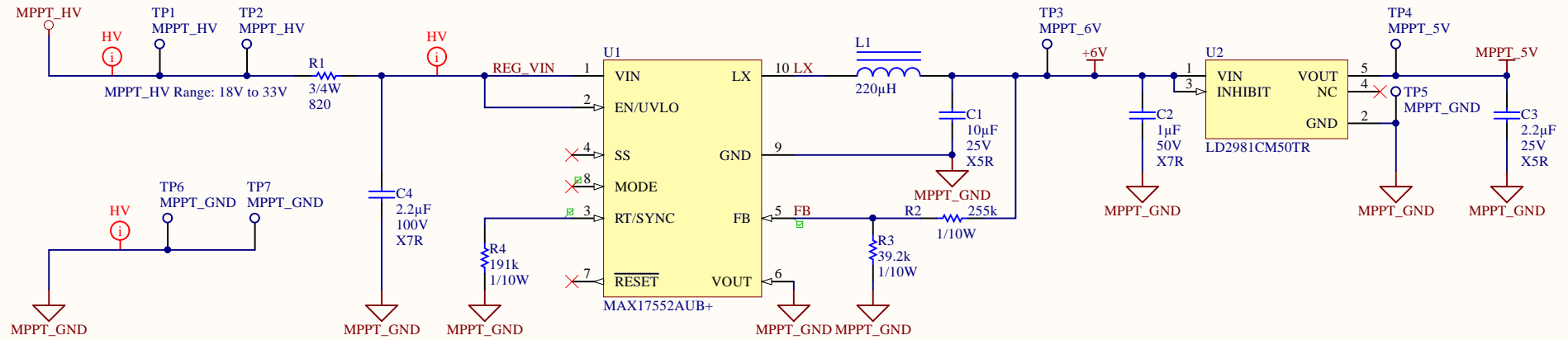
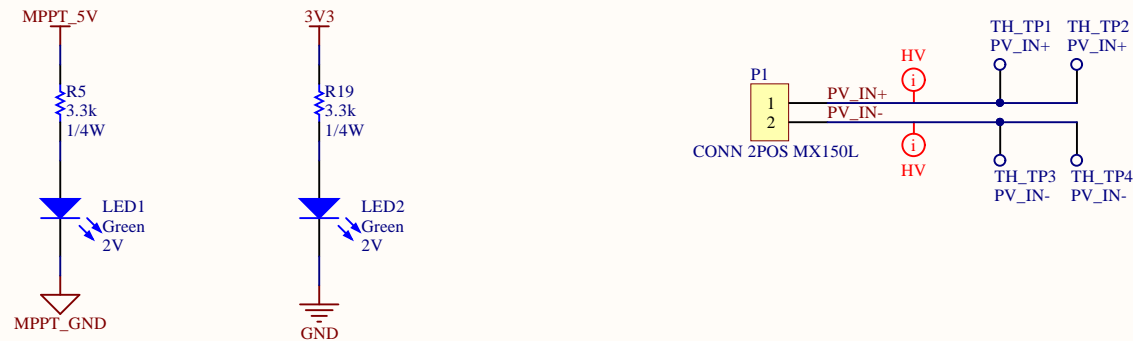



