# High Density Stacked SSDs

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3D Plus USA

# Why Stacking ?

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All these reasons are probably all good reasons but **really** why do we stack ?

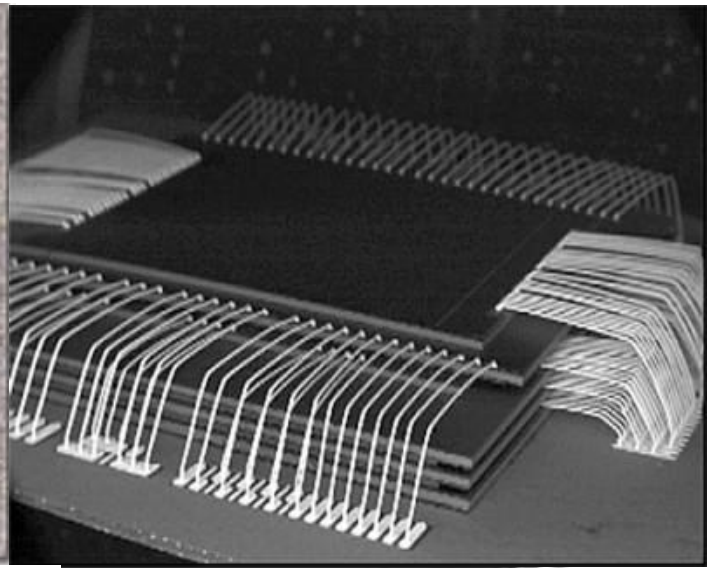
We stack because **WE WANT MORE**

# What do we want ?

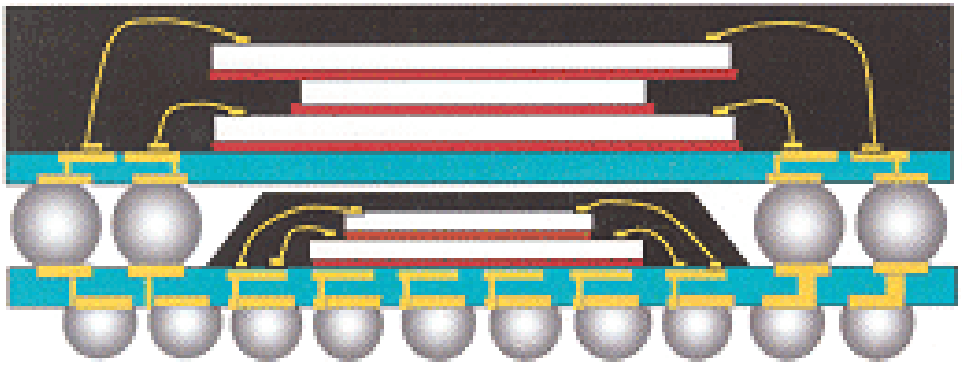
## WE WANT MORE :

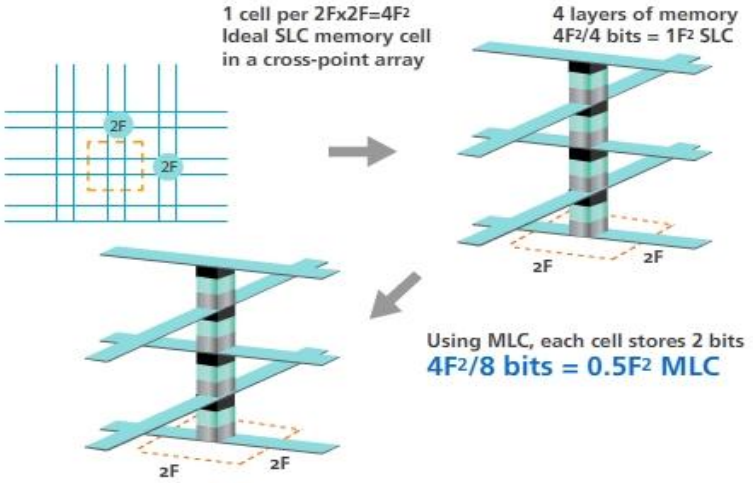
Density
Capacity
Performance
Reliability
Room for others
Flexibility
Compliance
Adaptability…

