



FUNCTION

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

APPLICATIONS

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

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 open.

PATENTS

United States: 7421793, Taiwan: I331674.
Patents pending.

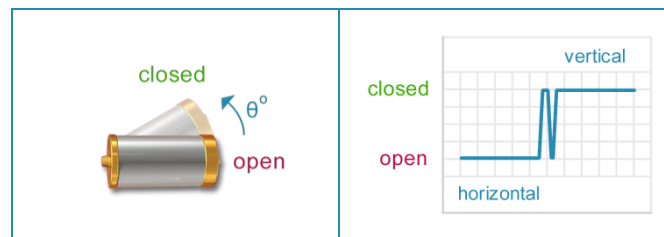
FEATURES

- **Zero-power Normally** - < 50 nA when activated
- **High Sensitivity & Long Life** - Semiconductor grade electroplating
- **Miniature Size** - 3.3 mm x 6.9 mm
- **Simple Interface** - No signal conditioning required
- **Quiet** - Undetectable sound level
- **Surface Mount**- RoHS compliant, lead-free, tape and reel
- **Activation Angle** - Available in 15°, 30°, 45°, 15° Bi-directional
- **Made in USA** - fully automated production, 100% testing, worldwide quality and price leader

FUNCTIONAL DIAGRAM

8XX SERIES SINGLE SIDED

SQ-SEN-815, SQ-SEN-830, SQ-SEN-845



8XX SERIES BIDIRECTIONAL

SQ-SEN-815B

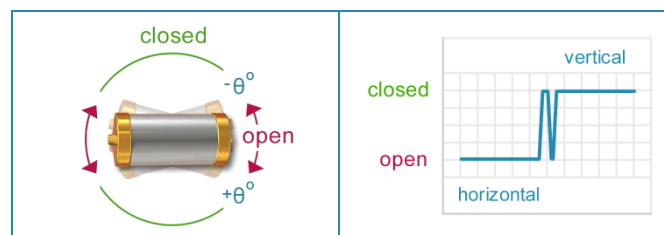


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THEORY OF OPERATION

The SQ-SEN-8xx sensor acts like a position sensitive switch which is normally open in a range of orientations, and 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 95% - 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 or closed state of the switch.

FUNCTIONAL BEHAVIOR

PART	SWITCH CLOSED ANGLE Degrees down from horizontal	SWITCH OPEN ANGLE Degrees back to horizontal
SQ-SEN-815	15	2
SQ-SEN-815B	+15, -15	2+, -2
SQ-SEN-830	27	9
SQ-SEN-845	37	17

Data represents average values.

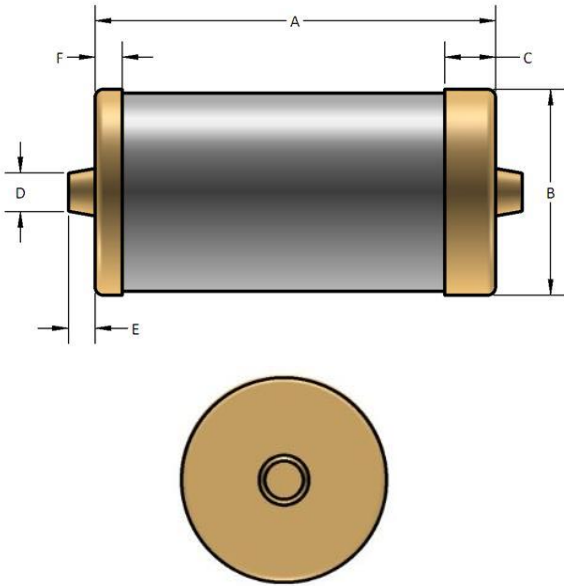
CHARACTERISTICS

PARAMETER	MIN	MAX	CONDITIONS
Shock Survival		5,000 g	5x, 0.1 ms half-sin, any axis
Storage Temperature	-40° C	85° C	
Supply Voltage Range	0.5 V	12 V	
Current Sink*	50 nA	10 mA	

