



***Non-compliant or Suspect Counterfeit
Packaging Materials Can Lead to
ESD Hazards & Long-Term Storage Issues
and Pose Issues in Handling,
Inspection and Manufacturing
1:45 PM to 4:15 PM***



*Bob Vermillion, CPP/Fellow
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RMV Technology Group, LLC
Member G-19 & G-21 Committees
NASA-AMES Research Center
Moffett Field, CA 94035
19 April 2013*






QLEF

March 17 & 18th, 2010
Radisson at the Port
Cape Canaveral, FL

Non-compliant or Suspect Counterfeit Materials Can Lead to ESD Hazards and Long-Term Storage Issues

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NASA-AMES Research Park
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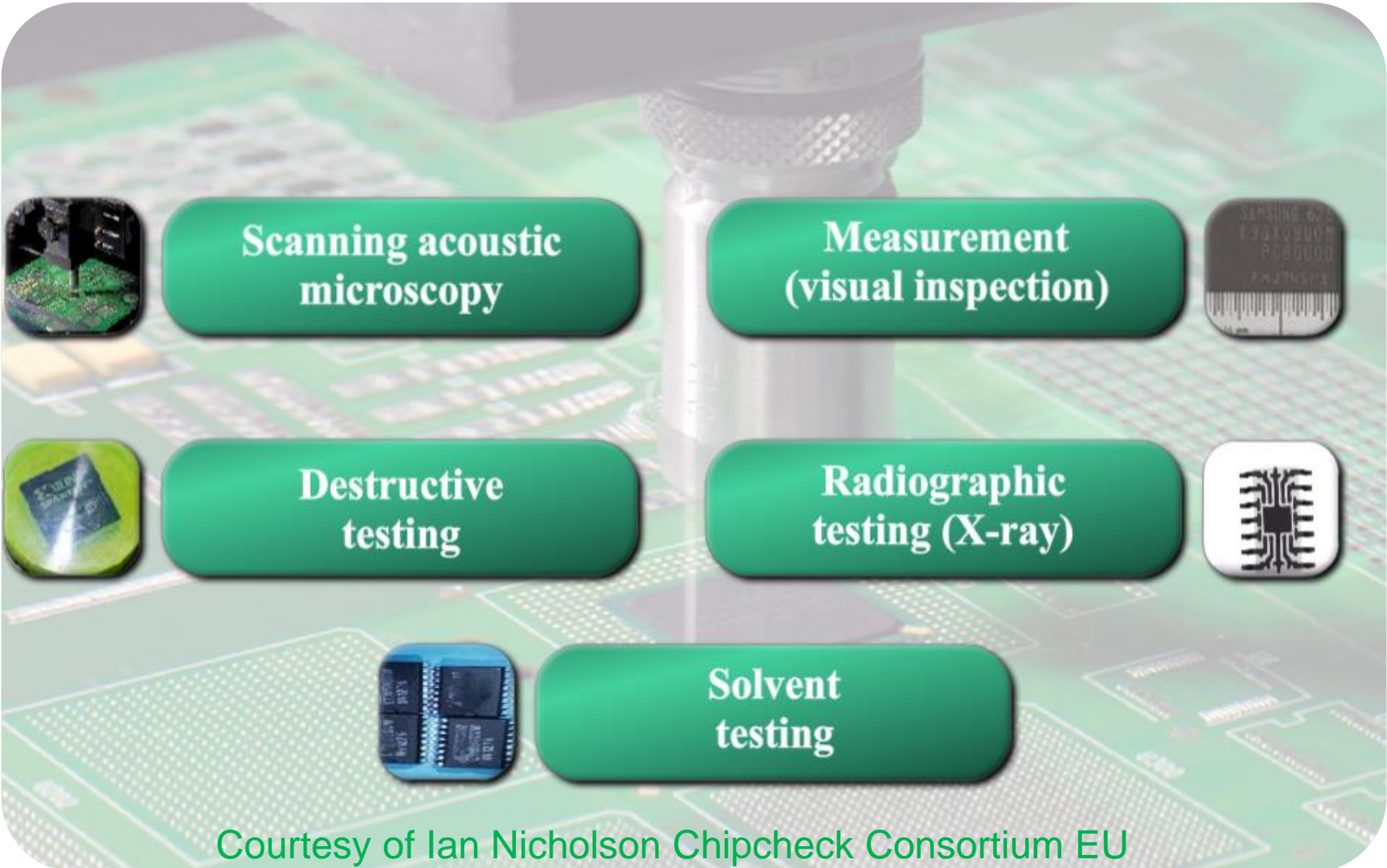


“I have had the great pleasure of Bob Vermillion’s association for many years. Bob is a diligent subject matter expert in the area of electrostatic discharge mitigation and control, who brings a unique capability to the electronics industry. His unique proficiency is based in his vast practical materials, packaging and test experience that he applies to the applications and handling of all types of electronic hardware. A few years ago, Bob unassumingly brought to the attention of the industry the fact that packaging materials for ESD-sensitive items can be supplied as meeting industry standards, but are actually non-conforming or fraudulently misrepresented. The integrity of such materials is often overlooked by using organizations with consequences that could result in the failure of the devices, electronic hardware or equipment either immediately or later in application. Bob provides a service to mitigate these problems and has been instrumental in addressing such issues for several organizations. However, Bob’s talents go far beyond this one example. Bob can provide an evaluation of your handling practices with respect to ESD control, he can present and instruct on the subject and he can provide a total solution to your packaging problems to enhance the size, weight, safety and reliability of the entire package. I would recommend Bob and his company to any organization involved with handling electronics and that wants to improve their assurance of providing reliable product to their customers.”

March 27, 2012

1st Phil Zulueta, SAE G-19 Chairman

Suspect Counterfeit Inspection Methods



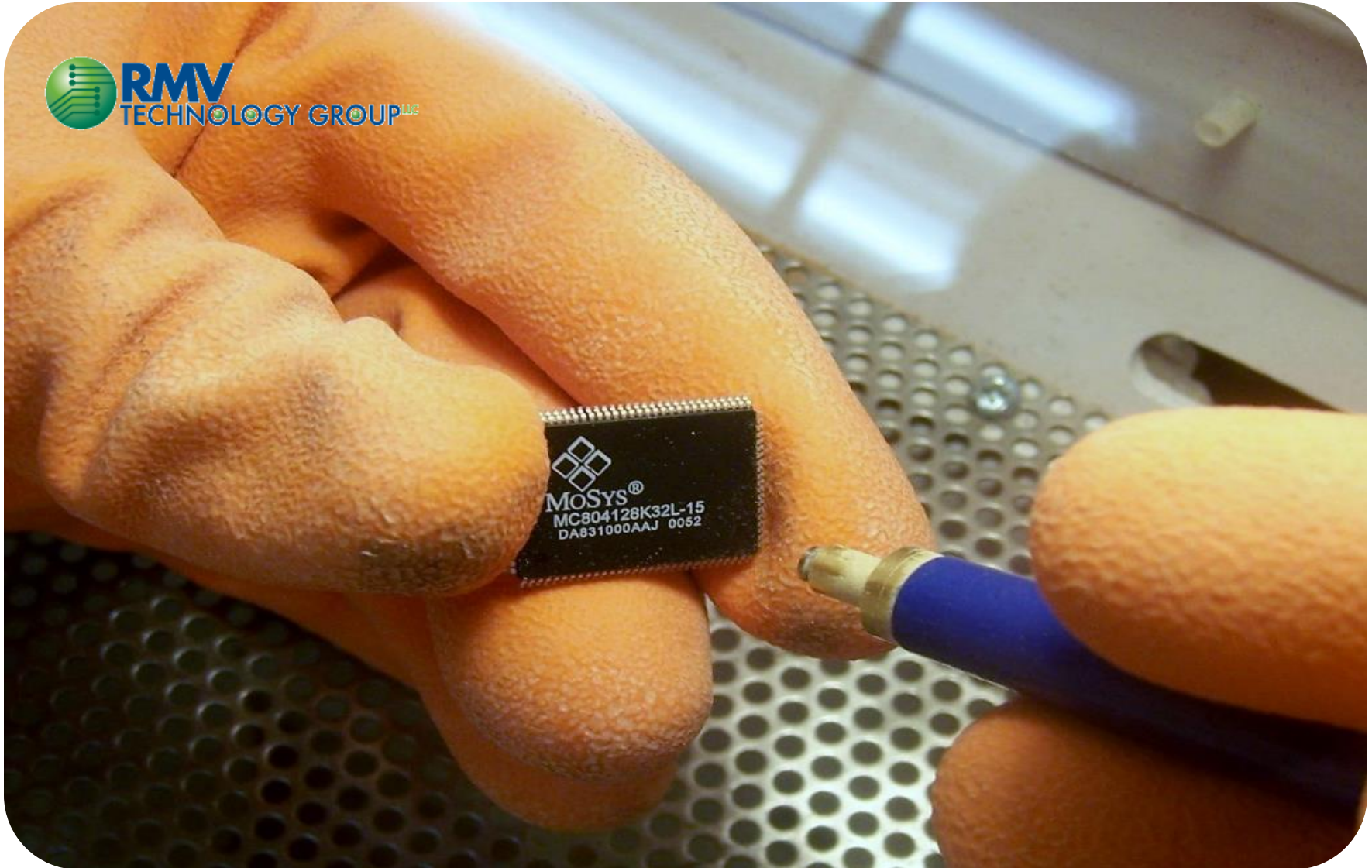
Courtesy of Ian Nicholson Chipcheck Consortium EU

