

DCM Test Report

Cable Type : 4x2x23 x ALL	Factory Number : Fac_1234	Data File Name : DA000053.SCS
Cable I.D. : 12345	Order Number : abcdef	Specification File : Category 6A ANSI-TIA-568-C.S3S
Temperature : 20.00 °C	Relative Humidity : 40 %	Test Date/Time : 04/10/2014 01:28:13 AM
Length : 89.00 m	Number of Pairs to Test : 4	Operator : DCM
Starting Position : 1		Analyzer Type : ENA

Pass - Fail Test Certificate - 4 Pairs

High Frequency

Test Type	Test Result
Input Impedance (Zin)(Ohms)(Open/Short)	For Information Only
Return Loss (RL)(dB)	OK
Return Loss (RL-Far End)(dB)	OK
Insertion Loss (IL)(dB/100.0 m)@20C	OK
Near End Crosstalk Loss (NEXT)(dB)	Failed
ACR to FEXT Ratio (ACRF)(dB)	OK
Power Sum NEXT(PSNEXT)(dB)	Failed
Power Sum ACRF (PSACRF)(dB)	OK
Propagation Delay (DELAY)(ns/100m)	OK
Propagation Delay Skew (SKEW)(ns/100m)	OK

Low Frequency

Test Type	Test Result
Conductor Resistance(Ohms/100.0 m)@20C	OK
Resistance Unbalance(%)	OK
Mutual Capacitance(nF/100.0 m)@1000Hz	OK
Cap. Unbalance to Ground(pF/100.0 m)@1000Hz	OK

