Annual Technical Report 2025

FY2025 OITDA

Optoelectronics Industry and Technology Development Association

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Message from OITDA

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We are pleased to present here a technical information report summarizing the surveys and R&D activities conducted by OITDA in FY2025.

First, let us look at the overall trends in the optoelectronics industry from the FY2025 survey. The total shipment value of the optoelectronics industry increased from +0.4% in FY2024 to +1.3% in FY2025, totaling 12,641 billion yen, while the domestic production value increased from +0.3% in FY2024 to +2.5% in FY2025, totaling 6,107 billion yen. As for the total shipment, the Imaging/Printing field, including image sensors, surveillance and vehicle-mounted cameras, and mirrorless single-lens digital cameras, increases for 5 consecutive years, resulting in +3.7% for FY2025. The Sensing/Measurement field has also increased by +6.1% and has grown for the 8th year in a row. The Optical Communications field has increased +19.3% along with investment of the data center infrastructure for generative AI demand increase.

Next, I would like to introduce some items of special note for FY2025

We established a special committee under the Technology Strategy Development Committee to create a “Technology Roadmap for Information Processing Photonics" in anticipation of demand for new applications. This roadmap aims at AI data center, physical AI, and optical quantum computing. The results of these were presented at the Symposium on the Optoelectronics Industry and Technology held on February 24, 2026.

In the area of standardization, we promoted 3 projects commissioned by the Ministry of Economy, Trade and Industry (METI) and actively participated in international standardization by the IEC, ISO, and in various forums, including ISO/ TC 172/SC 9 and IEC/ TC 76, in which we serve as the domestic secretariat.

OITDA is promoting the development of R&D and commercialization strategies, including the above-mentioned technologies, as the cornerstone of industry-academia-government collaboration related to optoelectronic industrial technology.

We are also implementing projects in FY2025 on key issues related to optoelectronic industrial technology. These issues include surveys and research, promotion of technological development, and promotion of standardization. Under the direction of METI and other government agencies, we are committed to enhancing and strengthening our business activities to meet the needs of our members, with the cooperation and understanding of many people in industry, including supporting members, and academia, an important partner.

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

Optoelectronics Industry Trends

1. Introduction

OITDA has been conducting the "Trend Survey of the Optoelectronics Industry" annually since its establishment in 1980. The accumulated survey data spanning over 40 years is widely recognized as a fundamental resource for understanding trends within the Japanese optoelectronics industry. We have now compiled the results of the FY2025 survey.

The survey was carried out by six specialized subcommittees for each product field. For total shipments and domestic production, the FY2025 estimates were compiled together with the FY2024 actual results. In addition, a qualitative survey was conducted for the FY2026 outlook.

2. Total Shipments and Domestic Production for the Optoelectronics Industry

2.1 Survey Method

A comprehensive questionnaire survey was conducted targeting domestic companies engaged in the production of optoelectronics-related products, including optical equipment/systems, and components. This survey focused on total shipments (encompassing overseas production) and domestic production for the FY2024 (actual), FY2025 (estimate), and FY2026 (qualitative prediction). A total of 239 companies was approached in October 2025, with data collection occurring between December 2025 and February 2026, resulting in responses from 70 companies.

A quantitative survey regarding forecasts for the subsequent fiscal year was conducted until FY2010; Then, the methodology was revised to a qualitative survey starting in FY2011 and continuing in subsequent years due to the lowering accuracy. This approach involved evaluations based on a five-level scale: increase, slight increase, flat, slight decrease, and decrease, in comparison to the previous year.

We have secured collaboration with the Japan Photovoltaic Energy Association (JPEA) in the Photovoltaic field, the Japan Lighting Manufacturers Association (JLMA) in the Solid-state Lighting field, the Japan Electronics and Information Technology Industries Association (JEITA) in the Display field, and the Camera & Imaging Products Association (CIPA) in the Imaging/Printing field.

In accordance with the findings of the survey, we have aggregated the total shipments and domestic production for the optoelectronics industry in Japan. This comprehensive analysis was conducted by specialized subcommittees for each product category, which performed rigorous data validity assessments and analyzed industrial trends. Furthermore, the Optoelectronics Industry Trends Investigation Committee has undertaken a thorough review of the data and the results of the analysis to ensure their accuracy and reliability.

In the context of the survey, we have categorized the optoelectronics industry, along with pertinent optoelectronics equipment/ systems and components, into the following six distinct fields:

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. Imaging/Printing:	Optical printers, multifunction printers, cameras (digital cameras, digital video cameras, surveillance cameras, car-mounted cameras), camera-equipped cell phones, image sensors, optical disc equipment (read-only, recordable), optical disc media, laser diodes, etc.
3. Display/Solid-state Lighting:	Flat panel display devices and equipment, projectors, solid-state lighting devices and equipment, LEDs (for lighting and displays), etc.
4. Photovoltaic Energy:	Photovoltaic power generation systems, photovoltaic cells and modules
5. Laser/Optical Processing:	Laser/optical processing equipment, lamp/LD lithography, additive manufacturing (3D printers), laser oscillators
6. Sensing/ Measurement:	Optical sensing equipment, optical measurement instruments

2.2 Overview of Survey Results of Total Shipments

Table 1 presents the total shipments for FY2024 (actual), FY2025 (estimate), and FY 2026 (prediction).

Figures 1 and 2 illustrate the changes in the total shipment value of the optoelectronics industry and the trends within each field. Additionally, Figure 1 depicts the nominal GDP and production levels of the electronics industry in Japan, facilitating a comparison of the changes in the scale of the optoelectronics industry against those of the Japanese economy and other sectors.

●FY2024(actual): 12.474 trillion yen, growth rate: 0.4%

In FY2024, the total shipments for the optoelectronics industry reached 12.474 trillion yen (growth rate: 0.4%). This total comprises 8.377 trillion yen attributed to optoelectronics equipment/systems (growth rate: 0.3%; composition ratio: 67.2%) and 4.098 trillion yen for optical components (growth rate: 0.5%; composition ratio: 32.8%).

The breakdown of shipments by field is as follows:

500 billion yen for the Optical Communication field (growth rate: 1.1%; composition ratio: 4.0%), 4.662 trillion yen for the Imaging/ Printing field (growth rate: 4.2%; composition ratio: 37.4%), 4.328 trillion yen for the Display/Solid-state Lighting field (growth rate: -4.0%; composition ratio: 34.7%), 1.591 trillion yen for the Photovoltaic Energy field (growth rate: -2.3%; composition ratio: 12.8%), 849 billion yen for the Laser/Optical Processing field (growth rate: 7.7%; composition ratio: 6.8%), and finally, 473 billion yen for the Sensing and Measurement field (growth rate: 3.8%; composition ratio: 3.8%).

●FY 2025 (estimate): 12.641 trillion yen, growth rate: 1.3%

The total shipments for the optoelectronics industry in FY2025 amount to 12.641 trillion yen (growth rate: 1.3%). This total is comprised of 8.524 trillion yen allocated for optoelectronics equipment/systems (growth rate: 1.8%; composition ratio: 67.4%) and 4.117 trillion yen for optical components (growth rate: 0.5%; composition ratio: 32.60%).

