EV5073-G-00A

5.5V, 2.5A Programmable Current Low R_{DSON} Load Switch

The Future of Analog IC Technology

DESCRIPTION

The EV5073-G-00A is an evaluation board for the MP5073, a low R_{DSON} load switch with current limit.

The MP5073 is a load switch to provide 2.5A load protection covering 0.5V to 5.5V voltage range. With the small R_{DSON} in tiny package, MP5073 provides very high efficient and space saving solution in notebook and tablet or other portable devices application.

The max load at the output (source) is current limited. This is accomplished by utilizing a sense FET topology. The magnitude of the current limit is controlled by an external resistor from the ILIM pin to ground.

The EV board can deliver a continuous 2A load current over 0.5V-to-5.5V operating input range.

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	0.5-5.5	V
Output Voltage	V_{cc}	3-5.5	V
Output Current	I_{OUT}	2	A

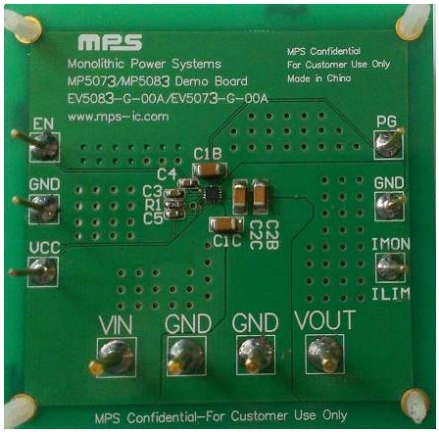
FEATURES

- Integrated 50mΩ Low RDSON FETs
- Adjustable Start Up Slew Rate
- Wide VIN Range from 0.5V to 5.5V
- <1uA Shutdown Current
- Programmable 2.5A Current Limit Range
- Power Good Indicator
- Output Discharge function
- Enable Pin
- <200ns Short-Circuit Protection Response Time
- Thermal Protection
- Small 2mmx2mmQFN Package for Space Saving

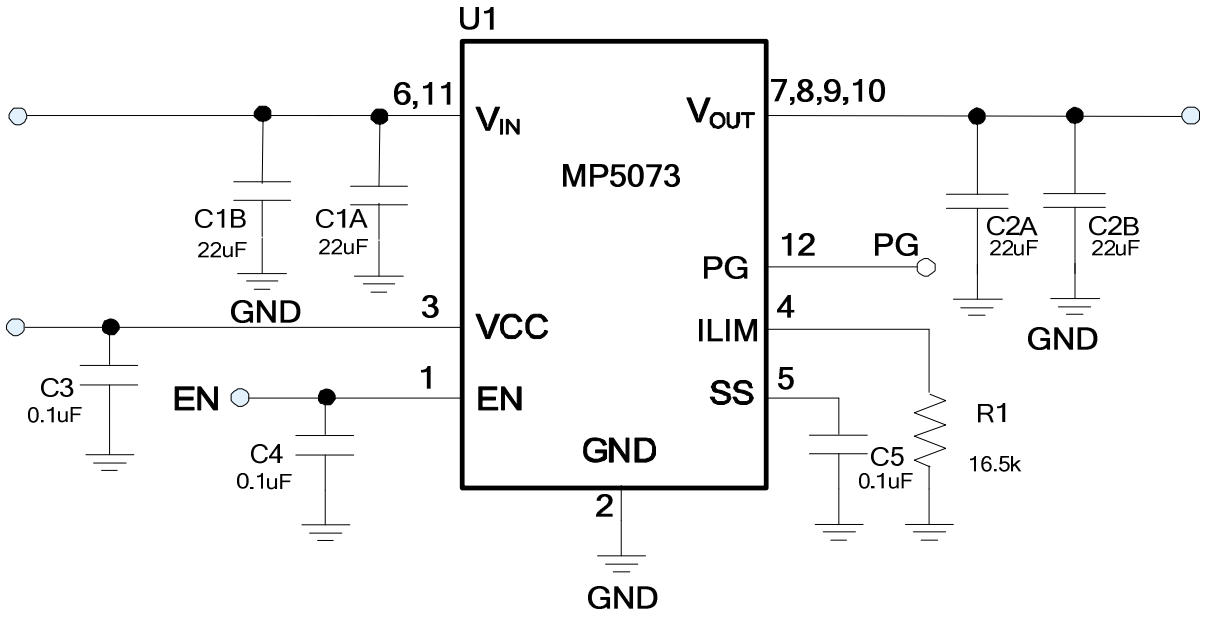
APPLICATIONS

- Notebook and Tablet Computers
- Portable Devices
- Solid State Drives
- Handheld Devices

