

MPI TS200-THZ | 200 mm Manual Probe System

Industry's first explicitly designed 200 mm probe system providing accurate tests for mm-wave, THz, and automated impedance tuner applications

FEATURES / BENEFITS

Variety of Applications

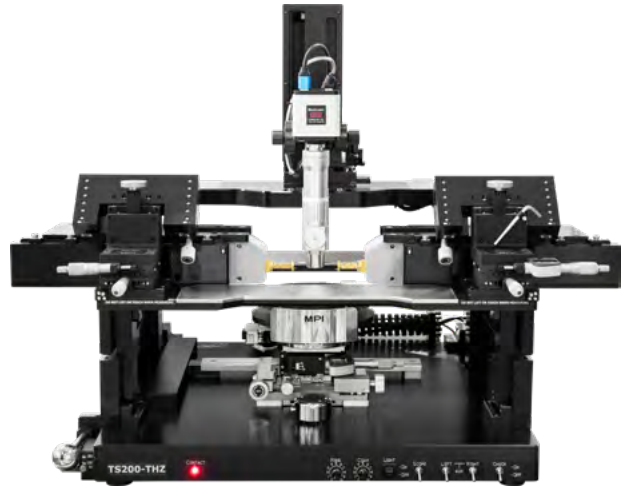
- Seamless integration of any banded, differential or broadband frequency extenders and automated impedance tuners
- Novel design of extenders/tuners integration for maximum of measurement dynamic
- Maximum on mechanical stability and repeatability combined with convenient and safety operation

Ergonomic Design

- Unique puck controlled air bearing stage for quick single-handed operation
- Rigid and large platen accommodates large area MicroPositioners, holding mmw extenders
- Highly repeatable platen lift design with three discrete positions for contact, separation, and loading

Upgradability

- Optional vibration isolated support for large automated impedance tuners
- Dedicated optics for shorting the cables and waveguide's lengths, for maximum of measurement directivity
- Various chuck options, PCB holders and a wide range of accessories such as DC/RF/mmW MicroPositioners



SPECIFICATIONS

Chuck XY Stage (Standard)

| | |
|-------------------------|--|
| Total travel range | 255 x 325 mm (10.0 x 12.8 in) |
| Fine-travel range | 25 x 25 mm fine micrometer control |
| Fine-travel resolution | < 1.0 μm (0.04 mils) @ 500 $\mu\text{m}/\text{rev}$ |
| Planarity | < 10 μm |
| Theta travel (standard) | 360° |
| Theta travel (fine) | $\pm 5.0^\circ$ |
| Theta resolution | 7.5×10^{-3} gradient |
| Movement | Puck controlled air bearing stage |

Chuck Z Stage

| | |
|------------------------|---|
| Travel range | 10 mm (0.4 in) |
| Fine-travel resolution | < 1.0 μm (0.04 mils) @ 500 $\mu\text{m}/\text{rev}$, with digital indicator |

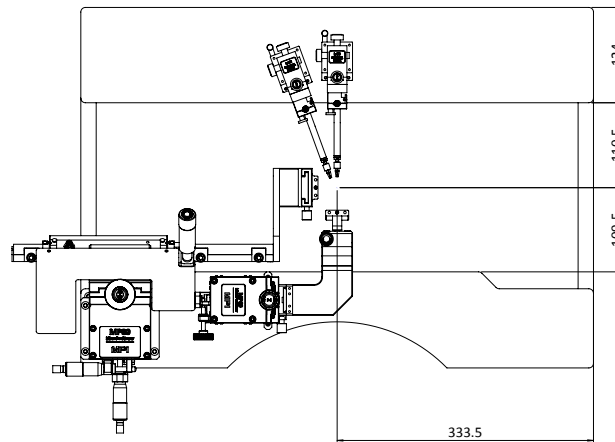
Manual Microscope Stage (Linear)

| | |
|----------------|---|
| Movement range | 50 x 50 mm (2 x 2 in) or 80 x 80 mm (3.15 x 3.15 in) |
| Resolution | < 5 μm (0.2 mils) |
| Scope lift | Manual, tilt-back or vertical (depending on microscope type) |
| Movement | Independently controlled X and Y movement with locking screws |

