

Small Meeting: Semiconductor Business

December, 2024



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1 Our Strategy and Positioning of Semiconductor Business

2 Explanation of Semiconductor Business Strategy

3 Q&A

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Long-term Trend of Sales and OP

Toward 2.5 trillion yen in sales and 250 billion yen in OP

Record sales for 11 consecutive terms!

3/24~3/29 CAGR
Sales 12.3%
OP 27.7%

3/09-3/24 CAGR
Sales 12.0%
OP 12.0%

*FY3/25-FY3/27 plan does not include additions from new M&As.

(billions of yen)

Sales

OP

256

13

FY3/09 FY3/10 FY3/11 FY3/12 FY3/13 FY3/14 FY3/15 FY3/16 FY3/17 FY3/18 FY3/19 FY3/20 FY3/21 FY3/22 FY3/23 FY3/24 FY3/25 FY3/26 FY3/27 FY3/29

← JGAAP | IFRS →

Plan Plan Plan Target

2,500
250

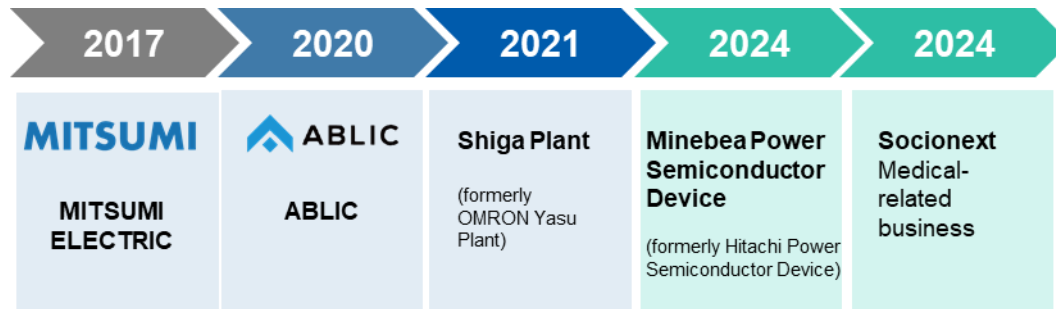


1 Organic Growth

- As global GDP grows, disposable income per person in the market rises.
- Sales of high-end functional products will increase the necessity for high-end components

2 M&A

- Ingrate companies with synergies, mainly in the eight spears products



4 Development of high-value added products through INTEGRATION

- Create synergies through INTEGRATION of core technologies (ultra-precision machining technology, mass production technology) and core businesses (Eight Spears)
- Accelerate development of high value-added products that only we can offer

3 Development of Products and Supply of Parts that Solve Social Issues

- Close and inseparable relationship with the Eight Spears

Our “Room for Growth” - Eight Spears Strategy

Analog semiconductors now positioned as the Second Spear, operating income of 30 billion yen is our target to come.

Aim for net sales of 200 billion yen and an operating margin of 30% in FY3/29 in the medium term

8



Definition of a “Spear”

1. Serve niche fields in massive markets
2. Not readily displaced even as a result of technological innovation
3. Capable of drawing on the strengths of the Company
4. Have synergies between Spears

1 Bearings



Operating income
60 billion yen or more

2 Analog semiconductors



Operating income
30 billion yen or more

3 Motors



Operating income
30 billion yen or more

4 Access Products



Operating income
20 billion yen or more

5 Sensors



6 Connectors / switches



7 Power supply components



8 Wireless/ communications/ software




INTEGRATION of Semiconductor Business and the Core Businesses

Expand business by creating synergies by **INTEGRATION** among 8 core businesses (8 spears)
Achieve one-of-a-kind system performance leveraging analog/power semiconductor technologies

High-efficiency fan motor

FAN motor × Ultra-precision bearing × Motor driver IC Motor control microcontroller


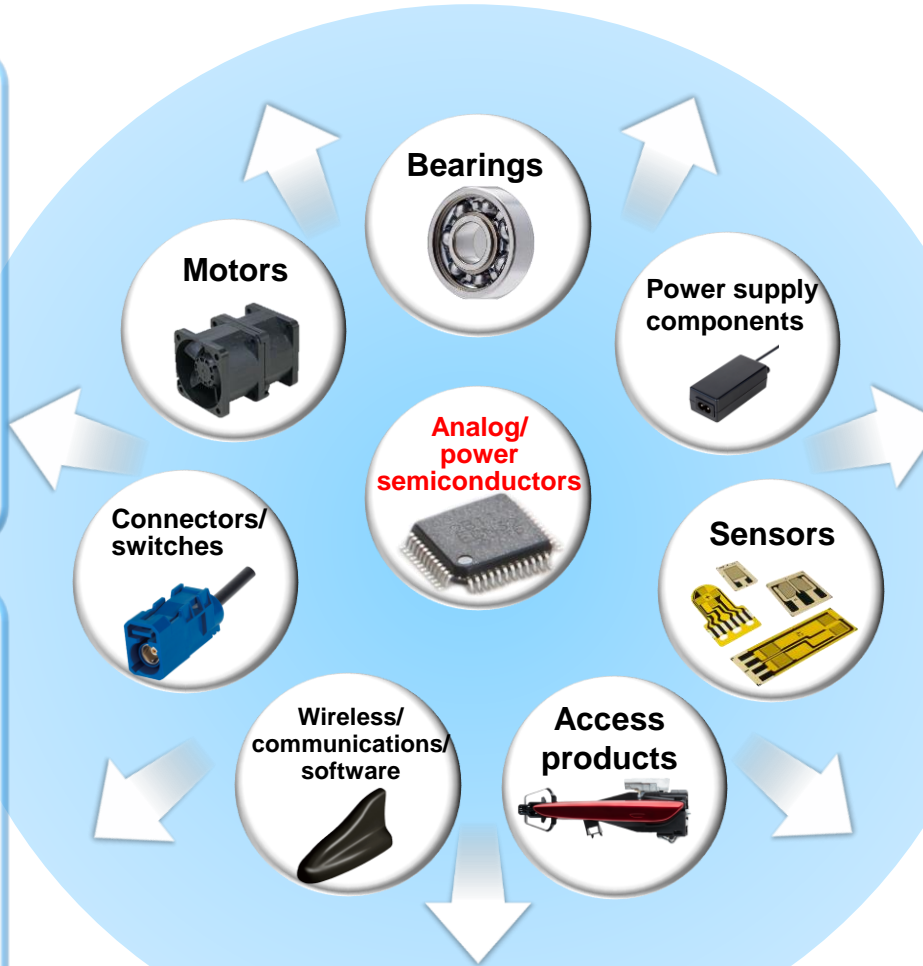
Maximize the characteristics of MinebeaMitsumi's motors
One-of-a-kind IC reduces power by 20%!



Low noise DC motor

DC motor × High voltage IC × High precision motor control IC

System development with highly accurate simulation technology
Noise characteristics reduced by 50%!
Achieved 30% reduction in the number of components, downsizing of the system, and cost reduction by mastering IC performance.

High power supply

Power supply module × Low loss SiC device

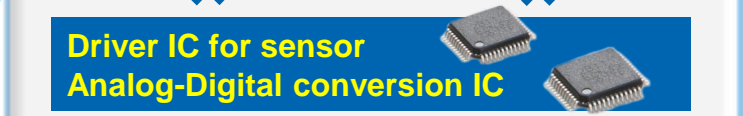
20% reduction of power loss in charging infrastructure by utilizing industry's top performance SiC technology!



Deepening sensing solutions with strain gauges and MEMS technology

Strain gauge × MEMS sensor × Driver IC for sensor Analog-Digital conversion IC

High-precision analog-to-digital conversion using a dedicated driver IC to bring out the performance of high-sensitivity sensors and return minute natural signals to the digital society.



8 core businesses | **8 spears**

Accelerated growth in both analog and power semiconductor markets from 2025 onward Aiming to become a "Global Niche Top" in our field of expertise!

Key Points

1 Analog semiconductor: Promote global niche top strategy that drives competitive edge for analog semiconductors

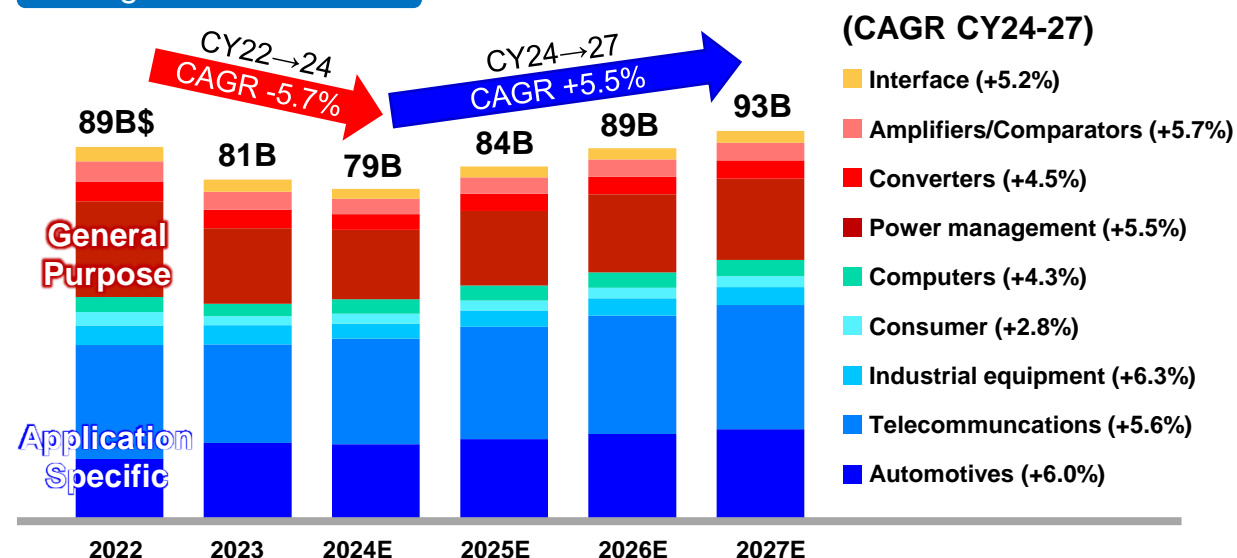
- Focus on niche and custom areas. Aim to build a solid position by providing products that meet customer needs leveraging harmony of craftsmanship (a market that is difficult for Chinese companies to enter).

2 Power semiconductor: Expanding lineup of high-voltage, high-performance products centered on our proprietary side-gate IGBT technology

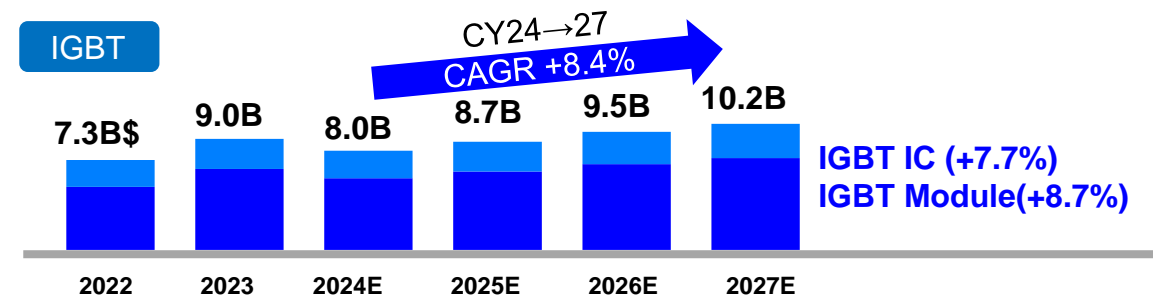
- Our strength lies in offering both high-efficiency IGBTs and SiC, targeting markets that recognize our technology as value-added, including the EV sector.
- Concentrate on high-voltage, high-performance products for tractions and power grids to drive growth on a distinct competitive field from Chinese companies.
- Profitability will further improve as capacity utilization at the Shiga Plant increases in line with the above-mentioned market expansion.

