

Sanken Electric
CORPORATE PROFILE

Power Electronics for Your Innovat!on



SANKEN ELECTRIC CO., LTD.

3-6-3 Kitano, Niiza-shi, Saitama-ken 352-8666, Japan
Tel: +81-48-472-1111
<https://www.sanken-ele.co.jp/en/>



Web site



YouTube



Facebook



twitter

Become a highly profitable company that grows on the performance of its unique technologies, people and organization, contributing to social innovation.

Hiroshi Takahashi
Representative Director, President



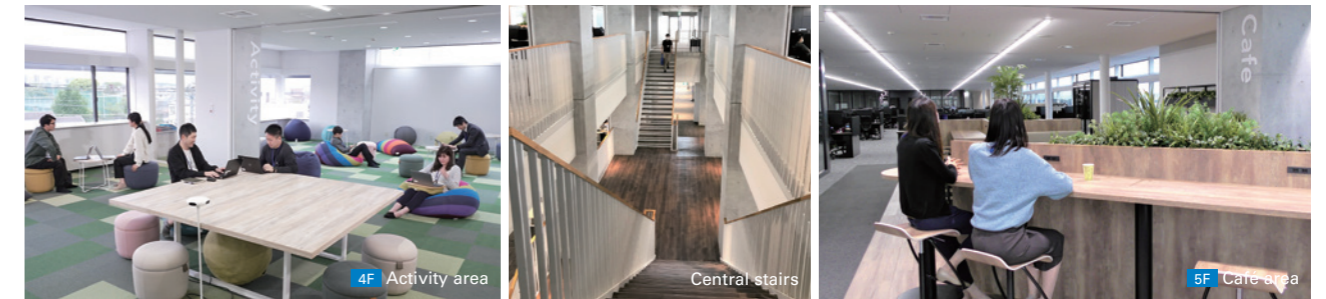
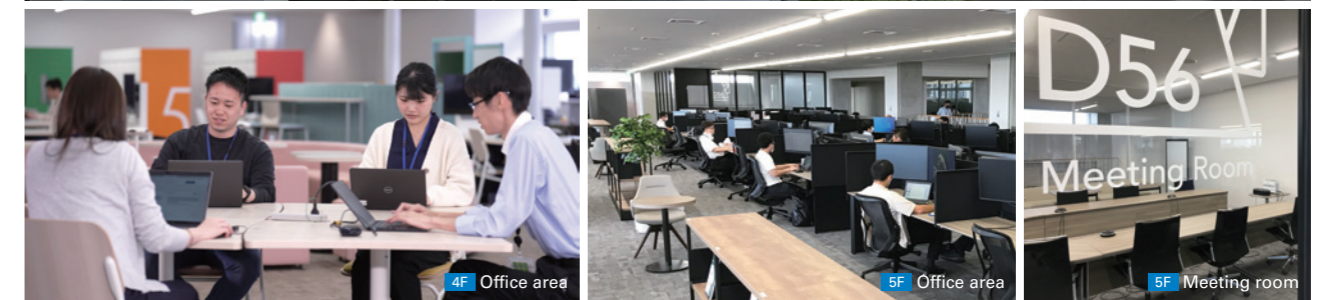
Sanken Electric Co., Ltd. is a company which has strong competitiveness in the global market by providing energy savings and solutions, based on our cutting-edge power conversion and motion control technologies. In FY2021, we began a fresh start as a specialized semiconductor manufacturer for products such as power modules, power devices, and sensors.

Electricity and electronics are indispensable to modern life. Power semiconductors are devices needed every time electricity is used. Sanken Electric products are used in familiar things like cars, air conditioners and televisions and also in places that aren't as visible. For over 70 years, our products have supported people's lives.

Addressing environmental problems and saving energy on a global scale have become urgent challenges. With a large number of products and technologies that lead to high efficiency and energy savings, Sanken Electric makes a major contribution to global energy conservation through products for

inverters used in air conditioners and for low fuel consumption and increased efficiency in automobiles. Additionally, we will promote activities such as carbon offsetting to reduce CO₂ generated from business activities and aim to be a company that can achieve continual growth and social contributions.

