

## ESD PROTECTIVE PACKAGING

ELECTROSTATIC DISCHARGE (ESD PROTECTIVE PACKAGING AND MARKING FOR ESD-SENSITIVE (ESDS) STANDARD ELECTRONIC MODULES (SEMS) PRINTED CIRCUIT CARDS/BOARDS, ELECTRONIC SUBASSEMBLIES, AND EQUIPMENT CONTAINING ESDS PARTS THAT ARE PROCURED FOR ON-BOARD REPAIR PARTS OR INSTALLATION AND CHECKOUT SPARES.

### A. REQUIREMENTS FOR ESDS STANDARD ELECTRONIC MODULE, PRINTED CIRCUIT CARDS/BOARDS AND ELECTRONIC SUBASSEMBLIES

1. EACH ESDS MODULE, PRINTED CIRCUIT CARD/BOARD, OR ELECTRONIC SUBASSEMBLY SHALL BE INDIVIDUALLY PACKAGED (UNIT PACK) IN TRANSPARENT MULTILAYER CONSTRUCTION (FARADAY CAGE) WRAP OR BAG HAVING AN INNER LAYER CAPABLE OF PREVENTING STATIC BUILD-UP WITHIN THE BAG, AND AN OUTER LAYER CAPABLE OF DISSIPATING EXTERNAL FIELDS AND CHARGES.

2. SHALL HAVE AN ESD SYMBOL (MIL-STD-129P OR MIL-STD-129J) ATTACHED TO THE UPPER LEFT OR RIGHT FRONT CORNER OF THE ESDS MODULE, PRINTED CIRCUIT CARD/BOARD OR ELECTRONIC SUBASSEMBLY, UNLESS OTHERWISE SPECIFIED ON THE ASSEMBLY DRAWING.

3. IF WRAPPED PROTECTIVE MATERIAL AS DESCRIBED ABOVE IS USED, ENSURE THAT THE STATIC DISSIPATIVE OR CONDUCTIVE SURFACE (OUTER) DOES NOT TOUCH INNER PROTECTIVE LAYER OR PARTS OR SURFACES OF THE ENCLOSED ITEM. BUBBLE WRAP SHALL BE SAME MATERIAL AS WRAP OR BAG. PLAIN PLASTIC MATERIALS SHALL NOT BE USED IN ANY PART OF PACKAGING.

4. PACKAGING SHALL BE FREE OF TEARS, SPLITS, HOLES, STAPLES OR OTHER DISCONTINUITIES.

5. INDIVIDUAL PACKAGING (UNIT PACK) SHALL HAVE AN ESD SYMBOL (MIL-STD-129P OR MIL-STD-129J) AND A CAUTION NOTE AS FOLLOWS ON THE OUTSIDE OF THE PACKAGE:  
CAUTION - SENSITIVE ELECTRONIC DEVICES OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC DISCHARGE SENSITIVE ITEMS WHEN REMOVED FROM

PACKAGING.

6. IN ADDITION TO THE MARKINGS REQUIRED BY MIL-STD-129, INDIVIDUAL PACKAGING (UNIT PACK) SHALL HAVE ENCLOSED ITEMS'S VENDOR AND/OR ELECTRIC BOAT CORPORATION PART NUMBER AND MATERIAL STOCK NUMBER, (IF APPLICABLE) LABELED ON OUTSIDE OF PACKAGE.

7. UNIT PACKS SHALL THEN BE HERMETICALLY SEALED IN A BAG OR WRAP (INTERMEDIATE PACK) OF MIL-B-81705, TYPE 1, OPAQUE PROTECTION MATERIAL.

8. INTERMEDIATE PACKAGE SHALL BE LABELED AS ABOVE AND HAVE A MIL-STD-129J, FIGURE 36, APPENDIX C, LABEL (2-INCH BY 2-INCH SIZE).

9. OUTER PACKAGING MAY CONTAIN ONE OR MORE INTERMEDIATE PACK PACKAGES AND SHALL HAVE A LABEL AS IN PARAGRAPH 8 ABOVE, EXCEPT LABEL SIZE SHALL BE 4 INCHES BY 4 INCHES FOR CONTAINERS LARGER THAN ONE CUBIC FOOT VOLUME.

B. REQUIREMENTS FOR EQUIPMENT CONTAINING ESDS ITEMS (METAL RACKS, CABINETS OR OTHER CONNECTORIZED ENCLOSURES)

1. SHALL HAVE AN ESD SYMBOL (EIA RS 471, MIL-STD-129P, MIL-STD-129J, OR ANSI ESD S8.1 - 2001) AND AN ESD CAUTION NOTE (SUCH AS "CAUTION, CONTAINS PARTS AND ASSEMBLIES SUSCEPTIBLE TO DAMAGE BY ELECTROSTATIC DISCHARGE") ATTACHED TO THE UPPER LEFT OR RIGHT FRONT CORNER, UNLESS OTHERWISE SPECIFIED ON THE EQUIPMENT ASSEMBLY DRAWING.

