

Cascade Probe Systems

Product Line Overview



FormFactor, Inc. - Company Profile

FormFactor, Inc. (NASDAQ:FORM) is a leading provider of essential test and measurement technologies along the full IC life cycle – from characterization, modeling, reliability, and design de-bug, to qualification and production test.



- / We constantly strive to help our customers solve the advanced test challenges of the broader semiconductor industry.
- / Our focus on customer partnership, innovation, agility and operational excellence allows us to earn sustainable business every day.



- / Founded in 1993, IPO 2003
- / 2022 Revenue \$748 million
- / #1 Advanced Probe Card Supplier
- / #1 Engineering Probe Systems Supplier
- / 10 BEST Supplier of Chip Making Equipment
- / Ship >115 million MEMS probes annually
- / Over 10,000 probe systems installed



- / Enable customer success through technology, partnerships, “First Time Right” product quality, global customer support
- / 2,200 employees, with >500 directly supporting customers
- / 23 service and repair centers
- / 13 sales offices
- / 10 design centers

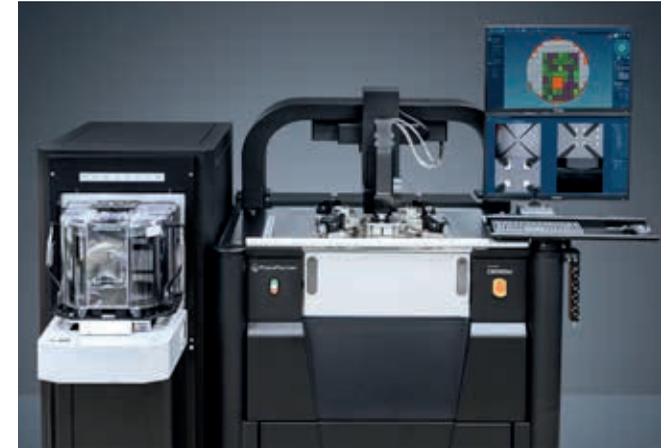
Cascade Probe Systems

Technology leadership

Cascade Probe Systems are an essential part of FormFactor, Inc. We offer a complete line of premium performance analytical probe solutions for on-wafer probing, board test and package test that help increase process performance while reducing cost of ownership. Our probe systems are available with a complete set of accessories such as microscopes, thermal control systems, software and industry-leading probes.

Worldwide expertise, service and support

We have an extensive patent portfolio and are ISO 9001:2015 and ISO 14001:2015 certified. With facilities in Dresden/Germany and Beaverton OR/USA, and worldwide sales and support offices we serve customers in all major sectors (fabless, integrated device manufacturers, foundries, governments, institutes, universities, subcontractors).



Probes

- / More than 50 analytical probe models for wafer, package, and board level characterization.
- / Our families of RF, mixed-signal and DC probes are designed to meet the challenges of a wide range of probing environments.

Cryogenic Probe Systems

- / FormFactor offers a range of cryogenic test and measurement solutions. From chip-scale to wafer probing systems, our solutions are customized to meet the most challenging requirements.

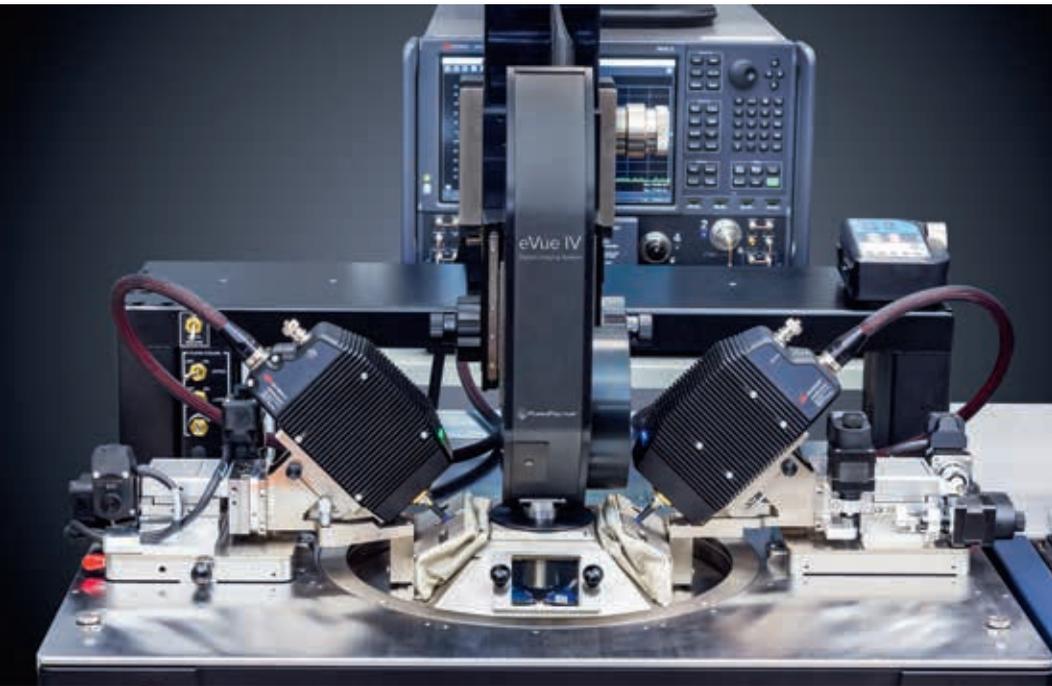
Probe Cards

- / Extensive portfolio of high-performance probe cards for memory, RF, foundry and logic devices that help lower overall production costs, improve yields and enable “more-than-Moore” advanced packaging technologies.

Worldwide Application Support and Customer Service

Global presence	Application support	Variety of service offerings	User and service training
<ul style="list-style-type: none">/ Over 10,000 installed probe systems/ Six strategically located global service centers/ Over 50 certified field service engineers/ Continued training/certification	<ul style="list-style-type: none">/ World-wide Customer Application and Product Solutions team/ Dedicated experts for state-of-the-art solutions/ Over 20 certified field application engineers/ Over 20 application experts at our partners	<ul style="list-style-type: none">/ Full performance guarantee/ Calibration/maintenance only options/ Labor or parts only options/ Customized agreements to meet customer needs/ Volume and multi-year discounts	<ul style="list-style-type: none">/ System- or application-specific user training/ Maintenance/calibration service certification training/ Complete system service certification/ Annual service certification renewals/ Available at FormFactor locations or customers site





Applications 8

- / MeasureOne - Integrated Test and Measurement Solutions
- / Device Characterization and Modelling
- / RF / mmW / THz
- / Silicon Photonics
- / Wafer-level Reliability
- / High Power Test
- / Opto / μ LED
- / Failure Analysis
- / MEMS Test
- / Customized Solutions

Technologies 22

- / Contact Intelligence™ Technology
- / Autonomous DC
- / Autonomous RF
- / Autonomous SiPh
- / MicroChamber® and AttoGuard® / PureLine™
- / VueTrack™

Systems 26

- / 150 mm Systems
- / 200 mm Systems
- / 300 mm Systems
- / High Power Systems
- / Vacuum, Cryogenic and Pressure Probe Systems

Software 54

- / Velox Probe Station Control Software
- / WinCal

Accessories 58

- / Engineering Probes
- / Calibration Substrates
- / Probe Cards
- / Positioners
- / Chucks
- / Thermal Systems
- / Microscopes
- / Vibration Isolation Tables
- / Light- and EMI-shielding solutions

Programs 62

- / Educational Savings Program
- / Trade-In / Buy Back
- / Factory-Refurbished Equipment
- / Factory Upgrades On Customer-Owned Stations
- / Product Safety and Ergonomics

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MeasureOne™ - Powerful, Integrated Test and Measurement Solutions

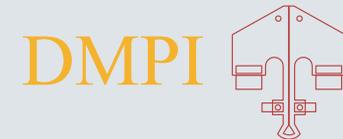
Guaranteed configuration, integration and support

MeasureOne is a unique commitment between FormFactor and a select group of partners to deliver optimized solutions to address customers' applications. FormFactor and its MeasureOne partners work together to configure and install solutions with validated performance and post-installation service and support.

Our solutions help reduce costs, time, and ultimately get your products to market – faster.

- / Powerful, integrated test and measurement solutions with best-of-breed partners
- / Eliminates the time and risk involved in sourcing incompatible products from multiple vendors
- / Provides confidence in measurement by applying combined know-how and expertise
- / Partners share a commitment to customer success and seek to understand and solve future customer challenges
- / Single point of contact to coordinate the optimal customer solution, managing all aspects of configuration, installation, service and performance

