Abstracts

An Accurate Approximation of the Impedance of a Circular Cylinder Concentric with an External Square Tube (Short Papers)

H.J. Riblet. "An Accurate Approximation of the Impedance of a Circular Cylinder Concentric with an External Square Tube (Short Papers)." 1983 Transactions on Microwave Theory and Techniques 31.10 (Oct. 1983 [T-MTT]): 841-844.

The problem of determining the characteristic impedance of a concentric coaxial transmission line having a circular inner conductor and a square outer conductor is reexamined. The Green's function for a rectangle is used to determine the geometrical capacitance of a series of structures ranging from 1-46 Omega with an error less than 10 -5. The method of analysis is illustrated in detail for the 1-Omega case. The resitlts are presented in terms of the "outer shield factor" R/sub eff/, which is defined as the ratio of the diameter of an outer circle, having the same capacitance as the outer square, to the side of the outer square, Values of this ratio are tabulated for impedances ranging from 1-46 Omega. These values are also plotted on a curve which can be read with an error of the order of 0.02 Omega for impedances greater than 3 Omega.

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