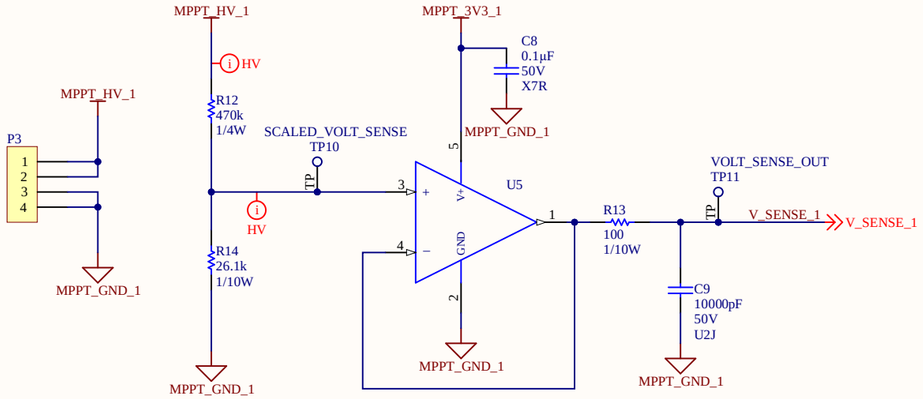
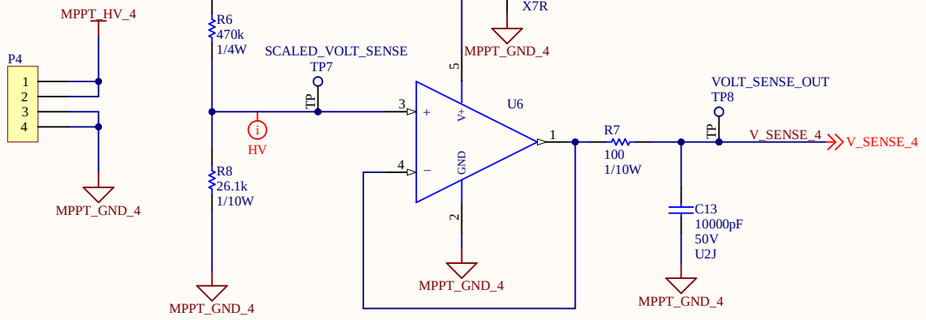
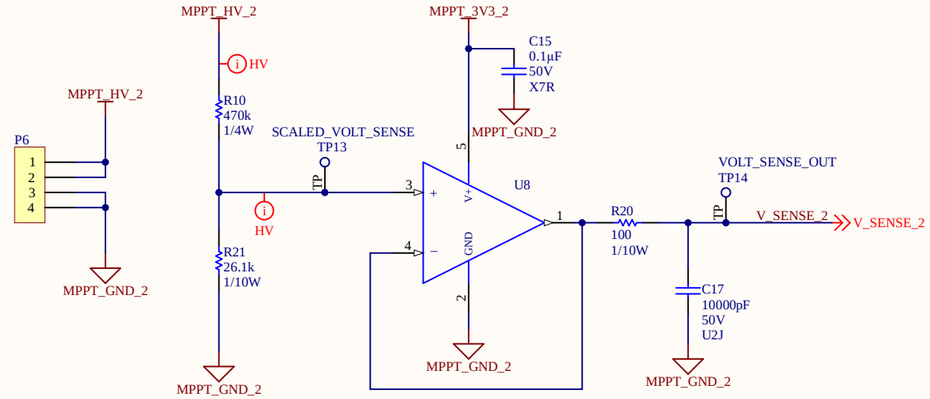
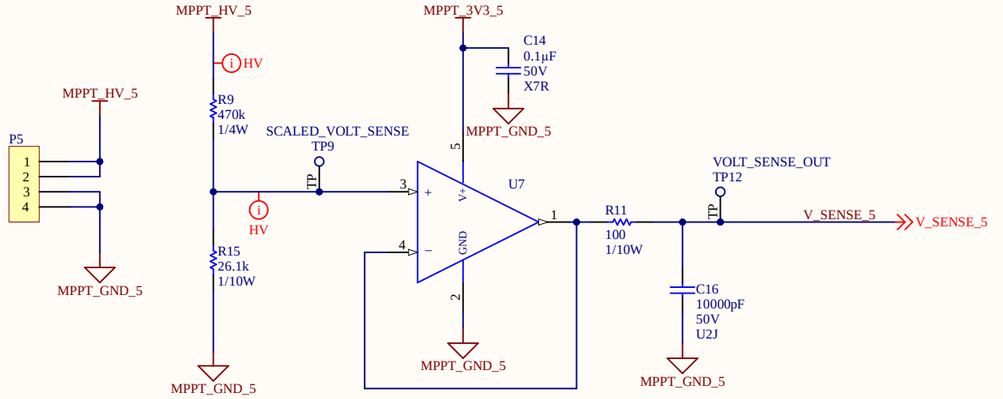
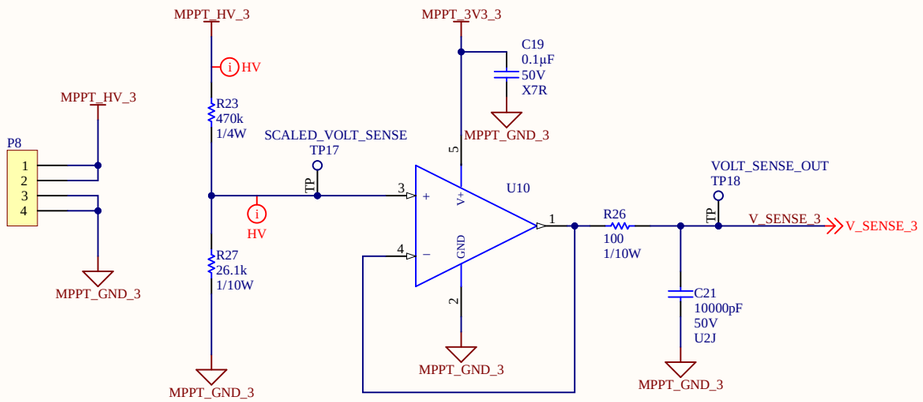
Voltage Sense