Global market forecast

Analog semiconductors

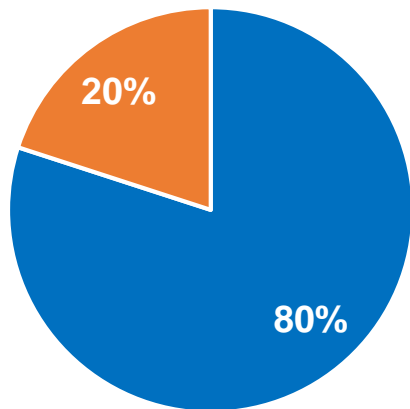


IGBT



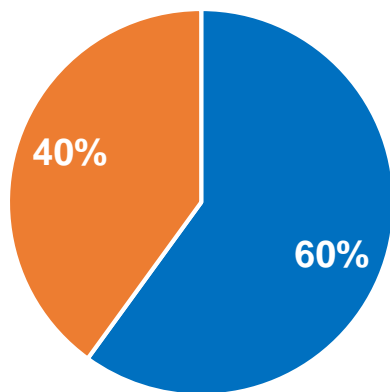
Semiconductor Business: Overview

Semiconductor niche ratio



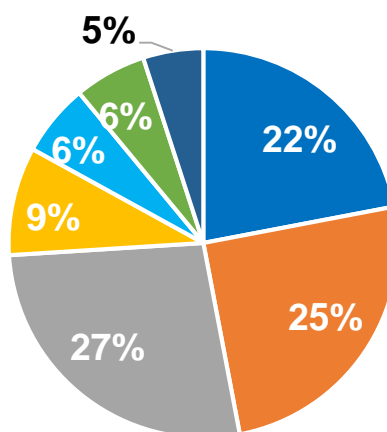
■ Niche ■ General purpose

Semiconductor type ratio



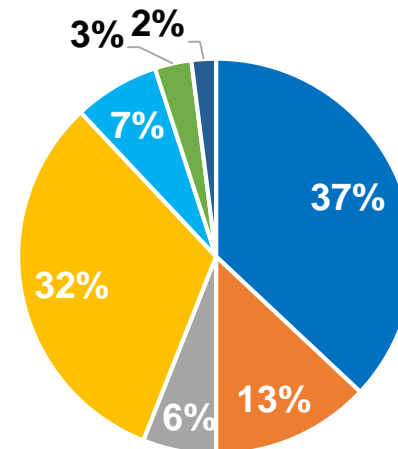
■ Analog semiconductor
■ Power semiconductor

Application ratio



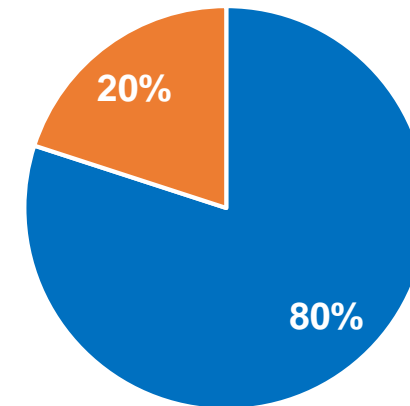
■ Mobile
■ Automotive
■ Consumer
■ Electric railway
■ Medical
■ Industrial machinery
■ Others

Sales by country ratio



■ Japan ■ U.S.
■ Europe ■ China
■ South Korea ■ Taiwan

Production ratio (pre-process)



■ Internal Fab
■ External Fab

FY3/17

Net sales: Approx. 20 billion yen
Operating margin: Red

FY3/25

Net sales: 120 billion yen
Operating margin: Approx. 20%

FY3/29

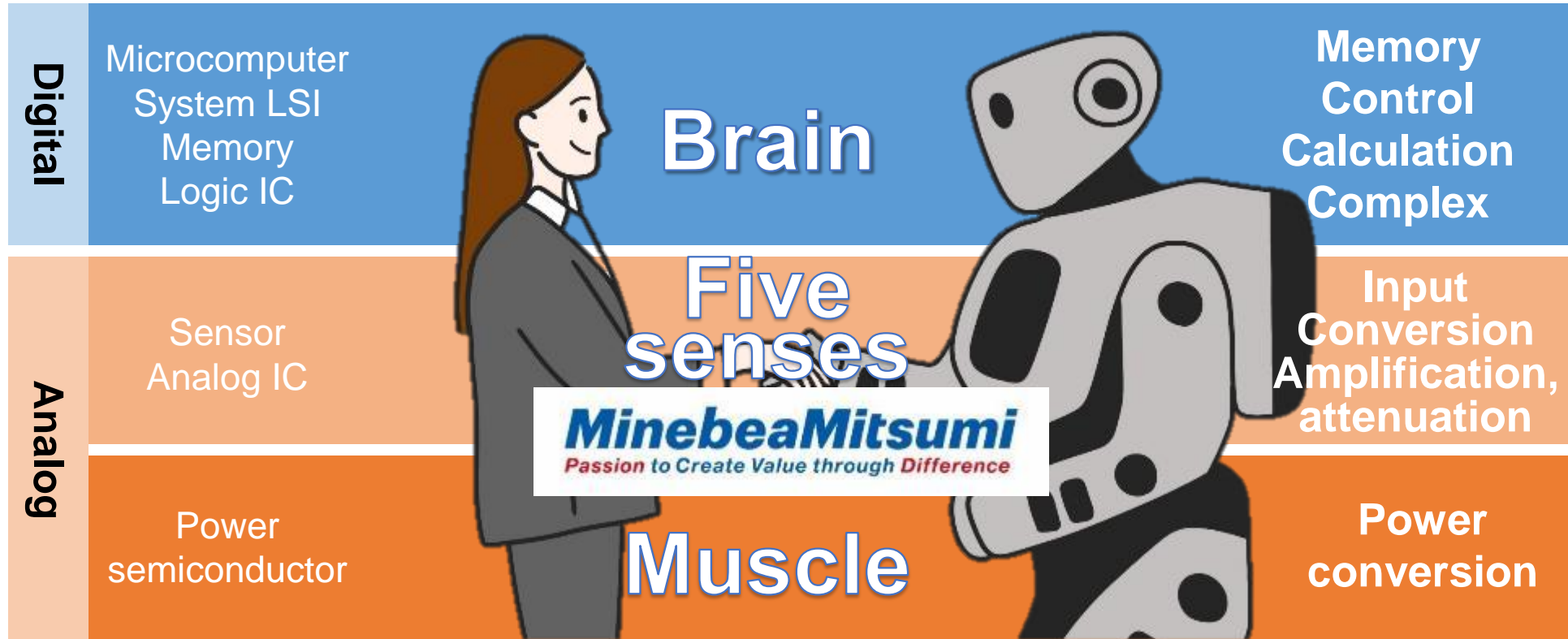
Net sales: 200 billion yen
Operating margin: 30%

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A single device can contain both analog and digital semiconductors
Main roles; **brains by digital** and **the limbs by analog**



Analog Semiconductor:

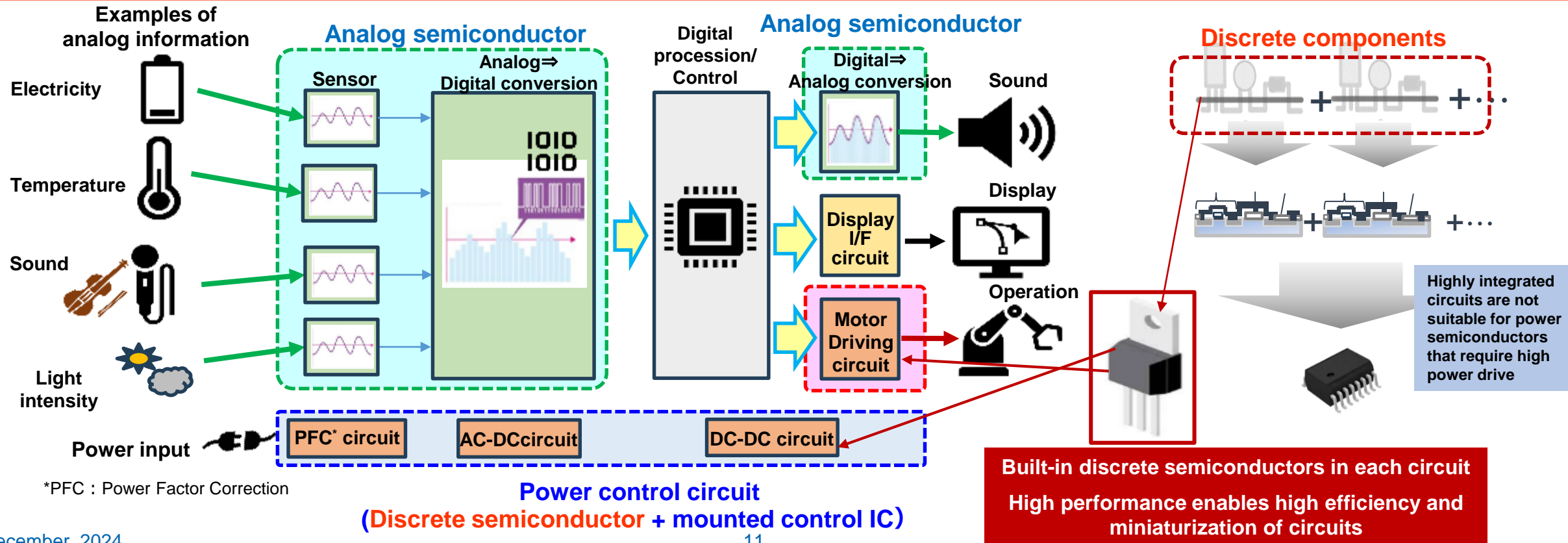
A semiconductor that converts continuous analog signals into digital signals by judging them as 1/0 (A/D conversion) or vice versa (D/A conversion).

*Analog: Signals that change continuously over time, such as electricity, temperature, sound, and light intensity.

