

## GENERAL DESCRIPTION

The EV6536-U-00A is the evaluation board for the MP6536, a three-phase BLDC motor driver. It accepts PWM modulated inputs for operation.

The MP6536 features a low current shutdown mode, standby mode, input under voltage protection, current limit, thermal shutdown and fault flag signal output. All channels of drivers interface with standard logic signals.

The MP6536 is available in a 40 lead QFN 5X5 package.

## ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Supply Voltage	V <sub>DD</sub>	5 – 26	V
Peak Output Current	I <sub>PEAK</sub>	5.5	A

## FEATURES

- 5V to 26V VDD
- ±5.5A Peak Current Output
- Up to 1MHz Switching Frequency
- Current Sense Output
- Optional 3.3V or 5V Logic Power Supply on Board
- All Switches Current Limited
- Internal Under Voltage Protection
- Internal Thermal Protection
- Short-circuit Protection
- Fault Output Flag

## APPLICATIONS

- Three-phase Brushless DC Motors and Permanent Magnet Synchronous Motors
- Power Drills
- Impact Drivers

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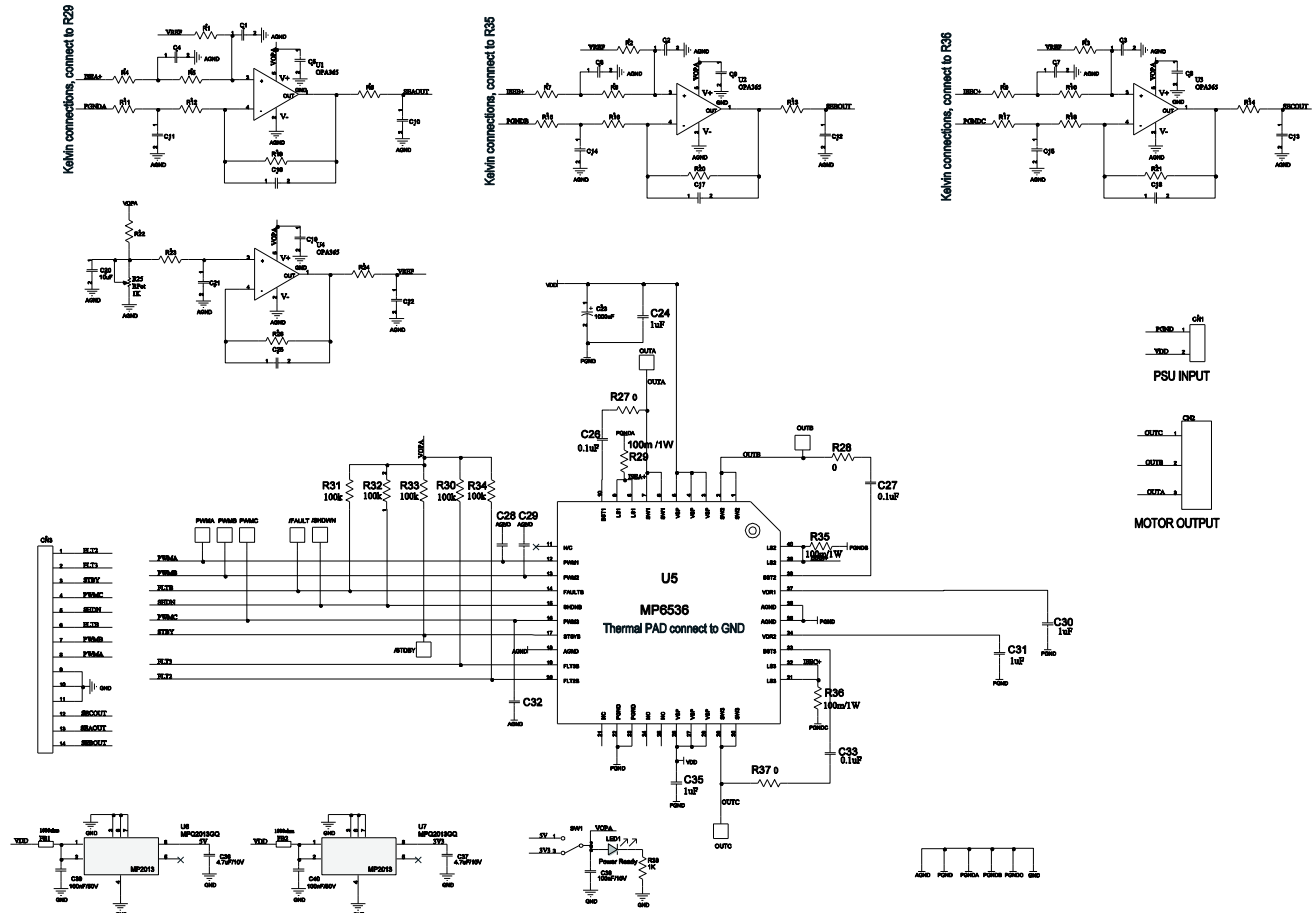
## EV6536-U-00A EVALUATION BOARD



