

DC/DC Conversion

DC/DC Converter Family Features

- Wide Output Current Range: 0.15–3 A
- Wide Input Supply Range: 2.5–32 V
- Support for all Fusion[™] Input Voltages
- 0.3–1.4 MHz Switch Frequencies
- Single-Chip DC/DC Solutions
- Step-Down and Step-Up Regulators
- Efficient in Operation and Standby
- Cost Efficient Proprietary Process

Applications

- Portable Diagnostic Systems
- Battery Chargers / Management
- Clock Management
- Broadband Modems / Networking
- Motor Control
- Custom Logic Designs

Description

As field programmable gate arrays (FPGAs) implement faster clock speeds and higher gate counts at lower voltages, high-performance power management becomes a requirement for optimum performance. Monolithic Power Systems (MPS) DC to DC regulators are the ideal solution for FPGA power supply needs.

MPS offers step-down and step-up DC to DC regulators, all of which can meet the voltage requirements for any of the Fusion power supplies (a sample is shown in Figure 1). Additionally, MPS power management products are rated to operate in the industrial temperature range (–40°C to 85°C).

With our proprietary process technology, designers no longer face the tradeoff between efficiency, cost, and size. Highly efficient MPS regulators are at the heart of the industry's smallest DC/DC solutions. Furthermore, I²R losses between the system power supply and switching regulator can be reduced by taking advantage of the high input voltage capability of our products.

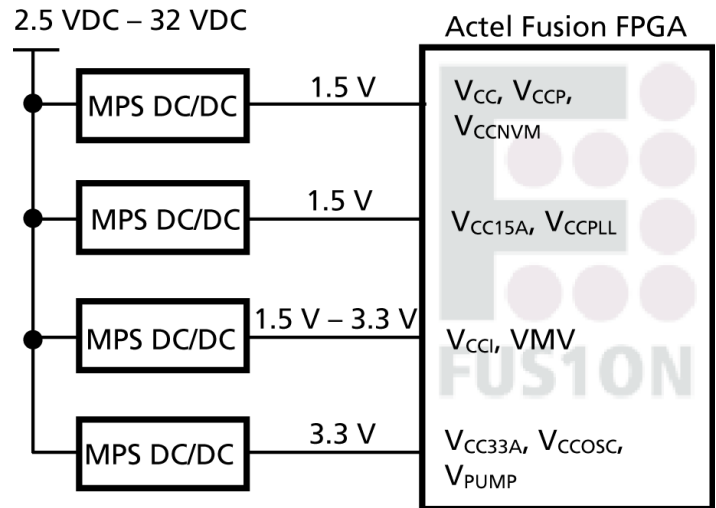


Figure 1 · MPS Converters Support Fusion[™] FPGA Input Voltages

MPS step-down regulators include low dropout linear and switching regulators that provide the industry's smallest DC/DC converter solutions. For example, the dual 800 mA output MP2109 is available in a 3 x 3 mm QFN package and requires just 10 external components for operation (Figure 2). Core and I/O supply requirements can be met with a board area of 2.3 cm² by 1 mm high.

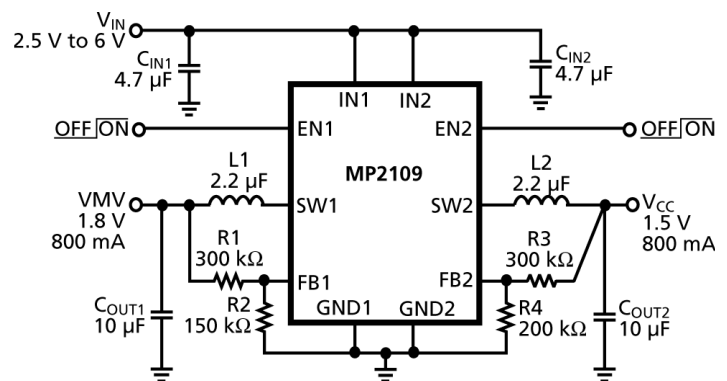


Figure 2 · MP2109 Application Circuit for Core (V_{CC}) and I/O (VMV) Supply

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MPS is also in the unique position to offer a line of pin-compatible high voltage step-down regulators, the MP2305/7/9 with output current capabilities of 1, 2, or 3 A. Details of the layout can be found in the MPS design note DN0008. Now your DC/DC power supply can migrate according to the needs of your Fusion FPGA.

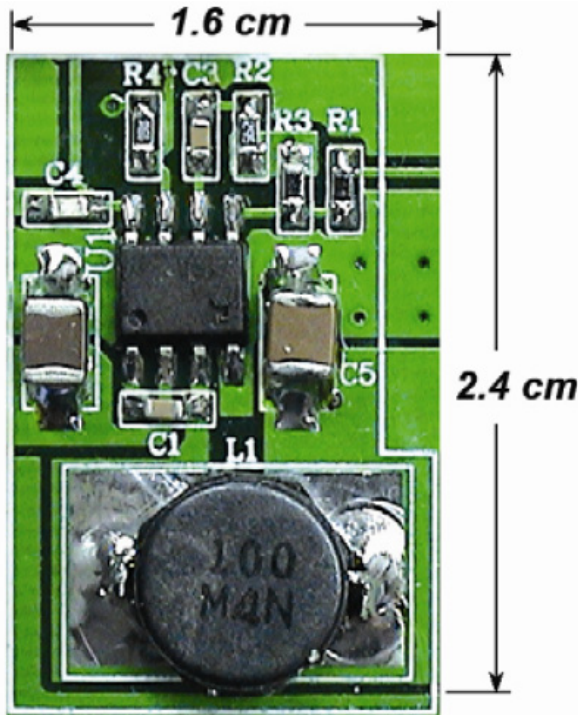


Figure 3 · MP2305, MP2307, and MP2309
Common PCB Layout (1–3A)

For noise sensitive supplies such as V_{CCPLL} and V_{CC15A} , the 150 mA MP8801 and 250 mA MP8802 low-dropout linear regulators boast a very high power supply ripple rejection (PSRR) of 70 dB, and excellent noise attenuation. Similar to the Fusion FPGA, these two performance LDOs have been designed to operate with a very low supply current.

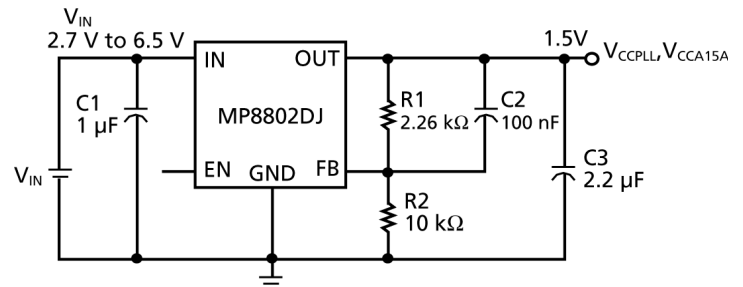


Figure 4 · MP8802 LDO Application Circuit

Additionally, MPS offers a wide line of compact step-up regulators that operate from voltages as low as 1.8 V and consume very low current in shutdown, making them suitable for multi-cell alkaline or Li-Ion battery applications.

For more information on our products, including how to obtain samples and evaluation boards, please visit our website:

<http://www.mps-ic.com/actel.htm>