



L5100

LINEAR INTEGRATED CIRCUIT

WHITE LED STEP-UP CONVERTER

■ DESCRIPTION

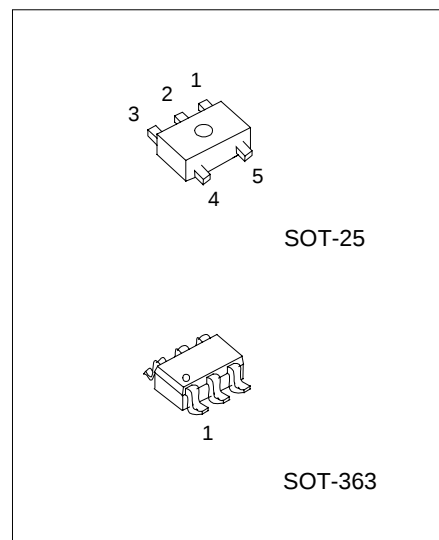
The UTC **L5100** is a STEP-UP DC/DC Converter and designed for driving white LEDs with a constant current. It can drive several LEDs in series by a Li-Ion cell. UTC **L5100** switches at a high frequency 1.2MHz, so it can allowing the use of tiny external components. The output capacitor can be as small as 0.22 μ F, saving space and cost compare with alternative other solutions. The low 95mV feedback voltage minimizes power loss in the current setting resistor can have better efficiency.

■ FEATURES

- * Inherently Matched LED Current
- * High Efficiency: 83% Typical
- * Drives Up to Four LEDs from a 3.2V Supply
- * Drives Up to Six LEDs from a 5V Supply
- * 36V Rugged Bipolar Switch
- * 1.2MHz Switching Frequency
- * Uses Tiny 1mm Tall Inductors
- * Output Capacitor can be small to only 0.22 μ F

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Normal	Lead Free Plating		
L5100-AF5-R	L5100L-AF5-R	SOT-25	Tape Reel
L5100-AN3-R	L5100L-AN3-R	SOT-363	Tape Reel

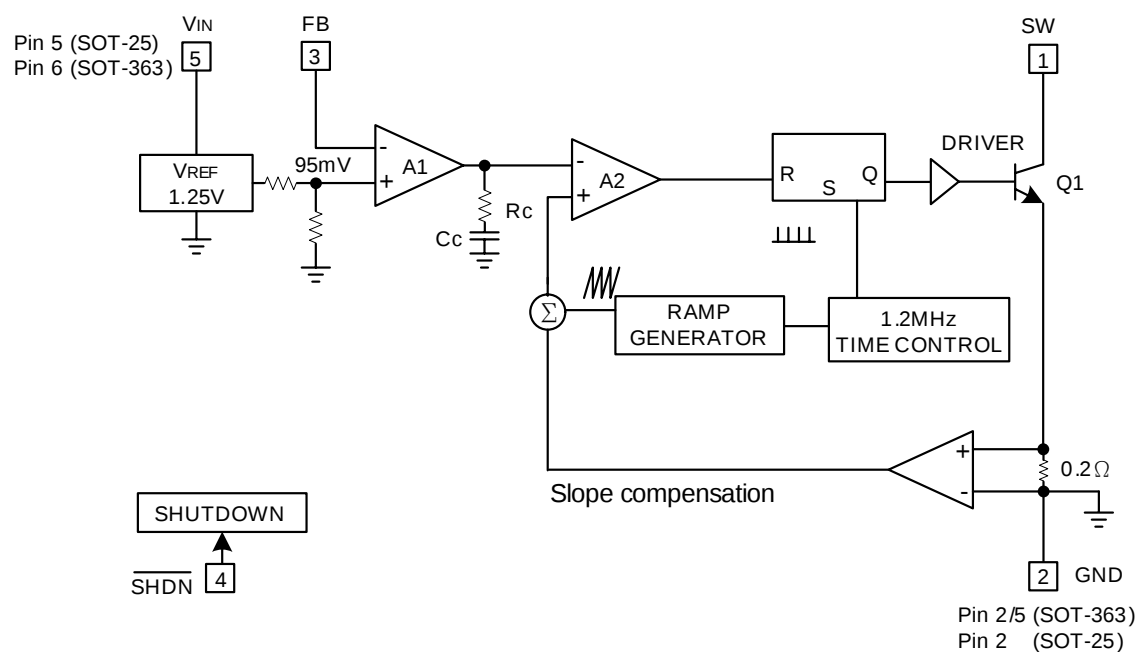


*Pb-free plating product number: L5100L

■ PIN DESCRIPTION

PIN NO.		PIN NAME	SYMBOL	FUNCTION
SOT-25	SOT-363			
1	1	Switch	SW	Connect inductor/diode here. Minimize trace area at this pin to reduce EMI.
2	2/5	Ground	GND	Connect directly to local ground plane.
3	3	Feedback	FB	Reference voltage is 95mV. Connect cathode of lowest LED and resistor here. Calculate resistor value according to the formula: $R_{FB} = 95\text{mV}/I_{LED}$
4	4	Shutdown	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.

