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## Micro-Circular HD Connector

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### 1. SCOPE

#### 1.1. Content

This specification covers performance, tests and quality requirements for the TE Connectivity (TE) Micro-Circular HD connector series. The Micro-Circular HD connector is a high-density, small form circular connector having the ease of push/pull self-locking mating. The connectors have the advantage of being able to be blind mated into tight spaces.

#### 1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

#### 1.3. Successful qualification testing on the subject product line was completed on 31Oct11. The Qualification Test Report number for this testing is 501-127002.

### 2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the latest edition of the document applies. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

#### 2.1. TE Documents

501-127002: Qualification Test Report (Micro-Circular HD Connector)

#### 2.2. Industry Documents

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- IEC 60529: Degrees of Protection Provided by Enclosures (IP Code)

#### 2.3. Reference Document

109-197: Test Specification (TE Test Specifications vs EIA and IEC Test Methods)

### 3. REQUIREMENTS

#### 3.1. Design and Construction

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

#### 3.2. Materials

Materials used in the construction of this product shall be as specified on the applicable product drawing.

## 3.3. Ratings

- Current:
  - 1.5 amperes per contact for 40 position insert
  - 3.0 amperes per contact for 7 position insert
- Operating Temperature: -55 to 125°C

## 3.4. Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

## 3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Initial examination of product.	Meets requirements of product drawing.	EIA-364-18. Visual examination and dimensional (C of C) inspection per product drawing.
Final examination of product.	Meets visual requirements.	EIA-364-18. Visual examination.
<b>ELECTRICAL</b>		
Contact resistance.	21 milliohms maximum for both 0.5 and 0.7 mm product with bulk wire resistance subtracted.	EIA-364-6. Four terminal measuring system, 3 amperes for 7 position contacts, 1.5 amperes for 40 position contacts.
Insulation resistance, room temperature.	5000 megohms minimum initial. 100 megohms minimum after conditioning.	EIA-364-21. 500 volts DC, 2 minute hold. Test between adjacent contacts of mated specimens.
Insulation resistance, elevated temperature.	100 megohms minimum.	EIA-364-21. Subject specimens to 125°C during testing. 500 volts DC, 2 minute hold. Test between adjacent contacts of mated specimens.
Withstanding voltage, sea level.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 750 volts AC at sea level for both 7 and 40 position product.
Withstanding voltage, 70,000 feet.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 175 volts AC at 70,000 feet for both 7 and 40 position product.
Electrical continuity between shells.	200 milliohms maximum at 1 ampere.	EIA-364-83.
<b>MECHANICAL</b>		
Random vibration.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition V, Test Condition Letter E. Subject mated specimens to 16.91 G's rms between 50 to 2000 Hz. Eight hours in each of 3 mutually perpendicular planes.

Figure 1 (continued)

Test Description	Requirement	Procedure
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Test Condition A. Subject mated specimens to 50 G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
Mechanical endurance.	See Note.	EIA-364-9. Mate and unmate specimens for the number of cycles specified in Figure 2 at a maximum rate of 300 cycles per hour.
Engagement force.	240 N [54 lbf] maximum engagement for 40 position product. 40 N [9 lbf] maximum engagement for 7 position product.	EIA-364-13, Method A. Measure force necessary to engage specimens at a maximum rate of 12.7 mm [.5 in] per minute.
<b>ENVIRONMENTAL</b>		
Thermal shock.	See Note.	EIA-364-32, Method A. Subject mated specimens to 5 cycles between -55 and 125°C with 30 minute dwells at temperature extremes and 1 minute maximum transition between temperatures.
Humidity/temperature cycling.	See Note.	EIA-364-31, Method IV. Subject specimens to 10 cycles (10 days) between 25 and 65°C at 98% RH with -10°C cold shock.
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 5, Test Time Condition D. Subject mated specimens to 125°C for 1000 hours.
Water immersion, receptacle connector.	No ingress of water through the rear seal. See Note.	IEC 60529. Immerse specimens in water to a depth of 1 m [39.4 in] for 2 hours.
Salt spray.	No damage affecting engagement or separation. See Note.	EIA-364-26. Subject mated specimens to a 5% salt concentration for 96 hours.

**NOTE**

*Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 2.*

Figure 1 (end)

## 3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)			
	1	2	3	4
	Test Sequence (b)			
Initial examination of product	1	1	1	1
Contact resistance	2,6,8,10		2,6	
Insulation resistance, room temperature		2,6		
Insulation resistance, elevated temperature		8		
Withstanding voltage, sea level		3,7		
Withstanding voltage, 70,000 feet		9		
Electrical continuity between shells	4			3,6
Random vibration	7			
Mechanical shock	9			
Mechanical endurance	5(c)		4(d)	4(d)
Engagement force	3,11		3,7	2,7
Thermal shock		5		
Humidity/temperature cycling		4		
Temperature life			5	
Water immersion, receptacle connector		10		
Salt spray				5
Final examination of product	12	11	8	8

**NOTE**

- (a) See paragraph 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) 1000 cycles.
- (d) 300 cycles.

Figure 2

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#### 4. QUALITY ASSURANCE PROVISIONS

##### 4.1. Qualification Testing

###### A. Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Specimens shall consist of connectors containing contacts representative of the largest and smallest offerings.

###### B. Test Sequence

Qualification inspection shall be verified by testing specimens as specified in Figure 2.

##### 4.2. Requalification Testing

If changes significantly affecting form, fit or function are made to the product or manufacturing process, product assurance shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by development/product, quality and reliability engineering.

##### 4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of Figure 1. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify the product. If product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

##### 4.4. Quality Conformance Inspection

The applicable quality inspection plan shall specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.



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