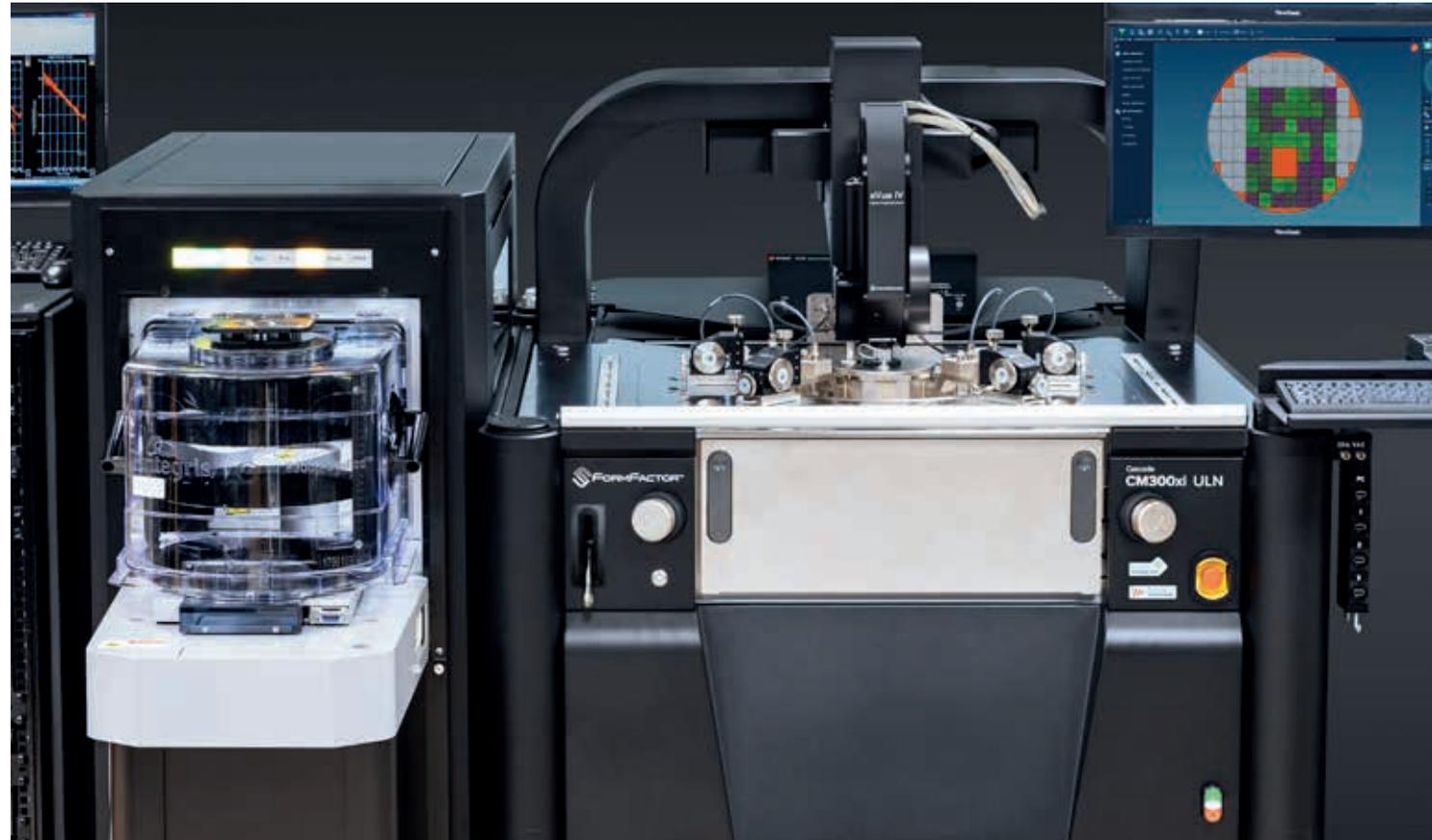
MeasureOne™
Your Integration Connection



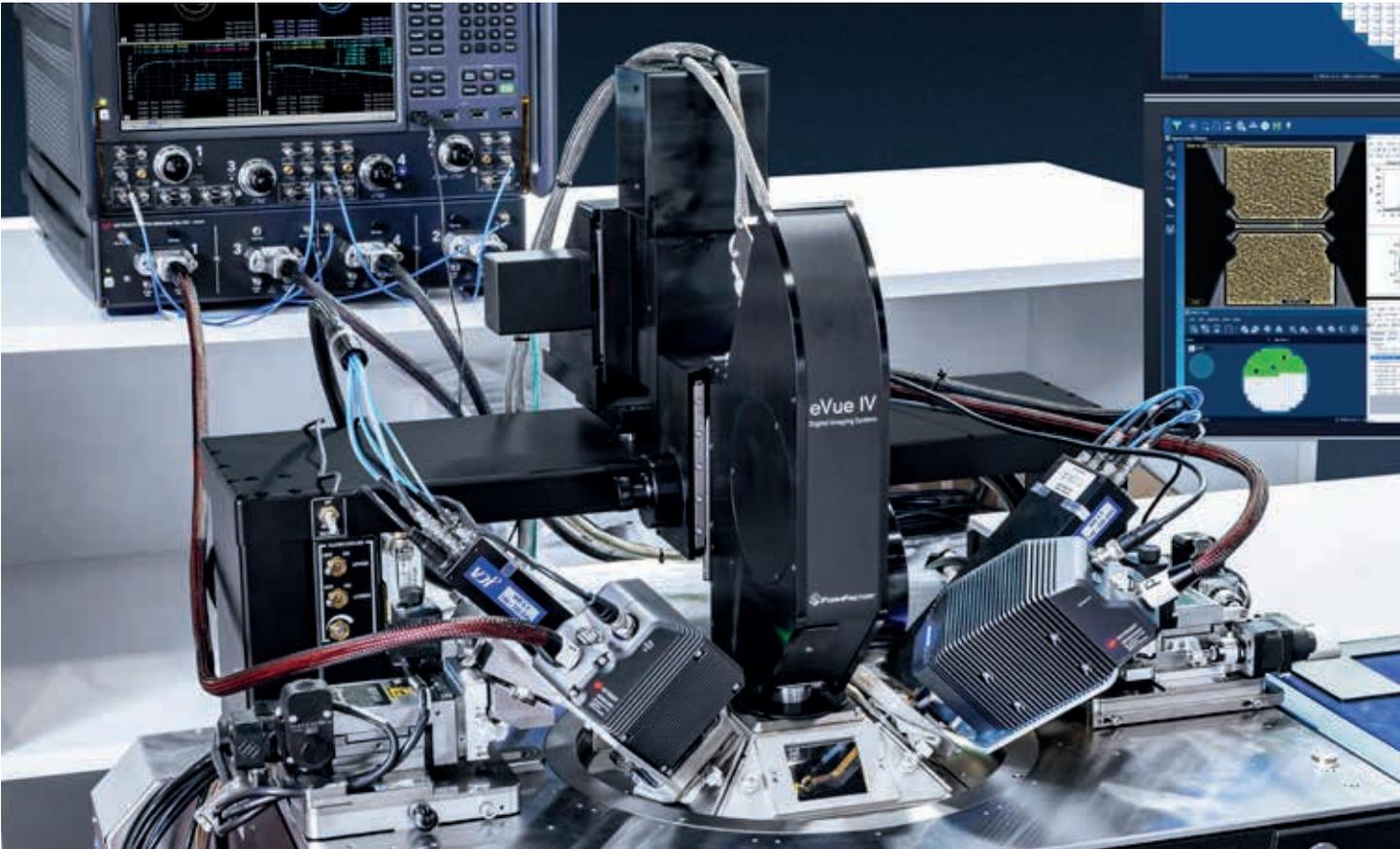
And more...

1/f Device Characterization

- / 300 mm or 200 mm fully- or semi-automated, especially CM300xi-ULN or SUMMIT200
- / FormFactor Autonomous DC Measurement Assistant
- / FormFactor DCP Probes, ACP Probes, Infinity Probes®, or IZIProbes®, with manual or motorized probe positioners
- / Keysight Technologies E4727B Advanced Low-Frequency Analyzer (A-LFNA), B1500A Semiconductor Device Parameter Analyzer, and WaferPro Express software

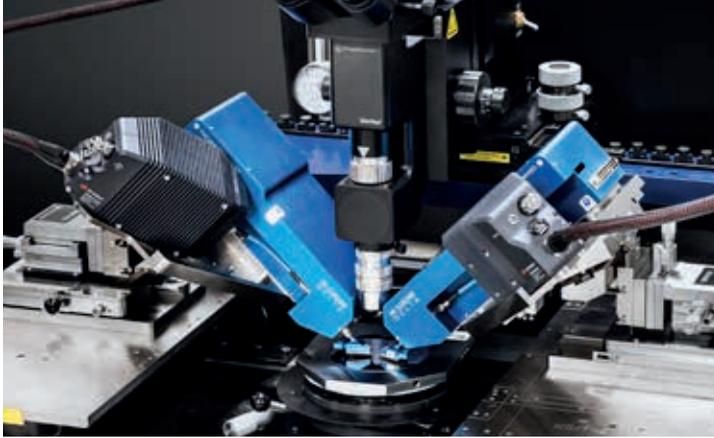


MeasureOne™
Your Integration Connection



High-frequency Probing

- / mmW and sub-THz on-wafer Ground-Signal-Ground probes
- / Solutions for electrical measurement of devices using rectangular waveguides from 50 GHz up to 1.1 THz
- / Validated on 150 mm, 200 mm and 300 mm probe stations



RF Tuning and Load-Pull Measurements

- / Fully-automated, semi-automated, or manual probe system – especially CM300xi, SUMMIT200, or MPS150
- / FormFactor WinCal calibration software, Infinity Probes®, ISS calibration standards, and Autonomous RF Measurement Assistant
- / Keysight Technologies PNA or PNA-X
- / Focus Microwaves or Maury Microwave tuners for load-pull system



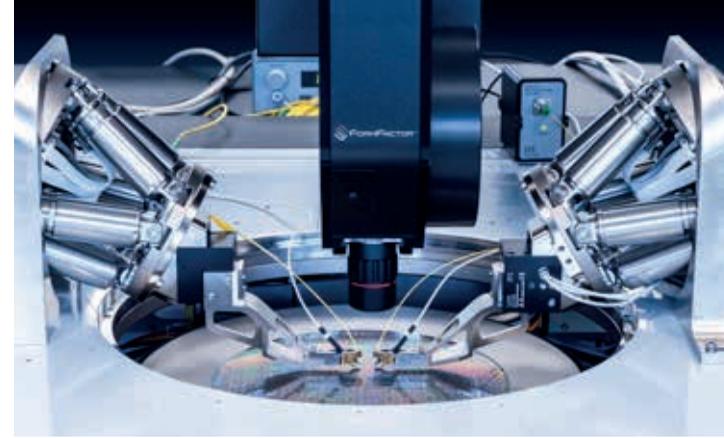
S-Parameter and DC Parametric Measurements

- / 200 mm or 300 mm semi-automated probe system, WinCal calibration software, Infinity Probes, and ISS calibration standards
- / Keysight Technologies PNA or PNA-X, B1500A, WaferPro-XP, IC-CAP software, and DC Power Analyzer



Circuit Characterization

- / 200 mm or 300 mm semi-automated probe system, WinCal calibration software, Infinity Probes, and ISS calibration standards
- / Keysight Technologies PNA or PNA-X, B1500A, WaferPro-XP, IC-CAP software, and DC Power Analyzer

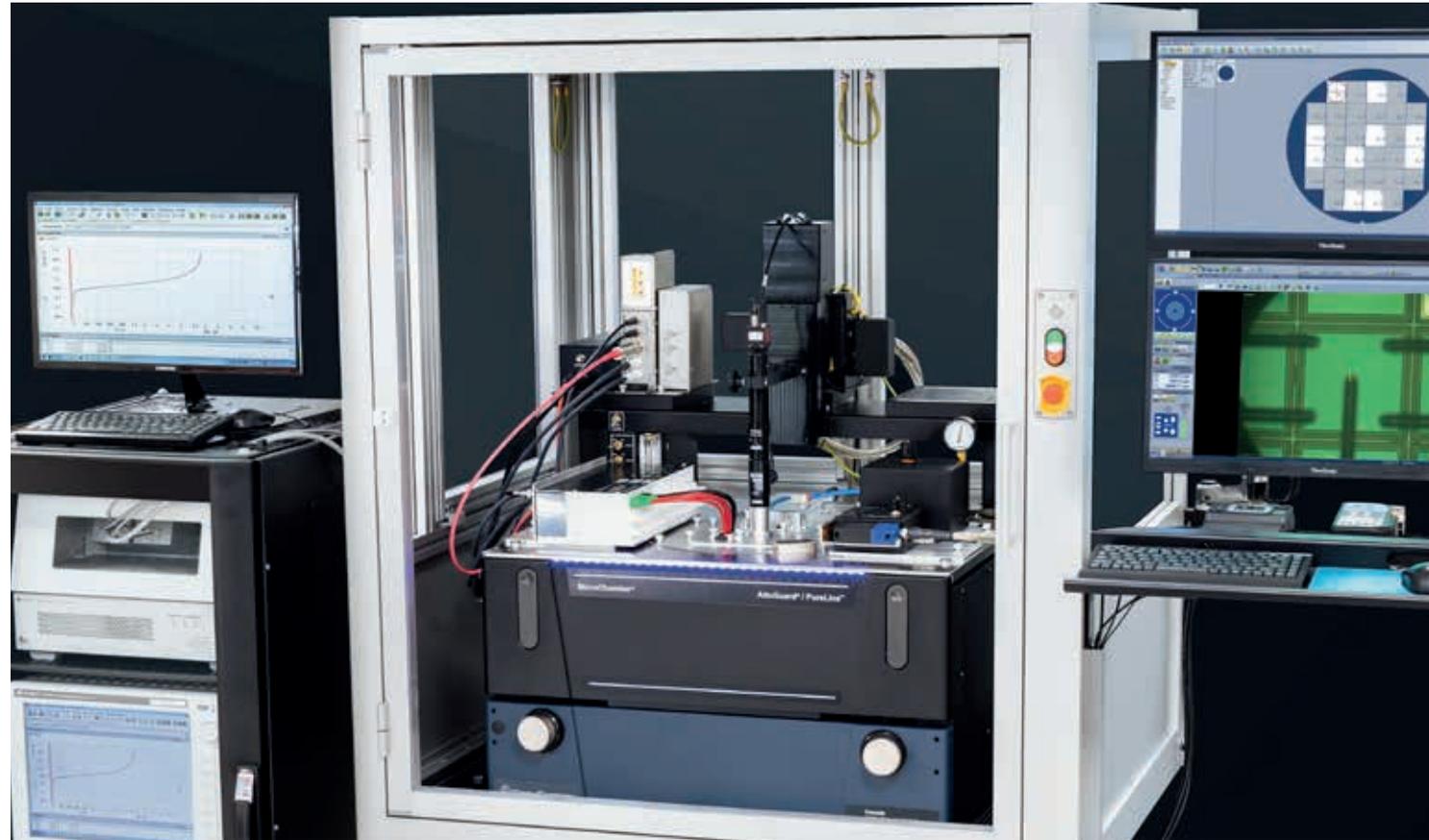


Silicon Photonics Test Solutions

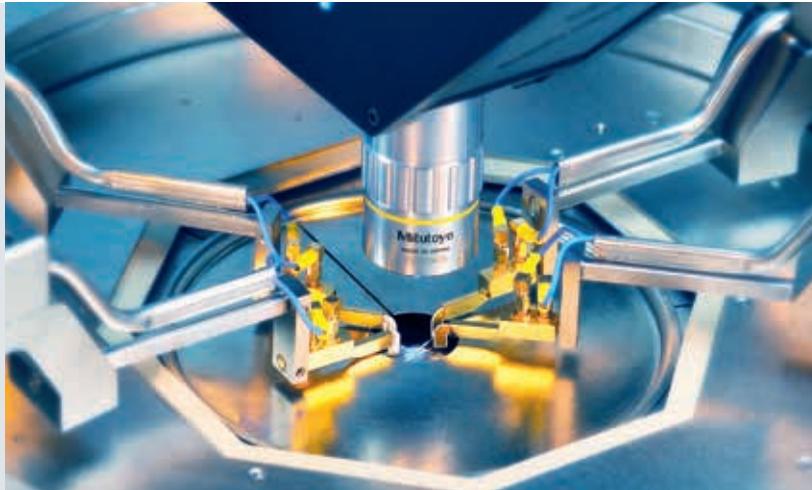
- / Fully-automated, semi-automated, or manual probe system – especially CM300xi-SiPh, SUMMIT200, or EPS150
- / FormFactor Autonomous SiPh Measurement Assistant and single-fiber, fiber array, and edge coupling fiber positioners
- / PI (Physik Instrumente) Hexapod High-Precision Fiber Alignment System
- / Keysight Technologies N7700A Photonic Application Suite

