Abstracts

An experimental and theoretical characterization of a broadband arbitrarily-polarized rectenna array

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Planar rectenna arrays for rectification of broadband electromagnetic waves of arbitrary polarization are designed and characterized. The performance of the arrays is accurately predicted using a combination of full-wave analysis for the passive part of the rectenna and harmonic balance simulations for the nonlinear rectification process. The arrays used in this paper to demonstrate the principles of operation consist of self-similar right-hand and left-hand polarized spirals which are simulated and measured over a 2.5:1 band (6-15 GHz). Two arrays with different diodes exhibit conversion efficiencies from 5 to 45% under monochromatic linearly polarized illumination with power densities from 1-1.6 mW/cm/sup 2/.

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