

Compact wideband bandpass filter using single corners-cut isosceles triangular patch resonator

ABSTRACT

Compact and simple bandpass filter (BPF) structure using microstrip isosceles triangular patch resonator (ITPR) is proposed. The new filter design technique is based on two main ideas: Firstly, cutting the corners of the triangular structure, to make the filter size more compact. Secondly, etching slit in staircase form near the base of the triangle in order to improve the filter performances. The proposed filter was designed and fabricated on Taconic CER-10 substrate with a relative dielectric constant of 10 and a thickness of 0.64 mm using standard photolithography process. The final dimension of the proposed filter is measured at 5.7 mm×7.6 mm. Measured S-parameters showed that the filter achieves a 3-dB fractional bandwidth of 55% at center frequency of 10.36 GHz, with measured insertion loss of 2.08 dB and measured return loss better than 10 dB. The measured results are in good agreement with the simulated results.

Keyword: Center frequency; Filter designs; Filter performance; Filter sizes; Fractional bandwidths; Isosceles triangular; Measured results; Microstripes; Relative dielectric constant; Return loss; S -parameters; Simulated results; Standard photolithography; Triangular structures; Wideband bandpass filter