AMP* CO Plus Insert for Cat. 6 Applications

1. INTRODUCTION

1.1 Purpose

Testing was performed on AMP* CO Plus Inserts for Cat. 6 applications to determine its conformance to the requirements of Tyco Electronics AMP Product Specification 108-22148, Rev. C.

1.2 Scope

This report covers the electrical, environmental and transmission performance of the AMP* CO Plus Inserts for Cat. 6 applications manufactured by Tyco Electronics.
The testing was performed between November 14th, 2003 and February 16th, 2011.

1.3 Conclusion

Tested AMP* CO Plus Inserts for Cat. 6 applications meet the electrical, environmental and transmission performance requirements of Tyco Electronics AMP Product Specification 108-22148, Rev. C.

1.4 Product Description

The AMP* CO Plus Insert for Cat. 6 applications is an assembly used to provide a universal connection interface between premise wiring of an office and the user's network of communications equipment (for data and voice networking systems).

1.5 Test Samples

Tested samples were randomly selected from pre-production and normal current production lots, and the following part numbers (PN) were used for tests:

15 samples of AMP CO Cat.6 single Insert Assembly, T568A	PN 336548
5 samples of AMP CO Cat.6 single Insert Assembly, T568B	PN 1644027
15 samples of AMP CO Cat.6 dual Insert Assembly, 100BT/100BT	PN 336553
5 samples of AMP CO Cat.6 dual Insert Assembly, TR/TR	PN 336554

* Trademark
| Indicates change

1.6 Qualification Test Sequence

	Test Group		
	1 (a)	2 (a)	3 (b)
	Test Sequence (c)		
Examination of product	1, 6	1, 11	1
Input-output signal resistance	2, 5	2, 10	
Input-output screen resistance	3	3	
Insulation resistance		5, 9	
Dielectric withstanding voltage		6, 8	
Current carrying capacity		4	
Insertion loss			2
Return loss			3
NEXT			4
FEXT			5
Delay			6
Delay Skew			7
Stress relaxation		7	
Corrosion Testing	4		

(a) PN 336548 and PN 336553 as 1.5
(b) All PN's as 1.5
(c) Numbers indicate sequence in which tests are performed

2. SUMMARY OF TESTING

2.1 Examination of product – All Test Groups.

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

2.2 Input-Output Signal Resistance – Test Groups 1 and 2.

All termination resistance measured values with low level method were lower than 200 mOhm (maximum specified value).

2.3 Input-Output Screen Resistance – Test Groups 1 and 2.

All shield termination resistance measured values with low level method were lower than 100 mOhm (maximum specified value).

2.4 Insulation Resistance – Test Group 2.

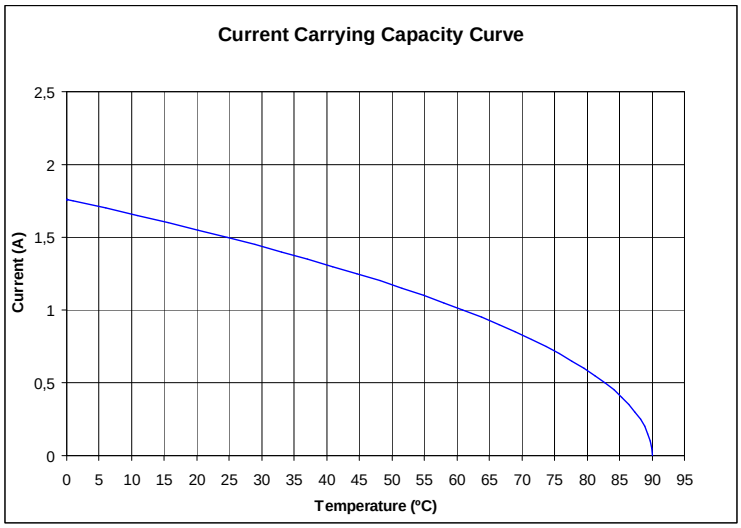
All insulation resistance measured values were higher than $5 \cdot 10^8$ Ω (minimum specified value).

