



# EV6532-R-01A

## 5V to 45V, Three-Phase Brushless DC Motor Pre-Driver Evaluation Board

### DESCRIPTION

The EV6532-R-01A is an evaluation board for the MP6532GR, a three-phase brushless DC motor pre-driver.

The MP6532 operates from a supply voltage of up to 45V. It is configured to drive three half-bridges consisting of six N-channel power MOSFETs. The rotor position information is provided by the Hall sensors assembled in the motor. Motor speed and direction are controlled by an on-board microcontroller.

### ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input voltage	V <sub>IN</sub>	5 to 45	V

### FEATURES

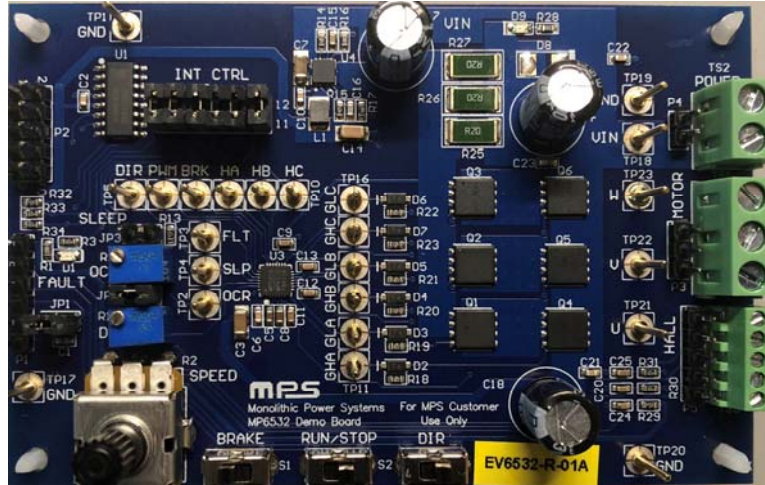
- Wide 5V to 45V Input Voltage Range
- Hall Sensor Inputs
- Configurable OCP Threshold
- Support 100% Duty Cycle Operation
- OCP, OTP
- Fault Indication Output

### APPLICATIONS

- Three-Phase Brushless DC Motors and Permanent Magnet Synchronous Motors (PMSMs)
- Power Drills
- Impact Drivers
- E-Bikes

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## EV6532-R-01A EVALUATION BOARD



(LxWxH) 10cmx6.5cmx1cm

Board Number	MPS IC Number
EV6532-R-01A	MP6532GR



## QUICK START GUIDE <sup>(1)</sup>

To quick start the EV6532-R-01A, follow the steps below:

1. Connect the U, V, and W wires of a brushless DC motor to the motor connector. Connect the motor's Hall sensors to the Hall connector.
2. Connect a power supply (between 5V and 45V) to the VIN and GND pins.
3. Slide the DIR switch to "Fwd" or "Rev" to control the direction of the motor. Slide the "Run/Stop" switch to the right to run the motor. Slide the "Brake" switch to the right to apply short braking to the motor.
4. Adjust the motor speed by turning the speed potentiometer.

**Note:**

- 1) To avoid damage caused by a reversed connection, pay close attention to the correct input polarity connection.

