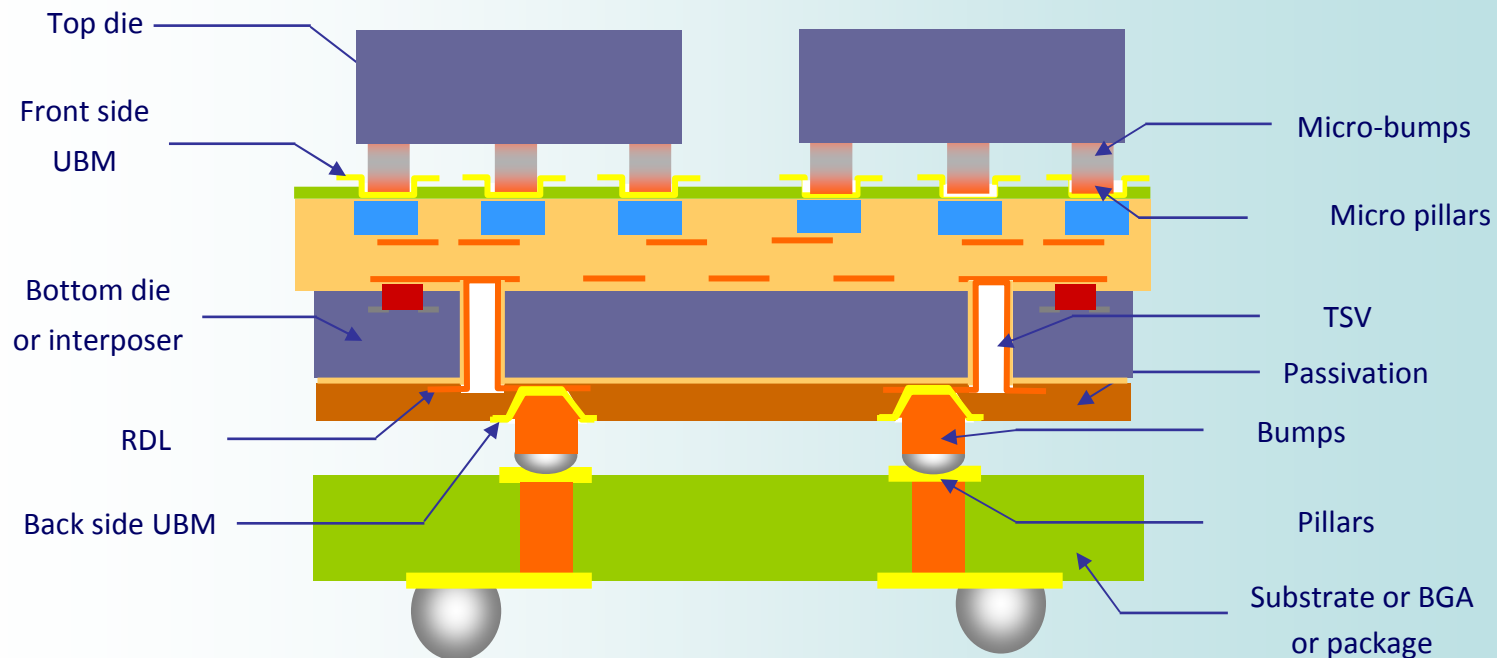


Technological offer overview

■ Technological modules definitions :

