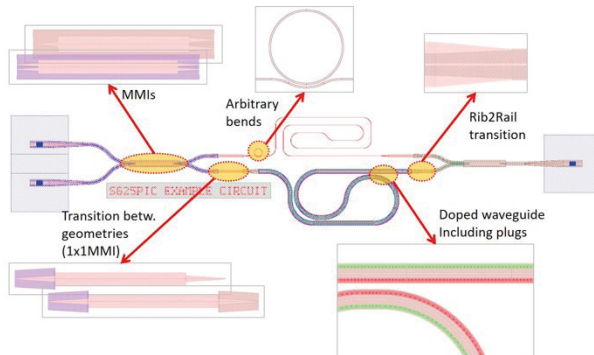


PROCESS DESIGN KIT SUPPORTED

- Luceda IPKISS
- Cadence support for basic electronic-
photonic circuit design (DRC, LVS, QRC)
- Siemens EDA (S-Edit, L-Edit, ELDO/AFS,
Calibre)

LUCEDA SIEMENS

cadence®



- α -PDK since June 2025
- New generation photodiode black box available
 - Implemented for Cadence and IPKISS



IHP – Leibniz- Institute for
High Performance Microelectronics

Im Technologiepark 25
15236 Frankfurt (Oder)

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09/2025



Photonic Technology

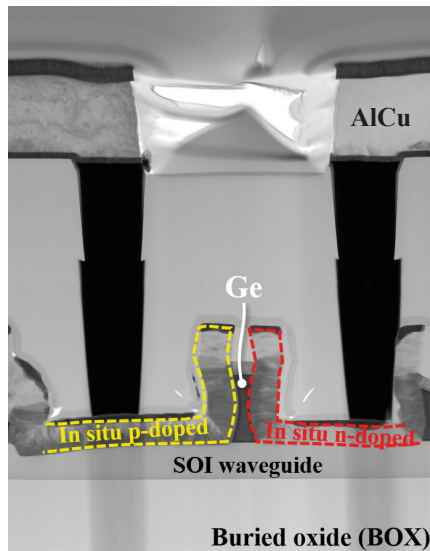
Take advantage
of IHP's
developments!



Photonic IC Technology – H7PIC

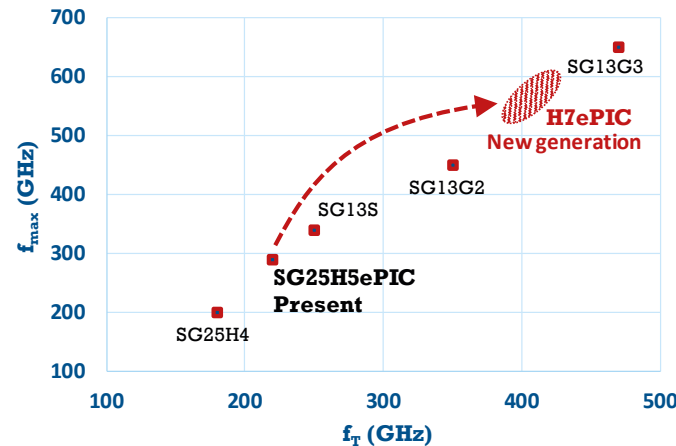
BASIC FEATURES

- SOI silicon photonics
 - 200 mm SOI wafer with 220 nm top Si layer
- Including local SOI process
- Full back-end of line
 - 3 thin & 2 thick AlCu metal layers
- 3 etch depths for waveguides
- 4 waveguide doping levels (p,n,p+,n+)
- Building blocks available
- High speed germanium photodiodes



Next generation Electronic Photonic IC Technology- H7EPIC

SiGe HBT PERFORMANCE



DEVELOPMENT GOALS

- Monolithic front-end integration
 - SiGe BiCMOS(bulk) + SOI silicon photonics
- All features of PIC available
- Germanium photodiodes > 110 GHz bandwidth
- Transistors (HBT) with double f_T in comparison to H5

			Responsivity @-2V*	3 dB Bandwidth @-2V*	I_{dark} @-2V
Ge-PIN-PD			>0.7 A/W	> 110 GHz	< 200 nA
			$V_{in} L$ @-1V **	Loss @-1V **	Capacity
p-n Phase shifter			3.0 V • cm	1.2 dB/mm	2.8 pF/cm
			Insertion loss *	1 dB Bandwidth *	
1D Grating coupler			< 3.5 dB	35 nm	
			Insertion loss *	Core width 1310 nm / 1550 nm	
Waveguide	Nano-WG	deep etch	< 2.5 dB/cm	380 nm / 450 nm	
	Rib-WG	shallow etch	< 0.8 dB/cm	590 nm / 700 nm	
		medium etch	< 1.2 dB/cm	425 nm / 500 nm	

* at 1310nm and 1550nm

** at 1550 nm