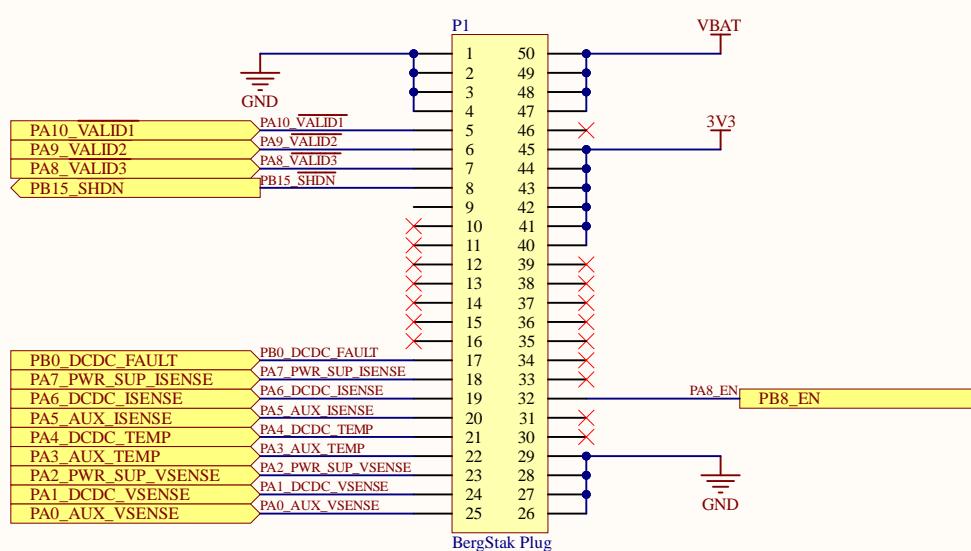
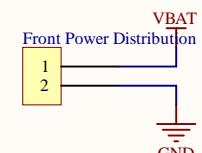
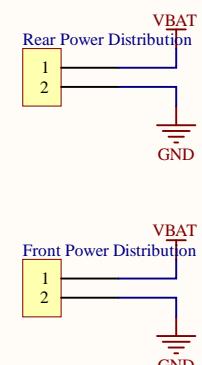
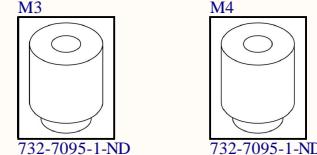
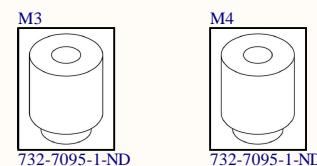
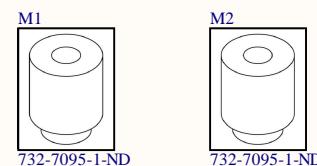
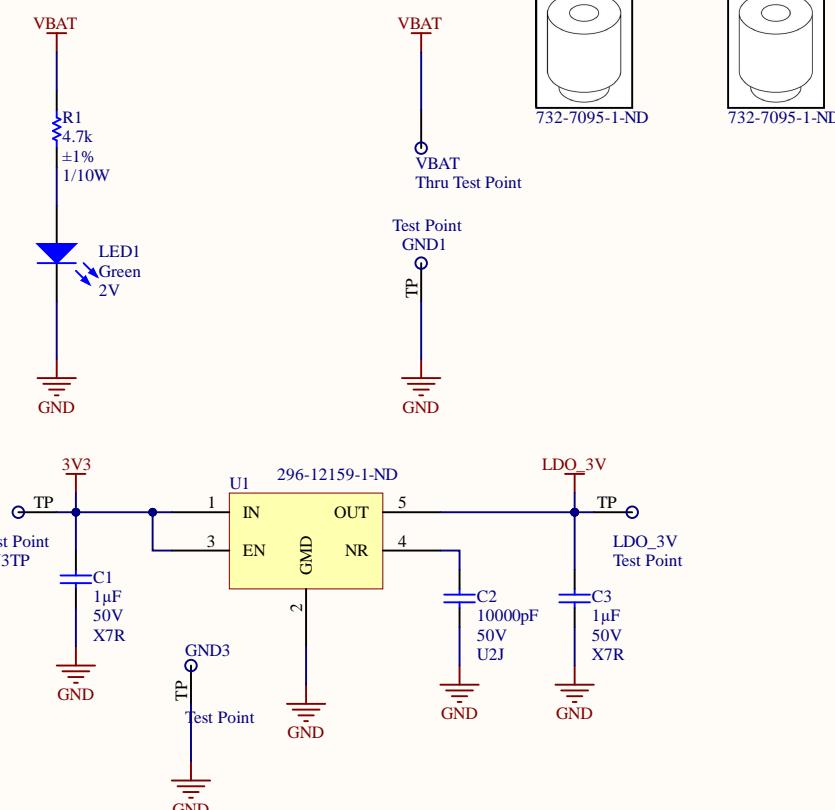


