



The Future of Analog IC Technology®

# EV2318-J-00A

High Efficiency, 24V, 2A, 2MHz, Synchronous Step-Down Converter Evaluation Board

## DESCRIPTION

The EV2318-J-00A is an evaluation board for MP2318, a high frequency, synchronous, rectified, step-down converter with built-in Power MOSFETs. The MP2318 offers a very compact solution to achieve 2A 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 MP2318 requires a minimum number of readily available standard external components and is available in a space saving 8-pin TSOT23 package.

## ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	$V_{IN}$	4.5 – 24	V
Output Voltage	$V_{OUT}$	3.3	V
Output Current	$I_{OUT}$	2	A

## FEATURES

- Wide 4.5V to 24V Operating Input Range
- 2A Continuous Load Current
- 90mΩ/40mΩ 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
- OCP Protection and Hiccup
- Thermal Shutdown
- Output Adjustable from 0.8V
- Available in an 8-pin TSOT-23 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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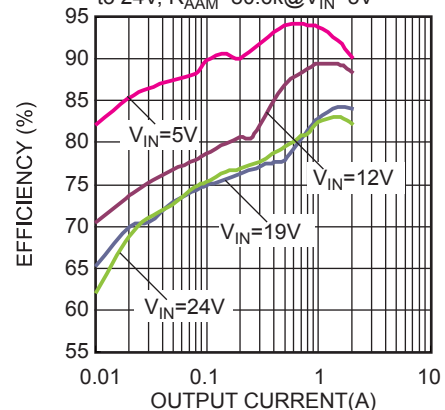
## EV2318-J-00A EVALUATION BOARD



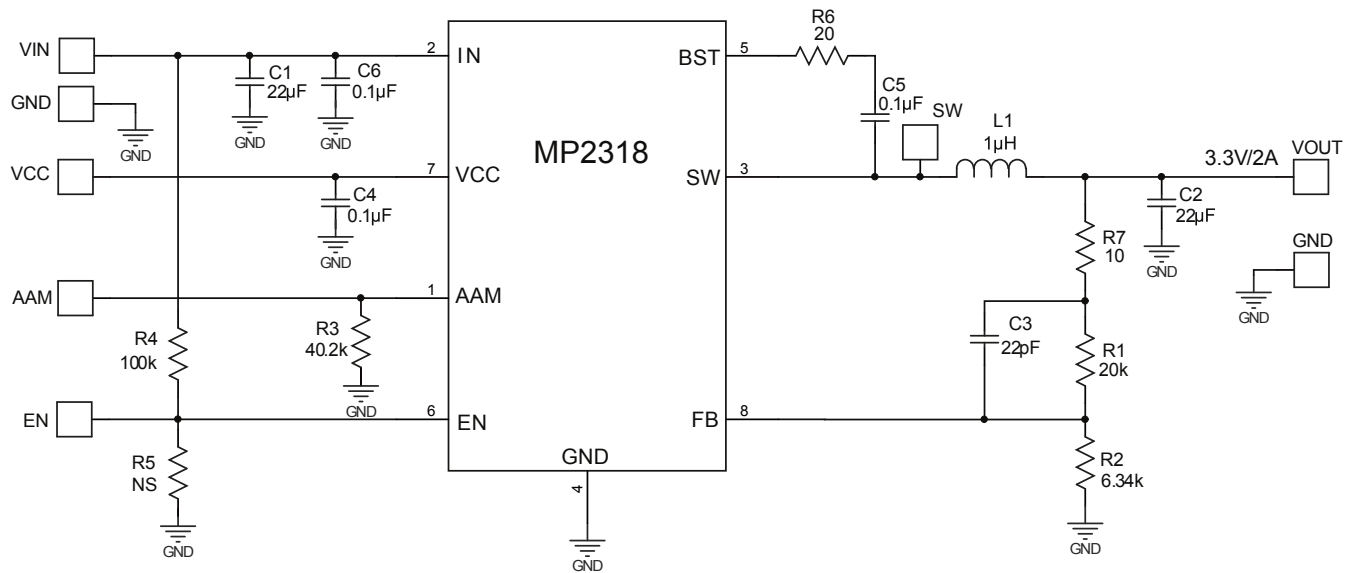
Board Number	MPS IC Number
EV2318-J-00A	MP2318GJ

### Efficiency vs. Output Current

$V_{OUT}=3.3V$ ,  $R_{AAM}=40.2k\Omega$  @  $V_{IN}=12V$   
to  $24V$ ,  $R_{AAM}=80.6k\Omega$  @  $V_{IN}=5V$



