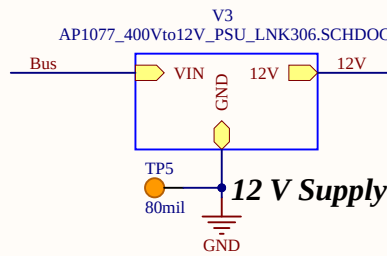


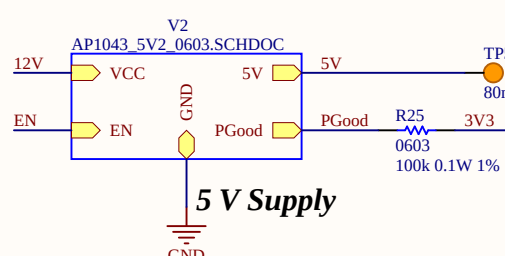
DC bus input



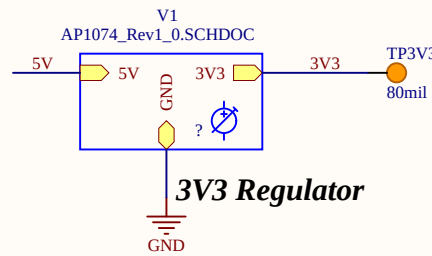
High Voltage



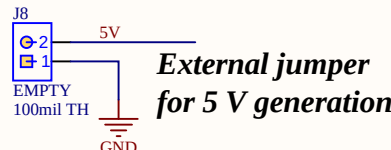
12 V Supply



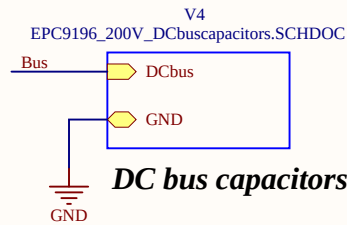
5 V Supply



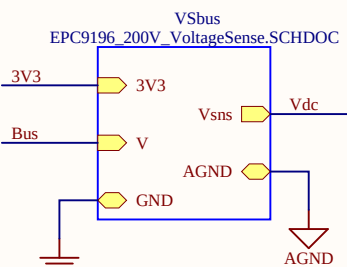
3V3 Regulator



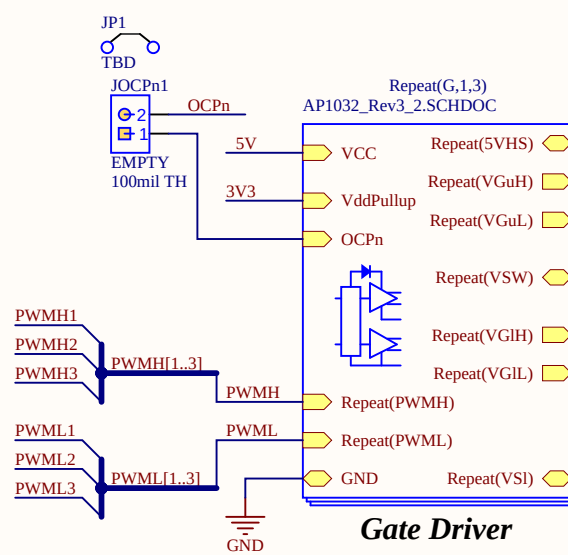
External jumper for 5 V generation



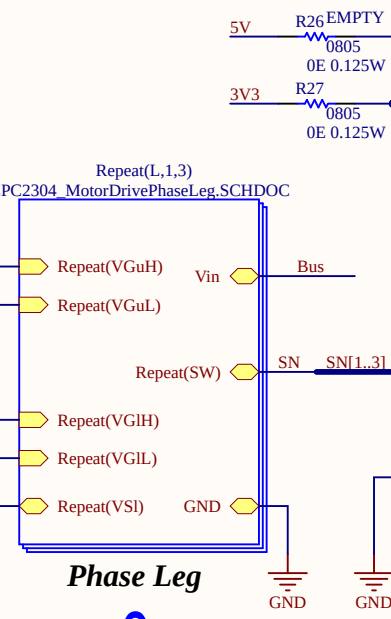
DC bus capacitors



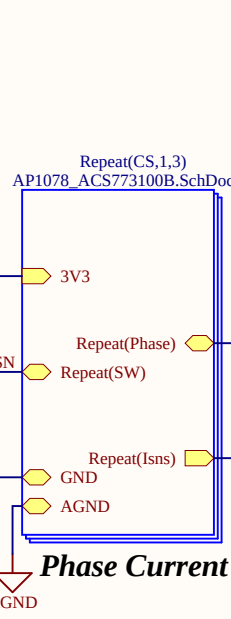
DC bus voltage sense



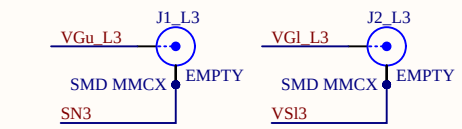
Gate Driver



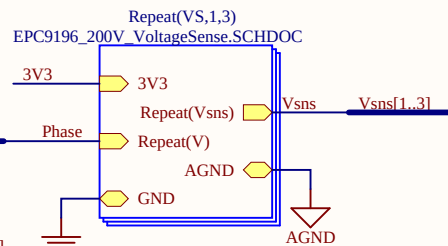
Phase Leg



Phase Current Sense



