

DESCRIPTION

The MP2344 is a high frequency synchronous rectified step-down switch mode converter with built in internal power MOSFETs. It offers a very compact solution to achieve 2A continuous output current over a wide input supply range with excellent load and line regulation.

The Evaluation Board can deliver a 2A continuous output current with excellent load and line regulation over a wide input supply range.

Full protection features include over-current protection and thermal shut down.

The MP2344 requires a minimum number of readily-available standard external components and is available in a space saving 6-pin TSOT23 package.

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	V _{IN}	7.5 – 26	V
Output Voltage	V _{OUT}	5	V
Output Current	I _{OUT}	2	A

FEATURES

- Wide 7.5V to 26V Operating Input Range
- 2A Load Current
- 95mΩ/45mΩ Low R_{ds(on)} Internal Power MOSFETs
- Power Save Mode for Light Load Condition
- 600kHz Fixed Switching Frequency at CCM
- Switching Node Ringing Reduction
- Internal Soft Start
- OCP Protection and Hiccup
- Thermal Shutdown
- Output Adjustable from 3.3V
- Available in a 6-pin TSOT23 package

APPLICATIONS

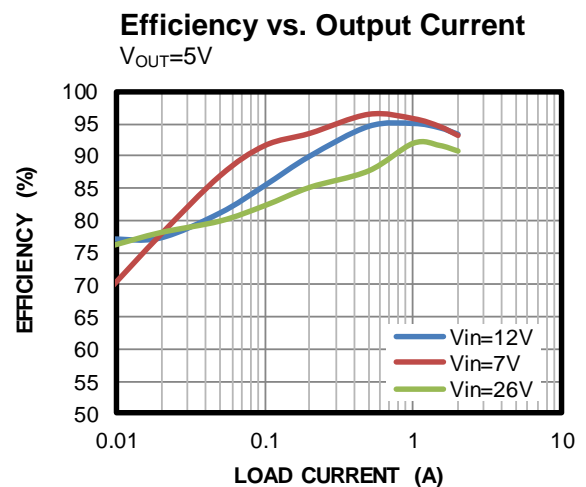
- Standby Power Supply
- White Goods
- Flat Panel Television and Monitors

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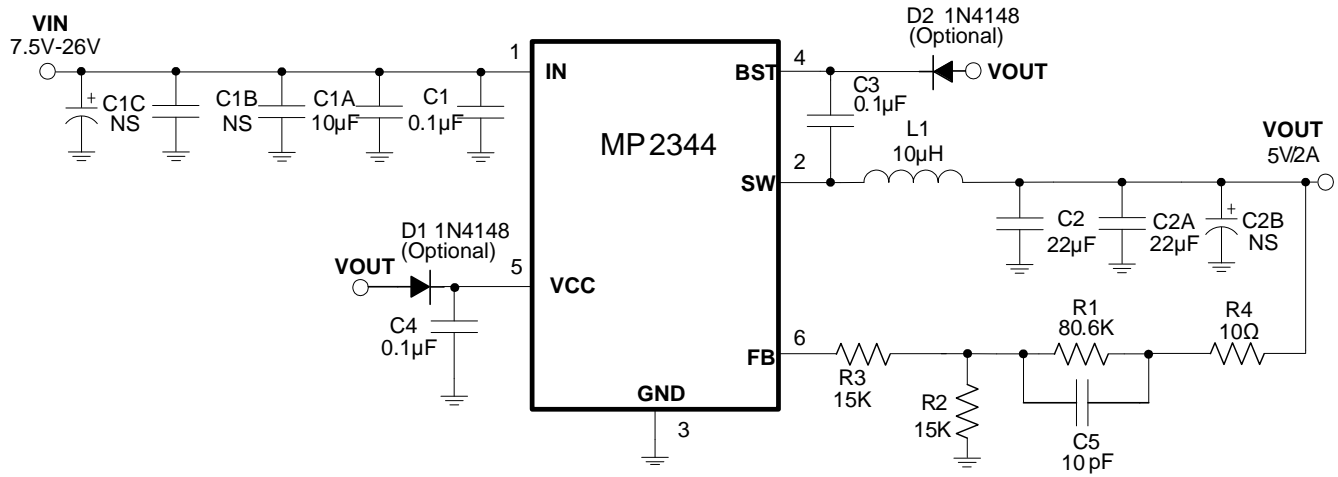
EV2344-J-00A EVALUATION BOARD



