



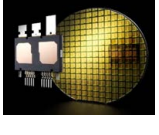



Contribution Fields and Mainstay Products

Since its establishment as a manufacturer of electrical equipment and radiators, DENSO has reflected changes in society by extending the Company's business domain to encompass lifestyle-related and industrial equipment through the application of technologies that were originally developed for automotive components. With a focus on various solutions that create value for society in the mobility field, DENSO is currently utilizing technologies accumulated in the automotive field to develop a range of businesses that will support the society of the future.

Value Creation in Our Businesses

In accordance with the Long-term Policy for 2030, our seven core businesses are pursuing innovations in leading-edge technologies to maximize the value of green and peace of mind. In addition, we will conduct business activities and utilize honed technologies to help achieve the Sustainable Development Goals (SDGs), address social issues, and create new value.

Segment		Revenue (Billions of yen)	Core Products That Contribute to Green and Peace of Mind				● Green ● Peace of mind
Automotive businesses	Electrification Systems □ P.82-83	<div><div>874.6</div><div>1,042.1</div><div>1,241.6</div></div> <div>222324 (FY)</div>	<div><p>● Inverters (Power control units) Appropriately control power between the batteries and motors of BEVs and HEVs</p></div>	<div><p>● Motor generators Help improve fuel efficiency as the main power sources for HEVs during driving and as generators during braking</p></div>	<div><p>● Battery ECUs Control batteries safely and with high precision and help improve fuel efficiency and extend driving distance</p></div>	<div><p>● ESUs (Electricity supply units) Incorporate charging control, AC chargers, voltage control, etc., into one unit</p></div>	
	Powertrain Systems □ P.84-85	<div><div>1,324.5</div><div>1,489.3</div><div>1,518.6</div></div> <div>222324 (FY)</div>	<div><p>● Common rail systems and gasoline direct injectors Realize stable combustion through optimally controlled fuel injection</p></div>	<div><p>● Ignition coils and spark plugs Enable ignition and efficient combustion in gasoline engines</p></div>	<div><p>● Exhaust and cam timing systems Detect oxygen concentration and adjust the opening and closing of intake and exhaust valves, etc.</p></div>	<div><p>● Starters and alternators Start engines and control power generation and charging</p></div>	
	Thermal Systems □ P.86-87	<div><div>1,282.0</div><div>1,585.6</div><div>1,730.8</div></div> <div>222324 (FY)</div>	<div><p>● Heat exchangers Cool and heat air and water by exchanging heat with the atmosphere</p></div>	<div><p>● Air-conditioning systems for cars (passenger and commercial) Adjust cabin temperature and airflow and boast excellent compactness, performance, ease of installation, and comfort</p></div>	<div><p>● Inverter cooling systems Improve power output density by cooling power semiconductors and realize compactness and weight reduction</p></div>	<div><p>● Thermal management systems Reduce air-conditioning energy wastage by utilizing atmospheric heat and contribute to battery life extension and rapid charging, etc., through temperature control</p></div>	
	Mobility Electronics □ P.88-89	<div><div>1,356.4</div><div>1,615.5</div><div>1,941.8</div></div> <div>222324 (FY)</div>	<div><p>● Powertrain electronic control units (ECUs) Optimally control the powertrains of gasoline vehicles, HEVs, and BEVs and contribute to carbon neutrality</p></div>	<div><p>● Advanced driver assistance systems (ADAS) Support safe driving by using image sensors and millimeter-wave radar to recognize the surrounding environment</p></div>	<div><p>● Integrated human-machine interface (HMI) systems Provide drivers with optimal information through integrated control of multiple HMI devices</p></div>	<div><p>● Software Software incorporated into various systems, ECUs, and sensors</p></div>	
	Advanced Devices □ P.90-91	<div><div>358.3</div><div>361.6</div><div>424.0</div></div> <div>222324 (FY)</div>	<div><p>● HEAT-PRO (Highly efficient thermal management valves for BEVs) Improve energy use efficiency by precisely controlling the cooling water of electric vehicles</p></div>	<div><p>● Electrical current sensors Help improve vehicle performance by improving electric mileage, etc., through measurement of the electrical currents of batteries</p></div>	<div><p>● Power semiconductors Switch strong electrical currents and high voltages on and off in inverters</p></div>	<div><p>● Application-specific integrated circuits (ASICs) Integrate a wide variety of complex in-vehicle controls in a single semiconductor</p></div>	
Non-automotive businesses	Factory Automation and Social Solutions □ P.92	<div><div>186.9</div><div>176.5</div><div>144.8</div></div> <div>222324 (FY)</div>	<div><p>● Industrial robots (Articulated and collaborative) Contribute to productivity and safety</p></div>	<div><p>● Internet of Things (IoT) system architecture products Include servers, integrated software, and visualization tools for Factory-IoT (F-IoT)</p></div>	<div><p>● Barcode and 2D code handy terminals Offer excellent operability as commercial code readers</p></div>	<div><p>● QR solution services Create new value reflecting society's needs and befitting the manufacturer responsible for the development of the QR Code®</p></div>	
	Food Value Chain □ P.93	<div><div>186.9</div><div>176.5</div><div>144.8</div></div> <div>222324 (FY)</div> <div>Note: The year-on-year decrease in revenue was due to such factors as the disposal of the cell phone sales and agency business.</div>	<div><p>● Greenhouses for medium-sized and large farms Adapt to producers' needs</p></div>	<div><p>● Fully automated harvesting robot Artemy® Fully automates the process of cherry truss tomato harvesting</p></div>	<div><p>● Cold chain (Compact mobile freezing and refrigeration units) Enables temperature-controlled delivery that is safe and reassuring</p></div>	<div><p>● QR traceability systems Facilitate secure, centralized data management encompassing supply chains from producers through to consumers</p></div>	

