TEST REPORT

AMP-Holland B.V.

ENVIRONMENTAL TESTING LABORATORY

Job Number	Project Number:	Date of issue:
98.04.01.	127130.	April 1998.

Description:

MODULAR JACK.

6 and 4 Position.

Part numbers:
100860-1, 6 pos. B.E.
100861-1, 6 pos. T.E.
106176-1, 4 pos. T.E.
5-641337-3 and 5-641334-3.

Scope:
To investigate the behaviour of the 6 and 4 position AMP Modular Jack, SMD version, when tested in accordance with the AMP PRODUCT SPECIFICATION 108-19117. (Rev.A)

Conclusions:

Test Specification:	AMP PRODUCT SPECIFICATION 108-19117, Rev.A
Test Carried Out:	1 See page 2 and 3. 2 3
Distribution:	1 W. Brummans. 2 Doc. center 3 File Lab.

Test Engineer:	J. Geven I.A.	**Requested by:**	Product Engineering	
Laboratory Manager:	D.M.J. Jooren.	**Classification:**	Unrestricted	
Disposal of Samples:	Returned to requester.	**Report Number:**	**501 - 19009.**	**Rev:** O
Appendices:		**Page** 1 **of** 10 **Pages**		

DESCRIPTION of SAMPLES:

Three kinds of SMD Modular Jacks, the 6-position Bottom Entry(part number 100860-1), the 6-position Top Entry (part number 100861-1) and the 4 position Top Entry (part number 106176-1), were divided in the following test groups:
Test group 1, 4, 7, and 8 consists of 10 Modular Jacks and 10 Plugs terminated on a 100 mm flat oval cable with 26 AWG unplated stranded conductors. Part number of 6-position plug was 5-641337-3 and part number of 4-position plug was 5-641334-3.
Test group 9 consists of 10 loose piece Modular Jacks.

TEST SEQUENCE:

Test group 1:	Termination resistance. Vibration. Termination resistance.
Test group 4:	Insulation resistance. Voltage proof. Temperature humidity cycling. Insulation resistance. Voltage proof.
Test group 7:	Insulation resistance. Voltage proof. Rapid change of temperature. Insulation resistance. Voltage proof.
Test group 8:	Static load axial, plug retention in Jack.
Test group 9:	Dry heat. Solderability. / Resistance to soldering heat.

TEST PROCEDURES:

IEC 512-2-2a:

TERMINATION RESISTANCE:
The termination resistance was measured with an open circuit voltage of 20 mVolt and a maximum current of 100 mA DC.

IEC 512-2-4a:

VOLTAGE PROOF:
This measurement was done with a high voltage tester. The test duration was one minute at 1000 V_{rms}.

IEC 512-2-3a:

INSULATION RESISTANCE:

This measurement was done with a programmable electrometer. The measuring voltage was 100 Volt during one minute.

IEC 512-6-11m:

DAMP HEAT CYCLIC:

The samples were subjected to a cyclic damp heat test under the following conditions:

Upper temperature	: 55°C.
Lower temperature	: 25°C.
Relative humidity	: 95%.
Condition	: mated.
Number of cycles	: 10.

IEC 512-6-11d:

RAPID CHANGE of TEMPERATURE:

The samples were subjected to a rapid change of temperature test under the following conditions:

One cycle consists of:

Upper temperature	: 70°C for 30 minutes.
Lower temperature	: -40°C for 30 minutes.
Condition	: mated.
Number of cycles	: 25.
Duration	: 500 hours.

IEC 512-4-6d:

VIBRATION:

The samples were mounted on a vibration table.
The frequency was traversed from 10-500-10 Hz with one octave per minute. Below the cross-over frequency the samples were vibrated with an amplitude of 0,35 mm, above that frequency with an acceleration of 5g. The duration was 2 hours in each of the three mutually perpendicular directions. The samples were provided with a circuit to detect interruptions of continuity longher than 1 micro-second.

IEC 68-2-20, Ta

SOLDERABILITY: (Method 1)

The samples were subjected to a dry heat test under the following conditions:

Temperature:	:155°C.
Duration:	:4 hours.

