Abstracts

5.8-GHz circularly polarized rectifying antenna for wireless microwave power transmission

B. Strassner and Kai Chang. "5.8-GHz circularly polarized rectifying antenna for wireless microwave power transmission." 2002 Transactions on Microwave Theory and Techniques 50.8 (Aug. 2002 [T-MTT]): 1870-1876.

This paper reports a new circularly polarized (CP) high-gain high-efficiency rectifying antenna (rectenna). The CP rectenna can be rotated and still maintain a constant dc output voltage. The high-gain antenna has an advantage of reducing the total number of rectenna elements to cover a fixed area. The rectenna is etched on Rogers Duroid 5870 substrate with /spl epsi//sub r/=2.33 and 10 mil thickness. A high-gain dual-rhombic-loop antenna and a reflecting plane are used to achieve a CP antenna gain of 10.7 dB and a 2:1 voltage standing-wave ratio bandwidth of 10%. The rectenna's pattern has an elliptical cross section with orthogonal beamwidths of 40/spl deg/ and 60/spl deg/. The rectenna circuit has a coplanar stripline band-reject filter that suppresses the re-radiated harmonics by 20 dB. A highly efficient Schottky diode is used for RF-to-dc conversion with an efficiency of approximately 80% for an input power level of 100 mW and a load resistance of 250 /spl Omega/.

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