

DRV8835/DRV8836 Evaluation Module

This document is provided with the DRV8835 and DRV8836 customer evaluation module (EVM) as a supplement to the DRV8835 (<u>SLVSB18</u>) and DRV8836 (<u>SLVSB17</u>) datasheets. It details the hardware implementation of the EVM.

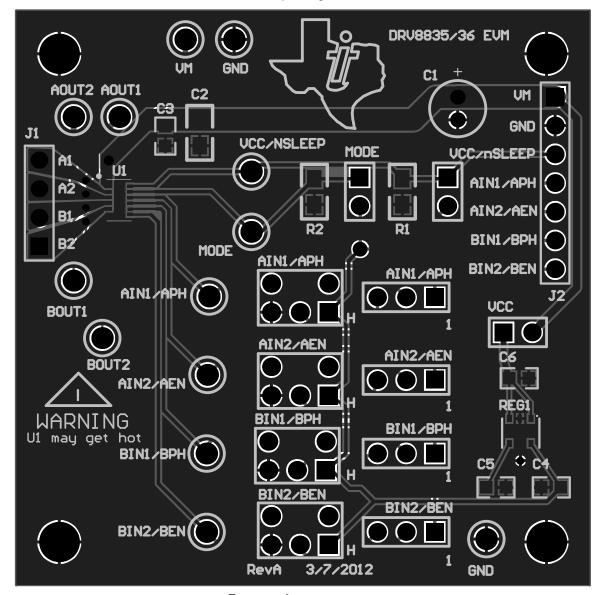
Contents

1	PCB Layout (Top Composite View)				
2		nections	3		
	2.1	Control (J2 Header)	3		
	2.2	Motor Output (J1 Header)	3		
	2.3	Power Connections	3		
3	Jump	pers and Controls	4		
	3.1	JP1 – VCC (DRV8835) or nSLEEP (DRV8836)			
	3.2	JP2 – MODE Select	4		
	3.3	JP3, JP4, JP5, and JP7 – Source Select Jumpers	4		
	3.4	JP6 – Regulator Input	4		
	3.5	S1, S2, S3, and S4 – Input Control	4		
	3.6	Test Points			
4	Schematic and Bill of Materials				
	4.1	Schematic	5		
	4.2	Bill of Materials	6		



1 PCB Layout (Top Composite View)

Top Layer



Bottom Layer



www.ti.com Connections

2 Connections

2.1 Control (J2 Header)

The control connections to the DRV8835 or DRV8836 are made through the header J2. Connections are clearly labeled on the PCB or can be seen in the figure above.

Note that pin 3 has a different meaning depending on whether it is a DRV8835 or DRV8836 device that is mounted to the board. If using a DRV8835, pin 3 on the J2 header is a regulated 5-V supply from an onboard linear regulator (REG1). If using a DRV8836, pin 3 on the J2 header controls the nSLEEP pin on the device.

Also note that pins 4, 5, 6 and 7 have different meanings depending on the mode the device is in. Installing the MODE jumper, JP3, will pull the MODE pin high and pins 4-7 will function as PHASE/ENABLE inputs. Removing the jumper on JP3, will pull the MODE pin low (via internal pull-down resistors) and pins 4-7 will function as PWM input pins.

Finally, note that depending on the location of jumpers JP3, JP4, JP5, and JP7, the control pins can either be routed from the J2 header or be generated from the on-board switches (S1-S4). Refer to the schematic and the jumper descriptions below.

2.2 Motor Output (J1 Header)

The motor is connected to the module through header J1, labeled A1, A2 for one bridge and B1, B2 for the other bridge. The polarity will affect the direction that the motor turns – refer to the datasheet for details.

2.3 Power Connections

Power is applied to the module through pins at the top of the EVM which are labeled VM and GND. Apply a voltage between 2 V and 11 V to this connector for DRV8835EVM and between 2 V and 7 V for DRV8836EVM. Be sure to observe the correct polarity (VM is positive, GND is negative).

WARNING

DRV8835EVM supply range is 2 V to 11 V. DRV8836EVM supply range is 2 V to 7 V.



Jumpers and Controls www.ti.com

3 Jumpers and Controls

3.1 JP1 – VCC (DRV8835) or nSLEEP (DRV8836)

For DRV8835EVM, the JP1 jumper MUST be installed for proper operation.

For DRV8836EVM, installing the JP1 jumper will place the device in an active state. Removing the jumper will pull the input to GND through an internal pull-down resistor and the device will be in an inactive or sleep state.

3.2 JP2 – MODE Select

JP2 is used to select the input signal control mode. Installing the JP2 jumper will pull the MODE pin high and the device will be in a "PHASE/ENABLE" mode. Removing the jumper on JP2 will put the device in an "IN/IN" mode. Please refer to the datasheet for a description of these different modes.

3.3 JP3, JP4, JP5, and JP7 – Source Select Jumpers

Installing jumpers across position 1-2 on all 4 headers will allow control of the device through the J2 header using an external microprocessor of other logic. Installing jumpers across positions 2-3, will allow the switches (S1-S4) to control the inputs with either a "high" or "low" depending on the switch location.

3.4 JP6 – Regulator Input

Installing the JP6 jumper will provide power to the onboard 5-V regulator (REG1). It is recommended to keep this jumper installed under all conditions.

3.5 S1, S2, S3, and S4 – Input Control

These switches are connected to the inputs via the source select jumpers (JP3, JP4, JP5, and JP7). Moving the switches towards J1 will place a "high" on the input pins corresponding to the switch. Moving the switch towards J2 will place a "low" on the input pins corresponding to the switch. There is an "H" marking on the PCB silkscreen. This is incorrect. The switch must be moved away from the "H" marking for a logic "high" condition on the input pins.