Shipments by field are projected to reach 597 billion yen in the Optical Communication field (growth rate: 19.3%; composition ratio: 4.7%), 4.836 trillion yen for the Imaging/Printing field (growth rate: 3.7%; composition ratio: 38.3%), 4.183 trillion yen for the Display/Solid-state Lighting field (growth rate: -3.4%; composition ratio: 33.1%), 1.580 trillion yen for the Photovoltaic Energy field (growth rate: -0.7%; composition ratio: 12.5%), 872 billion yen for the Laser/Optical Processing field (growth rate: 2.7%; composition ratio: 6.9%), and 502 billion yen for the Sensing/Measurement field (growth rate: 6.1%; composition ratio: 4.0%).

●FY 2026 (prediction): slight increase

The total shipments of the optoelectronics industry in FY2026 are anticipated to experience a slight increase. The shipments for optical equipment/systems are projected to experience a slight increase, and optical components are also expected to show a slight increase.

The expectations for shipment values across all fields—including the Imaging/Printing field, the Laser/Optical Processing field, the Sensing and Measurement field, the Optical Communication field, the Photovoltaic Energy field, and the Display/Solid-state Lighting field—are slight increase.

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 2023 Shipment Actual		FY 2024 Shipment Actual		FY 2025 Shipment Estimate		FY 2026 Shipment Prediction
	(in 100 million yen)	Growth Rate(%)	(in 100 million yen)	Growth Rate(%)	(in 100 million yen)	Growth Rate(%)	
Optical Communications Field	4,946	▲ 14.4	5,000	1.1	5,966	19.3	little increase
Optical Transmission Equipment	1,867	▲ 6.9	1,518	▲ 18.7	1,772	16.7	flat
Truck Line and Metro Line	733	▲ 28.5	660	▲ 10.0	800	21.2	flat
Subscriber Line	609	17.8	419	▲ 31.2	466	11.2	flat
Router and Switch	332	26.2	290	▲ 12.7	306	5.5	flat
Optical Fiber Amplifier	193	▲ 4.0	149	▲ 22.8	200	34.2	increase
Optical Transmission Components	2,871	▲ 18.6	3,267	13.8	3,982	21.9	increase
Optical Transmission Link	271	▲ 24.9	219	▲ 19.2	225	2.7	flat
Light Emitting Device	656	▲ 15.8	764	16.5	944	23.6	increase
Photo Detectors	67	▲ 25.6	76	13.4	110	44.7	little increase
Optical Passive Component	168	▲ 18.8	196	16.7	236	20.4	little increase
Optical Circuit Component	135	▲ 35.7	161	19.3	164	1.9	flat
Optical Fiber	1,046	▲ 18.9	1,085	3.7	1,403	29.3	increase
Optical Connector	349	▲ 5.9	542	55.3	685	26.4	little increase
Others (Semiconductor Amplifying Device, etc.)	179	▲ 19.0	224	25.1	215	▲ 4.0	flat
Optical Fiber Fusion Splicer	208	▲ 13.3	215	3.4	212	▲ 1.4	flat
Imaging/Printing Field	44,715	3.8	46,616	4.2	48,361	3.7	little increase
Optical I/O Equipment	24,131	1.6	24,869	3.1	25,689	3.3	little increase
Optical Printer・Multifunction Printer	7,639	4.9	8,218	7.6	8,245	0.3	flat
Imaging equipment	10,553	6.3	11,602	9.9	12,267	5.7	little increase
Digital Camera, Digital Video Camera	8,413	5.4	9,339	11.0	9,915	6.2	little increase
Security camera, Car-mounted camera *	2,140	10.1	2,263	5.7	2,352	3.9	little increase
Camera Mobile Phone	5,316	▲ 10.1	4,442	▲ 16.4	4,547	2.4	little decrease
Others (Barcode Reader, Image Scanner, etc.)	623	▲ 1.3	607	▲ 2.6	630	3.8	little decrease
Image Sensor	16,282	13.1	18,177	11.6	20,095	10.6	little increase
Optical Disk	4,239	▲ 13.3	3,570	▲ 15.8	2,577	▲ 27.8	decrease
Equipment	4,093	▲ 13.1	3,433	▲ 16.1	2,445	▲ 28.8	decrease
Read-only (CD, DVD, BD)	2,833	▲ 12.5	2,367	▲ 16.4	1,683	▲ 28.9	decrease
Recordable	1,260	▲ 14.3	1,066	▲ 15.4	762	▲ 28.5	decrease
Media	146	▲ 18.4	137	▲ 6.2	132	▲ 3.6	little decrease
Laser Diode for Optical Disk	63	1.6	0	▲ 100.0	–	–	–
Display and Solid-state Lighting Field	45,080	▲ 4.8	43,280	▲ 4.0	41,828	▲ 3.4	little increase
Display Equipment	23,053	▲ 3.6	23,076	0.1	22,990	▲ 0.4	increase
Flat Panel Display	18,101	▲ 5.9	17,973	▲ 0.7	17,636	▲ 1.9	flat
Large-scale LED Display	188	5.6	196	4.3	202	3.1	little increase
Projector	4,764	6.0	4,907	3.0	5,152	5.0	little increase
Display Device	10,824	▲ 16.0	9,154	▲ 15.4	7,105	▲ 22.4	decrease
Solid-state Lighting	7,649	4.1	7,632	▲ 0.2	8,212	7.6	increase
LED Device	7,224	4.3	7,229	0.1	7,787	7.7	increase
LED Lamp	425	1.7	403	▲ 5.2	425	5.5	increase
LED	3,554	10.1	3,418	▲ 3.8	3,521	3.0	increase
Photovoltaic Energy Field	16,278	▲ 10.5	15,906	▲ 2.3	15,796	▲ 0.7	little increase
Photovoltaic Power System	10,750	▲ 11.6	10,592	▲ 1.5	11,067	4.5	little increase
Photovoltaic Cell/Module	5,528	▲ 8.3	5,314	▲ 3.9	4,729	▲ 11.0	little increase
Laser/Optical Processing Field	7,877	▲ 11.0	8,486	7.7	8,715	2.7	little increase
Laser and Optical Processing Equipment	7,082	▲ 9.7	7,565	6.8	7,701	1.8	little increase
CO_2 Laser	449	▲ 45.4	457	1.8	727	59.1	little increase
Solid State Laser	755	▲ 0.3	991	31.3	977	▲ 1.4	little increase
Fiber Laser	763	2.4	769	0.8	830	7.9	little increase
Semiconductor Laser Direct Processing Equipment	28	0.0	30	7.1	30	0.0	flat
Excimer Laser	2,498	29.9	1,458	▲ 41.6	1,325	▲ 9.1	little increase
Lamp/LD Exposure Machine	2,464	▲ 28.7	3,687	49.6	3,634	▲ 1.4	little increase
Additive Manufacturing (3D Printer)	125	13.6	173	38.4	178	2.9	little increase
Oscillator	795	▲ 21.1	921	15.8	1,014	10.1	little increase
Optical Sensing and Measurement Field	4,557	9.2	4,732	3.8	5,019	6.1	little increase
Optical Sensing Equipment	4,417	9.9	4,547	2.9	4,821	6.0	little increase
Optical Measuring Instrument	140	▲ 9.7	185	32.1	198	7.0	increase
Others Field	849	▲ 18.7	724	▲ 14.7	728	0.6	little decrease

