LSM6DSV320X
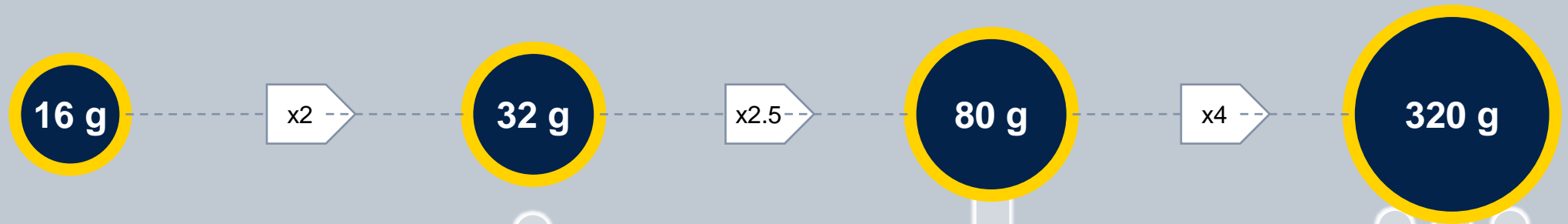
For all is on you and around you

Continue to unleash the potential of our cutting-edge MEMS sensors

16 g → x2 → 32 g → x2.5 → 80 g → x4 → 320 g

Motion tracking, Walking, running, jogging
LSM6DSV16X

Medium intensity activity tracking
LSM6DSV32X
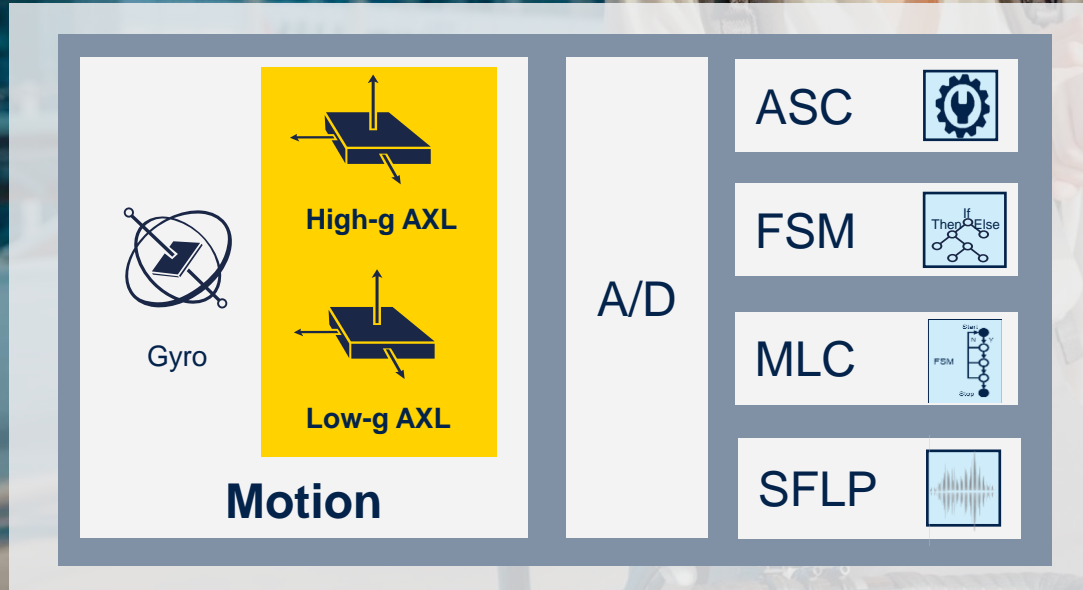
High intensity activities tracking
LSM6DSV80X

High-g shock tracking
LSM6DSV320X

What's the LSM6DSV320X?

New sensor technology for accurate and efficient measurement of both high and low acceleration levels

LSM6DSV320X

Accurate and **valuable insights** for motion and intense impact tracking

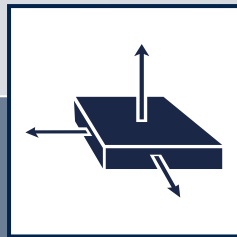**Edge AI and self-configuration**: FSM*, MLC*, ASC* and SFLP* embedded resources

*FSM = finite state machine
*MLC = machine learning core
*ASC = adaptive self-configuration
*SFLP = sensor fusion low power

Which attributes for LSM6DSV320X?