TYPICAL APPLICATION



EVALUATION BOARD SCHEMATIC



EV5073 BILL OF MATERIALS

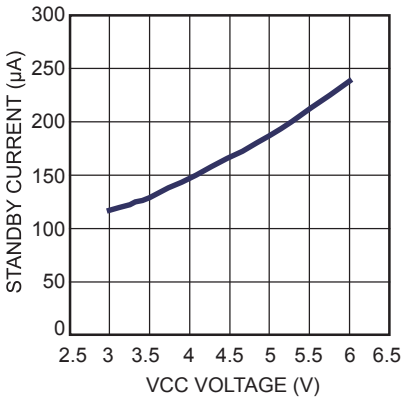
Qty	Ref	Value	Description	Package	Manufacturer	Part Number
4	C1B, C1C C2B, C2C	22μF	Ceramic Cap, 10V, X5R	1206	muRata	GRM31CR61A226ME19L
3	C3 ， C4，C5	0.1uF	Ceramic Cap, 16V, X7R	0603	muRata	GRM188R71C104KA01D
1	R1	16.5k	Film Res,1%	0603	ROYAL	RL0603FR-0716K5L
1	U1		2.5A Load Switch	QFN 2x2	MPS	MP5073

EVB TEST RESULTS

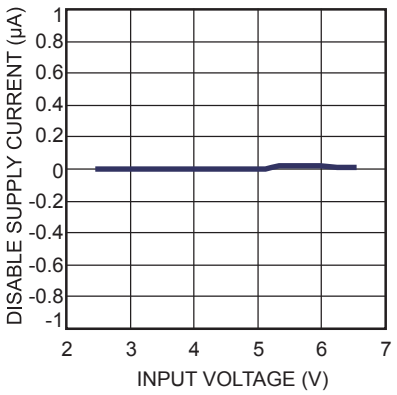
Performance waveforms are tested on the evaluation board.

V_{IN} = 3.6V, V_{CC} = 3.6V, EN=2.5V, R_{LIM} = 13k, T_A = 25°C, unless otherwise noted.

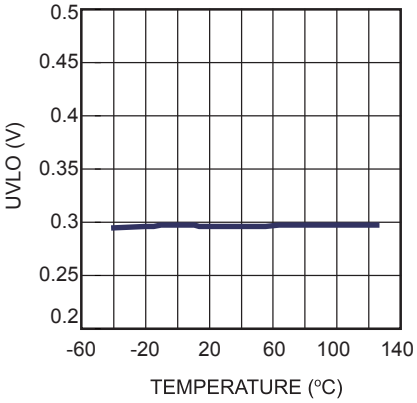
VCC Standby Current vs. V_{CC}



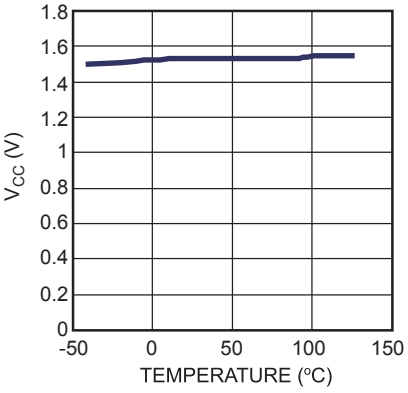
Disabled Supply Current vs. Input Voltage



