QUALIFICATION TEST REPORT

認 定 試 験 報 告 書

SEALED CONNECTOR
(187 Series)

501- 5021 Rev. 0

Product specification	:	108-5294	Rev. B
Reference Test Report No.	:	See attached sheet	
Date	:	12 Feb. 1992	
Classification	:	Unrestricted	

Prepared by	Reviewed by	Reviewed by	Approved by
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AMP (Japan), Ltd. Kawasaki, Japan

02-12-92

Introduction

1.1 Testing was performed on the 2Pos. .187 sealed connector to determine if it meets the requirements of AMP Specification, 108-5294, Rev. B.

1.2 Scope

This report covers the electrical, mechanical and environmental performance requirements of the 2Pos. .187 sealed connector.

This qualification testing was performed between November 5, 1991 and December 13, 1991.

1.3 Conclusion

The 2Pos. .187 sealed connector meets the electrical, mechanical and environmental performance requirements Specification, 108-5294, Rev. B.

1.4 Test Samples

Samples were taken randomly from current production.

The following samples were used.

Product Part No.	Descriptions
175087	Tab Contact (M Size), Waterproof Type
175088	Tab Contact (L Size), Waterproof Type
175090	Receptacle Contact (M Size), Waterproof Type
175091	Receptacle Contact (L Size), Waterproof Type
176143	2-Position, Cap Housing Assembly
176146	2-Position, Plug Housing Assembly

2. Product Qualification Test Sequence

501-5021

Test or Examination	Test Group											
	1	2	3	4	5	6	7	8	9	10	11	12
	Test Sequence											
Confirmation of Product	1	1	1	1	1	1	1	1	1,4	1,4	1	1
Termination Resistance, Specified Current							3,6,8					
Termination Resistance, Dry Circuit				3,6,8 10,12		2,6 8,10	7	2,4	2,5,7	2,5	2,6	2,4
Dielectric Withstanding Volage					3							
Insulation Resistance						3,11						
Temperature Rise vs Current					2							
Current Cycling												3
Vibration											3	
Mating Force				2								
Unmating Force				4								
Contact Insertion Force	2											
Contact Retention Force (a)			2									
Contact Retention Force (b)												5
Contact DisengagingForce	3											
Crimp Tensile Strength		2										
Durability											5	
Housing Lock Strength					5							
Thermal Shock				11								
Humidity, Steady State				9								
Corrosion, Salt Spray									3			
Handling Ergonomics							4					
Current Leakage					4							
Resistance to "Kojiri"							5					
Heat Aging				5								
Resistance to Cold				7								
Dust Bombardment						9						
Icing							7					
Sulfurous Acid Gas									3			
Resistance to Oil						7						
Resistance to Coolant						4						
Resistance to Frontshield Washer Agent						5						
Resistance to Ozon									6			
Water Sprinkling								3				
Watertight Sealing				13			9	5	8			

Numbers indicate the sequence in which the tests are preformed.
Discontinuities shall not take place in this test group during tests.

3. Test Results

Para	Test Items	Requirements	Procedures	Judgement
3.5.0	Confirmation of Product	Product shall be conforming to the requirements of applicable product drawing and Application specification 114-5126	Visually, dimensionally and functionally inspected per applicable inspection plan.	Acceptable
	Electrical Performance			
3.5.1	Termination Resistance (Specified Current)	Wire Size mm² / (AWG) / Test(A) Current / Resistance (mΩ) (max.) 0.35 / # 18 / 11.25 / 3.0 (Initial) 1.25 / # 16 / 14.25 / 10.0(Final) 2 / # 14 / 18.75 3 / # 12 / 25.5	Measure initial millivolt drop of contact test circuit in mated connectors. by probing between Y-Y'. Calculate Termiination resistance after deducting resistance of 150 mm long wire used for wiring.	Acceptable See Page 8
3.5.2	Termination Resistance (Low Level)	3 mΩ max. (Initial) 10 mΩ max. (Final)	Subject mated contacts assembled in housing to closed circuit current of 10±0.5 mA. at open circuit voltage of 20±1 mV	Acceptable See Page 8
3.5.3	Insulation Resistance	100 MΩ min. (Final)	Measure by applying test potential (500V DC) between the adjacent contacts, and between the contacts and ground in the unmated connector.	Acceptable See Page 11
3.5.4	Dielectric Strength	No abnormalities such as corona and flashover shall be present.	Measure by applying test potential of 1000 V AC between the adjacent contacts, and between the contacts and ground in the mated connector for 1 minute. MIL-STD-202, Method 301	Acceptable See Page 11
3.5.5	Current Cycling	Termination resistance (low level) 10 mΩ max. (Final)	Subject mated contacts to 300 cycles of intermitent current application of the specified intensity in Para. 3.5.1, 45 minuted ON, and 15 minutes OFF.	Acceptable See Page 10
3.5.6	Temperature Rise vs. Current	60 °C max. under loaded specified current. Fig. 4.	Measure temperature rise by energized current, probing at wire crimp of receptacle contact. Obtain temperature rise by subtracting room temperature. AMP Spec. 109-5310	Acceptable See Page 9
3.5.7	Current Leakage	3.5 mA max.	After exposing connector in test chamber (60±5 °C, 90-95 % R. H.) for 1 hour, measure by applying DC 12 V to the circuit.	Acceptable See Page 12

