



EVQ6612A-D-L-00A

40V, 5A, H-Bridge DC Motor Driver with Current Sense Evaluation Board, AEC-Q100 Qualified

DESCRIPTION

The EVQ6612A-D-L-00A is an evaluation board designed to demonstrate the capabilities of the MPQ6612A-D, an H-bridge motor driver used to drive one DC motor, one winding of a stepper motor, or other loads.

The MPQ6612A-D operates from a 4V to 40V supply voltage and can deliver a motor current up to 5A. For the MPQ6612A-D, the outputs are controlled through the DIR and ENBL pins,

which are applied through a connector on the board.

The MPQ6612A-D is available in a QFN-18 (3mmx4mm) package, and is available in AEC-Q100 Grade 1.

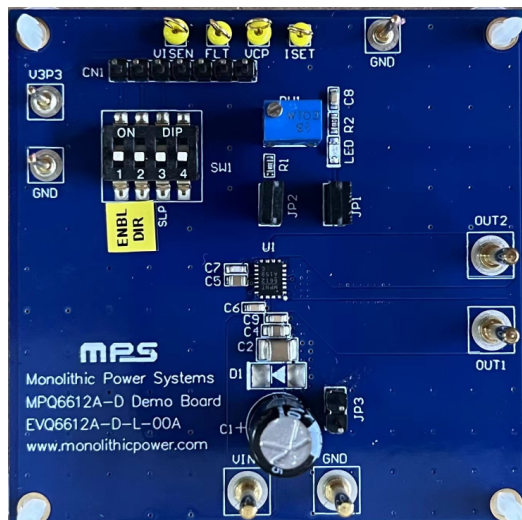
It is recommended to read the MPQ6612A-D datasheet prior to making any changes to the EVQ6612A-D-L-00A.

PERFORMANCE SUMMARY

Specifications are at $T_A = 25^\circ\text{C}$, unless otherwise noted.

Parameters	Conditions	Value
Input voltage (V_{IN}) range		4V to 40V
Maximum output current (I_{OUT})		5A

EVALUATION BOARD



LxWxH (6.35cmx6.35cmx1cm)

Board Number	MPS IC Number
EVQ6612A-D-L-00A	MPQ6612AGLE-D-AEC1

QUICK START GUIDE

1. Connect the input voltage ($4V \leq V_{IN} \leq 40V$) and input ground to the VIN and GND connectors, respectively.
2. Set the input control and logic signal through the CN1 connector via the external microcontroller (MCU), or set it manually through SW1. The manual action requires an external 3.3V or 5V voltage to act as a pull-up power supply. Table 1 shows the logic truth table.

Table 1: MPQ6612A-D Input Logic Truth Table

ENBL	DIR	OUT1	OUT2	Function (DC Motor)
High	Low	Low	High	Reverse
High	High	High	Low	Forward
Low	High or low	Low	Low	Brake

3. The VISEN output voltage (V_{ISEN}) scale is set by the adjustable resistor (RV1). V_{ISEN} can be calculated with Equation (1):

$$V_{ISEN} = \frac{I_{OUT}}{10000} \times R_{ISET} \quad (1)$$

Where I_{OUT} is sensed when one of the low-side MOSFETs (LS-FETs) turns on, and the maximum V_{ISEN} is 1.5V.

R_{ISET} can be estimated with Equation (2):

