Data Sheet

ADP1804H1

12V Battery Pack PMIC

FEATURES

- Startup with 5.5V supply voltage and operating down to 4V
- Preboost controller, 8V/9V/10V, up to 1.1A load
- Dual buck regulators, programmable as 4V/5.6V, 600mA and 3.3V/5V, 1A load
- LDO1, 3.3V/5V, 150mA load
- LDO2, programmable as 3.3V and 5.0V, 100mA load
- Ultra-low power LDO4, 3.3V or 5.0V, 10mA load
- 2 dual high-side drivers with independent boost regulators
- Multiple wake-up sources in sleep mode
- Timers
  - Question-answer (QA) window and pulse watchdog timer
  - Long duration timer up to 194 days
- Standard 4-wire 4MHz SPI subordinate interface and 3.3V/5V compliance
- Dedicated fault/reset monitor output
- Voltage monitors and ADC for functional safety
- ADP1804H1 is designed for use in ISO26262 application up to ASIL D in normal operation mode and ASIL B in sleep mode
- AEC-Q100 qualified for automotive applications

APPLICATIONS

- 12V battery pack power system
- 12V power distribution unit

TYPICAL APPLICATION DIAGRAM

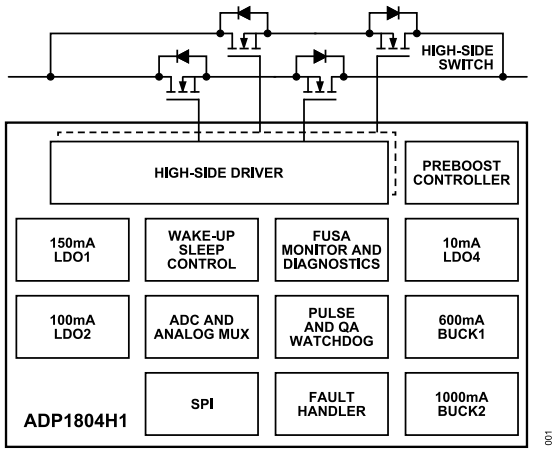


Figure 1. Typical Application Circuit

GENERAL DESCRIPTION

The ADP1804H1 is a multiple output power supply IC with high-side metal-oxide semiconductor field effect transistors (MOSFETs) driver. The ADP1804H1 integrated a preboost controller, two synchronous buck regulators, three low-dropout (LDO) regulators, and two high-side drivers groups.

Multiple switching and linear voltage regulators supply the microprocessor, sensor, and interface devices. The buck regulators operate in 2MHz or 1MHz switching frequency with spread spectrum. Three low noise LDOs provide clean voltage for the system. LDO4 is a high voltage always on LDO with extremely low quiescent current and low noise. An advanced power management scheme is implemented to maintain high efficiency over a wide range of input voltages.

High-side MOSFET drivers manage the power path for battery charging and loading. Each group has two independent high-side MOSFET drivers to control two sets of common source MOSFETs. Its strong driving capability is suitable for high current multiparalleled power devices.

The ADP1804H1 includes enhanced safety features, with voltage monitors, analog-to-digital converter (ADC), QA watchdog, pulse watchdog and fail-safe output, becoming a full part of a safety-oriented system partitioning, to reach a high integrity safety level (up to ASIL D).

Each voltage rail and driver are monitored internally and any fault event is reported to the system through the signal pins. Two window watchdogs (one pulse watchdog and one QA watchdog) monitor the processor in the system to ensure software and hardware errors are detectable. The ADP1804H1 integrates a 4-wire 4MHz serial peripheral interface (SPI) subordinate interface for system control and diagnostics.

Additional protection includes current limit, overvoltage protection, undervoltage protection, and thermal shutdown.

The ADP1804H1 is available in a 12mm × 12mm, 64-lead LQFP package.

For more details on the ADP1804H1, contact the local Analog Devices, Inc., sales office at www.analog.com/sales.

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NOTES

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