



Abstract

This document is provided with the DRV84xx, DRV89xx, and DRV8256x evaluation module (EVM) as a supplement to the DRV84xx Stepper Motor Driver, DRV89xx quad half-bridge driver, and DRV8256x DC brushed motor driver datasheets. 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 DRV84xxEVM GUI User's Guide, DRV84xxPEVM GUI User's Guide and DRV84xxE_89xx_8256x EVM GUI User's Guide.

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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 of 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)

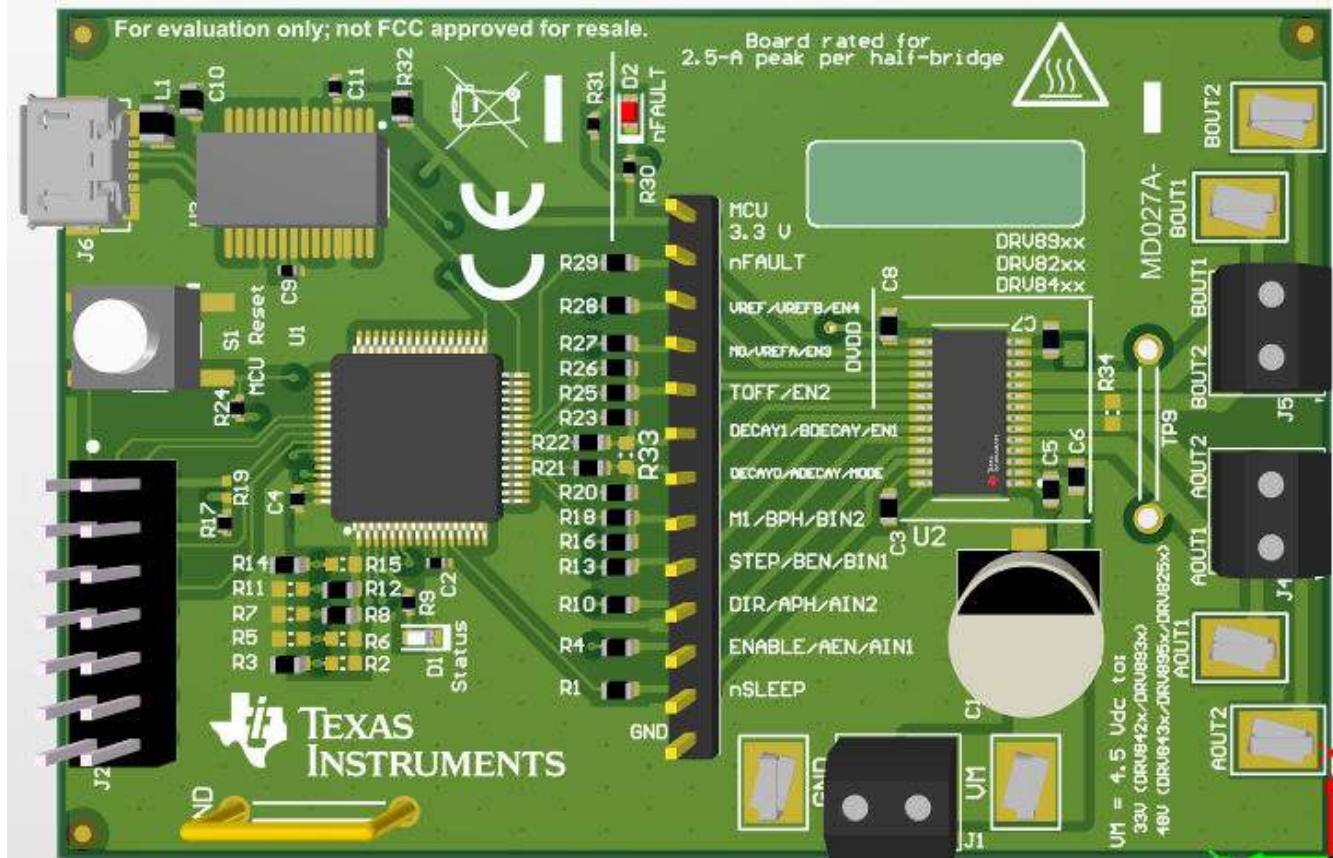


Figure 1-1. Top View of Typical Board Configuration (EVM provided may vary)

2 Introduction

The DRV84xx_89xxP_8256x EVM is a platform to support prototyping and evaluation for the DRV84xx devices, a medium-voltage dual H-bridge driver for stepper driving applications. The EVM also supports the DRV89xx devices, which is a quad half-bridge driver that can drive two brushed DC motors or a stepper motor, and the DRV8256x devices, which can drive a brushed DC motor.

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

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

2.1 Connectors

The DRV8xxx EVM supplies the VM (motor voltage) power rail through a reverse-battery protection circuit 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).

