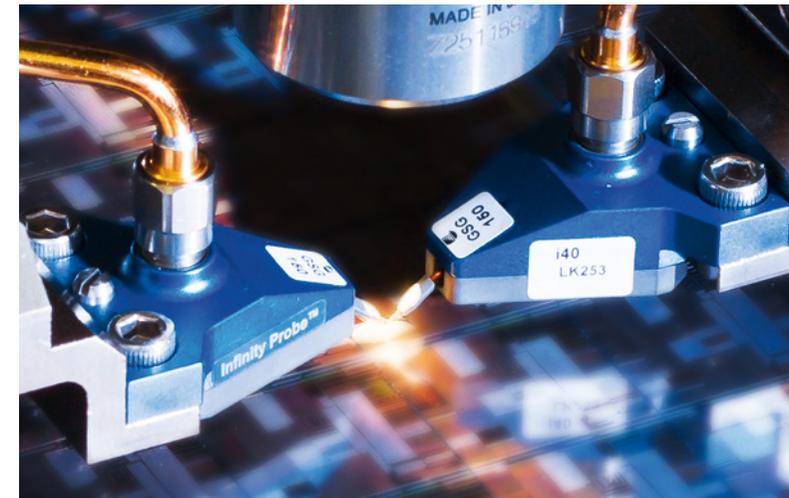
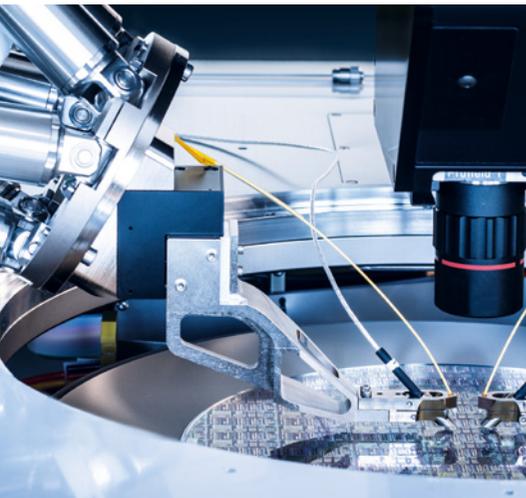


# Cascade Probe Systems

## 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
- / #1 Advanced Probe Card Supplier
- / #1 Engineering Probe Systems Supplier
- / Named as a BEST Supplier in customer satisfaction surveys, year-after-year
- / Ship >50 million MEMS probes annually
- / Over 10,000 probe systems installed



- / Enable customer success through technology, partnerships, “First Time Right” product quality, global customer support
- / 1600 employees, with >500 directly supporting customers
- / 22 service and repair centers
- / 13 sales offices
- / 9 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

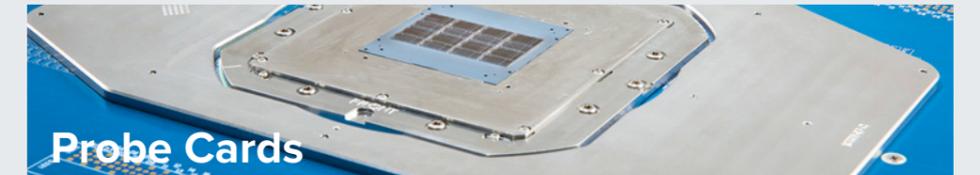
We have an extensive patent portfolio and are ISO 9001:2015 and ISO 14001:2015 certified. With facilities in Dresden/Germany and Beaverton OR/USA, and worldwide sales and support offices we serve customers in all major sectors (fabless, integrated device manufacturers, foundries, governments, institutes,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



# Further FormFactor Products



- / 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.

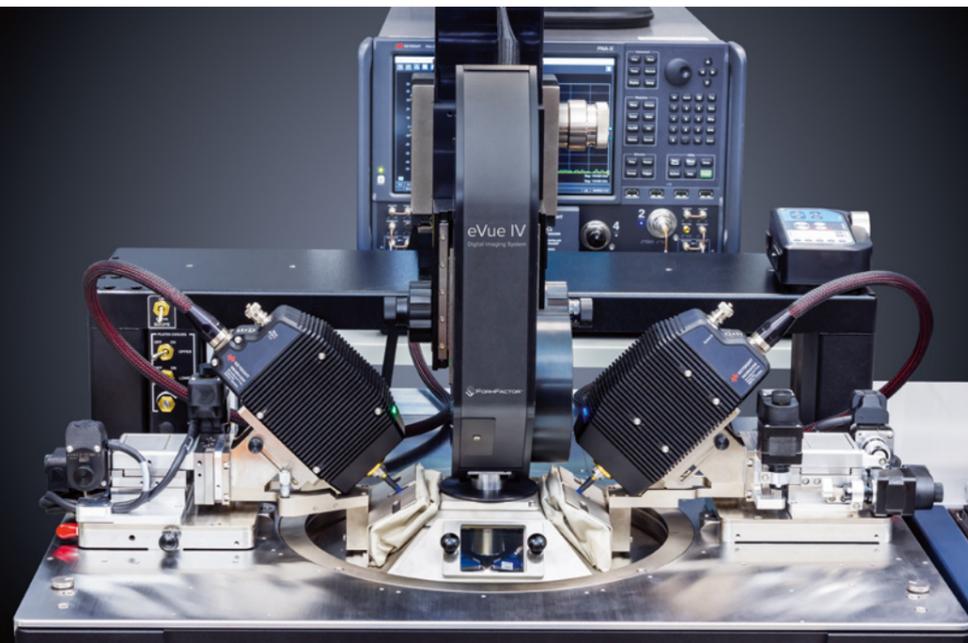


- / Extensive portfolio of high-performance probe cards for memory, RF, foundry and logic devices that help lower overall production costs, improve yields and enable “more-than-Moore” advanced packaging technologies.

## Worldwide Application Support and Customer Service

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





## Applications

8

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

## Technologies

18

- / Contact Intelligence™ Technology
- / MicroChamber® and AttoGuard® / PureLine™
- / VueTrack™

## Systems

22

- / 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 XE

## Accessories

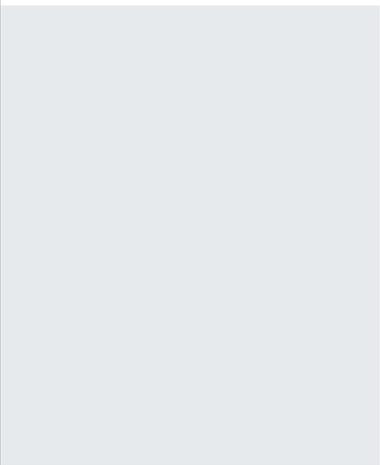
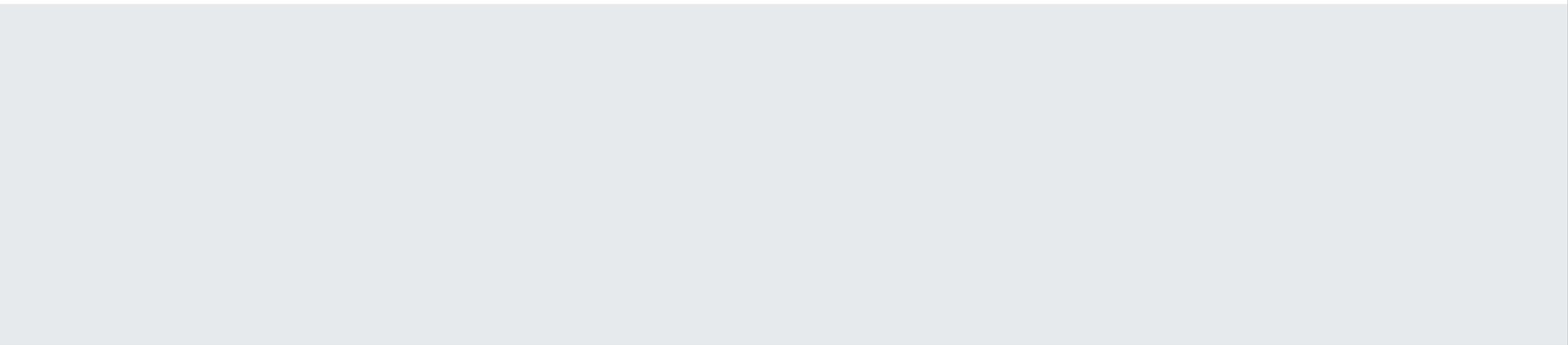
58

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

## Programs

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- / Educational Savings Program
- / Trade-In / Buy Back
- / Certified Used Equipment
- / Product Safety and Ergonomy



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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

/ Partners share a commitment to customer success and seek to understand and solve future customer challenges

/ Eliminates the time and risk involved in sourcing incompatible products from multiple vendors

/ Single point of contact to coordinate the optimal customer solution, managing all aspects of configuration, installation, service and performance

/ Provides confidence in measurement by applying combined know-how and expertise

**MeasureOne™**  
Your Integration Connection

**KEYSIGHT**  
TECHNOLOGIES

**DMPI**

**Lake Shore**  
CRYOTRONICS

And more...

## 1/f Device Characterization

/ Cascade 200 mm or 300 mm semi-automatic probe system, Velox™ Software

/ DCP Probes, ACP Probes, Infinity Probes®, or IZiProbes®

/ DPP precision DC positioners or RPP precision RF positioners

/ Keysight Technologies E4727A Advanced Low-Frequency Analyzer (A-LFNA), B1500A, WaferPro Express software

## Circuit Characterization

/ Cascade 200 mm or 300 mm semi-automatic probe system

/ WinCal XE calibration software

/ Infinity Probes and ISS calibration standards

/ Keysight Technologies PNA or PNA-X, B1500A, WaferPro Express, IC-CAP software, DC Power Analyzer

## Cryogenic / Magnetic Probing

/ Cascade cryogenic probe stations supporting device substrates up to 200 mm in diameter with manual, semi-automatic and fully-automatic operation for DC and RF measurements into the terahertz range.

