Title : Glass substrate as advanced packing solution

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Current explosive growth on artificial intelligence and machine learning (AI/ML), virtual reality, and networks and data centers are requiring high level of capability on increased processing speed, bandwidth density, and power efficiency. Co-packaged optics (CPO) is an approach to achieve these exponentially increasing needs by bringing optical transceivers and electronic integrated chips on the same substrate, so the length of the electrical path between optics and electrical ICs is significantly reduced, which may address the demand on bandwidth density, communication latency, and power efficiency. For advanced packaging, Si substrate has been widely accepted as a packaging substrate. However, due to the challenges on mechanical stability, management on warpage and thermal reliability, and low loss electrical interconnects, glass has been drawing interest as a new packaging substrate, which could provide solution to packaging challenges.
Glass has excellent surface flatness, relatively high stiffness, and tailorable coefficient of thermal expansion (CTE), which enables better management on the warpage. Low thermal conductivity and high electrical resistivity also provides great thermal stability and low electrical loss. Additionally, glass could be manufactured in panel level, with scalable substrate size and thickness, meeting the high requirement on warpage and flatness. To leverage the advantages of glass as a packaging substrate, Corning has been developing glass technologies for packaging application.
In this presentation, technologies developed for glass packaging substrate development, including optical waveguide, through glass via (TGV), metallization of TGV, and redistribution layer (RDL) will be introduced. Especially, advanced packaging system, which is electro-optic substrate, having both optical channel and electrical component on the same substrate will be described

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