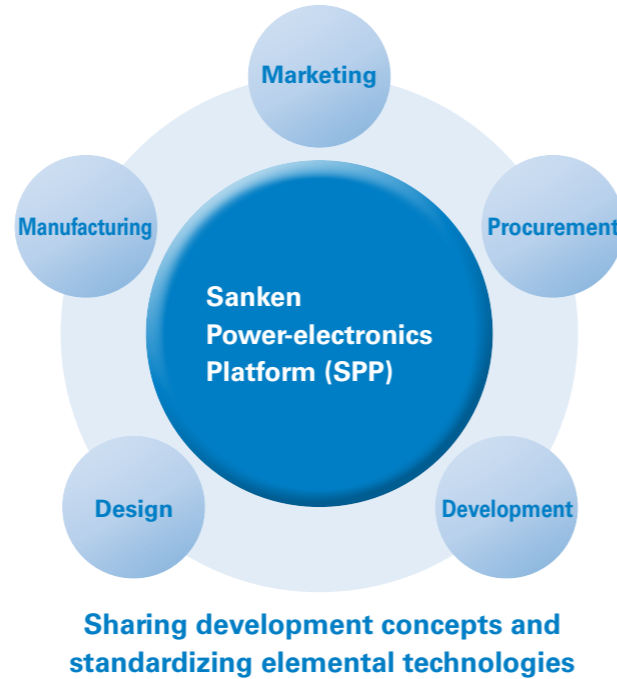
While business opportunities will be successively generated by the new industrial revolution being driven by IoT, AI, big data, autonomous driving, and 5G, the sustainability of global society is at a major turning point, reflecting the impact of the pandemic on the economy, society and other developments. Since its establishment in 1946, Sanken Electric has been constantly involved in research and development. We will continue to work on perpetually innovating technological capabilities and providing products of assured quality to help solve global environmental and social issues and further develop industries, the economy and culture.



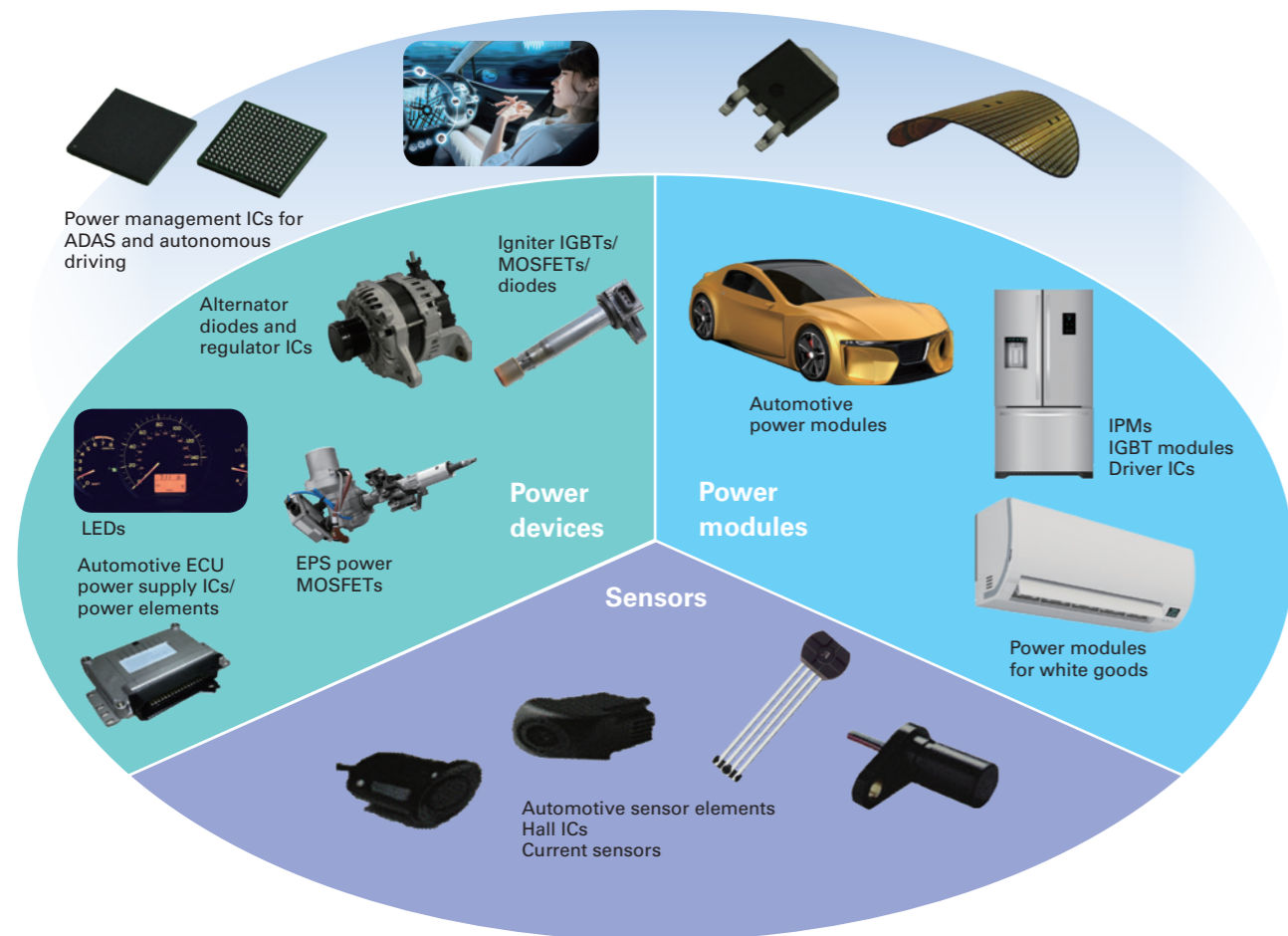
Sanken Power-electronics Platform (SPP)

