

New Cross-Coupled Filter Design Using Improved Hairpin Resonators

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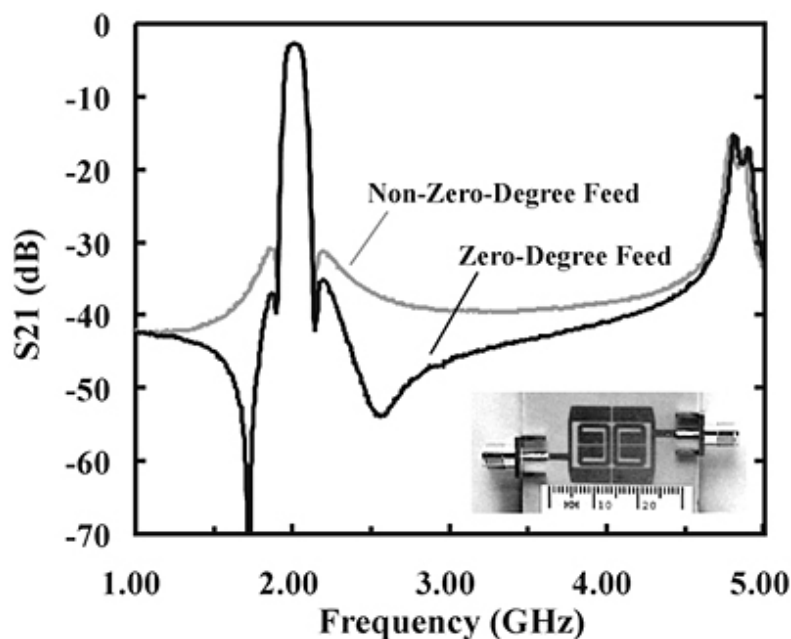
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Microwave (3GHz~30GHz) filters are mainly for wireless communications and radar applications. They are responsible for signal selection and noise rejection. Therefore they determine the sensitivity and dynamic range of a system. There are two major contributions in this paper. First, we corrected the well-know, but not totally right, step-impedance resonator equation from Sagawa. Then, we proposed a new skew-symmetric/zero-degree feed structure. It creates one extra transmission zero on each side of the passband, without changing the in-band response. This greatly enhances the filter's selectivity and near passband rejection, as shown in the figure. For the last seven years, these results have been cited for more than 120 times by SCI papers, among them only three are from ourselves. Most of the papers used our feeding structures and therefore improved their filter performance significantly.



Comparison of Microwave Filters with Zero-Degree and Non-Zero-Degree Feeds