100V adjustable current linear LED driver simplifies low power LED control

Needing only two additional components, the AL5801 linear LED driver enables designers to simplify automotive interior, signage and general lighting control circuits. Comprising a 100V rated N-channel MOSFET and pre-biased NPN transistor, this small footprint SOT26 packaged device will drive chains of up to 30 low power series connected LEDs with currents from 20mA to 350mA.

The AL5801’s open drain output will operate from between 1.1V and 100V, ensuring common 12V, 24V and 48V power rails are catered for, while the LED current is set using an external low value resistor. By generating a 0.56V reference voltage across the resistor, the driver’s internal control transistor helps minimize power losses and ensure sufficient supply voltage margin.

By virtue of the reference voltage’s negative temperature coefficient, the output current is also automatically reduced at higher temperatures, helping to protect the LED chain from any damage, so improving overall circuit reliability. In addition, the AL5801’s wide operating temperature range, of -40°C to +150°C, means it can be mounted immediately adjacent to LEDs where PCB space is tight.

Applications
- LED signs
- Automotive interior lamps
- General illumination
- Emergency lighting

Diodes’ Advantage

The AL5801 linear constant current LED driver provides a low cost, space saving solution for driving LED currents up to 350mA

- **Current set with one external resistor**
  Lower part count and a lower total cost compared to other devices.

- **Negative temperature coefficient automatically reduce LED current at high temperatures**
  Protects LEDs and improves circuit reliability.

- **Low reference voltage of 0.56V**
  Minimizes power loss in LED current setting resistor and ensures supply voltage headroom.

- **Wide ambient temperature operating range of -40°C to +150°C**
  Enables it to be circuit mounted very close to the LEDs in space limited lighting applications.
New Product Announcement

AL5801

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Typical application circuits

a) Low power LED driver

b) LED driving with PWM dimming

Product portfolio

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Product Type</th>
<th>Max power dissipation $P_D$ (Note 1)</th>
<th>OUT voltage range $V_{OUT}$</th>
<th>LED current Max. $I_{LED}$ (Note 2)</th>
<th>Operating ambient temperature range $T_A$</th>
</tr>
</thead>
<tbody>
<tr>
<td>AL5801</td>
<td>Linear mode current sink LED Driver</td>
<td>1.05W</td>
<td>1.1V to 100V</td>
<td>350mA</td>
<td>-40 to 150°C</td>
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</tbody>
</table>

Notes
1) Device mounted on 25mm x 25mm 2oz copper single-sided PCB board
2) Subject to ambient temperature, power dissipation and PCB.

Ordering Information

<table>
<thead>
<tr>
<th>Device</th>
<th>Packaging</th>
<th>Part mark</th>
<th>Reel size</th>
<th>Tape width</th>
<th>Quantity</th>
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</thead>
<tbody>
<tr>
<td>AL5801W6-7</td>
<td>SOT26</td>
<td>L100</td>
<td>7&quot;</td>
<td>8mm</td>
<td>3000</td>
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To find out more information: