IPC/JEDEC J-STD-020F

Moisture/Reflow Sensitivity Classification for Non-hermetic Surface Mount Devices (SMDs)

A joint standard developed by the IPC Plastic Chip Carrier Cracking Task Group (B-10a) and the JEDEC JC-14.1 Subcommittee on Reliability Test Methods for Packaged Devices.

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Users of this standard are encouraged to participate in the development of future revisions.

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MOISTURE/REFLOW SENSITIVITY CLASSIFICATION FOR NON-HERMETIC SURFACE MOUNT DEVICES (SMDS)

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LONG-TERM STORAGE GUIDELINES FOR ELECTRONIC SOLID-STATE WAFERS, DICE, AND DEVICES

(From JEDEC Board Ballot JCB-22-52, formulated under the cognizance of the JC-14.1 Committee on Reliability Test Methods for Packaged Devices.)

1 Purpose

The purpose of this standard is to identify the classification level of non-hermetic SMDs designed for surface mount assembly that are sensitive to moisture-induced stress so that they can be properly packaged, stored, and handled to avoid damage during assembly solder reflow attachment and/or repair operations.

This standard may be used to determine what classification level should be used for non-hermetic SMD qualification. Passing the criteria in this test method is not sufficient by itself to provide assurance of long-term reliability. The Moisture Sensitivity Levels (MSLs) rating generated for an SMD by this document is utilized to determine the soak conditions for preconditioning as per JESD22-A113 and how the SMD can be properly packaged, stored, and handled to avoid damage during assembly solder reflow attachment and/or repair operations as per J-STD-033.

For IC devices that may be process sensitive, please refer to J-STD-075 to determine if a PSL (Process Sensitivity Level) classification is required.

2 Scope

This classification procedure applies to all non-hermetic SMDs, which, because of absorbed moisture, could be sensitive to damage during solder reflow. The term SMD as used in this document means plastic encapsulated devices and other devices made with moisture-permeable materials designed for surface mount assemblies. The MSL classification levels are intended to be used by SMD producers to inform users (board assembly operations) of the level of moisture sensitivity of their SMDs~~,~~ and by board assembly operations to ensure that proper handling precautions are applied to moisture/reflow sensitive devices. If no major changes have been made to a previously qualified SMD, this method may be used for reclassification according to 4.3.

This standard cannot address all possible device, board assembly and product design combinations. However, the standard does provide a test method and criteria for commonly used technologies. Where uncommon or specialized devices or technologies are necessary, the development of the MSL rating should include customer and device supplier involvement and the criteria should include an agreed definition of product acceptance.

SMDs classified to a given moisture sensitivity level by using procedures or criteria defined within any previous version of J-STD-020 do not need to be reclassified to the current revision unless a change in classification level or a higher peak classification temperature is desired.

If the procedures in this document are used on packaged devices that are not included in this specification's scope, the failure criteria for such packages must be agreed upon by the device supplier and their end user.