

Abstract

Iman Galal Mahumod Ibrahim

DESIGN OF ULTRA-WIDE STOP-BAND DGS LOW-PASS FILTER USING MEANDER- a n d MULTILAYERTECHNIQUES

This article presents a new dog-bone defected ground structure (DGS) for low-pass filter (LPF) applications with wide rejection band a n d low-loss in the pass-band region. The prototype LPF consists of three dog-bone cells in the ground plane with an open stub on the top layer acting as a compensated capacitor. The prototype LPF is then realized as a multilayer structure to enhance the filter response a n d reduce its size. The size reduction of the proposed multilayer LPF is about 34% more than the conventional one. The proposed filter has been fabricated a n d measured. Good agreement can be realized between the electromagnetic simulation a n d the measurement results. To minimize the difference between the simulation a n d measurement results, a n d at the same time to reduce the loss in the pass-band region, a modification to the topology of the structure with the aid of the meander idea is used. The meander-filter presents advantages of compactness, low loss, a n d high out-band suppression. The dog-bone DGS cell is then used as a photonic band gap structure to minimize the coupling between two probe-fed patch antennas a n d to improve the two antenna element array efficiency.