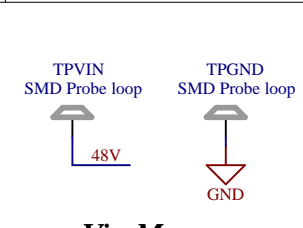
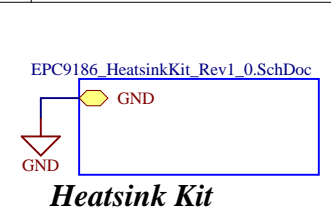
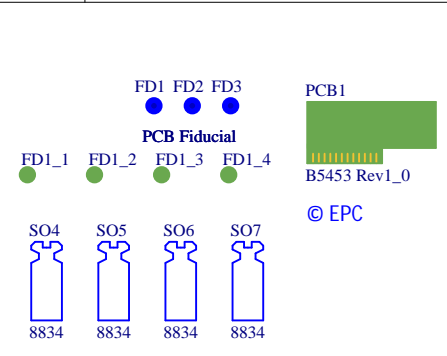
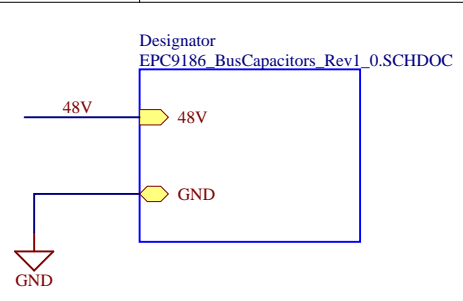


48 V Connection

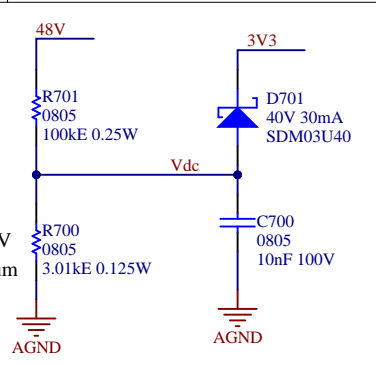


Vin Measure

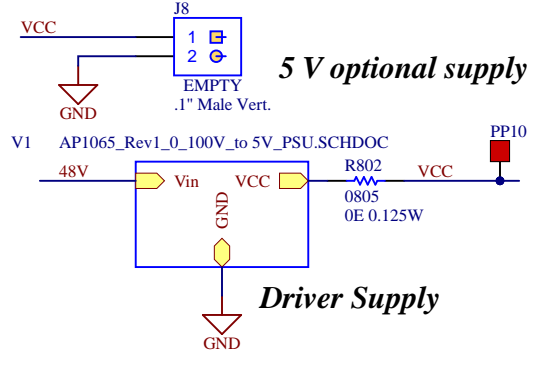


Heatsink Kit

112.93V scale to 3.3V
29.2 mv/V 112.93 V maximum

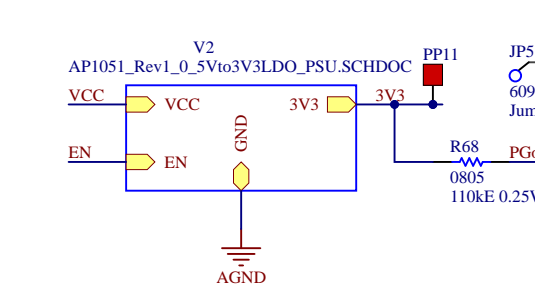


Switch-node Measure

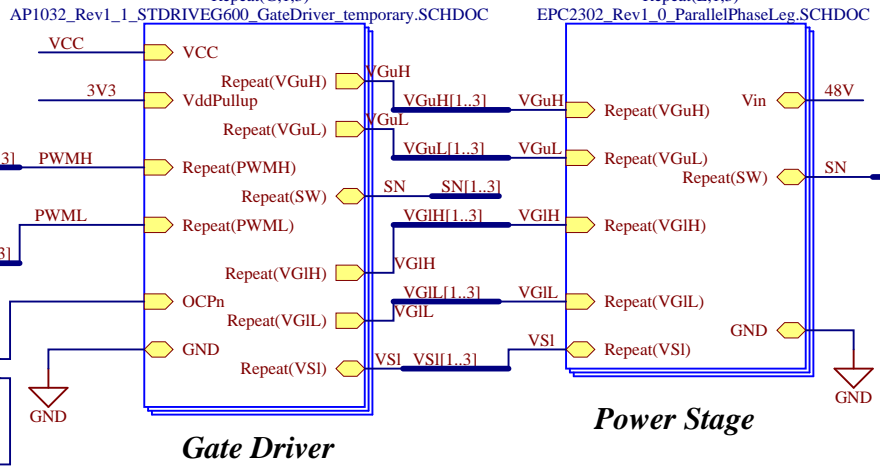


5 V optional supply

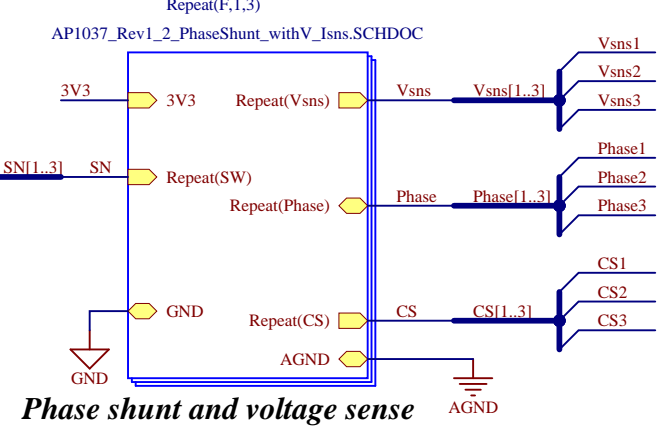
NOTE: this sheet is temporary: valid only for release R1.1 with PCB R1.0