Voltage Sense Power Supply

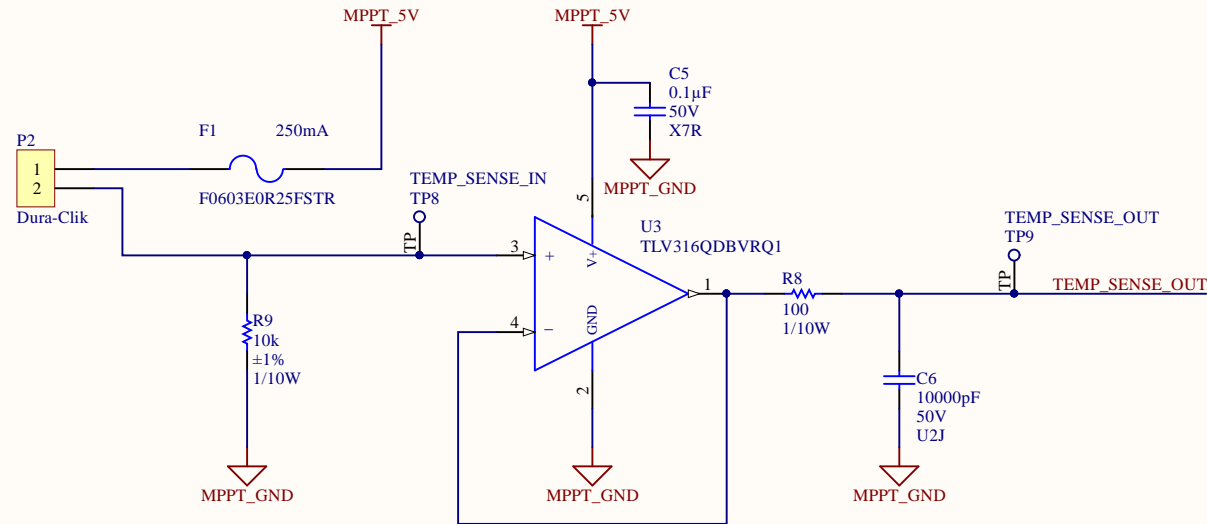


Power Indicator LED

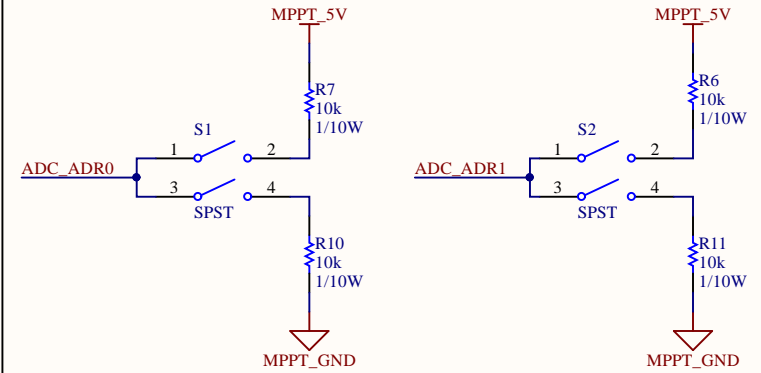


Project: <i>MSXII_SolarSenseSlave.PrjPcb</i>		
Title: Power Supplies		
Project Lead: Peiliang Guo		University of Waterloo 200 University Ave W Waterloo, ON, Canada N2L 3E9 Website: www.uwmidsun.com
Size: Letter	Revision: 2.0	
Date: 2018-06-22	Sheet2 of 4	

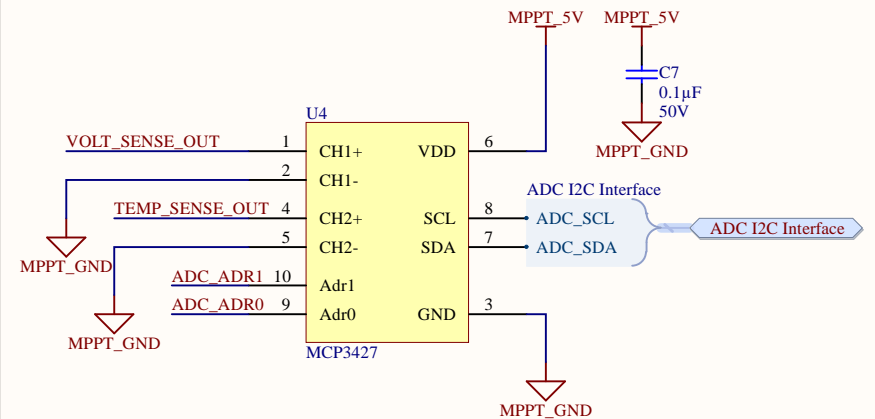
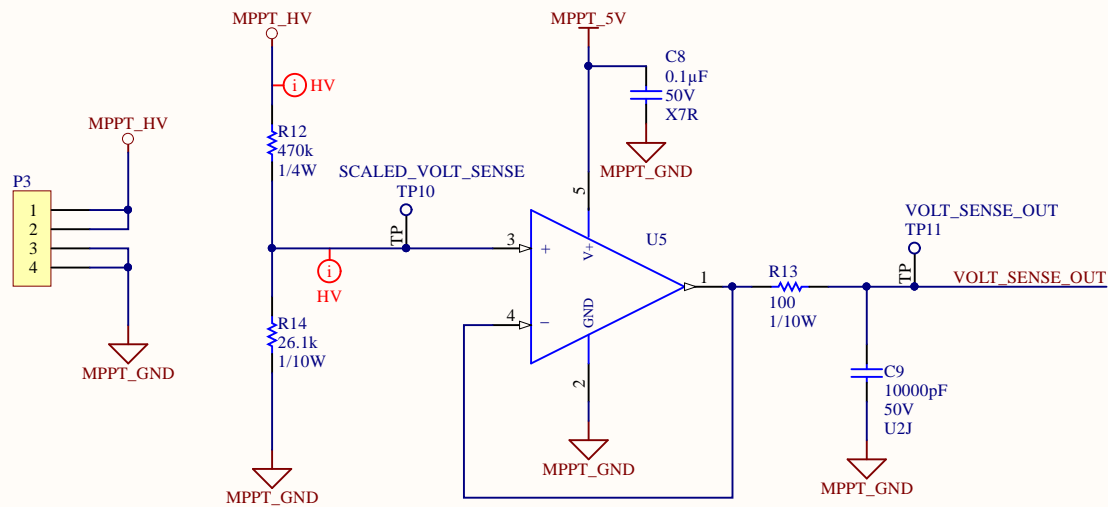
Temperature Sense



