

ABSTRACT

Weather is an important factor in human life and weather information is needed for various sectors. S-Band weather radars are used to detect rainfall and monitor cloud movements. However, at S-Band frequencies there is interference from other frequencies, such as 5G. To solve this problem, a bandpass filter is required. This research designs and builds a microstrip filter with split-ring resonator (SRR) method for S-Band weather radar. The SRR method was chosen because of its ability to set resonance at a specific frequency, increase bandwidth, and reduce filter size. Simulation results show that the designed filter has a bandwidth of 200 MHz with a working frequency of 2.8 GHz and return loss values of -41.02 dB and insertion loss of -2.16 dB. However, after fabrication the value of the filter parameters decreased. The return loss value becomes -23.43 dB, insertion loss becomes -1.93 dB, and bandwidth becomes 270 MHz. A shift in working frequency also occurs, which becomes 2.96 GHz. This is thought to be caused by fabrication errors, such as imperfect port soldering, port impedance mismatch, or contamination of the patch and groundplane. This research shows that the SRR method can be used to design bandpass filters for S-Band weather radars. Further research is needed to improve the fabrication accuracy and overcome the shift in working frequency.

Keywords: Bandwidth, Insertion Loss, Microstrip Filter, Return Loss, Split-Ring Resonator.