

DESCRIPTION

The EV5000ADQ-00A is the evaluation board for the MP5000ADQ, 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, EV5000ADQ-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 4.7A 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} | 4.5 | A |

FEATURES

- Adjustable Slew Rate for Output Voltage
- 4.7A Current Limit
- Integrated Power FET Thermal Protection
- Over Voltage Clamp

APPLICATIONS

- Hot Swap
- PC Cards
- Cell Phones
- Laptops
- Low Inrush Current

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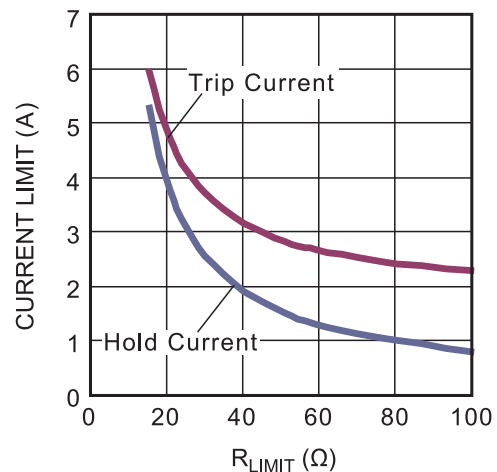
EV5000ADQ-00A EVALUATION BOARD



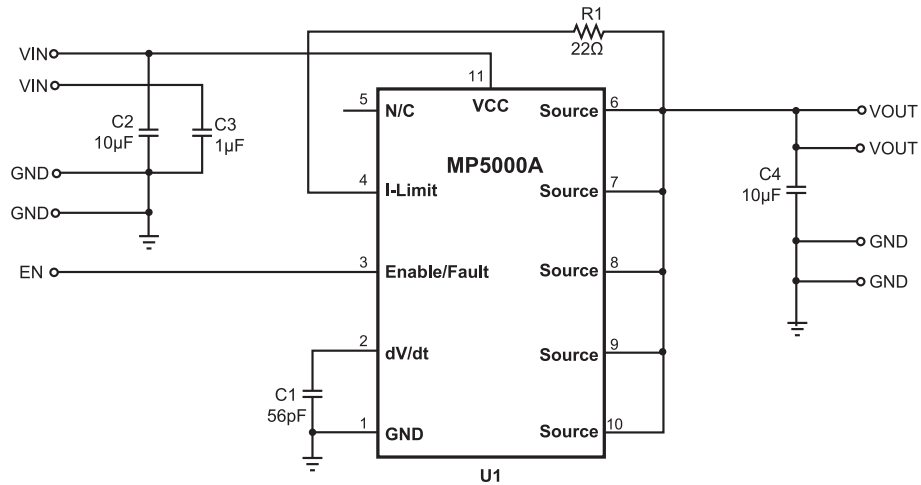
(L x W x H)
(6.35cm x 6.35cm x 0.3cm)

| Board Number | MPS IC Number |
|---------------|---------------|
| EV5000ADQ-00A | MP5000ADQ |

Trip Current and Hold Current vs. R_{LIMIT}



EVALUATION BOARD SCHEMATIC



EV5000ADQ-00A BILL OF MATERIALS

| Qty | Ref | Value | Description | Package | Manufacturer | Manufacturer P/N |
|-----|-------|-------|-----------------------|---------|--------------|--------------------|
| 1 | C1 | 56pF | Ceramic Cap, X7R, 50V | 0603 | Murata | GRM188R71H560KA01D |
| 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 | MP5000ADQ |

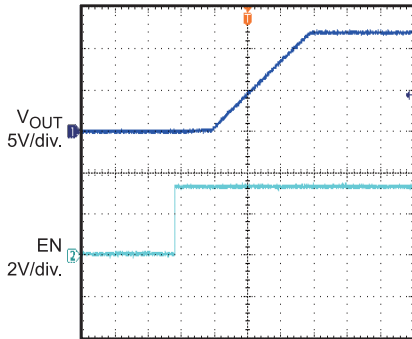
EVB TEST RESULTS

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 $1\mu F$ Load

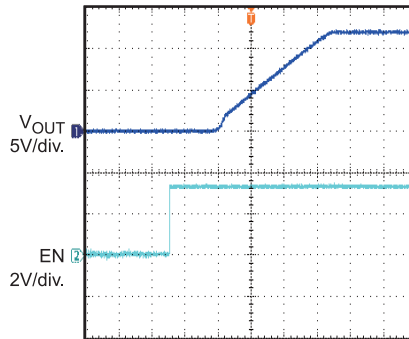
$C_{OUT} = 1\mu F$, No Load, $C_{dv/dt}=1nF$



10ms/div.

Turn On Delay and Rise Time with $1\mu F$ Load

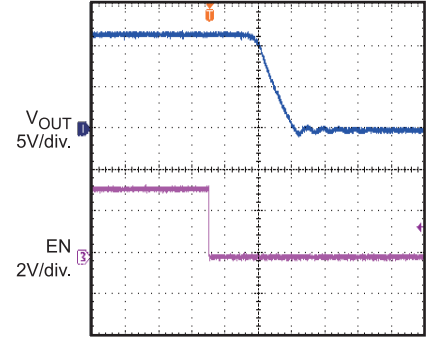
$C_{OUT} = 1\mu F$, No Load, $C_{dv/dt}=0$



400µs/div.