ADC



Voltage Sense



Project: **MSXII_SolarSenseSlave.PrjPcb**

Title: **Solar Sense Slave**

Project Lead: Peiliang Guo

Size: Letter

Date: 2018-06-22

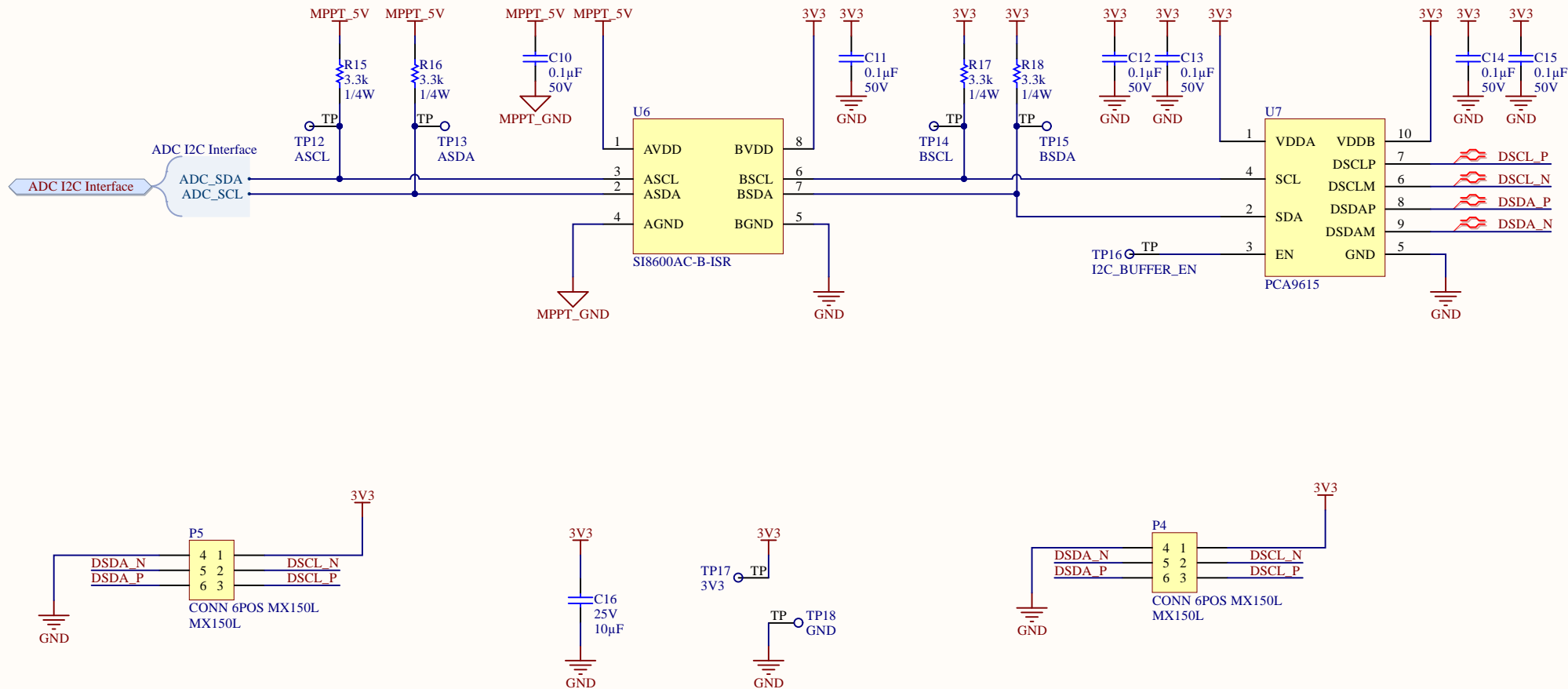
Revision: 2.0


Sheet3 of 4



University of Waterloo
200 University Ave W
Waterloo, ON, Canada
N2L 3E9

Website: www.uwmidsun.com