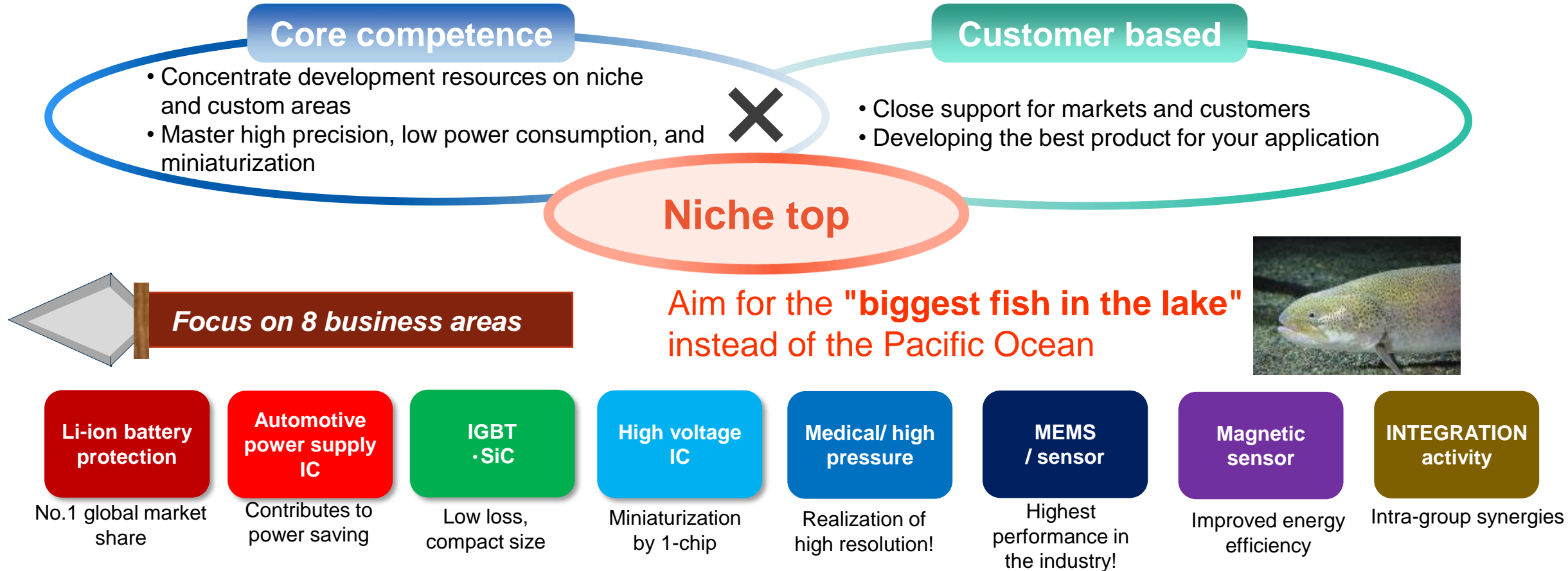
Discrete Semiconductor:

IGBTs, transistors, diodes, etc. packaged in a single element with a single function

*The circuits with highly integrated discrete elements are ICs, LSIs, etc., but they are not suitable for high-power driving. Therefore, **discrete forms are required for power semiconductors.**



The specialist of analog semiconductor



Providing niche, under the edge, and indispensable semiconductors for the realization of a sustainable society

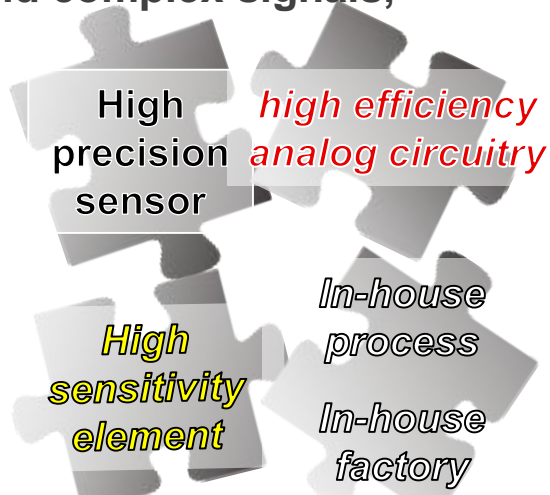
In this digital era where differentiation is a challenge, advanced analog technology has the potential to reshape the future.

Achieve business growth as a global niche leader by leveraging Japan's unique "monozukuri" (manufacturing) strengths.

- Our Strengths**
- ① **High barriers to entry** due to detailed customer service with a focus on niche markets
 - ② A unique process achieved through precise fine-tuning makes it **difficult to replicate**
 - ③ **Only IDM's** integrated production system from design to manufacturing can achieve this: multiple product types and short delivery times in response to customer requirements

Technologies required for analog semiconductors

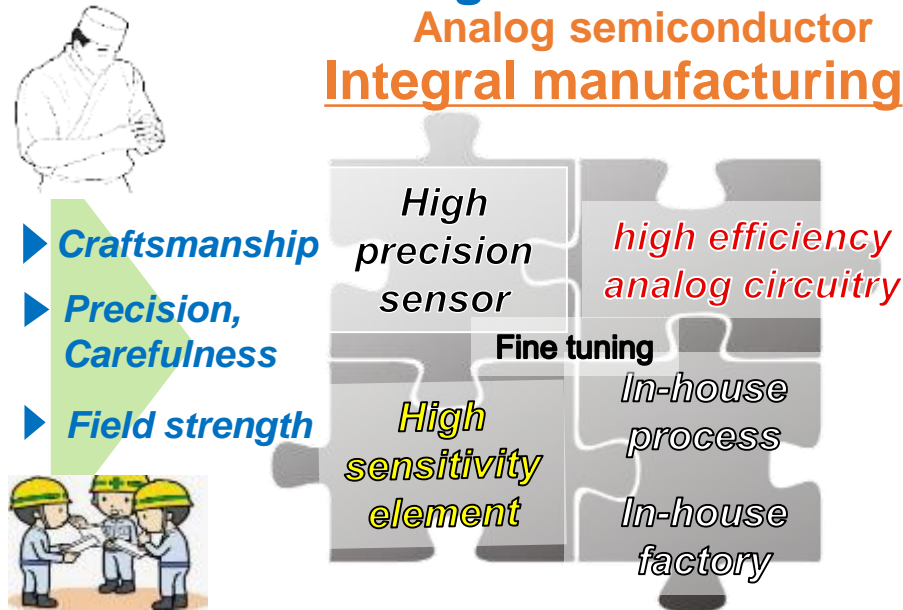
To accurately process diverse and complex signals,



Requires sharp and advanced technology, and a sharp manufacturing method

Manufacturing of our analog semiconductors

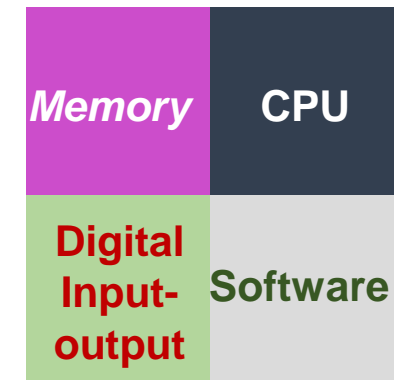
Analog semiconductor Integral manufacturing



*IDM : Integrated Device Manufacturer

Digital semiconductor Modular manufacturing

Mass production leveraging cutting-edge technology
(Investment capacity determines the winner)



Four strategies differentiate us from competing major analog semiconductor manufacturers and Chinese manufacturers

Aim for a small, nimble business entity, responding to customer needs in detail to dominate the niche

1. Short delivery time and multi-variety correspondence of development and manufacturing unit to meet various requests from customers

Competitor **Foundry system** ↔ **Minebea Mitsumi** **IDM system**

Chinese manufacturer

There are issues of delivery date and capacity due to outsourced manufacturing

Lithium protection IC

Integrated development with dedicated production line
Minimize development speed, production control, and delivery time

3. Collaborate with customers to dominate the niche top

Medical ICs, automotive power supply ICs, INTEGRATION activities

Competitor **Department store method** ↔ **Minebea Mitsumi** **Retail store method**

Major semiconductor companies offer a diverse lineup of products, and customers choose the products they want to buy

Collaborate with customers to meet their specific needs and secure major clients through semi-customized solutions

2. Anticipate next-generation functions and gain first-mover advantage

Lithium Protection IC best practices to other products such as MEMS

- Establish a position in a niche area by taking advantage of an integrated development and production system
- Earn customer trust and next-generation needs, and **gain first-mover advantage and market share** by releasing new features before any of the competition

Examples Lithium protection IC Worldwide share 80%

Next generation product release

Capture first-mover advantage, market share and new needs

<Establish a positive cycle>

4. Launch unprecedented one-of-a-kind products

Automotive power supply IC, INTEGRATION activities

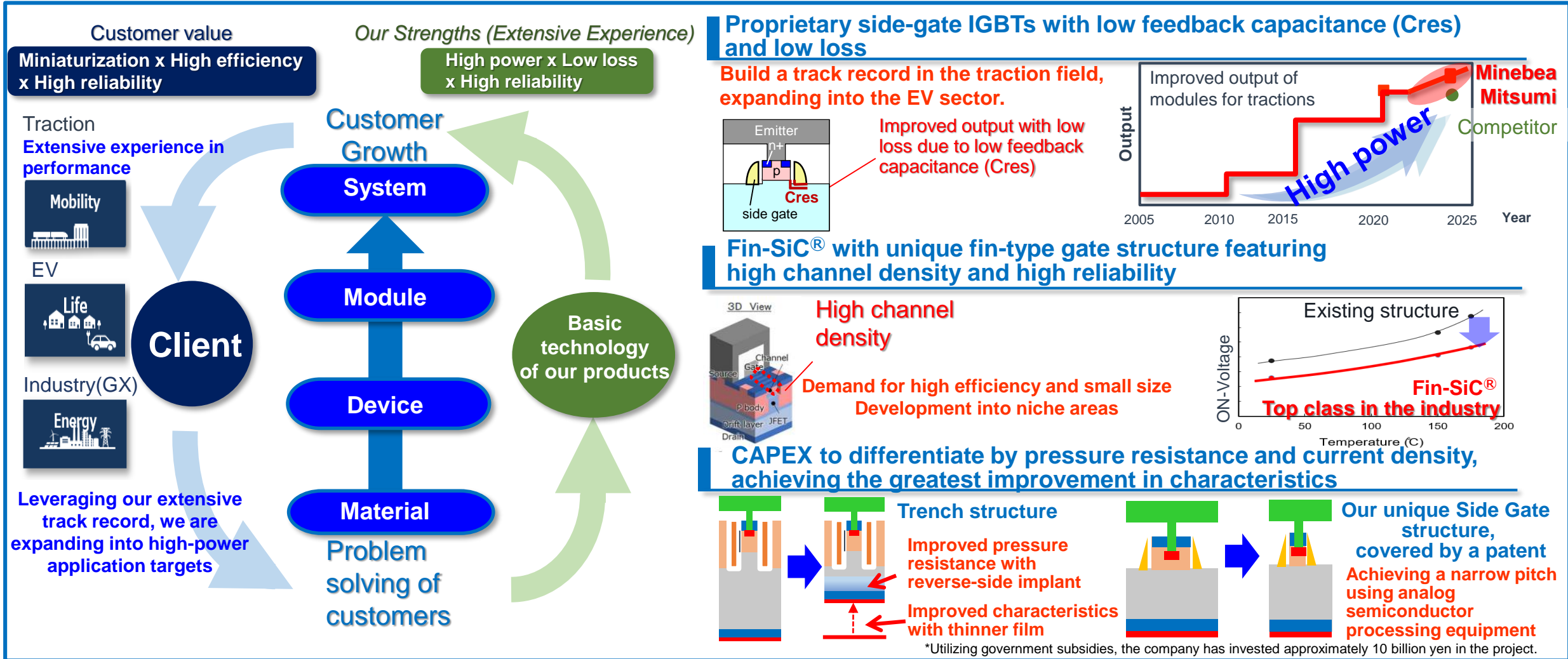
- Derive "**true issues**" of customers obtained through collaboration with customers
- Develop and market **power supply ICs that do not propagate noise!**

Examples I want to prevent system malfunctions caused by power supply noise, not by improving or reducing the noise performance of ICs, but by preventing the propagation of noise itself

<Creating new markets by launching products that do not exist anywhere else in the world>

