



## L5109

Advance

CMOS IC

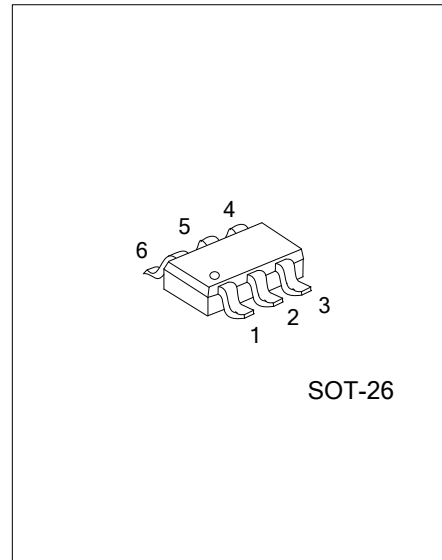
### WHITE LED STEP-UP CONVERTER

#### DESCRIPTION

The UTC **L5109** is an inductor-based DC/DC converter designed to drive up to six white LEDs in series or 2 rows of LEDs with 5 for each in parallel for backlight. Only one feedback resistor is needed to control the LED current and obtain required brightness.

#### FEATURES

- \* Inherently Uniform LED Current
- \* High Efficiency up to 83.5%
- \* No Need for External Schottky Diode
- \* Over Output Voltage Protection
- \* OVP
- \* 1.2MHz Switching Frequency

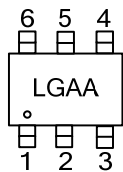


#### ORDERING INFORMATION

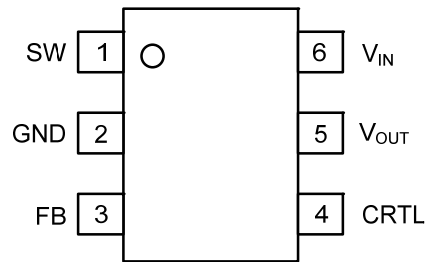
Ordering Number	Package	Packing
L5109G-AG6-R	SOT-26	Tape Reel

<p>L5109G-AG6-R</p>	<p>(1) R: Tape Reel  (2) AG6: SOT-26  (3) G: Halogen Free and Lead Free</p>
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#### MARKING



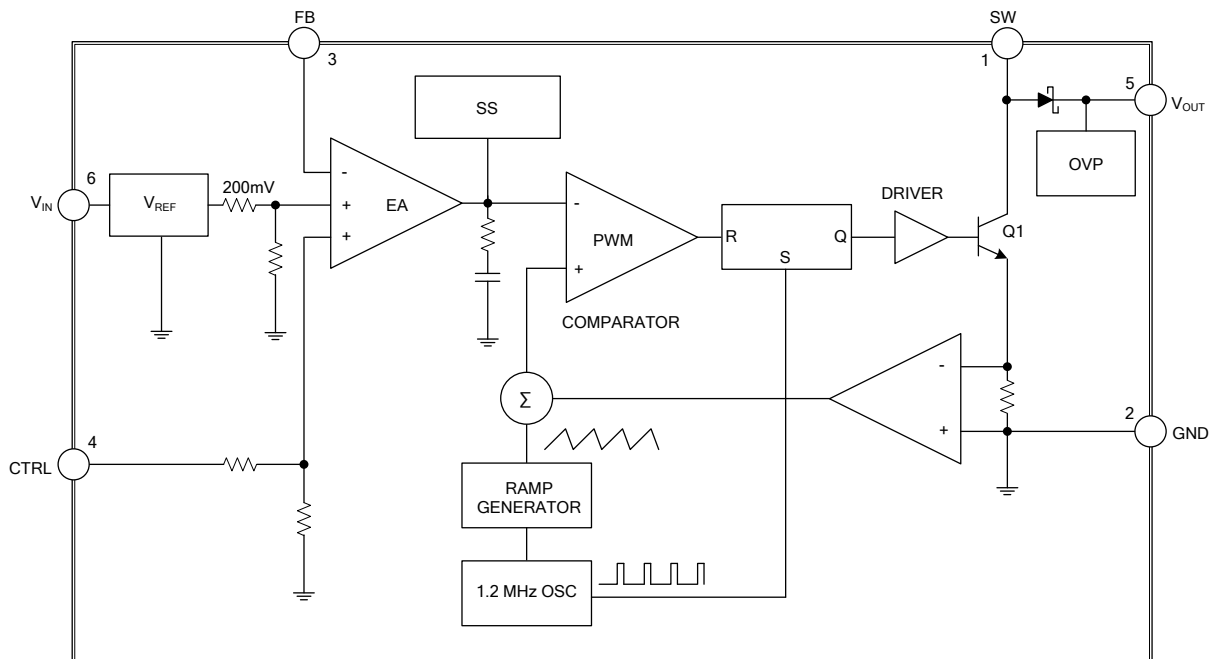
### ■ PIN CONFIGURATION



### ■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	SW	Switch Pin.
2	GND	Ground Pin
3	FB	Feedback Voltage.
4	CTRL	Shutdown and Dimming Pin.
5	V <sub>OUT</sub>	Output Pin.
6	V <sub>IN</sub>	Input Supply Pin.

