

DESCRIPTION

The EV5073-G-00B is an evaluation board for the MP5073, a low $R_{DS(on)}$ load switch with current limit.

The MP5073 is a load switch to provide 2A load protection covering 0.5V to 5.5V voltage range. With the small $R_{DS(on)}$ 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 SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage ⁽¹⁾	V_{IN}	0.8-5.5	V
Output Voltage	V_{CC}	3-5.5	V
Output Current	I_{OUT}	2	A

Note:

1) For specifications of lower voltage, please contact factory.

FEATURES

- Integrated 50mΩ Low $R_{DS(on)}$ FETs
- Adjustable Start Up Slew Rate
- Wide V_{IN} 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

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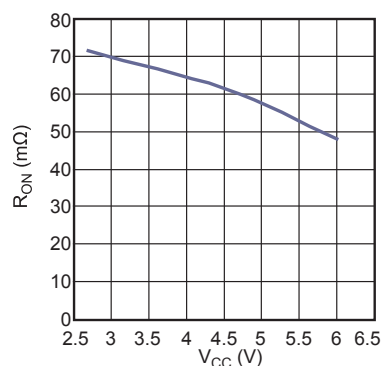
EV5073-G-00B EVALUATION BOARD



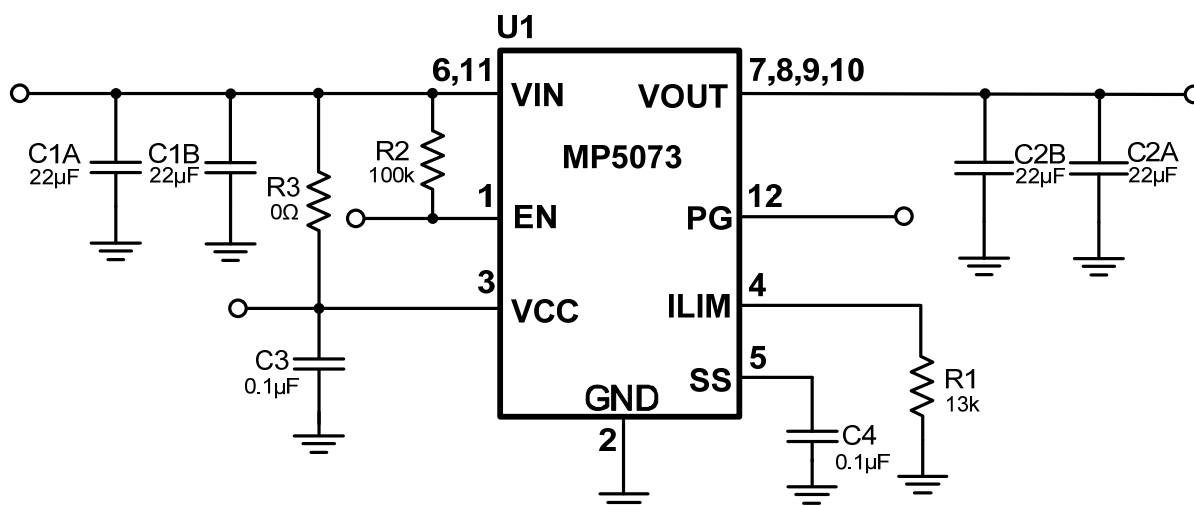
(L × W × H) 6.4cm × 6.4cm × 1.3cm

Board Number	MPS IC Number
EV5073-G-00B	MP5073GG

$R_{DS(on)}$ vs. V_{CC}



EVALUATION BOARD SCHEMATIC



EV5073-G-00B BILL OF MATERIALS

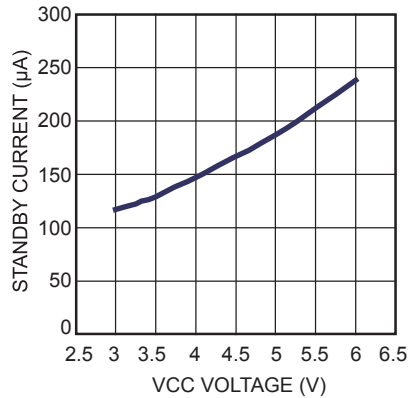
Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
1	R1	13kΩ	Film Res,1%	0603	ROYAL	RL0603FR-0713KL
1	R2	100kΩ	Film Res,1%	0603	ROYAL	RL0603FR-07100KL
1	R3	0Ω	Film Res,1%	0603	ROYAL	RC0603FR-070RL
4	C1A,C1B, C2A,C2B	22μF	Ceramic Cap,10V,X5R	0805	muRata	GRM21BR61A226ME51L
2	C3,C4	0.1μF	Ceramic Cap,16V,X7R	0603	muRata	GRM188R71C104KA01D
1	U1	MP5073	2A Load Switch	QFN 2x2	MPS	MP5073GG

