
Multifiber LC duplex fiber Optic Single mode Cable assembly

1. SCOPE

This document specifies the requirements for single mode multifiber cable assemblies.

The specified requirements cover interfaces, dimensions, optical, mechanical and environmental performance, which all products must meet to be categorized as a qualified product.

1.1. Qualification

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

All components for the cable assembly including connectors, over-mold and cable were subject to their individual design objectives and were qualified accordingly.

This document addresses the final cable assembly.

2. APPLICABLE DOCUMENTS AND FORMS

The following documents and forms constitute a part of this specification to the extent specified herein. Unless otherwise indicated, the latest edition of the document applies.

2.1. TE Documents

- 501-652 Qualification test report; Single mode LC connector conform GR326.
- 501-160184: Qualification Test Report 3 core (6-fibers) FO cable assembly
- 501-160185: Qualification Test Report 6 core (12-fibers) FO cable assembly
- 2835439; Cable drawing 3 core (6-fibers) single mode FO cable
- 2835400; Cable drawing 6 core (12-fibers) single mode FO cable
- 2835695; Cable assembly drawing- 3 core (6-fibers)
- 2835696; Cable assembly drawing- 6 core (12-fibers)

2.2. Reference Document

- 115-1226; Ferrule End Face, Single-Mode, Geometry (Reference GR-326-CORE Issue 4)

2.3. Other Documents

- IEC 61300 Series test and measurement methods.
- IEC 60794 Generic specification- Basic optical cable test procedures

3. REQUIREMENTS

3.1. Design and Construction

Product shall be of the design, construction, materials and physical dimensions specified on the applicable drawing as found in paragraph 2.1.

3.2. Material and finish

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

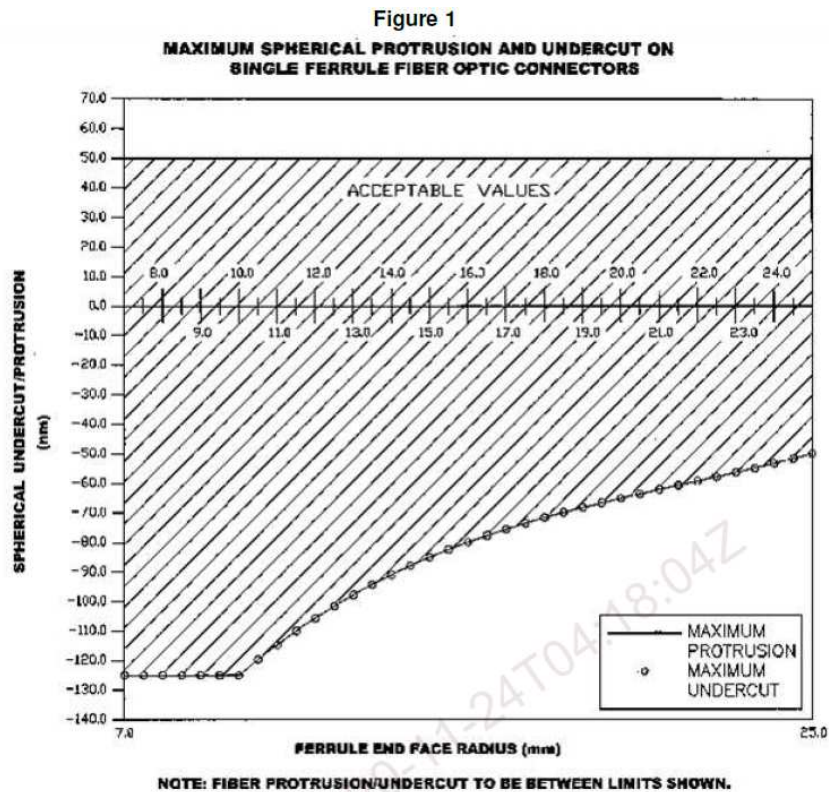
Protective Tubing - Flame Retardant, Black

Limiting Bending Boot - PP, UL 94 V-0, Blue

3.8. Test Requirements and Procedures Summary

Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

TEST DESCRIPTION	REQUIREMENT	PROCEDURE
Examination of product (Cable assembly)	Meets requirements of product drawing.	Visual, dimensional and functional as per applicable inspection plan.
OPTICAL		
Insertion Loss	Max 0.30 dB	according to IEC 61300-3-4 method B (Reference plug)
Return Loss:	Min 50 dB,	according to IEC 61300-3-6 method 1 or equivalent
Ferrule End face Geometry	Radius: 7 - 25 mm, Vertex offset: < 50um, Fiber protrusion: ≤ 50nm, Fiber withdrawal: ≤ 50nm (see figure-1)	115-1226



MECHANICAL

All measurements are to be performed at 20°C (Ambient temp.) @1550nm and no increase (>0.1dB) of insertion loss unless otherwise stated in the table below.

