

DESCRIPTION

The EV8867-LE-00A is used for demonstrating the performance of MPS's MP8867. MP8867 is a highly integrated and high frequency synchronous step-down switcher with I²C control interface. It is optimized to support up to 8A load current over an input supply range from 4.5V to 17V with excellent load and line regulation.

Current-Mode operation provides fast transient response and eases loop stabilization. The reference voltage level can be controlled, on-the fly through an I²C serial interface. Reference voltage range can be adjusted from 0.6V to 1.87V in 10mV steps. Voltage scaling slew rate, enable and power saving mode are also selectable through the I²C interface. Full protection features include over voltage, hiccup over-current protection and thermal shut down.

The MP8867 is available in QFN-14(3mmx4mm) package.

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	V _{IN}	4.5– 17	V
Output Voltage	V _{OUT}	1	V
Output Current	I _{OUT}	8	A

FEATURES

- Wide 4.5V-to-17V Operating Input Range
- 1% Internal Reference Accuracy
- I²C Programmable Reference Output Voltage
- Range from 0.6V to 1.87V in 10mV Steps with Slew Rate Control
- I²C Selectable Switching Frequency.
- 200kHz-2MHz Synchronized External Clock
- OTP, OCP Hiccup Indication Via I²C
- Selectable PSM and Fs Through I²C
- Programmable Soft Start Time
- Open-Drain Power Good Indicator
- Small 3x4mm QFN 14 Package

APPLICATIONS

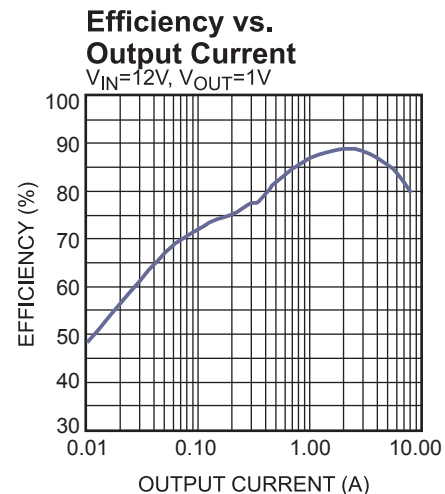
- SoC and Media Processors
- FPGA-based Systems
- ASIC Supplies
- Distributed Power Systems

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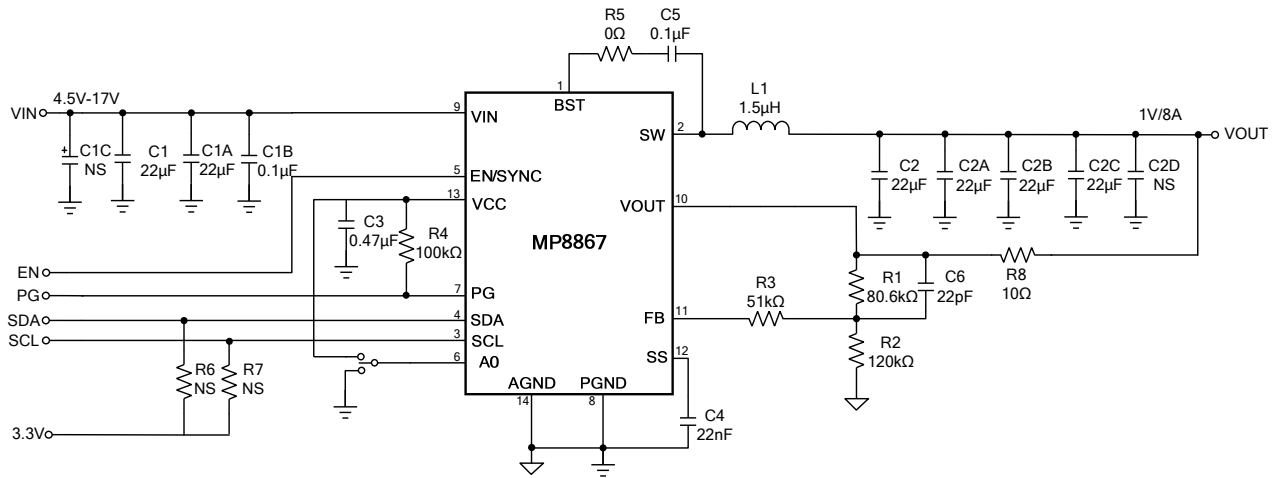
EV8867-LE-00A EVALUATION BOARD



