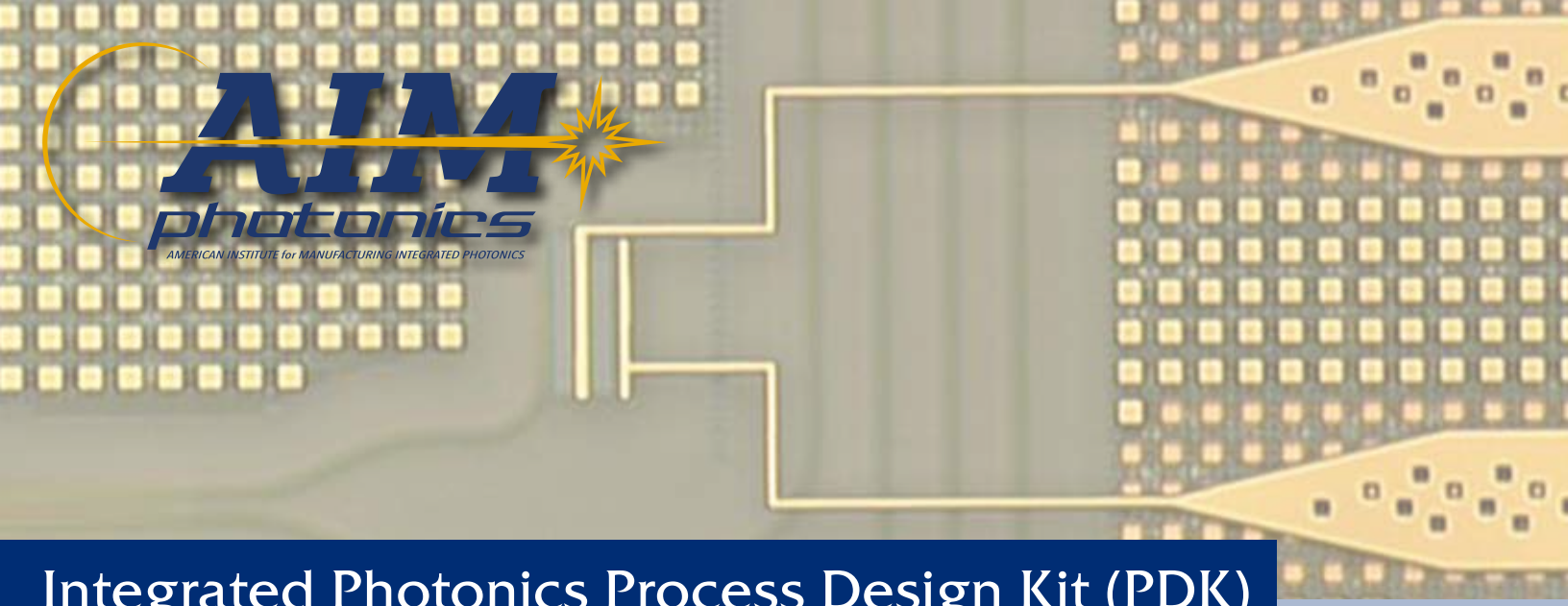

Integrated Photonics Process Design Kit (PDK)

Understanding the technical and cost challenges associated with integrated photonics design, AIM Photonics has partnered with multiple experts in the Electronic Photonic Design Automation (EPDA) field. When companies use an APSUNY Silicon Photonics Process Design Kit (PDK) under AIM Photonics, they not only have access to the most up-to-date Silicon Photonics PDK, but also access to a community driving and enabling tomorrow's silicon photonics design methodologies.

Benefits of AIM Silicon Photonics PDK

- 3 technologies: Full Active, Passive, and Interposer
- Extensive Component Library
- Support for simulation, layout, schematics, DRC
- Low power/low voltage optical modulators and high responsivity, low noise detectors to form best-in-class data comm & telecom transceivers
- Ultra low power/high speed large free-spectral-range resonant switches, filters, modulators and detectors
- First to offer Analog Modulator/Detector in a silicon photonics platform with large power handling and non-distorted translation of E-O and O-E conversion
- Multi-vendor EPDA software support enables complex designs such as large radix optical switches with compact thermo-optic phase shifters to be completed quickly
- Low loss waveguides and transitions from silicon to silicon nitride, broadband edge couplers, polarization control and manipulation on chip
- Sensor building blocks including deep trench

