A compact dual-band metamaterial absorber using square split rings for C-band and X-band sensors applications

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***Abstract*—A novel dual-band metamaterial absorber is proposed to achieve narrow-band absorption in the microwave range, making it highly suitable for sensor applications. Comprising two split-ring resonators one operating in the S-band and the other in the C-band the absorber is designed to operate simultaneously in both bands, providing narrowband absorption for different angles of incidence. The proposed absorber can achieve absorption peaks of greater than 99.5% and 96.9% in the respective bands. The physical mechanism of the proposed absorbers is demonstrated, along with the representation of its permeability and penetrability values, as well as its electric and magnetic field distributions. The metamaterial features a planar structure, showcasing polarization-insensitivity and angle-insensitive absorptive properties. Furthermore, the absorber has a compact size, making it suitable for sensing, EMI, and EMC applications.**

***(Pt9)Keyword*— metamaterial absorber, polarization insensitive, dual band, compact.**

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