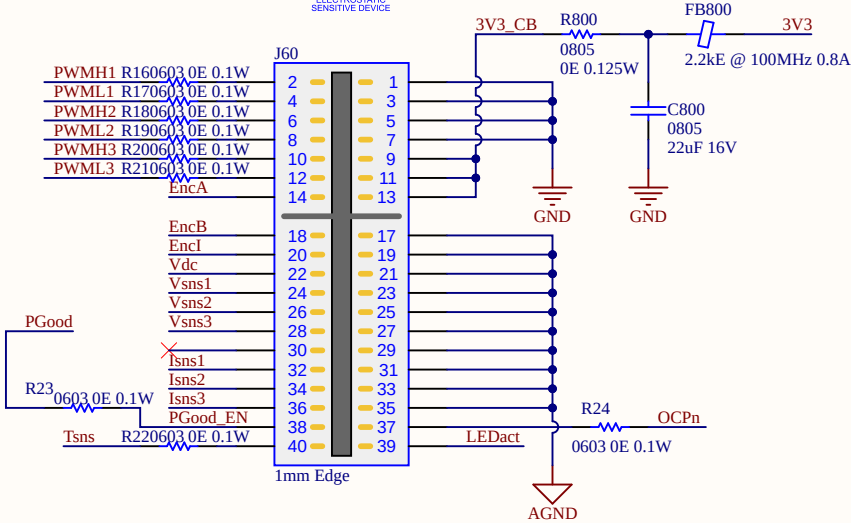
Gate Measurement Connectors - leg 3



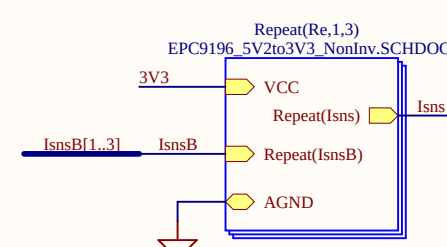
Phase voltage sense



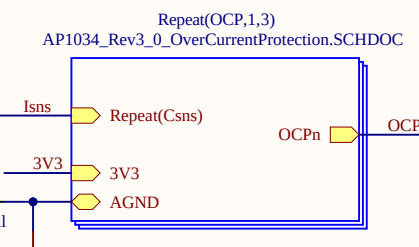
ELECTROSTATIC SENSITIVE DEVICE



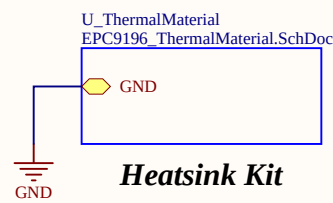
Control interface connector



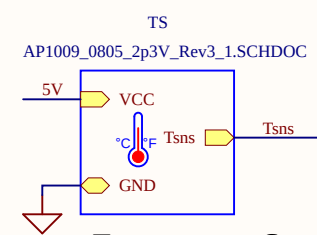
Current Sense Rescaling



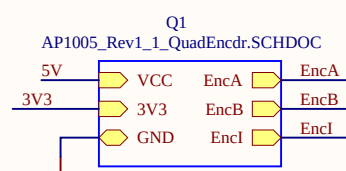
Over Current Protection



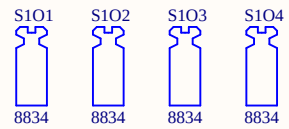
Heatsink Kit



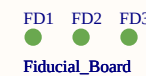
Temperature Sense



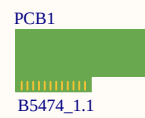
Shaft encoder input Quadrature with Index Supports optical and hall



