Abstracts

A Frequency Transformation for Commensurate Transmission-Line Networks (Jun. 1967 [T-MTT])

E.G. Cristal. "A Frequency Transformation for Commensurate Transmission-Line Networks (Jun. 1967 [T-MTT])." 1967 Transactions on Microwave Theory and Techniques 15.6 (Jun. 1967 [T-MTT]): 348-357.

The frequency transformation W=1/S, where S= tanh(gammaL), is investigated for commensurate transmission-line networks consisting of stubs, resistors, ideal transformers, and unit elements. This transformation takes transmission-line transformers into transmission-line lowpass filters and vice versa, Iowpass (or bandstop) filters into highpass (or band-pass) filters and vice versa, and elliptic-function bandstop filters into elliptic-function bandpass filters and vice versa. The practicality of the transformation lies in the fact that element values of the transformed network are easily related to the corresponding element values of the original network. The transformation is useful because it provides an alternative viewpoint for synthesis, and because it reduces the number of tables of designs needed for various filter types. Several examples of designs using the transformation are given. One design is an unusual narrowband 3-dB directional coupler.

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