A Band-pass Shielding Enclosure Design Using UC-PBG Elements for Wireless Communication Devices

郭宇帆、邱政男

E-mail: 9607732@mail.dyu.edu.tw

ABSTRACT

This paper proposes a new bandpass shielding enclosure (BPSE) for modern handheld communication devices. This enclosure is characterized by high transmittance at the specified wireless signal band and high shielding effectiveness outside this band. In addition, it has little influence on the impedance-matching bandwidth and antenna patterns of an internal antenna inside this BPSE. A novel bandpass shielding enclosure using uniplanar compact photonic bandgap (UC-PBG) elements is presented. This UC-PBG structure is a two-dimension periodic array structure. This unique structure has several applications for millimeter-wave and microwave integrated circuits, such as filters, microstrip antennas, resonant cavities, etc. This BPSE is designed to shield electromagnetic interference and keep the quality of communicational signals for WLAN and IMT-2000. Because high performance and compact design, this BPSE is very suitable for modern mobile wireless communication devices. The simulated and measured results demonstrate the promising performance of this newly proposed bandpass shielding enclosure.

Keywords : frequency-selective surface ; uniplanar compact photonic bandgap (UC-PBG) ; shielding ; EMI ; EMC

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