

DESCRIPTION

The EV2313-J-00A is an evaluation board for MP2313, a high frequency, synchronous, rectified, step-down converter with built-in Power MOSFETs. The MP2313 offers a very compact solution to achieve 1A continuous output current with excellent load and line regulation over a wide input supply range.

Current-mode operation provides fast transient response and eases loop stabilization.

Full protection features include over-current protection and thermal shutdown.

The MP2313 requires a minimum number of readily available standard external components and is available in a space saving TSOT23-8 package.

ELECTRICAL SPECIFICATION (1)

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	19	V
Output Voltage	V_{OUT}	3.3	V
Output Current	I_{OUT}	1	A

1). For different input, output spec, please refer to TYPICAL APPLICATION CIRCUIT section on datasheet to choose proper parameters.

FEATURES

- 1A Continuous Load Current
- 110mΩ/50mΩ Low $R_{DS(ON)}$ Internal Power MOSFETs
- Fixed 2MHz Switching Frequency
- High Efficiency Synchronous Mode Operation
- External AAM pin for Power-Save Mode Programming
- Internal Soft-Start
- Cycle-by-Cycle Over Current Protection
- Short Circuit Protection with Hiccup Mode
- Thermal Shutdown
- Output Adjustable from 0.8V
- Available in a TSOT23-8 Package

APPLICATIONS

- Notebook System and I/O Power
- Digital Set-Top Boxes
- Flat-Panel Television and Monitors

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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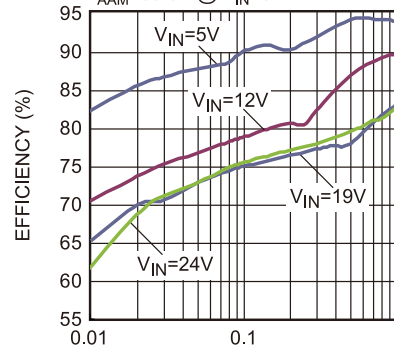
EV2313-J-00A EVALUATION BOARD



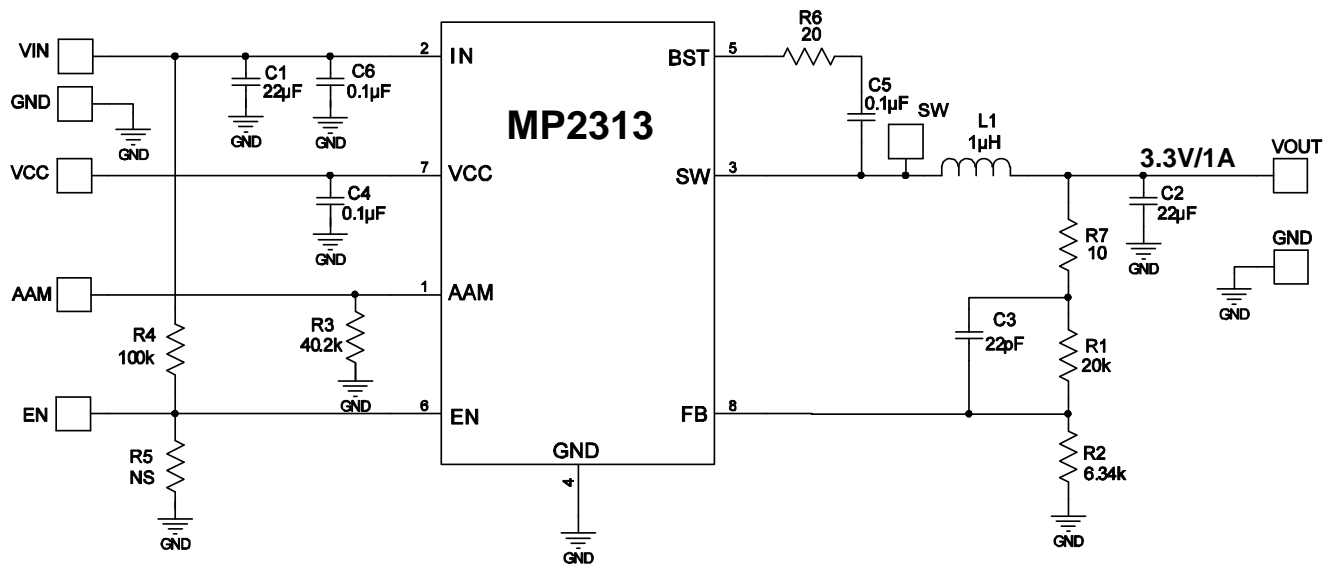
Board Number	MPS IC Number
EV2313-J-00A	MP2313GJ

