



# L5100

## LINEAR INTEGRATED CIRCUIT

### WHITE LED STEP-UP CONVERTER

#### DESCRIPTION

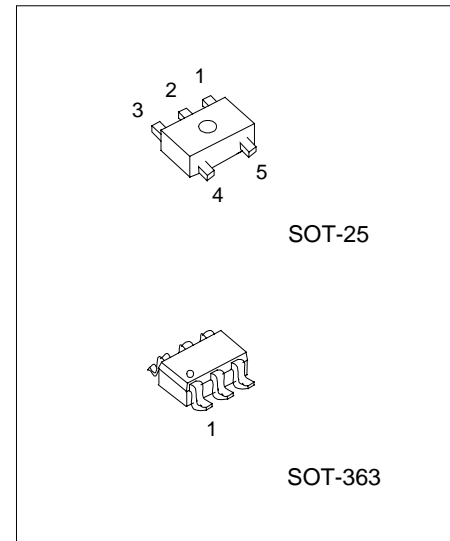
The UTC **L5100** is a STEP-UP DC/DC Converter and designed for driving white LEDs with a constant current. It can drive several LEDs in series by a Li-Ion cell. UTC **L5100** switches at a high frequency 1.2MHz, so it can allowing the use of tiny external components. The output capacitor can be as small as 0.22 $\mu$ 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 $\mu$ 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

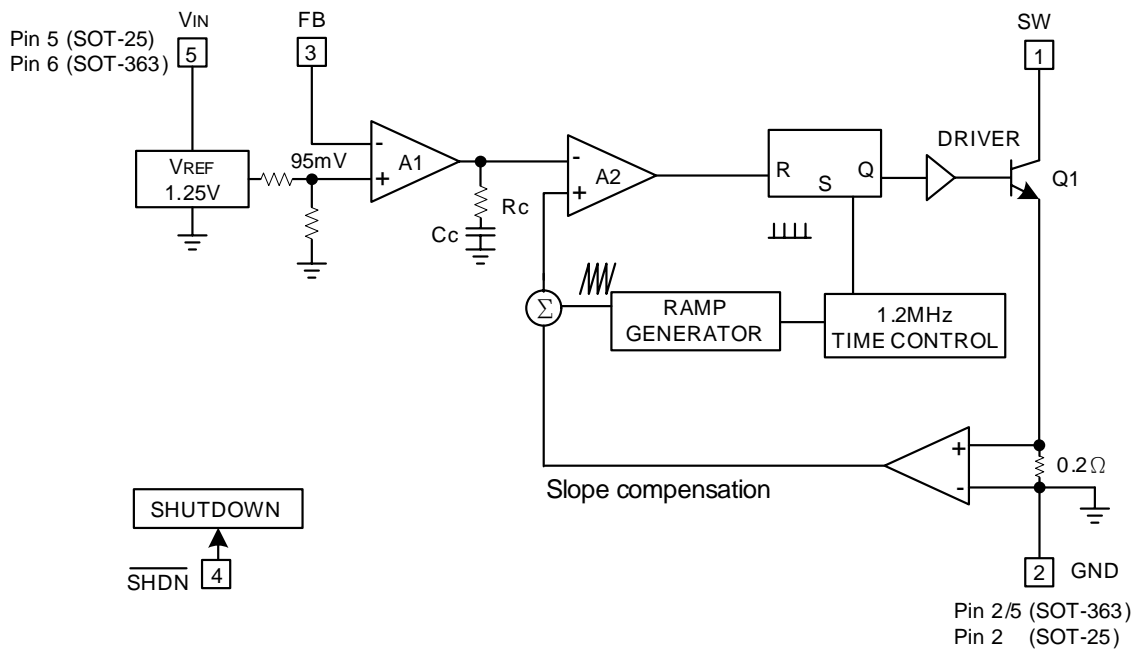


\*Pb-free plating product number: L5100L

## 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: $R_{FB} = 95mV/I_{LED}$
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 <sub>IN</sub>	Input Supply Pin. Must be locally bypassed.