Para.	Test Items	Requirements	Procedures	Judgement
	Physical Performance			
3.5.8	Vibration Sinusoidal High Frequency	No electrical discontinuity greater than 1 microsecond (s) shall occur.	Subject mated connectors to 20-200 Hz vibration traversed in 1 minute with 45 G accelerated velocity : for 4 hours in up--down, 2 hours in back-forth, and 2 hours in right-left directions.	Acceptable See Page 10
3.5.9	Connector Mating Force	No. of Pos. / Mating Force (kg max.) 2 / 5.0	Using autograph measure the force required to mate connector without locking latch by operating at 100 mm a minute.	Acceptable See Page 11
3.5.10	Connector Unmating Force	No. of Pos. / Unmating Force (kg max.) 2 / 3.0	Using autograph measure the force required to unmate connector without locking latch, by operating at 100 mm a minute.	Acceptable See Page 11
3.5.11	Handling Ergonomics	Connector shall be free from sharp edges that can injure or fatigue assemblers' hands during mating and unmating.	Manually repeat mating and unmating to confirm the absence of sharp edges.	Acceptable See Page 11
3.5.12				
3.5.13 (a)	Contact Retention Force (a)	8 kg min.	Apply axial load to contact by operating without double lock plate at a rate of 100 mm a minute. Use contact lead crimped on 0.35 mm^2 wire or greater.	Acceptable See Page 11
3.5.13 (b)	Contact Retention Force (b)	10 kg min.	Measure in the same manner as (a), with double lock plate set in effect.	Acceptable See Page 11
3.5.14	Contact Disengaging Force	200 g min. per contact.	Apply an axial pull-off load to mated contacts on the tester at a rate of 100 mm a minute.	Acceptable See Page 11
3.5.15	Crimp Tensile Strength	Wire Size: mm^2 / (AWG) / Crimp Tensile (min.) kg 0.35 / #18 / 13 1.25 / #16 / 18 2 / #14 / 27 3 / #12 / 30	Apply an axial pull-off load to crimped wire of contact secured on the tester, at a rate of 100 mm a minute.	Acceptable See Page 11

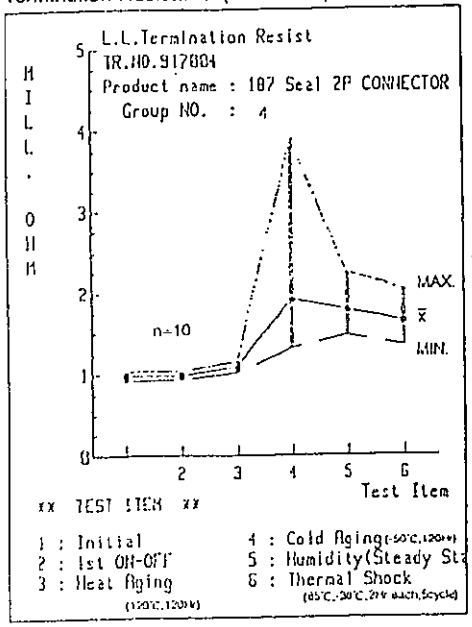
Para.	Test Items	Requirements	Procedures	Judgement
3.5.16	Durability (Repeated Mate/Unmating)	Termination Resistance (Low Level) (Final) 10 mΩ max.	Mate and unmate connectors for 30 cycles at a rate of 100 mm a minute.	Acceptable See Page 10
3.5.17	Housing Lock Strength	10 kg	Determine strength of housing locking mechanism by applying an axial pull-off load to engaged housings, until the housings are separated with or without breakage of locking device.	Acceptable See Page 11
3.5.18	Resistance to "Kojiri"	After testing, the requirements per Test Sequence specified in Para. 3.6 shall be met.	Securely fasten one of the mated connectors on a sturdy bench, and apply prying and twisting motions of 20 kg. cm (T) to free end connector in back forth direction at every 1 mm depth graduation until separation. Making this a cycle, repeat for 30 cycles. After completion, repeat in the right-left direction in the same manner for another 30 cycles.	Acceptable See Page 9
	Environmental Requirements			
3.5.19	Thermal Shock	Termination Resistance (Low Level) (Final) 10 mΩ max.	Subject mated connectors to 5 cycles between −30±5 °C and 85±5 °C, each cycle consisting of 2 hours holding at each extreme with temperature transition within 5 minutes.	Acceptable See Page 9
3.5.20	Humidity, Steady State	Termination Resistance (Low Level) (Final) 10 mΩ max.	Subject mated connectors to steady state humidity at 60 °C and 90-95% R.H. by applying test potential of 12 V DC. Measure after reconditioning to room temperature.	Acceptable See Page 9
3.5.21	Salt Spray	Termination Resistance (Low Level) (Final) 10 mΩ max.	Subject mated connectors to 5 % salt concentration for 96 hours for 2 cycles with one hour interval taken between them. After completion, rinse with tap water, and have them dried for 1 hour before measurement.	Acceptable See Page 10

