


Project: PowerDistribution.PrjPcb		
Title: Controller Board Interface		
Project Lead: Taiping Li		University of Waterloo 200 University Ave W Waterloo, ON, Canada N2L 3E9
Size: Letter	Revision: 1.5	
Date: 5/26/2017	Sheet2 of 7	
Website: www.uwmidsun.com		

A

B

C

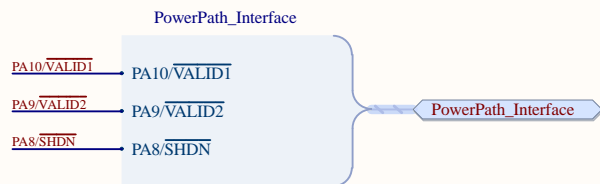
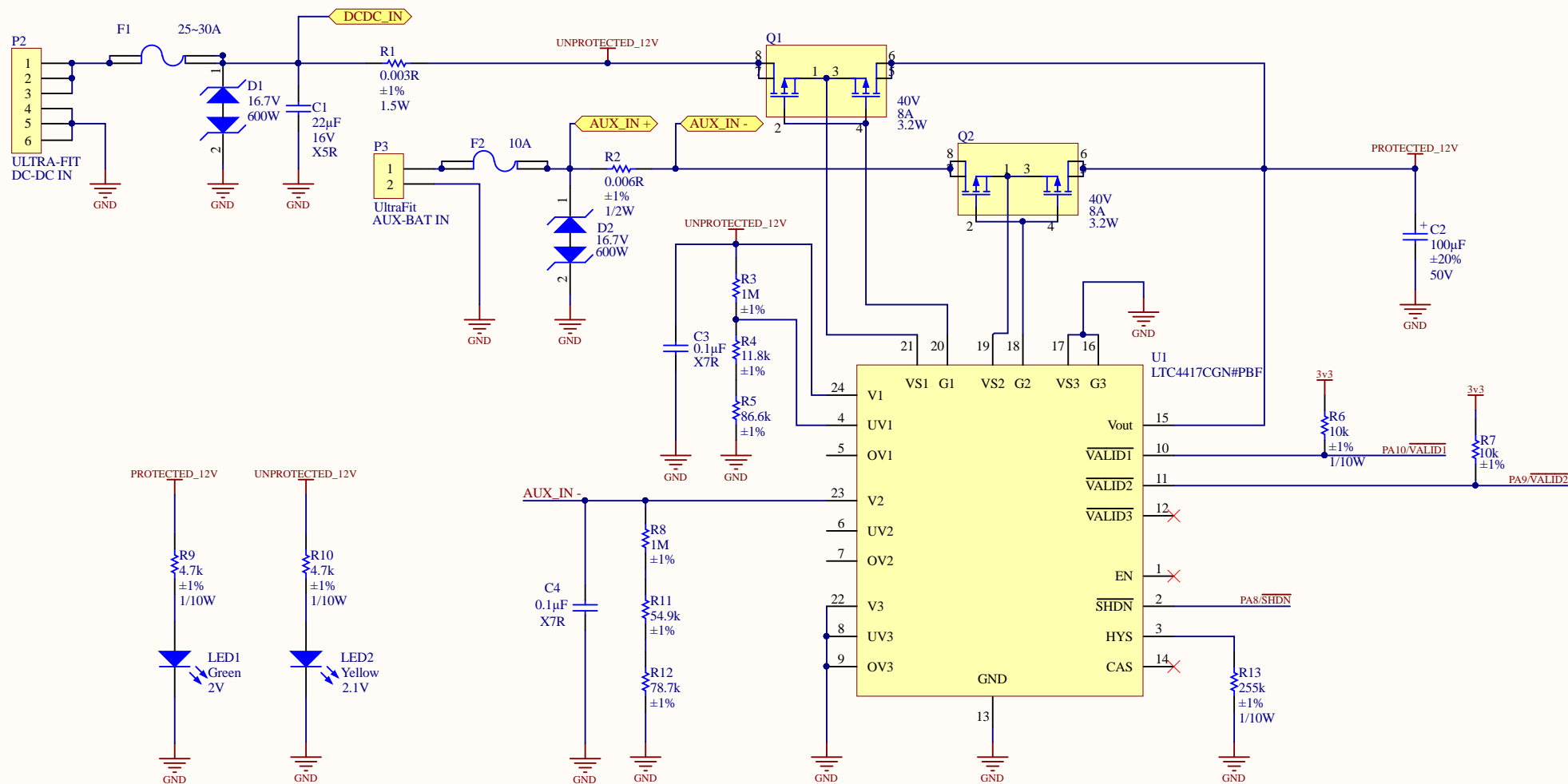
D

