Cascade

SUMMIT200

200 mm Semi-/ Fully-automated Probe System

Overview

The new Cascade SUMMIT200 advanced probing system, is essential for collecting high-accuracy measurement data on single or volume wafers as fast as possible.

Designed for R&D, device characterization and modelling or niche production applications, the SUMMIT200 enables precision electrical measurements over temperature for ultra-low noise, DC, RF, mmW and THz applications, with manual, semi-automatic, and now fully-automatic operation, for fastest time to accurate data.

The next-generation probe system uses PureLine™ technology to achieve one of the lowest noise levels available on the market. Patented AttoGuard® and MicroChamber® technologies significantly improve low-leakage and low-capacitance measurements. A new advanced 200 mm fast stage, cassette handling up to 50 wafers, high throughput test features, and wide temperature range of -60°C to 300°C, provides everything needed for the scientist, R&D and test engineer, or production operator to get their job done fast.

The SUMMIT200 supports Contact Intelligence™ – 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.

With a wide range of applications, and upgrade paths to meet any future needs, the SUMMIT200 provides the most advanced 200 mm probe station platform for fast, high-accuracy and high-volume measurements for existing and future devices and IC's

Contact Intelligence™

Videos

SUMMIT200 Introduction

Manual and Fully-auto Wafer Handling

ReAlign for SUMMIT200

Auto RF Measurement Asssistant

Microtron®
Flexible electronic solutions

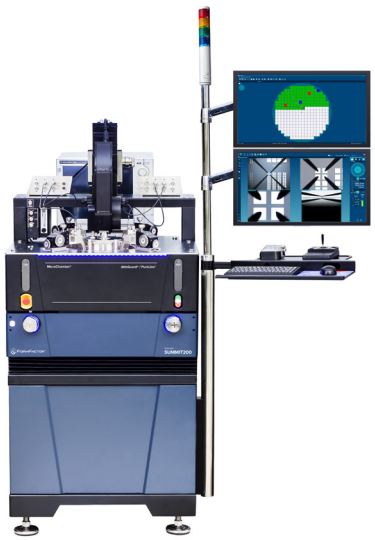
FormFactor™

Features / Benefits

Measurement Accuracy	• Best solution for high accuracy IV/CV, low-noise and 1/f measurements with PureLine, AttoGuard and next generation MicroChamber technologies • Minimize AC and spectral noise with effective shielding capability • Achieve unsurpassed RF/mmW measurement and calibration accuracy with integrated RF tools and WinCal • Shortest signal path test integration for accurate, thermally stable, and low-error data collection
Productivity	• Automated wafer handling for up to 5x faster time to accurate data • Contact Intelligence enables unattended tests on small pads • Thermally induced drift can be automatically corrected, enabling automated temperature transitions over the full temperature range using VueTrack or ReAlign (the effective temperature range and minimum obtainable pad size depend on probe card and probe card holder or positioner used) • Faster time to first data for standard and “hard to test” devices such as thin wafer, small pad and high power; including support for vertical probe cards • eVue digital imaging system with enhanced optical visualization, fast set-up, and in-die and wafer navigation • Powerful automation tools, reduce total test time on wafers, singulated dies, and modules
Positioning Accuracy	• Advanced 4-axis semi-automatic stage for accurate positioning and repeatable probe-to-pad contact • Precision sub-micron positioning and active thermal compensations with motorized positioners and VueTrack PRO • Additional quick “hands on” wafer positioning with manual ergonomic controls
Flexibility and application-tailored solutions	• RF/microwave device characterization, 1/f, WLR, FA and design debug • Seamless integration between Velox and analyzers/measurement software • Complete solutions using probe positioners and production probe cards • Versatile microscope mount system for fine-structure and large-area probing • Full thermal range of -60°C to +300°C
Ease of use	• Quick and comfortable manual wafer access via locking roll-out stage • Easy on-screen navigation, wafer mapping, and operation of accessories and thermal systems with Velox

Note: For physical dimensions and facility requirements, refer to the SUMMIT200 Facility Planning Guide.