## BLOCK DIAGRAM



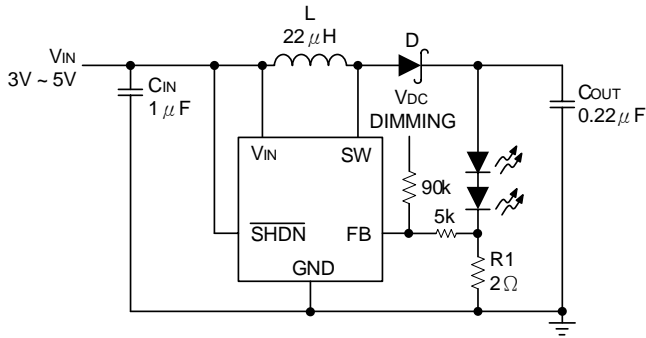
■ ABSOLUTE MAXIMUM RATINGS

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

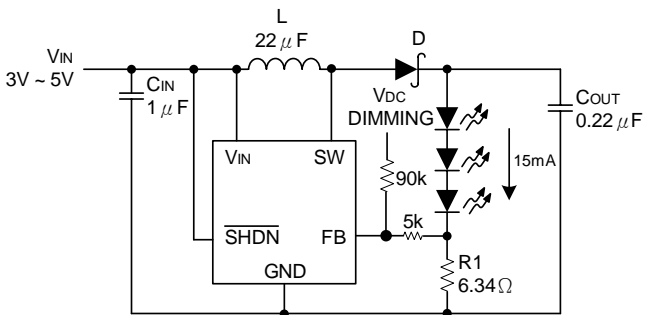
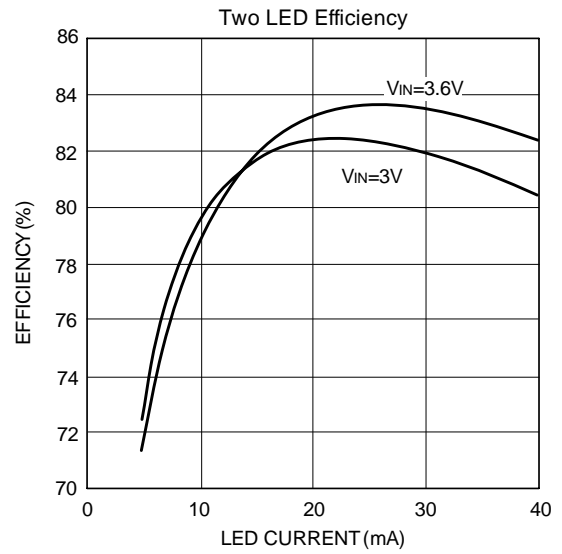
■ ELECTRICAL CHARACTERISTICS ( $T_a=25^{\circ}\text{C}$ ,  $V_{IN}=3\text{V}$ ,  $V_{SHDN}=3\text{V}$ , unless otherwise specified.)

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 $\mu\text{A}$
Switch Leakage Current	$I_{SW(OFF)}$	$V_{SW}=5\text{V}$		0.01	5	$\mu\text{A}$
Shutdown Pin Bias Current	$I_{SHDN}$			60		$\mu\text{A}$
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		%

