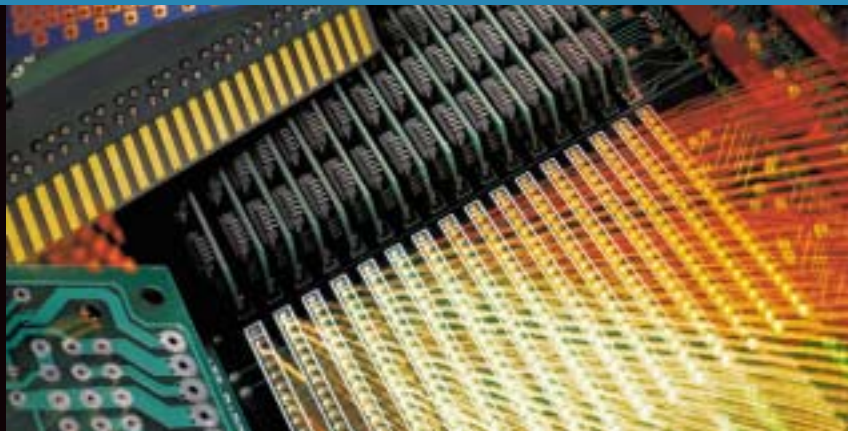


High Pin Count
Rapid Relay-Based
ESD & Latch-Up Test System
For Evaluating Advanced
IC Devices



KeyTek ZAPMASTER MK.4 ESD & Latch-Up Test System

Analyze • Detect • Measure • Control™

Thermo
ELECTRON CORPORATION



The KeyTek ZAPMASTER MK.4 Combination ESD & Latch-Up Test System For The Evaluation of Advanced IC Devices

Rapid Relay-Based Operations - Up To 2304 Channels

The first name in super fast, rapid relay (RR) ESD & Latch Up test systems – Thermo – now offers IC structure designers and QA program managers a breakthrough in flexible, high yield test systems designed to address global demands for devices that are smaller, faster, and smarter.

Introducing the KeyTek ZAPMASTER MK.4, our new flagship ESD & Latch-Up test system. With the highest speed of test execution, lowest Zap interval, and extensive parallelism that enables concurrent Zap and Curve Trace test capability, the KeyTek ZAPMASTER MK.4 is destined to become the de facto ESD and Latch-Up test system standard for producers of multifunction high pin-count devices.

A complete, robust and feature filled turn-key instrumentation package, the KeyTek ZAPMASTER MK.4 performs automatic and manual tests on devices with up to 2304 pins.

Operation is via easy to implement and upgradable Windows-based software that's both intuitive and comprehensive. With three levels of user-selectable software, including an optional exclusive KeyTek MK Middleware custom-scripting option, tests can

be rapidly set up with a minimum of operator and programmer training.

Thirty years in the making, the versatile and powerful KeyTek ZAPMASTER MK.4 test system is fully capable of taking your test operations through evolving regulatory and quality standards ahead.

Solid State Matrix Topology for Rapid, Easy-To-Use Testing Operations

The advanced rapid relay-based (modular matrix) hardware of the KeyTek ZAPMASTER MK.4, which is at least 10 times faster than mechanically driven testers, builds on the legendary performance and reliability of the original KeyTek ZAPMASTER, and its successor, the KeyTek ZAPMASTER MK.2. In constant use since the late-eighties, KeyTek ZAPMASTER and ZAPMASTER MK.2 have been embraced by manufacturers and test houses, with an installed user base numbering well into the hundreds.

A powerful, extraordinarily fast embedded VME controller drives the highest Speed of Test execution available, and eliminates unnecessary data transfer, a real timesaver when evaluating large devices.

The KeyTek ZAPMASTER MK.4 can be equipped with up to eight 0V to 100V 4-quadrant Voltage and Current (V/I) power supplies for accurate device parametric measurements.

Latch-Up stimulus and device biasing. Each V/I supply has a wide dynamic range enabling them to force and measure very low voltage at high current levels from 100mV/10A to 100V/1A. The system's power supply matrix can deliver up to a total of 18A of current, which is distributed between the installed number of supplies, and is limited by dissipation factors of the highest consumption supply. This provides a fast and versatile means of making any number of DC parametric and leakage tests, while offering total control and protection of the DUT. (Additional V/I supply configurations are also available.)

