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Automotive Vision Industry Research Report, 2023

Dec. 2023

Installation of cameras

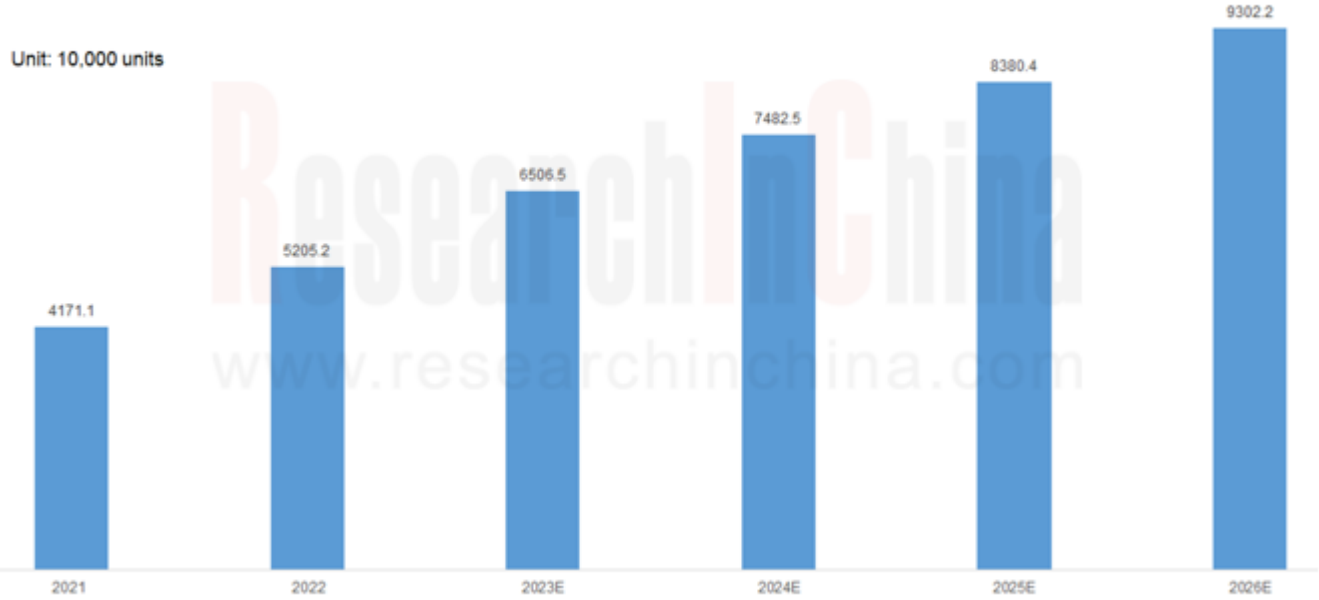
From January to September 2023, 48.172 million cameras were installed in new cars in China, a like-on-like jump of 34.1%, including:

9.209 million front view cameras, up 33.0%;
3.875 million side view ADS cameras, up 110.1%;
499,000 rear view ADS cameras, up 372.3%;
22.728 million surround view cameras, up 38.1%;
7.141 million rear view (reversing) cameras, down 4.4%;
355,000 streaming media cameras, up 75.3%;
2.336 million in-cabin cameras, up 96.3%;
2.029 million driving recorder cameras, up 17.8%.

It is estimated that the total installation of cameras will hit 65.065 million units in 2023, a figure projected to jump to 93.022 million in 2026.

