

DESCRIPTION

The EV8765-Q-00A is an evaluation board for the MP8765GQ, a high efficiency monolithic synchronous step-down converter.

The Evaluation Board can deliver 6A continuous load current from a 5V to 24V input with excellent load and line regulation.

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

The Evaluation Board can be turned on or shut down via a remote ON/OFF input that is reference to ground. This input is compatible with popular logic devices.

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	5 – 24	V
Output Voltage	V_{OUT}	1.05	V
Output Current	I_{OUT}	6	A
Switching Frequency	f_{SW}	500	kHz

FEATURES

- Wide 5V to 24V Operating Input Range
- 6A Continuous Output Current
- PFM/PWM Mode Selectable
- Low $R_{DS(ON)}$ Internal Power MOSFETs
- Proprietary Switching Loss Reduction Technique
- 1% Reference Voltage
- Internal Soft Start
- Output Discharge
- 500kHz Switching Frequency
- OCP, OVP, UVP Protection and Thermal Shutdown
- Available in a QFN3x3 package

APPLICATIONS

- Laptop Computer
- Tablet PC
- Networking Systems
- Personal Video Recorders
- Flat Panel Television and Monitors
- Distributed Power Systems

All MPS parts are lead-free and adhere to the RoHS directive. For MPS green status, please visit MPS website under Products, Quality Assurance page.

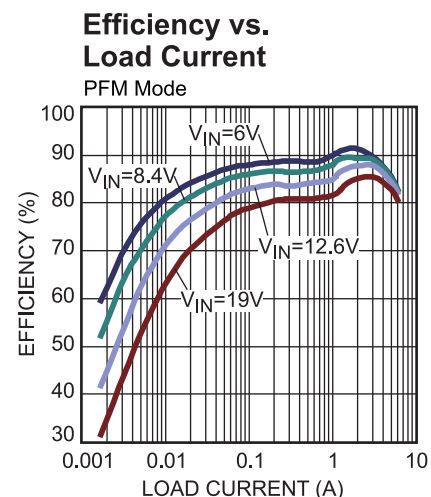
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EV8765-Q-00A EVALUATION BOARD

