# Advanced Packaging Update: Market and Technology Trends

Vol. 3-0716



The Advanced Packaging Update (3-0716) features an explanation of the drivers for fan-out wafer level packages (FO-WLPs) in high volume manufacturing and analysis of economic and technical issues that need to be addressed in large area panel production. Special coverage of trends in packaging and assembly for wearable electronics is provided. Recent developments in battery technology are included. An economic analysis examines macroeconomic trends and their impact on the semiconductor packaging and assembly industry.

#### **Table of Contents**

## 1 Industry and Economic Trends

- 1.1 Economic Trends
- 1.2 Semiconductor Sector

#### 2 FO-WLP and Large Area Processing

- 2.1 FO-WLP Applications and Adoption Drivers
- 2.1.1 Baseband Processors, Modems, and RF
- 2.1.2 Automotive Radar Modules
- 2.1.3 Processors and Memory for Mobile
- 2.2 Large Area Panel Processing
- 2.3 Consortia for Panel Processing
- 2.3.1 Fraunhofer's FO-PLP Consortium
- 2.3.2 FOPLP Large Panel Consortium
- 2.4 Supplier Plans for Large Area FO-WLP
- 2.5 FO-WLP Market Forecast

#### 3 Package Trends for Wearables

- 3.1 Fitness/Activity Trackers and Smartwatches
- 3.1.1 Package Trends
- 3.1.2 Fitness/Activity Packages
- 3.1.3 Smartwatch Packages
- 3.2 Virtual and Augmented Reality Headsets
- 3.2.1 Packages in VR Systems
- 3.2.2 Packages in AR Headsets and Glasses
- 3.3 Body Cameras and Wireless Earbuds

# 4 Battery Technology Developments

- 4.1 Consumer Needs
- 4.2 Future Solutions
- 4.2.1 Commercial Products
- 4.2.2 Research Phase Technologies

### References

#### List of Figures

- 1.1. Monthly U.S. housing starts.
- 2.1. Qualcomm audio CODEC in Samsung Galaxy 7.
- 2.2. AP and IPM in FO-WLP.
- 3.1. Populated board for Microsoft's Band 2.
- 3.2. Samsung Gear S2.

#### **List of Tables**

- 2.1. Thermal Performance Comparison
- 2.2. Panel FO-WLP Cost Advantage
- 2.3. FO-WLP Panel Sizes Under Development
- 2.4. FO-WLP Market Projections
- 3.1. Fitness/Activity Tracker Package Trends
- 3.2. Packages in Microsoft Band 2
- 3.3. Package Count in Apple Watch
- 3.4. Package Count in LG Watch Urbane
- 3.5. Package Count in Sun S2
- 3.6. Virtual Reality and Augmented Reality
- 3.7. Packages in the HTC Vive System
- 3.8. Packages in Narrative Clip
- 3.9. Chips in Bragi Dash
- 4.1. Selected Battery Research Activities



