Abstracts

Low-Pass Quasi-Optical Filters for Oversized or Focused-Beam Waveguide Applications (Dec. 1968 [T-MTT])

G.L. Matthaei and D.A. Leedom. "Low-Pass Quasi-Optical Filters for Oversized or Focused-Beam Waveguide Applications (Dec. 1968 [T-MTT])." 1968 Transactions on Microwave Theory and Techniques 16.12 (Dec. 1968 [T-MTT]): 1038-1047.

A form of Iow-pass quasi-optical filter for millimeter-wave and possibly infrared applications is described which consists of thin layers of dielectric interspersed with arrays of thin metallic strips in a manner similar to an artificial dielectric. Equivalent circuits for filter half-sections of the type used were developed, and formulas and graphs are presented from which image parameters for such half-sections can be obtained. A design procedure is given from which multisection fiters of this type can be designed from low-pass lumped-element prototypes in order to give prescribed transmission characteristics. Some trial designs were worked out and fabricated for use in oversized waveguide, and their responses were computed in detail with a digital computer. Except for some higher order mode effects believed to be due to the standard-size to oversize waveguide tapers which were used, the measured responses were in good agreement with the theory. Stopband edge ratios between 3:1 and 4:1 are possible. Filter structures of this type are amenable to fabrication by techniques similar to those used in integrated circuit technology.

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