



# Manufacturing that we will continue to refine

We were the first to use semiconductors in power supplies for movie projectors. This was the first product we manufactured after our founding. We have been contributing to the movie industry by using electronic control to provide stable light sources. Further, we succeeded in the in-house production of a semiconductor with applications in plating rectifiers and welding machines, thus contributing to the development of industry in Japan as well as Osaka. Currently, we continue to hone the technologies developed in those days and we are a leader in

environmentally friendly power supply technologies.

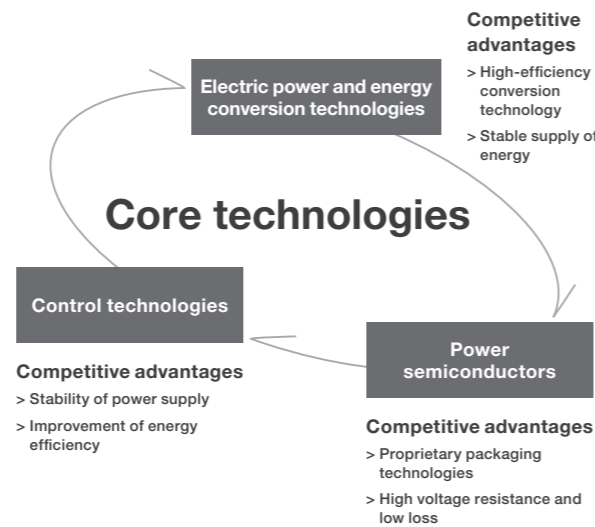
The range of applications has expanded. We provide power supplies for surface treatment, arc generators for welding machines, power supplies for lighting equipment and other equipment, various power conditioners and power supplies for the evaluation of environmentally friendly equipment and equipment applying new energy and highly reliable and customized power supplies which continue to stably support electronic equipment.

## Core technologies

### Core technologies and advantages

We have been engaged in the manufacturing of power semiconductors for 60 years. We are able to boast to the world about the high reliability of our packaging technologies that are used for the servo drivers of machine tools, which must have high capacity to endure repeated charging, as well as welding machines and PV junction boxes.

What constitute the design and manufacturing of power supplies, which consist of devices and control technologies, are exactly the power electronics technologies that have been attracting attention in recent years as part of national strategies. The power supplies manufactured by the Sansha Electric Manufacturing Group incorporate high-speed digital control technologies. Highly responsive and precise, they are praised by the industry. In addition, their environmental durability, which was fully developed on plating and welding work sites, enables them to be utilized in many settings.



## Research and development

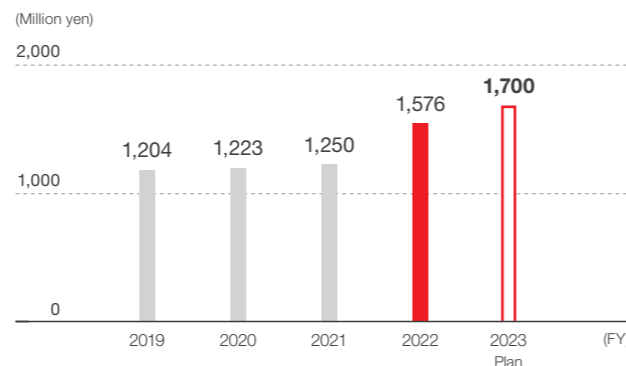
### Development themes and investment policy

At the Sansha Electric Manufacturing Group, we pursue research into technologies to further improve the reliability and heat resistance of power modules in high voltage and capacity ranges, new bonding technologies, the expansion of applications for SiC devices and next-generation semiconductors, to support social infrastructure.

Further, we will realize electric power conversion technologies that will enable high-speed, high-precision control in addition to compact dimensions and high efficiency. By applying communication and system technologies, we will enable electric power converters to evolve so that they can connect to peripheral equipment.

As an initiative to remain our customers' solution partner, we will use AI in our R&D processes and work on DX and automation in our efforts to reduce development lead time.