Efficiency vs. Output Current

$V_{OUT}=3.3V$, $L=1\mu H$, $I_{OUT}=0.01A$ to $1A$
 $R_{AAM}=40.2k$ @ $V_{IN}=12V$ to $24V$,
 $R_{AAM}=80.6k$ @ $V_{IN}=5V$



EVALUATION BOARD SCHEMATIC



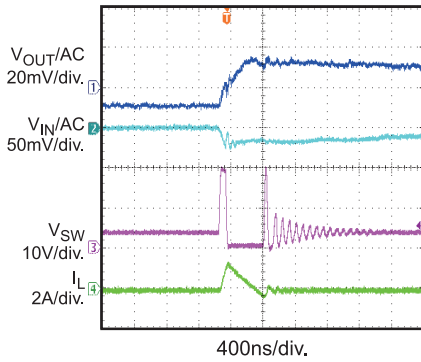
EV2313-J-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	22µF	Ceramic Cap,25V,X5R	1206	muRata	GRM31CR61E226KE15L
1	C2	22µF	Ceramic Cap,10V,X7R	1206	muRata	GRM31CR71A226KE15L
1	C3	22pF	Ceramic Cap,50V,C0G	0603	muRata	GRM1885C1H220JA01D
2	C4,C5	0.1µF	Ceramic Cap,16V,X7R	0603	muRata	GRM188R71C104KA01D
1	C6	0.1µF	Ceramic Cap,25V,X7R	0603	muRata	GRM188R71E104KA01D
1	R1	20k	Thick Film Res,1%	0603	ROYAL	RL0603FR-0720KL
1	R2	6.34k	Thick Film Res,1%	0603	ROYAL	RL0603FR-076K34L
1	R3	40.2k	Thick Film Res,1%	0603	ROYAL	RL0603FR-0740K2L
1	R4	100k	Thick Film Res,1%	0603	ROYAL	RL0603FR-07100KL
1	R5	NS				
1	R6	20Ω	Thick Film Res,1%	0603	ROYAL	RL0603FR-0720RL
1	R7	10Ω	Thick Film Res,1%	0603	ROYAL	RL0603FR-0710RL
1	L1	1µH	Inductor, DCR=8.4mΩ, Isat=10.2A	SMD	Wurth	744777001
			Inductor,DCR=14mΩ Isat=5.26A	SMD	Sunlord	SWPA4030S1R0NT
1	U1	MP2313GJ	Synchronous Step-Down Convert	TSOT23-8	MPS	MP2313GJ

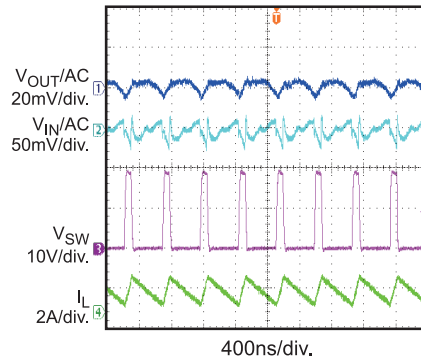
EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.
 $V_{IN} = 19V$, $V_{OUT} = 3.3V$, $T_A = 25^\circ C$, unless otherwise noted.

