



**Static Discharge can Destroy Your Item and Void your Warranty!**

**Handling Procedure  
For  
Electrostatic Discharge Sensitive Devices**

Revision B



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### *Revision History*

Date	Rev	Description	By
09/01/04	1	Preliminary	AW/RT/JL/ AM
10/19/04	A	Initial Release	
08/04/16	B	Updated Logo	RS



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### Purpose:

This document was written to provide a guide for the handling, shipping, inspecting and storage of electrostatic discharge sensitive devices, prior to and during the installation into the final product. Adherence to this procedure will provide adequate protection for electrostatic discharge sensitive devices.

### Definitions

**Electrostatic Discharge (ESD)** A transient or rapid transfer of charge, between bodies at different electrostatic potentials (voltages), either caused by direct contact, close proximity arc or induced by an electromagnetic field.

**Electrostatic Discharge Sensitive (ESDS)** Susceptible to damage or destruction by ESD. ESD usually causes melting of a microscopic segment of semi-conductive material.

**ESDS Device** (component, part) Any component whose structure incorporates: a very thin insulating layer between conductive materials, any very small semi-conductive junctions, any very thin layers of conductive materials or any combination of these structures.

**Triboelectric Effect** Electrical Phenomenon, where certain materials such as glass & silk, plastic, rubber & fur, etc become electrically charged by friction or rubbing. Often persons simply walking on a carpet may build up a charge of many thousands of volts, enough to cause a spark a centimeter or more long.

### Scope:

All personnel will abide by this document in support of static protection practices in their workplace, in turn, providing their customers with quality products. This document may be supplemented with work-place evaluation audit/s and static protection training by an experienced industry resource.



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### General ESD Preventative Practices

In all areas, ESDS devices and/or subassemblies or assemblies containing ESDS devices will be handled with the intent of providing maximum protection against damage from ESD. Before handling ESDS devices, an individual will remove any static charge by first touching the workstation mat or other known ground, and wearing ESD protection such as a static dissipative wrist strap. When handling ESDS devices always maintain a static dissipation path to ground. Minimize handling of ESDS devices. Hold an ESDS device by its body or edge without touching leads, pads or I/O pins/pads. When not in process, the ESDS device should be kept in a proper anti-static container. All pre-assembly handling, assembly handling and quality inspection should be performed by an operator wearing a grounded static dissipative wrist strap, or heel strap at a workstation with a grounded conductive work surface mat. Testing of the operator's wrist straps with an NIST approved testing device should be performed prior to the beginning of each assembly shift.

### Responsibility

All personnel handling sensitive devices has the responsibility to be aware of the ESD threat to reliability of electronic products. All personnel who handle ESDS devices must be trained and/or certified in ESDS device handling techniques. Training should be updated on an "as needed" basis. Each person will handle and protect ESDS devices according to this procedure. Each person is responsible for maintenance and certification of their workstation/s. All lead supervisors or managers who directly oversee or manage individuals who handle ESDS devices must have ESD training and/or certification.

### Receiving/Inspection:

Any item received that indicates an ESDS device is present, will have the outside packing container inspected for damage or penetration. If any damage exists, the shipping company, the shipment originator, purchasing, and any other applicable parties must be notified and material disposition determined. Also if any received item need be opened for inspection, then proper ESDS device handling will be exercised. Handling of the boards should be limited to touching the edges of the circuit board only. If edge handling is not practical, then direct contact with the electronic components on the board should be avoided. Triboelectric materials should be kept out of any area where ESDS devices are present. Do not slide products across surfaces, which creates triboelectric charges. Once the electronic product is assembled to the final housing, the housing may be handled with caution, without wrist straps.



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By *Tecumseh*

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### Shipping and Storage of ESDS Devices

ESDS devices will be shipped and stored only in static protected packaging. Static protected packaging contains a conductive coating designed to keep all pins on the electronic assemblies at the same electrical potential, and the shell of the pack acts to shunt static electricity away from the sensitive devices. Static protective coatings are usually black in color when applied to cardboard, and pink in color on foam and plastic wrap. Silver coloration normally appears on plastic bags.

The cartons should be stored indoors in an environment free from direct moisture contact and severe temperature swings. Dirt can be highly conductive, and is a contaminant to electronic assemblies. If cartons are opened prior to use on the assembly line, they should be re-sealed with tape if they are to be stored for a length of time exceeding one day. In the event that a damaged carton requires transfer of the product to a new container, only a static protected container should be used. All packages containing ESDS devices will have caution labels.

Caution label examples:





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### **Reject/Return/Rework:**

Any electronic assemblies containing ESDS devices, that are to be returned or reworked should be stored and handled using the same precautions as new product.

### **Recommendation:**

Visual aids should be employed in the work area to assure ongoing adherence to standards. Static control devices such as: grounded static dissipative surface mats, grounded static dissipative wrist straps, static dissipative heel straps, ESD safe bags, and static dissipative floor finish (paints or waxes), should be installed/used in all areas where ESDS devices are handled. ESD testers should be available for testing work stations and static dissipative ESD control devices. An ESD field meter should be used to periodically check work areas. The humidity should be monitored and maintained at minimum of 30% humidity. Apply moisturizer to hands and wrist to insure contact with wrist straps. Use an ionizer and insure proper air flow across ionizer. Assign a ESD coordinator responsible for managing all ESD matters.