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## D1500 Junction Box

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### 1. Scope :

#### 1.1 Contents

This specification covers the requirements for product performance, test methods and quality assurance provisions of DYNAMIC D1500 Junction Box. Applicable product description and part numbers are as shown in Fig. 7 in Appendix 1.

### 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 AMP Specifications :

- A. 109-5000 Test Specification, General requirements for Test Methods
- B. 501-106027 Test report
- C. 114-5377 Application Specification

#### 2.2 Commercial Standards and Specifications :

- A. MIL-STD-202
- B. IEC 512 Test Specification

### 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 :

##### A. Contact

Material : Pin: Brass                      Receptacle: Copper alloy  
Finish : Nickel plating all over  
Contact Point : Gold plating

##### B. Receptacle 10P plug Housing

Material : G.F. Polyester  
Color : Black  
Flammability : UL 94V-0

##### C. Base Housing, Cover and Attachment

Material : G.F. Polyester  
Color : Black  
Flammability : UL 94V-0

### 3.3 Ratings :

- A. Voltage Rating : 250 V AC/DC (3.5mm Pitch connector)
- B. Current Rating : See Fig. 1
- C. Temperature Rating : -55 centigrade to 105 centigrade  
(Include temperature rising by energized current)
- D. Minimum Rating: 1mV, 1μA Minimum

Unit : A

Contact	Rec. Contact and Tab Contact						
Wire Size	AWG #18	AWG #20	AWG #22	AWG #24	AWG #26	AWG #28	AWG #30
Pos.							
34 Pos.	-	-	3	1.5	1	0.8	0.5

Fig. 1

### 3.4 Performance Requirements and Test Descriptions :

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Fig.2. All tests shall be performed in the room temperature unless otherwise specified.

### 3.5 Test Requirements and Procedures Summary :

No.	3.5.1
Test Items	Examination of Product
Requirements	Meets requirements of product drawing and AMP Specification (114-5377) After test, no corrosion influence performance.
Procedures	Visual inspection No physical damage
<b>Electrical Requirements</b>	
No.	3.5.2
Test Items	Termination Resistance (Low Level)
Requirements	10 mΩ Max. (Initial) 20 mΩ Max. (Final)
Procedures	Subject mated contacts assembled in housing to 20mV Max. open circuit at 10mA. Take the resistance of the wire only away from measurement Fig. 6. TE Spec. 109-5311-1
No.	3.5.3
Test Items	Insulation Resistance
Requirements	1000 MΩ Min. (Initial) 100 MΩ Min. (Final)
Procedures	Impressed voltage 500 V DC. Test between adjacent circuits contact of mated connectors. AMP Spec. 109-5302 MIL-STD-202, Method 302 Condition B
No.	3.5.4
Test Items	Dielectric withstanding Voltage
Requirements	No creeping discharge nor flashover shall occur. Current leakage: 0.5 mA Max.

Procedures	1500V AC for 1 minute. Test between adjacent circuits contact of mated connectors.
No.	3.5.5
Test Items	Temperature Rising
Requirements	30 centigrade Max. under loaded specified current.
Procedures	Install Contact in the housing, energize, and measure the rise in heat by energizing. The measurement is measured on the condition of not receiving the influence of the convection of air. The thermo-couple is measured attaching to Crimp of the wire barrel of Contact. (Fig. 6) Wire selection refers Fig. 1. TE Spec. 109-5310
<b><u>Mechanical Requirements</u></b>	
No.	3.5.6
Test Items	Vibration (High Frequency)
Requirements	No electrical discontinuity greater than 1 µsec. shall occur. 20 mΩ Max. (Final)
Procedures	Subject mated connectors to 10-500-10 Hz traversed in 1cycle per 15 minutes at 1.52mm amplitude 3 hours each of 3 mutually perpendicular planes. 100 mA applied. TE Spec : 109-5202, Condition A MIL-STD-202 : Method 204, Condition A The product is mounted as Fig 8,9,10.
No.	3.5.7
Test Items	Shock
Requirements	No electrical discontinuity greater than 1µ sec. shall occur. 20 mΩ Max. (Final)
Procedures	Mated connectors Accelerated Velocity : 490m/s <sup>2</sup> Waveform: Sign Curve Duration : 11 m sec. Number of Drops : 3 drops each to normal and reversed directions of X, Y and Z axes, totally 18 drops. The product is mounted as fig 8, 9 and 10. TE Spec. 109-5208 MIL-STD-202, Method 213 Condition A
No.	3.5.8
Test Items	Connector Mating/Unmating Force
Requirements	Mating Force (2.94×Pos.)N Max. (300×Pos.)g Max. Unmating Force (0.12×Pos.)N Min. (1 <sup>st</sup> ) (12×Pos.)g Min. (1 <sup>st</sup> ) (0.08×Pos.)N Min. (50 <sup>th</sup> ) (8×Pos.)g Min. (50 <sup>th</sup> )
Procedures	Operation Speed : 25 mm/min. Measure the force required to mate/unmate connectors. However, It is measure without HSG Lock
No.	3.5.9
Test Items	Contact Insertion Force
Requirements	7.84N (0.8 kgf) Max. per contact
Procedures	Measure the force required to insert contact into housing. TE Spec. 109-5211
No.	3.5.10

