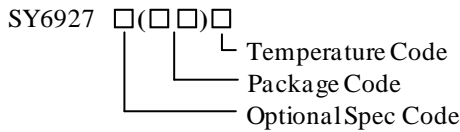




### General Description

The SY6927B is a 4.0-16V input, 1.5A single-cell synchronous Buck Li-Ion battery charger, suitable for portable application. The 800 kHz synchronous Buck regulator integrates 16V rating FETs with ultralow on-resistance to achieve high efficiency and simple circuit design.

### Ordering Information



Ordering Number	Package type	Note
SY6927BFAC	SO8	

### Features

- Wide Input Voltage Range: 4.0V to 16V
- High Efficiency Synchronous Buck Regulator with Fixed 800kHz Switching Frequency
- Trickle Current/Constant Voltage Charge Mode
- Adaptive Input Current Limit
- Programmable Charging Timeout
- Programmable (1.5A MAX) Constant Charge Current
- Input Voltage UVLO and Battery OVP
- Over Temperature Protection
- Output Short Circuit Protection
- Charge Status Indication
- Normal Synchronous Buck Operation when Battery is Removed
- Compact Package SO8

### Applications

- Cellular Telephones
- PDA, MP3 Players, MP4 Players
- Digital Cameras
- Bluetooth Applications
- PSP Game Players, NDS Game Players

### Typical Applications

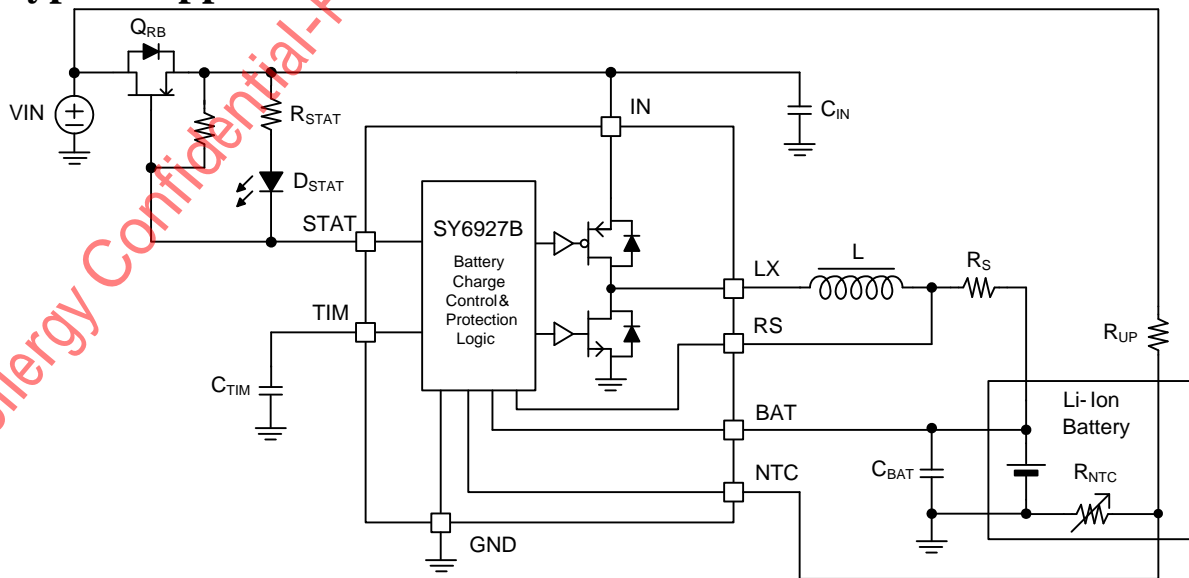
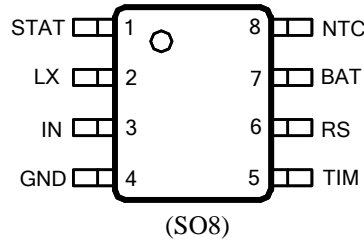


Fig.1 Schematic Diagram

## Pinout (top view)



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

Name	Number	Description
STAT	1	Charging status indication pin. It is open drain output pin and can be used for turning on a LED to indicate the charging in process. When the charging is done, LED will be off.
LX	2	Switch node pin. This pin connects the drains of the integrated main and synchronous power MOSFET switches. Connect to external inductor.
IN	3	Positive power supply input pin. $V_{IN}$ ranges from 4V to 16V for normal operation. It has UVLO function and must be 80mV larger than the battery voltage to enable normal operation.
GND	4	Ground pin.
TIM	5	Charging time limit pin. This pin should be connected with a capacitor to ground. Internal current source charges the capacitor for TC mode and CC mode's charging time limit. TC charging time limit is about 1/9 of CC charging time.
RS	6	Charge current program pin. Connect a current sense resistor from RS pin to BAT pin. Average charging current is detected for both TC mode and CC mode.
BAT	7	Battery positive pin.
NTC	8	Thermal protection pin. UTP threshold is about 75% $V_{IN}$ and OTP threshold is about 45% $V_{IN}$ . Pull up to IN can disable charge logic and make the IC operate as normal Buck regulator. Pull down to ground can shut down the IC.

