

Motion Sensors for Anything That Moves



POSITION 582-32
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POSITION: 28,405,11
ANGLE: 58,03,11
STATUS: TRACKING
SWITCHING: 27
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WARNING: 0
CODE: 2407/11
DISTANCE/RATIO: 28
ID: 120002



COMPANY FACT SHEET

The New Internet of Moving Things

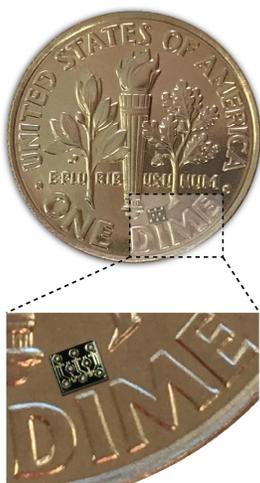
mCube is the provider of the world's smallest MEMS motion sensors, key enablers for the new Internet of Moving Things (IoMT). Virtually anything that moves can take advantage of a motion sensor, creating a huge market opportunity for MEMS manufacturers. By 2020, analysts predict more than 50 billion devices will be connected to the Internet and a large percentage of those devices will be in motion. From smartphones to tablets, from gaming devices to augmented reality experiences, from smart clothes to wearables, a plethora of new applications are coming to market that will further transform the way consumers live and businesses operate.

To connect anything that moves to the Internet and monitor, analyze and deliver real-time insights from the data requires a brand new approach to MEMS inertial motion sensors.

Requirements include:

- Extremely small size
- Very low power
- Cost competitive
- High performance

Small as a grain of sand, over 450 million units of mCube's MEMS accelerometers have already shipped for use in a range of smartphones and tablets. As one of the only private companies with the patented sensor technology needed to achieve the cost, size, low power and high performance needed for this growing market, mCube is paving the way for IoMT.

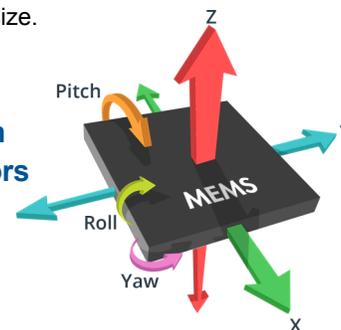


Sensors in Everything

While MEMS sensors have been used in industrial, automotive and even printer applications for many years, these first generation solutions are expensive and complex to manufacture, and are produced using proprietary manufacturing processes. Packaged in large multi-chip modules, first generation motion sensors require higher power and often have reduced reliability due to the packaging process. With the advent of smartphones and gesture-controlled gaming, second generation MEMS devices have emerged with smaller size and lower power. These second generation devices are still manufactured on proprietary processes and feature discrete MEMS and ASIC packaged with stacked die. As a result, they continue to be relatively large and also difficult to be reduced in size.

A Brand New Approach to MEMS Motion Sensors

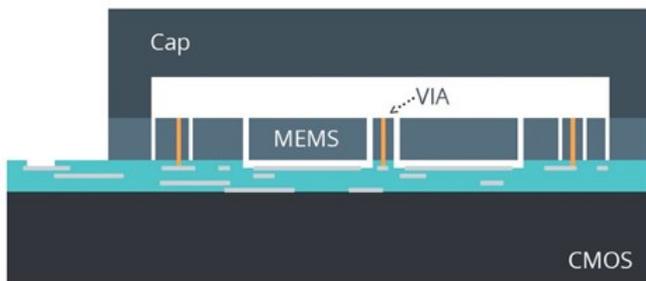
In contrast, mCube's monolithic, single-chip technology represents the next generation of sensors – very small, single-chip MEMS+ASIC devices that are cost effective, consume low power and feature high performance. These advancements make it possible to place one or more motion sensors onto nearly any object or device. In some cases, these MEMS motion sensors can be embedded directly onto a device without requiring a package, which saves considerable cost and real estate.



As the first company to integrate a MEMS sensor with ASICs onto a single die using standard CMOS processes, mCube is delivering this next generation of sensors by making them simple to manufacture and easy to design into a broad range of applications. mCube motion sensors have already been adopted in a range of smartphone and tablet reference designs and are featured on the approved vendor lists of leading chipset partners, such as MediaTek.

Monolithic, Single-Chip MEMS Technology

FEATURES	ADVANTAGES
Monolithic MEMS on CMOS IC	Single-chip Solution Multi-sensor Integration Platform Rapid Product Customization Simplified Test and Assembly Smaller Package Size
MEMS Fabrication in a CMOS Facility	MEMS with CMOS Process Control Higher Quality Better Reliability Cost Effective Production
Thick Silicon MEMS	Improved Signal to Noise Ratio Lower Power Consumption
Through-Silicon Electrical Contacts	Improved Performance Lower Parasitics
Hermetically Sealed MEMS	Improved Performance and Reliability Allows for Diverse Range of Applications



mCube Facts

- Founded 2009
- Ben Lee, CEO
- Headquartered in San Jose with locations in Hsinchu, Taipei, Shanghai, and Shenzhen
- Strong IP portfolio with over 179 patents filed to date
- Broad portfolio of products including accelerometer, magnetometer and iGyro hardware and software solutions for up to 9 degrees of freedom (DoF)

mCube Achievements

- Acquired Xsens in November 2017
- Delivered the industry's only monolithic single-chip MEMS+ASIC product, confirmed by Yole Développement in April 2015 as the world's smallest accelerometer
- Developed a complete portfolio of motion sensor hardware and software solutions for up to 9DoF
- Shipped more than 450 million accelerometers into the smartphone, tablet, and IoT markets
- First to ship industry's smallest and lowest-power, 3-axis accelerometer in 1.1x1.3mm WLCSP package
- 2015 MEMS Executive Congress
 - Sensor Device of the Year | MC3571 Accelerometer
 - Sensor Integrator of the Year | Dyna Image and mCube
 - Executive of the Year | Ben Lee

Jean-Christophe Eloy, [President and CEO, Yole Développement](#)

"mCube has achieved a technology leadership position in the market by delivering the world's smallest motion sensor. With mCube's innovative approach, the company has a unique opportunity to transform the industry, making MEMS sensors ubiquitous on anything that moves."

Michael Palma, [Research Manager, Semiconductor Consumer Devices and Electronic Manufacturing Services, IDC](#)

"A major hurdle for wearable technology and the IoT is the reduction in size of critical semiconductor components, including sensors, to enable smaller systems, reduce power consumption, and costs. By shrinking the size of a sensor, it's easy to envision a world where these tiny devices are seamlessly incorporated onto everyday things, providing valuable motion and context-relevant data that enhance consumers' lives."

Tony Massimini, [Chief of Technology, Semico Research](#)

"It's rare for a new MEMS supplier to ramp to high volume quickly as MEMS are typically very complex and hard to manufacture. It's especially impressive for mCube to ship 60 million units within 2.5 years of product launch. With a proven design that is ground-breaking in terms of its



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ABOUT MCUBE

mCube makes the smallest motion sensors in the world. As a technology leader, mCube aspires to be the enabler for the Internet of Moving Things by putting a MEMS motion sensor on anything that moves, improving the way consumers live and interact with technology. mCube is backed by leading investors and has already shipped over 250M units. For more information, visit www.mcubemems.com. Follow mCube @[mcubemems](https://twitter.com/mcubemems).

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