MicroBlasting or Walnut Blasting

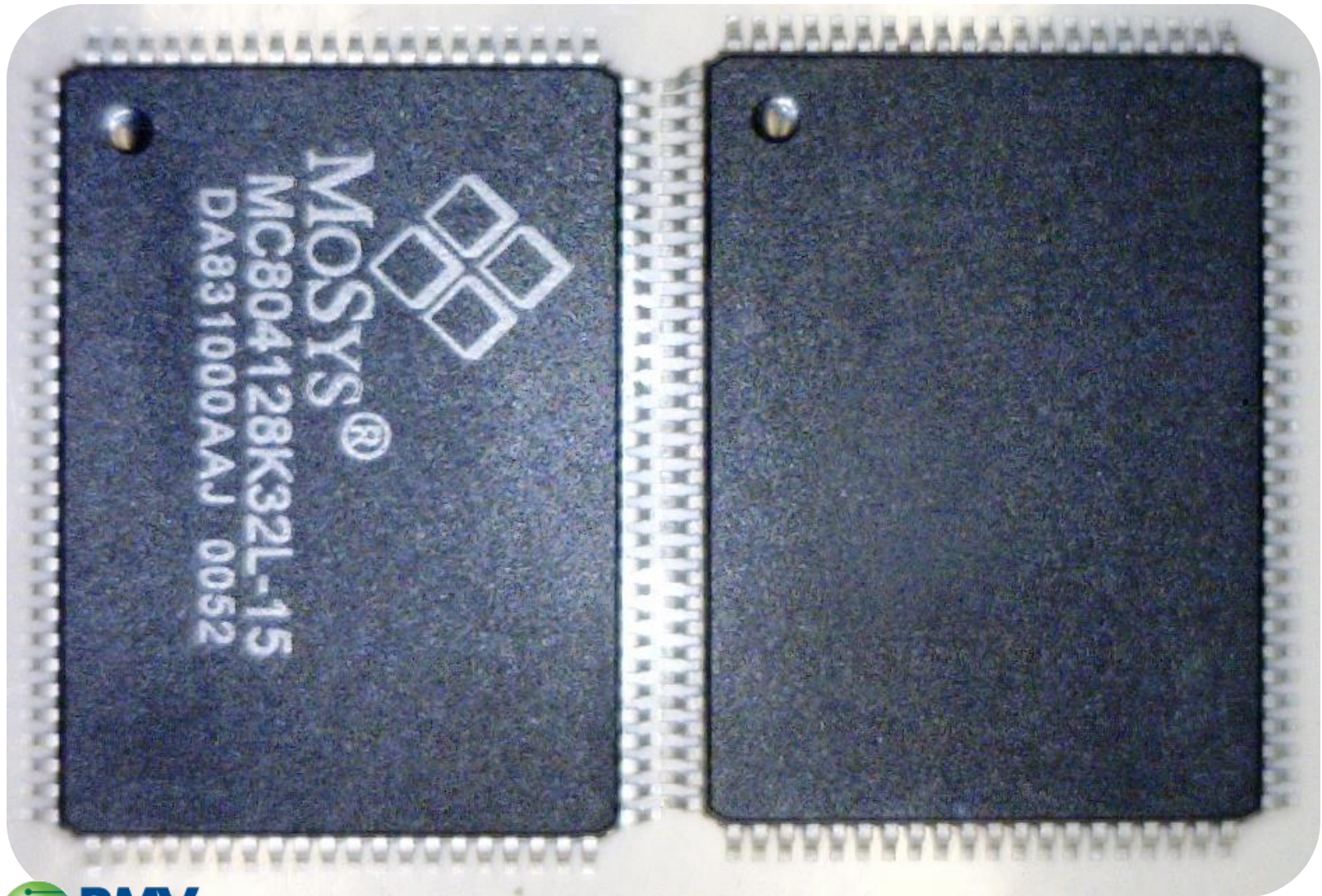


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Microblasting Process



Before & After Microblasting



Portable Microscope Inspection Issues



Phil Zulueta

Chairman

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G-19 Committee

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Bob Vermillion, CPP/Fellow

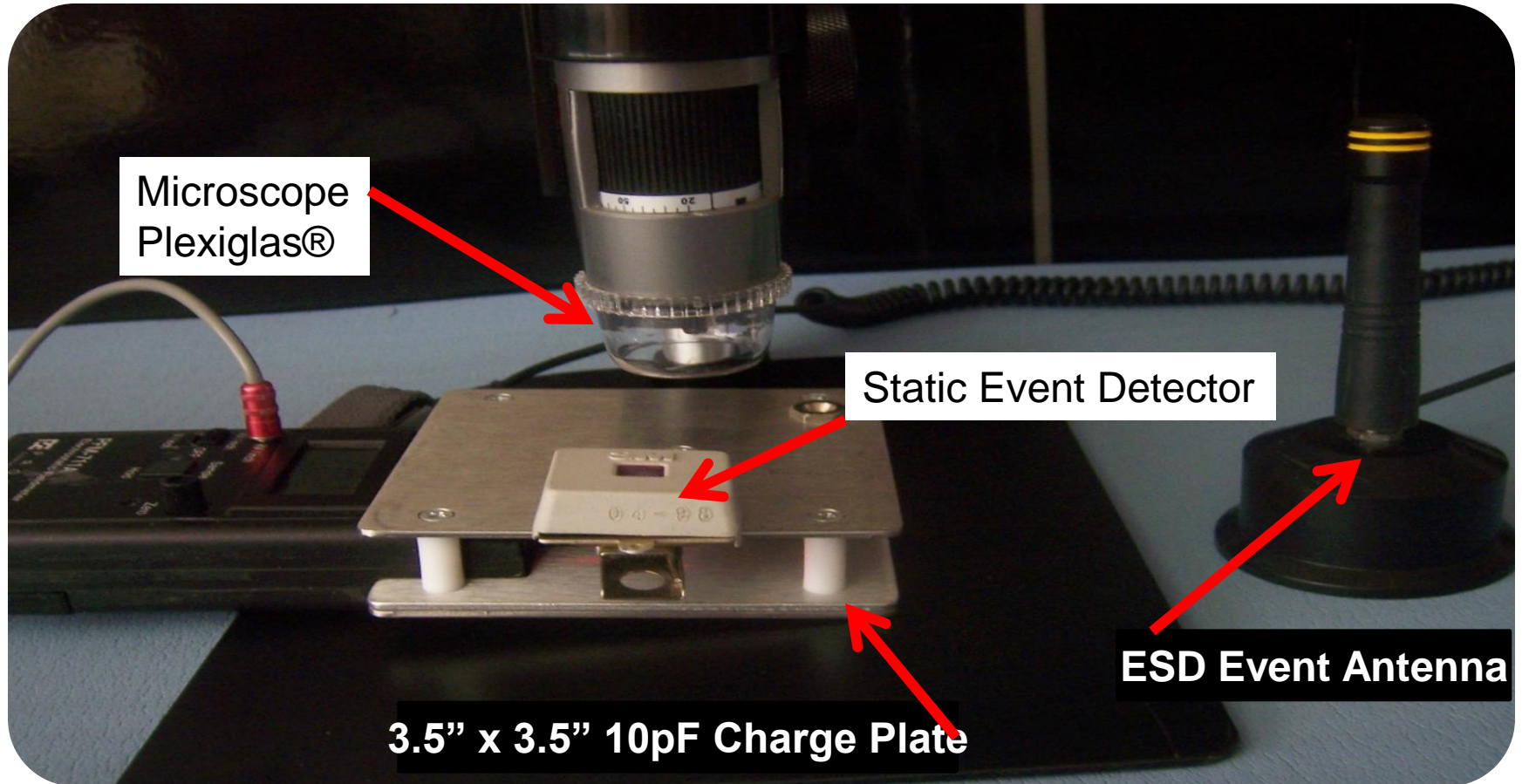
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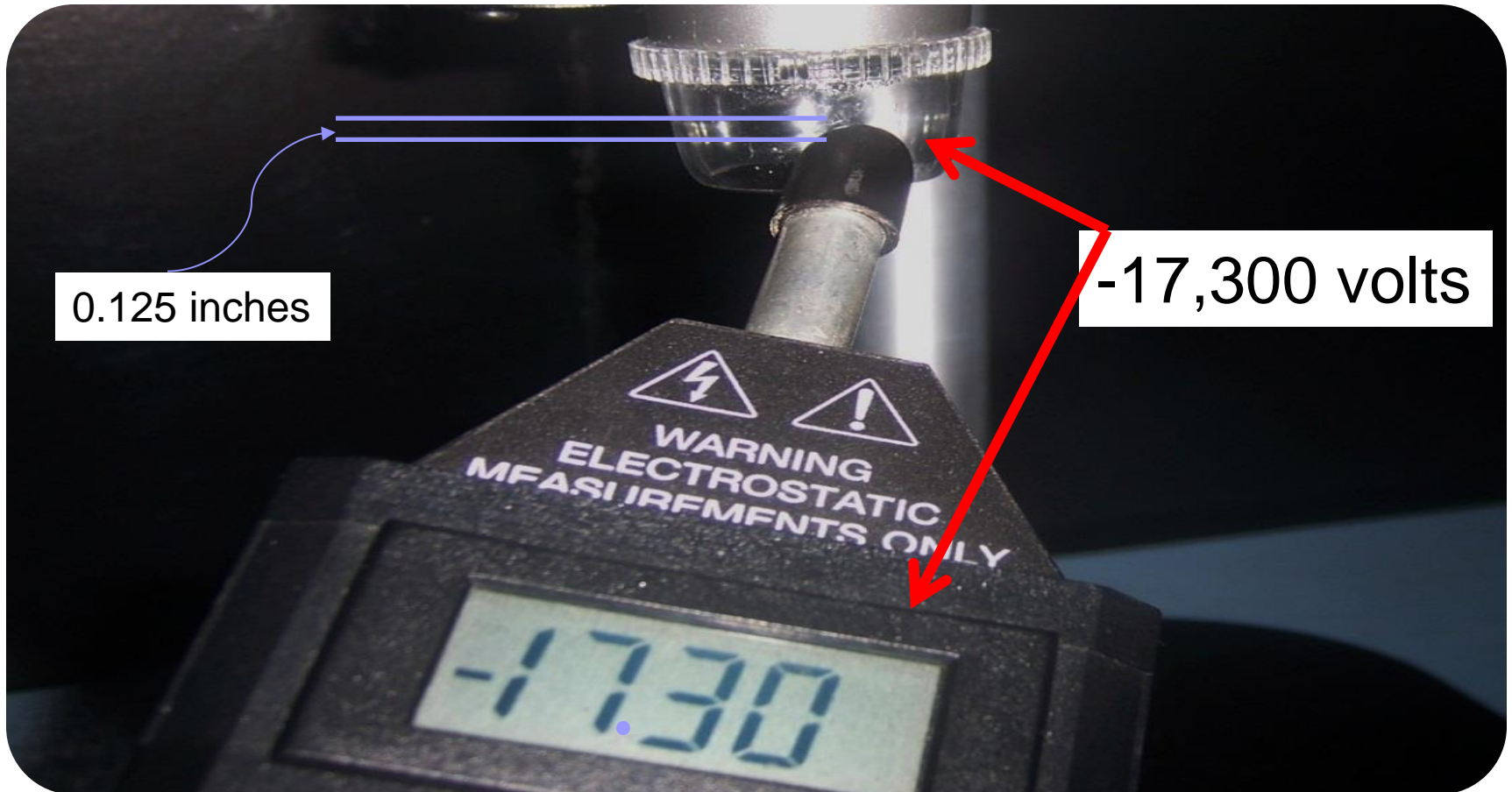
Do USB Microscopes (Scopes) Pose ESD Issues During Inspection?