Signature:	Approved:	Date:
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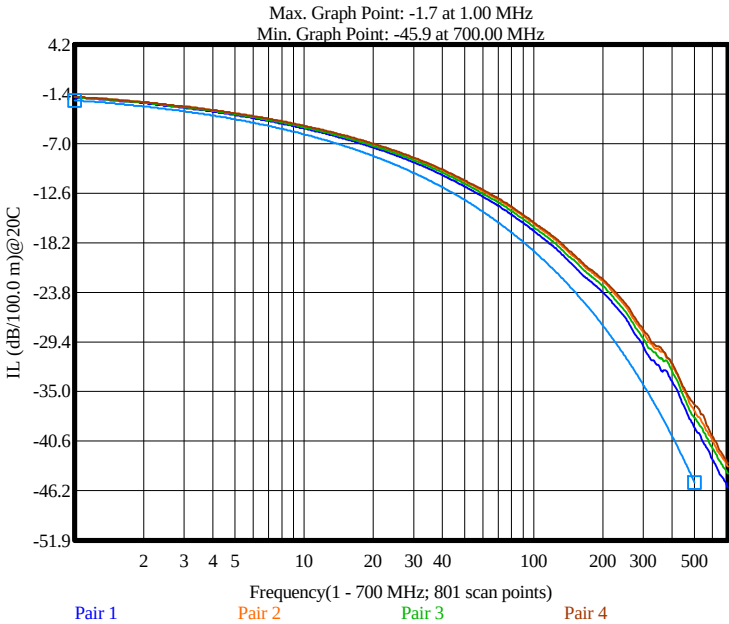
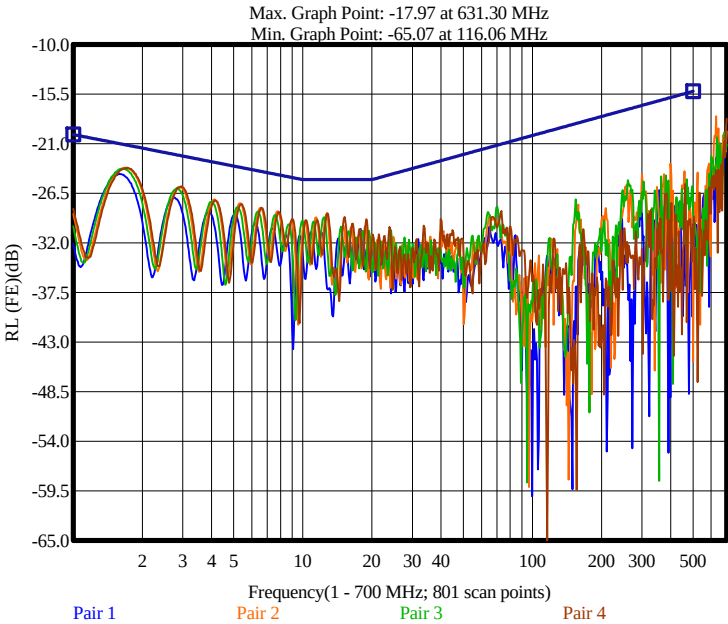
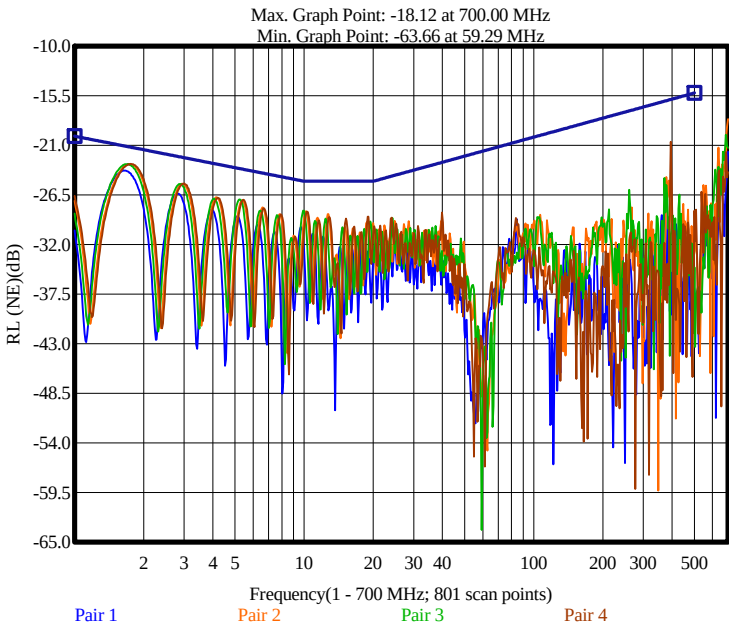
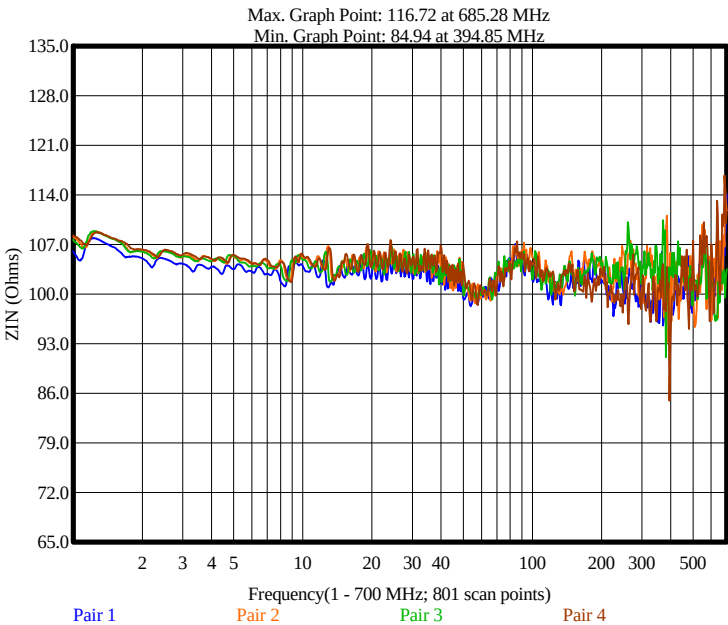
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Temperature : 20.00 °C	Relative Humidity : 40 %	Test Date/Time : 04/10/2014 01:28:13 AM
Length : 89.00 m	Number of Pairs to Test : 4	Operator : DCM
Starting Position : 1		Analyzer Type : ENA

