

SQ-EVA-022 & 026

SQ-SEN-200 AND SQ-MIN-200 EVALUATION BOARD

NANO-POWER TILT AND VIBRATION SENSOR
EVALUATION BOARD



FEATURES

- Ultra-low power reference design uses less than 3 μ A (configurable down to 50 nA)
- Coin battery operated
- High sensitivity
- Super bright LED output
- Compact 1.0" x 1.0" circuit board.

APPLICATIONS

- General motion, vibration, tilt and shock detection
- Ultra-low power motion-based device wake-up
- Ultra-low power orientation-sensitive switching
- RFID tag activation
- Tamper detection
- Process monitoring and control

DESCRIPTION

The SQ-EVA series boards demonstrate some of the many motion, vibration, tilt and shock sensing capabilities of the SQ-SEN sensor family. The SQ-EVA-022 and 026 board implements a useful reference circuit using only a few low-cost, passive components. The boards are available in a variety of configurations to provide maximum flexibility for SQ-SEN sensor evaluation, testing and integration.

FUNCTIONAL DIAGRAM

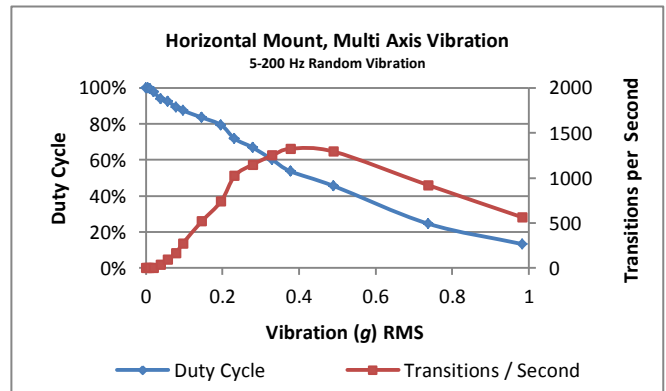
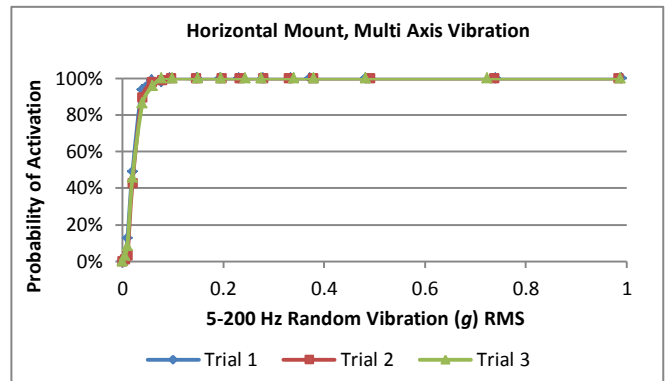
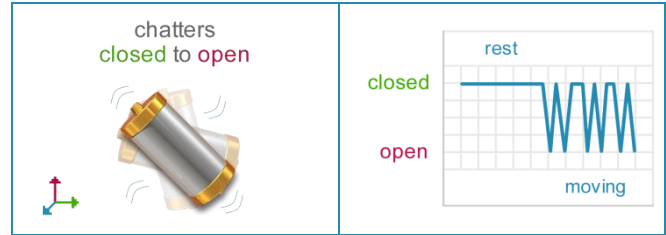
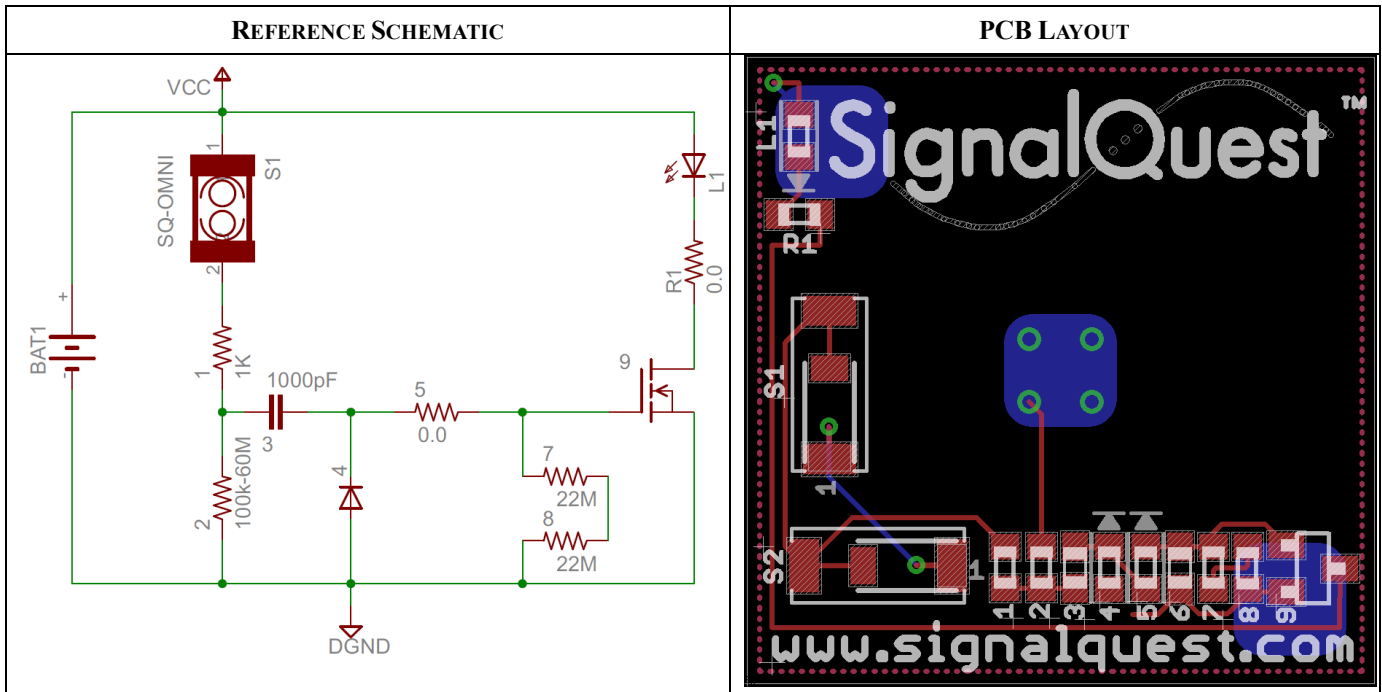


