



DYNAMIC D1000 Slim Connector

1. INTRODUCTION

1.1 Purpose

This document provides the qualification summary of Dynamic D1000 Slim Connector.

1.2 Scope

This specification covers the electrical, mechanical, and environmental performance of Dynamic D1000 Slim Connector.

1.3 Conclusion

Based on the test results, all meet the requirements according to Product Specification 108-140257 Rev.B.

1.4 Product Description

Name	Remarks
DYNAMIC D1000 Slim Connector Receptacle Housing	-
DYNAMIC D1000 Slim Connector Tab Housing	-
DYNAMIC D1000 Slim Connector Receptacle Contact	-
DYNAMIC D1000 Slim Connector Tab Contact	-

1.5 Test Samples

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

Product Part Number	Description
<input type="checkbox"/> -2366515- <input type="checkbox"/>	DYNAMIC D1000 SLIM REC HSG 4,6,8,12P X,Y KEY
<input type="checkbox"/> -2366600- <input type="checkbox"/>	DYNAMIC D1000 SLIM TAB HSG 4,6,8,12P X,Y KEY
<input type="checkbox"/> -2375948- <input type="checkbox"/>	DYNAMIC D1000 SLIM REC HSG 2,3,5,7,9P X,Y KEY
<input type="checkbox"/> -2375951- <input type="checkbox"/>	DYNAMIC D1000 SLIM TAB HSG 2,3,5,7,9P X,Y KEY
<input type="checkbox"/> -2423582- <input type="checkbox"/>	DYNAMIC D1000 SLIM REC HSG 18P X,Y KEY
<input type="checkbox"/> -2423584- <input type="checkbox"/>	DYNAMIC D1000 SLIM TAB HSG 18P X,Y KEY
<input type="checkbox"/> -2420333- <input type="checkbox"/>	DYNAMIC D1000 SLIM REC HSG 24P X,Y KEY
<input type="checkbox"/> -2420334- <input type="checkbox"/>	DYNAMIC D1000 SLIM TAB HSG 24P X,Y KEY
2367817-1	DYNAMIC D1000 SL REC CONTACT S Au0.2
2367819-1	DYNAMIC D1000 SL TAB CONTACT S Au0.2
2367817-2	DYNAMIC D1000 SL REC CONTACT M Au0.2
2367819-2	DYNAMIC D1000 SL TAB CONTACT M Au0.2

1.6 Qualification Test Sequence and Test result

Test Examination	Test Group											
	1	2	3	4	5	6	7	8	9	10	11	12
	Test Sequence (a)											
Examination of Product	1,3	1,6	1,9	1	1	1	1,5	1,9	1,9	1,5	1,5	1,5
Termination Resistance (Low Level)		2,5	3,8				2,4	2,8	2,8	2,4	2,4	2,4
Dielectric withstanding Voltage								4,7	4,7			
Insulation Resistance								3,6	3,6			
Temperature Rising	2											
Vibration		3										
Physical Shock		4										
Connector Mating Force			2,7									
Connector Unmating Force			4,6									
Durability			5									
Contact Insertion Force				2								
Contact Retention Force				3								
Crimp Tensile Strength					2							
Housing Locking Strength						2						
Thermal Shock							3					
Humidity-Temperature Cycling								5				
Humidity (Steady State)									5			
Industrial SO ₂ Gas										3		
Temperature Life											3	
Salt Spray												3

