

BOARD SPECIFICATIONS

- Dimensions: 8in by 8in, 0.093in thick, 2oz copper on all layers, ENIG, 6 layers

PRESS-FIT NOTES


- All other components should be 5mm from the center of the WolfPACK pins
- For the REDCUBE press-fit terminals, per the application notes, other components should be spaced at least 4mm away and the hole should be at least 3mm from the edge.

GENERAL NOTES

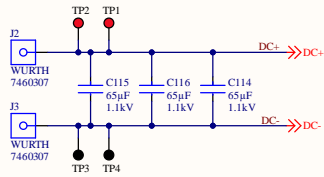
- The +5V_ALT power rail is required to avoid routing the +5V rail across the DC-link copper pours on the PCB. Only route the +12V rail across the DC-link.

Version History

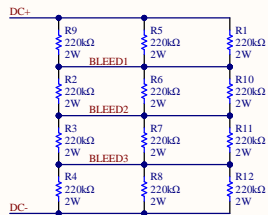
Version	Date	Description
V1.0	2023/04	Initial release.
V1.1	2023/07	Added 10kΩ to gate-source, made Rg easier to access, added thermal relief, switched to 1.65V regulators, fixed inverted regulator outputs
V1.2	2024/01	RELAY1 controlled by GPIO44; GPIO57 routed to spare pin connector; Updated spare connector pinout to reflect GPIO changes; Moved DC-DC converters from controller for easier insert/remove; Reduced mounting hole annular ring; Moved components hidden by heat sink to topside; Silkscreen & copper pour clean up; Added option to float heatsink; Fixed resolver excitation circuit; Design rule improvements; Removed thermal relief from press-fit pins since no soldering; Improved pin notations in footprint silkscreens; Switched +/-15V regulation circuit to LM5157QRTERQ1; Added top layer copper islands to DC+/- terminals of module for improved thermals Reduced number of unique BOM items by changing the following: 1) LED resistors, 2) input power conditioning resistors & RETRY capacitor, 3) NTC isolated supply

		[No Variations]	
Title: 25kW WolfPACK FM3 Six-Pack Inverter			
Drawing No: CRD25DA12N-FMC			
Date: 01/2024	Size: B	Revision: 1.2	Sheet: 1 of 8

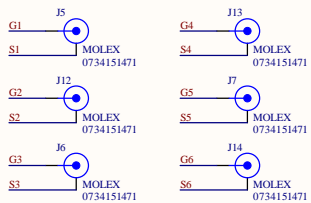
BULK CAPACITANCE



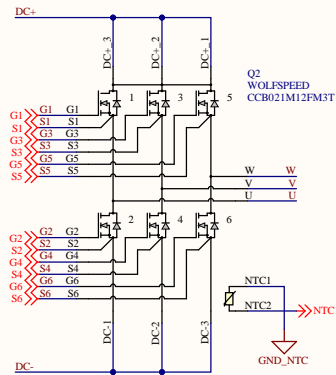
BLEED RESISTORS



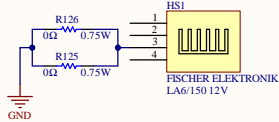
GATE METROLOGY



POWER MODULE

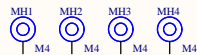


HEAT SINK



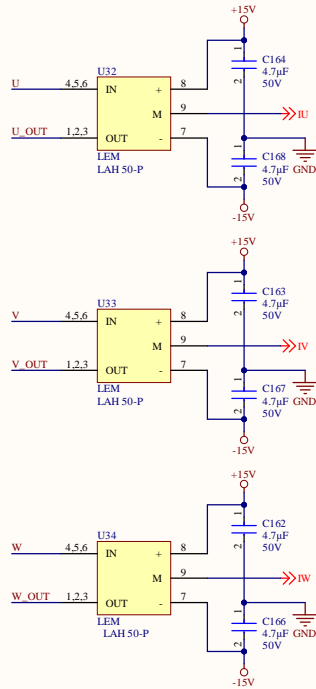
- Only ground in one location to prevent ground loops.
- Depopulate resistors to float heat sink (limited isolation)

MOUNTING HOLES

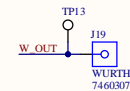
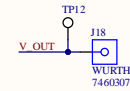
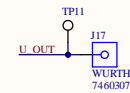


- Floating to avoid ground loops or short circuits through mounting hardware.
- Attach using 12mm standoffs (McMaster-Carr 98952A143)