2. SHALL HAVE CONDUCTIVE COVERS (I.E. CAP PLUGS, OR A SECTION OF ESD PROTECTIVE CONDUCTIVE MATERIAL WITH THE CONDUCTIVE SURFACE ADJACENT TO CONTACT PINS) INSTALLED OVER CABLE CONNECTORS OR RECEPTACLES WHOSE PINS CONNECT TO CIRCUITS WHICH COULD BE DAMAGED BY ESD POTENTIALS. THE CONDUCTIVE COVERS MUST HAVE A CONDUCTIVE

SURFACE RESISTIVITY AS  
DEFINED BY MIL-HDBK-263B. THE CONDUCTIVE COVER MUST BE  
SECURELY  
INSTALLED OVER THE CABLE CONNECTORS OR RECEPTACLES (E.G.,  
USING  
TIE-WRAPS OR ESD-SAFE TAPE).

3. SHALL HAVE AN ESD RS-471 SYMBOL PLACED ADJACENT TO EACH  
CABLE  
RECEPTACLE WHOSE PINS CONNECT TO CIRCUITS WHICH COULD BE  
DAMAGED BY  
ESD POTENTIALS AS DEFINED BY MIL-STD-1686B AND THE EQUIPMENT  
ASSEMBLY  
DRAWING.

4. SHALL HAVE THE MIL-STD-1285 ELECTROSTATIC SYMBOL AND A  
CAUTION NOTE AS FOLLOWS ON THE OUTERMOST PACKAGING LAYER:  
CAUTION- SENSITIVE ELECTRONIC DEVICES OBSERVE PRECAUTIONS FOR  
HANDLING ELECTROSTATIC DISCHARGE SENSITIVE ITEMS WHEN REMOVE  
FROM PACKAGING.

5. THE OUTERMOST PACKAGING LAYER SHALL ALSO HAVE A  
MIL-STD-129J,  
FIGURE 36, APPENDIX C, LABEL (2-INCH BY 2-INCH SIZE).

6. FOR EQUIPMENT USING TERMINAL BOARDS FOR CONNECTION TO  
EXTERNAL  
CABLING, EXPOSED TERMINAL STRIPS (WITHOUT COVERING  
PANELS/BOXES)  
CONNECTING TO INTERNAL ESDS CIRCUITS SHALL BE COVERED WITH  
CONDUCTIVE  
ESD PACKAGING MATERIAL (CONDUCTIVE LAYER ADJACENT TO  
TERMINALS) AND  
SECURED TO PREVENT INADVERTENT TERMINAL CONTACT BY PERSONNEL.

#### C. ADDITIONAL PACKAGING AND LABELING REQUIREMENTS

1. WHERE MORE THAN ONE ITEM IS REQUIRED FOR A PACKAGED SET,  
ALL ITEMS  
OF THE PACKAGED SET MAY BE PACKAGED TOGETHER IN LIEU OF  
SECTION A.1  
REQUIREMENTS. A "PACKAGED SET" IS DEFINED AS A COLLECTION OF  
MULTIPLE  
AND/OR DIFFERENT ITEMS ALL REFERENCED UNDER THE SAME PART  
NUMBER.

2. ANTI-STATIC PINK POLYESTER BAGS OR WRAP MAY BE USED AS  
SECONDARY

WRAPPING (I.E. INTERMEDIATE PACKAGING) FOR ESDS ITEMS, OR USED TO WRAP ESDS ITEMS BEFORE THEY ARE PLACED IN ESD PROTECTIVE UNIT PACKAGING. ANTI-STATIC PINK POLYESTER BAGS OR WRAP MAY NOT BE USED AS ESD UNIT PACKAGING.

3. PAPERWORK (E.G. INVOICES, SLIPS, TAGS) SHALL NOT BE PLACED WITHIN ANY UNIT PACKAGE CONTAINING THE ESDS ITEM(S). HOWEVER, THE PAPERWORK MAY BE ATTACHED TO THE OUTSIDE OF THE UNIT PACKAGE. THE ESDS ITEM MUST BE PACKAGED IN ESD UNIT PACKAGING PRIOR TO ATTACHING THE PAPERWORK.

4. UTILIZING ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) PACKAGING FOR PARTS, ASSEMBLIES, OR EQUIPMENT THAT ARE NOT ESDS IS STRICTLY PROHIBITED. APPLYING ESDS LABELS OR MARKINGS TO PARTS, ASSEMBLIES, OR EQUIPMENT THAT ARE NOT ESDS OR TO THE PACKAGING OF PARTS, ASSEMBLIES, OR EQUIPMENT THAT ARE NOT ESDS IS STRICTLY PROHIBITED. INCORRECT OR IMPROPER ESDS IDENTIFICATION OF NON-ESDS ITEMS, OR THE PACKAGING OF NON-ESDS ITEMS IN ESDS PACKAGING, WILL BE CAUSE FOR REJECTION BY ELECTRIC BOAT CORPORATION.