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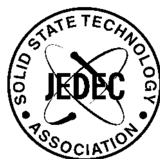
JOINT INDUSTRY STANDARD

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



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

3.2 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.