

# ESD Station Model 1200 Series

**1200 E : HBM/MM Pin Combination ESD Tester**

**1200 EL : HBM/MM Pin Combination ESD /Latch-up Tester**

**1200 ELC : HBM/MM Pin Combination ESD /Latch-up and CDM Tester**



## Features

- 4 functions; HBM, MM, Latch-up and CDM in one system
- Maximum 1350 pins test available (Between non-supply pin and supply pins using special DUT Board)
- Every Device level ESD test including CDM test available

## Applications

- Device development evaluation
- Device qualification and incoming test
- Quality Assurance
- device handling

### ESD Test

- Meets variable Standards
- Full pin combination
- 3 Modes of charge removal
- Damage progress viewable
- Plentiful damage detection

### CDM Test

- Meets international standards
- Automated test
- Direct Charging or FI-CDM
- Repeatable and stable discharge waveform.

### Latch-up Test

- Meets international standards
- Stabilizing  $I_{CC}$  current
- High Speed test by Successive approximation
- High Temp test up to 125°C

### General descriptions:

The ESD Station Model 1200 ELC tester is the world's FIRST commercially available ESD Test System that combines all ESD, Latch-Up and CDM tests in ONE system – for devices up to 256 pins. If a dedicated DUT Board is provided (as the DUT Board example 2 on the next page), non-supply pin vs. supply pin ESD Test up to 1350 pin pairs can be tested automatically, though this is some sort of a simplified ESD test.

This system can include 128 or 256 pins full pin-combination ESD test function as well as up to 4 Vcc supply Latch-up test capability and with CDM test that meets JEDEC standard with options to meet ESDA or JEITA standards.

Model 1200E : Supports HBM and MM ESD tests.

Model 1200EL : Supports HBM, MM and Latch-up tests.

Model 1200ELC: Supports HBM, MM, Latch-up and CDM tests.

By the ESD test, relations between device damage and ESD stress can be tested. The ESD stress includes Human Body Model (HBM) and Machine Model (MM). The model 1200E includes both HBM and MM but other stress model may be easily included as options. Any 128 or 256 pins can be programmed as ESD return pins (Terminal B) so that full pin combination test required by many ESD standards is allowed.

Latch-up test measures the latch-up sensitivity of the CMOS devices detecting the latch-up current ( $I_{dd}$  at latch-up detected). Current pulse, voltage pulse and supply over voltage pulse are included in the basic system as the trigger source of Latch-up. Also, HBM and MM ESD pulse may be used to trigger latch-up if required. Other latch-up trigger source can be installed as the option so that transient latch-up can be evaluated. To get a stable latch-up test result, it is very important to stabilize the device internal conditions as well as supply current,  $I_{CC}$ . The pull-up/down functions for all pins are provided by the basic configuration for this purpose. Clock and pattern generation is provided as an option as well.

Basic configuration of CDM tester, model 1200ELC, will include JEDEC air discharge CDM head that stimulates Field Induced CDM (FI-CDM or F-CDM). Optionally, other CDM head can be provided such as DI-CDM (or D-CDM for JEITA standard) as well as FI-CDM for ESDA or AEC standard. All CDM models simulate the fast air discharge stress caused by the charged device metal terminal contact to the external metal.



Model 1100E (High Pin count ESD Tester without supporting Pin Combination Test)



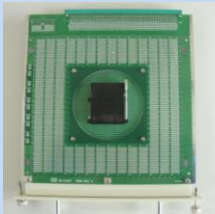
Inner view of the ESD Test Fixture



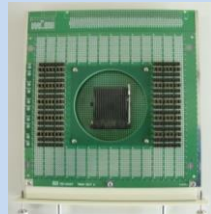
MM ESD Pulse Generator (EPG) Unit

## ESD test

Main window of ESD % method test  
ESD pulse voltage, polarity, period, repetition, pin combination and others are programmed by this window. I-V curve measurement points, averaging number and test pins will be defined as well.



DUT Board example 1  
For pin combination



DUT Board example 2  
For Higher pin count

## Latch-up Test

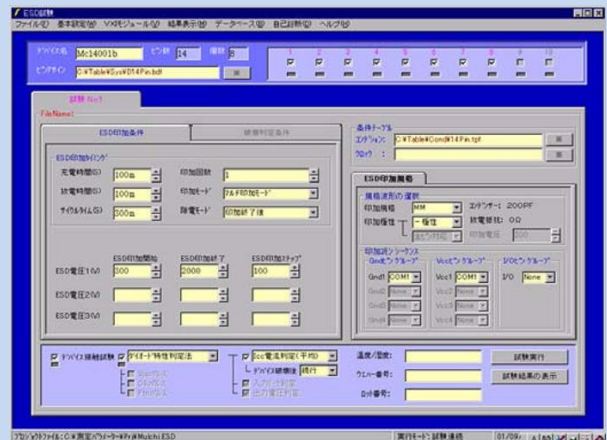
Main Window of Current pulse triggered Latch-up test  
Pulse width, period, current values, Vcc voltage and latch-up current criteria are programmed.

## CDM Test

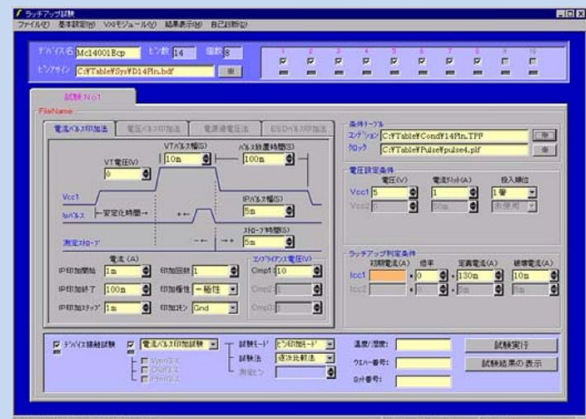
Right Window for CDM positioning  
Even to the fine contact pitch devices such as 0.4mm, CCD camera and Monitor view and capacitance measurement system will allow easy and reliable positioning. These features will work during test as well as programming the DUT pin positioning.

