36-Channel Automotive-Compliant Linear LED Driver from Diodes Incorporated for Display and Lighting Applications with Fault Reporting and Diagnostics

Plano, Texas – December 11, 2024 – Diodes Incorporated (Diodes) (Nasdaq: DIOD) today introduces a new 36-channel automotive-compliant* linear LED current driver. The AL5887Q, with its ability to drive RGB configurations as well as individual LEDs, addresses the need for OEMs to differentiate their brands by enabling designers to create different animated lighting patterns and color depths for interior and exterior lamps. This dual-role control capability simplifies the design of these once-complex LED-based modules and, coupled with its high efficiency, saves valuable power. Applications include interior ambient lighting, rear lighting, exterior EV charging status indicators, infotainment systems, and more.

The AL5887Q supports up to 12 RGB LED modules with three programmable banks (A, B, C) for software control of each color. An external resistor sets the output current of all 36 channels. Using the hardware-selectable digital interface (INT_SEL pin), lighting designers have the option to select either I²C or SPI for full system programming flexibility. Each channel current is configurable up to 70mA, enabling full optimization of the visual clarity of the LEDs, which avoids the need for paralleling. Designers also benefit from the device's automatic power-saving mode of 15µA and ultra-low quiescent shutdown of 1µA when all LEDs are off for more than 30ms, helping minimize unnecessary energy draw from the car's battery.

The device has multiple protection features, including an open drain FAULT pin for fault reporting and overtemperature protection (OTP) with pre-OTP warning. The individually addressable fault mask registers and open/short registers allow designers to enable and disable fault reporting for each of the 36 channels within the lighting system. Any unused RGB channels can be disabled by the LED configurable registers.

The AL5887Q features a built-in 16MHz oscillator for PWM dimming, eliminating the need for an external clock, which reduces the PCB footprint of the lighting modules, eases design and layout, and lowers bill-of-material (BOM) costs. To optimize color mixing and minimize audible noise, it uses a 12-bit PWM addressable register along with a 30kHz internal PWM generator. The device supports deep PWM dimming by modulating the duty cycle of the constant current from 100% to 3%. Once the duty cycle is below 3%, the internal circuitry transitions the PWM signal to analog dimming to maintain the overall

linearity. The AL5887Q has 3% device-to-device and channel-to-channel current accuracy, which enables designers to create precise color mixing and uniform color distribution across their lighting modules and displays.

The AL5887Q is specified for an operating temperature range of -40°C to +125°C and is available in the small-footprint wettable W-QFN6060-52/SWP (Type A1) package, occupying only 6mm x 6mm.

The AL5887Q is available at $1.13 in 1,000-piece quantities. A standard compliance version, AL5887, is available and is 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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