### Research and development expense



4 Evaluation analysis for achieving the vision

## Intellectual property

### Concept behind the intellectual property strategy

We believe that the unique qualities of the Sansha Electric Manufacturing Group lie in the support for the natural environment and social environment that we provided leveraging our technological strengths, with our intellectual property strategy built on our sales strategies reflecting our understanding of "technology strategy, management strategy and partners' strategies," based on the Global Power Solution Partner concept. Therefore, in our intellectual property strategy, we position intellectual property as management resources for protecting customers' markets and achieving goals together with them, and our activities are focused mainly on creating and maintaining competitiveness. In addition, we will strive to maintain and improve our corporate value and brand through these high-quality initiatives.

### Intellectual property activities

The Group implements initiatives to increase its competitiveness, starting from increasing intellectual property awareness and proactively obtaining intellectual property rights to achievements made through various R&D efforts and analyses and protecting and controlling intellectual property rights.

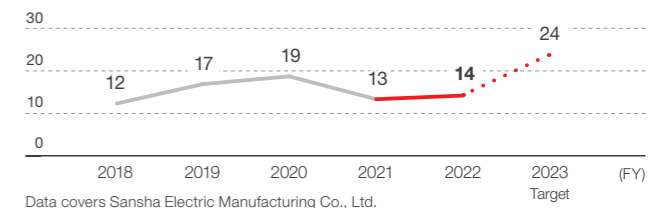
- Actively obtain intellectual property rights for inventions such as innovative new technologies and original designs.
- File applications to secure international intellectual property rights and maintain, manage and control them in accordance with the global strategy.
- To expand business in emerging countries, continuously collect information on counterfeit products to take appropriate measures to address them.

### Employee invention incentive program

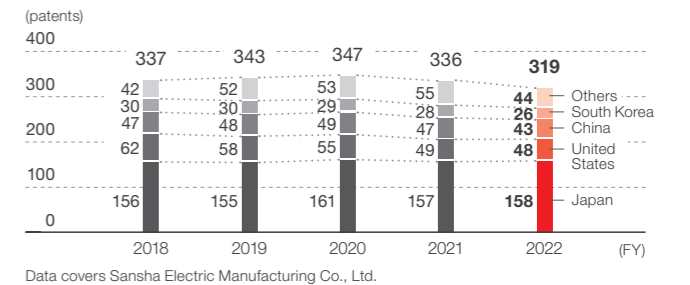
We have an employee invention incentive program aimed at encouraging engineers to develop inventions and at supporting corporate development and the improvement of individuals' skills by protecting and utilizing their inventions.

### Applications for and ownership of intellectual property rights

#### Number of applications



#### Number of patents owned



## Supply chain management

The Group carries out sustainable procurement activities throughout its supply chain to operate its business, which encompasses an extensive lineup of products all over the world. For this purpose, we ask suppliers to understand and comply with our Procurement Policy, which stipulates the observance of laws, ordinances and social norms, consideration of human rights and industrial safety, use of conflict-free minerals, consideration of the environment and the upholding of other social responsibilities.

In addition, we impartially evaluate and choose suppliers in accordance with the criteria below.

- Our suppliers must observe laws, ordinances, social norms and equivalence and place importance on human rights and the environment.
- Our suppliers must have a sound financial position and information management systems.
- Our suppliers must supply materials and services with an appropriate quality, price and delivery lead time.
- Our suppliers must have the ability to ensure stable supply and flexibly respond to changes in supply and demand.
- Our suppliers must conduct value analysis (VA) and value engineering (VE) activities\* to achieve mutual prosperity.
- Our suppliers must carry out risk management activities, such as business continuity planning, under normal circumstances to hold a capacity to continue supplying even in unexpected disaster or other extreme situations.

\* Value analysis (VA): Activities reducing the cost of mass-produced products throughout the entire value chain  
Value engineering (VE): Activities thinking about the maximization of value from the process of product development (consideration of design)

### Procurement Policy

- We will observe laws, ordinances, social norms and equivalence and place importance on human rights and the environment.
- We will offer fair transaction opportunities to suppliers.
- We will carry out procurement activities based on mutual understanding and relationships of trust with suppliers.

### Use of conflict-free minerals

The Group has drawn up the Sansha Electric Manufacturing Group Conflict Minerals Response Policy. From a humanitarian point of view, we will not use any conflict minerals, such as tin, tantalum, tungsten or gold, that are produced using inhumane practices in the Democratic Republic of the Congo and the surrounding region.

