# EV0059

## MP1567: Buck Boost Lumileds White LED Driver

Monolithic Power Systems

***EVALUATION BOARD***

## General Description

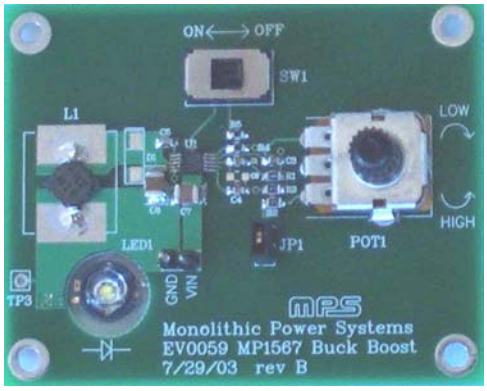
The EV0059 evaluation board is designed to drive Lumileds White LEDs using MPS' MP1567 step down converter. The EV0059 circuit is a positive to negative voltage converter with a positive input voltage range of 2.6V to 6V. The generated output voltage can be as low as -18V with respect to ground.

The MP1567 is a 2A peak, synchronous step down converter utilizing a constant frequency, current mode switching topology. The MP1567 has internal 180mΩ and 220mΩ MOSFETs and has soft start operation. The MP1567 switches at a high frequency (800KHz) reducing the size of external components. It includes under voltage lockout and over-temperature protection and is available in the tiny 10 pin MSOP and 3mm x 3mm QFN packages.

## Ordering Information

| Board Number | MPS Part Number |
|---|---|
| EV0059 | **MP1567DK** |
| Luxeon Emitter | **DS25** |

## Figure 1: EV0059 Evaluation Board




**Actual Size: 2.5"X x 2"Y**

## Absolute Maximum Ratings

| | |
|---|---|
| Input Supply Voltage $V_{IN}$ | 6.5V |
| Enable Voltage $V_{EN}$ | -0.3V to 6V |

## Recommended Operating Conditions

| | |
|---|---|
| Input Supply Voltage $V_{IN}$ | 2.6V to 6V |
| Output Voltage $V_{OUT}$ | 0V to –18V |

## Lumileds Emitter Features

- Highest Flux per LED in the world
  - Up to 120 lumens
- Very long operating life (up to100k hours)
- Superior ESD protection
- More Energy Efficient than Incandescent and most Halogen lamps
- Available in White, Green, Blue, Royal Blue, Cyan, Red, Red-Orange, and Amber

## MP1567 Features

- 2A Peak Current Limit
- Internal 180mΩ and 220mΩ Power Switches
- > 90% efficiency
- Zero Current Shutdown Mode
- Under Voltage Lockout Protection
- Soft Start Operation
- Thermal Shutdown
- Internal Current Limit (Source & Sink)

## Applications

- Handheld Computers, PDAs
- Cell phones, Digital and Video Cameras
- Small LCD Display

