3933 US ROUTE 11, CORTLAND, NEW YORK 13045, U.S.A.
Phone Number: 1-800-345-3851 Fax Number: 607-758-3648

PROJECT NO.: 3145779-311 **DATE:** March 5, 2008

TEST REPORT NO.: 3145779CRT-002d

RENDERED TO:

HellermannTyton Corporate
7930 North Faulkner Road
Milwaukee, WI 53224
USA

Hitachi Cable Manchester
900 Holt Avenue
Manchester, NH 03109
USA

TEST:

Performance testing of the cabling configurations as defined in and to the requirements of ANSI/TIA/EIA-568-B.2-1, Transmission Performance Specification for 4 Pair 100 Ω Category 6 Cabling.

STATEMENT OF LIMITATIONS:

At the client's request, the purpose of this report is to provide electrical performance data on the test sample. It is not valid to use this report for any other purpose.

STANDARDS USED:

ASTM D4566-98, Standard Test Methods for Electrical Performance Properties of Insulations and Jackets for Telecommunications Wire and Cable, dated December 10, 1998.

ANSI/TIA/EIA-568-B.2-1, Addendum 1: Transmission Performance Specification for 4 Pair 100 Ω Category 6 Cabling, dated June 2002.

AUTHORIZATION:

The project was authorized by, HellermannTyton Corporation & Hitachi Cable Manchester, Inc. with Purchase Order No. 24775.

DATE OF TEST:

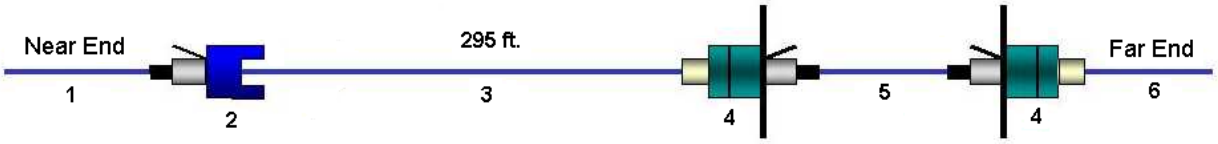
March 5, 2008

TEST REPORT REVISION HISTORY:

First Issue: March 5, 2008 Original Document

SAMPLE DESCRIPTION:

Channel (4 Connector)



Component ID	Manufacturer	Part Number	Description
1, 6	Hellermann Tyton	PCS6GRY7	Equipment Cord 10 ft.
2	Hellermann Tyton	RJ45FC6S	Shielded Wall Outlet
3	Hitachi	30129-8	Horizontal F/UTP Cable
4	Hellermann Tyton	PP110MOD24S	Patch Panel
5	Hellermann Tyton	PCS6GRY7	Cross Connect 10 ft.

The samples were received on February 19, 2008 and were in good condition. All samples were supplied by the client.

EQUIPMENT LIST:

The following equipment was employed in conducting the tests.

Equipment Used	Model Number	Serial Number	Calibration Date
Hewlett Packard Automatic Cable Test System	HP46152A	3903U01003	03/07/2007

PROCEDURE: The testing was measured in accordance with the measurements and calculations list below:

Measurements

- Attenuation (Insertion Loss): ASTM D4566-98 Paragraph 26
- Near End Cross Talk (NEXT): ASTM D4566-98 Paragraph 24
- Far End Cross Talk (FEXT): ASTM D4566-98 Paragraph 25
- Return Loss: ASTM D4566-98 Paragraph 45.3

Calculations

- Power Sum NEXT: ASTM D4566-98 Paragraph 24.6 and ANSI/TIA/EIA- 568-B.2-1 Paragraph 7.2.2
- Equal Level FEXT (ELFEXT): ASTM D4566-98 Paragraph 25 and ANSI/TIA/EIA-568-B.2-1 Paragraph 7.3.1.3
- Power Sum ELFEXT: ASTM D4566-98 Paragraph 25 and ANSI/TIA/EIA 568-B.2-1 Paragraph 7.3.2.2
- Attenuation to Cross Talk Ratio (ACR): Attenuation to Cross Talk Ratio was determined by subtracting the NEXT from the Attenuation