/ Lake Shore Cryotronics cryogenic probe stations for characterization of small material samples and devices (typically less than 100 mm) down to 2 Kelvin and with magnetic field strengths up to 2.5 Tesla.

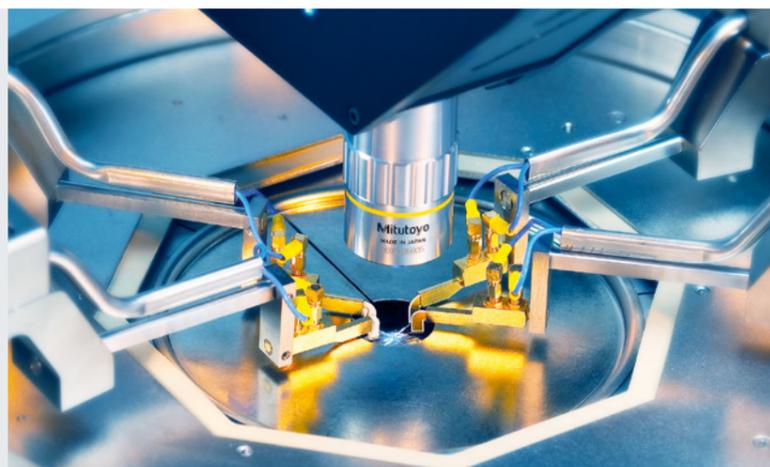
## Terahertz Probing

/ mmW and sub-mmW on-wafer Ground-Signal-Ground probes

/ Solutions for electrical measurement of devices using rectangular waveguides from 50 GHz up to 1.1 THz

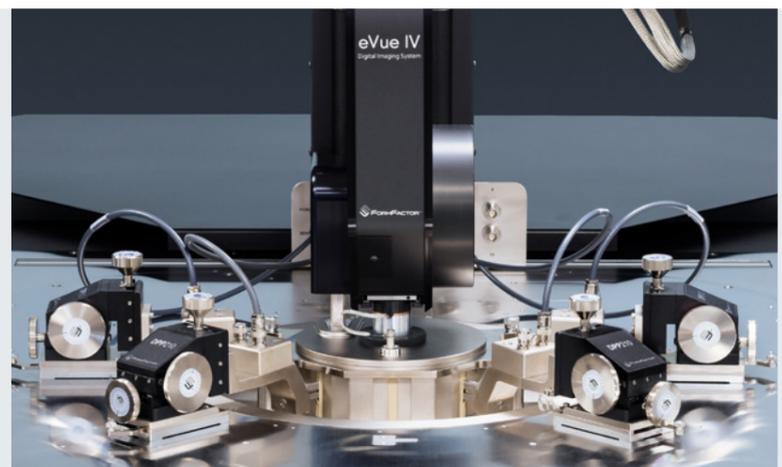
/ Validated on 150 mm, 200 mm and 300 mm probe stations

# Application Expertise



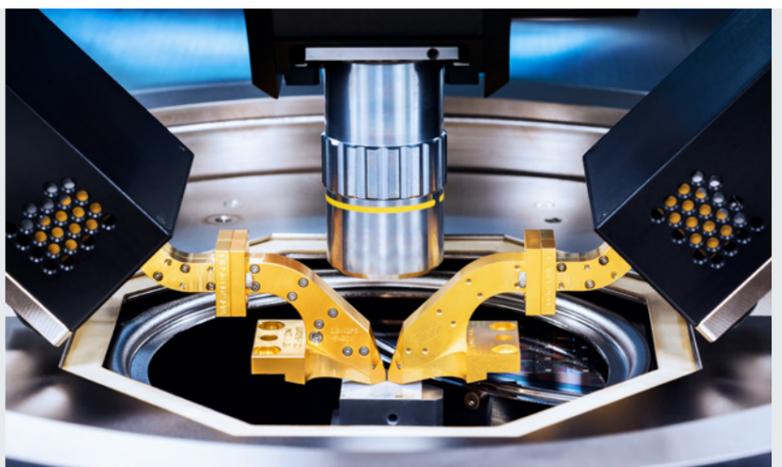
“Succeed by making the best decisions with the best data.”

/ 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

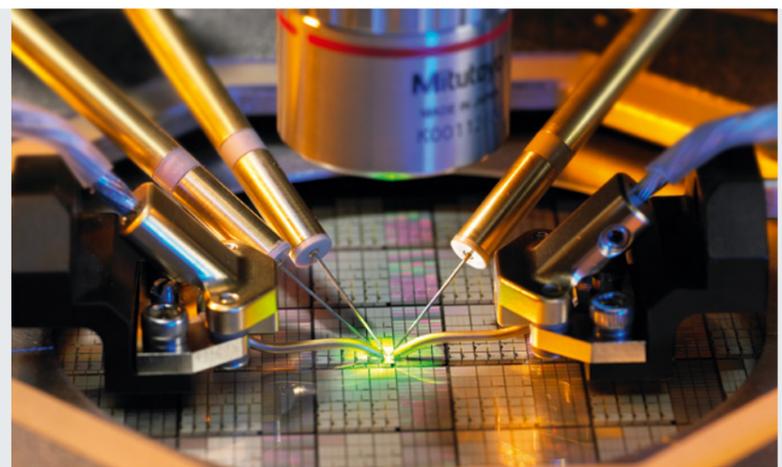


# Application Expertise



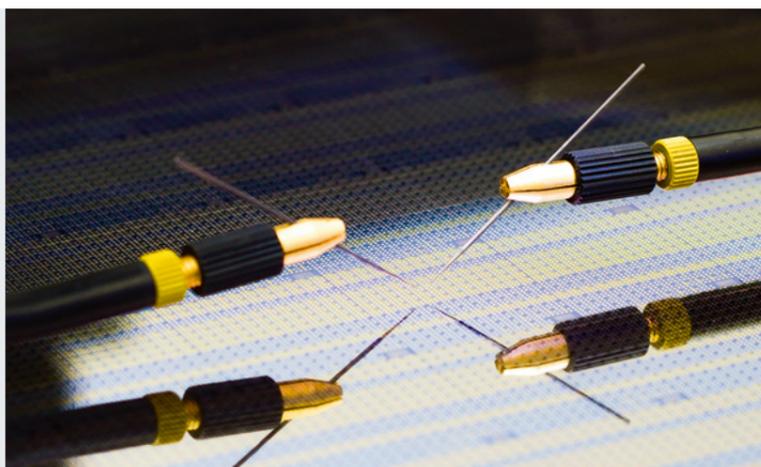
“Highly-accurate high-throughput functional testing of optoelectronics.”

/ Opto /  $\mu$ LED



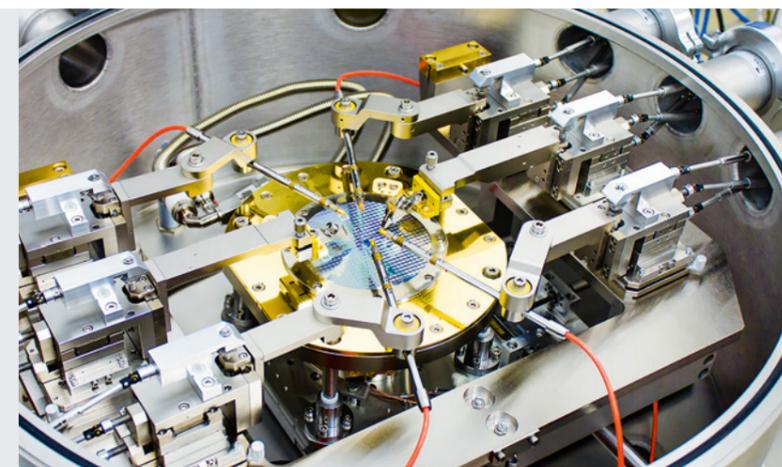
“Energize your power measurements.”

/ High Power Test



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

/ Failure Analysis



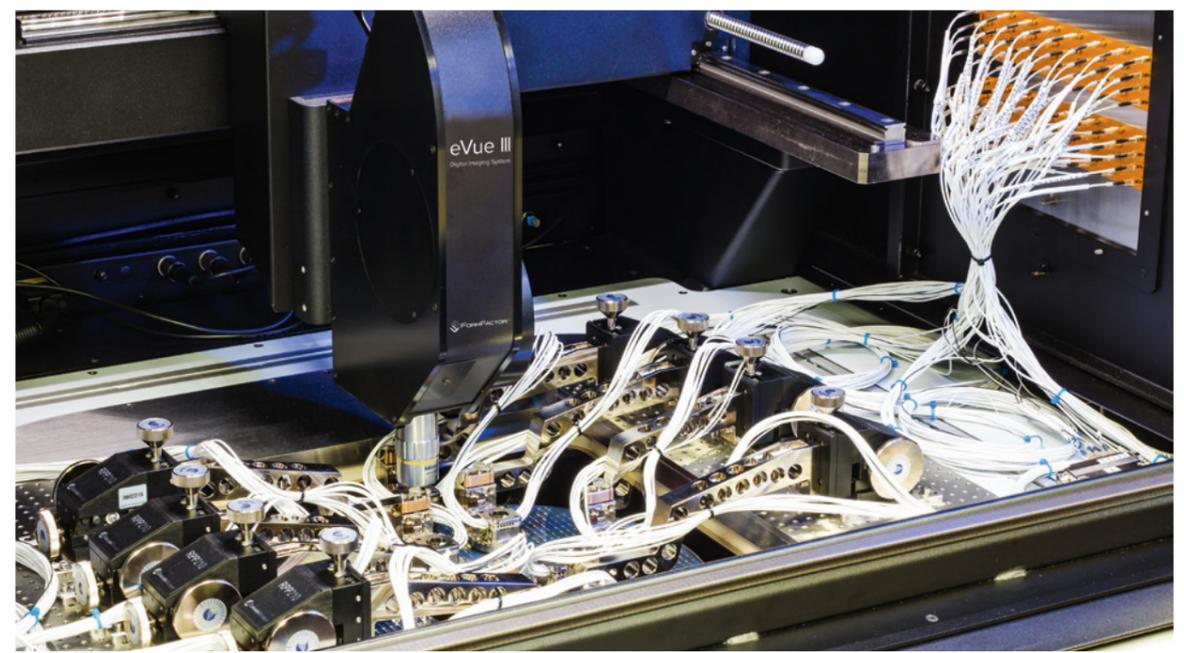
“Modern and innovative solutions for the special requirements in MEMS testing.”