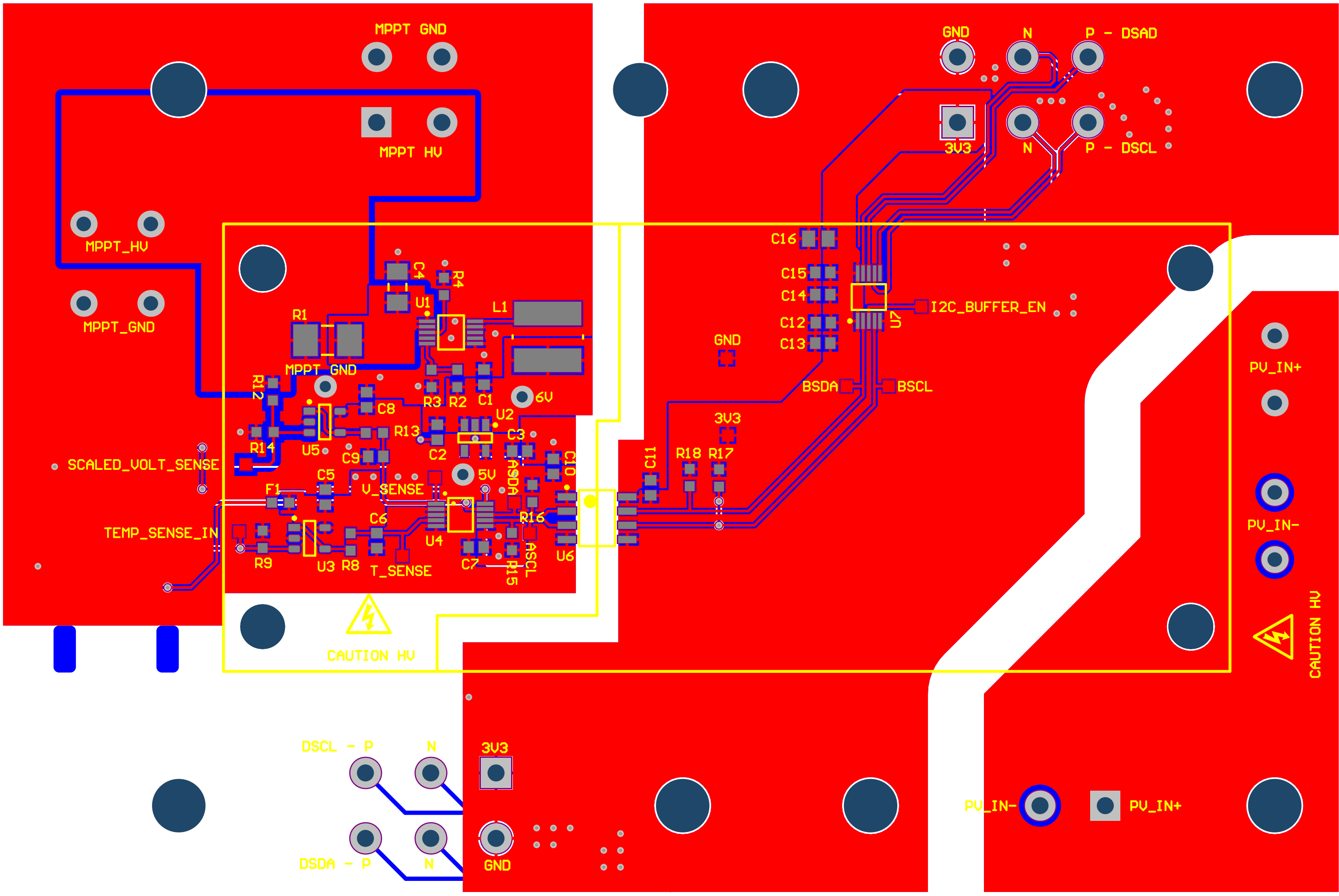
Project: <i>MSXII_SolarSenseSlave.PrjPcb</i>		<div><div>MIDNIGHT</div><div></div><div>SUN</div></div>
Title: I2C Interface		
Project Author: Peiliang Guo		University of Waterloo 200 University Ave W Waterloo, ON, Canada N2L 3E9
Size: Letter	Revision: 2.0	
Date: 2018-06-22	Sheet 4 of 4	
		Website: www.uwmidsun.com