Driver Supply

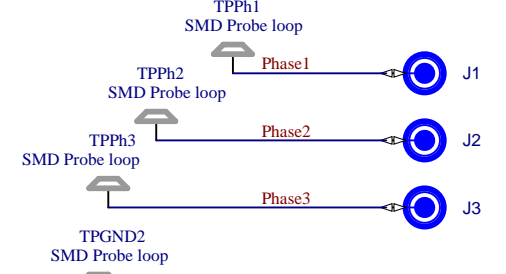


Gate Driver

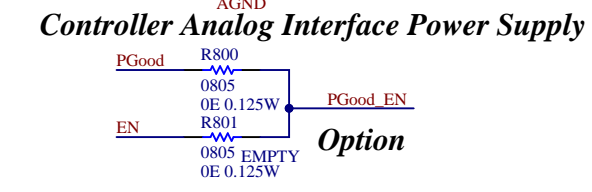


Power Stage

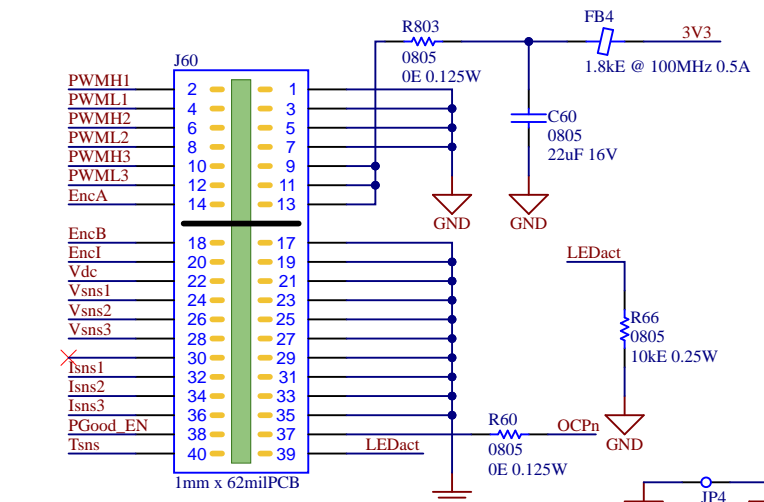
Phase shunt and voltage sense



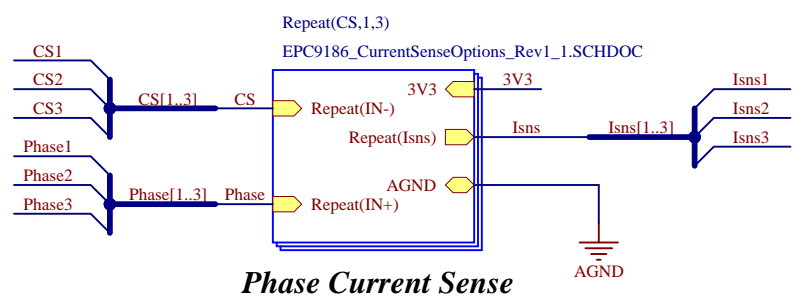
Motor Connection



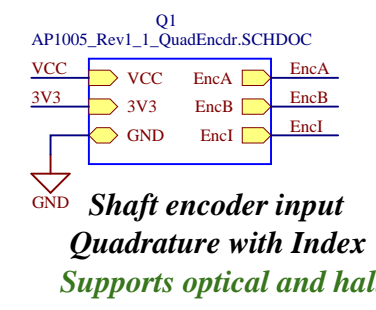
Controller Analog Interface Power Supply



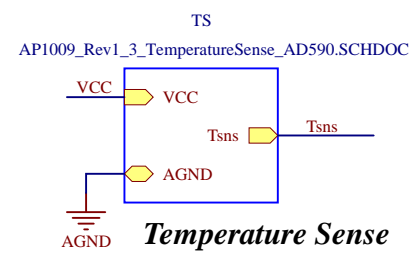
Option



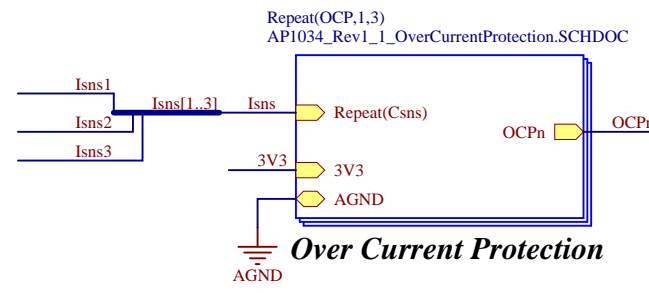
Phase Current Sense



**Shaft encoder input
Quadrature with Index
Supports optical and hall**

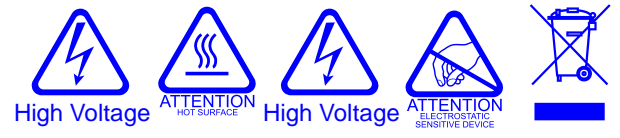


Temperature Sense



Over Current Protection

Control interface connector

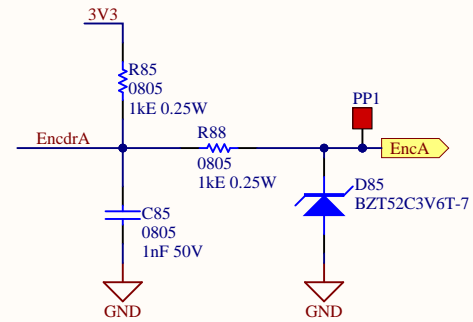
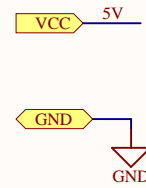


For evaluation only;
not FCC approved for resale
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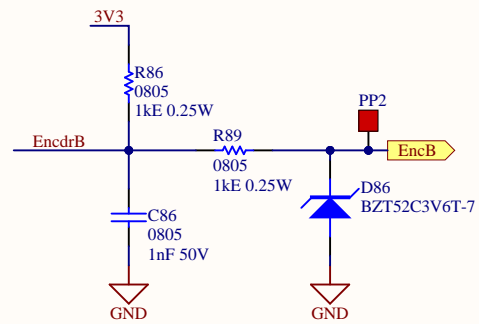
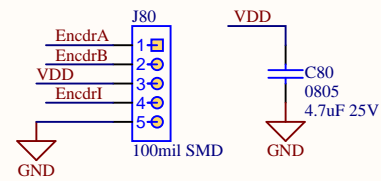
3-phase motor drive board using 4x EPC2302 power stage

Title: EPC9186 B5453 Rev. 1.1		Efficient Power Conversion 909 N. Pacific Coast Hwy, Ste. 23 El Segundo, CA 90245 United States www.epc-co.com	
Size: A	Revision: 1		
Date: 28-Jul-23	Sheet 1 of 15		
File: EPC9186_B5453_Rev1_1_Main.SCHDOC			

A

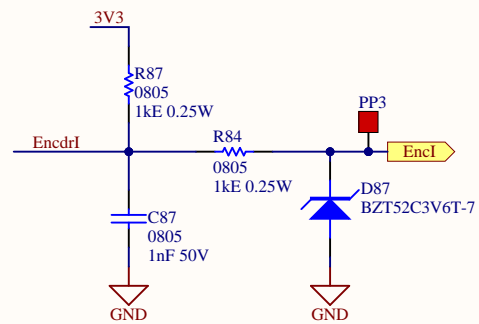
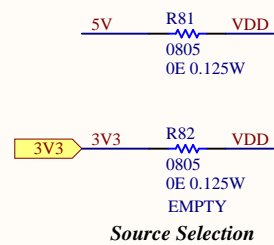


