DATASHEET

SQ-SEN-8XX

ON/OFF TILT SENSOR, HORIZONTAL NORMALLY OPEN


8xx Series


8xxB Series

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.

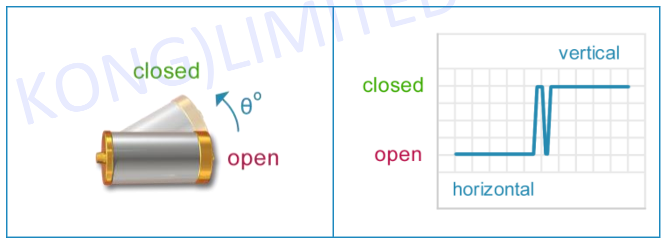
PATENTS

US 7326866, 7067748, 7326867, 7421793.
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 sounds 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



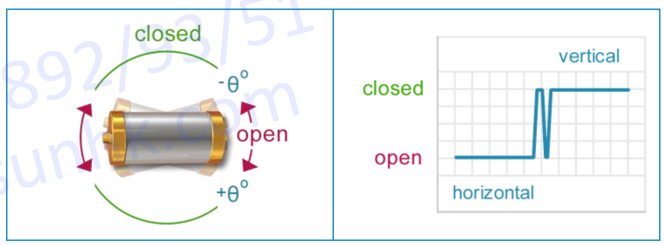


TABLE OF CONTENTS

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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 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 or closed state of the switch.

ANGLE ACCURACY

PART	SWITCH CLOSED ANGLE (DEGREES FROM HOR.)	SWITCH OPEN ANGLE (DEGREES FROM HOR.)
SQ-SEN-815	15	2
SQ-SEN-830	27	9
SQ-SEN-845	37	17

Data represents average values.

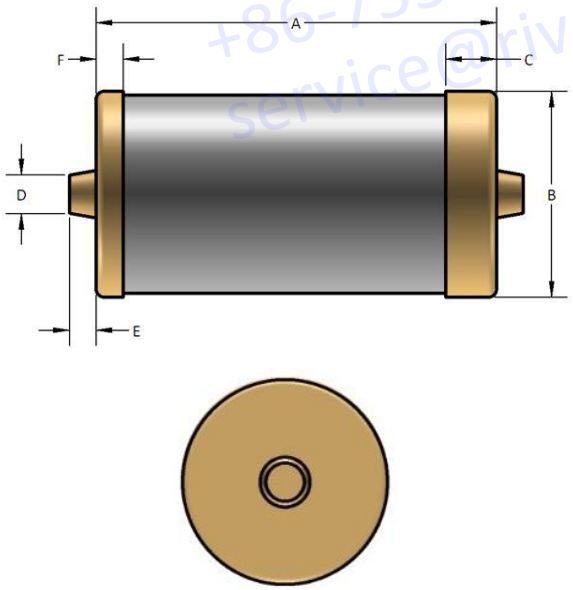
ELECTRICAL CHARACTERISTICS

PARAMETER	MIN	MAX
Supply Voltage Range	0.5 V	12 V
Current Sink*	50 nA (0.05 µA)	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	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

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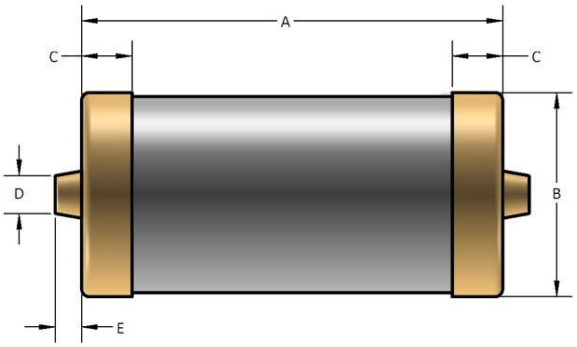
DIMENSIONS 8XXB

PHYSICAL SIZE



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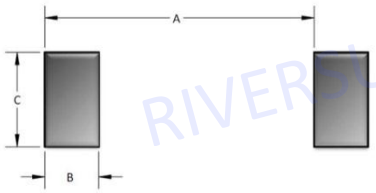
C	Terminal Width	0.8	±0.25
D	Solder Nub Diameter	0.9	±0.25
E	Solder Nub Length	0.4	±0.1

EXAMPLE PCB LANDING

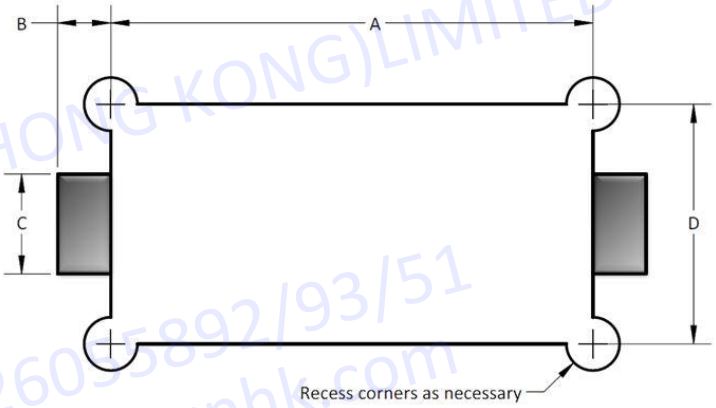
RECOMMENDED PCB LANDING

SYMBOL	DESCRIPTION	MM
A	Pitch	6.0
B	Pad Length	1.2
C	Pad Width	2.1



ALTERNATE, PCB CUTOUT LANDING (USE FOR LOWEST PROFILE)

SYMBOL	DESCRIPTION	MM
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

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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

PRODUCT COMPARISON

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	-25°C to + 70°C
I	Reflow Solder: 260° C peak Hand Assembly:315° C peak, 2 -3 seconds on end terminal	Yes	Washable	Yes	-40°C to + 85°C

ORDERING GUIDE

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

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