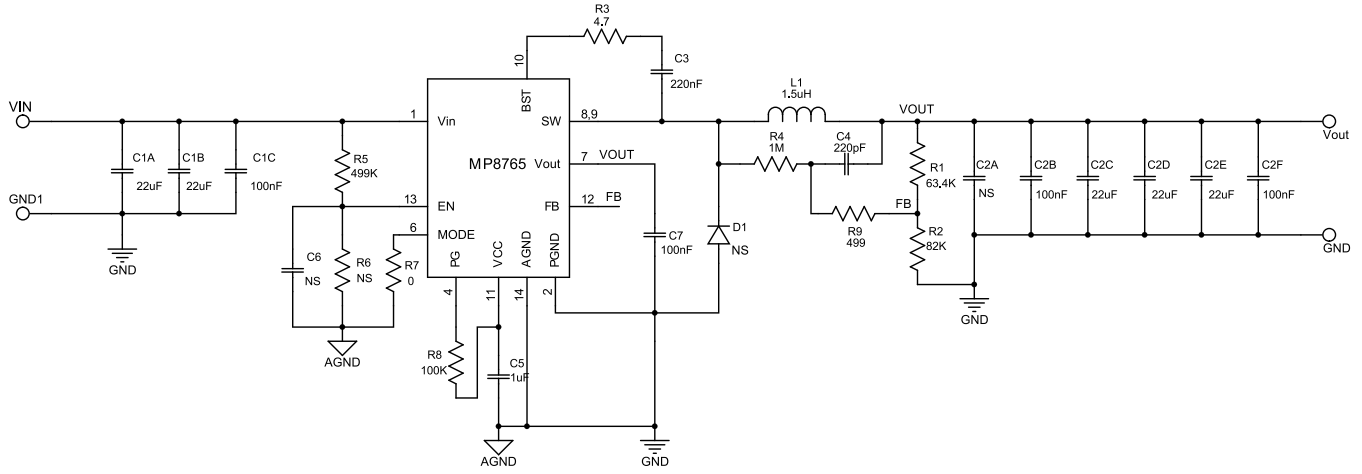


(L x W x H) 8.55cm x 8.55cm x 1.6cm

Board Number	MPS IC Number
EV8765-Q-00A	MP8765GQ



EVALUATION BOARD SCHEMATIC



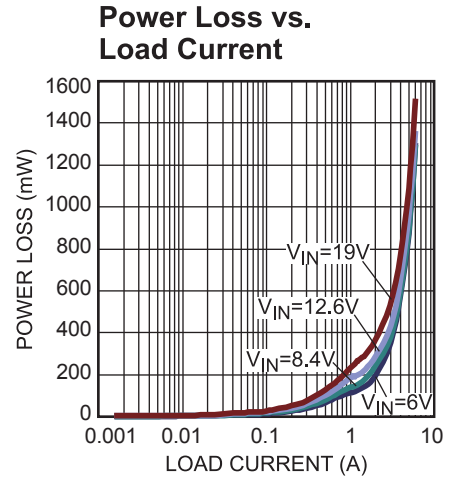
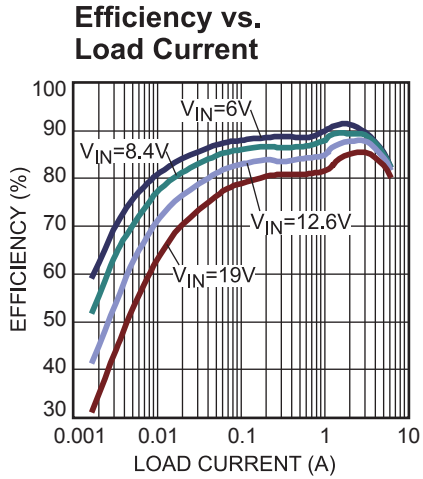
EV8765-Q-00A BILL OF MATERIALS

Qty.	Ref	Value	Description	Package	Manufacture	Manufacture_PN
2	C1A, C1B	22 μ F	Ceramic Capacitor; 25V;X5R;1210;	1210	muRata	GRM32ER61E226KE15L
1	C1C	100nF	Ceramic Capacitor; 50V;X7R;0603;	0603	muRata	GRM188R71H104KA93D
0	C2A	NS		POSCAP		
3	C2B, C2F, C7	100nF	Ceramic Capacitor; 16V;X7R;0603;	0603	muRata	GRM188R71C104KA01D
3	C2C, C2D, C2E	22 μ F	Ceramic Capacitor; 6.3V;X5R;1206	1206	muRata	GRM31CR60J226KE19
1	C3	220nF	Ceramic Capacitor; 16V;X7R;0603;	0603	muRata	GRM188R71C224KA01
1	C4	220pF	Ceramic Capacitor; 50V;X7R;0603;	0603	muRata	GRM188R71H221KA01D
1	C5	1 μ F	Ceramic Capacitor; 6.3V;X5R;0603	0603	muRata	GRM188R60J105KA01D
0	C6	NS		0603		
0	CN_OUT	NS	Connector			
0	D1	NS				
1	L1	1.5 μ H	Inductor;1.5 μ H;6.6m Ω ; 14A	SMD	Würth	744311150
1	R1	63.4k	Film Resistor;1%;	0603	Yageo	RC0603FR-0763K4L
1	R2	82k	Film Resistor;1%	0603	Yageo	RC0603FR-0782KL
1	R3	4.7	Film Resistor;5%;	0603	Yageo	RC0603JR-074R7L
1	R4	1M	Film Resistor;5%	0603	Any	
1	R5	499k	Film Resistor;1%;	0603	Yageo	RC0603FR-07499KL
0	R6	NS		0603		
1	R7	0	Film Resistor;5%	0603	Any	
1	R8	100k	Film Resistor;1%;	0603	Yageo	RC0603FR-07100KL
1	R9	499	Film Resistor;1%;	0603	Yageo	RC0603FR-07499RL
1	U1		Step down converter	QFN 3 \times 3	MPS	MP8765GQ

EVB TEST RESULTS

Performance waveforms are tested on the EV8765-Q-00A.

