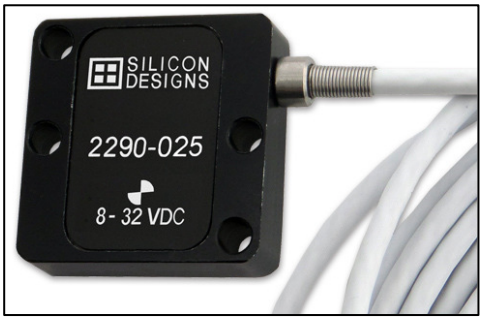
- Excellent Long-Term Stability
- Flexible +8 to +32 VDC Power
- ±4V Differential Output
- -55 to +125°C Operating Temperature Range
- Responds to Frequencies from Zero (DC) to 2000+ Hz
- Low Impedance Outputs Support up to 2000 Feet of Cable
- Integrated Cable, Traditional 1" square Size
- Integrated 10' Cable with Simple 4-Wire Connection
- Rugged Anodized Aluminum Case, Module Mass: 9 Grams
- Fully Calibrated and Serialized for Traceability

AVAILABLE G-RANGES

FULL SCALE ACCELERATION	MODEL SUFFIX
± 5 g	-005
± 10 g	-010
± 25 g	-025
± 50 g	-050



The SDI Model 2290 Precision Reference Single Axis MEMS Variable Capacitive Accelerometer is a rugged, plug-and-play measurement device designed for zero-to-medium frequency applications that demand highly precise and reliable, accurate measurements. It features SDI's hermetically sealed, low noise, Model 1527 Inertial MEMS accelerometer for extra-low noise performance and inertial-grade stability. The rugged, anodized aluminum, 1" x 1" square package provides all the durability and reliability of SDI's industrial accelerometers with the convenience of a 4-wire pigtail for use with almost any DAQ system.

The 2290 is relatively insensitive to temperature changes and gradients. Onboard voltage regulation and an internal voltage reference eliminate the need for precision power supplies. The anodized aluminum case is epoxy sealed and is easily mounted via two screws, an adhesive, or by attaching a magnet. The accelerometer is non-ferrous and will not respond to magnetic mounting. An initial calibration certificate is provided with each unit.

The 2290 is REACH and RoHS compliant; it is ECCN 7A994 and is not ITAR controlled.

ZERO (DC) TO MEDIUM FREQUENCY APPLICATIONS

ROBOTICS · SEISMIC · TILT · VIBRATION · CENTER OF GRAVITY · MONITOR · INSTRUMENTATION

PERFORMANCE BY G RANGE

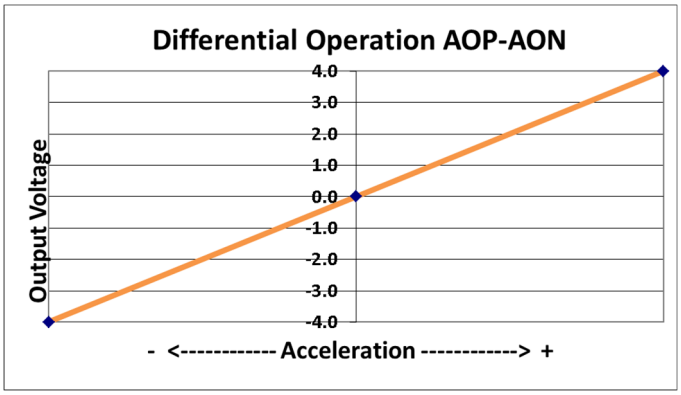
INPUT RANGE	SENSITIVITY, DIFFERENTIAL	*FREQUENCY RESPONSE (TYPICAL, 5%)	*FREQUENCY RESPONSE (TYPICAL, 3 DB)	*FREQUENCY RESPONSE (MINIMUM, 3 DB)	OUTPUT NOISE, DIFFERENTIAL (RMS, TYPICAL)	MAX. MECHANICAL SHOCK (0.1 MS)
g	mV/g	Hz	Hz	Hz	µg/(root Hz)	g (peak)
±5	800	0 – 500	0 – 700	0 – 400	15	2000
±10	400	0 – 700	0 – 1000	0 – 600	23	5000
±25	160	0 – 1200	0 – 1500	0 – 1100	38	
±50	80	0 – 1500	0 – 1800	0 – 1300	60	

By Model: *V_{DD}=V_R=5.0 VDC, T_C=25°C*

Silicon Designs, Inc. • 13905 NE 128th Street, Kirkland WA 98034 • Phone: 425-391-8329 • Fax: 425-391-0446

OPERATION

These accelerometer modules produce differential analog output voltage pairs (AON & AOP) which vary with acceleration. The signal outputs are fully differential about a common mode voltage of approximately 2.5 volts. At zero acceleration, the output differential voltage is nominally 0 volts DC; at ±full scale acceleration, the output is ±4 volts DC, respectively, as shown in the figure (below). The output scale factor is independent from the supply voltage of +8 to +32 volts.



