NOTE
All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters [and inches]. Unless otherwise specified, dimensions have a tolerance of ±0.13 [±.005] and angles have a tolerance of ±2°. Figures and illustrations are for identification only and are not drawn to scale.

1. SCOPE

1.1. Content

This specification covers the performance, tests and quality requirements for Ultra-Pod fully insulated receptacles and tabs. These connectors consist of either a FASTON or Positive Lock receptacle (tab) body that is partially assembled in an insulated housing and mates with FASTON or Positive Lock tabs (receptacles) which are on devices used in home entertainment centers, business machines, copying equipment, computer peripheral, appliance and other commercial equipment.

1.2. Qualification

When tests are performed on the subject product line, the procedures specified in Figure 1 shall be used. All inspections shall be performed using the applicable inspection plan and product drawing. Successful qualification testing on the subject product line was completed on 04Nov91. Additional testing was completed on 01Jun09. The Qualification Test Report number for this testing is 501-148. This documentation is on file at and available from Engineering Practices and Standards (EPS).

2. APPLICABLE DOCUMENTS

The following documents form a part of this specification to the extent specified herein. 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 Connectivity (TE) Documents

109-1:	Test Specification (General Requirements for Test Specifications)
109-Series:	Test Specifications as indicated in Figure 1
114-2124:	Application Specification (Ultra-Pod FASTON* Fully Insulated Receptacles and Tabs)
114-13030:	Application Specification (Ultra-Pod Positive Lock Fully Insulated Receptacles)
501-148:	Qualification Test Report (Ultra-Pod Fully Insulated FASTON* Receptacle and Tab)

2.2. Commercial Standard

UL 310: Electrical Quick Connect Terminals, Standard for

2.3. Reference Documents

CSA C22.2 No 153: Quick-Connect Terminals

DIN VDE 0627/09.91

3. REQUIREMENTS

3.1. Design and Construction

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

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3.2. Material:

Contact:	Brass and tin-plated brass
Housing:	6/6 Nylon, UL94V-2 or UL94V-0
Tabs (for test purposes):	Brass, temper 2 CDA 26000 complies with UL 310 Para 5.
Wire (for test purposes):	Complies with UL 310 Para 7.3., 600-volt rating

3.3. Rating

Voltage:	600 volts AC
Operating Temperature:	-40 to 105°C
UL/CSA	150°C

3.4. Performance and Test Description

Product is designed to meet the electrical, mechanical and environmental performance requirements specified in Figure 1. Unless otherwise specified, all tests are performed at ambient temperature.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement		Procedure
Examination of product.	Meets requirements of product drawing and Application Specification 114-2124.		Visual, dimensional, and functional per applicable quality inspection plan.
Electrical			
Termination resistance, dry circuit.	1 milliohm maximum initial. 5 milliohms maximum final.		TE Spec 109-6-1. Subject mated contacts assembled in housing to 50 millivolt open circuit at 100 milliampere maximum.
Dielectric withstanding, Condition A.	One minute hold with no breakdown or flashover.		TE Spec 109-29-1 and UL 310, 600-volt rating. 3400 volts AC at sea level. Test wired terminals in number 12 lead shot after coating end with insulating material.
Dielectric withstanding, Condition C.	One minute hold with no breakdown or flashover.		TE Spec 109-29-1 and UL 310, 600-volt rating. 3000 volts AC at sea level. Test on a flat metal plate. See Figure 3.
Dielectric withstanding, receptacle, tab entry portion.	Terminal Series	Applied Voltage (Volts AC)	TE Spec 109-29-1. Test wired terminals on a flat metal plate. See Figure 4.
	250	1000	
	187	1000	
	110	600	
	One minute hold with no breakdown or flashover.		

Figure 1 (continued)

