

Advanced Photonics Inc. (APi), a Tokyo University spin off venture business situated in Tokyo, have succeeded in developing an inter LSI chip communication system that can operate at 300 Gigabits per second. Using this new technology will enable an increase in the volume and speed of data transfer in communication networks such as computer servers and IT related applications. For example, the expected surge in use of cloud computing style software via computer networks will mean that a huge increase in data volume communication will be required in the near future. APi had already developed a 240 Gigabits per second system employing optical waveguides and improved on this by using 12.5 Gigabit signals via 24 individual waveguides. The aforementioned waveguides had a cross section of 50x50um and require an extremely high level of alignment. To facilitate this, a special manufacturing technique to ensure thickness uniformity along with use of the company's unique alignment tools and methods led to advances in PCB manufacturing techniques that enabled the increase in communication speeds. As well as the above advances, they have also succeeded in producing curved waveguides. To date the use of curved waveguides has resulted in an unacceptable loss of optical signal strengths but APi has succeeded to nullify this effect. The benefit of using curved waveguides is that it results in a freer mix of electrical and optical transmission lines within the same PCB.

Using conventional optical fiber communication techniques the required signal has to be passed through an optical/electronic conversion unit and the resultant signal then passed through the PCB substrate resulting in losses causing a decrease in the usable communication speeds. With APi's technique this limitation is overcome and APi is collaborating with electronics manufacturers to apply the technology to many applications.