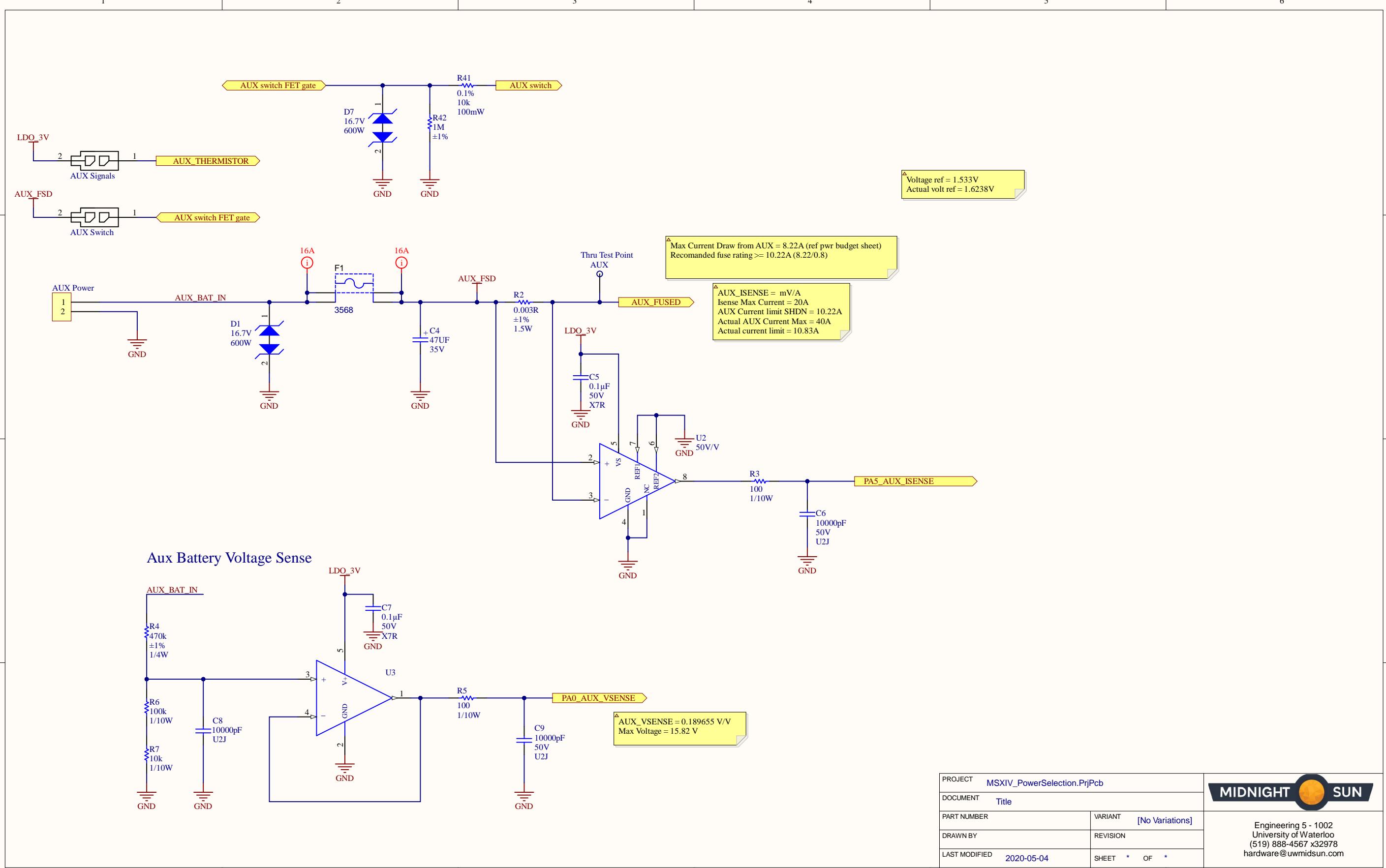
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< 3mA Max.



PROJECT	MSXIV_PowerSelection.PrbPcb	MIDNIGHT SUN
DOCUMENT	Title	
PART NUMBER	VARIANT [No Variations]	
DRAWN BY	REVISION	
LAST MODIFIED	2020-05-04	SHEET * OF *

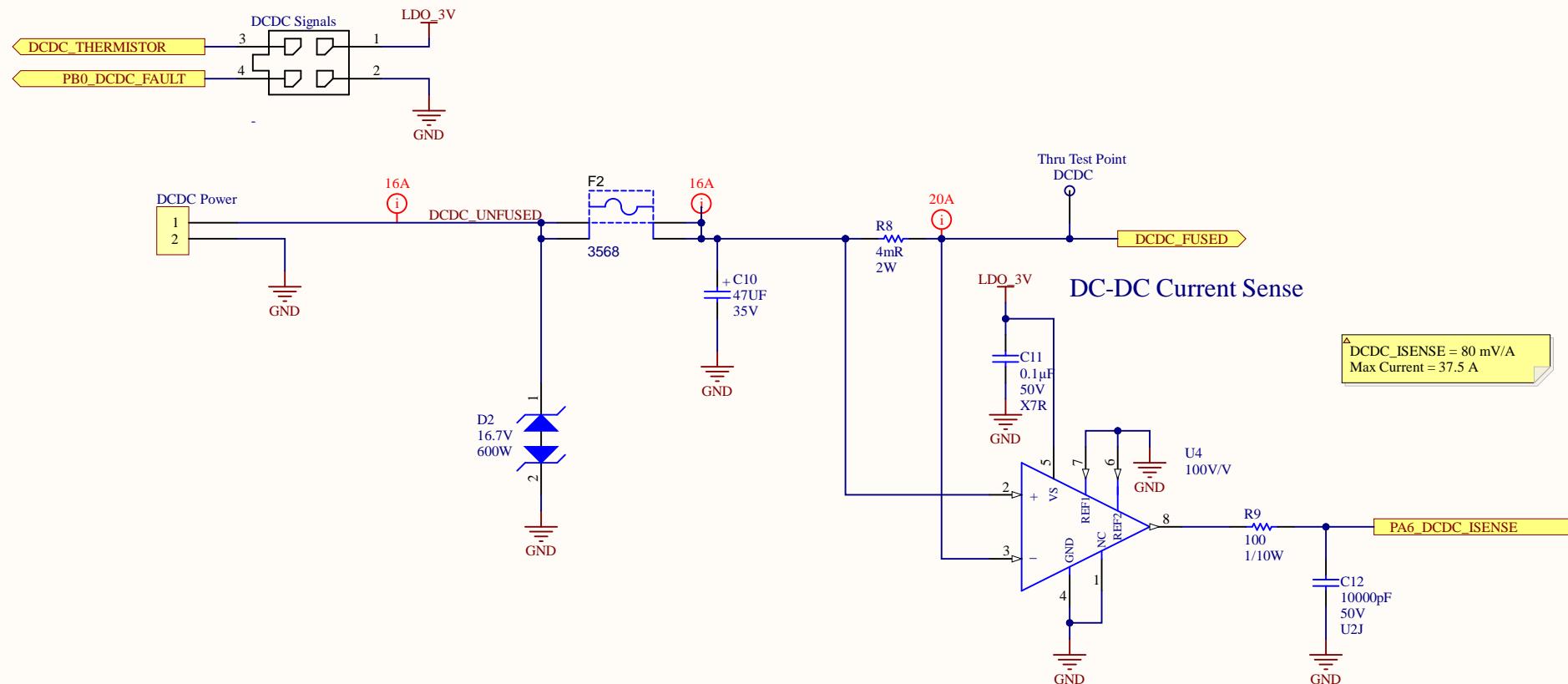


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DOCUMENT	Title	
PART NUMBER	VARIANT [No Variations]	
DRAWN BY	REVISION	

