EV2228-J-00A

High-Efficiency, 2A, 16V, 800kHz Sync. Step-Down Switch Evaluation Board

The Future of Analog IC Technology

DESCRIPTION

The EV2228-J-00A demonstrates MPS's MP2228, a high-frequency, synchronous, rectified, step-down converter with built-in high-side and low-side power MOSFETs. The MP2228 offers a very compact solution to achieve a 2A continuous output current with excellent load and line regulation over a wide input supply range. The MP2228 has synchronous mode operation for higher efficiency over the output current load range.

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

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

The MP2228 is available in a space-saving 8-pin TSOT23 package.

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	V_{IN}	6 – 16	V
Output Voltage	V_{OUT}	3.3	V
Output Current	I_{OUT}	2	A

FEATURES

- Wide 6V to 16V Operating Input Range
- 100mΩ/40mΩ Low $R_{DS(ON)}$ Internal Power MOSFET
- Proprietary Switching-Loss–Reduction Technique
- High-Efficiency Synchronous Mode Operation
- Default 800kHz Switching Frequency
- AAM Power-Save Mode
- 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
- Distributed Power Systems

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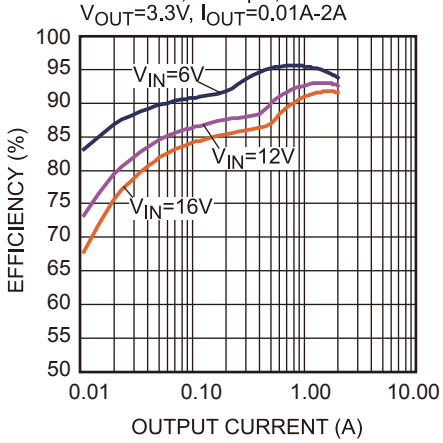
EV2228-J-00A EVALUATION BOARD

Board Number	MPS IC Number
EV2228-J-00A	MP2228DJ

Efficiency vs. Output Current

AAM=0.4V, L=4.7μH, V_{OUT}=3.3V, I_{OUT}=0.01A-2A



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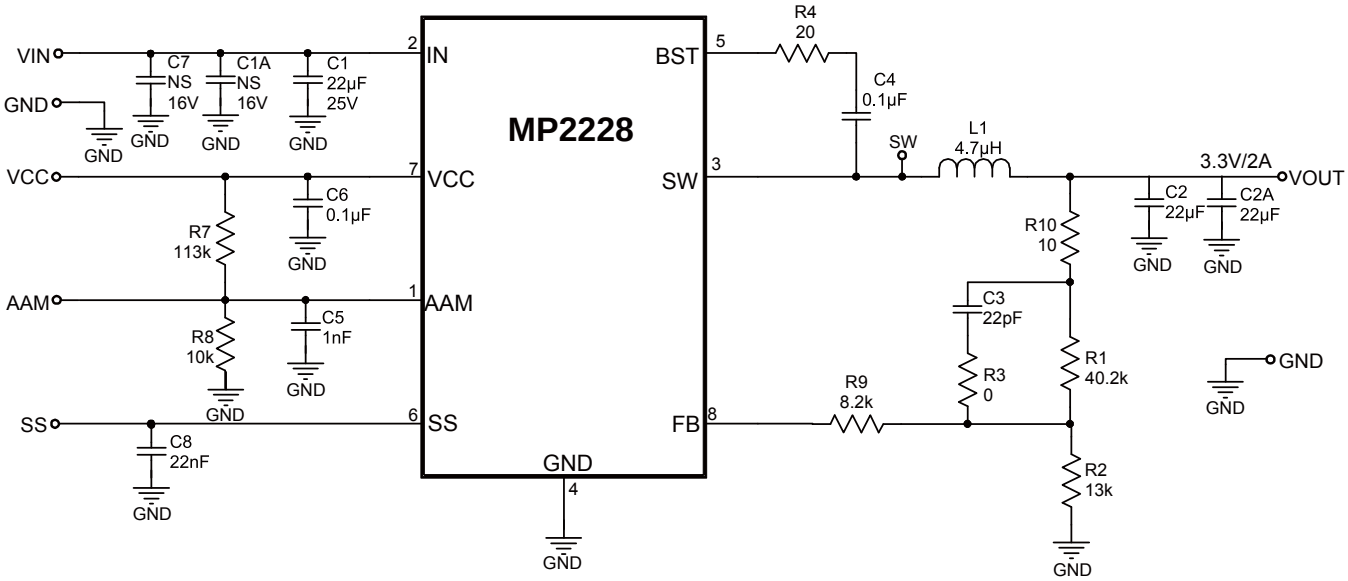
EVALUATION BOARD SCHEMATIC



