Rational Polynomial Expression for a Generalized Chebyshev Filtering Function with a Multiple Zero Pair at a Real Frequency

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Abstract

This paper presents a discussion of two known types of generalized Chebyshev (C) lowpass prototype filters, each exhibiting an equiripple passband response. The number of transmission zeros at infinity and the locations of the remaining transmission zero pairs at finite real frequencies are treated as design parameters. It is shown that both approximations yield filtering functions with the same rational polynomial form when both filters share the same transmission zero pairs. As an illustrative example, an even-degree LC ladder network realization is demonstrated.

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