MPQ3445

Wide Input Synchronous Boost Controller with Low Iq Bypass Mode AEC-Q100 Qualfied

PRELIMINARY SPECIFICATIONS SUBJECT TO CHANGE

DESCRIPTION

The MPQ3445 is a high-efficiency, current-mode, synchronous boost controller with wide input voltage range. It can be used as a pre-boost controller to maintain the output voltage from a vehicle battery during automotive cranking or from a backup battery. MPQ3445 has the capability to drive 10V MOSFETs, greatly improving the efficiency and minimizing power loss.

The MPQ3445 provides either I2C or SPI interface to program some key operating parameters, such as switching frequency, current limit, light load mode, spread spectrum, deadtime and slope compensation etc. The switching frequency can be adjusted from 250kHz to 2.5MHz or directly synchronized to the external source.

MPQ3445 operates in low quiescent current bypass mode in the condition that the output voltage is above the preset bypass threshold and the input voltage is higher than the output voltage at the same time. When the output voltage drops below the wake threshold, the part exits bypass mode and resumes normal operation with high side MOSFET and low side MOSFET switching to regulate output.

The MPQ3445 also includes under-voltage lockout, current limit and thermal shutdown protection. The MPQ3445 is available in a QFN-21 (5mmx5mm) package.

FEATURES

- **Designed for Automotive Applications**
  - Supports 2.9V Cold Crank
  - Supports 42V Load Dump
  - Junction Temperature Operation from -40°C to +150°C
  - AEC-Q100 Grade 1

FEATURES *(continued)*

- **Increases Battery Life**
  - 40μA Bypass Mode Quiescent Current
  - Automatic Wake-Up and Bypass Mode Transition
  - 10V Gate Driving Capability
- **I²C or SPI Interface Programmable**
  - Switching Frequency
  - Slope Compensation
  - Current Limit Reference
  - Light-load Mode Selection
  - Pulse-skip Modulation (PSM) for Ultra-light Load
  - Bypass Mode Threshold/Hysteresis
  - SYNCIN Phase & Frequency Division
  - Synchronous or Non-synchronous Operation
  - Frequency Spread Spectrum
- **Additional Features**
  - Switching Frequency Sync to External 250kHz -2.5MHz
  - Clock SYNC Out
  - Thermal Warning and Thermal Shutdown
  - Multiphase Capability
  - Boost Status indicator
  - Available in a QFN-21 (5mmx5mm) Package
  - Available in a Wettable Flank Package
- **Functional Safety System Design Capable**
  - MPSafe™ Compatible - Functional Safety Supporting Document Available

MPSafe™ FuSa Compatible

APPLICATIONS

- Automotive Start-Stop System
- Automotive Emergency Call System
- ADAS System
- Battery-Powered Boost Converters

TYPICAL APPLICATION