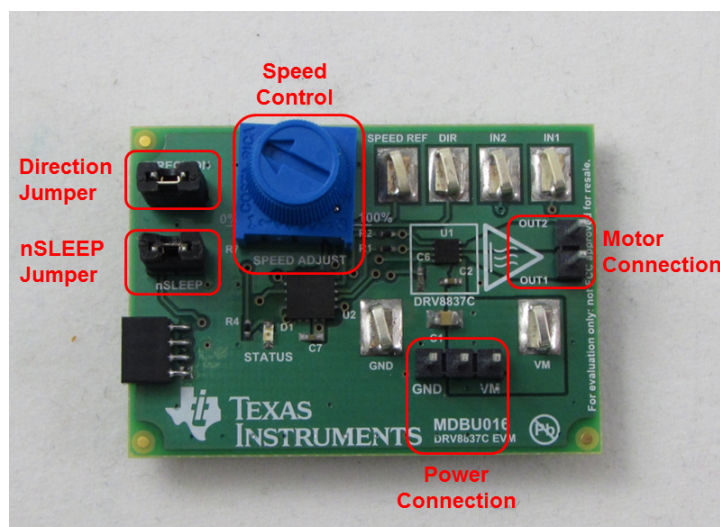


## ***DRV8837C Evaluation Module User's Guide***

This user's guide is provided with the DRV8837C customer evaluation module (EVM) as a supplement to the DRV8837C data sheet (SLVSD61). This document details the hardware implementation of the EVM.



**Typical Board Configuration (EVM Provided May Vary)**

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## 1 Introduction

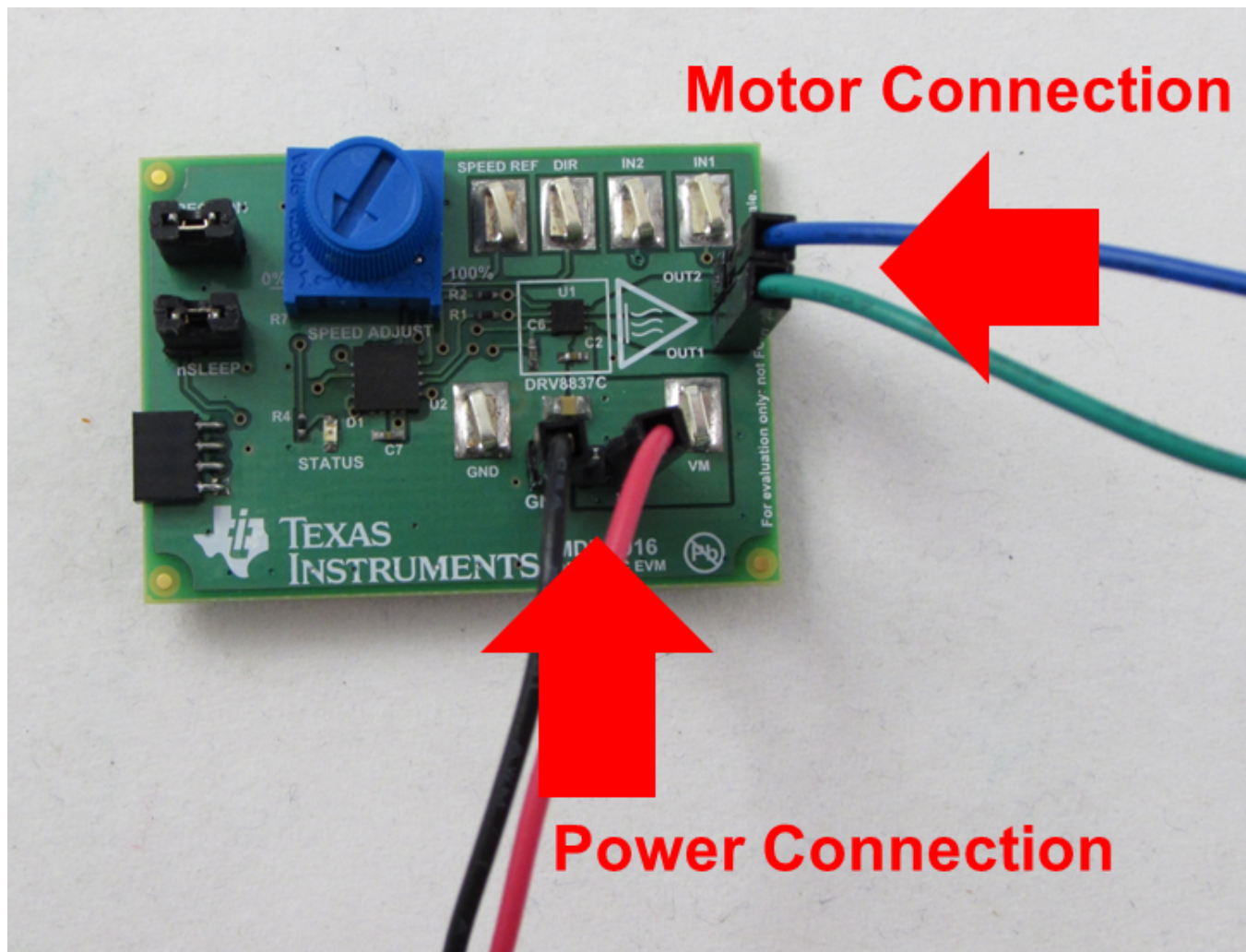
The DRV8837C customer EVM is a platform built around the DRV8837C device which is a single H-bridge brushed DC-motor driver. This device drives one brushed DC motor with up to 1 A of output current and is controlled using a PWM (IN/IN) input interface.