# Many technics over the years….

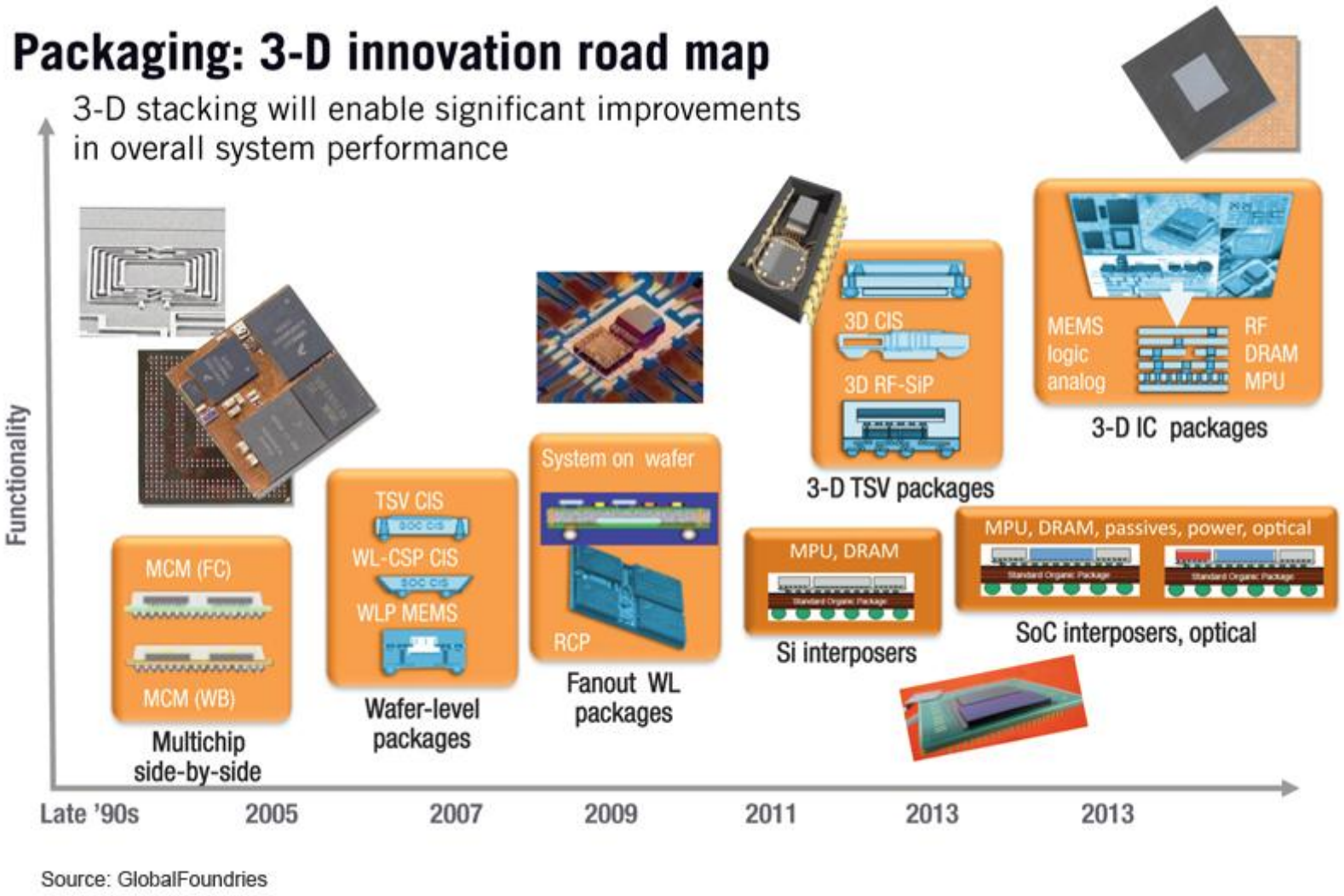


PoP Typical Package

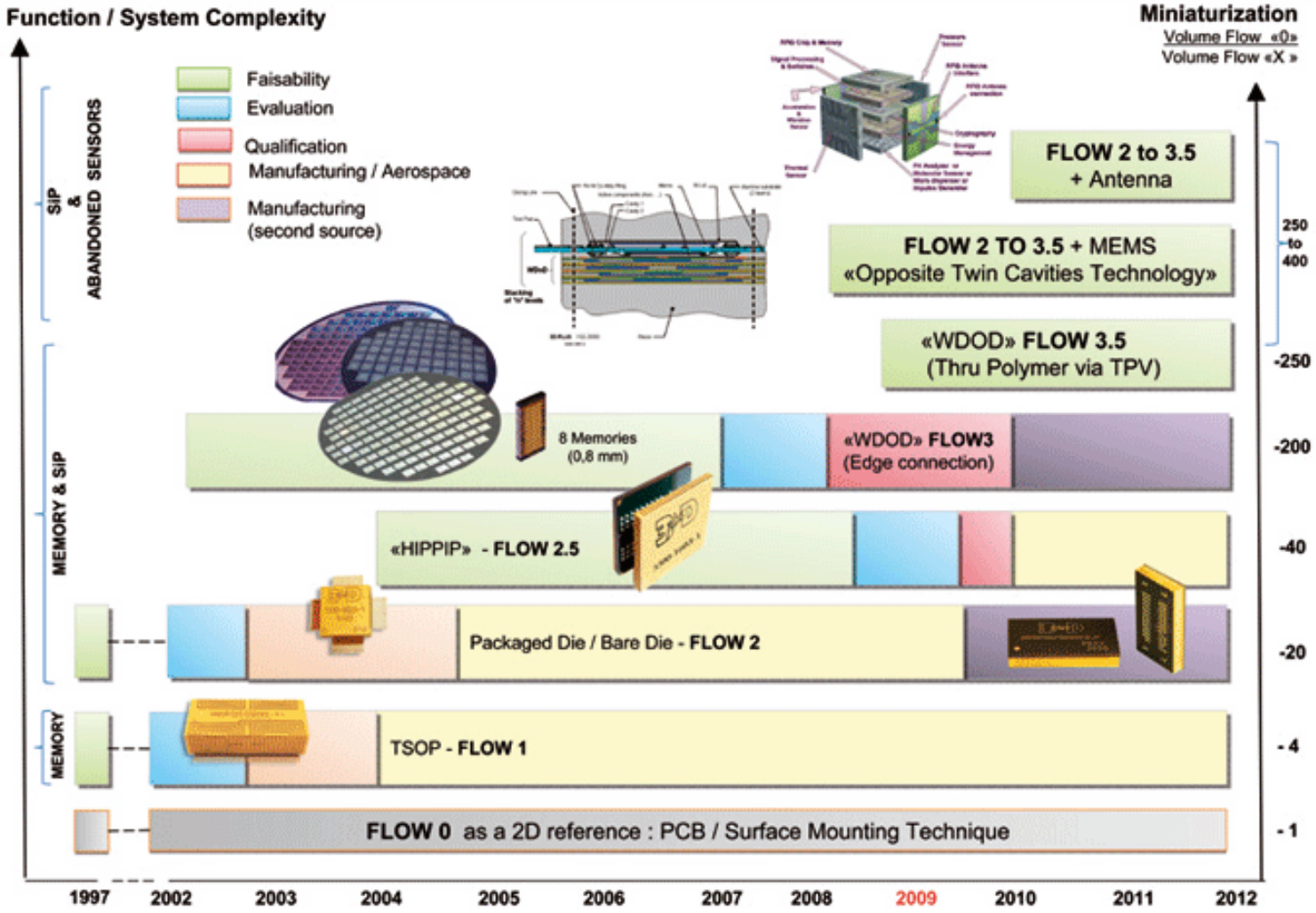




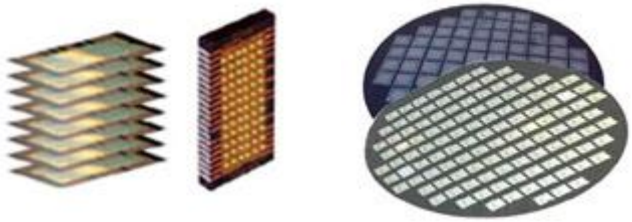
# 3-D road map


Packaging: 3-D innovation road map
3-D stacking will enable significant improvements in overall system performance
Functionality
MCM (FC)
MCM (WB)
Multichip side-by-side
TSV CIS
WL-CSP CIS
WLP MEMS
Wafer-level packages
System on wafer
RCP
Fanout WL packages
3D CIS
3D RF-SiP
3-D TSV packages
MPU, DRAM
Si interposers
MPU, DRAM, passives, power, optical
SoC interposers, optical
MEMS
logic
analog
RF
DRAM
MPU
3-D IC packages
Late '90s
2005
2007
2009
2011
2013
2013
Source: GlobalFoundries

