

Shindengen Electric Manufacturing Co., Ltd.

CORPORATE PROFILE

ShinDengen /
New power. Your power.

Maximizing energy conversion efficiency for the benefit of humanity and society.

In recent years, environmentalism has been gaining momentum, demanding power electronics companies to do more to address global warming and to make efficient use of energy resources.

Since our founding in 1949, Shindengen Electric Manufacturing Company's business has centered on power electronics, which has been represented in our power semiconductors, switching power supplies, and car electronics devices. Over the years, we have developed countless products that meet the expectations and trust of our customers worldwide.

As one of the few manufacturers in the world that combines device technology, circuit technology, and packaging technology, we are developing products such as power semiconductors and DC/DC converters for EV quick chargers, AC chargers, and environmentally friendly vehicles. Going forward, we will continue to create products that will play a role in the realization of a decarbonized society, by integrating, developing and applying our core technologies.

As stated in our mission statement, we will strive to benefit society and enhance our corporate value by pursuing business efficiency and effective growth.

President
Yoshinori Suzuki

Unchanging Philosophies

Management Philosophy

“Together with society, our customers, and our employees”

- Our activities shall lead to the betterment of society
- Our passion for quality shall foster customer trust
- Our employees shall have opportunities to be engaged at all levels

Mission Statement

“Maximizing energy conversion efficiency for the benefit of humanity and society.”

Variable Philosophies

Our Promise

Listen closely, look ahead, and create a future of value.

Brand Statement

New power. Your power.

Guidelines for Action

- Compliance with legislation and other regulations
- Respect of Human Rights
- A healthy workplace environment
- Our relationship with society

Company Outline

Trade Name	Shindengen Electric Manufacturing Co., Ltd.
Address	Shin-Otemachi Bldg., 2-2-1 Otemachi, Chiyoda-ku, Tokyo 100-0004, Japan
Established	August 16, 1949
Capital	\ 17,823,148,008
Main Business	Manufacturing and sales of semiconductors, car electronics products, and power supply products
Asaka Office Address	3-14-1 Saiwai-cho, Asaka City, Saitama 351-8503, Japan

Main Customer

ADVANTEST Corp.
 NEC Group
 NTT Group
 OMRON Corp.
 Kawasaki Heavy Industries Group
 Canon Group
 KDDI Group
 KOITO MANUFACTURING CO., LTD.
 SIIX Corp.

Sharp Group
 SUZUKI MOTOR Group
 STANLEY ELECTRIC CO., LTD.
 SUBARU Corp.
 Sumitomo Wiring Systems Group
 Sony Group
 SOFTBANK Group
 Daikin Industries Group
 TDK Group

TOSHIBA Group
 TOYOTA Group
 NISSAN Group
 NIPPON SEIKI CO., LTD.
 PIONEER Corp.
 Panasonic Group
 Hitachi Group
 FANUC LTD.
 FUJITSU Group

Honda Group
 Marelli Corp.
 Mitsuba Group
 Mitsubishi Group
 Yazaki Group
 YASKAWA Electric Corp.
 YAMAHA MOTOR Group

BMW Group
 BOMBARDIER RECREATIONAL PRODUCTS INC.
 DELTA Group
 DUCATI MOTOR HOLDING S.P.A
 KTM-SPORTMOTORCYCLE AG
 LG Group

PHILIPS Group
 PIAGGIO Group
 POLARIS INDUSTRIES INC.
 SAMSUNG Group
 TRIUMPH MOTORCYCLES LTD.

