



Elite300

■ The Next Step in 300 mm Probing

Satisfying the demand for more accuracy, precision and performance at the 32 nm technology node and beyond

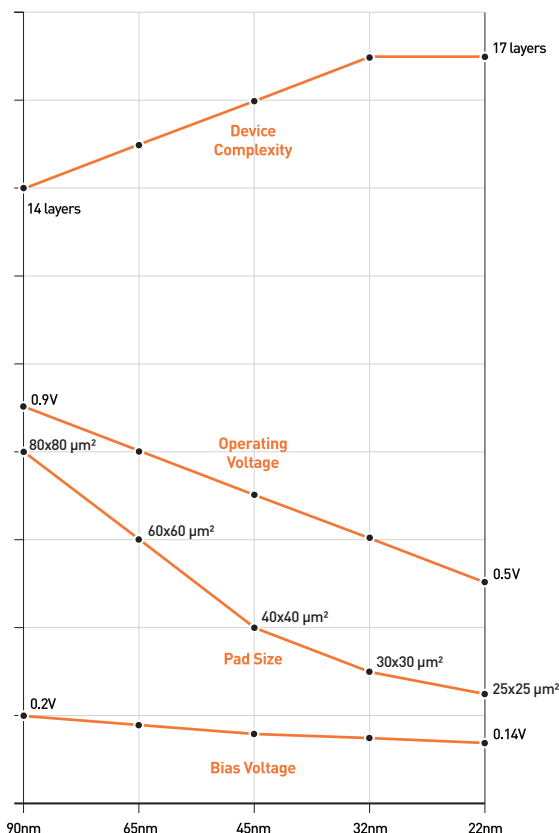


Advanced accuracy, precision and performance in an ultra-efficient measurement environment

Taking the next step in 300 mm probing means delivering a probe station that specifically solves the enormous measurement challenges brought on at each advancing technology node. Shrinking geometries, new process materials and increasingly complex designs are all pushing the boundaries of precision electrical metrology. Unfortunately, market windows have little patience for the complexity of today's or tomorrow's measurement challenges. From RF/DC device characterization, to wafer-level reliability, to IC failure analysis and design debug, more data needs to be collected faster and more accurately.

Based on Cascade Microtech's industry-leading products, the Elite™ 300 sets the new standard by incorporating new state-of-the-art mechanical and electrical technologies, plus leveraging advanced materials and leading-edge measurement techniques. The Elite 300 mm semi-automatic probe system changes everything and compromises nothing in delivering the next step in 300 mm probing. By anticipating your every test-setup need, across myriad applications, the Elite features substantial technology improvements, giving you access to the full and required measurement range of your test instruments. Employing a new, innovative motion-control system, utilizing advanced high-speed linear motors, frictionless air-bearing technology, with ultra accurate sub-micron ceramic reference encoders, the Elite delivers unprecedented stepping accuracy and wafer planarity over the full temperature range. The Elite features an ultra-stable, rigid, temperature-optimized platen complete with thermally matched components for more accuracy across the industry's widest available temperature range of -60 °C to 300 °C. The newly designed "hands-free," high-stability microscope bridge mount brings new levels of stability and control. Furthermore, the Elite features new AttoGuard® and MicroChamber® capabilities for improved low-leakage, low-capacitance measurements, plus the world's lowest-noise "Quiet" environment with next-generation PureLine™ performance.

In step with the ITRS roadmap at 32 nm and beyond, the Elite overcomes measurement challenges brought on by increased device complexity, lower voltages and smaller pad sizes.



The ultimate user experience — all the right stuff, in all the right places

For more than 25 years, Cascade Microtech has been a distinguished leader in precision electrical metrology. It's a reputation that has given customers throughout the world profound confidence in the performance and reliability of Cascade Microtech's stations, probes, software, accessories and service. The Elite not only provides more evidence of this technology leadership, it adds the extremely important benefit of an incredibly intuitive, easy-to-use and efficient measurement environment.

From an ergonomic armrest for added stability to the convenience of one-click probe positioning, the Elite was specifically designed with the utmost attention to enhancing, easing and speeding your time to test. Back and side shelves are employed for convenient placement of test instruments. By design, cabling, control panels and accessory mounts are all quickly and easily accessed. A new front LCD panel features assignable buttons for quick access to common tasks. In addition, the rollout chuck ensures fast and safe wafer loading and unloading.

PROBLEMS SOLVED

New process materials, lower operating voltages and increasingly complex IC designs require more advanced probing solutions. The Elite not only features necessary substantial technology improvements; it's automation and unique, new physical design provides unparalleled ease of use and efficiency.

