

DRV8871 Evaluation Module

This document is provided with the DRV8871 customer evaluation module (EVM) as a supplement to the DRV8871 ([SLVSCY9](#)) data sheet. It details the hardware implementation of the EVM.

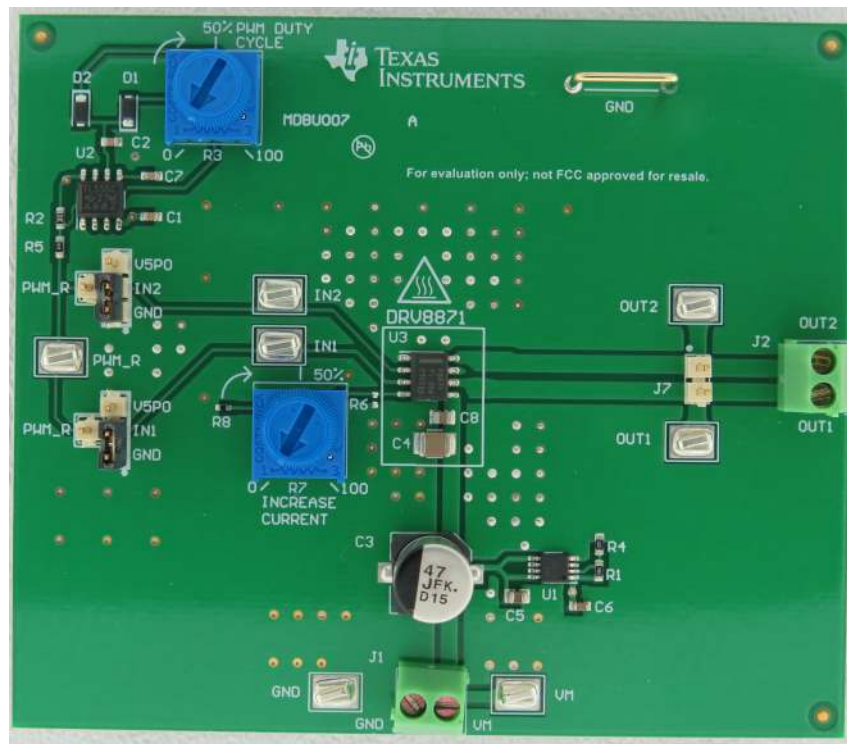


Figure 1. PCB (Top View, Some Components are not Fitted)

Contents

1	Introduction	2
1.1	Power Connectors	2
1.2	Test Points	3
1.3	Jumpers	3
1.4	Duty Cycle Potentiometer (R3).....	4
1.5	Motor Outputs	5
1.6	Operation of the EVM	5
1.7	Optional Current Control Using R6	6
2	EVM Documentation	6

1 Introduction

The DRV8871EVM is a complete solution for evaluating the DRV8871 brushed motor driver. It includes a voltage regulator to create 5 V, and a TLC555 timer configured to supply a PWM input to the DRV8871. 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 DRV8871EVM only requires connections to the motor and power supply to operate.

1.1 Power Connectors

The DRV8871EVM 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 DRV8871 data sheet ([SLVSCY9](#)) for the complete voltage range information of the driver itself.

VM for the DRV8871 is available through the J1 connector.

