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## Dual-channel photonic 2R regenerator delivers 100Gb/s performance

*\* hybrid integrated SOA/MZI delivers high-speed performance with low optical power requirements*

*\* passive assembly provides low loss performance and excellent manufacturability*

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**CIP Technologies (CIP)** has released a new 100Gb/s version of its innovative all-optical 2R (reamplification and reshaping) regenerator for optical networking applications.

Based on CIP's HyBoard™ platform, the new device is fabricated from a hybrid integrated combination of an array of CIP Technologies' world-leading high-speed nonlinear semiconductor optical amplifiers (SOA-XN), and planar silica Mach-Zehnder interferometers (MZIs). This component combination extends the outstanding signal regeneration properties of the company's hybrid 2R device from data rates of 40 Gb/s to 100Gb/s, and retains multi-channel capability.

Measuring just 9 x 3 x 1cm (~3.5 x 1.2 x 0.4 inch), the device - 100GXN-2R2-ORP - delivers an extremely compact and practical dual-channel building block for configuring advanced optical networking systems. It may be used for inline 2R regeneration of RZ (return to zero) signals in high-speed, optical network applications. The device's intrinsic ability to perform additional functions, including wavelength conversion, greatly extends the flexibility for network system developers. Optical logic functions can even be implemented by the combination of components.

100GXN-2R2-ORP employs a combination of planar silica and indium phosphide (InP) component technologies to achieve optimal performance. The two types of component functions used are planar single-mode waveguides with splitter/combiner elements configured to create a balanced MZI, and a monolithically integrated array of four nonlinear SOA-XNs. Hybrid integration, using the best component technologies for each function, ensures extremely low intra-device excess losses and high optical gain.

Special interface characteristics on both component types, combined with a unique precision alignment technique, additionally allow the 2R regenerator devices to be assembled without active alignment. This makes the finished component highly amenable to economic volume production.

The low-loss assembly technique, coupled with the improved performance of the SOA-XN, also allow the device to be switched with lower input optical powers than were possible previously, facilitating simpler high-speed experimentation. CIP is also able to provide custom

versions of the device, including versions with integrated push-pull time delays and all-optical XOR logic gates.

A datasheet is available from [info@ciphotonics.com](mailto:info@ciphotonics.com).

### **About CIP Technologies**

CIP Technologies is the trading name of The Centre for Integrated Photonics Ltd, a leading manufacturer of advanced photonic hybrid integrated circuits and InP based optoelectronic chips, devices, arrays and modules for the communications and defence markets. With over 600 man-years of expertise in photonics and nearly 250 published articles and patents, CIP Technologies refines research into viable, manufacturable products based on leading edge technologies, helping customers develop the photonic products of tomorrow. CIP Technologies is a major provider of technical services and consultancy and its uniquely broad range of competencies is based on world-renowned research, incorporating III-V photonic materials, silicon micromachining, planar silica waveguides and network architecture design and analysis. With state-of-the-art, ISO9001:2000 registered, co-located fabrication, coating, test, validation and pilot production facilities, as well as strategic partnerships with volume packaging providers, CIP Technologies is able to develop and deliver exciting products based on these core competences. ([www.ciphotonics.com](http://www.ciphotonics.com))

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