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April 17, 2013

Test Report Number: 3030592CRT-096
Project Number: 3030592

Legrand North America
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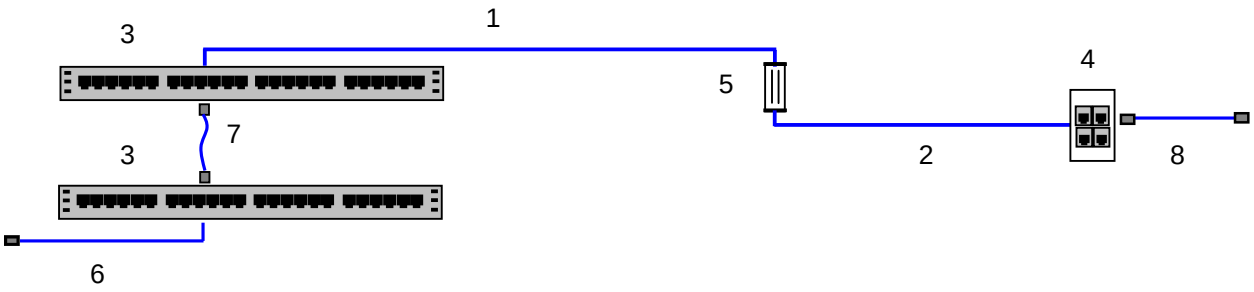
TEST:

Electrical transmission performance testing of a cabling configuration to the requirements of ANSI/TIA-568-C.2 Balanced Twisted-Pair Telecommunication Cabling and Component Standards for Category 6 Channel.

SAMPLE DESCRIPTION:

The client supplied and tested a 4-Connector channel as illustrated below and referenced to as "*nCompass CAT 6e+ U/UTP Channel, 4-Connector, 100 meters (328 ft)*".



Component ID	Manufacturer	Part Number	Length/Qty	Description
1	Superior Essex	54-272-xA	70m (229 ft) /1	NextGain Cable, C6eX U/UTP CMR
2	Superior Essex	54-272-xA	20m (65 ft) /1	NextGain Cable, C6eX U/UTP CMR
3	Ortronics, Inc.	OR-PHD66U24	2 (24 Port)	Clarity C6 Patch Panel
4	Ortronics, Inc.	OR-HDJ6	1	Clarity C6 High Density Jack
5	Ortronics, Inc.	OR-110ABC6050	1	Clarity C6 IDC 110 Block kit
6,7,8	Ortronics, Inc.	OR-MC609-06	3m (9.8 ft) /3	Clarity C6 U/UTP Patch Cords

STANDARD USED:

ANSI/TIA-568-C.2-2009: Balanced Twisted-Pair Telecommunications Cabling and Components Standard, dated August 2009

Note: U/UTP is a newer designation for LAN UTP cable construction.

SECTIONS:

6.2: Channel transmission performance (6.2.1 to 6.2.26)

AUTHORIZATION:

The project was authorized by Mr. Rob Aekins RCDD, representing Legrand Data Communications Incorporated.

EQUIPMENT LIST:

The following equipment was employed in conducting the tests.

Equipment used	Model number	Serial number	Calibration date	Calibration due date
Agilent Technologies Network Analyzer	E5071B	MY42403324	06/01/2012	06/01/2013
Hewlett Packard Multimeter	34401A	US36035667	06/01/2012	06/01/2013

DATE OF TEST:

April 3, 2013

TEST REPORT REVISION HISTORY:

First Issue:	April 17, 2013	Original Document

RESULTS: See appendixes A through C for the test results.

CONCLUSION:

The channel cabling configuration, as previously described and supplied by the client, was tested in accordance with the standard referred to herein, and did comply with the indicated applicable transmission requirements.

The procedures and requirements from the standard were followed, and the testing was performed at the client's facility as part of their qualifications under Intertek's SAT program.

