

Analog, Mixed Signal and Power Management

MC10XS3412

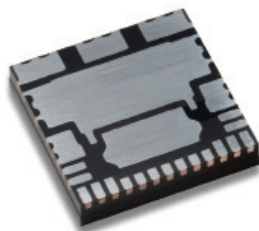
Quad high side switch—dual 10 mOhm, dual 12 mOhm

Applications

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

Overview

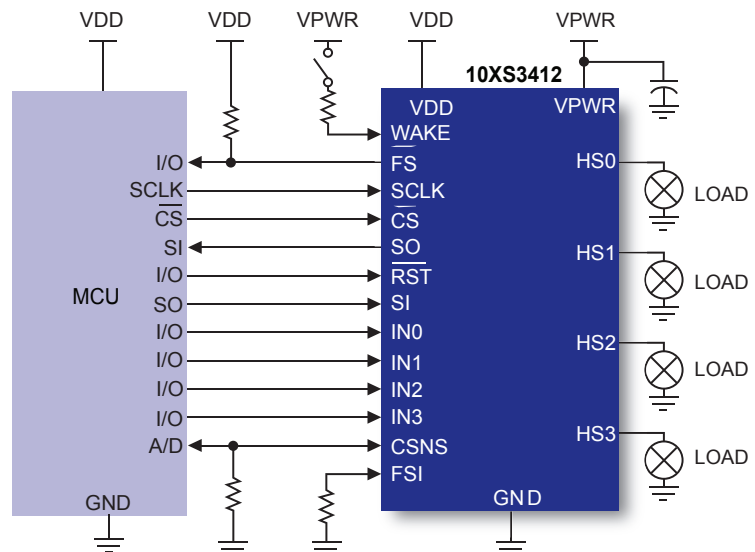
Freescale Semiconductor's third generation of its award-winning eXtreme Switch portfolio features devices tailored for automotive lighting applications. These high side power switches include the MC10XS3412, which is designed to drive high-intensity discharge (HID) light sources, improve efficiency, reduce wire harness size, and provide increased protection for longer bulb life. Featuring four low $R_{DS(ON)}$ MOSFETs (dual 10 mΩ/dual 12 mΩ), the MC10XS3412 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 MC10XS3412 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.



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

FK SUFFIX (Pb-FREE)
98ASA00426D
24-PIN PQFN

MC10XS3412 Simplified Application



Product Features

- Four protected 10 mΩ and 12 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 overcurrent shutdown, severe short-circuit, overtemperature 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.

Orderable Part

Part Number (for Tape and Reel, add an R2 suffix)	Temp. Ranges	Features	Package
MC10XS3412CHFK	-40 to +125 °C	Two—10 mΩ, 12	98ARL10596D 24-pin PQFN
MC10XS3412JHFK		Two—12 mΩ high side switches	98ASA00426D 24-pin PQFN

Development

Part Number	Description
KIT10XS3412EVBE	Evaluation Board - Contact Freescale Sales

Documentation

Document Number	Title	Description
MC10XS3412	Quad High Side Switch (Dual 10 mΩ, dual 12 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
AN3569	EMC, ESD and Fast Transient Pulses Performances for the MC10XS3412	Application Note
AN2467	Power Quad Flat No-lead (PQFN) Package	Application Note

For more information, visit freescale.com



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