

China Automotive Ultrasonic Radar and OEM Parking Roadmap Research Report, 2021

Abstract

China Automotive Ultrasonic Radar & OEM Parking Roadmap Research Report, 2021 combs through automotive ultrasonic radar market characteristics, suppliers, development trends and OEM's automatic parking roadmaps. At present, the market presents the following features:

①Proportion of 12 ultrasonic radar solution continues to increase;

②Home-zone parking pilot (HPP) and automated valet parking (AVP) put forward higher requirements for sensor fusion;

③ Cockpit applications such as life detection and gesture control are expected to become new growth points of ultrasonic radar.

Installation of China's automotive ultrasonic radars will hit 150 million units by 2025

Installation of China's automotive ultrasonic radars attained 86.20 mln units (factory-installed market), up 5.2% yr-on-yr. The ultrasonic radars are mainly applied to reversing assist and parking assist. With the upgrading of parking functions and the improvement of installation rate, demand for ultrasonic radars is steadily increasing, further to nearly 150 million units by 2025.

Installation of Ultrasonic Radar for Passenger Cars in China, 2019-2025E

(10,000 units)





Abstract

Proportion of 12 ultrasonic radar solution continues to increase

Viewed from ultrasonic radar configuration solution for single vehicle, 4 ultrasonic radar solution occupied most of the market share from 2019 to 2020, applied for realizing reversing assist. With the commercial promotion of automatic parking, the proportion of 12 ultrasonic radar solution is rapidly rising and is expected to become the mainstream of smart cars in the future.

Proportion of Varied Ultrasonic Radar Configuration Solutions for Single Vehicle, 2019 to 2025E



At present, APA solution launched by OEMs basically adopts 12 ultrasonic radars. Among them, BMW and Buick mainly adopt full ultrasonic radar solution. Partial OEMs (such as NIO, Xpeng, Changan and Geely) adopt the vision fusion solution of ultrasonic radar plus surround view camera to improve the success rate of parking in/out of the automatic parking system.

APA Solutions and Representative Models of Some Chinese Auto Brands (See the Report for More Details)

Brand	APA Solution	Typical Models	Number of Ultrasonic Radars (Units)	Number of Cameras (Units)			
Mercedes- Benz	Ultrasonic radar	Class A, Class C, etc.	12				
Buick	Ultrasonic radar	Envision, LaCrosse, etc.	10, 12				
вмм	Ultrasonic radar	rasonic radar X1, 3 Series, 5 10, 12 Series, etc.					
Tesla	Ultrasonic radar + camera	Model 3/X/Y	12	4			
Lynk & Co	Ultrasonic radar	Lynk & Co 01/02, etc.	12	- 7			
Geely	Ultrasonic radar	Binyue, Borui, etc.	12				
	Ultrasonic radar + camera	Xingyue, etc.	12	4			
WEY	Ultrasonic radar	W6, W5, etc.	12	eom			
Changan Auto	Ultrasonic radar + camera	CS75 PLUS, etc.	12	4			
Xiaopeng Motors	Ultrasonic radar + camera	Xpeng G3/P7	12	4			
NIO	Ultrasonic radar + camera	ES6, ES8, EC6	12	4			
Note: the data above are based on passenger car models in China.							
Source: ResearchInChina							



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HPP and AVP put forward higher requirements for sensor fusion

Existing L2 and L2 + automatic parking fusion solutions mostly adopt ultrasonic + visual fusion. L3 HPP and L4 AVP will realize the fusion of more sensors, such as the introduction of frontview cameras, radar or LiDAR.

Viewed from HPP, mass production time of HPP is scheduled in 2021 to 2022. Generally, OEMs adopt the solution of adding more sensors (such as front-view camera, millimeter wave angle radar, and high-precision positioning) on the basis of APA sensors, which puts forward higher requirements for sensor fusion.

OEM	HPP	AVP	Typical Model	Sensor Configuration	Progress
Xiaopeng Motors	V		Ρ7	Ultrasonic radar*12 Surround view camera*4 Front view camera*1 Angular radar*4 Centimeter-level high- precision positioning	In June 2021, supported HPP after OTA updates, and the point cloud angular radar was Continental SRR520
GAC	√		/	/	Expected to launch HPP in 2021Q4
Geely	V	V	Xingyue L	Surround vi <mark>ew</mark> camera*4 Radar*5 Ultrasonic r <mark>ada</mark> r*12	HPP has started production and is projected to be launched between Sept. and Oct. 2021
Ch <mark>angan</mark> Auto	V	Ų I	UNI-K	Ultrasonic radar*12 Radar*5 Surround view camera*4 Front view camera*1	Released HPP in Mar. 2021
Weltmeister	√ 	V	W6	77GHz radar*5 Surround view camera*4 Front view camera "2 Ultrasonic radar*12	The mass-produced model W6 was launched on market in Mar. 2021
Great Wall Motor	V	VI C	Mocha	Ultrasonic sensor*12 Surround view camera*4 Controller*1 Front view camera*1 HD map	Started pre-sale in Mar. 2021, and projected to be delivered in Nov. 2021
BAIC- ARCFOX	V	V	ARCFOX aS Huawei Inside (HI) Version	LiDAR*3 Radar*6 Ultrasonic radar*12 ADS camera*9 Surround view camera*4	ARCFOX aS HI Version launched in Apr. 2021 supports HPP and AVP, and is projected to be delivered in late 2021.