EVB TEST RESULTS

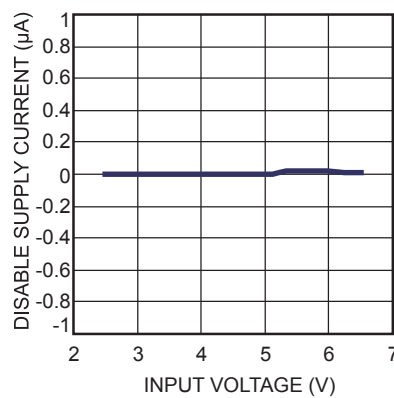
Performance waveforms are tested on the evaluation board.

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

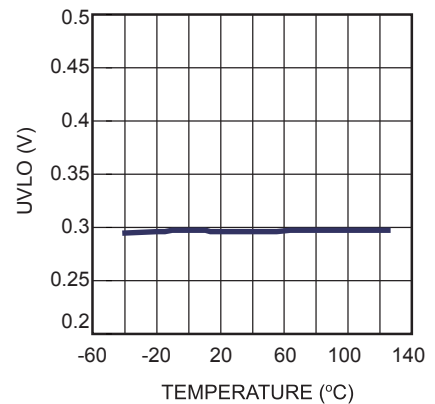
VCC Standby Current vs. VCC



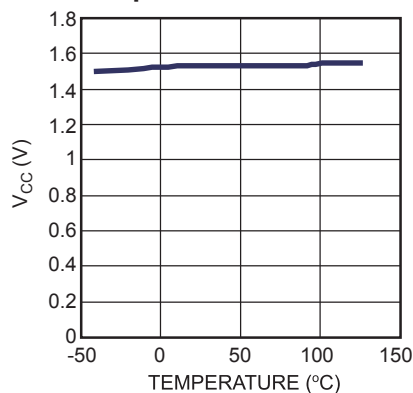
Disabled Supply Current vs. Input Voltage