After that, the samples were plunged in a solderbath with a temperature of 235°C for 2 seconds.

IEC 68-2-20, Tb

RESISTANCE TO SOLDERING HEAT: (Method 1a)

The samples were subjected to a temperature of 260°C during 3 minutes.

EQUIPMENT USED:

Equipment	Producer	Type	Series Nb	Cal Due.
Micro-ohmmeter	Keithley	580	477870	11-98
Accelero meter	B & K	4371	650308	01-99.
Exciter control	B & K	1050	1412882	01-99.
Vibrator	Ling+B&K	PA2000	S1165-002	01-99.
Climatic chamber	Weiss	125SBDU20	206083	11-98.
Climatic chamber (TS)	Weiss	64/80DUST	224/17413	11-98.
Oven	Heraeus	UT6060	9102051	11-98.
Tensile tester	MTS	400m	165811/20	01-99.
Electrometer	Keithley	617	325475	11-98.
High voltage tester	Becman	PA-5-152	634	
Solderbath	Meniscograph.			

TEST RESULTS:

REQUIREMENTS:	MEASURED:	
Termination resistance:		
ΔR 20 mΩ maximum.	Initial	: no ΔR.
	After vibration	: ΔR ≤ 7 mΩ.
Insulation resistance:		
5E8 Ω minimum initial.	Initial	: ≥ 1,2E10 Ω .
1E8 Ω minimum final	After humidity	: ≥ 4,8E7 Ω.
	After rapid change	: ≥ 2,9AE12 Ω.

Voltage proof:
All tested connectors, initial and final, passed the voltage proof. No breakdown or flashover was detected.

Vibration:
During the vibration test no interruptions of continuity > 1μsec. were detected.

Plug retention in jack:
The plugs were not dislodged from the jack and were no discontinuations.

Solderability:
Max. 5% dewetting on soldertines. O.K.

Resistance to soldering heat:
No cracks, chips or melting were observed.

All values represented in milli-Ohms.

Product name: 6 position Top Entry SMD.

Column.	Group	Lot	Test
-1-:	1	1..5	Termination Resistance Initial.
-2-:	1	6..10	Termination Resistance Initial.
-3-:	1	1..5	After Vibration.
-4-:	1	6..10	After Vibration.

	-1-	*-2-*	*-3-*	*-4-*
1	28,85	29,50	28,42	28,13
2	28,40	29,54	27,89	28,87
3	28,98	29,99	28,57	29,87
4	28,41	29,43	28,84	29,22
5	28,86	29,22	29,20	29,22
6	28,78	30,12	28,22	29,40
7	29,71	28,70	29,00	28,60
8	29,41	28,69	28,29	27,94
9	29,73	30,14	29,12	30,17
10	29,25	28,99	28,48	28,48
11	29,52	29,01	28,70	28,63
12	29,20	29,69	29,46	29,05
13	28,66	29,28	27,33	28,57
14	28,83	29,36	28,82	28,84
15	29,66	29,37	29,62	29,26
16	28,34	29,54	28,06	29,16
17	28,10	28,95	27,89	28,84
18	28,77	29,29	28,65	28,52
19	29,27	29,08	28,79	29,89
20	28,79	28,91	28,55	29,42
21	29,59	29,92	29,79	29,96
22	28,76	29,59	29,42	29,30
23	29,10	29,44	28,28	29,23
24	28,53	29,18	28,52	29,29
25	29,53	28,41	29,15	27,94
26	29,71	28,79	29,68	28,73
27	30,89	29,82	30,81	29,33
28	29,99	29,04	30,20	28,46
29	28,93	28,41	29,41	27,90
30	29,49	29,06	29,41	28,71
Max.	**30,89**	**30,14**	**30,81**	**30,17**
Min.	**28,10**	**28,41**	**27,33**	**27,90**
Mean.	**29,13**	**29,28**	**28,89**	**28,96**

All values represented in milli-Ohms.

Product name: 6 position Bottom Entry SMD.

