TSV/Silicon Interposers

Novati Technologies is a leader in enabling More-than-Moore technology development of innovative materials and novel MEMS/NEMS devices. Novati works with a variety of clients and nanotechnology partners, bringing process integration, design, in-line test, analysis and project management resources to enable custom development, prototyping, and low to medium volume production.

Novati’s extensive experience in back-end-of-line processing and Tezzaron’s pioneering 3D design, processing and test technologies makes Novati an ideal source of application-specific silicon (Si) interposers.

In addition to interposers, Novati is the first open-platform, full-line foundry in the world offering 3D wafer stacking services and test. Novati licensed the Ziptronix patents for direct bonding technology, ZiBond® and DBI®. With DBI, which contains interconnect at the bond interface, Novati provides technologically advanced products in [name the markets] markets at a lower cost, lower power and better performance compared to competing 2.5D/3D technologies.

We offer access to our 3D integration process technologies for the development and fabrication of silicon interposers through joint development projects, prototyping services, and low-to-medium volume production.

Silicon interposers provide an optimal integration platform:

- Excellent thermal expansion matching
- Increased signal speed due to shorter interconnects
- Reduced RLC parasitics
- More power savings
- Reduced ESD protection requirements
- Smaller form factor
- Allows for signal remapping between active chips without requiring customization
- Enables the separation of a mixed-signal system-on-chip into discrete devices
Capabilities

- **Wafer Size:** 200mm or 300mm
- **TSV Types:** Via First / Cu fill
  Via Last / Cu Liner / PI Fill
- **TSV Dia:** VF: 5um to 10um
  VL: 50um to 100um
- **TSV AR:** VF: 10:1
  VL: 5:1
- **TSV Pitch:** 50um (either VF or VL)
- **Front Side RDL:** Planarized Cu
- **FS RDL Design:** 2um/2um/2um L/S/T
  # of FS Layers: 4 (more possible)
- **# of BS Layers:** 1
- **Backside RDL:** Planarized Cu
- **BS RDL Design:** 5um/5um/3um L/S/T
- **Interposer Size:** 44mm x 27.6mm
  32mm x 26mm
- **TSV system design and wiring analysis**
- **TSV assembly** (Chip-to-Wafer bonding, temporary bonding / debonding, etc.)
- **Ultra thin wafer back grinding and polishing**
- **Signal and power integrity analysis and IC-to-TSV optimization**
- **Process design kit (PDK) and EDA Flow set-up**
- **Reliability and failure analysis**

Process Technologies

Novati’s silicon interposer technology platform is based on several enabling process modules and unit process capabilities.

Novati is capable of making customized interposers including integrated passive capacitors and inductors upon request.

2.5D Interposer Module

- 200mm/300mm wafer sizes
- 3 front side interconnect layers of dual damascene copper on top of single damascene copper metal layer (4 metal layers total)
- Copper interconnect dimensions are 2um Line/Space/Thickness (L/S/T)
- 10umx100um, copper-filled TSVs
- Single RDL layer on backside max width 10um
- Polyimide UBM isolation
- ENIG UBM Metallization on front and back
- Backside bump metal pad finish

Order and Product Information

To order any Novati Silicon Interposer Products contact Customer Service at info@novati-tech.com or (512) 356-2321