

MPI TS150-AIT | 150 mm Manual Probe System

Industry's first explicitly designed 150 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	180 x 300 mm (7.1 x 11.8 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

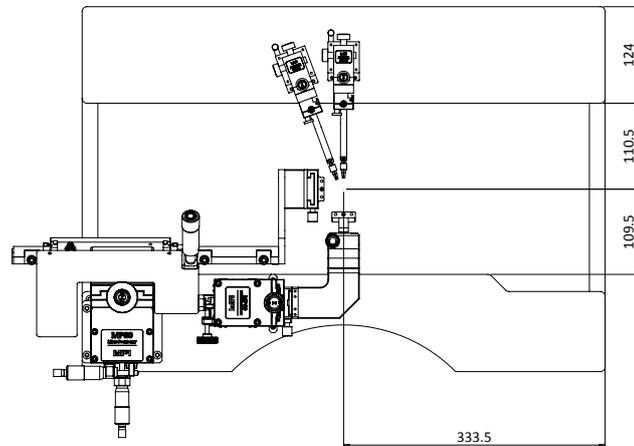
Manual Microscope Stage (Linear)

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

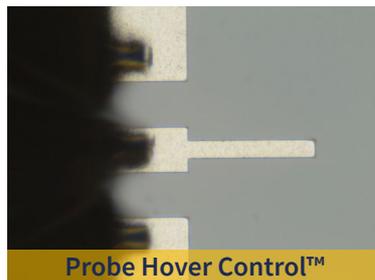
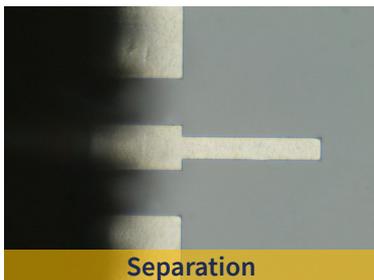
Design	For unsurpassed stability: low profile, four pole support
Material	Nickel plated steel
Dimension	Large area platen, see drawing
Chuck top to platen top	Min. 28 mm
Max. No of MicroPositioners	2x mmW E/W + 2x RF N/S and 4x DC or 2x mmW E/W + 8x DC
Platen lift control	3 positions - contact (0), separation (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