4/28/2013

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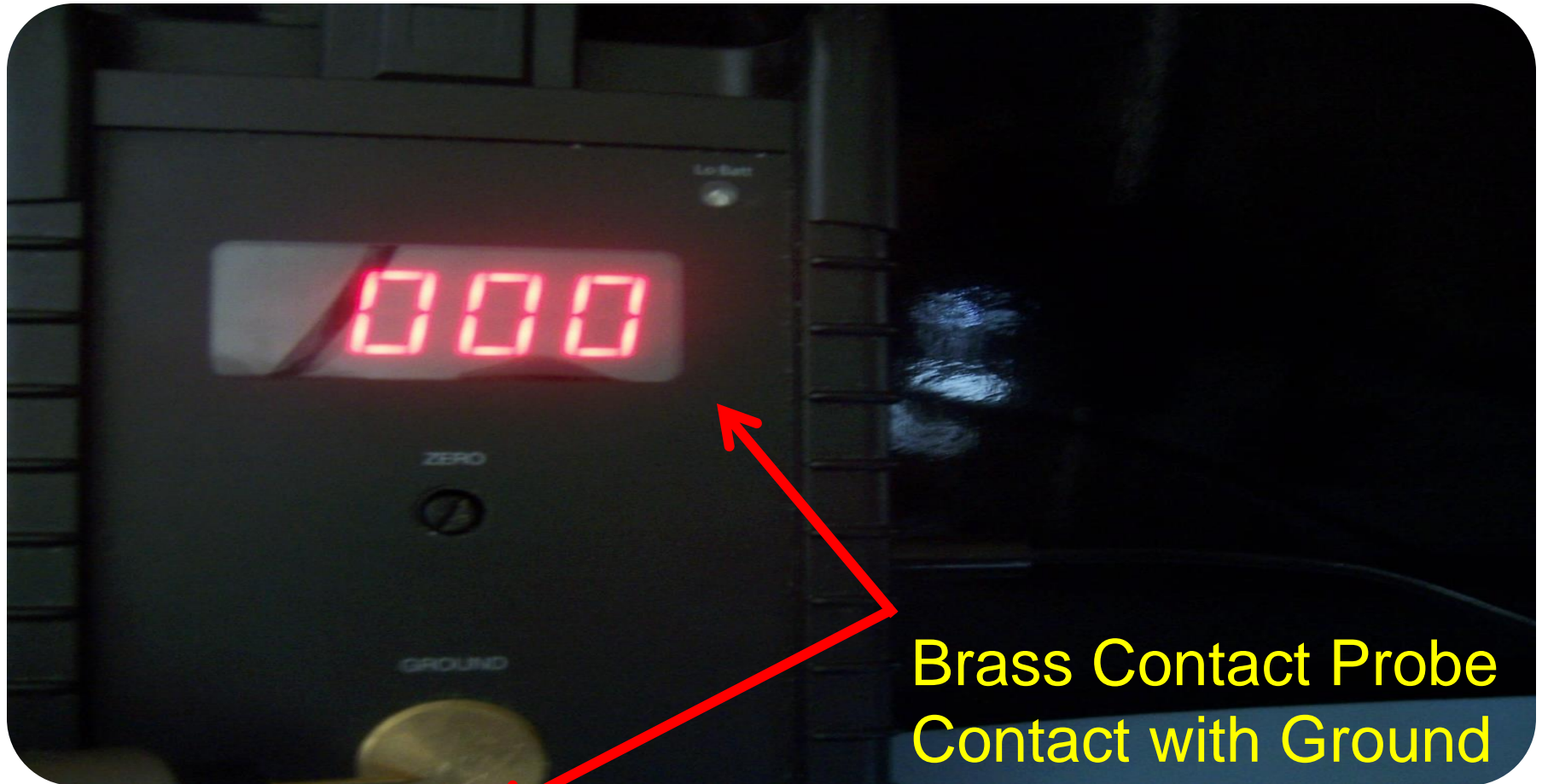
Adjustment Cap at 20%RH



0.125 inches

-17,300 volts

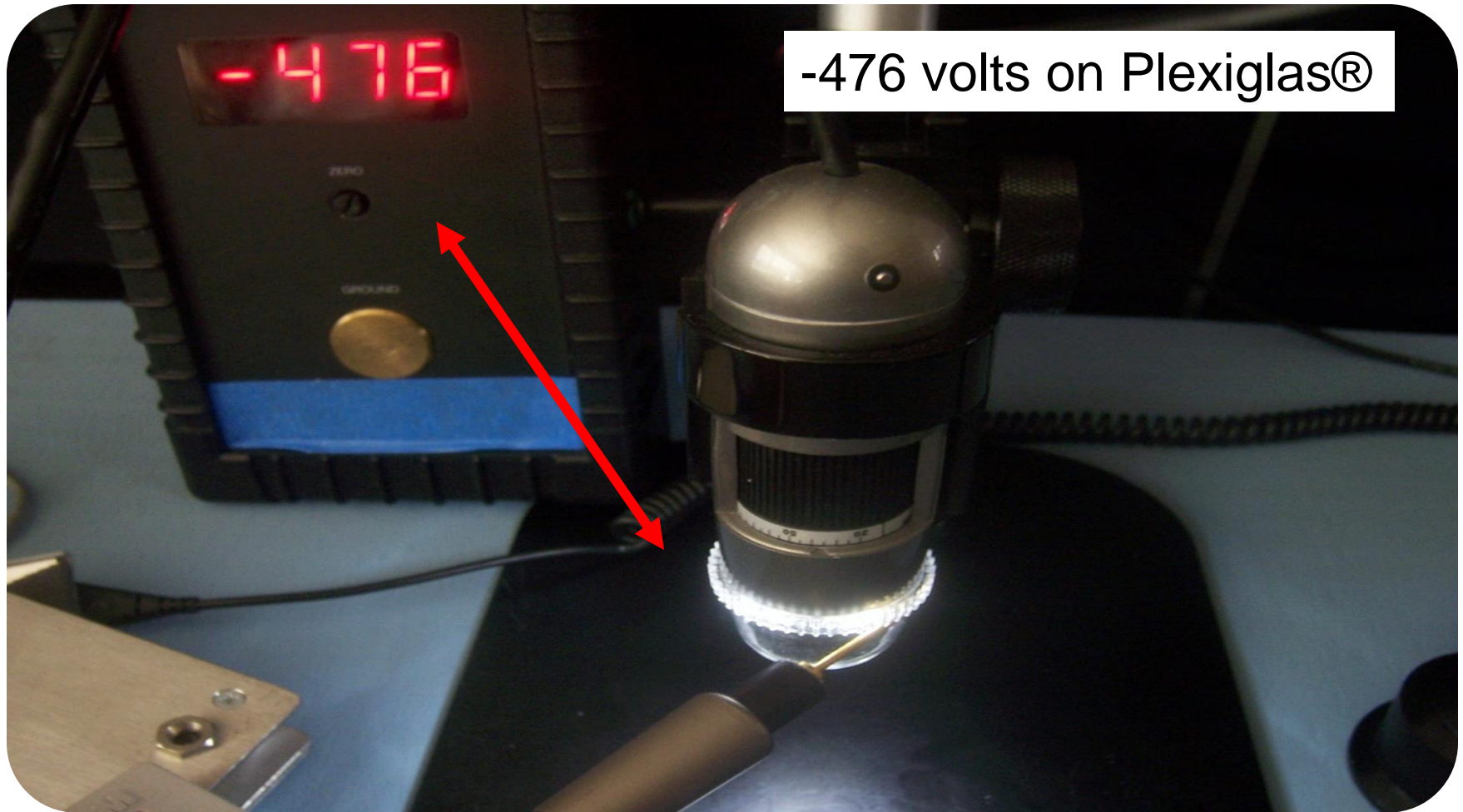
Contact Voltage Charge (Method 1)



Brass Contact Probe
Contact with Ground

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Contact Voltage Charge (Method 1)

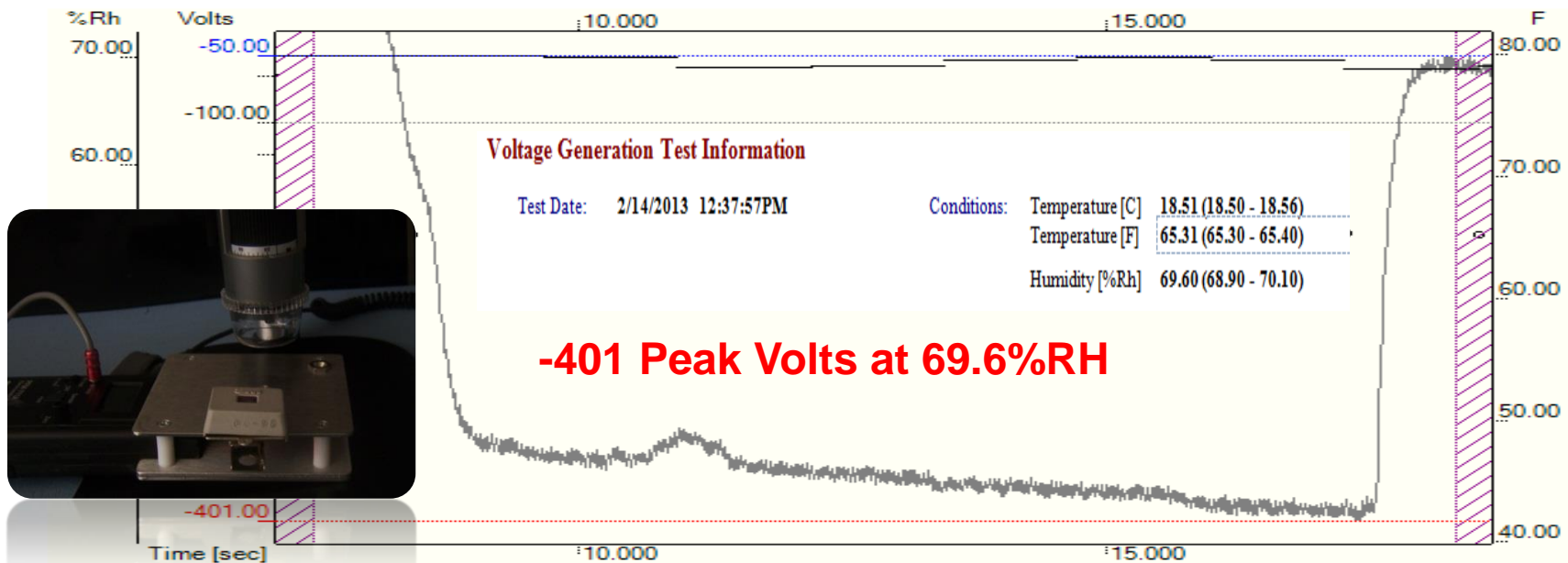


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Scope Charge at 1" From 3.5" x 3.5" 10pF Charge Plate (Proximity Voltage - Method 2)



