DRV8833 Evaluation Module

User's Guide

Literature Number: SLVU498
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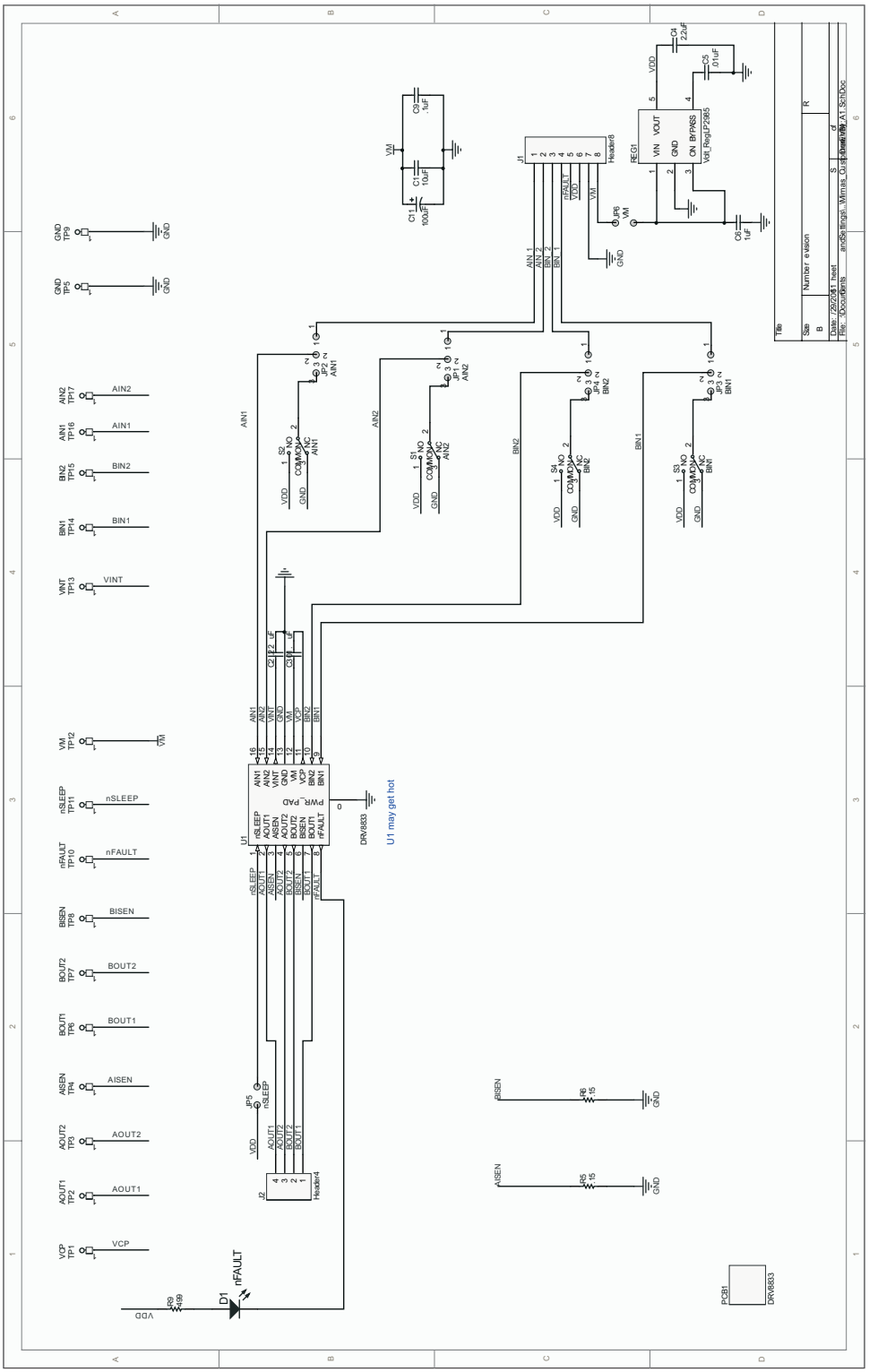
Contents

