Cascade

TESLA200

200 mm On-Wafer Power Semiconductor Probing System

Overview

Designed specifically for IGBT/power MOSFET (GaN, SiC, Si) device measurements at the wafer level, the new TESLA200 on-wafer power semiconductor probing system is engineered to provide accurate data up to 3,000 V (triaxial) / 10,000 V (coaxial) and 200 A (standard) / 600 A (high current). With next-generation test capabilities, anti-arcing solutions, wafer automation, and support for both engineering probes and T.I.P.S. “LuPo” High Voltage / High Power Probe Cards, the TESLA200 now enables complete thermal testing (-55°C to 300°C) with fully-automatic thin / TAIKO wafer loading. One system covers all on-wafer high power test needs, from R&D to niche production.

The new TESLA200, available in semi-automatic and fully-automatic models, is scalable and field upgradeable, allowing it to meet any budget requirements. The system is ideal for collecting high accuracy measurement data on single or volume wafers as fast as possible, and can be utilized in R&D, device characterization/modelling or niche production applications.

Patented AttoGuard® and MicroChamber® technologies built in TESLA200 significantly improve low-leakage and low-capacitance measurements. In combination with FormFactor’s patented TESLA FemtoGuard™ thermal chuck technology, the TESLA200 provides an ultra-low noise, fully guarded and shielded test environment. The high-power TESLA FemtoGuard chuck also incorporates MicroVac™ technology enabling low-contact resistance, thin-wafer handling and maximum power dissipation.

To ensure the utmost safety during high-voltage measurements, the TESLA200 on-wafer power semiconductor probing system employs a TUV-certified safety interlock system integrated with an ergonomic clear enclosure. With an advanced 200 mm fast stage, automatic wafer loader and thin wafer handling capability, TESLA200 provides everything needed for scientists, R&D / test engineers, or production operators to get their job done fast.

Features / Benefits

High-voltage / Current Probes	• On-wafer power device characterization up to 10,000 V DC / 600 A • Reduced probe and device destruction at high currents up to 20 A DC and 300 A pulse (600 A when two probes are used in parallel) • Increased isolation resistance and dielectric strength to provide full triaxial capability at high voltage (3,000 V) for low-leakage measurement
T.I.P.S. "LuPo" High Voltage / High Power Probe Cards	• On-wafer power device characterization up to 10,000 V DC • Safe and convenient integration kits to support T.I.P.S. "LuPo" High Voltage / High Power Probe Cards
Gold-plated TESLA High-power MicroVac Chucks	• Prevent thin wafers from curling and breaking • Advanced MicroVac chuck surface for minimum contact resistance between wafer and chuck • Accurate Rds(on) measurement at high current • Accurate UIS measurements at high temperature
Safety for Operator	• Safety interlock system with clear enclosure for operator safety during device measurements • Roll-out stage for full wafer access and easy wafer loading/unloading
Seamless Integration	• Convenient connection kits for easy and safe system integration with power device analyzers from Keysight Technologies and other major suppliers • Seamless integration between Velox and analyzers/measurement software
Productivity	• High throughput wafer auto-loading (standard, thinned, warped, TAIKO) • Contact Intelligence enables higher yield, accurate Rds vertical device measurements over temperature automatically • Easy on-screen navigation, wafer mapping, and operation of accessories with Velox software

Available Models

Semi-automated Probe System

Fully-automated Probe System

Note: For physical dimensions and facility requirements, refer to the TESLA200 Facility Planning Guide.

Power Handling

Tesla Chucks	Coax	Standard**	High Current**
Max voltage*	10 kV (coaxial)	3,000 V (triaxial), 10 kV (coaxial)	3,000 V (triaxial), 10 kV (coaxial)
Max current	200 A (pulsed), 10 A (DC)	200 A (pulsed), 10 A (DC)	600 A (pulsed), 20 A (DC)
Power dissipation			100 W generated in 1 cm2 area at -40°C

** Limited to 3kV for lift pin chucks. For automatic handling at higher test voltages, use non-liftpin chuck in combination with top-side wafer end effector.*

*** Performance is determined/selected with the connection breakout cable connecting the universal chuck connector to the instrument. Either max. voltage or max. current can be achieved, not simultaneously.*

Measurement Performance

Typical Chuck Noise (Triaxial)**

		TESLA200 AP Models		TESLA200 M Models		Settling Time***
		Standard	High Current	Standard	High Current	
10 V	-55°C/-50°C/-40°C	20 fA	180 fA	40 fA	180 fA	< 200 fA @ 1.0 sec
	25°C	20 fA	40 fA	40 fA	40 fA	< 200 fA @ 0.5 sec
	200°C	20 fA	120 fA	40 fA	120 fA	< 200 fA @ 1.0 sec
	300°C	30 fA	240 fA	60 fA	240 fA	< 200 fA @ 2.0 sec
3 kV	-55°C/-50°C/-40°C	2 pA	4 pA	4 pA	4 pA	< 15 pA @ 1.5 sec
	25°C	2 pA	4 pA	4 pA	4 pA	< 15 pA @ 1.5 sec
	200°C	3 pA	4 pA	6 pA	4 pA	< 15 pA @ 1.5 sec
	300°C	6 pA	12 pA	10 pA	12 pA	< 15 pA @ 4.5 sec

