MAX20095

Backup Battery Charger and Boost Controller

Integrated Backup Battery Charger and Boost Controller

Description

The MAX20094/MAX20095 ICs combine a configurable constant-current/constant-voltage (CC/CV) battery charger with a high-efficiency synchronous boost controller to supply critical systems in the event the primary power source is lost. In addition, diagnostic features are available to check battery state-of-health (SOH) and IC functionality. Charging thresholds and the boost output voltage are configurable to support popular battery chemistries and a wide range of cell counts. To support system integration, the ICs have an I^2C slave port through which configuration and status bits can be accessed.

Switching frequency of 2.2MHz also helps to reduce system cost by minimizing inductor size. The ICs also include a precision battery SOH check and have built-in functionality to minimize leakage current out of the backup battery (BUB).

The MAX20094/MAX20095 are available in a 28-pin (5mm x 5mm) side-wettable TQFN package and are AECQ-100 qualified.

Key Features

- Efficient Solution
  - Minimum 2V Sync Boost with n-Channel FET Control
  - Skip Mode Guarantees > 50% Efficiency at 1mA
- Multiple Functions to Enable Small Solution Size
  - 3V to 6V CC/CV Battery Charger
  - I^2C-Settable Charging Current Up to 1A
  - I^2C-Selectable CV Voltage and CC Current Levels
  - Gate-Driver Output for p-Channel Load Disconnect
  - Backup Battery Switchover-Trigger Signal
- State-of-Health for Backup Battery Monitoring
  - I^2C Interface Diagnostics and Control Interface
  - Accurate Internal Current Sink for Battery Impedance Measurement
  - Analog Readout of Internal Sink Current from Backup Battery
  - Remote Sense for BATT_ Voltage Measurement

- Robust for Automotive Environment
  - 3.5V to 36V V_{IN} (40V Load-Dump Tolerant)
  - < 1µA Leakage for Pins Connected to the Battery
  - -40°C to +125°C Operating Temperature Range
  - 28-Pin, Side-Wettable TQFN Package Enables Optical Inspection

Applications/Uses

- Automotive Telematics Battery Backup
- Single or Multicell Battery-Backup Systems