

عنوان مقاله:

Designing and Fabrication of High Frequency Ultrawide Band Passive Phase Shifters with Single Layer Microstrip Structure and Unequal Source and Load Impedances

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خلاصه مقاله:

In this paper, a method is presented to design and implement ultra-wideband phase shifters, in frequency ranges higher than 10 GHz, with fractional bandwidth near a hundred percent. The phase shifter is constructed from microstrip transmission lines and short circuit stubs. In comparison with conventional phase shifters which are composed of microstrip coupled lines and multilayer structures, the proposed phase shifter has advantages from the implementation and fabrication viewpoint. The design and optimization method is in such a way that arbitrary phase shift, source and load impedances may be considered in the design. To optimize the circuit dimension, a computer code is written, and two design examples are considered. The computer code is based on closed form equations for microstrip transmission lines and available circuit models for it and utilizes microwave network equations. Its results are then improved with electromagnetic full-wave packages to consider the parasitic effects of microstrip T-junctions. Two design cases are included, in the first design, the case of a 45 degrees phase shifter with a standard 50 ohms source and load impedances is investigated. In the second design case, the case of a 90 degrees phase shifter with 50 ohms input impedances and 75 ohm non-standard output impedances is considered. By observing the full-wave simulation results as well as the fabrication and measurement results in these examples, it is clear that the design goals are highly satisfied by this method.

کلمات کلیدی:

transmission line, scattering parameters, theoretical analysis

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