National Semiconductor

April 23, 2010

# LP8545 PRODUCT BRIEF

# High-Efficiency LED Backlight Driver for Notebooks

## General Description

The LP8545 is a white LED driver with integrated boost converter. It has six adjustable current sinks which can be controlled by PWM input or with I²C-compatible serial interface.

The boost converter has adaptive output voltage control based on the LED driver voltages. This feature minimizes the power consumption by adjusting the voltage to lowest sufficient level in all conditions.

LED outputs have 8-bit current resolution and up to 13-bit PWM resolution with additional 1-3 bit dithering to achieve smooth and precise brightness control. Proprietary Phase Shift PWM control is used for LED outputs to reduce peak current from the boost converter, thus making the boost capacitors smaller. The Phase Shifting scheme also eliminates audible noise.

Internal EEPROM is used for storing the configuration data. This makes it possible to have minimum external component count and make the solution very small.

LP8545 has safety features which make it possible to detect LED outputs with open or short fault. As well low input voltage and boost over-current conditions are monitored and chip is turned off in case of these events. Thermal de-rating function prevents overheating of the device by reducing backlight brightness when set temperature has been reached.

LP8545 is available in National's LLP-24 package.

**NOTICE: This document is not a full datasheet. For more information regarding this product or to order samples, please contact your local National Semiconductor sales office or visit http://www.national.com/support/dir.html.**

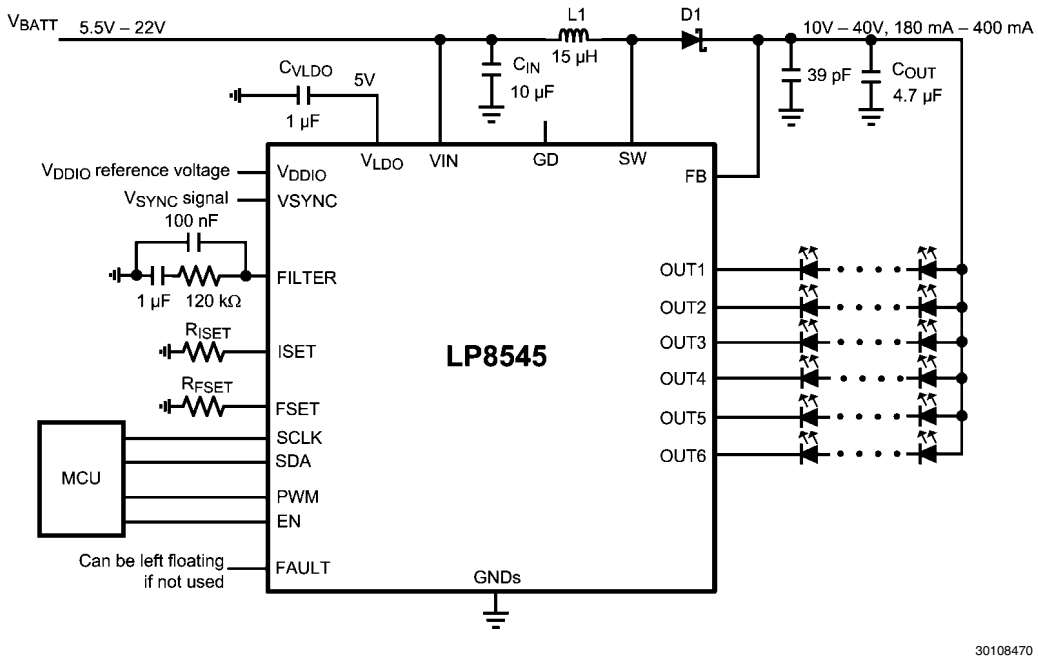
## Features

- High-voltage DC/DC boost converter with integrated FET with four switching frequency options: 156/312/625/1250 kHz
- Configurable for use with external FET for applications needing higher output voltage
- 2.7V – 22V input voltage range to support 1x…5x cell Li-Ion batteries
- Programmable PWM resolution
  -8 to 13 true bit (steady state)
  -Additional 1 to 3 bits using dithering during brightness changes
- I²C and PWM brightness control
- PWM output frequency and LED current set through resistors
- Optional synchronization to display $V_{SYNC}$ signal
- 6 LED outputs with LED fault (short/open) detection
- Low input voltage, over-temperature, over-current detection and shutdown
- Minimum number of external components
- LLP-24 package, 4 x 4 x 0.8 mm

