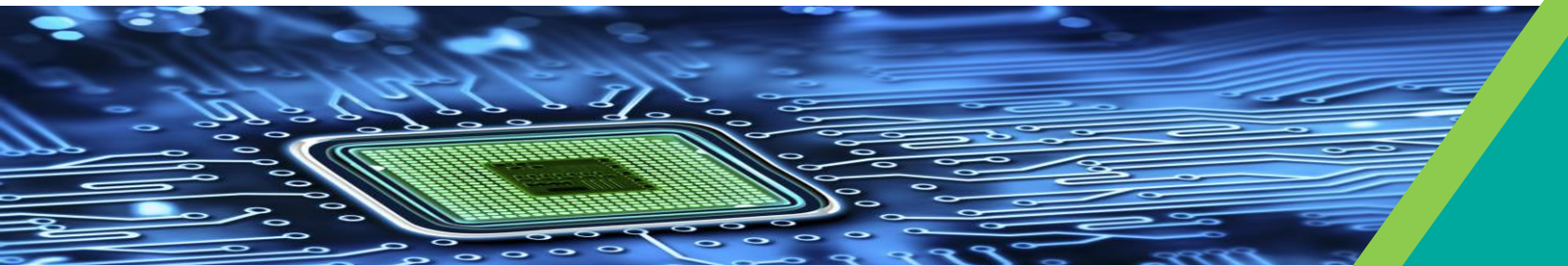


LUCINTEL INSIGHT
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SIX TRENDS SHAPING THE FUTURE OF THE AUTOMOTIVE SEMICONDUCTOR MARKET

The automotive semiconductor market is growing and gaining traction due to the increasing adoption of electronic content in the automotive sector for automation, electrification, digital connectivity, and security. Some of the key trends in the automotive semiconductor market are semiconductors to support vehicle artificial intelligence, V2X communication for enhanced safety

and mobility, increasing electronic content in automotive, development of ultra-wideband technology, development of integrated IoT based semiconductors, and growth of autonomous vehicles. The major growth drivers for this market are increasing vehicle production, increasing electronic content per vehicle, and growing demand for advanced vehicle safety and comfort systems.

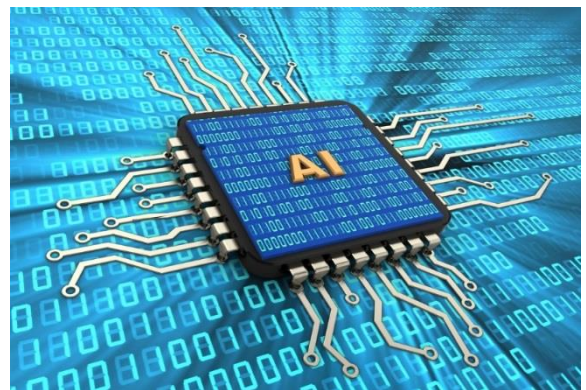


The automotive semiconductor market is divided into several segments, such as microcontrollers, integrated circuits, sensors, discrete power, and others. Key players in the automotive semiconductor market include NXP Semiconductors, Renesas Electronics, ST Microelectronics, Infineon Technologies, and Texas Instruments. These have been working on different strategies to drive sales using highly influential marketing approaches; however, as we examine the challenges and opportunities ahead in this market, companies can benefit from the strategy of developing the smallest single chips for radar sensor and IoT based semiconductors, as well as considering the key target market trends we have identified. Lucintel predicts that the global automotive semiconductor market will be valued at \$53.6 billion by 2025, with an expected CAGR of approximately 9.2% between 2020 and 2025.

Lucintel identifies six trends set to influence the global automotive semiconductor market. Most of the industry players and experts agree that these six trends will accelerate developments in the automotive semiconductor industry in the near future. In terms of the widespread knowledge about the automotive semiconductor market already on the horizon, there is still a lack of unified perspective on the direction the industry is moving to proactively address developments. To help bring more clarity to this gap, our study aims to provide insights concerning the direction that changes are taking and how these changes will impact the automotive semiconductor market.

