



ANSI/EIA-364F-2014
Approved: August 15, 2014

EIA-364F

EIA STANDARD

Electrical Connector/Socket Test Procedures Including Environmental Classifications

EIA-364F
(Revision of EIA-364E)

August 2014



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(From Standards Proposal No. 5329, formulated under the cognizance of the CE-2.0 Committee on EIA National Connector and Sockets Standards.)

Published by

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EIA Standards & Technology Department
2214 Rock Hill Road, Suite 265
Herndon, VA 20170

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**ELECTRICAL CONNECTOR/SOCKET
TEST PROCEDURES
INCLUDING ENVIRONMENTAL CLASSIFICATIONS**

(From EIA Standards Proposal No. 5329, formulated under the cognizance EIA CE-2.0 Committee on National Connector Standards, and previously published in EIA-364E.)

1 Introduction

1.1 Scope

This standard establishes a recommended minimum test sequence and test procedures for electrical connectors and sockets. This standard also includes administrative details and guidelines for connector/socket qualification and an annex for pertinent technical information.

1.2 Classifications

1.2.1 It is intended that the environmental classifications as established provide a guide to develop test sequences that are intended to assure proper evaluation for each classification.

1.2.2 Classes according to the intended application are defined in table 1. The classes cover a broad range of environmental conditions starting with controlled indoor environments and progressing to more severe environments, e.g., vehicular, marine and airborne applications. Four levels of building and room environments are listed in order to differentiate between significant control techniques that may or may not be present (temperature, humidity and/or filtering techniques).

1.2.3 Environmental conditions for each class are shown in table 2. The temperature and humidity levels reflect the expected maximum equipment operating conditions.

1.3 Applicable documents

Standard test procedures of the EIA-364 series shall be applied as specified herein.

Table 1 – Class definitions

Class number	Definition
General	
G1.0	Year-round filtered air conditioning with humidity control
G1.1	Year-round air conditioning (non-filtered) with humidity control
G1.2 (see note)	Air conditioning (non-year-round) with no humidity control
G1.3	Without air conditioning or humidity control but with normal heating and ventilation
G2.0	With normal ventilation but uncontrolled heating and humidity
G2.1	Year-round exposure to heat, cold, moisture, industrial pollutants, and fluids
G3.0	Outdoor environment with moisture, marine and/or weathering conditions
Application specific	
A1.0	Aircraft environment (uncontrolled)
A2.0	Automotive (uncontrolled)
A3.0	Test sockets
A4.0	Burn-in sockets
A5.0	Space applications
NOTE — For specific environmental test methodology to assess the performance of electrical connectors and sockets used in business office applications that are no more severe than class number G1.2; see EIA-364-1000.	

Table 2 – Equipment operating environmental conditions

Class number	Temperature (see note 1)	Relative humidity (see note 3)	Marine atmosphere	Harsh environment
G1.0	+25 °C to +65 °C	40% to 60%	No	No
G1.1	+25 °C to +65 °C	40% to 75%	No	Possible
G1.2 (see note 2)	+25 °C to +85 °C	85% maximum	No	Yes
G1.3	+15 °C to +85 °C	95% maximum	No	Yes
G2.0	+5 °C to +85 °C	95% maximum	No	Yes
G2.1	-40 °C to +100 °C	95% maximum	Possible	Yes
G3.0	-55 °C to +125 °C	95% maximum	Yes	Yes
A1.0	-65 °C to +200 °C	95% maximum	Yes	Yes
A2.0	-55 °C to +150 °C	95% maximum	Yes	Yes
A3.0	+15 °C to +35 °C	85% maximum	No	Possible
A4.0	-65 °C to +200 °C	85% maximum	No	Possible
A5.0	-65 °C to +200 °C	No	No	Possible

NOTES

- 1 The temperature limits as shown above are considered maximum limits. If the application within a classification requires limits other than those shown, said limits shall be specified in the referencing document.
- 2 For specific environmental test methodology to assess the performance of electrical connectors and sockets used in business office applications that are no more severe than class number G1.2; see EIA-364-1000.
- 3 The values indicated are test conditions and not operating conditions.

2 Requirements

2.1 Qualification

Qualification sequences and severity levels shall be invoked by the referencing document. The referencing document shall reference the applicable class and the specific test sequences to be used for product qualification.

2.1.1 Qualification of a connect/socket series may be established by similarity through testing parts representing the maximum size or as defined by the qualifying agency. A series includes connectors/sockets and contacts of identical design, spacing and configuration.

2.1.1.1 Similarity shall be granted for all sizes up to that level to which testing has been performed. Specimens for all sizes for which similarity is desired shall be submitted at the time of qualification.

2.1.1.2 Qualified contacts which have the same physical dimensional configuration, base material, plating type and thickness, material thickness in the engagement area except that the termination area has been changed (e.g. crimp, solder, IDC, etc.) shall be qualified with testing pertinent to the termination technique involved.

2.1.2 Following a connector/socket qualification, the manufacturer shall make no design changes, substitutions, material changes or process changes that affect form, or function, without full or partial requalification.

2.1.2.1 Requalification may consist of only those tests pertinent to the specific attributes that may be affected by said changes.

2.1.3 To successfully qualify or requalify a connector/socket series, test samples shall meet all the requirements as specified within the specified test groups. Deviation from the specified requirements may be granted only by the qualifying agency.

2.1.4 To successfully qualify, each specimen shall pass all the test requirements as specified for each test in the sequences indicated. No defects shall be allowed.

3 Qualification procedure

3.1 Test sequence

3.1.1 The test specimens shall be subjected to the test sequence as shown in figure 1. The test sequence establishes the order of exposure to the environmental conditions, and the subsequent test parameters measured to determine adequate performance for each connector/socket class.

3.1.2 Specific tests may be added or deleted from the recommended sequence, supplemental and/or termination tests contingent on the specific application.

3.2 Specimen size

3.2.1 The sample size shall be as specified in the referencing document. If not specified, each test group shall consist of the quantity of the test specimens shown in figure 1. Each specimen consisting of both mated halves with a full complement of contacts and shall include applicable hardware when appropriate.

3.2.2 The referencing document shall specify the number of data points to be monitored for each attribute. If not specified, 25% of the contact positions/specimen shall be measured but not fewer than 25. If there are fewer than 25 contact positions then all contact positions shall be measured. Additional specimens shall be added in order to obtain 25 data points for those situations when the number of positions are less than 25. When applicable, the positions measured shall be identified by a specimen identification and position number. All positions to be monitored shall be randomly chosen or as specified.

3.3 Standard atmospheric conditions

3.3.1 Unless otherwise specified, all measurements shall be made within the following ambient conditions:

- Temperature: 15 °to 35 °C,
- Atmospheric pressure: 650 millimeters of mercury to 800 millimeters of mercury,
- Relative humidity 20% to 80%.

3.3.2 Special tests may require tighter control of conditions when specified in the test procedure.

3.4 Test specimen

The test specimens shall be representative of the manufacturer's normal production and shall be selected at random. Each test specimen or part thereof shall be individually identified, such that the marking will not be destroyed throughout the test.

3.5 Test specimen disposition

Following completion of the test program, test specimens should be packaged and retained by the testing facility or test sponsor for not less than one year unless otherwise specified in the referencing document. Unit identification and all test report identification shall be included in each package.