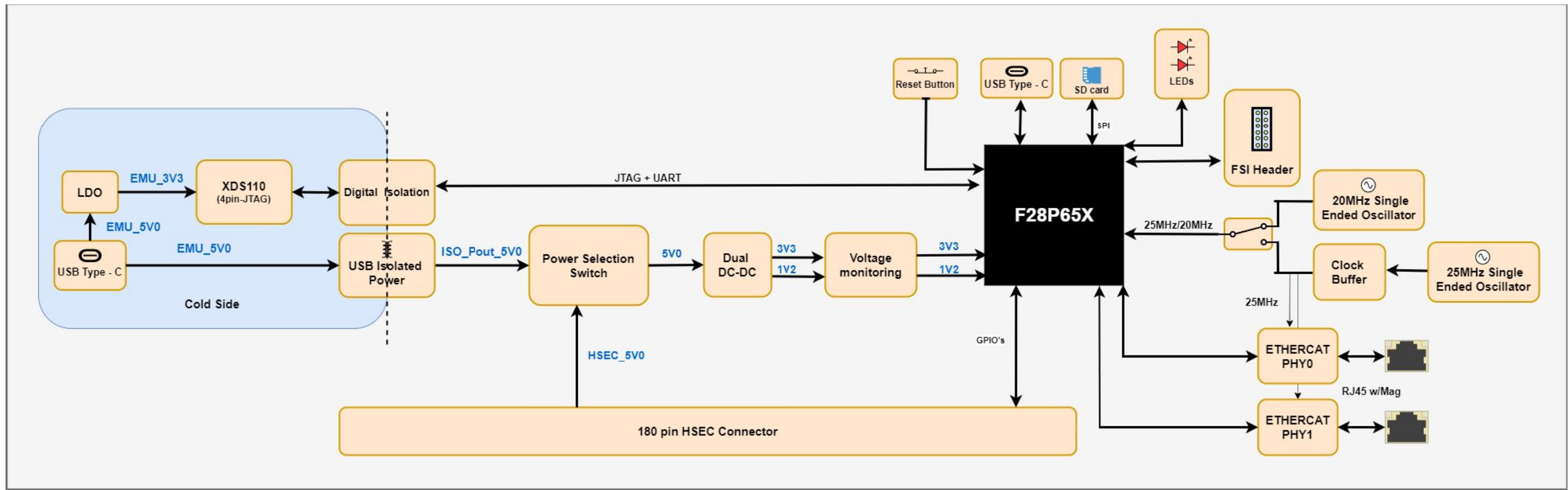


- 1) USB Differential Pairs - 90 Ohm
(A) XDS_D_P and XDS_D_N
(B) USB_D_P (GPIO42) and USB_D_N (GPIO43)
- 2) ADC Differential pair Impedance Matching - 50 Ohm
(A) HSEC_ADC even pins should match with HSEC_ADC + 1 pin(ie ADC-C2 should match with ADC-C3)
(B) MCU_ADC even pins should match with MCU_ADC + 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