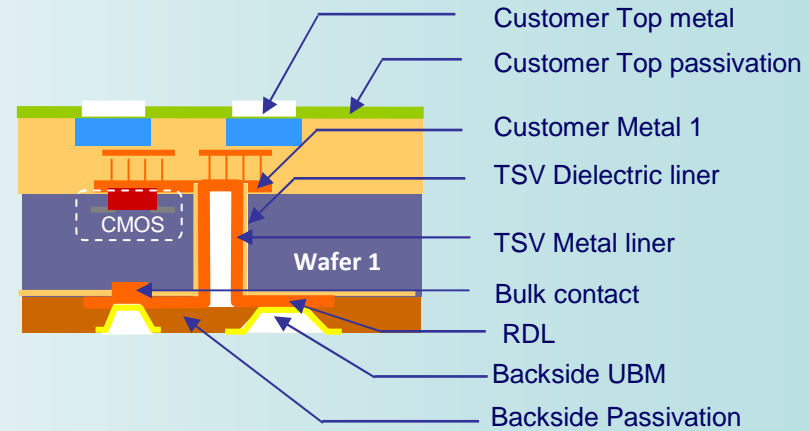
- Through Silicon via (TSV)
- Redistribution layer (RDL)
- UBM
- Interconnections
- Components stacking
- Packaging with partner collaboration



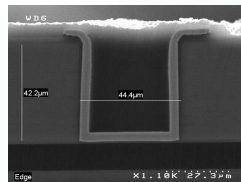
Technological offer in details : TSV + RDL

TSV & RDL DRM & schematic

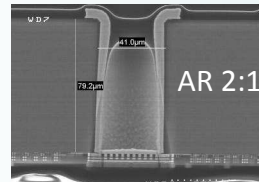
- Wafer size : **200 & 300 mm**
- TSV type : **via last / Cu liner**
- Minimum pitch : **80 μm**
- TSV diameter : **40 to 100 μm**
- Aspect Ratio (AR) : **from 1:1 to 3:1**
- RDL material : **Cu / protective layer possible**
- RDL thickness : **1-10 μm**
- RDL minimum width : **20 μm**
- RDL minimum space : **20 μm**



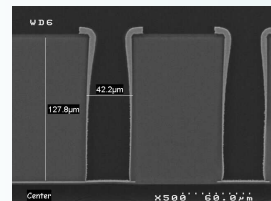
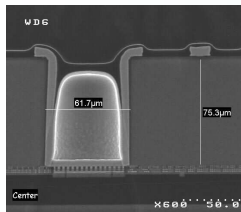
TSV & RDL morphological results



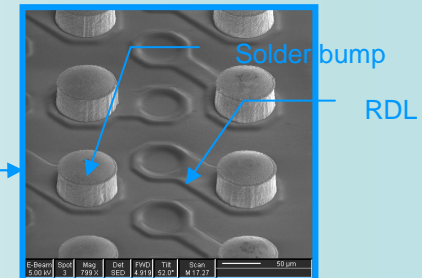
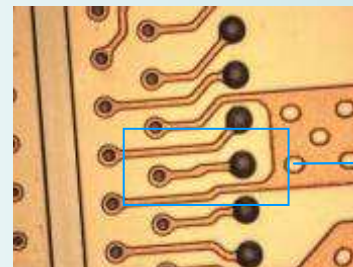
AR 1:1



AR 3:1



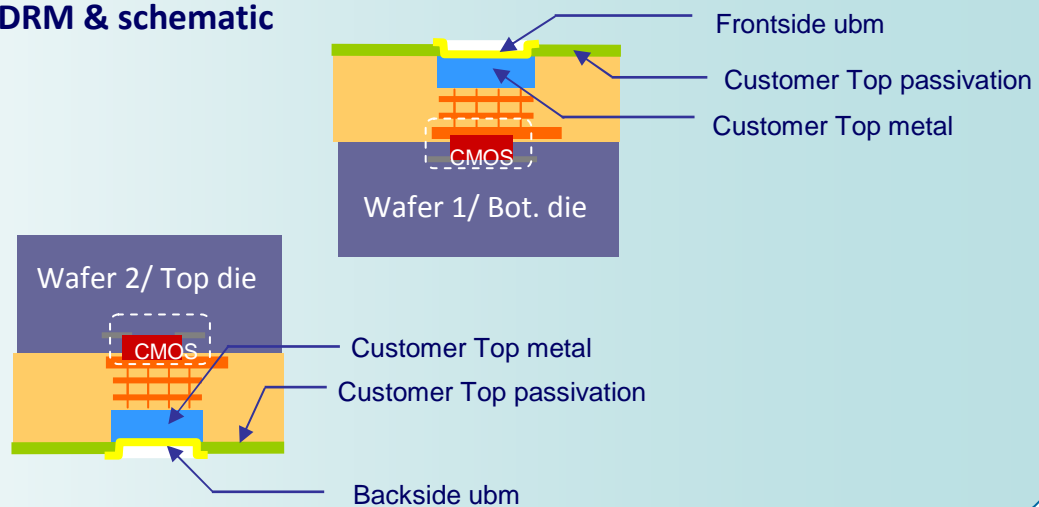
Cu RDL integration : pillars on RDL + passivation



