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

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

EIA-364: Electrical Connector/Socket Test Procedures Including Environmental Classifications

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.

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 6.2., 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. After testing, there shall be no corrosive influence on the performance and no physical damage that would impair product performance.	EIA-364-18 Visual and dimensional (C of C) inspection per the product drawing.
Electrical		
Low Level Contact Resistance	1 milliohm (maximum) initial 5 milliohms (maximum) final See Figure 8	EIA-364-23 Subject contacts to 20mV open circuit at 100mA MAX.
Temperature Rise vs. Current	Temperature rise at specific current: 30°C initial (maximum) & 45°C final (maximum) See Figures 5 & 8	UL310 A temperature shall be considered to be stable when three successive readings taken at intervals of 5 minutes indicate no further rise above the ambient temperature
Dielectric Withstanding Voltage, Insulation Puncture Test **(without pre-conditioning outlined in UL310 6.6.2.5)**	No breakdown or flashover	UL310 (600 Volt Rating) Duration: 1 minute 3400 VAC at sea level Test wired terminals in number 12 shot **(differs from 7½ shot dictated in spec)** after coating end with insulating material Rate of Application: 500V per second **Do Not pre-condition as outlined in UL310 6.7.3**
Dielectric Withstanding Voltage, Flashover Test	No breakdown or flashover	UL310 (600 Volt Rating) Duration: 1 minute 3000 VAC at sea level Test on a flat metal plate without wires, See Figure 3 Rate of Application: 500V per second

Figure 1 (continued next page)

Dielectric Withstanding Voltage, Receptacle, Tab Entry Position	Terminal Series	Applied Voltage (Volts AC)	EIA-364-20, Method B, Condition I Duration: 1 minute Test between contact and flat metal plate, See Figure 4 Rate of Application: 500V per second
	250	1000	
	187	1000	
	110	600	
Current Cycling	Temperature Rise, Δ Temperature Rise, and Millivolt Drop (See Figures 5 & 8) 24 and 500 cycles.		UL310 Subject mated contacts to 500 cycles for 45 minutes "ON" and 15 minutes "OFF"
Mechanical			
Crimp Tensile	Wire Size (AWG)	Crimp Tensile (lbs. minimum)	EIA-354-8 Determine crimp tensile strength as an axial force is applied at a rate of 25.4±6.35mm per minute
	22	8	
	20	13	
	18	20	
	16	30	
	14	50	
	12	70	
	10	80	
Durability	No physical damage detrimental to the product performance		EIA-364-9 Mate and un-mate connector assemblies for 6 cycles at a maximum rate of 600 cycles per hour.
Contact Retention to Failure Test	Contacts shall not dislodge from its insulator at a force of less than 10 lbs. (minimum) for 187 and 250 series products, and 8 lbs. (minimum) for 110 series products		EIA-364-29, Method C Measure force necessary to pull a fully seated contact out of housing Rate: 25.4mm/min MAX
Secureness of Insulation Test **(without pre-conditioning outlined in UL310 6.7.3)**	Contacts shall not dislodge from its insulator.		UL-310. Apply a 5 lb. force to a fully seated contact for 1 minute **Do Not pre-condition as outlined in UL310 6.7.3**
Engagement/Disengagement Force	See Figures 6 & 7		EIA-364-13, Method A Engage and disengage terminals and tabs 6 times
Environmental			
Humidity-Temperature Cycling	No physical damage detrimental to the product performance		EIA-364-31, Method IV Subject mated connectors to 10 humidity/temperature cycles between 25-65°C and 95% relative humidity for a duration of 240 hours
Temperature Life (118°C/33 days)	No physical damage detrimental to the product performance		EIA 364-17, Method A Subject mated connectors to 118°C for 33 days
Temperature Life (136°C/7 days)	No physical damage detrimental to the product performance		EIA 364-17, Method A Subject wired terminals to 136°C for 7 days.
Temperature Life (180°C/7 days)	No physical damage detrimental to the product performance		EIA 364-17, Method A 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 Sequences shown in Figure 2.

