

K-Shear[®] Accelerometer

Type 8742A...

High Resonant Frequency, Shock Accelerometer

Quartz shock accelerometer for measuring short duration impulse and impact shocks. Type 8742A... shock accelerometers have a rugged welded construction, integral stud and are available in four measuring ranges.

- Low impedance, voltage mode
- Unique quartz shear sensing element
- Ranges 5,000 ... 50,000 g
- Low transverse sensitivity
- Rugged connector for repeated connections
- Wide bandwidth, high resonant frequency
- Conforming to CE

Description

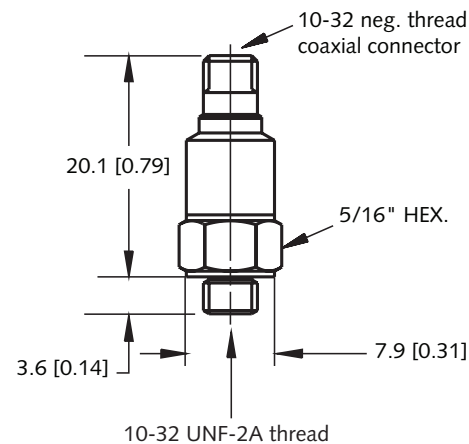
The sensing element contained within this shock accelerometer series features a unique, shear mode four quartz crystal configuration combined with an annular preload sleeve and seismic mass. The element design provides over 100 kHz resonance frequency ensuring accurate measurement of high speed events with zero shift and internal amplifier saturation virtually eliminated. These shock sensors exhibit insensitivity to thermal transients, and have extremely low transverse and base strain sensitivity. Using quartz as the sensing material adds another performance benefit in that quartz will not depolarize if exposed to high shock.

Poor connector pin continuity resulting from an applied shock can momentarily interrupt a measured event. To ensure reliable shock measurements, Type 8742A... accelerometer contains an improved spring insert made of a gold plated Beryllium-Copper. Beryllium Copper provides the elastic physical properties that promote positive contact and resists aging.

An internal microelectronic Piezotron[®] signal conditioning circuit converts the charge developed in the quartz element as a result of the accelerometer being subjected to shock, into a useable high level voltage output signal at a low impedance level. The low impedance output provides high immunity to noise and insensitivity to cable motion.



Dimensions



Application

Type 8742A... accelerometer is ideally suited for impact and impulse shock measurements where metal-to-metal impact occurs; where package and product survivability drop shock tests are of interest and where vehicle crash data is collected.

Mounting

Type 8742A... is attached to the test structure by its integral 10-32 UNF stud. Reliable and accurate measurements require that the mounting surface be clean and flat. The instruction manual for the shock accelerometer series provides detailed information regarding mounting surface preparation.

Usage of the base Type 8466K06 can allow for ground isolation while stud mounted.

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Technical Data

Type	Unit	8742A5	8742A10	8742A20	8742A50
Acceleration range	g	±5,000	±10,000	±20,000	±50,000
Acceleration limit	gpk	±6,000	±12,000	±24,000	±60,000
Threshold (noise ≤130 μV _{rms}), nom.	g _{rms}	0.13	0.25	0.5	1.3
Sensitivity, 5 %	mV/g	1	0.5	0.25	0.1
Resonant frequency mounted, nom.	kHz	100			
Frequency response, ±7 %	Hz	1 ... 10,000			
Amplitude linearity	%FSO	±1			
Time constant, nom.	s	≥0.5			
Transverse sensitivity	%	1.5 typ.; 5 max.			

Environmental

Base strain sensitivity @250 με	g/με	0.005			
Shock limit	gpk	50,000	50,000	50,000	100,000
Temperature coeff. of sensitivity,	%/°C [%/°F]	-0.06 [-0.03]			
Operating temperature range	°C [°F]	-55 ... 120 [-67 ... 250]			

Output

Bias, nom.	VDC	11			
Impedance	Ω	<100			
Voltage, full-scale	V	±5			

Source

Voltage	VDC	18 ... 30			
Constant current	mA	2 ... 20*			

Construction

Sensing element	type	quartz-shear			
Housing/Base	material	stainless steel			
Sealing housing/connector (EN 60529)		Hermetic			
Connector	type	10-32 neg.			
Ground isolation		with pad (Type 8466K06 when stud mounted) (Type 8436 when adhesive mounted)			
Mass	grams	4.5			
Mounting stud	type	10-32 UNF-2A			
Mounting torque	N·m [in·lbf]	2 [18]			

1 g = 9.80665 m/s², 1 in = 25.4 mm, 1 Gram = 0.03527 oz, 1 lbf-in = 0.113 N·m

*Recommended min. 4 mA

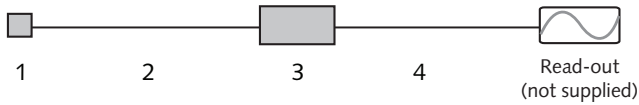
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Measuring Chain

- | | | | |
|---|--------------------------------------|------|----------|
| 1 | Low impedance sensor | Type | 8742A... |
| 2 | Sensor cable, 10-32 pos. to BNC pos. | | 1761B... |
| 3 | Power supply/signal conditioner | | 51... |
| 4 | Output cable BNC pos. to BNC pos. | | 1511 |

Ordering Key

Range	
±5,000 g	5
±10,000 g	10
±20,000 g	20
±50,000 g	50



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