EV0043 (MP1517)

3A, 25V, 1.1MHz Step-Up Converter for WLED Applications

EVALUATION BOARD

DESCRIPTION

The EV1517 is the evaluation board used to demonstrate the white LED driver capabilities of the MP1517. The low 0.7V feedback voltage offers higher efficiency in white LED driver applications including cell phone camera flash. Soft-start, cycle-by-cycle current limiting and input under voltage lockout prevent overstressing or damage to sensitive external circuitry at startup and output short-circuit conditions. Current-mode regulation and external compensation components allow the MP1517 control loop to be optimized over a wide variety of input voltages, output voltages and load current conditions.

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input Voltage (1)	V_{IN}	2.6 to 5.5	V
LED Current (Torch)	I_{OUT1}	20	mA
LED Current (Flash)	I_{OUT2}	150	mA

Note:

1) 5.5V input voltage limit is specific to the application circuit on this evaluation board. The input voltage limit of the MP1517 is 25V.

FEATURES

- 4A Peak Current Limit
- Low 700mV Feedback Threshold
- Internal 150mΩ Power Switch
- Input Range of 2.6V to 25V
- 95% Efficiency
- Zero Current Shutdown Mode
- Under Voltage Lockout Protection
- Open Load Protection
- Soft-Start Operation
- Thermal Shutdown
- Tiny QFN16 (4mm x 4mm) Package

APPLICATIONS

- Boost and SEPIC Regulators
- Handheld Computers
- Cell Phone Camera Flash, PDAs
- Digital Still and Video Cameras

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

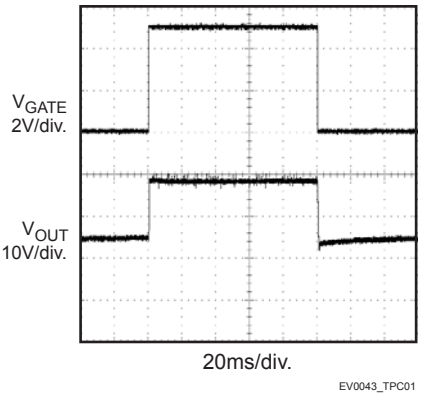
EV0043 EVALUATION BOARD



Dimensions (2.5"X x 2.0"Y x 0.4"Z)

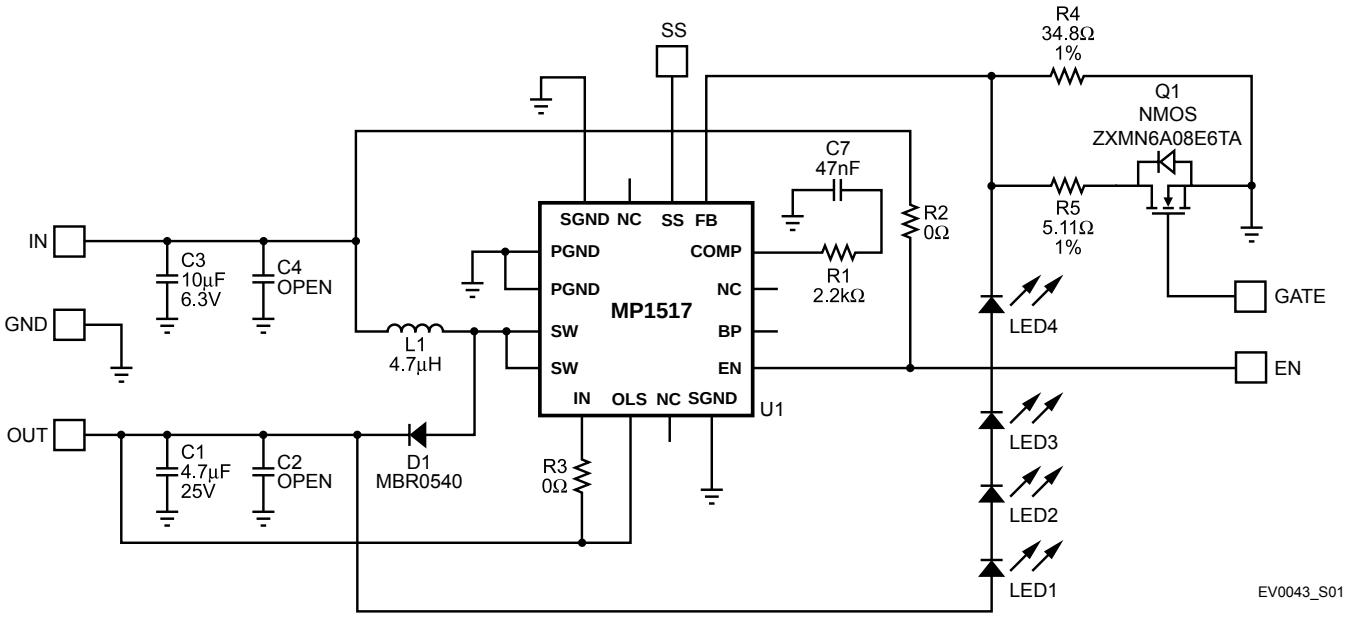
Board Number	MPS IC Number
EV0043	MP1517DR

Waveform in Flash Mode



MPS Proprietary Information. Unauthorized Photocopy and Duplication Prohibited.
© 2005 MPS. All Rights Reserved.

