

Integrated Photonics

Figures and Images for Instructors

Module 5

Integrated Photonics Circuits and Systems

Optics and Photonics Series



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Optical Transmitter

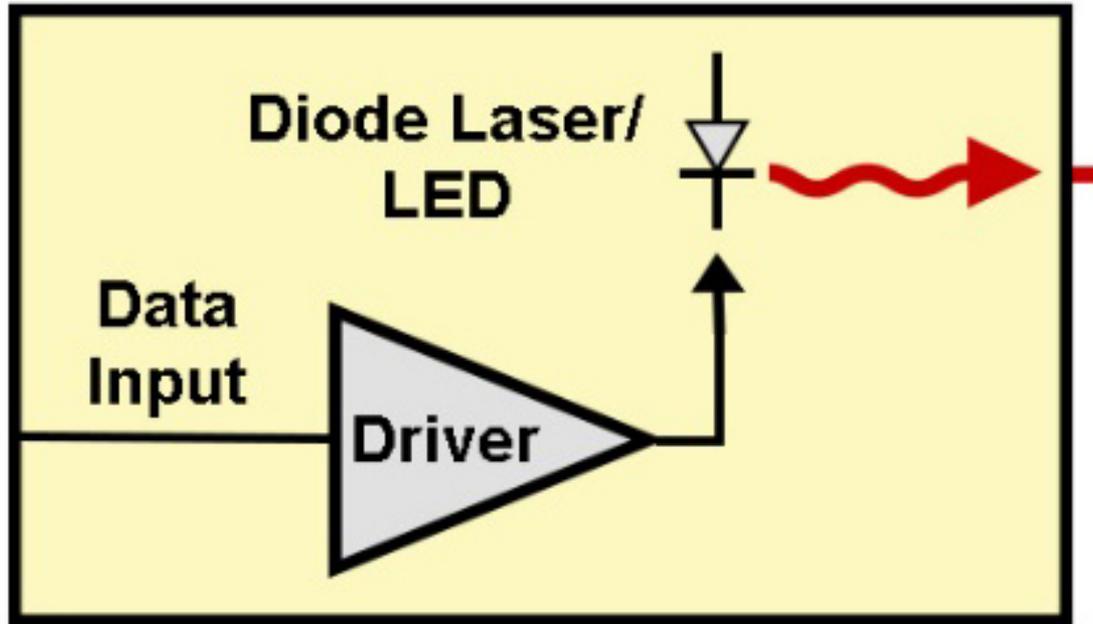


Figure 5-1 *Optical transmitter device*

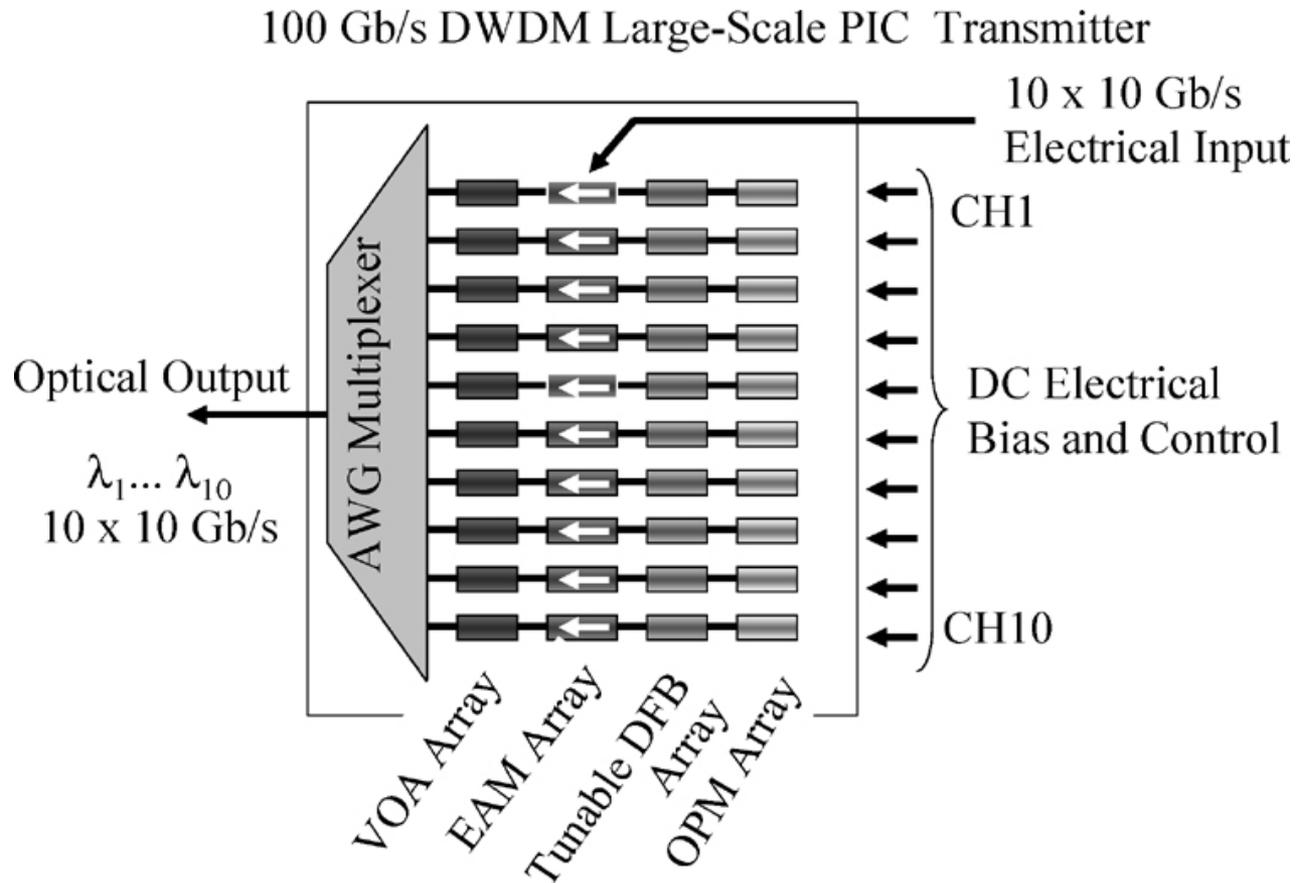


Figure 5-2 *Ten-channel LS-PIC transmitter architecture. Direction of propagation of light is from right to left. Courtesy of Infinera*

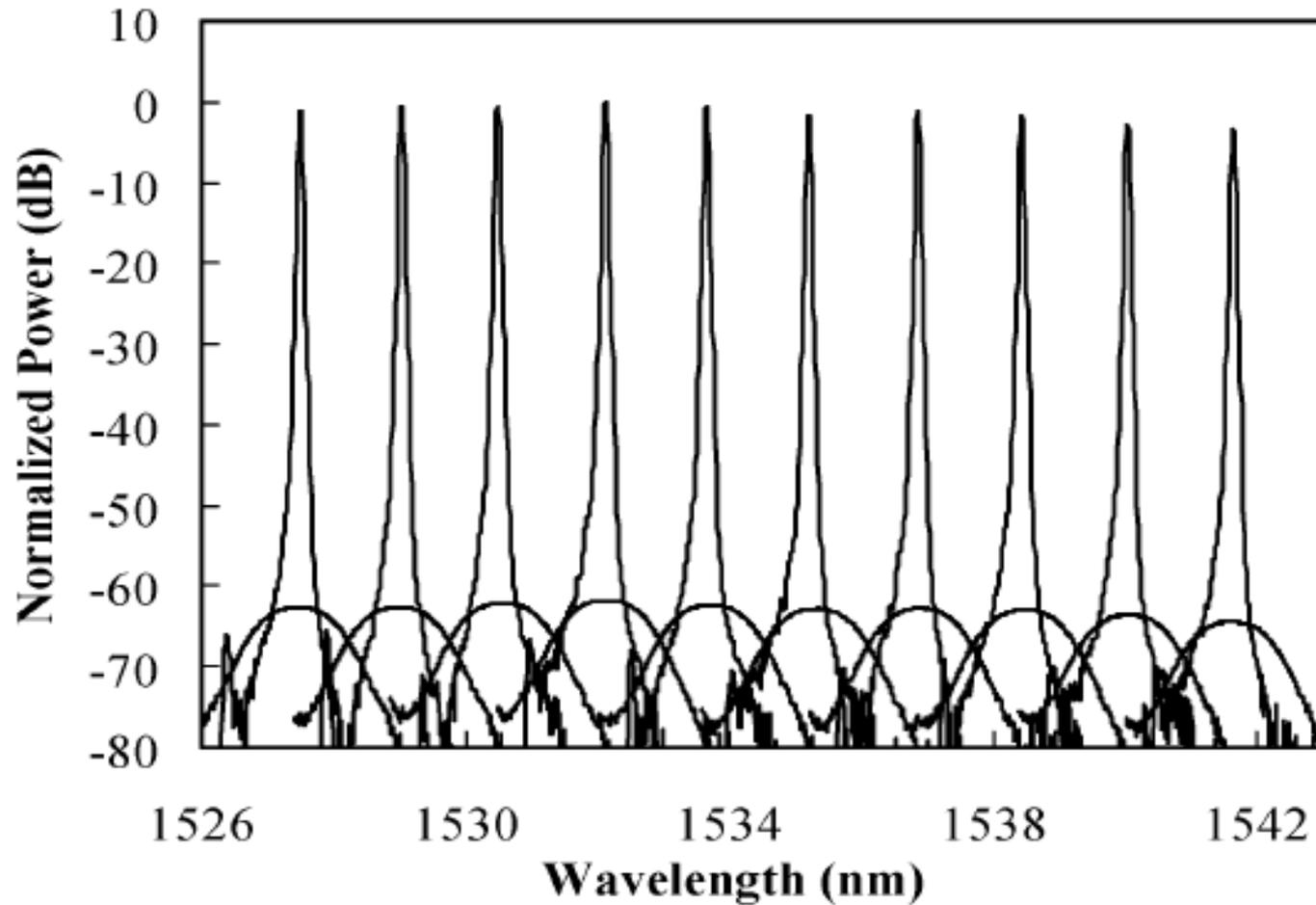


Figure 5-3 *Spectrum of the output light from a transmitter chip, showing the ten channels separated by 200 GHz. Courtesy of Infiner.*