APSUNY PDKv2.0b Now Available
v2.5a coming July 2018

PDK Passive Components	Qty	Selected Performance
Waveguides (Si & SiN), curves, etc.	20+	Si:<2.2dB/cm and <1.0dB/cm, SiN:<1dB/cm
Edge Couplers (Si & SiN)	3	<2.8dB/facet (SMF28-TE only), <1.8dB/facet (3.5um MFD fiber -TE and TM)
Vertical Couplers (Si & SiN)	2	<2.8dB loss
3dB 4-Port Couplers (Si & SiN)	2	loss ~0.5dB, deviation <0.8% std
Y- Junctions (Si & SiN)	2	loss ~0.35dB, deviation <0.8% std
Directional Coupler (Si (1% & 10%) and SiN (10%))	3	loss <0.25dB, deviation <5%
Escalators	3	loss <0.1dB
Crossing (Si)	1	loss <0.2dB, crosstalk < -40dB
Polarization Rotator	1	Loss 0.2-0.9dB
Polarization Splitter and Rotator	1	Loss 0.2-0.8dB, PDL<0.4dB
PDK Active Devices	**Qty**	**Selected Performance**
Digital Ge Photodetector	1	BW>45GHz, ~15nA Dark, R~1A/W
Analog Ge Photodetector	1	BW~35GHz, ~60nA Dark, SFDR>113dB/Hz$^{2/3}$
Digital Mach-Zehnder Modulator	1	50Gb/s NRZ, <1Vpp, ~6dB ER, ~3dB loss
Monitor Photodetector	1	R>1.1A/W, BW~30GHz
Analog Mach-Zehnder Modulator	1	BW>15GHz, push-pull <5Vpp per arm, SFDR>90dB/Hz2/3
Thermo-Optic Phase Shifter (Si)	1	<0.25dB loss, <25mW/π
Thermo-Optic Switch (Si)	1	<0.25dB loss, <35mW-per-switch
Microring Filters (Si, Tunable)	4	<0.5dB loss, ~26nm FSR, >1nm/mW tuning efficiency
Microdisk Switches (Si, Tunable)	4	<3ns (10%-to-90%) switch time, <2 dB loss, ~1V swing
Microdisk Modulators (Si, Tunable)	4	40Gb/s, 0.8Vpp, 7dB ER, 1.5dB Loss
Variable Optical Attenuator	1	0.1dB (0V) to 10dB (1.3V) voltage based

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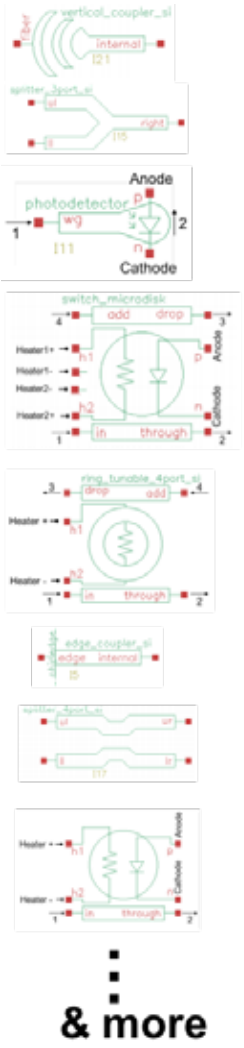

PDK Library

System Level Design
PIC / ASIC / SOC

Schematic Entry and Design

RTL / IP Partitioning and Design

Physical Design / Layout

Design Simulation, Verification, DRC

Fabrication

AIM Photonics PDK and library enables:

- **Less complex** design
- Large design community
- **Hierarchical** design
- **Design re-use**; IP market
- Latest EPDA methodologies
- **System-level E-O co-design**
- Layout & schematic based flows
- **Photonic schematic capture**
  - drag & drop components
  - *auto waveguide routing
- **Integrated photonic circuit simulation**
- Integrated E-O IC floorplanning
- **2.5D/3D & monolithic** integration
- *Parameter extraction
- DRC & *LVS
- MPW through MOSIS

(coming soon)*

MOSIS