

# JEDEC STANDARD

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## Solderability

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### JESD22-B102E

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JEDEC SOLID STATE TECHNOLOGY ASSOCIATION



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## TEST METHOD B102E SOLDERABILITY

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## TEST METHOD B102E SOLDERABILITY

(From JEDEC Board Ballot JCB-04-77 and JCB-07-79, formulated under the cognizance of the JC-14.1 Subcommittee on Reliability Test Methods for Packaged Devices.)

### 1 Scope

This test method provides optional conditions for preconditioning and soldering for the purpose of assessing the solderability of device package terminations. It provides procedures for dip & look solderability testing of through hole, axial and surface mount devices and a surface mount process simulation test for surface mount packages.

The purpose of this test method is to provide a means of determining the solderability of device package terminations that are intended to be joined to another surface using lead- (Pb-) containing or Pb-free solder for the attachment.

### 2 General summary

#### 2.1 Preconditioning

An accelerated precondition is generally used before Solderability testing to simulate package storage. The following are options for preconditioning. The user and supplier need to agree on the precondition requirements.

**Table 1 — Precondition conditions for solderability testing**

| Condition | Precondition type  | Exposure time         | Use guidelines                                                                                          |
|-----------|--------------------|-----------------------|---------------------------------------------------------------------------------------------------------|
| A         | Steam Precondition | 1 Hour $\pm$ 5 min.   | Intended for nontin and nontin-alloy leadfinishes that will be soldered after an extended storage time. |
| B         |                    | 4 Hours $\pm$ 10 min  | Optional legacy condition.                                                                              |
| C         |                    | 8 Hours $\pm$ 15 min  | Intended for tin and tin-alloy leadfinishes that will be soldered after an extended storage time.       |
| D         |                    | 16 Hours $\pm$ 30 min | Optional legacy condition.                                                                              |
| E         | 150 °C Dry Bake    | 16 Hours $\pm$ 30 min | Alternative to steam precondition.                                                                      |

## 2 General summary (cont'd)

### 2.2 Solderability testing

This test standard describes methods by which package terminations may be evaluated for solderability. Typically Pb containing terminations are evaluated using SnPb solderability test conditions and Pb-free terminations use Pb-free test conditions. If Pb-free terminations are to be used in an SnPb solder process (backward compatibility) then they should be evaluated using test parameters consistent with standard SnPb SMT reflow conditions. The backward compatibility test does not apply to Pb-free BGA type packages.

**Method 1 - Dip and Look Test:** This test is for leaded and leadless terminations.

**Method 2 - Surface Mount Process Simulation Test:** This method may be used for SMD packages as an alternative to the dip and look test method 1.

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## 3 Apparatus

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### 3.1 Precondition equipment

#### 3.1.1 Steam precondition equipment

A noncorrodible container and cover of sufficient size to allow the placement of specimens inside the vessel shall be used. The specimens shall be placed such that the lowest portion of the specimen is a minimum of 38 mm (1.5 inches) above the surface of the water. Equipment should be designed to minimize steam condensate from dripping onto the test specimens. A suitable method of supporting the specimens shall be improvised using noncontaminating material.

#### 3.1.2 High temperature bake equipment

A bake oven of sufficient size and capable of continuously maintaining  $150\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$  temperature control shall be used.

### 3.2 Solder pot

A static solder pot of sufficient size to accommodate the test specimens containing at least 8.9 N (2 lb) of solder shall be used. The apparatus shall be capable of maintaining the solder at the specified temperature within  $\pm 5\text{ }^{\circ}\text{C}$ .