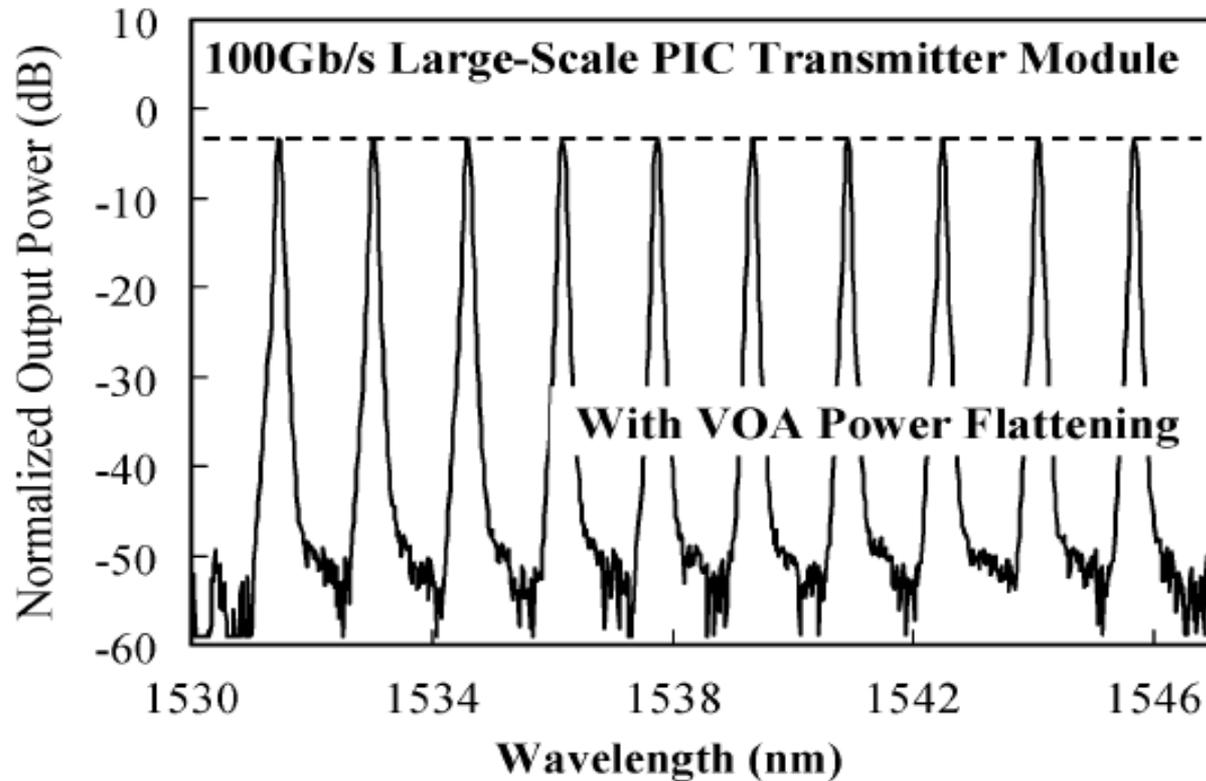


Figure 5-4 *Spectrum of the output light from transmitter chip with equal power in the ten channels. Courtesy of Infinera*

Optical Receiver

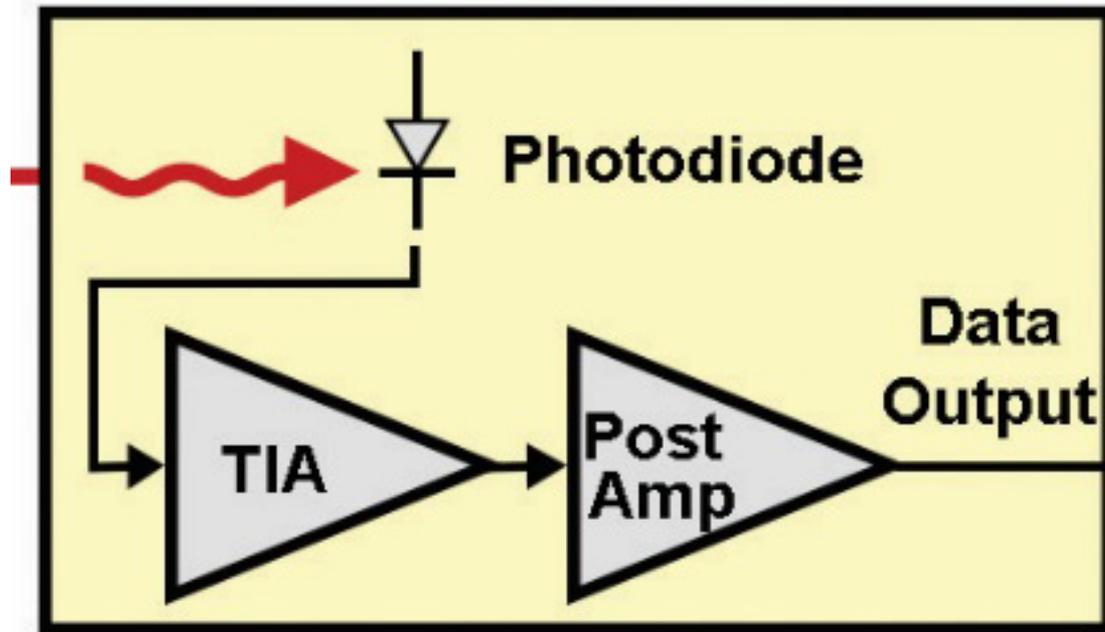


Figure 5-5 *Optical receiver device*

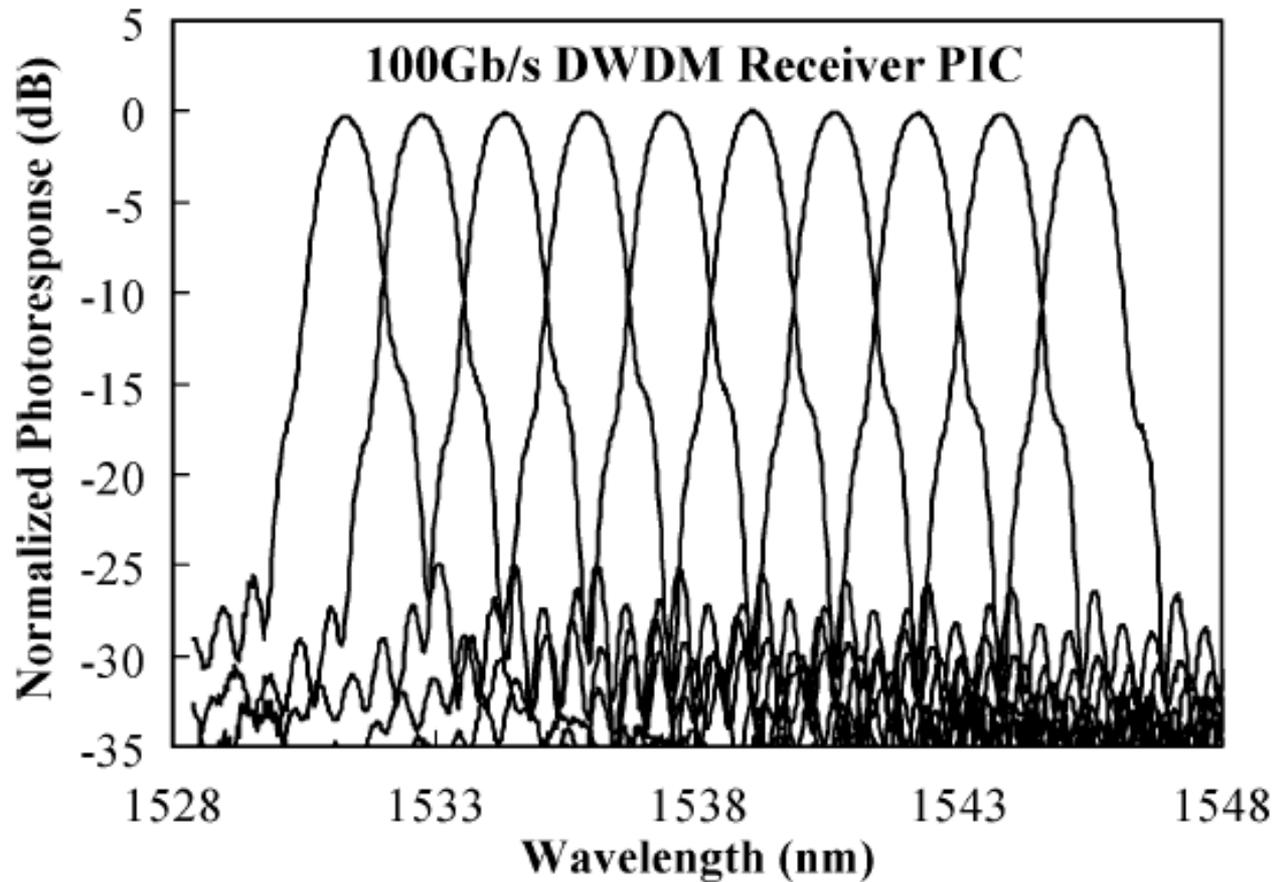


Figure 5-6 *Spectrum of the receiver chip output showing the ten channels separated by 200 GHz. Courtesy of Infinera*

