



# Semiconductor Business Strategies for FY2025

Semiconductor Business Group

May 27, 2025

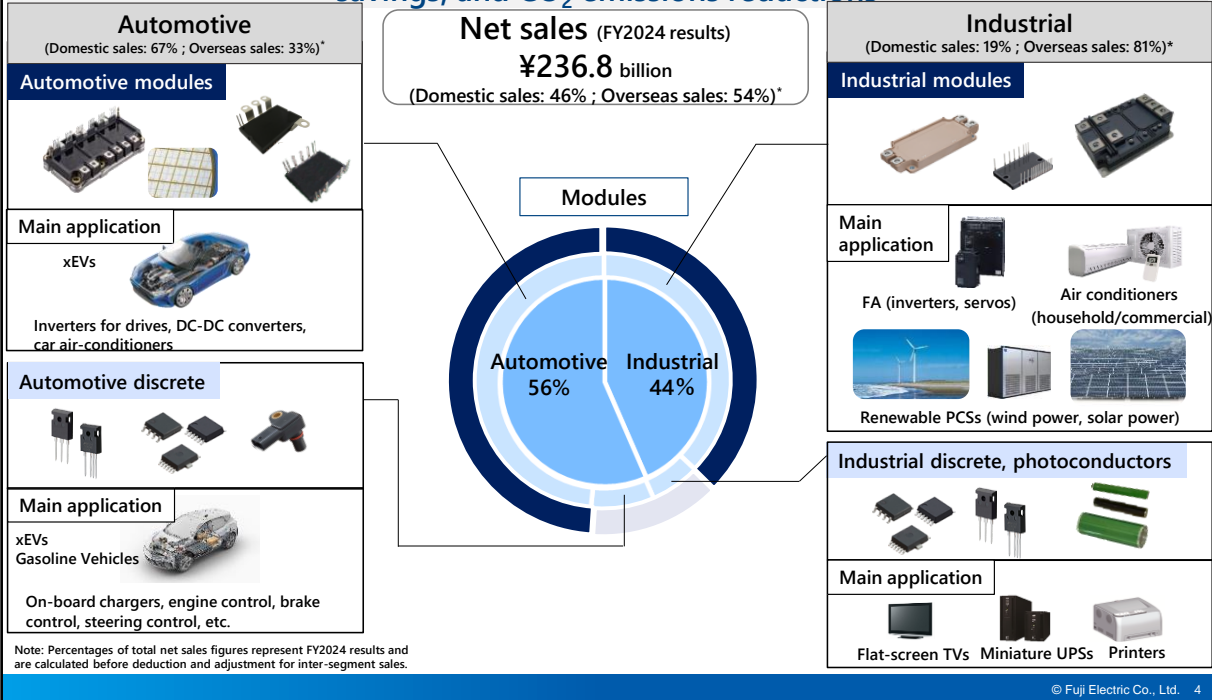
I am Hosen from the Semiconductor Business Group. Thank you for your time today.  
I will talk about semiconductor business strategy.

1 Business Overview	P.3
2 Review of FY2024	P.6
3 Management Plan for FY2025	P.8
Market Trends	P.9
Business Policies / Business Plan	P.10
Priority Measures	P.12
Capital Investment and Research and Development	P.21

# 1 Business Overview

# Business Overview

Contributions to vehicle electrification, more compact power electronics, energy savings, and CO<sub>2</sub> emissions reductions



This slide outlines our business overview.

Our semiconductor business comprises two main areas: automotive and industrial.

Automotive includes automotive power modules used in xEV inverters and DC/DC converters, as well as automotive discrete devices used in engine, brake, and steering controls for xEVs and ICE vehicles.

Industrial includes industrial power modules used in FA inverters, servos, and renewable energy, as well as industrial discrete devices for flat-screen TVs and printers, in addition to photoconductors.

In FY2024, the sales composition was 56% automotive and 44% industrial.

## No. 3 global market share for IGBT modules

- Chips with industry-low levels of loss (7th- and 8th-generation IGBTs)
- Forerunner in offering RC-IGBTs\* with track record of deliveries to numerous domestic and overseas electrified vehicle manufacturers
- Commercialization of industry's most compact modules with application of low-loss chips and high-density mounting technologies

## Trench SiC-MOSFETs employing cutting-edge technologies

- Industry-leading on resistance performance
- Optimal designing for customer facilities made possible by low variability

**Support for customers worldwide through global network of multiple production bases and design and sales centers**

\* Reverse Conducting-IGBT: Chips integrating both IGBT and FWD chips

This slide shows our strengths in the power semiconductor business.

