

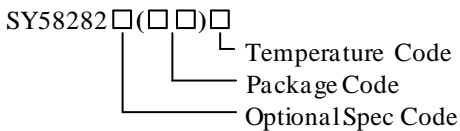
General Description

The SY58282N is a Buck regulator targeting at LED lighting applications.

It integrates a 500V MOSFET to decrease physical volume. It adopts the proprietary control architecture to achieve an accurate regulation of LED current and Quasi-Resonant valley turn-on for high efficiency operation. Proprietary self-bias technique saves the bias supply and reduces the startup time.

It integrates open/short LED protection and eliminates the need for opto-coupler or auxiliary winding (in floating switch application), thus minimizing the component count and board size.

Ordering Information



Ordering Number	Package type	Note
SY58282NFAC	SO8	----

Features

- Integrated 500V MOSFET
- Quasi-Resonant (QR) mode to achieve low switching losses
- Fast Start up (<300ms)
- No opto-coupler or auxiliary winding for feedback in the proprietary floating switch configuration.
- Reliable short LED and open LED protection
- Thermal foldback function
- Maximum output power : 24W
- Compact package: SO8

Applications

- LED lighting

Typical Applications

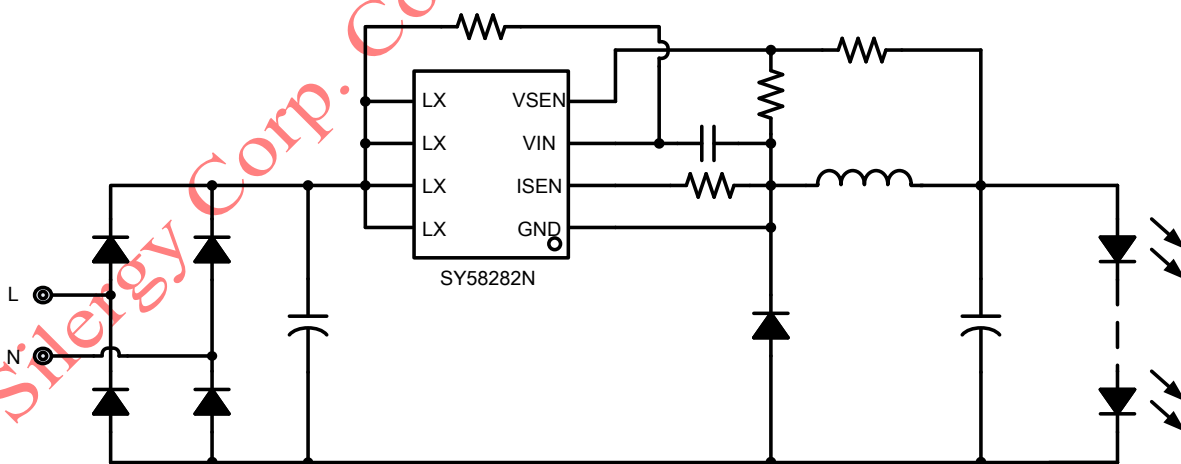
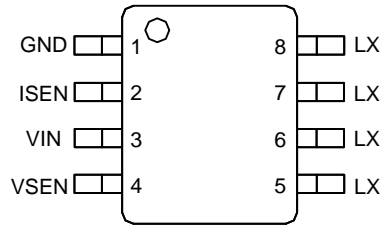


Figure 1. Schematic Diagram

Pinout (top view)



(SO8)

Top Mark: AYRxyz(device code: AYR, x=year code, y=week code, z=lot number code)

Pin Name	Pin number	Pin Description
GND	1	Ground Pin.
ISEN	2	Current set pin. Connect a resistor to program the reference output current. $I_O = \frac{V_{REF}}{2 \times R_{ISEN}}$
VIN	3	Power supply pin.
VSEN	4	Voltage sense pin. Connect to a resistor divider of inductor or auxiliary winding to sense output voltage.
LX	5-8	Internal HV MOSFET drain pin.

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Absolute Maximum Ratings (Note 1)

ISEN	-----	-0.3V~3.6V
VSEN	-----	-0.3V~16V
VIN	-----	-0.3V~20V
LX	-----	500V
Power Dissipation, @ TA = 25°C SO8	-----	1.1W
Package Thermal Resistance (Note 2)		
SO8, θ_{JA}	-----	88°C/W
SO8, θ_{JC}	-----	45°C/W
Lead Temperature (Soldering, 10 sec.)	-----	260°C
Storage Temperature Range	-----	-65°C to 150°C

Recommended Operating Conditions

Junction Temperature Range	-----	-40°C to 125°C
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Block Diagram

