



EVQ6532-V-00A

5V to 60V, Three-Phase Brushless DC Motor Pre-Driver Evaluation Board, AEC-Q100 Qualified

DESCRIPTION

The EVQ6532-V-00A is an evaluation board designed to demonstrate the capabilities of the MPQ6532, a three-phase brushless DC (BLDC) motor pre-driver.

The MPQ6532 operates with a supply voltage of up to 60V. It is configured to drive three half-bridges, which consist of six N-channel power

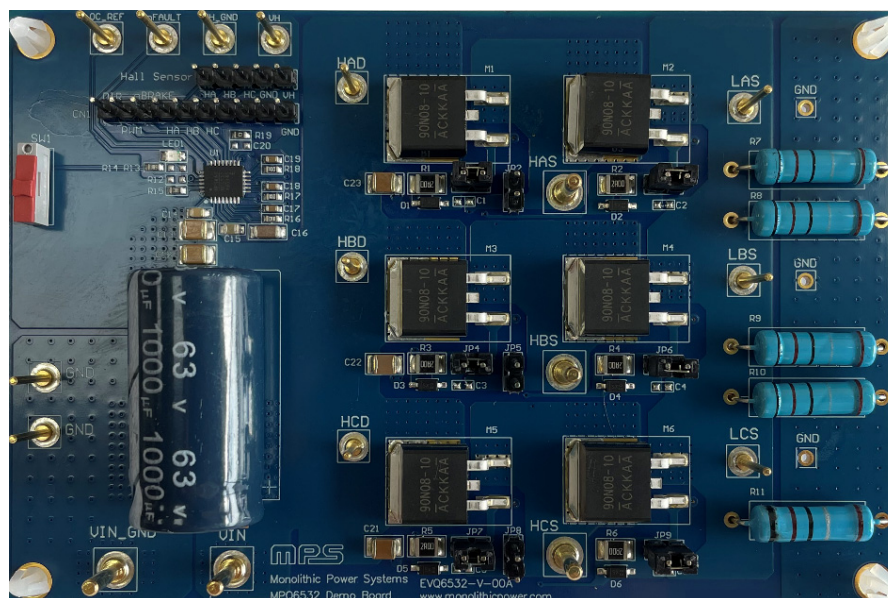
MOSFETs. The Hall sensors integrated in the motor provide the rotor position information, and the external controller (e.g. MCU or FPGA) generates the driving control signals.

It is recommended to read the MPQ6532 datasheet prior to making any changes to the EVQ6532-V-00A.

PERFORMANCE SUMMARY

Parameters	Value
Input voltage (V_{IN}) range	5V to 60V
OC_REF voltage (V_{OC_REF})	0.125V to 2.4V
VH voltage (V_H)	3.3V or 5V
Typical dead time	1.4 μ s

EVALUATION BOARD



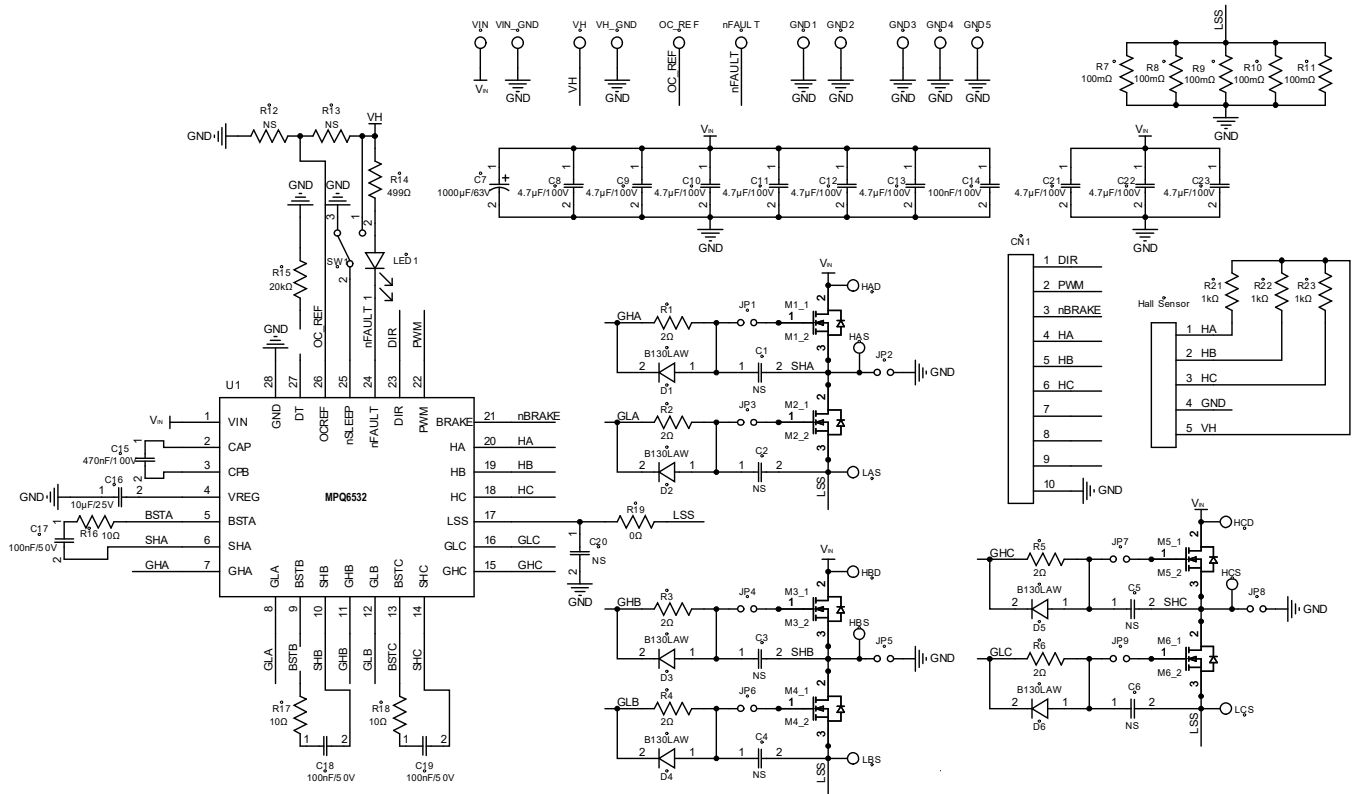
LxW (11.7cmx7.8cm)

