
AMP-DUAC UPC

1. SCOPE

1.1. Content

This specification covers performance, tests and quality requirements for the AMP* Dual Action (AMP-DUAC) Universal Power Connector (UPC) System. This 6 row by variable column count (M) connector system is designed for power applications and uses female crimp-snap contacts in the receptacle connector half, and male crimp-snap contacts in the plug half. Housings are keyed and polarized to prevent inverse mating, improper mating of dissimilar size housings and inverse mating of the plug on a panel.

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.

1.3. Qualification Test Results

Successful qualification testing on the subject product line was completed on 04Apr08. The Qualification Test Report number for this testing is 501-686. 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. 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. Tyco Electronics Documents

- ! 109-197: Test Specification (AMP Test Specifications vs EIA and IEC Test Methods)
- ! 114-13195: Application Specification (AMP-DUAC UPC)
- ! 501-686: Qualification Test Report (AMP-DUAC UPC)

2.2. Industry Standard

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

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. Materials

Materials used in the construction of this product shall be as specified on the applicable product drawing.

3.3. Ratings

- ! Voltage: 600 volts AC maximum peak (\leq a of minimum breakdown voltage)
- ! Current: See Figure 1

NOTE Socket contact part number 1934193 shall only be used in signal applications.

- ! Temperature: -55 to 105°C

Density (loading)	Current Rating (amperes)	Loading Array
48 Position UPC		
100%	4.25	Figure 4
Special (75%)	5	Figure 5
66 Position UPC		
100%	4	Figure 6
Special (73%)	4.5	Figure 7
Special (73%) 80 LFM	5.5	Figure 7

NOTE Figures 4 through 7 are patterns that were specifically tested and proved to produce $\leq 30^\circ\text{C}$ temperature rise when creating a different load pattern, which utilizes contacts running at > 3 amperes.

Figure 1

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 shall be performed at ambient environmental conditions per EIA-364.

3.5. Test Requirements and Procedures Summary

Test Description	Requirement	Procedure
Initial examination of product.	Meets requirements of product drawing.	EIA-364-18. Visual and dimensional (C of C) inspection per product drawing.
Final examination of product.	Meets visual requirements.	EIA-364-18. Visual inspection.
ELECTRICAL		
Low Level Contact Resistance (LLCR).	25 milliohms maximum.	EIA-364-23. Subject specimens to 100 milliamperes maximum and 20 millivolts maximum open circuit voltage. See Figure 8.

Figure 2 (continued)

Test Description	Requirement	Procedure
Insulation resistance.	1000 megohms minimum.	EIA-364-21. 500 volts DC, 2 minute hold. Test between adjacent contacts of mated specimens.
Withstanding voltage.	One minute hold with no breakdown or flashover.	EIA-364-20, Condition I. 1800 volts AC at sea level. Test between adjacent contacts of mated specimens.
Temperature rise vs current without air flow.	See Figure 1 for temperature rise vs current information.	EIA-364-70, Method 1. Stabilize at a single current level until 3 readings at 5 minute intervals are within 1°C.
Temperature rise vs current with air flow.	See Figure 1 for temperature rise vs current information.	EIA-364-70, Method 1. Stabilize at a single current level until 3 readings at 5 minute intervals are within 1°C. Subject specimens to 80 LFM flowing across the long side to the specimen.
MECHANICAL		
Random vibration.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-28, Test Condition VII, Condition D. Subject mated specimens to 3.10 G's rms between 20 to 500 Hz. Fifteen minutes in each of 3 mutually perpendicular planes.
Mechanical shock.	No discontinuities of 1 microsecond or longer duration. See Note.	EIA-364-27, Condition H. Subject mated specimens to 30 G's half-sine shock pulses of 11 milliseconds duration. Three shocks in each direction applied along 3 mutually perpendicular planes, 18 total shocks.
Durability.	See Note.	EIA-364-9. Mate and unmate specimens for 25 cycles at a maximum rate of 500 cycles per hour.
Mating force.	2.90 N single contact maximum average.	EIA-364-13. Measure force necessary to mate specimens at a maximum rate of 12.7 mm per minute.
Unmating force.	0.50 N single contact minimum average. 1.85 N single contact maximum average.	EIA-364-13. Measure force necessary to unmate specimens with latch disengaged at a maximum rate of 12.7 mm per minute.

