



EV6612D-F-00A

40V, 5A, H-Bridge DC Motor Driver with Current Sense and DIR/ENBL Control Evaluation Board

DESCRIPTION

The EV6612D-F-00A is an evaluation board designed to demonstrate the capabilities of the MP6612D, an H-bridge motor driver used for driving reversible motors.

The MP6612D operates from a 4V to 40V input voltage (V_{IN}) and can deliver a motor current up to 5A. The MP6612D's input control signals are applied through a connector on the board. For

the MP6612D, control of the outputs is accomplished through the DIR and ENBL pins.

The MP6612D is available in a TSSOP-20EP package with an exposed thermal pad.

It is recommended to read the MP6612D datasheet prior to making any changes to the EV6612D-F-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
EV6612D-F-00A	MP6612DGF

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. 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: MP6612D 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}) scaling is set by the adjustable resistor (RV1). V_{ISEN} can be calculated with Equation (1):

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

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

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

The output current (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

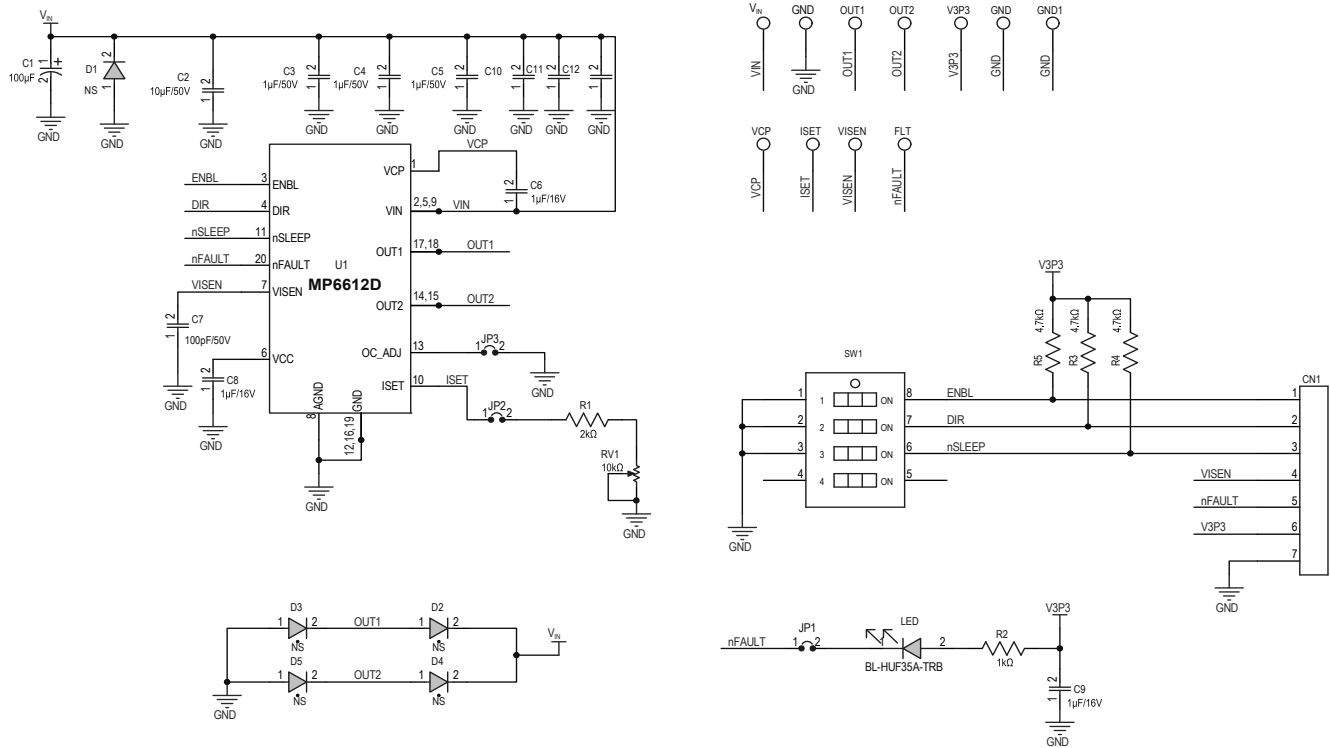


Figure 1: Evaluation Board Schematic

EV6612D-F-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	MP6612D	40V, 5A, H-bridge DC motor driver	TSSOP-20EP	MPS	MP6612DGF