Share of Total Sales

Other Businesses

11.9 %

Power System Products
 Actuator Products

Electronic Device

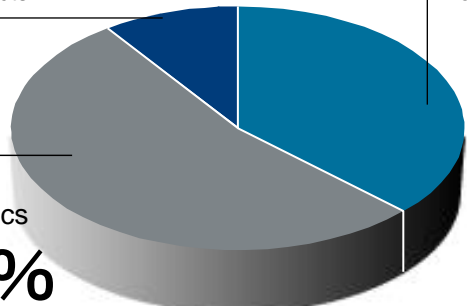
36.3%

Semiconductor Products
 Power IC Products

Car Electronics

51.8%

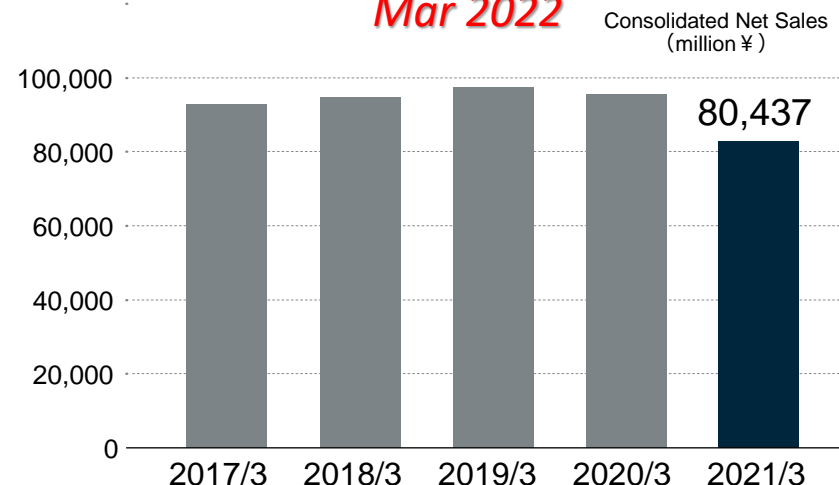
Power Management Electronics



Year ended March 31, 2021

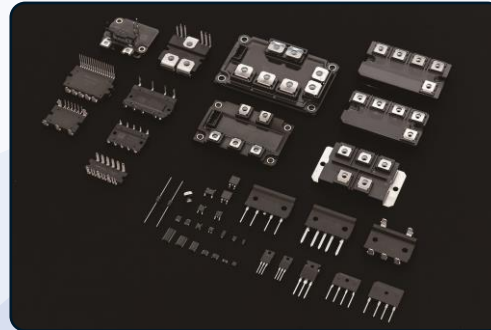
Net Sales

Approx. €673mil as of FY Mar 2022



Maximizing Energy Conversion Efficiency

Electronic Device



- Bridge Diodes
- High Speed Rectifier Diodes
- TVS (Transient Voltage Suppressor)
- Thyristors
- SIDACs
- Power MOSFETs
- Power ICs
- Power Modules



Core Technology

Packaging Technology

Circuit Technology

Device Technology



- Products for Motorcycles
- Products for Automobiles
- Products for Power Equipment

- Rectifiers for Communication Stations
- Rectifiers for Mobile Phone Base Stations
- Inverters for Communication Stations
- Monitoring Units
- Chargers for EV/PHEV
- Power Conditioners



