

## General Description

The SY5861 is an adaptive linear current regulator to eliminate low frequency current ripple targeting at LED lighting applications.

It is applied as a current filter to the output of a LED driver, especially single stage LED driver. It adopts adaptive control scheme and no additional electrical design is needed.

Reliable open/short LED protection and over thermal protection are all provided.

## Ordering Information

SY5861 □(□□)□  
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 Temperature Code  
 Package Code  
 Optional Spec Code

Ordering Number	Package type	Note
SY5861FAC	SO8	----

## Features

- Current filter for single stage LED driver to eliminate current ripple
- Proprietary scheme for low power loss  $\leq 2.5\%$
- Adaptive for wide output speculation:  
Output voltage range from 20V to 100V  
Output current  $\leq 250\text{mA}$
- Open LED Protection and Short LED protection
- Reliable short LED and Open LED protection
- Compact package: SO8

## Applications

- LED lighting

## Typical Applications

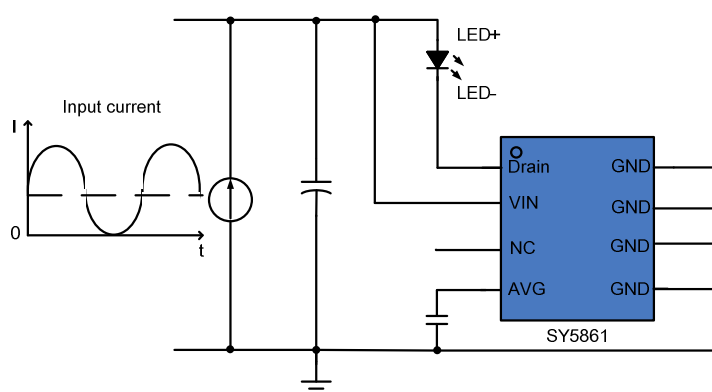
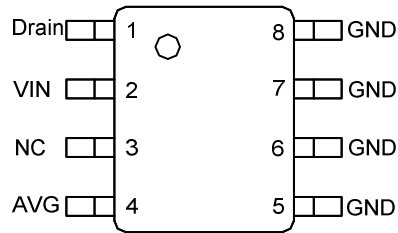


Figure 1. Schematic Diagram

## Pinout (top view)



(SO8)

**Top Mark:** ATNxyz (device code: ATN, *x*=year code, *y*=week code, *z*=lot number code)

Pin Name	Pin Number	Pin Description
Drain	1	Drain of internal power MOSFET.
VIN	2	Power Supply
NC	3	NC.
AVG	4	Average current filter pin. Bypass a capacitor (100nF) to this pin and GND.
GND	5/6/7/8	Ground pin

## Absolute Maximum Ratings (Note 1)

VIN	-0.3V~100V
Drain	-0.3~100V
Power Dissipation, @ T <sub>A</sub> = 25°C SO8	0.6W
Package Thermal Resistance (Note 2)	
SO8, $\theta_{JA}$	88°C/W
SO8, $\theta_{JC}$	45°C/W
Junction Temperature Range	-40°C to 150°C
Lead Temperature (Soldering, 10 sec.)	260°C
Storage Temperature Range	-65°C to 150°C

## Recommended Operating Conditions

VIN, Drain	20V~100V
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## Electrical Characteristics