LAST MODIFIED 2020-05-04 SHEET * OF *

Engineering 5 - 1002
University of Waterloo
(519) 888-4567 x32978
hardware@uwmidsun.com

A



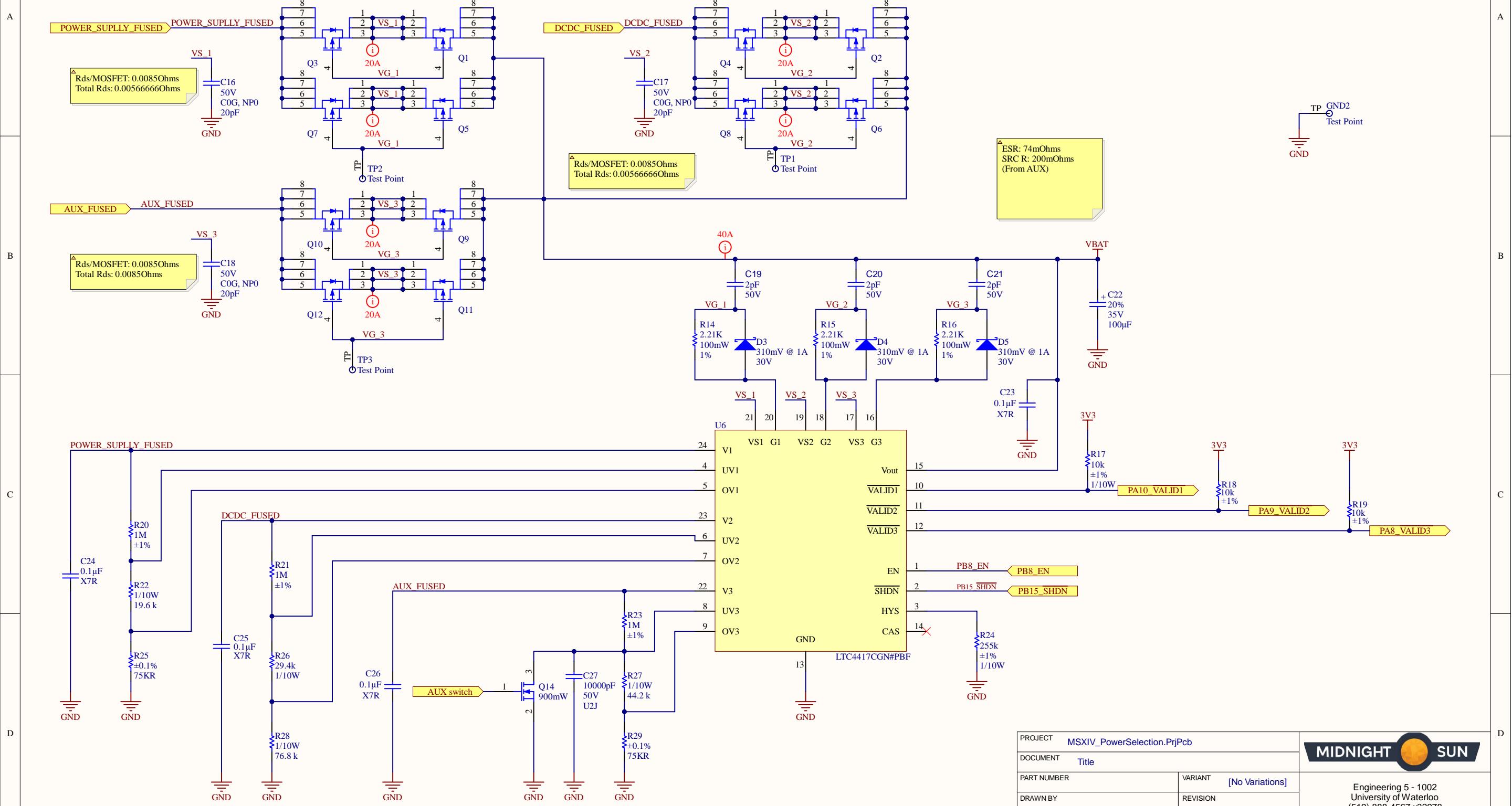
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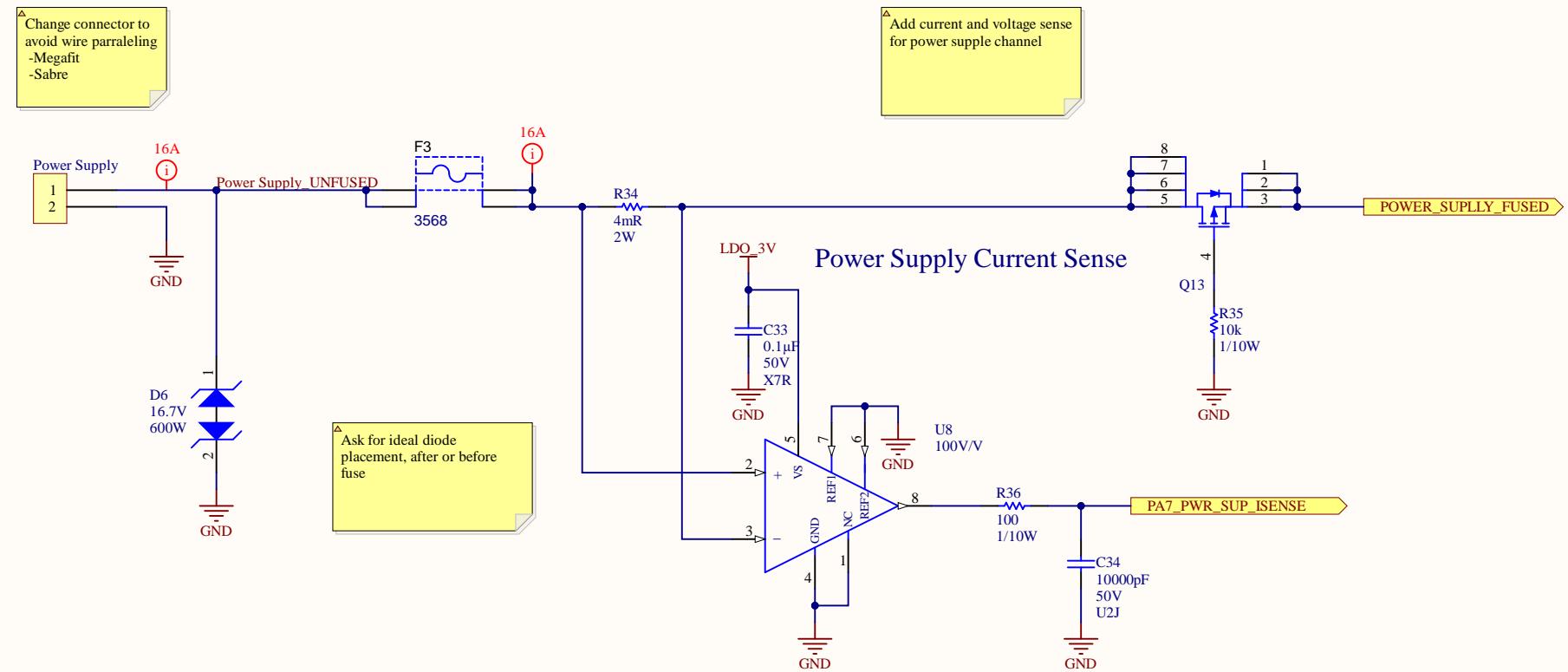
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DOCUMENT	Title	
PART NUMBER	VARIANT [No Variations]	
DRAWN BY	REVISION	
LAST MODIFIED	2020-05-04	SHEET * OF *