## CDM Discharge Waveform

Right picture shows discharging waveform from the small capacitance module.  
F-CDM requests air discharge except AEC, and it is variable depending on humidity, contact contamination and other environments. Model 1200ELC will give you a reasonable solution to it using relay discharge as well.



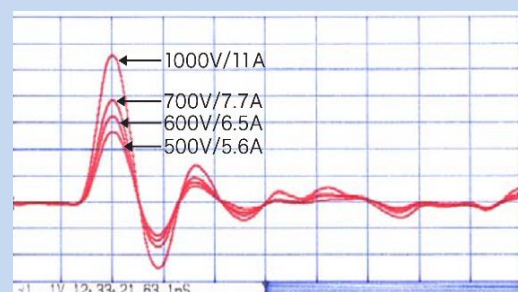
ESD Test condition programming Window



Current latch-up test programming Window



CDM positioning Window



Small module discharge waveform, 6.8pF

## Specifications

### 【ESD Test Specifications】

#### ● Test Items including options

V-I Curve measurements  
ESD Simulation  
ESD test using V-I curve % variation  
V-I curve graph display

#### ● ESD Part

Stress voltage  
HBM :  $\pm 5V$  to 4000V/5V MM :  $\pm 5V$  to 2000V/5V  
HBM :  $\pm 8000V$ (Option)  
Voltage accuracy:  $\pm 5\%+5V$  of programmed value  
Pin selection: 2 axis robot  
ESD Repetition: 1 to 100  
ESD Period: 300ms to 5s in 100ms step  
Charge removal mode: 3 mode by program selection  
Standards : MIL, JEDEC, JEITA, ESDA, AEC

#### ● Source meter (VF/IM)

Voltage source (VF)  
 $\pm 10mV$  to  $\pm 50V$ , 3 digits Accuracy:  $2\% \pm 20mV$   
Measured current (IM)  
 $\pm 10nA$  to  $\pm 100mA$ , Accuracy:  $2\% \pm 20nA$

#### ● Test Pin Count

128 pins or 256 pins (As the Full Pin Combination System)  
1350 pins (At only non-supply pin vs. Supply pins test using a dedicated DUT board)

### 【CDM Test Specifications】

Models : D-CDM and/or F-CDM  
Standards : JEITA, JEDEC, ESDA, AEC  
Pin count : Max2048/Device  
# of DUT : Max10DUT/Jig  
Positioning accuracy :  $\pm 0.05mm$   
Package : DIP, QFP, SOP, TAB, BGA and others  
Positioning method : CCD Camera, Capacitance sensor,  
Current peak detection

### 【LATCH-UP Test Specification】

#### ● Test Items

Current Pulse Latch-up Test  
Voltage Pulse Latch-up Test  
Supply Overvoltage Latch-up Test  
ESD Pulse Latch-up Test

#### ● Pulse Generator

Current Range: 1mA to 1000mA/1mA step (0 - 20V)  
1mA to 100mA/1mA step (20 - 50V)  
Voltage Range: 50mV to 20V (1A)  
20V to 50V (100mA)  
Pulse width: 1ms to 100ms (1ms step)  
Repetition: 1 to 100  
Supply overvoltage pulse: 0 to 20V (1A)  
: 20V to 50V (100mA)

#### ● Latch-up detection power supply Vcc1 to 4

Test Voltage :  $\pm 50V/50mV$   
Iccq test current : DC 0 - 0.5A (100nA Resolution)  
Latch-up detection current : 0 - 1A (1mA Resolution)  
Any Vcc supply can be combined with the above pulse generator so that supply overvoltage test to any supply channel can be done.

#### ● max HI/min LO Supply (Only for Latch-up test)

# of Channel : 3  
Voltage : 0 -  $\pm 15V$  (0.1V Step)

#### ● Clock/Pattern Generator (Optional)

4 clock Channels: 1us~100us/1us step  
16 channels pattern + Sync clock depth : 1024  
H/L Levels: H=2 - 15V, L=0V

#### ● Test Pin Count

128pins or 256 pins

### Other specifications

Operation Temperature : 15°C- 40°C Humidity : less than 60%  
AC Power:100V  $\pm 10\%$ , 50/60Hz, 1Phase, 800VA  
Other AC Voltage optionally available  
Host Controller: PC(Windows-7) and LCD Monitor  
Safety: EPO, Interlock, Leakage Breaker  
Main body size and weight: About 570W  $\times$  860D  $\times$  570H(mm)  
excluding a signal tower, About 60kg  
Sub cabinet size and weight: About 570W  $\times$  890D  $\times$   
830H(mm), About 100kg<sup>\*1</sup>  
PC table : About 800W  $\times$  800D  $\times$  1400H(mm)<sup>\*2</sup>  
Size and weight of a DUT Board case: About 340W  $\times$  360D  $\times$   
560H(mm) and 6kg.

<sup>\*1</sup>If more than one Latch-up detection power supply is ordered,  
sub cabinet weight will be increased 8kg/# of supply.

<sup>\*2</sup>We recommend PC table is purchased locally to save freight  
charge for over sea installation because the price of the PC table  
may be lower than the air freight of it.

Specifications are subject to change without notice. Please confirm the latest specifications before placing the order.

Contact: