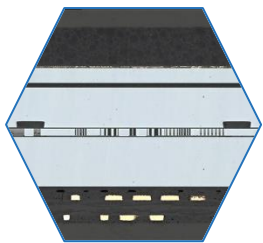
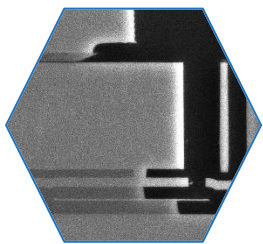


## Mobile Inertial Sensors Comparison 2021

*Focus on IMU in 114 smartphones released since 2019 from the three main manufacturers: STMicroelectronics, InvenSense and Bosch.*



The MEMS consumer inertial measurement unit (IMU) market is expected to reach \$838M in 2026 with a 5% CAGR 2019-2026 according to Yole Développement. This growth will be driven by an increasing attachment rate of MEMS IMUs in smartphones and wearables. Moreover, the increasing replacement of stand-alone MEMS accelerometers and gyroscopes with IMUs will contribute to this growth.

The MEMS inertial sensor market, focused on IMUs in smartphones, is mainly represented by three large manufacturers: STMicroelectronics, InvenSense, and Bosch.

This report provides an overview of MEMS integrated into 114 smartphones released since 2019. Thanks to our sampling, you can see which references are used in which smartphones and understand which manufacturer is integrated in which OEM's smartphone.

System Plus Consulting has conducted a comparative review of the most common IMU references found in our sampling. We examine the dimensions and internal

structures of their packages, MEMS arrays, and application-specific integrated circuits (ASICs), as well as their die sizes and cross-sections of packages, to provide a comprehensive review of MEMS inertial sensors in smartphones with a focus on the IMU. A comparison is also made at the IMU manufacturing process level between manufacturer and between the different technologies used by the same manufacturer and integrated in the smartphones of our sampling.

Additionally, this report features a package opening and a MEMS die opening for the components which integrate only a gyroscope or an accelerometer. Lastly, a complete technology and cost analysis is furnished of the most common references found in our sampling, including the MEMS, the ASIC, and the packaging.

**Title:** Mobile Inertial Sensors Comparison 2021

**Pages:** 140

**Date:** September 2021

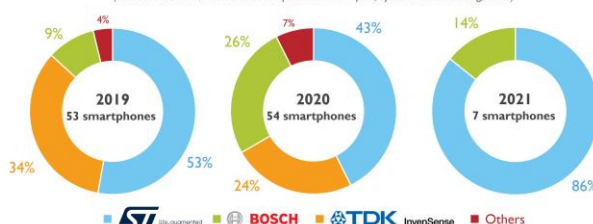
**Format:** PDF & Excel file

**Price:** EUR 6,490

**Reference:** SPR21533

**Inertial sensors for smartphones – Breakdown per company: 2019, 2020 and 2021\***

(Source: Mobile Inertial Sensors Comparison 2021 report, System Plus Consulting, 2021)



### COMPLETE TEARDOWN WITH:

- Package views and dimensions
- Package cross-sections
- Precise measurements
- Die descriptions
- Technology descriptions
- Manufacturing process flow
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**Dr. Youssef El Gmili** has joined System Plus Consulting's team in 2019 after ten years passed on high level research and development on microelectronics. He holds a Master Degree in Microelectronics, and a Phd in Physics/Materials Science.

## RELATED ANALYSES



### Silicon Sensing Systems Gyroscope Design Comparison

Technical and cost comparison of the technologies integrated by Silicon Sensing in its piezoelectric, capacitive and inductive gyroscopes.  
July 2021 - EUR 6,490\*



### Analog Devices High-End Accelerometers and Gyroscopes Comparison

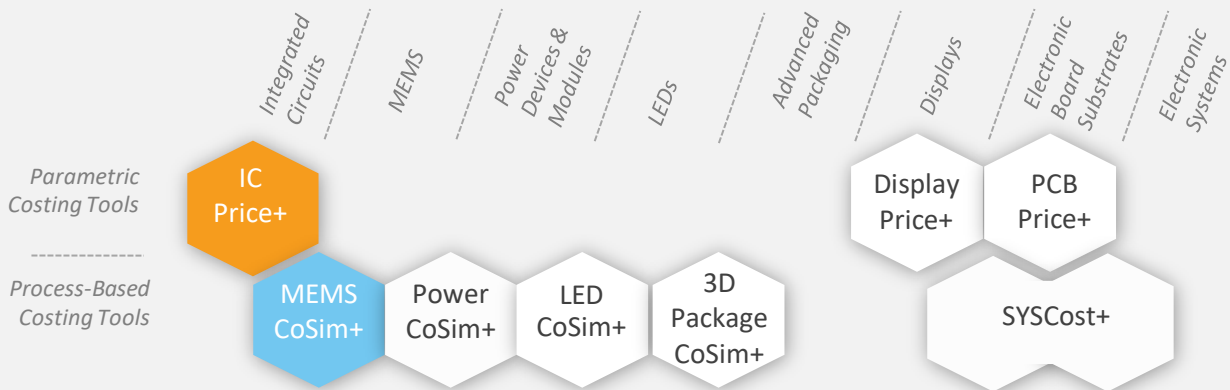
Comparison of different accelerometers and gyroscopes from Analog Devices integrated in high-end IMUs.  
May 2021 - EUR 6,490\*