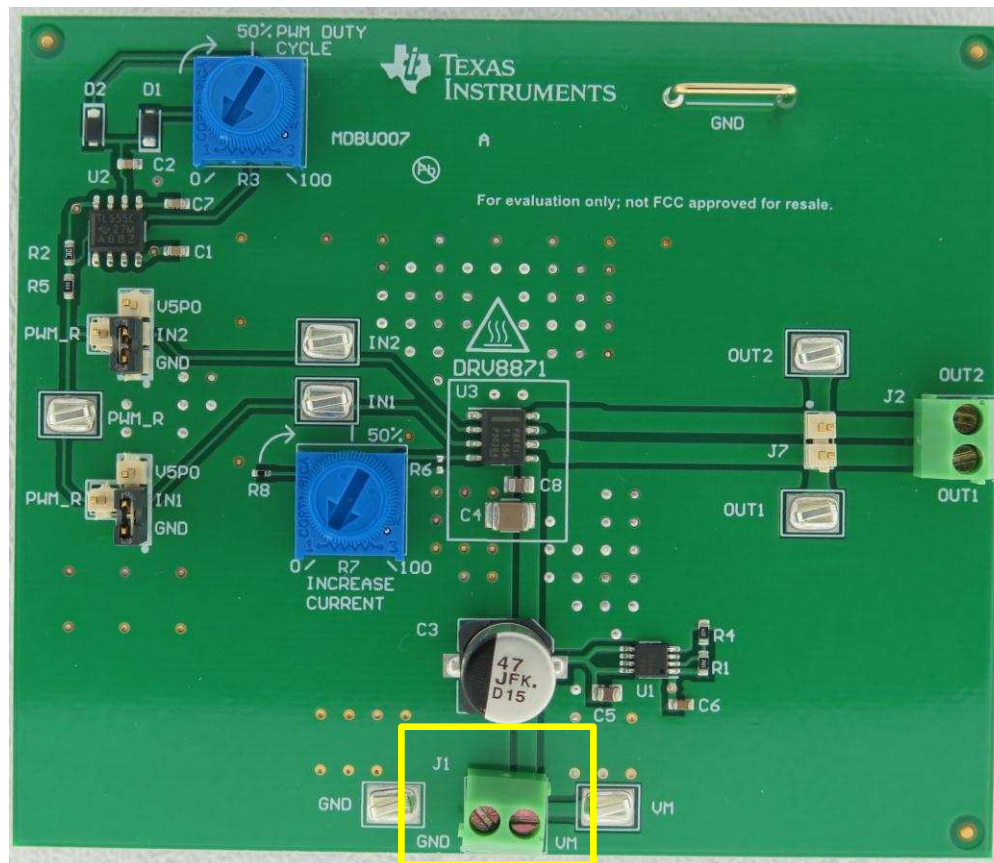


Figure 2. Top View (J1 Power Supply Connector)

1.2 Test Points

Test points are provided and labeled according to the inputs/outputs of the DRV8871 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

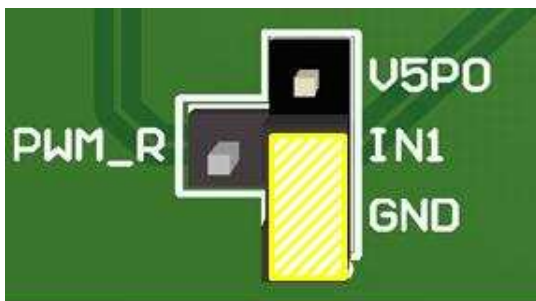


Figure 3. IN1 Connected to GND (Logic Low)

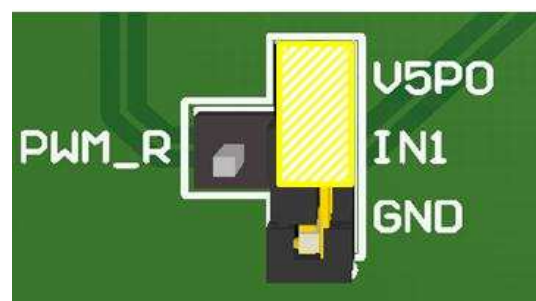


Figure 4. IN1 Connected to V5P0 (Logic High)



