

# LSM6DSM

## iNEMO<sup>®</sup> 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:  $\pm 2/\pm 4/\pm 8/\pm 16$  g
- Angular rate range:  $\pm 125/\pm 245/\pm 500/\pm 1000/\pm 2000$  dps
- Smart FIFO up to 4 kbytes
- Noise density (accel.):  $90 \mu\text{g}/\sqrt{\text{Hz}}$
- Rate noise (gyro.):  $3.8 \text{ mdps}/\sqrt{\text{Hz}}$
- 16-bit output resolution
- Current consumption (gyro. & accel.):
  - Normal mode  $0.45 \text{ mA @ ODR} = 208 \text{ Hz}$
- Supply voltage range: 1.71 to 3.6 V
- Temperature range: -40 to +85 °C
- Embedded sensor hub
- I<sup>2</sup>C/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

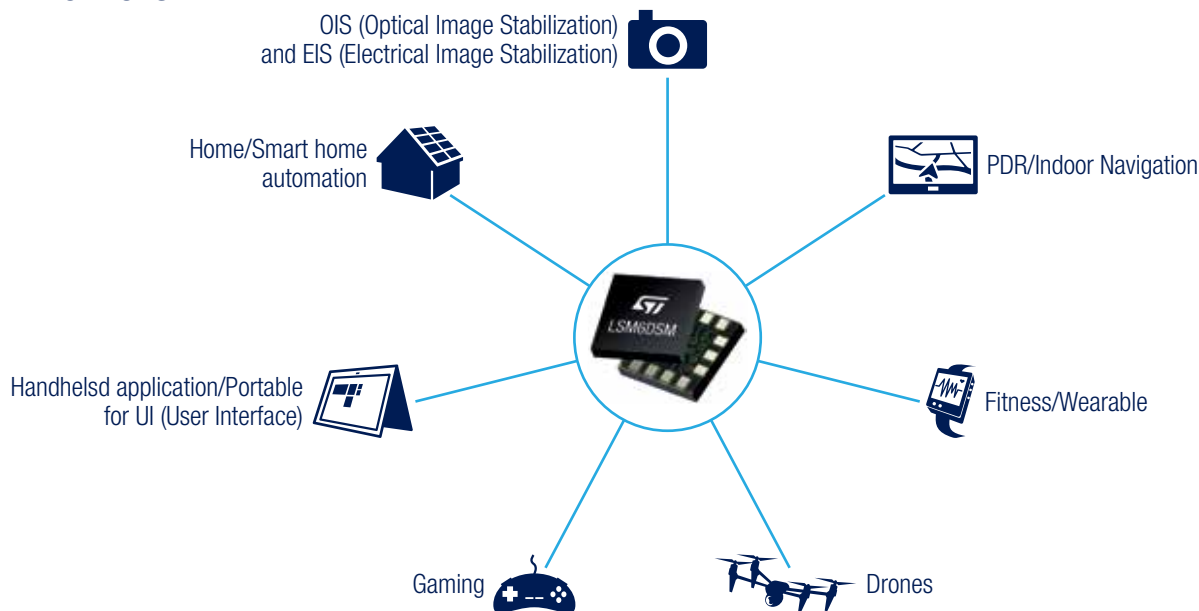
### Higher thermal stability

- 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



## EVALUATION TOOLS

Order code	Description
X-NUCLEO-IKS01A1	Expansion board for STM32 Nucleo boards

For further information please visit <http://www.st.com/inemo>