1 DRV8702D-Q1-EVM

This user's guide is provided with the DRV8702D-Q1 customer evaluation module (EVM) as a supplement to the DRV8702D-Q1 data sheet. This document details the hardware implementation of the EVM and how to use DRV8702D-Q1-EVM GUI application.

1.1 Board Overview

Figure 1. Board Components
WARNING

Hot surfaces include the power MOSFETs (Q1-Q2), power sense resistor R36, and areas around them.

The DRV8702D-Q1-EVM serves as an evaluation kit to demonstrate TI’s DRV8702D-Q1 half-bridge gate driver in a 3.5-in × 2.2-in compact form factor. An MSP430G553 device is used to control the speed and direction of the motor, while also monitoring the motor current from the DRV8702D-Q1 device. The power stage is created using the DRV8702D-Q1 half-bridge gate driver and the CSD18540Q5B N-channel NexFET™ power MOSFETs. The EVM is a high-performance, power-efficient, and cost-effective platform that speeds development for a quicker time to market.

![Figure 2. Block Diagram](image)
1.2 Jumper Settings and Test Points

The jumper settings and test points are as follows:

**micro-USB (J1)** — Use J1 to interface to a micro-USB cable used to download a program to the MSP430™ MCU memory and run it.

**GP Push Button or MCU Reset (J2)** — Set J2 to RESET for MCU reset functionality or PUSH for general-purpose input functionality.

**Spy-Bi-Wire (J3)** — J3 is for a serialized JTAG protocol used for MSP430 MCUs. J3 can connect an MSP430 Spy-Bi-Wire male header to this female header. Essentially it can be used to program the MSP430 on the EVM instead of using the USB-to-JTAG interfaces.

**Test and Interface Header (J4)** — J4 can be used to monitor input or output signals from the EVM or supply external control signals.

**IDRIVE Selection Header (J5)** — J5 is the current setting header for the gate drive. Placing a jumper to a specific header configures the peak source and sink current.

**Power Phase Test Pinouts** — These pinouts are to measure the single-half-bridge node voltages.

**To Motor** — Three-port bulk header to connect the brushed DC motor.

**To Power Supply** — Two-port power-supply bulk header. This header accepts supplies from 5.9 V to 45 V.

Figure 3. Board Jumpers and Test Points
2 GUI Application

2.1 Installation

Follow these steps to get started:

Step 1. Install the GUI.
Download and run the installer, Setup_DRV8702DQ1EVM-1.X.X_EVM, to install the GUI application.

Step 2. Install the FTDI device driver.
The FTDI USB device driver must be installed manually. The driver setup can be found in the C:\Program Files (x86)\Texas Instruments\DRV8702D-Q1\FTDI_USB_DRIVER folder after successfully completing installation in Step 1. Run the CDM21216_Setup.exe file in this folder and follow the installation instructions.

2.2 Hardware Setup

The hardware required to run the motor control is a micro-USB cable, the DRV8702D-Q1-EVM, and a power supply with a DC output from 5.9 to 45 V. First the brushed DC motor is connected to the motor header on the DRV8702D-Q1-EVM. Next the micro-USB is connected to the PC and to the DRV8702D-Q1-EVM. Finally the power supply is connected to the DRV8702D-Q1-EVM. Verify any faults by testing the nFAULT pin voltage to have a high logical value (pulled logic low if a fault condition exists).

2.3 DRV8702D-Q1-EVM GUI

The DRV8702D-Q1-EVM_GUI is provided with the DRV8702D-Q1-EVM to control a brushed DC motor and manipulate various settings. The GUI provides functionality for adjusting the speed and direction of the motor, adjusting the current-regulation limit, observing the measured drive current, and monitoring the device status.

Use these steps to control the DRV8702D-Q1 EVM through the GUI application

Step 1. Attach the brushed DC motor.
Step 2. Plug in the micro-USB cable.
Step 3. Enable your motor power supply (see Section 2.2).
Step 4. Click on the DRV8702D-Q1-EVM shortcut either on the desktop or from the start menu to run the GUI application.
The GUI will redirect to the *Serial Port* page for a manual connection of COM port out of the available for connection as shown in Figure 5. If nothing is physically connected to the PC, the COM drop-down list displays *-- No Ports --*.

**Figure 5. DRV8702D-Q1-EVM GUI (List COM Ports)**

**Step 5.** Select the relevant COM (USB Serial Port) from the drop-down list and click on the *Open* button.

**Step 6.** After the GUI connects, the window in Figure 6 is displayed. Verify that the COM port name (COM port number may differ), and baud rate match what is shown in Figure 6. The bottom left corner of the status bar shows a green indicator to indicate the connection with the opened COM port number and connected device’s name mentioned in the bracket.

**Figure 6. DRV8702D-Q1-EVM GUI (COM Opened)**
Step 7. Click on the Menu icon in the top-left corner of the GUI to open a side-bar menu. Using the side-bar menu, navigate to the following pages or sub-pages at any time:

- Introduction
  - General
  - Device
  - EVM
- Motor Control
- Serial Port

2.3.1 Introduction Page

The Introduction page has the general information about the DRV8702D-Q1 device. The sub-pages, Device and EVM, under Introduction page have the detailed description about the device and EVM respectively as shown in Figure 7.

Figure 7. DRV8702D-Q1-EVM GUI (Introduction Page)
2.3.2 Motor Control Page

This page has different widget controls to control the motor as shown in Figure 8.

![Motor Control Page](image)

**Figure 8. DRV8702D-Q1-EVM GUI (Motor Control Page)**
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- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
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3.2.1 For EVMs issued with an Industry Canada Certificate of Conformance to RSS-210 or RSS-247

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