Abstracts

An Equivalent Transformation for the Mixed Lumped Lossless Two-Port and Distributed Transmission Line

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It is shown that the circuit consisting of a cascade connection of a lumped type D section and a distributed transmission line is transformed to an equivalent circuit consisting of a cascade connection of a class of a nonuniform transmission line and a lumped type D section. Previously obtained equivalent transformations, i.e., Brune, type C, type A and type B sections, are included in the type D section transformation presented in this paper. The type D section is reduced into the Brune section and both type A and B sections are obtained as a degenerate case of the Brune section. Procedures for obtaining these transformations are given and a general theorem concerned with a mixed lumped lossless two-port and distributed transmission line transformation is established. By using these equivalent transformations, a new analytical method for nonuniform transmission lines is derived without having to solve the telegraph equations.

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