2220 series

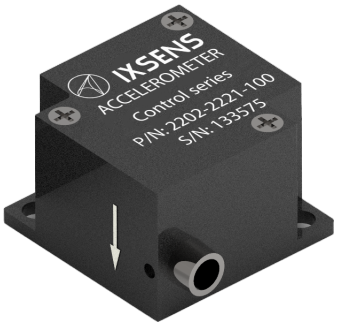
CONTROL GRADE ACCELEROMETERS

High end MEMS accelerometers

The high-resolution, high-linearity and shock resilient MEMS 2220 series brings the price further down with a novel high-end low noise capacitive MEMS accelerometer architecture specially designed for vibration measurement from DC to medium frequencies. Its Mean Time Between Failure (MTBF) of millions of hours make it the sensor of choice for various industrial and commercial platforms, including railway monitoring, seismic instrumentation, structural health monitoring (SHM), flight testing, wind turbine monitoring, and automotive testing.

The core technology used in IXSENS 2220 series is a silicon-based variable capacitance (VC) pendulous MEMS Accelerometer customised to IXSENS specifications, integrated, and tested by IXSENS.

At the heart of the MEMS is a die using a capacitive detection principle and mature 3-stack bulk micromachining process providing a very stable MEMS device. Both the die and it's controlling highly integrated ASIC (Application Specific Integrated Circuit) are hermetically sealed in a ceramic package to ensure robustness, long lifetime, and performance. The ASIC is based on a BCD process which combines the strengths of three different process technologies onto a single chip: Bipolar (for precise analogue functions), CMOS (Double Diffused Metal Oxide Semiconductor for digital design), and DMOS (Double Diffused Metal Oxide Semiconductor for power and high-voltage elements). Deep Trench Isolation (DTI) is also implemented to reduce crosstalk.



Depending on EMI specifications, the 2220 series is proposed in 2 form factors with various measurement ranges (from ±2g to ±200g) to better suit application requirements.

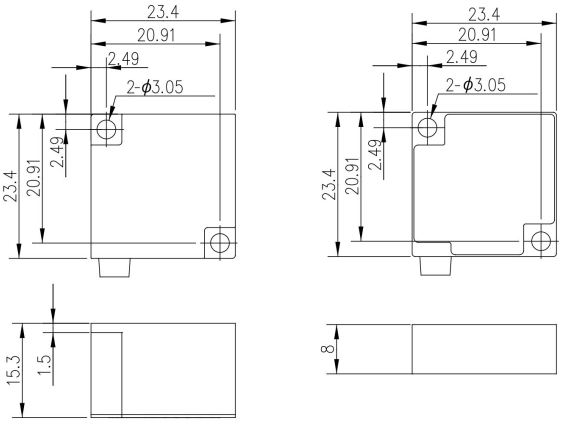
A standard 1.2 meters long integrated cable is provided. It consists of 6 silver-plated copper wires with PTFE (Teflon) insulation surrounded by a silver-plated copper braided shield. The cable shield jacket is PTFE with a nominal outer diameter of 3.80 mm. The cable's braided shield is electrically connected to the case. Custom lengths can be provided on demand for special orders (4.4 meters, 10 meters, 15.4 meters).

FEATURES

- 2g to 200g measurement range
- Low noise of less than 7 µg/√Hz (2g)
- Control-grade accuracy
- ITAR-free
- Superior reliability (MTBF ≥ 500,000 hr)
- 1-axis measurement
- Analogue output
- Low power electronics
- Validity of data signal (ERR)

DIMENSIONS – ELECTRICAL INTERFACE

Wires	Function	Characteristics
Red	Positive Power Supply	+8 V to +32 V
Black	Power return	Isolated from the case.
Green	AOP	Positive output
White	AON	Negative output
Yellow	ERR	Digital output, high if overload or error
Pink	GND	Electrical ground



IXSENS
Beyond Expectations

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PERFORMANCE AND KEY CHARACTERISTICS

