

Metamaterial superstrate effects to the stacked bandpass filter bowtie antenna performances

ABSTRACT

The integration of metamaterial superstrate with high-quality cavity 3-poles stacked filter with bowtie antenna are presented. The metamaterial inspired behavior is obtained using split ring resonators (SRR) printed on the dielectric substrate Rogers 5880 which is located 14mm from the top of the filter/antenna. The effects of the metamaterial structure on the vertically stacked filter/antenna performances at X-band with resonant frequency 10.18GHz are investigated. The gain of the filter/antenna system improved from 7.2dB to 8.5dB while the radiation pattern become more directive without distorting the filtering response.

Keyword: Bowtie antenna; Metamaterial; Stacked filter; Substrate integrated waveguide