

Furukawa Electric Announces Development of High Output 100mW Distributed Feedback Diode Laser Diode Chip

Designed to Increase Optical Transceiver Performance at Data Centers

Basel, Switzerland, September 20, 2022 -- Furukawa Electric Co., Ltd. (FEC) is pleased to introduce the development of a high output 100mW Distributed Feedback Diode (DFB) laser diode chip in response to the demand for increased optical transceiver performance at data centers. Higher output power contributes to reducing optical transceiver and data center power consumption.

Following the widespread use of data communication services, including cloud services and 5G, data traffic volumes continue to increase. Intensity-modulation optical transceivers are widely used at data centers. In recent years, silicon photonics technology (Note 1), having significant benefits in terms of small size, high integration, low power consumption, and low cost, has been broadly adopted. Many of these transceivers are equipped with DFB laser diode chips, providing a single-wavelength, high output power light source.

The performance of optical transceivers continues to increase along with the growth in data traffic. The former transmission speed was 400Gbps, but this is increasing to speeds exceeding 800Gbps, up to 1.6Tbps (Fig. 1). As transmission speed increases, the optical loss during high-speed, high-intensity modulation rises, making it necessary to have a DFB laser diode chip with increased output power. At the same time, the use of optical transceivers and other devices in the network equipment at data centers and network base stations has increased, and the growing power consumption is becoming an important issue.

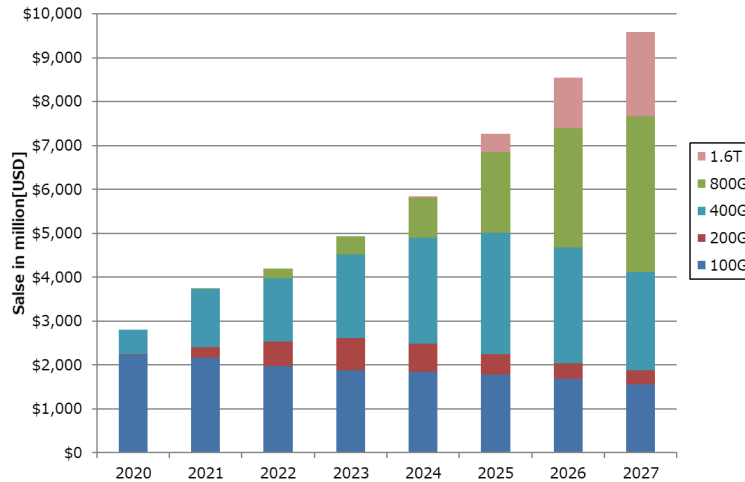


Fig. 1 Forecast of optical transceiver demand for Ethernet (LightCounting)

As GAFAM and the other large IT companies continue to actively invest in data centers, FEC is supplying DFB laser diode chips to multiple customers including optical transceiver manufacturers, where these products are highly regarded for their world-class output power characteristics and reliability.

Using Indium Phosphide (InP) (Note 2) semiconductor chip technology experience accumulated over the years, FEC has successfully developed a DFB laser diode chip with a high output power of 100mW - one of the highest in the world (Fig. 2). Through this new advancement, it will be possible to realize high-performance optical transceivers that support at least 800Gbps large volume data communication, as well as respond to further growth in overall data traffic. Also, the creation of high-performance transceivers using our high output power DFB laser diode chip as a key component should limit power consumption by the optical transceiver and reduce overall power consumption at the data center.

The high output 100mW DFB laser diode chip will be on display at the European Conference on Optical Communication 2022 (ECOC 2022) in Basel, Switzerland 19 – 22 September 2022.

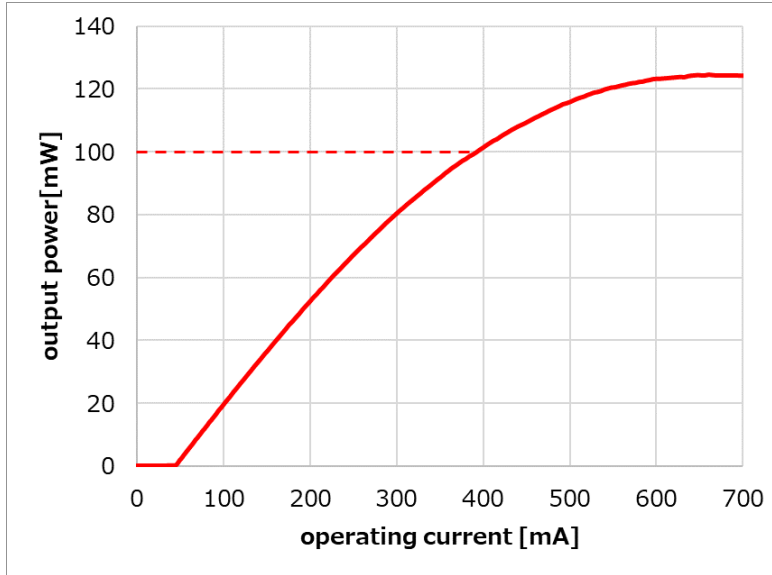


Fig. 2 Output power vs. current at 75 °C

Main product specification

Characteristic	Specification	Characteristic	Specification
Optical output power	100mW	Side-mode suppression ratio	Min. 35dB
Operating temperature	-5 ~ +75 °C	Beam divergence angle (vertical)	Typ. 22 deg
Peak wavelength	1271/1291/1311/1331nm	Beam divergence angle (horizontal)	Typ. 18 deg

The research will continue to develop and commercialize high-performance semiconductor laser light sources as a leading company in the laser business, and we will contribute to realizing a truly prosperous, sustainable society through advances in optical communication.

(Note 1) Silicon photonics technology: Forming technology for high-density optical device integrated platforms based on silicon electronics manufacturing technology. The ability to use widely adopted silicon electronics manufacturing technology makes it possible to reduce costs and achieve higher integration.

(Note 2) InP (Indium Phosphide): A III-V semiconductor family that is used in the manufacturing of laser diode chips and high-speed transistors.

About Furukawa Electric Co., Ltd.

Furukawa Electric Co., Ltd. (www.furukawaco.jp/english) is a global leader in the design, manufacture, and supply of fiber optic products, network products, electronics components, power cables, nonferrous metals, and other advanced technology products. Headquartered in Tokyo, Japan, Furukawa operates production facilities on six continents around the globe, including OFS in the U.S.A., Europe, Africa, and China.

About OFS

OFS is a world-leading designer, manufacturer, and provider of optical fiber, fiber optic cable, connectivity, fiber-to-the-subscriber (FTTx), and specialty fiber optic products. We put our development and manufacturing resources to work creating solutions for applications in such areas as telecommunications, medicine, industrial networking, sensing, aerospace, defense, and energy. We provide reliable, cost-effective fiber optic solutions that help our customers meet the needs of consumers and businesses today and into the future.

Headquartered in Norcross (near Atlanta) Georgia, U.S.A., OFS is a global provider with facilities in several countries worldwide. OFS is part of Furukawa Electric Group, a multi-billion-dollar leader in optical communications.

Please visit www.ofsoptics.com/.

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OFS PR Contact:

Sherry Salyer

shsalyer@ofsoptics.com

+1 (770) 798 - 4210