The EVM includes an MSP430G2131 microcontroller to supply all required drive signals for dual-direction motor rotation. This EVM also has an onboard regulator to supply 3.3 V to both the MCU and the logic supply of the DRV8837C device.

Two headers are included for simple direction and nSLEEP control. An easily adjustable potentiometer is also populated on the board to allow for simple motor speed adjustment. Because the DRV8837C device can operate with small VM voltages, the EVM includes a USB-Mini type B connector which can be used as a 5-V supply for the EVM.

## 2 Connectors

The DRV8837C EVM allows connections to the VM (motor voltage) power rail through a three-pin header (JP2). The center pin of this three-pin test clip is floating and intended to help the user differentiate between the motor and power connection. A test clip labeled VM is available to probe the input power rail.



**Figure 1. Connections**

## 2.1 Test Points

Six test clips are provided for VM, GND, IN1, IN2, DIR, and SPEED REF. Each test point is labeled on the evaluation module and connects to a same named pin of the DRV8837C device. [Table 1](#) lists the descriptions of these test points.

**Table 1. Test Point Labels and Descriptions**

| Test Point Label | Description                                    |
|------------------|------------------------------------------------|
| VM               | Motor voltage rail                             |
| GND              | Ground plane                                   |
| IN1              | IN1 pin on DRV8837C                            |
| IN2              | IN2 pin on DRV8837C                            |
| DIR              | Direction pin on DRV8837C                      |
| SPEED REF        | ADC pin on MSP430G2131 and 10-kΩ potentiometer |

## 2.2 Drive Configuration

The DRV8837C EVM can control the speed and direction of the motor by varying the signals supplied to the IN1 and IN2 pins on the DRV8837C device. The MSP430G2131 device varies the duty cycle of the PWM signal supplied to the driver based on the voltage measured between the 10-kΩ potentiometer R7. The direction can be varied using the jumper installed on JP1. [Table 2](#) lists the logic for this jumper.

**NOTE:** The direction that the motor spins in is dependent on the polarity of the motor lead connections to the bridge connections. Refer to the data sheet of the motor to determine which motor terminal should be connected to each driver output.

**Table 2. Motor Input Pins and Assigned Headers**

| Direction Jumper | DIR Pin Voltage |
|------------------|-----------------|
| Installed        | Forward         |
| Removed          | J3, J4          |

External drive signals can be supplied to the DRV8837C device by removing R1 and R2 from the EVM, and supplying signals to TP1 and TP2. [Table 3](#) lists the drive logic for the DRV8837C device.

**Table 3. Motor Input Pin States and Output Conditions**

| nSLEEP | IN1 | IN2 | OUT1 | OUT2 | MOTOR FUNCTION |
|--------|-----|-----|------|------|----------------|
| 0      | X   | X   | Z    | Z    | Coast          |
| 1      | 0   | 0   | Z    | Z    | Coast          |
| 1      | 0   | 1   | L    | H    | Reverse        |
| 1      | 1   | 0   | H    | L    | Forward        |
| 1      | 1   | 1   | L    | L    | Brake          |

## 2.3 Speed Control Potentiometer (R7)

To control the speed of the motor a 10-k $\Omega$  potentiometer is connected to an ADC on the MSP430G2131 device. When the pot is all the way to the left, the PWM signal supplied to the driver will be 0%, and when it is all the way to the right, the signal will be 100% which is denoted by the 0% and 100% labels next to the potentiometer.

