Abstracts

Interdigital Capacitors and Their Application to Lumped-Element Microwave Integrated Circuits

G.D. Alley. "Interdigital Capacitors and Their Application to Lumped-Element Microwave Integrated Circuits." 1970 Transactions on Microwave Theory and Techniques 18.12 (Dec. 1970 [T-MTT] (1970 Symposium Issue)): 1028-1033.

An analysis of the frequency response of interdigital capacitors, which leads to an optimal design, is given along with an expression for their static gap capacitance. The capacitor Q is given in terms of its geometry which consists of a planar interdigital thin-film conductor deposited on the surface of a relatively high dielectric constant substrate. Capacitance values ranging from 0.1 to 10 pF at L band with measured Q's in excess of 400 are realizable using 2-mil line and space widths on a 99.5-percent alumina substrate with a dielectric constant of 10.3. Experimental results obtained with a lumped-constant nine-section S-band Chebyscheff low-pass filter realized using spiral inductors and optimal designed interdigital capacitors are shown to be in excellent agreement with theory. The filter had less than 0.8-dB insertion loss and greater than 25dB return loss in the passband. The filter occupies an area 6.50 by 200 roils on a 24-mil-thick substrate.

❑ Return to main document.