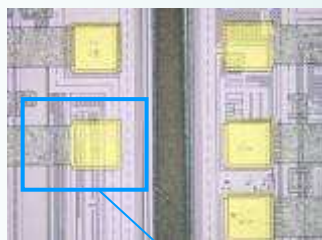
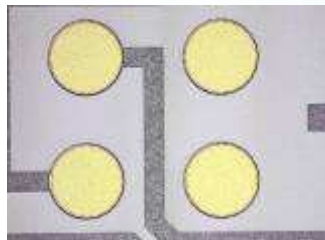
Technological offer in details : Under bump metallurgy (UBM)

UBM DRM & schematic

- Wafer size : **200 & 300 mm**
- UBM material : **TiNiAu**
- Possible on frontside and / or backside of the components
- UBM thickness : **0.5 – 1.5 μm**
- UBM width : **20 – 800 μm**
- UBM minimum pitch : **40 μm**

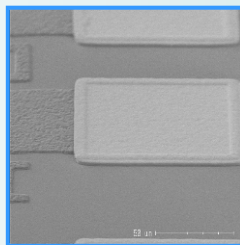


UBM morphological results



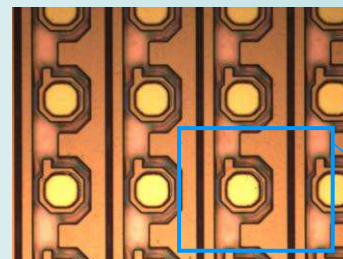
Different shape possible :

- Square
- Polygons
- Circle



Available technology :

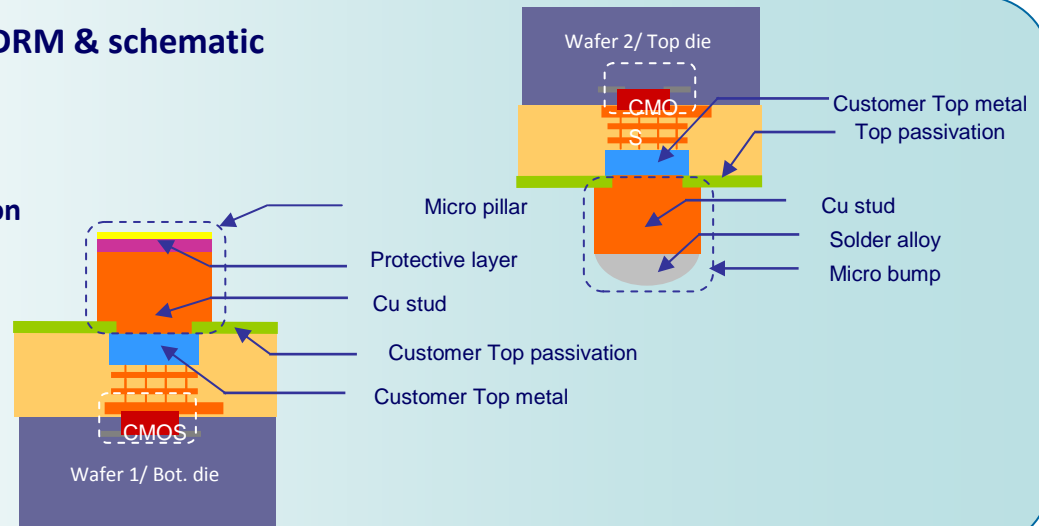
- Metal sputtering / thickness range : 0.5 – 1.5 μm