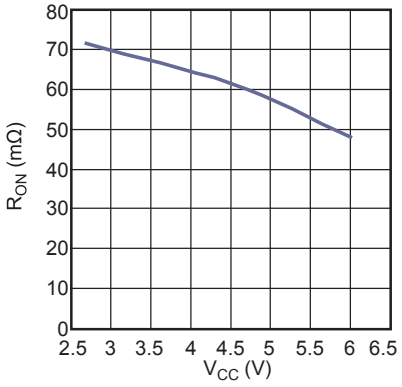
UVLO vs. Temperature



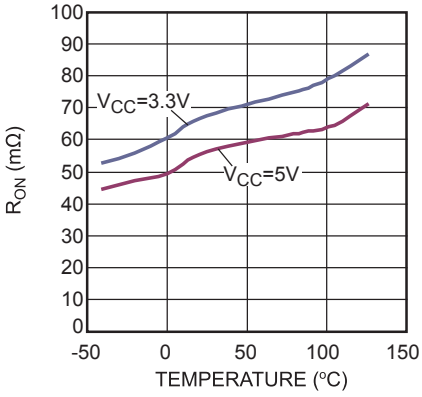
EN Rising Threshold vs. Temperature



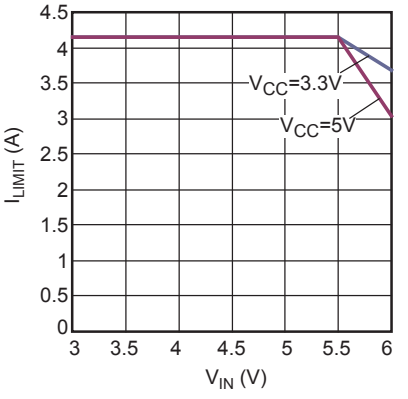
R_{DS_ON} vs. V_{CC}



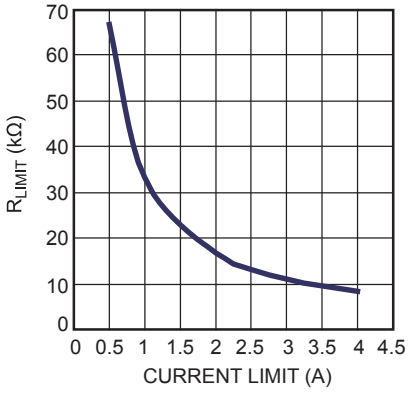
R_{DS_ON} vs. Temperature



The Maximum Limit vs. V_{IN}

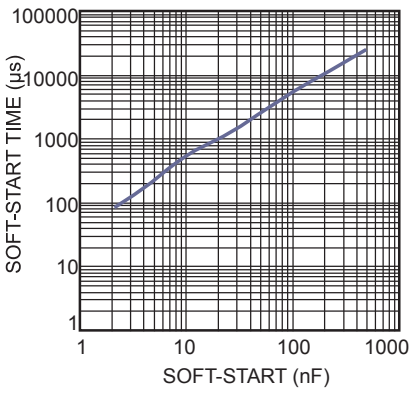


Current Limit vs. R_{LIMIT}



Soft-Start vs. Cap

V_{IN}=3.6V

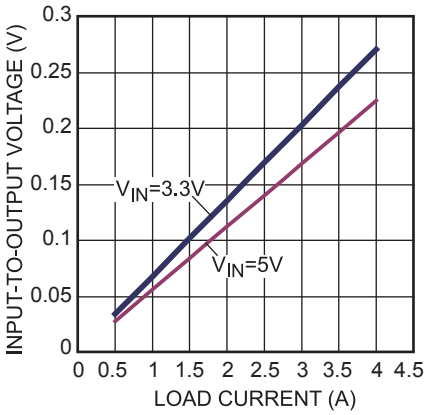


EVB TEST RESULTS *(continued)*

Performance waveforms are tested on the evaluation board.

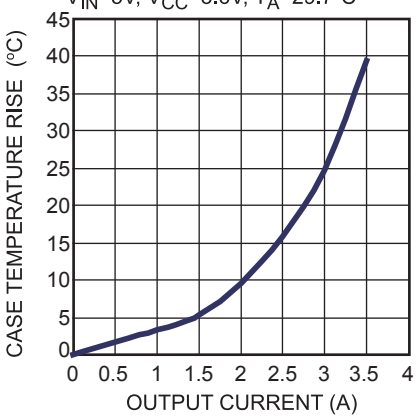
V_{IN} = 3.6V, V_{CC} = 3.6V, EN=2.5V, R_{LIM} = 13k, T_A = 25°C, unless otherwise noted.

Input-to-Output Voltage vs. Load Current



Case Temperature Rise vs. Output Current

V_{IN}=5V, V_{CC}=3.6V, T_A=29.7°C

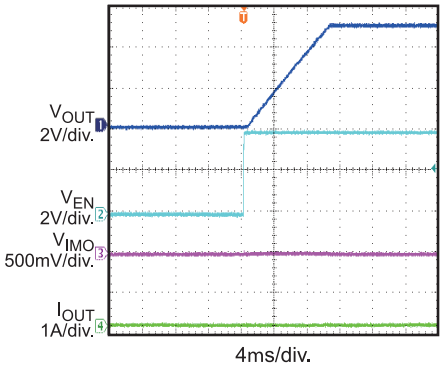


EVB TEST RESULTS *(continued)*

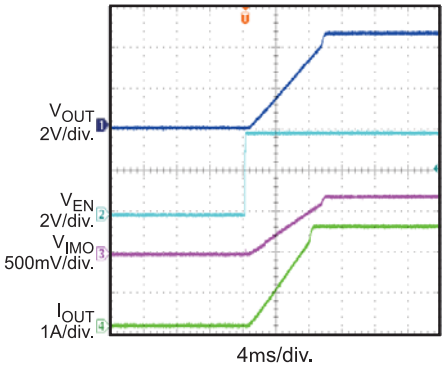
Performance waveforms are tested on the evaluation board.