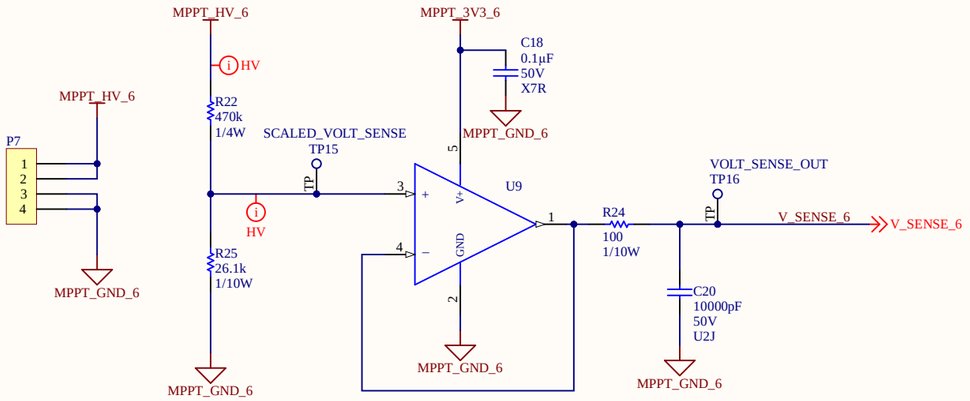




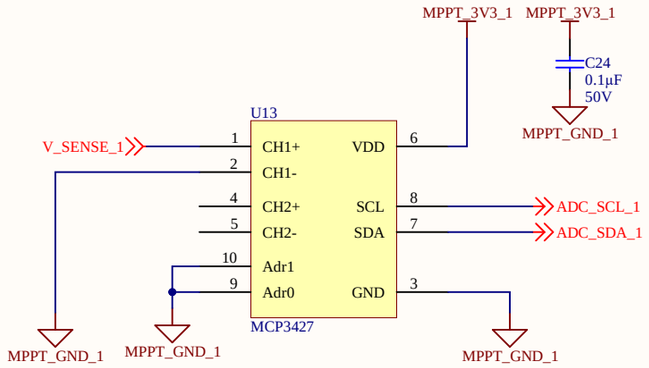


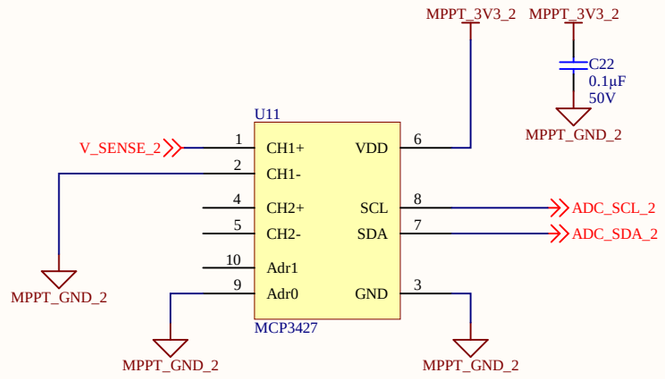


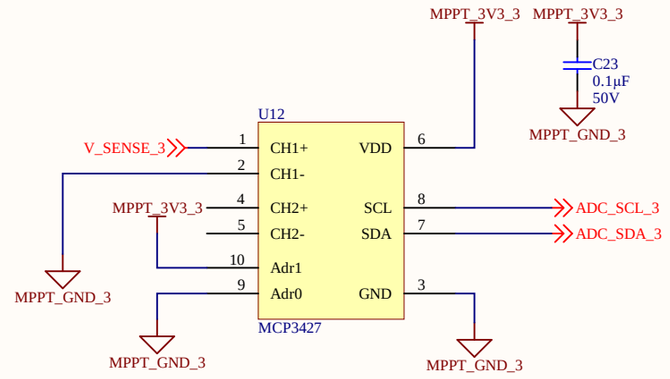




Project: ***MSXIV_SolarSense.PrjPcb***		MIDNIGHT SUN
Title: **Solar Sense Slave**		University of Waterloo 200 University Ave W Waterloo, ON, Canada N2L 3E9
Project Lead: *		
Size: Letter	Revision: *	
Date: 2020-01-19	Sheet 3 of 4	Website: www.uwmidsun.com

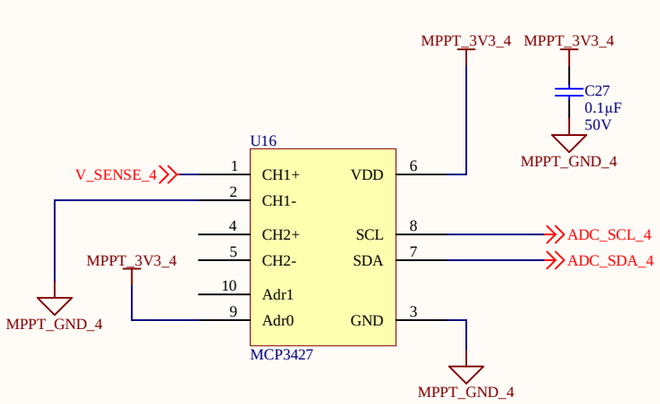


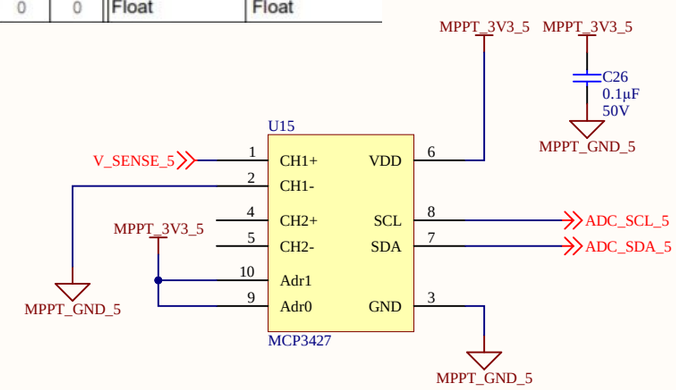


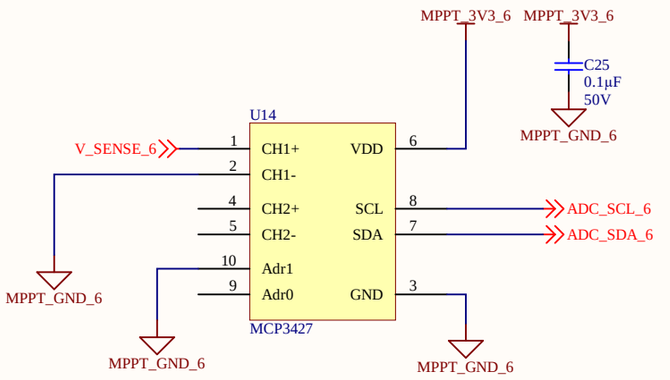


ADCs

I²C Device Address Bits			Logic Status of Address Selection Pins	
A2	A1	A0	Adr0 Pin	Adr1 Pin
0	0	0	0 (Addr_Low)	0 (Addr_Low)
0	0	1	0 (Addr_Low)	Float
0	1	0	0 (Addr_Low)	1 (Addr_High)
1	0	0	1 (Addr_High)	0 (Addr_Low)
1	0	1	1 (Addr_High)	Float
1	1	0	1 (Addr_High)	1 (Addr_High)
0	1	1	Float	0 (Addr_Low)
1	1	1	Float	1 (Addr_High)
0	0	0	Float	Float







change ports to i2c

Make combination of pulled high, low and floating (for address pins)

PROJECT	MSXIV_SolarSense.PrjPcb	MIDNIGHT SUN	
DOCUMENT	*		
PART NUMBER		VARIANT	[No Variations]
DRAWN BY	Aashmika Mali	REVISION	1.0
LAST MODIFIED	2020-01-19	SHEET * OF *	

