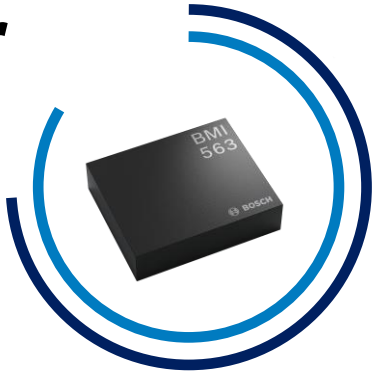
Invented for life

The control commander



Ultra precision for robotics & XR controllers – BMI563

The BMI563 delivers unparalleled motion tracking with ultra-low noise and exceptional vibration robustness, ensuring precise data acquisition even during the most dynamic controller or robotic movements.

With twice the full-scale range (FSR) of the previous generation, it captures every subtle change in orientation and position, fully saturation-less, leaving nothing unnoticed, even in the upper measurement range. Designed for demanding applications, it enables accurate simultaneous localisation and mapping (SLAM) for autonomous robots, motion-based automatic scene-tagging in action cams and high-dynamic motion tracking for XR controllers.

Target applications

Robotics

XR controllers

Action cams

Benefits

Out of the ordinary immersive experiences

2x higher full-scale range (±4k dps & ±32 g) compared to previous generation.

Reliable data acquisition

Exceptional vibration robustness (from 0 to 40 kHz up to MHz range) and stability against thermo-mechanical stress ensures precise data acquisition even in high-impact, noisy or vibrating environments.

Capture every nuance of motion

The new benchmark for low drifts and low noise: below 50µg/√Hz and below 3 mdps/√Hz. Precisely tracks the most delicate changes in orientation or position.

Inertial SLAM

AR/VR/MR motion

Motion-based automatic scene-tagging

Doc.-Number: BST-BMI563-FL000-00

Technical features

BMI563 technical data (preliminary, typical values)

Package dimensions	2.5 x 3.0 x 0.75 mm³ LGA
Digital resolution	Accelerometer (A): 16 & 24-bit Gyroscope (G): 16 & 24-bit
Measurement ranges	(A): ±2, ±4, ±8, ±16, ±32 g (G): ±125, ±250, ±500, ±1000, ±2000, ±4000 °/s
Output data rates (selectable)	(A): 1.56 Hz ... 6.4 kHz (G): 12.5 Hz ... 12.8 kHz
Offset (soldered on PCB)	(A): ± 10 mg (G): ± 0.5 °/s
Offset drift vs. temperature (TCO)	(A): ± 0.07 mg/K (G): ± 0.003 °/s/K
Sensitivity error (soldered on PCB)	(A): 0.1% (G): 0.3%
Noise density (typ.)	(A): < 50 µg/√Hz (≤8g) < 60 µg/√Hz (16g) (G): < 0.003 °/s /√Hz
Current consumption (A+G combo @ max. ODR)	650 µA for typ. operation
Current consumption (A+G combo @ 100 Hz ODR)	250 µA for low-power operation
Current consumption (A+G combo @ suspend mode)	3 µA for suspend operation
Interface	primary MIPI I³C®, I²C, SPI 2 Interrupt Pins (I²C, I³C) 1 Interrupt Pin (3-wire SPI) secondary AUX I²C controller secondary OIS MIPI I³C®, I²C, SPI
Power modes	High performance-, normal-, several low power-, standby- and suspend mode
FIFO	8 KB on-chip FIFO data buffer
Temperature range	-40 ... +85 °C
Supply voltage	VDD range 1.71 ... 3.6 V VDDIO range 1.08 ... 3.6 V

Integrated interrupt engine and legacy features

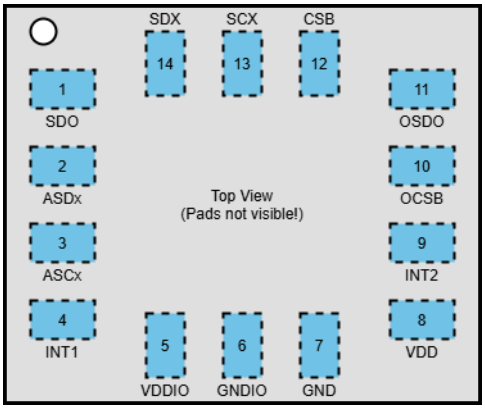
Configurable and FSR optimized Generic Interrupts, e.g. for Any/No-Motion, Low-g/High-g, Flat/Upside/Down, Significant-Motion Detection, Step Detection and plug'n'play Step Counter, Tap, Double-Tap and Triple-Tap Detection, Tilt Detection and Orientation Detection

Scan me for more product details!

Integrated edge-AI-classification engine and special features

On-demand Re-Trim, ongoing Compensation, Axis Remapping, Time-Sync, Multiple programmable AI Classification Engines incl. Gyro support, Activity Recognition and Classification for Robotics, XR-Controllers or Action Cams, Finite State Machine e.g. for Auto Operation Mode Change, Low Power and FSR optimized 6DoF Data Fusion e.g. for high-dynamic Game Rotation Vector, Data Injection to verify AI Models and Algorithms, supports AI frameworks like TensorFlow, Scikit-learn, PyTorch

Pin configuration (P2P compatible to predecessors and industry standard)



Pin	Name	Description
1	SDO	I2C address in I2C mode Serial data output in SPI 4W
2	ASDx	Auxiliary or OIS Serial Data I/O
3	ASCx	Auxiliary or OIS Serial Clock
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	OCSB	OIS Chip Select
11	OSDO	OIS Serial Data Out or INT3
12	CSB	Chip select for SPI mode
13	SCx	SCL for I2C/I3C serial clock SCK for SPI serial clock
14	SDx	SDA serial data I/O in I2C/I3C SDI serial data input in SPI 4W SDIO serial data I/O in SPI 3W

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Doc.-Number: BST-BMI563-FL000-00