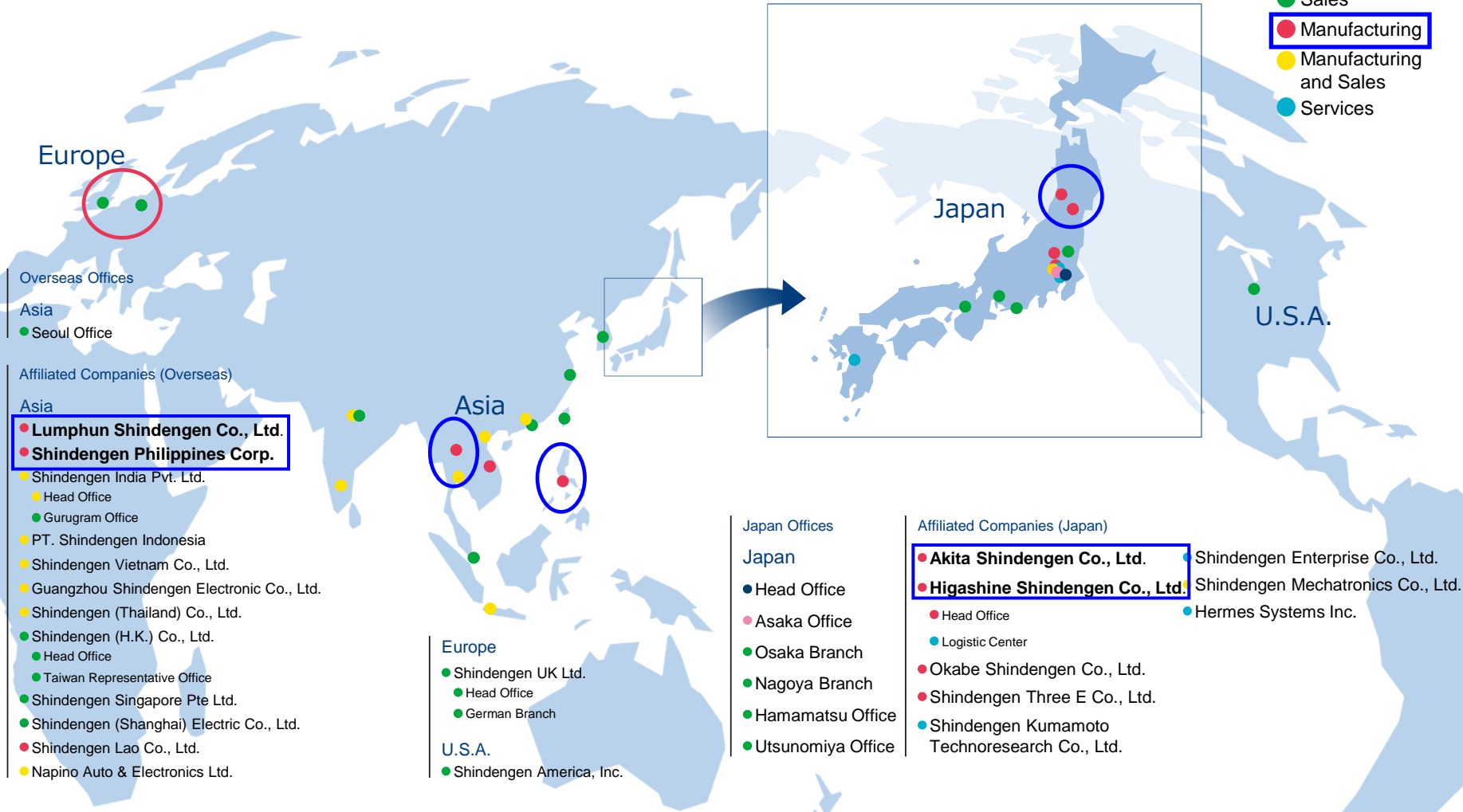
Car Electronics

Energy Systems & Solutions

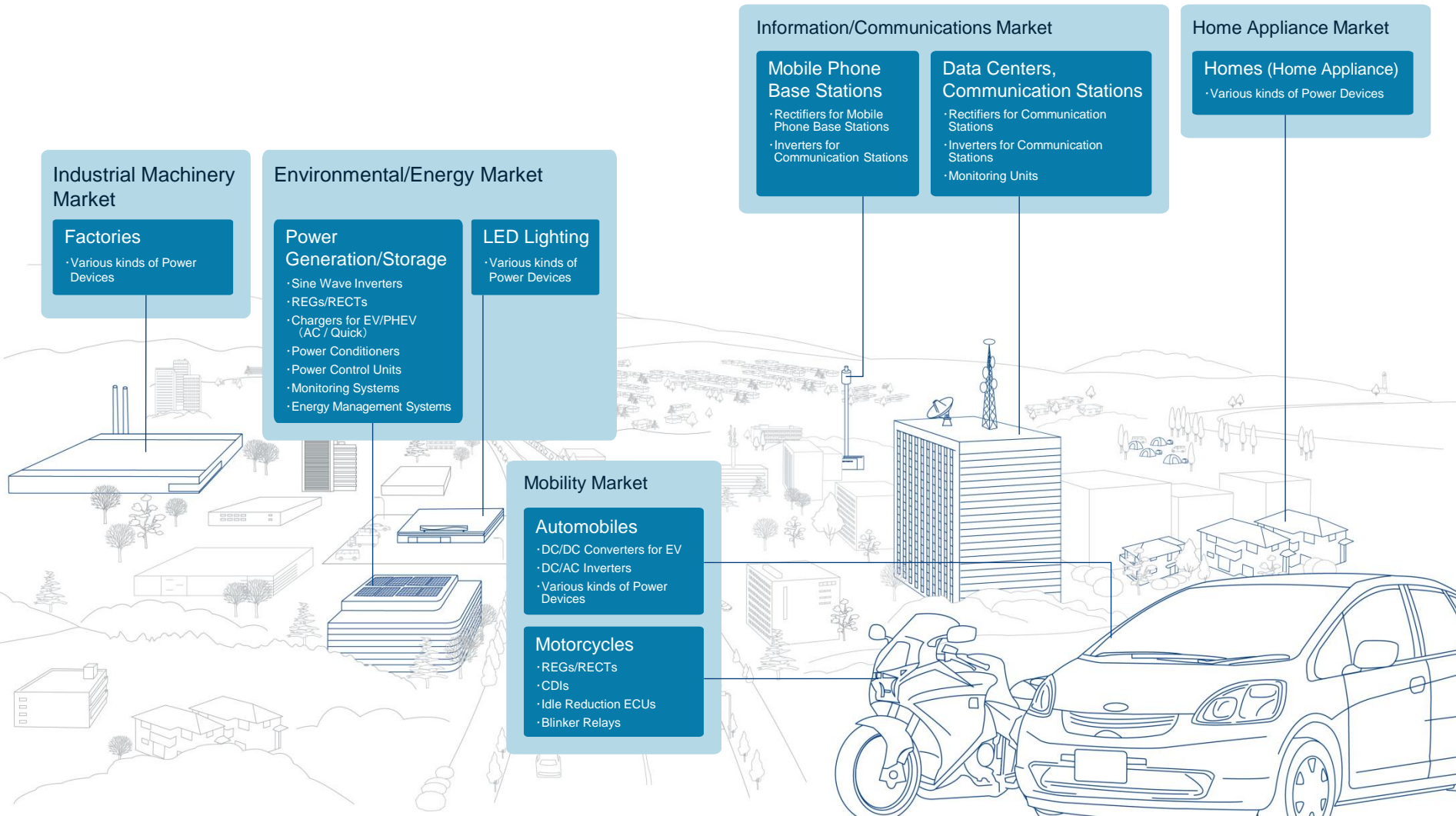
Be with our Customers by using our Global Outlook

