Aiming to be a quality company

TSE Prime Market (Securities code: 6524)

KOHOKU

Company Profile

Kohoku Kogyo Co., Ltd.

Kohoku Kogyo is a leading manufacturer of lead terminals for aluminum electrolytic capacitors and parts for submarine optical communication.

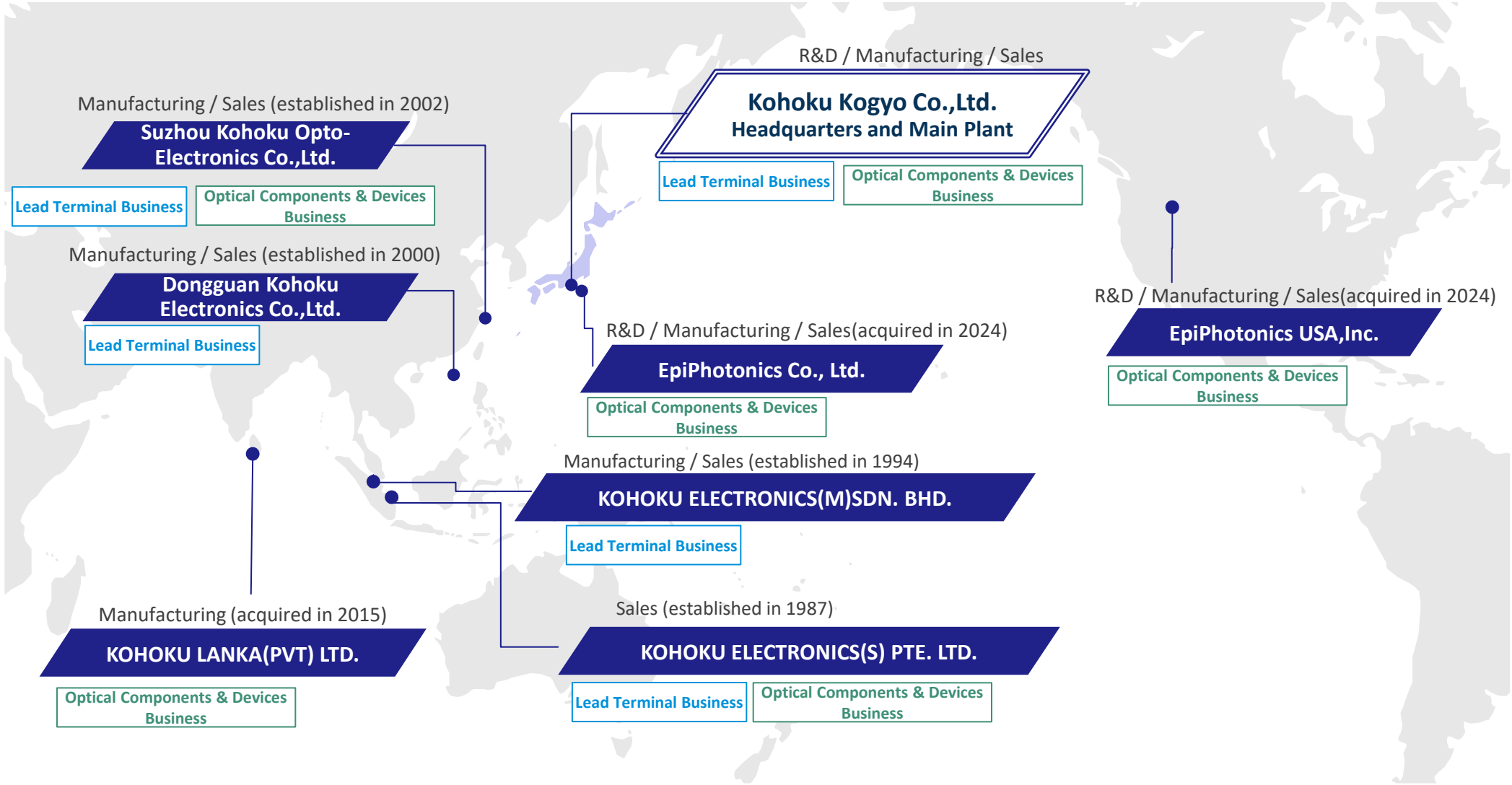
About Us

Company Name	KOHOKU KOGYO Co., Ltd.
Head Office	1623 Takatsuki, Takatsuki Town, Nagahama City, Shiga Prefecture
representative	President & CEO Futoshi Ishii
Established	August 1959
Capital	350 million yen
Business contents	■ Manufacture and sale of lead terminals for aluminum electrolytic capacitors ■ Manufacture and sale of optical components and devices for fiber optic communication networks
Consolidated subsidiaries	7 companies (Overseas 6, Domestic 1)
Number of Employees	Consolidated: 1,710

