Techniques to Fabricate Ultra-Fast Sub-1nm Photonic SRAMs

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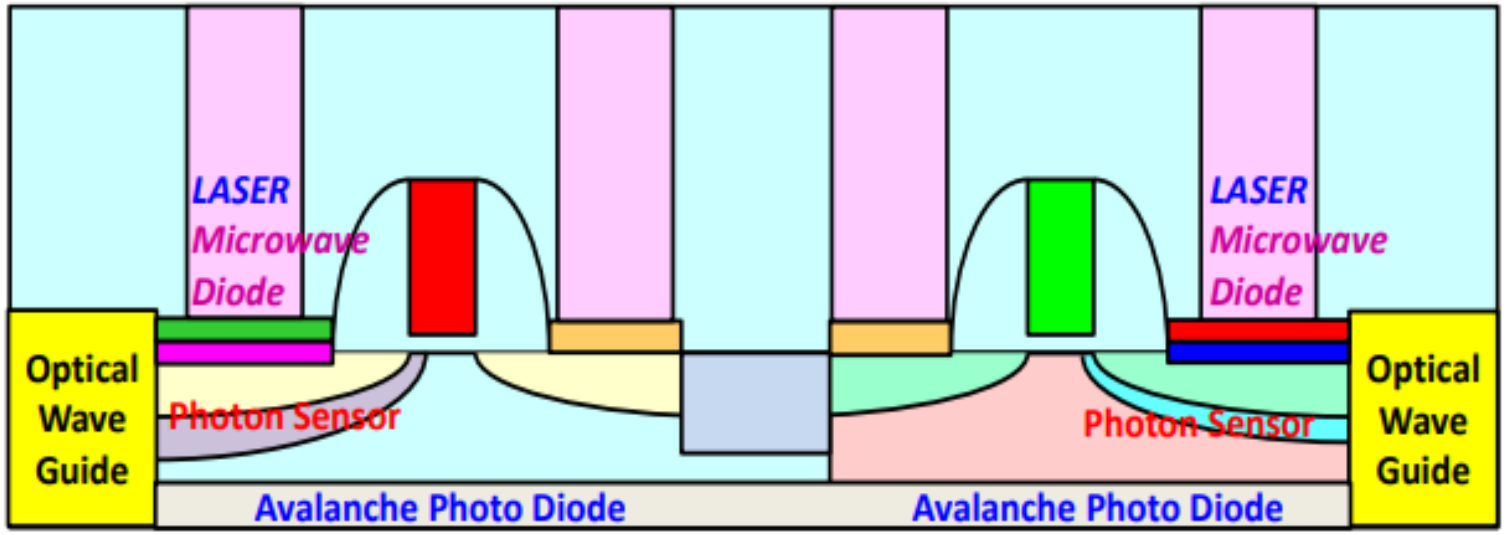
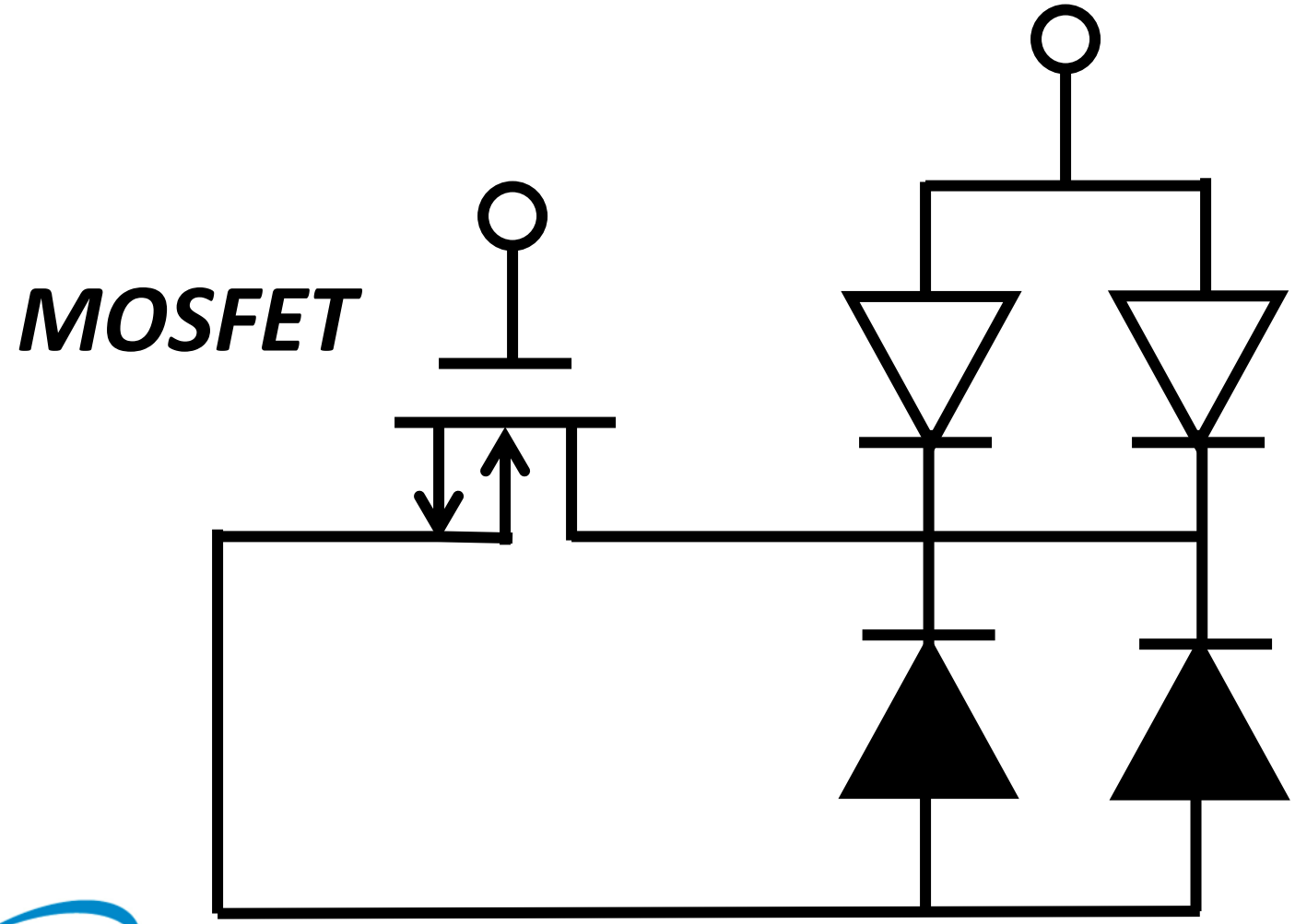
The Photonic CMOS Technology



