



**Connector, AMP* LightCrimp* SC, Multimode, Ceramic, Fiber
Optic**

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for AMP* LightCrimp* SC ceramic multimode fiber optic connectors.

1.2. Qualification

When tests are performed on subject product line, procedures specified in EIA-455 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 extent specified herein. Unless otherwise specified, latest edition of the document applies. In the event of conflict between requirements of this specification and 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

- A. 102-1099: Quality Specification
- B. 408-4066: Instruction Sheet
- C. 501-318: Test Report

2.2. Commercial Standard

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

3. REQUIREMENTS

3.1. Design and Construction

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

3.2. Optical Power Source

- I Primary wavelength for optical power source(s) shall be $1300 \pm 30\text{nm}$.

3.3. Ratings

Performance	Value	Units
Insertion Loss, typical (See Note)	0.4	dB
Operating Temperature	-40 to 65	°C
Coupling Mechanism Strength	33 [7.5]	Newtons [Pounds]
Durability	500	Cycles
Flex Cycling	500	Cycles

NOTE 62.5/125 fiber size.

Figure 1

3.4. Performance and Test Description

Product is designed to meet 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 RS-455-13. Visual, dimensional and functional per applicable quality inspection plan.
Insertion loss.	Maximum average of all values per test group shall be 0.4 dB. Maximum allowed value for any single sample shall be 0.7 dB. See Note.	TIA/EIA-455-34A, Method A2. Launch fiber/cable shall be wrapped 5 times around mandrel so that fiber loop shall be 20mm [.787 inch] for 62.5/125 fiber. Wraps shall be close wound turns on a smooth surface and be secured in such a manner to guarantee integrity for duration of test. See Figure 4 for cable length.
Temperature cycling.	Maximum change in optical transmittance during/after testing is 0.5 dB average and 1.0 dB for any single sample. See Note.	EIA/TIA-455-3A, Test Condition C2. Subject mated samples to 5 cycles between -40 and 65°C. Measure optical transmittance before and after test with samples in place in test chamber and 5 to 10 minutes before end of each dwell during each cycle. See Para 5.2.

Figure 2 (cont)

Test Description	Requirement	Procedure
Humidity, steady state.	Maximum change in optical transmittance during/after testing is 0.3 dB average and 0.6 dB for any single sample. See Note.	TIA/EIA-455-5B, Test Type 1, Test Condition A. Subject mated samples to steady state humidity at 90 to 95% RH at 60°C for 96 hours. Measure initial optical transmittance at least 1 hour after preconditioning with samples in place in test chamber. Measure optical transmittance once every 24 hours. Measure optical transmittance 1 to 2 hours after humidity exposure with samples in place in test chamber. See Para 5.2.
Coupling mechanism strength.	Maximum change in optical transmittance after testing is 0.4 dB average and 0.6 dB for any single sample. See Note.	EIA/TIA-455-185. Using a 7.6cm [3 inch] mandrel, apply 33 N [7.5 pound] tensile load to cable at minimum distance of 20cm [8 inches] behind end of strain relief of 1 connector of the mated test sample for 1 minute. Measure optical transmittance before and after test.
Cable flexing.	Maximum change in optical transmittance during/after testing is 0.3 dB average and 0.5 dB for any single sample. See Note.	EIA-455-1A, Figure 2 apparatus. Using a 7.6cm [3 inch] mandrel, apply 0.5 kg [1.1 pound] tensile load to cable at minimum distance of 20cm [8 inches] behind end of strain relief of 1 connector of the mated test sample. Flex 1 side $\pm 90^\circ$ per cycle for 500 cycles at maximum rate of 15 cycles per minute. Measure optical transmittance before test and after every 50 cycles with load removed.
Twist.	Maximum change in optical transmittance after testing is 0.3 dB average and 0.5 dB for any single sample. See Note.	EIA-455-36A. Apply 2.5 kg [5.51 pound] tensile load to cable. Twist and return $\pm 90^\circ$ from center for 10 cycles at maximum rate of 30 cycles per minute.
Durability.	Maximum change in optical transmittance during/after testing is 0.4 dB average and 0.7 dB for any single sample. See Note.	EIA-455-21A. Mate and unmate 1 connector of test sample 500 times. Measure optical transmittance every 50 cycles, cleaning optical interface before each measurement.

Figure 2 (cont)

Test Description	Requirement	Procedure
Off axial pull strength (90°).	Maximum change in optical transmittance after testing is 0.5 dB average and 0.7 dB for any single sample. See Note.	EIA-455-6B, Method 1. Using a 7.6cm [3 inch] mandrel located at a minimum distance of 20cm [8 inches] behind end of strain relief of the mated test sample, apply 22N [5 lbf] tensile load to cable at 90° for 1 minute. Measure optical transmittance before and after test.
Change in optical transmittance.	Maximum of 0.5 dB average and 0.7 dB for any single sample after completion of sequence.	EIA RS-455-20. Measure optical transmittance after all tests have been performed. Calculate change from last measurement taken for insertion loss test. See Para 5.1. and 5.2.

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	3
	Test Sequence (b)		
Examination of product	1	1	1
Insertion loss	2	2	2
Temperature cycling	3		
Humidity, steady state	4		
Coupling mechanism strength		3	
Cable flexing		4	
Twist		5	
Durability		6	
Off axial pull strength (90°)			3
Change in optical transmittance	5	7	4

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. Cable used for qualification shall be of type and length specified in Figure 4 and terminated with connectors on each end as required for equipment interfacing. Test cables shall be installed on test equipment and test samples by cutting test cables in center and terminating cut ends with sample connectors. This procedure shall be followed as part of insertion loss measurements at start of each test sequence.

Test Group	1	2	3
Fiber size (microns/microns)	62.5/125	62.5/125	62.5/125
Cable type (See Note)	LDS	LDS	LDS
Cable PN	503016-1	503016-1	503016-1
Connector kit PN	503692-1	503692-1	503692-1
Coupling adapter	1-502632-1	1-502632-1	1-502632-1
Test cable length	10m [32.81 feet]	10m [32.81 feet]	10m [32.81 feet]
Test samples required	5	5	5
Control cable required	1	0	0

NOTE *Light Duty Single, 3.0mm diameter.*

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**

If at any time, a connector sample is uncoupled during qualification testing, optical interface shall be cleaned according to applicable Instruction Sheet 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 specification, clean the interface a third time and accept that reading.

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 per EIA RS-455-20.