EVKT6530
5V to 60V, Three-Phase Brushless DC Motor Pre-Driver Evaluation Board

DESCRIPTION

The EVKT6530 is an evaluation board for the MP6530, a three-phase BLDC motor pre-driver.

The EVKT6530 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. Motor speed and direction are controlled by an on-board microcontroller.

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input Voltage	VIN	5 - 60	V
Hall Voltage	VH	3.3	V

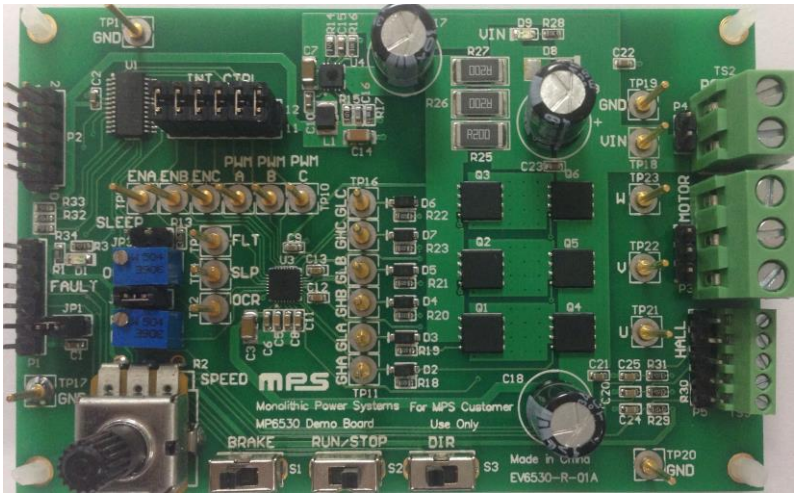
FEATURES

- Wide 5V to 60V Input Voltage Range
- Hall Sensor Inputs
- 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

