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"Manufacturing-less" IC companies

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As consumer and computing applications increase in functionality, semiconductor components are becoming more complex to meet the technology requirements of these products. Advanced devices require leading-edge front- and back-end processes to quickly move from concept, to silicon, to system integration.

Traditionally, semiconductor companies have invested heavily in front-end capital expenditures, while neglecting to ensure that their back-end facilities keep in step. As a result, back-end contract manufacturers play a larger role in today's market, in providing packaging, assembly and testing services to semiconductor companies in hopes of getting products to market faster.

The Rise of Fabless IC Makers

Most semiconductor manufacturers can be classified as fabless, as traditional integrated device manufacturers (IDM) have opted not to invest in the capital equipment and facilities needed to make the latest chips. Many IDMs also no longer invest in the advanced testing platforms, test equipment and assembly facilities required to get their products from silicon to market. Consequently, companies rely on back-end services to get their product to market on schedule.

Supplying internal back-end services does not make economic sense for many of today's IDMs. For example, the typical volume for a complex device is around 500,000 to 1 million units per year. These leading-edge devices have a short product life cycle, and time-to-market is always a pressing concern. To fully test, assemble and package these devices requires customized equipment and engineering support that typically is outside the scope of expertise of many companies, where the primary focus lies in the development of intellectual property for integrated circuit (IC) design.

The new generation of automatic test equipment (ATE) ranges in price from \$2 to 3.5 million, and for moderate production volumes of about 500,000 to 1 million, the expense is difficult to justify. In addition, the costs of setting up and maintaining the facilities that house ATE equipment are high, adding further overhead to the bottom line.

Time for Partnerships

To succeed, these manufacturing-less semiconductor companies should secure and maintain strategic partnerships with back-end subcontractors. These back-end subcontractors not only possess the expertise to provide integrated packaging, assembly and test services, but in many cases they can do so more efficiently and cost-effectively than a semiconductor manufacturer could do on its own. By integrating back-end services with subcontractors, the cost of evaluation is decreased, enabling the semiconductor companies to work with a single organizational structure, accelerating lead times and reducing time-to-market.

Today, back-end subcontractors are increasingly under pressure to expand their business models to support a wider range of services. Most of the business that subcontractors receive is contingent upon the ability to support packaging, assembly and test. Back-end subcontractors must perform packaging, wafer sort and final test at the semiconductor assembly location to streamline the assembly and test process, accelerate lead-time, reduce time-to-market and reduce the cost of doing business for manufacturing-less semiconductor companies.

Most subcontractors have established test departments at the assembly site, and some have further reduced costs by placing smaller test operations geographically positioned near core customers' technical and engineering organizations. Today there are several small test operations in the major technology corridors of the United States.

To succeed in today's market, companies are securing integrated strategic partnerships with back-end subcontractors that have the expertise to provide packaging, assembly and test services for their complex semiconductor devices. Such an integrated approach provides a sound economical solution and helps ensure reduced time-to-market, which can help companies build and sustain their core customer base.

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