*As of the end of Dec.2024

Subsidiaries and Offices

Worldwide operations from 8 locations in 6 countries

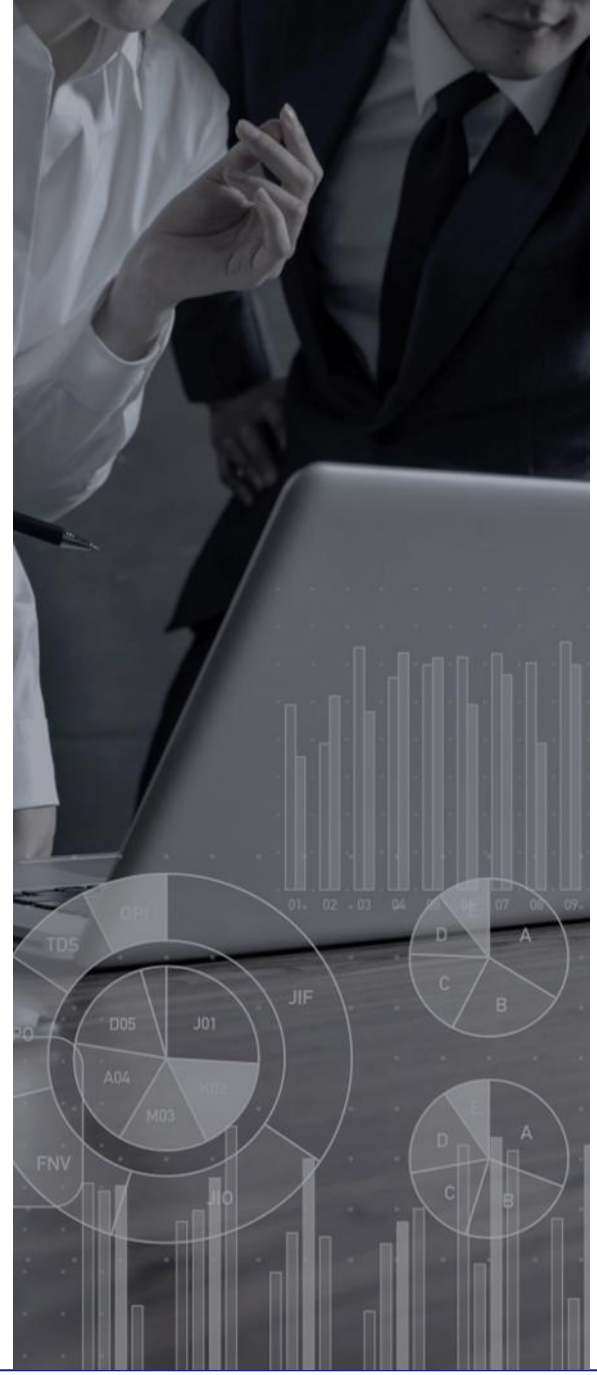


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Management Philosophy

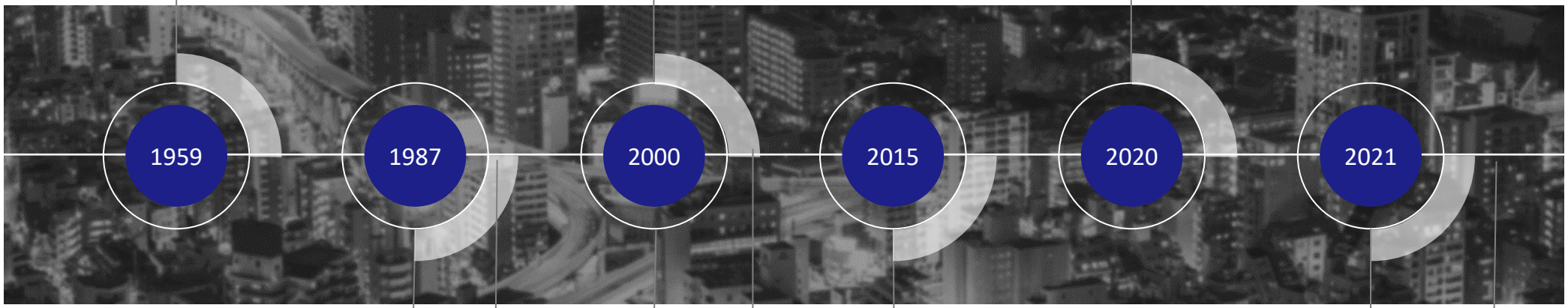
Management Philosophy

Practice all-participating-type management respecting rich originality to aim for an “only-one” company through creation of new values



History

Continuous technological innovation since its establishment in 1959



Aug.1959
Established Kohoku Kogyo Co., Ltd.

