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# China Around View System (AVS) Suppliers and Technology Trends Report, 2021 – Chinese Brands

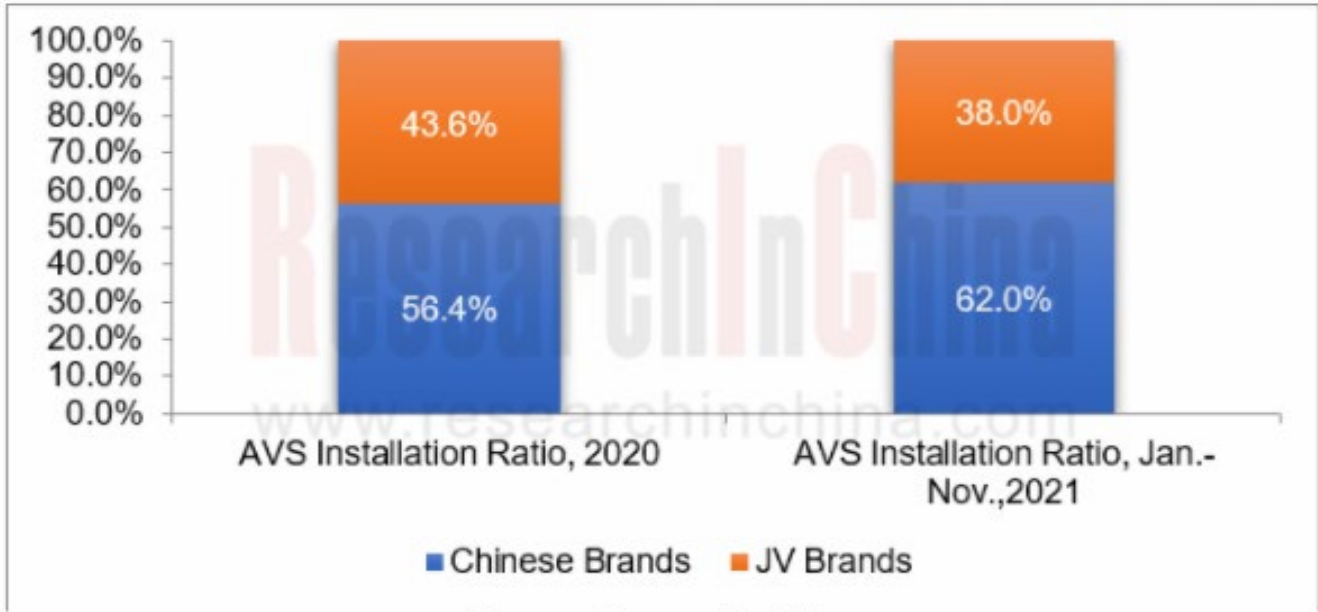
Jan.2022

# Chinese Brands Dominate the Market in Terms of AVS Installations

ResearchInChina published "China Around View System (AVS) Suppliers and Technology Trends Report, 2021 – Chinese Brands", which sorts and analyzes the Chinese OEMs' around view functions, Chinese AVS suppliers' technologies, typical Chinese manufacturers of AVS components, and the AVS development tendencies. AVS (Around (Surround) View System) serves as a system that delivers real-time imaging to the driver in a 360-degree range around the vehicle at low speeds (excluding systems with only rear cameras).

From January to November of 2021, AVS was available onto 4.266 million vehicles in China, an upsurge of 49.2% year-on-year; the installation rate of AVS registered 23.6%, a rise of 6 percentage points on an annualized basis, according to ResearchInChina. Elaborately, local Chinese brands' AVS installations accounted for 62.0%, an increase of 5.6 percentage points year-on-year, among which Haval, Changan and BYD stand at the first tier; while Geely, Hongqi, Roewe and Lynk&co were in the second echelon.