B




Shaft encoder connection
Quadrature with Index
Supports optical and hall

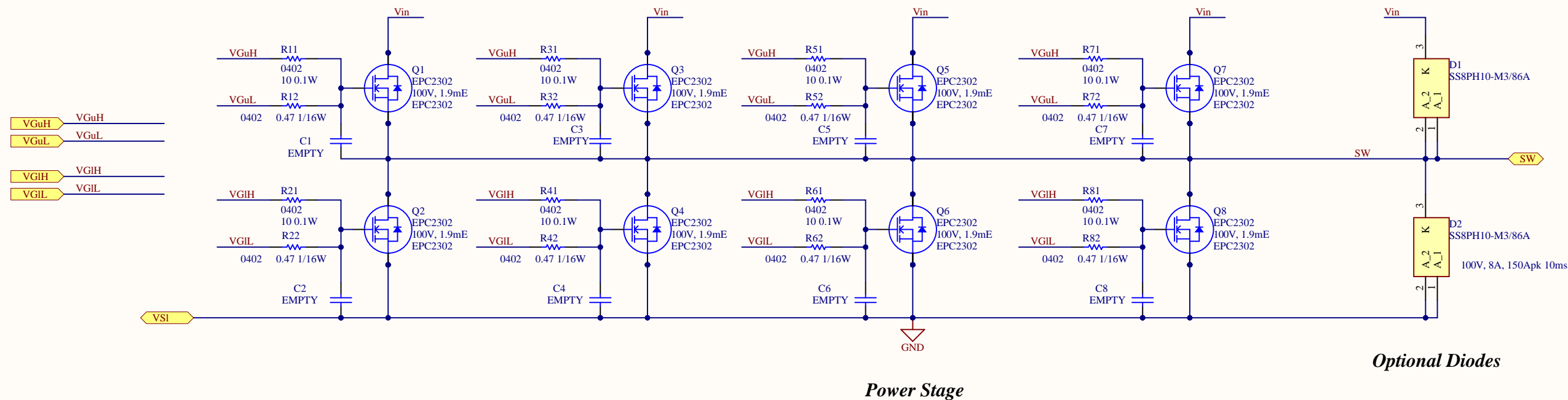
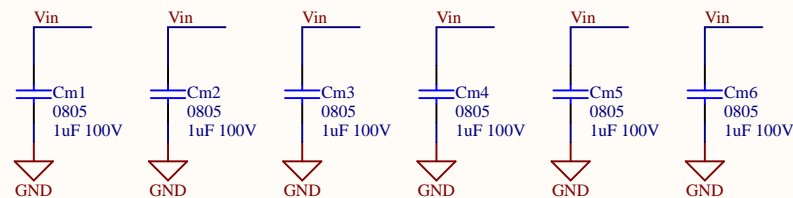
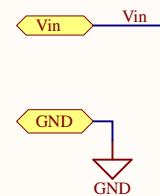
C

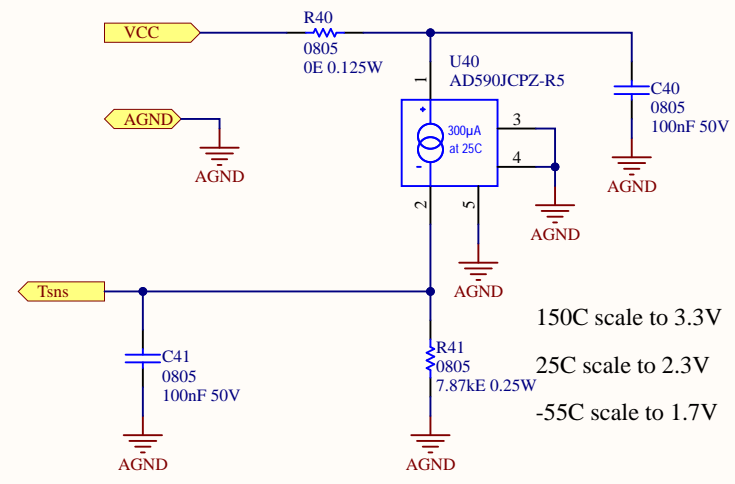


D

Quadrature Encoder Interface without 5V regulator

Title AP1005 Rev. 1.1		Efficient Power Conversion 909 N. Pacific Coast Hwy, Ste. 23 El Segundo, CA 90245 United States www.epc-co.com	
Size: A	*	Revision: 1	
Date: 13-Jul-22		Sheet 2 of 15	
File: AP1005_Rev1_1_QuadEncdr.SCHDOC			

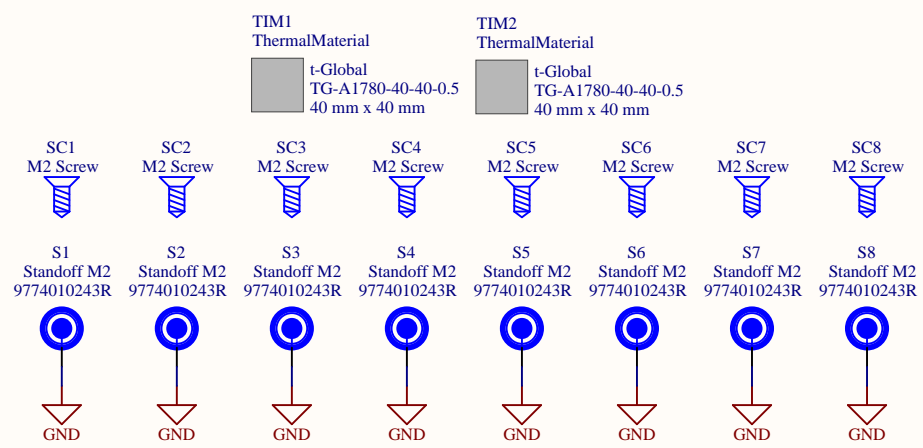
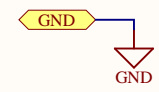


