

High Efficiency White LED Driver with Programmable Ambient Light Sensing Capability and I²C Compatible Interface

General Description

The LM3530 current mode boost converter supplies the power and controls the current in up to 11 series white LED's. The 839mA current limit and 2.7V to 5.5V input voltage range, makes the device a versatile backlight power source ideal for operation with Li+ batteries.

The LED current is adjustable from 0 to 29.5mA via an I²C compatible interface. The 127 different current steps and 8 different maximum LED current levels give over 1000 programmable LED current levels. Additionally, PWM brightness control is possible through an external logic level input.

Additionally, the device features two Ambient Light Sensor inputs. These are designed to monitor analog output ambient light sensors and provide programmable adjustment of the LED current with changes in ambient light. Each ambient light sensor input has independently programmable internal voltage setting resistors which can be made high impedance to reduce power during shutdown. The LM3530's 500kHz switching frequency allows for high converter efficiency over a wide output voltage range accommodating from 2 to 11 series LEDs. Finally, the support of Content Adjusted Backlighting maximizes battery life while maintaining display image quality.

The LM3530 is available in a tiny 12-bump (1.6mm × 1.2mm × 0.6mm) micro-SMD package and a 10-Lead 2mm × 2mm × 0.8mm LLP package.

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

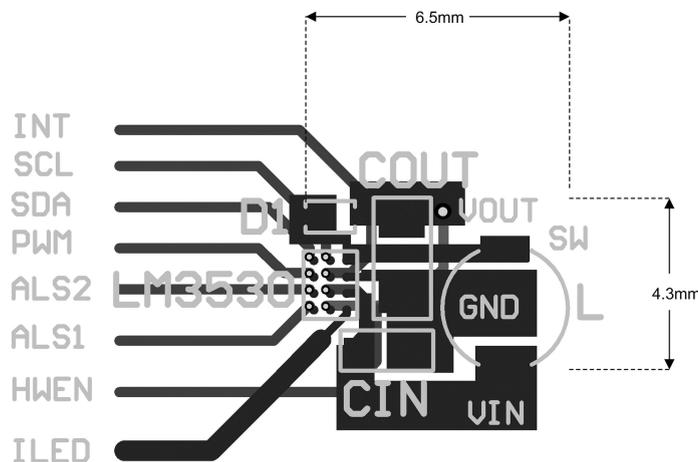
Features

- Drives up to 11 LED's in series
- 1000:1 Dimming Ratio
- 90% Efficiency
- Programmable Dual Ambient Light Sensor Inputs with internal ALS Voltage Setting Resistors
- I²C Programmable Logarithmic or Linear Brightness Control
- External PWM Input for Simple Brightness Adjustment
- True Shutdown Isolation for LED's and Ambient Light Sensors
- Internal Soft-Start Limits Inrush Current
- Wide 2.7V to 5.5V Input Voltage Range
- 40V Over-Voltage Protection
- 500 kHz Fixed Frequency Operation
- 839mA Peak Current Limit
- Low Profile 12-bump micro SMD Package