■ PROBE PLATEN

Specifications

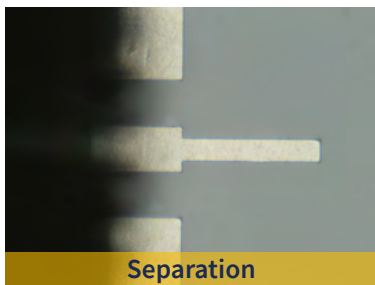
| | |
|------------------------------|--|
| Design | For unsurpassed stability: low profile, four pole support |
| Material | Nickel plated steel |
| Dimension | Large area platen, see drawing |
| Chuck top to platen top | Min. 28 mm |
| Max. No of MicroPositioners | 2x mmW E/W + 2x RF N/S and 4x DC or 2x mmW E/W + 8x DC |
| Platen lift control | 3 positions - contact (0), separation (300 µm), and loading (3 mm) |
| Separation repeatability | < 1 µm (0.04 mils) by „automated“ control |
| mmW MicroPositioner mounting | Bolt down |
| RF MicroPositioner mounting | Magnetic with guided rail |
| DC MicroPositioner mounting | Magnetic |



Probe Platen design for DC, RF and THz MicroPositioners

■ PROBE HOVER CONTROL™

MPI Probe Hover Control™ comes with hover heights (50, 100 or 150 µm) for easy and convenient probe to pad alignment.



Separation

Probe Hover Control™

Probe in contact

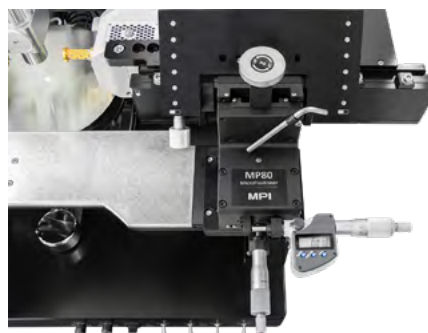
CONTACT / OVER-TRAVEL CONTROL



MPI offers the worldwide unique and most accurate contact / over-travel control with 1 μm accuracy for easy measurement reproducibility and accuracy. XY digital micrometers are optionally available as well.

FREQUENCY EXTENDER ADAPTATION

Seamless integration of any frequency extenders for best measurement directivity at 200 mm wafers.



AUTOMATED IMPEDANCE TUNER INTEGRATIONS



To achieve optimum tuning range & highest gamma

MPI ThermoShield™

Enables the testing of wafers up to a size of 200 mm with a thermal chuck.



NON-THERMAL CHUCKS

RF Wafer Chuck

| | |
|----------------------------------|---|
| Connectivity | Kelvin Triax (f) |
| Diameter | 210 mm with 2 integrated AUX areas |
| Material | Nickel Plated Aluminium (flat with 0.5 mm holes) |
| Chuck surface | Planar with 0.5 mm diameter holes in centric sections |
| Vacuum holes sections (diameter) | 3, 27, 45, 69, 93, 117, 141, 164, 194 mm |
| Vacuum actuation | Manual switch between Center (4 holes), 100, 150, 200 mm (4, 6, 8 in) |
| Supported DUT sizes | Single DUTs down to 5x5 mm size or wafers 100 mm (4 in) thru 200 mm (8 in)* |
| Surface planarity | $\leq \pm 5 \mu\text{m}$ |
| Rigidity | $< 15 \mu\text{m} / 10 \text{N @edge}$ |