PCB LAYOUT

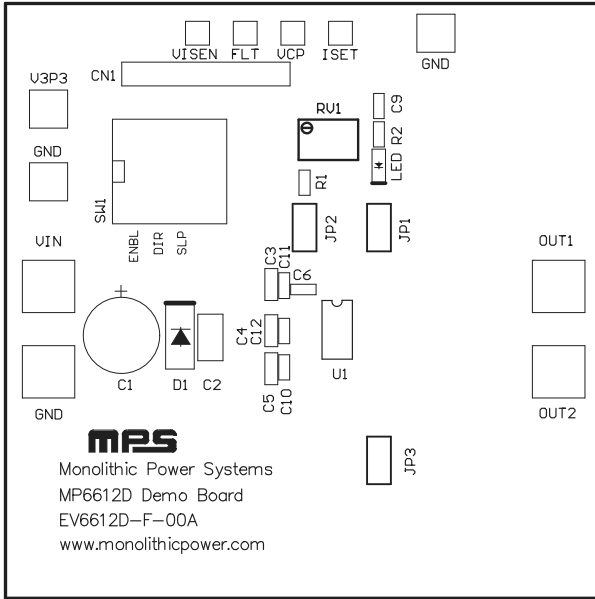


Figure 2: Top Silk

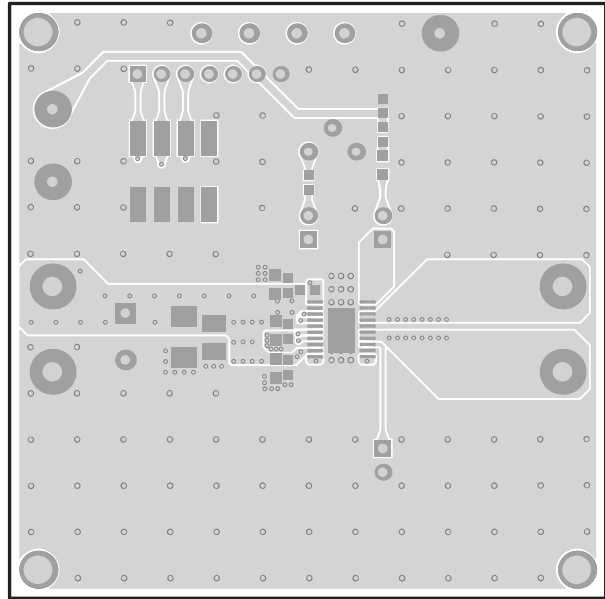


Figure 3: Top Layer

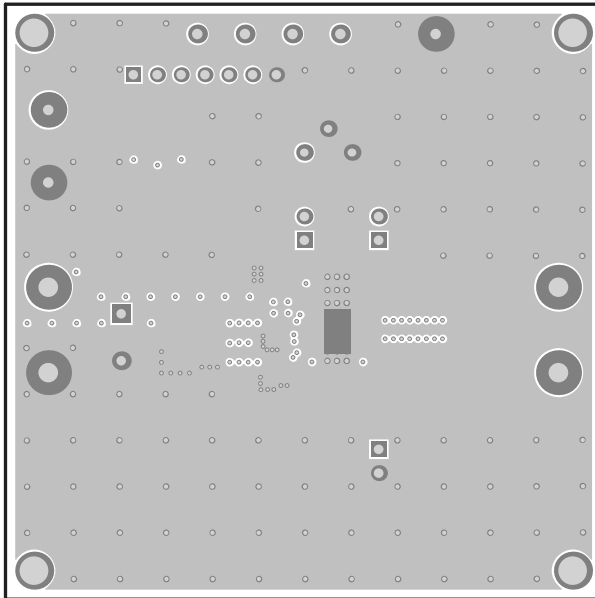


Figure 4: Mid-Layer 1

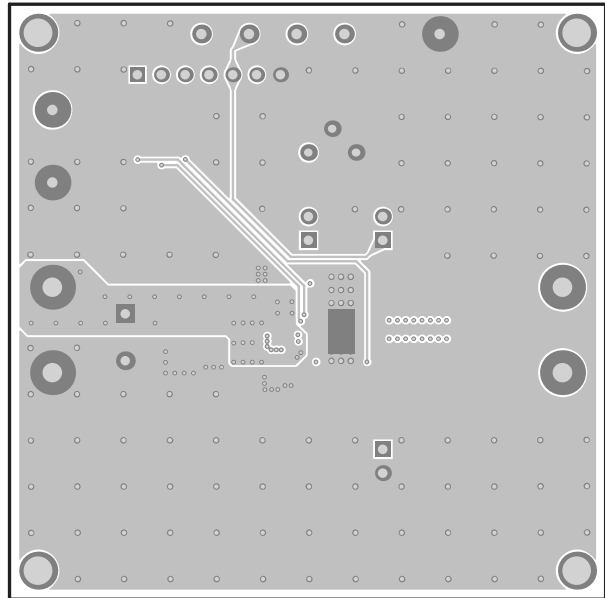


Figure 5: Mid-Layer 2

PCB LAYOUT (continued)

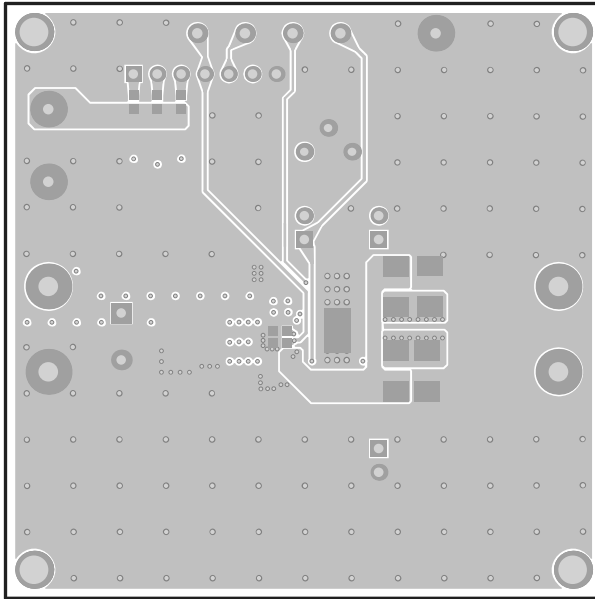


Figure 6: Bottom Layer

