Abstracts

Optimization of a Lumped Element Circulator Based on Eigenvalue Evaluation and Structural Improvement

T. Miura, M. Kobayashi and Y. Konishi. "Optimization of a Lumped Element Circulator Based on Eigenvalue Evaluation and Structural Improvement." 1996 Transactions on Microwave Theory and Techniques 44.12 (Dec. 1996, Part II [T-MTT] (1996 Symposium Issue)): 2648-2654.

An optimization technique for a lumped element circulator has been established from the point of view of theoretical characteristic design and structural improvement. A theoretical design based on the evaluation of the eigenvalues of an inductance matrix made it possible to optimize the isolation bandwidth characteristic of a structurally improved circulator. Structural optimization was achieved by the application of multilayer ceramic technology and novel conductor formation methods to increase the isolation bandwidth of the circulator and to decrease its insertion loss. The 20 dB isolation bandwidth of 5.8 % obtained by this circulator exceeded the characteristics of a conventional circulator of the same size by 29%, while an insertion loss of 0.35 dB was maintained. In view of the present status of ceramic technology, it is believed that this circulator has been ultimately close to the preferred structure for lumped element circulators.

❑ Return to main document.