Nylon Standoff StandOffs



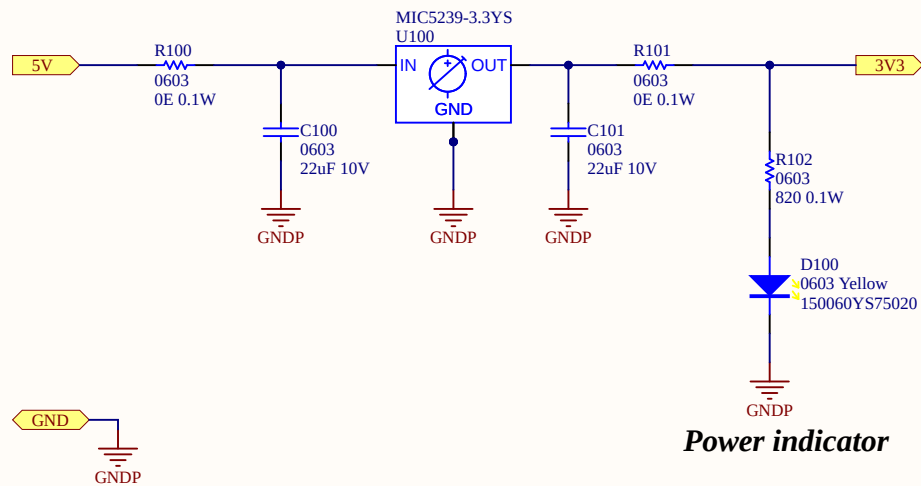
Fiducial Board



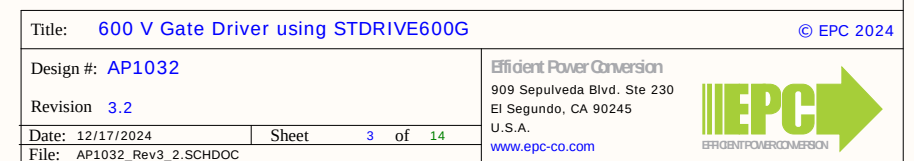
Serial# yyww-nnn

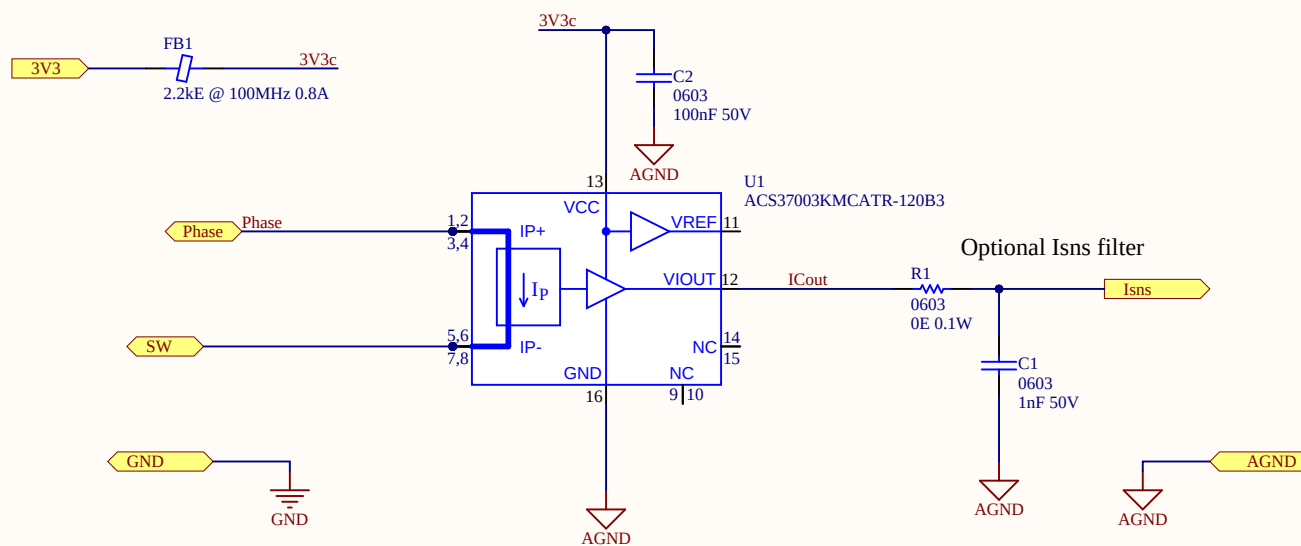
For evaluation only; not FCC approved for resale

Title: Evaluation Schematic		© EPC 2024	
Design #: EPC91200	PCB #: B5474	Efficient Power Conversion 909 Pacific Coast Hwy. Ste 230 El Segundo, CA 90245 U.S.A. www.epc-co.com	
Revision 1.1	Revision: 1.1		
Date: 4/1/2025	Sheet 1 of 14		
File: EPC9196_B5474_Rev1_1_Main.SCHDOC			



Title: 5V to 3V3 500mA LDO using MIC5239-3.3YS			© EPC 2024		
Design #: AP1074			Efficient Power Conversion 909 Pacific Coast Hwy. Ste 230 El Segundo, CA 90245 U.S.A. www.epc-co.com  EFFICIENT POWER CONVERSION		
Revision 1.0					
Date: 1/22/2025	Sheet	2 of 14			
File: AP1074_Rev1_0.SCHDOC					

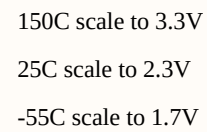


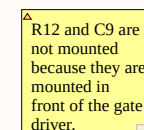


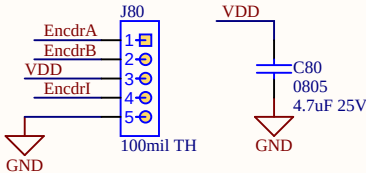
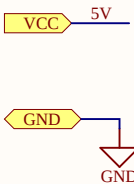
The polarity is intentionally inverted to comply with previous EPC motor drive inverter boards

Title: Bidirectional current sense using Hall effect sensor ACS773ECB-100B-PFF© EPC 2023			
Design #: AP1078		Efficient Power Conversion 909 Pacific Coast Hwy. Ste 230 El Segundo, CA 90245 U.S.A. www.epc-co.com 	
Revision 1.0			
Date: 1/6/2025	Sheet 4 of 14		
File: AP1078_ACS773100B.SchDoc			