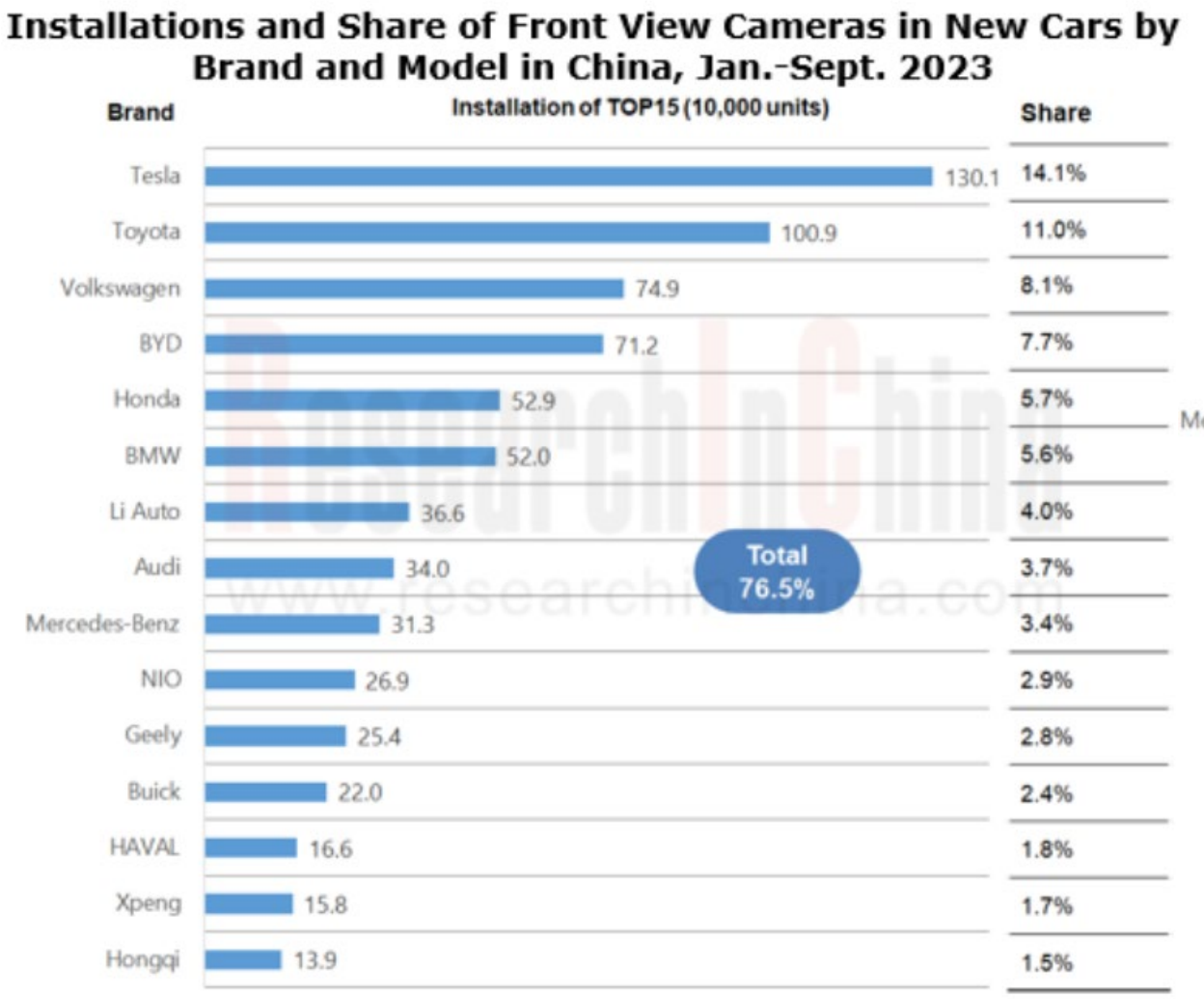
In terms of front view, mono cameras have obvious advantages. From January to September 2023, new cars in China were installed with 8.946 million front view mono cameras, up 34.5% from the prior-year period. 51.4% of front view cameras were concentrated in the vehicles priced at RMB100,000-250,000 from popular brands like Tesla, Toyota, Volkswagen and BYD, among which Tesla took an overwhelming 14.1% share. The installation of front view cameras in the vehicles worth RMB350,000-400,000 enjoyed the fastest growth, soaring by 119.2% on an annualized basis to 913,000 units, mainly driven by Model Y, Mercedes-Benz C-Class and Li L8.

