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**Connector, OPTIMATE\* Single Mode, Ceramic, 2.5mm Bayonet,  
Fiber Optic**

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**1. SCOPE****1.1. Content**

This specification covers performance, tests and quality requirements for the OPTIMATE\* ceramic single mode 2.5mm bayonet fiber optic connector.

**1.2. Qualification**

When tests are performed on the subject product line, procedures specified in EIA-455 shall be used. All inspections shall be performed using the applicable inspection plan(s) and product drawing(s).

**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. AMP Documents**

- A. 102-1099: Quality Specification
- B. 109 Series: Test Specifications
- C. 408-9645: Instruction Sheet
- D. 501-329: Test Report

**2.2. Commercial Standard**

- EIA-455: Standard Test Procedures for Fiber Optic Fibers, Cables, Transducers, Sensors, Connecting and Terminating Devices, and Other Fiber Optic Components

**3. REQUIREMENTS****3.1. Design and Construction**

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing(s).

**3.2. Optical Power Source**

Product shall be tested at both  $1310 \pm 30\text{nm}$  and  $1550 \pm 30\text{nm}$  wavelengths.

### 3.3. Ratings

Performance	Value	Units
Insertion Loss, typical (See Note)	0.3	dB
Reflectance	≤ -40	dB
Storage Temperature	-40 to 85	°C
Operating Temperature	-40 to 75	°C
Cable Retention	177.92 (40)	Newtons (Pounds)
Durability	100	Cycles
Flex Cycling	500	Cycles

**NOTE**

See Figure 2 for maximum values.

Figure 1

### 3.4. Performance and Test Description

Product is designed to meet the mechanical, environmental and optical transmittance performance requirements specified in Figure 2. Unless otherwise specified, all tests shall be performed at ambient environmental conditions.

### 3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Examination of product.	Meets requirements of product drawing.	EIA-455-13. Visual, dimensional and functional per applicable quality inspection plan.
Insertion loss.	Maximum average of all values per test group shall be 0.3 dB. Maximum allowed value for any single sample shall be 0.75 dB. See Note.	AMP Spec 109-1068, Method A.
Reflectance.	Maximum allowed value for any single sample shall be -40 dB. See Note.	AMP Spec 109-1068.
Thermal age.	Maximum change in optical transmittance after testing is 0.2 dB average and 0.4 dB for any single sample. Maximum reflectance after testing is -40 dB. See Note.	EIA-455-4B. Subject mated samples to 14 days at 85°C. Measure insertion loss and reflectance before and after test with samples in place in test chamber. See Para 5.2.

Figure 2 (cont)

Test Description	Requirement	Procedure
Humidity, steady state.	Maximum change in optical transmittance during/after testing is 0.2 dB average and 0.4 dB for any single sample. Maximum reflectance during/after testing is -40 dB. See Note.	EIA-455-5B. Subject non-preconditioned mated samples to steady state humidity at 90 to 95% RH at 75°C for 14 days. Measure insertion loss and reflectance before and after test and at 6 hour intervals during test. See Para 5.2.
Temperature cycling.	Maximum change in optical transmittance during testing is 0.3 dB average and 0.5 dB for any single sample. Maximum change in optical transmittance after testing is 0.2 dB average and 0.4 dB for any single sample. Maximum reflectance during/after testing is -40 dB. See Note.	EIA-455-3A. Subject mated samples to 42 cycles (14 days) between -40 and 75°C. Dwell 1 hour at each temperature plateau (including 23°C). Ramp time shall be 1 hour. Ramp to high temperature first. Measure loss and reflectance before and after test and at a minimum of 30 minutes after the start of each dwell at temperature. See Para 5.2.
Coupling mechanism strength.	Maximum change in optical transmittance after testing is 0.2 dB average and 0.4 dB for any single sample. Maximum reflectance after testing is -40 dB. See Note.	EIA/TIA-4750000-B, Section 4.5.2. Using a 7.6cm (3 inch) mandrel, apply 111.20 N (25 pound) tensile load for 1 minute at maximum rate of 2.5mm (0.1 inch) per minute. Release load at same rate. Mate only sample under test to coupling bushing. Measure insertion loss and reflectance before and after test.
Cable retention.	Maximum change in optical transmittance after testing is 0.2 dB average and 0.4 dB for any single sample. Maximum reflectance after testing is -40 dB. See Note.	EIA-455-6B, Method 1. Using a 7.6cm (3 inch) mandrel, apply 177.92 N (40 pound) tensile load to cable behind coupling nut of connector of unmated test sample for 1 minute. Measure insertion loss and reflectance before and after test.
Cable flexing.	Maximum change in optical transmittance after testing is 0.2 dB average and 0.4 dB for any single sample. Maximum reflectance after testing is -40 dB. See Note.	EIA-455-1A, Figure 2 apparatus. Using a 7.6cm (3 inch) mandrel, apply 0.5kg (1.1 pound) tensile load to cable of unmated sample. Flex 1 side $\pm 90^\circ$ per cycle for 500 cycles at maximum rate of 15 cycles per minute. Measure insertion loss and reflectance before and after test with load removed.

