

WHITE LED STEP-UP CONVERTER

DESCRIPTION

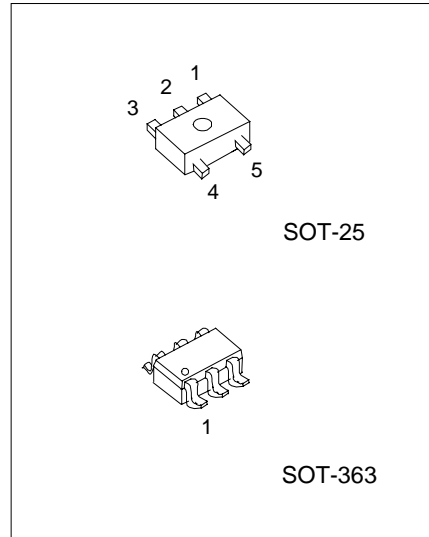
The UTC L1937 is a step-up DC/DC converter specifically designed to drive white LEDs with a constant current. The device can drive two, three or four LEDs in series from a Li-Ion cell. Series connection of the LEDs provides identical LED currents resulting in uniform brightness and eliminating the need for ballast resistors. The UTC LT1937 switches at 1.2MHz, allowing the use of tiny external components. The output capacitor can be as small as 0.22 μF, saving space and cost versus alternative solutions. A low 95mV feedback voltage minimizes power loss in the current setting resistor for better efficiency.

FEATURES

- * Inherently Matched LED Current
- * High Efficiency: 84% Typical
- * Drives Up to Four LEDs from a 3.2V Supply
- * Drives Up to Six LEDs from a 5V Supply
- * 36V Rugged Bipolar Switch
- * Fast 1.2MHz Switching Frequency
- * Uses Tiny 1mm Tall Inductors
- * Requires Only 0.22 μF Output Capacitor

APPLICATIONS

- * Marking code: LTGG
- * Cellular Phones
- * PDAs, Handheld Computers
- * Digital Cameras
- * MP3 Players
- * GPS Receivers



*Pb-free plating product number: L1937L

www.DataSheet4U.com

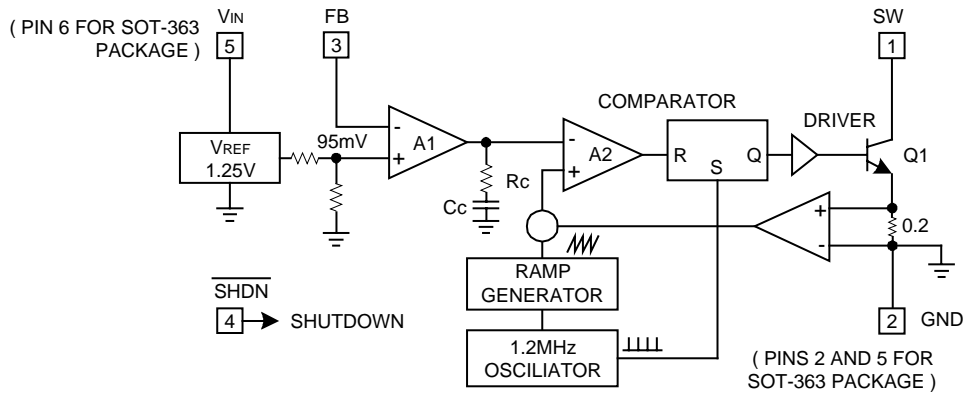
PIN FUNCTION

PIN NO. (SOT-25)	PIN NO. (SOT-363)	PIN NAME	SYMBOL	FUNCTION
1		Switch	SW	Connect inductor/diode here. Minimize trace area at this pin to reduce EMI.
2		Ground	GND	Connect directly to local ground plane.
3		Feedback	FB	Reference voltage is 95mV. Connect cathode of lowest LED and resistor here. Calculate resistor value according to the formula: $R_{FB} = 95mV/I_{LED}$
4		Shutdown	\overline{SHDN}	Connect to 1.5V or higher to enable device; 0.4V or less to disable device.
5	6	Input Supply	V_{IN}	Input Supply Pin. Must be locally bypassed.
	5	Ground	GND	Connect to Pin 2 and to local ground plane

