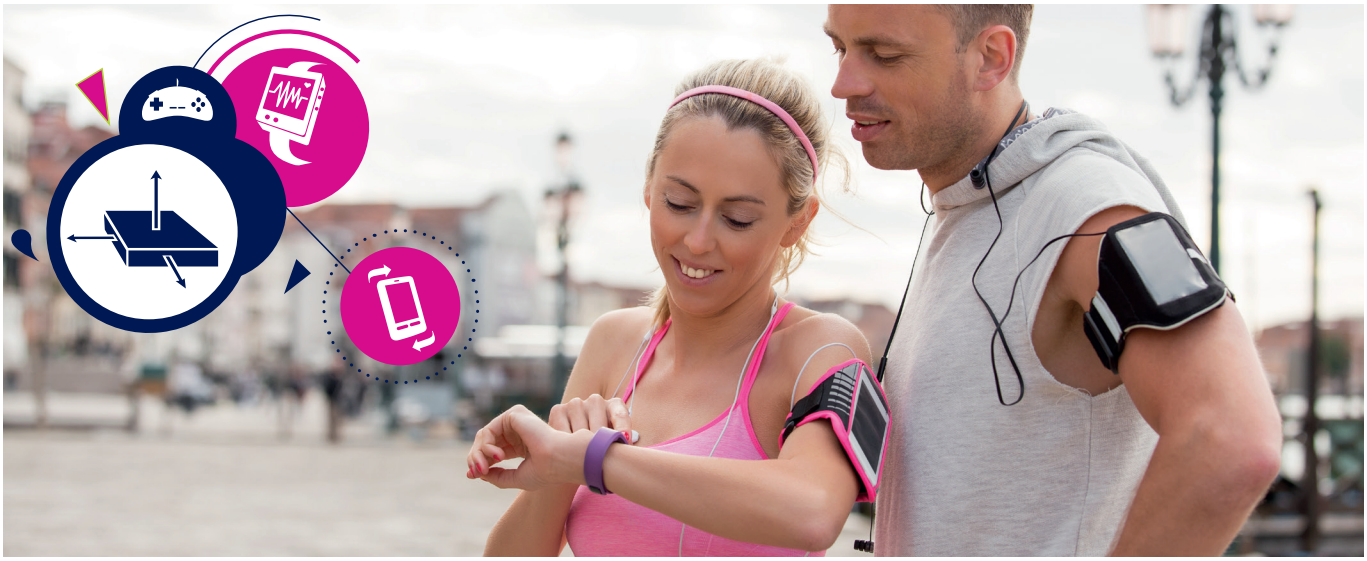
life.augmented

LIS2DW12

Flexible ultra-low-power 3-axis smart accelerometer



Versatile, high-performance, ultra-low-power, 3-axis, «femto» accelerometer in a 2 x 2 x 0.7 mm package

The LIS2DW12 is the latest generation of our high-performance 3-axis MEMS accelerometer with an ultra-low-power "femto" design.
The LIS2DW12 has 16-bit output and can be set to prioritize low power consumption less than 1 µA or low-noise performance down to 90 µg/√Hz with five settings in either mode.
Thanks to its measurement accuracy and flexibility, the LIS2DW12 is particularly suitable for next-gen applications from healthcare, fitness and gaming to industrial sensing and environmental monitoring.

KEY FEATURES

- Acceleration range: ±2/±4/±8/±16 g
- Multiple operating modes with multiple bandwidths
- 32-level FIFO
- Noise density (accel.): 90 µg/√Hz
- Very low noise down to 1.3 mg RMS in low power mode
- 16-bit output resolution
- Ultra-low power consumption:
  - Power-down mode: 50 nA
  - Low-power mode: < 1 µA @ ODR = 12.5 Hz
- Supply voltage range: 1.62 to 3.6 V
- Temperature range: -40 to +85 °C
- I²C/SPI digital interfaces
- LGA-12 package (2 x 2 x 0.7 mm)

KEY APPLICATIONS

- Motion detection for wearables
- Gesture recognition and gaming
- Motion-activated functions and user interfaces
- Display orientation
- Tap/double-tap recognition
- Free-fall detection
- Smart power saving for handheld devices
- Impact recognition and logging
- Hearing aids
- Portable healthcare devices
- Wireless sensor nodes
- Motion-enabled metering devices

ADVANCED FEATURES

Enhanced flexibility with embedded FIFO

32-level first-in, first-out (FIFO) buffer allowing the user to store data in order to limit intervention by the host processor.

Higher thermal stability

- Over the entire operating temperature range from -40 to +85 °C

Ultra-low power consumption

- High-performance mode:
  - 90 µA @ ODR = 12.5 to 1600 Hz
- Low-power mode:
  - 5 µA @ ODR = 100 Hz
  - 3 µA @ ODR = 50 Hz
  - 1 µA @ ODR = 12.5 Hz
  - 0.38 µA @ ODR = 1.6 Hz
- Power-down mode: 50 nA

Advanced digital features

- Dedicated internal engine to process motion and acceleration detection:
  - Free-fall wakeup
  - 6D/4D orientation
  - Tap and double-tap recognition
  - Activity/inactivity recognition
  - Portrait/landscape detection

Operating modes

Low-noise mode «Disabled»

Parameter	High-perf. mode	Low-power mode 4	Low-power mode 3	Low-power mode 2	Low-power mode 1
Resolution	14-bit	14-bit	14-bit	14-bit	12-bit
Noise density (µg/√Hz)	110	160	210	300	550

Low-noise mode «Enabled»

Parameter	High-perf. mode	Low-power mode 4	Low-power mode 3	Low-power mode 2	Low-power mode 1
Resolution	14-bit	14-bit	14-bit	14-bit	12-bit
Noise density (µg/√Hz)	90	130	180	240	450

EVALUATION TOOLS

Order code	Description
X-NUCLEO-IKS01A2	Motion MEMS and environmental sensor expansion board for STM32 Nucleo
STEVAL-MKI109V2	eMotion: ST MEMS adapters motherboard based on STM32F103, compatible with all ST MEMS adapter boards
STEVAL-MKI109V3	Professional MEMS tool: ST MEMS adapters motherboard based on the STM32F401VET6 compatible ST MEMS adapters
STEVAL-MKI179V1	LIS2DW12 adapter board for a standard DIL24 socket

For more information, visit www.st.com/accelerometers