FullAXS CABLE ASSEMBLY
Fiber Optic SM

1. SCOPE.

FullAXS is a compact, IP65 sealed connector system which allows an SFP transceiver to be changed without breaking the major seal of a cabinet.
This specification gives an overview of all relevant specifications or requirements related to duplex LC SM FullAXS Cable Assemblies.

1.1 Content.

This specification covers performance, test and quality requirements for the *TE FullAXS Connector, the LC Connector and the Cable related to the following Part numbers of FullAXS FO Cable Assemblies:
- 2061432-X Cable Assembly; FullAXS duplex LC to LC duplex. Single mode

Requirements directly related to the above mentioned Cable Assemblies and not covered within the list of Specifications, are explicitly specified in this document.

1.2 Qualification.

All components for the cable assembly, connectors, over-mould and cable were subject to their individual design objectives and were qualified accordingly.
This document addresses the total cable assembly.
When tests are performed on subject product, procedures specified in this specification shall be used. All inspections shall be performed using applicable inspection plan and product drawings.

2. APPLICABLE DOCUMENTS.

The following documents form a part of this specification to the 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, the 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 TE Connectivity Documents.

108-19436	Product Specification; FullAXS Cable Plug - Shielded and Unshielded Connection
501-19xxx	Qualification Test report; FullAXS Cable Plug - Shielded and Unshielded Connection
501-76086	Qualification Test report FullAXS cable assembly 2061432
501-652	Qualification Test report Single mode LC connector conform GR-326
114-32032	Application Specification FullAXS Connector System
2061502	Cable drawing 2-fold single mode outdoor FO cable
107-19517	FullAXS Packaging Procedure

2.2 Other Documents

IEC 61300 Series test and measurement methods.
IEC 60529 Degrees of protection provided by enclosures (IP Code)
IEC 60068-1 Environmental testing Part 1: General and Guidance
IEC 60512-1 Connectors for Electronic Equipment - Tests and Measurements

3. REQUIREMENTS.

3.1 Design and Construction.

Products shall be of design, construction, performance and physical dimensions as specified on the applicable product drawings as found in paragraph 1.1.

3.2 Material and Finish.

Fiber Optic Cable, 2 Fold	- Thermoplastic, Flame Retardant, Halogen Free, Black.
Overmoulded Drop Protection	- PA, Black
Overmoulded LC Duplex Plug Assembly	
Plug Protection Cap	- Glass Filled PPS, UL 94 V-0, Black
Protection Cap Seal	- Silicone rubber, Black
Cap Strap Assembly	
Nylon Cord	- PA, UL 94 V-0, Black
Ferrule	- Sn Plated Cu
FullAXS Inner body	- PA, UL 94 V-0, Black
FullAXS Wave spring	- Stainless Steel
FullAXS O-ring	- EPDM Rubber (silicone coated), Black
FullAXS Bayonet Shell	- Glass Filled PPS, UL 94 V-0, Black
Overmould	- PA, Black
Overmould O-ring	- EPDM Rubber (silicone coated), Black
LC Connector Assembly	
Dustcover	- TPE, UL 94 V-0, Black
Ferrule Sub Assembly	- Zirconia/Metal
Compression Spring	- Stainless Steel
Housing	- PEI, Blue
Inner Tubing	- PTFE, Clear, UL VW-1
Rear Body	- Aluminum
Duplex Clip	- PC Blend, UL 94 V-0, Black
Heat Shrink Tubing	- Polyolefin, Flame Retardant, Black / Yellow
Protective Tubing	- TPU, Flame Retardant, Black
Limiting Bending Boot	- PP, UL 94 V-0, Blue

3.3 Environment condition.

A. Operating temperature: – 40℃ to +70℃.
B. Storage temperature – 25℃ to +70℃.
C. Installation (assembly) – 15℃ to +60℃.
D. Protection Rating: IP65; Mated to bulkhead as well as Plug protection cap.

3.4 Performance and Test description.

The product is designed to meet optical, mechanical and environmental performance specified in this paragraph as tested per test sequence specified in paragraph 3.6.
Unless otherwise specified, all tests are performed at ambient environmental conditions per IEC specification 60068-1 clause 5.3. Tests are performed with the complete Cable Assembly in mated and fixed condition.

VISUAL			
Para	**Test Title**	**Performance / Severity Requirements**	**Procedure**
3.4.1	Examination of product (cable assemblies)	Meets requirements of product-drawing and applicable instructions on customer drawing, instruction sheet, application specification.	Visual, dimensional and functional per applicable inspection plan. IEC 60512-1-1 Magnification 10x