■ BLOCK DIAGRAM



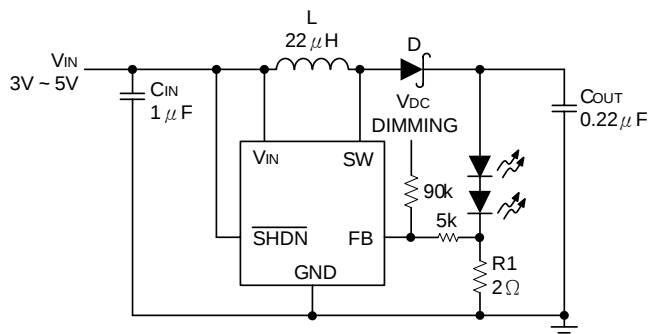
■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	12	V
Switch Voltage	V_{SW}	36	V
Feedback Voltage	V_{FB}	12	V
Shutdown Voltage	V_{SHDN}	12	V
Operating Temperature	T_{OPR}	0 ~ +70	°C
Junction Temperature	T_J	+125	°C
Storage Temperature	T_{STG}	-40 ~ +150	°C

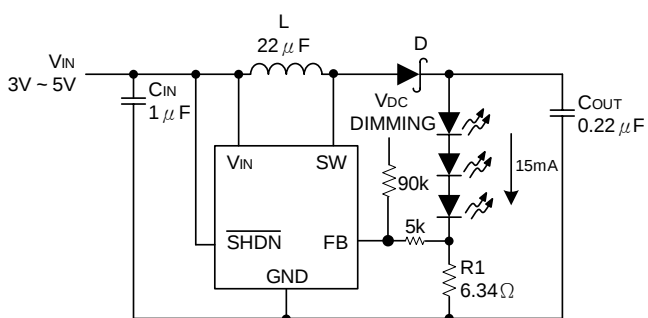
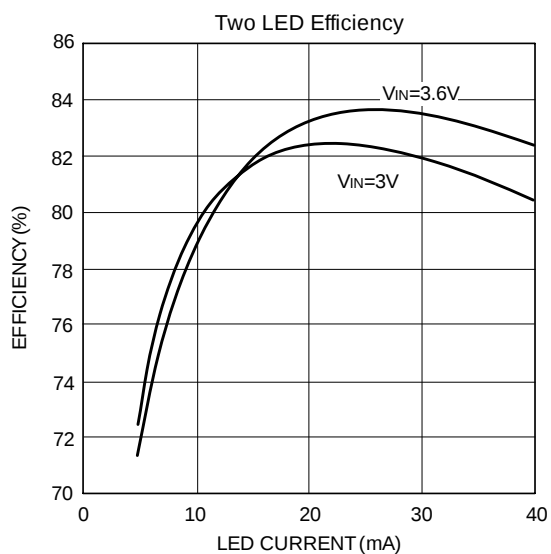
■ ELECTRICAL CHARACTERISTICS ($T_a=25^{\circ}\text{C}$, $V_{IN}=3\text{V}$, $V_{SHDN}=3\text{V}$, unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V_{IN}		2.5		12	V
Feedback Voltage	V_{FB}	$I_{SW}=100\text{mA}$, Duty Cycle=66%	87	95	104	mV
Shutdown Voltage ON	V_{ON}		1.5			V
Shutdown Voltage OFF	V_{OFF}				0.3	V
Switch V_{CESAT}	$V_{CESAT(SW)}$	$I_{SW}=250\text{mA}$		360		mV
Switch Current Limit	I_{SW}			320		mA
Supply current	I_{CC}	$\overline{SHDN}=0\text{V}$		1.8 0.1	2.5 1.0	mA μA
Switch Leakage Current	$I_{SW(OFF)}$	$V_{SW}=5\text{V}$		0.01	5	μA
Shutdown Pin Bias Current	I_{SHDN}			60		μA
Feedback Pin Bias Current	I_{FB}		10	45	100	nA
Switching Frequency	f_{OSC}		0.8	1.2	1.6	MHz
Maximum Duty Cycle	DC		85	90		%

