

DESCRIPTION

The EV5000SDQ-00A is the evaluation board for the MP5000SDQ, a protection device designed to protect circuitry on the output (source) from transients on input (VCC). It also protects VCC from undesired shorts and transients coming from the source.

Besides the input capacitor and output capacitor, EV5000SDQ-00A contains a low power resistor to set the current limit (ILimit) as well as a capacitor for dV/dt functions, which capacitor is optional.

The demo board defaults are for an 8.5 V turn on point and a 15 V over voltage clamp. The current limit is set at 5A limit (22Ω).

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input Voltage	V _{IN}	8.5-22	V
Output Voltage Clamp	V _{OUT}	15	V
Output Current	I _{OUT}	5	A

FEATURES

- Adjustable Slew Rate for Output Voltage
- 5A Current Limit
- Integrated Power FET Thermal Protection
- Over Voltage Clamp

APPLICATIONS

- Hot Swap
- PC Cards
- Cell Phones
- Laptops

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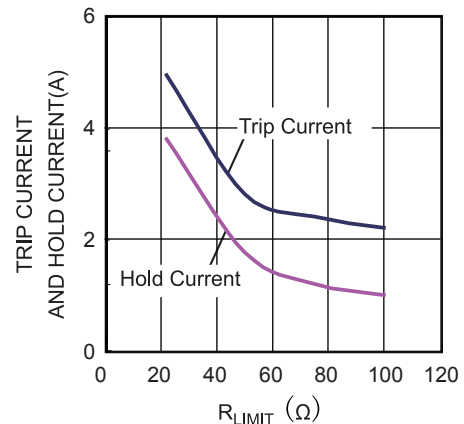
EV5000SDQ-00A EVALUATION BOARD



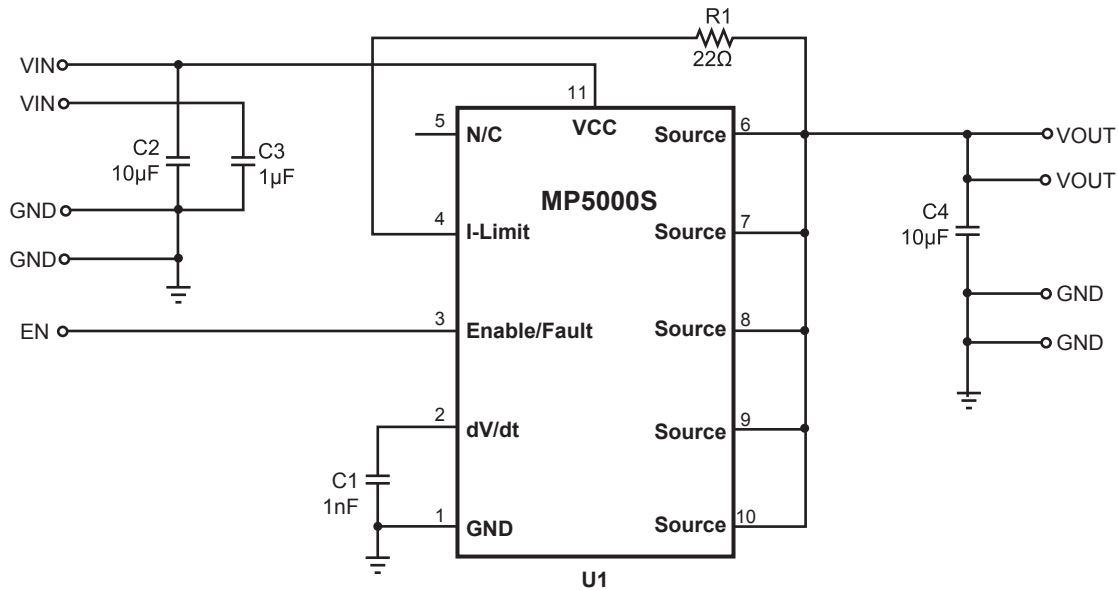
(L x W x H)
(6.35cm x 6.35cm x 0.3cm)

