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No. 3723

Customer Inquiries

Media Inquiries

Semiconductor & Device Marketing Div. B
Mitsubishi Electric Corporation

Public Relations Division
Mitsubishi Electric Corporation

www.MitsubishiElectric.com/semiconductors/

prd.gnews@nk.MitsubishiElectric.co.jp
www.MitsubishiElectric.com/news/

Mitsubishi Electric to Ship Samples of 200Gbps PIN-PD Chip for Both 800Gbps and 1.6Tbps Optical-fiber Communication

Will increase speed and capacity of data-center communication

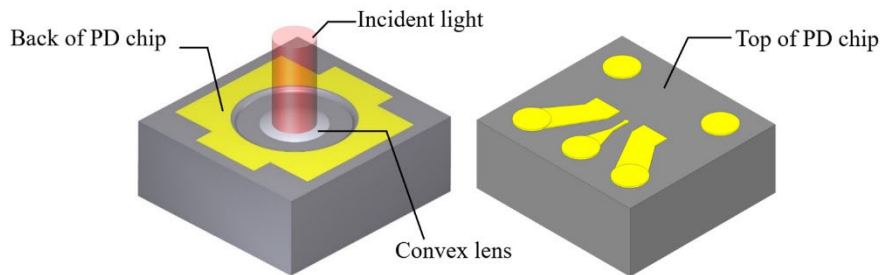


Illustration of 200Gbps PIN-PD chip for 800Gbps and 1.6Tbps optical-fiber communication

TOKYO, August 20, 2024 – [Mitsubishi Electric Corporation](https://www.mitsubishielectric.com) (TOKYO: 6503) announced today that it will begin shipping samples of its new 200Gbps PIN-photodiode (PD) chip for use in next-generation optical transceivers to support 800Gbps and 1.6Tbps fiber communication from October 1 this year. The addition of the new receiver chip to Mitsubishi Electric’s optical device lineup will enable existing devices capable of transmitting at 800Gbps/1.6Tbps to newly receive optical data at these same speeds, thereby expanding the communication capacity of optical transceivers, including for high-speed, high-capacity communication in data centers.

The upcoming introduction of the 200Gbps PIN-PD chip for optical reception follows Mitsubishi Electric’s launch of a mass-produced chip for optical transmission, the [200Gbps \(112Gbaud four-level pulse-amplitude modulation \[PAM4\]\) electro-absorption modulator laser diode \(EML\)](#), in April this year. Leveraging the company’s well-established expertise in optical devices, the newly announced PD chip was developed by minimizing the photoelectric conversion area within a chip structure that integrates backside illumination* and a convex lens.

Product Features

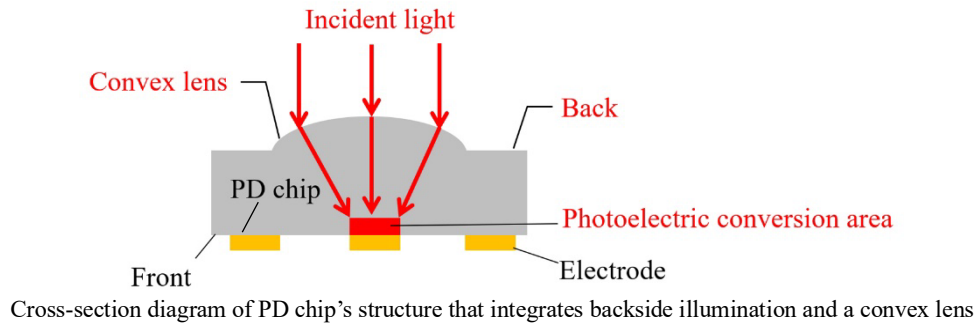
1) *Backside illumination and convex lens integrated for high-speed, high-capacity communication in data centers*

- The chip structure integrates backside illumination and a light-accumulating convex lens that minimizes the

* A structure in which the pin junction is on the front side of the semiconductor substrate, allowing incidental light to be received on the opposite (back) side.