Column.	Group	Lot	Test
-1-:	1	1..5	Termination Resistance Initial.
-2-:	1	6..10	Termination Resistance Initial.
-3-:	1	1..5	After Vibration.
-4-:	1	6..10	After Vibration.

	-1-	*-2-*	*-1-*	*-2-*
1	27,77	26,55	26,76	26,28
2	26,49	26,37	26,12	26,72
3	27,47	27,77	26,83	27,44
4	26,85	26,65	27,10	26,63
5	27,05	26,95	26,48	27,19
6	27,38	27,24	27,37	27,42
7	26,92	26,81	26,71	26,77
8	26,31	26,60	26,67	26,38
9	27,40	27,55	27,58	27,40
10	25,82	26,67	26,91	26,58
11	26,78	26,64	26,52	27,13
12	27,28	26,91	27,03	26,89
13	27,07	27,28	27,15	27,31
14	26,28	26,43	25,82	25,86
15	27,30	26,79	27,24	26,60
16	27,10	26,81	27,28	26,25
17	27,54	26,75	27,22	26,89
18	27,06	27,50	27,64	27,38
19	26,75	27,28	26,56	27,02
20	27,14	26,67	26,63	26,57
21	28,12	27,96	27,72	27,69
22	27,43	26,81	27,15	26,82
23	27,45	27,23	26,74	26,50
24	27,41	26,07	27,36	26,93
25	26,73	27,43	26,38	27,41
26	26,38	26,38	26,31	26,48
27	27,35	26,96	27,87	28,19
28	27,02	27,64	26,49	27,15
29	26,16	26,48	26,04	26,41
30	27,11	26,52	25,75	26,64
Max.	**28,12**	**27,96**	**27,87**	**28,19**
Min.	**25,82**	**26,07**	**25,75**	**25,86**
Mean.	**27,03**	**26,92**	**26,85**	**26,90**

All values represented in milli-Ohms.

Product name: 4 position Top Entry SMD.

Column.	Group	Lot	Test
-1-:	1	1..5	Termination Resistance initial.
-2-:	1	6..10	Termination Resistance initial.
-3-:	1	1..5	After Vibration.
-4-:	1	6..10	After Vibration.

	-1-	*-2-*		
1	29,30	28,91	29,57	29,28
2	33,11	28,16	32,87	28,38
3	28,47	28,66	28,52	28,68
4	28,91	29,28	28,76	28,93
5	29,13	29,32	28,59	29,12
6	29,66	30,49	28,81	30,64
7	27,90	29,03	27,22	29,14
8	28,21	29,51	28,03	29,64
9	28,61	28,39	29,42	28,29
10	29,32	28,51	29,64	28,32
11	27,31	28,07	27,90	28,19
12	28,65	28,84	28,91	29,02
13	29,10	30,11	28,66	30,15
14	29,53	29,96	28,82	30,16
15	28,73	28,74	28,68	28,80
16	29,11	29,97	28,69	29,82
17	29,69	28,60	29,14	28,46
18	29,54	28,23	29,24	28,04
19	28,68	28,43	28,82	28,94
20	28,58	29,03	27,90	28,51
Max.	**33,11**	**30,49**	**32,87**	**30,64**
Min.	**27,31**	**28,07**	**27,22**	**28,04**
Mean.	**29,08**	**29,01**	**28,91**	**29,03**

All values represented in Ohms.

Product name: 6 position Top Entry SMD.

Column.	Group	Lot	Test
-1-:	4	1..10	Insulation Resistance Initial.
-2-:	4	1..10	After Temp. / Humidity.

	-1-	*-2-*
1	3,23E+10	5,25E+07
2	2,63E+10	5,27E+07
3	3,33E+10	5,65E+07
4	3,35E+10	6,97E+07
5	3,78E+10	6,62E+07
6	3,59E+10	4,97E+07
7	4,10E+10	7,35E+07
8	4,21E+10	6,48E+07
9	4,01E+10	5,75E+07
10	3,69E+10	6,82E+07
Max.	**4,21E+10**	**7,35E+07**
Min.	**2,63E+10**	**4,97E+07**
Mean.	**3,59E+10**	**6,11E+07**

All values represented in Ohms.