UTC L1937

LINEAR INTEGRATED CIRCUIT

BLOCK DIAGRAM



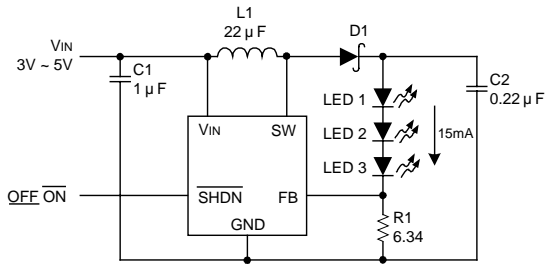
ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	10	V
SW Voltage	V_{SW}	36	V
FB Voltage	V_{FB}	10	V
SHDN Voltage	V_{SHDN}	10	V
Operating Temperature	T_{opr}	-40 ~ +85	
Storage Temperature	T_{stg}	-65 ~ +150	
Maximum Junction Temperature	T_j	125	
Lead Temperature (Soldering, 10 sec)	T_{Lead}	300	

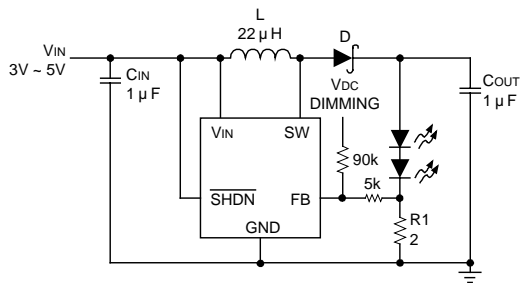
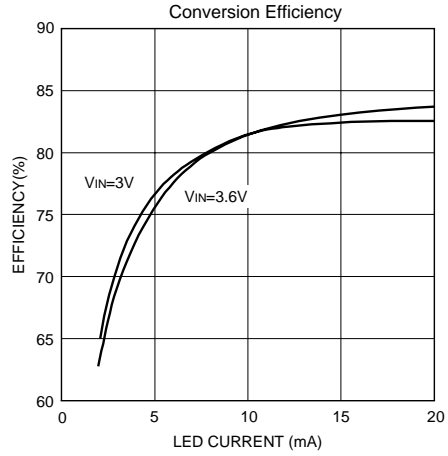
ELECTRICAL CHARACTERISTICS ($T_a=25^\circ\text{C}$, $V_{IN}=3\text{V}$, $V_{SHDN}=3\text{V}$, unless otherwise noted.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V_{IN}				10	V
Feedback Voltage	V_{FB}	$I_{SW}=100\text{mA}$, Duty Cycle=66%	86	95	104	mV
FB Pin Bias Current	I_{FB}		10	45	100	nA
Supply Current	I_{CC}	$\overline{SHDN}=0\text{V}$		1.9 0.1	2.5 1.0	mA μA
Switching Frequency	f_{osc}		0.8	1.2	1.6	MHz
Maximum Duty Cycle	DC		85	90		%
Switch Current Limit	I_{SW}			320		mA
Switch V_{CESAT}	$V_{CESAT(SW)}$	$I_{SW}=250\text{mA}$		350		mV
Switch Leakage Current	$I_{SW(OFF)}$	$V_{SW}=5\text{V}$		0.01	5	μA
SHDN Voltage High	V_{IH}		1.5			V
SHDN Voltage Low	V_{IL}				0.4	V
SHDN Pin Bias Current	I_{SHDN}			65		μA

