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Autore	De Branges, Louis
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Collana	Prentice-Hall series in modern analysis
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Autore	CAETANI, Leone
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Nota di bibliografia	Includes bibliographical references at the end of each chapters.
Nota di contenuto	Preface; Chapter 1; 1.1 Two-Port Networks; 1.2 Properties of Immittance and Transfer Functions; 1.2.1 The Laplace Frequency Domain; 1.2.2 Immittance Functions; 1.2.3 Transfer Functions; 1.3 Duality; 1.4 Filter Transfer Functions; 1.4.1 Pole-Zero Configuration; 1.4.2 Butterworth Filter Response; 1.4.3 Chebyshev Type I Filter Response; 1.4.4 Chebyshev Type II Filter Response; 1.4.5 Elliptic Filter Response; 1.4.6 Group Delay; 1.5 Conventional Filter Topologies; 1.5.1 Frequency Transformations; 1.6 Even- and Odd-Mode Analysis; 1.7 Transmission Lines. 1.7.1 The Telegrapher's Equations and Wave Solutions1.7.2 The Standard Transmission-Line Model; 1.7.3 Special Cases; 1.7.4 Impedance and Scattering Parameters; 1.7.5 Coupled Transmission Lines; Chapter 2; 2.1 Diplexers; 2.2 Directional Filters; 2.3 Hybrid-Coupled Filters; 2.4 Empirical Approaches; 2.4.1 Damped Resonators; 2.4.2 Absorptive Gaussian Filters; 2.4.3 Absorptive Transmission-Line Equalizers; 2.5 Constant-Resistance Networks; 2.5.1 Topologies; 2.5.2 Realizability; 2.5.3 Chebyshev Type I Example; 2.5.4 Higher-Order Solutions; Chapter 3; 3.1 Basic Filter Derivation; 3.1.1 Methodology. 3.1.2 Procedure3.1.3 Performance; 3.1.4 Third-Order Case; 3.2 Normalized Element Scaling; 3.2.1 Stop-Band Specification ($s = 1$); 3.2.2 Pass-Band 3 dB Corner Specification ($3\text{dB} = 1$); 3.2.3 Pass-Band 1

dB Corner Specification (1dB = 1); 3.2.4 Pass-Band Ripple Factor Specification (); 3.3 Nonuniqueness; 3.4 Auxiliary Components; 3.5 Frequency Transformations; 3.6 Design Example; 3.6.1 Monolithic Implementation; 3.6.2 Experimental Results; 3.7 The Problem of Discovering New Topologies; 3.7.1 Nonuniqueness of Dual Networks; 3.7.2 Nontrivial Equivalent Circuits; Chapter 4. 4.1 The Reflectionless Filter as a Diplexer; 4.2 Subnetworks; 4.2.1 Internal Subnetwork Analysis; 4.2.2 Subnetwork Attenuator; 4.2.3 Cross-Connected Subnetwork Analysis; 4.3 Compound Reflectionless Filters; 4.3.1 Third-Rank Compound Filter; 4.3.2 Design Example; 4.4 Combination Filters; 4.4.1 Second-Rank Filter with Subnetwork Attenuator; 4.4.2 Second-Rank Filter with Auxiliary Elements; 4.4.3 Reflectionless Notch Filters; 4.5 Cascade Combinations; 4.5.1 Cascaded High-/Low-Order Low-Pass Filters; 4.5.2 Cascaded High-/Low-Frequency Low-Pass Filters. 4.5.3 Cascaded High-/Low-Pass Ultrawideband Filters; 4.5.4 Predistortion Filters; 4.5.5 Slope Equalizers; Chapter 5; 5.1 Dual Reflectionless Filter Network; 5.1.1 Properties of Dual Multiport Networks; 5.1.2 Derivation; 5.1.3 Alternative Derivation; 5.2 Compound Filter Reduction; 5.3 Layout Considerations; 5.3.1 Monolithic Versions; 5.3.2 Discrete-Element Versions; Chapter 6; 6.1 ReEvaluation of Prior Topologies; 6.1.1 Compound High-Pass Filters; 6.1.2 Clues in the Pole-Zero Configuration; 6.2 Generalized Compound Topologies; 6.2.1 Seventh-Order Derivation; 6.2.2 Customized Responses.

Sommario/riassunto

This invaluable resource introduces progressive techniques for the creation of sophisticated reflectionless filter topologies that have identically zero reflection coefficient at all frequencies. Practical implementations are discussed along with their advantages when compared to classical absorptive filters and their benefits in real-world systems such as up/down converters, multiplier chains, broadband amplifiers, analog-to-digital converters, and time-domain applications. This book offers insight into the innovative process of developing reflectionless filters from first principles using both lumped elements and transmission lines. Tools for the creation of reflectionless multiplexers, matched sloped equalizers, and advanced, high-order, and nonplanar topologies are also presented.