1. Semiconductors to Support Vehicle Artificial Intelligence

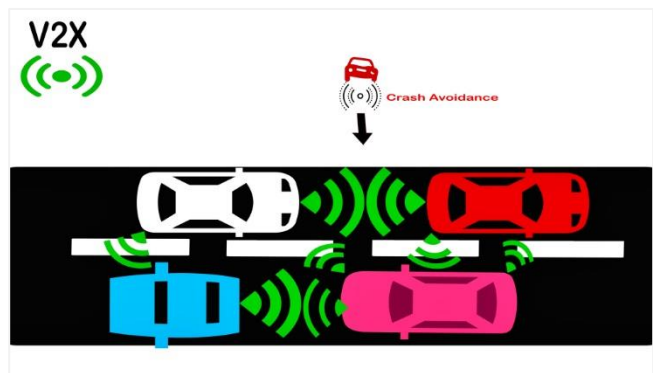
The automotive industry is using semiconductors to support vehicle AI to mimic, augment, and support the actions of humans, while simultaneously leveraging the advanced reaction times and pinpointing precision in machine based systems. In self-driving vehicles, AI is used to make the car more convenient and safer for both driver and passengers. In-car assistants, driven by natural language processing (NLP) and machine learning techniques,



allow a vehicle's systems to respond to voice commands and infer which actions to take, without human intervention. Despite the technological potential of both autonomous vehicles and in-car assistants, an abundance of caution relating to safety concerns, and a desire to ensure that users enjoy a smooth and glitch-free experience, these AI systems will likely be deployed gradually through smart semiconductors.

2. V2X Communication for Enhanced Safety and Mobility

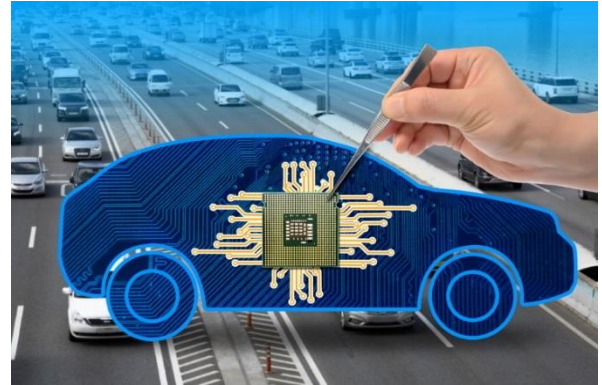
Vehicle-to-Everything (V2X) technology enables cars to communicate with their surroundings and makes driving safer and more efficient for everyone. V2X informs in advance about what's ahead, even without driver visibility. Unlike traditional sensors which try to replicate a sense we already have, such as vision, V2X adds a whole new dimension to human and machine perception. This sensor is capable of



seeing around corners and beyond any obstruction in a radius of up to one mile. V2X warns the driver of road hazards, helping reduce traffic injuries and fatalities. In addition to improving safety, V2X helps to optimize traffic flow, reduce traffic congestion, and lessen the environmental impact of transportation. Autotalks is a fabless semiconductor company focused on the V2X market. The company's chipsets address various issues related to V2X communication.

3. Increasing Electronic Content in Automotive

The automobile industry has been moving at a steady pace to integrate electronics into cars in innovative ways to augment safety (radar and collision avoidance, automatic braking), infotainment (satellite radio and Bluetooth), navigation (GPS mapping), system monitoring, on-board computers and many others, including emerging self-driving cars. This has resulted in a significant increase in demand for electronic components. The growing automotive market