Voltage Generation Analysis Test Summary



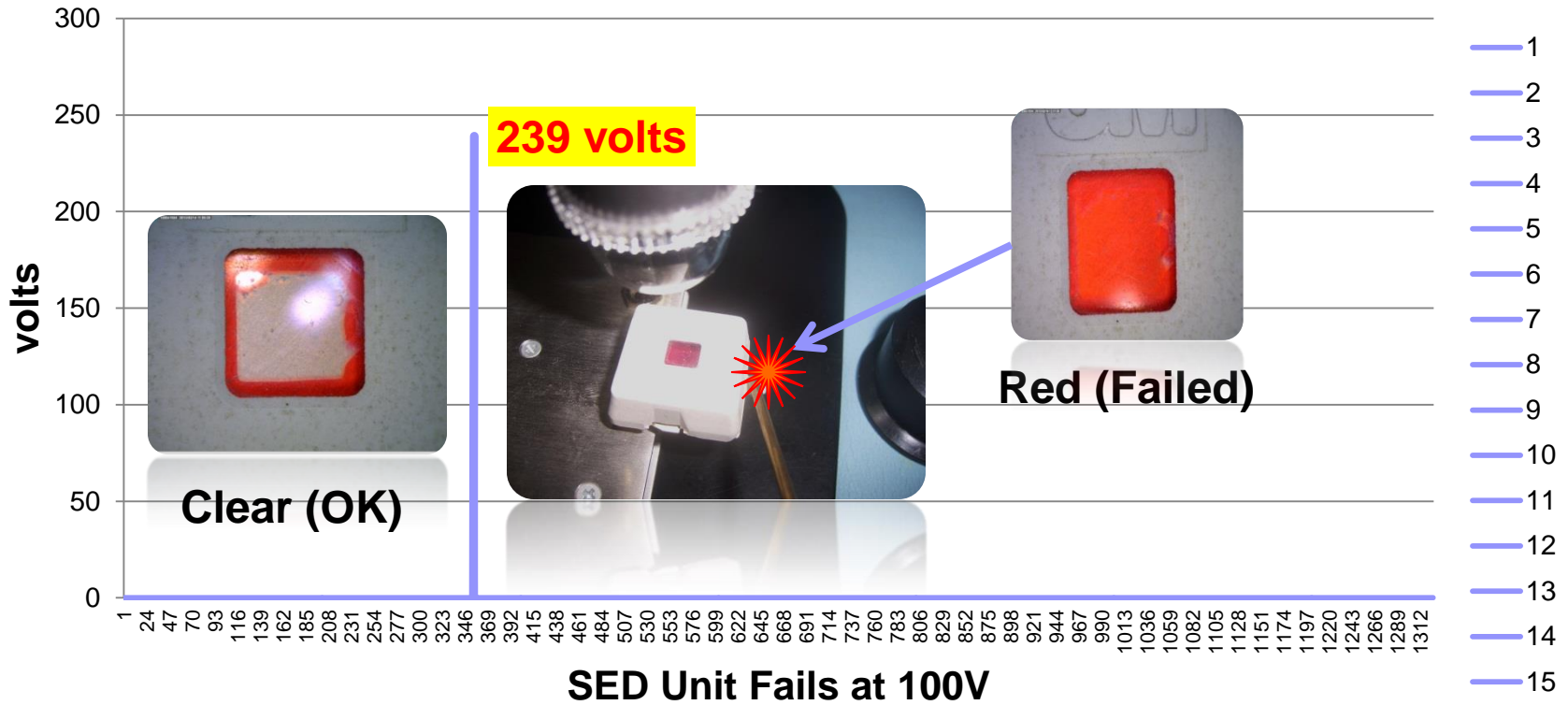
Data Summary:

Number of Full Test Cycles:	1	Min [V] Data	Max [V] Data	Global	
Peak Recorded Values [V]:	-401.00	Average Voltage [V]:	-50.00	-401.00	-313.28
	-50.00	Standard Deviation:	-50.00	-401.00	-401.00
	0.00	Minimum Voltage [V]:	-50.00	-401.00	-401.00
		Maximum Voltage [V]:	-50.00	-401.00	11.00

100 volt ESD Event Detector Triggered

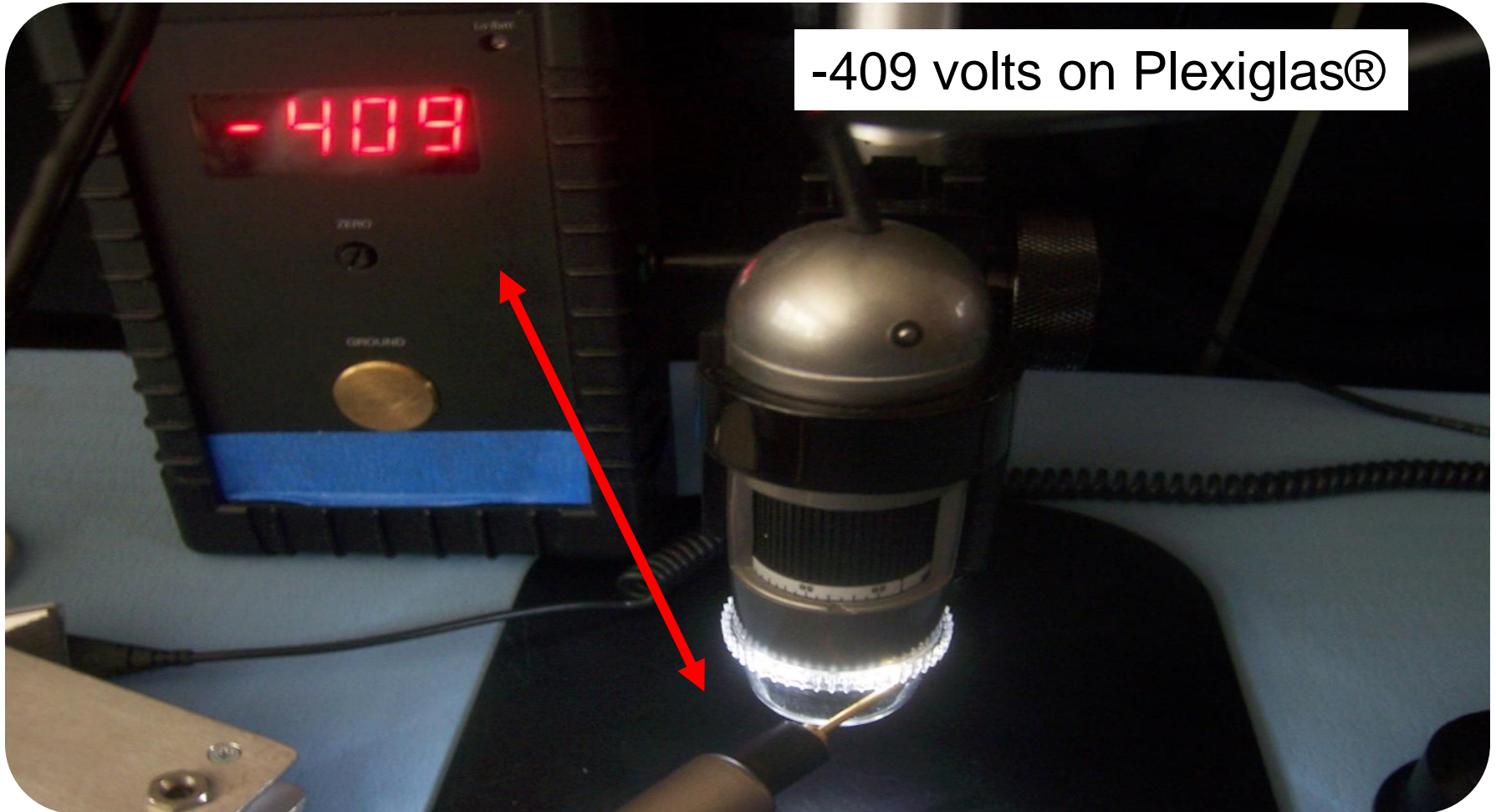


ESD Peak by Bringing Scope to SED Unit Using Grounded Brass Tip



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Contact Voltage Charge (Method 1)

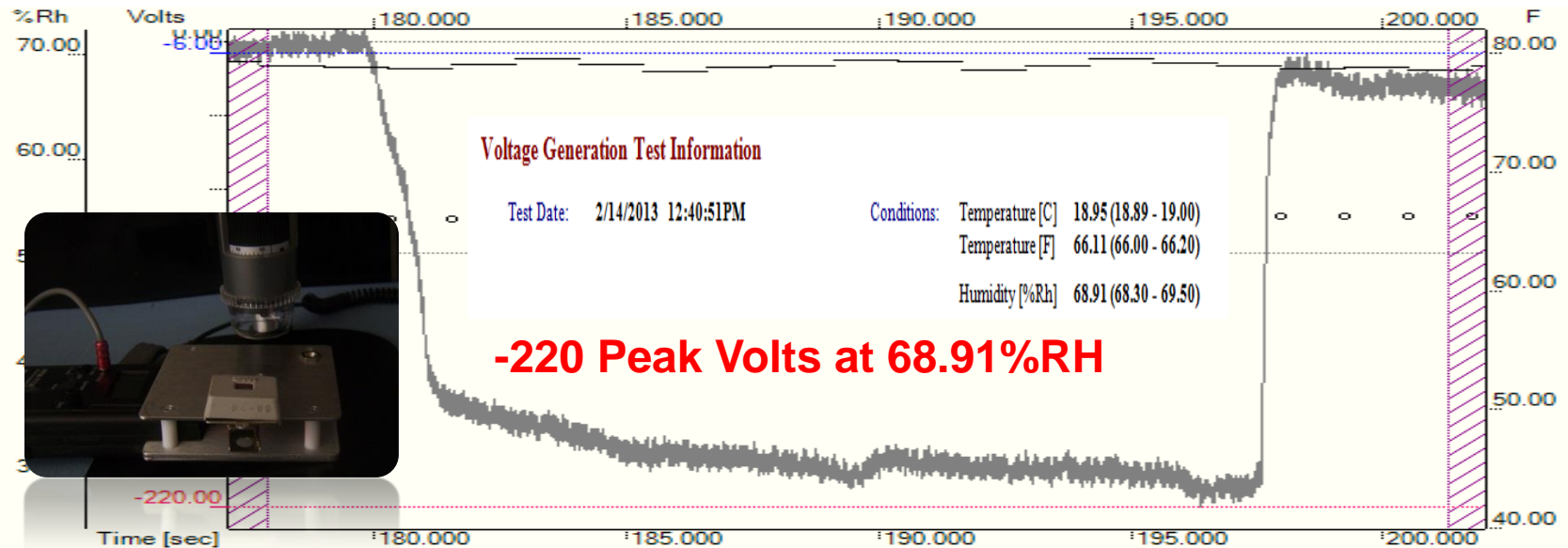


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Scope Charge at 1" From 3.5" x 3.5" 10pF Charge Plate (Proximity Voltage - Method 2)



Voltage Generation Analysis Test Summary



Data Summary:

