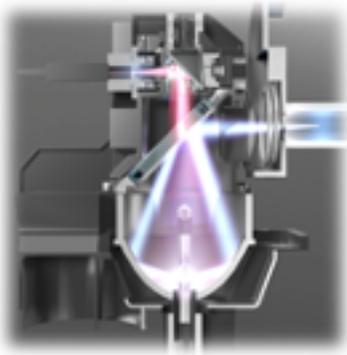


2835

Broadband Plasma Patterned Wafer Inspection System

The **2835 Broadband Plasma** is the industry's first logic-specific brightfield inspector, providing the broadest capture of defects of interest on sub-45nm logic devices. With a range of pixel sizes, a patented toolset of algorithms and data rate improvement, the 2835 delivers high sensitivity to yield-critical defects within complex pattern geometries at the highest throughput. Based on the 2800 series of DUV broadband brightfield inspectors, the 2835 offers flexibility for process development, reliability for production and process transfer, and extendibility for future nodes and emerging technologies.



Broadband Plasma Light Source



Productivity

Sensitivity

The 2835 delivers the sensitivity required to inspect all layers using flexible optical modes, innovative algorithms and a range of pixel sizes. Enhanced resolution is achieved with the industry's smallest imaging pixel, allowing for capture of critical defects within tight pattern geometries.



Results

Design Based Inspection

The 2835 with integrated IDA rack utilizes designed based binning inspection which enables improved separation of DOI and nuisance defects based on unique design properties, even if they appear optically similar to the detector.

Tunable Full-Spectrum Optics

The 2835 utilizes a tunable broadband illumination source covering DUV, UV and visible wavelength ranges. Selectable, pixel-independent high numerical aperture (NA) optical apertures, directional e-Field and custom algorithms enable optimal defect contrast and superior nuisance suppression to maximize the 2835's sensitivity to critical defects on a full range of layers, devices and design rules.



Savings

Flexibility

With the flexibility offered by multiple pixel options and unique optical modes, the 2835 meets the inspection requirements of various stages of the yield ramp. Process development is served by the highest sensitivity inspection modes, while production excursion control is supported with high reliability, production proven matching and the highest weighted average throughput.

Time to Results

Innovative algorithms and broadband illumination reduce the number of false counts arising from process variation and previous-layer defects. This advanced nuisance suppression capability combines with Inline Defect Organizer™ (iDO™) to accelerate the time to an actionable pareto, focusing resources on the most critical yield issues.

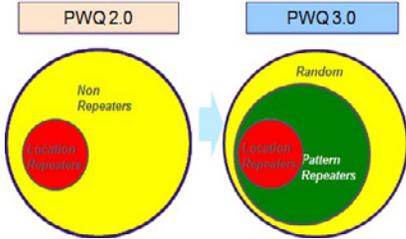
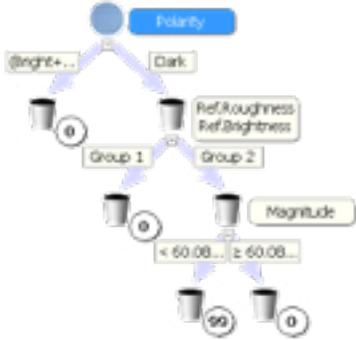
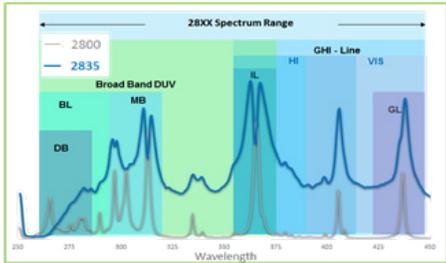
Commonality and Connectivity

The 2835 shares a common platform and user interface with KLA's darkfield and e-beam inspectors and e-beam review tools. This facilitates a mix-and-match inspection strategy, reduces the time required for recipe creation, and lowers the training burden.

Efficient Recipe Setup

Automated recipe optimization tools, such as automatic care area setup, have been implemented to speed recipe setup time. 2835 recipes can also be optimized off-line or on KLA's eDR-7380 SEM review and classification system, protecting inspector capacity and further reducing recipe writing cycle time.

Key Technologies



Broadband Plasma Spectrum:

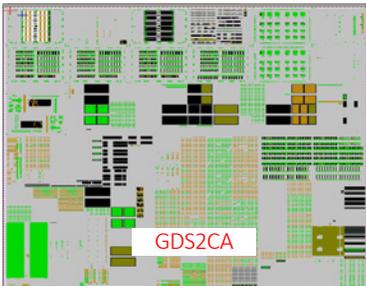
2835 covers multiple spectral bands in the DUV through visible spectrum. With 8x more light, new spectral bands (Hi & Vis), along with e-Field directional illumination and collection apertures, the 2835 can be tailored to inspect a wide variety of substrates, layers and materials for maximum performance.