Bill of Materials

MIDNIGHT SUN

Project:	MSXII_SolarSenseSlave.PrjPcb
Revision:	2.0
Project Lead:	Peiliang Guo
Generated On:	2018-06-22 4:43:49 AM
Production Quantity:	1
Currency:	CAD
Total Parts Count:	66

LibRef	Designator	Manufacturer 1	Manufacturer Part Number 1	Supplier 1	Supplier Part Number 1	Supplier Unit Price 1	Supplier Order Qty 1	Supplier Subtotal 1
CAP CER 10uF 25V 20% X5R 0603	C1	Murata	GRM188R61E106MA73D	Digi-Key	490-7202-1-ND	0.69	1	\$ 0.69
CAP CER 1uF 50V 10% X7R 0603	C2	Taiyo Yuden	UMK107AB7105KA-T	Digi-Key	587-3247-1-ND	0.39	1	\$ 0.39
CAP CER 2.2uF 25V 10% X5R 0603	C3	Murata	GRM188R61E225KA12D	Digi-Key	490-10731-1-ND	0.24	1	\$ 0.24
CAP CER 2.2uF 100V ±20% X7R 1206	C4	Murata	GRM31CR72A225MA73L	Digi-Key	490-12773-1-ND	0.93	1	\$ 0.93
CAP CER 0.1uF 50V 10% X7R 0603	C5, C7, C8, C10, C11, C12, C13, C14, C15	Kyocera AVX	06035C-104KAT2A	Digi-Key	478-5052-1-ND	0.15	10	\$ 1.52
CAP CER 10nF 50V 5% X7R 0603	C6, C9	KEMET	C0603C103J5JAC7867	Digi-Key	399-13384-1-ND	0.4	2	\$ 0.80
CAP CER 10uF 25V 10% X5R 0805	C16	Murata	GRM21BR61E106KA73L	Digi-Key	490-5523-1-ND	0.71	1	\$ 0.71
FUSE 250MA 32VDC 0603	F1	Kyocera AVX	F0603E0R25FSTR	Digi-Key	478-2858-1-ND	0.55	1	\$ 0.55
IND 220uH 0.59A 20%	L1	Laird Steward	TYS6045221M-10	Digi-Key	240-2742-1-ND	0.76	1	\$ 0.76
LED GREEN CLEAR 2V 0603	LED1, LED2	Würth Electronics	150060VS75000	Digi-Key	732-4980-1-ND	0.19	2	\$ 0.37
CONN 2POS MX150L	P1	Molex	0194270109	Digi-Key	0194270109-ND	3.43	1040	\$ 3,570.71
CONN 2POS DURA-CLIK 0.079" VERT	P2	Molex	560020-0220	Digi-Key	WM10862CT-ND	1.09	1	\$ 1.09
CONN 4POS MX150L	P3							
CONN 6POS MX150L	P4, P5	Molex	19427-0018	Digi-Key	WM17506-ND	8.01	2	\$ 16.02
RES 820 OHM 5% 3/4W 2010	R1	Stackpole Electronics	RMCF2010JT820R	Digi-Key	RMCF2010JT820RCT-ND	0.32	1	\$ 0.32
RES 255K OHM 1% 1/10W 0603	R2	Yageo	RC0603FR-07255KL	Digi-Key	311-255KHRCT-ND	0.13	1	\$ 0.13
RES 39.2K OHM 1% 1/10W 0603	R3	Yageo	RC0603FR-0739K2L	Digi-Key	311-39.2KHRCT-ND	0.13	1	\$ 0.13
RES 191K OHM 1% 1/10W 0603	R4	Yageo	RC0603FR-07191KL	Digi-Key	311-191KHRCT-ND	0.13	1	\$ 0.13
RES 3.3K OHM 1% 1/4W 0603	R5, R15, R16, R17, R18, R19	Panasonic	ERJPA3F3301V	Digi-Key	P3.3KBYCT-ND	0.21	6	\$ 1.28
RES 10K OHM 1% 1/10W 0603	R6, R7, R9, R10, R11	Yageo	RC0603FR-0710KL	Digi-Key	311-10.0KHRCT-ND	0.03	10	\$ 0.32
RES 100 OHM 1% 1/10W 0603	R8, R13	Yageo	RC0603FR-07100RL	Digi-Key	311-100HRCT-ND	0.13	2	\$ 0.27
RES 470K OHM 1% 1/4W 0603	R12	Panasonic	ERJPA3F4703V	Digi-Key	P470KBYCT-ND	0.21	1	\$ 0.21
RES 26.1K OHM 1% 1/10W 0603	R14	Yageo	RC0603FR-0726K1L	Digi-Key	311-26.1KHRCT-ND	0.13	1	\$ 0.13
SW SPST 2POS DIP 0.1A 20V	S1, S2	CTS	219-2MST	Digi-Key	CT2192MST-ND	0.8	2	\$ 1.60
Thru Test Point	TH_TP1, TH_TP2, TH_TP3, TH_TP4, TP1, TP2, TP3, TP4, TP5, TP6, TP7							
Test Point	TP9, TP11							
IC REG BUCK ADJ 0.1A 10UMAX	U1	Maxim	MAX17552AUB+	Digi-Key	MAX17552AUB+ND	3.57	1	\$ 3.57
IC REG LDO 5V 0.1A SOT23-5	U2	STMicroelectronics	LD2981CM50TR	Digi-Key	497-7787-1-ND	0.86	1	\$ 0.86
IC OP AMP GEN PURPOSE RR 10MHZ SOT-23-5	U3, U5	Texas Instruments	TLV316QDBVRQ1	Digi-Key	296-45323-1-ND	1.13	2	\$ 2.26
IC ADC MCP3427 10MSOP	U4	Microchip	MCP3427-E/UN	Digi-Key	MCP3427-E/UN-ND	3.87	1	\$ 3.87
IC DGTL ISO I2C 3.75KV 2CH 8SOIC	U6	Silicon Labs	SI8600AC-B-ISR	Digi-Key	SI8600AC-B-ISRCT-ND	4.43	1	\$ 4.43
IC DIFFERENTIAL I2C BUFFER PCA9615	U7	NXP Semiconductors	PCA9615DPJ	Digi-Key	568-11484-1-ND	3.92	1	\$ 3.92
							Total:	\$ 3,618.21