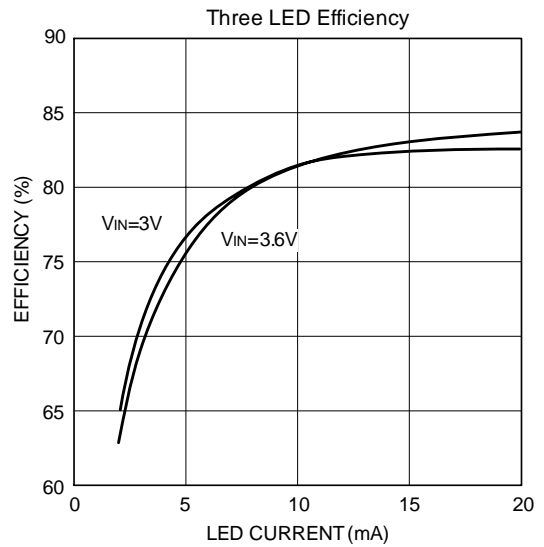
## ■ TYPICAL APPLICATION CIRCUIT



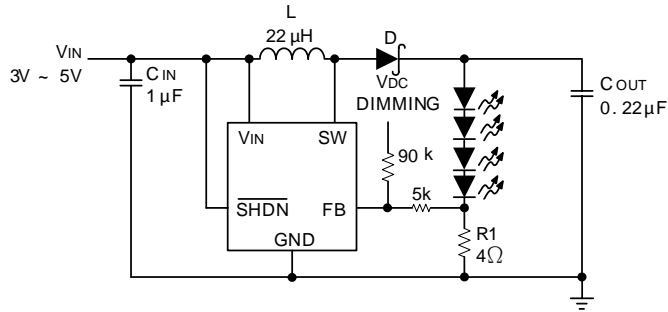
Li-Ion to Two White LEDs



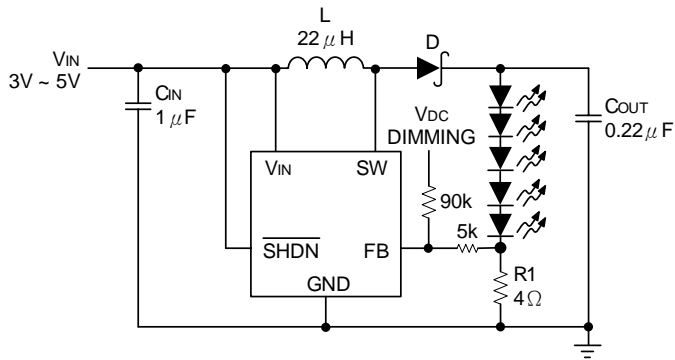
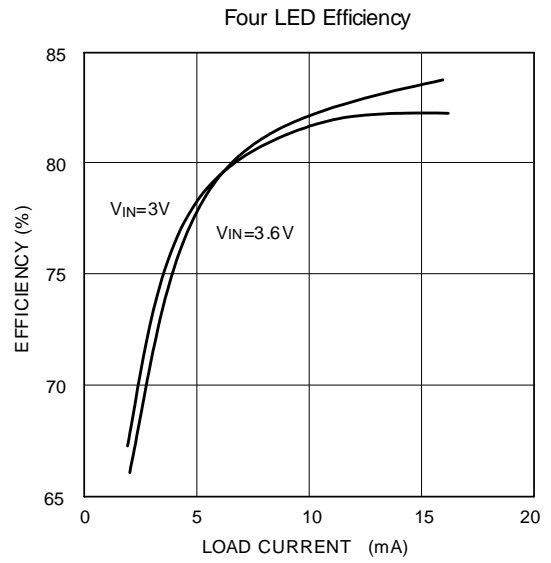
Li-Ion to Three White LEDs



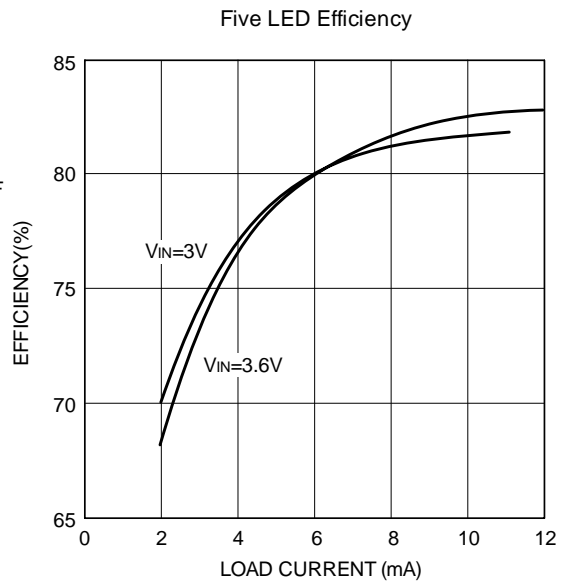
## ■ TYPICAL APPLICATION CIRCUIT (cont.)



