Abstracts

Synthesis of Broad-Band 3-dB Hybrids Based on the 2-Way Power Divider

G.L. Nystrom. "Synthesis of Broad-Band 3-dB Hybrids Based on the 2-Way Power Divider." 1981 Transactions on Microwave Theory and Techniques 29.3 (Mar. 1981 [T-MTT]): 189-194.

The synthesis of broad-band 2-way Wilkinson hybrids is well known. The even- and odd-mode analysis results in two equivalent circuits where the synthesis of the odd mode is done by computer optimization. This paper shows an exact synthesis of 2-way Wilkinson power dividers having one isolation resistor, but an arbitrary number of quarter-wave transformers. A large number of circuits have been synthesized with up to 6 quarter-wave transformers. The 2-way Wilkinson hybrid can be extended to a 4-port component. This 4-port component can operate as a 180° or 90° 3-dB hybrid depending on the input port. The hybrid has a high directivity independent of frequency when used as a 180° hybrid. Experimental results are given for a 2-way divider and a 3-dB hybrid built in microstrip with a center frequency of 5 GHz.

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