



EVQ6612A-L-00A

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

DESCRIPTION

The EVQ6612A-L-00A is an evaluation board designed to demonstrate the capabilities of the MPQ6612A, an H-bridge motor driver used for driving reversible motors.

The MPQ6612A operates from a 4V to 40V supply voltage and can deliver a motor current up to 5A. The MPQ6612A's input control signals are applied through a connector on the board.

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

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

PERFORMANCE SUMMARY ⁽¹⁾

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-L-00A	MPQ6612AGLE-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 MCU or manually through SW1. Manual action requires an external 3.3V or 5V voltage as a pull-up power supply. Table 1 shows the logic truth table.

Table 1: MPQ6612A Input Logic Truth Table

IN1	IN2	OUT1	OUT2	Function (DC Motor)
L	L	Z	Z	Coast
L	H	L	H	Reverse
H	L	H	L	Forward
H	H	L	L	Brake

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

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

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

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

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

EVALUATION BOARD SCHEMATIC

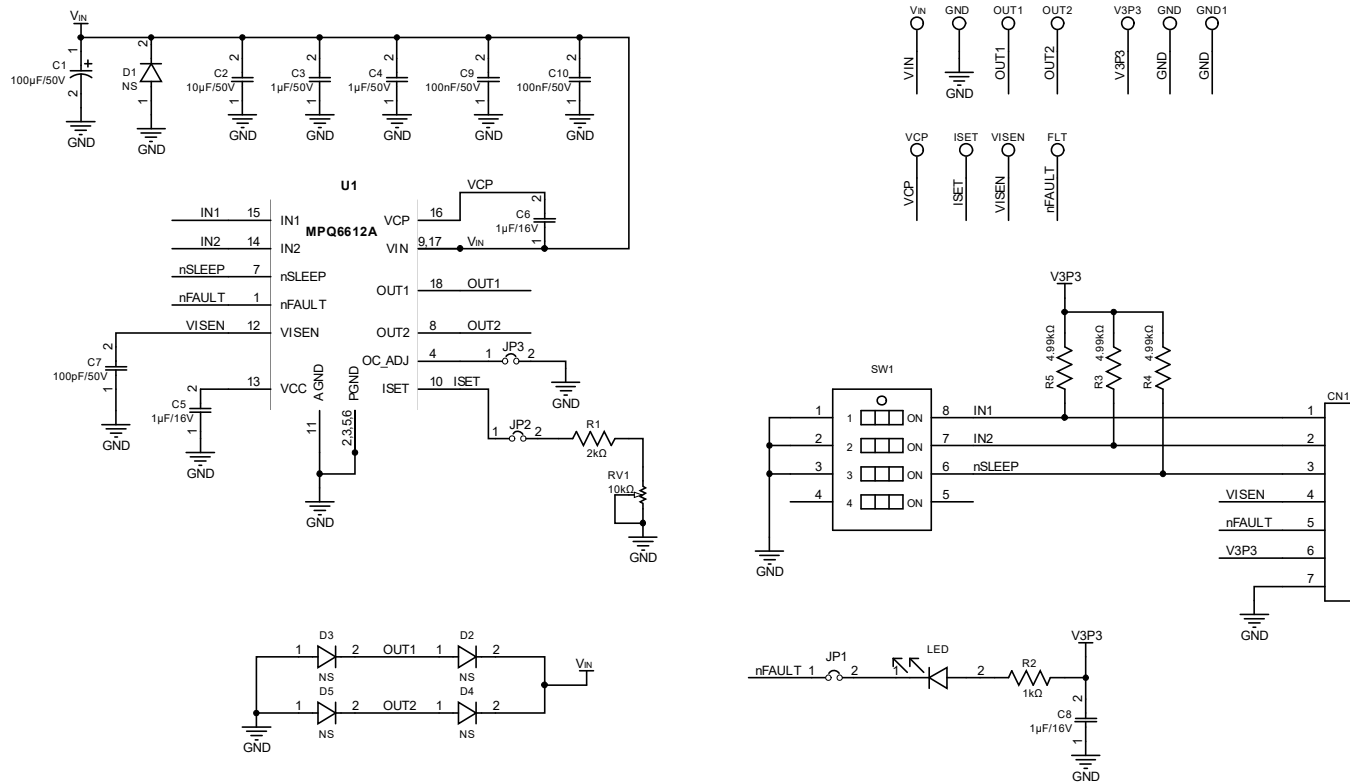


Figure 2: Evaluation Board Schematic

EVQ6612A-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	Würth	885012207103
3	C6, C8, C9	1μF	Ceramic capacitor, 16V, X7R	0603	Würth	885012206052
1	C7	100pF	Ceramic capacitor, 50V, NP0	0603	Würth	885012006057
3	C10, C11, C12	100nF	Ceramic capacitor, 50V, X7R	0603	Würth	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	Würth	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	40V, 5A, H-bridge DC motor driver	QFN-18 (3mmx4mm)	MPS	MPQ6612AGLE-AEC1