2.5 Dielectric withstanding voltage – Test Group 2.

No dielectric breakdown or flashover occurred during the test, having applied 1500 V_{AC} Peak between contacts and shield, and 1000 V_{AC} Peak between adjacent contacts, 1 minute hold and 2mA max. leakage current.

2.6 Current Carrying Capacity – Test Group 2.

The maximum permissible current for a given ambient temperature (t) that samples can drive is $I(t) = 1.76\ (1-(t/90))^{0.5}$.



2.7 Transmission Tests – Insertion Loss (conn. hardware config.) – Test Group 3.

Samples tested meet the requirements of Transmission tests for Cat.6 according to ISO 11801 Ed. 2.1 Amd. 2, TIA-568-C.2 and related standards.

2.8 Transmission Tests – Return Loss (conn. hardware config.) – Test Group 3.

Samples tested meet the requirements of Transmission tests for Cat.6 according to ISO 11801 Ed. 2.1 Amd. 2, TIA-568-C.2 and related standards.

2.9 Transmission Tests – NEXT Loss (conn. hardware config.) – Test Group 3.

Samples tested meet the requirements of Transmission tests for Cat.6 according to ISO 11801 Ed. 2.1 Amd. 2, TIA-568-C.2 and related standards.

2.10 Transmission Tests – ACR-F Loss (conn. hardware config.) – Test Group 3.

Samples tested meet the requirements of Transmission tests for Cat.6 according to ISO 11801 Ed. 2.1 Amd. 2, TIA-568-C.2 and related standards.

2.11 Transmission Tests – Delay (conn. hardware config.) – Test Group 3.

Samples tested meet the requirements of Transmission tests for Cat.6 according to ISO 11801 Ed. 2.1 Amd. 2, TIA-568-C.2 and related standards.

2.12 Transmission Tests – Delay Skew (conn. hardware config.) – Test Group 3.

Samples tested meet the requirements of Transmission tests for Cat.6 according to ISO 11801 Ed. 2.1 Amd. 2, TIA-568-C.2 and related standards.

2.13 Stress Relaxation – Test Group 2.

All tested samples meet visual requirements, show no physical damages and meet the requirements of additional tests specified in test sequence.

2.14 Flowing mixed gas corrosion – Test Group 1.

All tested samples meet visual requirements, show no physical damages and meet the requirements of additional tests specified in test sequence.

3. TESTS METHODS

3.1 Examination of product (Reference Standard: IEC 60512-1-1, Ed. 1 Feb 02).

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

3.2 Input-Output Resistance (Reference Standard: IEC 60512-2-1, Ed. 1 Feb 02).

Input Output Resistance measurements at low level current were made using four terminal technique.

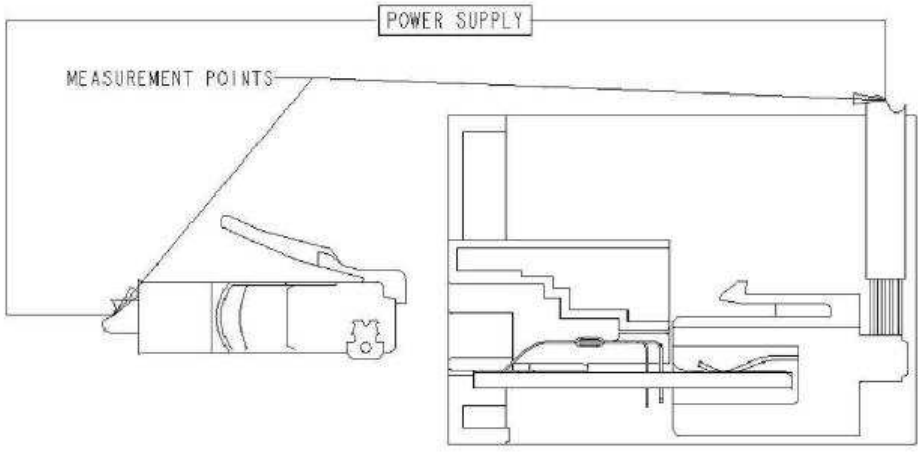


Figure 1

3.3 Insulation Resistance (Reference Standard: IEC 60512-3-1, Ed. 1 Feb 02)

Insulation Resistance was measured between adjacent contacts and between contacts and shield using a megaohmmeter applying 100 V_{DC}.

