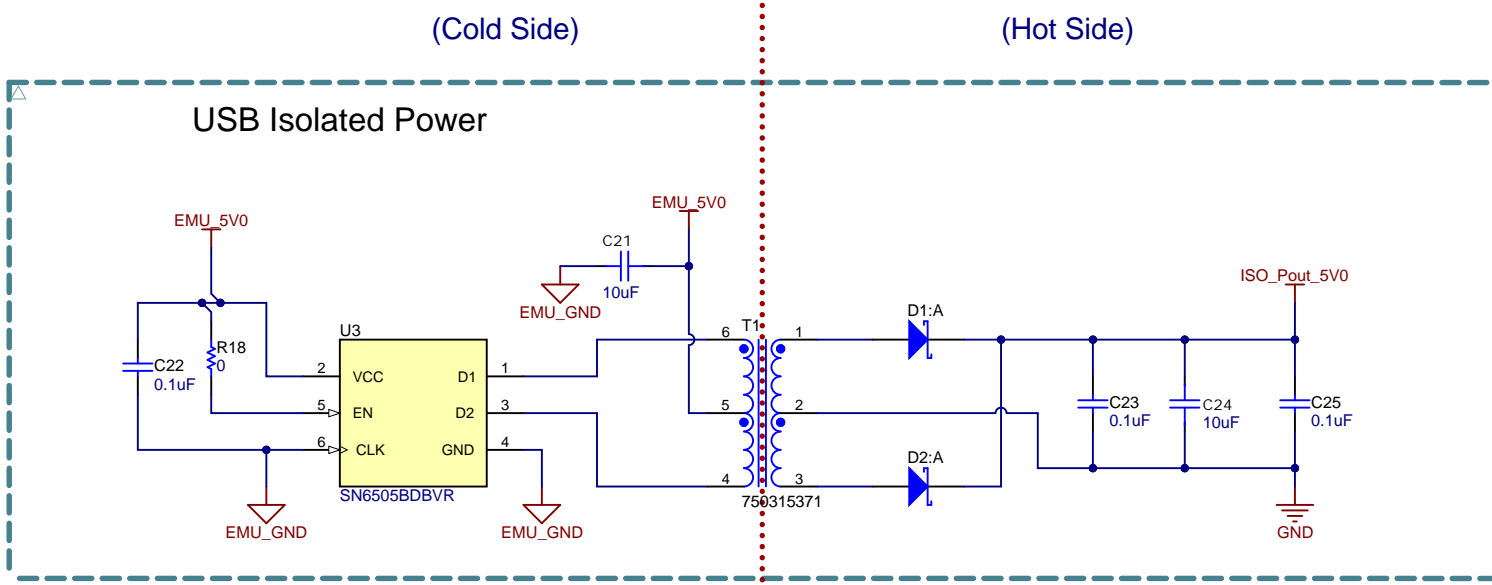
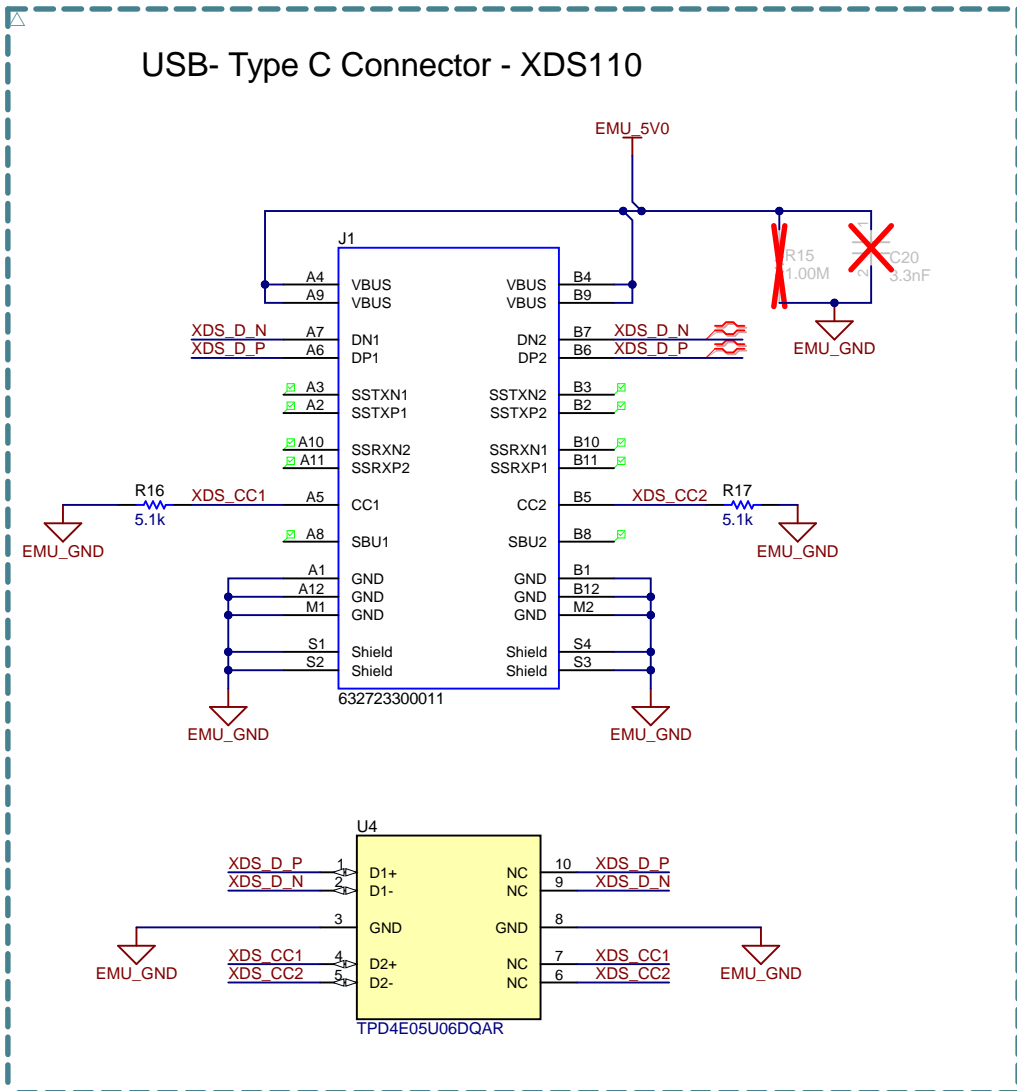
NOTE: USB VBUS_5V0, PFLT & EPEN do not have a specific mux position in this device.

