
Wafer Scale Transfer Printing for heterogeneous integration of photonic-electronic integrated circuits

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With the rapid growth in demand to increase functionality of integrated circuits for faster data speed, higher data capacity, low power consumption and more intelligent, the co-integration of electronics with photonic devices made from different materials are required to be achievable in a practical and scalable approach. Heterogenous integration is the key technology to over the limit of materials, fabrication process and function integrity of the photonic-electronic integrated circuits to improve the performance in photonic, electronics and system level. Transfer printing is one of the disruptive techniques to achieve the wafer scale implementation of photonic-electronics integrated circuit. In our work, we demonstrate the heterogeneous integration process of III-V photodetectors on silicon photonic integrated circuits through transfer-printing by evanescent coupling, on 8-inch wafer scale. A single channel of integrated receiver reaches 42 GHz of 3 dB bandwidth at -2 V reverse bias, showing a polarization-independent responsivity of 0.65 – 1 A/W with dark current within 90 pA.



Short Bio:

Zhiheng Quan received his PhD degree in Optoelectronics from Tyndall National Institute, University College Cork, Ireland. He is a Senior Researcher and Principal Engineer of JFS laboratory, Hubei Province, China.