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
Low Level Contact Resistance								2,7		
Temperature Rise vs. Current	2							3,8		
Dielectric Withstanding Voltage, Insulation Puncture Test		2	3						3	
Dielectric Withstanding Voltage, Flashover Test				2						
Dielectric Withstanding Voltage, Receptacle, Tab Entry Position					2					
Current Cycling	3 (c)									
Crimp Tensile		3								
Durability								4		
Contact Retention to Failure Test						2				
Secureness of Insulation Test										3
Engagement/Disengagement Force							2			
Humidity-Temperature Cycling								6		
Temperature Life (118°C/33 days)								5		
Temperature Life (136°C/7 days)			2							
Temperature Life (180°C/7 days)									2	2

Figure 2

NOTE

(a) See Para 4.2.A.
(b) Numbers indicate sequence in which tests are performed.
(c) Temperature rise and voltage drop measurements during current cycling to be collected simultaneously.

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.

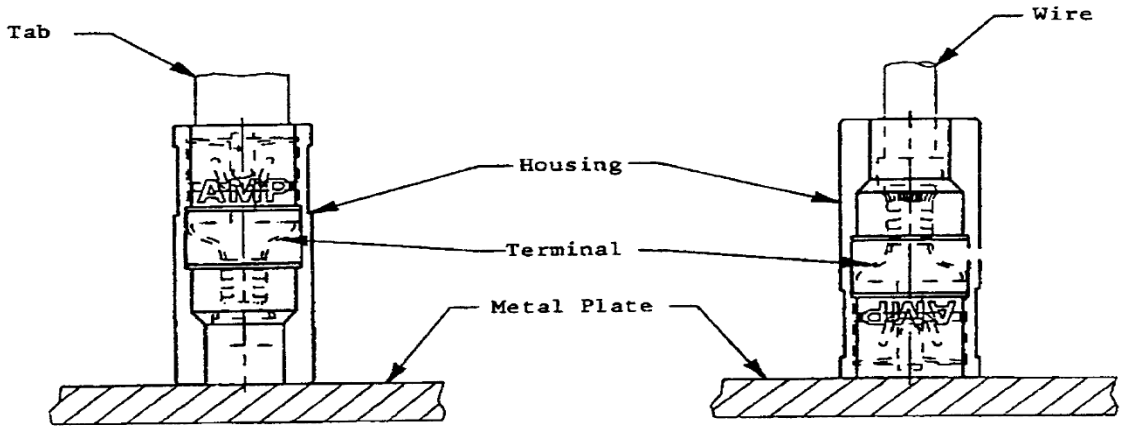

Figure 3
Metal Plate Test Fixture
(Dielectric Withstanding Voltage, Flashover Test)

Figure 4
Metal Plate Test Fixture
(Dielectric Withstanding Voltage, Receptacle, Tab Entry Position)

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
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) 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

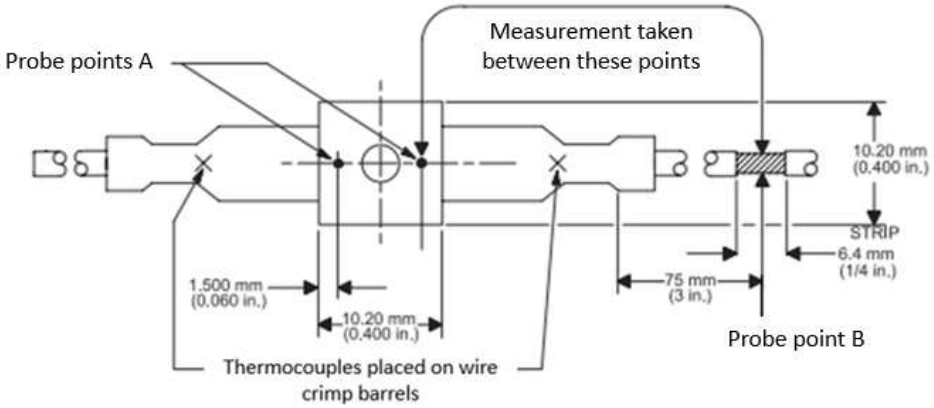

Figure 8
Thermocouple and Probe Setup for T-Rise
And Current Cycling Tests