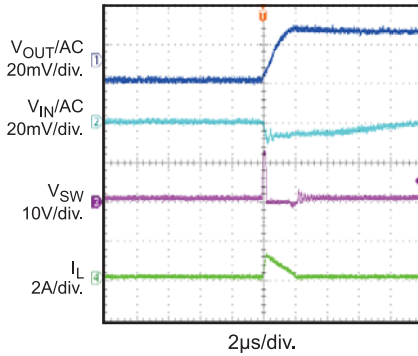
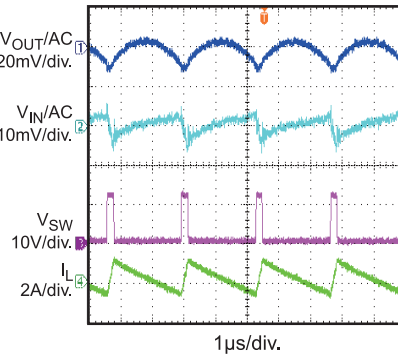
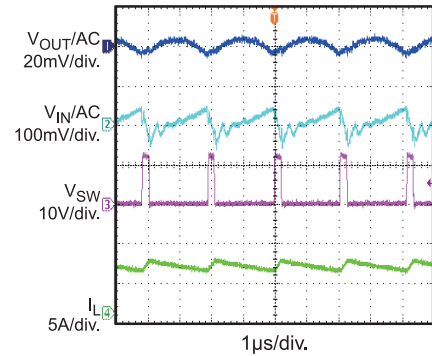
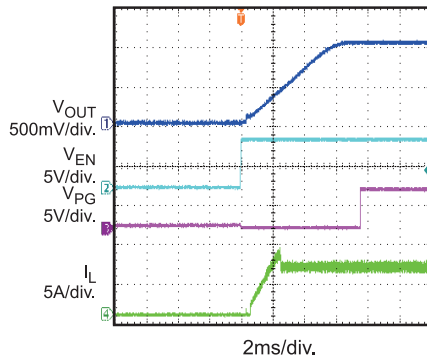
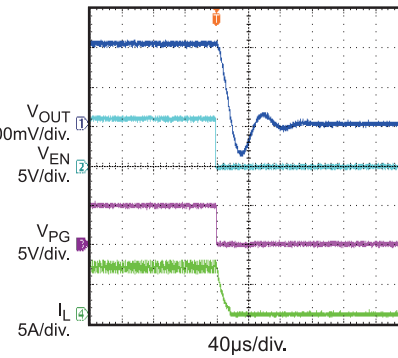
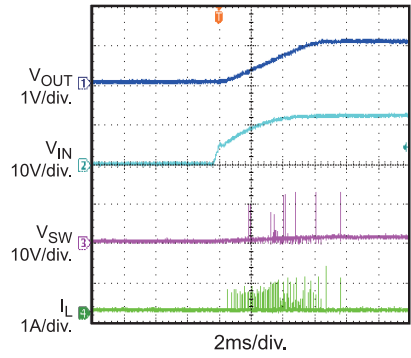
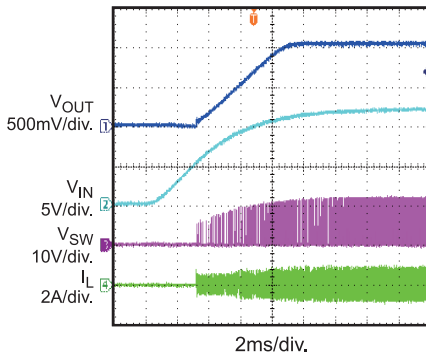
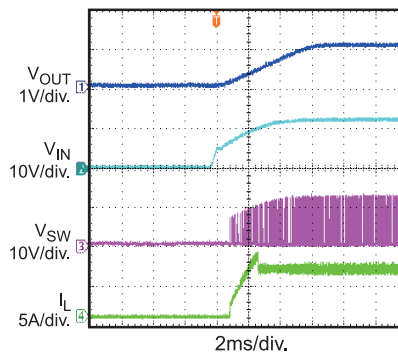
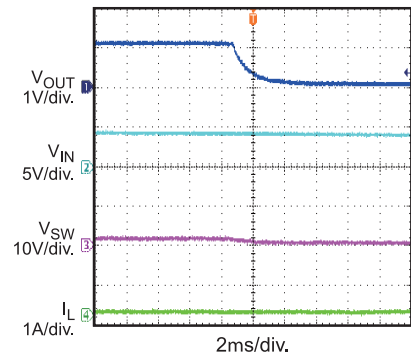
$V_{IN} = 12V$, $V_{OUT} = 1.05V$, $L = 1.5\mu H$, PFM mode, $T_A = 25^\circ C$, unless otherwise noted.