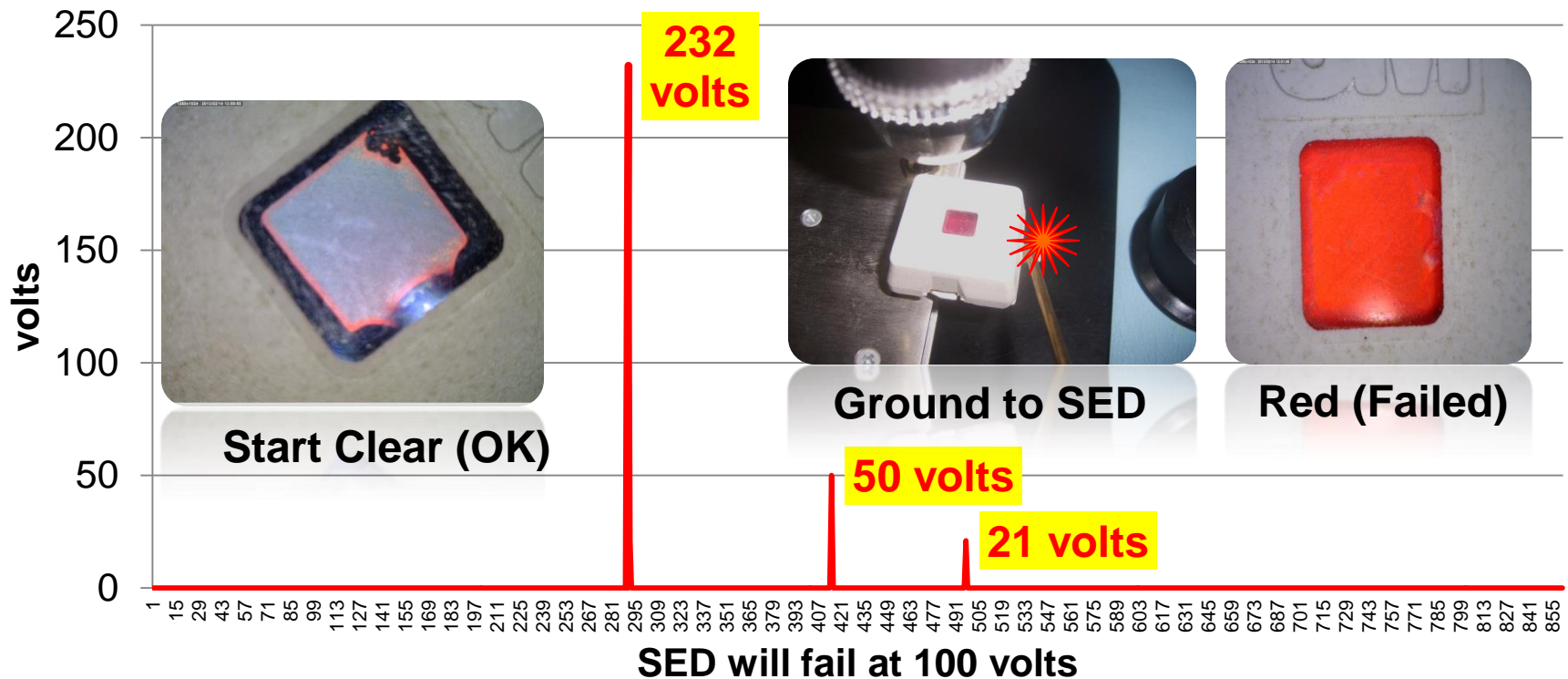
Number of Full Test Cycles:	1	Min [V] Data	Max [V] Data	Global
Peak Recorded Values [V]:	-220.00	Average Voltage [V]: -6.00	-220.00	-145.52
	-6.00	Standard Deviation:	-220.00	-220.00
	0.00	Minimum Voltage [V]:	-220.00	-220.00
		Maximum Voltage [V]:	-220.00	6.00

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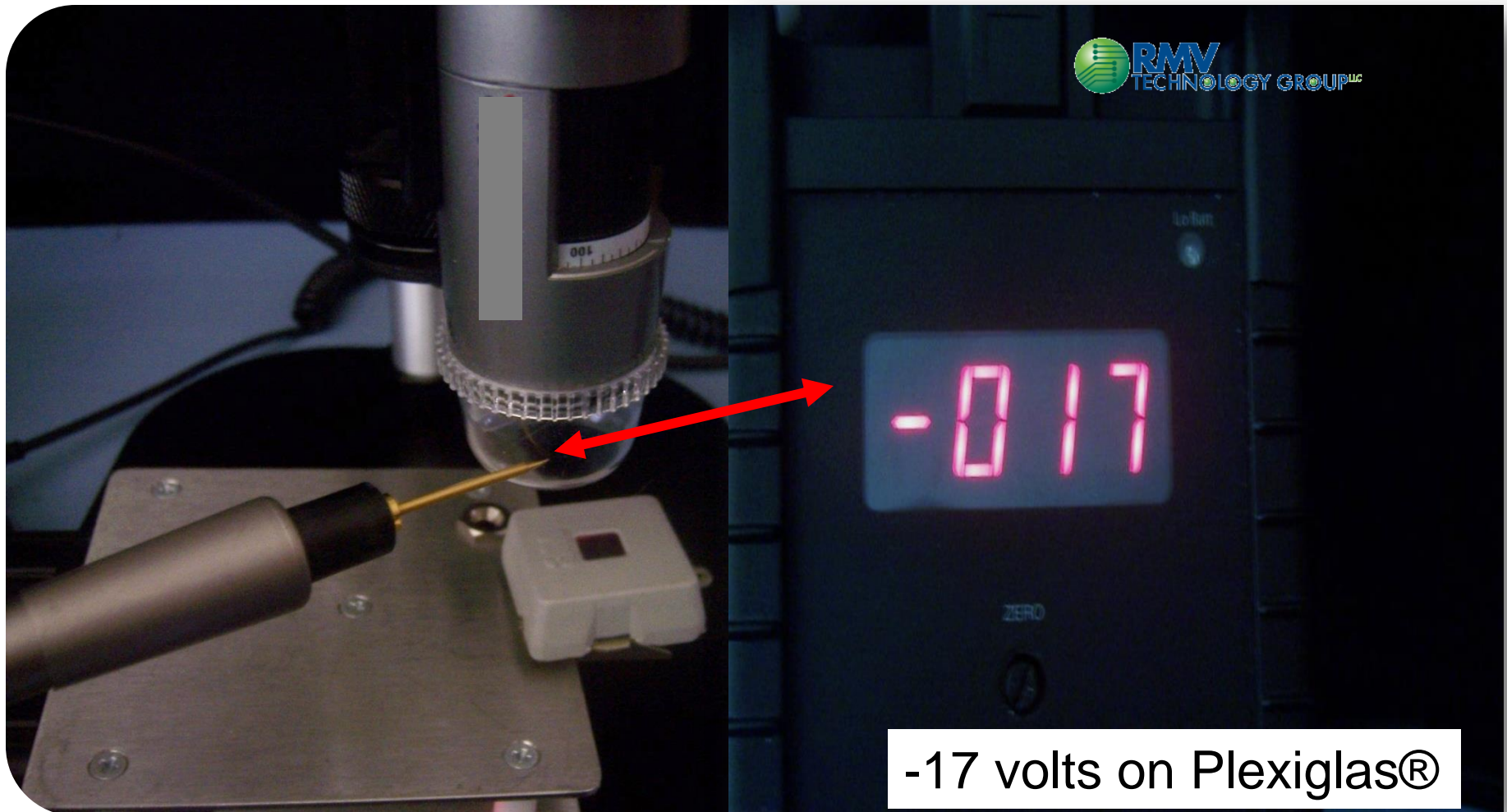
100 volt ESD Event Detector Triggered



ESD Peak between Brass Tip and Static Event Detector (SED)



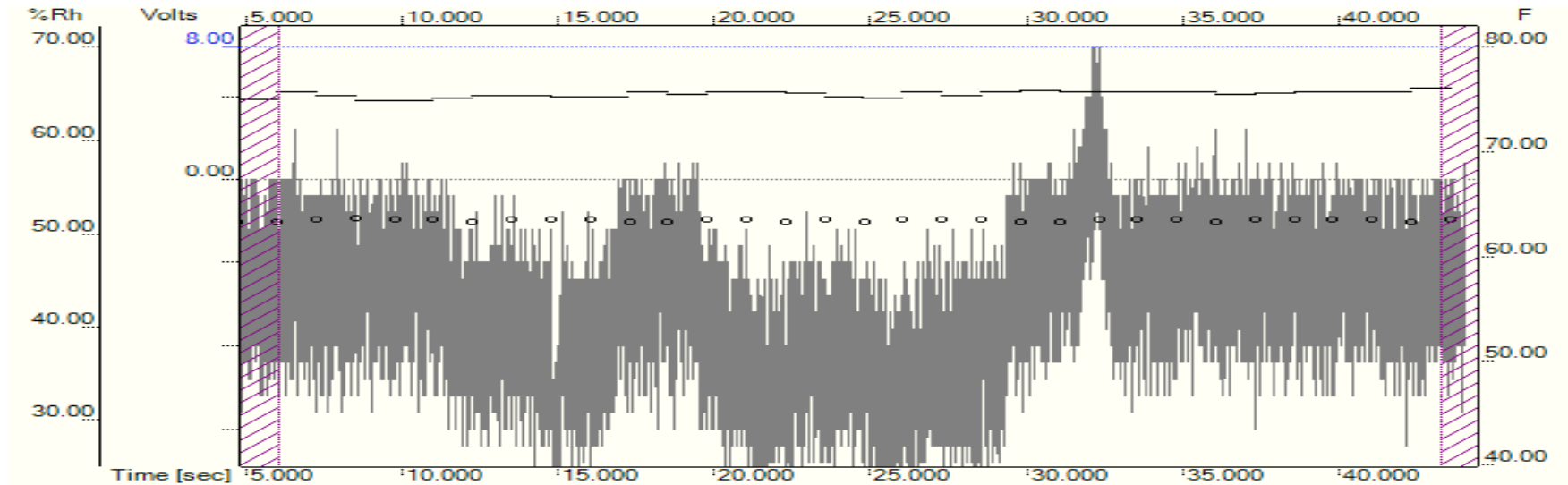
Scope under Ionization Flow



Scope Charge at 1" From 3.5" x 3.5" 10pF Charge Plate (Method 2, Under Ionization)



Voltage Generation Analysis Test Summary



Test Date: 2/14/2013 1:18:54PM

Conditions: Temperature [C] 17.47 (17.39 - 17.56)
Temperature [F] 63.45 (63.30 - 63.60)