Minimum Bending radius	10D static 20D Dynamic (D; cable Diameter)	IEC 60794-1-2-F1, E11A
Crush resistance (On Main cable)	3000N, 3 times, not less than 500mm apart. Duration 60s. No damage to the cable sheath	IEC 60794-1-2, E3
Tensile Force, Max	During installation: 450N During Service: 300N	IEC 60794-1-2, E1
Water penetration (for Raw cable)	1 Meter water head, 3 meters cable sample, 24 h	IEC 60794-1-2, F5B
Transition device IP rating	(IPX7)	IEC 60529
Pulling	5 assemblies, 9m End A and End B: Min. 50N straight, 120s Hold 0.5 meter from connector	IEC 61300-2-4

	<p>Measurement required: Before, during (continuous) and after the test</p> <p>ILΔ: During and after, ≤ 0.2 dB</p> <p>RL: Final test, ≥ 50 dB</p>	
Torsion	<p>5 assemblies, 9m</p> <p>Min. 15N straight, 25 cycles ± 180°</p> <p>Hold max. 0.5 meter from Junction on the main cable</p> <p>Measurement required: Before, during (continuous) and after the test</p> <p>ILΔ: During and after, ≤ 0.2 dB</p> <p>RL: Final test, ≥ 50 dB</p> <p>Before and after temperature cycling test</p>	IEC 61300-2-5
Ferrule compression force	<p>5 assemblies, 9m</p> <p>5 – 8N</p> <p>Before and after temperature cycling test</p>	IEC 61300-3-22
Temperature cycling	<p>5 assemblies, 9m</p> <p>1 assembly, 500m</p> <p>Wavelengths: 1310 nm ± 30nm</p> <p>1550 nm ± 30nm</p> <p>-40°C to +75°C. Dwell time @ -40°C and +75°C: 6h (500m)</p> <p>-40°C to +75°C. Dwell time @ -40°C and +75°C: 1.5h (3m)</p> <p>Measurements required: Before, during (maximum interval 10min) and after the test, using method IEC 61300-3-3</p> <p>Pre-conditioning procedure: 2h at normal conditions. The plug and adaptor shall be cleaned with dry lint free material.</p> <p>Recovery Procedure: 2h at normal ambient conditions</p> <p>12 cycles</p> <p>With both cable and connectors in the climatic chamber Cable coiled loosely, diameter ≥ 600mm (150m) / ≥ 300mm (3m)</p> <p>ILΔ: During test, ≤ 0.5 db. After test, ≤ 0.4 dB</p> <p>RL: Final test, ≥ 50 dB</p>	IEC 61300-2-22

ENVIRONMENTAL

Flame	Pass Cable must be IEC 60332-3-24 Connectors must be UL94 V-	IEC 60332-3-24
CPR Compliance	EN 50575 EN 13501-6	Pass Dca – s2, d1, a1
UV resistance	PASS	ISO 4892-3



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 Table 2.

3.9. Product Qualification and Requalification Test Sequence

Part number's to be selected as per the cable assembly requirement.

Table-1

TEST GROUP			
Test Group	Part Number	Description	Qty
A	2835695-9 2835696-9	FOSM 6F LC DUPLEX - LC DUPLEX,9M FOSM 12F LC DUPLEX - LC DUPLEX,9M	1 pc (9mtrs each)
B	2835695-7 2835696-7	FOSM 6F LC DUPLEX - LC DUPLEX,7M FOSM 12F LC DUPLEX - LC DUPLEX,7M	5 pcs (7mtrs each)
C	2835695-7 2835696-7	FOSM 6F LC DUPLEX - LC DUPLEX,7M FOSM 12F LC DUPLEX - LC DUPLEX,7M	5 pcs (7mtrs each)
D	2835695-9 2835696-9 9- 2835695-1 9- 2835696-1	FOSM 6F LC DUPLEX - LC DUPLEX,9M FOSM 12F LC DUPLEX - LC DUPLEX,9M FOSM 6F LC DUPLEX - LC DUPLEX,500M FOSM 12F LC DUPLEX - LC DUPLEX,500M	5 pcs (9mtrs each) & 1pc (500meters)

Table-2

Sl.no	Test or Examination	Test Group (A)	Test Group (B)	Test Group (C)	Test Group (D)
1	Examination of product				1
2	Minimum Bending radius			1	
3	Crush test	1			
4	Tensile test			2	
5	Transition device IP rating		1		
6	Ferrule compression force				4&8(Only 9m)
7	Pulling				5&9(Only 9m)
8	Torsion				6&10(only 9m)
9	Temperature cycling				7(Both 500m & 9m)


NOTE

- (a) Numbers indicate sequence in which tests are performed.
 (b)