

Compliant, High-Density Electrical/Optical Input-Output Connections. - M. Bakir, A. He, K. Martin, J. Meindl, S.A. Allen, and P. Kohl (Georgia Institute of Technology)

The drive toward higher density and performance of integrated circuits creates a need for keeping interconnect short and eliminating layers of packaging. In this talk, a high-density, compliant sea-of-leads input/output interconnect is presented. The mechanical compliance is addressed through slippery leads (released from the surface) and buried air-cavities. The ability to fabricate buried air-cavities has enabled the integration of optical interconnects with high index of refraction mismatch between core and cladding.

New fabrication methods are described for forming high aspect ratio chip-to-module optical pillars. The polymer pillars include the nano-imprinting of optical features, such as gratings. The imprint step used a prefabricated stamp to directly emboss the photosensitive polymer prior to ultraviolet exposure without affecting the photosensitivity of the polymer. A temporary glass layer was deposited over the imprinted structure to preserve the fine features so that the large-scale photo-definition process could be completed.