DRV8870 Evaluation Module

This document is provided with the DRV8870 customer evaluation module (EVM) as a supplement to the DRV8870 (SLVSCY8) data sheet. It details the hardware implementation of the EVM.

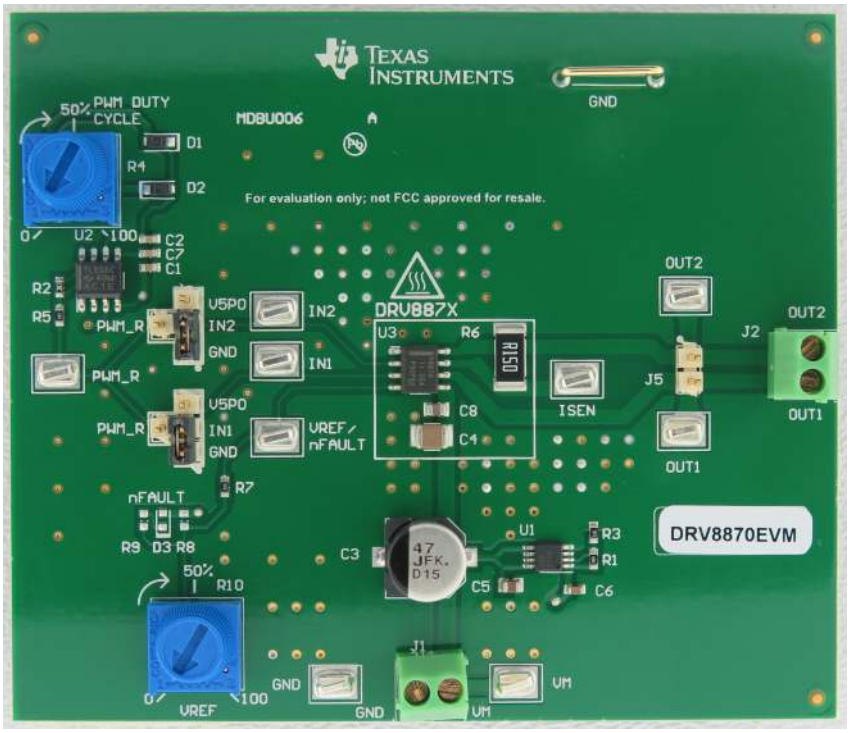

Figure 1. PCB (Top View, Some Components are not Fitted)

Contents

1 Introduction

The DRV8870EVM is a complete solution for evaluating the DRV8870 brushed motor driver. It includes a voltage regulator to create 5 V, and a TLC555 timer configured to supply a PWM input to the DRV8870. The EVM also includes a potentiometer to adjust the speed of the motor by varying the duty cycle of the PWM and a second potentiometer to set the chopping current value. Jumpers are provided to configure each input to a logic low, logic high, PWM, or to allow user control of the inputs. Test points are provided for ease of monitoring the input and output signals.

The DRV8870EVM only requires connections to the motor and power supply to operate.

1.1 Power Connectors

The DRV8870EVM uses a combination of headers for the application/monitoring of power. For the EVM, a single power-supply rail is necessary. Minimum recommended VM for the EVM is 8 V and maximum is 40 V. Refer to the DRV8870 data sheet (SLVSCY8) for the complete voltage range information of the driver itself.

VM for the DRV8870 is available through the J1 connector.

