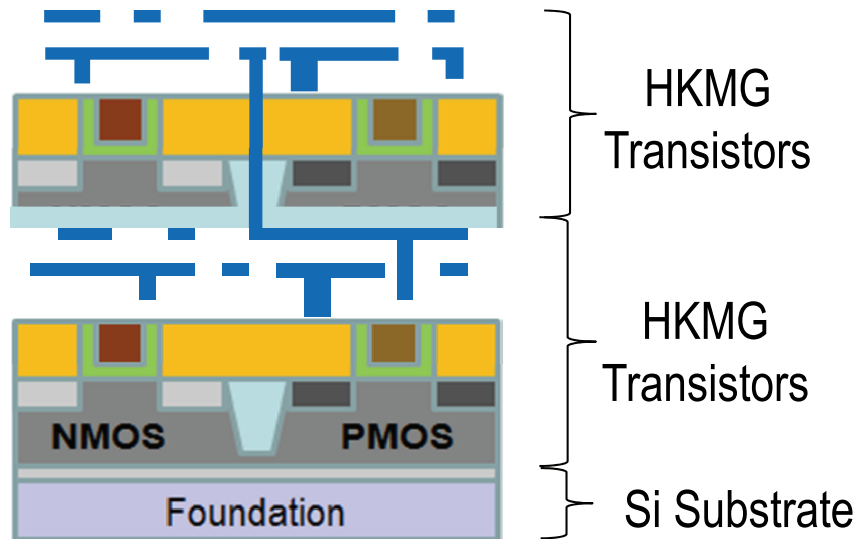


Monolithic 3D High Performance (HKMG) Transistors



Technology:

The monolithic 3D IC technology is applied to produce monolithically stacked high performance High-k Metal Gate (HKMG) devices, the world's most advanced production transistors.

3D Monolithic State-of-the-Art transistors are formed with ion-cut applied to a gate-last process, combined with a low temperature face-up layer transfer, repeating layouts, and an innovative inter-layer via (ILV) alignment scheme.

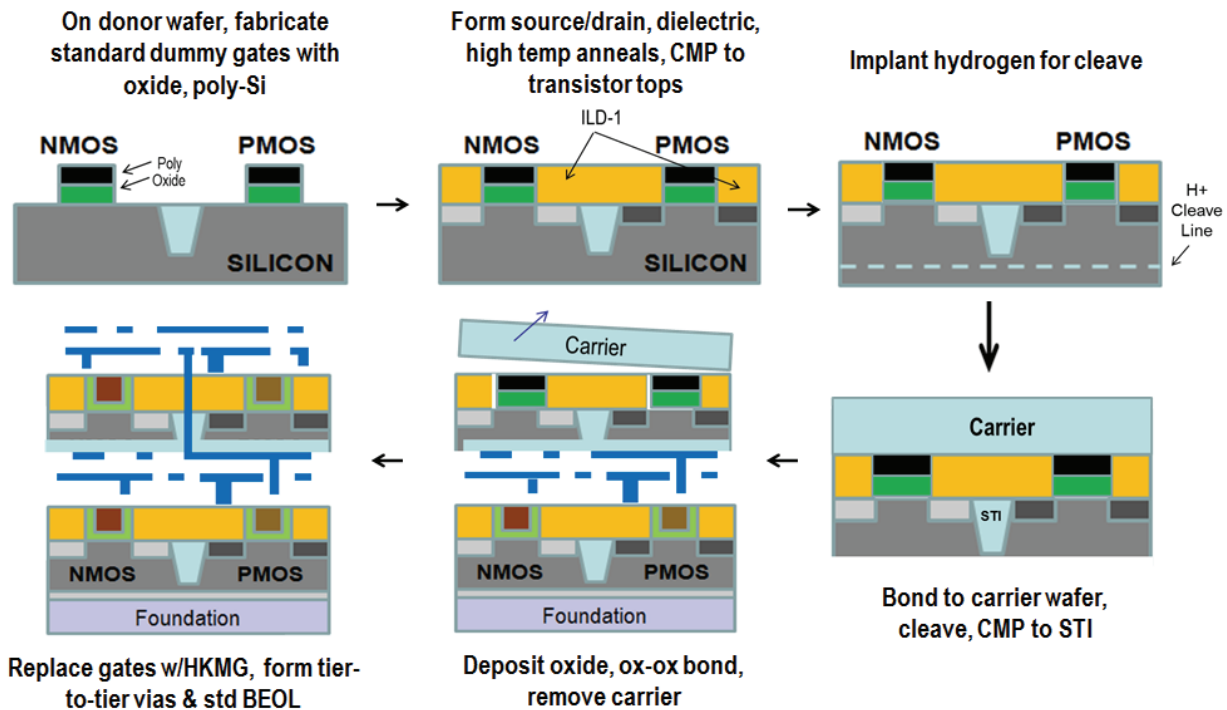
Monolithic 3D IC provides a path to reduce logic, SOC, and memory costs without investing in expensive scaling down.

*See reverse side for more on details
monolithic 3D IC technology & HKMG 3D
flow*

Benefits:

- Maximum State-of-the-Art transistor performance on multi-strata
- 2x lower power
- 2x smaller silicon area
- 4x smaller footprint
- Performance of single crystal silicon transistors on all layers in the 3DIC
- Scalable: scales normally with equipment capability
- Forestalls next gen litho-tool risk
- High density of vertical interconnects enable innovative architectures, repair, and redundancy

Create a logic layer with any transistor that uses a replacement-gate process. Innovative alignment schemes, combined with repeating layouts, obtain sub-50nm, and hence dense, through-silicon electrical connections.



Layer Transfer Technology (“Ion-Cut”) Defect-free single crystal obtained @ <400°C

Leveraging a mature technology (wafer bonding and ion-cleaving) that has been the dominant SOI wafer production method for over two decades.

Innovate and create multiple thin (10s – 100s nanometer scale) layers of virtually defect free Silicon by utilizing low temperature (<400°C) bond and cleave techniques, and place on top of active transistor circuitry. Benefit from a rich layer-to-layer interconnection density.

