

2.2MHz Dual-Output, Low-Voltage Step-Down Converters

General Description

The MAX20415 is a high-efficiency, dual-output, low-voltage DC-DC converter. The synchronous step-down converters operate from a 3.0V to 5.5V input voltage range and provide a 0.8V to 3.8V output voltage range at up to 3A. The buck converters achieve $\pm 1.5\%$ output error over load, line, and temperature range.

The IC features a 2.2MHz fixed-frequency pulse-width modulation (PWM) mode for better noise immunity and load-transient response, and a pulse-frequency modulation mode (skip) for increased efficiency during light-load operation. The 2.2MHz frequency operation allows for use of all-ceramic capacitors, minimizing the total solution footprint. Programmable spread-spectrum frequency modulation minimizes radiated electromagnetic emissions. Integrated low $R_{DS(ON)}$ switches improve efficiency at heavy loads and make the layout a much simpler task with respect to discrete solutions.

The IC is offered with factory-preset or resistor-adjustable output voltages. Other features include soft-start, over-current protection, pin diagnostics, and overtemperature protections. The MAX20415 is available in a lead(Pb)-free, 24-pin TQFN package (see the *Ordering Information/Selector Guide* for available options).

Applications

- Automotive ADAS Applications
- Short-Range Radar

Benefits and Features

- Multiple Functions for Small Size
 - Dual Synchronous Buck Converters up to 3A
 - Fixed Output Voltage from 0.8V to 3.8V
 - Resistor-Adjustable Output Voltage
 - 3.0V to 5.5V Operating Supply Voltage
 - 2.2MHz Operation
 - Individual EN_ Inputs and $\overline{\text{RESET}}_$ Outputs
 - Input Supply Monitoring PV_OV Output
- High Precision
 - $\pm 1.5\%$ Output-Voltage Accuracy
 - $\pm 1.5\%$ Over/Undervoltage Monitoring Accuracy
 - Good Load-Transient Performance
- Diagnostics and Redundant Circuits
 - ASIL-C Compliant
 - Redundant Reference
 - Fail Safe on Open Pins
 - Shorted-Pin Detection on $\overline{\text{RESET1}}/\overline{\text{RESET2}}$
 - Input Overvoltage Detection
- Robust for the Automotive Environment
 - Current-Mode, Forced-PWM, and Skip Operation
 - Overtemperature and Short-Circuit Protection
 - 4mm x 4mm, 24-Pin TQFN Package
 - -40°C to $+125^\circ\text{C}$ Automotive Temperature Range

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

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