SPECIFICATIONS

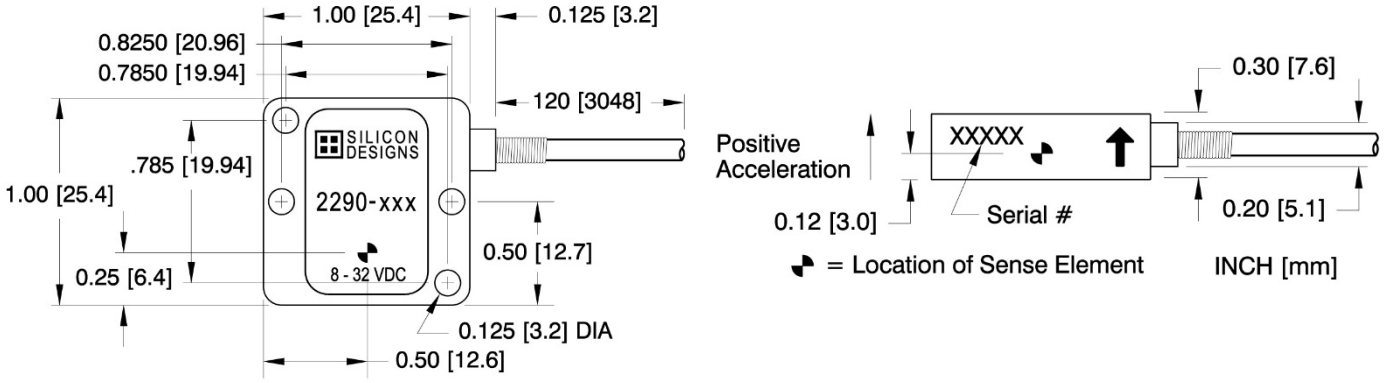
PARAMETER	MIN	TYP	MAX	UNITS
Bias Calibration Error (%)		0.25	0.6	± % of span
Bias Calibration Error (mV)		20	48	± mV
Bias Temperature Shift (Coefficient)	-75	0	+75	(PPM of span)/°C
Scale Factor Calibration Error		0.5	1.25	± %
Scale Factor Temperature Shift (Coefficient)	-75	0	+50	PPM/°C
Non-Linearity (-90 to +90% of span)		0.15	0.5	± % of span
Cross Axis Sensitivity		2	3	± %
Power Supply Rejection Ratio	50	>65		dB
Output Impedance		1		Ω
Output Common Mode Voltage		2.5		VDC
Operating Current (AOP & AON open)		7	10.5	mA DC
Mass (Excluding Cable)		9		Grams

Unless otherwise specified, T_C=25°C, Differential Mode. Span = ±g range = 8000 mV.

Max Case Operating Temperature	-55 to +125°C	Max Operating Voltage	+8 to +32 VDC
Max Storage Temperature	-55 to +125°C	Max. Mechanical Shock (0.1 MS)	5000g

NOTICE: Minimize exposure above 125°C for maximum lifespan. Stresses greater than those listed above may cause permanent damage to the device. These are maximum 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 and lifespan.

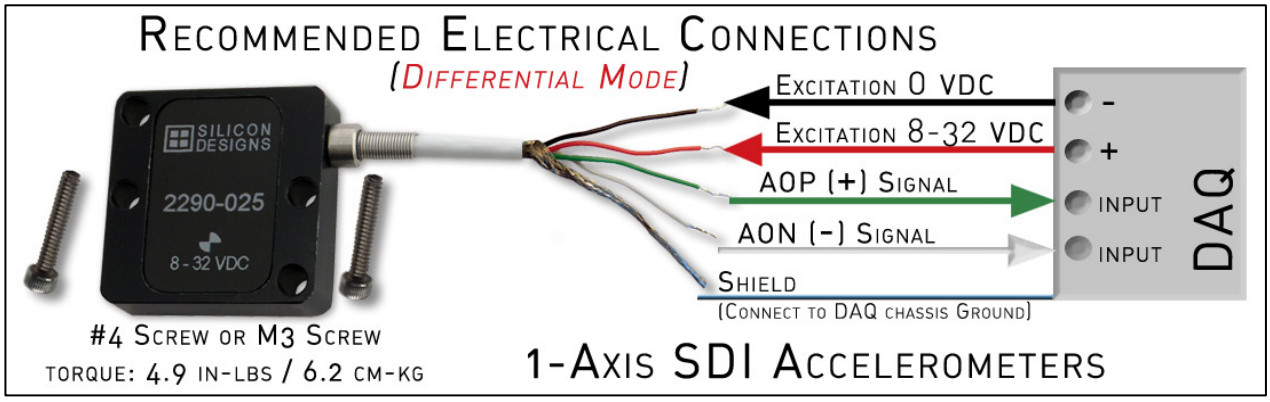
PACKAGE DIMENSIONS



CABLE SPECIFICATIONS & CONNECTIONS

The standard 10-foot (approximately 3m) integrated cable consists of four 28 AWG (7x36) tin-plated copper wires with Teflon FEP insulation surrounded by a 40 AWG tin plated copper braided shield. The shield jacket is Teflon FEP with a nominal outer diameter of 0.096". The cable's braided shield is electrically connected to the case. The black ground (GND) wire is isolated from the case. The cable ends in a 4-wire pigtail.

SDI Model 2290 MEMS Precision Reference Accelerometers provide optimal performance when they are connected to instrumentation in a differential configuration using both the AOP and AON output signals.



WIRE	SIGNAL
VS: red wire	Power
GND: black wire	Ground

WIRE	SIGNAL
AOP: (Output) green wire	Positive output
AON: (Output) white wire	Negative output

CABLE LENGTH CONSIDERATIONS

Cable lengths of up to 50 feet (15 meters) can be used without the need to test for output instability. For cable lengths exceeding 50 feet, SD recommends checking each individual installation for oscillation by tapping the accelerometer and watching the differential output for oscillation in the 20 kHz to 50 kHz region. If no oscillation is present, extended cable length should behave as expected. From the standpoint of output current drive and slew rate limitations, all SDI 8-32 VDC Accelerometers are capable of driving over 2000 feet (600 meters) of cable. However, at some length ranging between 50 feet and 2000 feet, each device will likely begin to exhibit oscillation.