Calculations (Cont'd)

- Power Sum ACR: The Power Sum ACR was determined using the same procedure as ACR except that the Power Sum Near-End Cross Talk was used in the computation in lieu of the NEXT
- Propagation Delay: ANSI/TIA/EIA-568-B.2-1 Paragraph 7.5.2
- Delay Skew: ANSI/TIA/EIA-568-B.2-1 Paragraph 7.5.4

REQUIREMENTS: The testing was computed with the measurements and calculations list below:

Measurements

- Insertion Loss: ANSI/TIA/EIA-568-B.2-1 Paragraph 7.1 using equation 8
- Near End Cross Talk (NEXT): ANSI/TIA/EIA-568-B.2-1 Paragraph 7.2.1.4
- Return Loss: ANSI/TIA/EIA-568-B.2-1 Paragraph 7.4.5

Calculations

- Power Sum NEXT: ANSI/TIA/EIA-568-B.2-1 Paragraph 7.2.2.2
- Equal Level FEXT (ELFEXT): ANSI/TIA/EIA-568-B.2-1 Paragraph 7.3.1.3
- Power Sum ELFEXT: ANSI/TIA/EIA-568-B.2-1 Paragraph 7.3.2
- Propagation Delay: ANSI/TIA/EIA-568-B.2-1 Paragraph 7.5.2
- Delay Skew: ANSI/TIA/EIA-568-B.2-1 Paragraph 7.5.4

RESULTS:

See appendix A for the test results.

CONCLUSION:

The channel configurations, as previously described and supplied by the client, were tested in accordance with the procedures contained herein, and did comply with the indicated applicable transmission requirements. The testing was performed at Intertek located in Cortland, New York.

These procedures and requirements were taken from the standards referred to on page 1.

Reviewed and Approved By:

Antoine Pelletier
Engineer
Global Cabling Products Testing

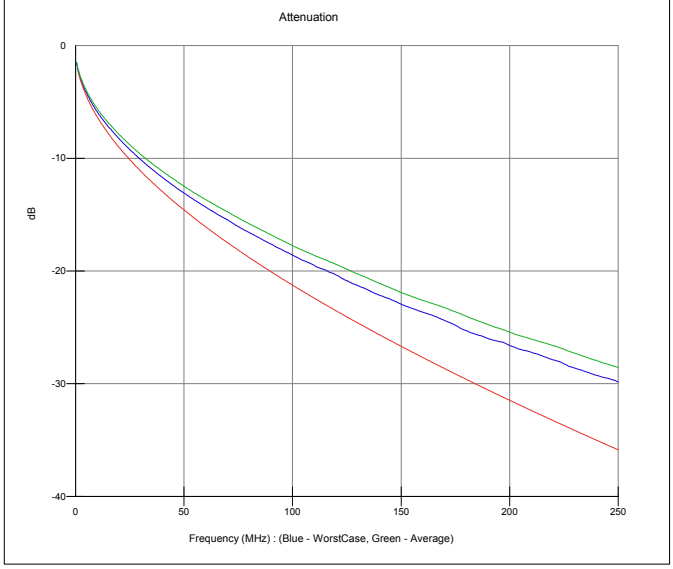
John Cash
Technician
Global Cabling Products Testing