Dec.1987
First overseas expansion (Singapore)

Sep. 1994
KOHOKU ELECTRONICS (M) SDN.BHD.

Sep.2000
Full-scale launch of optical component business

Dec. 2000
DONGGUAN KOHOKU ELECTRONICS CO.,LTD.

Jun. 2002
SUZHOU KOHOKU OPTO-ELECTRONICS CO.,LTD.

Feb.2015
Acquired optical device business (FDK Corporation)

Dec.2020
consolidated net sales
First to exceed 10 billion yen

Oct.2026
Listed on the Prime market of the Tokyo Stock Exchange

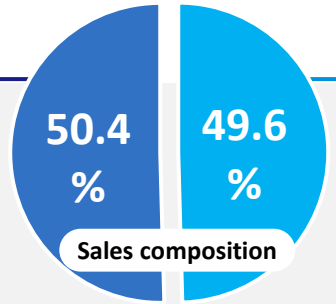
Listed on the Second Section of the Tokyo Stock Exchange
⇒Standard

Apr. 2024
Acquired PLZT device business (EpiPhotonics CO., LTD.)

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Business content

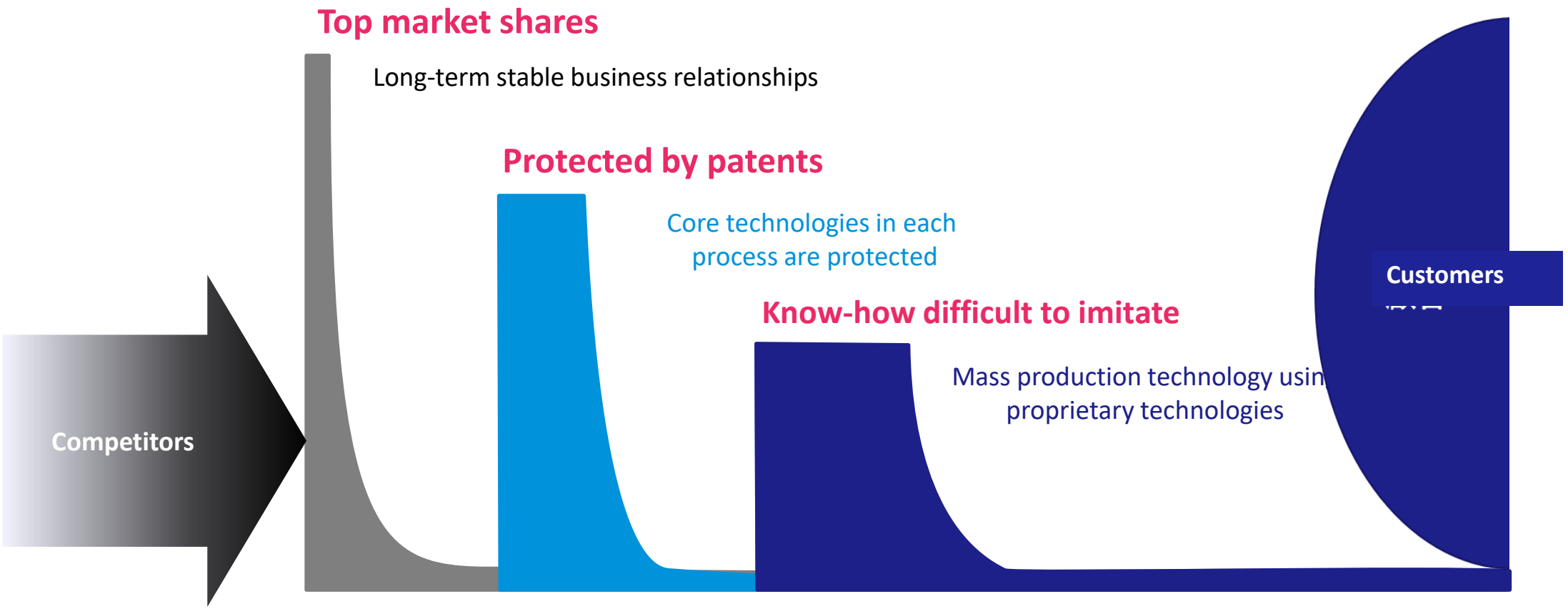
Engaged in products essential for automobiles, network equipment, and submarine cables