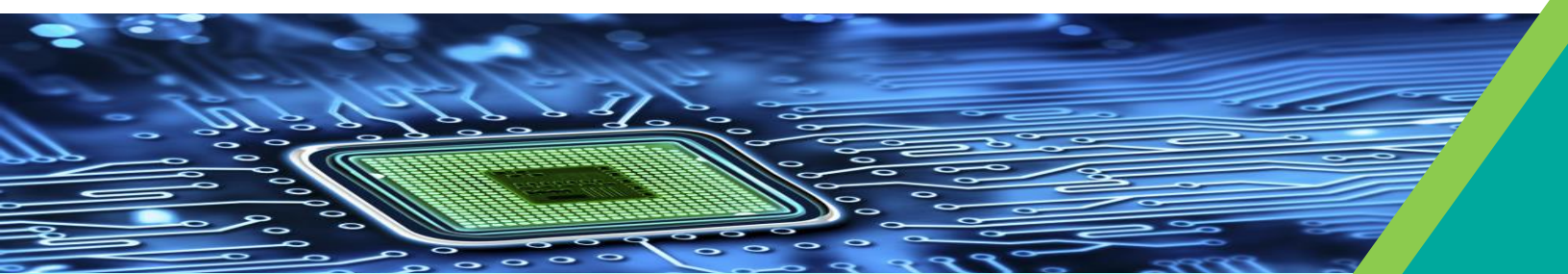
presents a huge opportunity for automotive semiconductors to support battery performance in EVs, increased connectivity, enhanced sensors, and other technologies. The use of automotive semiconductor content in electric and hybrid cars is higher compared to that in conventional cars. Hybrid and electric vehicles need high-performance microcontrollers, microprocessors, application specific integrated circuits, and power MOSFETs.

4. Development of Ultra-Wideband (UWB) Technology

NXP Semiconductors has introduced new automotive UWB IC. UWB provides precise, secure, real-time localization capabilities unrivaled by other wireless technologies such as Wi-Fi, Bluetooth, and GPS. Ultra-wideband technology makes use of a very high bandwidth of 499.2MHz. This technology is designed to give spatial awareness to UWB-equipped cars, mobiles, and other smart devices, to enable cars to know exactly where the users are. For



the first time, smartphone based car access offers the same level of convenience as state-of-



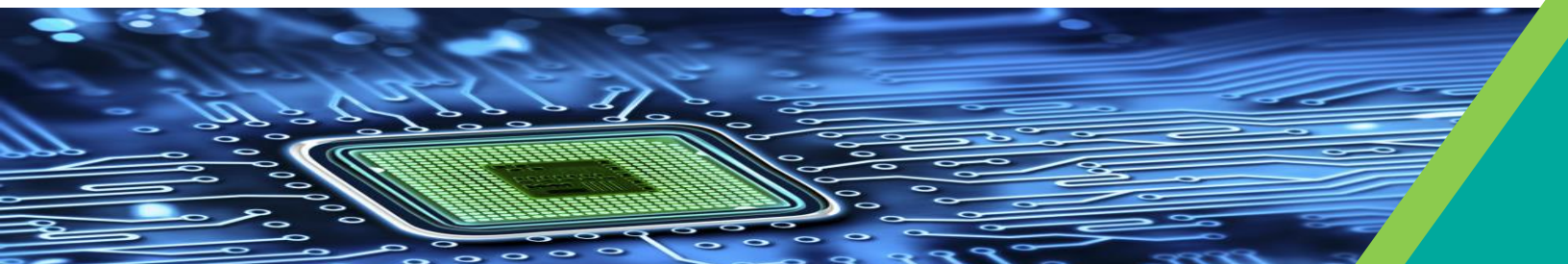
the-art key fobs. This technology is becoming more widespread, and the latest smartphones have already incorporated chips with UWB into their design, right next to the better-known technologies like Wi-Fi and Bluetooth. BMW will use ultra-wideband technology in the BMW iX to power the BMW Digital Key Plus. Overall, UWB technology is set to add great convenience features for car owners everywhere, promising both increased security and added ease when using car keys.