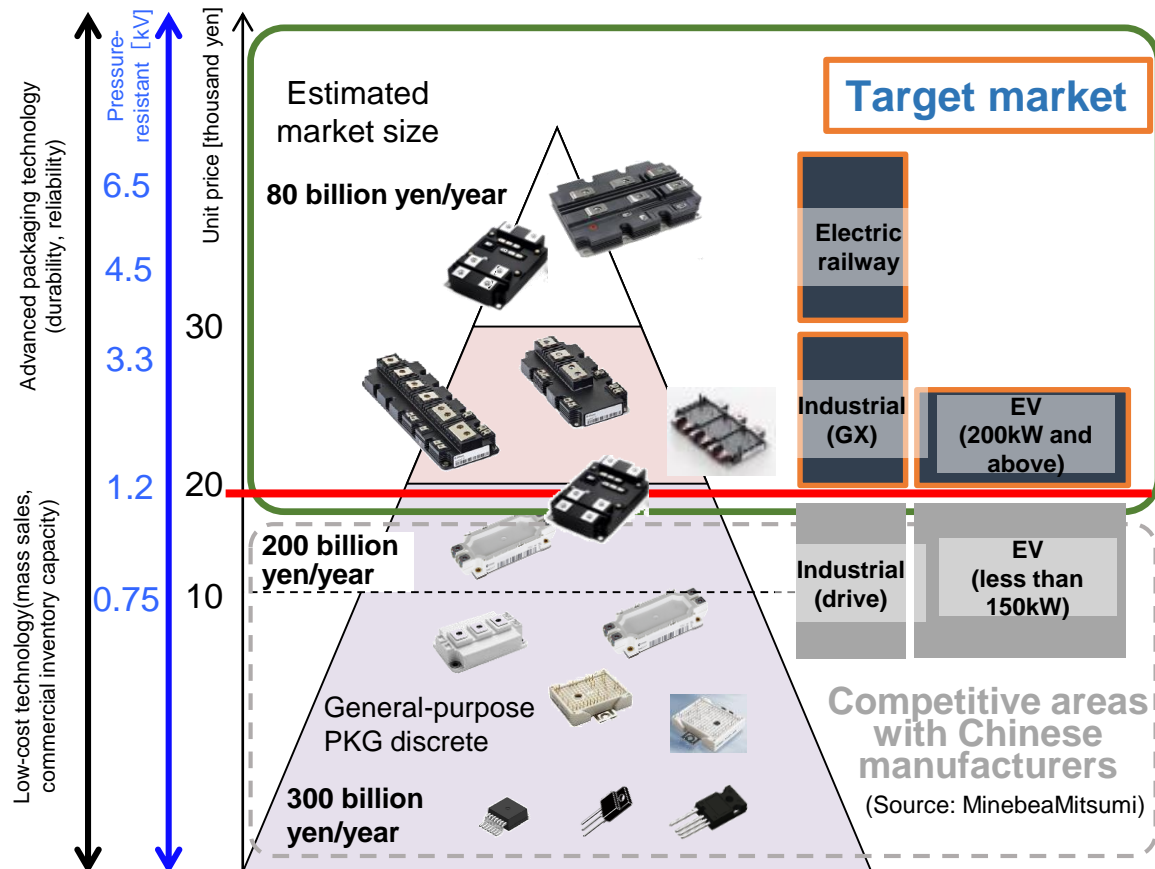
Further evolution of the core competence of high output, low loss, and high reliability cultivated through extensive experience in the traction field

Provide solutions to customer issues in high-power application systems with proprietary devices



Leveraging our extensive track record in the electric railway market requiring high durability and high reliability, we will focus on markets that require high voltage and high performance, which are high barriers to entry in response to the rise of Chinese manufacturers

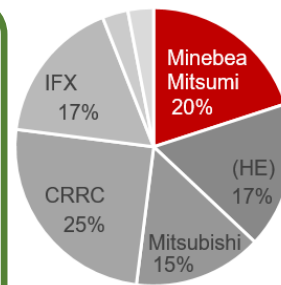
Power device market composition



Our position in electric railways

Sales for electric railways
'24:13 billion yen → '28:15 billion yen

Share in 3.3kV



Our strengths

- Over 20% market share
- Over 30 years of experience
- Adopted for Shinkansen, limited express, and suburban trains

(Source: MinebeaMitsumi)

Lower floor & more passenger space for suburban trains

Advanced power semiconductor technology for smaller size and higher efficiency

Inverter has been moved from under the floor to the ceiling to lower the floor height

Focus on industrial and EV (200kW and above) markets

Sales for industrial and EV
'24:4 billion yen → '28:16 billion yen

✓ Target applications

- Power supply, GX (wind power, solar power)
- High-end EVs, commercial vehicles (bus, taxi), construction machinery (dump trucks, tractors)

[Characteristics of the market]

- High frequency of start/stop/start
 - Long product life
- **Requires high durability**

Our superior technology

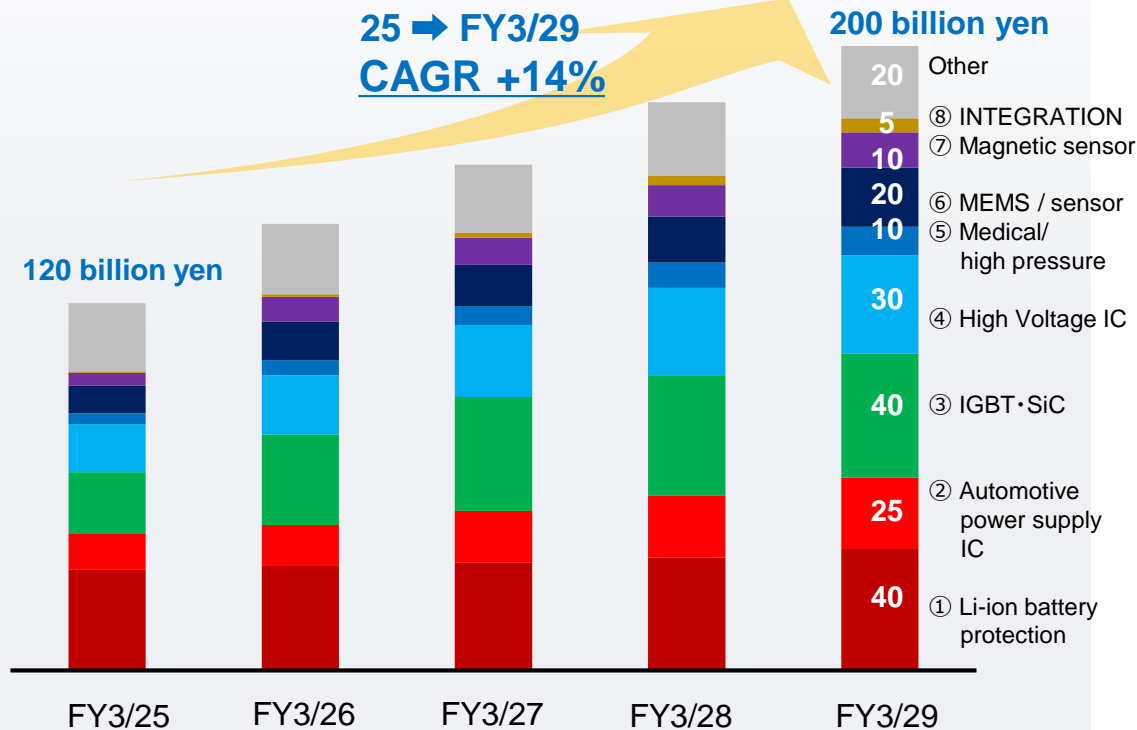
- Know-how cultivated in the electric railway industry, high durability technology
- To reduce the heat of the chip; **Si : side-gate**
- SiC : Fin - SiC® technology**
- To withstand heat generation; **Bonding technology (sintered copper, direct lead), heat dissipation technology (direct water cooling)**

Strengthen core technologies and focus on growth areas to achieve 200 billion yen in sales and an operating margin of 30% at an early stage

Semiconductor 8 Spears

- | | | |
|---|-----------------------------------|--|
| 1 | Li-ion battery protection | High capacity and quick charging support ensure overwhelming technological superiority. Maintaining an overwhelming No. 1 position in the market |
| 2 | Automotive power supply IC | Focus on growth areas and expand sales by uniting ABLIC and MITSUMI technology |
| 3 | IGBT·SiC | Focus on high-end and mid-range markets and provide IGBT and SiC products that meet customer needs |
| 4 | High Voltage IC | Contribute to smaller circuit board size and higher inverter efficiency by 1-chip and motor control technologies |
| 5 | Medical/ high pressure | Expand market share with total solutions by adding not only transmitting but also receiving and transmitting technology |
| 6 | MEMS / sensor | Provide high value-added products in growth areas by leveraging our core technology of high sensitivity MEMS and high-performance A/D converters |
| 7 | Magnetic sensor | Focus on magnetic linear ICs for electric current sensor to meet the growing need for large current |
| 8 | INTEGRATION activity | Contribute to the differentiation of MinebeaMitsumi products by uniting of MITSUMI, ABLIC and Power Devices technologies |

Semiconductor Division Sales Plan Image



①-1 Li-ion Battery Protection (for 1 cell)

Maintain and enhance high profitability by integrating our ability to obtain information by leveraging our position to have achieved leading market share, our technological expertise in lithium-ion batteries cultivated over many years, and our in-house production capabilities.

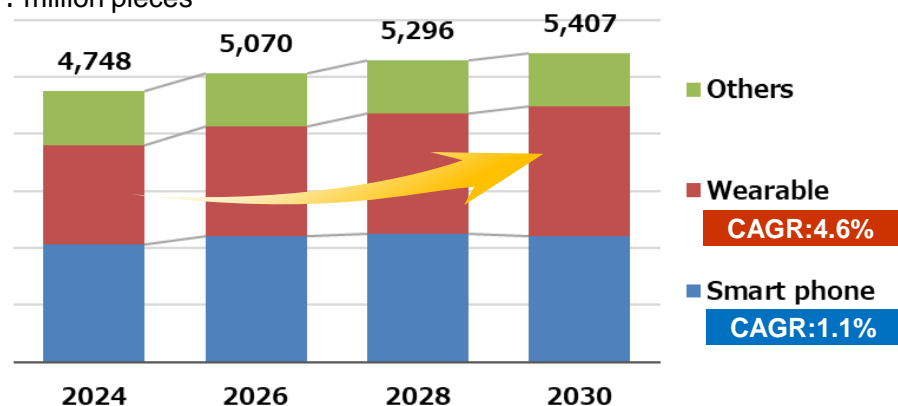
Product Strategy

- Create new technologies for new high capacity batteries and rapid recharging, and obtain first-mover advantage through these rights acquisition
- Introduce high performance, high-value-added products to the market based on battery protection technology

Market Trend

Li-ion battery protection (1 cell) market forecast 2024 → 2030 CAGR +2%

Unit : million pieces



Li-ion battery protection (For 1 cell)
80% world market share
(Source: MinebeaMitsumi)

Reference : Fuji Chimera 2024
Fuji Keizai2020

Although wearables are on the rise, the market as a whole is not expected to grow significantly.
Add value to products and increase revenues!