Available Models



Semi-automated Probe System

Fully-automated Probe System

MicroChamber Performance

Electrical	SUMMIT200 AP Models	SUMMIT200 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)	
Spectral noise floor*	≤ -170 dBVrms/rtHz (≤ 1 MHz) Non thermal	≤ -150 dBVrms/rtHz (≤ 1 MHz) Non thermal
	≤ -170 dBVrms/rtHz (≤ 1 MHz) Thermal ATT	≤ -150 dBVrms/rtHz (≤ 1 MHz) Thermal ATT
System AC noise**	≤ 5 mVp-p (≤ 1 GHz) Non thermal	≤ 15 mVp-p (≤ 1 GHz) Non thermal
	≤ 5 mVp-p (≤ 1 GHz) Thermal ATT	≤ 15 mVp-p (≤ 1 GHz) Thermal ATT

* *Typical results. Actual values depend on probe / test setup. Test setup uses triaxial thermal chuck, 50 Ω termination, high quality LNA, and DSA/DSO instrument.*

** *Test setup: Station power ON, Thermal system ON (40°C), MicroChamber closed, guard to shield shorted with triax adapter on chuck. Instrument setup: Time domain digital scope (DC to 1 GHz), 50 Ω input impedance, cable to chuck BNC connector. Measurement: Peak-Peak Noise Voltage (acquire 1000 data points, and calculate mean of Vp-p data).*

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)

* *Shown specification data valid for standard stage speed of 75mm/s.*

Mechanical Performance (continued)

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

* *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.

** 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

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

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

Platform (continued)

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

Contact Intelligence Technology*

The SUMMIT200 provides the lab automation capabilities needed to make critical precision electrical measurements. With Contact Intelligence technology, SUMMIT200 adapts to temperature variance and provides automated drift correction for unattended testing on small pads over time and temperature. Contact Intelligence technology is enabled by the following features:

- VueTrack™ closed-loop positioning capability minimizes the need of manual re-adjustment when probing small pads across multiple temperatures.
- Velox probe station software provides a single command interface for automated temperature transitions continuously managing the separation between probes and pad during temperature ramp.
- Velox probe station software provides the ability to optimize the soak time after a temperature transition or when stepping across the wafer based on the temperature variance.
- ReAlign offers the capability to perform automated probe to pad alignment and unattended testing over temperature using probe cards that do not allow unlimited top microscope view of probes and pads.
- High Thermal Stability (HTS) microscope bridge enables automated over-temperature measurements.
- HTS platen provides stability over a wide thermal probing range.
- HTS probe card holder ensures EMI-shielded and light-tight environment, achieving accurate and reliable small-pad probing (option).
- As an additional option, motorized positioners allow automatic drift correction for each probe individually and facilitate unattended testing on small pads across multiple temperatures using VueTrack Pro or Auto RF. Motorized positioners are part of the Autonomous DC and Autonomous RF Measurement Assistants.

* *SUMMIT200-S is not equipped with Contact Intelligence technology*

Wafer and AUX Chuck

Wafer Chuck

	FemtoGuard	MicroVac™	Hi-ISO	Basic
Type	Triax	Coax (high isolation)	Coax (high isolation)	Coax
Material*	Ni or Au	Au	Ni	Ni
Vacuum interface	Standard (35 holes)	MicroVac** (495 Micro-holes, best for thin wafers)	Standard (35 holes)	Rings
Diameter				
Thermal 200 mm (8 in.)	●	●	●	●
Non-Thermal 200 mm (8 in.)	●	●	●	
Non-Thermal 150mm (6 in.)			●	
DUT sizes supported	Shards or SEMI-M1 compliant wafers 50 mm (2 in.) through 200 mm (8 in.) Optional single-die accessory available.			
Vacuum zones	4	5	4	3
Vacuum diameters***	10, 70, 141, 180 mm (0.4, 2.8, 5.5, 7 in.)	10, 70, 93, 144, 178 mm (0.4, 2.8, 3.6, 5.6, 7 in.)	10, 70, 141, 180 mm (0.4, 2.8, 5.5, 7 in.)	16, 130, 190 mm (0.6, 5, 7 in.)
Vacuum actuation	Easy access multi-zone manual vacuum controls, and software control (semi-automated)			

* *Nickel (Ni) plated aluminum or Gold (Au) plated aluminum*

** *Patented MicroVac technology using 495 micro-hole pattern for uniform vacuum hold down of thin, warped and partial wafers, and uniform temperature conductivity.*

*** *Diameter of arranged vacuum hole patterns (or vacuum rings) into individual zones*

Auxiliary Chucks

Quantity	Up to three total AUX chucks
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	Steel (magnetically loaded) 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

