

A

A

B

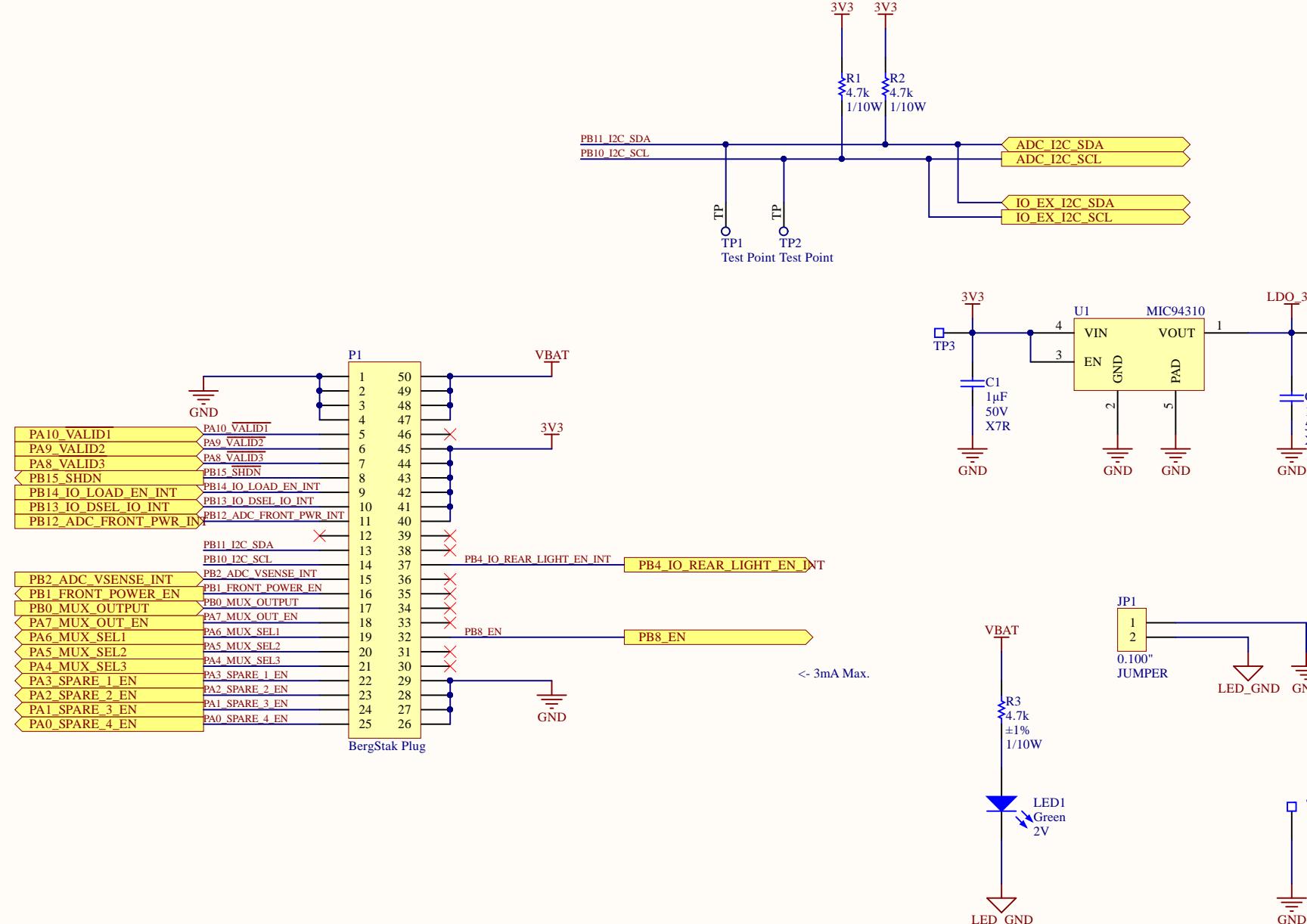
B

C

C

D

D

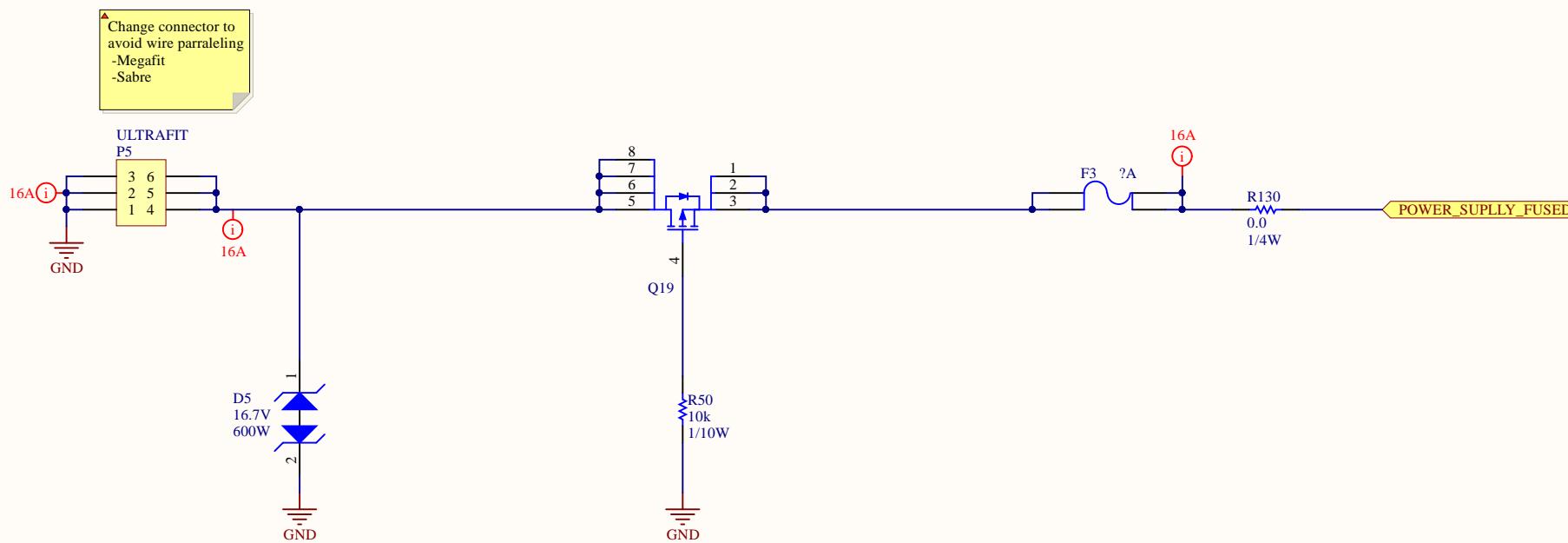


PROJECT	MSXIV_RearPowerDistribution.PjrPcb	MIDNIGHT SUN
DOCUMENT	Controller Board Interface	
PART NUMBER	VARIANT [No Variations]	
DRAWN BY	REVISION	
LAST MODIFIED	2019-09-15	
SHEET	1 OF 13	

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hardware@uwmidsun.com

A

A



B

B

C

C

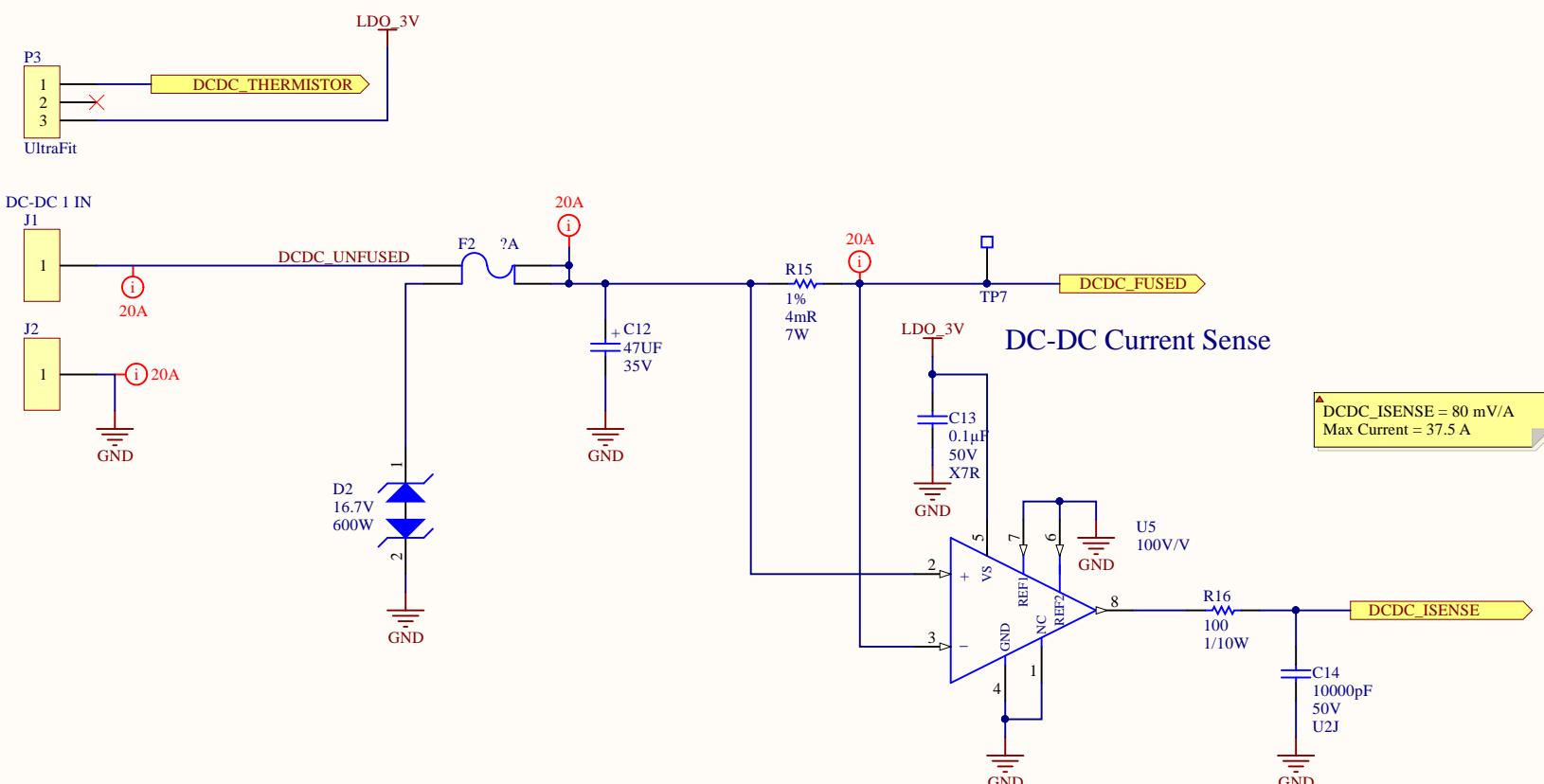
D

D

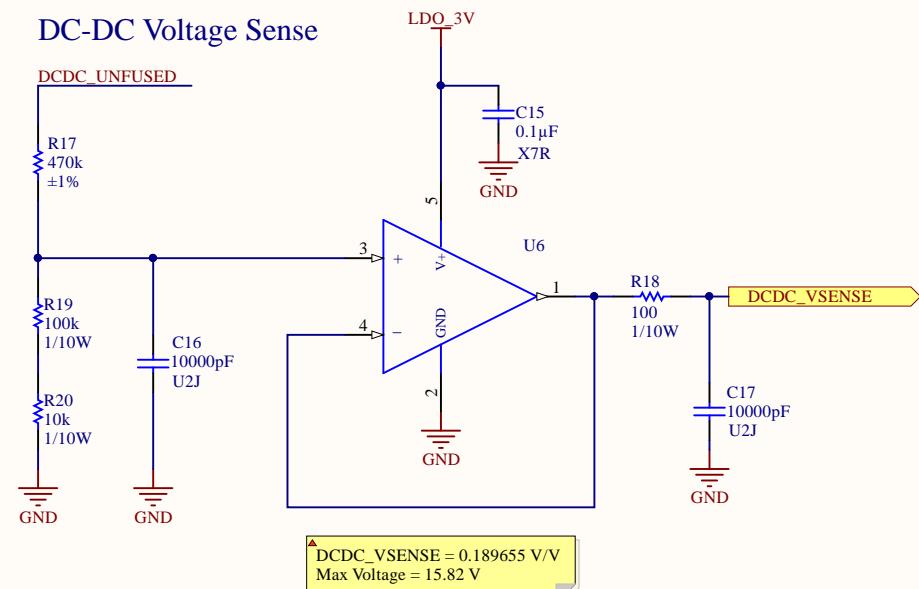
PROJECT	MSXIV_RearPowerDistribution.PrjPcb	MIDNIGHT SUN
DOCUMENT	Title	
PART NUMBER	VARIANT [No Variations]	
DRAWN BY	REVISION	
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A



