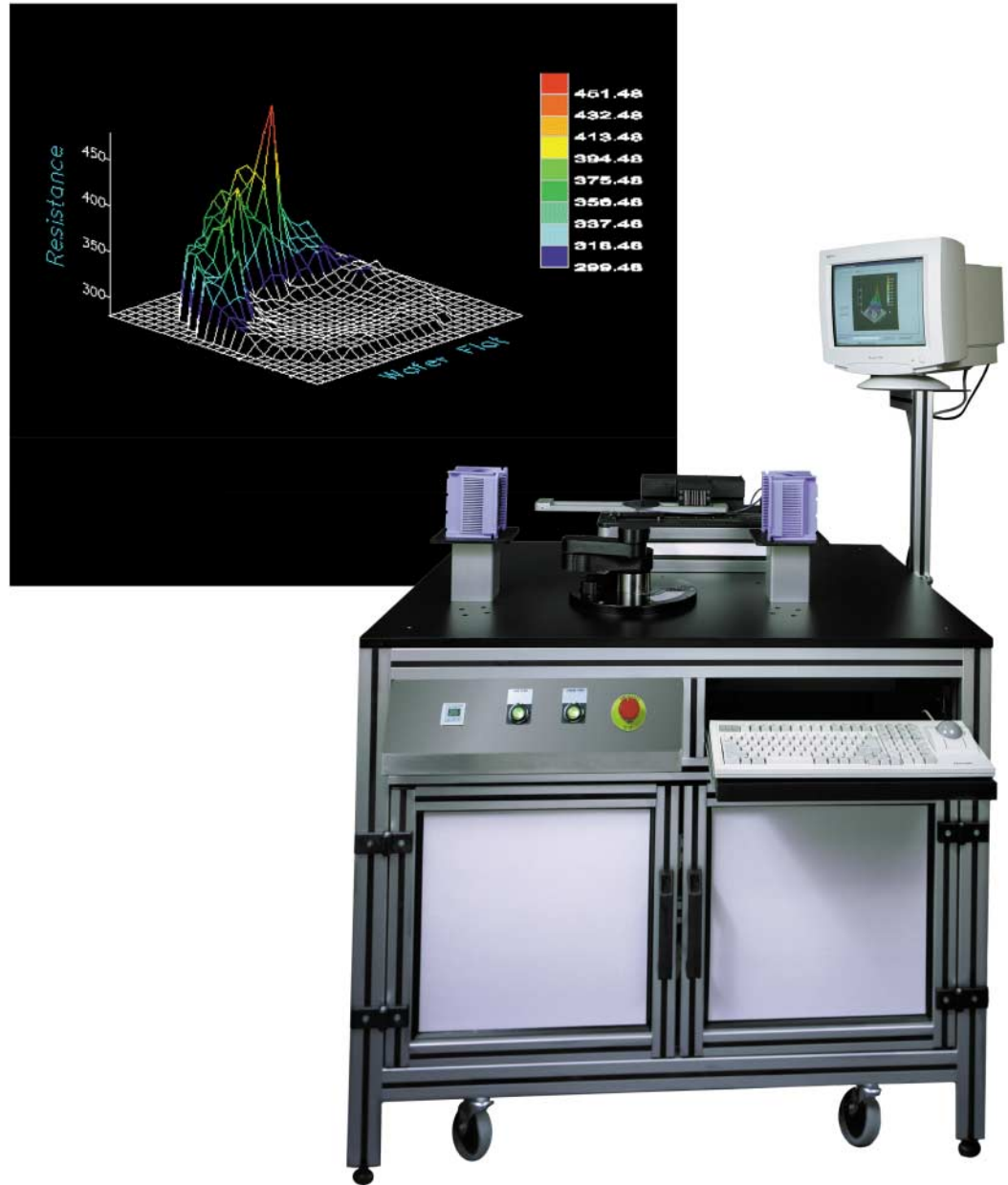




# Contactless Bulk Resistivity / Sheet Resistance Measurement and Mapping Systems

**1500 Family**



*LEI 1510RS (Robotic Sorting) shown with 2 cassettes (product may differ from photo)*

***Process Monitoring & Quality Control  
for High Production Yields.***

# Specifications



## Characterization of

- **GaAs wafers** (epi, annealed ion-implants on semi-insulating and some doped\* substrates)
- **Silicon wafers** (bulk Si, epi, annealed ion-implants, and POCl<sub>3</sub> doping uniformity on high resistivity substrates)
- **Thin film metallizations**

\* Contact factory for details.

