EV8763D-L-00A

High Efficiency, 12A, 18V Synchronous Step-down Converter Evaluation Board

The Future of Analog IC Technology

DESCRIPTION

The EV8763D-L-00A is an evaluation board for the MP8763DGL, a high efficiency monolithic synchronous step-down converter with output discharge function.

The EV board can deliver 12A continuous load current over a wide 8V to 18V operating input range. High efficiency can be achieved over a wide output current load range.

Constant-On-Time (COT) control mode provides fast transient response and eases loop stabilization.

This EV board can be turned on or shut down via a remote ON/OFF input that is referenced to ground. This input is compatible with popular logic devices.

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	8 – 18	V
Output Voltage	V_{OUT}	1.8	V
Output Current	I_{OUT}	12	A

FEATURES

- Wide 8V to 18V Operating Input Range
- 12A Output Current
- Low R_{DS}(ON) Internal Power MOSFETs
- Proprietary Switching Loss Reduction Technique
- Adaptive COT for Ultrafast Transient Response
- Programmable Soft Start and Shutdown Time
- Pre-Bias Start up
- Programmable Switching Frequency from 200kHz to 1MHz
- Non-latch OCP, OVP Protection and Thermal Shutdown
- Output Adjustable from 0.611V to 13V
- Available in a QFN3x4 Package

APPLICATIONS

- Storage
- Set-top Boxes
- XDSL Modem/DSLAM
- Samll-cell Base Stations
- Personal Video Recorders
- Flat Panel Television and Monitors
- Distributed Power Systems

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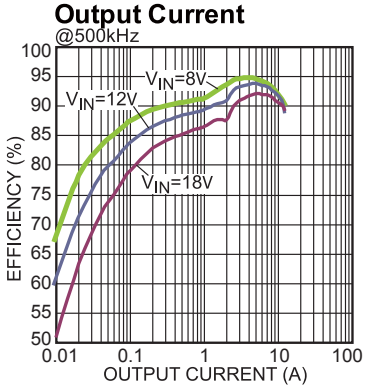
EV8763D-L-00A EVALUATION BOARD



(L x W x H)85.5 mm x 85.5mm x 1.6 mm)

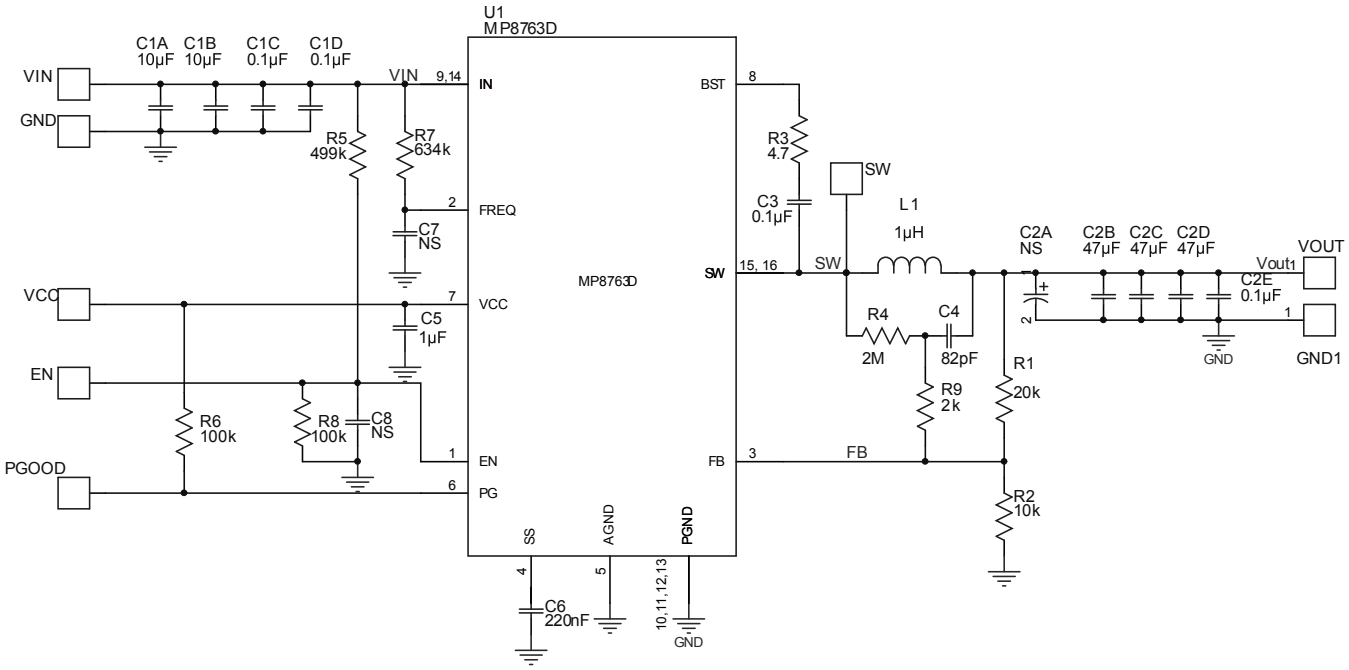
Board Number	MPS IC Number
EV8763D-L-00A	MP8763DGL