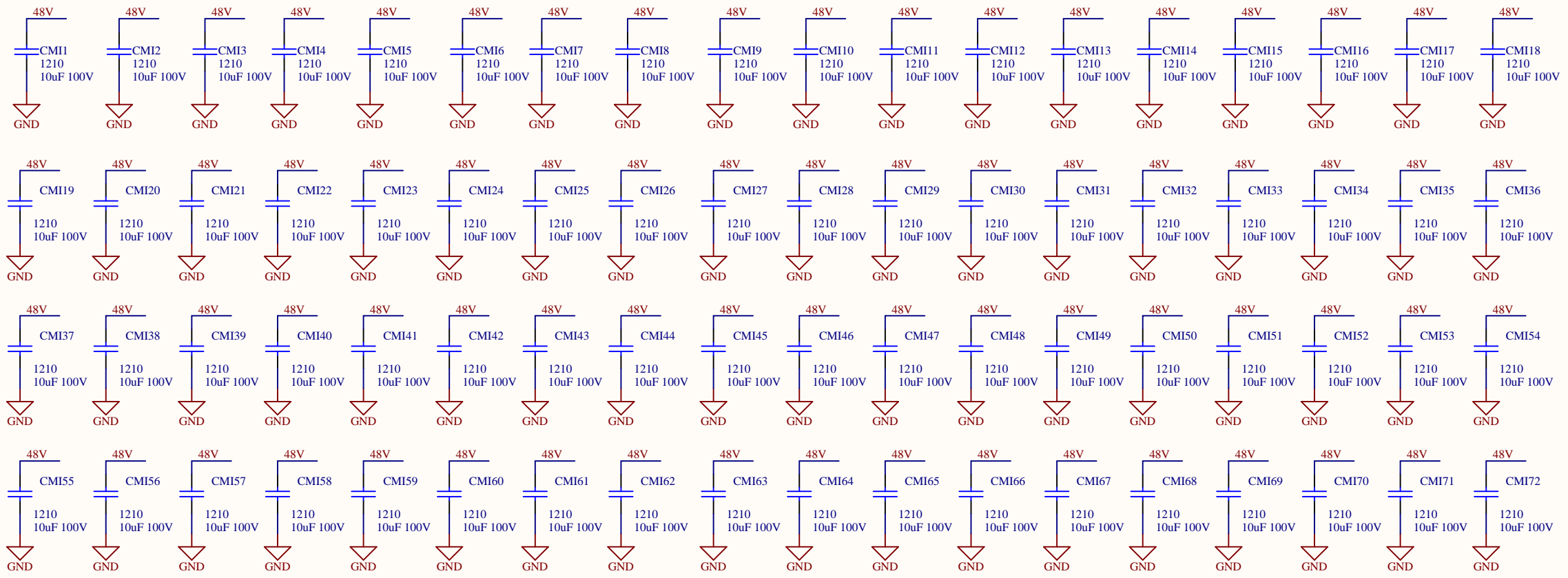
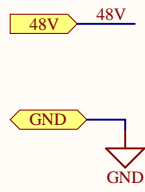


Temperature sense using AD590 with separate AGND

Title AP1009 Rev. 1.3		Efficient Power Conversion 909 N. Pacific Coast Hwy, Ste. 23 El Segundo, CA 90245 United States www.epc-co.com	
Size: A	*	Revision: 1	
Date: 03-Feb-23	Sheet 4 of 15		
File: AP1009_Rev1_3_TemperatureSense_AD590.SCHDOC			





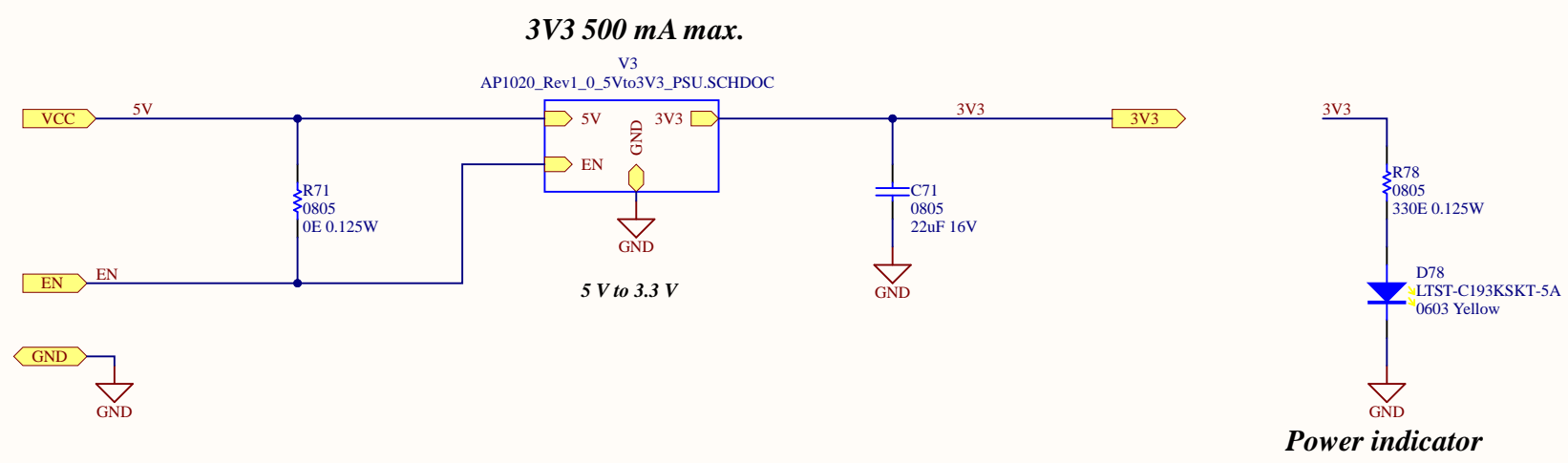


48 V DcBus Capacitors


High Power Motor Drive DcBus Capacitors

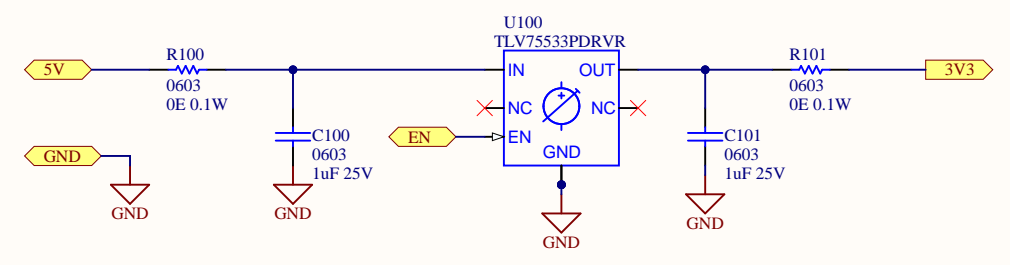
Title: EPC9186_BusCapacitors_Rev1_0		Efficient Power Conversion 909 N. Pacific Coast Hwy, Ste. 23 El Segundo, CA 90245 United States www.epc-co.com		
Size: A	*	Revision: 1		
Date: 14-Jun-23		Sheet 6 of 15		
File: EPC9186_BusCapacitors_Rev1_0.SCHDOC				

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5V to 3V3 LDO Housekeeping Power Supply