V_{IN} = 3.6V, V_{CC} = 3.6V, EN=2.5V, R_{LIM} = 13k, T_A = 25°C, unless otherwise noted.

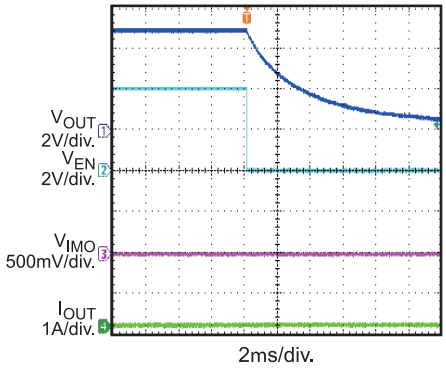
Enable Startup
V_{IN} = 5V, V_{CC} = 3.6V, No Load



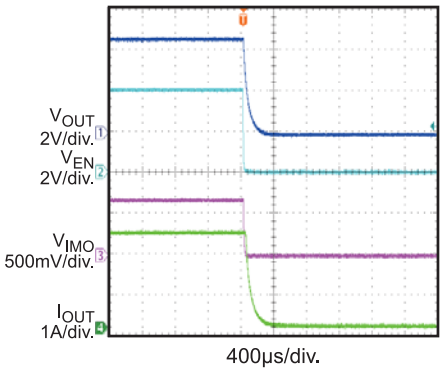
Enable Startup
V_{IN} = 5V, V_{CC} = 3.6V, 2.5A Load



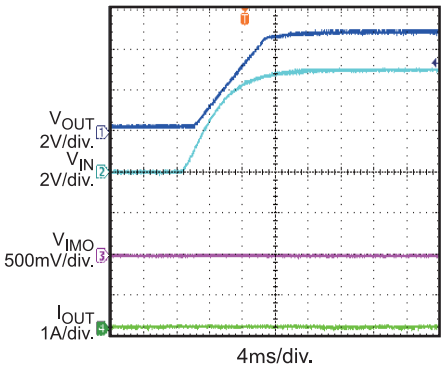
Enable Shutdown
V_{IN} = 5V, V_{CC} = 3.6V, No Load



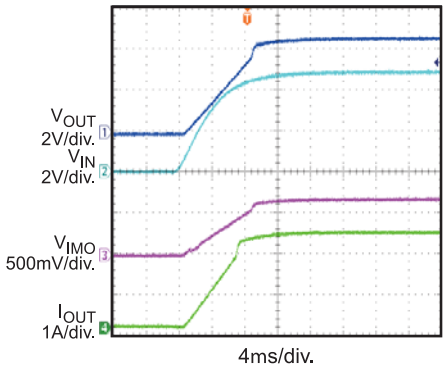
Enable Shutdown
V_{IN} = 5V, V_{CC} = 3.6V, 2.5A Load



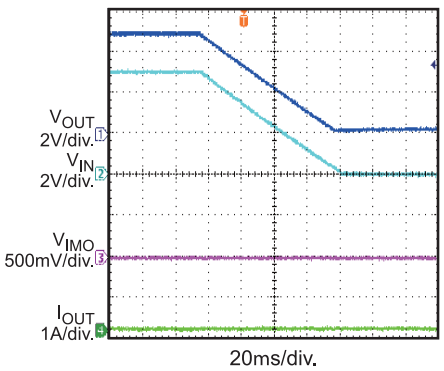
Power Up
V_{IN} = 5V, V_{CC} = 3.6V, I_{OUT} = 0A



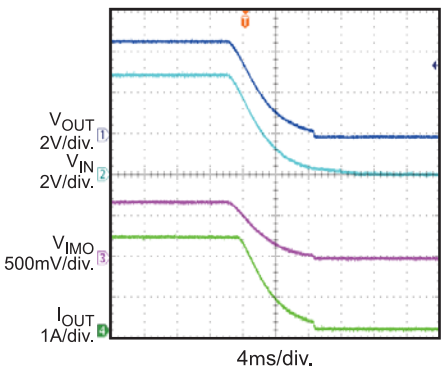
Power Up
V_{IN} = 5V, V_{CC} = 3.6V, I_{OUT} = 2.5A