**Absolute Maximum Ratings** (Note 1)

NTC, STAT	-----	-0.5V to 18V
IN, BAT, LX	-----	-0.5V to 18V
TIM	-----	-0.5V to 3.6V
RS	-----	BAT-0.3V to BAT+0.3V
LX Pin Current Continuous	-----	2A
Power Dissipation, P <sub>D</sub> @ T <sub>A</sub> = 25 °C, SO8	-----	1.1W
Package Thermal Resistance (Note 2)		
θ <sub>JA</sub>	-----	88 °C/W
θ <sub>JC</sub>	-----	45 °C/W
Junction Temperature Range	-----	-40 °C to 150 °C
Lead Temperature (Soldering, 10 sec.)	-----	260 °C
Storage Temperature Range	-----	-65 °C to 125 °C
ESD Susceptibility		
HBM (Human Body Mode)	-----	2kV
MM (Machine Mode)	-----	200V

**Recommended Operating Conditions** (Note 3)

NTC, STAT	-----	0.3V to 16V
IN, BAT, LX	-----	0.3V to 16V
TIM	-----	-0.3V to 3.6V
RS	-----	BAT-0.1V to BAT+0.1V
Junction Temperature Range	-----	-20 °C to 125 °C
Ambient Temperature Range	-----	-40 °C to 85 °C

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## Electrical Characteristics

$T_A=25\text{ }^\circ\text{C}$ ,  $V_{IN}=15\text{V}$ ,  $GND=0\text{V}$ ,  $C_{IN}=10\text{ }\mu\text{F}$ ,  $L=2.2\text{ }\mu\text{H}$ ,  $R_S=25\text{m}\Omega$ ,  $C_{TIM}=330\text{nF}$ , unless otherwise specified.

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
<b>Bias Supply (<math>V_{IN}</math>)</b>						
Supply Voltage	$V_{IN}$		4.0		16	V
$V_{IN}$ Under Voltage Lockout Threshold	$V_{UVLO}$	$V_{IN}$ rising and measured from $V_{IN}$ to GND			3.9	V
$V_{IN}$ Under Voltage Lockout Hysteresis	$\Delta V_{UVLO}$	Measured from $V_{IN}$ to GND		190		mV
<b>Quiescent Current</b>						
Battery Discharge Current	$I_{BAT}$	NTC pull down to GND			25	$\mu\text{A}$
Input Quiescent Current	$I_{IN}$	Disable charging			1.8	mA
<b>Oscillator and PWM</b>						
Oscillator Frequency	$f_{OSC}$		640	800	960	kHz
PFET Duty Cycle	D				100	%
<b>Power MOSFET</b>						
$R_{DS(ON)}$ of N-FET	$R_{NFET}$			150		m $\Omega$
$R_{DS(ON)}$ of P-FET	$R_{PFET}$			160		m $\Omega$
<b>Voltage Regulation</b>						
Single-cell CV Charge Mode	$V_{CV}$		4.16	4.20	4.24	V
Single-cell Voltage Threshold for Recharge	$\Delta V_{RCH}$		50	100	150	mV
Single-cell TC Charge Mode Voltage Threshold	$V_{TRK}$		2.2	2.5	2.8	V
<b>Battery Connect Detection</b>						
NTC Voltage Threshold for Battery Detect	$V_{DET}$	NTC Falling Edge	80%		90%	$V_{IN}$
Detect Delay Time	$t_{DET}$		30	35	40	ms
<b>Charge Current</b>						
Internal Charge Current Accuracy for Constant Current Mode		$I_{CC}=25\text{mV}/R_S$	-10%		10%	
Internal Charge Current Accuracy for Trickle Current Mode		$I_{TC}=2.5\text{mV}/R_S$	-50%		50%	
<b>Charge Termination</b>						
Charge Termination Current	$I_{TERM}$			10%		$I_{CC}$
Termination Delay Time	$t_{TERM}$			30		ms
<b>Input Current Limit Slow Response</b>						
IN Voltage Slow Falling Threshold at High Current	$V_{INSL}$	IN Falling Edge		4.6		V
IN Voltage Slow Threshold Hysteresis at High Current	$\Delta V_{INSL}$			50		mV
<b>Input Current Limit Quick Response</b>						
IN Voltage Quick Falling Threshold at High Current	$V_{INQK}$	IN Falling Edge		4.4		V
IN Voltage Quick Threshold Hysteresis at High Current	$\Delta V_{INQK}$			100		mV
<b>Output Voltage OVP</b>						
Output Voltage OVP Threshold	$V_{OVP}$		4.66	4.8	5.04	V

