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**China Around View System (AVS)  
Suppliers and Technology Trends  
Report, 2021 –Joint Venture  
Automakers**

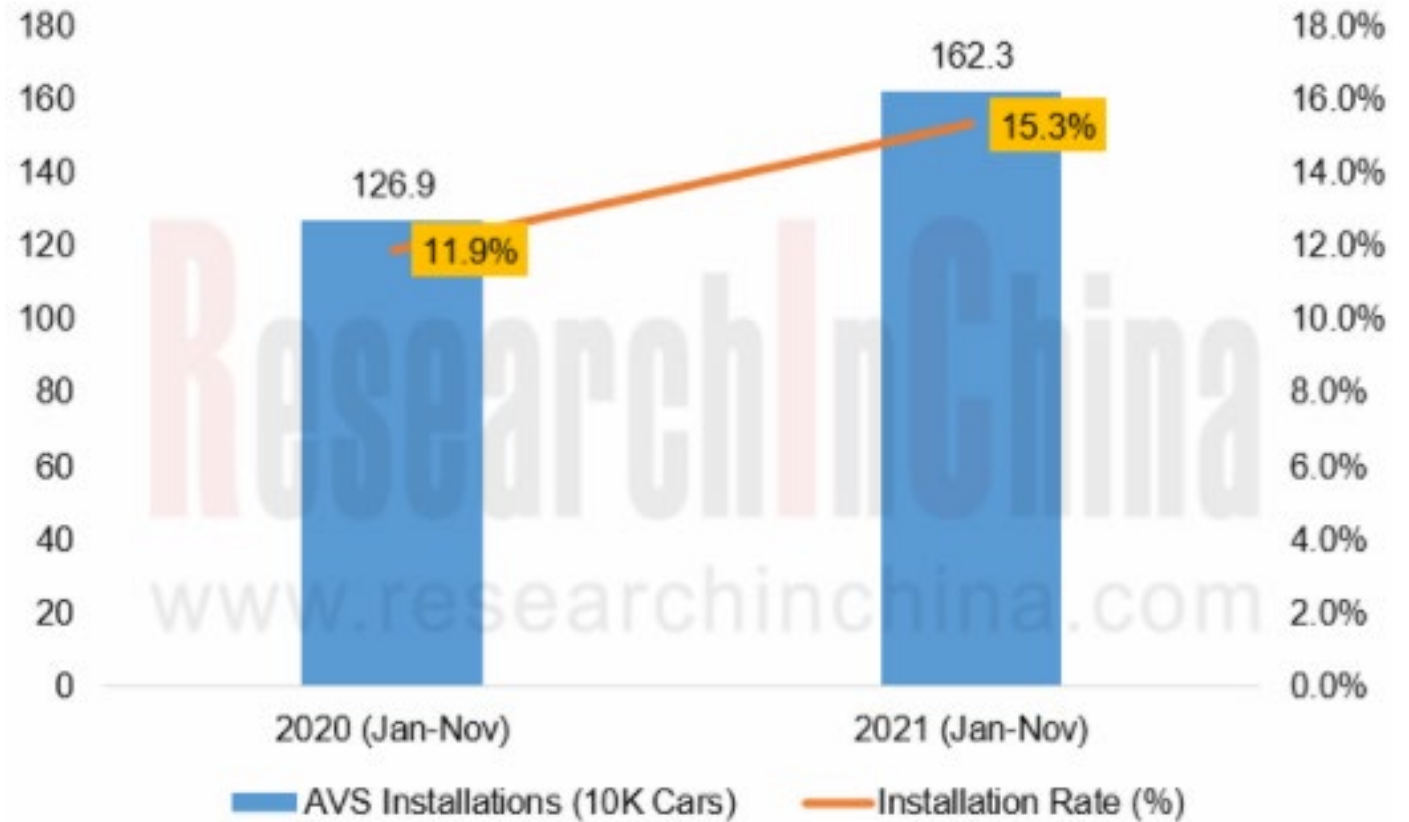
Feb.2022

# AVS Installations and Installation Rate of JV Auto Brands

Research into JV automakers' around view system: large-scale implementation of AVP is round the corner, and AVS vendors are energetically pushing ahead with parking fusion solution.