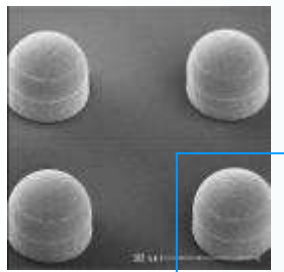
Technological offer in details : Micro bumps & micro pillars

Micro bumps & micro pillars DRM & schematic

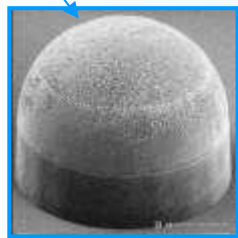
- Wafer size : 200 & 300 mm
 - Micro-bumps material : Cu post / SnAg solder
 - Micro pillar material : Cu post / NiAu protection
- possible**
- Minimum pitch : 50 μm
 - Micro-bumps diameter : 25 μm
 - Micro pillars diameter : 25 μm
 - Micro-bumps thickness : 25 – 35 μm
 - Micro pillars thickness : 8 – 12 μm



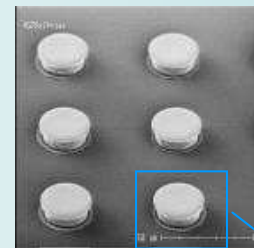
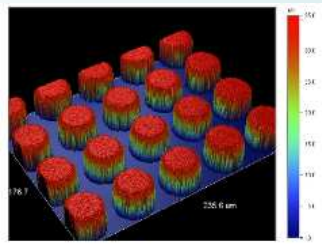
Micro bumps & micro pillars morphological results



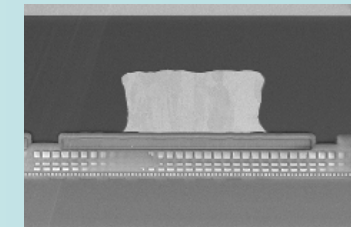
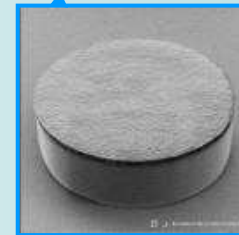
Micro-bumps after reflow



Micro-bumps characterization



Micro pillars with protective layer

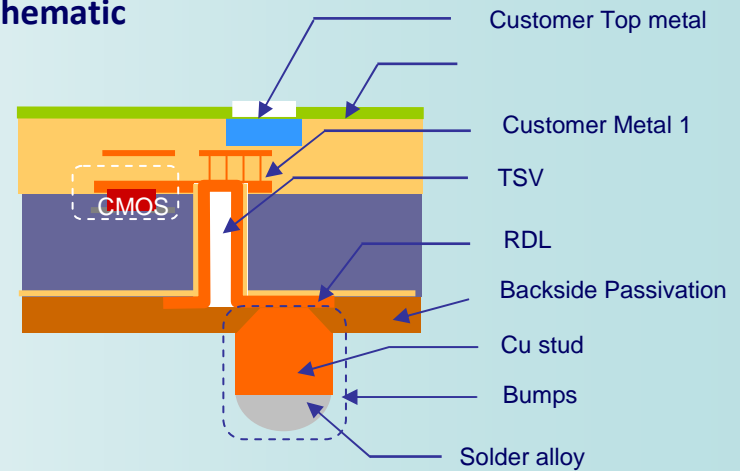


Micro pillars on top metal

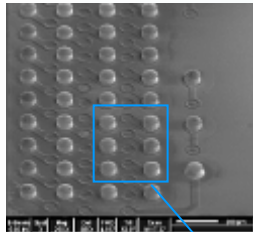
Technological offer in details : bumps & pillars