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 endeffector	Vacuum horseshoe handling on wafer bottom side (in combination with pin chuck) Wafer topside handling with cyclon technology and edge touch
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)
Die cycling	Chuck stepping time ≤ 0.75 sec (200 µm Z down – 1000 µm X-Y – 200 µm Z up)
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.*

Velox™ Probe Station Control Software

The SUMMIT200 is equipped with Velox probe station control software. VeloxPro can be added optionally for SEMI E95 compliance and test executive capabilities. 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 SUMMIT200 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

Non-Thermal Modular Chucks

FemtoGuard® Chuck Performance (200 mm)

Breakdown voltage*	Force-to-guard	≥ 500 V
	Guard-to-shield	≥ 500 V
	Force-to-shield	≥ 500 V
Resistance	Force-to-guard	≥ 1 x 10^{12} Ω
	Guard-to-shield	≥ 1 x 10^{12} Ω
	Force-to-shield	≥ 5 x 10^{12} Ω

** Breakdown Voltage tested at 500 V DC*

Non-Thermal Modular Chucks (continued)

MicroVac / Hi-ISO Coaxial Chuck Performance (200 mm)

Breakdown voltage*	≥ 500 V
Resistance	≥ 1 x 10^{12} Ω

** Breakdown Voltage tested at 500 V DC*

System Electrical Performance

Station with chuck (non-thermal)	SUMMIT200-AP FemtoGuard	SUMMIT200-M FemtoGuard	SUMMIT200-M MicroVac / Hi-ISO	SUMMIT200-S MicroVac / Hi-ISO
Probe leakage*	≤ 1 fA	≤ 1 fA	≤ 1 fA	≤ 20 pA
Chuck leakage*	≤ 10 fA	≤ 20 fA	≤ 600 fA	≤ 200 pA
Residual capacitance	≤ 1.0 pF	≤ 50 pF	N/A	N/A
Capacitance variation**	≤ 3 fF	≤ 75 fF	≤ 75 fF	≤ 75 fF
Settling time	≤ 50 fA @ 50 ms (typical)	≤ 100 fA @ 2 sec (typical)	N/A	N/A

Note: Results measured with non-thermal chuck at standard probing height (5,000 µm) with chuck in a dry environment. Moisture in the chuck may degrade performance.

** Overall leakage current is comprised of two distinctly separate components: 1) offset, and 2) noise. Offset is the DC value of current due to instrument voltage offset driving through isolation resistance. 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 4156C NOISE.dat CMI program or equivalent; 4 ms sample rate, auto scale, 1 nA compliance, 1 NPLC integration. Settling time is measured with a 4156C SETLB.dat CMI program or equivalent; 2 ms sampling rate, limited auto 1 nA, 1 µA compliance, 3 NPLC integration.*

*** This is chuck capacitance variation based upon chuck position anywhere in the 200 mm area, as measured by a stationary dc probe. Test conditions: Agilent 4284A LCR meter (Cp-d,1 Mhz,4 Average,0 Power), DCP-150, 75 µm above chuck surface, 4-wire connection (HiZ/Hipot to chuck, Loz/Lopot to Probe).*

Thermal Modular Chucks

FemtoGuard Chuck Performance (200 mm)

		Thermal Chuck @ -60/-55/-40°C	Thermal Chuck @ 25°C	Thermal Chuck @ 200°C	Thermal Chuck @ 300°C
Breakdown voltage*	Force-to-guard	≥ 500 V	≥ 500 V	≥ 500 V	≥ 500 V
	Guard-to-shield	≥ 500 V	≥ 500 V	≥ 500 V	≥ 500 V
	Force-to-shield	≥ 500 V	≥ 500 V	≥ 500 V	≥ 500 V
Resistance	Force-to-guard	≥ 1 x 10^{12} Ω	≥ 1 x 10^{12} Ω	≥ 5 x 10^{11} Ω	≥ 1 x 10^{11} Ω
	Guard-to-shield	≥ 1 x 10^{12} Ω	≥ 1 x 10^{12} Ω	≥ 5 x 10^{11} Ω	≥ 1 x 10^{11} Ω
	Force-to-shield	≥ 5 x 10^{12} Ω	≥ 5 x 10^{12} Ω	≥ 5 x 10^{11} Ω	≥ 1 x 10^{11} Ω

** Breakdown Voltage tested at 500 V DC*

Coaxial Chuck Performance (200 mm)