EVB TEST RESULTS (continued)

Performance waveforms are tested on the EV8765-Q-00A.

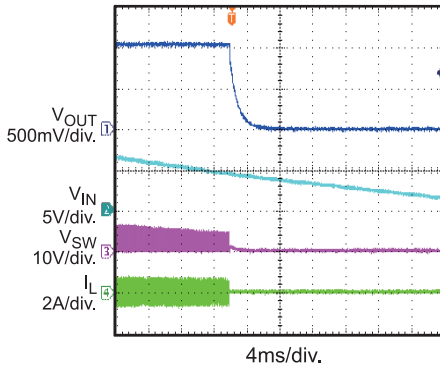
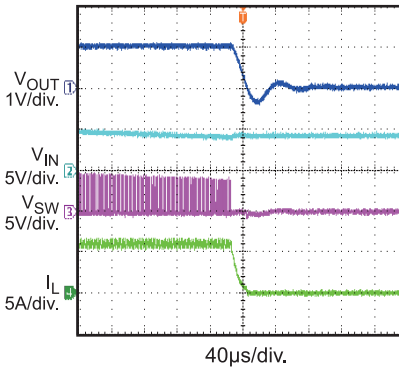
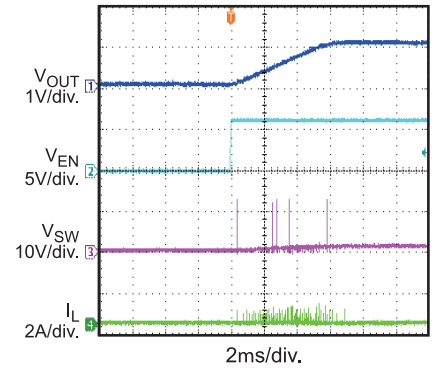
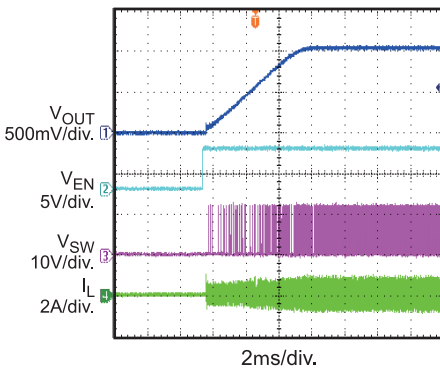
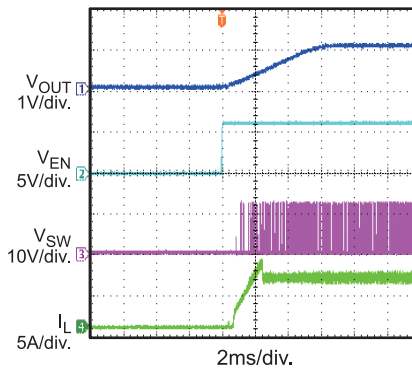
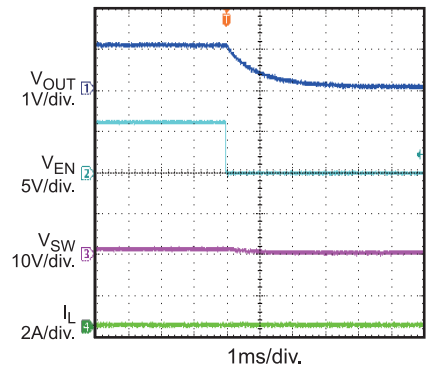
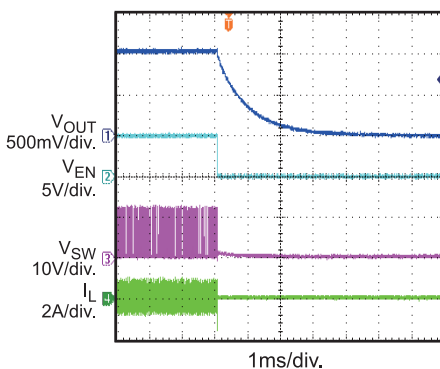
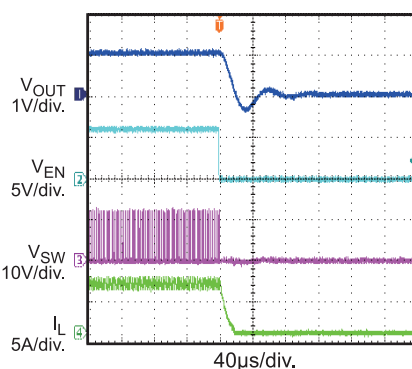
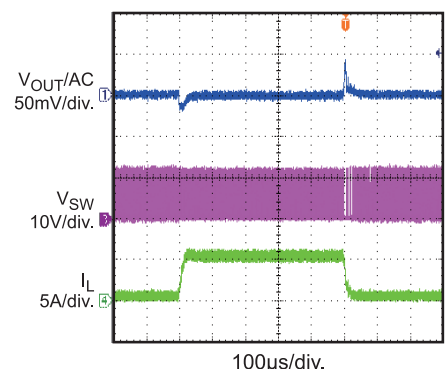
 $V_{IN}=12V$, $V_{OUT}=1.05V$, $L=1.5\mu H$, PFM mode, $T_J=+25^{\circ}C$, unless otherwise noted.

