

A4915MET Evaluation Board User Guide

DESCRIPTION

This evaluation board is used to demonstrate the Allegro A4915MET three-phase MOSFET driver IC.

FEATURES

- Onboard voltage regulator for logic inputs
- Screw-down connectors for motor voltage supply, motor outputs, and Hall inputs

EVALUATION BOARD CONTENTS

- APEK4915MET-01-T evaluation board

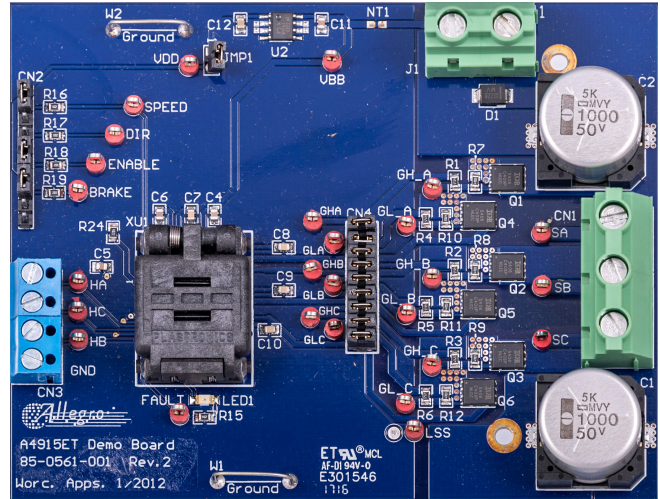


Figure 1: A4915MET Evaluation Board

Table 1: A4915MET Evaluation Board Configurations

| Configuration Name | Part Number |
|--------------------|-------------|
| APEK4915MET-01-T | A4915MET-T |

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Table 2: General Specifications

| Specification | Min. | Nom. | Max. | Units |
|---|---------------------|------|---------------------|-------|
| Motor Supply Voltage (V_{BB}) | 5 | – | 50 | V |
| VREF Output Voltage ($V_{BB} = 5$ to 50 V) | 3 | – | 5.5 | V |
| Input Logic Low Level | 0 | – | $V_{DD} \times 0.3$ | V |
| Input Logic High Level | $V_{DD} \times 0.7$ | – | 5.5 | V |

