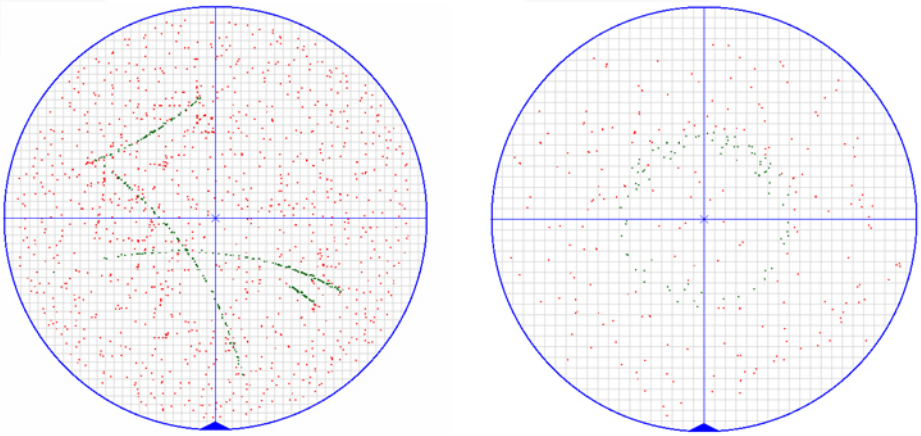
IDA DATA SHEET

Defect Signature Analyzer (DSA™) is one of the main components of the SiGlaz Intelligent Defect Analysis software suite. It provides yield engineers with a wide range of analysis and visualization tools with which to develop and optimize the defect signature analysis methodology and to train the defect signature library.
IDA employs several different signature recognition techniques to automatically identify the spatial signatures that may affect process yield. These techniques may be used alone or in combination to provide even higher accuracy and purity.



CMP scratches are identified using a special algorithm (left). A circular signature is identified using a combination of zonal analysis and object library (right).

Object Rules library - With IDA object signature analysis, the user can identify signatures that take the form of clusters. Spatial parameters (e.g., size, location, orientation) are extracted from each cluster that is identified in the inspection data. To recognize the signature, the spatial parameters of each cluster are compared to a set of object signature rules that are stored in the library.

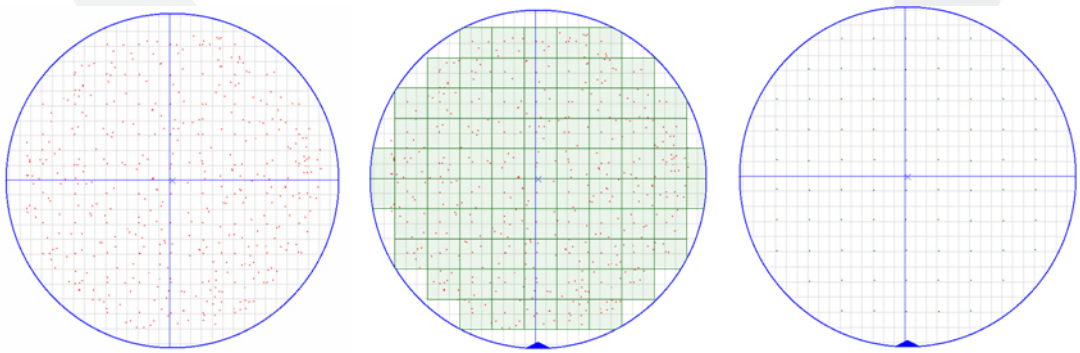
Wafer and Reticle Pattern library - A pattern signature is defined by the way that the defects are distributed over the entire wafer or over the stacked reticle field. The user defines a signature by training it into the pattern library. The signature is recognized whenever the correlation between the input data and the trained pattern exceeds a threshold value.

Pre-defined signature algorithms – Some IDA functions do not use the signature library. They are stand-alone algorithms that use linear algebra to analyze the defect data to identify special signature types, such as curved CMP scratches.

Layer-to-layer repeater analysis - With IDA layer repeater analyzer, the user may overlay multiple wafer levels and check them for defects that occur at the same location of the wafers. User specifies the proximity and frequency to define the repeater. The wafer layers may be grouped prior to overlay analysis (e.g., by process step or device ID).

Reticle repeater analysis - IDA reticle repeater analyzer checks all reticles fields on the wafer for defects that occur in the same relative location of the reticle field. User specifies proximity and frequency to define the repeater.

Zonal Analysis - Zonal analysis enables the user to define multiple areas of the wafer for comparative analysis. If the distribution of defects for the input wafer meets the specified conditions for each zone, then defects in the specified zone will be classified as a signature.



Repeater defects may be difficult to find (left). A reticle layout file (center) is automatically generated by IDA based on SetupID. Repeating defects (right) are identified based on proximity and frequency.

Other IDA Functions

Spatial Filters: In order to increase the accuracy of recognizing a latent defect signature in the inspection data, DSA employs a wide range of spatial filtering techniques, including filtering by density, defect size, classification number or wafer region.

Object Rules Wizard: To enable the user to easily generate object rules for the signature library, DSA provides a "wizard." The user can automatically generate the object rules by simply drawing a figure around the object in the KLARF.

High Resolution Mode: Object signature analysis can be extended to high resolution mode to analyze objects that are less than 100 microns in size with minimal impact on throughput.

Signature composer: An easy-to-use graphical editor called the Signature Composer enables the user to modify existing results files to create a defect signature to train into the library. It also allows the user to create new signatures that are anticipated.

Skip Line Interpolator: When only alternating rows or columns of a wafer are inspected, the Skip Line Interpolator will "fill in" the defects of dies that have not been inspected in order to enable signature analysis on those layers.

Randomness Analyzer: The initial step in recognizing a defect signature is the determination that the inspection file contains a non-random distribution of defects. IDA uses both k-NN analysis and spatial distribution to make this determination automatically.

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