- Threshold-less Laser
- Ultra-low Resistance LED
- Tunnel Microwave Diode
- Avalanche Photo Diode

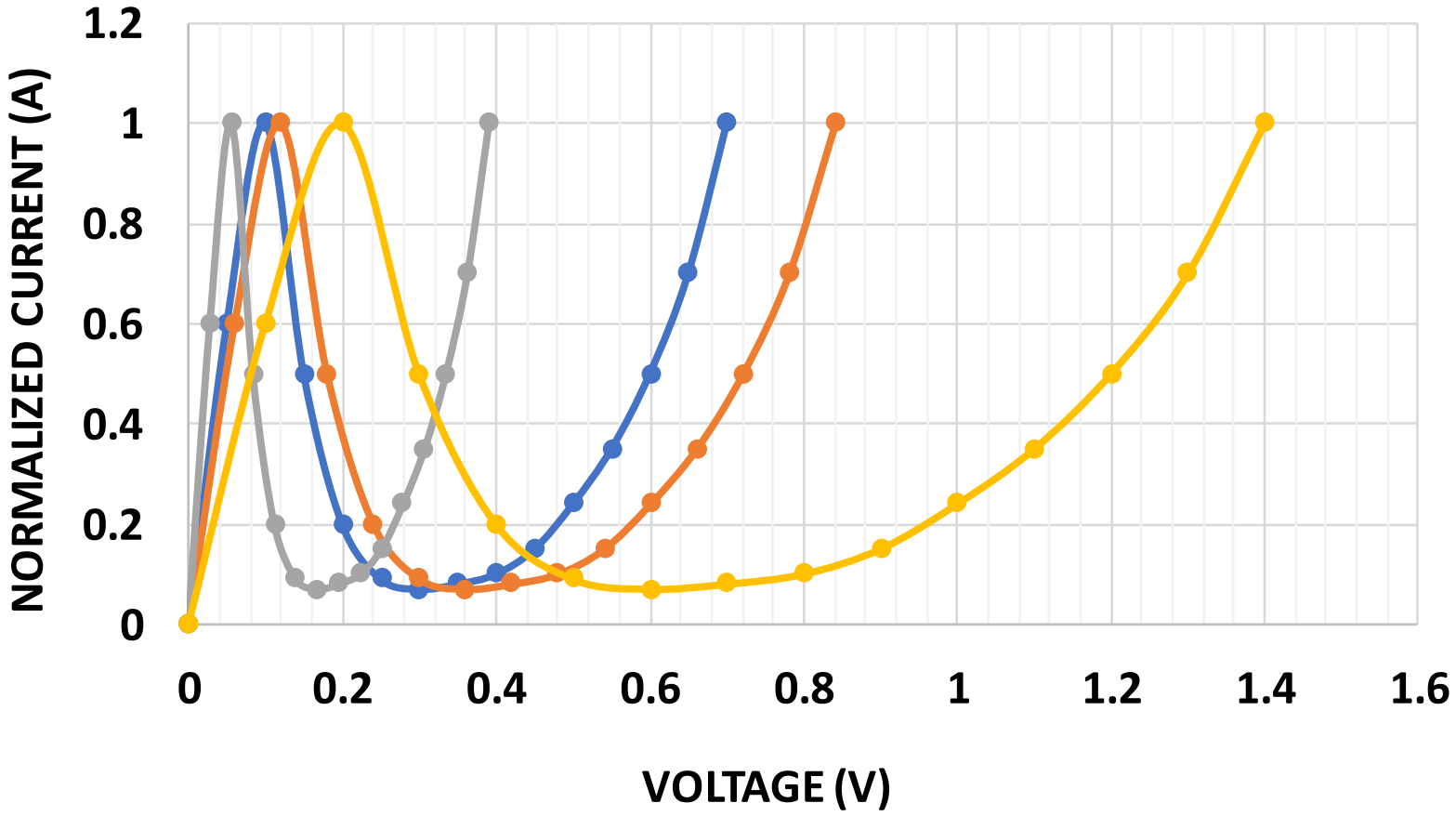
Millimeter Wave Photonic CMOS with 3D Micro Holography



