Side Entry Jack for Cat. 6 Applications

1. INTRODUCTION

1.1 Purpose

Testing was performed on Side Entry Jack for Cat.6 applications, to determine its conformance to the requirements of Tyco Electronics AMP Product Specification 108-22142 Rev. C.

1.2 Scope

This report covers the electrical, mechanical and environmental performance of the Side Entry Jack Cat. 6 manufactured by Tyco Electronics AMP España S. A. Testing was performed between July 25, 2002 and March 19, 2004.

1.3 Conclusion

Side Entry Jack for Cat.6 applications PN 336511-1 (Shield) and PN 336511-2 (Unshielded) meet the electrical, environmental and mechanical performance requirements of Tyco Electronics AMP Product Specification 108-22142 Rev. C.

1.4 Product Description

Side Entry Jack, shield and unshielded Cat.6 are connectors for printed circuit board applications.

1.5 Test Samples

The test samples were randomly selected from normal current production lots and the following part numbers were used for test:

Test Group	Qty	Part Number	Description
1 to 8	10	336511-1	Side Entry Jack Shield for Cat.6. applications
1 to 8	10	336511-2	Side Entry Jack Unshielded for Cat.6 applications
9	3	336511-1	Side Entry Jack Shield for Cat.6. applications
9	3	336511-2	Side Entry Jack Unshielded for Cat.6 applications
10	4	336511-1	Side Entry Jack Shield for Cat.6. applications
10	4	336511-2	Side Entry Jack Unshielded for Cat.6 applications

1.6 Qualification Test Sequence

	TEST GROUPS									
	1	2	3	4	5	6	7	8	9	10
Quantity of samples										
TEST OR EXAMINATION	Test Sequence (a)									
Examination of product	1,7	1,7	1, 10	1,6	1,7	1,5	1,3	1,3	1,3	1,3
Solderability							2			
Resistance to soldering heat						2				
Contact resistance	2,6	2,6	2, 9		2,6					
Shield contact resistance	3,5	3,5	3, 8		3,5					
Insulation resistance				2,5						
Current carrying curve									2	
Surge test										2
Voltage proof								2		
Vibration, sinusoidal	4									
Durability			4, 7 b)							
Mating and un-mating force						3				
Plug retention in jack						4				
Thermal shock			5 b)	3						
Humidity-temperature cycling			6 b)	4						
Stress relaxation		4								
Corrosion testing					4					

a) Numbers indicate sequence in which tests are performed.

b) -Perform 650 cycles mating-unmating cycles before thermal shock and measure contact resistance.
-Perform 50 cycles of thermal shock and measure contact resistance.
-Perform another 50 cycles of thermal shock and measure contact resistance.
-Perform 33 mating-unmating cycles followed by 7 days o Humidity –temperature cycling.
-Perform another 33 mating-unmating cycles followed by 14 days of Humidity-temperature cycling.
-Perform the last 34 mating-unmating cycles and measure contact resistance.

2. SUMMARY OF TESTING

2.1 Examination of product – All Groups

All samples submitted for testing were selected from normal current production batch. They were inspected and accepted by the Quality Assurance Department.

2.2 Contact resistance – Groups 1, 2, 3, 5

Contact resistance were less than 36,3 mohm. (40 mohm max.)

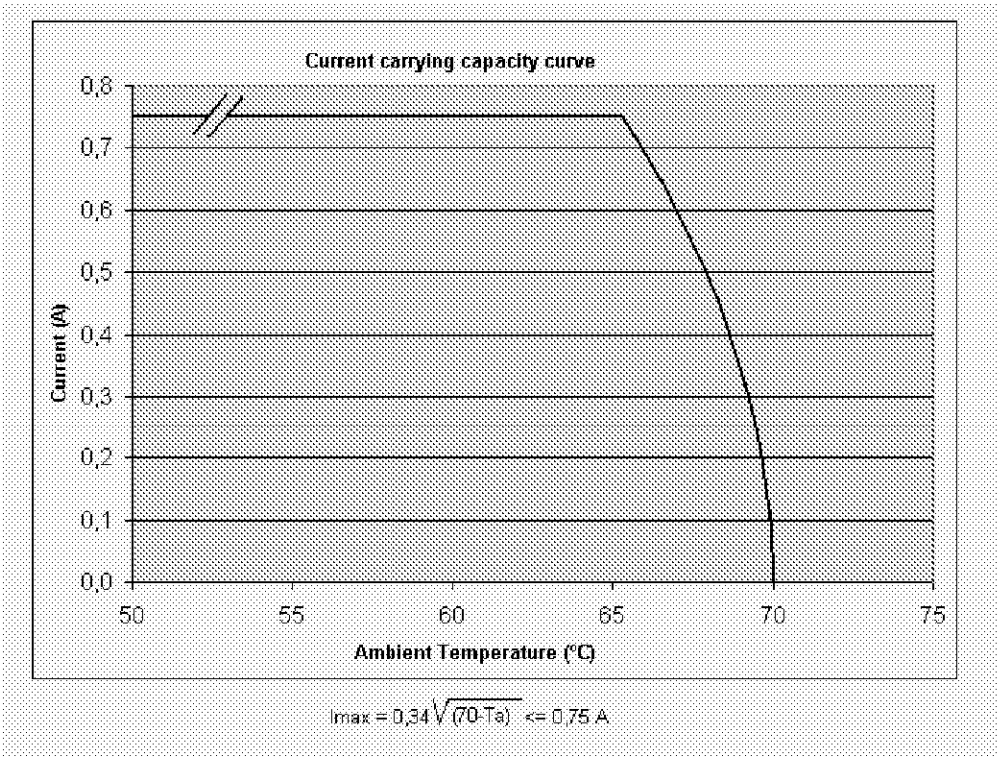
2.3 Shield Contact resistance- Groups 1, 2, 3, 5

