MAX20073

Single 2A/3A 2.2MHz Low-Voltage Step-Down DC-DC Converters

Small and Efficient Synchronous Buck Converter with Low I_Q for Point-of-Load Applications

Description

Create a design and simulate using EE-Sim® tools: MAX20073

The MAX20073/MAX20074 high-efficiency switching regulator family delivers up to 3A load current from 0.5V to 3.8V. The devices operate from an input voltage range of 2.7V to 5.5V, making them ideal for on-board point-of-load and post-regulation applications. Total output error is less than ±1.5% over load, line, and temperature.

The devices feature fixed-frequency PWM mode of operation, with a 2.2MHz switching frequency. High-frequency operation enables an all-ceramic capacitor design and small external components.

The low-resistance on-chip switches ensure high efficiency at heavy loads while minimizing critical inductances, making the layout a much simpler task with respect to discrete solutions. Following a simple layout and footprint ensures first-pass success in new designs.

The devices provide an enable input, spread-spectrum enable input, and active-low RESET output. The output voltage can be preset at the factory to allow customers to achieve ±1.5% output-voltage accuracy without using expensive 0.1% external resistors. In addition, the output voltage can be set to any customer value by using two external resistors at the feedback with 0.5V internal reference. The device offers a fixed 0.85ms soft-start time.

The 10-pin TDFN exposed pad devices include overtemperature shutdown and overcurrent limiting. All devices are designed to operate over the -40°C to +125°C ambient temperature range.

Key Features

- High-Feature Set in Ultra-Small Footprint
  - High-Efficiency DC-DC Converter
  - Up to 3A Output Current
  - 2.7V to 5.5V Operating Supply Voltage
  - Resistor-Adjustable or Factory-Preset Output Voltage
  - Synchronizable, 2.2MHz Switching-Frequency Enable Input
  - Active-Low RESET Output
  - Spread-Spectrum Enable Input
  - Forced-PWM and Skip Modes
  - Current-Mode Architecture
  - 3mm × 3mm × 0.85mm 10-Pin TDFN
- High Precision
  - 107% Overvoltage Monitor
  - 93% Undervoltage Monitor
  - ±1.5% Output-Voltage Accuracy
  - Excellent Load Transient Performance
  - Overtemperature and Short-Circuit Protection
  - -40°C to +125°C Operating Temperature Range

Applications/Uses

- Automotive
- Point-of-Load