Abstracts

Absolute Loss Measurement of Highly Reflective Samples by Using a High Q Gaussian Beam Open Resonator at Short Millimeter Wave Frequencies

T. Matsui, M. Kiyokawa and K. Araki. "Absolute Loss Measurement of Highly Reflective Samples by Using a High Q Gaussian Beam Open Resonator at Short Millimeter Wave Frequencies." 1995 MTT-S International Microwave Symposium Digest 95.2 (1995 Vol. II [MWSYM]): 557-560.

A high Q Gaussian beam open resonator and a new arrangement of it are described as a new method for determing absolute loss due to surface resistance of highly reflective materials at short millimeter- and sub-millimeter wave frequencies. The Gaussian beam open resonator are consist of a pair of spherical mirrors with highly reflective partially transparent circular coupling regions and a plane mirror, where the plane mirror is the test sample. Application of this new method to reflection type measurement enabled simultaneous attainment of high Q factor and high signal-to-noise ratio, which would have been impossible using a conventional reflection-type open resonator with a small coupling hole. Moreover, the use of a pair of identical spherical mirrors enabled direct measurement of the Q of these mirrors, which is equal to Q/sub others/, without changing the experimental conditions. Surface loss measurements of metal films are made at 100 GHz band. In the room temperature experiment, surface resistance of 110 m-Ohms was measured with an accuracy of ± 7.6%.

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