ICM-42605

Low Power High Performance 6-Axis MEMS MotionTracking™ Device

GENERAL DESCRIPTION

The ICM-42605 is a 6-axis MotionTracking device that combines a 3-axis gyroscope, and a 3-axis accelerometer in a small 2.5x3x0.91 mm (14-pin LGA) package. It also features a 2K-byte FIFO that can lower the traffic on the serial bus interface, and reduce power consumption by allowing the system processor to burst read sensor data and then go into a low-power mode. ICM-42605, with its 6-axis integration, enables manufacturers to eliminate the costly and complex selection, qualification, and system level integration of discrete devices, guaranteeing optimal motion performance for consumers.

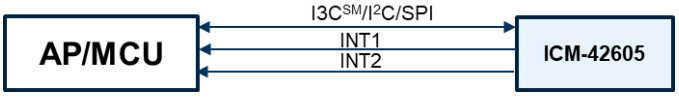
The gyroscope supports eight programmable full-scale range settings from ±15.625dps to ±2000dps, and the accelerometer supports eight programmable full-scale range settings from ±2g to ±16g.

Other industry-leading features include programmable digital filters, an embedded temperature sensor, and programmable interrupts. The device features I3C℠, I²C and SPI serial interfaces, a VDD operating range of 1.71 V to 3.6 V, and a separate digital IO supply, VDDIO from 1.71 V to 3.6 V.

The host interface can be configured to support I3C℠ slave, I²C slave, or SPI slave modes. The I3C℠ interface supports speeds up to 12.5MHz (data rates up to 12.5Mbps in SDR mode, 25Mbps in DDR mode), the I²C interface supports speeds up to 1 MHz, and the SPI interface supports speeds up to 24 MHz.

By leveraging its patented and volume-proven CMOS-MEMS fabrication platform, which integrates MEMS wafers with companion CMOS electronics through wafer-level bonding, InvenSense has driven the package size down to a footprint and thickness of 2.5x3x0.91 mm (14-pin LGA), to provide a very small yet high performance low cost package. The device provides high robustness by supporting 20,000*g* shock reliability.

BLOCK DIAGRAM



APPLICATIONS

- Smartphones and Tablets
- Wearable Sensors
- Virtual Reality headsets and controllers
- IoT Applications

FEATURES

- Gyroscope programmable full-scale range of ±15.625, ±31.25, ±62.5, ±125, ±250, ±500, ±1000, and ±2000 degrees/sec
- Accelerometer programmable full-scale range of ±2*g*, ±4*g*, ±8*g* and ±16*g*
- Low-Noise mode 6-axis current consumption of 0.65mA
  - Gyroscope Noise: 3.8mdps/√Hz
  - Accelerometer Noise: 70µg/√Hz
- 2K-byte FIFO reduces traffic on serial bus interface
- EIS FSYNC support
- User-programmable digital filters for gyroscope, accelerometer, and temperature sensor
- User-programmable interrupts
- APEX Motion Functions: Pedometer, Tilt Detection, Raise to Wake/Sleep, Tap Detection, Wake on Motion, Significant Motion Detection
- Host interface: 12.5MHz I3C℠, 1MHz I²C, 24MHz SPI
- Digital-output temperature sensor
- Nominal VDD operation at 1.8V
- 20,000 *g* shock tolerant
- RoHS and Green compliant

ORDERING INFORMATION

PART	TEMP RANGE	PACKAGE
ICM-42605†	−40°C to +85°C	14-Pin LGA

†Denotes RoHS and Green-Compliant Package

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