

Trek Model 1100TN Electrostatic Force Microscope (EFM) Electrostatic Voltage Distribution Measurement System

The Trek Model 1100TN Electrostatic Force Microscope (EFM) enables voltage distribution measurements with a very high spatial resolution – better than 10 μ m – which is well beyond the capability of typical electrostatic voltmeters. Trek's EFM can also measure voltage distribution across a much larger surface area as compared to a scanning probe microscope when operated under atmospheric conditions. Trek's EFM employs a feedback voltage to the detector which is equal to the measured voltage thus preventing arcing between the detector and the surface under test.

Key Specifications

- Voltage Range:
- Voltage Sensitivity:
- Accuracy:
- Incremental Step:
- Detector Tip:
- MeasurementArea:

Typical Applications Include

- Measurement of antistatic bags, Si wafer
- · Electrophotography material testing
- Photovoltaic materials evaluation
- MEMS testing

Features and Benefits

- Can be used in atmosphere conditions
- Spatial resolution is better than 10 µm
- Three measurement modes:
 - Static
 - Line Profile
 - 3D Mapping

 ± 1 kV Better than 100 mV Better than 0.5% of full scale 1 µm, minimum (detector) 5 µm X 5 µm 5 mm X 5 mm



Measurement Sample of the Antistatic Bag (500 μm X 500 $\mu m)$



Measurement Sample(Toner)Image





Model 1100TN Specifications		Features (cont.)		
Performance		Three Measurement Modes	Static Line Profile 3D Mapping	
Measurement Range	0 to ±1 kV DC	Video Camera	For observing actual point of measurement	
Spatial Resolution (Reference to input voltage with comb-	60% of signal strength for 10 μm width 70% of signal strength for 20 μm width	Note	DC to bias voltage controlled by PC to surface test available	
Separation between Detector Tip and Surface Under Test (Controlled with piezo stage in Z axis)	Typically 5 μm	Optical System	•	
		Laser Unit for Detecting Cantilever Distortion	Laser Diode 670 nm with detector photodiode	
Accuracy	Better than 0.5% of full scale	Observation for		
Voltage Sensitivity	Better than 100 mV	Point		
Sampling Speed	30 ms to 0.1 ms per data sample	Light Source	Green LED	
Scanning Area		Camera	CCD with 380k pixels	
X and Y Axis	± 15 mm with 1 μm resolution	Object Lens	10X lens for 500 um square under the monitor	
Z Axis Range	0 to 5 mm		camera	
Z Axis Piezo Stage Range	0 to 80 μm with 1 μm accuracy	Optional Acces	Optional Accessories	
Features		Photoreceptor Drum Installation Holder	Contact the factory for the Model Number	
		Laser System for Exposure	Contact the factory for the Model Number	
		Clean Booth	Contact the factory for the Model Number	
	1000 [μm] Detector CG Image 200 [μm] Material: Nickel with 5 μm thickness Detector tip size: 5x5 μm ²	Additional Information		
SEM pictures of detector		For additional information, please refer to "A New Field Nullification Method for Electrostatic Force Microscope (EFM) for Unknown High Voltage Measurement," a paper co-authored by Trek and Nihon University presented at the Imaging Science & Technology's Digital Printing Technologies Conference (IS&T/NIP27) on Wednesday, October 5, 2011 during NIP Track 2 Photoelectronic Imaging Materials and Devices session, in Minneapolis, Minnesota. <u>http://www.trekinc.com/pdf/EFMPaper.pdf</u>		

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Detector (Computer Generated Image)

Measurement and Power Solutions[™]

