

ALED6001

boost your LED light designs



Analog/PWM-dimmable LED driver with integrated boost controller optimized for driving one string of high-brightness LEDs

HB LEDs are gaining popularity in car exterior lighting applications, given their advantages in terms of superior efficiency, extended lifetime and small size. All front and rear lighting applications (hi/lo-beams, daytime running lights, brake/tail lights and blinkers) can benefit from the potential of LEDs to create innovative and emotional visual designs. Compact driving circuitry, optimized efficiency and reduced power dissipation, as well as reduced EMI, are all required to ensure LEDs are properly integrated within a vehicle. ST's new ALED6001 features both analog and PWM dimming controls for superior LED brightness management and supports boost, SEPIC and floating-load buck-boost topologies.

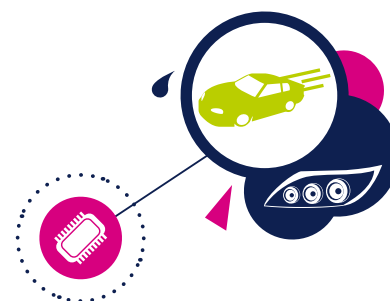
KEY FEATURES & BENEFITS

- AEC-Q100 qualified
- Boost controller and high-side current sensing circuitry optimized for driving one string of high-brightness LEDs
- Supports multiple topologies such as boost, SEPIC and floating-load buck-boost.
- Analog and PWM dimming for maximum LED brightness control
- High-accuracy ($\pm 4\%$) LED current regulation over the entire operating temperature range
- Comprehensive fault detection and management for enhanced safety and application compactness

APPLICATIONS

Ideal for driving LEDs in car exterior lighting applications:

- Front lights
- Daytime running lights
- High and low beam lights
- Fog lights
- Position lights / blinkers



FUNCTIONAL DESCRIPTION

The ALED6001 is an automotive-grade (AEC-Q100-compliant) LED driver that combines a 60 V boost controller and a high-side current sensing circuitry optimized for driving one string of high-brightness LEDs. The device is compatible with multiple topologies such as boost, SEPIC and floating-load buck-boost. A 1000:1 PWM dimming ratio can be achieved by means of an external MOSFET in series with the LED string and directly driven by a dedicated pin.

The LED current can also be varied (10:1 analog dimming) through a separate pin, eventually connected to an external negative temperature coefficient (NTC) thermistor to protect the LEDs against over-heating. The high-side current sensing provides a very good LED current accuracy ($\pm 4\%$) over the entire temperature range and production spread. The same circuitry, in combination with a P-channel MOSFET, provides effective protection in case the positive terminal of the LED string is shorted to ground. An open-drain output can be used to inform the host system in case of faulty conditions: device over-temperature, output over-voltage (disconnected LED string) and LED over-current.

DEVICE SUMMARY

Order code	Package	Packing
ALED6001/ ALED6001TR	HTSSOP16	Tube/Tape & reel



EVALUATION BOARDS

Order code	Description
STEVAL-ILL048V1	Single channel, 350mA LED driver for automotive day-time running lights (DTRL) and front lights based on ALED6001 and STM32F103C6T6
STEVAL-ILL049V1	Single-channel, 350mA constant-current LED driver operating with both boost and SEPIC topologies
STEVAL-ILL072V1	Single channel, 1 A automotive LED driver with boost controller for interior/exterior lights based on the ALED6001

