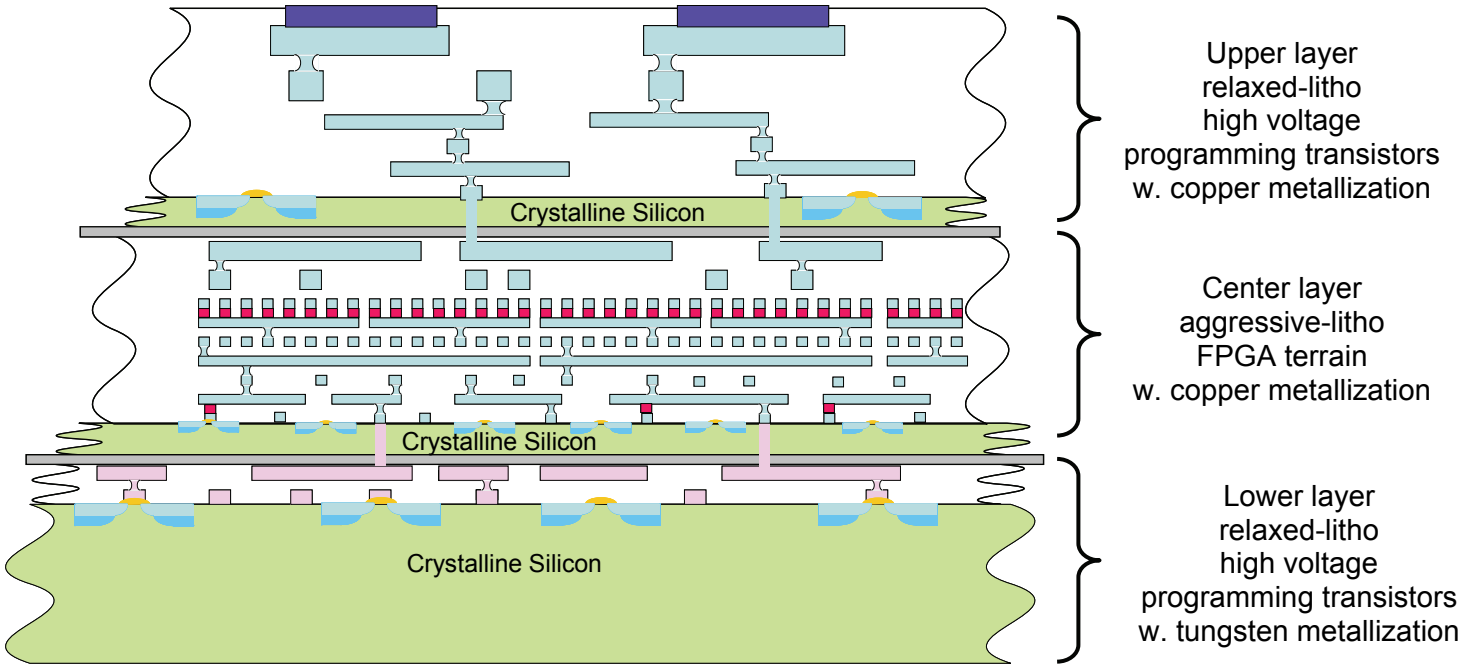
MonolithIC 3D™

Technology Breakthrough

Antifuse-based 3D High Density FPGA



Technology:

- **Antifuse-based CLB configuration**
- **Antifuse-based connectivity configuration**
- **Two layers of relaxed lithography for high voltage programming transistors**
- **Lower layer configures the CLB while higher-layer configures connectivity**

Benefits:

- Monolithic 3D integration with novel (patent-pending) technologies. Connections between device layers are at litho feature size
- Very high density FPGA terrain uninterrupted with high-voltage programming devices
- Easy integration of high voltage and low voltage terrains
- CLB programming and interconnect programming do not cross multiple metal layers or create routing blockages
- Brings rad-hard programmable technology into nanometer lithography devices
- Programming element density approaches maximum via density
- Particularly suited to military and aerospace applications