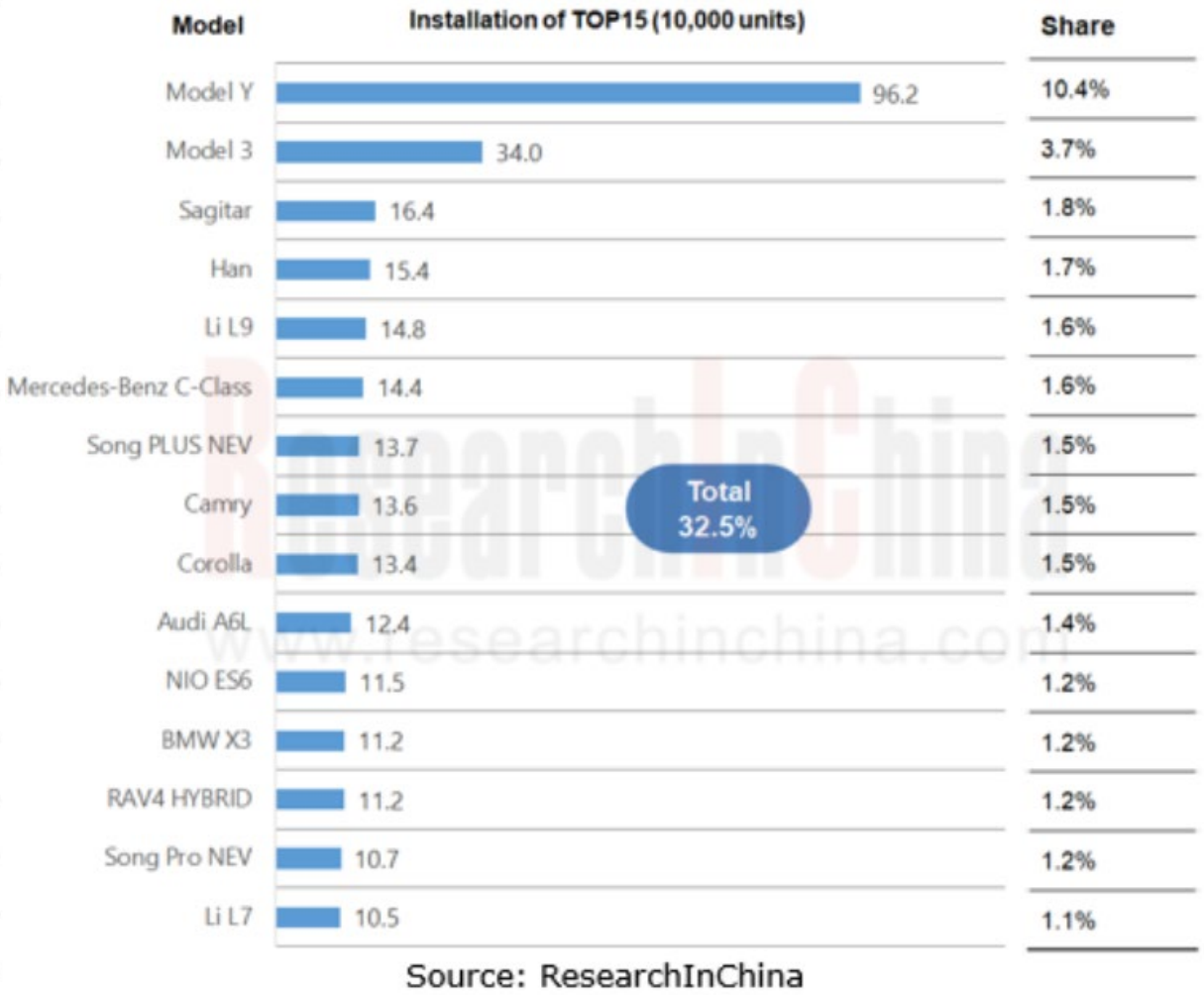
Installations of Cameras in New Passenger Cars in China, 2021-2026E



Source: ResearchInChina

Installations and Share of Front View Cameras in New Cars by Brand and Model in China

