

# LM3445 TRIAC Dimmable LED Driver

National's industry-leading TRIAC dimmable offline LED driver solution is perfect for any application where an LED driver must interface to a standard triac wall dimmer. National's new TRIAC dimmable LED driver delivers a wide, uniform dimming range free of flicker, best-in-class dimming performance, and high efficiency—all while maintaining ENERGY STAR® power factor requirements in a typical application.

Conventional TRIAC dimmers are designed to interface to a resistive load (halogen or incandescent bulbs). Since the LEDs don't appear to be a resistive load, dimming LEDs from a standard TRIAC wall dimmer is a challenge. Today's LED driver solutions for this challenge produce a 120 Hz flicker of the LEDs and/or do not allow full range dimming.

National's LM3445 LED driver provides best in class performance as it decodes the TRIAC chopped waveform to dim the LEDs, achieving a full, wide dimming range without flicker.

## Full Range Dimming Capability

The LM3445 LED driver offers 100:1 full range dimming capability, going from full light to nearly imperceptible light in a continuous range without being extinguished, and maintains a constant current to large strings of LEDs driven in series off of a standard line voltage.

## Easy To Use

The LM3445 LED driver enables a direct replacement of incandescent or halogen lamp systems that are currently interfaced to a TRIAC dimmer without having to change the original infrastructure or sacrifice performance. In addition, the new TRIAC dimmable LED driver is available in WEBENCH® LED Designer to allow for easy and quick design in.

## Uniform Dimming Without Flicker

The LM3445 LED driver allows master-slave operation control in multi-chip solutions which enables a single TRIAC dimmer to control multiple strings of LEDs with smooth consistent dimming, free of flicker.



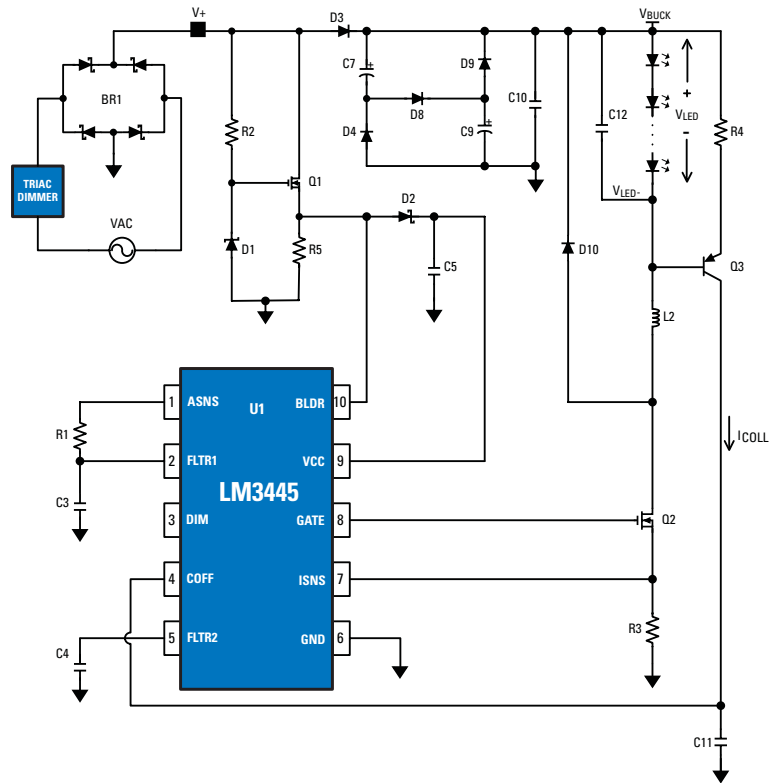
## Features

- Application voltage range from 80 VAC to 270 VAC
- Angle detector/decoder enables wide (100:1) full range dimming
- Integrated 300Ω bleeder resistor to ensure proper TRIAC signal decoding
- Patent-pending control architecture allows for constant ripple current which extends the life of the LEDs
- Scalable output current up to and greater than 1A
- Master/Slave control for uniform dimming across multi-channel applications

## Applications

- Retro-fit of existing lighting systems that are interfaced to a TRIAC wall dimmer:
  - Residential lighting
  - Architectural lighting
  - Industrial and commercial lighting

# LM3445 TRIAC Dimmable LED Driver



Key Features	Benefit
Off-line solution	Easy-to-use; reduces design complexity
Angle detector/decoder	Enables full dimming range 100:1
Simplified constant off-time	<ul style="list-style-type: none"> <li>Ease-of-design and smaller solution size</li> <li>Maintains constant ripple through the LED</li> </ul>

**National Semiconductor**  
 2900 Semiconductor Drive  
 Santa Clara, CA 95051  
 1 800 272 9959

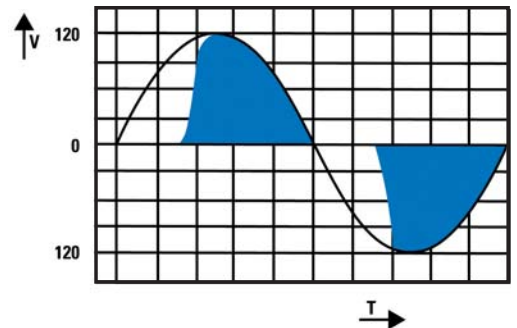
**Mailing address:**  
 PO Box 58090  
 Santa Clara, CA 95052

**Visit our website at:**  
[national.com/switcher](http://national.com/switcher)

**For more information,  
 send email to:**  
[support@nsc.com](mailto:support@nsc.com)

## TRIAC & LM3445 LED Driver Functionality

- TRIAC requires a resistive load to fire
- A holding resistor emulates the resistive load
- The LM3445 LED driver's angle detector and decoder translate the TRIAC chopped waveform to dim the LEDs



Forward-Phased TRIAC-Dimmed Waveform

For complete information, including application notes, reference designs and to use the WEBENCH® LED Designer online design tool, visit: [www.national.com/LED](http://www.national.com/LED)