Test Items	Contact Retention Force
Requirements	14.7N(1.5kgf) Min.
Procedures	Apply an axial pull-off load to crimped wire. Operation Speed : 100 mm / min. TE Spec. 109-5210
No.	3.5.11
Test Items	Contact Mate/Unmating Force
Requirements	Mate 2.94N(300g)Max.(1 <sup>st</sup> ~50 <sup>th</sup> ) Unmating 0.12N(12g)Min. (1 <sup>st</sup> ) 0.08N (8g)Min. (50 <sup>th</sup> )
Procedures	Operation speed 100 mm/min TE Spec. 109-5206
No.	3.5.12
Test Items	Durability (Repeated Mate/Unmating)
Requirements	20 mΩ Max.
Procedures	No. of Cycles : 50 cycles
No.	3.5.13
Test Items	Housing Locking Strength
Requirements	24.5 N (2.5 kgf) Min.
Procedures	Measure connector locking strength. Operation Speed : 100 mm/min. AMP Spec. 109-5210
No.	3.5.14
Test Items	Thermal Shock
Requirements	20 mΩ Max. (Final)
Procedures	Mated connector -55 centigrade/30 min., 85 centigrade/30 min. Making this a cycle, repeat 25 cycles. AMP Spec. 109-5103 Condition A MIL-STD-202 Method 107-1 Condition A-1 The measurement is held after being left indoor for 3 hours.
No.	3.5.15
Test Items	Humidity-Temperature Cycling
Requirements	Dielectric withstanding voltage 1 minute.(Final) 2.0mm pitch: 1000V AC 2.5 & 3.5mm pitch: 1500V AC Current leakage : 0.5 mA Max. Insulation resistance: 100 MΩ Min. (Final) Termination resistance: 20 mΩ Max. (Final)
Procedures	Mated connector, 25~65 centigrade 80~98 % R. H. 10 cycles Cold shock - 10 centigrade(not ) performed AMP Spec. 109-5106 MIL-STD-202, Method 106 The measurement is held after being left indoor for 3 hours. 1cycle=24hours
<b>Environmental Requirements</b>	
No.	3.5.16
Test Items	Salt Spray
Requirements	20 mΩ Max. (Final) No corrosion influence performance

Procedures	Subject mated connectors to 5±1% salt concentration for 48 hours. MIL-STD-202, Method 101 Condition B The measurement is held after remove the salt and dry up at indoor.
No.	3.5.17
Test Items	Temperature Life (Heat Aging)
Requirements	20 mΩ Max. (Final)
Procedures	Mated Conn. 105±2 centigrade Duration :96 hours AMP Spec. 109-5104-3 Condition A The Measurement is held after being left indoor for 3 hours.
No.	3.5.18
Test Items	SO2 Gas
Requirements	20 mΩ Max. (Final) No corrosion influence performance
Procedures	Mated conn. SO2 Gas : 10ppm. 95%RH 25 centigrade, 96hours. AMP Spec. 109-5107 Condition C

Fig. 2

Product must be without rust, corrosion transformation, crack and discoloration.

