

### DESCRIPTION

The EV2233-J-00A demonstrates MPS's MP2233, a high-frequency, synchronous, rectified, step-down converter with built-in high-side and low-side power MOSFETs. The MP2233 offers a very compact solution to achieve a 3A continuous output current with excellent load and line regulation over a wide input supply range. The MP2233 has synchronous mode operation for higher efficiency over the output current load range.

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

Protective features include OCP and thermal shutdown.

The MP2233 is available in a space saving 8-pin TSOT23 package.

### ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	$V_{IN}$	5 – 16	V
Output Voltage	$V_{OUT}$	3.3	V
Output Current	$I_{OUT}$	3	A

### FEATURES

- Wide 5V to 16V Operating Input Range
- 80mΩ/30mΩ Low  $R_{DS(ON)}$  Internal Power MOSFET
- Proprietary Switching-Loss-Reduction Technique
- High-Efficiency Synchronous Mode Operation
- Default 1.4MHz Switching Frequency
- Externally-Programmable 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
- Distributed Power Systems

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.

"MPS" and "The Future of Analog IC Technology" are registered trademarks of Monolithic Power Systems, Inc.

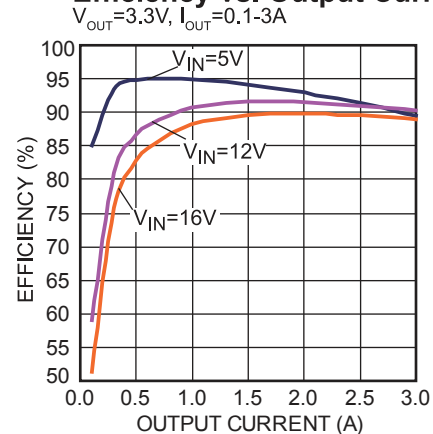
ADAM (Analog Digital Adaptive Modulation) and AAM (Advanced Asynchronous Mode) are trademarks of Monolithic Power Systems, Inc.