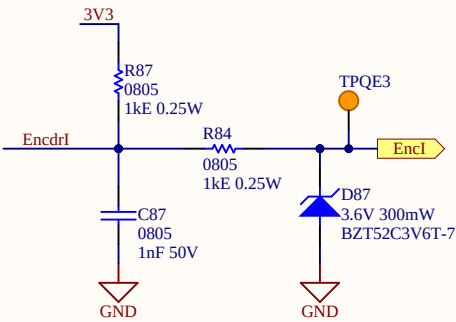
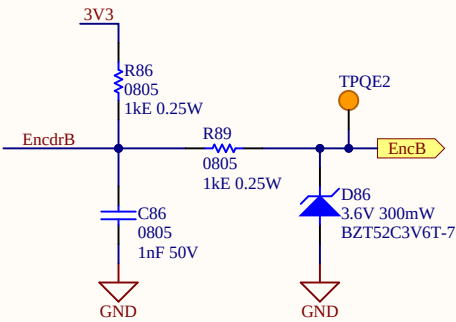
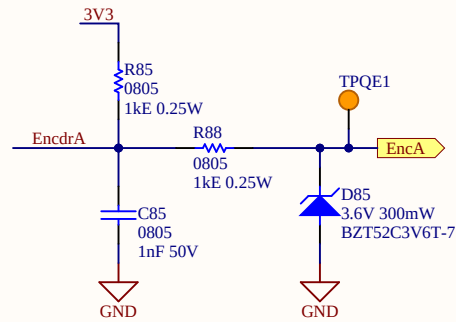
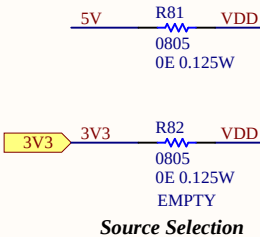




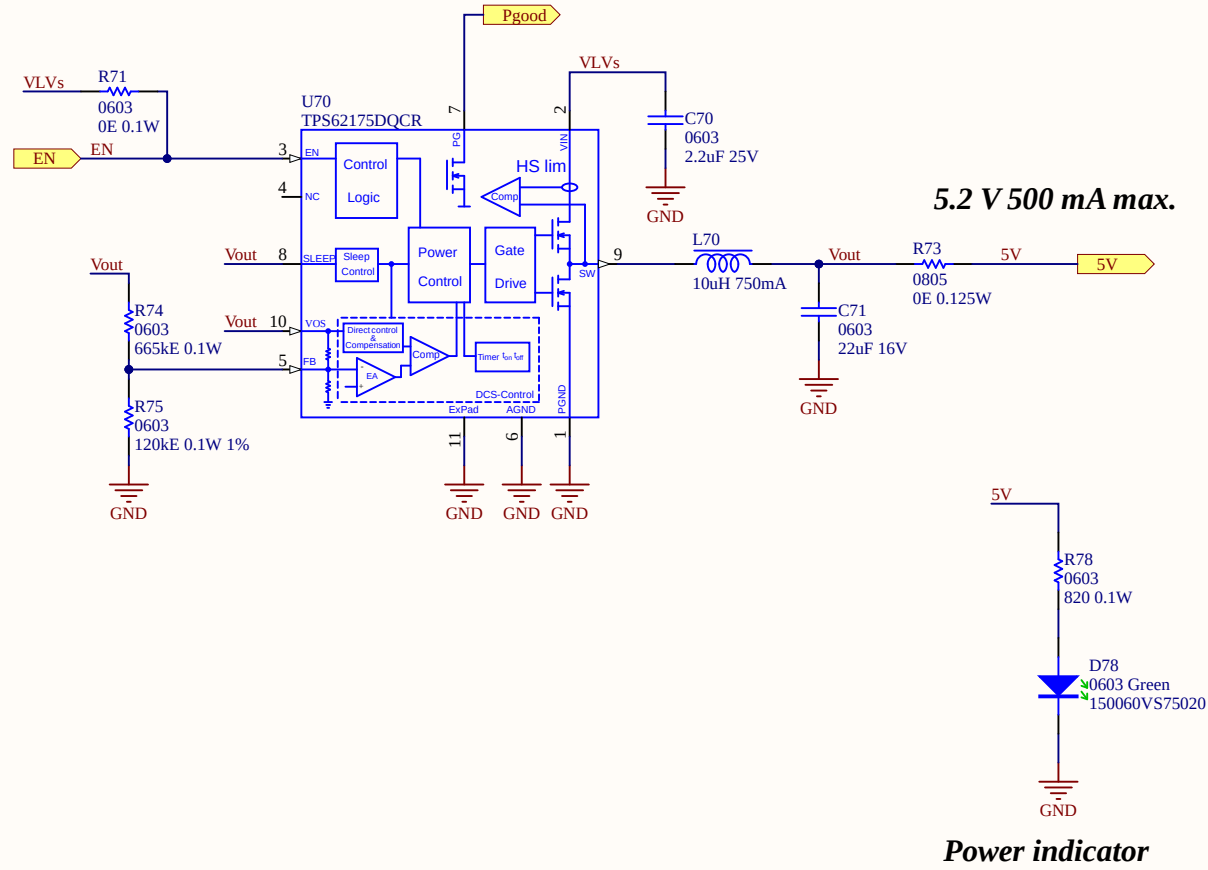
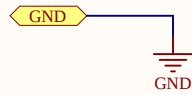




