Nova i570® HP

Highest Performance Integrated Metrology Solution

The Fastest Tool in the Market

Nova i570® HP is Nova's most advanced integrated metrology platform and the leading member of the Nova i570® product family. It provides the highest metrology performance, process control, and productivity capabilities for R&D and high-volume manufacturing in the most advanced logic and memory process nodes.

The platform offers extensive spectral information, the smallest pad size, and cutting-edge pattern recognition and enables enhanced within-wafer/within-die variation control by measuring more sites and pre- and post-wafer measurements.

Equipped with Nova's advanced modeling and algorithmic software solutions, Nova i570® HP significantly improves metrology accuracy, precision, and tool-matching capabilities.
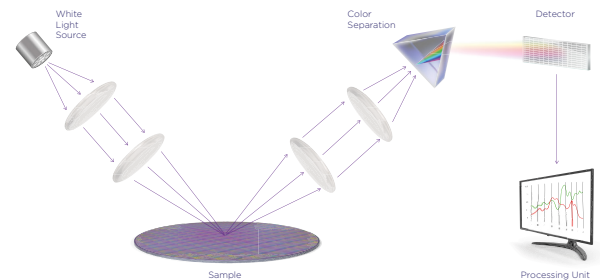
Advantages of Optical Scatterometry

- High measurement speed due to strong light sources and sensitive detectors
- Nondestructive with no impact on the production line
- Interpretation of the scattered signal is much more accurate than with other metrology technologies

Highlights and Benefits

Highest throughput
Brings significant improvement in wafers per hour to increase customer sampling, and attaches to the industry's fastest CMP polishers

Superior variation control
Enables control of every wafer, and measures within-wafer and within-die information

Highest accuracy
Demonstrates higher accuracy compared to previous generations, and offers best-in-class precision and tool-to-tool performance for leading-edge technology nodes
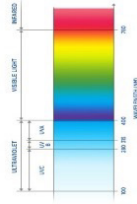
Compatible with Nova i550®
Fully backward compatible with the Nova i550® platform

Nova i570HP Key Capabilities and Benefits

Measurement

Enhanced metrology performance
- LDLS for better SNR with 30%-50% precision improvement
- Extended WL range (DUV)
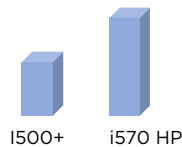- Minimum Pad-Size

Productivity Tools

TPT Improvement
- Significant TPT improvement 20% WPH over i550
    - Support new, faster polishers
   - Allow better WIW control by measure more sites

Reliability
- Longer lamp life
- Latest Security

I500+   i570 HP

Location Arrival

Navigation Accuracy
- Improved system navigation
- improved pattern recognition capabilities
    - Multi wavelength filtering HW
    - New filter allows coverage of Poly layers and high thickness layers for CIS
- PR-Less mode, better position accuracy
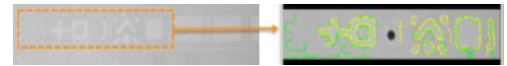
Modeling
- Improved Integrated Metrology accuracy

Nova Integrated Metrology Solutions Value Proposition

- Enabler for in-die measurement
- Best sensitivity
- Sub A level precision
- Standalone level accuracy
- Smallest pad size

- In die measurement – robust to underlayer process variation
- Combination of physical and model-less solution
- Tighter T2T spec and superb accuracy
- Automatic recipe monitoring and re-train capabilities

Metrology Performance

Productivity

Innovative Modeling solution

Shorten R&D Time To solution

- Best CoO / fastest TPT
- Support fastest TPT polishers
- High sampling Pre & post
- Best T2T
- Automatic recipe creation
- Reference reduction

- Accurate model-based solution
- Fast adaptation to CIP changes (<1day)
- Eliminate the need to measure on SA and IM for training set

NOVA

Nova MMSR+

Optimized for the Most Complex 3D Applications

Superior Performance

Nova MMSR+ is a high-end standalone dimensional metrology platform targeted for critical dimensions (CD) and thin film measurements for complex Optical CD applications. The combination of robust hardware, advanced modeling and machine learning algorithms offers faster throughput, high precision, and accuracy, critical for yield and cost of ownership optimization in a high-volume production environment

