Abstracts

High Directivity CTL-Couplers and a New Technique for the Measurement of CTL-Coupler Parameters (Dec. 1977 [T-MTT])

S. Rehnmark. "High Directivity CTL-Couplers and a New Technique for the Measurement of CTL-Coupler Parameters (Dec. 1977 [T-MTT])." 1977 Transactions on Microwave Theory and Techniques 25.12 (Dec. 1977 [T-MTT] (1977 Symposium Issue)): 1116-1121.

A very powerful method to measure the parameters of a one-section Coupled Transmission Line (CTL) coupler is presented. Three transmission measurements at the frequency of maximum coupling is sufficient to give the even- and odd-mode impedances (Z/sub e/, Z/sub 0/) and the even- and odd-mode lengths (Theta/sub e/,Theta/sub 0). Explicit equations are presented for the necessary calculations. Data for some stripline couplers measured with the new method are presented. The data show a very significant length difference between the even and odd modes, although boards with the same dielectric constant (measured according to the MIL standard) were used. Improved dielectric-constant measurement techniques for thin boards have been developed. The presented methods give more relevant information of dielectric constant and Q value of the thin boards. A new method for wide-band improvement of CTL-coupler directivity when Theta/sub e/ /spl ne/ Theta/sub 0/ has been developed. The theory is presented with all necessary equations and it covers both Theta/sub e/ > Theta/sub 0/ (microstrip) and Theta/sub e/ < Theta/sub 0/. The new method makes use of short compensating sections in the coupler to achieve a directivity pole at an arbitrary frequency. The wanted bandwidth determines the optimum location of the pole. Several examples with design data are given.

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