	Thermal Chuck @ -60/-55/-40°C	Thermal Chuck @ 25°C	Thermal Chuck @ 200°C	Thermal Chuck @ 300°C
Breakdown voltage*	≥ 500 V	≥ 500 V	≥ 500 V	≥ 500 V
Resistance (MicroVac / Hi-ISO)	≥ 1 x 10^{12} Ω	≥ 1 x 10^{12} Ω	≥ 5 x 10^{11} Ω	≥ 1 x 10^{11} Ω
Resistance (Basic)	≥ 1 x 10^{11} Ω	≥ 1 x 10^{11} Ω	≥ 1 x 10^{10} Ω	≥ 1 x 10^{9} Ω

** Breakdown Voltage tested at 500 V DC*

Thermal Modular Chucks (continued)

System Electrical Performance

Station with chuck (thermal)		SUMMIT200-AP FemtoGuard	SUMMIT200-M FemtoGuard	SUMMIT200-M MicroVac / Hi-ISO	SUMMIT200-S MicroVac / Hi-ISO	SUMMIT200-M&S Basic
Probe leakage*	Thermal controller OFF	≤ 1 fA	≤ 1 fA	≤ 1 fA	≤ 20 pA	N/A
	Thermal controller ON	≤ 5 fA	≤ 10 fA	≤ 10 fA	≤ 20 pA	N/A
Chuck leakage* (ATT)	Thermal controller OFF	≤ 2 fA	≤ 15 fA	25 pA	800 pA	N/A
	-60/-55/-40°C	≤ 6 fA	≤ 20 fA	25 pA	N/A	N/A
	25°C	≤ 3 fA	≤ 20 fA	25 pA	800 pA	N/A
	200°C	≤ 6 fA	≤ 20 fA	25 pA	800 pA	N/A
	300°C	≤ 6 fA	≤ 25 fA	220 pA	1000 pA	N/A
Residual capacitance		≤ 2.0 pF	≤ 50 pF	N/A	N/A	N/A
Capacitance variation**		≤ 3 fF	≤ 75 fF	≤ 75 fF	≤ 75 fF	N/A
Settling time***	All temperatures @ 10 V	≤ 50 fA @ 50 ms (typical)	≤ 100 fA @ 2 sec (typical)	N/A	N/A	N/A

NOTE: Results measured with thermal chuck at standard probing height (5000 µm) with chuck in a dry environment. Moisture in the chuck may degrade performance.

* *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. 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 4156C NOISE.dat CMI program or equivalent; 4ms sample rate, auto scale, 1nA compliance, 1 NPLC integration.*

** *This is chuck capacitance variation based upon chuck position anywhere in the 200 mm area, as measured by a stationary dc probe. Test conditions: Agilent 4284A LCR meter (Cp-d,1 Mhz,4 Ave,0 Power), DCP-150, 75 µm above chuck surface, 4-wire connection (HiZ/Hipot to chuck, Loz/Lopot to Probe), 25°C.*

*** *Settling time is measured with a 4156C SETLB.dat CMI program or equivalent; 2 ms sampling rate, limited auto 1 nA, 1 µA compliance, 3 NPLC integration.*

Thermal System Performance

Thermal System Overview

Temperature ranges	-55°C to 200°C, ATT, liquid cool (200 mm)	
	-60°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	FemtoGuard, MicroVac, Hi-Iso[4]	≤ ± 0.5C° @ 25°C, ≤ ± 1.25°C @ -60°C, ≤ ± 0.85°C @ 200°C, ≤ ± 1.5°C @ 300°C
	Basic Chuck[4]	≤ ± 0.5°C or ± 0.5% of measurement temp up to 200°C, (whichever is greater)

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.

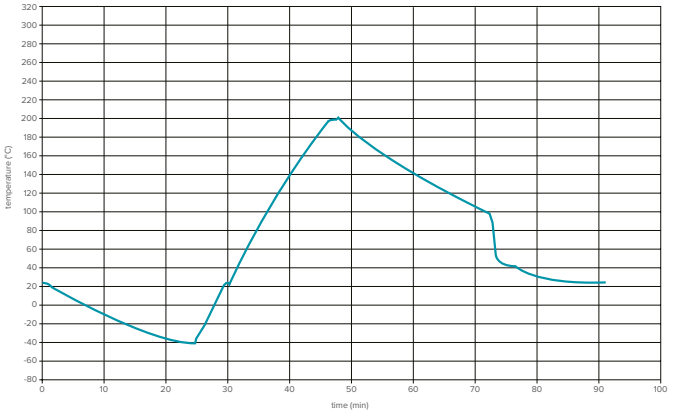
Note: For physical dimensions and facility requirements, refer to the SUMMIT200 Facility Planning Guide.

