NCP1421LEDEVB

NCP1421 High Current LED Driver Evaluation Board User's Manual

ON Semiconductor®

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EVAL BOARD USER'S MANUAL

Description

The NCP1421 is a monolithic, micro-power, high-frequency, step-up switching converter IC designed for battery operated hand-held electronic products with up to 600 mA loading. It integrates a synchronous rectifier (Sync-Rect) to improve efficiency and to eliminate the external Schottky Diode. The NCP1421's high switching frequency (up to 1.2 MHz) allows for a low profile, small sized inductor and output capacitor to be used. When the device is disabled, the internal conduction path from the battery to the load is fully blocked, which isolates the load from the battery. This True-Cutoff function reduces the shutdown current to typically only 50 nA. A Ring-Killer is also integrated to eliminate high-frequency ringing in discontinuous conduction mode. Finally, a Low-Battery Detector, Logic-Controlled Shutdown, Cycle-by Cycle Current Limiting and Thermal Shutdown provide value-added features for various battery operated applications. With all these functions on, the quiescent supply current is typically only 8.5 μA. This device is available in the compact and low profile Micro8™ package.

The NCP1421LED evaluation board uses the NCP1421 to drive a high power, white LED. The circuit is configured to minimize power dissipation in the current sense resistor and the effects of lot-to-lot LED forward voltage (VF) variation on LED current.

Features

- Capable of driving White LEDs up to 600 mA
- High Switching Frequency, up to 1.2 MHz
- True-Cutoff Function Reduces Device Shutdown Current to Typically 50 nA

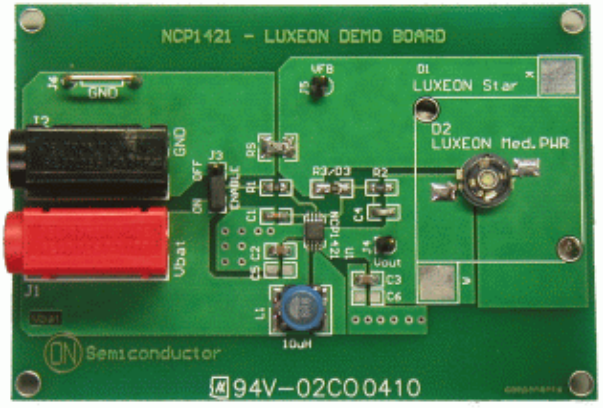

Figure 1. NCP1421LED Evaluation Board

Test Procedure

1. Set DC Power Supply to 3.6 Vdc and Current Limit to 2 A
2. Move Jumper on J3 to OFF Position
3. Connect DC Power Supply to J1 and J2 (Positive on J1 (Vbat), Negative on J2 (GND))
4. LED Should be Off
5. Remove Jumper Completely from J3
6. LED Should still be Off
7. Set Jumper on J3 to the ON Position
8. LED Should be On (CAUTION, DO NOT LOOK DIRECTLY AT THE LED. IT IS EXTREMELY BRIGHT)
9. Measure Voltage from J5 (VFB) to J6 (GND). It Should be between 500−700 mV