Board Number	MPS IC Number
EV2344-J-00A	MP2344GJ



EVALUATION BOARD SCHEMATIC



EV2344-J-00A BILL OF MATERIALS

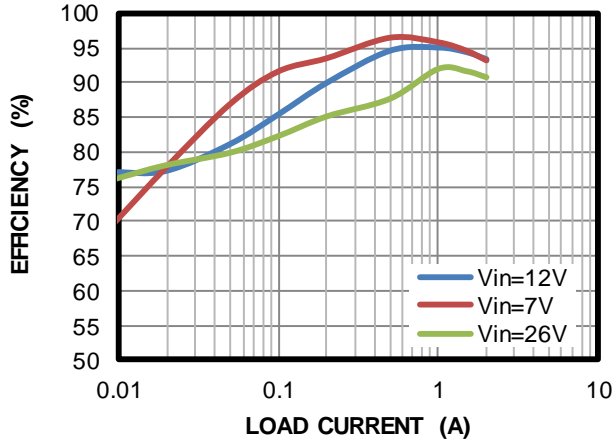
Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
1	C1	0.1µF	Ceramic Cap,50V,X7R	0603	Murata	GRM188R71H104KA93D
2	C3, C4	0.1µF	Ceramic Cap,25V,X7R	0603	Murata	GRM188R71E104KA01D
1	C1A	10µF	Ceramic Cap,50V,X5R	1206	Murata	GRM31CR61H106KA12L
2	C2, C2A	22µF	Ceramic Cap, 25V, X5R	1206	Murata	GRM31CR61E226KE15L
0	C1C, C2B, C1B	NS				
1	C5	10pF	Ceramic Cap,50V,C0G	0603	Murata	GRM1885C1H100JA01D
0	D1, D2	NS				
1	R1	80.6kΩ	Film Res., 1%	0603	Yageo	RC0603FR-0780K6L
2	R2, R3	15kΩ	Film Res., 1%	0603	Yageo	RC0603FR-0715KL
1	R4	10 Ω	Film Res., 1%	0603	Yageo	RC0603JR-0710RL
1	L1	10µH	DCR=35mΩ, Isat=4A	SMD	Würth	744 066 100
1	U1	MP2344	Step-Down Converter	TSOT23-6	MPS	MP2344GJ

EVB TEST RESULTS

$V_{IN} = 12V$, $V_{OUT} = 5V$, $L = 10\mu H$, $DCR=35m\Omega$, $T_A = 25^\circ C$, unless otherwise noted.