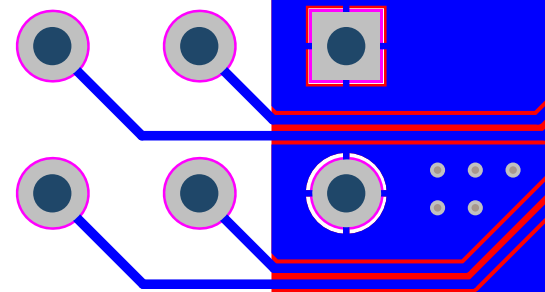


Do not touch
while the board
is charged



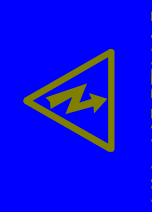
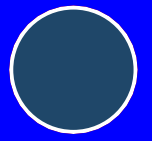
P5

SOLAR MASTER PWR
RIS LEDS
I2C SIGNAL IN-OUT

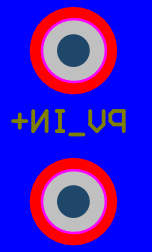


P1

SOLAR PANEL INPUT

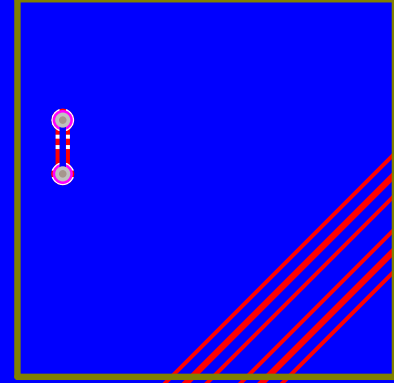


PV-IN-
PV-IN+



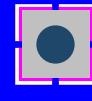
MPBT

P2



P3

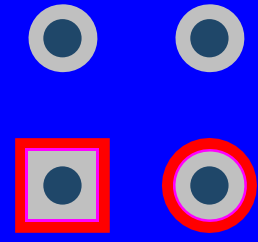
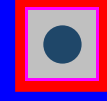
I2C SIGNAL IN-OUT



