Abstracts

The Stepped Cavity Coupled Elliptic Filter

J.D. Rhodes. "The Stepped Cavity Coupled Elliptic Filter." 1969 G-MTT International Microwave Symposium Digest of Technical Papers 69.1 (1969 [MWSYM]): 304-309.

A design procedure is presented whereby compact, narrow-band (<30%) T.E.M. line, band-pass, elliptic function filters may be realized. The proposed realization is in the form of a stepped impedance, digital n-wire line which is one half of a wavelength long at midband and short circuited to ground at both ends, where the digital line is stepped in impedance along any arbitrary prescribed plane in the filter. Due to its physical form and the mode of electrical operation, the filter has been called "The Stepped Cavity Coupled Elliptic Filter". Recently, "The Stepped Digital Elliptic Filter" has been proposed as a realization of the narrow-band, band-pass elliptic filter and consisted of a stepped impedance digital n-wire line, one quarter of a wavelength long at mid-band where the line was shorted to ground at one end and open-circuited at the opposite end. In this filter, the fringing capacitances at the open-circuited ends of the line necessitate the use of a compensation procedure based upon an estimation of these parasitic lumped capacitances. Consequently, in the very narrow-band cases, where these end effect capacitances have a considerable effect upon the performance of the filter, it is very difficult to construct a filter with the required electrical performance. In the new design procedure, this problem is eliminated since the digital line is short circuited to ground at both ends and this also provides the filter with greater physical rigidity.

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