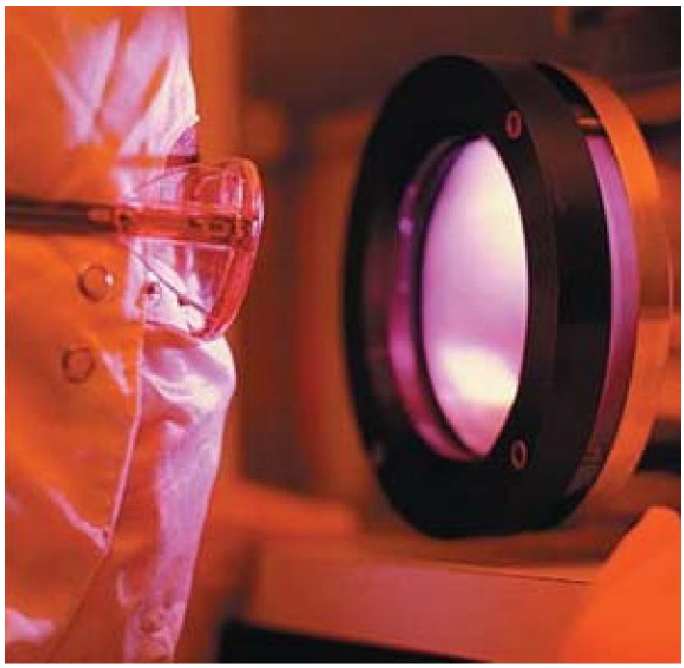
DATASHEET

Thermo Scientific Celestron

Flexible bench-top TLP/ VF-TLP Test System

The Thermo Scientific Celestron is a two-terminal bench-top TLP / VF-TLP Test System for fast, accurate, reliable, and affordable characterization of advanced semiconductor structures.



- Wafer and package level TLP testing
- Integrated WINDOWS® - based system controller
- High current TLP pulse generator
- Integrated +/-200V source/meter unit
- Optional bias supplies (up to 5) under computer control for powered testing and measurements
- Can be interfaced with semiautomatic probers
- Advanced, intuitive software for control and report generation
- Small bench top footprint

Flexible test capabilities

The Thermo Scientific Celestron™ TLP / VF-TLP Test System can be configured for Standard TLP and VF-TLP for testing at the wafer level and/or package level. Optional probes can also be used to measure signals on pins or pads other than the ones being stressed.

Unsurpassed test control

The Celestron system software is the most comprehensive in the industry, and utilizes graphics to assist in system setup and connection to the DUT. During test operations, it displays the recorded TLP pulse voltage and current waveforms, compiled pulsed I-V curve, leakage current measurements, and DC I-V curve trace data. The operator can select the range of test voltages (stress pulses), pulse polarity, leakage and curve trace parameters. The position and duration of the measurement window within the TLP pulse can also be selected, and modified after the data is collected.

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Thermo Scientific Celestron standard TLP configuration	
Pulse widths from 30 to 500ns	Integrated in the pulser box, the standard TLP Pulse width is 100ns Additional pulse widths can be added externally through a cable change ranging from 30 to 500ns Optional computer controlled pulse width with 3 selectable pulse widths
Rise times available	Standard rise time is 200ps Optional rise times from 500ps to 10ns Controlled by optional external rise time filters 2nS and 10nS external rise time filter included Optional computer controlled rise time with 3 selectable rise times Note: 500 MHz or faster oscilloscope is required for TLP measurements 1 GHz or grater scope is recommended for measurements with rise times of less than 1ns
Support of all TLP configurations	Optional changing of configuration for 25 to 500 ohm delivery impedances Support for all configurations described in the ESD Association's TLP Standard Test Method Both wafer level and package testing at all impedances
Time Domain Reflection with Overlapped pulses (TDR-O)	Standard TLP configuration for pulse widths above 30ns 50 ohm delivery impedance Allows "adaptive ranging" of oscilloscope for improved accuracy Maximum DUT current of 20A into 50 ohm load and 40A into a short Maximum DUT open circuit voltage to 2000V Multiple grounds, multiple biased pins/pads, multiple ground current path Measurement, and multiple voltage node measurements are possible
Time Domain Reflection with Separated pulses (TDR-S)	50 ohm delivery impedance Standard TLP configuration for pulse widths under 50ns or when measurement pod cannot be placed close to the DUT DUT current of 20A into 50 ohm load and 40A into a short Maximum DUT open circuit voltage to 2000V Multiple grounds possible
Optional Time Domain Transmission	25 ohm delivery impedance Maximum DUT current of 20A into 25 ohm load and 40A into a short Maximum DUT open circuit voltage to 1000V Multiple grounds, multiple biased pins/pads, multiple ground current path measurement, and multiple voltage node measurements are possible
Optional Time Domain Reflection and Transmission (TDRT)	100 ohm delivery impedance Maximum DUT current of 13.3A into 50 ohm load and 20A into a short Maximum DUT open circuit voltage to 2000V
Optional 500 ohm (current source) TLP	High-Z TDRT mode for high efficiency Computer switching between 500 ohm and 50 ohm TDR-O Maximum DUT current of 3.0A into 50 ohm load and 3.3A into a short Maximum DUT open circuit voltage to 2000V
48 pin DIP DUT board (one included)	50 ohm coaxial probe pulse delivery Tungsten ground probe Needles are replaceable
Wafer probe (one set included)	50 ohm coaxial probe pulse delivery

