

VERTICAL INTEGRATION OF CMOS ELECTRONICS WITH PHOTONIC DEVICES

ABSTRACT OF THE DISCLOSURE

A method of fabricating a composite semiconductor structure includes providing an SOI substrate including a plurality of silicon-based devices, providing a compound semiconductor substrate including a plurality of photonic devices, and dicing the compound semiconductor substrate to provide a plurality of photonic dies. Each die includes one or more of the plurality of photonics devices. The method also includes providing an assembly substrate having a base layer and a device layer including a plurality of CMOS devices, mounting the plurality of photonic dies on predetermined portions of the assembly substrate, and aligning the SOI substrate and the assembly substrate. The method further includes joining the SOI substrate and the assembly substrate to form a composite substrate structure and removing at least the base layer of the assembly substrate from the composite substrate structure.

Fig. 12

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