/ 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

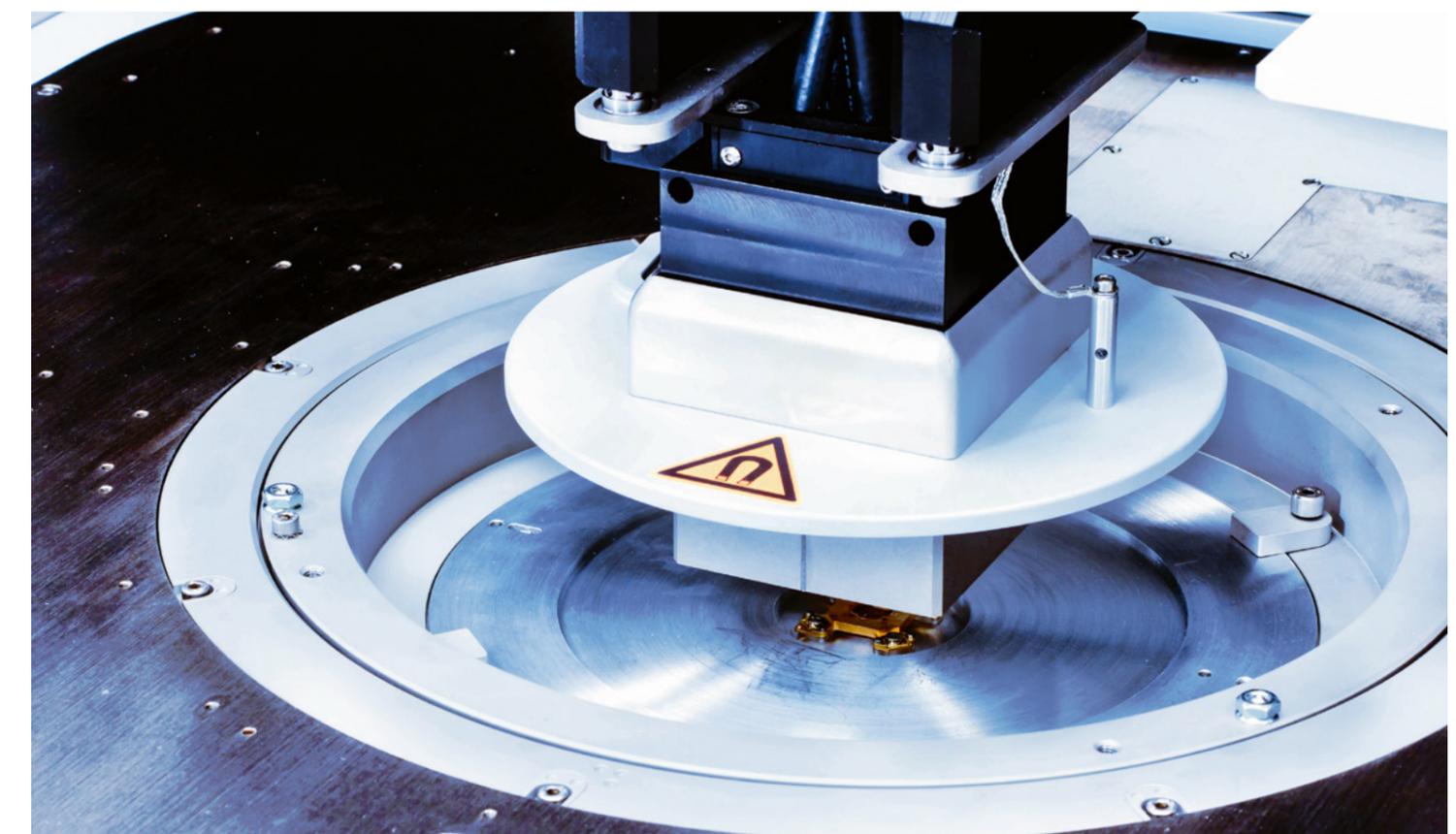
- / New applications (magnetic, mixed signal, WLR)
- / Total solution incl. customized software

## Advanced Setups

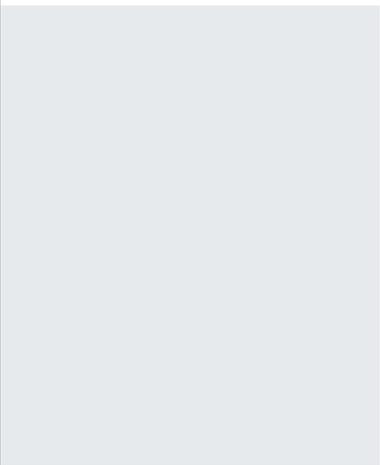
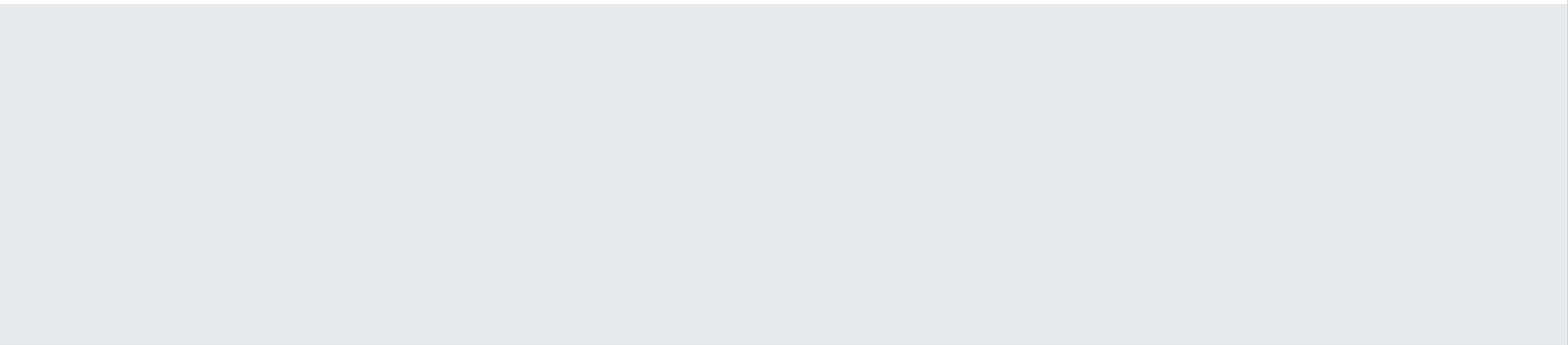
- / High number of positioners
- / Chuck top plates
- / Simultaneous setup of two microscopes
- / Upgrades

## 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.

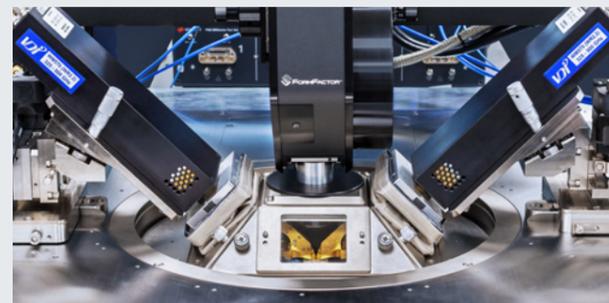
### Autonomous DC

- / 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

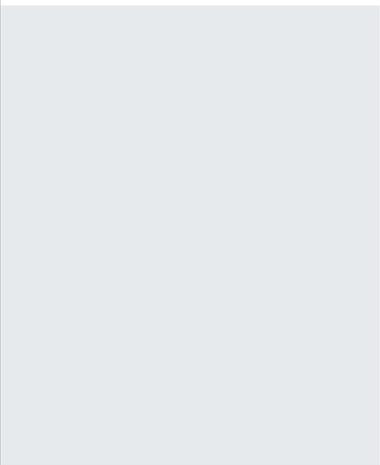
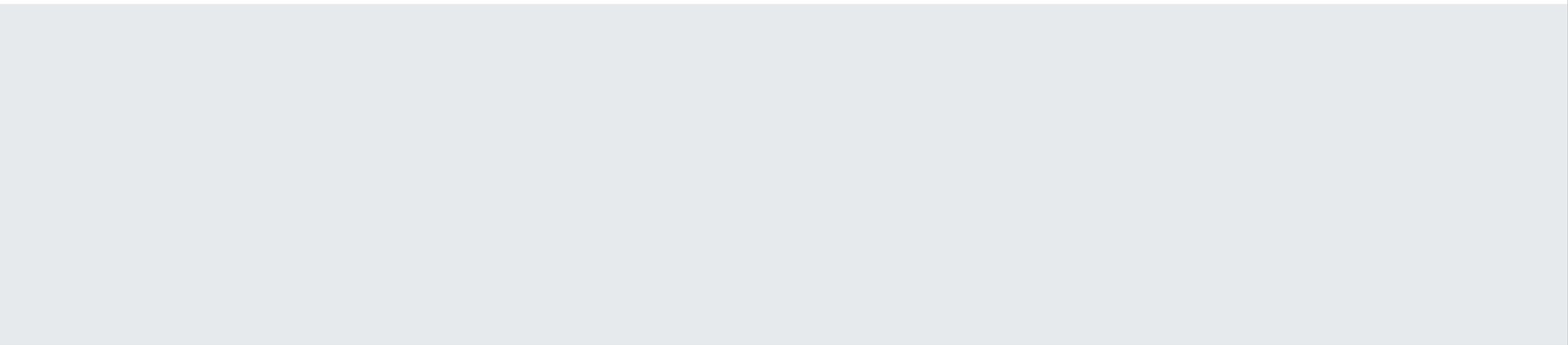
## VueTrack™ Technology