Typical Chuck Leakage (Coaxial)

		TESLA200 AP Models		TESLA200 M Models	
		Coax / Standard	High Current	Coax / Standard	High Current
3 kV	-55°C/-50°C/-40°C	2 nA	4 nA	2 nA	4 nA
	25°C	2 nA	4 nA	2 nA	4 nA
	200°C	2 nA	4 nA	2 nA	4 nA
	300°C	4 nA	10 nA	4 nA	10 nA
10 kV	-55°C/-50°C/-40°C	7 nA	10 nA	7 nA	10 nA
	25°C	7 nA	10 nA	7 nA	10 nA
	200°C	7 nA	12 nA	7 nA	12 nA
	300°C	14 nA	34 nA	14 nA	34 nA

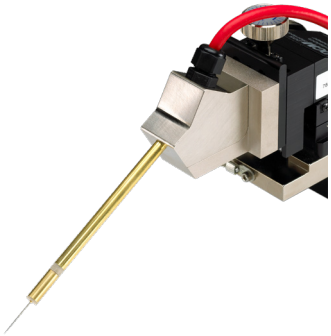
System Residual Capacitance

	TESLA200 AP Models	TESLA200 M Models
Capacitance	4.0 pF	40 pF

*** Overall leakage current is comprised of two separate components: 1) offset, and 2) noise. Offset is the DC value of current due to instrument voltage offset driving through isolation resistance and instrument offset current itself. Noise is low-frequency ripple superimposed on top of offset and is due to disturbances in the probe station environment. Noise and leakage are measured with a B1505A- B1510A (HPSMU) and or B1513A/B/C with Cascade Microtech setups or equivalent; 1s sample interval, auto or 1 nA range, 1 µA compliance, 40 PLC integration. Typical noise values are defined using the standard deviation. The maximum peak noise value may be 2-3 times higher than typical noise values depending on environmental factors such as humidity, vibration, temperature fluctuation, condition of the cable and connectors etc.*

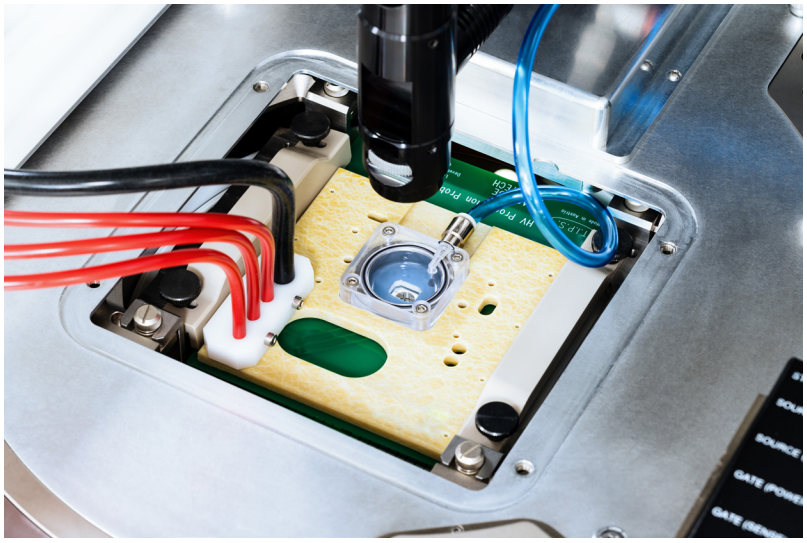
**** Settling time is measured with a B1505A/HPSMU Cascade Microtech setup or equivalent; 2 ms sampling interval, Fixed range: 1 nA, 1 µA compliance, 1 NPLC integration.*

High Power Probes for TESLA200

	Ultra High Power Probe	High-Current Probe	High-Voltage Probe
			
Probe	UHP	HCP-XX	HVP-XX
Current	Up to 300 A	Up to 100 A	Up to 5 A
Voltage	Up to 10,000 V	Up to 500 V	Up to 3,000 V

**See High-Power Probe data sheet for more information.*

T.I.P.S. “LuPo” High Voltage / High Power Probe Cards



- Chip scale pressure chamber surrounds DUT to increase breakdown voltage
- On-wafer power device characterization up to 10,000 V DC
- Non-thermal and thermal probe cards with temperatures up to 200°C
- Engineering and production probe cards

MicroChamber Performance

Electrical	TESLA200 AP Models	TESLA200 M Models
Integrated technologies	AttoGuard and PureLine	
EMI shielding	≥ 20 dB 0.5-3 GHz	≥ 20 dB 0.5-20 GHz (typical)
	≥ 30 dB 3-20 GHz (typical)	

Light Shielding	
Type	Complete dark enclosure around chuck
Wafer access	Front access door with rollout stage for easy manual wafer loading
	Side access door for fully automatic wafer loading
Probe compatibility	Standard MicroChamber TopHat™ allows access for up 8 probes
	Quad MicroChamber TopHat™ allows access for up 4 probes
Light attenuation	≥ 120 dB

