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(57) Abstract :

The suggested invention illustrates a method for increasing the bandwidth of a diamond slotted hexagonal antenna design. The antenna is a triple band microstrip patch antenna. The given antenna is developed for the 7-24 GHz (Upper mid band), which is used in 6G and microwave frequency band applications. The antenna is intended to resonate optimally at radar frequency bands. It has three operating bands, the first of which has a frequency of 11.83 GHz for the indicated X band (8.2 to 12.4 GHz). The second band's operating frequency in the Ku band is 16.84 GHz (12.4 to 18.0 GHz). The operating frequency of the third band is 20.77 GHz in the K band (18.0 to 26.5 GHz). The antenna, measuring 15mm×15mm×1.2mm, is crafted from the low-loss dielectric material Rogers RT/Duroid 5880(tm), boasting a relative permittivity, permeability of 2.2 and 1 respectively and dielectric loss tangent of 0.0009. The developed antenna is diamond shaped microstrip patch antenna with hexagon slotted with circle within diamond slot. The designed diamond patch with hexagonal slot is fed with 50-ohm microstrip line for excitation. The culmination of the antenna design effort manifests in the attainment of significantly improved bandwidth, efficiency, and gain characteristics across the spectrum of three distinct frequency bands.

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