SY5867

Dimming Interface Converter Compatible With 0/1~10V Dimming Resistor Dimming And PWM Dimming

Preliminary Specification

General Description

SY5867 is a dimming interface converter whose input signal can be a 0/1~10V dimming signal, resistor, or PWM signal. It recognizes the signal automatically. The final output of SY5867 is a PWM signal which is used to control a dimmable CC regulator or drive an opto-coupler to achieve isolated dimming. The frequency of output PWM signal and the source current to passive 0~10V dimmer/Resistor can be set by external capacitor and resistor.

Features

- Compatible with 0/1~10V dimming, resistor dimming and PWM dimming.
- Recognize different dimming signal automatically.
- Integrate 60V LDO module to simplify external circuit.
- The source current for passive 0~10V dimmer can be set.
- The frequency of output can be set.
- Compact package: SO8

Ordering Information

SY5867 □(□□)□

- Temperature Code
- Package Code
- Optional Spec Code

Ordering Number	Package type	Note
SY5867FAC	SO8	--

Applications

- LED Dimming

Typical Applications

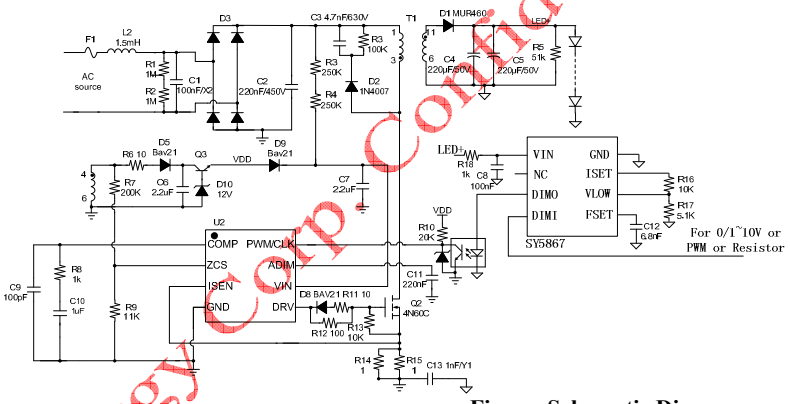
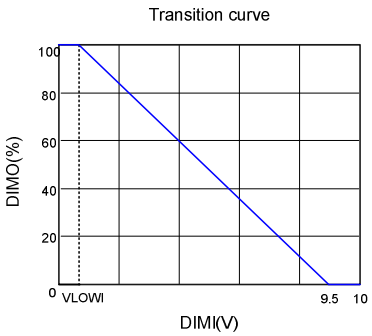
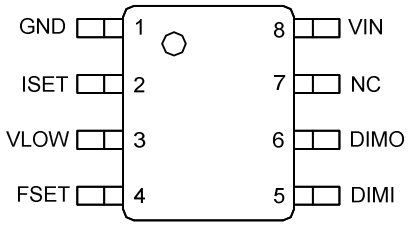


Figure .Schematic Diagram



Pinout(top view)

