

Ultra-Wideband (UWB) Technology-Based Vehicle Access Control Market - A Global and Regional Analysis: Focus on Application Type, Product Type, and Country-Level Analysis - Analysis and Forecast, 2022-2031

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Abstracts

Global Ultra-Wideband Technology-Based Vehicle Access Control Market: Industry Overview

The global ultra-wideband technology-based vehicle access control market was valued at \$92.6 million in 2022, which is expected to grow at a CAGR of 17.09% and reach \$383.1 million by 2031. The recent surge in the adoption of ultra-wideband technology across developed economies and their growing global awareness is shifting automakers' focus to equip their upcoming models with ultra-wideband technology-based vehicle access. For example, well-known automakers, including BMW, General Motors, Mercedes, and others, have already begun to offer ultra-wideband technology-based vehicle access in recent years. This shift in original equipment manufacturers' (OEMs) focus toward developing ultra-wideband technology-based vehicle access control is expected to drive market growth in the coming years.

Market Lifecycle Stage

Ultra-wideband (UWB) technology can be used for vehicle access control, particularly for vehicle keyless entry systems. UWB technology operates by transmitting short pulses of radio waves over various frequencies. By measuring the time it takes for these pulses to travel between devices, UWB technology can determine the distance between them with very high accuracy. When the user approaches the vehicle with the UWB-enabled key fob, the UWB system can detect the distance between the fob and the

vehicle and automatically unlock the doors.

Impact of Global Ultra-Wideband Technology-Based Vehicle Access Control Market

The global ultra-wideband technology-based vehicle access control market is expected to significantly impact the automotive industry and the broader economy. Ultra-wideband technology-based vehicle access control systems can be a key differentiator for automotive manufacturers looking to provide a more secure and convenient user experience. As such, we expect to see increased investment in UWB technology from automotive manufacturers and greater integration of UWB systems into vehicles. Ultra-wideband technology can provide a higher level of security than traditional keyless entry systems, as UWB signals are difficult to intercept or jam. As such, adopting UWB-based vehicle access control systems may help reduce the incidence of vehicle theft. For instance, in January 2021, BMW Digital Key Plus with ultra-wideband technology would be available for the BMW iX. BMW Digital Key Plus provides customers with a simple and secure keyless entry system.

Market Segmentation:

Segmentation 1: by Vehicle Type

Passenger Vehicles

Light Commercial Vehicles

Heavy Commercial Vehicles

Passenger vehicles are currently credited with the highest share of the demand for ultra-wideband technology. Some key factors that have enabled the technical acceptance of these vehicles are high demand, higher registration of passenger cars, and less operating difficulty as compared to commercial vehicles. The need for passenger vehicles is growing due to the demand for heavy and luxury vehicles and an increase in the number of cars driven by diesel engines. Additionally, increased population, urbanization, and disposable income have significantly increased passenger vehicle production.

Segmentation 2: by Authentication Type

Biometric

Non-Biometric

The biometric segment accounts for the largest market. The combination of biometric and UWB technologies for vehicle access can provide a highly secure and convenient solution for keyless entry systems in vehicles. Biometric technology can verify the user's identity, while UWB technology can ensure that the user is physically present in the correct location. If the user's identity is verified and their location is confirmed, the vehicle's access control system could automatically unlock the doors, allowing the user to enter the vehicle. Overall, combining biometric and UWB technologies for vehicle access control can provide a seamless and secure user experience while offering enhanced protection against vehicle theft and unauthorized access.

Segmentation 3: by Component Type

Software

Hardware

Smart Devices

Key Fob

In-Vehicle Access Chip Set

The hardware segment accounts for the largest market. Ultra-wideband (UWB) technology-based vehicle access systems use short-range radio waves to communicate between the vehicle and the access device. These systems require specific hardware components to operate. The UWB chip is the heart of the UWB system and is responsible for transmitting and receiving data; the control module manages the UWB system's functions and is usually located inside the vehicle. The access device is used to communicate with the UWB system and is generally located outside the vehicle.

Segmentation 4: by Frequency Range

3.1 GHz to 6 GHz

6 GHz to 10.6 GHz

The 6 GHz to 10.6 GHz segment accounts for the largest market. The frequency range of 6 GHz to 10.6 GHz is one of the frequency bands allocated for ultra-wideband (UWB) communications. Using a wide range of frequencies allows UWB to provide high data rates and low power consumption, making it ideal for wireless personal area networks, radar, and location-tracking applications. UWB in the 6 GHz to 10.6 GHz frequency range is used in various applications, including high-speed data transfer, radar imaging, and precision location tracking. UWB-based systems in this frequency range can provide accurate location information with sub-centimeter precision, making them suitable for asset tracking, industrial automation, automotive, and robotics applications.

