Annual Technical Report 2023

FY2023 OITDA

Optoelectronics Industry and Technology Development Association

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Message from OITDA

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It is my pleasure to present the Annual Technical Report 2023, outlining the surveys and R&D activities conducted by OITDA in FY2023.

Looking at trends in the optoelectronics industry, overall movements revealed by the 2023 survey are as follows: The total value of optoelectronics industry shipments increased by 1.4% in FY2023, following 6.9% increase in FY2022, to reach 12.7739 trillion yen. Domestic production value increased by 2.0% in FY2022 and 0.4% in FY2023, reaching 6.0896 trillion yen.

Notably, the optoelectronics imaging/printing sector, including image sensors and mirrorless single lens digital cameras, saw a significant increase of 7.4%. Additionally, the sensing and measurement sector, driven by increased demand for IoT and other applications, grew by 5.2%, marking the sixth consecutive year of growth.

We established a subcommittee under the Technology Strategy Development Committee to address new demands such as disaster response through satellite system monitoring for earthquakes and water-related disasters, virus sterilization systems using ultraviolet wavelengths safe for humans, security check systems at airports utilizing terahertz and near-infrared technologies, and prevention of information leakage using quantum cryptography communication technology. We developed " Technology Roadmap for Safety and Security Photonics" in anticipation of these new needs. These results were presented at the Symposium on Optoelectronics Industry and Technology held on February 16, 2024.

In the area of standardization, we used projects commissioned by the Ministry of Economy, Trade and Industry (METI) to promote projects that include the development of evaluation technologies for international standards such as for multicore fiber optical connectors, and for strain and voltage fiber sensors, and have successfully completed the first of these themes, achieving the initial goal.

We have also actively conducted international standardization activities at the IEC, ISO, and various other forums, including IEC/TC 76 and ISO/TC 172/SC 9, for which we act as the domestic secretariat.

In order to support the growth of the optoelectronics industry and technologies, as the cornerstone of industry-academia government collaboration, OITDA will strengthen and enhance our activities in accordance with needs, under the guidance of the Ministry of Economy, Trade and Industry and other governmental organizations and with the understanding and cooperation of our supporting members and many other people from the business world and the academic community who are our important partners.

We wish you good health and look forward to your continued support and cooperation.

Optoelectronics Industry Trends

1. Introduction

OITDA has conducted the "Trend Survey of the Optoelectronics Industry" annually since its foundation in 1980. The accumulated survey data of more than 40 years is highly regarded as the basic source for trends in the Japanese optoelectronics industry.

This year, we have placed seven research subcommittees under the "Optoelectronics Industry Trends Investigation Committee" and conducted a survey of statistical data from FY 2022 to FY 2024, including the total shipment and domestic production values of the entire Japanese optoelectronics industry.

2. Total Shipments and Domestic Production for the Optoelectronics Industry

2.1 Survey Method

We conducted a questionnaire survey of domestic companies producing optoelectronics-related products (optical equipment/systems and components) on total shipments (including overseas production) and domestic production for FY2022 (actual), FY2023 (estimate), and FY2024 (qualitative prediction). The questionnaires were sent to 225 companies in October 2023 and collected between December 2023 and February 2024. Responses were obtained from 74 companies.

A quantitative survey regarding forecasts for the next fiscal year was conducted until FY2010, but its accuracy and reliability were deemed insufficient. Therefore, it was changed to a qualitative survey in FY2011 and subsequent years. Specifically, an evaluation was made on a five-level scale: increase, slight increase, flat, slight decrease, and decrease, compared to the previous year.

We gained the cooperation of the Japan Photovoltaic Energy Association (JPEA) for the Photovoltaic field, the Japan Lighting Manufacturers Association (JLMA) for the solid-state lighting field, the Japan Electronics and Information Technology Industries Association (JEITA) for the display field, and the Imaging Products Association (CIPA) for the Imaging/Printing field.

Based on the survey, we have compiled total optoelectronics industry shipments and domestic production in Japan as a whole. This was achieved by the specialized subcommittee for each product field conducting data validity examinations and industrial trend analysis, and the Optoelectronics Industry Trends Investigation Committee has rechecked the validity of the data and analysis results.

For the survey, we classified the optoelectronics industry, together with relevant optoelectronics equipment/systems and components, into the seven fields shown below.

1. Optical Communication:	Optical transmission equipment/systems, optical fiber fusion splicers, light emitting devices, photo detectors, optical passive components, optical fibers, optical connectors, etc.
2. Optical Storage:	Optical disk equipment (read-only, recordable), optical disk media, laser diodes, etc.
3. Imaging/Printing:	Optical printers, multifunction printers, cameras (digital cameras, digital video cameras, surveillance cameras, car-mounted cameras), camera-equipped cell phones, image sensors, etc.
4. Display/Solid-state Lighting:	Flat panel display devices and equipment, projectors, solid-state lighting devices and equipment, LEDs (for lighting and displays), etc.
5. Photovoltaic Energy:	Photovoltaic power generation systems, photovoltaic cells and modules
6. Laser/Optical Processing:	Laser/optical processing equipment, lamp/LD lithography, additive manufacturing (3D printers), laser oscillators
7. Sensing/ Measurement:	Optical sensing equipment, optical measurement instruments

2.2 Overview of Survey Results of Total Shipments

Table 1 shows total shipments for FY 2022 (actual), FY 2023 (estimate), and FY 2024 (prediction).

●FY2022(actual): 12.774 trillion yen, growth rate: +6.9%

In FY2022, total shipments (actual) for the optoelectronics industry amounted to 12.774 trillion yen (growth rate: 6.9%). This breaks down as: 8.557 trillion yen for optoelectronics equipment/systems (growth rate: 8.4%; composition ratio: 67.0%) and 4.217 billion yen for optical components (growth rate: 3.9%; composition ratio: 33.0%).

The shipments by field were:

578 billion yen for the Optical Communication field (growth rate: 7.5%; composition ratio: 4.5%), 495 billion yen for the Optical Storage field (growth rate: 11.3%; composition ratio: 3.9%), 3.815 trillion yen for the Imaging/Printing field (growth rate: 21.9%; composition ratio: 29.9%), 4.783 trillion yen for the Display/Solid-state Lighting field (growth rate: -2.6%; composition ratio: 37.4%), 1.818 trillion yen for the Photovoltaic Energy field (growth rate: 3.6%; composition ratio: 14.2%), 832 billion yen for the Laser/Optical Processing field (growth rate: 9.7%; composition ratio: 6.5%), and 349 billion yen for the Sensing/ Measurement field (growth rate: 8.8%; composition ratio: 2.7%).

●FY 2023 (estimate): 12.954 trillion yen, growth rate: 1.4%

Total shipments for the optoelectronics industry in FY2023 are estimated to be 12.954 trillion yen (growth rate: 1.4%). This breaks down as: 8.653 trillion yen for optoelectronics equipment/systems (growth rate: 1.1%; composition ratio: 66.8%) and 4.301 trillion yen for optical components (growth rate: 2.0%; composition ratio: 33.2%).

The shipments by field are estimated to be 522 billion yen for the Optical Communication field (growth rate: -9.7%; composition ratio: 4.0%), 479 billion yen for the Optical Storage field (growth rate: -3.3%; composition ratio: 3.7%), 4.095 trillion yen for the Imaging/Printing field (growth rate: 7.4%; composition ratio: 31.6%), 4.890 trillion yen for the Display/Solid-state Lighting field (growth rate: 2.2%; composition ratio: 37.7%), 1.742 trillion yen for the Photovoltaic Energy field (growth rate: -4.2%; composition ratio: 13.4%), 762 billion yen for the Laser/ Optical Processing field (growth rate: -8.4%; composition ratio: 5.9%), and 368 billion yen for the Sensing/Measurement field (growth rate: 5.2%; composition ratio: 2.8%).

●FY 2024 (prediction): flat

The total shipments of the optoelectronics industry in FY2024 are expected to be flat. Likewise, the shipments for optical equipment/ systems and optical components are also expected to be flat.

The expectations for shipment values are as follows:

Slight increase for Imaging/Printing field, Display/Solid-state Lighting field, and Laser/Optical Processing field; flat for Optical Communication field and Sensing/Measurement field; slight decrease for Optical Storage field and Photovoltaic Energy field.

2.3 Overview of Survey Results of Domestic Production

Table 2 shows Domestic Production for FY 2022 (actual), FY 2023 (estimate) and FY 2024 (prediction).

●FY 2022 (actual): 6.066 trillion yen, growth rate: 2.0%

In FY2022, the domestic production of the optoelectronics industry (actual) was 6.066 trillion yen (growth rate: 2.0%). This breaks down as 3.700 trillion yen for optoelectronics equipment/systems (growth rate: 6.5%; composition ratio: 61.0%) and 2.366 trillion yen for optical components (growth rate: -4.2%; composition ratio: 39.0%).

