LED LIGHTING AND IoT POWER SOLUTIONS

Automotive-Compliant LED Lighting

IoT and LED Power Supply

Connected Lighting

Infotainment Display

Industrial LED Lighting

diodes.com
Diodes Incorporated products are well recognized for their simplicity, cost effectiveness, high efficiency, and incredible versatility to cover a wide range of LED lighting and IoT power applications and solutions:

- **Automotive-Compliant LED Drivers**
- **Connected LED Lighting and IoT Power Drivers**
- **Industrial LED Lighting and Power Drivers**
- **Infotainment Display Drivers**
- **Triac Dimmable and Offline LED Drivers**

Diodes automotive-compliant LED drivers help customers build innovative, reliable and cost-effective lighting systems that meet today’s stringent automotive LED Lighting requirements. Our highly efficient LED solutions extend the life of the automotive lighting system, enable greater driver and pedestrian safety, and enhance the driving experience.

Diodes connected lighting and IoT power drivers provide low standby power, increased efficiency, and high integration with buck, boost, buck-boost, and flyback. Its wide operating voltage range operates from 30Vac up to 277Vac. In addition, its optimized transient response supports the requirement of MCU, BLE, ZIGBEE and Wi-Fi communications.

Diodes industrial LED lighting and power drivers combine robust low thermal packages with high power density for industrial dimmable lighting and power applications. Integrated switching MOSFET LED drivers are capable of delivering LED currents up to 3A with operating DC voltage up to 400V. Controllers can deliver higher voltage and power using external MOSFET. Topologies include buck, boost, buck-boost, linear and multi-channels.

Diodes infotainment display drivers enhance user interface display experience with best-in-class features for backlight, AMOLED bias supply and camera flash solutions in personal electronic and automotive applications. Combined with high efficiency, wide input/output voltage range, high dimming ratios, selectable switching frequency, fault protection notification, digital interface and compact solutions, these drivers can extend battery life, reduce board space and BOM cost.

Triac dimmable and offline LED drivers provide the most cost-effective and quality solutions for retrofit bulbs and commercial LED lighting system. The triac dimmable LED Drivers are capable of being smoothly dimmed through triac dimmers. offline LED driver topologies include AC linear, buck, buck-boost, boost and flyback with main input voltages: 120Vac and 230Vac.

To help customers build innovative, reliable, and cost-effective products, Diodes offers design tools and solutions that will calculate and optimize systems performance.

diodes.com/applications/lighting
**AUTOMOTIVE-COMPLIANT LED LIGHTING**

<table>
<thead>
<tr>
<th>Part</th>
<th>Topology</th>
<th>Power (Watt)</th>
<th>Magnetic Component</th>
<th>MOSFET Options</th>
<th>PF</th>
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</thead>
<tbody>
<tr>
<td>AL17050</td>
<td>Buck</td>
<td>≤ = 0.2W</td>
<td>Single Winding</td>
<td>500V/0.5A</td>
<td>-</td>
<td>Adj</td>
<td>-</td>
<td>30-277</td>
<td>SOT23-5</td>
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<tr>
<td>AL6562A</td>
<td>Boost/Flyback</td>
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<td>Transformer with Auxiliary Winding</td>
<td>PFC Controller</td>
<td>&gt;0.9</td>
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<td>-</td>
<td>SO-8</td>
</tr>
<tr>
<td>AL1788</td>
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<td>SOT23-6</td>
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<tr>
<td>AL1771/2</td>
<td>PFC Controller + one or two channel Linear LED Driver</td>
<td>≤ = 40W</td>
<td>Transformer with Auxiliary Winding</td>
<td>PFC Controller</td>
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<tr>
<td>AL1673/2</td>
<td>Buck/Buck-Boost/Flyback</td>
<td>≤ = 15W</td>
<td>Single Winding</td>
<td>600V/12A/24A</td>
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<td>AL1685*</td>
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<tr>
<td>AL5822*</td>
<td>Linear</td>
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<td>–</td>
<td>Ripple Suppressor</td>
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**THE DIODES ADVANTAGE**

- High-performance, high-temperature LED drivers in low thermal impedance packages qualified to AEC-Q100
- High-accuracy LED control: 1% reference tolerance
  Better brightness control and matching between lamps
- Multi-topology device using one sense resistor
  Suitable for buck, boost, and buck-boost lighting
- LED current thermal management
  Reduces ILED at high temp -> improves reliability
- Diagnostic feedback pins
  Provide fault status for MCU on-board

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**CONNECTED LIGHTING AND IoT POWER**

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AL1788 is a high-performance AC/DC power factor corrected AC input and CV mode output regulator for LED lighting applications.

AL8843 is a hysteresis mode step-down DC/DC converter designed to drive LEDs with a constant current. It operates from an input supply between 4.5V and provides an externally adjustable output current up to 3A.

AL17050 is a universal AC high-voltage input step-down regulator that provides accurate constant voltage for IoT applications.

**THE DIODES ADVANTAGE**
- Primary Side Control for CV Stage
- High Power Factor and Low THD
- <200mW Standby Power for System
- Output Current up to 3A for Step-Down LED Driver
- Accurate LED Current Regulation
- Support PWM Dimming in CC Stage
- Multiple Protections: UVLO, OVP, OCP, OTP
- Low-Cost Independent Power for MCU

**CONNECTED LIGHTING**
**AL1772 + AL17050 + AL1783**

AL1772 is an integrated AC-DC PFC controller and dual-channel LED driver with PWM dimming control. AL1772 is targeted for dimmable and tunable white connected lighting applications.

