



EVQ6531-V-00A

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

DESCRIPTION

The EVQ6531-V-00A is an evaluation board for the MPQ6531, a three-phase BLDC motor pre-driver.

It operates from a supply voltage of up to 60V. It is configured to drive 3 half bridges consisting of 6 N-channel Power MOSFETs. The rotor position information is provided by the Hall sensors assembled in the motor and the driving control signals are generated by the external controller, such as MCU, FPGA, etc.

ELECTRICAL SPECIFICATIONS

| Parameter | Symbol | Value | Units |
|---------------|--------|-----------|-------|
| Input Voltage | VIN | 5 - 60 | V |
| OC_REF | OC_REF | 0.1 – 2.4 | V |
| Hall Voltage | VH | 3.3 or 5 | V |

FEATURES

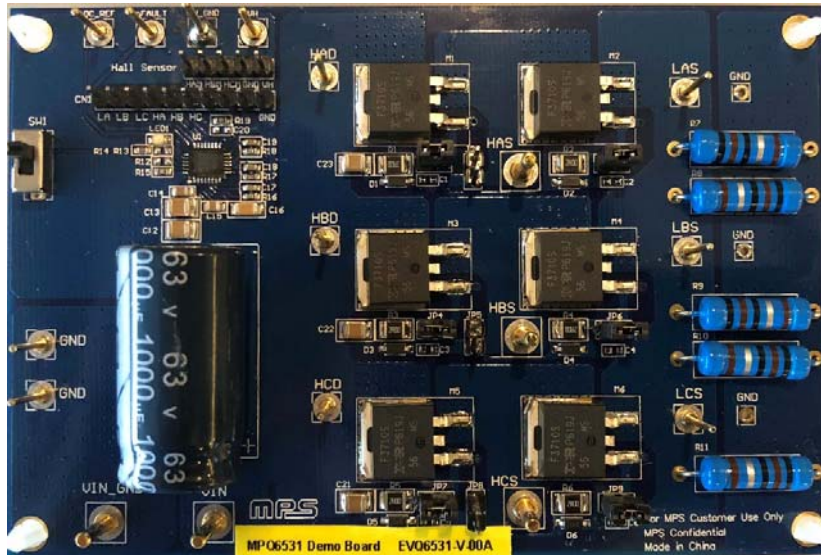
- Wide 5V to 60V Input Voltage Range
- Programmable OCP Threshold
- Support 100% Duty Cycle Operation
- OCP, OTP
- Fault Indication Output

APPLICATIONS

- 3-Phase Brushless DC Motors and Permanent Magnet Synchronous Motors
- Power Drills
- Impact Drivers
- E-Bike