Efficiency vs. Output Current



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EVALUATION BOARD SCHEMATIC



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EV8763D-L-00A BILL OF MATERIALS

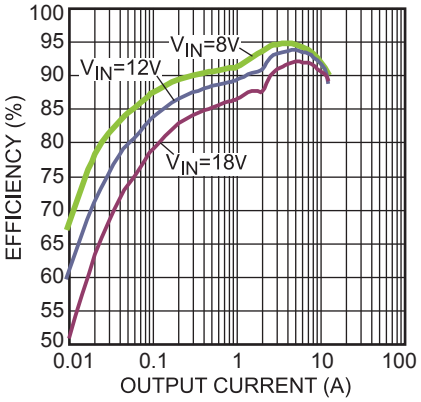
Qty	Ref	Value	Description	Package	Manufacture	Part Number
2	C1A, C1B	10μF	Ceramic Capacitor; 35V;X7R;1210;	1210	muRata	GRM32ER7YA106KA12L
4	C1C, C1D, C2E, C3	0.1μF	Ceramic Capacitor; 50V;X7R;0603	0603	muRata	GRM188R71H104KA93D
0	C2A	NS		POSCAP		
3	C2B, C2C, C2D	47μF	Ceramic Capacitor; 6.3V;X5R;1206	1206	TDK	C3216X5R0J476M
1	C4	82pF	Ceramic Capacitor; 50V;COG;0603	0603	muRata	GRM1885C1H820JA01D
1	C5	1μF	Capacitor;25V;X7R	0603	muRata	GRM188R71E105KA12
1	C6	220nF	Ceramic Capacitor; 25V;X7R;0603	0603	muRata	GRM188R71E223JA01D
0	C7, C8	NS		0603		
1	L1	1μH	Inductor;1μH; 1.35mOhm;32A	SMD	Wurth	7443330100
1	R1	20k	Film Resistor;1%	0603	Yageo	RC0603FR-0720KL
1	R2	10k	Film Resistor;1%;	0603	Yageo	RC0603FR-0710KL
1	R3	4.7Ω	Film Resistor;5%	0603	Yageo	RC0603JR-074R7L
1	R4	2M	Film Resistor;5%;	0603	Yageo	RC0603JR-072ML
1	R5	499k	Film Resistor;1%	0603	Yageo	RC0603FR-07499KL
2	R6, R8	100k	Film Resistor;1%;	0603	Yageo	RC0603FR-07100KL
1	R7	634k	Film Resistor;1%	0603	Yageo	RC0603FR-07634KL
1	R9	2k	Film Resistor;1%;	0603	Yageo	RC0603FR-072KL
1	U1		Step Down Converter	QFN16 3X4	MPS	MP8763DGL

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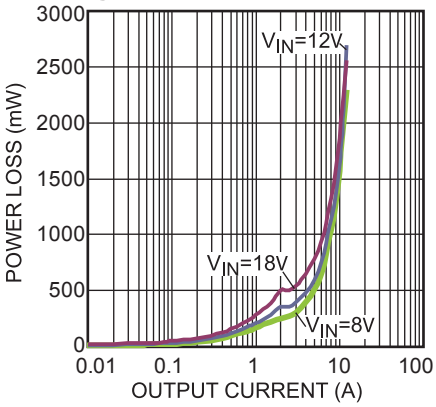
EVB TEST RESULTS

Performance waveforms are tested on the EV8763D-L-00A evaluation board.
V_{IN} = 12V, V_{OUT} = 1.8V, L = 1µH, T_A = +25ºC, unless otherwise noted.

