

ABSTRACT

A method and apparatus are provided for measuring the thickness of a copper oxide layer formed on an underlying copper layer. The method either measures a bulk characteristic of the copper layer, through the copper oxide layer (as in the case of sheet resistance) or determines the thickness of the copper oxide by measuring the attenuation caused by the copper oxide, which is a monotonic function of the thickness of the copper oxide layer (as in the case of reflectivity). A processor stores correlated data (e.g., reflectivity measurements obtained for various copper oxide thicknesses) or a relationship (e.g., a formula) which correlates a given measurement to a given copper oxide thickness. The method may be used for in situ or ex situ measurements, and may be performed during either vacuum or non-vacuum processes. The method may be employed to measure the thickness of any layer which attenuates a characteristic of a layer which lies thereunder provided the attenuation of the characteristic varies with the thickness of the overlying layer.

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This Sheet Has Been Replaced