E+H
Metrology GmbH

MX 601

Contactless High-Ohm
Wafer Resistivity Gauge

1 Description

Features

- Resistivity of semi-insulating materials (GaAs, SiC, InP, GaN))
- Non-contact, capacitive measuring method
- Fast, excellent repeatability
- No recalibration required
- PC-controlled via serial interface

The MX 601 measures the specific resistance of semi-insulating wafers like Gallium Arsenide.
It is not necessary to prepare a wafer for measuring, it is just placed on a hardcoated table and the cover is closed to keep out light. The wafer is chucked down by vacuum to effectively avoid piezo-electric effects.The vacuum is generated via a converter so that only a regular compressed air supply is required. A PC evaluates the data and then calculates and outputs the results. Using a computer has the added advantage that the calibration constants can be accessed, the output type can be changed, and statistical programs can be added.

Measuring Principle

If a capacitor is constructed in such a way, that the semiconductor material to be measured constitutes the dielectric of that capacitor, the specific resistance (resistivity) can be determined if the dielectric constant (relative permittivity) is known, by measuring the cut-off frequency.

$$\rho = \frac{1}{\omega_0 \cdot \varepsilon} \left[\frac{1}{\frac{1}{S} \cdot \frac{A \cdot S}{Vcm}} \right] = [\Omega cm]$$

This theory is based on the formal analogy between the electric flux of the electric field and the current in the flow field (> K. Kuepfmueller 1984)

2 Technical Specifications

Measuring range	5 E+4	to 5 E+9	Ωcm
Wafer sizes		up to 150	mm
Sensor area		Ø 10	mm
Thickness range		350 µm to 650	µm
Measuring time		max. 4 secs.	
Reproducibility		± 1%	
(at constant ambient temperature, Std. 1 Sigma)			
Power supply		110 / 240 V, 50/60	Hz
Power consumption		20	W
Weight		10	kgs
Dimensions		(height x width x depth)	
Electronics case		150 x 250 x 270	
Table (MX 601-4)		210 x 210	
Table (MX 601-6)		360 x 210	