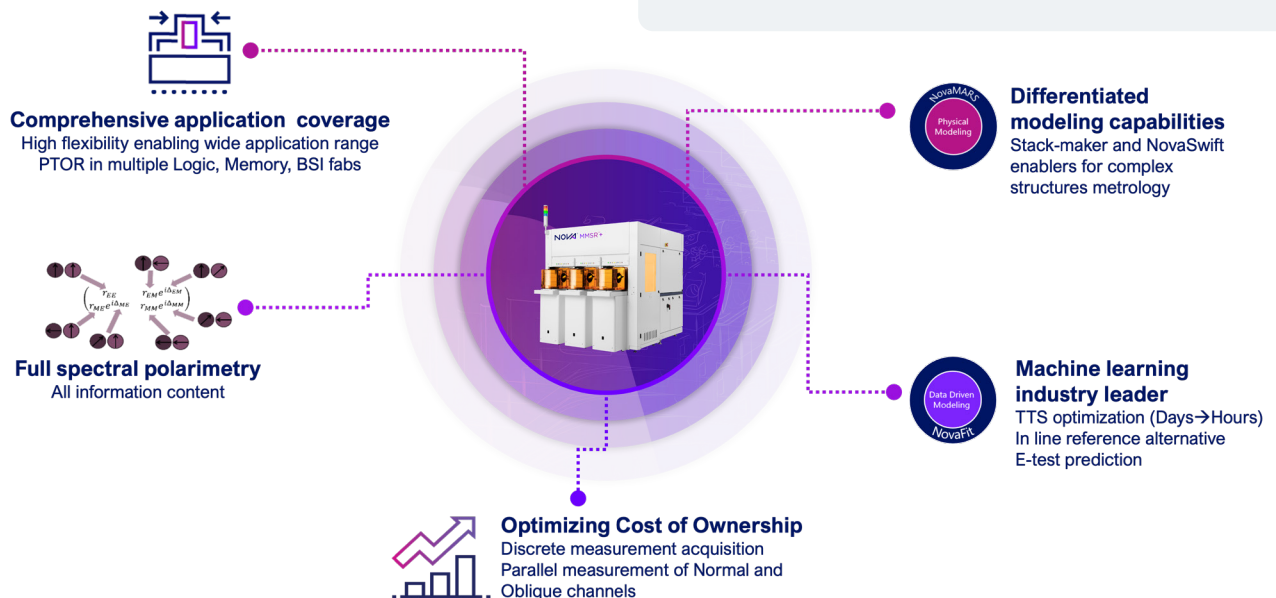### Highlights and Benefits

Multiple Data Channels
Advanced discrete measurement multi-channel Ellipsometry with rich spectral information combined with Normal Incidence Reflectometry provides exceptional metrology solutions for complex 2D and 3D structures with better accuracy and precision

Optimized Channel Selection
Ensures leading metrology performance by utilizing advanced algorithms for automatic channel selection to optimize optical measurement while ensuring high productivity and reducing time to solution

Robust Platform
Proven system architecture designed to guarantee outstanding stability and Reliability and achieving the highest performance level with superior cost of ownership efficiency.

Comprehensive application coverage
High flexibility enabling wide application range
PTOR in multiple Logic, Memory, BSI fabs

Full spectral polarimetry
All information content

Optimizing Cost of Ownership
Discrete measurement acquisition
Parallel measurement of Normal and Oblique channels

Differentiated modeling capabilities
Stack-maker and NovaSwift enablers for complex structures metrology

Machine learning industry leader
TTS optimization (Days→Hours)
In line reference alternative
E-test prediction

Why Nova MMSR+

Nova MMSR+ delivers extremely low variability and market-leading tool-to-tool matching to monitor and track critical parameters throughout the various steps of the most advanced IC device fabrication processes.
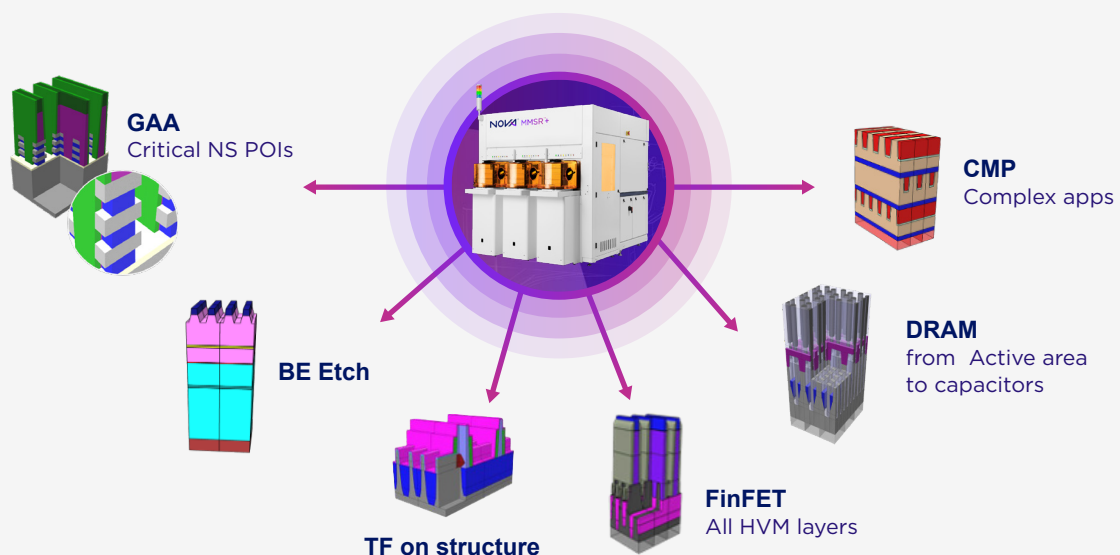
Incorporating Nova's advanced suite of modeling solutions, Nova MMSR+ provides high-end performance for critical dimensions and thin film measurements of the most complex layered stacks and structures. Supported by Nova's central fleet management, control, and connectivity solutions, Nova MMSR+ enhances operational efficiency and advanced metrology control functionality.