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THEORY OF OPERATION

When the SQ-SEN-200 or MIN-200 experiences vibration or motion, the sensor chatters open and closed. Sensor state transitions are AC-coupled by a clamped capacitor connected to the high-impedance gate of an NMOS FET. When the rate of positive-going edge transitions (which correlates to motion) is sufficient to raise the voltage on the capacitor above the FET's gate threshold voltage, the transistor switches on and activates the LED. Current draw in an idle state is 3 uA (configurable down to 50 nA). For more information on the SQ-SEN or MIN-200 sensors, please refer to the datasheets available at www.signalquest.com.



VCC (V)	Resistor "2" Value (Ohms)	Current Draw (uA)
3 V	100k	29.70
3 V	200k	14.93
3 V	500k	5.99
3 V	1M	3.00
3 V	2M	1.50
3 V	4M	0.75
3 V	8M	0.37
3 V	10M	0.30
3 V	20M	0.15
3 V	60M	0.05

BILL OF MATERIALS

Qty	Silk	Description	Mfg	Mfg PN
1		SQ-EVA Rev-F PCB	Advanced Circuits	
1	1	RES 1K OHM 1/10W 5% 0603 SMD	Panasonic	ERJ-3GEYJ102V
1	2	RES 100k OHM 1/10W 5% 0603 SMD RES 1.0M OHM 1/10W 5% 0603 SMD RES 30M OHM 1/8W 5% 0805 SMD	Yageo Yageo Rohm Semiconductor	RC0603JR-07100KL RC0603JR-071ML KTR10EZPJ306
1	3	CAP CER 1000PF 50V 10% X7R 0603	Murata	GRM188R71H102KA01 D
1	4	DIODE SWITCHING 75V 0.2A SOD523F	Fairchild	1N4148WT
2	5, R1	RES 0.0 OHM 1/10W JUMP 0603 SMD	Panasonic	ERJ-3GEY0R00V
1	9	MOSFET N-CH 50V 220MA SOT-23	Fairchild	BSS138
2	7, 8	RES 22M OHM 1/10W 10% 0603 SMD	Panasonic	ERJ-3GEYK226V
1	L1	LED SUPER RED CLEAR 0603 SMD	Lite-On Inc.	LTST-C190KRKT
1	BAT1	HOLDER BATTERY COIN 20MM DIA SMD	Keystone	3002
1	S1	SQ-SEN/MIN-200	SignalQuest Inc.	
1	Battery	BATTERY LITHIUM COIN 3V 20MM	Panasonic	CR2032

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 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, 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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