



Meeting the Challenges of the SATS Industry

BY DAVID COMLEY

Toward the end of August, the investment community was speculating that another downturn or inventory adjustment was upon us. Although most of us hope that we are experiencing the usual summer slowdown, we will see what October brings. The semiconductor industry is accustomed to its cycles, but the events over the past 7 years have changed our industry in ways well beyond those of other typical downturns.

In July 1997, the currencies of Indonesia, Thailand, Malaysia, South Korea, the Philippines, Singapore, and to a lesser degree Taiwan, collapsed against the U.S. dollar. These currencies remain between 20 to 90% weaker than their values in mid-1997. Semiconductor assembly and test subcontractors (SATS) with high debt suddenly found themselves with new owners. The semiconductor gods, however, were forgiving as the industry experienced unprecedented growth during 1999 and 2000. Some SATS companies took the opportunity to raise funds on the NASDAQ, but others were too late as this period of exceptional growth was then followed by the industry's worst downturn. Revenue dropped to 40% of its peak, and today those funds have almost disappeared from balance sheets. Profitable growth returned in mid-2003, but selling-price erosion of around 40% left SATS with underutilized assets. They now face a new source of competition in China, where SATS companies appear to use cash flow as the only financial parameter. Once again, however, the semiconductor gods showed the way forward when the industry introduced a new plastic package to the market — the Quad Flat No Lead (QFN). This package was smaller, thinner, cooler, faster, and potentially cheaper than its leaded equivalents, but could not use existing assets, leaving only those SATS companies with the financial and technology strength

to develop this family of packages. The QFN will be the next major test for the SATS industry, because it will have to find the cash to fund its growth, rather than relying on the margins from traditional leaded packages as they continue to see selling-price erosion driven by startups in China.

It is interesting that the integrated device manufacturers (IDMs) finally are taking note of the financial strength of SATS companies when selecting their suppliers. It is essential that the SATS company has the financial resources to develop new products, as well as be able to invest in production capabilities to respond to the many unforecasted upsides that appear to have become a fact of life in the industry. SATS' customers are unforgiving if a revenue opportunity cannot be supported.

Of course, the SATS industry has many challenges to meet aside from ensuring its financial stability. More IDMs are deciding that assembly and test functions can be more cost effective when carried out by the SATS companies, but this brings a transfer of technology expertise from its historic source of within the IDMs of the West to SATS companies in the East. Investing in new assembly and test technologies is now the responsibility of the SATS industry. Alignment of technology roadmaps has become an important factor.

Operational indices such as quality, cycle time and yields are important, but are viewed as "given." With assembly yields throughout the industry at 99% or greater, this has become an indice of low attention except for test yields. A lack of market visibility and concern for high levels of inventory have elevated cycle time as a key indice, and quality expectations continue its drive toward zero defects.

Communication of real-time data between SATS and their customers is another area of increasing needs. Customers expect to enter a SATS' website from anywhere in the world and gain access to quality, yield, work-in-progress, starts, shipments, cycle time and technical data.

I believe that the greatest challenge going forward lies in the cost reduction of electrical test. Although some IDMs think that their test technology has a significant level of IP and choose to keep it within, most IDMs use a turn-key assembly and test strategy with SATS. Some fundamental changes are needed, however, in how testers and handlers are selected. In the past, the choice came from the IDM. Today, the SATS test floors are a collection of a variety of handlers and testers. Equipment utilization is essential to the profitability of the SATS industry, and there is a push toward multi-site testing in strip form and minimizing the number of test platforms. SATS companies must begin to drive the choice of handlers and testers, and must offer their customers test development solutions.

The challenges for the SATS industry have become greater and can only be met by companies with healthy balance sheets, strong technology and support systems that can ensure their customers timely and cost-effective solutions. **AP**

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