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 XYZθ 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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# MPS150 / EPS150

## 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	EPS150COAX	EPS150TRIAx	EPS150RF	EPS150MMW	EPS150FA	EPS150TESLA
Optimized for	IV/CV Low noise RF mW Failure analysis High power	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	Failure analysis	High power up to 10 kV
Automation	Manual						
Thermal range	Up to 300° C (option)				200° C (option)		
Chuck	Coaxial, triaxial, RF, high power (depending on requirements)	Coaxial, vacuum-controlled	Triaxial, vacuum-controlled	RF with ceramic AUX chuck, vacuum-controlled	RF with ceramic AUX chuck, vacuum-controlled	Coaxial, vacuum-controlled	Triaxial, vacuum-controlled
Positioner platen	Stainless steel, for vacuum and magnetic positioner fixation			Stainless steel, guidance rails for positioners	Stainless steel, engraved guides on mmW platen	Stainless steel, for vacuum and magnetic positioner fixation	
Positioners	Depending on requirements	Four DC positioners with 100TPI	Four DC positioners with 100TPI, triaxial probe arms and cables	Two RF positioners with 100TPI	Dedicated, depending on measurement equipment	Four DC positioners with 200TPI, vacuum-controlled	DC positioners with 100TPI
Microscope	Depending on requirements	Camera-ready stereo scope with 100x magnification		Camera-ready stereo scope with 150x magnification	Slim body microscope with eye-pieces, camera-ready	Up to 4000x magnification, camera- and laser cutter-ready	Camera-ready stereo scope with 100x magnification
University support program	N/A	✓	✓	✓	✓	✓	✓

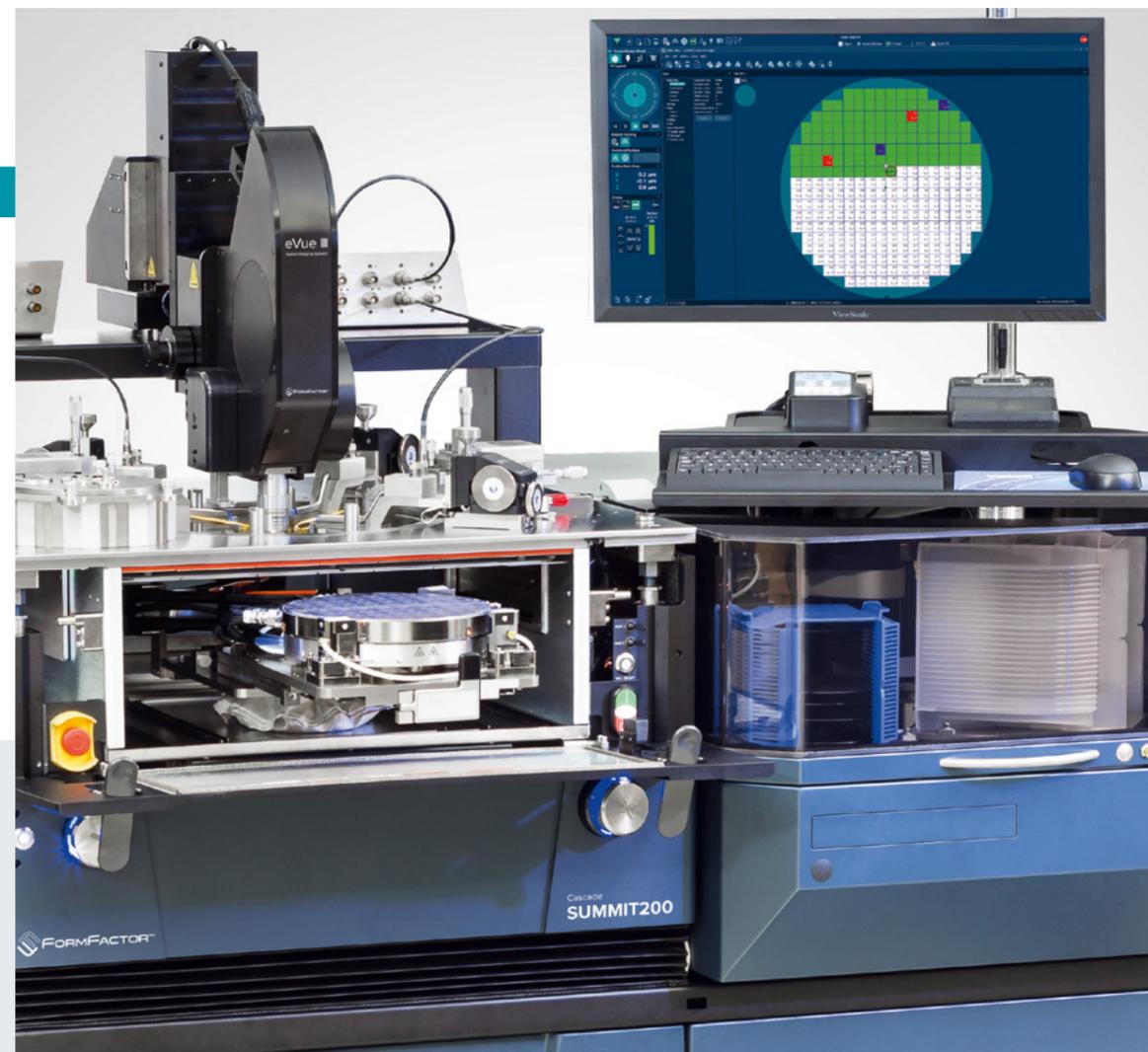
 Flexible Cascade MPS150 Modular 150 mm Probe Station



## 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 12000	Summit 11000	BlueRay	PM8/EPS200
Intended use	IV/CV RF/ (mmW/THz) Failure analysis Wafer level reliability Niche production High-volume engineering	mmW/THz	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	Shielded / open	Open	Open
Automation	Semi-automatic Fully-automatic	Semi-automatic	Manual	Semi-automatic Fully-automatic	Manual
Thermal range	-60 ... +300° C	-60 ... +300° C	-60° C ... +300° C	Ambient ... 175° C	Ambient ... +300° C
Unattended testing at multiple temperatures	✓	✓	–	–	–
Backside emission support (DSP)	–	–	–	✓	✓



# SUMMIT200

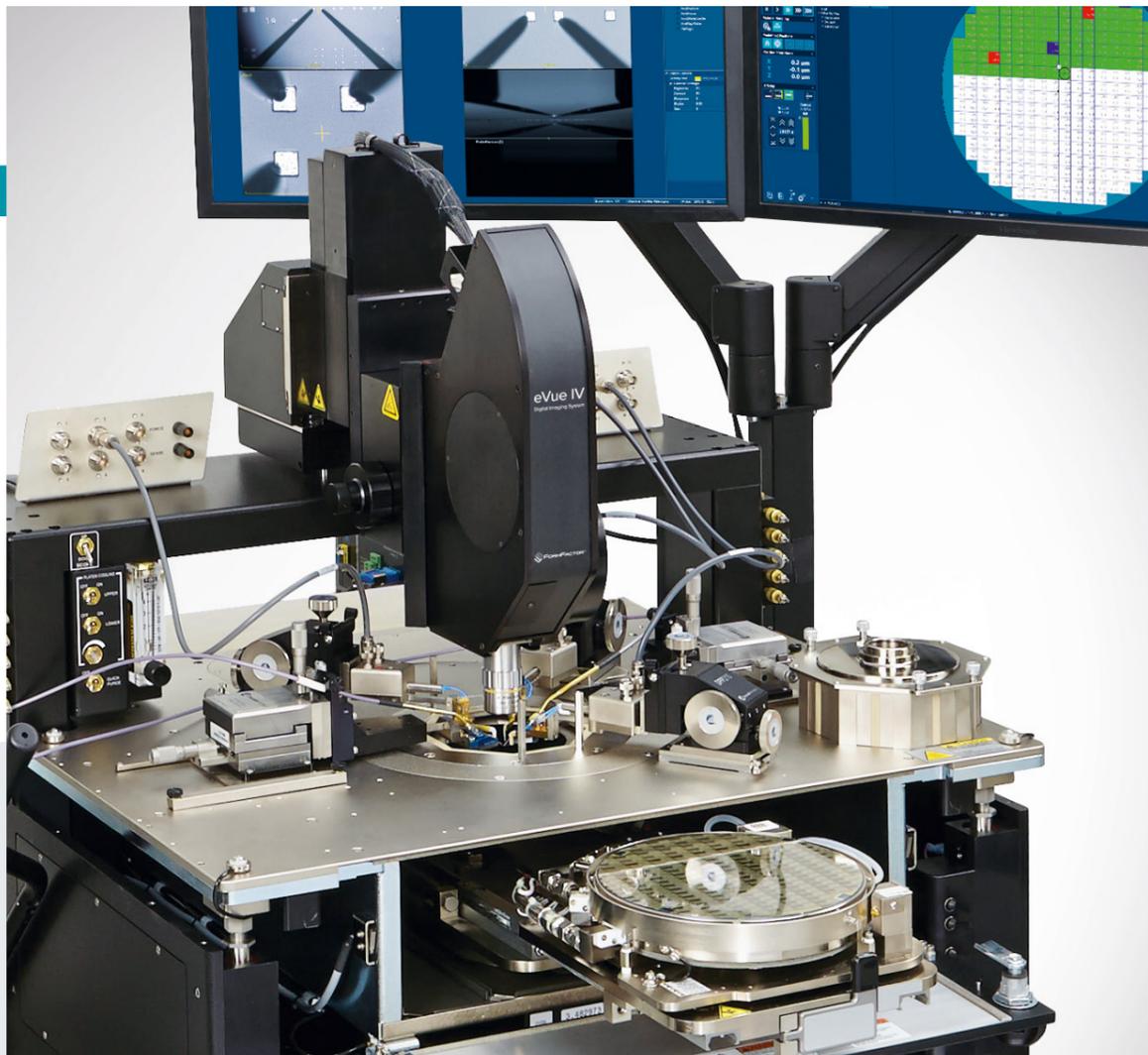
## Highlights

- / 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-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		