Reviewed and Approved By:

Antoine Pelletier
Engineer
Global Cabling Products Testing

John Cash
Technician
Global Cabling Products Testing

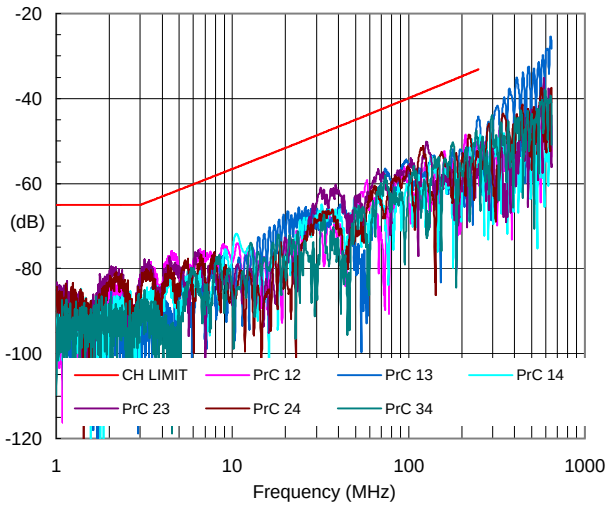
Appendix A

Test results

Internal (core) transmission characteristics

This appendix contains 5 pages.

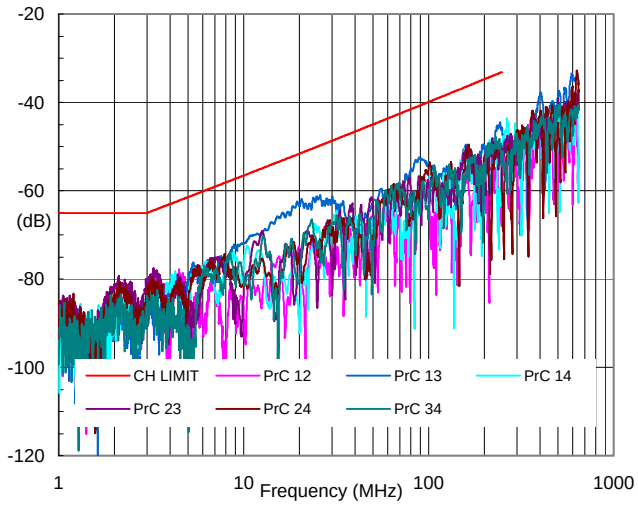
NEXT as measured from the TELECOMMUNICATIONS ROOM (TR)



Worst Case Margin

	Frequency Point (MHz)	Calculated Margin (dB)	Measured Value (dB)	CH LIMIT Value (dB)
Swept Freq	33.2	11.1	44.3	33.2
Discrete Points	1.00	20.4	85.4	65.0
	4.00	21.0	84.0	63.0
	8.00	19.9	78.1	58.2
	10.00	19.8	76.3	56.6
	16.00	19.6	72.8	53.2
	20.00	21.1	72.7	51.6
	25.00	17.1	67.1	50.0
	31.25	13.9	62.3	48.4
	62.50	16.5	59.9	43.4
	100.00	15.8	55.7	39.9
	200.00	17.7	52.5	34.8
	250.00	11.3	44.4	33.1
	300.00		46.1	n/a
	400.00		45.7	n/a
	500.00		41.2	n/a
	650.00		28.3	n/a

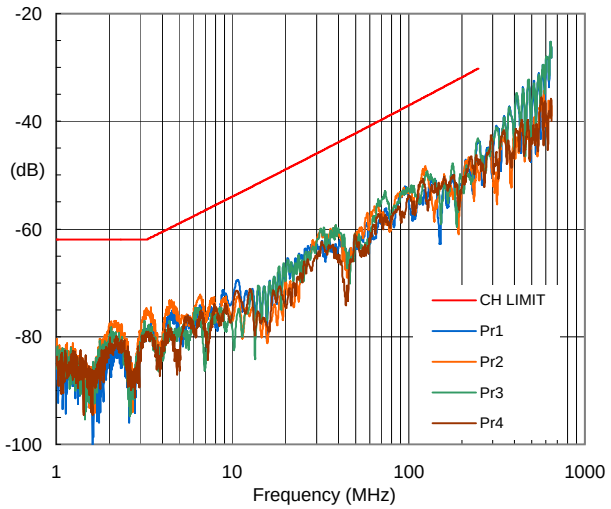
NEXT as measured from the WORK AREA (WA)



