Abstracts

Some Characteristics of Dielectric Image Lines at Millimeter Wavelengths

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The attenuation characteristics of several dielectric image lines have been calculated for the frequency range extending from 24 to 100 kmc and have been checked experimentally at 35 and 70 kmc. To obtain low attenuation at these high frequencies, dielectric materials with little loss and small size of cross section are required, while low values of the dielectric constant are also desirable. The effects of the size and shape of the dielectric cross section and of low dielectric constant are treated separately. To find proper materials with low dielectric constants several new foam plastics were investigated. Three types were found suitable for image line use, and in fact, these plastics have such good electrical and physical properties that they should be useful in many microwave applications. A qualitative measure of field extent is given for several image lines at 35 or 70 kmc, and various image lines and associated components are discussed. A new type of image line, called the tape line, is described.

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