Lead terminal business		Optical components and devices business
Lead terminals for aluminum electrolytic capacitors	Main product	Devices for submarine optical fiber communication cables
		
Over 60% global market share	market share	**Over 50% global market share**
Technological innovation in the automotive & network industry	Applications/ contribution fields	**Increased communication capacity**
 **In-vehicle**	 **Base station**	 **5G, 6G**
		 **IoT**

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Competitive Advantage

Kohoku has established three barriers to entry around its core technology



Aluminum Electrolytic Capacitors and Lead Terminals

Lead terminals are the main parts for aluminum electrolytic capacitors, along with aluminum foil and separators

Features of aluminum electrolytic capacitors

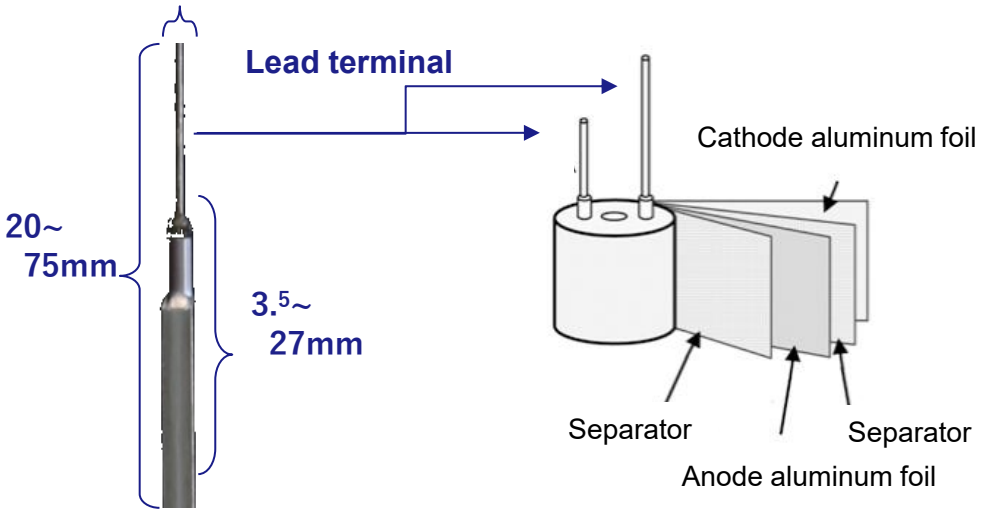
- Capacitors are one of the three major passive parts of electric/electronic circuits*
- Aluminum electrolytic capacitors are the standard type of large volume capacitors
- A wide variety of sizes and applications



Roles of lead terminals

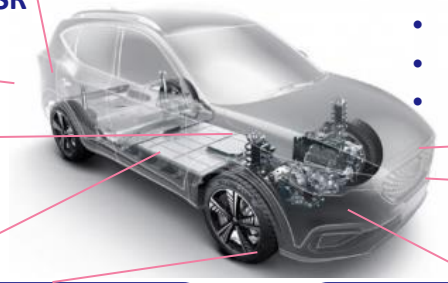
- Charging and regulating electricity
- Two lead terminals are used per capacitor
- Tiny parts supporting the miniaturization and high capacity of aluminum electrolytic capacitors

Illustration of aluminum electrolytic capacitors



Lead terminals per automobile: 400~800 pcs.