Figure 2 (continued)

Test Description	Requirement	Procedure
Latch retention.	111 N. Specimens shall remain latched and maintain continuity.	EIA-364-98. Applied specified force as a straight pull.
Contact retention.	44.5 N with PL installed (socket contacts only). 22.5 N without PL installed (pin contact only). Contacts shall not dislodge from normal position.	EIA-364-29. Apply specified force to contacts for 6 seconds.
ENVIRONMENTAL		
Thermal shock.	See Note.	EIA-364-32, Test Condition VII. Subject mated specimens to 5 cycles between -55 and 105°C.
Humidity/temperature cycling.	See Note.	EIA-364-31, Method III. Subject mated specimens to 10 cycles (10 days) between 25 and 65°C at 80 to 100% RH.
Temperature life.	See Note.	EIA-364-17, Method A, Test Condition 4, Test Time Condition D. Subject mated specimens to 105°C for 1000 hours.

NOTE

Shall meet visual requirements, show no physical damage, and meet requirements of additional tests as specified in the Product Qualification and Requalification Test Sequence shown in Figure 3.

Figure 2 (end)

3.6. Product Qualification and Requalification Test Sequence

Test or Examination	Test Group (a)				
	1	2	3	4	5
	Test Sequence (b)				
Initial examination of product	1	1	1	1	1
Low Level Contact Resistance (LLCR)	3,7	2,7			2,6
Insulation resistance			2,6		
Withstanding voltage			3,7		
Temperature rise vs current without air flow		3,8			
Temperature rise vs current with air flow					7
Random vibration	5	6			5
Mechanical shock	6				
Durability	4				
Mating force	2				
Unmating force	8				
Latch retention				2	
Contact retention				3	
Thermal shock			4		
Humidity/temperature cycling		4(c)	5(d)		3(c)
Temperature life		5			4
Final examination of product	9	9	8	4	8

NOTE

- (a) See paragraph 4.1.A.
- (b) Numbers indicate sequence in which tests are performed.
- (c) Precondition specimens with 5 durability cycles.
- (d) Final measurements shall be taken after the recovery period.

Figure 3

4. QUALITY ASSURANCE PROVISIONS

4.1. Qualification Testing

A. Specimen Selection

Specimens shall be prepared in accordance with applicable Instruction Sheets and shall be selected at random from current production. Each test group shall consist of a minimum of 4 mated pair specimens.

B. Test Sequence

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

4.2. Requalification Testing

If changes significantly affecting form, fit or function are made to the product or 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. If product failure occurs, corrective action shall be taken and specimens resubmitted for qualification. Testing to confirm corrective action is required before resubmittal.

4.4. Quality Conformance Inspection

The applicable quality inspection plan shall 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.

	8	7	6	5	4	3	2	1
A	4.25A	4.25A	4.25A	4.25A	4.25A	4.25A	4.25A	4.25A
B	4.25A	4.25A	4.25A	4.25A	4.25A	4.25A	4.25A	4.25A
C	4.25A	4.25A	4.25A	4.25A	4.25A	4.25A	4.25A	4.25A
D	4.25A	4.25A	4.25A	4.25A	4.25A	4.25A	4.25A	4.25A
E	4.25A	4.25A	4.25A	4.25A	4.25A	4.25A	4.25A	4.25A
F	4.25A	4.25A	4.25A	4.25A	4.25A	4.25A	4.25A	4.25A

Figure 4
48 Position 100 % Loaded

	8	7	6	5	4	3	2	1
A	5 A	5 A	5 A	5 A	5 A	5 A	5 A	5 A
B	5 A	5 A	100 mA	5 A	100 mA	5 A	100 mA	5 A
C	5 A	100 mA	5 A	100 mA	5 A	100 mA	5 A	5 A
D	5 A	5 A	100 mA	5 A	100 mA	5 A	100 mA	5 A
E	5 A	100 mA	5 A	100 mA	5 A	100 mA	5 A	5 A
F	5 A	5 A	5 A	5 A	5 A	5 A	5 A	5 A

Figure 5
48 Position Special Load, 75%

	11	10	9	8	7	6	5	4	3	2	1
A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A
B	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A
C	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A
D	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A
E	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A
F	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A

