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400-V Linear Regulators Deliver Constant LED Current In Compact Packages

Diodes' AL5890 linear constant-current regulator was developed to provide simple and more cost-effective solutions to driving LED strings from an offline or dc power supply (Fig. 1). Available in a range of packages, the small form-factor of the AL5890 makes it well suited for any LED application where a lower BoM cost and sizes are important.

The fully integrated design includes a power transistor and it is available in 10-mA, 15-mA, 20-mA, 30-mA, and 40-mA variants. A single device or multiple devices in parallel can be used to source or sink enough current for long LED strings, with an overall accuracy of less than ±2.0 mA (typ), working over a wide ambient temperature range of -40°C to +105°C.

Its simple two-pin PD123 design means it can be inserted directly in the LED string in low-side ac or dc, or high-side ac or dc linear configurations without any external resistors. It is designed to tolerate dc voltages of up to 400 V and can be used in offline applications up to 230 Vac.

Thermal foldback protection is included, which prevents system failure by reducing the current in the event of high operating temperatures. As well as lowering the overall BoM, it also provides an effective solution to tackling EMI without the need for additional switching inductors.

Packaging options include PDI123, SOT89-3L, and TO252-3L to help address heat dissipation in various LED lighting applications including LED lamps, commercial LED fixtures, emergency lighting, signage and downlights, as well as decorative and architectural lighting (Fig. 2). The AL5890 PDI123 package is priced at $0.09, the SOT89 is priced at $0.10 and the TO252 is priced at $0.12 in 10,000-piece volumes.

For more information, see the AL5890 product page.

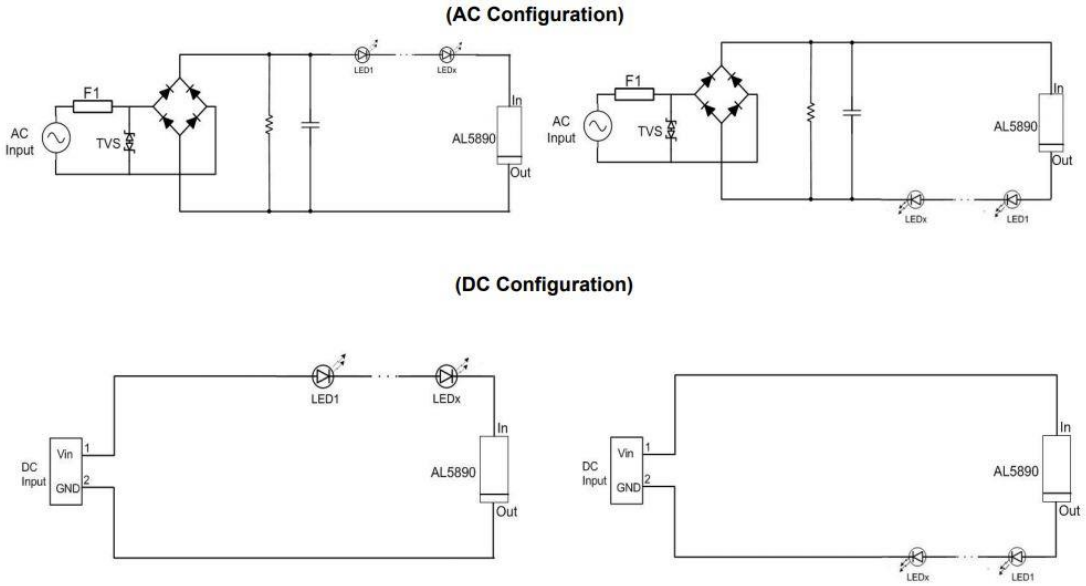

Fig. 1. Available in 10-mA, 15-mA, 20-mA, 30-mA, and 40-mA variants, the AL5890 linear constant-current regulator provides simple, low-cost solutions for driving LED strings from an offline or dc power supply. It is designed to tolerate dc voltages of up to 400 V and can be used in offline applications up to 230 Vac.

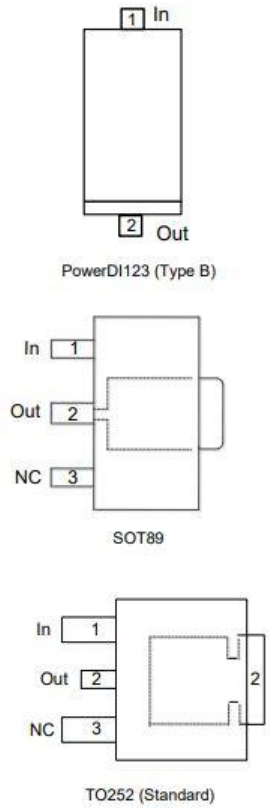

Fig. 2. The regulator is available in PDI123, SOT89-3L, and TO252-3L packages to help address heat dissipation in various LED lighting applications.