



DYNAMIC CONNECTOR D-5000 SERIES

1. INTRODUCTION

1.1. Purpose

Testing was performed on the Dynamic Conn. D-5000 Series to determine if it meets the requirements of Product Specification, 108-5453.

1.2. Scope

This specification covers the results of electrical, mechanical, and environmental performance tests of Dynamic connector D-5000 series.

The qualification testing was performed between 14 Feb, 1996 and 18 Mar, 1996, and between 1 Nov.2000 and 30 Nov.2000, and Jul.2009.

1.3. Conclusion

The Dynamic Conn. D-5000 Series Connector meets the electrical, mechanical and environmental performance requirements of Product Specification, 108-5453.

1.4. Product description

Power circuit connector for industrial application.

1.5. Test samples

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

Part Number	Description
1123829-1	D-5200M 8P(H)HEADER ASSY
1-179959-2	D-5200S 6P(H)HEADER ASSY
1-2326092-2	D-5200M 6P(V)HEADER ASSY
1-1123309-2	D-5200M 4P(H)HEADER ASSY
1-917541-2	D-5200S 4P(H)HEADER ASSY
1-917542-2	D-5200S 4P(V)HEADER ASSY
1-353081-2	D-5200S 3P(H)HEADER ASSY
1-353082-2	D-5200S 3P(V)HEADER ASSY
1-353079-2	D-5200S 2P(H)HEADER ASSY
1-353080-2	D-5200S 2P(V)HEADER ASSY
1-1318983-2/-6	D-5200alpha 4P(H)HEADER ASSY
1-1941458-6	D-5200M 4P(V)HEADER ASSY
1-917807-3	D-5200M 6P Rec Housing
1-917808-3	D-5200M 6P Tab Housing
1-179958-6	D-5200S 6P Rec Housing
0-917807-2	D-5200M 4P Rec Housing
1-917808-2	D-5200M 4P Tab Housing
1-179958-4	D-5200S 4P Rec Housing
1-179958-3	D-5200S 3P Rec Housing
1-353046-3	D-5200S 3P Tab Housing
1-179958-2	D-5200S 2P Rec Housing
1-353046-2	D-5200S 2P Tab Housing
1-1747821-3	D-5300 3P Rec Housing
1-1747819-3	D-5300 3P Tab Housing
1-1747822-2	D-5300 4P Rec Housing
1-1747820-2	D-5300 4P Tab Housing
1318985-2/-6	D-5 "SS"Size Rec Contact(Striped)
179955-2/-6	D-5 "S"Size Rec Contact(Striped)
179956-2/-6	D-5 "M"Size Rec Contact(Striped)
1318696-2/-6	D-5 "L"Size Rec Contact(Striped)
1318986-2/-6	D-5 "SS"Size Rec Contact(L/P)
316040-2/-6	D-5 "S"Size Rec Contact(L/P)
316041-2/-6	D-5 "M"Size Rec Contact(L/P)
1318697-2/-6	D-5 "L"Size Rec Contact(L/P)
917804-2/-6	D-5 "S"Size Tab Contact(L/P)
917805-2/-6	D-5 "M"Size Tab Contact(L/P)
1981691-2	D-5 "L"Size Tab Contact(L/P)
1747443-6	D-5 "L"Size Tab Contact(L/P)
2174022-1	D-5 "L"Size Long Tab Contact(L/P)
2174021-1	D-5 "L"Size Long Tab Contact(Striped)

Figure.1

2 Test contents

No.	TEST DESCRIPTION	REQUIREMENT		JUDGEMENT	
2.1	Examination of product	Meets requirements of product drawing.		Acceptable	
ELECTRICAL REQUIREMENTS					
2.2	Contact Resistance (Low Level)	2mΩ Max		Acceptable	
2.3	Dielectric withstanding Voltage	No creeping discharge or flashover shall occur. Current leakage: 0.5 mA Max.		Acceptable	
2.4	Insulation Resistance	1000 MΩ Min.		Acceptable	
2.5	Temperature Rising	Temperature rising: specified value Max. Under loaded specified current. Refer to 108-5453		Acceptable	
MECHANICAL REQUIREMENTS					
2.6	Contact Retention Force	49N Min.		Acceptable	
2.7	Crimp Tensile Strength	Wire Size		Crimp Tensile (Min.)	Acceptable
		mm²	(AWG)	N	
		0.50	#20	73.5	
		0.85	#18	117	
		1.309	#16	186	
		2.081	#14	245	
		3.309	#12	313	
		5.262	#10	401	
		8	#8	401	
2.8	Physical Shock	No electrical discontinuity greater than 1μsec shall occur. Meet requirement of Contact resistance (2mΩ Max.)		Acceptable	
2.9	Connector Mating Force	9.8N Max per 1 contact (Initial) Silver plated product: 19.6N Max per 1 contact (Initial)		Acceptable	
2.10	Connector Unmating Force	1.96N – 19.6N per 1 contact (Initial)		Acceptable	
2.11	Contact Insertion Force	9.8N Max per 1 contact		Acceptable	
2.12	Vibration (High Frequency)	No electrical discontinuity greater than 1μsec shall occur.		Acceptable	

