



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

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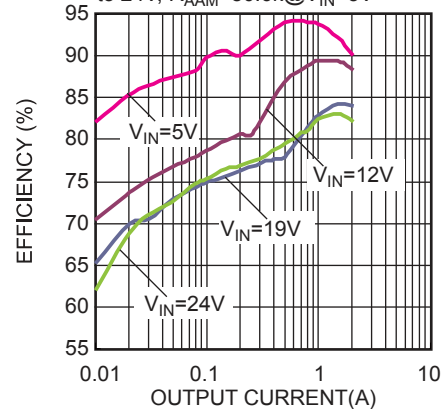
## EV2318-J-00A EVALUATION BOARD

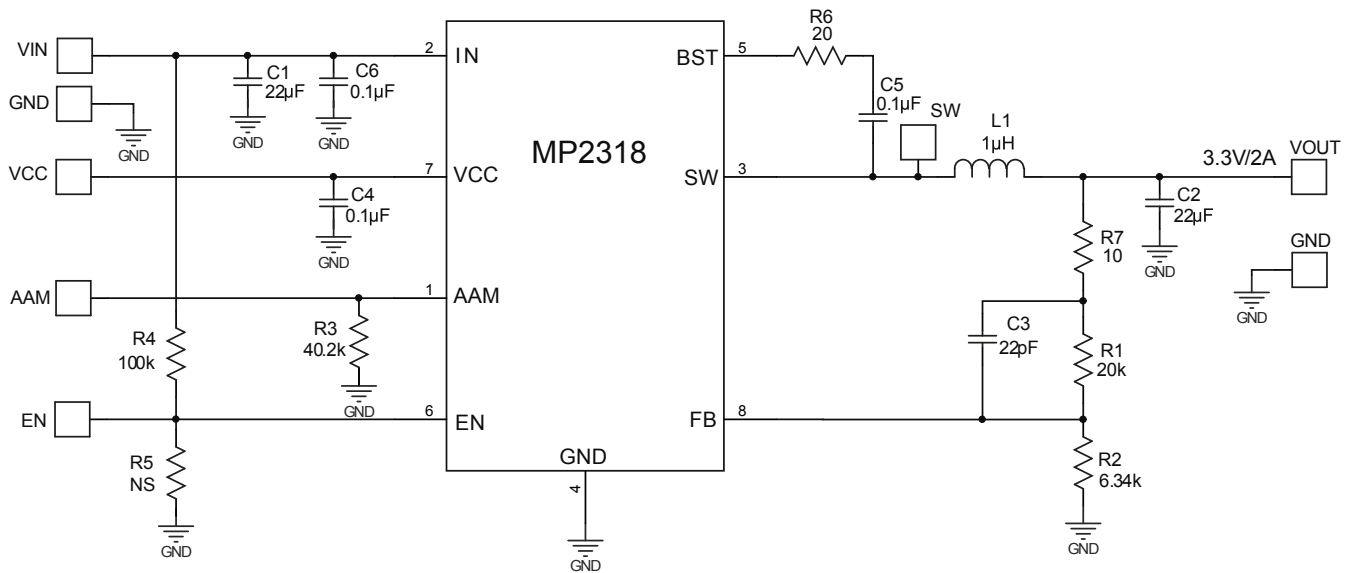


Board Number	MPS IC Number
EV2318-J-00A	MP2318GJ

### Efficiency vs. Output Current

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