With the market surrounding us continuing to undergo major changes, customer needs are diversifying, and it is becoming more important than ever to “create what is expected quickly.” Therefore, Sanken Electric is working to strengthen marketing functions and speed up development.

We have shifted to a structure that has functions with responsibility for everything from the development of technology for new products to commercialization and mass production to establish the Sanken Power-electronics Platform (SPP), a platform for sharing development concepts throughout the entire development and manufacturing process, from marketing to procurement, development, design, and manufacturing. The SPP will dramatically reduce development and production lead time through the use and standardization of chip packages based on platform development.



We use device technology and module technology to expand into diverse areas from white goods through to automobiles.



Core Technology

Sanken Electric will concentrate management resources on the three businesses of power devices, power modules, and sensors, which are the Sanken Core, to promote further strengthening of competitiveness and improvement of management efficiency, as well as transform ourselves into a company that can grow while solving social issues. We will also contribute to the development of our customers by offering a broad product portfolio based on Sanken Electric's core technologies, which include cutting-edge electric power conversion and motor control technologies.

Systems	
High-efficiency power supply control	<ul style="list-style-type: none"> Realizes energy-efficient power supply systems by optimally switching frequency and operation mode while monitoring input/output status and load conditions
Motor control	<ul style="list-style-type: none"> Realizes power modules that include a pre-driver featuring various controls to suppress noise generated by 3-phase BLDC motors, as well as provides a parameter auto-tuning application for sensorless vector control
Digital AC/DC power supply control	<ul style="list-style-type: none"> Easily realizes high-efficiency, low-noise power supply systems with a dedicated microcontroller optimized for power supply control and a 900V high-voltage chip for off-line power supply control in a single package, reducing the number of components
Digital LED lighting power supply control	<ul style="list-style-type: none"> Realizes highly functional digital power supply control that supports dimming control and toning communication by improving the efficiency of LED lighting systems using digital control
High-precision magnetic sensing	<ul style="list-style-type: none"> Deploys high-precision sensors include 2D and 3D position sensors that enable magnetic detection in 2D and 3D directions, a unique angle sensor using CVH (circular vertical hall element) technology, a high-precision linear sensor with a chopper stabilizer circuit for fast response, a current sensor, and a speed sensor with a rotational direction detection function

Semiconductor devices	
BCD process	<ul style="list-style-type: none"> Provides a wide range of high added-value products for automotive applications and white goods, etc., through the BCD process from 60V to ultra-high voltage 1200V
SiC MOSFETs	<ul style="list-style-type: none"> We are developing a 1200V/800V trench-structure lineup with low Ron and low switching loss
IGBTs/MOSFETs/diodes	<ul style="list-style-type: none"> Offers IGBTs with a proven track record in meeting the high reliability and high quality requirements of demanding automotive igniter applications Achieves high breakdown voltage and low Vsat in FS IGBTs (adoption of wafer thinning technology) Also provides Low-voltage MOSFETs with a VFP structure that reduces noise With multiple lifetime killer processes, optimizes SW characteristics, and tailors features to the product
Wafer thinning technology	<ul style="list-style-type: none"> In-house glass support and TAIKO process for 6-inch and 8-inch wafers (capable of processing 8-inch wafers as thin as 50 μm)
Wafer active test	<ul style="list-style-type: none"> Facilitates AC measurements, including wafer level high voltage measurement up to 1200V and UIS (L load test) test High productivity through simultaneous measurement of multiple chips and automatic visual inspection