Applications

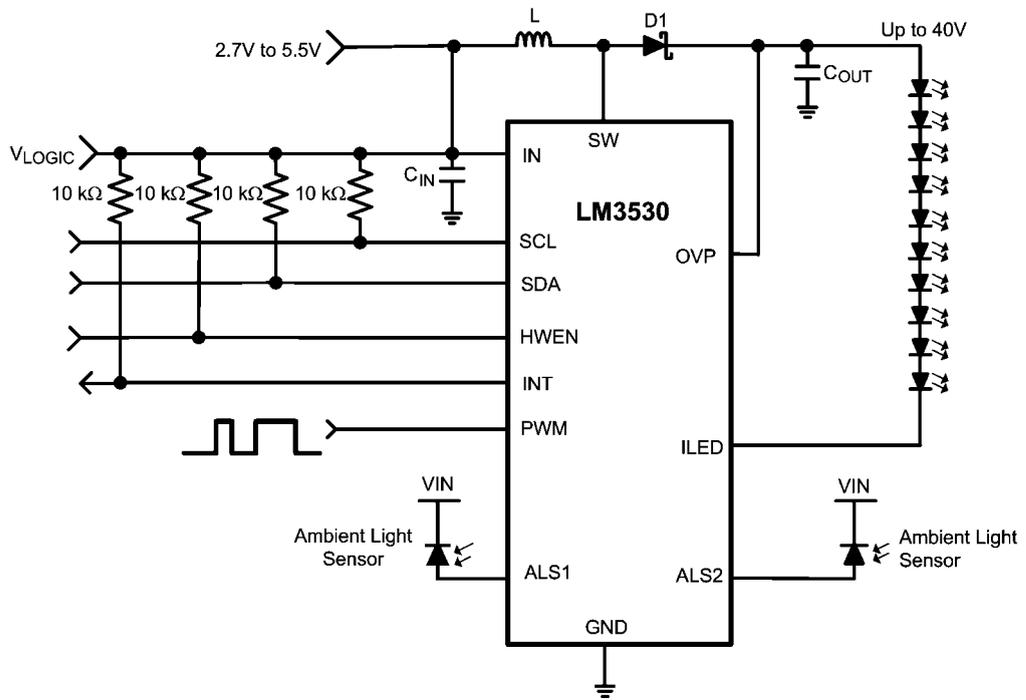
- Smartphone LCD Backlighting
- Personal Navigation LCD Backlighting
- 2 to 11 series White LED Backlit Display Power Source

LM3530 Layout Example



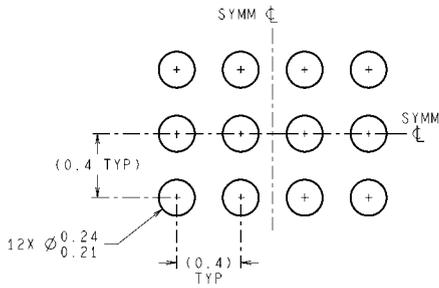
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Typical Application Circuit



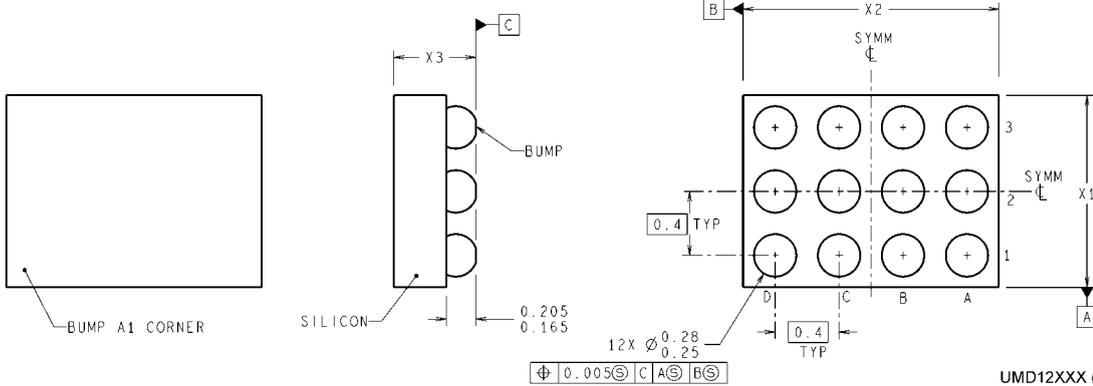
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Physical Dimensions inches (millimeters) unless otherwise noted



DIMENSIONS ARE IN MILLIMETERS
DIMENSIONS IN () FOR REFERENCE ONLY

LAND PATTERN RECOMMENDATION



UMD12XXX (Rev A)

12- Bump Ultra Thin Micro SMD Package
For Ordering, Refer to Ordering Information Table
NS Package Number TMD12
X1 = 1.215 mm (±0.1 mm), X2 = 1.615 mm (±0.1 mm), X3 = 0.425 mm

Notes

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