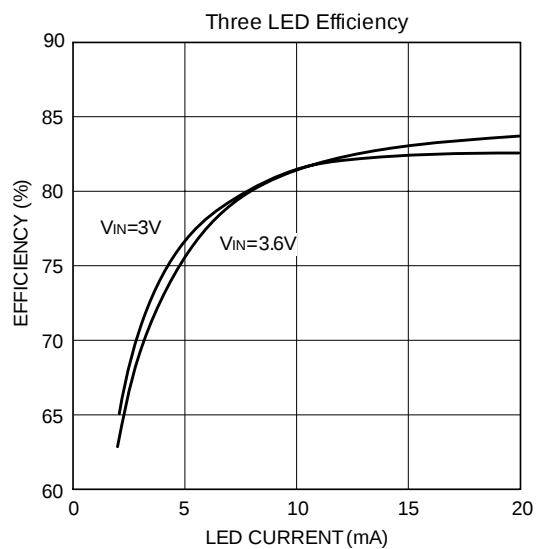
■ TYPICAL APPLICATION CIRCUIT



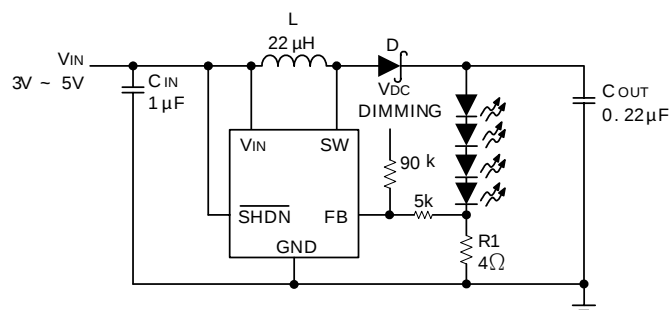
Li-Ion to Two White LEDs



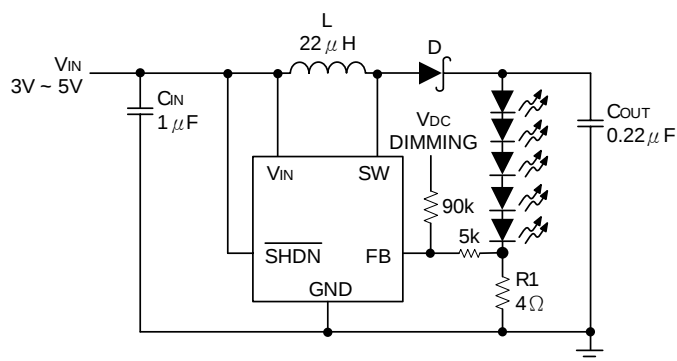
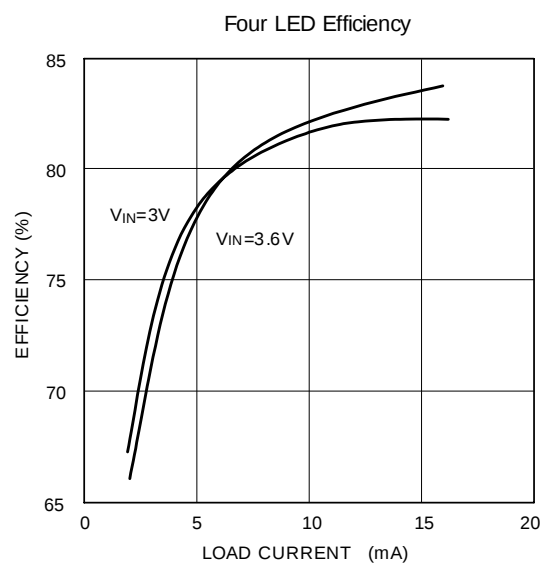
Li-Ion to Three White LEDs



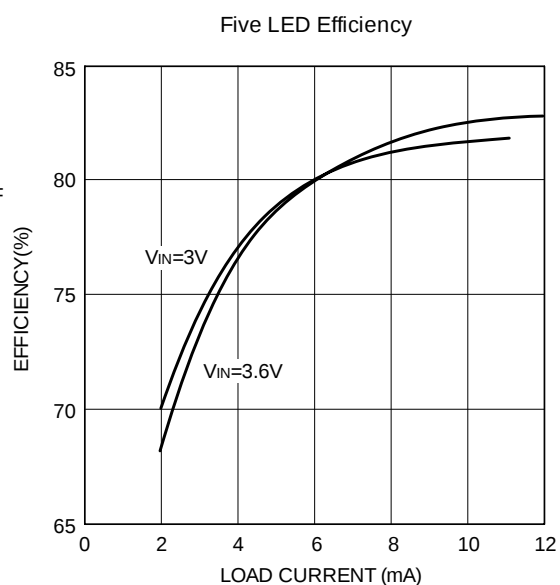
■ TYPICAL APPLICATION CIRCUIT (cont.)



