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1 Executive Summary
Executive Summary

- Revenue and operating profit margin of Power Device Business as a Key Growth Business are on track to hit the FY2026 target※1: over 240 billion yen in revenue and over 10% in OPM.

<table>
<thead>
<tr>
<th>Growth Target</th>
<th>FY2022 Actual</th>
<th>FY2023 Actual</th>
<th>FY2026 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semiconductor &amp; Device Revenue</td>
<td>¥241.4 billion</td>
<td>¥281.5 billion</td>
<td>¥0.3 trillion</td>
</tr>
<tr>
<td>OPM</td>
<td>7.0%</td>
<td>10.4%</td>
<td>12%</td>
</tr>
<tr>
<td>Power Device Revenue</td>
<td>¥179.0 billion</td>
<td>¥210.0 billion</td>
<td>¥240.0 billion or more</td>
</tr>
<tr>
<td>OPM</td>
<td>6.5%</td>
<td>8.4%</td>
<td>10% or more</td>
</tr>
</tbody>
</table>

- Accelerate business growth, making the most of market expansion, by strengthening SiC capability. Aim for SiC ratio in revenue of 30% or more, in Power Device Business by FY2031.

- Extensive SiC module installation in electric vehicles will significantly boost its demand, which will help SiC module to be applied to various fields. Mitsubishi Electric will contribute to the realization of GX※2 by providing highly competitive SiC modules leveraging our strengths to these wide range of fields.

- In order to ensure this growth strategy, we have doubled the investment plan from FY2022 to FY2026. Continuous aggressive investment for further business expansion will follow.

※1 Plan as of Nov. 2021   ※2 GX : Green Transformation
Business Overview
Provide key devices to support carbon-neutral, safe, secure and comfortable society for a sustainable future.

**Business Portfolio**

**Power Device Business**

Pursue technological evolution and contribute to the realization of GX

Contribute to the realization of a decarbonized society and comfortable life by implementing energy-saving power electronics equipment such as electric vehicles, consumer products (air conditioners, etc.), industrial equipment, renewable energy and railways

**Si Power Device**
- IPM
- IGBT module
- Power MOSFET module
- HVIC, etc.

**SiC Power Device**
- SiC-SBD, SiC-MOSFET
- Full SiC power module
- Full SiC-IPM
- Hybrid SiC power module, etc.

**Key Growth Business**

Revenue ratio 75%

**High-frequency and Optical Device Business**

Create DX and new value through changes in functions and applications

Contribute to the realization of a safe and secure world and a comfortable digital society with compound semiconductor devices, applied to various applications such as wireless communication, optical fiber communication and sensing fields

**High-Frequency Device**
Satellite Communications, 5G Base Stations, Millimeter Wave Radar, etc.

**Optical Device**
Optical Fiber Communication, Data Center, etc.

**Infrared Sensor Device**
Security, Monitoring, People Counting, Air Conditioning, Vehicle Interior Sensor, etc.

**Resilient Business**

Revenue ratio 13%

※Revenue ratio : FY2023 actual
Market Environment and Direction of Growth

- **Power Device**: Strong momentum for decarbonization initiates mid-term market expansion and high growth will be achieved mainly in the automotive and consumer fields.
- **High-Frequency and Optical Device**: Expand GaN device sales for base station applications, where demand is expected to grow, while maintaining solid optical device business.

### Market environment

<table>
<thead>
<tr>
<th>Power Device</th>
<th>Automotive</th>
<th>Consumer</th>
<th>Renewable Energy</th>
<th>Railways</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High-Frequency and Optical Device</strong></td>
<td>GaN Devices for 5G Base Stations</td>
<td>Optical Device for Data Center</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### FY2023 vs FY2026

- **Automotive**: Progress in electrification, Accelerating a shift toward SiC, enabling significant reduction of power loss compared to Si (FY2023–FY2026 CAGR: +165%)
- **Consumer**: Increasing use of inverters, Growing demand for ATW heat pumps
- **Industry Renewable Energy**: Progress in energy saving and automation
- **Railways**: Demand increasing due to service area expansion and investment in emerging countries
- **GaN Devices for 5G Base Stations**: Advances in high-speed optical networks due to larger data communication and artificial intelligence (AI)
- **Optical Device for Data Center**: Further strengthen SiC, Maintain top position, Accelerate market penetration

<table>
<thead>
<tr>
<th>Product Line</th>
<th>FY2023 (¥ billion)</th>
<th>FY2026 (¥ billion)</th>
<th>CAGR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive</td>
<td>500</td>
<td>CAGR +21%</td>
<td></td>
</tr>
<tr>
<td>Consumer</td>
<td>200</td>
<td>CAGR +9%</td>
<td></td>
</tr>
<tr>
<td>Renewable Energy</td>
<td>500</td>
<td>CAGR +7%</td>
<td></td>
</tr>
<tr>
<td>Railways</td>
<td>100</td>
<td>CAGR +18%</td>
<td></td>
</tr>
<tr>
<td>GaN Devices for 5G Base Stations</td>
<td>100</td>
<td>CAGR +6%</td>
<td></td>
</tr>
<tr>
<td>Optical Device for Data Center</td>
<td>100</td>
<td>CAGR +6%</td>
<td></td>
</tr>
</tbody>
</table>

※Market size is our estimate based on the forecast by a research company.
Our Strength

- Two strong businesses with global top-class product lines.
- Provide cutting-edge key devices to the market, making the most of synergies inside Mitsubishi Electric Group.