Purge and Condensation Control	
Test environment	Low volume for fast purge, external positioning and cable access to maintain sealed environment
Dew point capability	> -65° C for frost-free measurements*
Purge gas	Dry air or nitrogen*
Purge flow rate	Standard purge - manual controls, variable 0 to 110 l/min (4 CFM) at SATP
	Quick purge - manual/automated software control, standard purge rate or maximum > 110 l/min (4 CFM) at SATP*
Purge time	15 min for measurements @ -55°C (typical)
External condensation control	Integrated laminar-flow air distribution on external MicroChamber surfaces to eliminate condensation
	Controls for ON/OFF and flow rate for both top and bottom surfaces

**See Facility Planning Guide for details.*

Mechanical Performance*

X-Y Stage	Semi-/Fully-automated
Travel	203 mm x 203 mm (8 in. x 8 in.)
Motion control	High performance stepper motors and manual remote control
Resolution	0.2 µm (0.008 mils)
Feedback system	Closed loop optical linear encoder
Repeatability	≤ 1.5 µm (0.06 mils)
Accuracy	≤ 2 µm (0.08 mils)
Max speed	Up to 100 mm/sec (4 in./sec)

Z Stage	Semi-/Fully-automated
Travel	35 mm (1.4 in.)
Resolution	1 µm (0.04 mils)
Repeatability	≤ 1 µm (0.04 mils)

Theta Stage	Semi-/Fully-automated
Travel	± 7.5°
Resolution	0.5 µm (0.02 mils)**
Repeatability	< 1.5 µm (0.06 mils)**
Accuracy	± 2 µm (0.08 mils)** standard moves
	± 3 µm (0.12 mils)** large moves

** Specification valid for standard chuck. Mecanical performance might slightly deviate for high current chuck. Shown specification data valid for standard stage speed of 75mm/s.*

***Measured at edge of 200 mm chuck*

Platen System

Platen	
Material	Steel for magnetic positioners
Dimensions	74.5 cm (W) x 63.5 cm (D) x 20 mm (T) (29.3 in. x 23.4 in. x 0.78 in.)
Mounting system	Kinematic or fixed
Accessory compatibility	Minimum of 8 DC or 4 RF positioners allowed, compatible simultaneous probe card holder use
HTS thermal management	Integrated laminar-flow air-cooling for thermal expansion control
Standard interface	For MicroChamber, TopHat, probe card holders and custom adapters

Platen Lift*	
Type	Precision 4-point linear lift
Range**	5.0 mm (0.20 in.)
Repeatability	≤ 3 µm (0.12 mils)
Lift control	Ergonomic handle with 90° stroke. Optional micrometer control for fine adjustment of probe card contact.

** Optional on some models.*

*** 3.0 mm for application layers that exceed the platen size to the left*

Platform

General	
Physical dimensions	Please consult Facilities Planning Guide
Vibration isolation	Attenuation ≥ 0 dB @ 6 Hz, 5 dB per octave @ 6 Hz to 48 Hz,≥ 15 dB above 48 Hz*
Probe-force capability	20 kg (44 lb.) maximum
Probe-force deflection	≤ 0.0015 µm/µm slope per 10 kg load
System chuck planarity** (thermal chuck)	< 20 µm (0.8 mils) @ 25°C
	< 30 µm (1.2 mils) @ -60°C
	< 30 µm (1.2 mils) @ 200°C
	< 40 µm (1.6 mils) @ 300°C
Station Controller	High-performance system controller with Velox probe station control software and Windows 10
Die cycling	Chuck stepping time ≤ 0.75 sec (200 µm Z down – 1000 µm X-Y – 200 µm Z up)

* *Please see facilities planning guide for minimal environment background vibrations.*

** *Calibrated within 180 mm diamater area at 25° C.*

Communication Ports

Type	User-accessible	Location	Note
USB 2.0	0	Station Controller - Rear	For security keys and USB instrument control
USB 2.0	(2)	Station Controller - Front	
USB 3.0	1	Station Controller - Rear	
LAN GbE	1	Station Controller - Rear	
RS-232	2	Station Controller - Rear	For instrument control (thermal, microscope, etc).
GPIB IEEE 488.2	1 (option)	Station Controller - Rear	Supplied with USB adapter for test instrument control

Accessory Interface Ports

Type	Qty	Location	Note
Edge-sense	1	IO- / Pneumatic module	Probe card contact sense
INKER	2	IO- / Pneumatic module	Control for die inker

Wafer and AUX Chuck

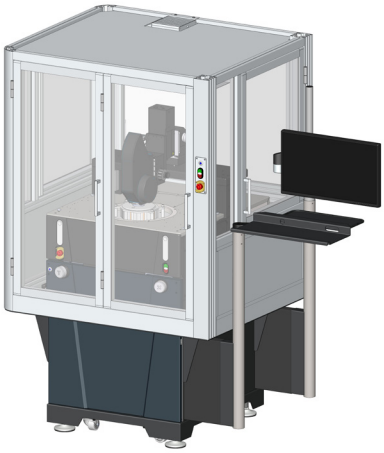
Wafer Chuck	Coax	Standard	High Current
Type	HV Coaxial (standard & 3kV)	HV FemtoGuard Triaxial	HV FemtoGuard Triaxial
Diameter			
200 mm (8in.) - Thermal	●	●	●
200 mm (8in.) - Non Thermal	●	●	
Material	Gold (Au) plated aluminum		
Electrical connection	Dual HV triax cables with integrated chuck port (except Coax 3kV - SHV connectors)		
Supported measurement modes			
Coaxial	●	●	●
Triaxial	●	●	
Vacuum uniformity	Patented MicroVac technology using 495 micro-hole pattern for uniform vacuum hold down of thin, warped and partial wafers, and uniform temperature conductivity.		
Vacuum zones	5 selectable zones, with hole patterns arranged in approximately 9, 70, 93, 143 and 178 mm diameters (0.4, 2.8, 3.8, 5.6 and 7 in.)		
Vacuum actuation	Easy access multi-zone manual vacuum controls, and software control (semi-automated)		
Thin wafer support	Thin wafers down to 50 µm and optional support for Taiko wafers		