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

DIMENSIONS 8XX

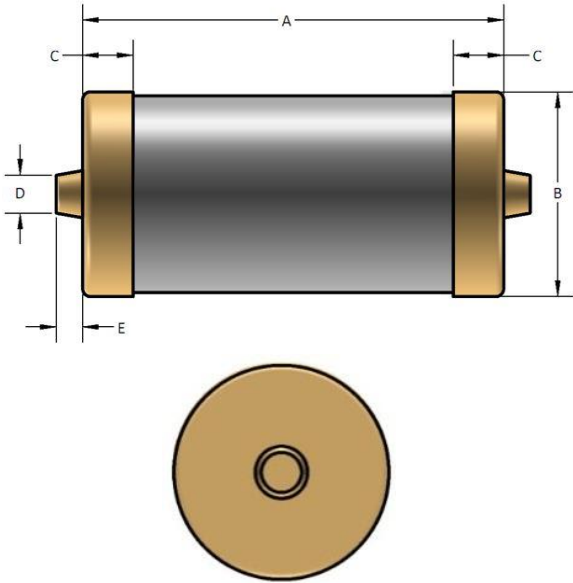
PHYSICAL SIZE



SYMBOL	DESCRIPTION	MM	TOLERANCE
A	Length	6.8	±0.25
B	Diameter	3.3	±0.1
C	Terminal Width 1	0.8	±0.25
D	Solder Nub Diameter	0.9	±0.25
E	Solder Nub Length	0.4	±0.1
F	Terminal Width 2	0.4	±0.25

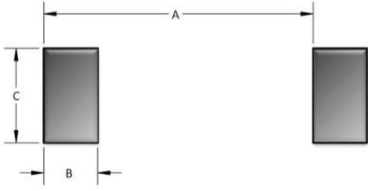
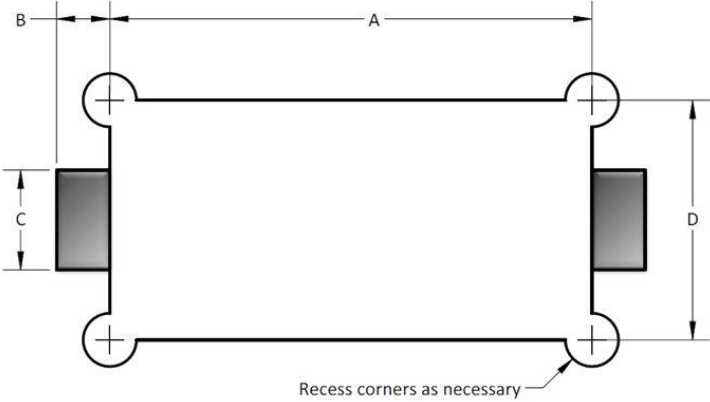
DIMENSIONS 8XXB

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

EXAMPLE PCB LANDING

RECOMMENDED PCB LANDING			ALTERNATE, PCB CUTOUT LANDING (USE FOR LOWEST PROFILE)		
SYMBOL	DESCRIPTION	MM			
A	Pitch	6.0	A	Recess Length	7.25
B	Pad Length	1.2	B	Pad Length	0.8
C	Pad Width	2.1	C	Pad Width	1.5
					

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

PRODUCT COMPARISON

GRADE	ASSEMBLY METHOD	SEALED	WASHABLE	ROHS	OPERATING TEMPERATURE	CYCLES *	SERVICE LIFE (YRS)
I	Reflow Solder: 260° C peak Hand Assembly: 315° C peak, 2 -3 seconds on end terminal	Yes	Yes	Yes	-40° to +85° C	1 Billion	10
C	Reflow Solder: 260° C peak Hand Assembly: 315° C peak, 2 -3 seconds on end terminal	Yes	Yes	Yes	-25° to +70° C	1 Billion	5

*Test conditions: 0.5 gRMS, 5 to 200 Hz flat spectrum

ORDERING GUIDE

PART NUMBER	PACKAGING CODE	EXAMPLE COMPLETE PART NUMBER
SQ-SEN-815-C SQ-SEN-815B-C SQ-SEN-830-C SQ-SEN-845-C	TR - Tape on Reel	SQ-SEN-815-CTR
SQ-SEN-815-I SQ-SEN-815B-I SQ-SEN-830-I SQ-SEN-845-I	CT - Cut Tape TR - Tape on Reel	SQ-SEN-815-ITR

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, LLC 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 OMMISIONS. 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, LLC 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, LLC Trademarks and registered trademarks are the property of their respective companies.

FURTHER INFORMATION

For pricing, deliveries, and ordering information, please contact SignalQuest at (603) 448-6266
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