Abstracts

Monolithic Capacitors as Transmission Lines

M. Ingalls and G. Kent. "Monolithic Capacitors as Transmission Lines." 1987 Transactions on Microwave Theory and Techniques 35.11 (Nov. 1987 [T-MTT]): 964-970.

The results of network analyzer measurements of high-Q multilayer (monolithic) chip capacitors show that the devices have the characteristics of open-circuited transmission lines. Both standard sizes (MIL-CDR-14 and MIL-CDR-12), ranging in capacitance values from 4.7 to 1000 pF, were tested on microstrip lines. A simple model of a periodically loaded line provides a dispersion relation that accounts for the distribution of resonant frequencies. The orientation of the capacitor with respect to the microstrip affects the occurrence and nature of resonances. This phenomenon is shown to result from a distributed excitation source. The unfolding of the capacitor to produce the periodic line is shdwn to produce anomalies in the dissipation loss when skin depth and electrode thickness are comparable.

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