## EVALUATION BOARD SCHEMATIC

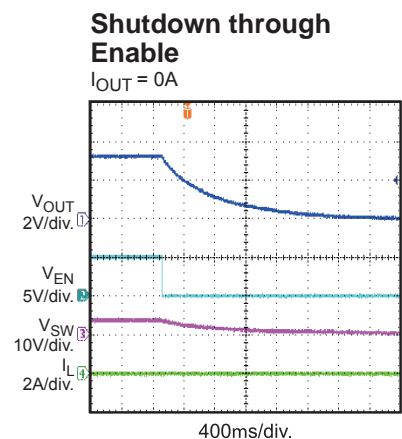
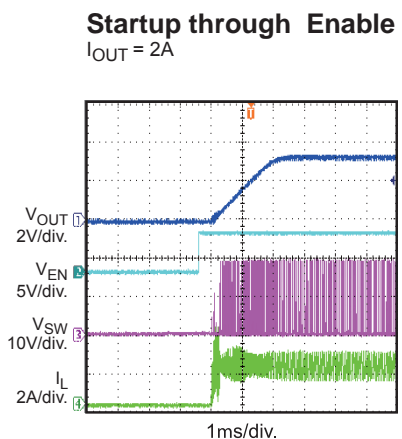
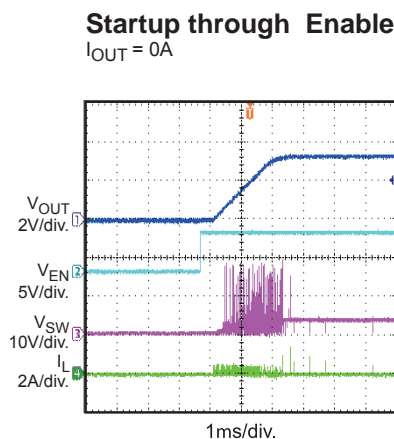
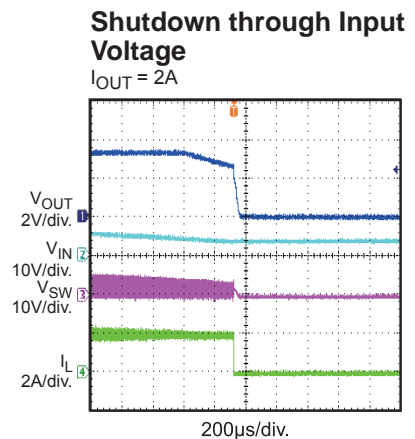
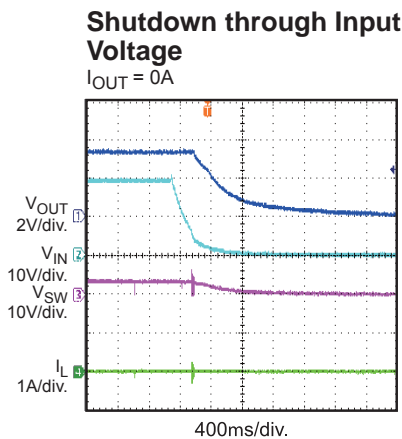
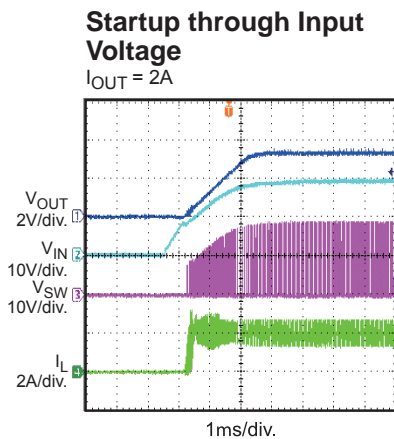
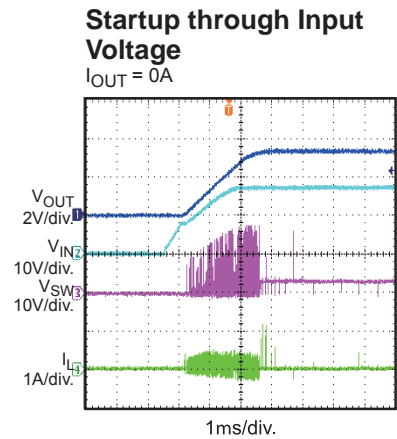
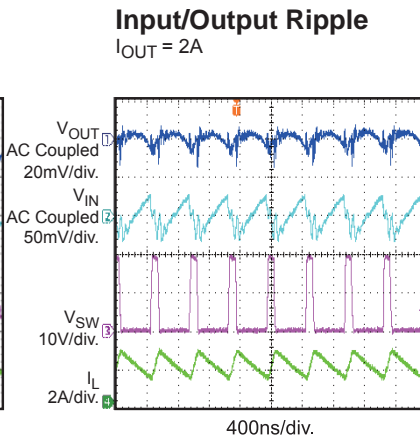
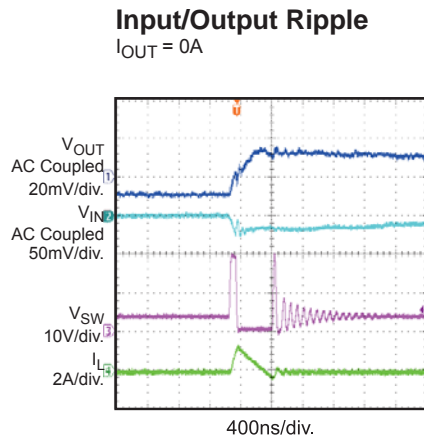


