

Parametric Analysis on Single-Band Planar Inverted F and Dual-Band Planar Inverted F-L Implant Antennas for Biomedical Services

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Abstract

The implant antennas are important in many biomedical implantable applications. In this work, a single band planar inverted F, a dual band planar inverted F-L, and a dual band elliptical-shape implantable antennas are presented. The planar inverted F element operates at the Medical Implant Communications Services (MICS) band. While, in order to cover the Industrial Scientific and Medical (ISM) band, a planar inverted L parasitic element is added to the design. In the elliptical-shape implantable antenna, a planar C active element is designed for the MICS band, while a planar inverted C parasitic element is used for the ISM band. The work represents a parametric study on how the dielectric constant, the short-circuited pin position, and the skin layer thickness affect the S11 and the frequency band for the three different antenna models. Simulation results for the scattering parameters of the introduced antennas are performed by the CST microwave studio.

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Keywords

Planar Inverted-F; Planar Inverted-L; Elliptical-Shape; Specific Absorption Rate; Constitutive Parameters; Return Loss