Power Semiconductor Probing

- / Fully- or semi-automated TESLA200 or TESLA300 power probe system
- / FormFactor high power analytical probes and/or T.I.P.S. "LuPo" High Voltage/ High Power Probe Card
- / Keysight Technologies B1505A Power Device Analyzer

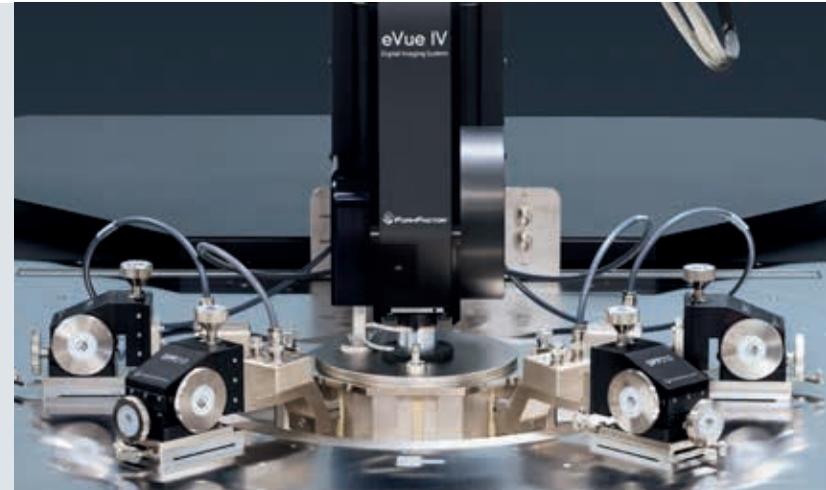


Application Expertise



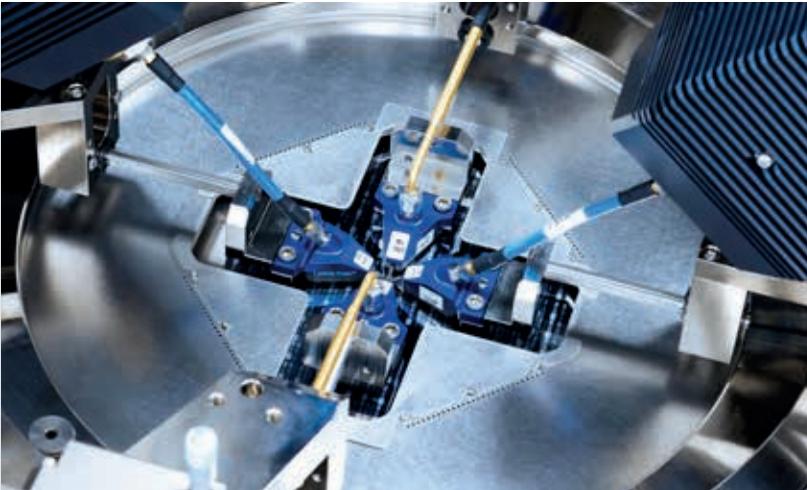
“Succeed by making the best decisions with the best data.”

/ IV/CV



“Investigate sensitive device measurements.”

/ Ultra-low Noise (1/f)



“Make the most of your RF expertise and take the shortest path to highest accuracy.”

/ RF / mmW / THz

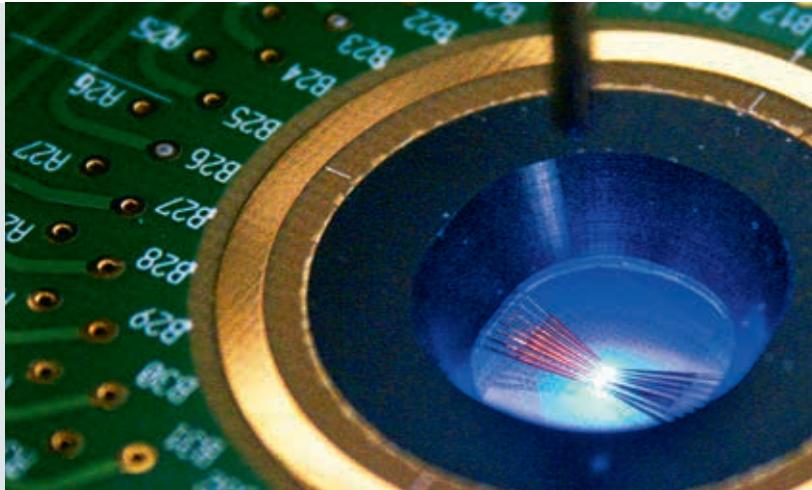


“Providing solutions in wafer-level photonics probing.”

/ Silicon Photonics

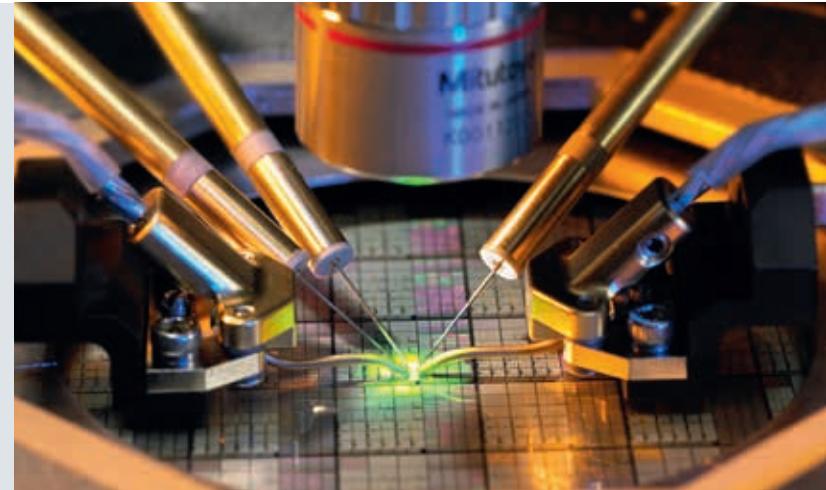


Application Expertise



“Highly-accurate high-throughput functional testing of optoelectronics.”

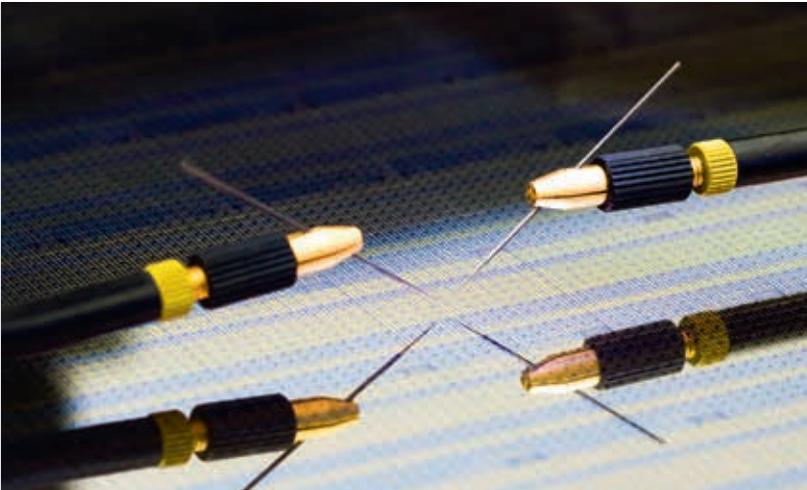
/ Opto / μ LED



“Energize your power measurements.”

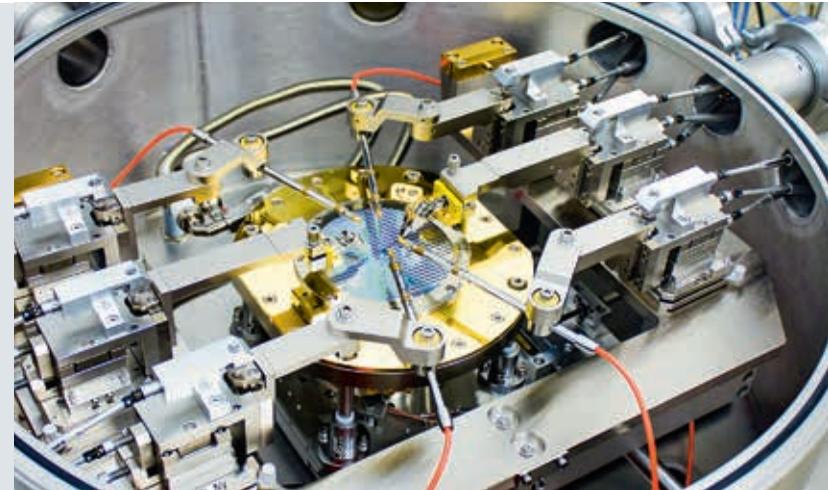
/ High Power Test





“Fast and accurate solutions for identifying the cause of a failure.”

/ Failure Analysis



“Modern and innovative solutions for the special requirements in MEMS testing.”

/ MEMS Test

Customized Probe Solutions

We are your partner for challenging applications. Our comprehensive technical and application know-how over all probe system platforms and our expertise for customized products is based on an extensive experience over many years.

We offer a special demo support in-house or at the customer, as well as after sales support for complicated setups.



Complicated Configurations

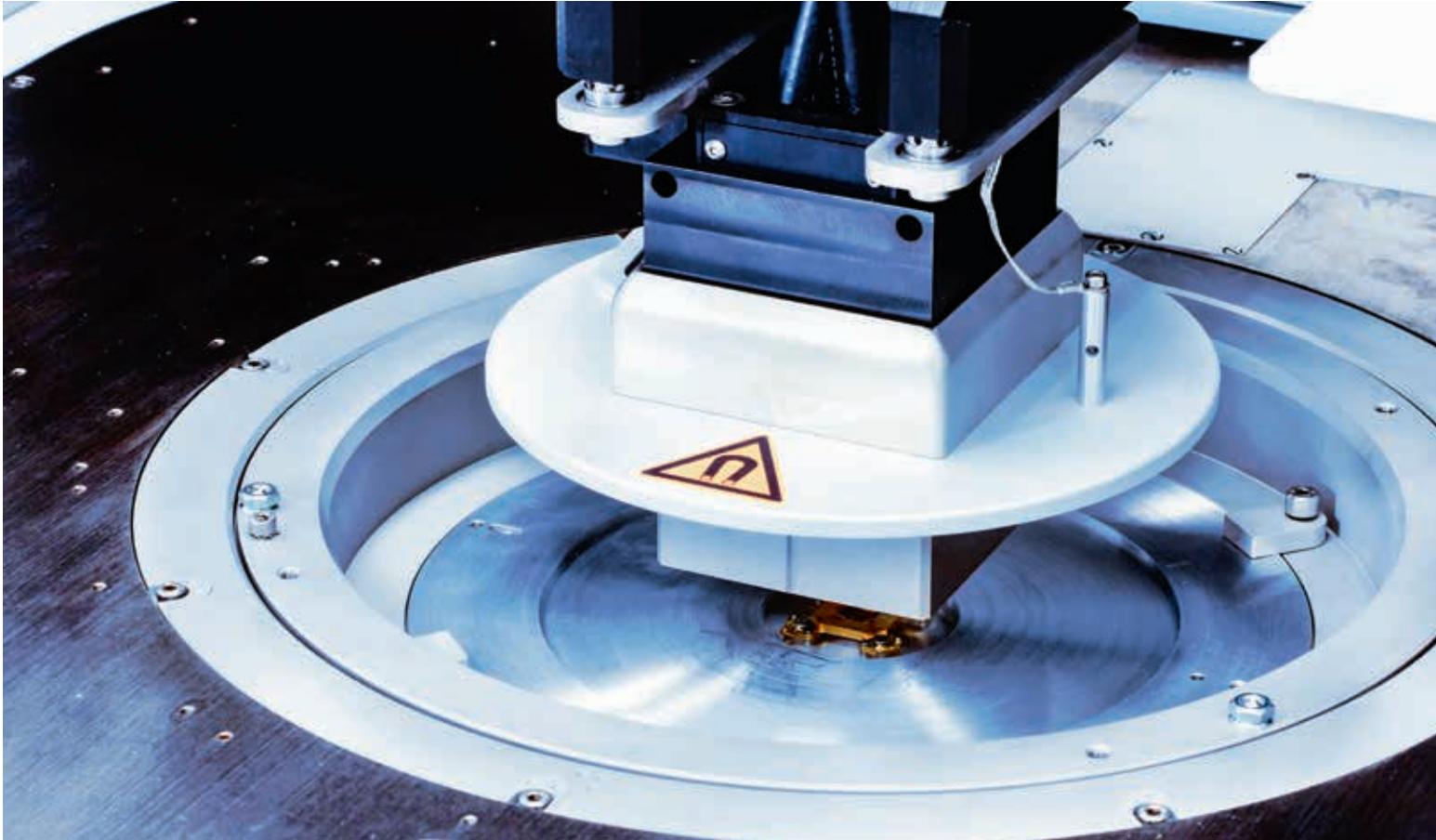
- / New applications
(magnetic, mixed signal, WLR)
- / Total solution incl. customized software

Advanced Setups

- / High number of positioners
- / Chuck top plates
- / Simultaneous setup
of two microscopes
- / Upgrades

Small Modifications

- / Probe holders
- / Cables
- / Microscope adapters



“We are your partner for challenging applications.”

