

Bandpass and Pseudo-High-Pass Quasi-Optical Filters

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Two forms of quasi-optical filters are discussed herein for use at millimeter-wave frequencies and possibly for far infrared frequencies. One form consists of metallic grids with intervening dielectric support material which forms a quasi-optical filter analogous to the inductively coupled waveguide bandpass filter. Because of dielectric losses, the relatively weak upper stopband, and the rapidly repeating passbands, this type of structure leaves much to be desired as a bandpass quasi-optical filter. However, when designed for wide bandwidth, it makes a very good pseudo-high-pass filter. For moderate- to wide-band bandpass applications, pseudo-high-pass filters of this type can be designed to match with a form of quasi-optical low-pass filter previously treated by the authors, in order to give a bandpass filter with strong, broad stopbands on both sides of the passband. Design principles, computed performance, and experimental results are presented for both pseudo-high-pass and bandpass structures.

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