Fuji Electric has the No. 3 global share in IGBT modules.

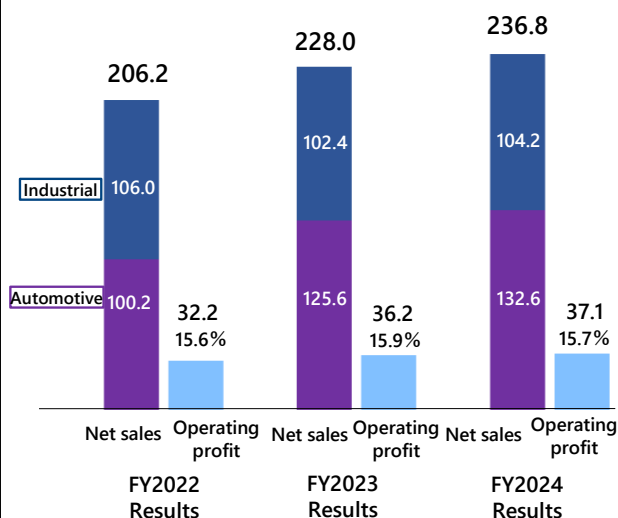
Our chips have the lowest energy loss in the industry. We beat rivals to the market in RC-IGBTs, which have been widely adopted by xEV manufacturers worldwide. Another strength is that we have commercialized the industry's most compact modules by combining low-loss chips with high-density mounting technology.

Our SiC MOSFETs feature best-in-class low on resistance and minimal characteristic variation, allowing optimal design for customer equipment.

Our global network of manufacturing bases, sales offices and design centers enables comprehensive worldwide support for our customers.

## 2 Review of FY2024

**Net Sales and Operating Profit by Subsegments**  
(Billions of yen)



## Successes

- **New product development**
  - Compact RC-IGBT modules for electrified vehicles
  - Large-capacity IGBT modules for renewable energy applications (1.7kV, 2.3kV)
- **Expanded production of 8-inch Si device production (front-end)**
  - Augmentation of production capacity at Fuji Electric (Malaysia)  
(Increase in ratio of 8-inch Si device production to 75%)
- **Commencement of full-fledged mass production of SiC devices**
  - Start of 6-inch SiC device mass production (front-end) at Fuji Electric Tsugaru Semiconductor (December 2024)
- **Approval for subsidies**
  - Approval for subsidiaries by Ministry of Economy, Trade and Industry for SiC device supply plan proposed jointly with DENSO (November 29, 2024)

## Challenges

- Expansion of sales in growth fields (electrified vehicles, renewable energy)
- Acceleration of new product specification solicitation activities and approach toward new customers
- Augmentation of production capacity in line with SiC demand
- Development of competitive next-generation products

In FY2024, Fuji Electric recorded net sales of ¥236.8 billion and operating profit of ¥37.1 billion, both up year-on-year.

Key successes included:

- Development of new products for xEVs and renewables
- Expansion of 8-inch Si device production capacity at Fuji Electric (Malaysia), raising the 8-inch production ratio to 75%
- Start of SiC mass production at Fuji Electric Tsugaru Semiconductor in December 2024
- METI's approval of our SiC supply plan, submitted jointly with DENSO

Challenges going forward include:

- Growing sales in the xEV and renewable energy areas
- Expanding specification wins and acquiring new customers for new products
- Scaling SiC production capacity to meet demand
- Developing competitive next-generation products






We will address these challenges as we move forward.

## 3 Management Plan for FY2025

# Market Trends

**Industrial:** Strong market growth for renewable energy field amid delayed recovery in demand centered on factory automation

**Automotive:** Ongoing growth of overall electrified vehicle market, despite slowdown in growth of EVs

Business Fields	Market Trends (FY2025)		FY2024 to FY2025
Industrial	Factory automation	Performance and growth relatively unchanged from FY2024	
	New energy	Ongoing trend toward decarbonization anticipated to sustain firm growth	
	Consumers	Modest growth trend to be supported by subsidies for purchasing new home applications in China	
Automotive	xEVs	Increased sales of HEVs and PHEVs, regardless of sluggish growth for BEVs Double-digit growth despite slowdown in electrified vehicle growth rates when compared to prior market outlook	
	Gasoline vehicles	Ongoing decline in sales	

Looking at market trends, in the industrial field, we expect little to flat growth in factory automation from FY2024, while renewables should continue growing strongly due to ongoing decarbonization initiatives. We anticipate modest growth in consumer electronics, supported by China’s home appliance trade-in subsidy.

