Abstracts

A New Development of an Equivalent Circuit Model for Magnetostatic Forward Volume Wave Transducers

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A new three-port equivalent circuit model of microstip transducers for the generation and detection of magnetostatic forward volume waves (MSFVW) is presented explicitly from fundamental physical considerations. In this circuit model, each microstrip of MSFVW transducers is expressed by a three-port circuit incorporating a series reactance, a lossless transformer, and a lossy transmission line. Circuit parameters are determined in closed forms by the use of solutions of pertinent boundary value problems. Hence, by virtue of the powerful and well-established methods of circuit theory, the three-port circuit can be directly applied to multibar microstrip transducers, of which configurations are of parallel bar, multibar pi, meander, etc. Furthermore, the effects of parasitic, for example, capacities of bonding pads, are also easily taken into account. Some typical configurations of transducers are analyzed numerically and compared with experimental results.

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