Packages	
Multi-packaging technology	<ul style="list-style-type: none"> Multi-chip packages and passive component molding technologies that realize high integration, compact size, and space saving Package technology and commercialization support to meet the recent increase in demand for lead-free and halogen-free products
Die bonding technology	<ul style="list-style-type: none"> Thin film chip and low thermal resistance die bonding technology for higher power efficiency and higher current Die bonding technology for chip stacks that achieve high integration and miniaturization
Wafer bonding technology	<ul style="list-style-type: none"> Laser soldering technology and copper wire technology for lower costs Copper clip technology to support higher current and lower impedance
Cooling and heat dissipation technology	<ul style="list-style-type: none"> High heat dissipation and high reliability DBC technology used in IGBT modules for automotive and industrial equipment Double-sided heat dissipation technology to realize thin modules with low thermal resistance and high heat dissipation

Diverse Product Portfolio

With a diverse product portfolio based on device and module technologies, Sanken Electric provides solutions that bring about innovation in a variety of devices, from white goods to automobiles.

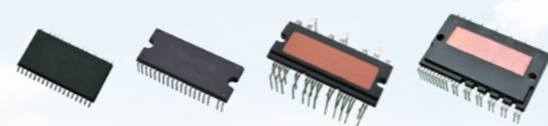
Automotive ICs

- We offer a wide range of automotive IC products with a history of adoption by Japanese and overseas automotive manufacturers and a long track record in mass production.
- Our lineup includes driver ICs for igniters that boast high reliability and surge resistance, highly reliable alternator regulator ICs with many protection, adjustment, and diagnostic functions, high-side drivers with built-in high-precision current control functions, and high-precision multi-output regulators with built-in power sections in high heat dissipation packages.
- We are also developing ICs for next-generation automotive applications such as xEV and ADAS/LiDAR.



IPMs/Power modules (motor drivers)

- We provide IPMs (motor drivers) optimized for fan motors and compressor control that are widely adopted by manufacturers of white goods in Japan and overseas.
- We offer high-voltage, 3-phase brushless motor drivers for fan motors with built-in control ICs for sinusoidal drive and sensorless vector control, which significantly reduces the number of components, and both MOSFET and IGBT high-voltage motor drivers with built-in pre-drivers.
- In addition, a high heat dissipation DIP package is available for automotive and industrial applications with a thermistor-based high-precision heat detection function. An FWD optimized for IPM has been developed to achieve low noise. 650V/1200V products are available.



Power supply ICs

- We develop high-efficiency power supply ICs that are widely used in applications such as white goods and TVs.
- Our product lineup includes the STR series, a highly efficient single-chip solution with built-in flyback PWM control IC and MOSFET, and high-efficiency, low-noise AC/DC converters with built-in LLC current control IC and high-side driver in a compact surface-mount package that support flow mounting.
- We offer a critical mode PFC control IC with fewer components and lower standby power consumption using the input voltage detection-less method.
- We offer a wide variety of products such as step-down switching regulators, linear regulators, etc. for various applications.



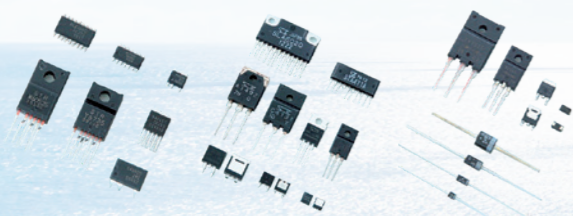
Digital power supply ICs

- We provide optimal power supply systems for applications used in power supply control for TVs and LED lighting, etc.
- We provide bridgeless PFC and current mode LLC converters with the latest digital control technology.
- With flexibility through optimal settings and tuning using firmware and fewer components than analog control, digital power supply ICs achieve highly efficient and low noise power supply.



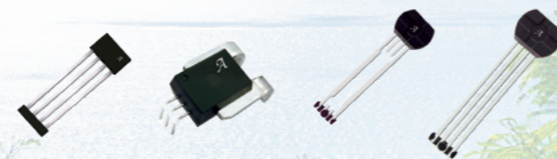
Discretes

- Our high voltage, long life rectifier diodes provide high efficiency through low VF.
- Our Schottky diodes provide high efficiency with avalanche guarantee and outstanding heat dissipation through heat dissipation packages.
- Our IGBTs with built-in Zener diodes and gate resistors and feature low saturation voltage.
- Our MOS arrays are low Ron with 3-phase bridge configuration.



