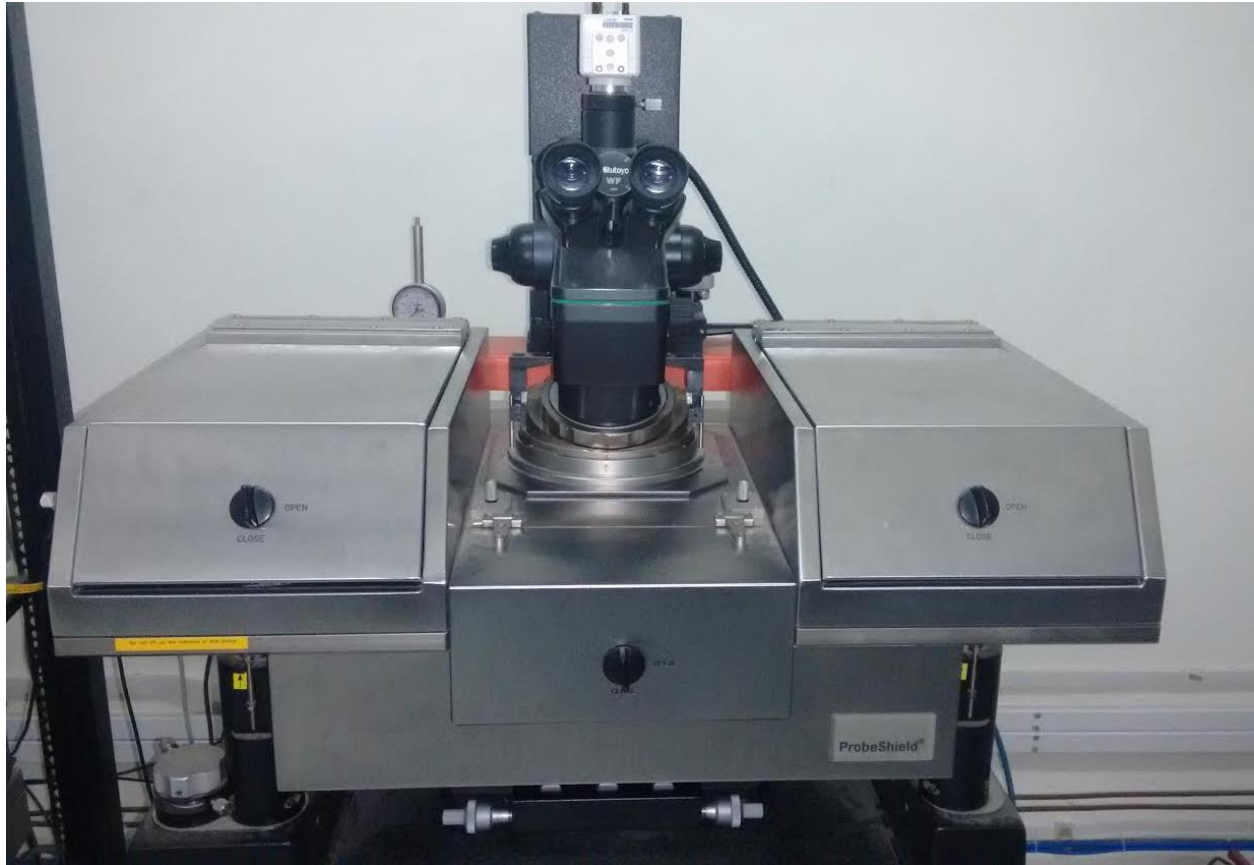
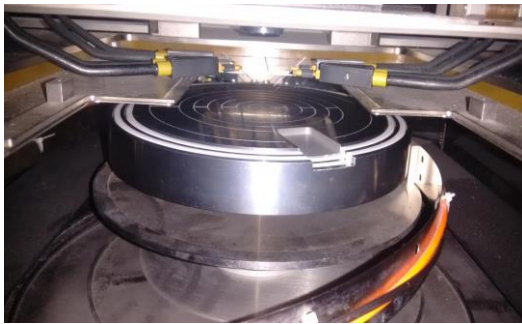


## GLIMPSE : PROXIMA TOOL



Proxima Tool (Agilent B1500 Semiconductor Device Analyzer)



Chuck



Proxima Tool

## Introduction:

Keysight B1500A Semiconductor Device Analyzer is an all in one analyzer supporting IV, CV, pulse/dynamic IV. It provides a wide range of measurement capabilities to cover the electrical characterization and evaluation of devices, materials, semiconductors, active/passive components, or virtually any other type of electronic device. Keysight EasyEXPERT group+ GUI based characterization software is available either on the B1500A's embedded Windows 7 platform with 15-inch touch screen or on your PC to accelerate the characterization tasks. EasyEXPERT group+ makes it easy to perform complex device characterization immediately with hundreds of ready-to-use measurements (application tests) furnished, and allows you the option of storing test condition and measurement data automatically after each measurement in a unique built-in database (workspace), ensuring that valuable information is not lost and that measurements can be repeated at a later date. Keysight B1500A provides the complete solution for device characterization with these versatile capabilities.