Domestic production by field was 439 billion yen for the Optical Communication field (growth rate: 7.6%; composition ratio: 7.2%), 28 billion yen for the Optical Storage field (growth rate: 22.1%; composition ratio: 0.5%), 1.096 trillion yen for the Imaging/Printing field (growth rate: 10.6%; composition ratio: 18.1%), 2.055 trillion yen for the Display/ Solid-state Lighting field (growth rate: -7.7%; composition ratio: 33.9%),

1.262 trillion yen for the Photovoltaic Energy field (growth rate: 3.8%; composition ratio: 20.8%), 808 billion yen for the Laser/Optical Processing field (growth rate: 9.7%; composition ratio: 13.3%), and 283 billion yen for the Sensing/Measurement field (growth rate: 9.0%; composition ratio: 4.7%).

●FY 2023 (estimate): 6.090 trillion yen, growth rate: 0.4%

For FY2023, the domestic production of the optoelectronics industry is estimated to be 6.090 trillion yen (growth rate: 0.4%). This breaks down as 3.640 trillion yen for optoelectronics equipment/systems (growth rate: -1.6%; composition ratio: 59.8%) and 2.450 trillion yen for optical components (growth rate: 3.5%; composition ratio: 40.2%).

Domestic production by field is estimated to be 392 billion yen for the Optical Communication field (growth rate: -10.6%; composition ratio: 6.4%), 23 billion yen for the Optical Storage field (growth rate: -16.3%; composition ratio: 0.4%), 1.284 trillion yen for the Imaging/Printing field (growth rate: 17.2%; composition ratio: 21.1%), 2.081 trillion yen for the Display/Solid-state Lighting field (growth rate: 1.2%; composition ratio: 34.2%), 1.168 trillion yen for the Photovoltaic Energy field (growth rate: -7.4%; composition ratio: 19.2%), 742 billion yen for the Laser/Optical Processing field (growth rate: -8.1%; composition ratio: 12.2%), and 308 billion yen for the Sensing/Measurement field (growth rate: 8.8%; composition ratio: 5.1%).

●FY 2024 (prediction): flat

The domestic production of the optoelectronics industry in FY2024 is expected to be flat. Likewise, production of optical equipment/systems is expected to be flat, and optical components are expected to increase slightly.

The expectations for production values are as follows:

Slight increase for Imaging/Printing field, Display/Solid-state Lighting field, and Laser/Optical Processing field; flat for Optical Communication field and Sensing/Measurement field; slight decrease for Optical Storage field and Photovoltaic Energy field.

2.4 Trend in Optoelectronics Industry

Figures 1 and 2, respectively, show changes in optoelectronics industry total shipment value and trends in each field. Figures 3 and 4, respectively, show changes in optoelectronics industry domestic production value and changes by field. Figure 1 and Figure 3 also show nominal GDP and electronics industry production in Japan in order to compare changes in the scale of the optoelectronics industry with those of the Japanese economy and other industries.

Japan's optoelectronics industry continued to grow for a long period of more than 20 years after the survey started in FY1980, although there was a temporary decline due to the burst of the dot-com bubble. However, it contracted due to the impact of the financial crisis in FY2008, and these challenging circumstances continued due to the impact of the Great East Japan Earthquake in FY2011.

Due to rapid growth in the solar power generation sector driven by the Renewable Energy Fixed Price Purchase System (Feed-in Tariff [FIT] system) that started in 2012, the industry returned to positive growth. However, the solar power generation sector began to decline significantly after peaking in FY2014, leading to a decrease in the overall optoelectronics industry for two consecutive years in FY2015 and FY2016. In FY2017, the decline showed signs of leveling off, raising hopes of a bottoming out. However, the decline continued from FY2018 onward. The COVID-19 pandemic in FY2019 caused an extraordinary situation, and the optoelectronics industry suffered a major blow in FY2020. Since then, it has been gradually recovering.

Recently, while the international business environment has entered a period of significant change, it is hoped that further recovery in the optical industry can be achieved by strengthening the foundation for growth.

The following is a summary of the survey results for the three consecutive years FY2022 to FY2024.

●FY2022 (actual)

In the Imaging/Printing field, both total shipments and domestic production increased significantly due to rising demand for image sensors for digital cameras and camera phones, etc., increased demand for mirrorless single lens digital cameras due to improved performance, and increased demand for printers and MFPs due to the return to offices from remote work.

In the Laser/Optical Processing field, both total shipments and domestic production increased due to higher capital investment, mainly in semiconductor-related fields, etc. In the Photovoltaic Energy field, both total shipments and domestic production increased slightly as demand grew due to soaring energy prices.

In the Optical Storage field, both total shipments and domestic production increased due to higher demand for dedicated playback equipment for game consoles. In the Optical Communication field, both total shipments and domestic production increased slightly due to rising demand for optical transmission equipment and devices, as well as strong demand for optical fiber and other components, as a result of facility expansion in response to increased telecommunications traffic spurred by 5G systems and COVID-19 lifestyle changes. In the Optical Sensing/Measurement field, both total shipments and domestic production increased slightly due to higher capital investment in the semiconductor, factory automation, and automotive industries. In the Display/Solid-state Lighting field, projectors and LED lighting fixtures performed well, but LCD panels and other products declined, resulting in a slight decrease in overall shipments and domestic production.

The optoelectronics industry as a whole continued to recover, with an increase in overall shipments and a slight increase in domestic production.

●FY 2023 (estimate)

In the Imaging/Printing field, demand for image sensors for digital cameras and camera-equipped cell phones is expected to further increase, and demand for mirrorless single lens digital cameras is also expected to continue, leading to an increase in both overall shipments and domestic production.

In the Display/Solid-state Lighting field, car navigation systems, projectors, and LED lighting fixtures are expected to do well, but LCD panels and other products are expected to decline, and overall shipments and domestic production are expected to remain flat. In the Optical Sensing/Measurement field, both total shipments and domestic production are expected to increase slightly due to strong growth in sensing devices. In the Optical Storage field, both total shipments and domestic production are expected to decrease due to a lull in demand for playback-only equipment for game consoles. In the Optical Communication field, both shipments and domestic production of optical transmission equipment/devices and components for optical transmission are expected to decline as the capital expansion for 5G systems comes to a halt.

In the Laser/Optical Processing field, although demand for excimer lasers is expected to increase due to a recovery in capital investment in semiconductor-related equipment, both total shipments and domestic production are expected to decrease slightly due to a sharp decline in demand for drilling of printed circuit boards, which had increased significantly in the previous fiscal year, and a decrease in lamp and LD lithography equipment due to a decline in shipments of PCs and other products. As a result, both total shipments and domestic production are expected to decline slightly.

In the Photovoltaic Energy field, both total shipments and domestic production are expected to decline slightly due to a downward trend in demand for power generation projects, especially mega solar power

Table 1　Total Shipment of Optoelectronics Industry (in 100 million yen)

(The total for each field is the sum of optoelectronics equipment/systems(■) and optical components(■).)