### 3.6 Product Qualification Test Sequence

Test or Examination	Test Group											
	1	2	3	4	5	6	7	8	9	10	11	12
	Test Sequence (a)											
Confirmation of Product	1,4	1,3	1,3	1,3	1,3	1,6	1,7	1,4	1,4	1,4	1,4	1,4
Termination Resistance (Low Level)						2,5	2,6	2,5	2,6	2,5	2,5	2,5
Dielectric withstanding Voltage									4,8			
Insulation Resistance									3,7			
Temperature Rising				2								
Vibration (High Frequency)						3						
Physical Shock						4						
Connector Mating Force							3					
Connector Unmating Force							4					
Contact Insertion Force			2									
Contact Mating Force	2											
Contact Unmating Force	3											
Durability (Repeated Mating/Unmating)							5					
Housing Locking Strength		2										
Humidity-Temperature Cycling									5			
Thermal Shock								3				
Salt Spray										3		
Contact Retention Force					2							
Temperature Life(Heat Asing)											3	
SO2												3

(a) Numbers indicate the sequence in which the tests are performed.

Fig.3

#### 4. Quality Assurance Provisions :

##### 4.1 Test Conditions :

Unless otherwise specified, all the test shall be performed in any combination of the following test conditions.

Temperature :	15~35 centigrade
Relative Humidity :	45~75 %
Atmospheric Pressure :	86.6~106.6 Kpa

Fig. 4

##### 4.2 Tests :

##### 4.2.1 Test Specimens :

The test specimens to be employed for the tests shall be conforming to the requirements specified in the applicable product drawings. The crimped contacts shall be prepared in accordance with the requirements of applicable application Specification, 114-5377, Crimping of DYNAMIC CONNECTOR D1000 Series, on the wires specified in Fig. 5 of this specification.

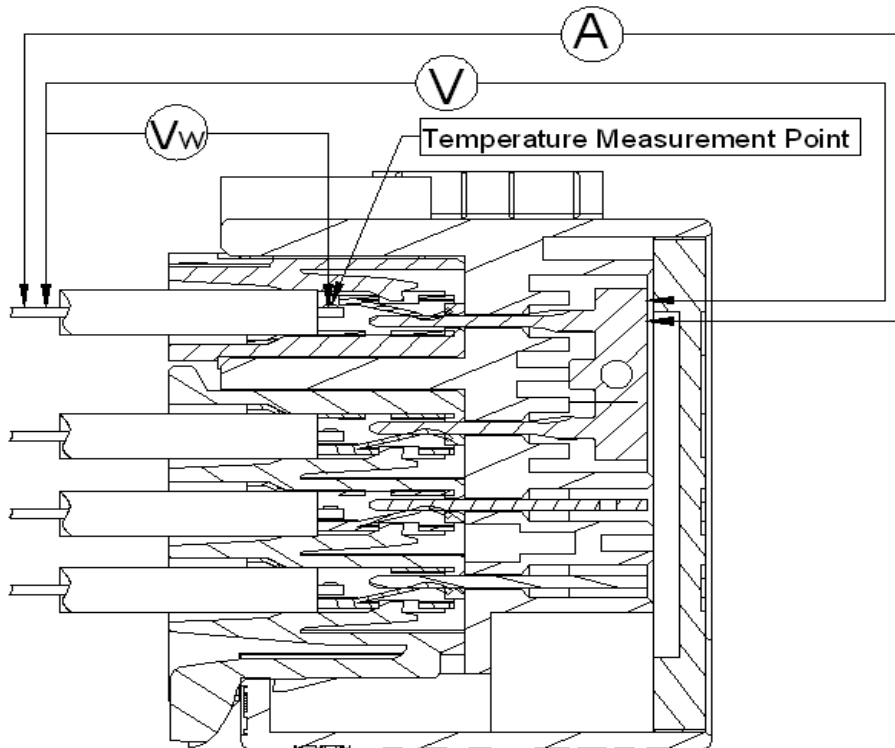
##### 4.2.2 Applicable Wires :

The wires to be used for crimping the samples for performance testing shall be conforming to the requirements specified in Fig. 5.