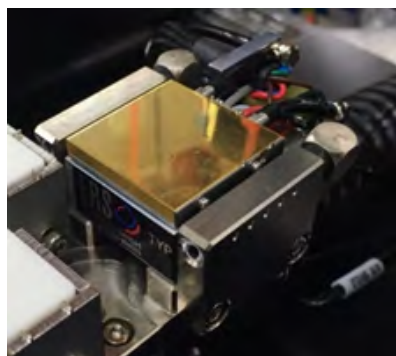
Electrical Specification

| | |
|-------------------|--|
| Operation voltage | In accordance with EC 61010, certificates for higher voltages available upon request |
| Isolation | $> 2 \text{ G}\Omega$ |

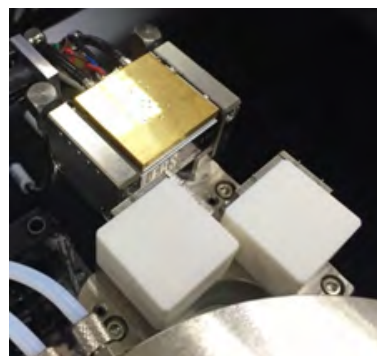
*Single DUT testing requires higher vacuum conditions dependent upon testing application.

Auxiliary Chuck

| | |
|------------------------|---|
| Quantity | 2 AUX chucks |
| Position | Integrated to rear side of main chuck |
| Substrate size (W x L) | Max. 25 x 25 mm (1 x 1 in) |
| Material | Ceramic, RF absorbing material for accurate calibration |
| Surface planarity | $\leq \pm 5 \mu\text{m}$ |
| Vacuum control | Controlled independently, separate from chucks |

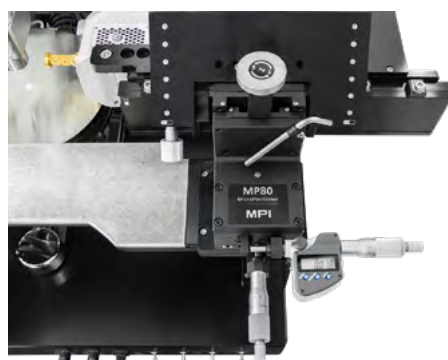


Thermal chuck system for testing single ICs



MPI auxiliary chucks made by ceramic

MP80-DX



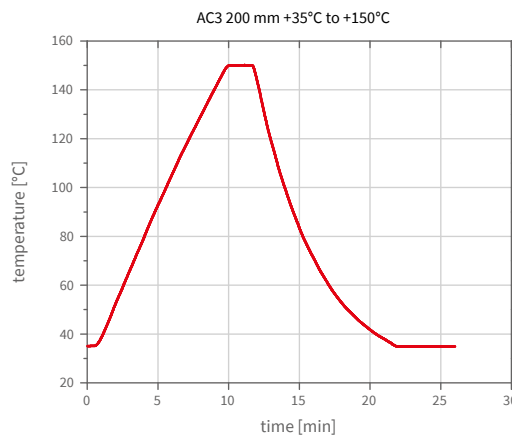
The optional MP80-DX MicroPositioner with the integrated digital micrometer enables outstanding simplicity for the multiline TRL. When operating the MP80-DX, the operator simply needs to zero-out the digital micrometer after the initial adjustment of the probes, i.e., on the thru standard. Next, the distance between RF probes can be easily re-adjusted to the required value of Δl with the precision better than $1 \mu\text{m}$.