EV2228-J-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	22µF	Ceramic Cap.,25V, 10%, X5R	1206	muRata	GRM31CR61E226KE15L
2	C1A, C7	NS				
2	C2, C2A	22µF	Ceramic Cap., 10V, X7R	1206	muRata	GRM21BR60J226ME39L
1	C3	22pF	Ceramic Cap., 50V, C0G	0603	muRata	GRM1885C1H220JA01D
2	C4, C6	0.1µF	Ceramic Cap., 16V, X7R	0603	muRata	GRM188R71C104KA01D
1	C5	1nF	Ceramic Cap., 50V, X7R	0603	muRata	GRM188R71H102KA01D
1	C8	22nF	Ceramic Cap,16V,X7R	0603	muRata	GRM188R71C223KA01D
1	R1	40.2k	Thick Film Res., 1%	0603	ROYAL	RL0603FR-0740K2L
1	R2	13k	Thick Film Res., 1%	0603	ROYAL	RL0603FR-0713KL
1	R3	0Ω	Thick Film Res., 1%	0603	ROYAL	RL0603L000JT
1	R4	20Ω	Thick Film Res., 5%	0603	ROYAL	RL0603FR-0720RL
1	R7	113k	Thick Film Res., 1%	0603	ROYAL	RL0603FR-07113KL
1	R8	10k	Thick Film Res., 1%	0603	ROYAL	RL0603FR-0710KL
1	R9	8.2k	Thick Film Res., 1%	0603	ROYAL	RL0603FR-078K2L
1	R10	10Ω	Thick Film Res., 1%	0603	ROYAL	RL0603FR-0710RL
1	L1	4.7µH	Inductor, DCR=19.5mΩ, Is=7.0A	SMD	Wurth	744311470
1	U1	MP2228-J	Synchronous Step-Down Convert	TSOT23-8	MPS	MP2228-J

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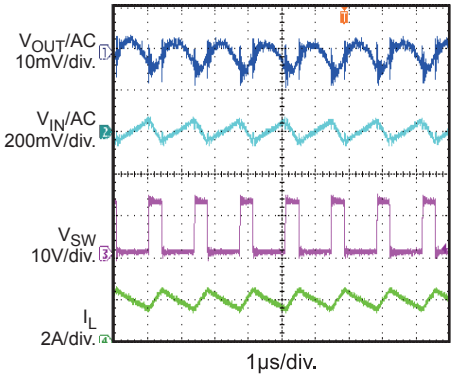
EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.
V_{IN} = 12V, V_{OUT} = 3.3V, L = 4.7µH, T_A = 25°C, unless otherwise noted.

