

MPI TS150 | 150 mm Manual Probe System

For accurate and reliable DC/CV, RF and High Power measurements

FEATURES / BENEFITS

Universal Use

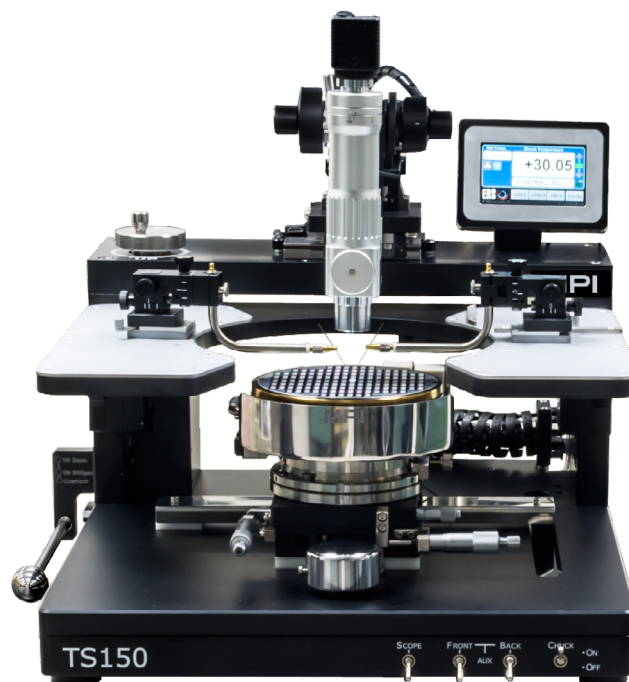
- Designed for wide variety of applications such as Device Characterization and Modeling, Wafer Level Reliability, Failure Analysis, IC Engineering, MEMS and High Power

Ergonomic Design

- Unique puck controlled air bearing stage for quick single-handed operation
- Rigid platen accommodates up to 10 DC or 4 RF positioners
- Highly repeatable platen lift design with three discrete positions for contact, separation, and loading

Upgradability

- Available with various chuck options and wide range of accessories such as DC/RF/mmW Micro-Positioners, Optics, microscopes and EMI shielded dark box to support various application requirements



SPECIFICATIONS

Chuck XY Stage (Standard)

| | |
|-------------------------|--|
| Total travel range | 180 x 230 mm (7.1 x 9.1 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 |

Optional XY Stage for TS150-ES

| | |
|-------------------------|---|
| Planarity | < 10 μm (0.4 mils) |
| Theta travel (standard) | Free movement up to 360° |
| Movement | Easy puck controlled air bearing stage for TS150-ES |
| Fine adjustment | N/A |

Manual Microscope Stage (Air Bearing)

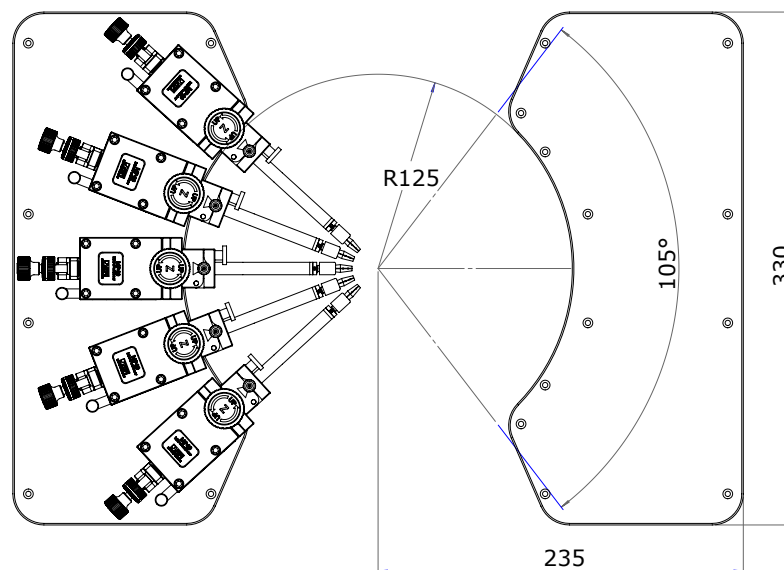
| | |
|----------------|--------------------------------------|
| Movement range | 25 x 25 mm (1 x 1 in) |
| Resolution | N/A |
| Scope lift | Manual, tilt-back |
| Movement | Air bearing control, fixed by vacuum |

