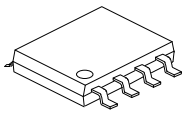
1A HIGH POWER LED DRIVER WITH 4.5~40V INPUT



SOP-8

■ DESCRIPTION

The UTC **L3012** is a step-down PWM control LED driver with a built-in power Switch. It achieves 1A continuous output current in 4.5~40V input voltage range. It has high efficiency up to more than 96%, with the excellent current accuracy within ±1%.

■ FEATURES

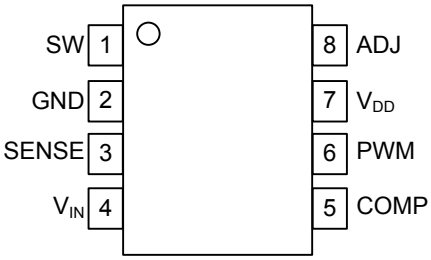
* 4.5~40V input voltage range
* Maximum 1A output current
* 0.15Ω built-in power MOSFET
* 280kHz fixed frequency
* Excellent constant current accuracy ±1%
* Thermal shutdown
* Cycle-by-cycle over current protection
* PWM dimming function

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
L3012L-S08-T	L3012G-S08-T	SOP-8	Tube
L3012L-S08-R	L3012G-S08-R	SOP-8	Tape Reel

L3012L-S08-R (1)Packing Type (2)Package Type (3)Lead Free	(1) T: Tube, R: Tape Reel (2) S08: SOP-8 (3) L: Lead Free, G: Halogen Free

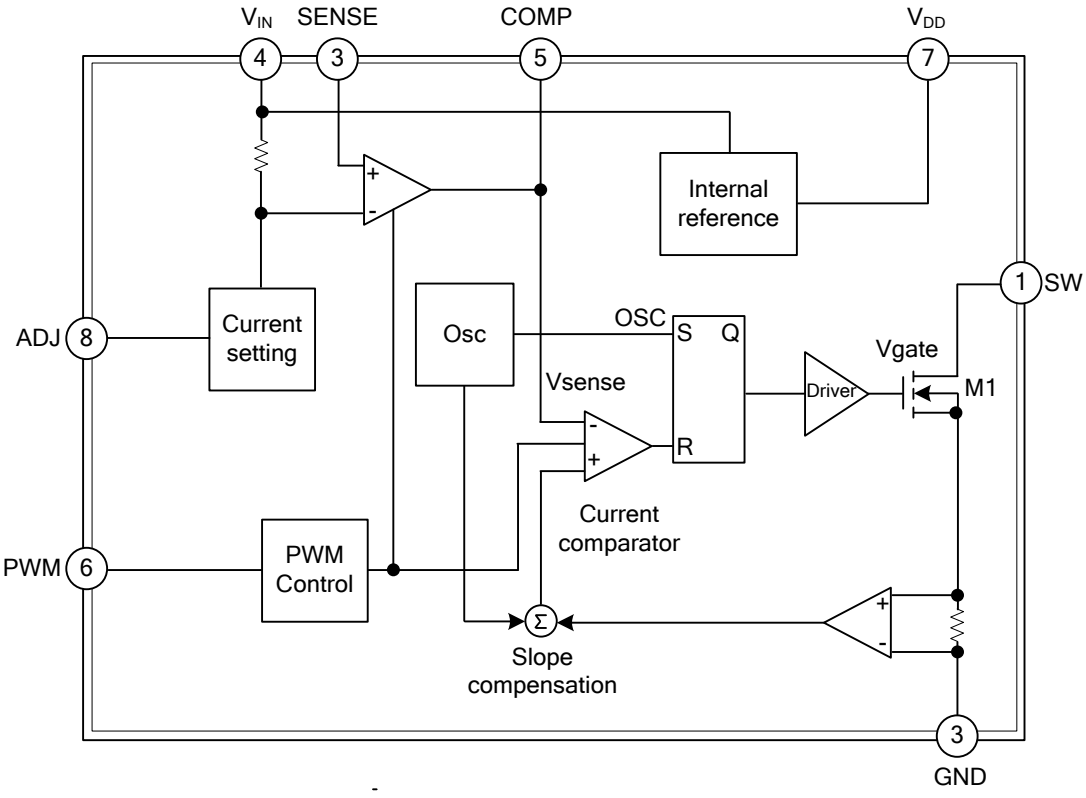
■ PIN CONFIGURATION



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1	SW	Power Switch output.
2	GND	Ground.
3	SENSE	Current sense pin.
4	V_{IN}	Input supply voltage.
5	COMP	Compensation pin, connects to external capacitor.
6	PWM	PWM dimming pin.
7	V_{DD}	5V LDO output
8	ADJ	Thermal compensation pin or linear dimming pin.

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATING (unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{IN}	40	V
Switch Voltage	V_{SW}	-1~V_{IN}+1	V
Comp Voltage	V_{COMP}	-0.3~6	V
SENSE Voltage	V_{SENSE}	-0.3~V_{IN}	V
Input Voltage	V_{IN}	4.5~40	V
Junction Temperature	T_J	150	°C
Operating Temperature	T_{OPR}	-40 ~ +125	°C
Storage Temperature	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.

■ ELECTRICAL CHARACTERISTICS (T_A=25°C, unless otherwise specified, V_{IN}=12V, I_{OUT}=700mA)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{IN}		6		36	V
Operating Current	I_{IN}	V_{CC}=4/40V (Switch Off)		2.2	4	mA
Upper Switch Leakage	I_L	V_{SW}=40V		0	5	μA
Current Limit	I_{LIM}	V_{IN}=SENSE=12V	1.7	2	3	A
Maximum Duty Cycle	D_{MAX}	3LED, V_{IN}=9V		94	96	%
Oscillator Frequency	f_{OSC}		250	280	320	kHz
COMP Clamp Voltage	V_{COMP}	Open without load	1.6	2	2.2	V
Switch Transistor on Resistance	R_{ON}	1LED, I_{OUT}=1A		0.15	0.5	Ω
Sampling Voltage Threshold	V_{IN}-V_{SENSE}	Drop voltage between V_{IN} and SENSE		100		mV
Thermal Shutdown Threshold	TSD			160		°C
Thermal Shutdown Hysteresis	TSD-hys			30		°C

■ FUNCTION DESCRIPTION

The UTC **L3012** is a current mode and fixed frequency (280kHz) LED driver.

1. Output current setting

The output current is determined by the sampling resistor (R_S) and setting voltage (V_{IN}-V_{SENSE} a built-in fixed 100mV).

$$I_{OUT} = \frac{V_{IN} - V_{SENSE}}{R_S} = 100mV/Rs$$

2. Current limiting

UTC **L3012** has internal current limiting function, and the voltage on COMP is clamped at about 2V, the output current of the power MOSFET is limited at about 2A by current comparator.

3. Diode Selection

UTC **L3012** driver LED need a Schottky diode. If output current is 700mA or smaller then SS14 (D1N5819) is ok.

The average current through the diode is I_D:

$I_D = (1-D) \cdot I_{LED}$

I_{LED} is the current of LED

■ TYPICAL APPLICATION CIRCUIT