ATE Value Add through Open Data Collection
Panel Position Paper For
“Dude! Where’s my data? - Cracking Open the Hermetically Sealed Tester”

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The exponential rising cost of semiconductor manufacturing has finally caused a slowing of Moore’s law. The industry is responding with platform ASICs, FPGAs and mask shuttles for lowering cost. In this environment, semiconductor test cannot afford to continue in an ever-increasing cost spiral as a limited-value added quality step in the flow.

It is being touted that advanced DFT solutions along with low cost desktop testers will save the day. If test continues to only play the roll of a quality gate, then I suspect this will be the fate. However, if test can begin to serve a much more valuable function that offsets the cost of other operations then its price will become justifiable. I believe that ATE vendors must begin to position their products as high accuracy and high volume metrology tools for yield enhancement and reliability improvement.

With increasing complexity of processes and circuitry, the traditional tools and techniques for yield enhancement are becoming less effective, more time consuming and more costly. With the increasing use of foundries, fabless companies do not have access to the fab data that used to drive yield enhancement efforts. The fault isolation and impact quantification information must come from die sort and final test.

I believe that the impact of advanced DFT solutions will not lessen the demands on the test hardware but enable the test hardware to gather data that can be translated into valuable information for yield enhancement and reliability improvement. The challenge for the ATE vendors is to redesign the hardware and software to enable very flexible test strategies and high volume functional and parametric data collection.

It would be natural for the ATE vendors to attempt to do all the test control, data collection and analysis on the tester. However, the rate of change in DFT solutions and analysis algorithms would be confined by a hardware solution. The ATE value would come from extensive open access to test control and data collection from outside the tester so that customers and third party software vendors could rapidly migrate up the DFT technology curve without needing hardware or operating system enhancements.

Ultimately, I propose an ATE evaluation criterion that stresses open access, flexibility, comprehensive API, and high volume data throughput. Most test platforms today position the hardware’s operating system as commander of the show. The test hardware should serve as the nimble and capable servant to the software systems that will drive the test, yield and reliability solution.