

DESCRIPTION

The EV8714-LE-00A is used for demonstrating the performance of MPS's MP8714. MP8714 is a highly integrated and high frequency synchronous step-down switch-mode converter. It is optimized to support up to 10A 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.

EN/SYNC supports external clock synchronization, and an open-drain power good pin(PG) indicates when the output voltage is in the nominal range.

Full protection features include over voltage, hiccup over-current protection and thermal shut down.

The MP8714 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}	10	A

FEATURES

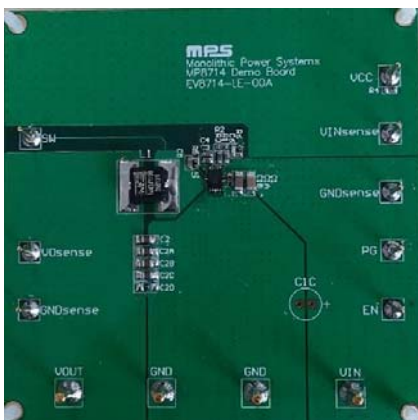
- Wide 4.5V-to-17V Operating Input Range
- 10A continues Output Current
- 26mΩ High-side, 11mΩ Low-Side RDS(ON) for Internal Power MOSFETS
- 200kHz-2MHz Synchronized External Clock
- Programmable Soft-Start(SS) Time
- Open-Drain Power Good(PG) Indicator
- Output Over-Voltage Protection (OVP)
- Thermal Shutdown
- Available in a Small QFN-14(3mmx4mm) Package

APPLICATIONS

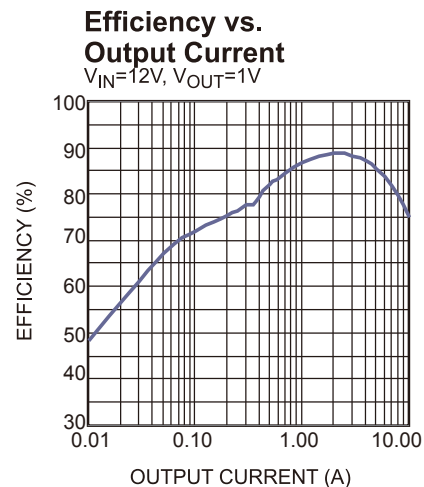
- Flat-Panel Televisions and Monitors
- Set-Top Boxes
- Distributed Power Systems

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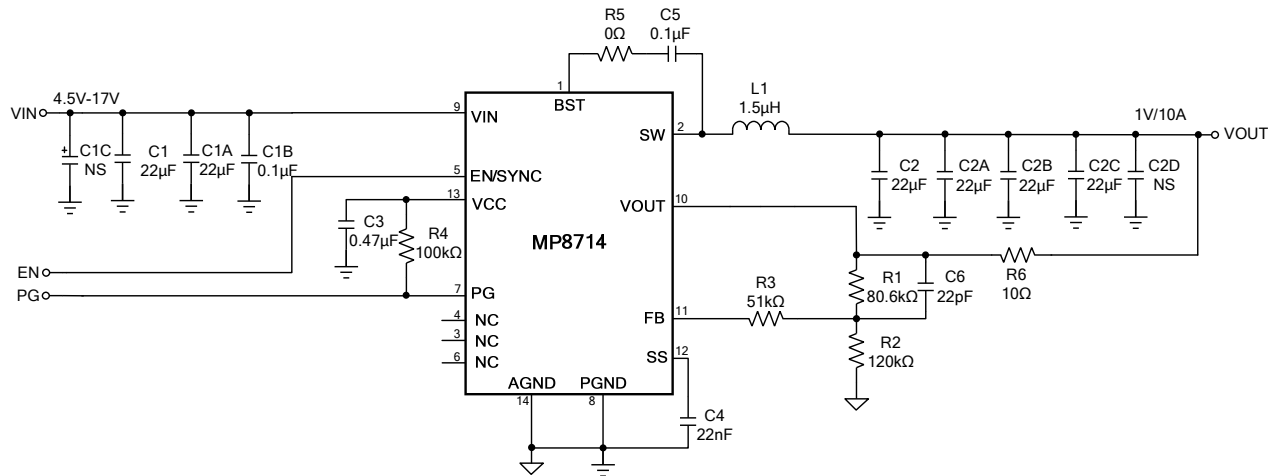
EV8714-LE-00A EVALUATION BOARD



