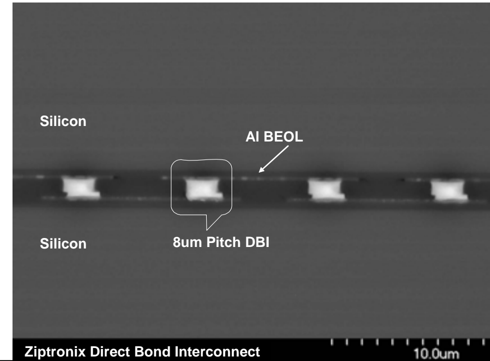
ziptronix

3D CMOS Imagers with Ziptronix DBI™ Technology

Ziptronix, Inc. is offering a three-dimensional integration technology that will set the standard for next generation 3D CMOS imagers sensors (CIS). The advantages of this revolutionary technology for CMOS imagers include the following.

Small Pitch

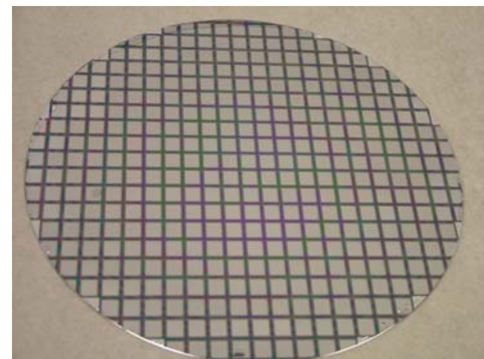
The non-planar nature of conventional bumping technologies fundamentally limit 3D interconection pitch. The planar characteristic of Ziptronix DBI™ eliminates this limit and allows much smaller interconnect pitches to be achieved. Three (3) micron pitch has been demonstrated allowing an interconnection density > 10 M/cm^2.



SEM cross-section of a 100% operable, 1,000,000 interconnection, 8 micron pitch, Ziptronix DBI™ 3D integration

Large Area

Ziptronix DBI™ is based on ZiBond™, a room temperature, direct oxide bond technology, that spontaneously forms covalent bonds between die or wafer surfaces by simply placing them together. 3D CIS can thus now be preferably fabricated at 300mm wafer scale without using external pressure or temperature. 150,000,000 3D interconnections between two 200mm wafers have been demonstrated.



Ziptronix DBI™ 200mm wafer-to-wafer hybridization with 150,000,000 interconnections

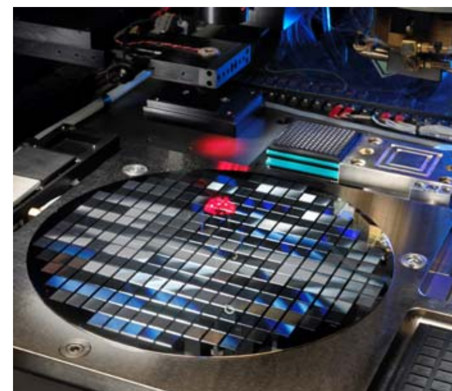
100% Interconnectivity

Conventional 3D CMOS imager operability is typically not 100%. This often results from variations in bump non-planarity used to achieve the 3D interconnect within the 3D CIS. The planar nature of Ziptronix DBI™ eliminates these variations, achieving 100% interconnectivity and allowing 100% 3D CIS operability. Repeatable 100% interconnectivity of 1,000,000 3D interconnections on an eight (8) micron pitch have been demonstrated.

Manufacturable Process Flow

The Ziptronix DBI™ process flow uses conventional production tools to implement the following steps.

1) Deposit DBI™ metal posts on detector / ROIC pixels
2) Cover DBI™ metal posts with silicon oxide
3) Planarize surface and expose metal posts with chemo-mechanical polish (CMP)
4) Terminate surface with proprietary process
5) Align / place planarized surfaces into contact



Ziptronix DBI™, 1 Mpixel. 8 micron pitch die hybridized to 200mm "ROIC" wafer by simple placement in pick-and-place tool