

# EV2324-J-00A

High Efficiency, 2A, 24V, 500kHz Step-Down Switch Evaluation Board

The Future of Analog IC Technology

## DESCRIPTION

The EV2324-J-00A demonstrates MPS's MP2324, a high-frequency, synchronous, rectified, step-down converter with built-in highside and low-side power MOSFETs. The MP2324 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 MP2324 has svnchronous mode operation for hiaher 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 MP2324 is available in a space-saving 8-pin TSOT23 package.

## **ELECTRICAL SPECIFICATION**

Parameter	Symbol	Value	Units
Input Voltage	V <sub>IN</sub>	4.5 – 24	V
Output Voltage	$V_{OUT}$	3.3	V
Output Current	I <sub>OUT</sub>	2	Α

# FEATURES

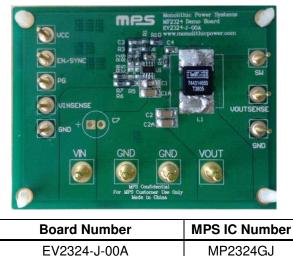
- Wide 4.5V to 24V Operating Input Range
- $120m\Omega/50m\Omega$  Low Rds(on) Internal Power MOSFETs
- Low Quiescent Current
- High Efficiency Synchronous Mode
  Operation
- Fixed 500kHz Switching Frequency
- Frequency Sync from 200kHz to 2MHz External Clock
- Power Save Mode at light load
- Internal Soft Start
- Power Good Indicator
- OCP Protection and Hiccup
- Thermal Shutdown
- Output Adjustable from 0.8V
- Available in an 8-pin TSOT-23 package

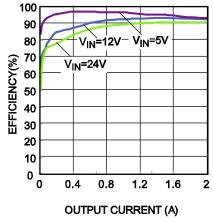
#### **APPLICATIONS**

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

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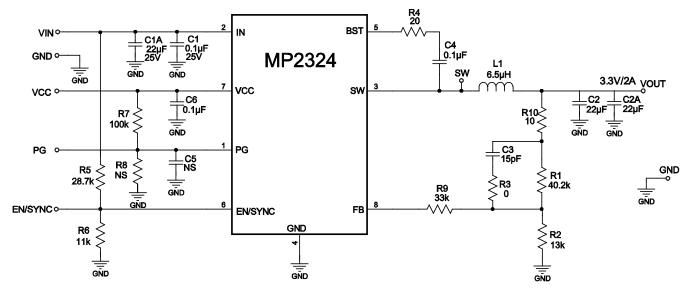
## **EV2324-J-00A EVALUATION BOARD**