2.13	Durability (Repeated Mate/Unmating)	Meet requirement of contact resistance (2mΩ Max.).	Acceptable
2.14	Housing Locking Strength	98N Min.	Acceptable
2.15	Solderability	Wet Solder Coverage: 95% Min.	Acceptable

ENVIRONMENTAL REQUIREMENTS

2.16	Resistance to soldering Heat	No physical damage shall occur.	Acceptable
2.17	Thermal Shock	Meet requirement of contact resistance (2mΩ Max).	Acceptable
2.18	Humidity- Temperature Cycling	Meet requirement of contact resistance (2mΩ Max).	Acceptable
2.19	Industrial Gas (SO ₂)	Meet requirement of contact resistance (2mΩ Max).	Acceptable
2.20	Temperature Life (Heat Aging)	Meet requirement of contact resistance (2mΩ Max).	Acceptable
2.21	Industrial gas (H ₂ S)	Meet requirement of contact resistance (2mΩ Max).	Acceptable



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 5.

Figure 2

3 Qualification Test Sequence

TEST OR EXAMINATION	TEST GROUP											
	1	2	3	4(b)	5	6	7	8	9	10	11	12(c)
	TEST SEQUENCE (a)											
Examination of product	1	1	1	1	1	1	1	1	1	1	1	1
Contact Resistance (Low Level)		2,5	2,4,6 8,10	2,5								2,5
Dielectric Withstanding Voltage						3,6						
Insulation Resistance						2,5						
Temperature Rising					2							
Vibration		3										
Physical Shock		4										
Conn. Mating Force	2,5,											
Conn. Unmating Force	3,6											
Conn. Locking Strength							2					
Cont. Insertion Force								2				
Cont. Retention Force								3				
Crimp Tensile Strength									2			
Durability (Repeated Mate/Unmating)	4		3	3								3
Solderability										2		
Resistance to Soldering heat											2	
Thermal Shock			7									
Humidity-Temperature Cycling			9			4						
Industrial SO ₂ gas				4								
Temperature Life			5									
Industrial H ₂ S gas												4



NOTE

- (a) Numbers indicate sequence in which tests are performed.
- (b) Gold plating only
- (c) Silver plating only

Figure 3

4 SUMMARY OF TEST RESULTS:

Test Group	Test Items	Unit	Result						Spec.	Judge-ment
			Set.	N	Max.	Min.	Ave.	S		
1	Gold plating Connector Mating Force (Initial)	Kg	10	10	4.2	3.3	3.8	0.284	6 Max	Acceptable
	Gold plating Connector Unmating Force (Initial)	Kg	10	10	5.0	4.0	4.51	0.342	1.2 Min 12 Max	Acceptable
	Gold plating Connector Mating Force (Final)	Kg	10	10	3.9	2.85	3.33	0.330	6 Max	Acceptable
	Gold plating Connector Unmating Force (Final)	Kg	10	10	4.95	3.45	4.00	0.398	1.2 Min 12 Max	Acceptable
	Silver plating Connector Mating Force (Initial)	Kg	3	12	2.3	1.8	2.23		8 Max	Acceptable
	Silver plating Connector Unmating Force (Initial)	Kg	3	12	2.4	1.35	1.86		0.8 Min 8 Max	Acceptable
	Silver plating Connector Mating Force (Final)	Kg	3	12	3.2	2.15	2.58		8 Max	Acceptable
	Silver plating Connector Unmating Force (Final)	Kg	3	12	3.6	1.60	2.53		0.8 Min 8 Max	Acceptable
2	Termination Resistance (Low Level) (Initial)	mΩ	4	24	0.534	0.390	0.4617	0.0425	2 Max	Acceptable
	Vibration (High Frequency)	—	4	24	No electric discontinuity greater than 1μsec shall occur					Acceptable
	Physical Shock	—	4	24	No electric discontinuity greater than 1μsec shall occur					Acceptable
	Termination Resistance (Low Level) (Final)	mΩ	4	24	0.613	0.476	0.5314	0.0431	2 Max	Acceptable
3	Termination Resistance (Low Level) (Initial)	mΩ	4	24	0.577	0.406	0.4816	0.0495	2 Max	Acceptable
	Termination Resistance (Low Level) (Durability)	mΩ	4	24	0.554	0.397	0.4796	0.045	2 Max	Acceptable
	Termination Resistance (Low Level) (Temperature Life)	mΩ	4	24	0.605	0.434	0.5176	0.0391	2 Max	Acceptable
	Termination Resistance (Low Level) (Thermal Shock)	mΩ	4	24	0.694	0.431	0.5390	0.0719	2 Max	Acceptable
	Termination Resistance(Low Level) (Temperature-Humidity Cycling)	mΩ	4	24	0.707	0.403	0.5384	0.0848	2 Max	Acceptable
4	Termination Resistance (Low Level) (Final)	mΩ	4	24	0.577	0.406	0.4856	0.0413	2 Max	Acceptable
	Termination Resistance (Low Level) (Final)	mΩ	4	24	0.691	0.461	0.5762	0.0686	2 Max	Acceptable

