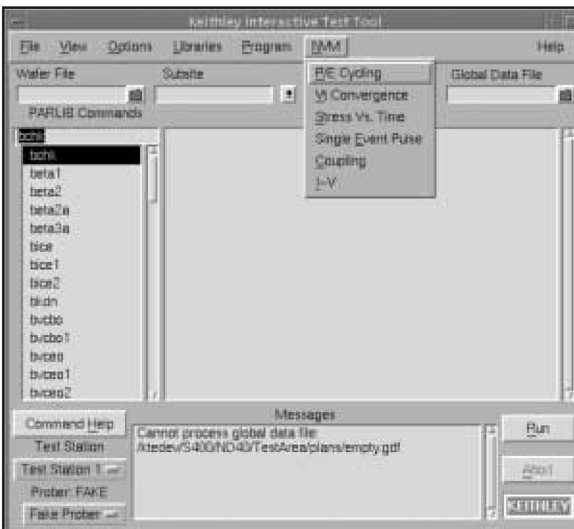
Flash Memory Test Systems

Semiconductor Characterization

Keithley's Flash Memory Test Systems offer producers of flash memory devices an accurate, turnkey approach to device characterization and/or production monitoring. These testers are based on high-speed pulse generators, a solid state switching system, and powerful software tools that simplify device development and control. They are designed as an expansion of Keithley's proven S400 and S600 Series Parametric Test Systems, so semiconductor production facilities can broaden their device testing capabilities quickly and cost-effectively. Now, there's a single system solution for a wide range of parametric, flash memory, and other non-volatile memory device testing tasks.

- **High-speed integrated hardware and software package**
- **Flexible endurance testing module**
- **Data link to engineering analysis tools**
- **Simple ASCII file test setup**



Keithley offers two different versions of the Flash Memory Test System. One system is tailored for the characterization needs of development groups, and the other is designed to address production monitoring needs. The Flash Memory Development System is designed for R&D and device characterization work. The hardware configuration for this option shortens the process of making cell lifetime measurements. This system includes a Keithley 9332-PCU (Pulse Control Unit) and two HP81110 dual-channel pulse generators. For production test applications that don't require the system to characterize cells, the Flash Memory Production System offers an economical alternative for monitoring device quality during manufacturing. This system includes pulse generators and control software.

ORDERING INFORMATION

Flash Memory Test Systems

This product is available with an Extended Warranty. See page 635 for complete ordering information.

System Description

The Flash Memory Test Systems build upon the high speed and accuracy inherent in the S400 and S600 Series Parametric Test Systems. Signals may be switched through the normal system matrix or through a set of solid-state relays. Extremely crisp pulses can be delivered to any pin using either technique. The Flash Memory System can deliver pulses as short as 50ns through the switching matrix.

Many device lifetime tests require the test system to perform thousands of program/erase cycles. The constant switching involved in performing these cycles can shorten the life of mechanical relays in a switching matrix. However, through the use of solid-state switches in the 9332-PCU, Keithley's flash measurement hardware can improve test times and extend the lifetime of the switching matrix.

SPECIFICATIONS

MINIMUM PULSE WIDTH: 50ns.

MINIMUM RISE/FALL TIME: 20ns.

MAXIMUM PULSE AMPLITUDE: 20V (into an open).

PULSE AMPLITUDE ACCURACY: 1% + 100mV.

TEST TIME (100,000 cycles): <2 hours typical.

MEASUREMENT CONFIGURATION

- 1 DUT terminal pulse for program and erase or pulse for program or erase and float/bias/ground for opposite state
- 2 DUT terminals pulse for program or erase and float/bias/ground for opposite state
- 2 DUT terminals bias or ground for program and erase

TESTS SUPPLIED

1. Program/Erase Cycle
2. V_t Convergence
3. Single Event (Program or Erase)
4. Gate Coupling Ratio
5. Transistor I-V Curve
6. Stress vs. Time

QUESTIONS?

1-800-552-1115 (U.S. only)

Call toll free for technical assistance, product support or ordering information, or visit our website at **www.keithley.com**.