Figure 6
66 Position 100% Loaded

	11	10	9	8	7	6	5	4	3	2	1
A	XA	XA	XA	XA	XA	XA	XA	XA	XA	XA	XA
B	XA	XA	100 mA	XA	100 mA	XA	100 mA	XA	100 mA	XA	XA
C	XA	100 mA	XA	100 mA	XA	100 mA	XA	100 mA	XA	100 mA	XA
D	XA	XA	100 mA	XA	100 mA	XA	100 mA	XA	100 mA	XA	XA
E	XA	100 mA	XA	100 mA	XA	100 mA	XA	100 mA	XA	100 mA	XA
F	XA	XA	XA	XA	XA	XA	XA	XA	XA	XA	XA

Note: If 80 LFM of airflow is applied over the connector, it is rated for 5.5 amperes; if no airflow is applied, it is rated for 4.5 amperes.

Figure 7
66 Position Special Load, 73%

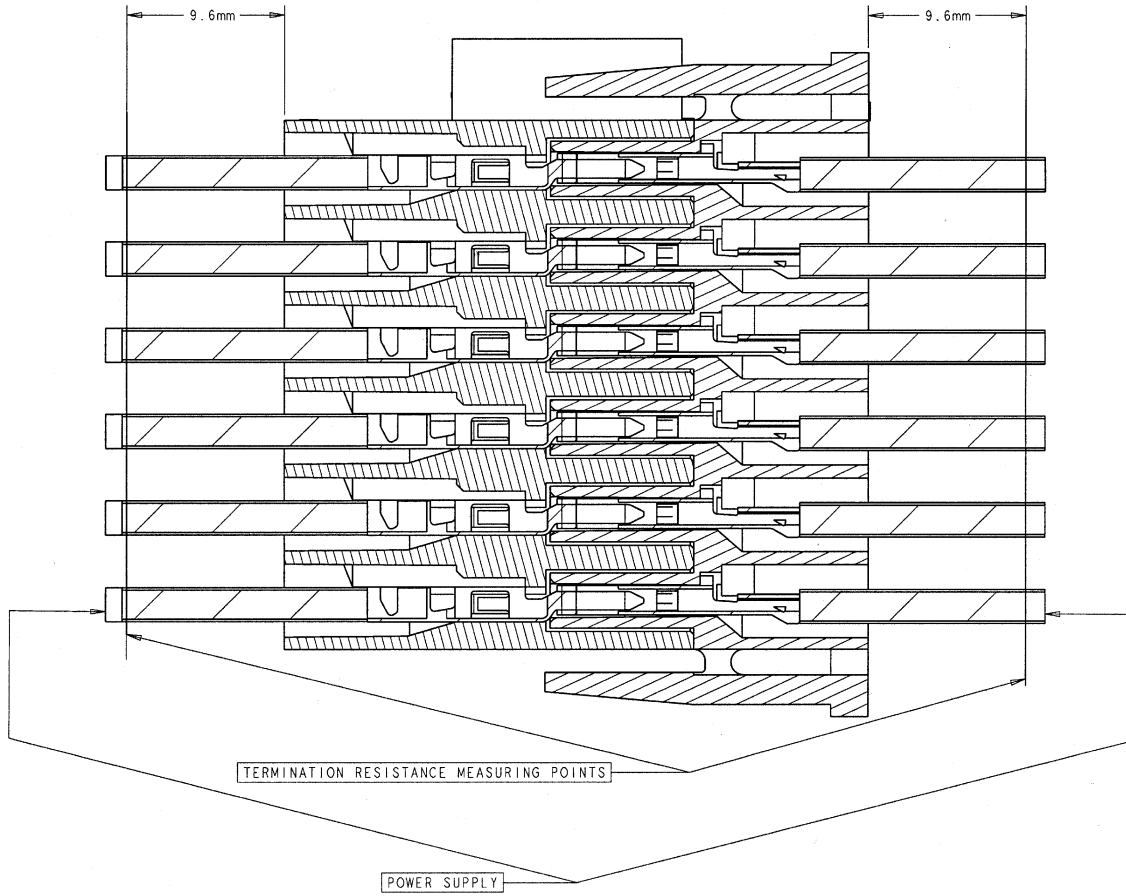


Figure 8
Low Level Contact Resistance Measurement Points