FAIRCHILD

SEMICONDUCTOR®

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FD2004 — Adaptive Digital DC-DC Controller with Current Sharing

1. Overview

1.1. Features

Power Conversion

- Efficient Synchronous Buck Controller

- Adaptive Performance Optimization Algorithms

- 4.5V to 14V Input Range

- 0.54V to 4V Output Range (with Margin)

- ± 1% V_{OUT} Setpoint Accuracy

- Fast Load Transient Response

- Current Sharing and Phase Interleaving

- Digitally Adjustable Current Sense Range

- *Snapshot™* Parametric Capture Mechanism

- RoHS-Compliant (5 x 5mm) QFN Package

Power Management

- Digital Soft-Start/Stop

- Precision Delay and Ramp-up

- Power Good / Enable

- Voltage Tracking, Sequencing, and Margining

- Voltage / Current / Temperature Monitoring

- SMBus Communication (PMBus™ Compliant)

- Output Voltage and Current Protection

- Internal Non-volatile Memory (NVM)

1.2. Applications

- Servers / Storage Equipment

- Telecom / Datacom Equipment

- Power Supplies (Memory, DSP, ASIC, FPGA)

IMPORTANT NOTE:

- For additional information, please contact digitalpower@fairchildsemi.com.

1.3. Description

The FD2004 is a digital DC-DC controller designed to work with the FD1505 MOSFET driver IC. Current sharing allows multiple devices to be connected in parallel to source loads with very high current demands. Adaptive performance optimization algorithms improve power conversion efficiency across the load range. The Digital-DC™ technology enables a blend of power conversion performance and power management features.

The FD2004 is designed to be a flexible building block for DC power and can be easily adapted to designs ranging from a single-phase power supply operating from a 4.5V input to a multi-phase supply operating from a 12V input. The FD2004 eliminates the need for complicated power supply managers as well as numerous external discrete components.

Operating features can be configured by pin-strap / resistor selection or through the SMBus serial interface. The SMBus is also used for communication with a host controller. For inter-device communication with other Digital-DC devices, the single-wire DDC bus is used.
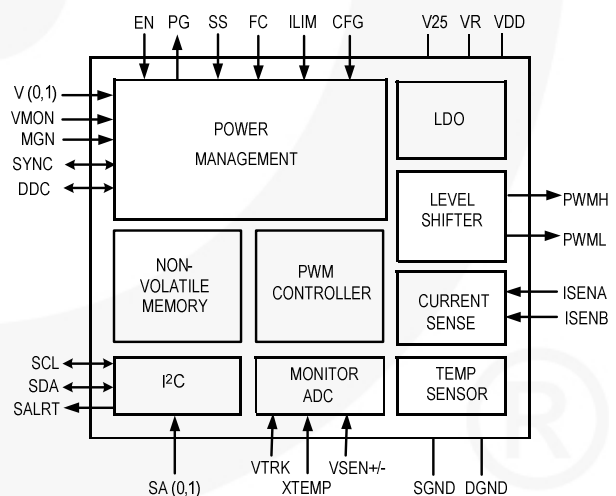

Figure 1. Block Diagram

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Definition of Terms

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Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
Obsolete	Not In Production	Datasheet contains specifications on a product that is discontinued by Fairchild Semiconductor. The datasheet is for reference information only.

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