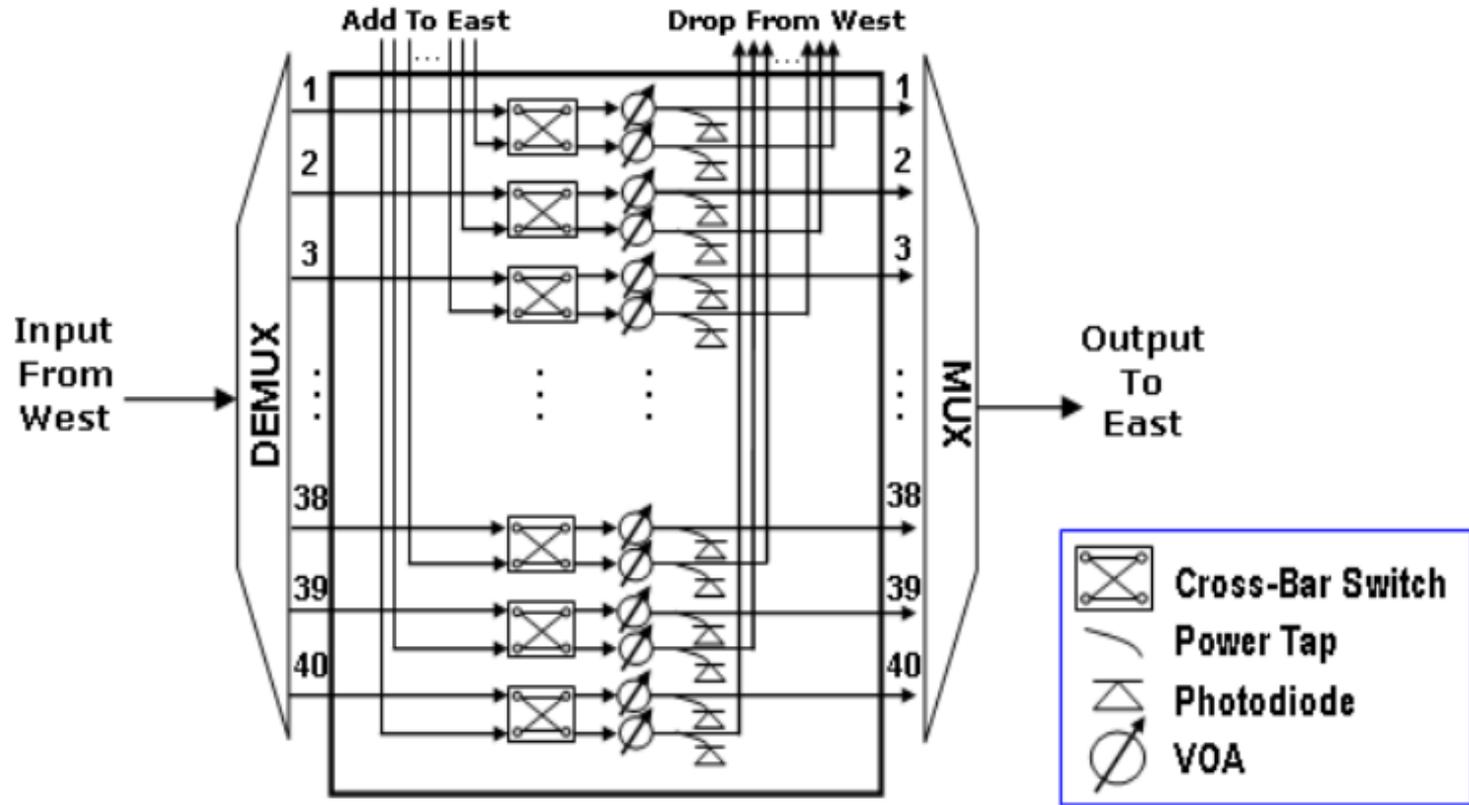


Figure 5-7 *Type I ROADM based on planar lightwave circuit (PLC) components*

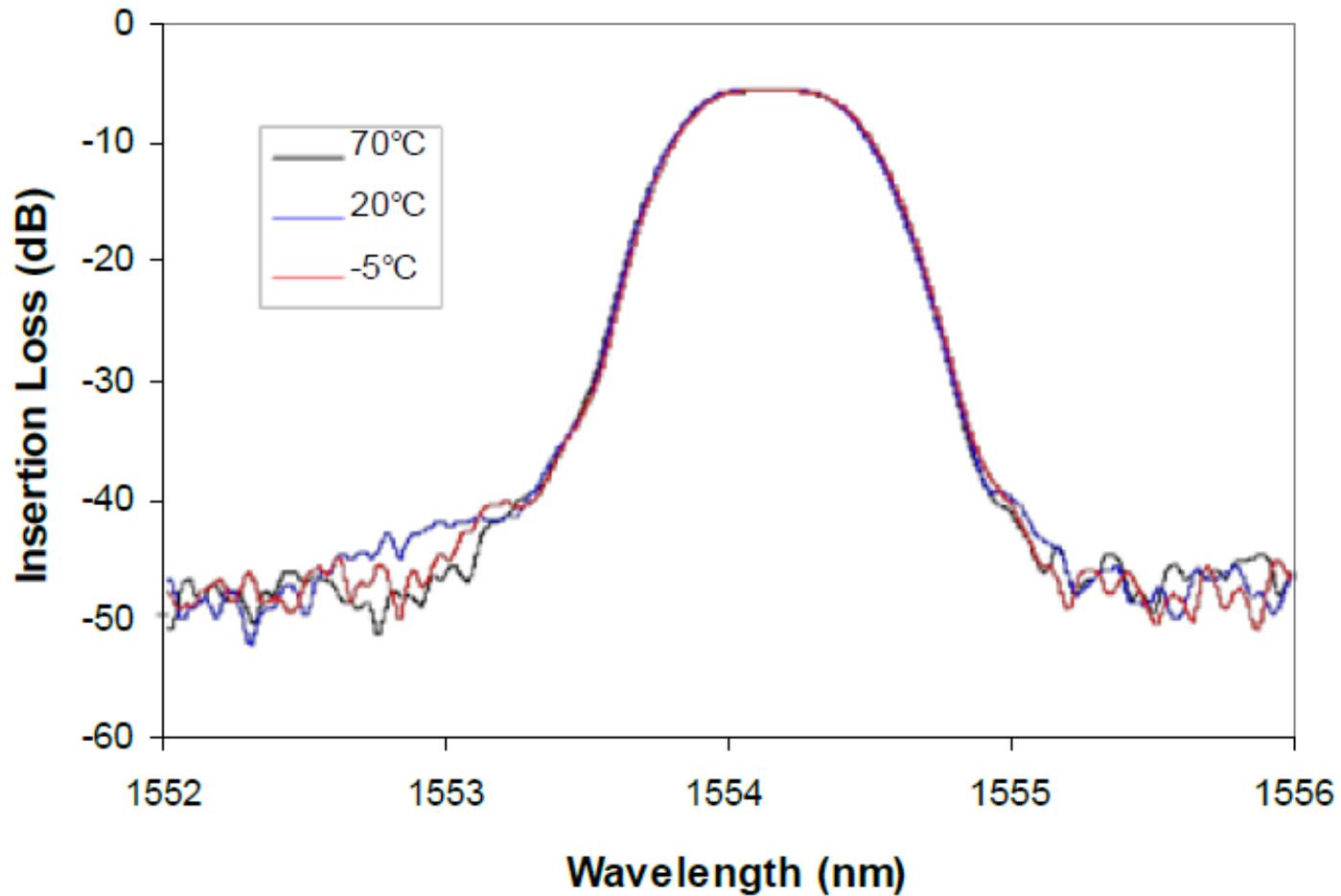


Figure 5-8 *Transmission for one of the athermal AWG channels at three different temperatures. Courtesy of Enablence*

