3 Axis Vibration Sensor
M-A542VR10

RoHS Compliant

Product number
M-A542VR10 : X2F000041000100

- Capable of measuring velocity, velocity RMS, and velocity P-P (ISO10816 / ISO20816 compliant)
- Frequency response characteristics: 10 Hz to 1,000 Hz (-3dB)
- Insensitive to magnetic influences
- High dynamic range: ±100 mm/s (110 dB)
- 3-axis digital output RS422
- Waterproof and dustproof IP67

Recommended Application

- MHM (Machine Health Monitoring) • Condition Based Maintenance (CBM) • Motion analysis and control
- SHM (Structural Health Monitoring) • Vibration analysis, control and stabilization • Lissajous analysis

Recommended Operating Condition

Parameter	Condition	Min	Typ	Max	Unit
V_{IN} to GND		9	12	32	V
Input Voltage	RD+ / RD-		5		V
Operating Temperature Range		-30		70	°C

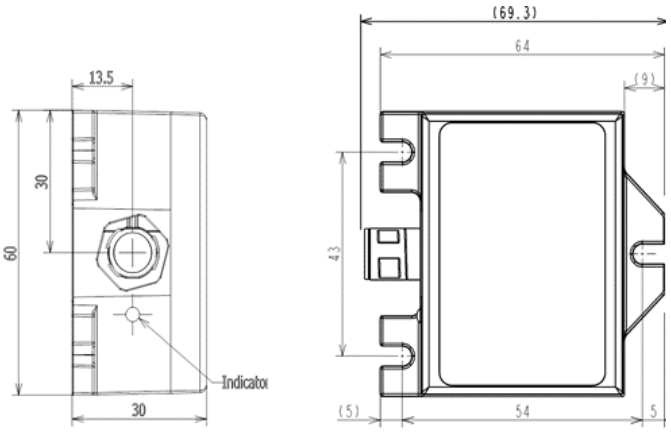
Specifications

T_A=-30°C to +85°C, VCC=3.15V~3.45V, ≤±1G, unless otherwise noted.

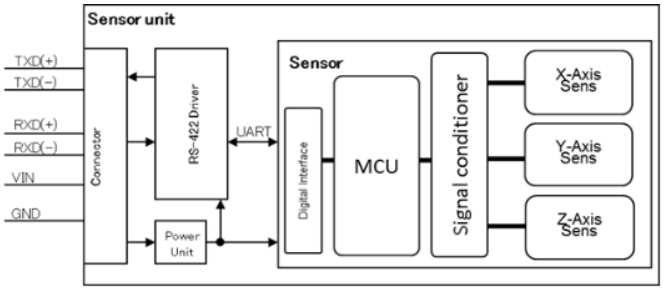
Parameter	Test Conditions / Comments	Min	Typ	Max	Unit
VELOCITY					
Sensitivity					
Output Range	f=10 Hz ~ 1000Hz			±100	mm/s
Scale Factor	2^{-22} m/s/LSB		$2.38*10^{-4}$		mm/s/LSB
Sensitivity Error	25 °C, ≤ 1 G	-1550		1550	$\times10^{-6}$ (ppm)
Nonlinearity	≤ 1 G, Best fit straight line, RT	-0.15		0.15	% of FS
Cross Axis Sensitivity	No alignment correction		±0.9 *3		%
Noise					
Noise Density	25 °C, Avg, f= 200 Hz ~ 1000Hz		$1.4*10^{-4}$		mm/s/√Hz, rms
Cantilever Resonance Frequency	25 °C, VCC 3.3 V		4,460		Hz
Frequency Property					
Frequency Range	-3 dB at 25 °C		10~1,000		Hz
DISPLACEMENT					
Sensitivity					
Output Range	f= 1 Hz ~ 100 Hz			±200	mm
Scale Factor	2^{-22} m/LSB		$2.38*10^{-4}$		mm/LSB
Nonlinearity	≤ 1 G, Best fit straight line, RT	-0.15		0.15	% of FS
Cross Axis Sensitivity			±0.9 *3		%
Noise					
Noise Density	25 °C, Avg, f = 20 Hz ~ 100 Hz		$0.7*10^{-5}$		mm/√Hz, rms
Frequency Property					
Frequency Range	-3 dB at 25 °C		1~100		Hz
TEMPERATURE SENSOR					
Output Range		-40		85	°C
16bit Scale Factor *1	Output=2634(0x0A4A) at 25 °C		-0.0037918		°C/LSB
8bit Scale Factor *1	Output=2634(0x0A4A) at 25 °C		-0.9707008		°C/LSB
RELIABILITY					
MTBF*2	JIS-C5003 TA = 25 °C	87,600			hour

*1) This is a reference value used for the internal temperature correction, and is not guaranteed to accurately output the interior temperature.
*2) The MTBF is an estimated value derived from the result of high temperature operation with a system requirement of TA=25℃ and a 60% reliability level.
*3) When the alignment is corrected by the host, the other axis sensitivity is Typ. 0.1 %.
Note) The values in the specifications are based on the data calibrated at the factory. The values may change according to the way the product is used.
Note) The Max/Min value is the maximum/minimum value of the design or factory shipment examination, unless otherwise specified.
Note) The calibrated standard 1G gravitational acceleration value is 9.80665 m/s2

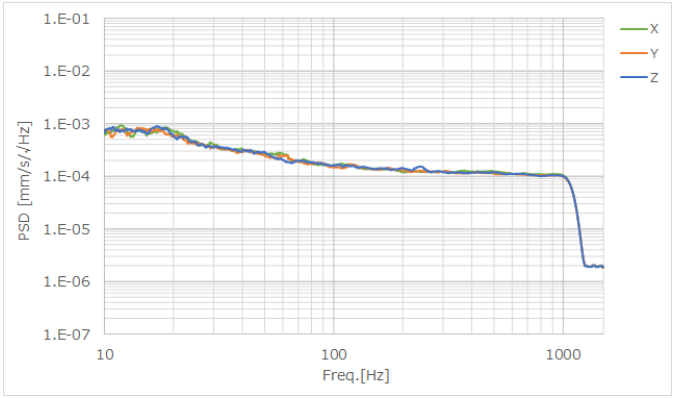
Outline Dimentions



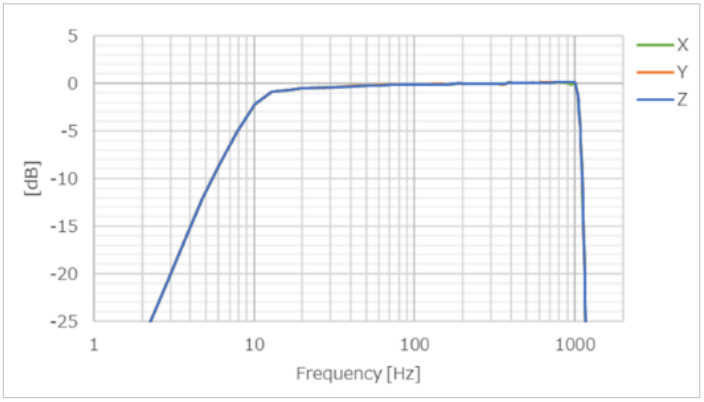
Block Diagram



Noise Density (Velocity Output)



Frequency Response (Velocity Output)



The product characteristics shown above are just examples and are not guaranteed as specifications

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