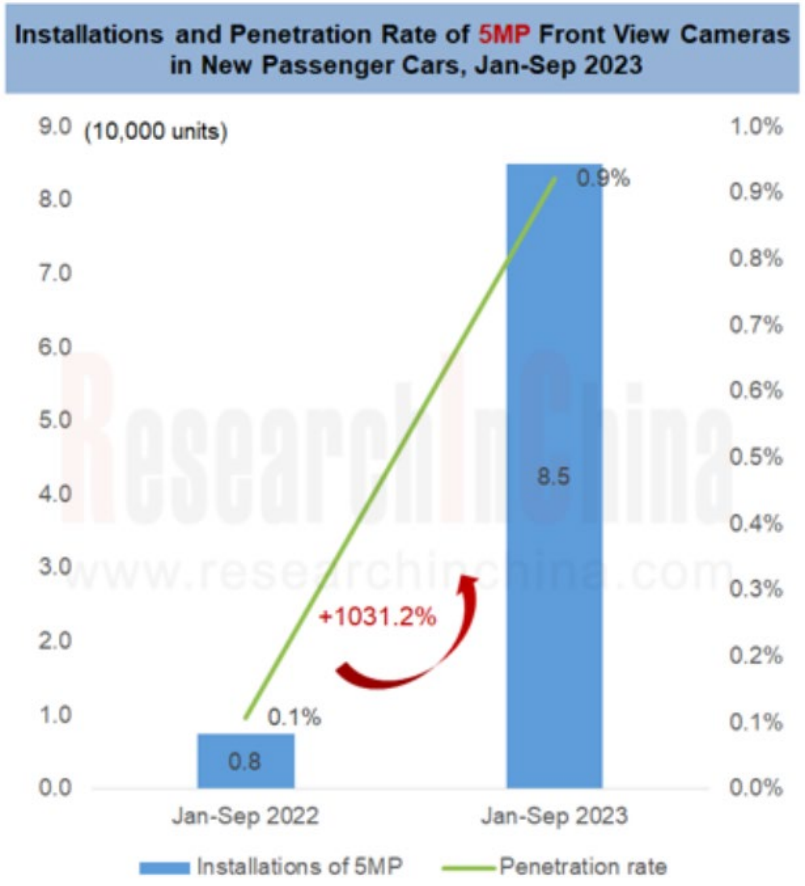


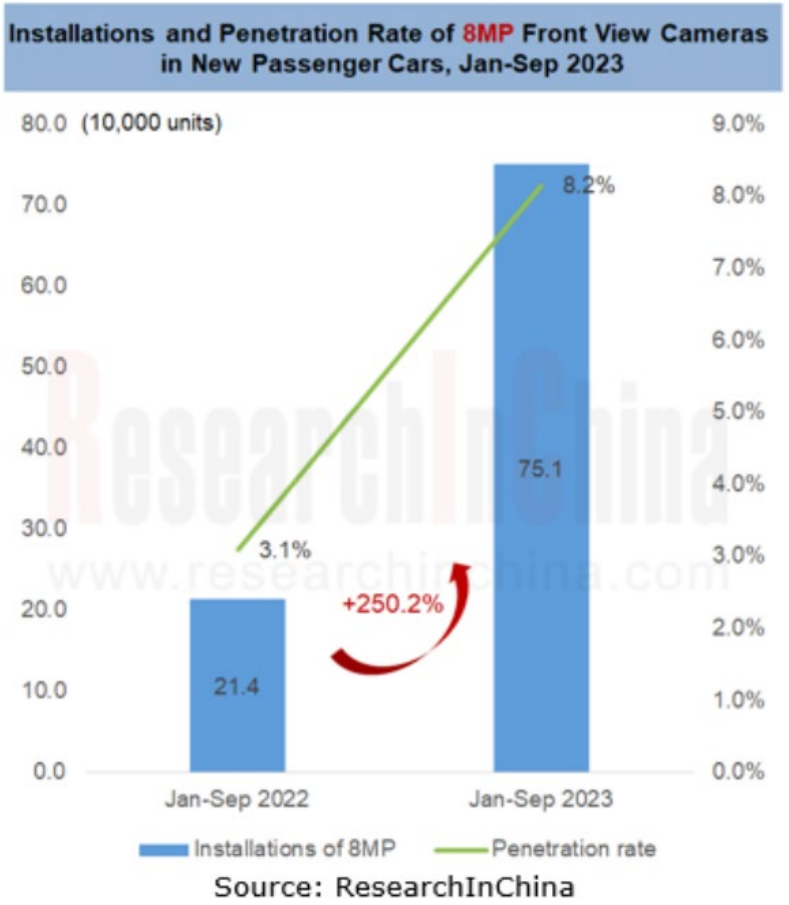


Source: ResearchInChina

Installation of 5MP and 8MP front view cameras

It is clearly that front view cameras tend to feature high resolution. According to the data of ResearchInChina, from January to September 2023, there were 85,000 5MP front view cameras installed, surging by 10 times on a like-on-like basis, with the penetration rate rising to 0.9% from 0.1% in the same period of the previous year; the installation of 8MP front view cameras soared by 250.2% to 751,000 units from 214,000 units in the same period of the previous year, and the penetration rate also jumped from 3.1% to 8.2%.





Source: ResearchInChina

Solutions of Some Vision Companies

To adapt to the current "involution" in intelligent driving functions, Tier 1 vision companies are working to build themselves into "full-stack suppliers" that can provide modular and definable autonomous driving solutions with software and hardware decoupled to optimize software and hardware synchronously. For example, some suppliers can provide OEMs with complete autonomous driving solutions consisting of "domain controller hardware + underlying basic software + upper application software + sensors", so as to reduce the R&D cost and shorten the mass production time for OEMs.