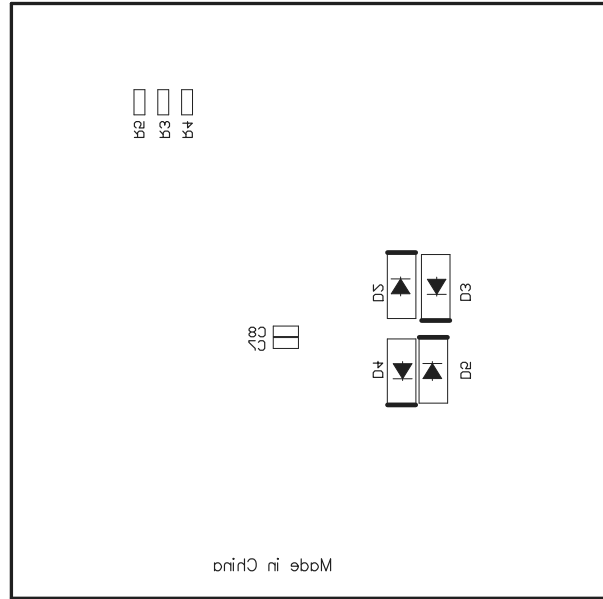


Figure 7: Bottom Silk

REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	3/31/2023	Initial Release	-
1.1	6/10/2024	Updated the maximum supply voltage from 45V to 40V in the header, Description, and Performance Summary sections	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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