



ARISTOTLE
UNIVERSITY
OF THESSALONIKI

RESEARCH
COMMITTEE

CHARACTERIZATION AND STUDY OF ADVANCED SEMICONDUCTOR DEVICES

Design, characterization, simulation, optimization, compact modelling and reliability study of modern semiconducting devices such as: TFTs, Organic TFTs, Double-gate transistors, FD-SOI, FinFET

Application Field

Semiconductor's Industrie

Services Offered to Third Parties

Design, characterization, simulation, optimization, compact modelling and reliability study of modern semiconducting devices

Electrical Characterization & Design of Micro- and Nano-Electronic Devices Laboratory

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Figure 1
Computer-controlled system for I-V and C-V measurements, to fully characterize modern transistors or diodes. The system comprises voltage, current sources and arbitrary pulse generator, thus is capable for studying also Hot-Carrier effects (static & dynamic electrical stress)

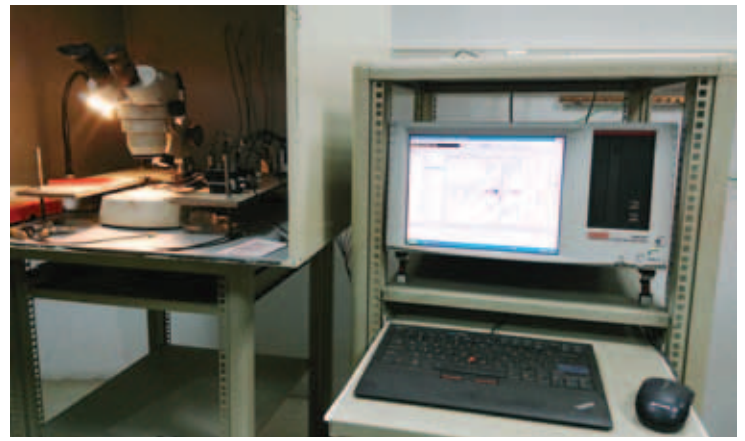


Figure 2
Keithley 4200-SCS (semiconductor characterization system) including I-V measurements and C-V spectroscopy, for electrical characterization of micro and nano-devices (2-4 terminals).



Figure 3
Computer controlled Low-Frequency Noise measurement system (1 Hz-100 kHz). It comprises two SR760 FFT spectrum analyzers, two SR570 low-noise current pre-amplifiers. All the critical stages are powered by NiMh batteries or are opto-isolated in order to reduce external noises and interference. The LFN technique allows for the characterization of carrier traps in semiconductor devices and materials.

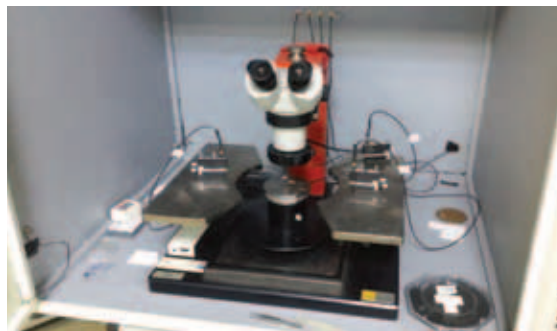


Figure 4
Probe station SussMicrotec EP4 for electrical contacts in "on-chip" semiconductor devices and integrated circuits



Figure 5
Van der Pauw and Hall measurements set-up for electrical characterization of materials in the temperature range of 10-330 K and magnetic fields up to 1.4 T.

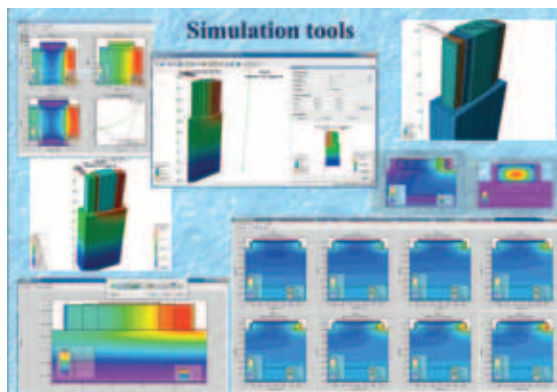


Figure 6
A computer network comprising Linux and MS windows based computers is equipped with 2-D and 3-D device simulators (Silvaco and Sentaurus TCAD suites), capable to simulate all modern electronic devices. We have successfully simulated devices comprising - but not limited to: multigate transistors (Double-gate, Triple-gate, Gate-all-around), JL FinFET, Nano-wire transistors, FDSOI, OECT, Organic TFTs, Textile Organic TFTs.