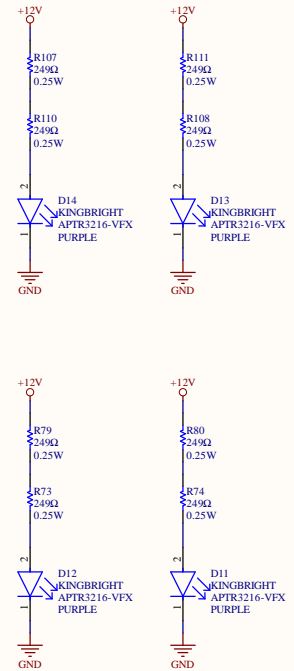
CURRENT MEASUREMENT



OUTPUT TERMINALS



UNDERGLOW



Vf = 3.3V
I_f = (12V-3.3V) / 498ohm = 17mA
P = 0.0117W / 249ohm = 72mW

Wolfspeed

[No Variations]

Title: Power Stage - 25kW WolfPACK FM3 Six-Pack Inv.

Drawing No: CRD25DA12N-FMC

Date: 01/2024

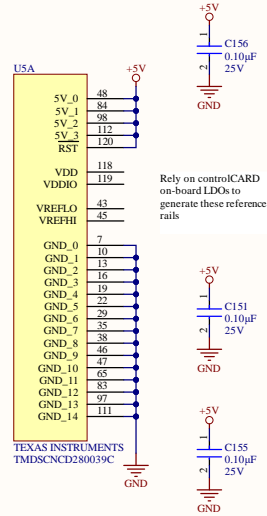
Size: B

Revision: 1.2

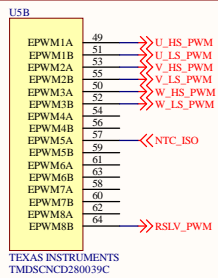
Sheet: 2 of 8

CONTROLLER

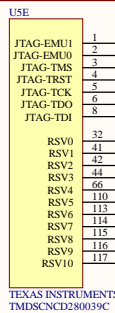
POWER



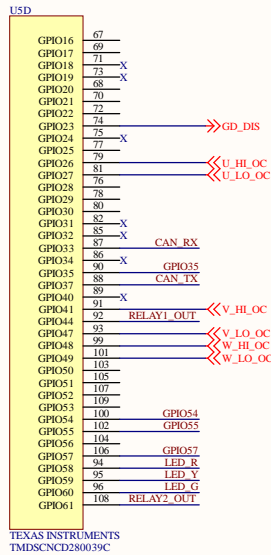
PWM



OTHER

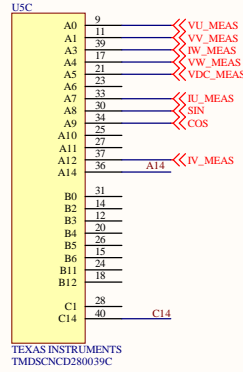


GPIO



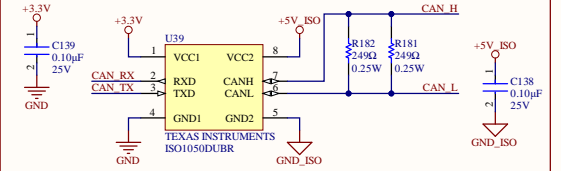
Signals labeled with "X" are preferred not to use due to pre-assigned functionality on the controller such as boot-mode

ANALOG



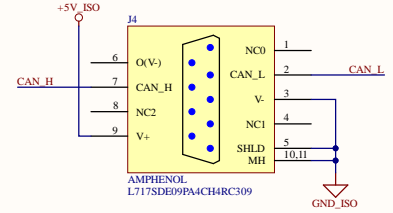
CAN

COMMUNICATION



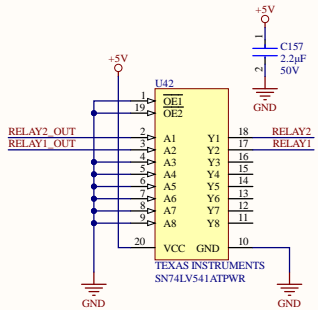
Parallel terminating resistors for BOM unique component reduction. Can use single 0603 120Ω resistor.