Board Number	MPS IC Number
EV5000SDQ-00A	MP5000SDQ

Trip Current and Hold Current vs. R_{LIMIT}



EVALUATION BOARD SCHEMATIC



EV5000SDQ-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	1nF	Ceramic Cap, X7R, 50V	0603	Murata	GRM188R71H102KA01D
2	C2,C4	10uF	Ceramic Cap, X5R, 25V	1206	Murata	GRM32DR71E106KA12
					TDK	C3216X5R1E106K
1	C3	1uF	Ceramic Cap, X7R, 16V	0603	Murata	GRM188R71C105KA12D
1	R1	22Ω	Film Res, 1%	0603	Yageo	RC0603FR-0722RL
1	U1		Electronic Fuse	QFN-10	MPS	MP5000SDQ

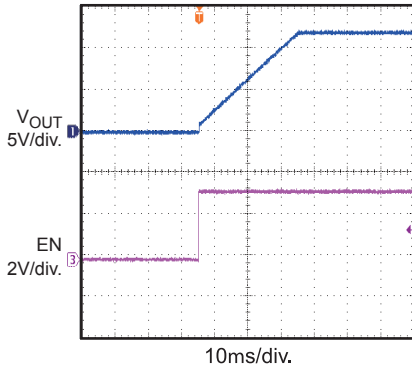
EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.

$V_{IN} = 12V$, $V_{EN} = 3.3V$, $R_{LIMIT} = 22\Omega$, $C_{OUT} = 10\mu F$, $C_{dv/dt} = 1nF$, $T_A = 25^\circ C$, unless otherwise noted.

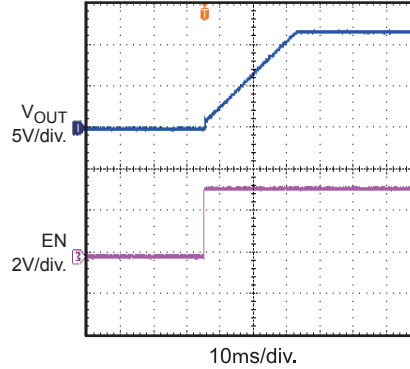
Turn On Delay and Rise Time With 1 μF Load

$C_{OUT} = 1\mu F$, no load, $C_{dv/dt} = 1nF$



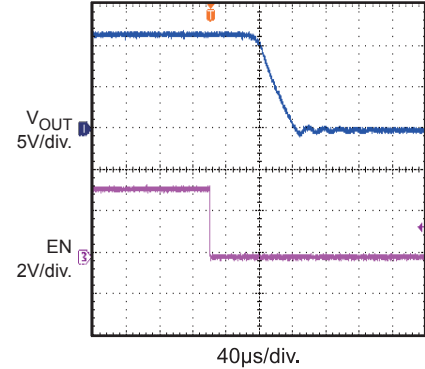
Turn On Delay and Rise Time With 10 μF Load

$R_{load} = 3.9\Omega$, $C_{OUT} = 10\mu F$

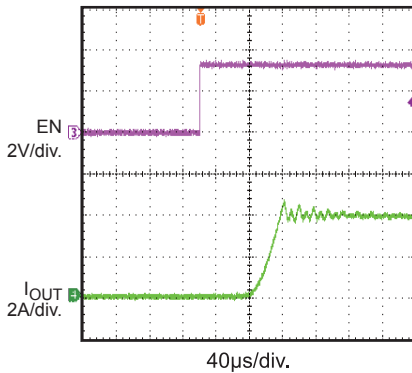


Turn Off Delay and Fall Time With 10 μF Load

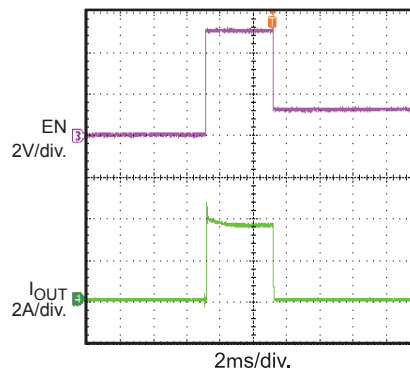
$R_{load} = 3.9\Omega$, $C_{OUT} = 10\mu F$



