

Four-Output Mini PMIC for Safety Applications

General Description

The MAX20430 is a high-efficiency, four-output DC-DC converter and windowed watchdog. OUT1 is a synchronous step-down converter that converts vehicle battery voltage to 3.3V at up to 2.5A. OUT3 boosts OUT1 to 5V at up to 500mA, while OUT2 and OUT4 low-voltage synchronous step-down converters operate from OUT1 and provide a 0.8V to 3.9875V output voltage range at up to 3A. All outputs achieve $\pm 1.5\%$ output error over load, line, and temperature range.

The device features 2.1MHz fixed-frequency PWM mode for all DC-DC outputs for better noise immunity and load-transient response. The 2.1MHz frequency operation allows for the use of all ceramic capacitors and minimizes external components. The programmable spread-spectrum frequency modulation minimizes radiated electromagnetic emissions. Integrated low RDS(on) switches improve efficiency at heavy loads and make the layout much simpler with respect to discrete solutions.

The device is offered with factory-preset output voltages. Other features include soft-start, overcurrent, and overtemperature protections.

Applications

- ADAS

Benefits and Features

- Multiple Functions for Small Size
 - Synchronous High-Voltage Buck Converter up to 2.5A
 - Input Voltage Range 3.5V to 40V
 - Output Voltage of 3.3V
 - 5V, Synchronous 500mA Boost Converter
 - Dual Synchronous Buck Converters up to 3A
 - 0.8V to 3.9875V in 12.5mV Steps
 - Flexible Power Sequencer for OUT2, OUT3, and OUT4
 - Programmable Challenge/Response or Windowed Watchdog
 - Two Free Programmable UV/OV Voltage Monitors
 - 0.8V to 3.9875V in 12.5mV Steps
 - I²C Fast Mode Plus-Compatible Interface with Packet Error-Checking Option (PEC)
 - 2.1MHz Internal Operation with Spread-Spectrum Option
 - $\overline{\text{RESET}}$ Output
 - Current-Mode, Forced-PWM Operation
- High Precision for ASIL Applications
 - $\pm 1.5\%$ Output Voltage Accuracy
 - $\pm 1\%$ OV/UV Monitoring
- Diagnostics and Redundant Circuits
 - ASIL C Compliant
 - Redundant Reference
 - BIST Diagnostics
 - Fail Safe on Open Pins
 - Shorted Pin Detection on $\overline{\text{RESET}}$
- Mount ID Location Detection
- Robust for the Automotive Environment
- Overtemperature and Short-Circuit Protection
- 5mm x 5mm, Side-Wettable TQFN Package
- -40°C to +125°C, Grade 1 Automotive Temperature Range

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

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DOCUMENT FEEDBACK

TECHNICAL SUPPORT

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