A

B

C

D

Project: **PowerDistribution.PrjPcb**Title: **PowerPath**Project Lead: **Taiping Li**Size: **Letter**Revision: **1.5**Date: **5/26/2017**

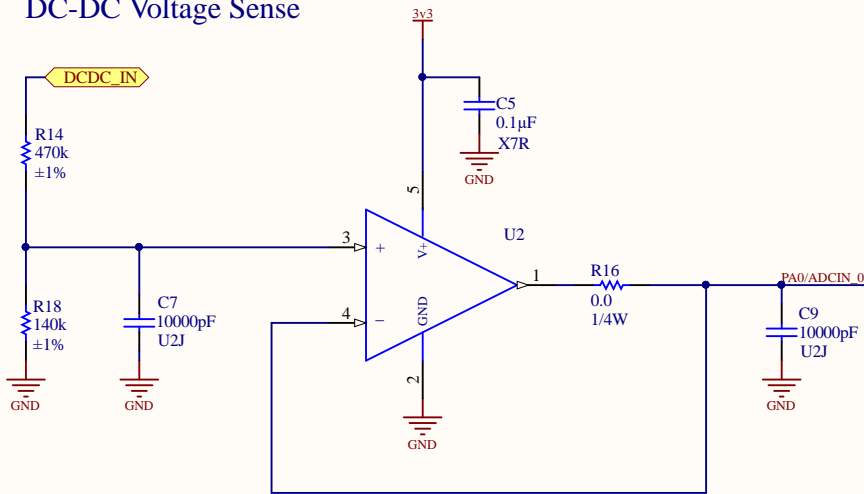
Sheet3 of 7



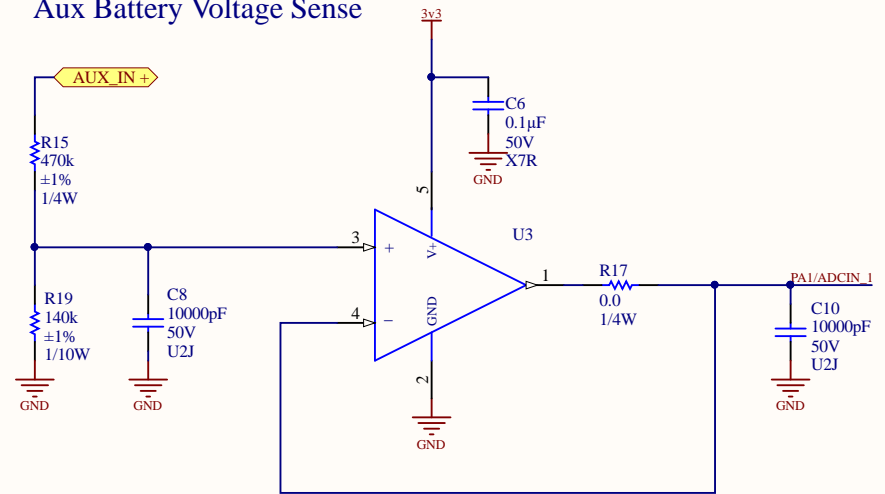
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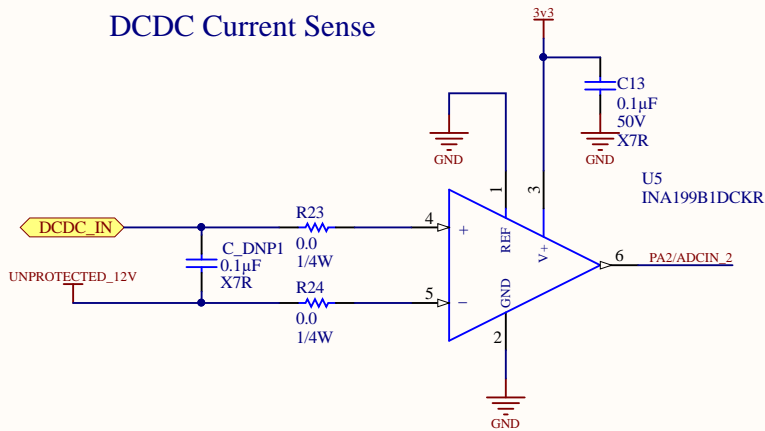
DC-DC Voltage Sense