-23 volts at 63.45%RH

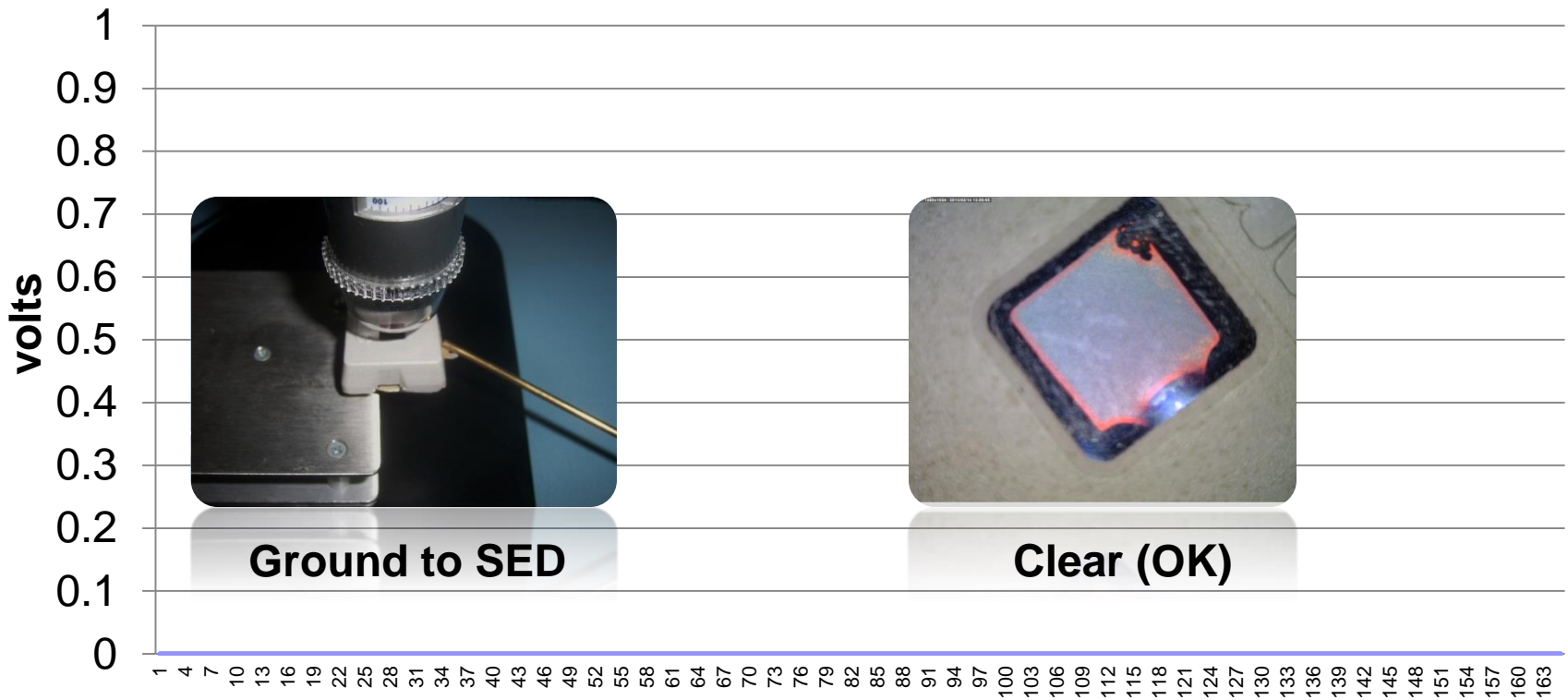
Data Summary:

Number of Full Test Cycles:	1	Min [V] Data	Max [V] Data	Global
Peak Recorded Values [V]:	-16.00	Average Voltage [V]: 8.00	Standard Deviation: -16.00	-7.65
	8.00	Minimum Voltage [V]: 8.00	Maximum Voltage [V]: -16.00	-23.00
	0.00	Maximum Voltage [V]: 8.00		8.00

100 volt ESD Event Detector = Clear (Under Ionization)



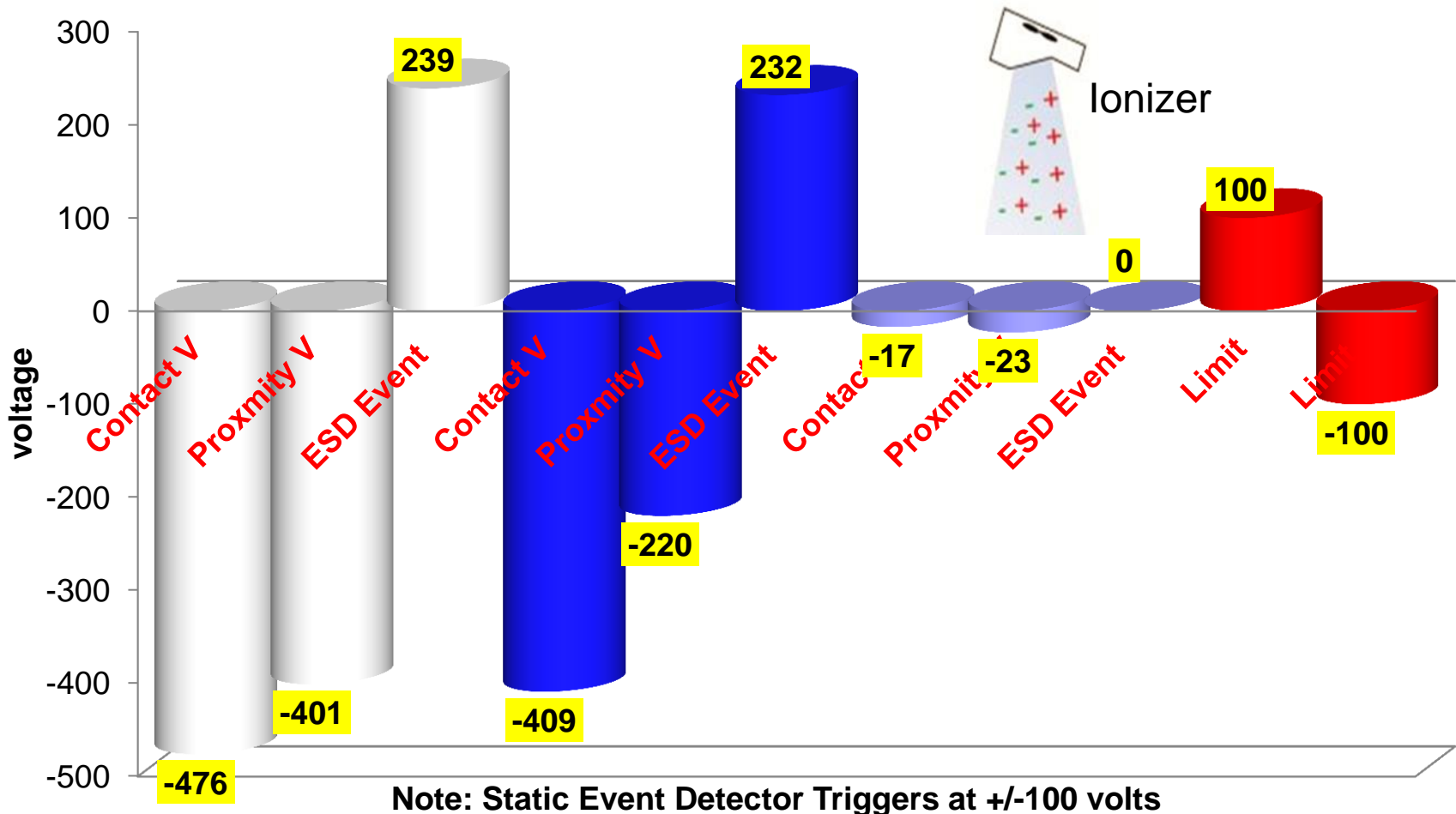
ESD Peak when Scope is Under Ionization Flow



SED Unit will Fail at 100 volts

Summary of Findings

Contact Voltage/Proximity Voltage and ESD Events





How Can Suspect Packaging Cause Issues!



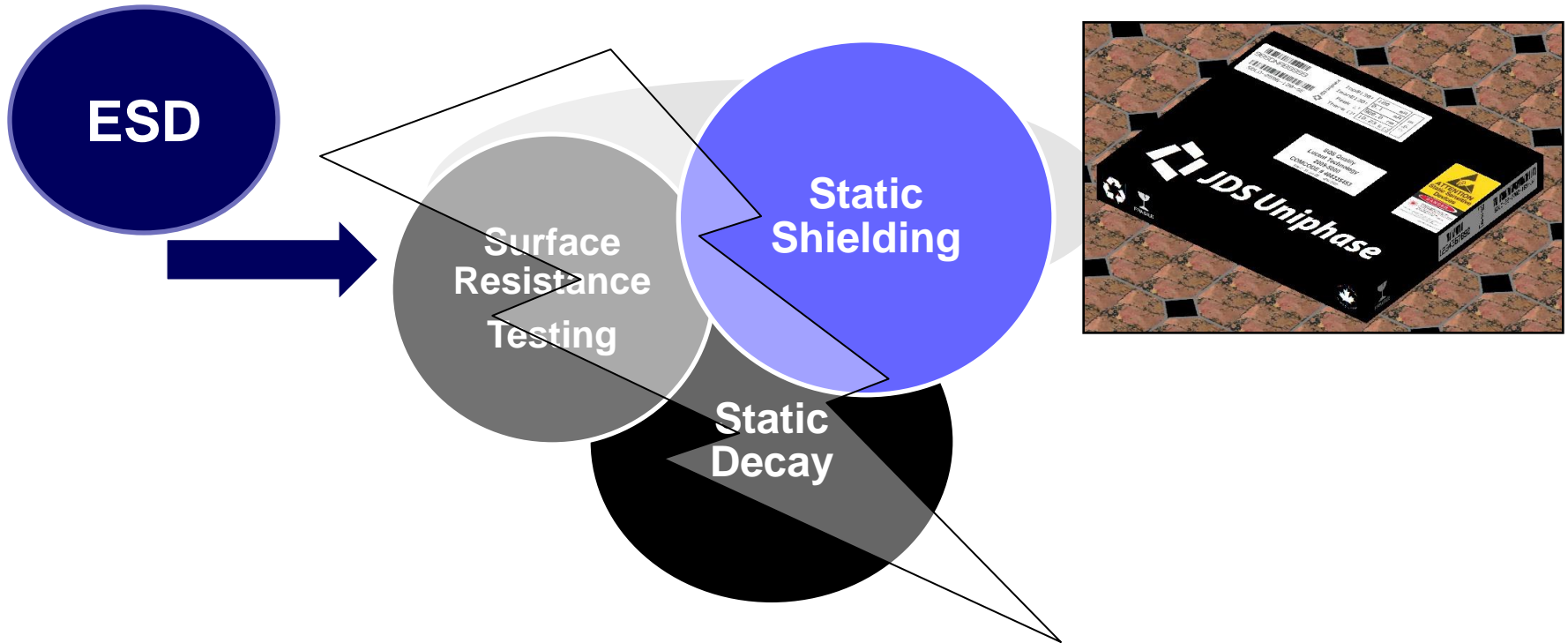
Packaging Engineered Package?