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Contact Intelligence™ Technology



Contact Intelligence is a unique technology which guarantees to make and hold wafer contact with constant high quality. A powerful combination of innovative system design and state of the art image processing provides an operator-independent solution to achieve highly-reliable measurement data at any time. Even over a wide temperature range this technology

ensures stable contact on small pad designs. With less operator interaction it reduces test cycle times and provides faster time to data, regardless of which application you are addressing. Contact Intelligence supports autonomous measurement assistants for dedicated applications.

Autonomous DC



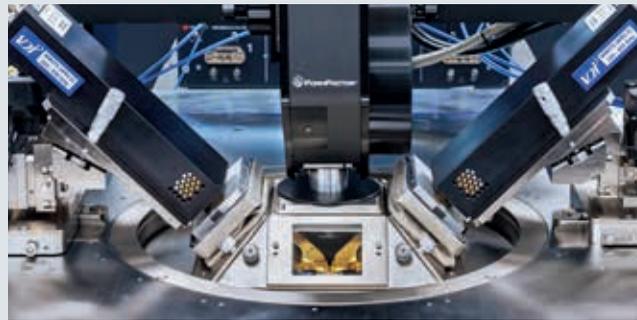
- / Reduced cost of test: Hands-free unattended Flicker Noise and DC measurements, at multiple temperatures
- / Measurement certainty: Constantly monitors accuracy and re-aligns probes to pads for 24/7 operation
- / Automates multi-DUT layout testing



Autonomous RF



- / Constantly monitors calibration accuracy and re-calibrates when needed
- / Patented RF TopHat for dark, shielded and frost-free probing
- / Known measurement certainty for every device measurement
- / Reduced cost of test with increased accuracy



Autonomous Silicon Photonics



- / Validated nanometer positioning technology
- / Integrated displacement sensors regulate distance between wafer and fiber(s)
- / Unique peak detection algorithms guarantee fast and repeatable measurement data
- / Specially developed automated calibration techniques



MicroChamber[®] and AttoGuard[®] / PureLine[™]

MicroChamber, AttoGuard and PureLine technologies guarantee an advanced shielding of the measurement environment.

MicroChamber for dark, dry and enhanced EMI-shielding enclosure

- / EMI shielding for low noise measurements
- / Environmentally sealed for moisture-free, low-temperature measurements
- / Low volume for the fastest purge
- / Light tight to eliminate the need for a dark box

PureLine technology for premium signal path fidelity

- / Enhanced EMI shielding
- / Lowest spectral noise floor and system AC noise
- / Ideal for low level and 1/f measurements

AttoGuard for enhanced IV and CV testing

- / Extends instrument guard to completely surround wafer
- / Makes the station invisible to the instrument
- / Extremely low capacitance and leakage characteristics
- / Fast settling times

VueTrack[™] Technology



VueTrack[™] technology enables automatic probe-to-pad alignment when testing over multiple temperatures

Increased productivity and faster time to data

- / Compensates drift that results from test temperature changes by automatically adjusting chuck XYZ θ for probe-to-pad alignment
- / Single-site and multi-site capability
- / Ensures constant contact quality when probing on smallest pads
- / Eliminates the need for manual re-adjustment when probing on small pads over multiple temperatures
- / Increases productivity by eliminating idle time waiting for operator intervention
- / Faster time to data due to minimized test times
- / Faster time to market due to higher efficiency of test equipment

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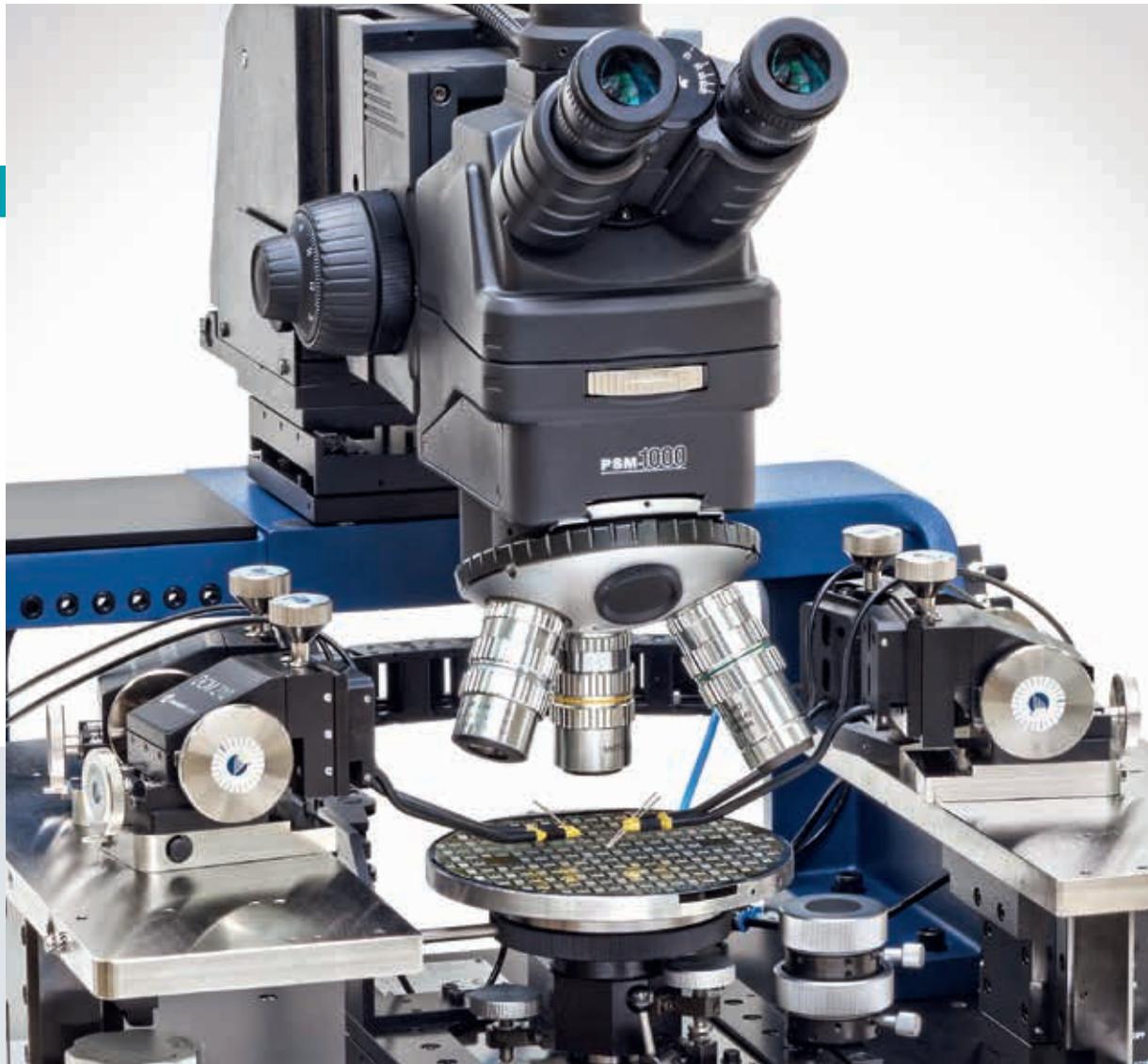
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Highlights

- / Manual, open probe system for wafers and substrates up to 150 mm
- / Flexible and stable design allows to configure and individualize the system to match application requirements
- / Pre-configured application-specific packages guarantee highly-precise measurement results

“The Cascade MPS150 is an easy-to-use probe solution for highly-accurate measurement results in the shortest time, with maximum confidence.”

MPS150 / EPS150

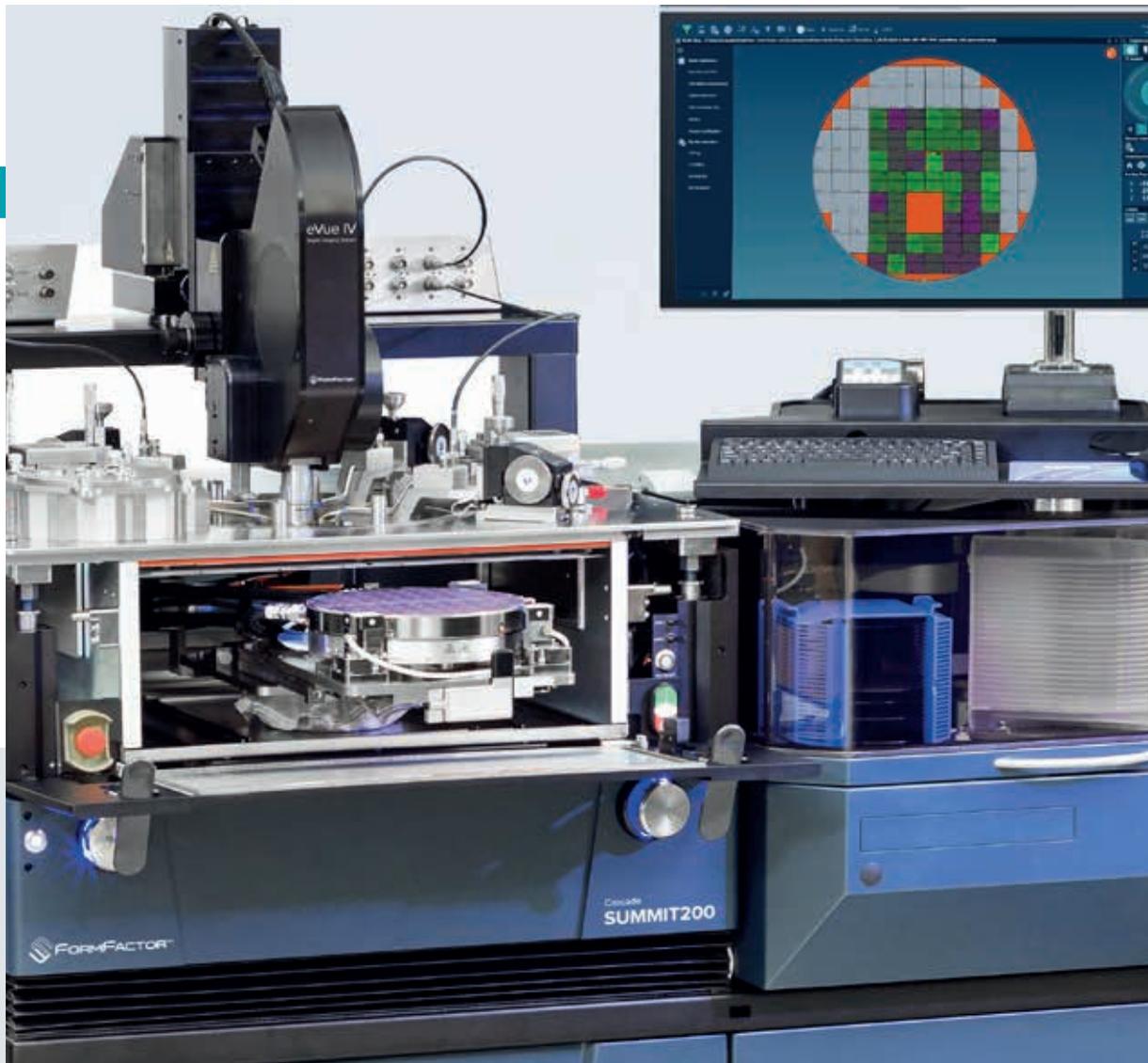
	MPS150	MPS150-SiPH	EPS150COAX	EPS150TRIAX	EPS150RF	EPS150MMW	EPS150THZ	EPS150FA	EPS150TESLA
Optimized for	IV/CV, Low noise, RF, mmW, Failure analysis, High power	SiPh	IV/CV down to pA level	IV/CV down to fA level, low noise	RF up to 67 GHz	mmW up to 1.1 THz	mmW, THz and load pull applications	Failure analysis	High power up to 10 kV
Automation	Manual								
Thermal range	Up to 300° C (option)	—	200° C (option)	200° C (option)	200° C (option)	200° C (option)	200° C	200° C (option)	300° C (option)
Chuck (vacuum-controlled)	Coaxial, triaxial, RF, high power (depending on requirements)	CalVue, DieVue, AUX chuck	Coaxial	Triaxial	RF with ceramic AUX chuck	RF with ceramic AUX chuck	RF with ceramic AUX inlay, fine theta adjustment	Coaxial	Triaxial
Positioner platen	Stainless steel, for vacuum and magnetic positioner fixation		Stainless steel, for vacuum and magnetic positioner fixation	Stainless steel, for vacuum and magnetic positioner fixation	Stainless steel, guidance rails for positioners	Stainless steel, engraved guides on mmW platen	tailored mmW platen	Stainless steel, for vacuum and magnetic positioner fixation	Stainless steel, for vacuum and magnetic positioner fixation
Positioners	Depending on requirements	RF + DC positioners, special motorized positioners, manual or automated adjustment	Four DC positioners with 100TPI, coaxial probe arms and cables	Four DC positioners with 100TPI, triaxial probe arms and cables	Two RF po-sitioners with 100TPI, calibration substrate, 2 HF connection cables, 2 probes (40, 50 or 67 GHz), RF probe arms, WinCal	Dedicated, depending on measurement equipment and frequency range, select SIGMA integration package	Dedicated, depending on measurement equipment and frequency range, select SIGMA integration package	Four DC positioners with 200TPI, coaxial arms and cables, vacuum-base	DC positioners with 100TPI, select SIGMA integration package
Microscope	Depending on requirements, illuminator	SlimVue, eVue, illuminator	Camera-ready stereo scope with 100x magnification, illuminator		Camera-ready stereo scope with 150x magnification, illuminator	Slim body microscope with eye-pieces, camera-ready, illuminator	SlimVue, camera-ready, illuminator	Up to 4000x magnification, camera- and laser cutter-ready, illuminator	Camera-ready stereo scope with 100x magnification, illuminator
University support program	N/A	N/A	✓	✓	✓	✓	✓	✓	✓



