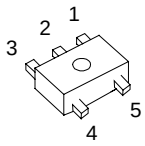
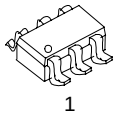
WHITE LED STEP-UP CONVERTER



SOT-25



SOT-363

*Pb-free plating product number: L5100L

■ 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 0.22μF, 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 0.22μF

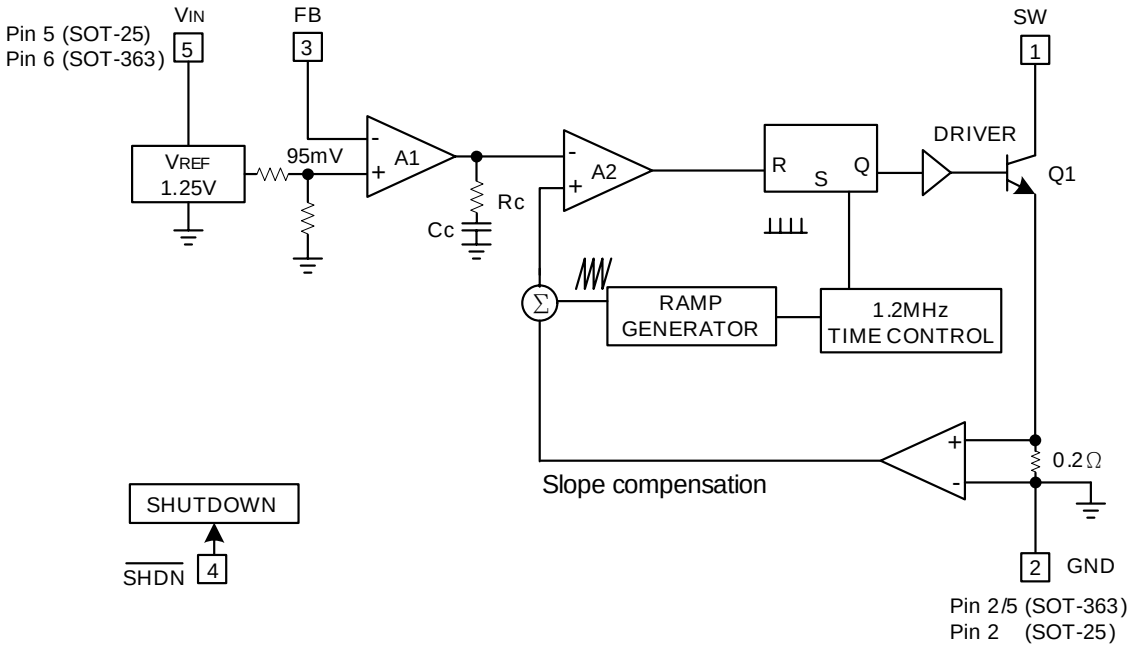
■ ORDERING INFORMATION

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

■ 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	$\overline{SHDN}$	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.

■ BLOCK DIAGRAM



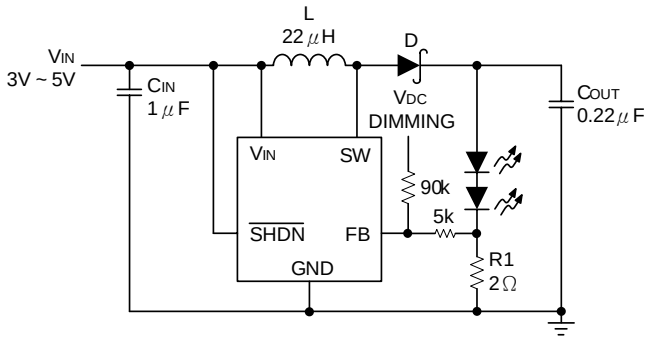
■ ABSOLUTE MAXIMUM RATINGS

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

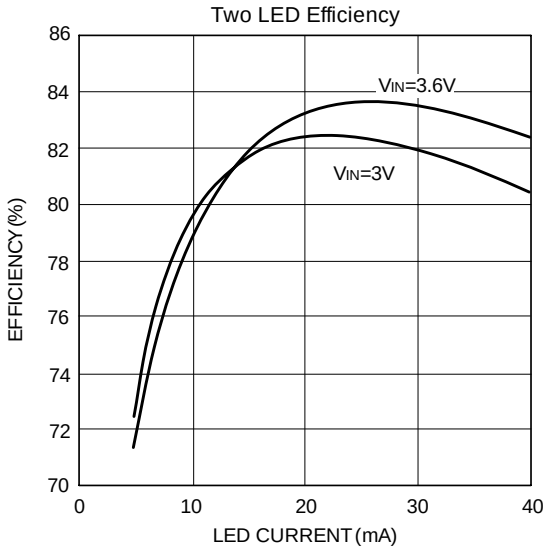
■ ELECTRICAL CHARACTERISTICS (Ta=25℃, V_{IN}=3V, V_{SHDN}=3V, unless otherwise specified.)