Our Strengths

- ✓ Product development capabilities based on battery protection technology
 - High Performance Protection IC ① Battery Level +Protection
 - Battery Level** (Digital Tech.): Accurately measure battery level and maximize battery capacity!
 - High Performance Protection IC ② ID Authentication +Protection
 - ID Authentication** (Digital Tech.): Records the manufacturing and usage history and certifies batteries and electronic devices conformity!
 - Battery Level** (Analog Tech.): Improve battery safety by detecting abnormal voltage and current with ultra-high accuracy
- Compliance with European regulations requiring Smartphone batteries to be interchangeable
- Ex.) Smartphone usage:
- ✓ Ability to provide the latest solutions demanded by customers by leveraging our No. 1 market share. Quickly commercializing the latest products that comply with the world's laws and regulations
- ✓ IDM's speedy mass production and ability to handle a wide variety of products

①-2 Li-ion Battery Protection (for multi cell)

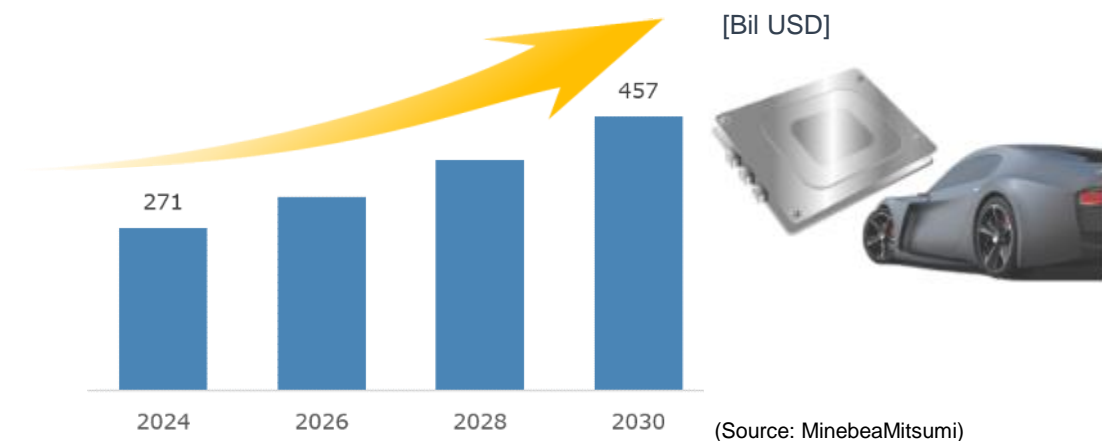
Expanding our business by strengthening large-scale application lineup based on the track record cultivated in consumer electronics and high quality

Product Strategy

- Contribute to realize more safer Battery Management System (BMS) by 2nd Protection IC for automotive
- Add battery monitoring analog front-end IC for storage batteries to our lineup

Market Trend

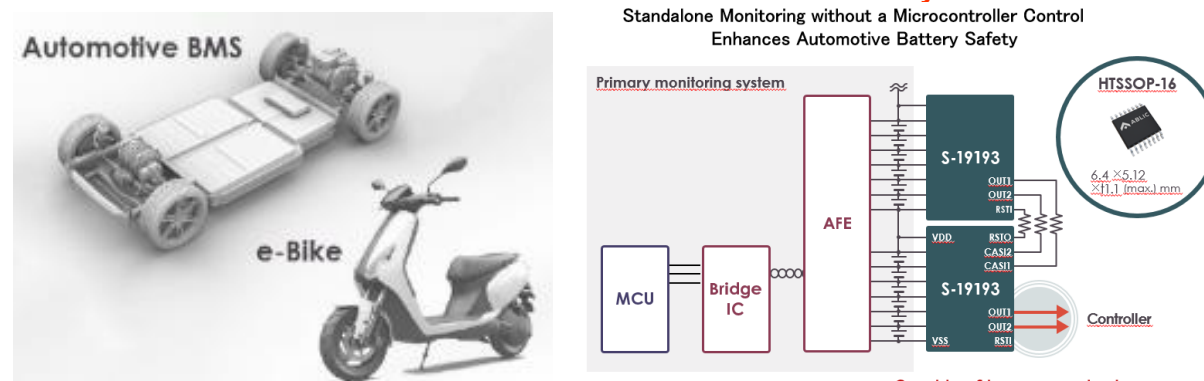
BMS market forecast
2024 → 2030 **CAGR +20%**



Growing demand for BMS for storage batteries to stabilize HEVs and BEVs power output as clean energy is utilized around the world

Our Strengths

- ✓ **Safety-oriented product design capabilities cultivated through 30 years of our experience**
- 1. **No microcontroller control is required, and even if the main monitoring system fails, 2nd Protection IC for automotive which can monitor the battery makes the car safer!**



- 2. **Battery monitoring analog front-end IC for large-scale storage batteries is under development**
Capable of measuring battery voltage and current with high accuracy.
Moreover, contribute to safe operation for storage batteries by strengthening temperature monitoring function

② Automotive Power Supply IC

Differentiation through enhanced support and high value-added products based on customer trust obtained from stable supply of high performance, high quality products by integrated production system in Japan.

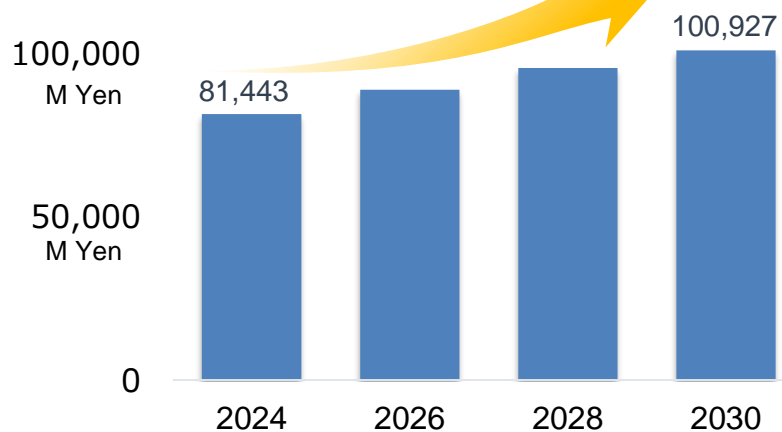
Product Strategy

- Achieved camera module miniaturization by leveraging our strength in miniaturization technology
→ Enables car design to be more freedom!
- Entered the ECU market for 48V auxiliary battery EVs by leveraging the strength of high-voltage technology
→ Contribute to improve fuel and electricity consumption of vehicles!

Market Trend

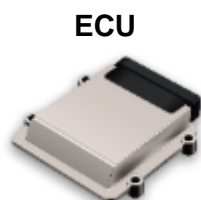
Automotive power supply IC market forecast

2024 → 2030 **CAGR +4%**



Reference : Fuji Chimera, YH Research (Only Generic product LDO, DC-DC and VD)

The market for Automotive power supply IC is expanding as vehicles become more electronic and electrified.



ECU



Camera Module



48V auxiliary Motor

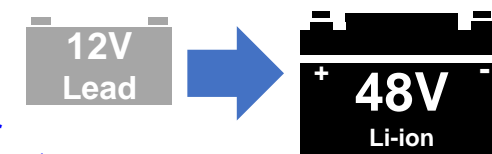
Our Strengths

- ✓ **Miniaturization, power saving and high-voltage technology**



Contribute to camera module miniaturization by miniaturization technology

Quickly respond to evolving EVs!

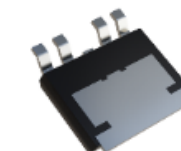


- Electricity cost improvement
- Reduce environmental impact
- Reduce number of battery replacements

Contribute to improve EV electricity costs with high-voltage and power-saving technology



Industry's smallest size
Step-down switching regulator
S-19954 series



Industry's lowest current consumption
LDO Regulator
Under development
S-192xx series

- ✓ **High quality and reliability cultivated through more than 20 years of experience in the automotive market**
- ✓ **Generous technical customers support (Thermal simulation and data acquisition)**

③ High Voltage IGBT and SiC

Low-loss, high power density technology (downsizing) contributes to higher efficiency of inverters
 ~ Providing both IGBT and SiC products to customers ~

Product Strategy

- Expand business in niche markets of EV (over 200kW) and GX (solar and wind power) based on over 30 years of our experience in electric railways
- Expand new technology proposals (IGBT side gate structure, high power density technology, Fin-SiC[®] structure)

Market Trend

High voltage IGBT and IC market forecast

Unit : 100 million yen

'24→'30 CAGR

Year	EV (Over 200kW)	Industry	Electric railways	Total
2024	~1,000	~5,000	~1,518	7,518
2026	~1,500	~4,500	~1,500	~7,500
2028	~2,500	~4,000	~1,500	~8,000
2030	~4,500	~3,500	~1,557	15,557

(Source: MinebeaMitsumi)

Expand our business in EV (Niche markets: commercial vehicles and construction equipment) and GX markets based on electric railway applications

Our Strengths

✓ **Our high power density technology is highly evaluated and adopted for EV projects in Europe. Mass production will start in FY3/25.**

Low-loss technology : IGBT Side Gate Structure

High Power Density Technology

Apply to EV apps

3.3kV600A nHPD2

Turn Off Loss [J/P]@600A, Tj=150°C

Vcesat [V]@600A, Tj=150°C

Loss characteristic trade-off

Adoption of IGBT side gate structure Achieves **low loss** due to (Trench⇒Side Gate)

Power Density A/L (relative comparison)

Power Density 1.3x ↑

Conventional Products vs VX Series

750V800A module power density

Contribute to **high power density** of the module due to chip resistive loss

Already on the market, to be expanded to Europe in 2025

- High power density allows us for expanding cabin spaces by miniaturizing on-board equipment and making maintenance easier.
- High efficiency enables miniaturizing of the on-board battery, which improved running fuel efficiency.

**Provide best solutions for customers with
1-chip technology + motor sensorless vector control technology
~ Delivering control as a set: motors turn faster, easier, and quieter ~**

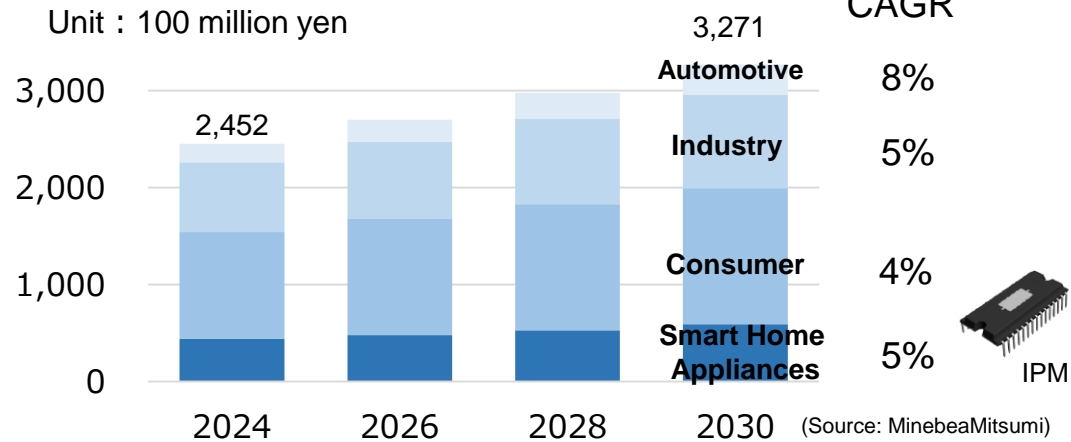
Product Strategy

- Expansion of market entry (Geographic expansion: India and other countries, package development)
- Acceleration of product development for the market entry (high power area + motor control software for application development)

Market Trend

IPM market forecast

'24→'30
CAGR



Expand entry into existing room air conditioner market on the strength of IPM* + motor control software (Geographic expansion: India and other countries, package development)
Expand consumer applications in the high-power range by leveraging sales channels and control software in existing markets

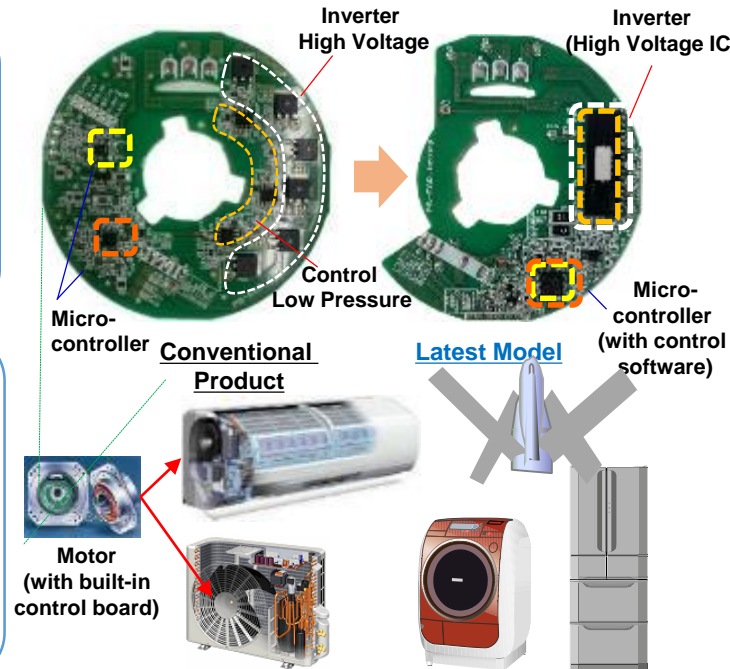
*IPM(Intelligent Power Module)
Power semiconductor elements that incorporate drive circuits and self-protection functions for power devices such as power MOSFETs and IGBTs that control power

Our Strengths

✓ Provide turnkey solutions in miniaturization and motor control

Miniaturization Tech.

