

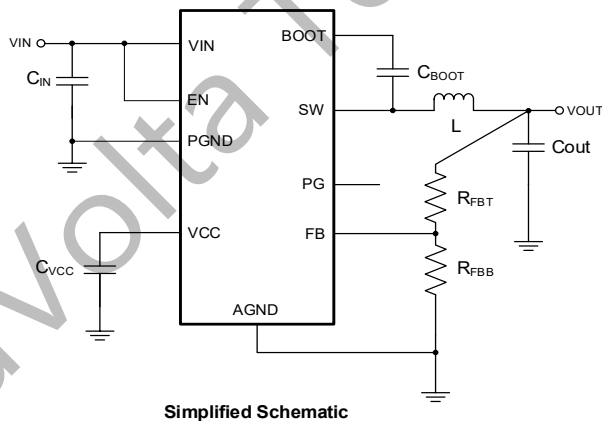
# 3.5-V to 36-V, 3-A Automotive Synchronous Step-Down Converter

## 1 Features

- AEC-Q100 qualified for automotive applications:
  - Temperature grade 1: -40°C to +125°C
- Wide Input Voltage: 3.5V to 36V
- Up to 3A continuous output current
- Optimized for ultra-low EMI requirements
  - Parallel input path minimizes switch node ringing
  - Spread spectrum reduces peak emissions
- Designed for reliable auto-application
  - Support 40-V automotive load dump
  - $1V \pm 1\%$  feedback reference voltage
  - $V_{OUT}$  adjustable from 1 V to 24V
  - Low drop-out mode
  - Frequency: 400 kHz, 1.4 MHz, 2.1 MHz
  - Integrated compensation network
- High-efficiency power conversion
  - Low operating quiescent current of 25- $\mu$ A
  - 79% PFM efficiency at 1-mA, 13.5  $V_{IN}$ , 5  $V_{OUT}$
  - 91% PFM efficiency at 10-mA, 13.5  $V_{IN}$ , 5  $V_{OUT}$
- Precision enable threshold for adjustable input voltage lock-out protection
- 5ms internal soft-start time
- Robust OVP, OCP, SCP, and OTP Protection
- Wettable Flank package, easy for soldering check
- 3mm $\times$ 2mm QFN-12 Package

## 2 Applications

- Automotive infotainment and cluster: head unit, media hub, USB charger, display
- Automotive wireless charger
- Automotive ADAS and body electronics



## 3 Descriptions

The NUQ3533 automotive-qualified regulator is an easy-to-use, synchronous, step-down DC/DC converter that delivers best-in-class efficiency for rugged applications. The NUQ3533 drives up to 3A of load current from an input of up to 36V. It integrates two low-R<sub>dson</sub> high-side and low-side MOSFETs. The NUQ3533 implements soft recovery from dropout which can eliminate overshoot on the output.

The NUQ3533 provides high light load efficiency and output accuracy in a very small solution size. Features such as a power-good flag and precision enable provide both flexible and easy-to-use solutions for a wide range of applications. Integration eliminates most external components and provides a pinout design for a simple PCB layout.

Protection features include thermal shutdown, input Undervoltage lockout, cycle-by-cycle current limit, and hiccup short-circuit protection.

The NUQ3533 is available in a 12-pin 3 mm x 2mm QFN package with wettable flanks.

### Device Information

Part Number	Package	Dimension
NUQ3533	QFN-12	3mm $\times$ 2mm

