

# Hints, Tips and Solutions

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**Q. How can I re-measure a certain device in the middle of BSIM3\_MG routine's data collection without closing and re-opening the log file?**

**A.** It is likely that there may be some contact problems or defected devices during the data collection. This problem can occur when the log file is open and some good device data has already been stored in the log file. Then it becomes a time consuming process to close the log file, deselect the good devices from the device strategy screen, append the log file and re-measure the device which created the problem.

In order to simplify this process, "Re\_Measure Last Plot" feature was developed. The user can re-measure the device which didn't have good data by pressing the "Re\_Measure" button and selecting the "Last plot" Menu option in the Graphics Screen. (Figure 1.) During the "Re-measure Last Plot" operation the log file can stay open. *UTMOST* will automatically overwrite the last device data with latest measured data.

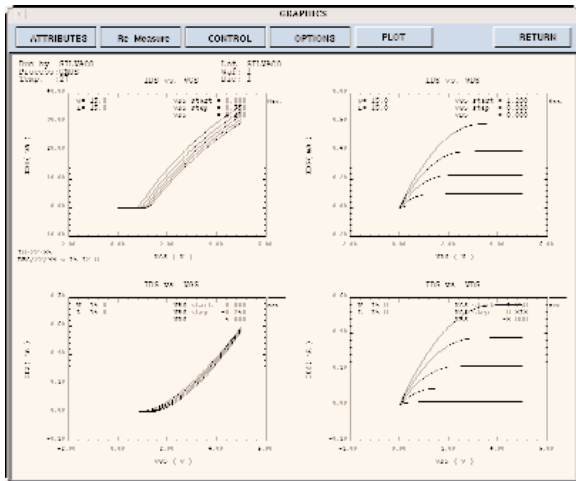


Figure 1. BSIM3\_MG routine Graphics Screen showing the "Re-Measure" button.

**Q. What are the available routines in *UTMOST* SOI module for measuring the parasitic bulk diode and Bipolar effects in SOI devices?**

**A.** There were number of routines developed in *UTMOST III* SOI module to characterize the parasitic diode or bipolar effects. All parasitic effect characterization routines require devices with body contact for measurements and 5 Terminal selection for simulation. Summary of these routines are:

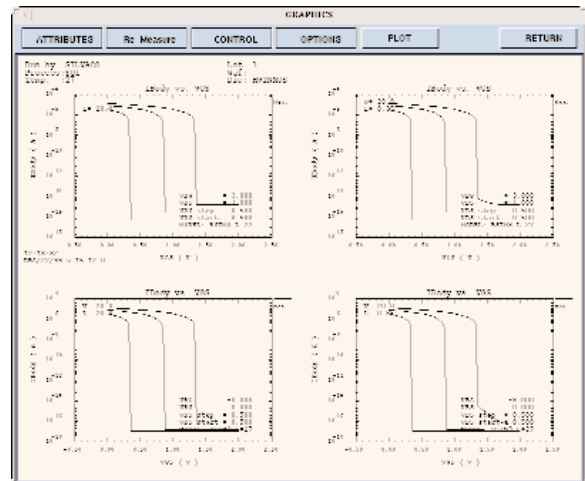


Figure 2. IB/VG\_MG Characteristics.

**IB/VG\_MG Routine:** This routine is used to measure IBody current versus VGS at different VDS steps and different Bulk voltage steps. The user can also specify the Back Gate voltage during the measurements. The IB/VG\_MG routine can be used for multiple geometry measurements.

**IB/VB\_MG Routine:** This routine is used to measure IBody current versus Bulk voltage (VB) at different VGS steps. IB/VB\_MG Routine allows users to bias the Back Gate, Drain and Source terminals with constant voltage sources. The IB/VB\_MG routine can be used for multiple geometry measurements.

**IC/VCE Routine:** This routine is used to characterize the parasitic bipolar effects in SOI devices. IC/VCE routine can measure IDrain versus Vdrain characteristics

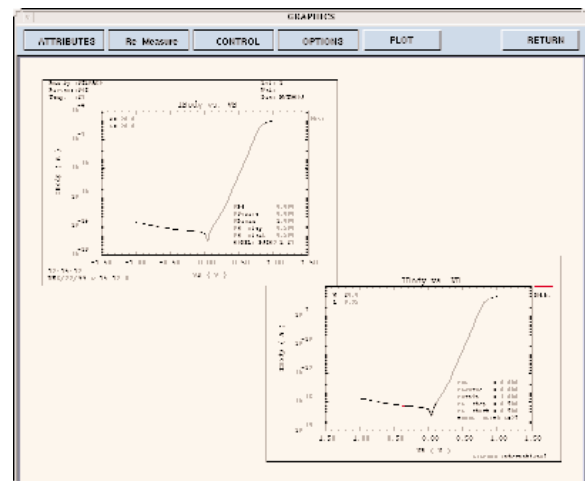


Figure 3. IB/VB\_MG Characteristics.

