Application Brief
SII

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Thin Film Evaluation Using Optional Software

1. Objective

To evaluate the film thickness and the film quality of a metallic film deposited on a circuit board using Nanopics.

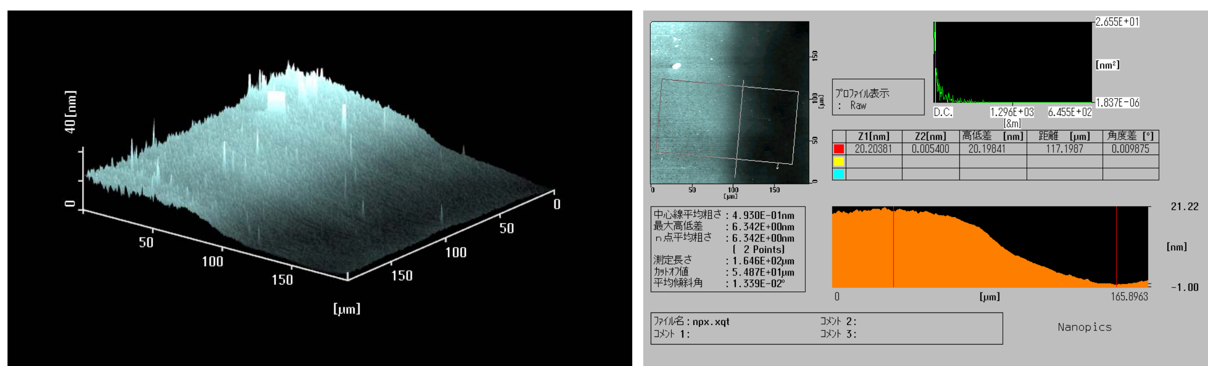
2. Evaluation Samples

Nanopics was set at the following conditions.

Sample	Deposition	
Observation Objective	Film thickness	Film quality
Observation Mode	DFM (Oscillation: HH)	DFM (Oscillation: LL)
Observation Range (µm)	200	4
Scan Speed (sec/frame)	90	190

3. Observation Results

3-1 Film Thickness Measurement

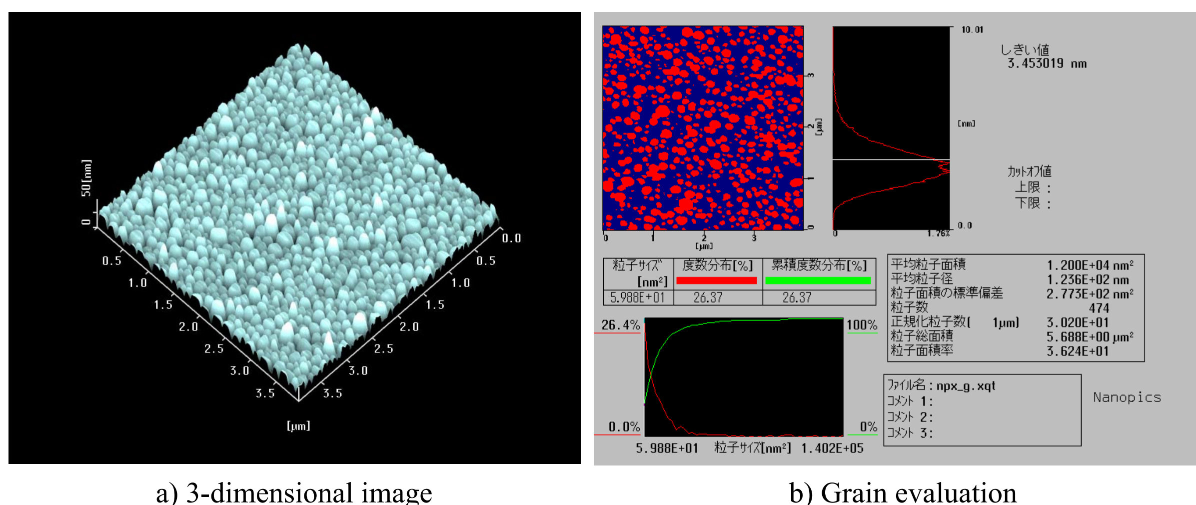


a) 3-dimensional image　　b) Average cross dimension profile

Figure1　Film Thickness Evaluation

Film thickness measurement of the deposition film was performed by masking the board and using the edge of the created deposition film. Figure 1(a) shows the 3-dimensional image of the edge and Figure 1(b) shows the cross section profile for film thickness evaluation. By using the average cross section profile that averages the cross section of the designated analysis area, deviations caused by operators and noise can be minimized with the arbitrary cross section profile that designates the cross section profile by line.

3-2 Film Quality Evaluation



a) 3-dimensional image b) Grain evaluation

Figure 2 Film Quality Evaluation

For deposition film quality evaluation, the observations were performed in the 4μm range. Grain analysis was performed on this data and the area ratio and the average grain diameter was found. Figure 2(a) shows the three-dimensional image of the deposition film's surface condition and Figure 2(b) shows the grain analysis image. From these results, we can see that the average grain diameter is 123.6nm and the grain diameter ratio is 36.

From these results, evaluation of deposition conditions (charge voltage, vacuum, etc) can be performed.

The 3-D images and analysis images above with the evaluation results use optional Nanopics software.

4. Summary

For this case, evaluations of thin film were made using optional Nanopics software. By combining cross section profile and grain analysis as shown above, it can be used for thin film condition evaluations and production process evaluations.