User's Guide
DRV8434A Evaluation Module User's Guide

TEXAS INSTRUMENTS

Abstract

This document is provided with the DRV8434A evaluation module (EVM) as a supplement to the DRV8434A stepper motor driver datasheet. This user's guide details the hardware implementation of the EVM. Details on using the graphical user interface (GUI) software with this EVM can be found in the DRV8434AEVM GUI User's Guide.

Table of Contents

Trademarks

MSP430™ is a trademark of Texas Instruments.

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1 Board Overview

WARNING

The EVM is rated for power supply voltages between 4.5 VDC and 48 VDC max. The components can support peak output currents up to a maximum 4A. To minimize risk or personal injury, fire and/or property damage, always maintain component temperatures below the 130°C rating of the printed circuit board material.

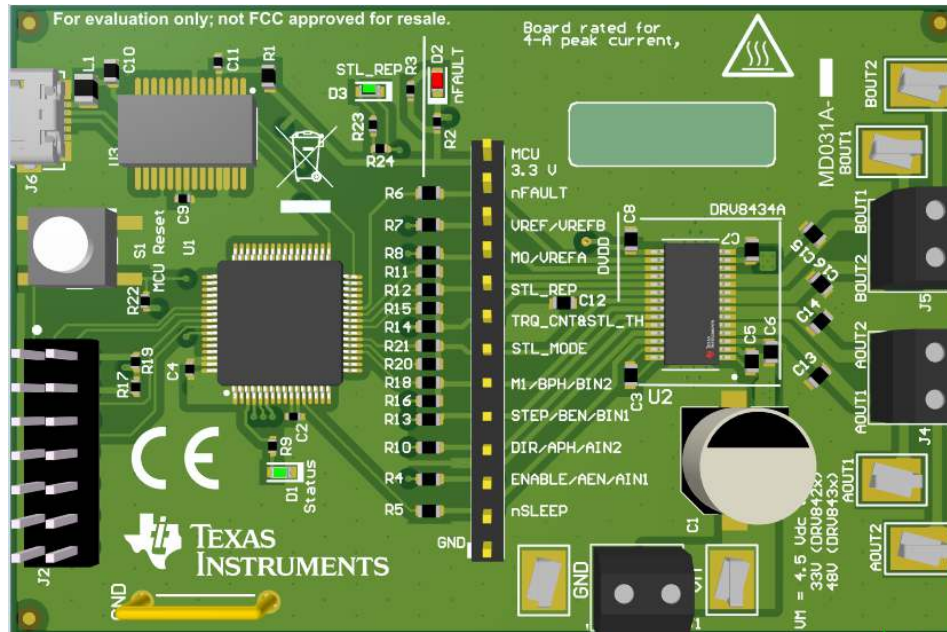Figure 1-1 shows the top view of the printed circuit board (PCB)

Figure 1-1. Top View of Typical Board Configuration (EVM provided may vary)

2 Introduction

The DRV8434AEVM is a platform to support prototyping and evaluation for the DRV8434A device, a medium-voltage dual H-bridge driver for stepper driving applications with analog stall detection function.

The EVM uses an MSP430™ microcontroller and a USB interface chip to manage communication from the GUI software application installed on a computer. The GUI sends serial commands to the MSP430 to control the device signals, monitor faults, and drive a motor.

This user's guide details the hardware configurability of the evaluation module.

2.1 Connectors

The DRV8434AEVM supplies the VM (motor voltage) power rail through the terminal block (J1). A set of test clips in parallel with the terminal block provide connections to monitor the input power rail.