During January to November of 2021, a total of 4.266 million vehicles were installed with around view system (AVS) in China, a year-on-year upsurge of 49.2%, including AVS installations onto 1.623 million cars of joint-venture brands, sharing as high as 38.0% and a year-on-year increase of 27.9%; the installation rate was 15.3%, a rise of 3.4 percentage points on an annualized basis. Noticeably, the JV brands' cars priced between RMB400,000 and RMB500,000 and installed with AVS constitute the largest portion 22.4% (364,000 units) of the total, according to ResearchInChina.

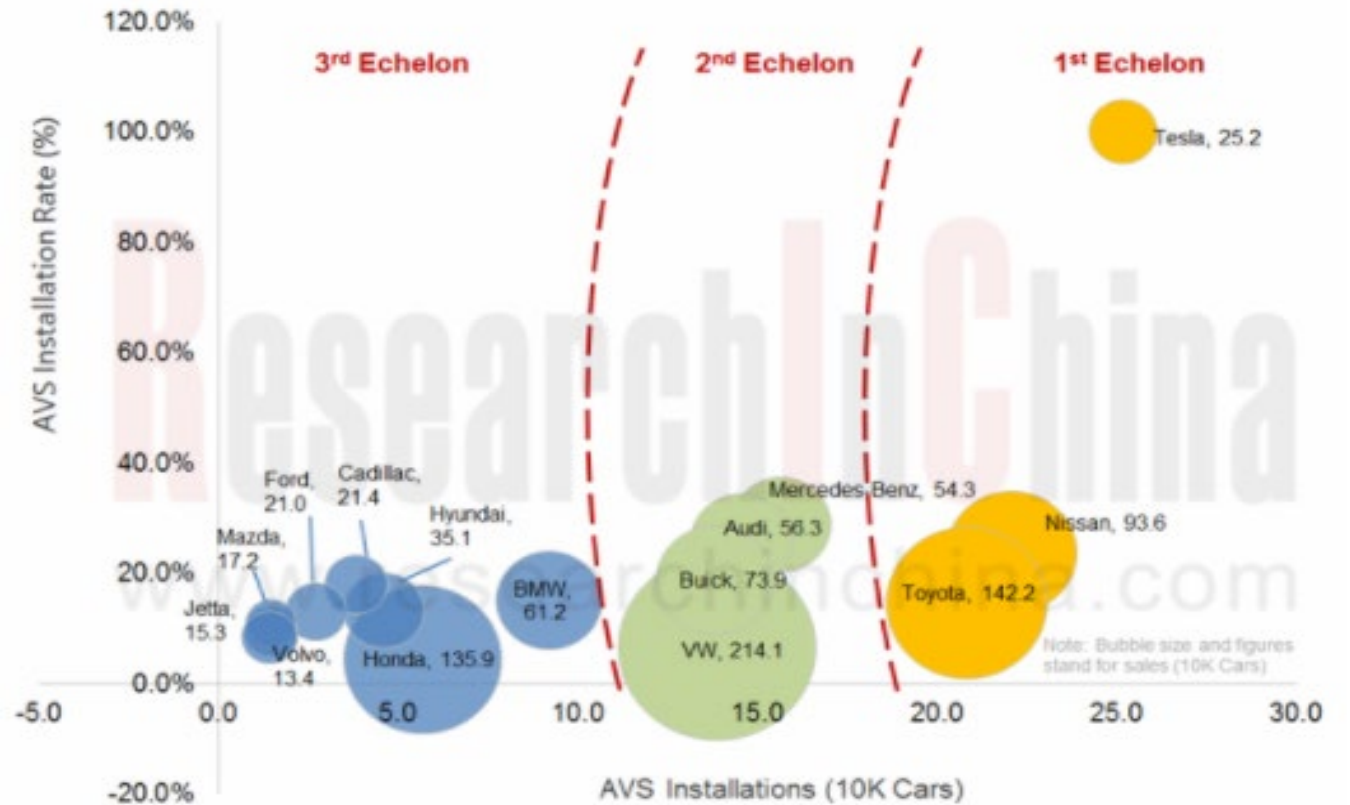
AVS Installations and Installation Rate of JV Auto Brands, 2020-2021



Source: ResearchInChina

# AVS Installations, Installation Rates and Overall Sales of Major JV Automakers

AVS Installations, Installation Rates and Overall Sales of Major JV Automakers, 2021 (Jan.-Nov.)