Figure 1


NOTE

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

2. TEST REQUIREMENTS AND PROCEDURES SUMMARY

Para	TEST DESCRIPTION	REQUIREMENT	PROCEDURE
2.1	Examination of Product	Meets requirements of product drawing and TE Specification 114-5377	Visual inspection No physical damage
ELECTRICAL			
2.2	Termination Resistance (Low Level)	30 mΩ Max.	Subject mated contacts assembled in housing to 20 mV Max open circuit at 10 mA Max closed circuit. Figure. 5. IEC 60512-2-2 Test 2b
2.3	Dielectric withstanding Voltage	No flashover or breakdown of voltage Current leakage:0.5mA Max.	Test voltage 1500V AC Duration 1minute. Test between adjacent circuits of mated connectors. IEC60512-4-1 Test 4a
2.4	Insulation Resistance	1000 MΩ Min. (Initial) 100 MΩ Min. (Final)	Test voltage 500V DC Time: 1minute Test between adjacent circuits of mated connectors. IEC 60512-3-1 Test 3a Method B
2.5	Temperature Rising	Temperature rising: specified value Max. Under loaded specified current. Refer Figure 1 and 2	Measure temperature rising by energized current. Figure. 1, Figure. 2 and Figure.5 IEC 60512-5-1 Test 5a
MECHANICAL			
2.6	Vibration Sinusoidal High Frequency	No electrical discontinuity greater than 1μs. Shall occur. Termination Resistance (Low Level)	Vibration Frequency:10~500Hz / 15 min. Amplitude : 1.52mm MAX Accelerated Velocity : 98 m/s ² Vibration Direction : X,Y,Z Duration : 3 h each Fixed position of cable:100mm IEC60512-6-4 Test 6d EIA 364-28 Test Condition 2
2.7	Physical Shock	No electrical discontinuity greater than 1 μs. Shall occur. Termination Resistance (Low Level)	Accelerated Velocity :490 m/s ² Waveform : Sin wave Duration : 11 m s Number of Drops : 3 drops each to normal and reversed directions of X, Y and Z axes, totally 18 drops. Fixed position of cable:100mm IEC60512-6-3 Test 6c
2.8	Connector Mating Force	(1.6×POSN) N Max.	Operation Speed : 20mm/min. Measure the force required to mate connectors. IEC 60512-13-1 Test 13a
2.9	Connector Unmating Force	(0.08N×POSN) Min.	Operation Speed : 20mm/min. Measure the force required to mate connectors. IEC 60512-13-1 Test 13a
2.10	Contact Insertion Force	9.8N Max. Per 1 contact	Measure the force required to insert contact into housing.

Para	TEST DESCRIPTION	REQUIREMENT		PROCEDURE	
2.11	Contact Retention Force	14.7 N Min.		Apply an axial pull-off load to crimped wire. Operation Speed : 20 mm/min. Test 15a of IEC 60512-15-1	
2.12	Crimp Tensile Strength	Wire Size		Apply an axial pull-off load to crimped wire of contact secured on the tester, Operation Speed : 50 mm/min. IEC 60512-16-4. Test16d	
		mm ²	(AWG)		Crimp Tensile (min.)
		0.05	#30		N
		0.08	#28		4.9
		0.12	#26		9.8
		0.20	#24		19.60
0.30	#22	29.40			
2.13	Durability	Termination Resistance (Low Level).		Repeat Insertion/Extraction of connector assembly following times at 100mm/min operation speed. Number of cycles : 30 cycles IEC 60512-9-1 Test 9a	
2.14	Housing Locking Strength	24.5 N Min.		Measure connector locking strength. Operation Speed : 100 mm/min. EIA 364-98	
ENVIRONMENTAL					
2.15	Thermal Shock	Termination Resistance (Low Level)		Subject mated specimen to Ta=-55±2°C to Tb=+125±2°C, duration t1: 30min each extreme, 25 cycles IEC 60512-11-4 Test 11d (IEC 60068-2-14 Test Na)	
2.16	Humidity-Temperature Cycling	Insulation resistance Dielectric Strength Termination resistance (Low Level)		Mated connector, 25~65°C, 80~95 % R. H. 10 cycles Cold shock -10°C(not) performed The measurement is held after being left indoor for 3 hours.1cycle=24hours EIA 364-31 Method 4 IEC60068-2-30	
2.17	Humidity, Steady State	Termination Resistance (Low Level)		Mated connector, 90-95 % R. H. 40 °C 96h MIL-STD-202 Method 103 Condition B	
2.18	Industrial Gas (SO ₂)	Termination Resistance (Low Level)		Mated connector SO ₂ Gas : 10±3 ppm, 95% R. H. 25°C, 96h	
2.19	Temperature Life (Heat Aging)	Termination Resistance (Low Level)		Subject mated specimen to +125°C Duration time:250h Test Bb IEC 60512-11-9 Test 11i (IEC 60068-2-2)	
2.20	Salt Spray	Termination Resistance (Low Level)		Subject mated specimen to 5±1% salt spray Temperature : 35±2°C Duration time: 96h IEC 60512-11-6	