Manual Microscope Stage (Linear)

| | |
|----------------|---|
| Movement range | 50 x 50 mm (2 x 2 in) |
| Resolution | < 5µm (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**

| | |
|-----------------------------|--|
| Material | Nickel plated steel |
| Dimensions | See drawing |
| Chuck to platen height | Min. 10 mm |
| Max. No of MicroPositioners | 10 DC and 4 RF |
| Platen lift control | 3 positions - contact (0), separation (300 µm), and loading (3 mm) |
| Platen Z-height movement | High resolution screw for fine control |
| Z-height adjustment range | Max. 20 mm (0.8 in) |
| Separation repeatability | < 1 µm (0.04 mils) by „automated“ control |
| RF MicroPositioner mounting | Magnetic with guided rail |
| DC MicroPositioner mounting | Magnetic |
| 300 °C thermal isolation | Depends on chuck configuration |



Universal probe platen design for up to 10 DC MicroPositioners

NON-THERMAL CHUCKS

Standard Wafer Chucks

| | |
|------------------------------------|--|
| Connectivity 1 | Coaxial chuck: Coax BNC (f) |
| Connectivity 2 | Triaxial chuck: Kelvin Triax (f) |
| Diameter | 160 mm |
| Material | Stainless steel |
| Chuck surface | Planar with centric engraved vacuum grooves |
| Vacuum grooves sections (diameter) | 3, 27, 45, 69, 93, 117, 141 mm |
| Vacuum actuation | Multizone control - All connected in meander shape, center hole in 3 mm diameter |
| Supported DUT sizes | Single DUTs down to 4 x 4 mm size or wafers 50 mm (2 in) thru 150 mm (6 in)* |
| Surface planarity | $\leq \pm 5 \mu\text{m}$ |
| Rigidity | $< 15 \mu\text{m} / 10 \text{ N @edge}$ |

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

RF Wafer Chuck

| | |
|----------------------------------|--|
| Connectivity | Coax BNC (f) |
| Diameter | 150 mm with 2 integrated AUX areas |
| Material | Nickel plated aluminum (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 mm |
| Vacuum actuation | Manual switch between Center (4 holes), 50, 100, 150 mm (2, 4, 6 in) |
| Supported DUT sizes | Single DUTs down to 4 x 4 mm size or wafers 50 mm (2 in) thru 150 mm (6 in)* |
| Surface planarity | $\leq \pm 5 \mu\text{m}$ |
| Rigidity | $< 15 \mu\text{m} / 10 \text{ N @edge}$ |

*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 |

Electrical Specification (Coax)

| | |
|---------------------------------------|--|
| Operation voltage | In accordance with EC 61010, certificates for higher voltages available upon request |
| Maximum voltage between chuck and GND | 500 V DC |
| Isolation | $> 2 \text{ G}\Omega$ |

Electrical Specification (Triax)

| | Standard Chuck (10 V) |
|-----------------|-------------------------|
| Chuck isolation | $> 100 \text{ G}\Omega$ |
| Force to guard | $> 100 \text{ G}\Omega$ |
| Guard to shield | $> 10 \text{ G}\Omega$ |
| Force to shield | $> 50 \text{ G}\Omega$ |

THERMAL CHUCKS

Specifications of MPI ERS Integrated Technology

| | 35 °C to 150 °C | 20 °C to 200 °C | 20 °C to 200 °C | 20 °C to 300 °C |
|---|--|--|--|--|
| Connectivity | Coax BNC (f) | Coax BNC (f) | Kelvin Triax (f) | Single Triax (f) |
| Temperature control method | Cooling air / Resistance heater | Cooling air / Resistance heater | Cooling air / Resistance heater | Cooling air / Resistance heater |
| Coolant | Air (user supplied) | Air (user supplied) | Air (user supplied) | Air (user supplied) |
| Smallest temperature selection step | 0.1 °C | 0.1 °C | 0.1 °C | 0.1 °C |
| Chuck temperature display resolution | 0.1 °C | 0.01 °C | 0.01 °C | 0.01 °C |
| External touchscreen display operation | N/A | Yes | Yes | Yes |
| Temperature stability | ±0.5 °C | ±0.08 °C | ±0.08 °C | ±0.08 °C |
| Temperature accuracy | ±1 °C | 0.1 °C | 0.1 °C | 0.1 °C |
| Control method | DC/PID | Low noise DC/PID | Low noise DC/PID | Low noise DC/PID |
| Interfaces | RS232C | RS232C | RS232C | RS232C |
| Chuck surface plating | Nickel plated with pinhole surface | 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 | Pt100 1/3DIN, 4-line wired |
| Temperature uniformity | < ±1 °C | < ±0.5 °C | < ±0.5 °C | < ±0.5 °C at 20 to 200 °C < ±0.5 °C at > 200 °C |
| Surface flatness and base parallelism | < ±15 µm | < ±10 µm | < ±10 µm | < ±10 µm |
| Heating and cooling rates | 35 to 150 °C < 10 min 150 to 35 °C < 15 min | 20 to 200 °C < 12 min 200 to 20 °C < 15 min | 20 to 200 °C < 20 min 200 to 20 °C < 20 min | 20 to 300 °C < 15 min 300 to 20 °C < 20 min |
| Electrical isolation Coax BNC (f) | > 0.5 T Ω at 25 °C | > 10 T Ω at 25 °C > 300 G Ω at 200 °C | N/A | N/A |
| Leakage @ 10 V Kelvin Triax (f) | N/A | N/A | < 15 fA at 25 °C < 30 fA at 200 °C | < 15 fA at 25 °C < 50 fA at 300 °C |
| Capacitance | < 750 pF | < 900 pF | N/A | N/A |
| Maximum voltage between chuck top and GND | 500 V DC | 500 V DC | 500 V DC | 500 V DC |