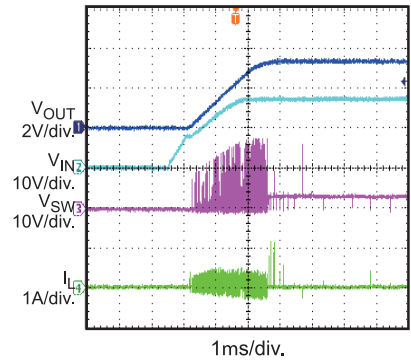
Input/Output Ripple
 $I_{OUT} = 0A$



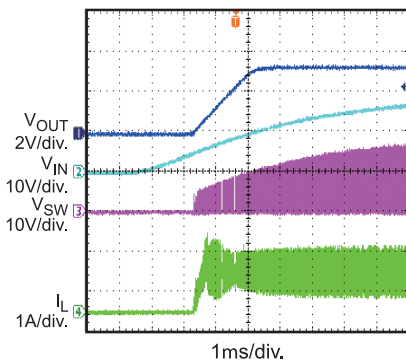
Input/Output Ripple
 $I_{OUT} = 1A$



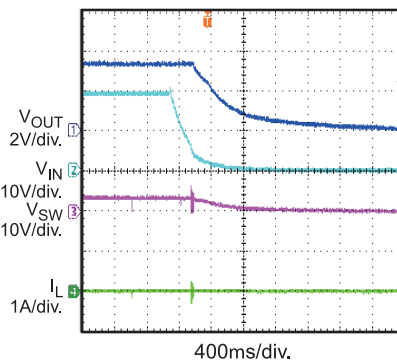
Startup through Input Voltage
 $I_{OUT} = 0A$



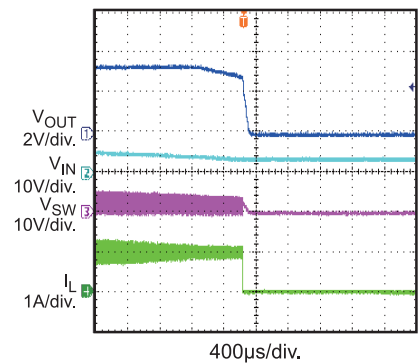
Startup through Input Voltage
 $I_{OUT} = 1A$



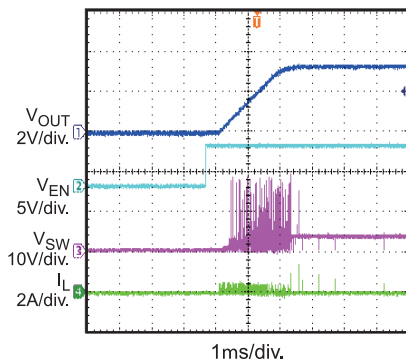
Shutdown through Input Voltage
 $I_{OUT} = 0A$



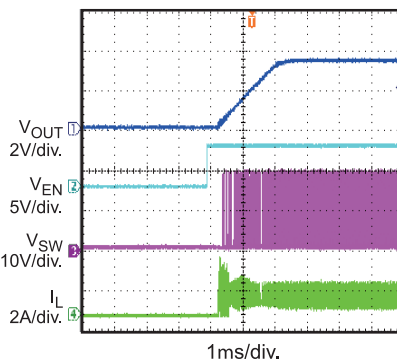
Shutdown through Input Voltage
 $I_{OUT} = 1A$