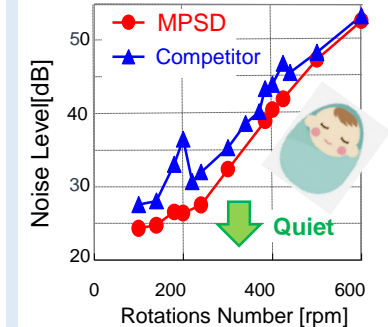
Motor Control Technology



Functions integrated into a 1-chip IC

Miniaturization of printed circuit boards (▲30%)

Achieved low noise and high efficiency by our unique sensorless vector control



⑤ Medical/ High Voltage

Expand highly profitable business for medical equipment by integrating newly acquired Socionext's receiver circuit technology with our track record of adoption in transmitter and high voltage switches and high-voltage analog IC technology

Product Strategy

- Expand market share with total solution covering all areas including transmission, reception, transmission/reception, high voltage switch
- Enhance ultrasound diagnostic system the fast-growing market for handheld ultrasound diagnostic system for medical institutions and home use with high image quality and miniaturization technology

Market Trend

Medical ultrasound diagnostic system market forecast 2024 → 2030 CAGR +5%

Global market for ultrasound equipment Revenue(\$ millions)

Year	Revenue (\$ millions)
2024	8,188
2026	-
2028	-
2030	10,896

(Source: MinebeaMitsumi)

Ultrasound diagnostic system IC Market Category Breakdown FY30 SAM 76B yen

Category	Percentage
Reception	26%
Transmission	25%
Transmission & Reception	30%
High voltage switch	19%

Enter the receiving, transmitting, and receiving markets Coverage of all areas

- For medical institutions (existing market) :** FY30 SAM 5B yen(for handheld) Continued growth in emerging markets and new demand for orthopedics
- For home use (New markets) :** FY30 SAM 18B yen (for handheld) Grow rapidly in the future and contribute to the spread of remote medical care, Market size may surpass that of medical institutions in the future

Our Strengths

- High voltage and high speed analog circuit, device technology and digital signal processing technology**
 - Transmission : Positive and negative symmetrical waveforms for high image quality
 - Reception : Digital signal processing technology for high image quality and unique analog signal multiplexing for miniaturization

Arbitrary wave → Positive and Negative Symmetry Pulse → Echo → Receiving IC → Image

200V 20MHz

Digital Signal Processing Image Signal Processing

High integration of the transmitter/receiver circuits enables mounting in a narrow probe!

S-US7502 64Channel transmitting and receiving ICs15x15mm

Down sizing

For medical institutions

Portable Premium

For home use

Other smartphones, PCs, etc.

- Product planning, development, and proposal capabilities through relationships with key customers
- Customer-focused technical support that understands the customer's products

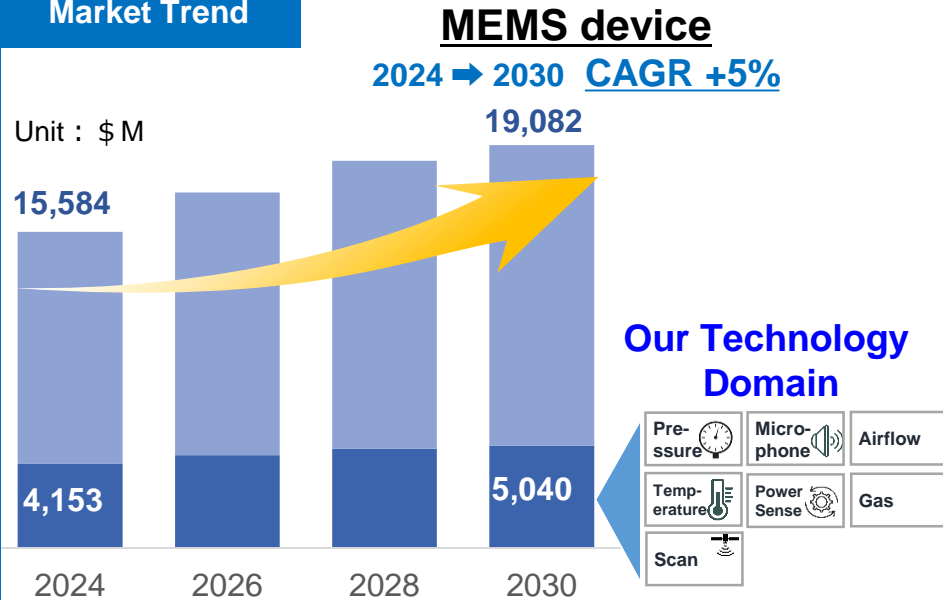
Achieve Industry-leading performance with uniquely designed high-sensitivity MEMS elements and high-precision A/D converters

Expand MEMS sensor business by focusing on growth areas

Product Strategy

- Expand product lineup and introduce differentiated products to the growth and high value-added zones of the MEMS market
- Timely response to market demands through an integrated system of design, in-house fab, and in-house assembly

Market Trend



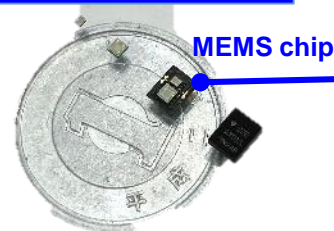
YOLE:Market and Technology Report 2024+ (Source: MinebeaMitsumi)

RF MEMS, IMU, **pressure sensors, and microphones** drive market growth!

Our Strengths

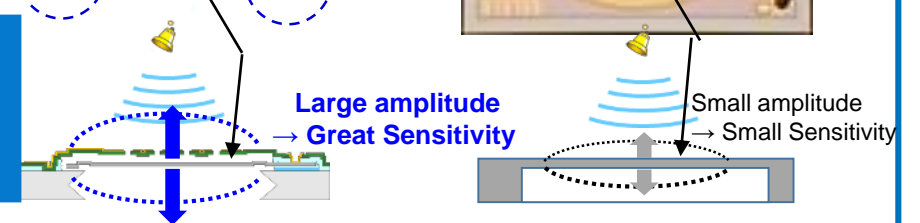
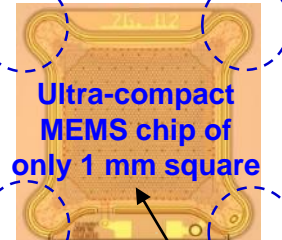
- ✓ **Fusion of high-precision MEMS development based on design and manufacturing technologies cultivated over 30 years in OMRON blood pressure monitors with a 50% share of the WW market, and in-house low-cost assembly line manufacturing (Cebu Plant)**
- ✓ **Achieve industry-leading product performance with proprietary design and process technologies**

Highly sensitive MEMS microphone

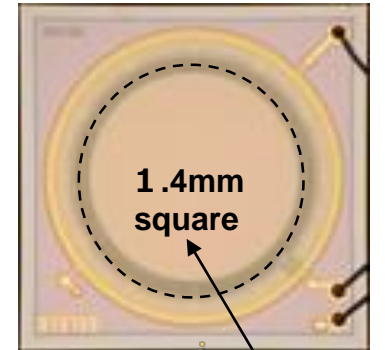


Achieve miniaturization and industry-leading high sensitivity and high performance by making diaphragm swing widely with unique structural design and process technology!

Our 4-point support structure



Competitor's product
Circumferential fixed structure



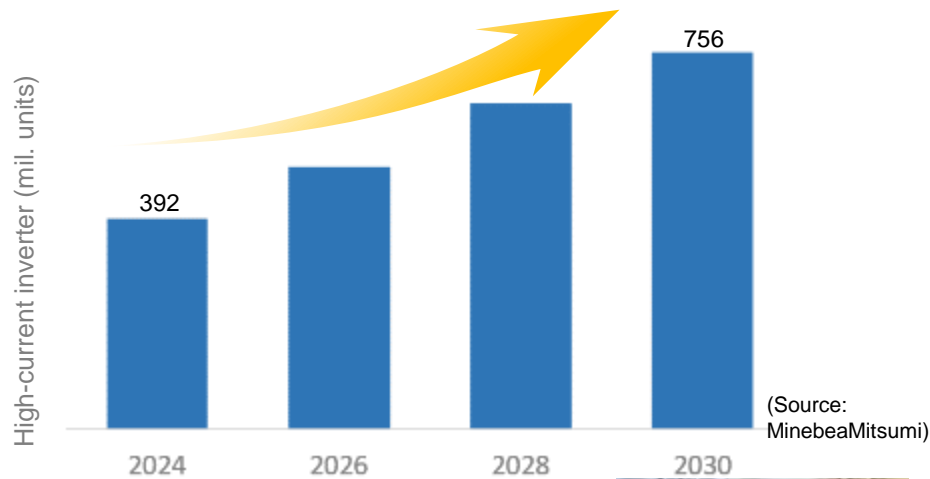
**Strengthen the lineup with magnetic switch ICs as a starting point
improve inverter energy efficiency with magnetic linear ICs for current sensors**

Product Strategy

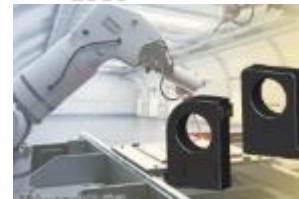
- Targeting high current needs with greater emphasis on improving energy efficiency
- Realize highly efficient and accurate control of motors with a magnetic linear IC for current sensors featuring low noise and high-speed response

Market Trend

High current inverter market forecast 2024 → 2030 CAGR +12%



With the rapid development of industrial automation, demand for high current inverters with improved energy efficiency (for industrial robots, solar and wind power generation, and automotive applications) is growing.

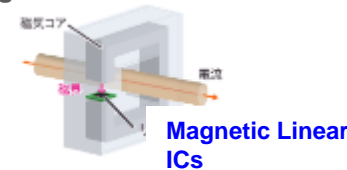


Our Strengths

✓ Industry-leading low-noise, high-speed response technology

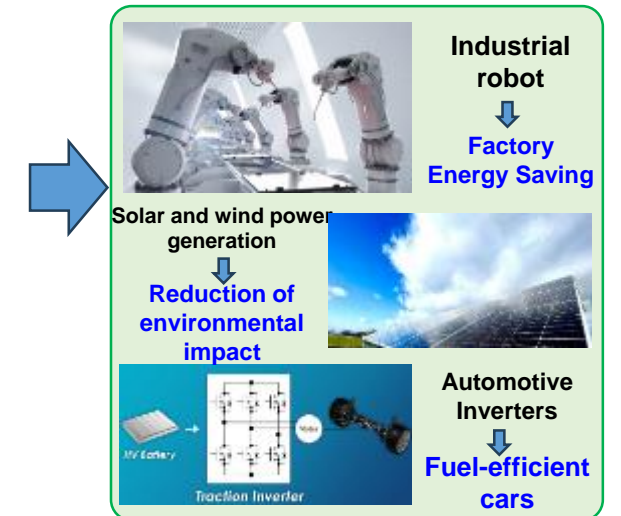
- Magnetic Linear IC for Current Sensor
 - ✓ Smallest in the industry
Low noise : $0.09\mu\text{T}/\sqrt{\text{Hz}}$
⇒ High efficiency and fine operation
 - ✓ Fastest in the industry
Fast response : $1.25\mu\text{sec}$
⇒ High-precision control
- Achieving both**

Magnetic core current sensor



Contribute to improved energy efficiency of inverters

- ✓ Industry-leading product quality (zero defects in magnetic properties)
- ✓ Magnetic simulation support tailored to customer needs



⑧-1 INTEGRATION Activity (Motor Driver)

Contributing to solve social issues such as power saving by the unified solution of motors and driver ICs by demonstrating the INTEGRATION with our motor business!