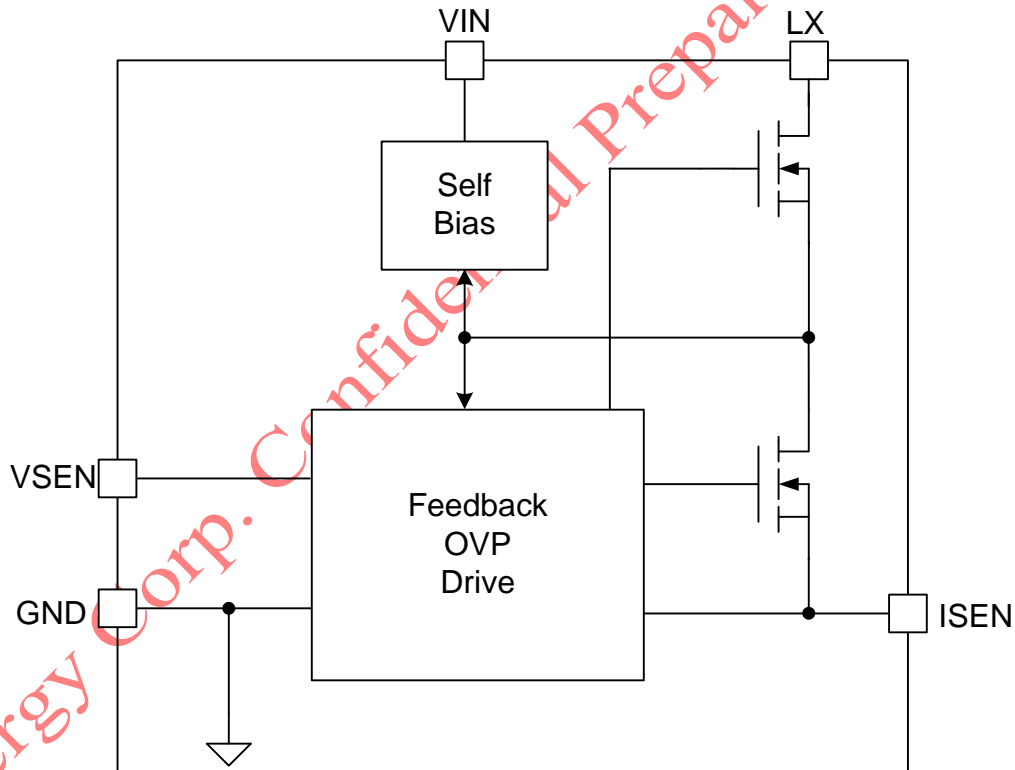


Fig.2 Simplified block diagram



Electrical Characteristics

($V_{VIN}=12V$ (Note 3), $T_A=25^{\circ}C$ unless otherwise specified)

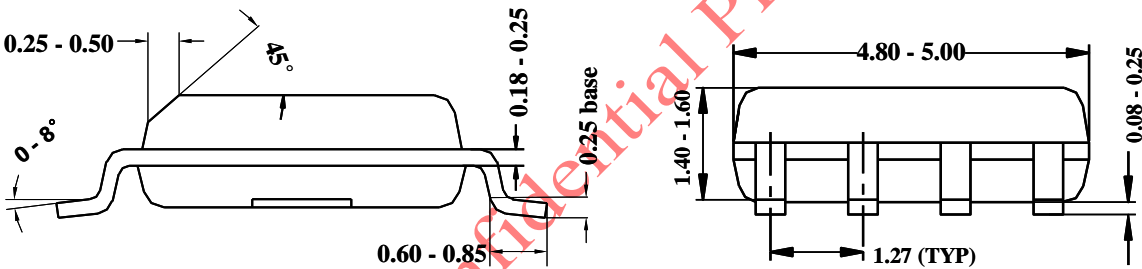
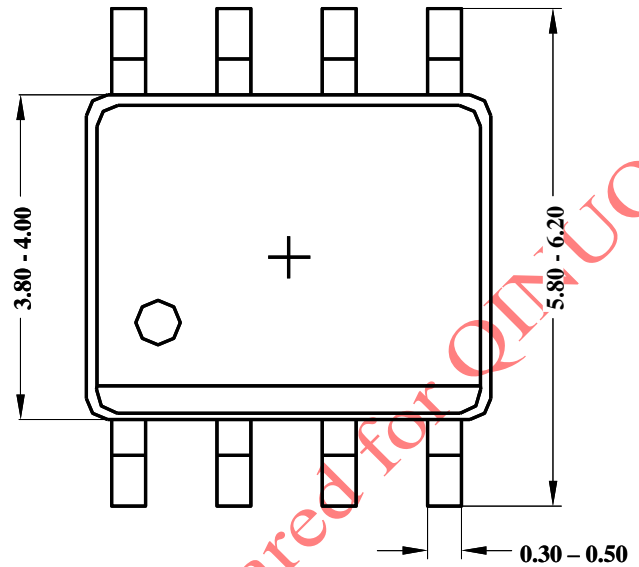
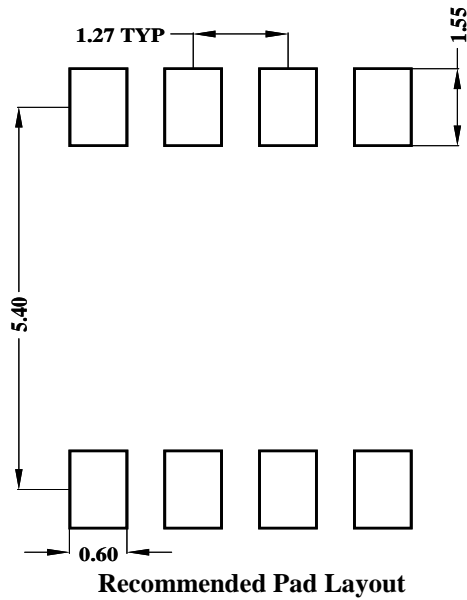
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Power Supply Section						
VIN turn-on threshold	$V_{VIN,ON}$			14.5		V
VIN turn-off threshold	$V_{VIN,OFF}$			7		V
Start up current	I_{ST}			60		μA
Quiescent current	I_Q			230		μA
VSEN pin Section						
VSEN pin reference voltage	$V_{VSEN,OV P}$			1.5		V
Driver Section						
PWM blanking time	$t_{ON,Blank}$			350		ns
Max ON Time	$t_{ON,MAX}$			40		μs
Min OFF Time	$t_{OFF,MIN}$			1.8		μs
Max OFF Time	$t_{OFF,MAX}$			200		μs
Max switching frequency	f_{MAX}			200		kHz
ISEN pin Section						
Current limit threshold voltage	$V_{ISEN,OC P}$			400		mV
Current reference	V_{REF}		294	300	306	mV
Integrated MOSFET Section						
BV of HV MOSFET	V_{BV}		500			V
Rdson of HV MOSFET	R_{DSON}			13.5	17	Ω
Leakage current@500V	I_{Leak}				1	μA
Thermal Section						
Thermal Foldback Temperature	T_{FB}		150	157	164	$^{\circ}C$