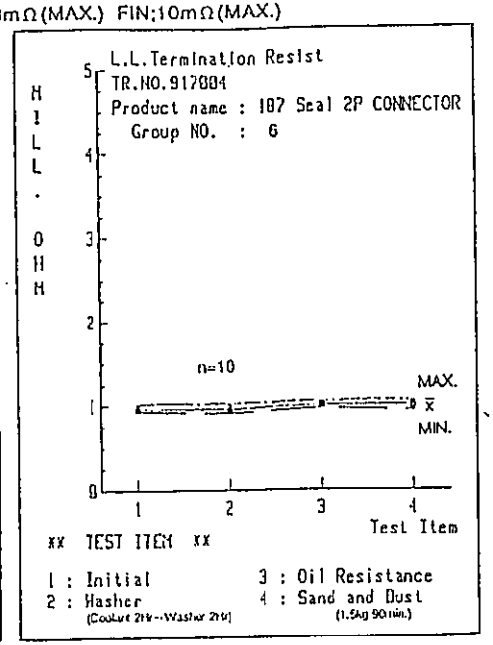
Para.	Test Items	Requirements	Procedures	Judgement
3.5.22	Resistance to Heat:	Termination Resistance (Final) 10 mΩ max.	Subject mated connectors to exposure of 120 °C for 120 hours. Recondition for 30 minutes at room temperature before measurement.	Acceptable See Page 9
3.5.23	Resistance to Cold	Termination Resistance (Low Level) 10 mΩ max.	Subject mated connectors to exposure of −50 °C ± 5 °C for 120 hours. Recondition at room temperature for 30 minutes before measurement.	Acceptable See Page 9
3.5.24	Dust Bombardment	Termination Resistance (Low Level) 10 mΩ max.	Subject mated connectors to a spray of Portland cement (JIS R 5210) propelled by compressed air at a rate of 1.5 kg in 10 seconds in every 15 minutes, in a closed chamber of 1,000 mm cude with the sample connector hung 150 mm away from the chamber wall.	Acceptable See Page 9
3.5.25	Icing	Termination Resistance (Low Level) 10 mΩ max.	Subject mated connector to immersion in boiling water for 1 hour. (-30°C)	Acceptable See Page 9
3.5.26	Resistance to Sulfurous Acid Gas	Termination Resistance (Low Level) 10 mΩ max.	Subject mated connectors to exposure under sulfurous acid gas of 10 p.p.m. concentration in the room temperature with 90 % R.H. minimum for 24 hours.	Acceptable See Page 10
3.5.27	Resistance to Oil	Termination Resistance (Low Level) 10 mΩ max.	Subject mated connectors to immersion in the oil shown be low, at 50 ± 5 °C for the specified duration, in the specified sequence. Rinse in kerosene for 5 minutes between every interval of oil immersion.	Acceptable See Page 9

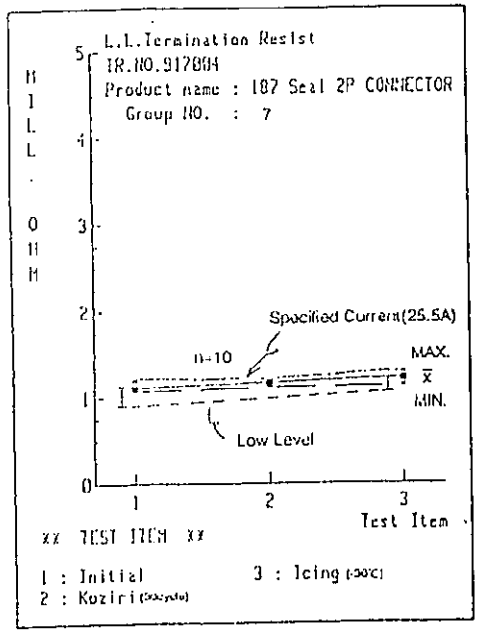
Step	Names of Oils	Duration
1	Torque Converter Oil	1 Hour
2	Transmission Oil	1 Hour
3	Engine Oil	1 Hour
4	Clutch Oil	1 Hour
5	Brake Oil	1 Hour