CONNECTOR

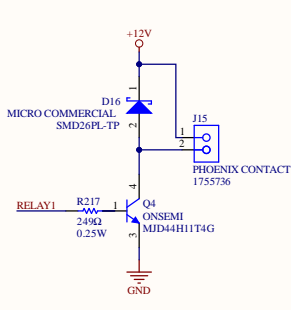


RELAYS

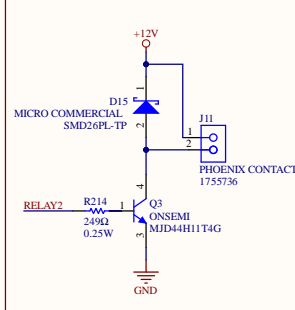
BUFFER



RELAY #1

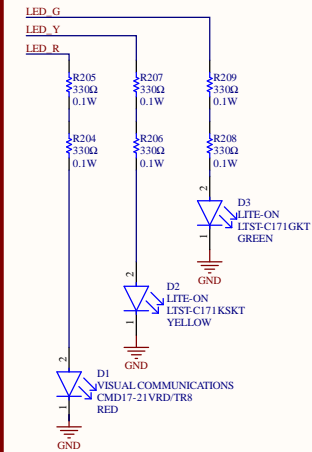


RELAY #2

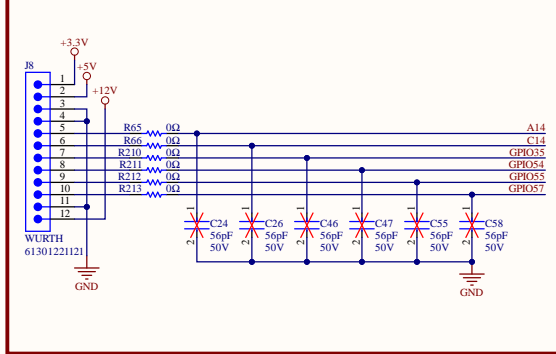


Mating Connectors:
- Connector with Wires Parallel to the PCB: Phoenix Contact 1792757
- Connector with Wires Perpendicular to the PCB: Phoenix Contact 1754449

PROGRAMMABLE LEDS



SPARE INPUTS/OUTPUTS



WolfSpeed

[No Variations]

