

The Product Specification For Micro Bayonet Connector

DATE : 2015-11-3

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1.0 OBJECTIVE

This specification defines the performance, test, quality and reliability requirements of Amphenol Micro Bayonet series connector.

2.0 SCOPE

This Specification includes the Materials/Finishing, Mechanical Characteristics, Electrical Characteristics and Environmental requirements of Amphenol Micro Bayonet Series connector.

3.0 APPLICABLE DOCUMENTS

3.1 Application

3.1.1 Engineering drawings

3.2 Reference Standards

3.2.1 MIL-C-39029: General Specification For Contacts, Electrical Connector

3.2.2 EIA 364 : Test Methods for Electrical Connectors

3.2.3 IEC 60664-1: Insulation coordination for equipment within low-voltage systems

Part 1: Principles, requirements and tests

3.3 Federal Specifications

3.3.1 QQ-N-290 : Nickel Plating (Electrodeposited)

3.4 Other Standards and Specifications

3.4.1 UL94 V-0 : Flammability

4.0 REQUIREMENTS

4.1 Qualification

Connectors furnished under this specification shall be capable of meeting the qualification test requirements specified herein. Unless otherwise specified, all measurements shall be performed within the following lab conditions:

- a) Temperature: 15 to 35°C
- b) Relative Humidity: 20% to 80%
- c) Atmospheric Pressure: 550mm to 800mm of Hg (73 ~106Kpa)

4.2 Material

Material for each part shall be specified herein, or equivalent. Substitute material shall meet the performance requirements of this specification.

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- 4.2.1 Receptacle Shell: Aluminum Alloy
- 4.2.2 Rivet: Stainless steel
- 4.2.3 Plug shell: Aluminum Alloy
- 4.2.4 Coupling nut: Aluminum Alloy
- 4.2.5 Waved ring: Stainless steel
- 4.2.6 Retaining ring: Stainless steel
- 4.2.7 EMI ring: Copper Alloy
- 4.2.8 Insert: PA66
- 4.2.9 Pin contact: Stainless steel & Copper Alloy
- 4.2.10 Socket contact: Stainless steel & Copper Alloy
- 4.2.11 Band it: Stainless steel

4.3 Finish

Plated finished for qualification components shall be as specified herein or equivalent.

- 4.3.1 Nickel Plating: 500~600u”
- 4.3.2 Gold Plating: Gold flash & 30 u” at indicated area

4.4 Mating

The connectors shall be capable of mating and un-mating manually without the use of special tools.

4.5 Workmanship

Connectors shall be uniform in quality and shall be free from burrs, scratches, cracks, voids, chips, blisters, pin holes, sharp edges, and other defects that will adversely affect product’s life or serviceability

5.0 ELECTRICAL CHARACTERISTIC

5.1 Low Level Contact Resistance

Mated with applicable connector, the low-level contact resistance shall not exceed a change of 15mΩ & 17 mΩ after environmental exposure when measured in accordance with EIA 364-23C.

The following details shall apply:

- a) Test Voltage: 20mV DC maximum at open circuit
- b) Test Current: not to exceed 100mA

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5.2 Contact Resistance

The contact resistance of contacts in the mated condition shall be not greater than 22mΩ (initial) or 26mΩ after conditioning when measured in accordance with EIA 364-06C. The following details shall apply:

- a) Ambient Conditions: still air at 25°C
- b) Current Rating: 1A per contact

5.3 Insulation Resistance

Mated with applicable connector, The insulation resistance shall not be less than 5000MΩ when measured in accordance with EIA 364-21C. The following details shall apply:

- a) Test Voltage: 500V DC
- b) Test Duration: 1 minute
- c) Point of Measurement: Between adjacent contacts, any contact & the shell

5.4 Dielectric Withstanding Voltage

At sea level, there shall be no evidence of arc-over, insulation breakdown, or excessive leakage current (5mA max) when the mated connectors are tested in accordance with EIA 364-20B, method B. The following details shall apply:

- a) Test Voltage: AC 500V rms
- b) Test Duration: 1 minute
- c) Point of Measurement: Between adjacent contacts, any contact & the shell

5.5 Shell-to-shell conductivity

Mated with applicable connector, the contact resistance shall not exceed than 2.5 mΩ when measured in accordance with EIA 364-83. The following details shall apply:

- a) Test Voltage: 1.5V DC max
- b) Test Current: 1A

6.0 MECHANICAL CHARACTERISTIC

6.1 Visual Inspection

This test is performed referring to EIA 364-18B. Do the visual inspection in a room temperature, the requirements are as below:

- a) There shall be no cracking and/or delaminating of components or finishes, or both
- b) There shall be no base exposed after test

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6.2 Intermateability

This test is required to choose any plug to mate and unmate any Receptacle, and the plug need mating and unmating with the Receptacle smoothly. Repeat the operation three times.

6.3 Durability

The test should be in accordance with EIA 364-09C. Counterpart connectors shall show no mechanical defects detrimental to the operation of the connector.

- a) Test rate: less than 100 cycles per hour
- b) Test cycle: 500 cycles

6.4 Maintenance aging

The test should be in accordance with EIA 364-05B. The contact installing and removal forces shall not exceed the requirements of 44N.

- a) Test cycle: 10 cycles

6.5 Contact retention

The test should be in accordance with EIA 364-29C, method A. Before the test, item 6.4 test is needed. After the test, there should no damage to contacts or inserts.

- a) Retention load: 44N

6.6 Mechanical Shock

Mated connectors shall not be damaged and there shall be no loosening of parts when tested in accordance with EIA 364-27B, nor shall there be an interruption of electrical continuity longer than 10 μ s during the exposure to mechanical shock.

