PACKAGING OF MIL-STD-1835 COMPLIANT ELECTRICAL DEVICES (ICS AND FPGAS)

1. SCOPE

1.1 This standard provides methods for the protection of Electrostatic Discharge (ESD) Sensitive FPGA and Integrated Circuits subject to damage from bent pins and electrostatic discharge.

1.2 Devices herein conform to the dimensional requirements of MIL-STD-1835 and Defense Logistics Agency (DLA) 5962- series. For devices conforming to other specifications, contact LMSSC Product Protection for recommendations.

1.3 Deviations, substitutions, or conflicts to this standard or to the applicable P-Sheet requirements shall be submitted to the cognizant LMSSC Buyer.

1.4 All specified documents shall be to "latest revision."

1.5 Order of precedence. In the event of conflict between this document and the industry specifications herein, the requirements of this document take precedence. Note that certain LMSSC documents (Program contamination control plans, PHST plans, etc.) may additionally restrict the materials and processes used herein. In those cases, those additional restrictions shall be followed.

2. REFERENCE DOCUMENTS

2.1 LMSSC DOCUMENTS

2.1.1 MAP-441008, Protection of Electrostatic Discharge Sensitive (ESDS) Devices

2.1.2 P-134, Shock and Vibration Indicators and Recorders

2.2 GOVERNMENT/MILITARY DOCUMENTS

2.2.1 MIL-D-3464, Desiccants, Activated, Bagged, Packaging Use and Static Dehumidification

2.2.2 MIL-STD-1835, Electronic Component Case Outlines

2.2.3 MIL-STD-129, Military Marking for Shipment and Storage

2.2.4 MIL-PRF-81705, Barrier Materials, Flexible, Electrostatic Free, Heat Sealable

2.3 INDUSTRY DOCUMENTS

2.3.1 ANSI/ESD S8.1, Symbols -- ESD Awareness

2.3.2 ANSI/ESD S20.20, Protection of Electrical and Electronic Parts, Assemblies and Equipment (Excluding Electrically Initiated Explosive Devices)

2.3.3 ANSI/ESD S541, Packaging Materials for ESD Sensitive Items

2.3.4 ASTM D5445, Pictorial Marking for Handling of Goods

3. GENERAL

3.1 Handling and packaging shall be performed with materials and procedures in accordance with ANSI/ESD S20.20 or MAP-441008.

3.2 Packaging furnished shall meet or exceed those requirements specified herein.

3.3 Packaging shall provide item(s) adequate physical, mechanical, chemical and cleanliness protection.

3.4 Packaging materials, procedures and workmanship shall be of good industry quality and practice.

3.4.1 In addition to the unit containers specified in section 4, there shall be one additional layer of conductive or dissipative ESD protective packaging.

3.4.2 There shall be no "Pink Poly," amine- or amide-treated material, or surfactant-treated ESD protective materials used in the packaging of devices herein.

3.4.3 Other ESD protective materials that require atmospheric humidity to retain dissipative or conductive qualities shall not be used for packaging of devices herein.

3.5 Packaging shall permit safe removal and replacement of item(s).

3.6 To the maximum extent possible, use recyclable packaging materials.

3.7 To prevent contamination of hardware, protective wrappings shall be as clean or cleaner than the cleanliness of the hardware it is being used to protect.

3.8 If shock indicators or shock recorders are required, they shall be installed per P-134.

4. UNIT CONTAINER

4.1 Packaging furnished shall meet or exceed those requirements specified herein.

4.2 The quantity per unit container shall be one item.

4.3 Multiple unit containers may be combined into intermediate packaging

4.4 Selection of Unit Container

4.4.1 Unless otherwise specified in the part drawing or specification, choose the adequate container sizes according to FPGA and IC parameters per Tables 1A and 1B. The containers listed in Tables 1A and 1B provide first-level ESD protection.

