EV6619L-Q-00A

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_{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_{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_{IN}) range		2.5V to 28V
Maximum output current (I_{OUT_MAX})		5A
VCC voltage (V_{CC})		2.8V to 5.5V
VDD voltage (V_{DD})		3.3V or 5V

EV6619L-Q-00A EVALUATION BOARD

LxW (7.5cmx7.5cm)

Board Number	MPS IC Number
EV6619L-Q-00A	MP6619LGQ

QUICK START GUIDE

1. Connect the input voltage (2.5V ≤ V_{IN} ≤ 28V) and input ground to the VIN and GND connectors, respectively.
2. Connect the VCC voltage (2.8V ≤ V_{CC} ≤ 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_{DD} as a pull-up power supply.

   Table 1 shows the logic truth table.

Table 1: Logic Truth Table

EN	INx	OUTx
0	X (1)	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_{ITRIP}) is set to the default (200mV). If a resistor is connected between ISET and GND, then V_{ITRIP} can be reduced below 200mV to reduce power loss on the sense resistor. The relationship between V_{ITRIP} and the ISET resistor (R_{ISET}) can be calculated with Equation (1):

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

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):

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

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

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

EVALUATION BOARD SCHEMATIC

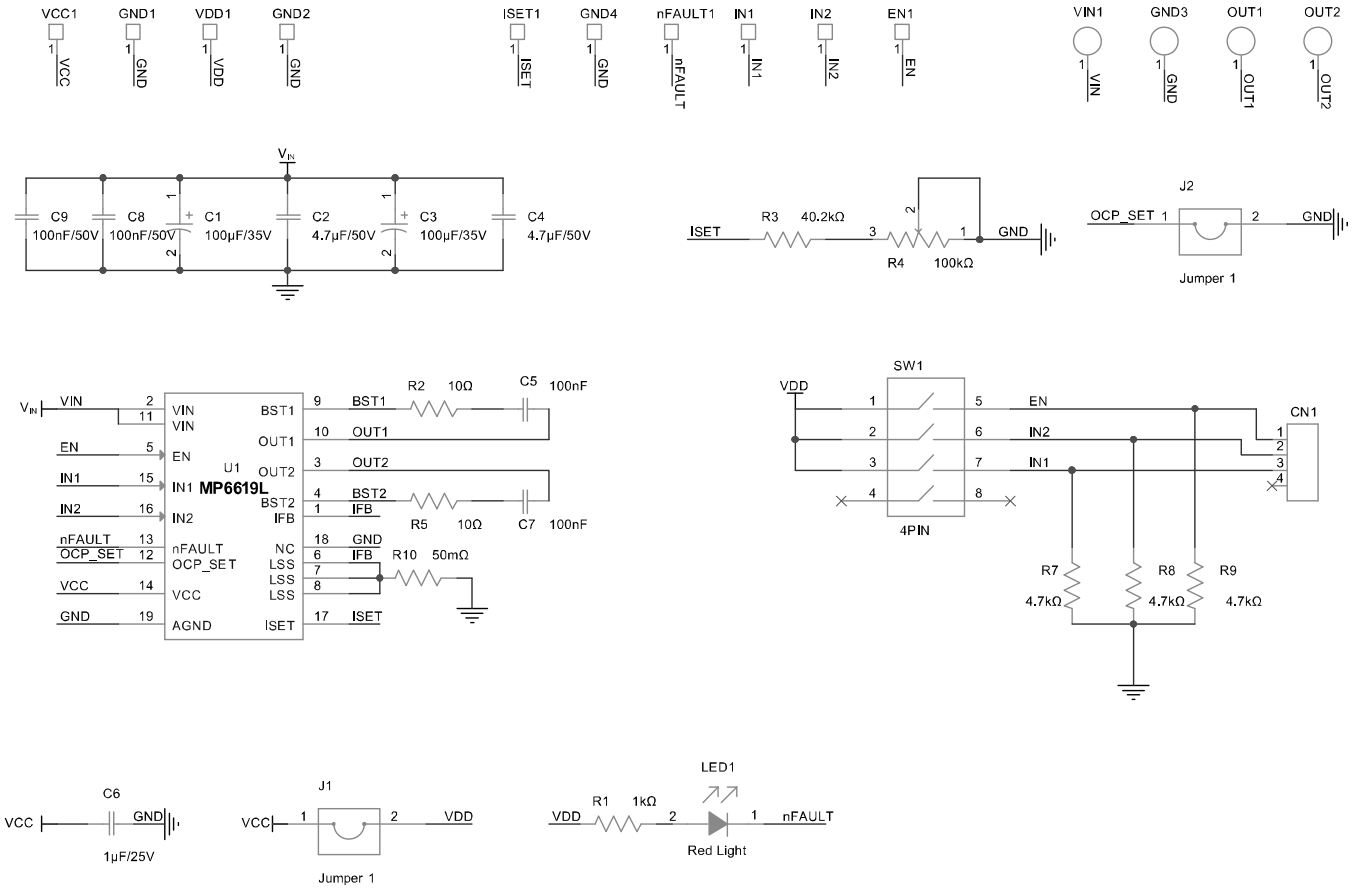

Figure 1: Evaluation Board Schematic

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

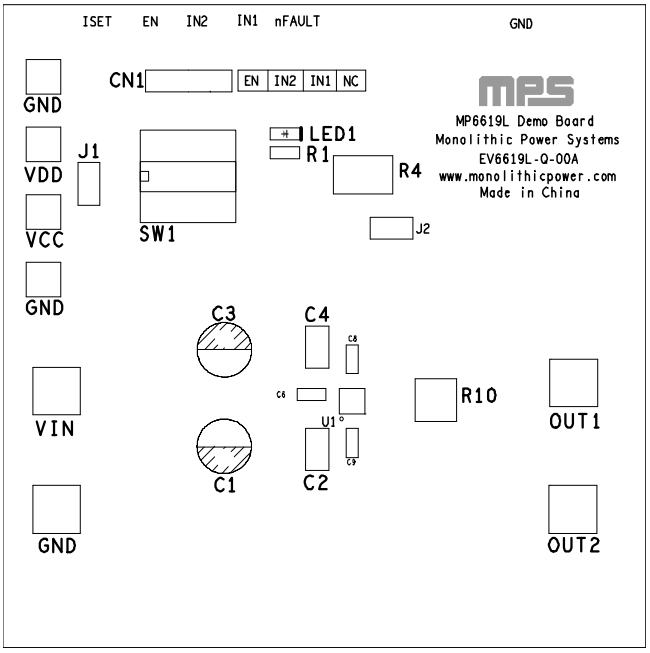

Figure 2: Top Silk

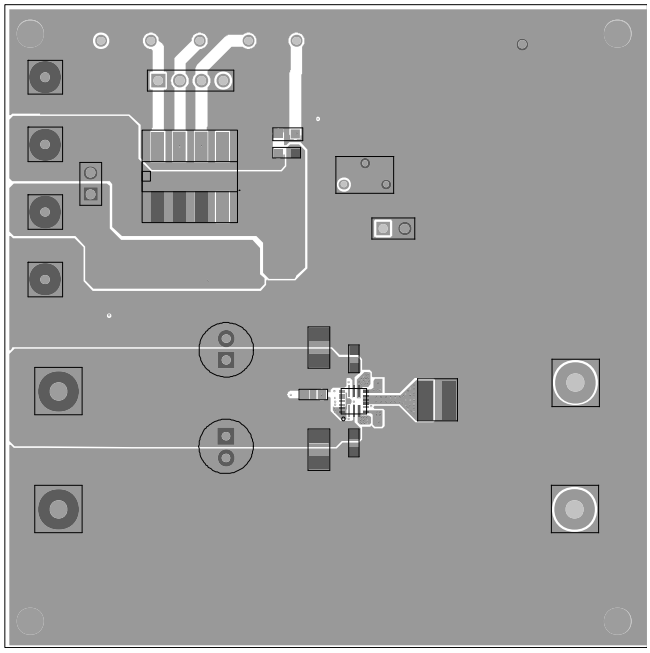

Figure 3: Top Layer

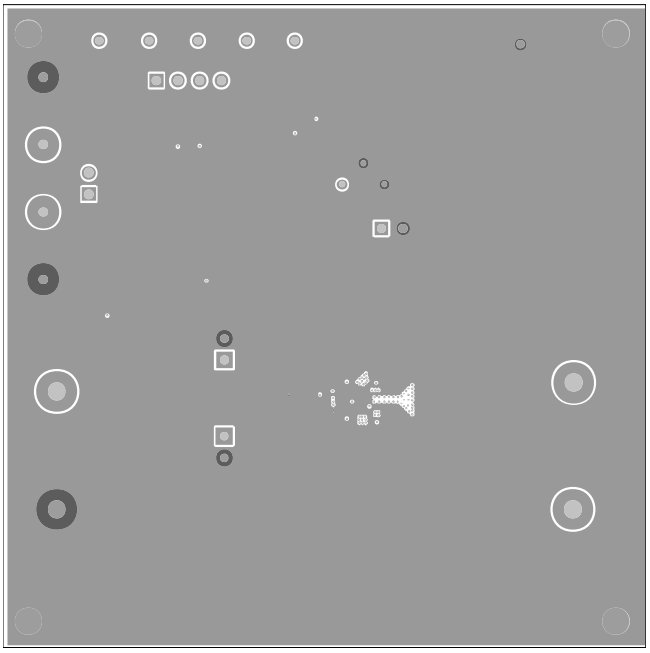

Figure 4: Mid-Layer 1

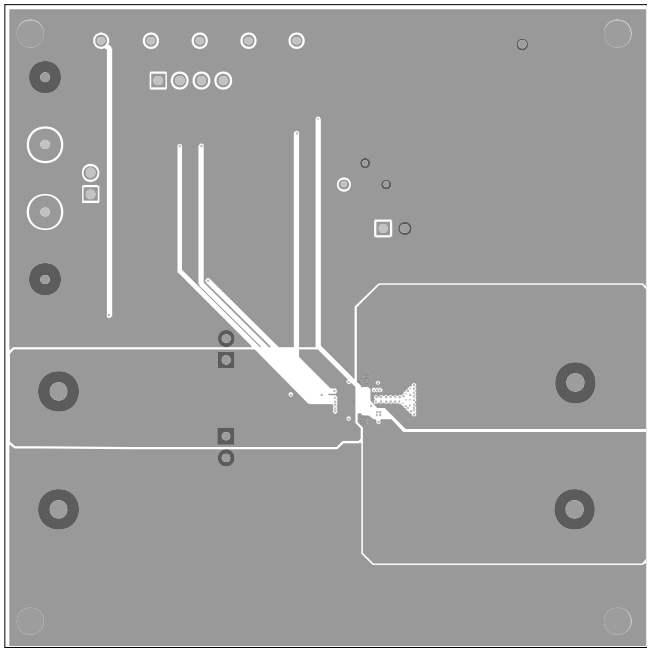

Figure 5: Mid-Layer 2

PCB LAYOUT *(continued)*

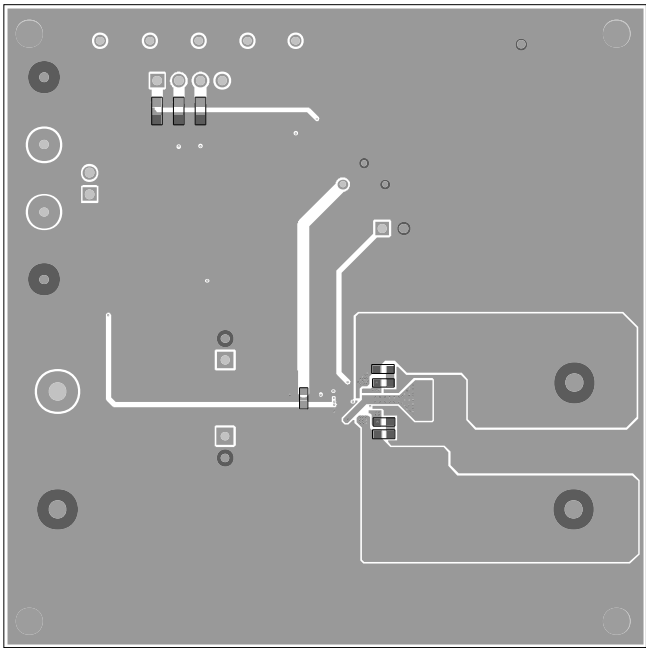

Figure 6: Bottom Layer

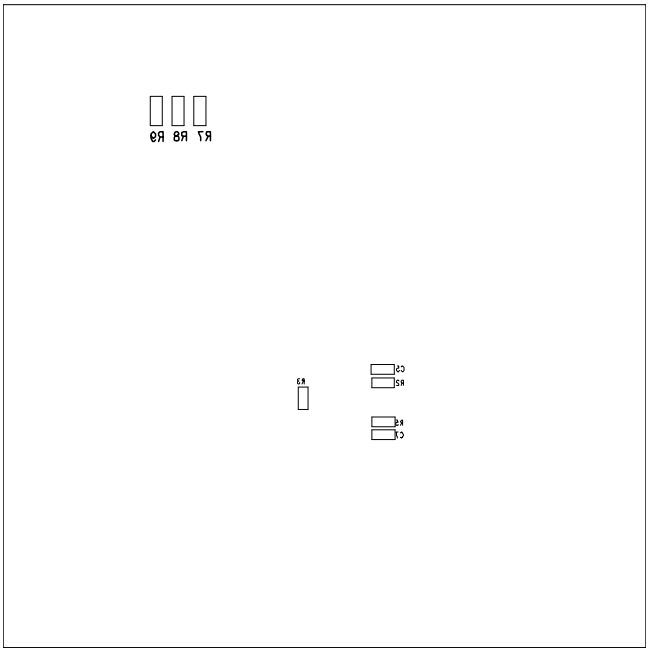

Figure 7: Bottom Silk

REVISION HISTORY

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