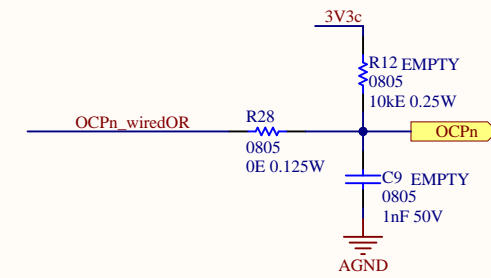
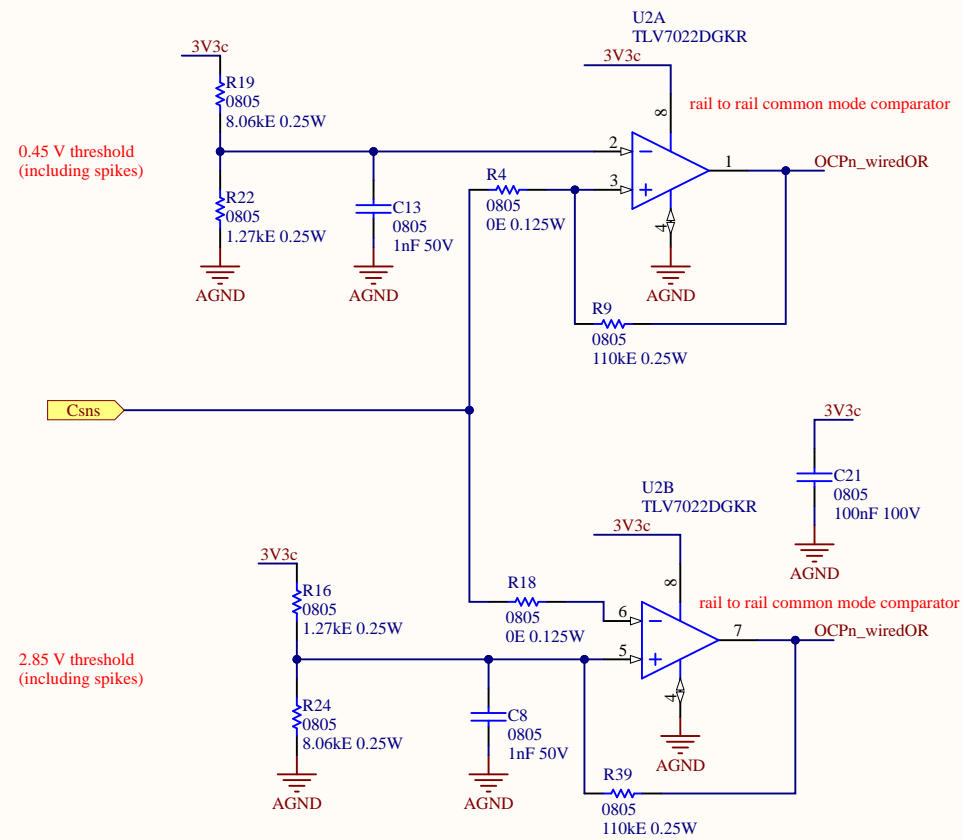
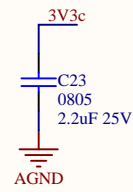
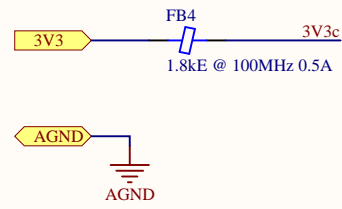
Title AP1051 Rev. 1.0		Efficient Power Conversion 909 N. Pacific Coast Hwy, Ste. 23 El Segundo, CA 90245 United States www.epc-co.com	
Size: A	Revision: 1		
Date: 13-Jul-22	Sheet 7 of 15		
File: AP1051_Rev1_0_5Vto3V3LDO_PSU.SCHDOC			



5 V to 3.3 V LDO power supply

Title AP1020 Rev. 1.0		Efficient Power Conversion 909 N. Pacific Coast Hwy, Ste. 23 El Segundo, CA 90245 United States www.epc-co.com	
Size: A	*	Revision: 1	
Date: 13-Jul-22	Sheet 8	of 15	
File: AP1020_Rev1_0_5Vto3V3_PSU.SCHDOC			

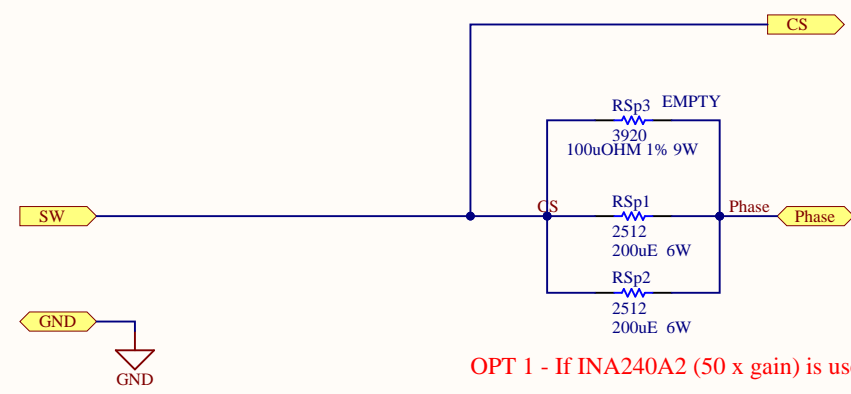




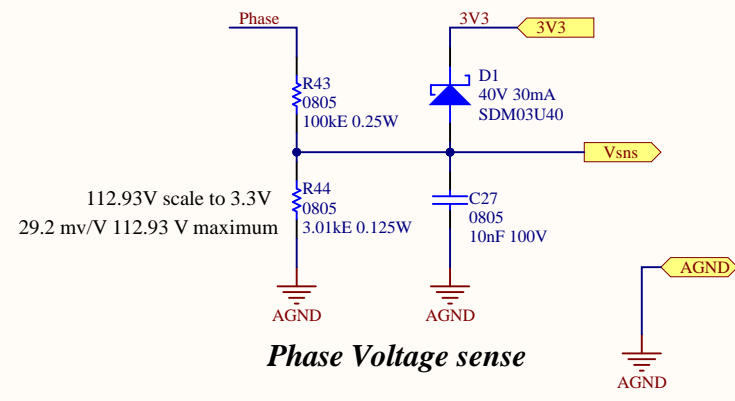
R12 and C9 are not mounted because they are mounted in front of the gate driver.

