



Innovating Test
Technologies®

On-Wafer Process Qualification – WLR System

Why is Cascade Microtech introducing this solution?

Leading edge semiconductor processes have aggressively scaled devices with ultra-thin gate dielectrics, high-k materials, and short channel lengths. Qualification of these new aggressively scaled processes and devices requires an understanding of overall reliability and projected lifetime-in-use. Packaged device testing has proven inadequate. To acquire truly relevant reliability data calls for an on-wafer device probing system capable of precision electrical DC and capacitance measurements.

What is the solution architecture?

Solution elements include:

- **200 mm or 300 mm wafer prober** with features optimized for high-resolution, high-accuracy on-wafer electrical measurements.(see below)
- **Multiple-site low-leakage probe cards:** Contact of multiple wafer test structures with one touchdown greatly increases throughput for time consuming reliability stress tests like Time Dependent Dielectric Breakdown – TDDB.
- **Wide area (6 x 8 inch) microscope travel:** Allows wide area probe contact viewing when using multi-site probe cards.
- **High temperature, low-noise probing:** Capable of contacting the wafer at up to 300°C with very low noise injection on the wafer substrate.
- **MicroChamber® measurement enclosure** (faraday shield): This localized metal enclosure provides electrostatic and electromagnetic shielding for noise-free measurements.
- **AttoGuard® integrated guarded shield** extends the SMU guard over much of the wafer, reducing stray capacitance for faster and more accurate measurements.

How does this system increase productivity in process qualification and reliability labs?

This solution saves valuable lab time and enhances lab productivity in several ways:

- **Parallel Testing:** Long voltage stress intervals can be applied simultaneously at multiple wafer sites.
- **One system does it all:** System has the measurement capability to handle all wafer qualification tests including the most sensitive. Reconfiguring for other reliability tests is fast and simple.
- **Faster measurements:** Guarded system reduces measurement electrical settling time.
- **Fast microscope and positioner access:** Unlike large cumbersome dark boxes, the MicroChamber enclosure provides a dark environment while allowing external viewing and control of microscope and probes.

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How does this solution help semiconductor companies meet their strategic objectives?

This solution increases productivity in reliability labs while providing the best possible reliability data. This results in reduced design cycle times, shorter time-to-market, more robust designs which translates to higher profitability. For fabless companies, this system is an important tool in qualifying a new foundry or new foundry process.

Why use Cascade on-wafer systems for process qualification?

Long the world leader in on-wafer lab characterization, Cascade Microtech probing systems are the tool of choice for virtually all the major foundries world-wide. Cascade is the clear number-one in all regions, including US, Asia, Japan and Europe. Adopting the world standard probing system naturally streamlines foundry/customer communication. Using the same probing tool with the same specifications clarifies and speeds up the qualification process.

What kinds of companies can benefit from this solution?

This solution is well suited to companies that:

- Are pushing the scaling limits of advanced CMOS processes
- Are fabless but need to qualify a new foundry or new foundry process
- Have a critical need to reduce time-to-market and shorten design cycles

Who do I contact for information?

Those interested in a system for process qualification or wafer reliability should contact Cascade Microtech. See the contact information at the end of this document.

Who is Cascade Microtech?

Cascade Microtech, Inc. is the worldwide leader in providing high-frequency and parametric on-wafer test solutions. Engineers use our solutions to test and characterize integrated circuits (ICs) and photonic devices. These devices are then used in semiconductor applications, such as personal computers, servers, cell phones, consumer and automotive electronics, fiber-optics, PDAs, and other wireless products. Cascade Microtech also produces thin-film probe cards for production-level on-wafer testing of fine pitch, high-speed IC devices for broadband communications and networking, wireless and cell phones as well as other market applications. For more information visit www.cascademicrotech.com.



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