A Multi-pole Bandpass Shielding Enclosure for Mobile Communication Terminals

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ABSTRACT

This paper proposes a new design for mobile communication terminals called the multi-pole bandpass shielding enclosure (BPSE). The purpose of the BPSE is to shield electromagnetic interference (EMI) except for communicational signals. First, multi-pole frequency selective surfaces (FSS) are studied in order to understand the key points of design. Then, the 3D shielding enclosure structure is analyzed and several multi-pole periodic elements are considered. Finally, the multi-pole elements with end-loading are studied in depth. The BPSE features high transmittance at the WLAN (2.4 GHz to 2.484 GHz) band and high shielding effectiveness (SE) outside of this band, which likes a filter and little influence on the radiation performance of an internal linear dipole antenna. A prototype was created, simulated, and measured. The results demonstrate promising performance for this newly proposed shielding enclosure.

Keywords : Shielding ; Frequency selective surfaces ; EMI ; Periodic structures

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