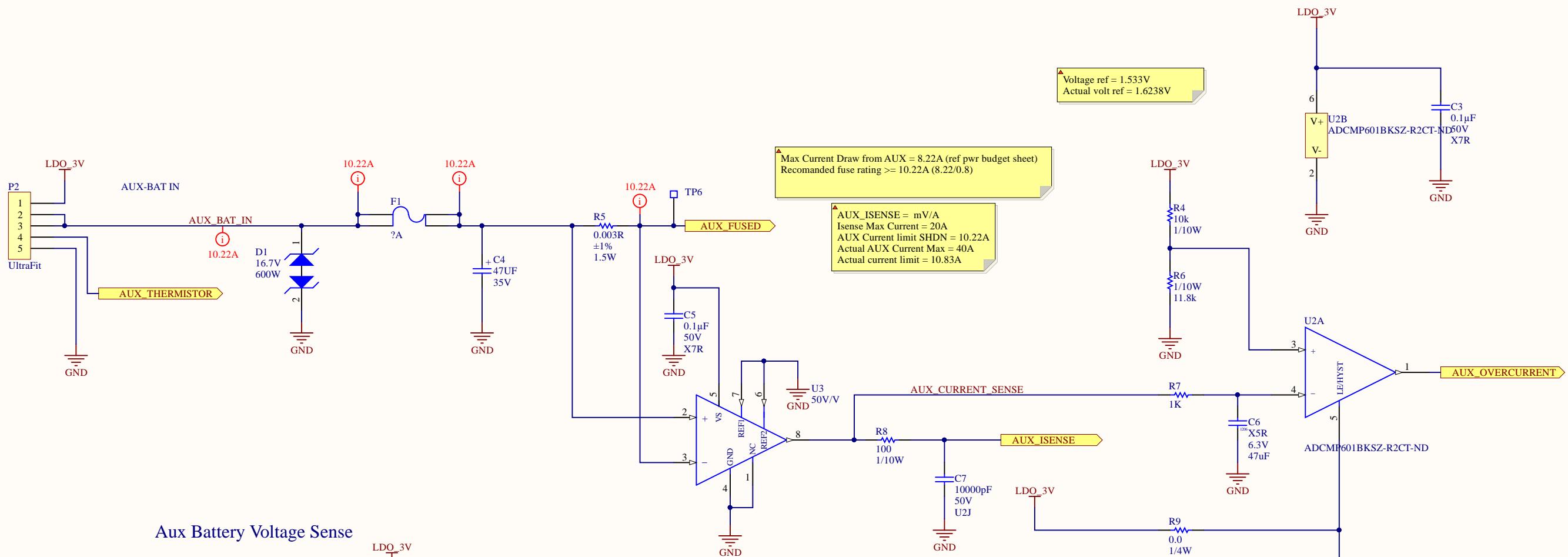
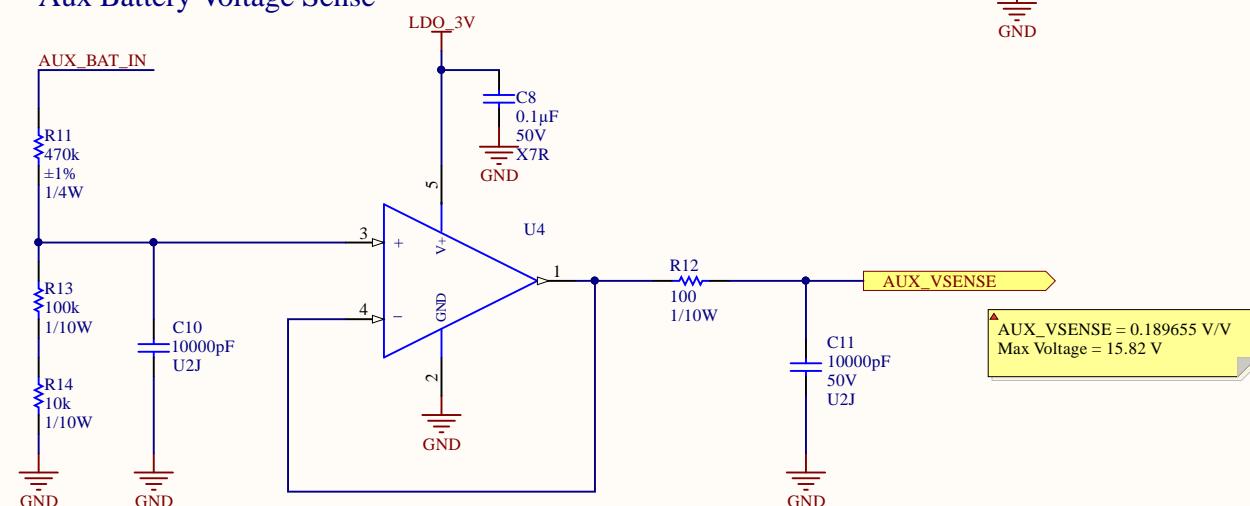
B

**DC-DC Voltage Sense**

D

PROJECT	MSXIV_RearPowerDistribution.PjrPcb	MIDNIGHT SUN
DOCUMENT	DC-DC Sense	
PART NUMBER	VARIANT [No Variations]	
DRAWN BY	REVISION	
LAST MODIFIED	2019-09-15	SHEET 3 OF 13

A

**Aux Battery Voltage Sense**

AUX\_VSENSE = 0.189655 V/V  
Max Voltage = 15.82 V

PROJECT	MSXIV_RearPowerDistribution.PnjPcb
DOCUMENT	AUX Sense
PART NUMBER	VARIANT [No Variations]
DRAWN BY	REVISION
LAST MODIFIED	2019-09-15
SHEET	4 OF 13

A

A

B

B

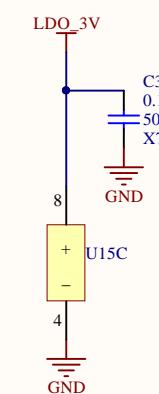
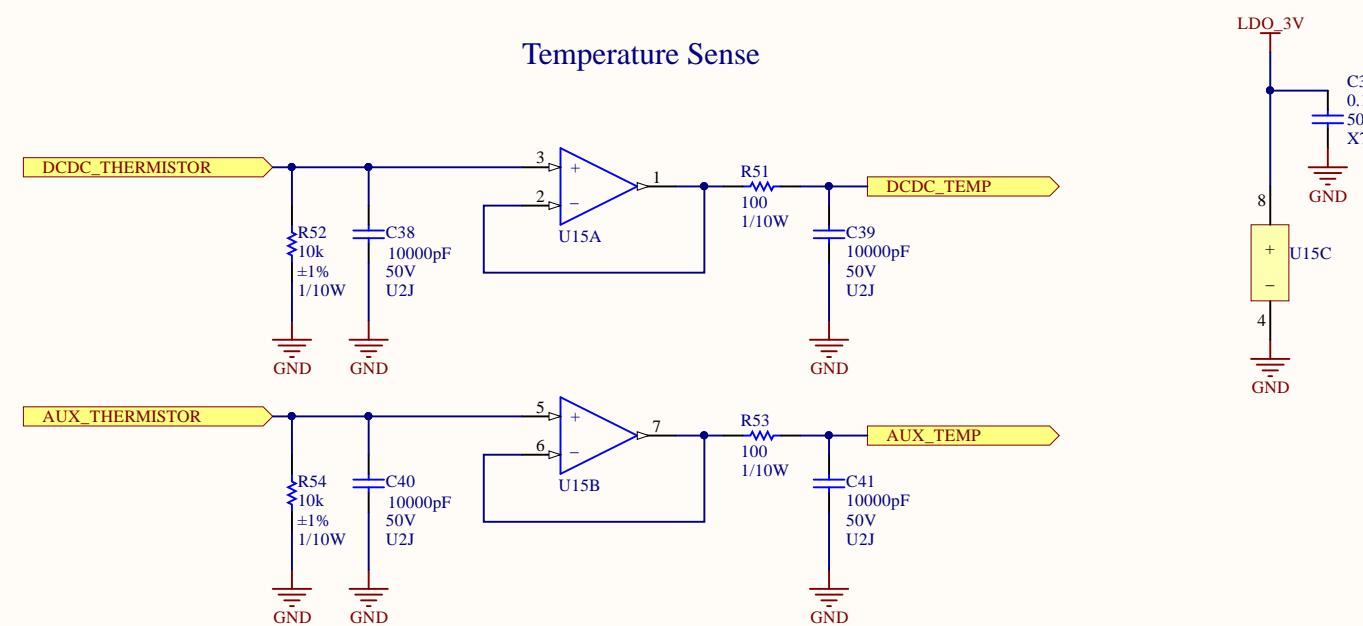
C

C

D

D

### Temperature Sense



Be aware that there will be two general purpose amp as dc/dc and aux both uses this design, please make sure does this part belong in main schematic or stays here.