AVS Installation Ratio of Chinese/JV Brands in China, Jan.-Nov., 2020-2021



Source: ResearchInChina

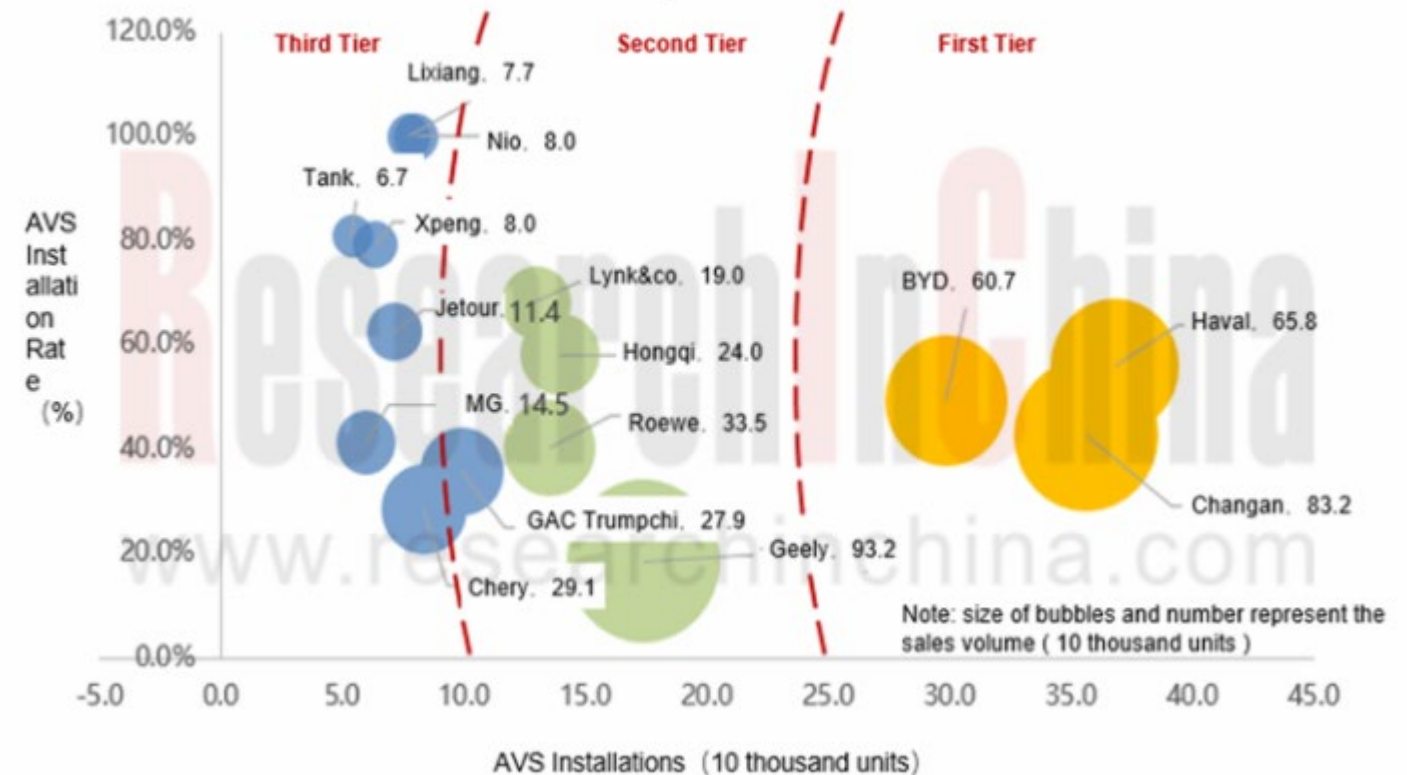
# AVS Installations, Installation Rate and Overall Sales of Major Chinese Brands, 2021 (Jan.-Nov.)

**By price**, from January to November 2021, Chinese brand models priced between RMB100,000-RMB150,000 constitute the largest part of AVS installations, reaching 1,366,000 vehicles, sharing 51.7%, and the local brands AVS installation rate in this range is 48.1%, up 4.3 percentage points year-on-year, followed by the Chinese brand models priced at RMB150,000-RMB200,000 and a total of 496,000 vehicles installed with AVS, accounting for 18.8%, and the local brand AVS installation rate in this range is 67.0%, up 8.3 points year-on-year.

**By models**, from January to November 2021, the top three Chinese brands' models in terms of installation were Haval H6 (208,000 units), Changan CS75 (156,000 units) and Hongqi HS5 (100,000 units).

In future, AVS installation rate will rise further with the cost reduction brought by gradual integration of AVS into the cockpit domain as well as the popularization of parking solutions combining surround view and ultrasonic.

AVS Installations, Installation Rate and Overall Sales of Major Chinese Brands, 2021 (Jan.-Nov.)