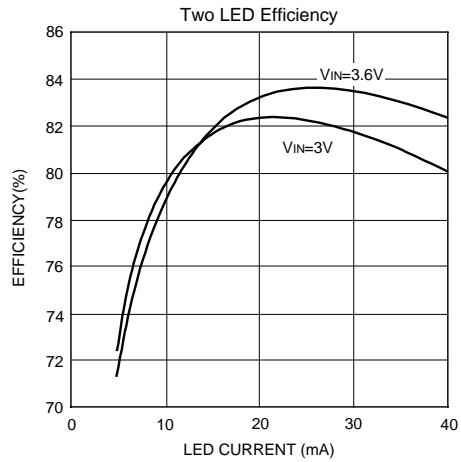
TYPICAL APPLICATIONS

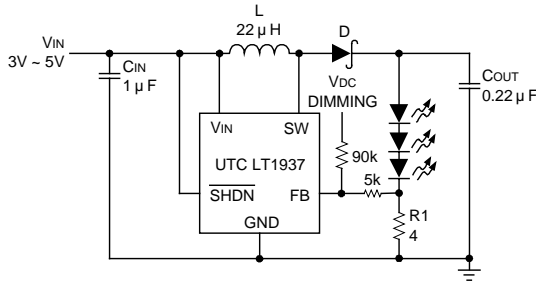


Li-Ion Powered Driver for Three White LEDs

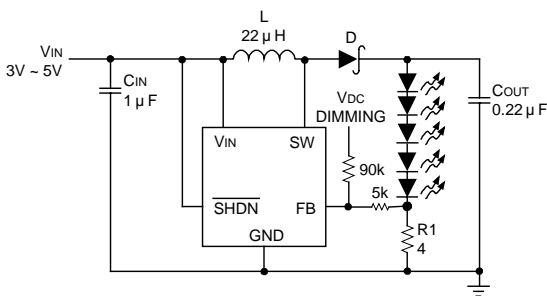
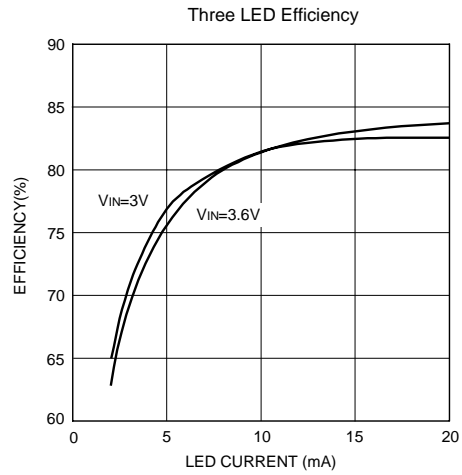


Li-Ion to Two White LEDs

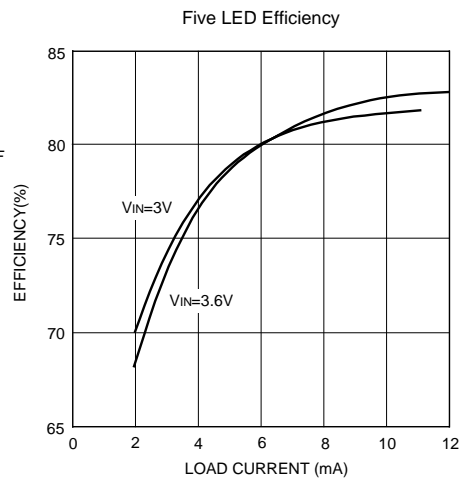


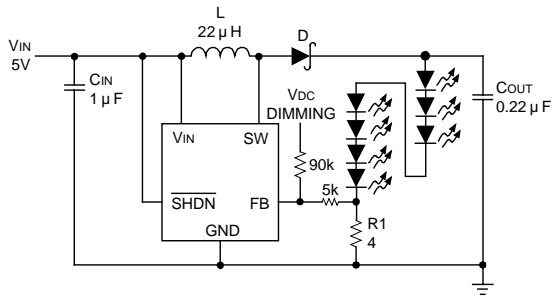


Li-Ion to Three White LEDs

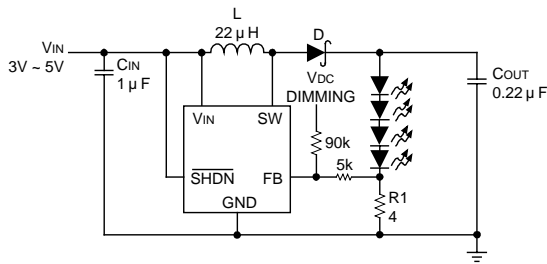
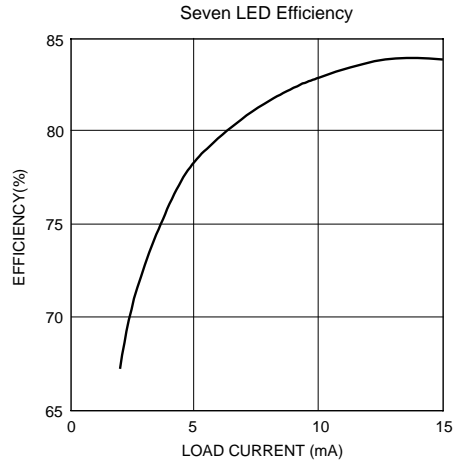


