Business Overview by Segment

ICs

Strengthening our automotive business while also expanding overseas markets and our industrial equipment business to become a major global player

In the IC business, we develop products with a focus on analog ICs such as power supplies, motors, analog front ends, and amplifiers. In particular, we are focusing on Application Specific Standard Products (ASSP) in which our Product Marketing Engineers (PMEs) accurately identify our customers' development trends so that we can proactively develop products that fulfill our customers' needs. In addition to engaging in close communication with the customers, the PMEs value customer feedback, which can be applied to product development, and are characterized by meticulous attention to detail ranging from support during the product launch to follow-up at the time of mass production.

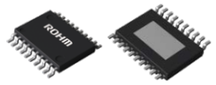
Naturally, in addition to product development, we also recognize the reduction of GHG emissions as a priority social issue. Because motors and power supplies account for the majority of power consumption around the world, ROHM's ICs enable a reduction in power consumption by motors and power supplies. With the advance of electrification and automation in every field and the growing need for device energy saving and miniaturization, we hope to help solve environmental issues by expanding our lineup of high value-added IC products to meet such needs.

Moreover, one of our future tasks is to develop not only the domestic but also overseas markets, and we are focusing our efforts on industrial equipment in addition to automobiles. The current sales ratio of IC products for automobiles is growing steadily at just over 40%, but we are strengthening our product development and sales promotion to achieve a sales ratio of 30% in industrial equipment as well. By utilizing our strengths of close customer contact, coordination, and the proposal of total solutions, the IC business provides comprehensive "technologies" and "services" to gain the absolute trust of customers and aims to become a key figure in the realization of becoming a major global player.

Key products

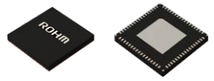
Isolated gate driver ICs

Controlling power devices, such as those in the drive units of electric vehicles. ROHM's unique microfabrication technology contributes to miniaturization and higher efficiency of inverters for automobiles.



LED driver ICs

With the spread of LED lighting and lower current consumption in automobiles, the number of LEDs installed has increased. We have dedicated drivers suitable for various applications, such as headlamps.



Power management/Power supply ICs (PMICs)

We have a diverse lineup of application-specific system power supplies to meet various uses and specifications. In addition to consumer products, we are expanding the product lineup of various PMICs for each electronic control unit (ECU) for automotive use.

ROHM's Position

Worldwide analog IC manufacturer sales ranking (2022)

(Millions of U.S. dollars)

Rank	Company name	Sales
1	Texas Instruments	13,168
2	Analog Devices	11,142
3	Qualcomm	10,302
4	STMicroelectronics	4,800
5	Renesas Electronics Corporation	4,584
:		
17	ROHM	1,001

Source: Omdia Competitive Landscaping Tool (CLT) 2022

Worldwide analog IC market

Total market (2022)
90,887 million U.S. dollars

ROHM's share
17th **1.1%**

Automotive–Analog ASSP, Automotive–Analog ASIC

Total market (2022)
13,880 million U.S. dollars

ROHM's share
12th **1.7%**

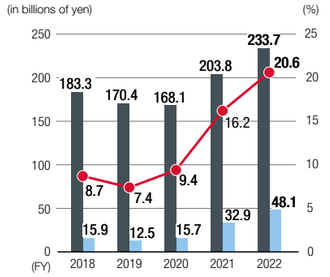
Industrial & Other–Analog ASSP, Industrial & Other–Analog ASIC

Total market (2022)
4,313 million U.S. dollars

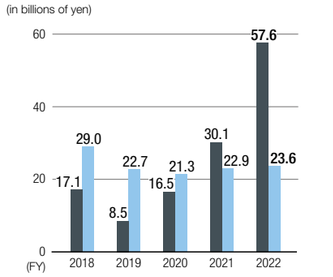
ROHM's share
13th **2.7%**

Performance Highlights

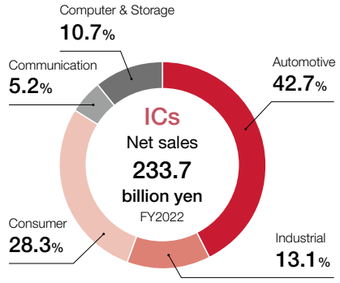
Net sales/operating profit/operating profit ratio