Worst Case Margin

	Frequency Point (MHz)	Calculated Margin (dB)	Measured Value (dB)	CH LIMIT Value (dB)
Swept Freq	20.6	10.5	61.9	51.4
Discrete Points	1.00	22.8	87.8	65.0
	4.00	17.9	80.9	63.0
	8.00	17.4	75.6	58.2
	10.00	15.4	71.9	56.6
	16.00	12.2	65.4	53.2
	20.00	12.0	63.6	51.6
	25.00	11.4	61.4	50.0
	31.25	13.9	62.3	48.4
	62.50	16.3	59.7	43.4
	100.00	13.6	53.6	39.9
	200.00	15.0	49.8	34.8
	250.00	13.3	46.4	33.1
	300.00		46.2	n/a
	400.00		38.2	n/a
	500.00		38.4	n/a
	650.00		35.8	n/a

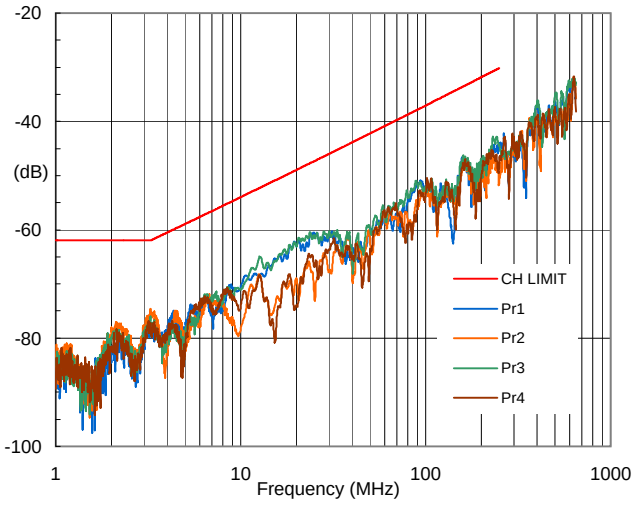
PSNEXT as measured from the TELECOMMUNICATIONS ROOM (TR)



Worst Case Margin

	Frequency Point (MHz)	Calculated Margin (dB)	Calculated Value (dB)	CH LIMIT Value (dB)
Swept Freq	3.3	12.7	74.7	62.0
Discrete Points	1.00	21.5	83.5	62.0
	4.00	20.0	80.6	60.5
	8.00	19.2	74.8	55.6
	10.00	19.3	73.3	54.0
	16.00	21.4	72.0	50.6
	20.00	20.6	69.6	49.0
	25.00	18.1	65.4	47.3
	31.25	15.0	60.7	45.7
	62.50	16.2	56.8	40.6
	100.00	15.5	52.5	37.1
	200.00	19.0	50.9	31.9
	250.00	13.3	43.4	30.2
	300.00		43.5	n/a
	400.00		42.7	n/a
	500.00		37.8	n/a
	650.00		28.2	n/a

