



ANSI/EIA-364-17B-1999
Approved: April 23, 1999

EIA-364-17B

EIA STANDARD

TP-17B

Temperature Life with or without Electrical Load Test Procedure for Electrical Connectors and Sockets

EIA-364-17B

(Revision of EIA-364-17A)

JUNE 1999

ELECTRONIC INDUSTRIES ALLIANCE

**Electronic Components, Assemblies, Equipment & Supplies
Association**



Electronic Components, Assemblies, Equipment & Supplies Association
A Sector of the Electronic Industries Alliance

NOTICE

EIA Engineering Standards and Publications are designed to serve the public interest through eliminating misunderstandings between manufacturers and purchasers, facilitating interchangeability and improvement of products, and assisting the purchaser in selecting and obtaining with minimum delay the proper product for his particular need. Existence of such Standards and Publications shall not in any respect preclude any member or nonmember of EIA from manufacturing or selling products not conforming to such Standards and Publications, nor shall the existence of such Standards and Publications preclude their voluntary use by those other than EIA members, whether the standard is to be used either domestically or internationally.

Standards and Publications are adopted by EIA in accordance with the American National Standards Institute (ANSI) patent policy. By such action, EIA does not assume any liability to any patent owner, nor does it assume any obligation whatever to parties adopting the Standard or Publication.

This standard is based upon the major technical content of International Electrotechnical Commission standard 512-5, Test 9b, electrical load and temperature, 1992-08. Method B conforms in all essential respects to this IEC standard.

This Standard does not purport to address all safety problems associated with its use or all applicable regulatory requirements. It is the responsibility of the user of this Standard to establish appropriate safety and health practices and to determine the applicability of regulatory limitations before its use.

(From Standards Proposal No. 3752, formulated under the cognizance of the CE-2.0 National Connector Standards Committee.)

Published by

©ELECTRONIC INDUSTRIES ALLIANCE 1999
Engineering Department
2500 Wilson Boulevard
Arlington, VA 22201

**PRICE: Please refer to the current
Catalog of EIA, Electronic Industries Alliance Standards and Engineering Publications
or call Global Engineering Documents, USA and Canada (1-800-854-7179)
International (303-397-7956)**

All rights reserved
Printed in U.S.A.

PLEASE!

DON'T VIOLATE
THE
LAW!

This document is copyrighted by the EIA and may not be reproduced without permission.

Organizations may obtain permission to reproduce a limited number of copies through entering into a license agreement. For information, contact:

Global Engineering Documents
15 Inverness Way East
Englewood, CO 80112-5704 or call
U.S.A. and Canada 1-800-854-7179, International (303) 397-7956

CONTENTS

Clause		Page
1	Introduction	1
1.1	Scope	1
1.2	Atmospheric pressure	1
2	Test resources	1
2.1	Equipment	1
3	Test specimen	1
3.1	Preparation	1
4	Test procedure	2
4.1	Method A, without electrical load	2
4.2	Method B, with electrical load for connectors	2
4.3	Method C, with electrical load	3
4.4	Test duration	4
4.5	Examination	5
5	Details to be specified	5
6	Test documentation	6
Table		
1	Test chamber temperature without electrical load	3
2	Test chamber temperature with electrical load	4
3	Length of test	4

(This page left blank)

TEST PROCEDURE No. 17B

TEMPERATURE LIFE WITH OR WITHOUT ELECTRICAL LOAD TEST PROCEDURE
FOR
ELECTRICAL CONNECTORS AND SOCKETS

(From EIA Standards Proposal No. 3752, formulated under the cognizance EIA CE-2.0 Committee on National Connector Standards, and previously published in EIA Recommended Standard RS-364 as TP-17A.)

1 Introduction

1.1 Scope

This standard establishes a test method to determine the ability of an electrical connector and sockets to withstand elevated temperatures with or without electrical loading.

1.2 Atmospheric pressure

This procedure for elevated temperature is performed at ambient pressure. High altitude and space vacuum applications may require testing at reduced pressure as required by the referencing document.

2 Test resources

2.1 Equipment

A suitable air circulating chamber and equipment shall be used that will maintain, monitor and record the test temperature to the tolerance and for the duration specified. For method B and C the chamber size or capacity shall be such that the connector under test shall be capable of dissipating the internally generated (I^2R) connector heat.

3 Test specimen

3.1 Preparation

The specimen shall be fully assembled, mated with the specified number of contacts. Proper wire type, size, and preparation, sealing plugs, other hardware, and test boards shall be as specified in the referencing document.

3.1.1 Without electrical load

Unless otherwise specified in the referencing document, the specimens, test boards, wires, and fixtures shall be normally positioned in the chamber so that there will be no restriction of the air flow.