Capital expenditures/R&D expenses



Sales by application



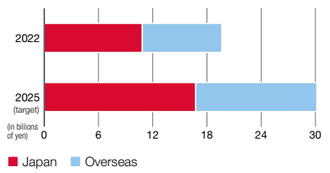
Progress of the Medium-Term Management Plan

Improving the sales ratio of the ASSP strategic Top 10

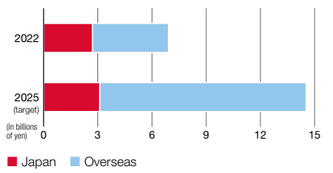
To further increase sales and profits in ICs, we aim to strengthen the automotive industry overseas as well as in Japan, home appliances in the consumer products field, and the PC and server field over the five-year period of the Medium-Term Management Plan. Most importantly, the sales of isolated gate driver ICs, LED driver ICs, and ADAS solutions, are steadily growing in the automotive market, which is expected to show further growth due to the progress of electrification of vehicles and more extensive use of electronic components in vehicles, and adoption is expanding not only among Japanese customers but also overseas customers.

Moreover, fields with sales growth and added value have been designated as strategic Top 10 fields, and our goal is to increase the average IC unit price and improve the profitability of the entire business by increasing the sales composition ratio of those fields. The sales ratio of the strategic Top 10 in FY2022 increased from 16% in the previous fiscal year to 22%, and profits for the overall IC segment were 48.1 billion yen, which represented an increase of 46% over the previous year. Going forward, we will strive to further expand sales and profits by continuing to introduce high value-added products.

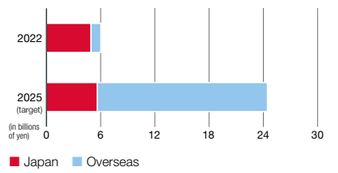
Isolated gate driver Ics



LED driver ICs



ADAS solutions (SerDes+AFE+PMIC)



Column **Toward the Realization of a Sustainable Society**

Development of isolated DC-DC converters which aid in miniaturization and the reduction of the number of man-hours spent on reducing noise in the design process for EV applications

EVs are equipped with applications such as traction inverters which drive the motors, electric compressors for the air conditioner, and PTC heaters which increase the temperature of the vehicle interior. Since these components are driven at high voltages, the primary side circuit with the battery must be isolated from the secondary side circuit with the motor, to ensure safety. Meanwhile, the noise suppression man-hours for different switch frequencies were an issue in previous isolated circuit configurations due to the size of the mounting area and power consumption as well as the output current. ROHM developed an isolated flyback[*1] DC-DC converter which is optimal for power supplies for driving the gate drivers installed in these applications. Our new products contribute to application miniaturization and reduced noise design man-hours by realizing a circuit configuration which does not require a photocoupler[*2] and stable switching frequency characteristics.

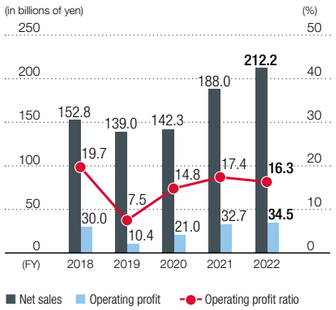
*1 Flyback: a type of circuit which is used in the configuration of an isolated power supply. It is suitable for applications up to 100W and is superior in terms of the number of components and cost.

*2 Photocoupler: an electronic component which converts an electrical signal input into light with light-emitting elements and then converts it back into an electrical signal with light-receiving elements.