We also use external sub-contractors (chip & Assy) in Asia

- Head Office
- Sales / Research and Development
- Sales
- Manufacturing
- Manufacturing and Sales
- Services



Power Innovation Moving into Various Areas



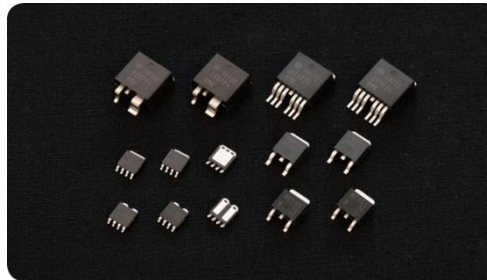
Generating Power Supply Potentials with Semiconductors

- Top market share with bridge diodes
- High efficiency and power saving Power MOSFETs and ICs

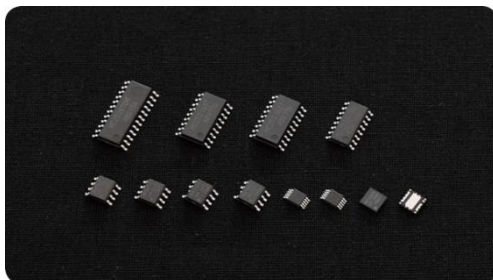
【Our Products】



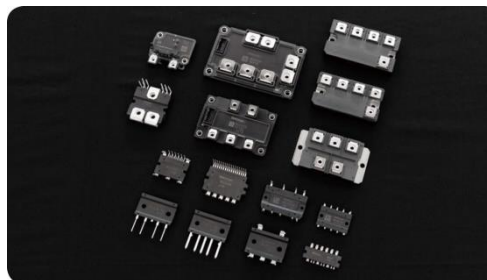
Diodes & TVS



Power MOSFETs



Power ICs



Power Modules



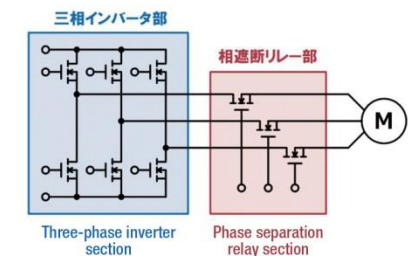
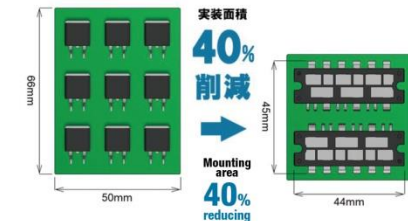
TOPICS

For maximizing energy conversion efficiency

Motor drive power modules for automotive applications [MG031 series]

As increasing complexity of the control systems for electrified vehicles leads to the increase of ECU components, there is growing demand for lighter weight, downsizing, and better efficiency in order to increase cruising ranges. In response there has also been increased development of electro-mechanical integration in order to achieve more lightweight and compact EPS.

