

DESCRIPTION

The EV2143-J-00A is used for demonstrating the performance of MPS's MP2143, a low voltage high switching frequency step-down switcher with built in power MOSFETs. MP2143 provides up to 3A highly efficient output with constant-on-time control for fast loop response.

MP2143 is ideal for powering portable equipment that runs from a single cell Lithium-ion (Li+) Battery. The output voltage can be regulated as low as 0.6V.

High power efficiency over a wide load range is achieved by scaling down the switching frequency at light load to reduce the switching related loss by constant on time control. Short circuit and thermal shutdown provides reliable, fault-tolerant operation.

MP2143 is available in TSOT23-8 package.

ELECTRICAL SPECIFICATION

| Parameter | Symbol | Value | Units |
|----------------|-----------|----------|-------|
| Input Voltage | V_{IN} | 2.5– 5.5 | V |
| Output Voltage | V_{OUT} | 1.2 | V |
| Output Current | I_{OUT} | 3 | A |

FEATURES

- Wide 2.5V to 5.5V Operating Input Range
- Up to 3A Output Current
- 40 μ A Quiescent Current
- 80m Ω and 40m Ω Internal Power MOSFET
- 1.2MHz CCM Switching Frequency
- EN and Power Good for Power Sequencing
- Cycle-by-Cycle Over Current Protection
- Auto Discharge at Power Off
- Short Circuit Protection with Hiccup Mode
- Thermal Shutdown
- Stable with Low ESR Ceramic Output Capacitors
- Internal Soft-Start
- Available in a TSOT23-8 Package

APPLICATIONS

- Low Voltage I/O System Power
- Handheld/Battery-powered Systems
- Wireless/Networking Cards

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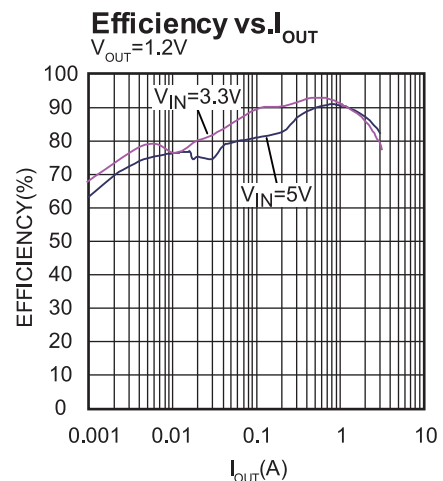
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The MP#### is covered by US Patents #,###,###, #,###,###, #,###,###.

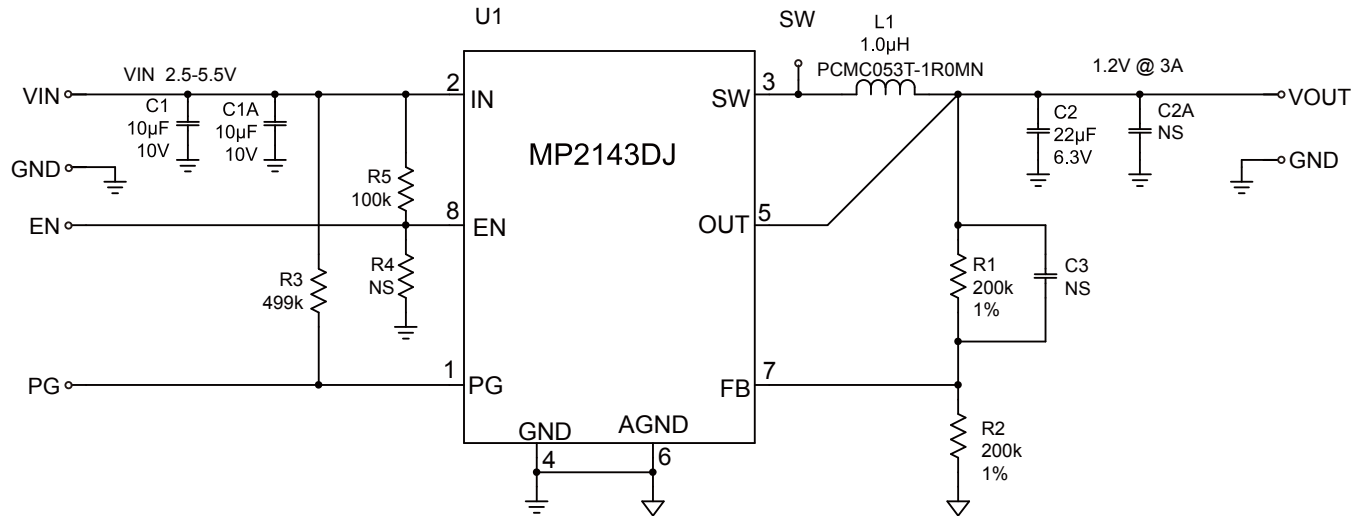
EV2143-J-00A EVALUATION BOARD



| Board Number | MPS IC Number |
|--------------|---------------|
| EV2143-J-00A | MP2143DJ |