## EV2233-J-00A EVALUATION BOARD

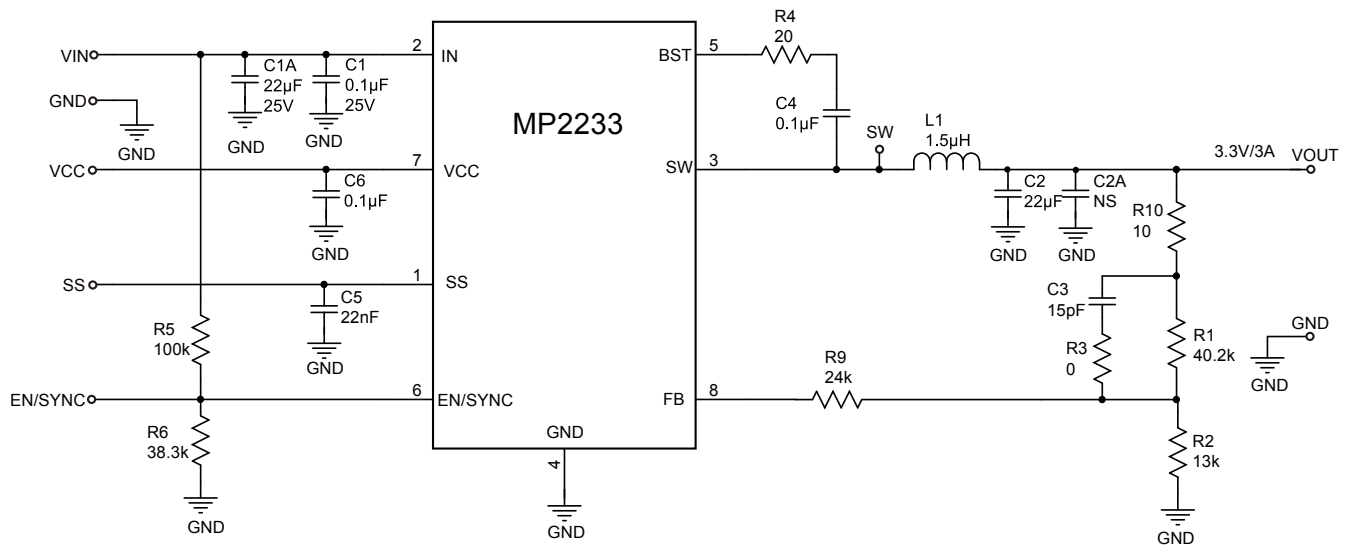


Board Number	MPS IC Number
EV2233-J-00A	MP2233DJ

### Efficiency vs. Output Current



## EVALUATION BOARD SCHEMATIC



## EV2233-J-00A BILL OF MATERIALS

Qty	RefDes	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	0.1μF	Ceramic Cap., 25V, X7R	0805	muRata	GRM21BR71E104KA01L
1	C1A	22μF	Ceramic Cap., 25V, X5R	1206	muRata	GRM31CR61E226KE15L
1	C2	22μF	Ceramic Cap., 10V, X7R	1206	muRata	GRM31CR70A226KE19L
1	C3	15pF	Ceramic Cap., 50V, C0G	0603	muRata	GRM1885C1H150JA01D
2	C4,C6	0.1μF	Ceramic Cap., 16V, X7R	0603	muRata	GRM188R71C104KA01D
1	C5	22nF	Ceramic Cap., 50V, X7R	0603	muRata	GRM188R71H223KA01D
	C2A,C7	NS				
1	R1	40.2K	Thick Film Res., 1%	0603	Yageo	RC0603FR-0740K2L
1	R2	13K	Thick Film Res., 1%	0603	Yageo	RC0603FR-0713KL
1	R3	0Ω	Thick Film Res., 1%	0603	Yageo	RC0603JR-070RL
1	R4	20Ω	Thick Film Res., 1%	0603	Yageo	RC0603FR-0720RL
1	R5	100K	Thick Film Res., 1%	0603	Yageo	RC0603FR-07100KL
1	R6	38.3K	Thick Film Res., 1%	0603	Yageo	RC0603FR-0738K3L
1	R9	24K	Thick Film Res., 1%	0603	Yageo	RC0603FR-0724KL
1	R10	10Ω	Thick Film Res., 1%	0603	Yageo	RC0603FR-0710RL
1	L1	1.5μH	Inductor, DCR=10mΩ, Is=11A	7×7×4	Würth	744311150
1	U1	MP2233 DJ	Synchronous Step-Down Convert	TSOT23-8	MPS	MP2233DJ

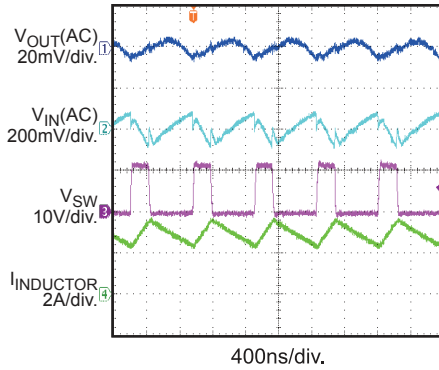
### EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.

$V_{IN}=12V$ ,  $V_{OUT}=3.3V$ ,  $L=1.5\mu H$ ,  $T_A=25^\circ C$ , unless otherwise noted.

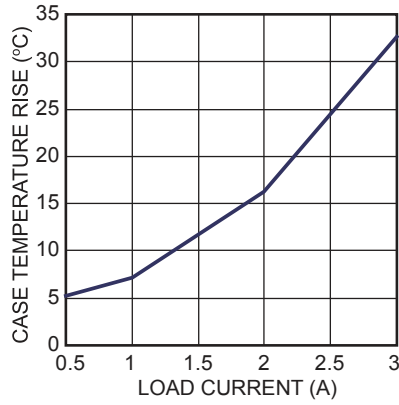
#### Input/Output Ripple

$I_{OUT} = 3A$



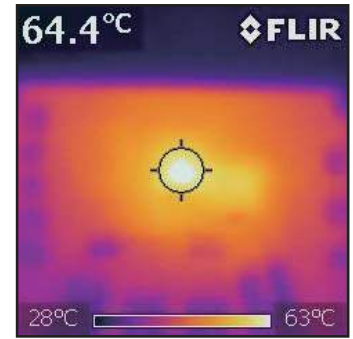
#### Case Temperature Rise vs. Output Current