In the automotive field, while EV growth is slowing, xEVs as a whole are projected to grow at a double-digit pace. ICE vehicle sales may continue declining.

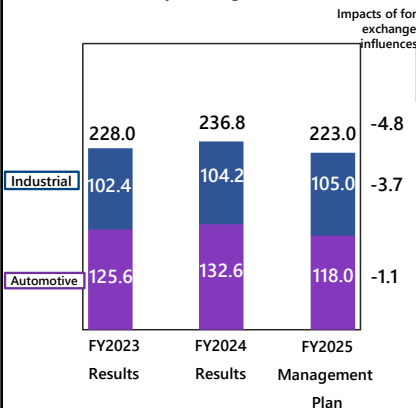
Business Policies

Accelerated efforts to solicit specifications and approach new customers centered on growth fields (electrified vehicles, renewable energy)

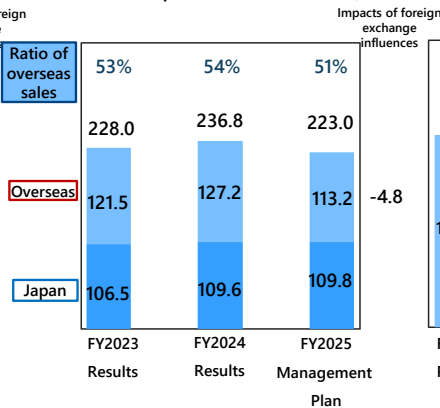
Augmentation of production capacity based on demand

Business Plan

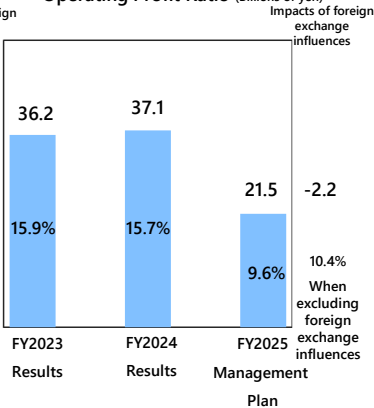
Net Sales by Subsegment (Billions of yen)



Net Sales in Japan / Overseas (Billions of yen)



Operating Profit / Operating Profit Ratio (Billions of yen)



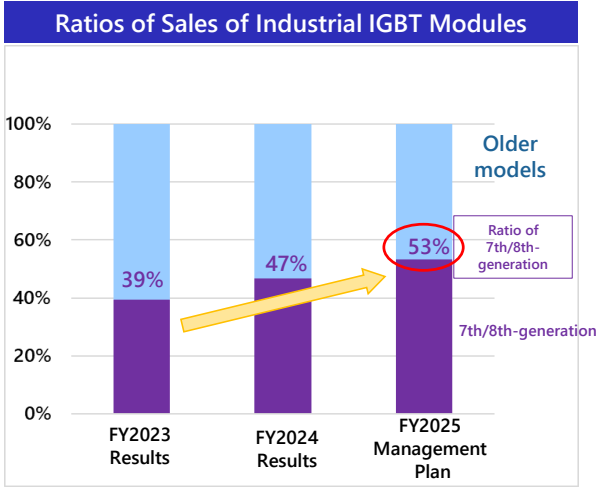
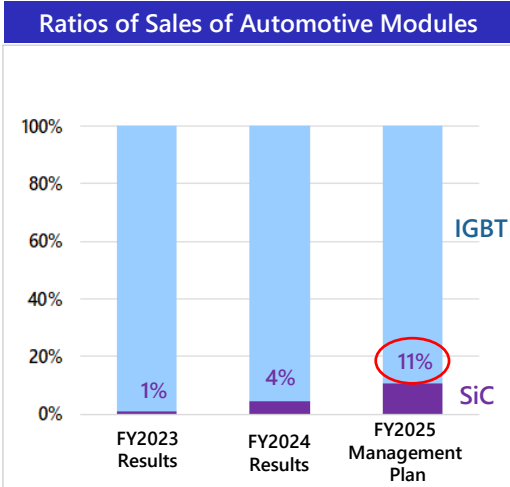
FY2025 business plan

We will focus on growth areas such as xEVs and renewable energy by strengthening specification wins and customer acquisition while scaling production capacity to meet demand.