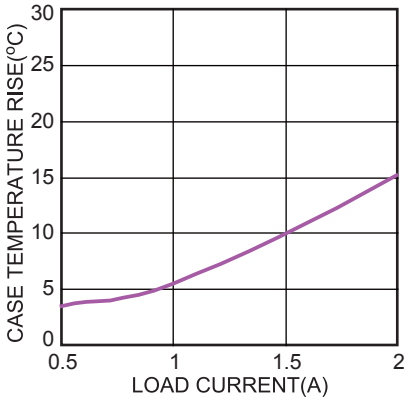
Input/Output Ripple

I_{OUT} = 2A



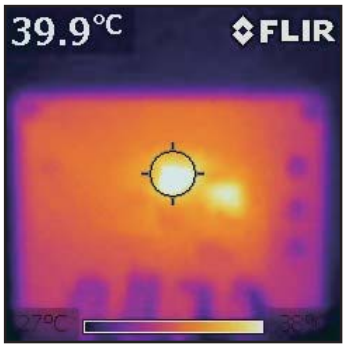
Case Temperature Rise vs. I_{OUT}

I_{OUT}=0.5A-2A



Infrared Thermal Image

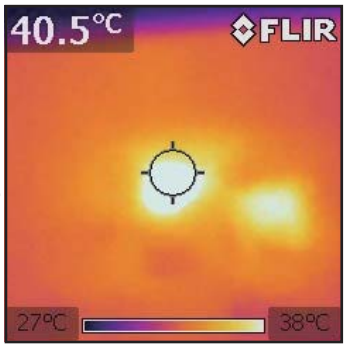
I_{OUT}=2A



Zoom in

Infrared Thermal Image

I_{OUT}=2A



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PRINTED CIRCUIT BOARD LAYOUT

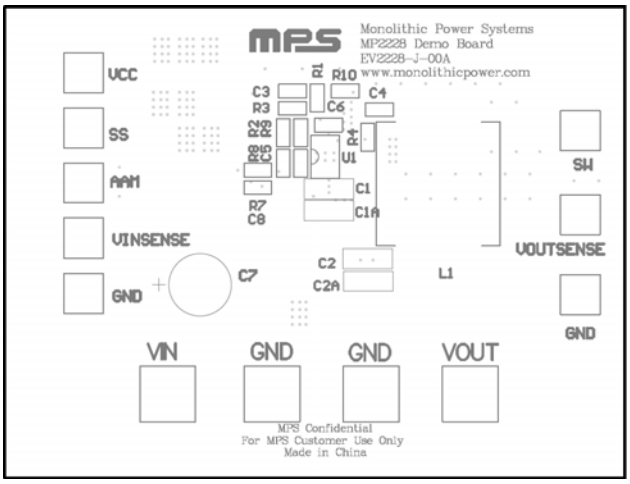

Figure 1—Top Silk Layer

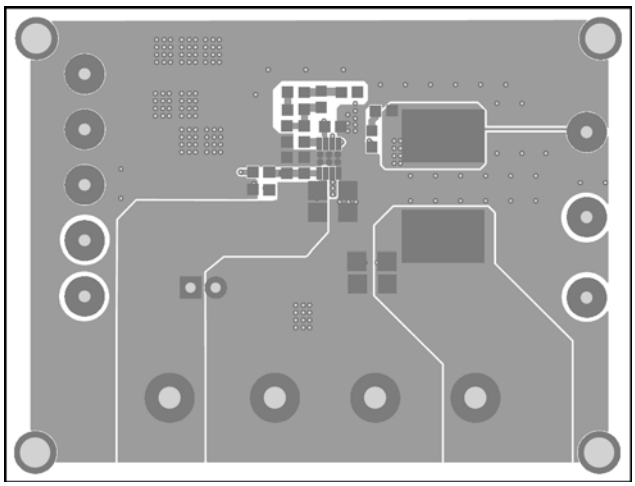

Figure 2—Top Layer

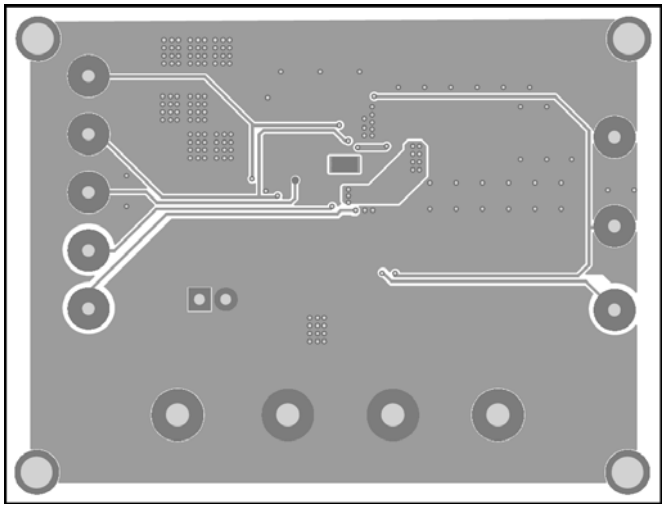

Figure 3—Bottom Layer

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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 6V 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.

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