Calculated Cross-sectional Area(mm <sup>2</sup> )	AWG	Diameter of a Conductor (mm)	Number of Conductors	Insulation Outer Diameter (mm)
0.05	30	0.102	7	0.8
0.09	28	0.127	7	1.08
0.14	26	0.16	7	1.3
0.22	24	0.16	11	1.4
0.34	22	0.16	17	1.6
0.52	20	0.16	26	1.8
0.86	18	0.16	43	2.2

Fig. 5

$$m\Omega = (V - V_w) / A$$



\* Take the resistance of wire only away

Fig. 6 Termination Resistance (Low Level) and Temperature Rising Vs. Current Measuring Methods

Description	Part No.	Remarks
D1500 Junction 34P PM type	1971151-1(H type)	
D1500 Junction 34P PM type	1971151-2(V type)	
DYNAMIC D1500 10P Receptacle Plug	1971150-1	
Attachment based on D1500 Junction Box	1971182-1	
Dynamic D1000 series Rec Contact (M Type)	1827570-2	
Dynamic D1500T Rec HSG 3 Pos	1-1827579-1	
Dynamic D1500T Rec HSG 6 Pos	1-2069029-2	
Dynamic D1500T Rec HSG 9 Pos	1-2069029-3	
Dynamic D1500T Rec HSG 12 Pos	1-2069029-4	

Fig. 7 Appendix 1

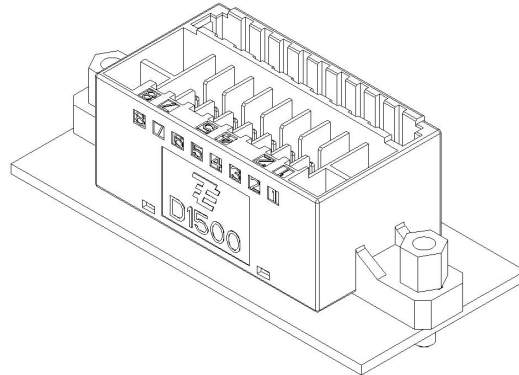


Fig. 8

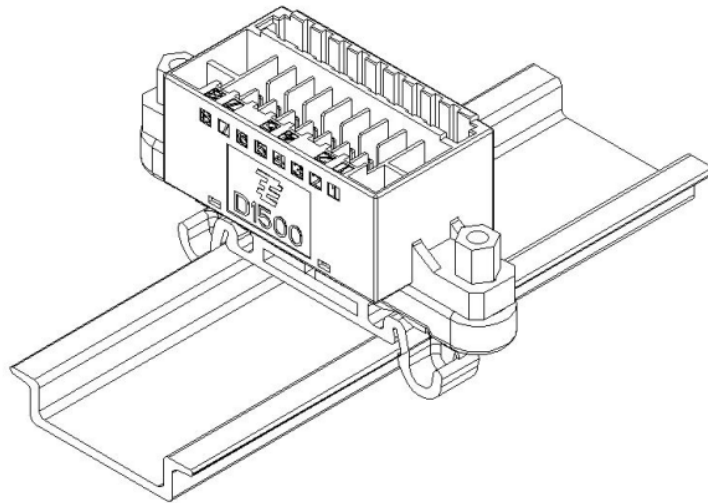


Fig. 9

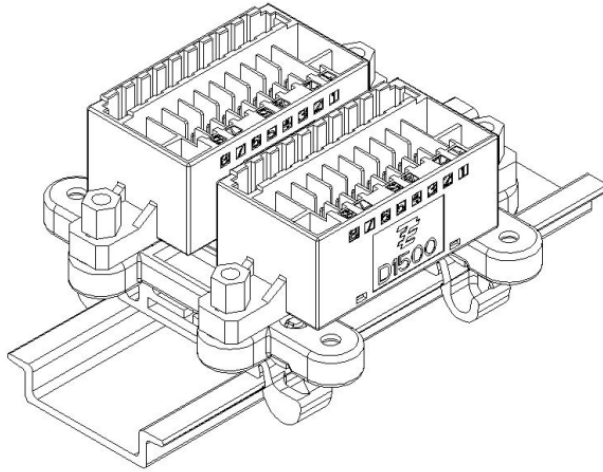


Fig. 10

LTR	REVISION RECORD	DR	CHK	APVD	DATE
A	Release	Digo Chen	Sam Wu	Julian Zhou	24DEC2008
A1	Revised	Digo Chen	Sam Wu	Julian Zhou	1 <sup>st</sup> Jun 2009
B1	Revised	Rock Lv	Rock Lv	Mark Westen	18 <sup>th</sup> Jul 2011