Small-pad probing

		Advanced Stage	Thermal System	PureLine/MicroChamber	Rigid Architecture	Automation
PROBLEM: As test-pad sizes scale down to 30 x 30 μm^2 and below, obstacles such as thermal expansion, wafer flatness, planarity and stepping accuracy have made it extraordinarily difficult to accurately land probe needles onto small pads with good contact during step-and-repeat wafer testing, in addition to preventing pad damage by excessive overdrive.	SOLUTION: The Elite addresses small pad probing with a series of architectural upgrades designed to provide 5x better stepping accuracy, ensure flatness and planarity, plus prevent probe card or needle shifting.	●	●	●	●	

Thermal measurements

		Advanced Stage	Thermal System	PureLine/MicroChamber	Rigid Architecture	Automation
PROBLEM: Demand for higher IC performance, quality and yield requires more test data. This means ICs/devices must be tested at higher temperatures and over wider temperature ranges. To date, inadequate temperature ranges, slow thermal transition and limited thermal test capabilities have compromised user productivity, throughput, plus the quality and quantity of data collected.	SOLUTION: With the industry's widest standard temperature range [-60°C to 300°C] the Elite has 25% faster transition times, ultra-stable over-temperature measurements and a kinematic platen mounting system. With the VueTrack™ technology, the Elite eliminates the idle time between temperature transitions for automatic generation of parametric and reliability data, resulting in increased test productivity and test cell efficiency. In addition, the HTS enhancement minimizes the thermal drift of the probe supporting components, reducing the die soak time.		●	●		●

Low-noise environment

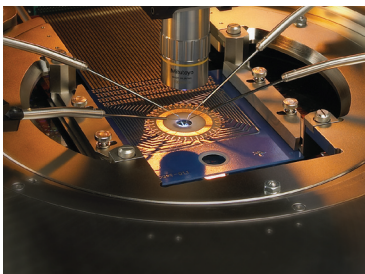
		Advanced Stage	Thermal System	PureLine/MicroChamber	Rigid Architecture	Automation
PROBLEM: At 32 nm and below, ensuing lower operating and bias voltages, plus new materials have compounded the challenges of making accurate, low-level device measurements. In fact, when noise immunity requirements cannot be met for lower stimulus and measurement test levels, both external environment noise and internal thermal chuck noise prevent critical measurements such as 1/f.	SOLUTION: Leveraging major technology improvements, the Elite provides the world's lowest-noise "quiet" environment for ultra low-level measurements. With next generation PureLine performance, utilizing proprietary noise-reduction technology, the Elite enables up to 10X lower spectral noise and 4x better AC noise. IV/CV accuracy is also improved with upgraded AttoGuard and MicroChamber.	●	●	●		

Multi-site testing

		Advanced Stage	Thermal System	PureLine/MicroChamber	Rigid Architecture	Automation
PROBLEM: Smaller devices, new materials and shrinking design tolerances are all feeding the demand for more reliability data with higher accuracy. Today's solutions are breaking down. In-package reliability testing is not only costly, it literally adds weeks to development cycles. Plus, interconnect and bond wire electrical issues can render the data to be inaccurate and unreliable. While on-wafer reliability testing provides higher accuracy, data collection is too slow using single-site probe cards and multi-site testing is riddled with complex setup issues.	SOLUTION: The Elite enables effortless multi-site testing with trustworthy, high-volume data collection. Major hardware and software upgrades enable easy setup, plus accurate, repeatable results for large-area and small-area multi-site test configurations. Wafer flatness, system and probe-card stability, plus compensation for thermal expansion are all addressed. A 300 mm large-area microscope system, with video and software navigation, eases verification of large-area and full-wafer needle contact.		●		●	●

Internal-node probing

		Advanced Stage	Thermal System	PureLine/MicroChamber	Rigid Architecture	Automation
PROBLEM: Higher IC complexity (DRAM/Logic) and tighter circuit-timing tolerances require more tests on more nodes to accurately verify a new design. Standing in the way of efficient sub-micron probing for design debug has been arduous set-up challenges, slow navigation to, and within, the test die, as well as to the need for more precise low-temperature and over-temperature probing of multiple internal nodes.	SOLUTION: For precise internal-node, sub-micron probing over temperature, the Elite has thermally matched components for superior mechanical stability. With the new low-profile probe-card holder, simultaneous probe-card and high-impedance node probing is easy. A new "hands-free" microscope bridgemount system, smart cabling, accessory shelves, ergonomic armrests all ensure faster setup and easier navigation to, and within, the test die.				●	●



far left: The Elite's new universal probe card holder makes easy work of complex internal node probing for memory applications.

left: Right at your fingertips, new and intuitive microscope controls make wafer navigation easier than ever.

Extremely versatile and easy to use, this is the world's hardest-working 300 mm probe station

To best address your particular measurement needs, the Elite is available in two station models. The Elite300/M model features MicroChamber technology, and the powerful Elite300/AP is equipped with PureLine, AttoGuard and MicroChamber technologies.

From custom measurements to multi-application testing, the Elite can be easily configured for a broad range of tests across applications including RF/DC characterization, failure analysis, design debug and wafer-level reliability. Features like a universal probe card holder will manage multiple applications, in any orientation. The rotatable universal platen ring makes for easy customization. Plus, you can choose from an impressive selection of accessories to ensure your measurement capabilities are satisfied. Below is a preview of key applications and tests coordinated with the capabilities of each Elite probe system model.



MAPPING STATIONS TO APPLICATIONS

		Elite300/AP	Elite300/M
Parametric	Gm, Vth	●	●
	Ig, Id off	●	●
	Cox, C-V	●	●
	1/f	●	●
RF	Gain, Power*	●	●
	NF, NP	●	●
	mmW	●	●
	Multi-port*	●	●
WLR	EM	●	●
	TDDB	●	●
	NBTI	●	●
	HCI	●	●
FA/DD	Internal node		●
	EM		●
	Laser		●
	Sub-micron		●

● Recommended ● Compatible

* PA300 recommended (open platform)

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