Global Top Class Key Devices

**Power Device Business**
- Combine design technology and manufacturing technology to achieve high performance and quality

**High-Frequency and Optical Device Business**
- Advanced compound semiconductor technology
- Product development capabilities to meet various market needs

Mitsubishi Electric Group Resource

- **R&D Department**
  Product development and technical collaboration with the R&D department that brings together advanced fundamental technology and production technology within the group

- **Application Business Department**
  Co-creation and collaboration with other departments, covering a wide range of application fields

Create synergy

Provide cutting-edge key devices to the market

※ All shares are actual results for FY2022, according to our estimate
3 Growth Strategy of Key Growth Business - Power Device -
Focus on enhancing business in the rapidly growing automotive field and the consumer field where we are strong, while maintaining industrial, renewable energy, and railway fields as solid business base.

Strengthen the growth capability based on our long-term experience and expertise of SiC, then accelerate growth by making the most of market expansion.

**Basic strategy**

- Concentrate resources on fields where our strengths meet market needs
- Expand sales by further strengthening the automotive and consumer fields as growth drivers

(Revenue, OPM)

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<table>
<thead>
<tr>
<th>Year</th>
<th>Si</th>
<th>SiC</th>
<th>SiC sales ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2022</td>
<td>¥179 billion</td>
<td>6.5%</td>
<td>30%+</td>
</tr>
<tr>
<td>FY2023</td>
<td>¥210 billion</td>
<td>8.4%</td>
<td>10%+</td>
</tr>
<tr>
<td>FY2026</td>
<td>¥240 billion +</td>
<td>10%+</td>
<td>30%+</td>
</tr>
</tbody>
</table>

Accelerate growth with SiC

Expand strategic products focus on automotives and consumer products

Strengthen growth capability focusing on strong SiC

- Accelerate development and next-generation SiC products for automotives
- Strengthen global sales activities
- Secure stable procurement and strengthen technical cooperation with SiC substrate suppliers, by building strategic partnerships
- Increase production capacity (enhance productivity of 150mm wafers, construction of new 200mm factory building)

Strengthen profitability and build a business foundation for the next growth

- Transform product portfolio (promotion of standardization and sharing, expansion of strategic products mainly for automotives and consumer products)
- Further productivity improvement (expand production of Si 200mm wafers at the highly efficient Fukuyama factory, increase Si wafer diameter to 300mm)

※ Plan as of November 2021
Focus Business Areas to Accelerate Growth - Power Device -

- Extensive SiC module installation in electric vehicles will significantly boost its demand, which will help SiC module to be applied to various fields.
- Mitsubishi Electric will contribute to the realization of GX by providing highly competitive SiC modules leveraging our strengths, e.g. comprehensive technology platform and rich market achievement, to those wide range of fields.

SiC Power semiconductor market trends

- The module market is expected to expand rapidly.
- Adoption of SiC spreads to various fields of application.

Mitsubishi Electric Power Device Business Strategy

- World-leading module product line
- Provide SiC modules for various applications

World's first (Released in October 2010)
Hybrid SiC DIPIPMTM installed in room air conditioner "Kirigamine"

World's first (Released in December 2012)
Hybrid SiC-IPM installed in numerical controller (CNC) drive unit

World’s highest output (Development announced in February 2019)
For xEV full SiC power module installed in ultra-compact power unit

Contribute to GX in a wide range of fields

※World’s first and world’s highest: According to our research at the time press release


**Strengths of SiC Module - Power Device -**

Provide optimal devices fit for the needs of the rapidly expanding SiC module market, by combining Mitsubishi Electric’s diverse elemental technologies (compound semiconductor technology, chip technology, and module technology) and our extensive achievements in the market.