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 $T_A=25^{\circ}C$ 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.

Note 3: Increase VIN pin voltage gradually higher than $V_{VIN,ON}$ voltage then turn down to 12V.

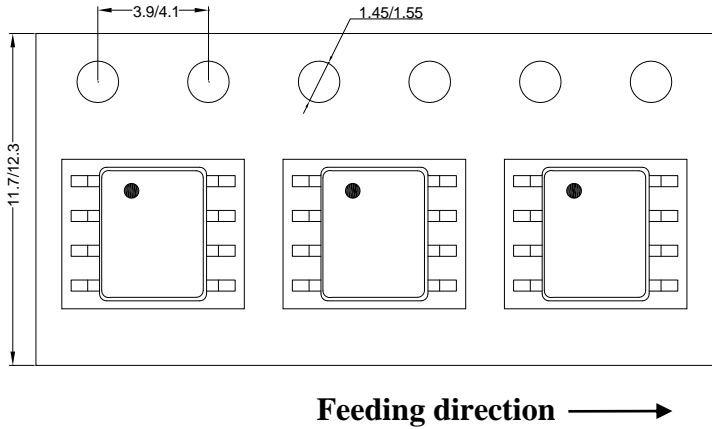
SO8 Package Outline & PCB Layout Design



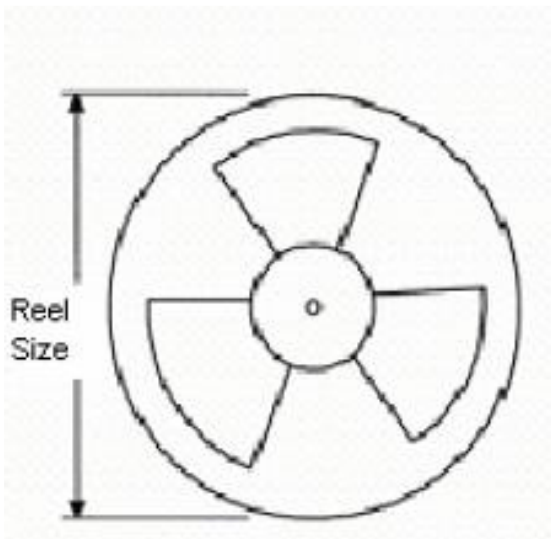
Notes: All dimensions are in millimeters.
All dimensions don't include mold flash & metal burr.

Taping & Reel Specification

1. SO8 taping orientation



2. Carrier Tape & Reel specification for packages



Package types	Tape width (mm)	Pocket pitch(mm)	Reel size (Inch)	Trailer length(mm)	Leader length (mm)	Qty per reel
SO8	12	8	13"	400	400	2500

3. Others: NA