

3-axis digital accelerometers for smarter, easier-to-use and energy-efficient portable devices



ST's ultra-low-power accelerometers for advanced motion recognition and power management features

Housed in ultra-small packages and featuring excellent stability over time and temperature, ST's accelerometers are the ideal choice for all the most demanding consumer and industrial applications. The LIS3DSHTR, LIS3DHTR, LIS2HH12TR, LIS2DH12TR, LIS2DE12TR accelerometers are able to operate in ultra-low-power modes, thus lowering the overall system power consumption and extending the device's battery life. They also offer smart motion features, such as sleep-to-wakeup and return-to-sleep functions, to easily design the most intuitive and precise user interfaces.

FEATURES

- Selectable full-scale up to 16g
- High resolution
- Power-down, sleep and ultra-low-power operating modes for advanced power saving
- Smart embedded functions such as 4D/6D orientation detection auto wakeup and return-to-sleep
- Programmable interrupts and embedded FIFO
- Embedded state machines for custom motion recognition (LIS3DSH)
- Digital interfaces: I²C/SPI
- Output data rates from 1 Hz to 5 kHz
- Embedded temperature sensor

BENEFITS

- Extremely accurate motion-sensing capabilities in ever smaller and sleeker consumer gadgets
- Design flexibility
- Extremely low power consumption maximizes battery life
- Embedded FIFO for smart data storage and power saving
- State machines enable custom motion recognition inside the sensor, further reducing system complexity
- Temperature detection for advanced thermal drift compensation

DEVICE SUMMARY



Features	LIS3DSHTR	LIS3DHTR	LIS2HH12TR	LIS2DH12TR	LIS2DE12TR
Full scale	±2g/4g/8g/16g	±2g/4g/8g/16g	±2g/4g/8g	±2g/4g/8g/16g	±2g/4g/8g/16g
Output resolution	14-bit	12-bit	14-bit	12-bit	8-bit
Noise density (µg/√Hz)	150	220	130	220	220
Output data rate (Hz)	3.125, 6.25, 12.5, 25, 50, 100, 400, 800, 1600	1, 10, 25, 50, 100, 200, 400, 1250, 1600, 5000	10, 50, 100, 200, 400, 800	1, 10, 25, 50, 100, 200, 400, 1250, 1600, 5000	1, 10, 25, 50, 100, 200, 400, 1250, 1600, 5000
Programmable interrupts	2	2	2	2	2
Embedded FIFO	√	√	√	√	√
Embedded finite state machine	√				
Supply voltage (V)	1.7 to 3.6	1.7 to 3.6	1.7 to 3.6	1.7 to 3.6	1.7 to 3.6
Temperature range (°C)	-40 to +85	-40 to +85	-40 to +85	-40 to +85	-40 to +85
Digital interfaces	I2C/SPI	I2C/SPI	I2C/SPI	I2C/SPI	I2C/SPI
Size (mm)	3 x 3 x 1	3 x 3 x 1	2 x 2 x 1	2 x 2 x 1	2 x 2 x 1

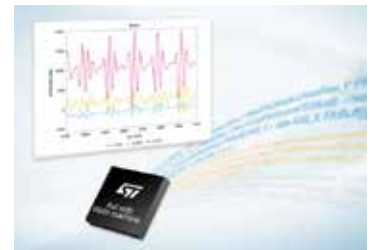
ACCELEROMETER WITH EMBEDDED STATE MACHINES

The LIS3DSHTR is an ultra-low-power high-performance 3-axis linear accelerometer with two embedded finite-state machines.

These programmable blocks allow the user to implement customized motion-detection-based applications with a high level of flexibility, working autonomously, so reducing the microprocessor workload by moving programming functionality inside the sensor.

In this way, the two embedded finite state machines can be programmed independently for motion detection. Each state machine has 16 states for data storage.

The device can be configured to generate interrupt signals activated by user defined motion patterns.



PRODUCT SELECTOR

Part number	Package	Packing type
LIS3DSHTR	LGA-16 3 x 3 x 1 mm	Tape and reel
LIS3DHTR	LGA-16 3 x 3 x 1 mm	Tape and reel
LIS2HH12TR	LGA-12 2 x 2 x 1 mm	Tape and reel
LIS2DH12TR	LGA-12 2 x 2 x 1 mm	Tape and reel
LIS2DE12TR	LGA-12 2 x 2 x 1 mm	Tape and reel

For detailed operating conditions, parameters and more information about MEMS product catalogue and datasheets, see www.st.com/accelerometers



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