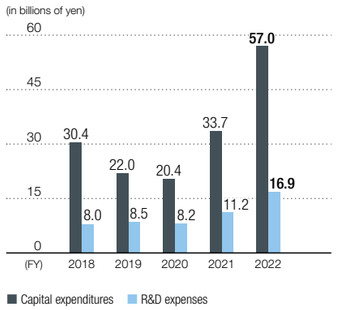
Discrete Semiconductor Devices

Performance Highlights

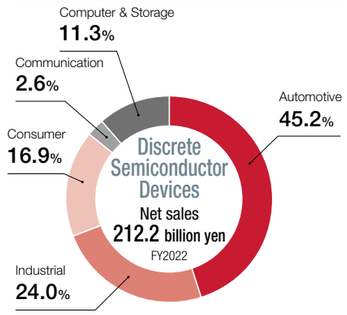
Net sales/operating profit/operating profit ratio



Capital expenditures/R&D expenses



Sales by application



Power devices

Aiming for “ROHM of Power” with products that contribute to a decarbonized society

In addition to power devices using Si and SiC as materials, ROHM has also started mass production of GaN devices, and our strength lies in our diverse lineup including power modules, equipped with several of these devices, and our ability to propose solutions which integrate sales promotion, support, and planning.

Power devices significantly contribute to the realization of carbon neutrality. They improve power conversion efficiency and contribute to energy savings for solar power generation, data centers, and charging stations in industrial equipment, and EV in-vehicle chargers, DC-DC converters, and traction inverters in automobiles. In particular, for growing traction inverters, by replacing IGBTs with SiC MOSFETs, not only will battery costs decrease due to improvements in electricity consumption, but system cost reductions such as lighter wiring harnesses and smaller inductors and capacitors are also expected.

In addition, we believe it is necessary to strengthen not only our device competitiveness but also deepen our understanding of customer systems. It is important to enter the ecosystem which includes automobile manufacturers and Tier 1 manufacturers. Going forward, we hope to build comprehensive relationships with each company and continue to be the power device manufacturer that is always chosen.

There will likely be some fluctuations in the supply and demand balance for SiC due to market conditions, but since high growth will continue until around 2030, we will increase our production capacity and expand sales through active investment. Chinese companies are also gaining power, but we believe that ROHM’s technological capabilities, solution proposal abilities, and supply capabilities which can produce everything from substrates to modules cannot be copied overnight. Because there is still more competition to come until we reach the physical limits which exhaust the capabilities of SiC, we hope to prevail in this field.

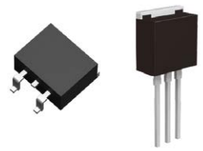
Power devices are expected to be a trump card for the revitalization of Japanese semiconductors, and we will achieve sustainable growth by establishing our position as a major global player that is recognized by customers and the industry as "ROHM as in power devices."

Key power device products

SiC power devices

MOSFETs and SBDs convert power more efficiently than conventional Si material devices

* Details of the strategy on page 36



Si power MOSFETs and IGBTs

They are used as core components of power and power supply systems and inverters to contribute to higher efficiency and energy conservation in a wide range of high-voltage and high-current applications.

Si power diodes

We offer a broad lineup of Schottky barrier diodes and fast recovery diodes, etc. to meet market needs.

ROHM’s Position

Worldwide power device manufacturer sales ranking (2022)

(Millions of U.S. dollars)

Rank	Company name	Sales
1	Infineon Technologies	5,480
2	onsemi	2,645
3	STMicroelectronics	2,207
4	Mitsubishi Electric	1,366
5	Fuji Electric	1,216
:		
9	**ROHM**	**824**