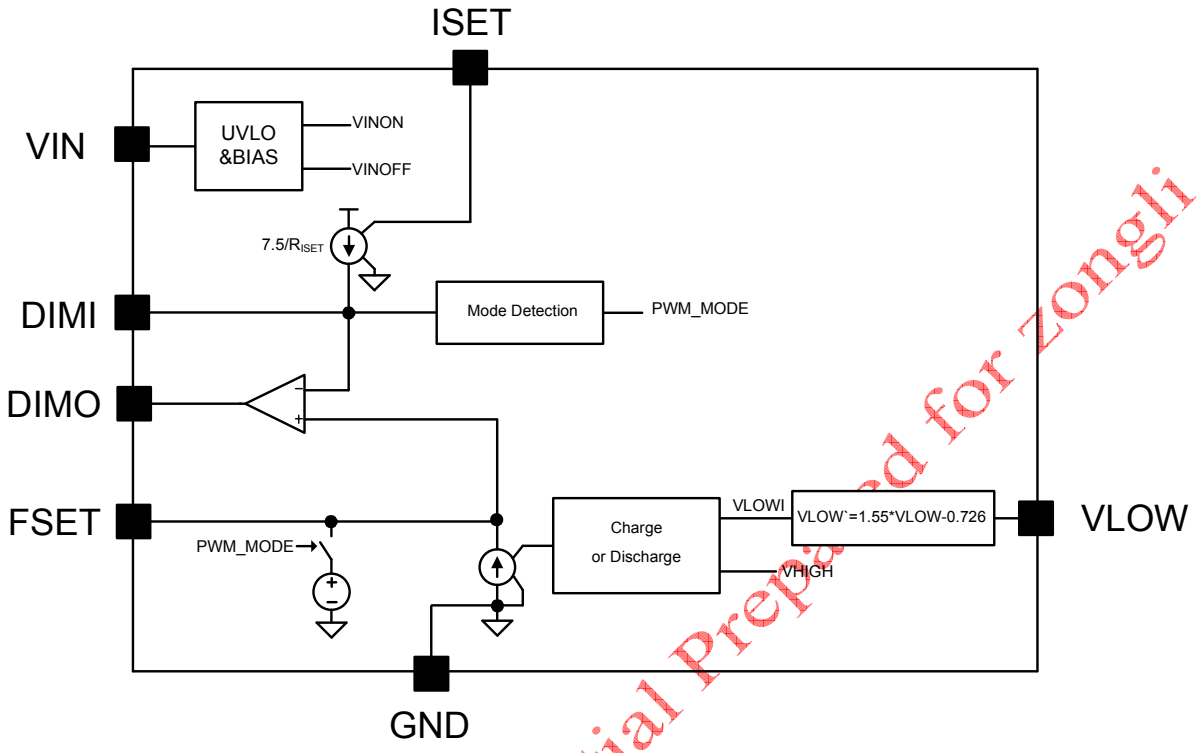


(SO8)

Top Mark: **BKR*xyz***, (Device code: BKR; ***x=year code, y=week code, z= lot number code***)

Pin Name	Pin number	Pin Description
GND	1	Ground pin
ISET	2	Source current setting pin. V_{ISET} is a 1.5V voltage source. This pin is used to set the source current of DIMI pin for passive dimmer. $I_{sr}=\frac{3\times1.5}{R_{ISET}}$
VLOW	3	The lowest input setting pin. This pin is used to set the lowest input voltage which corresponds to 0% duty. The real minimum 0~10V input is $V_{LOWI}=1.55\cdot V_{LOW}-0.726$
FSET	4	Dimming frequency setting pin. This pin is used to set the frequency of DIMO pin. $f_{DIM}=\frac{30\cdot10^{-6}}{(6.6-V_{LOW})\cdot C_{FSET}}$
DIMI	5	Dimming input pin. Dimming signal is connected to this pin. It maybe is a 0/1~10V analog signal, resistor or a PWM signal.
DIMO	6	Dimming output pin. This pin will output a PWM signal to driver opto-coupler for separation dimming.
NC	7	No connect.
VIN	8	Power supply pin. This pin provides power supply for IC.

Block Diagram



Absolute Maximum Ratings (Note 1)

VIN ---------- -0.3V~63V
ISET, FSET,VLOW---------- -0.3V~3.6V
DIMI,DIMO ---------- 0.3V~20V
Power Dissipation, @ TA = 25°C SO8 ---------- 0.8W
Package Thermal Resistance (Note 2)
SO8,θJA---------- 88°C/W
SO8, θJC---------- 45°C/W
Maximum Junction Temperature ---------- 125°C
Lead Temperature (Soldering, 10 sec.) ---------- 260°C
Storage Temperature Range ---------- -65°C to 150°C

Recommended Operating Conditions

VIN ---------- 12V~60V
Junction Temperature Range ---------- -40°C to 125°C

Electrical Characteristics

(V_{IN} = 15V, T_A = 25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Power Supply Section						
VIN voltage Range	V_{VIN}		13		60	V
VIN turn-on threshold	V_{VIN_ON}		11	12	13	V
VIN turn-off threshold	V_{VIN_OFF}		7	8.0	9	V
DIMI Section						
MAX DIMI source current	I_{SR_MAX}			2		mA
MIN DIMI source current	I_{SR_MIN}			0		mA
Range of Minimum Dimming voltage	$V_{LOW,Range}$		0		1.5	V
Maximum Dimming voltage	V_{HIGH}			9.5		V
Max duty of PWM	D_{PWM_MAX}			99(note 3)		%
Min duty of PWM	D_{PWM_MIN}			0		%
PWM ON voltage threshold	V_{PW_ON}				2	V
PWM OFF voltage threshold	V_{PWM_OFF}		0.8			V
Minimum PWM frequency	f_{PWM_MIN}		400			Hz
Thermal Section						
Thermal shut down Temperature	T_{SD}		140	145	150	°C

