ES612 ESD Tester (HBM, HMM, MM)

1. Description

The model ES612 ESD Tester is a 2 Pin tester designed for the evaluation of devices at both wafer level and package level. The tester is designed to carry HBM, HMM and MM ESD standards. Determination of ESD failure thresholds is made easy using one of the external DC characterization measurement capabilities. The unit can be expanded with our automatic multi-pin device tester and be used as part of your device qualification process.

The pulse source design and pulse source delivery method ensure waveform performance directly at the device under test. Current waveforms can be automatically captured and analyzed for each ESD event. In addition, voltage waveforms can be captured and used to determine the turn-on level of protection circuit. They can also be used as a means of failure determination, as the DC characterizations show changes after ESD events.

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2. Features

- Low Parasitic HBM/HMM/MM tester with high quality pulses
- Very configurable and expandable
- Friendly for probe station
- Large Touch Panel and Firmware Upgradable
- Optional Software Controlled Automated Pulse and Failure Measurement
- Optional Pulsed IV and DC IV Characterization

3. Applications

- General device level ESD test for wafer, packaged, PCB and system devices
- HBM module meets ANSI/ESDA/JEDEC JS-001-2017
- HMM module meets ANSI/ESD SP5.6-2009, 50 Ohm Method
- MM module meets ANSI/ESD STM5.2-2019

4. Specifications

ES612 Controller Options

Parameters	ES612-2K	ES612-8K	ES612-12K	ES612-20K	Unit
Output voltage	± 10 ~ 2000	± 10 ~ 8000	± 10 ~ 12000	± 10 ~ 20000	V
Output voltage step	1V up to 500V, 10V up to 2 kV	1V up to 500V, 10V up to 8 kV	1V up to 500V, 10V up to 12 kV	1V up to 500V, 10V up to 20 kV	V, kV
Output voltage precision	Better than ± 1 % ± 5 V				%
Dimensions	347 X 300 X 145				mm
Weight	5	6	6	7	kg
V and I Measurement	Passive voltage and current probes				
Supported Oscilloscopes	Majority models from Keysight, Tektronix, LeCroy.				
Supported SMU	Keithley 24xx/26xx series SMU.				

HBM External Human Body Model Module
(Per ANSI/ESDA/JEDEC JS-001-2017)

Parameters	HBM-2K	HBM -8K	HBM -12K	HBM -20K	Unit
Output voltage	± 10 ~ 2000	± 10 ~ 8000	± 10 ~ 12000	± 10 ~ 20000	V
Discharge RC Value	C: 100 pF ± 10%, R: 1.5kΩ ± 1%				
Short Load Peak Current Ips	0.67A ± 10 % per kV				ns
Short Load Rise Time Trs	2 < Trs < 10				ns
Short Load Decay Time Tds	130 < Tds < 170				ns
Short Load Ringing Irs	< 15% of Ips				
500 Ω Load Peak Current Ipr	Ipr/Ips ≥ 63%				
500 Ω Load Rise Time Trr	5 < Trr < 25				ns

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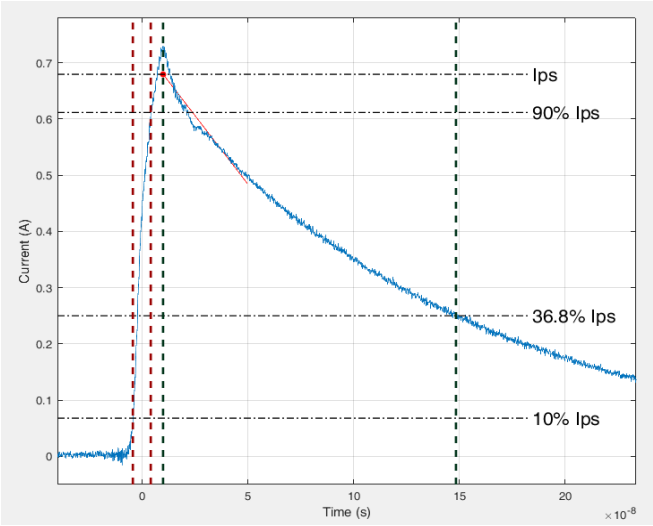
HMM External Human Metal Model Module
(Per ANSI/ESD SP5.6-2009)