- a) Reference: Test Condition H (294 m/s² 30G, 11msec, half-sine)
- b) Shocks: 3 shocks in each \pm X, \pm Y, \pm Z axes(18 total)

6.7 Vibration (Sine).

Mated connectors shall not be damaged and there shall be no loosening of parts due to vibration. Counterpart connectors shall be retained in full engagement when tested in accordance with EIA-364-28D, and the interruption of electrical continuity shall be not longer than 10 μ s.

- a) Reference: Test Condition II
- b) Amplitude: either 1.52mm (0.06 in) double amplitude (maximum total excursion) or 98.1 m/s² (10 gn) peak
- c) Sweep time: 10-500-10 HZ in 15 minute
- d) Duration: 180 minutes in each X, Y, Z axes

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7.0 ENVIRONMENTAL CHARACTERISTIC

After exposure to the following environmental conditions in accordance with the specified test procedures and/or details, the product shall show no physical damage and shall meet the electrical and mechanical requirements per paragraphs 5.0 and 6.0 as specified in Table 1 test sequence. Product subjected to these environmental tests must be applied to printed circuit boards. Unless otherwise specified, the assemblies shall be mated during exposure.

7.1 Thermal Shock

The connectors shall be tested in accordance with EIA 364-32D, that the temperature extremes shall be as specified in the table below. At the completion of the last cycle, the connectors shall be returned to room temperature for inspection, there should be no physical damage on the connector.

- a) Reference: method A
- b) Test durations : A, 5 continuous cycles
- c) Temperature Requirement

Temperature °C	Time, minutes
-55 (0, -3)	30
25±10	≤5
+125 (+3,0)	30
25±10	≤5

7.2 Humidity Cycling

Mated connectors shall be exposed to a relative humidity in accordance with EIA 364-31B, test condition A. Immediately after exposure, without any forced drying, insulation resistance should be no less than 100MΩ.

- a) Reference: method II
- b) Temperature: 40 ± 2 °C
- c) Relative Humidity: 90~95%
- d) Duration: 96 hour

7.3 Salt Spray

Unmated connectors shall show no exposure of the basis metal that will adversely effects performance when tested in accordance with EIA 364-26B, Test ConditionB, there should be no physical damage and corrosion on the connector.

- a) Temperature: 34~36°C

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- b) Concentration: 5%
- c) Relative Humidity: 95~98%
- d) Duration: 48 hour

8.0 QUALITY ASSURANCE PROVISIONS

8.1 Equipment Calibration.

All test equipment and inspection facilities used in the performance of any test shall be maintained in a calibration system in accordance with MIL-C-45662 and ISO 9000.

8.2 Inspection Condition.

Unless otherwise specified herein, all inspections shall be performed under the following ambient conditions.

- a) Temperature: 15 to 35°C
- b) Relative Humidity: 20% to 80%
- c) Atmospheric Pressure: 550mm to 800mm of Hg (73 ~106Kpa)

8.3 Sample Quantity and Description.

The numbers of samples to be tested in each group shown in Qualification Testing Sequences are defined as follows: Groups A through E: 3~5 samples in each group: All samples must be free of defects that would impair normal connector operation. All samples must meet dimensional requirements of connector.

8.4 Acceptance

8.4.1 Electrical and mechanical requirements placed on test samples as indicated in Paragraphs 5.0 and 6.0 shall be established from test data using appropriate statistical techniques or shall otherwise be customer specified, and all samples tested in accordance with this product specification shall meet the stated requirements.

8.4.2 Failures attributed to equipment, test setup, or operator error shall not disqualify the product. If product failure occurs, corrective actions shall not disqualify the product. If product failure occurs, corrective action shall be taken and samples resubmitted for qualification.

8.5 Qualification Testing.

Qualification testing shall be performed on sample units produced with equipment and procedures normally used in production. The test sequence shall be as shown in Qualification Testing Sequences

Visual Examination: EIA 364-18B

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8.6 Re-qualification Testing.

If any of the following conditions occur, the responsible product engineer shall initiate re-qualification testing consisting of all applicable parts of the qualification test matrix Table 1.

- A significant design change is made to the existing product which impacts the product form, fit or function. Examples of significant changes shall include, but not be limited to, changes in the plating material composition or thickness, contact force, contact surface geometry, insulator design, contact base material, or contact lubrication requirements.
- A significant change is made to the manufacturing process, which impacts the product form, fit or function.
- A significant event occurs during production or end use requiring corrective action to be taken relative to the product design or manufacturing process.

Table 1: Qualification Testing Sequences

Item	Test Content	Test Group and Sequence					Test Require& Method
		Group A	Group B	Group C	Group D	Group E	
1	Visual Inspection	1	1,7,9	1,4,6	1	1	6.1
2	Intermateability	2	2	2			6.2
3	Low Level Contact Resistance	3					5.1
4	Contact Resistance	4,9					5.2
5	Insulation Resistance	5	3,11	7	2	2	5.3
6	Dielectric Withstanding Voltage	6	4,12	8	3	3	5.4
7	Shell-to-shell conductivity	7,10	5				5.5
8	Durability	8					6.3
9	Maintenance aging		6				6.4
10	Contact retention		8				6.5
11	Mechanical Shock			3			6.6
12	Vibration (Sine)			5			6.7
13	Thermal Shock		10				7.1
14	Humidity Cycling				4		7.2
15	Salt Spray					4	7.3
Sample Size of Each Group		3	3	3	3	3	/

Remark:

- Unless otherwise specified in the referencing document, preconditioning shall be defined as 25 mating and un-mating cycles for connectors; 3~5pcs samples in each group.