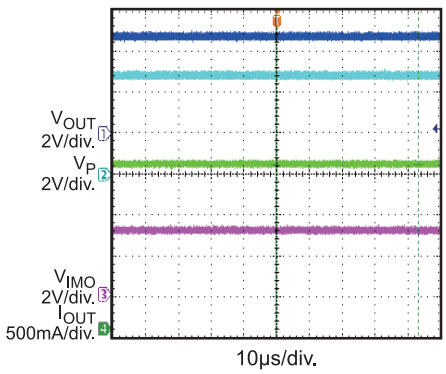
Power Down
V_{IN} = 5V, V_{CC} = 3.6V, I_{OUT} = 0A



Power Down
V_{IN} = 5V, V_{CC} = 3.6V, I_{OUT} = 2.5A



Steady State
V_{IN} = 5V, V_{CC} = 3.6V, I_{OUT} = 2A



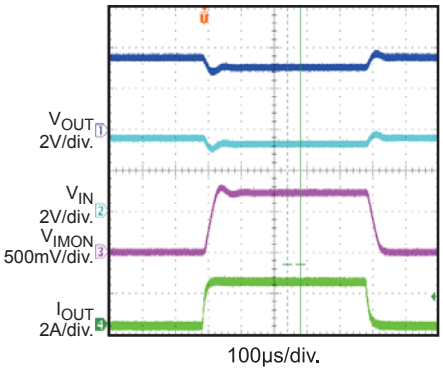
EVB TEST RESULTS *(continued)*

Performance waveforms are tested on the evaluation board.

V_{IN} = 3.6V, V_{CC} = 3.6V, EN=2.5V, R_{LIM} = 13k, T_A = 25°C, unless otherwise noted.

