



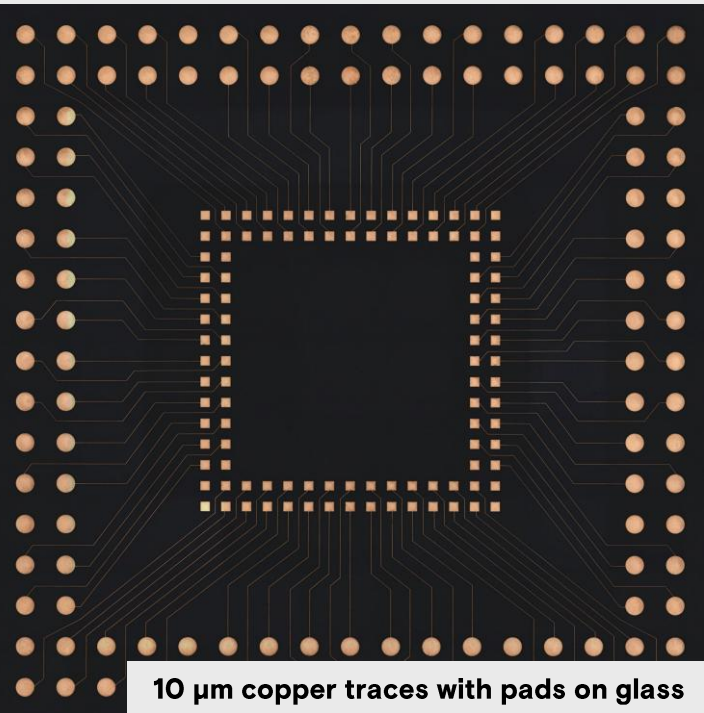
Semiconductor packaging with SSAIL

LASER TOOLS FOR HIGH RESOLUTION Cu TRACES:

- IC substrates
- Interposers
- RDL
- Wafer Level /
Panel Level
Packaging
- Glass
- PI, ABF, EMC,
other organic
materials

**Break free from the Mask
for NPI and volume
production!**

**Move beyond silicon interposers
– glass and laser-written copper
for high performance.**



10 µm copper traces with pads on glass

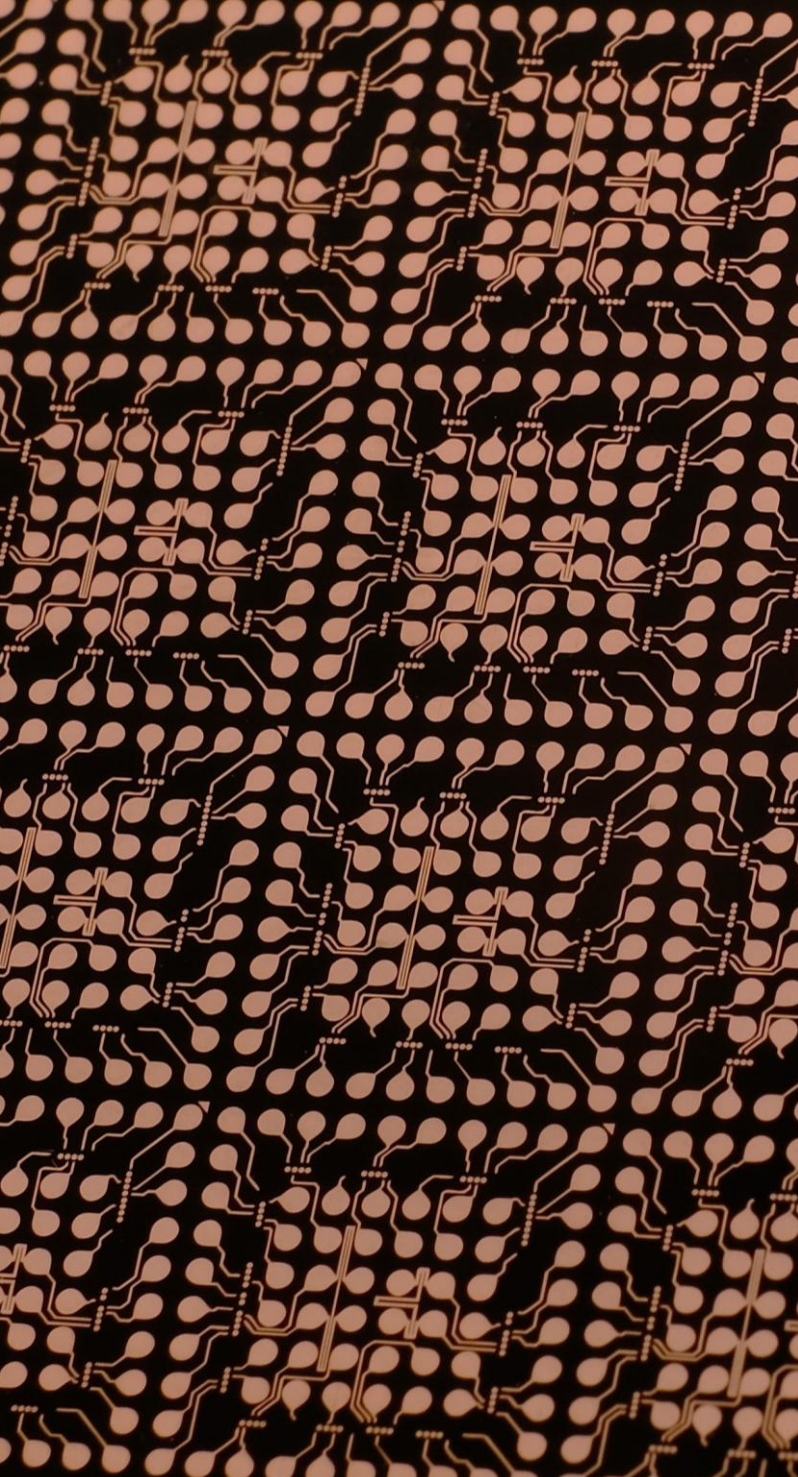
AI and HPC packaging are pushing beyond the limits of traditional silicon and organic interposers.