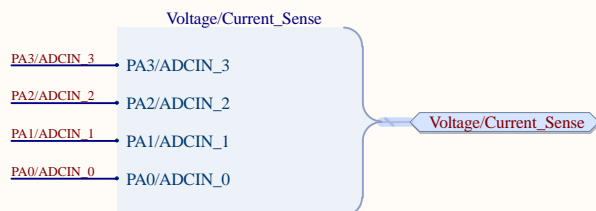
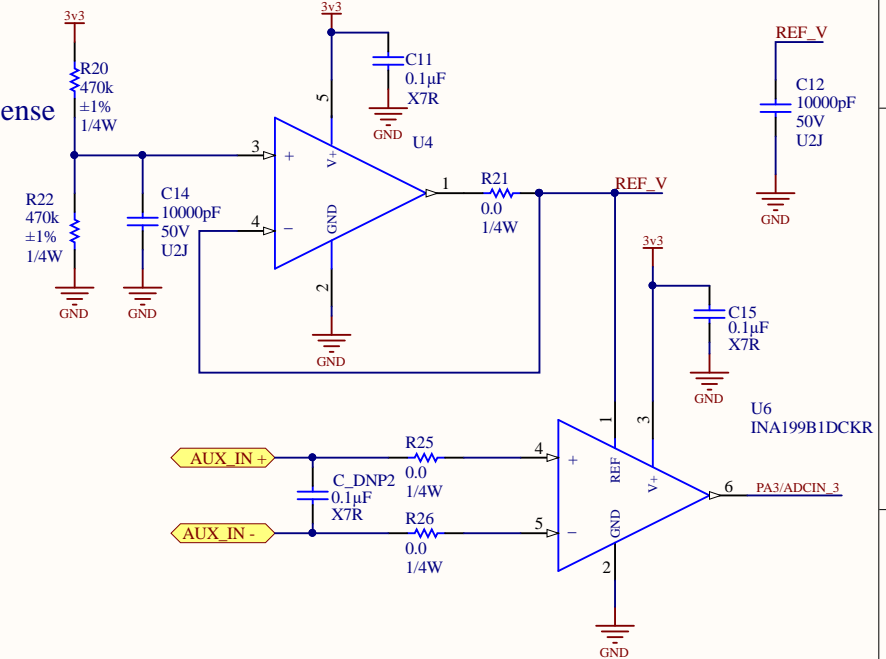
Aux Battery Voltage Sense



