

Nina Papovic-Basta

Senior Division Engineering

Wireless Powercord

The purpose of this experiment was to see if I could efficiently receive radio-wave power from a transmitting source using a bow-tie antenna array populated with diodes. In order to accomplish this, I used two different diodes, DI polarization, varied the number of diodes, and their arrangement (parallel or series connections). I used AutoCAD to lay out my bow-tie antennas and a PCB milling machine to fabricate them on a substrate. I then populated my antennas with a different number of diodes in different arrangements. I went from one diode to a 4*4 array of diodes and varied whether they were connected in series or in parallel. During the experiment, I varied the polarization of my antenna array, the frequency, load impedance, and transmission power. Using an existing MATLAB program, I measured and graphed the power in microWatts received by the antenna array. The received power data was collected for many combinations of the different parameters. The plots express received and rectified DC power as a function of DC load impedance, or as a function of frequency. The plots are parameterized by incident power density in microWatts/centimeters squared. I concluded from my data that the efficiency increases as the number of diodes increases and when the arrangement is in parallel. It also depended on the distance between the source and the antenna array and increases with transmitted power.