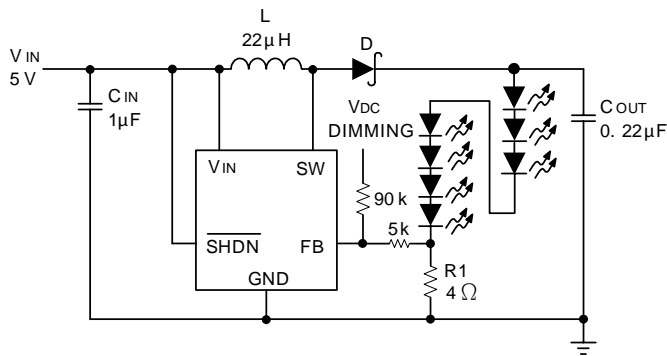
Li-Ion to Four White LEDs



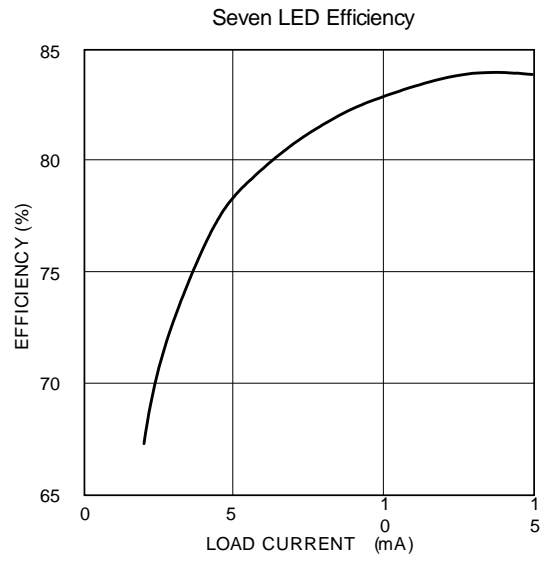
Li-Ion to Five White LEDs



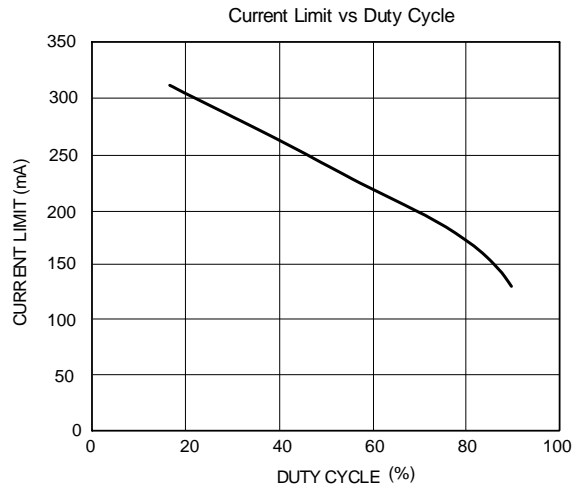
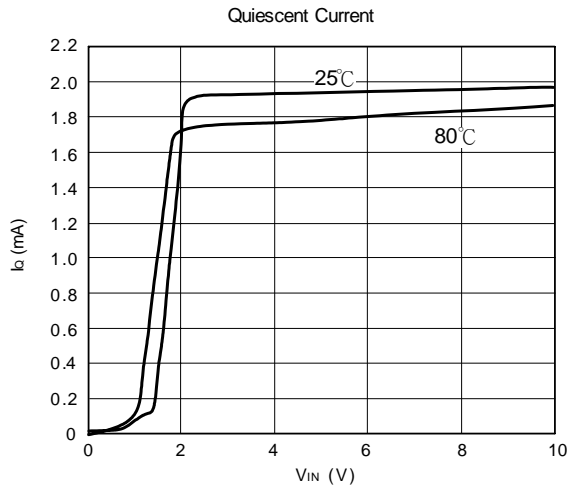
■ TYPICAL APPLICATION CIRCUIT (cont.)



5V to Seven White LEDs



## ■ TYPICAL CHARACTERISTICS



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

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