# 3D Plus road map



# WDoD Technology



| Key Features | Benefits |
|---|---|
| The components are stacked up | Decrease of the volume/weight by 25 to 100 times with regard to the existing 3D modules |
| Ultra small form factor and Low profile | Size of the 3D module after stacking is equal to the size of the larger die plus 100µm around it |
| Stacking of any kind of die (size and thickness) | Best combination of any standard semiconductor devices and technologies that cannot be acheaved with monolithic SoC approaches<br>More than 1 die per level |
| Use of standard wafers (die without « TSV ») | Die sourcing flexibility<br>Easy access to the industry<br>Cost effectiveness<br>WDoD™ is the only really available Wafer level stacking process |
| Test and burn-in (if necessary) of each level before stacking thanks to the Rebuilt Wafer Concept | Stacking of n levels with excellent yield |
| Parallel processing thanks to the Rebuilt Wafer Concept | Cost effectiveness |
| Use of well proven technologies | Very High reliability<br>High Resistance to harsh environment (thermal,vibrations...) |

# What are the benefits for SSDs ?

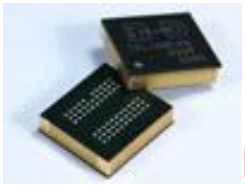
- Enable today the next generation of memory **density**

  The highest density available on the market in one package.

- Availability of Standard **packages / footprint**

  Same footprint than standard components

  Same surface (unique stacking technology!)

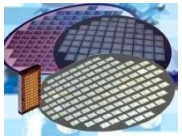


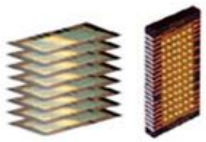
**Flexibility**

Any kind of package can be stacked, even BGA!

- A **wide range of products** and **bus configurations**

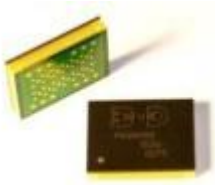
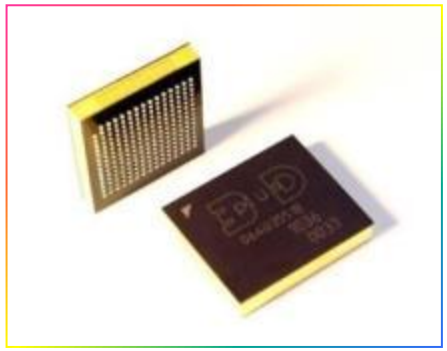
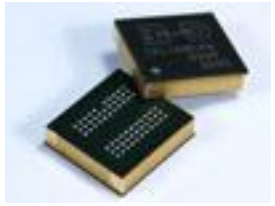
- Selection of **customer device reference** for product catalogue

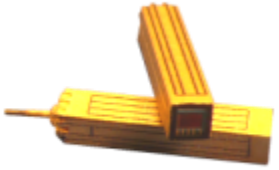
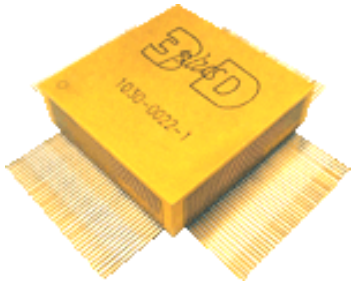




# 3D Plus Products

- **Memory Modules**
  - DDR-III
  - DDR-II
  - DDR-I
  - SDRAM
  - NAND FLASH
  - NOR FLASH
  - SRAM
- **Solid State Drives**
- **Micro cameras**
- **Interface modules**
  - LVDS Drivers/Receivers
- **Computer modules**
  - Intelligent and Re-Configurable Computer Module
- **Converter Modules**
  - Point of Load converters

# Thank you for your attention !

**www.3d-plus.com**

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