

Multi-Band, Polarization Insensitive, Wide Angle Receptive Metamaterial Absorber for Microwave Applications

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Abstract : This paper presents the design and simulation of a five band metamaterial absorber at microwave frequencies. The absorber unit cell consists of squares and strips arranged as the top layer and a metallic ground plane as the bottom layer on a dielectric substrate. Simulation results show five near perfect absorption bands at 3.15 GHz, 7.15 GHz, 11.12 GHz, 13.87 GHz, and 16.85 GHz with absorption magnitudes 99.68%, 99.05%, 96.98%, 98.36% and 99.44% respectively. Further, the proposed absorber exhibits polarization insensitivity and wide angle receptivity. The surface current analysis is presented to explain the mechanism of absorption in the structure. With these preferable features, the proposed absorber can be excellent choice for potential applications such as electromagnetic interference (EMI) shielding, radar cross section reduction.

Keywords : electromagnetic absorber, metamaterial, multi- band, polarization insensitive, wide angle receptive

Conference Title : ICMPCP 2017 : International Conference on Metamaterials, Photonic Crystals and Plasmonics

Conference Location : Istanbul, Türkiye

Conference Dates : September 28-29, 2017