

## **CES 2023: Bosch sensors – making people’s lives safer and more convenient**

### Technology for connectivity and climate action

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- ▶ Tanja Rückert: “Sensors improve quality of life and reduce the environmental footprint of smart everyday companions.”
- ▶ Mobility: new Bosch sensor-based innovations for greater road safety.
- ▶ Sustainability: new generation of Bosch sensors for fitness trackers, particulate matter and altitude measurement are half the size and consume half the power of previous generations.
- ▶ CES® Innovation Award: Bosch RideCare companion networked mobility solution receives Best of Innovation Award.

Las Vegas, NV – Sensors are ubiquitous. They allow cars, e-bikes, smartphones, fitness trackers, and headphones to sense their environment. Bosch develops and manufactures smart sensors that make life safer and more convenient. These sensors are becoming more efficient, which helps protect our planet. Bosch is a pioneer and market leader in microelectromechanical (MEMS) sensors – one of the most important and widely used sensor types today. “We started production of MEMS sensors in 1995. In the past five years, we have produced as many of these sensors as in all the years before that,” said Tanja Rückert, member of the board of management at Robert Bosch GmbH, at CES 2023 in Las Vegas. Since it began manufacturing them 27 years ago, the technology company has produced a total of more than 18 billion MEMS sensors; today, there are an average of 22 of them in every car. Bosch is currently the top MEMS sensor manufacturer, according to Yole Group\*, a market research and strategy consulting company. By 2027, global annual demand for such sensors is expected to grow from 33.5 billion now to around 49 billion units. Bosch also wants to share in this growth and expects a further significant increase in production figures in the years ahead. Rückert emphasized that the company wishes to remain the market leader and expand its leading position even further. To meet growing demand, Bosch is investing heavily in its wafer fabs in Dresden

and Reutlingen. Overall, the company plans to invest three billion dollars in its semiconductor business, and thus also in sensor development and manufacturing, by 2026 as part of its investment plan. In its work on microelectronics and communications technology, it will draw on the European IPCEI ME (“Important Project of Common European Interest on Microelectronics”) funding program.

### **Sensors save lives and pave the way for connectivity**

Sensors are at the heart of modern technology and the backbone of the connected world. They make vehicles safer, save lives every day, and help protect both the environment and human health. This makes them a crucial technological basis for all Bosch business areas – and they are also the focus of the sequel to the digital image campaign, under the tagline “Sensor tech #LikeABosch.” “With the help of sensors, we can take technology that is ‘Invented for life’ to a new level. They not only improve people’s quality of life but also reduce the environmental footprint of our smart everyday companions. Our new #LikeABosch campaign gives some striking examples of what this means,” Rückert said.

MEMS sensors first went into widespread use in the automotive industry. Bosch has remained one of the leading sensor manufacturers for this industry. Bosch sensors help with vehicle navigation, they control airbags and ESP systems, and they enable a wide range of assistance functions that enhance driving safety, comfort, convenience, and efficiency. For automated driving in particular, sensors are indispensable. They are, so to speak, the “eyes” with which cars can “see” and understand their surroundings. Bosch sensors are paving the way for the driverless car. The company already offers a range of radar, lidar, video, and ultrasonic sensors for automated driving. But MEMS sensors also play a central role in consumer electronics. For instance, pressure sensors in smartphones can pinpoint a device’s altitude to within a few centimeters. In an emergency, for example, this means first responders know very quickly which floor a person in distress is on. The U.S. Federal Communications Commission (FCC) estimates that such pressure sensors save 10,000 lives a year in the U.S. alone.

### **New Bosch innovations improve safety on the roads**

At CES 2023, Bosch will present several new sensor-based innovations for mobility – including the RideCare companion solution, which won a Best of Innovation Award from the industry association CTA. The RideCare companion will play a critical part in the enhancement of safety for all vehicle occupants in connected and automated mobility, the company says. The connected hardware and software solution consists of a camera, a wireless SOS button, and cloud-based data services. Vehicle drivers can use it to contact Bosch associates

around the clock should an accident or other dangerous situation occur. In the event of an incident, the Bosch associate can look into the vehicle via camera, assess the situation, and, if necessary, quickly request assistance. The RideCare companion serves as a valuable safety net, especially for cab or ridesharing drivers.

Off-zone crash detection also promises greater safety on the road: the system protects vehicle occupants in the event of side collisions, which often occur when changing lanes or crossing intersections. Smart sensors combined with a new software algorithm quickly and reliably detect the exact angle of impact in the event of a side collision and trigger the life-saving airbag in time to mitigate the consequences of an accident. "Our off-zone crash detection is a great example of how we use software to get more out of existing hardware. This creates an appreciable additional benefit in road transport," said Mike Mansuetti, president of Bosch in North America, at CES in Las Vegas.