MECHANICAL			
Para	**Test Title**	**Performance / Severity Requirements**	**Procedure**
3.4.2	Storage on primary packaging (shipping box)	Thermal shock – 25℃ to +70℃ 1 cycle 12 hrs / 12 hrs. Transition time 3 hrs	IEC 60512-6
3.4.3	Free Fall	Free Fall: Primary packaged product;10 drops from 1.5m height on concrete floor.	IEC 61300-2-12 Method B
3.4.4	Temperature cycling	-40℃ to +70℃. Dwell time @-40℃ and +70℃: 3h -40℃ to +70℃. Dwell time @-40℃ and +70℃: 1.5h 12 cycles Cable coiled loosely, diameter ≥ 600mm / ≥ 300mm AttLΔ: During test, ≤ 0.5 dB. After test, ≤ 0.4 dB BR: Final test, ≥ 50 dB	IEC 61300-2-22
3.4.5	Ferrule compression force	5 – 9 N. (Initial)	IEC 61300-3-22
3.4.6	Torsion	Min. 15N straight, 25 cycles ± 180° 0.5 meter from connector AttLΔ: During and after, ≤ 0.4 dB	IEC 61300-2-5
3.4.7	Fibre/Cable retention	**LC-end**: Min. 50N straight pull, during 120s **FULLAXS-end:** Min. F1= 100N straight. During 120s Min. F2= 50N 90°at direction 0°from axis. During 120s Min. F2=50N 90°at direction 90°from axis. During 120s Centre line through the two bayonet pins of the bulkhead. 0.3 meter from connector AttLΔ: During and after, ≤ 0.4 dB BR: Final test, ≥ 50 dB IP65: Before and after test	In acc. with IEC 61300-2-4 “See also paragraph. 3.5.1.”

3.5 Additional testing details.

3.5.1 Fibre/Cable retention tests.

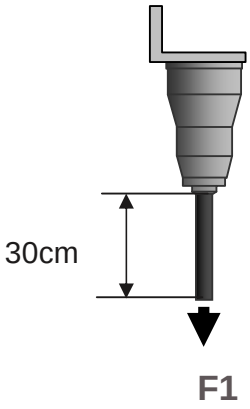

Figure 1: **Straight pull**

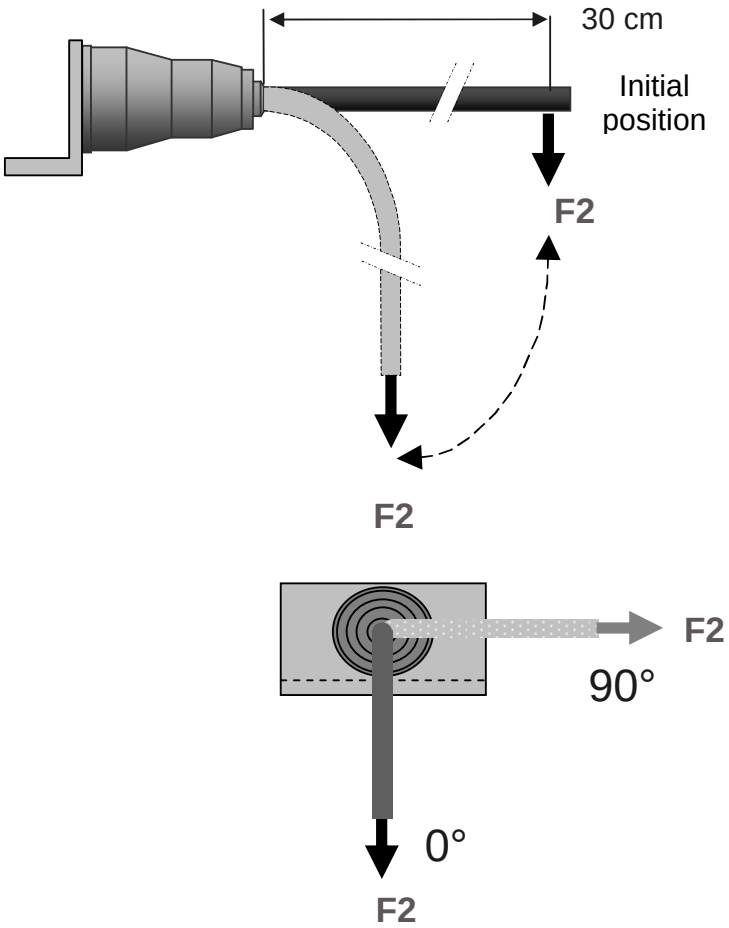

Figure 2: 90 degrees pull

3.6 Product Qualification and Requalification Test Sequence.

3.6.1 Cable assembly.

Test or examination Un-shielded cable assemblies	TEST-GROUP (a)				
	1	2	3		
	TEST-SEQUENCE (b)				
Storage (in primary packaging)	1				
Drop test (in primary packaging)	2				
Examination of cable assemblies	3, 10				
Fibre/Cable retention	4,8				
Torsion	5,9				
Ferrule compression force	6				
Temperature cycling	7				

Survey Of Sample In Test-groups					
Sample description	Number Of Samples To Be Tested In Test-groups				
	1	2	3		
Test frame panel	1				
Cable assemblies FO in primary packaging (shipping box) for step 1 and 2	5 pcs. from one box				

(a) See paragraph 4.1.
(b) Numbers indicate sequence in which tests are performed.

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.
All test-groups shall consist of a minimum of 5 cable assemblies.

B. Test sequence

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

4.2 Re-qualification testing.

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

4.3 Acceptance.

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

4.4 Quality conformance inspection.

Applicable TE 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.

Compliance information regarding EU RoHS/ELV, China RoHS, REACH SvHC and Halogen content about the products 2061432-X can be found at http://www.te.com/commerce/alt/product-compliance.do