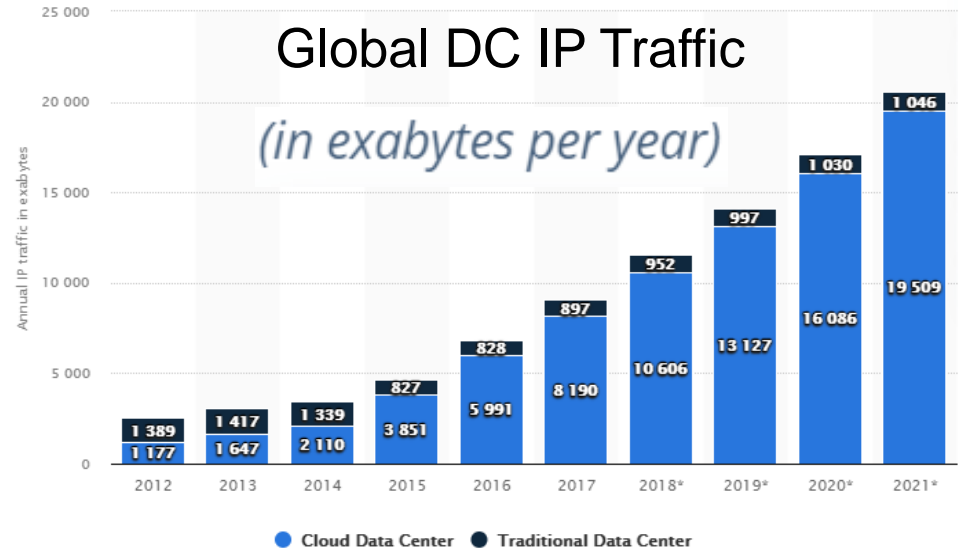


Increasing Traffics in Data Centers

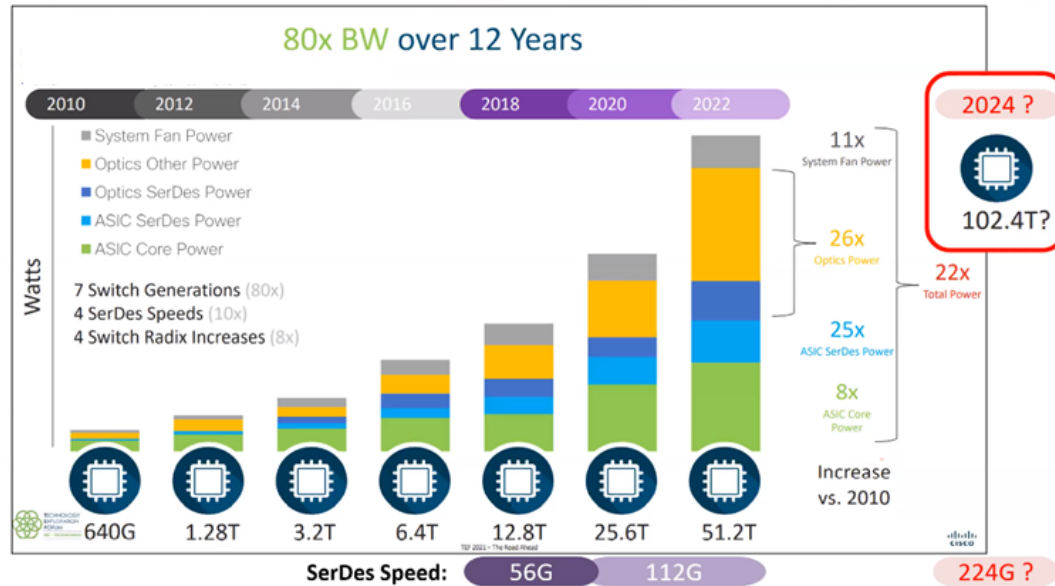


(Statista 2021)

✓ Tremendous increase in data traffic within data centers

➔ **Strong need for larger bandwidth in data center network**

Key Block : Switching Hardware

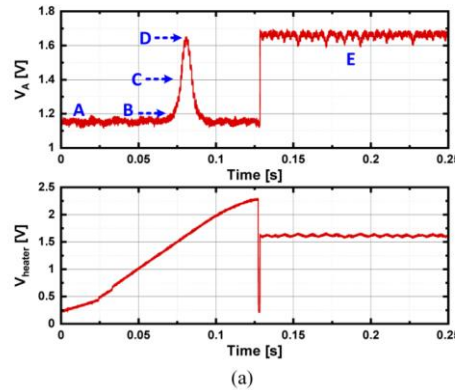
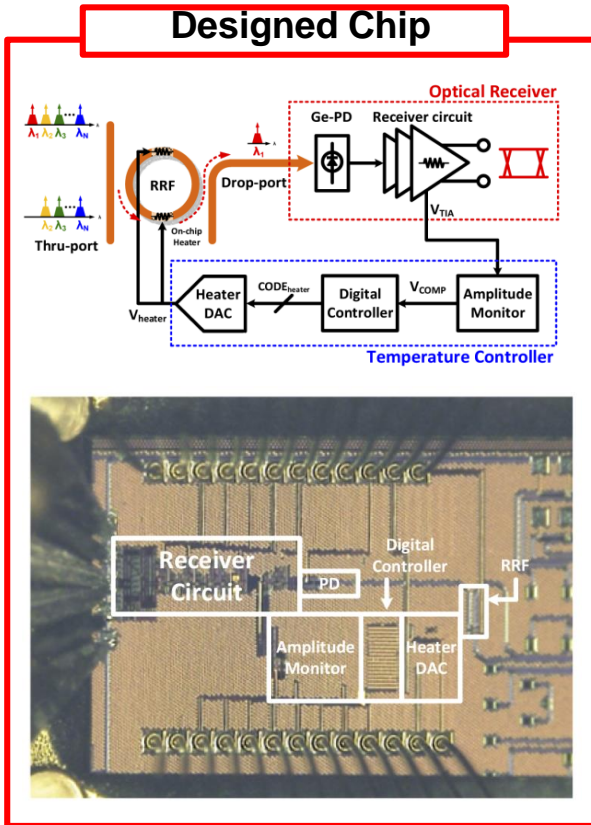