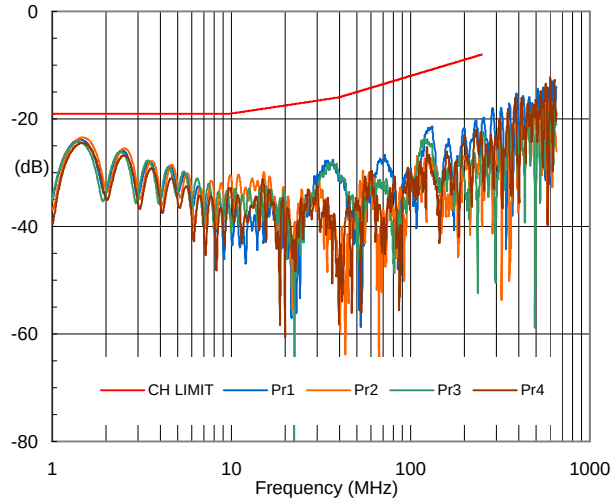
PSNEXT as measured from the WORK AREA (WA)



Worst Case Margin

	Frequency Point (MHz)	Calculated Margin (dB)	Calculated Value (dB)	CH LIMIT Value (dB)
Swept Freq	231.5	12.0	42.8	30.7
Discrete Points	1.00	23.0	85.0	62.0
	4.00	18.2	78.8	60.5
	8.00	16.4	72.0	55.6
	10.00	16.6	70.6	54.0
	16.00	14.3	64.9	50.6
	20.00	14.1	63.1	49.0
	25.00	13.3	60.7	47.3
	31.25	14.7	60.4	45.7
	62.50	15.6	56.2	40.6
	100.00	14.8	51.8	37.1
	200.00	15.0	46.8	31.9
	250.00	14.3	44.5	30.2
	300.00		43.2	n/a
	400.00		36.5	n/a
	500.00		35.2	n/a
	650.00		32.7	n/a

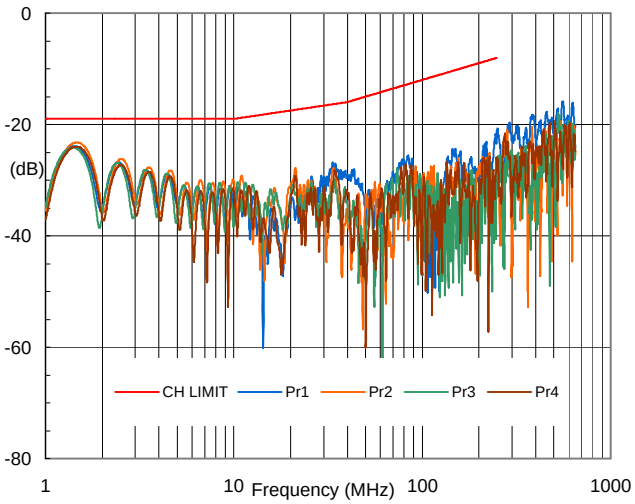
RL as measured from the TELECOMMUNICATIONS ROOM (TR)



Worst Case Margin

	Frequency Point (MHz)	Calculated Margin (dB)	Measured Value (dB)	CH LIMIT Value (dB)
Swept Freq	1.5	4.5	23.5	19.0
Discrete Points	1.00	16.1	35.1	19.0
	4.00	14.9	33.9	19.0
	8.00	15.0	34.0	19.0
	10.00	12.0	31.0	19.0
	16.00	15.8	33.8	18.0
	20.00	17.2	34.7	17.5
	25.00	17.5	34.5	17.0
	31.25	13.3	29.9	16.5
	62.50	17.4	31.4	14.0
	100.00	17.3	29.3	12.0
	200.00	12.7	21.7	9.0
	250.00	12.9	20.9	8.0
	300.00		23.2	n/a
	400.00		22.3	n/a
	500.00		16.4	n/a
	650.00		14.0	n/a