Shaft encoder connection
Quadrature with Index
Supports optical and hall



6 Vmin. to 28 Vmax.

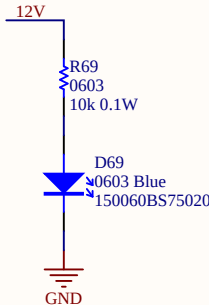
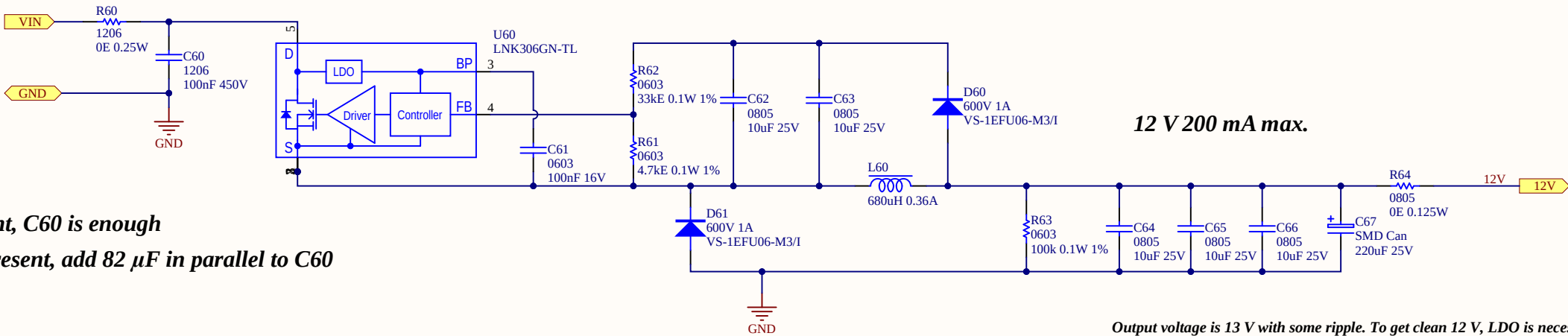


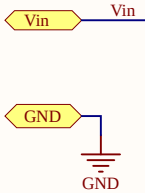
400 V max

When DC bus capacitors are present, C60 is enough
When DC bus capacitors are not present, add 82 μ F in parallel to C60

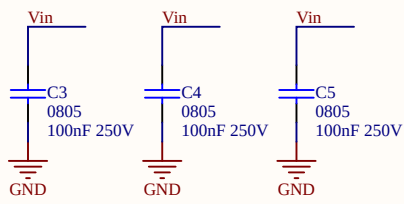
12 V 200 mA max.

Output voltage is 13 V with some ripple. To get clean 12 V, LDO is necessary

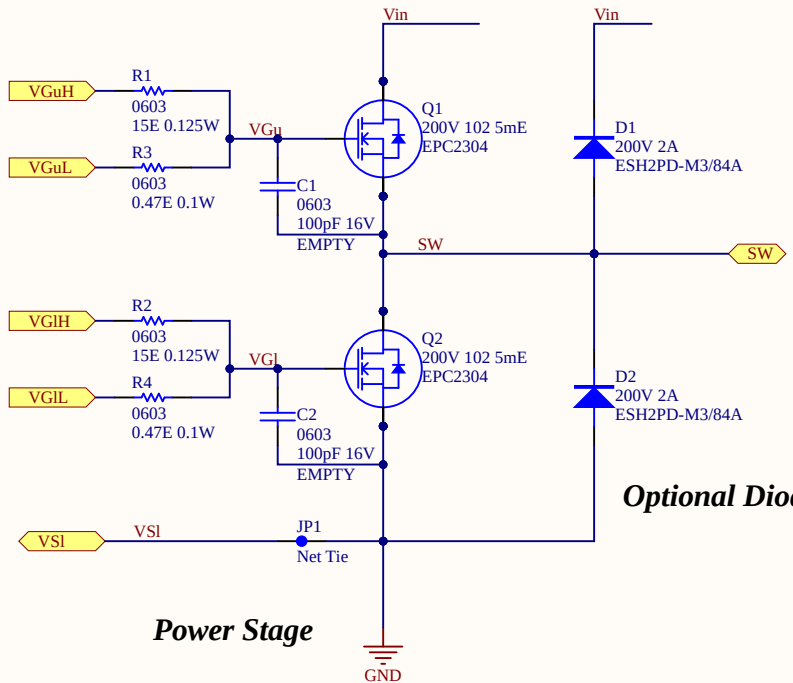




DC Input
200 Vmax.