DCDC Current Sense



Aux Current Sense



Project: **PowerDistribution.PrjPcb**

Title: **Voltage & Current Sense**

Project Lead: Taiping Li

Size: Letter

Revision: 1.5

Date: 5/26/2017

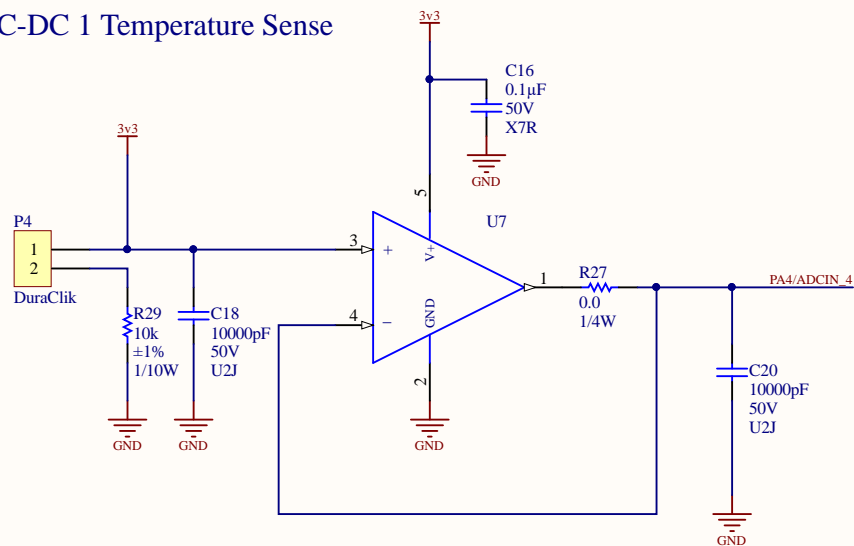
Sheet4 of 7



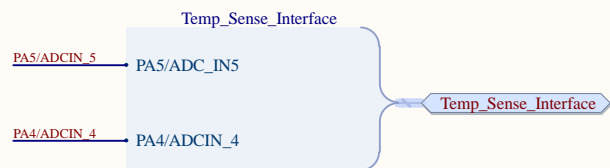
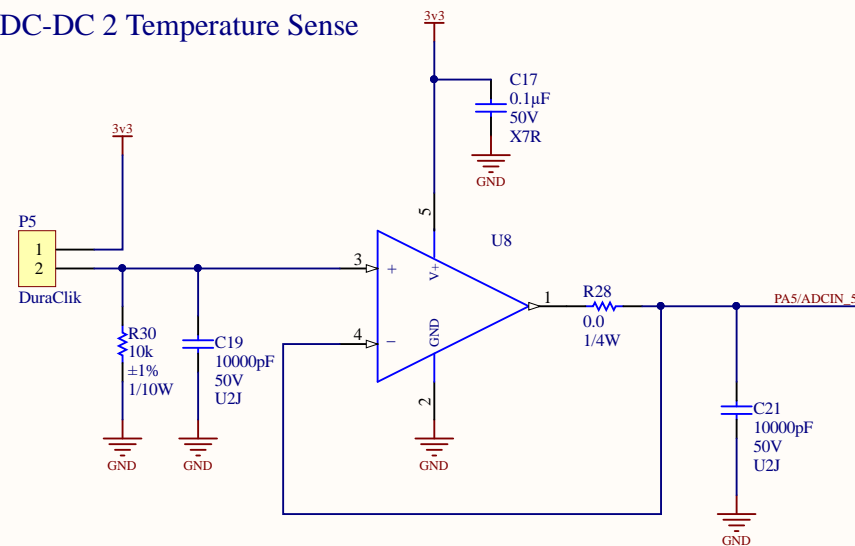
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DC-DC 1 Temperature Sense



DC-DC 2 Temperature Sense



Project: **PowerDistribution.PrjPcb**

Title: **Voltage/Current/Temp Sensing**

Project Lead: Taiping Li

Size: Letter

Revision: 1.5

Date: 5/26/2017

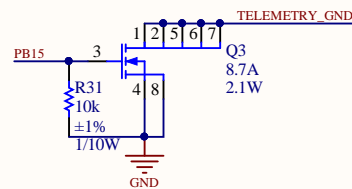
Sheet5 of 7



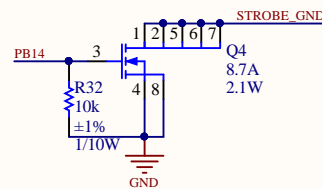
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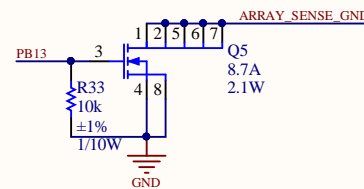
Roof Enclosure



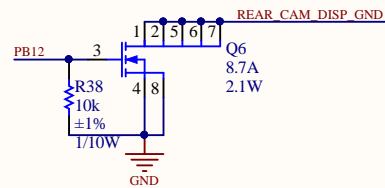
Telemetry (Protected)



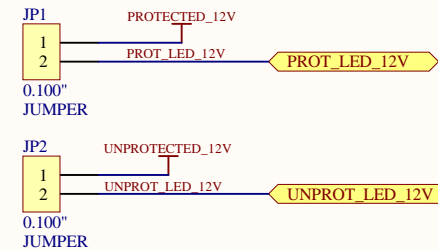
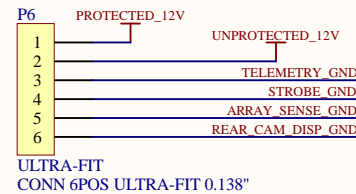
Strobe Light (Protected)