Board Number	MPS IC Number
EVQ6532-V-00A	MPQ6532GVE-AEC1

QUICK START GUIDE

1. Connect the input voltage ($5V \leq V_{IN} \leq 60V$) to the VIN connector, then connect input ground to the GND connector.
2. Connect the VH voltage (3.3V or 5V) to the VH connector, then switch SW1 down to the position 1 terminal (see Figure 1) to enable the MPQ6532.
3. To set the over-current protection (OCP) threshold, connect the OC_REF voltage ($0.125V \leq V_{OC_REF} \leq 2.4V$) to the OC_REF connector.
4. Connect the Hall signals coming from the motor to the Hall Sensor connector.
5. Connect the driving control signals generated by the external controller to the CN1 connector.

EVALUATION BOARD SCHEMATIC



EVQ6532-V-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
9	C1, C2, C3, C4, C5, C6, C20, R12, R13	NS				
1	C7	1000μF	Electrolytic capacitor, 63V	DIP	Jianghai	CD263-63V1000
9	C8, C9, C10, C11, C12, C13, C21, C22, C23	4.7μF	Ceramic capacitor, 100V, X7S	1210	TDK	C3225X7S2A475K
1	C14	100nF	Ceramic capacitor, 100V, X7R	0805	Murata	GRM21BR72A104KAC4L
1	C15	470nF	Ceramic capacitor, 100V, X7R	0805	Murata	GRM21BR72A474KA73L
1	C16	10μF	Ceramic capacitor, 25V, X5R	1206	TDK	C3216X5R1E106K
3	C17, C18, C19	100nF	Ceramic capacitor, 50V, X7R	0603	Murata	GCJ188R71H104KA12D
6	R1, R2, R3, R4, R5, R6	2Ω	Film resistor, 1%	1210	Yageo	RC1210FR-072RL
5	R7, R8, R9, R10, R11	100mΩ	Resistor, 2W	DIP	Any	
1	R14	499Ω	Film resistor, 1%	0603	Yageo	RC0603FR-07499RL
1	R15	20kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-0720KL
3	R16, R17, R18	10Ω	Film resistor, 1%	0603	Yageo	RC0603FR-0710RL
1	R19	0Ω	Film resistor, 1%	0603	Yageo	RC0603FR-070RL
3	R21, R22, R23	1kΩ	Film resistor, 1%	0603	Yageo	RC0603FR-071KL
6	D1, D2, D3, D4, D5, D6	30V	Schottky diode, 1A	SOD-123	Diodes, Inc.	B130LAW-7-F
6	M1, M2, M3, M4, M5, M6	80V	N-channel MOSFET, 90A, Q _G = 60nC, 11mΩ when V _{GS} = 10V	TO-263	Analog Power	AM90N08-10B
1	LED1	50mW	Red LED	0805	Baihong	BL-HUE35A-AV-TRB
1	SW1	500mA	Switch slide SPDT, 12V	DIP	Würth	450301014042
9	JP1, JP2, JP3, JP4, JP5, JP6, JP7, JP8, JP9	2.54mm	2-bit connector	DIP	Any	

EVQ6532-V-00A BILL OF MATERIALS *(continued)*

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer PN
6	JP1, JP3, JP4, JP6, JP7, JP9	2.54mm	Short jumper	DIP	Any	
1	CN1	2.54mm	10-bit connector	DIP	Any	
1	Hall Sensor	2.54mm	5-bit connector	DIP	Any	
5	VIN, VIN_GND, HAS, HBS, HCS	$\phi = 2\text{mm}$	Connector	DIP	Any	
12	OC_REF, nFAULT, VH, VH_GND, LAS, LBS, LCS, HAD, HBD, HCD, GND, GND	$\phi = 1\text{mm}$	Connector	DIP	Any	
1	U1	MPQ6532	60V, three-phase BLDC motor pre-driver	QFN-28 (4mmx 5mm)	MPS	MPQ6532GVE-AEC1