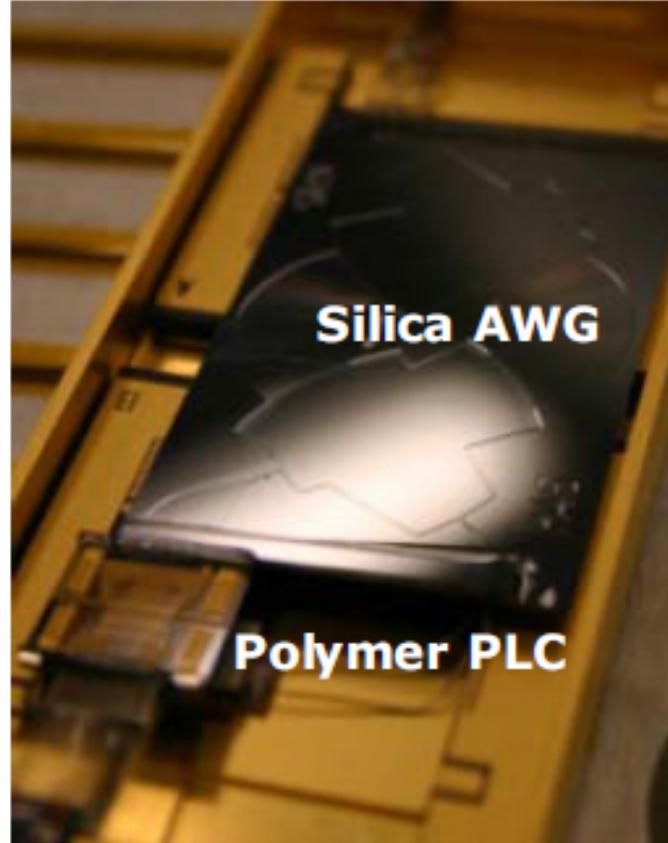


Figure 5-9 *Chip-to-chip bonded silica AWG and polymer switch/VOA array subassembly for type I ROADMs. Courtesy of Enablence.*