Product Items	FY 2023 Shipment Actual		FY 2024 Shipment Actual		FY 2025 Shipment Estimate		FY 2026 Shipment Prediction
	(in 100 million yen)	Growth Rate(%)	(in 100 million yen)	Growth Rate(%)	(in 100 million yen)	Growth Rate(%)	
Sub Total for Optoelectronics Equipment/Systems	83,536	▲ 3.2	83,769	0.3	85,239	1.8	little increase
Sub Total for Optoelectronics Components	40,766	▲ 3.3	40,975	0.5	41,174	0.5	little increase
Total for Optoelectronics Products	124,302	▲ 3.3	124,744	0.4	126,413	1.3	little increase

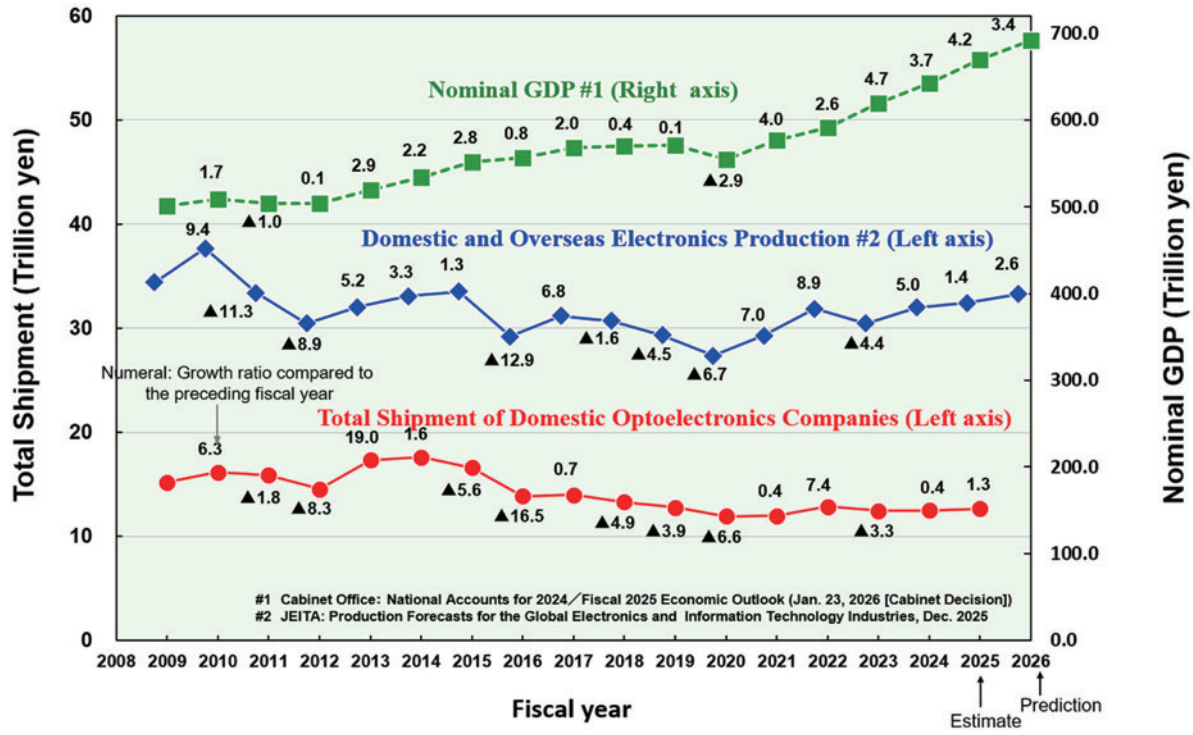

Fig.1 Total Optoelectronics Shipment, Nominal GDP, and Domestic & Overseas Electronics Production

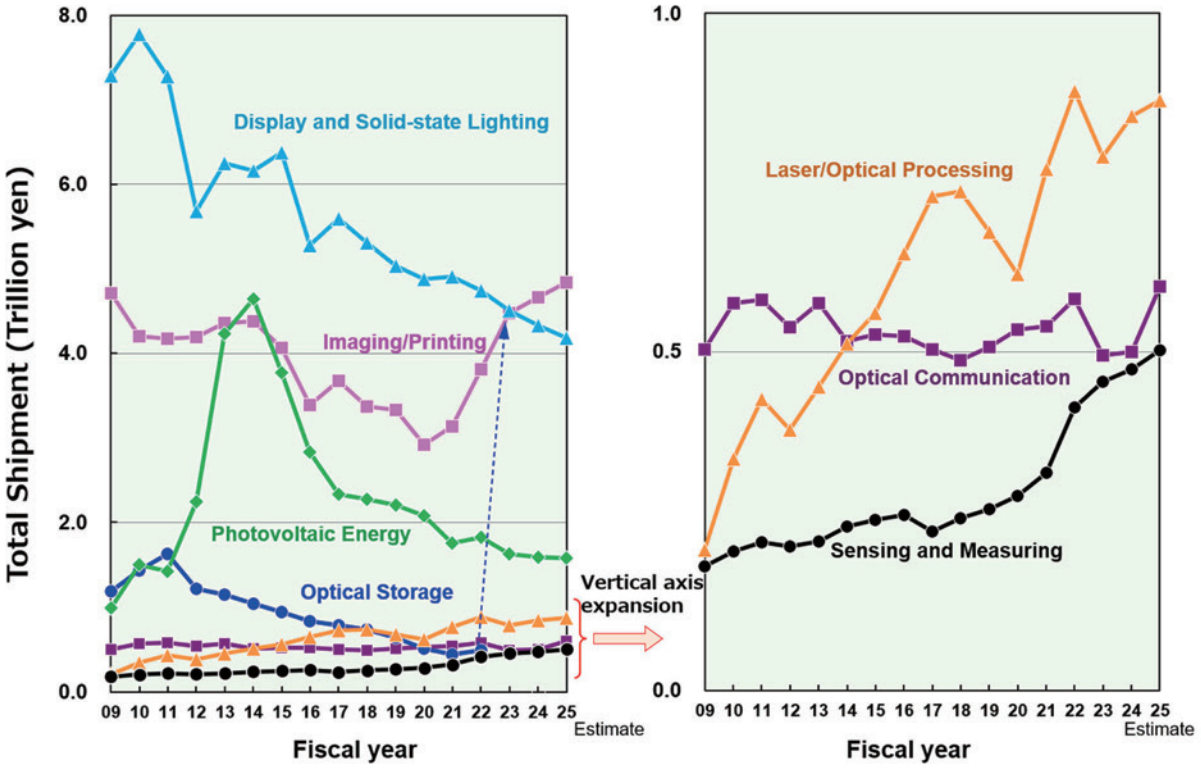

Fig.2 Shipment by Product Field

2.3 Overview of Survey Results of Domestic Production

Table 2 presents the Domestic Production for FY2024 (actual), FY2025 (estimate), and FY2026 (prediction).