(L x W x H) 2.8" x 2.5" x 1.3"  
 (7cm x 6.3cm x 3.4cm)

Board Number	MPS IC Number
EV6536-U-00A	MP6536DU

# EVALUATION BOARD SCHEMATIC



Thermal PAD connect to GND, to reduce the thermal stress Thermal PAD connect to GND, to reduce the thermal stress

**EV6536-U-00A BILL OF MATERIALS**

Qty	Ref	Value	Description	Package	Manufacturer	Part Number
15	C1, C2, C3, C4, C6, C7, C10, C11, C12, C13, C14, C15, C16, C17, C18	330pF	Ceramic Cap. 50V, X7R	0603	Murata	GRM1885C1H331JA01
9	C5, C8, C9, C19, C21, C22, C25, C30, C31	1μF	Ceramic Cap. 25V, X7R	0603	Murata	GRM188R71E105KA12D
1	C20	10μF	Ceramic Cap. 25V, X7R	1206	Murata	GRM31CR71E106KA12
1	C23	1000uF	Electrolytic Cap. 35V	DIP	Jianghai	CD287-35V1000
2	C24, C35	1μF	Ceramic Cap. 50V, X7R	1206	TDK	C3216X7R1H105K
6	C26, C27, C33, C38, C39, C40	0.1μF	Ceramic Cap. 50V, X7R	0603	Murata	GRM188R71H104KA93D
2	C36, C37	4.7μF	Ceramic Cap. 10V, X7R	0805	Murata	GRM21BR71C475KA73L
6	R1-R3, R19-R21	18k	Film Resistor ,1%	0603	Yageo	RC0603FR-0718KL
15	R4, R5, R7-R12, R15-R18, R23, R26, R38	1k	Film Resistor ,1%	0603	Yageo	RC0603FR-071KL
4	R6, R13, R14, R24,	10Ω	Film Resistor ,1%	0603	Yageo	RC0603FR-0710RL
1	R22	8.06k	Film Resistor ,1%	0603	Yageo	RC0603FR-078K06L
1	R25		Potentiometer, 10k	DIP		
3	R27, R28, R37	0Ω	Film Resistor ,1%	0603	Yageo	RC0603FR-070RL
3	R29, R35, R36	100mΩ	Sense Resistor, 1W	2512		RL-3264-9-R100-FN
5	R30, R31, R32, R33, R34	100k	Film Resistor ,1%	0603	Yageo	RC0603FR-07100KL
2	FB1, FB2		Magnetic Bead, I <sub>dc</sub> =3A	0603	Murata	BLM18PG330SN1
1	LED1		LED. 红光	0805	Bright LED	BL-HUF35A-TRB
4	U1-U4		Operational Amplifier	SOT23-5	TI	OPA365AIDBVR
1	U5		3-Phase BLDC Motor Pre-Driver	QFN-40(5x5mm)	MPS	MP6536DU
1	U6		Linear Regulator	QFN-8(3x3mm)	MPS	MPQ2013AGQ-5-Z
1	U7		Linear Regulator	QFN-8(3x3mm)	MPS	MPQ2013AGQ-33-Z

**EV6536-U-00A BILL OF MATERIALS**

1	SW1		Button	DIP	Würth	450301014042
1	CN1		Header, 2-Pin/5.08mm	DIP	Würth	691101710002
1	CN2		Header, 3-Pin/5.08mm	DIP	Würth	6911017100023
1	CN3		14-Bits/2.54mm Connector	DIP		
1	PWMA, PWMB, PWMC, /FAULT, /SHDWN, /STDBY		6-Bits/2.54mm Connector			
3	OUTA, OUTB, OUTC		Test Points			
	Others	NC				

