

MAX25252

Five-Output ASIL B PMIC with Accurate Temperature Monitoring for Next-Generation Camera Sensors

General Description

The MAX25252 is a high-efficiency, five-output ASIL B PMIC with three DC-DC converters, and two high-PSRR LDOs, with OV/UV monitoring on all outputs. OUT1 is a 1A high-voltage, synchronous step-down converter operating from power over coax. OUT2 and OUT3 are low voltage synchronous step-down converters and provide a 0.75V to 3.9375V output voltage range. OUT2 and OUT3 can deliver up to 1.7A current respectively for the high-megapixel cameras and high-speed serializers. LDO4 and LDO5 deliver up to 0.4A and 0.9A of current to power the secondary rails of the imager and a serializer. All outputs achieve $\pm 1.5\%$ output accuracy over load, line, and temperature range. Overvoltage and undervoltage for each output are monitored and their statuses are communicated through RESET and I²C.

The device features temperature monitoring with external NTC. The IC accurately measures PCB temperature and flags the temperature warning through RESET.

The device features a 2.1MHz fixed-frequency PWM mode 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.

The I²C programmable output voltages and sequencing increases flexibility for different image sensors and configurations. Other features include soft-start, overcurrent, and overtemperature protections.

Applications

- Surround-View Cameras
- Rear-View Cameras
- Side-View Cameras
- Forward-Looking Cameras

Benefits and Features

- Multiple Functions for Small Size
 - 1A Synchronous High-Voltage Buck Converter
 - Input Voltage Range 3.5V to 22V
 - 2.5V to 5V Output Voltage in 100mV Steps
 - Two Synchronous Low-Voltage Buck Converters
 - Delivers up to 1.7A Current
 - 0.75V to 3.9375V Output Voltage in 12.5mV Steps
 - High-PSRR, Low-Voltage LDO for Camera Sensor
 - Delivers up to 0.4A Current
 - 0.75V to 3.9375V Output Voltage in 12.5mV Steps
 - Low-Voltage LDO
 - Delivers up to 0.9A Current
 - 0.75V to 3.9375V Output Voltage in 12.5mV Steps
 - 2.1MHz Operation
 - RESET Output for OV/UV Detection and Other Diagnostics
 - SUP Voltage OV/UV Indication
- High Precision for ASIL B Applications
 - $\pm 1.5\%$ Output Voltage Accuracy (OUT1-OUT5)
 - $\pm 1\%$ OV/UV Monitoring Accuracy
- High-Precision Temperature Monitoring
 - 12-Bit ADC for Accurate Board Temperature
 - $\pm 0.096\%$ Voltage Measurement Accuracy
- Robust for the Automotive Environment
 - ASIL B Compliant
 - Current-Mode, Forced-PWM Operation
 - Overtemperature and Short-Circuit Protection
 - 5mm x 5mm, 28-Pin Side-Wettable TQFN
 - -40°C to +125°C Automotive Temperature Range
 - AEC-Q100 Qualified

Simplified Block Diagram