Product Items	FY 2021 Shipment Actual (in 100 million yen)		Grow th Rate(%)	FY 2022 Shipment Actual (in 100 million yen)		Grow th Rate(%)	FY 2023 Shipment Estimate (in 100 million yen)		Grow th Rate(%)	FY 2024 Shipment Prediction
Optical Communications Field	5,374		0.8	5,775		**7.5**	5,215		▲ 9.7	flat
Optical Transmission Equipment	1,785		▲ 6.3	2,006		**12.4**	1,795		▲ 10.5	little decrease
Truck Line and Metro Line		934	▲ 8.1		1,025	**9.7**		727	▲ 29.1	decrease
Subscriber Line		410	▲ 13.3		517	**26.1**		567	**9.7**	flat
Router and Switch		247	28.0		263	**6.5**		327	**24.3**	little increase
Optical Fiber Amplifier		194	▲ 13.0		201	**3.6**		174	▲ 13.4	little decrease
Optical Transmission Components	3,357		4.2	3,529		**5.1**	3,190		▲ 9.6	flat
Optical Transmission Link		309	▲ 4.6		361	**16.8**		365	**1.1**	little increase
Light Emitting Device		773	1.0		779	**0.8**		676	▲ 13.2	flat
Photo Detectors		128	▲ 16.9		90	▲ 29.7		79	▲ 12.2	flat
Optical Passive Component		220	▲ 6.4		207	▲ 5.9		170	▲ 17.9	flat
Optical Circuit Component		243	▲ 4.0		210	▲ 13.6		165	▲ 21.4	flat
Optical Fiber		1,127	10.5		1,290	**14.5**		1,158	▲ 10.2	flat
Optical Connector		353	13.1		371	**5.1**		343	▲ 7.5	flat
Others (Semiconductor Amplifying Device, etc.)		204	29.1		221	**8.3**		234	**5.9**	little increase
Optical Fiber Fusion Splicer	232		13.2	240		**3.4**	230		▲ 4.2	flat
Optical Storage Field	4,447		▲ 13.6	4,949		**11.3**	4,788		▲ 3.3	little decrease
Optical Disk	4,392		▲ 13.7	4,887		**11.3**	4,725		▲ 3.3	little decrease
Equipment		4,209	▲ 12.3		4,708	**11.9**		4,568	▲ 3.0	little decrease
Read-only (CD, DVD, BD)		2,561	▲ 9.7		3,238	**26.4**		3,218	▲ 0.6	little decrease
Recordable		1,648	▲ 16.0		1,470	▲ 10.8		1,350	▲ 8.2	little decrease
Media		183	▲ 37.1		179	▲ 2.2		157	▲ 12.3	flat
Laser Diode	55		▲ 9.8	62		**12.7**	63		**1.6**	little decrease
Imaging/Printing Field	31,305		7.1	38,147		**21.9**	40,953		**7.4**	little increase
Optical I/O Equipment	20,734		4.7	23,755		**14.6**	24,726		**4.1**	flat
Optical Printer・Multifunction Printer		6,350	2.9		7,283	**14.7**		7,689	**5.6**	flat
Imaging equipment		7,731	9.3		9,928	**28.4**		10,628	**7.1**	flat
Digital Camera, Digital Video Camera		5,873	6.5		7,985	**36.0**		8,450	**5.8**	flat
Security camera, Car-mounted camera *		1,858	19.6		1,943	**4.6**		2,178	**12.1**	flat
Camera Mobile Phone		5,962	4.3		5,913	▲ 0.8		5,770	▲ 2.4	little decrease
Others (Barcode Reader, Image Scanner, etc.)		691	▲ 18.2		631	▲ 8.7		639	**1.3**	flat
Image Sensor	10,571		12.2	14,392		**36.1**	16,227		**12.8**	little increase
Display and Solid-state Lighting Field	49,109		0.7	47,826		▲ 2.6	48,899		**2.2**	little increase
Display Equipment	23,907		▲ 4.5	24,372		**1.9**	24,626		**1.0**	flat
Flat Panel Display		19,808	▲ 7.3		19,699	▲ 0.6		19,678	▲ 0.1	little decrease
Large-scale LED Display		174	▲ 3.3		178	**2.3**		188	**5.6**	little increase
Projector		3,925	12.5		4,495	**14.5**		4,760	**5.9**	little increase
Display Device	15,092		6.2	12,879		▲ 14.7	12,080		▲ 6.2	flat
Solid-state Lighting	6,404		2.4	7,346		**14.7**	8,598		**17.0**	little increase
LED Device		6,010	2.6		6,928	**15.3**		8,145	**17.6**	little increase
LED Lamp		394	▲ 0.5		418	**6.1**		453	**8.4**	increase
LED	3,706		12.8	3,229		▲ 12.9	3,595		**11.3**	little increase
Photovoltaic Energy Field	17,559		▲ 15.4	18,184		**3.6**	17,422		▲ 4.2	little decrease
Photovoltaic Power System	11,593		▲ 18.2	12,158		**4.9**	11,401		▲ 6.2	little decrease
Photovoltaic Cell/Module	5,966		▲ 9.3	6,026		**1.0**	6,021		▲ 0.1	little decrease
Laser/Optical Processing Field	7,589		23.5	8,322		**9.7**	7,619		▲ 8.4	little increase
Laser and Optical Processing Equipment	6,697		23.4	7,314		**9.2**	6,755		▲ 7.6	little increase
CO_2 Laser		687	31.1		822	**19.7**		465	▲ 43.4	little increase
Solid State Laser		495	15.7		585	**18.2**		592	**1.2**	flat
Fiber Laser		673	9.4		745	**10.7**		790	**6.0**	flat
Semiconductor Laser Direct Processing Equipment		33	6.5		28	▲ 15.2		28	**0.0**	flat
Excimer Laser		1,757	36.3		1,923	**9.4**		2,317	**20.5**	little increase
Lamp/LD Exposure Machine		3,003	21.1		3,101	**3.3**		2,445	▲ 21.2	flat
Additive Manufacturing (3D Printer)		49	▲ 16.9		110	**124.5**		118	**7.3**	little increase
Oscillator	892		24.1	1,008		**13.0**	864		▲ 14.3	little increase
Optical Sensing and Measurement Field	3,210		12.2	3,492		**8.8**	3,675		**5.2**	flat
Optical Sensing Equipment	3,060		13.0	3,337		**9.1**	3,530		**5.8**	flat
Optical Measuring Instrument	150		▲ 1.3	155		**3.3**	145		▲ 6.5	flat
Others Field	931		1.4	1,044		**12.1**	969		▲ 7.2	flat

Product Items	FY 2021 Shipment Actual (in 100 million yen)		Grow th Rate(%)	FY 2022 Shipment Actual (in 100 million yen)		Grow th Rate(%)	FY 2023 Shipment Estimate (in 100 million yen)		Grow th Rate(%)	FY 2024 Shipment Prediction
Sub Total for Optoelectronics Equipment	78,954		▲ 2.2	85,570		**8.4**	86,531		**1.1**	flat
Sub Total for Optoelectronics Components	40,570		5.6	42,169		**3.9**	43,009		**2.0**	flat
Total for Optoelectronics Products	119,524		0.3	127,739		**6.9**	129,540		**1.4**	flat

Table 2 Domestic Production of Optoelectronics Industry (in 100 million yen)

(The total for each field is the sum of optoelectronics equipment/systems( ) and optical components( ).)