Figure 2

3. SUMMARY OF TEST RESULTS:

Test Group	Test Item		Set	N	Unit	Results			Requirement	Judgement	
1	Initial examination of products		3	12	-	No physical damage			Meets requirements of product drawing	Passed	
	Temperature Rising		3	12	-	Refer to Figure.4			Temperature rising: specified value Max. Under loaded specified current.		
	Final examination of products		3	12	-	No physical damage			No damage likely to impair function		
2	Initial examination of products		4	4	-	No physical damage			Meets requirements of product drawing	Passed	
	Termination Resistance	Initial	4	36	mΩ	MAX	MIN	AVE	30mΩ MAX		
		Finish				3.12	2.31	2.71			
	Vibration		4	4	-	No electrical discontinuity greater than 1usec .			No damage likely to impair function No discontinuities greater than $t > 1\mu s$		
	Physical Shock		4	4	-	No electrical discontinuity greater than 1usec .			No damage likely to impair function No discontinuities greater than $t > 1\mu s$		
	Final examination of products		4	4	-	No physical damage			No damage likely to impair function		
3	Initial examination of products		12	12		No physical damage			Meets requirements of product drawing	Passed	
	Mating force	4POSN	Initial	3	3	N	MAX	MIN	AVE		6.4 MAX
			Finish				3.15	2.75	2.95		
		6POSN	Initial	3	3	N	4.60	4.45	4.52		9.6 MAX
			Finish				4.85	4.50	4.70		
		8POSN	Initial	3	3	N	5.85	5.55	5.67		12.8 MAX
			Finish				6.20	5.65	5.87		
		12POSN	Initial	3	3	N	8.70	8.40	8.55		19.2 MAX
			Finish				8.40	8.25	8.30		

Figure.3(Continue)

Test Group	Test Item		Set	N	Unit	Results			Requirement		
						MAX	MIN	AVE			
3	Un- Mating force	4POSN	Initial	3	3	N	2.45	2.35	2.42	0.32 MIN	
			Finish				2.70	2.45	2.57		
		6POSN	Initial	3	3	N	4.65	3.75	4.23	0.48 MIN	
			Finish				4.25	3.50	3.88		
		8POSN	Initial	3	3	N	4.90	4.50	4.73	0.64 MIN	
			Finish				5.05	4.80	4.95		
		12POSN	Initial	3	3	N	7.60	6.75	7.18	0.96 MIN	
			Finish				7.40	6.00	6.77		
		Termination Resistance	4POSN	Initial	3	12	mΩ	2.67	2.19	2.36	30mΩ MAX
				Finish				2.87	2.16	2.50	
	6POSN		Initial	3	18	mΩ	2.57	2.09	2.34		
			Finish				3.06	2.37	2.64		
	8POSN		Initial	3	24	mΩ	2.68	2.04	2.36		
			Finish				3.03	2.12	2.52		
	12POSN		Initial	3	36	mΩ	2.80	2.14	2.43		
Finish			2.97				2.15	2.52			
Final examination of products			12	12	-	No physical damage			No damage likely to impair function		
4	Initial examination of products		16	16	-	No physical damage			Meets requirements of product drawing		
	Contact Insertion Force					MAX	MIN	AVE			
		4POSN	8	32	N	0.97	0.40	0.73	9.8 Max		
		6POSN	8	48	N	1.48	0.48	0.83			
		8POSN	8	64	N	1.34	0.53	0.87			
		12POSN	8	96	N	1.41	0.41	0.69			
						MAX	MIN	AVE			
	Contact Retention Force	4POSN	8	32	N	31.3	24.6	27.4	14.7 Min.		
		6POSN	8	48	N	30.4	21.4	27.2			
		8POSN	8	64	N	33.0	21.1	27.7			
12POSN		8	96	N	33.9	21.2	28.4				
						MAX	MIN	AVE			

Figure.3(Continue)