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hardware@uwmidsun.com

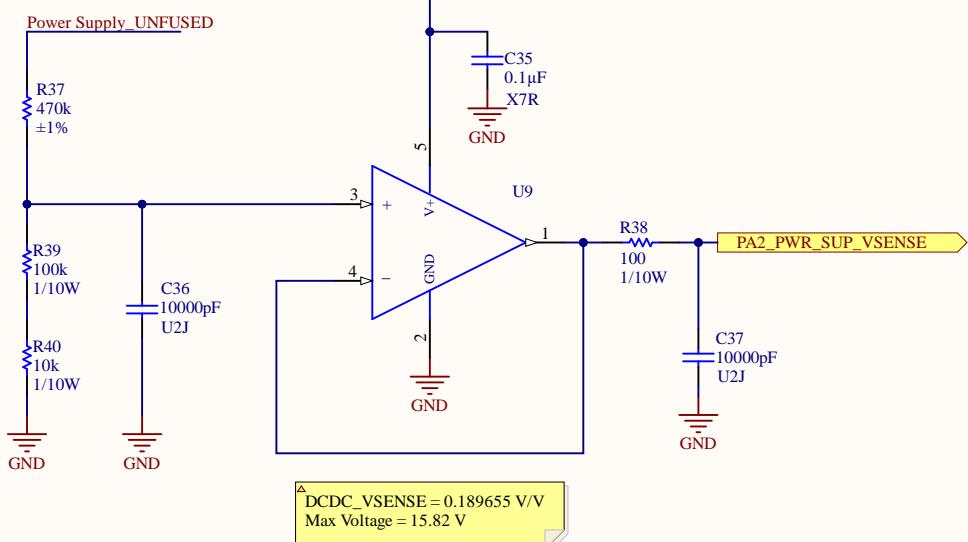


A



B

Power Supply Voltage Sense



C

PROJECT	MSXIV_PowerSelection.PrbPcb	MIDNIGHT SUN
DOCUMENT	Title	
PART NUMBER	VARIANT [No Variations]	
DRAWN BY	REVISION	
LAST MODIFIED	2020-05-04	SHEET * OF *

D

A

B

C

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A

A

B

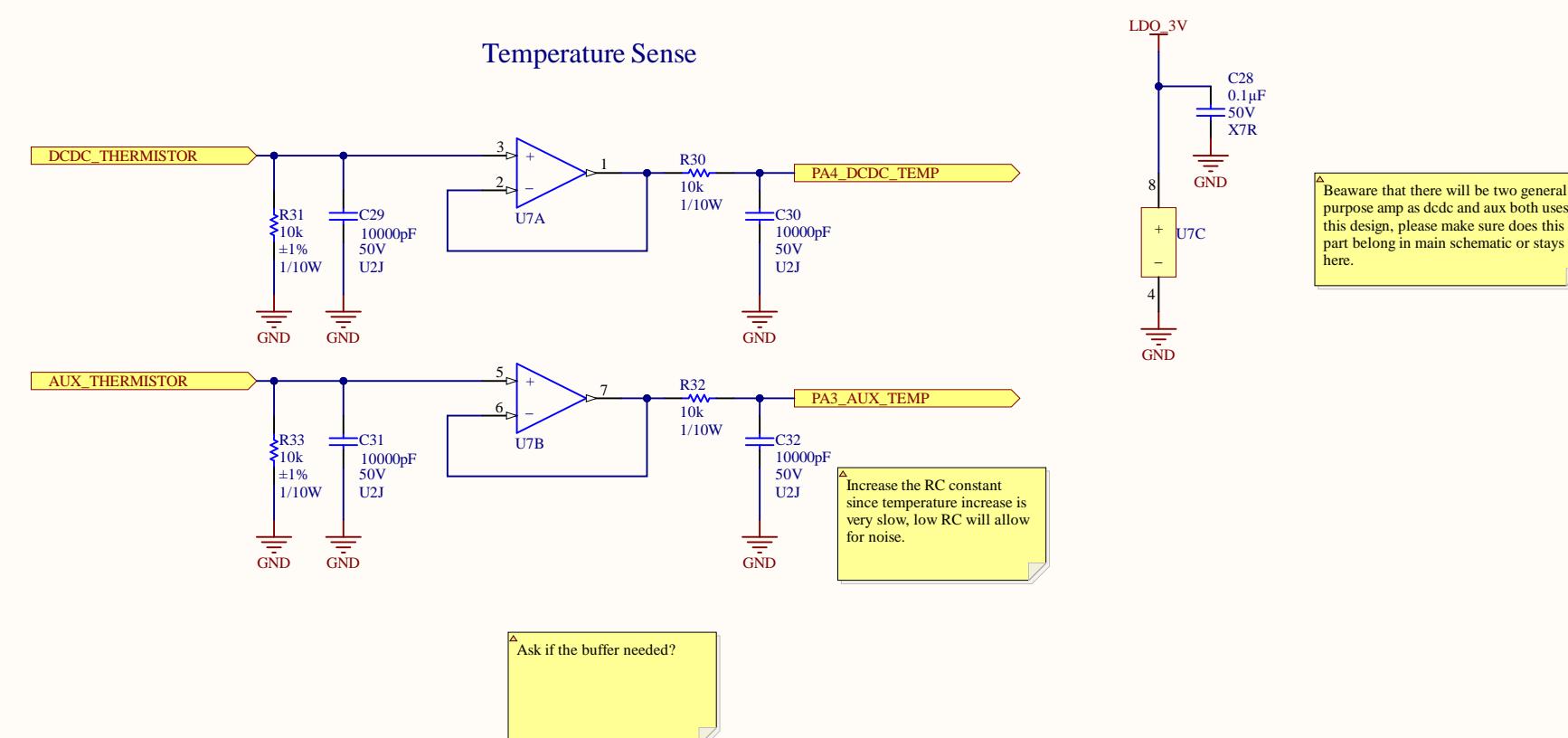
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C

