Abstracts

Microstrip Circuit Applications of High-Q Open Microwave Resonators

K.D. Stephan, S.-L. Young and S.-C. Wong. "Microstrip Circuit Applications of High-Q Open Microwave Resonators." 1988 Transactions on Microwave Theory and Techniques 36.9 (Sep. 1988 [T-MTT]): 1319-1327.

The problem of achieving a high circuit Q in hybrid and monolithic microwave integrated circuits becomes acute in the millimeter-wave range. An open microwave resonator can be formed above a planar microstrip substrate by suspending a spherical reflector above it. We develop a theory to account for the coupling between an open resonator mode and a microstrip line. The open resonator is shown to have useful circuit properties similar to a dielectric resonator, but with the potential of efficient operation well into the millimeter wave range. Experimental confirmation of the theory is demonstrated by a scale model of a microstrip-based single-pole bandpass filter, which shows a loaded Q of 860 and a minimum loss of 0.8 dB ±0.4 dB at 10 GHz.

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