Overview

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The Latest Status and Future Outlook of High Frequency & Optical Devices

Due to the progress in digital transformation (DX) that is revolutionizing products, services, and business models through the utilization of data and digital technology, innovation in business activities and a shift to new lifestyles are advancing on a global scale. Consequently, information communication infrastructure to support DX is becoming increasingly important. Accompanying the preparation of communication infrastructure and data centers with larger capacities, achieving low power consumption as well as high speeds in the high frequency and optical devices essential to the infrastructure is a significant development issue.

5th generation mobile communication system (5G) features Enhanced Mobile Broadband (eMBB), Ultra Reliable and Low Latency Communications (URLLC) and Massive Machine Type Communications (mMTC), uses array antennae with several antenna elements arranged in the base stations, and is able to simultaneously and efficiently send wideband, modulating signals to each user terminal. For electric power amplifiers for use in 5G base stations, in addition to the establishment of both highly efficient and highly linear operations, there is an increasing demand for wideband operations. For this use, Mitsubishi Electric is developing and productizing a compact, highly efficient, wideband gallium nitride (GaN) amplifier that generates little heat.

Meanwhile, in optical communication networks which are a core part of the communication infrastructure, we are increasing the speed and the transmission capacity of all network layers including in data centers. We are developing optical devices capable of multi-value modulation which doubles the transmission signal capacity per unit time, to realize the low power consumption products of the Distributed FeedBack Laser (DFB-LD) at 50 Gbps and the Electro-absorption Modulated Laser (EML) at 100 Gbps.

Furthermore, we are progressing with the implementation of a high pixel count and the expansion of the detection temperature range for the high-performance, compact, low-cost infrared sensor module, “MelDIR.” We hope to apply this in a wide range of fields such as in-vehicle monitoring in addition to uses like crime prevention, indoor monitoring, people counting, and smart buildings.

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