

220 V_{AC} LED Driver Demonstration Using CL8800

Summary

The CL8800 achieves efficient operation without employing conventional inductor-based switching techniques. A long string of LEDs is tapped at multiple locations, each tap having a linear current regulator that controls the LED current of upstream string segments. As instantaneous rectified input voltage rises, downstream segments get enough voltage to begin conducting. Once a segment starts conducting, the downstream regulator takes over from the upstream regulator. This limits the voltage across the regulators when they are conducting, minimizing power loss.

CL8800

The CL8800 is designed to drive a long string of inexpensive, low current LEDs directly from the AC mains. A basic driver circuit consists of the CL8800, six resistors and a bridge rectifier. Two to four additional components are optional for various levels of transient protection. No capacitors, EMI filters, or power factor correction circuits are needed.

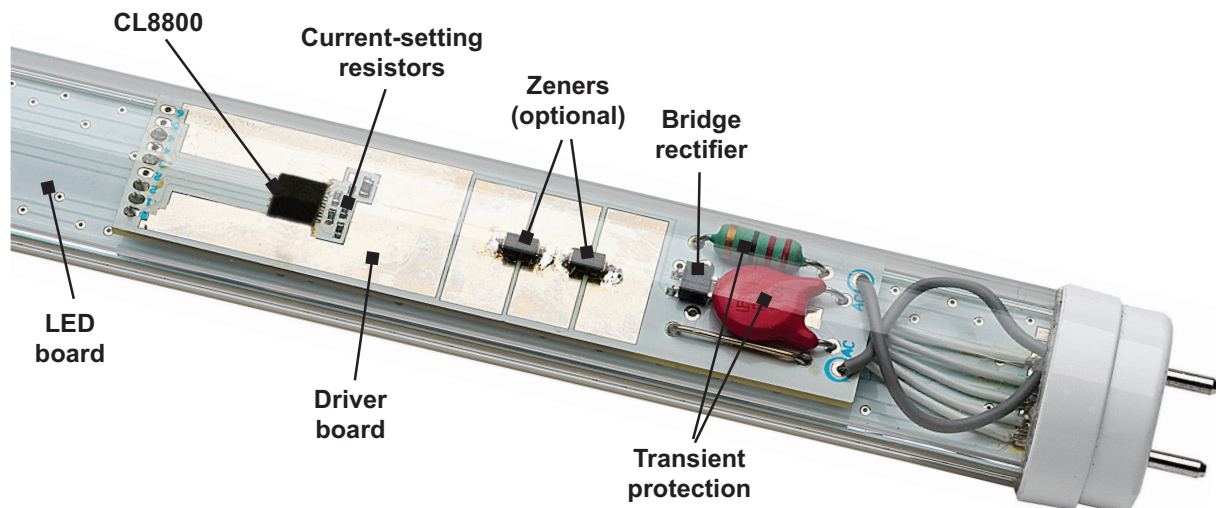
A string of series/parallel LEDs is tapped at six locations. Six linear current regulators sink current at each tap and are sequentially turned on and off, tracking the input sine wave voltage. Voltage across each regulator is minimized when conducting, providing high efficiency. Output current at each tap is individually resistor-adjustable. Cross-regulation, as the CL8800 switches from one regulator to another, provides smooth transitions. The current waveform can be tailored to optimize for input voltage range, line/load regulation, output power/current, efficiency, power factor, THD, dimmer compatibility and LED utilization.

With the addition of an RC network, the driver is compatible with phase dimming.

Specifications

Parameter	Value
Input voltage	220 V _{RMS} ±15% (264 V _{RMS} max)
Input power	7.80W
Light output	821 Lm
Luminous efficiency	105 Lm/W
Electrical efficiency	~90%
Line regulation	-20.0%/+8.8%
Line current THD	21.7%
Power factor	0.9760
Transient survivability	2.5 kV, pulse or ring
Dimmer compatibility	Low power dimmers and conventional dimmers using RC network
Conducted EMI (CISPR 15)	Pass

The CL8800 may be configured for performance requirements that differ from those above.



All driver components are visible.
There are no inductors or capacitors.



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