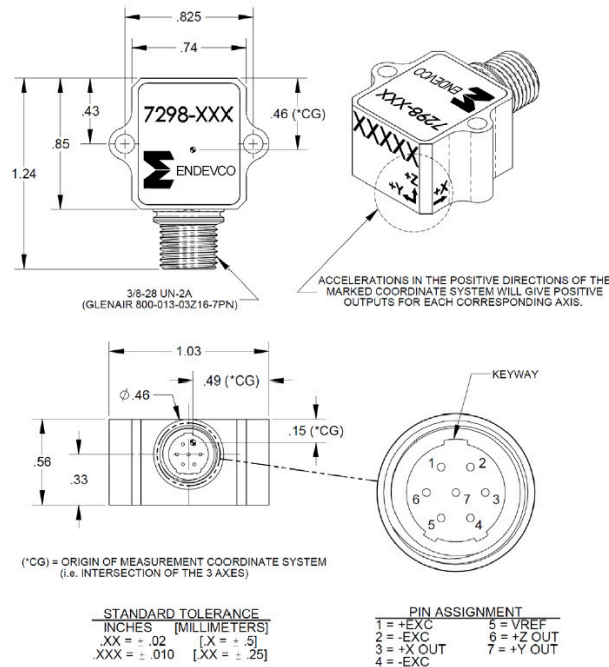


Triaxial variable capacitance accelerometer

Model 7298



Key features

- Hermetic package with water resistant connector
- 2, 5, 10, 30, 50, 100 and 200 g full scale ranges
- Motion, low frequency, tilt
- 10K g shock survivability
- Full analog signal path
- Precision digital temperature compensation

The Endevco® Model 7298 Triaxial Accelerometer family is designed to provide the high thermal stability and global accuracy that is typically required for the measurement of relatively low-level accelerations in aerospace and automobile environments. Typical applications require the measurement of whole body motion in three mutually orthogonal directions immediately following shock motion or in the presence of severe vibrational inputs. State of the art temperature compensation electronics provide for precise compensation over a wide temperature range, while maintaining a full analog signal path.

Each axis of the triaxial accelerometer utilizes a patented variable capacitance MEMS sensing element. Gas damping and internal overrange stops enable the MEMS sensing element to withstand high shock and acceleration loads. The triaxial sensor arrangement is housed in a truly hermetic bolt-mount package featuring an integral Glenair® Mighty Mouse 800-013 series hermetic receptacle. When used with a mating plug (Glenair® series 800-006 thru 800-009) the connector assembly is protected against water ingress, making the 7298 an ideal choice for permanent installations in hose-down locations.

Internal signal conditioning allows the 7298 to operate from an excitation voltage from 6Vdc to 45Vdc while providing a high level, low impedance output. For each axis, the single-ended output is DC coupled and varies linearly from 0.5Vdc to 4.5Vdc over the input range. For operating in differential mode, a precision 2.5Vdc reference voltage is available at the connector, providing a DC coupled ±2Vdc differential output. The signal conditioning includes factory programmable temperature compensation in order to maintain stringent thermal characteristics and high accuracy. Frequency response is controlled by the use of near-critically damped sensors. As opposed to oil damping, the use of gas damping in the sensing elements results in very small thermally induced changes in frequency response.

U.S. Patents 4,574,327, 4,609,968 and 4,999,735.

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Specifications

All values assume +75°F (+24°C) and 15 Vdc excitation and apply to each of the three axes, unless otherwise stated. Calibration data traceable to National Institute of Standards and Technology (NIST) is supplied.

