LSM6DSM

iNEMO® always-on 6-axis inertial module

3D accelerometer and 3D gyroscope ultra low power with enhanced embedded features in LGA-14 2.5 x 3 x 0.83 mm package

LSM6DSM, represent the latest generation of highly performance 6-axis MEMS inertial modules with ultra-low-power design that strengthen the smartphone’s emerging role as an “always-on” personal assistant. LSM6DSM enable enhance user experiences for digital cameras, wearables and remote controls, gaming, drones, and virtual reality. LSM6DSM offers best-in-class accuracy and efficiency as well as always-on low-power features for an optimal motion experience and support OIS requirements.

### KEY FEATURES
- Acceleration range: ±2/±4/±8/±16 g
- Angular rate range: ±125/±245/±500/±1000/±2000 dps
- Smart FIFO up to 4 kbytes
- Noise density (accel.): 90 μg/√Hz
- Rate noise (gyro.): 3.8 mdps/√Hz
- 16-bit output resolution
- Current consumption (gyro. & accel.):
  - Normal mode 0.45 mA @ ODR = 208 Hz
- Supply voltage range: 1.71 to 3.6 V
- Temperature range: -40 to +85 °C
- Embedded sensor hub
- I²C/SPI digital interfaces
- LGA-14 package (2.5 x 3 x 0.83 mm)

### KEY APPLICATIONS
- Full gesture recognition and movement detection
- Activity monitoring
- Gaming applications
- Wearable devices
- Mobile phone and portable devices
- Headsets and virtual reality
- Remote control
- IMU for helicopters, drones and robots
- Dead reckoning & LBS
- Electronic image stabilization (EIS)
- Optical image stabilization (OIS)
ADVANCED FEATURES

Enhanced flexibility with embedded FIFO
- Able to store external data from up to 4 different external sensors
- Synchronous data collection and possibility to store timestamp data

Advanced sensor hub
- Data coming from external and internal sensors can be stored, elaborated and efficiently sent to the upper-layer MCU.

Ultra-low power consumption
- 0.29 mA in Combo low-power mode
- 0.45 mA in Combo normal mode
- 0.65 mA in Combo high-performance mode at up to 1.6 kHz

Higher thermal stability
- For both offset/sensitivity of accelerometer and gyroscope over the whole operating temperature range from -40 to +85 °C

Advanced digital features
- Event detection and fully configurable interrupts:
  - Free-fall wakeup
  - 6D orientation
  - Tap and double-tap sensing
  - Activity/inactivity recognition
- Specific embedded IP blocks with negligible power consumption and high performance:
  - Pedometer functions including step detector and step counters
  - Relative tilt detection
  - Significant motion detection (Absolute Wrist tilt)
- Auxiliary SPI (3-4 wire) serial interface for external sensor connections (e.g. camera module)

APPLICATIONS

- OIS (Optical Image Stabilization) and EIS (Electrical Image Stabilization)
- Home/Smart home automation
- PDR/Indoor Navigation
- Handhelds application/Portable for UI (User Interface)
- Fitness/Wearable
- Gaming
- Drones

EVALUATION TOOLS

<table>
<thead>
<tr>
<th>Order code</th>
<th>Description</th>
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<tbody>
<tr>
<td>X-NUCLEO-IKS01A1</td>
<td>Expansion board for STM32 Nucleo boards</td>
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For further information please visit http://www.st.com/inemo