

# News Release

FOR IMMEDIATE RELEASE

## **Hitachi Automotive Systems Develops World's Smallest Class 77GHz Millimeter-wave Radar as a Long-range, Forward-direction Sensor for Autonomous Driving**

**Tokyo, October 3, 2017**— Hitachi Automotive Systems, Ltd. today announced that it has developed a long-range, forward-direction, 77GHz millimeter-wave radar that is the smallest of its class\* in the world. The radar will enable the detection of obstacles from long distances while driving. The newly developed radar has been reduced in size by more than 50% compared to the prototype developed in 2015. In addition, the radar now has detection capability in the upward and downward directions that were not possible with the previous prototype. This radar is scheduled to be commercialized in 2020 as a technology that will contribute to the increased adoption of autonomous driving vehicles.

In order to realize greater reliability in autonomous driving, advanced external sensors for real-time detection of obstacles surrounding a vehicle is an essential core technology. On expressways where cruising speed is high and greater detection distance is necessary, sensors capable of longer range detection are required. In response to this need, in 2015 Hitachi Automotive Systems developed a prototype long-range, forward-direction, millimeter-wave radar in the 77 GHz band that could detect obstacles over long distances. This millimeter-wave radar combines a horn-shaped antenna with a dielectric lens, allowing for the emission of electromagnetic waves into space with reduced attenuation. This has resulted in more efficient transmission and reception of millimeter-wave signals over long distances, achieving a detection range of 200 m in the distance of travel with an 18° angle on both sides of the vehicle.

To further improve on the prototype, thickness and size were reduced to allow for easier installation in a variety of vehicles. In addition, long-range detection capability in the upward and downward directions was necessary in order to identify falling objects from distant overpasses or pedestrian bridges, or objects that had fallen onto the road.

In the newly developed long-range, forward-direction, 77 GHz millimeter-wave radar, the dielectric lens of the horn-shaped antenna has been split and the antenna shape optimized, resulting in reduced antenna depth and width while maintaining efficiency in electromagnetic wave radiation. This has led to a reduction in dimensions of roughly 30% in depth, 15% in height and 25% in width compared to the prototype developed in 2015.

Product size has been reduced by more than 50%, making it easier to install on a range of vehicles.

Furthermore, the number of receiving antennas has been increased from two to four and these are now also installed in the upward and downward directions, in addition to the left and right directions. This has increased the vertical detection capability range by 4°, while maintaining detection capability of 200 m in the direction of travel.

Hitachi Automotive Systems will display the newly developed radar at the 45th Tokyo Motor Show 2017 held at Tokyo Big Sight from October 27 to November 5, and organized by the Japan Automobile Manufacturers Association.

Moving forward, Hitachi Automotive Systems will continue to actively develop and supply products and solutions to realize a future of autonomous driving vehicles.



The newly developed 77GHz millimeter-wave radar (30 mm in depth, 60 mm in height and 45 mm in width)

\* In comparison with long-range, forward-direction, millimeter-wave radars currently installed on mass production models

### **About Hitachi Automotive Systems, Ltd.**

Hitachi Automotive Systems, Ltd. is a wholly owned subsidiary of Hitachi, Ltd., headquartered in Tokyo, Japan. The company is engaged in the development, manufacture, sales and services of automotive components, transportation related components, industrial machines and systems, and offers a wide range of automotive systems including engine management systems, electric power train systems, drive control systems and car information systems. For more information, please visit the company's website at <http://www.hitachi-automotive.co.jp/en/>.

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Information contained in this news release is current as of the date of the press announcement, but may be subject to change without prior notice.

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