Product Items	FY 2021 Shipment Actual (in 100 million yen)		Grow th Rate(%)	FY 2022 Shipment Actual (in 100 million yen)		Grow th Rate(%)	FY 2023 Shipment Estimate (in 100 million yen)		Grow th Rate(%)	FY 2024 Shipment Prediction
Optical Communications Field	4,079		▲ 1.3	4,391		**7.6**	3,924		▲ 10.6	flat
Optical Transmission Equipment	1,583		▲ 8.7	1,758		**11.1**	1,509		▲ 14.2	little decrease
Truck Line and Metro Line		911	▲ 8.8		991	**8.8**		706	▲ 28.8	flat
Subscriber Line		390	▲ 11.6		470	**20.5**		516	**9.8**	flat
Router and Switch		116	11.5		125	**7.8**		139	**11.2**	**increase**
Optical Fiber Amplifier		166	▲ 12.6		172	**3.6**		148	▲ 14.0	little decrease
Optical Transmission Components	2,274		3.5	2,393		**5.2**	2,185		▲ 8.7	flat
Optical Transmission Link		163	1.9		181	**11.0**		175	▲ 3.3	flat
Light Emitting Device		375	4.7		371	▲ 1.1		374	**0.8**	**little increase**
Photo Detectors		49	▲ 15.5		35	▲ 28.6		37	**5.7**	flat
Optical Passive Component		178	▲ 8.2		149	▲ 16.3		115	▲ 22.8	flat
Optical Circuit Component		181	▲ 10.0		149	▲ 17.7		99	▲ 33.6	flat
Optical Fiber		947	10.8		1,095	**15.6**		966	▲ 11.8	flat
Optical Connector		229	14.5		248	**8.3**		229	▲ 7.7	flat
Others (Semiconductor Amplifying Device, etc.)		152	▲ 11.1		165	**8.6**		190	**15.2**	**little increase**
Optical Fiber Fusion Splicer	222		10.4	240		**8.1**	230		▲ 4.2	flat
Optical Storage Field	226		▲ 43.8	276		**22.1**	231		▲ 16.3	little decrease
Optical Disk	203		▲ 46.6	253		**24.6**	209		▲ 17.4	little decrease
Laser Diode	23		4.5	23		**0.0**	22		▲ 4.3	little decrease
Imaging/Printing Field	9,902		3.0	10,956		**10.6**	12,844		**17.2**	**little increase**
Optical I/O Equipment	4,262		▲ 4.8	4,163		▲ 2.3	3,615		▲ 13.2	flat
Optical Printer・Multifunction Printer		722	13.3		938	**29.9**		935	▲ 0.3	flat
Imaging equipment		2,291	28.7		2,388	**4.2**		2,463	**3.1**	**little increase**
Digital Camera, Digital Video Camera		1,613	▲ 11.6		1,798	**11.5**		1,845	**2.6**	flat
Car-mounted camera, Security camera *		678	85.8		590	▲ 13.0		618	**4.7**	flat
Camera Mobile Phone		1,006	▲ 7.8		600	▲ 40.4		0	▲ 100.0	–
Others (Barcode Reader, Image Scanner, etc.)		243	▲ 19.0		237	▲ 2.5		217	▲ 8.4	flat
Image Sensor	5,640		9.7	6,793		**20.4**	9,229		**35.9**	**little increase**
Display and Solid-state Lighting Field	22,264		4.1	20,553		▲ 7.7	20,808		**1.2**	**little increase**
Display Equipment	3,239		▲ 3.0	3,489		**7.7**	3,919		**12.3**	**little increase**
Flat Panel Display		2,961	▲ 4.1		3,194	**7.9**		3,608	**13.0**	**little increase**
Large-scale LED Display		174	▲ 3.3		178	**2.3**		188	**5.6**	**little increase**
Projector		104	46.5		117	**12.5**		123	**5.1**	**little increase**
Display Device	12,220		4.4	10,006		▲ 18.1	8,633		▲ 13.7	flat
Solid-state Lighting	4,571		3.3	5,029		**10.0**	5,908		**17.5**	**little increase**
LED Device		4,510	3.5		4,953	**9.8**		5,823	**17.6**	**little increase**
LED Lamp		61	▲ 7.6		76	**24.6**		85	**11.8**	**little increase**
LED	2,234		16.6	2,029		▲ 9.2	2,348		**15.7**	**little increase**
Photovoltaic Energy Field	12,158		▲ 19.1	12,619		**3.8**	11,679		▲ 7.4	little decrease
Photovoltaic Power System	11,572		▲ 17.5	12,141		**4.9**	11,339		▲ 6.6	little decrease
Photovoltaic Cell/Module	586		▲ 41.7	478		▲ 18.4	340		▲ 28.9	little decrease
Laser/Optical Processing Field	7,359		23.2	8,076		**9.7**	7,419		▲ 8.1	**little increase**
Laser and Optical Processing Equipment	6,494		23.3	7,098		**9.3**	6,588		▲ 7.2	**little increase**
CO_2 Laser		685	31.2		823	**20.1**		467	▲ 43.3	**little increase**
Solid State Laser		439	14.0		526	**19.8**		533	**1.3**	flat
Fiber Laser		532	6.2		592	**11.3**		631	**6.6**	flat
Semiconductor Laser Direct Processing Equipment		29	▲ 3.3		28	▲ 3.4		28	**0.0**	flat
Excimer Laser		1,757	36.3		1,918	**9.2**		2,367	**23.4**	**little increase**
Lamp/LD Exposure Machine		3,003	21.1		3,101	**3.3**		2,444	▲ 21.2	flat
Additive Manufacturing (3D Printer)		49	–		110	**124.5**		118	**7.3**	**little increase**
Oscillator	865		22.2	978		**13.1**	831		▲ 15.0	**little increase**
Optical Sensing and Measurement Field	2,596		12.6	2,829		**9.0**	3,079		**8.8**	flat
Optical Sensing Equipment	2,458		13.3	2,689		**9.4**	2,948		**9.6**	flat
Optical Measuring Instrument	138		2.2	140		**1.4**	131		▲ 6.4	flat
Others Field	867		18.3	964		**11.2**	912		▲ 5.4	flat

Shipment Actual	FY 2021 Shipment Actual (in 100 million yen)		Grow th Rate(%)	FY 2022 Shipment Actual (in 100 million yen)		Grow th Rate(%)	FY 2023 Shipment Estimate (in 100 million yen)		Grow th Rate(%)	FY 2024 Shipment Prediction
Sub Total for Optoelectronics Equipment	34,742		▲ 3.2	37,000		**6.5**	36,396		▲ 1.6	flat
Sub Total for Optoelectronics Components	24,709		5.5	23,664		▲ 4.2	24,500		**3.5**	little increase
Total for Optoelectronics Products	59,451		0.2	60,664		**2.0**	60,896		**0.4**	flat

generation.

In the optoelectronics industry as a whole, both total shipments and domestic production are expected to remain flat.

●FY 2024 (prediction)

In the Imaging/Printing field, both total shipments and domestic production are forecast to increase slightly due to increased demand for image sensors and continued demand for imaging equipment and printers/multifunction devices.

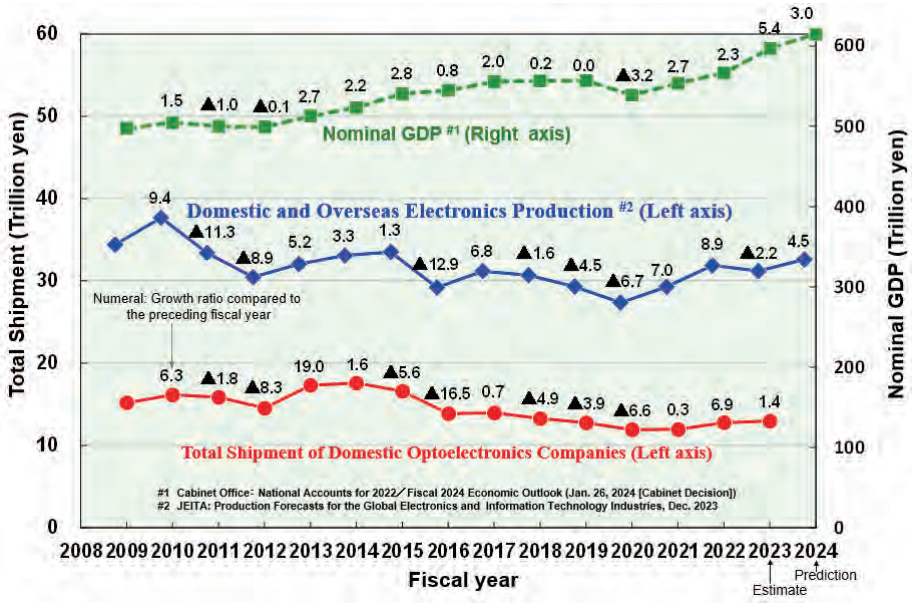
In the Display/Solid-state Lighting field, both total shipments and domestic production are forecast to increase slightly due to continued demand for in-vehicle displays, projectors, and other products, as well as firm demand for LED lighting fixtures.

In the Laser/Optical Processing field, both total shipments and domestic production are forecast to increase slightly due to continued capital investment, mainly in semiconductor-related fields.

In the Optical Sensing/Measurement field, both total shipments and domestic production are forecast to remain unchanged. In the Optical Communication field, both total shipments and domestic production are expected to remain flat, as capital investment has reached a plateau. In the Photovoltaic Energy field, both total shipments and domestic production are forecast to decrease slightly due to a downward trend in the number of power generation companies.

In the Optical Storage field, demand for playback-only equipment for game consoles is on a downward trend, and overall shipments are forecast to decline slightly.

For the optoelectronics industry as a whole, both total shipments and domestic production are forecast to remain unchanged.



#1 Cabinet Office：National Accounts for 2022／Fiscal 2024 Economic Outlook (Jan. 26, 2024[Cabinet Decision])

#2 JEITA: Production Forecasts for the Global Electronics and Information Technology Industries, Dec., 2023

Fig.1 Total Optoelectronics Shipment, Nominal GDP, and Domestic & Overseas Electronics Production