4.4.2 To order the containers listed in Tables 1A and 1B, see the ordering info in Section 6.

Table 1A. Selection of Tacki Pak Container per MIL-STD-1835

	Unit Container Numbers						
Configurations per MIL-STD 1835	**LM-3003**	**LM-3004**	**LM-3005**	**LM-3006**	**LM-3007**	**LM-3008**	**Package Type**
Requirement 101A: F1		X					C,D
Requirement 101A: F2		X					A,B
Requirement 101A: F2A		X					B
Requirement 101A: F3		X					C
Requirement 101A: F4		X					A,B
Requirement 101A: F4A		X					B
Requirement 101A: F5		X					A,B
Requirement 101A: F5A		X					B
Requirement 101A: F6		X					A,B,C,D
Requirement 101A: F6A		X					B
Requirement 101A: F8		X					C,D
Requirement 101A: F9		X					A,B,D
Requirement 101A: F9A		X					B
Requirement 101A: F10		X					A
Requirement 101A: F11		X					A
Requirement 101A: F11A		X					B
Requirement 101A: F12		X					B
Requirement 101A: F13		X					A
Requirement 101A: F14		X					A
Requirement 101A: F15		X					A
Requirement 101A: F16		X					A
Requirement 101A: F17		X					A
Requirement 101A: F18		X					B
Requirement 101A: F19		X					A
Requirement 101A: F20		X					A
Requirement 106: C-G1			X				G1
Requirement 106: C-G2				X			G2
Requirement 106: C-G3				X			G3
Requirement 107A: C-G7				X			G7
Requirement 110: CU1			X				CU1
Requirement 110: CU2			X				CU2
Requirement 110: CU3				X			CU3
Requirement 110: CU4				X			CU4

	Unit Container Numbers						
Configurations per MIL-STD 1835	**LM-3003**	**LM-3004**	**LM-3005**	**LM-3006**	**LM-3007**	**LM-3008**	**Package Type**
Requirement 110: CU5				**X**			CU5
Requirement 110: CU6				**X**			CU6
Requirement 114: CT1					**X**		CT1
Requirement 114: CT2					**X**		CT2
Requirement 114: CT3					**X**		CT3
Requirement 114: CT4					**X**		CT4
Requirement 114: CT5					**X**		CT5
Requirement 117A: FG1		**X**					FG1
Requirement 117A: FG2		**X**					FG2
Requirement 117A: FG3		**X**					FG3
Requirement 117A: FG4		**X**					FG4

Table 1B. Selection of Tacki Pak Container per Defense Logistics Agency (DLA) 5962- series

	Unit Container Numbers						
Configurations per Defense Logistics Agency (DLA) 5962- series	**LM-3003**	**LM-3004**	**LM-3005**	**LM-3006**	**LM-3007**	**LM-3008**	**Package Type**
5962-01508 Case Outline X						X	CQ256 Flat Pack
5962-01508 Case Outline Y						X	CQ208 Flat Pack
5962-01508 Case Outline Z	X						CQ84 Flat Pack
5962-01515 Case Outline X						X	CQ256 Flat Pack
5962-01515 Case Outline Y						X	CQ208 Flat Pack
5962-01517 Case Outline X 5962-96873 Case Outline Y 5962-96891 Case Outline X		X					28 Pin Flat Pack
5962-04219 Case Outline X						X	CQ352 Flat Pack
5962-04219 Case Outline Y						X	CQ208 Flat Pack
5962-04221 Case Outline U						X	CQ256 Flat Pack
5962-04221 Case Outline X						X	CQ352 Flat Pack
5962-06203 Case Outline X			X				Special 32 Pin Flat Pack (Top Braze)
5962-08203 Case Outline X	X						86 Pin Flat Pack on Chip Carrier
5962-92156 Case Outline Y					X		CQ172 Flat Pack
5962-92156 Case Outline U					X		CQ172 Flat Pack
5962-92183 Case Outline D ST99D311		X					14 Pin Flat Pack
5962-95539 Case Outline X ST99D325				X			96 Pin Quad Pack
5962-95845 Case Outline Y		X					28 Pin Flat Pack
5962-95845 Case Outline Z		X					36 Pin Flat Pack
5962-95845 Case Outline U			X				36 Pin Flat Pack
5962-96845 Case Outline Y			X				68 Pin Quad Pack
ST99D300				X			32 Pin Flat Pack
ST99D301		X					16 Pin Flat Pack
ST99D303					X		CQ172 Flat Pack
5962-91617 Case Y ST99D306				X			84 Pin Quad Pack
5962-91617 Case Z				X			84 Pin Quad Pack
ST99D331		X					32 Pin Flat Pack
ST99D333						X	CQ208 Flat Pack

