



Unisem Europe System in Package

A joint presentation with NXP
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(22nd April 2009)



Who are Unisem



- A global company with high volume manufacturing operations strategically located in 3 of the most cost effective areas in South East Asia and Greater China
 - 5 operations in 5 locations (Malaysia, Indonesia, China, US, Europe - UK)
 - Over 140,000 m² of factory space, 50,000 m² of clean room space
 - 15M units produced per day (5.4 Billion units per year)
 - 9,500+ Employees
 - 1,500 Wire Bonders
 - Broad portfolio (Leaded, QFNs, BGAs, FlipChip, Bumping) + Test
 - Publicly listed on Bursa Malaysia
 - HQ in Kuala Lumpur, Malaysia
 - Regional offices in US, Europe, Asia
 - Scale and operating leverage



Semiconductor Package Trends

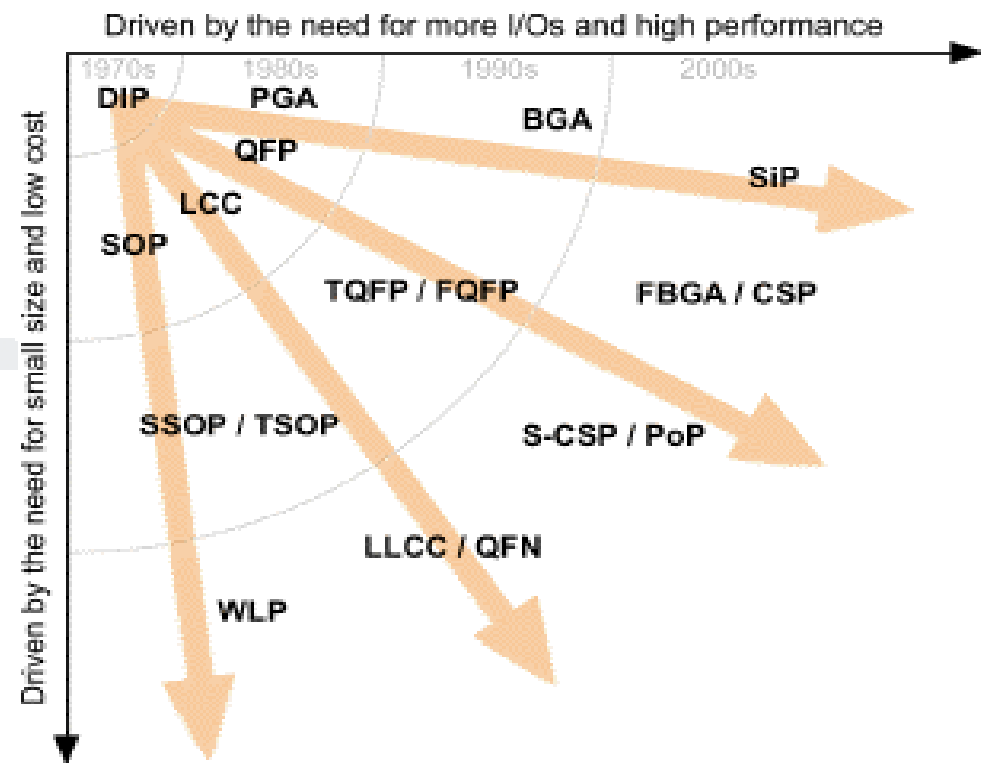
What are the main Market Drivers?

- Performance – Size – Weight – Cost – System Cost

Package Trends:

- Through Hole (PDIP)
- Surface Mount (SO, QFP)
- Area Array (BGA, LGA)
- Chip Scale (CSP)
- Multiple Chip (MCM)
- ***System in Package (SiP)***