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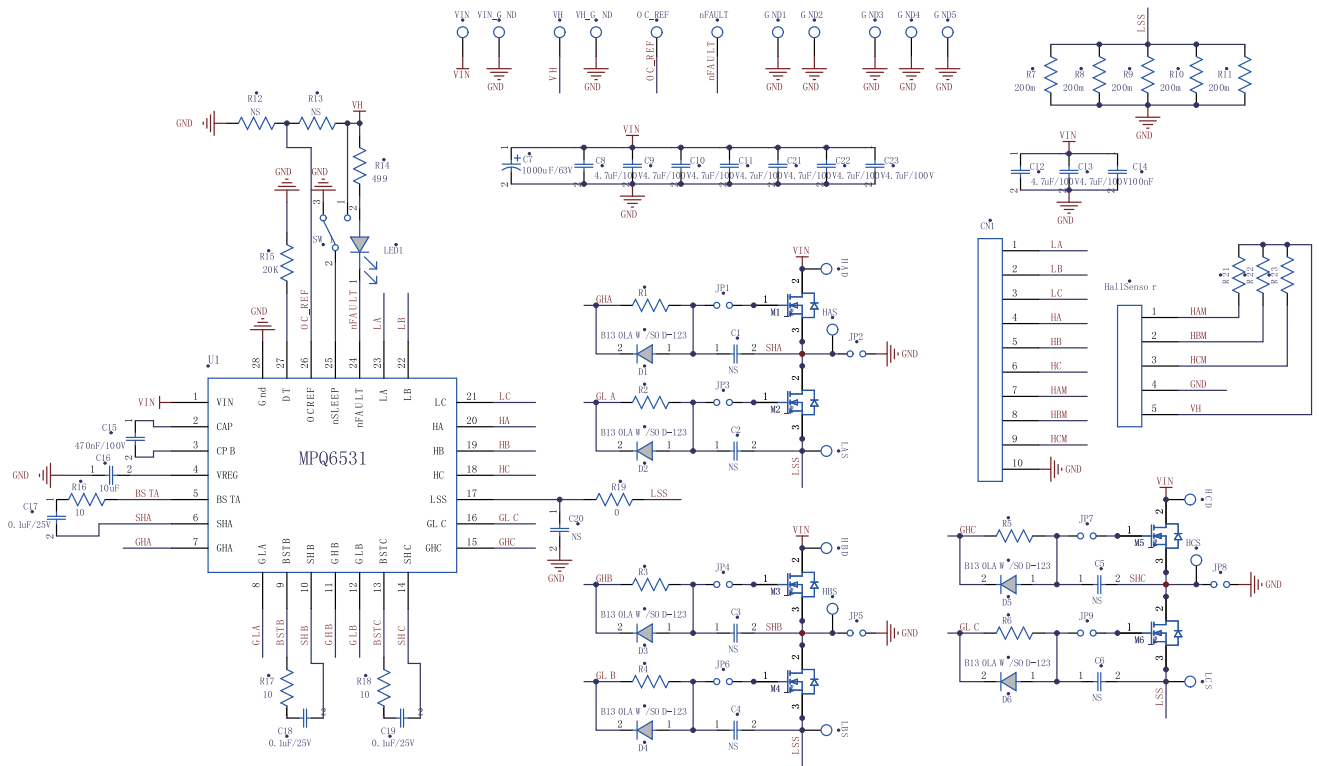
EVQ6531-V-00A EVALUATION BOARD



(L x W x H) 4.68" x 3.12" x 0.4"
(11.7cm x 7.8cm x 1cm)

| Board Number | MPS IC Number |
|---------------|----------------|
| EVQ6531-V-00A | MPQ6531GV-AEC1 |

