

COST OF OWNERSHIP MODEL FOR PROBE CARD TECHNOLOGY

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In January of 1992 the Sales and Marketing Executive council of SEMI (SMECS) chartered a subcommittee to explore the use of cost of ownership within the semiconductor equipment and materials industry. As modelling grows in acceptance, it grows in importance. Cost of ownership is only of an increasing number of cost modeling efforts [1]. In our rapid maturation as an industry, capital intensity has increased at a rate that threatens the traditional cost/performance curves of the end product. Currently cost of ownership models are available for front end, assembly and packaging, wafer sort and final test, and software development. New areas being developed are flat panel display manufacturing and environmental safety and health.

The probe card is the final electrical connection between the tester and the device under test (DUT). In the past, cantilever was the only predominant probe card technology to select from. These new technologies each have unique cost, performance, and lifetime considerations. Thus, selecting the ideal probe card can significantly impact the cost of test. The model reduces a multitude of complexly related factors involved in the probe card selection process to a single measure of value. To fully use the model, organizations need to understand their processes in terms of the elements of the model. These common elements provide a basis for further development. They could allow greater benchmarking among probe organizations and more effective sharing of information. The COO model developed has the objectives to:

- Make available a common tool with which suppliers and customers can assess and share probe solution performance data in a transparent format.
- Allow suppliers to present cost performance data to end users reducing the initial, currently repetitive analysis effort expended by end user testers.

The COO model is a spreadsheet-based tool that provides the following:

- Cost comparisons of different probe card solutions
- Quantification of the key contributing parameters
- Indication of the impact of varying demand volumes on an application-specific basis over the full product lifecycle and is realized considering the graph reported in figure.

References:

Walt Trybula “Cost of ownership – projecting the future” Microelectronic Engineering Volume 83, Issues 4-9, April-September 2006, Pages 614-618.