Solutions of Some Vision Companies

Company	Founded	Solution	Launch Time	Sensor Solution
MINIEYE	Dec. 2014	iPilot 1	Apr. 2023	5R6V
		iPilot 1 eco	Apr. 2023	5R6V
		iPilot 1 Plus	Apr. 2023	1R6V
		iPilot 2	Apr. 2023	5R5V
		iPilot 3	Apr. 2023	5R11V
		iPilot 3 Plus	Apr. 2023	5R11V3L
Suzhou INVO	Jan. 2012	i-Drive: DCU	2022	5R10V
JIMU Intelligent	Aug. 2011	L2+ passenger car solution	2022	5R10V/5R6V
MAXIEYE	Dec. 2016	MAXIPILOT 1.0 PLUS	Jul. 2022	nR1V
		MAXIPILOT 2.0 (basic version)	Jan. 2022	5R1V
		MAXIPILOT 2.0 (high configuration version)	Jan. 2022	5R5V
		MAXIPILOT 2.0 (enhanced version)/3.0	Jan. 2022	5R11V
Jingwei Hirain Technologies	Sept. 2003	Intelligent Driving Domain Controller ADCU	Oct. 2022	5R11V (3L/4D Radar)
Yihang.AI	Aug. 2015	Basic version of driving-parking integration	Apr. 2023	5R5V
		Flagship version of driving-parking integration	2022	5R11V
		All-scenario solution	2022	5R11V3L
ZongMu Technology	Jan. 2013	Amphiman 3000	Jul. 2022	5R5V
		Amphiman 5000	Jul. 2022	5R6V
		Amphiman 8000	Jul. 2022	5R11V (3L)
		Trinity 3000	Apr. 2023	5R5V
		Trinity 8000	Apr. 2023	5R9V3L
Huawei's Intelligent Automotive Solution (IAS) Business Unit (BU)	May 2019	ADS 1.0		6R13V3L
		ADS 2.0		3R11V1L
DJI	Jul. 2018	OSMO Intelligent Driving System	2022	1R6V
		Chengxing 7V	Apr. 2023	7V
		Chengxing 7V	Apr. 2023	9V
PhiGent Robotics	2021	PhiGo Air	Apr. 2023	nR1V
		PhiGo Pro	Apr. 2023	nR7V
		PhiGo Pro Lite		nR6V
		PhiGo Pro Standard		nR7V
		Phigo Pro (single-J5 version)		5R6V
		PhiGo Bi-Pro	Apr. 2023	nR7V
		PhiGo Bi-Max	Apr. 2023	nR11V
		PhiGo Max (Stereo)		nR9V
		PhiGo Max (Lidar)		nR11V1L
		PhiVision	Jun. 2023	nR6V
		PhiVision		nR11V

Source: ResearchInChina

Automakers tend to adopt “in-house R&D + outsourcing” parallel intelligent driving R&D strategies

Yet from the current selection of OEMs, it can be seen that there is not much scope for Tier 1 suppliers of intelligent driving, especially those without production experience.

OEMs have begun to treat intelligent driving rationally, and automakers tend to adopt “in-house R&D + outsourcing” parallel intelligent driving R&D strategies. For example:

Li Auto develops advanced intelligent driving solutions by itself, but develops low- and mid-level solutions with QCraft; The advanced intelligent driving solutions of **IM**, a brand under SAIC, are provided by Momenta, while IM’s own team is mainly responsible for low-level driving assistance functions and integration;

BYD's Dynasty and Ocean Series adopt solutions from Tier 1 suppliers. Later BYD Han will carry a highway NOA solution based on Horizon Robotics J5, while DENZA N7 and Yangwang U8 will use “God's Eye” advanced intelligent driving solution (hardware is self-developed by BYD, but software is developed by BYD and Dipai Zhixing jointly).