### **Quantum sensors offer great potential**

Bosch is also living up to its pioneering role in the development of new sensor fields: quantum sensors will be one of the emerging fields of innovation in the years ahead. They could soon enable measurements that are 1,000 times more precise than those of today's MEMS sensors. This would, for example, permit easier and more accurate diagnosis of neurological diseases. Bosch founded its own startup last year to drive the commercialization of quantum sensors and develop this market. As a broadly diversified technology company, Bosch is advancing the development of promising technologies in many fields and positioning itself for the future: "In the next three years alone, we will be investing ten billion euros in Bosch's digital transformation. Our current workforce of 40,000 software engineers will also grow," Rückert said.

### **Sustainability is driving technological progress**

Climate action and sustainability are top priorities for Bosch. "For the future of our planet, it's essential that we all commit to living increasingly energy-efficient lives. At the same time, climate change is driving technological progress at our company – including in sensors," Rückert said. At CES, Bosch is presenting the next generation of MEMS sensors. They are more accurate, more robust, and more power-efficient than previous models. The programmable and AI-enabled BHI360/BHI380 inertial sensor, for example, which adapts to the wearer's individual movements when installed in fitness trackers, is half the size and consumes half the power of its predecessor. The same applies to the new BMV080 particulate sensor, which measures the concentration of particulate matter and pollution in the air and, with its space-saving design, is up to 450 times smaller than products currently on the market. And then there's the

BMP585 barometric pressure sensor, which measures a change in altitude of a few centimeters and can thus detect individual pull-ups or push-ups: it requires 85 percent less energy and has increased its robustness by a factor of three compared to the previous generation.

\*Source: Status of the MEMS Industry report, Yole Intelligence, 2022

### **Bosch at CES 2023:**

- **PRESS CONFERENCE: Wednesday, January 4, 2023**, from 8:00 to 8:45 a.m. (PST) with Dr. Tanja Rückert, member of the board of management of Robert Bosch GmbH, and Mike Mansuetti, president of Bosch in North America, in Ballroom F, Mandalay Bay Hotel, Las Vegas, **South Convention Center, Level 2**, as well as **livestreamed** on the [Bosch Media Service](#).
- **BOOTH: January 5 – 8, 2023**, in the Central Hall, booth #16115.
- **LIVE DRIVING EXPERIENCE: Fusion of digital cockpit technologies and advanced driver assistance systems domains: January 5 – 8, 2023**, LVCC, Central Hall, Central Plaza.
- **FOLLOW** the Bosch CES 2023 highlights on Twitter: **#BoschCES**.
- **PANEL “Industrial Transformation with Robots Powered by AI”** on **Thursday, January 5, 2023, 10:00 a.m.**, Las Vegas Convention Center West / W216-218, session with Zico Kolter, Chief Scientist of AI at Bosch.

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### **About Bosch**

*Having established a regional presence in 1906 in North America, the Bosch Group employs nearly 35,500 associates in more than 100 locations, as of December 31, 2021. In 2021, Bosch generated consolidated sales of \$13.5 billion in the U.S., Canada and Mexico. For more information, visit [www.bosch.us](http://www.bosch.us), [www.bosch.ca](http://www.bosch.ca) and [www.bosch.mx](http://www.bosch.mx).*

*The Bosch Group is a leading global supplier of technology and services. It employs roughly 402,600 associates worldwide (as of December 31, 2021). The company generated sales of \$93.1 billion in 2021. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. As a leading IoT provider, Bosch offers innovative solutions for smart homes, Industry 4.0, and connected mobility. Bosch is pursuing a vision of mobility that is sustainable, safe, and exciting. It uses its expertise in sensor technology, software, and services, as well as its own IoT cloud, to offer its customers connected, cross-domain solutions from a single source. The Bosch Group's strategic objective is to facilitate connected living with products and solutions that either contain artificial intelligence (AI) or have been developed or manufactured with its help. Bosch improves quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is “Invented for life.” The Bosch Group comprises Robert Bosch GmbH and its roughly 440 subsidiary and regional companies in some 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. With its more than 400 locations worldwide, the Bosch Group has been carbon neutral since the first quarter of 2020. The basis for the company's future growth is its innovative strength. At 128 locations*

*across the globe, Bosch employs some 76,100 associates in research and development, of which more than 38,000 are software engineers.*

*Additional information is available online at [www.bosch.com](http://www.bosch.com), [www.iot.bosch.com](http://www.iot.bosch.com), [www.bosch-press.com](http://www.bosch-press.com), [www.twitter.com/BoschPresse](https://twitter.com/BoschPresse).*

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