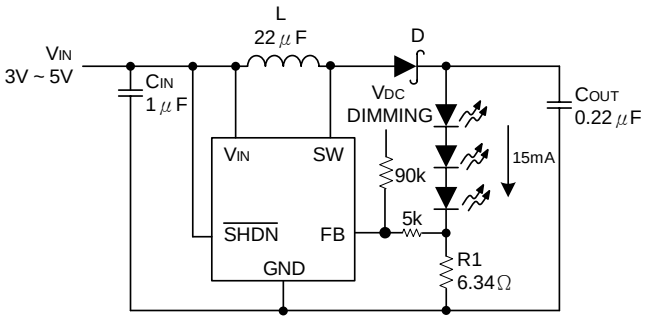
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Operating Voltage	V_{IN}		2.5		12	V
Feedback Voltage	V_{FB}	I_{SW}=100mA, Duty Cycle=66%	87	95	104	mV
Shutdown Voltage ON	V_{ON}		1.5			V
Shutdown Voltage OFF	V_{OFF}				0.3	V
Switch V_{CESAT}	$V_{CESAT(SW)}$	I_{SW}=250mA		360		mV
Switch Current Limit	I_{SW}			320		mA
Supply current	Icc	$\overline{SHDN}$=0V		1.8 0.1	2.5 1.0	mA μA
Switch Leakage Current	$I_{SW(OFF)}$	V_{SW}=5V		0.01	5	μA
Shutdown Pin Bias Current	$I_{\overline{SHDN}}$			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

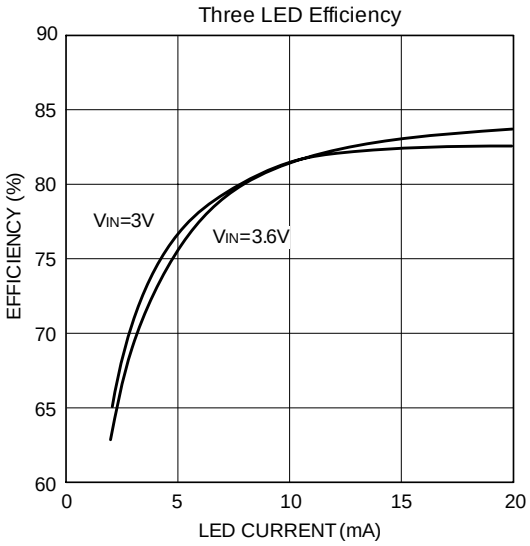


Li-Ion to Two White LEDs

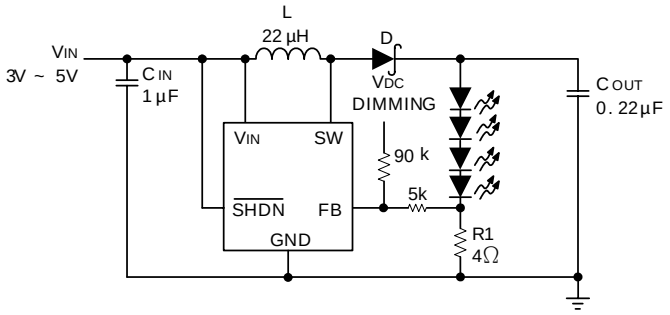




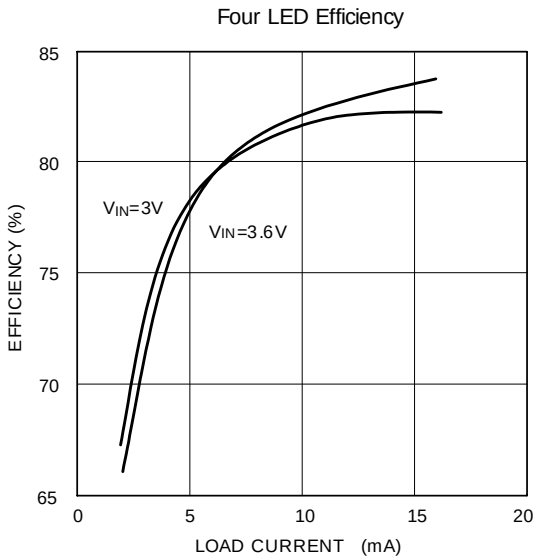
Li-Ion to Three White LEDs

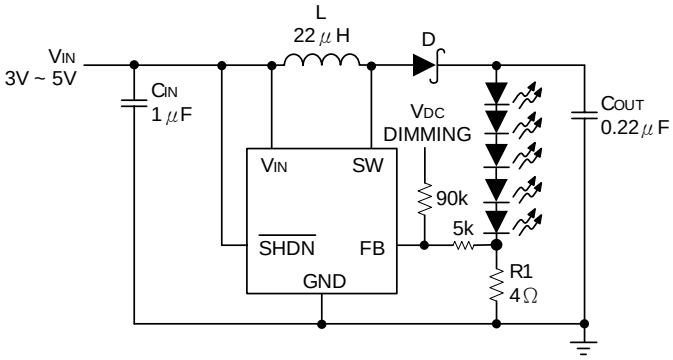


■ TYPICAL APPLICATION CIRCUIT (cont.)