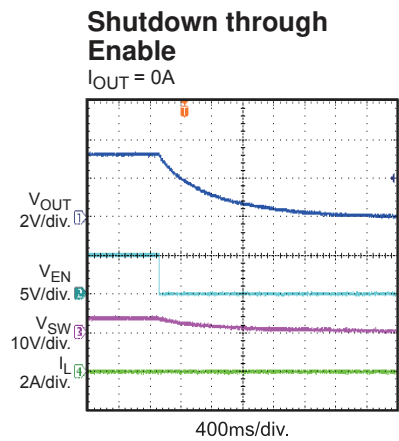
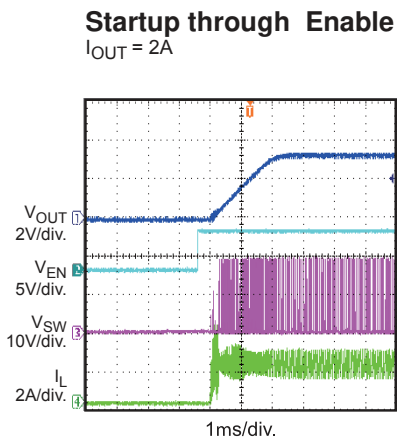
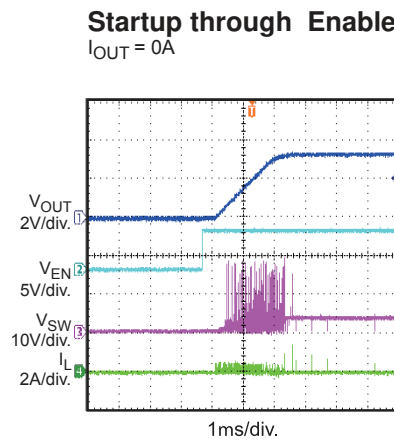
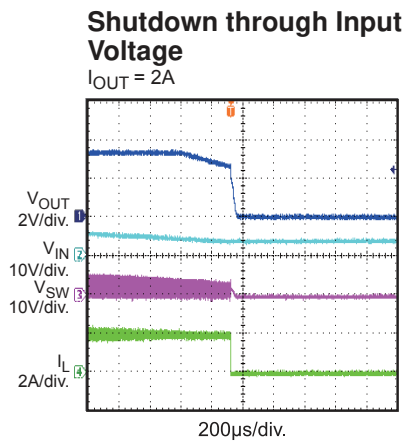
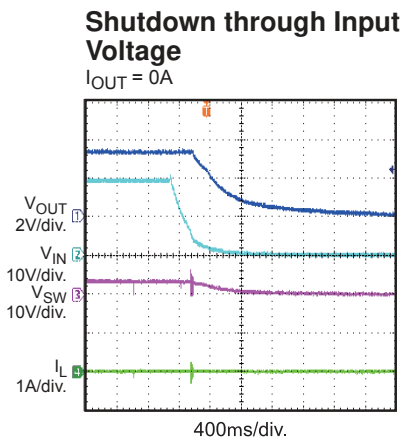
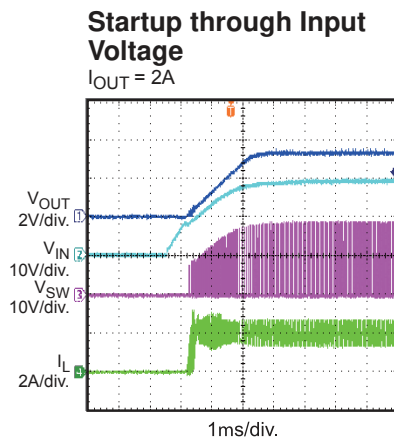
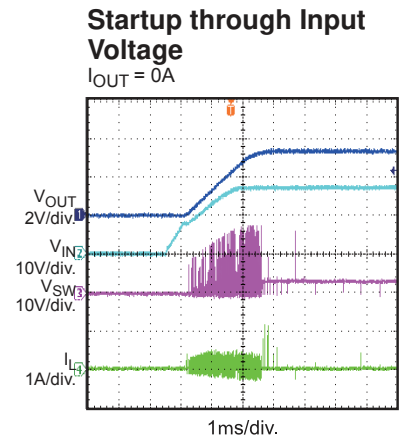
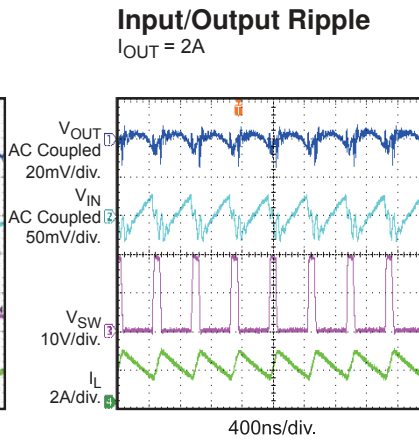
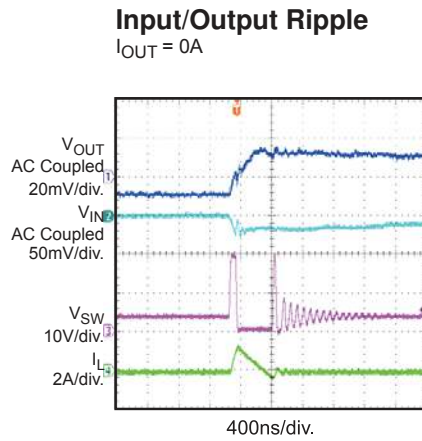