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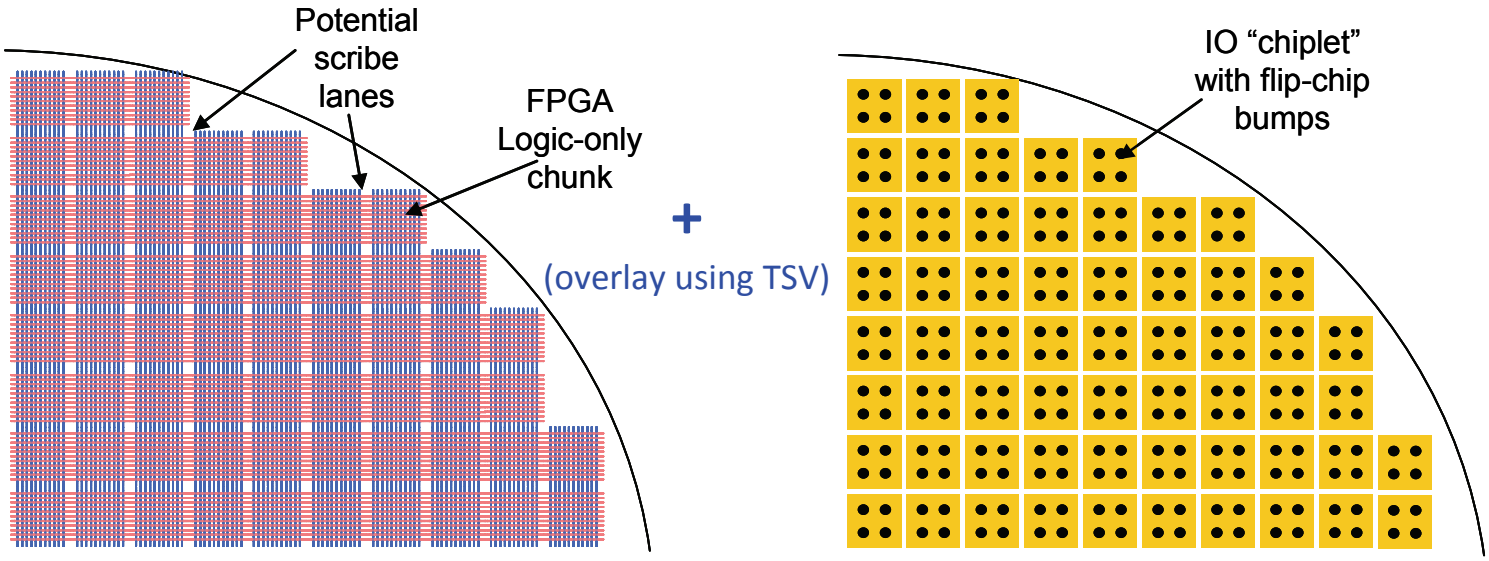
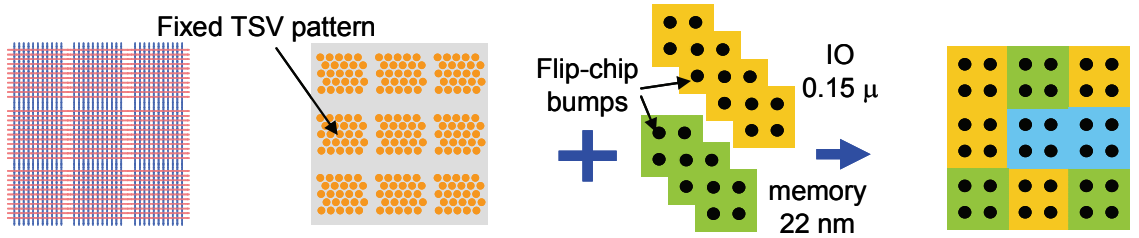
www.monolithic3d.com. ◆ **Patents pending**

Technology Breakthrough

Inexpensive Arbitrary-sized FPGA Manufacturing



Fab



22 nm FPGA with logic size 9

22 nm FPGA with TSV visible

Variety of "chiplets"

3D Hybrid FPGA stack with chiplets & flip chip bumps

Assembly

Technology:

- **Wafer-scale Continuous Array**
- **Applicable to both antifuse and memory-based FPGAs**
- **Block memory can be a part of the logic terrain, separate 3D-stacked layer, or in chiplets**
- **TSV or microbump-based Wafer-on-Wafer and Chip-on-Wafer 3D stacking**

Benefits:

- Infinitely variable FPGA family without the high cost of multiple mask sets
- Arbitrary-sized FPGA dies with a single mask set
- Inexpensive and flexible I/O configuration
- Re-use of older prequalified silicon I/O combined with the most advanced logic technology
- Large optimized memory blocks

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