### ■ BLOCK DIAGRAM



### ■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	$V_{IN}$	20	V
SW Voltage	$V_{SW}$	38	V
FB Voltage	$V_{FB}$	20	V
CTRL Voltage	$V_{CTRL}$	20	V
Operating Junction Temperature	$T_{OPR}$	+150	°C
Storage Temperature Range	$T_{STG}$	-65 ~ 150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

### ■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	$\theta_{JA}$	265	°C/W
Junction to Case	$\theta_{JC}$	60	°C/W

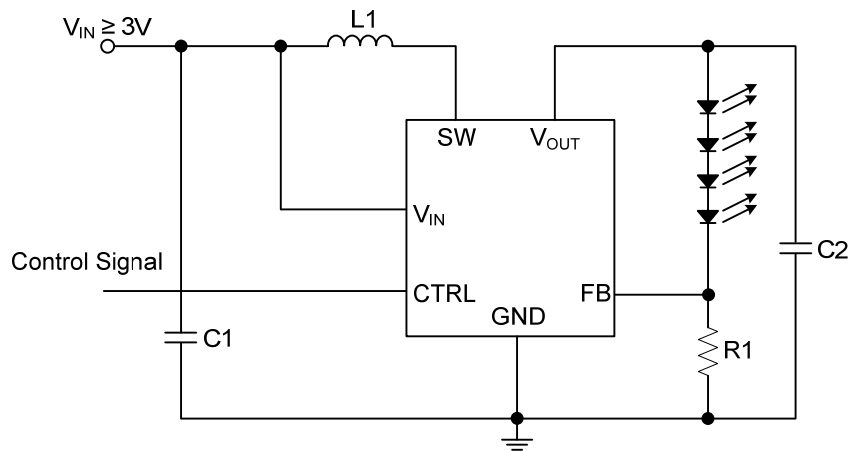
### ■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	RATINGS	UNIT
Operating Temperature Range	$T_{OPR}$	-40 ~ 85	°C
Input Voltage	$V_{IN}$	2.5 ~ 16	V
CTRL Voltage	$V_{CTRL}$	16	V

### ■ ELECTRICAL CHARACTERISTICS ( $V_{IN}=3V$ , $V_{CTRL}=3V$ , $T_A=25^\circ C$ , unless otherwise specified.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Minimum Operating Voltage	$V_{IN}$		2.5		16	V
Feedback Voltage	$V_{FB}$	$I_{OUT}=20mA$ , 4 LEDs, $T_A=-40^\circ C \sim 85^\circ C$	188	200	212	mV
FB Pin Bias Current	$I_{FB}$			35	100	nA
Supply Current	$I_{CC}$	$V_{FB}=V_{IN}$ , No Switching		2.5	3.2	mA
Shutdown Quiescent Current	$I_Q$	$V_{CTRL}=0V$	2.0	3.2	5.0	$\mu A$
Switching Frequency	f			1.2		MHz
Maximum Duty Cycle	$D_{MAX}$		90	93		%
Switch Current Limit	$I_{LIMIT}$	$T_A=25^\circ C$ , D=40%		550		mA
		$T_A=25^\circ C$ , D=80%		550		
Switch VCE Saturation Voltage	$V_{CESAT}$	$I_{SW}=250mA$		360		mV
Switch Leakage Current		$V_{SW}=5V$		0.01	5	$\mu A$
CTRL Pin Voltage	$V_{CTRL}$	High	1.8			V
		Low			0.05	
CTRL Pin Bias Current	$I_{CTRL}$		40	55	72	$\mu A$
		$T_A=85^\circ C$		50		
		$T_A=-40^\circ C$		75		
OVP Voltage	$V_{OV}$			29		V
Schottky Forward Drop	$V_{DROP}$	$I_D=150mA$		0.7		V
Schottky Leakage Current		Reverse Voltage $V_R=23V$		0.1	4	$\mu A$
		Reverse Voltage $V_R=27V$			150	
Soft Start Time	t			300		$\mu S$

## ■ TYPICAL APPLICATION CIRCUIT



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