**Figure 2: EV0059 Schematic**

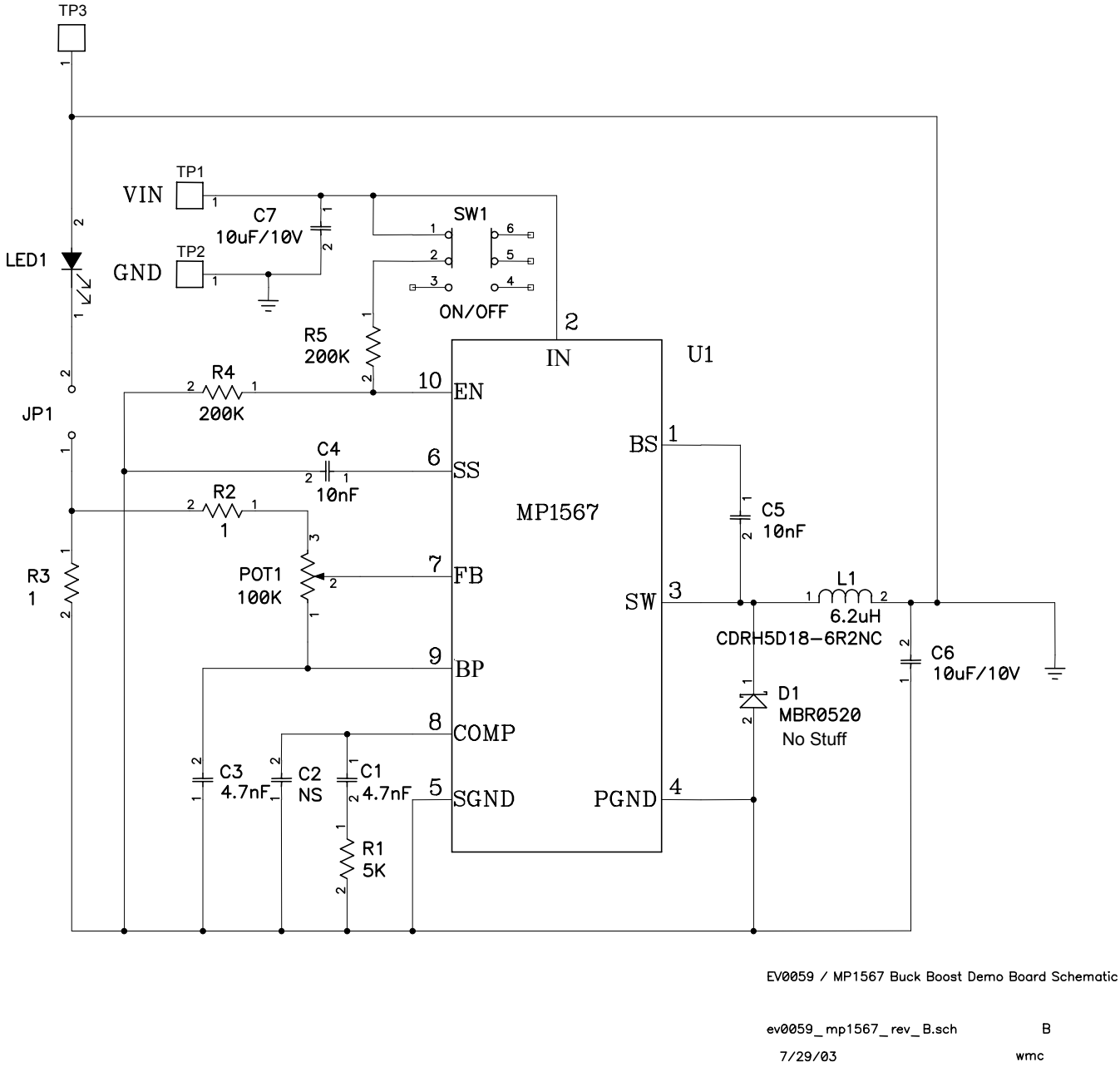


**Table 1: EV0059 Bill of Materials**

| Component | Part Number | Vendor | Package | QTY |
|---|---|---|---|---|
| U1 | MP1567DK | Monolithic Power Systems | MSOP10 | 1 |
| LED1 | Emitter | Lumileds | DS25 | 1 |
| C1, C3 | 4.7nF | Any | 0805 | 2 |
| C2 | No Stuff | Any | 0805 | 0 |
| C4, C5 | 10nF | Any | 0805 | 2 |
| C6, C7 | 10µF, 10V | Any | 1210 | 2 |
| R1 | 5KΩ | Any | 0805 | 1 |
| R2, R3 | 1Ω | Any | 0805 | 1 |
| R4, R5 | 200KΩ | Any | 0805 | 2 |
| D1 | No Stuff | None | 1810 | 0 |
| L1 | 6.2µH | Sumida | CDRH5D18-6R2NC | 1 |
| | | | **Total** | **13** |
| **Optional** | | | | |
| POT1 | 100KΩ | Any | N/A | 1 |
| SW1 | SW_DPDT_B | Any | N/A | 1 |

## Board Operation

1. Attach input voltage $2.6V \leq V_{IN} \leq 6V$ and input ground to VIN and GND pins respectively.
2. Turn SW1 to ON position to enable board. Turn SW1 to OFF position to disable board.
3. Turn POT1 clockwise to increase brightness and counterclockwise to decrease brightness.
4. Jumper JP1 can be replaced with a resistor to measure current.