## EV2318-J-00A BILL OF MATERIALS

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	MP2318GJ	Synchronous Step-Down Convert	TSOT23-8	MPS	MP2318GJ

### 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.



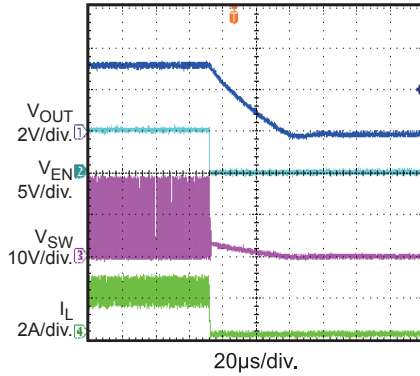
**EVB TEST RESULTS (continued)**

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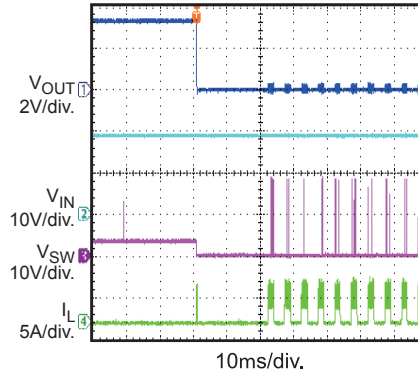
**Shutdown through Enable**