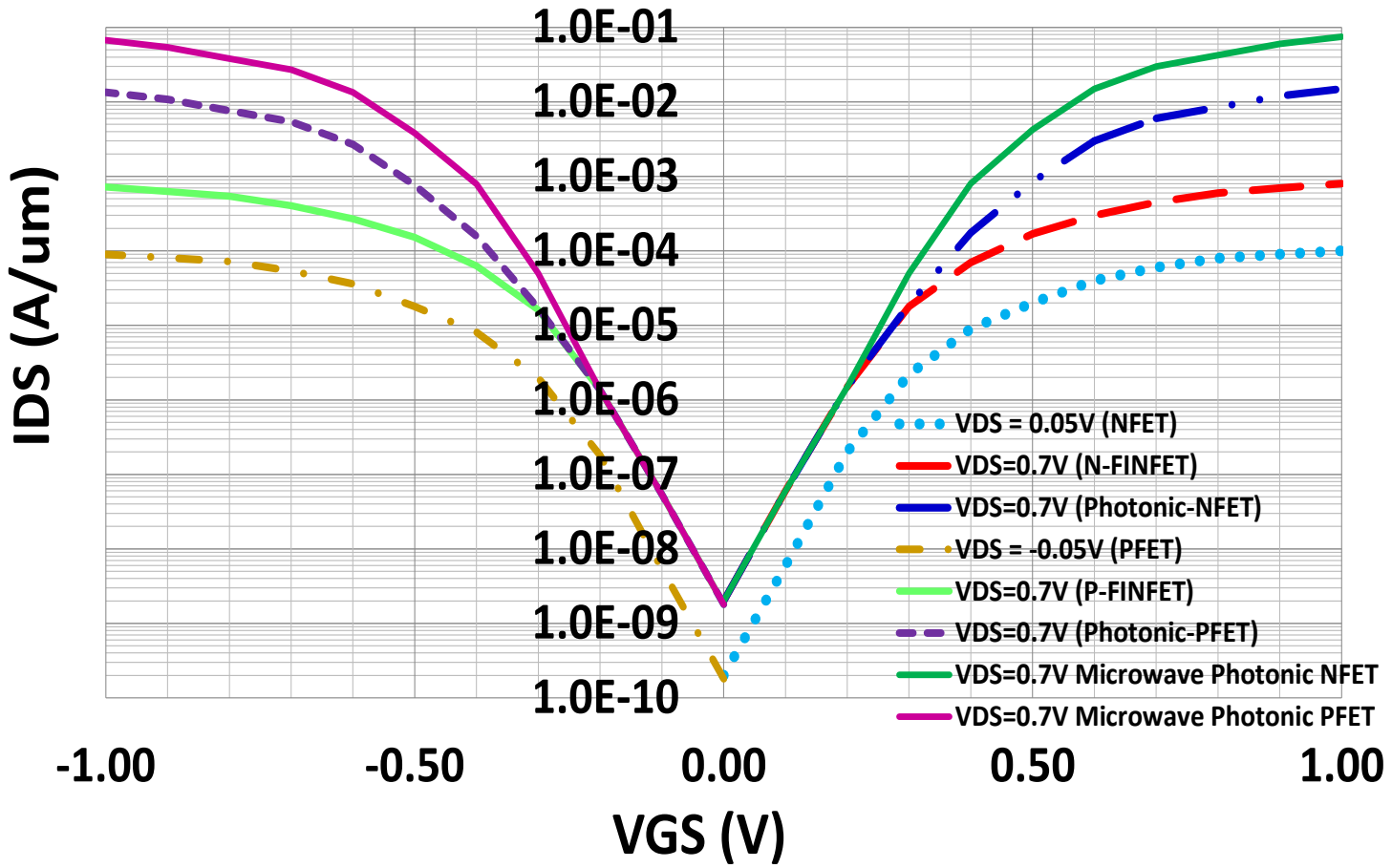
Lasers
Microwave Diodes

Photon
Sensors
APD

I-V Characteristics – Millimeter Wave Photonic CMOS



Simulated I-V Characteristics – Microwave Photonic CMOS



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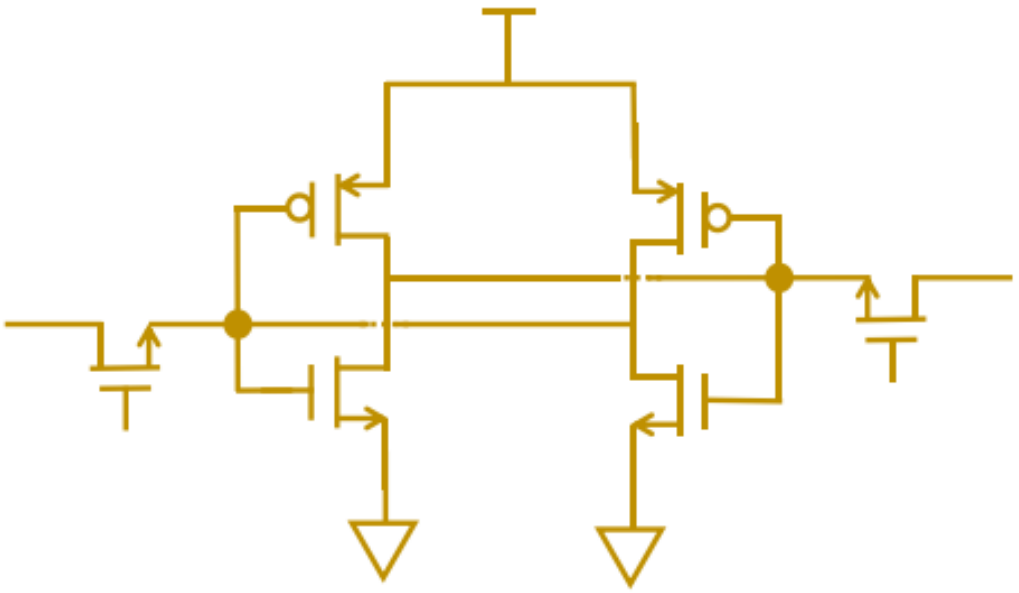
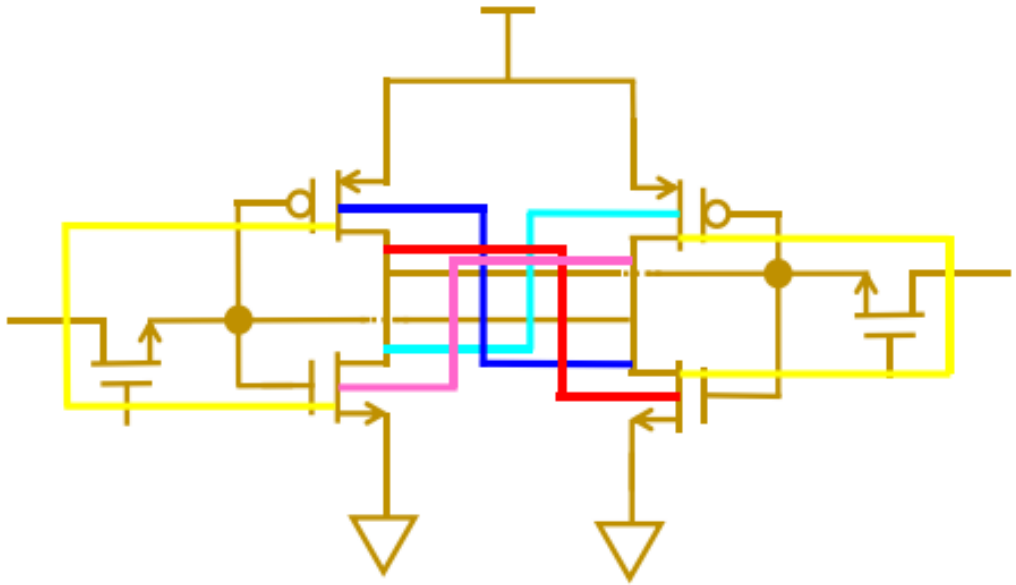