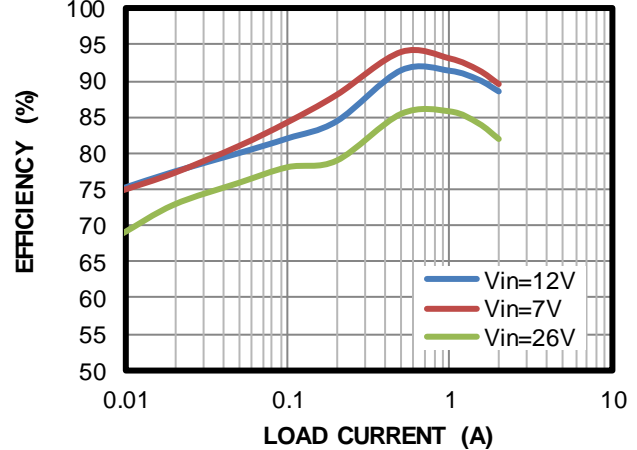
Efficiency vs. Output Current

$V_{OUT}=5V$

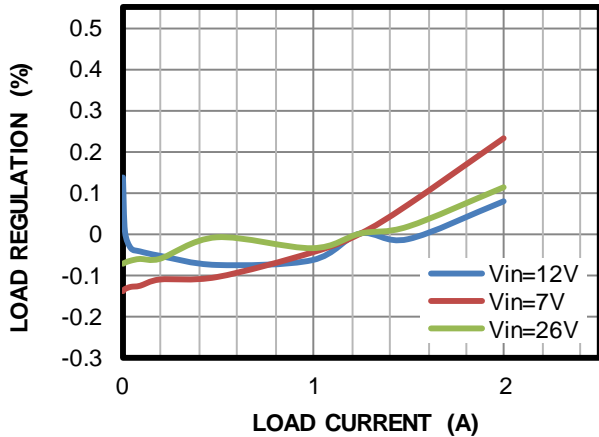


Efficiency vs. Output Current

$V_{OUT}=3.3V$

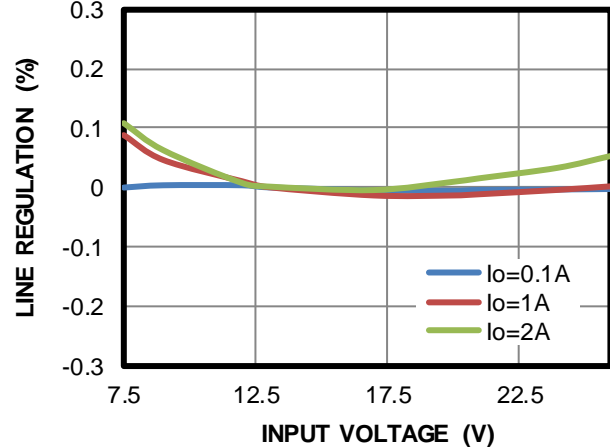


Load Regulation

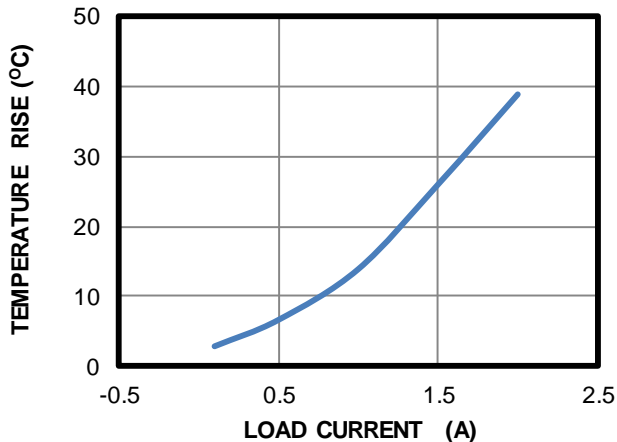


Line Regulation

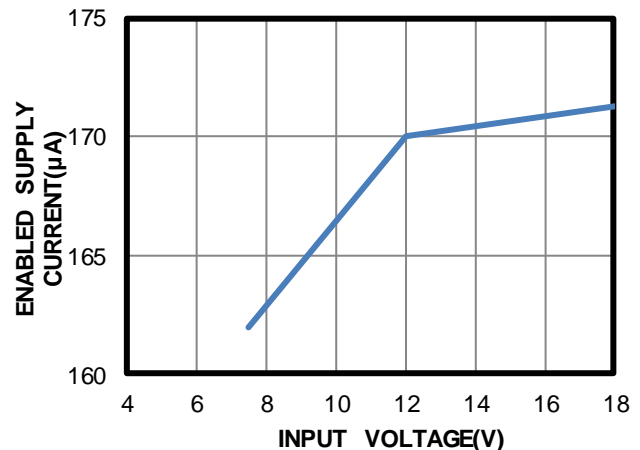
$I_{OUT}=0.1A$



Case Temperature

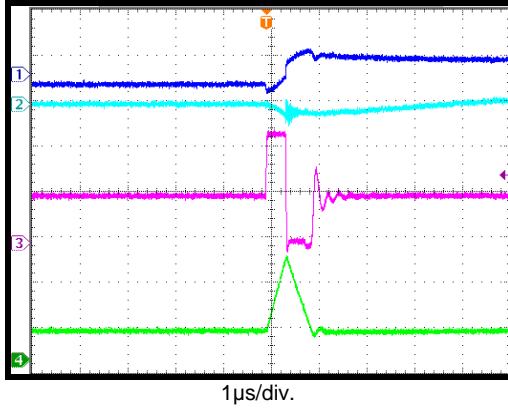


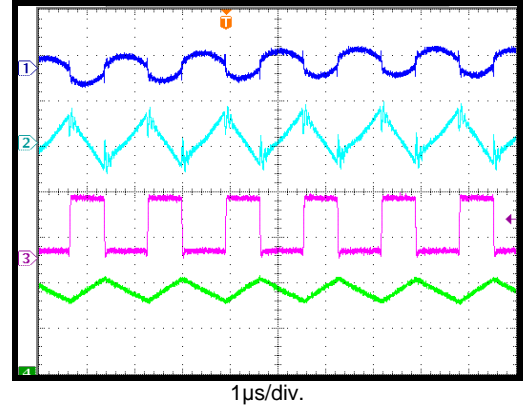