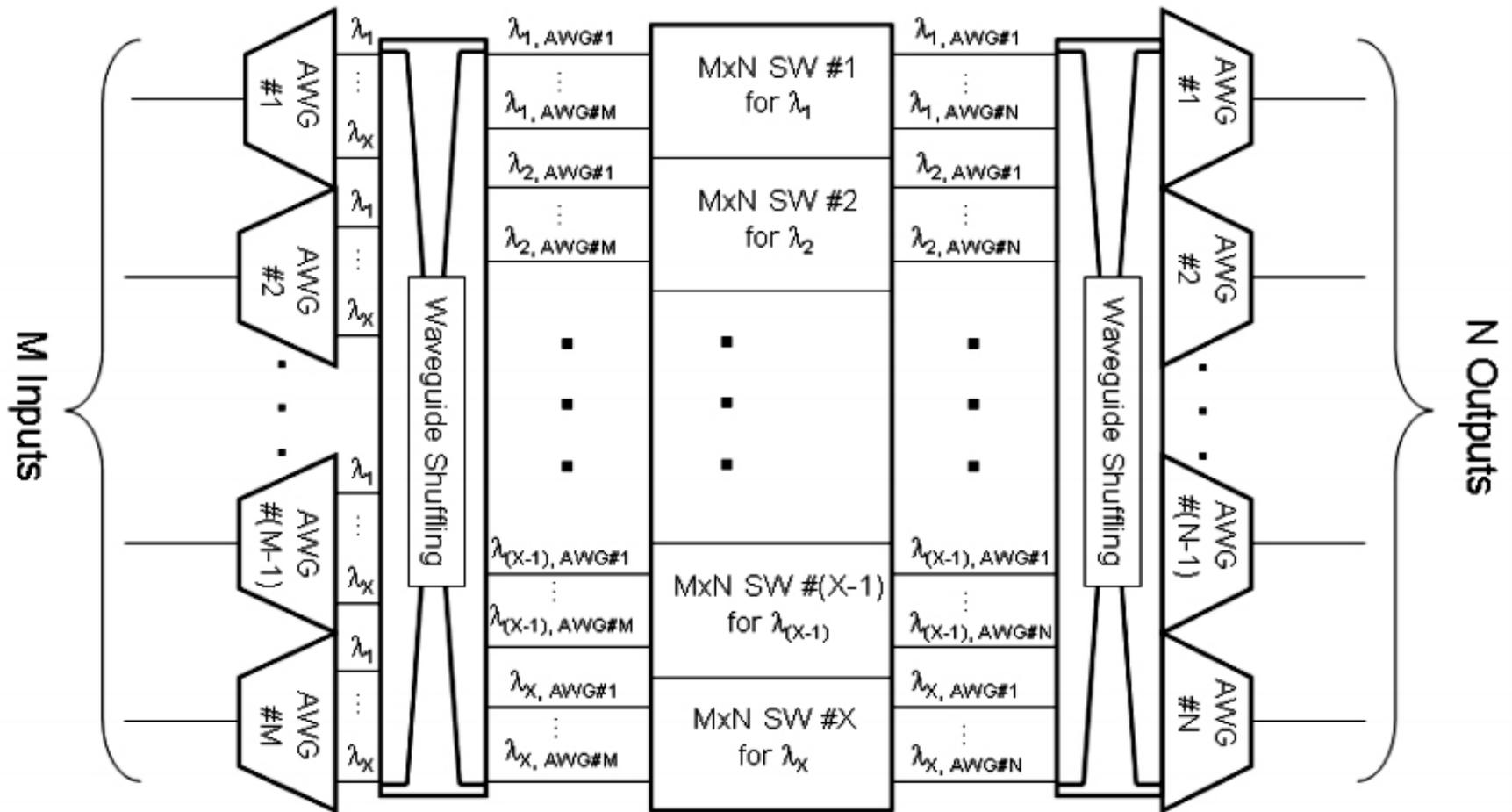


Figure 5-10 $M \times N$ ROADMs based on PLC components

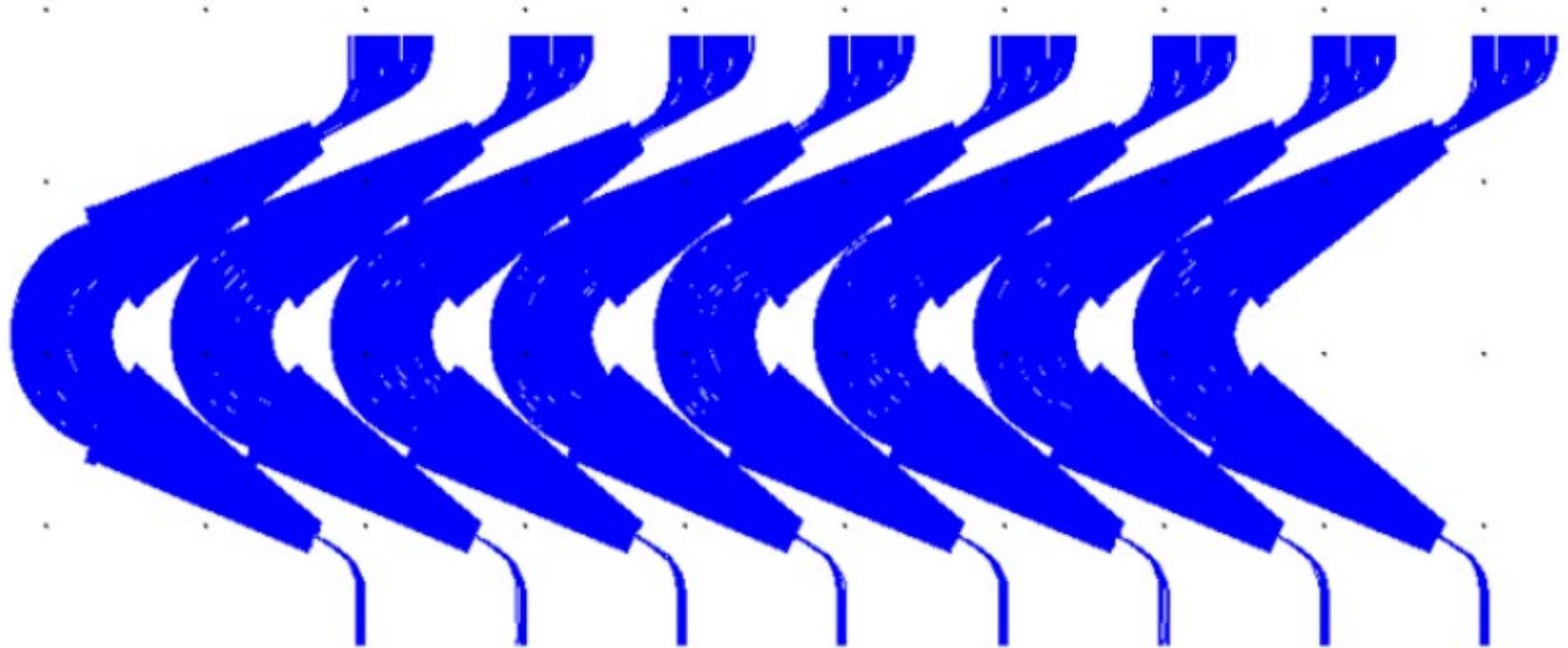


Figure 5-11 *Super high delta silica-on-silicon chip integrating eight AWGs*

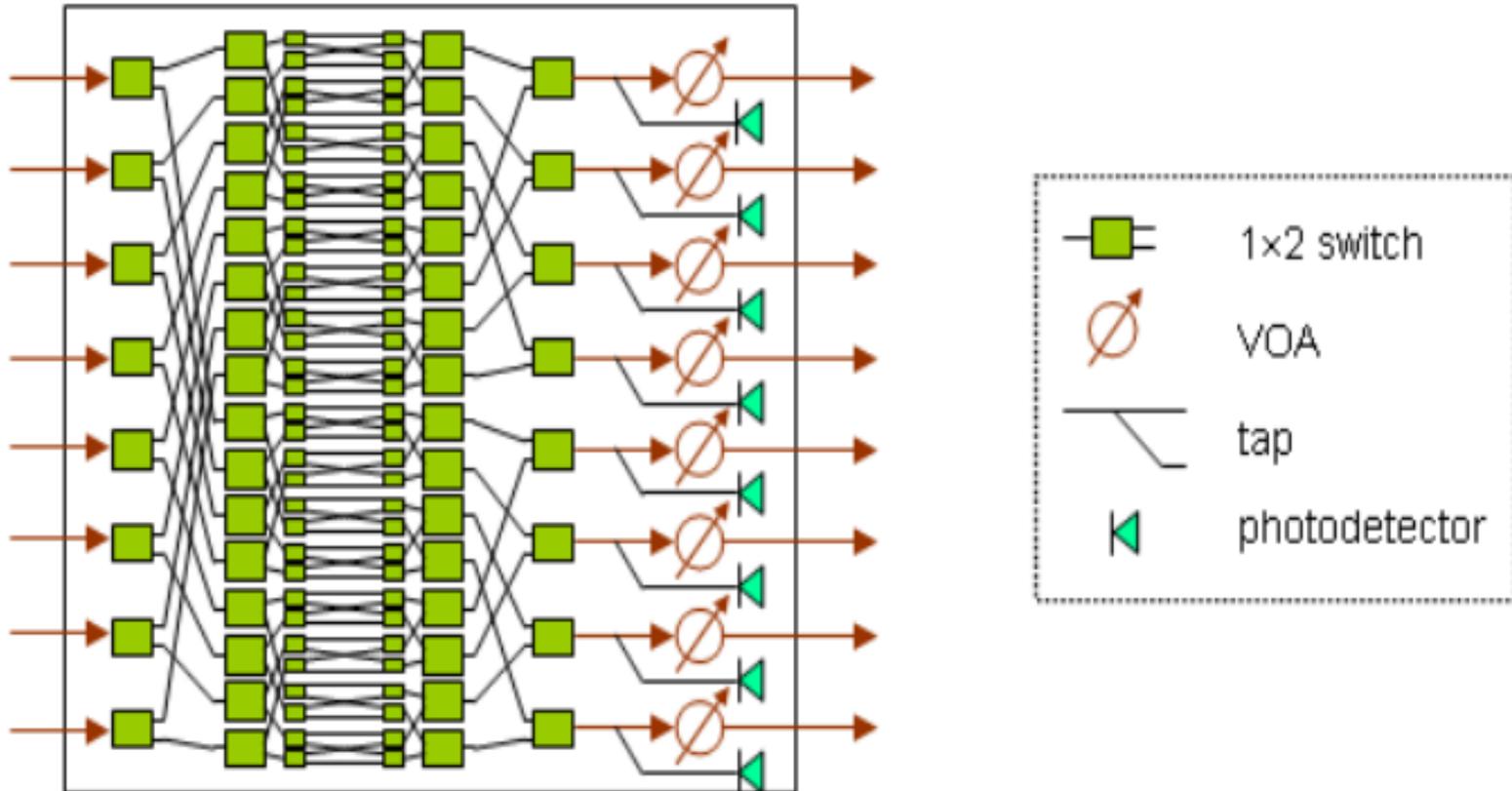


Figure 5-12 *Super-high delta polymer chip integrating switches, VOAs, and taps for photodetectors*

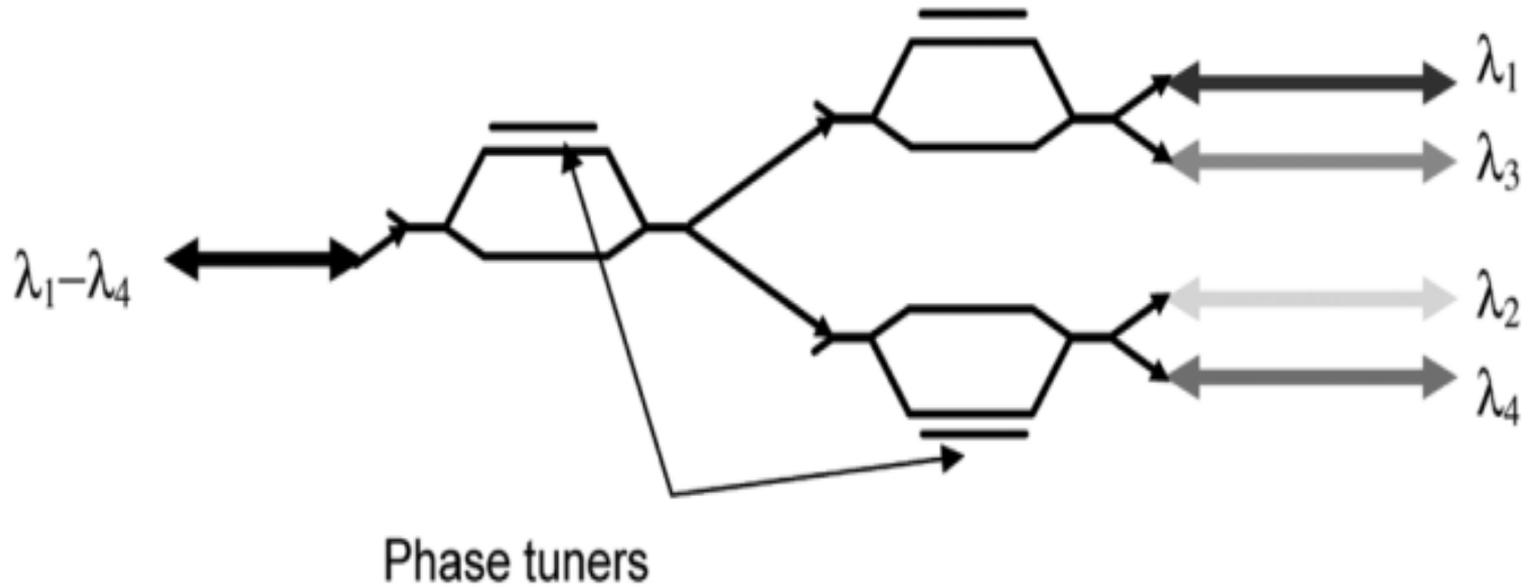


Figure 5-13 *Four channel interleaver with phase tuners in the interferometer arms*