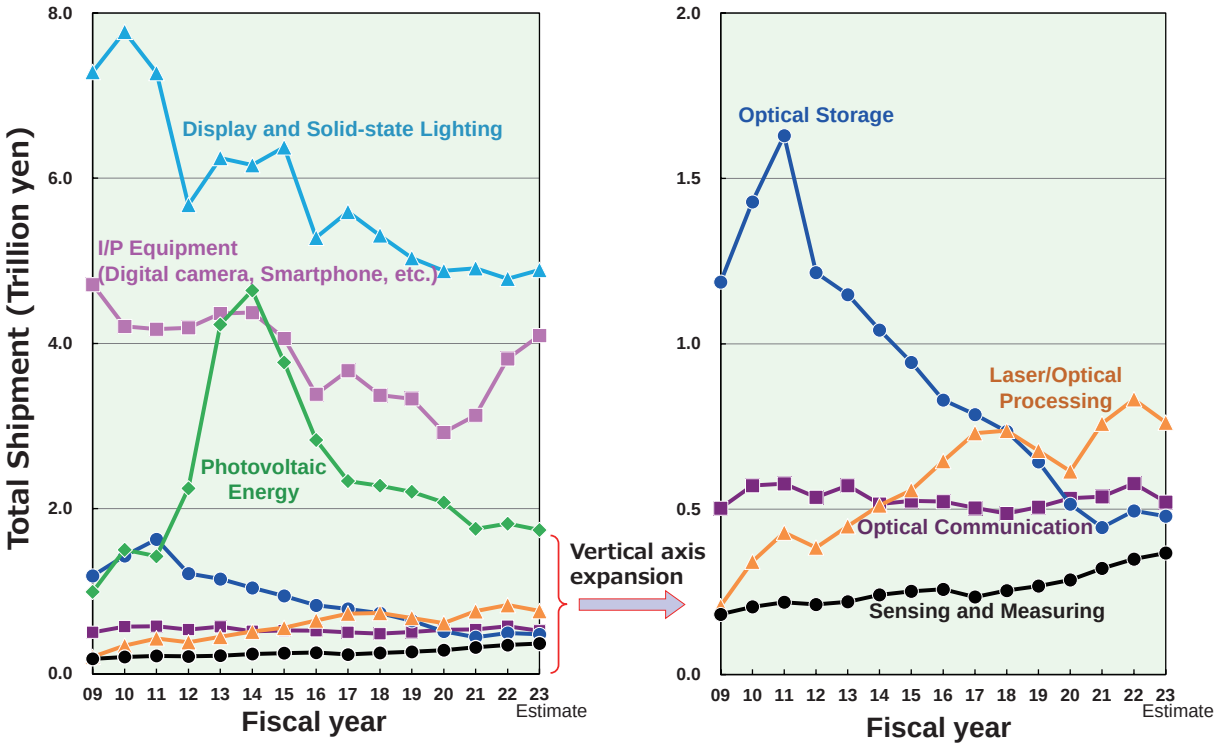
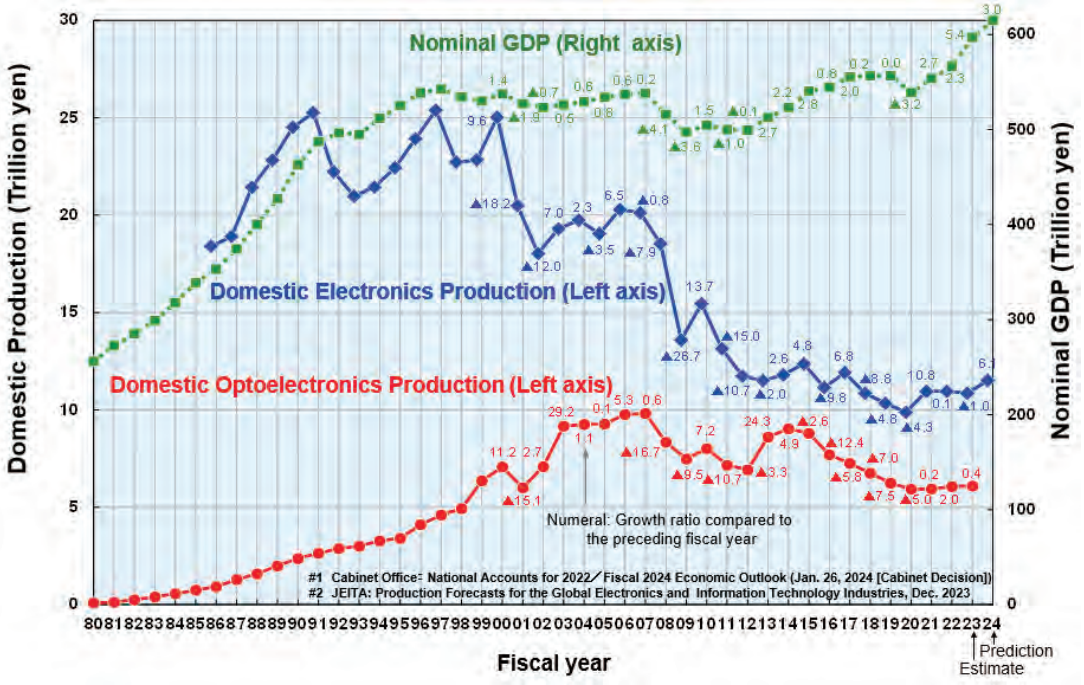


Fig.2 Shipment by Product Field

[Note] The data between FY2016 and FY2017 in the Sensing/Measuring field and the I/O field are shown by the dotted lines because surveillance Cameras and car-mounted cameras have been moved from the Sensing/Measuring field to the I/O field.



#1 Cabinet Office: National Accounts for 2022／Fiscal 2024 Economic Outlook (Jan. 26, 2024[Cabinet Decision])
#2 JEITA: Production Forecasts for the Global Electronics and Information Technology Industries, Dec., 2023

Fig.3 Domestic Optoelectronics Production, Nominal GDP, and Domestic Electronics Production

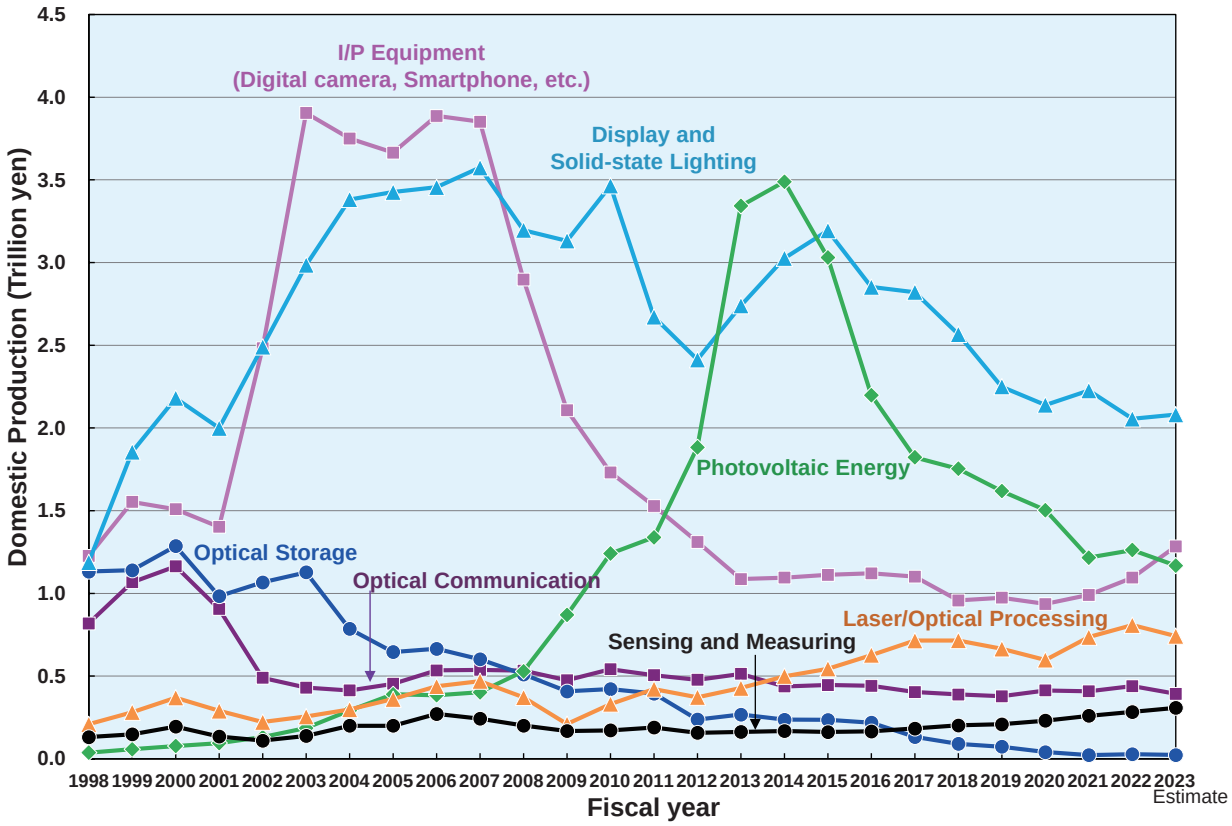


Fig.4 Domestic Optoelectronics Production by Product Field

Technological Strategy Development

1. Introduction

OITDA has been conducting optical technology roadmap development activities since FY1996 with the aim of determining the future development of the optoelectronics industry and directing research and development of optoelectronics technology.

These activities have contributed extensively to the development of the optoelectronics industry and technology as a foundation for the launch of many national projects in the fields of optical communications, optical storage, display, photovoltaic energy, and laser processing.

Since FY2016, rather than identifying how optoelectronics technology can contribute to each technological field, the goal of strategy formulation has been to draw up roadmaps focusing on contributions to specific application fields, with keywords including Automotive & Mobility, AI/IoT, Beyond 5G, Imaging & Sensing, Cyber-Physical Society, Visible Light Semiconductors, and Laser Technology.