Input/Output Voltage Ripple
 $I_{OUT}=0A$

Input/Output Voltage Ripple
 $I_{OUT}=0A$, PWM Mode

Input/Output Voltage Ripple
 $I_{OUT}=6A$

Power Good Through EN Start-Up
 $I_{OUT}=6A$

Power Good Through EN Shutdown
 $I_{OUT}=6A$

Start-Up Through VIN
 $I_{OUT}=0A$

Start-Up Through VIN
 $I_{OUT}=0A$, PWM Mode

Start-Up Through VIN
 $I_{OUT}=6A$

Shutdown Through VIN
 $I_{OUT}=0A$


EV8 TEST RESULTS (continued)

Performance waveforms are tested on the EV8765-Q-00A.

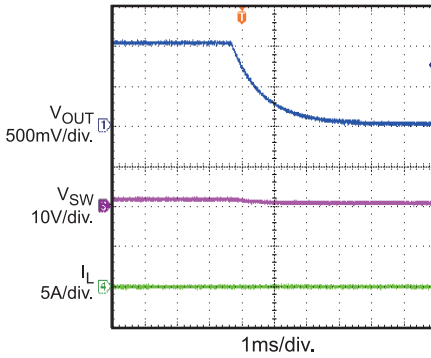
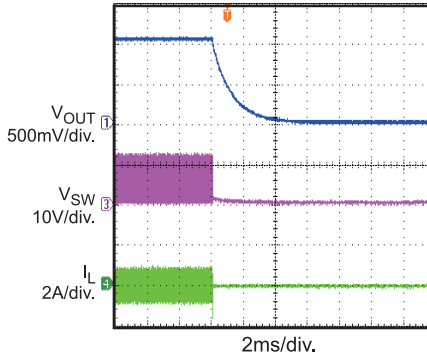
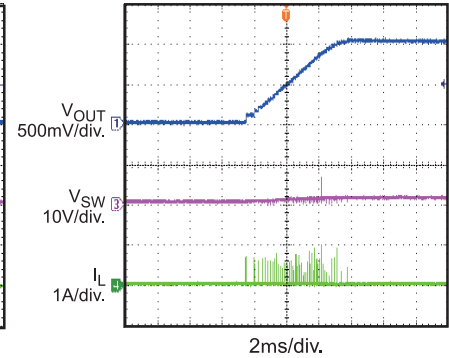
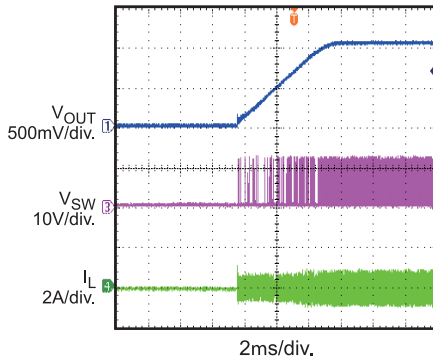
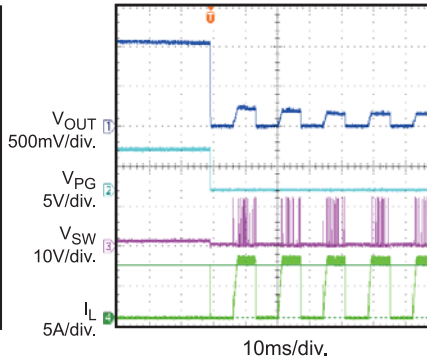
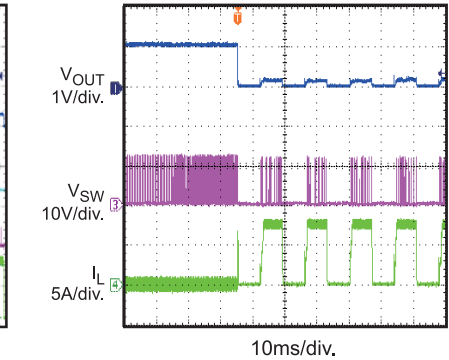
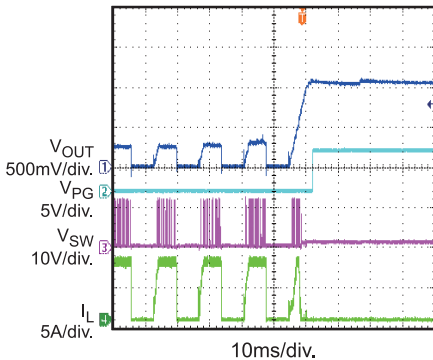
