

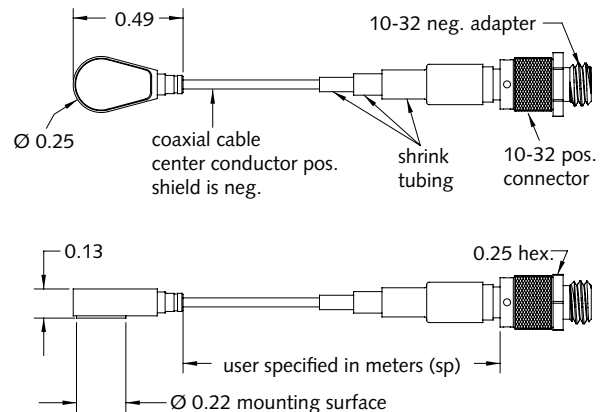
# Ceramic Shear Accelerometer

Type 8278A...

## Miniature, 0.7 Gram, Charge Mode Accelerometer

Small, light weight general purpose accelerometer for vibration and shock measurements

- High impedance charge mode
- Ultra low base strain
- Wide frequency response  $\pm 5\%$ , 1 ... 10000 Hz
- Ground Isolated
- High sensitivity, -1.3 pC/g
- Integral cable
- Temperature -103 ... 356 °F



### Description

The 8278A... is a wide frequency, ultra miniature, light weight accelerometer that contains a uniquely designed ceramic shear sensing element. The shear mode element design provides an immunity to base strain and transverse motion.

The standard 8278A... accelerometer includes an integral repairable Teflon jacketed 3ft. long cable terminated with a 10-32 pos. connector. Special length cables are also available. A 1729 10-32 neg. to 10-32 neg. adapter is provided to facilitate connection to standard extension cables with 10-32 pos. connectors. The 8278A... is designed for wax or adhesive mounting and is supplied with a custom wrench to facilitate removal after testing.

External signal conditioning converts the charge developed in the ceramic element, due to shock and vibration, into a low impedance voltage signal. For example, the 5050A... In-Line Charge Amplifier, can be powered by a power supply/coupler like the 5134A... to create a representative voltage signal.

### CE Compliant Information

Because high impedance, charge mode accelerometers contain no electronics, CE certification to the EMC Directive is not appropriate. When a high impedance accelerometer is used with a CE certified signal conditioner (i.e., charge amplifier...), it is said that this system is CE compliant.

### Application

The light weight, low profile and small size of the 8278A... accelerometer makes it ideal for: precision vibration measurements; modal analysis on small, thin walled structures or where space is limited and mass loading is of primary concern. Typical applications include product test stress screening and critical component evaluation as well environmental testing.

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**Technical Data**

| Type                                    | Unit     | 8278A500             |
|---|----------|----------------------|
| Acceleration Range                      | g        | ± 500                |
| Sensitivity, ±20%                       | pC/g     | -1.3                 |
| Resonant Frequency, mounted, nom.       | kHz      | ≥ 40*                |
| Frequency Response, ±5%                 | Hz       | 1...10000            |
| Shock (1ms pulse width), max.           | g        | 10000                |
| Transverse Sensitivity, max. 5%         | %        | 3 Typ*               |
| Amplitude Linearity                     | %FSO     | ±1                   |
| <b>ELECTRICAL</b>                       |          |                      |
| Capacitance (without connector), nom.   | pF       | 100                  |
| Insulation Resistance                   | @ 70 °F  | Ω ≥ 10 <sup>12</sup> |
|   | @ 356 °F | Ω ≥ 108              |
| Ground Isolation                        | MΩ       | ≥ 10                 |
| <b>Environmental:</b>                   |          |                      |
| Temperature Range, Operating            | °F       | -100 ... 350         |
| Temperature Coeff. of Sensitivity, nom. | %/°F     | 0.1                  |
| Base Strain Sensitivity @250µε          | g/µε     | 0.001                |
| <b>Construction:</b>                    |          |                      |
| Sensing Element                         | Type     | Ceramic Shear        |
| Construction                            | Seal     | Epoxy                |
| Mounting                                | Type     | Wax/Adhesive         |
| Case Material                           | Type     | Anodized Al.         |
| Weight                                  | grams    | 0.7                  |

\* wax mounted

1 g = 9.80665 m/s<sup>2</sup>, 1 inch = 25.4 mm, 1 gram = 0.03527 oz, 1 lbf-in = 0.113 Nm

**Mounting**

The 8278A... can be attached to the test structure by adhesive or wax. The accelerometer's side cable facilitates orientation in confined areas. Reliable and accurate measurements require the mounting surface to be clean and flat. The Operating Instruction Manual for the 8278A... accelerometer provides detailed information regarding mounting surface preparation

The recommended adhesives to be placed between the accelerometer's base and the test object surface include:

- Petro Wax
- Loctite 430 general purpose for adhesion to metals
- Loctite 495 general purpose for adhesion to other materials

Note: Removal of an adhesively mounted accelerometer is extremely difficult and care should be exercised during the removal process. An appropriate adhesive solvent and the 1378 custom designed removal wrench should be used to twist the accelerometer off of the test object.

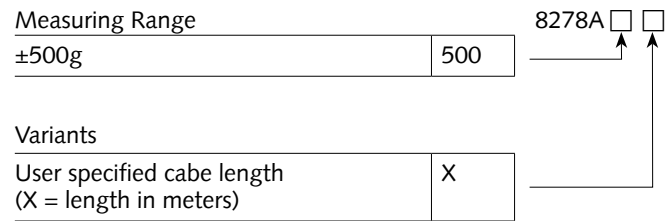
**Accessories Included**

- |                                    |      |
|------------------------------------|------|
| • Petro Wax                        | 8432 |
| • Removal Wrench                   | 1388 |
| • Adapter 10-32 neg. to 10-32 neg. | 1729 |

**Optional Accessories**

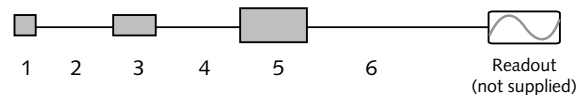
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|---|----------|
| • High impedance Cable, 10-32 pos. to BNC | 1631C    |
| • In-line charge amp                      | 5050A... |
| • Power supply/Signal conditioner         | 5134A... |
| • Outout cable, BNC pos. to BNC pos.      | 1511     |

**Ordering Key**



**Measuring Chain**

- |   |                                       |          |
|---|---------------------------------------|----------|
| 1 | High impedance sensor                 | 8278A... |
| 2 | Sensor cable, 10-32 pos. to BNC pos.. | 1631C... |
| 3 | In-Line charge converter              | 5050A... |
| 4 | Outout cable, BNC pos. to BNC pos.    | 1511     |
| 5 | Power supply/Signal conditioner       | 51...    |
| 6 | Outout cable, BNC pos. to BNC pos.    | 1511     |



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