P4

P3

MPBT OUTPUT

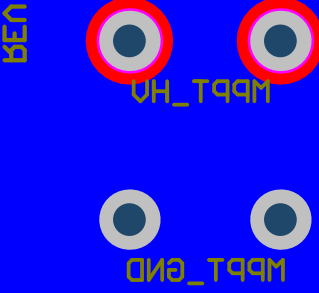
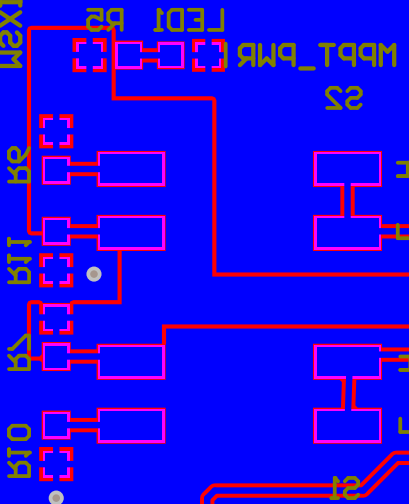


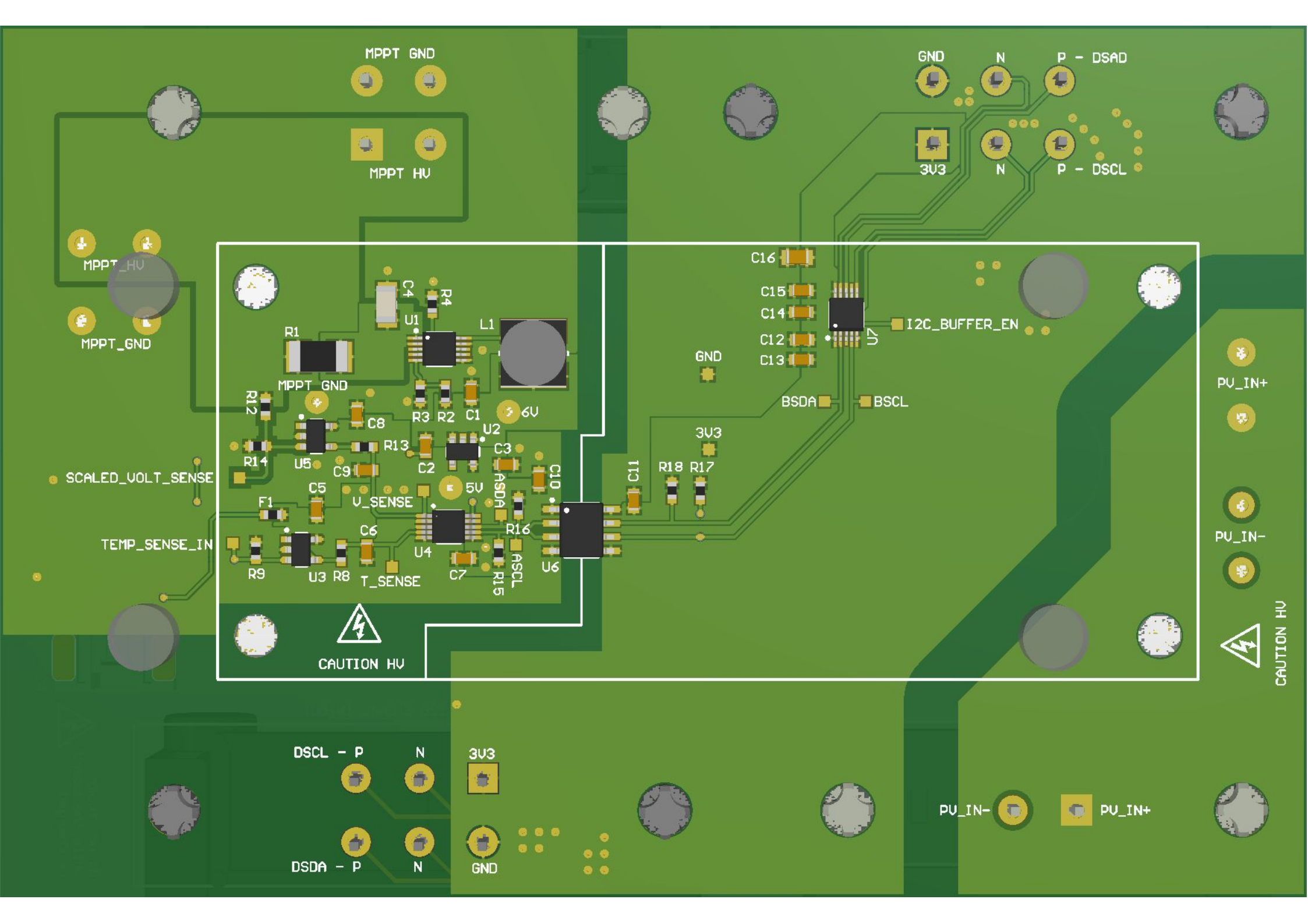
MPBT_GND

MPBT_HV

0.5V REF
SENSE
I2C

P5





Electrical Rules Check Report

Class	Document	Message
Warning	SolarSenseBoard.SchDoc	Net NetP2_2 has no driving source (Pin P2-2,Pin R9-1,Pin TP8-TP,Pin U3-3)
Warning	SolarSenseBoard.SchDoc	Net NetR12_2 has no driving source (Pin R12-2,Pin R14-1,Pin TP10-TP,Pin U5-3)

Design Rules Verification Report

Filename : C:\Users\Taiping\Documents\MidnightSun\hardware\MSXII_SolarSenseSlave\SolarSenseSlave.dwg Warnings 0
Rule Violations 6

Warnings	
Total	0

Rule Violations	
Clearance Constraint (Gap=0.53mm) (InNetClass('HV')),(InNet('MPPT_GND'))	0
Clearance Constraint (Gap=0.152mm) (All),(All)	0
Clearance Constraint (Gap=5mm) (InNet('PV_IN+') OR InNet('PV_IN-')),(InNet('3V3') OR InNet('GND'))	0
Clearance Constraint (Gap=0.53mm) (InNet('PV_IN+')),(InNet('PV_IN-'))	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=0.152mm) (Max=2.54mm) (Preferred=0.254mm) (All)	0
Power Plane Connect Rule(Relief Connect)(Expansion=0.508mm) (Conductor Width=0.254mm) (Air Gap=0.254mm)	0
Minimum Annular Ring (Minimum=0.15mm) (All)	0