| Dynamic characteristics | Units | -2 | -5 | -10 | -30 | -50 | -100 | -200 |
|--|------------------|-------------|-------------|-------------|-------------|-----------|-----------|-----------|
| Range | g | ±2 | ±5 | ±10 | ±30 | ±50 | ±100 | ±200 |
| Sensitivity | mV/g | 1000 ±50 | 400 ±20 | 200 ±10 | 66 ±4 | 40 ±2 | 20 ±1 | 10 ±0.5 |
| Frequency response (± 5%) | Hz (max) | 0 to 15 | 0 to 30 | 0 to 500 | 0 to 1000 | 0 to 1500 | 0 to 1500 | 0 to 1500 |
| Frequency response (± 10%) | Hz | 0 to 30 | 0 to 65 | 0 to 1200 | 0 to 1800 | 0 to 3000 | 0 to 3000 | 0 to 3000 |
| Frequency response (± 3dB) | Hz | 0 to 55 | 0 to 120 | 0 to 3200 | 0 to 3400 | 0 to 4500 | 0 to 4500 | 0 to 4500 |
| Mounted resonance frequency | Hz typ. | 1300 | 1600 | 3000 | 5500 | 6000 | 6000 | 6000 |
| Non-linearity and hysteresis [1] | % FSO typ (max) | ±0.5 (±1.0) | ±0.5 (±1.0) | ±0.5 (±1.0) | ±0.5 (±1.0) | ±1 (±2) | ±1 (±2) | ±1 (±2) |
| Transverse sensitivity | % (max) | 1 (3) | 1 (3) | 1 (3) | 1 (3) | 1 (3) | 1 (3) | 1 (3) |
| Zero measurand output | mV | ±50 | ±50 | ±50 | ±50 | ±50 | ±50 | ±50 |
| Damping ratio | % typ | 3.0 | 2.5 | 0.7 | 0.7 | 0.6 | 0.6 | 0.6 |
| Damping ratio change | %/°C | +0.08 | +0.08 | +0.08 | +0.08 | +0.08 | +0.08 | +0.08 |
| Thermal zero shift (max) | | | | | | | | |
| From -40°F to 212°F (-40°C to 100°C) | % FSO | ±1.0 | ±1.0 | ±1.0 | ±1.0 | ±1.0 | ±1.0 | ±1.0 |
| Thermal sensitivity shift (max) | | | | | | | | |
| From -40°F to 212°F (40°C to +100°C) | % | ±1.0 | ±1.0 | ±1.0 | ±1.0 | ±1.0 | ±1.0 | ±1.0 |
| Overrange (determined by electrical clipping or mechanical stops, whichever is smaller.) | | | | | | | | |
| Electrical clipping | volts | ±2.4 | ±2.4 | ±2.4 | ±2.4 | ±2.4 | ±2.4 | ±2.4 |
| Mechanical stops | g (typ) | ±4 | ±12 | ±30 | ±90 | ±90 | ±200 | ±300 |
| Recovery time | µs | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 | < 10 |
| Threshold (resolution) [2] | Equiv. g's | 0.0005 | 0.0013 | 0.0025 | 0.0075 | 0.013 | 0.025 | 0.050 |
| Base strain sensitivity, max | Equiv. g's (max) | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |

Electrical characteristics

| | | |
|-----------------------|-------|--|
| Excitation voltage | Vdc | 6.0 to 45.0 |
| Current drain | mA | 12 (typ) 16 (max) |
| Output impedance/load | ohms | 120 max |
| Residual noise | mVrms | 0.5 to 1000Hz, 0.3 typ/0.5 max 0.5 to 10 000Hz, 0.5 typ/1.0 max |

Physical characteristics

| | |
|-----------------|--|
| Case material | Stainless steel |
| Connector | Glenair® Mighty Mouse 800-013-03216-7PN |
| Mounting/torque | Two holes for 4-40 mounting screws / 8 ±2 lbf-in (0.9 ±0.2 Nm) |
| Weight | 22 grams (0.8 oz) |

Environmental characteristics

| | |
|--|---|
| Acceleration limits (in any direction) | |
| Static | 10 000 g |
| Shock | 5000 g (150 µs haversine pulse) for -2, -5 and -10; 10 000 g (80 µs haversine pulse) for -30, -50, -100 |
| Zero shift | 0.1% FSO typical at 5000 g |
| Temperature | |
| Operating | -67°F to +257°F (-55°C to +125°C) |
| Storage | -76°F to +302°F (-60°C to +150°C) |
| Humidity/altitude | Unaffected. Unit is hermetically sealed. |
| ESD sensitivity | Unit meets Class 2 requirements of MIL-STD-883, Method 3015 |

Calibration

| | |
|-----------------------|--|
| Sensitivity | 1 g and 5 Hz for -2 and -5; 10 g and 100 Hz for all other ranges |
| Frequency response | 1 g, 1 to 100 Hz for -2 and -5; 10 g, 20 to 5000 Hz for all other ranges |
| Zero measurand output | |

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Accessories

| Product | Description | 7298 |
|----------|--------------------------------|----------|
| EHW265 | Size 4, flat washer (2) | Included |
| EH69 | 4-40 x 3/4 inch cap screws (2) | Included |
| EHM464 | Hex key wrench | Included |
| 3907-36 | Mating cable assembly, 36" | Optional |
| 3907-120 | Mating cable assembly, 120" | Optional |

Notes

1. Full scale output (FSO) is nominally 4 volts.
2. Threshold = (max. residual noise; 0.5 to 100 Hz) / sensitivity.
3. Maintain high levels of precision and accuracy using Endeveco's factory calibration services. Call Endeveco's inside sales force at 866-ENDEVCO for recommended intervals, pricing and turn-around time for these services as well as for quotations on our standard products.

Model definition

7298 - XXX

Denotes typical in g's:

- 2 = 2g's
- 5 = 5g's
- 10 = 10g's
- 30 = 30g's
- 50 = 50g's
- 100 = 100g's
- 200 = 200g's

Basic model number

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