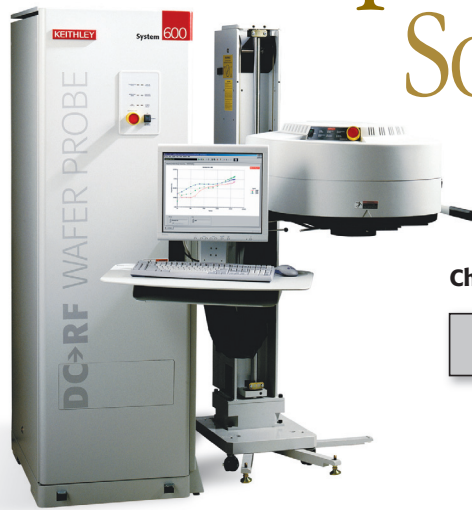
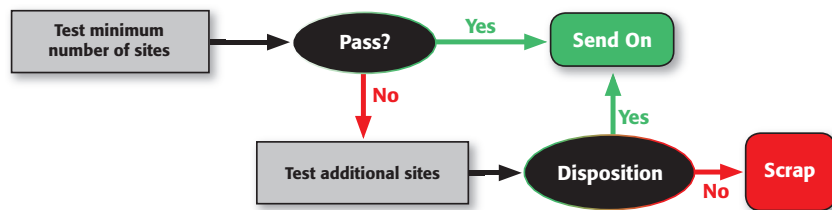


AdapTest Software Option



Change test plans in real time with AdapTest



Are your test plans in the zone?

Keithley's AdapTest software bundle delivers the tool kit you need to enhance test throughput, product yields, and process control, particularly for 300mm fabs running copper processes. It adds intelligence to the parametric test data gathering process, changing test plans automatically based on that data. This layered option for Keithley S600 Series testers running KTE V4.2.2 or later includes software tools that support adaptive testing, SoftTouch probe height adjustment, and automated probe tip cleaning. Two methods of adaptive testing are supported. Results-based adaptive testing is fully implemented from the instrument level up to the wafer cassette level. Preset zone-based testing generates random site test patterns for each cassette at runtime.

How much testing do you need?

Keithley's results-based adaptive testing allows the tester to be programmed to increase or decrease the number of sites tested and the tests performed, based on the results of previous measurements. If previous site results are acceptable, the number of sites and/or tests can be reduced, increasing throughput when testing good wafers. When previous test results don't meet preset criteria, adaptive test supports several different scenarios. If the tester is used for process control, it can make extensive additional tests at the bad sites automatically (more tests, same die), so full information is available for process diagnostics upon engineer intervention.

When used for lot dispositioning, the tester can perform the same tests at all die on the wafer automatically (same tests,

more die), to determine known good die for final test. In either case, AdapTest eliminates the time, expense, and errors involved in re-probing. Managers at one early adopter of Keithley's adaptive test solution, a 30,000 wafers/month fab, have estimated that implementing these techniques saved them more than \$600,000 in a single year by automating a decision-making process that once required operator and engineer intervention. In addition to a 15% reduction in test time, they have been able to detect additional random defects by testing 100% of the wafers produced, rather than the 60% they tested previously.

Ready to clean up your results?

Innovative features help ensure measurements are valid before results-based adaptive testing begins. For example, many apparent process failures are actually the result of probing problems. Probing copper pads typically doesn't produce the scrub marks used to verify contact with aluminum pads. Manual probe height adjustments are time-consuming, prone to error, and often result in broken probe pins. Keithley's SoftTouch solution automates detecting probe-to-pad contact on copper pads, minimizing overdrive while verifying good electrical contact. Similarly, probe tip needles contaminated with copper oxide can produce misleading results and false failures. The Probe Tip Cleaning Option allows programming the tester to initiate a cleaning cycle after a user-defined number of touchdowns, based on quality criteria when used with Probe Card Manager, or after a probe contact failure detected with SoftTouch. Together, these options ensure that tester-related effects are eliminated before adaptive testing reconfigures the test sequence.

KEITHLEY

A GREATER MEASURE OF CONFIDENCE

AdapTest Software and KTE—The Solution to Your Test Throughput Challenges

Challenge:

“I work in a foundry. Our Wafer Acceptance Testing (WAT) procedure allows us to substitute good data from an adjacent die for random failures. Can AdapTest help me take advantage of this flexibility?”

Solution:

One of the many results-based test modes available supports testing alternate sites on the current wafer. When user-defined critical tests fail at the current site, an additional alternate site is tested automatically. If the alternate site produces good results, Keithley’s adaptive testing solution automatically substitutes the good results for the results from the failed site. Testing on the primary sites resumes at the next site.

Challenge:

“I can make sure my processes are in good control with just a few critical parameters, but I measure many more “just in case” some of the critical parameters fail. Why should I gather reams of data I’ll never have time to analyze?”

Solution:

Keithley’s adaptive testing software supports measuring only critical parameters on a reduced set of sites for subsequent wafers if results from the first wafers from the cassette are satisfactory. However, if certain types or numbers of failures are encountered in the reduced test plan, the tester automatically returns to the initial test plan. This technique allows fabs to reduce test times for good material while maintaining product quality and gathering failure information vital for process control.

Challenge:

“My line yield is dominated by wafer-to-wafer variation within a lot, not variation within a wafer. How can Keithley’s adaptive testing solution help me detect these within-lot non-uniformities while reducing test time?”

Solution:

Keithley’s flexible results-based adaptive testing can be implemented many ways. One user has solved this problem by first selecting five wafers from the cassette at random and testing them thoroughly. If all parameters are good, all remaining wafers in the lot are tested with a minimum of critical parameters (fewer tests, more wafers). If some of the initial five wafers fail, then ten more wafers are selected randomly for thorough testing. For uniformly good lots, this method provides critical testing on 100% of the wafers with a 15% test time reduction and no need for operator intervention. For non-uniform lots, the tester defaults to the pre-existing sampling plan—thorough testing on 60% of the wafers in the lot.

Challenge:

“My new 300mm process can give high process variation within a wafer, but that variation is very consistent from wafer to wafer within the lot. How can Keithley’s AdapTest reduce my test times while providing more information for process control?”

Solution:

Using zone-based preset adaptive testing, a “virtual wafer” that has all die tested can be constructed from the results of all wafers within the lot, even though only nine to thirteen die per wafer were actually tested. This allows coverage of 300mm wafers in 200mm test times.

For more information on AdapTest, contact your Keithley sales manager.

Learn more at 1.888.KEITHLEY or www.keithley.com

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