Abstracts

Planar periodic structures for microwave and millimeter wave circuit applications

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Periodic structures, some of which are known as photonic band-gap (PBG) crystals, offer new dimensions of freedom in controlling the behavior of electromagnetic waves in modern microwave and millimeter wave circuits and antennas. This paper summarizes several novel structures developed recently at the authors' group, as well as some of their applications. The structures described include: (1) Dielectric-based PBG microstrip lines; (2) PBG ground plane for microstrip lines; (3) PBG-based high-Q image guide resonator; (4) Compact 2D PBG lattice for surface wave suppression in microstrip patch antennas; and (5) Uniplanar compact PBG (UC-PBG) structure and its unique characteristics such as slow-wave effect, wide stopband, leakage suppression as well as perfect magnetic surface impedance.

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