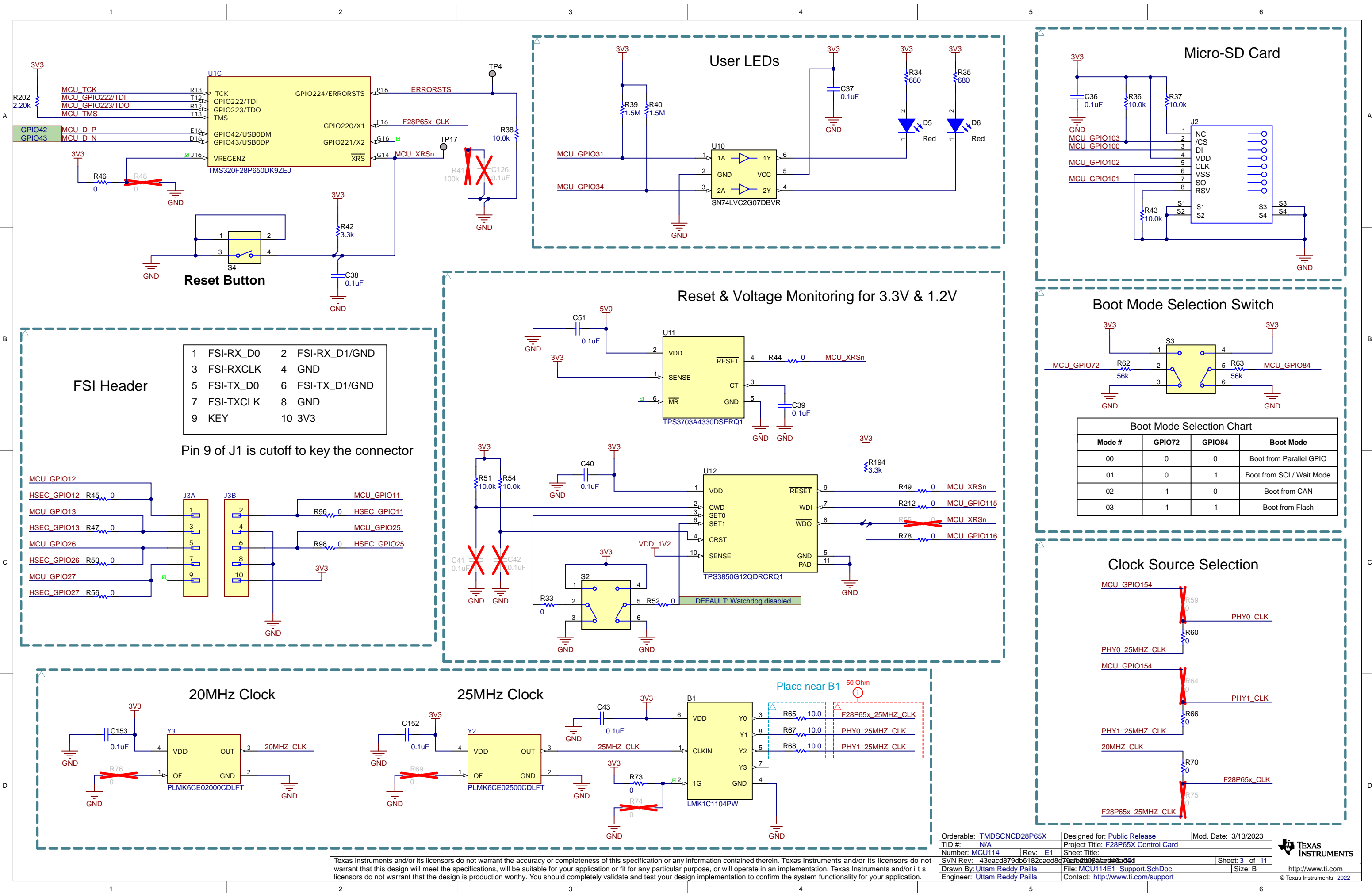
Revision History				
Rev	ECN #	Approved Date	Approved by	Notes
E1	N/A	N/A	N/A	Initial

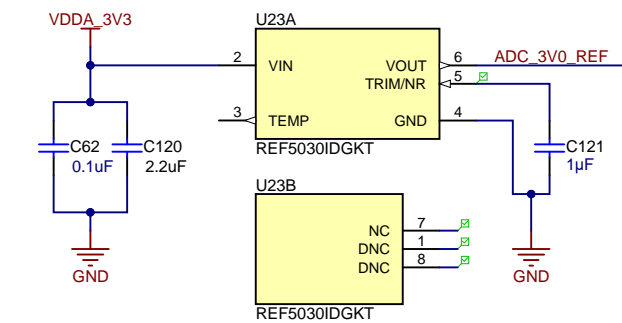


Power to the MCU is either supported by the USB-C on the left or the HSEC 180 pin.

