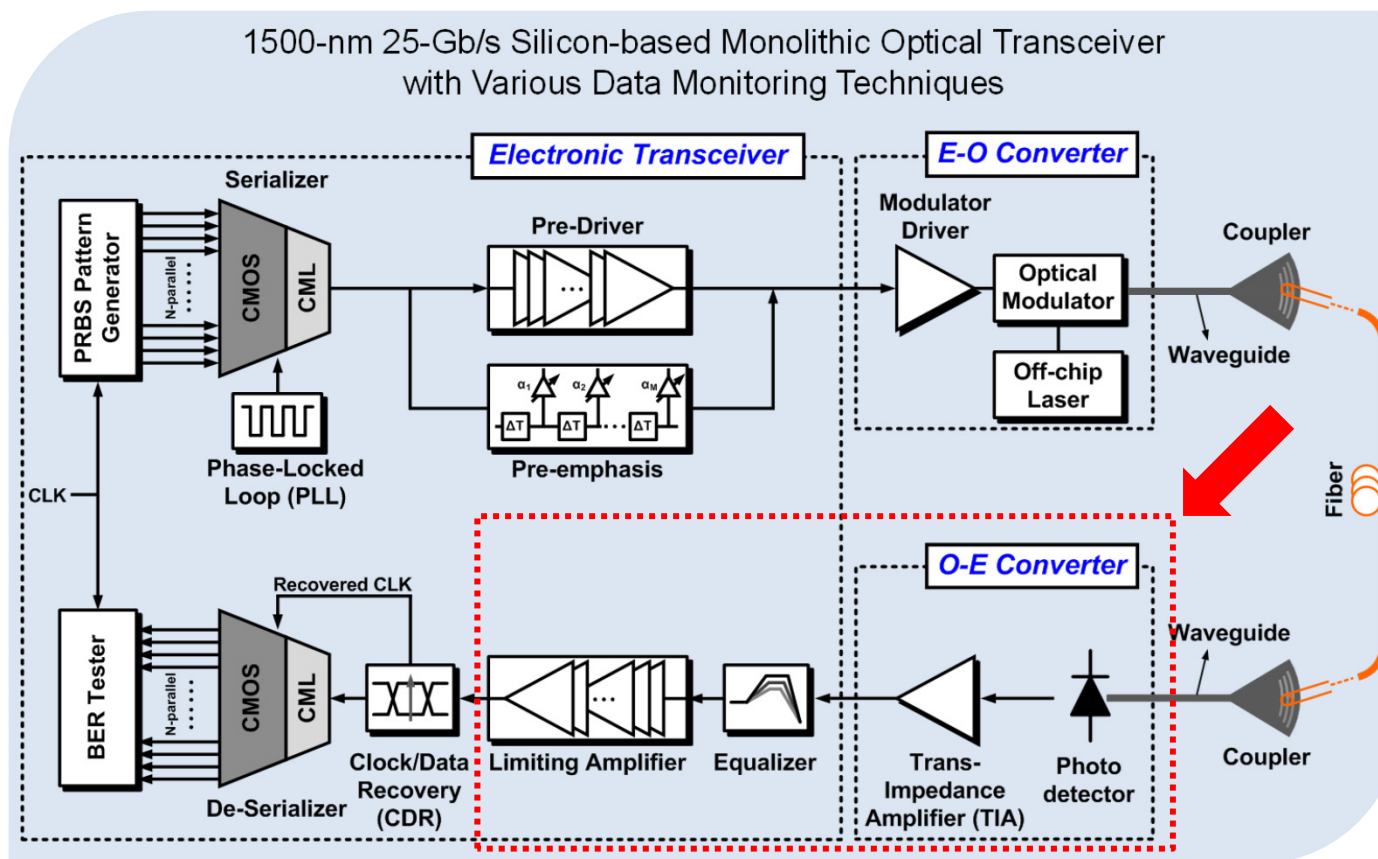


# Silicon-based Optical Transceiver

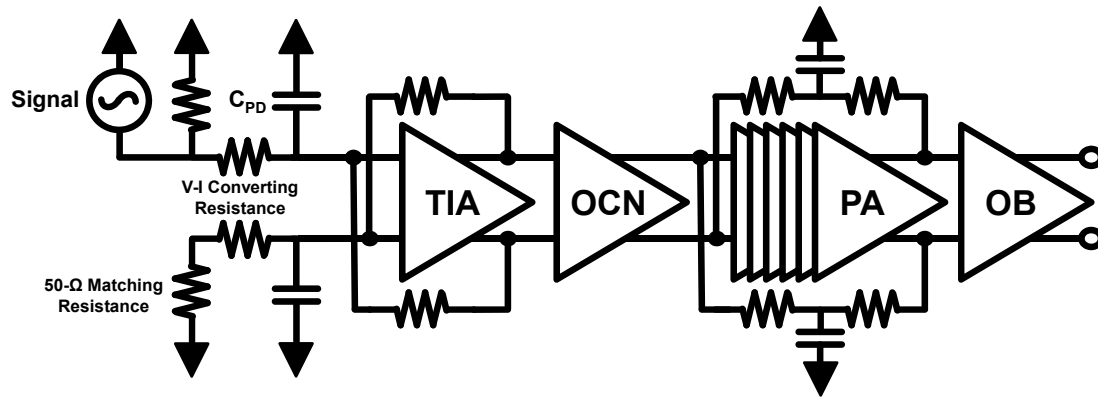
- 25-Gb/s Silicon-based monolithic optical transceiver block diagram



