DYNAMIC CONNECTOR D5900 SERIES

1. INTRODUCTION

1.1. Testing was performed on the Dynamic Connector D-5900 Series to determine if it meets the requirement of Product Specification,108-140022.

1.2. Scope

This report covers the electrical, mechanical and environmental performance requirements of the Dynamic Connector D-5900 Series Connector.

This product confirmation examination was performed from 16JUL2014 to 02OCT2014.

1.3. Conclusion

The Dynamic Connector D-5900 Series Connector meets the performance requirements of Product Specification, 108-140022.

1.4. Product Description

Connector for signal circuit and power supply circuit of Industrial equipment.

1.5. Test sample

Samples were taken randomly from current production. The following samples were used:

PART NUMBER	Description
4-2260663-1	Receptacle Assembly 4Pos. X-key
4-2260663-2	Receptacle Assembly 4Pos. Y-key
6-2260663-1	Receptacle Assembly 6Pos. X-key
6-2260663-2	Receptacle Assembly 6Pos. Y-key
4-2260661-1	Header Assembly 4Pos. X-key
4-2260661-2	Header Assembly 4Pos. Y-key
6-2260661-1	Header Assembly 6Pos. X-key
6-2260661-2	Header Assembly 6Pos. Y-key

Fig. 1

2. TEST CONTENTS

<table>
<tr><th>No.</th><th>Test Items</th><th>Requirements</th><th>Judge -ment</th></tr>
<tr><td>2.1</td><td>Examination of product</td><td>Visually Inspect
No physical damage</td><td>Accept -able</td></tr>
<tr><td colspan="4">Electrical Requirements</td></tr>
<tr><td>2.2</td><td>Contact Resistance
(Low level)</td><td>Initial: 2mΩ MAX
Final: 10mΩ MAX</td><td>Accept -able</td></tr>
<tr><td>2.3</td><td>Dielectric Withstanding Voltage</td><td>Initial/Final:2.2kVAC,1minute. Current lerkage:0.5mA MAX.
No creeping dischage nor flashover shall occur.</td><td>Accept -able</td></tr>
<tr><td>2.4</td><td>Insulation Resistance</td><td>Initial: 1000MΩ MIN
Final: 100MΩ MIN</td><td>Accept -able</td></tr>
<tr><td>2.5</td><td>Temperature Rising</td><td>30℃MAX. Specified Current. Ref. as Follows
<table>
<tr><th rowspan="2">Pos</th><th colspan="5">Wire size (AWG)</th></tr>
<tr><th>#8</th><th>#10</th><th>#12</th><th>#14</th><th>#16</th></tr>
<tr><td>4</td><td>42</td><td>30</td><td>20</td><td>15</td><td>10</td></tr>
<tr><td>6</td><td>35</td><td>30</td><td>20</td><td>15</td><td>10</td></tr>
</table></td><td>Accept -able</td></tr>
<tr><td colspan="4">Mechanical Requirements</td></tr>
<tr><td>2.6</td><td>Vibration
(Low Frequency)</td><td>Subject mated connectors to 10-55-10 Hz traversed in 1cycle per 1 minute with amplitude of 1.52mm, 2 hours each of 3 mutually perpendicular planes.
Fix the cable to vibration test jig at the point of 10cm from the cable insert hole of housing.
100 mA applied.
Contact Resistance: 10mΩ MAX(Final)</td><td>Accept -able</td></tr>
<tr><td>2.7</td><td>Physical Shock</td><td>No electrical discontinuity greater than 1μsec.
Termination Resistance: 10mΩMAX (Final)
490m/s², Half Sine wave.
3 drops each to normal and reversed directions of X, Y and Z axes, totally 18 drops.</td><td>Accept -able</td></tr>
<tr><td>2.8</td><td>Connector Mating Force</td><td>9.8N×Pos. MAX
Operation Speed 100mm/min
Locking feature of housing shall be removed.</td><td>Accept -able</td></tr>
<tr><td>2.9</td><td>Connector Unmating Force</td><td>1.0 ~ 9.8N per contact.
Operation Speed 100mm/min
Locking feature of housing shall be removed.</td><td>Accept -able</td></tr>
<tr><td>2.10</td><td>Wire Pullout Force</td><td>
<table>
<tr><th colspan="2">Wire Size</th><th>Wire Pullout Force (MIN)</th></tr>
<tr><td>mm²</td><td>(AWG)</td><td>N</td></tr>
<tr><td>0.82</td><td>#18</td><td>30</td></tr>
<tr><td>1.3</td><td>#16</td><td>40</td></tr>
<tr><td>2.1</td><td>#14</td><td>50</td></tr>
<tr><td>3.3</td><td>#12</td><td>60</td></tr>
<tr><td>5.3</td><td>#10</td><td>80</td></tr>
<tr><td>8.4</td><td>#8</td><td>90</td></tr>
</table></td><td>Accept -able</td></tr>
<tr><td>2.11</td><td>Durability
(Repeated Mating/ Unmating)</td><td>25 cycles
Contact Resistance:10 mΩ MAX(Final)</td><td>Accept -able</td></tr>
<tr><td>2.12</td><td>Housing Locking Strength</td><td>49N MIN. Operation speed: 100mm/min</td><td>Accept -able</td></tr>
</table>

