Abstracts

A Waveguide Type Power Divider/Combiner of Double-Ladder Multiple-Port Structure

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We propose a waveguide type microwave power divider/combiner of double-ladder multiple-port structure which is advantageous for its very low insertion loss and high power capability. Analysis based on equivalent circuits gives the design formula for perfect power dividing/combining. Numerical analysis gives optimal design parameters for broadband characteristics both of the divider and of the combiner. Analyses of power flows in the divider structure and isolation characteristic are given. Operation characteristics of divider-combiner system and the effect of phase deviation in combiner input signals on the combining efficiency are also discussed. Experiments showed good performances in accordance with the theory: The -0.5 dB relative bandwidths of four-, eight- and twelve-way dividers were as large as 0.5, 0.38, and 0.38, respectively. For four- and eight-way divider-combiner systems, relative bandwidths were 0.22 and 0.13, respectively, both with insertion loss of less than 0.1 dB.

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