Thermal System Performance (continued)

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	< 63 dB (A)

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

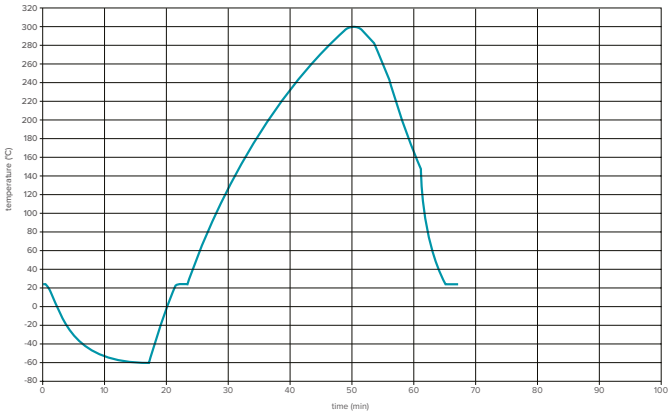


Typical times using SUMMIT200-AP with FemtoGuard Chuck.

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)

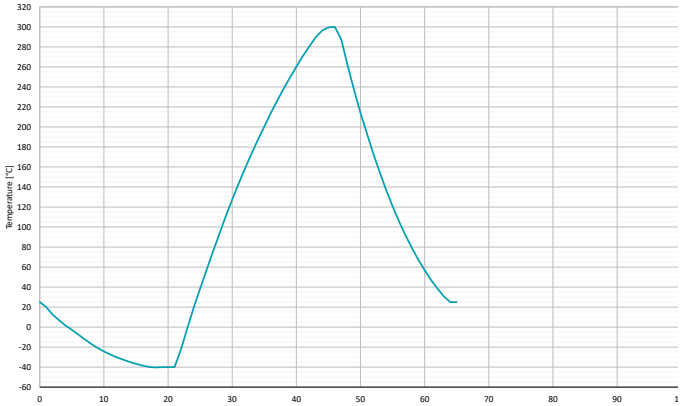


Typical times using SUMMIT200-AP with FemtoGuard Chuck.

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)



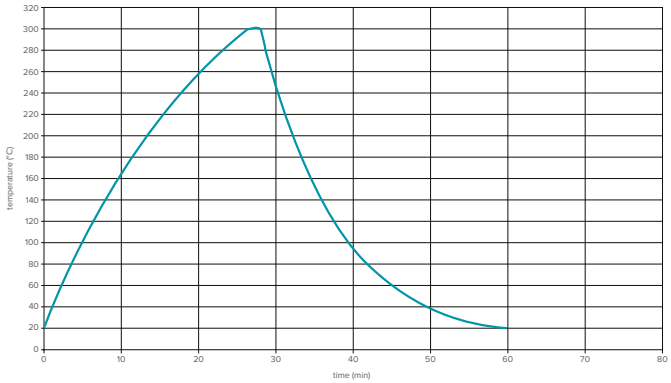
Typical times using SUMMIT200-AP with FemtoGuard Chuck.

Thermal System Performance (continued)

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)

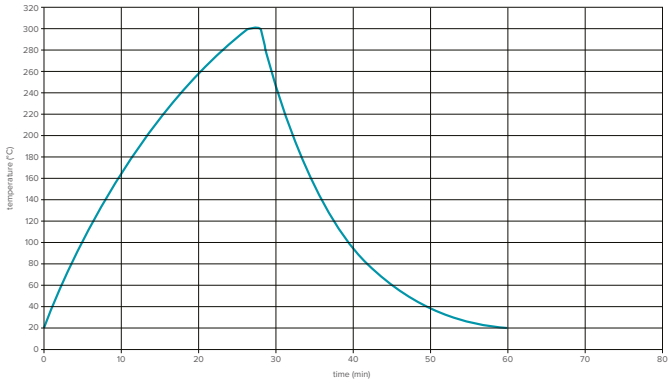


Typical times using SUMMIT200-AP with FemtoGuard Chuck.

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 SUMMIT200-AP with FemtoGuard Chuck.