Title: Controller - 25kW WolfPACK FM3 Six-Pack Inverter

Drawing No: CRD25DA12N-FMC

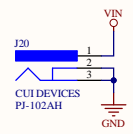
Date: 01/2024

Size: B

Revision: 1.2

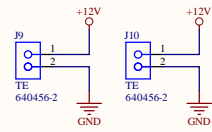
Sheet: 3 of 8

INPUT AUX POWER

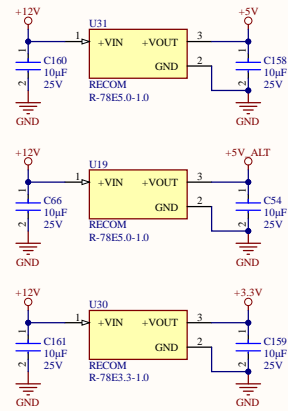


MATING: CUI DEVICES PP3-002A

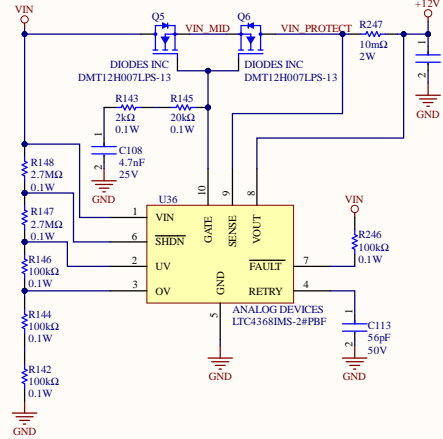
EXTERNAL FAN POWER



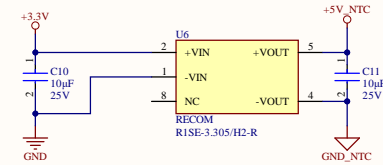
+3.3V AND +5V RAILS



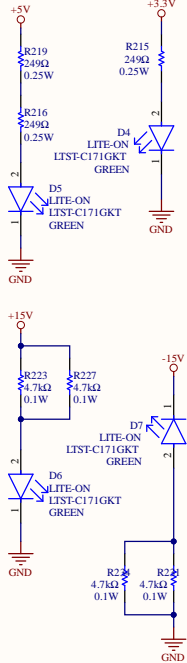
INPUT POWER CONDITIONING



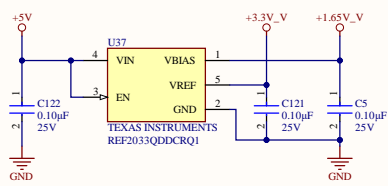
NTC ISOLATED +5V RAIL



