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EIA STANDARD

TP-59A

LOW TEMPERATURE TEST PROCEDURE FOR ELECTRICAL CONNECTORS AND SOCKETS

EIA/ECA-364-59A

(Revision of EIA-364-59)

AUGUST 2006

Electronic Components, Assemblies & Materials Association

THE ELECTRONIC COMPONENTS SECTOR OF THE ELECTRONIC INDUSTRIES ALLIANCE

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(From Standards Proposal No. 5111-A formulated under the cognizance of the CE-2.0 National Connector Standards Committee.

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TEST PROCEDURE No. 59A

LOW TEMPERATURE TEST PROCEDURE FOR ELECTRICAL CONNECTORS AND SOCKETS

(From EIA Standards Proposal No. 5111, formulated under the cognizance EIA CE-2.0 Committee on National Connector Standards, and previously published in EIA-364-59.)

1 Introduction

1.1 Scope

This standard establishes a test method for exposing electrical connectors and sockets to low temperature for a specified duration.

1.2 Object

The object of this test procedure is to provide a standardized method of exposing electrical connectors and sockets to sub-ambient temperatures. Measurements and observations made before, during and after the exposure shall be specified in the referencing document and may assess functionality of connectors and sockets at low temperatures.

2 Test resources

2.1 Equipment

2.1.1 A suitable chamber shall be used that will maintain, monitor and record the test temperature to the tolerance and for the duration specified in the referencing document. The chamber temperature measurement shall be made in a manner that will indicate the specimen exposure temperature rather than the chamber temperature.

2.1.2 Forced air circulation and baffling devices may be used to maintain homogeneous conditions.

2.1.3 The chamber size or capacity shall be such that the specimens under test shall be capable of dissipating through air convection currents, any internally generated specimen heat. The specimens shall be arranged in the chamber in a manner that allows all to maintain the same temperature.

3 Test specimen

3.1 Description

A specimen shall consist of a mated assembly, unless otherwise specified in the referencing document.

3.2 Preparation

Unless otherwise specified in the referencing document the specimens shall be wired, mated and mounted in the normal manner. The method of fixturing, when specified in the referencing document, shall be such that the normal temperature dissipation, absorption, conduction reflection characteristics of the specimen is not infringed.

4 Test procedure

4.1 Test temperature

The specimens shall be subjected to the test temperature as specified in the referencing document. Table 1 gives recommended test temperatures that may be specified.

Table 1 – Test temperature

Condition	Temperature	Tolerance
1	-65° C	±3° C
2	-55° C	±3° C
3	-40° C	±3° C
4	-25° C	±3° C
5	-10° C	±3° C
6	+5° C	±3° C

4.2 Test duration

The specimens shall be subjected to the test durations as specified in the referencing document. Table 2 gives recommended test durations that may be specified.

Table 2 – Test duration

Condition	Exposure time	Tolerance
A	2 hours	-0, +0.25 hour
B	16 hours	-0, +1.0 hour
C	72 hours	-0, +5.0 hours
D	96 hours	-0, +5.0 hours
E	240 hours	-0, +5.0 hours
F	500 hours	-0, +10.0 hours
G	1000 hours	-0, +10.0 hours

4.3 Specimen exposure

4.3.1 The chamber shall be at room ambient temperature when the specimens are installed.

4.3.2 If specified in the referencing document, the electrical load shall be connected and proper operation verified.

4.3.3 The temperature within the chamber shall be adjusted and stabilized at the specified level. Unless otherwise specified in the referencing document the rate of temperature change within the chamber shall not exceed 1° C per minute, averaged over 5 minutes.

4.3.4 After the chamber temperature has stabilized, it shall be maintained for the length of time specified in the referencing document.

4.3.5 At the end of this period, the electrical load (if used) shall be disconnected, the specimens shall be left in the chamber and the temperature shall be gradually increased to room ambient temperature. The rate of temperature change within the chamber shall not exceed 1° C per minute, averaged over 5 minutes.

4.3.6 The test specimens shall be removed from the chamber. If necessary, unmated specimens may be carefully shaken by hand to remove water droplets that may have condensed on the specimen exterior surfaces. Mated or unmated specimens may be blotted with a towel or gently blasted with air. If an air blast is used as an aid to drying, the air shall be oil free, clean and dry. Care shall be taken not to disturb mated contact interfaces.

4.3.7 Unless otherwise specified in the referencing document, the specimens shall be examined visually and measured as specified in the referencing document, after 1 hour minimum, but not more than 2 hours after removal from the chamber.

5 Details to be specified

The following details shall be specified in the referencing document:

5.1 Number of specimens to be tested

5.2 Test temperature condition, see table 1

5.3 Test duration condition, see table 2

5.4 Dwell time at ambient temperature before measurements, if other than specified in 4.3.7.

5.5 Electrical load including voltage, current and wiring configuration, if specified

5.6 Special fixturing and mounting, if required

5.7 Other special conditions and requirements

6 Test documentation

Documentation shall contain the details specified in clause 5, with any exceptions, and the following:

6.1 Title of test

6.2 Specimen description, including fixturing if applicable

6.3 Test equipment used, and date of last and next calibration

6.4 Name of operator and date of test

EIA Document Improvement Proposal

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Revision History

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A	SP-5111	Revised, retyped and reformatted.