Automotive High-precision Positioning Research Report, 2020-2021

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STUDY GOAL AND OBJECTIVES

This report provides the industry executives with strategically significant competitor information, analysis, insight and projection on the competitive pattern and key companies in the industry, crucial to the development and implementation of effective business, marketing and R&D programs.

REPORT OBJECTIVES

- To establish a comprehensive, factual, annually updated and cost-effective information base on market size, competition patterns, market segments, goals and strategies of the leading players in the market, reviews and forecasts.
- To assist potential market entrants in evaluating prospective acquisition and joint venture candidates.
- To complement the organizations' internal competitor information gathering efforts with strategic analysis, data interpretation and insight.
- To suggest for concerned investors in line with the current development of this industry as well as the development tendency.
- To help company to succeed in a competitive market, and

METHODOLOGY

Both primary and secondary research methodologies were used in preparing this study. Initially, a comprehensive and exhaustive search of the literature on this industry was conducted. These sources included related books and journals, trade literature, marketing literature, other product/promotional literature, annual reports, security analyst reports, and other publications. Subsequently, telephone interviews or email correspondence was conducted with marketing executives etc. Other sources included related magazines, academics, and consulting companies.

INFORMATION SOURCES

The primary information sources include Company Reports, and National Bureau of Statistics of China etc.

Abstract

Our Automotive High-precision Positioning Research Report, 2020-2021 highlights characteristics, industry dynamics and market size of different high-precision positioning technologies (based on signals, environmental features, inertial navigation, etc.), their application in automated driving (passenger cars, low-speed autonomous vehicles, special vehicles, etc.), OEM high-precision positioning solutions, and solution providers with different technology roadmaps.

2020 C-V2X Cross-Industry & Large-scale Pilot Plugfest's introduction of HD map/high-precision positioning technology indicates the significance of high-precision positioning to autonomous driving, especially highly automated driving that requires <10cm positioning accuracy.

Indicators of Positioning System Required by L4/L5 Autonomous Vehicles

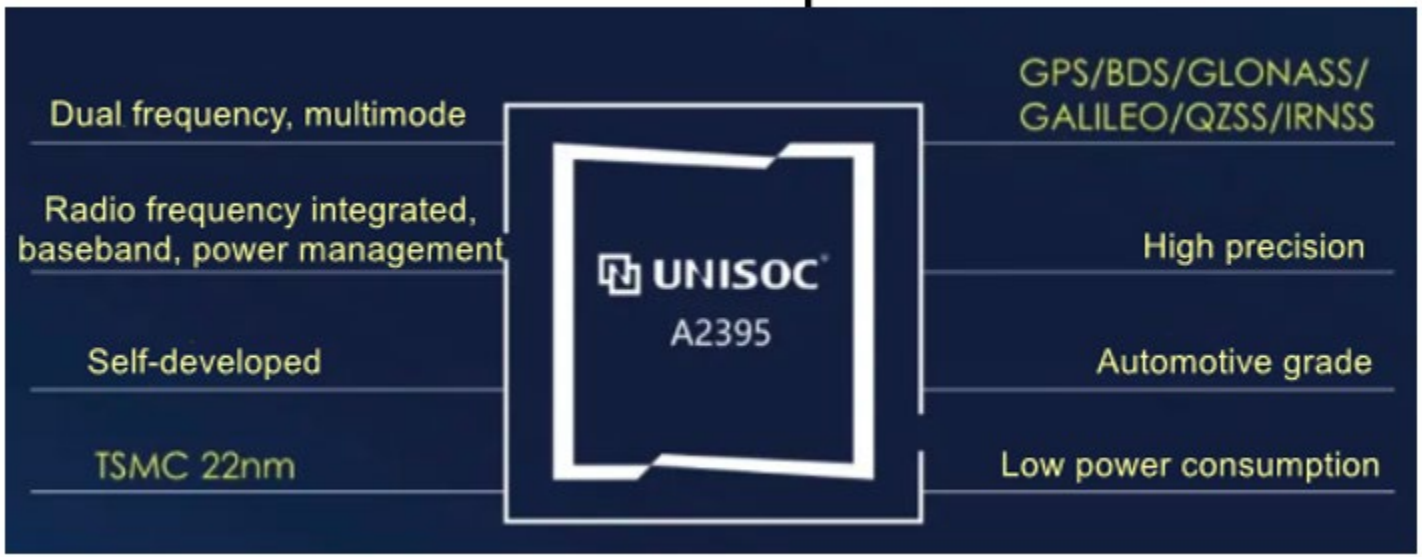
Item	Indicator	Ideal Value
Positional Accuracy	Mean error	<10cm
Positional Robustness	Max. error	<30cm
Attitude accuracy	Mean error	<0.5°
Attitude Robustness	Max. error	<2.0°
Scenario	Available scenario	All weather

Source: White Paper on Vehicle High-precision Positioning

The promising high-precision positioning market attracts quite a few new entrants.