Test Group	Test Items		Unit	Result						Spec.	Judge-ment
				Set.	N	Max.	Min.	Ave.	S		
5	Temperature Rising		°C	See Figure 5, 6, 7 Max temperature rise at rated current. Ambient-T 75°C: T-rise 30°C MAX Ambient-T 40°C: T-rise 65°C MAX Ambient-T 25°C: T-rise 80°C MAX						See 108-5453	Acceptable
6	Insulation Resistance (Initial)		10 ¹³ Ω	4	20	1 Min.	0.173	—	—	1000MΩ Min.	Acceptable
	Dielectric withstanding Voltage (Initial)		—	4	20	No abnormality allowed					
	Insulation Resistance (Final)		10 ¹³ Ω	4	20	1 Min	0.233	—	—	1000MΩ Min	Acceptable
	Dielectric withstanding Voltage (Final)		—	4	20	No abnormality allowed					
7	Housing Locking Strength		Kg	10	10	37.55	23.8	32.605	3.721	10 Min.	Acceptable
8	Contact Insertion Force		Kg	2	12	0.205	0.075	0.1354	0.0364	1 Max.	Acceptable
	Contact Retention Force		Kg	2	12	19	10.9	15.54	1.828	5 Min.	Acceptable
9	Crimp Tensile Strength (Applicator)	AWG #16	Kg	—	10	34.8	32.8	33.82	0.62	18.9 Min	Acceptable
		AWG #14	Kg	—	10	41.3	38.2	39.49	1.10	25 Min	
		AWG #12	Kg	—	10	78.3	71.9	74.51	2.22	31.9 Min	
		AWG #10	Kg	—	10	74.1	66.9	70.58	2.98	40.9 Min	
	Crimp Tensile Strength (Hand Tool)	AWG #16	Kg	—	10	35.1	33.0	34.43	0.62	18.9 Min	Acceptable
		AWG #14	Kg	—	10	38.9	34.1	37.52	1.75	25 Min	
		AWG #12	Kg	—	10	78.3	73.2	76.28	1.65	31.9 Min	
		AWG #10	Kg	—	10	74.2	62.9	68.47	3.26	40.9 Min	
	Crimp Tensile Strength (silver plating)	AWG #20	Kg	—	10	14.6	14.1	14.3	0.17	7.5 Min	Acceptable
		AWG #18	Kg	—	10	22.3	20.0	21.5	0.80	11.9 Min	
		AWG #16	Kg	—	10	35.3	32.3	34.1	1.17	18.9 Min	
		AWG #14	Kg	—	10	38.8	34.0	37.5	1.74	25 Min	
		AWG #12	Kg	—	10	78.2	73.1	76.2	1.64	31.9 Min	
		AWG #10	Kg	—	10	74.1	62.8	68.4	3.26	40.9 Min	
AWG #8	Kg	—	20	104.5	93.7	99.7	2.6	40.9 Min			
10	Solder ability		—	4	24	Wet solder coverage :95% Min					Acceptable
11	Resistance to solderability Heat		—	4	24	No physical damage shall occur					Acceptable
12	Termination Resistance (Low Level) (Final)		mΩ	3	12	0.38	0.3	0.328	—	2 Max	Acceptable
	Termination Resistance (Low Level) (Final)		mΩ	3	12	0.54	0.33	0.401	—	2 Max	Acceptable

Figure 4

- Ambient temperature: 75°C, Temperature rise 30°C MAX at rated current.