In FY2023, a roadmap titled "Safety & Security Photonics" was formulated for the three areas of disaster prevention, crime prevention, and health in order to solve various problems facing modern society and realize appealing cities for 2040.

2. Optical Technology Roadmap

For sustainable human development, it is essential to research and develop technologies that ensure safety and security. As society and technology become more complex, it is now particularly necessary to establish a roadmap for safety and security technologies with a long-term perspective of 10 to 20 years. We have clarified the values required in cities people will want to live in by 2040, identified the challenges we will face in achieving these values, and specified the optoelectronics technologies necessary to overcome these challenges, summarizing them in a roadmap.

2.1 Elemental Technologies

The threats to human safety and security are diverse, and the photonics technologies required to counter them are similarly varied. We have focused on the most important challenges and the technology developments that can potentially address them.

We classified these technological areas into three categories: disaster prevention, crime prevention, and health, and reconsidered them within a unified framework.

1. Disaster Prevention: Measures to protect people's lives and property from natural disasters and accidents.
   <Elemental Technologies>
   - Airborne laser surveying technology and Doppler LIDAR for weather observation
   - Laser acoustic inspection of structures
   - Wide-area monitoring from space
   - Gravity potential monitoring using optical lattice clocks

2. Crime Prevention: Measures to protect people from human threats.
   <Elemental Technologies>
   - Quantum Cryptographic Communications
   - Terahertz (THz) Imaging Devices
   - Mid-infrared light sources for toxic gas detection/Detectors
   - Infrared (IR) image sensors

3. Health: Aiming to protect health and prevent diseases that threaten human survival.
   <Elemental Technologies>
   - Health monitoring (THz imaging, IR imaging)
   - Sterilization using ultraviolet light sources

Through these efforts, we aim to create a society that provides both physical safety and peace of mind.

2.2 Application areas

(1) Visualization of Weather Conditions

For the social implementation of air mobility, there is an urgent need to develop and widely deploy wind measurement LIDAR technology. Development needs to aim at device miniaturization, weight reduction, and cost reduction. Ultimately, development efforts should pursue a compact and lightweight wind measurement LIDAR using high-power light sources, making it possible to mount the technology on air mobility craft themselves, thereby enhancing safety and operational efficiency.

(2) Structural Monitoring

Laser acoustic technology and neutron defect visualization technology need to be developed to accurately confirm the safety of aging social infrastructure while reducing maintenance costs. Practical use of laser acoustic devices on self-driving cars and drones, as well as truck-mounted laser-driven neutron sources, are anticipated by around 2040. This will require policies to enable more detailed neutron radiography measurements.

(3) Disaster Monitoring from Space

Improving disaster monitoring using space technology requires the building of satellite constellations to achieve high-frequency Earth observation. Additionally, high-precision 3D maps are indispensable during disasters, necessitating advancements in laser altimetry technology and the construction of 3D maps with 40 cm resolution. Efforts should be made to map disaster-prone areas using constellations of satellites equipped with hyperspectral sensors and achieve real-time wide-area observation using geostationary satellites.

(4) Detection of Gravity Changes

Gravity change detection technology can provide clues to reveal earthquake precursors and changes in underground structures by capturing subtle changes in the gravitational field caused by Earth's mass distribution and motion. The development of highly accurate optical lattice clock technology is anticipated for this purpose. The accuracy of gravity change detection technology using optical lattice clocks needs to be improved so that it evolves to a level capable of detecting height displacements of millimeters (19 digits) rather than centimeters (18 digits). Additionally, the portability and miniaturization of optical lattice clocks must be advanced to enable real-time monitoring of crustal movements through a nationwide gravity potential sensing network.

(5) Absolutely Secure Optical Communication

For absolutely secure optical communication technology, the focus will be on developing three main technologies: direct transmission quantum cryptography for use within and between cities, twin-field quantum cryptography, and long-distance quantum cryptography. For direct transmission quantum cryptography, efforts will be made to extend communication distances and improve communication speeds by developing highly efficient photon detectors with low dark count rates, such as superconducting nanowire single-photon detectors, and high-precision single-photon sources. For twin-field quantum cryptography, development will focus on long-distance optical interference technology and phase synchronization technology. For long-distance quantum cryptography, it is necessary to enhance the performance of quantum relay technology and material quantum memory for sharing quantum entanglement.

(6) Visualization of Threats to Safety

Visualization technologies for threats to safety include terahertz imaging technology, mid-infrared laser and detector technology, and uncooled infrared sensor technology, each contributing to counterterrorism, industrial safety enhancement, night surveillance, and body temperature screening. For terahertz imaging technology, efforts should be made to develop efficient security systems by promoting the use of multiple heterodyne detectors and the development of superconducting detectors. For mid-infrared laser and detector technology, the development of tunable QCL performance and mid-infrared SC light sources should be advanced to enhance the simultaneous multi-component analysis capability for toxic gases. In uncooled infrared sensor technology, efforts should be made to miniaturize pixel pitch and improve cost efficiency through innovations in pixel structure and the development of new materials.

(7) Non-contact Vital Monitoring Technology

As preventive medicine becomes more crucial, there is increasing demand for non-contact technology to monitor vital signs such as body temperature, respiratory rate, pulse, and blood pressure in real time on a daily basis. Infrared sensors and THz wave technology can be highlighted for this purpose. For non-contact vital monitoring using infrared sensors, efforts should be made to promote miniaturization by reducing sensor pixel pitch and developing new pixel structures, and to improve temperature resolution by utilizing spectral information, thus requiring the development of technology to add spectral functionality to infrared sensors. For non-contact vital monitoring using THz wave technology, it is necessary to advance research and development of beam steering technology to achieve high-precision non-contact measurement of pulse waves.

(8) Sterilization and Virus Inactivation

There is a growing need for safe and effective spatial sterilization using optical technology. Research and development should be promoted to utilize UV-C (especially 200 nm – 280 nm) and Far UV-C (200 nm – 230 nm). Far UV-C LED products are expected to reach the market around 2030, and low-cost and high-power improvements are anticipated to lead to their widespread use by 2040.

2.3 Conclusion

(1) Diversity of Technologies and Impact on Society

Events threatening human safety and security (disasters, crime, health issues) are diverse, and the optoelectronics technologies needed to counter them (encryption, threat detection, imaging, sterilization, etc.) are similarly diverse. Fortunately, laser and photonics technologies are highly multifunctional, and it is becoming increasingly important to further utilize these diverse functions and promote their diverse applications.

(2) Deepening of Seed Technologies

Advances in optical technology have expanded the range of wavelengths available to humanity and ventured into new areas. By utilizing new wavelengths of light, from deep ultraviolet to terahertz waves, it is possible to address unresolved challenges, from sterilization to sensing.

(3) Integration of Hardware and Software

Advancements in hardware technology, particularly in multi-pixelization and multi-spectralization, have led to an increase in the types and volumes of data handled in the imaging and sensing fields. As the volume of data to be handled is expected to increase, the integration of advanced hardware technology with corresponding software technology is essential to transform this vast amount of data into meaningful information and support quick and effective decision-making.

In other words, the fusion of hardware and software will be the key to the development and application of next-generation safe and secure photonics.

Standardization

1. Introduction

Standardization efforts have been an important part of OITDA's activities since its establishment, and OITDA has promoted the standardization of optoelectronics in a wide range of fields. The scope of standardization extends beyond the optical transmission field to include a number of fiber optics applications and laser fields. The Optoelectronics Industry Technology Standardization Committee is active in not only domestic standards (JIS), but also international standards such as IEC and ISO. In addition, OITDA has established or revised OITDA standards and OITDA/TP (technical documents) as a supplement to obsolete JIS standards and as materials for international proposals, and is committed to standardization that responds to the changing industrial structure and is thoroughly examined by the subcommittees in each field.

The following is an overview of these subcommittees' activities.

2. Fiber Optics Standardization Committee

The Fiber Optics Standardization Committee was established to lead standardization activities for fiber optics and is responsible for the planning and promotion of such activities under the Optoelectronics Industry Technology Standardization Committee. Below this, two subcommittees have been established to carry out activities: the Administrative Advisory Subcommittee and the Intra-Building Optical Wiring Subcommittee.

In FY2023, we focused on addressing problems and formulating strategies in JIS and international standardization. In addition, for OITDA standards and OITDA/TP (technical documents), which were considered and introduced by this committee to complement JIS and international standards, the OITDA Standards Documentation Manual was revised and further developed to promote standardization.

2.1 Administrative Advisory Subcommittee

For the purpose of international standard proposals and JIS backup, we are actively promoting enactment/revision of OITDA standards and OITDA/TP (technical documents), which are group standards. In addition, we continue to identify problems and study improvement measures for efficient standardization drafting. Moreover, OITDA also examines issues common to the standardization subcommittee in each area of expertise and coordinates with other organizations.

