Abstracts

Circulators Using Planar WYE Resonators

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An important class of commercial three-port circulator relies for its operation on a junction resonator consisting of the symmetrical connection of three open-circuited transmission lines. A feature of this resonator is that it may be quarter-wave coupled to form a circulator with a moderate specification (25-percent bandwidth to 25-dB return loss points) and physical dimensions of the order of directly coupled conventional circulators (using a disk resonator). For circulators for which the in-phase eigennetwork may be represented by an ideal short-circuit, the equivalent circuit is a one-port network which may be formed from a characterization of the constituent resonator. This feature is used in this paper to study the equivalent circuit of junction circulators using planar WYE resonators. The derivation of the equivalent circuit parameters is supported with the design of a 4-GHz quarter-wave-coupled stripline circulator.

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