EVALUATION BOARD SCHEMATIC



EV2143-J-00A BILL OF MATERIALS

| Qty | RefDes | Value | Description | Package | Manufacturer | Manufacturer P/N |
|-----|---------|--------|--------------------------------|-----------|--------------|--------------------|
| | C2A, C3 | NS | | | | |
| 2 | C1, C1A | 10µF | Ceramic Cap., 10V., X7R | 1206 | MuRata | GRM31CR71A106KA01L |
| 1 | C2 | 22µF | Ceramic Cap., 6.3V, X5R | 1206 | MuRata | GRM31CR60J226KE19 |
| 1 | L1 | 1.0µH | Inductor, 6.4A, 8.8mΩ | 7.3x6.8mm | TDK | RLF7030-1R0N6R4 |
| | | 1.0µH | Inductor, 6.4A, 8.4mΩ | 7.3x7.3mm | Würth | 744777001 |
| | | 1.0µH | Inductor, 6.4A, 8.8mΩ | 5x5mm | Delta | PCMC053T-1R0MN |
| 2 | R1, R2 | 200k | Film Res., 1% | 0603 | Yageo | RC0603JR-07200KL |
| 1 | R3 | 499k | Film Res., 5% | 0603 | Yageo | RC0603JR-07499KL |
| 1 | R5 | 100k | Film Res., 5% | 0603 | Yageo | RC0603JR-07100KL |
| 1 | R4 | NS | | | | |
| 1 | U1 | MP2143 | Synchronous Step-Down switcher | TSOT23-8 | MPS | MP2143DJ |

PRINTED CIRCUIT BOARD LAYOUT

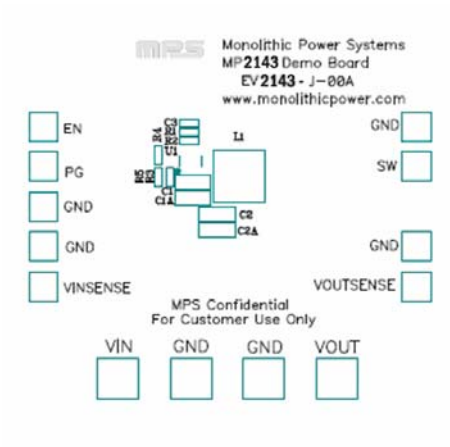


Figure 1—Top Silk Layer

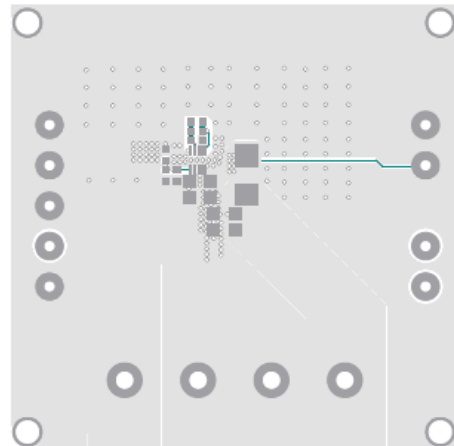


Figure 2—Top Layer

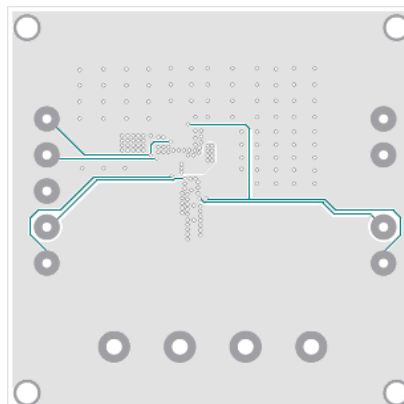


Figure 3— Bottom Layer

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 2.5V and 5.5V, 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 pin. Drive EN higher than 1.2V to turn on the regulator or less than 0.4V to turn it off.

LAYOUT RECOMMENDATION OF MP2143

Proper layout of the switching power supplies is very important, and sometimes critical to make it work properly. Especially, for the high switching converter, if the layout is not carefully done, the regulator could show poor line or load regulation, stability issues.

For MP2143, the high speed step-down regulator, the input capacitor should be placed as close as possible to the IC pins. As shown in Figure 4, the 0805 size ceramic capacitor (C1) is used, please make sure the two ends of the ceramic capacitor be directly connected to PIN2 (the Power Input Pin) and PIN 4 (the Power GND Pin).

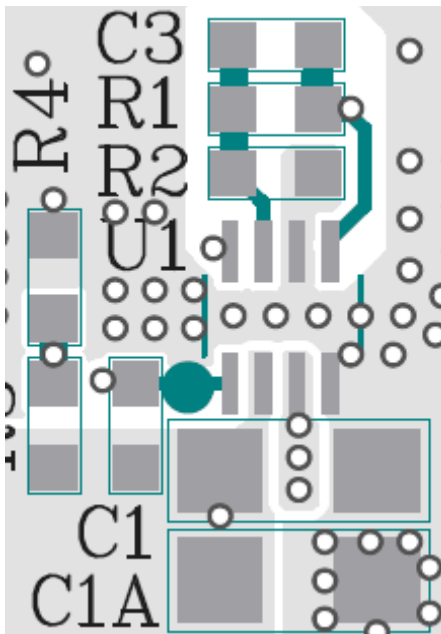


Figure 4— Two ends of Input decoupling Capacitor close to Pin 2 and Pin 4

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