<table>
<tr><td>Temperature rise vs current.</td><td>Maximum temperature rise at specified current: 30°C initial, 45°C maximum final.
See Figure 5.</td><td>TE Spec 109-45-1.
Measure temperature rise vs current.</td></tr>
<tr><td>Current cycling.</td><td>Temperature rise, Δ temperature rise, and voltage drop.
See Figure 5.
24 and 500 cycles.</td><td>TE Spec 109-51, Condition F, Test Method 4.
Subject mated contacts to 500 cycles for 45 minutes ON and 15 minutes OFF.</td></tr>
<tr><td colspan="3">Mechanical</td></tr>
<tr><td>Crimp tensile.</td><td colspan="2"><table><tr><th>Wire Size (AWG)</th><th>Crimp Tensile (min.) (Lbs)</th></tr><tr><td>22</td><td>8</td></tr><tr><td>20</td><td>13</td></tr><tr><td>18</td><td>20</td></tr><tr><td>16</td><td>30</td></tr><tr><td>14</td><td>50</td></tr><tr><td>12</td><td>70</td></tr><tr><td>10</td><td>80</td></tr></table></td><td>TE Spec 109-16.
Determine crimp tensile at a maximum rate of 1 inch per minute.</td></tr>
<tr><td>Durability.</td><td>See Note.</td><td>TE Spec 109-27.
Mate and unmate connector assemblies for 6 cycles at a maximum rate of 600 cycles per hour.</td></tr>
<tr><td>Contact retention, Condition A.</td><td>Contacts shall not dislodge from its insulator at a force of less than 10 pounds minimum for 187 and 250 product, and 8 pounds minimum for 110 products.</td><td>TE Spec 109-30.
Measure force necessary to pull a fully seated contact out of housing.</td></tr>
<tr><td>Contact retention, Condition B.</td><td>Contacts shall not dislodge from its insulator.</td><td>UL-310.
Apply a 5-pound force to a fully seated contact for 1 minute.</td></tr>
<tr><td>Engagement/disengagement force.</td><td>See Figure 6 for Ultra-Pod FASTON products.
See Figure 7 for Ultra-Pod Positive Lock products.</td><td>TE Spec 109-42.
Measure force required to engage and disengage terminals, while in housing, with test tabs 6 times.</td></tr>
<tr><td colspan="3">Environmental</td></tr>
<tr><td>Humidity/temperature cycling.</td><td>See Note.</td><td>TE Spec 109-23-3, Condition B.
Subject mated connectors to 10 humidity/temperature cycles between 25 and 65°C and 95% RH.</td></tr>
<tr><td>Temperature life.</td><td>See Note.</td><td>TE Spec 109-43, Test level 9,
Test duration I.
Subject mated connectors to 118 ± 2°C for 33 days.</td></tr>
</table>

Figure 1 (continued)

Heat age, Condition A.	See Note.	Subject wired terminals to 136°C for 7 days.
Heat age, Condition B.	See Note.	Subject wired terminals to 180°C for 7 days.

Figure 1 (end)

NOTE
Shall meet the visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence.

3.6. Product Qualification and Requalification Tests

Test or Examination	Test Group (a)									
	1	2	3	4	5	6	7	8	9	10
	Test Sequence (b)									
Examination of product	1,4	1,4	1,4	1,3	1,3	1,3	1,3	1,9	1,4	1,4
Termination resistance, dry circuit								2,7		
Dielectric withstanding, Condition A		2	3						3	
Dielectric withstanding, Condition C				2						
Dielectric withstanding, receptacle, tab entry portion					2					
Temperature rise vs current	2(c)							3,8		
Current cycling	3(c)									
Crimp tensile		3								
Durability								4		
Contact retention, Condition A						2				
Contact retention, Condition B										3
Engagement/disengagement force							2			
Humidity/temperature cycling								6		
Temperature life								5		
Heat age, Condition A			2							
Heat age, Condition B									2	2

Figure 2

NOTE

(a) See paragraph ***Error! Reference source not found.****1. A.*
(b) Numbers indicate sequence in which tests are performed.
(c) Temperature rise and voltage drop measurements during current cycling are to be collected simultaneously. Prepare samples in accordance with UL 310. Use #30 AWG iron constantan wire thermocouple pressure fitted between contact and insulation as shown. (Welded arrangement optional). Fit must be sufficient to produce good thermal contact, void of free movement between thermocouple and contact. Thermocouple lead must have strain relief suitable to protect interface.

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Sample Selection

Terminals and tabs shall be prepared in accordance with applicable Instruction Sheets. They shall be selected at random from current production. Test groups 3, 4, 5, 6, and 7 shall consist of 20 samples of each terminal type per group. Test groups 1 and 2 shall consist of 20 samples of each wire size and terminal type per group. Test group 8 shall consist of 20 samples of each terminal type per group on the maximum wire size for the intended range of wires. All samples to be terminated shall be crimped to appropriate tin-plated test conductors. Test groups 9 and 10 shall each consist of 6 specimens of each terminal type per group. All specimens shall be crimped to the appropriate tin-plated test conductors.

B. Test Sequence

Qualification inspection shall be verified by testing samples as specified in Figure 2.

4.2. Requalification Testing

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

4.3. Acceptance

Acceptance is based on verification that the product meets the requirements of Figure 1. Failures attributed to equipment, test setup, or operator deficiencies shall not disqualify the 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

The applicable quality inspection plan will specify the sampling acceptable quality level to be used. Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

4.5. Certificate

This product has been listed by Underwriters' Laboratories Inc., Electrical File Number E-66717 and | certified by Canadian Standards Association Certification Number LR-7189.