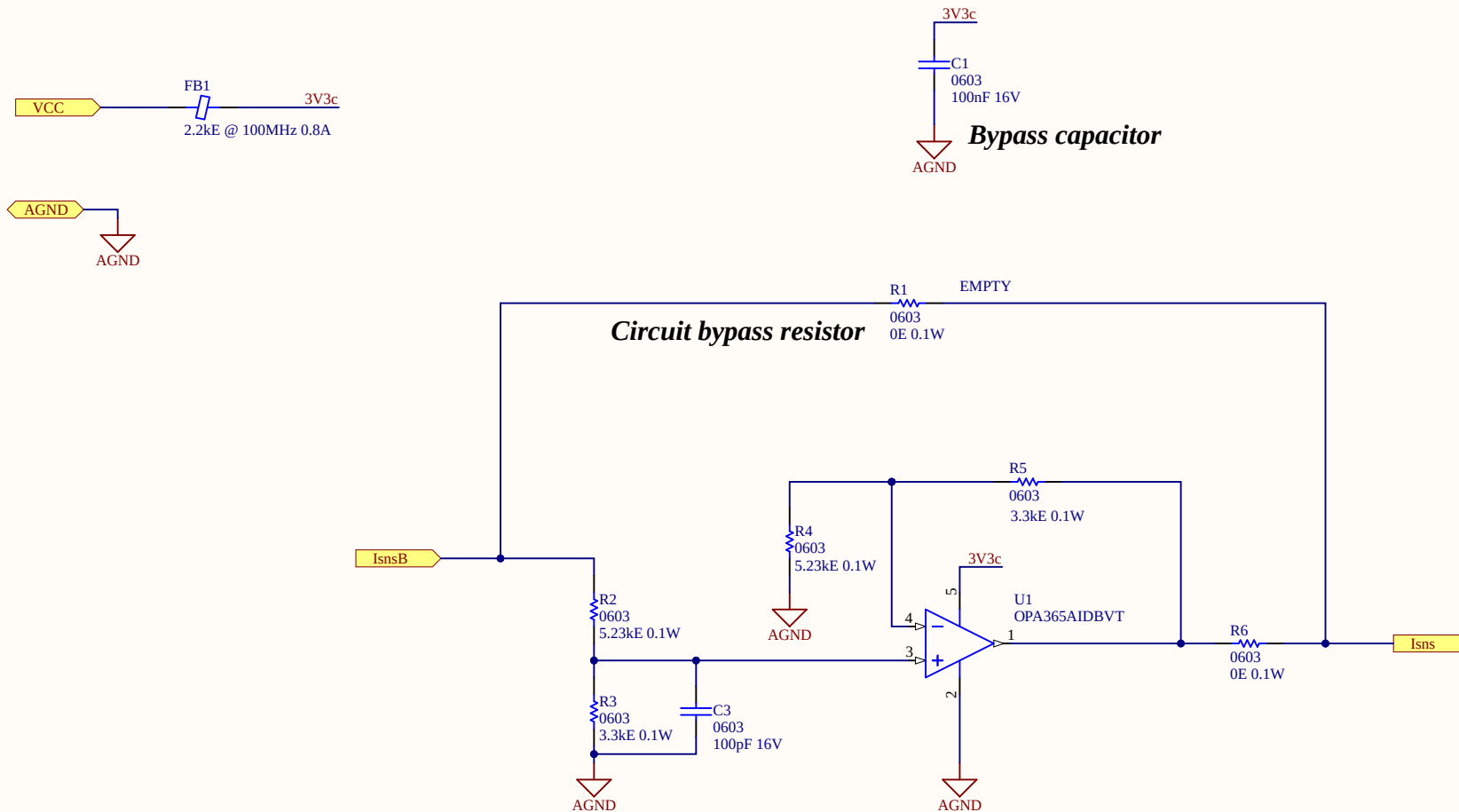


Decoupling Capacitors



Optional Diodes

Power Stage



Three options:

- 1) Bypass: place **R1** only, **R6 EMPTY**
- 2) Balanced amplifier: **R2=R4**, **R3=R5**; $V_{out}/V_{in} = R3/R2$. Choose **R2 > 1kΩ** to have **HiZ** input; **R1 EMPTY**
- 3) Voltage follower: **R5=0Ω**, **R4=EMPTY**, total gain is set by voltage divider **R2,R3**; **R1 EMPTY**

5V to 3.3V:

- 1) N/A
- 2) **R2=R4=4.99kΩ**; **R3=R5=3.3kΩ**
- 3) **R5= 0Ω**, **R4=EMPTY**, **R2=1.69kΩ**; **R3=3.3kΩ**

5.2V to 3.3V:

