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**Standard for handling, packing,
shipping and use of moisture/reflow
sensitive surface mount devices**

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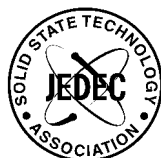
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JOINT INDUSTRY STANDARD

Standard for Handling,
Packing, Shipping and
Use of Moisture/Reflow
Sensitive Surface
Mount Devices



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

STANDARD FOR HANDLING, PACKING, SHIPPING AND USE OF MOISTURE/REFLOW SENSITIVE SURFACE MOUNT DEVICES

FOREWORD

A PAS is a technical specification not fulfilling the requirements for a standard, but made available to the public and established in an organization operating under given procedures.

IEC-PAS 62169 was submitted by JEDEC and has been processed by IEC technical committee 47: Semiconductor devices.

The text of this PAS is based on the following document:

This PAS was approved for publication by the P-members of the committee concerned as indicated in the following document.

| Draft PAS | Report on voting |
|-------------|------------------|
| 47/1469/PAS | 47/1502/RVD |

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STANDARD FOR HANDLING, PACKING, SHIPPING AND USE OF MOISTURE/REFLOW SENSITIVE SURFACE MOUNT DEVICES

Contents

| | Page |
|---|------|
| 1 Foreword | 1 |
| 2 Purpose | 1 |
| 3 Scope | 1 |
| 3.1 Packages | 1 |
| 3.2 Assembly process | 2 |
| 3.3 Reliability | 2 |
| 4 Applicable documents | 2 |
| 4.1 EIA JEDEC/Institute for Interconnecting and Packaging Electronic Circuits (IPC) & Joint Industry Standards | 2 |
| 4.2 Electronic Industries Alliance (EIA, JEDEC) | 2 |
| 4.3 Department of Defense | 3 |
| 4.4 American Society for testing and Materials (ASTM) | 3 |
| 5 Terms and definitions | 3 |
| 6 Dry packing | 4 |
| 6.1 Requirements | 4 |
| 6.2 Drying of components before being sealed in MBBs | 4 |
| 6.3 Dry pack | 5 |
| 7 Drying | 8 |
| 7.1 Post exposure to factory ambient | 9 |
| 7.2 General considerations for baking | 9 |
| 8 Use | 10 |
| 8.1 Incoming bag inspection | 10 |
| 8.2 Floor life | 11 |
| 8.3 Safe storage | 11 |
| 8.4 Reflow | 11 |
| 8.5 Drying indicators | 12 |
| 8.6 Board rework | 13 |
| 9 Derating due to factory environmental conditions | 13 |

**STANDARD FOR HANDLING, PACKING, SHIPPING AND USE OF MOISTURE/REFLOW
SENSITIVE SURFACE MOUNT DEVICES**

Contents (concluded)

| | Page |
|--|------|
| Tables | |
| 1 Dry packing requirements | 4 |
| 2 Reference conditions for drying components that were exposed to conditions $\leq 60\%$ RH | 8 |
| 3 Default baking times used prior to dry-pack that were exposed to conditions $\leq 60\%$ RH | 8 |
| 4 Moisture classification level and floor life | 11 |
| 5 Recommended equivalent total floor life (days) | 14 |
| Figures | |
| 1 Typical dry pack configuration for moisture-sensitive packages in shipping tubes | 5 |
| 2 Sample humidity indicator card | 6 |
| 3 Moisture-sensitive identification label (Example) | 7 |
| 4 Moisture-sensitive caution label (Example) | 7 |

STANDARD FOR HANDLING, PACKING, SHIPPING AND USE OF MOISTURE/REFLOW SENSITIVE SURFACE MOUNT DEVICES

(From JEDEC Board Ballot JCB-99-04, formulated under the cognizance the IPC Plastic Chip Carrier Cracking Task Group, B-10a, and the JEDEC JC-14.1 Committee on Reliability Test Methods for Packaged Devices.)