Li-Ion to Five White LEDs

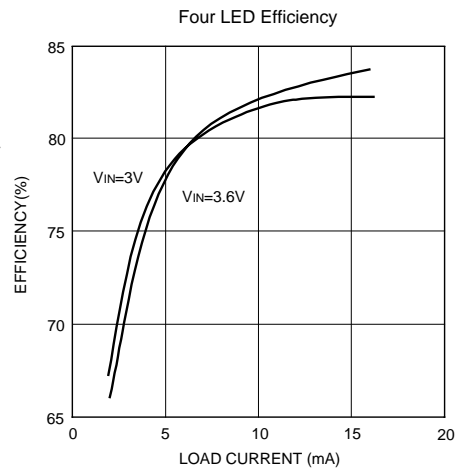




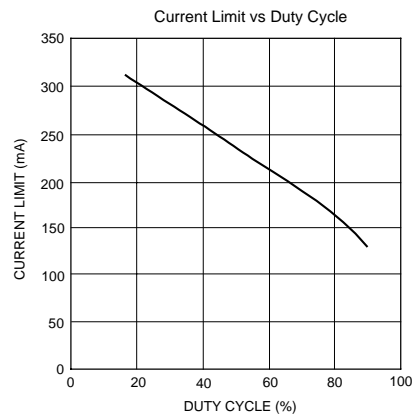
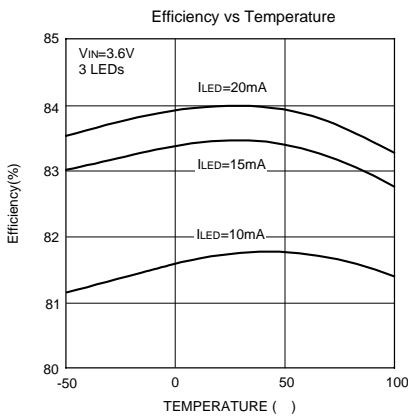
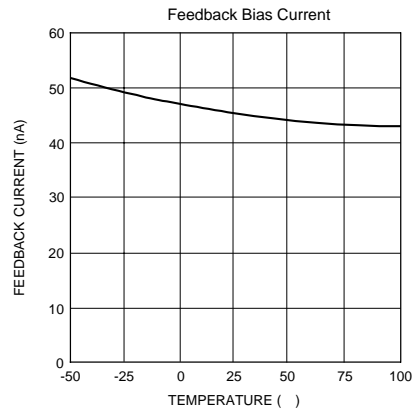
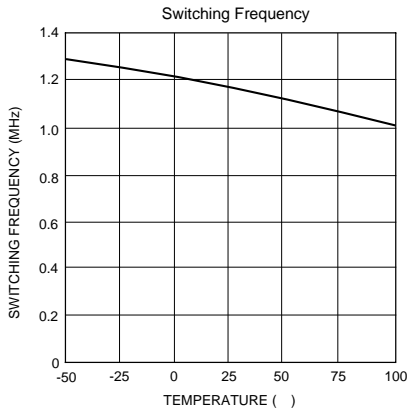
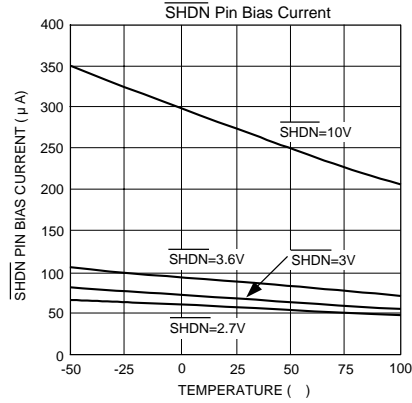
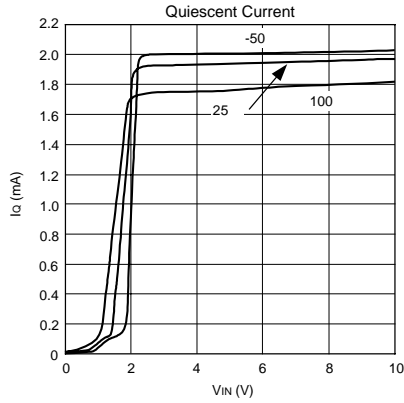
5V to Seven White LEDs



Li-Ion to Four White LEDs



TYPICAL PERFORMANCE CHARACTERISTICS



UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.