EV2143-J-00A

3A, 5.5V, 1.2MHz Synchronous Step-Down Switcher Evaluation Board

The Future of Analog IC Technology

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
- 40μA Quiescent Current
- 80mΩ and 40mΩ 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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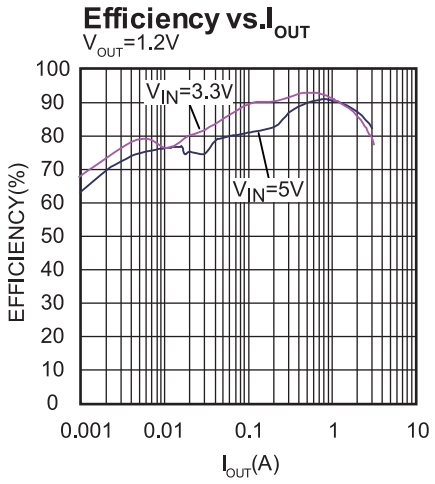
ADAM (Analog Digital Adaptive Modulation), AAM (….) areTrademarks of Monolithic Power Systems, Inc.

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

EV2143-J-00A EVALUATION BOARD

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



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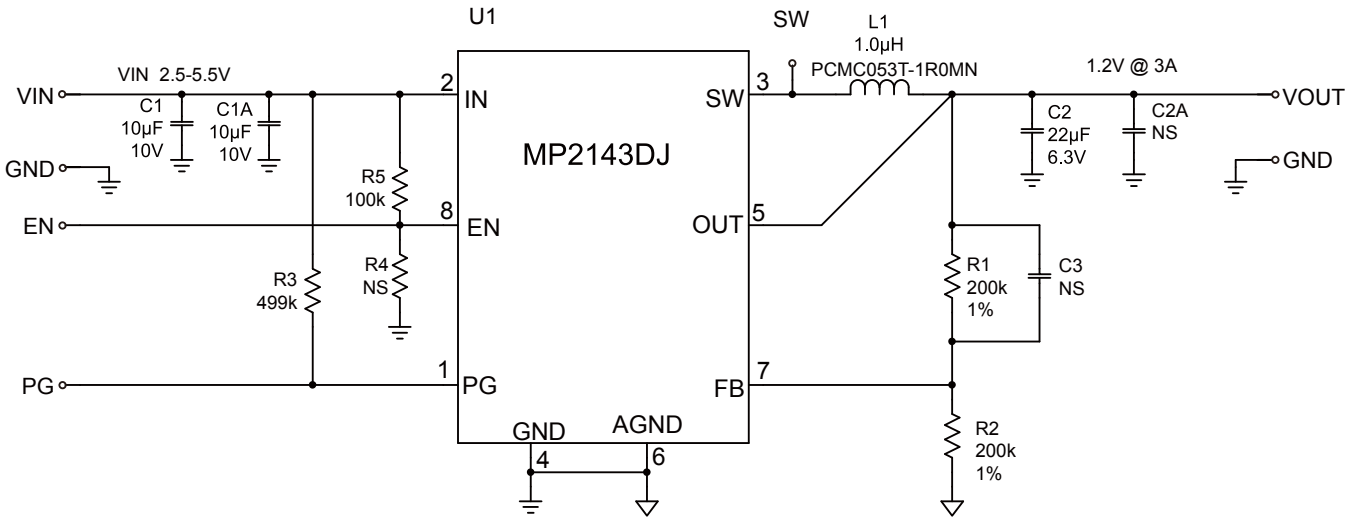
EVALUATION BOARD SCHEMATIC



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	Wurth	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

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PRINTED CIRCUIT BOARD LAYOUT

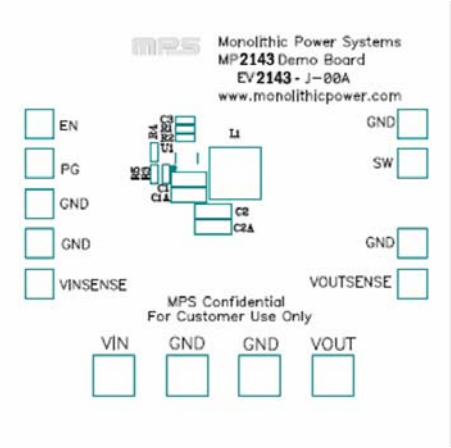

Figure 1—Top Silk Layer

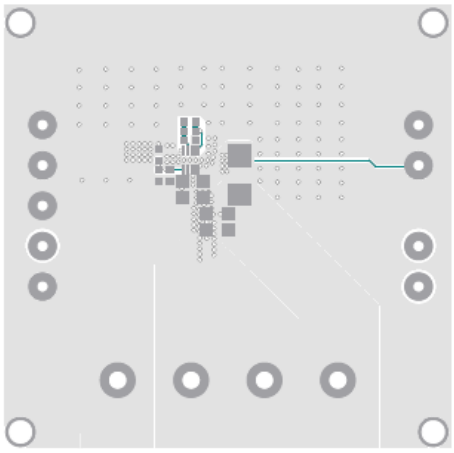

Figure 2—Top Layer

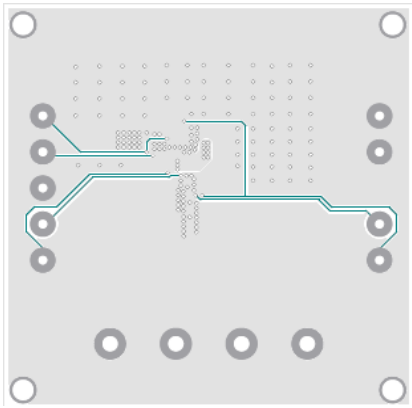

Figure 3— Bottom Layer

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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).

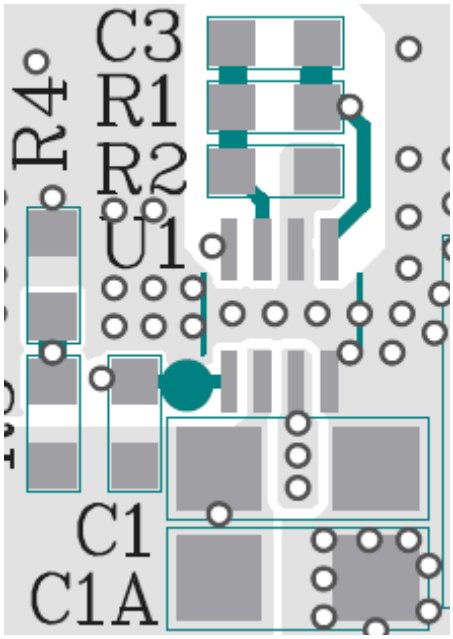

Figure 4— Two ends of Input decoupling Capacitor close to Pin 2 and Pin 4

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