Shield contact resistance were less than 31,1 mohm. (40 mohm max.)

2.4 Insulation resistance – Group 4

Insulation resistance values were higher than 1,20E+8 mohm. (>100E+6 ohm)

2.5 Current carrying curve- Group 9



2.6 Surge test- Group 10

Samples tested withstand the test without damage. There is not electrical continuity between contacts after test; electrical continuity plug-jack is kept after test.

2.7 Voltage proof – Group 8

No dielectric breakdown or flashover occurred during the test.

2.8 Vibration, sinusoidal- Group 1

No electrical discontinuities have been produced.

2.9 Durability- Group 3

Contact resistance were less than 31,6 mohm (40 mohm max.)

2.10 Mating and un-mating force- Group 6

Maximum mating force 22,2 N (25 N max.)

2.11 Plug retention in jack- Group 6

Plugs do not dislodge from jack maintaining electrical continuity after test.

2.12 Thermal shock- 3, 4

No physical damage occurred to the samples after thermal shock test.

2.13 Humidity-temperature cycling- Group 3, 4

No physical damage occurred to the samples after Humidity-temperature test.

2.14 Stress relaxation – Group 2

No physical damage occurred to the samples after stress relaxation test.

2.15 Solderability – Group 7

There has not been produced de-wetting after test.

2.16 Resistance to soldering heat – Group 6

No functional damage has been produced after test.

2.17 Corrosion testing – Group 5

No physical damage occurred to the samples after corrosion test.