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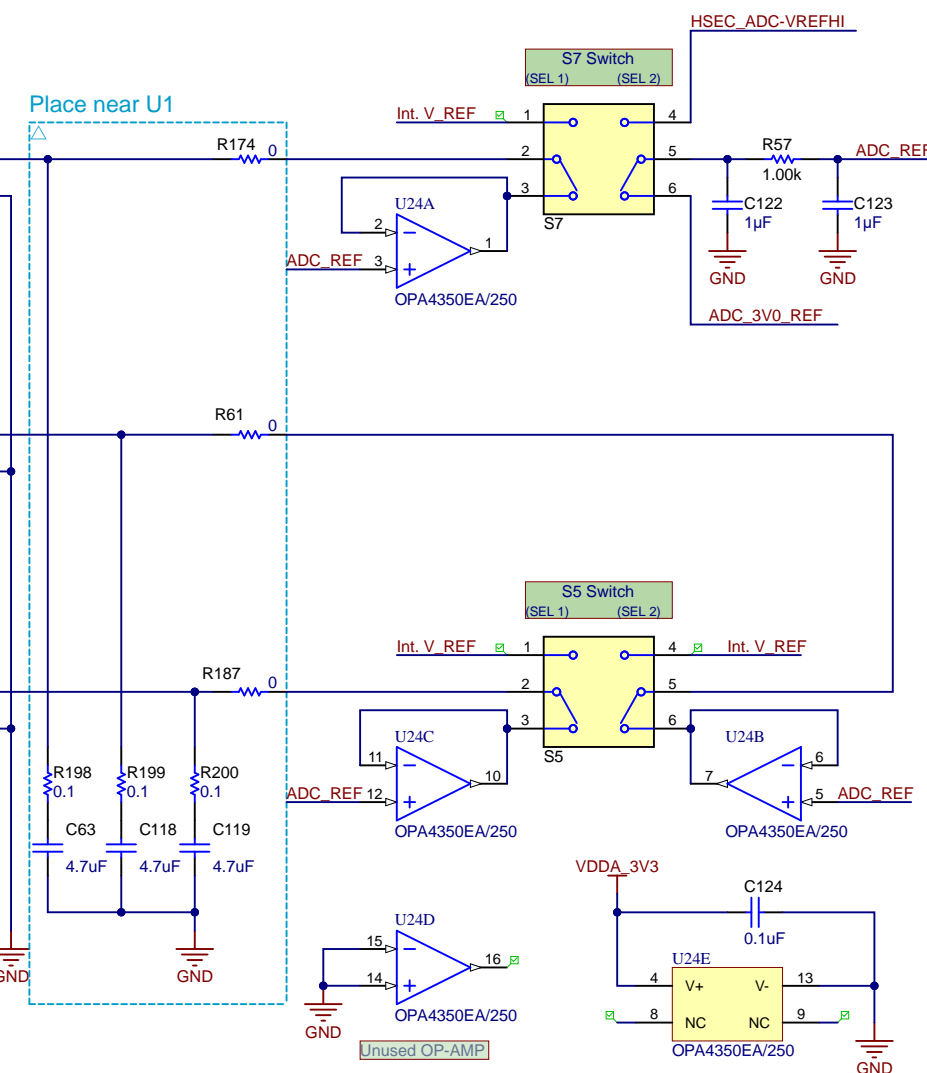
Orderable: TMDSCNCD28P65X	Designed for: Public Release	Mod. Date: 10/5/2022
TID #: N/A	Project Title: F28P65X Control Card	
Number: MCU114	Rev: E1	Sheet Title:
SVN Rev: 73e91ac938d78e4362d0f066e00b544e04507b	File: MCU114E1_CoverSheet.SchDoc	Sheet: 1 of 11
Drawn By: Uttam Reddy Paila	Size: B	
Engineer: Uttam Reddy Paila	Contact: http://www.ti.com/support	