Auxiliary Chucks	
Quantity	Up to three total AUX chucks
Design	High-voltage 10 kV compatible
Substrate size (maximum)	15.2 mm x 22.1 mm (0.59 in. x 0.87 in.) ISS substrate 19 mm x 19 mm (0.75 in. x 0.75 in.) substrate
Material	Absorber (magnetically loaded) Ceramic
Thermal isolation	Ensures negligible load drift on ISS
Flatness	≤ 8 µm (0.3 mils) adjustable planarity
Vacuum actuation	Independently controlled apart from wafer vacuum zones

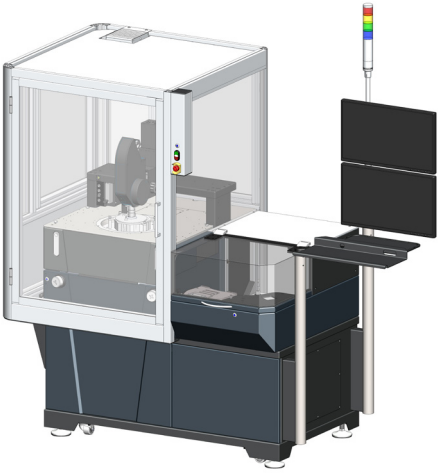
Tesla Safety Systems

TUV-certified Safety System and Enclosure for TESLA200 Power Semiconductor Probing System

- Safety-rated interlock system for high-power testing (meets EN 60947-5-1, EN 60204-1)
- Impact resistant safety approved clear enclosure
- Front opening door for ergonomic test setup and operation
- Side and rear access panels for easy equipment configuration
- Integrated design using TESLA200 universal mounting system



TESLA200 Semi-automated Model



TESLA200 Fully-automated Model

Wafer Loader

Test Automation	
Supported cassettes	25 wafers with 100 mm or 150 mm (SEMI E1) or 200 mm (SEMI E1 like)*
Cassette stations	Up to 2
Wafer handling	Wafers in compliance with SEMI M1 Handling of non-SEMI M1 compliant (“thin”) wafers to be tested prior to quote, special solutions available
Pre-alignment	Optical pre-aligner with flat/notch detection Translucent wafer materials require test prior to quote
Wafer ID reading	Optional at top or bottom side (user changeable) Supports barcode (BC 412 SEMI T1-95 standard) and IBM 412, OCR text (SEMI M12, M13 and M1.15 standard), IBM, triple and OCR-A fonts or 2D code (Data Matrix T7 and M1.15 standard)
Quick access port	Optional – storage of up to 2 wafers (100 mm / 150 mm / 200 mm) for throughput enhancement or procedure support
Wafer handling @ ambient	≤ 18 sec cassette load (incl. wafer scan) after latching door ≤ 38 sec first wafer (cassette → pre-aligner → prober chuck) (SEMI M1 wafer) ≤ 47 sec next wafer with quick access port (prober chuck → wafer unload and next wafer → prober chuck) ≤ 57 sec next wafer without quick access port (prober chuck → wafer unload and next wafer → prober chuck)
Automation management	Integrated into Velox Probe Station Control Software. The creation of workflows and receipts is as simple as it can get.

** Restrictions may apply for 200 mm cassettes of some vendors, as there is no uniform standard. Double-check required to confirm compatibility.*

Wafer Loader (continued)

Wafer End Effector

X2-EHS48	Wafer end effector for auto-loading, standard, 4-8" wafers	• With standard wafer scanner for standard silicon wafers • Bottom side wafer lifting blade with vacuum hold • For standard thickness and “low warp” thinned wafers • Requires wafer chuck with lift pins
X2-EHS48P	Wafer end effector for auto-loading, standard, 4-8” wafers	• With advanced wafer scanner for non-silicon, glass and non-standard wafers • Bottom side wafer lifting blade with vacuum hold • For standard thickness and “low warp” thinned wafers • Requires wafer chuck with lift pins
X2-EVTS48	Wafer end effector for auto-loading, top-side, 4-8" wafers	• Top-side wafer lifting blade, patented Vacuum Grip (3-point/center) • Optimized for “compliant handling” of warped thinned wafers • Supports standard wafers and all chucks (with or without lift pins)
X2-ECTS68	Wafer end effector for auto-loading, top-side, edge, 6-8" wafers	• Top-side wafer lifting blade with CYCLONE “Bernoulli” design • Edge grip for warped thinned wafers (6 mm exclusion required) • Supports standard wafers and all chucks (with or without lift pins)
X2-ECTS4	Wafer end effector for auto-loading, top-side, edge, 4" wafers	• Top-side wafer lifting blade using CYCLONE “Bernoulli” design • Edge grip for warped thinned wafers (6 mm exclusion required) • Supports standard wafers and all chucks (with or without lift pins)

Velox Probe Station Control Software

The TESLA200 is equipped with Velox probe station control software and optional VeloxPro SEMI E95-compliant test executive software that enables simplified and safe automation of the entire wafer test cycle. Operating system is Windows 10.

