

SemiMap

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Contactless Resistivity Mapper COREMA-WT 150mm X 150mm Stage Version Detailed Specifications

1. Mechanical Setup

Components

XY translation stage	150 mm x 150 mm
Loading	Manual
Probe height positioning	Self-adjusting
Vacuum chuck	150mm diameter; Vacuum pump supplied
Light tight hood	Prevents light leakage in measurement area
System dimensions	Approximately 700 mm (width) x 700 mm (depth) x 1300 mm (height); 120 kg (weight).

Specifications

Translation speed	40 mm/s max.
Repositioning accuracy	10 μ m

2. Measurement System

Components

Charge amplifier	Specially developed
Digitizer	Adapted OEM unit
Pulse generator	Adapted OEM unit

Specifications

Measurement range	1E5 - 1E12 Ω cm
Probe size	1 mm diameter
Repeatability:	1 \times 10 ⁶ - 1 \times 10 ⁹ Ω cm: better than 1% < 1 \times 10 ⁶ and > 1 \times 10 ⁹ Ω cm: better than 10%
Edge exclusion	5 mm standard, 2.5 mm minimum
Resistivity evaluation time	270 ms @ 1E7 Ω cm, including 1 mm step translation time
Wafer evaluation time	36 min. for 100 mm \varnothing wafer and 1 mm x 1 mm step

3. Measurement Control

Components

Computer	Pentium based PC, with Flat Panel Display monitor
System software	Microsoft Windows XP - English language version
COREMA Software	Custom Windows based program

Specifications

Operation	User-friendly menu-driven selection and control of routines
Full wafer topogram	Maximum 1024 x 1024 data points
Rectangular area	Selectable sizes and positions
Local measurement	Customer specified measurement plans
Evaluation	Resistivity and respective material volume percentage

4. Evaluation and Documentation

Specifications

Measurement protocol	User-friendly menu-driven routines
Topograms	Gray scale, color, and pseudo3D
Statistical evaluation	Extensive, e.g. macroscopic variations, local variations, line scans, histograms etc.

5. Customer supply requirements

Environment:	Clean laboratory with recommended temperature variation < 1 K while taking a wafer topogram. Ambient temperature 18 - 25 deg. C. Floor space 700 mm (width) x 1100 mm (depth) to place the mainframe and to lift the hood backwards. Adjacent bench space sufficient for keyboard, mouse and screen.
Utilities:	AC power supply: 195 - 230 VAC, 50 Hz, 6 Amps Clean (oil free) air or nitrogen gas, pressure > 2 bar
Hardware:	Printer (preferably color)

6. Sample requirements

Wafer thickness	250 μm - 5000 μm
Lateral dimensions	arbitrary shape up to 150 mm x 150 mm
Lateral thickness variation	< 20 μm within area of 20 mm diameter < 50 μm over sample area
Sample surface	Sawed, etched or polished, roughness below 10 μm

7. Miscellaneous

We shall be pleased to supply measurement services, if desired and subject to an NDA, to meet your characterization needs between contract award and delivery.

As a precautionary measure we have confined the 1% repeatability to the standard COREMA-WT range ($1E6 - 1E9 \Omega\text{cm}$). We found that, in the extended ranges, some minor influences such as amplifier drift correction, repositioning of highly inhomogeneous material and definition of the starting point of extremely rapid transients may render an amicable assessment of the extremely stringent 1% repeatability somewhat difficult. Please come back to us for further clarification if this issue should be of decisive importance.