

Abstract

In this thesis, a compact dual-mode square-loop resonator bandpass filter using novel capacitive stepped impedance inner arm is proposed. Both stepped impedance and capacitive loading effects are studied so as to achieve simultaneous size reduction and spurious response suppression for the dual-mode bandpass filter. By introducing the above new inner arm at the four inner corners along the square-loop resonator, it is found that effective spurious response suppressions at 2nd harmonic and 3rd harmonic can be realized. In order to demonstrate the performance of the proposed filter structure, a prototype filter is designed @ 900 MHz with 1% fractional bandwidth. Significant suppressions up to 37 dB and 31 dB are measured @ 1.8 GHz and @ 2.7 GHz respectively. Moreover, a circuitry size reduction of 40% is achieved when compared with that of the conventional structure.