Design of parallel-plate waveguide simulator for 3 GHZ microwave device characterization

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Abstrak

Cbaracterization of the properties of microwave device proves to be an .. senlial complement 10 lbe theoretical or simulaUon works. Thus, Ibe .. tablishment of tool used for the characterization Is one of Ibe important steps in the experimeDtal sludy. In this paper, a test-fixture to characterize the reflectivity aDd traDsmissivity of microwave device is reported whereby the reflection and traDsmission properties caD be obtained under normal incidence using a specially designed paraUel plate waveguide (PPW) simulator. This Is possible siDce this type of simulator is potentially \<e'\Y accurate in simulating its reflection and transmission response through the use of the available 3-dimension electromagnetic (3D EM) software. The simulator Is designed numerically to work for 2.60 GHz to 3.95 GHz operation, with waveguide transducen type WGIO used for the wave exciter. After optimizing some parameten, the simulator with plate widlb of 200 mm, plate separatioD of 75 mill, and taper length of 100 mm is theD fabricated. This was followed by the experimental measurement, taken to be compared with the design result. Some characterization of 3 GHz microwave devices including a sample of frequeDcy selective surfaces (FSS) aD-d

microwave absorber is also demonstrated, from which the results are then compared with the simulatelr ones.