The OmniMap RS35e Resistivity Mapping System

The OmniMap RS35e® is a highly advanced measurement system designed for sheet resistance process control in semiconductor fabs. The OmniMap collects and analyzes sheet resistance data on various conductive layers such as implants, diffusions, epi, CVD, metals and bulk substrates. The RS35e system provides accurate and repeatable sheet resistance measurements from 5 mΩ/sq to 5 MΩ/sq on 2-inch (50mm) to 8-inch (200 mm) wafers by uniting sophisticated modeling algorithms, advanced analysis techniques and precision electronics.

With PMX/Touch™ software, the OmniMap measures up to 1264 sites per wafer using standard or user-defined patterns, and displays test results in the form of contour maps, 3-D maps, diameter scans, and die maps. In addition, you can recall and analyze data from your PMX/Touch database and use it to generate trend charts for short- or long-term process monitoring.

The OmniMap RS35e computer houses a 40-MB fixed disk for loading and running the system software, and uses 1.44-MB 3.5-inch diskettes to store and retrieve test configurations and collected data. The RS35e contains an 16-MHz CPU.

The Prometrix Wafer Handler C2C™ is an optional part of the RS35e Resistivity Mapping System. It automatically transfers wafers, and performs flat or notch alignment as well as centering. The C2C offers dual-cassette loading and unloading of 3-inch to 8-inch wafers under local or remote control. Throughout this manual, references to the Wafer Handler C2C are made to accommodate customers who have purchased this option.

In short, the OmniMap RS35e, with its powerful yet easy-to-use PMX/Touch software, is the ideal tool for process and equipment control. The RS35e offers the accuracy, reliability and user support on which Prometrix has built its reputation.

Features and Benefits

Table 1 lists the features and benefits of the RS35e system.

Table 1: System Features and Benefits

Features	Benefits
Maps, trend charts, and diameter scans	Flexible views of sheet resistance variations help solve process problems.
Sheet resistance measurements of to 5 mΩ/sq to 5 MΩ/sq	1) Automatically adjusts from milliohms per square to megohms per square measurements on a large variety of wafers. 2) Detects subtle changes in sheet resistance.
PMX/Touch software	Powerful, versatile, and easy to use.

Table 1: System Features and Benefits, continued

Features	Benefits
Dual configuration switching technique	Detects resistivity changes as small as 0.1 percent.
1.44 megabyte floppy diskette	Quick conversion from one test procedure to another.

OmniMap System Specifications

Hardware Specifications

- Accommodates all standard wafer sizes: 2, 3, 3.25 inch and 100, 125, 150 and 200 mm
- Dimensions: DxWxH = 26"x49"x20"
- Weight: 199 lbs. (90.3 kg)
- Power requirements: 115/230V, <8 A, 50/60 Hz
- Vacuum: 300 mm Hg
- Pressure: 50 psig (3.3 bar)
- 40-MB fixed hard disk drive
- 3.5-inch diskette drive, 1.44 megabyte capacity

Components

- Customized 16-MHz 386 SX computer
- VGA Monochrome monitor
- Dot matrix printer with buffer

PMX/Touch Capabilities

- Trend charts
- Average, difference, ratio maps, and more
- Curve fitting
- Data import and export
- ASCII copy to diskette

Measurement Options

- Contour, 3-D maps and diameter scans (up to 625 sites)
- Quick tests: Standard and user-definable tests (up to 30 sites)
- Qualification tests
- Pattern tests (up to 1025 sites)

Data Transfer

- Standard: SECS II protocol data upload
- Optional: Enhanced SECS II for more demanding host to Prometrix equipment communications

Performance Specifications

- Absolute accuracy, based on NIST (NBS) standard wafers corrected to 23°C: **±1% of NIST certified range**
- Measurement repeatability <0.2% (1 sigma)
- Accuracy, based on precision resistor networks: ± 0.2%