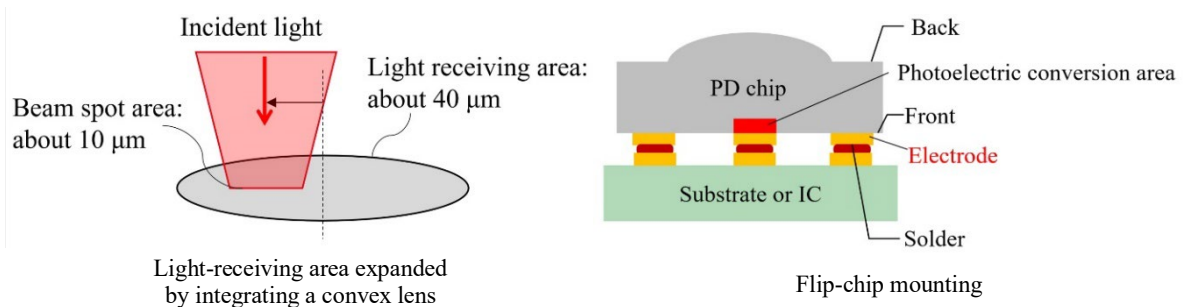
photoelectric conversion area, resulting in low capacitance to enable high-speed 200Gbps transmission (112Gbaud PAM4), twice that of conventional mainstream products (100Gbps).

- An optical transceiver equipped with four of these new PD chips achieves 800Gbps communication, and eight chips enable 1.6Tbps communication, which will contribute to high-speed, high-capacity data centers.



2) **Enables optical transceivers to be assembled more efficiently and manufactured at lower cost**

- The convex lens increases the light-receiving area by about four times compared to conventional structures, allowing the new PD chip to receive slightly off-center incident light. Eliminating the need for precise alignment of the incident light contributes to more efficient assembly of optical transceivers.
- The electrodes can be flip-chip mounted** on signal-amplification ICs and substrates, eliminating the wire connection process during assembly and reducing manufacturing costs.



Main Specifications

Model	PD7CP47
Application	200Gbps PIN-PD chip
Responsivity	0.60A/W (typ.)
3dB bandwidth	60GHz (typ.)
Dimensions	0.38×0.36×0.15mm (typ.)
Shipments	From October 1, 2024

The demand for high-speed, high-capacity networks is growing rapidly due to dramatically increasing data communication volume resulting from the proliferation of network-connected terminals, the expansion of high-resolution video streaming, and the popularization of generative AI technology. Especially in data centers, where the market is growing rapidly, communication speeds are shifting from 400Gbps to 800Gbps and even 1.6Tbps. While there are products capable of 800Gbps/1.6Tbps optical transmission, few products are also capable of reception at these speeds.

** A method of mounting a chip upside down on another component.

Environmental Awareness

This product is compliant with the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) directive 2011/65/EU and (EU) 2015/863.

Reference

For more information about Mitsubishi Electric's optical devices, please visit:

<https://www.MitsubishiElectric.com/semiconductors/opt/>

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About Mitsubishi Electric Corporation

With more than 100 years of experience in providing reliable, high-quality products, Mitsubishi Electric Corporation (TOKYO: 6503) is a recognized world leader in the manufacture, marketing and sales of electrical and electronic equipment used in information processing and communications, space development and satellite communications, consumer electronics, industrial technology, energy, transportation and building equipment. Mitsubishi Electric enriches society with technology in the spirit of its "Changes for the Better." The company recorded a revenue of 5,257.9 billion yen (U.S.\$ 34.8 billion*) in the fiscal year ended March 31, 2024. For more information, please visit www.MitsubishiElectric.com

*U.S. dollar amounts are translated from yen at the rate of ¥151=U.S.\$1, the approximate rate on the Tokyo Foreign Exchange Market on March 31, 2024