Enable Supply Current vs. Input Voltage

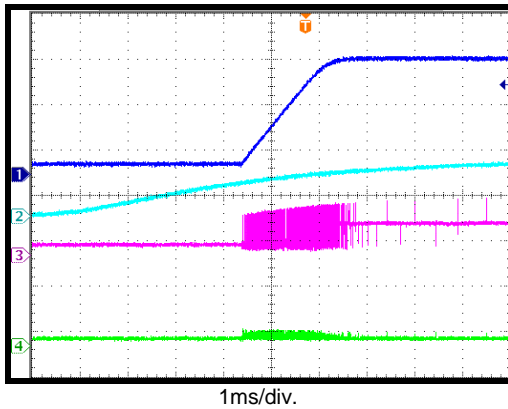


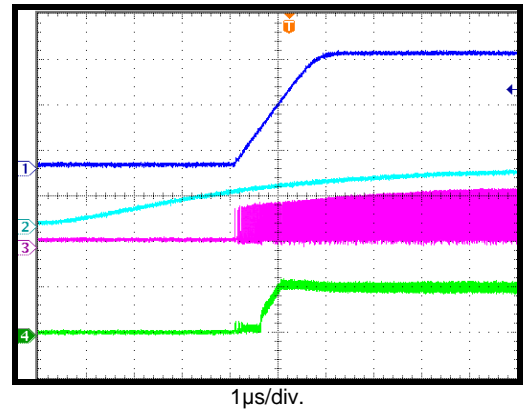
EVB TEST RESULTS (continued)
 $V_{IN} = 12V$, $V_{OUT} = 5V$, $L = 10\mu H$, $DCR=35m\Omega$, $T_A = 25^\circ C$, unless otherwise noted.

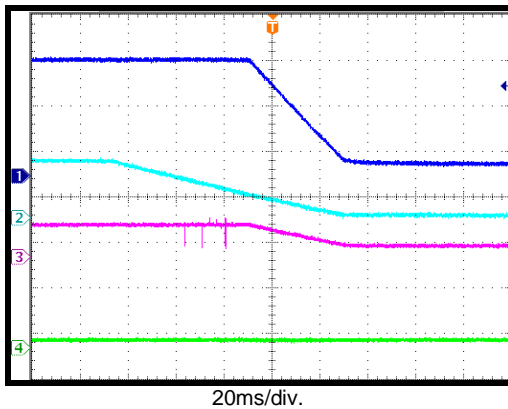
Input/Output Ripple
 $I_{OUT}=0A$

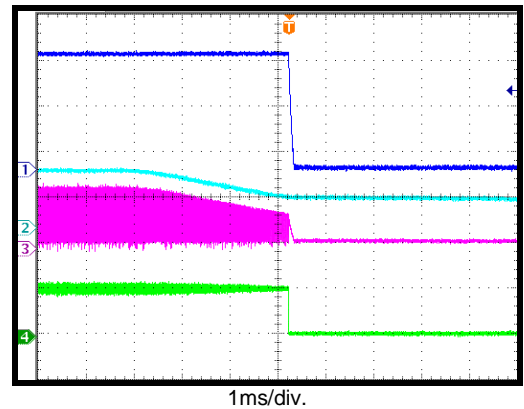
 CH1: V_{OUT}/AC
 10mV/div.
 CH2: V_{IN}
 50mV/div.
 CH3: V_{SW}
 5V/div.
 CH4: I_{OUT}
 200mA/div.