Product name: 6 position Bottem Entry SMD

Column.	Group	Lot	Test
-1-:	4	1..10	Insulation resistance Initial.
-2-:	4	1..10	After Temp. / Humidity.

	-1-	*-2-*
1	5,53E+10	4,80E+07
2	5,92E+10	4,87E+07
3	5,57E+10	5,33E+07
4	6,60E+10	6,18E+07
5	6,46E+10	5,06E+07
6	5,91E+10	5,76E+07
7	5,89E+10	5,12E+07
8	6,35E+10	4,80E+07
9	6,90E+10	5,93E+07
10	7,18E+10	6,25E+07
Max.	**7,18E+10**	**6,25E+07**
Min.	**5,53E+10**	**4,80E+07**
Mean.	**6,23E+10**	**5,41E+07**

All values represented in Ohms.

Product name: 4 position Top Entry SMD.

Column.	Group	Lot	Test
-1-:	4	1..10	Insulation Resistance Initial.
-2-:	4	1..10	After Temp. / Humidity.

	-1-	*-2-*
1	1,14E+11	8,23E+07
2	1,16E+11	7,80E+07
3	1,33E+11	7,92E+07
4	1,39E+11	7,94E+07
5	1,40E+11	7,97E+07
6	1,26E+10	1,26E+08
7	1,26E+11	8,39E+07
8	1,31E+11	7,49E+07
9	1,33E+11	8,05E+07
10	1,36E+11	7,65E+07
Max.	**1,40E+11**	**1,26E+08**
Min.	**1,26E+10**	**7,49E+07**
Mean.	**1,18E+11**	**8,40E+07**

All values represented in Ohms.

Product name: 6 position Top Entry SMD.

Column.	Group	Lot	Test
-1-:	7	1..10	Insulation Resistance Initial.
-2-:	7	1..10	After Rapid Change.

	-1-	*-2-*
1	3,53E+10	6,36E+12
2	3,28E+10	6,19E+12
3	3,30E+10	7,23E+12
4	4,67E+10	5,34E+12
5	4,72E+10	6,07E+12
6	5,07E+10	5,83E+12
7	4,38E+10	6,45E+12
8	4,54E+10	6,78E+12
9	4,61E+10	5,60E+12
10	4,08E+10	6,70E+12
Max.	**5,07E+10**	**7,23E+12**
Min.	**3,28E+10**	**5,34E+12**
Mean.	**4,22E+10**	**6,25E+12**

All values represented in Ohms.

Product name: 6 position Botttom Entry SMD.

Column.	Group	Lot	Test
-1-:	7	1..10	Insulation Resistance Initial.
-2-:	7	1..10	After Rapid Change.

	-1-	*-2-*
1	5,55E+10	4,01E+12
2	5,30E+10	4,70E+12
3	5,74E+10	5,08E+12
4	6,18E+10	4,67E+12
5	6,74E+10	4,64E+12
6	5,84E+10	4,36E+12
7	7,18E+10	4,00E+12
8	6,99E+10	4,24E+12
9	6,23E+10	3,25E+12
10	7,76E+10	4,51E+12
Max.	**7,76E+10**	**5,08E+12**
Min.	**5,30E+10**	**3,25E+12**
Mean.	**6,35E+10**	**4,35E+12**

All values represented in Ohms.

Product name: 4 position Top Entry SMD.

Column.	Group	Lot	Test
-1-:	7	1..10	Insulation Resistance Initial.
-2-:	7	1..10	After Rapid Change.

	-1-	*-2-*
1	1,09E+11	3,60E+12
2	1,06E+11	3,06E+12
3	1,13E+11	3,92E+12
4	1,09E+11	3,61E+12
5	1,14E+11	3,66E+12
6	1,06E+11	3,57E+12
7	1,07E+11	2,96E+12
8	1,22E+11	3,68E+12
9	1,24E+11	3,64E+12
10	1,25E+11	4,79E+12
Max.	**1,25E+11**	**4,79E+12**
Min.	**1,06E+11**	**2,96E+12**
Mean.	**1,13E+11**	**3,65E+12**