USING THE EVALUATION BOARD

EQUIPMENT REQUIRED

- Three-phase BLDC motor with Hall elements
- Motor voltage supply

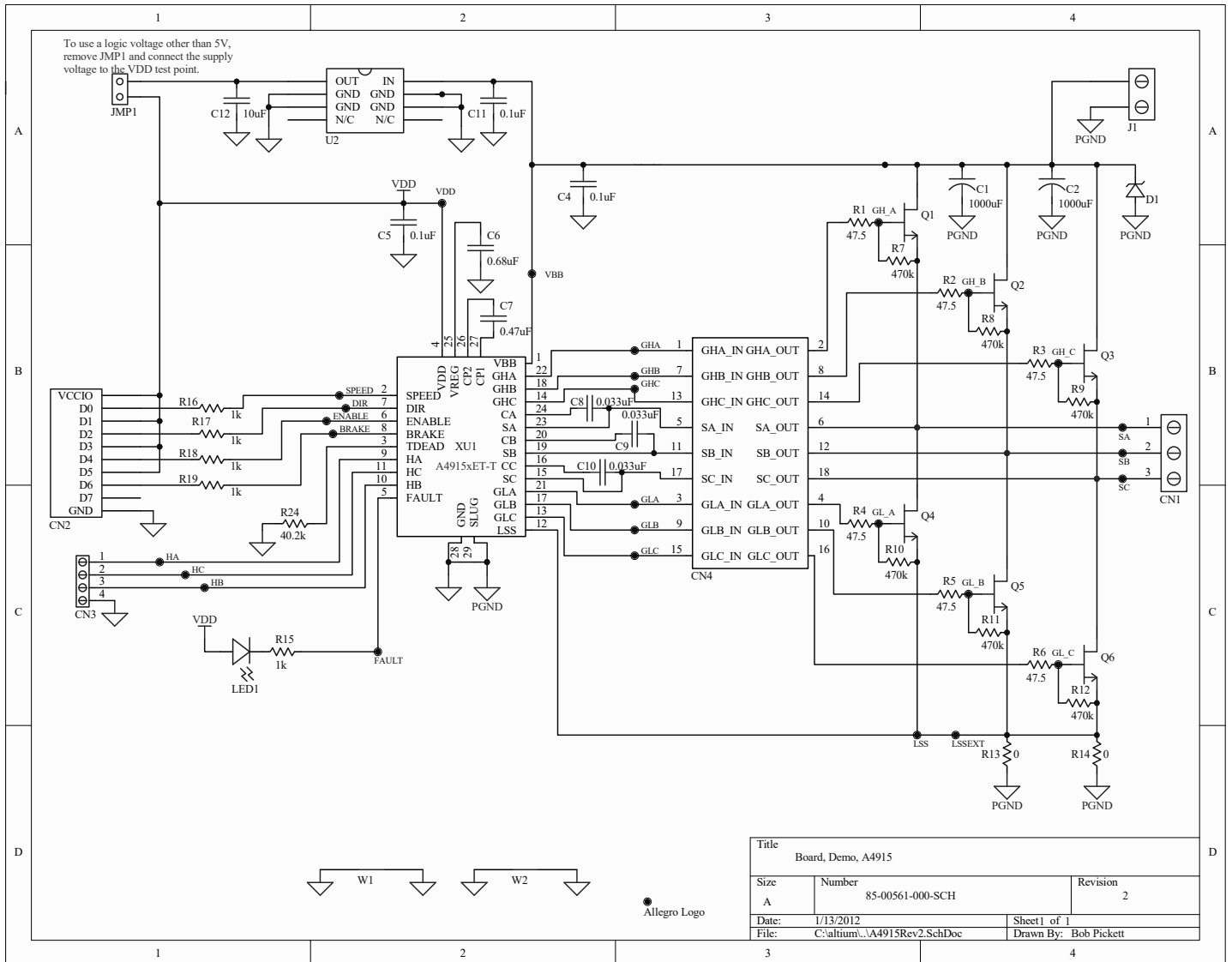
SETUP

1. Set the motor voltage supply to the intended voltage.
2. Turn off motor voltage supply.
3. Connect motor windings to CN1.
4. Connect motor Hall elements to CN3.
5. Connect motor voltage supply to J1.

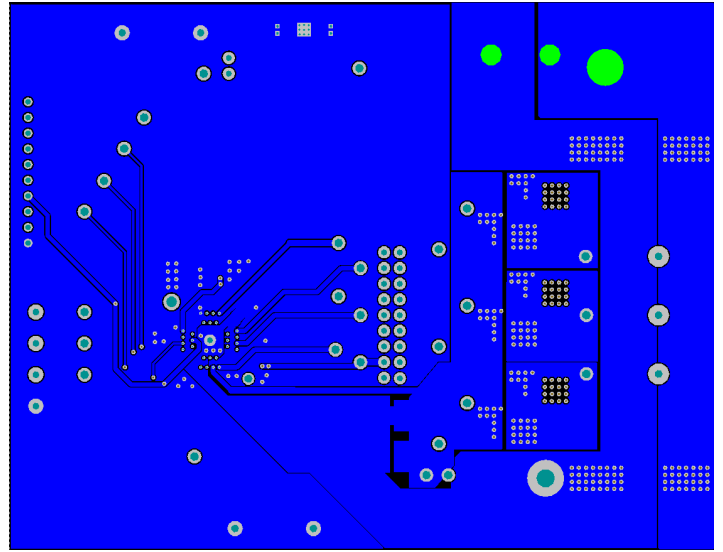
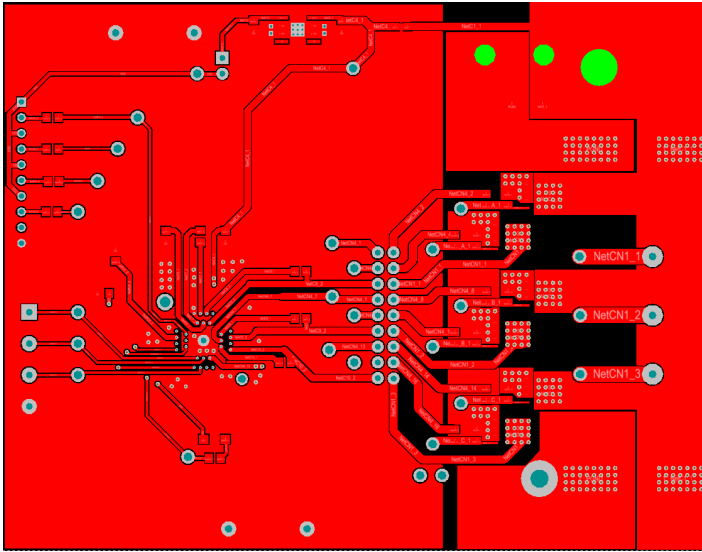
Note: Do not connect or disconnect the motor unless the outputs are either disabled or the VBB voltage is off.

