Advanced Devices

Beyond the mobility domain, in order to create and expand businesses that solve social and customer challenges, our organization has been restructured around the ability to contribute to society and customers, rather than a pure focus on technology. We are enhancing the value of systems through the integration of sensing and actuation while leveraging our strengths in vertical integration in semiconductors. While creating new devices and systems, we aim to win the trust of our customers with an all-points approach to quality, cost, and delivery (QCD) in the expanding electrification market.

Eiichi Kurokawa Head of Business Group

Business Strengths	Opportunities	Risks
• Creation of new value through sensing and actuation • Robust semiconductor supply base through in-house production, consignment production, and partnerships • Advanced production technologies and on-site expertise to handle changes in models and volumes in new product domains	• Moderate growth of the automotive market, particularly in emerging economies • Expansion in demand for diverse electric vehicle products (BEVs, HEVs/PHEVs) • Greater opportunities to propose solutions as systems become increasingly integrated and intelligent	• Entry of competitors from other industries and the rise of start-ups as BEVs and SDVs become more widespread • Price declines resulting from past overinvestment by semiconductor manufacturers • Shrinking business opportunities due to OEMs canceling BEV projects

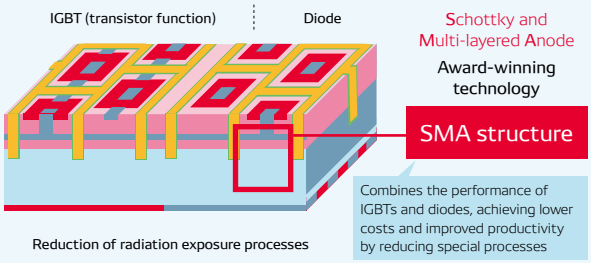
Business Strategy

With steady diversification in mobility, there has been a shift toward HEVs/PHEVs in the electrification domain, alongside accelerated system integration and intelligence in the ADAS domain. In such an environment, we recognize that the success of our business hinges on the swift rollout of products needed by customers and greater society. Looking ahead to 2030, the Advanced Devices Business Group has identified its key success drivers as "enhancing the value of systems," "collaborating with partners," and "promoting a product lineup," and is keen to strengthen competitiveness in semiconductors, sensing, and actuation.

Progress on Mid-term Policy for 2025 and Outlook

Recipient of the Okochi Memorial Prize

DENSO received the 71st Okochi Memorial Prize*1 (fiscal 2025) in recognition of its development and highly efficient production of compact, low-loss reverse-conducting IGBTs*2 for electric vehicles. This technology helps reduce costs and improve productivity in response to rapid progress in vehicle electrification, enabling IGBT production using 300mm wafers manufactured at United Semiconductor Japan Co., Ltd. (USJC), as well as the development of a broad supply chain and decentralized production at multiple sites.



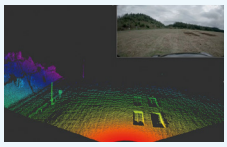
*1 An award presented for achievements that have significantly contributed to the advancement of industry and society, based on academic progress in the fields of production engineering, manufacturing technology, and production systems
*2 IGBTs: Insulated gate bipolar transistors

Integrated In-house Production Using Innovative Technologies and Methods

In response to growing demand for SiC semiconductors due to the shift to BEVs, DENSO is working to develop the world's most energy-efficient chips for its customers. To enhance added value, ensure stable supply, and strengthen competitiveness, we are making preparations for integrated in-house production, from wafers and epitaxial wafers to devices. On the manufacturing front, we are using the world's first gas method to reduce costs and downsize devices, contributing to better vehicle fuel efficiency through lower power loss. We aim to complete technical validation by fiscal 2025 and begin production in fiscal 2028.

In-house Development of High-Precision, High-Reliability 3D LiDAR

We are leveraging our core sensing technologies developed in the automotive field to address labor shortages by developing products that contribute to work automation. DENSO has developed a high-precision, high-reliability 3D LiDAR sensor that detects the three-dimensional shape of objects. It has been selected for autonomous driving systems used in mining vehicles to detect uneven road surfaces and obstacles undetectable by cameras to plot optimal driving routes, helping to reduce excessive working hours and improve safety and productivity. As a potential future application, we are also exploring whether this technology can be used to detect vehicles driving the wrong way on highways, a problem in society. We will continue to pursue broader adoption of this technology across various applications.



Point cloud data from DENSO's LiDAR system
(Top right: Camera image for reference)

Global Production Deployment and Optimization of In-house and Outsourced Manufacturing to Meet Market Needs and Enhance Cost Competitiveness

On the *Monozukuri* front, we are pursuing a supply framework that delivers greater value to customers in terms of quality, cost, and speed. We will also accelerate optimization of semiconductor operations, which have been concentrated in Japan, to include overseas sites. In addition to the Group, we will also consider and pursue alliances with other companies as strategic options to enhance our competitiveness.