Figures 3 and 4 illustrate the variations in the domestic production value of the optoelectronics industry and the changes categorized by field. Figure 3 depicts the nominal GDP alongside the electronics industry production in Japan, facilitating a comparison of the optoelectronics industry's scale with that of the Japanese economy and other sectors.

●FY 2024 (actual): 5.956 trillion yen, growth rate: 0.3%

In FY2024, the domestic production of the optoelectronics industry was 5.956 trillion yen (growth rate: 0.3%). This total comprises 3.562 trillion yen attributed to optoelectronics equipment/systems (growth rate: -0.1%; composition ratio: 59.8%) and 2.394 trillion yen for optical components (growth rate: 0.8%; composition ratio: 40.2%).

Domestic production segmented by field includes 382 billion yen for the Optical Communication field (growth rate: 1.0%; composition ratio: 6.4%), 1.421 trillion yen for the Imaging/Printing field (growth rate: 9.7%; composition ratio: 23.9%), 1.835 trillion yen for the Display/Solid-state Lighting field (growth rate: -7.3%; composition ratio: 30.8%), 1.082 trillion yen for the Photovoltaic Energy field (growth rate: -1.8%; composition ratio: 18.2%), 818 billion yen for the Laser/Optical Processing field (growth rate: 7.7%; composition ratio: 13.7%), and 353 billion yen for the Sensing/Measurement field (growth rate: 2.1%; composition ratio: 5.9%).

●FY 2025 (estimate): 6.107 trillion yen, growth rate: 2.5%

For FY2025, the domestic production of the optoelectronics industry is projected to reach 6.107 trillion yen (growth rate: 2.5%). This total comprises 3.732 trillion yen attributed to optoelectronics equipment/systems (growth rate: 4.8%; composition ratio: 61.1%) and 2.375 trillion yen for optical components (growth rate: -0.8%; composition ratio: 38.9%).

Domestic production segmented by field is anticipated to be 465 billion yen for the Optical Communication field (growth rate: 21.7%; composition ratio: 7.6%), 1.520 trillion yen for the Imaging/Printing field (growth rate: 6.9%; composition ratio: 24.9%), 1.713 trillion yen for the Display/Solid-state Lighting field (growth rate: -6.7%; composition ratio: 28.0%), 1.125 trillion yen for the Photovoltaic Energy field (growth rate: 4.0%; composition ratio: 18.4%), 841 billion yen for the Laser/Optical Processing field (growth rate: 2.8%; composition ratio: 13.8%), and 378 billion yen for the Sensing/Measurement field (growth rate: 7.2%; composition ratio: 6.2%)

●FY 2026 (prediction): slight increase

The domestic production of the optoelectronics industry in FY2026 is anticipated to experience a slight increase. Similarly, the production of optical equipment/systems is projected to show a slight increase, and optical components are also expected to experience a slight increase.

The forecasts for production values are as follows:

A slight increase is expected in the Optical Communication field, the Imaging/Printing field, the Photovoltaic Energy field, the Laser/Optical Processing field, and the Sensing and Measurement field; stability is anticipated in the Display/Solid-state Lighting field.

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 2023 Shipment Actual		FY 2024 Shipment Actual		FY 2025 Shipment Estimate		FY 2026 Shipment Prediction
	(in 100 million yen)	Growth Rate(%)	(in 100 million yen)	Growth Rate(%)	(in 100 million yen)	Growth Rate(%)	
Optical Communications Field	3,781	▲ 13.9	3,820	1.0	4,648	21.7	little increase
Optical Transmission Equipment	1,629	▲ 7.3	1,305	▲ 19.9	1,544	18.3	flat
Truck Line and Metro Line	698	▲ 29.6	646	▲ 7.4	772	19.5	flat
Subscriber Line	605	28.7	412	▲ 31.9	459	11.4	flat
Router and Switch	163	30.4	121	▲ 25.8	144	19.0	flat
Optical Fiber Amplifier	163	▲ 5.2	126	▲ 22.7	169	34.1	increase
Optical Transmission Components	1,952	▲ 18.4	2,307	18.2	2,898	25.6	increase
Optical Transmission Link	100	▲ 44.8	106	6.0	131	23.6	flat
Light Emitting Device	361	▲ 2.7	433	19.9	533	23.1	increase
Photo Detectors	36	2.9	36	0.0	55	52.8	little increase
Optical Passive Component	118	▲ 20.8	143	21.2	169	18.2	little increase
Optical Circuit Component	75	▲ 49.7	71	▲ 5.3	74	4.2	flat
Optical Fiber	870	▲ 20.5	924	6.2	1,243	34.5	increase
Optical Connector	237	▲ 4.4	404	70.5	522	29.2	little increase
Others (Semiconductor Amplifying Device, etc.)	155	▲ 6.1	190	22.6	171	▲ 10.0	little decrease
Optical Fiber Fusion Splicer	200	▲ 16.7	208	4.0	206	▲ 1.0	flat
Imaging/Printing Field	12,952	15.3	14,211	9.7	15,198	6.9	little increase
Optical I/O Equipment	3,522	▲ 15.4	3,822	8.5	3,912	2.4	little increase
Optical Printer・Multifunction Printer	816	▲ 13.0	1,042	27.7	1,078	3.5	flat
Imaging equipment	2,506	4.9	2,590	3.4	2,636	1.8	little increase
Digital Camera, Digital Video Camera	1,908	6.1	1,954	2.4	1,990	1.8	little increase
Car-mounted camera, Security camera *	598	1.4	636	6.4	646	1.6	flat
Camera Mobile Phone	0	▲ 100.0	–	–	–	–	–
Others (Barcode Reader, Image Scanner, etc.)	200	▲ 15.6	190	▲ 5.0	198	4.2	flat
Image Sensor	9,228	35.8	10,259	11.2	11,169	8.9	little increase
Optical Disk	180	▲ 21.4	130	▲ 27.8	117	▲ 10.0	little decrease
Laser Diode	22	▲ 4.3	0	▲ 100.0	–	–	–
Display and Solid-state Lighting Field	19,787	▲ 3.4	18,348	▲ 7.3	17,127	▲ 6.7	flat
Display Equipment	3,771	10.1	3,458	▲ 8.3	3,567	3.2	little increase
Flat Panel Display	3,455	9.6	3,132	▲ 9.3	3,228	3.1	little increase
Large-scale LED Display	188	5.6	196	4.3	202	3.1	little increase
Projector	128	32.0	130	1.6	137	5.4	little increase
Display Device	8,351	▲ 16.6	7,252	▲ 13.2	5,392	▲ 25.6	decrease
Solid-state Lighting	5,345	6.3	5,305	▲ 0.7	5,711	7.7	increase
LED Device	5,272	6.4	5,236	▲ 0.7	5,641	7.7	increase
LED Lamp	73	▲ 3.9	69	▲ 5.5	70	1.4	flat
LED	2,320	14.3	2,333	0.6	2,457	5.3	increase
Photovoltaic Energy Field	11,021	▲ 12.7	10,820	▲ 1.8	11,249	4.0	little increase
Photovoltaic Power System	10,701	▲ 11.9	10,564	▲ 1.3	11,042	4.5	little increase
Photovoltaic Cell/Module	320	▲ 33.1	256	▲ 20.0	207	▲ 19.1	flat
Laser/Optical Processing Field	7,592	▲ 9.5	8,177	7.7	8,410	2.8	little increase
Laser and Optical Processing Equipment	6,831	▲ 7.8	7,294	6.8	7,434	1.9	little increase
CO_2 Laser	449	▲ 45.4	456	1.6	727	59.4	little increase
Solid State Laser	734	0.4	963	31.2	959	▲ 0.4	little increase
Fiber Laser	625	5.6	652	4.3	708	8.6	little increase
Semiconductor Laser Direct Processing Equipment	28	0.0	30	7.1	30	0.0	flat
Excimer Laser	2,462	28.4	1,358	▲ 44.8	1,225	▲ 9.8	little increase
Lamp/LD Exposure Machine	2,464	▲ 24.3	3,687	49.6	3,634	▲ 1.4	little increase
Additive Manufacturing (3D Printer)	69	13.1	148	114.5	151	2.0	little increase
Oscillator	761	▲ 22.2	883	16.0	976	10.5	little increase
Optical Sensing and Measurement Field	3,457	9.6	3,530	2.1	3,784	7.2	little increase
Optical Sensing Equipment	3,335	10.7	3,356	0.6	3,599	7.2	little increase
Optical Measuring Instrument	122	▲ 12.9	174	42.6	185	6.3	increase
Others Field	786	▲ 18.5	650	▲ 17.3	653	0.5	little decrease