**EVALUATION BOARD SCHEMATIC**

**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	Würth	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.



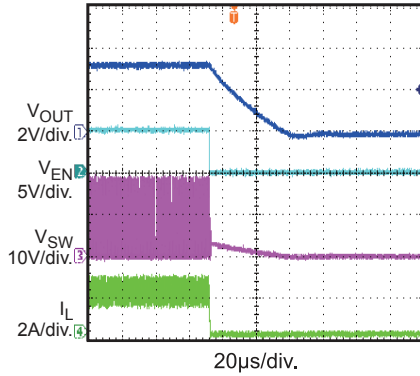
**EVB TEST RESULTS (continued)**

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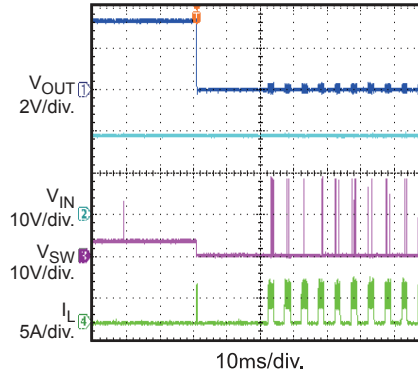
**Shutdown through Enable**

$I_{OUT} = 2A$



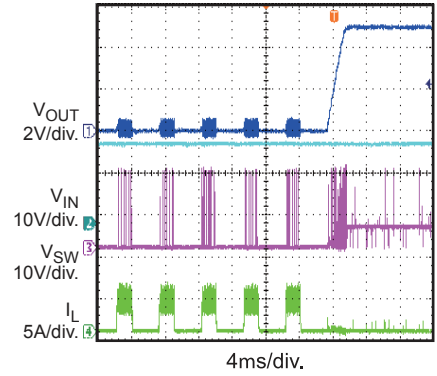
**Short Circuit Entry**

$I_{OUT} = 0A$



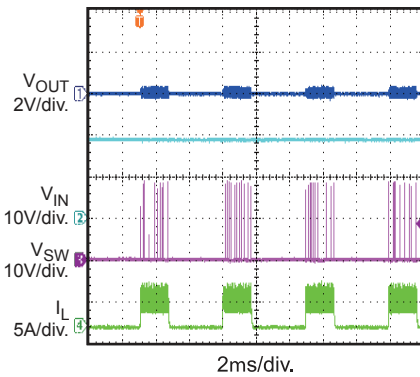
**Short Circuit Recovery**

$I_{OUT} = 0A$



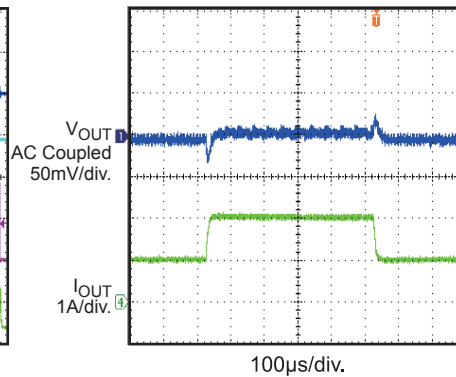
**Short Circuit Steady**

$I_{OUT} = 0A$



**Load Transient**

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



## PRINTED CIRCUIT BOARD LAYOUT

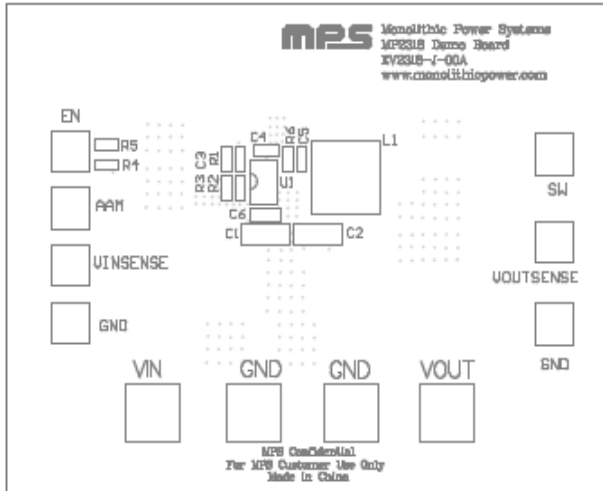


Figure 1—Top Silk Layer

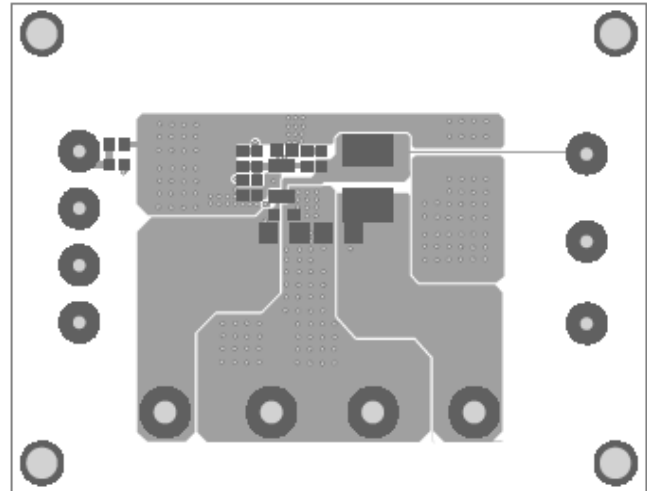