Without EMI filter

Performance	2202-2220-002 Ultra-low noise	2202-2220-100 Low noise	2202-2220-200 Standard
Input Range	±2 g	±100 g	±200 g
Bias	≤7 mg	≤333 mg	≤667 mg
Bias temperature coefficient	≤0.2 mg/°C	≤10 mg/°C	≤20 mg/°C
Scale factor	1,350±20 mV/g	27±1 mV/g	13±1 mV/g
Scale factor temperature coefficient (typical)	≤120 ppm/°C	≤120 ppm/°C	≤120 ppm/°C
Axis Misalignment	≤10 mrad	≤10 mrad	≤10 mrad
Non-linearity (full scale) (typical)	0.1 %	0.1 %	0.1 %
Noise (in frequency range)	7 µg/√Hz	339 µg/√Hz	678 µg/√Hz
Environment			
Operating Temperature Range	-40 to +125 °C	-40 to +125 °C	-40 to +125 °C
Shock, half-sine	1,500 g 0.5 ms 6000 g ≤0.5 ms (survivability)	1,500 g 0.5 ms 6000 g ≤0.5 ms (survivability)	1,500 g 0.5 ms 6000 g ≤0.5 ms (survivability)
Vibration Peak Sine	15 g @ 20-2 kHz	15 g @ 20-2 kHz	
Frequency range (±5%)	0-700 Hz	0-2,900 Hz	0-2,500 Hz
Frequency range (-3dB)	0-1,150 Hz	0-5,000 Hz	0-7,000 Hz
Temperature sensor output			
	No	No	No
Electrical			
Quiescent Current (typical)	6 mA	6 mA	6 mA
Input Voltage	+8 to +32 VDC	+8 to +32 VDC	+8 to +32 VDC
Physical			
Weight	13 ±2 grams	13 ±2 grams	13 ±2 grams
Footprint of mounting surface	23.4 mm × 23.4 mm	23.4 mm × 23.4 mm	23.4 mm × 23.4 mm
Height top to mounting surface	8 mm	8 mm	8 mm
Case Material	Coated stainless steel	Coated stainless steel	Coated stainless steel

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PERFORMANCE AND KEY CHARACTERISTICS

With EMI filter

Performance	2202-2221-002 Ultra-low noise	2202-2221-100 Low noise	2202-2221-200 Standard
Input Range	±2 g	±100 g	±200 g
Bias	≤7 mg	≤333 mg	≤667 mg
Bias temperature coefficient	≤0.2 mg/°C	≤10 mg/°C	≤20 mg/°C
Scale factor	1,350±20 mV/g	27±1 mV/g	13±1 mV/g
Scale factor temperature coefficient (typical)	≤120 ppm/°C	≤120 ppm/°C	≤120 ppm/°C
Axis Misalignment	≤10 mrad	≤10 mrad	≤10 mrad
Non-linearity (full scale) (typical)	0.1 %	0.1 %	0.1 %
Noise (in frequency range)	7 µg/√Hz	339 µg/√Hz	678 µg/√Hz
Environment			
Operating Temperature Range	-40 to +125 °C	-40 to +125 °C	-40 to +125 °C
Shock, half-sine	1,500 g 0.5 ms 6000 g ≤0.5 ms (survivability)	1,500 g 0.5 ms 6000 g ≤0.5 ms (survivability)	1,500 g 0.5 ms 6000 g ≤0.5 ms (survivability)
Vibration Peak Sine	15 g @ 20-2 kHz	15 g @ 20-2 kHz	
Frequency range (±5%)	0-700 Hz	0-2,900 Hz	0-2,500 Hz
Frequency range (-3dB)	0-1,150 Hz	0-5,000 Hz	0-7,000 Hz
EMI	35 dB Minimum Insertion loss at 100 kHz to 1 GHz	35 dB Minimum Insertion loss at 100 kHz to 1 GHz	35 dB Minimum Insertion loss at 100 kHz to 1 GHz
Temperature sensor output			
	Yes	Yes	Yes
Electrical			
Quiescent Current (typical)	6 mA	6 mA	6 mA
Input Voltage	+8 to +32 V DC	+8 to +32 V DC	+8 to +32 V DC
Physical			
Weight	18 ±2 grams	18 ±2 grams	18 ±2 grams
Footprint of mounting surface	23.4 mm × 23.4 mm	23.4 mm × 23.4 mm	23.4 mm × 23.4 mm
Height top to mounting surface	15.3 mm	15.3 mm	15.3 mm
Case Material	Coated stainless steel	Coated stainless steel	Coated stainless steel

Additional product specifications, outline drawings, block diagrams, and test data are available on request.

DISCLAIMER:
Specifications are subject to change without notice. IXSENS does not assume any liability arising out of the application or use of the product.

FOR INFORMATION:
Product not subject to Export Control.

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