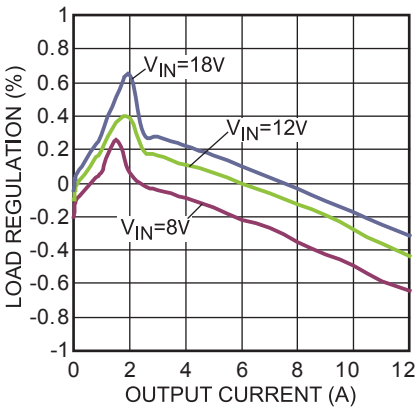
Efficiency vs. Output Current
@500kHz



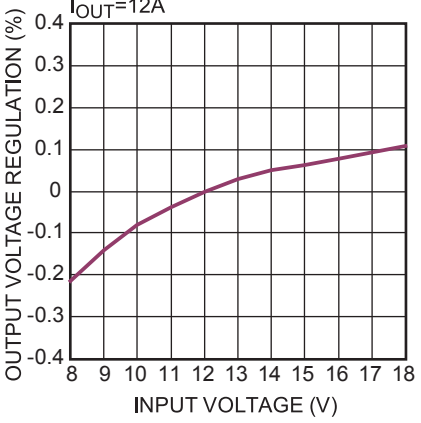
Power Loss vs. Output Current
@500kHz



Load Regulation vs. Output Current



Line Regulation vs. Input Voltage
I_{OUT}=12A

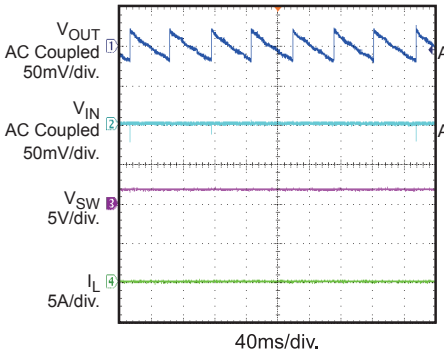


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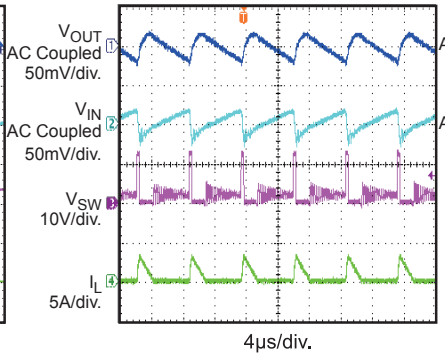
EVB TEST RESULTS *(continued)*

Performance waveforms are tested on the EV8763D-L-00A evaluation board.
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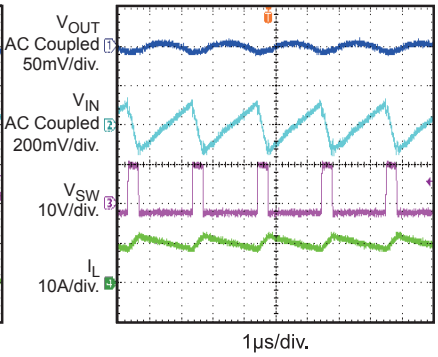
Input/Output Voltage Ripple
I_{OUT}=0A



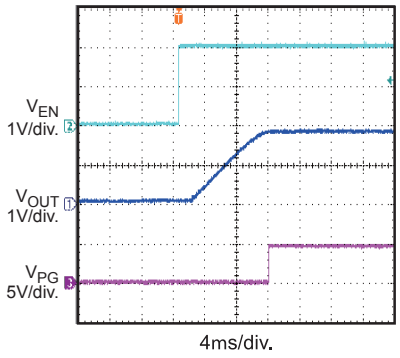
Input/Output Voltage Ripple
I_{OUT}=0.5A