PROJECT MSXIV\_RearPowerDistribution.PnjPcb

DOCUMENT Temperature Sense

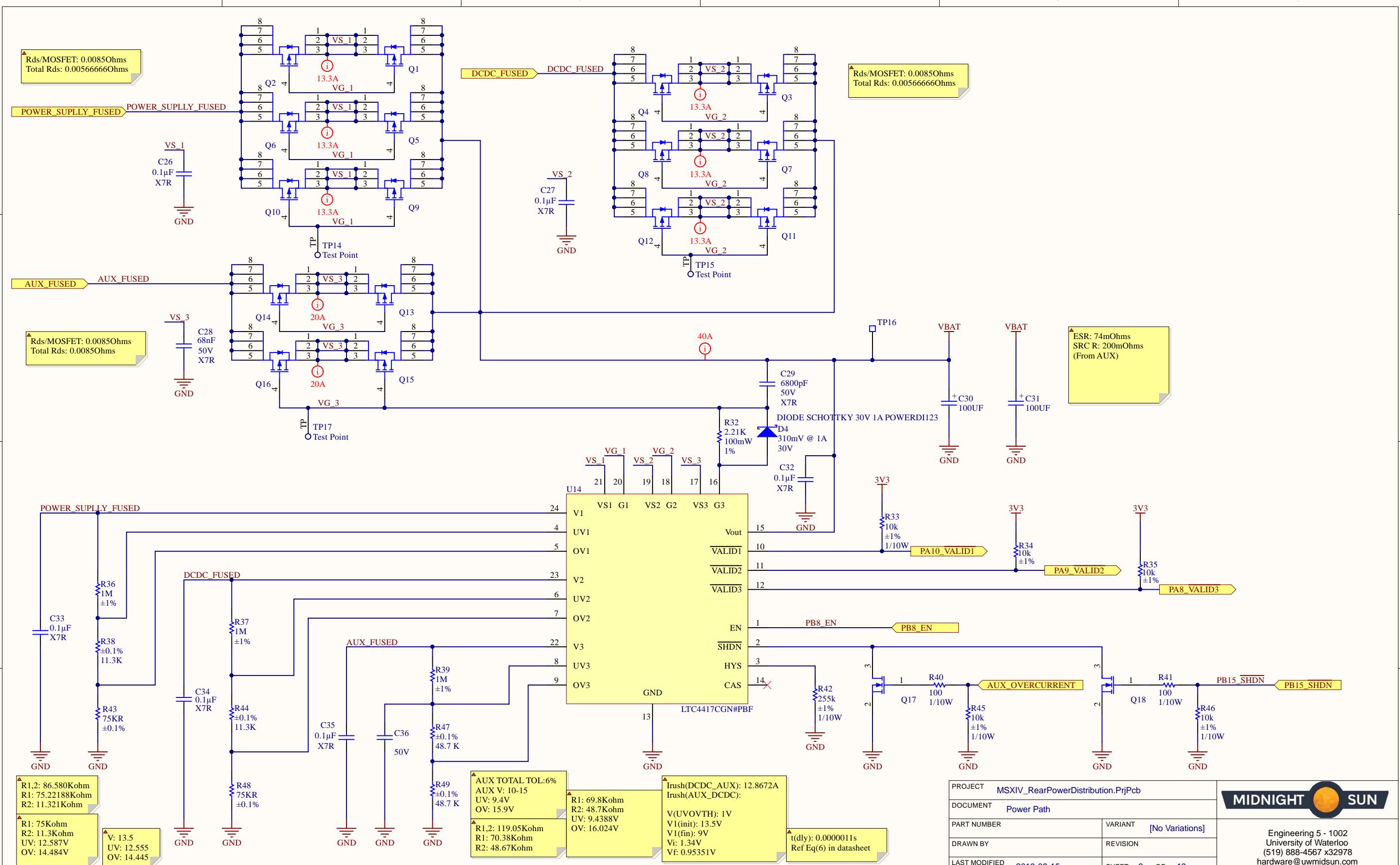
PART NUMBER      VARIANT [No Variations]

DRAWN BY      REVISION

LAST MODIFIED 2019-09-15      SHEET 5 OF 13

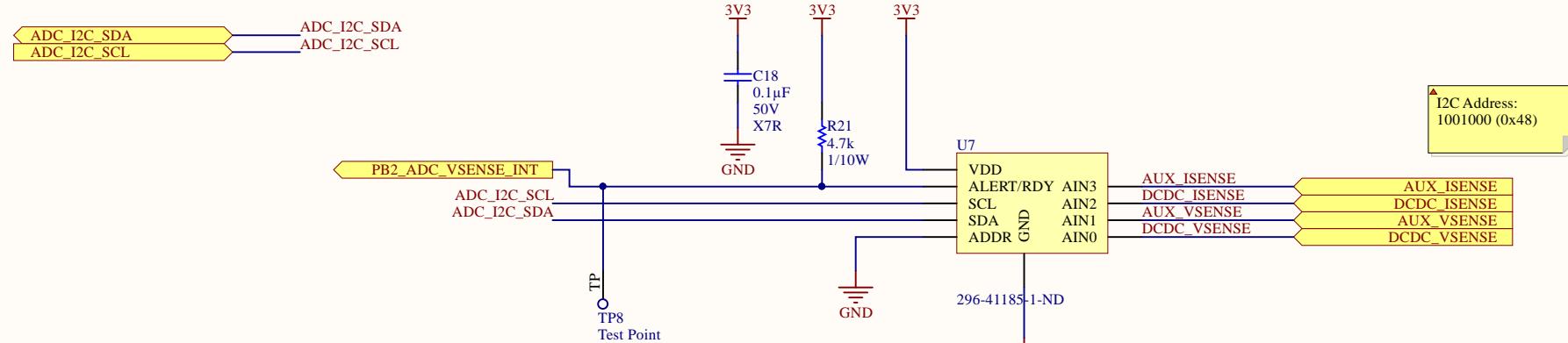


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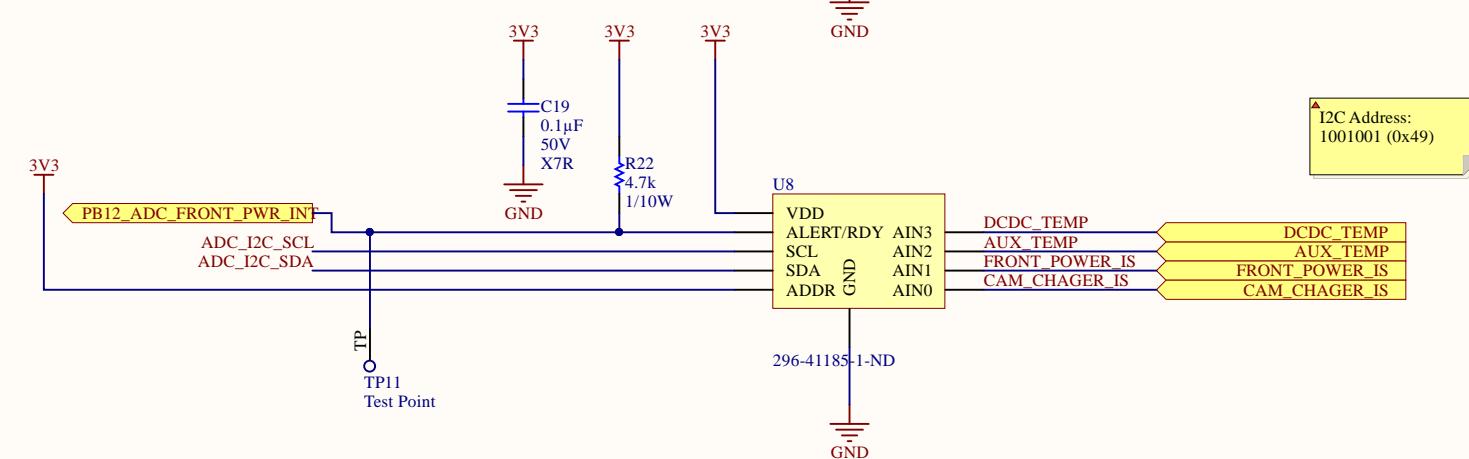


A

## ADC

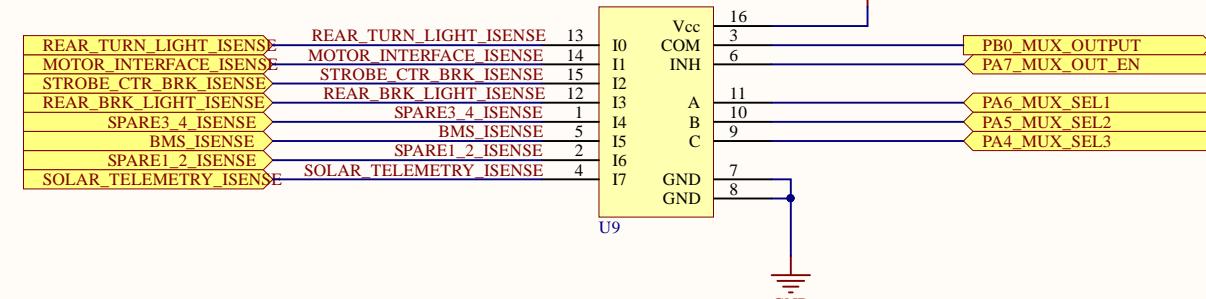


B



C

## Multiplexer



PROJECT MSXIV\_RearPowerDistribution.PnjPcb

DOCUMENT External ADC

PART NUMBER      VARIANT [No Variations]

