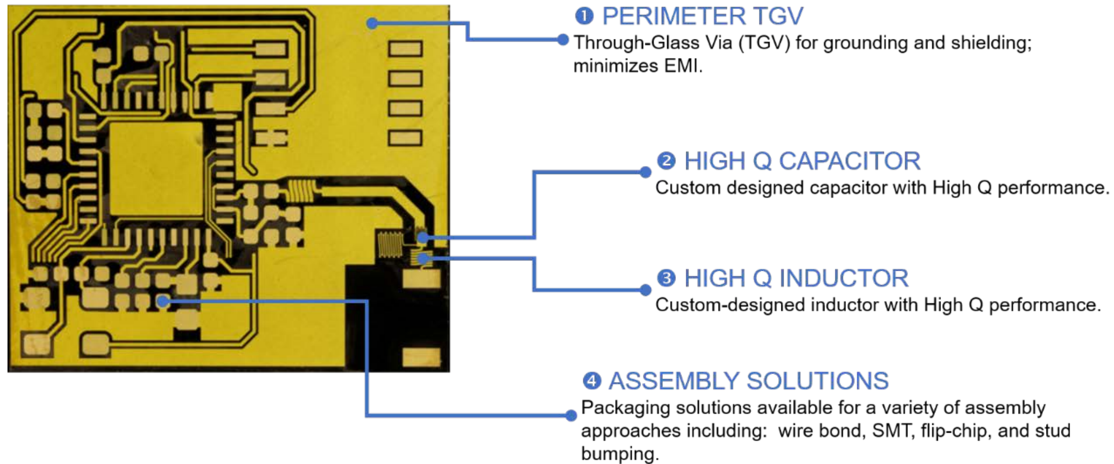
3D GLASS SOLUTIONS

APEX® Glass
RF System-in-a-Package Solutions



Solution Overview

Glass-based RF SiP interposers allow you to offer significant product differentiation. Our proprietary APEX® Glass allows you to realize high-value system integration in the most compact footprint enabling you to meet even the most demanding product definitions for next generation RF and wireless products.

At the heart of our interposer technology is the ability to manufacture precise through glass vias (TGVs; 50 microns in diameter) for I/Os with tight metal redistribution line and spacing (<30 microns) with micron-scale precision. Additionally, the in-glass manufacturing of integrated passive devices (e.g. inductors and capacitors) enable advanced RF performance.

These three factors lead to the following benefits for our customers:

- Reduce chip size by 70% compared to PCBs
- Up to 50% reduction in power utility
- More than a 50% increase in wireless bandwidth
- Wideband applications ranging from DC to 100GHz
- Embed passive devices (e.g. inductors, capacitors, baluns, antenna, etc.) into the package
- Minimize assembly costs

3D Glass Solutions offers "build-to-print" glass-based RF SiP interposer devices that are customized for your specific product needs.

Common applications include:

- Wireless handheld and infrastructure devices
- High-frequency, high-performance RF devices
- 400GB/sec and 600GB/sec optical transceiver electronic packages
- MEMS sensor packages
- Internet infrastructure components
- Integrated photonic components

3D Glass Solutions www.3DGlassSolutions.com 505.916.5590

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Our APEX® Glass provides the highest systems-level integration of passive and active devices for your RF SiP products compared to any other packaging technology available today.

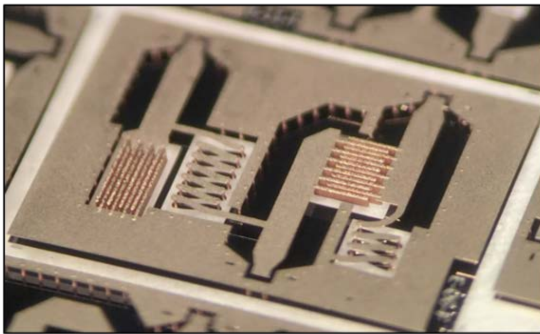

Figure 1. Lumped-element RF filter

SiP assembly options are customizable to the application. Standard die integration approaches, such as direct mount utilizing SMT processes, wire bonding, and flip-chip assemblies, are easily accomplished with 3D Glass Solutions' 2.5D SiP products.

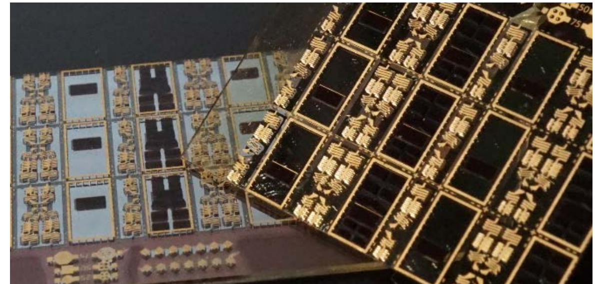

Figure 2. IPD Matching Networks

Design Limits

Parameters	Typical	Performance Limit
Size	< 5 mm x 5 mm	< 40 mm x 40 mm
Height	300µm	> 200µm
TGV Diameter	> 50µm	> 30µm
Metal Redistribution Line/Space	30µm / 30µm	10µm / 10µm
Frequency Range	0.5 – 60GHz	0.5 – 60GHz
Assembly Connections	SMT, wire bond, flip-chip	SMT, wire bond, flip-chip
Compliance	RoHS, Lead-Free	RoHS, Lead-Free