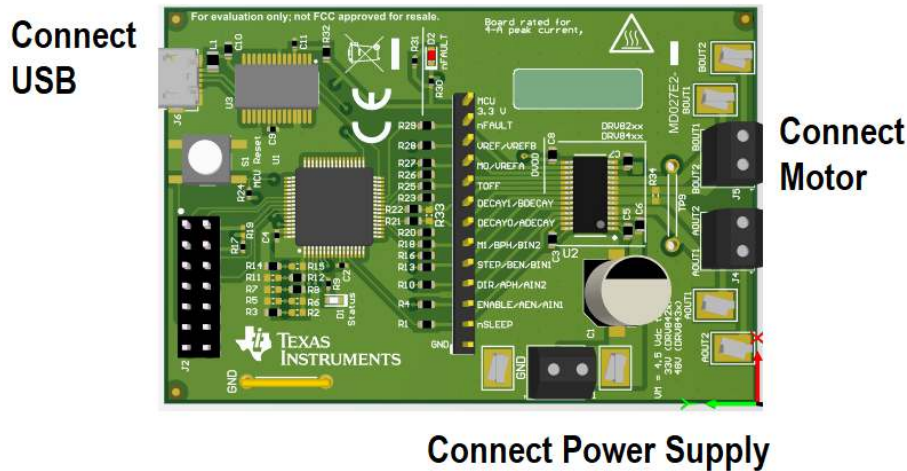


Figure 2-1. Board Connections

2.2 Test Points

A header connector with 0.100-inch pitch (J3) provides access to the DRV8xxx signals. This can be used for measurement or as a connector to control the DRV8xxx 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 a similarly named pin of the DRV84xx.

Table 2-1. Connections to the DRV8xxx 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 set reference input (DRV84xx), Bridge B current set reference input (DRV84xxE/P & DRV8256x & DRV8932), or EN4 (DRV8955).
M0/VREFA/EN3	Microstepping mode-setting pin (DRV84xx), Bridge A current set reference input (DRV84xxE/P & DRV8256x, DRV8932), or EN3 (DRV8955).
TOFF/EN2	Sets the Decay mode off time during current chopping.
DECAY1/BDECA/EN1	Decay mode setting pins and EN1 pin (only for DRV8955)
DECAY0/ADECA/MODE	Decay mode setting pins and MODE pin (only for DRV8955)

Table 2-1. Connections to the DRV8xxx Using External Microcontroller (continued)

Header Label	Description
M1/BPH/BIN2	Microstepping mode-setting pin (DRV84xx); or Bridge B phase input (DRV84xxE & DRV8256E); or PWM input (DRV84xxP & DRV89xx & DRV8256P).
STEP/BEN/BIN1	STEP pin (DRV84xx); or Bridge B enable input (DRV84xxE & DRV8256E); or PWM input (DRV84xxP & DRV89xx & DRV8256P).
DIR/APH/AIN2	DIR pin (DRV84xx); or Bridge A phase input (DRV84xxE & DRV8256E); or PWM input (DRV84xxP & DRV89xx & DRV8256P).
ENABLE/AEN/AIN1	Enable pin (DRV84xx); or Bridge A enable input (DRV84xxE & DRV8256E); or Bridge A PWM input (DRV84xxP & DRV89xx & DRV8256P).
nSLEEP	Sleep mode input
GND	Ground

2.3 Jumpers

The DRV84xx_89xxP_8256x EVM 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 [DRV84xxEVM GUI User's Guide](#), [DRV84xxPEVM GUI User's Guide](#) or [DRV84xxE_89xxP_8256x EVM 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 or VBAT connections, but do not apply power at this step.
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. Open the GUI. The GUI can be found in the start menu at Texas Instruments → DRV84xx_82xx_89xx X.Y.Z, where X, Y, and Z are the revision numbers (to be verified) or by typing "DRV84xx_82xx_89xx" into the search bar of the start menu. If a shortcut was created, double-click on the shortcut to open the GUI. The GUI can take up to 30 seconds to establish a connection. If connection is not established, select the COM port under the *Options* menu. The baud rate is 9600.
6. Apply the desired voltage to the VM/VBAT and GND connections.
7. For more instructions on how to control the DRV84xx_89xxP_8256x EVM from the GUI, see [DRV84xxEVM GUI User's Guide](#), [DRV84xxPEVM GUI User's Guide](#) or [DRV84xxE_89xxP_8256x EVM GUI User's Guide](#).

2.6 EVM documentation

The EVM schematics, layout, and BOM are provided in the [DRV84xxEVM hardware files](#). The GUI, USB drivers, and MSP430F2617 source code are provided in the DRV84xxEVM firmware and GUI software files.

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