Platen Lift with Probe Hover Control™

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



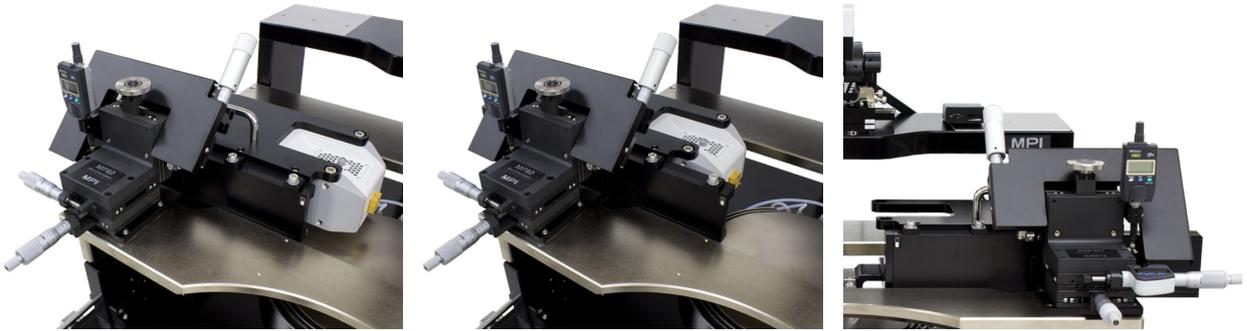
CONTACT / OVER-TRAVEL CONTROL



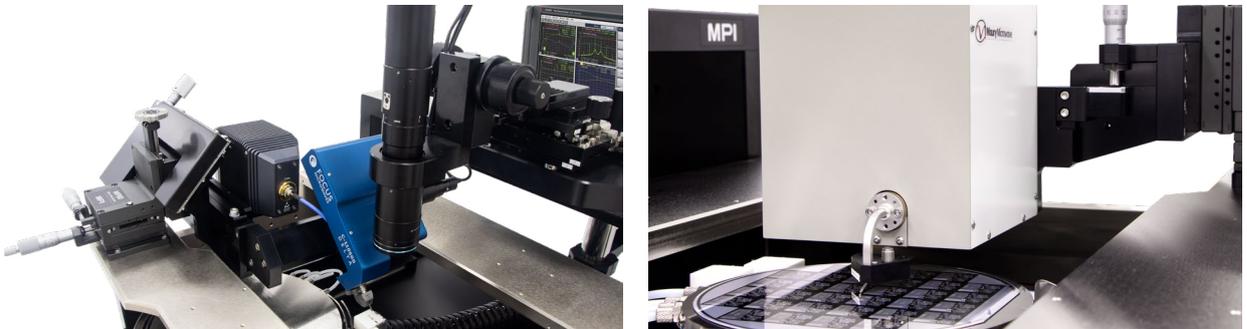
MPI offers the worldwide unique and most accurate contact / over-travel control with 1 µm accuracy for easy measurement reproducibility and accuracy. XY digital micrometers are optionally available as well.

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

NON-THERMAL CHUCKS

RF Wafer Chuck

Connectivity	Coax BNC (f)
Diameter	160 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 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	≤± 5 µm
Rigidity	< 15 µm / 10 N @edge

Electrical Specification

Operation voltage	In accordance with EC 61010, certificates for higher voltages available upon request
Isolation	> 2 GΩ

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

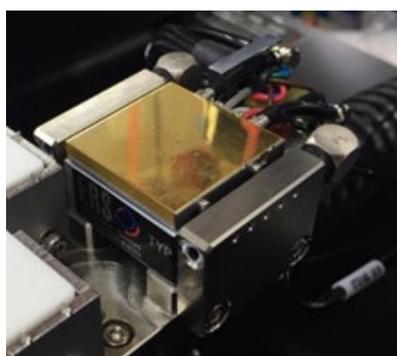
mmW Wafer Chuck

Connectivity	N/A
Diameter	160 mm with 2 integrated AUX areas
Material	Ceramic with high temperature conductivity, RF absorbing material for accurate measurements at mm-wave and sub-mm wave (THz) frequency range
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	≤± 5 μm
Rigidity	< 15 μm / 10 N @edge

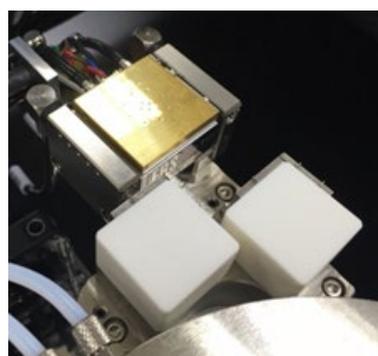
*Single DUT testing requires higher vacuum conditions dependent upon testing application.

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	≤± 5 μm
Vacuum control	Controlled independently, separate from chucks



Thermal chuck system for testing single ICs



MPI auxiliary chucks made by ceramic

MP80-DX



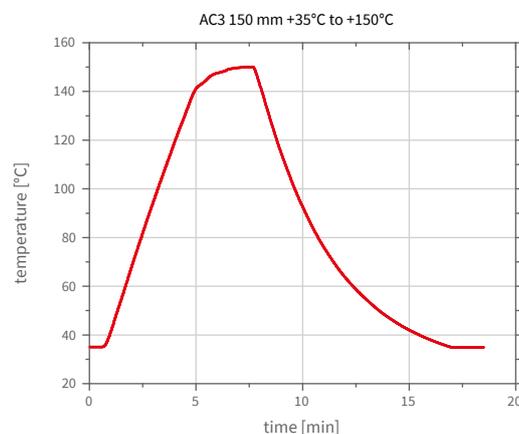
The optional MP80-DX MicroPositioner with the integrated digital micrometer enables outstanding simplicity for the multiline TRL. When operating the MP80-DX, the operator simply needs to zero-out the digital micrometer after the initial adjustment of the probes, i.e., on the thru standard. Next, the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

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	150 mm	150 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 < 10 min 150 to 35 °C < 15 min	20 to 200°C < 15 mins 200 to 20°C < 15 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	< 750 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