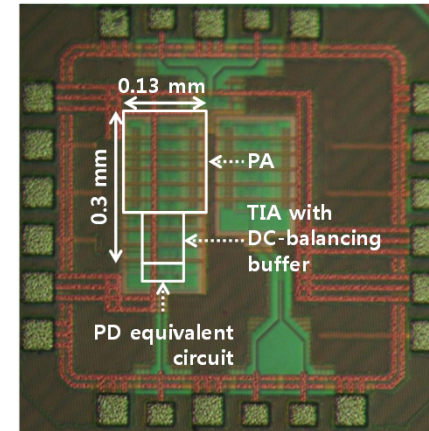
***“Development of CMOS-compatible optical components is of paramount importance”***

(ITRS Road 2009 – Interconnect, p.56)

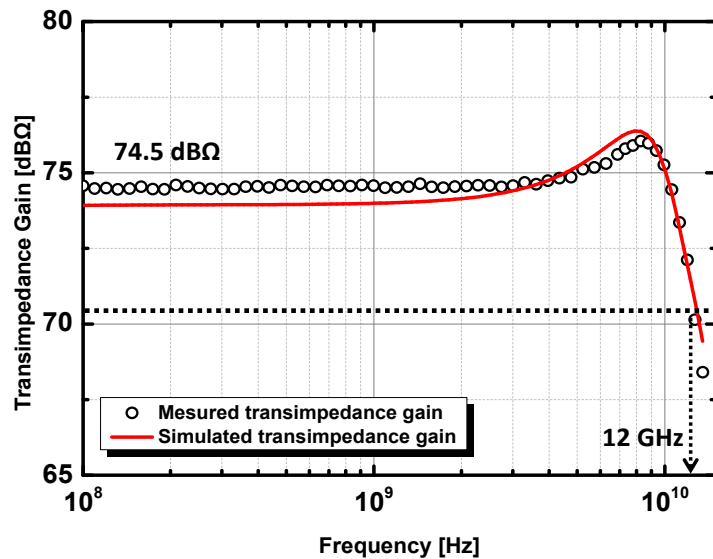
# 20 Gb/s Optical Receiver for Ge Photodetector