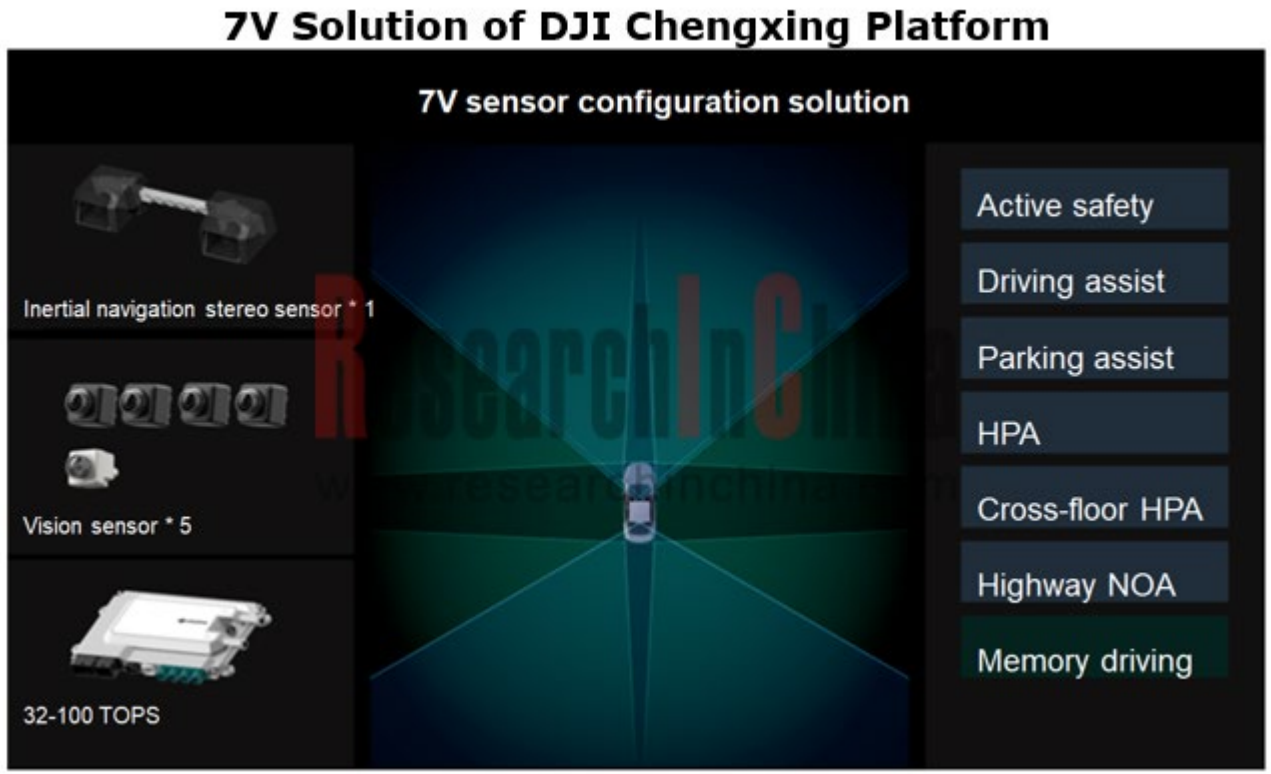
As the competition in the ADAS market intensifies, orders go to top suppliers (e.g., Huawei, DJI and Momenta), making it hard for small and medium-sized suppliers depending on financing to survive. Some of them have to shrink their business or seek to be acquired.

In December 2023, Chery iCAR 03 was released for global pre-sale. The Intelligent Driving Edition of iCAR 03 packs the **7V vision-only solution of DJI Chengxing Platform**, with sensors including a pair of 8MP front view inertial navigation stereo cameras, a 3MP rear view mono camera and four 3MP surround view fisheye cameras. This solution enables memory driving, highway NOA, cross-floor home-zone parking assist and other functions. It costs about RMB5,000.

Huawei ADS 3.0, Momenta, DJI and iMotion

Following the launch of ADS 1.0 and ADS 2.0, Huawei ADS 3.0 has been filed. According to Dong Zhihua, Director of Autonomous Driving R&D at Avatr, Huawei ADS 3.0 features point-to-point connection, that is, in the period of time from the user getting on the car in the residential community garage to getting off the car in the office building garage, the entire process is fully connected, with much higher reliability and safety and fewer manual takeovers.

As of August 2023, Momenta had been publicly designated by SAIC IM, BYD DENZA/Yangwang and Geely Lotus among others for over 10 mass production projects and over 25 models. DJI has cooperated with Wuling, Volkswagen, Chery, etc. By the end of 2024, more than 20 car models will be equipped with its intelligent driving products. In December 2023, iMotion, listed on Hong Kong Exchanges and Clearing, was designated by 16 OEMs including Chery, Geely, Great Wall Motor and Dongfeng, and secured mass production orders for more than 200,000 sets.



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