Test Group	Test Item		Set	N	Unit	Results			Requirement	Judgement	
5	Initial examination of products		60	60	-	No physical damage			Meets requirements of product drawing	Passed	
	Crimp tensile strength	S size	AWG30	10	10	N	MAX	MIN	AVE		
			AWG28	10	10	N	15.9	13.0	14.1		4.9 MIN
	M size	AWG28	10	10	N	24.5	18.8	22.7	9.8 MIN		
		AWG26	10	10	N	24.3	19.7	21.7	9.8 MIN		
		AWG24	10	10	N	39.8	33.7	36.6	19.6 MIN		
		AWG22	10	10	N	63.2	58.6	60.3	29.4 MIN		
6	Initial examination of products		16	16	-	No physical damage			Meets requirements of product drawing	Passed	
	Housing Locking Strength	4POSN	4	4	N	50.2	48.7	49.7	25.4 MIN		
		6POSN	4	4	N	57.5	54.2	56.5	25.4 MIN		
		8POSN	4	4	N	54.6	50.1	51.9	25.4 MIN		
		12POSN	4	4	N	52.7	49.6	50.6	25.4 MIN		
7	Initial examination of products		3	3	-	No physical damage			Meets requirements of product drawing	Passed	
	Termination Resistance (Thermal Shock)	Initial	3	24	mΩ	MAX	MIN	AVE	30mΩ MAX		
		Finish				2.99	2.22	2.54			
	Final examination of products		3	3	-	No physical damage			No damage likely to impair function		

Figure.3(Continue)

Test Group	Test Item		Set	N	Unit				Requirement		
8	Initial examination of products		15	15	-	No physical damage			Meets requirements of product drawing	Passed	
	Termination Resistance (Humidity-Temperature Cycling)					MAX	MIN	AVE			
			Initial	3	24	mΩ	3.02	1.79	2.01		30mΩ MAX
			Finish				2.69	2.12	2.38		30mΩ MAX
	Dielectric Withstand Voltage Test(Humidity-Temperature Cycling)	4POSN	Initial	3	3	-	No breakdown or flashover				No breakdown or flashover
			Finish				No breakdown or flashover				
		6POSN	Initial	3	3		No breakdown or flashover				
			Finish				No breakdown or flashover				
		8POSN	Initial	3	3		No breakdown or flashover				
			Finish				No breakdown or flashover				
		12POSN	Initial	3	3		No breakdown or flashover				
			Finish				No breakdown or flashover				
						MAX	MIN	AVE			
	Insulation Resistance (Humidity-Temperature Cycling)	4POSN	Initial	3	3	MΩ	9.2 x10 ⁶	3.7 x10 ⁶	5.7 x10 ⁶		1000 MΩ MIN
			Finish				2.1 x10 ⁶	9.2 x10 ⁶	1.6 x10 ⁶		100 MΩ MIN
		6POSN	Initial	3	3		4.5 x10 ⁶	2.3 x10 ⁶	3.7 x10 ⁶		1000 MΩ MIN
			Finish				4.3 x10 ⁶	1.3 x10 ⁶	2.3 x10 ⁶		100 MΩ MIN
		8POSN	Initial	3	3		5.0 x10 ⁶	2.2 x10 ⁶	3.9 x10 ⁶		1000 MΩ MIN
			Finish				3.5 x10 ⁶	1.0 x10 ⁶	2.0 x10 ⁶		100 MΩ MIN
		12POSN	Initial	3	3		1.5 x10 ⁶	1.3 x10 ⁶	1.4 x10 ⁶		1000 MΩ MIN
Finish			1.4 x10 ⁷				6.3 x10 ⁶	5.0 x10 ⁶	100 MΩ MIN		
Final examination of products		15	15	-	No physical damage			No damage likely to impair function			

Figure.3(Continue)