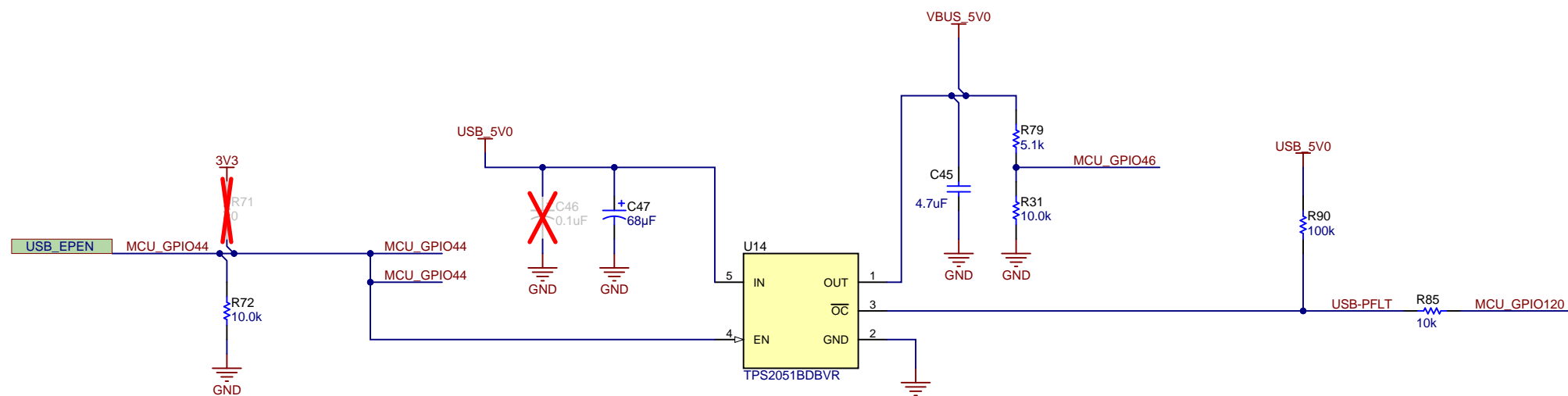
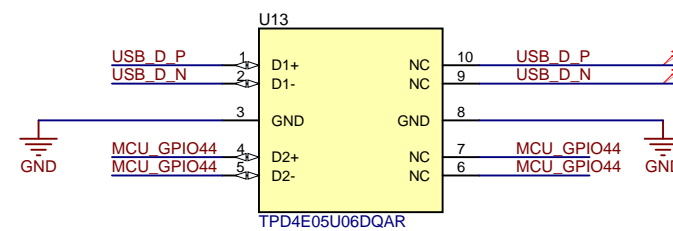
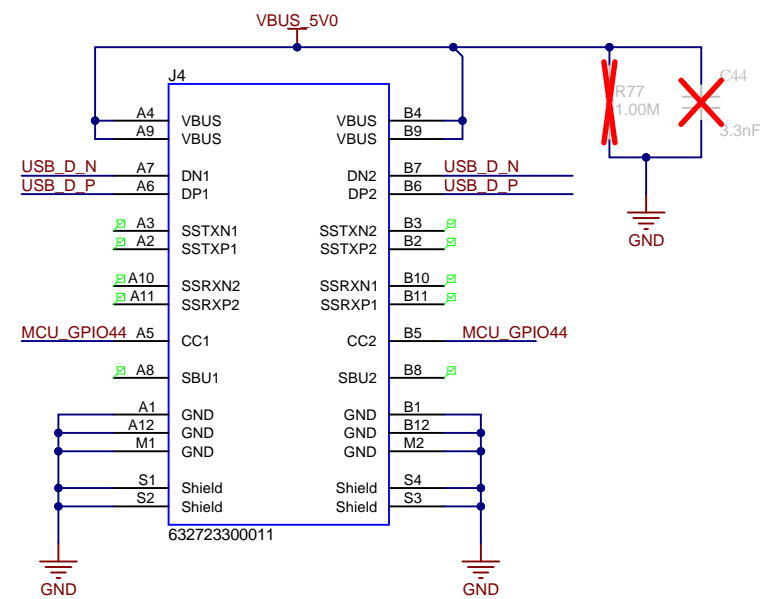
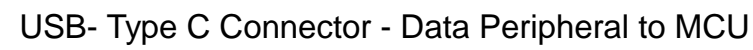
Ext. V_REF Selection	
S7 (SEL 2)	ADC_REF
1	HSEC_ADC-VREFHI
0	ADC_3V0_REF (DEFAULT)

S7 (SEL 1)	S5 (SEL 1)	S5 (SEL 2)	C2000 ADC V_REF	DESCRIPTION
1	1	1	Int. V_REF	NC - No reference input
0	0	0	Ext. V_REF	ADC_REF