Development Progress of Some OEM's HPP and AVP



Abstract

In April 2021, WM W6 was released to the market. It is equipped with HAVP (Home-AVP) for one-key autonomous driving, obstacle avoidance, intelligent search for parking spaces, and automatic parking in or out without human intervention. WM W6's HAVP supports up to 100m distance and 5 routes learning. WM W6's HAVP integrates autonomous driving computing platform (Apollo ACU Wuren), with sensors integrating ultrasonic radars, surround view cameras, front-view angle radars and angle radars. Sensor configurations include 5 77GHz radars, 4 surround view cameras, 2 front-view cameras and 12 ultrasonic radars.

WM W6 HAVP

In June 2021, Xpeng Motor added HPP function in the OTA upgrade of Xpeng P7 (Xmart OS 2.6.0). The HPP does not rely on the renovation of parking lot end, with up to 1,000m of route learning, supporting up to 100 routes learning in the parking lots (learning one route for each parking lot).

Xpeng P7's HPP integrates ultrasonic radars + surround view cameras + frontview camera + angle radars. Sensor configuration includes 12 ultrasonic radars, 4 surround view cameras, 1 front-view camera, 4 angle radars and centimeterlevel high-precision positioning. Of which, its angle radars adopt SRR520 point cloud radars provided by Continental.





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As of AVP, many OEMs actively deploy AVP at present. But most of AVP projects are under demo stage

Great Wall WEY Mocha, scheduled to be delivered in Nov.2021, adopt AVP solution of car-end intelligence. Its sensors integrate ultrasonic sensors, surround view cameras, front-view cameras and HD map. The AVP solution is mainly applied for parking scenarios in areas such as supermarkets.

ARCFOX α S S Hi version, with mass production scheduled for the end of 2021, adopts AVP solution of car end intelligence. Its sensor configuration includes LiDAR, radar, ultrasonic radar, ADS camera and surround view camera.

Automated Valet Parking of ARCFOX aS HI Version



Cockpit applications like life detection and gesture control are expected to be new drivers for the growth of ultrasonic radar As intelligent cockpits advance, ultrasonic radar may become applicable to new functions such as life detection and gesture control.

One example is Audiowell Rear Occupant Alert (ROA), a system that detects moving objects via ultrasonic radar. When confirming a moving object at the rear row, it sends a warning to the owner; when the rear occupants fall sleep, it detects slight movements caused by breathing through the Doppler Effect of ultrasonic waves.

Audiowell Rear Occupant Alert System

Human Detection





Sealed Ultrasonic Sensor



With ultrasonic signals as the carrier, Maxus Tech enables gesture control, a function applicable to scenarios such as smart home, smart wearable device and intelligent cockpit.





Table of Content (1)

1 Overview of Automotive Ultrasonic Radar

- 1.1 Introduction
- 1.1.1 Features
- 1.1.2 Structure
- 1.1.3 Principle
- 1.1.4 Classification
- 1.1.5 Technical Solutions
- 1.2 Application Scenarios and Typical Configuration Solutions of
- Automotive Ultrasonic Radar
- 1.2.1 Automated Parking Assist
- 1.2.2 Remote Parking
- 1.2.3 Home Zone Parking Pilot
- 1.2.4 Automated Valet Parking
- 1.2.5 Highway Side Assist
- 1.2.6 Development Trends of Automated Parking
- 1.2.7 Application Trends of Ultrasonic Radar
- 1.2.8 Other Application Scenarios of Ultrasonic Radar
- 1.3 Industry Chain
- 1.3.1 Supply of Industrial Chain
- 1.3.2 Competitive Pattern of Ultrasonic Radar Companies
- 1.3.3 Product Layout of Ultrasonic Radar Companies

2 China's Automotive Ultrasonic Radar Market

- 2.1 Overall Installation
- 2.1.1 Installations by Price Range
- 2.1.2 Installation Rate by Price Range
- 2.1.3 Sales Volume of Joint-venture/Chinese Brand Ultrasonic
- Radar-enabled Vehicle Models and Installation Rate of Ultrasonic Radar

Joint-venture/Chinese Brands 2.1.5 Average Number of Ultrasonic Radars Per Vehicle 2.2 Single Vehicle Ultrasonic Radar Solution 2.2.1 Sales Structure of Ultrasonic Radar Solution by Price Range 2.2.2 4-ultrasonic Radar Solution 2.2.3 8-ultrasonic Radar Solution 2.2.4 12-ultrasonic Radar Solution 2.3 China's Passenger Car Ultrasonic Radar Market Size, 2019-2025E **3 Parking Development Route and Ultrasonic Radar Configuration Solutions of OEMs**