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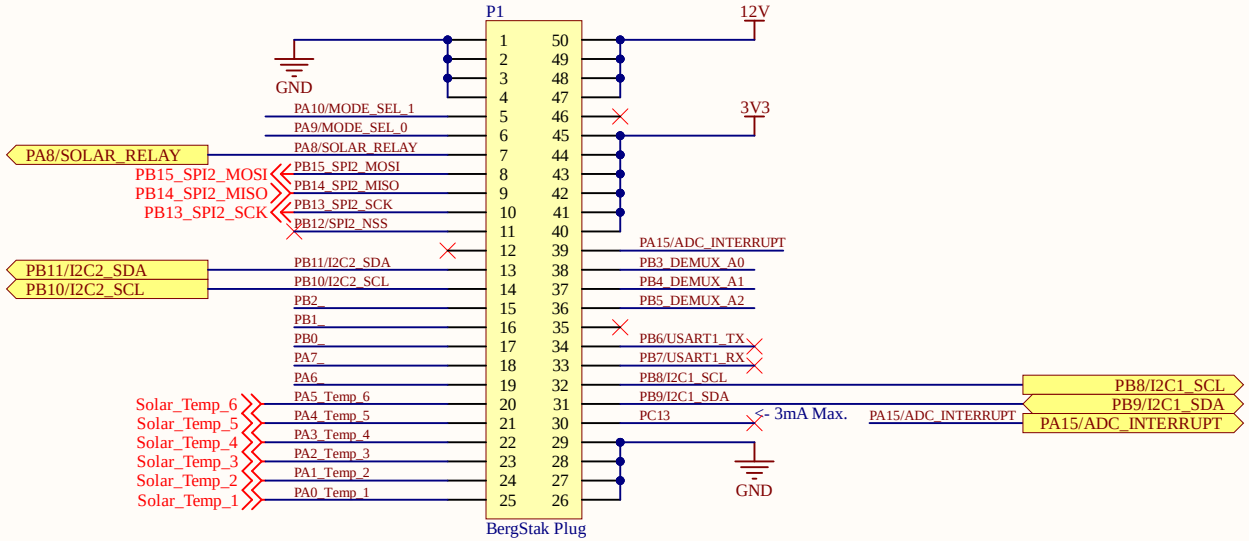
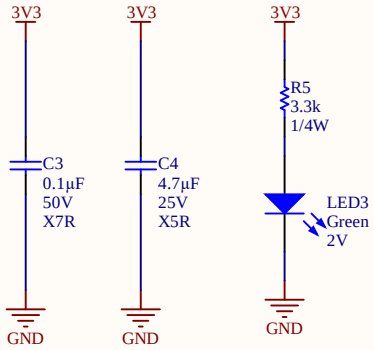
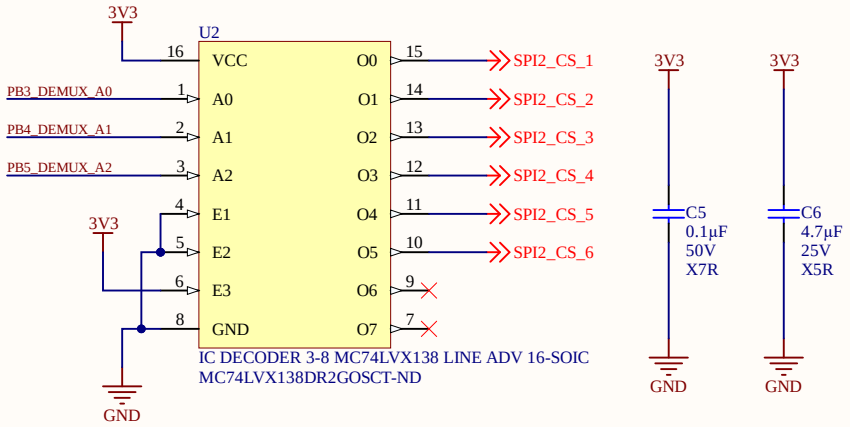
Add 6 gpio pins for slave select on spi, and 6 gpios for temperature sensing

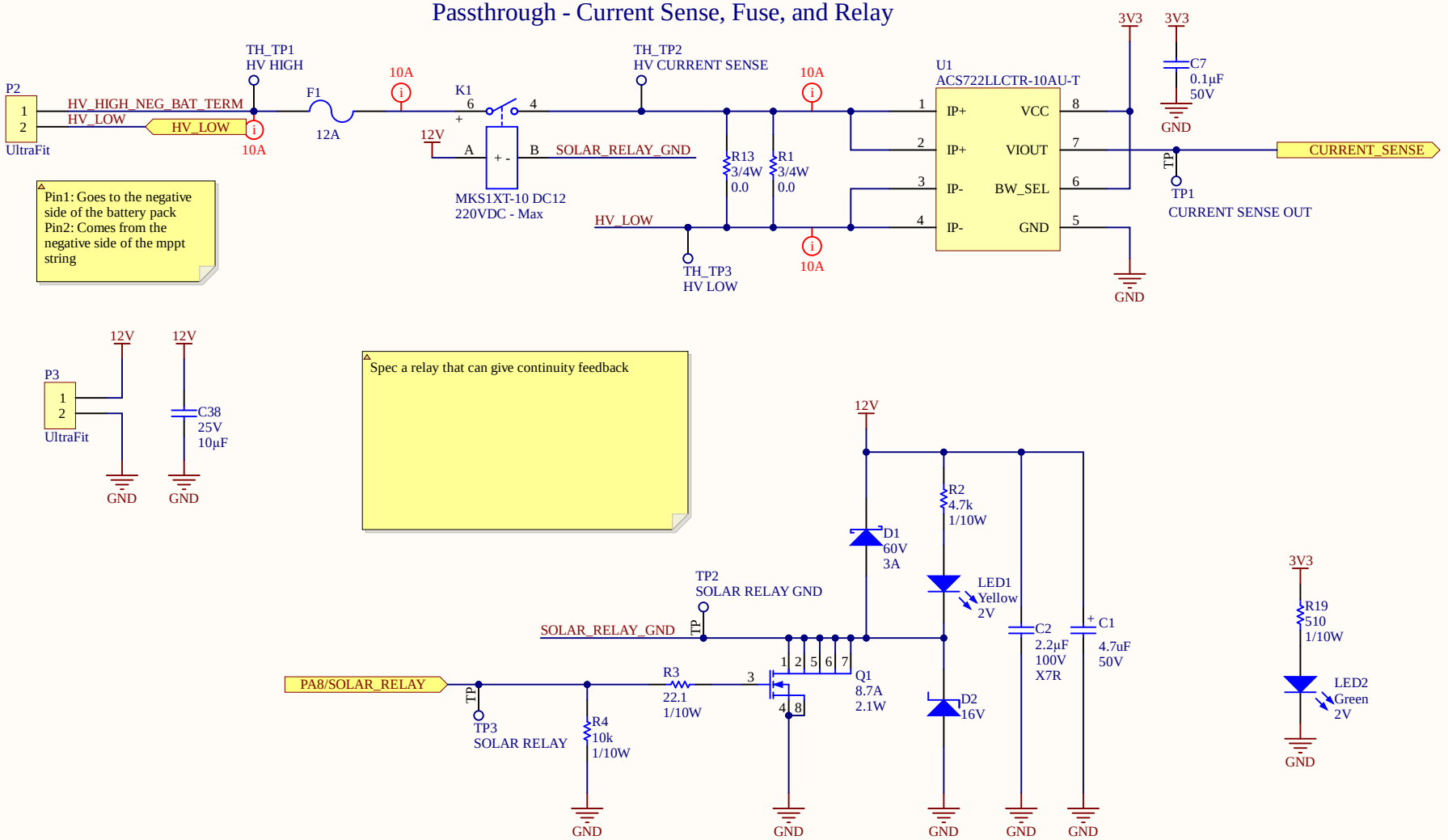






Project: ***MSXIV_SolarSense.PrjPcb***		MIDNIGHT SUN
Title: *		University of Waterloo 200 University Ave W Waterloo, ON, Canada N2L 3E9
Project Author: Aashmika Mali		
Size: Letter	Revision: 1.0	
Date: 2020-01-19	Sheet * of *	Website: www.uwmidsun.com