Figure 2 (cont)

Test Description	Requirement	Procedure
Twist.	Maximum change in optical transmittance after testing is 0.2 dB average and 0.4 dB for any single sample. Maximum reflectance after testing is -40 dB. See Note.	EIA-455-36A. Apply 2.5kg (5.51 pound) tensile load. Twist and return $\pm 90^\circ$ from center for 10 cycles at maximum rate of 15 cycles per minute. Measure insertion loss and reflectance before and after test.
Durability.	Maximum change in optical transmittance during/after testing is 0.2 dB average and 0.4 dB for any single sample. Maximum reflectance during/after testing is -40 dB. See Note.	EIA-455-21A. Mate and unmate samples 100 times. Measure insertion loss and reflectance every 50 cycles, cleaning optical interface before each measurement.

**NOTE** *Shall meet visual requirements, show no physical damage and shall meet requirements of additional tests as specified in Test Sequence in Figure 3.*

Figure 2 (end)

**3.6. Product Qualification and Requalification Test Sequence**

Test or Examination	Test Group (a)	
	1	2
	Test Sequence (b)	
Examination of product	1	1
Insertion loss	2	2
Reflectance	3	3
Thermal age	4	
Humidity, steady state	5	
Temperature cycling	6	
Coupling mechanism strength		4
Cable retention		5
Cable flexing		6
Twist		7
Durability		8

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

Figure 3

**4. QUALITY ASSURANCE PROVISIONS**

**4.1. Qualification Testing**

**A. Sample Selection**

Samples shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production per Figure 4. A sample shall be defined as a cable terminated with 2 connector plugs. Cable used for qualification shall be of type and length specified in Figure 4. Test cables shall be cut in center of length and fiber ends shall be attached to the measurement system. Connector plugs form a mated pair.

Test Group	1	2
Cable type	LDS(a)	LDS(a)
Cable PN	501530-1	501530-1
Connector kit PN	502579-1(b)	502579-1(b)
	502579-2(b)	502579-2(b)
Coupling bushing PN	502750-1	502750-1
Test cable length	20m (65.61 feet)	20m (65.61 feet)
Test samples required	7	7
Control cable required	1	1

**NOTE** (a) *Light Duty Single, 3.0mm diameter*  
 (b) *Fiber fit per IS 408-9645*

Figure 4

**B. Test Sequence**

Qualification inspection shall be verified by testing samples as specified in Figure 3.

**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 development/product, quality and reliability engineering.

**4.3. Acceptance**

Acceptance is based on verification that product meets requirements of Figure 2. Failures attributed to equipment, test setup or operator deficiencies shall not disqualify 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.

**5. SPECIAL INSTRUCTIONS****5.1. Cleaning****A. Single-sided procedure.**

Blow compressed air (or canned compressed gas that is clean, dry, and oil free) into open end of the adapter. Moisten lint-free wiping material (free of abrasive particles) with ethyl alcohol (USP  $\geq$  90%). Wipe the ferrule sides, then wipe across the ferrule endface. Repeat with dry wipe. Blow compressed air across the ferrule endface. Do not wipe the ferrule or allow anything to contact the ferrule after cleaning. Mate the ferrule to the adapter. Compare optical power level to the previous value recorded. If the value is within 0.05 dB, continue with the next test step. If the value is not within 0.05 dB, repeat this procedure two additional times. If the value is still not within 0.05 dB, unmate both connectors and follow the double-sided cleaning procedure below.

**B. Double-sided procedure.**

Blow compressed air through the adapter and repeat Para 5.1.A. for both connectors. Repeat this procedure two additional times if the value is not within 0.05 dB of the previous recorded value. If the value still is not within 0.05 dB, proceed with the next test step.

**5.2. Control cables.**

Control cables shall be subjected to climatic environmental tests. Transmittance shall be recorded each time a sample transmittance is made. Changes in control cable power of less than 0.05 dB may be neglected in test sample power and loss calculations. If control cable power changes by more than 0.05 dB over test or sequence of tests, change in control cable power shall be included in power and loss calculation.