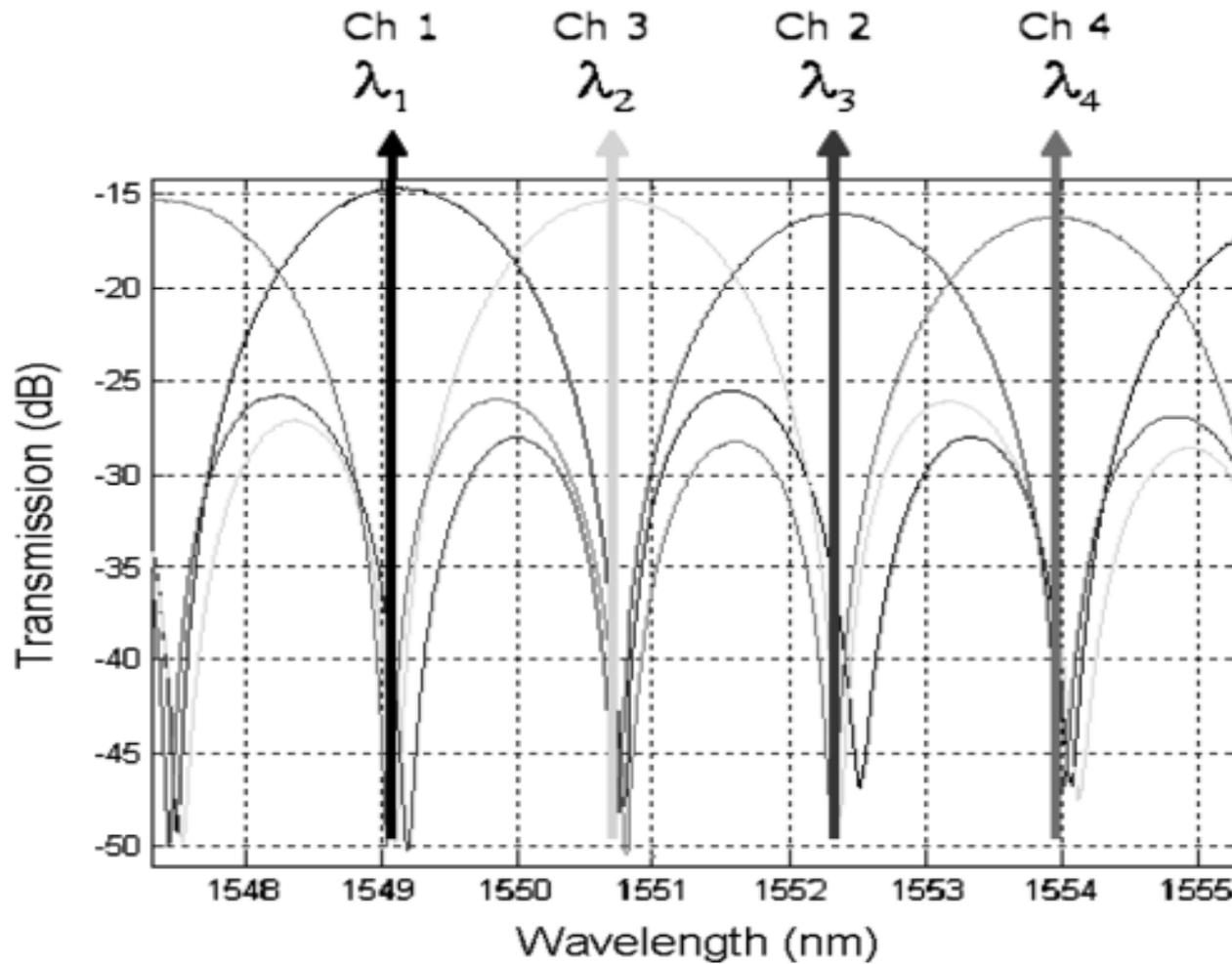


Figure 5-14 *Transmission of the four channel tuned interleaver*

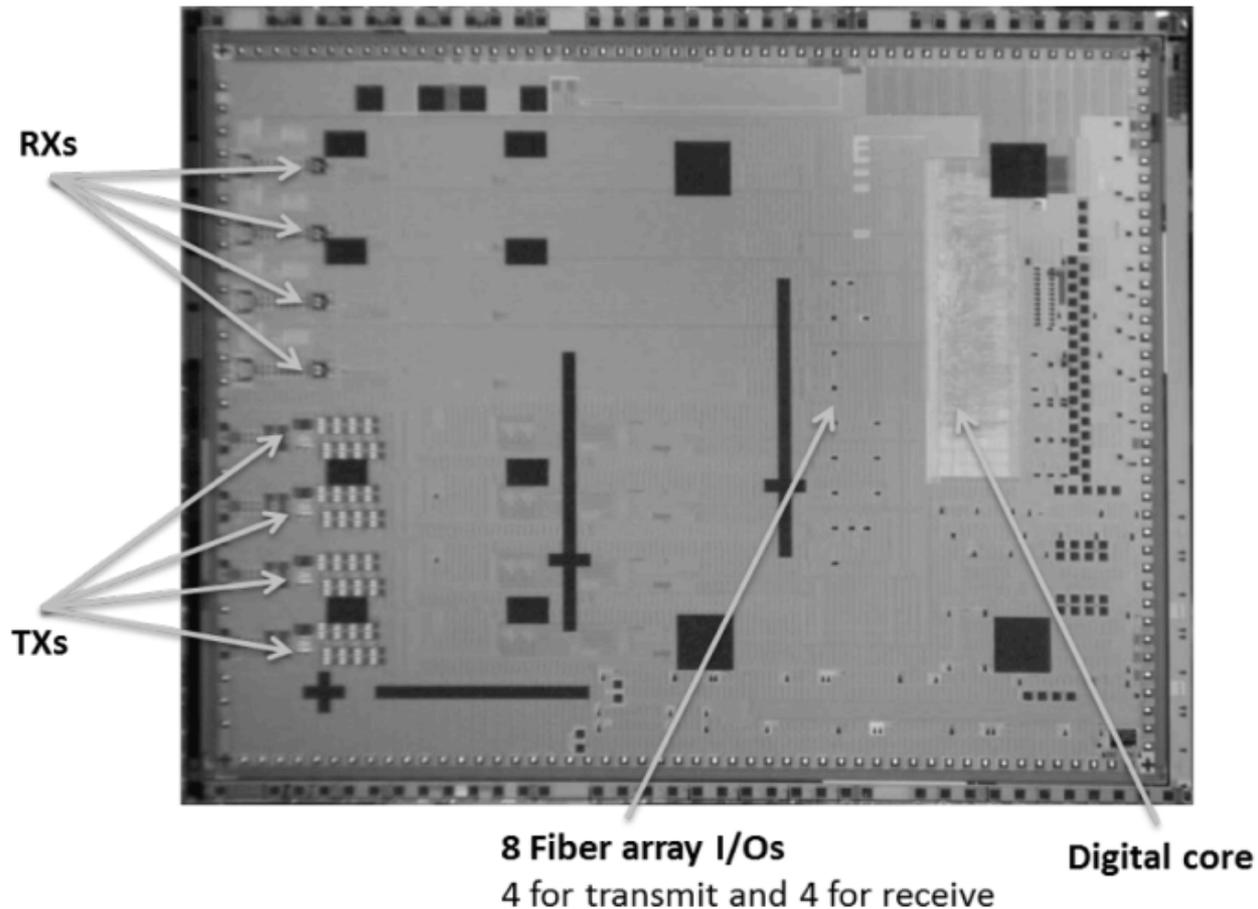


Figure 5-15 *Microscope view of monolithically integrated transceiver chip. TX indicates transmitters; RX indicates receivers. Courtesy of Luxtera.*