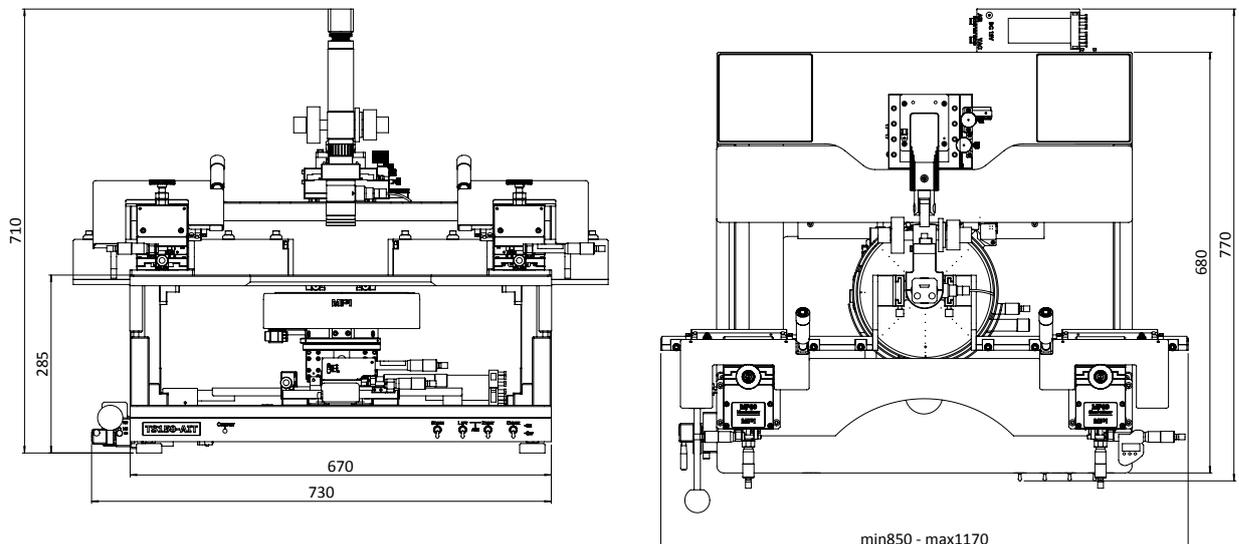
*See MPI Corporation's Terms and Conditions of Sale for more details.

PHYSICAL DIMENSIONS

Station Platform with Bridge*

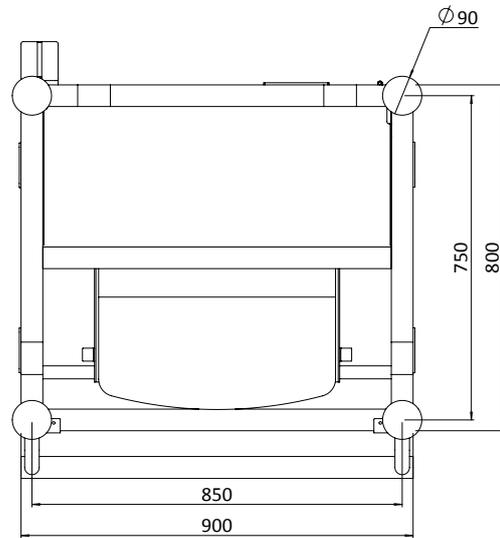
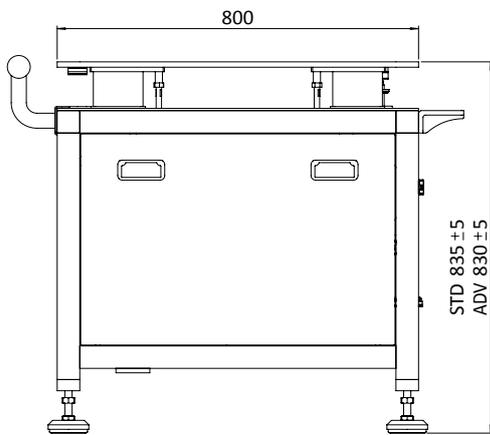
Dimensions (W x D x H)	670 x 680 x 710 mm (26.4 x 26.8 x 28.0 in)
Weight	~120 kg (265 lb.)

*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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