Higher bandwidths, denser chiplet connections, and stricter power budgets demand new substrates like glass that minimize loss and improve thermal behaviour. These new substrates are pushing boundaries to enable new optical I/O architectures, denser packaging and new optimized RF interconnects.

Conventional photolithography introduces high cost, long cycle times, and heavy chemical use – a barrier to sustainable high-performance manufacturing.

THE SSAIL ADVANTAGE:

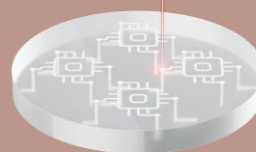
Maskless Laser Process	Direct surface activation – no masks, no photoresist, minimal waste.
Glass Compatibility	Works on many glasses; supports through-glass vias.
Fine Line Precision	Down to 1 µm line / width spacing; plated copper near bulk conductivity.
Signal Integrity	Lower insertion loss vs. organic interposers is achieved on glass substrates.
Material independent	Process works for any dielectric or semiconductor material (glass, organic, ceramic, silicon, etc.)
Sustainability	Massive reduction in chemical and process waste by SSAIL.



SSAIL PROCESS FLOW:



Clean substrate of any dielectric. No preprocessing is needed.



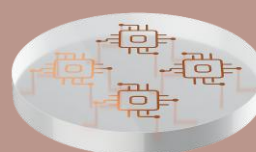
Laser “marking” of trace pattern and drilling of vias.



Chemical activation of the marked pattern



Electroless plating of copper



Finished part with plated copper traces and vias

Demonstrated functional fan-out glass interposer circuits for advanced packaging for most advanced chips.

Verified RDL layers for Wafer and Panel Level Packaging (WLP/PLP).

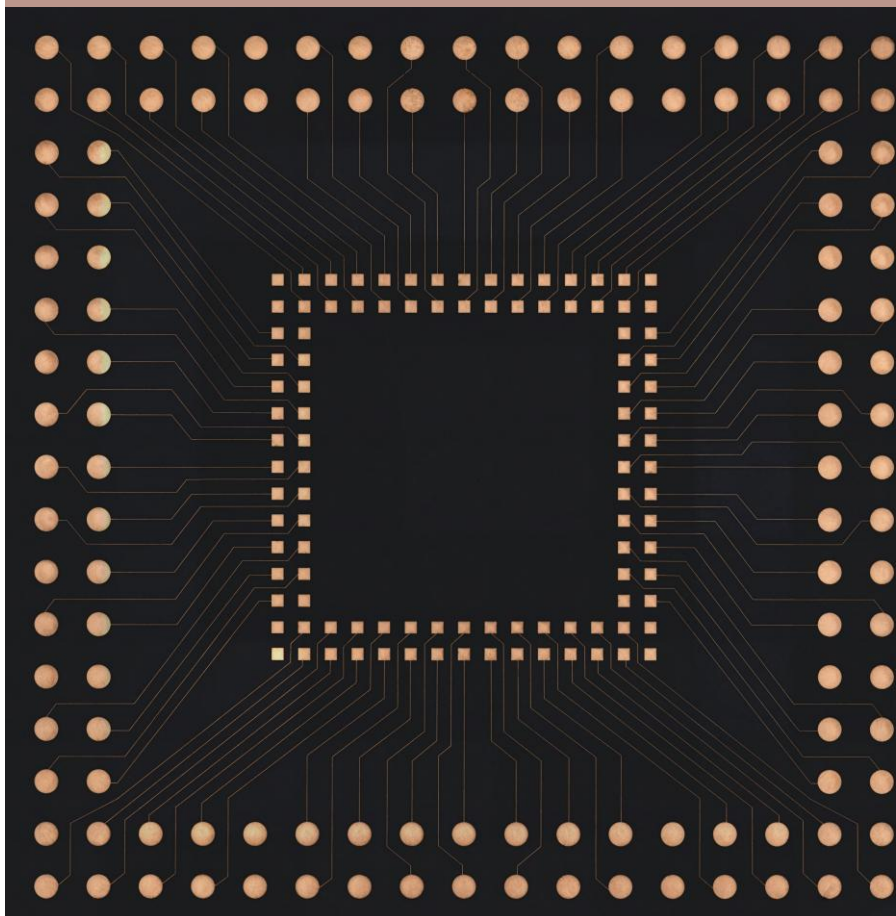
Verified sensor and microLED routing on glass substrates for display applications.

Partnerships with advanced substrate and packaging innovators to establish a new leap in heterogenous chip integration

LASER TOOLS FOR HIGH RESOLUTION Cu TRACES:

- 600x400 mm working area
- Femtosecond laser source
- Machine vision for alignment and calibration
- Resolution: $<1\text{ }\mu\text{m}$
- Repeatability: $\pm 0.5\text{ }\mu\text{m}$
- Accuracy: $\pm 3\text{ }\mu\text{m}$ over whole working area
- Modular and customizable design
- 5 axis version for 3D parts

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