EVALUATION BOARD SCHEMATIC



EVQ6531-V-00A BILL OF MATERIALS

| Qty | RefDes | Value | Description | Package | Manufacturer | Manufacturer P/N |
|-----|---|---------------|---|------------------|--------------|------------------------|
| 12 | C1,C2,C3,C4,C5,C6, C20,R12,R13,R21,R 22,R23 | NS | | | | |
| 1 | C7 | 1000 μ F | Electrolytic Cap. 63V | DIP | Jianghai | CD263-63V1000 |
| 9 | C8,C9,C10,C11,C12 ,C13,C21,C22,C23 | 4.7 μ F | Ceramic Cap. 100V, X7S | 1210 | TDK | C3225X7S2A475K |
| 1 | C14 | 100nF | Ceramic Cap. 100V, X7R | 0805 | TDK | CGA4J2X7R2A104K |
| 1 | C15 | 470nF | Ceramic Cap. 100V, X7R | 0805 | Murata | GRM21BR72A474K A73L |
| 1 | C16 | 10 μ F | Ceramic Cap. 25V, X5R | 1206 | Murata | GRM31CR61E106K A12L |
| 3 | C17,C18,C19 | 0.1 μ F | Ceramic Cap. 25V, X7R | 0603 | Murata | GRM188R71E104K A01D |
| 6 | R1,R2,R3,R4,R5,R6 | 2 Ω | Film Resistor. 1% | 1210 | Yageo | RC1210FR-072RL |
| 5 | R7,R8,R9,R10,R11 | 100m Ω | Resistor. 2W | DIP | 闽达 | |
| 1 | R14 | 499 Ω | Film Resistor. 1% | 0603 | Yageo | RC0603FR- 07499RL |
| 1 | R15 | 20k | Film Resistor ,1% | 0603 | Yageo | RC0603FR-0720KL |
| 3 | R16,R17,R18, | 10 Ω | Film Resistor ,1% | 0603 | Yageo | RC0603FR-0710RL |
| 1 | R19 | 0 Ω | Film Resistor ,1% | 0603 | Yageo | RC0603FR-070RL |
| 6 | D1,D2,D3,D4,D5,D6 | | Schottky Diode. 30V, 1A | SOD- 123 | Diodes | B130LAW-7-F |
| 6 | M1,M2,M3,M4,M5,M 6 | | N-channel MOSFET, 100V,57A, Qg=130nC, 23m Ω @Vgs=10V , Id=28A | TO-263 | IR | IRF3710S |
| 1 | LED1 | | LED. 红光 | 0805 | Bright LED | BL-HUF35A-TRB |
| 1 | SW1 | | Button | | | SK-12D01EG4 |
| 9 | JP1,JP2,JP3,JP4,JP 5,JP6,JP7,JP8,JP9 | | 2PIN. 2.54MM | | | |
| 6 | JP1,JP3,JP4,JP6,JP 7,JP9 | | 2.54MM Short Jumper | | | |
| 1 | CN1 | | 10PIN. 2.54MM | | | |
| 1 | Hall Sensor | | 5PIN. 2.54MM | | | |
| 5 | VIN,VIN_GND,HAS, HBS,HCS | | 2.0 公针 | | | |
| 9 | OC_REF,nFAULT, VH,VH_GND,LAS,L BS,LCS,GND,GND | | 1.0 公针 | | | |
| 1 | U1 | | 3-Phase BLDC Motor Pre-Driver | QFN28 (4x5mm) | MPS | MPQ6531GV-AEC1 |

