



PRESS RELEASE

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Disruptive Impact of Fan-out WLP Growth Coming for Electronics Industry

Fan-out wafer level packaging (FO-WLP) is a disruptive technology that will have a significant impact on the electronics industry in the coming years. WLP has seen strong growth, especially in the mobile devices, because it provides a low-profile package that meets the requirements of many smartphone makers. Billions of WLPs are shipped each year and FO-WLP adoption will drive the number even higher. In its new report, TechSearch International projects an 87% CAGR for FO-WLPs in unit volumes over the next 5 years.

As companies move to the next semiconductor technology node, smaller die are possible, allowing a greater number of die per wafer. At the same time the number of I/Os is increasing, and to route them a conventional WLP would require small diameter solder balls with fine pitch. Qualcomm has published information on the reliability challenges of going to $\leq 0.35\text{mm}$ pitch with a conventional fan-in WLP.

FO-WLP is an attractive solution that allows companies to continue taking advantage of the powerful economics of die shrink, while also meeting the small form factor, low-profile package requirements of mobile devices. FO-WLP is disruptive technology because there is no substrate and thin-film metallization is used for interconnect instead of bumps or wires. In the case of a face-up process, the die has a thick Cu post, but not a Cu pillar with a solder cap. The use of redistribution layers patterned with semiconductor technology makes it possible to achieve much finer feature sizes $\leq 5\mu\text{m}$ lines and spaces, than conventional organic substrate technologies.

With the use of FO-WLP for the logic bottom package in a package-on-package (PoP) configuration, the ultra thin target of $< 0.8\text{mm}$ PoP can be met. The only lower-profile PoP with memory and logic is a 3D IC memory and logic stack using through silicon vias (TSVs). Such an approach is costly, however and there are no thermal solutions for this stack in mobile applications.

TechSearch International's new 42-page *Advanced Packaging Update* report with full references provides forecasts for all types of FO-WLP, including a separate analysis for high-density fan out, in number of parts and reconstituted wafers. Supplier offerings are listed and broken out by face-up and face-down configuration. The report also contains a new market forecast for silicon interposers and a section on automotive safety features and packaging trends, including FO-WLP. A set of 36 PowerPoint slides accompanies the report.

TechSearch International, Inc., founded in 1987, is a market research leader specializing in technology trends in microelectronics packaging and assembly. Multi- and single-client services encompass technology licensing, strategic planning, and market and technology analysis. TechSearch International professionals have an extensive network of more than 17,000 contacts in North America, Asia, and Europe. Contact TechSearch at tel: 1-512-372-8887 or visit <http://www.techsearchinc.com>.