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Broadband Antenna for WLAN and WiMAX Applications

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This study aims to design a smaller broadband radio wire (WLAN) as well as overall microwave access (WIMAX) interoperability. The suggested receiving wire is made up of an octagonal radiator with Vicsek fractal apertures and a fractional ground plane, and it is imprinted on FR4 dielectric substrate with a global aspect of 50 50 1.6 mm3. The radio wire is planned and developed utilizing both CST MICROWAVE STUDIO® and CADFEKO electromagnetic solver, and to approve the gained reproduction results, the recieving wire is produced and tried utilizing vector network analyzer E5071C. The estimation results show that the planned recieving wire achieves a broadband transfer speed . The broadband data transmission covers the two required groups: WiMAX at the frequencies 2.3/2.5/3.3/3.5/5/5.5 GHz and WLAN at the frequencies 3.6/2.4-2.5/4.9-5.9 GHz. What's more, the recommended recieving wire gives great additions of 2.78 dB and 5.32 dB, omnidirectional estimated radiation designs in the E-plane and the H-plane and high effi- ciencies of 88.5% and 84.6% at the full frequencies. A nearby arrangement of around 90% among recreation and estimation results is taken note.

Both the CST MICROWAVE STUDIO®, which relies on limited reconciliation innovation (FIT), and the CADFEKO test system, which employs the strategy for minutes, completed the replica of the recommended radio wire (MoM). The radio wire was activated by a waveguide port, and the limit box, as shown in Figure 8, had an area of 200 mm x 200 mm x 200 mm, with 374,088 cross section cells. The suggested broadband receiving wire was built to demonstrate that the simulation results are accurate. Using the vector network analyzer E5071C, the reflection coefficient S11 was calculated. The variation of the suggested broadband radio wire's reflection coefficient S11.. The careful results show that the antenna has a broadband of 4.22 GHz from 2.48 GHz to 6.7 GHz, with two resounding frequencies at 3.6 and 5.3 GHz, respectively, with reflection coefficients of 41.3 dB and 57.2 dB. WiMAX groups at frequencies 2.3/2.5/3.3/3.5/5/5.5 GHz and WLAN at frequencies 3.6/2.4-2.5/4.9-5.9 GHz are covered by the planned radio cable.

With the rapid advancement of remote innovation frameworks, there is a strong demand for tennas with low profiles, smaller aspects, planar math, and especially the capacity to provide a high impedance data transmission to WLAN and WiMAX applications in a few bands, such as 2.4-2.5/3.6/4.9-5.9 GHz and 2.3/2.5/3.3/3.5/5/5.5 GHz, separately [1-3]. Because of their low weight, easy scaling down, compactness, setup adaptability, high performance, and low assembly costs, microstrip radio wires are the best type of receiving wires that match these requirements.

It is presented a new broadband octagonal microstrip fix radio wire with Vicsek fractal apertures that is suitable for WLAN and WiMAX applications. This radio wire has dimensions of 50 50 1.6 mm3 and is imprinted in FR4 substrate. The estimation findings show that this receiving wire has a frequency range of 2.48 to 6.7 GHz, as well as two resounding frequencies of 3.6 and 5.3 GHz, which cover the WiMAX (2.3/2.5/3.3/3.5/5/5.5 GHz) and WLAN (2.4-2.5/3.6/4.9-5.9 GHz) groups. At the thundering frequencies, this recieving wire achieves amazing peak gains of 2.78 and 5.32 dBi, as well as radiation efficiencies of 88.5 and 84.6 percent. In addition, the proposed receiving wire has an omnidirectional radiation design in both the H and E planes.