# EVALUATION BOARD SCHEMATIC

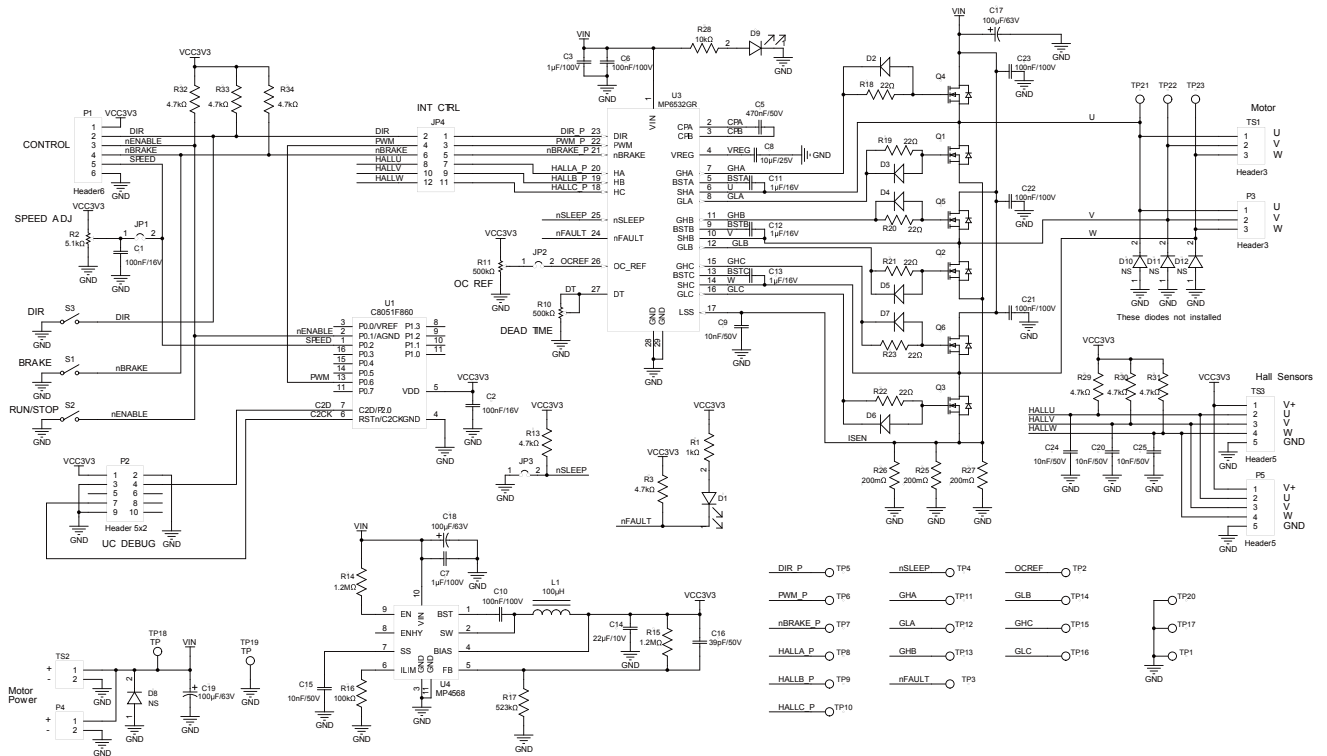


Figure 1: Evaluation Board Schematic

**EV6532-R-01A BILL OF MATERIALS**

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
2	C1, C2	100nF	Ceramic capacitor, 16V, X7R	0603	Murata	GRM188R71C104KA01D
5	C6, C10, C21, C22, C23	100nF	Ceramic capacitor, 100V, X7R	0603	Murata	GRM188R72A104KA35D
2	C3, C7	1μF	Ceramic capacitor, 100V, X7R	1206	Murata	GRM31CR72A105KA01L
1	C5	470nF	Ceramic capacitor, 50V, X7R	0603	TDK	C1608X7R1H474K
1	C8	10μF	Ceramic capacitor, 25V, X5R	0603	Murata	GRM188R61E106MA73D
3	C11, C12, C13	1μF	Ceramic capacitor, 16V, X7R	0603	Murata	GRM188R71C105KA12D
5	C9, C15, C20, C24, C25	10nF	Ceramic capacitor, 50V, X7R	0603	Murata	GRM188R71H103JA01D
1	C14	22μF	Ceramic capacitor, 10V, X7R	1206	Murata	GRM31CR71A226KE15L
1	C16	39pF	Ceramic capacitor, 50V, C0G	0603	Murata	GRM1885C1H390JA01
3	C17, C18, C19	100μF	Electrolytic capacitor, 63V	DIP	Rubycon	63PX100MEFC8X11.5 100uF 63V
2	D1, D9	Red	LED	0805	Baihong	BL-HUE35A-AV-TRB
6	D2, D3, D4, D5, D6, D7	75V, 0.15A	Diode	SOD-123	Changdian	1N4148W
4	D8, D10, D11, D12	NS				
4	JP1, JP2, JP3, P4	2-bits/ 2.54mm	Connector	DIP	Any	
1	JP4	2-bits/ 2.54mm, dual row	Connector	DIP	Any	
8	JP1, JP2, JP4	2.54mm	Short jumper	DIP	Any	
1	L1	100μH	Inductor, 2.7Ω, 180mA	SMD	Murata	LQH32PN101MN0L
1	P1	6-bits/ 2.54mm	Connector	DIP	Any	
1	P2	5-bits/ 2.54mm, dual row	Connector	DIP	Any	
1	P3	3-bits/ 2.54mm	Connector	DIP	Any	
1	P5	5-bits/ 2.54mm	Connector	DIP	Any	
6	Q1, Q2, Q3, Q4, Q5, Q6 <sup>(2)</sup>		N-channel MOSFET, 80V, 19A, 9mΩ, Q <sub>G</sub> = 52nC	SOIC-8PP	Analog Power	AM7484N
			N-channel MOSFET, 80V, 18A, 13mΩ, Q <sub>G</sub> = 72nC	SOIC-8PP	Analog Power	AM7482N

