

IX4351 Evaluation Board IX4351-EVAL



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1. Introduction



IXYS Integrated Circuits Division's IX4351 Evaluation Board contains all the necessary circuitry to demonstrate the features of a high power SiC MOSFET gate driver and SiC MOSFET. The board includes an LSIC1MO120E0080 1200V SiC MOSFET from Littelfuse with an $R_{DS(on)}$ of 80m Ω typical and an I_D of 25A. The board has an optically isolated interface for the input drive and FAULT output indication pin.

1.1. Features

- 9A source and sink outputs on gate driver
- Output capable of switching 25A
- Gate drive supply range: from 13V to 25V
- 3.3V/5V CMOS/TTL logic compatibility enables seamless interfacing with microcontrollers
- Independent under-voltage lockout (UVLO)
- Input pin includes schmitt trigger for better noise immunity
- Desaturation detection with soft shutdown
- Negative charge pump regulator
- FAULT indication pin

Figure 1. Evaluation Board, Top & Bottom

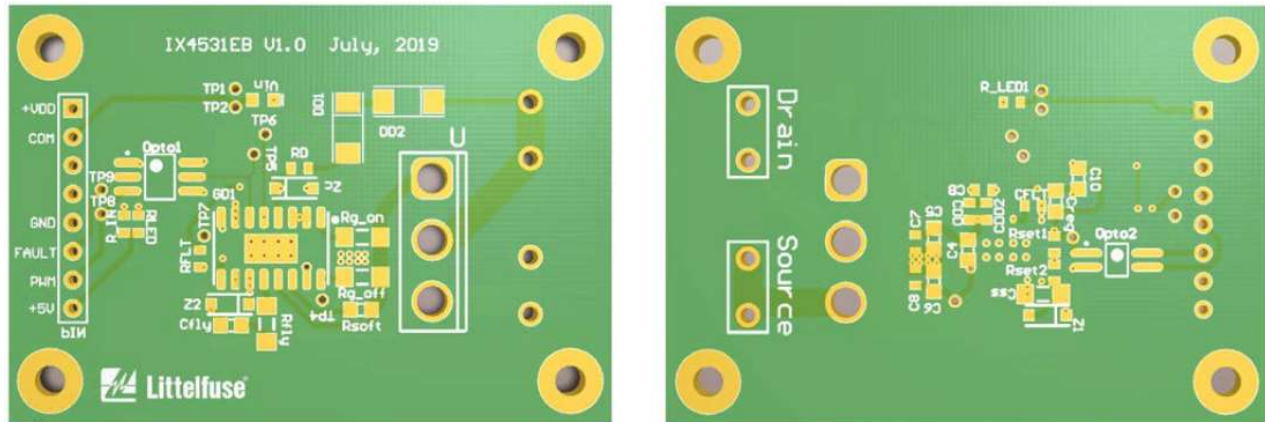


Figure 2. Evaluation Board, Top Layer & Inner Layer 2

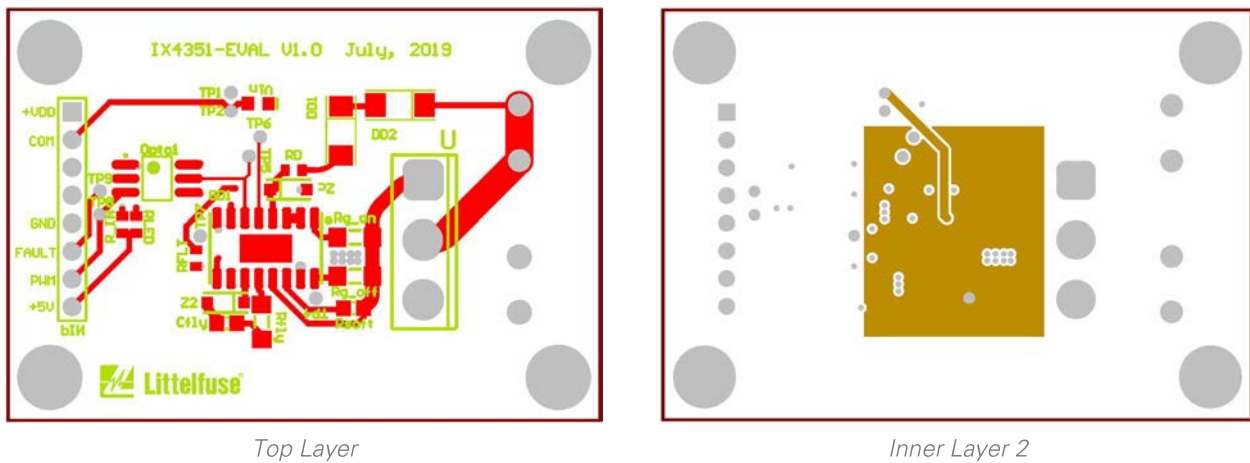


Figure 3. Evaluation Board, Inner Layer 3 & Bottom Layer

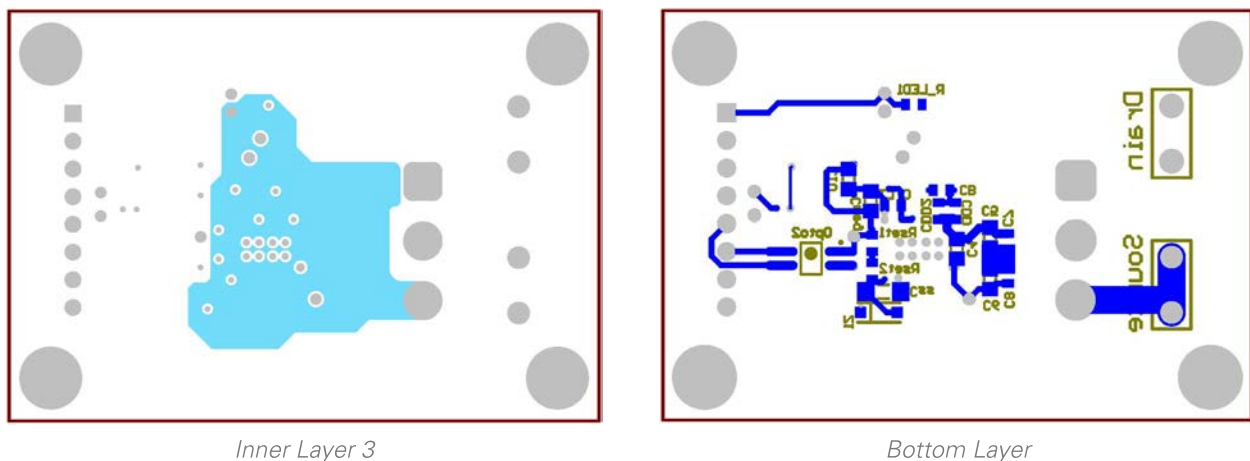
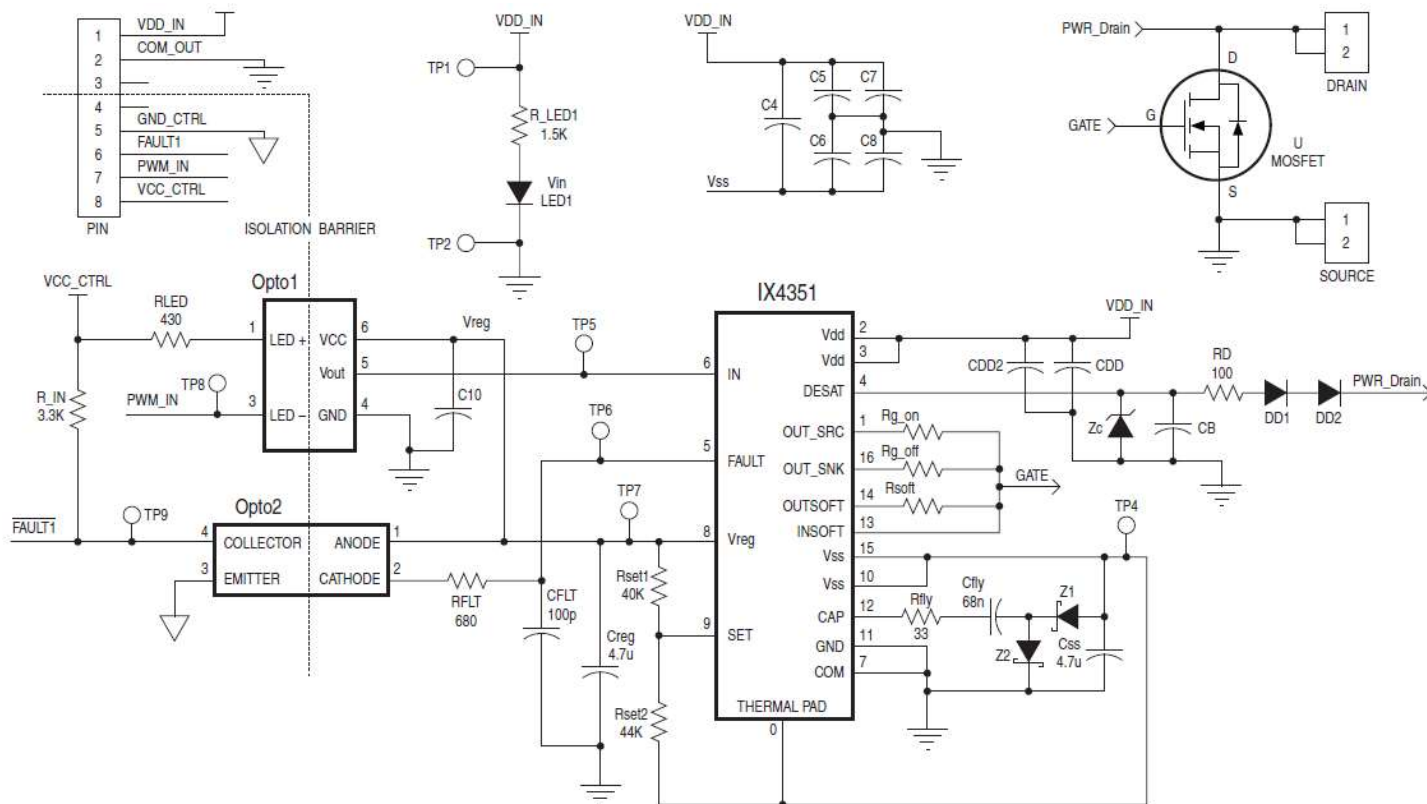


