Abstracts

Coaxial E-Field Probe for High-Power Microwave Measurement (Short Papers)

S. Burkhart. "Coaxial E-Field Probe for High-Power Microwave Measurement (Short Papers)." 1985 Transactions on Microwave Theory and Techniques 33.3 (Mar. 1985 [T-MTT]): 262-265.

Open-ended semirigid coaxial cable is characterized for use as a coupling element for the measurement of high-power microwaves. There are many high-power microwave experiments where a high vacuum must be maintained, and yet it is necessary to measure the power and frequency of the microwave energy in a cavity or waveguide. Semirigid coaxial cable which is left open-ended and inserted no more than fresh with the inner waveguide wall is a convenient way to couple out a known sample of the power. The cable is inserted into the waveguide in a direction parallel to the electric field. The coupling value is expressed in terms of an area multiplier which is applied to the area of the end of the center conductor. The induced charge Q on the center conductor is then determined from Q = /rarr over D/ · n · (effective area), and the coupled power is calculated from P = (omega Q)²/(2Z/sub 0/). For a flush mounted Z/sub 0/ = 50 - Omega with PTFE dielectric, the area multiplier is shown to be 3.846 theoretically and 3.77 experimentally. The area multiplier is also determined for various withdrawal depths of the coax into the waveguide wall.

❑ Return to main document.