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DATASHEET

Thermo Scientific MK.1TE

ESD & static Latch-Up test system

The Thermo Scientific MK.1TE is a relay-based, exceptionally fast ESD and Static Latch-Up Test System used in the evaluation of advanced IC devices. It fully addresses today's JEDEC/ESDA standards, and can be configured with 64, 128, 192 or 256 test pins.

- Waveform network: 8-site HBM pulse sources
- Human Body Model (HBM) and Machine Model (MM) testing to industry standards
- Static Latch-Up testing per current JEDEC's JESD 78 method
- Highly repeatable, reproducible test data
- Enhanced data set features
- High voltage power supply chassis
- Power supply sequencing
- Event trigger output
- Intuitive set-up and operation using the Thermo Scientific™ Scimitar™ software platform
- Direct use of existing 256 pin-style ZapMaster fixtures

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Rapid, high-throughput testing of complex IC devices, from design through post-production qualification

The Thermo Scientific MK.1TE ESD and Static Latch-up Test System provides users with advanced capabilities to test mid-range pin count devices to today's Human Body Model (HBM) and Machine Model (MM) ESD standards. The system's pulse delivery design ensures waveform hazards noted in the standards, such as the trailing pulse and the pre-discharge voltage rise are addressed. Trailing pulses were shown to cause non-ESD related failures by exposing the DUT to an electrical overstress after the main HBM event. Pre-discharge voltage can cause voltage-triggered protection structures to fail, as the pin under test may not be at zero volts when the HBM event occurs.

A user-selectable 10K Shunt can be connected during the pulse to eliminate any voltage prior to the actual HBM event. A combination test system, today's MK.1TE test system also performs Static Latch-Up testing per JEDEC's JESD 78 method.

Easy-to-use testing operations

The MK.1TE Scimitar Windows®-based software is both intuitive and comprehensive. Tests are set-up quickly, and user training requirements are minimal.

Advanced controller and communications

A powerful, extraordinarily fast embedded VME controller drives the highest Speed-of-Test execution available. Data transfer between the embedded controller and the tester's PC server, is handled through TCP/IP communication protocols, minimizing data transfer time. The tester's PC server can be accessed through internal networks, as well as through the Internet allowing remote access to the system to determine the systems status or to gather result information.

Consistent, precise ESD waveforms

By locating multiple discharge networks close to the test fixture board, unwanted stray inductance and capacitance is kept to a minimum at every pin. This ensures excellent in-test waveform quality and easily reproducible test data.

Define, achieve and sustain your test objectives

The MK.1TE's flexible, modular design and options enable you to upgrade on-site when corporate or industry standards change. Options include additional pins, bias supplies, and static latch-up. The MK.1TE design and matrix layout allows the direct use (no adapter required) of 256-pin-style ZapMaster fixtures. Optional carriers are available for centrally mounted sockets. Adapters are also available for 256-pin Verifier DUT boards.

Reach the next level of success

Experience the many benefits of working with recognized experts in the field of component reliability ESD and Latch-Up testing. Our goal is to support you with lifelong service — from applications support, calibration services, service contracts, and field service scheduling to full technical field support. We can help you reach that next level of success.

General specifications		
Tests Devices up to 256 pins	Systems available configured as 64, 128, 192, or 256 pins; upgradeable in the field. Additional capability, faster throughput, multi-site testing	
Relay-Based Operations	Enables test speeds 5 to 10 times faster than robotic-driven testers	
Waveform Network	8-site HBM pulse source with 100pF/1500Ω. Patented design ensures waveform compliance for technology generations to come	
High Voltage Power Supply Chassis	Modular chassis with patented HV isolation enables excellent pulse source performance	
Power Supply Sequencing	Additional flexibility to meet more demanding test needs of integrated system-on-chip designs	
Event Trigger Output	Manage your setup analysis with customized scope trigger capabilities	
Human Body Model (HBM)	100pF/1500Ω network, per ESDA, JEDEC/ESDA JS-001, MIL-STD 883E, and AEC Q100-002 specs, 30V to 8kV. Test to multiple industry standards in one integrated system; no changing or alignment of pulse sources	
Machine Model (MM)	200pF/0Ω network, per ESDA STM5.2, JEDEC JESD22-A115, and AEC Q100-003, 30V to 1kV Integrated pulse sources allow fast multi-site test execution	
Static Latch-Up Testing	Per JEDEC EIA/JESD 78 and AEC Q100-004. Optional static Latch-Up testing allows control of DUT pins using embedded bias supplies	
Up to 4 separate V/I Supplies (1 stimulus and 3 bias)	DUT power, curve tracing, and Latch-up stimulus with 4-wire sensing to the matrix for high accuracy. 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	User-defined 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	
Interlocked Safety Cover	Ensures no user access during test. All potentially lethal voltages are automatically terminated when cover is opened. Safety cover window can be easily modified to accept 3rd party thermal heads	
Dimensions / Weight	63 cm (23.5 in) W x 85 cm (33.5 in) D x 109 cm (43 in) H; 109 kg (240 lbs)	
Low resolution/high accuracy parametric measurements using an embedded Tektronix Keithley PSU	With the optional Tektronix Keithley PSU feature (replaces one V/I), nA measurements are achievable, allowing supply bus resistance measurement analysis to be performed	
Power Requirements	System Computer and Monitor	90-250 VAC, 10A, 50/60 Hz 100-240 VAC, 6.5A, 50/60 Hz
Temperature Range	Operating Temperature Non-operating temperature Humidity Range	+15°C to +40°C (+59°F to +104°F) 4°C to +60°C (+40°F to +140°F) 30-60% non-condensing

Scimitar software features
Summary Panel with easy navigation among test plan, device plan components
Wizard-like prompts on multi-step user actions
Control of external devices through the use of Scimitar's user programmable Plug-in capabilities, in addition to the Event Trigger Outputs, which provide TTL control signals for external devices, such as power supplies or for triggering oscilloscopes
Flexible parametric tests that are defined and placed at an arbitrary position within the executable test plan.
Comprehensive results viewer that provides:
ESD and Static Latch-up data viewing capabilities
Curves viewer with zooming capabilities and the ability to add user comments
Data filtering on the following criteria – failed pins, failed results, final stress levels
A complete set or subset of results using user defined parameters
Sorting in ascending or descending order by various column criteria
Tree-like logical view of the tests and test plans
Flexible data storage that provides the ability for the end-user to query the data
Seamless support of existing ZapMaster, MK.2, MK.4, and Paragon test plans
Off-line curve analyzing, including third-party generated waveforms
Canned JESD78A test (static latch-up only) that can be defined automatically
Intermediate results viewing
Automated waveform capture capability and analysis using the embedded EvaluWave software feature
Curve tracing with curve-to-curve and relative spot-to-spot comparison
Pause/Resume test capabilities
Full support for the latest JS-001 test standard combinations
Capability to induce a latch up condition using pulses compliant with standard test models (TLU test type)
Instrumentation support for third party instruments – oscilloscopes, source-meter units, power sources, heat streams, etc.
Realistic representation of the package under test. Variety of sources available for importing outlines into new or existing test plans.
Wide range of device and result data visualizers; comprehensive waveform and statistical data analysis tools.

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Notes

Find out more at **thermofisher.com/EM-Sales**

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