

The simulation of the microwave shielding properties of the dual band pass frequency selective surface

Microwave leakage from a microwave oven door can interrupt the functions of electronic devices and endanger human health. The harmful radiation leaking from the oven front door has to be blocked but the visible light is still allowed to be transmitted. The door design is based on the frequency selective surface (FSS) because of the filter behavior. In the simulation, a proposed FSS of 40.7×40.7 mm with its dielectric thickness of 2 mm is designed. Two important characteristics in term of shielding effectiveness (SE) and optical transparency (OT) of the proposed FSS configuration at the normal incidence was found to be 40.8 dB and 59%, respectively. The simulation result indicates that the proposed FSS is applicable to the design of the microwave oven door. Parametric studies on the characteristics due to geometrical dimensions, dielectric substrate thickness, and incident angle were also considered. These parameters were found to affect the shielding and transmitting performance of the proposed FSS.

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Track Classification: Optics, Ultrafast Phenomena and Photonics