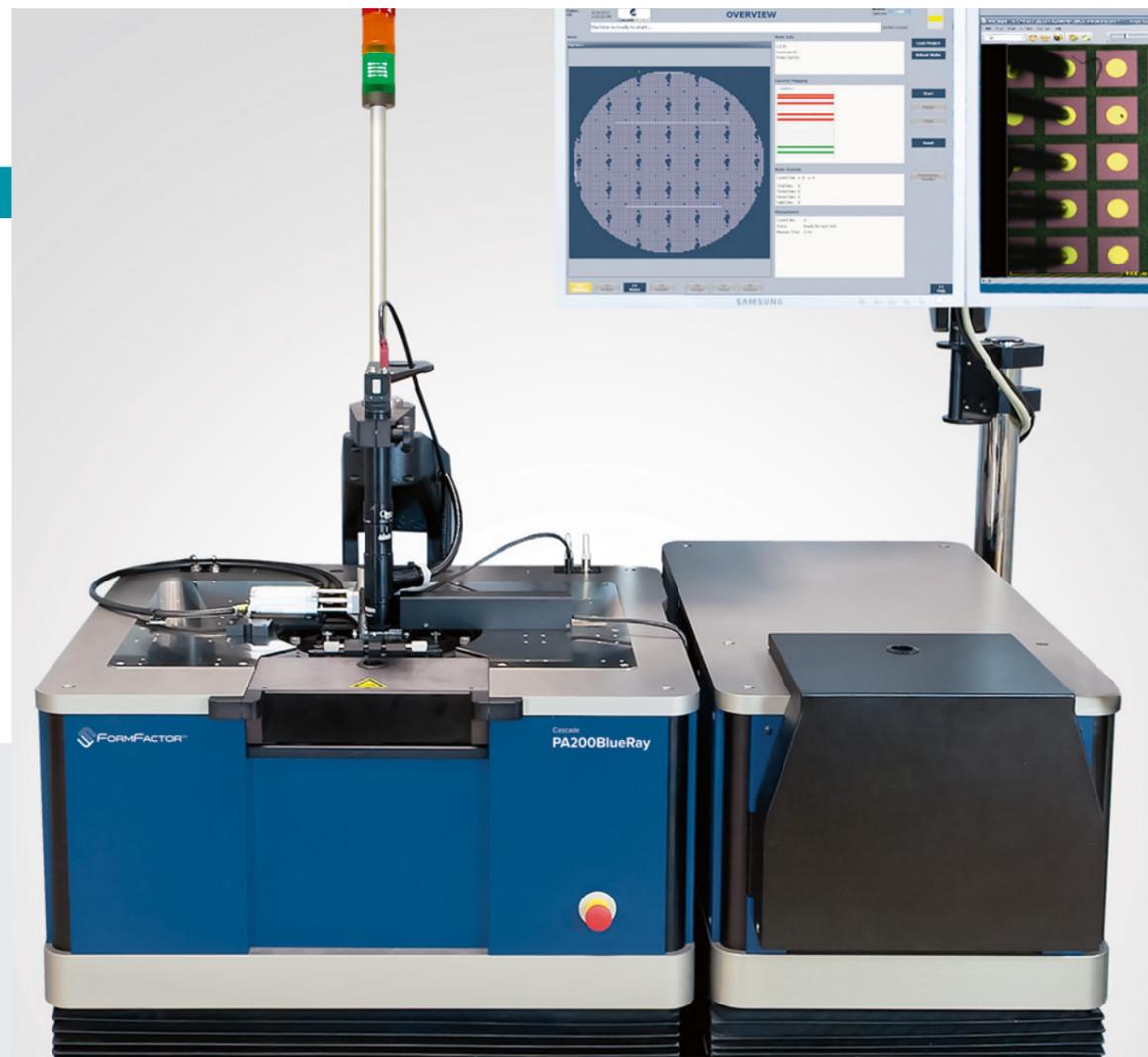
# Summit 11000

## 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-AP	Summit 11000-M
Optimized for	1/f Low noise CV	IV/CV RF/mmW/THz Opto Wafer level reliability
EMI shielding	≥30 dB 3-20 GHz (typical)	≥ 20 dB 0.5-20 GHz (typical)
Light attenuation	≥120 dB	
Spectral noise floor	≤-170 dBVrms / rHz (≤1 MHz)	≤-150 dBVrms / rHz (≤1 MHz)
System AC noise	≤5 mVp-p (≤1 GHz)	≤15 mVp-p (≤1 GHz)
Automation	Manual	
Thermal range	-60° C ... +300° C	
Wafer loading	Unique roll-out chuck	



# BlueRay

## 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.”

	PA200 BlueRay	PA200DS BlueRay
<b>Optimized for</b>	RF/mmW Opto MEMS	RF/mmW Opto MEMS
<b>Automation</b>		Semi-automatic Fully-automatic
<b>Thermal range</b>	Ambient ... +150° C	Ambient
<b>Backside emission support (DSP)</b>	—	✓
<b>Backside instrumentation e. g.</b>	—	Integrating sphere Fiber setup Pressure module
<b>Wafer fixation</b>	Vacuum	Vacuum, clamped
<b>Z stage resolution</b>	0.25 µm	0.25 µm



PM8 / EPS200

## 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	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	
Positioner 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	
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		IV/CV RF/mmW Failure analysis Wafer level reliability Silicon photonics 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	Open	EMI shielding	Open
Automation	Semi-automatic Fully-automatic	Semi-automatic Fully-automatic	Semi-automatic Fully-automatic	Semi-automatic Fully-automatic	Manual	Manual
Thermal range	-60 ... +300° C	-60 ... +300° C	-60 ... +300° C	Ambient ... +300° C	-60 ... +300° C	Ambient ... +300° C
Material handling unit	Option	Option	Option	Option	—	—
Dual automatic system	—	Option	Option	Option	—	—



# CM300xi / CM300

## 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-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)	≤20 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		



# CM300xi ULN

## Highlights

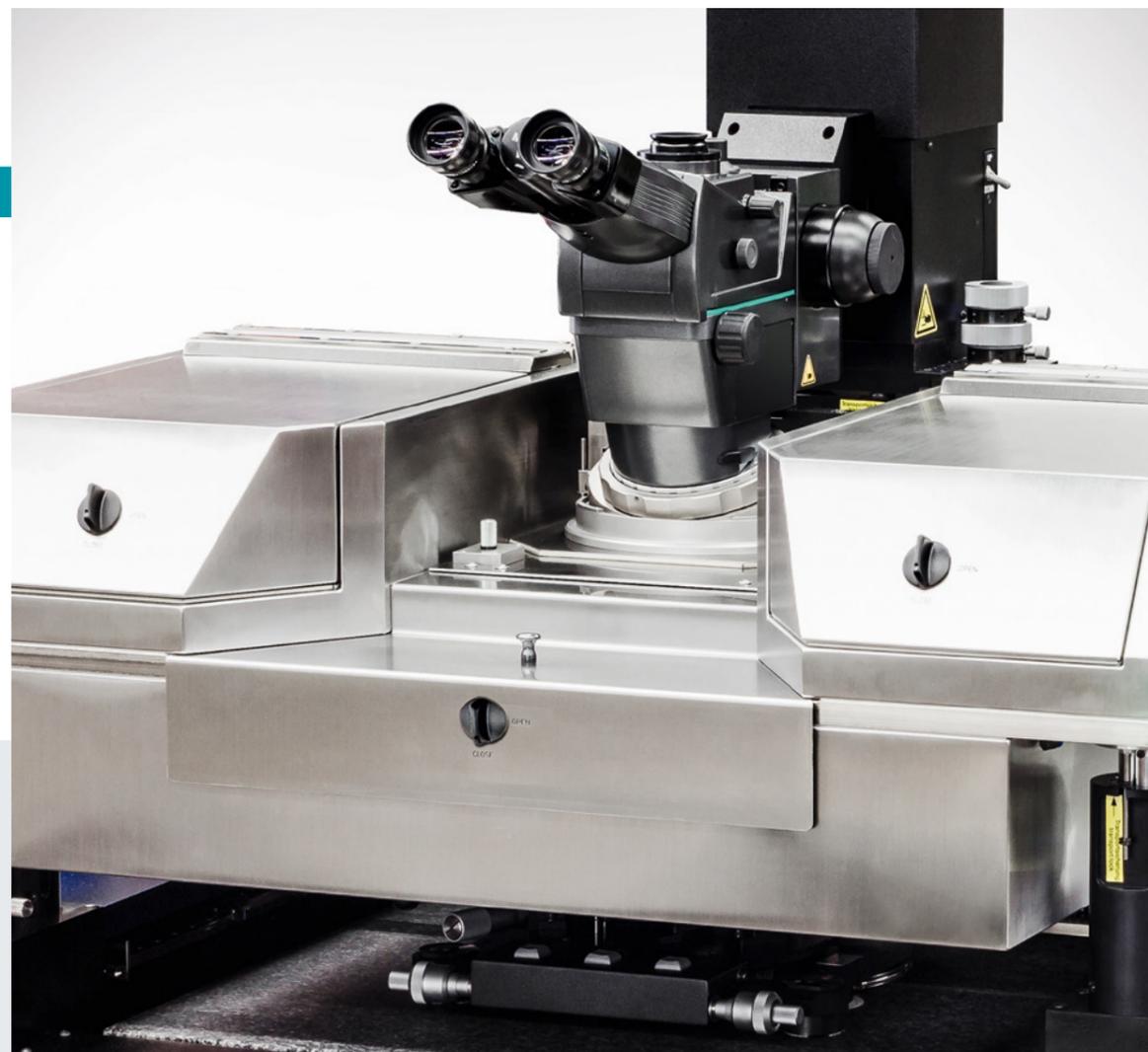
- / First automated probe station to achieve -190dB spectral noise
- / Plug In and Go: Integrated TestCell Power Management
- / Autonomous 24/7 Operation: Up to 4x faster flicker noise thermal testing on 30 μm pads
- / Reduce Setup Time and Costs: Exclusive low noise site survey, and system verification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