200 mm Systems Overview

“Cascade 200 mm wafer probing systems have the precision and versatility needed for advanced semiconductor processes and aggressively scaled devices.”

	SUMMIT200	Summit 11000	BlueRay	PM8/EPS200
Intended use	IV/CV RF/ (mmW/THz) Failure analysis Wafer level reliability Niche production High-volume engineering	IV/CV RF/mmW/THz Failure analysis Wafer level reliability	RF/mmW Opto MEMS Niche production High-volume engineering	IV/CV RF/mmW/THz Failure analysis Wafer level reliability
EMI shielding	Shielded / open	Shielded / open	Open	Open
Automation	Semi-automatic Fully-automatic	Manual	Semi-automatic Fully-automatic	Manual
Thermal range	-60 ... +300° C	-60° C ... +300° C	Ambient ... 150° C	Ambient ... +300° C
Unattended testing at multiple temperatures	✓	—	—	—
Backside emission support (DSP)	—	—	✓	✓



Highlights

- / Automatic wafer loading option
- / Unattended thermal testing
- / Thin wafer handling capability
- / Advanced shielding with Microchamber and AttoGuard/PureLine
- / Modular system - scalable in the field
- / Designed for 24/7 operation

“The new SUMMIT200 advanced probing system enables up to 5x faster time to accurate data.”

SUMMIT200





SUMMIT200
Automated & manual handling



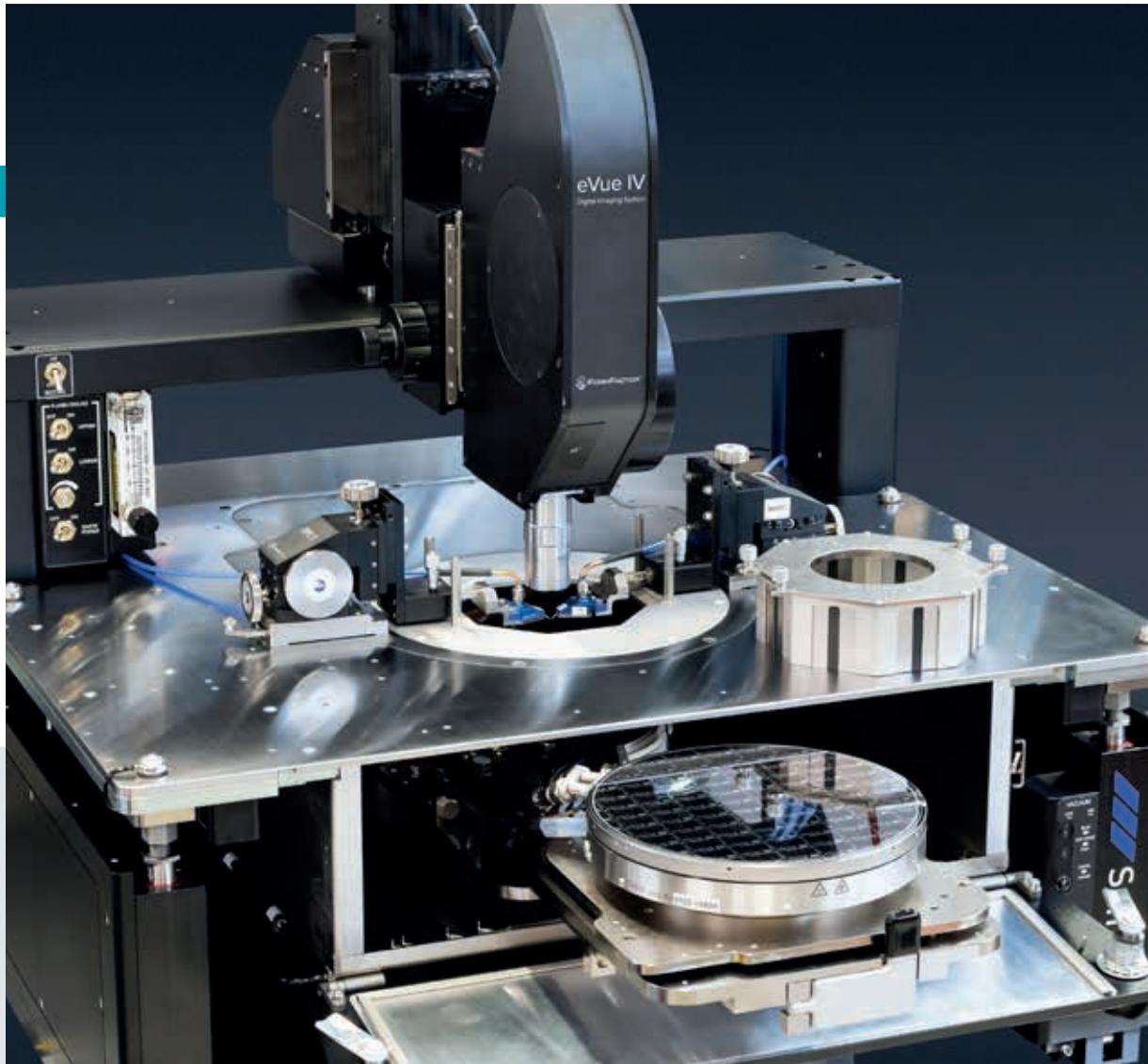
SUMMIT200
Advanced Probing System



Automated Wafer Probing with
Vertical Probe Cards



	SUMMIT200-AP	SUMMIT200-M	SUMMIT200-S
Optimized for	1/f Low noise CV Niche production High volume engineering	IV/CV RF/ (mmW/THz), High power RF Opto, Wafer level reliability Niche production High volume engineering	IV/CV (coax) RF/ (mmW/THz) Niche production High volume engineering
Contact Intelligence Technology	✓	✓	✓
Unattended testing at multiple temperatures	✓	✓	✓
EMI shielding	≥30 dB 3-20 GHz (typical)	≥ 20 dB 0.5-20 GHz (typical)	Open
Light attenuation	≥120 dB		Open
Spectral noise floor	≤-170 dBVrms / rtHz (≤1 MHz)	≤-150 dBVrms / rtHz (≤1 MHz)	Open
System AC noise	≤5 mVp-p (≤1 GHz)	≤15 mVp-p (≤1 GHz)	Open
Automation	Scalable wafer probing from single wafer to high volume engineering: semi-automatic and fully-automatic		
Thermal range	-60° C ... +300° C		Ambient ... +300° C
Wafer loading	Unique roll-out chuck Optional auto-loader		



Highlights

- / Manual advanced shielding solution
- / Stable and repeatable measurements over a wide thermal range
- / Small- and large-area multi-site probe cards

“The Cascade Summit 11000 allows you to access the full range of your test instruments.”

Summit 11000

Summit 11000-AP

Optimized for

1/f
 Low noise
 CV
 IV/CV
 RF/mmW/THz
 Opto
 Wafer level reliability

EMI shielding

≥30 dB 3-20 GHz (typical)

Light attenuation

≥120 dB

Spectral noise floor

≤-170 dBVrms / rtHz (≤1 MHz)

System AC noise

≤5 mVp-p (≤1 GHz)

Automation

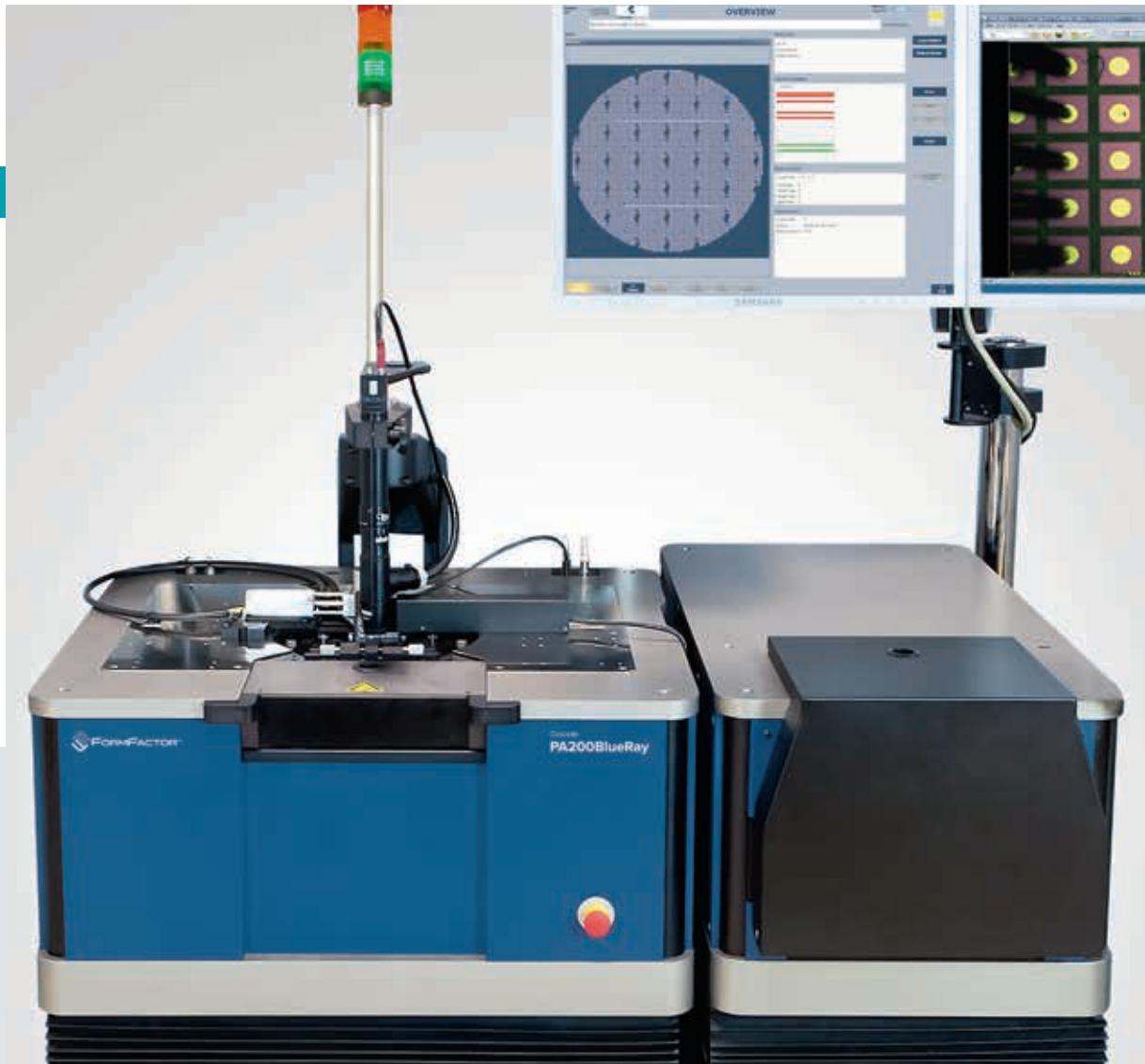
Manual

Thermal range

-60° C ... +300° C

Wafer loading

Unique roll-out chuck



Highlights

- / Up to 8 dies/sec
- / Die-to-die stepping time of under 100 ms
- / Highest Z-axis resolution of any production prober
- / Double-side option

