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News Release

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## ZARLINK DEMONSTRATES GROUNDBREAKING LASER FOR VERY SHORT REACH (VSR) OPTICAL SYSTEMS

**March 20, 2002** Zarlink Semiconductor (NYSE/TSE:ZL) has designed and demonstrated a patent-pending, large-aperture VCSEL that increases the performance and reliability of multi-gigabit, VSR optical interconnect equipment. In laboratory tests, the 12-micron aperture VCSEL achieved 10 Gb/s transmission at 80 degrees C (centigrade) over 300 meters of high bandwidth fiber, with a power penalty of only 0.5dB (optical decibels). Zarlink's large-aperture 850nm VCSEL is also capable of transmitting light at even higher speeds.

"This success may result in a highly reliable, large-aperture 10 Gb/s VCSEL that transmits farther than the industry-standard 300 meters, at data rates extending beyond 10 Gb/s," said Jitesh Vadhera, vice president and general manager, Optical Systems division, Zarlink Semiconductor.

Today, VCSELs are widely used for high-speed, short-reach optical interconnections in Gigabit Ethernet, Fibre Channel, and central office equipment. With rising demand for terabit-class networking equipment to meet Internet-driven bandwidth requirements, a new generation of single wavelength, 850nm VCSELs is under development for 10 Gb/s (OC-192 and 10 Gigabit Ethernet) and 40 Gb/s (OC-768) optical interconnect. Zarlink large-aperture VCSEL achieves dramatic reduction in power penalty.

A key challenge in designing 10 Gb/s VCSELs is to increase the density of information-carrying photons passing through the aperture of the laser. Higher photon density equates with higher bandwidth, higher modulation efficiency, and lower noise.

Designers must also meet power penalty specifications. In an optical transmitter-receiver link, factors such as noise, attenuation, dispersion and jitter combine to degrade the quality

of the light signal as it travels along the fiber. This degradation - called the power penalty - is measured in optical decibels. For 10 Gigabit Ethernet over 300m, the IEEE 802.3ae standard specifies that the power penalty may not exceed 4.7dB. Zarlink bettered the industry's power penalty requirement by designing an innovative 12-micron aperture 10 Gb/s VCSEL. Large-aperture VCSELs are more reliable and deliver longer device life span because they operate with lower current density than small-aperture designs. However, large-aperture VCSELs also produce several unwanted, higher-order modes that degrade signal integrity.

Zarlink met this challenge by altering the structure of a large-aperture VCSEL to eliminate higher-order modes. This was achieved with a patent pending innovation that deliberately introduced losses for higher-order lateral modes, and that also decreased the power penalty.

As a result, in laboratory tests Zarlink successfully demonstrated 10 Gb/s transmission with a power penalty of only 0.5dB, over 300m of high bandwidth LaserWave(TM) Fiber from OFS, at an industry-standard 80 degrees C. Zarlink's large-aperture VCSEL thus provides a 4.2dB margin in the optical link, resulting in potentially better link performance, longer reach and lower cost, plus increased link reliability.

LaserWave Fiber is a trademark of Fitel USA Corp. 03/20/2002 - PR Newswire

## About OFS

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OFS' corporate lineage dates back to 1876 and includes technology powerhouses such as

AT&T and Lucent Technologies. Today, OFS is owned by Furukawa Electric, a multi-billion dollar global leader in optical communications.

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