

Abstract Submitted
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Electrical and Optical Characterization of α -Silicon Thin Films¹ KIRAN SHRESTHA, TANWEER MIRZA BEIG, PRADEEP GALI, PRATHYUSHA NUKALA, CHRIS LITTLER, VINCENT LOPES, USHA PHILIPPOSE, Dept. of Physics, University of North Texas, NIGEL SHEPHERD, Materials Science and Eng., University of North Texas, A. J. SYLLAIOS, L-3 Communications EOS — We report on progress in the characterization of amorphous silicon thin-films utilized in infrared detectors. Specifically, we have observed changes in the Raman spectra, resistivity, and activation energy in protocrystalline Si films grown by PECVD as substrate temperature, dopant type and concentration, and hydrogen dilution of the reactants are varied. Both n- and p-type films exhibit four Raman spectral peaks [1]. The TO Raman peak becomes better defined and shifts towards the crystalline TO energy for increasing substrate temperature or H dilution, or for decreasing dopant concentration. Hall and resistivity measurements as a function of both magnetic field and temperature on the same material have been conducted to better understand the relationships between specific growth parameters and key electrical properties.

[1] A. J. Syllaios, et al, “Raman Characterization of Protocrystalline Silicon Films”, MRS Symp. Proc.Vol.1153, A16-04, 2009.

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