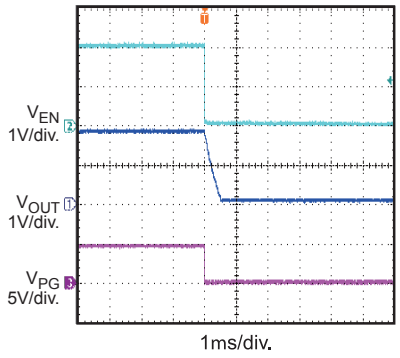
Input/Output Voltage Ripple
I_{OUT}=12A



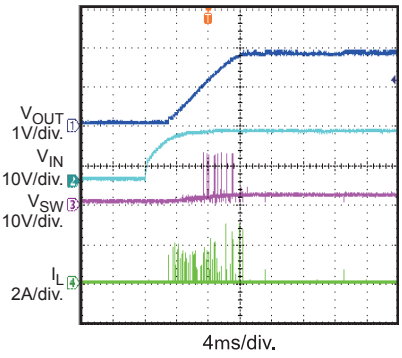
Power Good through EN Start Up
C_{SS} =220n, I_{OUT}=0.5A



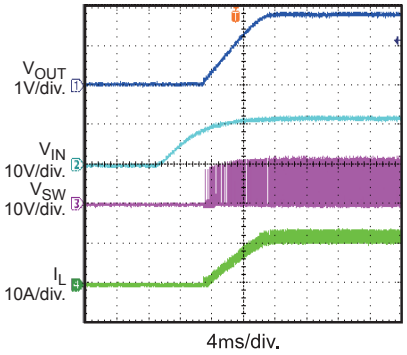
Power Good through EN Shutdown
C_{SS} =220n, I_{OUT}=0.5A



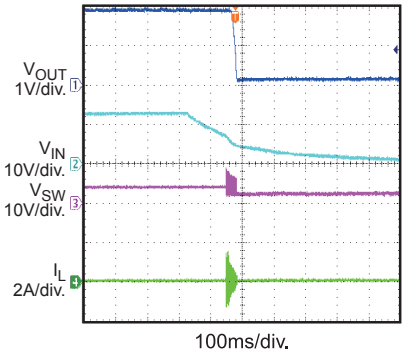
Start Up through VIN
I_{OUT}=0A



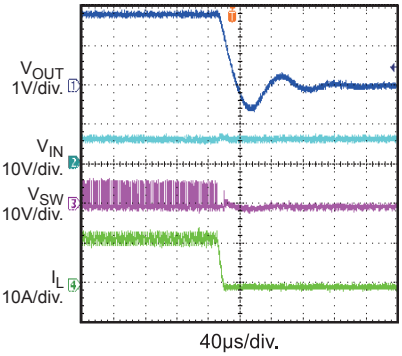
Start Up through VIN
I_{OUT}=12A



Shutdown through VIN
I_{OUT}=0A



Shutdown through VIN
I_{OUT}=12A

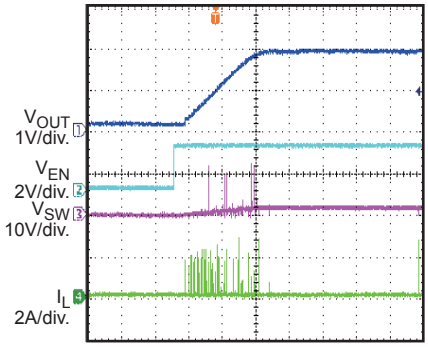


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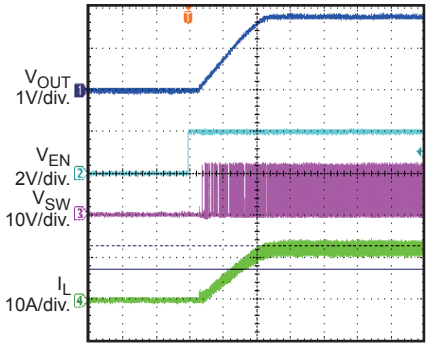
EVB TEST RESULTS *(continued)*

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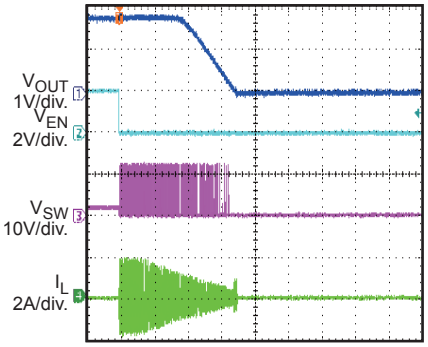
Start Up through EN
I_{OUT}=0A



