



RoHS compliant,  
lead-free SMD  
package

## FUNCTION

- On / off tilt sensing
- Normally open when **horizontal**
- Normally closed when below the switch angle
- Non-sensitive to vibration when open

## FEATURES

- Ultra low power** - As little as 0.25 uA continuous
- Surface mount device (SMD)** - RoHS compliant, lead-free, tape and reel
- High sensitivity & long life** - 99.97% pure gold plating
- Miniature size** - 3.3 mm x 6.9 mm
- Simple interface** - No signal conditioning required
- Quiet** - Undetectable sounds level

## APPLICATIONS

- TV remote control tilt wake-up
- Screen orientation
- Security, anti-tamper, anti-theft

## SWITCH ANGLES

- 15°, 30°, 45° standard
- Custom angles available

## PATENTS

- US 7326866, 7067748, 7326867, 7421793.  
Patents pending.

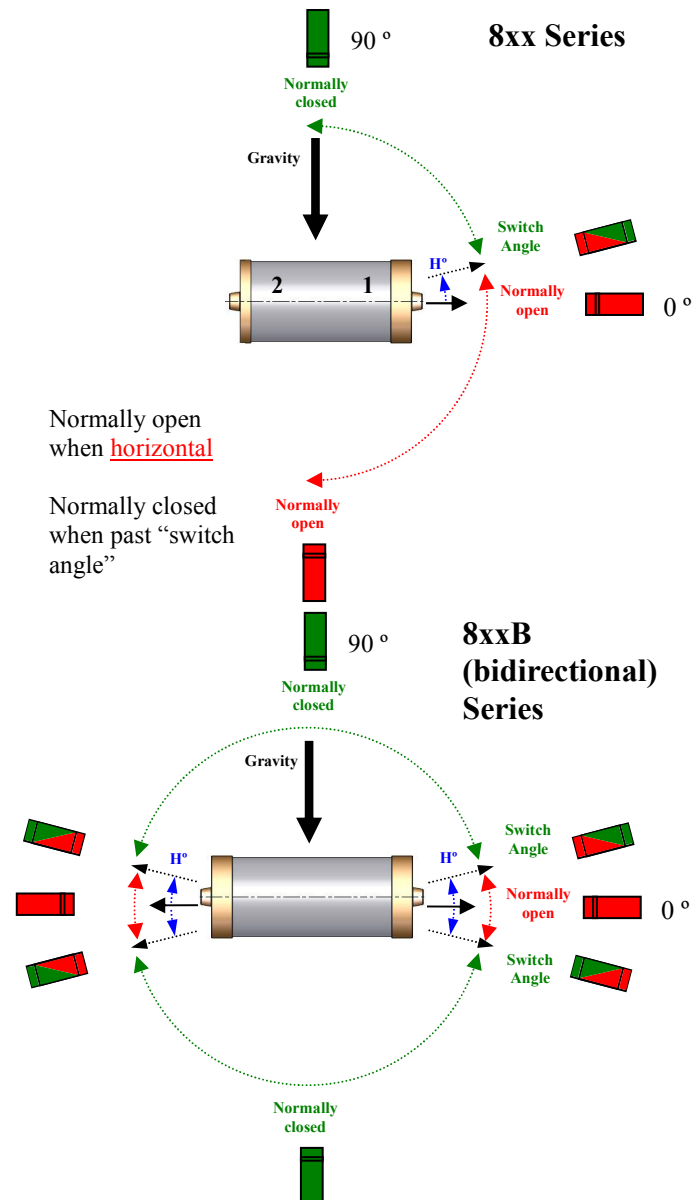
## 8XX SERIES

The 8xx series is designed to be non-sensitive to vibration when **horizontal**.

## DESCRIPTION

The SQ-SEN-8xx sensor acts like a position sensitive switch that is normally open when **horizontal**, and normally closed below the switch angle. It is designed to be non-sensitive to vibration a horizontal orientation. When at rest in a horizontal orientation, the sensor will settle in an open state. When tipped down from vertical to the "switch angle" it will produce continuous on/off contact closures while in motion. When at rest below the switch angle, it will settle normally closed.

## FUNCTIONAL DIAGRAM (8XX)





DATASHEET

# SQ-SEN-8XX

ON/OFF TILT SENSOR, HORIZONTAL NORMALLY OPEN

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## THEORY OF OPERATION

The SQ-SEN-8xx sensor acts like a position sensitive switch which is normally open in a range of orientations, and a normally closed in another range of orientations. When resting in a normally open orientation, contacts are virtually guaranteed to be open. When resting in the normally closed orientation (unlike normally open) contacts are not guaranteed to be closed. A good rule of thumb is that they will be closed 75% - 99% of the time, when at rest.