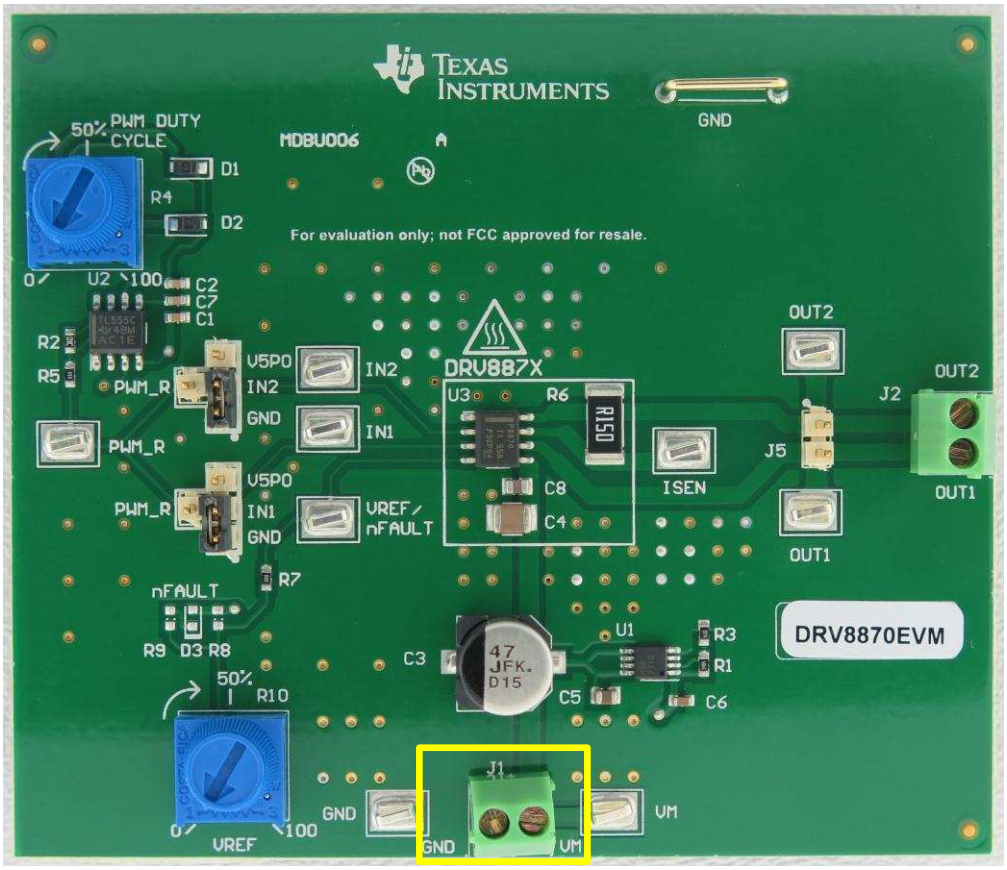

Figure 2. Top View (J1 Power Supply Connector)

1.2 Test Points

Test points are provided and labeled according to the inputs/outputs of the DRV8870 motor driver.

Test point “PWM_R” is generated by a TLC555 located on the EVM. If an externally generated PWM signal is desired, either:

1. Remove the shunt on IN1 or IN2 and connect the external PWM signal to the IN1 or IN2 test point (this is recommended), or
2. Remove the 0.0-Ω resistor **R5** and connect the external PWM signal to the “PWM_R” test point. The “PWM” signal generated by the onboard circuitry EVM is approximately 25 kHz and can be adjusted from 5% to 95% duty cycle by the potentiometer (R6) located on the EVM.

1.3 Jumpers

The following images illustrate the possible connections to the INx jumpers:

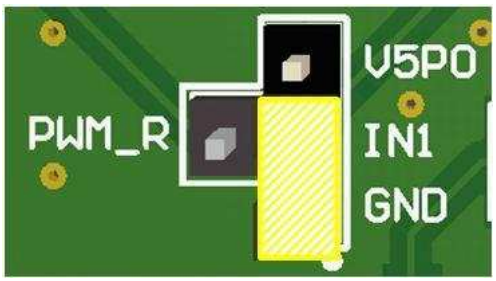

Figure 3. IN1 Connected to GND (Logic Low)

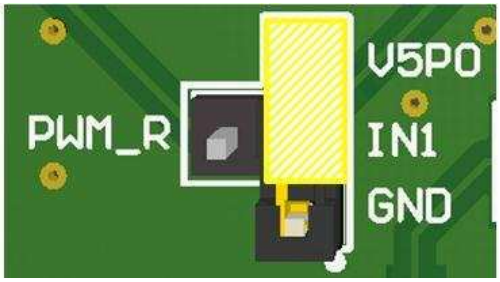

Figure 4. IN1 Connected to V5P0 (Logic High)

Figure 5. IN1 Connected to PWM Output

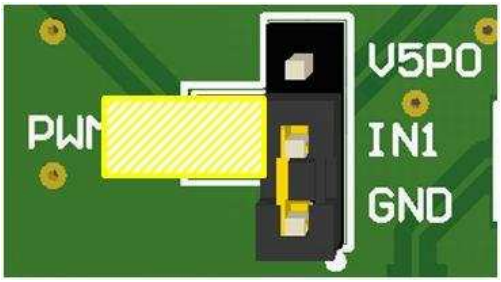

Figure 6. IN1 Floating, can be Controlled Externally

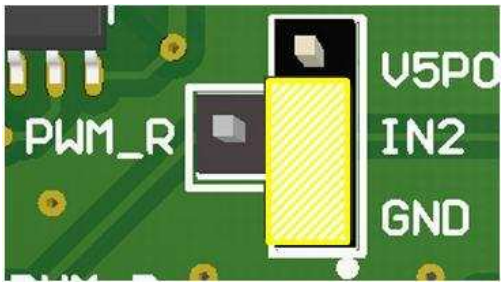

Figure 7. IN2 Connected to GND (Logic Low)

