



# 2.5V to 28V, 5A, H-Bridge Motor Driver Evaluation Board

#### **DESCRIPTION**

The EV6619L-Q-00A evaluation board is designed to demonstrate the capabilities of the MP6619L, an H-Bridge motor driver. It operates from a supply input voltage ( $V_{\text{IN}}$ ) up to 28V, and can deliver a motor current up to 5A. The MP6619L is typically used to drive a brushed DC motor.

The MP6619L has a configurable current limit ( $I_{\text{LIMIT}}$ ). For simplicity, the output polarity can be controlled by pulling the IN1 and IN2 pins high or low.

Full protection features include over-current protection (OCP), input over-voltage protection (OVP), under-voltage lockout (UVLO), and thermal shutdown. The input control signals for the MP6619L are applied via the connector or generated on the board.

The MP6619L is available in a QFN-19 (3mmx3mm) package. It is recommended to read the MP6619L datasheet prior to making any changes to the EV6619L-Q-00A.

#### PERFORMANCE SUMMARY

Parameters	Conditions	Value
Input voltage (V <sub>IN</sub> ) range		2.5V to 28V
Maximum output current (Iout_Max)		5A
VCC voltage (V <sub>CC</sub> )		2.8V to 5.5V
VDD voltage (V <sub>DD</sub> )		3.3V or 5V

#### **EV6619L-Q-00A EVALUATION BOARD**



LxW (7.5cmx7.5cm)

<b>Board Number</b>	MPS IC Number	
EV6619L-Q-00A	MP6619LGQ	



#### **QUICK START GUIDE**

- 1. Connect the input voltage (2.5V  $\leq$  V<sub>IN</sub>  $\leq$  28V) and input ground to the VIN and GND connectors, respectively.
- 2. Connect the VCC voltage (2.8V  $\leq$  V<sub>CC</sub>  $\leq$  5.5V) and ground to the VCC and GND connectors, respectively.
- 3. Connect the VDD voltage (3.3V or 5V) and ground to the VDD and GND connectors, respectively.
- 4. 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 V<sub>DD</sub> as a pull-up power supply.

Table 1 shows the logic truth table.

**Table 1: Logic Truth Table** 

EN	INx	OUTx
0	X <sup>(1)</sup>	Hi-Z
1	0	Low
1	1	High

#### Note:

- 1) X denotes N/A.
- 5. The current control trip value is set by the adjustable resistor (R4). When the ISET pin is floating, the current trip voltage (V<sub>ITRIP</sub>) is set to the default (200mV). If a resistor is connected between ISET and GND, then V<sub>ITRIP</sub> can be reduced below 200mV to reduce power loss on the sense resistor. The relationship between V<sub>ITRIP</sub> and the ISET resistor (R<sub>ISET</sub>) can be calculated with Equation (1):

$$V_{ITRIP}(V) = 0.2 \times \frac{40}{R_{ISET}(k\Omega)}$$
 (1)

6. The output current limit ( $I_{OUT\_LIM}$ ) is determined by  $V_{ITRIP}$  and  $R_{ISEN}$ . If  $R_{ISET}$  is connected between ISET and ground, then  $I_{OUT\_LIM}$  can be estimated with Equation (2):

$$I_{OUT\_LIM}(A) = 0.2 \times \frac{40}{R_{ISFT}(k\Omega)} \times \frac{1}{R_{ISFN}(\Omega)}$$
(2)

If ISET remains floating, then  $I_{OUT LIM}$  can be calculated with Equation (3):

$$I_{OUT\_LIM}(A) = \frac{0.2}{R_{ISEN}(\Omega)}$$
(3)