Product Items	FY 2023 Shipment Actual		FY 2024 Shipment Actual		FY 2025 Shipment Estimate		FY 2026 Shipment Prediction
	(in 100 million yen)	Growth Rate(%)	(in 100 million yen)	Growth Rate(%)	(in 100 million yen)	Growth Rate(%)	
Sub Total for Optoelectronics Equipment/Systems	35,636	▲ 5.1	35,616	▲ 0.1	37,317	4.8	little increase
Sub Total for Optoelectronics Components	23,740	0.3	23,940	0.8	23,752	▲ 0.8	little increase
Total for Optoelectronics Products	59,376	▲ 3.0	59,556	0.3	61,069	2.5	little increase

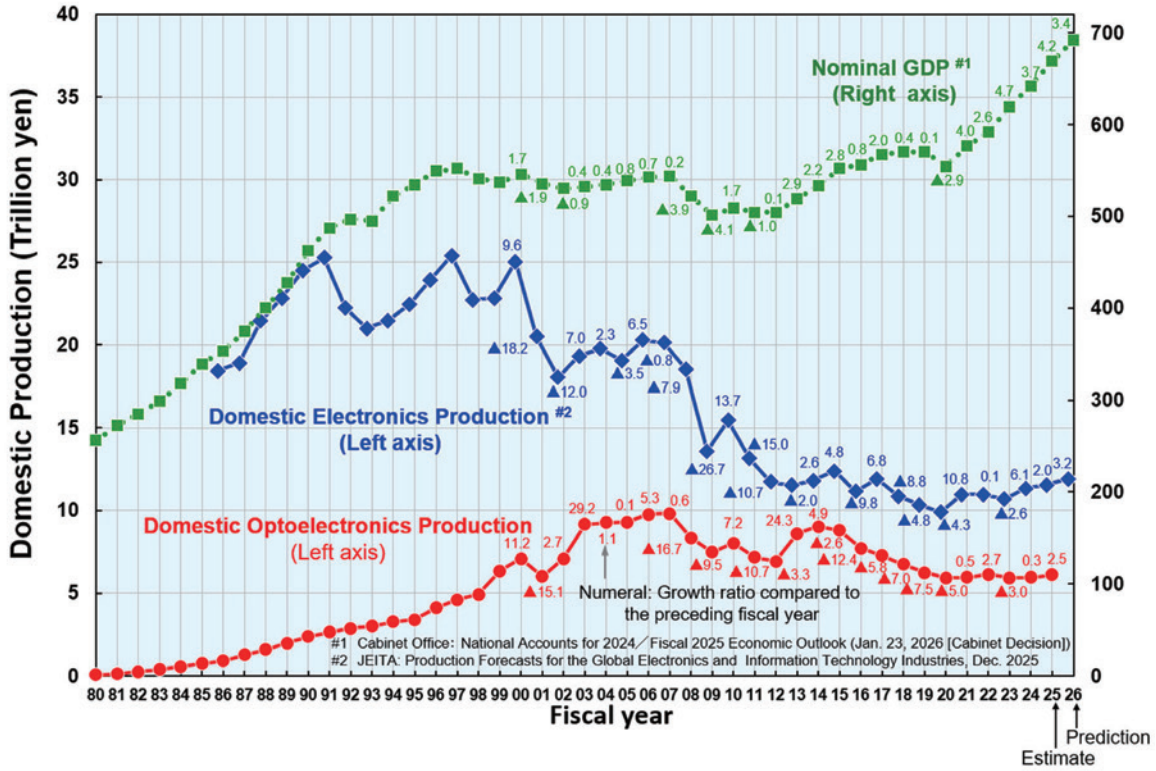

Fig.3 Domestic Optoelectronics Production, Nominal GDP, and Domestic Electronics Production