These products allow for creation of motor drive + phase separation relay circuits from just 2 power modules, achieving a 40% reduction in mounting area compared to similar circuits composed of 9 discrete MOSFET.



Further Leap in Future Business by Integrating Core Technologies

- Car electronics products for motorcycles such as REGs/RECs having a worldwide high share
- High efficiency and reliability DC/DC converters for FCV/PHEV/HEV/EV
- The development promotion of next generation products by business synergy.

【Our Products】



Products for Motorcycles (REGs, CDIs, ECUs)



Products for FCV/PHEV/HEV/EV (DC/DC Converters)



DC/AC Inverters for automotives



Sine Wave Inverters for Portable Generators



TOPICS

Next generation for eco-cars

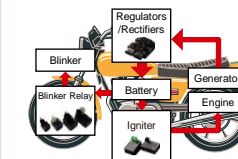
DC/DC converter

This is a vehicle-mounted DC/DC converter developed for environmentally friendly vehicles such as HEVs, PHEVs, EVs, and FCEVs. A DC/DC converter is an electrical product that supplies power from the high-voltage BATT (90–420V) that drives the motor to the 12V electrical system for auxiliary equipment. By using semiconductors, modules, and high-efficiency power circuits made in-house, we have achieved industry-leading conversion efficiency and reduced size and weight, contributing to the needs of vehicles for improved fuel efficiency and lower power consumption.



Power Control Unit System of electronic components for two-wheel electric vehicle

The power control unit (PCU) is designed to properly control the electric power that powers the motor. The PCU reads various information about the vehicle and digitally controls the motor according to the vehicle's running status to achieve smooth vehicle running. In addition, the motor drive unit is configured as a three-phase full-bridge circuit using high-efficiency MOSFETs.



System of electronic components for motorcycles

Shindengen's electronic components for motorcycles are being used by motorcycle manufacturers all over the world in motorcycles of all sizes.

Responding Quickly to New Demands

- High quality and function chargers for EVs/PHEVs use with telecommunication network application

【Our Products】

Rectifiers for Communication Stations "HVDC-S"



Rectifiers for Mobile Phone Base Stations




Inverters for Communication Stations




Rectifiers for Communication Stations (48V)



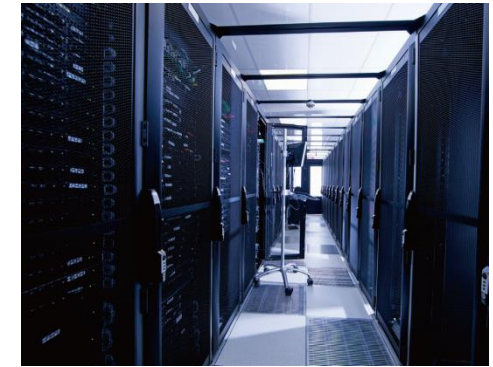
AC Chargers for EVs/PHEVs "PM-CS Series"



Quick Charger for Evs "SDQC2F90 Series"



Quick Charger for Evs "SDQC2F60 Series"



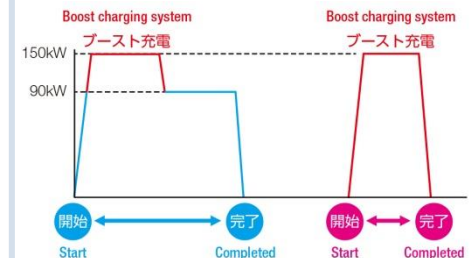
TOPICS

A boost charging system that considers the user's comfort in charging operations.