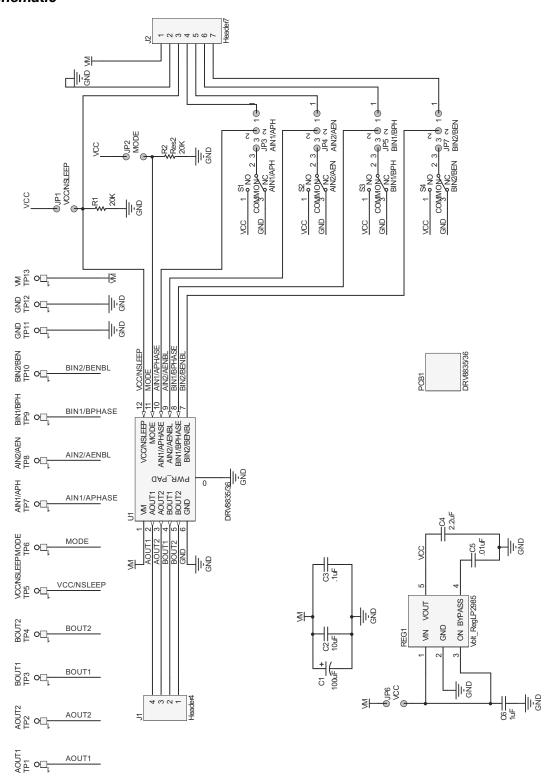
3.6 Test Points

Test points are provided on all signals that connect to the pins of the DRV8835 or DRV8836. Refer to the schematic and PCB drawings below.



4 Schematic and Bill of Materials

4.1 Schematic





Schematic and Bill of Materials www.ti.com

4.2 Bill of Materials

QTY	Designator	Value	Description	Manufacturer	MFG Part Number
DNI	C1	100μF	Polarized Capacitor (Radial)	Nichicon	RNE1C101MDS1PX
1	C2	10μF	Capacitor	TDK Corporation	C2012X5R1C106M
1	C3	0.1µF	Capacitor	TDK Corporation	C1608X7R1E104K
1	C4	2.2µF	Capacitor	TDK Corporation	C1608X5R0J225K
1	C5	0.01µF	Capacitor	Murata Electronics	GRM188R71E103KA01D
1	C6	1µF	Capacitor	TDK Corporation	C1608Y5V1C105Z
1	J1		Header, 4-Pin	3M	961104-6404-AR
1	J2		Header, 7-Pin	Molex	90120-0127
3	JP1, JP2, JP6	N/A	Two Pin Jumper	Phoenix Contact	1945096
4	JP3, JP4, JP5, JP7	N/A	Three Pin Jumper	Phoenix Contact	1945106
DNI	R1, R2	20k	Resistor		
1	REG1		5-V Linear Voltage Regulator	Texas Instruments	LP2985-50DBVR
4	S1, S2, S3, S4		SPDT ON NONE ON	C&K GT SERIES	GT11MCBE
13	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13	WHITE	Glass Beaded Test Point	Kobiconn	151-101-RC
1	U1		Dual Low Voltage H-bridge	Texas Instruments	DRV8835 or DRV8836

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User Power/Frequency Use Obligations: This radio is intended for development/professional use only in legally allocated frequency and power limits. Any use of radio frequencies and/or power availability of this EVM and its development application(s) must comply with local laws governing radio spectrum allocation and power limits for this evaluation module. It is the user's sole responsibility to only operate this radio in legally acceptable frequency space and within legally mandated power limitations. Any exceptions to this are strictly prohibited and unauthorized by Texas Instruments unless user has obtained appropriate experimental/development licenses from local regulatory authorities, which is responsibility of user including its acceptable authorization.

For EVMs annotated as FCC - FEDERAL COMMUNICATIONS COMMISSION Part 15 Compliant

Caution

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Interference Statement for Class A EVM devices

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

FCC Interference Statement for Class B EVM devices

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- · 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.

For EVMs annotated as IC - INDUSTRY CANADA Compliant

This Class A or B digital apparatus complies with Canadian ICES-003.

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Concerning EVMs including radio transmitters

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Concerning EVMs including detachable antennas

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

This radio transmitter has been approved by Industry Canada to operate with the antenna types listed in the user guide with the maximum permissible gain and required antenna impedance for each antenna type indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Cet appareil numérique de la classe A ou B est conforme à la norme NMB-003 du Canada.

Les changements ou les modifications pas expressément approuvés par la partie responsable de la conformité ont pu vider l'autorité de l'utilisateur pour actionner l'équipement.

Concernant les EVMs avec appareils radio

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Concernant les EVMs avec antennes détachables

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le présent émetteur radio a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés dans le manuel d'usage et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

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If you use this product in Japan, you are required by Radio Law of Japan to follow the instructions below with respect to this product:

- Use this product in a shielded room or any other test facility as defined in the notification #173 issued by Ministry of Internal Affairs and Communications on March 28, 2006, based on Sub-section 1.1 of Article 6 of the Ministry's Rule for Enforcement of Radio Law of Japan,
- 2. Use this product only after you obtained the license of Test Radio Station as provided in Radio Law of Japan with respect to this product, or
- 3. Use of this product only after you obtained the Technical Regulations Conformity Certification as provided in Radio Law of Japan with respect to this product. Also, please do not transfer this product, unless you give the same notice above to the transferee. Please note that if you could not follow the instructions above, you will be subject to penalties of Radio Law of Japan.

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