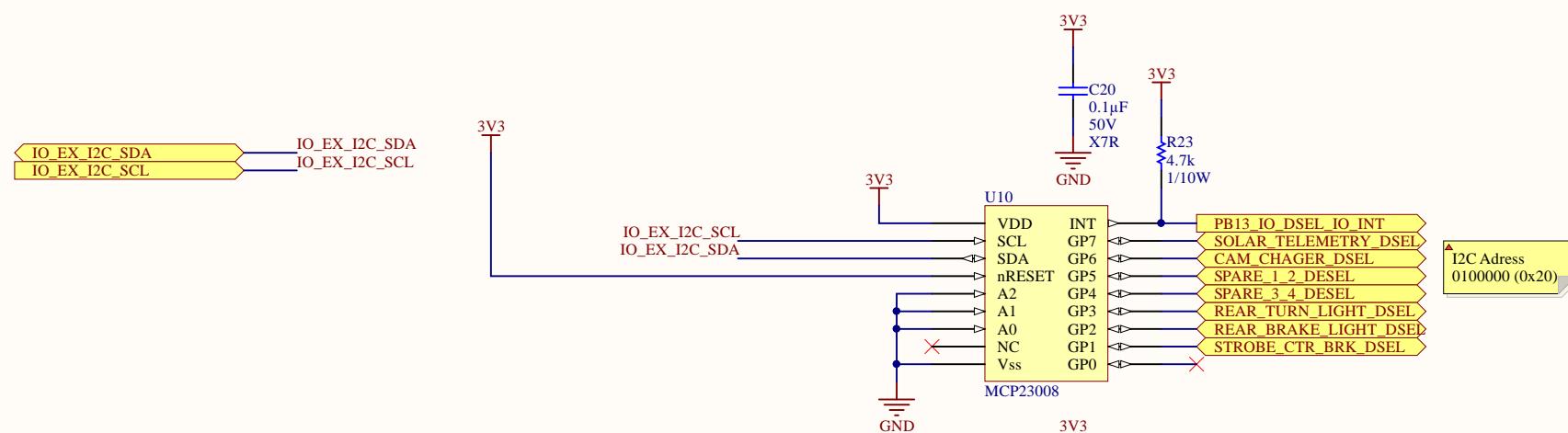
DRAWN BY      REVISION

LAST MODIFIED 2019-09-15      SHEET 7 OF 13

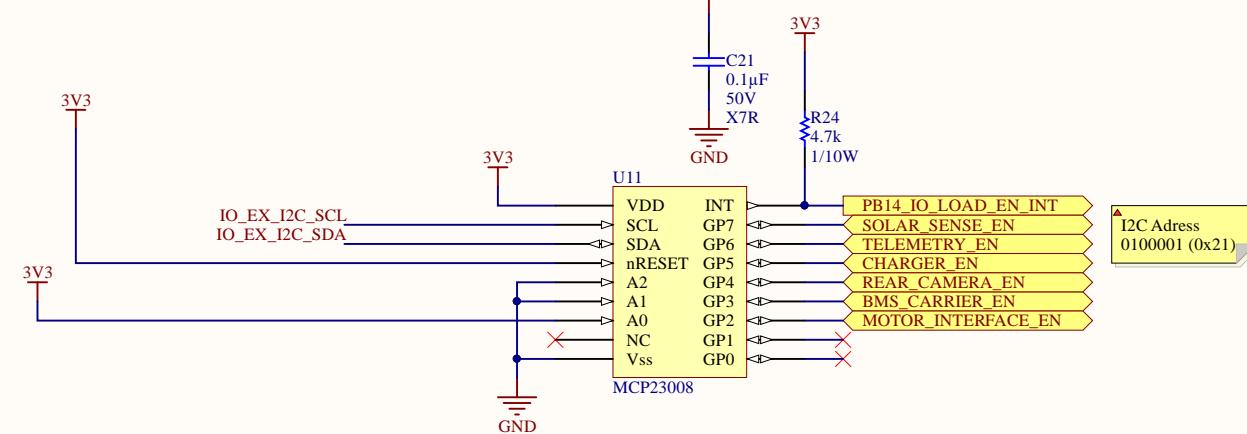


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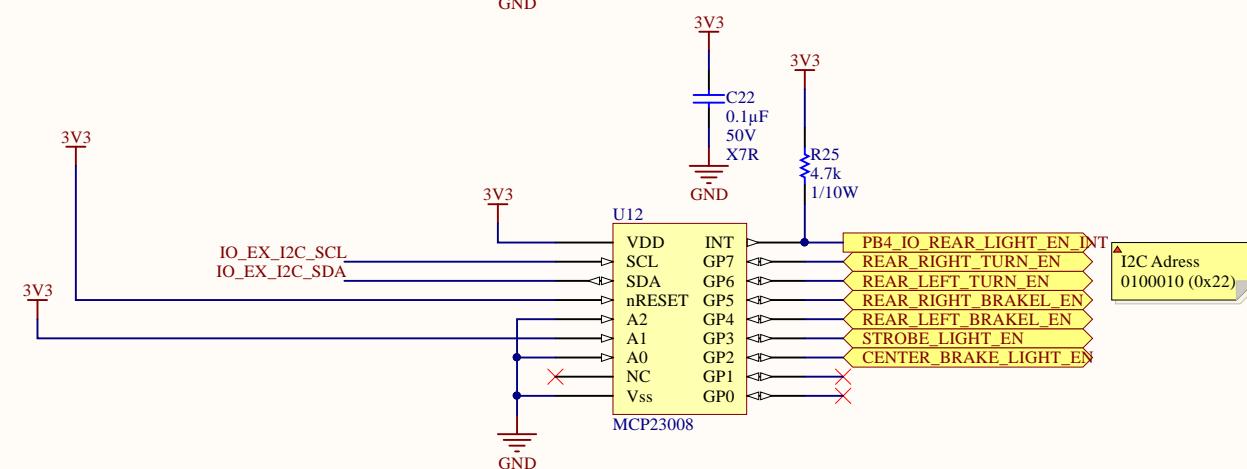
A



B

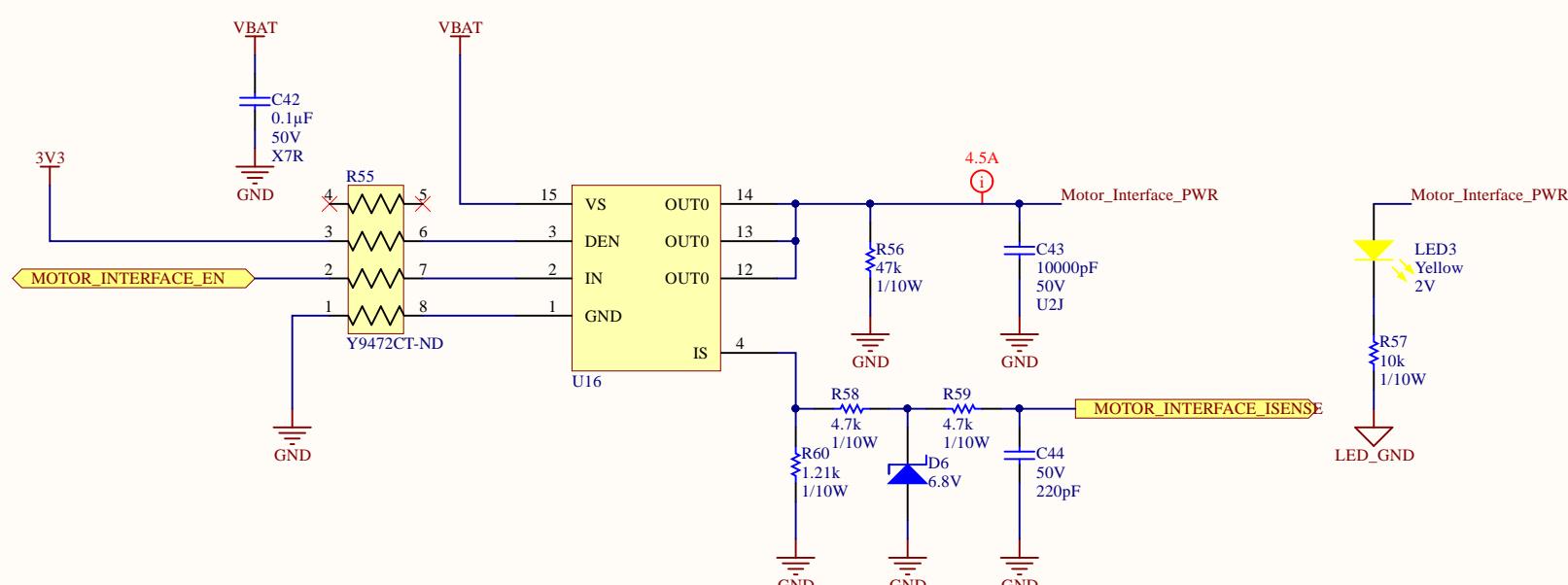


C

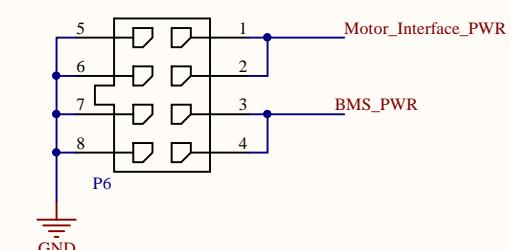
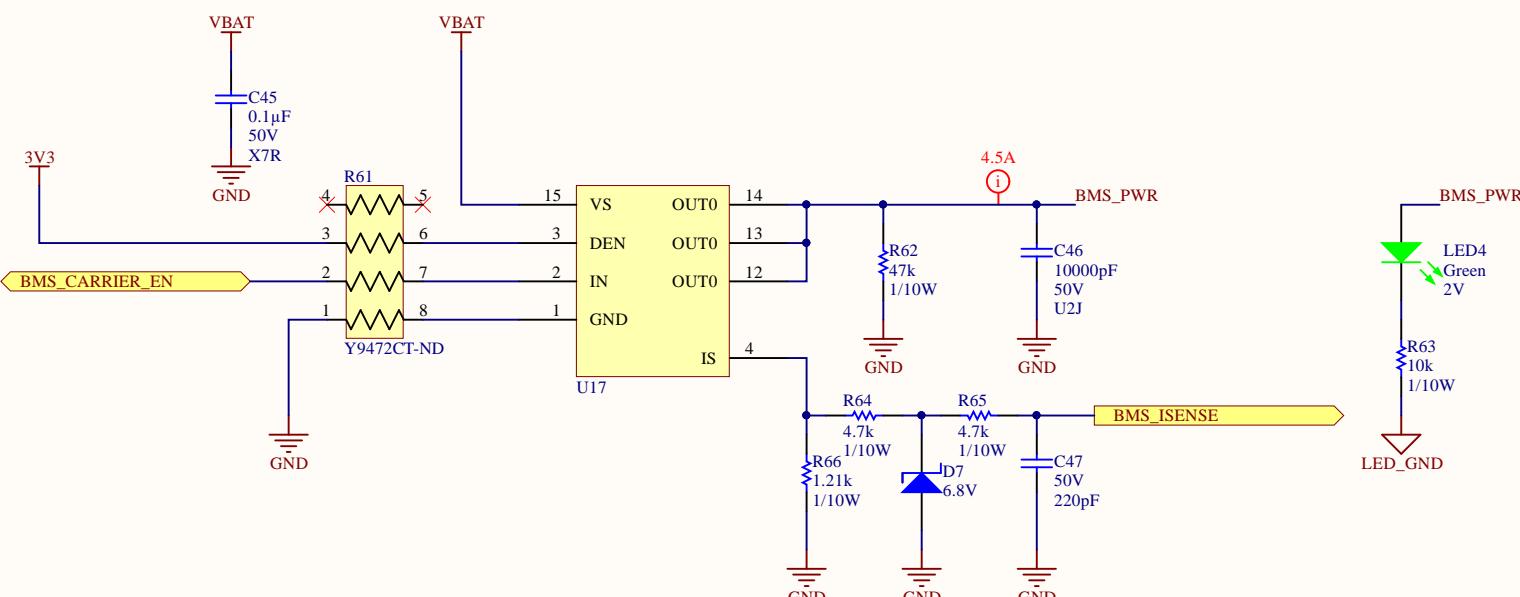


PROJECT	MSXIV_RearPowerDistribution.PjrPcb	MIDNIGHT SUN
DOCUMENT	Title	
PART NUMBER	VARIANT [No Variations]	
DRAWN BY	REVISION	
LAST MODIFIED	2019-09-15	SHEET 8 OF 13

## Motor Interface



## BMS



▲ Use 18 AWG wires

PROJECT MSXIV\_RearPowerDistribution.PjrPcb

DOCUMENT Title

PART NUMBER VARIANT [No Variations]