FACILITY REQUIREMENTS

Thermal Chuck Electrical Supply

| | |
|-------------------------------|----------------------------|
| 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 - Coax BNC (f) | 300 x 265 x 135 | 10 | 500 | 150 |
| 20 to 200 °C - Coax BNC (f) | 300 x 360 x 135 | 12 | 700 | 200 |
| 20 to 200 °C - Kelvin Triax (f) | 300 x 360 x 135 | 12 | 700 | 200 |
| 20 to 300 °C - Single Triax (f) | 300 x 360 x 135 | 12 | 700 | 200 |

General Probe System

| | |
|----------------|--|
| Power | 100-240 V AC nominal; 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.

REGULATORY COMPLIANCE

- Certification: CE

WARRANTY

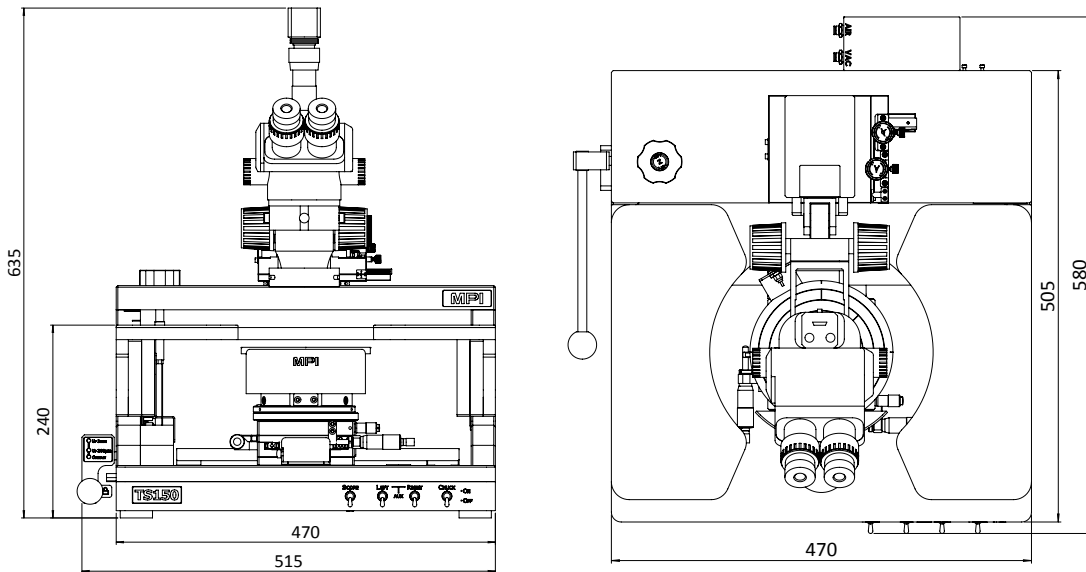
- Warranty*: 12 months
- Extended service contract: contact MPI Corporation for more information

PHYSICAL DIMENSIONS

Station Platform with Bridge*

| | |
|------------------------|--|
| Dimensions (W x D x H) | 470 x 505 x 635 mm (18.5 x 19.9 x 25.0 in) |
| Weight | ~60 kg (132 lb.) |

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



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

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MPI Global Presence