Series Plating: Au	Position	Temperature rise at rated current [unit: °C]						
		AWG 8	AWG 10	AWG 12	AWG 14	AWG 16	AWG 18	AWG 20
D5200	2	24	23.8	23.4	23.1	24.2	17.1	20.5
	3	24.9	23.5	24.3	22.2	23.6	18.9	18.7
	4	24	22.9	25.4	25.4	23.8	16.9	20.2
	6	19.8	20.7	21.5	21.1	19.8	15.4	18.2
	8	23.9	24.8	23.9	19.4	22.6	16.5	18.6
D5300	3	24.1	26.3	23.5	22.4	21.9	-	-
	4	26.7	26.7	26.3	21.7	23.4	-	-
D5200alpha	3	-	-	-	-	-	-	-
	4	24.4	24.5	21.1	18.9	17.3	18.6	17.1

Series Plating: Ag	Type	Position	Temperature rise at rated current [unit: °C]						
			AWG 8	AWG 10	AWG 12	AWG 14	AWG 16	AWG 18	AWG 20
D5200	WTB	4	24	24.1	24	23.2	20.4	20.4	19.4
	WTW	2	21.7	22.6	21.9	23.3	22.4	-	-
		3	22.5	24.4	23.2	23.7	21.8	-	-
		4	23.1	22.2	20.4	23.6	21.6	-	-
		6	24.2	24.7	24.6	24.2	19.3	-	-
D5300	WTW	3	21.8	23.1	21.3	22.8	22.4	-	-
		4	21.6	22.4	26	21.8	22.2	-	-
D5200alpha	WTB	3	25	25	25.7	28.1	26.3	26.6	22.3
		4	25.1	26.6	27.1	25.8	26.5	24.1	26.7

Figure 5

- Ambient temperature: 40°C, Temperature rise 65°C MAX at rated current.

Series Plating: Au	Position	Temperature rise at rated current [unit: °C]						
		AWG 8	AWG 10	AWG 12	AWG 14	AWG 16	AWG 18	AWG 20
D5200	2	41.5	41.9	40.7	42.1	42.6	38.8	37.4
	3	43.4	41.8	40.6	39.6	38.8	36.4	35.8
	4	41.6	40.5	40.3	41.8	39.8	37.5	38.1
	6	41.2	41.5	42.2	41.5	39.1	37.2	35.8
	8	37.8	37.1	39.2	34.5	38.3	34.6	31.5
D5300	3	40.7	40.8	41.8	41	40.8	-	-
	4	41.2	43	41.5	42	39.2	-	-
D5200alpha	3	-	-	-	-	-	-	-
	4	40.7	41.8	42.8	41.5	39.9	38	41.7

Series Plating: Ag	Type	Position	Temperature rise at rated current [unit: °C]						
			AWG 8	AWG 10	AWG 12	AWG 14	AWG 16	AWG 18	AWG 20
D5200	WTB	4	41.5	43.3	44.9	41.1	40.8	41.6	39.7
	WTW	2	43.3	42.5	42.1	40.8	41.2	-	-
		3	42.2	42.8	43.2	42.6	41.2	-	-
		4	42.6	42.3	41.7	42.1	40.8	-	-
		6	42.5	42.2	44.1	43.6	39.3	-	-
D5300	WTW	3	41.4	41.2	41.4	40.1	40.8	-	-
		4	41.2	41.5	43.1	41.1	40.4	-	-
D5200alpha	WTB	3	-	-	-	-	-	-	-
		4	41.5	42.3	41.8	42.2	40.3	40.9	40.5

Figure 6

- Ambient temperature: 25°C, Temperature rise 80°C MAX at rated current.

Series Plating: Au	Position	Temperature rise at rated current [unit: °C]						
		AWG 8	AWG 10	AWG 12	AWG 14	AWG 16	AWG 18	AWG 20
D5200	2	51.8	49.6	50	50.5	50.4	46.6	47.9
	3	53	51.7	50.3	48.5	49.8	45.2	41.2
	4	50.3	49.8	50.2	51.5	51.4	46.4	43.5
	6	50.4	50.6	50.1	51.1	47.2	41.8	41.2
	8	45.9	44.9	46.9	40.2	45.6	38.7	41.8
D5300	3	49.8	51.4	51.5	50.1	48.4	-	-
	4	50.1	51.4	51.5	51.5	50.5	-	-
D5200alpha	3	-	-	-	-	-	-	-
	4	49.9	52.1	51.5	51.3	49.5	50.4	50.7

Series Plating: Ag	Type	Position	Temperature rise at rated current [unit: °C]						
			AWG 8	AWG 10	AWG 12	AWG 14	AWG 16	AWG 18	AWG 20
D5200	WTB	4	51.9	54.2	56.7	51.8	50.1	49.5	49.9
	WTW	2	54.1	52.2	53.7	50.2	54.5	-	-
		3	51.6	53.8	53.5	50.1	52.9	-	-
		4	52.1	52.2	50.3	52.3	51	-	-
		6	50.8	51.7	54.5	52.1	50.1	-	-
D5300	WTW	3	50.9	51.2	50.5	49	48.1	-	-
		4	51.3	51.4	50.2	49.9	51.5	-	-
D5200alpha	WTB	3	-	-	-	-	-	-	-
		4	50.5	51.3	52.6	50.3	50.1	49.3	50.1

Figure 7