Board Number	MPS IC Number
EV8867-LE-00A	MP8867GLE



EVALUATION BOARD SCHEMATIC



EV8867-LE-00A BILL OF MATERIALS

Qty	RefDes	Value	Description	Package	Manufacturer	Manufacturer P/N
1	R1	80.6k	Film Res,1%	0603	ROYAL	RC0603FR-0780K6L
1	R2	120k	Film Res,1%	0603	ROYAL	RL0603FR-07120KL
1	R3	51k	Film Res,1%	0603	ROYAL	RL0603FR-0751KL
1	R5	0Ω	Film Res,1%	0402	RALEC	RTT020000FTP
1	R4	100k	Film Res,1%	0603	ROYAL	RL0603FR-07100KL
2	R6, R7	NS				
1	R8	10 Ω	Film Res,1%	0603	ROYAL	RL0603FR-0710RL
2	C1B, C5	0.1μF	Ceramic Cap,25V,X7R	0603	muRata	GRM188R71E104KA01D
2	C1A, C1	22μF	Ceramic Cap,25V,X5R	1206	muRata	GRM31CR61E226KE15L
4	C2, C2A, C2B, C2C	22μF	Ceramic Cap, 25V,X5R	0805	muRata	GRM21BR61E226ME44L
2	C2D, C1C	NS				
1	C3	0.47 μF	Ceramic Cap,16V,X7R	0603	muRata	GRM188R71C474KA88D
1	C4	22nF	Ceramic Cap,16V,X7R	0603	muRata	GRM188R71C223KA01D
1	C6	22pF	Ceramic Cap,50V,C0G	0603	muRata	GRM1885C1H220JA01D
1	L1	1.5μH	IR=11A,Isat=14A, DCR=6.6m Ω	SMD	Wurth	744 311 150
1	U1	MP8867	Step-Down Converter with I2C Interface	QFN14 (3*4)	MPS	MP8867GLE

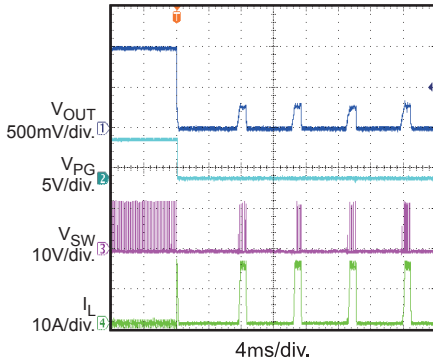
EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.

V_{IN} = 12V, V_{OUT} = 1V, L = 1.5μH, T_A = 25°C, unless otherwise noted.

