

A Polarization Insensitive and Wide Angle Metamaterial Absorber for X-band Applications

Dipangkar Borah and Nidhi S. Bhattacharyya

Microwave Engineering Laboratory, Department of Physics, Tezpur University, Napaam, Sonitpur, Assam, 784028

Abstract—*Design, simulation and experimental verification of a polarization insensitive metamaterial absorber for X-band applications is reported. A unit cell of the metamaterial consists of four fold symmetric circular split ring with a cross is imprinted on a metal backed dielectric substrate. The geometry parameter of the structure is adjusted to obtain a single band, polarization insensitive, wide angle absorber. The absorption mechanism of the suggested structure is explained by electric field and surface current distribution. In addition, influence of the gaps of the split ring and thickness of the substrate on absorption, are also investigate. Absorption is found to be independent of polarization. Influence of incident angle on the absorption for both TE and TM mode are also analyzed. Waveguide technique is used to measure the absorption. The measurement shows 97% absorption at 9.8GHz, which matches with the simulation result.*

Keywords: *metamaterial, split ring, absorber.*