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PHIX Photonics Assembly and TEEM Photonics join forces to scale up Spot Size Converter assembly manufacturing.

TEEM Photonics glass Waveguide Array to Fiber Transposer (WAF) allows users to make an efficient coupling from small mode field diameter Photonic Integrated Circuits (PIC) to Single Mode fibers using its proprietary glass ion exchange technology. Combined with the strength of the assembly of PIC's and fiber array manufacturing capabilities from PHIX Photonics Assembly both companies decided to join forces and offer pre-assembled glass WAF to Fiber array solutions to support their customers in the early phases of their development and pave the road for volume manufacturing.

TEEM has an outstanding 20 years track record when it comes to manufacturing components based on their glass ion exchange process (ioNext). Early products were introduced in the market as early as the late 90's and were used for the Fiber To The Home (FTTH) rollout. Glass splitters provided a very low loss with this technology. Fiber attachment to these devices was straightforward since the mode was matching very nice with the single mode fibers used in the telecommunication industry.

Integrated chip platforms have become available which provide complex active functionality based on silicon, Indium Phosphide or Lithium Niobate materials. The challenge of these chip technologies is that in order to make the more complex photonic circuits, small mode field diameters and high index contrast waveguides are used. While this brings the benefit of allowing more components to be designed per unit area,

interfacing such tightly confined waveguides with fibers presents a challenge since no scalable assembly solution is available. Most Indium Phosphide Chips use tapered fibers in combination with High Numerical Aperture (NA) fibers in order to achieve acceptable coupling losses. In Silicon Photonics, similar challenges arise and inverted taper approaches are being developed to improve mode matching and allow passive integration schemes.

TEEM and PHIX collaboration allows the photonic ecosystem to easily benefit from WAF's insertion loss reduction technology. It also provides a turnkey solution for the assembly of photonic chips in a volume manufacturing perspective says Arnaud Rigny (Head of Business Line at Teem Photonics).

Another challenge is the tight alignment tolerance of the fibers with respect to the waveguide within the chips. The small mode dimensions add to the constraints on positioning accuracy are high if losses are to remain under control. Furthermore, keeping low losses in an array configuration is nearly impossible due to the intrinsic fiber tolerances on diameter and core concentricity.

The WAFT - fiber array assemblies elegantly solve this problem. By using off-the-shelf fiber array configurations and by pre-assembling those to the WAFT products, a good and efficient coupling is guaranteed on the assembly. The set can then be assembled to the integrated photonics chips by using butt or a grating coupling configuration. This makes sure that the lithographic defined interface is perfectly matched to the PIC.

Beyond this standard offering of standalone 1, 4, 8 and 16 channel Spot Size Converting fiber arrays (SSC-FA), PHIX offers to attach these SSC-FA's as part of their Characterization Package Standard (CPS) prototyping platform. This is taking away the hurdle for MPW customers to design a specific package for their design. On the other hand, TEEM provides customization of the WAFTs allowing for pitch conversion as well as the addition of other passive optical functions.

The collaboration of PHIX and TEEM enables customers to get their prototype designs off the lab alignment stage and provides an off-the-shelf solution for multiple chip platforms says Jeroen Duis (Chief Commercial Officer at PHIX)

The new products are launched as of ECOC 2019 in Dublin. Visit the PHIX booth #507 for more information

About TEEM Photonics

Founded at the end of 1998, the company entered the telecom market and was the first to commercially introduce Erbium Doped Waveguide Amplifiers, complementing it by a range of wide band high performance splitter for FTTH applications deployed in the US, Japan and Europe. Its specific ion-exchange process enables high confinement and variable confinement optical waveguides. These can be tailored into standard and advanced integrated optics products such as the innovative WAFT series solutions for Silicon Photonics Interfacing. The ioNext technology also allow functions such as splitters, couplers, Taps, Mux/Demux, polarizers and custom devices.

For further information, please visit us at www.teemphotonics.com

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About PHIX Photonics Assembly

Founded in 2017, PHIX is a European based provider of automated photonics assembly services with its main facilities in Enschede The Netherlands. We aim to become world leader in packaging and assembly of Photonic Integrated Circuits (PICs) by supplying PIC based components and modules in scalable production volumes. We offer fiber arrays and assembly services for the three major PIC technology platforms (InP, Si, LiN and SiN) and are specialized in hybrid integration of chip-to-chip and fiber-to-chip modules. PHIX provides a one-stop-shop from design to volume production of PIC modules.

For further information, please visit us at www.phix.com

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