$I_{OUT} = 2A$



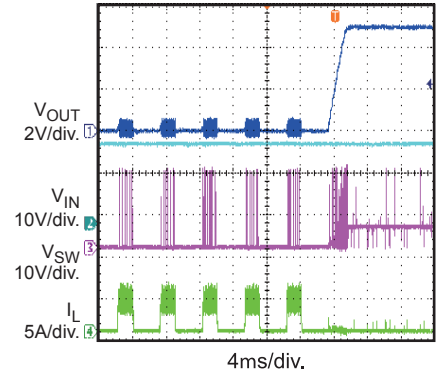
**Short Circuit Entry**

$I_{OUT} = 0A$



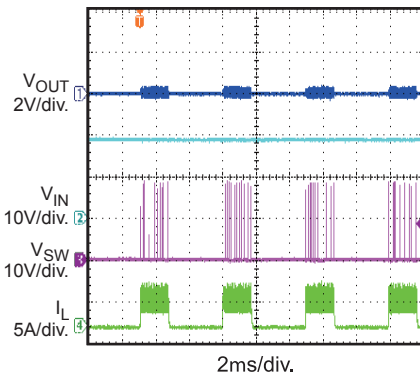
**Short Circuit Recovery**

$I_{OUT} = 0A$



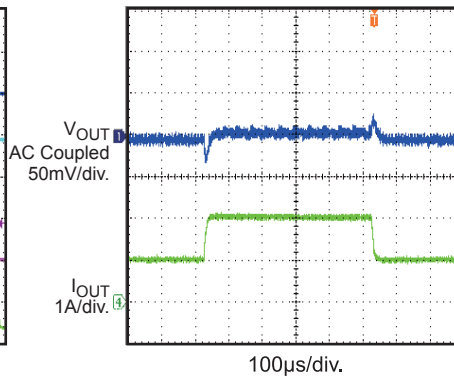
**Short Circuit Steady**

$I_{OUT} = 0A$

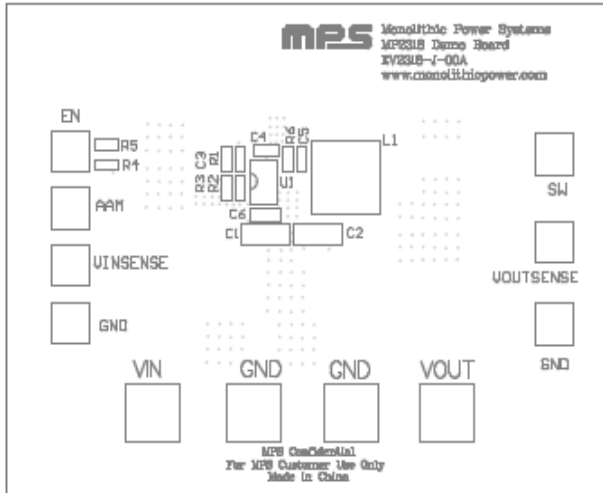


**Load Transient**

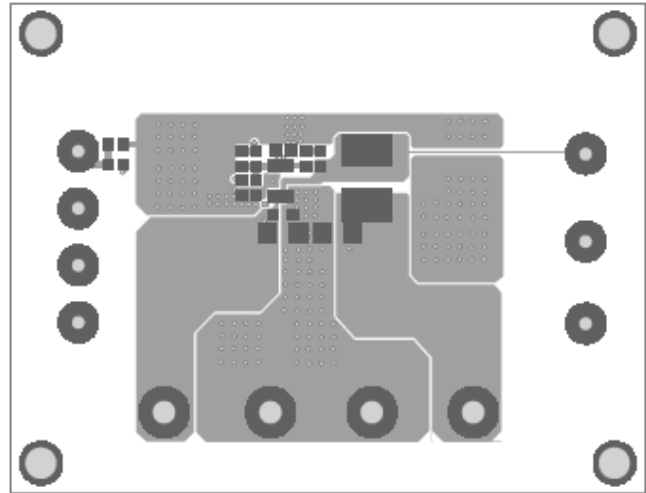
$I_{OUT} = 1A$  to  $2A$ ,  $2.5A/\mu s$



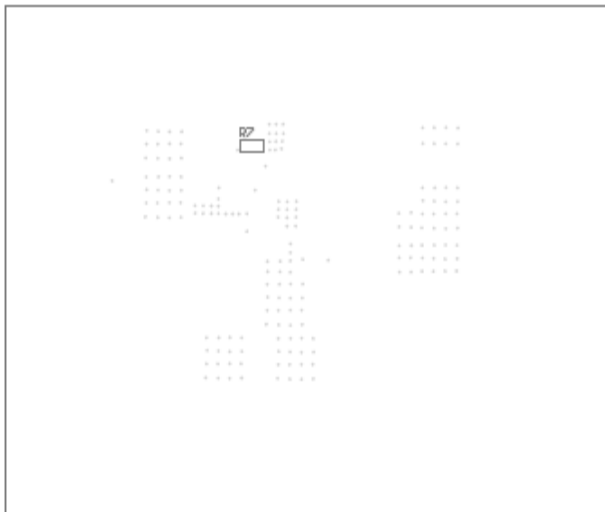
**PRINTED CIRCUIT BOARD LAYOUT**



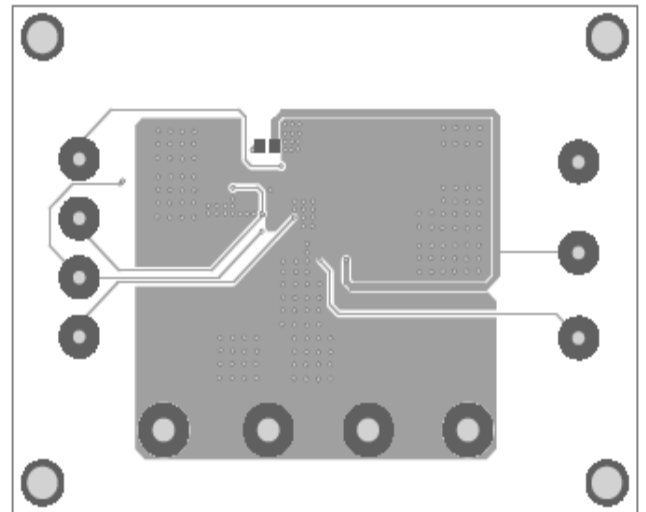
**Figure 1—Top Silk Layer**



**Figure 2—Top Layer**



**Figure 3—Bottom Silk Layer**



**Figure 4—Bottom Layer**