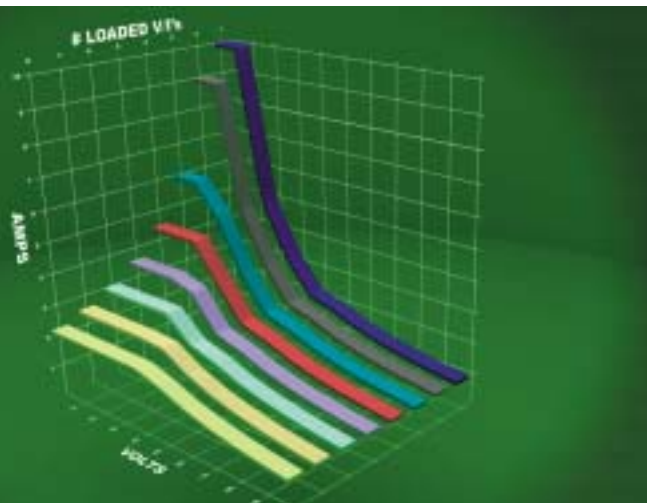
In addition, the High Voltage power source chassis with Patent Pending HV isolation enables excellent pulse source performance.

Advanced Device Preconditioning. The KeyTek ZAPMASTER MK.4 provides the most advanced device preconditioning capability available. The DUT can be vectored with complex test and vector patterns, which give the operator excellent control over the DUT. Each device pin can be driven with vectors up to 256k deep, at clock speeds up to 10MHz. The read back capability on every pin makes device verification fast and easy.

The switching matrix, while providing consistent ESD paths, also allows any pin to be grounded, floated, vectored or connected to any of the installed V/I supplies.

100W V/I Performance KeyTek ZAPMASTER MK.4 8 V/I configuration

The powerful V/I's in the KeyTek ZAPMASTER MK.4 can deliver a total of 800W to the DUT, enabling complex testing of all advanced high power processors on your product roadmap.



KeyTek ZAPMASTER MK.4 Software & Operating System Yields Outstanding Accuracy and Long Term Return

The stable, networkable KeyTek ZAPMASTER MK.4 Windows-based operating software empowers users with easy and rapid test set-up to current (and evolving) standards, as well as effective and readily reproducible IC test data. Embedded software enables the VME to handle an enormous amount of test program and result data.

Advanced software algorithms ensure accurate switching of HV, in support of pulse source technology, per recent JEDEC/ESDA trailing pulse standards; the system has been designed with flexibility to fully address global standards as they evolve.

Furthermore, its optional new KeyTek MK Middleware capability, a unique and exclusive feature of the KeyTek ZAPMASTER MK.4 operating system, enables users to write custom test scripts "on-the-fly," providing immediate functional availability. This offers users unmatched flexibility when testing to existing global and company-driven quality standards, as well as those yet to be defined.

Massive Parallelism Drives Remarkable Test & Throughput Speeds

The KeyTek ZAPMASTER MK.4 software drives the system capability to enable testing of 12 devices at once (parallel 8/4 device curve trace). As curve trace (CT)

testing has a higher overhead than Zap/ESD testing, this simultaneous testing capability saves a great deal of time over sequential CT testing. It substantially increases throughput, while offering significant potential to reduce test costs, particularly as device pin counts increase.

As such, the strategically designed field upgradable structure of the KeyTek ZAPMASTER MK.4 ensures a substantial return on investment over a very considerable test system lifecycle. And, its compact size optimizes valuable lab space.

