

Z-PACK* 2mm UNSHIELDED FB CABLE CONNECTOR

"The product may not perform according to the product specification if precautions have not been taken in the application to provide mechanical stability of the connector in relation to its mating parts".

1 SCOPE.

1.1 Content.

This specification covers the performance, test and quality requirements for AMP Z-Pack* 2mm Unshielded Futurebus+ (FB) Cable Connector. The connector has Insulation Displacement type of Contacts (IDC), is end-to-end stackable and field installable. It has a 2mm contact grid and is designed in version of 30 and 24 positions. The connector is delivered as kit consisting of 3 modules loaded with contacts, a sub-assembly (forming the bottom cover), a top cover and a cable-tie.

The connector is a device used to connect a cable to a pc-board by means of either backpanel or frontpanel connection. For backpanel connections, the cable connector mates a shroud placed over pins extending from the rear side of the motherboard and is fixed with its integrated locking latch. For frontpanel connections, the cable connector mates a right-angle male connector and is fixed with its integrated locking latch.

1.2 Qualification.

When tests are performed on subject product, procedures specified in this Product Specification shall be used. All inspections shall be performed using applicable inspection plan and product drawing.

2 APPLICABLE DOCUMENTS.

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

2.1 AMP Documents.

501-19052 Test report Z-Pack* 2mm unshielded FB Cable Connector.
114-19047 Application specification Z-Pack* 2mm unshielded FB Cable Connector.

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DATE 08 Feb 01

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DATE 12 Feb 01

EC EHOO-0545-01

2.2 Other Documents.

IEC 60512	Connectors used for frequencies below 3 MHz
IEC 61076-4-104	Connectors with assessed quality, for use in DC low-frequency analogue and in digital high speed data applications.

3 REQUIREMENTS:

3.1 Design and Construction.

Products shall be of design, construction and physical dimensions as specified on the applicable product drawings.

3.2 Materials and Finish.

- | | | |
|----|--------------------|--|
| A. | Signal Contacts: | - Phosphor Bronze plated with nickel underlayer, selective gold on contact area and tin/lead on termination-end. |
| B. | Housing and Latch: | - Liquid crystal polymer (LCP), colour black. |
| C. | Covers: | - Glassfilled Polyamide, colour black. |

3.3 Ratings.

- | | | |
|----|-----------------------|---|
| A. | Operating voltage | - 750 V rms. |
| B. | Current | - 1 Ampere max. per contact at 70°C (All contacts simultaneous) |
| C. | Operating temperature | - -40°C to 70°C |
| D. | Durability | - 250 cycles |

3.4 Performance and Test Description.

The product is designed to meet electrical, mechanical and environmental performance specified in this paragraph as tested per test sequence specified in Para 3.6.

Unless otherwise specified, all tests shall be performed at ambient environmental conditions per IEC specification 60068-1 clause 5.3 and are performed with connectors in mated condition.

VISUAL			
Para	Test Description	Performance Requirements or Severity	Procedures
3.4.1.	Examination of product	Meets requirements of product drawing and applicable instructions on customer drawing and application specification.	Visual, dimensional and functional per applicable inspection plan. In acc.with IEC 60512-1-1 Magnification 10x
ELECTRICAL			
3.4.2.	Termination resistance	Max. open voltage 20mV. Max. current 100 mA DC. All contacts to be measured. Measuring points shall be as indicated in figure 1. (Termination resistance is contact resistance + resistance of contact-bulk) Requirement: 20 mΩ max. (Initial) ΔR 5 mΩ max. (Final)	In acc. with IEC 60512-2-1 "See also para. 3.5.1."
3.4.3.	Insulation resistance	Test between adjacent contacts. Test voltage 100V DC or AC peak. Duration: 1 minute. Requirement: 10 ⁴ MΩ min. initial 10 ³ MΩ min. final	In acc. with IEC 60512-3-1
3.4.4.	Voltage proof	Test between adjacent contacts. Test voltage 1000 V rms. Duration 1 minute. Requirement: no break-down or flash-over	In acc. with IEC 60512-4-1
3.4.5.	Electrical load and temperature	Oven temperature: 70°C Current: 1.0 A, all contacts loaded Minimum wire gauge 26 AWG to be used Duration: 1000 hrs Requirement: ΔT 55°C max.	In acc. with IEC 60512-9-2