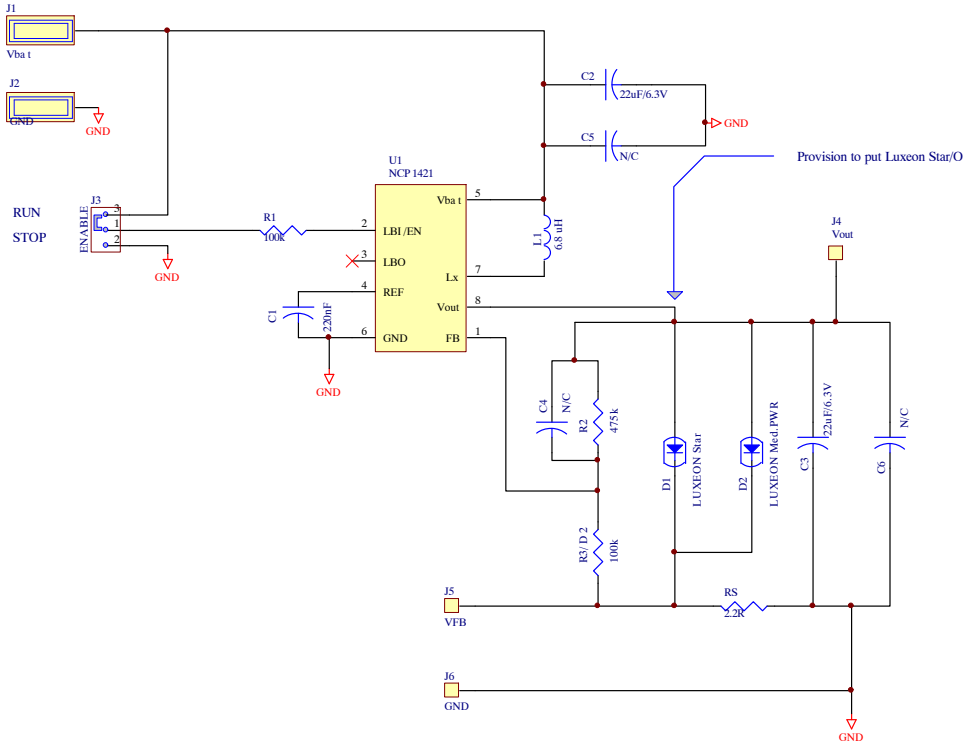

Figure 1. NCP1421LED Evaluation Board Schematic

Table 1. NCP1421LED EVALUATION BOARD BILL OF MATERIALS

Desig-nator	Qty.	Description	Value	Toler-ance	Footprint	Manufacturer	Manufacturer Part Number	Substi-tution Allowed	Lead Free
U1	1	Boost Converter	NA	NA	Micro8™	ON Semiconductor	NCP1421DMR2	No	No
D1/D2	1	High Power White LED	NA	NA	NA	Lumiled	LXHL−BW01/2	Yes	No
L1	1	SMD Inductor	6.8 μH, 1.6 A	20%	5.8 × 6.2 × 1.4 mm	TDK	VLP6214T−6R8M1R2	Yes	Yes
C1	1	Ceramic Chip Capacitor	220 nF	10%	0603	TDK	C1608X5R1C224MT	Yes	No
C2, C3	2	Ceramic Chip Capacitor	22 μF, 6.3 V	20%	0805	TDK	C2012X5R0J226M	Yes	No
C4	0	Ceramic Feedforward Cap	−	−	−	−	−	−	−
R1, R3	2	Chip Resistor	100 kΩ, 1/8 W	1%	0805	Yageo−America	9C08052A1003FKHFT	Yes	No
R2	1	Chip Resistor	475 kΩ, 1/8 W	1%	0805	Yageo−America	9C08052A4753FKHFT	Yes	No
RS	1	Chip Resistor	1.0 Ω, 1.0 W	1%	1218*	Vishay	CRCW12181R00FT	Yes	No
J1	1	4MM PCB Socket, Black	NA	NA	NA	Deltron Emcon	571−0100	Yes	No
J2	1	4MM PCB Socket, Red	NA	NA	NA	Deltron Emcon	571−0500	Yes	No
J3	1	Header Pins, 3 Positions	1” Pitch	NA	NA	Tyco Electronics/AMP	4−103239−0	Yes	No
J4, J5	2	Header Pins, 1 Position	1” Pitch	NA	NA	Tyco Electronics/AMP	4−103239−0	Yes	No
J3	1	Jumper, 2 Positions	1” Pitch	NA	NA	Sullins Electronics	SPC02SYAN	Yes	No
J6	1	Un-insulated Plug	NA	NA	10.16 × 9.0 mm	Harwin	D3082−05	Yes	No

*2 1206, 2 Ω resistors were placed in parallel on this board

Micro8 is a trademark of International Rectifier.

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