## Applications

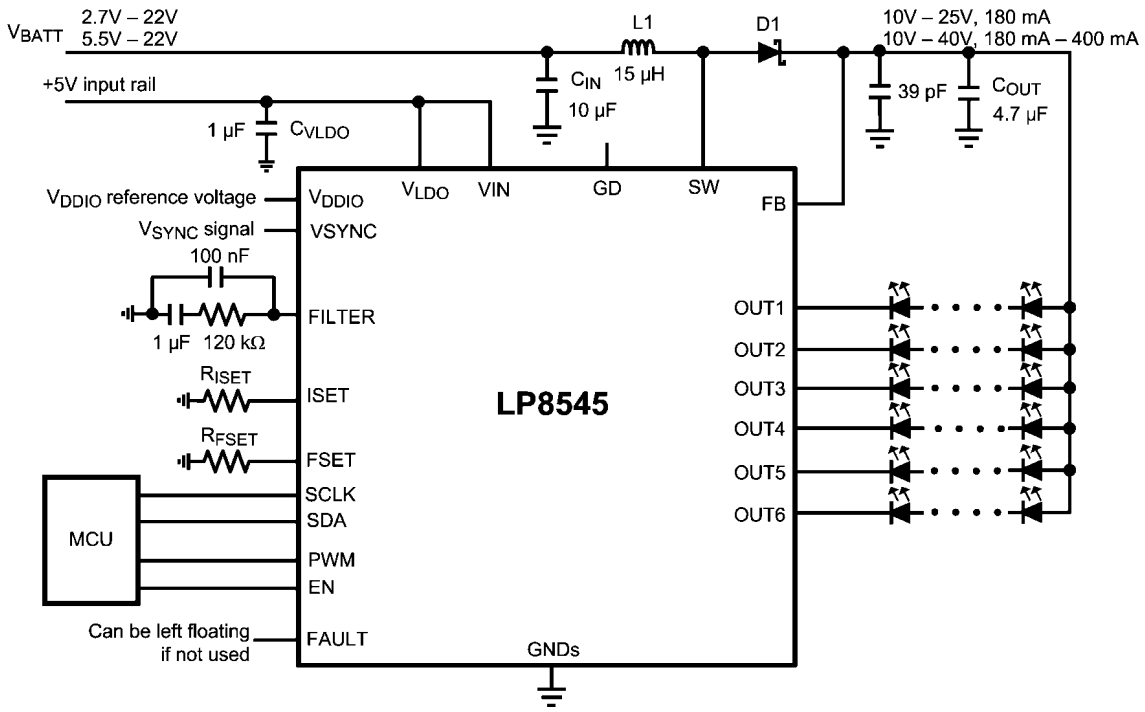
- Notebook and Netbook LCD Display LED Backlight
- LED Lighting

## Typical Application (1)



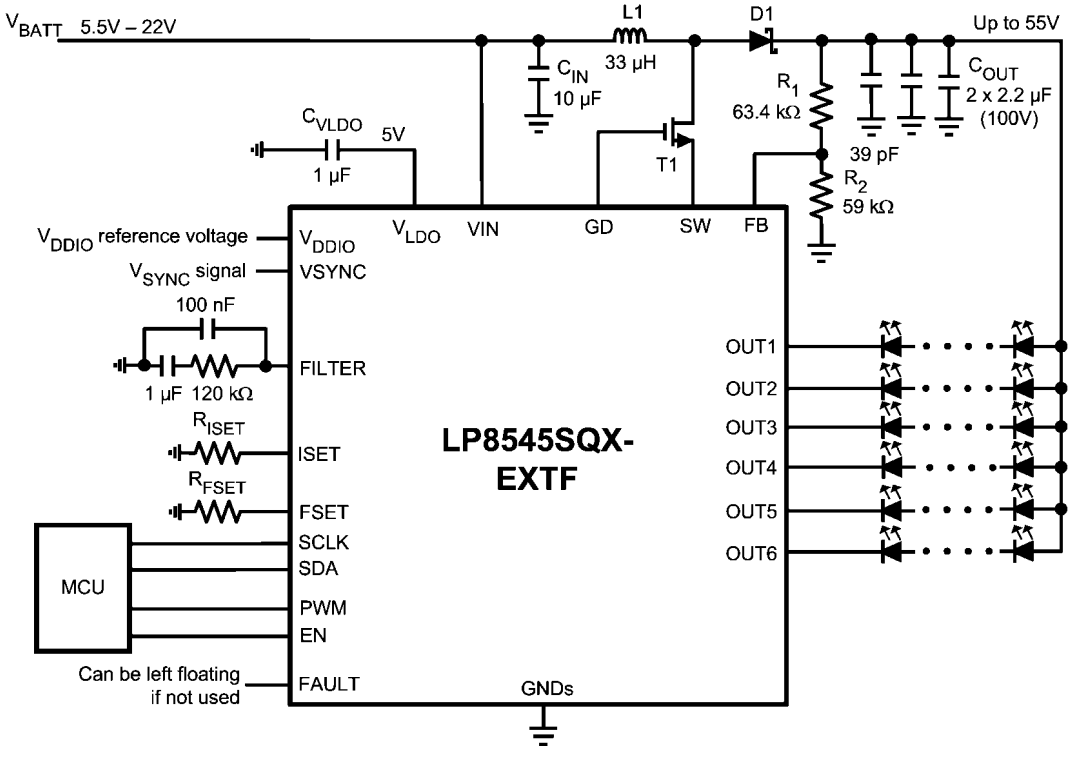

 

## Typical Application for Low Input Voltage (2)




**Note:** Separate 5V rail to $V_{LDO}$ can be also used to improve efficiency for applications with higher battery voltage. No power sequencing requirements between $V_{IN}$/$V_{LDO}$ and $V_{BATT}$.

## Typical Application for High Output Voltage (3)



# Notes

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