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## VITA 66.4 Half-Size Fiber Optic Connectors

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### 1. SCOPE

#### 1.1. Content

This specification covers the performance, tests and quality requirements for the TE Connectivity (TE) VITA 66.4 (Half-size) Fiber-Optic Connectors, for multi-mode MT ferrule variants accepting a single 12-count fiber.

#### 1.2. Qualification

When tests are performed on the subject product line, procedures specified in Figure 2 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 Documents

- [108-2467](#): VITA 66.1 Fiber Optic Connectors
- [501-134012-1](#): Qualification Test Report (VITA 66.4 (Half-Size) Fiber Optic Connectors)
- [101-46](#): Workmanship Specification (Polished Optical End Faces)
- [501-134012](#): Qualification Test Report (VITA 66.1 Style Fiber Optic Connectors)

#### 2.2. Industry Documents

- EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications
- Telcordia Technologies GR-1435-CORE, Issue 2: Generic Requirements for Multi-Fiber Optical Connectors
- TIA/EIA-455-B: Standard Test Procedures for Fiber Optic Fibers, Cables, Transducers, Sensors, Connecting and Terminating Devices and Other Fiber Optic Components

#### 2.3. Government Document

MIL-STD-810: Environmental Engineering Considerations and Laboratory Tests

### 3. REQUIREMENTS

#### 3.1. Design and Construction

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing. Cable is Type I Media – Multiple fibers arranged in a linear array and bound with a matrix material into a single unit (i.e., fiber ribbon).

#### 3.2. Optical Power Source

The optical power source wavelengths shall be 850  $\pm$ 30 and 1300  $\pm$ 30 nanometers for multi-mode product, or as stated in the Test Report.

3.3. Ratings

Performance	Value at 850 nm	Value at 1300 nm	Units
Attenuation, Typical (see Note)	0.5	0.4	dB
Return Loss, Typical (see Note)	28	30	dB
Storage Temperature	-55 to 85		°C
Operating Temperature	-20 to 85		°C
Durability	100		Cycles



**NOTE**

Typical values represent the median of the sample data for new product. See Figure 2 for maximum attenuation and minimum return loss requirements

Figure 1

3.4. Test Requirements and Procedures Summary

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

Test Description	Requirement	Procedure
Visual and mechanical inspection.	Connectors meet requirements of product drawings. MT Ferrules & cable assemblies meet end face requirements per Workmanship Specification 101-46 and Engineering Specification 115-1215-7.	TIA/EIA-455-13A. Visual, dimensional and functional per applicable quality inspection plan.
Attenuation.	For both pre-test measurements (random mate): Maximum attenuation value for any single specimen (connector joint or fiber) is 1.2 dB. Maximum average attenuation for any connector assembly is 0.7 dB. Maximum average attenuation for the test group (lot) is 0.65 dB. See Note 1.	TIA/EIA-455-171A, Method D1. Measure all fiber paths initially and at the end of the test sequence. At all other times, measure 3 fiber paths per paragraph 4.1.A. Clean per standard cleaning procedure (see GR-1435-CORE, Issue 2, Section 4.1.5). Take first pre-test measurement. Clean per TE recommended cleaning instructions. Record second pre-test measurement. See paragraph 4.1.
Return loss.	For both pre-test measurements (random mate): Minimum return loss value for any single specimen (connector joint or fiber) is 20 dB. See Note 1.	TIA/EIA-455-107A or TIA/EIA-455-8. Measure all fiber paths initially and at the end of the sequence. At all other times, measure 3 fiber paths per paragraph 4.1.A. Clean per standard cleaning procedure (see GR-1435 Issue 2, Section 4.1.5). Take first pre-test measurement. Clean per TE recommended cleaning instructions. Take second pre-test measurement. See Paragraph 4.1.

Figure 2 Cont.

Test Description	Requirement	Procedure
Vibration, sinusoidal.	Maximum attenuation value for any single specimen (connector joint or fiber) after testing each plane is 1.2 dB. Maximum attenuation increase for any single specimen (connector joint or fiber) after testing each plane is 0.5 dB. Minimum return loss for any single specimen (connector joint or fiber) after testing each plane is 20 dB. See Notes 1 and 2.	TIA/EIA-455-11D, Test Condition 1. Measure attenuation after installation on test fixture. Vibrate specimens for 2 hours at an amplitude of 1.5 mm (peak-to-peak) with the frequency sweeping continuously between 10 and 55 Hz. Mount and run in other 2 planes.
Vibration, random.	Maximum attenuation value for any single specimen (connector joint or fiber) after testing each plane is 1.2 dB. Maximum attenuation increase for any single specimen (connector joint or fiber) after testing each plane is 0.5 dB. Minimum return loss for any single specimen (connector joint or fiber) after testing each plane is 20 dB. See Notes 1 and 2.	TIA/EIA-455-11D, Test Condition VI, Condition Letter D. Subject mated and mounted specimens to 11.95 Gs rms between 50 and 2000 Hz. Fifteen minutes in each of 3 mutually perpendicular planes.
Shock.	Maximum attenuation value for any single specimen (connector joint or fiber) after testing each plane is 1.2 dB. Maximum attenuation increase for any single specimen (connector joint or fiber) after testing each plane is 0.5 dB. Minimum return loss for any single specimen (connector joint or fiber) after testing each plane is 20 dB. See Notes 1 and 2.	TIA/EIA-455-14A, Condition E. Subject mated and mounted specimens to 50 Gs sawtooth shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
End of service life.	Maximum attenuation value for any single specimen (connector joint or fiber) is 1.2 dB. Maximum attenuation increase for any single specimen (connector joint or fiber) is 0.5 dB. Maximum average attenuation for any connector assembly is 0.7 dB. Maximum average attenuation for the test group (lot) is 0.65 dB. Minimum return loss for any single specimen (connector joint or fiber) is 20 dB. See Note 1.	TIA/EIA-455-20A. After completing all testing, measure attenuation and return loss for all fibers in each specimen. Calculate change from last measurement taken for the initial attenuation test. See Paragraph 4.1.


