BOSCH

BMI088
High-performance Inertial Measurement Unit (IMU)

GENERAL DESCRIPTION

BMI088 is a high-performance IMU with high vibration suppression, specifically designed for drone and robotics applications in demanding environments. The 6-axis sensor combines a 16 bit triaxial gyroscope and a 16 bit triaxial accelerometer in a miniature 3 x 4.5 x 0.95 mm^3 (16-pin) LGA package.

> ### BMI088 TARGET APPLICATIONS
> ▶ Drones and flying toys
> ▶ Industrial robots, hover boards
> ▶ Domestic appliances (e.g. vacuum cleaners, social robots, etc.)

SENSOR FEATURES

The BMI088 is designed for drones, robotics and industry applications with challenging performance requirements. BMI088 provides accurate and reliable inertial sensor data even under demanding conditions, including environments where those conditions change, such as thermal effects like heating, mechanical impacts and stress like shocks, vibrations and pcb bending.

BMI088 is offering a wide acceleration measurement range (up to 24 g), high vibration suppression ratio and vibration robustness, as well as high bias and temperature stability. The automotive-proven gyroscope of the BMI088 has an unmatched bias stability of less than 2°/h and a low temperature coefficient of offset (TCO) below 15 mdps/K.

The accelerometer features a low TCO of 0.2 mg/K and low spectral noise of only 230 µg/sqrt(Hz) in the widest measurement range of ± 24 g. The performance allows to measure the orientation of a device with high precision and to track motions accurately.

The high robustness of the sensor gives the user more freedom in placing the sensor on a pcb, and can help to reduce the design effort and costs on system level, for example by omitting additional damping structures or loosing space on the floorplan when considering heat sources or thermal distributions among the pcb. Depending on the application needs, the sensor may also allow to reduce calibration effort at end-of-line test.

TECHNICAL SPECIFICATIONS

BMI088 Technical data	
Digital resolution	Accelerometer (A): 16-bit Gyroscope (G): 16-bit
Resolution	(A): 0.09 mg (G): 0.004 °/s
Measurement range and sensitivity (calibrated)	(A) ±3 g: 10920 LSB/g ±6 g: 5460 LSB/g ±12 g: 2730 LSB/g ±24 g: 1365 LSB/g (G) ±125 °/s: 262.1 LSB/°/s ±250 °/s: 131.1 LSB/°/s ±500 °/s: 65.5 LSB/°/s ±1000 °/s: 32.8 LSB/°/s ±2000 °/s: 16.4 LSB/°/s
Zero offset (typ. Over life-time)	(A): ± 30 mg (G): ± 1 °/s
TCO	(A): ± 0.2 mg/K (G): ± 0.015 °/s/K
Noise density (typ.)	(A): 230 µg/√Hz (G): 0.014 °/s/√Hz
Bandwidths (progr.)	685 Hz ... 8 Hz
Selectable output data rates	12.5 Hz ... 2 kHz
Digital inputs/outputs	SPI, I^{2}C 4 x digital interrupts
Supply voltage (V$_{DD}$)	2.4 ... 3.6 V
I/0 supply voltage (V$_{DDIO}$)	1.2 ... 3.6 V
Temperature range	-40 ... +85 °C
Current consumption (full operation)	5.15 mA
LGA package	3 x 4.5 x 0.95mm³