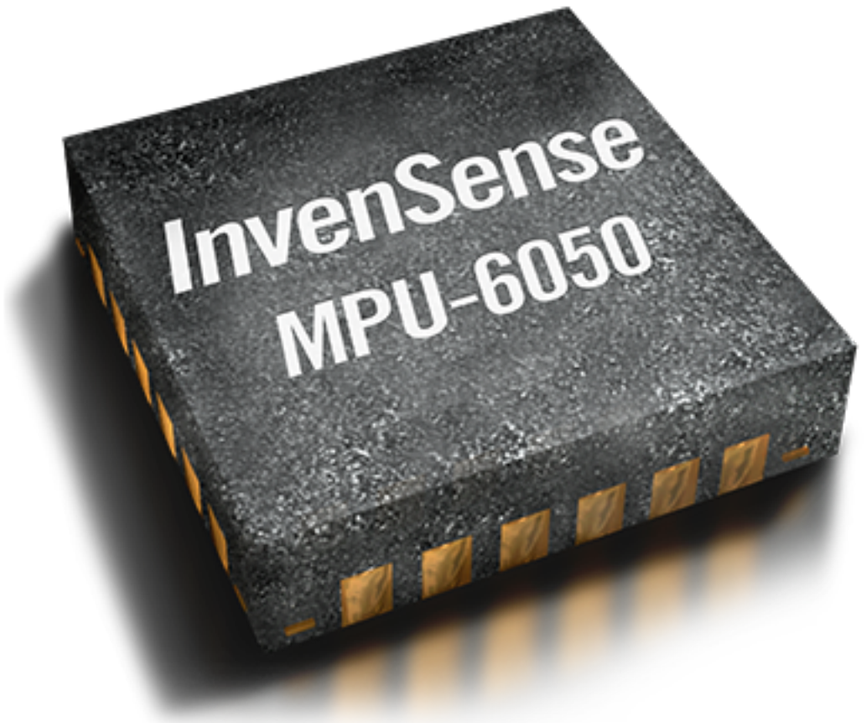


DOCUMENTATION

PURCHASE (HTTP://STORE.INVENSENSE.COM/PRODUCTDETAIL/MPU-6050-INVENSENSE-INC/422200/PID=1135)

PURCHASE EVB (HTTP://STORE.INVENSENSE.COM/PRODUCTDETAIL/MPU6050EVB-INVENSENSE-INC/422548/)

MPU-6050 Six-Axis (Gyro + Accelerometer) MEMS MotionTracking™ Devices

The MPU-6050™ parts are the world's first MotionTracking devices designed for the low power, low cost, and high-performance requirements of smar sensors.

The MPU-6050 incorporates InvenSense's MotionFusion™ and run-time calibration firmware that enables manufacturers to eliminate the costly and comp system level integration of discrete devices in motion-enabled products, guaranteeing that sensor fusion algorithms and calibration procedures de consumers.

The MPU-6050 devices combine a 3-axis gyroscope and a 3-axis accelerometer on the same silicon die, together with an onboard Digital Motion Process complex 6-axis MotionFusion algorithms. The device can access external magnetometers or other sensors through an auxiliary master I^2C bus, allowing th sensor data without intervention from the system processor. The devices are offered in a 4 mm x 4 mm x 0.9 mm QFN package.

(http://www.invensense.com/wp-content/uploads/2014/12/mpu-6000-family-diagram.png)

MPU-6000 Family Block Diagram

The InvenSense MotionApps™ Platform that comes with the MPU-6050 abstracts motion-based complexities, offloads sensor management from the op structured set of APIs for application development.

For precision tracking of both fast and slow motions, the parts feature a user-programmable gyro full-scale range of ±250, ±500, ±1000, and ±2000 °/sec (accelerometer full-scale range of ±2g, ±4g, ±8g, and ±16g. Additional features include an embedded temperature sensor and an on-chip oscillator with ± temperature range.