**EV6532-R-01A BILL OF MATERIALS (continued)**

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
1	R1	1k $\Omega$	Film resistor, 1%	0603	Yageo	RC0603FR-071KL
1	R2	5.1k $\Omega$	Square trimming potentiometer	DIP	CTS	296UD502B1N
8	R3, R13, R29, R30, R31, R32, R33, R34	4.7k $\Omega$	Film resistor, 1%	0603	Yageo	RC0603FR-074K7L
2	R10, R11	500k $\Omega$	Square trimming potentiometer	DIP		3266W-1-504LF
2	R14, R15	1.2M $\Omega$	Film resistor, 1%	0603	Yageo	RC0603FR-071M2L
1	R16	100k $\Omega$	Film resistor, 1%	0603	Yageo	RC0603FR-07100KL
1	R17	523k $\Omega$	Film resistor, 1%	0603	Yageo	RC0603FR-07523KL
6	R18, R19, R20, R21, R22, R23	22 $\Omega$	Film resistor, 1%	0603	Yageo	RC0603FR-0722L
3	R25, R26, R27	200m $\Omega$	Sense resistor, 1%, 2W	2512	CTS	73L7R20J
1	R28	10k $\Omega$	Film resistor, 1%	0603	Yageo	RC0603FR-0710KL
3	S1, S2, S3	SPDT	Button	DIP	Any	
23	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13, TP14, TP15, TP16, TP17, TP18, TP19, TP20, TP21, TP22, TP23	$\Phi = 1\text{mm}$	Connector, $\Phi = 1\text{mm}$ needle	DIP	Any	
1	TS1	3 pins	Header	DIP	Würth	691236510003
1	TS2	2 pins	Header	DIP	Würth	691236510002
1	TS3	5 pins	Header	DIP	Würth	691210910005
1	U1		Microcontroller C8051F860	SOIC-16	Silicon	C8051F860-C-GSR
1	U3	MP6532	Three-phase BLDC motor pre-driver	QFN-28 (4mmx4mm)	MPS	MP6532GR
1	U4	MP4568	Buck converter	QFN-10 (3mmx3mm)	MPS	MP4568GQ

**Note:**

2) Some boards are assembled with AM7484N; the others are assembled with AM7482N.

PCB LAYOUT

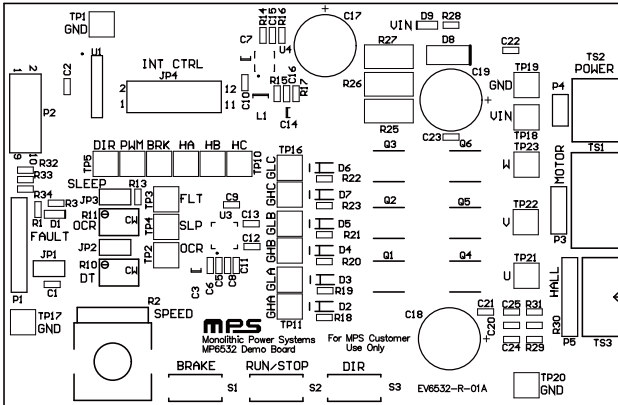


Figure 2: Top Silk

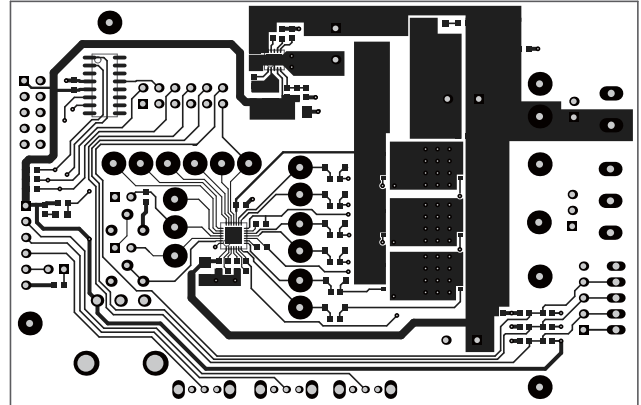


Figure 3: Top Layer

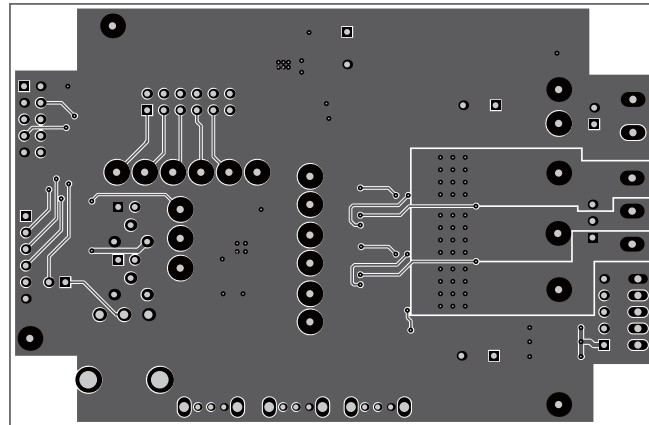


Figure 4: Bottom Layer

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