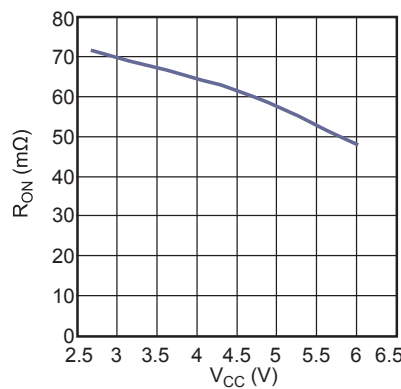
UVLO vs. Temperature



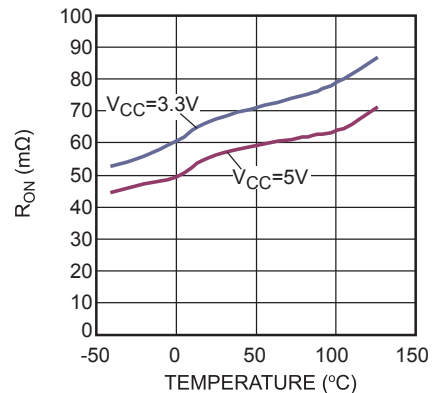
EN Rising Threshold vs. Temperature



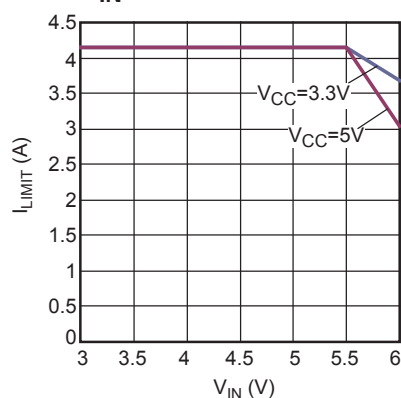
R_{DS_ON} vs. VCC



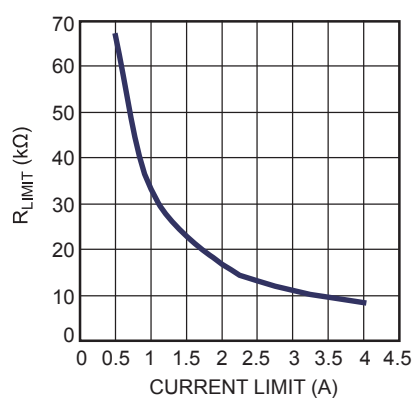
R_{DS_ON} vs. Temperature



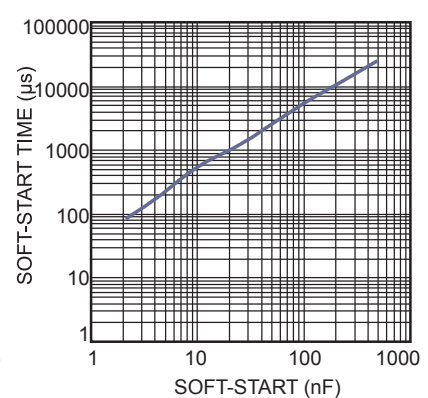
The Maximum Limit vs. V_{IN}



Current Limit vs. R_{LIMIT}



Soft-Start vs. Cap
 $V_{IN}=3.6V$

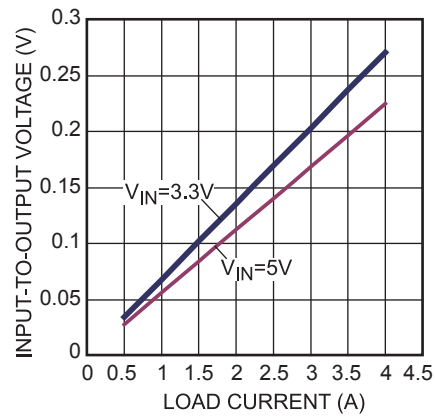


EVB TEST RESULTS *(continued)*

Performance waveforms are tested on the evaluation board.

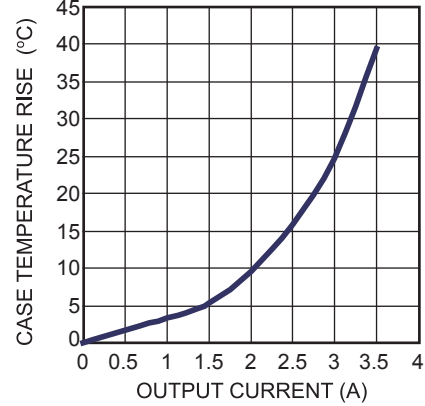
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**Input-to-Output Voltage
vs. Load Current**



**Case Temperature Rise
vs. Output Current**

$V_{IN}=5V$, $V_{CC}=3.6V$, $T_A=29.7^{\circ}C$



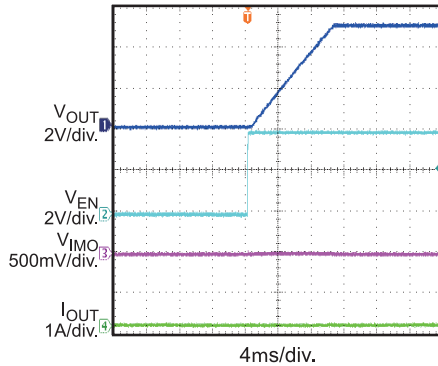
EVB TEST RESULTS *(continued)*

Performance waveforms are tested on the evaluation board.

