

AUTOMATED ELECTRICAL CHARACTERIZATION OF SILICON-ON-GLASS MICRO-FABRICATED DEVICES

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Development and characterization of a new substrate material for flat panel display applications known as silicon-on-glass (SiOG) has been ongoing at RIT for several years through projects sponsored by Corning, Inc. Many thin-film transistors and other semiconductor devices are fabricated on this substrate and are characterized electrically using current-voltage (I-V) measurements. The performance of these devices is one metric in determining the quality of the SiOG substrate in development. Other metrics are the uniformity of the devices across the entire substrate, and the consistency between substrates. This work presents progress towards the automation of I-V electrical characterization of thin-film semiconductor devices on SiOG substrates. Improvements have been made to the system hardware which provides lower noise and higher resolution measurements. Several new test structures have been implemented, along with corresponding parameter extraction algorithms. Software routines have been written to handle data collected from full wafer sampling (40 die per wafer, approximately 50 types of device tests) on process lots containing 10 device wafers. With over 100 data points per electrical test, the characterization of each process lot typically produces over 2 million data points.