“The Cascade PA200 BlueRay enables high-throughput functional testing of optoelectronic, MEMS and RF devices.”

BlueRay

	PA210 BlueRay	PA210DS BlueRay
Optimized for	RF/mmW Opto MEMS	RF/mmW Opto MEMS
Automation		Semi-automatic Fully-automatic
Thermal range	Ambient ... +150° C	Ambient
Backside emission support (DSP)	—	✓
Backside instrumentation e. g.	—	Integrating sphere Fiber setup Pressure module
Wafer fixation	Vacuum	Vacuum, clamped
Z stage resolution	0.25 µm	0.25 µm



Highlights

- / Submicron precision and stability
- / Supports multiple applications and accessories
- / Wide-range coarse movement
- / Micrometer-level fine movement

“The Cascade PM8 is designed to provide a highly stable, ergonomic and flexible probing platform for precise analytical probing.”

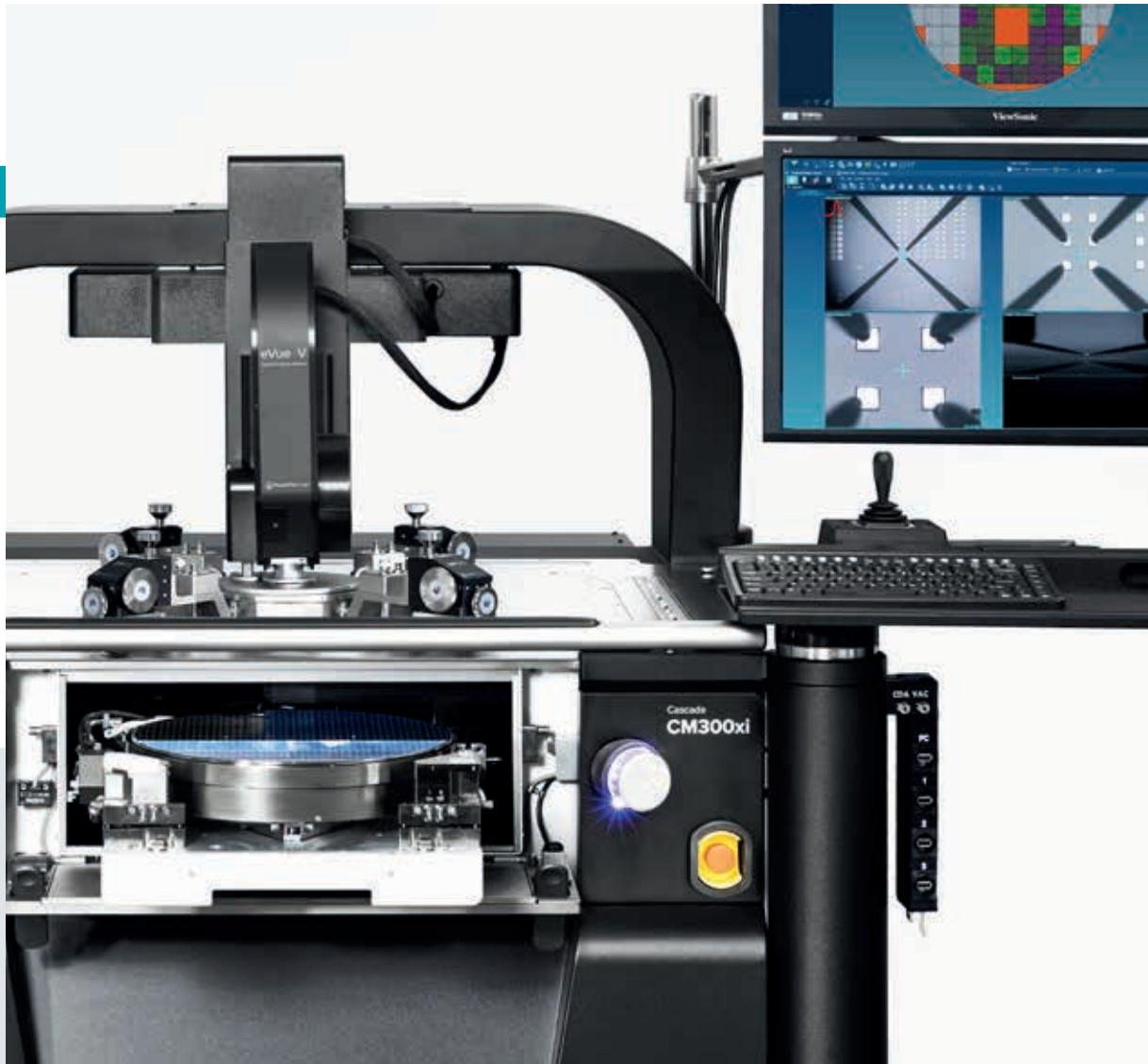
PM8 / EPS200

	PM8	EPS200RF	EPS200MMW
Optimized for	IV/CV RF/mmW/THz Failure analysis Wafer level reliability	RF up to 67 GHz	mmW up to THz Load-pull
Automation		Manual	
Thermal range		Up to 300° C (option)	—
Chuck	Coaxial, triaxial, RF (depending on requirements)		RF with ceramic AUX chuck, vacuum-controlled
Posioner platen	Stainless steel for vacuum, magnetic and bolt down-positioner fixation	Stainless steel, bolt down-positioner fixation	Stainless steel, engraved guides on mmW platen
Positioner	Manual, motorized (depending on requirements)	Two RF positioners with 50 TPI included	Dedicated, depending on measurement equipment, select SIGMA integration package and frequency range
Microscope	Depending on requirements	Camera-ready stereo zoom microscope with 150x magnification	Slim body high-resolution zoom microscope with eye-pieces, camera-ready

300 mm Systems Overview

“The Cascade 300 mm systems product line sets the industry benchmark for on-wafer test, delivering the precision and versatility needed to address a wide range of advanced, complex testing requirements.”

	CM300xi-ULN	CM300xi-F	CM300xi-S	CM300-O	PM300PS	PM300
Intended use	Highly accurate low frequency flicker noise (1/f), random telegraph signal noise (RTN or RTS), and phase noise measurements of ultra-sensitive devices	Low Leakage IV/CV 1/f measurements RF/mmW Failure analysis Wafer level reliability Silicon Photonics Niche production High volume engineering	IV/CV RF/mmW Failure analysis Wafer level reliability Silicon photonics Niche production High volume engineering	Silicon Photonics RF/mmW IV/CV Failure analysis Niche production High volume engineering	IV/CV Failure analysis Wafer level reliability	IV/CV RF/mmW, Failure analysis Wafer level reliability Silicon photonics
EMI shielding	Advanced EMI shielding	Advanced EMI shielding	EMI shielding	RF/mmW	EMI shielding	Open
Automation	Semi-automatic Fully-automatic	Semi-automatic Fully-automatic	Semi-automatic Fully-automatic	IV/CV	Maunal	Manual
Thermal range	-60 ... +300° C	-60 ... +300° C	-60 ... +300° C	Failure analysis	-60 ... +200° C	Ambient ... +300° C
Material handling unit	Option	Option	Option	Niche production	—	—
Dual automatic system	—	Option	Option	High volume engineering	—	—



Highlights

- / Unattended testing on small pads over time and at multiple temperatures
- / Highest flexibility to support a wide range of applications
- / Best-in-class measurement performance
- / Advanced EMI-shielded, light-tight and moisture-free test environment

“The Cascade CM300xi delivers best-in-class measurement performance at a high level of automation in the lab.”

CM300xi / CM300





CM300xi
With Focus Load-Pull Integration



	CM300xi-F	CM300xi-S	CM300-O
Optimized for	IV/CV, RF/mmW, Failure analysis, Wafer level reliability, Silicon photonics Niche production, High volume engineering		
Contact Intelligence Technology	✓	✓	—
Unattended testing at multiple temperatures	✓	✓	—
EMI shielding	>30 dB (typical) at 1 kHz to 1 MHz	>20 dB (typical) at 1 kHz to 1 MHz	Open
Light attenuation	≥120 dB		Open
Spectral noise floor	≤-170 dBVrms / rtHz (≤ 1 MHz)	≤-150 dBVrms / rtHz (≤ 1 MHz)	Open
System AC noise	≤5 mVp-p (≤1 GHz)	≤15 mVp-p (≤1 GHz)	Open
Automation	Scalable wafer probing from single wafer to high volume engineering: semi-automatic, fully-automatic, dual fully-automatic system		
Thermal range	-60 ... +300° C		Ambient ... +300° C
Wafer loading	Unique roll-out chuck Optional auto-loader		
Available Platen Inserts for efficient switching between different application setups	TopHat, Probecard Holder	TopHat, IceShield (without Light / EMI Shielding) and Probecard Holder	Probecard Holder



Highlights

- / First automated probe station to achieve -190dB spectral noise
- / Plug In and Go: Integrated TestCell Power Management
- / Autonomous 24/7 Operation: Up to 4x faster flicker noise thermal testing on 30 μm pads
- / Reduce Setup Time and Costs: Exclusive low noise site survey, and system verification services

“The CM300xi-ULN system establishes a new industry gold standard for ultra-low noise measurements.”

CM300xi ULN



CM300xi-ULN

Highly accurate low frequency flicker noise (1/f), random telegraph signal noise (RTN or RTS), and phase noise measurements of ultra-sensitive devices

Optimized for

Contact Intelligence Technology

✓

Unattended testing at multiple temperatures

✓

EMI shielding

>30 dB (typical) at 1 kHz to 1 MHz

Light attenuation

≥130 dB

Spectral noise floor

Low band (- 1Hz – 1kHz): -120@1Hz, -140@10Hz, -160@100Hz (dBVrms/rtHz)
Wide band (1kHz – 1MHz): ≤-190 dBVrms/rtHz
Extended wide band (1kHz – 20MHz): ≤-180 dBVrms/rtHz

System AC noise

≤ 3 mVp-p (≤ 2.5 GHz)

Automation

Scalable wafer probing from single wafer to high volume engineering: semi-automatic, fully-automatic

Thermal range

-60 ... +300° C

Wafer loading

Unique roll-out chuck
Optional auto-loader



Highlights

- / Excellent measurement accuracy
- / Fast navigation and high-precision probe positioning
- / Modular upgrade path
- / Fast transition between wafer and packaged device test

“The Cascade PM300 analytical probe system enables highly-precise manual semiconductor failure analysis and in-process testing.”

