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India Automotive Electronics and Software Market Assessment, By Components [Electronic Control Units (ECU)/Domain Control Units (DCU), Sensors, Software, Power Electronics, Harness Systems, Other Electronics Components], By With-In Vehicle Application [Advance Driver Assistance Systems (ADAS), Powertrain, Infotainment, Safety Systems, Others], By Sales Channel [OEM, Aftermarket], By Vehicle Type [Internal Combustion Engine (ICE), Hybrid Vehicle, Electric Vehicle (EV)], By Region, Opportunities and Forecast, FY2017-FY2031

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Abstracts

India Automotive Electronics and Software Market size was valued at USD 24.84 billion in FY2023 which is expected to reach USD 76.09 billion in 2030 with a CAGR of 15.02% for the forecast period between FY2024 and FY2031. Increasing demand for automobiles, technological advancements, declining costs of electronic sensors, emission standards, and automotive policies, coupled with increasing public demand for better and technologically advanced vehicles, is fueling the market for automotive electronics and software in India.

India Automotive Electronics and Software market is an important segment of the Indian automotive industry, which is one of the largest industries in India, encompassing the design, development, manufacturing and selling of vehicles. India’s annual production of automobiles in FY2023 was 22.93 million. India automotive industry has been consistently growing and is driven by innovation and diversification and manufacturers

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are constantly adapting and adopting their automotive electronic systems to the needs and wants of the India diaspora. The last 5 decades have seen a drastic shift in the automotive industry from being reliant on mechanical parts, to increasing adoption of electronic components and systems. Engine control units, EV/HV, HVAC, infotainment, and lighting account for 95% of the automotive electronics demand in India which has revolutionized the interaction and driving experience with increased safety and security, enhanced engine and transmission performance, improved driver comfort, and offering internet-integrated multimedia and entertainment.

Emission Policies Augmenting the Need for Enhanced Automotive Efficiency

From April FY2024, the India automotive industry saw the implementation of new emission regulations known as RDE (Real Driving Emissions) norms under the second stage of BS6 emission standards (equivalent to euro-VI emission standards), wherein vehicles will need to demonstrate compliance with emission limits while being driven on roads, in addition to undergoing testing based on the Modified India Test Cycle (MIDC) in a controlled environment. Thus, automobiles will require more sophisticated equipments and the implementation of technologies such as an Electronic Control Unit (ECU), which not only optimizes fuel injection, ignition timing, and other engine parameters, resulting in better performance, improved fuel economy and lower vehicle emissions. OEMs are switching to Exhaust Gas Recirculation (EGS), Selective Catalytic Reduction (SCR) to revamp their existing fleet and BS-VI mandates installing certain technology like On-Board Diagnostics Modules in the new and upcoming models.

Major automotive manufacturer Tata Motors made enhancements to its range of passenger vehicles to comply with the more stringent BS-VI emission standards. Similarly, Maruti Suzuki India and Mahindra & Mahindra are confident that they will successfully transition their product lineup to meet the requirements before the deadline of April 1.

Customers Seek Advanced Connectivity, Infotainment, Increased Safety and Comfort

The demand for connected features and infotainment systems in vehicles is increasing rapidly. Consumers expect features like smartphone integration, navigation systems, voice commands, and wireless connectivity. This trend has driven the integration of advanced electronic systems that enable seamless connectivity and enhanced entertainment options.

As the Indian automotive market continues to evolve, it is expected that the demand for

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connected features and advanced electronic and software systems will only increase. The automotive industry in India is likely to witness further advancements in connectivity, infotainment, and driver-assistance technologies in the coming years, making the driving experience more enjoyable and convenient for consumers.

Government’s Semiconductor Policy

The government of India plays a crucial role in the automotive electronics and software market by establishing regulations, policies, and standards that shape the industry. The India Government encourages foreign investment in the automobile sector and has allowed 100% FDI under the automatic route and issued a notification in FY2022 regarding a PLI scheme for automobile and auto components worth USD 3.49 billion.

To make the India automotive electronics and software sector self-reliant from semiconductors imported from China and Tiwan, the Gujarat government in July FY2023 announced a semiconductor policy, where it will set up Dholera Semicon City along with lucrative incentives for investment in this sector. Following this Gujarat government signed a Memorandum of Understanding (MoU) with the US-based computer storage chip maker Micron in June FY2024 to set up India’s first semiconductor facility with USD 2.75 billion investments to setup semiconductor assembly and test facility at Sanand in Ahmedabad district.