The user must apply the VM voltage according to the recommended parameters listed in the datasheet of the device populated on the EVM (should be labeled on the EVM).
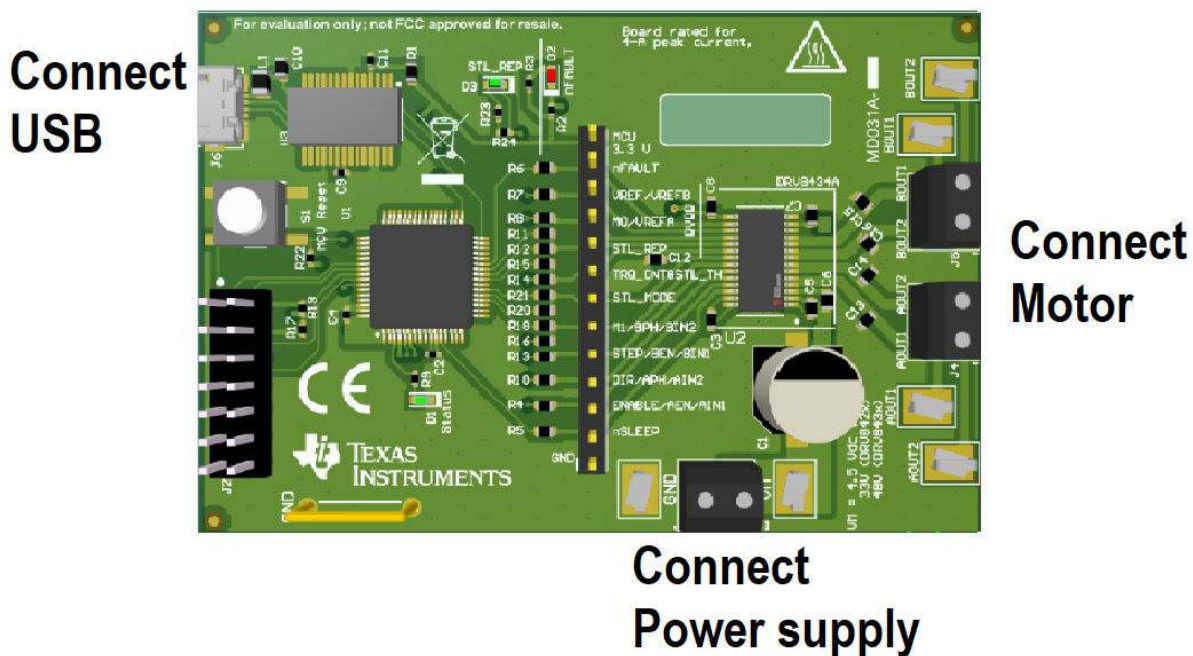

Figure 2-1. Board Connections

2.2 Test Points

A header connector with 0.100-inch pitch (J3) provides access to the DRV8434A signals. This can be used for measurement or as a connector to control the DRV8434A from an external microcontroller for prototype purposes. To disconnect the on-board MSP430 microcontroller, remove related zero ohm resistors between the MSP430 and the J3 header. Table 2-1 describes the connections available on the J3 header. Each header pin is labeled on the evaluation module and connects to the corresponding pin of the DRV8434A.

Table 2-1. Connections to the DRV8434A Using External Microcontroller

Header Label	Description
MCU 3.3V	3.3 V rail for the on-board MSP430 and nFAULT LED.
nFAULT	Fault output.
VREF/VREFB/EN4	Current setting reference input.
M0/VREFA/EN3	Microstepping mode-setting pin.

Table 2-1. Connections to the DRV8434A Using External Microcontroller (continued)

Header Label	Description
STL_REP	Stall report pin: the STL_REP pin is set high by the DRV8434A whenever stall is detected. If the pin is pulled low external to the device, then stall fault reporting is disabled. In stall threshold learning mode, after a successful learning, STL_REP goes from high to low. This pin must be pulled-up using an external resistor.
TRQ_CNT/STL_TH	Torque count output when STL_MODE = 0V; Learn result output when STL_MODE=HiZ; Stall threshold input when STL_MODE = DVDD.
STL_MODE	STL_MODE pin: When STL_MODE = 0V, stall threshold is computed by the driver and the TRQ_CNT/STL_TH pin acts as torque count (analog voltage output). When STL_MODE=HiZ, stall threshold learning is enabled. When STL_MODE = 1, stall threshold is set by applying a voltage on the TRQ_CNT/STL_TH pin.
M1/BPH/BIN2	Microstepping mode-setting pin.
STEP/BEN/BIN1	STEP pin.
DIR/APH/AIN2	DIR pin.
ENABLE/AEN/AIN1	Enable pin.
nSLEEP	Sleep mode input.
GND	Ground.

2.3 Jumpers

The DRV8434AEVM has no jumpers.

2.4 Motor Outputs

Two motor connectors are provided (J6 and J7).

2.5 EVM Operation

Use the following steps to operate the EVM:

1. Install the drivers and GUI. For instructions see DRV8434AEVM GUI User's Guide.
2. Connect the wires of the stepper motor to the AOUT1, AOUT2, BOUT1, and BOUT2 terminals.
3. Connect the VM power supply to VM connections, but do not turn on power yet.
4. Connect the USB cable between the PC and the EVM. When the USB is connected to the EVM, the status LED will begin to blink.
5. Download and install the DRV8434A GUI from www.ti.com. Run the GUI program. The GUI can take up to 30 seconds to establish a connection with the EVM. If connection is not established, try manually selecting the correct COM port under the *Options* menu. The baud rate should be 9600.
6. Apply the desired voltage to the VM and GND connections.
7. For more instructions on how to control the DRV8434AEVM using the GUI, refer the DRV8434AEVM GUI User's Guide.

2.6 EVM documentation

The EVM schematics, layout, and BOM are provided in the DRV8434AEVM hardware files. The GUI, USB drivers, and MSP430F2617 source code are provided in the DRV8434AEVM firmware and GUI software files.

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