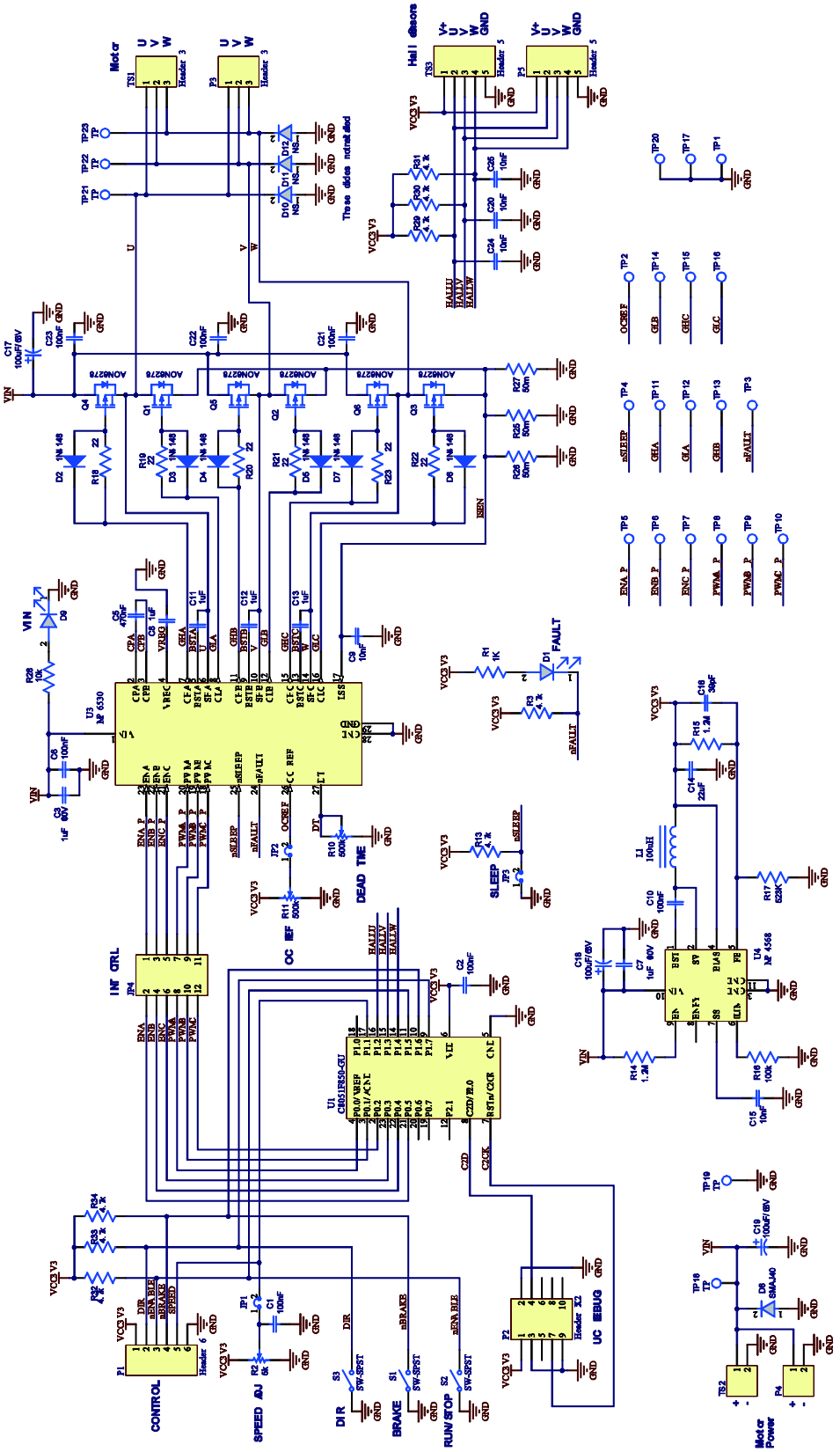
EVKT6530



(L x W x H) 4” x 2.6” x 0.4”
(10cm x 6.5cm x 1cm)

Board Number	MPS IC Number
EVKT6530	MP6530

EVKT6530 BOARD SCHEMATIC



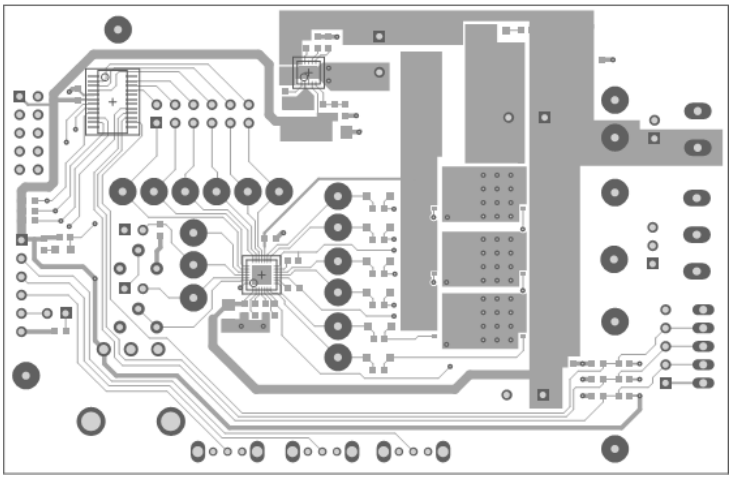
EVKT6530 BOARD BILL OF MATERIALS

Qty	Ref	Value	Description	Manufacture	Manufacture_PN
7	C1, C2, C6, C10, C21, C22, C23	100nF	Ceramic Capacitor;16V;X7R;0603;	muRata	GRM188R72A104KA35D
2	C3, C7	1μF/100V	Ceramic Capacitor;100V;X7R;1206;	muRata	GRM31CR72A105KA01L
1	C5	470nF	Ceramic Capacitor;16V;X7R;0603;	muRata	GRM21BR72A474KA73L
4	C8, C11, C12, C13	1μF	Ceramic Capacitor;16V;X7R;0603;	muRata	GRM188R71C105KA12D
5	C9, C15, C20, C24, C25	10nF	Ceramic Capacitor;16V;X7R;0603;	muRata	GRM188R71H103JA01D
1	C14	22μF	Ceramic Capacitor;10V;X7R;1206	muRata	GRM31CR71A226KE15L
1	C16	39pF	Ceramic Capacitor;50V;C0G;0603;	muRata	GRM1885C1H390JA01D
3	C17, C18, C19	100μF/63V	Electrolytic Capacitor;50V;Electrolytic	Nichicon	UPW1J101MPD
2	D1, D9	BL-HUF35A-TRB	LED;ºì¹â;	BRIGHT LED	BL-HUF35A-TRB
6	D2, D3, D4, D5, D6, D7	1N4148W	Diode SOD-123	Diodes	1N4148W
1	D8	SMAJ40	Diode;50V;3A;	NS	NS
3	D10, D11, D12	NS	Diode;50V;3A;	NS	NS
4	JP1, JP2, JP3, P4	Header 1X2	Header, 2-Pin		
1	JP4	Header 2X6	Header, 6-Pin, Dual row		
1	L1	100uH	1210 Inductor	Murata	LQH32PN101MN0L
1	P1	Header 1X6	Header, 6-Pin		
1	P2	Header 2X5	Header, 5-Pin, Dual row		
1	P3	Header 1X3	Header, 3-Pin		
1	P5	Header 1X5	Header, 5-Pin		
6	Q1, Q2, Q3, Q4, Q5, Q6	AON6278	MOSFET NCH DFN	Alpha Omega	AON6278
1	R1	1k	Film Resistor;1%	Yageo	RC0603FR-071KL
1	R2	5k	Square Trimming Potentiometer	CTS	296UD502B1N
8	R3, R13, R29, R30, R31, R32, R33, R34	4.7k	Film Resistor;1%	Yageo	RC0603FR-074K7L
2	R10, R11	500k	Square Trimming Potentiometer	Bourns	3266W-1-504LF
2	R14, R15	1.2M	Film Resistor;1%	Yageo	RC0603FR-071M2L
1	R16	100k	Film Resistor;1%	Yageo	RC0603FR-07100KL
1	R17	523k	Film Resistor;1%	Yageo	RC0603FR-07523KL