Kathy Heath
Project Coordinator
Global Cabling Products Testing

Summary

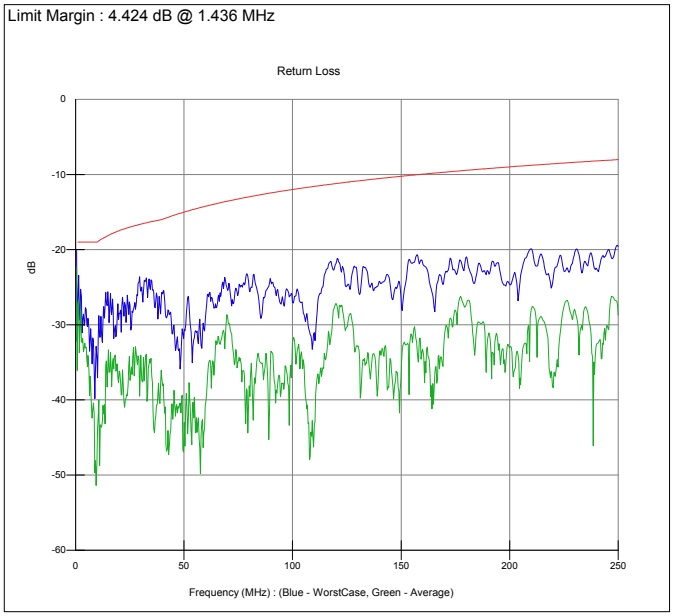
Client	Hellermann	**Report No**	3145779CRT-002d
Specification	TIA 568B2-1 - Cat 6 Chan Swept250 Limits250MHz		
Part No	Cat 6 Shielded Riser	**Length**	100
Test Started	3/5/2008 8:44:49 AM	**Temperature**	20 °C
Description	4x24 ScTP-CMR-Solid		A
Technician	John Cash	**Test Status**	Complies

Limit Margin : 0.122 dB @ 1.124 MHz



Attenuation			
Freq	Worst Case	Average	Spec
1.	2.0	1.9	2.2
4.	3.8	3.6	4.0
8.	5.3	5.0	5.7
10.	5.9	5.6	6.3
16.	7.4	7.0	8.0
20.	8.2	7.9	9.0
25.	9.2	8.8	10.1
31.25	10.3	9.9	11.4
62.5	14.6	13.9	16.4
100.	18.6	17.8	21.3
200.	26.6	25.4	31.5
250.	29.9	28.6	35.9

Limit Margin : 4.424 dB @ 1.436 MHz

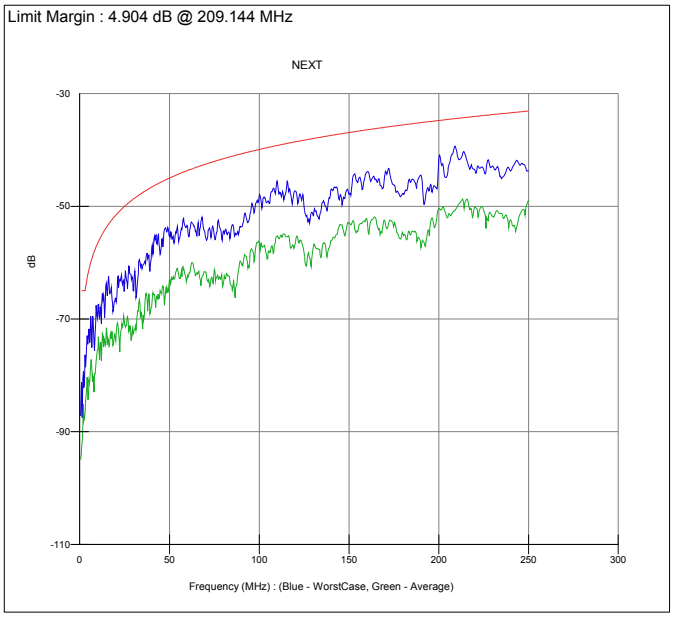


Return Loss			
Freq	Worst Case	Average	Spec
1.	29.4	30.8	19.0
4.	30.0	33.0	19.0
8.	31.8	41.2	19.0
10.	37.0	46.3	19.0
16.	26.3	34.5	18.0
20.	29.7	36.9	17.5
25.	27.2	36.0	17.0
31.25	26.1	35.7	16.5
62.5	26.6	37.8	14.0
100.	27.0	32.4	12.0
200.	24.6	33.0	9.0
250.	19.6	28.7	8.0