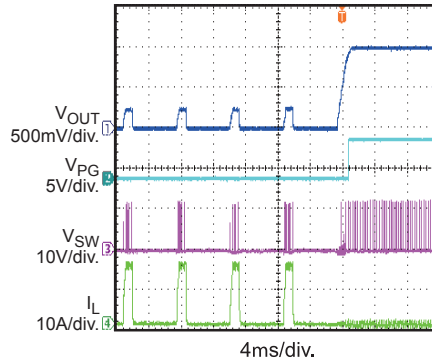
Short Entry

I_{OUT} = 0A



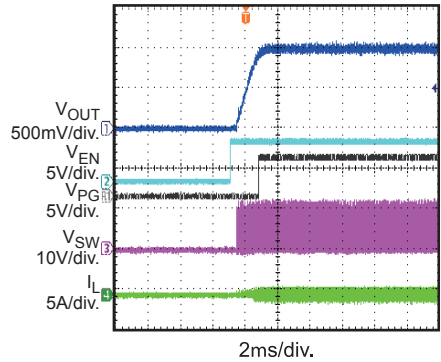
Short Recovery

I_{OUT} = 0A



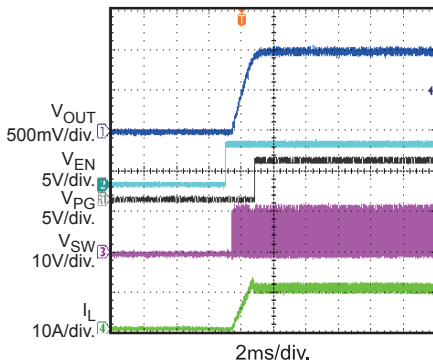
Start-Up through Enable

I_{OUT} = 0A



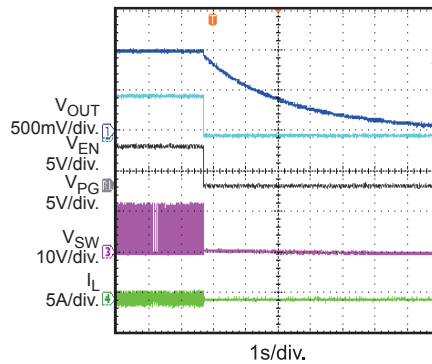
Start-Up through Enable

I_{OUT} = 8A



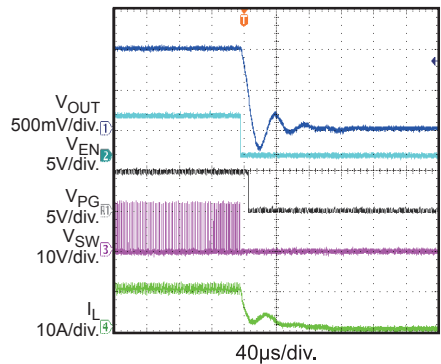
Shutdown through Enable

I_{OUT} = 0A



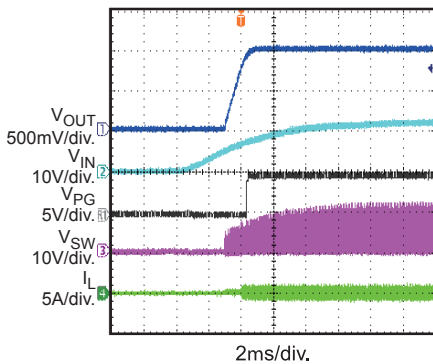
Shutdown through Enable

I_{OUT} = 8A



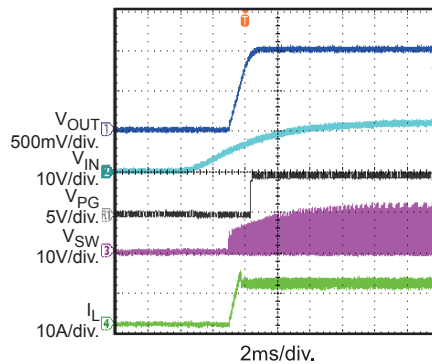
Start-Up through Input Voltage

I_{OUT} = 0A



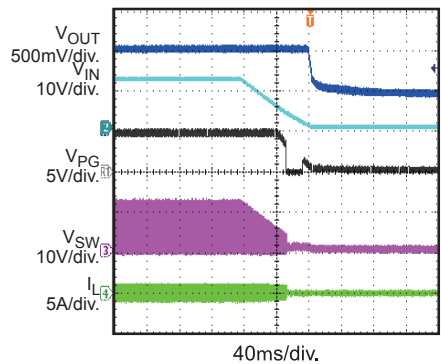
Start-Up through Input Voltage

I_{OUT} = 8A



Shutdown through Input Voltage

I_{OUT} = 0A

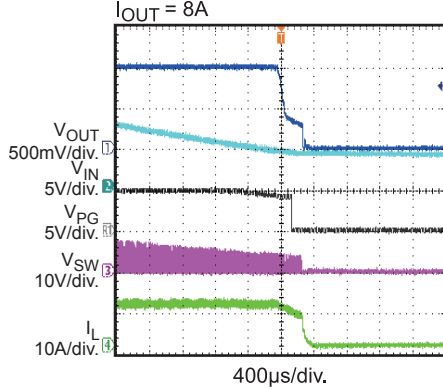


EVB TEST RESULTS (continued)

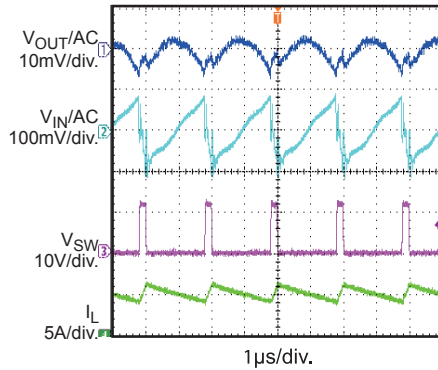
Performance waveforms are tested on the evaluation board.