THERMAL CHUCKS

Specifications of MPI ERS Integrated Technology

| | 35 °C to 150 °C | 20 °C to 200 °C | 25 °C to 150 °C |
|---|--|--|--|
| Maximal wafer size | 200 mm | 200 mm | 25 x 25 mm Single IC |
| Connectivity | Coax BNC (f) | Kelvin Triax (f) | Coax BNC (f) |
| Temperature control method | Cooling air / Resistance heater | Cooling air / Resistance heater | Peltier heater |
| Coolant | Air (user supplied) | Air (user supplied) | Air (max. 50 l/min) |
| Smallest temperature selection step | 0.1 °C | 0.1 °C | 0.1 °C |
| Chuck temperature display resolution | 0.1 °C | 0.01 °C | 0.1 °C |
| External touchscreen display operation | N/A | Yes | N/A |
| Temperature stability | ±0.5 °C | ±0.08 °C | ±0.2 °C |
| Temperature accuracy | ±1 °C | ±0.1 °C | ±1 °C |
| Control method | DC/PID | Low noise DC/PID | DC/PID |
| Interfaces | RS232C | RS232C | RS232C |
| Chuck surface plating | Nickel plated with pinhole surface | Nickel plated with pinhole surface | Gold plated with pinhole surface |
| Temperature sensor | Pt100 1/3DIN | Pt100 1/3DIN, 4-line wired | Pt100 1/3DIN, 4-line wired |
| Temperature uniformity | < ±1 °C | < ±0.5 °C | < ±0.5 °C |
| Surface flatness and base parallelism | < ±15 µm | < ±10 µm | < ±15 µm |
| Heating and cooling rates | 35 to 150 °C < 12 min 150 to 35 °C < 15 min | 20 to 200°C < 15 mins 200 to 20°C < 20 mins | 25 to 150 °C < 6 min 150 to 25 °C < 6 min |
| Electrical isolation | > 0.5 T Ω at 25 °C | > 10 T Ω at 25 °C > 300 G Ω at 200 °C | > 0.5 T Ω at 25 °C |
| Leakage @ 10 V | N/A | N/A | N/A |
| Capacitance | < 750 pF | < 900 pF | < 750 pF |
| Maximum voltage between chuck top and GND | 500 V DC | 500 V DC | 500 V DC |

TYPICAL TRANSITION TIME



FACILITY REQUIREMENTS

Thermal Chuck Electrical Supply

| | |
|-------------------------------|----------------------------|
| Electrical Supply | Hot only thermal chucks |
| Electrical primary connection | 100 to 240 VAC auto switch |
| Frequency | 50 Hz / 60 Hz |

Compressed Air Supply

| | |
|--------------------|--|
| Operating pressure | 6.0 bar (0.6 MPa, 87 psi) at specified flow rate |
| CDA dew point | ≤ 0 °C |

Controller Dimensions / Power and Air Consumption

| System Type | W x D x H (mm) | Weight (kg) | Power Cons. (VA) | max. Air Flow (l/min) |
|--------------|-----------------|-------------|------------------|-----------------------|
| 35 to 150 °C | 300 x 265 x 135 | 10 | 500 | 200 |
| 20 to 200 °C | 300 x 360 x 135 | 12 | 700 | 200 |
| 25 to 150 °C | 300 x 261 x 135 | 3.3 | 100 | 50 |

General Probe System

| | |
|----------------|---|
| Power | 100-240 V AC 50/60 Hz for optical accessories* only |
| Vacuum | -0.5 bar (for single DUT) / -0.3 bar (for wafers) |
| Compressed air | 6.0 bar |

*e.g. microscope illumination, CCD cameras, monitors.

WARRANTY

- Warranty*: 12 months
- Extended service contract: contact MPI Corporation for more information