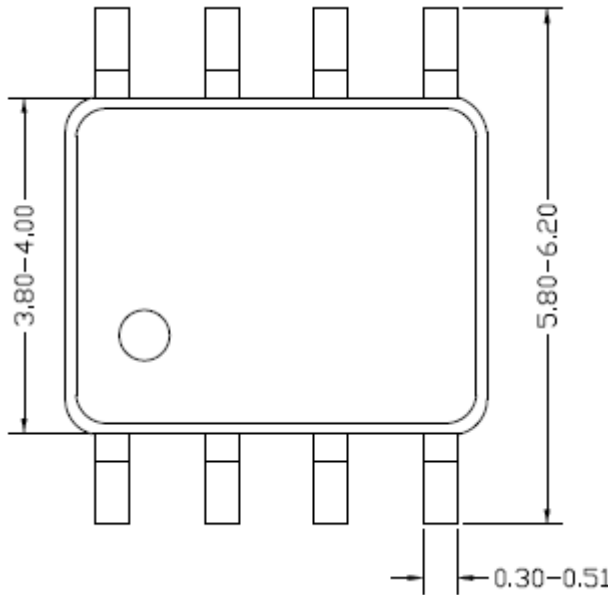
<b>Output Short Protection</b>						
Output Short Protection Threshold	$V_{SHORT}$	$V_{BAT}$ falling edge	1.70	2.00	2.30	V
Frequency Fold Back	$f_{FBK}$	$V_{BAT} < 2V$		12.5%		$f_{OSC}$
Power FET Current Limit	$I_{LM}$			2.4		A
<b>Timer</b>						
Trickle Current Charging Timeout	$t_{TC}$	$C_{TIM}=330nF$	0.37	0.55	0.7	hour
Constant Current Charging Timeout	$t_{CC}$		3.3	5	6.7	hour
Charging Mode Change Delay Time	$t_{MC}$			30		ms
Recharge Time Delay	$t_{RCHG}$			30		ms
<b>Fault Mode Indicate</b>						
LED Flash Frequency at Fault Mode	$f_{STAT}$	$C_{TIM}=330nF$	0.37	0.5	0.76	Hz
<b>Battery Thermal Protection NTC</b>						
Under Temperature Protection	$V_{NTC\_UTP}$	Rising edge	74%	75%	76%	$V_{IN}$
Under Temperature Protection Hysteresis	$V_{NTC\_UTP\_HYS}$			1.3%		
Over Temperature Protection	$V_{NTC\_OTP}$	Falling edge	44%	45%	46%	
Over Temperature Protection Hysteresis	$V_{NTC\_OTP\_HYS}$			1.3%		
<b>Automatic Shutdown</b>						
ASD Voltage Threshold Hysteresis	$\Delta V_{ASD}$	Measured from $V_{IN}$ to $V_{BAT}$		80		mV
<b>Thermal Shutdown</b>						
Thermal Shutdown Temperature	$T_{SD}$	Rising threshold		160		°C
Thermal shutdown Hysteresis	$T_{SD\_HYS}$			20		°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.

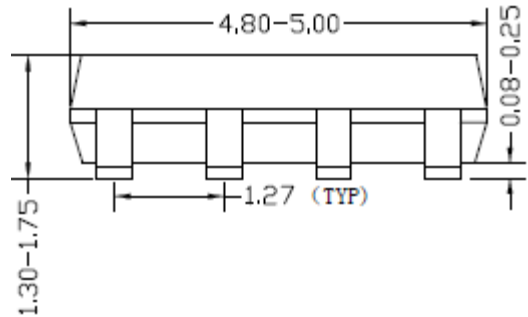
**Note 2:**  $\theta_{JA}$  is measured in the natural convection at  $T_A = 25\text{ °C}$  on a low effective four-layer thermal conductivity test board of JEDEC 51-3 thermal measurement standard.