- **Compound semiconductor technology:**
  - Advanced epitaxial growth and wafer processing technology
  - Established cutting-edge manufacturing technology to make SiC substrate defects harmless
  - Ensured high reliability and productivity with highly precise screening technology

- **Market achievement:** SiC module
  - Awarded Siemens Mobility “Moving Beyond” prize at InnoTrans 2022 for high performance and high reliability

- **Market achievement:** automotive market
  - Cumulative adoption including Si, equivalent to 26 million cars

- **Chip technology:** World’s highest level of low loss※1
  - Unique trench MOSFET structure, reduces electric field, achieves approx. 50% lower on resistance compared to conventional SiC※2.
  - Contribute to xEV’s longer cruising range and system cost reduction

- **Module technology:** Industry-leading compact design and weight reduction
  - J1※3 Series is approx. 29% smaller and approx. 53% lighter than other companies (products in the same capacity range※4)
  - Contribute to compact design and cost reduction of inverters

Provide module solutions, optimized for various applications

※1 For devices withstand voltage of 1500V or more. According to Mitsubishi Electric’s research as of Sep 30, 2019, press release
※2 Our planar MOSFET ※3 Power module for automotive ※4 As of May 2023, according to our research
Manufacturing Strategy  - Power Device -

- Promote wafer diameter enlargement and increase production capacity, in addition to establishing and expanding automated production line with high productivity.
- Establish integrated product development and manufacturing structure in assembly and inspection process for development, design and production technology verification in order to enhance product competitiveness.

Power device manufacturing map

Fukuoka City, Fukuoka Prefecture
Development and design Assembly & inspection primary factory

Fukuyama City, Hiroshima Prefecture
Main facilities

Koshi City, Kumamoto Prefecture
(Wafer process primary factory)
Kikuchi City, Kumamoto Prefecture (Shisui)
(Start operation in FY2027, scheduled to be gradually expanded)
- SiC 200mm
- SiC 300mm (Scheduled to start operation in FY2025)

Assembly & inspection process facilities (power module)
- Melco Power Device Corporation (Fukuoka [Fukuoka City/Itoshima City], Hyogo [Tamba City/Toyooka City])
- Mitsubishi Electric GEM Power Device (Hefei) Co., Ltd. (Hefei, Anhui, China)

Key initiatives

<table>
<thead>
<tr>
<th>Wafer Process</th>
<th>SiC</th>
<th>Strategic investment to expand capacity for mid-term growth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>- 200mm: construct a new wafer plant in Kumamoto (Shisui) area, achieve cutting-edge energy efficiency and automation. The capacity will be increased according to future demand</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- 150mm: enhance existing production facilities</td>
</tr>
<tr>
<td>Production capacity: approx. 5 times (FY2023–FY2027)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Si</th>
<th>Further improve productivity by expanding production at the Fukuyama Factory</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- 300mm: start large-diameter line operation from FY25 at Fukuyama Factory</td>
</tr>
<tr>
<td></td>
<td>- 200mm: constructed a line with improved production efficiency and increase production at Fukuyama Factory</td>
</tr>
<tr>
<td>Production capacity: approx. 2 times (FY2021–FY2026)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assembly &amp; Inspection</th>
<th>• Enhance manufacturing capabilities: construct a new factory in Fukuoka area to integrate product development and manufacturing structure for development, design and production technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembly &amp; Inspection</td>
<td>• Increase capacity: expand timely and appropriately in response to increasing demand</td>
</tr>
</tbody>
</table>
Strategic Investment Plan - Power Device -

Double the previous investment plan*1 to approximately 260 billion yen, including the construction of a new factory building for SiC, in order to drive the growth strategy for Power Device Business.

- Double cumulative capital investment from FY2022 to FY2026
- Continue strategic growth investment for further business expansion in SiC, in addition to the conventional plan
- Achieve high production efficiency through cutting-edge energy conservation and high-level automation
- Achieve energy savings of approximately 30%*3 compared to the conventional system by thoroughly recovering waste heat, in addition to adopting a swirl-induced stratified air conditioning system (TCR-SWIT®*2) in clean rooms
- Employ automatic transport system to enable labor saving and equipment operation rate improvement

Capital investment (actual, planned)

<table>
<thead>
<tr>
<th>Year</th>
<th>Actual</th>
<th>Planned</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY2017-2021</td>
<td>¥100 billion</td>
<td></td>
</tr>
<tr>
<td>FY2022-2026</td>
<td>¥260 billion</td>
<td></td>
</tr>
<tr>
<td>FY2027-2031</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SiC 200mm wafer new factory building

Startup scheduled in April 2026

※1 Plan as of November 2021  ※2 TCR-SWIT is a registered trademark of Takasago Thermal Engineering Co., Ltd.  ※3 Simulation value in this project
Continuous Growth by Leveraging Business Synergies
Continuous Growth of Semiconductor & Device Business by Leveraging Business Synergies

- Strengthen Mitsubishi Electric Group’s integrated solutions by providing key devices.
- Develop devices with high added value from the customer’s perspective, by incorporating the knowledge from internal application business departments.

**Infrastructure BA**
- DC power transmission
- Railways
- Defense/Space
- Renewable energy
- Uninterruptible power system (UPS)
- Optical network

**Industry & Mobility BA**
- Industrial robot
- Inverter, servo
- xEV

**Life BA**
- Elevator
- Air conditioner
- Home appliances

Semiconductor & Device Business

Device development with high market competitiveness

- High quality
- High performance
- Advanced technology

“Leading social change through the "evolution" and "innovation" of semiconductors”

- Provide high value-added devices from the customer's perspective to a wide range of markets
- Continuous growth of the Semiconductor & Device business