Velox Probe Station Control Software

Velox software provides all features and benefits required for semi- and fully-automated operation of the probe system, such as:

- **User-centered design:** Minimized training costs and enhanced efficiency.
- **Windows 10 compatible:** Highest performance and safe operation with state-of-the-art hardware.
- **Loader integration:** No need for any additional software. Easy creation of workflows and receipts.
- **Smart automation features:** Faster time to data due to reduced test cycle times.
- **Hundreds of tuneable options:** High flexibility for a large variety of applications.
- **Simplified operation for inexperienced users:** Reduced training costs with Workflow Guide and condensed graphical user interface.

VeloxPro Package (Optional)

VeloxPro is a SEMI E95-compliant enhancement with test executive capabilities, featuring:

- **SEMI E95-compliant** probe station control software with condensed graphical user interface for simplified operation
- **Test executive software** enabling control of third-party measurement equipment via the probe station

Tester Interface

The TESLA200 uses commands through GPIB as a permanent listener. The GPIB interface provides the ability to:

- Request an inventory of all wafers available in the cassettes
- Define a wafer map
- Define a job (out of wafers and recipe)
- Change chuck temperature and initiate re-alignment
- Receive notifications when the wafer is aligned and ready to test

Thermal System Performance

Thermal System Overview			Coax	Standard	High Current
Temperature ranges	-50°C to 200°C, ATT, liquid cool (200 mm)		●	●	●
	-55°C to 300°C, ATT, air cool (200 mm)		●	●	●
	-40°C to 300°C, ATT, air cool (200 mm)		●	●	●
	+20°C to 300°C, ATT, air cool (200 mm)		●	●	●
	+30°C to 300°C, ATT, air cool (200 mm)		●	●	●
Wafer temperature accuracy	Standard[1, 2]	± 2.5°C at 100°C			
	High Accuracy[3]	± 0.05°C (0 to 250°C)			
Thermal uniformity	Coax, Standard, High Current[4]	≤ ± 0.5C° @ 25°C, ≤ ± 1.5°C @ -60°C, ≤ ± 0.85°C @ 200°C, ≤ ± 1.5°C @ 300°C			

1. As measured with an Anritsu WE-11K-TSI-ANP or WE-12K-GW1-ANP type K thermocouple surface temperature measurement probe with offset calibration procedure. Conditions: closed chamber with minimum recommended purge air, probe centered on a blank silicon wafer, chuck at center of travel and standard probe height. Typical type K thermocouple probe tolerances are ±2.2°C or ±0.75% of the measured temperature in °C (whichever is greater).

2. The test setup can change the wafer temperature accuracy from the calibration by ±5°C (typical). Test setup attributes include open or closed chamber, probe or probe card construction and number of contacts, purge air flow rate, and lab environmental conditions.

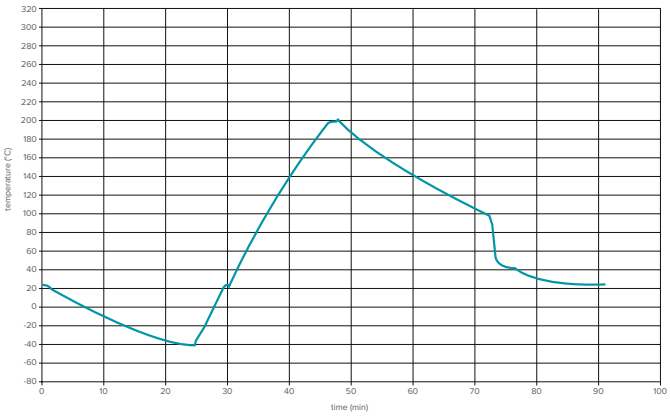
3. Special high accuracy calibration using KLA Sense array wafer (Consult factory for pricing and availability)

4. As measured at DUT (device under test) probing location.

ATT Thermal System Specifications, 200 mm (liquid cool, -55°C to 200°C)

Temperature ranges	-55°C to 200°C
Transition time – Heating (-55°C to 25°C)	5 min (typical)
Transition time – Heating (25°C to 200°C)	14 min (typical)
Transition time – Cooling (200°C to 25°C)	34 min (typical)
Transition time – Cooling (25°C to -55°C)	20 min (typical)
Temperature resolution	0.1° C
Audible noise	< 60 dB (A)

ATT Thermal Transition Time (-55°C to 200°C)

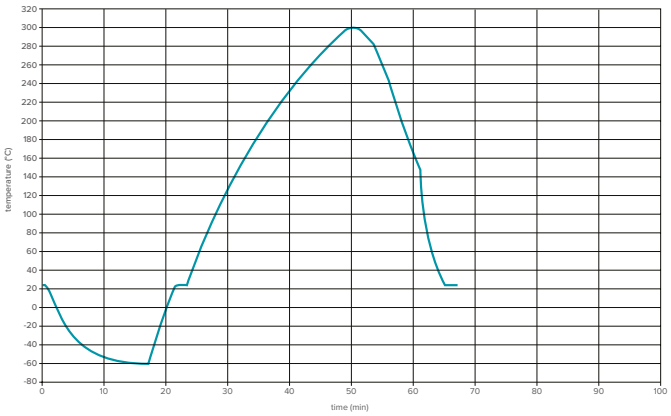


Typical times using TESLA200-AP with FemtoGuard Chuck.

