

## Abstract

This paper presents a novel microstrip low-pass filter (LPF) configuration with low insertion loss, wide and deep rejection band employing defected ground structure (DGS) and microstrip stub techniques. The proposed LPF comprises three open stubs, three identical new shapes (named hourglass) DGS and two rectangular shapes DGS. The proposed LPF has acceptable performances in terms of insertion loss, less than 1.5 dB, return loss in the pass-band, less than 9.5 dB, wide stop-band at 0–2 dB suppression level ranging from 3.88 GHz to more than 20 GHz and size of  $35 \times 14$  mm<sup>2</sup>. A good agreement is achieved between experimental and simulation results indicating that the proposed LPF is well suited for various communication systems.