Sensors

- Allegro offers high-precision Hall ICs and current sensors with a high market share for automotive applications.
- A rotational speed Hall IC with automatic gain and offset adjustment to cope with gap variation and temperature drift.
- Current sensor with programmable magnetic sensitivity, offset voltage, etc. using built-in EEPROM, and high accuracy in all temperature ranges.
- Angle sensor with strong magnetic field detection for air gap fluctuation applying CVH technology.



LEDs

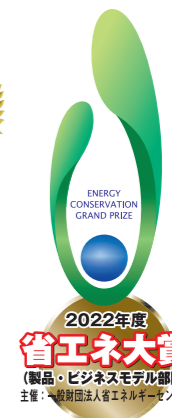
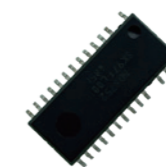
- Our LEDs enable high-precision tones for automotive interiors.
- They also support individual requirements such as narrow chromaticity and luminosity.
- We offer a diverse lineup of luminous intensity distribution, chromaticity, etc.
- We propose high value-added LEDs for special lighting, etc. capable of handling customized spectra such as high color rendering and color enhancement.
- We produce a large number of products with a strong presence in specific markets.
- We have a high reliability and flexible follow up system for domestic production.



Received 2022 Energy Conservation Grand Prize Award

Best Products and Business Models Category
Grand Prize of Minister of Economy, Trade and Industry (METI)

MD6750 series



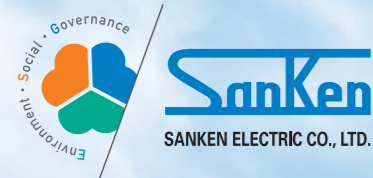
2022年度
省エネ大賞
(製品・ビジネスモデル部門)
主催：一般財団法人省エネモニター

Click here for more information >>>



Fulfilling Our Responsibility to the Next Generation (Promoting ESG Management)

The changes taking place in the times and the environment are increasingly accelerating and becoming more difficult to predict, including globalization, digitization, responding to diversity, more severe disasters and mounting calls for conservation of the global environment as well as responding to COVID-19. To respond to such changes in the times and to foster harmony between the creation of societal value and the pursuit of economic value, Sanken Electric believes it is increasingly important to steadily implement ESG management that integrates business activities with enhancement of the social value of existence as a company.



The Sanken Group engages in ESG management with a commitment to contribute to creating a sustainable society by providing optimal solutions in the field of power electronics as the source of its corporate social responsibility and new value creation.



Environment

Contributions through products
Reduce the environmental impact of our business activities

- Reduce CO₂ emissions from products to prevent global warming
- Reduce CO₂ and water discharged at each base
- Use clean energy in production
- Introduce production processes considerate of the environment
- Reduce waste materials and plastics generated at each plant



Social

Value creation to improve a working environment

- Reduce occupational accidents and make safe and secure workplace environments
- Promote good mental and physical health among employees and balance professional and private lives
- Provide opportunities equally to all and eliminate inequality in workplace environments
- Create workplaces where diverse human resources can thrive
- Offer flexible work styles to preserve a work-life balance



Governance

Strengthen governance

- Respect human rights
- Engage in fair business transactions
- Prevent misconduct
- Enhance the crisis management framework
- Information security



Click here for more information >>>

Domestic / Overseas Centers

1 Headquarters



Overview As the headquarters for the Sanken Group, it oversees the entire Group, and the central functions related to management, technology, production, and quality are located. It aims to halve development speed through the Technical Center, the Production Development Center, and the Evaluation and Analysis Center.

Address 3-6-3 Kitano, Niiza-shi, Saitama-ken 352-8666, Japan

URL <https://www.sanken-ele.co.jp/en/>

2 Ishikawa Sanken Co., Ltd.



Overview Ishikawa Sanken is Sanken Electric's main production center for semiconductor manufacturing, responsible for assembly, which is the back-end process of semiconductor manufacturing. It produces ICs, transistors, diodes, and other products at the Horimatsu Plant, the Shika Plant, and the Noto Plant, its three plants in Ishikawa Prefecture.