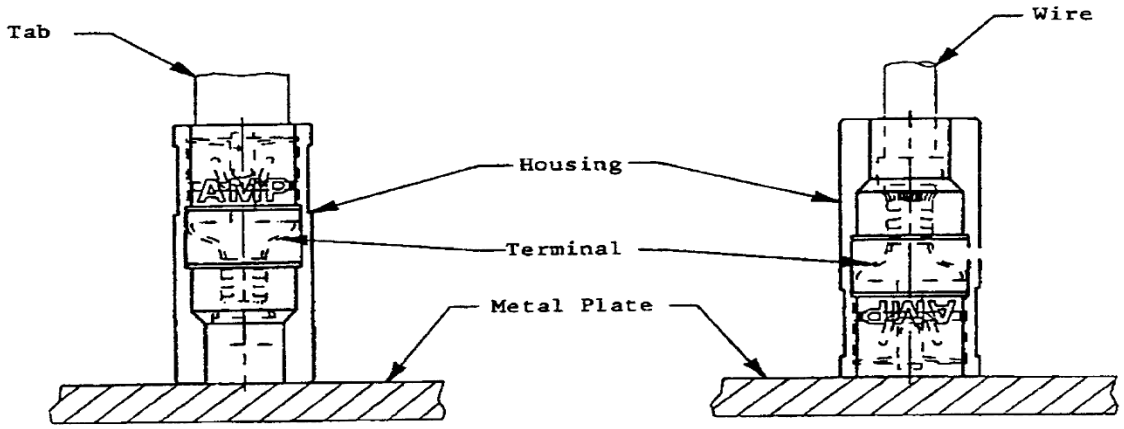


Figure 3
Metal Plate Test Fixture
Dielectric Condition C

Figure 4
Receptacle
Tab Entry Portion

Wire Size (AWG)	Test Current (amperes) See Note (a)				Test Voltage Drop (millivolts maximum) See Note (b)				Temperature Rise	
	Heating		Cycling		24 cycles		500 cycles			
	110	All Others	110	All Others	.250	All Others	.250	All Others	Heating	Cycling
22	2	3	4	6	10	14	14	18	30°C maximum initial. 45°C maximum final.	85°C maximum See Note (c)
20	3	4	6	8	11	15	15	19		
18	4	7	8	14	13	17	17	21		
16	5	10	10	20	15	19	19	23		
14		15		30	20	21	26	25		
12		20		40	22		28			
10		24		48	26		30			

Figure 5

NOTE

(a) Δ temperature rise between 24 and 500 cycles shall not exceed 15°C on any conductor.

(b) Alternating current to be used for temperature rise measurements, direct current to be used for voltage drop measurements.

(c) Total Voltage Drop = Crimp + Friction - EWL (equivalent wire length). These values are for tin/tin or tin/brass receptacle to tab connections.

TAB SERIES	FORCE (NEWTONS [LBS])					
	FIRST MATING (MAXIMUM) INDIVIDUAL	FIRST UNMATING		SIXTH UNMATING		
		(MAX)	(MINIMUM)		MINIMUM	
			AVERAGE	INDIVIDUAL	AVERAGE	INDIVIDUAL
TEST TAB AND UNPLATED FASTON RECEPTACE						
250	80.1 [18]	80.1 [18]	26.7 [6]	17.8 [4]	22.2 [5]	17.8 [4]
187	66.7 [15]	89 [20]	22.2 [5]	13.3 [3]	13.3 [3]	8.9 [2]
110	53 [12]	62 [14]	13 [3]	9 [2]	9 [2]	4 [1]
TEST TAB AND TIN-PLATED FASTON RECEPTACLE						
250	75.6 [17]	75.6 [17]	22.2 [5]	13.3 [3]	17.8 [4]	13.3 [3]
187	66.7 [15]	89 [20]	22.2 [5]	13.3 [3]	13.3 [3]	8.90 [2]
110	53 [12]	62 [14]	13 [3]	9 [2]	9 [2]	4 [1]

Figure 6

TAB SERIES	FORCE (NEWTONS [LBS])			
	FIRST MATING (MAXIMUM)	FIRST UNMATING (MINIMUM)		SIXTH UNMATING (MINIMUM)
		LOCKED	UNLOCKED	LOCKED
TEST TAB AND UNPLATED POSITIVE LOCK RECEPTACE				
250	35.6 [8]	80.1 [18]	9 [2]	66.7 [15]
187	35.6 [8]	66.7 [15]	9 [2]	53 [12]
110	31.1 [7]	53 [12]	9 [2]	44.5 [10]

Figure 7