2.2 Intra-Building Optical Wiring Subcommittee

The committee is working on standardization of optical wiring systems that enable residents or providers of single-family houses, apartment buildings, and commercial buildings to use high-speed broadband data and video services. Specifically, it disseminates and provides information on FTTH optical wiring in buildings and related technological trends, and prepares materials for this purpose.

3. Optical Fiber Standardization Committee

The committee is working to harmonize international standards related to optical fiber with various IEC and ITU-T test methods and product standards and is reviewing JIS in accordance with the status of establishment and revision of international standards. In addition, the committee conducts research and studies to accurately ascertain the situation in Japan and overseas and to respond to new technologies so that no opportunity is missed to review and revise JIS drafts as necessary.

4. Optical Connector Standardization Committee

Communication networks ranging from backbone, metro, and access networks to data center systems are expected to grow in scale and capacity. It is thus necessary to ensure and guarantee interoperability between manufacturers of the same product types, and standardization to this end is of great significance. Based on the WTO/TBT agreement that came into effect in 1995, the committee is promoting the harmonization of JIS with corresponding IEC standards, which are international standards for optical connectors.

5. Passive Optical Device Standardization Committee

The committee prepares new JIS drafts and revised drafts of existing JIS standards for optical passive components, conducts surveys and studies on general rules, test and measurement methods, and individual JIS standards for passive optical components, and investigates trends in international standardization.

6. Active Optical Device Standardization Committee

Relevant JIS standards are being developed based on the principle of adopting a system of standards that is consistent with the IEC approach. The IEC is currently developing standards for active optical components with a view to the development of new optical transmission systems such as WDM-PON, digital coherent transmission, ultrahigh-speed LAN, and spatial multiplexing optical transmission, etc. In addition to the standardization of individual components, the IEC is also developing package standards and performance standards for analog optical transceivers for mobile fronthaul and photonic integrated circuits (PICs) as integrated functional devices. We are proceeding with our activities while collecting information on these issues.

7. Optical Amplifier and Dynamic Module Standardization Committee

Following the IEC decision to merge TC 86/SC 86C/WG 3 and WG 5, the Optical Amplifier and Dynamic Module Standardization Committee was established by merging the Optical Amplifier Standardization Committee and the Dynamic Module Technical Subcommittee of the Fiber Optics Standardization Committee. The main activities of the committee are (1) to prepare JIS draft translations while taking into consideration the IEC standardization deliberations and national circumstances, and (2) to keep abreast of international standardization trends and make proposals as appropriate via the domestic committees.

8. Optical Subsystem Standardization Committee

IEC/TC 86/SC 86C/WG 1 deals with standardization of the physical layer of optical communication systems and subsystems, and work is proceeding on establishing design guidelines for optical systems and standardizing test methods for optical systems (systems in general, digital systems, optical cabling equipment, and optical links). The committee has been supporting standardization in SC 86C/WG 1 and has been working on JIS standardization of published IEC standards highly needed in Japan. In addition, in order to promote more active proposals to the IEC regarding technologies in which Japan is making progress, the committee is supporting the survey of new technologies and the preparation of contributing documents.

9. Optical Measuring Instruments Standardization Committee

The committee is working on JIS revision of test methods for optical attenuators for measurement, test methods for optical reflection attenuators, calibration methods for optical power meters for optical fiber, and test methods for light sources for optical fiber.

10. TC 76/Laser Safety Standardization Committee

In order to strengthen activities relating to IEC/TC 76/WG 5 (Laser safety in optical communications), a Technical Subcommittee on Optical Communications has been established under the TC 76/Laser Safety Standardization Committee. In addition, deliberations on IEC 62471-1

are conducted by JTC5 (JTC with IEC and CIE), those on IEC 62471-7 by JWG21 (JWG with IEC TC34), those on JWG10 and JWG12, which deliberate on joint standards with the ISO, by the corresponding national committees of the ISO, and those related to optical fiber communications by IEC/ TC 86/JAHG 10.

10.1 JIS C 6802 Subcommittee

This committee is revising JIS C 6802: Safety of laser products.

11. ISO/TC 172/SC 9 Standardization Committee

Regarding the deliberation of ISO documents, in FY2023 the committee discussed the documents circulated by each ISO working group and proposed Japanese opinions. In addition, with regard to efforts for ISO/TC 172/SC 9 international meetings, we participated in the annual meeting of SC 9 (held remotely) with experts to reflect Japanese opinions on the draft international standards.

12. Optical Disk Standardization Committee

The Optical Disk Standardization Committee specializes in the standardization of optical-disk-related technologies, and its main activities include the drafting of domestic standards and research and study of related technology trends. It has established two subcommittees to carry out its activities: the Optical Disk Media Subcommittee and the Optical Disk Format Subcommittee.

12.1 Optical Disk Media Subcommittee

This subcommittee conducts research and study activities related to standardization of physical format standards, application standards, and reliability evaluation standards for magneto-optical, phase-change, write-only, and read-only optical disks.

12.2 Optical Disk Format Subcommittee

This subcommittee conducts research and studies on optical disk volume and file formats.

13. Fiber Optic Sensors Standardization Committee

This committee was established as a subcommittee under the former Fiber Optics Standardization Committee to serve as a mirror committee of IEC/TC 86/SC 86C/WG 2, and to reflect Japanese opinions in the development of international standards and actively disseminate Japanese technologies as international standards. It became an independent committee in FY2022. In FY2023, the committee is working on the establishment of two JIS standards following the publication in the Official Gazette of JIS C 61757: Fiber optic sensors—Generic specification.

14. International Standardization Proposal Committee on Optical Interoperability of Connectors for Multicore Fibers

The practical application of space division multiplexing (SDM) technology to increase transmission capacity is an urgent issue in order to meet the ever-growing demand for telecommunications. MCF connectors are indispensable to realize this system. At the same time, standardization of optical compatibility is also required, entailing an interface necessary to guarantee performance when optical connectors from multiple manufacturers are interconnected for use in optical networks. Therefore, the committee aims to expand the market worldwide in the future through the prompt diffusion of new technologies for optical connectors for MCFs, which are under development in Japan. This three-year project, which began in FY2021, will involve the committee making technical presentations at IEC meetings for the international standardization of optical connectors for MCFs, and preparing draft international standards for optical compatibility of optical connectors for MCFs.

15. International Standardization Committee on Optical Fiber Sensors for Improving Infrastructure Resilience

Optical fiber sensing is becoming an important technology for monitoring the condition of aging infrastructure and minimizing damage from increasingly frequent and severe natural disasters. Distributed strain sensors, which provide continuous strain information along optical fibers installed in infrastructure or in the ground, and optical voltage sensors, which are installed in power transmission infrastructure to locate damage such as short circuits and ground faults, are particularly important categories of optical fiber sensors for these purposes. The IEC/TCA is a member of the IEC/TCA. In FY2023, this committee started a three-year project in IEC/TC 86/SC 86C/WG2 to establish an international standard for methods of testing these optical fiber sensors.

Educational and Public Relations Activities

1. FY 2023 Symposium on Optoelectronics Industry and Technology

The FY2023 Symposium on Optoelectronics Industry and Technology was held at the Rihga Royal Hotel Tokyo on Friday, February 16, 2024. The event was jointly sponsored by OITDA and the Photonics Electronics Technology Research Association (PETRA), with support from METI. Under the theme of "Safety and Security Photonics," six important presentations were given as shown in Table 4. with around 180 participants.

2. 10th Technology Symposium on Electronics and Photonics

The 10th Technology Symposium on Electronics and Photonics was held under the theme of "Electronics and Photonics Processing and Informatics" on Monday, December 18, 2023, at Akihabara UDX Conference Hall, Tokyo. Approximately 130 people attended. Twelve presentations were made, and lively discussions took place.

FY 2023 Symposium on Optoelectronics Industry and Technology Lecture Venue Scene

The 10th Technology Symposium on Electronics and Photonics - Lecture Venue Scene

3. interOpto

The cutting-edge optical technology exhibition, interOpto, was held over three days from Wednesday, May 31 to Friday, June 2 at Tokyo Big Sight. This exhibition was supported and sponsored by numerous organizations, including METI.

