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New Enabling Optical Isolator Developed for FTTx Solutions

Sumitomo Metal Mining Co., Ltd. (SMM: Minato-ku, Tokyo/President: Koichi Fukushima) and NanoOpto Corporation (New Jersey, U.S.A./President and CEO: Barry J. Weinbaum) announce the joint development of a new optical isolator for bi-directional optical modules, such as diplexers and triplexers, for FTTx applications.

In optical communication networks, optical signals from laser diodes (LD) transmit through optical fiber, but a reflection is generated by interference of optical components in the optical transmission path. When the reflection returns to the LD, it causes destabilization of the LD oscillation and results in degradation of transmission characteristics. Optical isolators play a key role in cutting out this reflection in optical communication networks.

The new isolator co-developed by SMM and NanoOpto functions as a conventional isolator to cut out a reflected beam with the same wavelength as the emitting LD, and also serves like a transparent glass sheet to signals with different wavelengths moving in the return direction. By integrating a conventional Faraday rotator and a brand-new polarizer with wavelength selectivity (never before available), the optimal isolator has been achieved for bi-directional modules.

Amidst the rapid and wide spread of FTTH (fiber-to-the-home) networks, introduction of the new isolator will enable drastic downsizing of the isolator in bi-directional modules, which in turn will result in significant cost reduction for such modules. As demand for high-speed transmission in FTTH networks expands, the new isolator is expected to generate new demand for its use in ONUs (optical network unit) at subscriber homes, besides the conventional use of isolators in OLTs (optical line terminal) at operator base stations.

Customization of the new isolator will be available upon request. Samples will be ready for shipment commencing in April.

The new isolator will be on show in booth #1521 at OFC2007 in Anaheim from March 27 through 29.

Reference:

Optical isolators conventionally require polarizers capable of functioning across a broad range of wavelengths. For that reason, the position of the isolator in bi-directional modules has been restricted to a location just behind the LD. In that position, the diameter of the beam emitted from the LD is invariably large, thus necessitating a relatively large isolator, and this has pushed up the price of the isolator.

Terms:

FTTH (fiber-to-the-home)

Fiber-to-the-home (FTTH), also called "fiber-to-the-premises" (FTTP), is the installation and use of optical fiber from a central point directly to individual buildings such as residences, apartment buildings and businesses to provide unprecedented high-speed Internet access. FTTH dramatically increases the connection speeds available to computer users compared with technologies currently used in most networks.

ONU (optical network unit)

An ONU provides optical-to-electrical (O-E) and electrical-to-optical (E-O) conversion between optical fiber and the copper wires that reach homes and offices in an FTTH network.

OLT (optical line terminal)

An optical line terminal (OLT) is a device located in the telco central office or cable company head end. It generates or passes on SONET and DWDM signals via fiber to an ONU in the field.

Faraday Rotator

A Faraday rotator is a crystal film which has the effect discovered by Faraday in 1845

whereby non-optically active materials or substances become capable of rotating the polarization plane of polarized radiation (light) passed through them when placed into a strong magnetic field with a component in the direction of rotation.

Polarizer

A polarizer is a device that converts an unpolarized or mixed-polarization beam of electromagnetic waves (e.g., light) into a beam with a single polarization state (usually, a single linear polarization).