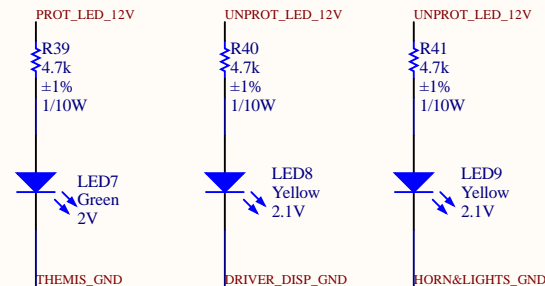
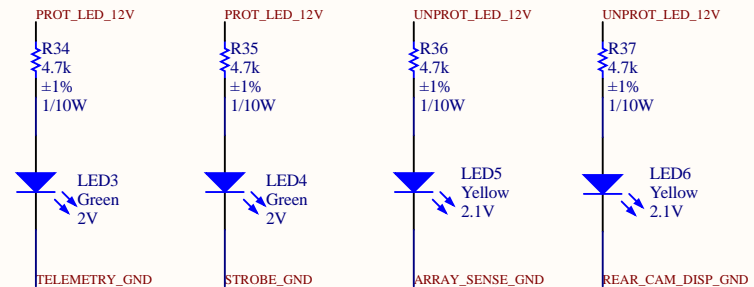
Array Sense (Unprotected)



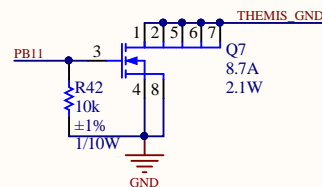
Rear Camera/Disp (Unprotected)



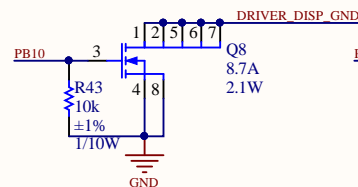
Remove jumpers to disable all LEDs



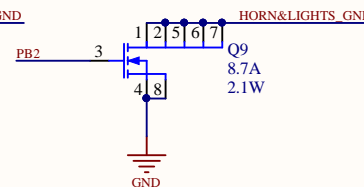
Front Enclosure



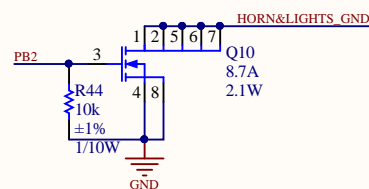
Themis (Protected)



Driver Disp/Rasp Pi (Unprotected)

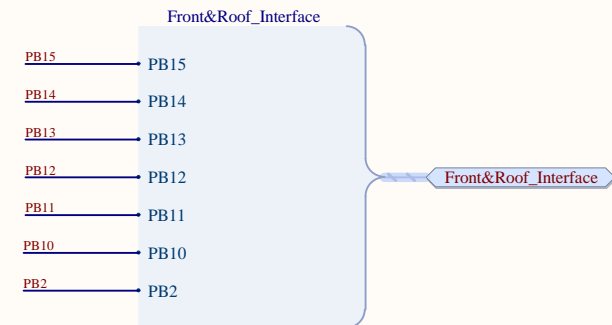
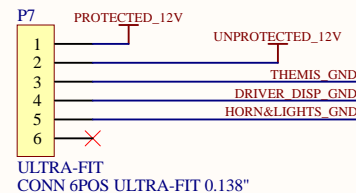



Horn & Lights 1 (Unprotected)

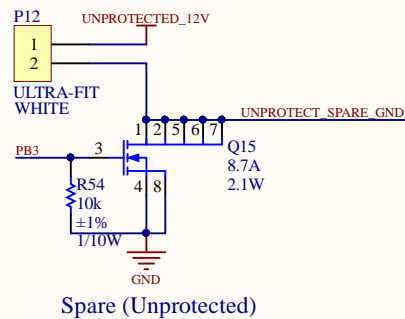
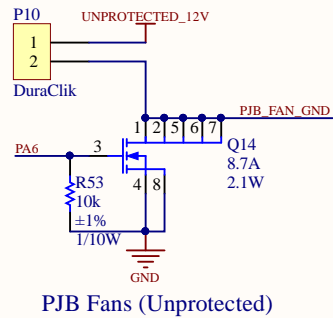
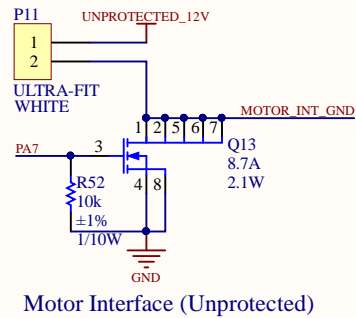
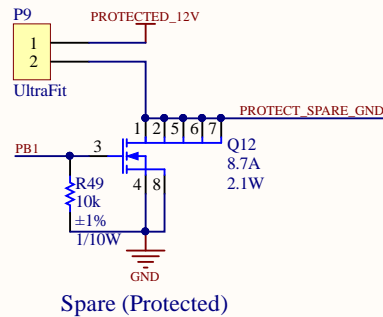
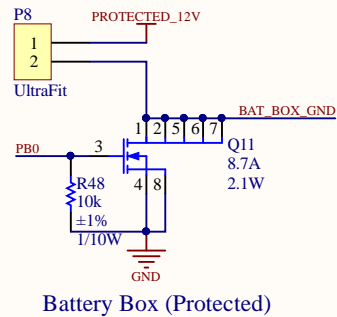