For FY2025, Fuji Electric targets net sales of ¥223.0 billion, with overseas sales accounting for 51%, and operating profit of ¥21.5 billion, for an operating profit ratio of 9.6%. Excluding forex impact, this is 10.4%.

# Automotive and Industrial Module Sales Trends

- Automotive modules: Steady increase in ratio of SiC devices (FY2024: 4% → FY2025: 11%)
- Industrial IGBT modules: Increases in ratios of sales of 7th- and 8th-generation modules (FY2024: 47% → FY2025: 53%)



Although sales have not grown much yet, we are working to increase the ratio of product adoptions to expand sales, such as SiC devices and 7th/8th generation modules.

We aim to raise the sales ratio of SiC devices in automotive modules to 11% this fiscal year.

We also expect 7th/8th generation modules to account for 53% of industrial IGBT module sales, as the sales ratio of new products steadily increases.

- **Automotive field**
  - Growth in sales of SiC devices and acceleration of specification solicitation efforts
- **Industrial field**
  - Growth in sales centered on renewable energy market
- **Enhancement of manufacturing**
  - Front-end: Bolstering of SiC device production capacity and mass production of 8th-generation IGBTs based on demand
  - Back-end: Mass production of new compact automotive RC-IGBT modules  
Preparation for mass production of new SiC modules  
Augmentation of industrial IGBT module production capacity in response to demand growth
- **Development of competitive new products**
  - Accelerated development of 3rd-generation SiC-MOSFETs and 8th-generation IGBTs
  - Development and mass production of IGBTs and SiC modules for automotive and industrial (large-capacity) applications
  - Development of technologies for 8-inch SiC devices

Next is priority measures.

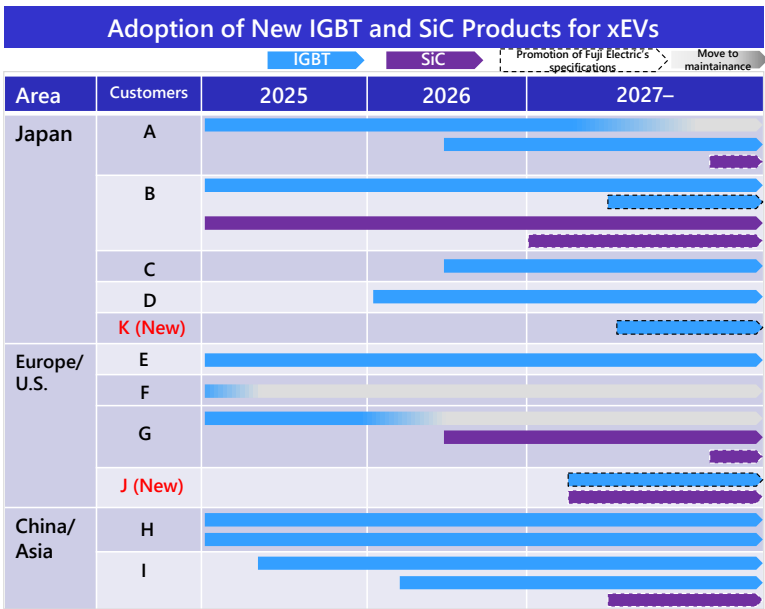
In automotive, we will focus on expanding SiC device sales and increasing specification wins.

In industrial, we aim to expand sales primarily in the renewable energy market.

In manufacturing, for the front-end, we aim to expand SiC device production capacity and begin mass production of 8th-generation IGBTs. For the back-end, we are preparing to mass produce new products for xEVs. The plan is to scale up industrial IGBT module production in line with demand.

On the new product development side, we are accelerating development of 3rd-generation SiC MOSFETs and 8th generation IGBTs. We are developing large-capacity IGBT and SiC modules for xEVs and industrial use. Another priority is to advance the development of 8-inch SiC device technology.

- Acceleration of campaigns to encourage use of Fuji Electric’s specifications and engagement in new negotiations with new and existing customers



**New Automotive Module Products**

\*1  
Compact RC-IGBT modules



\*2  
SiC modules



Looking at specification wins in automotive, Fuji Electric secured wins from two new customers, one in Japan (Company K) and one in Europe/U.S. (Company J). We are now engaged in specification activities for compact RC-IGBT and SiC modules for delivery after 2027. We will work to convert these specification wins into future orders and grow sales.