Board Number	MPS IC Number
EV8714-LE-00A	MP8714GLE



EVALUATION BOARD SCHEMATIC



EV8714-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	R4	100k	Film Res,1%	0603	ROYAL	RL0603FR-07100KL
1	R5	0Ω	Film Res,1%	0402	RALEC	RTT020000FTP
1	R6	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	MP8714	Step-Down Converter	QFN14 (3*4)	MPS	MP8714GLE

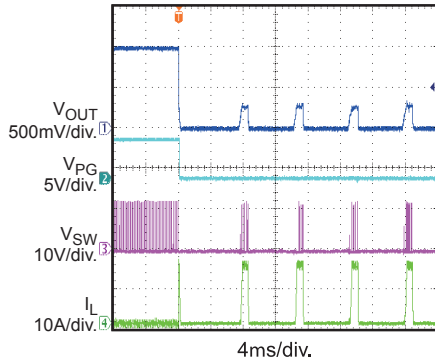
EV8 TEST RESULTS

Performance waveforms are tested on the evaluation board.

$V_{IN} = 12V$, $V_{OUT} = 1V$, $L = 1.5\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

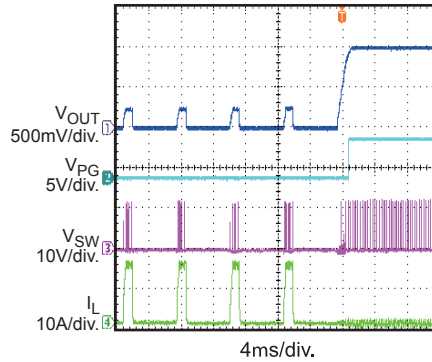
Short Entry

$I_{OUT} = 0A$



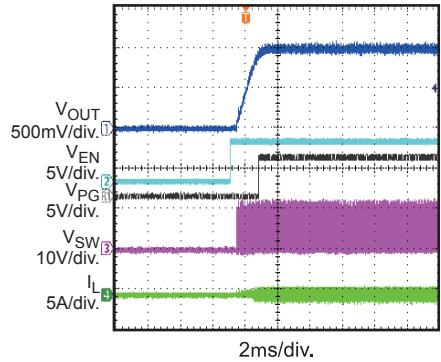
Short Recovery

$I_{OUT} = 0A$



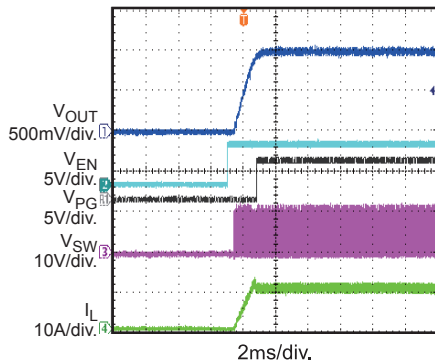