4.5 If the shipment is to be desiccated, the following shall be followed.

4.5.1 There shall be one unit container per bag.

4.5.2 Desiccant shall not be contained within the unit container.

4.5.3 Desiccant shall be MIL-D-3464 Type II (non-dusting). It is recommended that the desiccant be taped to the unit container; if performed, ESD protective tapes shall be used.

4.5.4 The unit container shall be enclosed in a heat-sealed bag created from MIL-PRF-81705 Type I Class I water vapor barrier film.

4.6 The number of unit or intermediate packages per shipping container is restricted to the dimensions and gross weight limitations of the container specifications. Fill any voids with suitable dunnage, blocking or bracing as appropriate.

5. LABELING AND MARKING

5.1 Apply appropriate label(s) to all levels of packaging.

5.2 Label(s) must adhere permanently to all package materials.

5.3 Marking

5.3.1 Unless otherwise specified in contract or P.O., use the following criteria.

5.3.2 All markings shall be uniform, legible, durable and properly placed on package.

5.3.3 Unless otherwise specified or required, application may be by any method (e.g., labels, stencil, tagging, etc.).

5.3.4 When required markings are visible through the package, markings need not be repeated.

5.3.5 Unit package markings shall include part number per contracting document, supplier identity (name may be abbreviated), and quantity and unit (e.g., 1 each, 2 sets, 3 lbs., etc.).

5.3.6 Intermediate package markings shall include component part number per contracting document, supplier identity (name may be abbreviated), and total unit quantity contained in intermediate package.

5.3.7 Special and precautionary handling labels shall meet ASTM D5445. Precautionary marking shall include (as applicable):

- Identification of special storage environments
- “Packaged with desiccant. Do No Open Until Ready to Use or Inspection.”
- “Caution: Inspect shock indicators (or environmental recorders) inside container for indication of damage”.

5.3.8 Each level of packing shall have ESD caution labeling in accordance with ANSI/ESD S8.1 or MIL-STD-129.

5.3.9 Marking of unit containers shall include the ESD sensitivity classification of the device as defined by MAP-441008 (ref. Class 0 Super ESD or Class 1 Standard ESD).

5.4 Enclose or attach a copy of the packing slip to the shipping container. (If shipment consists of multiple pieces, place packing slip in piece number one of the shipment and mark ”Packing Slip Enclosed”).

6. TACKI PAK CONTAINER ORDERING INFO

6.1 Tacki Pak Containers are made by Conductive Containers Incorporated (CCI) and distributed by Techni-Tool.

6.1.1 To order Tacki Pak Containers, contact Techni-Tool as follows:

Techni-Tool
1-800-832-4866

6.1.2 Tacki Pak Container Configurations

6.1.2.1 LM-3003

6.1.2.2 LM-3004

6.1.2.3 LM-3005

6.1.2.4 LM-3006

6.1.2.5 LM-3007

6.1.2.6 LM-3008

REVISION HISTORY

Release Date	Rev	Change Description	Responsible Engineers
12/11/2012	0	Original Release	Catherine Rice/Eric Kline
10/15/2013	1	Revised Section 4.4.2 and added Section 6 to add contact info for Techni-Tool	Catherine Rice

The technical and selected non-technical changes to this specification are indicated by change bars in the margin (not applicable on original document).

APPROVALS

Approvers	Disciplines	Date: TBD
Catherine Rice	PHST - DV	12/11/2012
Eric Kline	PHST - SV	12/10/2012
Regina Izydorek	SME - DV	12/11/2012
Tom Shanley	PHST (Lead) - DV	12/11/2012
Rick Dumlao	PHST (Lead) - SV	12/06/2012
Melanie Kuo	PHST - SV	12/06/2012
Bill Manning	PHST - DV	12/07/2012