Segmentation 5: by Positioning Technique

Time Difference of Arrival (TDoA)

Two-Way Ranging (TWR)

The TWR segment accounts for the largest market. Two-way ranging is used in ultra-wideband (UWB) technology-based vehicle access systems to determine the distance between the vehicle and the access device. This technique uses time-of-flight measurements to calculate the distance based on the time it takes for a signal to travel from the vehicle to the access device and back again. Two-way ranging in UWB technology-based vehicle access systems has several advantages. It provides accurate distance measurement with sub-centimeter precision, which is critical for ensuring secure and reliable vehicle access.

Segmentation 6: by Region

North America

Europe

U.K.

China

Asia-Pacific and Japan

Rest-of-the-World

North America currently holds the largest share of the global ultra-wideband technology-based vehicle access control market. The North America region comprises the U.S., Canada, and Mexico. The presence of technology providers, minimal miscalculations, product customization, and reduced production timescale are the primary driving factors of the North America ultra-wideband technology-based vehicle access control market. The U.S. government's policies for research and development activities regarding ultra-wideband technology also hasten the region's adoption of ultra-wideband technology.

Recent Developments in the Global Ultra-Wideband Technology-Based Vehicle Access Control Market

In June 2022, CEVA, Inc. announced that the RW-UWB-CCC MAC software package had been added to its RivieraWaves ultra-wideband (UWB) IP to support the Car Connectivity Consortium® (CCC) Digital Key 3.0 specification.

In June 2021, NXP Semiconductors announced the availability of beta ultra-wideband (UWB) development tools from its NXP Trimention portfolio that interoperate with the U1 chip in supported Apple products.

In January 2022, Qorvo, Inc. introduced the first wideband Wi-Fi front-end module (FEM) for customer premises equipment, covering the 5.1 GHz to 7.1 GHz bands (CPE). Qorvo's new wideband QPF4730 can support full-frequency Wi-Fi 6 and Wi-Fi 6E enterprise solutions.

Demand – Drivers and Limitations

The following are the drivers of the global ultra-wideband technology-based vehicle access control market:

Increasing Adoption of Real-Time Location System (RTLS) Applications in Vehicle

Growing Adoption of the Internet of Things (IoT) in Automotive Applications

The following are the challenges for the global ultra-wideband technology-based vehicle access control market:

Risk of Cyber Attacks

Spectrum Expansion for New Applications

How can this report add value to end users?

Product/Innovation Strategy: The product segment helps the readers understand the different types of ultra-wideband technology. Furthermore, the study provides the readers with a detailed understanding of the global ultra-wideband technology-based vehicle access control market based on application and product.

Growth/Marketing Strategy: To improve the capabilities of their product offerings, players in the global ultra-wideband technology-based vehicle access control market are developing unique products. The readers will be able to comprehend the revenue-generating tactics used by players in the global ultra-wideband technology-based vehicle access control market by looking at the growth/marketing strategies. Other market participants' tactics, such as go-to-market plans, will also assist readers in making strategic judgments.

Competitive Strategy: Players in the global ultra-wideband technology-based vehicle access control market analyzed and profiled in the study include vehicle manufacturers that capture the maximum share of the market. Moreover, a detailed competitive benchmarking of the players operating in the global ultra-wideband technology-based vehicle access control market has been done to help the readers understand how players compete against each other, presenting a clear market landscape. Additionally, comprehensive competitive strategies such as partnerships, agreements, collaborations, and mergers and acquisitions are expected to help the readers understand the untapped revenue pockets in the market.

Key Market Players and Competition Synopsis

The companies that are profiled have been selected based on inputs gathered from

primary experts and analyzing company coverage, product portfolio, and market penetration.

Key Companies Profiled

Alereon Inc.

Apple Inc.

Microchip Technology Inc.

NXP Semiconductors

Pulse~LINK, Inc.

Qorvo, Inc.

STMicroelectronics N.V.

Xiaomi

BMW Group

CEVA, Inc.

Continental AG

Hyundai Motor Group

Robert Bosch GmbH

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Sirin Software

Valeo

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