Source: Omdia Competitive Landscaping Tool (CLT) 2022

Worldwide power device market

Total market (2022)
25,920 million U.S. dollars

ROHM’s share
9th 3.2%

Power transistors

Total market (2022)
20,189 million U.S. dollars

ROHM’s share
10th 2.6%

Power diodes

Total market (2022)
4,738 million U.S. dollars

ROHM’s share
4th 6.3%

Progress of the Medium-Term Management Plan

Expanding the sales of power devices and developing them into a core business

Within discrete semiconductor devices, power devices are positioned as one of the most important products for driving ROHM’s growth. In addition to power devices which use Si materials such as IGBTs, SJMOSs, MOSFETs, bipolar transistors, SBDs, and FRDs, ROHM possesses a broad lineup of SiC-based products including SBDs and MOSFETs. We can propose the optimal device combination and operating conditions as a solution according to the customer’s circuit configuration. It is our goal to apply these strengths to achieve a CAGR of 29.8% for the power device business from FY2021 to FY2027. In FY2022, we achieved a year-on-year increase of 59% for sales. ROHM was originally strong in small-signal general-purpose devices and was a newcomer to power device development. However, with our entry into the high growth potential automotive and industrial equipment markets, we aim to further expand the power device business.

Further accelerating the SiC business through the shift to 8-inch wafers

The demand for SiC power devices is growing significantly faster than forecasted. In addition to the product characteristics, securing capacity is also important for maintaining our competitive superiority. Not only did we start production in a new building at the Chikugo Plant at the end of 2022, but we also reached a basic agreement in July 2023 to acquire the Kunitomi Plant in Miyazaki formerly owned by Solar Frontier K.K. The aim of this deal was to expand our production capacity two years earlier through the acquisition of an existing plant instead of constructing a new building. At the same time, each company is trying to compete by improving production efficiency and reducing costs through the shift to a larger diameter wafer. Currently, 6-inch SiC wafers are mainstream, but each company is advancing its shift to 8-inch wafers. ROHM is advancing its development to be able to ship products which use 8-inch wafers in FY2025.

General-Purpose Devices

Aiming to expand overseas market share with high technological capabilities that contribute to product miniaturization

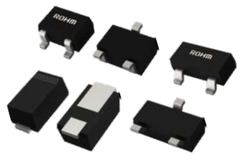
Tsuguru Ariyama
Corporate Officer, Director of General Purpose Device Business Unit

General-purpose devices are essential products which are used in every type of electric and electronic equipment regardless of the market or application. ROHM's general-purpose devices are a business which has continued from the early years of the company. Through our diverse portfolio consisting of products such as SBDs, TVSs, bipolar transistors, MOSFETs, FRDs, and RECs, as well as our high quality, miniaturization and high productivity technologies, and stable production capacity, we have gained a high degree of trust from customers and maintained a top-class market share for many years. In particular, we have secured an overwhelming share in the Japanese automotive market which requires a high level of quality and service.

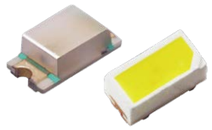
In general-purpose devices, we lead the industry and believe that we can help reduce the environmental impact by efficiently using limited power and proposing small packages which allow space for component mounting. Furthermore, as the industry focuses on power devices, we will contribute to the development of the electric and electronic equipment market by continuing to supply the market in perpetuity.

Going forward, we believe that we need to expand the business by increasing our share in overseas markets and promoting a product strategy which is globally tailored to the appropriate quality and cost. Specifically, we are realizing continuous cost reductions, productivity improvements, inventory design optimizations, and a stable supply and low costs through production leveling while also developing next-generation production lines with higher-efficiency. In this way, it will help us realize the goal of becoming a major global player by supplying products which are essential to the world in perpetuity.

Key products in general-purpose devices



Small-signal devices
Small-signal transistors (less than 1W)
Small-signal diodes (less than 500mA)
Used universally in a variety of applications.



Light-emitting diodes (LED)
Discrete semiconductor devices which emit light when voltage is applied.
Used for lighting and status indications, etc. in all kinds of electronic devices.

Laser diodes
ROHM's laser diodes boast the industry's leading production volume. They are used in laser printers and multifunction printers, and in recent years in laser ranging devices and as a light source for LiDAR, etc.

