

## Major Historical Events in Packaging, Assembly and Test (5/15/06)

### Packaging Processes

- Eutectic Die Attach
- Glass Die Attach
- Epoxy Die Attach
- Wire Bonding
  - Gold Ball
  - Aluminum wedge
- Beam Lead
- Flip Chip
- Plastic Package Molding
- (Automation of all of above)

### Packages

- TO series
- Power Series
- Flat Packs
- DIP (Dual-In Line)
- Metal Flat Packs
- Ceramic Packages
- Cer-Dip Style (DIP and flat-packs)
- Plastic molded packages
- Array Packages
  - Pin Grid array
  - Ball Grid Array

### Board Mount

- Through-Hole Assembly
- Surface Mount
- Array Mount (could no longer see the attachment)
- Lead free
- Automation of above

### Test

- Hand test to automation
  - wafer sort
  - final test
  - Board test
- Special Testers (when testers became generalized as opposed to being built by the company needing the test done.) (Tester Companies appeared)
  - Logic
  - Memory
  - Etc.
- Speed testing and other special requirements

Other possible items

- Look at material changes
- Look at lead count changes
- Look at when the package became part of the circuit (not just protection for the device)
  - speed of circuit
  - number of I/Os
  - lower voltages
- Multi-Chip Packages
- Hybrid Industry
- Stacked Packages
- System in a Package
- System on a Chip (wafer)
- When EIA came into existence for Standardization
  - JEDEC Committees
- Start of SEMI Standardization for packaging.