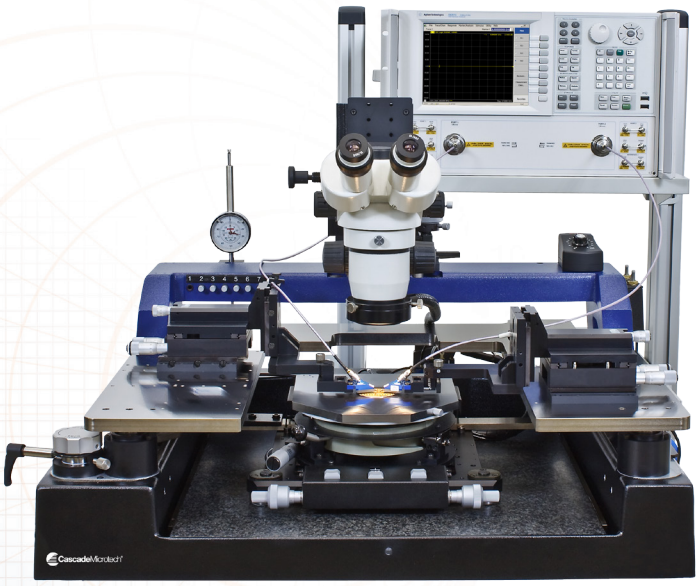
PM8

200 mm Manual Probe System



DATA SHEET

The PM8 is designed to provide a highly stable, ergonomic and flexible probing platform for precise analytical probing applications up to 200 mm, such as device and wafer characterizations, failure analysis (FA), RF/mmW and sub-THz probing, opto-engineering and MEMS.

The innovative fine-glide chuck stage offers both wide-range coarse movement and micrometer-level fine movement, simplifying precision measurements. The granite plate can easily withstand any thermal or mechanical influences and therefore ensures complete system stability during testing. The solid structure of the PM8 makes it ideal for all RF and mm-wave applications up to sub-THz range and beyond. These RF tests are supported by the WinCal XE™ calibration software, including LRRM, LRM+, NIST-style TRL and hybrid calibration methods.

The unique movable microscope bridge option provides an easy and ergonomic coarse and fine adjustment of the observation system of up to 200 mm, making all FA and inspection tasks and wafer-level reliability (WLR) tests easy.

Ergonomically, the PM8 was designed with the operator in mind. All controls are located to provide comfortable, effortless control.

The PM8 can be upgraded with a variety of accessories, such as laser cutters and the remote-controlled manual positioners for FA applications and chucks with special designs for calibration substrates and burnishing pads for high-frequency applications. Probe cards can be easily used for testing, and packaged parts can be tested with minimum setup adjustment.

FEATURES / BENEFITS

Flexibility	Ideal for FA, WLR, RF/mmW, sub-THz and MEMS applications Extensive accessories available, such as laser cutters and a wide range of equipment for RF test Compatible with probe cards and/or packaged parts
Stability	Fine-glide chuck stage on highly-stable granite base Ideal for sub-micron probing Active platen cooling for thermal stability Solid structure Superior vibration attenuation
Ease of use	Low-profile, straightforward design for easy and ergonomic operation Fast, independent X-Y chuck stage movement Simple and easy to use microscope

Microtron®
Flexible electronic solutions

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Note: For physical dimensions and facility requirements, refer to the PM8 Facility Planning Guide.