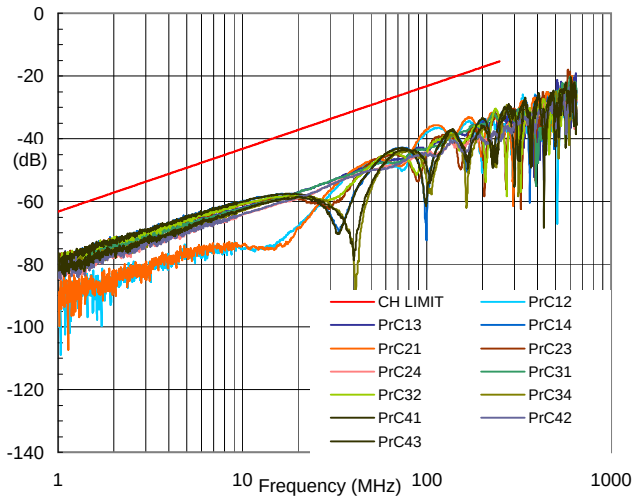
RL as measured from the WORK AREA (WA)



Worst Case Margin

	Frequency Point (MHz)	Calculated Margin (dB)	Measured Value (dB)	CH LIMIT Value (dB)
Swept Freq	1.5	4.2	23.2	19.0
Discrete Points	1.00	15.9	34.9	19.0
	4.00	15.7	34.7	19.0
	8.00	14.1	33.1	19.0
	10.00	11.2	30.2	19.0
	16.00	15.1	33.1	18.0
	20.00	13.4	30.9	17.5
	25.00	13.5	30.6	17.0
	31.25	12.8	29.4	16.5
	62.50	21.2	35.2	14.0
	100.00	21.0	33.0	12.0
	200.00	18.7	27.7	9.0
	250.00	13.2	21.2	8.0
	300.00		22.1	n/a
	400.00		22.3	n/a
	500.00		22.9	n/a
	650.00		20.4	n/a

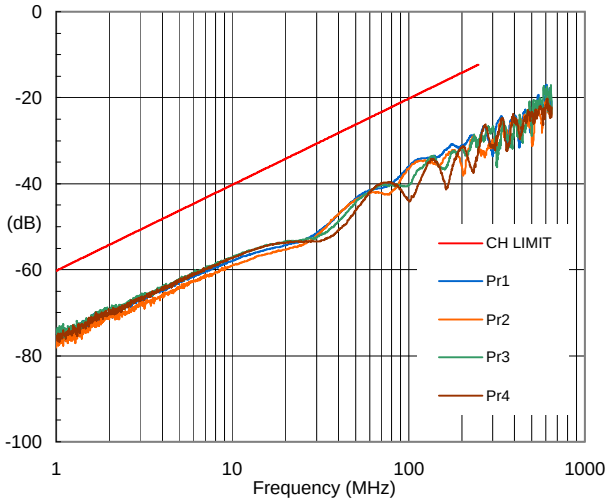
ACRF



Worst Case Margin

	Frequency Point (MHz)	Calculated Margin (dB)	Measured Value (dB)	CH LIMIT Value (dB)
Swept Freq	104.7	13.2	36.1	22.9
Discrete Points	1.00	14.0	77.3	63.3
	4.00	15.6	66.8	51.2
	8.00	16.5	61.7	45.2
	10.00	16.8	60.0	43.3
	16.00	18.6	57.7	39.2
	20.00	19.8	57.1	37.2
	25.00	19.9	55.2	35.3
	31.25	19.8	53.1	33.4
	62.50	16.9	44.2	27.3
	100.00	13.8	37.1	23.3
	200.00	16.3	33.5	17.2
	250.00	18.2	33.5	15.3
	300.00		30.5	n/a
	400.00		26.8	n/a
	500.00		25.6	n/a
	650.00		25.4	n/a

