



RoHS compliant,
lead-free SMD
package

FUNCTION

- On / off shock & acceleration sensing

FEATURES

- Ultra low power** - As little as 0.25 μ A
- Surface mount device (SMD)** - RoHS compliant, lead-free, tape and reel
- High sensitivity & long life** - 99.9% pure gold plating
- Miniature size** - 3.3 mm x 6.9 mm
- Simple interface** - No signal conditioning required
- Ultra fast response** - <100 μ s
- Multiple sensitivities** - 15 G to 350 G standard

APPLICATIONS

- Shock and acceleration detection
- Shock & acceleration triggered wake up
- GPS, RFID, alarms, automotive security, anti-tamper

SWITCH ACCELERATIONS

- 150 G*, 250 G, 350 G standard
- Others from 20 G – 2000 G by special order

*G = acceleration of gravity

PATENTS

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

DESCRIPTION

The SQ-ASx series act like acceleration sensitive switches that open or close when accelerated past an acceleration threshold.

The sensor can be used to produce CMOS or TTL pulses to interrupt (wake up) a microcontroller. Alternatively, these pulses can be counted to estimate the amount and duration of activity. The sensor is fully passive, requires no signal conditioning, and operates with currents as low as 0.25 μ A.

ASA SERIES

Axial sensitive, single ended, normally closed

ASB SERIES

Omnidirectional, normally closed

ASC SERIES

Axial sensitive, single ended, normally open

ASD SERIES

Omnidirectional, normally open

FUNCTIONAL DIAGRAM

ASA Series

Normally closed in
all orientations

Opens momentarily
when accelerated on
axis



Acceleration

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THEORY OF OPERATION

The SQ-ASx series sensor is a normal closed device. It is designed to be sensitive only in one direction. However, it will exhibit some cross axis sensitivity. Typical cross axis open signals are in the 2 – 8 mS range, where on axis open signals are proportional to the duration of acceleration above the threshold.

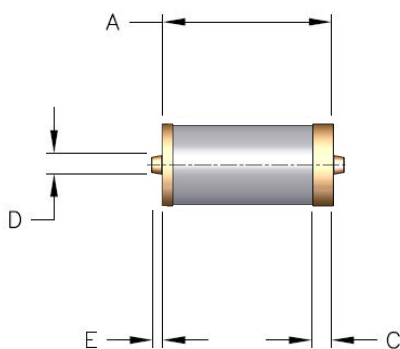
ELECTRICAL CHARACTERISTICS

PARAMETER	MIN	MAX	UNITS
Supply Voltage Range	0.5	12	Vdc
Current Sink*	0.00025	5	mA

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

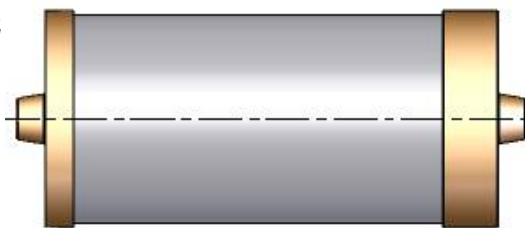
DIMENSIONS

PHYSICAL SIZE



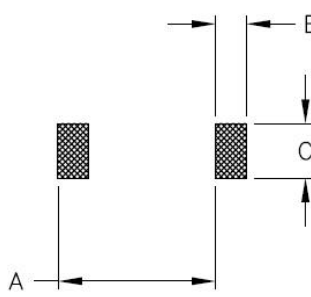
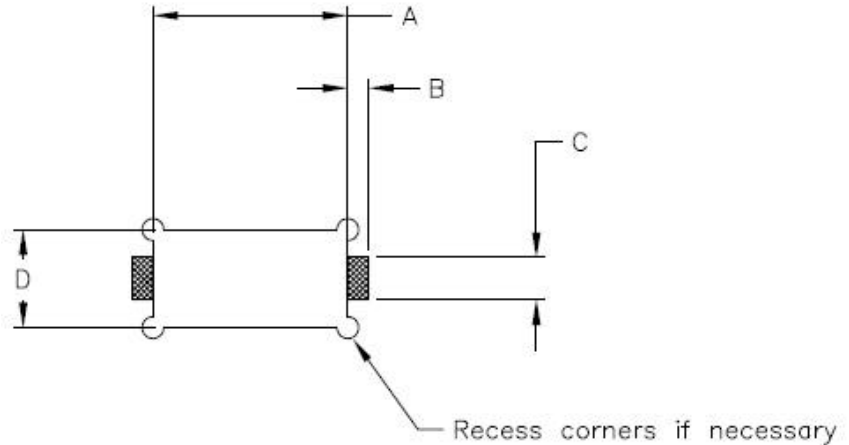
SYMBOL	DESCRIPTION	MM	TOLERANCE
A	Length	6.8	±0.25
B	Diameter	3.3	±0.1
C	Terminal Width	0.8	±0.25
D	Solder Nub Diameter	0.9	±0.25
E	Solder Nub Length	0.4	±0.1

Terminal 2



Terminal 1

EXAMPLE PCB LANDING

RECOMMENDED PCB LANDING			ALTERNATE, PCB CUTOUT LANDING (USE FOR LOWEST PROFILE)		
SYMBOL	DESCRIPTION	MM	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

PART COMPARISON

PART NUMBER	TYPE	SENSITIVITY	ACCELERATION THRESHOLD (ON AXIS)	CROSS AXIS SENSITIVITY
SQ-ASA-150	Normally closed	One axis, single sided	150 G	Crackle at 75 G, less than < 10 mS pulse width
SQ-ASB-005	Normally closed	Omnidirectional	2 - 10 G	2 - 10 G
SQ-ASB-010	Normally closed	Omnidirectional	5 - 20 G	5 - 20 G

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 NUMBER

SQ-ASA-150-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, 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, 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.

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