Address Ha-5 Nashitanikoyama, Shikamachi, Hakui-gun, Ishikawa-ken 925-0151, Japan

URL <https://www.sanken-ele.co.jp/ishikawa/>

3 Yamagata Sanken Co., Ltd.



Overview Yamagata Sanken is Sanken Electric's main production center responsible for semiconductor chip manufacturing, which is the front-end process of semiconductor manufacturing. It produces ICs, transistors, and diodes among other products.

Address 5600-2 Oaza-Higashine-Ko, Higashine-shi, Yamagata-ken 999-3701, Japan

URL <https://www.sanken-ele.co.jp/yamagata/>

4 Fukushima Sanken Co., Ltd.

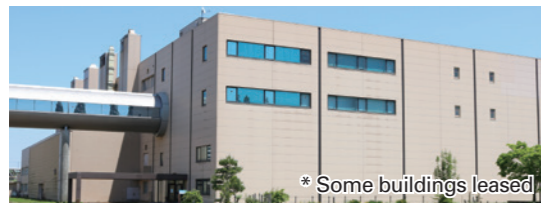


Overview Fukushima Sanken is responsible for Sanken Electric's semiconductor chip inspection process, playing a role that connects front-end and back-end processes. It also produces LEDs.

Address 15 Miyado, Nihonmatsu-shi, Fukushima-ken 964-0811, Japan

URL <https://www.sanken-ele.co.jp/fukushima/>

5 Niigata Sanken Co., Ltd.



Overview Niigata Sanken is a new plant established on May 16, 2023. It handles assembly, which is the back-end process of Sanken Electric's semiconductor manufacturing. It is scheduled to be commenced mass production in the second half of 2024 as a power module production plant.

Address Koh 3000, Chiya, Ojiya-shi, Niigata-ken 947-0052, Japan

URL <https://www.sanken-ele.co.jp/niigata/>

* Some buildings leased

6 Dalian Sanken Electric Co., Ltd.



Overview Dalian Sanken Electric is Sanken Electric's main overseas production center for semiconductor manufacturing, responsible for assembly, which is the back-end process of semiconductor manufacturing. It mainly produces white goods ICs and automotive ICs, and is focusing on expanding capacity with an eye to promoting local production for local consumption.

