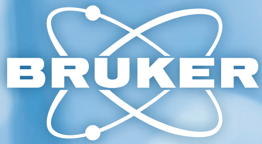


X-RAY METROLOGY FOR SILICON SEMI

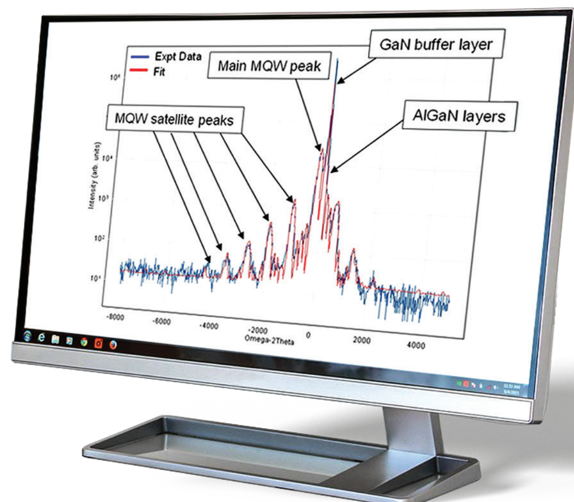
7300LSI

Automated X-Ray Diffractometry for R&D and Fab Production Monitoring on Full Wafers

Bruker's 7300 LSI automated X-ray diffractometer systems are fully automated and designed for in-line use when performing HRXRD, XRR, and XRD on epitaxial layers and crystalline thin films on full wafers. All of these applications are enabled by a comprehensive analytical software suite (RADS and REFS) for analysis, simulation, and fit. The base 7300L system can be tailored to your application with the optional addition of S and/or I channels, with the most common configurations being L, LI, and LSI. Choosing which 7300 is right for you generally comes down to your application.

Techniques Include:

XRD	X-Ray Diffraction
XRR	X-Ray Reflectometry
HRXRD	High-Resolution XRD



RADS software enables accurate and fast XRD measurement analysis.

Most Versatile Automated Diffractometer for Thin Film Production Monitoring

7300L

The base configuration for the 7300L line enables HRXRD, HRR, and XRD (including grazing-incidence and wide-angle XRD), which are first-principle techniques that do not require calibration. This makes 7300L ideal for:

- AlGaN/GaN device, buffer, and capping layer characterization for GaN/Si technology
- PZT characterization for MEMS technology

7300LI

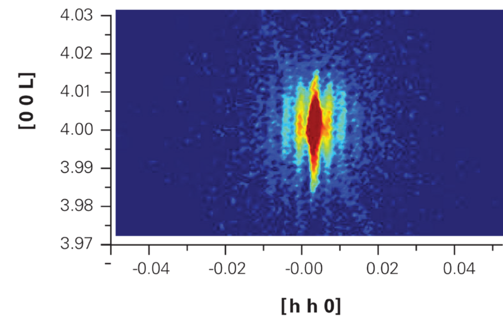
The addition of the I channel enables phase and orientation monitoring on ultra-thin crystalline films using an in-plane (non-coplanar) XRD arm. This makes 7300LI ideal for:

- Epitaxial characterization of advanced materials
- In-plane crystallinity and thickness of ultrathin films, such as <1 nm high-K and 2D materials
- High-K/metal gate stack thickness, roughness, and density

7300LSI

The addition of the S channel provides a unique combination of large-spot and micro-spot HRXRD in one tool, with μHRXRD for the measurement of 50 μm pads. This makes 7300LSI ideal for:

- Epitaxial characterization of complex stacks for advanced logic and memory
- Strain measurements through fast reciprocal space mapping (RSM) on patterned structures with a 50 μm HRXRD beam
- In-plane crystallinity and thickness of ultrathin films, such as <1 nm high-K material and 2D materials
- High-K/metal gate stack thickness, roughness, and density



Reciprocal space map (RSM) for strain analysis.

Superior Service and Support

Bruker is a metrology solutions expert with a deep experience with semiconductor fabrication plants. We actively leverage our semiconductor fab experience to develop solutions that meet the evolving needs of mass-production environments. We know that down-time and excursions are costly, so maximizing up-time is at the core of how our tools are designed and how our service and support operates.

Bruker has a long tradition of partnering with our customers to solve real-world application issues. After developing next-generation technologies with industry leaders and assisting customers in selecting the right system and accessories, this partnership continues through training and extended service long after the tools are sold. Our highly trained and certified team of support engineers, application scientists, and subject-matter experts are wholly dedicated to maximizing your productivity.

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