ASM330LHHX

First automotive IMU with embedded machine learning



Dual operating modes and machine learning core in an automotive 6-axis inertial module

The ASM330LHHX is a system-in-package featuring a high-performance 3-axis digital accelerometer and 3-axis digital gyroscope. It's the first automotive IMU embedding ST's proprietrary machine learning core.

The ASM330LHHX has two operating modes including a low-power mode for running always-on applications. It supports also a high-performance mode for applications that demand the highest accuracy and lowest latency.

All the design aspects are optimized to reach superior output stability, extremely low noise, and full data synchronization to benefit sensor-assisted applications like accurate positioning and ADAS.

KEY FEATURES & BENEFITS

- Dual operating modes: high-performance and low-power modes
- Embedded compensation for high stability over temperature
- Six-channel synchronized output to enhance accuracy of dead-reckoning algorithms
- Embedded machine learning core
- Extended temperature range -40 to +105 °C
- AEC-Q100 qualified

KEY APPLICATIONS

- Dead reckoning (DR)
- Vehicle-to-everything (V2X)
- Telematics box
- Antitheft systems
- Impact detection and crash reconstruction
- Motion-activated functions (adaptive lighting, sensors
- Precise positioning
- Display navigation

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Machine learning core

ASM330LHHX is the first automotive IMU with ST's proprietary machine learning core – a hard-wired engine that can be trained, run a decision tree and trigger an interrupt when a specific event is detected.

The embedded machine learning core enables sophisticated real-time performance that demands far lower system energy and computing power than a solution embedded in an application processor or cloud-based AI.

Evaluation tools

Demonstration boards and free software example libraries are available to simplify application development. Functions available include vehicle-stationary detection, attitude and heading reference, altitude estimation, car-tow detection, and crash detection.

A ready-to-use professional MEMS tool (STEVAL-MKI109V3) lets engineers monitor the behavior of ST MEMS sensors, which can help accelerate time to market and maximize the performance of new product designs.

The STEVAL-MKI212V1 adapter board facilitates the evaluation of our ASM330LHHX series of 6-axis inertial modules. The board offers an effective solution for fast system prototyping and device evaluation directly within the user's own application. Configuration examples for the Machine Learning Core are available in ST's public GitHub repository.

Part number	Description
STEVAL-MKI212V1	ASM330LHHX adapter board for a standard DIL 24 socket
MLC-Examples	Configuration examples for embedded Machine Learning Core feature

Ordering information

Order number	General description	Supply voltage (V)		Range (g)	Current consumption (µA)	Package size (mm)
		Min.	Max.	Typ	Typ	
ASM330LHHXTR	Automotive 6-axis inertial module with embedded machine learning core and dual operating modes	1.71	3.6	±2; ±4; ±8; ±16	1300 NM(1) 3 PDM(1)	VFLGA2.5X3X.86 14L P.5 L.475X.25

Note1: NM: normal mode; PDM: power-down mode

FIND OUT MORE

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