$$R_{ISET} = R1 + RV1 \quad (2)$$

EVALUATION BOARD SCHEMATIC

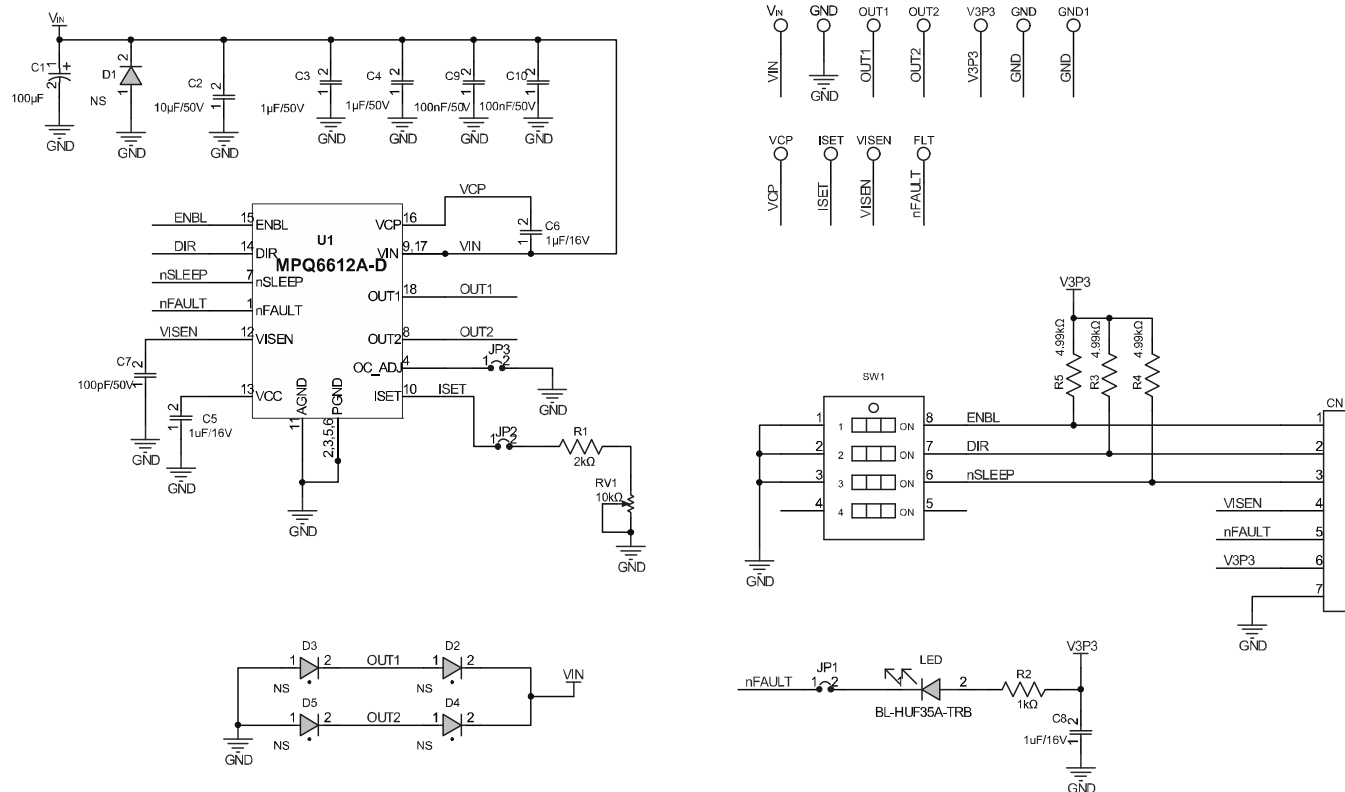


Figure 2: Evaluation Board Schematic

EVQ6612A-D-L-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
1	C1	100μF	Electrolytic capacitor, 50V	DIP	Rubycon	50YXF100MEFC
1	C2	10μF	Ceramic capacitor, 50V, X7R	1210	TDK	C3225X7R1H106M
3	C3, C4, C5	1μF	Ceramic capacitor, 50V, X7R	0805	Wurth	885012207103
3	C6, C8, C9	1μF	Ceramic capacitor, 16V, X7R	0603	Wurth	885012206052
1	C7	100pF	Ceramic capacitor, 50V, NP0	0603	Wurth	885012006057
3	C10, C11, C12	100nF	Ceramic capacitor, 50V, X7R	0603	Wurth	885012206095
1	R1	2kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-072KL
1	R2	1kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-071KL
3	R3, R4, R5	4.99kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-074K99L
1	RV1	10kΩ	Through-hole trimmer potentiometer	DIP	Bourns	3266W-1-103F
1	LED	20mA	Red LED	0805	Kingbright	2012SURC-11
1	SW1	25mA	SPST slide switch	DIP	Wurth	418121270804
3	JP1, JP2, JP3	2.54mm	Connector header through-hole	DIP	Any	
2	JP1, JP2	2.54mm	Short jumper	DIP	Any	
1	CN1	2.54mm	Connector header through-hole	DIP	Any	
4	OUT1, OUT2, VIN, GND	2mm	Connector	DIP	Any	
3	V3P3, GND, GND1	1mm	Connector	DIP	Any	
4	VISEN, FLT, VCP, ISET	1mm	Test points	DIP	Any	
5	D1, D2, D3, D4, D5	NS				
1	U1	MPQ6612A-D	40V, 5A, H-bridge DC motor driver	QFN-18 (3mmx4mm)	MPS	MPQ6612AGLE-D-AEC1

