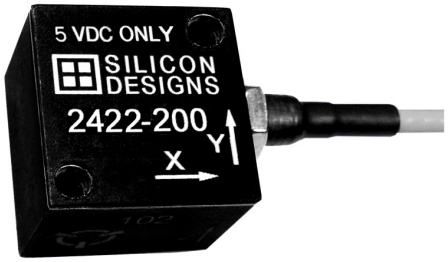
- 3 Axis Acceleration Sensing
- Capacitive Micromachined
- Nitrogen Damped
- ±4V Differential Output or 0.5V to 4.5V Single Ended Output
- Fully Calibrated
- Low Power Consumption
- -55 to +125°C Operation
- +5V DC Power
- Eight (8) Wire Connection
- Responds to DC and AC Acceleration
- Non Standard g Ranges Available
- Rugged Anodized Aluminum Module
- Serialized for Traceability



Available G-Ranges

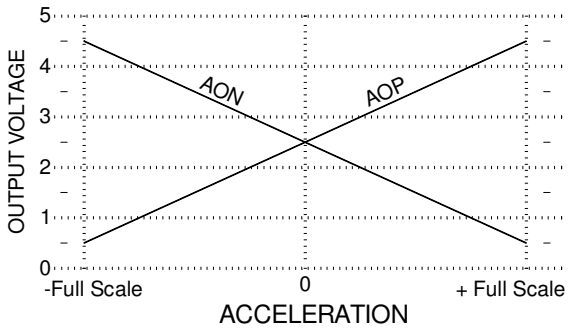
Full Scale Acceleration	Model Number
± 2 g	2422-002
± 5 g	2422-005
± 10 g	2422-010
± 25 g	2422-025
± 50 g	2422-050
±100 g	2422-100
±200 g	2422-200
±400 g	2422-400

DESCRIPTION

The Model 2422 triaxial accelerometer module combines three orthogonally mounted SDI low noise integrated accelerometers in a rugged case for measuring accelerations in commercial/industrial environments. It is tailored for zero to medium frequency instrumentation applications. The anodized aluminum case is epoxy sealed and is easily mounted via two #8 (or M4) screws. It is relatively insensitive to temperature changes and gradients. An optional initial calibration sheet (2422-CAL) and periodic calibration checking are also available.

OPERATION

The Model 2422 produces three differential analog output voltage pairs (**AON** & **AOP**), which vary with acceleration as shown in the figure (at right). The signal outputs are fully differential about a common mode voltage of approximately 2.5 volts. The output scale factor is ratiometric to the applied **VDD** voltage and at zero acceleration, both **AON** & **AOP** are equal to halfway between **VDD** and **GND**. The axis directions are marked on the case with positive acceleration defined as acceleration in the direction of the axis arrow.



APPLICATIONS

- Vibration Monitoring & Analysis
- Machine Control
- Modal Analysis
- Robotics
- Crash Testing
- Instrumentation
- Rotating Machinery Control

SIGNALS

VS: (Power) reddish brown wire, GND: (Ground) black wire

AOPX: (Output) green wire	X-Axis positive output
AONX: (Output) white wire	X-Axis negative output
AOPY: (Output) light brown wire	Y-Axis positive output
AONY: (Output) orange wire	Y-Axis negative output
AOPZ: (Output) light blue wire	Z-Axis positive output
AONZ: (Output) yellow wire	Z-Axis negative output

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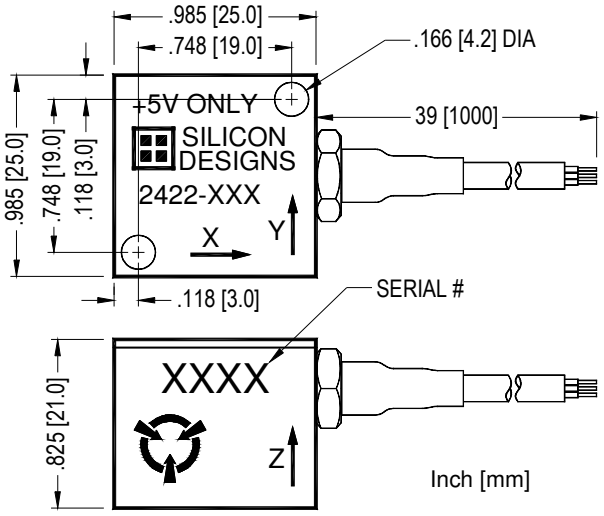
www.silicondesigns.com

ABSOLUTE MAXIMUM RATINGS *	
Case Operating Temperature	-55 to +125°C
Storage Temperature	-55 to +125°C
Acceleration Over-range	2000g for 0.1 ms
Voltage on V_{DD} to GND	-0.5V to 6.5V
Voltage on Any Pin to GND [1]	-0.5V to V_{DD}+0.5V
Power Dissipation	250 mW

**** NOTICE:*** *Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only. Functional operation of the device at or above these conditions is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.*