PRINTED CIRCUIT BOARD LAYOUT

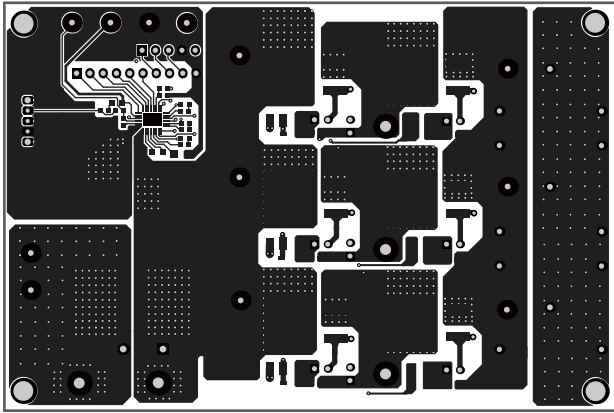


Figure 1: Top

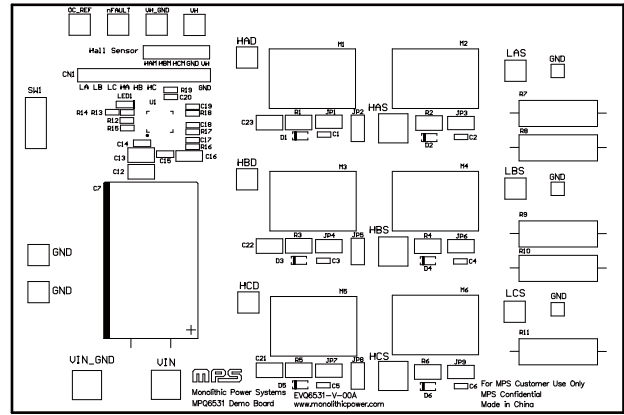


Figure 2: Top Silk

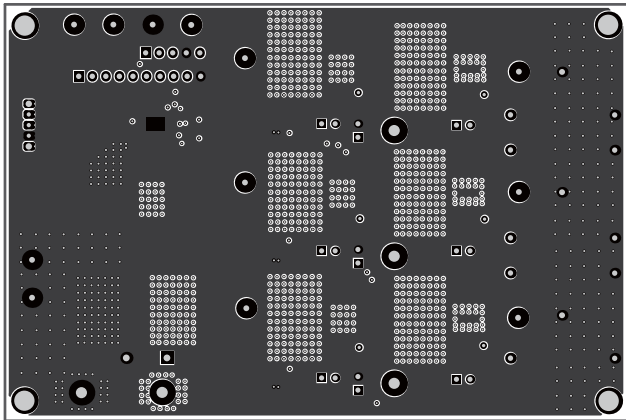


Figure 3: Inner1

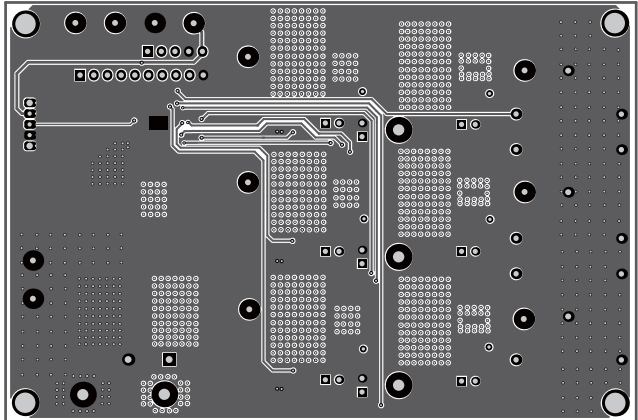


Figure 4: Inner2

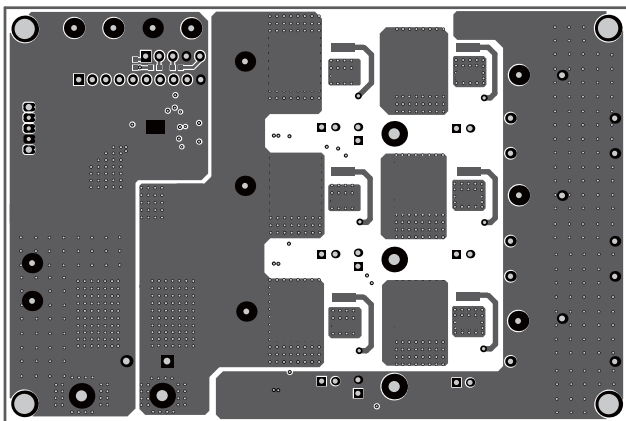


Figure 5: Bottom

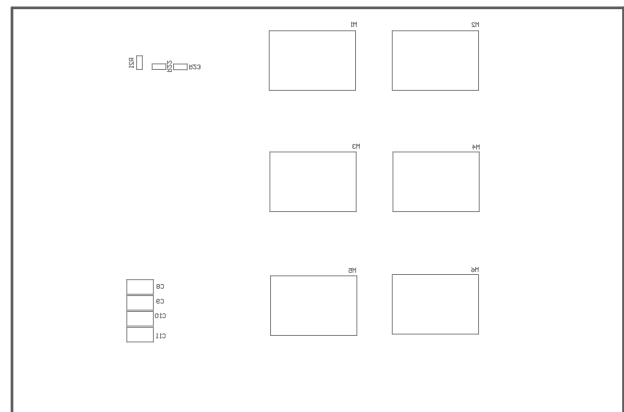


Figure 6: Bottom Silk



QUICK START GUIDE

1. Attach the input voltage ($5V \leq V_{IN} \leq 60V$) and input ground to the VIN and GND connectors respectively.
2. Attach a 3.3V or 5V constant voltage to the VH connector and switch the SW1 to the position 1(Top side) to enable the chip.
3. Attach the OCP reference voltage ($0.1V \leq V_{OC_REF} \leq 2.4V$) to the OC_REF connector to set OCP threshold.
4. Attach the hall signals coming from the motor to the Hall Sensor connector.
5. Attach the driving control signals generated by the external controller to the CN1 connector.

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