# Automotive Semiconductors: New Module Products

- Solicitation of specifications centered on compact IGBT and SiC modules and approach toward new customers
- Contribution to reductions in size and costs of customers' equipment

## Compact RC-IGBT modules

- Compact, short packages (**smartphone sized**)
- Compatibility with three rated values through combinations of two types of cooling units

Comparison to Prior Models (Values translated to same rated value<sup>\*1</sup>)

Size: 54% less area  
Height: Down 50%  
(Down 57% in terms of volume)



Dimensions: W136 x D70 x H14 mm

<sup>\*1</sup> Comparisons based on effective module output values converted to accommodate differences in current rate value between prior and new models

Inverter output	50kW	75kW	100kW
Module rate value (750V)	300A	450A	600A
Adopting Vehicles Types	Light vehicles		
			Compact vehicles
	Hybrid vehicles (generation)		

### Launch timing

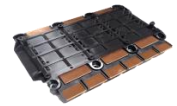
- 600A devices: Mass production commenced in April 2025
- 300A/450A devices: Mass production to be commenced in FY2026

## SiC modules

- Three-dimensional wiring contributing to thinner, more compact modules
- Massive reduction in inductance<sup>\*2</sup> to capitalize on high-speed switching capabilities of SiC

Comparison to Prior Models

Size/width: Down 49% (volume basis)  
Inductance: Down 80% (Ls24 → 5nH)



Dimensions: W167 x D111 x H16 mm

<sup>\*2</sup> Higher inductance results in higher switching losses and noise

Inverter output	330kW
Module rate value (1200V)	660A
Adopting Vehicles Types	Large vehicles
	Sports vehicles

- 600A devices: Mass production to be commenced in 3Q of FY2026

Here, I will introduce some new automotive module products.

The compact RC-IGBT module on the left features a small, low-profile package roughly the size of a smartphone. It is 57% smaller by volume than our previous models, while keeping the same specifications.

We have developed a product lineup covering 300A to 600A for mini and compact vehicles. Mass production of the 600A model began in April 2025, with 300A and 450A models to follow next fiscal year.

The SiC module on the right uses 3D wiring technology to reduce size and thickness by 49% and significantly lower inductance within the module, enabling the high-speed switching capabilities of SiC.

We plan to develop and start mass production of the 660A SiC module from the third quarter of FY2026.

# Automotive Semiconductors: Development of Next-Generation SiC Devices

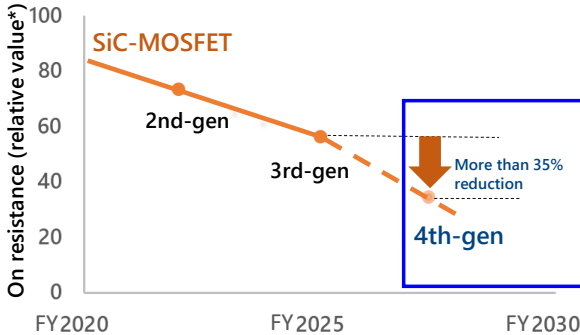
- Development of SiC-MOSFETs and SiC module technologies to contribute to more compact equipment

## 4th-Generation SiC-MOSFET Technology Development

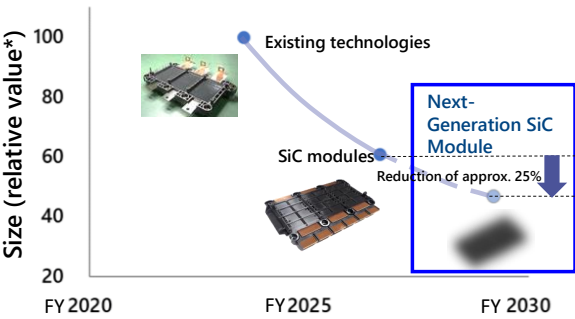
- Industry-low on resistance performance (reduction of more than 35% compared to 3rd-generation models)
- Unique three-dimensional structure

## Next-Generation SiC Module Technology Development

- Industry-leading compact design (size reduction of more than 25% compared to prior SiC modules)
- Utilization of 4th-generation SiC-MOSFETs and new terminal structures



