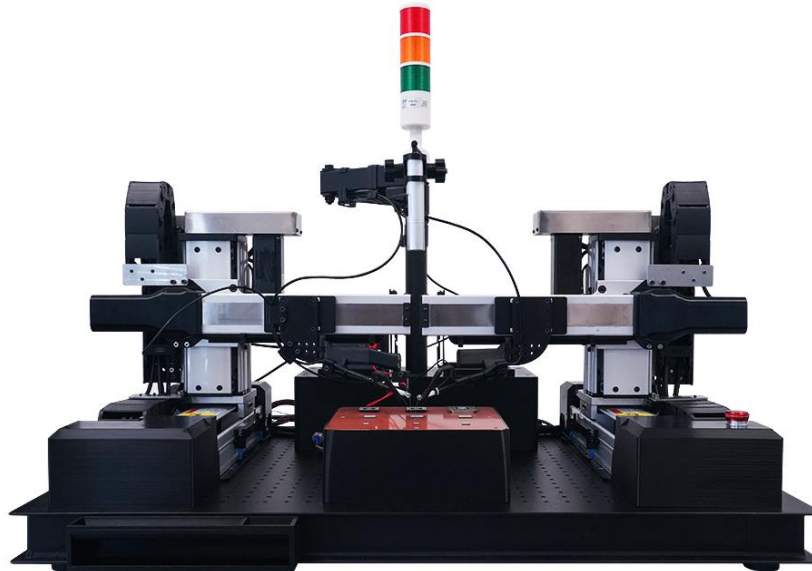


ES650 Automated Probing System



(Default 2-pin configuration, new options and modules maybe updated without notice)

1. Introduction

Probing could be a very time-consuming portion of device test, especially for high pin count devices with HBM where most pins are required to be tested with all possible 2-pin combinations. A fully automated test system could greatly improve the test throughput, reduce time and measurement errors.

The Model ES650 automated probing system is a 2-pin probing solution for HBM, MM, TLP, HMM, CC-TLP, LI-CCDM, RP-CCDM, CDM(JS-002) on package level, wafer level, and board level devices. In addition to ESD testing solutions, the Model ES650 can be used solely for its robotic probing capabilities to precisely automate many probing applications for RF measurements, I-V curve tracing, and many other applications where precise probing is required. The probing system operates using two independently controlled (left & right) XYZ gantry with probes for contacting pins or pads on the chips or wafer. It has less parasitic compared with relay-based solutions without the need for socket PCB. Furthermore, the system support also multiple device testing, with mid-test failure checking and stop criteria for automated classification of multiple devices.

The HBM pulse module provides reliable pulsing up to 8kV with the ability to internally switch the probe connection to an SMU for leakage measurement allowing for device stressing and failure

testing all in one solution. The pulse module can also internally swap the left and right probe connections to avoid needing to cross the probes during automated testing.

In addition to the HBM pulse module, the ES650 is available with modules that offer solutions for other pulsed testing such as MM and HMM as well CDM type solutions such as FICDM, LI-CCDM, CC-TLP, and RP-CCDM, a patent-pending contact first relay based CDM method. The system is also able to provide robotic probing for other testing methods such as TLP, EOS, RF probing, and many others.

2. Features

- High resolution cameras on each probe arm allows for easy pin alignment
- High resolution motion control system (down to 1 μ m step)
- Batch Device Testing
- Leakage Sweep
- Automatic Collision Avoidance
- Probe contact can be captured by camera during test
- Customizable dimensions fit all types of device test requirement
- Current Probe is mounted close to DUT
- Device Definition Utility
- HBM Test Generator
- Data Analysis

3. Applications

- Fully automated 2 pin probing system
- Support many popular ESD standards and methods with leakage test capability:
 - ✓ ANSI/ESDA/JEDEC JS-001 (HBM)
 - ✓ ANSI/ESDA STM5.2 (MM)
 - ✓ ANSI/ESDA SP5.6 (HMM)
 - ✓ ANSI/ESDA STM5.5.1 (TLP)
 - ✓ ANSI/ESDA/JEDEC JS-002 (FICDM)
 - ✓ CC-TLP (ESDA SP pending, VF-TLP required)
 - ✓ ANSI/ESD SP5.3.3 (LI-CCDM, VF-TLP required)
 - ✓ ANSI/ESD SP5.3.4 (CC-TLP)
 - ✓ Patent pending RP-CCDM method
 - ✓ Customized solutions available upon request