Worst Case Summary

High Frequency

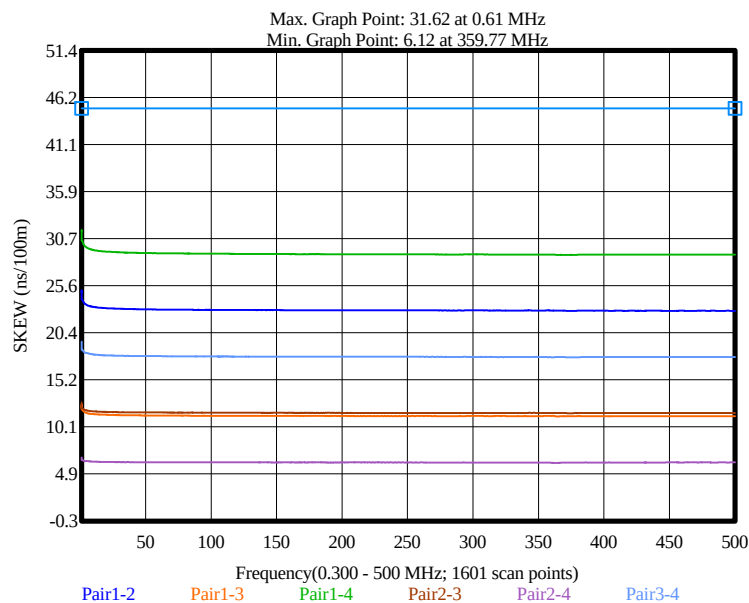
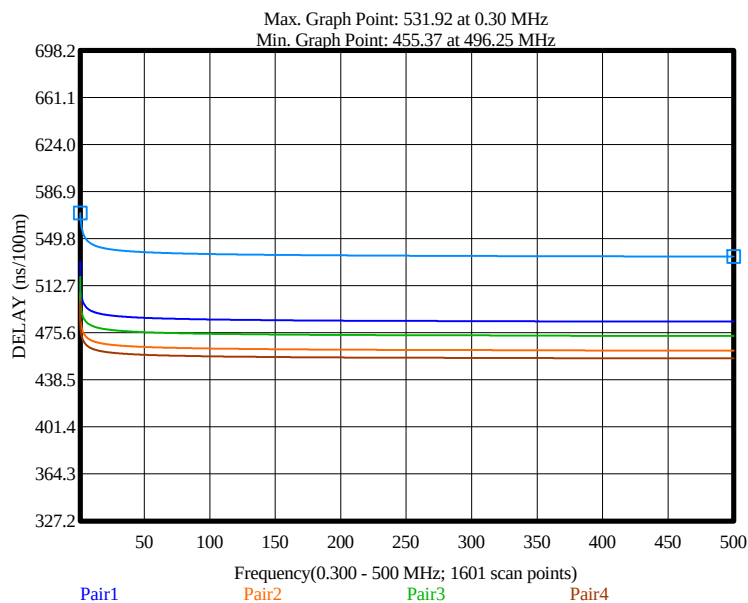
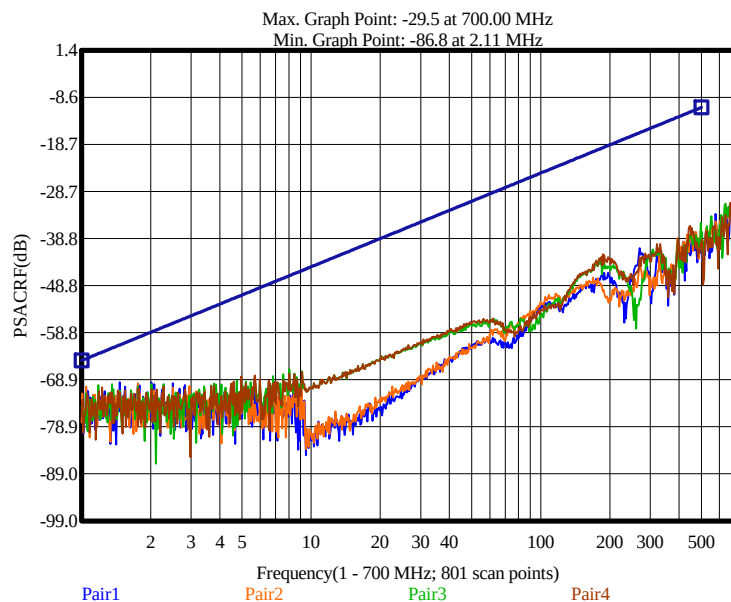
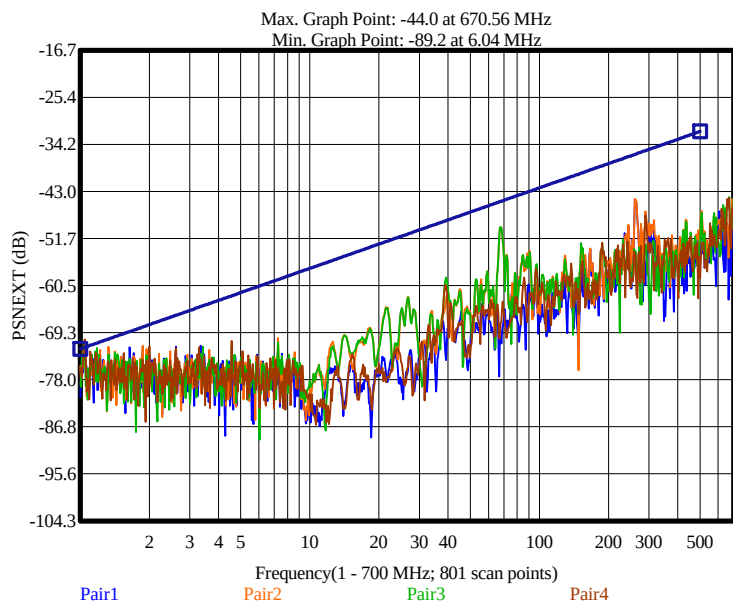
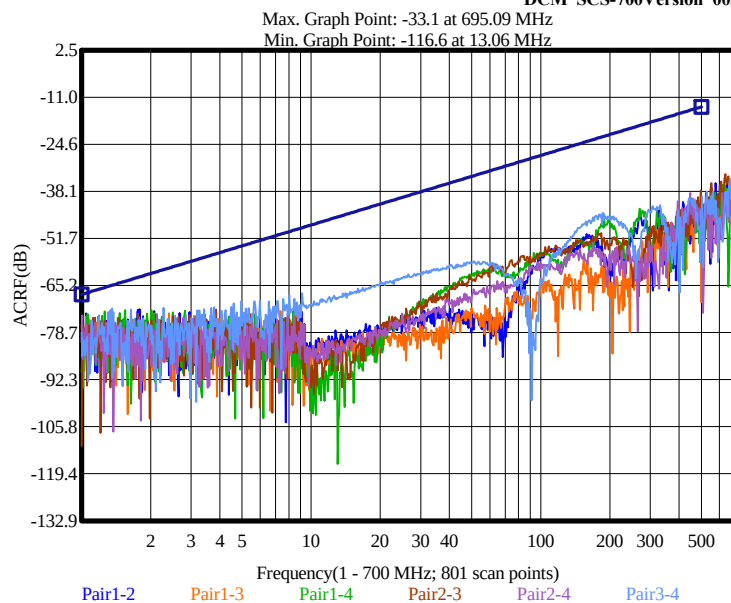
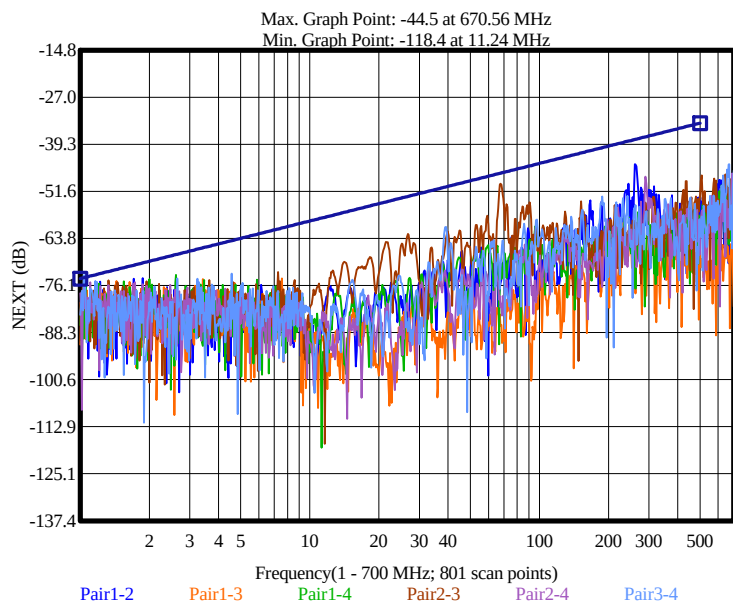
Test Type	Specification	Measured (Pair)	Margin	@ Frequency (MHz)	Test Result
Input Impedance (Zin)(Open/Short)	xxx (Min)	N/A	N/A	N/A	N/A
Input Impedance (Zin)(Open/Short)	xxx (Max)	N/A	N/A	N/A	N/A
Return Loss (RL)	21.23 (Min)	23.06 (Pair 4)	1.83	1.76	Passed
Return Loss (RL-Far End)	21.18 (Min)	23.67 (Pair 2)	2.49	1.72	Passed
Insertion Loss (IL)@20C	2.1 (Max)	1.8 (Pair 1)	0.3	1.01	Passed
Near End Crosstalk Loss (NEXT)	74.1 (Min)	73.4 (Pairs 3-4)	-0.7	1.04	Failed
ACR to FEXT Ratio (ACRF)	67.4 (Min)	73.2 (Pairs 1-2)	5.8	1.05	Passed
Power Sum NEXT(PSNEXT)	72.0 (Min)	70.5 (Pair 4)	-1.5	1.05	Failed
Power Sum ACRF (PSACRF)	64.4 (Min)	70.4 (Pair 1)	6.0	1.05	Passed
Propagation Delay (DELAY)	535.63 (Max)	484.35 (Pair 1)	51.28	485.01	Passed
Propagation Delay Skew (SKEW)	45.00 (Max)	30.48 (Pairs 1-4)	14.52	1.24	Passed



