



Analog, Mixed Signal and Power Management

# MC10XS3535

## Smart Front Corner Light Switch - Triple 10 mOhm, Dual 35 mOhm

**Overview**

Freescale Semiconductor's third generation of its award winning eXtreme Switch portfolio features devices tailored for automotive applications. These high side power switches include the 10XS3535, which is designed to drive high-intensity

discharge light sources, improve efficiency, reduce wire harness size, and provide increased protection for longer bulb life. Featuring five  $R_{DS(ON)}$  MOSFETs, the 10XS3535 can control five separate bulbs and/or LEDs, plus an optional load with external smart power switch.

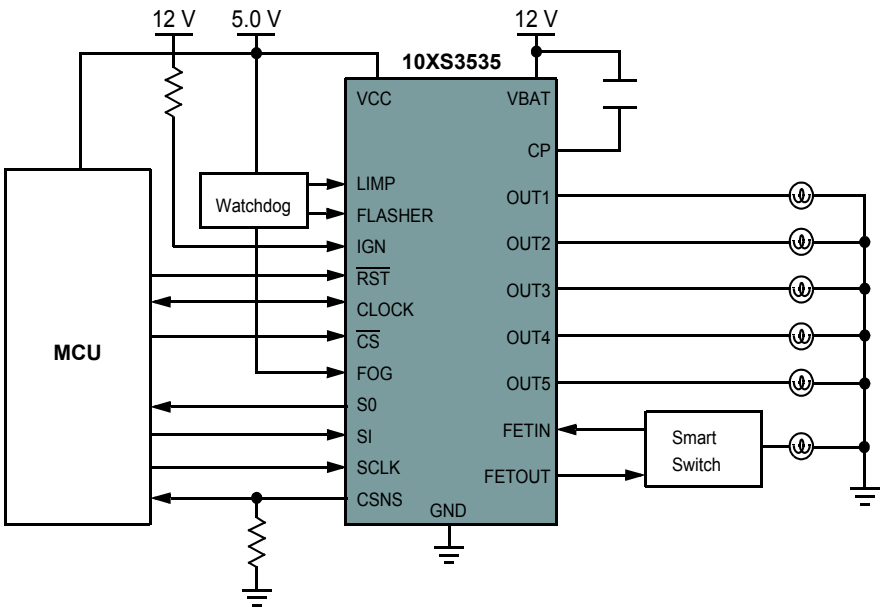
The 10XS3535 is designed for low voltage automotive and industrial lighting applications. Its five low  $R_{DS(ON)}$  MOSFETs (three 10 m $\Omega$ , two 35 m $\Omega$ ) can control the high sides of five separate resistive loads (bulbs, Xenon-HID modules, and LEDs). Programming, control, and diagnostics are accomplished using a 16-bit SPI interface (3.3 or 5.0 V). Each output has its own pulse-width modulation (PWM) programmed via the SPI. The 10XS3535 has highly sophisticated failure mode handling to provide high availability of the outputs. Its multi phase control and output edge shaping improves electromagnetic compatibility (EMC) behavior.

The 10XS3535 is packaged in a power-enhanced 12 x 12 mm non-leaded Power QFN package with exposed tabs.

**Applications**

- Low-voltage automotive lighting
- Halogen bulbs
- Light-emitting diodes (LEDs)
- High or low beams
- Power distribution
- Flashers
- Low voltage industrial lighting

MC10XS3535 Simplified Application Drawing



## Features

- Triple 10 mΩ and Dual 35 mΩ high side switches
- 16-bit SPI communication interface with daisy chain capability
- Current sense output with SPI-programmable multiplex switch and board temperature feedback
- Digital diagnosis feature
- PWM module with multi phase feature including prescaler
- LED control including accurate current sensing and low duty cycle capability
- Fully-protected switches
- Overcurrent shutdown detection
- Power net and reverse polarity protection
- Low power mode
- Fail mode functions including unlimited autorestart feature
- External smart power switch control including current recopy



98ARL10596D  
24-PIN PQFN

## Ordering Information

Part Number (for Tape and Reel, add an R2 suffix)	Temperature range (T <sub>A</sub> )	Package
MC10XS3535HFK		
MC10XS3535DHFK	-40 °C to +125 °C	24-pin PQFN
MC10XS3535JHFK		

## Development Tools

Part Number	Description
KIT10XS3535EVBE	Evaluation Kit - 10XS3535, Smart Front Corner Light Switch (Triple 10mΩ and Dual 35mΩ)

## Documentation

Document Number	Title	Description
MC10XS3535	Smart Front Corner Light Switch (Triple 10 mΩ and Dual 35 mΩ)	Data Sheet
SG1002	Analog, Mixed Signal and Power Management	Selector Guide
SG187	Automotive	Selector Guide
AN2467	Power Quad Flat No-Lead (PQFN) Package	Application Note
AN4144	EMC, ESD and Fast Transient Pulses Performances	Application Note

Performance	Typical Values
Outputs	5 (+1 Optional)
R <sub>DS(ON)</sub> at 25 °C	3 x 10 mΩ and 2 x 35 mΩ
Operating Voltage	7.0 to 28 V
Peak Current	78A (10 mΩ) 37A (35 mΩ)
ESD	±8.0 kV power I/Os ±2.0 kV digital I/Os
Ambient Operating Temperature	-40 °C ≤ T <sub>A</sub> +125 °C
Junction Operating Temperature	-40 °C ≤ T <sub>J</sub> +150 °C

Protection	Detect	Shut Down	Auto Retry	Status Reporting
Short-circuit	•	•		•
Overtemperature	•	•	•	•
Overcurrent	•	•	•	•
Overvoltage	•			•
Undervoltage	•	•	•	•
OpenLoad Detect	•			•
Load Shorted to Battery	•			•

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