MECHANICAL PERFORMANCE

Chuck Stage	
Travel	Coarse: 200 mm x 200 mm (8.0 inch x 8.0 inch)
	Fine: 10 mm x 10 mm (0.4 inch x 0.4 inch)
Fine-travel resolution	< 1.0 µm (0.04 mils) (~0.8 mm/rev)
Feedback system	Visual position indicator for fine movement with micrometer screw
Z load stroke	10 mm
Z load stroke repeatability	≤ 2 µm
Theta travel	± 8.5°
Theta resolution	< 6.75 x 10^{-3} (< ± 5 µm at wafer edge)
Manual Microscope Stage (Fixed Bridge)	
Travel range	50 mm x 50 mm (2.1 inch x 2.1 inch) / 100 mm x 100 mm (4.0 inch x 4.0 inch)
Resolution	≤ 5 µm (0.2 mils)
Scope lift	Manual: Tilt-back or linear pneumatic
Manual Microscope Stage (Movable Bridge)	
Travel range	200 mm x 200 mm (8.0 inch x 8.0 inch)
Resolution	Coarse: 88 mm (3.46 inch)/ rev.
	Fine: 250 µm (9.8 mils)/ rev.
Scope lift	Manual: Tilt-back
Programmable Microscope Stage *	
Travel range	50 mm x 50 mm (2.0 inch x 2.0 inch)
Resolution	0.25 µm (0.01 mils)
Scope lift	Programmable, 130 mm

*Electronics box required for manual systems (P/N 157-137).

PLATEN SYSTEM

Platen	
Platen space (typical)	DC platen: Able to mount up to eight DPP2xx/DPP3xx/DPP4xx/RPP210 or up to twelve DPP105 positioners
	RF platen: Able to mount up to four RPP305 and LAP positioners
Z-height adjustment range	40.0 mm (1.57 inch)
Minimum platen-to-chuck height	17 mm – 22 mm (depending on platen)
Separation lift	500 µm (19.6 mils)
Separation repeatability	< 2 µm (0.08 mils)
Vertical rigidity /force	5 µm/10N (0.2 mils / 2.2 lb.)
Accessory mounting options	DC platen: Magnetic, vacuum
	RF platen: Bolt-down, magnetic
Standard Wafer Chuck	
Diameter	200 mm
Material	Stainless steel
Supported DUT sizes	Shards or wafers 25 mm (1 inch) through 200 mm (8 inch)
Vacuum ring diameter	Universal: 4 mm, 7 mm, 22 mm, 42 mm, 66 mm, 88 mm, 110 mm, 132 mm, 176 mm
	Standard: 22 mm, 42 mm, 66 mm, 88 mm, 110 mm, 132 mm, 176 mm
Vacuum ring actuation	Universal: All connected in meander shape, center hole 1.5 mm diameter
	Standard: Mechanically selected, center hole 1.0 mm diameter
Chuck surface	Planar with centric engraved vacuum holes
Surface planarity*	≤ ± 6 µm

PLATEN SYSTEM (CONTINUED)

RF Wafer Chuck

Diameter	200 mm with two additional AUX areas
Material	Stainless steel with HF/OPTO surface (flat with 0.7 mm holes)
Supported DUT sizes	Main: Single DUTs down to 3 mm x 5 mm size or wafers 25 mm (1 inch) through 200 mm (8 inch) AUX: Up to 18 mm x 26 mm (1 inch x 0.7 inch) each
Vacuum hole sections (diameter)	22 mm, 42 mm, 66 mm, 88 mm, 110 mm, 132 mm, 176 mm (four holes in center with 2.5 mm x 4.3 mm distance)
Vacuum holes actuation	Mechanically selected
Chuck surface	Planar with 0.7 mm diameter holes in centric sections
Surface planarity*	≤ ± 6 µm

* Deviations in the maximum chuck Z height at the center when moving the stage over a full X/Y range.

NON-THERMAL CHUCKS

Note: Results measured with non-thermal chuck at standard probing height (10,000 µm) with chuck in a dry environment.
Moisture in the chuck may degrade performance.

Chuck Stage

Standard chuck performance (Non triaxial)	
Operation voltage	Standard: In accordance with EC 61010, higher certificates available on request
Isolation*	> 2 GΩ
System electrical performance (Triaxial)	
Probe leakage**	≤ 500 fA (typical)
Probe capacitance***	50 fF – 80 fF (typical)

* Factory test with multimeter with maximum 2 GΩ range.