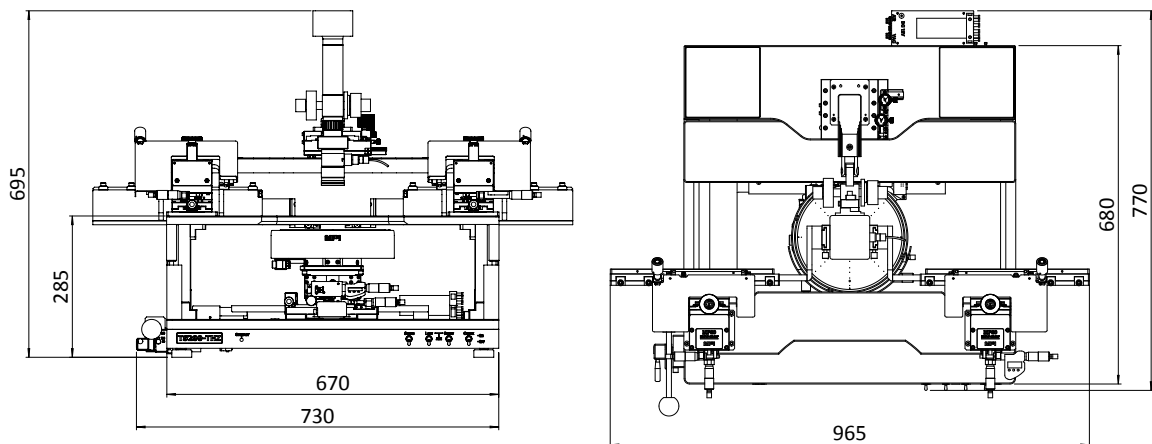
*See MPI Corporation's Terms and Conditions of Sale for more details.

PHYSICAL DIMENSIONS

Station Platform with Bridge*

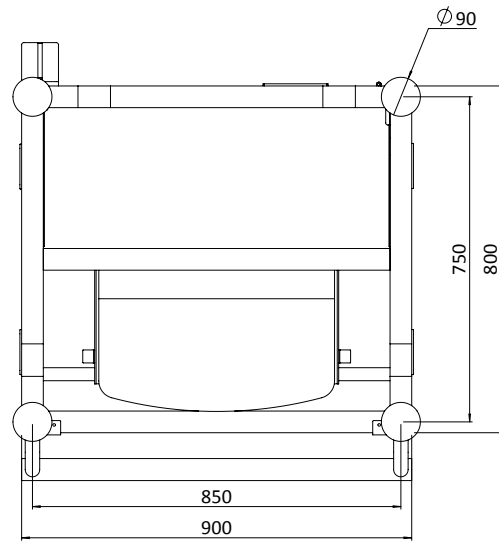
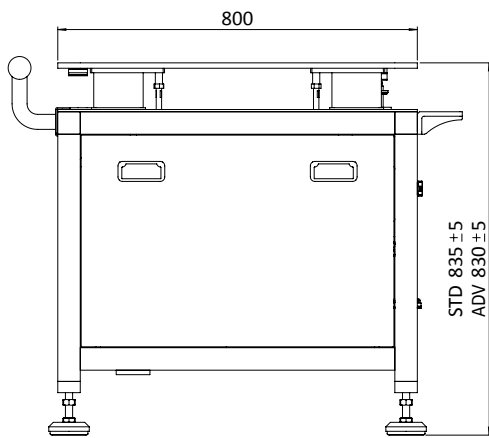
| | |
|------------------------|--|
| Dimensions (W x D x H) | 670 x 680 x 695 mm (26.4 x 26.8 x 27.4 in) |
| Weight | ~135 kg (298 lb.) |

*Station accessories, such as different microscopes, cameras, or laser cutters, may change the total height.



Vibration Isolation Table

| | Standard | Advanced |
|--------------------------------|---|---|
| Dimensions (W x D x H) | 900 x 800 x 835 mm (35.4 x 31.5 x 32.9 in) | 900 x 800 x 830 mm (35.4 x 31.5 x 32.7 in) |
| Feature | Adjustable air damping system | Automatic load leveling |
| Keyboard / Mouse Tray Included | Yes | |
| Front Protection Bar | Yes | |
| Castors Included | Yes | |
| Shelves Included | Upper and Lower | |
| Accessories Accepted | Monitor Stand(s) and Instrument Shelf | |
| Weight | Approx. 210 kg (463 lb.) | Approx. 210 kg (463 lb.) |



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MPI Global Presence