Horn & Lights 2 (Unprotected)

Horn & Lights 1 is in parallel with Horn & Lights 2 for load sharing



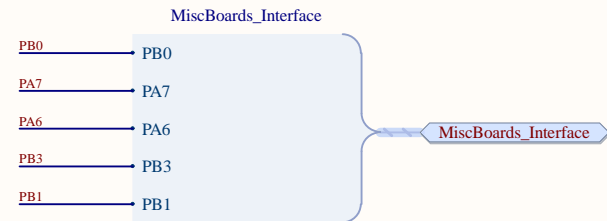
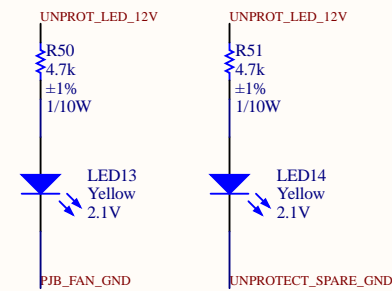
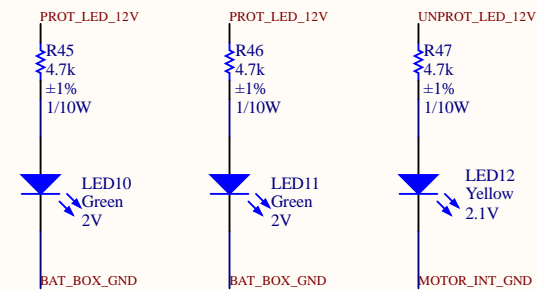
Project: PowerDistribution.PrjPcb		
Title: Front and Roof Enclosure Boards		
Project Lead: Taiping Li		University of Waterloo 200 University Ave W Waterloo, ON, Canada N2L 3E9
Size: Letter	Revision: 1.5	
Date: 5/26/2017	Sheet6 of 7	
		Website: www.uwmidsun.com



White/Natural color for unprotected rail

PROT_LED_12V PROT_LED_12V

UNPROT_LED_12V UNPROT_LED_12V



Project: **PowerDistribution.PrjPcb**

Title: **Misc Boards Switching**

Project Lead: Taiping Li

Size: Letter

Revision: 1.5

Date: 5/26/2017

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MIDNIGHT SUN

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Website: www.uwmidsun.com

Bill of Materials

Source Data From:	PowerDistribution.PrjPcb
Project:	PowerDistribution.PrjPcb
Variant:	None

