

# Global and China IC Advanced Packaging Equipment Industry Report, 2013-2014

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## Abstracts

Global and China IC Advanced Packaging Equipment Industry Report, 2013-2014 mainly deals with the followings:

1. Overview of semiconductor industry
2. Status quo of memory and wafer foundry industry
3. Downstream market of semiconductor industry
4. Trend in emerging advanced packaging technology
5. Packaging equipment industry analysis and ranking
6. 15 major advanced packaging equipment vendors

Packaging equipment can fall into two categories: wafer level and die level. And the former is typically included in wafer equipment as it is used in the manufacturing of wafer. Wafer level packaging is primarily used in the following 5 fields, namely, Analog & Mixed Signal (including IPD, PA, PMU, Local Power, IC Driver, and Audio & Video), Wireless Connectivity (including Bluetooth+FM+WLAN Combo and GPS Single Chip), Optoelectronic (including CIS, AL Sensor), MEMS & Sensor (including Accelerometers, Gyroscope, RF-MEMS, Pressure Sensor, and Fingerprint Sensor), as well as Misc Logic and Memory (covering Logic gate and EEPROMs). And these applications mostly adopt the Fan-in design, with the number of Pin usually less than 20.

In future, WLCSP will be required to follow the Fan-out design to expand its applications. However, the current Fan-out design, which is not mature, restricts the application of wafer level packaging, leaving an untapped market potential for now. But if the Fan-out design is mature, WLCSP will embark on a new development stage.

Wafer level packaging equipment consists of Process Tool (mainly including CVD and

PVD, Etching, Sputtering), Packaging Lithography, Contact Probers, and Packaging Inspection. Among them, the main vendors of Process Tool are Applied Material (including the acquired NEXX) and ULVAC; the major companies in Packaging Lithography field are Ultratech, SUSS, and EV Group; the companies involved in Contact Probers are represented by Tokyo Seimitsu and Tokyo Electron (already acquired by Applied Material); the companies engaging in Packaging Inspection principally include Rudolph, Camtek, and KLA-TENCOR. In 2014, the market size of wafer packaging level equipment will be very likely to reach approximately USD1.3 billion.

Die packaging level equipment mainly involves Wire Bonder (main vendors are Kulicke & Soffa, ASM Pacific, and Shinkawa), Die Bonder (represented by ASM Pacific, Hitachi High Technologies, BESI, and Canon), Flip chip Bonder (typical vendors cover PFSA, BESI, ASM Pacific, Toray Engineering, and Hanmi), Test Handler (Delta Design, Advantest, Epson, and Tesec serve as the major players), Wafer Dicing Saws (players include DISCO and Tokyo Seimitsu), Molding/Encapsulation (Towa, BESI, Dai-ichi Seiko are the typical vendors), and Package singulation (Hanmi, ASM Pacific, and DISCO play the main role).

With obvious periodicity, semiconductor devices saw a rise during 2001-2007 but a slump in 2008-2009, while fiercely surged by 100% in 2011, then declined for 3 consecutive years from 2011. And in 2014, they will witness an explosive growth, with the estimated market size of die packaging level equipment rising significantly by 20% to USD4.1 billion. And this figure is projected to climb to USD4.3 billion in 2015 and then begin to fall in 2016. The major growth engine would be Die Bonder, Flip-chip Bonder, and Test Handler.

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