Abstracts

Design of Short High-Power TE/sub 11/- HE/sub 11/ Mode Converters in Highly Overmoded Corrugated Waveguides

M. Thumm, A. Jacobs and M.S. Ayza. "Design of Short High-Power TE/sub 11/- HE/sub 11/ Mode Converters in Highly Overmoded Corrugated Waveguides." 1991 Transactions on Microwave Theory and Techniques 39.2 (Feb. 1991 [T-MTT]): 301-303.

A theoretical parametric study of TE/sub 11/ to HE/sub 11/ mode conversion in highly oversized, circumferentially corrugated circular waveguides with different inner diameters is presented for various frequencies in the range of 28 to 140 GHz. The depth of the annular slots is tapered gradually from one half to one quarter wavelength. Computer-aided optimization of converter length, shape of corrugations, and nonlinear slot depth variation has been achieved with a scattering matrix code employing the modal field matching techniques (modular analysis concept). Relatively short mode transducers with matched converter lengths of L /spl ap/ pi/Delta beta/sub [TE/sub 11/-TM/sub11/]/ are feasible. In all cases the HE/sub 11/ output mode purity is 99% to 99.5%. The maximum cross-polarization and input-reflection levels are below -29 dB and -50 dB, respectively. Experimental results at 70 GHz (I.D. = 27.79 mm) are in excellent agreement with the theoretically predicted performance.

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