Source: ResearchInChina

# Chinese OEMs' around view function gets continuously optimized, expanding to transparent chassis and ADAS function

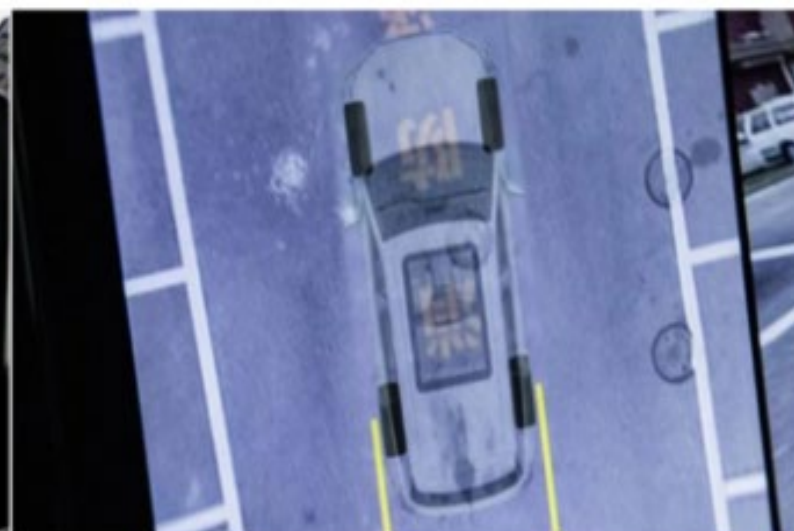
The AVS of Chinese OEMs is functionally evolving from a single 360° panoramic view in the past to rich ADAS features (such as moving object detection and warning (MOD), lane departure warning (LDW), and driving recorder, etc.) and transparent chassis.

For instance, Haval H6S (launched in October 2021) is added with 180-degree transparent chassis based on 360-degree panoramic image, which can realize 0%, 50% and 100% transparency settings; Trumpchi GS8 (unveiled in December 2021) has the AVS not only enabling 2D/3D panorama, MOD (moving object detection), driving recorder, and transparent chassis functions, but with a fusion of ultrasonic to achieve APA automatic parking.

**Haval H6S Transparent Chassis Function**



**Trumpchi GS8 Transparent Chassis Function**



# Chinese OEMs' around view function gets continuously optimized, expanding to transparent chassis and ADAS function

Comparison of Chinese OEMs' AVS Functions

Chinese OEM	Model	3D Around View	Support Driving Recorder	Support Chassis Transparency	Speed for Access/ Exiting of AVS	View Switch	Others
Changan	UNI-K	√	√	√	Access: <27 km/h Exit: >30 km/h	Support wheel view, rut view, front/back/left/right camera views switching	-
GWM	Haval First Love	√	x	x	Access: <15 km/h Exit: >15 km/h	Support front / back / left / right camera views switching	-
BYD	Song PLUS DM-i	√	x	√	-	Support single-frame view switching for front view, back view, left view, right view, front wide angle, back wide angle, and double front view	-
GAC	2 <sup>nd</sup> -Gen Trumpchi GS8	√	√	√	Access: ≤ 20km/h Exit: > 20 km/h	Support front / back / left / right camera views switching	-
Geely	Xingyue L (2021)	√	x	√	Access: <30 km/h Exit: >30 km/h	Support front / back / left / right camera views switching	-
NIO	NIO ET5	√	x	√	-	Support front / back / left / right camera views switching	The AR/VR mode will be linked to surround view camera hardware, which will record the trip as a VR video
Hongqi	Hongqi H9 (2022)	√	x	x	Access: <15 km/h Exit: >15 km/h	Wide angle view, regular view, 3D view and tire view	-
HOZON	NETA U Pro	√	x	x	Access: <27 km/h Exit: >30 km/h	Support front / back / left / right camera views switching	-
Li Auto	2021 Lixiang ONE	√	x	x	Access:- Exit: When the current driving speed ≥ 20km/h, speed in narrow road ≥ 10km/h, auto-parking speed ≥ 10km/h or auto pulling out speed ≥ 10km/h, the AVS will automatically exit or cannot be activated.	Support "AUTO", "regular view", "wide angle", "dynamic view" and " hub view" five views switching	After vehicle is parked and before power is turned off, the system will automatically take a picture of surroundings and upload it to cloud via 4G network, which can be viewed by the user through Lixiang App, making it easy to find the vehicle.
Xpeng	Xpeng P5	√	x	√	-	Support front / back / left / right camera views switching	The 360-degree panoramic camera records scenery on the way and transmits it to phone via Bluetooth.

Source: ResearchInChina

# Surround view cameras move toward higher pixel and more powerful perception

For clearer imaging, Chinese AVS suppliers are aggressively developing high pixel surround view cameras.

Ofilm, for example, spawned 2-megapixel HD surround view cameras in September 2021 and is working on 5-megapixel (to be launched in 2023) and 8-megapixel. SOE, a subsidiary of Minth Group, has upgraded its camera pixels from traditional VGA and current popular 1.3-megapixel HD camera to 2-megapixel FHD products, also with a plan for improvement to 8 megapixels in future. **CalmCar, in cooperation with ZF, provides 192° fisheye cameras embedded with deep learning-based garage position recognition to enable higher perception capability in the AVP system based on surround view.**

## CalmCar 192° Fisheye Cameras Embedded with Deep Learning-based Garage Position Recognition



Source: ZF

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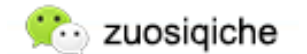
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