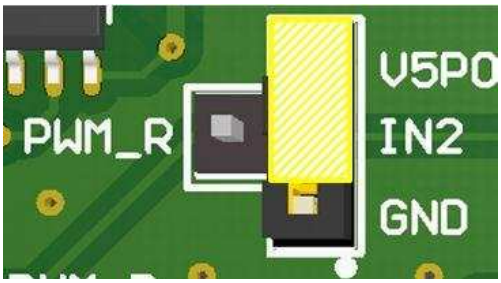

Figure 8. IN2 Connected to V5P0 (Logic High)

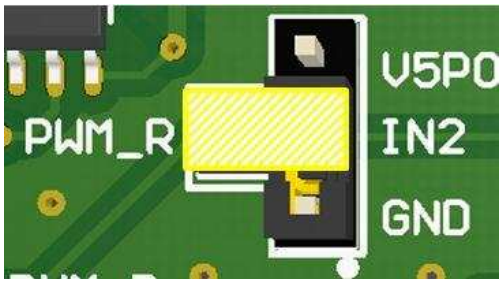

Figure 9. IN2 Connected to PWM Output

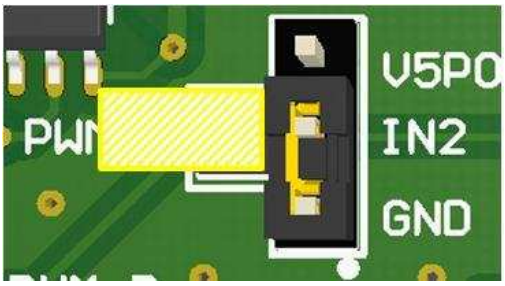

Figure 10. IN2 Floating, can be Controlled Externally

1.4 Duty Cycle Potentiometer (R4)

The duty cycle potentiometer “PWM DUTY CYCLE” can be found in Figure 11. The potentiometer adjusts the duty cycle of the PWM signal which will adjust the speed of the motor. To lower the duty cycle, turn the potentiometer counter-clockwise. To increase the duty cycle, turn the potentiometer clockwise.

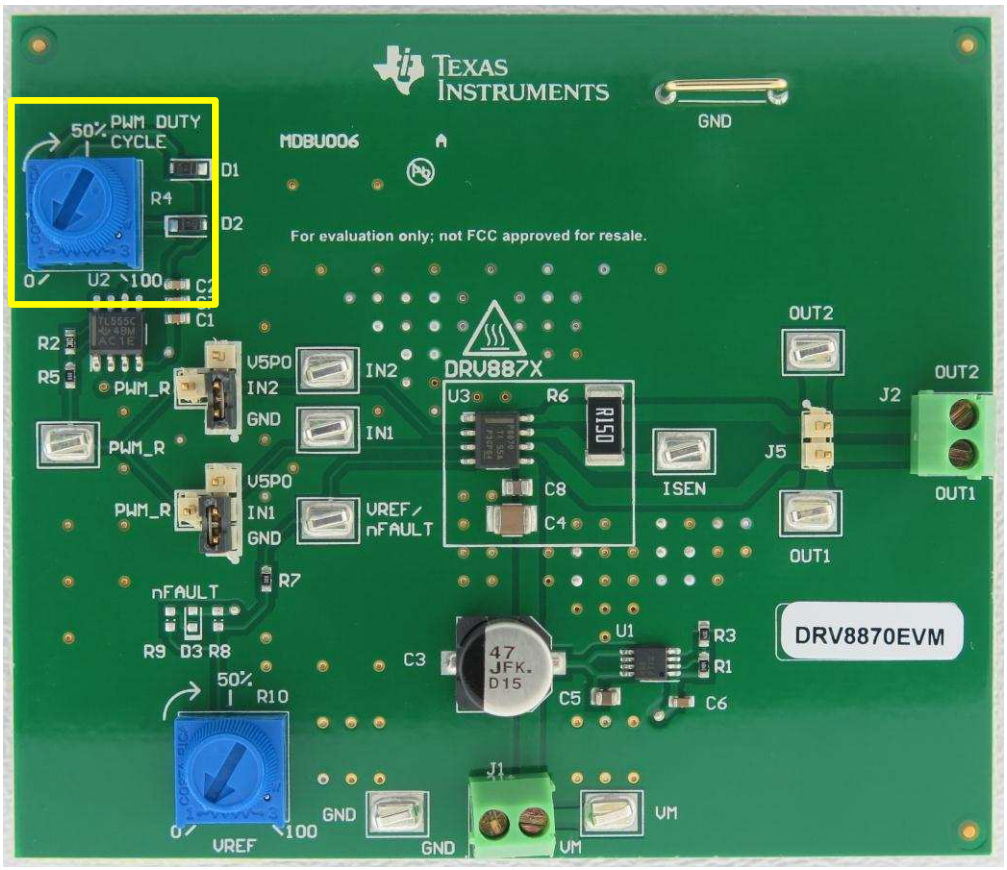

Figure 11. PWM Duty Cycle

The onboard PWM signal for the DRV8870 is generated by a circuit based upon the Texas Instruments' TLC555 low-power timer. It is capable of an approximately 25-kHz output that can be adjusted from 5% to 95% duty cycle. This square output signal will switch from 0 V to V5P0.