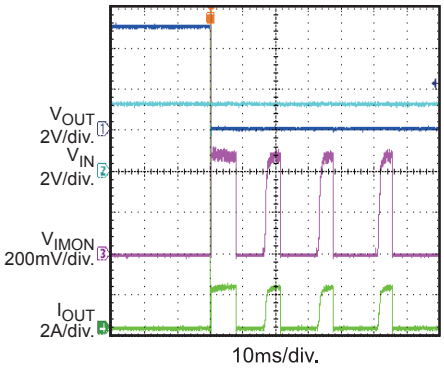
Load Transient Response

V_{IN} = 3.6V, V_{CC} = 3.6V, I_{OUT} = 0A-2.5A



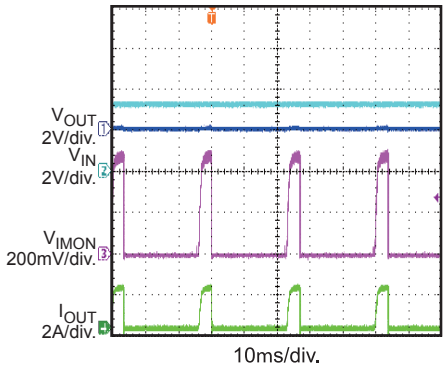
SCP Enter

V_{IN} = 5V, V_{CC} = 3.6V



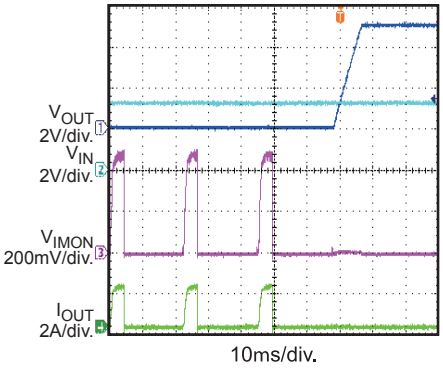
SCP Steady State

V_{IN} = 5V, V_{CC} = 3.6V



SCP Recovery

V_{IN} = 5V, V_{CC} = 3.6V



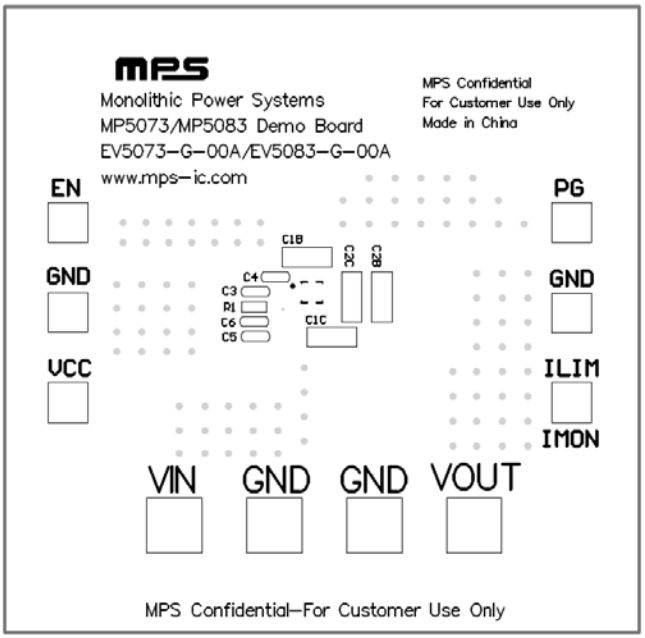


Figure1: Top Layer Silkscreen

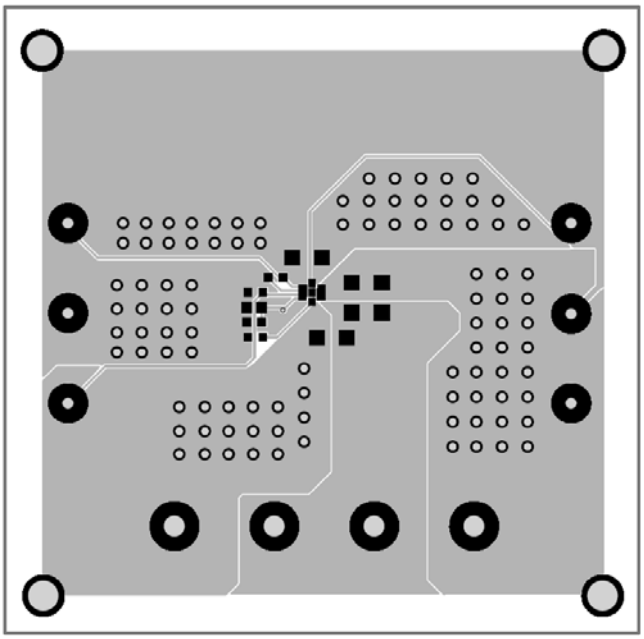


Figure2: Top Layer

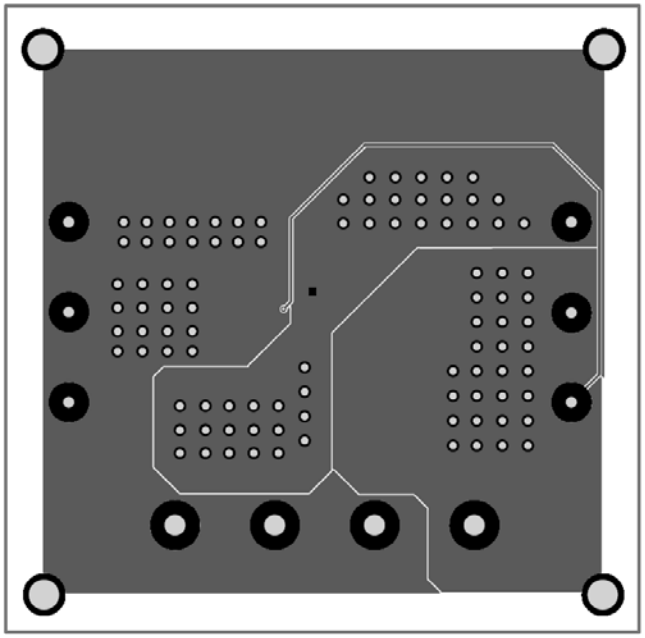


Figure3: Bottom Layer

QUICK START GUIDE

1. Connect the positive and negative terminals of the load to the VOUT and GND pins, respectively.
2. Preset the power supply output between 0.5V and 5.5V, and then turn off the power supply.
3. Connect the positive and negative terminals of the power supply output to the VIN and GND pins, respectively.
4. Follow the step 1-3 to set the Vcc voltage between 3V and 5.5V.
5. Turn the power supply on. The MP5073 will automatically startup.
6. To use the Enable function, apply a digital input to the EN pin. Drive EN higher than 2.6V to turn on the regulator or less than 0.4V to turn it off.
7. Use R1 to set the output current limit. C5 to set the SS time, Follow the Application Information section in the device datasheet to select appropriate R1, C5.