Data Sheet

ADBT1000

4-Channel AFE, Digital Controller, and PWM for Battery Formation and Testing

FEATURES

- Precise measurement of the voltage and current
- 4 PWM control channels up to 18 bits (effective) resolution
  - Selectable synchronous and asynchronous rectifier operation
  - Programmable dead time compensation
  - Programmable switching frequency from 62.5 kHz to 500 kHz in powers of 2 steps
- Multiphase operation
  - Interchip digital current sharing
  - Interchip frequency synchronization
- Digital control loop
  - Programmable PID loop filters
  - Fast DC bus voltage feedforward
- Integrated spectrum analysis per channel
  - Measure load impedance
- SPI port control and status interface
  - Host interrupt on programmable status changes
- CC, CV, CP, and CR operating modes
  - 15-bit setpoint resolution
  - Input and output inrush current protection
- External NTC thermistor temperature sensing
  - Internal die temperature measurement
- User calibration of input voltages and currents
- 0°C to 85°C operation

APPLICATIONS

- Battery formation and testing
- High efficiency battery test systems with recycle capability
- Battery conditioning (charging and discharging) systems

GENERAL DESCRIPTION

The ADBT1000 is a flexible, feature rich digital controller that targets high volume battery testing and formation manufacturing and precision battery test instrumentation applications. The ADBT1001 is optimized for minimal component count, maximum flexibility, and minimum design time. Features include differential remote voltage sense, current sense, pulse-width modulation (PWM) generation, frequency synchronization, overvoltage protection (OVP), and current sharing. Programmable protection features include overcurrent protection (OCP), OVP limiting, and external overtemperature protection (OTP).

Parameters can be programmed over the serial peripheral interface (SPI), providing extensive programming of the integrated loop filter, PWM signal timing, and soft start timing. The SPI provides access to the many monitoring and system test functions. Reliability is improved through a built-in checksum and programmable protection circuits.

A comprehensive graphical user interface (GUI) is provided for simple system and channel configuration and programming of the safety features. The ADBT1000 is available in a 100-lead LQFP_EP.

TYPICAL APPLICATION DIAGRAM

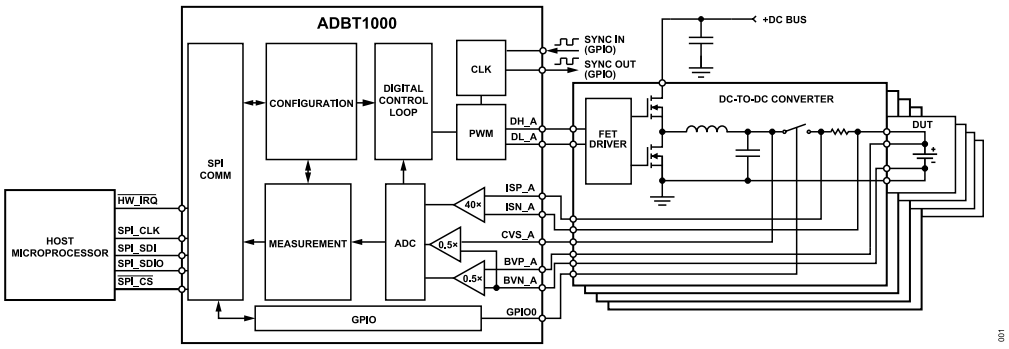

Figure 1.

For more information about the ADBT1000, contact ADBT1000@analog.com

Analog Devices is in the process of updating documentation to provide terminology and language that is culturally appropriate. This is a process with a wide scope and will be phased in as quickly as possible. Thank you for your patience.

Rev. Sp0

DOCUMENT FEEDBACK

TECHNICAL SUPPORT

NOTES