

#### **MAX20419**

# High-Efficiency, 3-Output, Low-Voltage DC-DC Converter

## **General Description**

The MAX20419 is a high-efficiency, 3-output, low-voltage DC-DC converter IC. OUT1 boosts the input supply to 5V at up to 750mA, while two 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 3.6A. The boost converter achieves ±1.9% and the buck converters achieve ±1.4% 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 pulsefrequency-modulation mode (skip) for increased efficiency during light-load operation. The 2.2MHz frequency operation allows the use of all-ceramic capacitors and minimizes external components. The programmable spreadspectrum frequency modulation minimizes radiated electromagnetic emissions. Integrated low R<sub>DS(ON)</sub> 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 output voltages (see the <u>Ordering Information/Selector Guide</u> for available options). Other features include soft-start, overcurrent, and overtemperature protections. The MAX20419 also has several redundancy and diagnostic features for compatibility with ASIL-rated applications.

#### **Applications**

- Advanced Driver-Assistance Systems (ADAS)
- Infotainment
- SoC Power

#### **Benefits and Features**

- Multiple Functions for Small Size
  - Synchronous 750mA Boost Converter
  - Fixed at 5V Output
  - Dual Synchronous Buck Converters up to 3.6A
    - Factory Configurable from 0.8V to 3.8V in 25mV Steps
  - · Programmable Windowed Watchdog
  - 3.0V to 5.5V Operating Supply Voltage
  - 2.2MHz Operation
  - Individual RESET Outputs
  - · High-Precision Performance
    - ±1.9% Output-Voltage Accuracy (OUT1) and ±1.4% Output-Voltage Accuracy (OUT2, OUT3)
    - ±1.3% OV/UV Monitoring (OUT1–OUT3, PV)
    - Excellent Load-Transient Performance
- Diagnostics and Redundant Circuits
  - ASIL C Compliant
  - · Redundant Reference
  - · Fail Safe on Open Pins
  - Shorted Pin Detection on RESET1–RESET3
  - Input Overvoltage Detection
- Robust for the Automotive Environment
  - · Current Mode, Forced-PWM, and Skip Operation
  - · Overtemperature and Short-Circuit Protection
  - 24-Pin (4mm x 4mm) TQFN with Exposed Pad
  - -40°C to +125°C Automotive Temperature Range

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

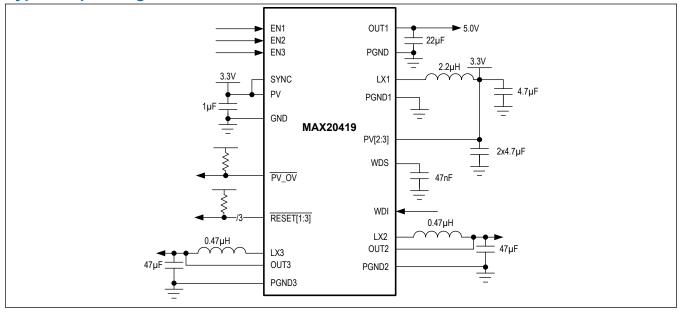
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<u>Ordering Information/Selector Guide</u> appears at end of data sheet.

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# **Typical Operating Circuit**



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