Abstracts

Phase Step Beam Waveguide

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Experimental tests on a new type of beam waveguide constituted by a series of equispaced dielectric frames are described. Field-pattern and power-loss measurements have been performed on short-circuited sections of the waveguide working at 10 GHz and on the 37-GHz prototype constituted by Teflon square frames. In comparison with the more common iris and lens beam waveguides, it presents advantages concerning diffraction, reflection, and dissipation losses. In addition, it is lightweight and compact. The experimental results confirm these advantages, along with a low sensitivity to assembling and constructive imperfections. Design criteria are suggested as a result of the optimization for the lowest losses obtained through numerical computations performed on the equivalent open resonator.

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