

# MEMS Sensors & Sensing Elements





## Accelerometers

Murata has 30 years of experience in low-g acceleration sensors for industrial and safety critical automotive applications. The extensive accelerometer product range includes high performance digital accelerometers based on 3D MEMS technology.

Murata accelerometers offer a number of excellent product features for the most demanding applications. The robust sensing element design with over damped frequency response enables excellent performance even in harsh and vibrating environments. The sensing element is also environmentally protected, resulting in excellent performance and reliability in humid environments and varying temperatures..

Series	No. of axes	Range	Supply voltage	Temperature range	Sensitivity	Signal bandwidth	Output type	Typical applications
SCA800	1	±2 g	3.3 V	-40 ... +125 °C	900 LSB/g	50 Hz	Digital/SPI	Automotive safety critical applications, IMU, Industrial applications
SCA2100	2	±2 g	3.3 V	-40 ... +125 °C	900 LSB/g	45 Hz	Digital/SPI	
SCA3100	3	±2 g ±6 g	3.3 V	-40 ... +125 °C	900 LSB/g 650 LSB/g	45 Hz	Digital/SPI	
SCA3300	3	±3 g ±6 g ±1.5 g	3.3 V	-40 ... +125 °C	2700 LSB/g 1350 LSB/g 5400 LSB/g	70 Hz 70 Hz 70 Hz/10Hz*	Digital/SPI	

\* user selectable via SPI bus



## Inclinometers

Murata inclination sensors are an optimum choice for high accuracy leveling and inclination measurement instruments. Highest accuracy 3-axis inclination measurement is available with Murata's SCL3300. This sensor also features direct inclination angle output making it a perfect choice for variety of different use cases and applications.

With the best shock durability available on the MEMS market, Murata inclinometers provide trouble-free measurements in moving machines, vehicles, airplanes, construction machines and handheld devices.

Series	No. of axes	Range	Supply voltage	Temperature range	Sensitivity	Signal bandwidth	Output type	Typical applications
SCA830	1	±90°, ±1 g	3.3 V	-40 ... +125 °C	32000 LSB/g	6.25 Hz	Digital/SPI	Levelling, Tilt sensing, Machine control, Structural health monitoring, Inertial measurement units (IMUs), Robotics, Positioning and guidance systems
SCL3300	3	±1.8g/±90°	3.3 V	-40 ... +125 °C	6000 LSB/g/*182 LSB/°	40 Hz	Digital/SPI	
		±3.6g/±90°			3000 LSB/g/*182 LSB/°	70 Hz		
		- /±10°			12000 LSB/g/*182 LSB/°	10 Hz		

\* Inclination output

Murata Electronics Oy's product range also includes inclination modules and sub-assemblies. For more information, please refer to the product datasheets available online at [www.murata.com](http://www.murata.com)



## Gyroscopes

Murata develops and manufactures gyroscope components based on the company's proven 3D MEMS technology and highly integrated electronics.

Industrial gyros offer a performance level that typically has been available only for expensive module products. The sensing elements and measuring circuitry are assembled into a premolded plastic dual-in-line (DIL) package, protected with silicon gel and covered with a stainless steel lid. All products are RoHS compatible and suitable for lead-free reflow soldering.

Series	No. of axes	Range	Supply voltage	Temperature range	Sensitivity	Signal bandwidth	Output type	Typical applications
SCC2130	X-axis gyro 3-axis accelerometer	$\pm 125^\circ/\text{s}$ , $\pm 6\text{ g}$	3.3 V	-40 ... +125 °C	50 LSB/(°/s) 1962 LSB/g	60 Hz/10 Hz*	Digital/SPI	Platform stabilization, Motion analysis and control, Guidance and navigation systems
SCR2100	X-axis gyro	$\pm 125^\circ/\text{s}$	3.3 V	-40 ... +125 °C	50 LSB/g	60 Hz/10 Hz*	Digital/SPI	
SCC2230	Z-axis gyro 3-axis accelerometer	$\pm 125^\circ/\text{s}$ , $\pm 6\text{ g}$ $\pm 125^\circ/\text{s}$ , $\pm 2\text{ g}$	3.3 V	-40 ... +125 °C	50 LSB/(°/s) 1962 LSB/g (6 g) 5886 LSB/g (2 g)	60 Hz/10 Hz*	Digital/SPI	
SCC3134	X-axis gyro 3-axis accelerometer	$\pm 300^\circ/\text{s}$ $\pm 6\text{ g}$ (14.6 g)	3.0 V ... 3.6 V	-40 ... +110 °C (+125°C)	80 LSB/(°/s) 3924 LSB/g (1962 LSB/g)	13 Hz, 20 Hz, 46 Hz, 200 Hz, 300 Hz	Digital/SPI	
SCC3234	Z-axis gyro 3-axis accelerometer	$\pm 300^\circ/\text{s}$ $\pm 6\text{ g}$ (14.6 g)	3.0 V ... 3.6 V	-40 ... +110 °C	80 LSB/(°/s) 3924 LSB/g (1962 LSB/g)	13 Hz, 20 Hz, 46 Hz, 200 Hz, 300 Hz	Digital/SPI	
SCC3334	XZ-axis gyro 3-axis accelerometer	$\pm 300^\circ/\text{s}$ $\pm 6\text{ g}$ (14.6 g)	3.0 V ... 3.6 V	-40 ... +110 °C	80 LSB/(°/s) 3924 LSB/g (1962 LSB/g)	13 Hz, 20 Hz, 46 Hz, 200 Hz, 300 Hz	Digital/SPI	