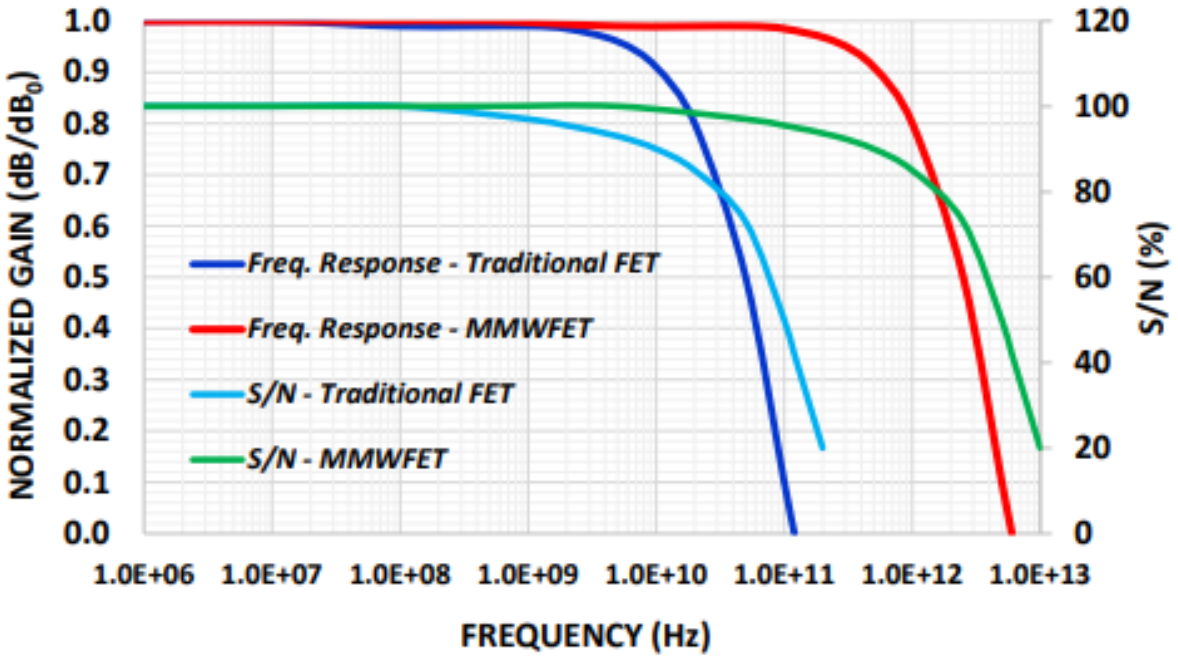
- Sub-7nm SRAM
- Six-transistor SRAM Cell
- Two Back-to-Back CMOS Invertors