MECHANICAL			
Para	Test Description	Performance Requirements or Severity	Procedures
3.4.6.	Vibration Sinusoidal	10-500 Hz sweeping 1 oct./min., displacement 0,35mm peak/accel. 5g , 30 minutes in each of 3 mutual perpendicular axes. No Physical damage No discontinuity > 1 μ sec	In acc. with IEC 60512-6-4
3.4.7.	Physical shock	Subject connector to 50 g half sine shock pulses of 11 ms duration. 5 shocks in each direction of 3 mutual perpendicular axis.	In acc. with IEC 60512-6-3
3.4.8.	Gauge retention force	Sizing and retention gauges shall be as specified in paragraph 3.5.3. Requirements: Test 6 contacts min. per connector Retention gauge shall be retained by the contact	In acc. with IEC 60512-16-5
3.4.9.	Insertion/withdrawal forces	Mate and unmate connector-pair with locking latch disabled. (see figure 8) Speed: 10 mm/sec. Rest: 30 s min. Requirements: Mating-force 0.75N max./contact Unmating-force 0.15 N min./contact	In acc. with IEC 60512-13-2
3.4.10.	Mechanical operation	Mate and unmate connector-pair Rate: (250) cycles/hour. Speed: 10 mm/s Operation cycles: 250 total per test-group. (e.g. 1 x 250 or 2 x 125)	In acc. with IEC 60512-9-1
3.4.11.	Polarization strength	Cable connector shall be attempted to mate with header in upside-down orientation at their appropriate mating position. Apply force in mating direction. Requirements: Polarization shall withstand 10 N min. force during 10 seconds. No functional damage.	In acc. with IEC 60512-13-5
3.4.12.	Straight cable pull	Mount cable connector at appropriate position in header and assure that it is fixed with its locking latch. (see figure 4.) Fix header and pull straight on cable with 25N force during 1 minute. Requirement: No functional damage	In acc. with IEC 60512-17-3

MECHANICAL (continued)			
Para	Test Description	Performance Requirements or Severity	Procedures
3.4.13.	90° cable-bend	Mount cable connector horizontal at appropriate position in header and assure it is fixed with that it is locking latch. Fix header and apply downward load of 5 N. (see figure 5.) Duration: 1 minute in each direction Requirement: No functional damage	In acc. with IEC 60512-17-1
3.4.14.	Contact retention in insert	Apply 10 N axial force at a contact of a sub-assembly, in mating and unmating direction during 10 seconds. Requirements: Max. displacement in both directions after the force has been removed 0.2 mm.	In acc. with IEC 60512-15-1
3.4.15	Connector locking force	Mount cable connector at appropriate position in header and assure that it is fixed with its locking latch. Fix header and apply 50 N straight force at cable connector housing in unmating direction during 10 sec. Requirements: Cable connector shall remain fixed. No functional damage	
ENVIRONMENTAL			
3.4.16.	Rapid change of Temperature	-40°/85°C, 0,5 hrs / 0,5 hrs, 5 cycles	In acc. with IEC 60512-11-4
3.4.17.	Climatic sequence Dry heat 1 st Damp heat cycle Cold 2 nd Damp heat cycle	70°C, 16 hrs 25°/55°C, RH 93%, 24hrs 40°C, 16 hrs 25°/55°C, RH 93%, 24hrs	In acc. with IEC 60512-11-1
3.4.18.	Damp/heat steady state	Temperature 40°C, RH 93%, Duration: 56 days	In acc. with IEC 60512-11-3
3.4.19.	Corrosion mixed flowing gas	Temperature 30°C, RH 70%, Cl ₂ 10 ppb, NO ₂ 200 ppb, H ₂ S 10 ppb, SO ₂ 100 ppb. Duration: 10 days	In acc. with IEC 60512-11-7

3.5 Additional Test and Measuring Details.

3.5.1 Termination resistance measurement.

Termination resistance shall be measured as indicated in figure 1. Bulk of wire is not included in the requirement and therefore it shall be measured and documented separately.