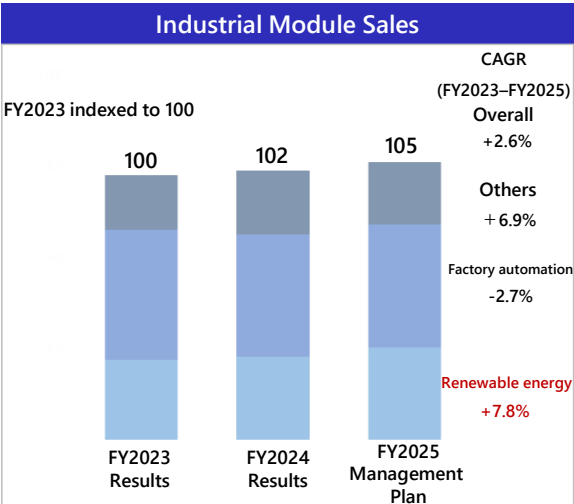
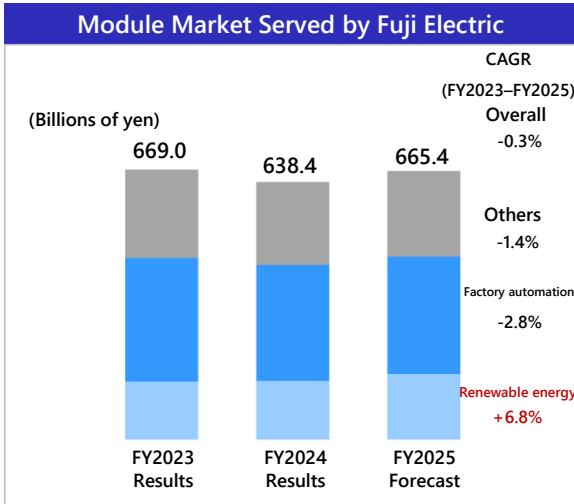
\* Based on standardized value of 175 °C on resistance used for 1st-generation SiC-MOSFETs



\* Based on standardized value used for existing technologies

Next is next-generation products.  
We are developing 4th-generation SiC MOSFETs, targeting a further 35% reduction in loss versus 3rd-generation products, which we aim to commercialize this fiscal year.  
We are also developing modules using the 4th-generation chips, aiming for a 25% size reduction versus current SiC modules, the smallest in their class, with launch planned as early as FY2027.

- Strong market growth for renewable energy field amid sluggish recovery in demand centered on factory automation
- Sales growth surpassing market growth driven by 7th-generation IGBTs sales to major renewable energy customers



Note:

"Factory automation" refers to inverters, servos, numerically controlled machine tools, and industrial robots.

"Others" refers to electric railway, power supply, air conditioning, consumers, and other products.

Source: Fuji Electric (estimates based on data from research institutions)

Next we take a look at industrial semiconductors.

While growth in the module market targeted by Fuji Electric remained flat from FY2023 to FY2025, the renewable energy field has grown 6.8%.

The chart on the right indexes the company's sales so that 2023 equals 100.

Overall growth is plus 2.6%, while the market flatlines, and renewable energy is plus 7.8%, as sales increase faster than the market average.

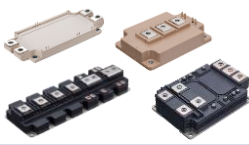
# Industrial Semiconductors: New Renewable Energy Modules Fuji Electric Innovating Energy Technology

- Expansion of lineup of products accommodating voltages ranging from 1,200V to 2,300V and solicitation of Fuji Electric's specifications to renewable energy market
- Response to needs for high voltage resistance and high reliability required for increasing generation capacity and stabilizing power supplies


## Renewable Energy Product Lineup

### IGBT

Module voltage resistance  
1,200V  
1,700V

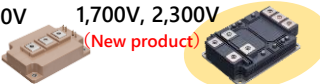


2,300V  
(New product)



### SiC

1,700V 1,700V, 2,300V  
(New product)



## New Large-Capacity Modules

- High reliability achieved by using ultrasonic wave terminal connection technology (temperature cycle resistance approx. 10 times higher than prior models)
- Low inductance for capitalizing on high-speed switching capabilities (reduction of 70% in comparison to prior models, Ls 42 → 12.5nH)



Large-Capacity Package  
High Power next Core (HPnC)  
Dimensions: W144 x D100 x H40 mm