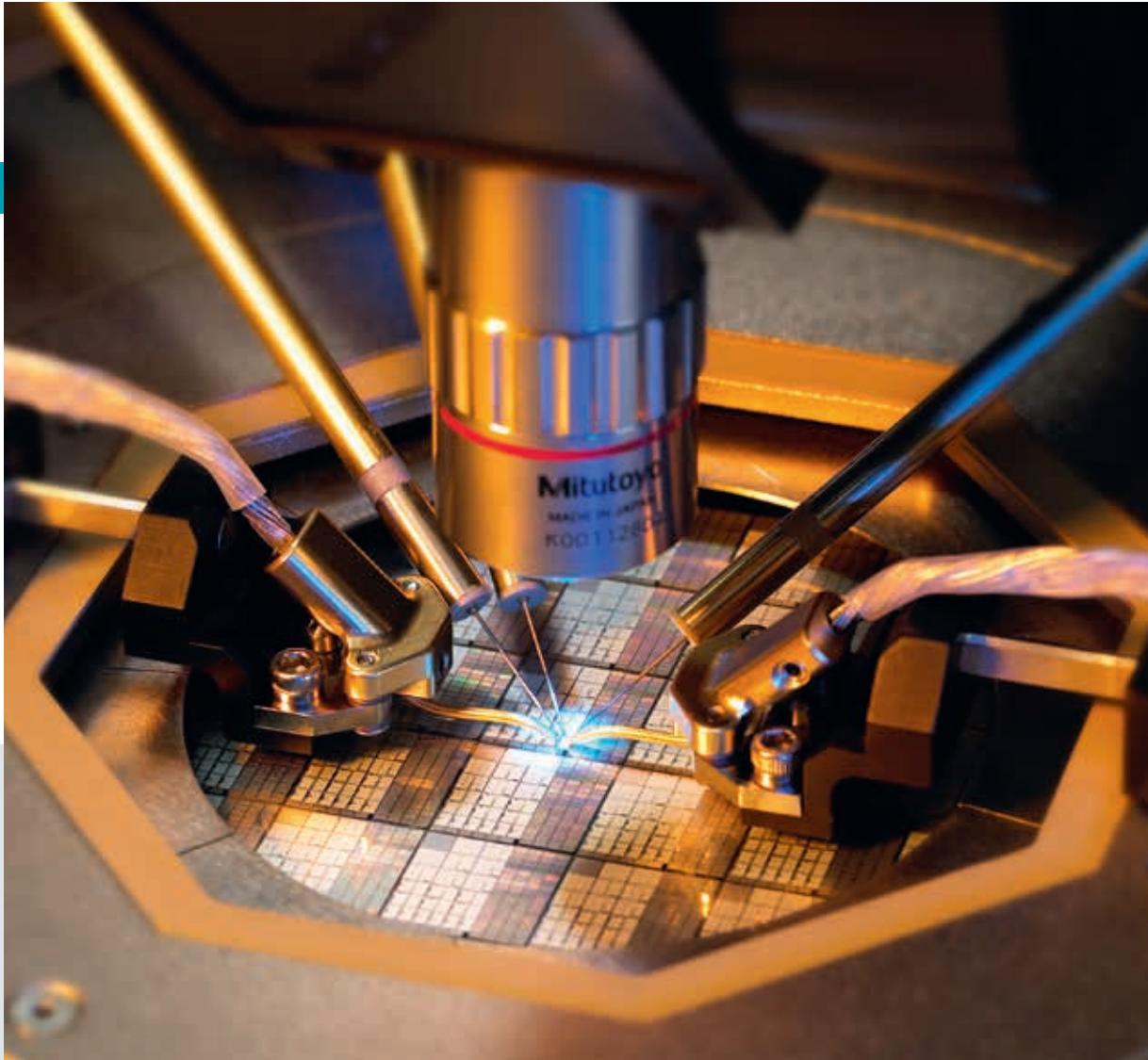
PM300PS / PM300

	PM300PS	PM300
Optimized for	IV/CV Failure analysis Wafer level reliability	IV/CV RF/mmW Failure analysis Wafer level reliability Silicon photonics
EMI shielding	EMI shielding	Open
Light attenuation	≥120 dB	Open
Automation	Manual	
Thermal range	-60 ... +200° C	Ambient ... +300° C
Operation workflow	Fine-glide chuck stage which offers both wide-range coarse movement and μm-level fine movement	

Dedicated Systems Overview

“FormFactor provides comprehensive measurement solutions for most challenging test requirements.”

	High Power Systems	Vacuum / Cryogenic Systems
Optimized for	On-wafer power device characterization and production test	<ul style="list-style-type: none"> MEMS devices IR imaging devices Optoelectronic test Compound semiconductor devices Superconductor devices Cutting edge technologies
Shielding	Shielded	Shielded
Automation	<ul style="list-style-type: none"> Manual Semi-automatic Fully-automatic 	<ul style="list-style-type: none"> Manual Semi-automatic
Thermal range	-60° C ... +300° C	< 7 K ... +300° C



Highlights

- / Low electrical and thermal contact resistance across the entire wafer
- / Prevents thin wafers from curling and breaking
- / Certified safety solutions to protect device, operator and probing equipment
- / High-current probes up to 600 A

“On-wafer power device characterization systems from FormFactor reduce time-to-market for new power devices and keep up with production.”

High Power Systems



	TESLA300	TESLA200	EPS150TESLA
Wafer size	300 mm	200 mm	150 mm
Contact Intelligence Technology	✓	✓	—
Automation	Semi-automatic Fully-automatic	Semi-automatic Fully-automatic	Manual
Thermal range	-55° C ... +300° C		Ambient ... +300° C
Thin wafer support	✓	✓	✓
Maximum voltage triax/coax	3 kV / 10 kV	3 kV / 10 kV	3 kV / 10 kV
Maximum current	200 A (pulsed), 20A (DC)	600 A (pulsed), 20A (DC)	40 A (pulsed), 2 A (DC)



TESLA200 – 200mm High
Power Probe System





Highlights

- / Unique chip-scale to wafer-level probing down to < 7 K
- / Test of devices (e.g. MEMS) in a high vacuum ($< 1 \times 10^{-5}$ mbar)
- / Manual, a semi-automatic and fully-automatic version up to 200 mm (optional 300 mm)
- / Probing is as simple as on standard wafer-level probe systems

“Cascade vacuum and cryogenic probe systems enable precise on-wafer measurements in extreme environments.”

Vacuum / Cryogenic Systems

	PLV50	PMV200	PAV200	PAP200	PLC50	PMC200	PAC200
Optimized for	Wide range of applications, including DC and RF measurements, MEMS and optoelectronic tests			MEMS tests and a wide range of other applications	Wide range of applications, including DC and RF measurements of the latest silicon, compound semiconductor and superconductor devices, MEMS and optoelectronic tests (e.g. cooled IR tests)		
Automation level	Manual	Manual	Semi-automatic or fully-automatic	Semi-automatic or fully-automatic	Manual	Manual	Semi-automatic or fully-automatic
Wafer size	Up to 150 mm	Up to 200 mm (300 mm optional)	Up to 200 mm (300 mm optional)	Up to 200 mm (300 mm optional)	Up to 100 mm	Up to 200 mm (300 mm optional)	Up to 200 mm (300 mm optional)
Thermal range	-60° C ... +300° C	-60° C ... +300° C	-60° C ... +300° C	-60° C ... +200° C	Down to 77 K with liquid nitrogen or < 7 K with liquid helium	Down to 77 K with liquid nitrogen or < 7 K with liquid helium	Down to 77 K with liquid nitrogen or 10 K with liquid helium
Dry-cooling	—	—	—	—	✓	✓	✓
Vacuum down to	< 1×10 ⁻⁵ mbar	< 1×10 ⁻⁵ mbar	< 1×10 ⁻⁵ mbar	< 1×10 ⁻⁵ mbar or 4.0 bar (in overpressure environment)	< 1×10 ⁻⁵ mbar	< 1×10 ⁻⁵ mbar	< 1×10 ⁻⁵ mbar
Probe card usage	—	✓	✓	✓	—	✓	✓
Positioners	Up to 6	Up to 8	Up to 8	Up to 8	Up to 6	Up to 8	Up to 8
Wafer access	Topside	Frontside	Frontside or via autoloader	Frontside or via autoloader	Topside	Frontside	Frontside or via autoloader

Applications
8 - 21

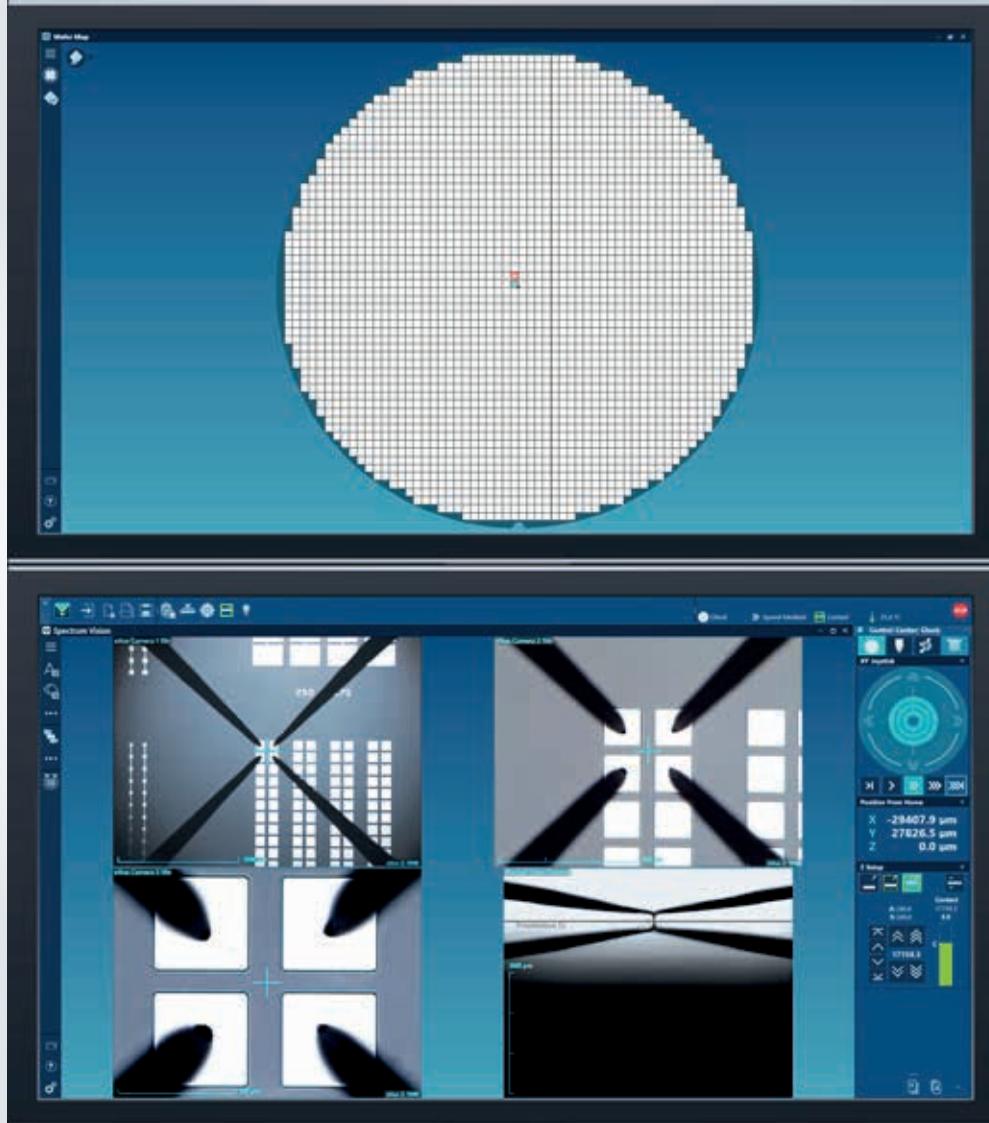
Technologies
22 - 25

Systems
26 - 53

Software
54 - 57

Accessories
58 - 61

Programs
62 - 65



Highlights

- / Intuitive graphical user interface
- / Intelligent alignment functions enable autonomous semiconductor test
- / Workflow Guide for easy step-by-step guidance
- / Integrated loader UI
- / Optional SECS/GEM interface
- / Windows 10 compatible

“Reaching new heights with the most powerful engineering software in the market”