Features

- **Rapid Relay-based operations.** Super fast, enables test speeds at least 10 times faster than robotic-driven testers
- **Test devices up to 2304 pins.** Systems available configured as 1152, 1728 or 2304 pins.
- **Waveform network: 12 site HBM (100pF/1500Ω) pulse source.** Patent Pending design ensures waveform compliance for technology generations to come.
- **Multiple device selection.** System automatically detects when multiple devices are present; a graphical display indicates which of the devices are selected to test, with a progress indicator displaying the current device under test.
- **Automatically translates pin type test requirements.** Enables device rotation when testing devices with pin counts that exceed the matrix channel count.
- **Enables use of device set-up information from other test equipment.** For increased efficiency and accuracy.
- **Device fixturing.** System and software detects the fixture fitted, and its suitability for the selected test plan; provides user with appropriate configuration warnings and advice.
- **Event trigger output.** Manage your setup analysis with customized scope trigger capabilities.
- **High voltage power supply chassis.** Modular chassis with Patent Pending HV isolation enables excellent pulse source performance.
- **Power supply sequencing.** Provides additional flexibility to meet more demanding test needs of integrated system-on-chip (SOC) designs.
- **Manages ancillary test equipment required for automated testing.**
- **Supports commercially available tools.** e.g.: Crystal Reports.
- **Human Body Model: (HBM) per ESDA STM5.1, JEDEC/JESD22-A114, MIL-STD 883E, and AEC Q100-002 specifications, 25V- 8KV in steps of 1V.** Test to multiple industry standards in one integrated system; no changing or alignment of pulse sources.



- **Machine Model (MM) per ESDA STM5.2, JEDEC/JESD22-A115, and AEC Q100-003, 25V to 2kV in steps of 1V.** Integrated pulse sources allow fast multi-site test execution.
- **Latch-up testing per JEDEC/JESD 78 and AEC Q100-004.** Includes preconditioning, state read-back and full control of each test pin.
- **Pin drivers for use during Latch-Up testing and parametric measurements.** Vector input/export capability from standard tester platforms.
- **256k vectors per pin with read-back.** Full real-time bandwidth behind each of the matrix pins.
- **6 independent vector voltage levels.** Test complex I/O and Multi-Core products with ease.
- **Up to 10MHz vector rate programmable from an internal clock.** Quickly and accurately set the device into the desired state for testing.
- **Up to eight separate V/I supplies (1 stimulus and 7 bias supplies).** High accuracy DUT power, curve tracing, and Latch-up stimulus available. System design also provides high current capability through the V/I matrix.
- **Multiple self-test diagnostic routines.** Ensures system integrity throughout the entire relay matrix, right up to the test socket.
- **Test reports:** pre-stress, pre-fail (ESD) and post-fail data, as well as full curve trace and specific data point measurements. Data can be exported for statistical evaluation and presentation.
- **Individual pin parametrics.** Allow the user to define V/I levels, compliance ranges, and curve trace parameters for each pin individually.
- **Enhanced data set features.** Report all data gathered for off-line reduction and analysis; core test data is readily available. All data is stored in an easy-to-manipulate standard XML file structure.
- **Comprehensive engineering vector debug.** Debug difficult part vectoring setups with flexibility.
- **Safety.** Interlocked safety cover ensures no user access during test. All potentially lethal voltages are automatically terminated when cover is opened or the test fixture is raised. Safety cover window can be easily modified to accept 3rd party thermal heads.
- **6 square ft. system footprint.** Efficient use of space with convenient user access.



Cost Effective Fixtures

Custom fixtures include universal package adaptors to enable the industry's lowest cost-in-service high pin count device fixturing yet devised.

2304 pin Universal 1mm pitch BGA package adaptor shown.

Ready for Today's Component Reliability Demands, and Anticipating Those to Come

The fact is ESD and Latch-Up testing of electronic and electrical goods can be very expensive aspects of the design and manufacturing process. This is especially true as market demands for products that are smaller, faster and smarter become the standard, rather than the exception.

The KeyTek ZAPMASTER MK.4 leverages the technology and know-how gained over three decades of test system experience, as well as our in-depth participation and contributions to global regulatory bodies governing these changes, enabling today's products to meet both global and industry-driven quality standards.

Our thirty-year presence in the component reliability industry has demonstrated that addressing today's standards is one thing. But the real key to our customers' success is in anticipating what's next. And to ensure that our customers possess the ability to evolve quickly to meet all change factors with efficiency and cost effectiveness.

As such, the KeyTek ZAPMASTER MK.4 has been thoughtfully and thoroughly designed with the future of component reliability squarely in mind.

Get on board to better short- and long-term quality and ESD & Latch-Up test economies. The KeyTek ZAPMASTER MK.4 is your 1st Class ticket to the Compliance Test world.





Single Source, Total Component Reliability ESD & Latch-Up Test Solutions.

Specialists who understand the challenges you face. Innovative ideas. Leading technologies. Breadth of high yield component reliability test equipment. Thermo's Compliance Test Solutions group—your component reliability test solutions partner. Contact us today for details.

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