Abstracts

A Plasma-Column Band-Pass Microwave Filter

I. Kaufman and W.H. Steier. "A Plasma-Column Band-Pass Microwave Filter." 1962 Transactions on Microwave Theory and Techniques 10.6 (Nov. 1962 [T-MTT]): 431-439.

A tunable band-pass filter using the dipole resonance of a plasma column has been investigated. The center frequency of the pass band can be electronically tuned over a large portion of a waveguide band. For the prototype investigated at S band, the insertion loss at the center frequency was less than 2 db, with isolation for frequencies outside the pass band on the order of 12 db. A typical 3-db bandwidth of this prototype was 150 Mc. It is expected that this figure can be improved by choice of better discharges than the positive column of the mercury discharge used here. An analysis of the external Q's for the input and output coupling is presented. From these calculations, it is possible to determine approximately the various coupling parameters that produce a given degree of overcoupling.

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