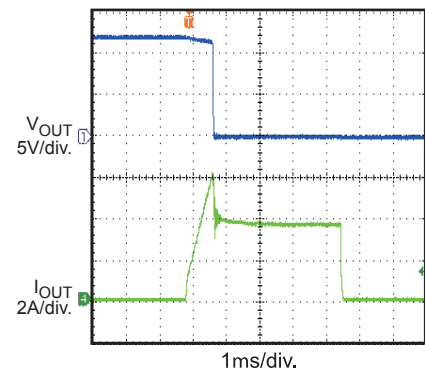
Short Circuit Current Device Enabled Into Short



Short Circuit Current Device Enabled Into Short and Thermal Shut Down (EN Floating)



Trip Current With Ramped Load On Enabled Device (2.5A/ μs)



PRINTED CIRCUIT BOARD LAYOUT

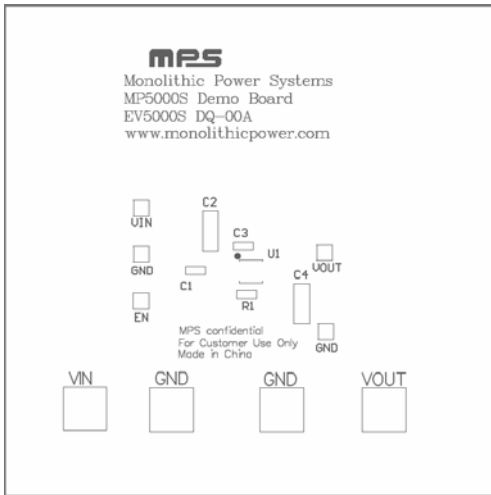


Figure 1—Top Silk Layer

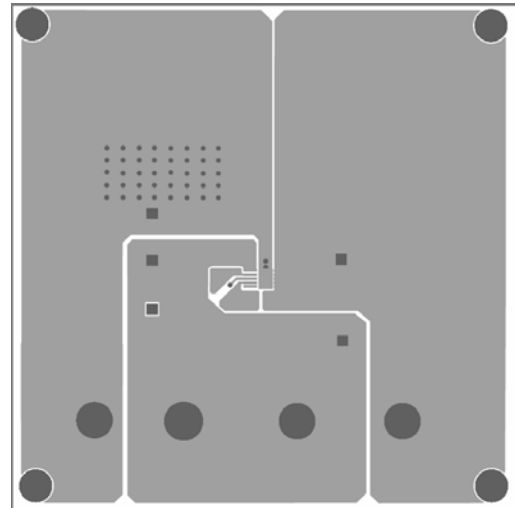


Figure 2—Top Layer

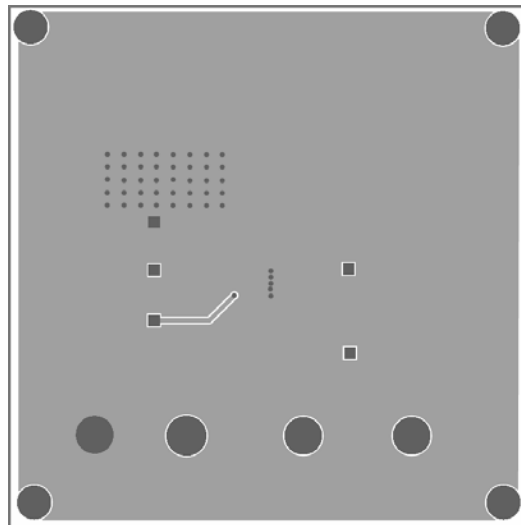


Figure 3—Bottom Layer

QUICK START GUIDE

1. Connect the positive terminal of the load to VOUT pins, and the negative terminal of the load to GND pins.
2. Preset the power supply output to 8.5V – 22V and turn off the power supply.
3. Connect the positive terminal of the power supply output to the VIN pin and the negative terminal of the power supply output to the GND pin.
4. Turn the power supply on. The MP5000SDQ will automatically startup.
5. To use the Enable function, apply a digital input to EN pin. Drive EN higher than 2.5V to turn on the regulator, drive EN less than 0.5V to turn it off.
6. A thermal fault will cause a mid level on the enable pin, and will set the fault flag. Vin restart or a low voltage on EN/FAULT pin can clear fault flag.
7. The output current limit value of this board is set to 5A. And the output voltage rising time is set to about 21ms. Both of the two parameters can be programmed. For detailed application, please refer to the MP5000SDQ datasheet.

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