Figure 5. IN1 Connected to PWM Output

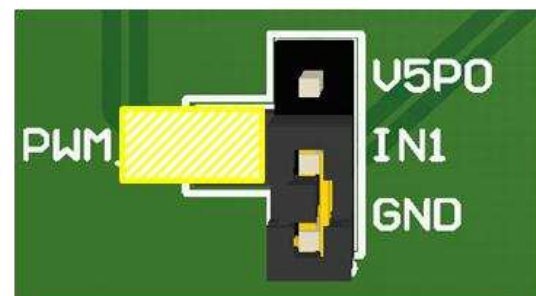


Figure 6. IN1 Floating, can be Controlled Externally

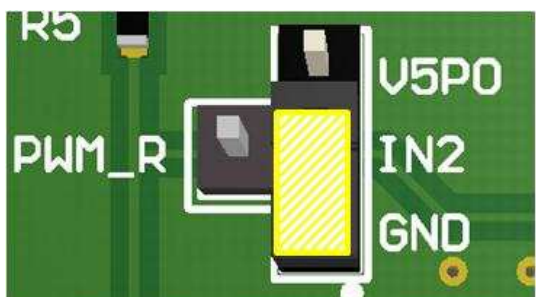


Figure 7. IN2 Connected to GND (Logic Low)

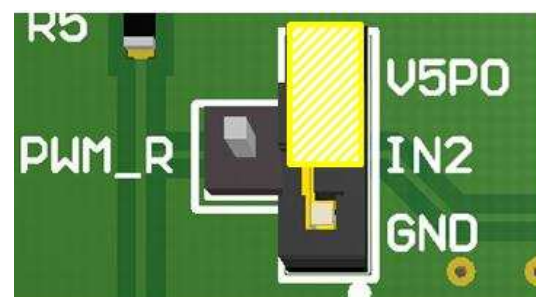


Figure 8. IN2 Connected to V5P0 (Logic High)

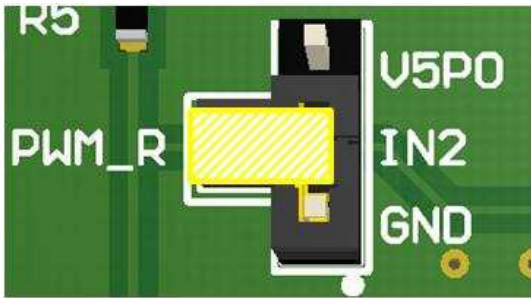


Figure 9. IN2 Connected to PWM Output

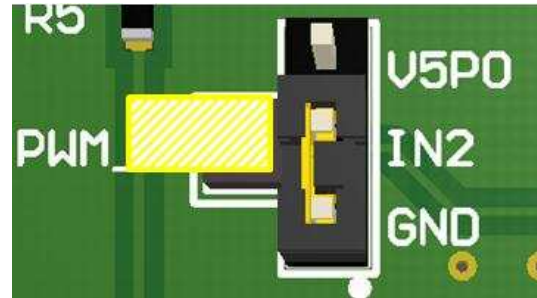


Figure 10. IN2 Floating, can be Controlled Externally

1.4 Duty Cycle Potentiometer (R3)

The duty cycle potentiometer “PWM DUTY CYCLE” is 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.