PCB LAYOUT

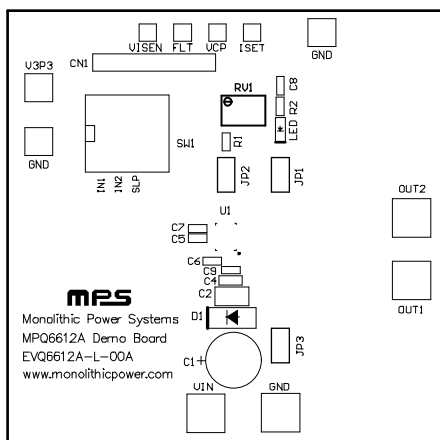


Figure 3: Top Silk

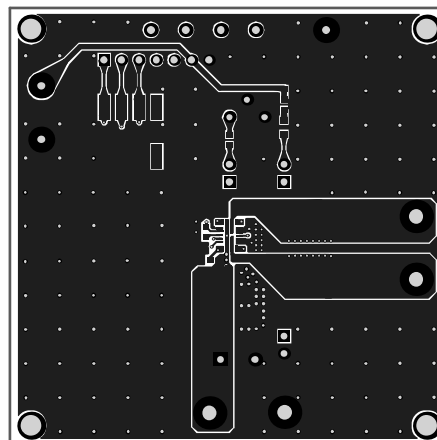


Figure 4: Top Layer

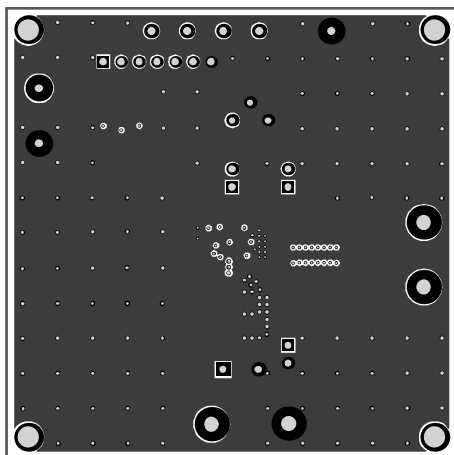


Figure 5: Mid-Layer 1

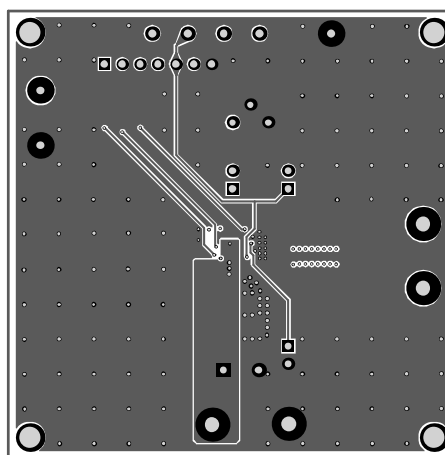


Figure 6: Mid-Layer 2

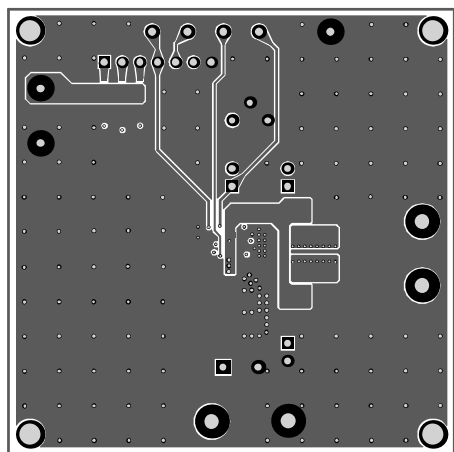


Figure 7: Bottom Layer

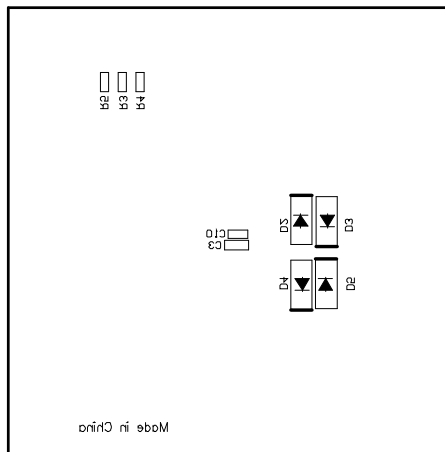


Figure 8: Bottom Silk

REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	2/23/2022	Initial Release	-
1.1	6/10/2024	Updated the maximum supply voltage from 45V to 40V in the header, Description, and Performance Summary sections; Added Conditions column in Performance Summary	1
		Updated the maximum supply voltage from 45V to 40V in the Quick Start Guide section	2
		Updated the maximum supply voltage from 45V to 40V in the Bill of Materials section	4

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