Downgraded Liner
to save Money?

Packaged to Insure
No Stacking Issues

Insure Compliance!



Test Both Tray & Primary Container



Identifying Suspect Packaging



Visual Identifiers which Trigger Parts Inspection

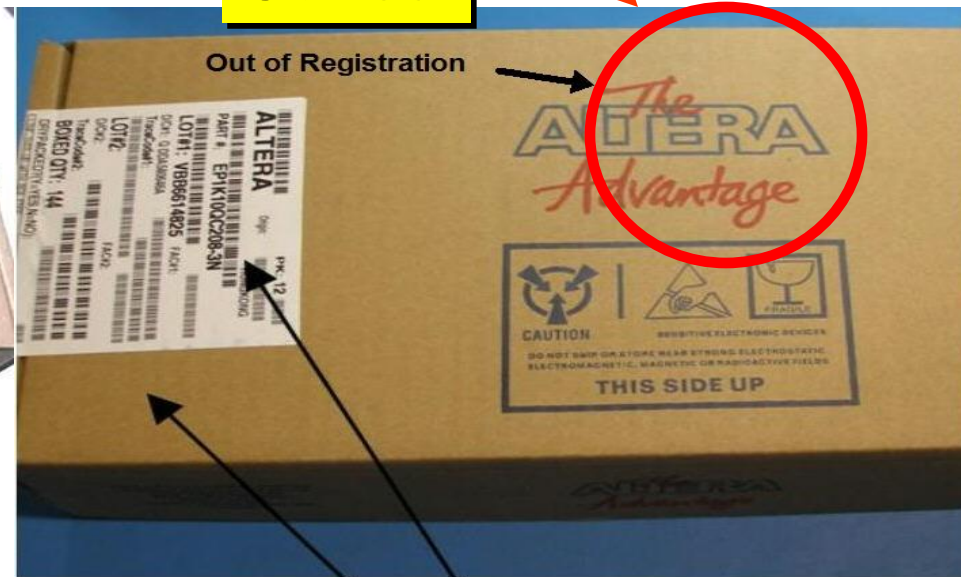


The
ALTERA
Advantage

Correct



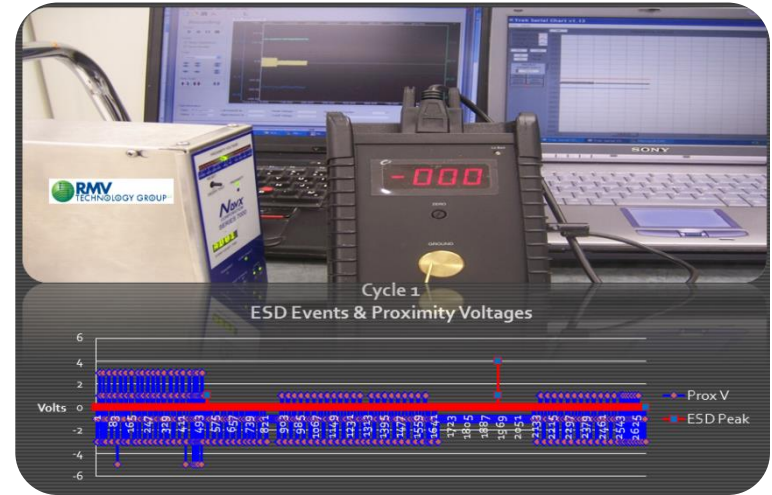
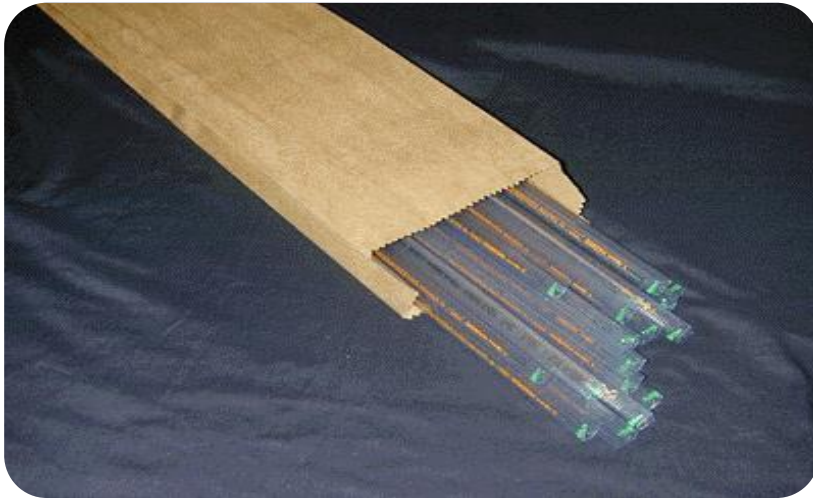
Reverse Printing



5) Non factory labels

6) Non factory boxes

The Dip Tube



© 2012-Bob Vermillion Photograph

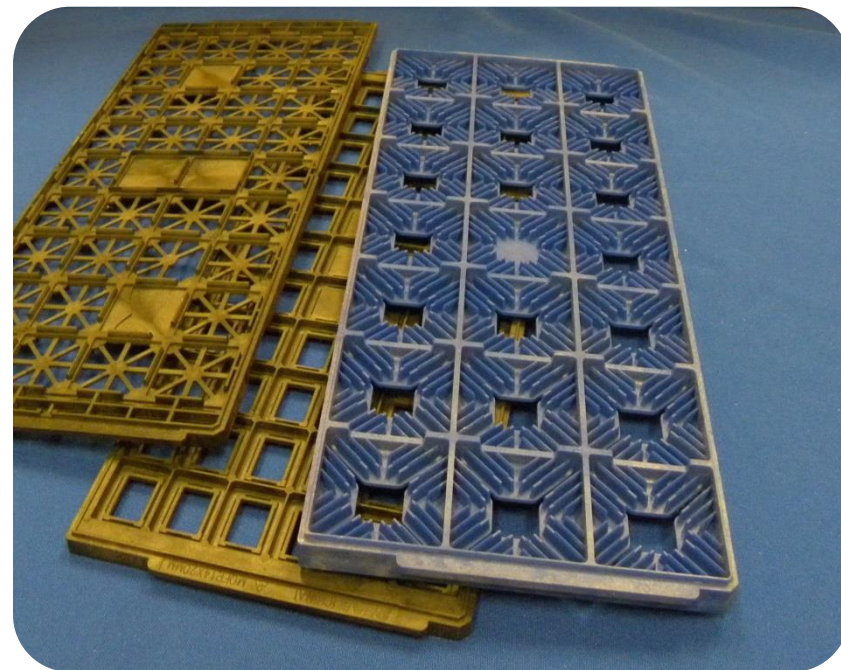


© 2012-Bob Vermillion Photograph

JEDEC Tray An Overview



Single Trays (1-6)
6 Positions per Surface

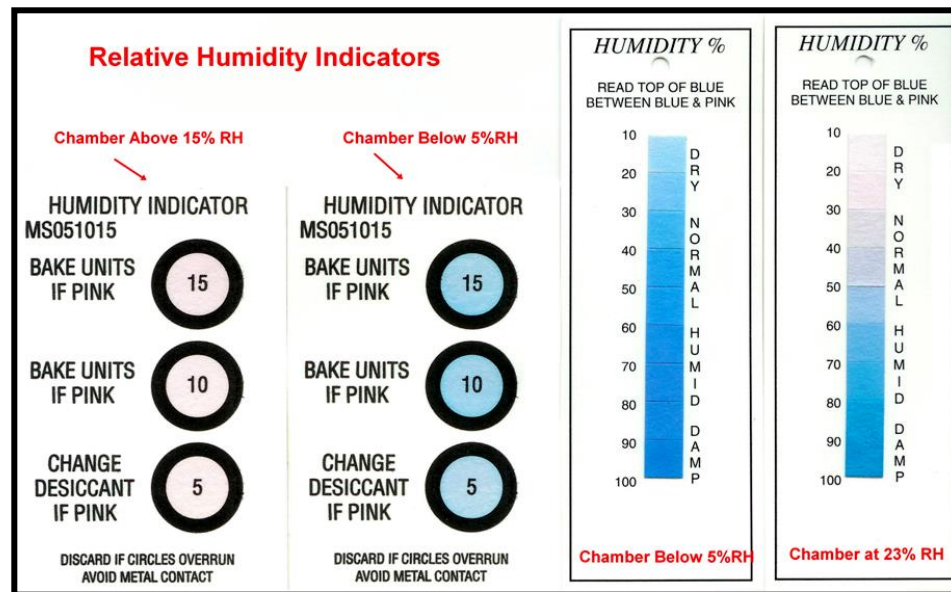


BOGUS Trays

1-Point Resistance through the JEDEC on Grounded Surface

JEDEC Protocols

Once the JEDEC trays have been unitized, while grounded, place into a Type 1 Mil-PRF-81705E compliant aluminum Moisture Barrier Bag of the specified caliper along with a humidity indicating strip and then seal said package.



While grounded, place said JEDEC package into outer shipping package utilizing a rectangular BMC for placement into a Lock Front Mailer as illustrated in the next slide and close the outer packaging to apply the appropriate tamper resistant tape, RFID tag and printed labels.

JEDEC Packaging Protocols

Despite the real issue of Suspect Counterfeit Dip Tubes and Tape & Reel, non-conforming ESD safe JEDEC trays are being sold into the supply chain as initially presented during the NASA Quality Leadership Forum 2010. The articles should be referenced to understand the scope of the issues. *The Dip Tube*, JEDEC and Tape & Reel issues, Interference Technology UK, by *Bob Vermillion*, CPP/Fellow, November 2010 and *Interference Technology*, June 2010. Figure 1 illustrates the improper use of a one sided corrugated pad placing low RH charge generating corrugated against the JEDEC tray with the conductive side facing upwards. A suspect counterfeiter would not know that the conductive side shall be placed against the JEDEC tray before the banding process takes place .

Insulative “white or black” charge generating strapping tape promotes field induced model discharges. Static dissipative strapping is available on the open market, however, the reader must validate material for ESD performance.

