

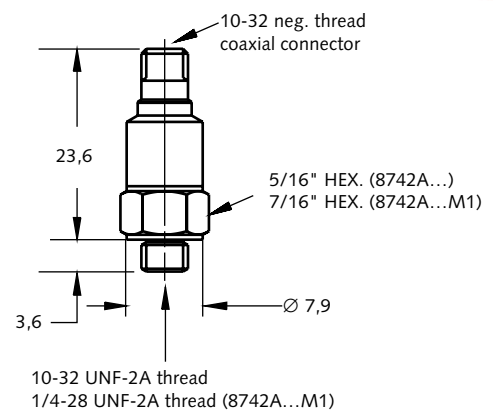
K-Shear® Accelerometer

Type 8742A...

High Resonant Frequency, Shock Accelerometer, Optional Ground Isolation

Quartz Shock Accelerometer for measuring short duration impulse and impact shocks., The 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 from 5000g to 50000g
- Optional Ground Isolation
- 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 100k Hz 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. The ground isolated option uses a patented technique that ensures high resonant frequency while providing electrical isolation.

Poor connector pin continuity resulting from an applied shock can momentarily interrupt a measured event. To ensure reliable shock measurements, the 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.

Application

The 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.

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Technical Data

Type	Unit	8742A5	8742A10	8742A20	8742A50
Acceleration Range	g	±5000	±10000	±20000	±50000
Acceleration Limit	g _{pk}	±6000	±12000	±24000	±60000
Threshold nom. (noise 130µV _{rms})	g _{rms}	0,13	0,25	0,5	1,3
Sensitivity, mon.	mV/g	1	0,5	0,25	0,1
Resonant Frequency mounted, nom.	kHz	100	100	100	100
Frequency Response, ±10%	Hz	1 ... 10000	1 ... 10000	1 ... 10000	1 ... 10000
Amplitude Non-linearity	%FSO	±1	±1	±1	±1
Time Constant nom.	s	≥0,5	≥0,5	≥0,5	≥0,5
Transverse Sensitivity nom., (max. 5)	%	1,5	1,5	1,5	1,5
Environmental:					
Base Strain Sensitivity @ 250µε	g/µε	0,005	0,005	0,005	0,005
Shock Limit (1ms pulse)	g _{pk}	50000	50000	100000	100000
Temperature Coeff. of Sensitivity	%/°C	-0,054	-0,054	-0,054	-0,054
Temperature Range Operating	°C	-55 ... 120	-55 ... 120	-55 ... 120	-55 ... 120
Output:					
Bias nom.	VDC	11	11	11	11
Impedance	Ω	<100	<100	<100	<100
Voltage full scale	V	±5	±5	±5	±5
Source:					
Voltage	VDC	18 ... 30	18 ... 30	18 ... 30	18 ... 30
Constant Current	mA	2 ... 20	2 ... 20	2 ... 20	2 ... 20
Construction:					
Sensing Element	type	Quartz Shear	Quartz Shear	Quartz Shear	Quartz Shear
Housing/Base	8742A...	material	St. Stl.	St. Stl.	St. Stl.
	8742A...M1	material	Titanium/St. Stl	Titanium/St. Stl	Titanium/St. Stl
Sealing-housing/connector	type	Hermetic	Hermetic	Hermetic	Hermetic
Connector	type	10-32 UNF neg.	10-32 UNF neg.	10-32 UNF neg.	10-32 UNF neg.
Ground Isolation min.	8742A...M1	MΩ	≥100	≥100	≥100
Weight	8742A...	grams	4,5	4,5	4,5
	8742A...M1	grams	8,2	8,2	8,2
Mounting (stud)	8742A...	type	10-32 UNF	10-32 UNF	10-32 UNF
	8742A...M1	type	1/4-28 UNF	1/4-28 UNF	1/4-28 UNF
Mounting Torque	8742A...	Nm	2	2	2
	8742A...M1	Nm	3	3	3

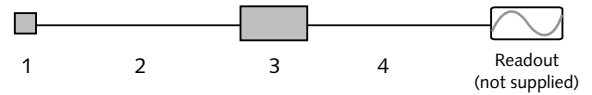
1 g = 9,80665 m/s², 1 Inch = 25,4 mm, 1 gram = 0,03527 oz, 1 lbf-in = 0,1129 Nm

Mounting

The case isolated 8742A... is attached to the test structure by its integral 1/4-28 UNF stud and the non isolated 8742 version, uses an integral 10-32 UNF stud. Reliable and accurate measurements require that the mounting surface be clean and flat. The Operating Instruction Manual for the shock accelerometer series provides detailed information regarding mounting surface preparation.

Measuring Chain

- | | Type |
|--|-------------|
| 1 Low Impedance Sensor | 8742A... |
| 2 Sensor cable, 10-32 pos. to BNC pos. | 1761B... |
| 3 Power Supply/Signal Conditioner | 51... |
| 4 Outout cable, BNC pos. to BNC pos. | 1511 |



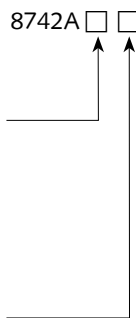
Ordering Key

Measuring Range

±5000g	5
±10000g	10
±20000g	20
±50000g	50

Variants

Standard	-
Ground Isolated	M1



Optional Accessories

- 10-32 pos. to BNC pos. cable **Type**
1761B...

8742A_000-250e-11.06