- 1) N/A
- 2) **R2=R4=5.23kΩ**; **R3=R5=3.3kΩ**
- 3) **R5= 0Ω**, **R4=EMPTY**, **R2=1.91kΩ**; **R3=3.3kΩ**

Title: 5V to 3.3 V scale current sense rescale

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Design #: AP1xxx

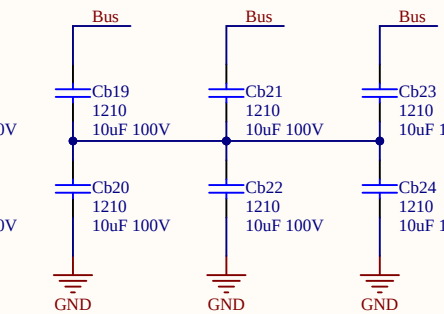
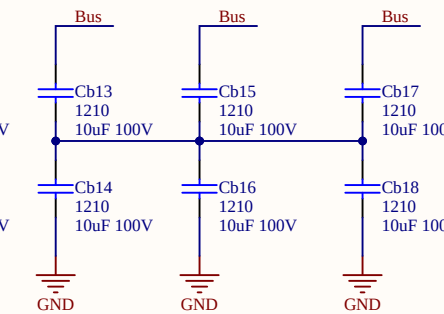
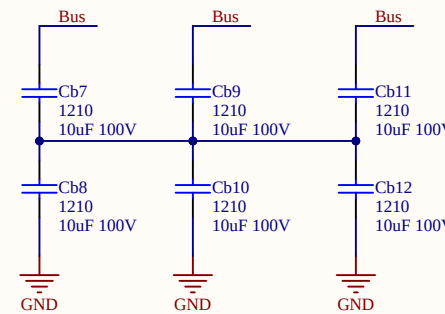
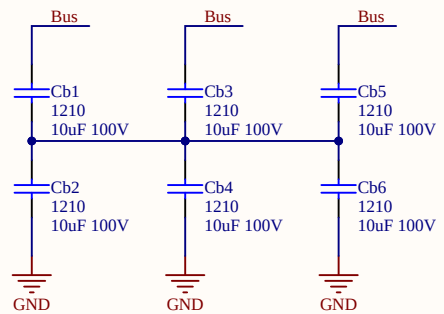
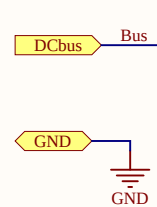
Revision 1.1

Date: 1/6/2025
File: EPC9196_5V2to3V3_NonInv.SCHDOC

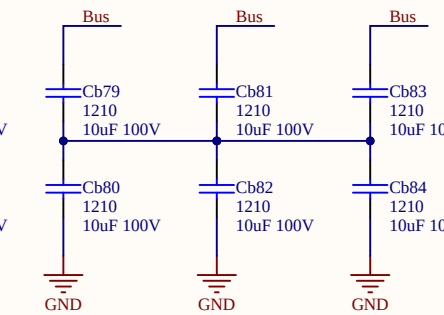
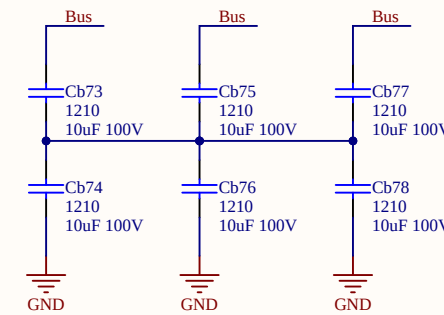
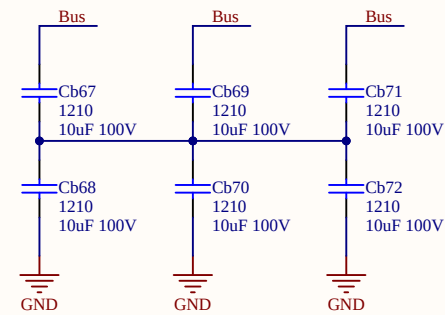
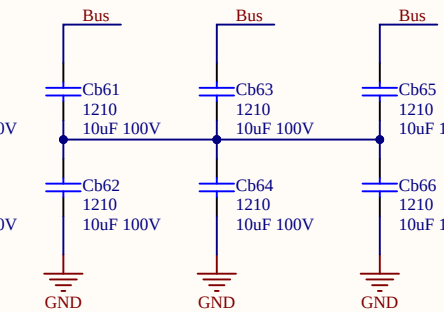
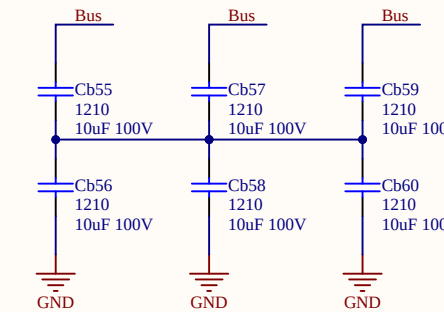
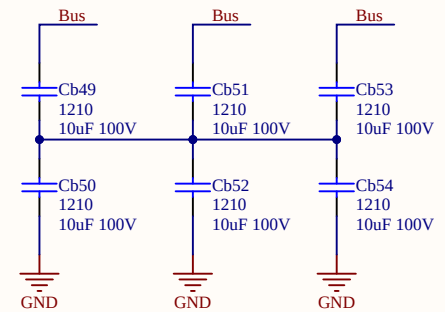
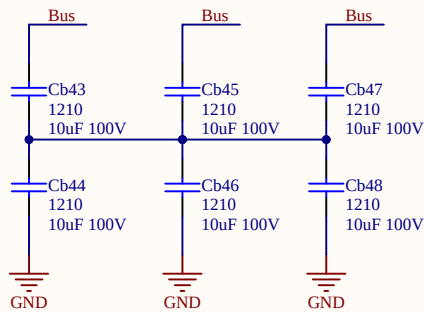
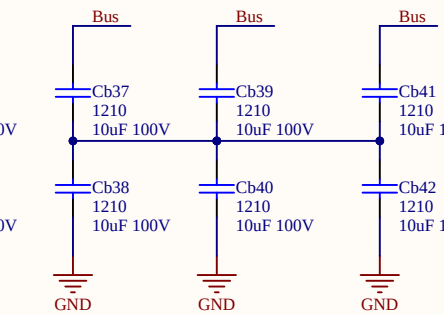
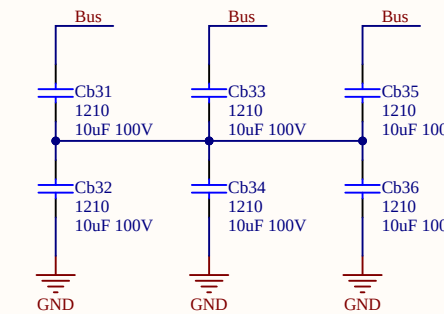
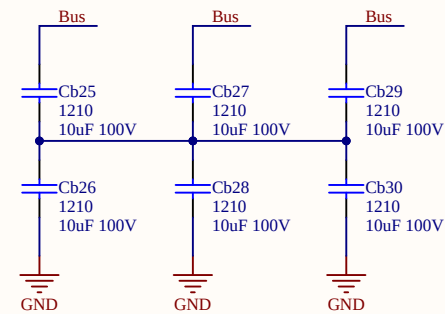
Sheet 11 of 14