No.	Test Items	Requirements	Judgement
		Environmental Requirements	
2.13	Thermal Shock	-55℃/30min, +85℃/30min. 25cycles Contact Resistance:10 mΩ MAX(Final)	Accept-able
2.14	Humidity-Temperature Cycling	25℃～65℃、80～95%RH、-10℃、10 Cycle Shall satisfy the requirements of Dielectric withstanding voltage and Insulation resistance after the test. Contact Resistance:10 mΩ MAX(Final)	Accept-able
2.15	Humidity	40℃, 90～95%RH, 96 Hours Contact Resistance:10 mΩ MAX(Final)	Accept-able
2.16	Salt Spray	5±1%、48hours Contact Resistance:10 mΩ MAX(Final)	Accept-able
2.17	Heat Aging	105℃、250Hrs. Contact Resistance:10 mΩ MAX(Final)	Accept-able
2.18	SO_2 Gas	25℃, 10ppm, 90%RH, 96 Hours Contact Resistance:10 mΩ MAX(Final)	Accept-able
2.19	Solderability	Solder Temperature:240±5℃ Immersion Duration:5±0.5sec Wet solder converage:95% MIN.	Accept-able
2.20	Resistance to Soldering Heat.	Solder Temperature:260±5℃ Immersion Duration:10±0.5sec No physical damage shall occur.	Accept-able

Fig. 2

3. PRODUCT QUALIFICATION TEST SEQUENCE

TEST OR EXAMINATION	TEST GROUP														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
	TEST SEQUENCE (a)														
Examination of product	1,3	1,3	1,3	1,7	1,5	1,5	1,9	1,5	1,5	1,5	1,5	1,5	1,3	1,3	1,5
Contact Resistance (Low Level)					2,4	2,4	2,8	2,4	2,4	2,4	2,4	2,4			2,4
Dielectric Withstanding Voltage				3,6											
Insulation Resistance				2,5											
Temperature Rising			2												
Vibration					3										
Physical Shock						3									
Conn. Mating Force							3,6								
Conn. Unmating Force							4,7								
Wire pullout force	2														
Durability (Repeated Mate/Unmating)							5								
HSG Locking Strength		2													
Thermal Shock								3							
Humidity-Temperature Cycling				4					3						
Humidity															3
Salt spray										3					
Heat Aging											3				
SO_2 Gas												3			
Solderability													2		
Resistance to Soldering Heat														2	