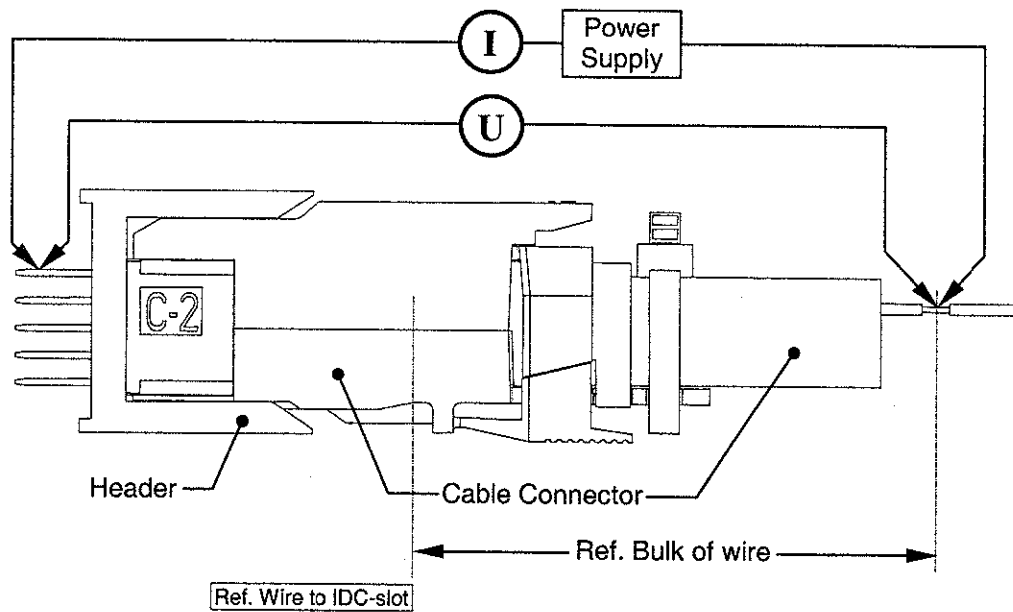


Figure 1

3.5.2 Voltage proof / Insulation resistance - test wiring layout

Voltage proof and insulation resistance tests shall be carried out with wire arrangement as indicated in figure 2. Test voltage applied at X and Y (adjacent contacts)

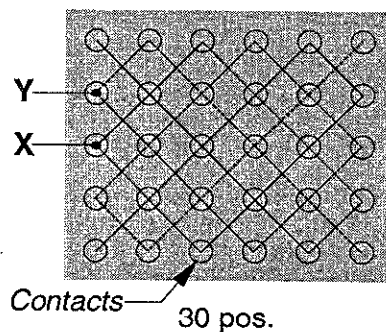


Figure 2

3.5.3 Sizing and retention gauges

Sizing and retention gauges shall be according to configurations as specified in below table and figure 3.

Gauge type	Dim. "A"	Weight	Surface roughness
Sizing	$0.505^{+0.005}$ mm	Not Applicable	✓ Ra 0.2 μm
Retention	$0.485^{+0.005}$ mm	$15.5^{+0.5}$ gram	✓ Ra 0.2 μm

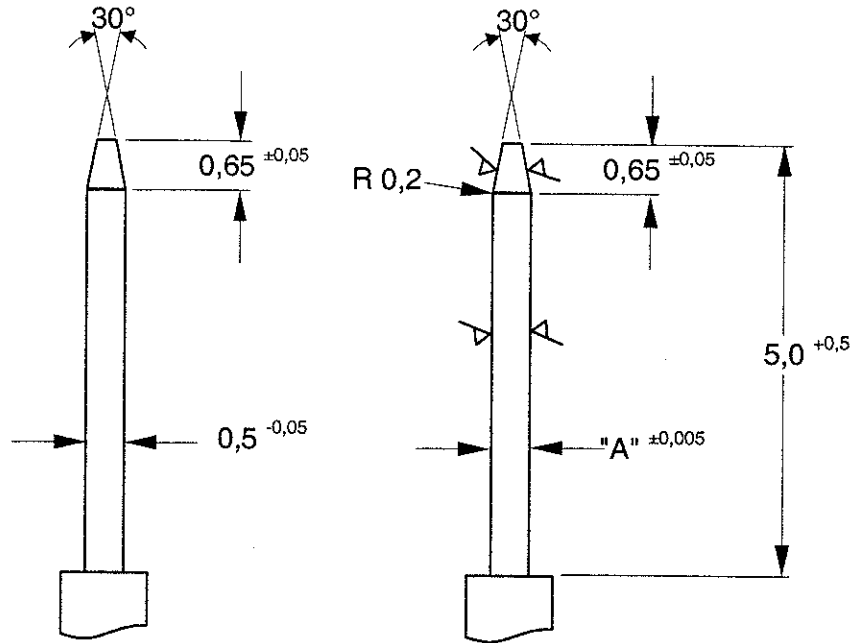
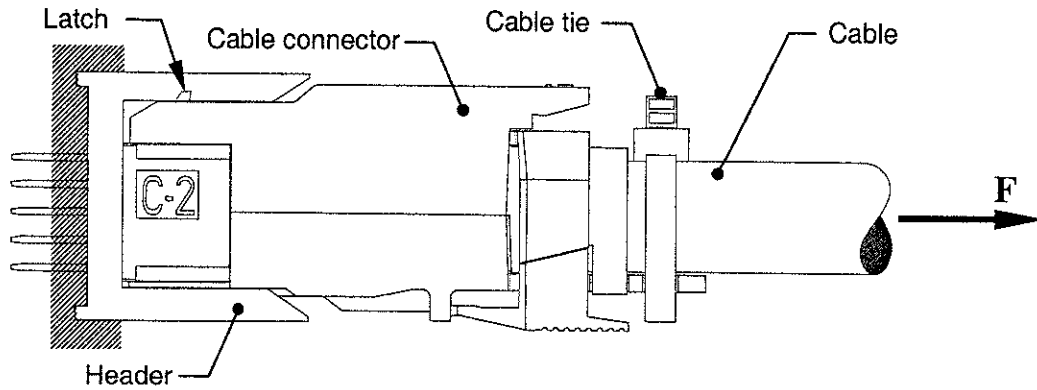