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Orderable: TMDSNCND28P65X	Designed for: Public Release	Mod. Date: 10/4/2022	 TEXAS INSTRUMENTS http://www.ti.com © Texas Instruments 2022
TID #: N/A	Project Title: F28P65X Control Card		
Number: MCU114	Rev: E1	Sheet Title:	
SVN Rev: 73e91ac938d78e4362d0f06620b544ad4507b		Sheet: 4 of 11	
Drawn By: Uttam Reddy Paila	File: MCU114E1_Adc.SchDoc	Size: B	
Engineer: Uttam Reddy Paila	Contact: http://www.ti.com/support		

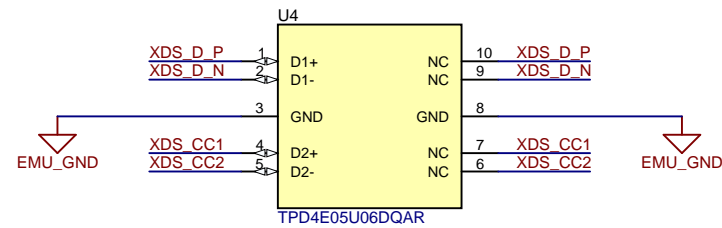
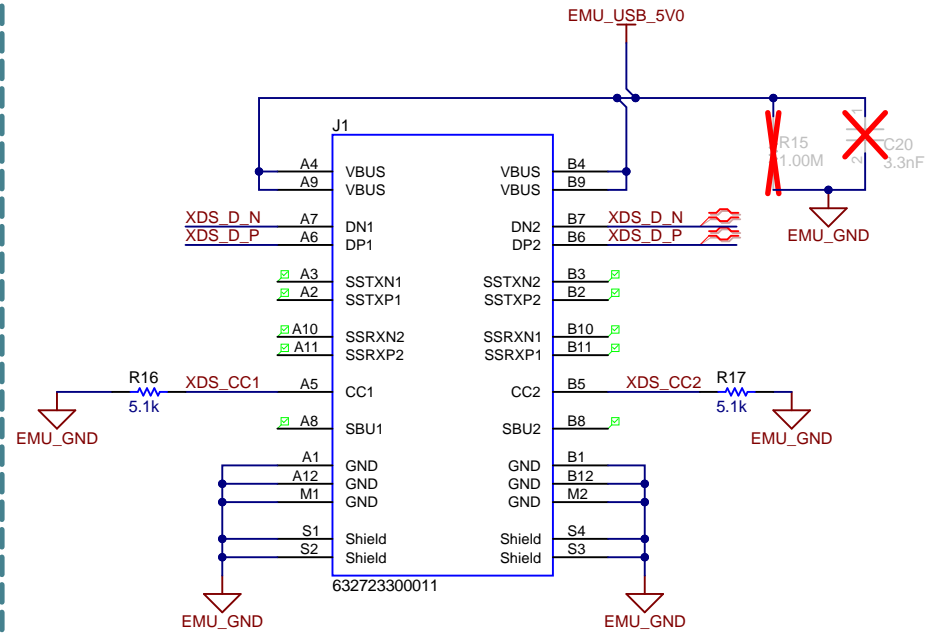


Switch Truth Table		
MCU_GPIO44 STATUS	DESCRIPTION	USB_MODE
1 (HIGH)	UB_CC1 & USB_CC2 are pulled up	Host mode
0 (LOW)	UB_CC1 & USB_CC2 are strongly pulled down	Device mode (DEFAULT)