Required Characteristics of Aluminium Capacitors for Automotive and Kohoku's Technology



Body control
- Anti-vibration performance
- High-temperature performance
- Low ESR

ADA system
- Low ESR

Airbag system
- High capacity
- Low ESR
- Superior reliability

Power steering
- High ripple current
- Low ESR
- High-temperature performance

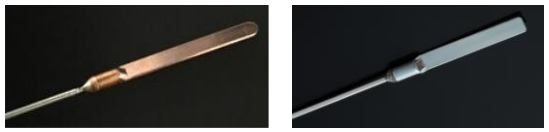
Navigation system
- Compact design
- High performance

Motor system
- High-temperature performance
- High ripple current
- Low ESR

Battery management system
- High-temperature performance
- High ripple current
- Low ESR

Brake system
- Compact design
- Superior reliability

Lighting system
- High ripple current
- Compact design

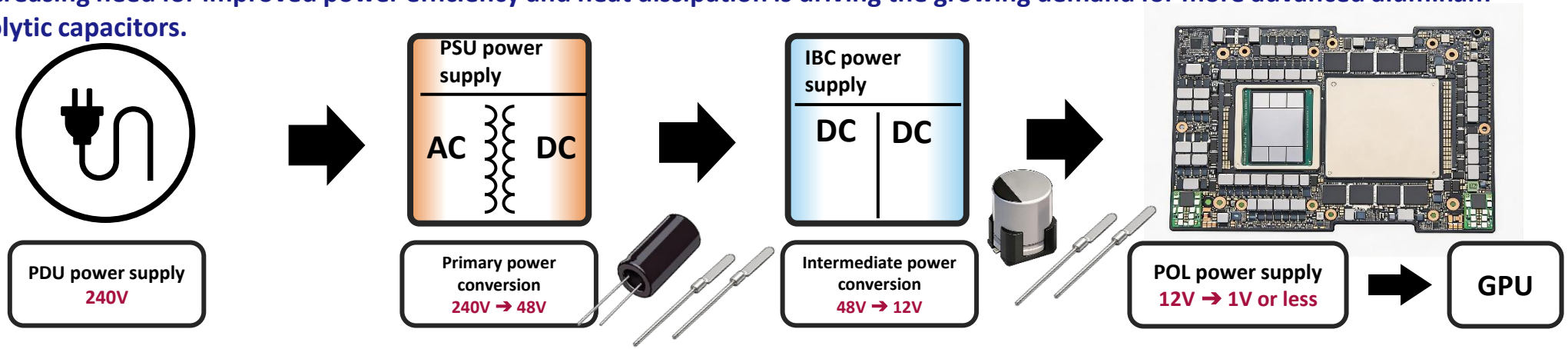


Major performance requirements by areas	
Drive system	• High-temperature performance, low ESR, high ripple current
Body	• Anti-vibration performance, high-temperature performance
Safety system	• Low ESR, long life, high capacity
Information system	• Low ESR, low profile
Common requirements	• Reliable and stable supply system

Capacitor performance	Performance requirements for lead terminals	Technology to realize performance
Low ESR (equivalent series resistance)	Bonding performance *Adhesion	**Pressing, washing**
Low leakage current	Leakage current characteristics, bonding performance	**Forming, washing**
Long life	Leakage current characteristics, contamination (impurity) prevention	**Welding, washing, forming**
Vibration resistance	Anti-vibration type	**Welding, pressing**

As the AI server market expands, highly reliable lead terminals are becoming increasingly important.

The increasing need for improved power efficiency and heat dissipation is driving the growing demand for more advanced aluminum electrolytic capacitors.



Increased power consumption of GPUs

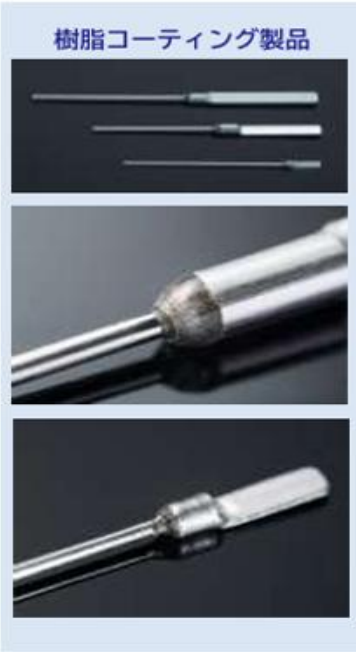
Increased power output for AI chip servers