C

D

D



PROJECT	MSXIV_PowerSelection.PnjPcb
DOCUMENT	Title
PART NUMBER	VARIANT [No Variations]
DRAWN BY	REVISION
LAST MODIFIED	2020-05-04
SHEET *	OF *

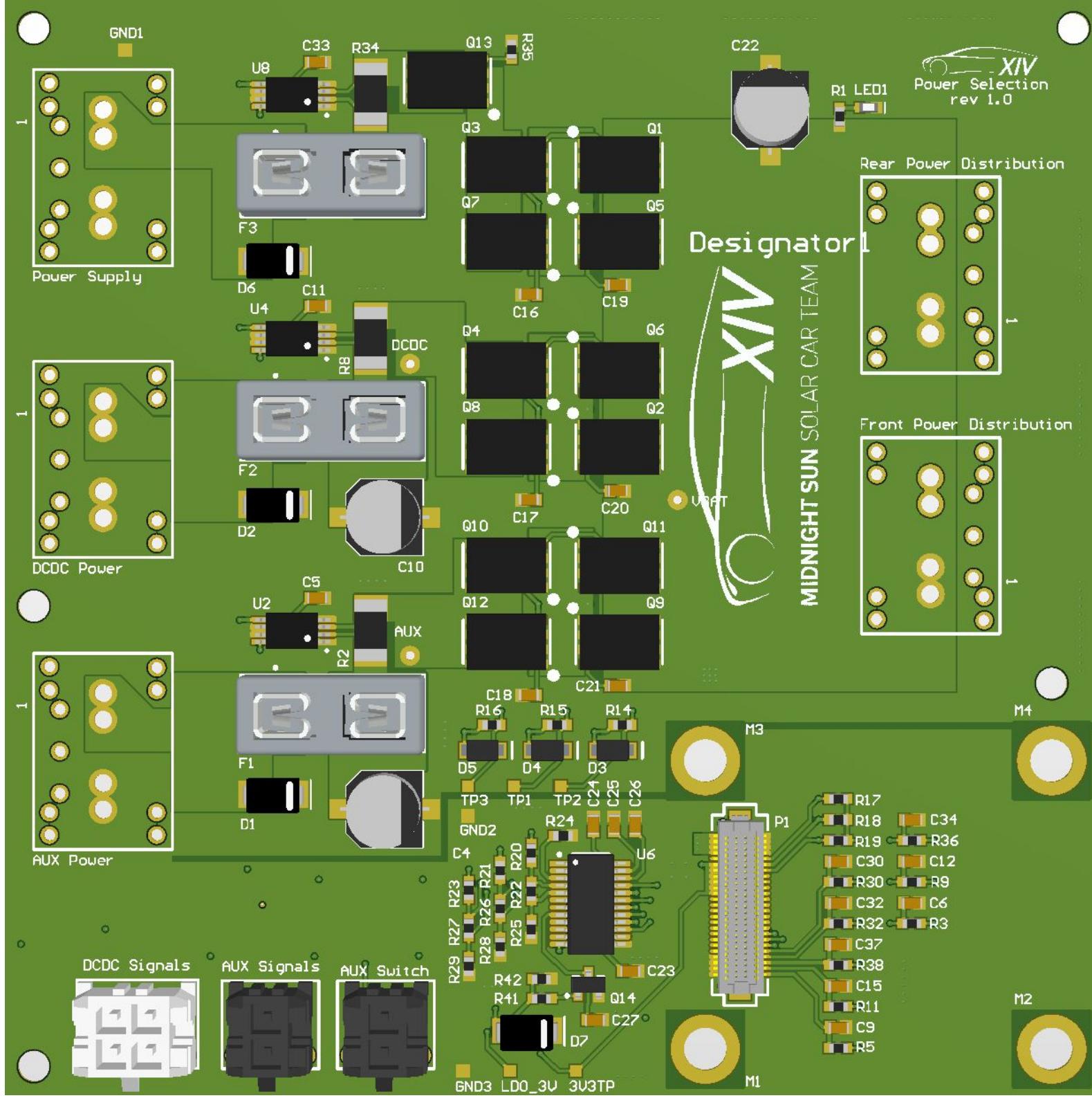
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