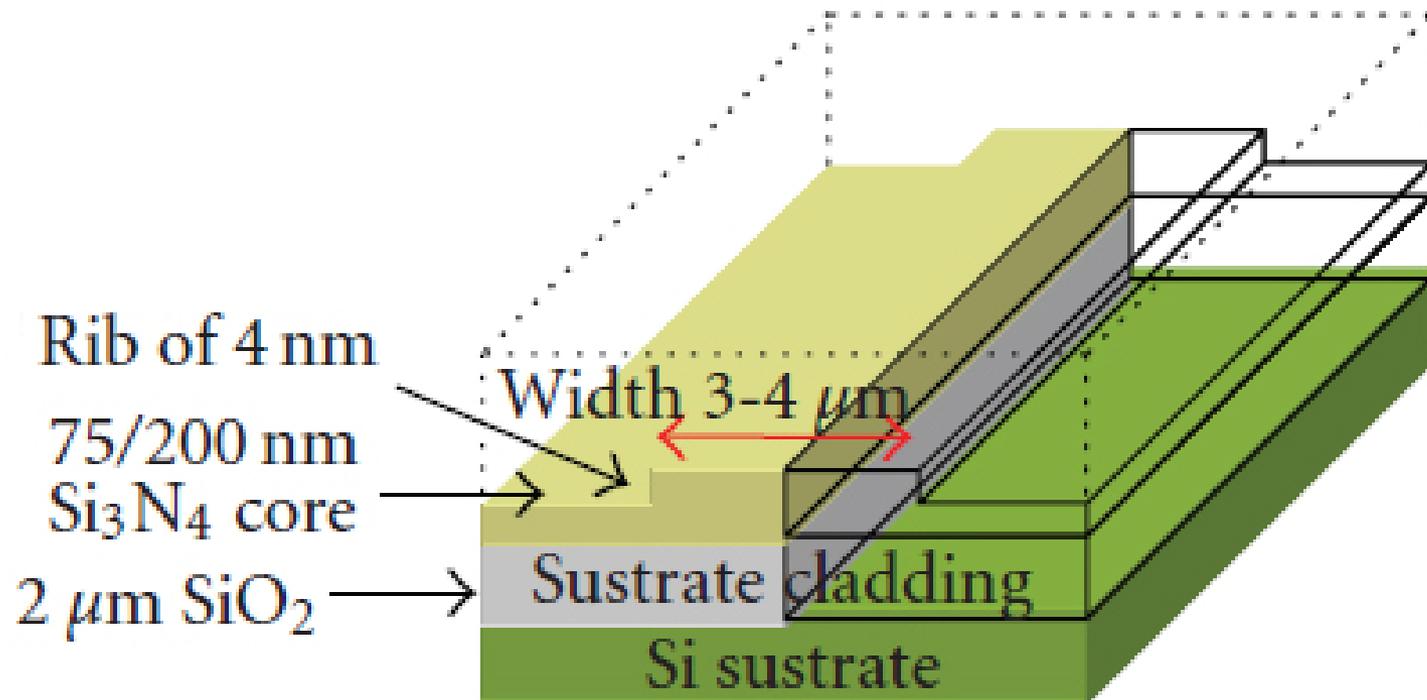


Figure 5-16 *Rib waveguide structure used in photonic biosensor*

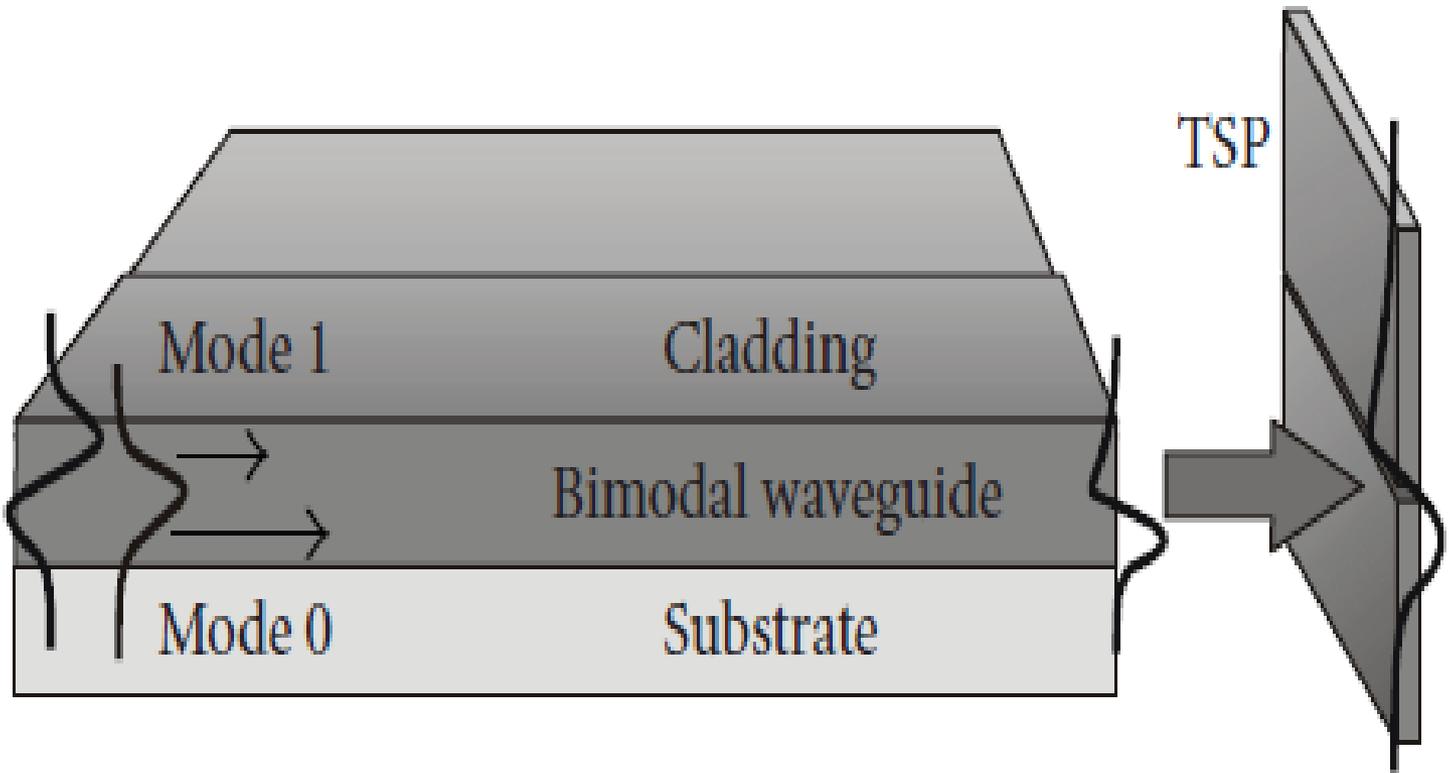


Figure 5-17 *Bimodal waveguide for photonic biosensor*

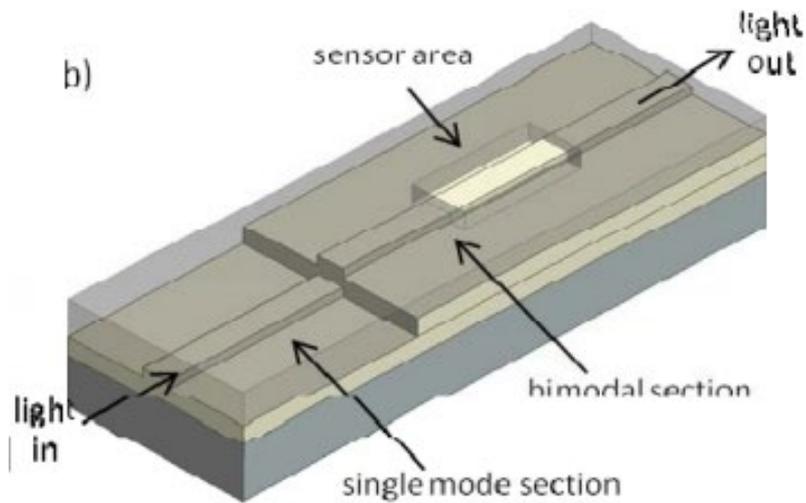


Figure 5-18 *Left: bimodal waveguide based photonic biosensor. Right: five-sensor chip with light coupled to the chip through gratings.*