Thermo Scientific Celestron standard TLP / VF-TLP configuration	
Wafer and package level TLP testing	Flexibility
Integrated system controller	No need for a dedicated computer. Windows® operating system.
TLP pulse generator	Cable-generated pulse. Dual polarity pulses under computer control. Peak pulse current 40A. Open circuit voltage of up to 2000V. Voltage Resolution: Range 1: $0 < V < V_{threshold1}$, step resolution = 0.25V +/- 0.1V +/- 15% Range 2: $V_{threshold1} < V < V_{threshold2}$, step resolution = 0.5V +/- 0.25V +/- 15% Range 3: $V > V_{threshold2}$, step resolution = 2.5V +/- 1.25V +/-15% Note: $V_{threshold1}$ is ~ 40V, $V_{threshold2}$ is ~160V
Current and voltage probes	Included in a small pod for flexibility.
Integrated source/meter unit	Curve Tracing to ± 200V. Leakage measurements down to 50pA. DUT failure detection based on leakage or voltage with forced current or both.
Optional bias supplies	Up to 5 under computer control for powered SOA testing and measurements. Kit includes Bias Tee and cables.
Can be interfaced with semi-automatic probers	Flexibility, cost-savings, ease of test.
Advanced software	Exacting test control, report generation.
Platform	TLP test capability (TDR 50 ohm standard): Pulse single pin. Can ground one or multiple pins (TDR) Semiautomatic operation. Customer supplied oscilloscope: 500 MHz min. BW for Standard TLP. 2.5 GHz min. BW for VF-TLP Wafer interface kit requires customer-supplied prober station and micro positioners.
Transmission Line Pulse (TLP / VF-TLP)	Designed in compliance with the current ESD Association Standard Test Method Documents (ANSI/ESD STM 5.5.1-2016).
Operating Range	Operating Temperature +5°C to +44°C (+40°F to +112°F) Non-operating temperature 4°C to +60°C (+40°F to +140°F) Humidity Range 10-80% non-condensing
Dimensions	56 cm (22 in) x 61 cm (32 in) D x 81.3 cm (32 in) H
Power Requirements	System 100-240 VAC, 10A, 50/60 Hz Computer and Monitor 100-240 VAC, 6.5A, 50/60 Hz
Options	Bias supply up to ±50V and 2A DUT test fixture boards (may also use Keithley 24XX or Keithley 2600.) Semi-automatic prober interface software. VF-TLP charge lines: 1.2 to 10ns. Custom time delay/TDR-S cables: 10ns to 500ns Variable pulse widths and rise times from 0.2 to 10ns. Computer controlled switching between 3 pulse widths. Note: Option limits short circuit current to 20A. Computer controlled switching between 3 selectable rise times. Coaxial and solid wafer probe needles. Kelvin measurement kit to remove wafer contact resistance. Additional ground wafer probes (for TDR and TDT only). Wafer probes of various radius tips in tungsten and copper

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Thermo Scientific Celestron standard VF-TLP configuration	
Pulse widths from 1.2 to 10ns	Selected by cable change at front of system Standard widths are 1.2, 2.5 and 5ns (others optional)
Maximum pulse current	15A into a 50 ohm load Approximately 30A into a short circuit
Maximum open circuit voltage	1500V
DUT testing	Wafer level and package-level
Rise times from 200ps to 2ns	Controlled by optional filters Standard rise times are 200 and 300ps 2ns external rise time filter included
Time Domain Reflection (TDR) with Separated pulses standard (TDR-S)	50 ohm delivery impedance Uses high frequency GS or GSG needle assembly (sold separately)
Time Domain Reflection and Transmission standard (TDRT)	100 ohm delivery impedance Flexible independent needles for testing wafer or packaged parts
Signal merge box technology	Converts TDR-S signals to TDR-O Allows “adaptive ranging” to reduce voltage noise
VF-TLP current and voltage measurement pod	Bandwidths > 2 GHz
VF-TLP DUT boards	VF-TLP DUT board for DIP device included Calibration standards included on DUT board
Typical pulse characteristics	Overshoot vs. rise time: < 10% at 200ps and < 5% at 300ps Ringing amplitude peak-to-peak including overshoot < 20% at 200ps and < 10% at 300ps Settling time (ring duration) to < ± 2%: < 1 ns at < 300ps rise time and < 500ps at > 300ps rise time Fall times between 1 and 2 times the rise time

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

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