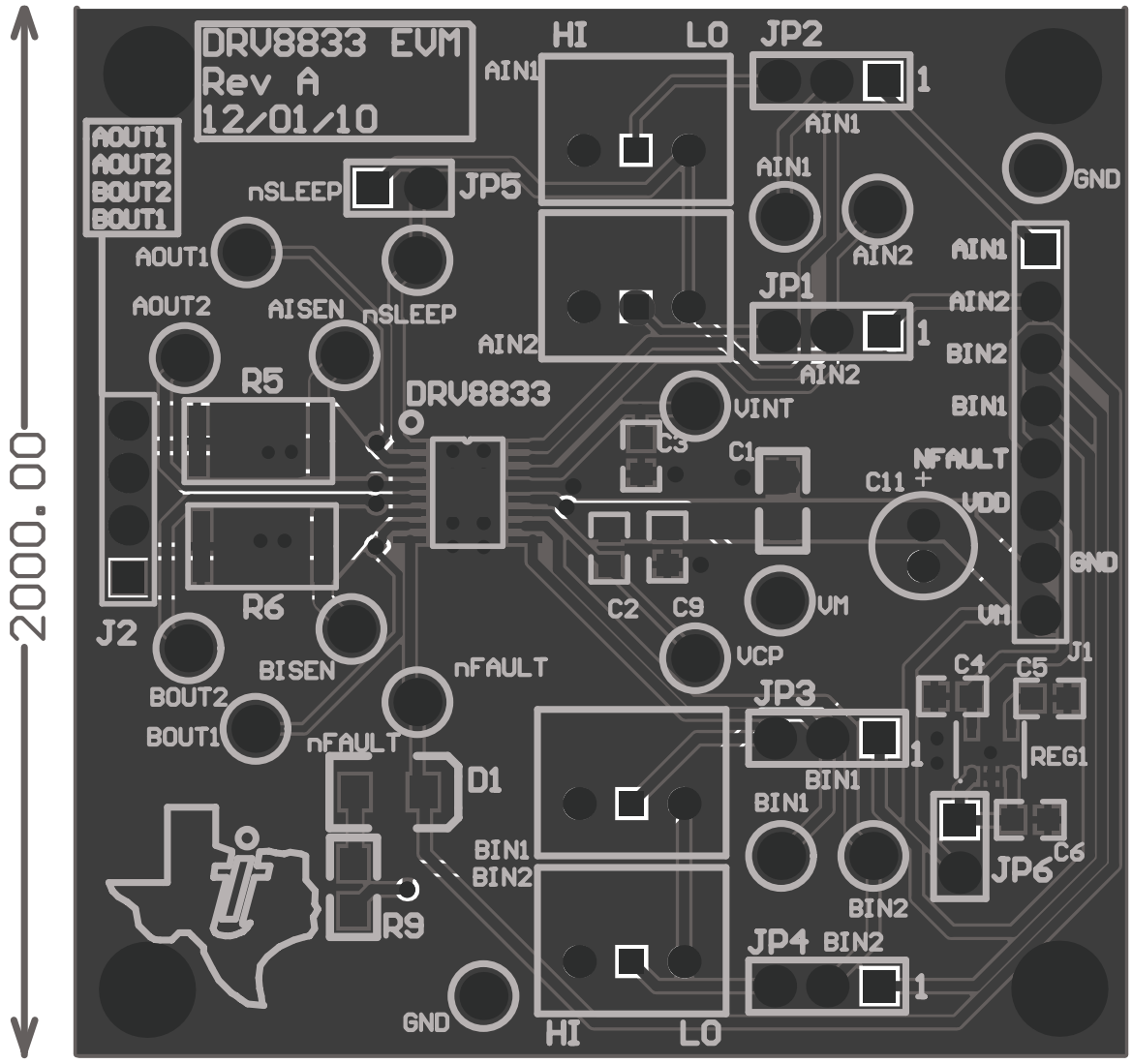
1 Introduction

This document is provided with the DRV8833 customer evaluation module (EVM) as a supplement to the DRV8833 datasheet. It details the hardware implementation of the EVM.

2 Schematic



3 PCB



4 Connectors

4.1 Motor Outputs

The connector J2 should be connected to the motor terminals. Each pin in this terminal is labeled on the EVM itself as AOUT1, AOUT2, BOUT1 and BOUT2. The polarity of these connections will affect the direction of the motor in the case of a brushed DC motor. In case of a stepper motor, one winding should be connected to AOUT1 and AOUT2, while the other should be connected to the outputs BOUT1 and BOUT2. Refer the datasheet for further information.

