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## zSFP+ Stacked Connector and Cage Assemblies

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### 1. SCOPE

#### 1.1. Content

This specification covers performance, tests and quality requirements for the TE Connectivity (TE) Small Form-factor Pluggable (zSFP+) Stacked Connector and Cage Assemblies.

#### 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.

### 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 Connectivity (TE) Documents

- [114-13319](#) Application Specification (Stacked Small Form-Factor Pluggable zSFP+ Connector and Cage Assembly)
- 501-128800 Qualification Test Report (zSFP+ Stacked Connector and Cage Assemblies)

#### 2.2. Industry Document

EIA-364 Electrical Connector/Socket Test Procedures Including Environmental Classifications

#### 2.3. Reference Document

[109-197](#) AMP 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

- Voltage: 120 volts AC
- Current: Signal application only
- Temperature: -55 to 105 °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 and Application Specification 114-13319	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>		
Low Level Contact Resistance (LLCR)	$\Delta R$ 10 milliohms maximum for shield and signal contacts	EIA-364-23 Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage
Insulation Resistance	$1 \times 10^9$ ohms minimum	EIA-364-21 300 volts DC, 2 minute hold Test between adjacent contacts of mated specimens
Withstanding Voltage	One minute hold with no breakdown or flashover	EIA-364-20, Condition I 300 volts AC at sea level Test between adjacent contacts of mated specimens
<b>MECHANICAL</b>		
Random Vibration	No discontinuities of 1 microsecond or longer duration See Note	EIA-364-28, Test Condition VII, Test Condition Letter D Subject mated specimens to 3.10 G's rms between 20 to 500 Hz. Fifteen minutes in each of 3 mutually perpendicular planes
Mechanical Shock	No discontinuities of 1 microsecond or longer duration See Note	EIA-364-27, Test Condition H Subject mated specimens to 30 G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks
Durability	See Note	EIA-364-9 Mate and unmate specimens for 100 cycles at a maximum rate of 500 cycles per hour with cage latch operable
Transceiver Insertion Force	18 N [4.0 lbf] maximum	EIA-364-13 Measure force necessary to insert the transceiver into the receptacle with kick-out springs inoperable at a maximum rate of 12.7 mm [.5 in] per minute
Transceiver Extraction Force	12.5 N [2.8 lbf] maximum	EIA-364-13 Measure force necessary to extract the transceiver from the receptacle with kick-out springs inoperable at a maximum rate of 12.7 mm [.5 in] per minute
Rotational Cable Pull	33.4 N [7.5 lbf] minimum without displacement of cage assembly or connector from Printed Circuit Board (PCB)	Load cabled module into cage/connector assembly applied to PCB with attached bezel. Rotate cable 40 degrees toward PCB, and then rotate 360 degrees with the load still applied at 4 RPM

Figure 1 (continued)

Test Description	Requirement	Procedure
Press- Fit Insertion Force	35 N [7.9 lbf] maximum per pin for connector/cage assembly	Measure force necessary to press the specimen onto the PCB into proper seating location at a maximum rate of 12.7 mm [.5 in] per minute
Press-Fit Extraction Force	4.4 N [1.0 lbf] minimum per pin for cage EON 1.4 N [.32 lbf] minimum per pin for signal EON	Measure force necessary to extract the specimen from the PCB at a maximum rate of 12.7 mm [.5 in] per minute
Cage Latch Strength/ Module Retention	90 N [20.2 lbf] minimum	Load cable module into cage/connector assembly applied to PCB with attached bezel. Apply specified axial load to engaged module at a maximum rate of 6.35 mm [.25 in] per minute and hold for 1 minute to verify module retention and cage latch strength
Reseating	See Note	Unmate and mate specimens 3 times
Mate/Unmate	See Note	Unmate and mate specimens 1 time
<b>ENVIRONMENTAL</b>		
Thermal Shock	See Note	EIA-364-32, Method A, Test Condition VII Subject mated specimens to 5 cycles between -55 and 105 °C with 30 minute dwells at temperature extremes and 1 minute maximum transition between temperatures
Thermal Disturbance	See Note	Cycle mated specimens between 15 ± 3 °C and 85 ± 3 °C at a maximum rate of 2 °C per minute for 10 cycles
Humidity/Temperature Cycling	See Note	EIA-364-31, Method III Subject mated specimens to 10 cycles (10 days) between 25 and 65 °C at 80 to 100% RH
Temperature Life, Preconditioning	See Note	EIA-364-17, Method A, Test Condition 4 Subject specimens mated to blank transceivers to 105 °C for 120 hours
Temperature Life	See Note	EIA-364-17, Method A, Test Condition 4 Subject specimens mated to blank transceivers to 105 °C for 240 hours
Mixed Flowing Gas	See Note	EIA-364-65, Class IIA (4 gas) Subject specimens to environmental Class IIA for 20 days (10 days unmated followed by 10 days mated)
Dust	See Note	EIA-364-91 Subject unmated specimens to benign dust contamination for 1 hour


**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	5	6
	Test Sequence (b)					
Initial Examination of Product	1	1	1	1	1	1
LLCR		3(e),6,9	3(e),5,7	2(e),4,6,8,10,12,14		2(e),4,6,8
Insulation Resistance					2,6	
Withstanding Voltage					3,7	
Random Vibration		7				
Mechanical Shock		8				
Durability		4(g)				
Transceiver Insertion Force		2(c)				
Transceiver Extraction Force		10(c)				
Rotational Cable Pull	2					
Press-Fit Insertion Force			2			
Press-Fit Extraction Force			8			
Cage Latch Strength	3					
Reseating				13		7
Mate/Unmate				7		
Thermal Shock					4(d)	
Thermal Disturbance				11		5
Humidity/Temperature Cycling			6		5	
Temperature Life, Preconditioning		5(d)				
Temperature Life			4(d)	3(d)		
Mixed Flowing Gas, Unmated				5(f)		
Mixed Flowing Gas, Mated				9		
Dust						3
Final Examination of Product	4	11	9	15	8	9


**NOTE**

- (a) See paragraph 4.1.A.
- (b) Numbers indicate sequence in which tests are performed
- (c) Modified transceiver that removes the kick-out spring and latch from the test
- (d) Mated to blank transceivers
- (e) Precondition specimens with 20 durability cycles
- (f) Transceivers not exposed
- (g) 79 cycles

Figure 2

#### **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. Test groups 1, 2, 3, 5 and 6 shall each consist of 5 gold plated specimens. Test group 4 shall consist of 5 gold plated specimens and 5 palladium nickel plated specimens.

###### **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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