In this controlCARD, a standard GPIO is used to detect changes to these signals.

NOTE: for TYPE C, the USB2.0 OTG device is referred as a Dual Role Port (DRP)

DRP can function either as a USB host or USB peripheral, the selection choice depends on the channel configuration (CC1/CC2).

1. USB host (DFP) - Use pull-up resistors on CC1/CC2 ; Provides Vbus to the attached peripheral
2. USB peripheral (UFP) -Use pull-down resistors on CC1/CC2 ; monitors Vbus to establish a data connection and/or power on board circuits



Switch Truth Table		
HSEC_5V0 > 4V	ISO_Pout_5V0 > HSEC_5V0	POWER_SWITCH_OUT
Yes	X	HSEC_5V0
No	No	HSEC_5V0
No	Yes	ISO_Pout_5V0

A

B

C

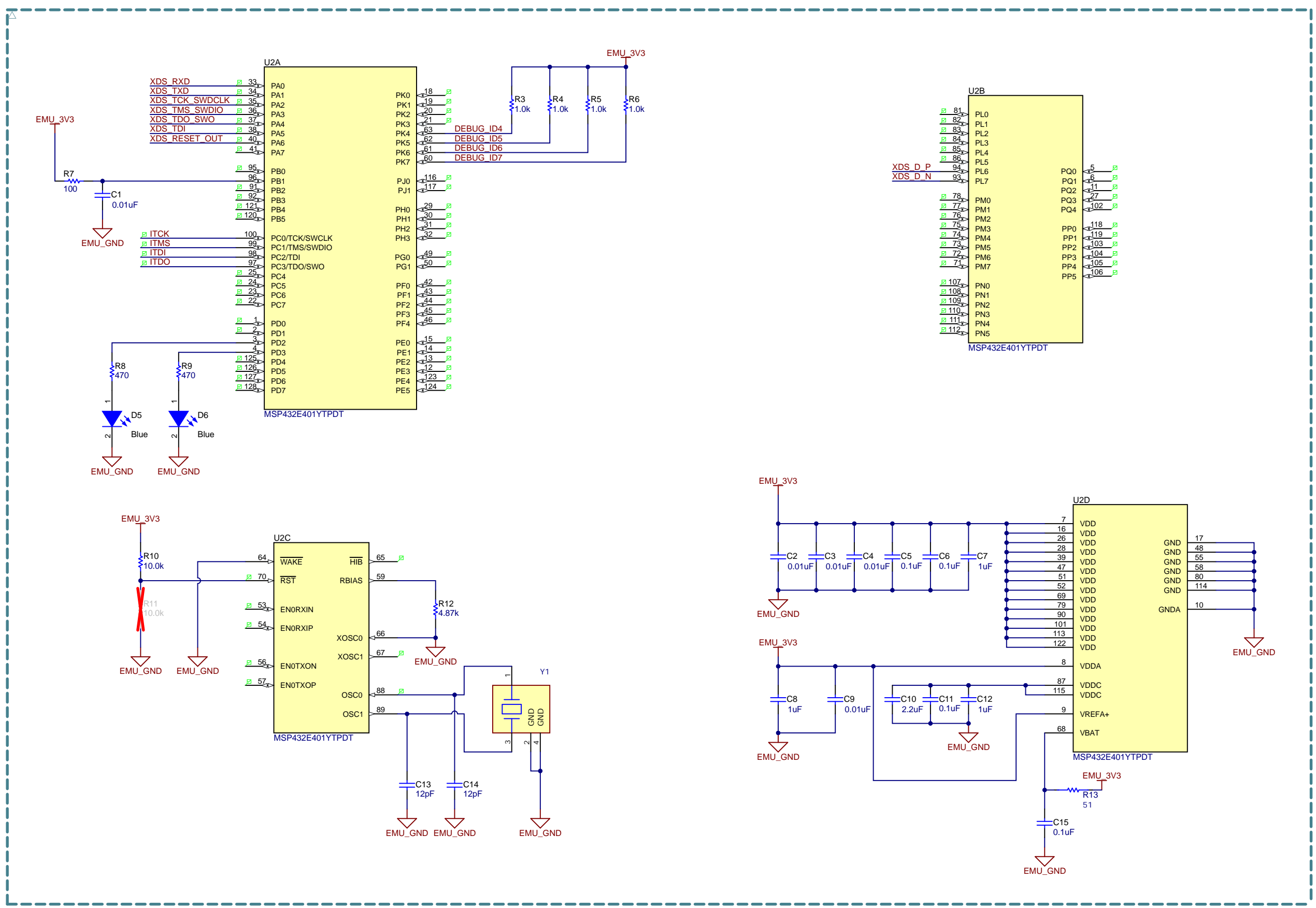
D

A

B

C

D

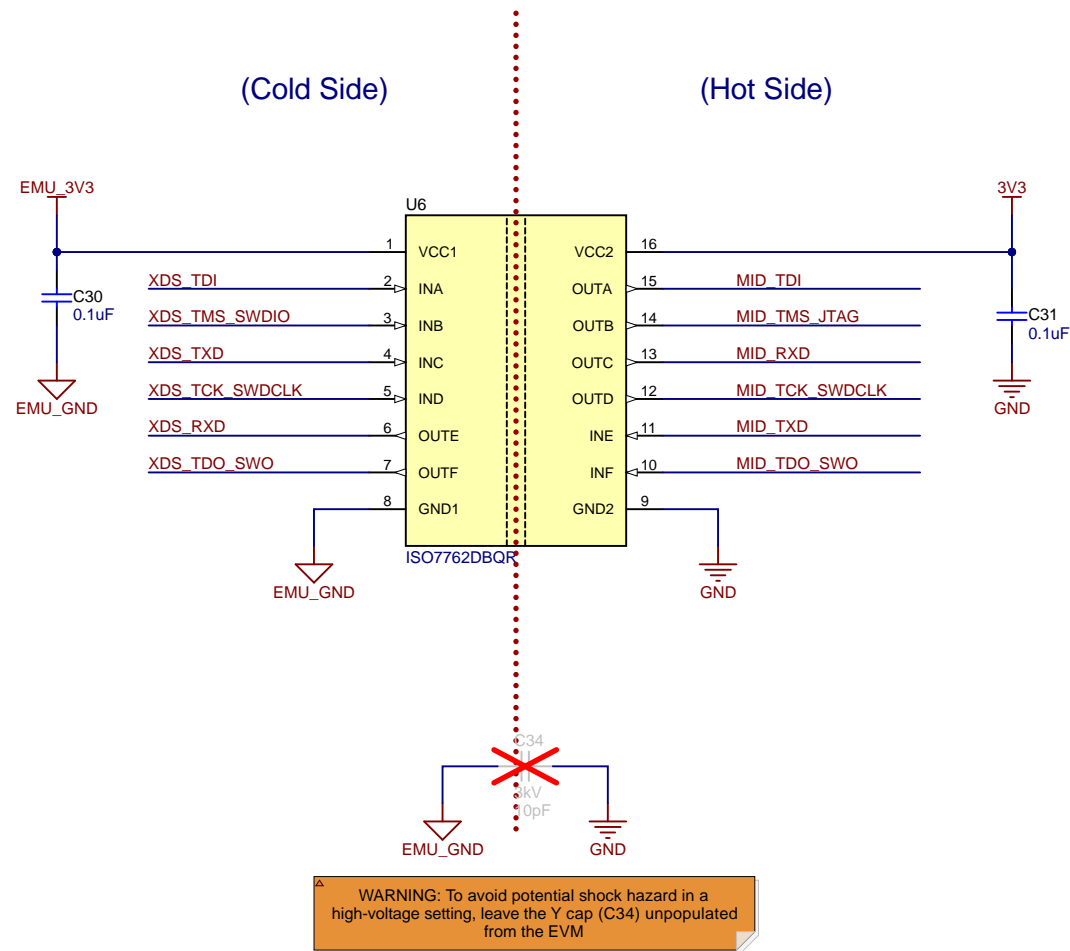


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Orderable: TMDSCNCD28P65X	Designed for: Public Release	Mod. Date: 9/27/2023
TID #: N/A	Project Title: F28P65X Control Card	
Number: MCU114	Rev: B	Sheet Title:
SVN Rev: Not in version control	Assembly Variant: 001	Sheet: 9 of 11
Drawn By: Uttam Reddy Pailla	File: MCU114B_XDS110_MCU.SchDoc	Size: B
Engineer: Uttam Reddy Pailla	Contact: http://www.ti.com/support	



NOTE: In this design JTAG signals are isolated.
cJTAG is not supported on this control card.



