

NEWS RELEASE

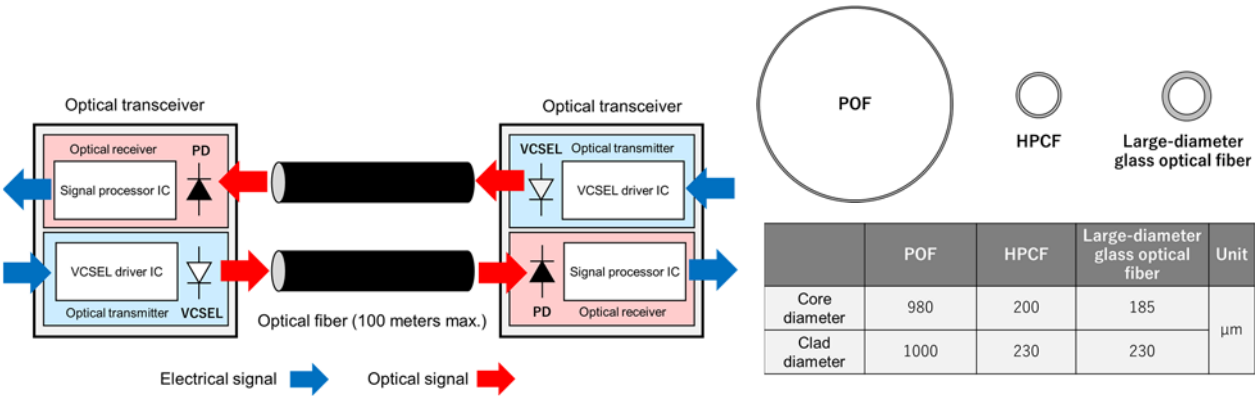
Newly developed 1.25-Gbps optical transceiver achieving high-speed communications at a low cost

February 8, 2023
Hamamatsu Photonics K. K.
 Headquarters: 325-6, Sunayama-cho,
 Naka-ku, Hamamatsu City, Japan
 President and CEO: Tadashi Maruno

Hamamatsu Photonics has developed an optical transceiver P16671-01AS that achieves fiber-optic communications at a data transmission speed of 1.25 Gbps (gigabits per second). We did this by applying our unique design technology based on opto-semiconductor manufacturing technology fostered over the years.

Compared to our current optical link products whose maximum data transmission speed is 150 Mbps, the P16671-01AS offers a significantly higher speed. It also provides standard-compliant optical connectors that attach to the preferred optical fibers, depending on the application. For short-distance board-to-board communication within the equipment, the P16671-01AS is usable with inexpensive POF (plastic optical fibers) achieving high-speed data communication at a low cost. Also, using it along with HPCF (hard plastic clad fibers) or large-diameter glass optical fibers extend the data transmission distance up to 100 meters making it ideal for setting up a network or communicating between devices or equipment.

The P16671-01AS optical transceiver will be available from February 13, 2023 to domestic and overseas manufacturers of medical equipment, scientific and laboratory instruments, and semiconductor manufacturing equipment.



Fiber-optic communication using P16671-01AS

Optical fiber diameter comparison

Product overview

The P16671-01AS is a compact, low-cost optical transceiver. It consists of an optical transmitter for converting electrical signals into optical signals, an optical receiver for converting optical signals into electrical signals, and lens/connector assemblies for connecting to optical fibers.

Hamamatsu Photonics designs, manufactures and markets fiber-optic communication products. This includes transmitter photo ICs which are integrated with a light emitter and a driver circuit as well as receiver photo ICs which are integrated with a light sensor and signal processing circuit, capable of a maximum data transmission speed of 150 Mbps. We have also been working tirelessly on developing optical transceivers that deliver higher-speed data communication and include optical connectors that couple to optical fibers.

Unlike our current transmitter photo ICs that use a LED as the light emitter, the P16671-01AS optical transceiver uses a vertical-cavity surface-emitting laser (VCSEL) that operates at higher speeds to further increase the data transmission speed. However, handling the VCSEL, compared to a LED, is difficult because the VCSEL light output differs from product to product and the output also greatly fluctuates with changes in ambient temperature. To solve this problem and achieve stable operation, the P16671-01AS employs a driver IC that compensates for different light outputs from individual VCSEL. The P16671-01AS also uses a high-speed light sensor and a signal processing IC that maximizes the light sensor characteristics, which were designed in-house. This in turn led to the successful development of an optical transceiver with a data transmission speed of 1.25 Gbps.

Practical applications of the P16671-01AS include short-distance board-to-board communications using POF in equipment such as semiconductor manufacturing equipment, scientific and laboratory instruments, and measuring instruments as well as image and video transmission in medical equipment. When used with HPCF or large-diameter glass optical fibers, medium-to-long distance communication and networking between equipment is possible up to distances of 100 meters. Therefore, using the P16671-01AS in conjunction with a suitable optical fiber will achieve high-speed communication spanning a wide range of applications.

We will keep delivering further increases in transmission speed while expanding our product lineup by providing products in various configurations and taking further steps to meet market needs.



Application examples of P16671-01AS optical transceiver

Main features of P16671-01AS optical transceiver

1. Fiber-optic communication at a transmission speed of 1.25 Gbps

Successfully developed a 1.25-Gbps optical transceiver by utilizing a high-speed light emitter and sensor, and semiconductor integrated circuits that extract maximum emitter and sensor characteristics.

2. Compatible with POF, HPCF, and glass optical fibers

The use of standard-compliant optical connectors allows fiber-optic communication spanning a wide range of applications using inexpensive POF, HPCF and large-diameter glass optical fibers for communication at distances up to 100 meters.

3. Small size and low cost

Along with the lens design optimized for coupling to optical fibers, the latest in opto-semiconductor mounting and assembly technologies, we adopted the passive alignment method to achieve a small size and low cost.

4. High reliability

It offers a high degree of reliability for stable operations over a long period of time, which is achieved based on the production and quality control know-how gained in manufacturing our current products.

●Main specifications

| Parameter | P16671-01AS | | Unit |
|-------------------------------------|---|-----|------|
| Transmission speed | 0.15 to 1.25 | | Gbps |
| Operating temperature | -10 to +70 | | °C |
| Supply voltage | 3.3 (Vcc_Tx / Vcc_Rx), 5 (VPD) | | V |
| Peak emission wavelength | 850 | | nm |
| Laser safety | Class 1 (JIS C 6802, IEC 60825-1) | | - |
| Electrical interface | CML (Current Mode Logic) | | - |
| Dimensions (W×D×H) | 28 × 19.1 × 10.7 | | mm |
| Compatible connectors | F07 connector (JIS C 5976), PN connector (IEC 61754-16) | | - |
| Communication distance at 1.25 Gbps | POF | 2 | m |
| | HPCF | 10 | |
| | Large-diameter glass optical fiber | 100 | |



1.25-Gbps optical transceiver P16671-01AS for fiber-optic communication