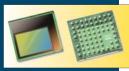
# 2019 Flip Chip and WLP: Trends and Market Projections













Fan-in wafer level package (WLP) and fan-out WLP continue to show strong growth. This report provides examples of the many products using WLP, including the supplier, number of WLPs in each product, and dimensions. Demand for flip chip in applications ranging from large die for Al accelerators to small die for amplifiers and filters is covered. Cu pillar is increasingly used for many devices. Demand continues for both 300mm and 200mm bumping and market projections in units and wafers are provided. An analysis of bumping, WLP, and FO-WLP capacity is presented for each segment by geographic region, technology, and wafer size. Panel processing developments, applications, and production plans are presented. Flip chip equipment and assembly methods are discussed. A set of 90 PowerPoint slides is included with the detailed analysis.

#### **Executive Summary**

- 1 Technology Developments
- 1.1 Fan-in and Fan-out WLPs
- 1.1.1 Chip Package Interaction Issues
- 1.1.2 Singulation and Edge Protection
- 1.1.3 Solder Ball Material and Pitch Trends
- 1.2 FO-WLP Developments
- 1.2.1 Large Area Panel Development
- 1.2.2 Panel Process Challenges
- 1.2.2.1 Economic Issues
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- 1.2.3 PLP Consortia Activities
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- 1.3.2 Cu Pillar
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- 1.3.4 CPI Issues
- 1.4 Wafer Sizes
- 1.5 Flip Chip Bump and WLP Price Trends
- 1.6 Flip Chip Substrate Trends
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- 1.6.3 Warpage Challenges
- 1.6.4 Leadframe and Molded Substrates
- 1.7 Underfill Material Trends

#### 2 Flip Chip Market Projections

- 2.1 Wafer Bump Capacity
- 2.1.1 Flip Chip Bump Capacity
- 2.1.2 Electroless NiAu
- 2.1.3 Gold Bump Capacity

#### 2.2 Flip Chip Demand

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- 2.2.2 Cu Pillar Trends
- 2.2.3 Gold Bumping Market Projections
- 2.2.4 Flip Chip Application by Device Type
- 2.2.4.1 High-Performance Devices
- 2.2.4.2 PCs and Game Consoles
- 2.2.4.3 Cryptocurrency
- 2.2.4.4 Media Chips
- 2.2.4.5 Pre-amps for HDDs
- 2.2.4.6 Mobile Phones and Tablets
- 2.2.4.7 RF Front-end Modules
- 2.2.4.8 Consumer Products and Games
- 2.2.4.9 Flip Chip on Leadframe
- 2.2.4.10 Filters
- 2.2.4.11 Medical
- 2.2.4.12 Automotive Electronics
- 2.2.4.13 Military and Aerospace
- 2.2.4.14 Integrated Photonics
- 2.2.4.15 DRAM
- 2.2.4.16 RFID Tags
- 2.2.4.17 High Brightness LEDs

#### 3 WLP Trends and Market Projections

- 3.1 Fan-in WLP Applications
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- 3.1.2 Tablets and Laptop/Tablet Hybrids
- 3.1.3 Wearables
- 3.1.3.1 Smartwatches
- 3.1.3.2 Smart Earbuds
- 3.1.4 Smart Speakers
- 3.1.5 AR/VR Headsets
- 3.1.6 Drones
- 3.1.7 Automotive Electronics



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## 2019 Flip Chip and WLP:

### **Trends and Market Projections**

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