



ANSI/EIA-364-38B-1999
Approved: April 23, 1999

EIA-364-38B

EIA STANDARD

TP-38B

Cable Pull-Out Test Procedure for Electrical Connectors

EIA-364-38B

(Revision of EIA-364-38A)

JULY 1999

ELECTRONIC INDUSTRIES ALLIANCE

**Electronic Components, Assemblies, Equipment & Supplies
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This standard is based upon the major technical content of International Electrotechnical Commission standard 512-9, test 17c, cable clamp resistance to cable pull (tensile), 1992-04. It conforms in all essential respects to this IEC standard.

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(From Standards Proposal Number 3987, formulated under the cognizance of the CE-2.0 National Connector Standards Committee.)

Published by

8ELECTRONIC INDUSTRIES ALLIANCE 1999
Engineering Department
2500 Wilson Boulevard
Arlington, VA 22201

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TEST PROCEDURE No. 38B
CABLE PULL-OUT TEST PROCEDURE
FOR
ELECTRICAL CONNECTORS

(From EIA Standards Proposal No. 3987, formulated under the cognizance EIA CE-2.0 committee on National Connector Standards.)

1 Introduction

1.1 Scope

This standard establishes a test method to determine the axial tensile load that can be applied to a mated pair of connectors and the holding effect of a connector cable clamp without causing any detrimental effects upon the cable or connector when subjected to inadvertent axial tensile loads.

1.2 Object

The object of this test procedure is to detail a standard method to determine the holding effect of a connector cable clamp without causing any detrimental effects upon the cable or connector components when the cable is subjected to inadvertent axial tensile loads.

1.3 Normative reference

EIA-364-46: Continuity test procedure for electrical connectors

2 Test resources

2.1 Equipment

2.1.1 An apparatus capable of applying gradual axial loads along a connector and a cable axis with devices for holding or clamping a cable. The apparatus shall be capable of applying the tensile force(s) indicated in table 1.

2.1.2 Force gage or equivalent with a full scale accuracy of ± 2 percent.

2.1.3 A detector capable of detecting discontinuities of one microsecond or longer.

3 Test specimen

3.1 Description

The test specimen shall consist of a connector made up of a receptacle, and plug, or mated plug and receptacle, with a cable clamp and specified cable or accessories, as applicable.

3.2 Preparation

3.2.1 Method A, not terminated

3.2.1.1 The cable shall be securely held in the connector cable clamp in accordance with the referencing document. Visually inspect for damage after assembly.

3.2.1.2 Unless otherwise specified, the specimen shall not be terminated.

3.2.1.3 When it is required to determine the linear motion of the cable when subjected to an axial tensile load, a dot of contrasting color or other distinguishable mark shall be made approximately 2.5 cm (1 in) from where the cable exits from the clamping mechanism, unless otherwise specified in the referencing document.

3.2.2 Method B, terminated

3.2.2.1 The cable shall be securely held in the connector clamp and a visual inspection for harmful effects shall be made of the cable at the clamp.

3.2.2.2 When it is required to determine the linear motion of the cable when subjected to an axial tensile load, a dot of contrasting color or other distinguishable mark shall be made approximately 2.5 cm (1 in) from where the cable exits from the clamping mechanism, unless otherwise specified in the referencing document.

3.2.2.3 The test specimen cable leads shall be terminated to contacts. The specimen(s) shall be wired in series circuit(s) to detect any circuitry discontinuity during test, per EIA-364-46.

4 Test procedure

4.1 Method A, not terminated

4.1.1 Attach each end of the test specimen to the test apparatus.

4.1.2 Apply the load specified in table 1 at a rate of 89 newtons per minute \pm 4 newtons per minute (20 pounds per minute \pm 1 pound per minute) and maintain specified load for 1 hour, unless otherwise specified.

Table 1 - Cable pull-out test loads

Test condition	Cable pull-out force	
	Newtons	Pounds force
E	111	25
A	222	50
B	333	75
C	445	100
D	556	125

4.2 Method B, terminated

4.2.1 Attach each end of the test specimen to the test apparatus.

4.2.2 Apply the specified load specified in table 1 at a rate of 89 newtons per minute \pm 4 newtons per minute (20 pounds per minute \pm 1 pound per minute) and maintain specified load for one hour, unless otherwise specified.

4.2.3 A maximum of 100 milliamperes of current shall pass through the contacts to detect any circuitry discontinuity during test per EIA-364-46.

4.3 Failures

Potential modes of failure resulting from this test include:

4.3.1 Cable jacket damage.

4.3.2 Conductor insulation and conductor damage.

4.3.3 Cable clamp failure.

4.3.4 Cable disengagement from the clamp or cable pull-out in excess of the allowed value.

4.3.5 Cable-to-connector seal damage.

4.3.6 No discontinuities are allowed, if applicable.

4.3.7 Distortion or bending of metal parts on the connector.

4.3.8 Excessive linear motion, when specified.

5 Details to be specified

The following details shall be specified in the referencing document:

5.1 Type of cable to be used

5.2 Cable clamping method

5.3 Maximum allowable linear motion of the cable with respect to the clamp when specified

5.4 Test method and test condition letter, see table 1

5.5 Visual examination requirements for cable clamps and connectors

5.6 For method B duration of discontinuity monitoring shall be specified, if other than 1 microsecond.

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

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

6.4 Test procedure

6.5 Test condition; see table 1

6.6 Values and observations

6.7 Name of operator and date of test

EIA Document Improvement Proposal

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