Abstracts

Dielectric Resonator Filters with Wide Stopbands (Short Paper)

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Use of dielectric resonators in filter networks enables construction of small, low-loss, stable filters. However, such resonators present a modal spectrum with undesired, or spurious, resonances in close proximity to the desired one. Through the use of evanescent mode band-pass irises tuned to the filter center frequency, the resonator spurious modes are suppressed, resulting in N-section filters with stopbands clean to at least (N-1) times the individual iris stopband levels. The tuned irises contribute a small amount of insertion loss but also further reduce the size of the composite filter as compared to a conventional design. The problem of achieving a wide stopband is thus reduced to the more or less well-known problems of realizing the resonating capacitance required in an evanescent bandpass filter plus the computation of the junction susceptance occurring at the interface between a larger evanescent section (the resonator enclosure) and the smaller iris opening. The technique to be described results in high-Q resonator filters with stopbands clean to at least -55 dBc, out to at least 1.7 times the filter center frequency.

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