Start-Up through Enable

$I_{OUT} = 0A$



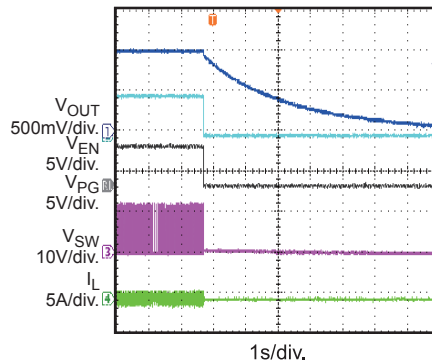
Start-Up through Enable

$I_{OUT} = 10A$



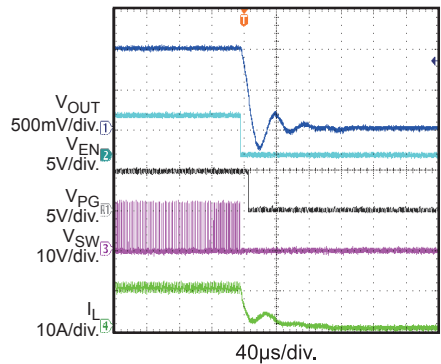
Shutdown through Enable

$I_{OUT} = 0A$



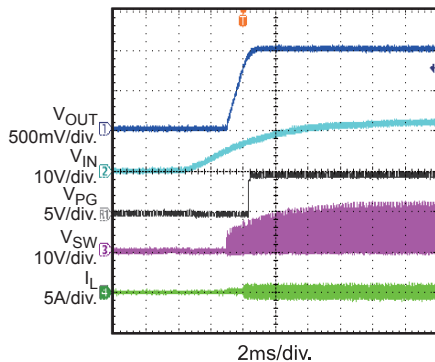
Shutdown through Enable

$I_{OUT} = 10A$



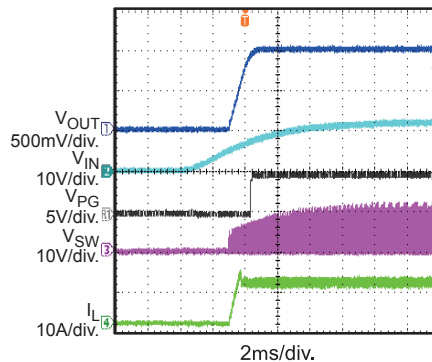
Start-Up through Input Voltage

$I_{OUT} = 0A$



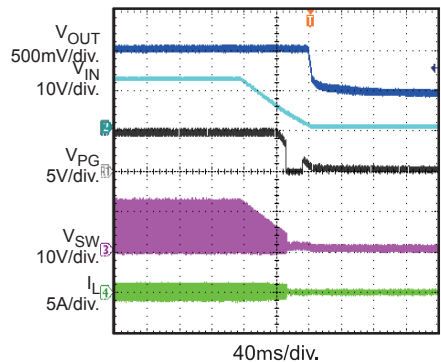
Start-Up through Input Voltage

$I_{OUT} = 10A$



Shutdown through Input Voltage

$I_{OUT} = 0A$



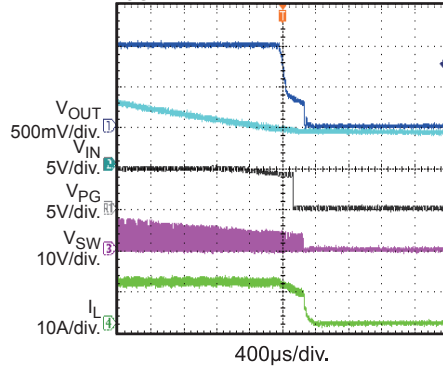
EVB TEST RESULTS *(continued)*

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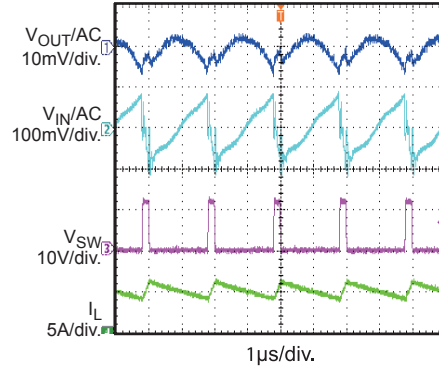
Shutdown through Input Voltage