ROHM's Position

Worldwide small signal device (SSD) manufacturer sales ranking (2022)

(Millions of U.S. dollars)

Rank	Company name	Sales
1	onsemi	834
2	Nexperia	792
3	**ROHM**	**541**
4	Diodes	367
5	Infineon Technologies	319

Source: Omdia Competitive Landscaping Tool (CLT) 2022

Worldwide small signal device market

Total market (2022)
4,782 million U.S. dollars

ROHM's share
3rd 11.3%

Small signal transistors

Total market (2022)
2,155 million U.S. dollars

ROHM's share
3rd 11.0%

Small signal diodes

Total market (2022)
2,627 million U.S. dollars

ROHM's share
3rd 11.5%

Progress of the Medium-Term Management Plan

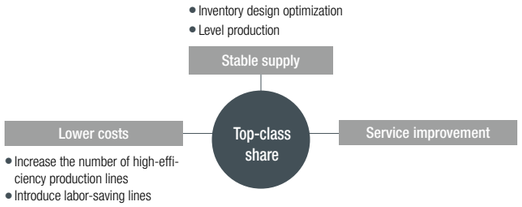
■ Maintaining a top-class market share as a cash cow business

When it comes to semiconductors, power devices tend to attract attention, but the demand for small-signal, general-purpose devices is also increasing due to the electrification trend. For example, as more electronic components are used in automobiles, the demand for transistors and diodes is increasing as essential components. These components are small-signal general-purpose devices that handle power of 1W or less and are used in control and other circuits, and ROHM boasts a high market share due to our expertise in development, manufacturing, and sales accumulated over many years. The General Purpose Device Business' theme for the Medium-Term Management Plan is to contribute to ROHM's growth as a cash cow business while maintaining this high market share.

Because general-purpose devices are highly versatile products used in large quantities for all kinds of applications, we are required to supply them to customers in a stable manner and at low cost. At ROHM, we have increased our production efficiency and capacity to achieve a stable supply, low costs and service improvements by introducing high-efficiency production lines and labor-saving lines. In addition, because semiconductors for automobiles require a particularly high level of quality, we apply our strengths as an IDM to implement thorough quality control. Such initiatives have helped us to steadily respond to customer requests and increase revenue.

Small-Signal Device Business

Maintain the top share as a cash cow business



Column Toward the Realization of a Sustainable Society

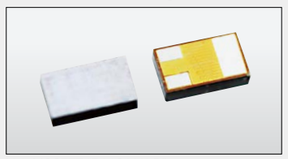
Vitesco Technologies and ROHM signed a long-term SiC power device supply partnership to contribute to the efficiency of EVs

In June 2023, ROHM signed a long-term supply partnership agreement regarding SiC power devices with Vitesco Technologies, a major manufacturer of modern drive technologies and electrification solutions. The transaction value is over 130 billion yen for the period from 2024 to 2030. The two companies have been conducting joint development since 2020, and as the initial result, Vitesco plans to start supplying its advanced inverters equipped with ROHM's SiC power devices in 2024. Two major automobile manufacturers have already decided to incorporate the inverters into their electric vehicles (EV). SiC power devices are an extremely important item in EV inverter development. They are an important key technology which is required to be high-voltage compatible, and they help extend the cruising range and reduce the battery size through the effective use of electric energy. ROHM and Vitesco are deepening their partnership to support high-efficiency EVs and rapid charging through SiC power devices.

Andreas Wolf (right)
CEO, Vitesco Technologies
Kazuhide Ino (left)
Member of the Board, Managing Executive Officer, CFO, ROHM Co. Ltd.