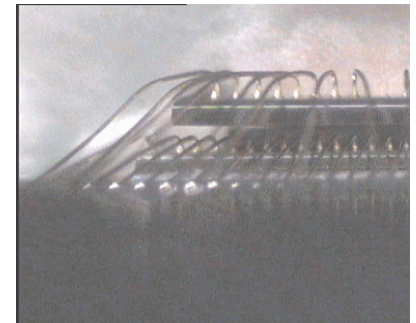
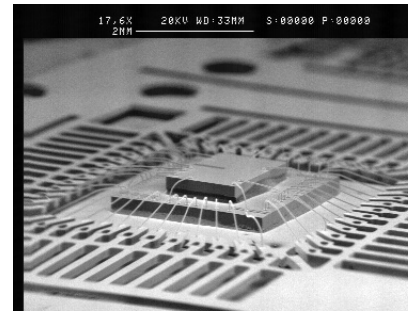
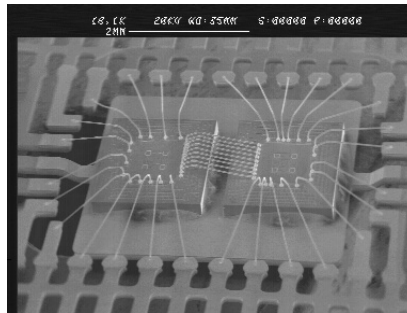
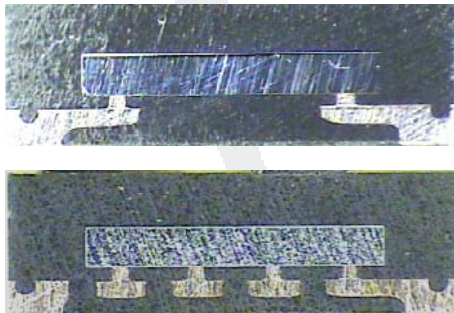
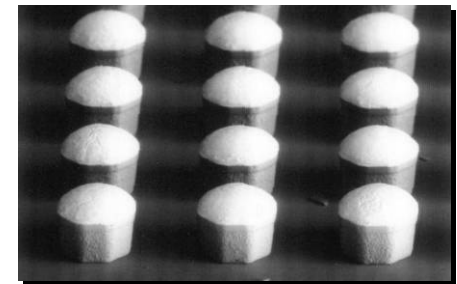
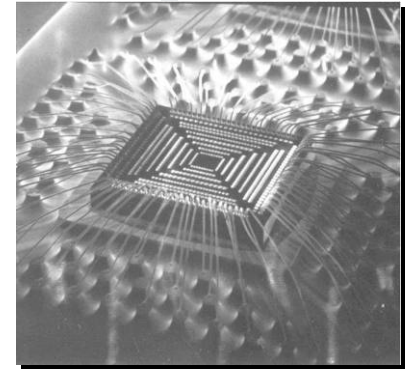
The Evolution of IC Packaging



Source: IC Insights

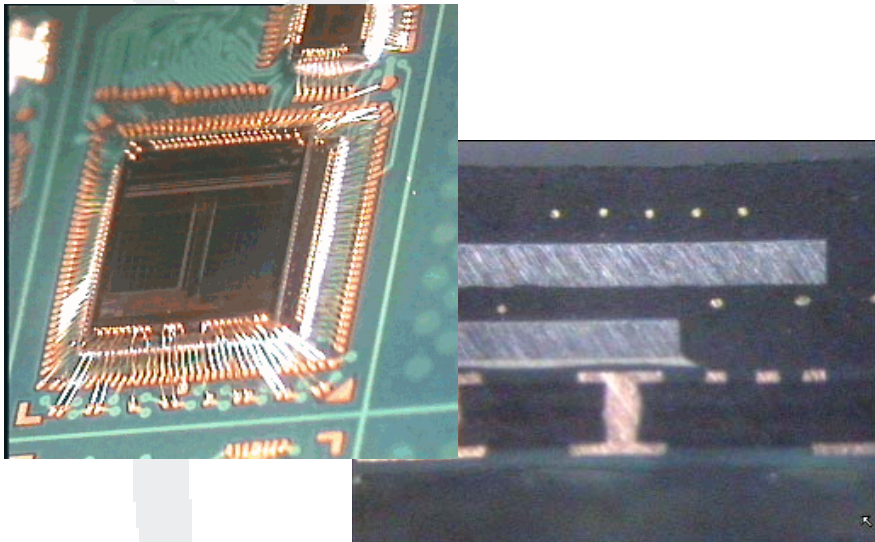
Technology Direction at Unisem

- 12" wafer capability
- Cu wire bonding now in production
- ELP Package – Multi-row QFN
- Stacked Die – Leadframe and Array Packages
- Wafer bumping and Flip-chip packages (4 – 8")
- Wafer level Chip-scale packages (4 – 8")
- Multi-chip Modules / ***System-in-Package***