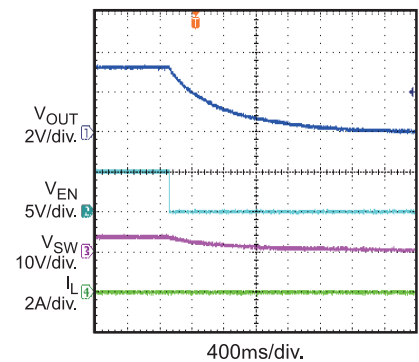
Startup through Enable
 $I_{OUT} = 0A$



Startup through Enable
 $I_{OUT} = 1A$



Shutdown through Enable
 $I_{OUT} = 0A$

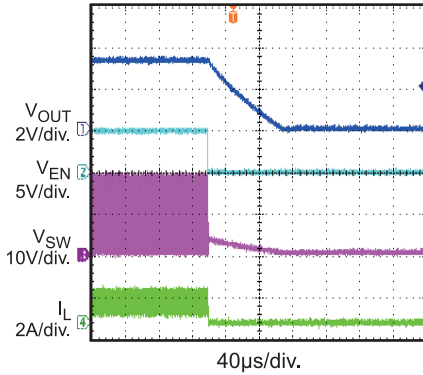


EVB TEST RESULTS (continued)

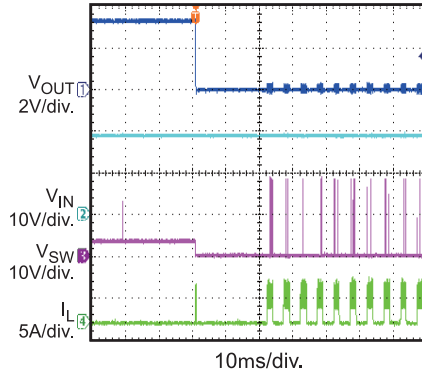
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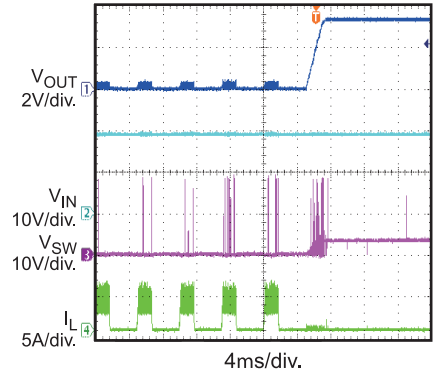
Shutdown through Enable
 $I_{OUT} = 1A$