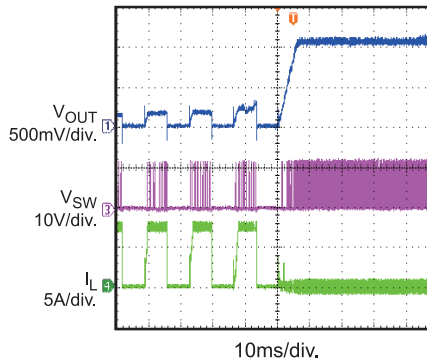
 $V_{IN}=12V$, $V_{OUT}=1.05V$, $L=1.5\mu H$, PFM Mode, $T_J=+25^\circ C$, unless otherwise noted.

Shutdown Through V_{IN}
 $I_{OUT}=0A$, PWM Mode

Shutdown Through V_{IN}
 $I_{OUT}=6A$

Start Up through EN
 $I_{OUT}=0A$

Start Up through EN
 $I_{OUT}=0A$, PWM Mode

Start Up Through EN
 $I_{OUT}=6A$

Shutdown Through EN
 $I_{OUT}=0A$

Shutdown Through EN
 $I_{OUT}=0A$, PWM Mode

Shutdown Through EN
 $I_{OUT}=6A$

Transient
 $I_{OUT}=0.6A-5.4A@2.5\mu s$,
 $f_{SW}=500kHz$, $C_{OUT}=3x22\mu F$


EV8 TEST RESULTS (continued)

Performance waveforms are tested on the EV8765-Q-00A.

 $V_{IN}=12V$, $V_{OUT}=1.05V$, $L=1.5\mu H$, PFM Mode, $T_J=+25^{\circ}C$, unless otherwise noted.