When in a normally closed orientation, the sensor will chatter open and closed as it is vibrated. The engineer should design his or her software to look for high-to-low and low-to-high edge transitions rather than an open of closed state of the switch.

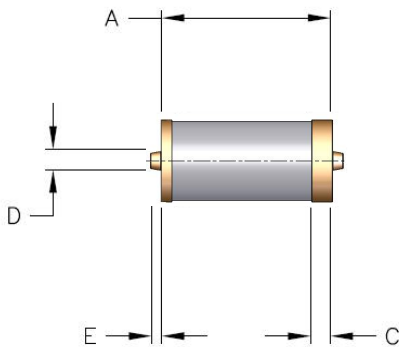
## ELECTRICAL CHARACTERISTICS

PARAMETER	MIN	MAX	UNITS
Supply Voltage Range	2.7	12	Vdc
Current Sink*	0.00025	5	mA

\* Current consumption is determined by the resistance of the application circuit and the supply voltage.

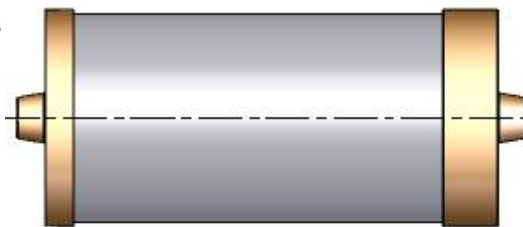
## DIMENSIONS (8XX)

### PHYSICAL SIZE



SYMBOL	DESCRIPTION	MM	TOLERANCE
A	Length	6.8	±0.25
B	Diameter	3.3	±0.1
C	Terminal Width	0.8	±0.25
D	Solder Nub Diameter	0.9	±0.25
E	Solder Nub Length	0.4	±0.1

Terminal 2



Terminal 1

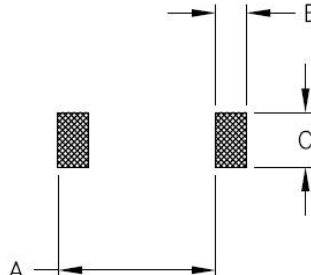
**EXAMPLE PCB LANDING**

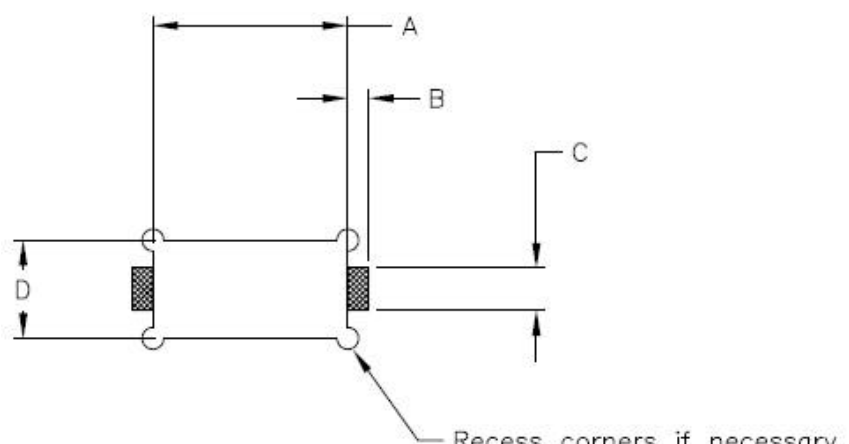
RECOMMENDED PCB LANDING			ALTERNATE, PCB CUTOUT LANDING (USE FOR LOWEST PROFILE)		
<b>SYMBOL</b>	<b>DESCRIPTION</b>	<b>MM</b>			
A	Pitch	6.0			
B	Pad Length	1.2			
C	Pad Width	2.1			

<b>SYMBOL</b>	<b>DESCRIPTION</b>	<b>MM</b>
A	Recess Length	7.25
B	Pad Length	0.8
C	Pad Width	1.5
D	Recess Width	3.6

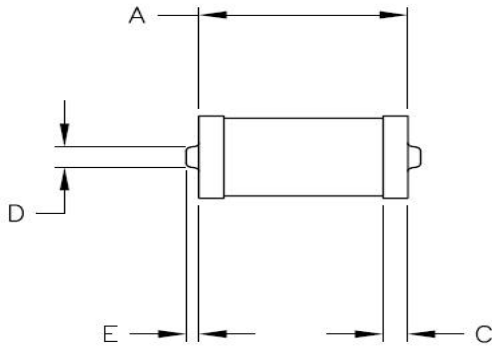




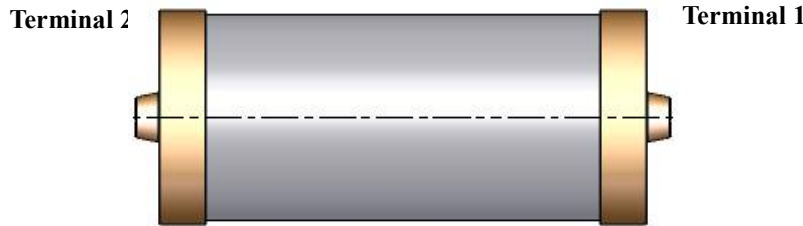
**\*Note:** Alternative layouts may be used to optimize size or manufacturability