Product Details

Part #	Gyro Full Scale Range	Gyro Sensitivity	Gyro Rate Noise	Accel Full Scale Range	Accel Sensitivity	Digital Output	Logic Supply Voltage	O
UNITS:	(°/sec)	(LSB/°/sec)	dps/√Hz	(g)	LSB/g		(V)	
 MPU-6050 (../../6-axis/mpu-6050/)	±250 ±500 ±1000 ±2000	131 65.5 32.8 16.4	0.005 0.005 0.005 0.005	±2 ±4 ±8 ±16	16384 8192 4096 2048	I²C	1.8V±5% or VDD	

MPU-6050

DS MPU-6000 Datasheet (https://www.invensense.com/wp-content/uploads/2015/02/MPU-6000-Datasheet1.pdf)

AN ARM Reference Board Application Note (https://www.invensense.com/wp-content/uploads/2015/02/ARM-Reference-Board.pdf)

EVB MPU-6000/MPU-6050 EV Board User Guide (https://www.invensense.com/wp-content/uploads/2015/02/MPU-6000-EV-Board1.pdf)

RM MPU-6000 and MPU-6050 Register Maps and Descriptions (https://www.invensense.com/wp-content/uploads/2015/02/MPU-6000-Register-Map1.pdf)

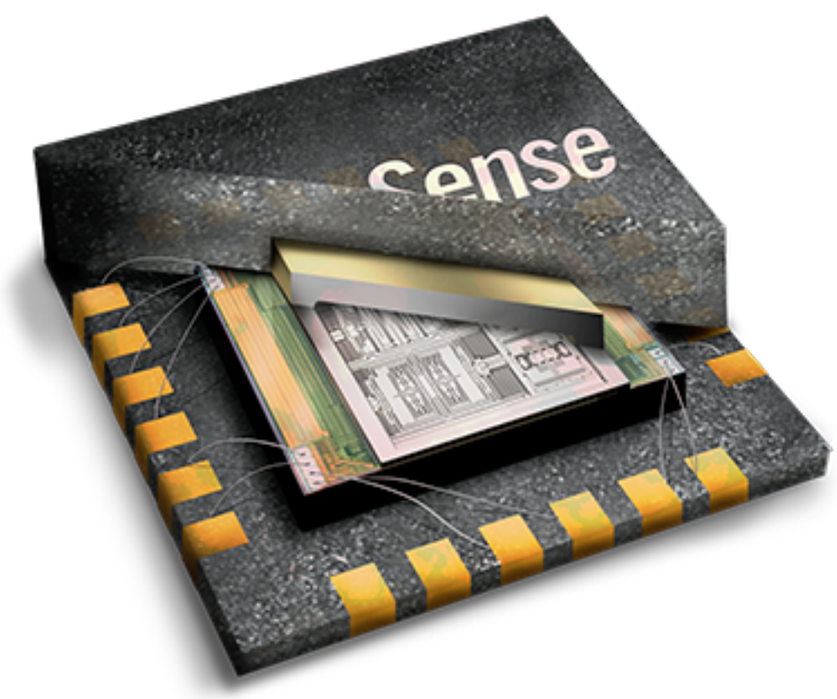
Features

- • Digital-output of 6-axis MotionFusion data. 9-axis fused data from Motion Processing Library
- Programmable interrupt supports gesture recognition, pannir scrolling, and shake detection

- Tri-Axis angular rate sensor (gyro) with a sensitivity up to 131 LSBs/dps and a full-scale range of ±250, ±500, ±1000, and ±2000dps
- Tri-Axis accelerometer with a programmable full scale range of ±2*g*, ±4*g*, ±8*g* and ±16*g*
- Reduced settling effects and sensor drift by elimination of board-level cross-axis alignment errors between accelerometers and gyroscopes
- Digital Motion Processing™ (DMP™) engine offloads complex MotionFusion, sensor timing synchronization and gesture detection
- MotionApps™ Platform support for Android, Linux, and Windows
- Embedded algorithms for run-time bias and compass calibration in library. No user intervention required
- Digital-output temperature sensor
- Digital input on FSYNC pin to support video Electronic Image Stabilization and GPS

- VDD Supply voltage range of 2.375V–3.46V; VLOGIC (MPU-60 or VDD
- Gyro operating current: 3.6mA (full power, gyro at all rates)
- Gyro + Accel operating current: 3.8mA (full power, gyro at all r 1kHz sample rate)
- Accel low power mode operating currents: 10µA at 1Hz, 20µA at 20Hz, 140µA at 40Hz
- Full Chip Idle Mode Supply Current: 5µA
- 400kHz Fast Mode I^2C or up to 20MHz SPI (MPU-6000 only) se interfaces
- User self test
- 10,000*g* shock tolerant
- Smallest and thinnest package for portable devices (4x4x0.9r
- RoHS and Green compliant

Related Products



(https://www.invensense.com/products/motion-tracking/6-axis/

6-Axis (https://www.invensense.com/products/motion-tracking/6-axis/)

For the Audio forum and additional support, login to our Developers Corner (https://www.invensense.com/developers).

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