Passthrough - Current Sense, Fuse, and Relay



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Date: 2020-01-19	Sheet * of *	Website: www.uwmidsun.com

Pin2: Goes to - output terminal
Pin1: Goes to + output terminal

MPPT1 (jumper across pins for 5 mppt version)

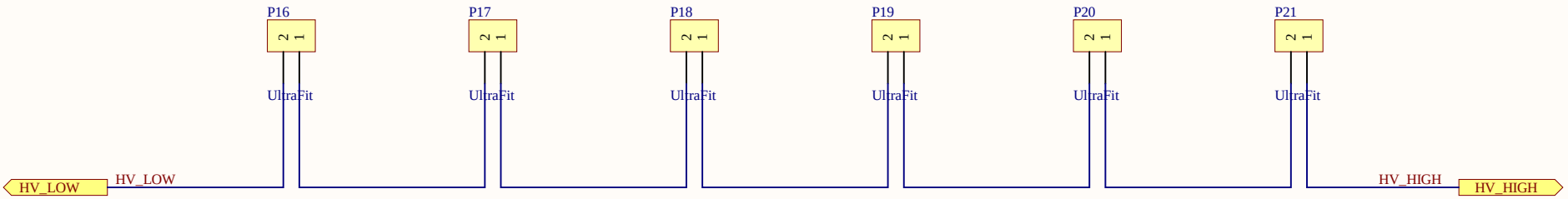
MPPT2

MPPT3

MPPT4

MPPT5

MPPT6



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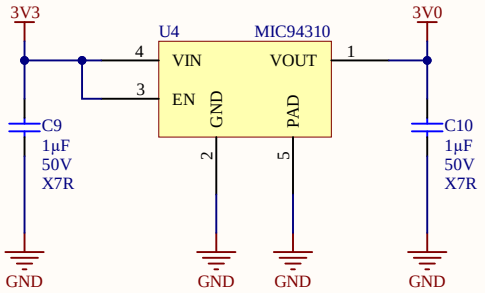
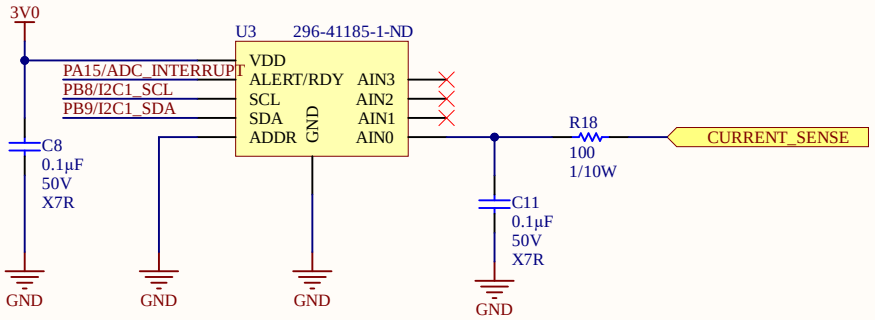
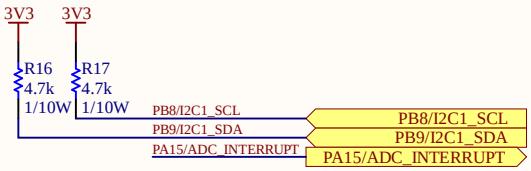
Date: 2020-01-19	Sheet * of *	Website:

I2C Interface (for Current Sense)







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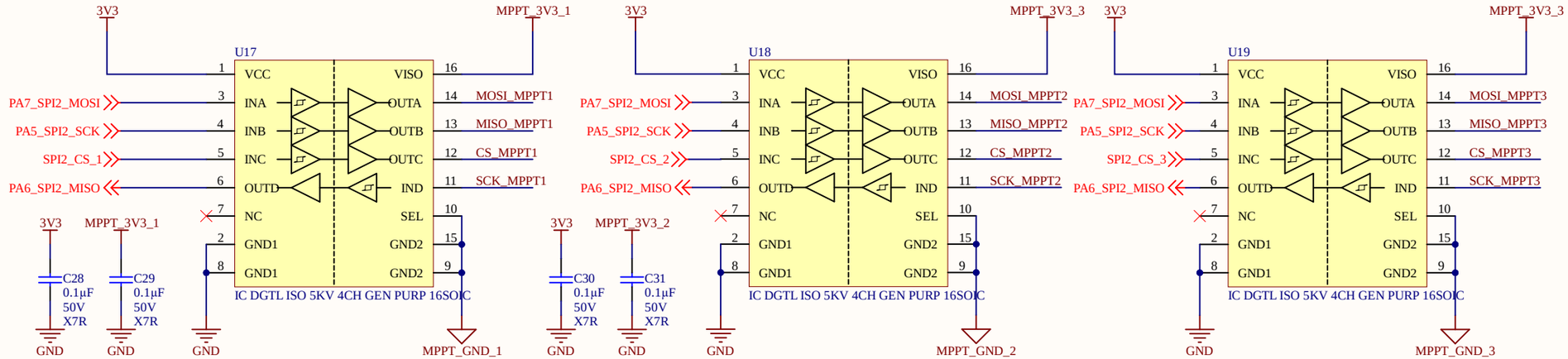
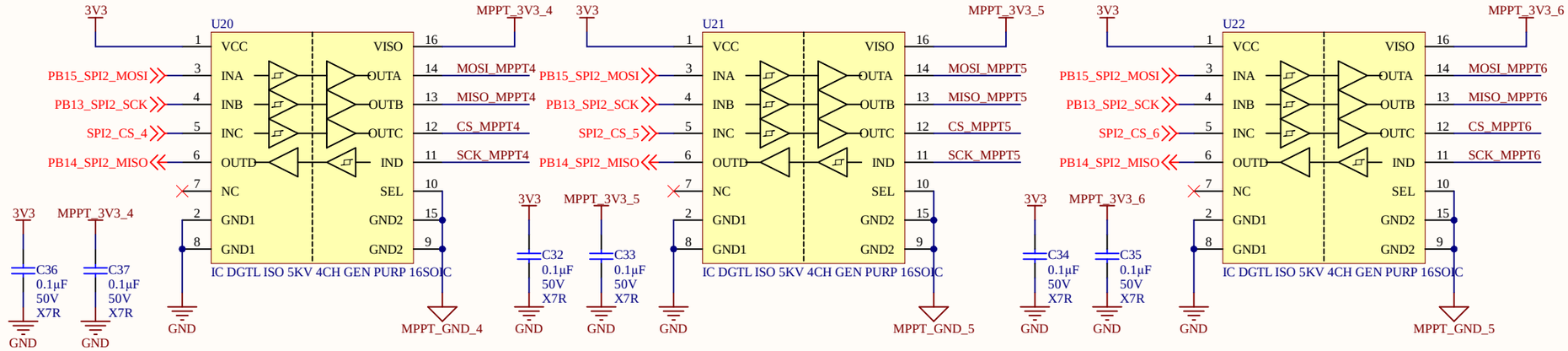
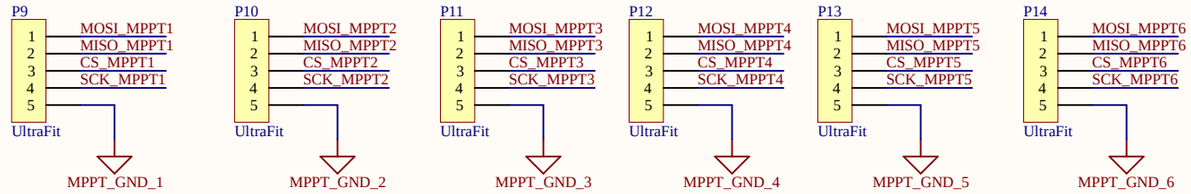
SPI Isolators