$I_{OUT} = 10A$



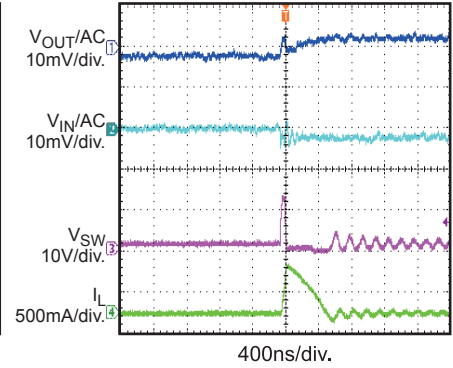
Input/Output Ripple

$I_{OUT} = 10A$



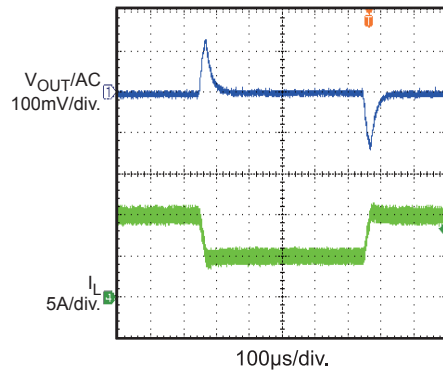
Input/Output Ripple

$I_{OUT} = 0A$, PFM



Load Transient Response

$I_{OUT} = 5A$ to $10A$



PRINTED CIRCUIT BOARD LAYER

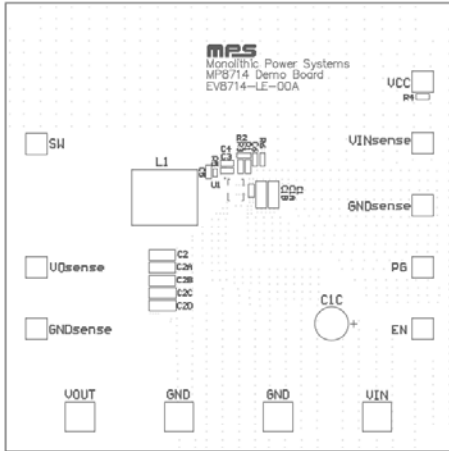


Figure 1: Top Silk Layer

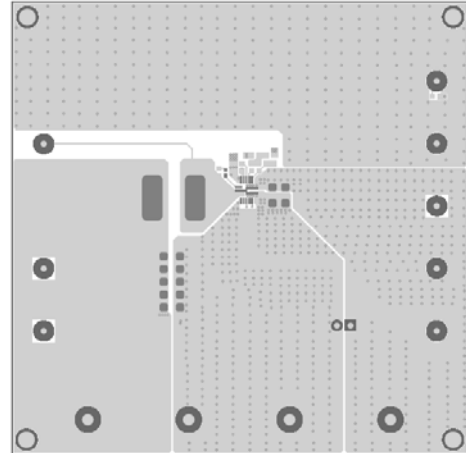


Figure 2: Top Layer

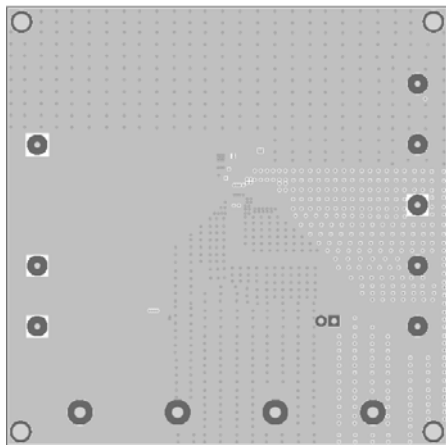


Figure 3: Inner 1 Layer

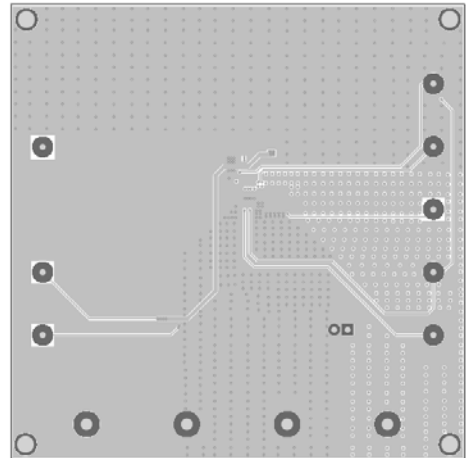


Figure 4: Inner 2 Layer

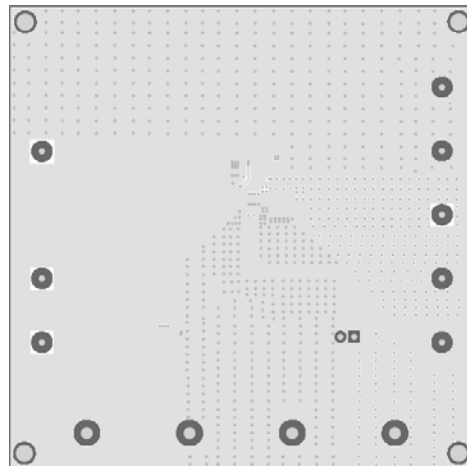


Figure 5: Bottom Layer