Advanced Packaging Update: Market and Technology Trends

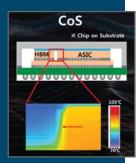
This issue of the Advanced Packaging Update features a detailed financial analysis of the OSATs and an outlook for the remainder of 2019. The impact of trade friction on the

Vol. 1-0619











electronics industry is analyzed. TSMC and Samsung foundry package offerings from mobile to high performance are described. A unit forecast for BGAs and CSPs by package construction is provided. The CSP market is divided into laminate and leadframe (QFN) substrates. Unit growth projections and future trends for package-on-package (PoP) are included. Estimates of the market for each package type are based on input from captive as well as merchant assembly operations.

Table of Contents

- 1 Industry and Economic Trends
- 1.1 Economic Trends
- 1.2 Semiconductor Sector: Hit by Trade War
- 2 OSAT Financial Analysis
- 2.1 Definitions
- 2.2 OSAT Market Overview
- 2.2.1 Growth Drivers in 2018
- 2.2.2 Memory Market Growth
- 2.2.3 Impact of Exchange Rates
- 2.2.4 Regional OSAT Growth
- 2.2.5 Growth Analysis of Top OSATs
- 2.3 Metrics
- 2.4 Outlook

3 Foundry Packaging Roadmaps

- 3.1 TSMC
- 3.1.1 Mobile
- 3.1.2 High-Performance
- 3.1.2.1 CoWoS
- 3.1.2.2 Fan-out on Substrate
- 3.1.2.3 SoIC and WoW: New Architectures
- 3.2 Samsung
- 3.2.1 Mobile
- 3.2.2 High-Performance
- 4 BGA Applications and Markets
- 4.1 BGA Market Projections

5 CSP Applications and Markets

- 5.1 Mobile Phones
- 5.2 Tablets
- 5.3 Wearable Electronics
- 5.4 QFNs
- 5.5 Molded Interconnect Substrates
- 5.6 Laminate CSPs
- 5.7 Stacked Die CSPs
- 5.8 PoP Developments
- 5.8.1 PoP Applications
- 5.8.2 Future PoP Replacements

5.8.3 PoP Forecast

5.9 CSP Market Projections

References

List of Figures

- 1.1. Monthly U.S. housing starts.
- 3.1. CoS versus CoW.
- 5.1. TSMC's InFO PoP for Apple watch.
- 5.2. Samsung's mobile processor and memory.
- 5.3. Processor and memory for Apple's iPad Pro.

List of Tables

- 2.1. Revenues for Top 20 Publicly Traded OSATs
- 2.2. Market Profile of Top 20 Publicly Traded OSATs
- 2.3. 2018 CAPEX for Top 10 Publicly Traded OSATs
- 2.4. OSAT Revenue Q1 2018 vs. Q1 2019
- 2.5. OSAT CAPEX Trends
- 3.1. CoWoS Standard Offerings
- 3.2. CoWoS Roadmap for Future Silicon Nodes
- 3.3. CoWoS Trends
- 3.4. InFO_oS Trends
- 3.5. Comparison of SoIC and WoW.
- 3.6. Comparison of SoIC and Foveros
- 4.1. PBGA/LGA Market Projections
- 5.1. Select CSPs in Samsung's Galaxy S10+
- 5.2. Selected CSPs in Huawei's P30 by Supplier
- 5.3. Select CSPs in the iPad Pro 11-inch
- 5.4. Examples of CSPs in the LTE Galaxy Watch
- 5.5. QFN Examples
- 5.6. FBGA Examples
- 5.7. LGA-Package Examples
- 5.8. Stacked Die CSP Examples
- 5.9. PoP Market Forecast
- 5.10. CSP Market Projections



Annual subscription – \$5,100 (4 issues) Single issue – \$2,500 Corporate license – \$8,750 4801 Spicewood Springs Road • Suite 150 Austin, Texas 78759 Tel: 512-372-8887 • Fax: 512-372-8889 tsi@techsearchinc.com • www.techsearchinc.com