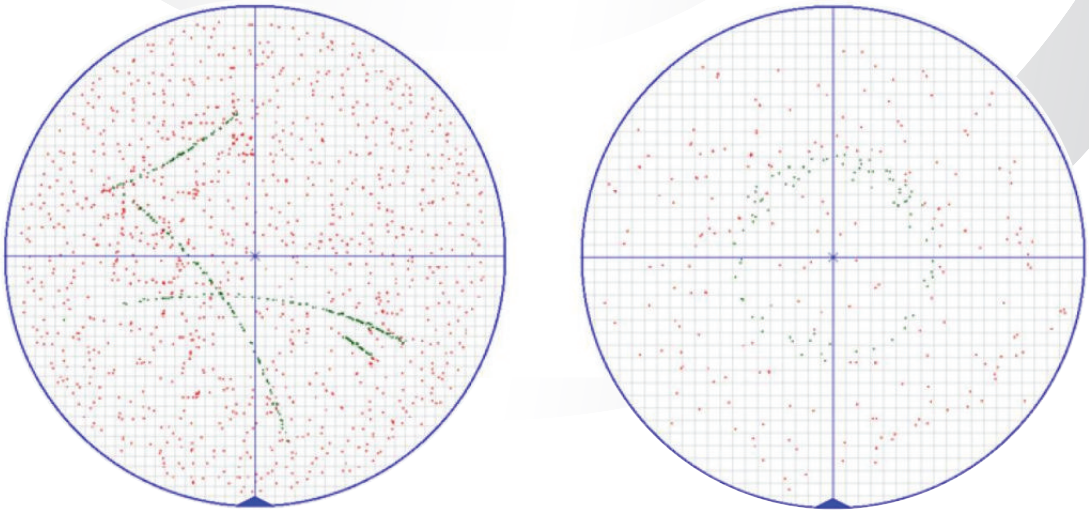
DSA DATA SHEET

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. It also enables the user to create the defect signature library, which is used by the Automation Workbench analysis recipes.

ID employs several different signature recognition techniques to automatically identify the spatial signature that may affect process yield. These techniques may be used alone or in combination to provide high accuracy and purity results.



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

Object Signature Analysis – 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 defect signature library.

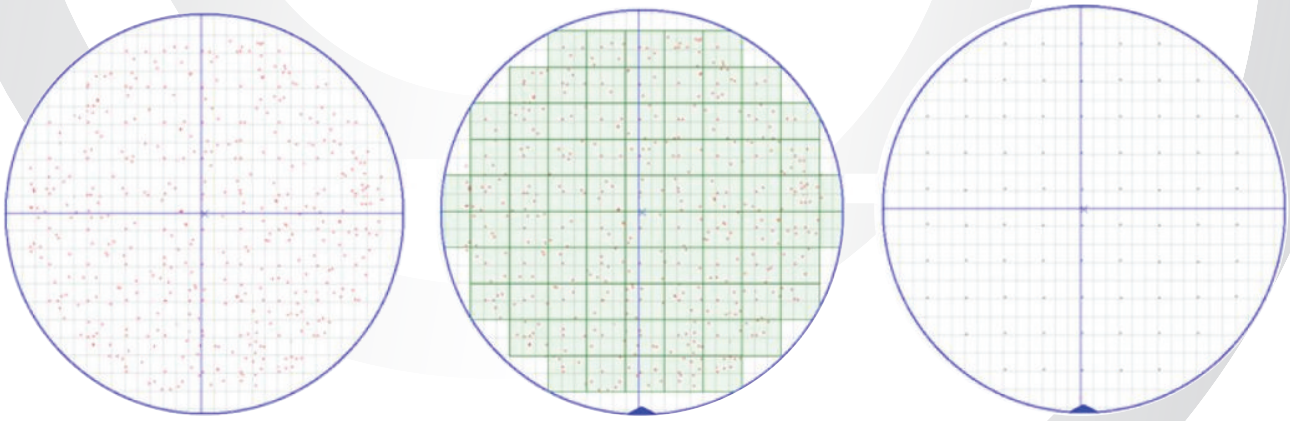
Pre-defined signature algorithms – Some IDA functions do not require the use the defect signature library. They are standalone algorithms that use linear algebra to analyze the defect data and identify special signature types, such as curved CMP Scratches.

Zonal Analysis – Zonal analysis enables the user to define multiple areas of interest on the wafer for comparative analysis. If the distribution of defects for the input wafer meets the specified conditions for each defined zone, then the defects in the specified zone are classified as a defect signature.

Reticle repeater analysis – IDA reticle repeater analyzer overlays all reticle fields on the wafer level to look for defects that occur at the same relative location of the reticle field. The user specifies the proximity and frequency of corresponding defects to identify the repeaters.

Layer-to-layer repeater analyzer – With IDA layer repeater analyzer, the user may overlay multiple wafer levels and check them for defects that occur at the same location on more than one layer of the wafer. The user specifies the proximity and frequency of corresponding defects to define the repeaters. The wafer layers may be grouped prior to overlay analysis (e.g., by Step ID or by Device ID).

DSA DATA SHEET



Repeater defects may be difficult to find manually (left). A reticle layout file (center) is automatically generated by IDA based on the Setup ID in the KLARF file. 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.

High Resolution Mode – Object signature analysis can be extended to high resolution mode to analyze objects that are less than100 microns in size. This can be done with minimal impact on throughput.

Signature Composer – An easy-to-use graphical editor called the Signature Composer enables the user to modify an existing results file in order to create a simulated defect signature, which then can be used to train a signature rule into the defect signature library.

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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