

Analysis and optimization of a coplanar isolator for microwave systems

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Abstract : The miniaturization of circuits and the increasing frequency are two important issues of future communication systems and non-destructive testing equipment. This requires a high degree of integration and higher performance at reduced cost. The objective of this work is the study of a coplanar isolator for telecom applications. This isolator is constructed with a coplanar line charged by a ferrimagnetic material. We have started with an analytical study of a coplanar isolator, this allowed us to highlight the essential parameters influencing on the performances of our isolator, which are the longitudinal component of the magnetic field and the imaginary part of the non diagonal terms of permeability tensor. This confirms the importance of ferrite in the operation of our component. Then, we have contributed to the development of a resonance coplanar isolator using the simulator HFSS (High Frequency Structure Simulator) which concurrentially comparatively to other works advantageous. The simulation results are very encouraging because we get insertion losses less than 2 dB and isolation more than 28 dB.

Keywords : Magnetic material, Microwave, non reciprocal passive component, Coplanar isolator, Ferrite