Abstracts

A Generalized Analysis for Grid Oscillator Design

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A full-wave analysis of infinite periodic grid structures loaded with active devices is presented. The grid consists of arbitrary periodic metal patterns printed on one or both sides of a dielectric slab in free space. Since the structure is periodic, under equi-phase conditions it is sufficient to analyze a single unit cell. An expression is derived relating the radiated electric field to the surface current density on the metal, which is determined by the method of moments. The driving-point impedances are found for any active devices embedded in the grid structure. Using this analysis, the metal geometry can be optimized for designing active quasi-optical power-combining grids for the microwave and millimeter-wave regions.

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