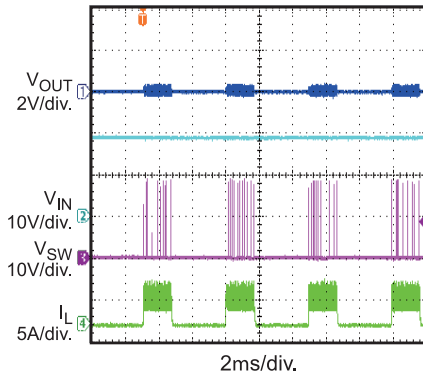
Short Circuit Entry
 $I_{OUT} = 0A$



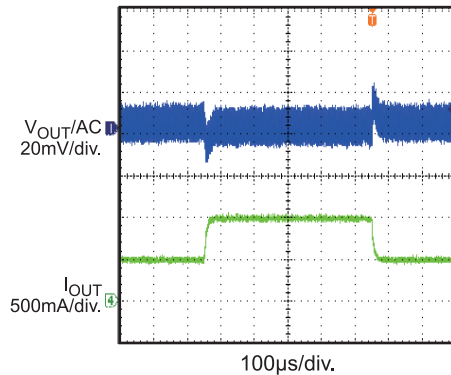
Short Circuit Recovery
 $I_{OUT} = 0A$



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



Load Transient
 $I_{OUT} = 0.5A$ to $1A$, $2.5A/\mu s$



PRINTED CIRCUIT BOARD LAYOUT

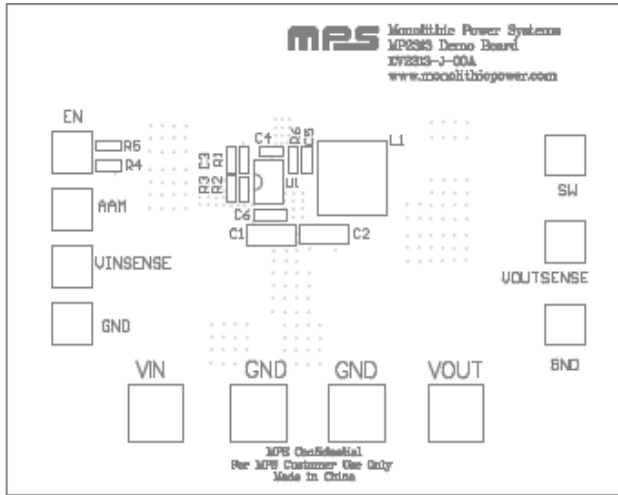


Figure 1—Top Silk Layer

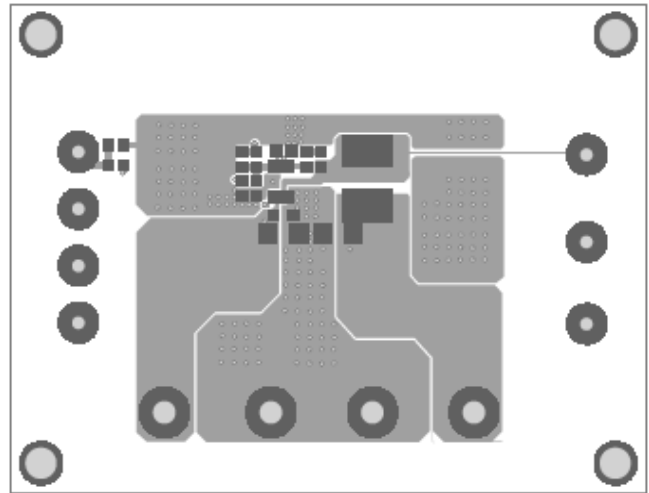


Figure 2—Top Layer

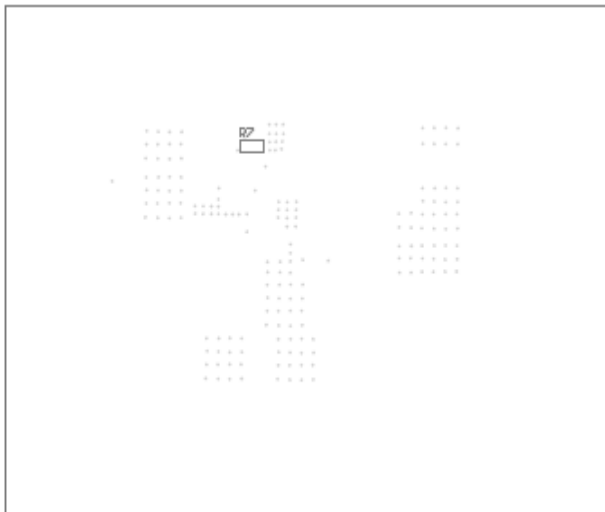


Figure 3—Bottom Silk Layer

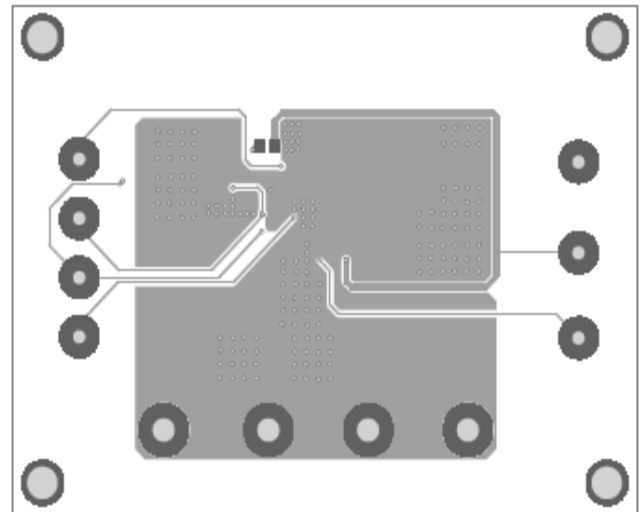


Figure 4—Bottom Layer