AL1783 is a three-channel linear LED driver with PWM dimming control designed to target for three-channel smart connected lighting applications.

AL17050 is a universal AC high-voltage input step-down regulator that provides accurate constant voltage for IoT applications.

**THE DIODES ADVANTAGE**
- AL1772 for Main Dual-Channel LED Driver with PWM Dimming
- AL1783 for 3-Channel Connected Lighting Applications
- High Efficiency Step-Down LED Driver
- Primary Side Control for CV Stage
- High Power Factor and Low THD
- <200mW Standby Power for System
- Output Current up to 3A for Step-Down LED Driver
- Accurate LED Current Regulation
- Support PWM Dimming in CC Stage
- Multiple Protections: UVLO, OVP, OCP, OTP
- Low-Cost Independent Power for MCU

**AL1788 + AL8843 + AL17050**

AL1772 is an integrated AC-DC PFC controller and dual-channel LED input regulator for LED lighting applications.

AL8843 is a hysteresis mode step-down DC/DC converter designed to drive LEDs with a constant current. It operates from an input supply between 4.5V and provides an externally adjustable output current up to 3A.

AL17050 is a universal AC high-voltage input step-down regulator that provides accurate constant voltage for IoT applications.
The AL3353 is a highly integrated and cost-effective LED controller optimized for LCD monitor and TV backlighting application.

The AL3353 offers PWM-to-analog dimming method for a wide range of dimming control. The AL3353 offers comprehensive protection features to protect the system in various fault conditions.

**THE DIODES ADVANTAGE**

- Wide Input Voltage Range: 9V to 40V
- Constant current output or constant voltage output with low BOM cost
- Current mode PWM controller with good dynamic response
- Support PWM-to-Analog Dimming with 100:1
- Built-in multiple protections: over-voltage protection, over-current protection, LED open protection, output short protection, diode & inductor short protection, LED cathode short to GND protection, OTP

**AL5814/6Q* 60V LINEAR DIMMABLE LED CONTROLLER**

The AL5814/Q* is a 5-terminal and AL5816/Q* is a 5-terminal adjustable linear LED driver-controller offering excellent temperature stability and output current capability. It works with a wide input voltage range from 4.5V to 60V.

With an external LED driving power device, its internal power dissipation is minimized compared with traditional linear LED drivers. This makes it ideal for medium to high current LED circuits.

**THE DIODES ADVANTAGE**

- 15mA Output Drive Capability for MOSFET or Bipolar Transistor
- Programmable Reference
- Low Temperature Drift
- Compatible for PWM Dimming
- LED Open Protection Detected by VFAULT Pin
- Built-in multiple protection: UVLO, OTP, and thermal foldback protection

* Engineering samples available upon request
## Industrial LED Lighting

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<tr>
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<tr>
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<td>Single Winding Inductor</td>
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<td>AL1692/7</td>
<td>Buck-Boost</td>
<td>&lt;=125W</td>
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<td>Single Winding Inductor</td>
<td>300V@2A, 300V@3A, 500V@3A, 500V@2A, 600V@2A, 650V@4A Controller</td>
<td>&gt;0.9</td>
<td>No</td>
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**TRIAC DIMMABLE AND OFFLINE LED DRIVERS**

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High Efficiency, Cost-Effective Infotainment Display LED Drivers for Smartphone, Notebooks, TVs and Monitors

- **High Precision Current Source**
  The LED current accuracy is ≤ ±3%. The current matching between any channel is ≤0.5% (typical for AL3065A).

- **Versatile Protection Features**
  Meet strict safety requirements with built-in multiple protections: OVP, OCP, LED open, Output short circuit. Diodes and Inductor short circuit, LED cathod short to GND, and OTP.

- **Drive 4 LED strings at 250mA per string, 400mA pulse current max**
  High LED current precision and channel matching meets the latest requirements for medium to large LCD panels including 3D TVs

- **Adjustable operating frequency from 0.1MHz to 1MHz**
  Supports flexible operating frequency for better selection on inductor size and EMI solution

- **High efficiency, high switching boost solutions cover all screen sizes**
  Smaller inductor values and overall footprint

- **Analog, Direct (10.000:1) and Fast PWM Dimming Controls**
  Versatile and wide dimming range for large brightness variations

*Engineering samples available upon request*
Diodes Incorporated is a leading global manufacturer and supplier of high-quality application specific standard products within the broad discrete, logic, analog and mixed-signal semiconductor markets. Diodes serves the consumer electronics, computing, communications, industrial, and automotive markets.

Diodes’ corporate headquarters and Americas’ sales office are located in Plano, Texas and Milpitas, California. Design, marketing, and engineering centers are located in Plano; Milpitas; Taipei, Taiwan; Taoyuan City, Taiwan; Zhubei City, Taiwan; Manchester, England; and Neuhaus, Germany.

Diodes’ wafer fabrication facilities are located in Manchester and Shanghai. Diodes has assembly and test facilities located in Shanghai, Jinan, Chengdu, and Yangzhou, China, as well as in Hong Kong, Neuhaus and Taipei.

Additional engineering, sales, warehouse, and logistics offices are located in Taipei; Hong Kong; Manchester; Shanghai; Shenzhen, China; Seongnam-si, South Korea; and Munich, Germany, with support offices throughout the world.