Input/Output Ripple
 $I_{OUT}=2A$

 CH1: V_{OUT}/AC
 10mV/div.
 CH2: V_{IN}
 10mV/div.
 CH3: V_{SW}
 10V/div.
 CH4: I_{OUT}
 1A/div.

Start-Up through Input Voltage
 $I_{OUT}=0A$

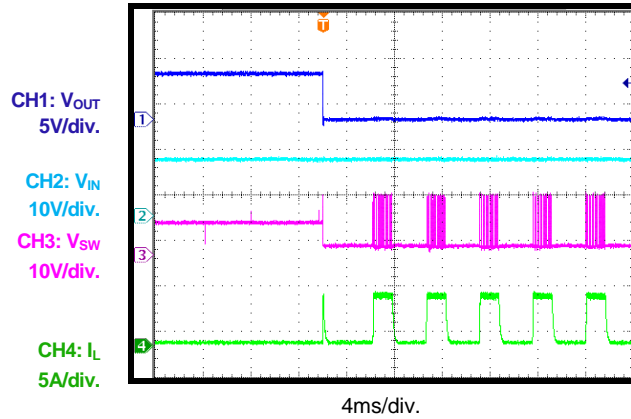
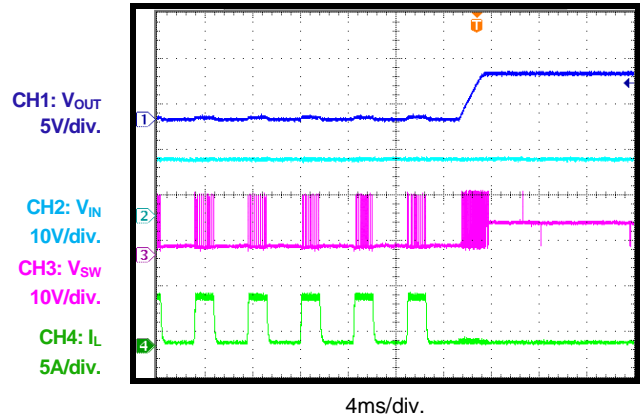
 CH1: V_{OUT}
 2V/div.
 CH2: V_{IN}
 10V/div.
 CH3: V_{SW}
 10V/div.
 CH4: I_L
 2A/div.

Start-Up through Input Voltage
 $I_{OUT}=2A$

 CH1: V_{OUT}
 2V/div.
 CH2: V_{IN}
 10V/div.
 CH3: V_{SW}
 10V/div.
 CH4: I_L
 2A/div.

Shutdown through Input Voltage
 $I_{OUT}=0A$

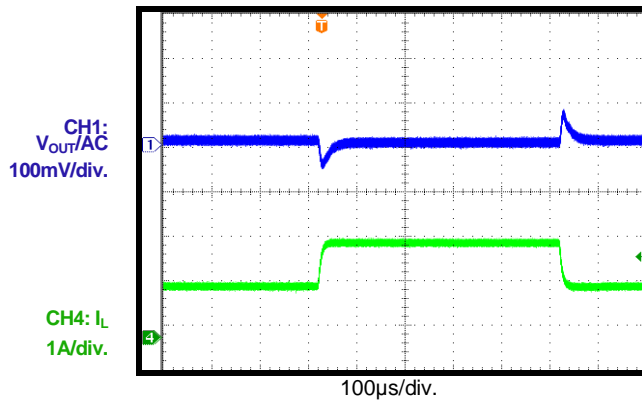
 CH1: V_{OUT}
 2V/div.
 CH2: V_{IN}
 10V/div.
 CH3: V_{SW}
 10V/div.
 CH4: I_L
 2A/div.