** Verified with DCP-150K probes and 4 x 2 m SSMC triaxial cables. Test condition: Force 10 V on each SMU. Integration time: Long. Limit range: Fixed 10 pA measure current.

Note: Cascade Microtech has no influence on the surrounding equipment, which might induce distracting peaks. Leakage current levels depend on surrounding atmosphere and are valid for low humidity cases.

*** Typically for triaxial arm setup (1 kHz frequency, maximum 3 m cable). Achievable measurement capacitance resolutions depend mainly on the equipment and measurement frequency used.

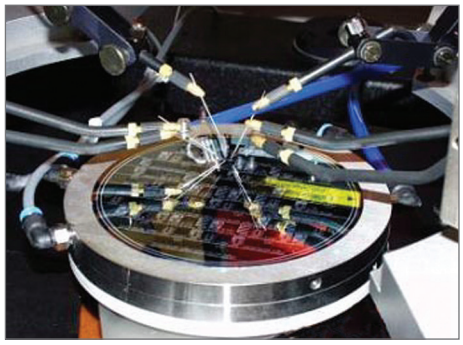
THERMAL CHUCKS (ATT A200)*

Note: For details on facility requirements, refer to the Facility Planning Guide for your thermal system.

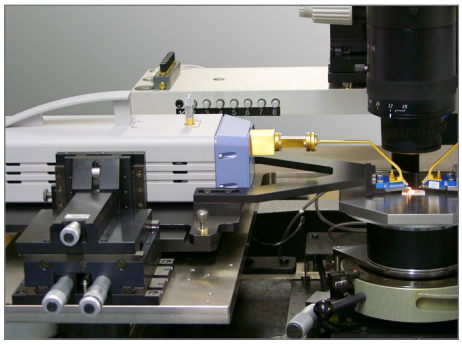
Temperature range	+25°C to +200°C
Extended temperature range	+25°C to +300°C
Temperature stability	±0.1°C
Temperature accuracy	±0.5°C
Transition time - Heating	+25°C to +200°C = < 10 minutes
Transition time - Cooling	+200°C to +25°C = < 8 minutes
Temperature uniformity	< ± 0.5 K @ +25°C to +400°C < ± 0.5 % @ +100°C to +300°C
Flatness/ Paralellism	< ± 8 µm
Isolation	> 2 TΩ @ 25°C
Capacitance	1,000 pF (standard), 100 pF (triaxial)
Interface	RS232 (standard), IEEE488 (option)

* Results measured with a thermal chuck at standard probing height with a chuck in a dry environment. Moisture in the chuck may degrade performance.

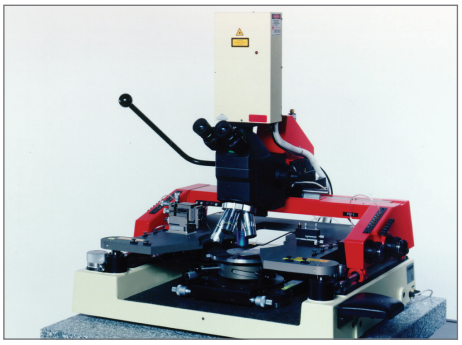
APPLICATIONS



MEMS testing on PM8 with pressure chuck.



Sub-THz measurements with the Infinity Probes®.



Failure analysis with an optional laser cutter.