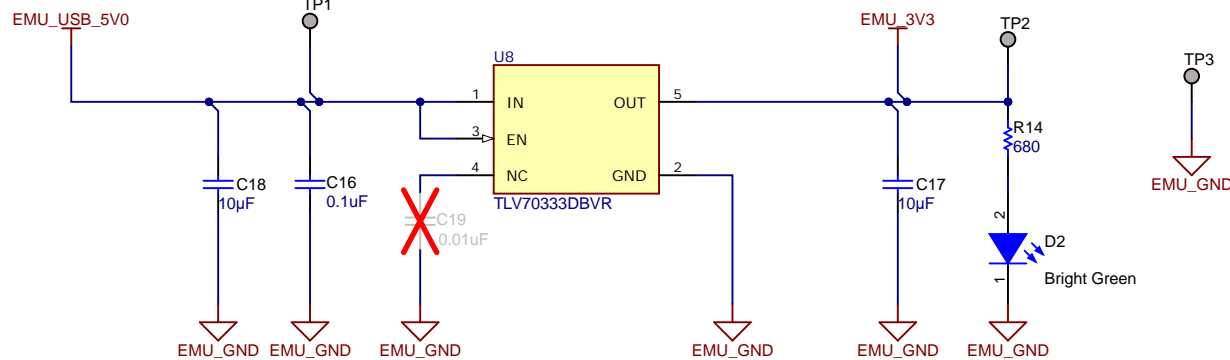
NOTE: USB VBUS_5V0, PFLT & EPEN do not have a specific mux position in this device.

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

USB- Type C Connector - XDS110

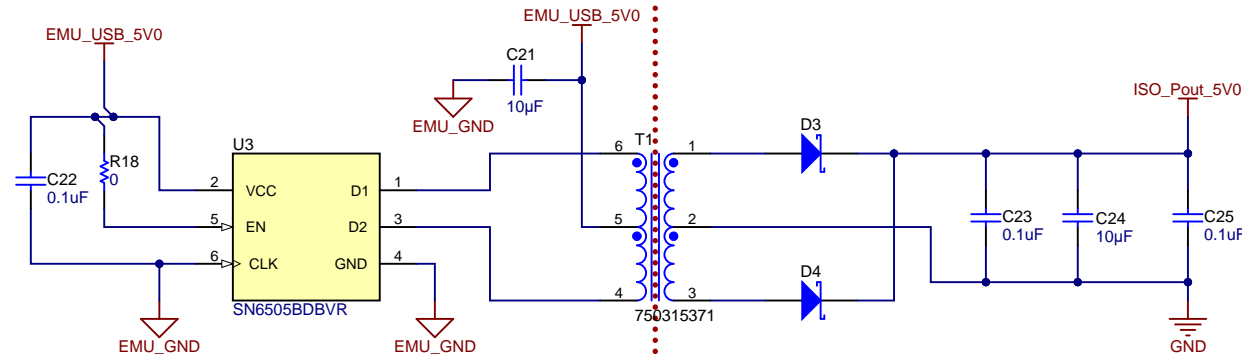


LDO_5V0_3V3



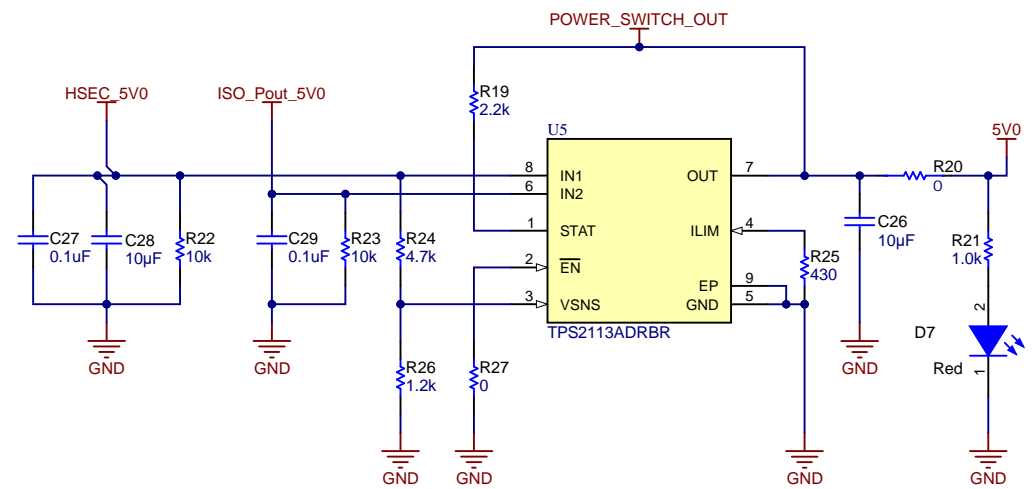
(Cold Side)

USB Isolated Power



(Hot Side)

