1 SCOPE

The purpose of this document is to detail the use of the SemiTest Surface Charge Analyzer. All users are expected to have read and understood this document. It is not a substitute for in-person training on the system and is not sufficient to qualify a user on the system. Failure to follow guidelines in this document may result in loss of privileges.

2 REFERENCE DOCUMENTS

- SCA 2500 Surface Charge Analyzer User Manual Part I

3 DEFINITIONS

n/a

4 TOOLS AND MATERIALS

4.1 General Description – The Surface Charge Analyzer measures the quality of an oxide or a blank silicon wafer and can be used to monitor a process over time. A transparent Mylar probe is placed in contact with the oxide layer. A slowly varying dc bias is applied with an ac modulated light to induce an ac photocurrent. The resulting ac photopotential is measured as a function of applied dc bias through capacitive coupling.

5 SAFETY PRECAUTIONS

5.1 Hazards to the Operator
   5.1.1 High voltages - Only operate with all covers and guards in place.

5.2 Hazards to the Tool
   5.2.1 Particles – The tool is sensitive to particulate contamination. Wafers should be clean and have low particle counts as measured on the Surfscan, or the probe head may be damaged.
6  **INSTRUCTIONS**

6.1  **Initial State Check**

6.1.1 The system is typically left on, but logged out. If it is off, turn it on and it will boot up automatically. The system should be allowed to warm up for 30 minutes if it has been turned off.

6.2  **Operating the System**

6.2.1 Log on to the system. The username is **FACTORY** and the password is **OPER**.

6.2.2 Press F1 Operate.

6.2.3 Press F1 Test.

6.2.4 Load the wafer onto the stage making sure that it is centered. Be careful not to damage or contaminate the surface.

6.2.5 Use the arrow keys on the keypad to select the program. For example use FAC-P or FAC-N to measure oxide, depending on the wafer type.

6.2.6 Use the arrow keys to select and enter a **Lot ID** and **Wafer ID**.

6.2.7 Use the arrow keys to select and enter the **Oxide Thickness** in Angstroms.

6.2.8 Press **F12** to start a test. The test will take several minutes and will output the following to the screen. For more information consult the User Manuals.

   - Nsc is the average surface doping concentration in atoms/cm³
   - Qox is the oxide charge in q/cm²
   - Dit is the density of interface traps in cm⁻²eV⁻¹
   - Qfb is the flatband surface charge in q/cm²
   - Ts is the lifetime

6.2.9 For a printout make sure the printer is loaded with paper and press the **Print Screen** button.

6.2.10 Press **F8** to log off and place the wafer stage in the standby condition.
## REVISION RECORD

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<td>Sean O'Brien</td>
<td>A-06/01/2009</td>
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