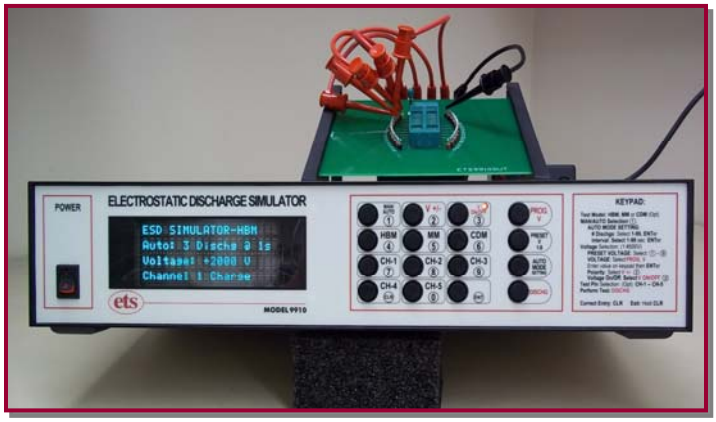
ELECTROSTATIC DISCHARGE SIMULATOR

Model 9910

A microprocessor-based system that generates ESD pulses up to ±8kV for testing electronic devices for susceptibility to Electrostatic Discharge (ESD) using HBM, MM and HMM networks.

Features:



- ☐ **Voltage range: ±5V to ±8kV**
- ☐ **Standard built-in R/C networks:**
  - **HBM (100pf/1,500Ω) to 8kV**
  - **MM (200pf/0Ω) to 1kV**
  - **HMM (150pf/330Ω) to 4kV**
- ☐ **9 user programmed test voltages**
- ☐ **Tests most device configurations**
- ☐ **Keypad or computer control**
- ☐ **Meets (HBM) MIL STD. 883E, *ANSI/ESDA/JEDEC JS-001-2012* (MM) ANSI/ESDA S5.2, JEDEC 22-A115C**
- ☐ **Optional Charged Device Model (CDM) Test Fixture to 1kV**

Applications:

Electrostatic discharge (ESD) has become a significant factor contributing to the disruption of electronic equipment or the premature failure of microelectronic devices in both the field and during the manufacturing process. Sensitivities below 30V are now common. Since it is not always possible to control the environment where electronic devices are used or handled, the burden of product reliability falls upon the manufacturer to design and build equipment with reduced susceptibility to ESD. The ETS Model 9910 ESD Simulator is a valuable tool for developing components for use in today's military, industrial and consumer electronic applications.

The Model 9910 is a bench top system designed for low pin count devices or small product testing and is ideal for meeting the latest 2-pin testing requirements.

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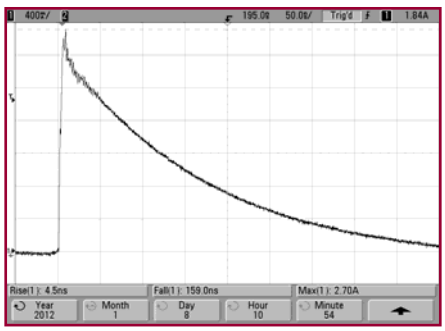
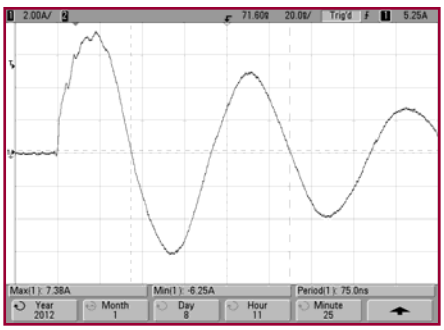
Description:

The Model 9910 Electrostatic Discharge Simulator is a completely integrated microprocessor-based system used to determine the ESD susceptibility level of electronic devices from ±5V to ±8kV. The optional Model 9903 Charged Device Model Test Fixture adds CDM testing capability up to ±1kV. This enables the Model 9910 to meet virtually any ESD susceptibility requirement.

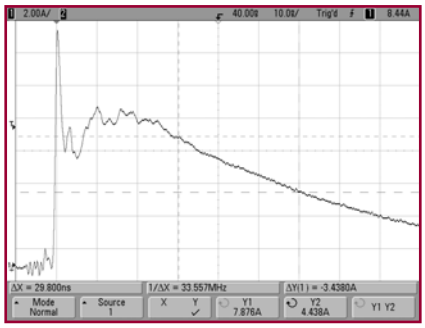
Typical discharge waveforms taken with a Tektronix CT-1 Current Transducer are shown below for Human Body Model (HBM), Machine Model (MM) and Human Metal Model (HMM) at 4kV, 400V and 4kV respectively.



Human Body Model (HBM
(100pF/1500Ω)



Machine Model (MM)
(200pF/0Ω)



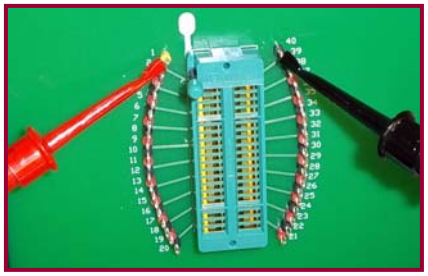
Human Metal Model
(330pF/150Ω)

The Model 9910 can be operated either manually via the front panel keypad or switched to computer control. Serial communication protocol is provided to interface the Simulator with user developed control software **(ETS does not offer software)**. Voltage is adjustable in 1 Volt increments and up to 9 preset levels from ±5 to ±8250V that can be programmed by the user.