Power Selection Switch



Switch Truth Table

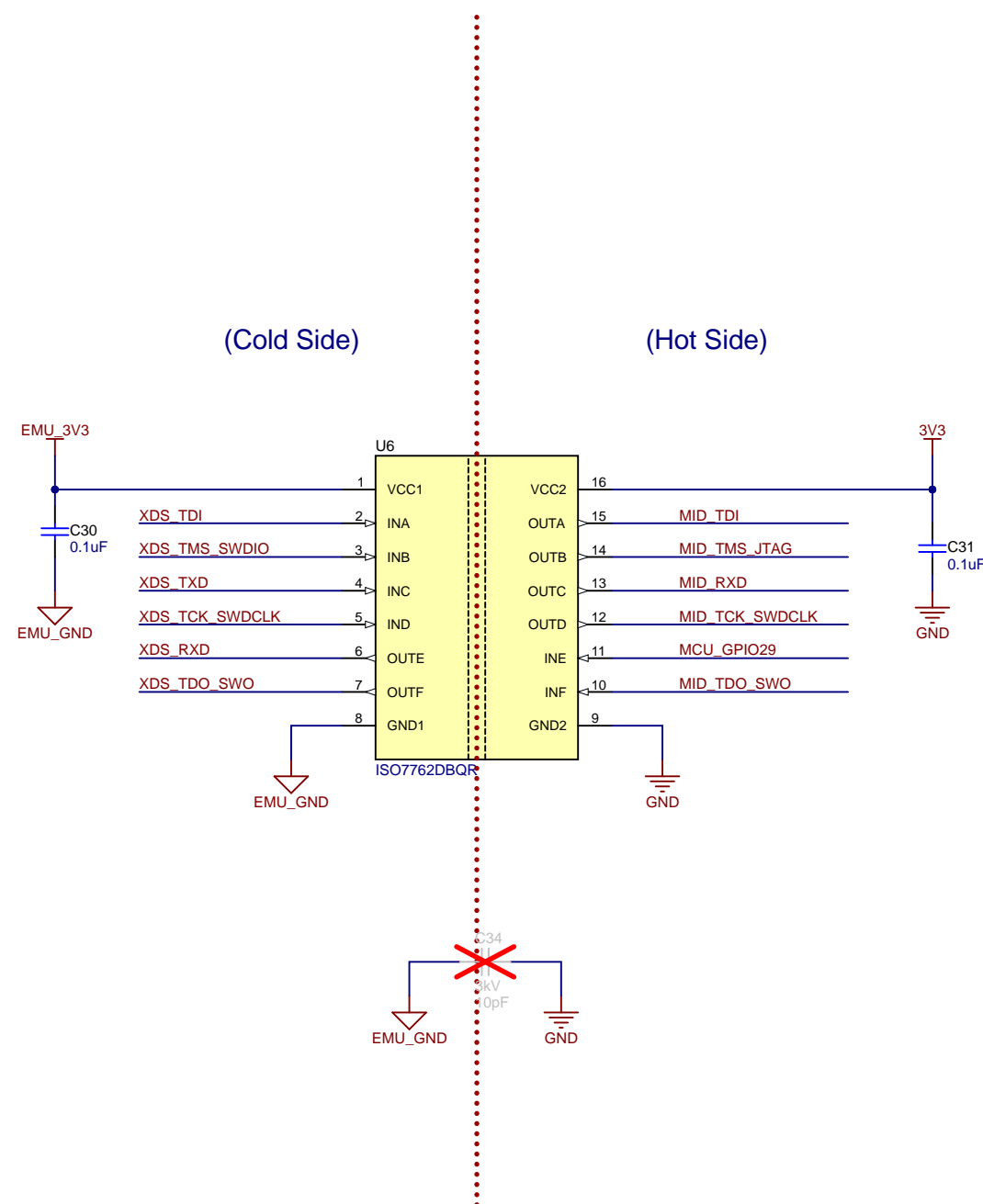
HSEC_5V0 > 4V	ISO_Pout_5V0 > HSEC_5V0	POWER_SWITCH_OUT
Yes	X	HSEC_5V0
No	No	HSEC_5V0
No	Yes	ISO_Pout_5V0