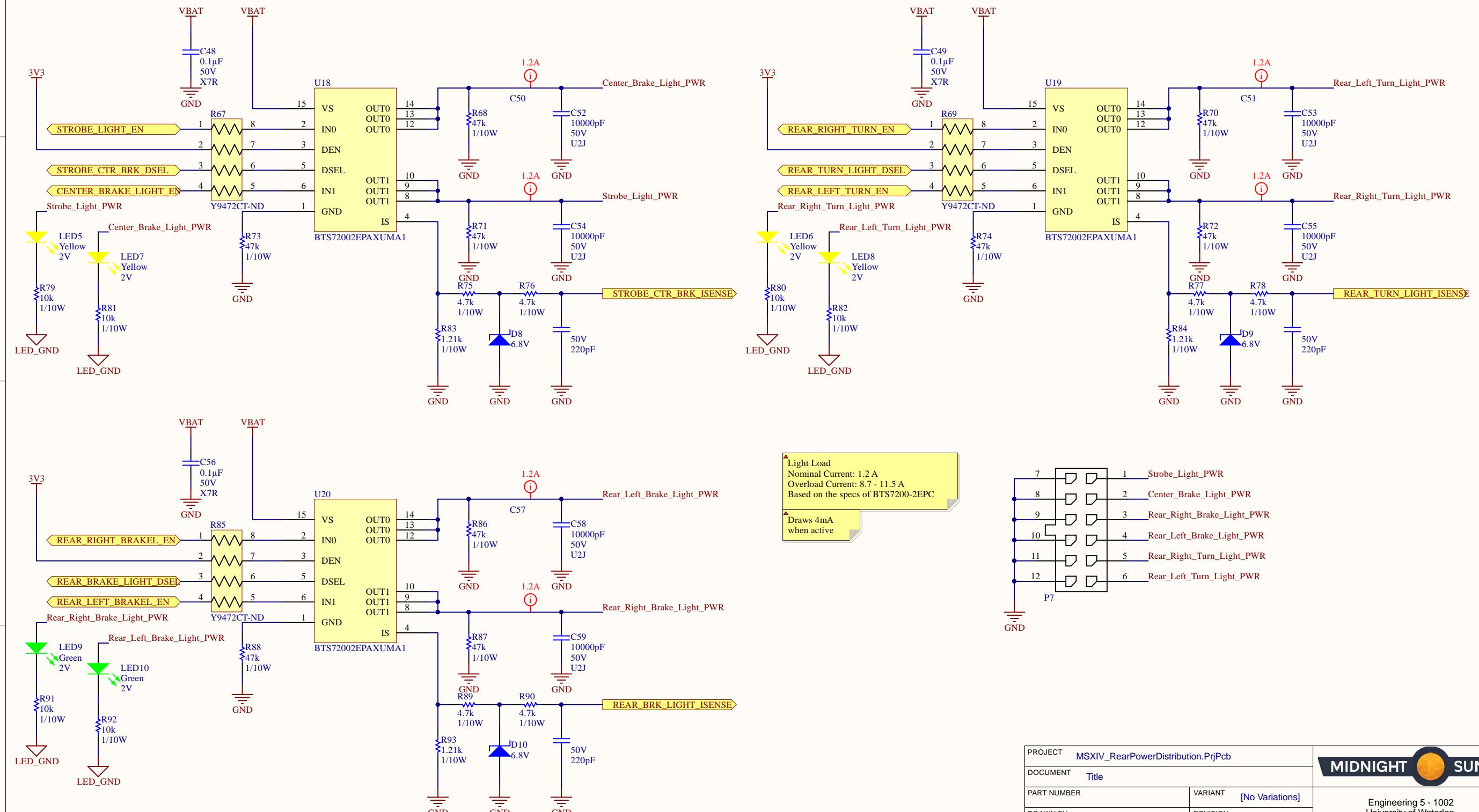
DRAWN BY REVISION

LAST MODIFIED 2019-09-15 SHEET 9 OF 13

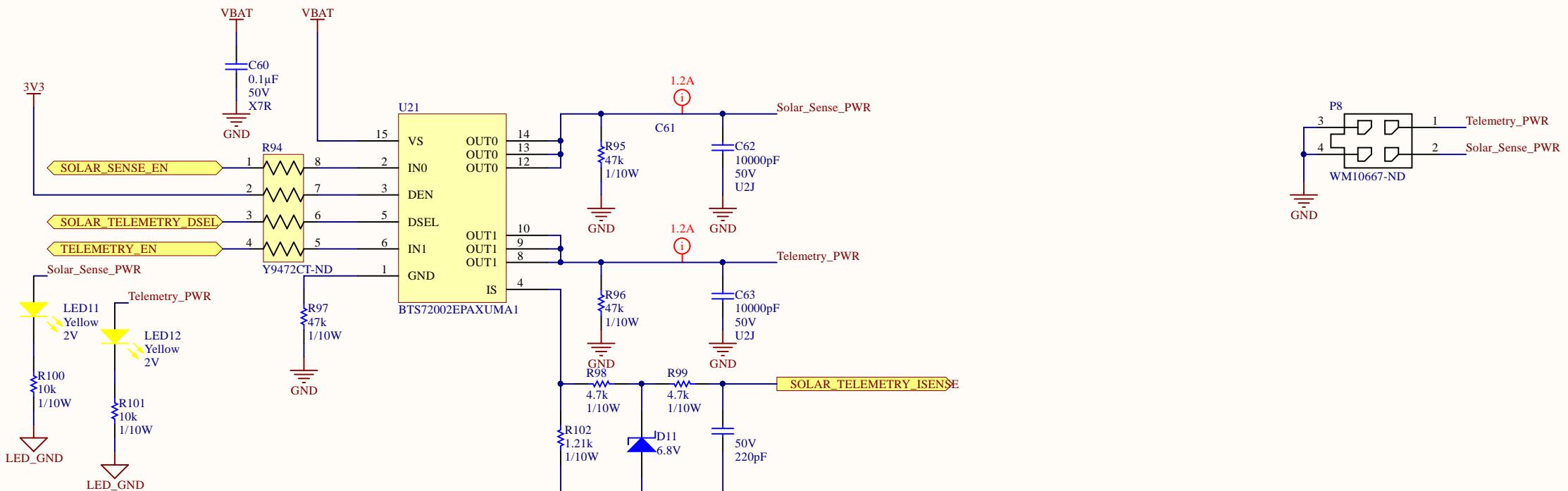
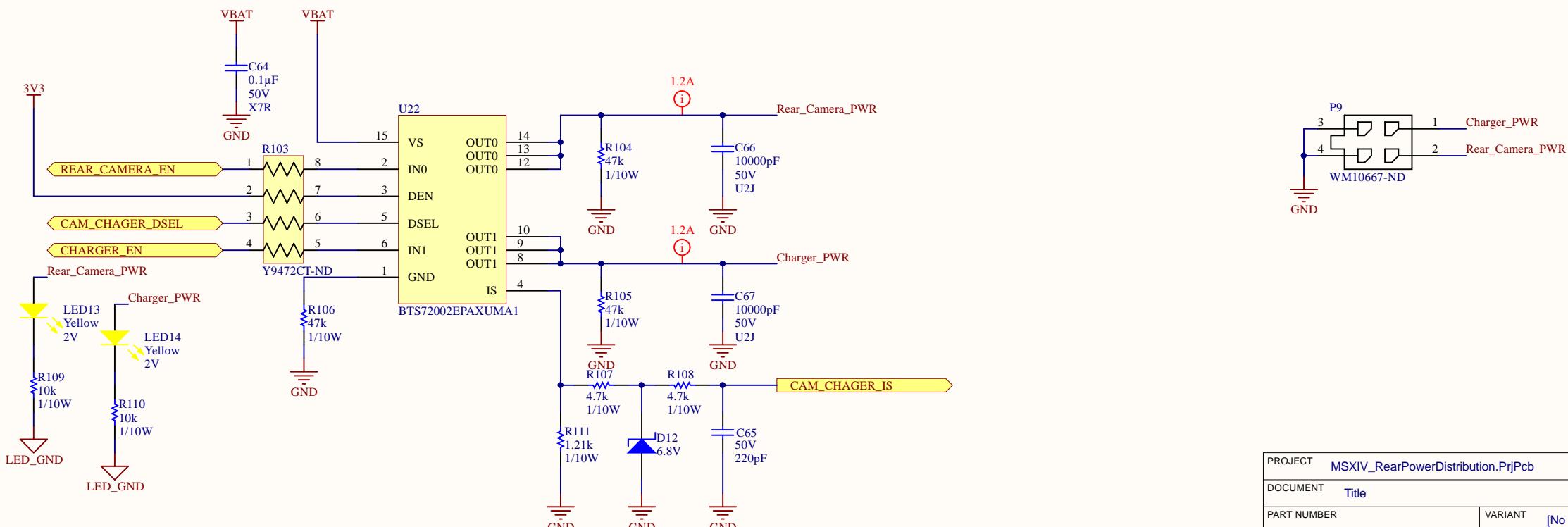


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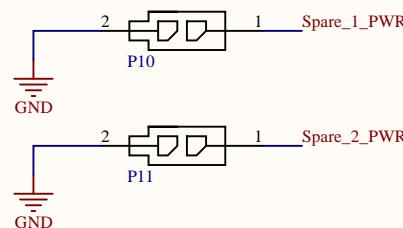
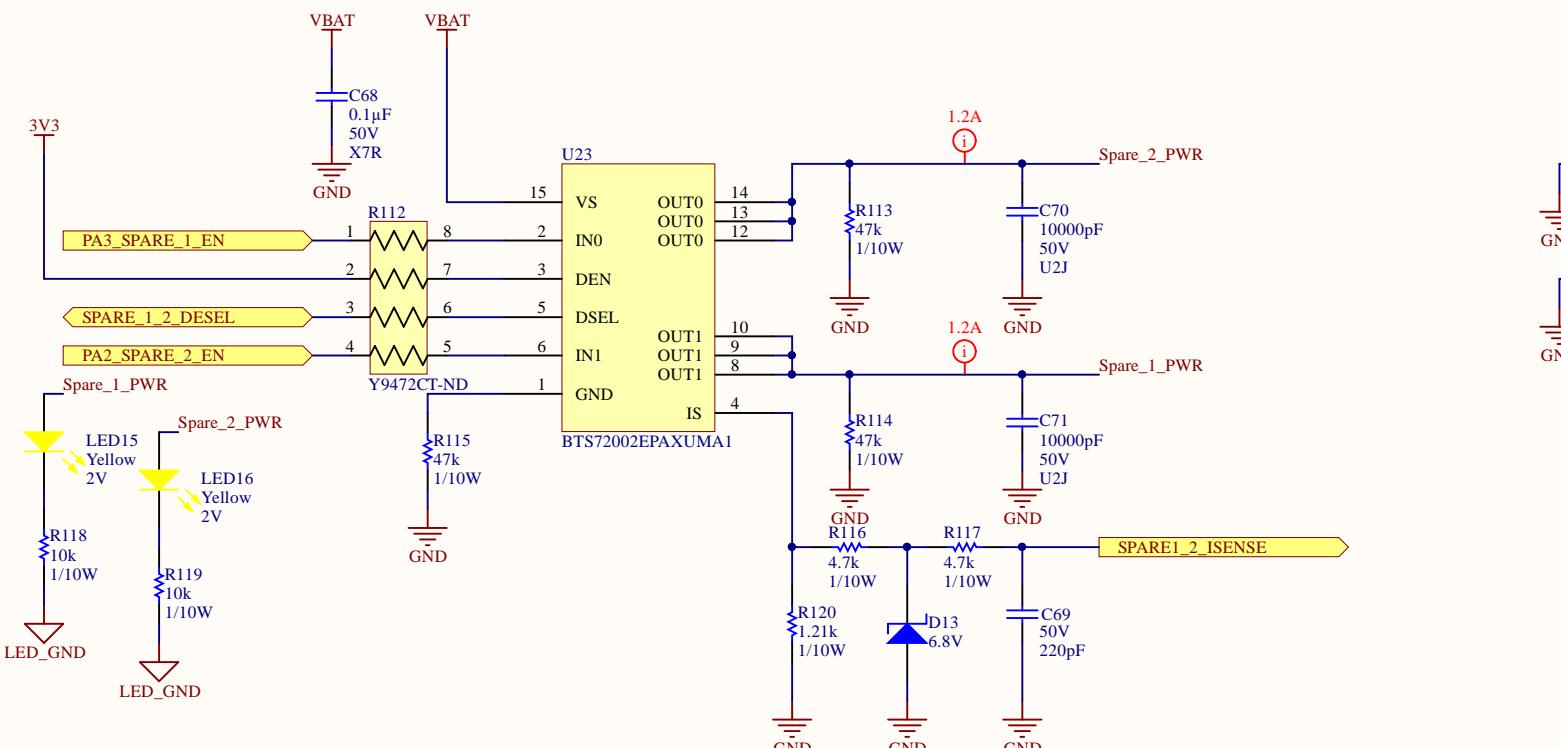
## Rear light