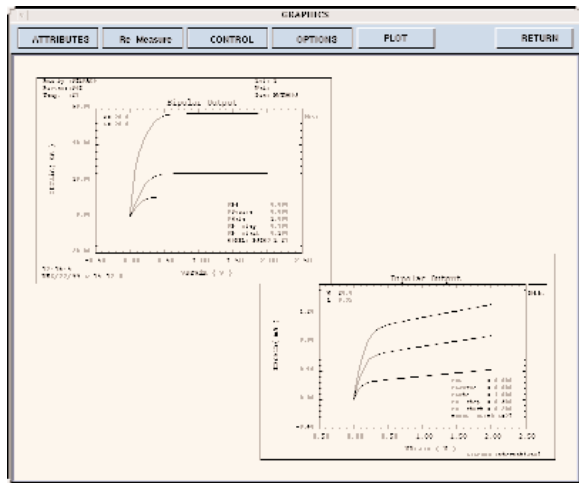


Figure 4. IC/VCE Characteristics.

at different  $V_{Bulk}$  voltage steps. The user can bias the Back Gate, Drain and Source terminals with constant voltage sources. The IC/VCE routine can be used for multiple geometry measurements.

**DIODE Routine:** This routine can be used to measure the Drain-Body and Source-Body diodes. The displayed results will present the  $I_{Body}$  versus  $V_{Bulk}$  characteristics. The VGS voltage can be stepped during the measurement. The user can also bias the Back Gate, Drain and Source terminals with constant voltage sources. In order to measure only Drain to Bulk diode without any additional source terminal current, the Source terminal is left floating during the measurement. The Drain terminal is left floating during the Source to Bulk diode measurements. The DIODE routine can be used for multiple geometry measurements.

**Gummel Routine:** This routine is used to measure  $I_{Body}$  and  $I_{drain}$  currents versus  $V_{body}$  voltage. The measured data is similar to the Gummel characteristics of a bipolar device. The Gummel routine allows users

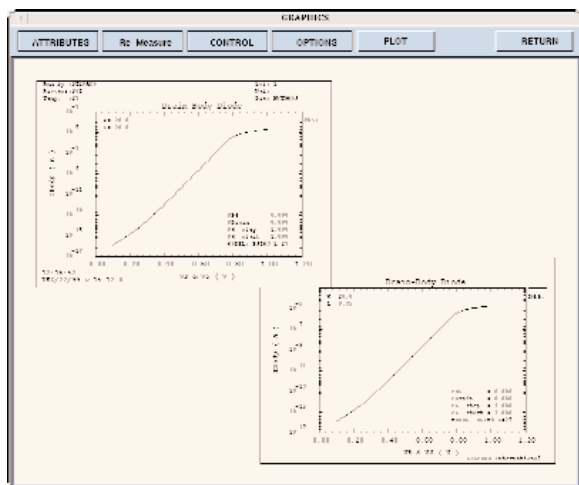


Figure 5. DIODE Characteristics.

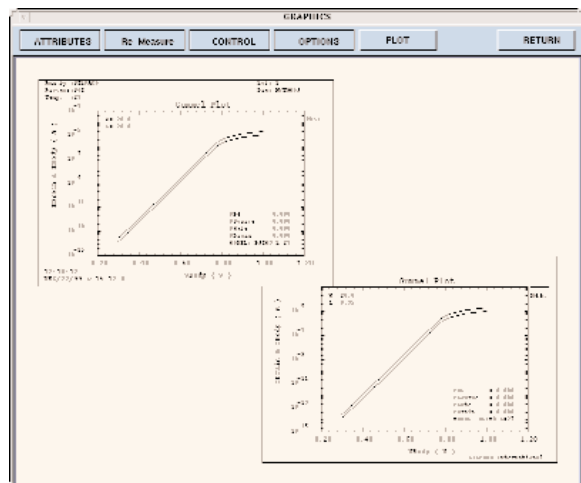


Figure 6. Gummel Characteristics.

to bias the Back Gate, Drain and Source terminals using constant voltage sources. The Gummel routine can be used for multiple geometry measurements.

**GP\_VS Routine:** The GP\_VS routine is similar to the Gummel routine. However in GP\_VS routine the  $I_{Body}$  and  $I_{Drain}$  currents are measured against the  $V_{source}$  voltage. The Drain, Gate, Bulk and Back Gate terminals can be biased using constant voltage sources. The GP\_VS routine can be used for multiple geometry measurements.

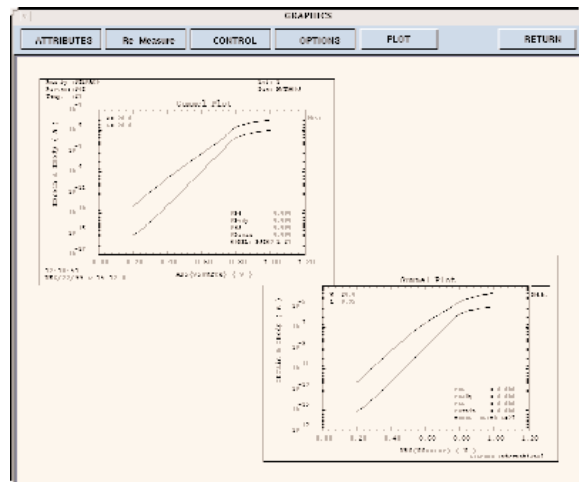


Figure 7. GP\_VS Characteristics.

### Call for Questions

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