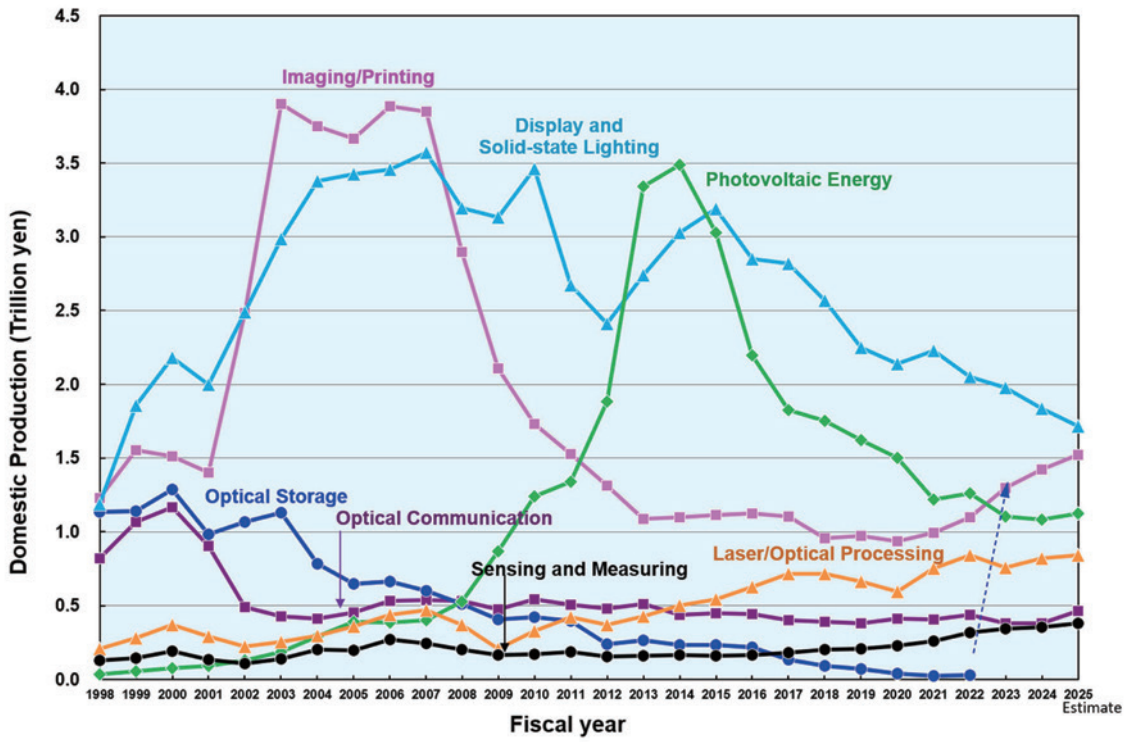

Fig.4 Domestic Optoelectronics Production by Product Field

2.4 Trend in Optoelectronics Industry

This presents a comprehensive summary of the survey results spanning three consecutive years, from FY2024 to FY2026.

●FY2024 (actual)

In the Imaging/Printing field, total shipments and domestic production experienced an increase driven by growing demand for digital cameras due to enhanced functionality and increased video recording, as well as a significant rise in demand for image sensors, including those for smartphones and in-vehicle cameras.

In the Laser/Optical Processing field, although excimer lasers declined significantly due to a reactionary drop from the previous fiscal year, lamps/LD exposure machines increased substantially driven by expanding demand for generative AI, resulting in an increase in both total shipments and domestic production.

In the Sensing and Measurement field, total shipments and domestic production saw a slight increase owing to continued capital investments in semiconductors and factory automation.

In the Optical Communication field, although optical transmission components such as optical connectors increased significantly due to rising data center investments driven by expanding generative AI demand, capital investment in optical transmission equipment/systems declined substantially, resulting in flat total shipments and domestic production.

In the Photovoltaic Energy field, total shipments and domestic production experienced a slight decrease due to the lack of growth in new business developments.

In the Display/Solid-state Lighting field, a decline in televisions and display elements led to a decrease in total shipments and domestic production.

Overall, the optoelectronics industry remained stable in both total shipments and domestic production.

●FY 2025 (estimate)

In the Optical Communication field, increased investment in data center infrastructure driven by the expanding demand for generative AI is expected to lead to a substantial rise in optical fibers, optical connectors, light-emitting/receiving devices, and passive optical components. In addition, the deployment of equipment exceeding 400 Gb/s is accelerating, resulting in a significant increase in optical transmission equipment/systems and contributing to a substantial rise in both total shipments and domestic production.

In the Imaging/Printing field, demand for digital cameras is projected to increase due to enhanced functionality and increased video recording. Furthermore, a significant rise in demand for image sensors, including those for smartphones and in-vehicle cameras, is expected to drive an increase in both total shipments and domestic production.

In the Sensing and Measurement field, increased capital investment in semiconductors and factory automation, along with rising demand for mobility applications, is expected to result in an increase in both total shipments and domestic production.

In the Laser/Optical Processing field, continued capital investment in printed circuit boards for generative AI servers and increased demand for PCB drilling are expected to lead to a slight increase in both total shipments and domestic production.

In the Photovoltaic Energy field, although system demand shows an increasing trend due to policy support, declines in modules are expected to offset this growth, resulting in stable total shipments and domestic production.

In the Display/Solid-state Lighting field, while car navigation systems, projectors, and LED lighting fixtures are expected to perform well, declines in televisions are projected to result in a slight decrease in both total shipments and domestic production overall.

In the optoelectronics industry as a whole, both total shipments and domestic production are expected to experience a slight increase.

●FY 2026 (prediction)

In the Imaging/Printing field, total shipments are projected to experience a slight increase, driven by continued demand for image sensors and sustained interest in imaging equipment such as digital cameras.

In the Display/Solid-state Lighting field, although televisions and display elements are expected to decline, increasing demand for car navigation systems, projectors, and LED lighting fixtures is projected to result in a slight increase in total shipments, while domestic production is expected to remain stable.

In the Photovoltaic Energy field, demand is anticipated to increase due to the government policy support, leading to a slight increase in both total shipments and domestic production.

In the Laser/Optical Processing field, both total shipments and domestic production are projected to rise slightly, supported by continued capital investment in semiconductor-related industries.

In the Optical Communication field, ongoing capital investment in data centers driven by expanding generative AI demand is expected to result in a slight increase in both total shipments and domestic production.

In the Sensing and Measurement field, both total shipments and domestic production are projected to increase slightly due to continued capital investment.

Overall, the optoelectronics industry is expected to experience a slight increase in both total shipments and domestic production.

Technological Strategy Development

1. Introduction

Since FY1996, OITDA has promoted the Photonics Technology Roadmap initiative to identify future directions for the optical industry and guide photonics R&D. Since FY2016, the roadmap has focused on specific application domains and clarified how photonics technologies can contribute to solving societal challenges. In FY2025, considering the rapid advancement of generative AI, accelerated social deployment, and the resulting increase in AI data center power consumption, the roadmap was developed under the theme of **"Information Processing Photonics."**

2. Photonics Technology Roadmap

The emergence of AI agents and Physical AI is driving explosive growth in computing and communication demand. Conventional electronics alone can no longer simultaneously achieve higher performance and lower power consumption. Toward the 2040s, optical interconnects, optical switches, optical interposers, optical processors, and photonic quantum computers will become increasingly important.

2.1 Vision for Information Processing Systems in the 2040s

Generative AI, based on deep learning, is rapidly evolving and becoming embedded in daily lives. Japan's declining working-age population will require a society in which humans, AI, and robots coexist. Physical AI will perform physical tasks, while AI agents will assist decision making. Future platforms will require deeper integration of cyber and physical systems. Because power consumption will increase dramatically, optical-electrical hybrid infrastructures emphasizing energy efficiency and resilience are expected to become the foundation of society in the 2040s.