3.4 Dielectric Withstanding Voltage (Reference Standard: IEC 60512-4-1, Ed. 1 May 03).

A 1000 V_{DC} or $_{AC}$ peak voltage was applied between adjacent contacts during 60 s.
A 1500 V_{DC} or $_{AC}$ peak voltage was applied between contacts and shield during 60 s.
Maximum leakage current was set to 2 mA.

3.5 Current Carrying Capacity (Reference Standard: IEC 60512-5-2, Ed. 1 Feb 02).

The contact temperature at several current steps was measured. The maximum allowed temperature minus the measured temperature increase was plotted vs. current.

3.6 Insertion Loss, IL (conn. hardware config.) (Reference Standard: ISO 11801 Ed. 2.1 Amd. 2).

Insertion Loss (IL) was measured according to the standard ISO 11801 Ed 2.0 Sep/2002 and TIA-568-C.2 at GHMT AG Laboratory (GHMT AG Laboratory Test Report p1195a-03-E, p1196a-03-E, p1197a-03-E, p1198a-03-E).

3.7 Return Loss, RL (conn. hardware config.) (Reference Standard: ISO 11801 Ed. 2.1 Amd. 2).

Return Loss (RL) was measured according to the standard TIA-568-C.2 at GHMT AG Laboratory (GHMT AG Laboratory Test Report p1195a-03-E, p1196a-03-E, p1197a-03-E, p1198a-03-E).

3.8 Near End crosstalk Loss, NEXT loss (conn. hardware config.) (Reference Standard: ISO 11801 Ed. 2.1 Amd. 2).

Near End crosstalk Loss, NEXT loss was measured according to the standard TIA-568-C.2 at GHMT AG Laboratory (GHMT AG Laboratory Test Report p1195a-03-E, p1196a-03-E, p1197a-03-E, p1198a-03-E).

3.9 Far End crosstalk Loss, FEXT, loss (conn. hardware config.) (Reference Standard: ISO 11801 Ed. 2, Amd. 2).

Far End crosstalk Loss, FEXT, loss was measured according to the standard TIA-568-C.2 at GHMT AG Laboratory (GHMT AG Laboratory Test Report p1195a-03-E, p1196a-03-E, p1197a-03-E, p1198a-03-E).

3.10 Delay (conn. hardware config.) (Reference Standard: ISO 11801 Ed. 2, Amd. 2).

Far End crosstalk Loss, FEXT, loss was measured according to the standard TIA-568-C.2 at GHMT AG Laboratory (GHMT AG Laboratory Test Report p1195a-03-E, p1196a-03-E, p1197a-03-E, p1198a-03-E).

3.11 Delay Skew (conn. hardware config.) (Reference Standard: ISO 11801 Ed. 2, Amd. 2).

Far End crosstalk Loss, FEXT, loss was measured according to the standard TIA-568-C.2 at GHMT AG Laboratory (GHMT AG Laboratory Test Report p1195a-03-E, p1196a-03-E, p1197a-03-E, p1198a-03-E).

3.12 Stress Relaxation (Reference Standard: IEC 60512-5, Test 9b).

Mated samples were placed into an oven at 70º C for 500 h.
Half of samples connected to 0.5 A and the other half not connected.

3.13 Corrosion Testing (Reference Standard: IEC 60512-11-7, Ed. 2 May 03).

Samples were placed during 4 days in a chamber with:
SO_2 = 0.5 ppm (Volume).
H_2S = 0.1ppm (Volume).
T = 25º C +/-1º C, HR = 75 % +/-3 %.