L99LD01
Automotive LED driver

SPI-configurable boost controller with detailed diagnostics

The L99LD01 is dedicated driver for controlling high-brightness LEDs in vehicle headlight applications.
This device offers high software configurability and architecture-topology flexibility using a versatile platform approach.
The scalable solution enables a cost-optimized selection of the power components and provides full diagnostics and protection for enhanced system reliability.

KEY FEATURES - GENERAL SECTION

- Spread spectrum
- SPI interface

KEY FEATURES - LED DRIVER

- High-side current sense and PWM dimming
- LED over-temperature detection and protection with external NTC
- Software configurable LED current

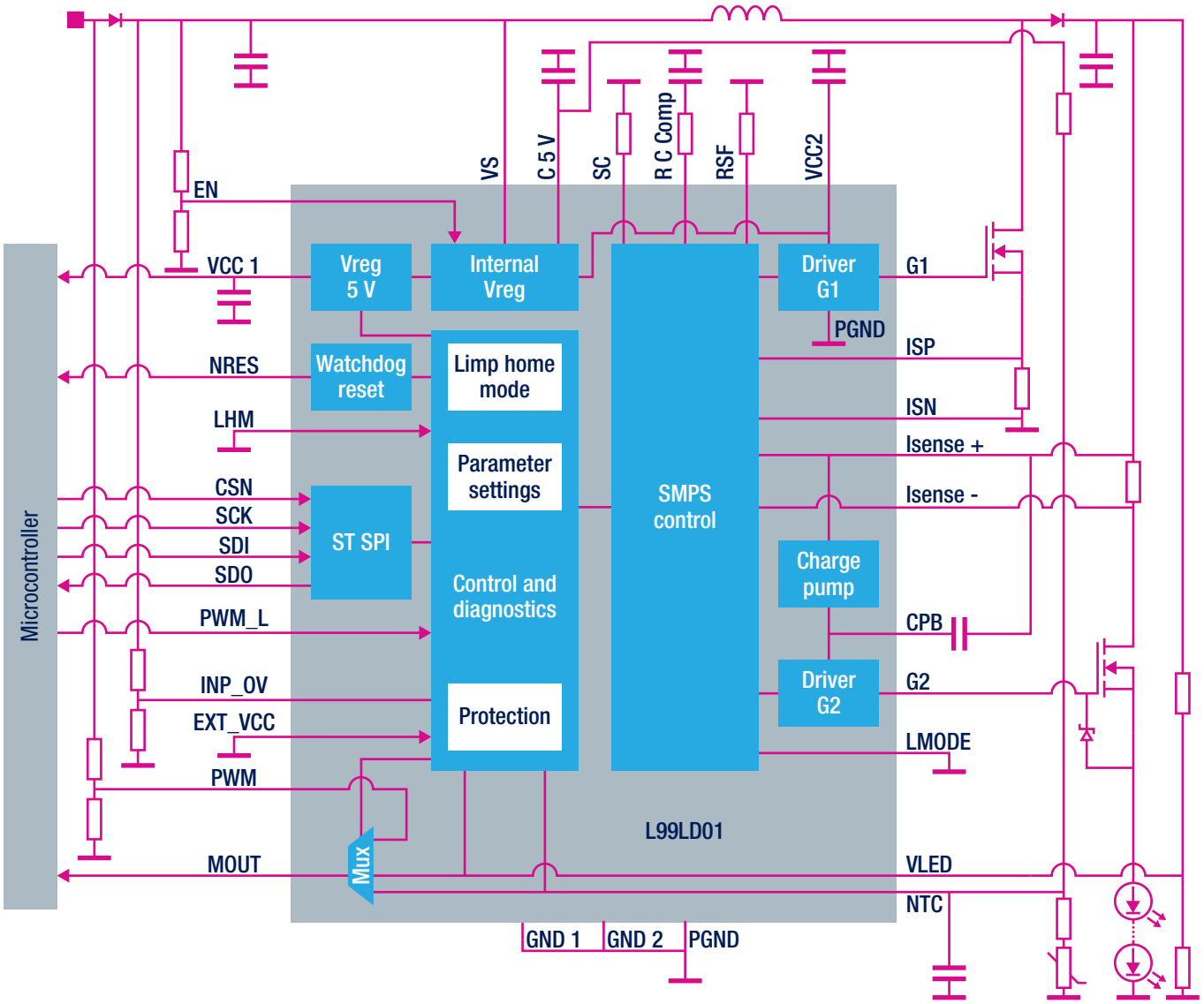
KEY BENEFITS

- Software configurability for platform approach
- Compatible with boost, floating buck-boost and flyback topologies
- Supports fail-safe strategies (ASILB, ISO 26262)
- Full application protection
- Single wire to the LED strings
- Compatible with both microcontroller and standalone configuration

MAIN APPLICATIONS

- LED headlamps
- LED signal lights
- LED daytime running lights

APPLICATION EXAMPLE: L99LD01 IN BOOST CONFIGURATION



DEVICE DESCRIPTION

The L99LD01 consists of a boost controller, which is optimized as a constant-current generator.
The boost section is based on a constant switching frequency and peak current mode architecture, which provides an inherent cycle-by-cycle input current limitation. The device integrates a powerful gate driver for an n-channel switching MOSFET, and a charge pump for the control of an n-channel high-side dimming MOSFET that allows the LED string to be connected directly to ground/chassis.
The L99LD01 enables full protection of the application: input and output overvoltage, temperature sensing via the NTC input with programmable current foldback and LED overcurrent protection.

The SPI interface offers unique software configurability: adjustable LED current, input current limitation, PWM dimming features and dithering, and more. It also offers a detailed diagnosis of the potential application failures, and supports high functional safety requirements (ASILB according to ISO 26262) through the watchdog, the watchdog timer status and the limp home mode.

The 5 V regulator (which supplies up to 20 mA), combined with the reset control and the watchdog, provides reliable power management for an 8-bit microcontroller. The L99LD01 can also operate in standalone configuration.