Sansha Electric Manufacturing Group Conflict  
<https://www.sansha.co.jp/csr/purchase.html>





Unifying thinking

# Solutions and quality that are created because of the integrated production structure

## Integrated production system

Our power semiconductors supporting high voltage and current are manufactured in an integrated production system including wafer processing and package assembly. Power supply devices, circuit boards and other components are manufactured in an integrated production system that includes development, design and manufacturing. This enables us not only to provide standard products but also to quickly deliver products which are specially customized to cater to customer needs.

The Sansha Electric Manufacturing Group develops, designs and manufactures both power semiconductors and power supplies. This has made us very familiar with how power semiconductors are used in power supplies. That allows us to create proposals that are highly efficient, safe, and best suited to

the specific environment the customer will use them in, including peripheral circuits.

We believe that maintenance is a vital part of ensuring the safety of power supplies. We are ready to provide one-stop support including efficient installation, operation, maintenance and replacement. Please watch the video, which mainly introduces the manufacturing processes at the Okayama Plant (semiconductors) and the Shiga Plant (power supplies).

### Our plants

<https://www.sansha.co.jp/eng/company/factory/>



## Strengths of the integrated production system

### Stable quality

Quality checks are conducted in all processes to maintain stable quality.

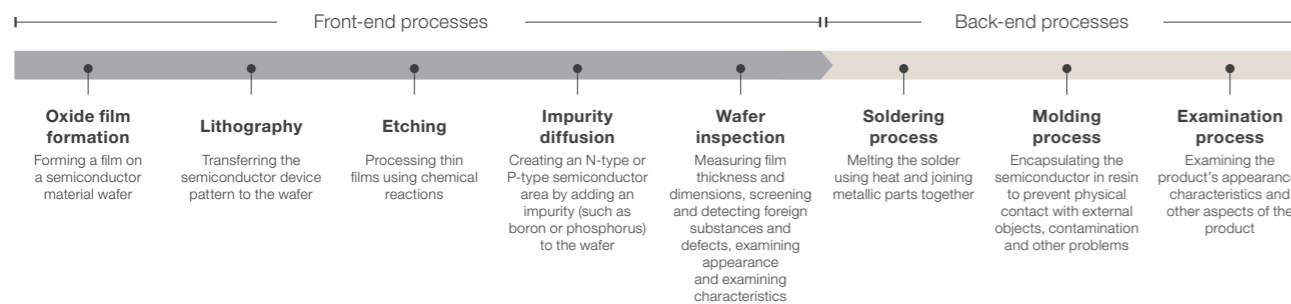
### Customization

To respond to diverse needs, we propose solutions to customers from the perspectives of high efficiency, safety and other perspectives.

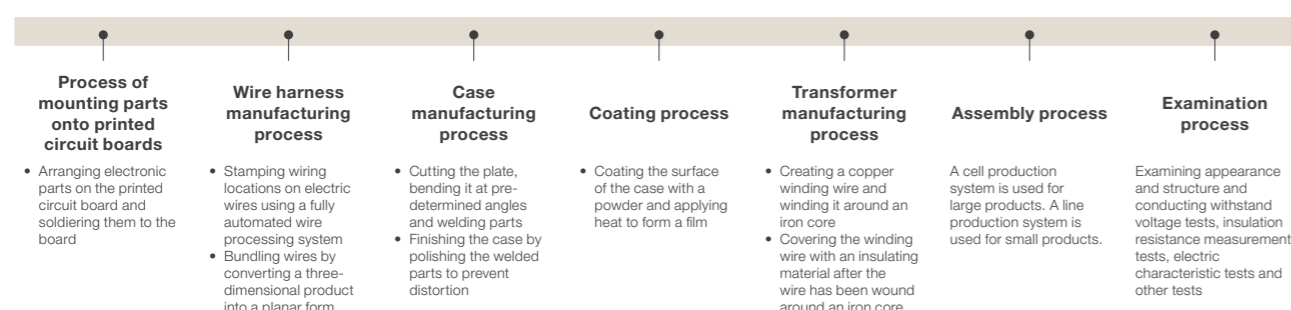
### Quick delivery

The time from production to delivery is shortened by streamlining the production process.

## Power semiconductor manufacturing processes



## Power supply manufacturing processes



4

Evaluation analysis for achieving the vision

## Quality management

The Group implements quality management attaching importance to increasing customer satisfaction and social value. We strive to create more value by appropriately managing products' safety, environmental performance, service life, maintainability and other elements, in addition to achieving product specifications, such as specifications for functionality and operability. Quality management is implemented by all organizations of the company and quality improvement activities are carried out continuously via management circles.