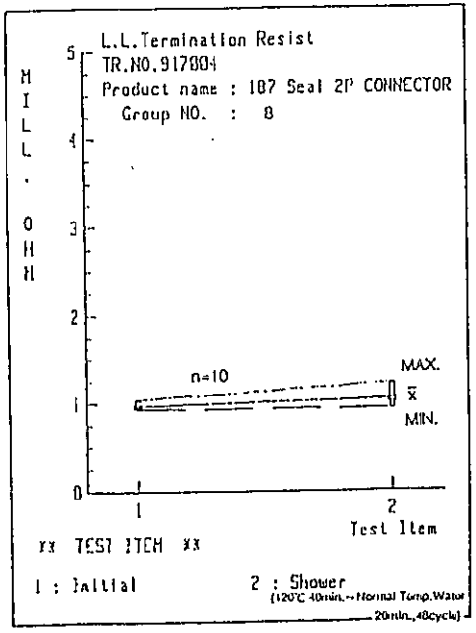
Para.	Test Items	Requirements	Procedures	Judgement
3.5.28	Resistance to Coolant	Termination Resistance (Low Level) 10 mΩ max.	Subject mated connectors to immersion in commercial coolant at 50±2 °C for 2 hours. After this duration, rinse in tap water for 5 minutes, and have them dried at room temperature before measurement.	Acceptable See Page 9
3.5.29	Resistance to Frontshield Washer Agent	Termination Resistance (Low Level) 10 mΩ max.	Subject mated connectors to immersion in commercial front shield washer agent at 50±2 °C for 2 hours. After this duration, rinse in tap water for 5 minutes, and have them dried at room temperature before measurement.	Acceptable See Page 9
3.5.30	Resistance to Ozon	Termination Resistance (Low Level) 10 mΩ max. No abnormalities shall be present, when evaluated per Class C, Para. 9 of JIS D 0205, and Para. 6.6 of JIS K 6301 for aged cracking of rubber.	Subject mated connectors to ozon test atmosphere in the closed test chamber at 40±2 °C by hanging for 24 hours. The concentration of ozon shall be 50±5 p.p.m. per Para. 16 of JIS K 6301.	Acceptable See Page 10
3.5.31	Water Sprinkle	Termination Resistance (Low Level) 10 mΩ max. Current Leakage : 100 μA max.	Subject mated connectors to water sprinkle test in the closed test chamber where the samples are heated at 120 °C±3 °C for 40 minutes and sprinkle water of normal temperature for 20 minutes. Making this a cycle, repeat for 48 cycles per Test Class S1 of JIS D 0203. During test, apply test potential of 12 V DC by using lead wires of 2 meters.	Acceptable See Page 10
3.5.32	Watertight Sealing	Initial: 0.5 kg/cm² min. Final: 0.3kg/cm² min.	Subject one of mated connectors to be drilled in order to make a hole, through which compressed air of 0.1 kg/cm² (9.8 KPa) is blown in inside them while the wire ends are solder-sealed with insulation ends masked with adhesives. Immerse in water in 30 cm max. deep for 30 seconds. Monitor for air leakage and increase pressure by 0.1 kg/cm² graduation, until leakage takes place.	Acceptable See Page 12

Termination Resistance(Low Level) Spec. INI;3mΩ(MAX.) FIN;10mΩ(MAX.)