Bi-Directional Over Current Detection

Title AP1034 Rev. 1.1		Efficient Power Conversion 909 N. Pacific Coast Hwy, Ste. 23 El Segundo, CA 90245 United States www.epc-co.com	
Size: A	*	Revision: 1	
Date: 03-Feb-23	Sheet 9 of 15		
File: AP1034_Rev1_1_OverCurrentProtection.SCHDOC			



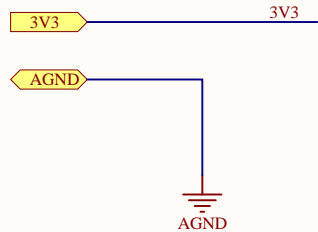
OPT 1 - If INA240A2 (50 x gain) is used, there is 100 uE shunt (2 in parallel) - gain is 5 mV/A
 OPT 2 - If ACS72981 is used, do not mount the 2 shunt resistors



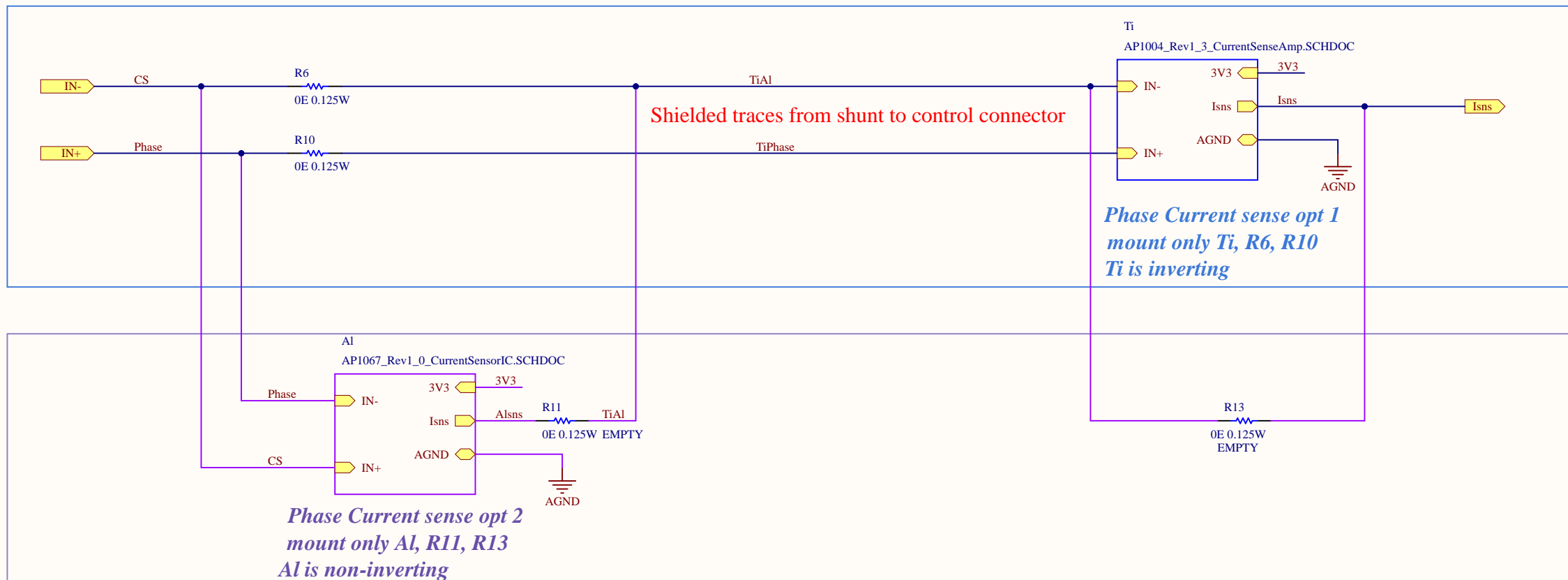
Phase Shunt and phase voltage sense

Title AP1037 Rev. 1.2		Efficient Power Conversion 909 N. Pacific Coast Hwy, Ste. 23 El Segundo, CA 90245 United States www.epc-co.com	
Size: A	*	Revision: 1	
Date: 09-Feb-23	Sheet 10 of 15		
File: AP1037_Rev1_2_PhaseShunt_wthV_Isns.SCHDOC			





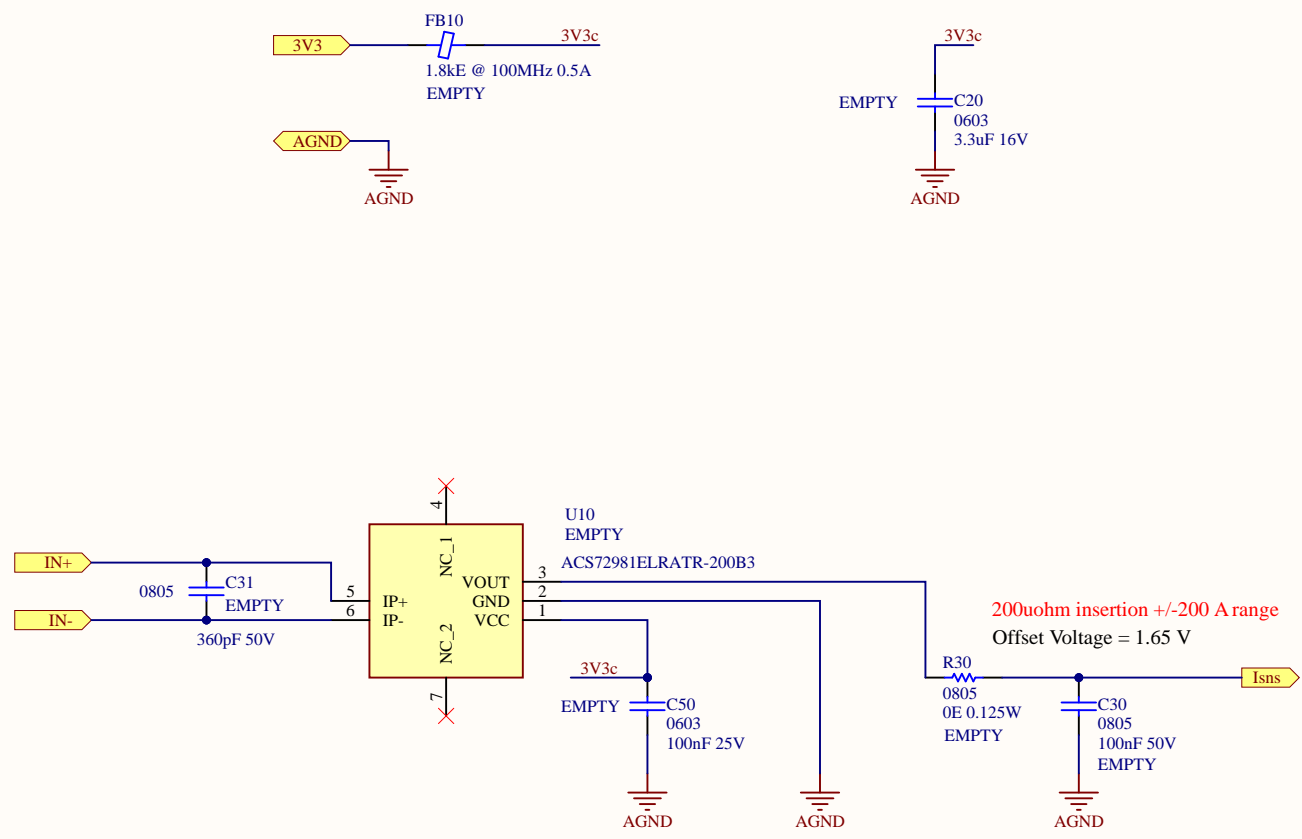
Valutare se usare tutte e due le piste con uscita Allegro



