Abstracts

A novel W-band spectrometer for dielectric measurements (2000 Vol. III [MWSYM])

M.N. Afsar, I.I. Tkachov and K.N. Kocharyan. "A novel W-band spectrometer for dielectric measurements (2000 Vol. III [MWSYM])." 2000 MTT-S International Microwave Symposium Digest 00.3 (2000 Vol. III [MWSYM]): 1627-1630.

A new spectrometer for the precision measurement of dielectric permittivity and loss tangent is presented. The new instrument is capable of providing the high resolution data for the first time over extended W-band (68-118 GHz) frequencies for specimens with a large range of absorption values, including highly absorbing specimens which otherwise would not be possible. A novel technique based on the unbalanced bridge is developed for the measurement of the phase of the wave passed through the specimen in free space (quasi-optical) with reference provided by a waveguide arm. Specially constructed precision waveguide and quasi-optical components allowed reliable broadband operation. A number of common dielectrics are measured and results are compared with previously reported data.

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