Shutdown through Input Voltage
 $I_{OUT}=2A$

 CH1: V_{OUT}
 2V/div.
 CH2: V_{IN}
 10V/div.
 CH3: V_{SW}
 10V/div.
 CH4: I_L
 2A/div.


EVB TEST RESULTS *(continued)*
 $V_{IN} = 12V$, $V_{OUT} = 5V$, $L = 10\mu H$, $DCR=35m\Omega$, $T_A = 25^\circ C$, unless otherwise noted.

OCP Entry
 $I_{OUT}=0A$

OCP Recovery

Load Transient Response

1A-2A



PRINTED CIRCUIT BOARD LAYOUT

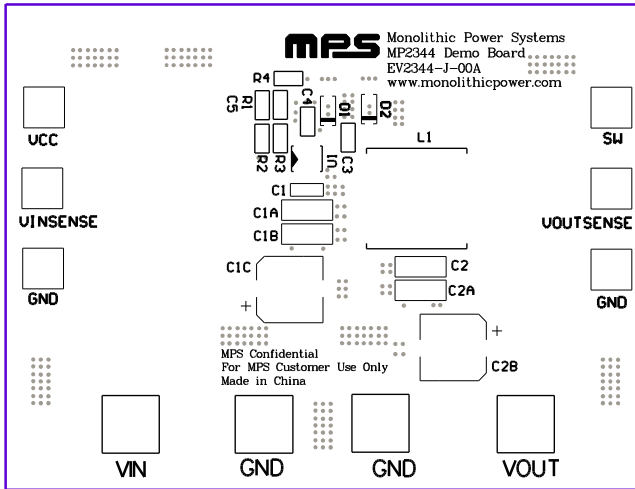


Figure 1—Top Silk Layer

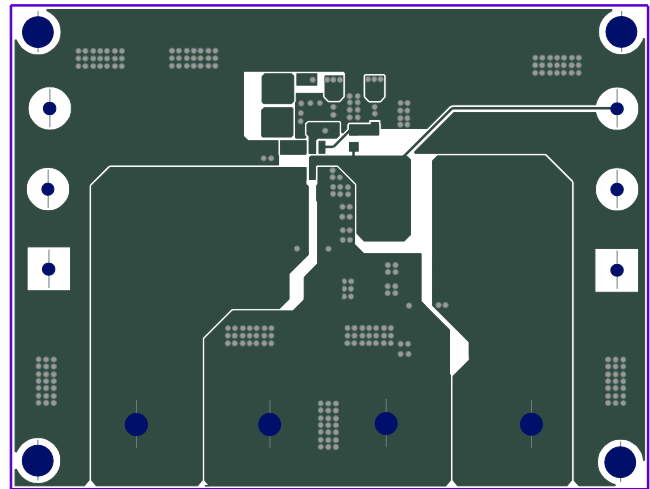


Figure 2—Top Layer

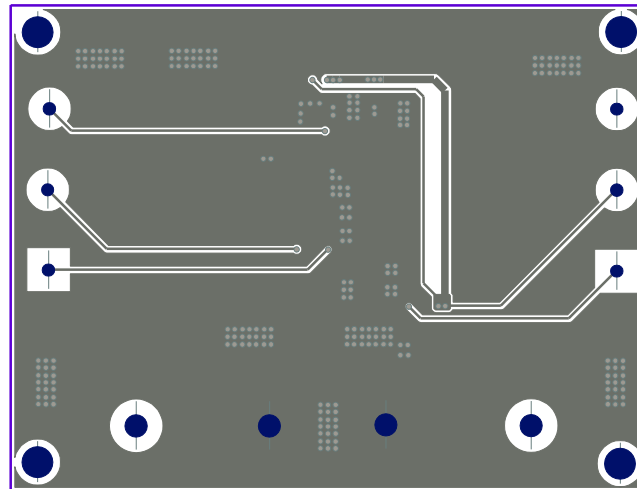


Figure 3—Bottom Layer