

General Description

The MAX25229 is a high-efficiency, eight-output, low-voltage PMIC. OUT1 is a 1.6A boost converter which can boost a 3.3V input supply to 5V at up to 500mA output current, while four synchronous step-down converters provide an output voltage range of 0.5V to 2.0V at up to 4A for 1-phase and 8A for 2-phase operation. Three 600mA PMOS LDOs operate from an input voltage range of 2.7V to 5.5V and provide an output voltage of 0.5V to 3.68V. All DC-DC converters achieve $\pm 1\%$ DC accuracy over load, line, and temperature range, while the LDOs achieve $\pm 3\%$ AC+DC accuracy.

This device features a 2.1MHz fixed-frequency PWM mode for better noise immunity and load-transient response. The high switching frequency operation allows for the use of all ceramic capacitors and minimizes external components. The spread-spectrum frequency modulation minimizes radiated electromagnetic emissions. Integrated low $R_{DS(ON)}$ switches improve efficiency at heavy loads and simplify the layout with respect to discrete solutions. The MAXQ™ architecture minimizes output capacitance for each output by individually optimizing each output for the application requirements and eliminating process variations that reduce performance.

The device is offered with factory-preset output voltages. See the [Ordering Information](#) table for options.

Key Applications

- Domain ECU
- Advanced Driver-Assistance Systems

Benefits and Features

- Multiple Functions for Small Size
 - Synchronous 5V Boost Converter
 - Up to 700mA Output Current
 - Four 4A Buck Converters
 - OUT2–4: 0.5V to 2.0V
 - OUT5: 0.5V to 3.3V
 - Supports Dual-Phase Operation
 - Three 600mA PMOS LDOs
 - Can Be Configured as Voltage Monitors
 - Five Programmable GPIO Pins
 - Challenge-Response Watchdog
 - I²C Fast-mode Plus-Compatible Interface
 - 2.1MHz Internal Operation with Spread Spectrum
- High-Precision Performance
 - $\pm 1\%$ Output Voltage Accuracy
 - $\pm 1\%$ OV/UV Monitoring
 - Excellent Load-Transient Performance
 - MAXQ™ Architecture
- Diagnostics and Redundant Circuits
 - ASIL D Compliant
 - Redundant Reference
 - Fail Safe on Open Pins
 - Packet Error Checking (PEC) on I²C
 - Shorted Pin Detection on $\overline{\text{RESET}}$
 - AV Supply OV/UV Monitor
- Robust for the Automotive Environment
 - Current-Mode, Forced-PWM Operation
 - Overtemperature and Short-Circuit Protection
 - 5mm x 5mm, 29-Pin FCQFN
 - -40°C to +125°C Grade 1 Automotive Temperature Range

[Ordering Information](#) appears at end of data sheet.

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

Simplified Block Diagram



