

National Semiconductor Translation and Innovation Centre (Advanced Photonics) Technical Capabilities

Design and Simulation	Photonics Simulation	Ansys Lumerical Modules FDTD, FDTD Accelerator, MODE, INTERCONNECT, Multiphysics
	Electronic Simulation	Silvaco Modules - Victory Mesh 2D Meshing - Victory Process 2D: Stress, Physical Etch & Deposition, Oxidation, Diffusion & Implantation - TCAD Interactive Bundle - Atlas: Blaze, Laser, Luminous, S-Pisces
	RF Simulation	Ansys HFSS
Silicon Photonics Integration Platforms	SiN-on-SOI	- Wafer size: 200 mm - SiN waveguide optical loss: 0.3 dB/cm - Si waveguide optical loss: 3 dB/cm - Ge photodetector bandwidth: 100 GHz - Ge photodetector responsivity: 1 A/W - Max Ge photodetector dark current: 30 nA
	TFLN-on-Insulator	- Wafer size: 200 mm - Metallisation schemes: Al and Cu dual damascene - TFLN waveguide optical loss: 1 dB/cm - TFLN Mach-Zehnder modulator (MZM) length: 5 mm - TFLN MZM bandwidth: 100 GHz - TFLN MZM modulation efficiency: 2.5 V·cm
	PHI TFLN-on-SiPh (Co-integrates low-loss SiN, Si waveguide, high-speed TFLN modulator and Ge photodetector)	- Wafer size: 200 mm and scalable to 300 mm - TFLN MZM length: 5 mm - TFLN MZM bandwidth: 100 GHz - TFLN MZM modulation efficiency: 2.5 V·cm - Ge photodetector bandwidth: 100 GHz - Ge photodetector responsivity: 1 A/W - Max Ge photodetector dark current: 30 nA
Electrical-Optical Testing	Optical, RF and Data Communication Testing	- Electro-optical testing: Wafer-scale and chip-scale - Wavelengths: O-band, C-band - Max RF bandwidth: 110 GHz - Max data rate: 200 Gbps