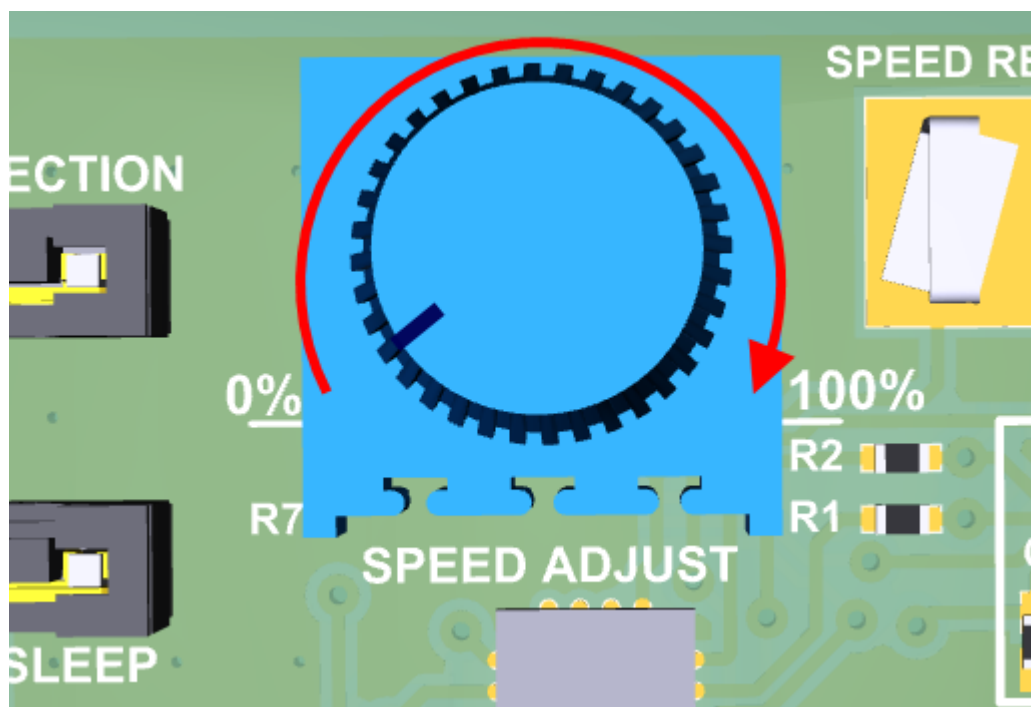


Figure 2. Motor Speed Control Potentiometer

## 2.4 Motor Outputs

One brushed DC motor can be connected to JP3 as shown in [Figure 1](#).

### 3 Operation of the EVM

Use the steps that follow for operating the EVM:

- Step 1. Connect a brushed DC motor to header JP3.
- Step 2. Turn the speed-adjust potentiometer R7 all the way to the left so that the arrow points to 0%.
- Step 3. Connect the positive terminal of the power supply to the JP2 header lead labeled VM.  
Connect the negative terminal of the power supply to the JP2 header lead labeled GND.
- Step 4. Install the JP1 jumper.
- Step 5. Turn on the power supply. The D1 LED labeled STATUS should start blinking.
- Step 6. Slowly turn the R7 potentiometer to the right towards the 100% label until the motor begins spinning.
- Step 7. To change direction either install or remove the JP4 jumper.



#### **WARNING**

**Hot surface. Contact may cause burns. Do not touch.**

### 4 Hardware Source Files

The complete design files can be found in the [tools folder](#), including the schematic, Gerber files, designs files, PCB views, and bill of materials (BOM).

## 5 DRV8837CEVM Schematic

Figure 3 shows the DRV8837CEVM schematic.