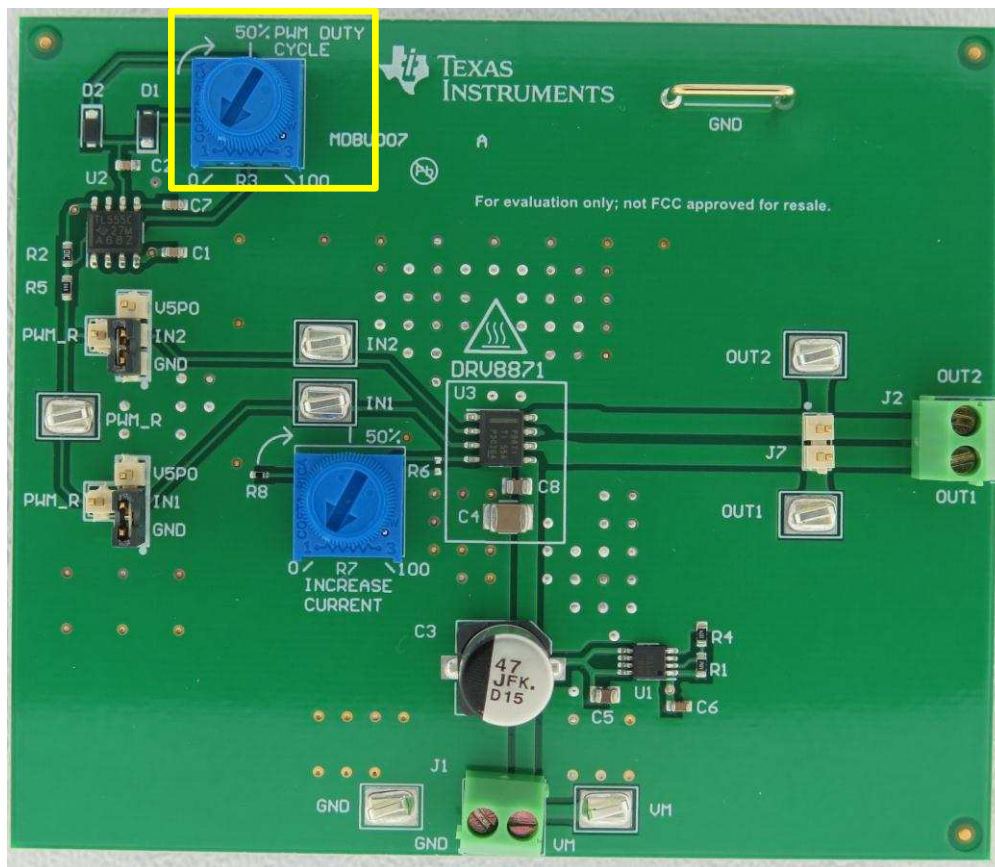


Figure 11. PWM Duty Cycle

The onboard PWM signal for the DRV8871 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 J7 are available as shown in Figure 12.

Connector J2 is intended to be used for all motor types. Header J7 is available for use with motors rated for less than 1-A current and containing a 2-pin, 0.100-inch spaced connector.