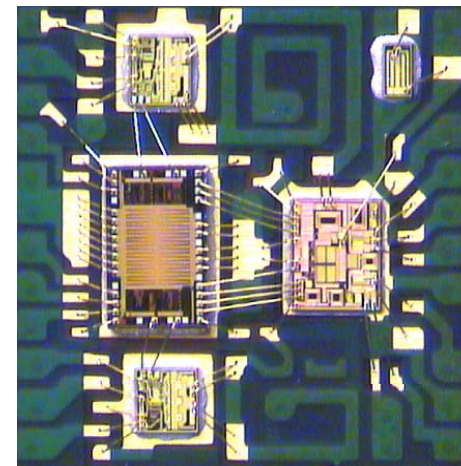


Examples of Multi Chip Modules

- Multi-Die to System in Package (SiP - integrated passives)



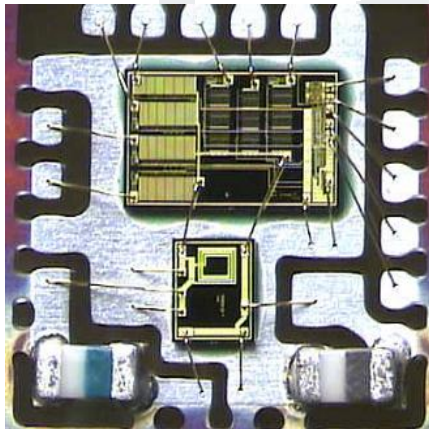
- 6x8mm BGA
3x Die + Interposer die



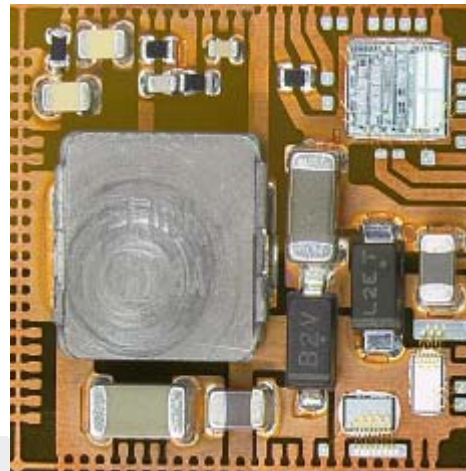
- 6x6mm LGA
5x Die

Examples of System in Package

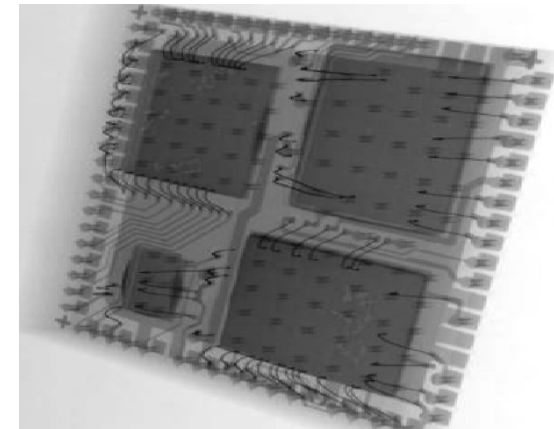
- SMT Passives and Silicon Passives



- 4x4mm QFN
- 2x Die
- 2x SMT Passives



- 13x14mm QFN
- 2x Die
- 15x SMT Passives



- 10x10mm LGA
- 4x Die
- 70x Silicon Passives
- Using NXP PICS technology

Silicon Passives:

- Allow standard production processes to be utilised to create highly integrated System in package solutions.
- To give higher performance in a smaller footprint, lower profile package, with a lower overall system cost.

Thank you