$I_{OUT} = 0.5A - 3A$



#### Infrared Thermal Image

$I_{OUT} = 3A$ ,  $T_A = 31^\circ C$



### PRINTED CIRCUIT BOARD LAYOUT

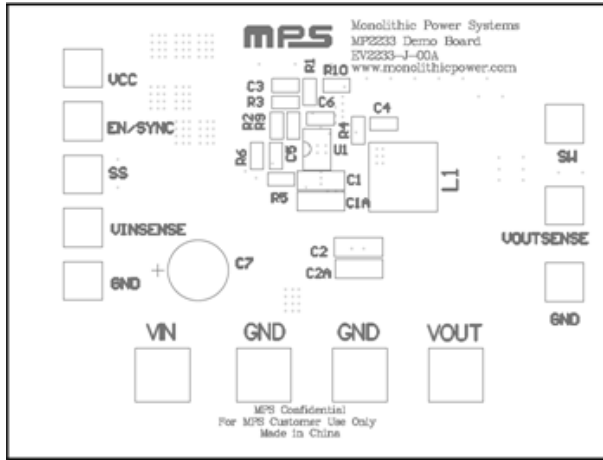


Figure 1—Top Silk Layer

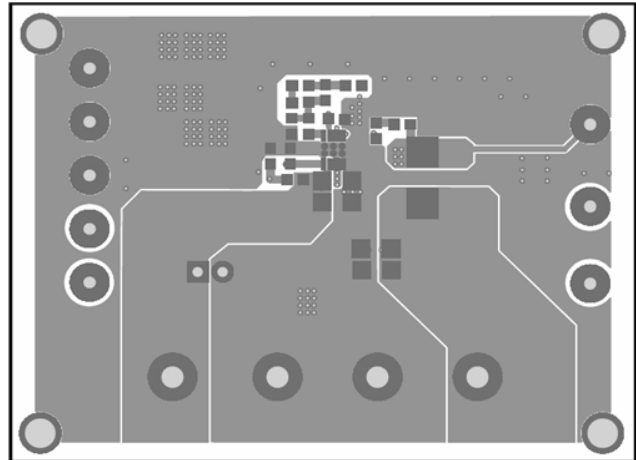


Figure 2—Top Layer

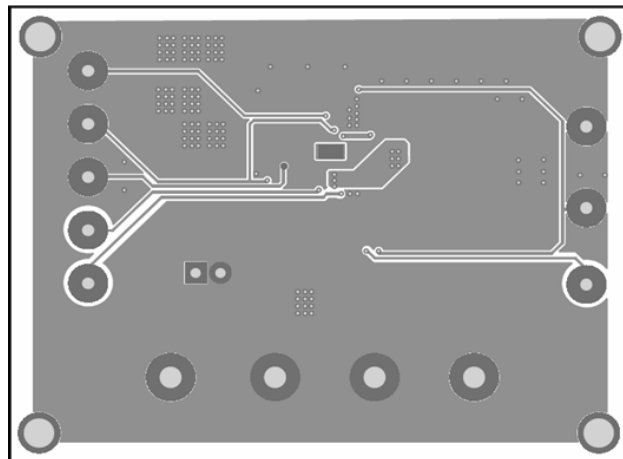


Figure 3—Bottom Layer

## 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 5V and 16V, 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 1.4V to turn on the regulator or less than 1.25V to turn it off.

**NOTICE:** The information in this document is subject to change without notice. Please contact MPS for current specifications. Users should warrant and guarantee that third party Intellectual Property rights are not infringed upon when integrating MPS products into any application. MPS will not assume any legal responsibility for any said applications.