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



## CM300xi-ULN

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



PM300PS / PM300

## Highlights

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

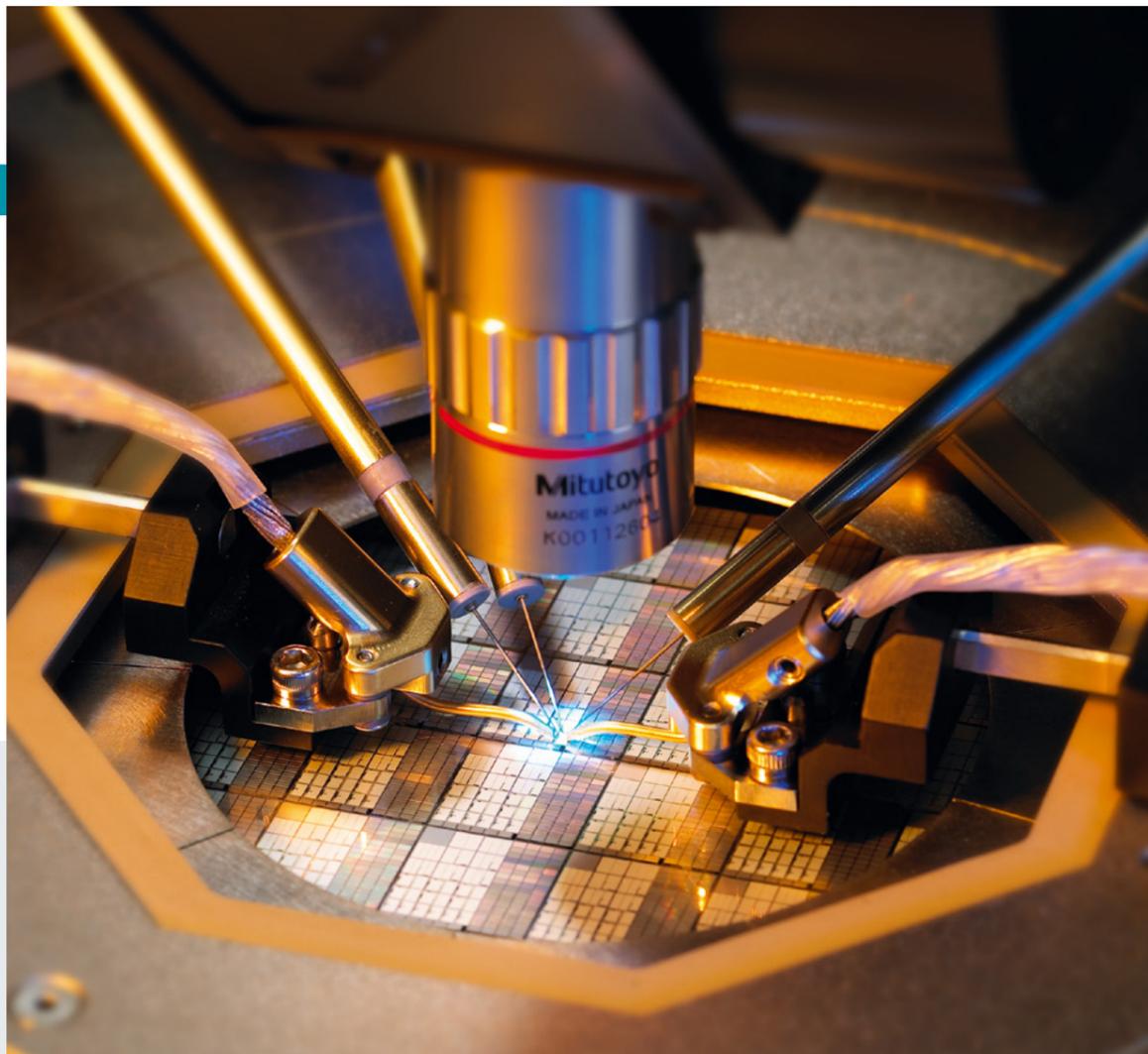
“The Cascade PM300 analytical probe system enables highly-precise manual semiconductor failure analysis and in-process testing.”

	PM300PS	PM300
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 ... +300° 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	MEMS devices IR imaging devices Optoelectronic test Compound semiconductor devices Superconductor devices Cutting edge technologies
Shielding	Shielded	Shielded
Automation	Manual Semi-automatic Fully-automatic	Manual Semi-automatic
Thermal range	-55° C ... +300° C	< 7 K ... +300° C



# High Power Systems

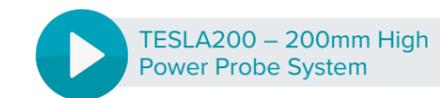
## Highlights

- / 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.”



	TESLA200	T200	EPS150TESLA
Wafer size	200 mm	200 mm	150 mm
Contact Intelligence Technology	✓	—	—
Automation	Semi-automatic Fully-automatic	Manual	Manual
Thermal range	-55° C ... +300° C / 400° C	-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	600 A (pulsed), 20A (DC)	200 A (pulsed), 10A (DC)	40 A (pulsed), 2 A (DC)





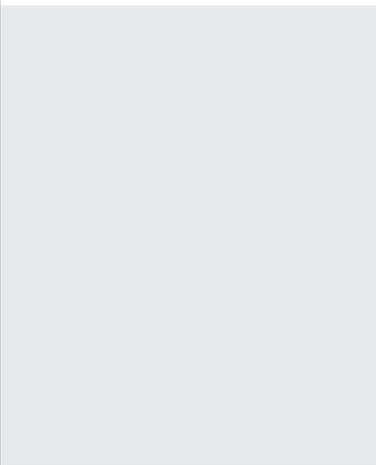
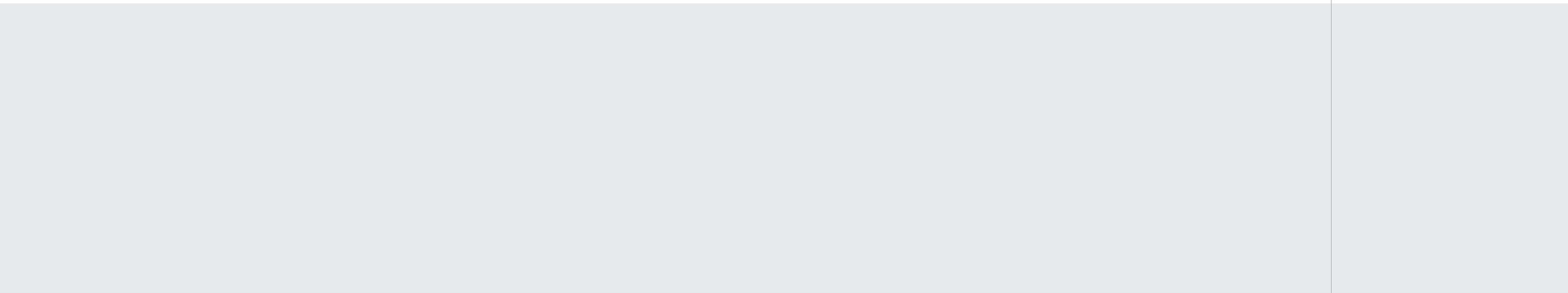
## Vacuum / Cryogenic Systems

### Highlights

- / Unique wafer-level probing down to 7 K
- / Test of devices (e.g. MEMS) in a high vacuum ( $<1 \times 10^{-5}$  mbar)
- / Manual and semi-automatic versions up to 200 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.”