Figure 3

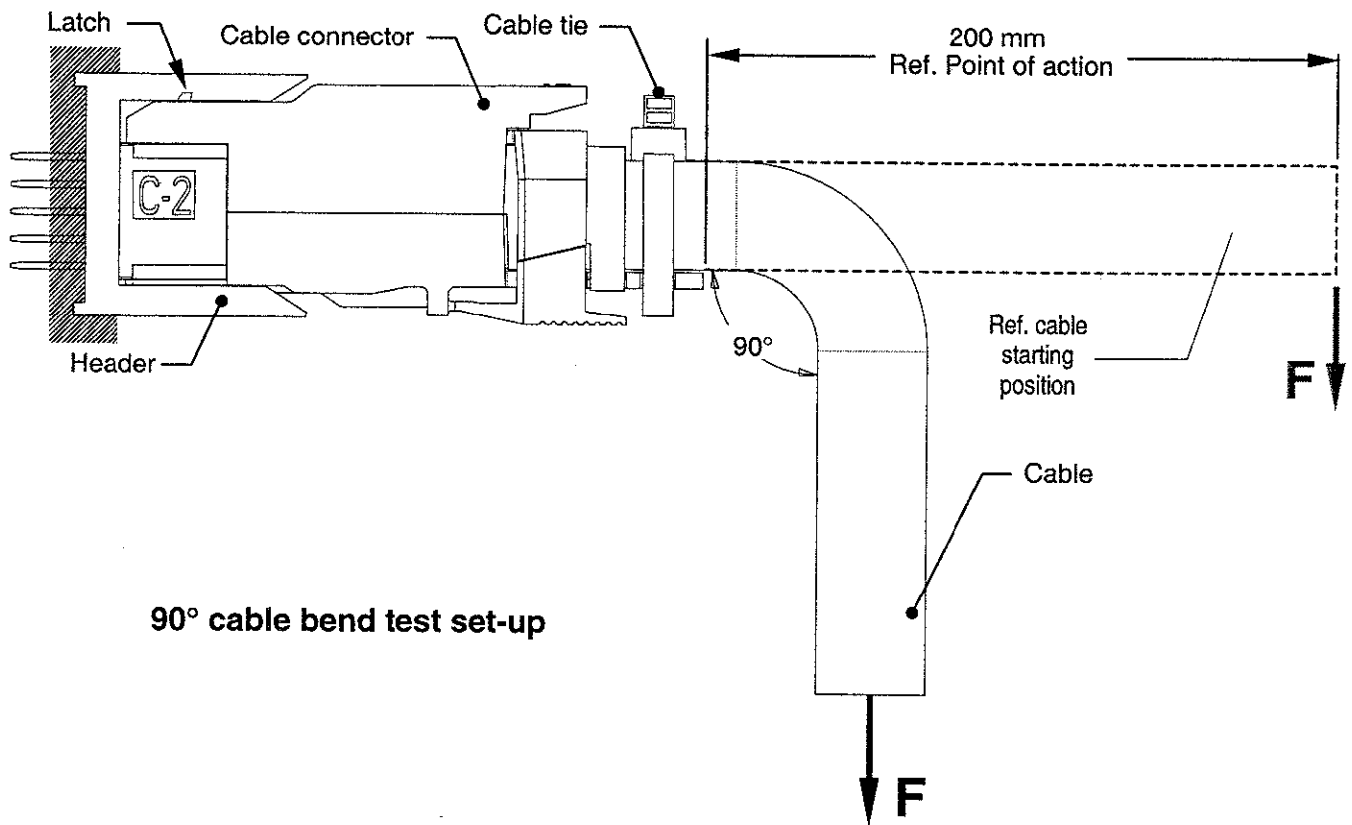
3.5.4 Cable manipulation tests

Straight cable pull and -90° cable bend tests shall be carried out as indicated in figures 4 and 5. Cable connector shall be mounted in header and be fixed with its locking device.