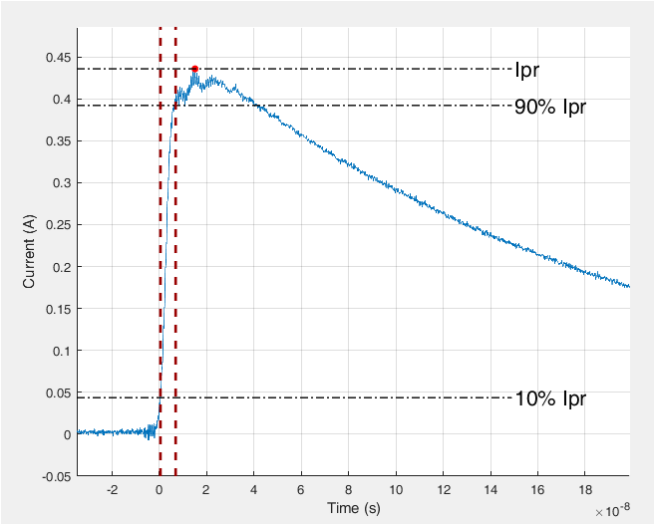
Parameters	HMM-24K	Unit	Comments
HMM first peak current	90	A	3.75 A per 1 kV ≤ ± 10 % IEC 61000-4-2 (R=330Ω, C=150pF)
HMM current @ 30 ns	48	A	≤ ± 10 % (better than ±30% IEC)
HMM current @ 60 ns	24	A	≤ ± 10 % (better than ±30% IEC)

MM External Machine Model Module
(Per ANSI/ESD STM5.2-2019)

Parameters	MM-2K	Unit	Comments
Output Voltage	±10 ~ 2000	V	
Discharge RC Value	C: 200 pF, R: 0 Ω		
Short Load Peak Current I_{p1}	1.75±10% per 100V	A	Tolerance may be different if socket is used
Short Load I_{p2}	67% ~ 90% of I_{p1}	A	
Short Load Pulse Period t_{pm}	66 < t_{pm} < 90	ns	
500 Ω Load Peak Current I_{pr}	0.85 – 1.2	A	
500 Ω Load I_{100}	0.23 – 0.4	A	
500 Ω Load I_{200}	30 -50% of measured I_{100}	A	