Turn Off Delay and Fall Time With $10\mu F$ Load

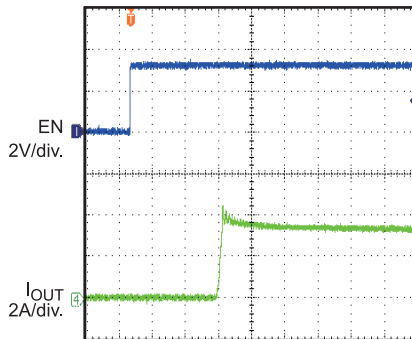
$R_{load} = 3.9\Omega$, $C_{OUT} = 10\mu F$



40µs/div.

Short Circuit Current Device Enabled Into Short

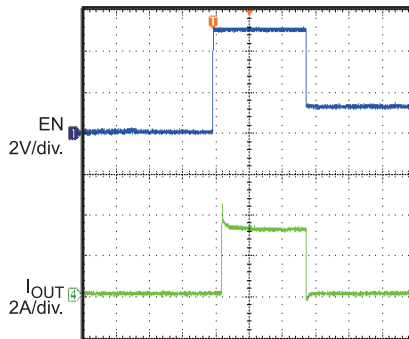
$C_{dv/dt}=0$



200µs/div.

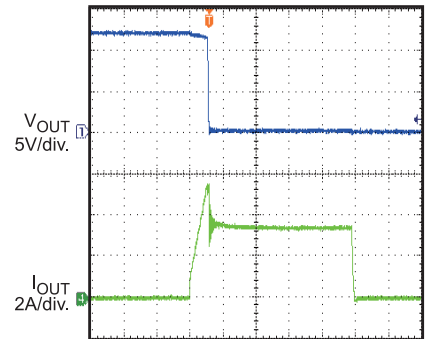
Short Circuit Current Device Enabled Into Short and Thermal Shut Down (EN Floating)

$C_{dv/dt}=0$



2ms/div.

Trip Current With Ramped Load On Enabled Device ($0.01A/\mu s$)



1ms/div.

PRINTED CIRCUIT BOARD LAYOUT

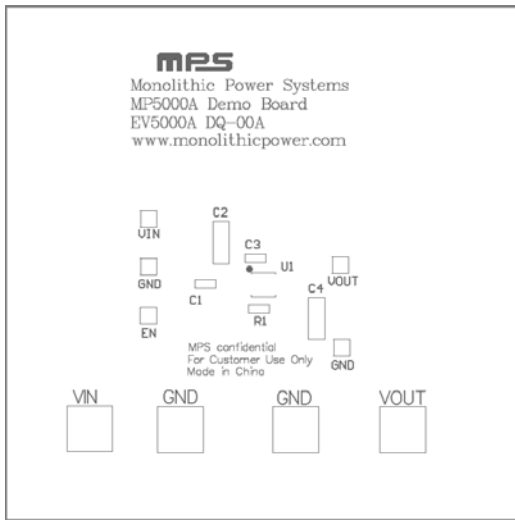


Figure 1—Top Silk Layer

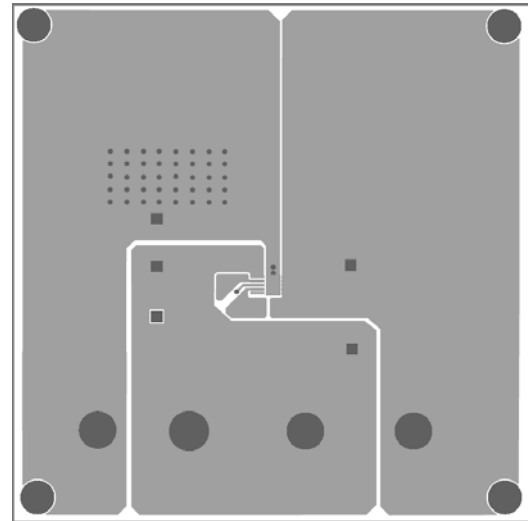


Figure 2—Top Layer

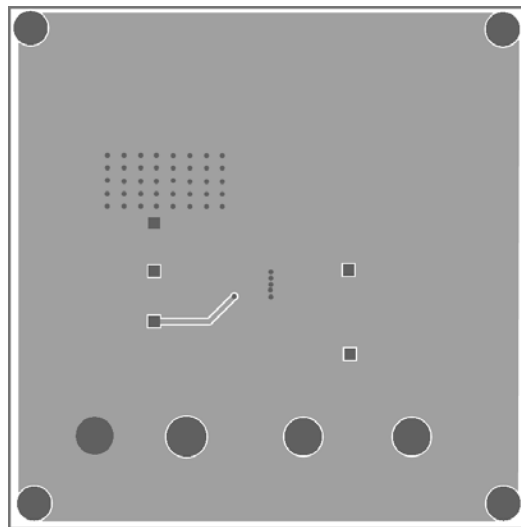


Figure 3—Bottom Layer

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 MP5000ADQ 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.

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