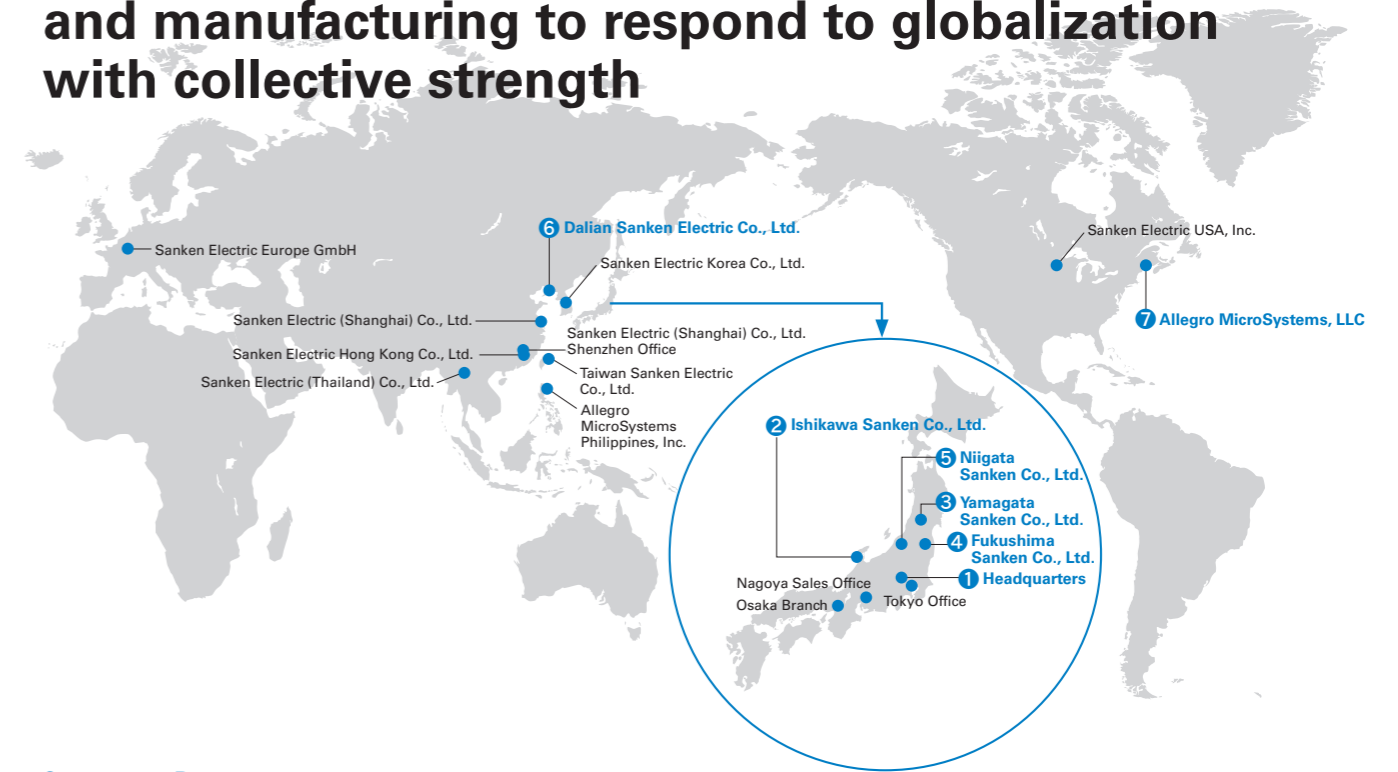
7 Allegro MicroSystems, LLC



Overview Allegro MicroSystems is a Sanken Electric's U.S. subsidiary. Using its original technologies, it mainly develops, produces, and sells motor driver ICs and sensor ICs. It is also responsible for sales of Sanken Electric's semiconductors in Europe. Allegro MicroSystems has two offices in the U.S., including a research and development division, a back-end semiconductor manufacturing subsidiary in the Philippines, and sales subsidiaries in Europe, the U.S., and China.

URL <https://www.allegromicro.com/>

Group companies in Japan and overseas collaborate on sales, development, technology, and manufacturing to respond to globalization with collective strength



Corporate Data

Company Overview

■ Name	Sanken Electric Co., Ltd.	■ Paid-in capital	¥20,896,789,680
■ Trademark		■ Number of shares outstanding	25,098,060
■ Headquarters	3-6-3 Kitano, Niiza-shi, Saitama-ken 352-8666, Japan	■ Date of establishment	September 5, 1946
■ Business purpose	1. Manufacture and sale of electronic components, devices, and electronic circuits 2. Manufacture and sale of electric equipment and apparatus 3. All matters related to the conduct of the business stated in the preceding items		

Business Offices

■ Headquarters	3-6-3 Kitano, Niiza-shi, Saitama-ken 352-8666, Japan Tel: +81-48-472-1111	■ Osaka Branch	Meiji Yasuda Seimei Osaka Umeda Bldg. 3-3-20, Umeda, Kita-ku, Osaka-shi, Osaka 530-0001, Japan Tel: +81-6-6450-4400
■ Tokyo Office	Tokyu Building Higashi 5-gokan 2-25-5, Minami-Ikebukuro, Toshima-ku, Tokyo 171-0022, Japan Tel: +81-3-3986-6151	■ Nagoya Sales Office	Nagoya Crosscourt Tower 4-4-10 Meieki, Nakamura-ku, Nagoya-shi, Aichi-ken 450-0002, Japan Tel: +81-52-581-2768

Board of Directors

■ Directors	Representative Director, President Director, Senior Vice President Director, Senior Vice President Director, Senior Corporate Officer Director, Senior Corporate Officer External Director External Director External Director External Director External Director External Director External Director	Hiroshi Takahashi Satoshi Yoshida Katsumi Kawashima Myungjun Lee Mizuki Utsuno Noriharu Fujita Takaki Yamada Yoko Sanuki Hideki Hirano Yumi Ogose	■ Corporate Officers	Senior Corporate Officer Senior Corporate Officer Senior Corporate Officer Corporate Officer Corporate Officer Corporate Officer Corporate Officer Corporate Officer	Mitsunobu Fukuda Kazuo Akaishi Yusuke Harada Toshio Noguchi Kojiro Hatano Hirokazu Maruo Mitsuhiro Suzuki Hirofumi Mizuno Hironobu Soh
	Director, Full-time Audit and Supervisory Committee Member		Yasuhisa Kato		
	External Director, Audit and Supervisory Committee Member		Atsushi Minami		
	External Director, Audit and Supervisory Committee Member		Yumiko Moritani		