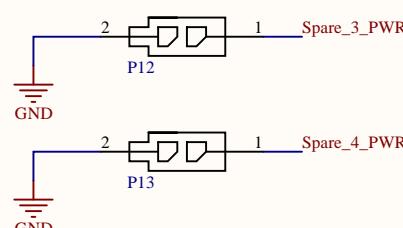
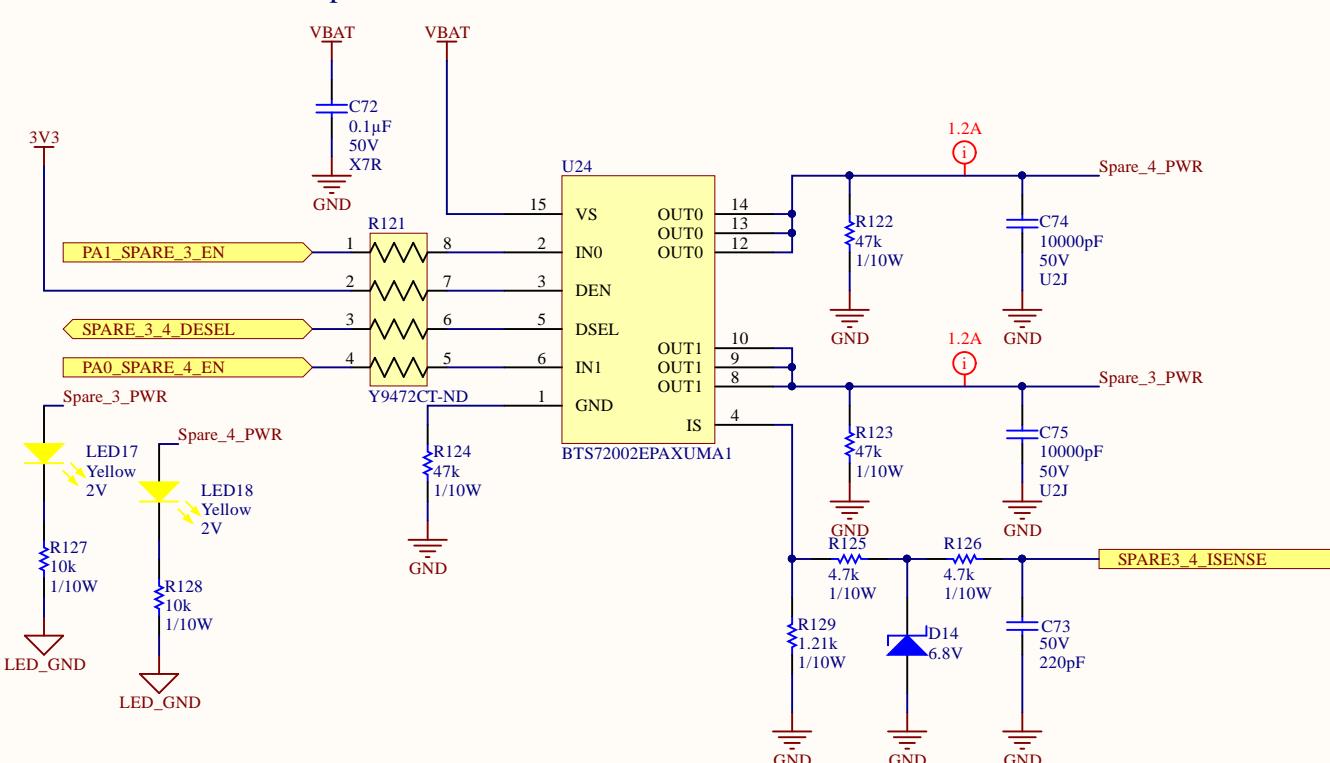
PROJECT	MSXIV_RearPowerDistribution.PnjPcb	MIDNIGHT SUN
DOCUMENT	Title	
PART NUMBER	VARIANT [No Variations]	
DRAWN BY	REVISION	
LAST MODIFIED	2019-09-15	SHEET 10 OF 13

**Solar Sense and Telemetry****Rear Camera and Charger**

## Spare 1 and 2

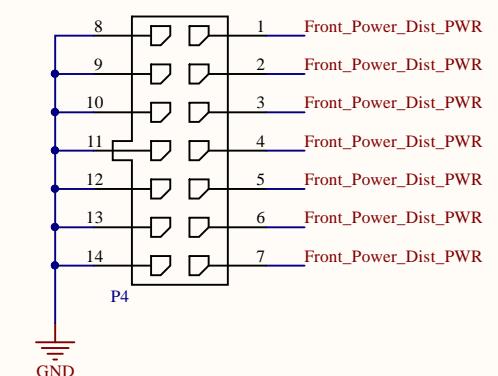
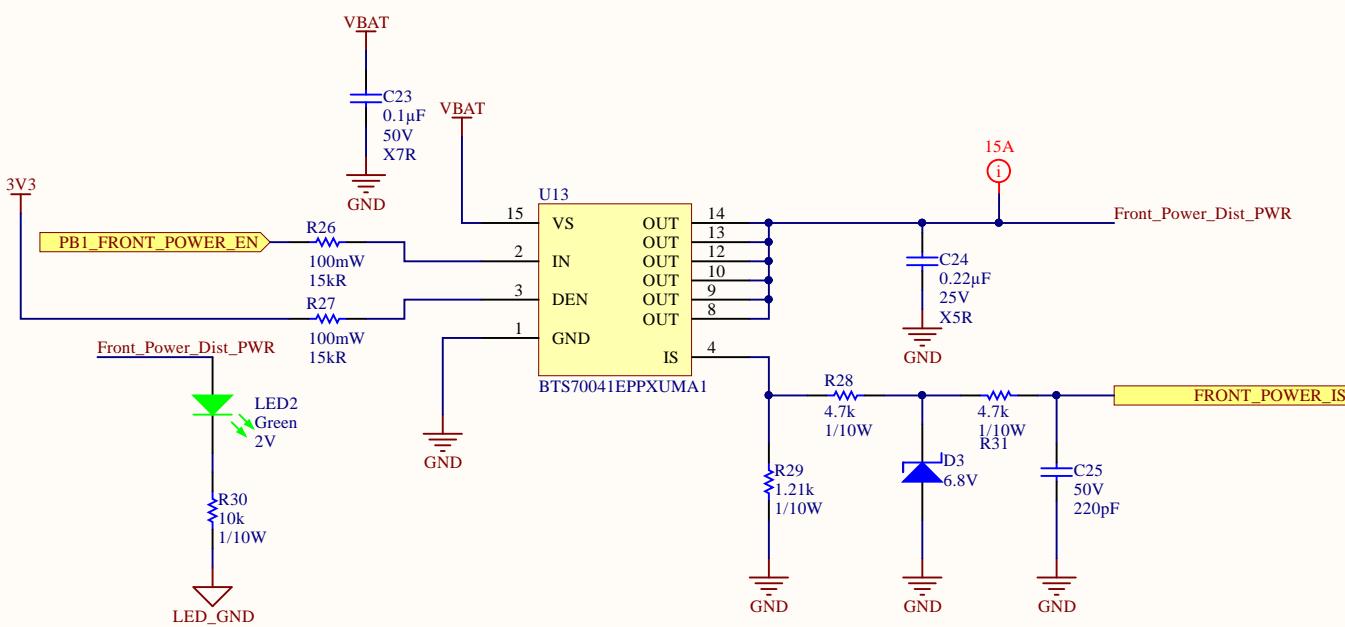


## Spare 3 and 4



PROJECT	MSXIV_RearPowerDistribution.PrjPcb	 MIDNIGHT SUN
DOCUMENT	Title	
PART NUMBER	VARIANT [No Variations]	
DRAWN BY	REVISION	
LAST MODIFIED	2019-09-15	SHEET 12 OF 13

A



B

PROJECT	MSXIV_RearPowerDistribution.PjPcb	<b>MIDNIGHT SUN</b>
DOCUMENT	Output to Front Power Distribution	
PART NUMBER	VARIANT [No Variations]	
DRAWN BY	REVISION	

