

Conductivity measurements at the interface between the sintered conductor and dielectric substrate at microwave frequencies

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A novel measuring technique of the effective conductivity at microwave frequencies for both the sintered conductor surface and the interface between conductor and dielectric materials was developed. In the measurement, a dielectric rod resonator is placed between two dielectric plates, one side of which is coated with a sintered conductor. For measuring the surface conductivity, the dielectric rod is sandwiched by the conductor side of the plates. On the other hand, for measuring the interface conductivity, the dielectric rod is sandwiched by the dielectric side of the plates. By the configuration, only interface conductivity contributes to the conducting loss of the resonator, thus allowing the measurement of the interface conductivity. Using the new technique, the frequency dependence of both the surface and interface conductivity of a sintered copper, formed on a glass ceramic substrate by the co-firing technique, was investigated in the frequency range from 11 to 34 GHz. It was confirmed that the values of interface conductivity of the sintered copper were smaller than the values of the surface conductivity.

 [Return to main document.](#)