PERFORMANCE - By Model: V_{DD}=5.0VDC, T_C=25°C

MODEL NUMBER	Input Range	Frequency Response (Nominal, 3 dB)	Sensitivity, Differential [2]	Output Noise, Differential (RMS, typical)	Max. Mechanical Shock (0.1 ms)
UNITS	g	Hz	mV/g	µg/(root Hz)	
2422-002	±2	0 - 300	2000	10	2000 g
2422-005	±5	0 - 400	800	12	
2422-010	±10	0 - 600	400	15	
2422-025	±25	0 - 1000	160	35	
2422-050	±50	0 - 1500	80	70	
2422-100	±100	0 - 2000	40	140	
2422-200	±200	0 – 2500	20	280	
2422-400	±400	0 – 3500	10	560	

Note 1: Voltages on AOP & AON may exceed 0.5 volt above or below the supply voltage, provided the current into or out of the wire is limited to 1mA. Note 2: Single ended sensitivity is half of values shown.

PERFORMANCE - All Models: Unless otherwise specified V_{DD}=5.0VDC, T_C=25°C, Differential Mode.

PARAMETER		MIN	TYP	MAX	UNITS
Cross Axis Sensitivity			2	3	%
Bias Calibration Error[3]	-002 & -005		2	4	% of Span
	-010 thru -400		1	2	
Bias Temperature Shift[3] (T_C= -40 to +80°C)	-002 & -005		100	300	(ppm of span)/°C
	-010 thru 400		50	200	
Scale Factor Calibration Error[3, 4]			1	2	%
Scale Factor Temperature Shift[3] (T_C= -40 to +80°C)			+300		ppm/°C
Non-Linearity (-90 to +90% of Full Scale) [3, 4]	-002 thru -100		0.5	1.0	% of span
	-200		0.7	1.5	
	-400		1.0	2.0	
Power Supply Rejection Ratio			25		dB
Output Impedance			90		Ω
Operating Voltage		4.75	5.0	5.25	V
Operating Current (AOP & AON open)			21	30	mA
Mass (not including cable)			21		grams
Cable Mass			18		grams/meter

Note 3: Tighter tolerances may be available on special order. Note 4: 100g versions and above are tested from -65 to +65g.

ESD CONSIDERATIONS

The model 2422 accelerometer is a CMOS device subject to damage by large electrostatic discharges. Diode protection is provided on the outputs but care should be exercised during handling of the cable wire ends. Individuals and tools should be grounded before coming in contact with the cable wire ends.

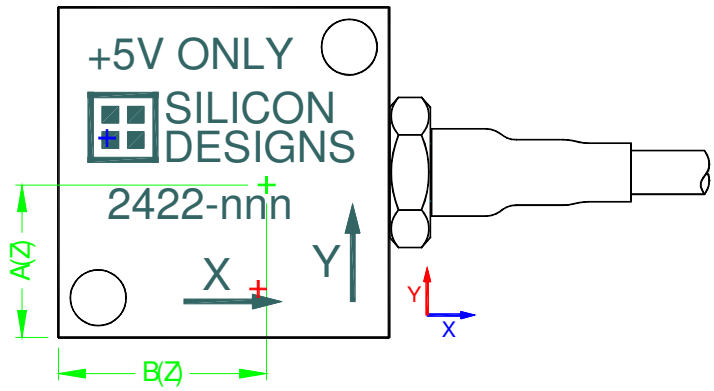
CABLE SPECIFICATION & LENGTH CONSIDERATIONS

The cable consists of seven 28 AWG (7x36) and one 26 AWG (7x34) tin plated copper wires. The seven smaller 28 AWG wires are covered by 6.5 mils of Teflon FEP insulation. The larger single 26 AWG wire is covered by 9 mils of black Teflon FEP insulation. The seven smaller gauge wires surround the single larger gauge (black) wire and the bundle is covered by a 10 mil thick Teflon FEP jacket with a nominal outer diameter of 0.115". We do not recommend extending the standard 1 meter cable length of the model 2422. If you decide to extend the cable length, we recommend you check each individual installation for oscillation by tapping the accelerometer and watching the differential output for oscillation in the 20kHz to 50kHz region. If no oscillation is present then the cable length being used is OK for that particular device. Different devices will tolerate different cable lengths.

DIFFERENTIAL vs SINGLE ENDED OPERATION

The model 2422 accelerometer will provide its best performance when you connect it to your instrumentation in a differential configuration using both the **AOP** and **AON** output signals. But a differential connection may not always be possible. In such cases, it is perfectly fine to connect the accelerometer to your instrumentation in single ended mode by connecting **AOP** and **GND** to your instrumentation and leaving **AON** disconnected. Keep in mind however, that for a single-ended connection, the signal to noise ratio is reduced by half, the signal is more susceptible to external noise pickup, and the accelerometer's output will vary directly with any change in the +2.5V reference that you provide.

SENSOR LOCATIONS:



	For serial numbers:	
	up to 3000	after 3000
A(X)	0.61	0.58
B(X)	0.16	0.13
C(X)	0.59	0.55
A(Y)	0.16	0.13
B(Y)	0.59	0.60
C(Y)	0.59	0.55
A(Z)	0.54	0.37
B(Z)	0.64	0.60
C(Z)	0.22	0.18

dimensions in inches