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

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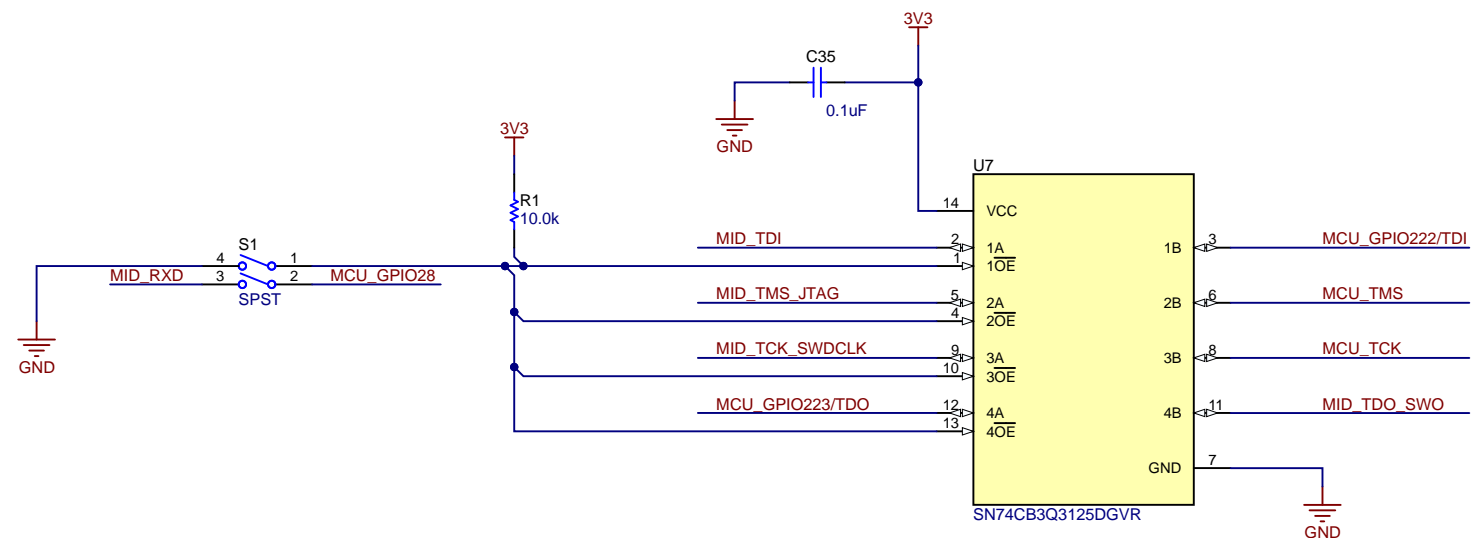
S1 - Emulation & GPIO28 Switch

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: GPIO-28 will be controlled by the USB-to-UART adapter on the XDS110 emulator MCU

POS 2 OFF: GPIO-28 can be controlled by a pin in HSEC connector



NOTE: If control Card is specifically used for high voltage applications, It is recommended not to use 10pF capacitor between EMU_GND and GND to prevent shock on the cold side.

NOTE: cJTAG is not supported on this control card

FID1 FID2 FID3 FID4 FID5 FID6

PCB Number: MCU114
PCB Rev: E1



PCB
LOGO
Texas Instruments

PCB
LOGO
FCC disclaimer

PCB
LOGO
WEEE logo

PCB
LOGO
ETHERCAT LABEL

PCB Label

THT-14-423-10
Size: 0.65" x 0.20 "

Variant/Label Table

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: TMDSCNCD28P65X	Designed for: Public Release	Mod. Date: 9/29/2022
TID #: N/A	Project Title: F28P65X Control Card	
Number: MCU114	Rev: E1	Sheet Title:
SVN Rev: 570116fc99fa7a2f210ce1828c2b244dd86c0d1	Doc ID: 28P65X-001	Sheet: 11 of 11
Drawn by: Uttam Reddy Paila	File: MCU114E1_EVM_Hardware_SchDoc	Size: B
Engineer: Uttam Reddy Paila	Contact: http://www.ti.com/support	



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