PCB LAYOUT

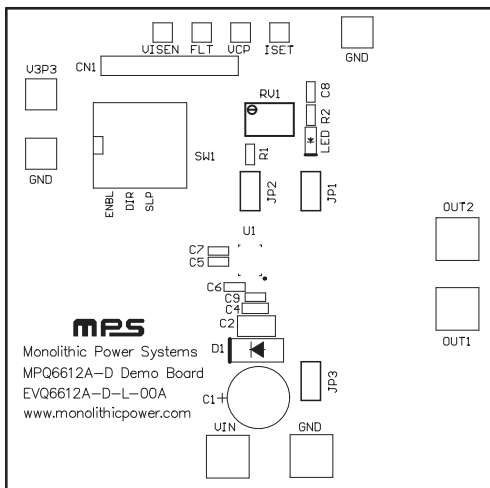


Figure 3: Top Silk

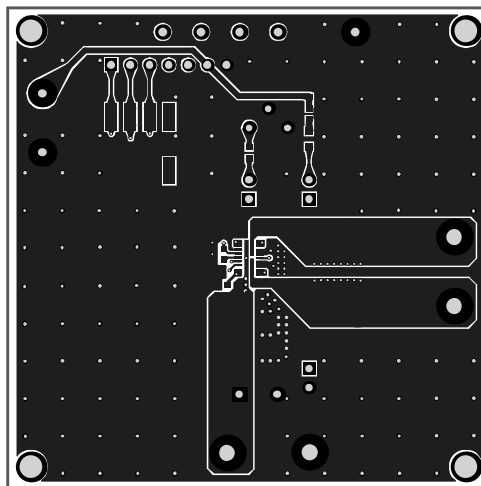


Figure 4: Top Layer

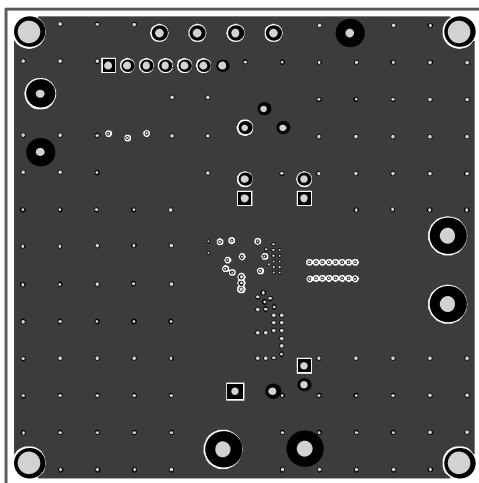


Figure 5: Mid-Layer 1

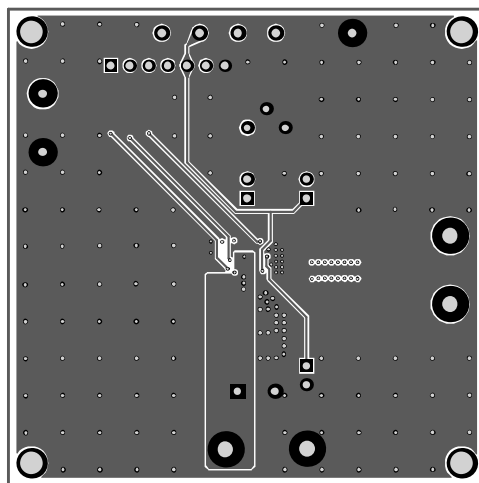


Figure 6: Mid-Layer 2

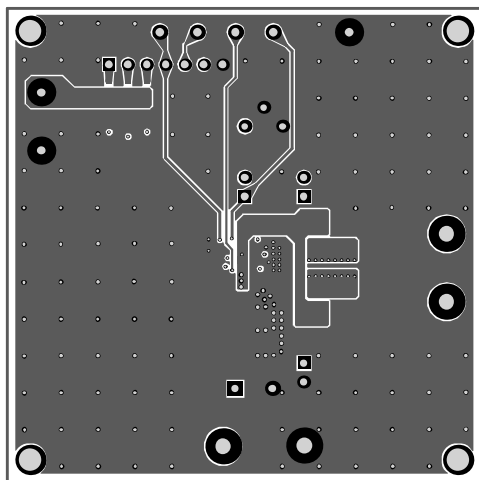


Figure 7: Bottom Layer

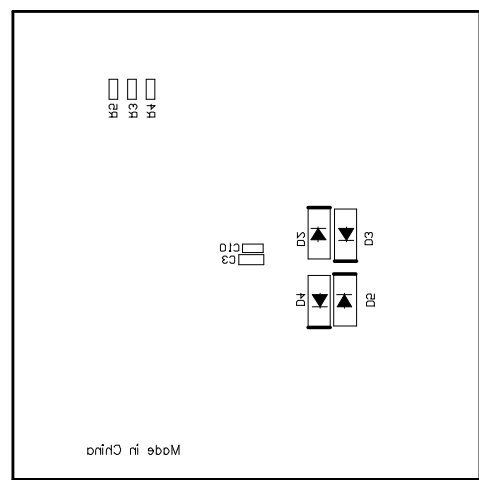


Figure 8: Bottom Silk



REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	4/16/2024	Initial Release	-

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