V_{IN} = 12V, V_{OUT} = 1V, L = 1.5μH, T_A = 25°C, unless otherwise

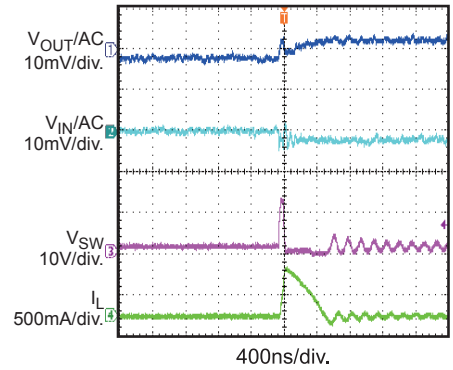
Shutdown through Input Voltage
I_{OUT} = 8A



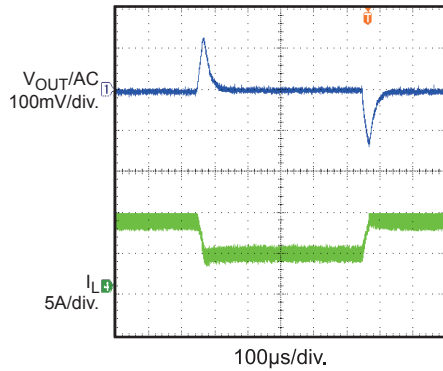
Input/Output Ripple
I_{OUT} = 8A



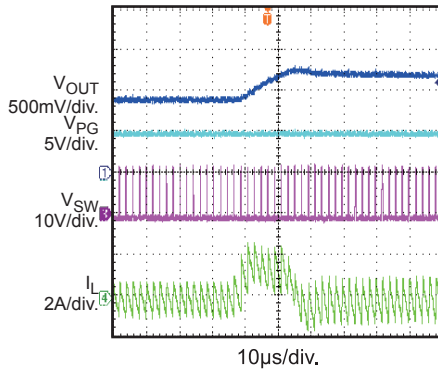
Input/Output Ripple
I_{OUT} = 0A, PFM



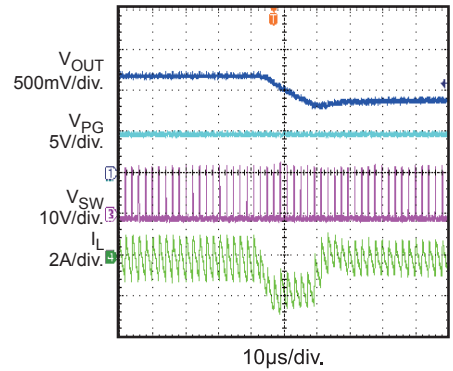
Load Transient Response
I_{OUT} = 4A to 8A



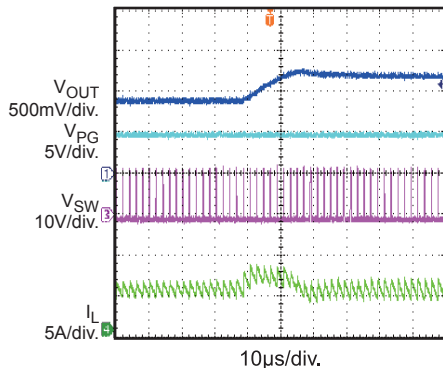
I²C Control Slew Rate
Slew Rate=16mV/μs, I_{OUT} = 0A, from 0.9V to 1.2V



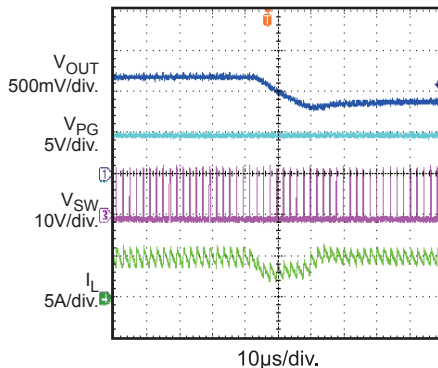
I²C Control Slew Rate
Slew Rate=16mV/μs, I_{OUT} = 0A, from 1.2V to 0.9V