6. Turn the motor voltage supply on.

SCHEMATIC



LAYOUT



BILL OF MATERIALS

Table 3: APEK4915MET-01-T Evaluation Board Bill of Materials

| ELECTRICAL COMPONENTS | | | | | |
|---|----------|----------|--|--|--------------------------------|
| Designator | Quantity | Value | Description | Part Type | Footprint |
| BRAKE, DIR, ENABLE, FAULT, GH_A, GH_B, GH_C, GHA, GHB, GHC, GL_A, GL_B, GL_C, GLA, GLB, GLC, HA, HB, HC, LSS, SA, SB, SC, SPEED, VBB, VDD | 26 | | Large Test Point | Keystone Electronics 5010; Digikey 5010K-ND | PAD 57 125 TP HB |
| C1, C2 | 2 | 1000 µF | 50 V Capacitor | United Chemi-Con EMVY500GDA102MMN0S; Digikey 565-2501-2-ND | UCC MNO Cap |
| C4, C5, C11 | 3 | 0.1 µF | 50 V Capacitor | TDK C2012X7R1H104K; Digikey 445-1349-1-ND | 0805 |
| C6 | 1 | 0.68 µF | 25 V Capacitor | TDK CGA4J3X7R1E684K; Digikey 445-5686-1-ND | 0805 |
| C7 | 1 | 0.47 µF | 25 V Capacitor | AVX 08053D474KAT2A; Digikey 478-1407-1-ND | 0805 |
| C8, C9, C10 | 3 | 0.033 µF | 50 V Capacitor | Yageo CC0805KRX7R9BB333; Digikey 311-1374-1-ND | 0805 |
| C12 | 1 | 10 µF | 25 V Capacitor | Murata GRM21BR61E106KA73L; Digikey 490-5523-1-ND | 0805 |
| CN1 | 1 | | 3-Pin Screw Down Connector | Phoenix Contact 1714984; Digikey 277-1272-ND | MKDS 5/ 3-9,2 2 |
| CN2, JMP1 | 1 | | 10-Pin Male Header, Cut pins from 50-pin strip | Samtec TSW-150-07-T-S; Digikey SAM1035-50-ND | 2-pos. shunt, 10 pin USBConn |
| CN3 | 1 | | 4-Pin Screw Down Connector | On Shore ED120/4DS; Digikey ED2227-ND | 4-pin screw down connector2 |
| CN4 | 1 | | Cut from 80-Pin Strip | Tyco 9-146257-0; Digikey A34977-40-ND | 18-Pin Dual Row 0.1" Connector |
| D1 | 1 | | TVS Zener | Bourns SMBJ45A; Digikey SMBJ45ABCT-ND | DO-214AA |
| | 4 | | Bumpon Foot | 3M SJ-5303 (CLEAR); Digikey SJ5303-7-ND | Bumpon Foot |
| J1 | 1 | | 2-Pin Screw Down Connector | Phoenix Contact 1714971; Digikey 277-1271-ND | MKDS 5/ 2-9,5 |
| LED1 | 1 | | Green LED | Lite-On LTST-C150GKT; Digikey 160-1169-1-ND | 1206 LED |
| Q1, Q2, Q3, Q4, Q5, Q6 | 6 | | 60 V, 50 A, N-Channel MOSFET | TI CSD18537NQ5AT; Digikey 296-37747-1-ND | PQFN 5x6 B |
| R1, R2, R3, R4, R5, R6 | 6 | 47.5 Ω | 1/8 W Resistor | Panasonic ERJ-6ENF47R5V; Digikey P47.5CCT-ND | 0805 |
| R7, R8, R9, R10, R11, R12 | 6 | 470 kΩ | 1/8 W Resistor | Panasonic ERJ-6ENF4703V; Digikey P470KCCT-ND | 0805 |
| R15, R16, R17, R18, R19 | 5 | 1 kΩ | 1/8 W Resistor | Panasonic ERJ-6GEYJ102V; Digikey P1.0KACT-ND | 0805 |
| R24 | 1 | 40.2 kΩ | 1/8 W Resistor | Vishay/Dale CRCW080540K2FKEA; Digikey 541-40.2KCCT-ND | 0805 |
| - | 10 | - | Shunts for JMP1 and CN4 | 3M 969102-0000-DA; Digikey 3M9580-ND | |
| - | 1 | - | PCB | 85-0561-001 Rev. 2 | |
| U2 | 1 | 5 V | Linear Voltage Regulator | National LM2936HVMA-5.0/NOPB; Digikey LM2936HVMA-5.0/NOPB-ND | LM2936HVMA |
| W1, W2 | 2 | | 22 Gauge Buss Wire (300 mils above PCB) | | Scope Ground |
| XU1 | 1 | | Socket for 3-Phase Motor Controller | 28QN50K15050-B | 28QN50K15050-B |

RELATED LINKS

A4915 Product Page: <https://www.allegromicro.com/en/products/motor-drivers/bldc-drivers/a4915>

APPLICATION SUPPORT

For applications support contact, go to <https://www.allegromicro.com/en/about-allegro/contact-us/technical-assistance> and navigate to the appropriate region.

Revision History

| Number | Date | Description |
|--------|-----------------|-----------------|
| - | August 31, 2023 | Initial release |

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