S500

Integrated Test System

- **Highly configurable, instrument-based system**
- **Ideal for SMU-per-pin Wafer Level Reliability (WLR) testing, high speed parallel test, die sorting and binning, NBTI, Process Control Monitoring (PCM)**
- **Intuitive test setup, data gathering and analysis with ACS software**
- **Keithley's backplane provides high speed measurement throughput**
- **Flexible solution to meet emerging and mature testing needs**
- **Full control of automated and semi-automated probers**
- **Develop and execute tests at the device, site, wafer, and cassette level**

Versatile Systems with the Instrument Advantage

S500 Integrated Test Systems are highly configurable, instrument-based systems for semiconductor characterization at the device, wafer, or cassette level. Built on our proven instrumentation, S500 Integrated Test Systems provide innovative measurement features and system flexibility, scalable to your needs. The unique measurement capability, combined with the powerful and flexible Automated Characterization Suite (ACS) software, provides a comprehensive range of applications and features not offered on other comparable systems on the market. Specific capabilities and system configurations include:

- Full-range source measure unit (SMU) instrument specifications, including sub-femtoamp measurement, ensure a wide range of measurements on almost any device.
- Pulse generation and ultra-fast I-V for memory characterization, charge pumping, single-pulse PIV (charge trap analysis), and PIV sweeps (self-heating avoidance).
- Low or high channel-count sytems, including parallel test, with Keithley's system-enabling and scalable SMU instruments.
- High voltage, current, and power source-measure instrumentation for testing devices such as power MOSFETs and display drivers.
- Switching, probe cards, and cabling take the system all the way to your DUT.

Flexibility Combined with Applications Experience

S500 Integrated Test Systems are designed around three standard Keithley principles: configuration, integration, and customization. What this means to you is that you will receive a comprehensive test system for semiconductor characterization with both industry-leading Keithley hardware and highly configurable ACS software applications that include device characterization, reliability/WLR, parametric, and component functional test. With Keithley's proven instrumentation and user-friendly ACS software, the S500 is configured, integrated, and customized with the applications experience that only Keithley can provide.

Value-Focused Systems and Service

- Assessment of individual application needs for customization
- Proposal of integrated system configuration
- Installation and system user support
- Management of system-out cabling and probe card adaptation
- Implement training, test code development, and applications services
- Assurance of turnkey solutions for future applications

S500 Integrated Test System

Key System Components

- **4200-SCS lab-grade parameter analyzer characterizes devices using unique instrumentation modules such as sub-femtoamp SMU instruments, capacitance-voltage units, pulse generators, and ultra-fast I-V units**
- **Series 2600B family of System SourceMeter SMU Instruments offering a wide dynamic range of 1fA to 10A and 1µV to 200V, combines into a high channel-count system via the Keithley TSP-Link interface**
- **Model 707B high speed switch matrix integrates seamlessly with Series 2600B System SourceMeter SMU Instruments via the Keithley TSP-Link interface for a complete multipoint test solution**
- **Model 2410 High Voltage 20W SourceMeter Unit sources up to 1100V, 1A**
- **Model 2651A High Power System SourceMeter SMU Instrument offers 2000W pulsed power, 200W DC power, and up to 50A @ 40V with pA and µV resolution**
- **ACS software provides intuitive test setup, data gathering and analysis for parametric characterization from single die to full cassette**
- **Full control of automated and semi-automated probers, as well as other test instruments, further simplifies device test and characterization**

Flexible and User-Friendly Software Environment

Each comprehensive S500 test system includes advanced components and productivity features to make workflow smooth and easy. The ACS application software is designed to perform complex functions, such as:

- Wafer description
- Test setup
- Prober control
- Test execution
- Real-time and post-test analysis

The integrated test plan and wafer description function allows the user to set up single or multiple test plans on one wafer and selectively execute them later, either manually or automatically. Additionally, the user has maximum flexibility for performing applications—easily switching between lab use (manual) and production (fully automated) using the same test plan.

High Throughput WLR

SMU-per-pin configuration is especially beneficial in scaled CMOS reliability testing.

- Ideal for DC "on-the-fly" NBTI testing
- High speed measurements produce lifetime predictions from two to five times faster than conventional WLR solutions
- Embedded Test Script Processor (TSP®) technology and deep measurement buffers ensure deterministic timing on all pins
- Up to 200V stress and picoamp measurements provide a wide range of capabilities and technologies
- Real-time plotting provides visibility into tests as they occur

Automated Device Characterization

Exceptional balance of high precision testing and automated data gathering.

- Flexible configurations to meet current and emerging test needs
- Powerful analysis, presentation, and reporting tools
- Control full and semi-automatic probers with intuitive setup and operation

Parametric Die Sort

Uniquely suited for multi-site parallel testing for die sort and other high throughput applications.

- Multi-group testing allows groups of SMU instruments to execute in parallel on different devices, structures, or dies
- True parallel test is enabled through distributed processing with embedded Test Script Processor (TSP®) technology in each SMU.
- High voltage and high current capabilities provide capabilities across a wide range of technologies
- Large library of ready-to-use tests and parameter extractions