Abstracts

The Negative Capacitor, An Impedance Matching Element for Dielectric-Filled Transmission Line (Correspondence)

A.J. Kelly. "The Negative Capacitor, An Impedance Matching Element for Dielectric-Filled Transmission Line (Correspondence)." 1967 Transactions on Microwave Theory and Techniques 15.10 (Oct. 1967 [T-MTT]): 583-584.

The well-known problem of a capacitive dielectric window in an air-filled cylindrical transmission Iine can be extended to the general problem in which the transmission line is dielectric filled, as shown in Fig. 1. This leads to a unique result, When the dielectric constant of the window is less than that of the loading material, the window can be represented by a shunt negative capacitor at the reference plane Z/sub 0/ in the uniformly filled line. This result does not contradict Foster's reactance theorem. The negative capacitor is a lumped parameter representation of a distributed-parameter network and, as such, has no accessible port. The lumped-parameter representation-even though it entails some approximations-facilitates the use of the window for impedance matching.

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