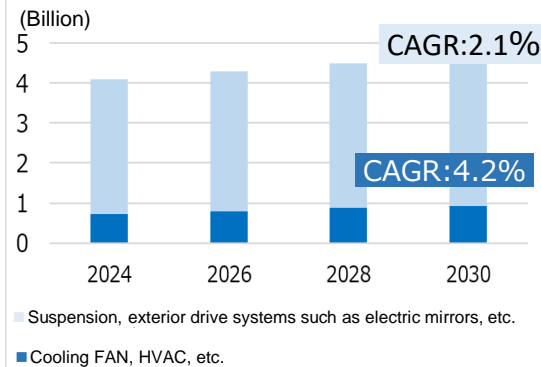
Product Strategy

- Expand optimal driver IC solutions for high efficiency and miniaturization of motors by quickly responding to internal user requirements
- Based on integration activities, focus on markets with synergistic effects and growth potential (for automotive, data server)

Market Trend

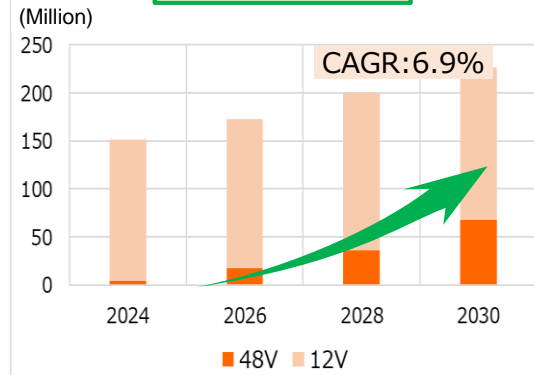
★source : Based on Fuji Keizai data, created by MinebeaMitsumi

For automotive small motors



The market for automotive small motors is robust
⇒ Attack the global niche top (with a focus on cooling fan systems)

For data server



The growing demand for AI servers has led to an increase in 48V server systems, which are effective for energy saving.

Our Strengths

- ✓ **Our unique high-efficiency motor control algorithm**

Low power (20%reduction)

Noise reduction (50% reduction @vibration)

- ✓ **Experienced Mixed Signal HW Solution *2) Technology**

Space-saving (15% reduction @chip)

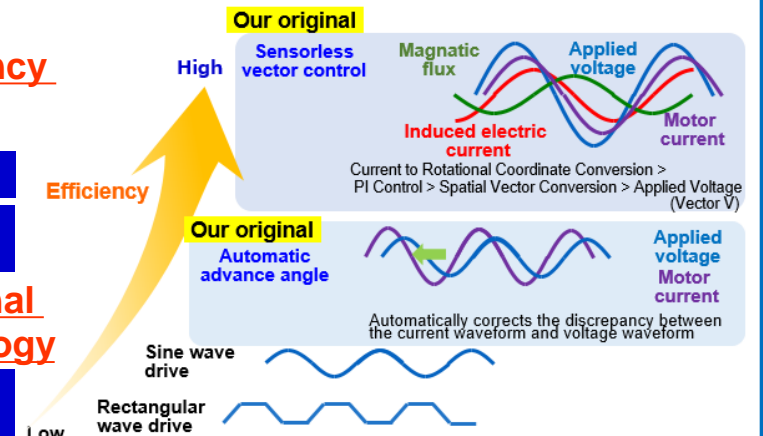
*1) Compared to our previous products

*2) HW Solution = Hardware solution (lower cost than microcomputer + software)

Contributing to an energy-saving society through the high efficiency of motor motion achieved by automatic advance angle and sensorless vector control!

- ✓ **Collaborating with internal motors, we optimize characteristics, functions, and costs**

Contributing to energy saving by quickly providing the optimal solution for 48V high-output motors for servers (distribution power can be reduced to 1/16 of the conventional level)



⑧-2 INTEGRATION Activity (High Power Supply)

Providing high-efficiency, compact, lightweight power supply modules through synergy to develop charging infrastructure as a key to the popularization of EVs that will lead the way to a decarbonized society

Product Strategy

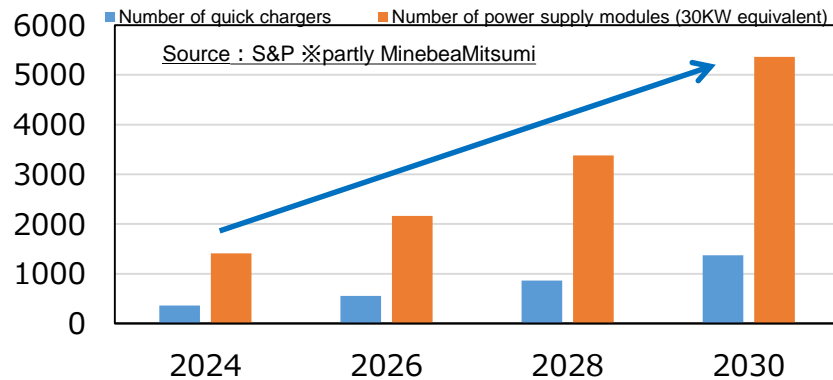
- Achieves high efficiency, downsizing and light weighting of power supply modules by incorporating next-generation power semiconductors (Fin-SiC[®]) with industry-leading performance
~ Maximizing added value through internal INTEGRATION activities ~

Market Trend

High power supply market

2024 → 2030 CAGR +25%

Units : thousand



EV quick chargers



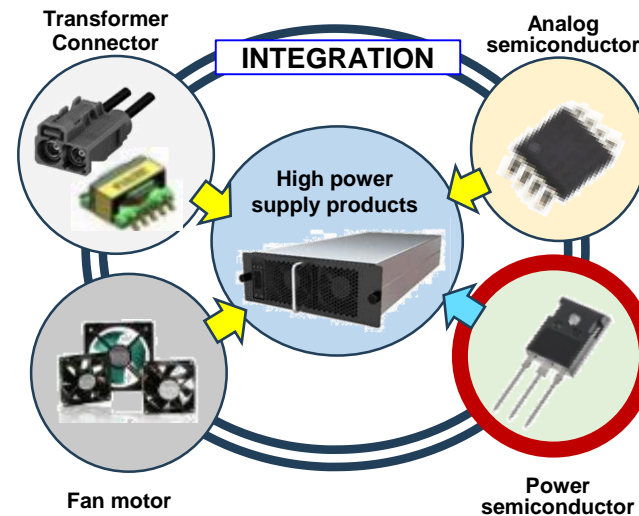
Power supply module

EV quick chargers are becoming larger and larger, with multiple power supply modules installed. The trend is towards even higher efficiency, smaller size and lighter weight.

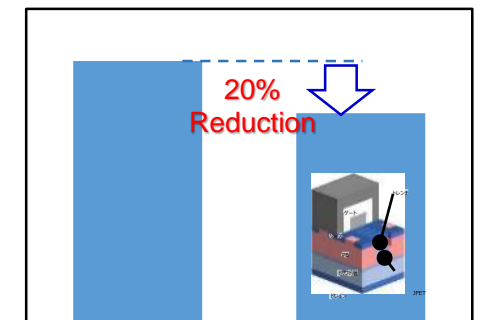
Meeting market demand (reduction in the number of modules, smaller size) by installing Fin-SiC[®] devices, which have excellent performance (low on-resistance) and are made of SiC.

Our Strengths

- ✓ High reliability, high durability, and miniaturization contribute to reduced maintenance costs.
- ✓ Contributing to reduced user costs by increasing efficiency and reducing electricity consumption
- **Device alone : 30% reduction in loss (compared to conventional SiC)**
- **Power Supply Module System : 20% reduction in power loss (compared to conventional system)**



Possible to make smaller and lighter
System loss (relative comparison)



Power module system loss

Development of a new noise reduction method that achieves smaller and lighter ECUs Aiming to rapidly capture the market by making it easier to introduce with proposals for semiconductor products

Product Strategy

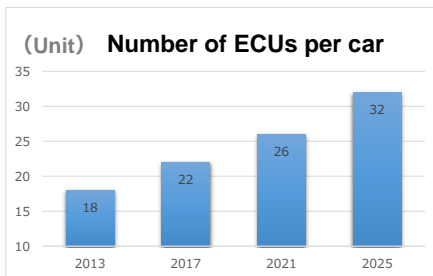
- Make clear the superiority over conventional technology and create market results early on
- Rapidly expanding a product lineup suitable for automotive applications to capture first-mover advantage

Market Trend

The number of ECUs and cable wiring is increasing rapidly as automobiles become increasingly electronic and multifunctional!



Source : Japan Embedded Systems Technology Association website



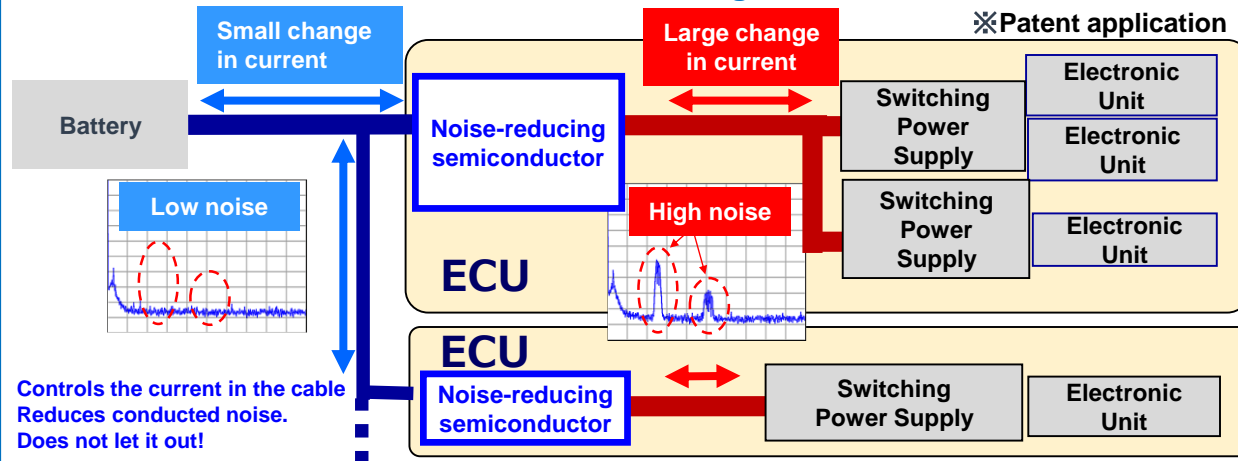
Source: Fuji Chimera Research Institute



The inside is full of cables!

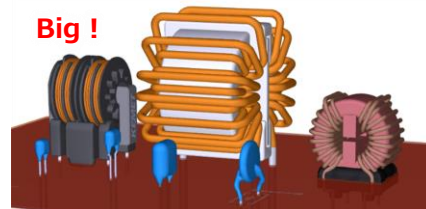
Conducted noise in cables is the cause of malfunctions. Countermeasures are essential. Conventional methods significantly increase the number of design man-hours, noise countermeasure components, and costs. **Proposing new noise countermeasures is urgent!**

Our Strengths



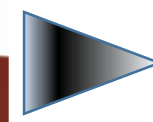
Controls the current in the cable
Reduces conducted noise.
Does not let it out!

Big !



Current noise countermeasures Components

Countermeasures using semiconductors!