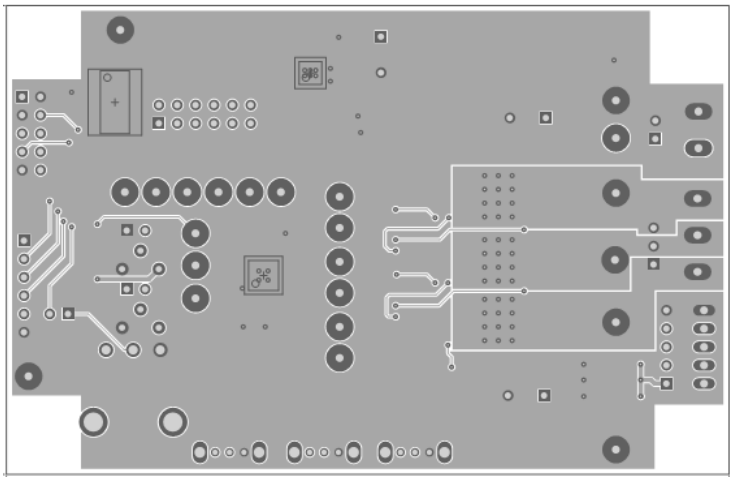
EVKT6530 BOARD BILL OF MATERIALS *(continued)*

Qty	Ref	Value	Description	Manufacture	Manufacture_PN
6	R18, R19, R20, R21, R22, R23	22	Film Resistor;1%	Yageo	RC0603FR-0722L
3	R25, R26, R27	200m	Sense Resistor;1%;2W;	CTS	73L7R20J
1	R28	10k	Film Resistor;1%	Yageo	RC0603FR-0710KL
3	S1, S2, S3	0S102011 MS2QN1	Single-Pole, Single-Throw Switch	C&K Components	0S102011MS2QN1
23	TP1, TP2, TP3, TP4, TP5, TP6, TP7, TP8, TP9, TP10, TP11, TP12, TP13, TP14, TP15, TP16, TP17, TP18, TP19, TP20, TP21, TP22, TP23	TP	Connector;		
1	TS1	1729131	Header, 3-Pin	Phoenix Contact	1729131
1	TS2	1729128	Header, 2-Pin	Phoenix Contact	1729128
1	TS3	1725698	Header, 5-Pin	Phoenix Contact	1725698
1	U1	C8051F850-C-GU		SiLabs	C8051F850-C-GU
1	U3	MP6530		MPS	MP6530
1	U4	MP4568	IC Buck converter	MPS	MP4568

EVKT6530 PRINTED CIRCUIT BOARD LAYOUT



Top Layer



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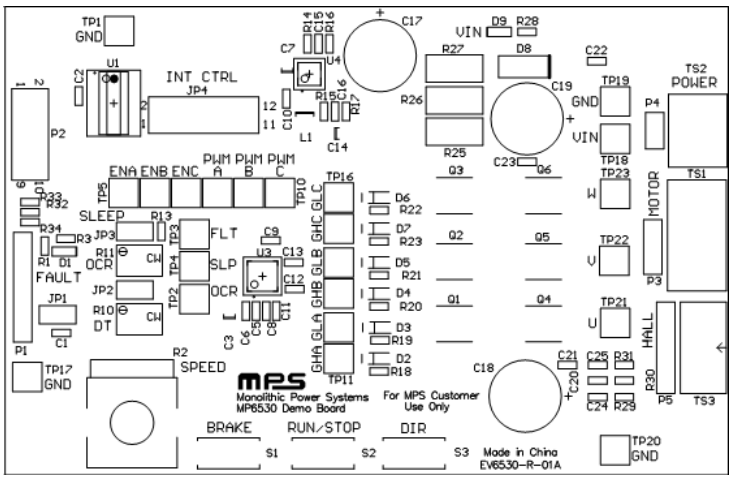

Silkscreen

QUICK START GUIDE

To quickly start using the EVKT6530 BLDC motor driver board, do the following:

1. Connect the U, V, and W wires of a BLDC motor to MOTOR connector. Connect the motor Hall sensors to the HALL connector.
2. Connect a power supply (between 5V and 60V) 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 pot.

Note:

Please pay attention to the correct input polarity connection, to avoid damage due to reversed connection.