Abstracts

An Asymmetric Non-Monotonic Stripline Magic-T

E.W. Carpenter. "An Asymmetric Non-Monotonic Stripline Magic-T." 1969 G-MTT International Microwave Symposium Digest of Technical Papers 69.1 (1969 [MWSYM]): 320-323.

Several techniques have been described in the literature for the design of Magic-T circuits in a strip-transmission-line configuration. Among these are the symmetrical quadrature coupler used in conjunction with the 90° Schiffman phase shifter, the tapered (or stepped) line coupler designed using an impedance transformer prototype, and the asymmetric coupler with a Schiffman phase compensator. This paper describes a new cascaded coupled TEM transmission line Magic-T which requires less overall path length to achieve a specified performance than any of these earlier designs. The design employed in this report was suggested by the unusual configuration employed by R. Pegis. The coupler equivalent for an optical filter design of this broadband -3 db optical filter has the performance of a Magic-T over a portion of the coupler bandwidth. This coupler has a number of coupled sections which have monotonically increasing even mode impedance and an equal number of non-monotonic weakly coupled sections. The resulting 8-section coupler gives a -3.01± .22 db coupling over a 17:1 bandwidth. This is slightly better than the balance which can be achieved with an asymmetric coupler of 8 sections. The existence of such an asymmetric non-monotonic Magic-T was also suggested by Young.

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