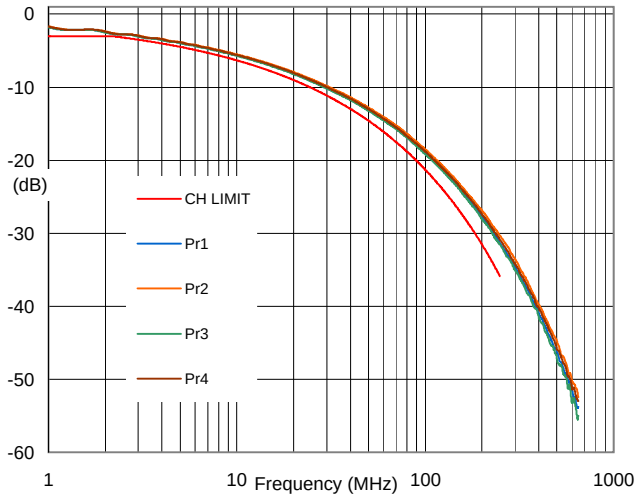
PSACRF



Worst Case Margin

	Frequency Point (MHz)	Calculated Margin (dB)	Calculated Value (dB)	CH LIMIT Value (dB)
Swept Freq	1.1	13.2	72.6	59.5
Discrete Points	1.00	13.8	74.0	60.3
	4.00	15.7	63.9	48.2
	8.00	16.4	58.6	42.2
	10.00	16.8	57.1	40.3
	16.00	18.1	54.3	36.2
	20.00	19.1	53.4	34.2
	25.00	20.8	53.1	32.3
	31.25	20.7	51.0	30.4
	62.50	17.0	41.3	24.3
	100.00	15.8	36.1	20.3
	200.00	17.0	31.2	14.2
	250.00	17.7	30.0	12.3
	300.00		26.7	n/a
	400.00		24.1	n/a
	500.00		23.5	n/a
	650.00		22.7	n/a

INSERTION LOSS (ATTN)



Worst Case Margin

	Frequency Point (MHz)	Calculated Margin (dB)	Measured Value (dB)	CH LIMIT Value (dB)
Swept Freq	2.21	0.30	2.73	3.04
Discrete Points	1.00	1.19	1.8	3.0
	4.00	0.47	3.6	4.0
	8.00	0.59	5.1	5.7
	10.00	0.64	5.7	6.3
	16.00	0.75	7.3	8.0
	20.00	0.81	8.2	9.0
	25.00	0.88	9.2	10.1
	31.25	0.99	10.4	11.4
	62.50	1.58	14.9	16.5
	100.00	2.11	19.2	21.3
	200.00	3.50	28.0	31.5
	250.00	4.39	31.6	36.0
	300.00		35.1	n/a
	400.00		41.4	n/a
	500.00		47.2	n/a
	650.00		55.0	n/a

GLOSSARY of TERMS

Calculated Margin: The minimum difference in dB between the measured value and the LIMIT value at the specifed frequency point for all tested pairs (CalculateMargin@100MHz = MeasuredValue@100MHz - LIMITValue@100MHz (dB)).

Discrete Points: Specific reference points of interest in MHz within the swept frequencies.

Frequency Point: A specific frequency point in megahertz (MHz) for which the data indicated is applicable.

LIMIT Value: The calculated response LIMIT in dB at the indicated frequency point as calculated using applicable equations defined by the appropriate standard.

Measured Value: The worst case measured response in dB at the frequency indicated for all tested pairs.

Swept Freq: The band of measured values from 1 MHz to the upper frequency LIMIT as defined by the category of test.

Swept Freq (Margin): The minimum margin in dB detected across the Swept Frequency band.

Worst Case: A composite value calculated from the maximum response of each pair or pair combination at a given frequency. ($WorstCase_{100MHz} = Max(Pr1_{100MHz}, Pr2_{100MHz}, Pr3_{100MHz}, Pr4_{100MHz})$ etc.

ACR / PSACR: If Provided are for reference only. Limit line(s) are provided for reference and are calculated as the difference between the applicable NEXT Loss and Insertion loss limits ($ACR_{limit} = NEXT_{limit} - Il._{limit}$).