NOTE

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

Fig. 3

4. TEST RESULTS

TEST Group	Test Items			Unit	Result					Spec.	Judgement
					Set	N	MAX.	MIN.	Ave.		
1	Wire pullout force	AWG#18		N	2	4	52	37	45.8	30MIN	Acceptable
		AWG#16		N	2	12	61	45	51.6	40MIN	Acceptable
		AWG#14		N	2	12	88	69	81.2	50MIN	Acceptable
		AWG#12		N	2	12	106	78	92.5	60MIN	Acceptable
		AWG#10		N	2	12	115	91	102.5	80MIN	Acceptable
		AWG#8		N	2	12	212	154	181.8	90MIN	Acceptable
2	Housing Locking Strength	4P		N	5	5	275	259	270	49 MIN	Acceptable
		6P		N	5	5	267	231	251	49 MIN	Acceptable
3	Temperature rising	AWG#16		℃	6	6	5.7	4.3	4.8	30MAX	Acceptable
		AWG#14		℃	6	6	10.5	7.3	8.7	30MAX	Acceptable
		AWG#12		℃	6	6	14	10.2	11.8	30MAX	Acceptable
		AWG#10		℃	3	3	19.5	17.5	18.1	30MAX	Acceptable
		AWG#8	6P	℃	3	3	22	19.6	20.8	30MAX	Acceptable
			4P	℃	3	3	27.3	25.5	26.5	30MAX	Acceptable
4	Insulation Resistance	Initial		Ω	6	24	10000M MIN			1000M MIN	Acceptable
		Final		Ω	6	24	10000M MIN			100M MIN	Acceptable
	Dielectric withstanding Voltage	Initial		—	6	24	No abnormality allowed				
		Final		—	6	24	No abnormality allowed				
5	Termination Resistance	Initial		mΩ	6	30	0.9	0.36	0.6	2MAX	Acceptable
		Final		mΩ	6	30	3.47	2.74	3.15	10MAX	Acceptable
	Vibration (Low Frequency)			-	6	6	No electric discontinuity greater than 1μsec. shall occur				Acceptable
6	Termination Resistance	Initial		mΩ	6	30	0.89	0.33	0.54	2MAX	Acceptable
		Final		mΩ	6	30	0.86	0.38	0.53	10MAX	Acceptable
	Physical shock			-	6	6	No electric discontinuity greater than 1μsec. shall occur				Acceptable
7	Termination Resistance (Initial)		4P	mΩ	10	40	0.67	0.37	0.49	2MAX	Acceptable
			6P	mΩ	10	60	0.70	0.36	0.47	2MAX	Acceptable
	Termination Resistance (Final)		4P	mΩ	10	40	0.81	0.34	0.48	10MAX	Acceptable
			6P	mΩ	10	60	0.59	0.29	0.44	10MAX	Acceptable
	Connector Mating Force (Initial)		4P	N	10	10	13.1	9.2	10.7	39.2MAX	Acceptable
			6P	N	10	10	20.3	14	15.6	58.8MAX	Acceptable
	Connector Mating Force (Final)		4P	N	10	10	16.1	10.8	12.5	39.2MAX	Acceptable
			6P	N	10	10	23.0	15.4	17.4	58.8MAX	Acceptable
	Connector Unmating Force (Initial)		4P	N	10	10	8.2	5.4	6.6	4~39.2	Acceptable
			6P	N	10	10	13	8.9	10.2	6~58.8	Acceptable
	Connector Unmating Force (Final)		4P	N	10	10	10.2	7	8.3	4~39.2	Acceptable
			6P	N	10	10	15	10.5	12.5	6~58.8	Acceptable
8	Thermal Shock	Initial		mΩ	6	30	0.58	0.93	0.54	2MAX	Acceptable
		Final		mΩ	6	30	1.33	0.46	0.76	10MAX	Acceptable

TEST Group	Test Items		Unit	Result					Spec.	Judgement
				Set	N	MAX.	MIN.	Ave.		
9	Humidity-Temperature Cycling	Initial	mΩ	6	30	0.84	0.42	0.58	2MAX	Acceptable
		Final	mΩ	6	30	1.21	0.55	0.76	10MAX	Acceptable
10	Salt spray	Initial	mΩ	6	30	1.22	0.39	0.61	2MAX	Acceptable
		Final	mΩ	6	30	4.1	0.44	1.73	10MAX	Acceptable
11	Heat Aging	Initial	mΩ	6	30	1.06	0.38	0.58	2MAX	Acceptable
		Final	mΩ	6	30	1.52	0.51	0.88	10MAX	Acceptable
12	SO_2 Gas	Initial	mΩ	6	30	1.22	0.38	0.58	2MAX	Acceptable
		Final	mΩ	6	30	4.16	0.38	1.61	10MAX	Acceptable
13	Solderability	-	-	6	6	Wet solder coverage: 95% MIN				Acceptable
14	Resistance to Soldering Heat	-	-	6	6	No physical damage shall occur.				Acceptable
15	Humidity	Initial	mΩ	6	30	0.75	0.4	0.54	2MAX	Acceptable
		Final	mΩ	6	30	1.38	0.47	0.82	10MAX	Acceptable

Fig. 4