Developing MOSFETs which realize a compact size and industry-leading*1 low power loss to contribute to high efficiency and the safe operation of small devices

In recent years, small devices have become more highly functional, and the component mounting space has decreased due to larger battery sizes for increased power requirements. Moreover, to efficiently use the limited battery power, the equipped components need to reduce power loss to a greater degree. To meet such requirements, ROHM developed the "RA1C030LD," a compact and high-efficiency Nch MOSFET*2 with a 20V withstand voltage which is suitable for small and thin device switching. This new product adopts ROHM's own wafer-level chip size package*3 to realize low power loss as well as miniaturization. It reduces power loss by up to roughly 20% more than general products with the same package and achieves an industry-leading power loss value which significantly contributes to high efficiency and a reduction in the substrate component area for various small devices. Going forward, ROHM will continue to help solve social issues such as reducing the environmental impact through the development of products that contribute to the high efficiency of small devices.



Nch MOSFET "RA1C030LD"

*1 Researched by ROHM, as of November 10, 2022
*2 Nch MOSFET
A type of MOSFET which conducts when a positive voltage is applied to the gate with respect to the source. Because the drain-source ON resistance is smaller than with a Pch MOSFET, it can reduce the steady-state loss.
*3 Wafer-level chip size package
An ultra-compact package in which the formation of terminals and wiring are performed on the wafer which is then subsequently divided into individual pieces.

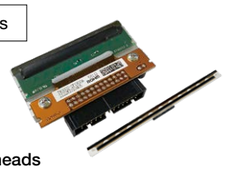
Modules and Others

Helping to solve social issues by providing high added value

ROHM's thermal printheads and resistors are high market-share products with a global share ranked in the top 5 and we have a lineup of products for customers around the world to choose from. At the same time, we are developing products which contribute to "energy savings" and "miniaturization" for customers as stated in our Management Vision, and we are striving to help solve social issues. For example, in printheads, we are mass-producing energy-saving thermal printheads which can reduce the customers' drive battery from two cells to one. In resistors, we are strengthening our lineup of shunt resistors and other special resistors which support small sizes and high power with the increasing need for high functionality in automobiles. In addition, we are switching our product component materials to general-purpose materials that are easier to procure to contribute to energy conservation in society as a whole.

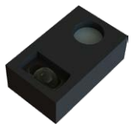
Moreover, we will build a family of products that can be supplied over the long term in a stable manner to expand our share of the industrial equipment market and achieve further growth. For long tail customers in industrial equipment, effectively balancing high-mix, low-volume production with mass production lines will be an issue in the future. Responding to detailed needs in each market and supplying products which constantly pursue high output, energy saving, miniaturization, and high reliability will help us become a major global player and grow together with our customers.

Key products



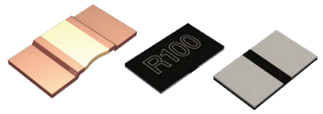
Thermal printheads

These use ROHM's proprietary semiconductor technology, thick-film printing and thin-film deposition technologies which achieve small-sizes, energy saving, high image quality and high quality.



Sensor modules

ROHM can propose total solutions by combining the world's top-level sensor variations with ROHM's core technologies.



Shunt resistors

Resistors for current detection applications which detect the circuit current. We have a broad lineup to support everything from mobile devices such as smartphones to automobiles, industrial equipment, and other applications which require high reliability.

ROHM's Position

Worldwide thermal printhead manufacturer sales share ranking (2022)

ROHM's share **2nd** **23.8%**

Rank	Company name	Share of sales
1	Kyocera	37.2%
2	**ROHM**	**23.8%**
3	SHEC	19.4%
4	Toshiba Hokuto Electronics	7.8%
5	AOI ELECTRONICS	5.8%
6	ALPS ALPINE	2.3%

Source: CHUNICHISHA Co., Ltd.

