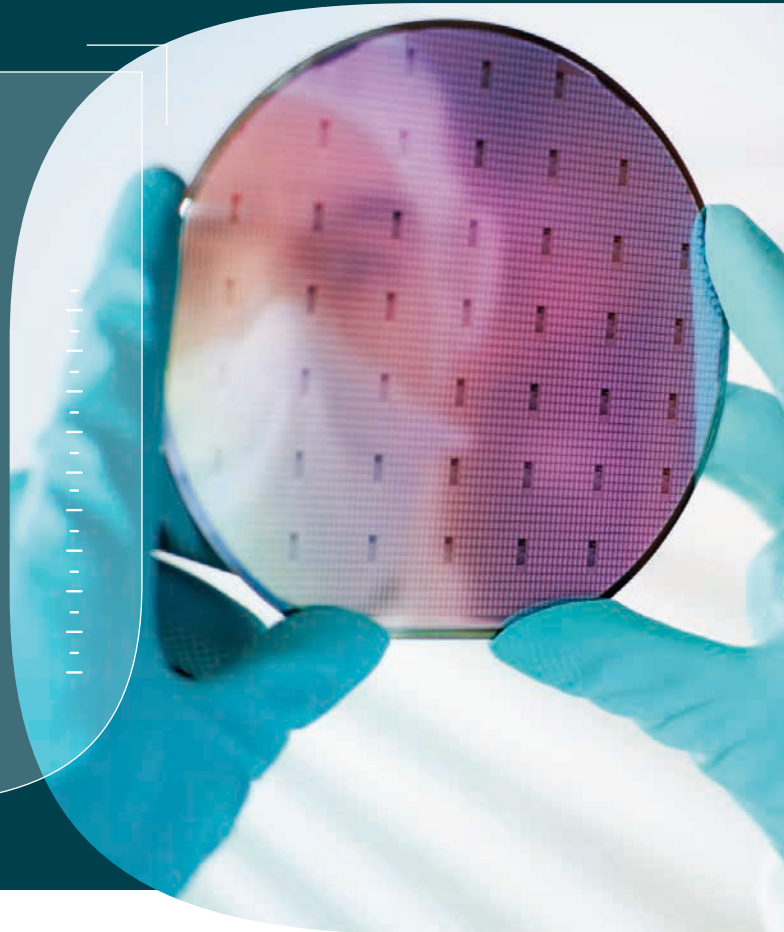


SEMICONDUCTOR INSPECTION SOLUTIONS

The semiconductor industry, a cornerstone of modern technology, is rapidly expanding to become one of the largest industries in the world.

Its applications span from personal computers and smartphones to renewable energy solutions like solar cells. As demand and complexity increase, so does the need for precise and efficient inspection. Inspection in the semiconductor industry is essential to ensure quality, reliability and efficiency.



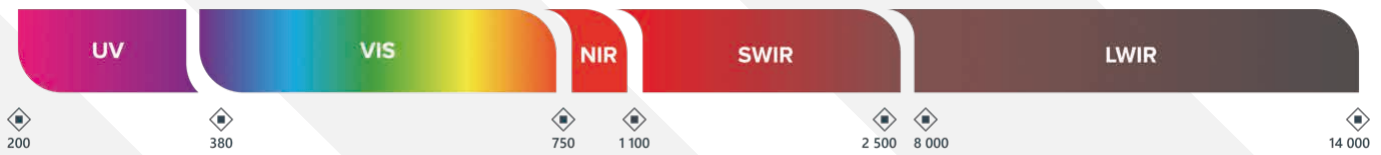
EARLY DETECTION WITH WAFER INSPECTION

Precision is paramount in semiconductor manufacturing. Our advanced imaging solutions, leveraging UV, SWIR and LWIR technologies, provide early defect detection and ensure superior wafer quality. By identifying and addressing imperfections at the earliest stages, we help you optimize production efficiency, reduce costly rework, increase yield, maximizing production throughput and as a result, enhancing the equipment ROI.

MAXIMIZE PROFITABILITY WITH EARLY DEFECT DETECTION:

- **Prevents costly rework** or the discarding of defective wafers, safeguarding profitability.
- **Early process drift detection** thanks to in-line inspection, thus allowing short loop correction.
- Ensures the production of high-quality semiconductors with **higher yield rates**.
- **Minimizes waste** by identifying and addressing defects early in the manufacturing process.