Bi-Directional Current Sense options

Title EPC9186_CurrentSenseOptions_Rev1_0		Efficient Power Conversion 909 N. Pacific Coast Hwy, Ste. 23 El Segundo, CA 90245 United States www.epc-co.com	
Size: A	*	Revision: 1	
Date: 22-Jun-23	Sheet 11 of 15		
File: EPC9186_CurrentSenseOptions_Rev1_1.SCHDOC			

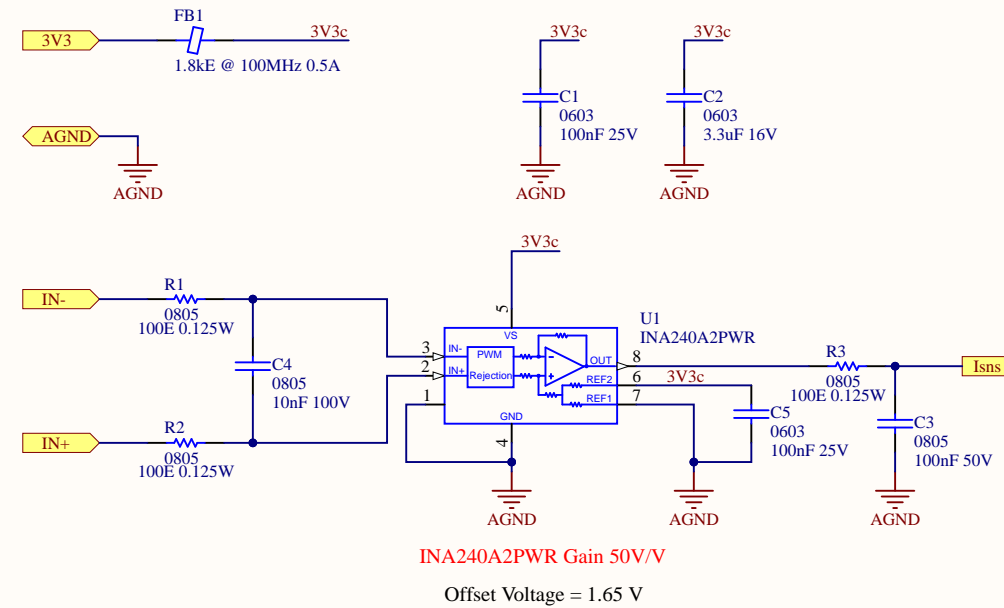




Bi-Directional Current Sensor IC - no shunt required

Title AP1067 Rev. 1.0		Efficient Power Conversion 909 N. Pacific Coast Hwy, Ste. 23 El Segundo, CA 90245 United States www.epc-co.com	
Size: A	*	Revision: 1	
Date: 27-Jul-23	Sheet 12 of 15		
File: AP1067_Rev1_0_CurrentSensorIC.SCHDOC			

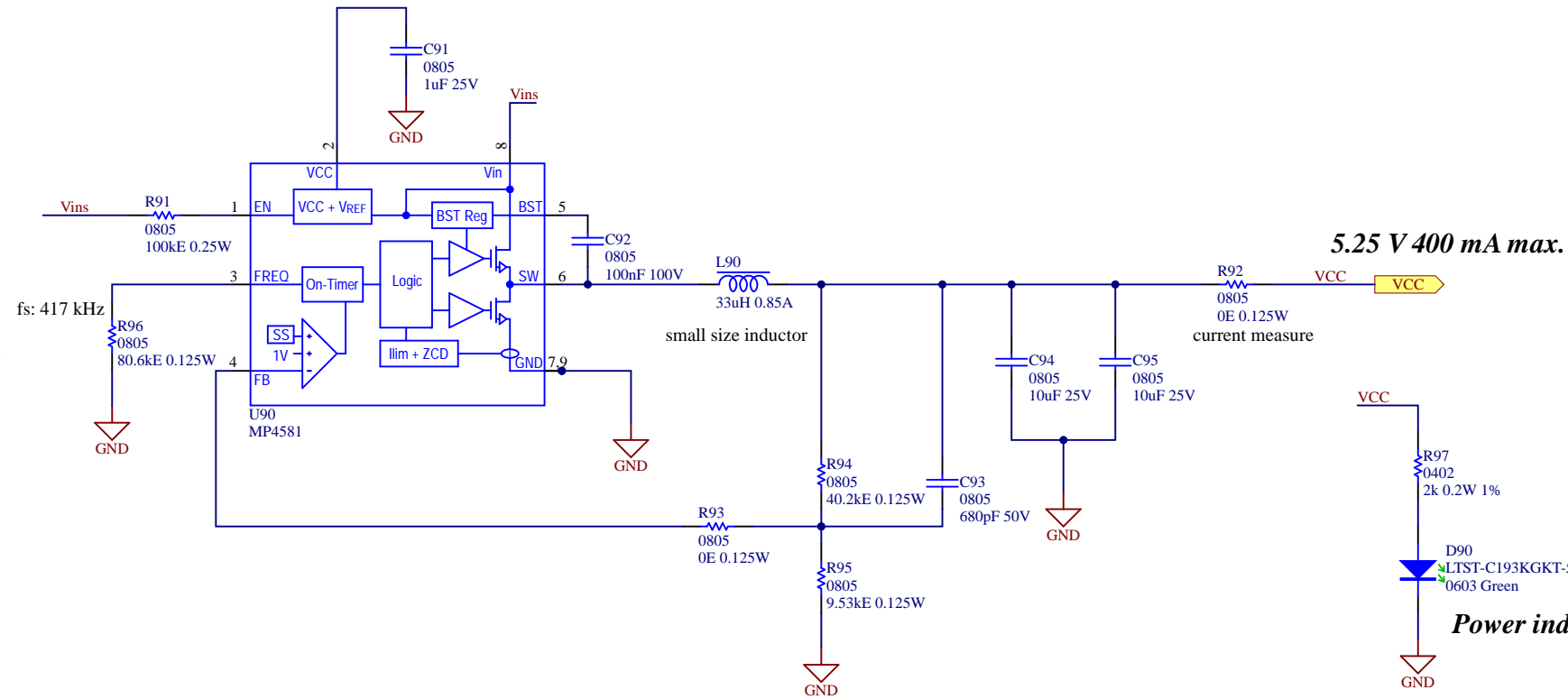
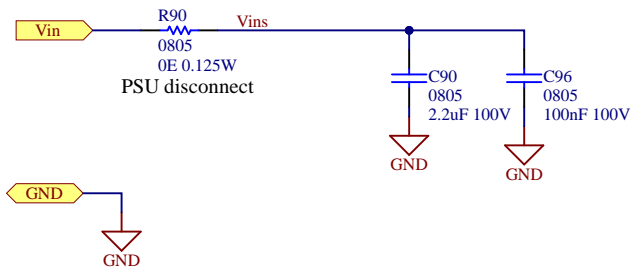