## Performance

(Conforms to ASTM F673)

- Based on the average of five 150 center-point tests (contact LEI for complete details). Where available, the data below is derived using NIST-traceable, uniformly-doped silicon standards. These tests are conducted with samples manually placed on handler rails and a .035" gap setting. NIST and VLSI standard wafers are available for calibration.

	Sheet Resistance*	Standard Deviation*	Bulk Resistivity†*
HI	3000 ohm/□	1.0 %	200 ohm-cm
	400 ohm/□	0.1%	25 ohm-cm
	15 ohm/□	0.1%	1 ohm-cm
LO	15 ohm/□	1.0%	1 ohm-cm
	2 ohm/□	0.20%	0.1 ohm-cm
XL	0.2 ohm/□	0.25%	0.01 ohm-cm
	1.5 ohm/□	0.7%	0.1 ohm-cm
	0.1 ohm/□	0.55%	0.005 ohm-cm

† Based on keyboard entry of known thickness

\* Sheet Resistance values ≠ Bulk Resistivity values

## Linearity

- .035 to 3,000 Ohms/□  $\pm$  3%

## Thin-film thickness

- Thickness =  $\frac{\text{Bulk resistivity (known)}}{\text{Sheet resistance (measured)}}$

## Measurement Capabilities

- Nominal doped substrate thickness range of 450 to 800 microns
- Normal .035" (.889mm) gapping preset at factory
- Adjustable gap to accommodate thicker substrates
- Robotic measurement of 2", 3", 4"(100mm), 6"(150mm), and 8"(200mm) wafers(optional)

## Wafer Thickness

- Capable of calculating resistivity with keyboard-entered thickness
- Optional capacitance thickness probes

## Sensor Transducer Sizes

- **HI Range** 14 mm diameter
- **LO Range** 14 mm diameter
- **XL Range** 14 mm diameter

## Sample Handling and Sensing

- Up to 300 measurement points
- Automatic drift compensation
- Software-selectable resistivity ranges

## Operating Characteristics

- High spatial resolution
- Precise voltage regulation for tight linearity and consistently repeatable results

## Calibration

- Performed via easy-entry computer screen
- Software-controlled (no manual adjustments)
- 16 bit system for data acquisition

## Computerization

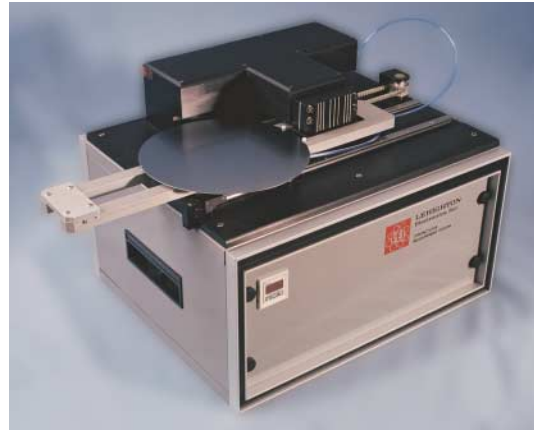
- System is network- and Windows NT compatible
- Setup information may be saved under operator-designated file names
- Ability to create custom test point plans
- Measurements and associated test plans can be graphically displayed
- Computer, FPD and printer included
- 10 BASE-T ethernet network connection

*"We estimate we save a minimum of \$250K per year by having the Leighton systems."\**

-Dr. Martin J. Brophy  
Senior Process Engineer for Wafers/Implant/Anneal  
TriQuint Semiconductor

\* Please visit us on the web at [www.leighton.com/fabtech1/index.html](http://www.leighton.com/fabtech1/index.html) to view this and other testimonials.

## Models/Options



1510 standalone

LEI 1510RP The unit shown accommodates 2" to 200mm(8") cassettes (max. diameter).