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

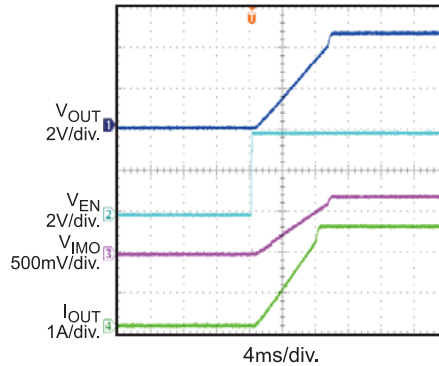
Enable Startup

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



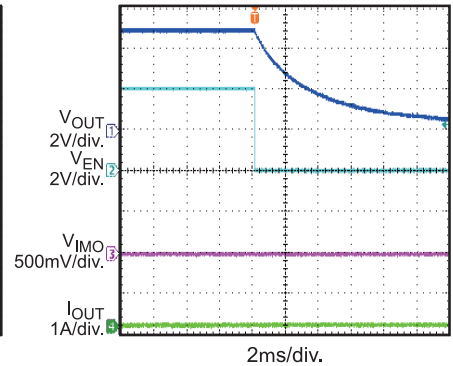
Enable Startup

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



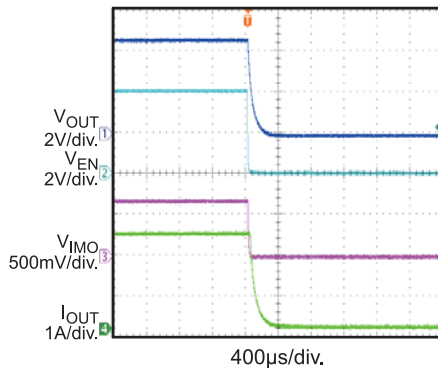
Enable Shutdown

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



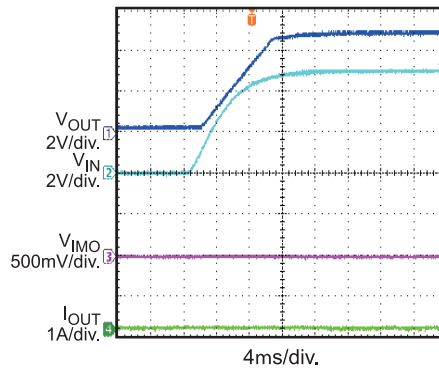
Enable Shutdown

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



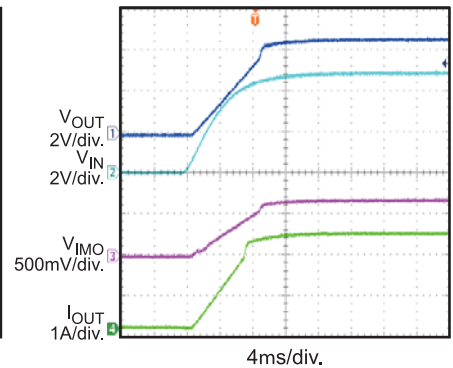
Power Up

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



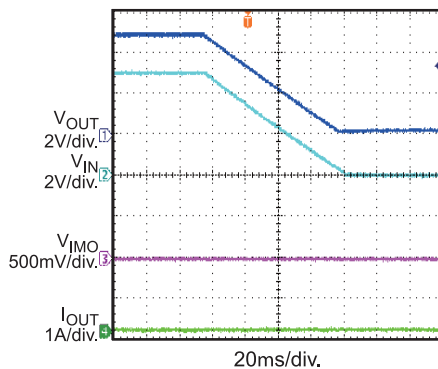
Power Up

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



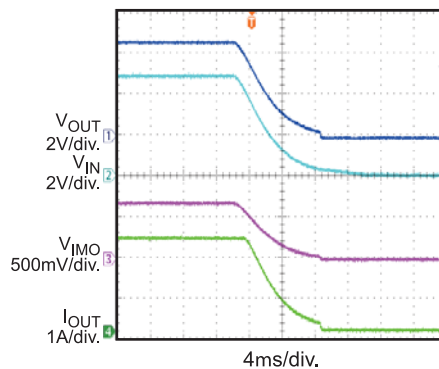
Power Down

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



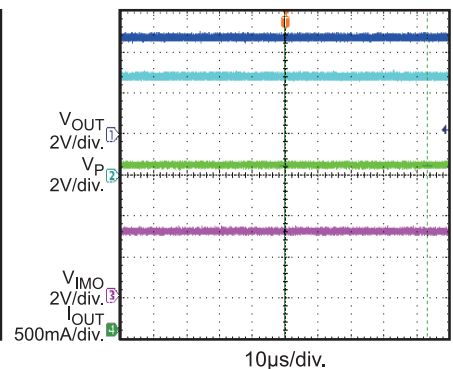
Power Down

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



Steady State

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



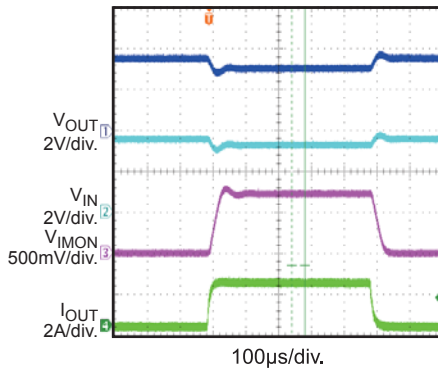
EVB TEST RESULTS *(continued)*

Performance waveforms are tested on the evaluation board.