Note: Amounts equivalent to revenue from semiconductors manufactured in-house for other DENSO businesses have been excluded.

Product Technologies Supporting Value Creation

DENSO's Comprehensive Strengths: Supporting Vehicle Electrification and the Evolution of Inverters

An inverter is a power converter that plays a key role in supporting the driving power of an electric vehicle. It converts the direct current from the battery into an alternating current that is supplied to and runs the motor, which in turn powers the vehicle. Enhancement of inverter performance is essential for the popularization of electric vehicles. In particular, the efficient cooling of inverters, which handle high voltages and large currents, is essential for the achievement of high power output, which indicates that an inverter is performing effectively. Moreover, efficient cooling is vital for the realization of more-compact, lower-cost inverters.

The history of DENSO's inverter development began with the establishment of the EV Project Room in 1992. After our inverters for HEVs had been adopted by several manufacturers, we decided to take up the challenge of developing an ultra-compact inverter capable of delivering three times the power output of conventional inverters of the same size. We realized a level of power output that was generally considered to be impossible at the time by using a world-first technology for double-sided layered cooling structures, which we created through the application of heat exchange technology fostered in the development of radiators. In 2004, DENSO began production of inverters. We established an original production technology by eliminating issues through more than 200 rounds of on-site inspections and swift decision-making. In 2007, DENSO started up mass production of inverters with the aforementioned revolutionary structure and brought them to market.

In the 2020s, as the worldwide trend toward vehicle electrification began gathering momentum, DENSO developed high-efficiency inverters that use silicon carbide (SiC) power semiconductors. Under certain driving conditions, these inverters reduce power loss by more than half compared with conventional inverters, which use silicon (Si) power semiconductors. Our new inverters help extend the driving distance of BEVs by increasing their electric mileage.

By tirelessly refining its technologies and *Monozukuri* capabilities and concentrating its comprehensive strengths, DENSO will continue giving people products that address social issues.

For HEVs



Double-sided cooling inverters (2007)

For BEVs



Inverters with SiC power semiconductors (2023)