求められるコンデンサ特性	高付加価値製品の採用拡大
漏れ電流特性	特殊化成、樹脂コーティング
高耐圧	特殊化成
高リップル（低ESR）	銅線リード化

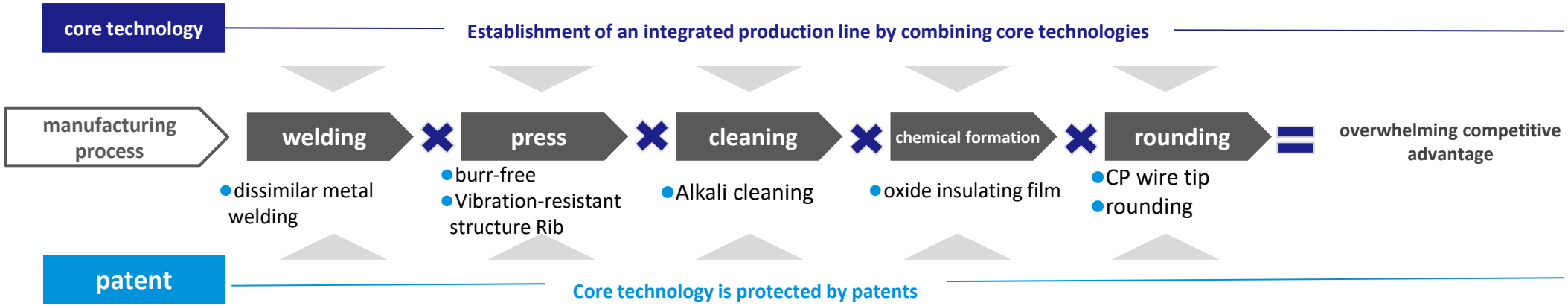


※ グラフは総務省『令和6年版　情報通信白書』より引用



Our Strengths and Barriers to Entry

Core technology is preserved by patents, while mass production technology is black boxed (in-house developed manufacturing equipment)



Core Technology Topics

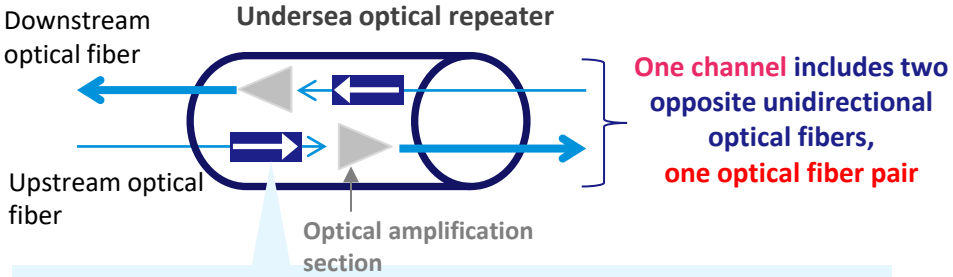
- Differentiation through in-house developed manufacturing equipment core technology
- Welding of dissimilar metals
  Shape and short-circuit measures
- Self-developed power source Welding temperature is 2,000° C, realizing 5 welds per second at high speed
- Ultra-high speed production 5 lead terminals per second
- Monthly production volume of mass-produced lead terminals is 4 billion units, equivalent to the length of 3.6 times the Earth or 20 million vehicles.

Undersea Cables and Optical Isolators

The growing capacity of the communication infrastructure is increasing demand for optical isolators

Optical undersea repeaters and optical isolators

Optical isolators are core devices of undersea optical repeaters



- Stabilizes optical amplification by blocking backward light, only passing light in one direction

Demand for optical isolators

Multi-channeling of undersea cables (increase in fiber pairs) and increasing the number of cables will further boost demand for optical isolators

High capacity = More cables × Multi-channel

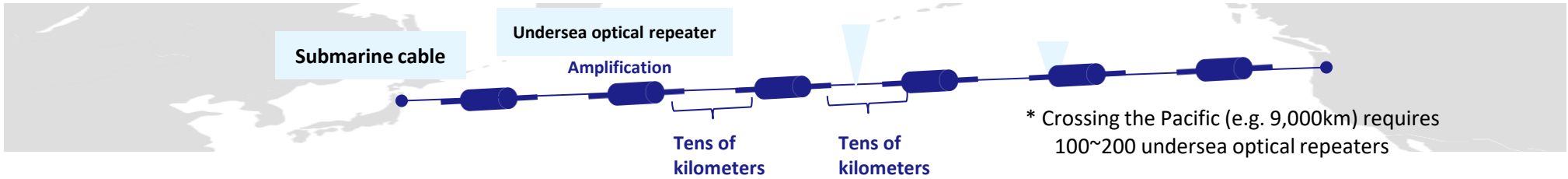
Increase in installed undersea cables = Increase in the number of undersea optical repeaters

Increase in optical fiber pairs*
- **Around2020~: 16 pairs**
- **Around2024~: 24 pairs**
- **Around2029~: 48 pairs**

*Source) Based on company materials, Verified based on external information including NEC Technical Journal (https://jpn.nec.com/techrep/journal/index.html) and KDDI Research, disclosures of business partners(NEC, SubCom, Alcatel Submarine Networks), research announced by HMN, etc., taking into consideration Kohoku's delivery results, interviews with clients, etc.