Bi-Directional 80 V Current Sense Amplifier

Title AP1004 Rev. 1.3		Efficient Power Conversion 909 N. Pacific Coast Hwy, Ste. 23 El Segundo, CA 90245 United States www.epc-co.com		
Size: A	*	Revision: 1		
Date: 22-Jun-23		Sheet 13 of 15		
File: AP1004_Rev1_3_CurrentSenseAmp.SCHDOC				

10 Vmin. to 100 Vmax.

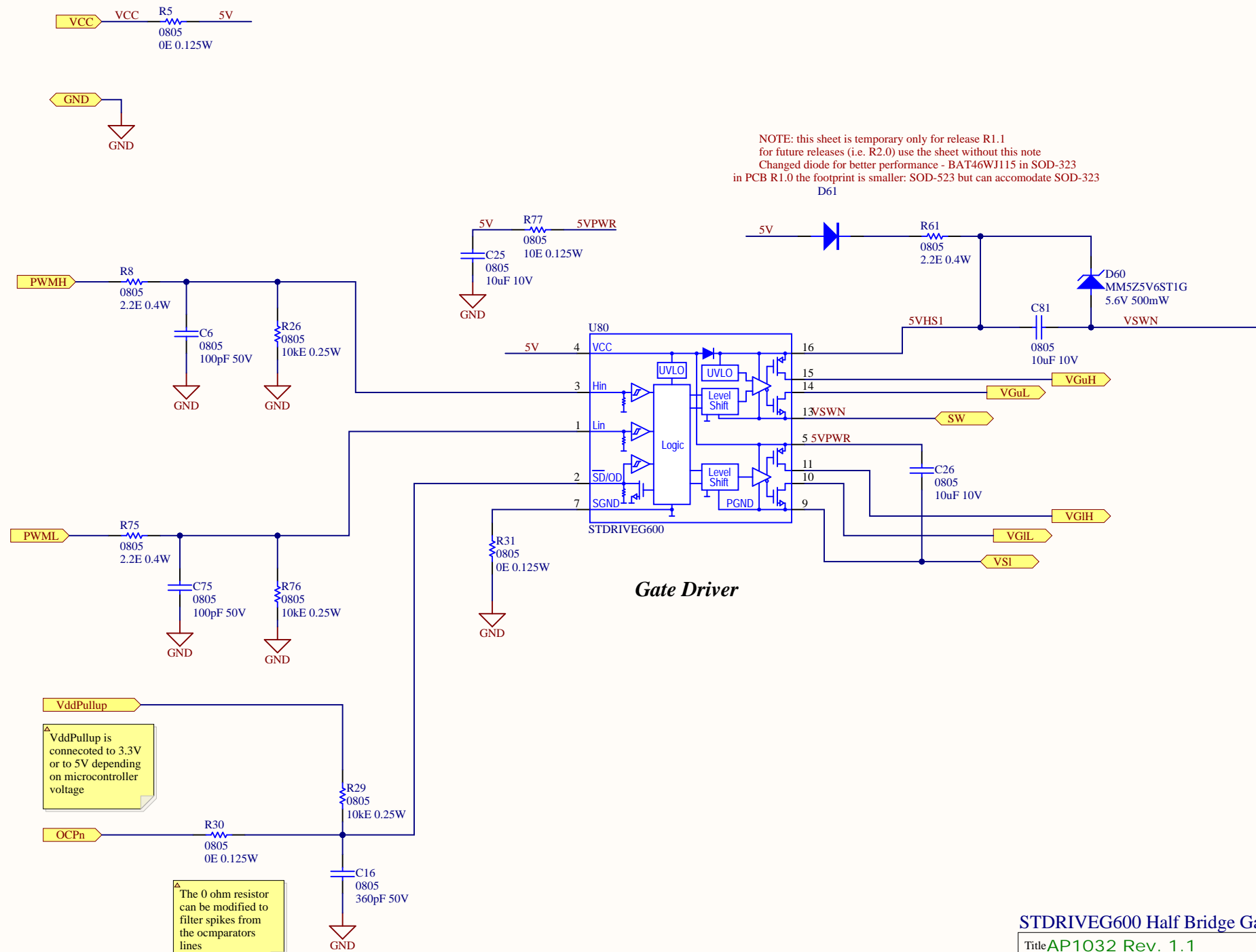


5.25 V 400 mA max.

100 V to 5 V Housekeeping Power Supply

Title AP1065 Rev. 1.0		Efficient Power Conversion 909 N. Pacific Coast Hwy, Ste. 23 El Segundo, CA 90245 United States www.epc-co.com	
Size: A	*	Revision: 1	
Date: 27-Jul-23	Sheet 14 of 15		
File: AP1065_Rev1_0_100V_to_5V_PSU.SCHDOC			

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NOTE: this sheet is temporary only for release R1.1
 for future releases (i.e. R2.0) use the sheet without this note
 Changed diode for better performance - BAT46WJ115 in SOD-323
 in PCB R1.0 the footprint is smaller: SOD-523 but can accomodate SOD-323
 D61

Gate Driver

VddPullup is connected to 3.3V or to 5V depending on microcontroller voltage

The 0 ohm resistor can be modified to filter spikes from the comparators lines

STDRIVEG600 Half Bridge Gate Driver

Title AP1032 Rev. 1.1		Efficient Power Conversion 909 N. Pacific Coast Hwy, Ste. 23 El Segundo, CA 90245 United States www.epc-co.com	
Size: A	Revision: 1		
Date: 28-Jul-23	Sheet 15 of 15		
File: AP1032_Rev1_1_STDRIVEG600_GateDriver_temporary.SCHDOC			