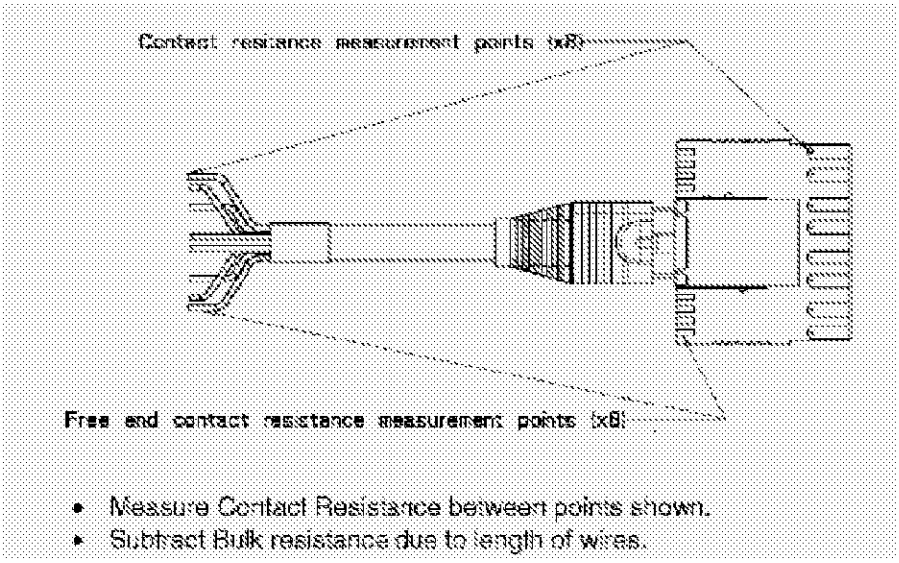
3. TESTS METHODS

3.1 Examination of product (Reference Standard: IEC 60512, test 1a, 1b)

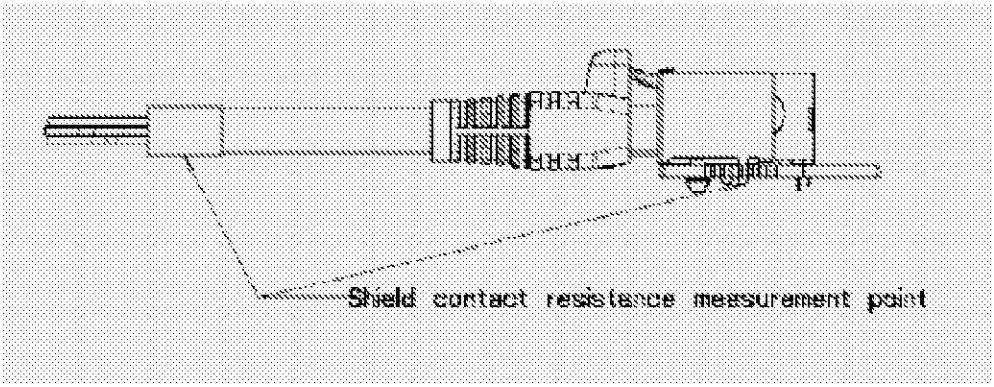
Product drawings and inspections plans were used to examine the samples. They were examined visually and functionally.

3.2 Contact resistance (Reference Standard: IEC 60512-2, test 2a)

Contact resistance measurements at low level current were made using four terminal technique as shown in the next Figure.



3.3 Shield Contact resistance (Reference Standard: IEC 60512-2, test 2a)



3.4 Insulation resistance (Reference Standard: IEC 60512 test 3a)

Test at 100 Vdc between adjacent contacts during 60s.

3.5 Current carrying curve (Reference Standard: IEC 60512-3, test 5b)

The temperature between plug-jack at several current steps up to 0,75A was measured. The maximum allowed temperature minus the measured temperature increase was plotted vs. current

3.6 Surge test (Reference Standard: IEC 60603-7-1, ITU-T K20 test 2.1.1a, 2.1.1b, 2.1.3a, 2.2.1a, 2.2.1b, ITU-T K44)

5 pulses in intervals of 1 minute of each polarity 10 / 700us 1,5kV (test level "improved") have been applied to each sample, 1) contact to contact, 2) contact to test panel, 3) all contacts to test panel; 4) 600V ac 50Hz contact to contacts and test panel during 0,2s (5 times); 5) 230V ac 50Hz during 15 minutes contact to contacts and test panel.

3.7 Voltage proof (Reference Standard: IEC 60512 test 4a)

A 1000 V ac or dc peak voltage contact to contact and 1500 V ac or dc peak voltage between all contacts and test panels (mated connectors) during 60s. Maximum leakage current: 5 mA.

3.8 Vibration, sinusoidal (Reference Standard: IEC 60068-2-6 test method Fc)

Frequency range 10-55Hz. Displacement amplitude 0,75mm. Sweep cycles 20 (each of 3 linear axis). Endurance time 1h 45 min (each axis).

3.9 Durability (Reference Standard: IEC 60603-7-1 level A)

Mate and un-mate plug and jack for 750 cycles total at a maximum rate of 500 cycles / hour and a speed of 10 mm / s, latch inoperative.

3.10 Mating and unmating force (Reference Standard: IEC 512-7 test 13b)

Force necessary to mate with plug latch depressed, at a rate of 25mm/min.

3.11 Plug retention in jack (Reference Standard: IEC 512-8 test 15f)

Apply axial load of 90 N to the cable which is terminated to the plug, at a rate of 25mm / min, with plug mated in jack and latch enganged. Jack shall be soldered to a printed circuit board.

3.12 Thermal shock (Reference Standard: IEC 68-2-14 Test Method Nb)

100 cycles between -40ºC and 70ºC with 30 minutes in each temperature extreme. Min Average rate of temperature change 3ºC /min.

3.13 Humidity-temperature cycling (Reference Standard: IEC 60068-2-38 Test Method Z/AD)

21 cycles between 25 and 65ºC at (93± 3) % RH with cold sub-cycle -40ºC. Cycle time 24 hours.

3.14 Stress relaxation (Reference standard: IEC 60512, test 11i and IEC 60068-2-2)

Samples were placed into an oven at 70ºC for 500 hours.

3.15 Solderability (Reference Standard: IEC 68-2-20 Test Ta method 1).

Solder bath: 235ºC; duration : 2 seconds; ageing: 4 hours at 155ºC.

3.16 Resistance to soldering heat (Reference Standard: IEC 68-2-20 Test Tb method 1)

Solder bath: 260ºC; duration : 5 seconds.

3.17 Corrosion testing (Reference Standard: IEC 60512-11-7 and IEC 60068-2-60).

Samples were placed during 10 days in a chamber with:

SO_2 = 0.5 ppm (volume)
H_2S = 0.1 ppm (volume)
T =25 +- 2ºC; HR =75% +- 3%