## Basic Features

### 1. Current versus voltage (IV) measurement

- Accurate and precise measurement ranges of 0.1 fA - 1 A and 0.5  $\mu$ V - 200 V – Spot and sweep measurement
- – Time sampling measurements (100  $\mu$ s minimum sampling rate)
- – Pulsed measurement with minimum pulse widths of 50  $\mu$ s using the MCSMU or 500  $\mu$ s using the HPSMU, MPSMU, or HRSMU
- – The ASU (atto-sense and switch unit) can be used with the MPSMU, or HRSMU to provide 0.1 fA measurement resolution and SMU/AUX path switching
- – Two analog-to-digital converter choices (high-resolution ADC or high-speed ADC) available for each SMU type (HPSMU, MPSMU and HRSMU)

### 2. Capacitance Measurement

- – Multi-frequency AC impedance measurement supports CV (capacitance versus voltage), C-t (capacitance versus time) and C-f (capacitance versus frequency) measurement
- – Capacitance measurement frequency range of 1 kHz to 5 MHz
- – Quasi-Static Capacitance-Voltage (QS-CV) measurement with leakage current compensation
- – Automated switching between IV and CV measurements using either the optional SCUU (SMU CMU unify unit) and GSWU (guard switch unit) or a pair of ASUs

### 3. Pulsed IV/Fast IV/Transient IV measurement

- – Provides high speed and high sensitivity measurement capability for ultra-fast IV (current-voltage), pulsed IV and transient IV measurements, including NBTI/PBTI and RTN (Random Telegraph Signal Noise) measurements

- – Arbitrary waveform generation with 10 ns programmable resolution
  - – Simultaneous high-speed voltage/current measurement (200 MSa/s, 5 ns sampling rate) – SMU technology supports pulsed IV measurement without load line effects
4. Pulse Generation
- Up to  $\pm 40$  V voltage pulsing and arbitrary waveform generation for non-volatile memory evaluation
  - – Single channel two-level and three level pulsing capability
5. B1500A platform
- – 15-inch touch screen supports all capabilities of the intuitive GUI for convenient device characterization
  - – Configurable and upgradable measurement modules with 10 slots per mainframe
  - – GPIB, USB, LAN interfaces, and VGA video output port
6. EasyEXPERT group+ software
- – Characterization environment is available either on mainframe (embedded Windows 7) or on user's PC – Intuitive GUI based operation with keyboard, mouse operation and touch screen.
  - – Application Test mode provides the furnished hundreds of ready-to-use application tests for quick measurement execution
  - – Classic test mode provides easy access to the full capability of instrument features.
  - – Graphical display and analysis capabilities facilitate front-end data analysis without additional utilities and support report generation as image data or Excel data.
  - – Individualized built-in database (workspace) records test data automatically, and simplifies the data management without annoying numerous data files.
  - – Tracer test mode enables a curve tracer like knob control of measurement parameters to support interactive real-time device characterization and automatic data recording feature
  - – Oscilloscope view (available for the MCSMU) supports pulsed voltage and current waveform viewing for quick and easy timing verification
  - – Quick test mode supports test sequencing without programming
  - – GUI-based control of the Keysight B2200A, B2201A and E5250A switching matrices
  - – GUI-based self-test, self-calibration and diagnostics menu for hardware maintenance
  - – EasyEXPERT remote control function supports the remote measurement execution of application tests that are created on GUI interactively, via the LAN interface
  - – Data back capability and various data protection feature for shared usage by multiple users
  - – EasyEXPERT group+ can be installed on as many PCs as you need without additional charge to take advantage of offline personal analyzer environment among users in your department.

## 7. Specification conditions

- Temperature: 23 °C  $\pm$ 5 °C
- Humidity: 20 % to 60 %
- After 40 minute warm-up followed by self-calibration
- Ambient temperature change less than  $\pm$ 1 °C after self-calibration execution, not applicable for MFCMU and WGFMU
- Measurement made within one hour after self-calibration execution, not applicable for MFCMU and WGFMU
- Calibration period: 1 year
- SMU integration time setting: 1 PLC (1 nA to 1A range, voltage range) 20 PLC (100 pA range) 50 PLC (1 pA to 10 pA range) Averaging of high-speed ADC: 128 samples per 1 PLC
- SMU filter: ON (for HPSMU, MPSMU and HRSMU)
- SMU measurement terminal connection: Kelvin connection
- WGFMU load capacitance: 25 pF or less

### Instrument Connections:

1. Three SMUs are connected to switch matrix column 1 (SMU 1) ,2 (SMU 2) and 3 (SMU 3) respectively.
2. GNDU is connected to switch matrix column 4.
3. Manipulator A, B, C and D connected to switch matrix rows A, B, C & D respectively.
4. Chuck connected to row E.
5. CV (High) connected to column 10.
6. CV (Low) connected to column 11.