PROJECT MSXIV_SolarSense.PrjPcb	MIDNIGHT SUN
DOCUMENT *	
PART NUMBER	VARIANT [No Variations]
DRAWN BY Aashmika Mali	REVISION 1.0
LAST MODIFIED 2020-01-19	SHEET * OF *

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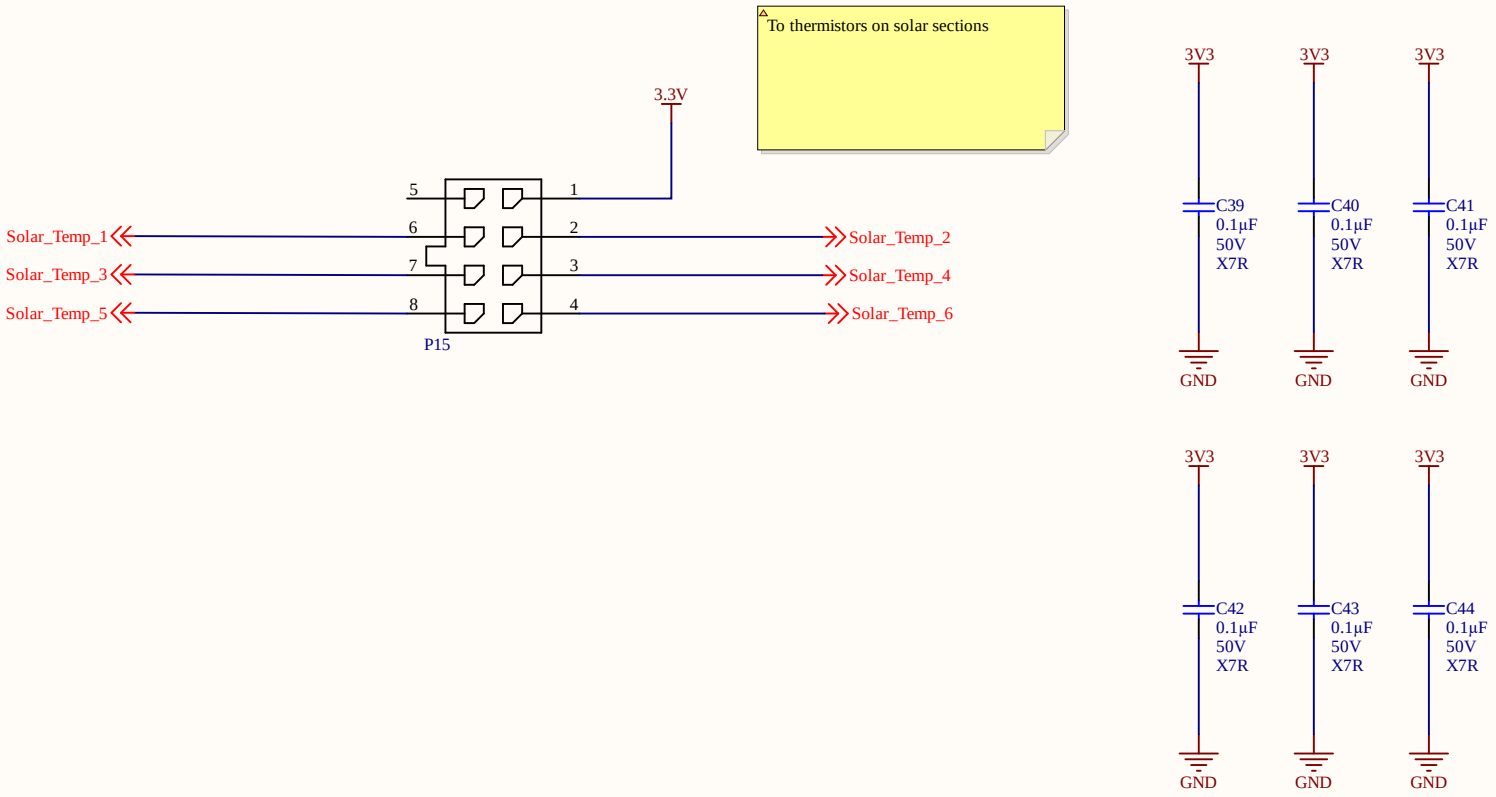

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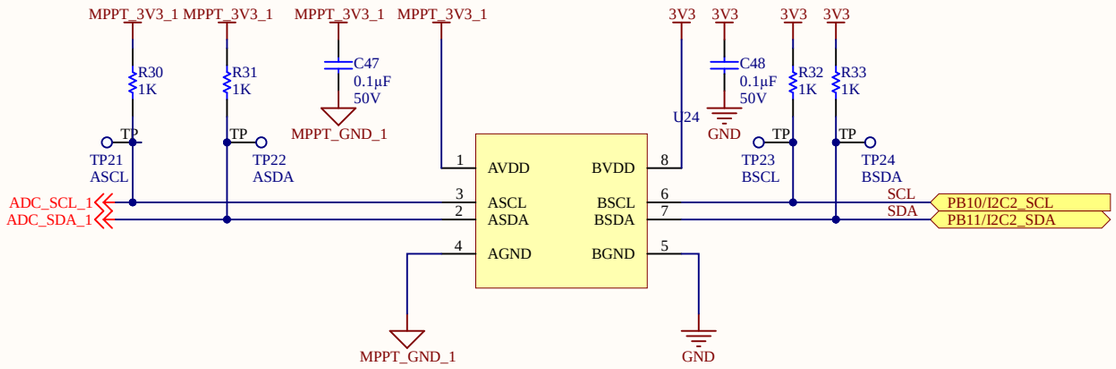

