

ANALYSIS OF A CONDUCTOR-BACKED COPLANAR WAVEGUIDE MOISTURE SENSOR

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ABSTRACT

The analysis of conductor-backed coplanar waveguide moisture sensor by using numerical method is presented. The structure of the sensor is based on the 4-layer system which consists of RT-duriod substrate, protective cover, moist layer and air. The numerical analysis involves with the calculation of effective dielectric constant, characteristic impedance and dielectric loss of the multi-layer structure at various moisture contents with respect to protective layer thickness. A reasonable close agreement between computed and experimental data for attenuation of the sensor at various moisture contents ranging from 30% to 80% (wet basis) of the oil palm fruit has been achieved. This analysis is useful for the prediction of the dynamic range and sensitivity of the sensor by choosing suitable thickness of the protective layer, geometrical parameters and substrate of the sensor.

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