Reflectance measurement of In-Plane distribution of Wafer (Absolute Reflectance : Incident angle 12°)

INTRODUCTION

Wafer is a material for the production of semiconductor elements used in cell phones, LSI, and solar batteries. One of the quality control methods for the wafer is the transmittance/reflectance measurement. By using U-4100 spectrophotometer (large sample measurement system) with a top-mount transmittance/reflectance measurement unit, the transmittance (incidence angle 0°) and reflectance (incidence angle 12°) of a large sample can be measured. In addition, by changing the measurement position for a sample, the in-plate distribution of the wafer can be analyzed.
This time, the analysis example of the in-plate reflectance distribution is introduced here.

SAMPLE

Sample : Wafer with evaporated film (sample size: ϕ6 inches)

INSTRUMENT CONDITIONS

Instrument : U-4100 Spectrophotometer (large sample measurement system)
+ Top-mount transmittance/reflectance measurement unit (P/N : 134-0108)

【UV/VIS】

Measurement wavelength	: 240 - 400 nm
Scan speed	: 120 nm/min
Slit	: 8 nm
Sampling interval	: 1 nm

ACCESSORY

Top-mount transmittance/reflectance measurement unit (P/N : 134-0108)

Polarizer holder
(P/N : 132-0325)

Glan-Taylor polarizing prism
MGTYB 20
(Karl Lambrecht, Chicago, USA)

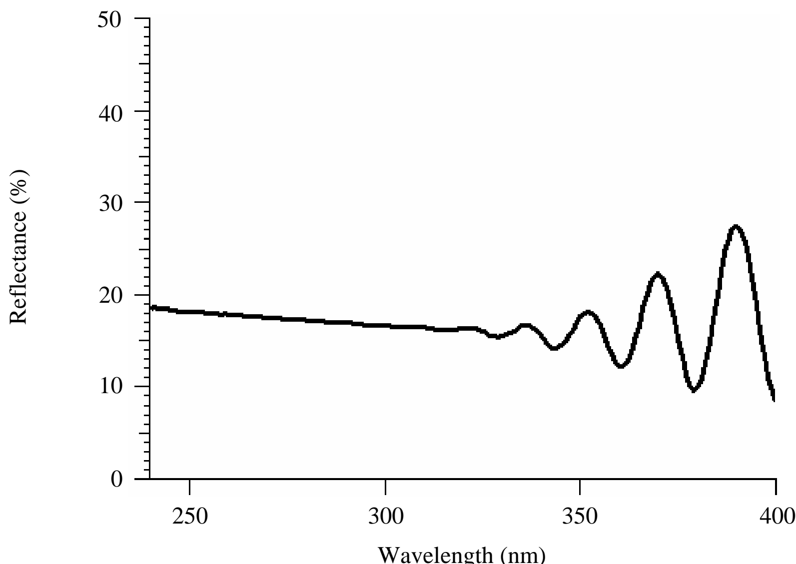

Figure 1 Result of Wafer Reflectance Measurement (s-polarization)

KEY WORDS

Wafer with Evaporated Film, Wafer, In-plate Distribution, Absolute Reflectance, Spectrophotometer, Large Sample Measurement System, UV, U-4100

Spectrophotometer (UV)

Sheet No. UV080011-01

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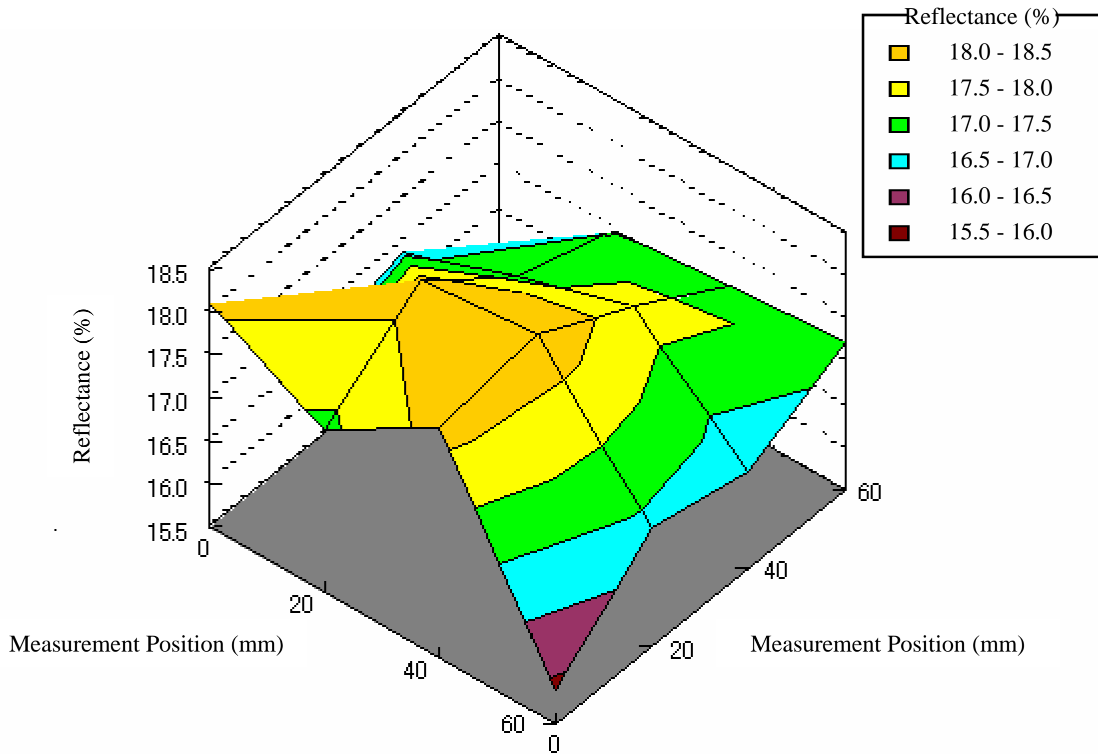

Figure 2 In-plate Distribution of Wafer Reflectance
(wavelength: 248 nm, s-polarization)

* Microsoft Office Excel was used to prepare the graph.

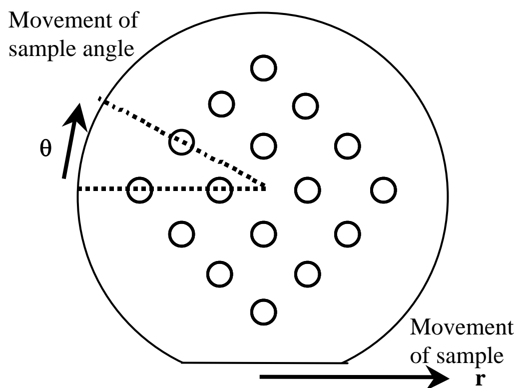

Figure 3 Sample measurement position
(○ : measurement position)

To measure the in-plate distribution of the wafer reflectance, it is necessary to measure the reflectance at multiple positions.

In this system, the measurement positions can be adjusted in both radius (r) direction and angle (θ) direction based on the movement/revolution stages.

In this analysis, the sample was measured at 16 positions as shown in Figure 3.

【Specification of This System】

Measurement sample size : ϕ6 inches, ϕ8 inches
Radius (r) direction: can be adjusted by 2 mm increments
Angle (θ) direction: can be adjusted by 5° increments
Flux size: Appx. 11.2 × 10.4 mm

KEY WORDS

Wafer with Evaporated Film, In-plate Distribution, Absolute Reflectance, Spectrophotometer, Large Sample Measurement System, UV, U-4100

Spectrophotometer (UV)

Sheet No. UV080011-02