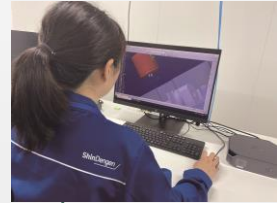
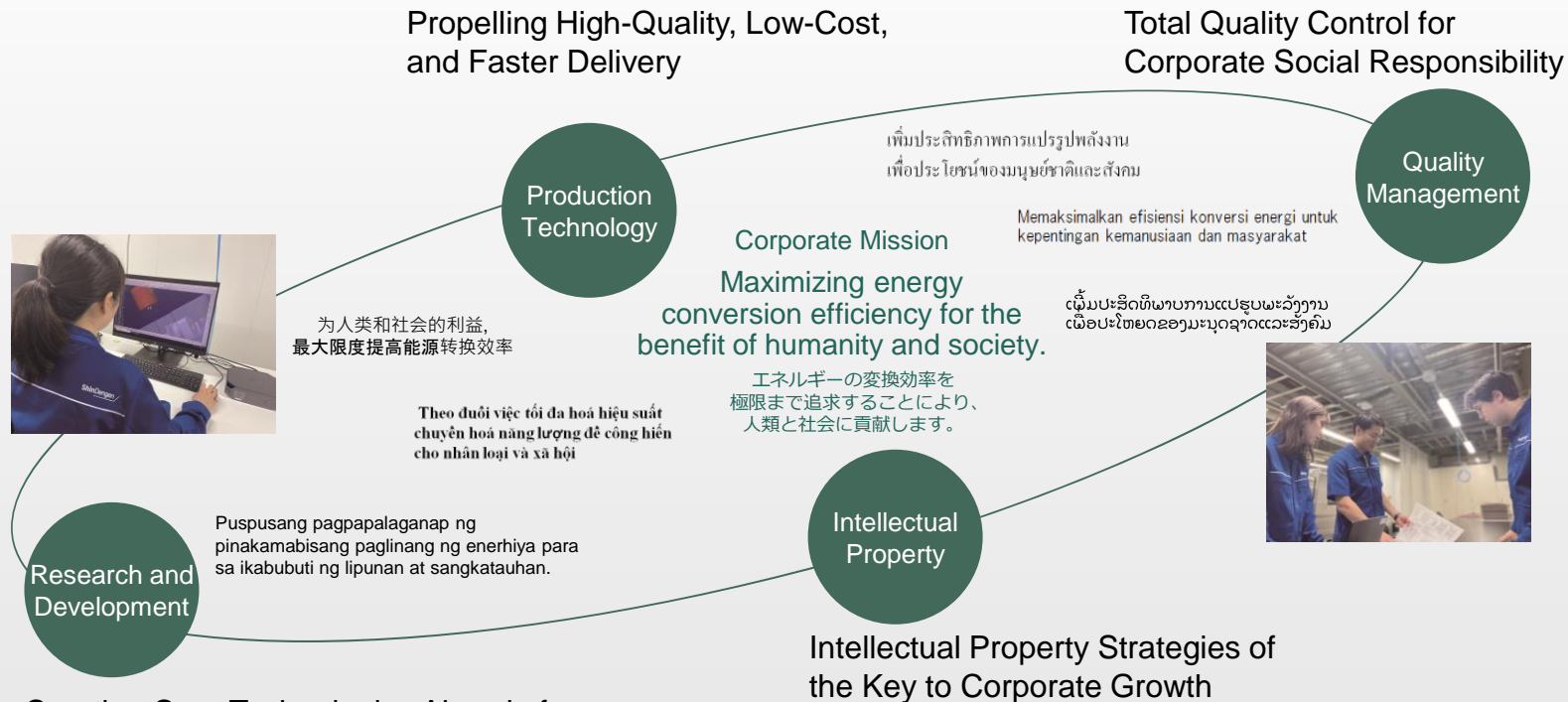
Boost charging system

The larger the battery capacity of an EV, the longer its cruising range can be. On the other hand, the larger the battery capacity, the longer the charging time. In order to shorten the charging time, high power charging is required, but in order to charge with high power, the charging cable needs to be thicker. However, thicker charging cables increase the weight and worsen the operability. To solve this problem, there is a method of measuring the temperature of the charging cable and controlling the charging time so that it does not become too hot, thereby enabling charging at high power without increasing the cable thickness. This is called the boost charging method.

Note: This method is used in the SDQC2F150 series.



A global manufacturing system which utilizes ICT and IoT.