**Note 3:** The device is not guaranteed to function outside its operating conditions

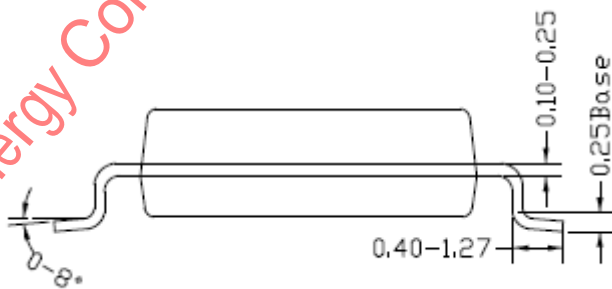
**SO8 Package Outline & PCB Layout Design**



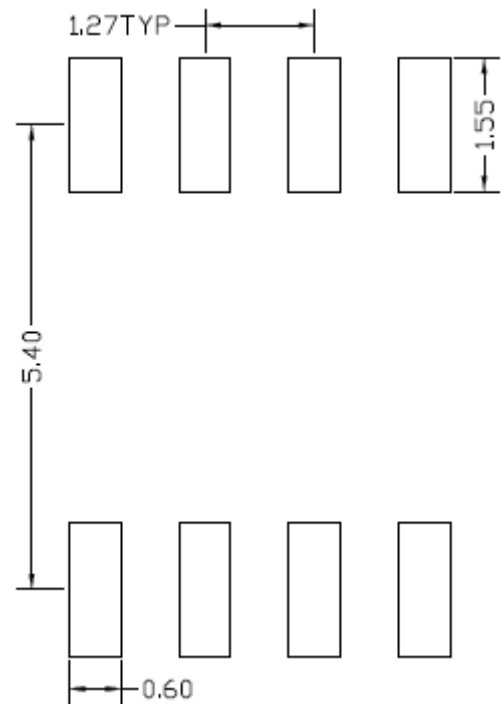
**Top view**



**Front view**



**Side view**

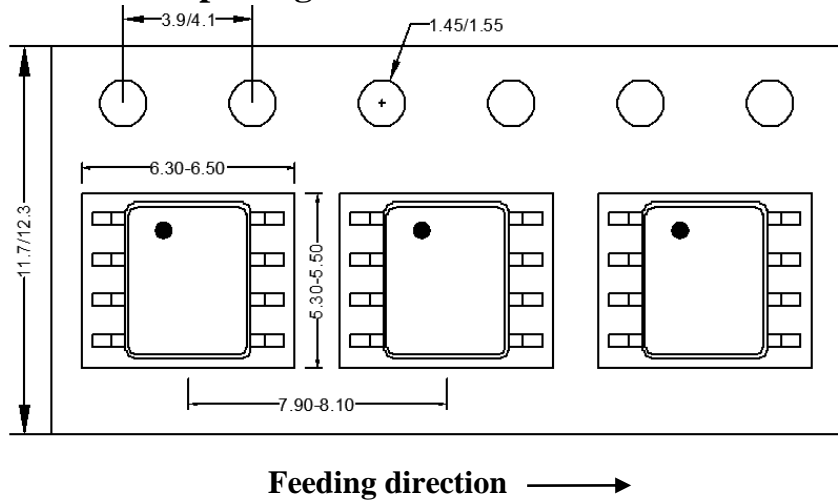


**Recommended Pad Layout  
(Reference only)**

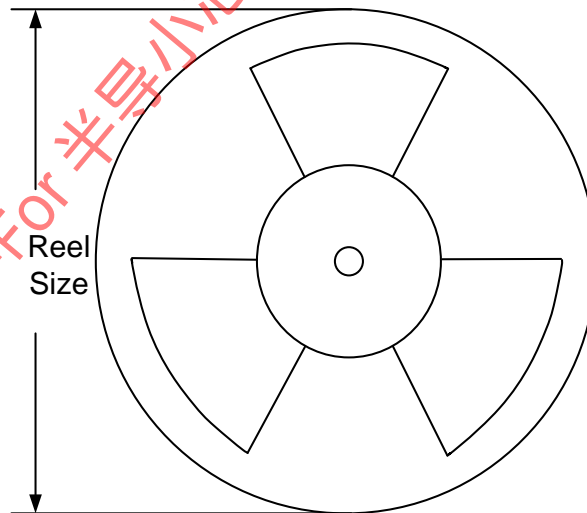
**Notes: All dimension in millimeter and exclude mold flash & metal burr.**

**Taping & Reel Specification**

**1. Taping orientation for packages (SO8)**



**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
SOP8	12	8	13"	400	400	2500

**3. Others: NA**

单击下面可查看定价，库存，交付和生命周期等信息

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