Performance Comparison Test of Conventional and Metamaterial Antenna

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ABSTRACT

In this paper, the performance of conventional and metamaterial antennas (microstrip rectangular patch antenna with V-shape using Circular Ring defected ground structure (DGS) and rectangular microstrip patch antenna with nine squares of Electromagnetic Band Gap (EBG) structure on the ground plane) in Wi-Fi application which having the frequency of 2.45GHz is tested. The performance and distance coverage is determined by using Transceiver (AirMax Bullet M2 Hp) and AirMax AirOS by Ubiquiti Networks. The scope of project includes recording time duration to transfer small-size of video (16.6Mb) and medium-sized movie (369Mb) files from a local to remote host by varying output power of the transceiver, distance and type of antennas at both transmitting and receiving ends. The performance of the conventional antenna is better than metamaterial antenna. At 20 meter, both antenna is still working with the same signal strength -58 dBm but conventional antenna have higher transfer rate and shorter time taken to transfer files compare to metamaterial antenna. As for two metamaterial antenna tested, it is conclude that EBG antenna is better than DGS antenna because of it higher signal strength and time taken to transfer file is shorter compare to DGS antenna which is 7.83 second (16.6Mb) and 143 second (369Mb) for DGS antenna and 5.7 second (16.6Mb) and 143 second (369Mb) for EBG antenna. This result will help to add market value to antenna tested.

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