Abstracts

Quasi-Optical Low-Pass Filters which Attenuate by Absorption (Dec. 1969 [T-MTT])

G.L. Matthaei and D.A. Leedom. "Quasi-Optical Low-Pass Filters which Attenuate by Absorption (Dec. 1969 [T-MTT])." 1969 Transactions on Microwave Theory and Techniques 17.12 (Dec. 1969 [T-MTT]): 1123-1129.

A type of filter structure is discussed which has application for quasi-optical systems using focused beams or oversized waveguide. The filter structure consists of a number of focusing reflectors which in the passband of the filter focus the energy from one reflector to the next so that the energy is beamed in a zig-zag fashion. However, the focusing reflectors are made from arrays of spaced-apart metal plates with the edges of the plates parallel to the E field. The focusing face of each reflector is thus formed by the front edges of the plates. When the frequency is suffcientIy high so that the spacing between the plates is greater than a half-wavelength, the energy passes between the plates and is absorbed by dissipative material placed therein. Thus above a certain frequency the reflectors are absorptive and a stopband is formed. A trial three-reflector structure was fabricated and tested with very encouraging results. The minimum loss points in the passband were about 1 dB, and the stopband was broad and free from spurious responses. There were 3- or 4-dB attenuation spikes in the passband due to "trapped modes," but it should be possible to eliminate these by improved mode launchers.

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