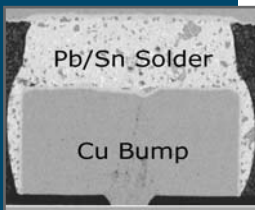
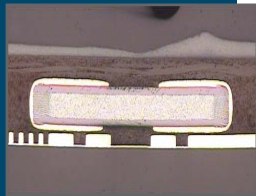
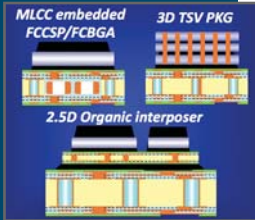


# Advanced Packaging Update: Market and Technology Trends

Vol. 2-0114



The second volume of the Advanced Packaging Update provides an economic outlook for the electronics industry and the latest trends in organic substrates for flip chip BGAs and CSPs. Trends in coreless substrates and organic interposers for 2.5D are included. Material and equipment developments are also discussed. TechSearch International's annual survey, providing special coverage of design rules from suppliers of organic flip chip substrates, PBGAs, and laminate CSPs (FBGAs) worldwide, is highlighted. The design rules include body size, core thickness, via and pad diameter, minimum bump pitch supported, and substrate finish.

## Table of Contents

### 1 Industry and Economic Trends

- 1.1 Economic Trends
  - 1.1.1 Macroeconomic Trends

### 2 Advances in Laminate Substrates

- 2.1 Flip Chip BGA
  - 2.1.1 High-Performance Processors
  - 2.1.2 Network/Server ASICs
- 2.2 Flip Chip CSP
  - 2.2.1 Mobile Processors
- 2.3 Organic Interposers for 2.5D
  - Kinsus, Kyocera, NTK, SEMCO, Shinko
  - Electric's Organic MCP, and Unimicron
- 2.4 New Materials
  - Hitachi Chemical, MGC, Sekisui Chemical, and Zeon Chemicals
- 2.5 Laser Direct Imaging
- 2.6 New Fabrication Technologies
  - 2.6.1 Averatek Corporation

### 3 Substrate Design Rules

- 3.1 Today's Laminate Feature Size
  - 3.1.1 Coreless Substrates
- 3.2 Company Design Rules
  - Access, ASE Materials, Daisho Denshi, FICT, Ibsiden, i3 Electronics, JCI, Kinsus, Kyocera SLC, LG Innotek, Nanya PCB, NTK, SEMCO, Samsung Techwin, Shennan Circuits, Shinko, Simmtech, Toppan Printing, and Unimicron

### Appendix: Substrate Suppliers

### References

### List of Figures

- 1.1. Monthly U.S. housing starts.
- 2.1. Interconnect density on flip chip substrates.
- 2.2. Bump trends.
- 2.3. Shinko's Organic Multi-Chip Package.
- 2.4. High-density substrates.

- 2.5. Hitachi's roadmap for build-up materials.
- 2.6. Registration with laser direct imaging.
- 2.7. Fully-additive process with Averatek ink.
- 2.8. Semi-additive process with Averatek ink.

### List of Tables

- 2.1. Characteristics of Organic FC-BGA Substrates
- 2.2. CPU Flip Chip Substrates from 2000 to 2012
- 2.3. nVIDIA GPU Bump Roadmap
- 2.4. nVIDIA GPU Substrate Roadmap
- 2.5. Characteristics of Organic FC-CSP Substrates
- 2.6. nVIDIA Mobile and Tablet Packaging Roadmap
- 2.7. nVIDIA GPU PoP Roadmap
- 2.8. Organic Interposer Substrates
- 2.9. Altera's Roadmap for Organic Interposers
- 2.10. Organic Interposer Suppliers and Technology
- 2.11. Kyocera's Advanced SLC™ Substrate
- 2.12. NTK's High Density Organic Substrate
- 2.13. Silicon versus Organic Interposer
- 2.14. Organic MCP Interface Layer Features
- 2.15. Reliability on Organic Multi-Chip Package
- 2.16. Requirements for Advanced Packages
- 2.17. Properties of Hitachi's New Build-up Films
- 2.18. Properties of MGC's High-Frequency BT Resin
- 2.19. Sekisui's New Build-Up Materials
- 2.20. Properties of Zeon's New Build-up Films
- 2.21. Orbotech's LDI System
- 3.1. Selected Build-up FC-BGA Substrate Suppliers
- 3.2. Laminate PBGA/CSP Substrate Suppliers
- 3.3. Coreless Substrate Suppliers and Technology

  
**TechSearch**  
INTERNATIONAL

4801 Spicewood Springs Road • Suite 150  
Austin, Texas 78759  
Tel: 512-372-8887 • Fax: 512-372-8889  
tsi@techsearchinc.com • www.techsearchinc.com

Annual subscription – \$4,200 (4 issues)  
Single issue – \$1,500