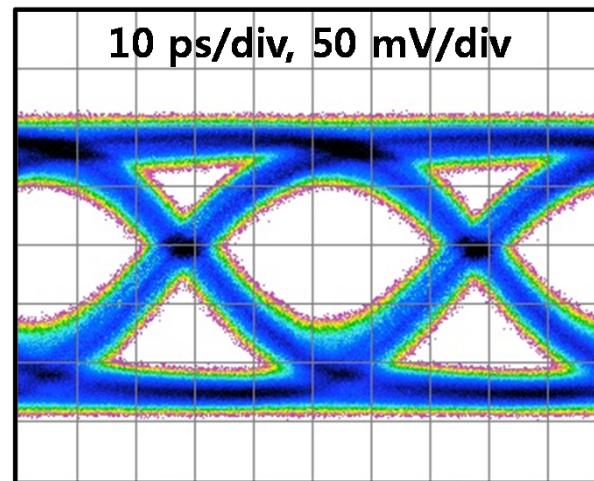
<Block diagram>



<Chip photo>



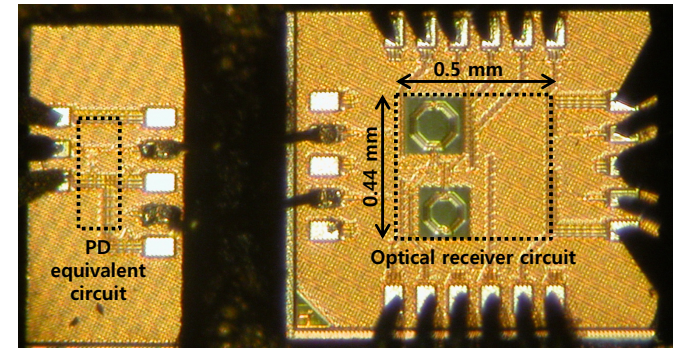
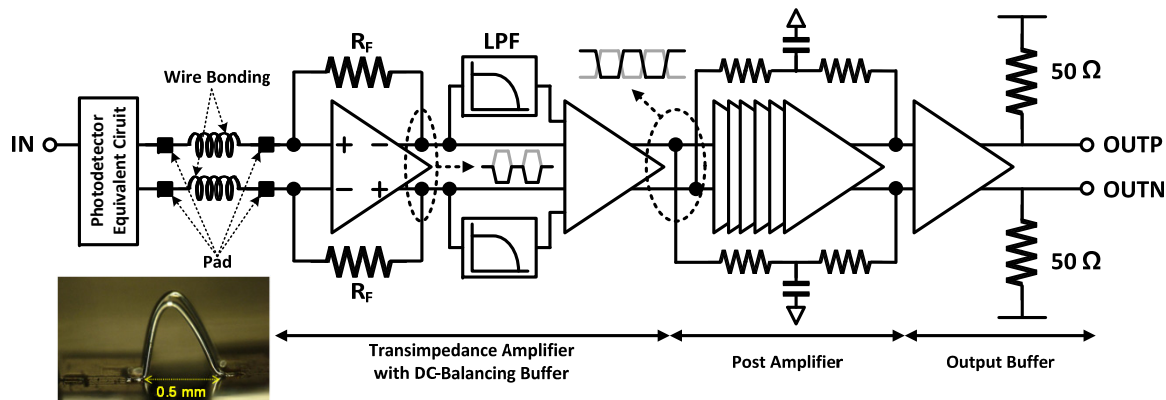
<Magnitude response>



<Eye diagram of 20-Gb/s data>

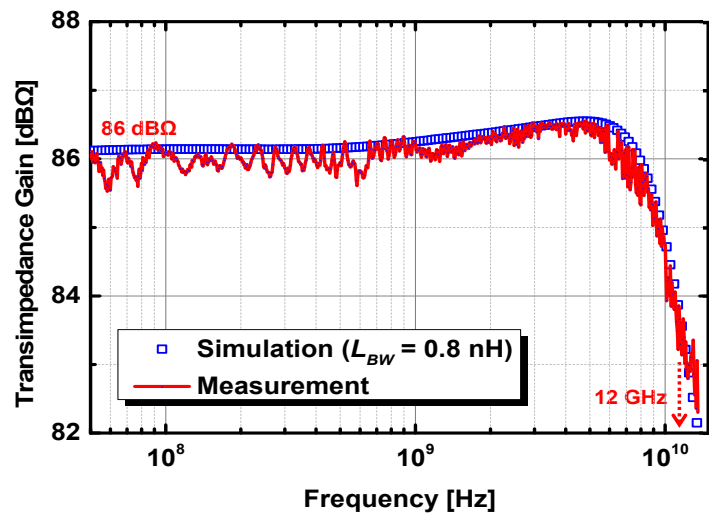
Process	TSMC 65-nm GP
Supply	1.2 V
Input cap	30 fF
Bandwidth	12 GHz
Power (@1.2 V)	120 mW W/O buffer
Area	0.0434 mm <sup>2</sup>
Gain	74.5 dBΩ
GD (ps)	30 ps
Noise	12.35 pA/ $\sqrt{\text{Hz}}$ (sim)

# 20 Gb/s Optical Receiver for Hybrid-Integration

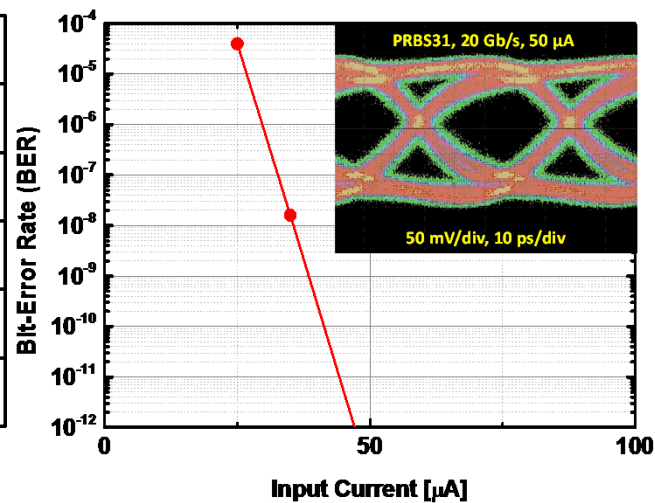


<Block diagram>

<Chip photo>



<AC response>



<BER curve & eye diagram>

Process	SEC 65 nm
Supply	1.2 V
Input cap	227 fF
Bandwidth	12 GHz
Power (@1.2 V)	84 mW W/O buffer
Area	0.22 mm <sup>2</sup>
Gain	74.5 dB $\Omega$
GD (ps)	30 ps
Noise	12.35 pA/ $\sqrt{\text{Hz}}$ (sim)