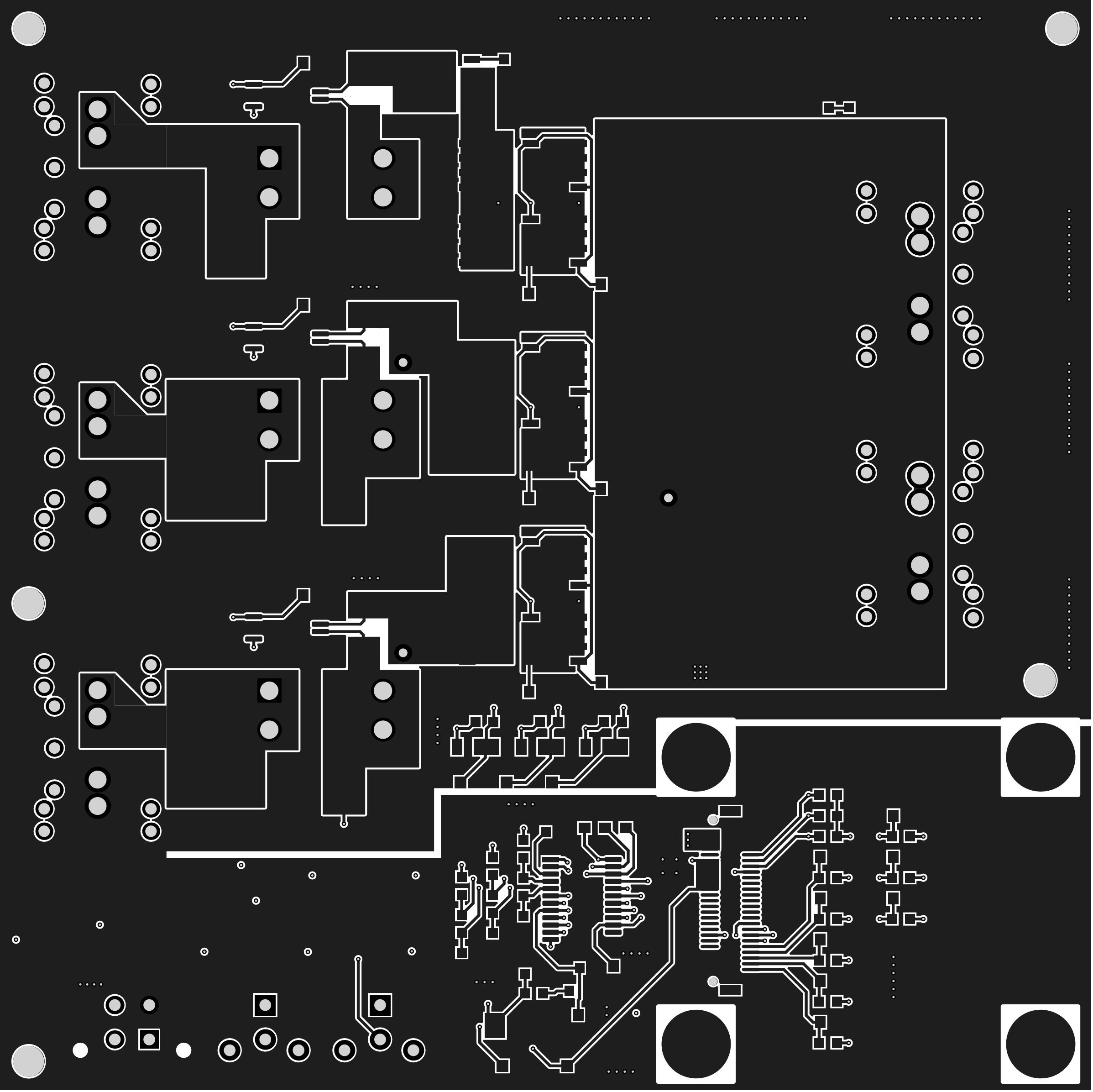
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Currency	CAD
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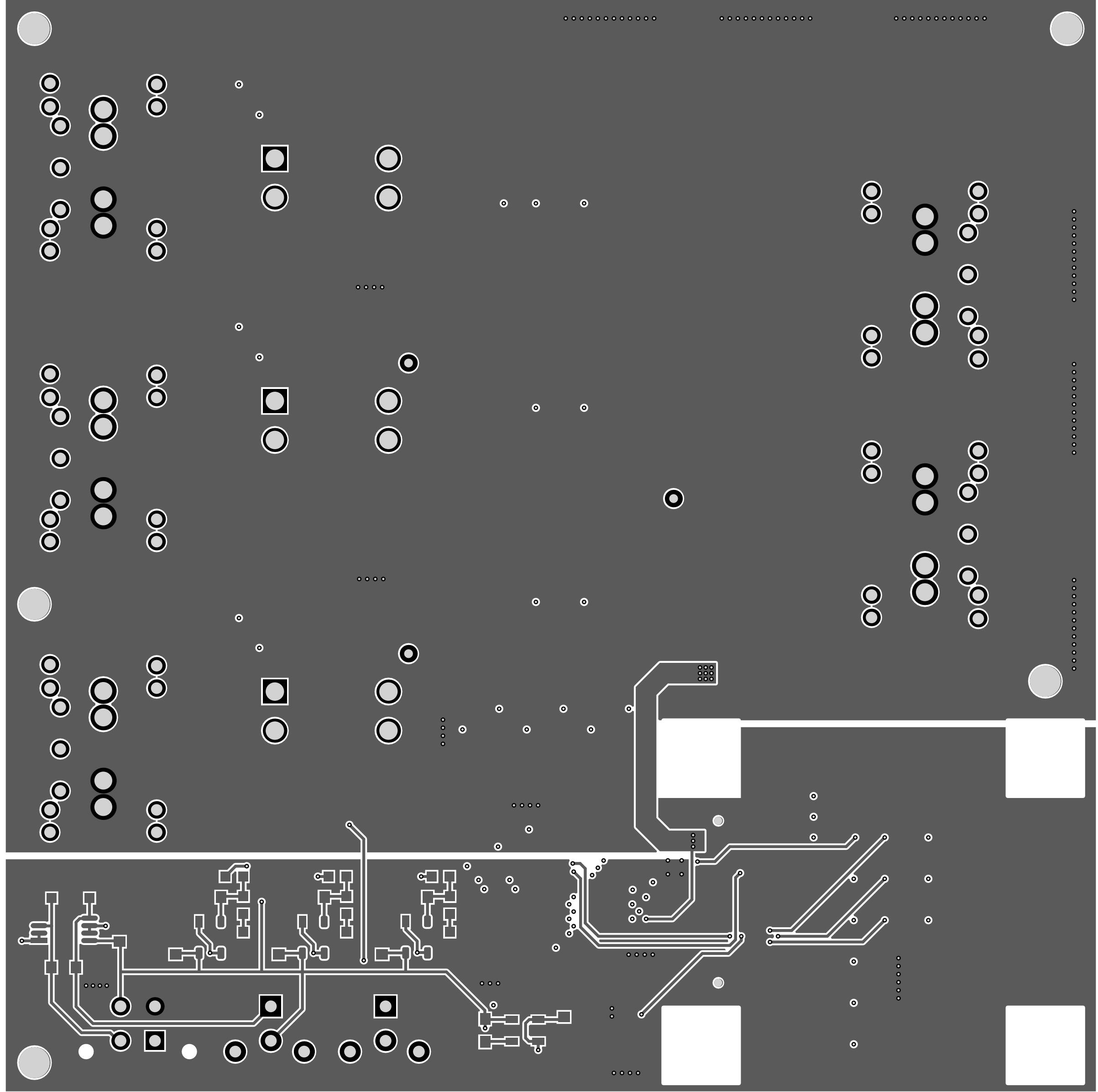
MIDNIGHT SUN



