

BMG160

3-axis gyroscope sensor

Bosch Sensortec



BOSCH
Invented for life

General description

The BMG160 is an ultra-small, digital 3-axis angular rate sensor with a measurement range up to 2000°/s and a digital resolution of 16 bit for consumer electronics applications.

The BMG160 allows low-noise measurement of angular rates in 3 perpendicular axes and is designed for use in mobile phones, handhelds, computer peripherals, man-machine interfaces, virtual reality features, remote and game controllers.

BMG160 target applications

- ▶ Gaming
- ▶ Navigation systems
- ▶ Motion and activity measurement
- ▶ Optical image stabilization

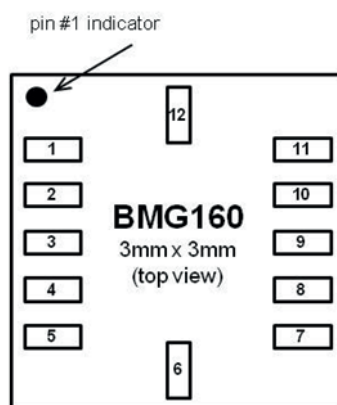
Key features

With its small footprint of only 3 mm x 3 mm the BMG160 is unique in the class of low-noise consumer electronics gyroscopes. The zero-rate offset and offset stability over temperature of the BMG160 are outstanding.

- ▶ 3-axis integrated, digital gyroscope
- ▶ 16 bit digital resolution
- ▶ 5 programmable angular rate measurement ranges
- ▶ Integrated interrupt engine and FIFO buffer
- ▶ Low power consumption <5 mA
- ▶ Short start-up time of 30 ms
- ▶ I²C and SPI interface (4-wire and 3-wire)
- ▶ Low-pass filters (programmable)
- ▶ Fast and slow offset controller
- ▶ Ultra small size: 3 mm x 3 mm x 0.95 mm outline dimensions
- ▶ MSL level 1 category 12-pin LGA package
- ▶ RoHS compliant, halogen-free

BMG160	Technical data
Digital resolution	16 bit
Measurement ranges (programmable)	±125°/s, ±250°/s, ±500°/s, ±1000°/s, ±2000°/s
Sensitivity (calibrated)	±125°/s: 262.4 LSB/°/s ±250°/s: 131.2 LSB/°/s ±500°/s: 65.5 LSB/°/s ±1000°/s: 32.8 LSB/°/s ±2000°/s: 16.4 LSB/°/s
Zero-rate offset (typ.)	±1°/s
Zero-rate offset over temperature	0.015°/s/K
Noise density (typ.)	0.014°/s/√Hz
Low-pass filter bandwidths (progr.)	230, 116, 64, 47, 32, 23, 12 Hz
Date rates (programmable)	2000, 1000, 400, 200, 100 Hz
Digital inputs/outputs	SPI, I ² C, 2x digital interrupts
Supply voltage (V _{DD})	2.4 ... 3.6 V
I/O supply voltage (V _{DDIO})	1.2 ... 3.6 V
Temperature range (operating)	-40 ... +85 °C
Current consumption	
▶ full operation	5.0 mA
▶ fast power-up	2.5 mA
FIFO data buffer	100 samples depth (each axis)
LGA package	3 mm x 3 mm x 0.95 mm
Shock resistance	10,000 g x 200 μs

Pin configuration (top view)



Pin no.	Name	Type	Description
1	NC	-	Not connected
2	V _{DD}	Power supply	Analog power supply
3	GNDA	Power supply	Analog ground
4	INT1	Input/output	Interrupt 1
5	CSB	Input	Chip select
6	PS	Input	Protocol Select
7	SCL/SCK	Input	Serial clock
8	SDO	Output	Serial data out
9	SDI/SDA	Input / output	Serial data in / out
10	V _{DDIO}	Power supply	Power supply digital interface
11	GND _{IO}	Power supply	I/O ground
12	INT2	Input/output	Interrupt 2

Featuring a full operation current consumption of only 5 mA the BMG160 is ideally suited for battery powered devices, like mobile phones, remote controllers and mobile gaming devices. In fast power-up mode the current consumption can be even further reduced to only 2.5 mA.

The BMG160 offers many configuration possibilities in

order to give the designer full flexibility when integrating the sensor into the target application. Depending on the programmable settings the integrated interrupt engine of the BMG160 signals the occurrence of certain events via the sensors' interrupt pins. The corresponding registers of the BMG160 can easily be set and read-out via the digital sensor interfaces.

The BMG160 features I²C and SPI (3-wire/4-wire) digital, serial interfaces. Sensor parameters, like measurement ranges or low-pass filter settings and also all interrupt engine settings can be easily programmed via the digital interfaces.

System compatibility

The BMG160 has been designed for best possible fit into modern mobile consumer electronics devices. Besides the ultra-small footprint and very low power consumption, the BMG160 has very wide ranges for V_{DD} and V_{DDIO} supply voltages.

Last but not least, the BMG160 also includes a FIFO buffer with 100 samples depth for each axis. An integrated self-test feature facilitates overall system reliability.

Headquarters Bosch Sensortec GmbH

Gerhard-Kindler-Strasse 8
72770 Reutlingen · Germany
Telephone +49 7121 3535 900
Fax +49 7121 3535 909
contact@bosch-sensortec.com
www.bosch-sensortec.com



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

Телефон: 8 (812) 309 58 32 (многоканальный)

Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.