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

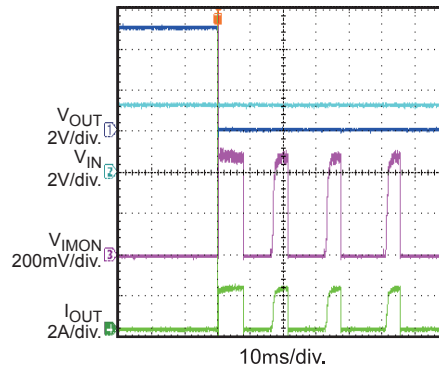
Load Transient Response

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



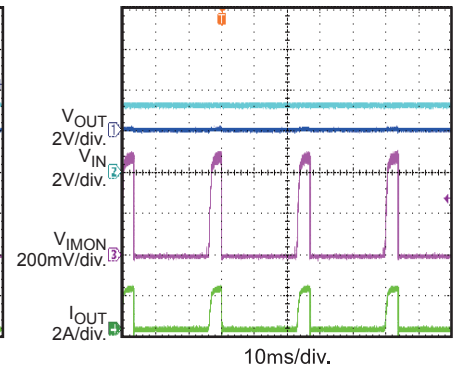
SCP Enter

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



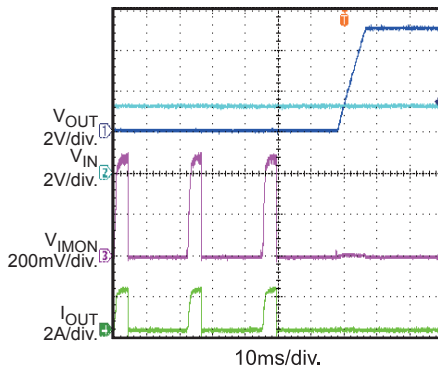
SCP Steady State

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



SCP Recovery

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



PRINTED CIRCUIT BOARD LAYOUT

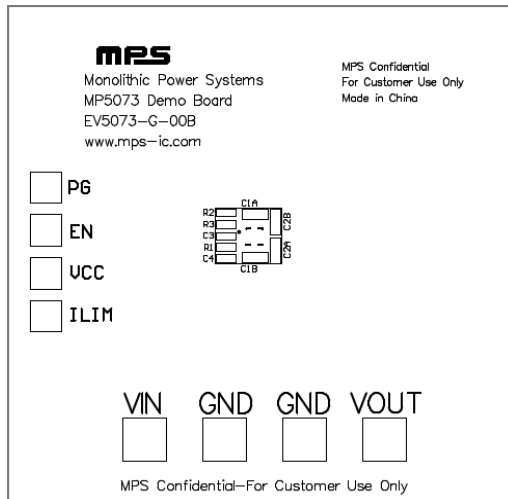


Figure1: Top Layer Silkscreen

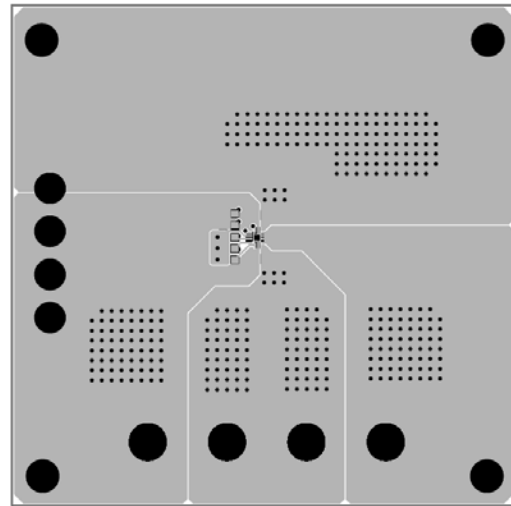


Figure2: Top Layer

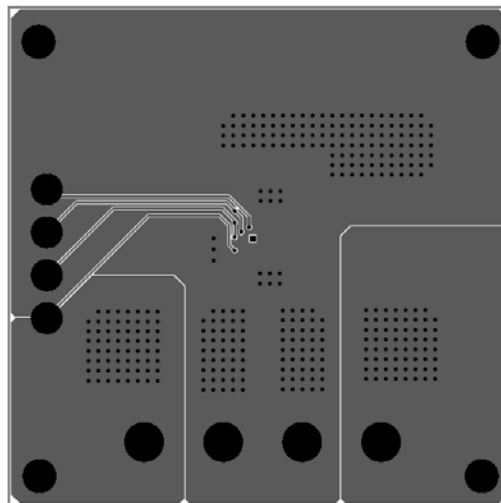


Figure3: Bottom Layer

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 0.8V 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. C4 to set the SS time, Follow the Application Information section in the device datasheet to select appropriate R1, C4.

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