Contributions to More Compact High-Voltage Systems (1,500V DC Capacity)

Circuit structure	3 level	2 level
Model rate capacity (voltage resistance)	1,700V	2,300V
Model number (per unit)	3	1
Mounting area	43,200 mm <sup>2</sup>	14,400 mm <sup>2</sup> (66% size reduction)

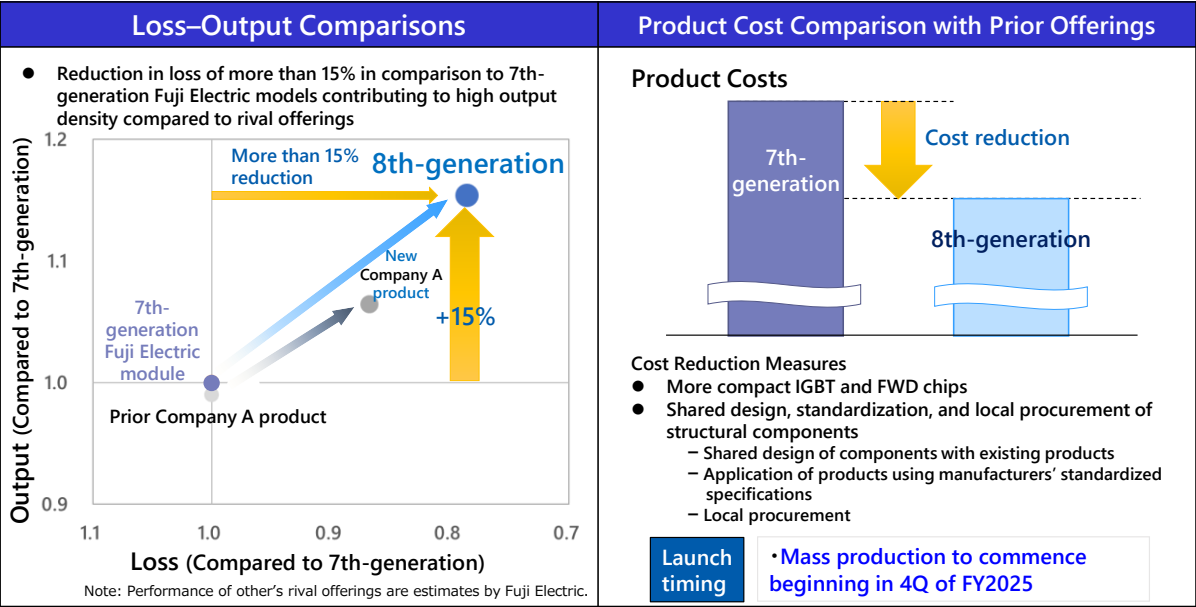
### Launch timing

- IGBT modules: Mass production commenced in April 2025
- SiC models: Mass production to be commenced in 4Q of FY2026

We are developing new products for the renewable energy market. For IGBTs, we are developing 2,300V models in addition to 1,200V and 1,700V models. For SiC devices, we are developing new 1,700V and 2,300V products. These products use ultrasonic bonding technology for 10x higher reliability than before, and feature a low-inductance design to leverage SiC's high-speed switching capabilities. Higher voltages allow a shift from three-level to two-level circuit designs in a single module, reducing mounting area and cost. Mass production of IGBT modules began in April 2025, with SiC modules set to launch in the 4Q of FY2026.

# Industrial Semiconductors: Development of Competitive New Products (8th-Generation IGBT Modules)

- Development of low-loss modules using 8th-generation IGBT technologies
- Competitiveness supported by performance improvements (loss reduction) and massive cost reductions



We are also developing next-generation industrial IGBT modules. Our 8th-generation IGBT modules offer roughly 15% lower loss than 7th-generation models.

We are pursuing major cost reductions by downsizing IGBT and diode chips, using common structural components, standardizing specs and localizing procurement.

Mass production is scheduled to begin in the 4Q of this fiscal year.

- **Bolstering of SiC device production capacity and mass production of 8th-generation IGBTs based on demand**



Japan (Matsumoto)

- Mother factory
- Mass production of 8th-generation IGBTs to begin in 4Q of FY2025
- Development of line for early production of 8-inch SiC devices



Japan (Yamanashi)

- 8-inch Si devices
- Automotive IGBTs



Japan (Tsugaru)

- Mass production underway for 6-inch SiC devices
- Augmentation of production capacity planned in FY2025 (150% capacity increase compared to FY2024)



Malaysia

- 8-inch Si devices
- 7th-generation industrial IGBTs

Next is manufacturing.