High impact tracking

An **innovative new mechanical structure** for high and low accelerations

Context identification

Edge AI computing and **sensor fusion inside the sensor** for spatial orientation

Efficiency

Compact package with three fully synchronized **sensors** and **adaptive sensor configuration** (ASC)
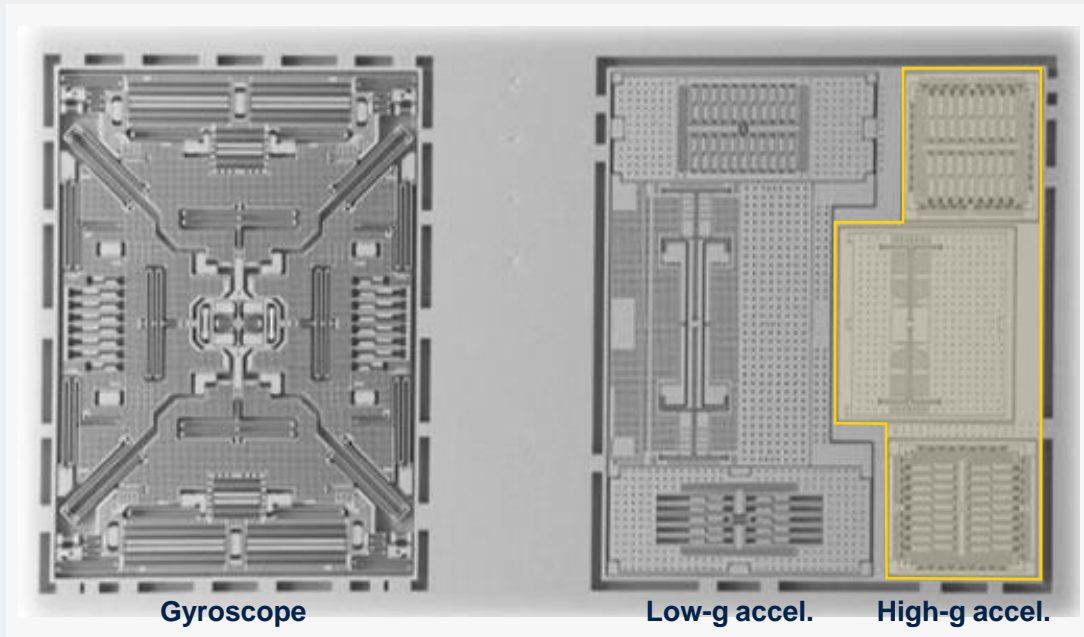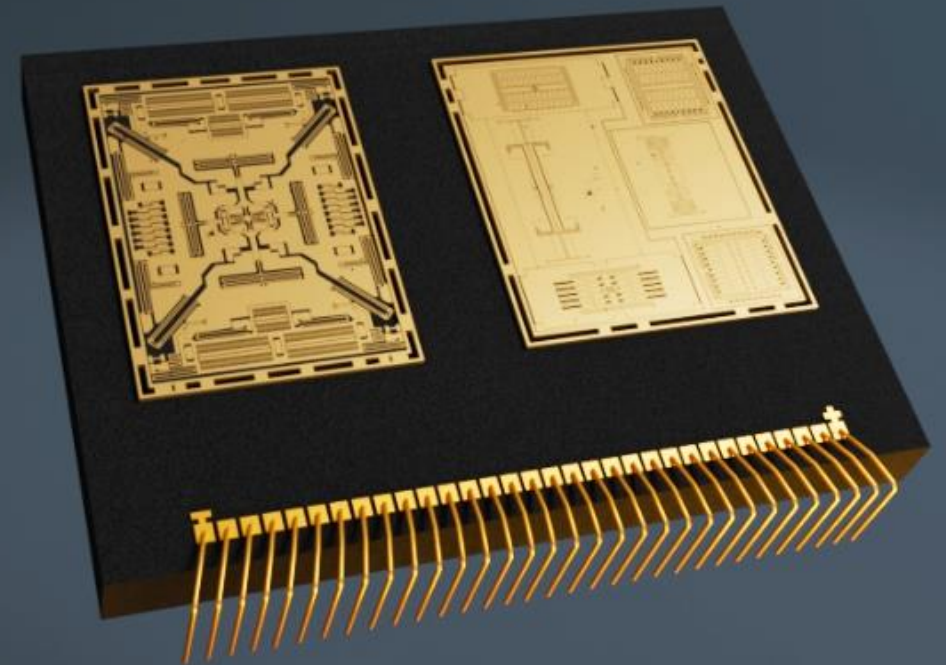
Differentiating features for new applications

