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Advanced Micro Foundry (AMF) Pte Ltd, the world's first silicon photonics specialty foundry, announced the release of a new fabrication Platform for 400Gbps application, including advanced SiN-on-SOI integration flow, passive and high-speed devices and related Process Design Kits (PDK).

The new Platform aims at supporting the data transfer and telecommunication industries facing an ever-increasing demand from cloud computing and big data applications. The bandwidth requirement challenges the 100Gbps optical link technology used in the current Data Center architecture leading to the adoption of 400Gbps technology. With this objective, the new AMF Platform offers advanced solutions for high-bandwidth and low power applications.

Dr. Patrick Lo, President and Head of the R&D Division said that "after the release of our 100G PDK based on a 28GBaud technology in 2018, AMF is keeping an aggressive pace of innovation by releasing this new 400G Platform, based on a 56GBaud device library, to the Silicon Photonics industry. Our technical teams will work closely with our customers to support their transition to this new platform".

Overcoming various challenges, the platform is highly flexible and includes the release of new building blocks critical to reaching the high performance required by the Data Center expansion and the launch of 5G (i.e. 200G and 400G).

One of these new devices is a MZI-based modulator with bandwidth over 32GHz in both O-band and C-band. It successfully achieved 62Gpbs in an NRZ platform and was also demonstrated in a PAM4 configuration that can directly support 400G FR/LR8 modules.

The newly released devices also include a new Ge photodetector achieving a bandwidth over 35GHz and a dark current below 100nA with no degradation of responsivity owing to improvements of the epitaxial process.

All the new devices are available in conjunction with the existing solutions offered by AMF and already widely adopted by AMF customers. Those include:

- 0.13um CMOS equivalent process platform based on 193-Lithography



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- Waveguides with advanced passive devices including low-loss couplers, wavelength multiplexing filter, polarization splitter, polarization rotator
- Multiple ion-implantation and multi-layer metallization for high speed modulators, Ge photodetectors, and thermal phase shifters
- Integration of multi-layered SiN waveguides enabling low propagation loss for large scale photonic integrated circuits and large tolerance for wavelength division multiplexer (WDM)
- Polycrystalline silicon based grating coupler overlay for low-loss vertical coupling
- Packaging solutions with various MEMS structures for laser diode and fiber assembly
- UBM and solder bumping for electro-photonic flip-chip bonding

After thorough testing, the new 400G integrated high-bandwidth Platform was recently deployed to production.

As a dedicated pure-play Silicon Photonics Foundry, AMF will continue to drive its advanced technology roadmap to deliver both Platform and Customer-Driven technology and business solutions, including 800G, 1.6T bandwidths and OEIC packaging solutions.