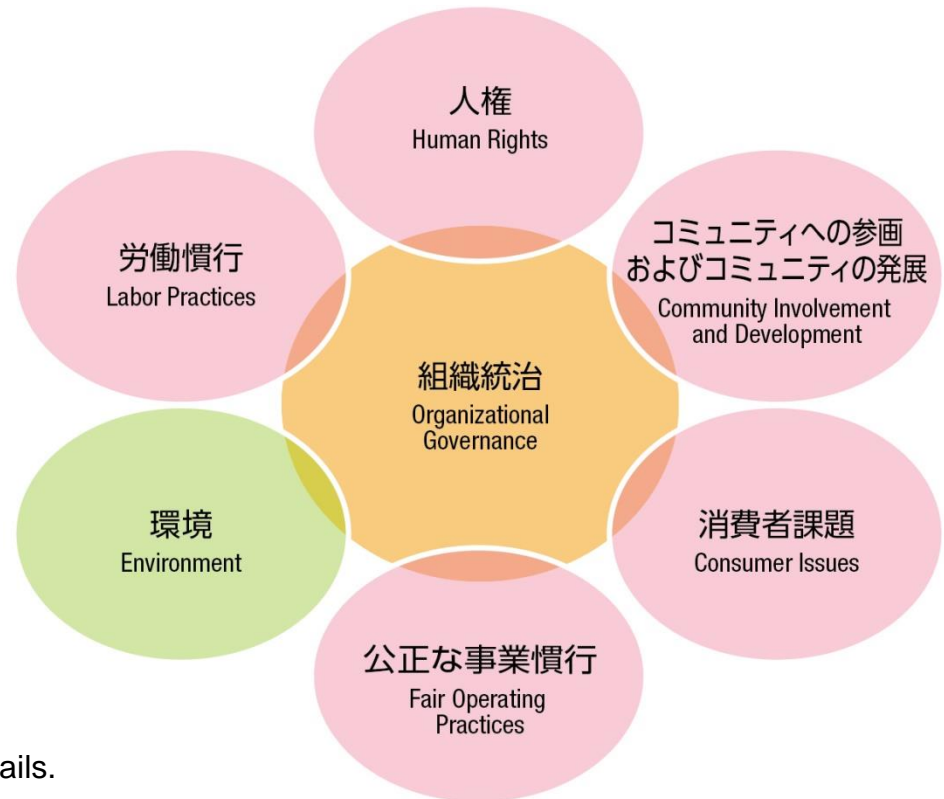
Manufacturing innovation initiatives
As one of our initiatives aimed at improving our manufacturing quality and productivity, we are working to implement realtime visualization of equipment operating status at group production bases both within Japan and overseas then analyzing the data obtained in order to implement improvements on a group-wide level.

The Shindengen Group aims to realize its management philosophy by practicing its mission statement and promoting CSR activities. The Group is fulfilling its social responsibility and building trust-based relationships with stakeholders as a global company by promoting social contribution activities and striving to be a sustainable corporate operator from an environmental, social, and governance (ESG) perspective.

This is Shindengen Group's Basic CSR Policy. We are pursuing this Basic CSR Policy and, with "maximizing energy conversion efficiency for the benefit of humanity and society" as our mission statement, are working to help achieve a carbon-free society by developing and providing products with superior environmental performance.

The Shindengen Group is expanding its CSR activities in line with the core subjects of ISO26000.

As we continue to engage in CSR activities going forward, we consider social issues such as holding fair competition and human rights in high regard, ensuring a safe and easy-to-work environment as well as implementing countermeasures for environment problems. We continue to support sustainable development in society and the global environment in terms of the value chain in order to gain the trust of customers and shareholders, to maintain a positive reputation in the region and in society and to ensure that employees and their families are proud of the company.



Please refer to our CSR report for more details.

<https://www.shindengen.co.jp/csr/report>

Environment

Aiming at a carbon-free society

At Shindengen Group, we ensure our business activities help create a sustainable society and support carbon-free as outlined per the “Paris Agreement”, through our business activities and adopting policies that help mitigate and adapt to climate change.



Case Study on Reducing CO₂ Emissions through Sales of Environmentally Friendly Products in FY2020

事業部 Division	製品分類 Product type	使用電力量の削減 Reduction of energy consumption	二酸化炭素排出量削減 Reduction of CO ₂ emissions
デバイス Electronic Device	電源用ICシリーズ IC series	411.7 million kWh	186,239 t-CO ₂
エネルギーシステム Energy System & Solutions	通信機用整流器 Rectifiers for communication devices	115.0 million kWh	56,103 t-CO ₂
	パワーコンディショナ Power conditioner	69.6 million kWh	33,972 t-CO ₂
事業部 Division	製品分類 Product type	燃料(ガソリン)消費量の削減 Reduction of Fuel (gasoline) sumption	二酸化炭素排出量削減 Reduction of CO ₂ emissions
電装 Car Electronics	四輪用DC/DCコンバータ DC-DC converter for four-wheel vehicles	2,127 kℓ	4,934 t-CO ₂
	二輪用電装製品 Motorcycle products	2,127 kℓ	4,934 t-CO ₂

Community Involvement and Development

Supporting Community Service Activities

Shindengen Group is striving to be a trusted group of companies by the local community by developing activities that promote the co-existence with the local community and mutual prosperity.



