



Analog, Mixed Signal and Power Management

## MC10XS3435

### Quad High Side Switch—Dual 10 mOhm, Dual 35 mOhm

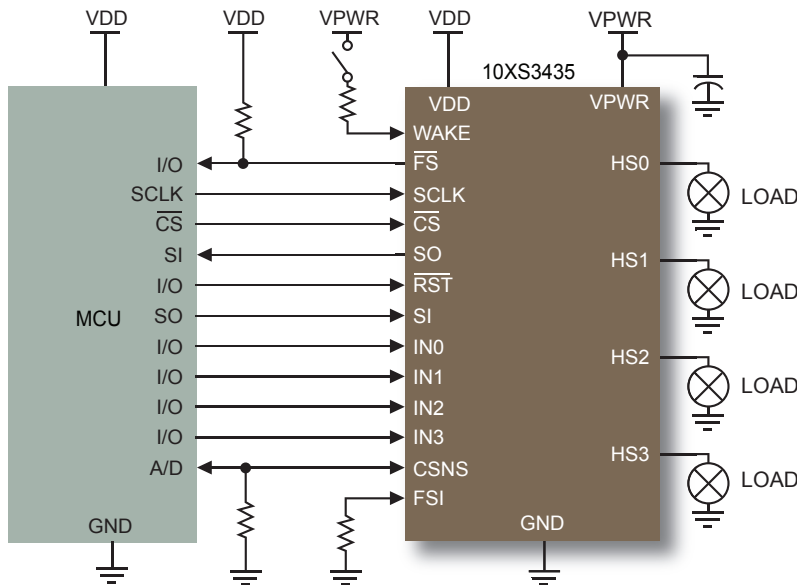
#### Overview

Freescale Semiconductor's third generation of its award-winning eXtreme Switch portfolio features devices tailored for automotive lighting applications. These high side power switches include the MC10XS3435, which is designed

to drive high-intensity discharge (HID) light sources, improve efficiency, reduce wire harness size, and provide increased protection for longer bulb life. Featuring four low  $R_{DS(ON)}$  MOSFETs (dual 10 m $\Omega$ /dual 35 m $\Omega$ ), the MC10XS3435 can control four

separate 55 W/28 W bulbs, and/or Xenon modules, and/or LEDs. Programming, control, and diagnostics are accomplished using a 16-bit SPI interface. Its output with selectable slew rate improves electromagnetic compatibility (EMC) behavior. Additionally, each output has its own parallel input or SPI control for pulse-width modulation (PWM) control, if desired. The MC10XS3435 allows the user to program via the SPI the fault current trip levels and duration of acceptable lamp inrush. The device has Fail-safe mode to provide functionality of the outputs in case of a damaged MCU.

#### MC10XS3435 Simplified Application Diagram

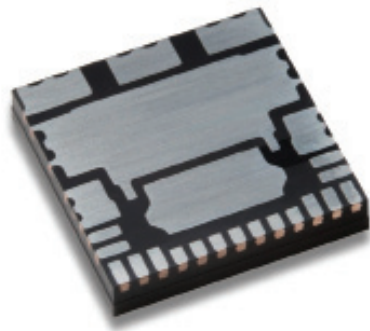


#### MC10XS3435 Applications

- Low-voltage automotive lighting
  - Xenon bulbs
  - Halogen bulbs
  - Light-emitting diodes (LEDs)
  - High beam
  - Low beam
  - Flashers
- Low-voltage industrial lighting

### MC10XS3435 Product Features

- Four protected 10 mΩ and 35 mΩ high side switches (at 25 °C)
- Operating voltage range of 6.0 to 20 V with standby current < 5.0 μA, extended mode from 4.0 to 28 V
- 8.0 MHz 16-bit 3.3 V and 5.0 V SPI control and status reporting with daisy chain capability
- PWM module using external clock or calibratable internal oscillator with programmable outputs delay management
- Smart over-current shutdown, severe short-circuit, over-temperature protections with time limited autoretry, and Fail-safe mode in case of MCU damage
- Output OFF or ON open-load detection compliant to bulbs or LEDs (<10 mA) and short to battery detection
- Analog current feedback with selectable ratio and board temperature feedback



FK SUFFIX (Pb-FREE)  
98ARL10596D  
24-PIN PQFN

### Selector Guide

Part Number (for Tape and Reel, add an R2 suffix)	Temp. Ranges	Features	Package
MC10XS3435BHFK MC10XS3435DHFK	-40°C to +125°C	Two—10 mΩ, Two—35 mΩ high side switches	24-pin PQFN

### Development Tools

Part Number	Description
KIT10XS3435EVBE	Evaluation board Contact Freescale Sales

### Documentation

Document Number	Title	Description
MC10XS3435	Quad High Side Switch (Dual 10 mΩ, dual 35 mΩ)	Data Sheet
SG1002	Analog, Mixed Signal and Power Management	Selector Guide
SG187	Automotive	Selector Guide
AN3740	Evaluation of Power Dissipation for the eXtreme Switch Devices	Application Note
AN2467	Power Quad Flat No-lead (PQFN) Package	Application Note

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