PCB LAYOUT

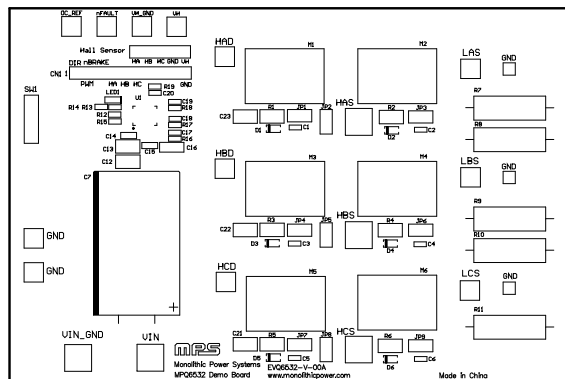


Figure 2: Top Silk

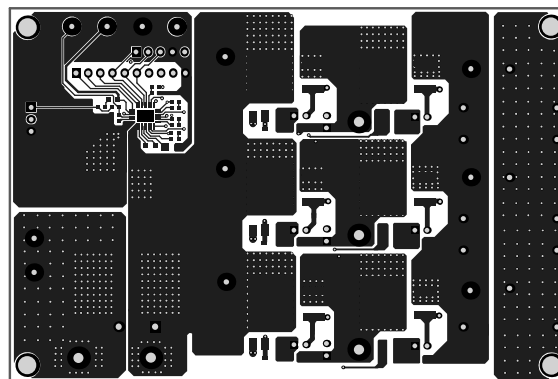


Figure 3: Top Layer

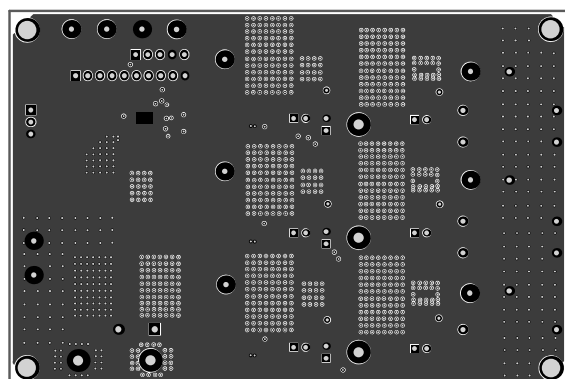


Figure 4: Mid-Layer 1

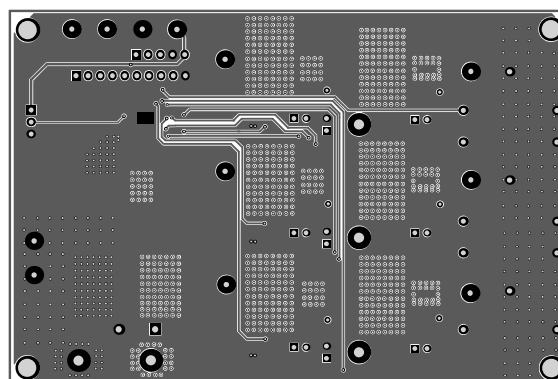


Figure 5: Mid-Layer 2

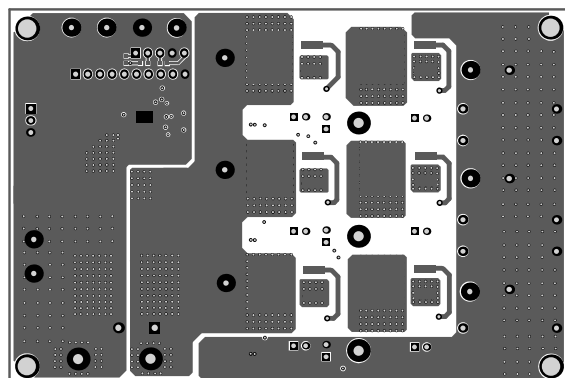


Figure 6: Bottom Layer

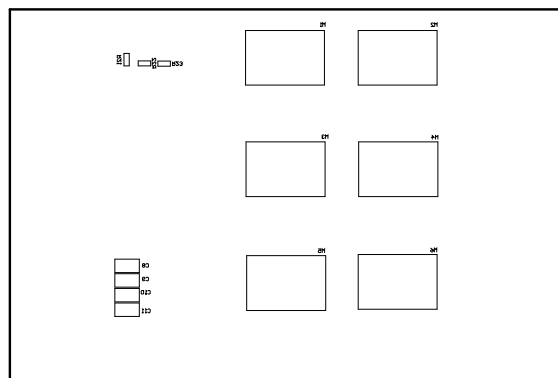


Figure 7: Bottom Silk

REVISION HISTORY

Revision #	Revision Date	Description	Pages Updated
1.0	09/28/2021	Initial Release	-

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