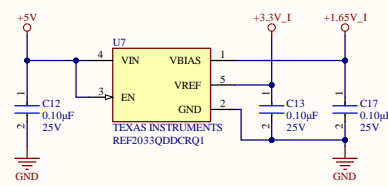
STATUS LEDs



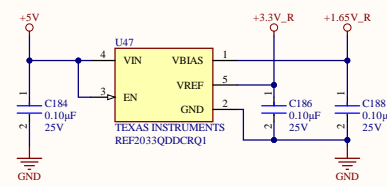
VOLTAGE REFERENCE RAILS



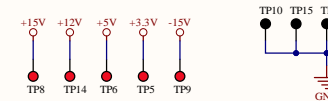
CURRENT REFERENCE RAILS



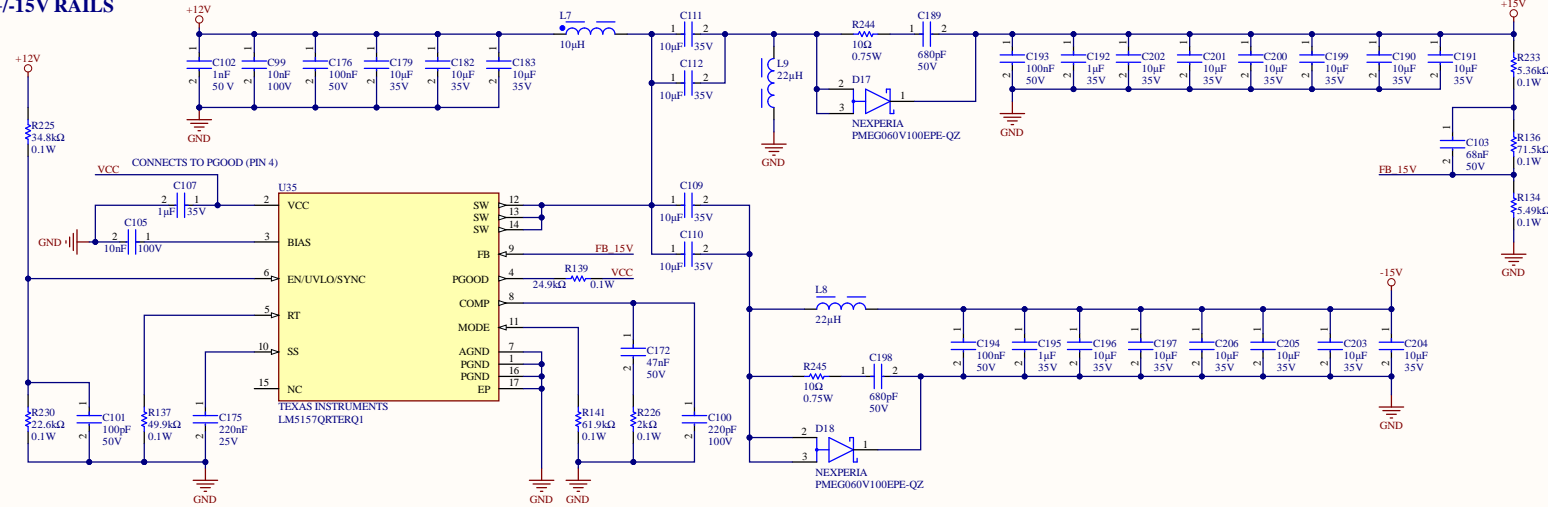
RESOLVER REFERENCE RAILS



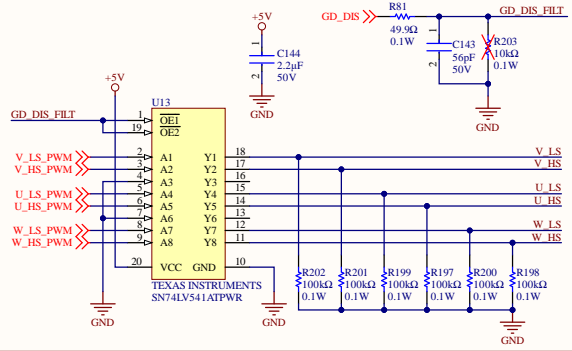
TEST POINTS



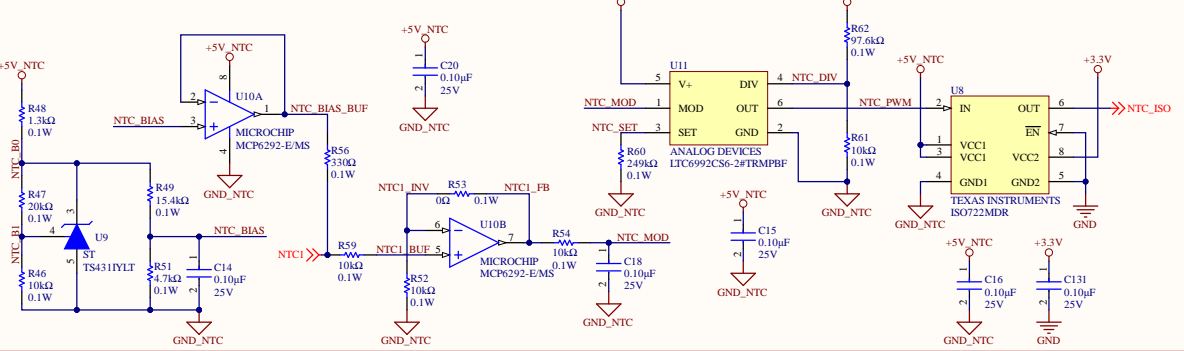
+/-15V RAILS



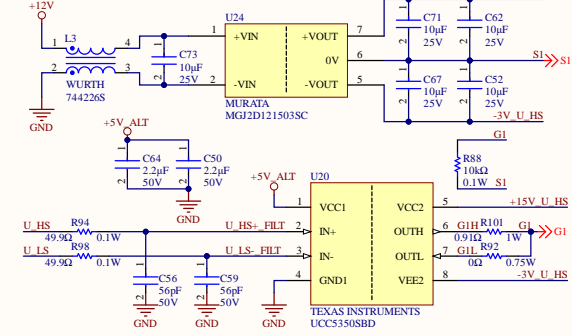
GATE DRIVER BUFFER



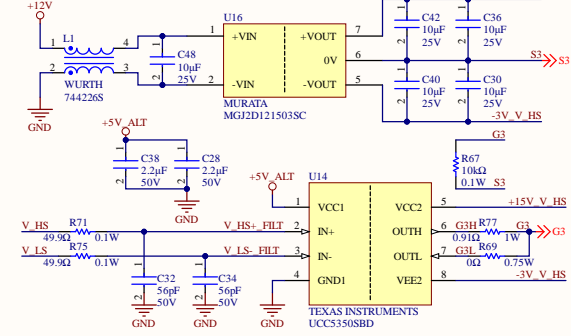
TEMPERATURE MEASUREMENT



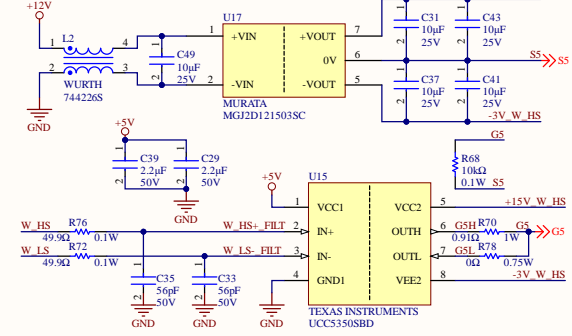
U-HS (G1) GATE DRIVER



