Abstracts

Analysis and Application of a New Waveguide Structure with Dielectric Loading

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A new waveguide structure has been proposed for the design of a distributed constant circuit elements at a lower microwave frequency band. Theoretical and experimental analysis of the structure has been carried out, and it was applied to the design of a compact 850 MHz band radio frequency filter. The equivalent permittivity of the waveguide (epsilon /sub eff/) is about half the perrnittivity of the medium dielectric material (epsilon /sub r/). The amount of coupling between quarter wavelength resonators (the diameter of the dielectric rod is 15 mm and epsilon /sub r/ = 20) within the cutoff waveguide (15 mm x 31 mm) is approximately 3 x 10/sup -2/ for spacing of 2 mm. Unloaded Q (Qu) of the resonator is about 1,600 using the dielectric material of which tan delta is about 1.4 x 10/sup -4/ at 6.3 GHz.

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