Summary

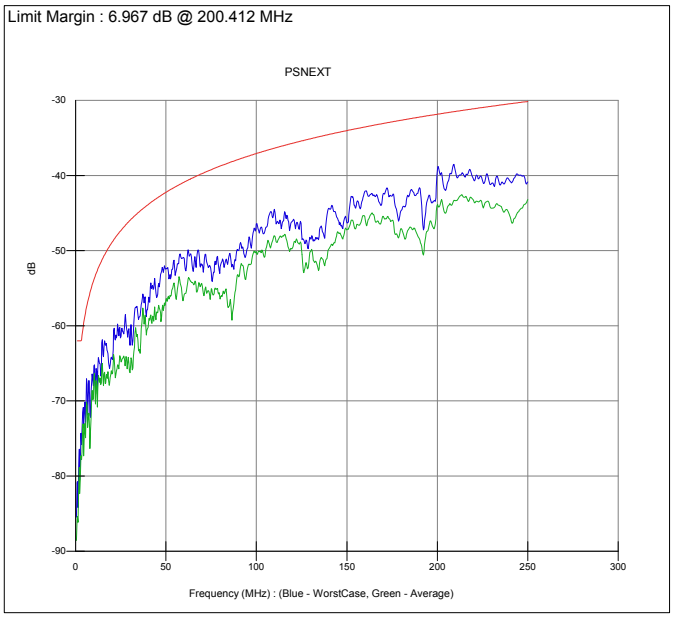
Client	Hellermann	**Report No**	3145779CRT-002d
Specification	TIA 568B2-1 - Cat 6 Chan Swept250 Limits250MHz		
Part No	Cat 6 Shielded Riser	**Length**	100
Test Started	3/5/2008 8:44:49 AM	**Temperature**	20 °C
Description	4x24 ScTP-CMR-Solid		A
Technician	John Cash	**Test Status**	Complies

Limit Margin : 4.904 dB @ 209.144 MHz



NEXT			
Freq	Worst Case	Average	Spec
1.	81.7	93.4	65.0
4.	73.9	81.7	63.0
8.	74.5	82.8	58.2
10.	69.0	75.4	56.6
16.	62.8	74.1	53.2
20.	66.4	73.6	51.6
25.	64.3	70.6	50.0
31.25	64.9	71.6	48.4
62.5	52.9	60.0	43.4
100.	48.1	56.4	39.9
200.	41.9	50.4	34.8
250.	43.6	48.8	33.1

Limit Margin : 6.967 dB @ 200.412 MHz

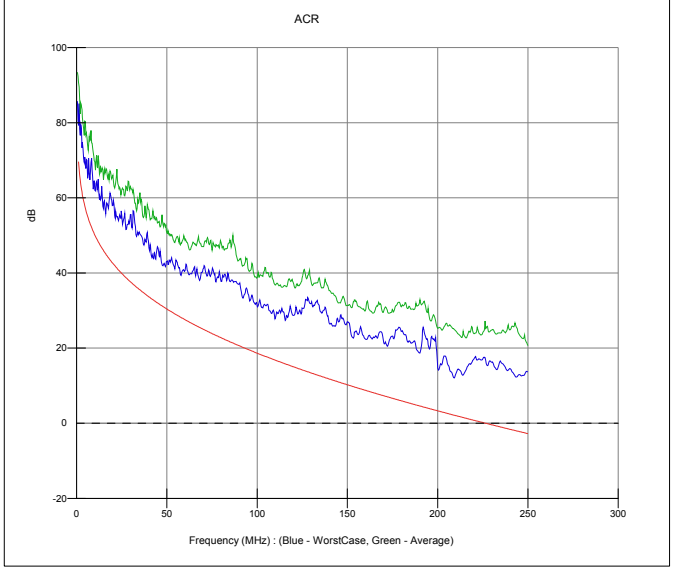


PSNEXT			
Freq	Worst Case	Average	Spec
1.	80.8	85.5	62.0
4.	71.4	73.1	60.5
8.	71.8	76.2	55.6
10.	66.9	68.4	54.0
16.	62.4	66.2	50.6
20.	64.5	66.2	49.0
25.	61.7	64.6	47.3
31.25	62.1	65.3	45.7
62.5	50.2	53.6	40.6
100.	46.4	50.1	37.1
200.	39.4	43.9	31.9
250.	40.9	43.2	30.2