Bumps & pillars DRM & schematic

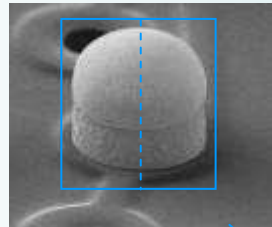
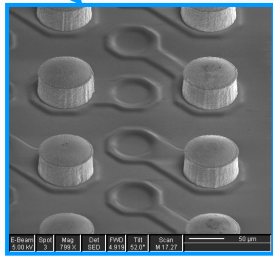
- Wafer size : 200 & 300 mm
- Pillars material : Cu stud / SnAg solder
- Minimum pitch : 120 μm
- Pillars diameter : 60 – 80 μm
- Pillars thickness : 60 – 80 μm



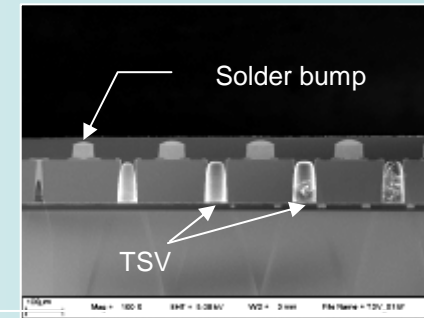
Bumps & pillars morphological results



Bumps



Bumps cross section

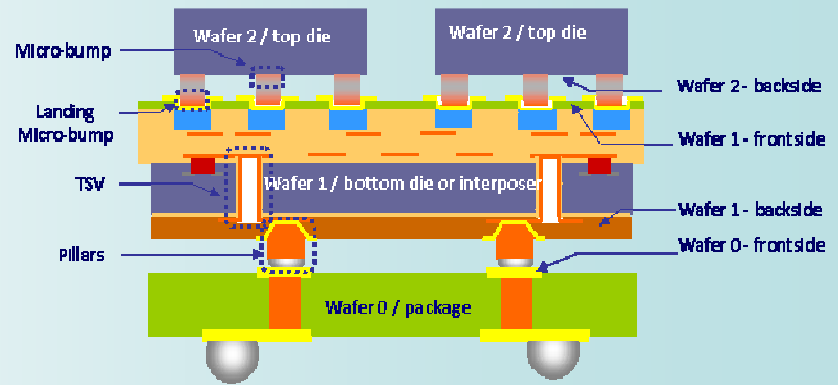


Pillars integration with TSV

Technological offer in details : 3D electrical tests

Electrical test approach

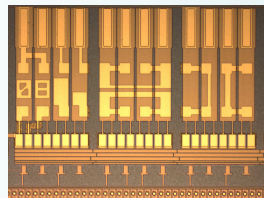
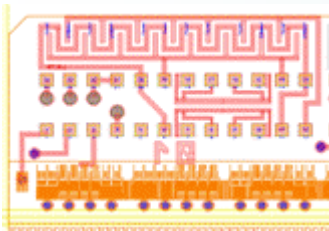
- Electrical tests at each level
- Specific structures for 3D technologies
- Non invasive structures into dicing lines
- Using of Standard probe cards
- Data exploitation tool



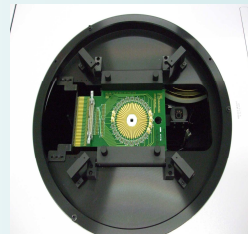
Electrical test results & tools



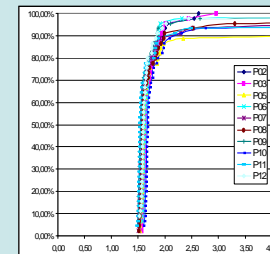
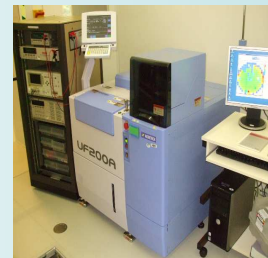
3D tests structures



Electrical test tool



Probe card



Electrical test results

