



Analog and Discrete
Power Solutions

85V Automotive-Compliant LED Driver from Diodes Incorporated Supports Multiple Topologies with Fault Reporting

Plano, Texas – December 19, 2024 – Diodes Incorporated (Diodes) (Nasdaq: DIOD) today announces the expansion of its automotive-compliant* LED driver portfolio by introducing the [AL8866Q](#). This DC-switching LED driver-controller drives an external MOSFET and supports buck, boost, buck-boost, and single-ended primary-inductance converter (SEPIC) topologies for high-power LED lighting systems. Applications include daytime running lights (DRL), high/low beams, fog lights, turn lights, brake/stop lights, and more.

It operates within a wide input power supply range from 4.7V to 85V, covering the common 12V, 24V, and 48V battery power rails. This flexibility and multi-mode operation enables lighting designers to standardize on a single component type, streamlining inventory and simplifying design processes.

The AL8866Q has a fixed-frequency (400kHz) peak current-mode control architecture. It incorporates a spread spectrum frequency modulation technique to enhance EMI performance, which is compliant with the most stringent CISPR 25 Class 5 standard.

The device supports analog and PWM dimming of the LED current via its DIM pin and has a 1% reference tolerance, enabling better brightness control and matching between lamps. With an over 100:1 analog dimming range, it achieves $\pm 12\%$ output current accuracy at low (20%) analog dimming levels, making it more precise than similar LED drivers available. Alternatively, PWM dimming (0.1 to 1kHz) achieves a 100:1 dynamic range.

The AL8866Q integrates a soft-start function, gradually increasing the inductor and switch current to minimize potential overvoltage and overcurrent at the output. It features an open-drain fault output to indicate various fault conditions, which include LED output-overvoltage, LED output-open/-short, cycle-by-cycle overcurrent protection, sense-resistor and shorted-inductor/-diode detection, diode-open circuit, and thermal shutdown.

The [AL8866Q](#) is available in the SO-8EP and U-DFN3030-10 packages, with an operating temperature range of -40°C to $+125^{\circ}\text{C}$. The AL8866QSP-13 (SO8-EP) and AL8866QFN-7 (U-DFN3030-10) are available at \$0.50 and \$0.48 in 1,000-piece quantities, respectively. A standard compliance version, AL8866, is available and suitable for industrial and commercial applications.

About Diodes Incorporated

Diodes Incorporated (Nasdaq: DIOD), a Standard and Poor's SmallCap 600 and Russell 3000 Index company, delivers high-quality semiconductor products to the world's leading companies in the automotive, industrial, computing, consumer electronics, and communications markets. We leverage our expanded product portfolio of analog and discrete power solutions combined with leading-edge packaging technology to meet customers' needs. Our broad range of application-specific products and solutions-focused sales, coupled with global operations including engineering, testing, manufacturing, and customer service, enable us to be a premier provider for high-volume, high-growth markets. For more information, visit www.diodes.com.

**Automotive-compliant - AEC qualified, manufactured in facilities certified to IATF 16949, supporting PPAP documents.*

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