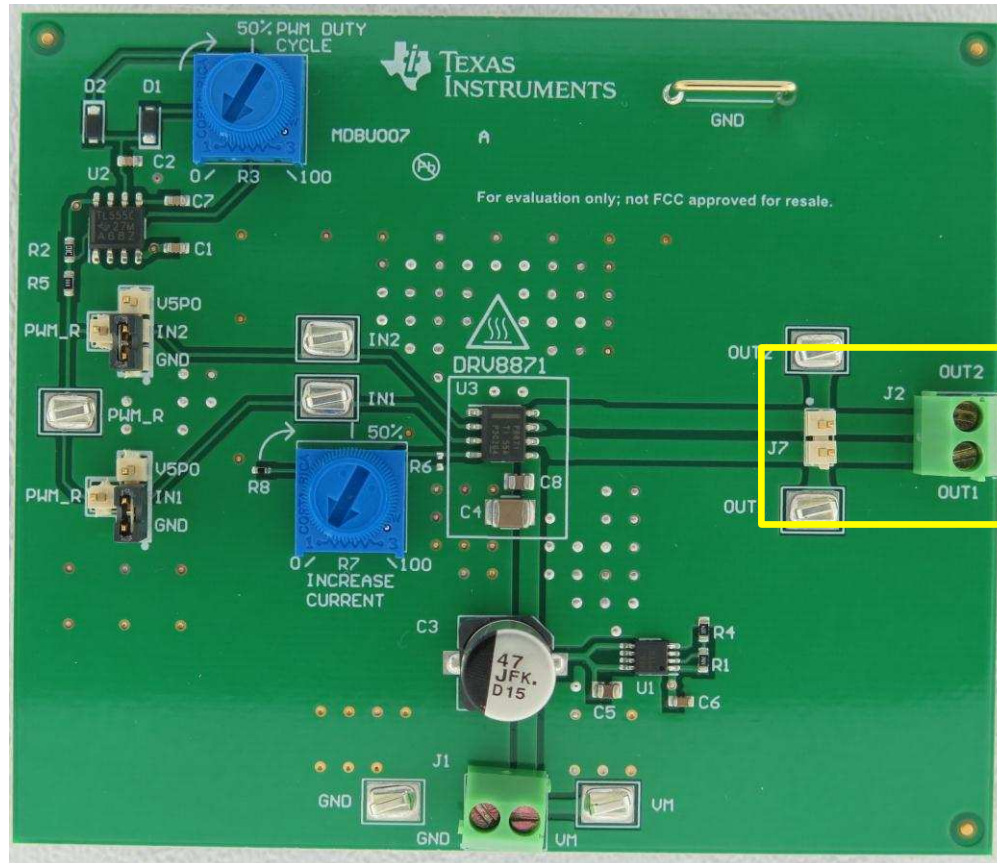


Figure 12. Header J7 and Connector J2

1.6 Operation of the EVM

1. Connect a brushed DC motor to pins OUT2 and OUT1 of J2 or J7.
2. Adjust the "PWM DUTY CYCLE" potentiometer **R3** 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 current chopping potentiometer (R7) to the desired current chopping level.
6. To change direction, re-configure the IN1/IN2 connection per the data sheet.

1.7 Optional Current Control Using R6

If desired, R6 can be populated to set the current chopping level. To use R6:

1. Either remove potentiometer R7, or cut the trace between R7 and R6 as shown in [Figure 13](#).
2. Next, populate R6 with the desired value.

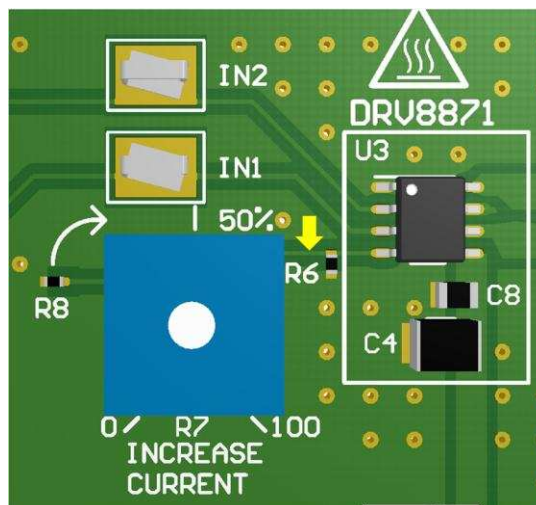


Figure 13. Current Control (R6)

2 EVM Documentation

All EVM documentation (schematic, BOM, and manufacturing files are available on line at [\(SLVC633\)](#)).

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as "components") are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI's terms and conditions of sale of semiconductor products. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

TI assumes no liability for applications assistance or the design of Buyers' products. Buyers are responsible for their products and applications using TI components. To minimize the risks associated with Buyers' products and applications, Buyers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of significant portions of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI components or services with statements different from or beyond the parameters stated by TI for that component or service voids all express and any implied warranties for the associated TI component or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences, lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI's goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed a special agreement specifically governing such use.

Only those TI components which TI has specifically designated as military grade or "enhanced plastic" are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have **not** been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.

Products

Audio	www.ti.com/audio
Amplifiers	amplifier.ti.com
Data Converters	dataconverter.ti.com
DLP® Products	www.dlp.com
DSP	dsp.ti.com
Clocks and Timers	www.ti.com/clocks
Interface	interface.ti.com
Logic	logic.ti.com
Power Mgmt	power.ti.com
Microcontrollers	microcontroller.ti.com
RFID	www.ti-rfid.com
OMAP Applications Processors	www.ti.com/omap
Wireless Connectivity	www.ti.com/wirelessconnectivity

Applications

Automotive and Transportation	www.ti.com/automotive
Communications and Telecom	www.ti.com/communications
Computers and Peripherals	www.ti.com/computers
Consumer Electronics	www.ti.com/consumer-apps
Energy and Lighting	www.ti.com/energy
Industrial	www.ti.com/industrial
Medical	www.ti.com/medical
Security	www.ti.com/security
Space, Avionics and Defense	www.ti.com/space-avionics-defense
Video and Imaging	www.ti.com/video

TI E2E Community

e2e.ti.com