Summary

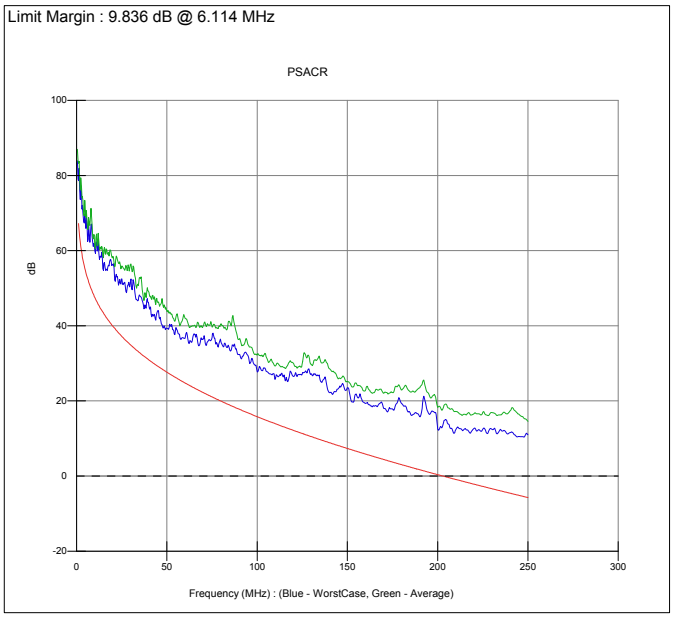
Client	Hellermann	**Report No**	3145779CRT-002d
Specification	TIA 568B2-1 - Cat 6 Chan Swept250 Limits250MHz		
Part No	Cat 6 Shielded Riser	**Length**	100
Test Started	3/5/2008 8:44:49 AM	**Temperature**	20 °C
Description	4x24 ScTP-CMR-Solid		A
Technician	John Cash	**Test Status**	Complies

Limit Margin : 9.650 dB @ 1.124 MHz



ACR			
Freq	Worst Case	Average	Spec
1.	79.8	91.3	70.4
4.	70.5	78.0	59.0
8.	69.5	77.8	52.5
10.	63.7	69.8	50.3
16.	56.1	67.0	45.2
20.	58.0	65.8	42.6
25.	55.9	61.8	39.9
31.25	55.3	61.8	37.0
62.5	39.6	46.2	26.9
100.	31.1	38.8	18.7
200.	15.2	25.3	3.3
250.	13.6	20.7	-2.8