Straight cable pull test set-up

Figure 4



90° cable bend test set-up

Figure 5

3.5.5 Insertion/Withdrawal Forces Test Performance.

The insertion/withdrawal forces shall be tested as indicated in figures 6a and 6b. Connectors latching device shall not be assembled for this test.

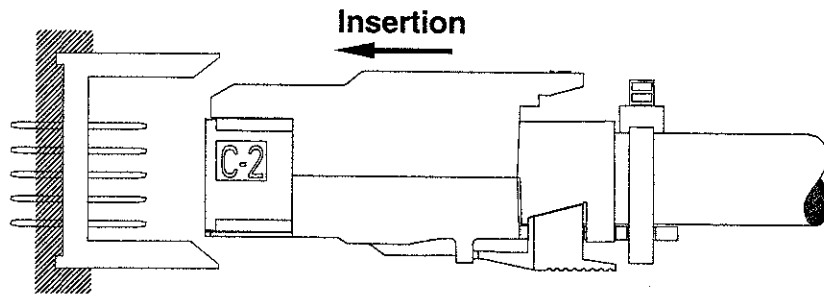


Figure 6a

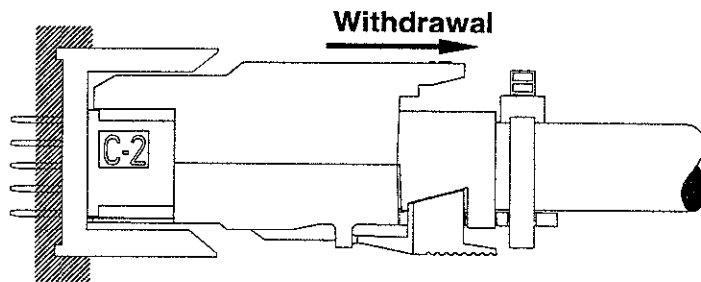


Figure 6b

3.6 Product Qualification and Requalification Test Sequence.

Test or examination	TEST-GROUP (a)			
	1	2	3	4
	TEST-SEQUENCE (b)			
Examination of product	1,13,15	1, 8	1,13	1,8
Termination resistance	2, 6,8,10	2, 7	4,8,10	2,5
Insulation resistance	3,11			
Voltage proof	4,12			
Electrical load and temperature				4
Vibration sinusoidal			5	
Physical shock			6	
Gauge retention force			2,11	
Insertion/withdrawal force			3,12	3,6
Mechanical operation			7	
Polarization strength				7
Straight cable pull		4		
90° cable-bend		5		
Contact retention in insert	14			
Connector locking force		3,6		
Rapid change of temperature	5			
Climatic sequence	7			
Damp/heat steady state	9			
Corrosion mixed flowing gas			9	

- a) See Para 4.1.A.
- b) Numbers indicate sequence in which tests are performed.

3.6.1 Connection-system representing test-connectors.

Connectors to be tested are specified in table below, which relates to above testsequence-table.

SURVEY OF CONNECTOR TYPES AND QUANTITIES IN RELATED TEST- GROUPS				
Product Description	NUMBER OF PRODUCTS TO BE TESTED IN TEST-GROUPS			
	1	2	3	4
2mm unshielded FB Cable Connector - 30 pos.	5	5	5	5
2mm FB Connector Header - 30 pos.	5	5	5	5

4 QUALITY ASSURANCE PROVISIONS.

4.1 Qualification Testing.

A. Sample Selection.

Samples shall be prepared in accordance with applicable instructions and shall be selected at random from current production.

Unless otherwise specified all testgroups shall consist of a minimum of 5 connectors of applicable type. Unless details to perform test require otherwise, cable connectors shall be terminated on cables according to applicable instructions and requirements specified in appropriate Application Specification. A minimum of 50 contacts from each applicable connector in each testgroups shall be measured.

B. Test Sequence.

Qualification inspection shall be verified by testing samples as specified in Para 3.6.

4.2 Requalification Testing.

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

4.3 Acceptance.

Acceptance is based on verification that product meets requirements of Para 3.4. Failures attributed to equipment, test set-up, test sub-components or operator deficiencies shall not disqualify the product. When product failure occurs, corrective action shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4 Quality Conformance Inspection.

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