**DIMENSIONS (8XXB BIDIRECTIONAL VERSION)**

**PHYSICAL SIZE**



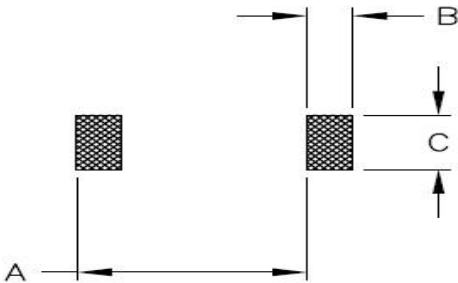
SYMBOL	DESCRIPTION	MM	TOLERANCE
A	Length	7.3	±0.25
B	Diameter	3.3	±0.1
C	Terminal Width	0.8	±0.25
D	Solder Nub Diameter	0.9	±0.25
E	Solder Nub Length	0.4	±0.1



**EXAMPLE PCB LANDING**

**RECOMMENDED PCB LANDING**

SYMBOL	DESCRIPTION	MM
A	Pitch	7.3
B	Pad Length	1.2
C	Pad Width	2.1



**\*Note:** Alternative layouts may be used to optimize size or manufacturability



DATASHEET

**SQ-SEN-8XX****ON/OFF TILT SENSOR, HORIZONTAL NORMALLY OPEN****PART COMPARISON**

PART NUMBER	SWITCH ANGLE	DAMPING
SQ-SEN-815	15 degrees down from horizontal	Yes
SQ-SEN-830	30 degrees down from horizontal	Yes
SQ-SEN-845	45 degrees down from horizontal	Yes

**PRODUCTION GRADES**

GRADE	ASSEMBLY METHOD	SEALING	WASH TOLERANCE	PB-FREE, ROHS	OPERATING TEMPERATURE
C	Reflow Solder: 260° C peak Hand Assembly: 315° C peak, 2 -3 seconds on end terminal	Yes	Washable	Yes	0C to + 70C
I	Reflow Solder: 260° C peak Hand Assembly: 315° C peak, 2 -3 seconds on end terminal	Yes	Washable	Yes	-40C to + 85C

**PACKAGING OPTIONS**

PACKAGE CODE	DESCRIPTION
BB	Bulk bag, various sizes
CT	Cut tape, 100 piece multiples
TR	Tape on reel, 2000 pieces

**EXAMPLE COMPLETE PART NUMBERS**

SQ-SEN-815-ITR  
 SQ-SEN-830-ICT  
 SQ-SEN-815B-ICT



DATASHEET

**SQ-SEN-8XX**

**ON/OFF TILT SENSOR, HORIZONTAL NORMALLY OPEN**

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## **LIMITATIONS AND WARNINGS**

This product is not designed for use in life support and/or safety equipment where malfunction of the product can reasonably be expected to result in personal injury or death. Buyer uses this product in such applications at Buyer's own risk and agrees to defend, indemnify, and hold harmless SignalQuest, Inc. from any and all damages, claims, suits, or expenses resulting from such misuse.

## **TESTING**

The performance of each sensor is verified through build-time testing.

## **SYSTEM INTEGRATION TESTING**

Thorough testing should be carried out prior to product release to ensure system integration has not introduced unforeseen problems. The system integrator assumes the ultimate responsibility for the safety of the target application.

## **NOTICE**

Information furnished by SignalQuest, Inc is believed to be accurate and reliable. However, this document may contain ERRORS and OMISSIONS. Accordingly, the design engineer should use this document as a reference rather than a strict design guideline and should perform thorough testing of any product that incorporates this or any other SignalQuest product. No responsibility is assumed by SignalQuest, Inc. for this use of this information, nor for any infringements of patents or other rights of third parties that may result from its use. Specifications are subject to change without notice. No license is granted by implication or otherwise under any patent or patent rights of SignalQuest, Inc. Trademarks and registered trademarks are the property of their respective companies.

## **FURTHER INFORMATION**

For pricing, delivery, and ordering information, please contact SignalQuest at (603) 448-6266  
For updates on this and other documents, visit our website at [www.signalquest.com](http://www.signalquest.com).

## **NOTE**