Typical HBM Waveform for +1000V short and 500Ω





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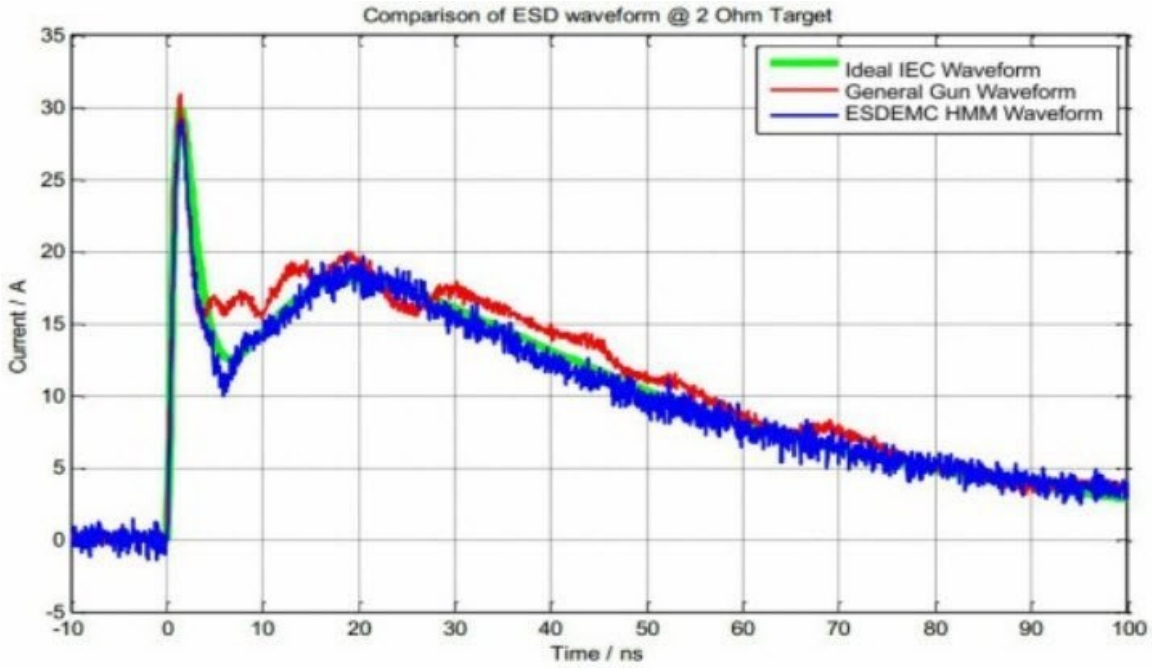
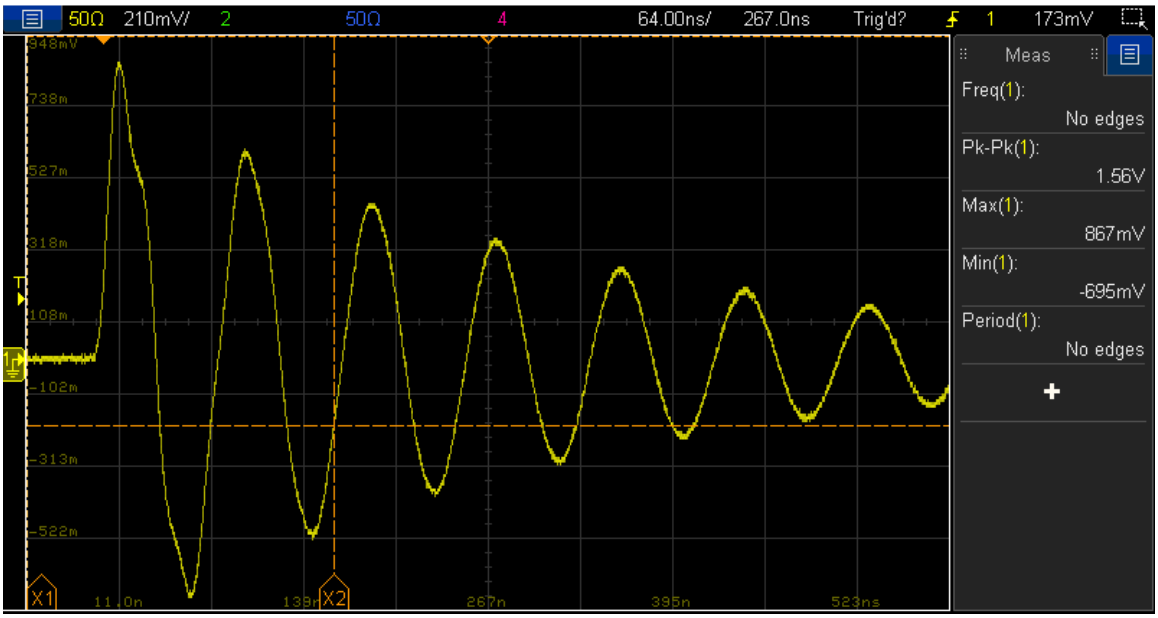
Typical HMM Waveform



Typical MM Waveform



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5. Ordering Information

Line	Part # or Option #	Description
		ESD Tester
1.1	ES612	ES612 ESD Tester, Max 8 kV or 20 kV, RS232 SCPI Supported
1.2	ES612-HBM	Human Body Model 2 Pin Module
1.3	ES612-HMM	Human Metal Model 2 Pin Module
1.4	ES612-MM	Machine Model 2 Pin Tester Module
		Additional Options
2.1	ES62x-PC-HBM	PC with HBM Pulse & Failure Automation Software
2.2	KSMU2400	SMU, 200V, 1A, 20W, Single Channel (For device DC automation failure check))
2.3	ES62X-CMPS	Compact Manual Probe Station
2.4	ES62X-XYZM	XYZ Micropositioner – XYZ travel 500 mils with 0.01mm per step
2.5	ES62X-XYZM-PAA	PCB Probe Arm Assembly with Voltage Measurement (Type C X1, Type B X2)
2.6	ES62X-XYZM-GAA	GND Probe Arm Assembly
2.7	HBM-TC0.3	0.3 mm Pitch Test Clip for Packaged IC Probe
2.8	HBM-TC2.5	2.54 mm Pitch Test Clip for PCB Probing
2.9	ES62X-XYZM-PP048	048 Pogopin for package level Probing
2.10	ES62X-XYZM-PP075	075 Pogopin for PCB level Probing
2.11	ES62X-XYZM-TN1	Tungsten Needles – 5 mils sharp tip, for wafer level probing

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