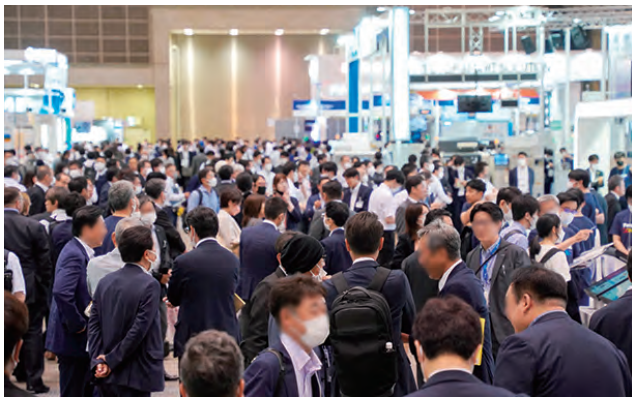
Following the pattern of the previous year, the 2023 interOpto was held as part of the "Total Solution Exhibition for Electronic Equipment 2023" centered around the JPCA Show, under the theme "Optics & Next-Generation Application Network Systems Exhibition." In all, 12 exhibitions were held concurrently, including Imaging Japan related to optical technology, the JPCA Show—a comprehensive exhibition for electronic devices and manufacturing equipment—Smart Sensing, and Edge Computing.

In their entirety, the concurrent exhibitions occupied East Halls 2 to 6 at Tokyo Big Sight, attracting 48,018 visitors over the three-day period, a significant increase from the previous year's 27,972 attendees.

Within the exhibition halls, interOpto featured its customary "Special

Table 4　FY 2023 Symposium on Optoelectronics Industry and Technology

10:00 ～ 10:05	Opening Remarks	Mr. Yasuhisa Odani President / Vice Chairman, OITDA
10:05 ～ 10:15	Guest Greeting	Mr. Hisashi Kanazashi Director, IT Industry Division, Commerce and Information Policy Bureau, METI
10:15 ～ 11:15	Keynote Speech: The present and future of Nano satellites with optical technology	Dr. Yoshihide Aoyanagi Associate Professor Headquarters for Innovative Society-Academia Cooperation University of Fukui
11:15 ～ 12:00	Evolution of biometric technology and value creation ～ The future of a safe and secure society using face recognition ～	Dr. Hitoshi Imaoka Fellow NEC Corporation
13:00 ～ 14:00	Safety and Security Photonics	Dr. Takasumi Tanabe Professor of Electronics & Electrical Engineering, Faculty of Science and Technology, Keio University
14:00 ～ 14:45	Improving endoscopic imaging through advances in optical technology -	Mr. Yuji Kamo Manager Research and Development, Optical Engineering OLYMPUS MEDICAL SYSTEMS CORP.
15:00 ～ 15:45	Low-power-consumption optical transceiver technology for high-performance distributed computing system	Dr. Shinsuke Tanaka Photonics Electronics Technology Research Association (PETRA)
15:45 ～ 16:30	Innovative research and development for beyond 10 Tbps optical transceiver - Integrated optical isolator -	Dr. Yuya Shoji Associate Professor Laboratory for Future Interdisciplinary Research of Science and Technology, Institute of Innovative Research Tokyo Institute of Technology
16:35 ～ 17:00	The Award Ceremony of 39th Kenjiro Sakurai Memorial Prize	



Exhibition Zone for Notable Optoelectronics Technologies," where nine organizations recommended by the Optoelectronics Technology Trend Research Committee showcased their technologies and products with support from the association. Additionally, these organizations promoted their innovations at presentations on their technologies and products at the seminar venue within the exhibition.

The OITDA booth displayed photos and panels providing an overview of the optoelectronics industry and technology. The booth particularly focused on research and studies related to the optoelectronics industry and technology, featuring various survey reports and distributing technical information reports free of charge. This effort was part of the association's activities to share the latest information on the optoelectronics industry and technology.

Moreover, on Wednesday, May 31, an OITDA seminar was held under the theme "Optoelectronics and Laser Technology Contributing to Industry Advancement and Miniaturization." The seminar included five lectures on future optical and laser technologies, with speakers invited from EPIC (Europe) and OPTICA (USA) to discuss the situation in their regions. A total of 210 participants attended the seminar.

4. 39th Kenjiro Sakurai Memorial Prize

The winner of the Kenjiro Sakurai Memorial Prize for FY2023 was selected from among six nominations for achievements since FY2013 that have played a pioneering role in the optoelectronics industry and technology. The prize was awarded to Shigeki Takeuchi of Kyoto University for "Pioneering Researches on Photonic Quantum Sensing using Quantum Entangled Light."

The Kenjiro Sakurai Memorial Prize was established to honor the late Kenjiro Sakurai, a director of OITDA, for his contributions to the promotion of the optoelectronics industry, and to promote and raise awareness of the optoelectronics industry and technology.

The reasons for the award are as follows.

Professor Takeuchi has been engaged in research on quantum technology, a field that has been attracting attention in recent years. His particular focus is new optical quantum sensing technology using quantum entangled light, and he has been involved in research in this field since it first began. In quantum optical coherent tomography (QOCT), he succeeded in observing quantum photon interference fringes with the world's highest resolution of 0.54 μm by broadening the spectrum of quantum light source.

Awardees of the 39th Kenjiro Sakurai Memorial Prize
Dr. Shigeki Takeuchi

More recently, he has made remarkable achievements in the development of quantum infrared spectroscopy, which enables infrared spectroscopy with a silicon detector for the visible region. As mentioned above, Professor Takeuchi has achieved outstanding results in quantum technology, especially in the new field of optical quantum sensing using quantum entangled light, and has been a leader in research and development in Japan and abroad.

He is expected to contribute greatly to the development of Japan's optoelectronics industry by further strengthening collaboration with industry, and we believe that his achievements are worthy of this prize.

The award ceremony for Professor Takeuchi was held at the RIHGA Royal Hotel Tokyo on February 16, 2024, following the 2023 Symposium on Optoelectronics Industry and Technology at the same venue.

After a report on the selection process adopted by the Kenjiro Sakurai Memorial Prize Committee, delivered by Chair Yasuhiko Arakawa (Professor Emeritus, University of Tokyo), the award certificates, medals, and supplementary prizes were handed to the winner. Professor Takeuchi then made a speech of thanks, and the award ceremony came to a close.

Supporting Members

(As of March 31, 2024)

[Construction]

Kajima Corporation

[Chemistry]

Dexerials Corporation

Fujifilm Corporation

Mitsubishi Chemical Holdings Corporation

Nissan Chemical Corporation

Shin-Etsu Chemical Co., Ltd.

Sumitomo Bakelite Co., Ltd.

Tokyo Ohka Kogyo Co., Ltd.

[Glass & Ceramics]

AGC Inc.

Corning International K.K.

Nippon Sheet Glass Co., Ltd.

Sumitomo Osaka Cement Co., Ltd.

Toyo Glass Co., Ltd.

[Electric Wire & Cable]

Fujikura Ltd.

Fujikura Dia Cable Ltd.

Furukawa Electric Co., Ltd.

Sumitomo Electric Industries, Ltd.

SWCC Corporation

[Machine]

Daikin Industries, Ltd.

[Electronics & Electronic Appliances]

AIO Core Co., Ltd.

Anritsu Corporation

Asahi Kasei Microdevices Corporation

CIG Photonics Japan Limited

Fujitsu Limited

Hakusan, Inc.

Hamamatsu Photonics K.K.

Hitachi, Ltd.

Honda Tsushin Kogyo Co.,Ltd.

Huawei Technologies Japan K.K.

Japan Aviation Electronics Industry, Ltd.

Kyocera Corporation

Lumentum Japan, Inc.

Mitsubishi Electric Corporation

NEC Corporation

NTT Electronics Corporation

Oki Electric Industry Co., Ltd.

Panasonic Holdings Corporation

Pioneer Corporation

Santec Holdings Corporation

SANWA Technologies, Inc.

Seiko Epson Corporation

Seiwa Electric Mfg. Co., Ltd.

Sharp Corporation

Sony Group Corporation

Taiyo Yuden Co., Ltd.

Toshiba Corporation

Ushio Inc.

Yokogawa Electric Corporation

[Precision Instrument]

Konica Minolta, Inc.

Nikon Corporation

Olympus Corporation

Ricoh Company, Ltd.

Seikoh Giken Co., Ltd.

Sigma Koki Co., Ltd.

Suruga Seiki Co., Ltd.

Topcon Corporation

[Commercial & Advertisement]

JTB Communication Design, Inc.

Marubun Corporation

The Optronics Co., Ltd.

[Electric Power]

Central Research Institute of Electric Power Industry

[Other Manufacturing]

Dai Nippon Printing Co., Ltd.

Natsume Optical Corporation

Optoquest Co., Ltd.

Orbray Co., Ltd.

[Others]

Institute for Laser Technology

Japan Optomechatronics Association

Japan Science Foundation

KDDI Research, Inc.

Nippon Telegraph and Telephone Corporation

NTT Advanced Technology Corporation

Photonics Electronics Technology Research Association (PETRA)

TOYOTA Central Research and Development Labs., Inc.

UL Japan, Inc.

Yazaki Corporation

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