
XFP Copper Module Direct Attach Cable Assembly and Cage

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the Tyco Electronics XFP Copper Module Direct Attach Cable Assembly and Cage.

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. Qualification Test Results

Successful qualification testing on the subject product line was completed on 08Dec05. Additional qualification testing was completed on 13Jul07. The Qualification Test Report number for this testing is 501-624. This documentation is on file at and available from Engineering Practices and Standards (EPS).

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. Tyco Electronics Documents

- 109-197: Test Specification (AMP Test Specifications vs EIA and IEC Test Methods)
- 114-13096: Application Specification (XFP Connector and Cage Assembly)
- 501-624: Qualification Test Report (XFP Copper Module Direct Attach Cable Assembly and Cage)

2.2. Industry Standard

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

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:
 - 3.13 to 3.46 volts DC (VCC 3 pins per XFP MSA, pins 8 and 9)
 - 1.7 to 1.9 volts DC (VCC 2 pins per XFP MSA, pin 22)
- Current: Signal application only
- Temperature: -10 to 70°C
- Humidity: 10 to 90% RH, non-condensing

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 per EIA-364.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Initial examination of product.	Meets requirements of product drawing.	EIA-364-18. Visual and dimensional (C of C) inspection per product drawing.
Final examination of product.	Meets visual requirements.	EIA-364-18. Visual inspection.
ELECTRICAL		
Low level contact resistance.	35 milliohms maximum. ΔR 10 milliohms maximum. Shield and signal contacts.	EIA-364-23. Subject mated specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage.
MECHANICAL		
Vibration, random.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition VII, Condition D. Subject mated specimens to 3.10 G's rms between 20-500 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, Method H. Subject mated specimens to 30 G's half-sine shock pulses of 11 milliseconds duration. 3 shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
Durability.	See Note.	EIA-364-9. Manually mate and unmate the XFP module to the PCB connector interface of each test specimen for 100 cycles with latches enabled.

Figure 1 (continued)

Test Description	Requirement	Procedure
Mating force, XFP module to PCB connector and XFP cage.	40 N [9 lbf] maximum without heat sink and clip. 55 N [12.3 lbf] maximum with heat sink and clip. See Note.	EIA-364-13. Measure force necessary to mate specimens at a maximum rate of 12.7 mm [.5 in] per minute.
Unmating force, XFP module from PCB connector and XFP cage.	30 N [6.75 lbf] maximum without heat sink and clip. 67 N [15 lbf] maximum with heat sink and clip. See Note.	EIA-364-13. Measure force necessary to unmate specimens with latches disabled at a maximum rate of 12.7 mm [.5 in] per minute.
Cage latch strength.	180 N [40.5 lbf]. See Note.	EIA 364-13. Determine latch retention with latch engaged by applying specified force using a metal block at a maximum rate of 12.7 mm [0.5 in] per minute and hold for 1 minute.
Cage press fit insertion force.	550 N [123.6 lbf] maximum. See Note.	EIA-364-13. Measure force necessary to push the cage into the host board at a maximum rate of 12.7 mm [.5 in] per minute.
Cage press fit extraction force.	133 N [29.9 lbf] minimum. See Note.	EIA-364-13. Measure force necessary to push the cage out of the host board by applying specified force in a vertical direction at a maximum rate of 12.7 mm [.5 in] per minute.
Cable pull, cage.	100 N [22.5 lbf]. See Note.	Load a specimen with cable into a cage assembly mounted to a test board, with attached bezel. Apply specified force to the free end of the cable while the assembly is held 45 degrees from vertical. Rotate the assembly 360 degrees while load is applied.
Cable retention force.	No discontinuities of 1 microsecond or longer duration. Shall remain mated. See Note.	EIA-364-38. Apply a force of 75 N [16.9 lbf] in an axial direction and hold for 10 minutes.
Cable side load force.	No discontinuities of 1 microsecond or longer duration. Shall remain mated. See Note.	EIA-364-38. Apply a force of 75 N [16.9 lbf] to the cable plug in a plane parallel to the bezel and hold for 10 minutes.
Cable longitudinal force.	No discontinuities of 1 microsecond or longer duration. Shall remain mated. See Note.	EIA-364-38. Apply a force of 100 N [22.5 lbf] to the cable plug in a plane perpendicular to the bezel and hold for 10 minutes.

Figure 1 (continued)

Test Description	Requirement	Procedure
ENVIRONMENTAL		
Thermal shock.	See Note.	EIA-364-32. Subject mated specimens to 5 cycles between -10 and 70°C.
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.	See Note.	EIA-364-17, Method A, Test Condition 2, Test Time Condition C. Subject mated specimens to 70°C for 500 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	5
	Test Sequence (b)				
Initial examination of product	1	1	1	1	1
Low level contact resistance	3,7		3,6	3,5	
Vibration, random	5				
Mechanical shock	6				
Durability	4				
Mating force, XFP module to PCB connector and XFP cage	2				
Unmating force, XFP module from PCB connector and XFP cage	8				
Cage latch strength	10				
Cage press fit insertion force			2	2	
Cage press fit extraction force			7	6	
Cable pull, cage		2			
Cable retention force	9				2
Cable side load force					3
Cable longitudinal force					4
Thermal shock			4		
Humidity/temperature cycling			5		
Temperature life				4(c)	
Final examination of product	11	3	8	7	5

NOTE

- (a) See paragraph 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Precondition specimens with 10 durability 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. All test groups shall each consist of 5 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.