Industry-first high performance 6-axis IMU with a **dedicated high-g accelerometer** for intensity impact and shock detection
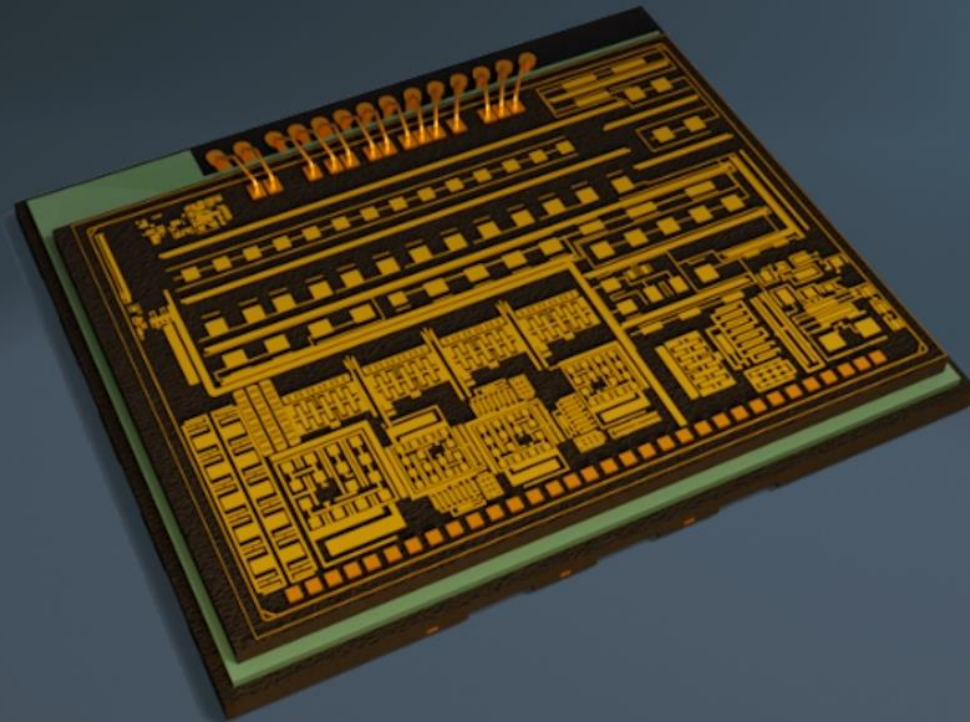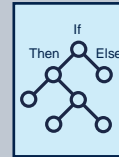
Gyroscope   **Low-g accel.**   **High-g accel.**

Top view of MEMS unit of LSM6DSV320X

Enhanced **contextual awareness** with an IMU embedding AI and advanced processing features
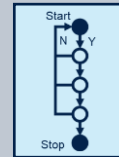
MLC	FSM	ASC	SFLP
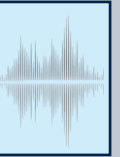
Emergency calls

Fall/drop reconstruction

Intense movements tracking

Concussion monitoring

MLC = machine learning core
FSM = finite state machine
ASC = adaptive self-configuration
SFLP = sensor fusion low power

You and all around you Applications with LSM6DSV320X

Smartphone & foldable	Wearable	Smart tags & IoT	PC, laptop, and tablet	Gaming
Emergency call	Emergency call	Shock and drops impact tracking	High impact recording	Intense gestures
Human activity recognition	Intense sports tracking	Motion tracking	Lid angle detection	High impact recording
Lid angle detection	Human activity recognition	Context awareness	Context awareness	
Camera: image stabilization	Context awareness			
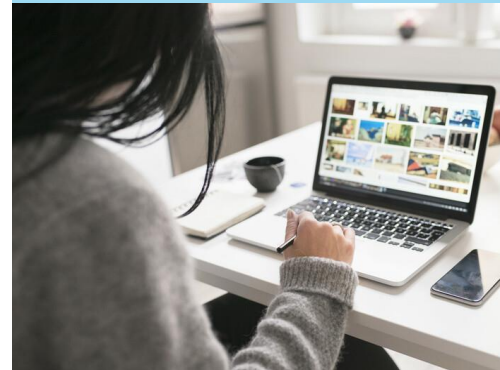
Now, you can capture all events around you by yourself

A comprehensive ecosystem for developers

Software libraries	Software tool	Development kits

Software libraries

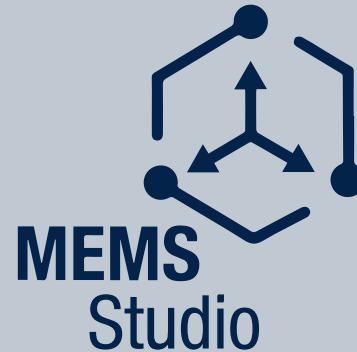**Motion XLF**
Accuracy data (fusion of high-g and low-g)