**Figure 3: EV0059 Top Silk Layer**

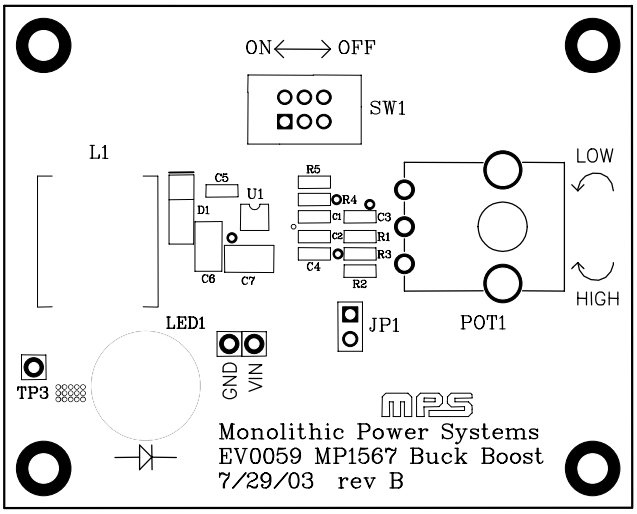



**Figure 4: EV0059 Top Layer**

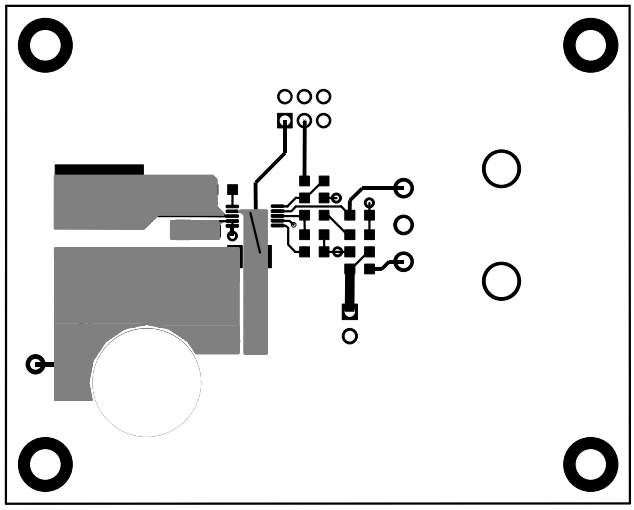


**Figure 5: EV0059 Bottom Silk Layer**

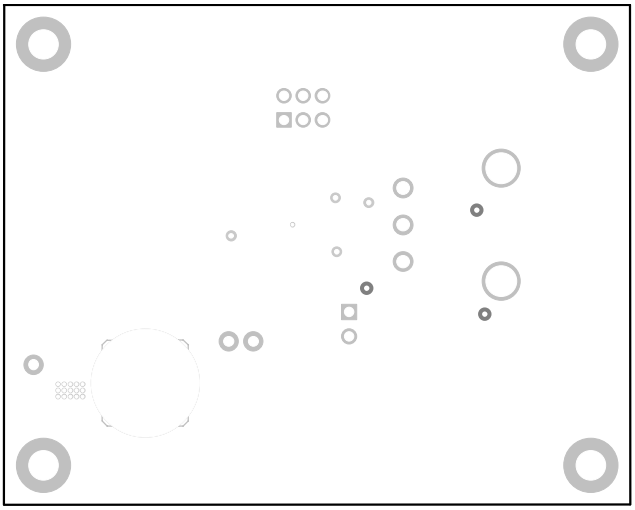
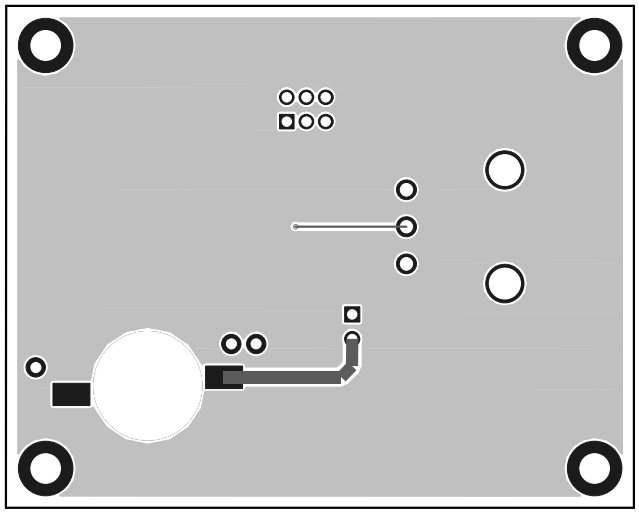


**Figure 6: EV0059 Bottom Silk Layer**



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