Two modes of operation are available: A MANUAL mode, where a Discharge is initiated each time the DISCHARGE button is depressed and an AUTO mode, where the number of discharges (0-99) and the discharge interval (1-99 sec.) are selected by the user and activated when the DISCHARGE button is depressed. Typically, each device pin combination is tested at both polarities using 3 discharges at 1 second intervals.

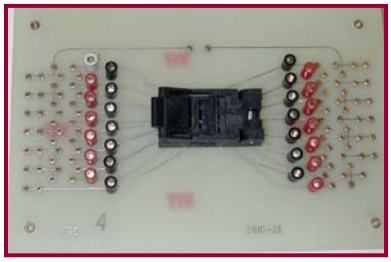
The Model 9910 features selection of built-in HBM, MM or HMM networks. The discharge circuit utilizes mercury high voltage relays for bounce-free operation.

The Model 9910 interfaces with the Device Under Test (DUT) via a universal holding fixture and minigrabber leads that enable connection to virtually any device that has accessible contacts. DUT boards with 40-pin DIP, 16-Pin and 28-Pin SOIC pin configurations, shown below plus custom DUT boards up to 84 pins with manual programming input/output, power and ground pins per specification are available. DUT boards from the Model 910 can be used with the Model 9910.



40-Pin DIP (without programming pins)
.3” to .6” (7.6-15.2mm)

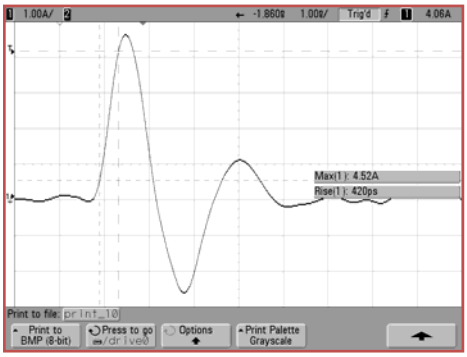
16-Pin SOIC (with programming pins)

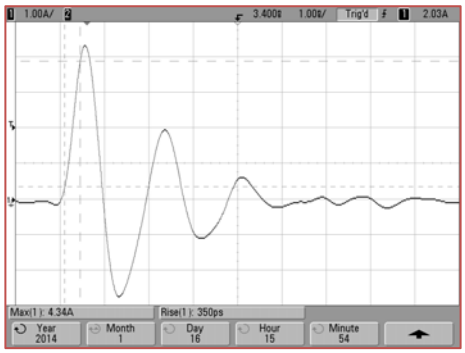


28-Pin SOIC (with programming pins)

Optional Accessories:

Model 9903 Charge Device Model Test Fixture: This user-friendly test fixture enables the user to perform both Induced and Direct Charge Charge/Discharge CDM functions. It includes a Magnetic Holding Fixture for precise alignment of the DUT, a 1 Ohm radial resistor for direct connection to an oscilloscope plus interchangeable spring-loaded discharge pins with flat, cup, and pointed tips. Gold-plated 4pf ANSI/ESD S5.3.1 verification modules and JEDEC 6.8pf silver-plated discs mounted on 0.8mm FR4 dielectric are included.





4pF 6.8pF

(Waveforms taken with 1GHz scope with 4Gs sampling rate)

Induced Discharge @ 500V

Model 9903 CDM Test Fixture

NOTE: The Model 9903 currently does not meet all verification module waveform characteristics as specified in ESD and JEDEC specifications. It is up to the end user to determine if the Model 9903 will meet their specific requirements.

Model 9902 Remote Discharge Probe: This Probe is for those applications where testing off line from the Model 9910 console is desired such as being added to an automatic pick and place test set up.

The ETS Model 9902 Remote Discharge Probe operates up to 1000V for HBM and MM discharge models. The Model 9910 provides the necessary signals and voltages to operate the Probe. It can also be used as a handheld device or with the addition of remote cables, be attached to an automatic pick and place test system.

Model 9902 Remote Discharge Probe

Specifications:

Control Section:

Range: ±5 to ±8250V

HV Adjust: Keypad or computer control

Resolution: ±1V

Displays: 4-line vacuum fluorescent

Accuracy: Better than 5%
AUTO Mode:
Discharges: 1-99
Interval: 1-99 sec

Computer Interface: Serial communication
Power: Voltage: 90-260VAC, 50/60Hz
Input: IEC Socket with 6' (1.83m) cable with NA Plug
Mechanical:
Dimensions: 19"Wx12"Dx3.75"H
(48.24x77.4x9.5cm)
Weight: 12-lbs. (5.4kg)

Discharge Section:

HV Switch: Mercury SPST Relays
HBM: 100pf ±5%Cap & 1500Ω ±1% Resistor to 8kV
MM: 200pf ±5%Cap & 0Ω Resistor to 1kV
HMM: 150pf ±5%Cap/330Ω ±5% Resistor to 4kV

Output/Gnd.: Standard .161" (4mm) Banana jack
Cables: 6" (152mm)
HBM, MM HMM: Banana-Minigrabber
Optional:
Model 9903 (CDM) Charge Device Model Test Fixture
Model 9902 Remote Dis. Probe (HBM & MM Only ±1kV)

DUT Programmable Socket Modules:
DIP: 2 to 40 pins (available without programming pins)
SOIC: 16 pins
SOIC: 28 pins
Custom up to 84 pins PLCC/CLCC

Warranty: One (1) Year

Specifications subject to change without notice

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