Hole Size Constraint (Min=0.3mm) (Max=6.3mm) (All)	0
Hole To Hole Clearance (Gap=0.254mm) (All),(All)	0
Minimum Solder Mask Sliver (Gap=0.3mm) (Disabled)(All),(All)	0
Silk To Solder Mask (Clearance=0.178mm) (IsPad),(All)	6
Silk to Silk (Clearance=0.254mm) (All),(All)	0
Net Antennae (Tolerance=0mm) (All)	0
Height Constraint (Min=0mm) (Max=25.4mm) (Preferred=12.7mm) (All)	0
Height Constraint (Min=0mm) (Max=50mm) (Preferred=12.7mm) (HasFootprint('CONN, 4POS MX150L') OR	0
Total	6

Silk To Solder Mask (Clearance=0.178mm) (IsPad),(All)	
Silk To Solder Mask Clearance Constraint: (0.115mm < 0.178mm) Between Pad P2-3(15mm,22mm) on Bottom Layer And Track	
Silk To Solder Mask Clearance Constraint: (0.125mm < 0.178mm) Between Pad U2-1(43.454mm,42.025mm) on Top Layer And Track	
Silk To Solder Mask Clearance Constraint: (0.125mm < 0.178mm) Between Pad U2-2(42.504mm,42.025mm) on Top Layer And Track	
Silk To Solder Mask Clearance Constraint: (0.125mm < 0.178mm) Between Pad U2-3(41.554mm,42.025mm) on Top Layer And Track	
Silk To Solder Mask Clearance Constraint: (0.125mm < 0.178mm) Between Pad U2-4(41.554mm,39.725mm) on Top Layer And Track	
Silk To Solder Mask Clearance Constraint: (0.125mm < 0.178mm) Between Pad U2-5(43.454mm,39.725mm) on Top Layer And Track	