Abstracts

Design technique and performance assessment of new multiport multihole power divider suitable for M(H)MICs

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Novel power-dividing structures are studied for application in solid-state power amplifiers and array-antenna related beam-forming networks. This paper is directed to the design and study of a class of compact sinusoidally tapered power dividers suitable for use in monolithic and hybrid microwave integrated circuits at microwave and millimeter-wave frequencies. An efficient computer-aided design (CAD) technique is used in the accurate design of such planar circuits generally having irregular topologies and contours. A so-called multiport and multihole power divider is developed and modeled and a 1-9 power divider is designed through a cascading of four sets of 1-3 simple multihole dividers. Compared to conventional structures, advantageous features of the new power divider are demonstrated such as small size, short linearly aligned ports, potential high-power handling capability, potential large bandwidth, and easy post-fabrication tuning. Capacity of the proposed CAD technique is shown in the design of an electrically large multiport power dividing circuit for which only limited computer resource and time are required. Electrical performance and design effectiveness of the new multiport and multihole divider are assessed with design prediction and experimental results for Ku-band prototypes.

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