

In this paper, three types of defected ground structure (DGS) units which are triangular-head (TH), rectangular-head (RH) and U-shape (US) are investigated and their characteristics are compared each other. Further, they are used in the design of low-pass filters (LPF) and band-pass filters (BPF) and the obtained performances are examined. The LPF employing RS-DGS geometry presents the advantages of compact size, low-insertion loss and wide stopband compared to the other filters. It provides a cutoff frequency at 2.5 GHz, a largest rejection band width of 20 dB from 2.98 to 8.76 GHz, a smallest transition region and a smallest sharpness response at the cutoff frequency. The BPF based on RS-DGS has the highest bandwidth (BW) of about 0.74 GHz and the lowest center frequency of 3.24 GHz whereas the other BPFs have BWs less than 0.7 GHz