Test Group	Test Item		Set	N	Unit	Results			Requirement	Judgement			
9	Initial examination of products		15	15	-	No physical damage			Meets requirements of product drawing	Passed			
	Termination Resistance ((Humidity State))					MAX	MIN	AVE					
			Initial	3	24	mΩ	2.22	1.93	2.05		30mΩ MAX		
			Finish				2.19	1.72	1.97		30mΩ MAX		
	Dielectric Withstand Voltage Test(Humidity- (Humidity State))		4POSN		Initial	3	3	-	No breakdown or flashover				
					Finish								
			6POSN		Initial	3	3	-	No breakdown or flashover				
					Finish								
			8POSN		Initial	3	3	-	No breakdown or flashover				
					Finish								
			12POSN		Initial	3	3	-	No breakdown or flashover				
					Finish								
	Insulation Resistance ((Humidity State))					MAX	MIN	AVE					
			4POSN		Initial	3	3	MΩ	9.8 x10 ⁶		3.6 x10 ⁶	5.7 x10 ⁶	1000 MΩ MIN
					Finish				1.1 x10 ⁷		3.6 x10 ⁶	6.3 x10 ⁶	100 MΩ MIN
			6POSN		Initial	3	3	MΩ	1.0 x10 ⁷		2.8 x10 ⁶	6.4 x10 ⁶	1000 MΩ MIN
					Finish				2.8 x10 ⁶		2.2 x10 ⁶	2.4 x10 ⁶	100 MΩ MIN
			8POSN		Initial	3	3	MΩ	7.0 x10 ⁶		1.6 x10 ⁶	4.2 x10 ⁶	1000 MΩ MIN
					Finish				4.0 x10 ⁶		1.7 x10 ⁶	2.8 x10 ⁶	100 MΩ MIN
			12POSN		Initial	3	3	MΩ	1.2 x10 ⁶		1.1 x10 ⁶	1.2 x10 ⁶	1000 MΩ MIN
	Finish	1.2 x10 ⁶			8.2 x10 ⁵				1.1 x10 ⁶		100 MΩ MIN		
Final examination of products		15	15	-	No physical damage			No damage likely to impair function					

Figure.3(Continue)

Test Group	Test Item	Set	N	Unit	Results	Requirement	Judgement	
10	Initial examination of products	3	3	-	No physical damage	Meets requirements of product drawing	Passed	
	Termination Resistance (Industry SO2 Gas)				MAX	MIN		AVE
		Initial	3	24	mΩ	2.26		1.92
	Finish				2.56	1.93		2.19
	Final examination of products	3	3	-	No physical damage	No damage likely to impair function		
11	Initial examination of products	3	3	-	No physical damage	Meets requirements of product drawing	Passed	
	Termination Resistance (Temperature Life)				MAX	MIN		AVE
		Initial	3	24	mΩ	2.20		1.86
	Finish				3.53	2.42		2.99
	Final examination of products	3	3	-	No physical damage	No damage likely to impair function		
12	Initial examination of products	3	3	-	No physical damage	Meets requirements of product drawing	Passed	
	Termination Resistance (Salt Spray)				MAX	MIN		AVE
		Initial	3	24	mΩ	2.22		1.90
	Finish				2.43	1.88		2.15
	Final examination of products	3	3	-	No physical damage	No damage likely to impair function		

Figure.3(End)

POSN	Set	N	Wire size	Temperature rise 30°C MAX at rated current.		Temperature rise 100°C MAX at rated current.	
				Current Rating [A]	Result MAX [°C]	Current Rating [A]	Result MAX [°C]
4POSN	3	12	AWG30	0.8	6.3	1.5	17.5
			AWG28	1.0	5.0	1.8	13.8
			AWG26	3.2	20.0	5.8	64.4
			AWG24	3.9	18.8	7.2	63.8
			AWG22	4.5	17.5	8.3	58.1
6POSN	3	12	AWG30	0.8	12.5	1.5	26.3
			AWG28	1.0	6.25	1.8	16.3
			AWG26	2.9	21.3	5.1	63.7
			AWG24	3.4	18.8	6.4	63.8
			AWG22	4.2	19.4	8.0	66.3
8POSN	3	12	AWG30	0.8	10.0	1.5	31.2
			AWG28	1.0	5.0	1.8	17.5
			AWG26	2.6	18.7	4.8	50.6
			AWG24	3.1	18.8	5.8	63.2
			AWG22	3.8	18.1	7.0	60.0
12POSN	3	12	AWG30	0.8	9.6	1.5	28.7
			AWG28	1.0	8.8	1.8	25.0
			AWG26	2.3	18.2	4.4	63.1
			AWG24	2.8	20.0	5.2	66.3
			AWG22	3.5	19.4	6.5	64.4
18POSN	3	6	AWG30	0.8	7.8	1.5	24.6
			AWG28	1.0	6.7	1.8	18.8
			AWG26	2.1	18.5	4.0	62.7
			AWG24	2.7	18.6	5.2	64.5
			AWG22	3.3	19.2	6.3	65.2
24POSN	3	6	AWG30	0.8	9.0	1.5	27.7
			AWG28	1.0	7.6	1.8	22.0
			AWG26	2.0	18.3	3.9	64.6
			AWG24	2.7	18.4	5.2	64.5
			AWG22	3.2	19.0	6.1	63.1

Figure.4