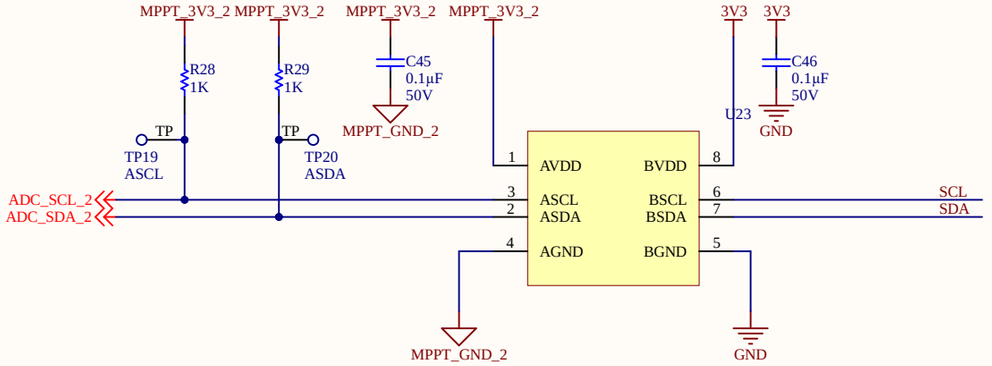

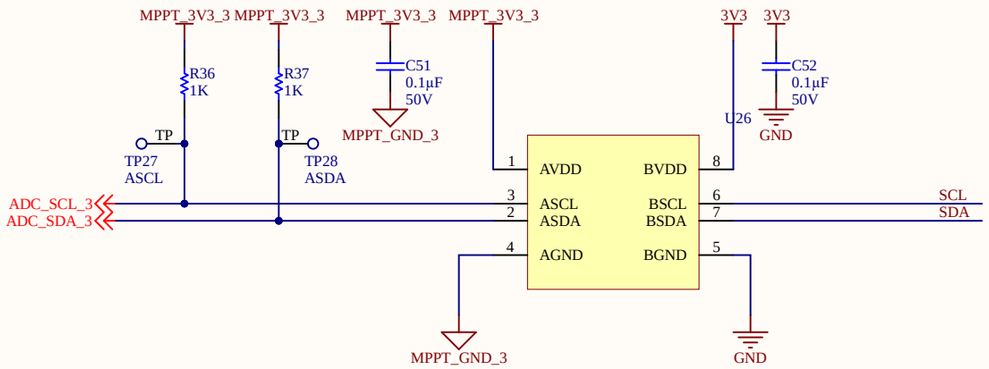

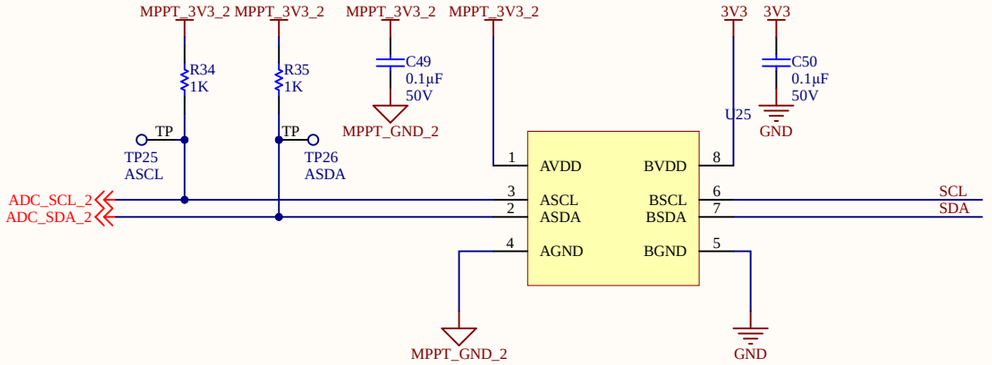

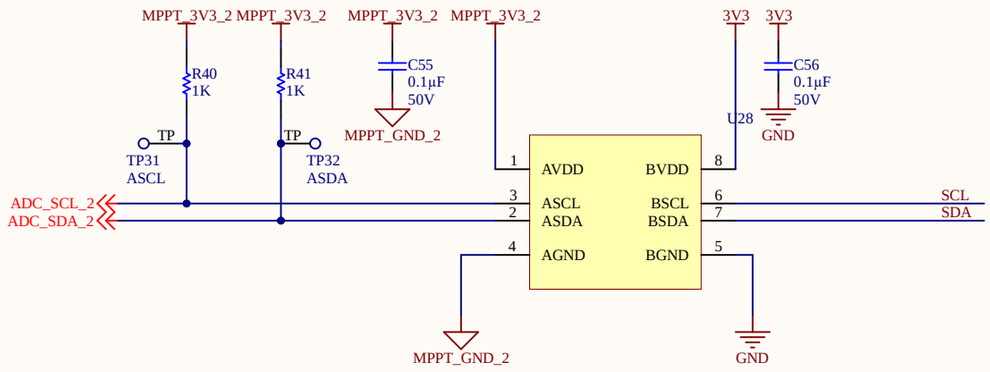

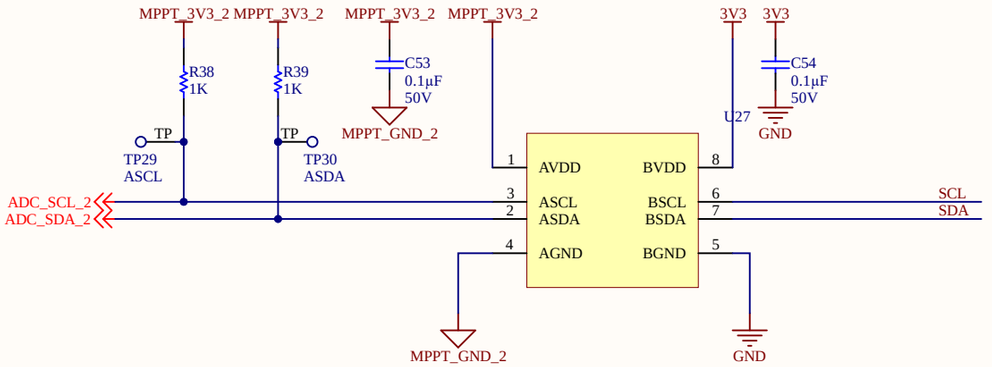

PROJECT	MSXIV_SolarSense.PrjPcb		MIDNIGHT SUN
DOCUMENT	*		
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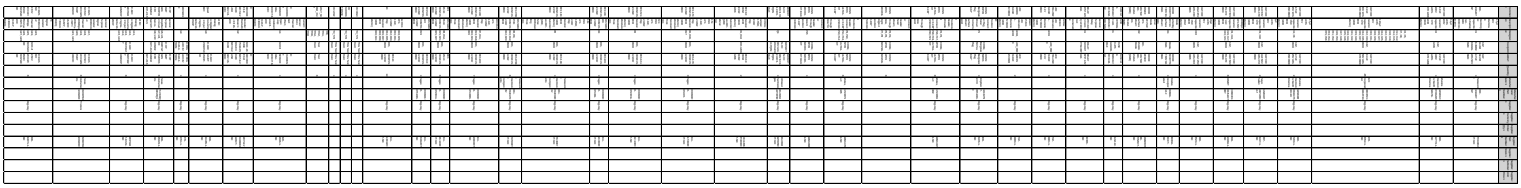