Worldwide resistor manufacturer sales share ranking (2022)

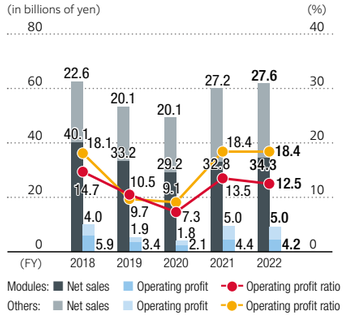
ROHM's share **4th** **8.9%**

Rank	Company name	Share of sales
1	Company A	19.7%
2	Company B	13.0%
3	Company C	11.4%
4	**ROHM 21.2 billion yen**	**8.9%**
	Other	47.0%

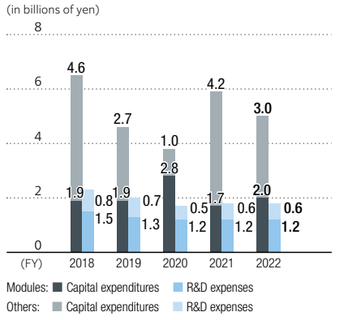
Source: Researched by ROHM

Performance Highlights

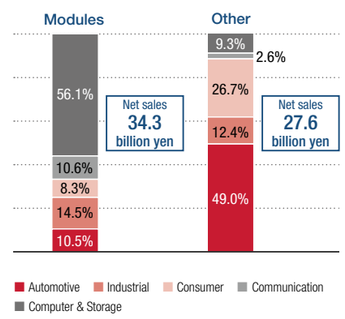
Net sales/operating profit/operating profit ratio



Capital expenditures/R&D expenses



Sales by application (FY2022)



Progress of the Medium-Term Management Plan

Achieve high value-added modules and aim for qualitative transformation

In the module business, our major goal during the Medium-Term Management Plan is to achieve qualitative transformation. In FY2022, sales of printheads for office equipment and optical modules for telecommunication equipment increased. Going forward, we will focus on expanding sales of sensing modules for autonomous driving support modules and security (authentication). In particular, the practical application of low-speed, small-sized automatic delivery robots has accelerated due to the labor shortage in recent years, and the demand for modules which combine laser diodes in various sensor applications is also increasing. We will work to differentiate our products from those of other companies, such as through superior high-temperature characteristics, and aim to increase revenue.

High value-added sensor modules Sales ratio			
FY2022 Results	1%	→ FY2025 Forecast	18%

Expand the lineup of special resistors

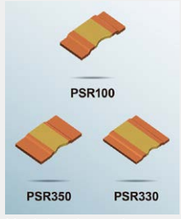
By application, automotive applications account for more than half of our sales of resistors, which are trusted by many customers. In FY2022, sales increased mainly due to high value-added high-power resistors and shunt resistors for the automobile market, which is expected to grow at a particularly high rate, and the adoption of these resistors also advanced. Because the number of equipped motors and ECUs will increase along with the component mounting density due to the shift to high functionality in automobiles, we will contribute to the miniaturization and high reliability of customer applications by enhancing our lineup of shunt resistors and other special resistors which can support small sizes and high power.

High value-added special resistors Sales ratio			
FY2022 Results	53%	→ FY2025 Forecast	54%

Column **Toward the Realization of a Sustainable Society**

Strengthening the "PSR Series" lineup of metal plate shunt resistors to contribute to the miniaturization and energy saving of automotive and industrial equipment

In recent years, thin power modules with cooling mechanisms on both sides of the module are increasing in EV traction inverters to miniaturize the housing, and there is a growing demand to build shunt resistors into these modules. However, conventional products are taller, and there is a risk that they may reduce the cooling efficiency of power devices. In response, ROHM developed the metal plate shunt resistor "PSR350," which has roughly half the height of conventional products in the 12W rated power class. In addition, the Company plans to commercialize the "PSR100" 0.2mΩ product, which is compact and detects even larger currents, and the "PSR330," which is the industry's smallest metal plate shunt resistor in the 15W rated power class. Going forward, ROHM will contribute to the miniaturization and energy saving of automotive and industrial equipment by strengthening and improving the performance of the "PSR Series" lineup of metal plate shunt resistors.



Metal plate shunt resistors "PSR Series"