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Abstract
The band-pass filters and a self-complementary Antenna designed with Stepped Impedance Resonator structures (SIR) are proposed in this research. Open-Loop Ring Resonator (OLRR) with SIR structure and Inverted Triangle Open-Stub structure (ITOS) are used to reduce filter size and increase the bandwidth and impedance matching of antenna.
The 2.4GHz/5.7GHz and 2.4GHz/5.2GHz dual-band filters are illustrated and measured in this paper. The filter using open-loop ring resonator designed by stepped Impedance Resonator structure is fabricated on a Duroid/RT5880 substrate with a relative dielectric constant 2.2 and a thickness of 0.787mm.The overall size for the proposed filters is about 40mm × 19mm. In addition, the proposed dual-band filter can generate two pairs of transmission zeros, it can provide a better cutoff rate in the stop-band and give much improved selectivity. The measurement results are found to be in good agreement with the simulation results.
Besides, with stepped impedance resonator structures and ITOS structures combined together, the bandwidth and impedance matching of antenna can be further increased. Then, a self-complementary microstrip antenna for WLAN/WiMAX application is presented in this research. In order to suppress 4-5GHz band，the OLRR structure with center frequency of 4.5GHz is proposed for this purpose. Finally, a miniaturized antenna with complementary structure fabricated on FR4 structure is proposed in this research.
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