



Analog, Mixed Signal and Power Management

MC35XS3500

Smart Rear Corner Light Switch (penta 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 35XS3500, 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 five $R_{DS(ON)}$ MOSFETs, the 35XS3500 can control five separate bulbs and/or LEDs, plus an optional load with an external smart power switch.

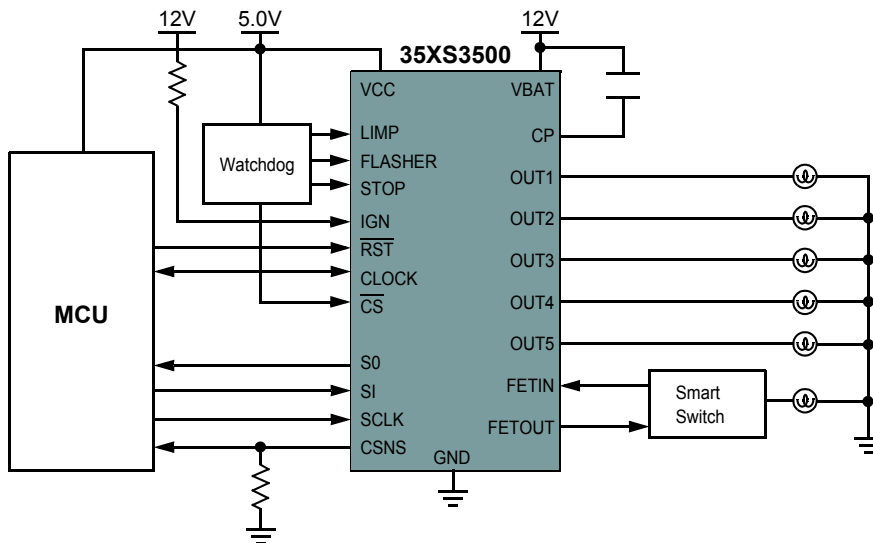
The 35XS3500 is designed for low voltage automotive and industrial lighting applications. Its five low $R_{DS(ON)}$ MOSFETs (35 m Ω) can control the high sides of five separate resistive loads (bulbs, Xenon-HID modules, and LEDs). Programming, control, and diagnostics are accomplished using a 16-bit SPI interface (3.3 or 5.0 V), with daisy chain capability. Each output has its own pulse-width modulation (PWM) control via the SPI. The 35XS3500 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 35XS3500 is packaged in a power-enhanced 12 x 12 mm non-leded Power QFN package with exposed tabs.

Applications

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

MC35XS3500 Simplified Application Drawing



Features

- Penta 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 auto restart feature
- External smart power switch control including current recopy



98ART10511D
24-PIN PQFN

Ordering Information

Part Number (for Tape and Reel, add an R2 suffix)	Temperature range (T _A)	Package
MC35XS3500HFK	-40 °C to +125 °C	24-pin PQFN
MC35XS3500DHFK		

Development Tools

Part Number	Description
KIT35XS3500EVBE	Evaluation Kit - 35XS3500, Smart Rear Corner Light Switch (Penta 35mΩ)

Documentation

Document Number	Title	Description
MC35XS3500	Smart Rear Corner Light Switch (Penta 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

Performance	Typical Values
Outputs	5 (+1 Optional)
R _{DS(ON)} at 25 °C	5 x 35 mΩ
Operating Voltage	3.3 to 5.0 V
Peak Current	37 A
ESD	±8.0 kV power I/Os ±2.0 kV digital I/Os
Ambient Operating Temperature	-40 °C ≤ T _A +125 °C
Junction Operating Temperature	-40 °C ≤ T _J +150 °C

Protection

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

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