On the front end, we are expanding SiC device production capacity to meet demand and preparing for mass production of 8th-generation IGBTs.

In Japan, we will start mass production of 8th-generation IGBTs in the fourth quarter at the Matsumoto site. We are building and developing production lines for 8-inch SiC devices. At the Tsugaru site, we plan to increase SiC device production capacity to 2.5x the FY2024 level.

## Back-End Processes—Measures by Base

- Start of mass production of new products and augmentation of production capacity based on demand growth



Japan (3 bases)

- Mother base for assembly products, manufacturing of products for domestic customers
  - : Start of production of new electrified vehicle products (April 2025)
  - : Start of production of 8th-generation IGBTs



Philippines

- Principal base for production of discrete and air-conditioner modules
  - : Start of production of new 7th-generation IGBT products (October 2025)



China (Shenzhen)

- Production base for industrial IGBT modules for Chinese market
  - : Augmentation of 7th-generation IGBT production capacity in response to demand growth (30% capacity increase compared to FY2024)



Malaysia

- Production base for industrial IGBT modules for U.S. and European market

Looking at back-end processes,

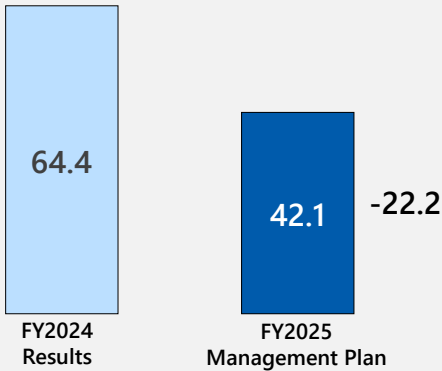
We are ramping up production for new products and expanding capacity in line with the pace of growth in demand.

In Japan, we began production of new products for xEVs, and will start 8th-generation IGBT production. In China, we are increasing 7th-generation IGBT production capacity at the Shenzhen plant by 30% versus FY2024.

In the Philippines, we will begin production of new 7th-generation IGBT modules in October.

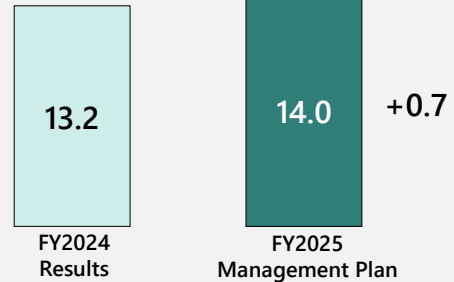
# Capital Investment / Research and Development

## Capital Investment (Billions of yen)



- Expansion of front-end production capacity (6-inch SiC devices)
- Expansion of back-end (automotive and industrial module) production capacity
- Development of line for early production of 8-inch SiC devices

## Research and Development (Billions of yen)



- Development for new products (3rd-generation SiC-MOSFETs and 8th-generation IGBTs)
- Acceleration of 8-inch SiC device technology development

Note: The R&D expenditure figures above represent expenditures that have been allocated to segments based on theme and may therefore differ from figures contained in consolidated financial reports.

© Fuji Electric Co., Ltd. 21

Last is capital investment and research and development.

This fiscal year, our capital investment budget is ¥42.1 billion, down ¥22.2 billion year-on-year, with a focus on production capacity expansion for SiC and new products, and building a pilot line for 8-inch SiC devices.

Our R&D budget is ¥14.0 billion, up ¥0.7 billion from last year.

We will continue R&D with an eye on the future, and aim to translate R&D successes into higher sales in the future.

That concludes my presentation.

1. Statements made in this documents or in the presentation to which they pertain regarding estimates or projections are forward-looking statements based on the company's judgments and assumptions in light of information currently available. Actual results may differ materially from those projected as a result of uncertainties inherent in such judgments and assumptions, as well as changes in business operations or other internal or external conditions. Accordingly, the company gives no guarantee regarding the reliability of any information contained in these forward-looking statements.
2. These documents are for information purpose only, and do not constitute an inducement by the company to make investments.
3. Unauthorized reproduction of these documents, in part or in whole, is prohibited.