Dual-Phase Synchronous Boost Controllers with Programmable Gate Drive and I2C

MAX25203D/MAX25203E

General Description

The MAX25203D/MAX25203E automotive dual-phase synchronous boost controllers enable infotainment systems to stay in regulation during cold-crank or start-stop operation all the way down to a battery input of 1.8V. They can also be used to generate backlight voltage and Class D audio amplifier voltages. These devices can start with an input voltage supply from 4.5V to 42V and can operate down to 1.8V after startup, and have a low 5µA shutdown supply current.

The MAX25203D/MAX25203E operate at up to 2.1MHz frequency to allow small external components and reduced output ripple, and guarantee no AM band interference. The switching frequency is resistor adjustable (220kHz to 2100kHz) or it can be synchronized on-the-fly to an external clock.

The MAX25203D/MAX25203E have a spread-spectrum option for frequency modulation to minimize EMI interference. A 90° out-of-phase clock output enables synchronizing a second MAX25203D/MAX25203E for quad-phase operation.

Pass-through operation has over 98% efficiency when the supply voltage exceeds the output regulation voltage. Programmable current-limit blanking handles high peak loads without oversizing the inductor.

The MAX25203D/MAX25203E feature a power-OK monitor and undervoltage lockout. Protection features include cycle-by-cycle current limit and thermal shutdown. These devices operate over the -40°C to +125°C automotive temperature range.

Applications

- Infotainment Systems
- Automotive Audio Amplifier

True Shutdown is a trademark of Maxim Integrated Products, Inc.

Benefits and Features

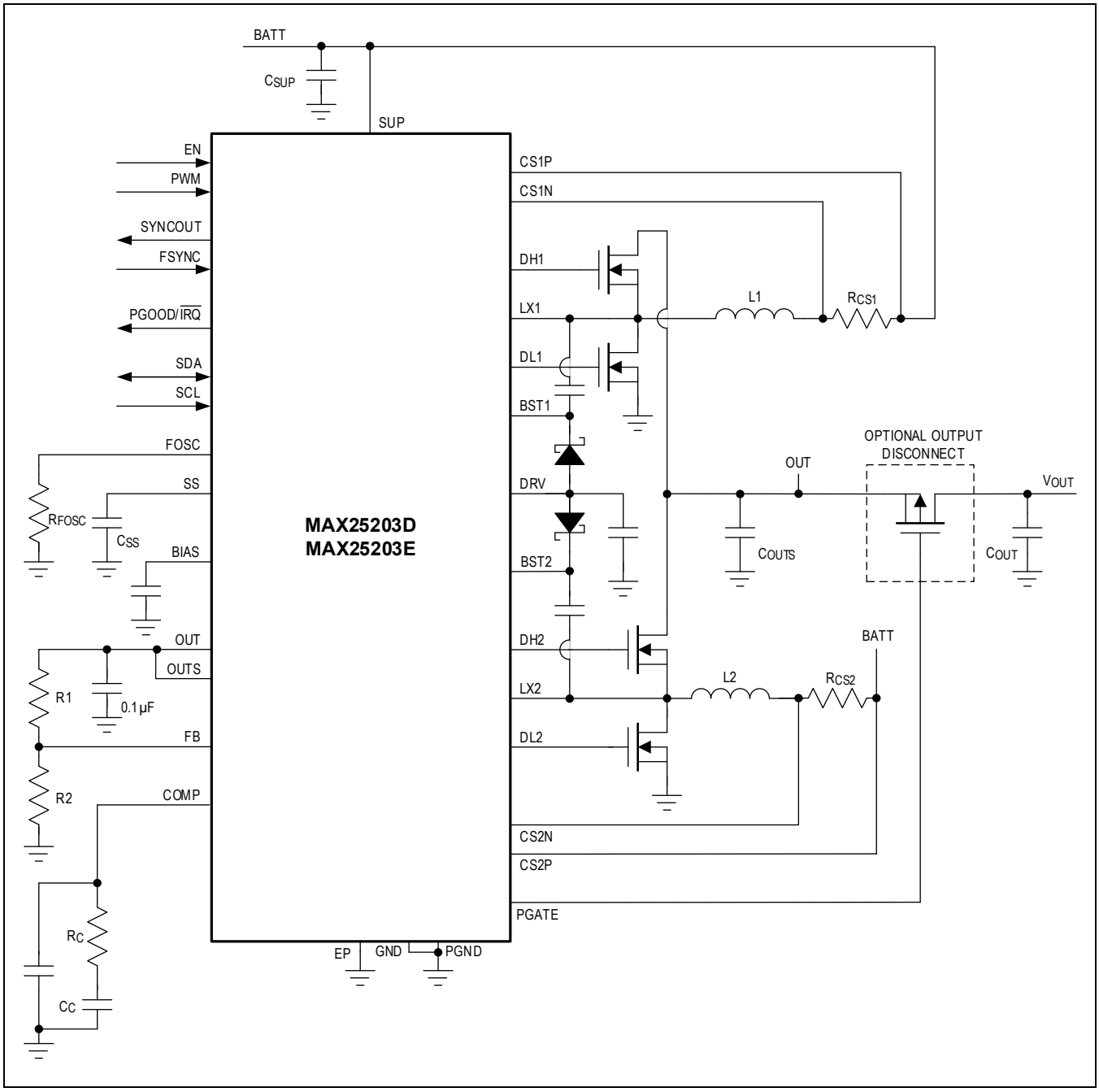
- Meet Stringent OEM Module Power Consumption and Performance Specifications
  - ±1.5% Output-Voltage Accuracy at FB
  - Output Voltage Adjustable between 12V and 65V (70V, abs max)
  - 5µA Shutdown Supply Current
- High Efficiency and Current Sharing
  - Pass-Through for >98% Efficiency
  - One-Time Programming (OTP) Gate Drive Voltage from 6.5V to 10V Allows User to Optimize External MOSFETs and Improve Efficiency
  - Current Sharing Accuracy of ±5% between Phases to Improve System Efficiency
  - Programmable Current-Limit Blanking Handles High Peak Loads without Oversizing Inductor
- EMI-Reduction Features Reduce Interference with Sensitive Radio Bands without Sacrificing Wide Input Voltage Range
  - Spread-Spectrum Option
  - On-the-Fly Frequency-Synchronization Input
  - Resistor-Programmable Frequency between 220kHz and 2.1MHz
  - Synchronization Output Provides 90° Out-of-Phase Clock for Quad-Phase Operation
- Integration and Thermally Enhanced Package Saves Board Space and Cost
  - Current-Mode Controllers with Forced-Continuous and Skip Modes
  - Side-Wettable, 32-Pin TQFN-EP Package
- Protection Features and I²C Diagnostics for Improved System Reliability
  - Operational Undervoltage Lockout
  - Short-Circuit Protection with True Shutdown™
  - Supply Undervoltage Lockout through I²C
  - Die Temperature Monitoring through I²C
  - Individual Phase Current Monitoring through I²C

Visit Web Support to complete the nondisclosure agreement (NDA) required to receive additional product information.

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Simplified Application Diagram



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