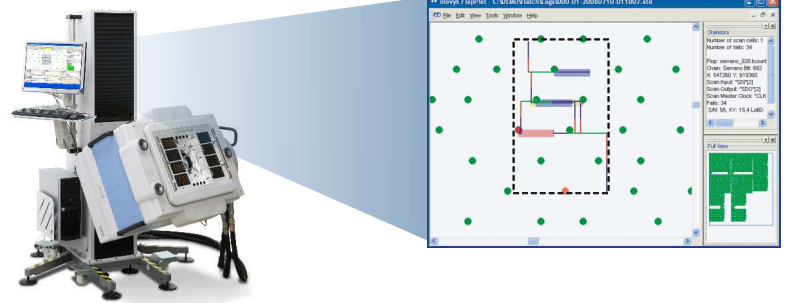


# Triage Fault Locator™

Capture of millions of faults per day on the tester



Maximize entitlement yield using comprehensive product based yield solution.



Triage Fault Locator is our pre-analysis module allowing real-time interaction with the tester and fault localization faster than it takes to write the data to disk. Triage performs the necessary on-tester smart data collection and transformation to allow comprehensive analysis and localization of electrical faults. Triage brings the power of our award winning YieldVision analysis packages to the V93000 SOC platform.

## Data Transformation

One of the greatest challenges in yield enhancement is converting between the native languages of the various disciplines that are required to produce a nanometer level integrated circuit. One of the most important conversions is to translate from the language of Automated Test Equipment (ATE) into a physical context. Efficient conversion from pin/cycle-count to pattern-chain-bit provides the location of the failures captured by the tester. It is then possible to relate those locations to the structure of the DTF solution, the hierarchy of the design and to the physical location on the die. This is the power of Logic Bit Map; transforming huge datalog files into a simple message in the language of the end user.

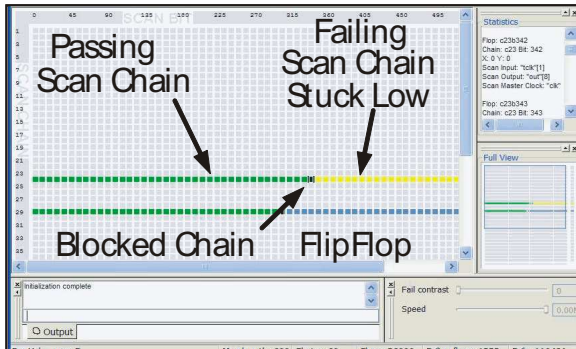
Typically this conversion from pin/cycle-count to pattern/chain/bit is done on a single logic fault using an Automatic Test Program Generation tool by simulating the failure using a schematic level representation of the device. This typically takes several hours per defect. DfX Solutions has developed proprietary methods of localizing millions of failures faster than it takes to write the data to disk. This provides the volume of localized faults required to provide statistically valid data for subsequent analysis. Not only will you know that you are working on the right defect, you will also have a sufficient number of failing die to get to an actionable result.

## Key Benefits:

- Localizes faults on-test in less time than it takes to write data to disk
- Significantly reduces data log volume by more than 1000x
- Adaptive data log approach provides simple control of data source
- Reduces time and number of wafers required to achieve yield entitlement

- The industry's most comprehensive solution for parametric and systematic fault analysis on the best-in-class V93000 SoC tester
- Accelerated time to volume production through proprietary, fault-targeted approaches
- Analyze the collected data on our comprehensive YieldVision analysis package
- Accelerate yield ramps by closing the loop between test and fab

# High Speed Automated Collection of Fault Locations



## End Point Logging:

The fundamental principal of Triage is logging the result as opposed to the raw data. Triage logs the chain and bit that captures the result of a failing pattern rather than the raw datalog.

## Blocked Chain Faults:

Triage uses Fault Targeted Patterns to localize the fault while the die is still in the socket eliminating the time consuming and expensive step of offline simulation. Blocked chain faults can produce millions of failures that can overwhelm traditional approaches leading to long process times and poor hit rates. Now, faster than it takes to log the data to disk, Triage localizes the fault and reports it in a few bytes.

## Hold Time Faults:

Triage uses Fault Targeted Patterns, generated on-the tester, to localize the fault while the die is still in the socket. Hold time faults are often Vdd sensitive and exhibit a variety of failure signatures. It is not possible to localize the fault based data collected by a production test program. It is necessary to apply additional patterns to localize the faults. Since hold time faults are often design sensitivities, it is important that all of the faults are characterized and reported so that they can all be addressed at one time. Triage performs a comprehensive analysis and reports the faults in a few bytes.

## Smart Sampling and Adaptive Data Logging:

Yield enhancement is the process of efficiently converting quantity of data into quality of information. Triage provides a smart sampling engine that allows the user to select the right amount of information without modifying the test program. This allows the user to tune the data collection process for first silicon, beginning of the ramp or entitlement yield.

## Integrated Tool Set

Yield loss mechanisms on leading edge process flows are driven by process/design interaction. Triage is the on-the-tester component of an integrated tool set that reduces time and number of wafers to achieve yield entitlement. Transforming datalogs into a simple message; localization and analysis of difficult blocked chain and hold-time faults; feeding those results into the comprehensive YieldVision analysis packages. Triage brings the industry's most comprehensive product based yield analysis package to the V93000 SOC tester. Triage provides the data to perform rapid debug, characterization and yield analysis of new designs facilitating rapid release to production and world class entitlement yield.

## SPECIFICATIONS

### Linux Based Native V93000 Proprietary Algorithms

- Takes advantage of V93000 architecture to provide on-the-tester localization of faults

### Real-time Generation of Fault Targeted Vectors

- Localize blocked chain and hold-time faults

### Data Transform and Reduction

- Localize blocked chain defects faster than it takes to write the data to disk

### End Point Logging of Electrical Faults

- Chain/bit localization for blocked chain and hold-time faults
- Compressor output chain/bit for logic fault in the combinational logic
- Selective capture of pattern/chain/bit for logic faults prior to ATPG simulation

### Adaptive Data Logging

- Turn on data logging when certain conditions are present
- User defined variables, conditions and required data using template based datalog profiles
- APIs for creation of profiles and addition/deletion of rules and accessing properties
- Custom datalog properties are allowed that can be evaluated by test methods at run-time

### High Volume Collection of Value Added Data

- Perform high volume analysis of electrical defect data using the offline analysis package YieldVision