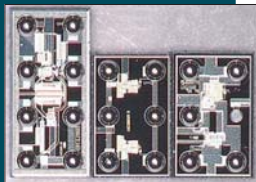
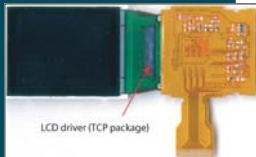
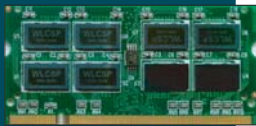
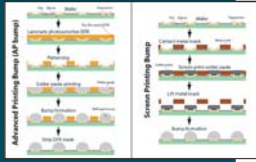


Flip Chip and Wafer Level Packaging Trends and Market Forecasts



Demand for flip chip bumping and wafer level packaging is growing rapidly. Increasing shipments of processors, ASICs, field programmable gate arrays (FPGAs), chip sets, graphics devices, and high-end DSPs are driven by the need for improved performance. Form factor needs are driving greater adoption of flip chip in CSPs. Trends include the use of flip chip for silicon with low-k dielectrics, 300mm wafer bumping, adoption of lead-free bumping, and new underfill materials and methods. New applications are described. This analysis provides an updated forecast of the flip chip wafer bumping market by product application, device type, bump type, die size, number of wafers, and number of die. Included are projections for capacity (merchant and captive) and demand. Capacity is projected by number of wafers and bump type. WLPs are also growing in volume with shipments of integrated passives, power amplifiers, battery management devices, controllers, image sensors, diodes, filters, memory (DRAM, flash, SRAM), and power MOSFETS. Projections for wafer level packages (WLPs) are provided in both units and number of wafers. New applications are discussed.

Executive Summary

1 Flip Chip Technology Trends

- 1.1 New Bumping Technologies
 - 1.1.1 Copper Pillar Bump
 - 1.1.2 ELASTec® Bump
- 1.2 Issues with Low-k Dielectrics
- 1.3 Lead-Free Bump Trends
- 1.4 Electromigration Issues
- 1.5 300mm Wafer Bumping
- 1.6 Bumping Price Trends
- 1.7 Bump Pitch Trends
- 1.8 Flip Chip Substrate Trends
- 1.9 Underfill Material Trends

2 Flip Chip Market Projections

- 2.1 Wafer Bump Capacity
 - 2.1.1 Solder Bump Capacity
 - 2.1.2 Gold Bump Capacity
- 2.2 Flip Chip Demand
 - 2.2.1 Solder Bumping Market Projections
 - 2.2.1.1 FCIP vs. FCOB Solder Bumping
 - 2.2.2 Gold Bumping Market Projections
 - 2.2.3 Gold Stud Bump
- 2.3 Flip Chip Application by Device Type
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 - 2.3.2 Microprocessors for PC and Games
 - 2.3.3 Digital Signal Processors
 - 2.3.4 ASIC, FPGA, and Switches
 - 2.3.5 Chipsets and Graphics ICs
 - 2.3.6 Wireless
 - 2.3.7 Hard Disk Drives
 - 2.3.8 Consumer Products
 - 2.3.9 Medical
 - 2.3.10 Defense and Aerospace
 - 2.3.11 Memory
 - 2.3.12 Gold Stud Bump Applications
 - 2.3.13 Display Drivers
- 2.4 Future Applications

- 2.4.1 RFID Tags
- 2.4.2 High Brightness LEDs

3 Wafer Level Package Projections

- 3.1 Wafer Level Package Capacity
- 3.2 Wafer Level Package Demand
 - 3.2.1 Demand by Device Type
- 3.3 Wafer Level Packaging Applications
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 - 3.3.2 DRAM Memory
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 - 3.3.2.2 Impediments to WLP Adoption
 - 3.3.3 Passive Devices
 - 3.3.4 Power MOSFETS
- 3.4 Future Applications

4 Wafer Bumping / WLP Service Providers

- 4.1 Solder Bumping Options
- 4.2 Wafer Level Packaging Options
- 4.3 Wafer Bumping / WLP Service Providers
 - ASE, ACET, APS, Amkor, Aptos, Casio
 - Micronics, Chipbond, Citizen Watch,
 - EM Microelectronics - Marin, Fujitsu
 - Microelectronics, FuPo, FlipChip
 - International, Fujikura, IC
 - Interconnect, MEGIC, MicroScale,
 - NEPES, Pac Tech, Polymer Assembly
 - Technology, Samsung, Techwin, SMIC,
 - ShellCase, SPIL, STATSChipPAC, TSMC,
 - and Unitive



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Flip Chip and Wafer Level Packaging Trends and Market Forecasts

5 Contract Assembly Services

5.1 IC Package Assembly Services

AIT, ASE, Amkor, ASAT, Carsem, Casio Micronics, Chipbond, ChipMOS, Corwil, Fujitsu Microelectronics, GAPT, KSW Microtec, Kyocera, Misuzu Industries, Nantai, OSE, Shinko Electric, SPIL, STATChipPAC, UTAC, Valtronic, and White Electronic Designs

5.2 Board-Level Assembly Services

Belton, Binder Elektronik, Celestica, Endicott Interconnect Technologies, Fabrinet, Flextronics International, HEI, Isis Surface Mounting, Jabil Circuit, Nextek, Pemstar, Promex Industries, SAE Magnetics, Sanmina-SCI, Saturn Electronics and Engineering, Solectron, and Texas Prototypes

Appendix - vendor contact information:

Solder and Gold Bumping Services, Wafer Level Packages, Flip Chip Bonding Equipment, Underfill Dispense Systems, Wafer Bump Inspection Systems, Underfill and ACF Materials, Contract Assembly IC Packaging, Contract Assembly Board Level, and Laminate Substrate Suppliers

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