DC/DC Conversion

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DC/DC Converter Family Features

The following are the features of DC/DC converter:

- Wide output current range: 0.15 A – 3 A
- Wide input supply range: 2.5 V – 32 V
- Support for all Fusion input voltages
- 0.3 MHz – 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

The following are the applications of DC/DC converter:

- Portable Diagnostic Systems
- Battery Chargers or Management
- Clock Management
- Broadband Modems or 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. MPS power management products are rated to operate in the industrial temperature range of -40°C to 85°C.

With Microsemi proprietary process technology, designers no longer face the tradeoff among efficiency, cost, and size. Highly efficient MPS regulators are at the heart of the industry’s smallest DC/DC solutions. Furthermore, I^2R losses between the system power supply and switching regulator can be reduced by taking advantage of the high input voltage capability of Microsemi products.

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 is shown in Figure 2. Core and I/O supply requirements can be met with a board area of 2.3 cm and 2 by 1 mm high.

**Figure 1 • MPS Converters Support Fusion FPGA Input Voltages**

With Microsemi proprietary process technology, designers no longer face the tradeoff among efficiency, cost, and size. Highly efficient MPS regulators are at the heart of the industry's smallest DC/DC solutions. Furthermore, I^2R losses between the system power supply and switching regulator can be reduced by taking advantage of the high input voltage capability of Microsemi products.

**Figure 2 • MP2109 Application Circuit for Core (VCC) and I/O (VMV) Supply**
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 A, 2 A, or 3 A. Details of the layout can be found in the MPS design note DN0008. Now DC/DC power supply can migrate according to the needs of Fusion FPGA.

For noise sensitive supplies such as VCCPLL and VCC15A, 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.

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 shut down, making them suitable for multi-cell alkaline or Li-Ion battery applications.

For more information on how to obtain samples and evaluation boards, visit: [https://www.monolithicpower.com](https://www.monolithicpower.com)
List of Changes

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<td>Non-technical updates.</td>
<td>NA</td>
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<tr>
<td>Revision 0</td>
<td>Initial release.</td>
<td>NA</td>
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*The part number is located on the last page of the document.*
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