

# **JEDEC STANDARD**

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## **Salt Atmosphere**

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### **JESD22-A107B**

(Revision of JESD22-A107-A)

**JANUARY 2004**

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**JEDEC SOLID STATE TECHNOLOGY ASSOCIATION**



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## **TEST METHOD A107B SALT ATMOSPHERE**

(From JEDEC Board Ballot JCB-03-62, formulated under the cognizance of JC-14.1 Subcommittee on Reliability Methods for Packaged Devices.)

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### **1 Scope**

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This salt Atmosphere test is conducted to determine the resistance of solid state devices to corrosion. It is an accelerated test that simulates the effects of severe seacoast atmosphere on all exposed surfaces.

The salt atmosphere test is considered destructive. It is intended for lot acceptance, process monitor, and qualification testing.

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### **2 Apparatus**

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The following items are required for performing the salt atmosphere test:

- a) Temperature-controlled exposure chamber with suitable non-corrodible rack for supporting devices.
- b) Salt solution reservoir. (The salt used shall be sodium chloride containing, on a dry basis, not more than 0.1% of sodium iodide and not more than 0.3% of total impurities. Distilled, or other water used, should not contain more than 200 parts per million of total solids. The solution should be kept free from solids by filtration or decantation.)
- c) Means for atomizing the salt solution, including suitable nozzles and compressed air supply.
- d) Means for humidifying the air at a temperature above the chamber temperature.
- e) Magnifier, 10X to 20X.

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### **3 Procedure**

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After initial conditioning in accordance with paragraph 3.1, the devices shall be placed in the test chamber in such a way that they do not contact each other or shield each other from the freely settling fog and that corrosion product and condensate from one specimen does not fall on another. A salt atmosphere fog shall be maintained in the test chamber for the time specified by the required test condition listed in paragraph 3.2. During the test, the chamber shall be held at a temperature of 35 °C +3 °C/-0 °C. The deposit in the test area shall be 30 +/- 10 grams per square meter per 24 hours. The pH of the salt solution shall be maintained between 6.0 and 7.5 when measured at 95 °F minimum (35 °C minimum).

### 3 Procedure (cont'd)

#### 3.1 Initial conditioning

When initial conditioning is specified, the device leads shall be subjected to a stress in accordance with test condition B of JESD22-B105 "Lead Integrity" before the specimens are mounted for the salt atmosphere test. When the sample devices being subjected to the salt atmosphere have already received the required initial conditioning, as part of another test employing the same sample devices, the lead bend need not be repeated.

#### 3.2 Length of test

Calling out a test condition letter from Table 1 shall specify the minimum duration of exposure of the salt atmosphere test. Unless otherwise specified, test condition "A" shall apply.

**Table 1 — Minimum duration of exposure**

Test Condition	Length of Test
A	24 hours
B	48 hours
C	96 hours
D	240 hours

#### 3.3 Cleaning

Upon completion of the test, unless otherwise specified, the devices' deposits shall be prepared in the following manner:

Salt deposits shall be removed by a gentle wash or dip in water not warmer than 37.8 °C (100 °F) and a light brushing using a soft hair or plastic bristle brush.

#### 3.4 Examination and Failure Criteria

A device shall be considered as having failed if:

- a) Specified markings are illegible when viewed under normal room lighting with a magnification of 1X to 3X.
- b) There is evidence of corrosion over more than 5% of the area of the finish or base metal of any package element (e.g., lid, lead, or cap), missing or broken leads, excessive lead-to-lead leakage (above that specified in the appropriate specification), or any corrosion that completely crosses the element when viewed with a magnification of 10X to 20X. In this specification, corrosion is defined as actual damage to the structure of the material or finish. Stains or discoloration, including those associated with spots of corrosion, are not to be considered as part of the damaged area. Corrosion at the tip of the leads (and corrosion product resulting from such corrosion) shall be disregarded.

NOTE The finish shall include the package and the entire exposed lead area from meniscus to the lead tip (excluding the sheared-off tip itself) and all other exposed metal surfaces.

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**4 Summary**

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The following details shall be specified in the applicable procurement document:

- a) Test condition, if other than Test Condition “A” (see 3.2).
- b) Cleaning procedure, if different from 3.3.
- c) Failure criteria, if different from 3.4.
- d) Required quality level or sampling plan.
- e) Initial conditioning, if required.





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