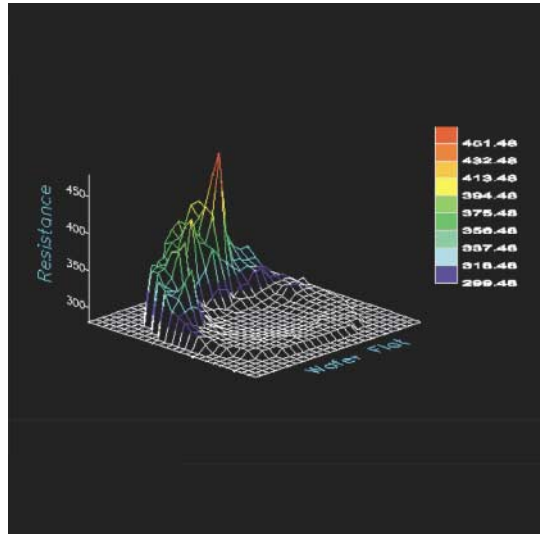
	1510B			1510C		
	manual	RP	RS	manual	RP	RS
<b>throughput (wafer test time)</b>						
<i>single wafer</i>						
9 point plan	0:45	0:45	0:45	0:22	0:22	0:22
24 point plan	2:45	2:45	2:45	1:15	1:15	1:15
55 point plan	5:30	5:30	5:30	2:30	2:30	2:30
<i>25 wafer cassette*</i>						
10 center plan	N/A	27:00	27:00	N/A	13:50	13:50
24 point plan	N/A	42:15	42:15	N/A	21:15	21:15
55 point plan	N/A	80:00	80:00	N/A	41:00	41:00
<b>robotic handling of sample wafers</b>						
<i>single cassette</i>	NO	YES	YES	NO	YES	YES
<i>multiple cassette</i>	NO	NO	YES	NO	NO	NO
<b>repeatability</b>						
<i>positional</i>	±.003" (.0762mm)			±.0015" (.0381mm)		
<i>rotational</i>	±2.5°			±1°		

\* Ideal throughput does not include time to change cassette.

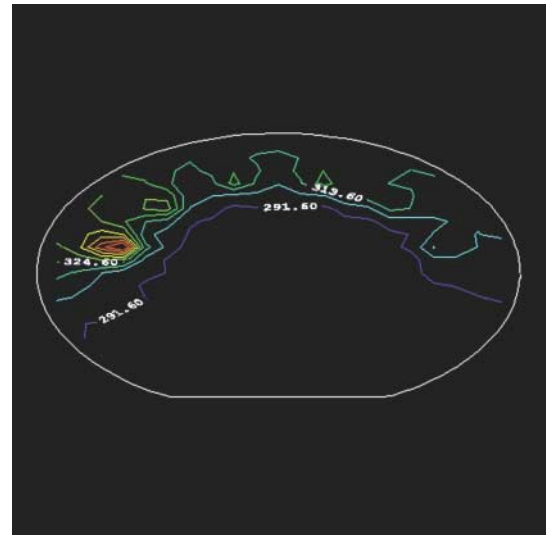
Throughput times are calculated with the Auto Reference feature on.

RP(Robotic Pick-and-Place), RS(Robotic Sort)

**LEI Models/options**



surface map



contour map

### Accessories and Options

- Cassette-to-cassette sorting
- Capacitance thickness capability
- Wafer mapping
- SPC
- Calibration standards
- 1-4 cassettes for 2", 3", 4"(100mm), 6"(150mm) wafers
- 2 cassettes for 8" (200mm) wafers
- Scanning End Effector
- Light Shield

### Available Power Configurations

- 117 VAC  $\pm$  10% 50-60 Hz
- 220 VAC  $\pm$  10% 50-60 Hz
- 100 VAC  $\pm$  10% 50-60 Hz

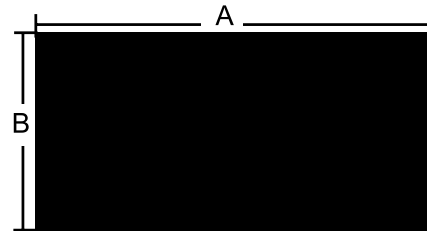
### Vacuum

- 40-60 cm Hg

### 1510RP/RS Footprint

Manual	A (width)	B (depth)
Tabletop Stand Alone	31"(787mm)	20" (508mm)
Robotic	A (width)	B (depth)
1510RP	37" (950mm)	41" (1040mm)
1510RS	48" (1219mm)	40" (1014mm)

\* Specifications subject to change; contact LEI for the latest details.



## For More Information:

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**300mm Resistivity Thickness has arrived!**  
**LEI 1510RS-300** (200-300mm with integrated thickness)  
 footprint: 86" (2184mm)w x 40" (1016mm)d w/monitor float  
 Contact LEI for more details.