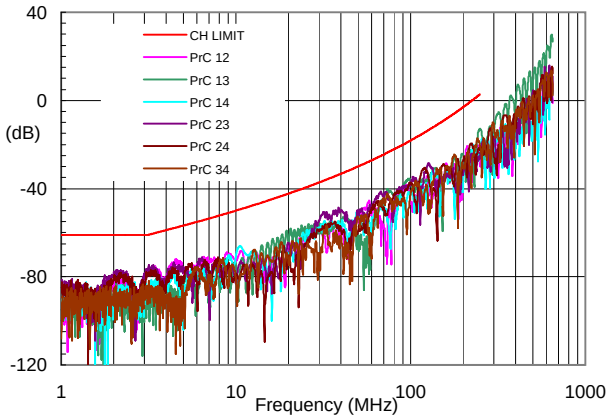
Appendix B

Test results

ACR transmission performance provided for reference ONLY

This appendix contains 2 pages.

Pair-to-Pair ACR as measured from the TELECOMMUNICATIONS ROOM (TR)

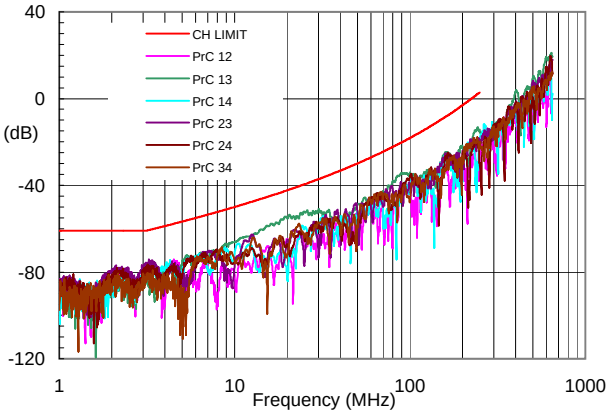


Worst Case Margin

	Frequency Point (MHz)	Calculated Margin (dB)	Calculated Value (dB)	CH LIMIT Value (dB)
Swept Freq	3.2	13.8	-74.7	-60.9
Discrete Points	1.00	22.7	-83.7	-61.0
	4.00	21.8	-80.6	-58.9
	8.00	20.8	-73.1	-52.3
	10.00	20.7	-70.7	-50.0
	16.00	20.6	-65.6	-44.9
	20.00	22.2	-64.5	-42.3
	25.00	18.3	-57.9	-39.6
	31.25	15.3	-51.9	-36.7
	62.50	18.5	-45.0	-26.5
	100.00	18.3	-36.5	-18.2
	200.00	21.4	-24.5	-3.1
	250.00	15.6	-12.8	2.8
	300.00		-11.8	n/a
	400.00		-4.3	n/a
	500.00		6.0	n/a
	650.00		26.7	n/a

NOTE: Limit line/values provided for reference ONLY and are extrapolated from NEXT Loss and IL limit requirements. ACR $_{limit}$ = NEXT $_{limit}$ - IL $_{limit}$

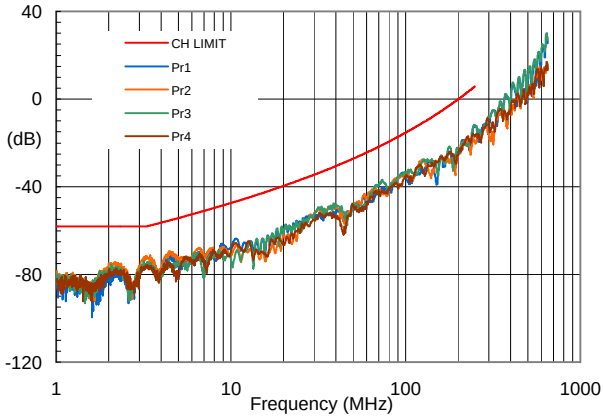
Pair-to-Pair ACR as measured from the WORK AREA (WA)



