

Opto-Electronics Review, 2015, volume 23, issue 3, pp. 214-221

Reflection and transmission from left-handed material structures using Lorentz and Drude medium models

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DOI: <https://doi.org/10.1515/oere-2015-0031>

Abstract:

The present article investigates theoretically the reflection and transmission through a lossless dielectric slab embedded between two semi-infinite left-handed materials (LHMs) in which the electric permittivity and magnetic permeability are simultaneously negative. The LHM is assumed to be dispersive according to Lorentz as well as Drude medium model. The reflection and transmission coefficients are studied with the angle of incidence, frequency and slab thickness. The effect of the damping frequency is also investigated. It is found that the damping frequency has an insignificant effect on reflected, transmitted and loss powers. Band pass filter is one of the possible applications of the proposed structure.