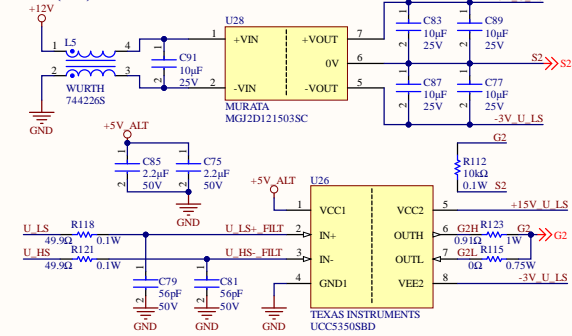
V-HS (G3) GATE DRIVER



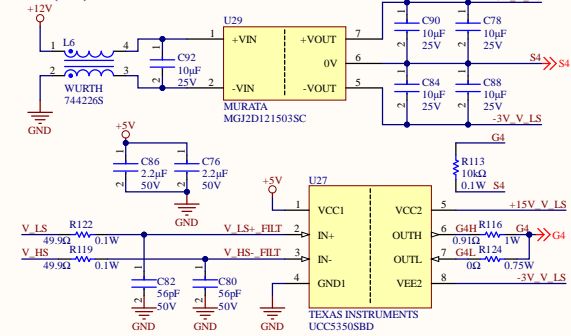
W-HS (G5) GATE DRIVER



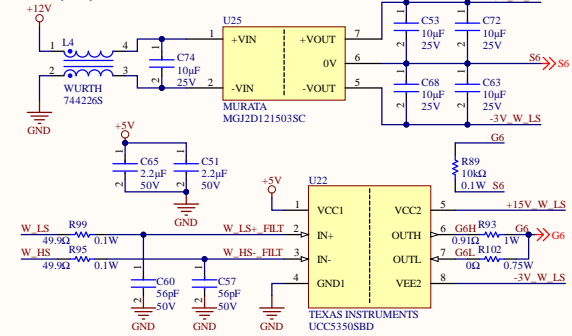
U-LS (G2) GATE DRIVER



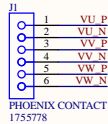
V-LS (G4) GATE DRIVER



W-LS (G6) GATE DRIVER

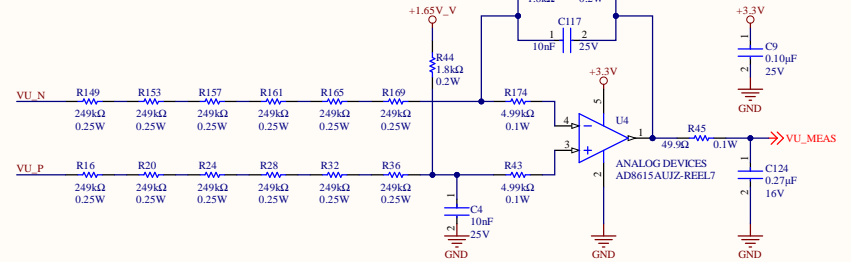


AC VOLTAGE FEEDBACK

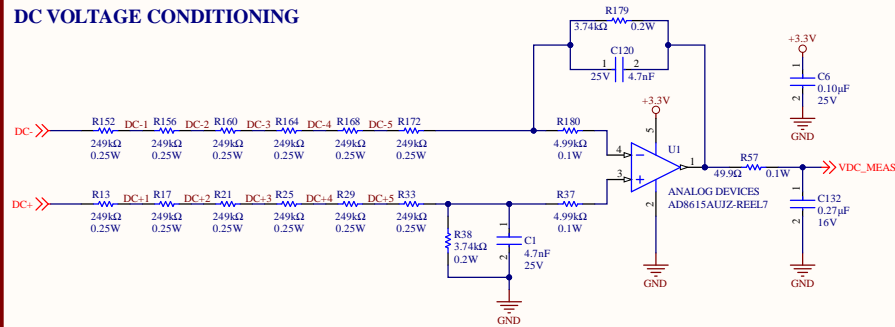


Mating Connectors:
 - Connector with Wires Parallel to the PCB: Phoenix Contact 1792799
 - Connector with Wires Perpendicular to the PCB: Phoenix Contact 1757051

