Dual, 6A, ASIL C Low-Voltage Buck Converter

General Description

The MAX25322 is an ASIL C-compliant, high-efficiency, dual switching regulator that delivers up to 6A (peak) load current per output from 0.5V to 1.5875V in 12.5mV steps and 1.6V to 3.8V in 50mV steps. The IC operates from 3V to 5.5V, making it ideal for on-board point-of-load and post regulation applications. Total output error is less than ±1.0% over load, line, and temperature.

The MAX25322 features fixed-frequency PWM mode operation with a switching frequency of 2.1MHz or 3.2MHz. The high-frequency operation allows for an all-ceramic capacitor design with 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 ensure first-pass success in new designs.

The device features the MAXQ® power architecture, which provides precision transient performance and phase margin. This allows obtaining the maximum power, performance, and precision from the converter over a very wide range of configurations.

The MAX25322 provides independent enable input for each channel. The output voltage is preset at the factory to allow customers to achieve ±1% output-voltage accuracy without using expensive 0.1% resistors. The device offers factory-programmable soft-start and $\overline{\text{RESET}}$ times.

The device includes overtemperature shutdown and overcurrent limiting. It is designed to operate over the -40°C to +125°C ambient temperature range.

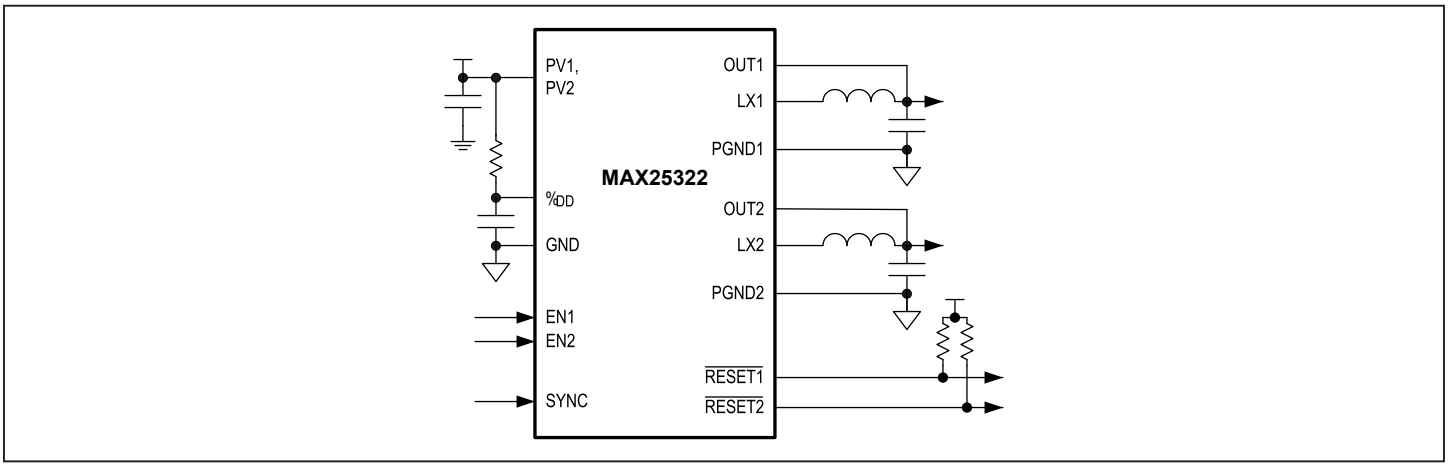
Benefits and Features

- High Feature Set in Ultra-Small Footprint
  - High-Efficiency DC-DC Converter
  - Two Independent Outputs, up to 6A per Output
  - 3.0V to 5.5V Operating Supply Voltage
  - Factory-Preset Output Voltage
  - 2.1MHz/3.2MHz Options
  - Individual Enable Input
  - Individual $\overline{\text{RESET}}$ Outputs
  - Spread-Spectrum Option
  - Peak Current-Mode Architecture
  - 3mm x 3.5mm FCQFN
- ASIL C Compliant
  - Factory-Programmable OV/UV with ±1% Accuracy
  - Redundant Reference
  - BIST Diagnostics
- Precision
  - ±1% Output-Voltage Accuracy
  - Excellent Load-Transient Performance
  - PWM and SKIP Mode Operation
  - MAXQ Power Architecture
- High Efficiency
  - Up to 96% Efficiency 5V to 3.3V
  - Up to 90% Efficiency 5V to 1V
- -40°C to +125°C Operating Temperature Range
- AEC-Q100 Qualified

Applications

- Secondary Regulator for SoC/MCU Supply

Simplified Block Diagram



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