Abstracts

Reflection Charts Relating to Impedance Matching

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A reflection chart is some grid of coordinates on which to plot an impedance locus over a frequency range. Taking as a reference a constant real impedance, one may construct contours of the reflection coefficient (or the related VSWR, reflection loss, etc.). The reference may be the wave impedance of a transmission line. This may be a line connecting radio equipment with an antenna or it may be a standard line used in measuring the impedance. The reflection chart in widest use is the so-called "Smith Chart" proposed by Philip H. Smith in 1939. It is one form of the hemisphere chart, which was proposed, also in 1939, by Philip S. Carter. Its properties, uses are described. It has some limitations. A reference value must be assigned, after which the shape of a locus depends on this value. Also, a locus is crowded toward the rim of the chart. A logarithmic reflection chart has recently been proposed by the author, which overcomes these limitations but loses some desirable features of the hemisphere chart.

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