Electrical Rules Check Report

Class	Document	Message
Error	Voltage_Sense.SchDoc	Duplicate Component Designators C8
Error	Voltage_Sense.SchDoc	Duplicate Component Designators C9
Error	Voltage_Sense.SchDoc	Duplicate Component Designators P3
Error	Voltage_Sense.SchDoc	Duplicate Component Designators R13
Error	TemperatureSense.SchDoc	Net 3.3V has only one pin (Pin P15-1)
Error	ADCs.SchDoc	Net ADC_SCL_4 has only one pin (Pin U16-8)
Error	ADCs.SchDoc	Net ADC_SCL_5 has only one pin (Pin U15-8)
Error	ADCs.SchDoc	Net ADC_SCL_6 has only one pin (Pin U14-8)
Error	ADCs.SchDoc	Net ADC_SDA_4 has only one pin (Pin U16-7)
Error	ADCs.SchDoc	Net ADC_SDA_5 has only one pin (Pin U15-7)
Error	ADCs.SchDoc	Net ADC_SDA_6 has only one pin (Pin U14-7)
Error	HV_PowerPath.SchDoc	Net HV_HIGH has only one pin (Pin P21-1)
Error	Controller_Board_Interface.SchDoc	Net PA6_ has only one pin (Pin P1-19)
Error	Controller_Board_Interface.SchDoc	Net PA7_ has only one pin (Pin P1-18)
Error	Controller_Board_Interface.SchDoc	Net PA9/MODE_SEL_0 has only one pin (Pin P1-6)
Error	Controller_Board_Interface.SchDoc	Net PA10/MODE_SEL_1 has only one pin (Pin P1-5)
Error	Controller_Board_Interface.SchDoc	Net PB0_ has only one pin (Pin P1-17)
Error	Controller_Board_Interface.SchDoc	Net PB1_ has only one pin (Pin P1-16)
Error	Controller_Board_Interface.SchDoc	Net PB2_ has only one pin (Pin P1-15)
Warning	SPI_Interface.SchDoc	Footprint of component Component U17 IC DGTL ISO 5KV 4CH GEN PURP 16SOIC cannot be found
Warning	SPI_Interface.SchDoc	Footprint of component Component U18 IC DGTL ISO 5KV 4CH GEN PURP 16SOIC cannot be found
Warning	SPI_Interface.SchDoc	Footprint of component Component U19 IC DGTL ISO 5KV 4CH GEN PURP 16SOIC cannot be found
Warning	SPI_Interface.SchDoc	Footprint of component Component U20 IC DGTL ISO 5KV 4CH GEN PURP 16SOIC cannot be found
Warning	SPI_Interface.SchDoc	Footprint of component Component U21 IC DGTL ISO 5KV 4CH GEN PURP 16SOIC cannot be found
Warning	SPI_Interface.SchDoc	Footprint of component Component U22 IC DGTL ISO 5KV 4CH GEN PURP 16SOIC cannot be found
Warning	HV_PowerPath.SchDoc	Net HV_HIGH has no driving source (Pin P21-1)
Warning	Voltage_Sense.SchDoc	Net NetR6_2 has no driving source (Pin R6-2, Pin R8-1, Pin TP7-TP, Pin U6-3)
Warning	Voltage_Sense.SchDoc	Net NetR9_2 has no driving source (Pin R9-2, Pin R15-1, Pin TP9-TP, Pin U7-3)
Warning	Voltage_Sense.SchDoc	Net NetR10_2 has no driving source (Pin R10-2, Pin R21-1, Pin TP13-TP, Pin U8-3)
Warning	Voltage_Sense.SchDoc	Net NetR12_2 has no driving source (Pin R12-2, Pin R14-1, Pin TP10-TP, Pin U5-3)
Warning	Voltage_Sense.SchDoc	Net NetR22_2 has no driving source (Pin R22-2, Pin R25-1, Pin TP15-TP, Pin U9-3)
Warning	Voltage_Sense.SchDoc	Net NetR23_2 has no driving source (Pin R23-2, Pin R27-1, Pin TP17-TP, Pin U10-3)
Warning	Controller_Board_Interface.SchDoc	Net PA15/ADC_INTERRUPT has no driving source (Pin P1-39, Pin U3-2)
Warning	Controller_Board_Interface.SchDoc	Net PB3_DEMUX_A0 has no driving source (Pin P1-38, Pin U2-1)
Warning	Controller_Board_Interface.SchDoc	Net PB4_DEMUX_A1 has no driving source (Pin P1-37, Pin U2-2)
Warning	Controller_Board_Interface.SchDoc	Net PB5_DEMUX_A2 has no driving source (Pin P1-36, Pin U2-3)
Warning	Controller_Board_Interface.SchDoc	Nets Wire PA0_Temp_1 has multiple names (Cross-Sheet Connector Solar_Temp_1, Cross-Sheet Connector Solar_Temp_1, Net Label PA0_Temp_1)
Warning	Controller_Board_Interface.SchDoc	Nets Wire PA1_Temp_2 has multiple names (Cross-Sheet Connector Solar_Temp_2, Cross-Sheet Connector Solar_Temp_2, Net Label PA1_Temp_2)
Warning	Controller_Board_Interface.SchDoc	Nets Wire PA2_Temp_3 has multiple names (Cross-Sheet Connector Solar_Temp_3, Cross-Sheet Connector Solar_Temp_3, Net Label PA2_Temp_3)
Warning	Controller_Board_Interface.SchDoc	Nets Wire PA3_Temp_4 has multiple names (Cross-Sheet Connector Solar_Temp_4, Cross-Sheet Connector Solar_Temp_4, Net Label PA3_Temp_4)
Warning	Controller_Board_Interface.SchDoc	Nets Wire PA4_Temp_5 has multiple names (Cross-Sheet Connector Solar_Temp_5, Cross-Sheet Connector Solar_Temp_5, Net Label PA4_Temp_5)
Warning	Controller_Board_Interface.SchDoc	Nets Wire PA5_Temp_6 has multiple names (Cross-Sheet Connector Solar_Temp_6, Cross-Sheet Connector Solar_Temp_6, Net Label PA5_Temp_6)
Warning	Controller_Board_Interface.SchDoc	Nets Wire PB10/I2C2_SCL has multiple names (Net Label PB10/I2C2_SCL, Net Label SCL, Net Label SCL, Net Label SCL, Net Label SCL, Net Label SCL, Net Label SCL)
Warning	Controller_Board_Interface.SchDoc	Nets Wire PB11/I2C2_SDA has multiple names (Net Label PB11/I2C2_SDA, Net Label SDA, Net Label SDA, Net Label SDA, Net Label SDA, Net Label SDA, Net Label SDA)
Warning	ADCs.SchDoc	Off grid C24 at 3818.11mil,8674.41mil
Warning	ADCs.SchDoc	Off grid Cross-Sheet Connector ADC_SCL_1 at 3600mil,7694.41mil
Warning	ADCs.SchDoc	Off grid Cross-Sheet Connector ADC_SDA_1 at 3600mil,7544.41mil