LibRef	Designator	Manufacturer 1	Manufacturer Part Number 1	Supplier 1	Supplier Part Number 1	Supplier Unit Price 1	Quantity	Supplier Subtotal 1
CMP-002-00071-3	Power, Front Power Distribution, Power Supply, Rear Power Distribution						5	
CONN 2POS MICRO-FIT 3mm	AUX Signals, AUX Switch	Molex	43045-0227	Digi-Key	WM10657-ND	1.19	2	\$ 2.38
Thru Test Point	AUX, DCDC, VBAT						3	
CAP CER 1UF 50V 10% X7R 0603	C1, C3	Taiyo Yuden	UMK107AB7105KA-T	Digi-Key	587-3247-1-ND	0.35487	2	\$ 0.71
CAP CER 10nF 50V 5% X7R 0603	C9, C12, C14, C15, C27, C29, C30, C31, C32, C33	KEMET	C0603C103J5JACTU	Digi-Key	399-13384-1-ND	0.31796	15	\$ 4.77
CAP ALUM 47uF 20% 35V SMD	C4, C10	Panasonic	EEE-1VA470WP	Digi-Key	PCE3961CT-ND	0.58198	2	\$ 1.16
CAP CER 0.1uF 50V 10% X7R 0603	C7, C11, C13, C23, C24, C25, C26, C28, C33	Kyocera AVX	06035C104KAT2A	Digi-Key	478-5052-1-ND	0.09936	11	\$ 1.09
CMP-013-0033-1	C16, C17, C18	Murata Electronics North America	GRM1885C1H200JA01D				3	
CMP-001-00085-2	C19, C20, C21						3	
CMP-013-0003-1	C22	Panasonic	EEE-1VA101XP				1	
DIODE TVS 15VW 24.4VC DO-214AA (SMB)	D1, D2, D6, D7	Taiwan Semiconductor	SMBJ15CA	Digi-Key	SMBJ15CAFST-ND	0.69554	4	\$ 2.78
DIODE SCHOTTKY 30V 1A POWERDI123	D3, D4, D5	Diodes	DFLS130L-7	Digi-Key	DFLS130LDICT-ND	0.62456	3	\$ 1.87
CMP-003-0105-1	DCDC Signals						1	
CMP-005-00014-1	F1, F2, F3						3	
LED GREEN CLEAR 2V 0603	LED1	Wurth Electronics	150060VS75000	Digi-Key	732-4980-1-ND	0.19872	1	\$ 0.20
STANDOFF RND M2.5X0.45 STEEL 5MM	M1, M2, M3, M4	Wurth Electronics	9774050151R	Digi-Key	732-7095-1-ND	1.55	4	\$ 6.19
CONN 50POS Bergstak Plug 0.02"	P1	Amphenol FCI	10132797-055100LF	Digi-Key	609-5226-1-ND	2.04	1	\$ 2.04
MOSFET P-CH PWR56 40V 4.9 MOHM	Q2, Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12	ON Semiconductor	FDWS508L_F085	Digi-Key	DWS9508L-F085OSCT-ND		13	
CMP-003-0074-1	Q14						1	
RES 4.7K OHM 1% 1/10W 0603	R1	Yageo Phycomp	RC0603FR-074K7L	Digi-Key	311-4.70KHRC-ND	0.14195	1	\$ 0.14
RES 0.003 OHM 1% 1.5W 2010	R2	Stackpole Electronics	CSNL2010FT3L00	Digi-Key	CSNL2010FT3L00CT-ND	0.92265	1	\$ 0.92
RES 100 OHM 1% 1/10W 0603	R3, R5, R9, R11, R36, R38	Yageo	RC0603FR-07100RL	Digi-Key	311-100HRCT-ND	0.14195	6	\$ 0.85
RES 470K OHM 1% 1/4W 0603	R4, R10, R37	Panasonic	ERJ-PA3F4703V	Digi-Key	P470KBYCT-ND	0.19872	3	\$ 0.60
RES 100K OHM 5% 1/8W 0603	R6, R12, R39	Yageo	RC0603JR-07100KL	Digi-Key	311-100KGRC-ND	0.14195	3	\$ 0.43
RES 10K OHM 1% 1/10W 0603	R13, R17, R18, R19, R30, R31, R32, R33, R35	Yageo Phycomp	RC0603FR-0710KL	Digi-Key	311-10.0KHRCT-ND	0.03265	11	\$ 0.36
RES 4m OHM 1% 2W 2010	R8, R34	KOA Speer	TLR2HWDT4L00F75	Digi-Key	TLR2HWDT4L00F75C	1.25	2	\$ 2.50
RES 2.21K OHM 1% 1/10W 0603	R14, R15, R16	Yageo	AC0603FR-072K21L	Digi-Key	YAG3586CT-ND	0.14195	3	\$ 0.43
RES 1M OHM 1% 1/10W 0603	R20, R21, R23, R42	Yageo	RC0603FR-071ML	Digi-Key	311-1.00MHRCT-ND	0.14195	4	\$ 0.57
RES 19.6K OHM 1% 1/10W 0603	R22	Stackpole Electronics	RMCF0603FT19K6	Digi-Key	RMCF0603FT19K6CT-ND	0.14195	1	\$ 0.14
RES 255K OHM 1% 1/10W 0603	R24	Yageo	RC0603FR-07255KL	Digi-Key	311-255KHRC-ND	0.14195	1	\$ 0.14
RES SMD 75K OHM 0.1% 1/10W 0603	R25, R29	Panasonic	ERA-3AEBT753V	Digi-Key	P75KDBCT-ND	0.49681	2	\$ 0.99
RES 29.4K OHM 1% 1/10W 0603	R26	Yageo	RC0603FR-0729K4L	Digi-Key	311-29.4KHRCT-ND	0.14195	1	\$ 0.14
RES SMD 44.2K OHM 1% 1/10W 0603	R27	Panasonic	ERJ-3EKF4422V	Digi-Key	P44.2KHCT-ND	0.14195	1	\$ 0.14
RES 76.8K OHM 1% 1/10W 0603	R28	Stackpole Electronics	RMCF0603FT76K8	Digi-Key	RMCF0603FT76K8CT-ND	0.14195	1	\$ 0.14
CMP-010-0039-1	R41						1	
IC REG LINEAR 3V 200MA SOT23-5	U1	Texas Instruments	TPS79330DBVR	Digi-Key	296-12159-1-ND	0.85168	1	\$ 0.85
IC CURRENT AMPLIFIER INA240 8-TSSOP	U2	Texas Instruments	INA240A3PWR	Digi-Key	296-45090-1-ND	3.95	1	\$ 3.95
C OP AMP GEN PURPOSE RR 10MHZ SOT-23-5	U3, U5, U9	Texas Instruments	TLV316QDBVRQ1	Digi-Key	296-45323-1-ND	1.32	3	\$ 3.96
IC CURRENT AMPLIFIER INA240 8-TSSOP	U4, U8	Texas Instruments	INA240A3PWR	Digi-Key	296-45090-1-ND	3.95	2	\$ 7.89
C OR CONTROLLER SOURCE SELECT 24SSOP	U6	Analog Devices / Linear Technology	LTC4417CGN#PBF	Digi-Key	LTC4417CGN#PBF-ND	11.13	1	\$ 11.13
IC OP AMP DUAL GP RR 10MHZ 8-VSSOP	U7	Texas Instruments	OPA2197IDGKR	Digi-Key	296-47349-1-ND	3.32	1	\$ 3.32
							Total:	\$ 62.78