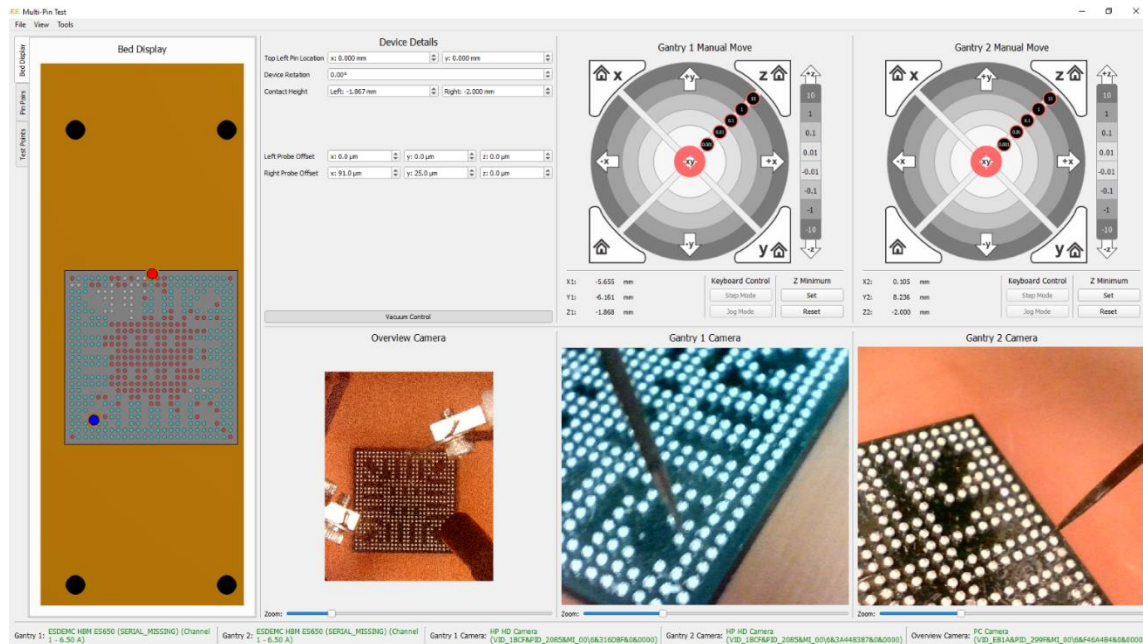
4. Specifications

Parameters	ES650-150	ES650-300	Units	Comments
XY Test Area	≥ 150 X 150	≥ 300 X 300	mm	Probe motion area
Z Travel	≥ 50		mm	
X, Y, Z Step Size	1		μm	
Reposition Repeatability	≤ ±6		μm	
Test Voltage Range	±1 to 2000 or 12000		V	Customizable
Test Voltage Step	1		V	
Test Voltage Accuracy	± 1% ± 0.1V		% V	
XY Vision Resolution	1920 X 1080		Pixel	Allow zoom & pan
Vertical Vision Resolution	2592 X 1944		Pixel	Allow zoom & pan
Operating Temperature	10 to 40		(°C)	
Operating Humidity	10 to 80		%	
Power	120-240 VAC, 50/60 Hz		VAC	