ATT Thermal System Specifications, 200 mm (air cool, -60°C to 300°C)

Temperature range	-60°C to 300°C
Transition time – Heating (-60°C to 25°C)	5 min (typical)
Transition time – Heating (25°C to 300°C)	27 min (typical)
Transition time – Cooling (300°C to 25°C)	15 min (typical)
Transition time – Cooling (25°C to -60°C)	15 min (typical)
Temperature resolution	0.1°C
Audible noise	< 63 dB (A)

ATT Thermal Transition Time (-60°C to 300°C)



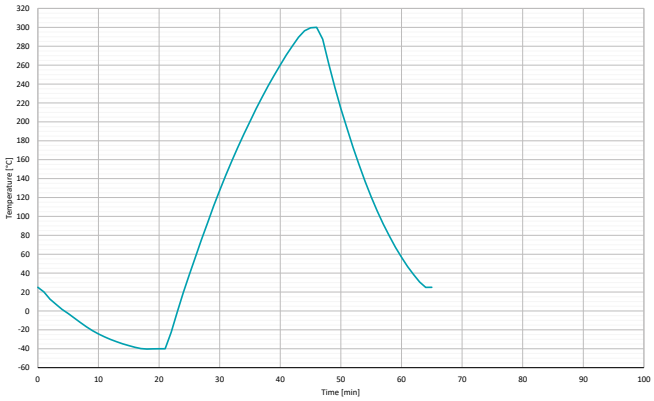
Typical times using TESLA200-AP with FemtoGuard Chuck.

Thermal System Performance (continued)

ATT Thermal System Specifications, 200 mm (air cool, -40°C to 300°C)

	Standard Mode	Power Mode
Temperature range	-40°C to 300°C	-40°C to 300°C
Transition time – Heating (-40°C to 25°C)	5 min (typical)	5 min (typical)
Transition time – Heating (25°C to 300°C)	27 min (typical)	27 min (typical)
Transition time – Cooling (300°C to 25°C)	18 min (typical)	14 min (typical)
Transition time – Cooling (25°C to -40°C)	22 min (typical)	19 min (typical)
Temperature resolution	0.1°C	0.1°C
Audible noise	< 55 dB (A)	< 55 dB (A)

ATT Thermal Transition Time (-40°C to 300°C)

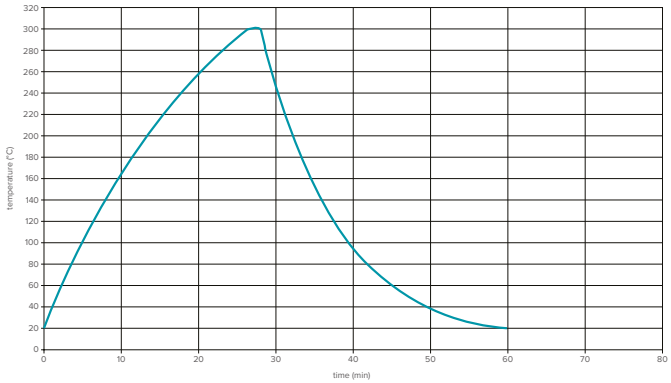


Typical times using TESLA200-AP with FemtoGuard Chuck.

ATT Ambient Option Specifications, 200 mm (air cool, + 20°C to 300°C)

Temperature range	+ 20°C to 300°C
Transition time - Heating	27 min 200 mm (typical)
Transition time - Cooling	31 min 200 mm (typical)
Temperature resolution	0.1°C
Audible noise	< 55 dB (A)

ATT Thermal Transition Time (+20°C to 300°C)

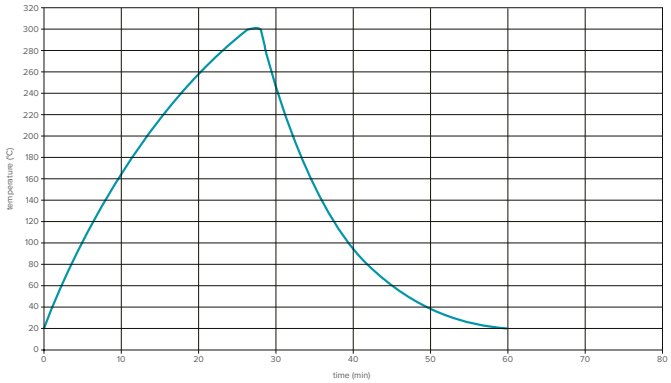


Typical times using TESLA200-AP with FemtoGuard Chuck.