5. Development of Integrated IOT Based Semiconductors

Internet of Things (IoT) enables physical and virtual objects to connect with each other via cloud technology, and exchange data and information. IoT empowers transformational change, and the auto sector is changing to a great degree at a very quick pace. Connected cars and IoT offer numerous opportunities for both consumers and automotive manufacturers. For consumers,



connected cars mean integration with entertainment, traffic, navigation information, and advanced features such as remote diagnostics and maintenance, safety, and emergency assistance. For manufacturers, connected cars and telematics enable valuable insights into vehicle operations and performance, remote diagnostics, and safety services for the lifetime of a vehicle, as well as providing improved contact with customers.



6. Growth of Autonomous Vehicles

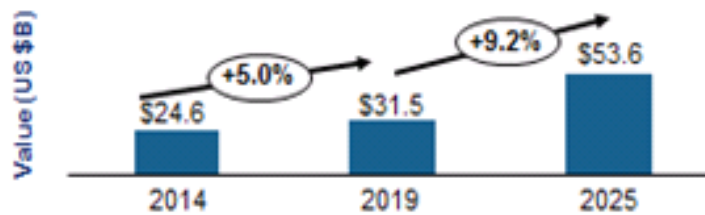
The rise of autonomous vehicles is shifting demand for automotive chips and prompting OEMs to consider in-house design. The strong focus on autonomous vehicles (AVs) has already altered demand patterns for automotive semiconductors, as the sales of specialty silicon chips tailored to specific applications are growing strongly. These customized chips are only available from a few semiconductor companies, and some OEMs are now designing them in-house to reduce development timelines and gain more control. With demand for specialty silicon continuing to grow, other OEMs could take the same route.



Strategic Considerations for Key Players in the Automotive Semiconductor Market

The automotive semiconductor industry is dynamic and ever-changing. Successful industry players are masters of innovation, change, and adaptation. To retain this status, they need to be attentive to current trends. We believe there will be promising opportunities for automotive semiconductors in passenger cars, and commercial and electric vehicles. As per Lucintel's latest market research report (Source: <https://www.lucintel.com/automotive-semiconductor-market.aspx>), the [automotive semiconductor market](https://www.lucintel.com/automotive-semiconductor-market.aspx) is expected to grow with a CAGR of approximately 9.2% between 2020 and 2025, and reach \$53.6 billion by 2025. This market is primarily driven by increasing vehicle production, increasing electronic content per vehicle, and growing demand for advanced vehicle safety and comfort systems.

Trends and Forecast for the Global Automotive Semiconductor Market (US \$B) (2014-2025)



Source: Lucintel

Whether you are new to the automotive semiconductor market or an experienced player, it is important to understand the trends that impact the development process, as these trends as listed above will lead players to create long-term strategy formulation that will allow them to remain competitive and successful in the long run. For example, to capture growth, some of the strategic considerations for players in the automotive semiconductor market are as follows:

- Automotive semiconductor market players can increase their capabilities in developing smallest single chips for radar sensor and IoT based semiconductors.
- Players can focus on auto ultra-wideband (UWB) technology, which enable cars to know exactly where the users are.
- Players can also focus on automotive semiconductors to support vehicles' artificial intelligence, which is expected to lead future trends.
- Investment to increase competencies to fulfill packaging requirements of miniature and high function semiconductors.
- Research and development activities to develop low-cost high-power semiconductors

Note: In order to gain better understanding, and learn more about the scope, benefits, and companies researched, as well as other details in the automotive semiconductor market report from Lucintel, click on <https://www.lucintel.com/automotive-semiconductor-market.aspx>. This comprehensive report provides you with in-depth analysis on market trends and forecast,

segment analysis, regional analysis, competitive benchmarking and company profiling of key players. In addition, we also offer **strategic growth consulting** to meet your customized needs. We have worked with many PE firms and corporate customers in the process of their market entry and M&A initiatives.



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