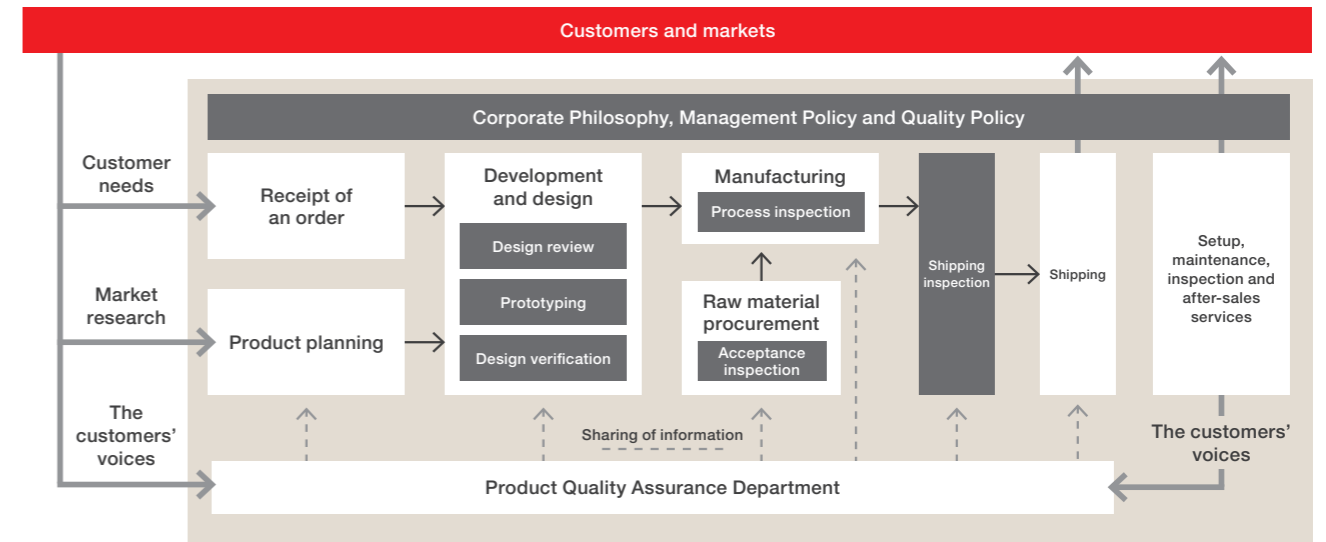
An important feature is that information can be shared seamlessly between the power semiconductor business and power supply business that uses power semiconductors. This has resulted in our skills for appropriately assuring quality

and our after-sales services, in addition to sales activities and development and design in both businesses.

In addition, we focus on quality in all phases, from product planning to development, design, manufacturing and after-sales services and we provide feedback using the quality information collected by each section to the departments that need such information. This is how we improve product quality, with the goal of achieving sustainable growth.

Further, we have internal plants making plates, transformers, harnesses, printed circuit boards and other parts. This enables us to demonstrate our comprehensive ability to ensure high quality, which is our strength. We internally manage the quality of parts in our efforts to improve the quality of products as a whole.

## Quality assurance system diagram



## Sansha Electric Manufacturing Group Quality Policy

<p><b>1 Compliance with laws and regulations</b></p> <p>Comply with related laws, regulations and social norms.</p>	<p><b>2 Customer satisfaction</b></p> <p>Make customer satisfaction the top priority and respond to the demand generated by society leveraging the high-level technological capabilities we have accumulated and strive to improve customer satisfaction.</p>	<p><b>3 Quality system</b></p> <p>Refine quality with an integrated system including product planning, development, order acceptance, design, manufacturing and after-sales services to deliver reliability to customers.</p>	<p><b>4 Company-wide activities for quality improvement</b></p> <p>Work together company-wide to improve quality through business improvement activities, the development of human resources and S-PS activities,* which are small-group activities unique to our company.</p> <p><small>*SanRex Producer System activities</small></p>	<p><b>5 Continuous improvement of the quality management system</b></p> <p>Establish a quality management system adapted to social environment and management environment and continue to improve it.</p>
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## Proposing solutions to customer issues

The Group conducts the integrated production of high-voltage and large-current power semiconductors and power supplies. This means that we internally conduct all processes ranging from wafer processing to package assembly for power semiconductors and every process from the development and design of circuit boards to their assembly for power supplies. This allows us to provide customers with the proposals that are best suited to their needs from the perspective of high efficiency, safety and other features.