Rise of Electric Vehicles Drives the Automotive Electronics Market

Electric vehicles rely heavily on advanced electronic components and systems for their operation, and the increasing adoption of EVs has driven the demand for automotive electronics and software, particularly in areas such as electric powertrains, regenerative braking systems, and energy management systems. Moreover, to boost this and support the Automotive Electronics and Software Market, India government introduced the ‘Battery Swapping Policy’ in Union Budget FY2024.

In March 2022, MG Motors, owned by China's SAIC Motor Corp, announced plans to raise USD 350 to 500 million in private equity in India to expand its EV fleet and fund its future needs. The expansion of the EV market in India will create a domino effect, driving investment and advancements in the automotive electronics and software industry. As automakers like MG Motors invest in the development of EVs and the required electronic systems, it will stimulate the growth of electronic component suppliers, semiconductor manufacturers, and technology providers within India. This will lead to job creation, technology transfer, and overall economic growth within the

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automotive electronics and software sector in the country.

Growing trend of Autonomous, Connected, Electric, and Smart-Shared-Mobility

The growing trend of autonomous, connected, electric, and smart vehicles in India is indicative of the country's transition towards cleaner and more technologically advanced transportation. With increasing investments, government initiatives, and consumer awareness, the market for these vehicles is expected to further expand in the coming years. Passenger car segment in automotive market is expected to account for two thirds of the India Automotive Electronics and Software Market due to increasing customer demand in infotainment systems, On-board Diagnostics, Electronics control Unit (ECU), Anti-locking Braking Systems (ABS) etc.

The premium segment (with ex showroom prices above USD 13,000) regularly have features like Head-up display (HUD), blind spot monitoring system, auto-dimming mirror, advanced driver assistance systems (ADAS) and automatic transmission and the certain of these features like anti breaking and powertrain electronics and assisted parking same have started to trickle down to lower segments as well. Toyota Motors became the first car maker to install Antilock Braking System (ABS) as a standard fitment in all locally made vehicles. Mahindra Electric, a leading electric vehicle manufacturer, in FY2022 introduced connected car technology in its electric SUV, the XUV300 Electric.

Impact of COVID-19

The COVID-19 pandemic had a significant impact on the India automotive market. The measures implemented to control the spread of the virus, such as lockdowns and travel restrictions, led to a sharp decline in demand for automobiles. India Automotive sales dropped by 25 % in FY2023 and its repercussions reaching the India automotive electronics and software market. Furthermore, the automotive market was heavily reliant on global supply chains, which were disrupted due to travel restrictions and border closures. This resulted in shortages of certain components, leading to production delays and increased costs.

Several automotive electronics and software manufacturers and technology companies have made significant investments in India. For example, Tata AutoComp Systems collaborated with Australia-based Tritium to manufacture and supply DC fast chargers for electric vehicles in India. Similarly, in FY2022, Bosch announced a strategic partnership with Ola Electric, an India electric vehicle manufacturer. As part of the

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collaboration, Bosch will provide its expertise in automotive electronics and software, including powertrain systems, charging infrastructure, and battery management systems, to support Ola Electric's EV lineup.

Impact of Russia-Ukraine War

Russia Ukraine war disrupted oil and gas supplies and highlighted the vulnerabilities of relying heavily on fossil fuels for energy. This situation has prompted many countries to explore alternative energy sources and technologies. Owing to this, there is a growing demand for economical hybrid and battery-powered vehicles that lower carbon emissions and mitigate the impact of fluctuating fuel prices.

This adds to an existing supply chain issue brought about by the prevailing semiconductor shortage. Some of the key components of semiconductors such as purified neon gas and palladium metal used in semiconductor are sourced from both countries. India government has recently approved budget of over USD 10 billion and various schemes to establish compound semiconductors, silicon photonics, sensors fabs, and semiconductor assembly, testing, marking, and packaging (ATMP), as well as OSAT (Outsourced Semiconductor Assembly and Test) facilities in India that aim at fostering the growth of the semiconductor and display manufacturing ecosystem to support the supply chain, encompassing electronic components, sub-assemblies, and finished goods.

Key Players Landscape and Outlook

Key players are heavily investing in R&D and diversifying the features their automobile offers to attract more customers. Automotive manufacturers are exploring alternative suppliers for semiconductors and electronic components, both domestically and internationally. This helps reduce dependence on a single source and ensures a more stable supply chain. To get an edge over the competitors' automotive manufacturers are collaborating with software and electronics manufacturers to provide Hi-Tech solutions.

For instance, in FY2023 Tata Motors partnered with Japan's Renesas Electronics Corporation to provide semiconductor solutions as well as establishing a next generation EV innovation center 'NEVIC'.

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