Table 1. Evaluation Board Pin Descriptions

Pin Number	Pin Name	Description
1	V _{DD}	Positive supply voltage for gate driver outputs
2	COM	Return for driver circuitry. Note that COM is isolated electrically from GND pin
3	N/C	Make no connection
4	N/C	Make no connection
5	GND	Logic Ground. This ground is isolated from COM pin
6	FAULT	A low signal indicates a FAULT was detected. Phototransistor collector is pulled up to +5V with a 1K Ω resistor for this isolated output referred to GND
7	PWM	Isolated logic input to gate driver referred to GND
8	+5V	Logic supply voltage. The evaluation board can be connected to either a +5V or +3.3V power supply

Table 2. Evaluation Board Bill of Materials

Ref. Des.	Qty.	Description	Manufacturer	Mfr. P/N
C4, C5, C6, Creg	3	Cap 4.7 μ F, 50V	TDK	C2012X7R1H475K125AE
C7, C8	2	Cap 2.2 μ F, 50V	Yageo	CC0603KRX5R9BB225
C10	1	Cap, 1 μ F, 50V	Yageo	CC0805KKX7R9BB105
CB	1	Cap, 33 pF, 50V	Yageo	CC0603JRNPO9BN330
CDD	1	Cap, 1 μ F, 50V	Yageo	CC0603KRX7R9BB105
CDD2	1	Cap, 0.01 μ F, 50V	Yageo	CC0603KRX7R9BB103
CFLT	1	Cap, 100pF, 50V	Yageo	CC0603KPX7R9BB101
Cfly	1	Cap, 68nF, 50V	Yageo	CC0805KRX7R9BB683
Css	1	Cap, 4.7 μ F, 50V	AVX	12065C475KAT4A
DD1, DD2	2	Rectifier, 1A, 1200V	STmicro	STTH112A
Drain, Source	2	Drain and Source Connector	Keystone	1287-ST
U	1	MOSFET in TO247	Littelfuse	LSIC1MO120E0080
Opto1	1	High Speed Optocoupler	Toshiba	TLP2361E
Opto2	1	Transistor Output Optocoupler	On Semiconductor	FODM217D
PIN	1	Header 1x8	TE Connectivity	3-644456-8
RD	1	Resistor, 100 Ω	Vishay / Dale	CRCW0603100RJNEAC
RFLT	1	Resistor, 1.8K Ω	Yageo	RC0603FR-071K8L
Rfly	1	Resistor, 33 Ω	Yageo	RC1206FR-7W33RL
Rg_off, Rg_on	2	Resistor, 2 Ω	Yageo	RC1206JR-072RL
RLED	1	Resistor, 430 Ω	KOA Speer	RK73B1JTTDD431J
Rset1	1	Resistor, 40.2K Ω	Yageo	RC0603FR-0740K2L
Rset2	1	Resistor, 44.2K Ω	Yageo	RC0603FR-0744K2L
Rsoft	1	Resistor, 510 Ω	Yageo	RC0805JR-07510RL
R_IN	1	Resistor, 3.3K Ω	Yageo	RC0603JR-073K3L
R_LED1	1	Resistor, 1.5K Ω	Vishay / Dale	CRCW06031K50FKEAC
TP1-TP9	9	Test Point – Do not populate		
LED1	1	Red LED	Dialight	599-0010-007F
Zc	1	Zener Diode 7.5V 500mW	Diodes Inc.	MMSZ5236B-7-F
Z1, Z2	2	Schottky Diode	On Semiconductor	MBR0540

Figure 5. Evaluation Board Schematic


For additional information please visit www.ixysic.com

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