Abstracts

Wideband Interdigital Filters with Capacitively Loaded Resonators

L.A. Robinson. "Wideband Interdigital Filters with Capacitively Loaded Resonators." 1965 G-MTT Symposium Program and Digest 65.1 (1965 [MWSYM]): 33-38.

The interdigital filters described by Matthaei consist of resonators formed by coupled-line elements that are lambda/4 long at midband, with alternate ends of the coupled-line elements grounded, and the opposite ends open-circuted. It will be shown in this paper that the coupled-line elements can be made shorter than lambda/4 at midband provided that loading capacitances are added at the open-circuited element ends. In addition to making the filter more compact in one dimension, capacitive loading has the advantage of moving the second pass band (that is, the first spurious pass band) even farther from the first pass band. The shorter the resonators are at midband, the wider the upper stop band, since the second pass band cannot occur until the resonators are somewhat greater than lambda/2 long. The capacitively loaded version retains the other advantages of the version without loading, that is, the relatively large spacings between coupled-line elements permit relatively relaxed manufacturing tolerances, the rates of cutoff and strength of the stop bands are enhanced by multiple-order poles at zero frequency and between the pass bands, and they can be fabricated using little or no dielectric. The wide separation between first and second pass bands should make this filter type useful in parametric amplifiers and in frequency multipliers, the latter application has been demonstrated by Cuccia.

❑ Return to main document.