Demand for data center computation is projected to grow from several thousand times to as much as one million times the 2025 level. Even under realistic assumptions, approximately 3,500-fold growth is expected. Package-level I/O bandwidth requirements are projected to reach 3.2 Pbps by 2040. Electrical wiring will face distance and power limitations, making optical connectivity and Co-Packaged Optics (CPO) essential.

2.2 Overview of the Information Processing Photonics Roadmap

The roadmap organizes key technologies required for future information processing systems, including data-center optical I/O, Physical AI, and new-computing paradigms. It establishes performance targets for the present day, the 2030s, and the 2040s.

(1) Co-Packaged Optics (CPO)

AI data centers require dramatic increases in computing performance and network bandwidth. CPO architectures place optical engines near GPUs and switch ASICs. Key development directions include higher-efficiency external laser sources, low-power modulators based on silicon photonics, thin-film lithium niobate (TFLN), EO polymers, reduced DSP dependence, and advanced receiver integration. By 2040, CPO is expected to deliver more than 200 Tbps throughput with sub-pJ/bit energy efficiency and become the standard data-center optical I/O architecture.

(2) Optical Switches

Future data centers will require highly scalable, energy-efficient networking. Optical switches eliminate optical-electrical-optical conversion and offer significant advantages in power consumption, latency, and cost. Important development areas include loss reduction, SOA integration, hybrid EPS/OCS control, multi-band and WDM operation, and integration with optical interposers. Switch capacities are projected to reach 0.5 Pbps by 2030 and 8 Pbps by 2040.

(3) Optical Interposers

Optical interposers provide optical routing between photonic integrated circuits (PICs) and fiber-array units (FAUs), overcoming distance limitations of electrical links in CPO systems. Low-loss materials such as SiN and glass, ultra-low-loss optical coupling, and large-scale waveguide integration are key requirements. Optical interposers are expected to become a core technology supporting AI-era ultra-high-capacity networks.

(4) Physical AI

Physical AI supports autonomous vehicles and robots operating in real environments. By 2040, vehicle SoCs may require approximately 5,000 TOPS processing capability. Optical interconnects will be essential because of electromagnetic-noise immunity, high bandwidth, and low latency. Key targets include 100 Gbps transmission, 2 pJ/bit energy efficiency, operation from -40° C to 125° C, and reliability below 1 FIT. Quantum-dot lasers are regarded as promising due to superior high-temperature characteristics and long-term reliability.

(5) New Computing Paradigms

(5.1) Optical Processors

Optical computing uses photons as the information carrier and performs matrix operations using optical interference and diffraction. Optical neural networks based on Mach-Zehnder Interferometer arrays are a leading approach. Critical challenges include low-power phase shifters, efficient optoelectronic conversion, non-linear devices, and receiver-less photodetection. Future systems are expected to exceed 100,000 TOPS with large-scale integration and co-packaged architectures.

(5.2) Photonic Quantum Computers

Photonic quantum computing leverages quantum superposition and entanglement and is considered highly scalable due to room-temperature operation and compatibility with optical communications technology. Major architectures include time-domain multiplexed measurement-based quantum computing and Gaussian Boson Sampling. Key technologies include quantum light sources, detectors, and low-loss photonic circuits. Long-term goals include squeezed-light sources exceeding 20 dB and 1 THz bandwidth, ultra-bright single-photon sources, detector efficiencies above 99%, and photonic networks supporting up to 10^8 qubits.

2.3 Summary, Challenges, and Recommended Actions

By the 2040s, generative AI, AI agents, and Physical AI will become essential social infrastructure, leading to explosive growth in computing and communication demand. Optical technologies will be indispensable for overcoming limitations in power consumption, bandwidth, packaging density, and reliability.

CPO, optical switches, and optical interposers will form the core of future information-processing infrastructure. Physical AI applications will require highly reliable optical devices capable of high-temperature operation. Optical processors and photonic quantum computers will complement or eventually replace the limitations of conventional electronic computing.

To achieve these goals, cross-disciplinary R&D, heterogeneous integration, advanced packaging, integrated manufacturing capabilities, standardization, workforce development, and long-term collaboration among industry, academia, and government will be essential. Information Processing Photonics is expected to become a foundational technology for a sustainable and globally competitive digital society in the 2040s.

Standardization

1. Introduction

Since its establishment, OITDA has promoted standardization in the field of optoelectronics. The scope covers optical transmission, fiber-optic applications, laser safety, and optical discs. In addition to Japanese Industrial Standards (JIS) activities, OITDA participates in international standardization through ISO, IEC, IEEE, and other organizations. Standardization efforts are also advanced through the establishment and revision of own OITDA standards and technical reports in response to changes in industrial structures.

In FY2025, the following three international standardization projects were commissioned by Mitsubishi Research Institute:

- Optical sensors for improving infrastructure resilience
- Fan-In/Fan-Out (FIFO) devices for Spatial Division Multiplexing (SDM) systems
- Building-Integrated Photovoltaics (BIPV)

In addition, standardization activities were promoted through the public JIS draft development program. In FY2025, 7 new standards and 16 revisions were announced, while drafts for additional new and revised standards are being prepared.

2. IEC/TC 76 Laser Safety Standardization Committee

This committee is responsible for IEC standards and JIS adoption related to laser product safety. In FY2025, members attended international meetings in France and discussed standards covering laser classification, safety requirements, medical laser equipment, optical communication systems, and protective equipment. A specialized committee was also established to revise JIS C 6804 in line with IEC revisions.

3. ISO/TC 172/SC 9 Domestic Committee

This committee reviews ISO standards related to lasers and electro-optical systems, consolidates national opinions, and supports JIS adoption. In FY2025, it participated in international meetings and deliberations on numerous standards concerning laser test methods, terminology, safety, medical applications, and optical components. A dedicated committee was also established to promote JIS adoption of the ISO 11146 series on laser beam quality measurements.

4. International Standardization of Optical Sensors for Infrastructure Resilience (“R Project”)

International standardization of optical fiber sensing technologies was promoted in response to aging infrastructure and natural disasters. Distributed strain sensors and optical voltage sensors are areas in which Japan has strong expertise. Four committee meetings were held in FY2025, experts were dispatched to international conferences, and an IEC standard on distributed strain sensing was published. Activities to maintain and promote optical voltage sensor standards also continued.

Future efforts will focus on wider adoption of optical fiber sensing technologies for disaster prevention and infrastructure monitoring, as well as dissemination of the established international standards.

5. International Standardization of FIFO Devices for SDM Systems (“FI Project”)

Established in FY2025, this committee promotes international standardization of Fan-In/Fan-Out devices for multicore fiber transmission systems that enable next-generation high-capacity optical communications. Four committee meetings were conducted to investigate technology and market trends and to prepare draft standards. Surveys of major conferences such as OFC and ECOC confirmed the importance of multicore fiber technology. Domestic manufacturer surveys and sample evaluations also verified the validity of inter-channel crosstalk measurement methods.

Future work will continue evaluations and further develop international standardization proposals.