ATT Ambient Option Specifications, 200 mm (air cool, +30°C to 300°C)

Temperature range	+ 30 to 300°C
Transition time - Heating	25 min (typical)
Transition time - Cooling	36 min (typical)
Temperature resolution	0.1°C
Audible noise	< 55 dB (A)

ATT Thermal Transition Time (+30°C to 300°C)



Typical times using TESLA200-AP with FemtoGuard Chuck.

TESLA200 Station Models and Included Features

Station Type	Fully-automated		Semi-automated	
Models	**AP**	**M**	**AP**	**M**
Features				
High-power safety enclosure (TUV certified)	●	●	●	●
MicroChamber for dark, dry and enhanced EMI-shielding enclosure	●	●	●	●
PureLine technology for premium signal path fidelity	●		●	
AttoGuard for enhanced IV and CV testing	●		●	
Fully-automatic station (base) • Precision 4-axis 200 mm wafer stage • High rigidity universal platen for stable probe contact • Station frame with integrated control electronics and computer (with LCD, ergo mounts) • Passive vibration isolation for full-auto station frame • Automatic wafer loader module (incl. single cassette port, robot, pre-aligner) • Velox probe station control software, with + Complete automation tools - AutoAlign, AutoDie, AutoXYZT Correction + Thermal control, video window, wafermap, remote access • User guides, tools, and accessories, and universal power cord kit	●	●		
Semi-automatic station (base) • Precision 4-axis 200 mm wafer stage • High rigidity universal platen for stable probe contact • Station frame with integrated control electronics and computer (with LCD, ergo mounts) • Passive vibration isolation for semi-auto station frame • Velox probe station control software, with + Complete automation tools - AutoAlign, AutoDie, AutoXYZT Correction + Thermal control, video window, wafermap, remote access • User guides, tools, and accessories, and universal power cord kit			●	●
Microscope bridge / transport – High stability programmable 50 mm (2x2”) (X2-TMT50P)	●		●	
Microscope bridge / transport – High stability manual 50 mm (2x2”) (X2-MT50)		●		●
Manual XY ergonomic controls for motorized wafer stage (X2-TXYCTRL)	●		●	
Precision 4-point platen lift and kinematic mount (X2-PLA)	●		●	
Fixed platen mount (X2-FPM)		●		●
High temperature stability module for platen (X2-HTSM)	●		●	
Fixed chuck mount adapter (non-rollout) (X2-FCM)	●	●		
Wafer chuck rollout module (X2-WRO)			●	●
Smart door lock for MicroChamber (X2-DLCK)	●		●	
AUX chucks - High Voltage (positions 1 and 2) (X2-TAUXA1 and X2-TAUXA2)	●		●	
Platen insert - MicroChamber TopHat (8 sides) with AttoGuard (X2-PIMTH8A)	●		●	
Platen insert - MicroChamber TopHat (8 sides) (X2-PIMTH8)		●		●
GPIB Interface (X2-GPIB)	●	●	●	●

● *= Base features and options included in Model/Package (consult FormFactor representative for more information).*

Thermal Options

TESLA200 Non-Thermal Chucks		Chuck Compatibility	
Part Number	**General Description**	**AP**	**M**
TC-007-2x4	Coaxial TESLA Chuck, non-thermal, 200mm (8"), Au		●
TC-007-2x4-SHV	SHV Coaxial TESLA Chuck, non-thermal, 3kV with SHV connectors, 200mm (8"), Au		●
TC-007-4x4	FemtoGuard Triaxial TESLA Chuck, non-thermal, 200mm (8"), Au	●	●

TESLA200 Thermal Chucks		Cooling	Chuck Compatibility	
Part Number	**General Description**		**AP**	**M**
TC-417-2x4	Coaxial TESLA Chuck, -55°C to +300°C, 200mm (8"), Au	Air		●
TC-417-4x4	FemtoGuard Triaxial TESLA Chuck, standard, -55°C to +300°C, 200mm (8"), Au	Air	●	●
TC-417-504	FemtoGuard Triaxial TESLA Chuck, high-current (600A), -55°C to +300°C, 200mm (8"), Au	Air	●	●
TC-407-2x4	Coaxial TESLA Chuck, -50°C to +200°C, 200mm (8"), Au	Liquid		●
TC-407-4x4	FemtoGuard Triaxial TESLA Chuck, standard, -50°C to +200°C, 200mm (8"), Au	Liquid	●	●
TC-407-504	FemtoGuard Triaxial TESLA Chuck, high-current (600A), -50°C to +200°C, 200mm (8"), Au	Liquid	●	●

**x=0 standard (10 kV), x=3 lift pin ready (3 kV limit)*

TESLA200 Thermal Systems		Cooling
Part Number	**General Description**	
TS-417-02T	Thermal system for SUMMIT200/TESLA200, +30°C to 300°C (100-230 VAC 50/60 Hz)	Air
TS-417-05T	Thermal system for SUMMIT200/TESL200, +20°C to 300°C (100-230 VAC 50/60 Hz)	Air
TS-427-08R	Thermal system for SUMMIT200, -40°C to 300°C, ATT, air cool (200-220 VAC 60 Hz, UL-certified)	Air
TS-427-08P	Thermal system for SUMMIT200, -40°C to 300°C, ATT, air cool (200-230 VAC 50/60 Hz)	Air
TS-417-14R	Thermal system for SUMMIT200/TESL200, -60°C to 300°C (200-220 VAC 60 Hz, 200 VAC 50 Hz)	Air
TS-417-14E	Thermal system for SUMMIT200/TESL200, -60°C to 300°C (200-240 VAC 50 Hz)	Air
TS-407-07E	Thermal system for SUMMIT200/TESL200, -55°C to 200°C (230 VAC 50 Hz)	Liquid

Note: Thermal systems must match the thermal chuck selected, i.e. TS-417-xxx thermal systems are compatible only with TC-417-xxx chucks.