The Photonic CMOS Technology



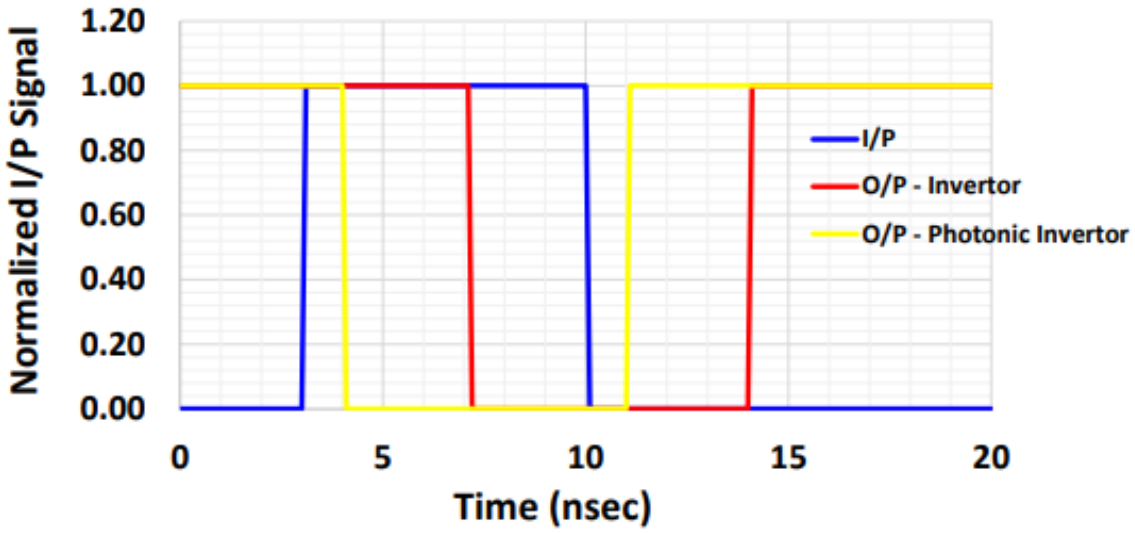
- Sub-7nm SRAM
- Six-transistor SRAM Cell
- Two Back-to-Back Photonic CMOS Invertors
- Local Interconnect Optical Waveguides

The Photonic CMOS Technology



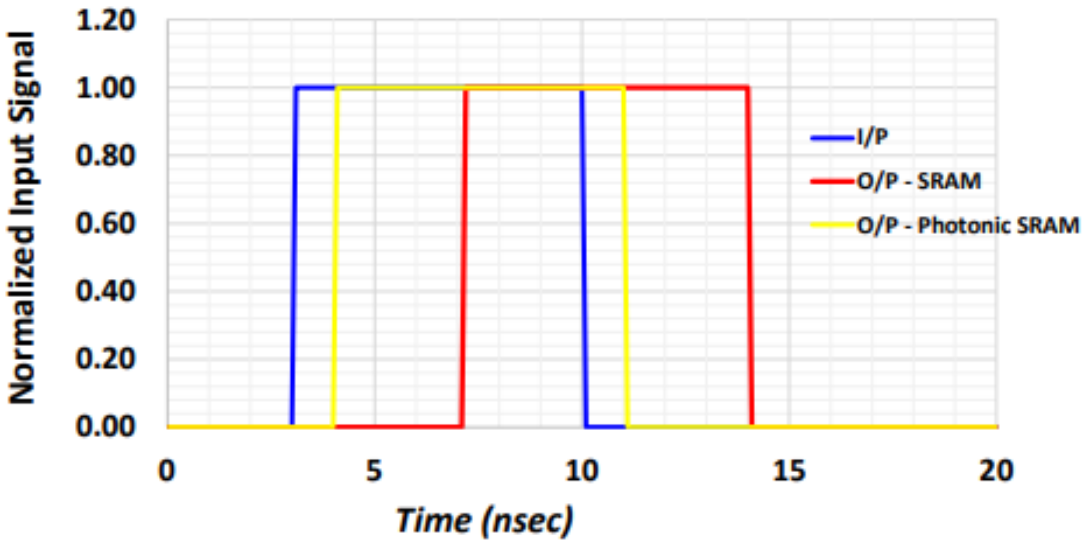
- Higher ft and fmax
- Terahertz Operations

The Photonic CMOS Technology



- Improved CMOS Invertor Delay Times.

The Photonic CMOS Technology



- Improved SRAM Delay Times.

Conclusion

- Photonic CMOS extends Moore's Law to sub-1nm Technology Nodes
- Millimeter Wave Photonic CMOS outperforms FINFET and All Around Gates
- Optoelectronic SRAMs show reduced delay times
- Optical Computing becomes a reality to deliver 30% more performance with each CMOS technology node.