Sensor fusion
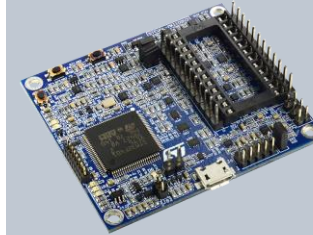Heterogenous data (different sensors' fusion)

Context awareness (MLC)
Human activity recognition, gesture from wrist

Software tool

MEMS
Studio

Development kits

Professional MEMS tool
(STEVAL-MKI109D)

STEVAL-MKI251A

SensorTile.Box PRO

Evaluate and program the LSM6DSV320X – Develop embedded AI features, design no-code algorithms

Innovative structure for optimized low-g and high-g sensing

LSM6DSV320X

Flexible

Dual accelerometer with dedicated channels and self test

- Low-g accelerometer: up to ± 16 g
- High-g accelerometer: **up to ±320 g.**
- Gyroscope: up to ±4000 dps

No overhead in the package size

- Compact IMU footprint: 2.5 x 3.0 x 0.83 mm

At-the-edge processing

- Adaptive self-configuration (ASC)
- MLC[1] (1 kHz, 256 nodes), FSM[2], SFLP[3]
- 1.5 KB FIFO (up to 4.5 KB with compression)
- OIS with Aux I^{3}C interface (v1.1)
- And more…

Automatic switch with FSM

320 g

High-g accelerometer

16 g

Low-g accelerometer
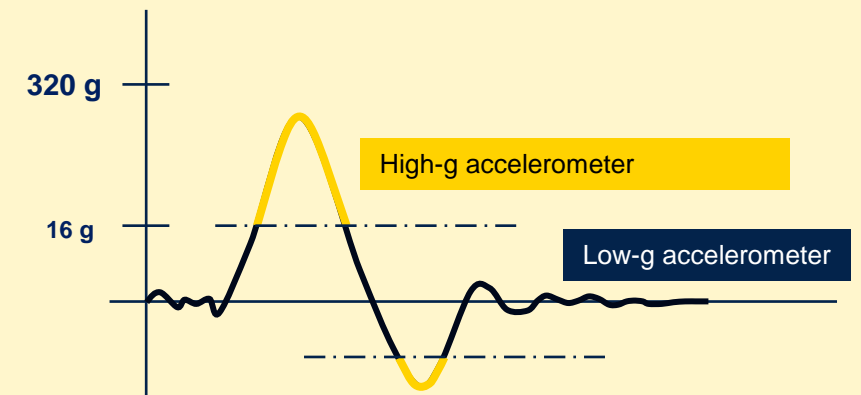
(1) MLC: Machine learning core

(2) FSM: Finite state machine

(3) SFLP: Sensor fusion low power

Why use LSM6DSV320X?

LSM6DSV320X enables solutions unlocking creativity and transforming applications

- High-g sensing removing false positive detection

- High-fidelity dynamic signal tracking

- Always-on sensing in the best efficient way

- System level complexity reduction and efficiency

LSM6DSV320X: comparison vs competitors

Features	LSM6DSV320X	Competitor IMUs
Mechanical structure	Three sensing elements in a single package • Gyroscope • Low-g accelerometer (±16 g) • High-g accelerometer (±320 g)	Two sensing elements in a single package • Gyroscope • Low-g accelerometer (±32 g)
Signal dynamics reconstruction	Capable of high-fidelity motion tracking and reconstruction	Limited reconstruction of dynamics
False-positive robustness	High robustness with advanced filtering and signal processing	Basic filtering capabilities
Edge AI	Machine learning core and adaptive self-configuration	--
Software libraries	Motion XLF, sensor fusion, context awareness, basic libraries	Basic libraries for standard operations
Target applications	Superior functionality in mobile, IoT, and asset tracking devices	Limited functionality in standard wearable applications

The perfect product for you and all around you
LSM6DSV320X

Industry-first IMU with dual MEMS accelerometer
Measures accurately up to 320 g full-scale range

New frontiers for personal electronics and IoT
Emergency call, drops and falls tracking, concussion, etc

Miniaturized AI-enabled sensor with context-awareness
for system level complexity reduction and efficiency

Our technology
starts with You

Find out more at st.com/LSM6DSV320X