Abstracts

Criteria for the evaluation of unconditional stability of microwave linear two-ports: a critical review and new proof

The problem of unconditional stability for active two-port networks has been widely discussed in literature. A geometrical condition involving the stability circles and the Smith circle is generally found. Then, depending on the authors, several criteria, involving the two-port S-parameters, and equivalent to the geometrical one, are derived. The equivalence among the different stability criteria has been clearly shown and some complete proof exists in the literature. In this paper, after a critical outlook on the material existing in the literature, a new proof of the unconditional stability criterion is presented. This proof has the advantage of being directly related to the concept of stability circles and to some geometrical conditions on the Smith chart. Moreover, a straightforward proof is given in which the unconditional stability at the input port implies that at the output port and vice versa.

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