Source: ResearchInChina

**By brands**, Tesla, Nissan and Toyota are in the first echelon as concerns AVS installations (onto more than 200,000 cars apiece), which is largely boosted by the best-selling models like Model Y, Model 3, RAV4 and QASHQAU.

The second echelon is home to Mercedes-Benz, Audi, Volkswagen and BUICK, with AVS installed to 100,000 to 200,000 cars each.

In the third hierarchy, 92,000 BMW cars are configured with AVS, hopefully striding towards the second echelon. Concerning vehicle models, during 2021 (Jan.-Nov.), the top five vehicle models of joint venture automakers by AVS installations are RAV4 (133,000 units), Model Y (130,000 units) & Model3 (121,000 units), Mercedes-Benz E Class (100,000 units), and Qashqai (99,000 units).

# AVP is on the Cusp of Massive Implementation, and Tier1 Suppliers are Promoting the Parking Fusion Solution Earnestly.

## History of Bosch 'AVS + Ultrasonic' Parking Solution



Source: Bosch



The parking system is evolving apace, amid the previous reversing camera system being increasingly replaced by AVS. The parking solution integrating AVS with ultrasonic sensors grows a popular trend. At the same time, the suppliers are forging partnerships with OEMs on faster mass production of AVP.

Take example for Bosch's Home Zone Park Assist system exhibited during 2021 BOSCH Automobile & Intelligent Transportation Technology Innovation Experience Day, it does data fusion through 12 Bosch ultrasonic sensors together with an around view camera system made up of 4 near-range cameras, coupled with the reuse of 4 corner radars (driving assistance function), and successfully enables HPP (Homezone Parking Pilot) by software upgrades and without additional hardware sensors. Such parking solution has been available onto GAC AION V.

# AVP is on the Cusp of Massive Implementation, and Tier1 Suppliers are Promoting the Parking Fusion Solution Earnestly.

At the IAA Mobility held in Frankfurt in September 2021, Valeo and its partners NTT DATA and Embotech unveiled their joint AVP (Automated Valet Parking) solution that encompasses ECU, ultrasonic, radar and around view cameras, and dispenses with the costly LiDAR.

## Valeo 'AVS + Ultrasonic' Parking Solution



Source: Valeo

# Progress of Autonomous Driving Facilitates the Around View Camera Market, and Foreign Parts Suppliers Beef up Local Cooperation.

The advances in autonomous driving technology come with the growing number of varied perception sensors in vehicle. Every car carries ten to fifteen cameras rather than one to five ones in the past, and even more in the future. Besides, the automotive CMOS image sensors get ever improved in pixel, from VGA to 1-megapixel, 2-megapixel and to date 8-megapixel.

To meet the market demand for around view cameras, ON Semiconductor as a leading supplier of automotive cameras CMOS image sensors has been in cooperation with many Chinese autonomous driving companies. In July 2021, the fifth-generation driverless system – AutoX Gen5, the outcome of joint efforts by ON Semiconductor and AutoX was launched, for which ON Semiconductor offered a total of 28 high-definition 8-megapixel image sensors AR0820AT and 4 LiDAR SiPM matrices, thus enabling 360-degree reversing image without any blind spots. Concurrently, ON Semiconductor also deepened its collaboration with Baidu Apollo and established a joint studio for image development with the latter, focusing on self-driving image perception solutions.