1.5 Motor Outputs

Two motor connectors are provided. Connector J2 and header J5 are available as shown in Figure 12.

Connector J2 is intended to be used for all motor types. Header J5 is available for use with motors rated for less than 1-A current and containing a 2-pin, 0.100-inch spaced connector.

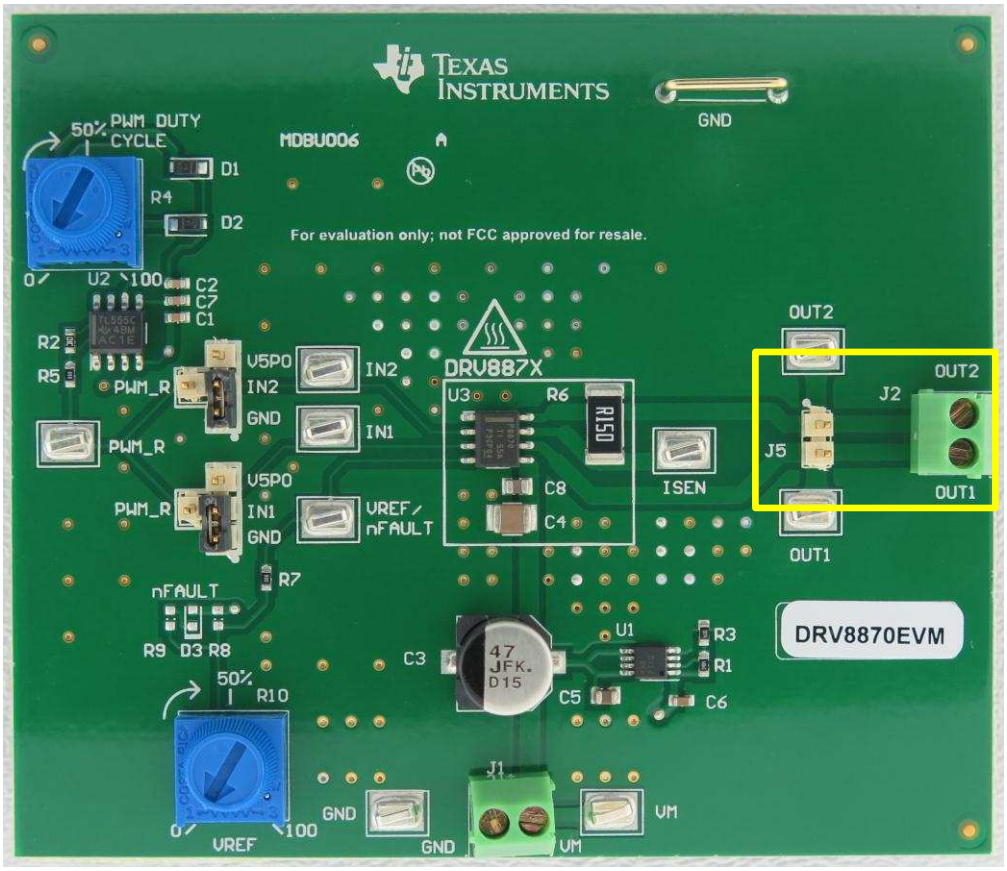

Figure 12. Connector J2 and Header J5

1.6 Operation of the EVM

1. Connect a brushed DC motor to pins OUT2 and OUT1 of J2 or J5.
2. Adjust the “PWM DUTY CYCLE” potentiometer **R4** to minimum voltage by turning it all the way counter-clockwise.
3. Apply VM and GND to the J1 connector.
4. Configure the IN1 and IN2 jumpers as desired. If using the PWM_R signal, adjust the “PWM DUTY CYCLE” potentiometer clockwise to increase speed and the motor will start to turn. Continue adjusting as desired.
5. Adjust the VREF potentiometer (R1) to the desired current chopping level
6. To change direction, re-configure the IN1/IN2 connection per the data sheet.

2 EVM Documentation

All EVM documentation (schematic, BOM, and manufacturing files are available online at (SLVC634).

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- *Reorient or relocate the receiving antenna.*
- *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.*
- *Consult the dealer or an experienced radio/TV technician for help.*

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2. Use EVMs only after User obtains the license of Test Radio Station as provided in Radio Law of Japan with respect to EVMs, or
3. Use of EVMs only after User obtains the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to EVMs. Also, do not transfer EVMs, unless User gives the same notice above to the transferee. Please note that if User does not follow the instructions above, User will be subject to penalties of Radio Law of Japan.

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265