1 Foreword

The advent of surface mount devices (SMDs) introduced a new class of quality and reliability concerns regarding package cracks and delamination. This document describes the standardized levels of floor life exposure for moisture/reflow-sensitive SMDs along with the handling, packing and shipping requirements necessary to avoid moisture/reflow-related failures. Companion documents, J-STD-020, define the classification procedure and JEP113 define the labeling requirements.

Moisture from atmospheric humidity will enter permeable packaging materials by diffusion and preferentially collect at the dissimilar material interfaces. Assembly processes, used to solder SMDs to printed circuit boards (PCBs), will expose the entire package body to temperatures higher than 200 °C. During solder reflow, the combination of rapid moisture expansion and materials mismatch can result in package cracking and/or delamination of critical interfaces within the package.

The solder reflow processes of concern are convection, convection/IR, infrared (IR), vapor phase (VPR), and hot air rework tools. The use of assembly processes that immerse the component body in molten solder are not recommended for most SMD components.

2 Purpose

The purpose of this document is to provide SMD manufacturers and users with standardized methods for handling, packing, shipping, and use of moisture/reflow sensitive SMDs. These methods are provided to avoid damage from moisture absorption and exposure to solder reflow temperatures that can result in yield and reliability degradation. By using these procedures, safe and damage-free reflow can be achieved, with the dry packing process, providing a minimum shelf life capability in sealed dry-bags of 12 months from the seal date.

3 Scope

3.1 Packages

3.1.1 This standard applies to all nonhermetic SMDs subjected to bulk solder reflow processes during PCB assembly, including plastic encapsulated packages and all other packages made with moisture-permeable polymeric materials (epoxies, silicones, etc.) that are exposed to the ambient air.

3.1.2 Hermetic components are not at risk and do not require moisture precautionary handling.

3 Scope (cont'd)

3.2 Assembly processes

3.2.1 This standard applies to bulk solder reflow assembly by convection, convection/IR, infrared (IR), and vapor phase reflow (VPR) processes. It does not apply to bulk solder reflow processes that immerse the component bodies in molten solder (e.g., backside wave solder). Such processes are not allowed for many SMDs and are not covered by the component qualifications standards used as a basis for this document.

3.2.2 This standard also applies to moisture sensitive components that are removed or attached singly by local ambient heating, i.e., "hot air rework."

3.2.3 This standard does not apply to components that are socketed and not exposed to solder reflow temperatures. Such components are not at risk and do not require moisture precautionary handling.

3.2.4 This standard does not apply to components in which only the leads are heated to reflow the solder, e.g., hand-soldering, hot bar attach of gull wing leads, and pin-thru-hole with backside wave solder. The heat absorbed by the package body from such operations is typically much lower than for bulk surface mount reflow or hot air rework, and moisture precautionary measures are typically not needed.

3.3 Reliability

3.3.1 The methods set forth in this specification ensure that adequate component reliability, as evaluated and verified by J-STD-020 and/or by JESD22-A113 plus environmental reliability testing, is maintained during and after the PCB assembly operation.

3.3.2 This specification does not address or ensure solder joint reliability of attached components.

4 Applicable documents

4.1 EIA JEDEC/Institute for Interconnecting and Packaging Electronic Circuits (IPC) & Joint Industry Standards

J-STD-020 Moisture/Reflow Sensitivity Classification for Nonhermetic Solid State Surface Mount Devices

4.2 Electronic Industries Alliance (EIA, JEDEC)

| | |
|-------------|--|
| EIA-541 | Packaging Material Standards for ESD Sensitive Items |
| EIA-583 | Packaging Material Standards for Moisture Sensitive Items |
| EIA-625 | Requirements for Handling Electrostatic Discharge Sensitive (ESD) Devices |
| JEP-113 | Symbol and Labels for Moisture Sensitive Devices |
| JESD22-A113 | Preconditioning of Nonhermetic Surface Mount Components Prior to Reliability Testing |