	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		
Automation level	Manual	Manual	Semi-automatic	Semi-automatic	Manual	Manual	Semi-automatic
Wafer size	Up to 150 mm	Up to 200 mm	Up to 200 mm	Up to 200 mm	Up to 100 mm	Up to 200 mm	Up to 200 mm
Thermal range	-60° C ... +300° C	-60° C ... +300° C	-60° C ... +300° C	-60° C ... +300° 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 < 20 K with liquid helium
Vacuum down to	$<1 \times 10^{-5}$ mbar	$<1 \times 10^{-5}$ mbar	$<1 \times 10^{-5}$ mbar	$<1 \times 10^{-5}$ mbar or 4.0 bar (in overpressure environment)	$<1 \times 10^{-5}$ mbar	$<1 \times 10^{-5}$ mbar	$<1 \times 10^{-5}$ 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	Frontside	Topside	Frontside	Frontside



Applications  
8 - 17

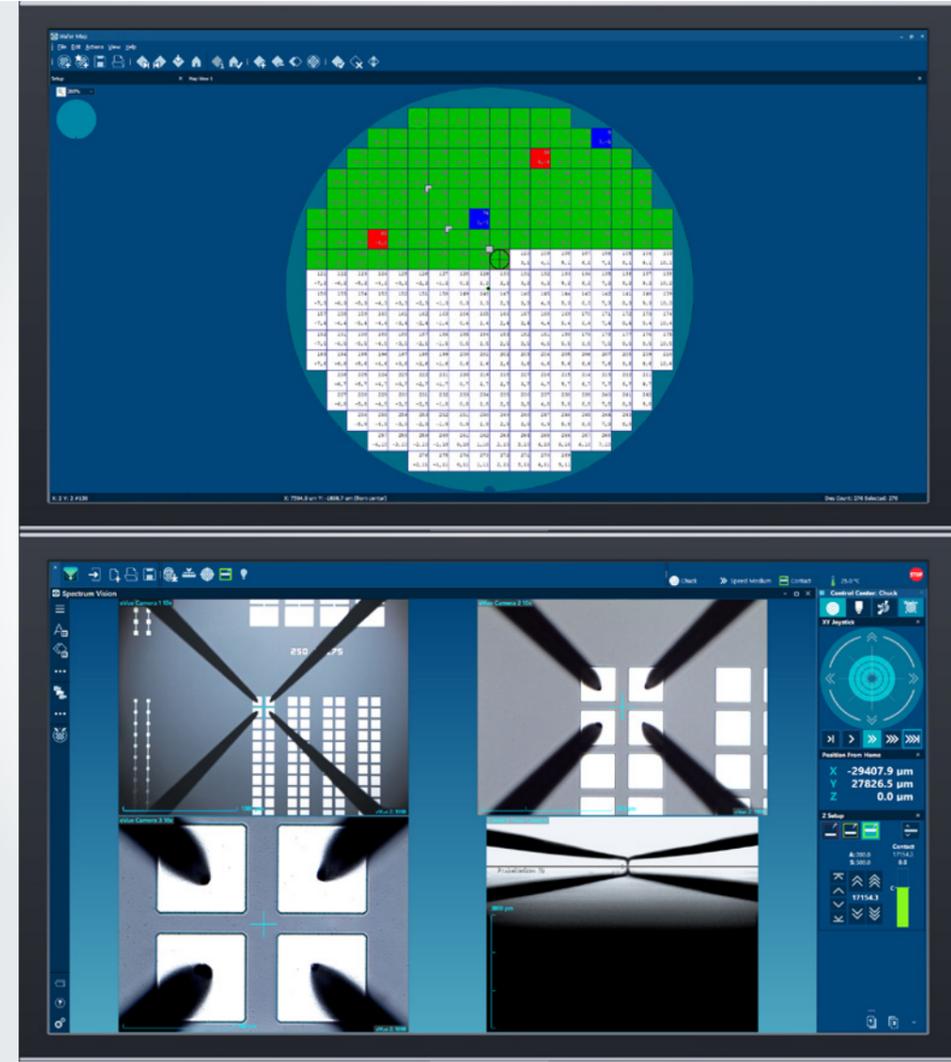
Technologies  
18 - 21

Systems  
22 - 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”

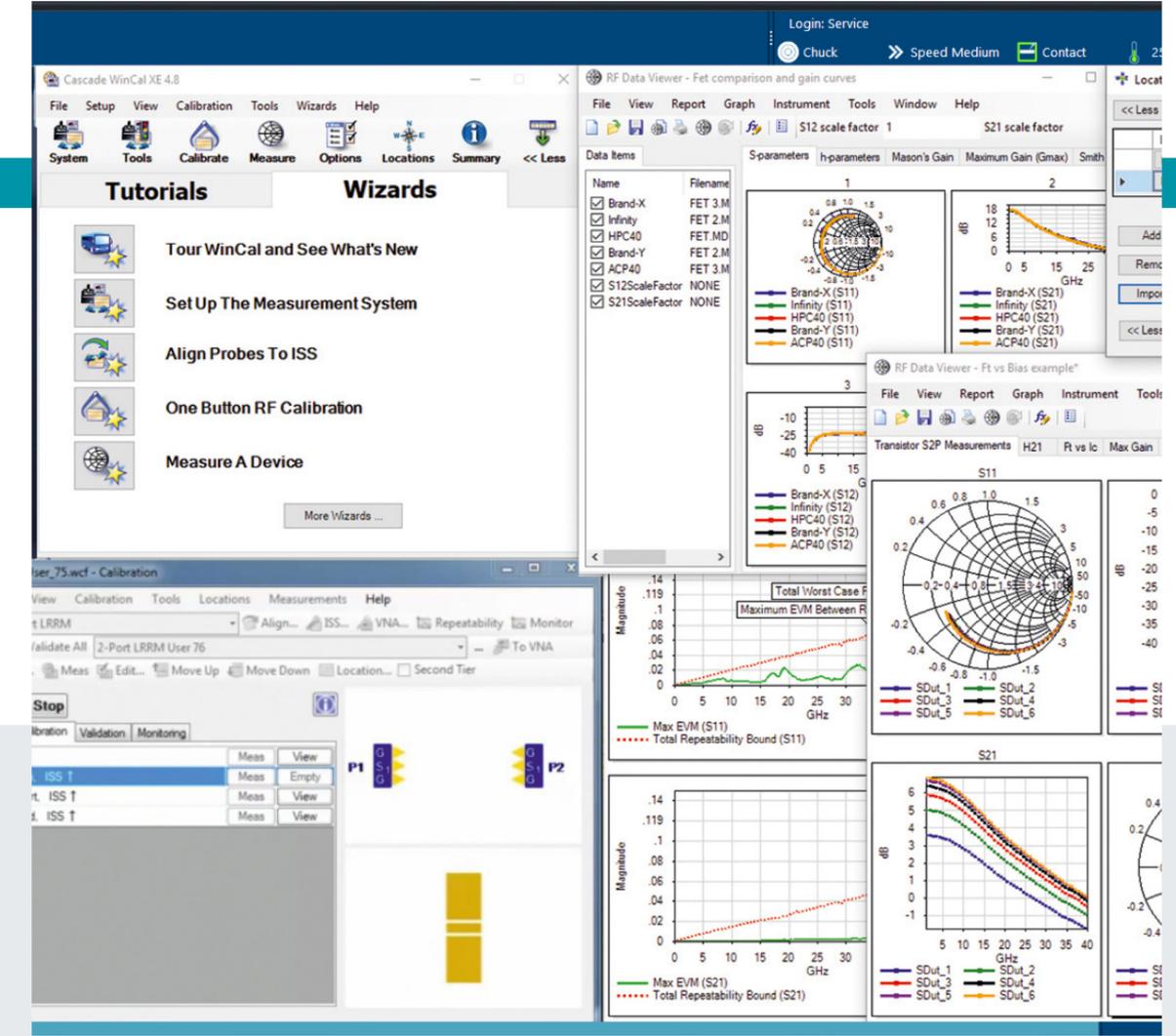


Velox™ Probe Station Control Software

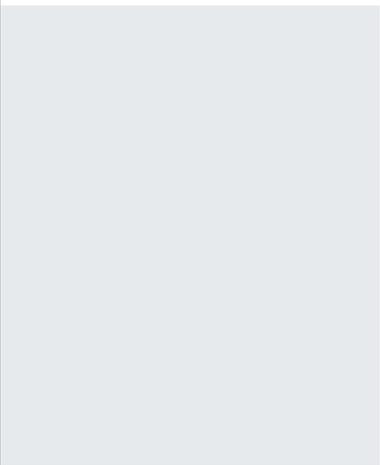
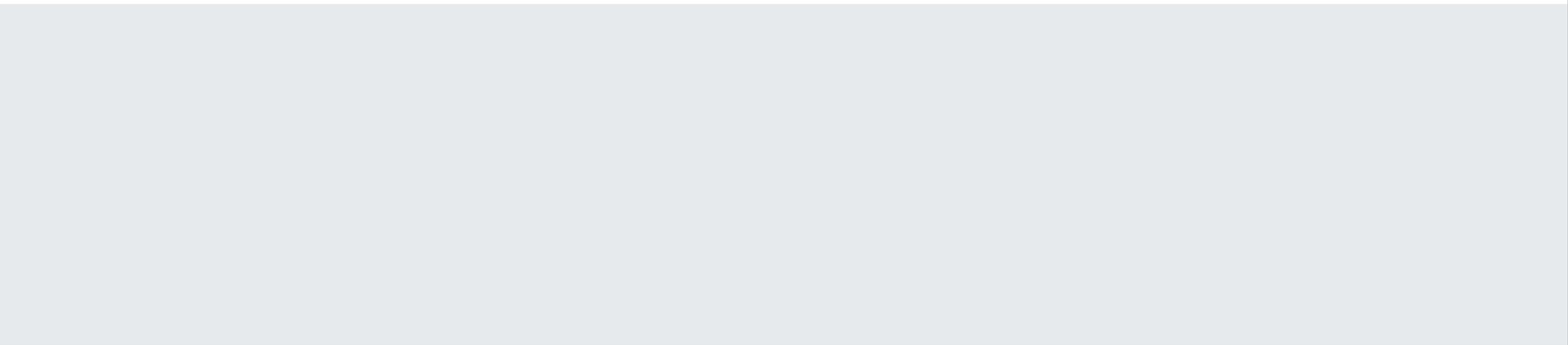
### Highlights

- / Achieve the most accurate and repeatable calibrations every time
- / 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 measurement calibration software.”