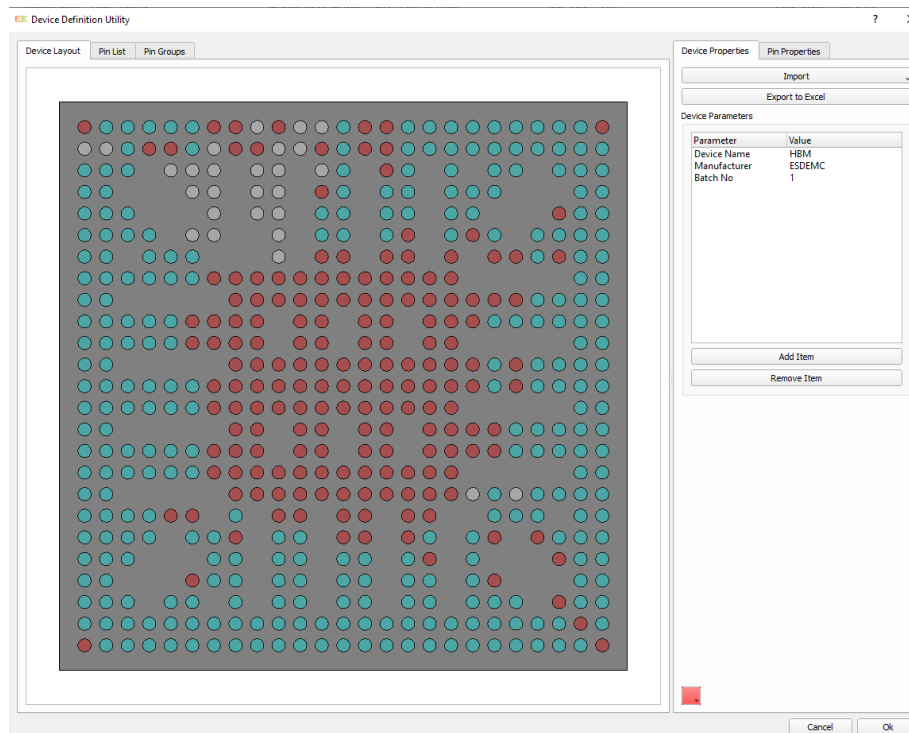
5. Ordering information

Line	Part # or Option #	Description	Status
1.1	ES650-150-PS	Robotic 2-pin probe station with 150*150 probing area, including two 3-axis precision probing arms	
1.2	ES650-300-PS	Robotic 2-pin probe station with 300*300 probing area, including two 3-axis precision probing arms	
1.3	ES650-SW-2PPF	Hardware and software package for 2 pin pulse and failure. General 2-pin pulse and failure setup for TLP/HMM/MM/HBM/LVS/EOS and ES650 system integration. Related hardware is needed.	
1.4	ES650-JS002	Hardware and software package for JS002 CDM testing with ES650	
1.5	ES650-SIV	Hardware and software package for SMU/static IV test with ES650	
1.6	ES650-CCTLTP	Hardware and software package for CC-TLP and leakage testing with ES650	