LAST MODIFIED 2019-09-15 SHEET 13 OF 13

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C

C

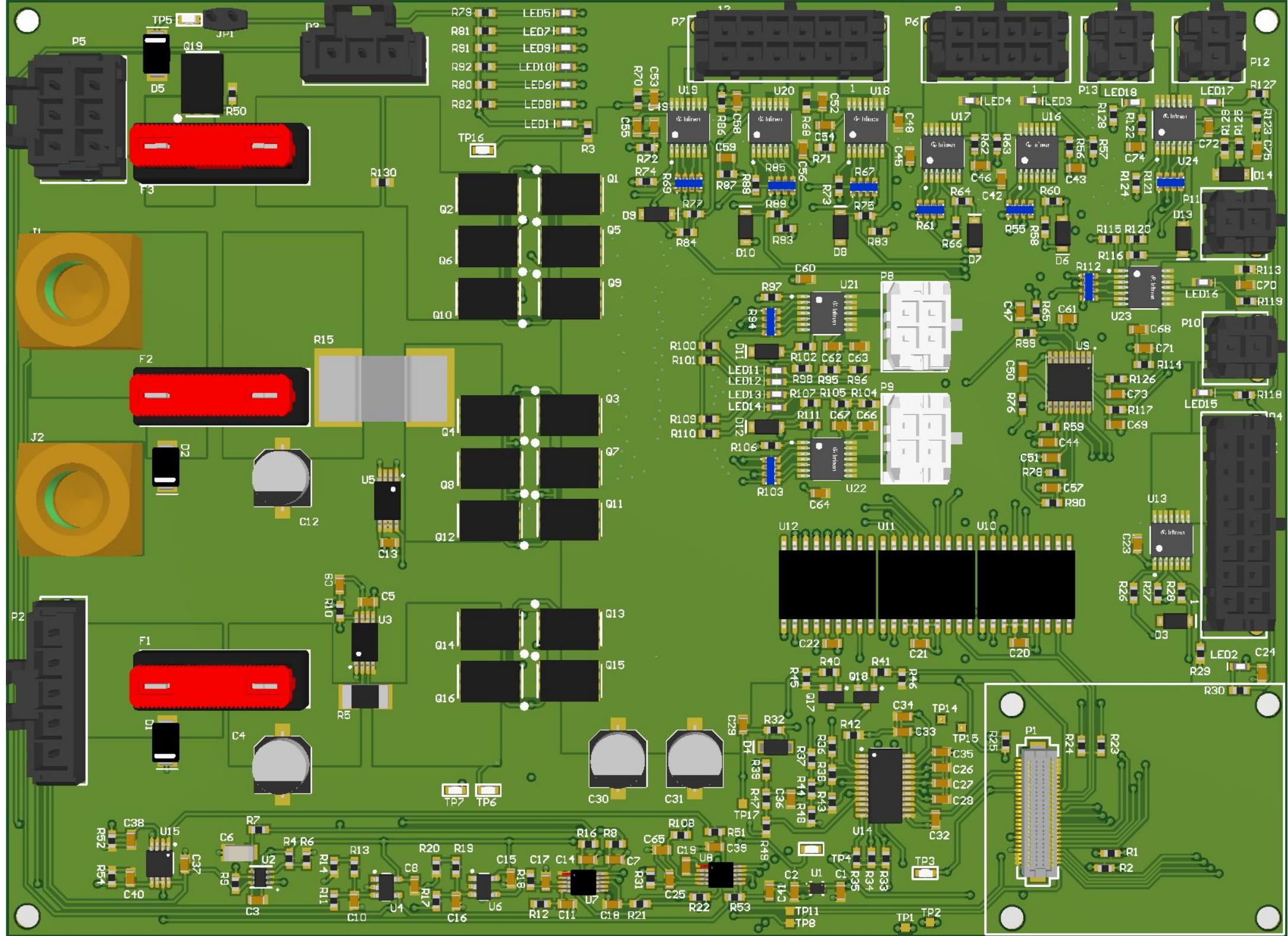
D

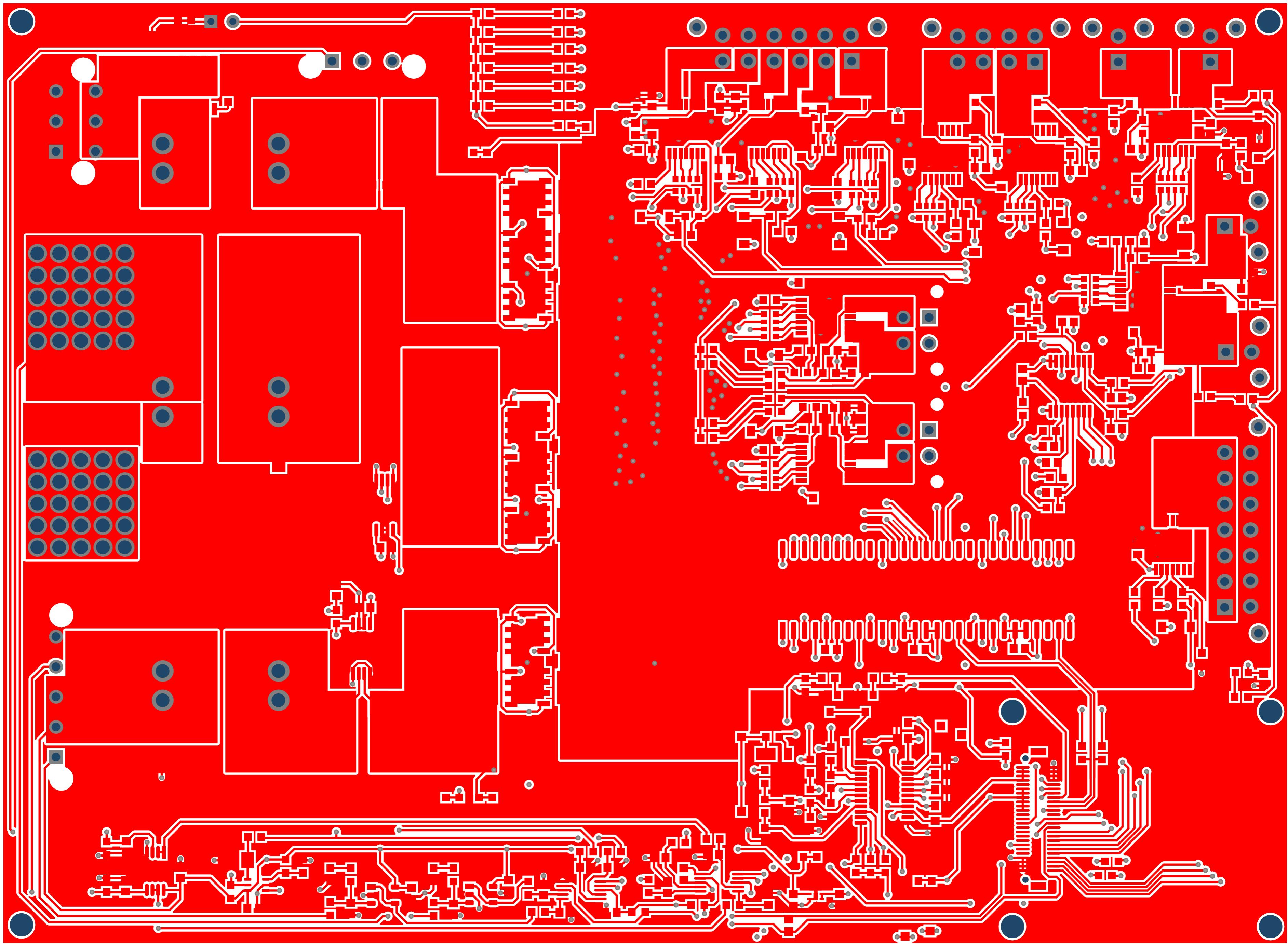
D

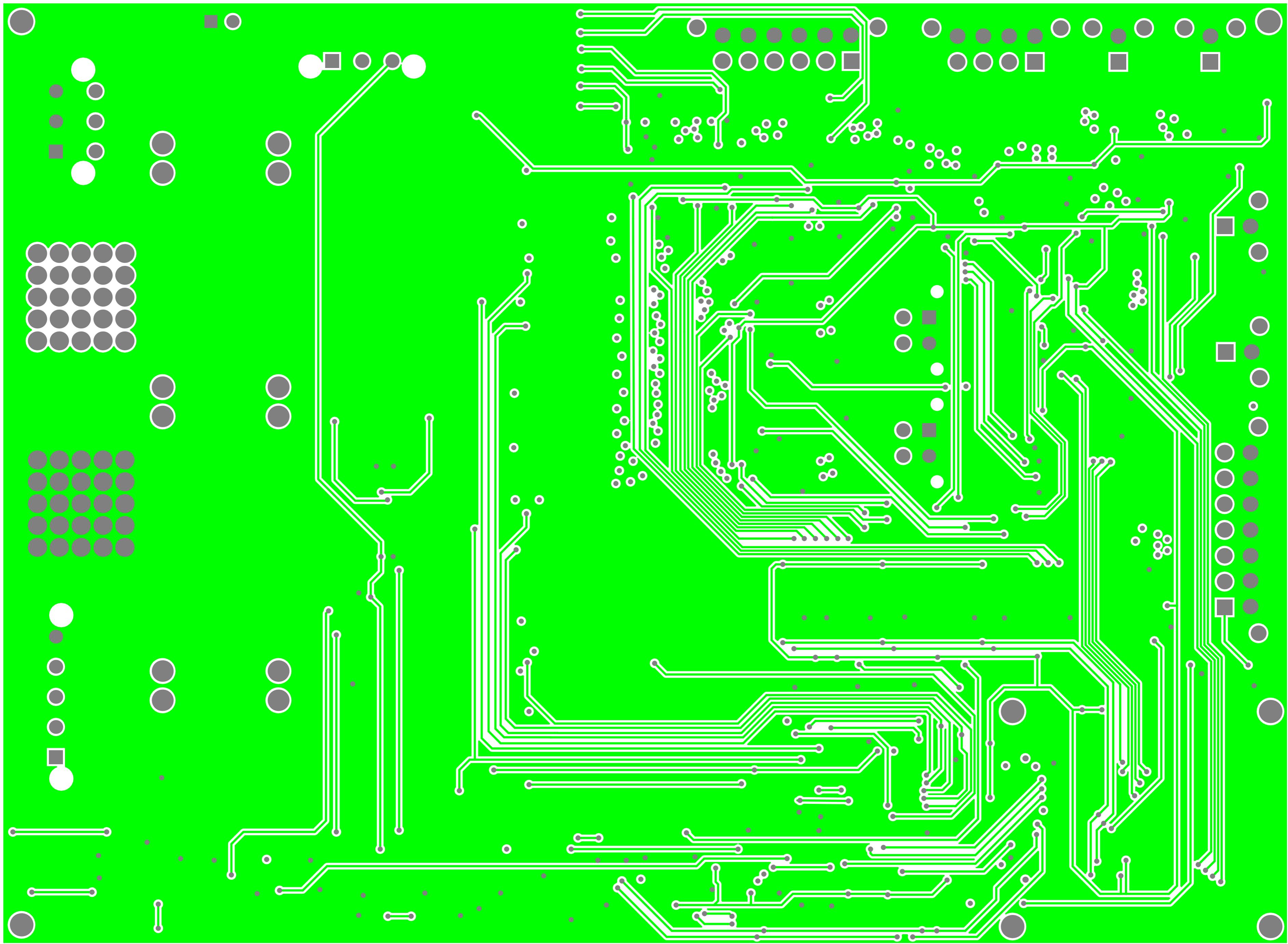
## **Bill of Materials**

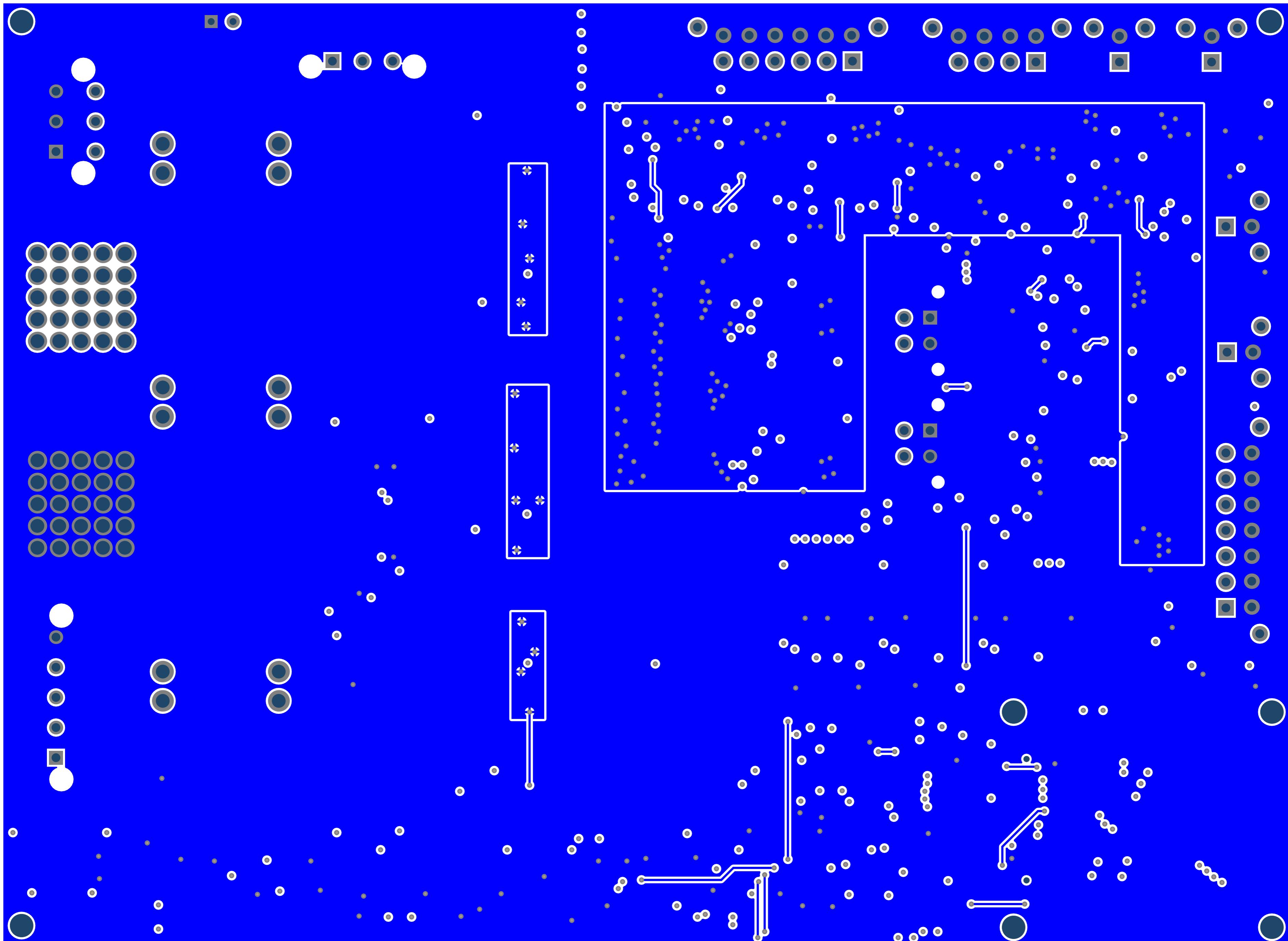
Project:	MSXIV_RearPowerDistribution.PrjPct
Revision:	<Parameter ProjectRevision not found>
Project Lead:	<Parameter ProjectAuthor not found>
Generated On:	2019-09-15 9:39 PM
Production Quantity:	1
Currency	CAD
Total Parts Count:	304