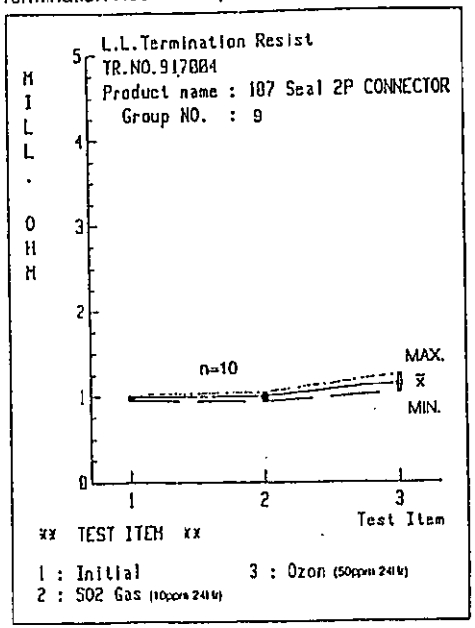


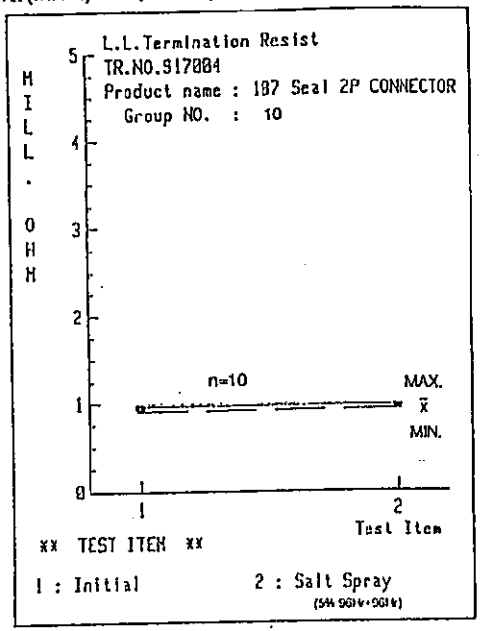


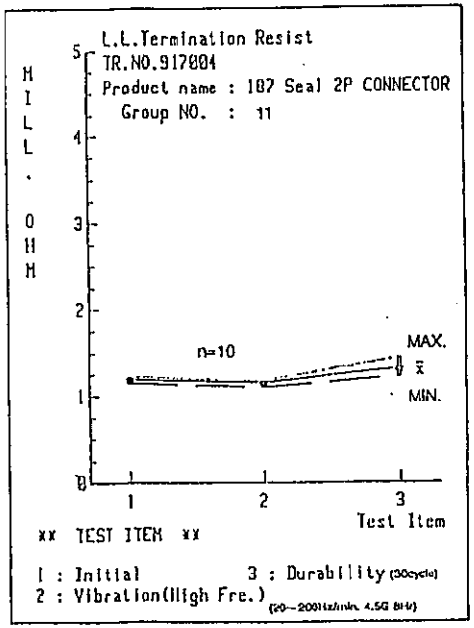


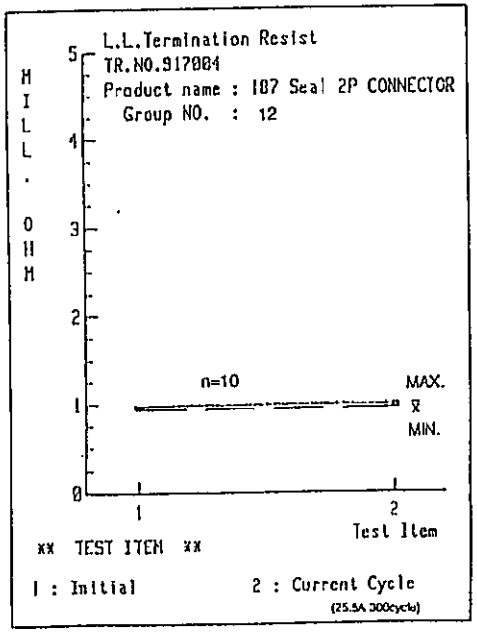


Termination Resistance(Low Level) Spec. INI;3mΩ(MAX.) FIN;10mΩ(MAX.)

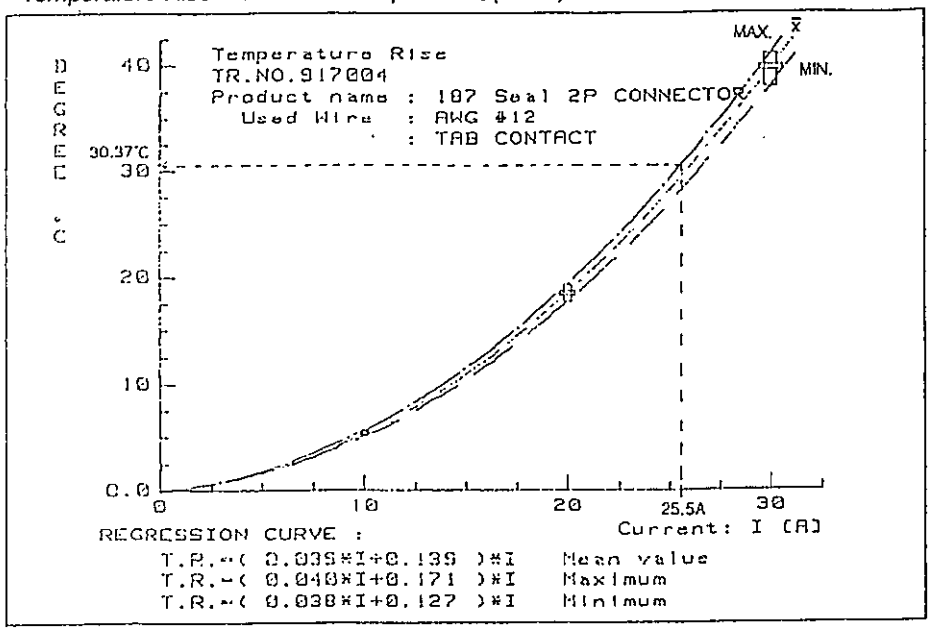


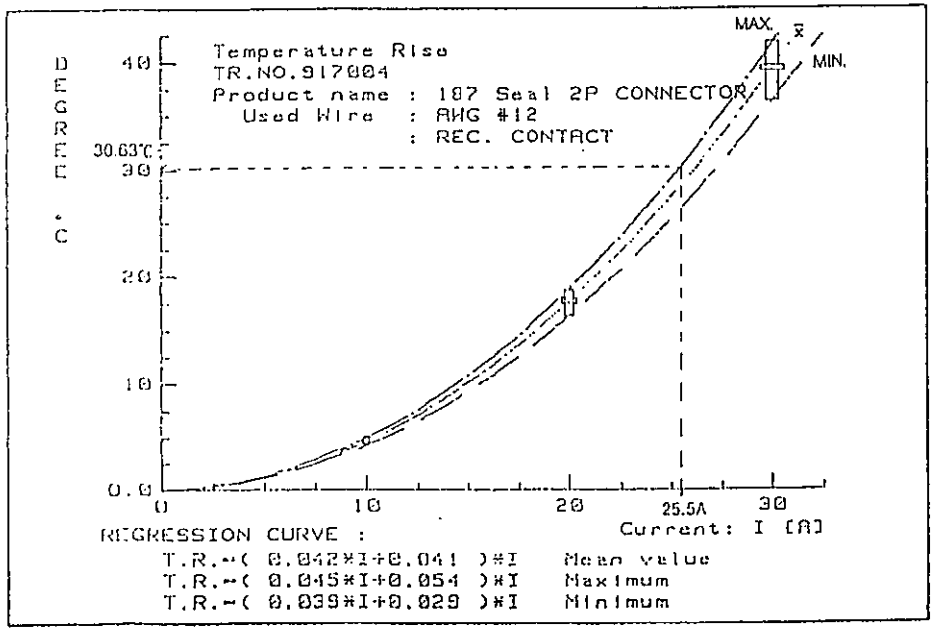






Temperature Rise vs. Current Spec. 60°C(MAX.)