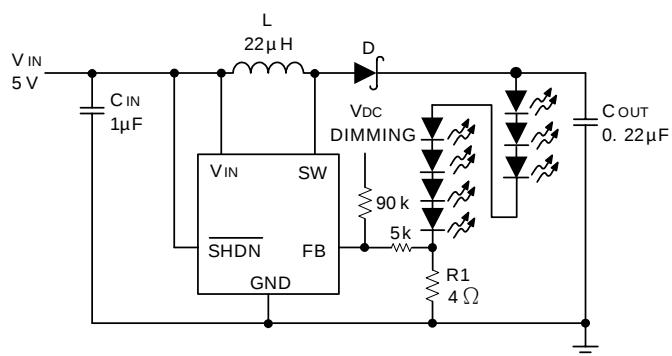
Li-Ion to Four White LEDs



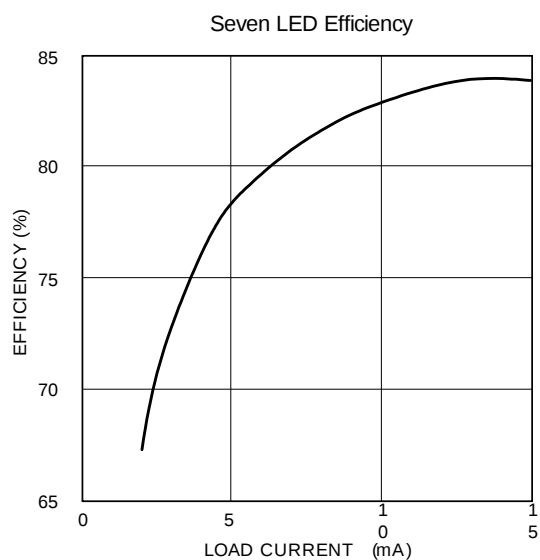
Li-Ion to Five White LEDs



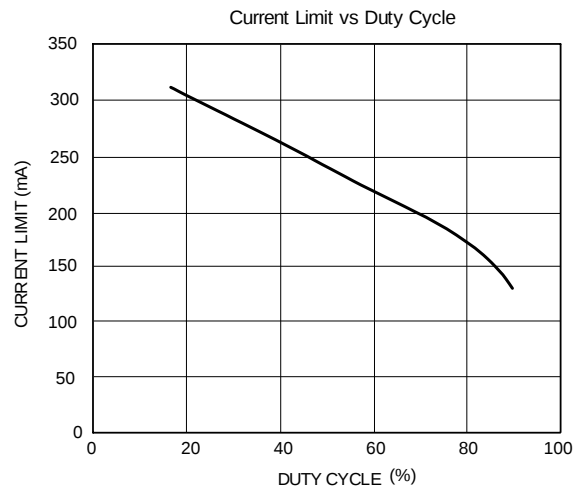
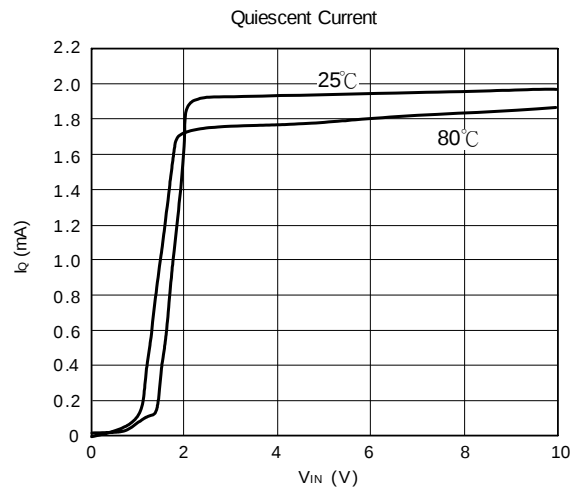
■ TYPICAL APPLICATION CIRCUIT (cont.)



5V to Seven White LEDs



■ TYPICAL CHARACTERISTICS



* UTC L5100 is guaranteed the operating temperature range of 0°C ~ 75°C.

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