2.1.4 Installation Structure of Ultrasonic Radars in

- 3.1 Parking Solutions of OEMs
 3.1.1 Sales of APA-enabled Vehicle Models
 3.1.2 Typical Brands and Models Using APA Solution
 3.1.3 OEMs' Progress in Home Zone Parking Pilot/Automated Valet Parking
 3.1.4 Ranking of Automated Parking
 3.2 Great Wall Motor
 3.2.1 Ultrasonic Radar Installations & Configuration Solutions
 3.2.2 Development Route of Automated Parking System
 3.2.3 Fully Automated Integrated Parking System
- 3.2.3 Fully Automated Integrated Parking System 3.2.4 All-scenario Automated Parking System
- 3.3 NIO 3.3.1 Ultrasonic Radar Installations & Configuration Solutions 3.3.2 Development Route of Automated Parking System 3.3.3 Fully Automated Integrated Parking System 3.4 LiXiang 3.4.1 Ultrasonic Radar Installations & Configuration Solutions 3.4.2 Development Route of Automated Parking System 3.4.3 Automated Parking System 3.5 BAIC 3.5.1 Ultrasonic Radar Installations & Configuration Solutions 3.5.2 Development Route of Automated Parking System 3.5.3 Fully Automated Parking System 3.6 BYD 3.6.1 Ultrasonic Radar Installations & Configuration Solutions 3.6.2 Automated Parking System 3.7 Weltmeister 3.7.1 Ultrasonic Radar Installations & Configuration Solutions 3.7.2 Evolution of Automated Parking 3.7.3 Automated Parking Solutions 3.8 BMW

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Table of Content (2)

4.1.4 Ultrasonic Radar Application 5.2.1 Profile 3.8.1 Ultrasonic Radar Installations & Configuration Solutions 4.1.5 Development Plan for Automated Parking 5.2.2 Parking & Ultrasonic Radar Solutions 3.8.2 Development Route of Automated Parking System 3.8.3 Automated Parking System 4.1.6 Automated Parking Products 5.2.3 Development Route of Automated Parking System 3.9 Daimler 4.2 Valeo 5.3 Sunrich-Teck 3.9.1 Ultrasonic Radar Installations & Configuration 4.2.1 Profile 5.3.1 Profile & Ultrasonic Radar Development Route 4.2.2 Development History of Automated Parking System 5.3.2 Ultrasonic Radar Products Solutions of Mercedes-Benz 4.2.3 Automated Parking Products 5.3.3 Development Plan for Automated Parking 3.9.2 Development Route of Automated Parking System of 4.2.4 Layout of Automated Parking in China 5.4 Weihai Sensortec Mercedes-Benz 4.3 Continental 541 Profile 3.9.3 L4 Parking System 3.9.4 Parking System Partners 4.3.1 Profile 5.4.2 Operation 4.3.2 Ultrasonic Radar Products 5.4.3 Layout of Automotive Ultrasonic Radar 3.10 Ford 3.10.1 Ultrasonic Radar Installations & Configuration Solutions 4.4 Nicera 5.5 Whetron Electronics 3.10.2 Development Route of Automated Parking System 4.4.1 Profile 5.5.1 Profile 4.4.2 Ultrasonic Radar Products 3.10.3 Parking Assist System 5.5.2 Ultrasonic Radar Application 5.6 Hangsheng Electronics 3.10.4 Automated Valet Parking System 4.5 Murata 3.11 GM 4.5.1 Profile 5.6.1 Profile & Ultrasonic Radar Products 3.11.1 Ultrasonic Radar Installations & Configuration Solutions 4.5.2 Ultrasonic Radar Products 5.7 Shenzhen Shunhe Electric Technology 4.6 Denso 3.11.2 Development Route of Automated Parking System 5.7.1 Profile 4.6.1 Profile & Ultrasonic Radar Products 5.7.2 Ultrasonic Radar Products 3.11.3 Fully Automated Intelligent Parking System (APA) 5.8 LongHorn 3.12 Honda 4.7 Hyundai Mobis 3.12.1 Ultrasonic Radar Installations & Configuration Solutions 4.7.1 Profile 5.8.1 Profile 3.12.2 Development of Automated Parking System 4.7.2 Ultrasonic Radar Products 5.8.2 Product Layout 3.12.3 Automated Parking Assist System 5.9 Hefei Softec Auto Electronic **5** Chinese Automotive Ultrasonic Radar Companies 5.9.1 Profile 5.1 Audiowell 5.9.2 Ultrasonic Radar Products **4 Global Automotive Ultrasonic Radar Companies** 5.10 ForVision Intelligent Technology 5.1.1 Profile 4.1 Bosch 5.1.2 Classification of Ultrasonic Sensors 5.10.1 Profile & Ultrasonic Radar Products 4.1.1 Profile 4.1.2 Development History of Ultrasonic Radar Products 5.1.3 Ultrasonic Sensor Products 4.1.3 Ultrasonic Radar Products 5.2 TungThih Electronic





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