Creation Date:	5/26/2017	3:30:23 PM
Print Date:	26-May-17	3:30:40 PM

Production Quantity:	1
Currency	<none>

Footprint	Comment	LibRef	Designator	Description	Quantity	#Column Name	#Column Name Error:Supp	#Column Name Error:S	#Column Name Error:R	#Column Name Error:M	#Column Name Error:Manufacturer
CAP, 1210	CAP CER 22UF 16V ±20% X5R 1210	CAP CER 22UF 16V ±20% X5R 1210	C1	22µF ±20% 16V Ceramic Capacitor X5R 1210 (3225 Metric)	1						
CAP ALUM 100UF 50V	CAP ALUM 100UF 20% 50V RADIAL	CAP ALUM 100UF 20% 50V RADIAL	C2	100µF 50V Aluminum Capacitors Radial, Can 74 mOhm @ 100kHz 3000 Hrs @ 105°C	1						
CAP, 0603	CAP CER 0.1UF 50V 10% X7R 0603	CAP CER 0.1UF 50V 10% X7R 0603	C3, C4, C5, C6, C11, C13, C15, C16, C17, C_DNP1, C_DNP2	0.10µF ±10% 50V Ceramic Capacitor X7R 0603 (1608 Metric)	11						
CAP, 0603	CAP CER 10nF 50V 5% X7R 0603	CAP CER 10nF 50V 5% X7R 0603	C7, C8, C9, C10, C12, C14, C18, C19, C20, C21	10000pF ±5% 50V Ceramic Capacitor U2J 0603 (1608 Metric)	10						
DO-214AA Diode	DIODE TVS 15VWM 24.4VC DO-214AA (SMB)	DIODE TVS 15VWM 24.4VC DO-214AA (SMB)	D1, D2	TVS DIODE 15VWM 24.4VC SMB	2						
FUSE ATO/ATC FUSE HOLDER	FUSE ATO FUSE HOLDER 10A	FUSE ATO FUSE HOLDER 10A	F1	Fuse Block 30A 500V 1 Circuit Blade PCB	1						
FUSE ATO/ATC FUSE HOLDER	FUSE ATO FUSE HOLDER 10A	FUSE ATO FUSE HOLDER 10A	F2	Fuse Block 30A 500V 1 Circuit Blade PCB	1						
CONN 2POS JUMPER 0.1"	JUMPER JUMPER 0.1"	JUMPER JUMPER 0.1"	JP1, JP2	2 Positions Header Connector Through Hole Gold	2						
LED_0603	LED GREEN CLEAR 2V 0603	LED GREEN CLEAR 2V 0603	LED1, LED3, LED4, LED7, LED10, LED11	Green 572nm LED Indication - Discrete 2V 0603 (1608 Metric)	6						
LED_0603	LED YELLOW CLEAR 2.1V 0603	LED YELLOW CLEAR 2.1V 0603	LED2, LED5, LED6, LED8, LED9, LED12, LED13, LED14	LED2, LED5, LED6, LED8, LED9, LED12, LED13, LED14	8						
CONN, Bergstak 50 Pos Plug	CONN 50POS Bergstak Plug 0.02"	CONN 50POS Bergstak Plug 0.02"	P1	50 Position Connector Plug, Outer Shroud Contacts Surface Mount Gold	1						
CONN, 6POS ULTRA-FIT	CONN 6POS ULTRA-FIT 0.138"	CONN 6POS ULTRA-FIT 0.138"	P2, P6, P7		3						
CONN, 2POS ULTRA-FIT	CONN 2POS ULTRA-FIT 0.138"	CONN 2POS ULTRA-FIT 0.138"	P3, P8, P9	2 Positions Header, Shrouded Connector 0.138" (3.50mm) Through Hole Gold	3						
CONN, 2POS Dura Click	CONN 2POS DURA-CLICK 0.079"	CONN 2POS DURA-CLICK 0.079"	P4, P5, P10	2 Positions Header, Shrouded Connector 0.079" (2.00mm) Surface Mount, Right Angle Tin	3						
CONN, 2POS ULTRA-FIT NATURAL COLOR	CONN 2POS ULTRA-FIT NATURAL COLOR 0.138"	CONN 2POS ULTRA-FIT NATURAL COLOR 0.138"	P11, P12	2 Positions Header, Shrouded Connector 0.138" (3.50mm) Through Hole	2						
SOIC8	MOSFET DUAL P-CH 40V 8A 3.2W 8-SOIC	MOSFET DUAL P-CH 40V 8A 3.2W 8-SOIC	Q1, Q2	Mosfet Array 2 P-Channel (Dual) 40V 8A 3.2W Surface Mount B	2						