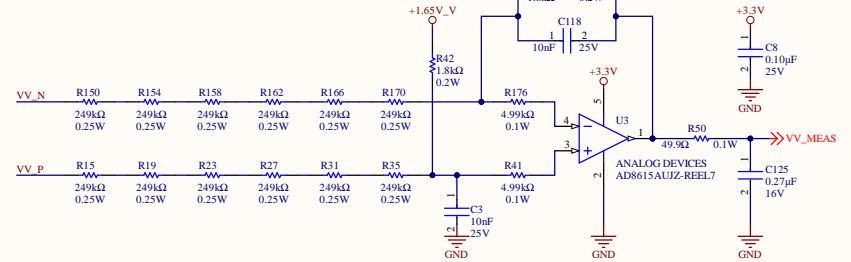
U VOLTAGE CONDITIONING



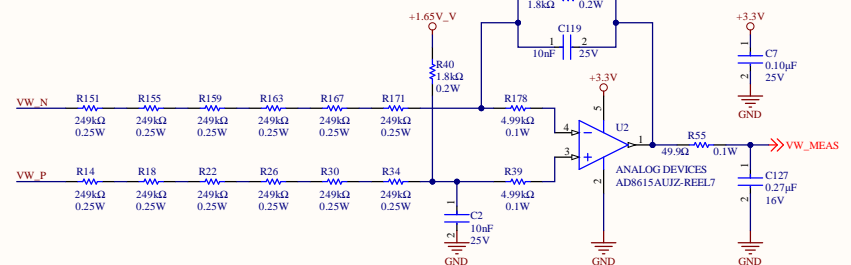
DC VOLTAGE CONDITIONING



V VOLTAGE CONDITIONING



W VOLTAGE CONDITIONING



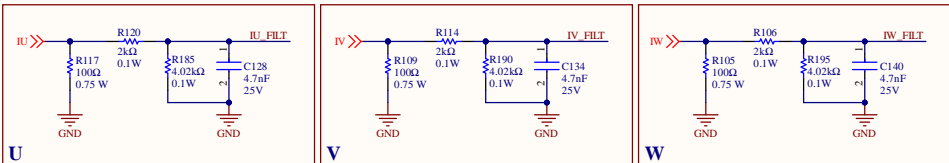
WolfSpeed [No Variations]

Title: Voltage Sense - 25kW WolfPACK FM3 Six-Pack Inv.

