Abstracts

Wide-Band Directional Couplers in Dielectric Waveguide

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In this work, the II guide is proposed as an alternative in designing proximity directional couplers using dielectric guides in order to obtain coupling factors constant with the frequency, thus increasing the bandwidth of these devices. The propagation constants of the even and odd modes of the coupling zones are determined by means of Schelkunoff's method and the effective dielectric constant method (EDCM). Two directional couplers, 10 dB and 3 dB, made of polystyrene and Teflon respectively, were designed and measured to work in the millimetric frequency band (32-40 GHz). The inclusion of metallic walls in the curved zones avoids additional couplings and results in flat coupling. Furthermore, the metallic walls reduce the radiation losses and allow the coupling factor to be finely adjusted. The results obtained show a maximum coupling variation of ±0.5 dB for 20-percent bandwidth.

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