### **EVALUATION BOARD SCHEMATIC**

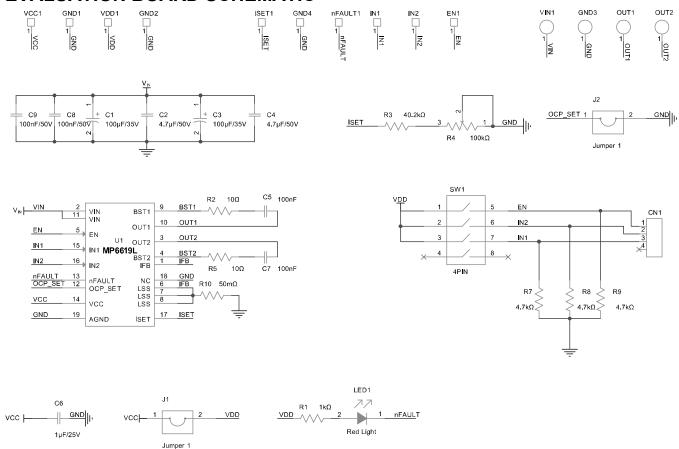


Figure 1: Evaluation Board Schematic

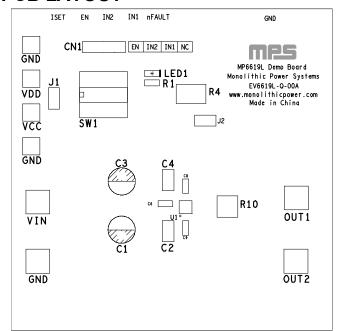


## **EV6619L-Q-00A BILL OF MATERIALS**

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
2	C1, C3	100µF	Electrolytic capacitor, 35V	DIP	Jianghai	CD287-35V100
2	C2, C4	4.7μF	Ceramic capacitor, 50V, X7R	1210	Murata	GRM32ER71H475KA88L
2	C5, C7	100nF	Ceramic capacitor, 50V, X7R	0603	Murata	GRM188R71H104KA93D
1	C6	1µF	Ceramic capacitor, 25V, X7R	0805	Murata	GRM21BR71E105KA99L
2	C8, C9	100nF	Ceramic capacitor, 50V, X7R	0805	Murata	GRM21BR71H104KA01L
1	R1	1kΩ	Film resistor, 1%	0805	Yageo	RC0805FR-071KL
2	R2, R5	10Ω	Film resistor, 1%	0603	Yageo	RC0603FR-0710RL
1	R3	40.2kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-0740K2L
1	R4	100kΩ	Square trimming potentiometer	DIP	Bourns	3266W-1-104LF
3	R7, R8, R9	4.7kΩ	Film resistor, 5%	0805	Yageo	RC0805JR-074K7L
1	R10	50mΩ	Film resistor, 1%	3720	Cyntec	RL3720WT-R050-FN
1	LED1	50mW	Red LED	0805	Baihong	BL-HUE35A-AV-TRB
1	SW1	25mA	Dial switch, 4-bit	SMD	Wurth	418121270804
4	VDD, VCC, GND1, GND2	1mm	Connector	DIP	Any	
4	VIN1, OUT1, OUT2, GND	2mm	Connector	DIP	Any	
1	CN1	2.54mm	Connector, 4-bit	DIP	Any	
2	J1, J2	2.54mm	Jumper	DIP	Any	
6	nFAULT, GND, ISET, EN, IN2, IN1	1mm	Yellow test point	DIP	Any	
1	U1	MP6619L	2.5V to 28V, 5A, H-bridge motor driver	QFN-19 (3mmx 3mm)	MPS	MP6619LGQ



### **PCB LAYOUT**



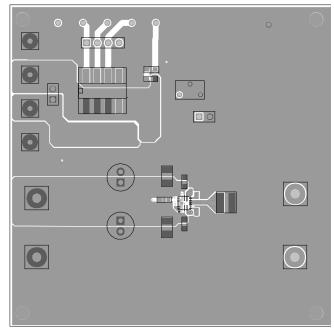
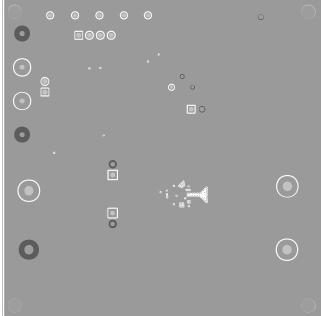


Figure 2: Top Silk







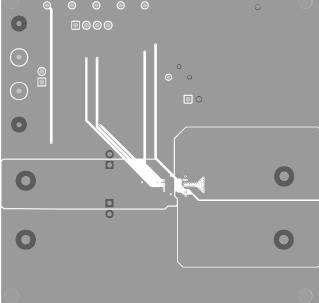
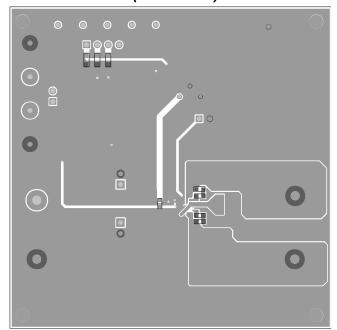


Figure 5: Mid-Layer 2



## **PCB LAYOUT** (continued)



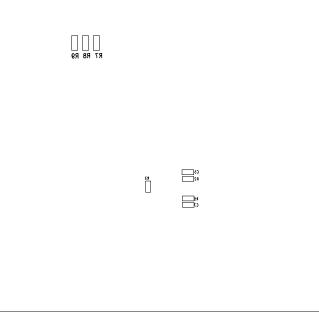


Figure 6: Bottom Layer

Figure 7: Bottom Silk



### **REVISION HISTORY**

Revision #	Revision Date	Description	Pages Updated
1.0	6/29/2022	Initial Release	-

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