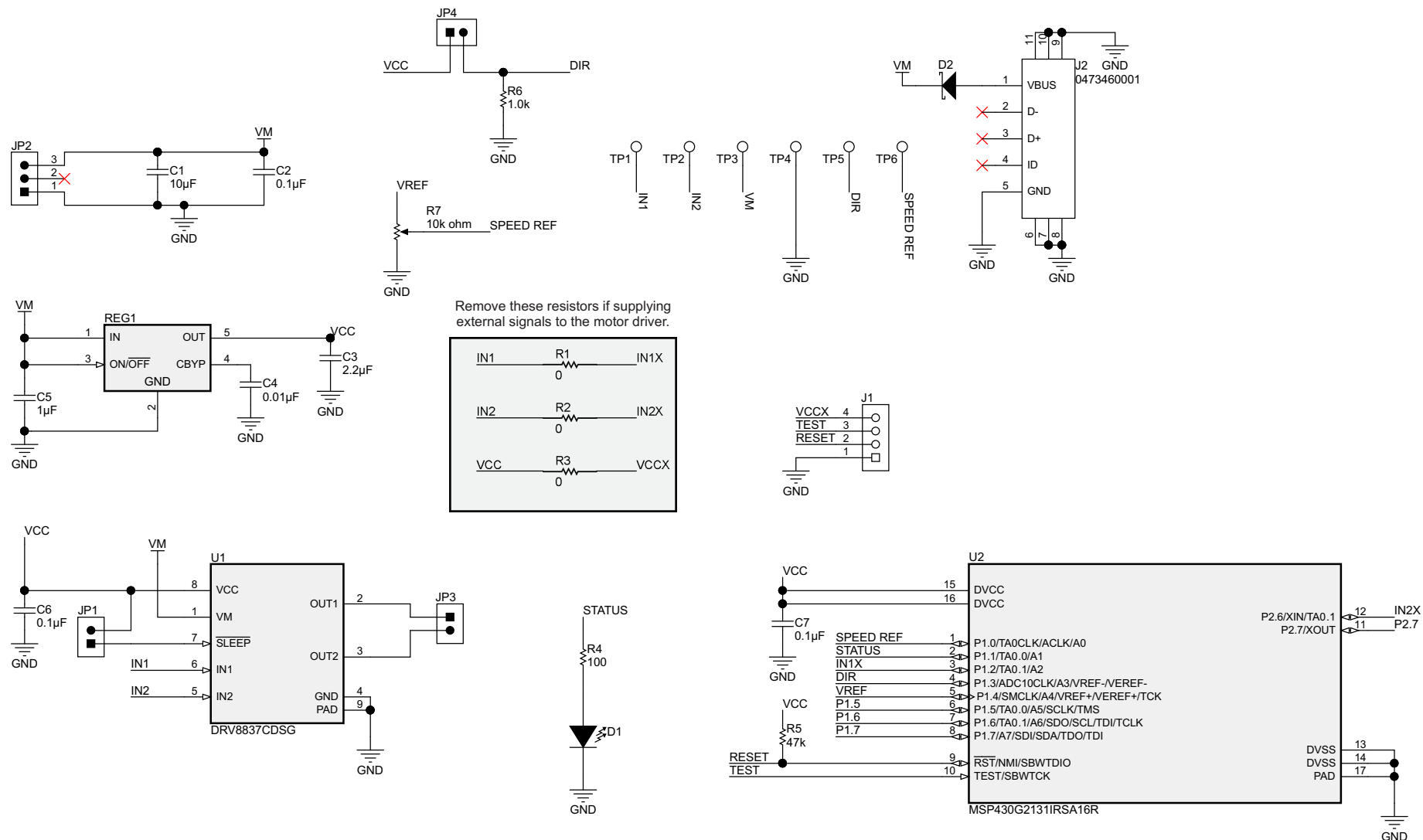


Figure 3. DRV8837CEVM Schematic

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| Logic                        | <a href="http://logic.ti.com">logic.ti.com</a>                                       |
| Power Mgmt                   | <a href="http://power.ti.com">power.ti.com</a>                                       |
| Microcontrollers             | <a href="http://microcontroller.ti.com">microcontroller.ti.com</a>                   |
| RFID                         | <a href="http://www.ti-rfid.com">www.ti-rfid.com</a>                                 |
| OMAP Applications Processors | <a href="http://www.ti.com/omap">www.ti.com/omap</a>                                 |
| Wireless Connectivity        | <a href="http://www.ti.com/wirelessconnectivity">www.ti.com/wirelessconnectivity</a> |

### Applications

|                               |                                                                                          |
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| Computers and Peripherals     | <a href="http://www.ti.com/computers">www.ti.com/computers</a>                           |
| Consumer Electronics          | <a href="http://www.ti.com/consumer-apps">www.ti.com/consumer-apps</a>                   |
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