6. International Standardization of Building-Integrated Photovoltaics (BIPV) (“PV Project”)

As part of renewable energy deployment toward carbon neutrality, international standardization of BIPV-related technologies is being promoted. This project began in FY2025 as a two-year initiative.

The following themes were addressed in FY2025:

- Performance evaluation of snow-melting photovoltaic systems
- Requirements for building glass with integrated solar cells
- Evaluation methods for solar heat gain coefficient of BIPV
- Safety of snow-melting photovoltaic modules

For each theme, participation in international meetings and preparation of draft standards were advanced, supporting consensus building and publication of international standards. Efforts to promote BIPV deployment and international standardization will continue.

Educational and Public Relations Activities

OITDA advanced Japan's optoelectronics and photonics industries through workforce development, public outreach, technical information sharing, and international communications.

FY 2025 Symposium on Optoelectronics Industry and Technology

The FY2025 Symposium on Optoelectronics Industry and Technology, co-hosted with the Photonics Electronics Technology Research Association (PETRA) and supported by the Ministry of Economy, Trade and Industry (METI), was held on February 24, 2026, at the Rihga Royal Hotel Tokyo. Under the theme "Information-Processing Photonics: A Future in Which Light Accelerates AI," the symposium drew approximately 230 participants from member companies, PETRA, related organizations, and the broader photonics community.

Opening remarks emphasized that generative AI and advanced semiconductors are sharply increasing the need for computing performance and energy efficiency, making optical technologies strategically important. METI reaffirmed its support for strengthening Japan's industrial base in semiconductors, AI, photonics, and photonics-electronics convergence.

Keynote and invited presentations covered device R&D for NTT's IOWN initiative; optical quantum computing at room temperature; a 2040 roadmap for information-processing photonics; and the combination of approximate computing with photonic computing. Speakers positioned compact, low-power, high-throughput optical interconnects and photonic devices as critical enablers for AI data centers, AI supercomputers, physical AI, and next-generation computing architectures.

Other two talks examined high-speed optical devices for AI/ML back-end networks and photonic streaming computation using integrated optical circuits. Topics included the transition from pluggable optical transceivers to co-packaged optics (CPO), high-speed electro-absorption modulator integrated lasers (EMLs), silicon photonic neural networks, optical differentiation and integration, and device technologies aimed at higher bandwidth, lower latency, and reduced power consumption.

41st Kenjiro Sakurai Memorial Prize (Sakurai Prize)

The 41st Kenjiro Sakurai Memorial Prize recognized two significant contributions to optoelectronics industry and technology. Hamamatsu Photonics K.K. was honored for the development and commercialization

Figure 5 FY 2025 Symposium on Optoelectronics Industry and Technology

Table 3 FY 2025 Symposium on Optoelectronics Industry and Technology program

	Opening Remarks	Mr. Yasuhisa Odani President and Vice Chairman, OITDA
1	Guest Greeting	Mr. Tomonari Nanbu Director, IT Industry Division Commerce and Information Policy Bureau METI
2	Device Research and Development Toward the IOWN Initiative	Dr. Takashi Saida Director, Device Innovation Center NTT Corporation
3	Research and industrial development of optical quantum computer	Dr. Warit Asavanant Director and CTO, OptQC Inc.
4	Information Processing Photonics Technology Roadmap	Dr. Mitsuru Takenaka Professor, Department of Electrical Engineering and Information Systems Graduate School of Engineering The University of Tokyo
5	Integrating Approximate Computing with Photonic Computing	Dr. Michihiro Koibuchi Professor and Deputy Director-General, Information Systems Architecture Science Research Division National Institute of Informatics (NII)
6	High-Speed Optical Devices for AI/ML Backend Networks	Dr. Nobuo Ohata Group Manager, Advanced Photonics Group Optical Technology Department Information Technology R&D Center Mitsubishi Electric Corporation
7	Optical streaming computing and signal processing using photonic integrated circuits	Dr. Cong Guangwei Leader, Optical Computing Research Team Photonics-Electronics Convergence Research Center National Institute of Advanced Industrial Science and Technology (AIST)
	The Award Ceremony of 41st Kenjiro Sakurai Memorial Prize	

Hamamatsu Photonics K.K.
Naoki Nozawa, Norio Fukuchi, Mikio Nagata, Yuichi Asaina

Furukawa Electric Co., Ltd.
Masanobu Wakaba, Junji Yoshida, Naoya Hojo, Hirokazu Ito

Figure 6　Recipients of the 41st Kenjiro Sakurai Memorial Prize

of high-performance liquid-crystal-on-silicon spatial light modulators (LCOS-SLMs). By improving thermal tolerance through optimized materials and internal device structures, the team enabled stable high-power laser beam control and expanded LCOS-SLM use in laser processing, additive manufacturing, and semiconductor wafer stealth dicing.

Furukawa Electric Co., Ltd. was recognized for developing and commercializing pump light sources for ultra-wideband Raman amplifiers with world-class optical output and very low drive power. The team's asymmetric multi-layer InGaAsP/InP waveguide laser enabled high-output, high-efficiency semiconductor pump lasers for fiber Raman amplification, supporting higher-capacity, higher-speed, and longer-reach optical networks from the S band through the C band and into the U band in spectral range.

The award ceremony followed the symposium. After Professor Emeritus Yasuhiko Arakawa of the University of Tokyo, the selection committee chairperson, reported on the selection process, certificates, medals, and supplementary prizes were presented to the recipients. Including this year's awards, the prize has reached 75 achievements and 190 individual recipients in total, underscoring its role in promoting innovation and public awareness in photonics and optoelectronics.

Supporting Members

(As of March 31, 2025)

[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.

Yamamoto Kogaku Co., Ltd

[Glass & Ceramics]

Corning International K.K.

Nippon Sheet Glass Co., Ltd.

Sumitomo Osaka Cement Co., Ltd.

Toyo Seikan Group Holdings, Ltd.

[Electric Wire & Cable]

Fujikura 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

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 Innovative Devices Corporation

Oki Electric Industry Co., Ltd.

Panasonic Projector & Display Corporation

Santec Holdings Corporation

SANWA Technologies, Inc.

Seiko Epson Corporation

Seiwa Electric Mfg. Co., Ltd.

Sony Group Corporation

Taiyo Yuden Co., Ltd.

Toshiba Corporation

Ushio Inc.

Yokogawa Electric Corporation

1Finity, Inc. / Fujitsu Limited

[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

Towa Laserfront Corporation

[Commercial & Advertisement]

Marubun Corporation

The Optronics Co., Ltd.

[Electric Power]

Central Research Institute of Electric Power Industry

[Other Manufacturing]

Dai Nippon Printing Co., Ltd.

Optoquest Co., Ltd.

Orbray Co., Ltd.

[Others]

Institute for Laser Technology

Japan Optomechatronics Association

Japan Science Foundation

NTT, Inc.

NTT Advanced Technology Corporation

Photonics Electronics Technology Research Association (PETRA)

UL Japan, Inc.

Yazaki Corporation

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