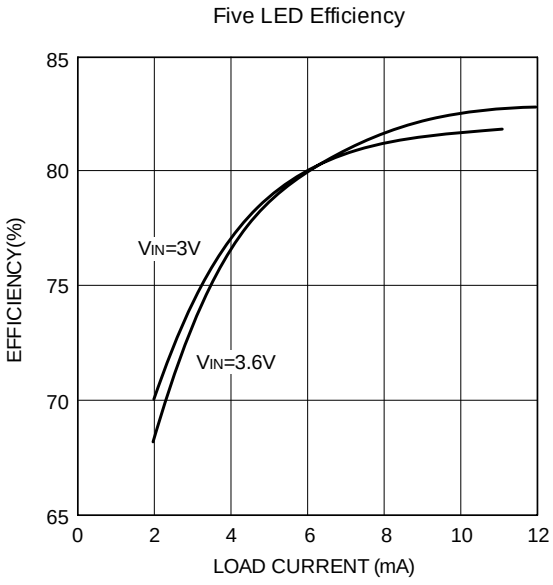


Li- Ion to Four White LEDs

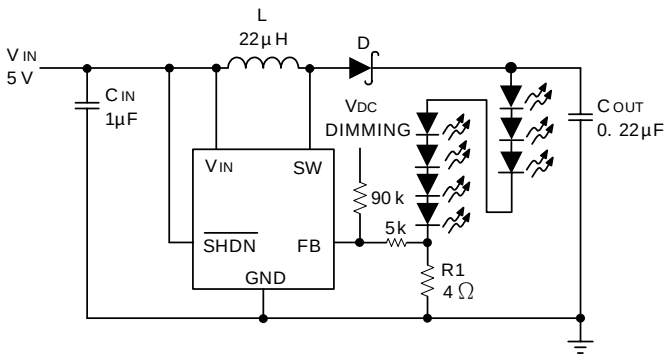




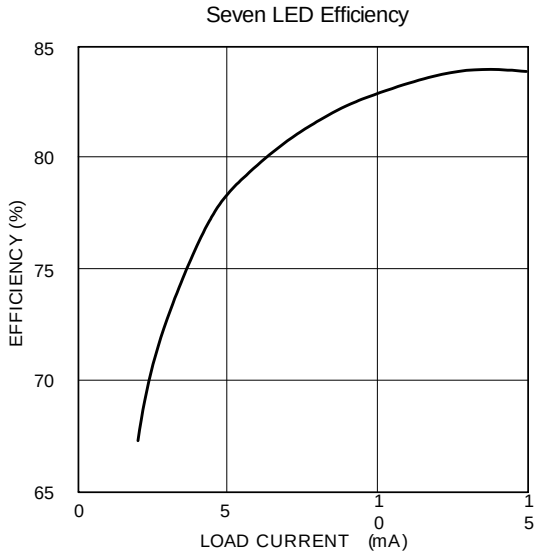
Li-Ion to Five White LEDs



■ TYPICAL APPLICATION CIRCUIT (cont.)

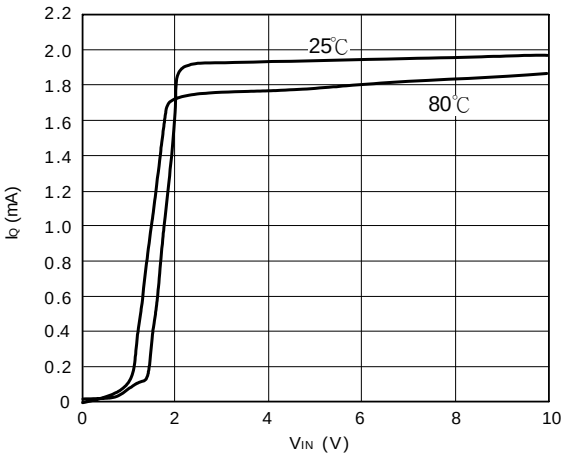


5V to Seven White LEDs

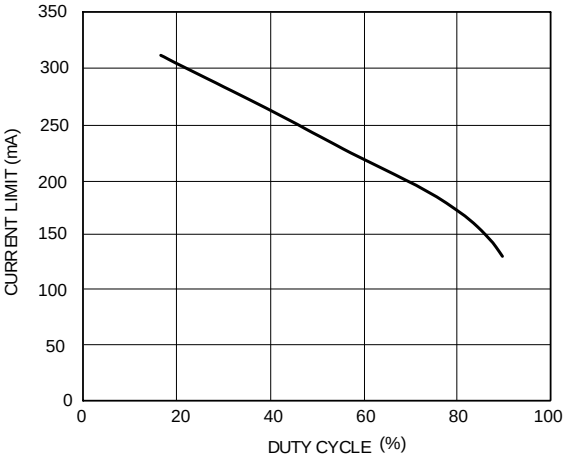


■ TYPICAL CHARACTERISTICS

Quiescent Current



Current Limit vs Duty Cycle



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