Velox™ Probe Station Control Software



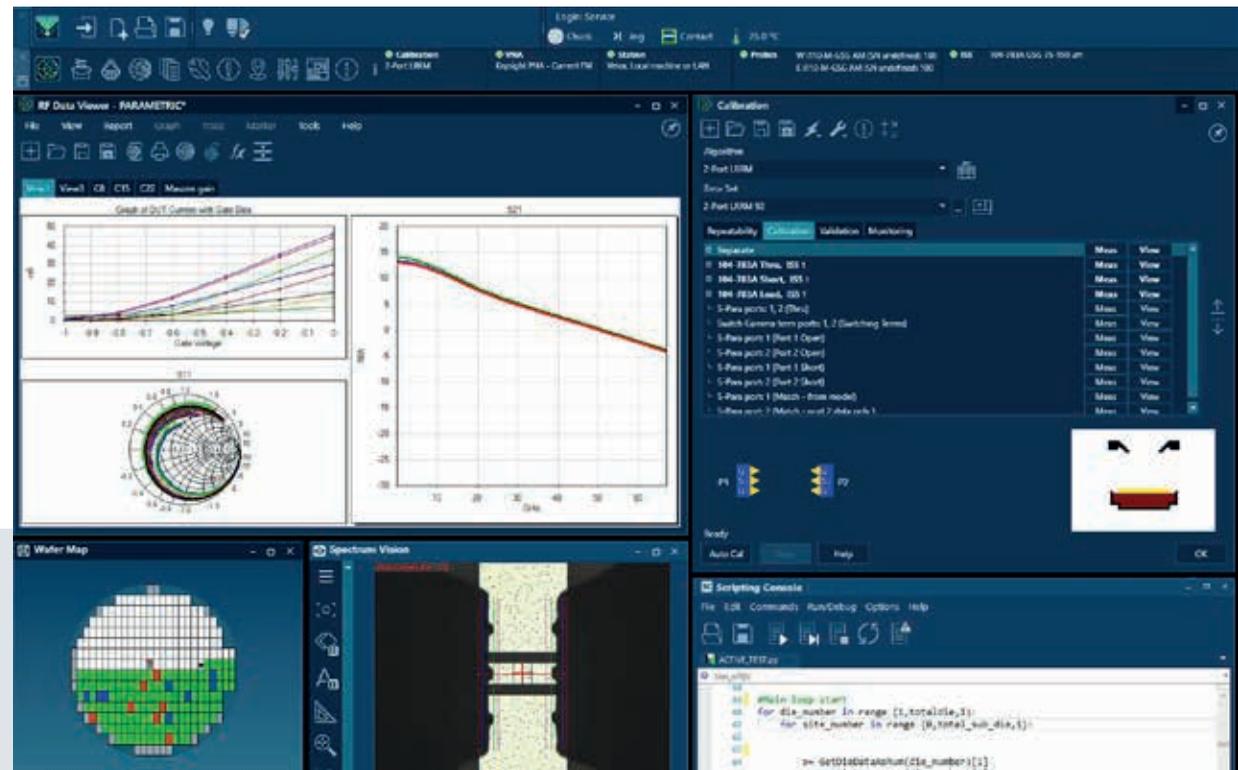
Velox Probe Station Control Software



Highlights

- / Achieve the most accurate and repeatable on-wafer S-parameters (and other VNA-related) calibrations and measurements
- / Supports advanced calibration algorithms, e.g. LRRM, eLRRM, Hybrid LRRM, SOLR
- / Data reporting, mathematical transformations and sequencing built-in
- / Supports up to 12 VNA ports
- / Interfaces with Velox

“Comprehensive and intuitive on-wafer RF calibration, validation, measurement and analysis software.”



WinCal RF Calibration Software

Applications
8 - 21

Technologies
22 - 25

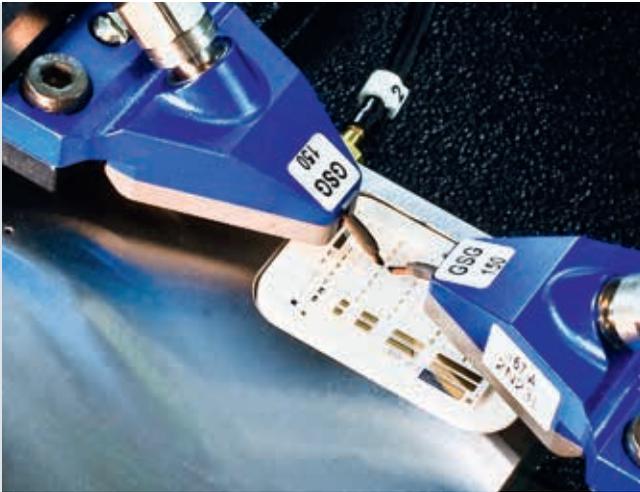
Systems
26 - 53

Software
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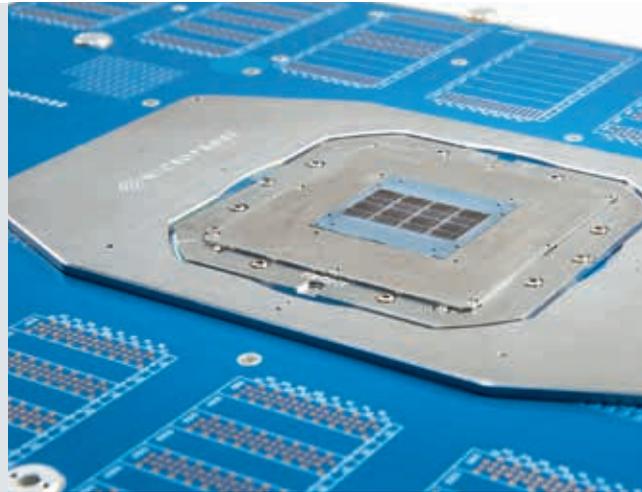
Accessories
58 - 61

Programs
62 - 65

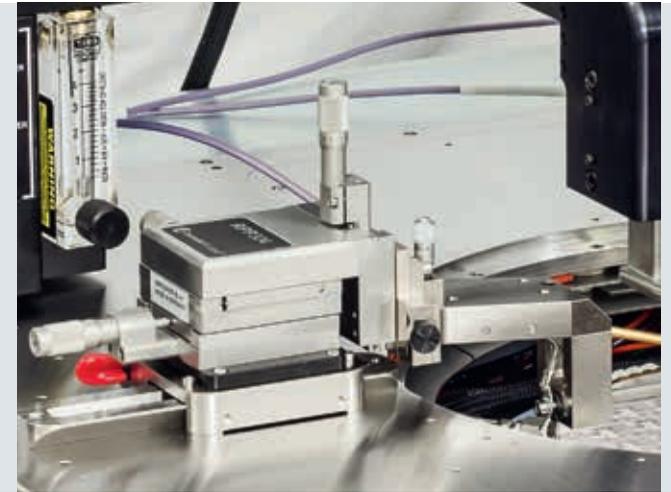
Full Range of Accessories



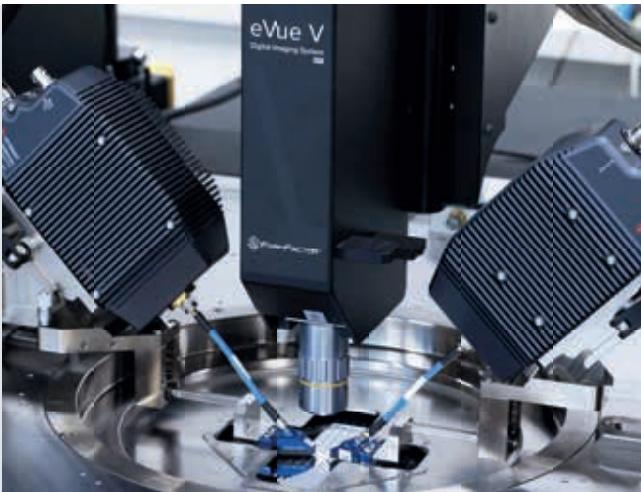
/ Probes
/ Calibration Substrates



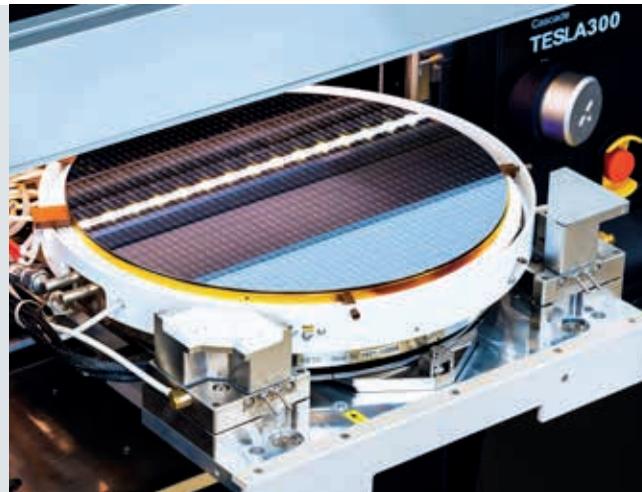
/ Probe Cards



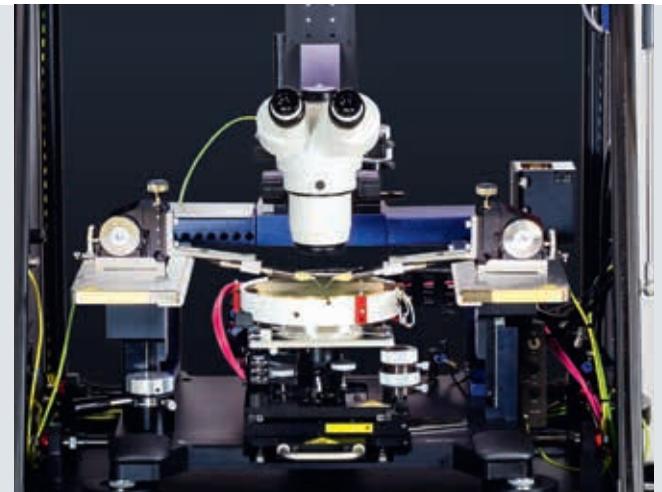
/ Positioners
/ Probe Mounts



/ Microscopes



/ Chucks
/ Thermal Systems



/ Light- and EMI-shielding solutions
/ Vibration Isolation Solutions

Applications
8 - 21

Technologies
22 - 25

Systems
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Software
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Accessories
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Programs
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Educational Savings Program

Make the most of your research budget

With our Educational Savings Program you can benefit from exclusive savings on 150 mm wafer probe systems.

Program Benefits*

- / Free shipping
- / Two-year factory warranty
- / Four years of free WinCal calibration software updates
- / 10% discount on upgrades



*For terms and conditions please contact your local sales representative or visit us at <https://www.formfactor.com/product/probe-systems/150-mm-systems/mps150/>

SourceOne™ - Factory-Refurbished Equipment

Our SourceOne™ program provides top-notch quality and industry-leading performance, even within the secondary equipment market. Whether you choose a reconditioned probe system, trade-in your current device, or engage in a buyback or removal process with us, we'll assist you throughout the entire journey.

Trade-In / Buy Back

- / Receive cash or credit for your returned probe station
- / Credit is good toward any Cascade probe system or service
- / Simplified logistics for easy shipping or removing
- / Competitive market rates

Factory-Refurbished Equipment

- / Eliminate the risk associated with used equipment acquisition by purchasing from the OEM.
- / Ensure like-new performance through comprehensive factory refurbishment.
- / Experience reduced time to first measurement with support from order configuration through installation.
- / Enjoy extra assurance of quality with the standard factory warranty on probe stations.

Factory Upgrades On Customer-Owned Stations

- / Greatest Flexibility: We turn the prober you have into the one you need
- / Performance and productivity upgrades available
- / Includes FormFactor's standard warranty
- / All from one source: We take care of the pickup, refurbishment and reinstallation of your probe station



Product Safety and Ergonomy

Cascade probe systems and systems-related services conform to the highest international standards and regulatory requirements.



Quality



/ ISO 9001 : 2015

- / Products and services meet all customer and regulatory requirements
- / Continual improvement of products and processes



Safety



/ SEMI S2, cNRTLus, CE, UL

- / Compliance with safety, health and environmental requirements to prevent or reduce the risk of injury



Ergonomics



/ SEMI S8

- / Straightforward design
- / Easy and ergonomic operation



Environment



/ ISO 14001 : 2015, RoHS

- / Prevention of pollution
- / Reduced consumption of natural resources
- / Minimization of waste
- / No use of hazardous materials
- / **SourceOne™ program**
Reuse of used equipment, controlled removals for recycling, customer support for end-of-life equipment

Certifications in collaboration with TÜV SÜD and TÜV Rheinland.

BR-SYSTEMS-2311

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