



## Outline of MDC CSM/Win SYSTEM FUNCTIONS and FEATURES and HARDWARE



1. Junction Programs:
  - a. C-V Plotting
  - b. Doping Profiling
  - c. Resistivity Profiling
  - d. Average Doping or Resistivity Function
  - e. Find Flat Zone Function
  - f. Q-V Plotting
  - g. Doping-Voltage Plotting
  - h. Series Resistance Correction
  - i.  $1/C^2$ -V Plotting
  - j. 2DEG Analysis
2. MOS Programs:
  - a. C-V Plotting
    - i) Swept, Pulsed, Retrace, and Hysteresis
    - ii) Dual Frequency Mode for Leaky Oxides
    - iii) Inversion Layer Stabilization
    - iv) Series Resistance Correction
  - b. Conductance-Voltage Plotting
  - c. Theoretical MOS C-V Plots
  - d. CVC Computations for Thin Oxides
  - e. Quantum Modeling using CVC
  - f. Polysilicon Depletion Modeling using CVC
  - g. Dielectric Constant Mode
  - h. Ricco Analysis for Thin Oxide Parameters
  - i. Sub-Oxide Doping Profiling (Ziegler)
  - j. Implant Profiling
  - k. Partial Dose Integration
  - l. Mobile Ionic Charge (CVBT Method)
  - m. Tests for Valid/Invalid CVBT Shifts
  - n. Overlay Plots
  - o. Production Version
3. Capacitance-Time Programs
  - a. C-T Plots
  - b. Lifetime-Depth Plots
  - c. Zerbst Plots
  - d. Automatic Time Selection Mode
4. Conductance-Voltage-Frequency Plots
  - a. C-F Plots
  - b. G-F Plots
  - c. Dit-V Plots
  - d. Nicollian-Goetzberger Analysis
  - e. G(F,V) Plot Families
  - f. C(V,F) Plot Families
5. Quasi-Static C-V Plots
  - a. Leakage Correction
  - b. Offset Correction
  - c. Theoretical Plots
  - d. Alternate CVC Computations
  - e. Quantum Modeling using CVC
  - f. Polysilicon Depletion Modeling using CVC
6. Capacitance - Surface Potential Plots
  - a. Find Bergland Integration Constant
  - b. Dit versus Surface Potential using Kuhn Method
  - c. Dit versus Energy using Kuhn Method
  - d. Dit versus Surface Potential using Castagne Method
7. TVS Plots
  - a. Mobile Ionic Charge Concentration
  - b. Mobile Ionic Charge Species
  - c. Plot C-V or I-V
  - d. Find Peak Current
  - e. Production Version
8. Current versus Voltage Plots
  - a. Plot Current versus Voltage
  - b. Fowler Nordheim Analysis for Thin Oxides
  - c. Junction Characteristics for pn or Schottky Barriers
  - d. Pulsed I-V Measurement Mode
  - e. Current-Time Plots for Cu Diffusion Studies
  - f. PV Mode for Solar Cells. Finds Pmax, Rs, Rsh, FF
9. GOI Tests
  - a. Force Constant Voltage (TDDB-V)
  - b. Force Ramped Voltage (TZBD)
  - c. Force Constant Current (TDDB-I)
  - d. Force Stepped Voltage (JT)
  - e. Pulsed Voltage Source (PVBD)
  - f. Pulsed Voltage Wearout (TDDW-V)
  - g. Pulsed Current Wearout (TDDW-I)
  - h. Fixed Voltage
  - i. Analyses
    - i) Histograms
    - ii) TDDB Plots
    - iii) JT Plots
    - iv) Qbd Plots
    - v) Weibull Plots
10. Dielectric Constant Tests
  - a. Find Permittivity
  - b. Find Loss Factor
  - c. Frequency Dependence
11. Probe Station Interfacing
  - a. Standard Hot Chuck
  - b. Prober with Stepping
  - c. Prober with Autoloading
  - d. Glove Box for Oxygen-Free Measurements
  - e. QuietCHUCK with Hermetic Enclosure for Oxygen-Free Measurements
  - f. Mercury Probes for Rapid, Non-Destructive Measurements
  - g. Cryogenic Prober for Low Temperature Measurements
12. System Features
  - a. Multi-level password protection
  - b. Database Interface
  - c. ASCII File Output
  - d. Spreadsheet Compatible Output
  - e. Multiple Plot Overlays
  - f. Tabular Outputs
  - g. Operator Message Monitor
  - h. Test Functions for Multiplexers and Hot Chucks
  - i. Remote Mode for Software Operation in Other Computers
  - j. Network Interface (Ethernet)
13. Help File
  - a. Automatic Help Links in Program
  - b. Help with all Measurements and Tests
  - c. Diagrams of Ideal and Anomalous Plots
  - d. Comprehensive Reference List
  - e. Over 1,000 Pages of Information
  - f. Repair Information
  - g. Circuit Diagrams
14. Special Functions
  - a. Production Resistivity Measurements
  - b. Production TVS Measurements
  - c. Implant Modeling
  - d. SPC
15. TFT or Transistor Test Suite
  - a. Transfer Characteristics
  - b. Saturation Characteristics
  - c. Output Characteristics
  - d. Leakage Tests
  - e. Conductivity tests
16. Calculations
  - a. Parallel Plate Capacitor
  - b. Doping-Resistivity
  - c. Depletion-Doping-Voltage
  - d. Breakdown Voltage-Doping
17. Four Point Probe Tests
  - a. Resistance
  - b. Resistivity
  - c. Sheet Resistance
  - d. Doping
18. Multiple Material Parameters
  - a. Permittivity
  - b. Bandgap
  - c. Electron Affinity
  - d. Mobility
19. Drive Level Capacitance Profiling
  - a. C-V Plot Family
  - b. Defect Density Profiles
  - c. Standard CV Profiles
  - d. Variable Frequency
  - e. Variable Temperature
20. Electrochemistry
  - a. Cyclic Voltammetry
  - b. Galvanic Charging
- vi) 3D Surface Plots with Probers
- vii) Wafer Maps with Probers
- e. Generation Lifetime
- f. Multiple Measurement Sequencing
- g. Electromigration
- h. Parametric Testing