A COMPACT SIW RADIATING BANDPASS FILTER FOR C-BAND APPLICATIONS

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ABSTRACT

This paper presents a design of integrated Substrate Integrated Waveguide (SIW) filter and microstrip rectangular patch antenna using multilayer technique on the Printed Circuit Board (PCB). The filtering and radiating element are designed for C-band applications at 4 GHz center frequency. The circular cavity structure using TM_{010} mode for filter and rectangular antenna are used in the design. To realize the technique, modes of SIW filter and microstrip antenna are coupled using rectangular aperture at common ground plane. The simulation results show good antenna gain and radiation pattern that proved the capability to integrate SIW filter and microstrip antenna directly without requirement of external matching, thus reduce the overall size of the device. To prove the concept, the multilayer structure is fabricated using Rogers RO3003 with dielectric constant, ε_r = 3. The measured results show a good agreement with the simulated results and the size is compact with overall physical dimension of 65mm × 40.9mm × 1.285mm.

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