A SENSITIVE DIGITAL MOISTURE DETECTOR FOR NANOSTRUCTURED THIN FILM SENSOR

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Abstract- A digital moisture measuring instrument based on phase angle measuring technique with porous silicon (PSi) or porous alumina (PA) as capacitive moisture sensor is proposed. The proposed technique can measure digitally the phase angle change of capacitive impedance of porous silicon or porous alumina sensor due to change in moisture concentration in terms of clock pulses. Analysis shows that the proposed circuit leads to higher precision by minimizing the errors caused by parasitic earth capacitance as well as offset voltage in the circuit. Simulation and experimental results are reported to confirm the effectiveness of the technique.

Index terms*:* Porous sensors, moisture sensing, digital phase angle measurement, detection circuit.