Abstracts

Cascaded Active and Passive Quasi-Optical Grids

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A general method for analyzing systems of cascaded grids is presented. The analysis is based on a full-wave theory for arbitrary periodic metal gratings printed on dielectrics and loaded with active and/or passive lumped devices. Each quasi-optical component is characterized as a multiport network, in which two of the ports represent the free-space regions on the two sides of the grid surface, and the remaining ports are connected to the devices. This approach allows cascading of quasi-optical components using transmission-line theory. Several examples are presented which demonstrate the theory: free-space filters containing lumped capacitors and resistors; an X-band transmission-mode linear-to-circular polarization converter; an S-band voltage-controlled frequency-selective surface; and a C-band mode-selective grid oscillator.

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