JEDEC STANDARD

Preconditioning of Nonhermetic Surface Mount Devices Prior to Reliability Testing

JESD22-A113H

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JEDEC SOLID STATE TECHNOLOGY ASSOCIATION

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TEST METHOD A113H

PRECONDITIONING OF NONHERMETIC SURFACE MOUNT DEVICES PRIOR TO RELIABILITY TESTING

Foreword

This document provides an industry standard test method for preconditioning packaged devices that is representative of a typical industry multiple solder reflow operation.

Introduction

The typical use of surface mount devices (SMD) involves subjecting the SMDs to elevated temperatures during board assembly, which, by itself or combined with moisture in the package can induce internal package damage that could be a reliability concern. Preconditioning of SMD packages is used to simulate the effects of board assembly prior to reliability testing. This allows reliability testing at the packaged device level on as shippable products with a board assembly simulation. During preconditioning, test samples are subjected to temperature cycling (optional), dry bake, moisture soaking, solder reflow simulation, flux, rinse, dry, and electrical test before reliability testing.

This test method references the reflow profiles stated in J-STD-020. If a packaged device is not able to withstand the full thermal profile as stated in J-STD-020, J-STD-075 should be used to evaluate and classify process sensitivities.

TEST METHOD A113H

PRECONDITIONING OF NONHERMETIC SURFACE MOUNT DEVICES PRIOR TO RELIABILITY TESTING

(From JEDEC Board ballot JCB-16-52, formulated under the cognizance of the JC-14.1 Subcommittee on Reliability Test Methods for Packaged Devices.)

1 Scope

This Test Method establishes an industry standard preconditioning flow for nonhermetic solid state SMDs that is representative of a typical industry multiple solder reflow operation. These SMDs should be subjected to the appropriate preconditioning sequence of this document by the manufacturer prior to being submitted to specific in-house reliability testing (qualification and reliability monitoring) to evaluate long term reliability (which might be impacted by solder reflow).

NOTE For good correlation of results between moisture/reflow-induced stress sensitivity testing (per J-STD-020 and JESD22-A113) and actual reflow conditions used, identical temperature measurements by both the SMD manufacturer and the board assembler are necessary. Therefore, it is recommended that the package temperature at the top center of the package be determined during assembly board reflow profile setup, to ensure that it does not exceed the evaluation temperature based on package thickness and volume as stated in J-STD-020.

2 Normative reference

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

IPC/JEDEC J-STD-033, *Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices*

ECIA/IPC/JEDEC J-STD-075, *Classification of Non-IC Electronic Components for Assembly Processes*

JESD22-A104, *Temperature Cycling*

JESD625, *Requirements for Handling Electrostatic Discharge Sensitive (ESD) Devices*

JESD47, *Stress-Test-Driven Qualification of Integrated Circuits*

JESD94, *Application Specific Qualification Using Knowledge Based Test Methodology*