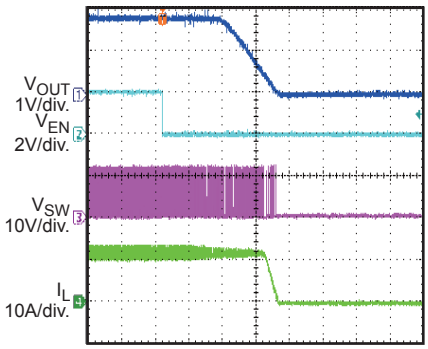
Start Up through EN
I_{OUT}=12A



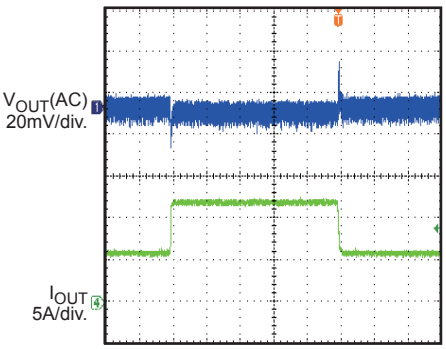
Shutdown through EN
I_{OUT}=0A



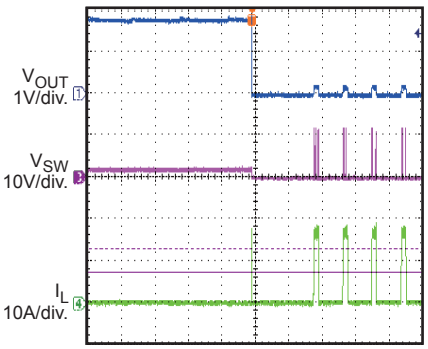
Shutdown through EN
I_{OUT}=12A



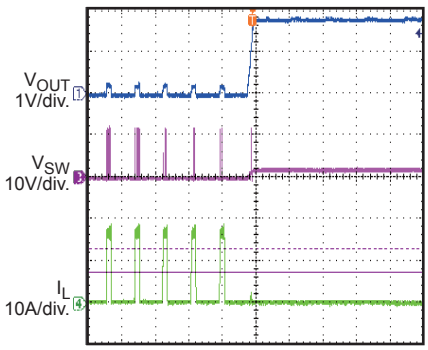
Transient Respond
I_{OUT}=6-12A , 2.5A/µs, F_{SW}=500kHz,
C_{OUT}=3×47µF



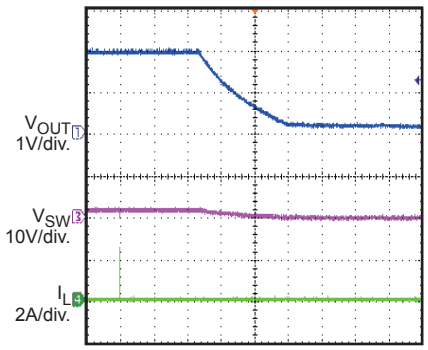
SCP Entry



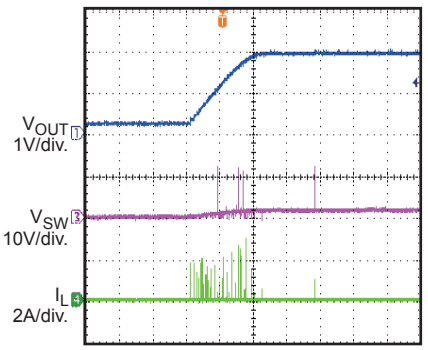
SCP Recovery



Thermal Shutdown
I_{OUT}=0A



Thermal Recovery
I_{OUT}=0A



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PRINTED CIRCUIT BOARD LAYOUT