Class	Document	Message
Warning	SPI_Interface.SchDoc	Off grid Cross-Sheet Connector PA5_SPI2_SCK at 6574.41mil,6651.811mil
Warning	SPI_Interface.SchDoc	Off grid Cross-Sheet Connector PA6_SPI2_MISO at 6574.41mil,6251.811mil
Warning	SPI_Interface.SchDoc	Off grid Cross-Sheet Connector PA7_SPI2_MOSI at 6574.41mil,6851.811mil
Warning	TemperatureSense.SchDoc	Off grid Cross-Sheet Connector Solar_Temp_2 at 6687.008mil,4796.063mil
Warning	TemperatureSense.SchDoc	Off grid Cross-Sheet Connector Solar_Temp_4 at 6687.008mil,4596.063mil
Warning	Controller_Board_Interface.SchDoc	Off grid Cross-Sheet Connector Solar_Temp_6 at 2247.008mil,4300mil
Warning	TemperatureSense.SchDoc	Off grid Cross-Sheet Connector Solar_Temp_6 at 6700mil,4396.063mil
Warning	ADCs.SchDoc	Off grid Cross-Sheet Connector V_SENSE_1 at 1350mil,8044.41mil
Warning	ADCs.SchDoc	Off grid Cross-Sheet Connector V_SENSE_2 at 6281.89mil,8100mil
Warning	ADCs.SchDoc	Off grid Cross-Sheet Connector V_SENSE_3 at 11381.89mil,8100mil
Warning	ADCs.SchDoc	Off grid Cross-Sheet Connector V_SENSE_4 at 1481.89mil,3650mil
Warning	ADCs.SchDoc	Off grid Cross-Sheet Connector V_SENSE_5 at 6331.89mil,3750mil
Warning	ADCs.SchDoc	Off grid Cross-Sheet Connector V_SENSE_6 at 11331.89mil,3800mil
Warning	SPI_Interface.SchDoc	Off grid Net Label CS_MPPT2 at 8674.41mil,6451.811mil
Warning	SPI_Interface.SchDoc	Off grid Net Label MISO_MPPT2 at 8674.41mil,6651.811mil
Warning	SPI_Interface.SchDoc	Off grid Net Label MOSI_MPPT2 at 8674.41mil,6851.811mil
Warning	SPI_Interface.SchDoc	Off grid Net Label SCK_MPPT2 at 8674.41mil,6251.811mil
Warning	SPI_Interface.SchDoc	Off grid No ERC at 6774.41mil,6051.811mil
Warning	TemperatureSense.SchDoc	Off grid P15 at 4521.654mil,5096.063mil
Warning	ADCs.SchDoc	Off grid Pin C24-1 at 3818.11mil,8674.41mil
Warning	ADCs.SchDoc	Off grid Pin C24-2 at 3818.11mil,8374.41mil
Warning	TemperatureSense.SchDoc	Off grid Pin P15-1 at 5421.654mil,4996.063mil
Warning	TemperatureSense.SchDoc	Off grid Pin P15-2 at 5421.654mil,4796.063mil
Warning	TemperatureSense.SchDoc	Off grid Pin P15-3 at 5421.654mil,4596.063mil
Warning	TemperatureSense.SchDoc	Off grid Pin P15-4 at 5421.654mil,4396.063mil
Warning	TemperatureSense.SchDoc	Off grid Pin P15-5 at 4521.654mil,4996.063mil
Warning	TemperatureSense.SchDoc	Off grid Pin P15-6 at 4521.654mil,4796.063mil
Warning	TemperatureSense.SchDoc	Off grid Pin P15-7 at 4521.654mil,4596.063mil
Warning	TemperatureSense.SchDoc	Off grid Pin P15-8 at 4521.654mil,4396.063mil
Warning	ADCs.SchDoc	Off grid Pin U13-1 at 1658.11mil,8044.41mil
Warning	ADCs.SchDoc	Off grid Pin U13-2 at 1658.11mil,7894.41mil
Warning	ADCs.SchDoc	Off grid Pin U13-3 at 3108.11mil,7194.41mil
Warning	ADCs.SchDoc	Off grid Pin U13-4 at 1658.11mil,7694.41mil
Warning	ADCs.SchDoc	Off grid Pin U13-5 at 1658.11mil,7544.41mil
Warning	ADCs.SchDoc	Off grid Pin U13-6 at 3108.11mil,8044.41mil
Warning	ADCs.SchDoc	Off grid Pin U13-7 at 3108.11mil,7544.41mil
Warning	ADCs.SchDoc	Off grid Pin U13-8 at 3108.11mil,7694.41mil
Warning	ADCs.SchDoc	Off grid Pin U13-9 at 1658.11mil,7194.41mil
Warning	ADCs.SchDoc	Off grid Pin U13-10 at 1658.11mil,7344.41mil
Warning	SPI_Interface.SchDoc	Off grid Pin U18-1 at 6774.41mil,7051.811mil
Warning	SPI_Interface.SchDoc	Off grid Pin U18-2 at 6774.41mil,5851.811mil
Warning	SPI_Interface.SchDoc	Off grid Pin U18-3 at 6774.41mil,6851.811mil
Warning	SPI_Interface.SchDoc	Off grid Pin U18-4 at 6774.41mil,6651.811mil
Warning	SPI_Interface.SchDoc	Off grid Pin U18-5 at 6774.41mil,6451.811mil
Warning	SPI_Interface.SchDoc	Off grid Pin U18-6 at 6774.41mil,6251.811mil
Warning	SPI_Interface.SchDoc	Off grid Pin U18-7 at 6774.41mil,6051.811mil
Warning	SPI_Interface.SchDoc	Off grid Pin U18-8 at 6774.41mil,5651.811mil
Warning	SPI_Interface.SchDoc	Off grid Pin U18-9 at 8574.41mil,5651.811mil
Warning	SPI_Interface.SchDoc	Off grid Pin U18-10 at 8574.41mil,6051.811mil
Warning	SPI_Interface.SchDoc	Off grid Pin U18-11 at 8574.41mil,6251.811mil
Warning	SPI_Interface.SchDoc	Off grid Pin U18-12 at 8574.41mil,6451.811mil
Warning	SPI_Interface.SchDoc	Off grid Pin U18-13 at 8574.41mil,6651.811mil
Warning	SPI_Interface.SchDoc	Off grid Pin U18-14 at 8574.41mil,6851.811mil
Warning	SPI_Interface.SchDoc	Off grid Pin U18-15 at 8574.41mil,5851.811mil
Warning	SPI_Interface.SchDoc	Off grid Pin U18-16 at 8574.41mil,7051.811mil
Warning	TemperatureSense.SchDoc	Off grid Power Object 3.3V at 5899.606mil,5389.764mil
Warning	SPI_Interface.SchDoc	Off grid Power Object 3V3 at 6174.41mil,7351.811mil
Warning	SPI_Interface.SchDoc	Off grid Power Object GND at 6774.41mil,5351.811mil
Warning	ADCs.SchDoc	Off grid Power Object MPPT_3V3_1 at 3218.11mil,8674.41mil
Warning	ADCs.SchDoc	Off grid Power Object MPPT_3V3_1 at 3818.11mil,8674.41mil
Warning	SPI_Interface.SchDoc	Off grid Power Object MPPT_3V3_3 at 9074.41mil,7351.811mil
Warning	ADCs.SchDoc	Off grid Power Object MPPT_GND_1 at 818.11mil,7074.41mil
Warning	ADCs.SchDoc	Off grid Power Object MPPT_GND_1 at 3468.11mil,7074.41mil

Class	Document	Message
Warning	ADCs.SchDoc	Off grid Power Object MPPT_GND_1 at 3818.11mil,8374.41mil
Warning	SPI_Interface.SchDoc	Off grid Power Object MPPT_GND_2 at 8574.41mil,5351.811mil
Warning	ADCs.SchDoc	Off grid U13 at 1958.11mil,8194.41mil
Warning	SPI_Interface.SchDoc	Off grid U18 at 7474.41mil,6651.811mil

Design Rules Verification Report

Filename : C:\Users\Aashmika Mali\Documents\First Year\Midnight Sun\hardware\MSXIV_So

Warnings 0
Rule Violations 0

Warnings	
Total	0

Rule Violations	
Clearance Constraint (Gap=10mil) (All),(All)	0
Short-Circuit Constraint (Allowed=No) (All),(All)	0
Un-Routed Net Constraint ((All))	0
Modified Polygon (Allow modified: No), (Allow shelved: No)	0
Width Constraint (Min=10mil) (Max=10mil) (Preferred=10mil) (All)	0
Hole Size Constraint (Min=1mil) (Max=100mil) (All)	0
Hole To Hole Clearance (Gap=10mil) (All),(All)	0
Minimum Solder Mask Sliver (Gap=10mil) (All),(All)	0
Silk To Solder Mask (Clearance=10mil) (IsPad),(All)	0
Silk to Silk (Clearance=10mil) (All),(All)	0
Net Antennae (Tolerance=0mil) (All)	0
Height Constraint (Min=0mil) (Max=1000mil) (Prefered=500mil) (All)	0
Total	0