AMP-Japan Test Laboratory

TR.NO.917004

< TEST Sample > 187 Seal 2P CONNECTOR

Measuring Item : L.L.Termination Resist

Wire Size :#12

Group:4 (Unit : mΩ)

	Initial	After First Mating	After Heat	After Cold	After Humidity	After Thermal Shock
1	2.080	2.110	2.180	2.530	3.110	2.590
2	2.060	2.080	2.140	3.130	2.590	2.920
3	2.130	2.160	2.190	2.490	2.810	2.650
4	2.150	2.160	2.200	5.010	3.300	3.160
5	2.110	2.100	2.280	2.520	2.920	2.650
6	2.090	2.060	2.250	2.490	2.590	2.470
7	2.090	2.060	2.250	2.530	2.740	2.640
8	2.110	2.150	2.140	2.520	2.630	2.920
9	2.120	2.110	2.170	2.440	2.930	2.690
10	2.040	2.100	2.260	4.650	3.360	2.940
N	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000
Max	1.03000	1.04000	1.16000	3.89000	2.24000	2.94000
Min	0.92000	0.94000	1.02000	1.32000	1.47000	1.35000
Mean	0.97800	0.98900	1.08600	1.91100	1.77800	1.64300
Sigma	0.03293	0.03755	0.05082	0.97218	0.28201	0.21002
X+3*s	1.07679	1.10165	1.23845	4.82755	2.62403	2.27546
X-3*s	0.87921	0.87635	0.93355	-1.00555	0.93197	1.01054
Spec.	3mΩ (MAX.)	10mΩ (MAX.)				
Judgement	Acceptable	Acceptable				

Group:6 (Unit : mΩ)

	Initial	After Washer	After Oil	After Dust
1	4.320	4.330	4.390	4.420
2	4.310	4.290	4.330	4.340
3	4.310	4.270	4.330	4.300
4	4.290	4.270	4.350	4.340
5	4.310	4.340	4.390	4.330
6	4.300	4.310	4.350	4.360
7	4.350	4.350	4.410	4.380
8	4.300	4.350	4.380	4.410
9	4.330	4.340	4.330	4.380
10	4.310	4.290	4.350	4.350
N	10.00000	10.00000	10.00000	10.00000
Max	1.02000	1.02000	1.05000	1.06000
Min	0.93000	0.91000	0.97000	0.94000
Mean	0.95500	0.95700	1.00100	1.00700
Sigma	0.02503	0.03383	0.02923	0.03676
X+3*s	1.03110	1.05750	1.08869	1.11227
X-3*s	0.88090	0.86450	0.91331	0.90173
Spec.	3mΩ (MAX.)	10mΩ (MAX.)		
Judgement	Acceptable	Acceptable		

Group:7 (Unit : mΩ)

	Initial	After Kojiri	After Icing	Initial	After Icing
1	1.118	1.161	1.166	2.110	2.150
2	1.097	1.131	1.189	2.070	2.190
3	1.107	1.204	1.267	2.080	2.260
4	1.113	1.212	1.293	2.120	2.270
5	1.065	1.121	1.126	2.080	2.110
6	1.111	1.190	1.220	2.120	2.170
7	1.218	1.210	1.297	2.200	2.270
8	1.115	1.149	1.217	2.120	2.190
9	1.064	1.113	1.160	2.090	2.170
10	1.080	1.167	1.243	2.090	2.230
N	10.00000	10.00000	10.00000	10.00000	10.00000
Max	1.21765	1.21178	1.29725	1.08000	1.15000
Min	1.06392	1.11333	1.12627	0.95000	0.99000
Mean	1.11071	1.15820	1.21815	0.98800	1.08200
Sigma	0.04154	0.03677	0.05781	0.03736	0.05371
X+3*s	1.23531	1.27551	1.39159	1.10007	1.24112
X-3*s	0.98610	1.05559	1.04472	0.97593	0.92088
Spec.	3mΩ (MAX.)	10mΩ (MAX.)		3mΩ (MAX.)	10mΩ (MAX.)
Judgement	Acceptable	Acceptable		Acceptable	Acceptable

< TEST Sample > 187 Seal 2P CONNECTOR

Measuring Item : L.L.Termination Resist

Wire Size :#12

Group:8 (Unit : mΩ)

	Initial	After Water Spraying
1	2.030	2.070
2	2.020	2.150
3	2.130	2.190
4	2.030	2.120
5	2.100	2.110
6	2.070	2.100
7	2.050	2.120
8	2.020	2.110
9	2.100	2.050
10	2.050	2.170
N	10.00000	10.00000
Max	1.04000	1.23000
Min	0.95000	0.94000
Mean	0.98100	1.01200
Sigma	0.03137	0.07935
X+3*s	1.05912	1.28150
X-3*s	0.90288	0.90250
Spec.	3mΩ(MAX.)	10mΩ(MAX.)
Judgement	Acceptable	Acceptable

Group:9 (Unit : mΩ)

	Initial	After SO2 Gas	After Ozon
1	2.100	2.150	2.370
2	2.120	2.120	2.300
3	2.110	2.110	2.190
4	2.030	2.120	2.220
5	2.110	2.110	2.350
6	2.070	2.070	2.150
7	2.110	2.170	2.320
8	2.110	2.100	2.230
9	2.070	2.050	2.160
10	2.120	2.130	2.310
N	10.00000	10.00000	10.00000
Max	1.02000	1.05000	1.23000
Min	0.95000	0.93000	1.04000
Mean	0.99800	0.99800	1.11900
Sigma	0.02258	0.03858	0.08117
X+3*s	1.06574	1.10173	1.39250
X-3*s	0.93026	0.89427	0.84550
Spec.	3mΩ(MAX.)	10mΩ(MAX.)	
Judgement	Acceptable	Acceptable	