# Design Rules Verification Report

Filename : D:\Josh9\Documents\Midnight Sun\hardware\MSXIV\_RearPowerDistribution\Re

Warnings 0  
Rule Violations 406

Warnings	
Total	0

Rule Violations	
Clearance Constraint (Gap=0.254mm) (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(Relief 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 =3mm) (All)	0
Hole To Hole Clearance (Gap=0.254mm) (All), (All)	0
Minimum Solder Mask Sliver (Gap=0mm) (All), (All)	0
Silk To Solder Mask (Clearance=0.254mm) (IsPad), (All)	359
Silk to Silk (Clearance=0.254mm) (All), (All)	47
Net Antennae (Tolerance=0mm) (All)	0
Height Constraint (Min=0mm) (Max =25.4mm) (Preferred=12.7mm) (All)	0
Total	406

Silk To Solder Mask (Clearance=0.254mm) (IsPad),(All)
Silk To Solder Mask Clearance Constraint: (0.012mm < 0.254mm) Between Arc (106.762mm,84.238mm) on Top Overlay And Pac
Silk To Solder Mask Clearance Constraint: (0.012mm < 0.254mm) Between Arc (117.262mm,84.238mm) on Top Overlay And Pac
Silk To Solder Mask Clearance Constraint: (0.169mm < 0.254mm) Between Arc (125.538mm,77.638mm) on Top Overlay And Pac
Silk To Solder Mask Clearance Constraint: (0.012mm < 0.254mm) Between Arc (134.862mm,87.438mm) on Top Overlay And Pac
Silk To Solder Mask Clearance Constraint: (0.012mm < 0.254mm) Between Arc (78.462mm,87.338mm) on Top Overlay And Pad R69-1(78.52mm,87.8mm)
Silk To Solder Mask Clearance Constraint: (0.169mm < 0.254mm) Between Arc (88.338mm,56.109mm) on Top Overlay And Pac
Silk To Solder Mask Clearance Constraint: (0.169mm < 0.254mm) Between Arc (88.338mm,73.517mm) on Top Overlay And Pac
Silk To Solder Mask Clearance Constraint: (0.012mm < 0.254mm) Between Arc (89.382mm,87.038mm) on Top Overlay And Pad R85-1(89.44mm,87.5mm)
Silk To Solder Mask Clearance Constraint: (0.188mm < 0.254mm) Between Arc (93.606mm,6.354mm) on Top Overlay And Pad U1-1(94.114mm,6.1mm)
Silk To Solder Mask Clearance Constraint: (0.012mm < 0.254mm) Between Arc (98.991mm,86.838mm) on Top Overlay And Pac
Silk To Solder Mask Clearance Constraint: (0.2mm < 0.254mm) Between Pad C 12-1(32.4mm,56.85mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.2mm < 0.254mm) Between Pad C 12-1(32.4mm,56.85mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.2mm < 0.254mm) Between Pad C 12-2(32.4mm,50.95mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.2mm < 0.254mm) Between Pad C 12-2(32.4mm,50.95mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.216mm < 0.254mm) Between Pad C 15-1(59.109mm,7.675mm) on Component Side And Text "R18"
Silk To Solder Mask Clearance Constraint: (0.216mm < 0.254mm) Between Pad C 15-2(59.109mm,6.325mm) on Component Side And Text "R18"
Silk To Solder Mask Clearance Constraint: (0.225mm < 0.254mm) Between Pad C 20-1(119.175mm,34.6mm) on Component Side And Text "C 20"
Silk To Solder Mask Clearance Constraint: (0.225mm < 0.254mm) Between Pad C 20-2(117.825mm,34.6mm) on Component Side And Text "C 20"
Silk To Solder Mask Clearance Constraint: (0.225mm < 0.254mm) Between Pad C 21-1(107.575mm,34.5mm) on Component Side And Text "C 21"
Silk To Solder Mask Clearance Constraint: (0.225mm < 0.254mm) Between Pad C 21-2(106.225mm,34.5mm) on Component Side And Text "C 21"
Silk To Solder Mask Clearance Constraint: (0.225mm < 0.254mm) Between Pad C 23-1(132.3mm,46.875mm) on Component Side And Text "C 23"
Silk To Solder Mask Clearance Constraint: (0.225mm < 0.254mm) Between Pad C 23-2(132.3mm,45.525mm) on Component Side And Text "C 23"
Silk To Solder Mask Clearance Constraint: (Collision < 0.254mm) Between Pad C 24-2(146.9mm,30.325mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.2mm < 0.254mm) Between Pad C 25-1(77.6mm,6.225mm) on Component Side And Text "C 25"
Silk To Solder Mask Clearance Constraint: (0.2mm < 0.254mm) Between Pad C 30-1(71.642mm,23.95mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.2mm < 0.254mm) Between Pad C 30-1(71.642mm,23.95mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.2mm < 0.254mm) Between Pad C 30-2(71.642mm,18.05mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.2mm < 0.254mm) Between Pad C 30-2(71.642mm,18.05mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.2mm < 0.254mm) Between Pad C 31-1(80.546mm,23.95mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.2mm < 0.254mm) Between Pad C 31-1(80.546mm,23.95mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.2mm < 0.254mm) Between Pad C 31-2(80.546mm,18.05mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.225mm < 0.254mm) Between Pad C 36-1(91.8mm,16.937mm) on Component Side And Text "R44"
Silk To Solder Mask Clearance Constraint: (0.225mm < 0.254mm) Between Pad C 36-2(91.8mm,15.587mm) on Component Side And Text "R48"
Silk To Solder Mask Clearance Constraint: (0.2mm < 0.254mm) Between Pad C 4-1(32.4mm,23.25mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.2mm < 0.254mm) Between Pad C 4-1(32.4mm,23.25mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.2mm < 0.254mm) Between Pad C 4-2(32.4mm,17.35mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.2mm < 0.254mm) Between Pad C 4-2(32.4mm,17.35mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.2mm < 0.254mm) Between Pad C 44-1(122.575mm,58.067mm) on Component Side And Text "C 44"
Silk To Solder Mask Clearance Constraint: (Collision < 0.254mm) Between Pad C 53-1(75.8mm,97.625mm) on Component Side And Text "C 49"
Silk To Solder Mask Clearance Constraint: (0.177mm < 0.254mm) Between Pad C 61-1(123.463mm,72.562mm) on Component Side And Text "C 61"
Silk To Solder Mask Clearance Constraint: (0.177mm < 0.254mm) Between Pad C 61-2(124.813mm,72.562mm) on Component Side And Text "C 61"
Silk To Solder Mask Clearance Constraint: (0.2mm < 0.254mm) Between Pad C 70-2(145.675mm,76.5mm) on Component Side And Text "C 70"
Silk To Solder Mask Clearance Constraint: (0.218mm < 0.254mm) Between Pad D10-1(86.5mm,84.9mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.218mm < 0.254mm) Between Pad D11-1(87.3mm,68.7mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.247mm < 0.254mm) Between Pad D1-2(18.9mm,21mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.218mm < 0.254mm) Between Pad D12-1(87.3mm,59.9mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.218mm < 0.254mm) Between Pad D13-1(137.7mm,80.3mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.218mm < 0.254mm) Between Pad D14-1(145mm,89.5mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.247mm < 0.254mm) Between Pad D2-2(18.9mm,53.236mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.218mm < 0.254mm) Between Pad D3-1(138.411mm,37.127mm) on Component Side And Track
Silk To Solder Mask Clearance Constraint: (0.247mm < 0.254mm) Between Pad D5-2(17.7mm,105.464mm) on Component Side And Track













Silk To Silk (Clearance=0.254mm) (All),(All)
Silk To Silk Clearance Constraint: (0.163mm < 0.254mm) Between Arc (106.762mm,84.238mm) on Top Overlay And Text "R61" (106.6mm,83.1mm) or
Silk To Silk Clearance Constraint: (0.198mm < 0.254mm) Between Text "1" (120.2mm,99.104mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.098mm < 0.254mm) Between Text "1" (129.8mm,108.204mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.198mm < 0.254mm) Between Text "1" (138.66mm,39.5mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.098mm < 0.254mm) Between Text "1" (140.5mm,108.204mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.098mm < 0.254mm) Between Text "1" (147.76mm,83.9mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.098mm < 0.254mm) Between Text "1" (147.9mm,69.3mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.198mm < 0.254mm) Between Text "1" (98.9mm,99.204mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.198mm < 0.254mm) Between Text "12" (83.4mm,108.404mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.198mm < 0.254mm) Between Text "14" (147.86mm,58mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.198mm < 0.254mm) Between Text "8" (111.1mm,108.304mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.098mm < 0.254mm) Between Text "D11" (85.4mm,69.6mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.118mm < 0.254mm) Between Text "D12" (85.38mm,60.9mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.098mm < 0.254mm) Between Text "D14" (146.1mm,89mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.148mm < 0.254mm) Between Text "D4" (86.3mm,23mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.098mm < 0.254mm) Between Text "D6" (122.9mm,79mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.003mm < 0.254mm) Between Text "F3" (15.9mm,87.3mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.065mm < 0.254mm) Between Text "F3" (15.9mm,87.3mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.168mm < 0.254mm) Between Text "LED10" (60.2mm,101.7mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.193mm < 0.254mm) Between Text "LED18" (128.6mm,98.7mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.216mm < 0.254mm) Between Text "LED3" (121.65mm,97.69mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.234mm < 0.254mm) Between Text "LED6" (60.8mm,99.6mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.234mm < 0.254mm) Between Text "LED8" (60.8mm,97.3mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.21mm < 0.254mm) Between Text "P1" (119.4mm,23.9mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.198mm < 0.254mm) Between Text "P1" (119.4mm,23.9mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.159mm < 0.254mm) Between Text "P10" (137.64mm,71.7mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.125mm < 0.254mm) Between Text "P11" (137.8mm,86.2mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.249mm < 0.254mm) Between Text "P4" (147.9mm,60.7mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.238mm < 0.254mm) Between Text "P4" (147.9mm,60.7mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.164mm < 0.254mm) Between Text "P8" (102.4mm,77.2mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.163mm < 0.254mm) Between Text "P8" (102.4mm,77.2mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.097mm < 0.254mm) Between Text "Q19" (20.9mm,104.125mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.252mm < 0.254mm) Between Text "Q4" (51.127mm,58.9mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.198mm < 0.254mm) Between Text "R30" (140.3mm,28.6mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.198mm < 0.254mm) Between Text "TP16" (53.05mm,93.4mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.098mm < 0.254mm) Between Text "TP3" (106.4mm,8.6mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.123mm < 0.254mm) Between Text "TP6" (55.15mm,15.5mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.098mm < 0.254mm) Between Text "TP6" (55.15mm,15.5mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.173mm < 0.254mm) Between Text "TP7" (51.4mm,15.5mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.098mm < 0.254mm) Between Text "TP7" (51.4mm,15.5mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.217mm < 0.254mm) Between Text "U2" (30.1mm,8.8mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.241mm < 0.254mm) Between Text "U4" (56.633mm,3.3mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.241mm < 0.254mm) Between Text "U6" (56.633mm,3.3mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.23mm < 0.254mm) Between Text "U7" (67.927mm,4.073mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.23mm < 0.254mm) Between Text "U7" (67.927mm,4.073mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.175mm < 0.254mm) Between Text "U8" (81.2mm,9mm) on Top Overlay And Track
Silk To Silk Clearance Constraint: (0.175mm < 0.254mm) Between Text "U8" (81.2mm,9mm) on Top Overlay And Track