\* User selectable via SPI bus



## 6DoF Components

Murata has developed new MEMS (Micro-Electro-Mechanical Systems) 6DoF (Six Degrees of Freedom) inertial sensors for safety critical automotive applications, autonomous off road vehicles, dynamic inclination sensing and GNSS positioning support. The sensor enables further advancement in technology and novel solutions for advanced driver / operator assistance systems, autonomous vehicles and GNSS based measurement instruments.

Orthogonality of measurement axes are calibrated at Murata, enabling system integrators to leave out this costly and performance critical process step. Both industrial and automotive versions include several advanced self-diagnostic features and can achieve full compliance with ASIL-D (Automotive Safety Integrity Level).

The sensors are a perfect starting point for system integrators to create high performance IMUs for various applications.

Series	No. of axes	Range	Supply voltage	Temperature range	Sensitivity	Signal bandwidth	Output type
SCHA634	3-axis gyro 3-axis acc.	$\pm 125$ or $\pm 300^\circ/\text{s}$ $\pm 6\text{ g}$	3.0 V ... 3.6 V	-40 ... +110 °C	160 or 80 LSB/(°/s) 4905 LSB/g	13 Hz, 20 Hz, 46 Hz, 300 Hz	Digital/SPI
SCHA63T	3-axis gyro 3-axis acc.	$\pm 125$ or $\pm 300^\circ/\text{s}$ $\pm 6\text{ g}$	3.0 V ... 3.6 V	-40 ... +110 °C	160 or 80 LSB/(°/s) 4905 LSB/g	13 Hz, 20 Hz, 46 Hz, 300 Hz	Digital/SPI

For more information, please refer to the product datasheets available online at [www.murata.com](http://www.murata.com)



## Pressure Sensing Elements

Murata SCB10H capacitive absolute pressure sensing elements have been designed for applications that require a small size and ultra low power consumption. The SCB10H pressure sensing elements are ideal for implantable medical devices thanks to their inherent accuracy, reliability, small size and enabled low power consumption.

The SCB10H pressure sensing element allows the possibility for volume OEM customers to integrate pressure measurement functions in an optimal way into their products.

Parameter	Unit	B012	B250	Typical applications
Measuring range	kPa	30–120	100–2500	Medical devices, Barometers
Capacitance at min. pressure	pF	7.8	7.3	
Capacitance at max. pressure	pF	11.8	13.9	
Capacitance dynamics	pF	4.0	6.6	
Sensitivity	fF/kPa	55 (@100 kPa)	1.3 (@100 kPa) 6.5 (@2500 kPa)	

For more information, please refer to the product datasheets available online at [www.murata.com](http://www.murata.com)

# Global Locations

For details please visit [www.murata.com](http://www.murata.com)



## ⚠ Note

### 1 Export Control

*For customers outside Japan:*

No Murata products should be used or sold, through any channels, for use in the design, development, production, utilization, maintenance or operation of, or otherwise contribution to (1) any weapons (Weapons of Mass Destruction [nuclear, chemical or biological weapons or missiles] or conventional weapons) or (2) goods or systems specially designed or intended for military end-use or utilization by military end-users.

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For products which are controlled items subject to the "Foreign Exchange and Foreign Trade Law" of Japan, the export license specified by the law is required for export.

2 Please contact our sales representatives or product engineers before using the products in this catalog for the applications listed below, which require especially high reliability for the prevention of defects which might directly damage a third party's life, body or property, or when one of our products is intended for use in applications other than those specified in this catalog.

- ① Aircraft equipment
- ② Aerospace equipment
- ③ Undersea equipment
- ④ Power plant equipment
- ⑤ Medical equipment
- ⑥ Transportation equipment (vehicles, trains, ships, etc.)
- ⑦ Traffic signal equipment
- ⑧ Disaster prevention / crime prevention equipment
- ⑨ Data-processing equipment
- ⑩ Application of similar complexity and/or reliability requirements to the applications listed above

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4 Please read rating and ⚠CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.

5 This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

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7 No ozone depleting substances (ODS) under the Montreal Protocol are used in our manufacturing process.

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