Design Rules Verification Report

Filename : D:\Josh9\Documents\Midnight Sun\hardware\MSXIV_PowerSelection\Power Sel

Warnings 0
Rule Violations 202

Warnings	
Total	0

Rule Violations	
Clearance Constraint (Gap=0.152mm) (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=0.254mm) (Max =0.254mm) (Preferred=0.254mm) (All)	0
Power Plane Connect Rule(Direct Connect)(Expansion=0.508mm) (Conductor Width=0.254mm) (Air Gap=0.254mm)	0
Power Plane Connect Rule(Direct Connect)(Expansion=0.508mm) (Conductor Width=0.254mm) (Air Gap=0.254mm)	0
Hole Size Constraint (Min=0.025mm) (Max =2.54mm) (All)	9
Hole To Hole Clearance (Gap=0.254mm) (All), (All)	0
Minimum Solder Mask Sliver (Gap=0.254mm) (All), (All)	35
Silk To Solder Mask (Clearance=0.254mm) (IsPad), (All)	156
Silk to Silk (Clearance=0.254mm) (All), (All)	2
Net Antennae (Tolerance=0mm) (All)	0
Height Constraint (Min=0mm) (Max =25.4mm) (Preferred=12.7mm) (All)	0
Total	202

Hole Size Constraint (Min=0.025mm) (Max=2.54mm) (All)	
Hole Size Constraint: (2.7mm > 2.54mm) Pad Free-(2.5mm,2.5mm) on Multi-Layer Actual Hole Size = 2.7mm	
Hole Size Constraint: (2.7mm > 2.54mm) Pad Free-(2.5mm,42.4mm) on Multi-Layer Actual Hole Size = 2.7mm	
Hole Size Constraint: (2.7mm > 2.54mm) Pad Free-(2.5mm,92.5mm) on Multi-Layer Actual Hole Size = 2.7mm	
Hole Size Constraint: (2.7mm > 2.54mm) Pad Free-(90.6mm,35.7mm) on Multi-Layer Actual Hole Size = 2.7mm	
Hole Size Constraint: (2.7mm > 2.54mm) Pad Free-(92.5mm,92.5mm) on Multi-Layer Actual Hole Size = 2.7mm	
Hole Size Constraint: (3.7mm > 2.54mm) Pad M1-(60.6mm,4mm) on Multi-Layer Actual Hole Size = 3.7mm	
Hole Size Constraint: (3.7mm > 2.54mm) Pad M2-(90.6mm,4mm) on Multi-Layer Actual Hole Size = 3.7mm	
Hole Size Constraint: (3.7mm > 2.54mm) Pad M3-(60.6mm,29mm) on Multi-Layer Actual Hole Size = 3.7mm	
Hole Size Constraint: (3.7mm > 2.54mm) Pad M4-(90.6mm,29mm) on Multi-Layer Actual Hole Size = 3.7mm	

Silk to Silk (Clearance=0.254mm) (All),(All)

Silk To Silk Clearance Constraint: (0.03mm < 0.254mm) Between Region (1 hole(s)) Top Overlay And Text "VBAT" (59.534mm,51.1mm) on Top Overlay

Silk To Silk Clearance Constraint: (Collision < 0.254mm) Between Text "Designator1" (59.45mm,73.202mm) on Top Overlay And Track

