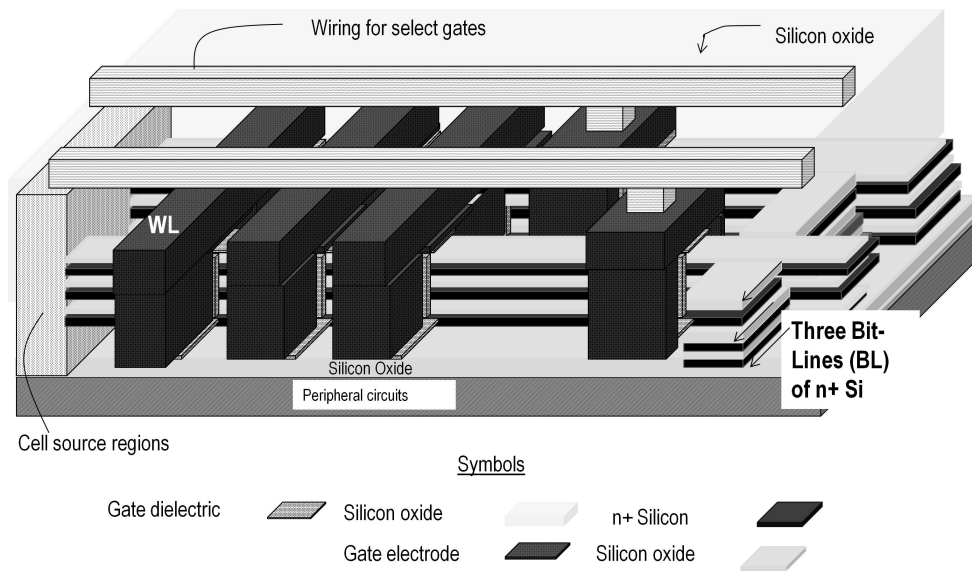




# Technology Breakthrough

## Monolithic 3D NAND Flash Memory



### Technology:

The monolithic 3D IC technology is applied to producing a monolithically stacked single crystal silicon double-gated NAND flash memory. Peripheral circuits below the monolithic memory stack provide control functions.

Monolithic 3D IC provides a path to reduce NAND flash bit cost without investing in expensive scaling down.

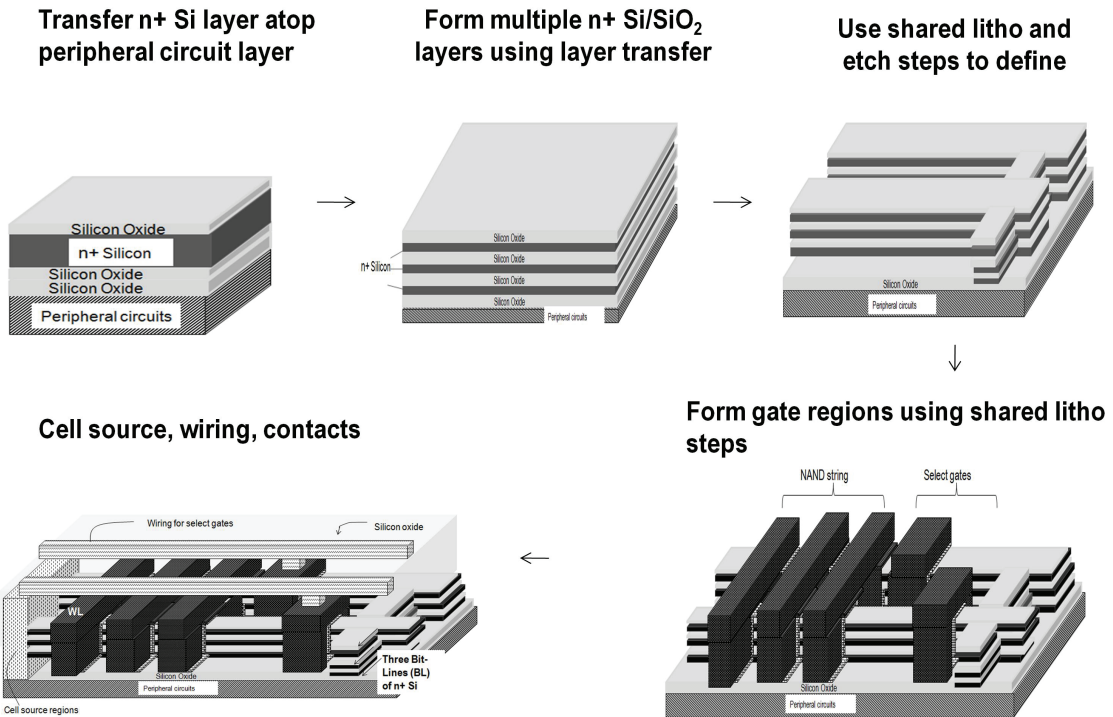
*See reverse side for more on details monolithic 3D IC technology & flash flow*

### Benefits:

- 4X the density of conventional NAND flash
- Similar number of litho steps as conventional NAND flash
- Single crystal silicon on all layers
- Scalable: Multiple generations of cost-per-bit improvement for same equipment cost and process node: use the same fab for 3 generations
- Forestalls next gen litho-tool risk
- Uses manufacturable aspect ratios

Our 3D flash technology innovatively combines these well-studied technologies:

- Monolithic 3D with litho steps shared among multiple memory layers
- Stacked Single crystal Si with ion-cut



## 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.