Standard Options for Microscope Mounts

High Stability Bridge/Transport (programmable)	**Part Number X2-TMT50P**
Travel X-Y	50 mm x 50 mm (2 in. x 2 in.)
Travel X-Y in TopHat	26 mm x 26 mm (1 in. x 1 in.)
Type	Stepper motor with closed loop encoder system
Resolution X-Y	0.4 µm (0.016 mils)
Repeatability X-Y	≤ 2 µm (0.08 mils)
Accuracy X-Y	≤ 5 µm (0.2 mils)
Speed X-Y	5 mm (0.2 in.) /sec
Planarity	10 µm (0.4 mils) over full travel with 5 kg (11 lb.) load
Z gross lift	100 mm (4 in.) vertical lift, pneumatic with up/down, for easy probe access
Z gross repeatability	1 µm (0.04 mils)
Z focus	Coarse/fine focus uses microscope system

Standard Options for Microscope Mounts (continued)

High Stability Bridge/Transport (manual)	**Part Number X2-MT50**
Travel X-Y	50 mm x 50 mm (2 in. x 2 in.)
Travel X-Y in TopHat	26 mm x 26 mm (0.5 in. x 0.5 in.)
Resolution X-Y	5 mm (0.2 in.) / turn, coaxial XY control
Planarity	10 µm (0.4 mils) over full travel with 5 kg (11 lb.) load
Z gross lift	4” vertical lift, pneumatic with up/down, for easy probe access
Z gross repeatability	1 µm (0.04 mils)

High Stability Bridge/Transport (manual, fixed XY)	**Part Number X2-MTF**
Planarity	10 µm (0.4 mils) over full travel with 5 kg (11 lb.) load
Z gross lift	4” vertical lift, pneumatic with up/down, for easy probe access
Z gross repeatability	1 µm (0.04 mils)

TESLA200 Station Accessories

Microscope / video system
Probe card holders
RF and DC probes, needles and probe cards
RF and DC cables and adapters
RF and DC probe positioners
Calibration software and standards
Vacuum pump, air compressor

Probing Kits

Probing kit includes necessary accessories, such as high-current/voltage probes, probe holders, positioners and interconnect cables for typical vertical and lateral device measurement setup.

Probing Kit for Keysight B1505A

Item	**Description**
High-current probe package	HCP high-current parametric probe holder with BNC connector (quantity of two)
	Replaceable probe tips (box of five)
	Probe micropositioner (quantity of two)
High-voltage probe package with Kelvin sense capability	HVP high-voltage parametric probe holders with SHV connectors (quantity of three), or with Keysight triaxial connectors (quantity of two)
	Replaceable probe tips (box of 25)
	Probe micropositioner (quantity of five)
System interface panels	Keysight B1505A accessory mounting kit
Cables	Basic cable kit for Keysight B1505A accessory connection, including probe-to-panel, panel-to-chuck and chuck-to-instruments cables

Probing Kits (Continued)

Probing Kit for Keithley Equipment 236/237

Item	Description
High-current probe package	HCP high-current parametric probe holder with banana jack (quantity of two)
	Replaceable probe tips (box of five)
	Probe micropositioner (quantity of two)
High-voltage probe package with Kelvin sense capability	HVP high-voltage parametric probe holders with Amphenol triaxial connectors (quantity of three)
	Replaceable probe tips (box of 25)
	Probe micropositioner (quantity of three)
System interface panels	High-voltage interface panel (triaxial)
	High-current interface panel
Cables	High-voltage triaxial cable package, including probe-to-panel, panel-to-instrument and chuck-to-instruments cables

VueTrack™ Technology Upgrade

The VueTrack technology provides a novel method to track probe tips and correct for drift, allowing a customer to run a probe station unattended at multiple temperatures with no operator intervention. The VueTrack technology significantly increases test productivity and test cell efficiency by eliminating the idle time between temperature transitions and automatically generating parametric and reliability data. VueTrack technology works best with high thermal stability probe arms/probe card holder.

Available Items*

Part Number	Description
151-243	VueTrack 30 day demo license**
X2-PIPCHMH	HTS Probe Card Holder, 40 mm, universal
151-359	VueTrack onsite PTPA option**
	Various HTS single probe arms*

** See FormFactor's Station Accessory Guide for other available items, such as HTS probe arms and probe tips.*

*** eVue PRO model required. Contact FormFactor for eVue PRO upgrade.*

Regulatory Compliance

Certification	TÜV compliance tested for CE and CB, certified for US and Canada, SEMI S2 and S8

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 Terms and Conditions for Sale for more details.*

TESLA200-DS-0621