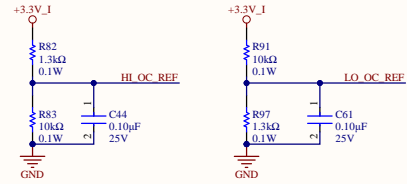
Drawing No: CRD25DA12N-FMC

Date: 01/2024 Size: B Revision: 1.2 Sheet: 6 of 8

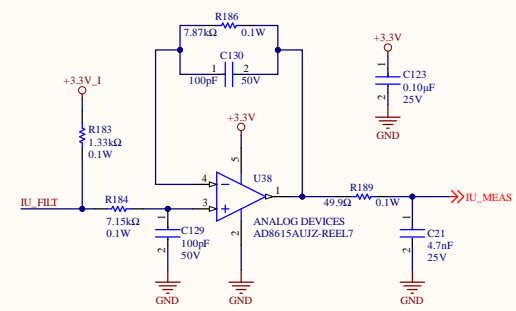
I-TO-V CONVERSION



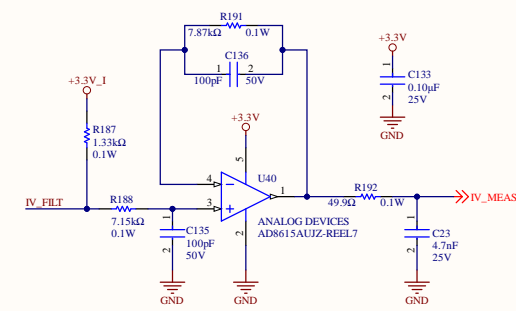
OVERCURRENT REFERENCES



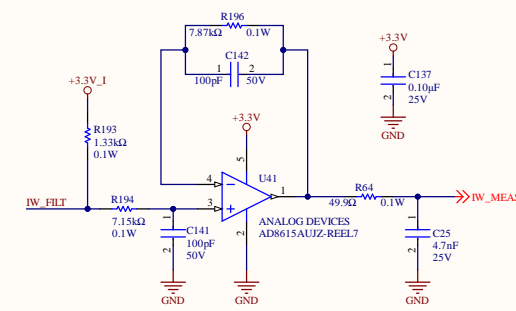
U CURRENT CONDITIONING



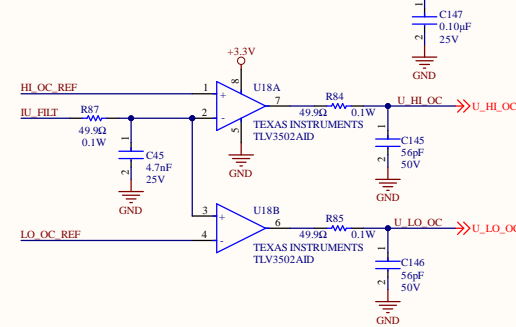
V CURRENT CONDITIONING



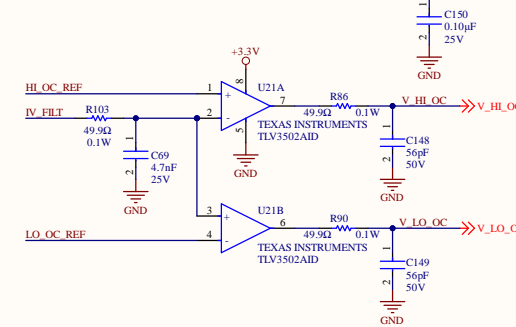
W CURRENT CONDITIONING



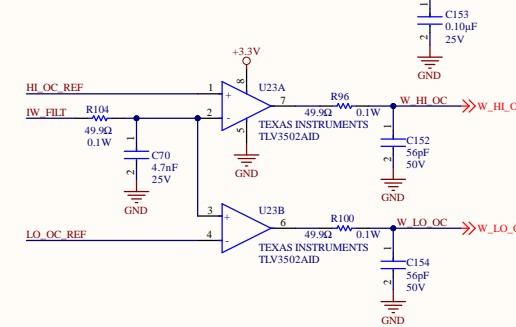
U OVERCURRENT DETECTION



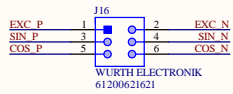
V OVERCURRENT DETECTION



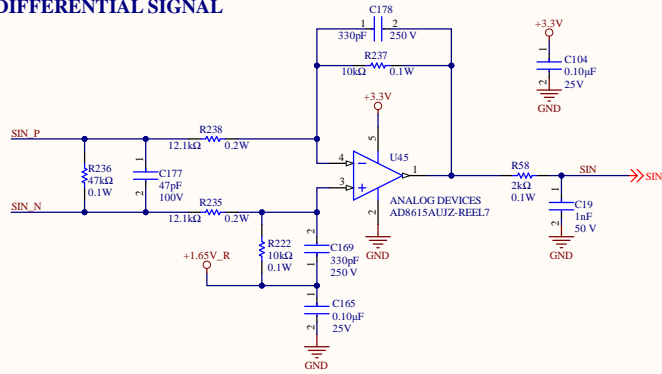
W OVERCURRENT DETECTION



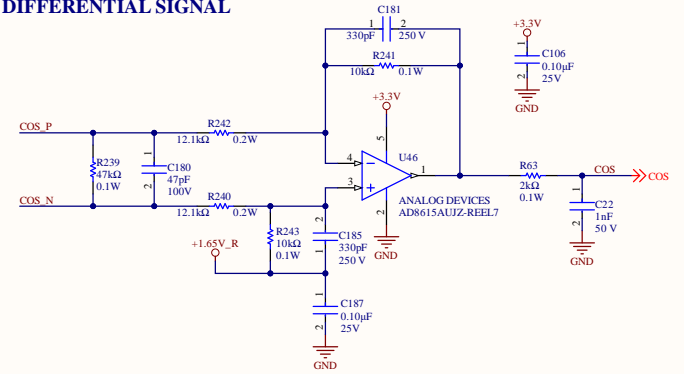
RESOLVER CONNECTOR



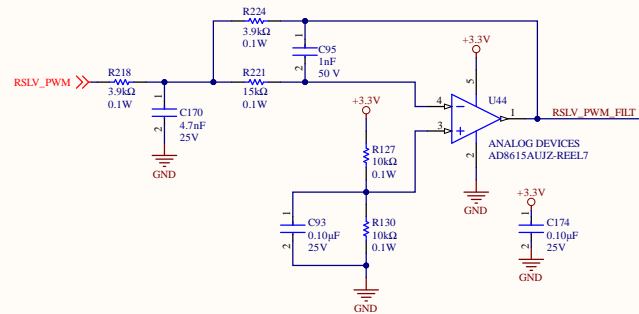
SINE DIFFERENTIAL SIGNAL



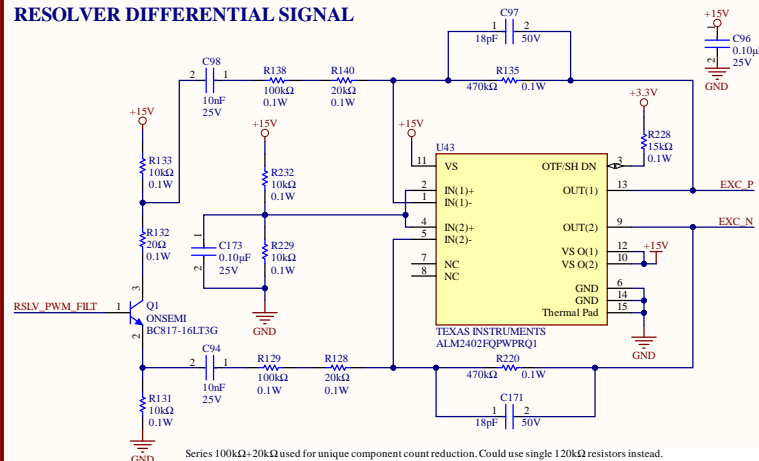
COSINE DIFFERENTIAL SIGNAL



RESOLVER CONDITIONING



RESOLVER DIFFERENTIAL SIGNAL



PROTECTION