I²C Control Slew Rate
Slew Rate=16mV/μs, I_{OUT} = 5A, from 0.9V to 1.2V



I²C Control Slew Rate
Slew Rate=16mV/μs, I_{OUT} = 5A, from 1.2V to 0.9V



PRINTED CIRCUIT BOARD LAYER

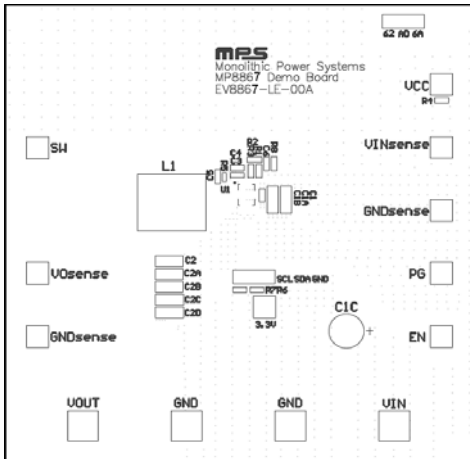


Figure 1: Top Silk Layer

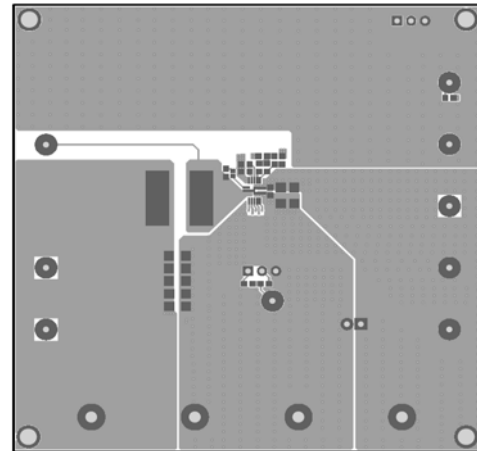


Figure 2: Top Layer

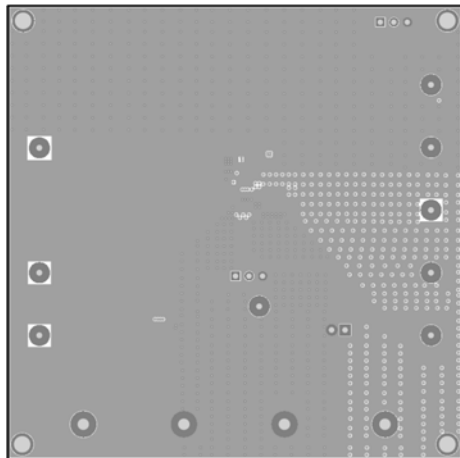


Figure 3: Inner 1 Layer

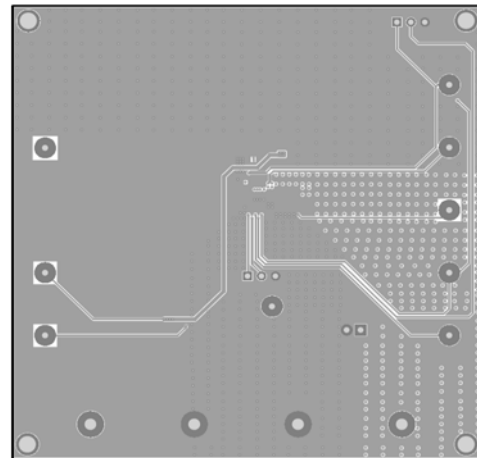


Figure 4: Inner 2 Layer

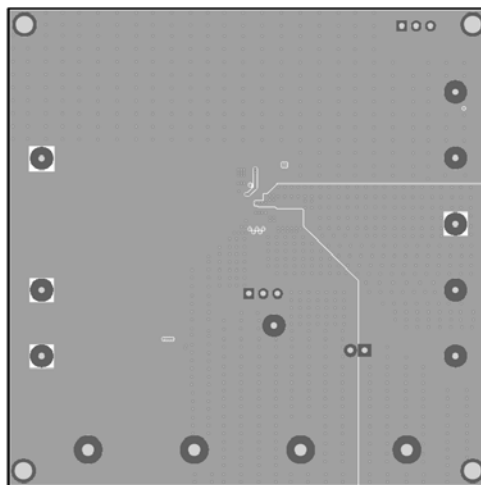


Figure 5: Bottom Layer