4.2 Power and Control Signals

The power and control signals for the DRV8833 are applied through the connector J1. Each pin in the connector is labeled on the EVM. Check the schematic for further clarification. The control signals for AIN1, AIN2, BIN1 and BIN2 can also be generated on board. Refer the Jumpers section in this user guide. The connector J1 also outputs the nFAULT signal from the IC and the VDD (5 V) generated from the on-board voltage regulator. These signals are labeled on the EVM silkscreen.

Apply a power of 2.7 V – 10.8 V between VM and GND on J1. Be sure to observe the correct polarity.

5 Jumpers

5.1 Voltage Regulator (JP6)

For the purpose of easy evaluation, a voltage regulator is provided on the DRV8833EVM. This regulator regulates the VM voltage down to 5 V if VM is greater than 5 V and maintains VM if VM is less than 5 V. If jumper JP6 is left shunted, the VDD signal on the board is provided by this regulator. It is 5 V and can drive up to 150 mA. This signal is used to light up the nFAULT LED, drive the nSLEEP signal and generates the HI signal for the switches AIN1, AIN2, BIN1 and BIN2. If the sleep current of the DRV8833 is being evaluated, leave this shunt off the board. This would make sure that the current measurement through VM doesn't include the current to the voltage regulator.

5.2 nSLEEP (JP5)

If this jumper is shunted, the 5 V generated from the on-board voltage regulator is connected to the nSLEEP pin. This ensures the part doesn't enter the SLEEP mode. If the SLEEP mode is not being evaluated, then the Jumper can be left shunted. If the SLEEP mode is being controlled externally through any controller, then disconnect this jumper and connect the nSLEEP signal from the external controller directly to the test point – nSLEEP.

5.3 xINx Signals (JP1, JP2, JP3 and JP4)

Jumpers JP1, JP2, JP3 and JP4 are used to select the source of the control signals AIN2, AIN1, BIN1 and BIN2 respectively. By placing a shunt between positions 1-2, the source of these control signals are routed to the connector J1. This connection allows the user to control these signals through an external controller.

If the shunt is placed between positions 2-3, then the source of these control signals are routed to the switches AIN1, AIN2, BIN1 and BIN2. Refer to the section on the Switches for more information.

6 Switches (AIN1, AIN2, BIN1 and BIN2)

When the jumpers JP1, JP2, JP3 and JP4 are set such that the control signals AIN1, AIN2, BIN1 and BIN2 are routed to the switches, these switches can be used to control the state of these input signals. The positions are labeled appropriately as HI and LO. LO is GND and HI is VDD (5 V). The state of the motor outputs for various input combinations can be inferred from the datasheet.

7 LED (D1)

The diode D1 indicates the status of the nFAULT signal. When there is a FAULT condition on the DRV8833, this LED lights up. The two possible fault conditions are over current and over temperature. Refer to the schematic / datasheet for more information.

8 Test Points

Kelvin connections are provided for all pins of DRV8833. They are appropriately labeled on the EVM. These test points can be used to measure the status of the pin or can be connected to the Sense of the controlling instrument.

9 Current Sense Resistors (R5, R6)

R5 and R6 are the current sense resistors directly connected to AISEN and BISEN respectively. The other side of this resistor is connected to GND. The value of this resistor is chosen to be 0.15 Ω. This value controls the current through the DRV8833 to be 1.33 A. To change this value of regulating current, this resistor value must be changed as mentioned in the datasheet.

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EVM Warnings and Restrictions

It is important to operate this EVM within the input voltage range of 0 V to 10.8 V.

Exceeding the specified input range may cause unexpected operation and/or irreversible damage to the EVM. If there are questions concerning the input range, please contact a TI field representative prior to connecting the input power.

Applying loads outside of the specified output range may result in unintended operation and/or possible permanent damage to the EVM. Please consult the EVM User's Guide prior to connecting any load to the EVM output. If there is uncertainty as to the load specification, please contact a TI field representative.

During normal operation, some circuit components may have case temperatures greater than 90°C. The EVM is designed to operate properly with certain components above 90°C as long as the input and output ranges are maintained. These components include but are not limited to linear regulators, switching transistors, pass transistors, and current sense resistors. These types of devices can be identified using the EVM schematic located in the EVM User's Guide. When placing measurement probes near these devices during operation, please be aware that these devices may be very warm to the touch.

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