

# Evolution of Photonic Integration from Integrated Optics

**Hideo Isshiki**

The University of Electro-Communications, Tokyo, Japan

Technical Committee on **P**hotonic **I**ntegrated **C**ircuit and **S**ilicon Photonics, IEICE

# Evolution of Photonic Integration

S.E. Miller, Integrated Optics  
BSTJ 48, 2059(1969)

Y. Suematsu, Present Status of Integrated Optics  
Kogaku 1, 175(1972) in Japanese

- Straight line propagation -> Waveguide
- Stability of optics system
- Compact

MOVPE  
Developed

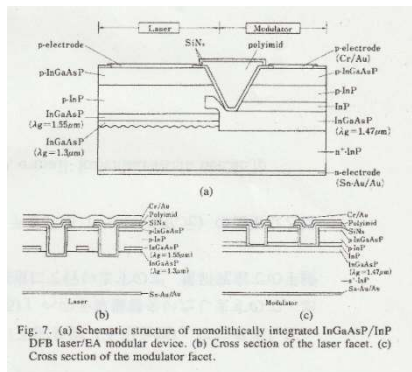
T.C. OIC -> IPDA ( 1986 - 2019)

Heterogeneous  
Integration on  
Si platform

(beginning) Integrated Photonics ( III-V, LN, silica, polymer)

Join to  
T.C. PICS ( 2019 - )

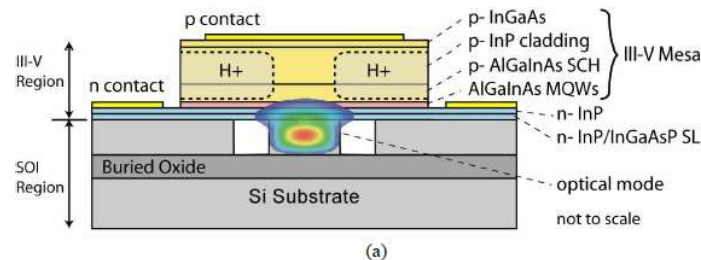
GaAs-Al<sub>x</sub>Ga<sub>1-x</sub>As LD CW operation at RT  
I. Hayashi et al., APL 17, 109(1970)



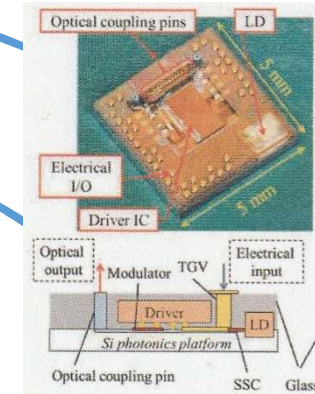
Integration of DFB-LD and EA-Mod.  
M. Suzuki et al., IEEE, LT 14, 9203 (1987)

Silicon Photonics

T.C. SIPH ( 2004 - 2019)



Hybrid Si evanescent LD  
A.W. Fang et al., Optics Express 14, 9203 (2006)



Optical I/O Core  
K. Yashiki et al., OFC 2015 Th1G.1

1970 1980 1990 2000 2010 2020