Lumphun Shindengen donated medical supplies purchased with employee donations to the local Lamphun hospital to support the healthcare professionals providing treatment for COVID-19.

Labor Practices

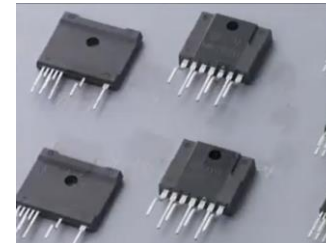
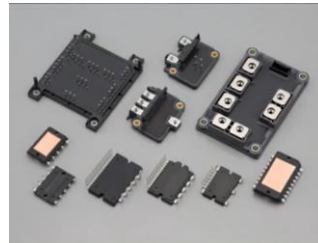
Health and safety Initiatives

In order to ensure the safety of all employees, customers, and other individuals involved in our group’s business activities, the Shindengen Group Action Agenda includes items on “Safe workplace environments” and “Health considerations”, and we continually work to promote the create of safe and healthy workplaces.



Shindengen Indonesia ranked first in the nation in the “Best Companies for Women to Work for” sponsored by the Ministry of Health of the Indonesian government in FY2020.

- 1949: Company Establishment
- 1955: Released Germanium Diode/Selenium Rectifier for Central Telephone Offices)
- 1976: Released Regulator Rectifier for Motorcycles
- **1975: Released MOSFET(LV)**
- **1987: Released ICs for Switching Power Supply**
- 1988: Released Inverter Units for Generators
- **1996: Acquired ISO 9000**
- **1999: Acquired ISO 14000**
- 2000: Released Idle Reduction ECUs
- **2009: Released MOSFET (HV)**
- 2010: Released SiC Schottky Barrier Diode and Solar Inverter
- 2011: Released EV Charger
- **2014: Released Power Modules**
- **2016: Acquired IATF16949**
- 2017: Brand Logo Renewal from prev. to present one



It is our pleasure to announce the opening of our new Asaka Office in April 2021.

Asaka office, where we consolidated the functions of the Otemachi Head Office and Hanno Factory, which was responsible for the R&D and business operation functions of our group, officially opened on April 1, 2021. At Asaka office, we aim to improve productivity and ensure business continuity based on four concepts: consolidate functions and improve productivity, advanced environment, comfort and ease of working, and safety and security.

Efforts to reform work styles

- (1) The aim is to consolidate the main functions of the Otemachi Head Office and Hanno Factory, and to increase synergy by closer cooperation between the business units.
- (2) The entire building is equipped with Wi-Fi, and a free address system has been adopted. Meeting spaces are available throughout the building, creating an environment that encourages interaction among business units. In addition, all employees are eligible for flexible working hours, and we have created an environment that allows employees to work from home.
- (3) The Asaka Office has received the highest CASBEE Wellness Office rating of S rank.



Atrium



Meeting Space



CANTEEN

Reduce CO₂ emissions from business activities

- (1) We have established a Group Environmental Policy and Environmental Objectives and Targets, and we are actively working to reduce CO₂ emissions from our business activities.
- (2) With the opening of the Asaka Office in April 2021, we are aiming to reduce power consumption by consolidating several buildings on the Hanno Factory site which had previously been responsible for business functions, and the Otemachi Head Office, into a single building.
- (3) The Asaka Office has an atrium to promote natural lighting and ventilation, and actively adopts energy-saving technologies such as floor air-conditioning, an air-conditioning system using a humidity controller, and automatic CO₂ control. The building has been certified as ZEB Ready, meeting a 52% reduction in primary energy consumption from the standard primary energy consumption.



Cross-section perspective view

World wide Automotive Customers of MOSFET & DIODE



World-Wide customers for Non-Automotive

YASKAWA

arcelik
beko

Panasonic

KUKA **Midea**

HITACHI
Inspire the Next



BOSCH
Invented for life

B/S/H/**SIEMENS**

ABB

VESTEL

SHARP

Danfoss

Electrolux



E·G·O
high-tech since 1921

DIEHL
Controls

Miele

FANUC

Haier

jorenje *Life Simplified*



LG
Life's Good

SAMSUNG

KOLLMORGEN

Because Motion Matters™

Whirlpool
CORPORATION