MOSFET N-CH 30V 12A 2mmx2mm PQFN RES 2010	MOSFET N-CH 30V 8.7A 2.1W 5-PQFN (2x2) RES 0.003 OHM 1% 1.5W 2010	MOSFET N-CH 30V 8.7A 2.1W 5-PQFN (2x2) RES 0.003 OHM 1% 1.5W 2010	Q3, Q4, Q5, Q6, Q7, Q8, Q9, Q10, Q11, Q12, Q13, Q14, Q15		13						
RES 1206	RES 0.006 OHM 1% 1/2W 1206	RES 0.006 OHM 1% 1/2W 1206	R1	0.003 Ohm ±1% 1.5W Chip Resistor 2010 (5025 Metric) Current Sense, Moisture Resistant Metal Foil	1						
RES, 0603	RES 1M OHM 1% 1/10W 0603	RES 0.006 OHM 1% 1/2W 1206	R2	0.006 Ohm ±1% 0.5W, 1/2W Chip Resistor 1206 (3216 Metric) Automotive AEC-Q200, Current Sense, Moisture Resistant Metal Element	1						
RES, 0603	RES 11.8K OHM 1% 1/10W 0603	RES 1M OHM 1% 1/10W 0603	R3, R8	1M Ohm ±1% 0.1W, 1/10W Chip Resistor 0603 (1608 Metric) Moisture Resistant Thick Film	2						
RES, 0603	RES 86.6K OHM 1% 1/10W 0603	RES 11.8K OHM 1% 1/10W 0603	R4	11.8K Ohm ±1% 0.1W, 1/10W Chip Resistor 0603 (1608 Metric) Moisture Resistant Thick Film	1						
RES, 0603	RES 10K OHM 1% 1/10W 0603	RES 86.6K OHM 1% 1/10W 0603	R5	86.6K Ohm ±1% 0.1W, 1/10W Chip Resistor 0603 (1608 Metric) Automotive AEC-Q200 Thick Film	1						
RES, 0603	RES 4.7K OHM 1% 1/10W 0603	RES 10K OHM 1% 1/10W 0603	R6, R7, R29, R30, R31, R32, R33, R38, R42, R43, R44, R48, R49, R52, R53, R54	RES SMD 10K OHM 1% 1/10W 0603	16						
RES, 0603	RES 54.9K OHM 1% 1/10W 0603	RES 4.7K OHM 1% 1/10W 0603	R9, R10, R34, R35, R36, R37, R39, R40, R41, R45, R46, R47, R50, R51	4.7K Ohm ±1% 0.1W, 1/10W Chip Resistor 0603 (1608 Metric) Moisture Resistant Thick Film	14						
RES, 0603	RES 78.7K OHM 1% 1/10W 0603	RES 54.9K OHM 1% 1/10W 0603	R11	54.9K Ohm ±1% 0.1W, 1/10W Chip Resistor 0603 (1608 Metric) Automotive AEC-Q200 Thick Film	1						
RES, 0603	RES 255K OHM 1% 1/10W 0603	RES 78.7K OHM 1% 1/10W 0603	R12	78.7K Ohm ±1% 0.1W, 1/10W Chip Resistor 0603 (1608 Metric) Automotive AEC-Q200 Thick Film	1						
RES, 0603	RES 470K OHM 1% 1/4W 0603	RES 255K OHM 1% 1/10W 0603	R13	255K Ohm ±1% 0.1W, 1/10W Chip Resistor 0603 (1608 Metric) Moisture Resistant Thick Film	1						
RES, 0603	RES 0.0 OHM 1/4W 0603	RES 470K OHM 1% 1/4W 0603	R14, R15, R20, R22	RES SMD 470K OHM 1% 1/4W 0603	4						
RES, 0603	RES 140K OHM 1% 1/10W 0603	RES 0.0 OHM 1/4W 0603	R16, R17, R21, R23, R24, R25, R26, R27, R28	RES SMD 0.0 OHM JUMPER 1/4W 0603	9						
IC OR CTRLR SRC SELECT 24SSOP	IC OR CONTROLLER SOURCE SELECT 24SSOP	IC OR CONTROLLER SOURCE SELECT 24SSOP	U1	OR Controller Source Selector Switch P- Channel 3:1 24-SSOP	1						
IC OP AMP GP RR 10MHZ SOT-23-5	IC OP AMP GEN PURPOSE RR 10MHZ SOT-23- 5	IC OP AMP GEN PURPOSE RR 10MHZ SOT-23- 5	U2, U3, U4, U7, U8	General Purpose Amplifier 1 Circuit Rail-to- Rail SOT-23-5	5						
IC OP AMP CURR SENSE 80KHZ SC70-6	IC CURRENT AMPLIFIER SC70-6	IC CURRENT AMPLIFIER SC70-6	U5, U6	Current Sense Amplifier 1 Circuit SC-70-6	2						
					132					\$	-

Approved	Notes	