Worst Case Margin

	Frequency Point (MHz)	Calculated Margin (dB)	Calculated Value (dB)	CH LIMIT Value (dB)
Swept Freq	20.6	11.7	-53.6	-41.9
Discrete Points	1.00	25.0	-86.0	-61.0
	4.00	18.5	-77.4	-58.9
	8.00	18.3	-70.6	-52.3
	10.00	16.2	-66.2	-50.0
	16.00	13.2	-58.2	-44.9
	20.00	13.1	-55.4	-42.3
	25.00	12.6	-52.1	-39.6
	31.25	15.2	-51.9	-36.7
	62.50	18.6	-45.1	-26.5
	100.00	16.1	-34.4	-18.2
	200.00	18.7	-21.8	-3.1
	250.00	17.7	-14.9	2.8
	300.00		-12.0	n/a
	400.00		3.1	n/a
	500.00		8.8	n/a
	650.00		19.2	n/a

Power Sum (PS) ACR as measured from the TELECOMMUNICATIONS ROOM (TR)

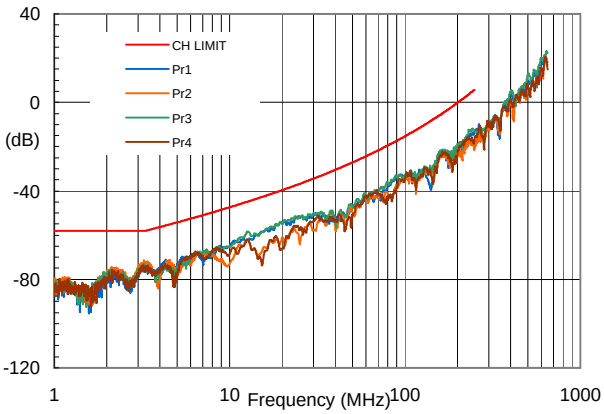


Worst Case Margin

	Frequency Point (MHz)	Calculated Margin (dB)	Calculated Value (dB)	CH LIMIT Value (dB)
Swept Freq	3.3	13.6	-71.6	-58.0
Discrete Points	1.00	23.8	-81.8	-58.0
	4.00	20.8	-77.2	-56.4
	8.00	20.1	-69.8	-49.7
	10.00	20.2	-67.6	-47.4
	16.00	22.4	-64.7	-42.3
	20.00	21.7	-61.4	-39.7
	25.00	19.3	-56.2	-36.9
	31.25	16.5	-50.5	-34.0
	62.50	18.8	-42.5	-23.7
	100.00	18.0	-33.4	-15.4
	200.00	22.7	-22.8	-0.1
	250.00	17.6	-11.9	5.8
	300.00		-8.3	n/a
	400.00		-1.4	n/a
	500.00		9.4	n/a
	650.00		26.8	n/a

NOTE: Limit line/values provided for reference ONLY and are extrapolated from PSNEXT Loss and IL limit requirements. $psACR_{limit} = psNEXT_{limit} - IL_{limit}$

Power Sum (PS) ACR as measured from the WORK AREA (WA)



Worst Case Margin

	Frequency Point (MHz)	Calculated Margin (dB)	Calculated Value (dB)	CH LIMIT Value (dB)
Swept Freq	3.3	13.4	-71.4	-58.0
Discrete Points	1.00	25.1	-83.1	-58.0
	4.00	18.9	-75.3	-56.4
	8.00	17.3	-67.1	-49.7
	10.00	17.5	-65.0	-47.4
	16.00	15.3	-57.6	-42.3
	20.00	15.2	-54.9	-39.7
	25.00	14.6	-51.5	-36.9
	31.25	16.0	-50.0	-34.0
	62.50	17.7	-41.4	-23.7
	100.00	17.4	-32.8	-15.4
	200.00	18.7	-18.8	-0.1
	250.00	18.7	-12.9	5.8
	300.00		-9.0	n/a
	400.00		4.9	n/a
	500.00		12.0	n/a
	650.00		22.3	n/a