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El Segundo, CA 90245
U.S.A.
www.epc-co.com

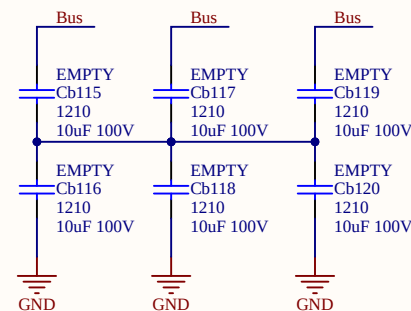
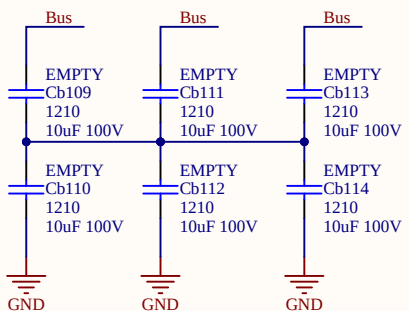
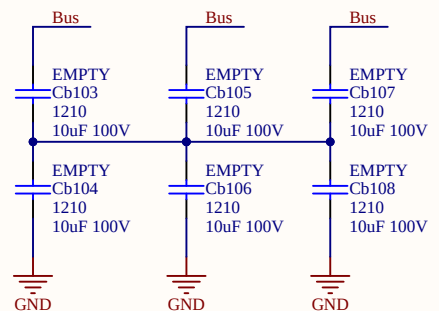
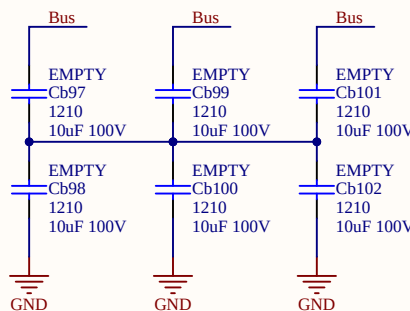
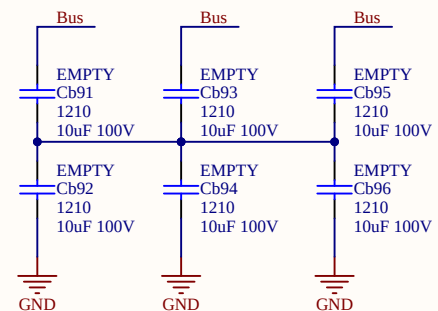
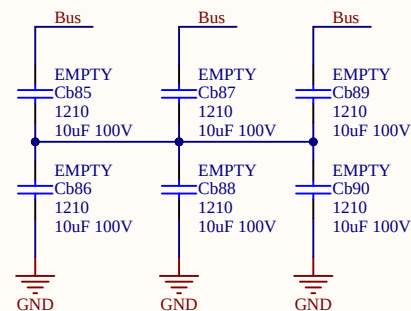


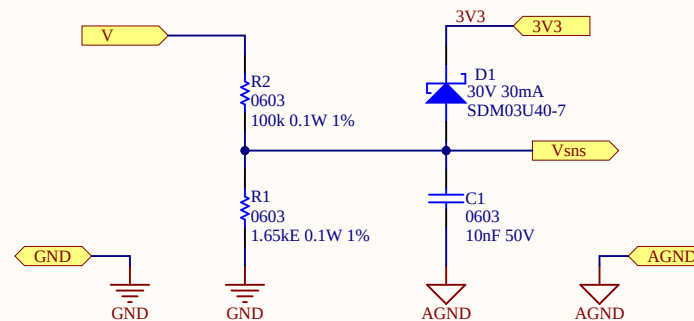


Always mount capacitors Cb1->Cb42



Additional capacitors





16.23 mV/V

203.3 V maximum readable voltage

Title: Sub Schematic		© EPC 2023	
Design #: EPC9196_200V_VoltageSense		Efficient Power Conversion 909 Pacific Coast Hwy. Ste 230 El Segundo, CA 90245 U.S.A. www.epc-co.com 	
Revision 1.0			
Date: 1/6/2025	Sheet 13 of 14		
File: EPC9196_200V_VoltageSense.SCHDOC			