EVALUATION BOARD SCHEMATIC



EV0043 BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer P/N	Distributor P/N
1	C1	4.7uF	Capacitor, 25V, Ceramic X5R	1210	Panasonic ECJ-4YB1E475K	Digikey PCC2251CT-ND
2	C2, C4	NS	Do Not Stuff			
1	C3	10uF	Capacitor, 6.3V Ceramic X5R	1210	Taiyo-Yuden JMK325BJ106MF	
1	C7	47nF	Capacitor, 25V, Ceramic X7R	0603	Panasonic ECJ-1VB1E473K	Digikey PCC1771CT-ND
1	D1		Schottky Diode, 0.5A, 40V	SOD123	ON Semi MBR0540T1	Digikey MBR0540T1OSCT-ND
1	L1	4.7uH	Inductor, 5.6A		Sumida CDRH8D43-4R7NC	
4	LED1, LED2, LED3, LED4		White LED, 40MCD	1206	Lumex SML-LX23UWC-TR	Digikey 67-1607-1-ND
1	Q1		N-Channel MOSFET	SOT23-6	Zetex ZXMN6A08E6TA	Digikey ZXMN6A08E6CT-ND
1	R1	2.2kΩ	Film Resistor, 5%	0603	Panasonic ERJ-3GEYJ222V	Digikey P2.2KGCT-ND
2	R2, R3	0	Film Resistor, 5%	0603	Yageo 9C06032A0R00JLHFT	Digikey 311-0.0GCT-ND
1	R4	34.8Ω	Film Resistor, 1%	0805	Panasonic ERJ-6ENF34R8V	Digikey P34.8CCT-ND
1	R5	5.11Ω	Film Resistor, 1%	0805	Yageo 9C08052A5R11FGHFT	Digikey 311-5.11CCT-ND
1	U1		Step-Up Converter	QFN16	MPS MP1517DR	

MPS Proprietary Information. Unauthorized Photocopy and Duplication Prohibited.
© 2005 MPS. All Rights Reserved.

PRINTED CIRCUIT BOARD LAYOUT

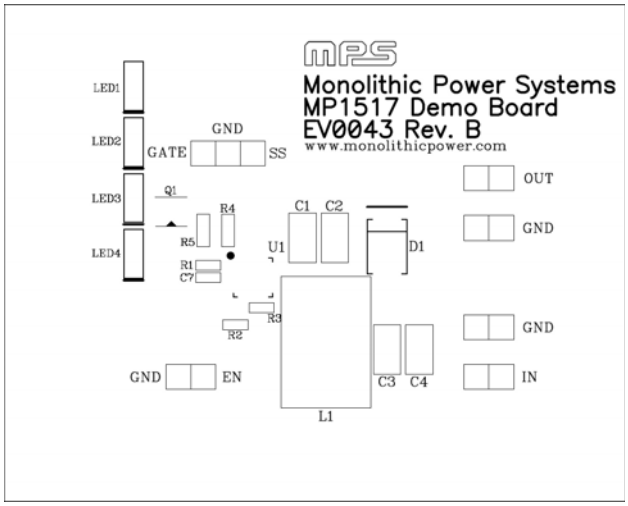


Figure 1—Top Silk Layer

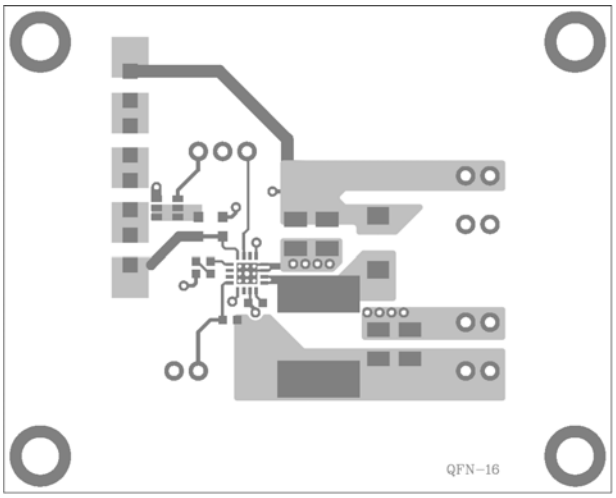


Figure 2—Top Layer

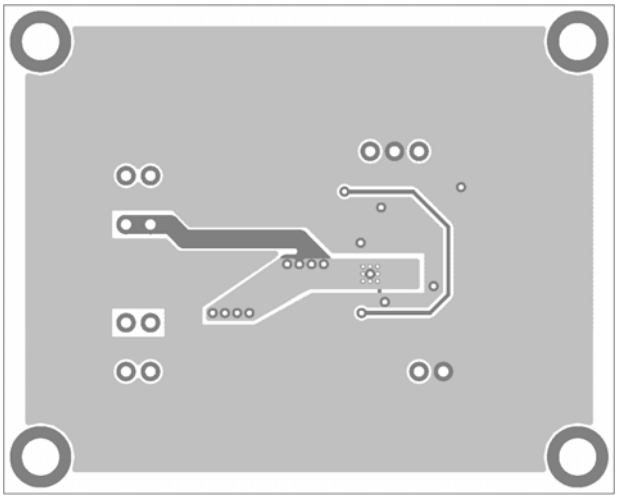


Figure 3—Bottom Layer

QUICK START GUIDE

1. Connect LEDs to LED1 to LED4 terminals.
2. Connect positive and negative terminals of the 2.5V to 5.5V power supply to the IN and GND pins, respectively.
3. Drive GATE of Q1 with a pulsed signal to switch between two (2) LED currents.
4. The device is automatically enabled because EN is connected to IN through a 0Ω resistor (R2). It will be disabled only if V_{IN} is removed.

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.

MPS Proprietary Information. Unauthorized Photocopy and Duplication Prohibited.
© 2005 MPS. All Rights Reserved.