### High-End Inertial Sensors for Defense, Aerospace and Industrial Applications 2020

High-end inertial sensors are still the backbone of systems that will enable autonomous transportation and the new space industry despite COVID-19.  
February 2020 - EUR 6,490\*

## COSTING TOOLS



Our analysis is performed with our costing tools IC Price+ and MEMS CoSim+.

System Plus Consulting offers powerful costing tools to evaluate the production cost and selling price from single chip to complex structures.

### IC Price+

The tool performs the necessary cost simulation of any Integrated Circuit: ASICs, microcontrollers, DSP, memories, smartpower...

### MEMS CoSim+

Cost simulation tool to evaluate the cost of any MEMS process or device.

## ABOUT SYSTEM PLUS CONSULTING

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Reverse Costing® is the process of disassembling a device (or a system) in order to identify its technology and calculate its manufacturing cost, using in-house models and tools.



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System Plus Consulting is specialized in the cost analysis of electronics from semiconductor devices to electronic systems.

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# TERMS AND CONDITIONS OF SALES

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## 1. INTRODUCTION

The present terms and conditions apply to the offers, sales and deliveries of services managed by System Plus Consulting except in the case of a particular written agreement.

Buyer must note that placing an order means an agreement without any restriction with these terms and conditions.

## 2. PRICES

Prices of the purchased services are those which are in force on the date the order is placed. Prices are in Euros and worked out without taxes. Consequently, the taxes and possible added costs agreed when the order is placed will be charged on these initial prices.

System Plus Consulting may change its prices whenever the company thinks it necessary. However, the company commits itself in invoicing at the prices in force on the date the order is placed.

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The quoted prices already include the rebates and discounts that System Plus Consulting could have granted according to the number of orders placed by the Buyer, or other specific conditions. No discount is granted in case of early payment.

## 4. TERMS OF PAYMENT

System Plus Consulting delivered services are to be paid within 30 days end of month by bank transfer except in the case of a particular written agreement.

If the payment does not reach System Plus Consulting on the deadline, the Buyer has to pay System Plus Consulting a penalty for late payment the amount of which is three times the legal interest rate. The legal interest rate is the current one on the delivery date. This penalty is worked out on the unpaid invoice amount, starting from the invoice deadline. This penalty is sent without previous notice.

When payment terms are over 30 days end of month, the Buyer has to pay a deposit which amount is 10% of the total invoice amount when placing his order.

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System Plus Consulting remains sole owner of the delivered services until total payment of the invoice.

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The delivery schedule on the purchase order is given for information only and cannot be strictly guaranteed. Consequently any reasonable delay in the delivery of services will not allow the buyer to claim for damages or to cancel the order.

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The transport costs and risks are fully born by the Buyer. Should the customer wish to ensure the goods against lost or damage on the base of their real value, he must imperatively point it out to System Plus Consulting when the shipment takes place. Without any specific requirement, insurance terms for the return of goods will be the carrier current ones (reimbursement based on good weight instead of the real value).

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System Plus Consulting responsibility will not be involved in non execution or late delivery of one of its duties described in the current terms and conditions if these are the result of a force majeure case. Therefore, the force majeure includes all external event unpredictable and irresistible as defined by the article 1148 of the French Code Civil?

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As a rule, all information handed by customers to system Plus Consulting are considered as strictly confidential.

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The Buyer is responsible for the use and interpretations he makes of the reports delivered by System Plus Consulting. Consequently, System Plus Consulting responsibility can in no case be called into question for any direct or indirect damage, financial or otherwise, that may result from the use of the results of our analysis or results obtained using one of our costing tools.

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Any dispute that may arise about the interpretation or execution of the current terms and conditions shall be resolved applying the French law.

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