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

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Abstrak

Cbaracterization of tbe properties of microwave device proves to be an .. senlial complemenl 10 Ibe tbeoretical or simulaUon works. Tbus, Ibe .. tablishment of tool used for tbe cbaraclerization Is one of Ibe important steps in tbe experimeDtal sludy. In this paper, a test-fixture to cbaracterize tbe reflectivity aDd traDsmissivity of microwave device is reported wbereby tbe refleelion and traDsmission properties caD be obtained under normal incidence using a specially designed paraUel plate waveguide (PPW) simulator. Tbis Is possible siDce tbis type of simulator is potentially \<e'\Y accurate in simulating its refleelion and transmission response tbrougb tbe use of tbe available 3-dimension electromagnetic (3D EM) software. Tbe simulator Is designed numerically to work for 2.60 GHz to 3.95 GHz operation, witb waveguide transducen type WGIO used for tbe wave exciter. After optimizing some parameten, tbe simulator witb plate widlb of 200 mm, plate separatioD of 75 mill, and taper lengtb of 100 mm is tbeD fabricated. This was followed by tbe experimental measurement, taken to be compared witb tbe design result. Some cbaracterization of 3 GHz microwave devices including a sample of frequeDcy selective surfaces (FSS) aD-d
microwave absorber is also demonstrated, from wbicb tbe results are tben compared witb tbe simulatelr ones.