Standard Configurations

	Fully-automated			Semi-automated		
Models	**AP**	**M**	**S**	**AP**	**M**	**S**
MicroChamber	●	●	○	●	●	○
AttoGuard	●	○	○	●	○	○
PureLine	●	○	○	●	○	○
Std. wafer safety enclosure	○	○	●	○	○	●
Microscope Bridge / Transport – High stability programmable 50mm (2x2")	●	○	○	●	○	○
Microscope Bridge / Transport – High stability manual 50mm (2x2")	○	●	●	○	●	●
Manual XY ergonomic controls for motorized wafer stage	●	○	○	●	○	○
Precision 4-point Platen Lift and kinematic mount	●	○	○	●	○	○
Fixed platen mount	○	●	●	○	●	●
High temperature stability module for platen	●	○	○	●	○	○
Wafer roll-out module for safe and easy loading	●	○	○	●	●	●
Fixed chuck mount with kinematic quick change	○	●	●	○	○	○
Platen Insert - MicroChamber TopHat (8 sides) with AttoGuard	●	○	○	●	○	○
Platen Insert - MicroChamber TopHat (8 sides)	○	●	○	○	●	○
Platen Insert - Open cover	○	○	●	○	○	●
AUX chuck - steel (1)	●	○	○	●	○	○
AUX chuck - echosorb (1)	●	○	○	●	○	○
GPIB Interface	●	●	●	●	●	●

Thermal Options

SUMMIT200 Non-Thermal Chucks		Chuck Compatibility		
Part Number	**General Description**	**AP**	**M**	**S**
TC-007-3xy*	FemtoGuard triaxial chuck, non-thermal, 200 mm (8”)	●	◐	
TC-007-1xy**	Hi-ISO coaxial chuck, non-thermal, 200 mm (8”)		●	●

**x=3 lift pin, x=0 standard, y=2 Gold-plated, y=1 Nickel-plated*

***x=3 lift pin, x=0 standard, y=4 Gold-plated MicroVac, y=1 Nickel-plated*

SUMMIT200 Thermal Chucks		Cooling	Chuck Compatibility		
Part Number	**General Description**		**AP**	**M**	**S**
TC-417-3xy*	FemtoGuard triaxial chuck, thermal, -60°C to 300°C , 200 mm (8”), Ni/Au	Air	●	◐	
TC-417-1xy**	Hi-ISO coaxial chuck, thermal, -60°C to 300°C, 200 mm (8”), Ni	Air		●	●
TC-417-031	Basic chuck, coaxial, thermal, -60°C to 300°C, 200 mm (8”), Ni, lift pin	Air		◐	●
TC-407-3xy*	FemtoGuard triaxial chuck, thermal, -55°C to 200°C, 200 mm (8”), Ni/Au	Liquid	●	◐	
TC-407-1xy**	Hi-ISO coaxial chuck, thermal, -55°C to 200°C, 200 mm (8”), Ni	Liquid		●	●
TC-407-031	Basic chuck, coaxial, thermal, -55°C to 200°C, 200 mm (8”), Ni, lift pin	Liquid		◐	●

**x=3 lift pin, x=0 standard, y=2 Gold-plated, y=1 Nickel-plated*

*** x=3 lift pin, x=0 standard, y=4 Gold-plated MicroVac, y=1 Nickel-plated*

SUMMIT200 Thermal Systems (200 mm)

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

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-MT50P3**
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.)
Travel Z	125 mm (4 in.)
Type	Stepper motor with closed loop encoder system
Resolution X-Y	1 µm (0.04 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
Resolution Z	0.4 µm (0.016 mils)
Repeatability Z	≤ 2 µm (0.08 mils)
Speed Z	5 mm (0.2 in.) /sec

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 (1 in. x 1 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)

Large Area Bridge / Transport	**Part Number X2-MLAB**
XY travel	200 mm x 125 mm (7.8 in. x 4.9 in.)
XY travel in TopHat	26 mm x 26 mm (1 in. x 1 in.)
Resolution X-Y	5 mm (0.2 in.) / turn
Planarity	75 µm (3 mils)over full travel with 5 kg (11 lb.) load
Z gross lift	150 mm (6 in.) manual linear lift with counterbalance
Z gross repeatability	5 µm (0.2 mils)

Microscope Boom Stand (manual)	**Part Number X2-MBS**
XY travel	150 mm x 200 mm (6 in. x 8 in.)

SUMMIT200 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

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.*

SUMMIT200-DS-0821