BOSCH

Max your motion

Extended measurement range & voice activity detection – BMI423

This versatile sensor delivers enhanced robustness and precision for a wide array of applications, from hearables and wearables to robotics.

Experience intelligent Voice Activity Detection (VAD) that significantly conserves power and boosts privacy by activating microphones only when needed. With capabilities including an extended acceleration range of up to 32g and a gyroscope range of up to 4000 dps, the BMI423 packs a punch in a compact 2.5 x 3.0 x 0.83 mm³ footprint.
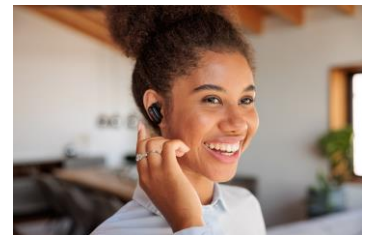
Target applications

Hearables

Wearables

Robotics

Benefits

Enhanced measurement range
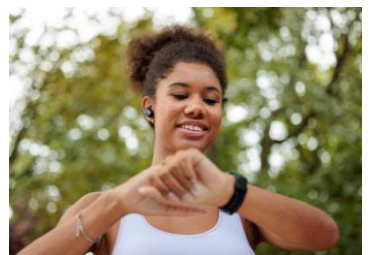32g and 4000dps care for superior detection in dynamic environments.

Voice activity detection (VAD)
VAD intelligently conserves power and enhances privacy by activating microphones only on demand.

Power efficient
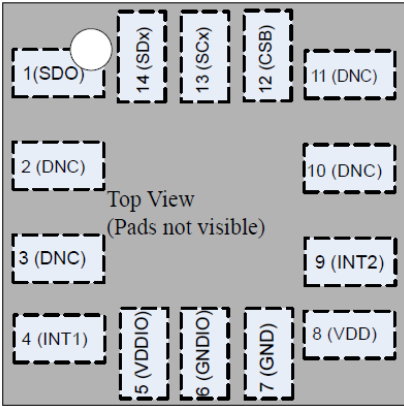Low current consumption extends battery life for "always-on" devices.

User interface features in hearables

User interface features in wearables

Motion control in robotics

Technical features

BMI423 technical data

Package dimensions (typ.)	2.5 x 3.0 x 0.83 mm³
Digital resolution	Accelerometer (A): 24-bit Gyroscope (G): 24-bit
Measurement ranges	A: ±2, ±4, ±8, ±16, ±32 g G: ±125°/s, ±250°/s, ±500°/s, ±1000°/s, ±2000°/s, ±4000°/s
Output data rates (selectable)	12.5 Hz ... 6.4 kHz
Offset soldered, over life	(A): ± 35 mg (G): ± 0.6 °/s
TCO	(A): ± 0.25 mg/K (G): ± 0.011 °/s/K
Sensitivity Error	(A): 0.25% (G): 0.5%
Noise density (typ.)	(A): 90 µg/$\sqrt{}$ Hz (≤8g) 120 µg/$\sqrt{}$ Hz (≥16g) (G): 0.0055 ° /s/$\sqrt{}$ Hz
Current consumption (high performance mode, A+G)	660 µA
Current consumption (low power mode, A+G)	322 µA
Current consumption (suspend mode, A+G)	13.5 µA
Interface	I3C, I²C and SPI 2 Interrupt Pins
Power modes	High perf. mode, normal mode, low power mode (LPM), suspend mode
FIFO	4 KB on-chip FIFO data buffer
Temperature range	-40 ... +85 °C
Supply voltage	1.62 ... 3.63 V (VDD) 1.08 ... 3.63 V (VDDIO)
Interrupts	Activity recognition Motion detection Step detection Plug 'n' play step counter Single/double/triple tap detection Voice activity detection Wrist wear wake-up Wrist gesture detection

Pin configuration

Top View
(Pads not visible)

Pin	Name	Description
1	SDO	Serial data output in SPI 4W I²C/I3C address in I²C/I3C mode
2	NC	Not connected
3	NC	Not connected
4	INT1	Interrupt pin 1
5	VDDIO	Digital I/O supply voltage
6	GNDIO	Ground for I/O
7	GND	Ground for digital & analog
8	VDD	Power supply analog & digital
9	INT2	Interrupt pin 2
10	NC	Not connected
11	NC	Not connected
12	CSB	Chip select for SPI mode
13	SCx	SCK for SPI serial clock SCL for I²C/I3C serial clock
14	SDx	SDA serial data I/O in I²C/I3C SDI serial data input in SPI 4-wire SDA serial data I/O in SPI 3-wire

Scan me for more product details!

Doc.-Number: BST-BMI423-FL000-00