3.1.2 With electrical load

Unless otherwise specified in the referencing document, the specimens shall have the same size contacts wired in a series circuit. The test specimens shall be suitably fitted with temperature sensing device(s), wired and mounted as specified in the referencing document. See EIA-364-70 for further instructions and spacing requirements. The chamber temperature measurements shall be made in a manner that will indicate the connector exposure temperature rather than the chamber source temperature.

4 Test procedure

4.1 Method A, without electrical load

The connector specimen shall be subjected to the chamber temperature specified in table 1 for the test condition number and test duration specified in the referencing document; see 4.3.

4.2 Method B, with electrical load for connectors

4.2.1 The test specimen rated current shall be applied until stabilization is reached.

4.2.2 The chamber temperature shall be increased until the specified test temperature is obtained (temperature rise + chamber temperature = specified test temperature).

4.2.3 The chamber temperature shall be recorded and maintained for the specified duration; see 4.3.

Table 1 - Test chamber temperature without electrical load

Test condition	Chamber temperature (T) and tolerance (maximum operating temperature)	
	C	F
1	55 2	131 3.6
2	70 2	158 3.6
3	85 2	185 3.6
4	105 2	221 3.6
5	125 2	257 3.6
6	175 5	347 9
7	200 5	392 9
8	350 tolerance as specified	662 tolerance as specified
9	500 tolerance as specified	932 tolerance as specified
10	150 5	302 9
11	65 ± 2	149 ± 3.6

4.3 Method C, with electrical load

The test specimen shall be placed in the test chamber that has stabilized at a connector exposure temperature and tolerance specified in table 2.

4.3.1 A dc current shall be applied until the maximum connector internal temperature specified in table 2 is obtained.

4.3.2 The dc current of the test specimen shall not be exceeded nor shall the temperature rating of the test specimen be exceeded.

4.3.3 If the rated test current does not result in the maximum internal temperature to be exceeded, the chamber temperature shall be increased until the maximum internal temperature is achieved.

4.3.4 The applicable test current and/or chamber temperature shall be recorded and maintained for the specified test duration; see 4.3.

Table 2 - Test chamber temperature with electrical load

Test condition	Connector exposure temperature and tolerance		Connector internal temperature, maximum	
	C	F	C	F
1	55 2	131 3.6	65	149
2	70 2	158 3.6	84	183
3	85 2	185 3.6	102	216
4	105 2	221 3.6	125	257
5	125 2	257 3.6	150	302
6	175 5	347 9	206	402
7	200 5	392 9	238	460
8	350 tolerance as specified	662 tolerance as specified	400	752
9	500 tolerance as specified	932 tolerance as specified	575	1067

4.4 Test duration

The duration of the test (see table 3) shall be specified in the referencing document. The commonly used duration for specimens are 250 hours, 500 hours, 1000 hours, and 2000 hours.

Table 3 - Length of test

Test time condition	Hours
A	96
B	250
C	500
D	1000
E	1500
F	2000
G	3000
H	5000

4.5 Examination

At the conclusion of the test, the specimen(s) shall be examined for any of the following:

- 4.5.1 Dimensional changes in excess of specified limits.
- 4.5.2 Hardening or softening of dielectric materials in excess of specified limits.
- 4.5.3 Opening of seals.
- 4.5.4 Cracking or crazing or delamination of components or finishes.
- 4.5.5 Fusing or seizure of mating connectors or components.
- 4.5.6 Leakage of potting materials, as specified.

The above conditions shall be judged on their effect on the continued successful operation of the specimen and the ability of the specimen to meet the test requirements specified in the referencing document.

5 Details to be specified

The following details shall be specified in the referencing document:

- 5.1 Test method letter and condition number, and temperature tolerance if applicable
- 5.2 Location of temperature sensing device(s), when applicable
- 5.3 Specimen description
- 5.4 Number of specimens to be tested
- 5.5 Length of test
- 5.6 Rated current and maximum operation temperature for method B and C

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 Test equipment used, and date of last and next calibration

6.3 Test procedure

6.4 Values and observations

6.4.1 Visual examination

6.4.2 Monitoring measurements as required by the referencing document

6.4.3 Current required to maintain specified internal temperature, method C only

6.7 Name of operator and date of test

EIA Document Improvement Proposal

If in the review or use of this document, a potential change is made evident for safety, health or technical reasons, please fill in the appropriate information below and mail or FAX to:

Electronic Industries Alliance
Engineering Department – Publications Office
2500 Wilson Blvd.
Arlington, VA 22201
FAX: (703) 907-7501

Document No.	Document Title:
Submitter's Name:	Telephone No.: FAX No.: e-mail:
Address:	
Urgency of Change: Immediate: <input type="checkbox"/> At next revision: <input type="checkbox"/>	
Problem Area: a. Clause Number and/or Drawing: b. Recommended Changes: c. Reason/Rationale for Recommendation:	
Additional Remarks:	
Signature:	Date:
FOR EIA USE ONLY	
Responsible Committee:	
Chairman:	
Date comments forwarded to Committee Chairman:	

