The DLD101 is a 1A rated linear mode constant current driver specifically designed for driving LEDs for illumination and indication applications. It has been configured using optimized discretes in a thermally efficient DFN package. It can also be used for low cost applications that require DC current regulation.

**Description**

The DLD101 linear constant current driver is rated up to 1A and the LED current is programmed with one external resistor, offering a low cost, space saving LED drive solution.

- **DFN, flat, no lead package**
  Saves board space, allowing for higher integration of PC board

- **DFN package - highly thermally efficient**
  Provides higher power dissipation than relatively comparable SOT-23 form factor

- **1A current capability**
  High drain current MOSFET element for increased light intensity output of the LEDs and lower bias current than provided by BJT pass elements

- **Uses unique PBT or double base connection BJT to incorporate bias resistors into package**
  Integrates resistors and provides added circuit flexibility. E.g. can attach external capacitor across base resistor

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

**Applications**

- Flashlights
- Emergency lights
- Garden lights
- LED lights
- Signage
- Back lighting applications

www.diodes.com
DLD101 - 1A rated linear mode constant current LED driver

Typical application circuit

The DLD101 has been designed primarily for solid state lighting applications, to be used as a current sink circuit solution for LEDs. It features a N-channel MOSFET capable of 1A drive current and a prebiased NPN transistor (which allows direct connection to the base, or via a series base resistor).

Figure (left) shows a typical application circuit diagram for driving an LED or string of LEDs. Note that the pre-biased transistor (Q2) has the option of bypassing the series base resistor by connecting directly to pin 7. The N-MOSFET (Q1) is configured as a VBE referenced current sink and is biased on by $R_C$. The current passed through the LED string, MOSFET and source resistor, develops a voltage across $R_S$ that provides a bias to the NPN transistor. Consideration of the expected linear mode power dissipation must be factored into the design, with respect to the DLD101’s thermal resistance.

$$V_{DS} = V_{CC} - V_F \text{ LED String} - V_R$$

$$P_{Q1} = V_{DS} \cdot I_{\text{LED String}}$$

PWM dimming functionality can be effected by either driving the NPN base via an additional resistor (thereby overriding the feedback from $R_S$) or by pulling the gate of the MOSFET down by direct connection.

The PWM control pulse stream can be provided by a microcontroller or simple 555 based circuitry.

Product Overview

| Part Number | Product Type          | Max power dissipation | Drain source voltage $V_{DSS}$ | Gate source voltage $V_{GSS}$ | Drain current $I_D$ Max | Static drain source on resistance $R_{DSON}$ Max @ $V_{GS} = 1/2 I_D$ | Gate threshold voltage $V_{GS(th)}$ Min @ $I_D = 250\mu A$ | Input capacitance $C_{ISS}$ Typ
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<tr>
<td>DLD101</td>
<td>Linear mode current sink LED driver</td>
<td>700mW</td>
<td>100V</td>
<td>±20V</td>
<td>1A</td>
<td>0.85Ω @ 10V/1.5A, 0.99Ω @ 6V/1A</td>
<td>2V</td>
<td>129pF</td>
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To find out more information:
