



The SL0600 is a high brightness (HB) LED driver control IC suitable for outdoor applications in displays or signaling in automotive, industrial, white goods, medical and gaming equipment industry. The device is capable of driving output current from a few milliamps up to 1.0A and has a voltage range of 10v to 450v input. The extra design tolerance driving the serial LED string by a constant current source meets demands of outdoor environmental changes in thermal noise.

The SL0600 controls an external MOSFET with PWM switching frequencies up to 300kHz. This also allows for more controllability for features such as enhanced dimming etc. through an external control with configurable duty ratios. The SL0600 is packaged in SOIC package for low operating temperature and long life at high ambient conditions.

## Features

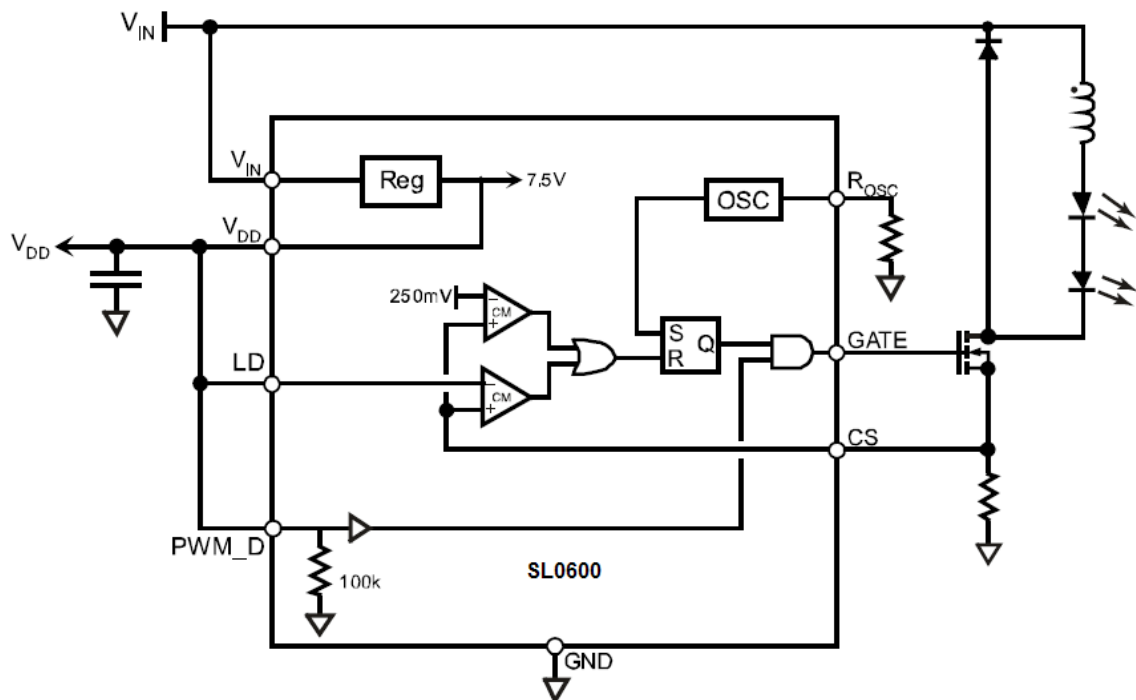
- >90% Efficiency
- 10v to 650v input range
- Constant current architecture
- Applications max range to 1.0A
- LED serial connection to up to 100 LEDs
- PWM Control to GATE pin - external MOSFET
- Input surge protection

## Applications

HBLED applications fall under 2 distinctive categories, illumination and indication. Under illumination, there are general lighting and direct lighting applications. For indication, common applications are panel indicators and messaging.

HBLED and U(Ultra)HBLED are quickly replacing conventional lighting in many applications. Their enhanced brightness levels allow them to be the better choice for solutions needing multiple LEDs, saving costs and design cycle time.

## Block Diagram



## Pin Assignments

NAME	DESCRIPTION		
	SOIC8 DIP8	SOIC16	
Vin	1	1	Input Voltage 10V to 450V DC
CS	2	4	Current Sense input from LED serial
GND	3	5	Ground
GATE	4	8	Drives PWM on external MOSFET
PWM_D	5	9	PWM Dimming for control. Tie to VDD to allow constant operation. Tie to GND to disable the PWM output. Internal 100kohm Pull Down
VDD	6	12	Internal working voltage. 8V. Can supply up to 1.0A external.
LD	7	13	Linear Dimming by changing current limit threshold at current sense comparator.
Rosc	8	14	Oscillator Control. This value sets the PWM frequency range.

## Functional Description

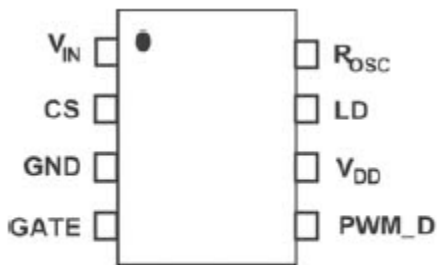
The SL0600 is a constant current configuration device. It is broken up into 2 stages. Stage 1 is the buck-boost configuration whose purpose is to regulate the incoming voltage range from 8V to 650V to internal V<sub>DD</sub> at approximately 5V.

This internal 5V powers up the 2<sup>nd</sup> stage, which is the output PWM control. This internal circuitry comprising of the comparator, SR flip flop, and input oscillator control block. The comparator checks that the V<sub>DD</sub> exceeds the UVLO (6.7V) to turn on the GATE. The CS (Current Sense connected to external sense resistor) checks that the external LED voltage does not exceed the peak voltage threshold (250mV). Else it will turn the GATE off. A simple estimation on the V<sub>LED</sub> is calculated from the Duty cycle of PWM,

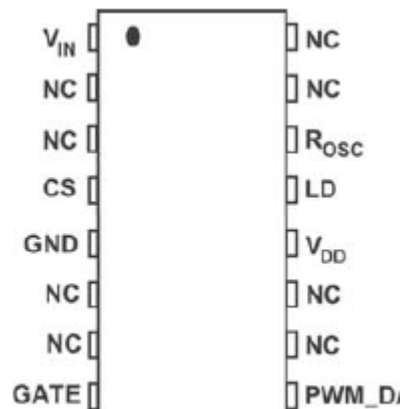
$$D = T_{on}/T_{cycle} = V_{LED}/V_{in}$$

Additional features include the voltage protection and LED dimming control through the PWM\_D (PWM Dimming which turns the GATE output on/off) and the LD (linear dimming) modes.

## Packaging



8-Pin DIP/SOIC



16-Pin SOIC