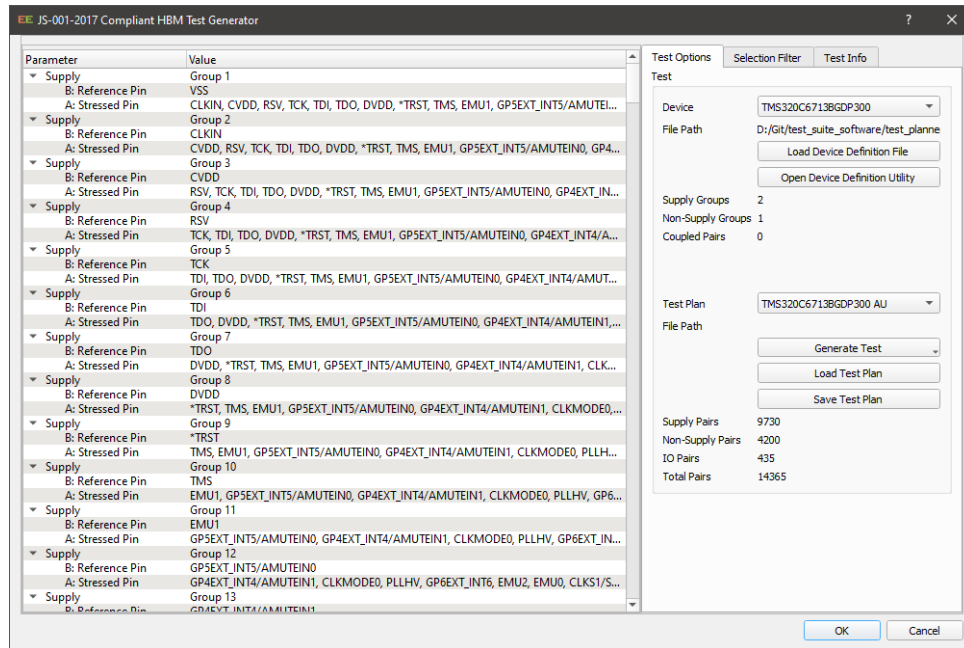
6. System & Software Pictures



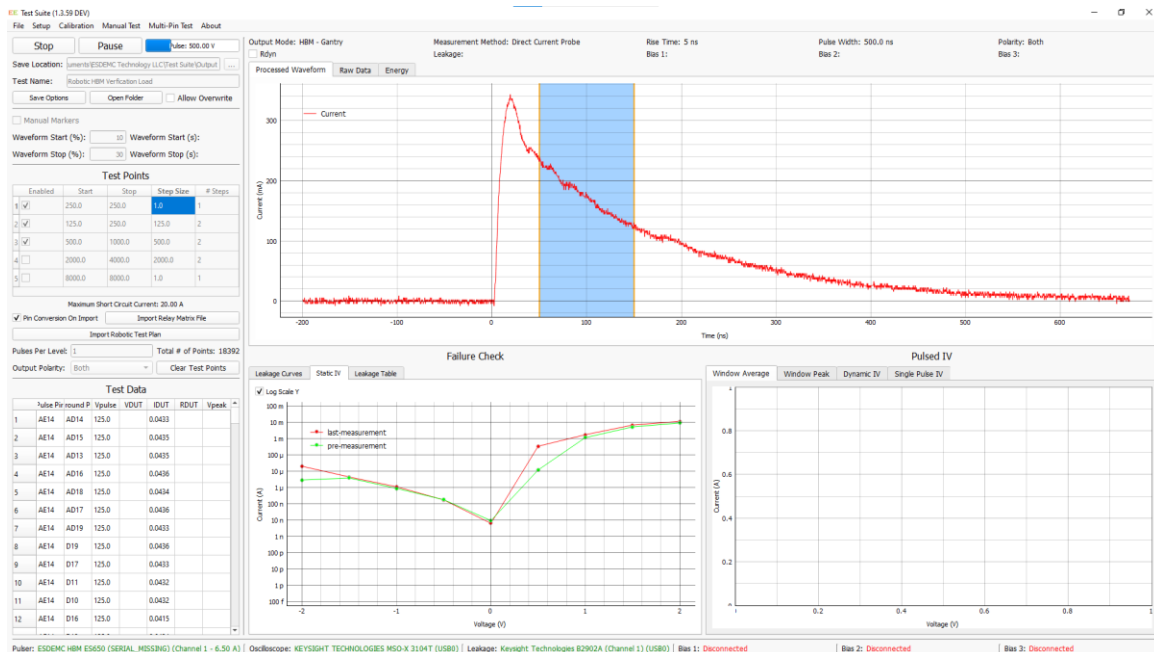
Main GUI



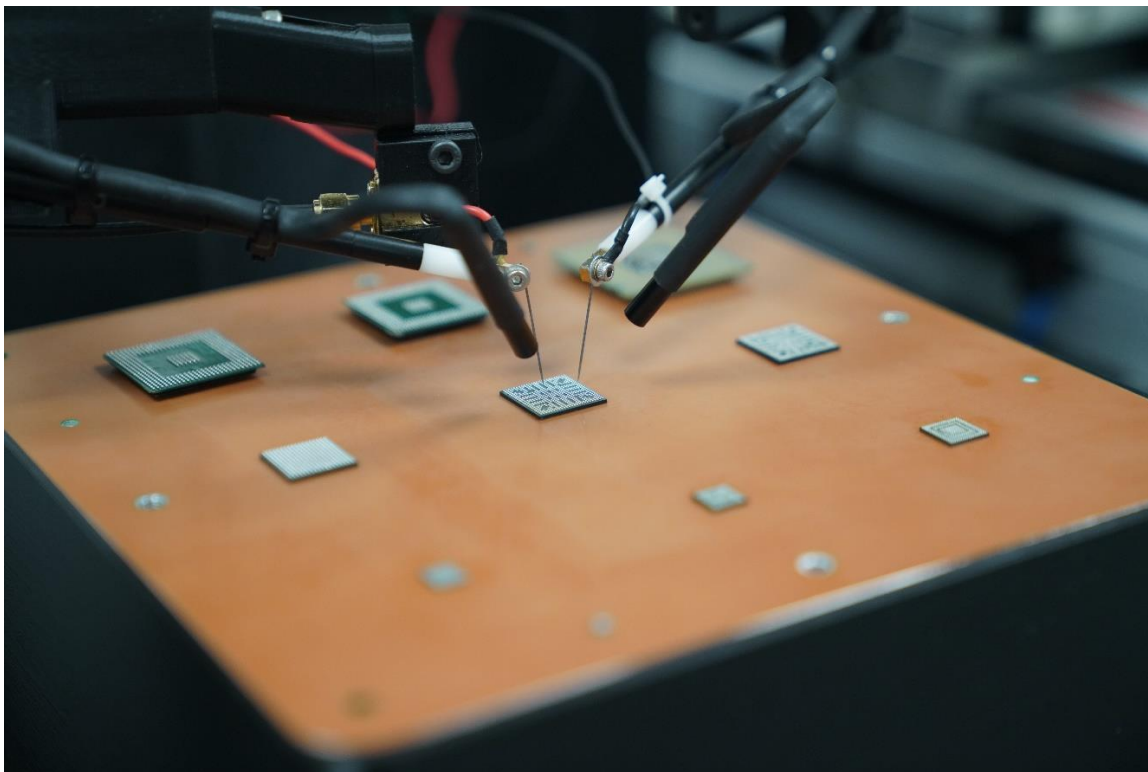
Device Definition GUI



Test Plan GUI



System Verification GUI



HBM Probe over a BGA Chip