From UV to IR, our comprehensive wavelength capabilities provide the versatility needed for precise semiconductor inspection.



- ◆ **UV (Ultraviolet 190 to 400 nm)** Unmatched precision for detecting microscopic surface defects, down to the nano-meter level.
- ◆ **SWIR (Short-Wave Infrared 0.9 to 1.7μm)** Utilizes the transparency of silicon to ensure precise alignment for stacking, bonding and packaging.

- ◆ **LWIR (Long-Wave Infrared 8 to 12μm)** Analyzes thermal patterns and uniformity during a tight process control, enables short control loop for adjustments and reduces equipment downtime during manufacturing.

With these cutting edge inspection techniques, semiconductor manufacturers can confidently produce high-quality components that reduce scrap, maximize yields and optimize cost and enhance their return on investment.

UV CAMERAS

Exosens offers two UV cameras that see beyond the visible and are suitable for semiconductor inspection. The cameras capture light between 190 nm and 400 nm, revealing invisible phenomena. These intensified cameras enhance the detection of microscopic defects and residues across various colors, depending on the light source, ensuring high-quality components that meet stringent industry standards.

Benefits and features:



HIGH RESOLUTION
1280 x 1024 or 1936 x 1216 pixels



GATING OPTIONS Non-gated,
Auto-gated, Fast-gated (up to 3 ns)



DOUBLE MCP TECHNOLOGY
up to 1 000 000 photon gain



MULTIPLE VIDEO OUTPUTS
(PAL/NTSC, CameraLink,
HD-SDI, USB 3.0, GigE)

UV CAMERAS YOUR IDEAL TOOL FOR WAFER INSPECTIONS:

- Darkfield wafer surface inspection
- Defects detection in mask and inline wafer inspection
- Layer thickness inspection using spectral ellipsometry technique

i2Nocturn series



iNocturn series



SWIR CAMERAS

SWIR cameras are ideal for inspecting silicon wafers after ingot growth. They can detect defects during wafer slicing and chip dicing. For failure analysis, SWIR cameras can help identify cracks and other issues in integrated circuits. Optical Coherence Tomography (OCT) can also be used to measure thickness variations.

Exosens offers a wide range of SWIR cameras both for two-dimensional (2D) and line-scan imaging. SWIR cameras typically use Indium Gallium Arsenide (InGaAs) based detectors and have a high response (quantum efficiency) in the 900 to 1700 nm wavelength range, ideally suited for imaging through or inside silicon.

YOUR VERSATILE TOOL FOR SILICON INSPECTION

- **Silicon Ingot and brick inspection**
- **Wafer and die inspection**
- **Total thickness variation measurement**
- **Photovoltaic wafer inspection**
- **Crack detection**

AREA-SCAN SWIR CAMERAS



Cheetah+ (NEW)

World's fastest InGaAs camera with high image resolution



***Wildcat+**

Compact, high performance InGaAs camera with low noise and high dynamic range



***Bobcat+**

Small, high performance InGaAs camera with windowless option

LINE-SCAN CAMERAS



Manx

World's fastest InGaAs line-scan camera available in rectangular and square pixels



Lynx

Small, uncooled InGaAs line-scan camera available in rectangular and square pixels

Benefits and features:



SHORT LATENCY
and time to first image



HIGH RESOLUTION and highly sensitive SWIR imaging



HIGH QUALITY IMAGE



INDUSTRY STANDARD INTERFACES
(CameraLink, GigE Vision, USB3 Vision and CoaXPress)

*Windowless option available for laser related measurements

LWIR CAMERAS

Exosens also offers high-performance LWIR cameras designed for detecting thermal defects and ensuring uniform temperature distribution in wafer manufacturing. These cameras enable precise temperature measurements and accurate detection of thermal anomalies, enhancing quality control in the production process.

Ceres T

Compact, high performance thermographic camera



Our GigE cameras come with a standard PTP (Precision Time Protocol), ensuring synchronized operation in a multi-camera system.

Benefits and features:



COMPACT SIZE



LOW LATENCY
synchronization



SUPERIOR PERFORMANCE

Excellent on-board thermographic performance (Stability, accuracy)



FLEXIBLE OPTIONS

Flexible optical mount & lens options

For more information on how our UV, SWIR and LWIR solutions can be used in semiconductor inspection, contact us at advancedimaging@exosens.com or visit us exosens.com/products/advanced-imaging-solutions



EXOSENS
REVEAL THE INVISIBLE



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