(Ref. Cisco)

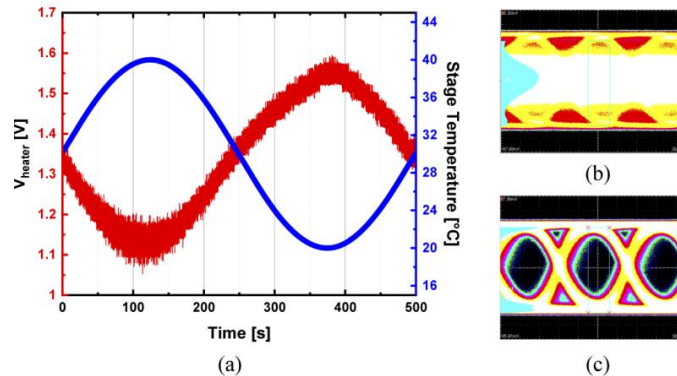
- CMOS Process scaling \uparrow \neq Larger Bandwidth
- Next structure for high-speed switching network \rightarrow **Optical switching system**

Automatic λ_{res} Calibration for Ring-Resonator

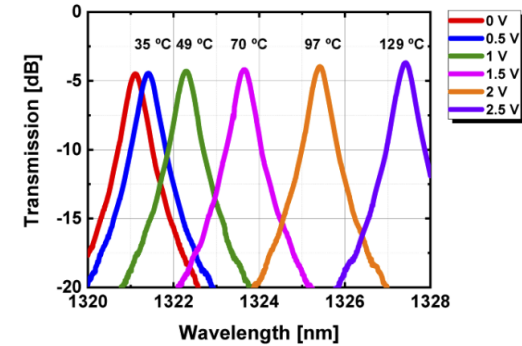
Designed Chip



< Calibration process >



< Resonance stabilization >

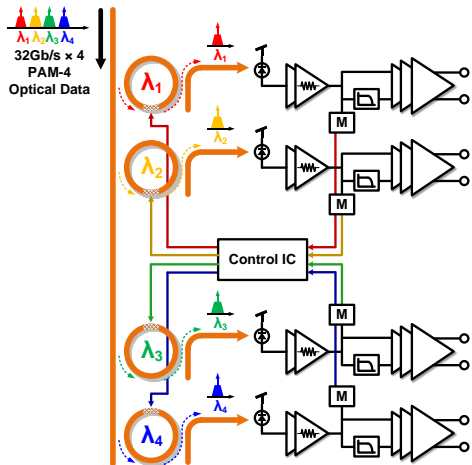


< RRF characteristic >

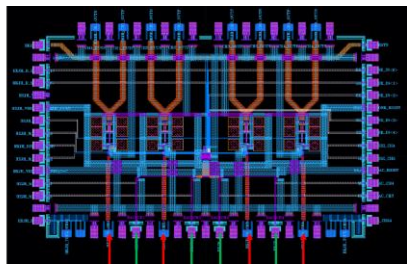
Performances	This work
Data rate	12.5-Gb/s
BER	10 ⁻¹²
Power (Rx)	48 mW
Power (Cont)	11.7 mW
Power (DAC+Heater)	23.2 mW

Automatic λ_{res} Calibration for RRF based WDM Rx

Designed Chip



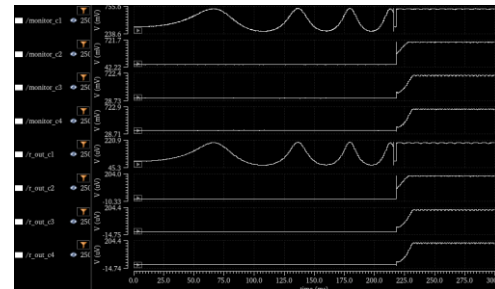
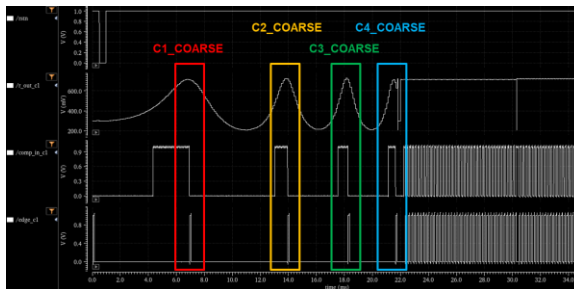
Electronic IC