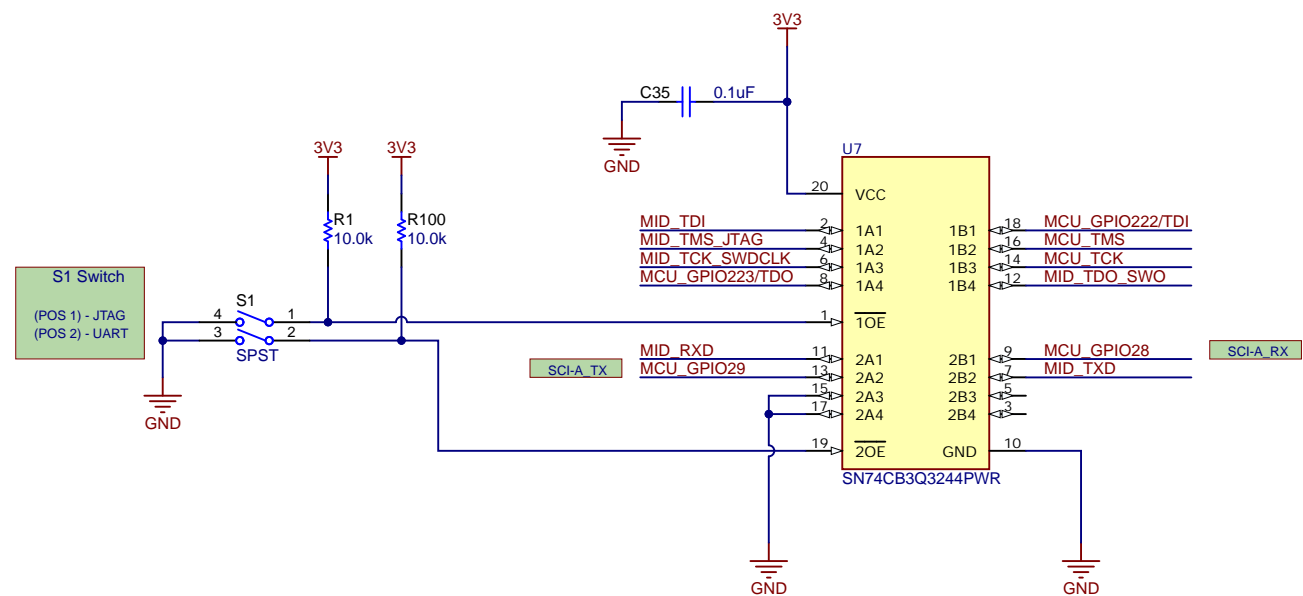
S1 - JTAG Emulation & UART Switch

POS 1 ON: Use XDS110 emulator that is on the cCARD

POS 1 OFF: Boot from FLASH/peripheral (see boot mode switch) OR use emulator on baseboard

POS 2 ON: GPIOs 28 & 29 will be connected to the USB-to-UART adapter on the XDS110 emulator

POS 2 OFF: GPIOs 28 & 29 are disconnected from the USB-to-UART adapter on the XDS110 emulator and connected to the HSEC connector pins



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Orderable: TMDSCNCD28P65X	Designed for: Public Release	Mod. Date: 11/3/2023
TID #: N/A	Project Title: F28P65X Control Card	
Number: MCU114	Rev: B	Sheet Title:
SVN Rev: Not in version control	Assembly Variant: 001	Sheet: 10 of 11
Drawn By: Uttam Reddy Pailla	File: MCU114B_Emulator_Interface.SchDoc	Size: B
Engineer: Uttam Reddy Pailla	Contact: http://www.ti.com/support	

FID1 FID2 FID3 FID4 FID5 FID6

PCB Number: MCU114
PCB Rev: B



PCB
LOGO
Texas Instruments

PCB
LOGO
FCC disclaimer

PCB
LOGO
WEEE logo

PCB
LOGO
ETHERCAT LABEL

Variant/Label Table	
Variant	Label Text
001	TMDSCNCD28P65X - 20MHz CLK
002	TMDSCNCD28P65X - 25MHz CLK

ZZ1

Label Assembly Note

Label Assembly Note
This Assembly Note is for PCB labels only

ZZ2

Assembly Note

These assemblies are ESD sensitive, ESD precautions shall be observed.

ZZ3

Assembly Note

These assemblies must be clean and free from flux and all contaminants. Use of no clean flux is not acceptable.

ZZ4

Assembly Note

These assemblies must comply with workmanship standards IPC-A-610 Class 2, unless otherwise specified.

Orderable: TMDSNCND28P65X	Designed for: Public Release	Mod. Date: 9/27/2023
TID #: N/A	Project Title: F28P65X Control Card	
Number: MCU114	Rev: B	Sheet Title:
SVN Rev: Not in version control	Assembly Variant: 001	Sheet: 11 of 11
Drawn By: Uttam Reddy Paila	File: MCU114B_EVM_Hardware_SchDoc	Size: B
Engineer: Uttam Reddy Paila	Contact: http://www.ti.com/support	



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