

# SUMMIT 13203b

## Rugged $\pm 1$ to $\pm 5$ g Uniaxial Accelerometer with Signal Conditioning and Temperature Sensor

### Technical Data\*



#### Features and Benefits

##### High Accuracy and Linearity over Wide Temperature Range

The voltage output for the 13203B is directly proportional to the acceleration along the axis. The DC-coupled output is fully scaled, referenced, and temperature compensated. Accuracy is improved by minimizing variations due to temperature and aging effects, resulting in a sensor that is more stable over temperature than piezoelectric or piezoresistive devices. Critical applications can use the built-in temperature sensor to compensate for residual temperature effects.

##### Calibration Certificate

Each 13203B can be supplied with an optional calibration certificate listing gain, offset, and on-axis and transverse alignment parameters needed to ensure rapid and efficient system implementation. The alignment data can be used to compensate the measured values if needed.

##### Self-Test on Digital Command

A TTL-compatible self-test input causes a simulated acceleration to be injected into the accelerometer to verify channel integrity.

##### Small Size

Complete conditioned uniaxial accelerometer in less than a cubic inch.

##### Built-in Power Supply Regulation

Unregulated DC power from +8 to +30 volts is all that is required to measure accelerations. The 13203B is ideal for automotive applications with the ability to survive both continuous reverse battery to -20V and load dump transients to +60V.

##### Easy installation

Built-in terminal block or cable with 9-pin connector makes it easy to wire the 13203B. Two through holes and four tapped holes simplify mounting.

##### Suitable for Harsh Environments

The 13203B is robust and can be used in harsh environments. The unit will survive 500 g powered and 1000 g unpowered.

### Simplify Acceleration and Temperature Measurements

The Summit Instruments 13203B accelerometer includes a temperature sensor in its small rugged package. The small size and built-in power regulation allow the 13203B to fit where other accelerometers can't. A power source of +8 to +30 VDC is all that is required to measure temperature and  $\pm 1$  g,  $\pm 1.5$  g,  $\pm 2$  g,  $\pm 2.5$  g,  $\pm 3$  g,  $\pm 4$  g or  $\pm 5$  g accelerations.

When extra precision is required, the high repeatability of the built-in temperature allows precise compensation of temperature effects and alignment data provided on the optional calibration certificate can be used to compensate for transverse sensitivity and alignment errors.

Tested over the -40 to +85°C temperature range, the accelerometer has a nominal full scale output swing of  $\pm 2$  volts. The zero g output level is nominally +2.5 volts. Precise values axis are provided on the optional calibration certificate. Custom versions of the 13203B can be provided for applications which require different range and/or bandwidth.

\*Data subject to change without notice

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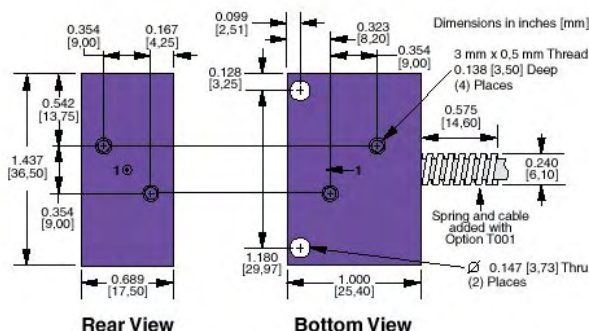
## Specifications

$T_A = T_{MIN}$  to  $T_{MAX}$ ,  $8 \leq V_S \leq 30$  V, Acceleration = 0 g, unless otherwise noted.

Parameter	Min	Typical	Max	Units	Conditions/Notes
<b>Range</b>					
Measurement Full Scale	$\pm 1$		$\pm 5$	g	Must specify via Opt. Rnnn
Shock survival, powered	-500		+500	g	Any axis for 0.5 ms. Recovers on power cycle.
Shock survival, unpowered	-1000		+1000	g	Any axis for 0.5 ms.
<b>Sensitivity</b>					
At 25°C, $\pm 5$ g FSR Drift $T_{MIN}$ to $T_{MAX}$		450 <sup>†</sup> $\pm 0.5$		mV/g %	Precise values on Opt. C001 cal certificate. Percent of sensitivity at 25°C
<b>Zero G Bias Level</b>					
At 25°C Drift $T_{MIN}$ to $T_{MAX}$	1.875	$\pm 0.2$	3.125	V g	Precise values on Opt. C001 cal certificate. Repeatable, can be compensated.
<b>Alignment</b>					
Deviation from ideal axes		$\pm 2.0$	$\pm 3.0$	degrees	Precise values on Opt. C001 cal certificate. Can be compensated if required.
<b>Transverse Sensitivity</b>					
		0.25		%	Inherent sensor error, excluding misalignment.
<b>Nonlinearity</b>					
		0.2		% FSR	Best fit straight line.
<b>Upper Cutoff Frequency</b>					
	4.6		10000	Hz	-3dB point $\pm 10\%$ Must specify via Opt. Bnnn.
<b>Noise</b>					
Density Amplitude DC to 100 Hz		0.225 2.25	0.325	mg/ $\sqrt{\text{Hz}}$ mg rms	4 Hz to 1 kHz
<b>Self Test Input Impedance</b>					
	30	50		kW	To ground. Logic "1" = 2V, Logic "0" = 0.8V
<b>Temperature Sensor</b>					
Sensitivity +25°C Bias Level	2.4	8	2.6	mV/ $^{\circ}\text{K}$ V	Precise values on Opt. C002 cal certificate.
<b>Outputs</b>					
Output voltage swing Capacitive Drive Capability	0.05 1000		4.95	V pF	$I_{OUT} = \pm 0.5$ mA Accelerometer output; T output drives 300pF
<b>Power Supply (<math>V_S</math>)</b>					
Input voltage limits Input voltage - operating Input current Rejection Ratio	-20 +8	6	+60 +30 9	V V mA dB	-20V continuous, >30V if <100ms, duty <1% No load, quiescent. DC
<b>Temperature Range (<math>T_A</math>)</b>					
	-40		+85	$^{\circ}\text{C}$	Terminal block Opt. T000 rated to -30°C
<b>Mass</b>					
		35		g	Precise value on Opt. C001 cal certificate.

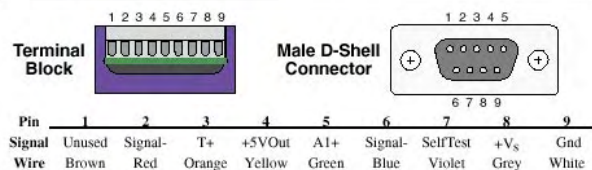
<sup>†</sup> Scale linearly with range option Rnnn.

### Mechanical



Two through holes and four 3 mm x 0.5 mm threaded holes are provided for mounting.

### Connections



### Ordering Information

- 13203B** Biaxial accelerometer  $\pm 1$  to  $\pm 5$  g (-Bnnn, -Rnnn, & -Tnnn options required)
- Bnnn Bandwidth 3 dB cutoff (nnn Hz)
  - C001 Add calibration certificate
  - C002 Add temperature calibration
  - Rnnn Range ( $\pm$ nnn g FSR)
  - Tnnn Terminal block (T000) or (nnn foot) cable with 9-pin male D-subminiature connector at end
  - W024 Extend warranty from 1 year to 2 years