Thermal Shutdown
 $I_{OUT}=0A$

Thermal Shutdown
 $I_{OUT}=0A$, PWM Mode

Thermal Recovery
 $I_{OUT}=0A$

Thermal Recovery
 $I_{OUT}=0A$, PWM Mode

Short Circuit Entry
 $I_{OUT}=0A$

Short Circuit Entry
 $I_{OUT}=0A$, PWM Mode

Short Circuit Recovery
 $I_{OUT}=0A$

Short Circuit Recovery
 $I_{OUT}=0A$, PWM Mode


PRINTED CIRCUIT BOARD LAYOUT

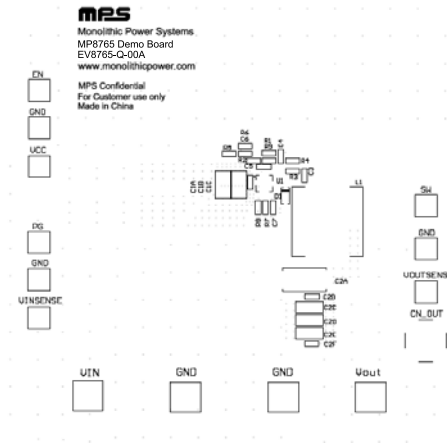


Figure 1: Top Silk Layer

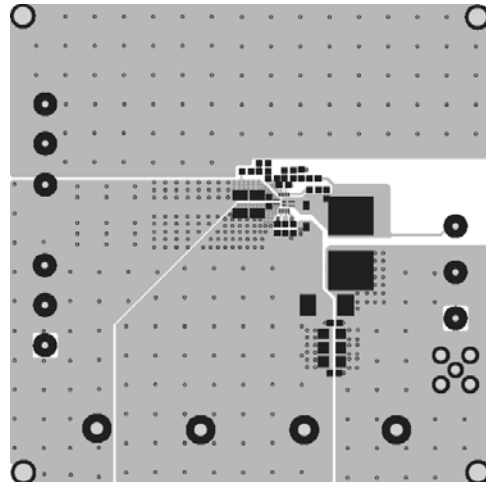


Figure 2: Top Layer

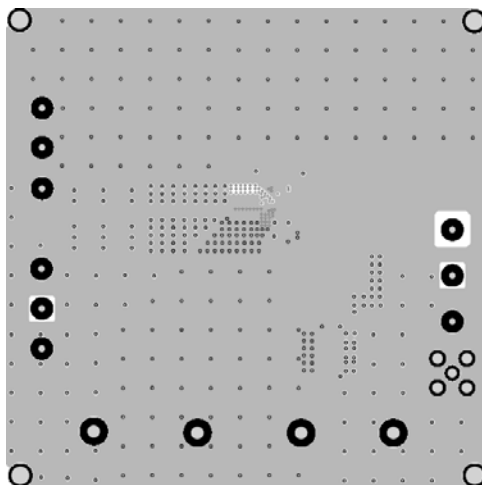


Figure 3: Inner Layer1

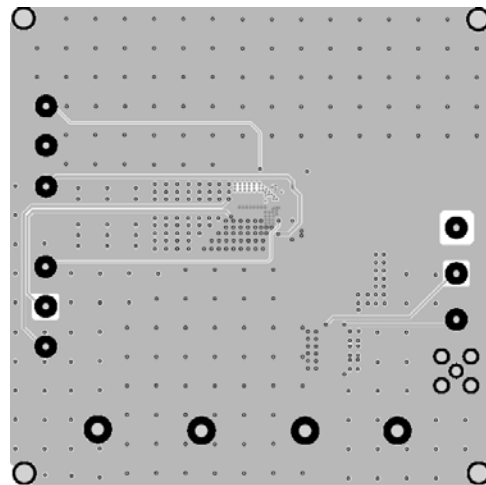


Figure 4: Inner Layer2

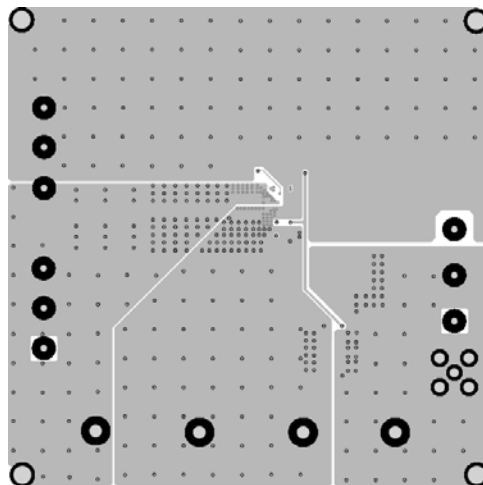


Figure 5: Bottom Layer