ORDERING INFORMATION

PART NUMBER	DESCRIPTION
130377	PM8 manual analytical probe station, base machine with manual probe platen drive
EPS200MMW	200 mm manual probing solution for mmW, THz and load pull applications, including: PM8 probe station with a 200 mm chuck stage, a tailored mmW platen, contact height gauge, rigid scope bridge with 50 mm x 50 mm movement, unique SlimVue microscope, camera-ready C-mount, vibration-isolation solution, dedicated 200 mm RF chuck with ceramic AUX inlay, fine theta adjustment, full WinCal XE™ software license, probe cleaning brush, ProbePolish, contact substrate, tweezers and accessories set.
EPS200RF	200 mm RF manual probing package for applications up to 67 GHz, including: PM8 probe station with a 200 mm chuck stage, a tailored RFplaten, contact height gauge, cast microscope bridge with 50x50 mm scope movement with tilt, stereo zoom microscope with 150x magnification and LED ring-light (camera-ready C-mount), vibration-isolation solution, special 200 mm RF chuck with ceramic AUX inlay, fine theta adjustment, two RPP305 bolt-down positioners, full WinCal XE license, choice of two flexible Gore cables (67 GHz /90 cm, 50 GHz / 120 cm or 40 GHz / 120 cm), two 2.4(f) - 2.92(m) adapters, ProbePolish and contact substrate, probecleaning brush, choice of two RF single-ended ACP Probes, FPC probes, |Z| Probes® or Infinity Probes® at 40, 50 or 67 GHz, with one matching calibration substrate (ISS or CSR). The FPC probes require two adapters (P/N 104-913).
PM8-COAX-ST-PCKG	200 mm manual station package for coaxial measurement, including: PM8 probe station, probe platen for vacuum and magnetic positioner bases, 40mm Z platen movement with fine 400 µm contact/separation stroke, 200 mm universal chuck, cast scope bridge, 50x50 mm scope movement with tilt, camera-ready Stereo Zoom microscope SMZ168 with 20x eyepieces and ring-light illumination, four DC positioners with magnetic base (DPP210-M-L/R-S), four coaxial arms with 1.5m cable and BNC connector, a set of 7MIC (25) tungsten probe tips
PM8-COAX-HR-PCKG	200 mm manual station package for high-resolution coaxial measurement, including: PM8 probe station, probe platen for vacuum and magnetic positioner bases, 40 mm Z platen movement with fine 400 µm contact/separation stroke, 200 mm universal chuck, cast scope bridge, 50x50 mm scope movement with tilt, PSM1000 high-resolution microscope with 10x eyepiece and included switchable, 1x/2x body lens, 2x/10x/20x objective lens and 4x turret, camera-/laser-ready coaxial fiber optics illumination, four DC positioners with magnetic base (DPP210-M-L/R-S), four coaxial arms with 1.5 m cable and BNC connector, a set of 7MIC (25) tungsten probe tips

ORDERING INFORMATION (CONTINUED)

PART NUMBER	DESCRIPTION
PM8-FA-PCKG	200 mm manual station package for failure analysis, including: PM8 probe station, probe platen for vacuum and magnetic positioner bases, 40 mm Z platen movement with fine 400 µm contact/separation stroke, 200 mm universal chuck, 200x200 mm large-area scope movement with tilt (Movable Cast Bridge), PSM1000 high-resolution microscope with 10x eyepiece and included switchable 1x and 2x body lens, 2x/10x/20x objective lens and 4x turret, camera-/laser-ready coaxial fiber optics illumination, two high-resolution positioners with vacuum base (DPP305-V-S), two DC positioners with vacuum base (DPP210-V-L/R-S), four coaxial arms with 1.5 m cable and BNC connector, a set of 0.5 MIC (5) flexible tungsten probe tips

Option

PART NUMBER	DESCRIPTION
EPS-ACC-HDTV	DigitalTV option for C-mount compatible with EPS200MMW, EPS200RF, PM8-COAX-PCKG, PM8-COAX-HR-PCKG and PM8-FA-PCKG

REGULATORY COMPLIANCE

Certification	CE
Power supply certification	CE, UL, PSE

WARRANTY

Warranty*	Fifteen months from date of delivery or twelve months from date of installation
Service contracts	Single and multi-year programs available to suit your needs

*See Cascade Microtech's Terms and Conditions of Sale for more details.

PM8-DS-0416

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