WinCal XE™ RF Calibration Software



Applications  
8 - 17

Software  
54 - 57

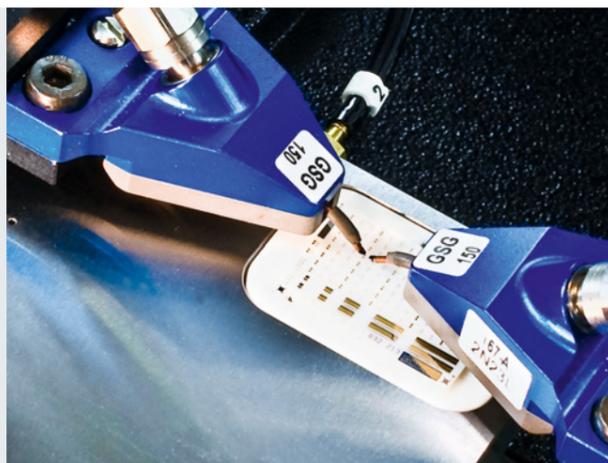
Technologies  
18 - 21

**Accessories  
58 - 61**

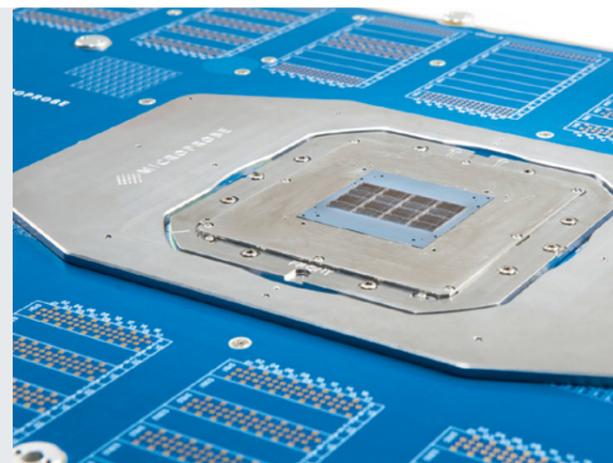
Systems  
22 - 53

Programs  
62 - 65

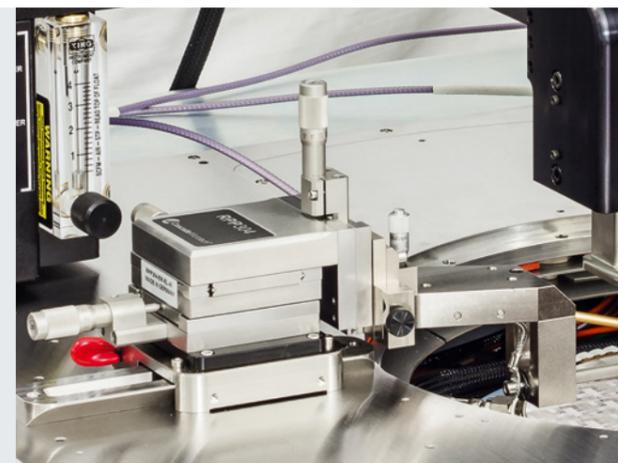
# Full Range of Accessories



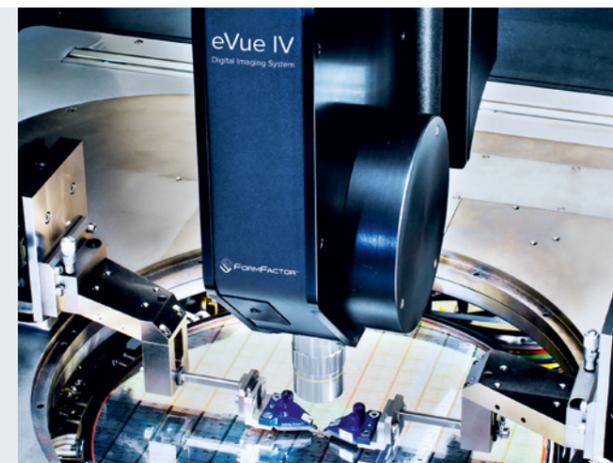
/ Probes  
/ Calibration Substrates



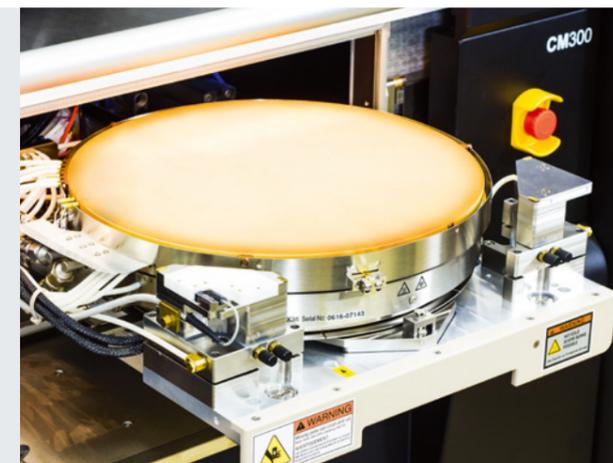
/ Probe Cards



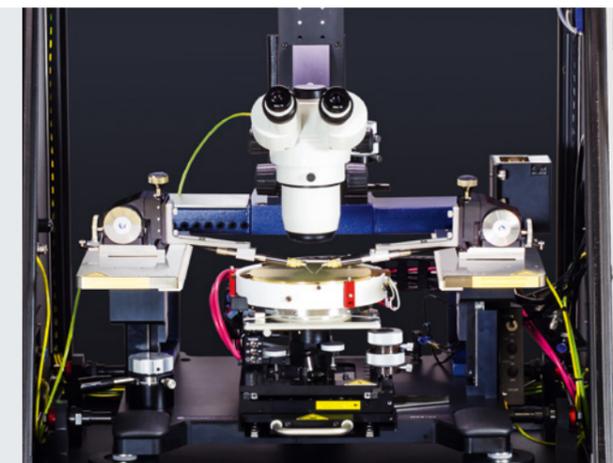
/ Positioners  
/ Probe Mounts



/ Microscopes

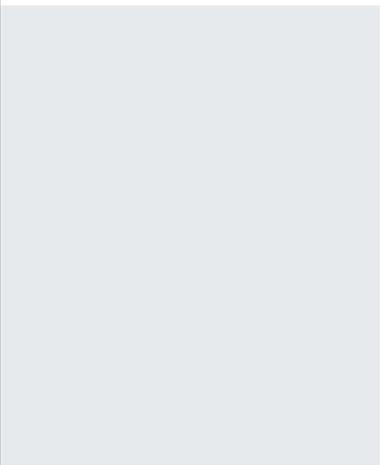
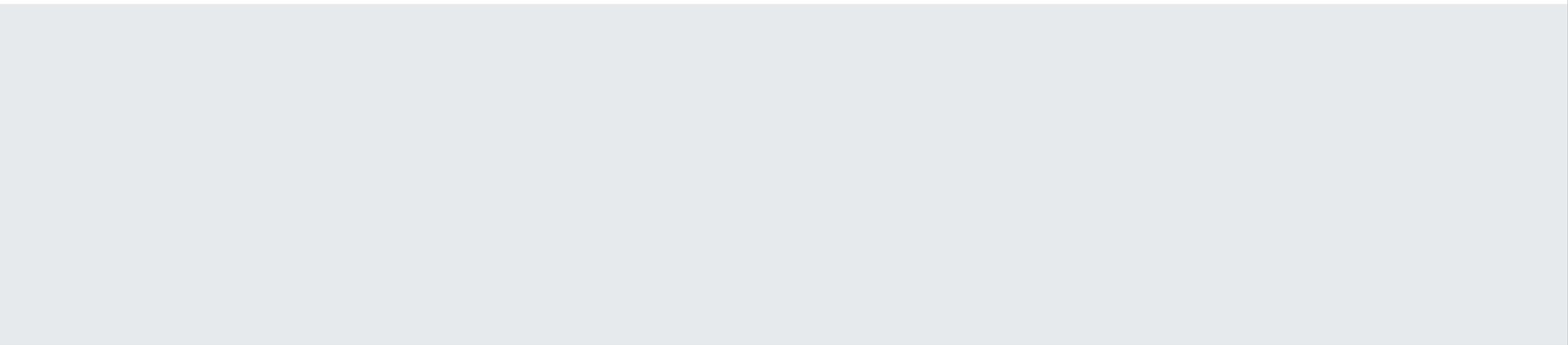


/ Chucks  
/ Thermal Systems



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

 eVue IV  
Digital Imaging System 



Applications  
8 - 17

Software  
54 - 57

Technologies  
18 - 21

Accessories  
58 - 61

Systems  
22 - 53

**Programs  
62 - 65**

## 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 FreeWinCal XE™ 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 - Protect Your Test Investment

Our SourceOne program brings quality and industry-leading performance to the secondary equipment market. Whether you choose to purchase a reconditioned probe system or trade in your old equipment (or simply let us buy it back!) – We will support you every step of the way, from order to installation.

### 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 and handling
- / Competitive market rates

### Pre-owned Equipment

- / Purchasing from OEM removes the risk from used equipment acquisition
- / Support from order configuration through setup reduces time to first measurement
- / Complete factory refurbishment ensures like-new performance
- / Standard one-year factory warranty on probe stations is an extra assurance of quality



# Product Safety and Ergonomy

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

<b>Quality</b> ✓	<b>Safety</b> ✓	<b>Ergonomics</b> ✓	<b>Environment</b> ✓
<ul style="list-style-type: none"> <li>/ ISO 9001 : 2015</li> <li>/ Products and services meet all customer and regulatory requirements</li> <li>/ Continual improvement of products and processes</li> </ul>	<ul style="list-style-type: none"> <li>/ SEMI S2, cNRTLus, CE, UL</li> <li>/ Compliance with safety, health and environmental requirements to prevent or reduce the risk of injury</li> </ul>	<ul style="list-style-type: none"> <li>/ SEMI S8</li> <li>/ Straightforward design</li> <li>/ Easy and ergonomic operation</li> </ul>	<ul style="list-style-type: none"> <li>/ ISO 14001 : 2015, RoHS</li> <li>/ Prevention of pollution</li> <li>/ Reduced consumption of natural resources</li> <li>/ Minimization of waste</li> <li>/ No use of hazardous materials</li> </ul>

Certifications in collaboration with TÜV SÜD and TÜV Rheinland.



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