Abstracts

Impedances of an Elliptic Waveguide (For the /sub e/H/sub 1/ Mode)

G.R. Valenzuela. "Impedances of an Elliptic Waveguide (For the /sub e/H/sub 1/ Mode)." 1960 Transactions on Microwave Theory and Techniques 8.4 (Jul. 1960 [T-MTT]): 431-435.

The power-voltage, power-current and voltage-current impedances for the elliptical waveguide for the fundamental mode (/sub e/H/sub 1/ mode) are obtained by two different methods. The first method consists of using the exact fields inside a perfectly conducting elliptical pipe. Numerical results were obtained by numerical integration of the integrals involving Mathieu functions by the Gaussian Quadratures method by a digital computer. In the second method approximate fields which satisfy the boundary conditions were used. By this approximate method, actual expressions for the impedances are obtained as a function of minor to major diameter ratio with no need of numerical integration. The actual expressions for the impedance obtained by the approximate method give the impedance for elliptical waveguide within six per cent. On the basis of comparison with the exact numerical solution the expressions for the approximate impedance give the impedance of elliptical waveguide within three per cent if they are scaled by 1.03.

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