## **EVALUATION BOARD SCHEMATIC**



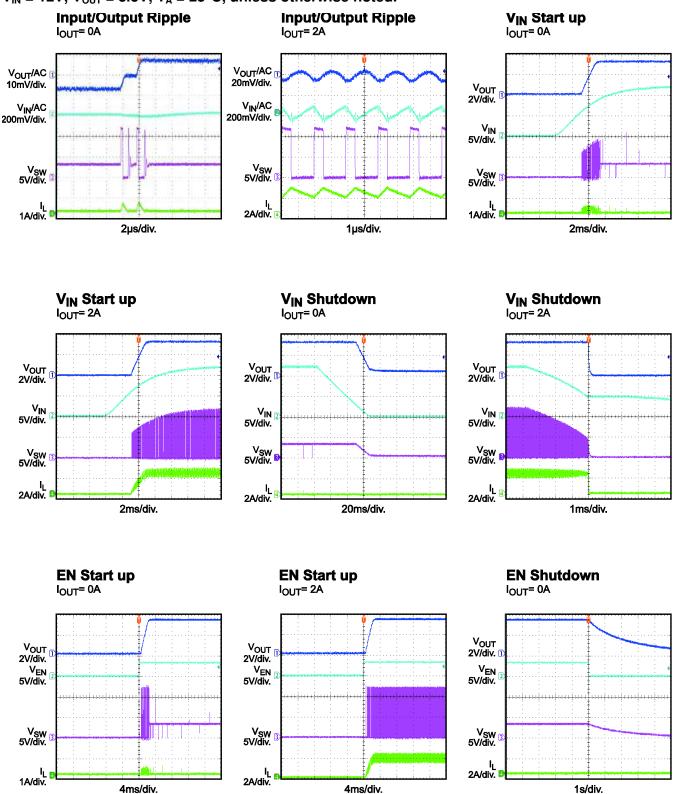
#### **EV2324-J-00A BILL OF MATERIALS**

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
0	C7,R8, C5	NS				
2	C2,C2A	22µF	Ceramic Cap., 10V, X7R	1206	muRata	GRM21BR60J226ME39L
1	C3	15pF	Ceramic Cap., 50V, C0G	0603	muRata	GRM1885C1H150JA01D
2	C4,C6	0.1µF	Ceramic Cap., 16V, X7R	0603	muRata	GRM188R71C104KA01D
1	R1	40.2k	Thick Film Res., 1%	0603	Yageo	9C06031A4022FKHFT
1	R2	13k	Thick Film Res., 1%	0603	Yageo	9C06031A132FKHFT
1	R3	0Ω	Thick Film Res., 1%	0603	Yageo	9C06031A0R00JLHFT
1	R4	20Ω	Thick Film Res., 5%	0603	Yageo	9C06031A20R0JLHFT
1	R5	28.7k	Thick Film Res., 1%	0603	Yageo	9C06031A2872FKHFT
1	R6	11k	Thick Film Res., 1%	0603	Yageo	9C06031A1102FKHFT
1	R7	100k	Thick Film Res., 1%	0603	Yageo	9C06031A1003FKHFT
1	R9	33k	Thick Film Res., 1%	0603	Yageo	9C06031A3302FKHFT
1	R10	10Ω	Thick Film Res., 1%	0603	Yageo	9C06031A20R0FKHFT
1	L1	6.5µH	Inductor, DCR=21.5mΩ, Is=6A	SMD	Wurth	744314650
1	U1	MP2324	Synchronous Step-Down Convert	TSOT23- 8	MPS	MP2324GJ



#### **EVB TEST RESULTS**

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



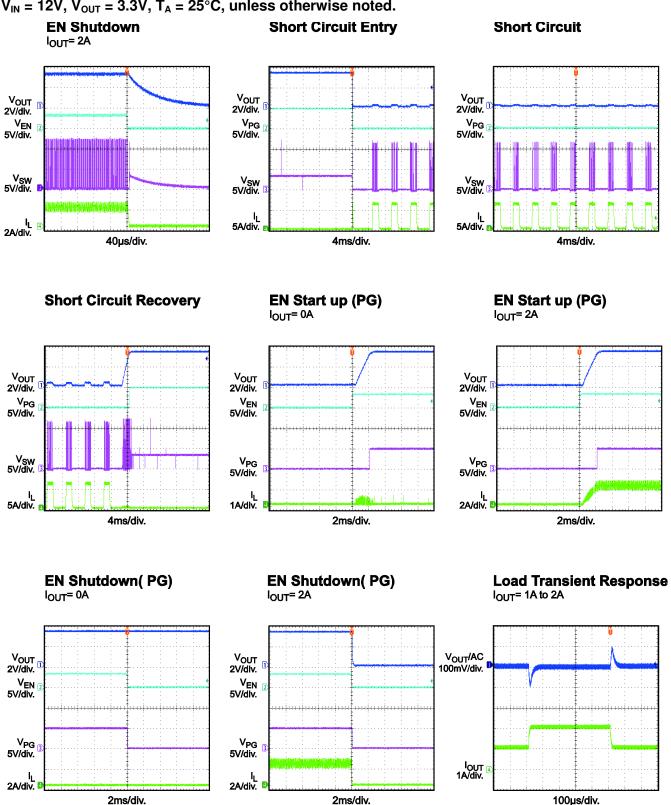
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#### EVB TEST RESULTS (continued)

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



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## PRINTED CIRCUIT BOARD LAYOUT

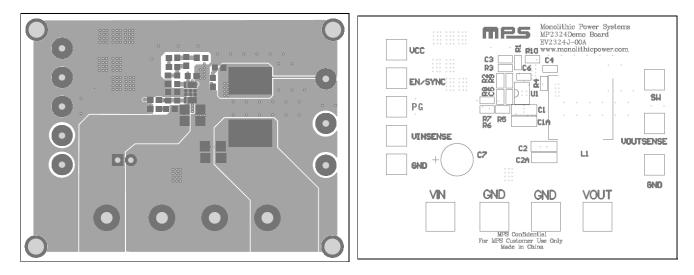


Figure 1—Top Layer

Figure 2—Top Silk Layer

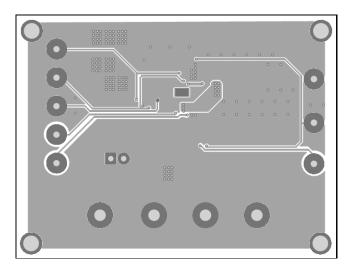


Figure 3—Bottom Layer



#### **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 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/SYNC pin. Drive EN higher than 1.4V to turn on the regulator, or less than 1.25V to turn it off.
- 6. To use the external synchronous function to adjust the switching frequency, apply an external clock signal to EN/SYNC pin.

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