Image of a long-distance undersea cable system

Optical signal amplification through undersea optical repeaters is a key technology that enables long-distance high-capacity communication



Our Strengths and Barriers to Entry

Integrated Production Powered by Advanced Materials & Precision Machining

patent

Materials Technology ① | Compositional Design

- Product design based on field experience
- Technology for blending the main raw material iron with additive materials

patent

Precision Machining ① | Precision Assembly

- In-house designed jigs and tools and skilled personnel
- Unique assembly technology with an accuracy of less than 1 micron

Head office factory

Sri Lanka Factory

Compositional Design

Element making

precision assembly

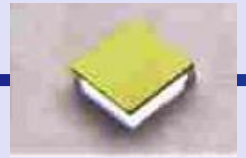
inspection

Optical Isolators

Manufacturing Process



raw materials



Functional material: Faraday rotator



Screening test
Lot Assurance Testing
Whole number test



patent

Material technology ② | Device manufacturing

- Process technology for crystal growth and processing
- Creation of elements in accordance with product specifications

Precision Machining② | Inspection

- Screening to prevent initial failure
- Lot Assurance Testing Know-How

Towards a new pillar of business - Creating cutting-edge businesses (high-purity quartz glass business)

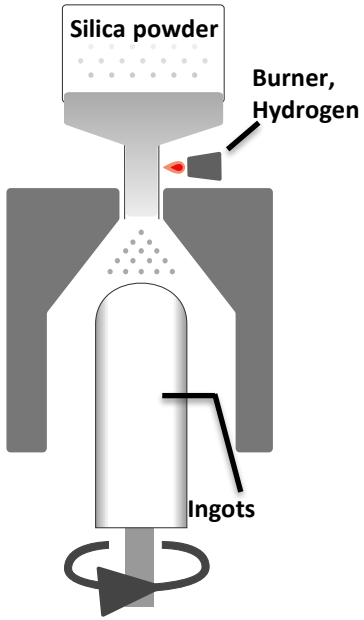
Breakthroughs in manufacturing technology are expected to lead to expansion into semiconductor manufacturing equipment, special fiber preforms, and other applications.

Opening up a new market for high-purity quartz glass produced by slurry casting.

- High degree of freedom in shape is achieved through die casting.
- Significantly reduces the machining and polishing processes during the molding process.
- Significantly reduces waste and energy consumption.

Conventional main manufacturing method (flame melting method)

① Generate ingots using methods such as the VAD method.



② The ingot is shaped by cutting and polishing.

Slurry Casting Method

① Silica particles Slurry formation



② Mold forming and drying



③ Sintering in a sintering furnace



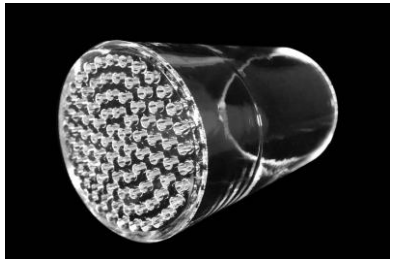
Key sales expansion areas	
Semiconductor manufacturing equipment	fiber optic Preform
Various lenses	Bio Medical



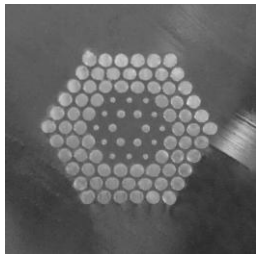
Preforms for special fibers



Large ring for semiconductor manufacturing



spray nozzle



Light source preform (jointly developed product)

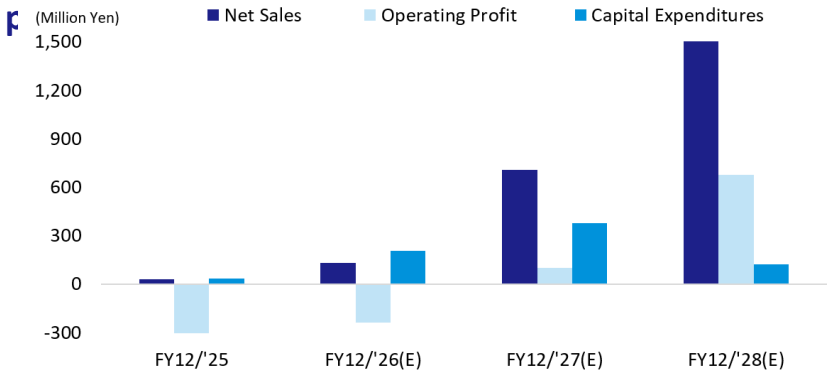
Progress of the High Purity Silica Glass "SSG®" Business