ON Semiconductor to Offer 8MP Sensors for AutoX Gen5

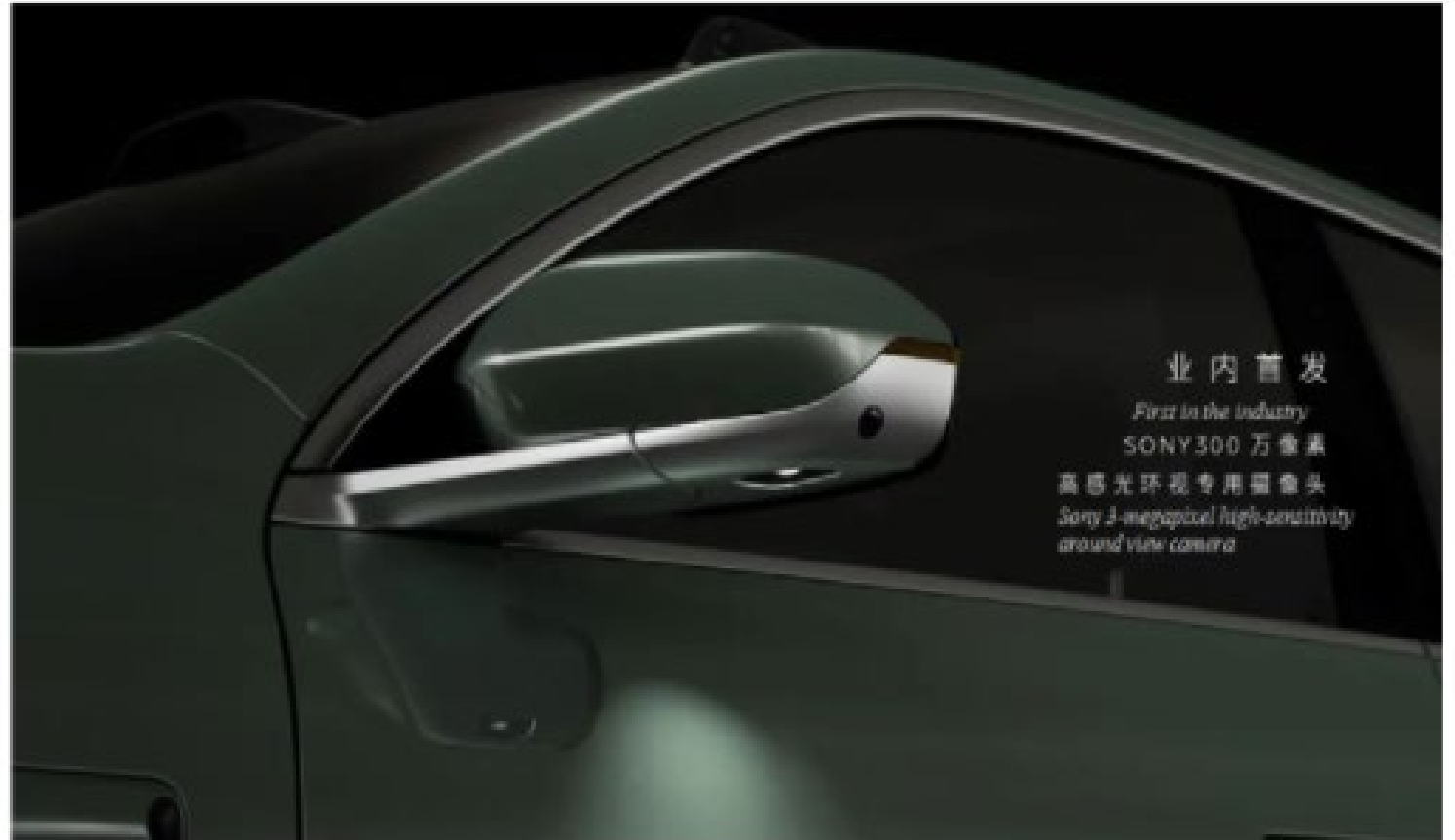


Source: AutoX

# Progress of Autonomous Driving Facilitates the Around View Camera Market, and Foreign Parts Suppliers Beef up Local Cooperation.

## Sony to Offer the Dedicated High-sensitivity 3MP Around View Cameras for NIO ET5

Sony, another leading supplier of image sensors, will provide NIO ET7 (to be delivered in March 2022, built on NT2.0 technology platform) and ET5 (to be delivered in September 2022) with the dedicated 3-megapixel high-sensitivity around view cameras. Compared with the 8-megapixel cameras previously used in ET7, this 3MP camera outperforms in dim light and the exterior rearview mirror is also added with ambient light compensation lamp that acts as a better enabler for 360-degree panorama imaging, transparent chassis, guard mode, park assist, etc.



Source: NIO

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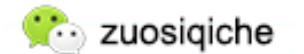
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