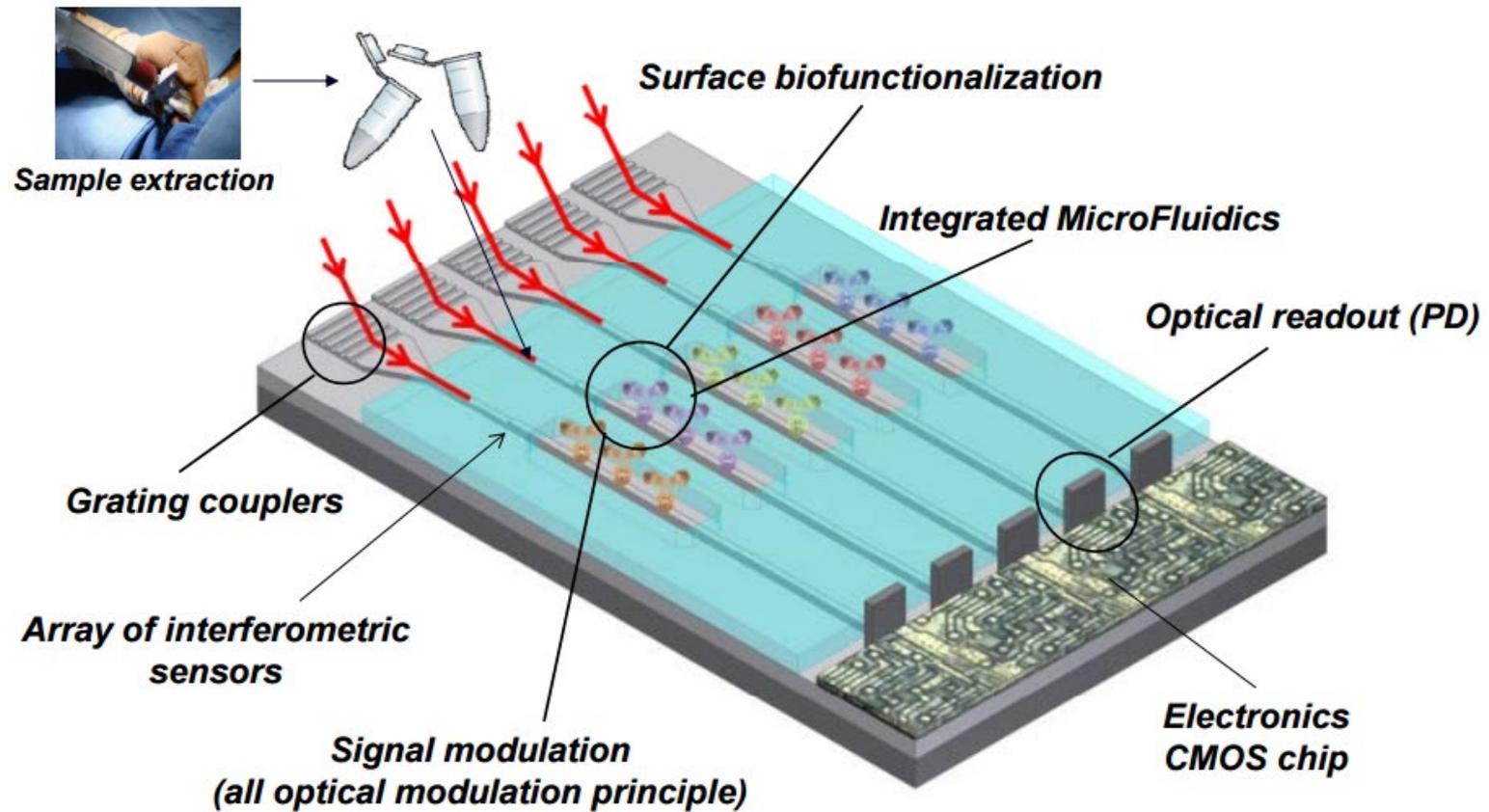


Figure 5-19 *Lab-on-a-Chip biosensor platform*

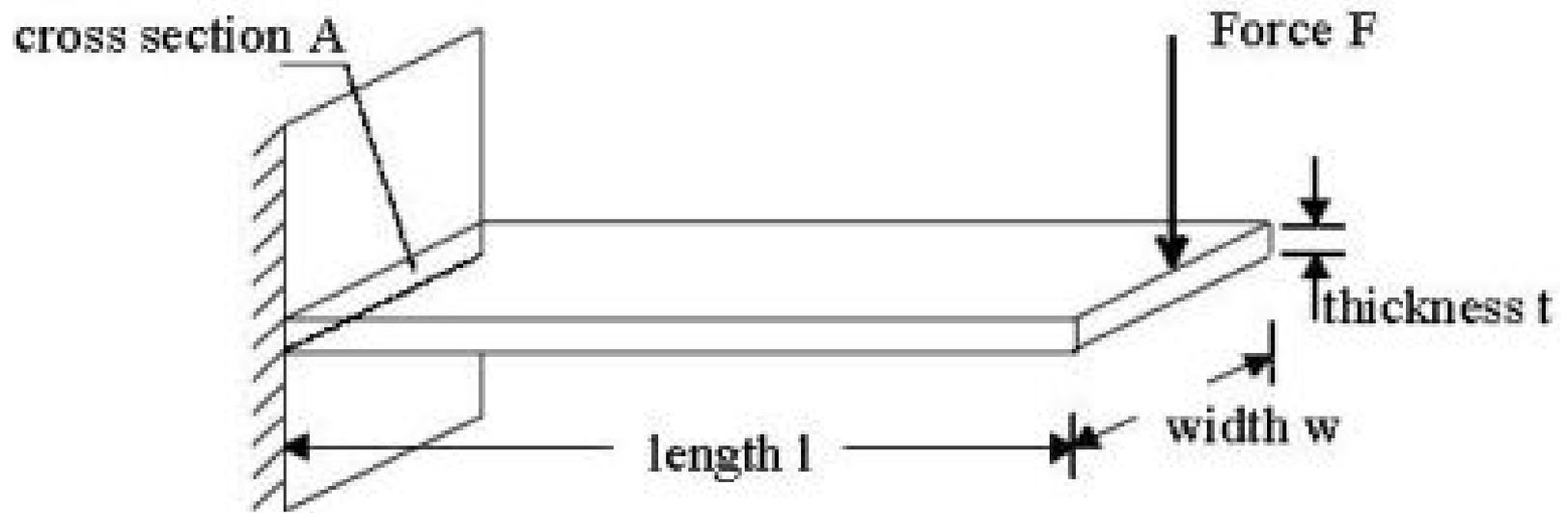


Figure 5-20 *Illustration of cantilever beam*

MEMS Deformable Mirror Schematic

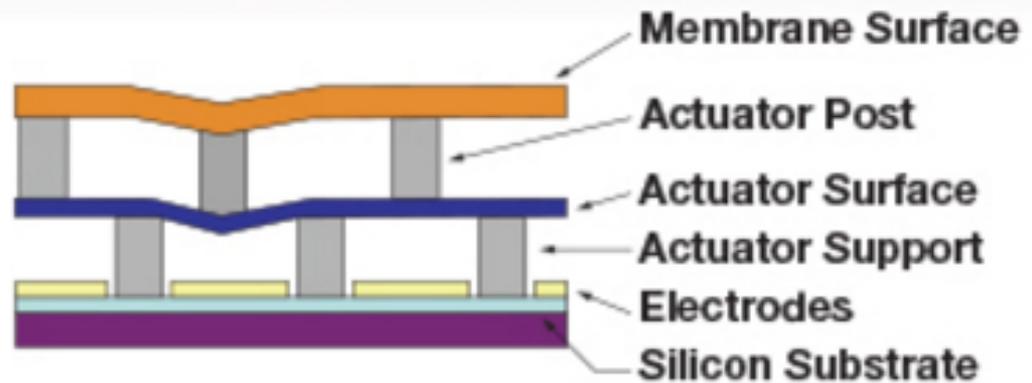


Figure 5-21 *MEMS deformable mirror with a 12 x 12 actuator array. Courtesy of Thorlabs.*

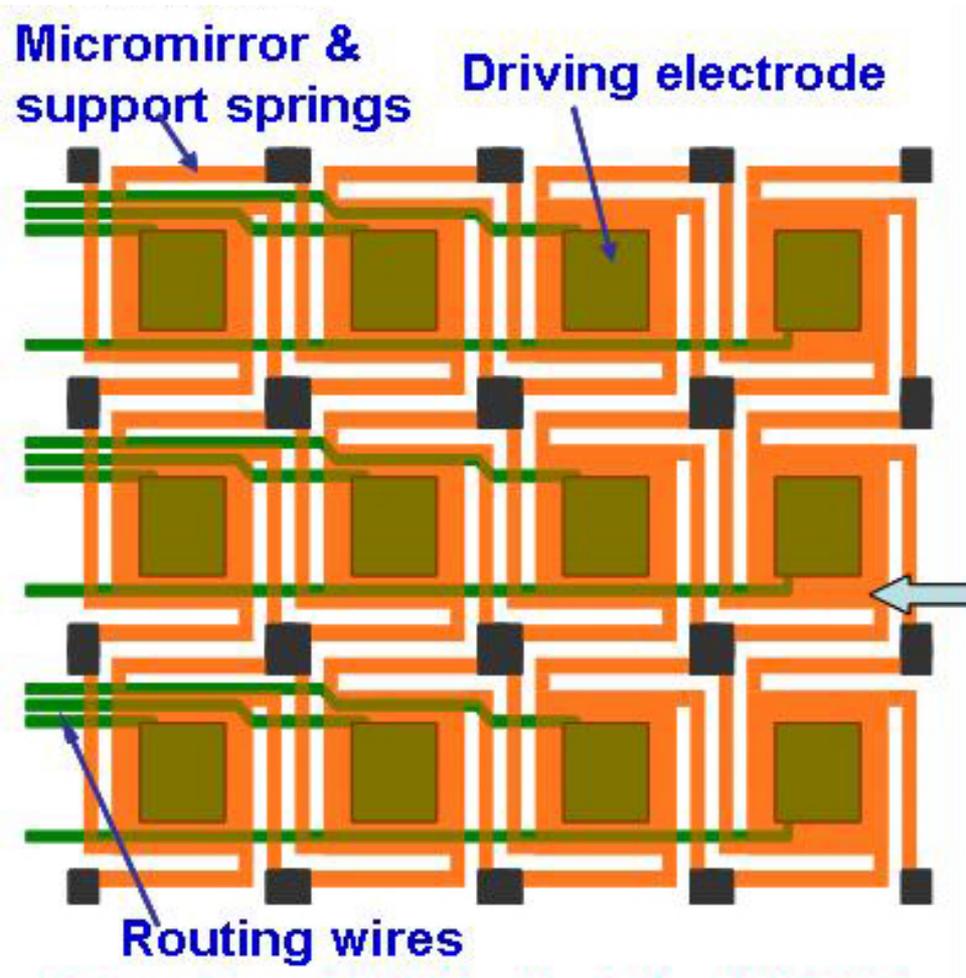


Figure 5-22 *Steerable micromirror array illustration*

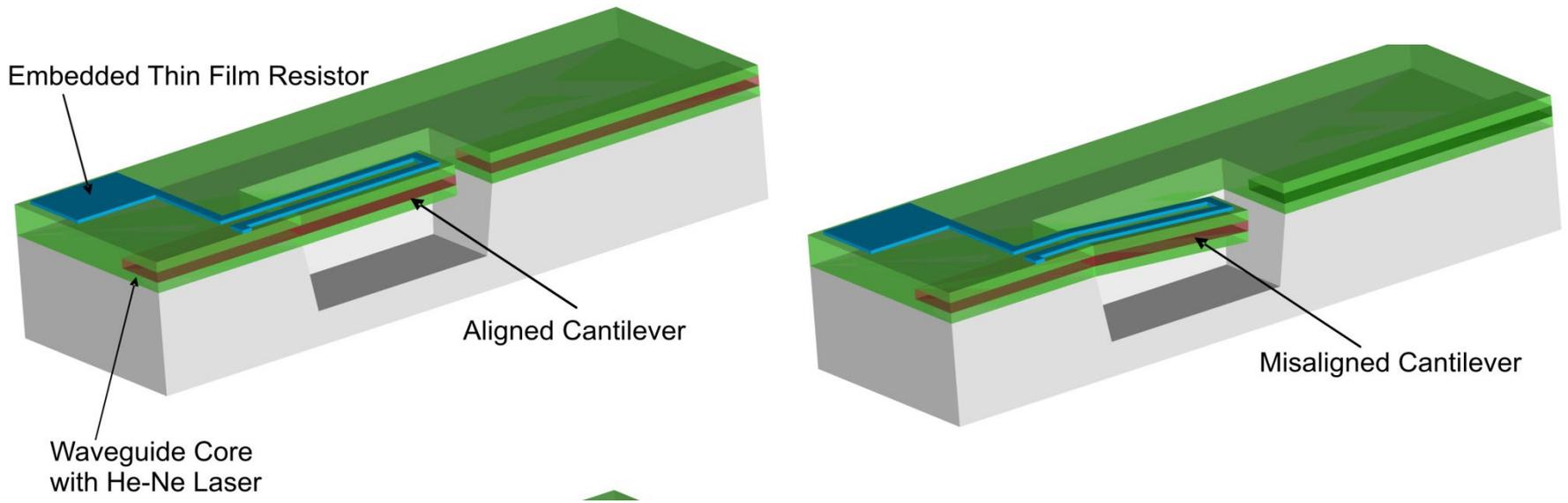


Figure 5-23 *Cantilever beam on-off optical switch*