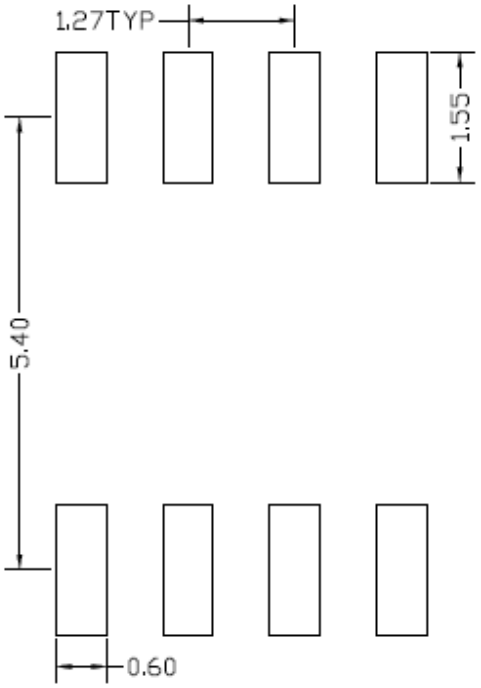
Note 1: Stresses beyond the "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specification is not implied. Exposure to absolute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

Note 2: Θ_{JA} is measured in the natural convection at T_A = 25°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.

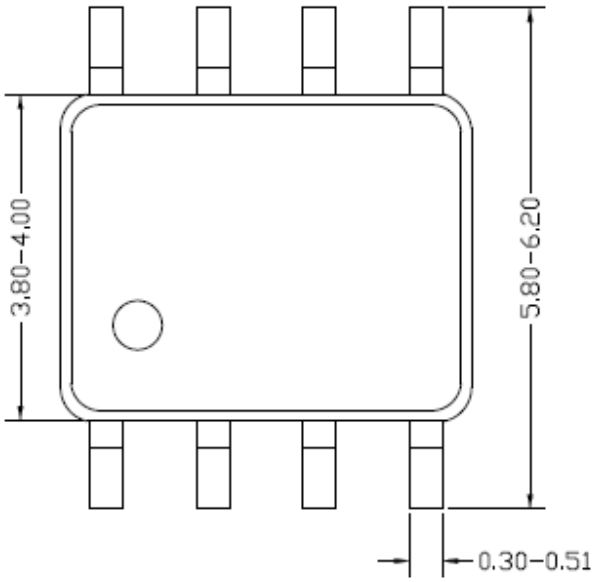
Note 3: the minimum voltage of V_{LOW} is 0.6, while the real V_{LOWI} is 0.2V.

Note 4: If PWM duty is 100% and its amplitude is not 10V, SY5867 could not recognize the current state is PWM mode or not. But if the amplitude of PWM is 10V, the maximum duty is 100%.

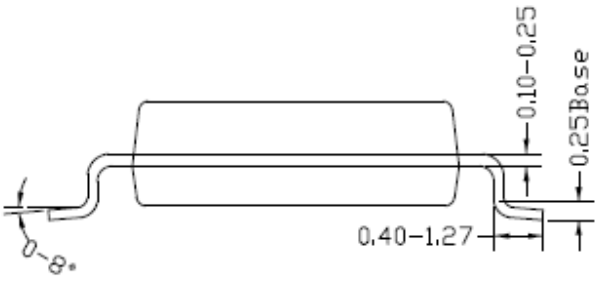
SO8 Package outline & PCB layout design



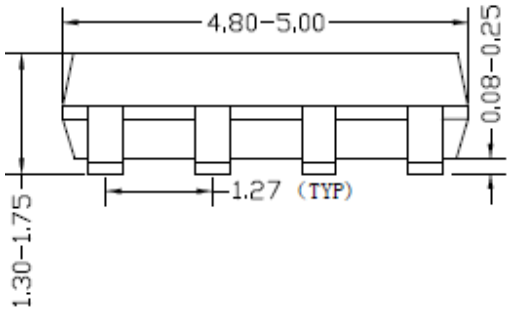
Recommended Pad Layout
(Reference only)



Top view



Side view



Front view

Notes: **All dimension in millimeter and exclude mold flash & metal burr.**