Figure 2—Top Layer

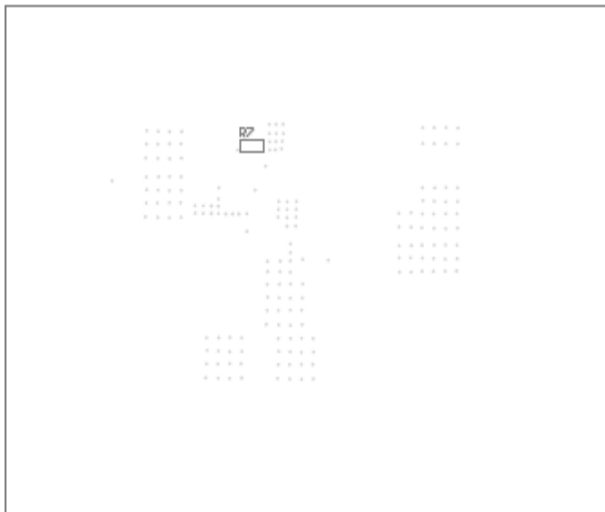


Figure 3—Bottom Silk Layer

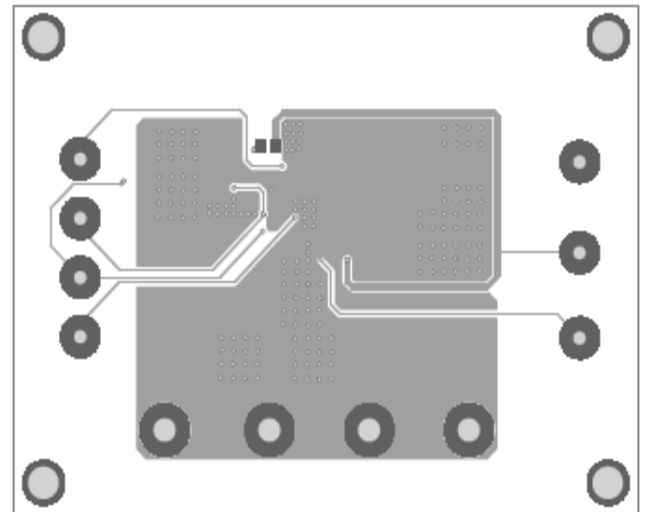


Figure 4—Bottom Layer

## QUICK START GUIDE

1. Connect the positive and negative terminals of the load to the VOUT and GND pins, respectively.
2. Preset the power supply output between 4.5V and 24V, and then turn off the power supply.
3. Connect the positive and negative terminals of the power supply output to the VIN and GND pins, respectively.
4. Turn the power supply on. The board will automatically start up.
5. To use the Enable function, apply a digital input to the EN pin. Drive EN higher than 1.6V to turn on the regulator, or less than 0.9V to turn it off.
6. Float AAM pin or drive AAM to a high level voltage to set MP2318 work at force PWM mode.

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