Group:10 (Unit : mΩ)

	Initial	After Salt Spray
1	2.070	2.100
2	2.120	2.050
3	2.030	2.060
4	2.030	2.050
5	2.100	2.110
6	2.100	2.100
7	2.090	2.100
8	2.090	2.100
9	2.080	2.100
10	2.070	2.090
N	10.00000	10.00000
Max	1.00000	0.99000
Min	0.91000	0.93000
Mean	0.96300	0.97000
Sigma	0.02406	0.01764
X+3*s	1.03518	1.02292
X-3*s	0.89082	0.91708
Spec.	3mΩ(MAX.)	10mΩ(MAX.)
Judgement	Acceptable	Acceptable

Group:11 (Unit : mΩ)

	Initial	After Vibration	After Durability
1	2.860	2.860	3.130
2	2.890	2.850	3.020
3	2.900	2.850	3.060
4	2.910	2.840	2.960
5	2.890	2.820	2.960
6	2.850	2.820	2.960
7	2.840	2.820	2.950
8	2.830	2.780	2.920
9	2.840	2.810	2.900
10	2.890	2.830	3.010
N	10.00000	10.00000	10.00000
Max	1.23000	1.18000	1.45000
Min	1.15000	1.10000	1.22000
Mean	1.16900	1.14800	1.30900
Sigma	0.02846	0.02348	0.06855
X+3*s	1.27439	1.21843	1.51465
X-3*s	1.10362	1.07757	1.10335
Spec.	3mΩ(MAX.)	10mΩ(MAX.)	
Judgement	Acceptable	Acceptable	

Group:12 (Unit : mΩ)

	Initial	After Current Cycling
1	2.060	2.110
2	2.080	2.080
3	2.100	2.140
4	2.090	2.090
5	2.120	2.110
6	2.120	2.130
7	2.110	2.130
8	2.110	2.120
9	2.090	2.130
10	2.090	2.080
N	10.00000	10.00000
Max	1.00000	1.03000
Min	0.94000	0.96000
Mean	0.97700	0.99400
Sigma	0.01889	0.02459
X+3*s	1.03366	1.06776
X-3*s	0.92034	0.92024
Spec.	3mΩ(MAX.)	10mΩ(MAX.)
Judgement	Acceptable	Acceptable

< TEST Sample > 187 Seal 2P CONNECTOR

Measuring Item : Temperature Rise

Wire Size :#12

Group:5 (Unit:°C)

	TAB 10A	TAB 20A	TAB 30A	REC. 10A	REC. 20A	REC. 30A
1	30.000	44.000	67.700	29.000	42.500	66.300
2	30.000	44.800	68.400	29.500	44.400	69.100
3	29.600	43.500	65.300	29.700	44.500	66.700
4	29.700	44.100	66.000	29.100	44.000	67.700
5	30.300	45.100	67.800	28.800	42.100	63.700
N	5.00000	5.00000	5.00000	5.00000	5.00000	5.00000
Max	5.80000	19.30000	41.10000	5.20000	18.70000	41.80000
Min	5.10000	17.70000	38.00000	4.30000	16.30000	36.40000
Mean	5.42000	18.50000	39.74000	4.72000	17.70000	39.40000
Sigma	0.27749	0.64420	1.32023	0.37014	1.12027	1.99499
X+3*s	6.25247	20.43261	43.70068	5.83041	21.06080	45.38498
X-3*s	4.58753	16.56739	35.77932	3.60959	14.33920	33.41502

Spec. 60°C(Under loaded 25.5A)

judgement : Acceptable

< TEST Sample > 187 Seal 2P CONNECTOR

Measuring Item : Mechanical Performance   Wire Size :#12

	Group:1				Group:3		Group:12		Group:4		Group:5
	CONTACT(g)		Insertion Force (kg)		Retention Force(a) (kg)		Retention Force(b) (kg)		Connector(kg)		Housing lock Strength (kg)
	Engaging Force	Disengaging Force	TAB	REC.	TAB	REC.	TAB	REC.	Mating	Unmating	
1	350.000	375.000	2.400	1.850	16.500	19.500	18.200	20.500	3.370	2.850	11.800
2	350.000	315.000	2.150	2.900	15.500	19.400	17.500	22.500	3.170	2.800	12.300
3	350.000	290.000	1.100	3.450	16.400	19.000	18.200	19.100	3.500	2.300	11.700
4	375.000	315.000	1.500	3.400	16.600	20.600	18.000	20.000	3.700	2.270	11.800
5	315.000	280.000	1.550	1.400	16.500	20.200	18.200	18.000	3.500	2.800	12.200
6	330.000	250.000	1.170	1.400	16.000	20.000	18.200	18.000			
7	315.000	250.000	1.450	2.700	17.000	20.200	13.500	19.000			
8	330.000	350.000	1.300	1.650	15.200	20.000	16.000	18.900			
9	315.000	275.000	1.500	2.550	17.200	19.500	17.900	17.500			
10	350.000	300.000	1.500	1.660	16.200	19.400	18.600	18.500			
N	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	5.00000	5.00000	5.00000
Max	375.00000	350.00000	2.40000	3.45000	17.20000	20.20000	18.50000	22.50000	4.32000	2.85000	12.30000
Min	315.00000	250.00000	1.30000	1.40000	15.00000	18.50000	17.50000	17.50000	3.17000	2.20000	11.60000
Mean	352.00000	291.00000	1.52200	2.27830	16.15000	19.61000	18.05000	19.23000	3.59300	2.54800	11.92000
Sigma	22.75473	38.81728	0.35563	0.81371	0.39511	0.55817	0.27152	1.55210	0.35351	0.30060	0.31145
X+3σ	420.26419	412.91133	2.58950	4.71972	17.33533	21.31451	18.87493	23.93329	4.77393	3.44810	12.85434
X-3σ	283.73581	175.08927	0.55450	-0.16372	15.26462	17.95549	17.24511	14.57371	2.61917	1.64360	10.98566
Spec.	———	200g(min.)	———		8kg(min.)		10kg(min.)		5kg(max.)	3kg(max.)	10kg(min.)
Judgement	———	Acceptable	—	—	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable