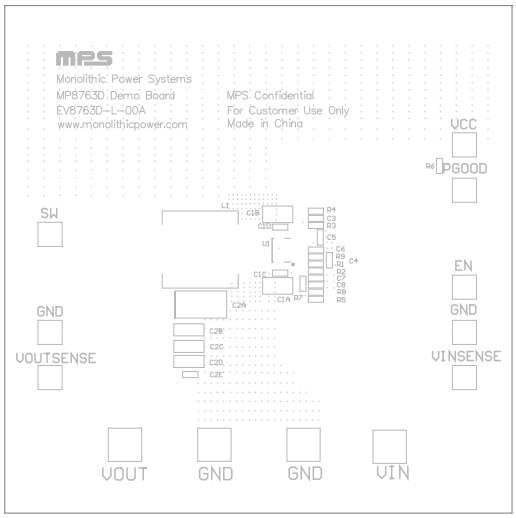


Figure 1—Top Silk Layer

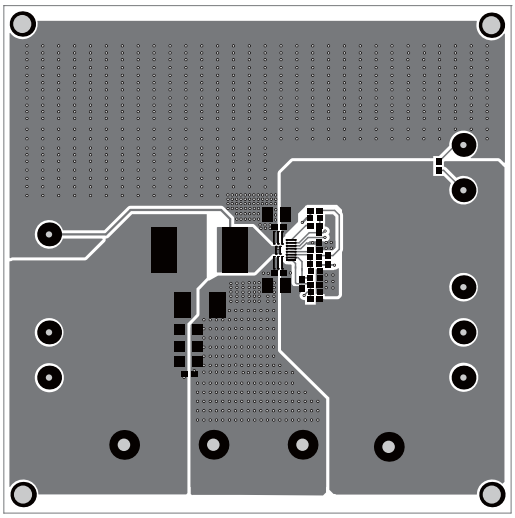


Figure 2—Top Layer

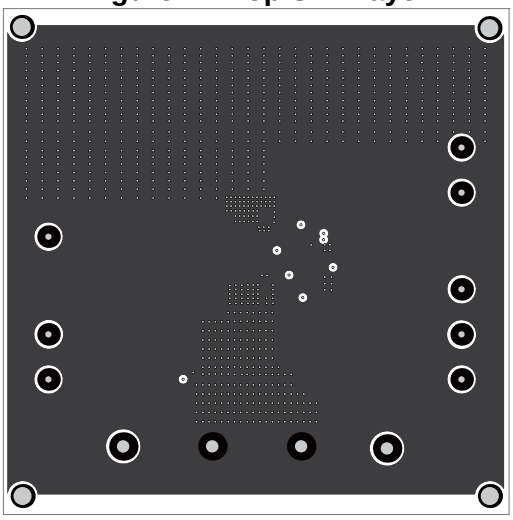


Figure 3—Inner Layer 1

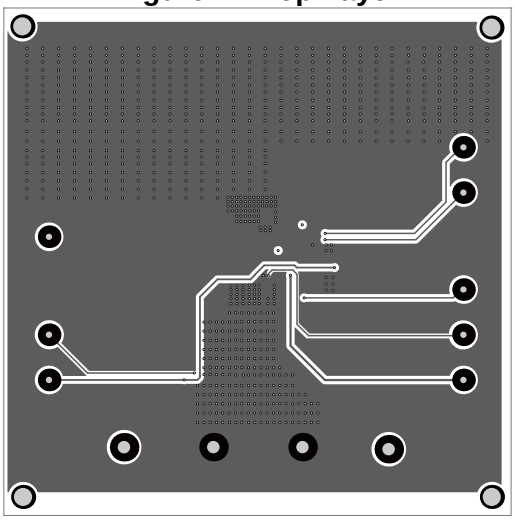


Figure 4— Inner Layer 2

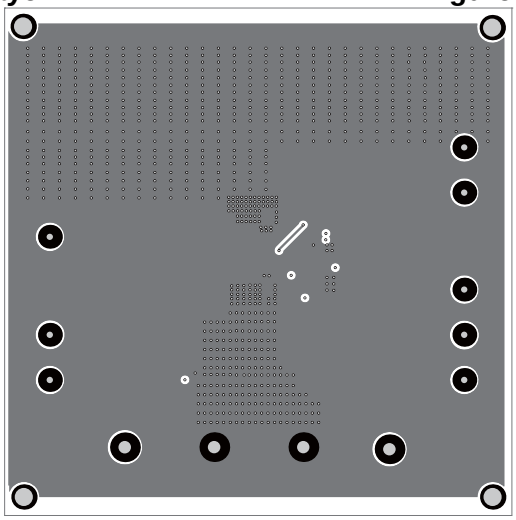


Figure 5—Bottom Layer

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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 8V and 18V, 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. Turn the power supply on. The MP8763DGLwill automatically startup.
5. To use the Enable function, apply a digital input to the EN pin. Drive EN higher than 2V to turn on the regulator or less than 0.4V to turn it off.
6. Use R1 and R2 to set the output voltage with VFB = 0.611V. Follow the Application Information section in the device datasheet to select the proper value of R1, R2, inductor and output capacitor values when output voltage is changed.
7. If lower ripple at light loads is needed, then use 1.2μH or 1.5μH L1. But with the larger L1, the transient response peak to peak value will become larger too.

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