Suspect Counterfeit Awareness Training

NDA 2012, HR 1540, Sec. 818

Mission Critical Components, Parts, Materials & Packaging

Detection ~ Verification ~ Mitigation ~ Avoidance



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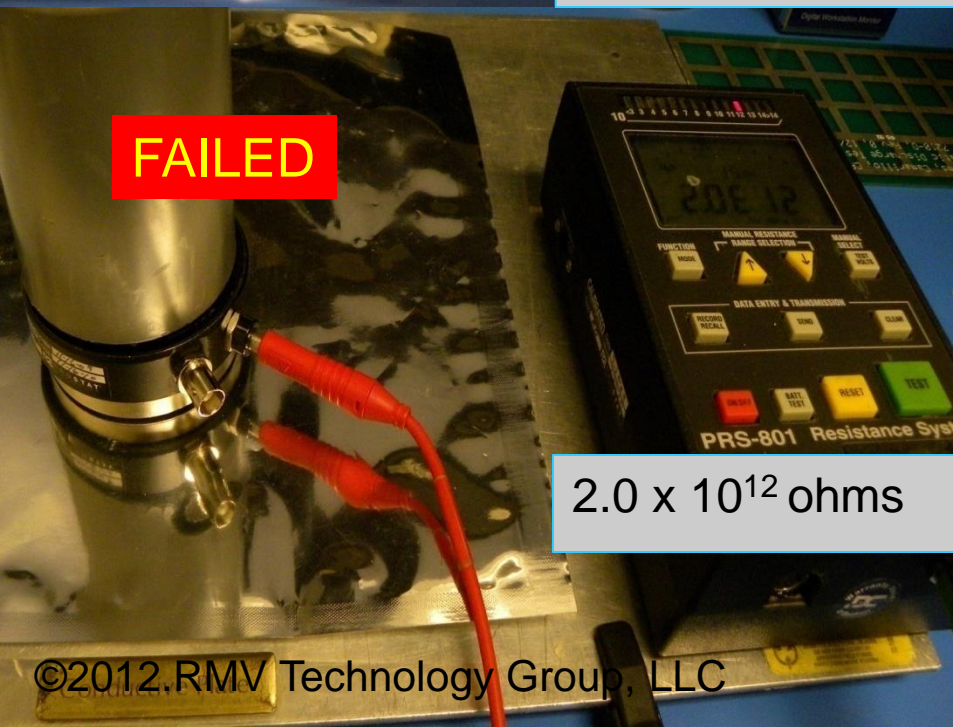
What Are the Consequences of Suspect Counterfeit Materials used in Manufacturing, Long Term Storage and Shipping?



According to JPL/NASA Website, ESD Represents a **40 billion dollar** Annual Problem!

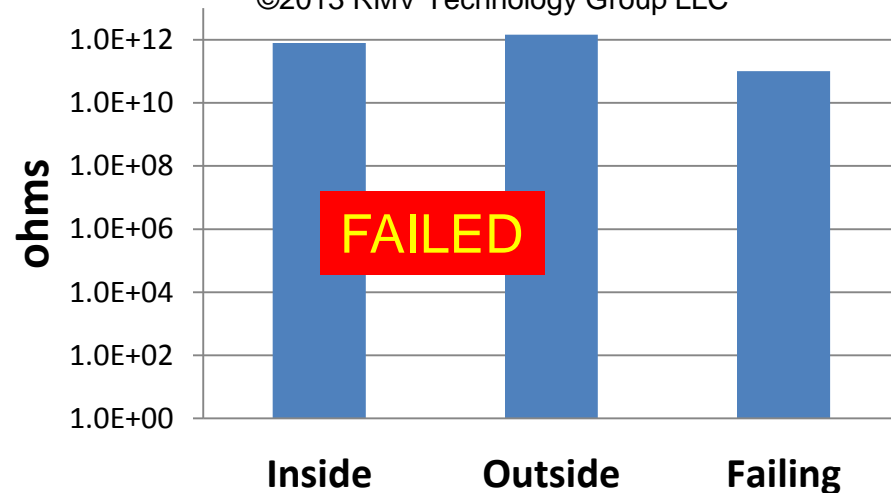
Tape & Reel Package

Resistance Validation



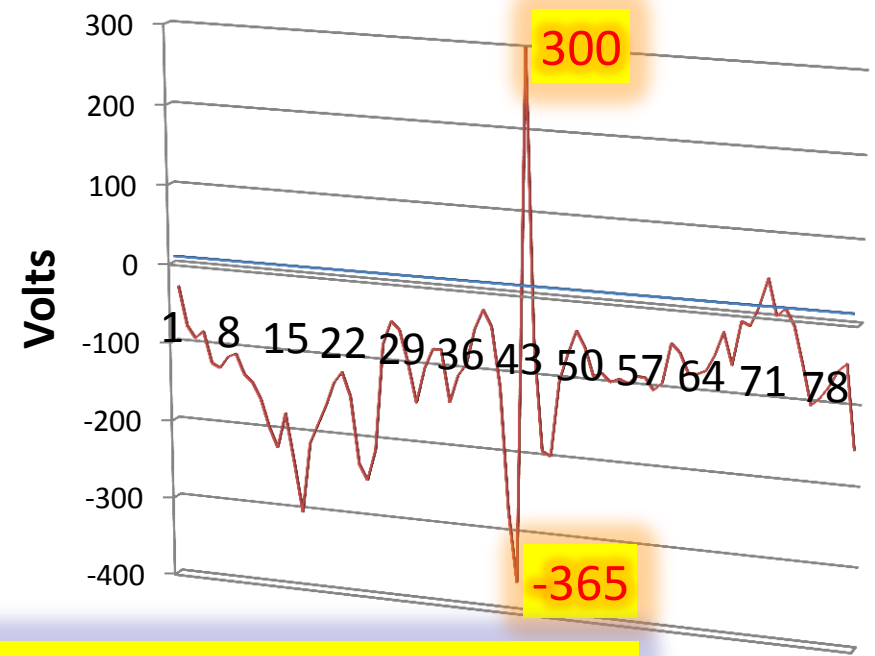
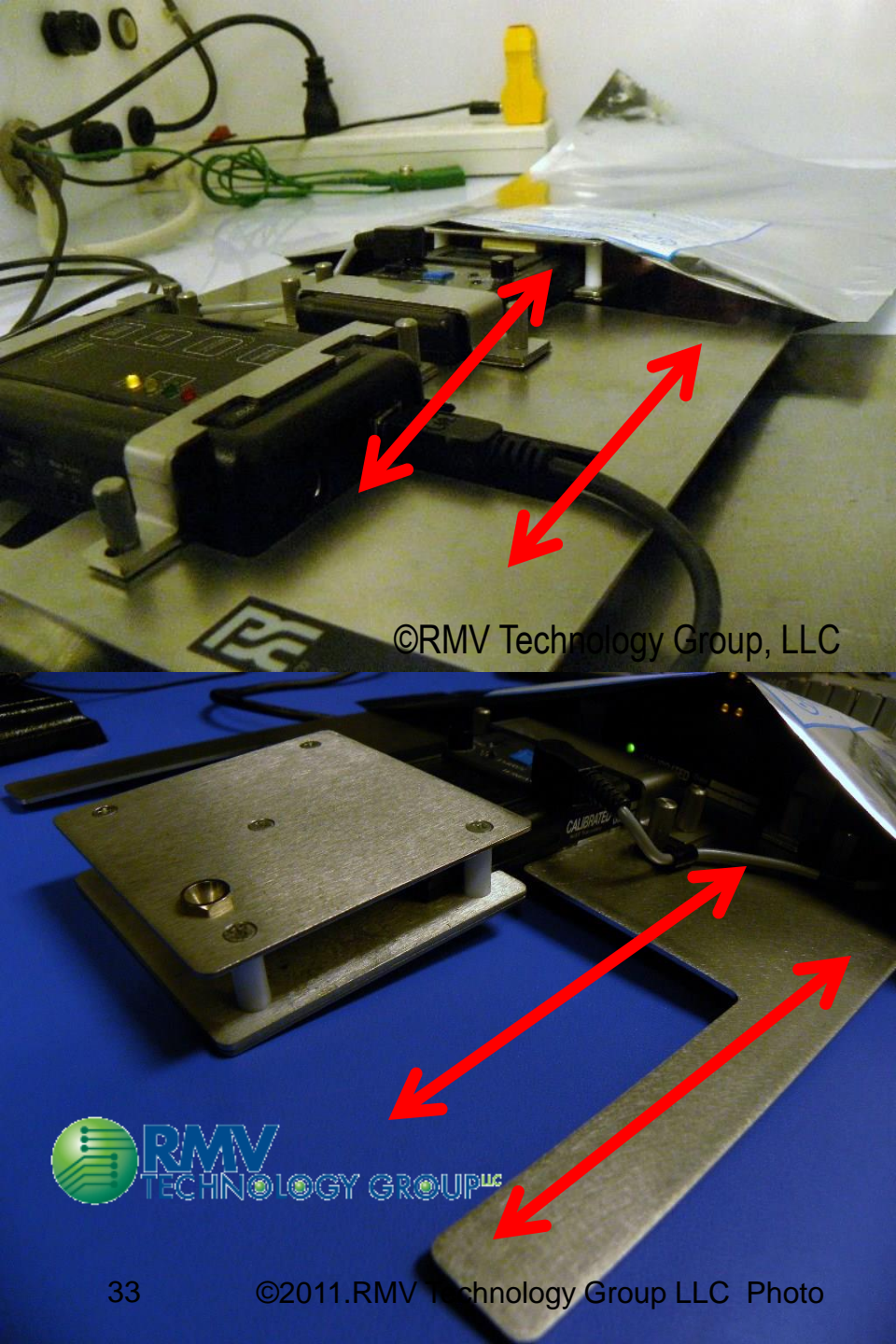
Surface Resistance Average Of Type 1 Bag

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Charge Generation Pull from Bag

*A Bag Can See <4%RH
when Pulling a Vacuum*



G-21 Counterfeit Materiel and Mechanical Parts Committee

AS6174 - Counterfeit Material; Detection, Mitigation, and Disposition

- *1.1 Purpose This SAE Standard standardizes practices to: a. maximize availability of authentic materiel (made from the proper materials using the proper processes with required testing,) b. procure materiel from reliable sources, c. assure authenticity and conformance of procured materiel d. control materiel identified as counterfeit, and e. report counterfeit materiel to other potential users and government investigative authorities. 1.2 Application This document is intended for use in high performance/reliability or safety of life applications. This standard is recommended for use by all contracting organizations that procure materiel, whether such materiel is procured directly or integrated into assemblies or equipment. The requirements of this standard are generic and intended to be applied/flowed down to all organizations that procure materiel, regardless of type, size, and product provided.*

G19 SUB COMMITTEE DEFINITION OF COUNTERFEIT

Generally, the term counterfeit refers to instances in which the identity or pedigree of a product is knowingly misrepresented by individuals or companies. Counterfeiters often try to take advantage of the established worth of the imitated product, and the counterfeit product may not work as well as the genuine article. The threat of counterfeit parts continues to grow as counterfeiters have developed more sophisticated capabilities to replicate parts and gain access to scrap materials that were thought to have been destroyed. Counterfeiters exist across industries and are able to respond to changes in market conditions. Counterfeit parts can be quickly distributed in online markets. Almost every industry can be affected by counterfeit parts.

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RMV Technology Group, LLC is a Service Disabled Veteran Owned Business, SBA 8(a) & SDB Firm.



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Building Better Lives for America's Disabled Veterans