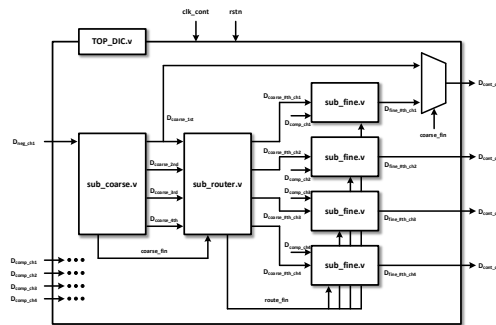
Photonic IC



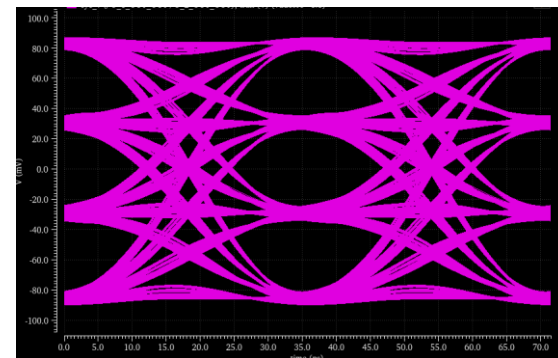
Calibration Process



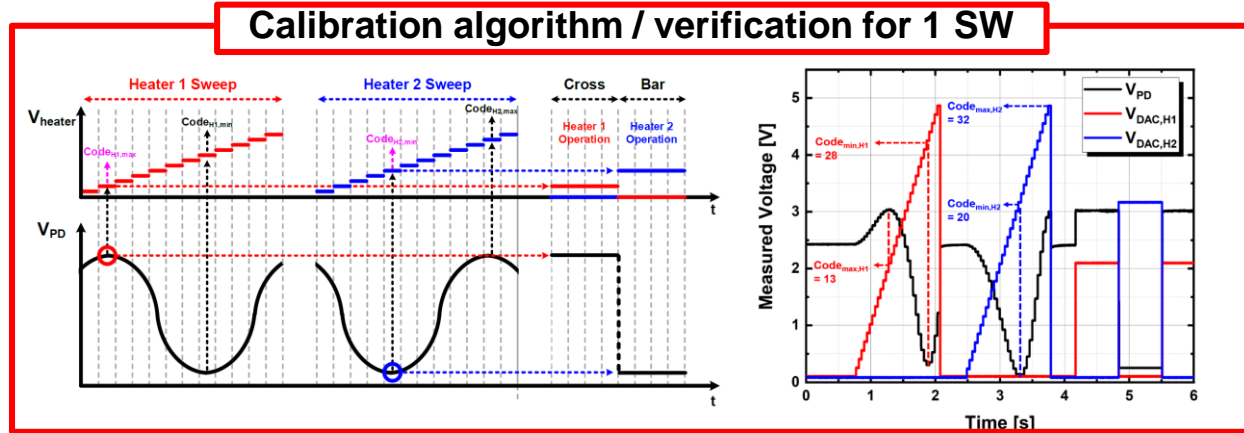
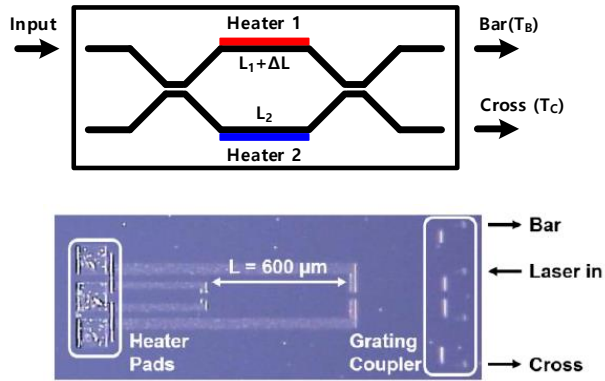
Cal. Algorithm Flow



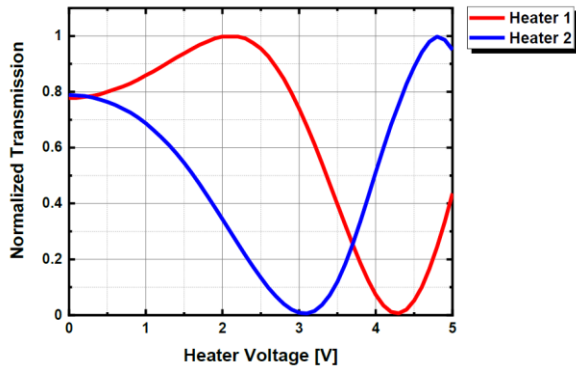
Eye Diagram (Sim)



Automatic PV Calibration for MZI Switch Matrix



< MZI with process variation >



< Characteristic curve >

PCB control board

