Abstracts

Precise Calibration of Plane-Wave Microwave Power Density Using Power Equation Techniques

H.I. Bassen and W.A. Herman. "Precise Calibration of Plane-Wave Microwave Power Density Using Power Equation Techniques." 1977 Transactions on Microwave Theory and Techniques 25.8 (Aug. 1977 [T-MTT]): 701-706.

A power-density calibration methodology utilizing an anechoic chamber, high-power transmitter, and truncated pyramidal horn antenna is described, Plane-wave power density is accurately computed in the far field of the antenna, based upon precise measurements of antenna gain, absolute transmitted power, and multipath reflections. The application of power equation techniques enables direct precise measurements of system mismatches and the accurate transfer of calibration of special bolometers. Several considerations, unique to hazard probe calibrations, are discussed. Absolute power density uncertainties are estimated at 0.56 dB, at 2450 MHz, and 0.76 dB, at 915 MHz, under worst case conditions. A discussion of second-order error sources and their elimination includes the effects of antenna alignment, antenna sidelobes, multipath reflections, field curvature at noninfinite distances, and scattering from test apparatus.

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