In November 2020, Unisoc released A2395, its first high-precision positioning 22nm chip featuring homemade CPU design. As China's first automotive-grade dual-frequency positioning chip, A2395 supports L1+L5 dual-frequency positioning and delivers centimeter-level positioning accuracy 10 times higher than single-frequency ones.

A2395 Chip



Source: Unisoc

In October 2020, BYD became the third largest shareholder of Allystar Technology (Shenzhen) Co., Ltd., a Beidou-based high-precision navigation and positioning chip vendor, after a capital increase.

In November 2020, BYD and Allystar formally started a lane-level positioning project, aiming to develop lane-level positioning vehicle models

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Providers race to deploy indoor and outdoor integrated positioning

Operation of multiple positioning technologies and construction of location-based service (LBS) platforms, including accuracy data feedback from satellite positioning, scenario positioning, and vehicle positioning, are a foundation for reliable high precision positioning, in addition to simple redundant design.
For higher level of automated driving needs both outdoor and indoor positioning, indoor and outdoor integrated high precision positioning technology will become a future trend, which means terminals will adopt the combination of technical means for indoor and outdoor scenarios.
Precise positioning for all scenarios will provide a critical guarantee for safe, reliable vehicle operation, contributing to massive commercial use of automated driving. In current stage, some positioning technology solution providers have begun to make deployments in this field.

In June 2020, Qianxun Spatial Intelligence Inc. (Qianxun SI) and Nullmax Inc. worked together on development of an indoor and outdoor integrated LBS solution which combines Qianxun SI's indoor and outdoor high-precision positioning solution (RTK+UWB) and Nullmax's perception, planning, control and visual simultaneous localization and mapping (VSLAM) capabilities for autonomous driving. Completely based on embedded system and automotive hardware, the solution can be really production-ready for OEM market.

In October 2020, Beijing NavInfo Internet Fund Management Center under NavInfo Co., Ltd. made an investment in Sichuan Zhongdian Kunchen Technology Co., Ltd., hoping to integrate the investee's UWB positioning technology and products, coupled with high-precision satellite positioning technology (provided by Sixents Technology) and HD map (provided by NavInfo), to build map + positioning based indoor and outdoor integrated solutions.

In February 2021, Hi-Target Surveying Instrument Co., Ltd. and BlueIoT (Beijing) Technology Co., Ltd., an AOA solution provider (wholly owned by Tsingoal (Beijing) Technology Co., Ltd.) forged a strategic partnership. Combining Hi-Target's high-precision positioning technologies (GNSS, IMU, HD map, etc.) and BlueIoT's Bluetooth AOA/AOD high-precision positioning technology, the high-precision positioning capabilities available to all scenarios will be developed as a solution to challenges posed by integration and commercialization of positioning technologies for automated driving that integrates with CVIS V2X, automated parking and vehicle summon in a parking lot, for example. They plan to jointly release an all-scenario high-precision positioning solution for intelligent driving and human-vehicle interaction in the second half of 2021.

Chengdu Jingwei Technology Co., Ltd. projects to unveil its fourth-generation indoor and outdoor integrated positioning chip—JW900, in May 2021.

In October 2020, China Mobile launched OnePoint, its Beidou-based high-precision positioning service product. OnePoint offers 1 to 5cm-level dynamic high-precision positioning services and builds an all-weather, global accurate time and space service system for transportation fields from vehicle management and vehicle-infrastructure cooperation to autonomous driving and automated parking.

Mass-produced vehicle models with high precision positioning technology

In 2018, General Motors used Trimble RTX technology as the high-accuracy GNSS/GPS correction source to deliver absolute positioning to vehicles equipped with GM's Super Cruise hands-free highway driving system, available on the 2018 Cadillac CT6.

In 2020, 7 mass-produced models packing Qianxun SI's high-precision positioning solution were launched on market, including GAC Aion V/LX, Xpeng P7, Hongqi HS5/H9/E-HS9 and SAIC-GM Buick GL8 Avenir.

Positioning Technology Solutions of Some Mass-produced Models Equipped with High Precision Positioning Technology

OEM	Passenger Car Model	AD Level	Launch Time	Positioning Solution	Sensor Configuration
Weltmeister	Weltmeister W6	L4 (parking)	Jan. 2020	SLAM + HD Map	5 77GHz radars, 7 cameras, 12 ultrasonic radars
Xiaopeng Motors	Xpeng P7	L3	Apr. 2020	HD Map + GNSS + RTK + IMU	12 ultrasonic radars, 5 radars, 13 cameras for driving assistance, 1 in-vehicle camera
Aion	Aion V	L3	Jun. 2020	HD Map + GNSS + IMU	12 ultrasonic radars, 4 HD panoramic cameras
	Aion LX	L3	Nov. 2020		12 ultrasonic radars, 5 radars, 4 HD panoramic cameras, 1 in-vehicle camera for driver monitoring, 1 front view camera
FAW Hongqi	E-HS9	L3	Dec. 2020	HD Map + GNSS + RTK + IMU	26 body sensors (including 3 cameras and 5 radars)

Source: ResearchInChina

As more L2+ and L3 vehicle models become available on market, high-precision positioning technology will be mounted on more models.

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