**NOTE**

- (a) Test shall be performed and optical measurements made at the minimum insertion condition, corresponding to a Module Engagement Dimension of 23.5 mm as shown in Figure 5.
- (b) Shall meet visual requirements, show no physical damage, and shall meet the requirements of additional tests as specified in the Product Qualification Test Sequence in Figure 3.
- (c) For the durability test, product shall be tested at the maximum insertion condition, corresponding to a Module Engagement Dimension of 22.5 mm per Figure 5.

Figure 2 end

3.6. Product Qualification Test Sequence

Test or Examination	Test Group (a) VITA 66.4 (c)
	Test Sequence (b)
Visual and mechanical inspection	1
Attenuation	2
Return loss	3
Vibration, sinusoidal	4
Vibration, random	5
Shock	6
End of service life	7



**NOTE**

- (a) Specimens shall be selected at random from current production per Figure 4. Cable assemblies shall be cut in half to create 2 pigtailed, each terminated with a connector plug. One pigtail of each part number are mated to form a connector pair and fiber ends attach to the measurement system. Cable used for qualification shall be of type and length specified in Figure 4. For VITA 66.4 (Half-Size) connectors, measure the performance of fibers 1, 2, 6, 7, 11 and 12. Specimens shall have insertion losses no higher than 0.5 dB against a reference-quality lead in production.
- (b) *Numbers indicate sequence in which tests are performed.*
- (c) *The product qualification test sequence for VITA 66.4 Style connectors has been simplified due to product similarity to the previously-qualified VITA 66.1 Style connectors. Reference Product specification 108-2467*

Figure 3

Component	Part number/Type
Fiber size (microns / microns)	50/125
Cable type	Bare ribbon
Cable PN	5599749-2
Cable assembly PN	1938482-3
LIGHTRAY MPO spring	492259-1
LIGHTRAY MPO pin holder	492077-2
Backplane connector	VITA 66.4: 2226880-1
Module connector	VITA 66.4: 2226881-1
Test cable length	10 m
Test specimens required	5
Control cable required	Yes

Figure 4

**4. SPECIAL INSTRUCTIONS**

4.1. Cleaning

If at any time, a connector specimen is uncoupled during qualification testing, the optical interfaces shall be cleaned according to TE recommended cleaning instructions prior to any subsequent optical measurements. Additional cleaning techniques deemed necessary by Product Engineering shall be described in the test report. If, after cleaning the connector as prescribed, loss performance exceeds the specified limit, or, if the operator suspects the presence of debris at the optical interface, perform the cleaning procedure a second time. If the resultant optical reading still exceeds the specification, clean the interface a third time and accept that reading.

Cleaning is permitted between any two tests.

During the initial attenuation test, and after the end of service life test, follow cleaning recommendations in GR-1435-CORE, Issue 2, Table 4-2. For standard cleaning procedure, see GR-1435-CORE, Issue 2, Section 4.1.5.

After any other disconnects that occur during testing (such as to mount a specimen to a test fixture), clean per TE recommended cleaning procedure.

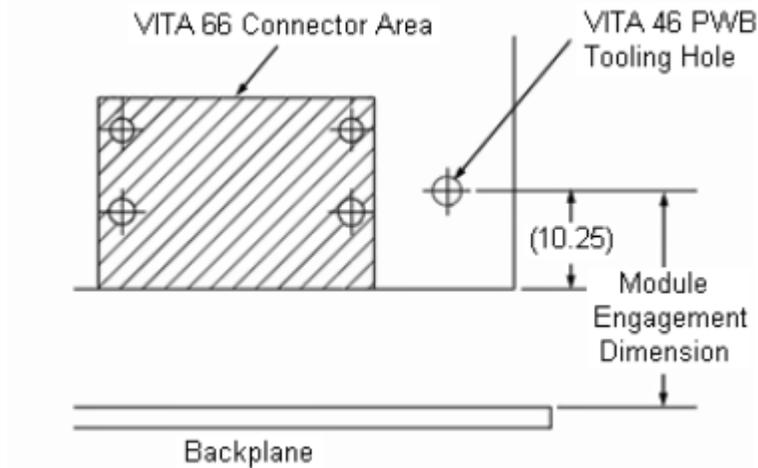


Figure 5