Abstracts

A derivation of a class of 3-port baluns from symmetrical 4-port networks

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This paper describes an approach in deriving the general conditions that need to be satisfied for a class of 3-port baluns. This is done by analyzing the behavior of a general symmetrical 4-port network when one of the ports is terminated with an arbitrary impedance. These conditions will be useful in devising new balun structures and in deriving exact design equations for such baluns. Examples will be presented for some known and new baluns in this class. These insights have also made the cascading of multisection baluns possible by specifying the overall requirements for the cascaded structures. Based on these results, a 3-section, Marchand-type, coupled-line balun has been designed and fabricated. Good agreements between simulation and measured results have been obtained, thereby verifying the validity of the design equations.

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