Strengthen business foundation and establish a sales growth trend in the medium to long term

＜Action items and issues in the mid-term plan＞

Theme	Implementation Items and Issues	FY2025 progress	FY2026 Action Plan
Strengthening development capabilities	Shorten development time by improving mold design, prototype simulation technology, etc.	Semiconductor device related, laser related, Expanded lineup of shape samples, including various lenses and special fiber preforms	Improved development capabilities by shortening development lead times
	Expand lineup of shapes to meet diversifying applications		
Strengthening sales and marketing	Strengthen sales structure for global customers	Strengthening global sales expansion structure, including the establishment of an overseas sales promotion office	Establishment of a global sales department and strengthening of sales structure
	Participate in exhibitions and provide technical support to customers	Semicon Japan and others	Increased participation in exhibitions, mainly overseas, including Semicon West (San Francisco) and OFC (Los Angeles), and enhanced sales promotion materials
Production System	Expand sintering furnace and other production equipment	Enhanced auxiliary facilities at the head office factory in preparation for increased production capacity	In 2026, a large sintering furnace will be added, and production capacity will be significantly increased.
	Establish BCP system	Strengthening the stable supply system, including water stoppage measures	

<Performance targets in the medium-term



＜Current situation＞

- Inquiries from semiconductor-related companies are progressing smoothly into the second and third measures
- Increased inquiries for special fiber preforms from fiber-related manufacturers
- The key areas are:
  ①Semiconductor-related products, ②Preforms for optical fibers, ③Various lenses, ④Biomedical

Towards a new pillar of business - Creating cutting-edge businesses (satellite communications and next-generation devices)

Optical devices for satellite communications equipment

Leveraging the products and technologies cultivated in submarine optical devices, we are currently developing optical devices for optical amplifiers in satellite optical communications.

Environmental resistance required for satellite products

- Cosmic ray (radiation) exposure
- Vacuum, high/low temperature harsh environments
- Rocket launch vibration shock
- High-power laser light connecting satellites

Product examples utilizing submarine cable device technology



Multiplex light filter



Optical isolator

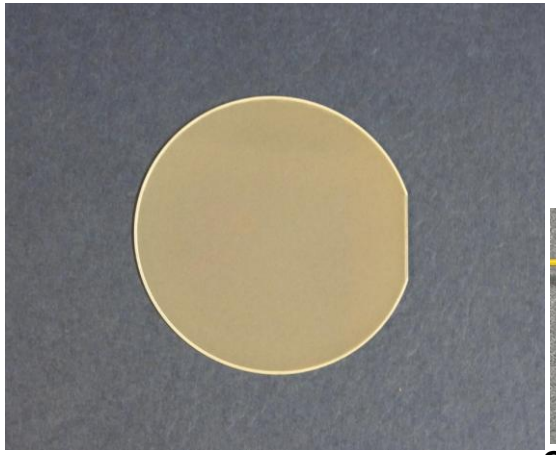
★Sample shipments have begun to research institutions such as JAXA and domestic and international satellite communications equipment manufacturers.

"PLZT," a material for ultra-high-speed communication devices.

Development of PLZT crystal materials with a robust perovskite structure for applications in space devices and optoelectronic fusion.

PLZT Next-Generation Optical Device Materials

- Next-generation device with 10 times the electro-optic effect compared to LN (lithium niobate)
- Expected to be used as a material for next-generation devices such as high-speed optical communication and optical quantum computers.
- The potential for high radiation resistance due to the perovskite structure.



PLZT thin single crystal wafer



Optical variable attenuator



Optical modulator

"PLZT": Lanthanum zirconate titanate. A transparent ceramic material whose light transmission and polarization state can be rapidly controlled by electrical signals. It possesses excellent electro-optical properties and is used in optical communication equipment, laser equipment, and optical devices for the space and defense sectors.

This document contains our current plans and performance forecasts.

These future plans and forecast figures are plans and projections made by us based on available information. Actual results may differ from these plans and forecast figures due to various conditions and factors.

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