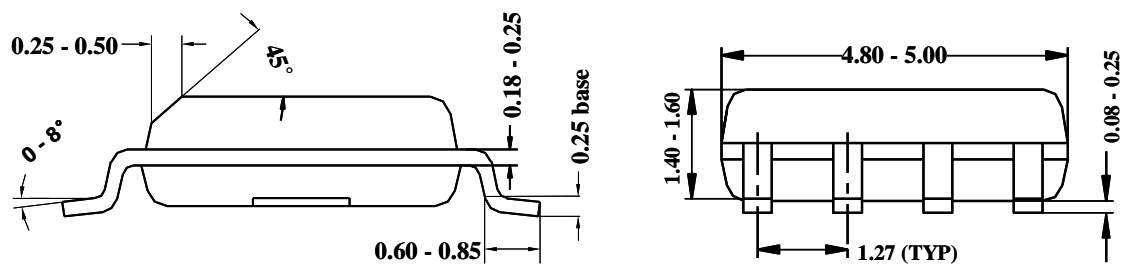
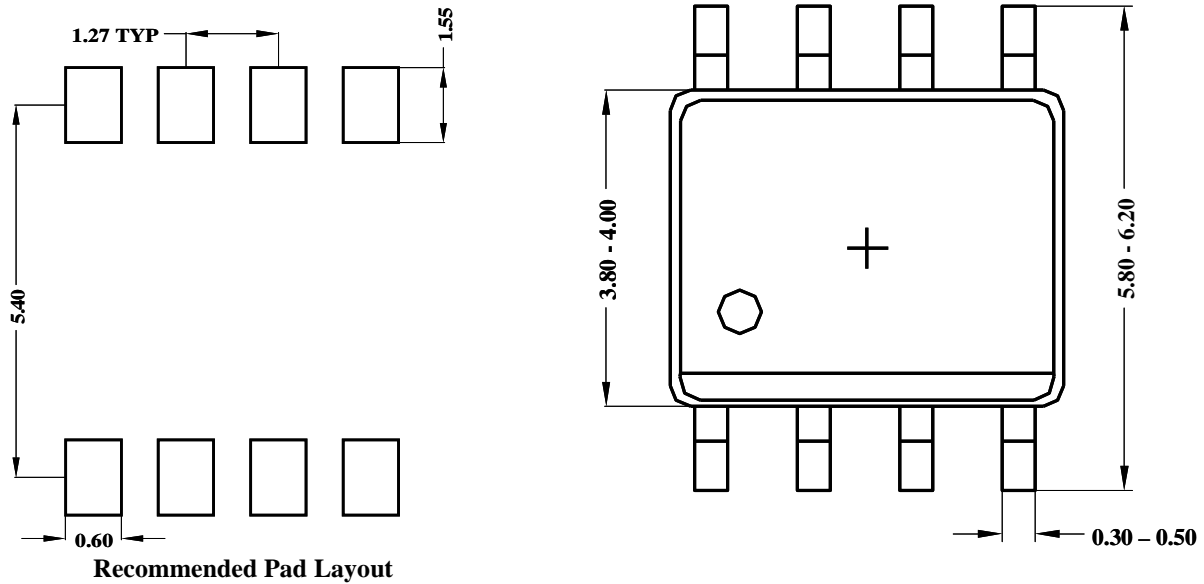
( $V_{IN} = 12V$ ,  $T_A = 25^{\circ}C$  unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Power Supply Section						
VIN turn-on threshold	$V_{VIN,ON}$			10		V
VIN turn-off threshold	$V_{VIN,OFF}$			8		V
VIN operating current	$I_{VIN}$			80		$\mu A$
Drain Section						
BV of internal MOSFET	$V_{BV}$			100		V
Thermal Section						
Thermal Shutdown Temperature	$T_{SD1}$	$V_{DRAIN} < 10V$		150		C
Thermal Shutdown Temperature	$T_{SD2}$	$V_{DRAIN} > 10V$		125		C
Thermal Hysteresis Temperature	$T_{HYS}$			25		C

**Note 1:** Stresses beyond the “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

**Note 2:**  $\Theta_{JA}$  is measured in the natural convection at  $T_A = 25^{\circ}C$  on a low effective single layer thermal conductivity test board of JEDEC 51-3 thermal measurement standard. Test condition: Device mounted on 2” x 2” FR-4 substrate PCB, 2oz copper, with minimum recommended pad on top layer and thermal vias to bottom layer ground plane.

## SO8 Package Outline & PCB Layout Design



**Notes: All dimensions are in millimeters.**

**All dimensions don't include mold flash & metal burr.**