

# LM3501 Evaluation Board

National Semiconductor  
Application Note 1318  
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February 2004



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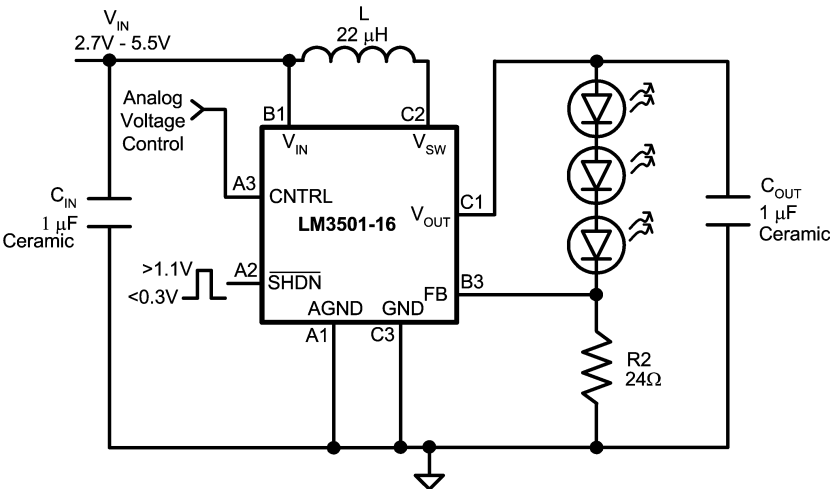
## Introduction

The LM3501 is a synchronous step-up DC/DC converter designed for white LED applications. The evaluation board is set up to drive 3 standard  $V_F$  white LEDs from a single Li-Ion battery. A fourth LED pad (D4) is included for testing of up to 4 low  $V_F$  white LEDs.

The LED current is set using the resistor R2 and the equation  $I_{LED} = V_{FB}/R2$ .  $V_{FB}$  is determined by the voltage applied to the CNTRL pin. The maximum value of  $V_{FB}$  is 0.515V and

occurs with a CNTRL voltage of approximately 2.7V. This condition translates into approximately 20mA LED current. A lower CNTRL voltage translate into a lower  $V_{FB}$  voltage and a lower LED current. The feedback voltage can be calculated using the equation  $V_{FB} = 0.191 \cdot CNTRL$ . A CNTRL voltage of 125mV or greater turns the LEDs on while a CNTRL voltage of 75mV or less turns the LEDs off. Please note that for correct operation the SHDN pin must have a voltage greater than 1.1V applied to it.

## Schematic



20097001

## Bill of Materials

Designator	Component	Manufacturer
U1	LM3501TL-ADJ, $\mu$ SMD 8-lead	National Semiconductor
L	22 $\mu$ H, DT1608C-223	Coilcraft
C <sub>IN</sub>	1 $\mu$ F, 25V Ceramic C3216X7R1E105K	TDK
C <sub>OUT</sub>	1 $\mu$ F, 25V Ceramic C3216X7R1E105K	TDK
D1-D3	White LED, LWT67C	Osram
D4	0 $\Omega$ Resistor, 1206 Case, CRCW1206-000J	Vishay
R1	24 $\Omega$ , 1206 Case, CRCW1206-240J	Vishay

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## Notes

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