Detector

Color Separation

White Light Source

Sample
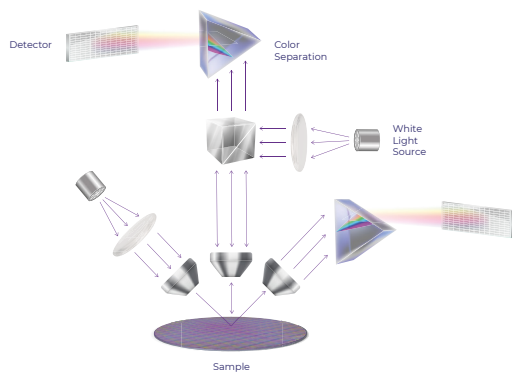
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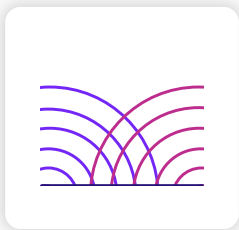
Nova MMSR+ Application Domain

GAA
Critical NS POIs

CMP
Complex apps

BE Etch

DRAM
from Active area to capacitors

TF on structure

FinFET
All HVM layers

Nova Prism 2

A New Dimension in Optical CD

Unique Information for Critical Applications

Nova introduces Prism 2, a high-end Optical CD platform employing a unique Spectral Interferometry (SI) information channel, designed to deliver comprehensive metrology solutions for the most advanced memory and logic technology nodes and unique packaging metrology challenges

Highlights and Benefits

Application Performance
Robustness within a tight process window, addressing the most complex applications

Powerful Hardware
An all-new platform designed from the ground up based on most recent HW advancements in optical design and throughput for high productivity

Essential Information
Inaccessible by alternative solutions

Industry-leading
machine learning solutions, and a cohesive synergy of hardware and advanced algorithms

Future-Ready
The modular design and unique SI optical path support future innovation, extendibility, and improvements.

Why Nova Prism?

Nova Prism 2 combines state-of-the-art multi-channel Spectral Reflectometry and Ellipsometry (SR/SE) with revolutionary Spectral Interferometry (SI) in a novel combination to extend metrology capabilities beyond traditional OCD. The unique optical SI channel provides access to new spectral information inaccessible by alternative techniques.

The exclusive data measured by Nova Prism 2 allows improved sensitivity and accuracy required to address R&D and HVM metrology needs of advanced process nodes.

Nova MARS® physical modeling solutions and Nova Fit® machine learning algorithms further enhances Nova Prism 2 metrology performance and productivity to unmatched levels for multiple challenging applications.
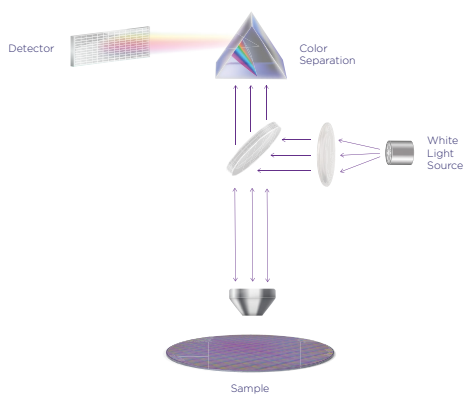

Advantages of Spectral Interferometry

- **New sensitivities:** Broadband complex wavefront information, carrying unique sensitivities and unique decorrelation capabilities
- **High-end metrology:** Robust, high-accuracy, and high-precision
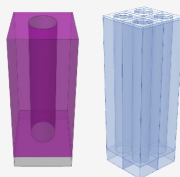- **Closer to the process:** Improved correlation to device yield across critical steps

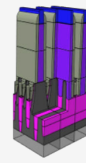## Key Application Challenges Addressed by Nova Prism
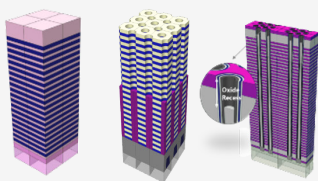
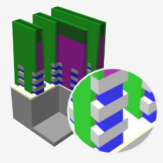**3D NAND**
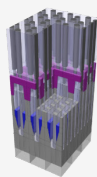
DRAM
Active area to capacitors

TSV Module

Deep Trenches Plasma Dicing

FinFET

GAA

NOVA