Crimp Tensile Strength

Group:2   Wire Size :#12   (Unit:kg)

Wire Size	AWG#18		AWG#16		AWG#14		AWG#12	
	TAB	REC.	TAB	REC.	TAB	REC.	TAB	REC.
1	19.300	15.700	24.500	21.500	39.400	37.000	61.200	53.600
2	18.500	17.900	21.500	21.500	42.800	39.000	62.500	51.000
3	18.500	19.700	26.700	21.300	40.000	38.000	55.500	57.400
4	19.300	11.600	24.900	23.000	41.200	39.600	57.000	55.000
5	19.600	17.600	24.100	21.100	41.100	38.000	60.000	55.200
6	15.300	18.900	26.300	23.100	42.000	38.600	56.400	58.500
7	20.000	18.000	25.500	21.200	40.000	35.500	60.300	51.100
8	19.200	18.500	27.500	22.500	42.400	36.700	50.300	53.200
9	13.900	17.000	25.300	24.500	41.200	39.700	57.200	51.500
10	20.400	19.200	24.200	25.400	32.300	37.500	55.500	53.200
N	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000	10.00000
Max	20.40000	19.70000	27.50000	25.40000	42.80000	39.60000	62.50000	57.40000
Min	18.20000	15.70000	24.10000	22.50000	32.30000	35.50000	50.30000	51.10000
Mean	19.05000	18.00000	25.39000	21.67000	40.24000	37.95000	57.95000	54.01000
Sigma	0.73911	1.15837	1.09113	0.94105	2.97563	0.98527	3.42165	2.00831
X+3σ	21.26933	21.45937	28.58339	24.50211	49.22355	40.83567	68.20494	60.03503
X-3σ	16.81167	14.53013	22.01671	21.25723	31.25312	34.92133	47.72505	48.04497
Spec.	13kg(min.)		18kg(min.)		27kg(min.)		30kg(min.)	
Judgement	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable	Acceptable

AMP-Japan Test Laboratory
TR.NO.917004

< TEST Sample > 187 Seal 2P CONNECTOR

Measuring Item : Dielectric Strength

Wire Size :#12

Group5   (A.C. 1000V,1Minute)

	Between contacts	Between contacts and housing
1	OK	OK
2	OK	OK
3	OK	OK
4	OK	OK
5	OK	OK
N		
Max		
Min		
Mean		
Sigma		
X+3σ		
X-3σ		
Spec.	No corona and flashover	
Judgement	Acceptable	Acceptable

Measuring Item : Insulation Resistance tance

Wire Size :#12

Group6   (Unit : Ω)   (D.C. 500V,1Minute)

	Initial (X10⁶)		Final(X10⁶)	
	Between contacts	Between contacts and housing	Between contacts	Between contacts and housing
1	1.000	1.000	0.100	2.030
2	1.000	1.000	0.090	0.270
3	1.000	0.020	0.330	0.360
4	1.000	0.620	0.160	122.000
5	1.000	1.000	4.100	0.460
N	5.00000	5.00000	5.00000	5.00000
Max	1.00000	1.00000	4.10000	122.00000
Min	1.00000	0.02000	0.08000	0.27000
Mean	1.00000	0.72800	0.95400	25.02400
Sigma	0.00000	0.42863	1.76141	54.21608
X+3σ	1.00000	2.01388	6.23824	187.67223
X-3σ	1.00000	-0.55788	-4.33024	-137.62423
Spec.	———		1X10⁴ (min.)	
Judgement	———	———	Acceptable	Acceptable

501-5021

CURRENT LEAKAGE

D.C.12V UNIT μA

	GROUP4	GROUP5	GROUP8
1	0	0	70
2	0	0	70
3	0	0	70
4	0	2.0	70
5	0	0	70
SPEC.	3m A (MAX.)		
JUDG.	Acceptable	Acceptable	Acceptable

Wire size #12

WATERTIGHT SEALING

UNIT kg/cm²

	GROUP4	GROUP7	GROUP8	GROUP9
1	0.5	0.5	0.5	0.5
2	0.5	0.5	0.5	0.5
3	0.5	0.5	0.5	0.5
4	0.5	0.5	0.5	0.5
5	0.5	0.5	0.5	0.5
SPEC.	0.3(MIN.)			
JUDG.	Acceptable	Acceptable	Acceptable	Acceptable

Wire size #12