The medium-term management plan states that one of the priority measures for the power supply business is to accelerate the proposal of systems that combine power conditioners with storage batteries and network functions, rather than proposals related to power conditioners alone. A strength of the Group is the flexibility of its development and manufacturing. We will help customers solve their problems by proposing systems based on this strength.



### Test equipment that contributes to product quality

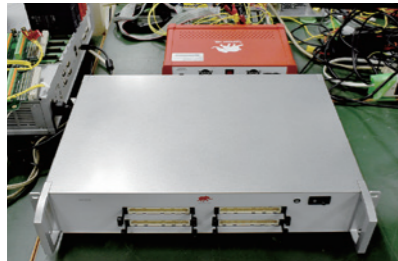
To deliver reliable, satisfactory products to customers, we have installed and use a variety of test equipment to maintain the safety of our products and improve their quality.

#### Example test equipment



#### Electromagnetic anechoic chamber and sealed room

In accordance with IEC standards (international standards for all electrical, electronic and related technologies) and other standards, we measure electromagnetic waves to see if our products affect other electric equipment and for other purposes.



#### Software testing system

Previously, it was necessary to assemble hardware when verifying software. The introduction of this system enables us to test software without assembling hardware. We use this system to improve the efficiency of software development and improve quality.



#### Environmental test room

We conduct environmental performance tests to check our products' tolerance to low temperatures, high temperatures and high humidity.

### S-PS activities

Since 1970, we have been engaged in QC circle activities called the SanRex Producer System (S-PS) activities. S-PS activities are based on QC circle activities and incorporate the policies of the company's organizations. Through these activities, we encourage employees to identify and solve problems and practice and learn methods for improving, in our efforts to improve their ability to execute business and further, to develop next-generation leaders. Another goal of these activities is to contribute to the establishment of rewarding workplaces with positive atmospheres.

We hold a conference for presenting achievements twice a year. During the conference, awards are granted for excellent activities selected based on the recommendations of the chairperson of the S-PS Activity Promotion Committee.



S-PS activities presentation conference

### Total solution services deliver safe and secure power supplies

Sansha Solution Service Co., Ltd., a maintenance service company of the Sansha Electric Manufacturing Group, caters to customer needs with one-stop services including the installation of power supply equipment as well as the operation, maintenance and replacement of equipment under its policy of providing services which support the stable operation of power supply equipment.

Sansha Solution Service is implementing four priority measures in the medium-term management plan to enhance the total solution services of the Sansha Electric Manufacturing Group.



Power supply maintenance and inspection services

Four priority measures under the medium-term management plan	FY2022 Initiatives	Achievements	Issues
1 Improve quality of services	• Increase service staff and sign contracts with new service partners to improve the service structure	• Signed consignment contract with a new partner company	• Develop service staff at the new partner company
	• Train service staff to develop their skills	• In FY2022, group training for service staff was provided three times	• Provide training continuously to enable the establishment of the content of the training program
	• Build a system for preventing mistakes in work	• Released an electronic form system in September 2022, aiming to standardize inspection work	• Enhance the electronic form system
2 Accelerate construction of the maintenance structure	• Carry out a demonstration trial of the remote maintenance system	• Installed remote systems in already-delivered uninterruptible power supplies and confirmed that it is possible to check the condition of local areas and receive abnormality alerts	• Maintenance proposals need to be submitted at the time of the installation and introduction.
3 Enhance the construction work implementation structure	• Increase staff qualified as construction management engineers for construction work	• Increased the number of technical supervisors to 9 and the number of class-1 electrical supervising engineers to 12	• Establish a structure for expanding construction work
4 Propose long-term service plans	• Propose long-term maintenance services for a recommended operation period from the start of operations	• Long-term service plans were developed for inverters and other products delivered in the past ten years.	• Propose long-term service plans • Improve services for large power supplies

### Sansha Electric Manufacturing Group's comprehensive solution services