Inline Defect Optimizer (iDO) on Leaf Filtering

uses feature vectors and defect attributes to classify defects. This classification engine happens in real time while running an inspection without loss in system throughput. When the inspection is completed, defects are automatically sorted and tagged into their respective groups (or bins), enabling more efficient SEM review for final classification.

Process Window Qualification 3.0 (PWQ)

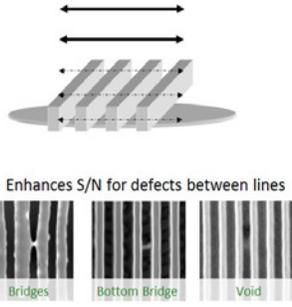
accounts for non-location specific repeaters via design-based grouping (DBG). PWQ 3.0's new sampling algorithm leads to better results, improved process window determination and improved systematic discovery of defects which can then be monitored utilizing design-based classification (DBC).



GDS to Care Area: With GDS to care area, care areas can be auto generated using GDS files. This allows for much faster and accurate inspection care area definition and overall recipe creation.

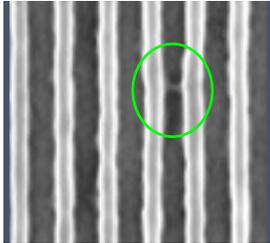


Unique Brightfield and Darkfield Apertures Recipe selectable optical apertures allow for easier defect detection and reporting of your most critical defects.

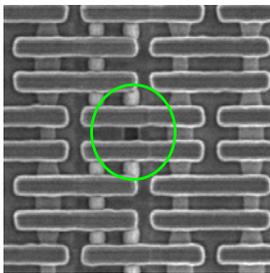


Directional Electrical Field (DEF): Enhance the signal to capture defects at the bottom surface of patterning layers—both vertically and horizontally—allowing for easy detection of bridges and open defects such as voids.

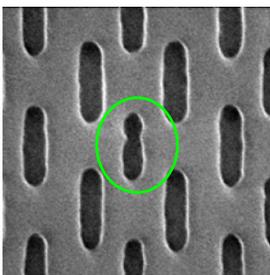
Defect Examples



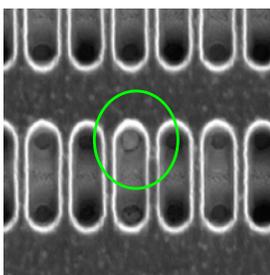
Bridge



Missing EPI



Pattern Issue



Via Residue

Benefits

- Delivers highest sensitivity required to monitor and control a full range of layers and defect types with selectable broadband DUV/UV/visible illumination, apertures, imaging pixels, algorithms and binning
- Enables high sampling rates and effective capture of yield-impacting FEOL and BEOL defects with the highest weighted average throughput in production (WATIP)
- Provides superior material contrast required for the detection of smaller defect types on resolution-limited layers
- Established, production-proven, extendible tool architecture protects the fab's capital investments with field upgrades from previous-generation tools
- Integrates quickly into a production environment, sharing commonalities with KLA's vast inspection suite of products. Contact KLA for additional details.

Applications

Line Monitoring and Engineering Analysis

With the industry's broadest defect capture performance on all wafer layers, the 2835 provides comprehensive inspection results for both line monitoring and engineering analysis applications. Capable of finding defects smaller than 28nm.

Etch and CMP

Using unique optical features, the 2835 achieves the best material contrast and highest defect sensitivity on all critical patterning layers, capturing line thinning, bridges, voids, and protrusions.

Photo ADI, PCM and Immersion Lithography

Broadband illumination, selectable apertures and automated defect binning provide a meaningful defect pareto for effective photo-cell monitoring (PCM) using test wafers, or after-develop inspection (ADI) on product. The unique defect detection attributes of the 2835 enable litho engineers to solve the yield issues associated with traditional or immersion lithography.

Process Window Qualification (PWQ 3.0)

The Process Window Qualification (PWQ) application uses an intelligent wafer layout, GDS/OASIS design files and sophisticated analysis software to identify printed reticle design errors that limit the lithographic process window. PWQ enables lithographers to qualify the process window for their sub-28nm designs prior to production.

On Product ADI (After-Develop Inspection)

Many defects occur only on production integrated wafers, necessitating on product ADI. Noise-suppression technologies used during ADI reduce sensitivity to process-induced noise and enable the 2835 to efficiently detect these yield-limiting defects, such as poisoned photoresists, micro-bridges, and resist bubbles.

KLA SUPPORT

Maintaining system productivity is an integral part of KLA's yield optimization solution. Efforts in this area include system maintenance, global supply chain management, cost reduction and obsolescence mitigation, system relocation, performance and productivity enhancements, and certified tool resale.

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