Abstracts

Resonant Cavity Type Mode Transducer

S. Shimada. "Resonant Cavity Type Mode Transducer." 1966 Transactions on Microwave Theory and Techniques 14.8 (Aug. 1966 [T-MTT]): 384-391.

This paper describes the operating principle and the properties of a resonant cavity type mode transducer which was newly devised. The theoretical equations necessary for designing the mode transducer from a TE/sub 10/ mode of a rectangular waveguide to an arbitrary mode of a circular waveguide have been derived, and a design method using the coupling parameters is discussed. The experiments were made for the rectangular TE/sub 10/-circular TE/sub 01/ mode transformation in the 50 Gc band. Showing an example (N=1), the transfer loss, input SWR and mode purity were 1.34 dB, 1.13, and 95 percent (power contents), respectively, at the resonant frequency of 50 Gc/s. The 3 dB bandwidth of the transfer loss was 83 Mc/s at the constant cavity length, but it can be made much larger if the cavity length is adjusted according to the frequency change. This mode transducer is unique in that various modes can be excited purely in the circular guide by merely varying the cavity length.

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