### PRINTED CIRCUIT BOARD LAYOUT

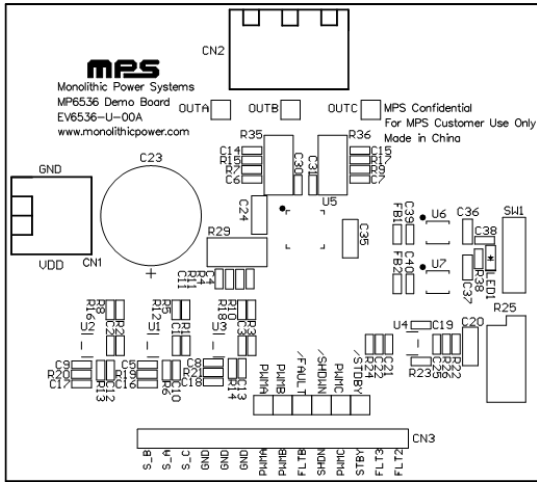


Figure 1—Top Silk Layer

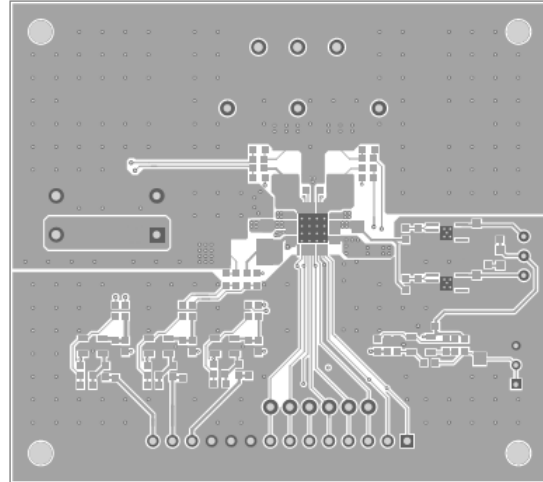


Figure 2—Top Layer

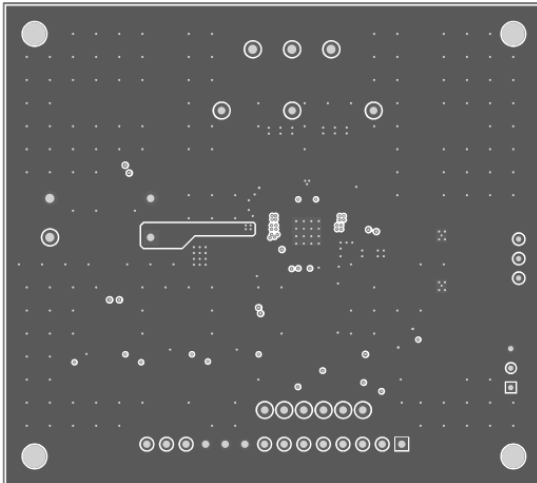


Figure 3—Inner 1 Layer

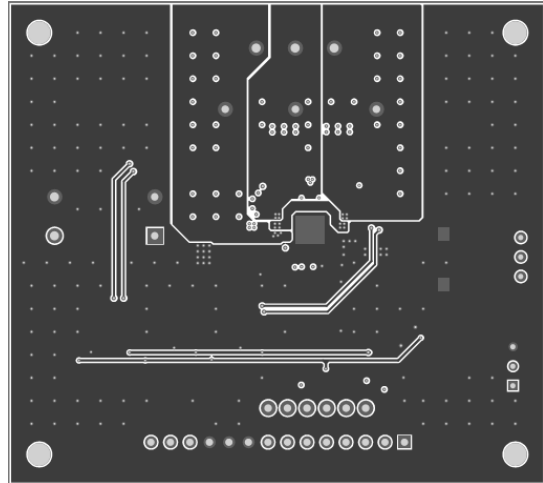


Figure 4—Inner 2 Layer

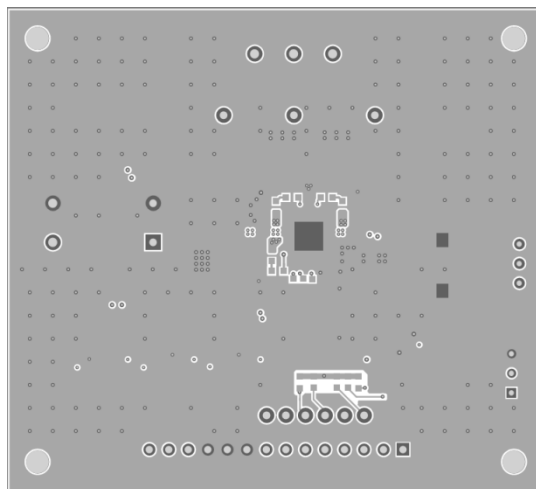


Figure 5—Bottom Layer

## QUICK START GUIDE

The EV6536-U-00A comes pre-configured to operate as a three-phase BLDC motor driver.

### Input/Output Requirements

1. Power supply (CN1): 5V to 26V.
2. Control signals for the MP6536 demo board are applied through the header connector CN3.
3. The BLDC motor is connected to the connector CN2: OUTA, OUTB and OUTC.
4. Each pin in the connector is labeled on the demo board.

### Instructions for PWM Input and Logic I/O

PIN	I/O	DESCRIPTION																									
PWMA PWMB PWMC	INPUT	Accept TTL LEVEL PWM signal for driving each of the half bridge																									
SHDNB	INPUT	Active low, pull low to shut off the MP6536																									
STBYB	INPUT	Active low, pull low to enter standby mode (turn all the switches to high impedance)																									
FAULTB	OUTPUT	FAULTB will be pull low once OCP or OTP is triggered																									
FLTB2 FLTB3	OUTPUT	Error reporting, details please refer to the below table																									
		<table border="1"> <thead> <tr> <th>FLTB2</th> <th>FLTB3</th> <th>OCP</th> <th>OTP</th> <th>UVP</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>0</td> <td>1</td> <td>0</td> <td>0</td> <td>1</td> </tr> <tr> <td>1</td> <td>0</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>0</td> <td>0</td> <td>1</td> <td>0</td> <td>0</td> </tr> </tbody> </table>	FLTB2	FLTB3	OCP	OTP	UVP	1	1	0	0	0	0	1	0	0	1	1	0	0	1	0	0	0	1	0	0
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Note: for more details, please find the datasheet of MP6536.

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