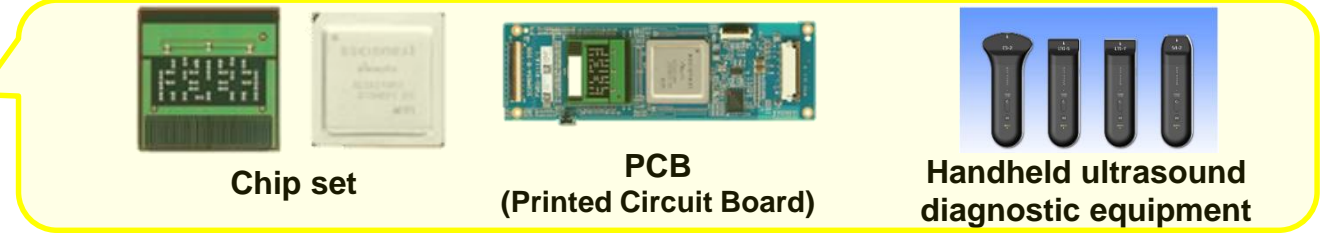
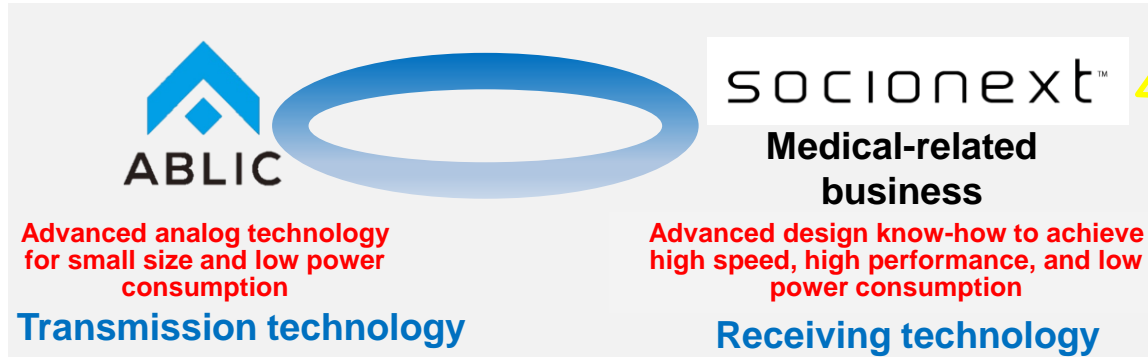


Noise-reducing semiconductor

Volume and weight are less than 1/10!
Easy to design with a wide bandwidth!
Saves development time!

ABLIC acquires medical-related business from Socionext Leveraging handheld ultrasound diagnostic system to support the penetration of diagnostic imaging

Q2 Financial results
presentation



Outline of transaction

1 Description of the business
Assets, intellectual property, employees, etc. of medical-related business
(Mainly **handheld ultrasound diagnostic systems and LSI** (Large Scale Integrated circuits) development, manufacturing, and sales business)
- Operates fabless business and do not possess production facilities

2 Source of competitive edge
In-depth knowledge of systems including firmware as well as LSI, and receiving technology including high-definition image generation

Target

1 High technological synergy

- ABLIC's **transmission technology** and Socionext's high-end **receiving technology** do not overlap and are complementary.
- In addition to the low-end products for handheld ultrasound diagnostic equipment that ABLIC previously owned, ABLIC has acquired **mid- and high-end products**. Going forward, we will leverage the acquired high-end receiving technology to expand the **product lineup for** ultrasound diagnostic equipment.

2 Expanding business opportunities through higher resolution

- Full-scale product rollout of high-value-added 64-channel products from the second half of 2024, which **enable higher pixel counts and deeper imaging**.
- Realize quality in handheld equipment to approach that of cart-based products. **Accelerate penetration of diagnostic imaging (echocardiographic diagnosis) in the medical field. Making it possible for anyone to quickly capture internal body images.**

Maximize the capabilities of each of our bases, and use subsidies to reduce the burden of investment

Utilize external Fabs to achieve a flexible production system

***In-house production ratio 80% (actual results 1H of this fiscal year)**

Basic Strategy

- **Analog semiconductors:** In addition to in-house production, utilize external resources for microprocesses (0.18μm or less)
- **Power semiconductors:** Expand production capacity with a focus on in-house production of high-efficiency products such as side-gate IGBTs and SiC


■ **MITSUMI Chitose** * High voltage IC · SiC main base *



Production capacity: 40,000 sheets/month
Strengthening bottleneck processes

6 inch

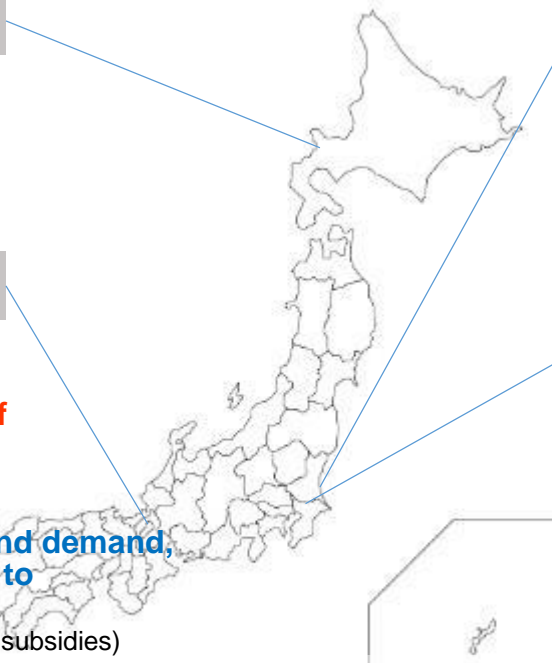
■ **MMIS Shiga** * Analog · IGBT main base *



Production capacity: 15,500 sheets/month

- **Aim to increase the ratio of analog semiconductors, improve operating rates and profitability**
- **Assessing future supply and demand, plans to increase capacity to 27,500 sheets per month (considering the use of government subsidies)**

8 inch



■ **MPSD Rinkai** * Power Device main base *



Production capacity: 14,000 sheets/month
Strengthening bottleneck processes

6 inch

■ **ABLIC Takatsuka** * Analog main base *



Production capacity: 18,000 sheets/month
Start of high-voltage IC production (scheduled for 2026)

6 inch

Note) MMIS: MMI SEMICONDUCTOR
MPSD: Minebea Power Semiconductor Device

[Network strategy]

- ① **Increase production of analog semiconductor and strengthen BCP**
: Increasing production capacity in Shiga and mutual complementarity of 6-inch (Chitose and Takatsuka)
- ② **Increase production of IGBT** : Increasing production capacity in Shiga (implemented in conjunction with ①)
- ③ **Increase production of high-voltage ICs and SiC**
: Utilizing the production capacity of the three bases (Rinkai, Chitose, Takatsuka)

Manufacturing in-house in areas where technological, cost and adjustment can be differentiated
(utilizing subsidies to reduce investment burden)

Utilizing OSAT to achieve a flexible production system*In-house production ratio 60% (actual results 1H of this fiscal year)

Basic Strategy

- Expand sales by promoting mutual utilization of each manufacturing base and utilizing external Fabs
- Utilize MinebeaMitsumi Group resources to promote in-house production of power module components and capture added value

Advantages of in-house production (compared to OSAT)

- Quality :** Ensuring product quality in-house, and fulfilling high customer requirements for automotive and medical applications, etc.
- Cost :** Overwhelming competitiveness achieved by the “best of both worlds” of Akita's high productivity and Cebu's low costs.
- Delivery :** Responding flexibly to changes in demand, BCP measures through production at multiple locations

MITSUMI Cebu * Analog package base *



Production capacity: 100 million units/month
Effective use of the accumulated infrastructure, engineers and operators at MITSUMI's main overseas bases.

To meet future demand, a new building will be constructed on the site, and a high-productivity line for the industry's thinnest 0.3 mm-thick packages will be introduced
Mass production will begin in 2028, and production capacity will be increased to 150 million units per month
Total investment: 10.5 billion yen (including 4 billion yen in Global South subsidies)
Reference: Next page

ABLIC Akita * Analog package base *

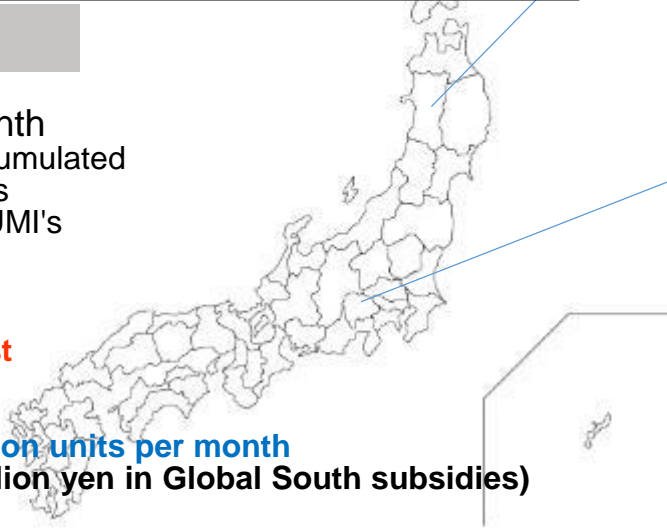


Production capacity: 300 million units/month
Enhancing production of high-value-added products such as automotive and medical products (considering production of high-voltage IC packages)

MPSD Yamanashi * IGBT module main base *



Production capacity: 37,000 units/month (IGBT module)
Strengthening the production system as the mother plant for high-voltage IGBTs



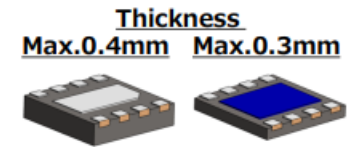
[Network strategy]

- Domestic** (Analog: Akita, Power: Yamanashi, Fukushima): Manufacturing high-value-added products, R&D base
- Overseas** (Cebu): Strengthening as a mass production base for low-cost mass-produced products
- OSAT** : Outsourcing small-lot, specialized packaging, etc., for which it is difficult to recover investment in-house

The Global South Future-Oriented Co-Creation Project:
 Selected Companies (1st Application)

Mitsumi Electric Co., Ltd.
“Verification of production innovation of Analog IC packaging process”

- ◆ Head office: Tokyo ◆ 100% subsidiary company of MinebeaMitsumi Inc., listed on Tokyo Stock Exchange
- ◆ Founded: 1954
- ◆ Business area: Manufacturing and sales of semiconductors, electronic and electrical equipment, and precision instruments
- ◆ Cebu Mitsumi, Inc. will jointly implement the project



Project Plan

“Build state-of-the-art high-productivity lines for semiconductor thin packages in the Philippines to demonstrate productivity improvements”

- <Outline>
- Project period: From January 2025 through January 2028
 - Establish state-of-the-art high-productivity lines for thin semiconductor packages in Cebu Mitsumi, Philippines, to increase production and reduce cost
- <Expected results>
- Expand production capacity by 50 million units per month (1.5 times the current capacity) through production innovations including equipment automation and process streamlining
 - Increase production capacity and enhance cost competitiveness in Japan and the Philippines, and strengthen supply chain, as well as reduce economic security risks by transferring some processes from 3rd parties in overseas to the Philippines

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JETRO Website https://www.jetro.go.jp/services/global_south/kekka-gs1.html

1 Our Strategy and Positioning of Semiconductor Business

2 Explanation of Semiconductor Business Strategy

3 Q&A



Any statements in this presentation which are not historical are future projections based on certain assumptions and executive judgments drawn from currently available information.

Please note that actual performance may vary significantly from any particular projection due to various factors.

Factors affecting our actual performance include but are not limited to: (i) changes in economic conditions or demand trends related to MinebeaMitsumi's business operations; (ii) fluctuation of foreign exchange rates or interest rates; and (iii) our ability to continue R&D, manufacturing and marketing in a timely manner in the electronics business sector, where technological innovations are rapid and new products are launched continuously.

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