Limit Margin : 9.836 dB @ 6.114 MHz

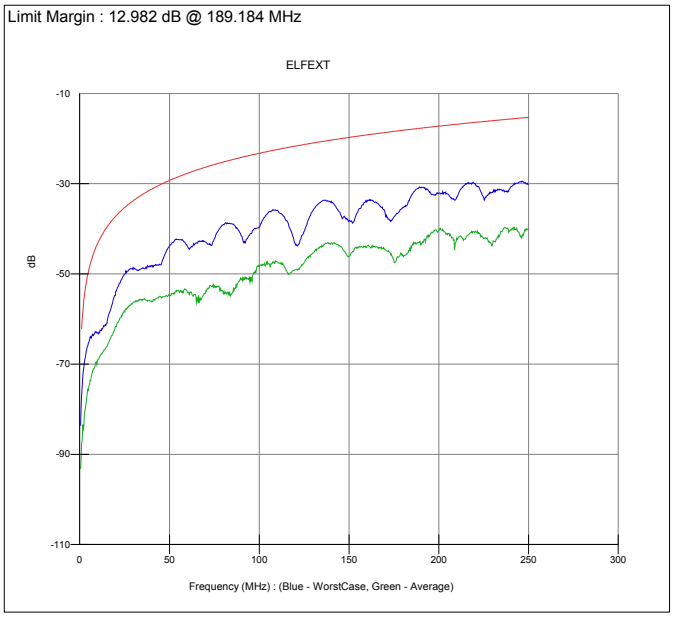


PSACR			
Freq	Worst Case	Average	Spec
1.	78.8	83.5	68.0
4.	68.0	69.4	56.5
8.	66.9	71.1	49.9
10.	61.2	62.7	47.7
16.	55.0	59.1	42.6
20.	56.2	58.2	40.0
25.	52.5	55.7	37.2
31.25	51.8	55.4	34.3
62.5	35.5	39.5	24.1
100.	27.8	32.3	15.8
200.	12.8	18.4	0.4
250.	11.0	14.5	-5.7

Summary

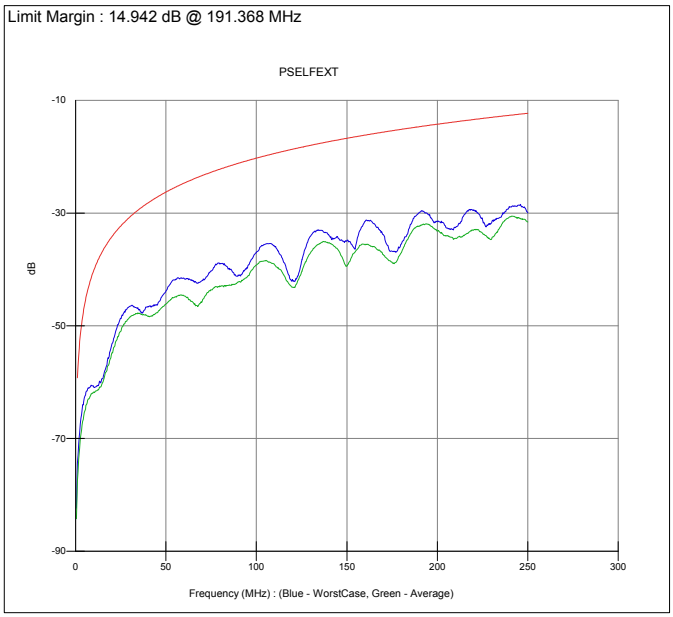
Client	Hellermann	**Report No**	3145779CRT-002d
Specification	TIA 568B2-1 - Cat 6 Chan Swept250 Limits250MHz		
Part No	Cat 6 Shielded Riser	**Length**	100
Test Started	3/5/2008 8:44:49 AM	**Temperature**	20 °C
Description	4x24 ScTP-CMR-Solid		A
Technician	John Cash	**Test Status**	Complies

Limit Margin : 12.982 dB @ 189.184 MHz



ELFEXT			
Freq	Worst Case	Average	Spec
1.	78.0	88.8	63.1
4.	66.5	77.1	51.2
8.	63.4	70.9	45.2
10.	63.1	69.1	43.3
16.	59.3	65.3	39.2
20.	54.3	61.7	37.2
25.	50.1	58.3	35.3
31.25	49.0	56.1	33.4
62.5	44.0	54.5	27.3
100.	39.7	48.4	23.3
200.	32.1	40.4	17.2
250.	30.1	40.0	15.3

Limit Margin : 14.942 dB @ 191.368 MHz



PSELFEXT			
Freq	Worst Case	Average	Spec
1.	75.2	78.5	60.1
4.	64.0	66.9	48.2
8.	60.9	62.6	42.2
10.	60.8	61.8	40.3
16.	58.2	59.1	36.2
20.	53.5	55.0	34.2
25.	48.7	51.0	32.3
31.25	46.4	48.2	30.4
62.5	41.8	45.3	24.3
100.	37.1	39.2	20.3
200.	31.5	33.2	14.2
250.	30.0	31.6	12.3