

## **Abstract**

A data acquisition, parameter extraction and characterization system for electronic active components is presented in this paper. High sensitivity measuring equipments were used for data acquisition and effective extraction models based on optimization techniques developed to obtain the parameters of p-n junction diodes, Schottky diodes, field effect transistors and bipolar junction transistors. The performance of the developed extraction techniques are apparent via comparing experimental data with Spice simulated data using the model parameter that is graphically extracted and also those extracted using optimization techniques. The performance of the developed extraction techniques has been demonstrated by comparing the experimental characteristics with Spice simulated curves using default parameters and model parameters extracted using graphical and optimization techniques. The relative excursions of the simulated  $I$ - $V$  characteristics of most investigated devices were less than 2.5 % with respect to the experimental curves, which shows the accuracy and effectiveness of the developed system. A number of software routines have also been implemented under Matlab environment to extract the Spice model parameters for different electronic devices