N/A = Not Applicable.
--- = Disable/Bypassed Pair.

* = Measured value out of spec.
xxx = No entry.

*** = Measured value is invalid.



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Worst Case Summary

Low Frequency

Statistical Parameter	Maximum		Minimum		Average Maximum		Standard Deviation		
Test Type	Spec Limit	Measured	Spec Limit	Measured	Spec Limit	Measured	Spec Limit	Measured	Result
Conductor Resistance(Ohms/100.0 m)@20C	9.38	8.01	xxx	7.48	xxx	7.67	xxx	0.174	Passed
Resistance Unbalance(%)	5.00	1.47	xxx	0.29	xxx	0.63	xxx	0.487	Passed
Mutual Capacitance(nF/100.0 m)@1000Hz	5.60	4.81	xxx	4.47	xxx	4.62	xxx	0.131	Passed
Cap. Unbalance to Ground(pF/100.0 m)@1000Hz	330.00	46.42	xxx	27.23	xxx	40.19	xxx	7.747	Passed

Summary: Conductor Resistance@20C

	Spec Limit	Measured Values		Result
Unit	Ohms/100.0 m	ohms/L	Ohms/100.0 m	
Maximum	9.38	7.13	8.01	Passed
Minimum	xxx	6.66	7.48	N/A
Avg. Max.	xxx	6.83	7.67	N/A
Std. Deviation	xxx	0.155	0.174	N/A

Summary: Resistance Unbalance

	Spec Limit	Measured Values		Result
Unit	%	%	%	
Maximum	5.00	1.47	1.47	Passed
Minimum	xxx	0.29	0.29	N/A
Avg. Max.	xxx	xxx	0.63	N/A
Std. Deviation	xxx	xxx	0.487	N/A

Summary: Mutual Capacitance@1000 Hz

	Spec Limit	Measured Values		Result
Unit	nF/100.0 m	nF/L	nF/100.0 m	
Maximum	5.60	4.29	4.81	Passed
Minimum	xxx	3.98	4.47	N/A
Avg. Max.	xxx	4.11	4.62	N/A
Std. Deviation	xxx	0.117	0.131	N/A

Summary: Cap. Unbalance to Ground@1000 Hz

	Spec Limit	Measured Values		Result
Unit	pF/100.0 m	pF/L	pF/100.0 m	
Maximum	330.00	41.31	46.42	Passed
Minimum	xxx	24.23	27.23	N/A
Avg. Max.	xxx	35.77	40.19	N/A
Std. Deviation	xxx	6.895	7.747	N/A

Detail: Resistance/Capacitance Measurement -Raw

Test Types	Conductor Resistance Ra @20C	Conductor Resistance Rb @20C	Resistance Unbalance	Mutual Capacitance @1000 Hz	Capacitance Unbalance to Ground @1000 Hz
Unit	ohms/L	ohms/L	%	nF/L	pF/L
Pair 1 [1]	7.13	7.02	1.47	4.29	40.82
Pair 2 [2]	6.76	6.73	0.46	4.04	-41.31
Pair 3 [3]	6.80	6.83	0.32	4.15	-36.72
Pair 4 [4]	6.66	6.68	0.29	3.98	-24.23

Detail: Resistance/Capacitance Measurement -Normalized

Test Types	Conductor Resistance Ra @20C	Conductor Resistance Rb @20C	Resistance Unbalance	Mutual Capacitance @1000 Hz	Capacitance Unbalance to Ground @1000 Hz	Test Result
Unit	Ohms/100.0 m	Ohms/100.0 m	%	nF/100.0 m	pF/100.0 m	
Max Spec	9.38	9.38	5.00	5.60	330.00	
Min Spec	xxx	xxx	xxx	xxx	xxx	
Pair 1 [1]	8.01	7.89	1.47	4.81	45.86	
Pair 2 [2]	7.59	7.56	0.46	4.54	-46.42	
Pair 3 [3]	7.64	7.67	0.32	4.66	-41.25	
Pair 4 [4]	7.48	7.51	0.29	4.47	-27.23	

N/A = Not Applicable.
--- = Disable/Bypassed Pair.

* = Measured value out of spec.
xxx = No entry.

*** = Measured value is invalid.

Detail Discrete Frequencies ---Return Loss (RL)(dB)(Cat 6A): $RL \geq 20 + 5 * \log(f)$; 25; 25 - 7 * $\log(f/20)$

Frequency	1.00	4.00	8.00	10.00	16.00	20.00	25.00	31.25	62.50	100.00
Min Spec	20.00	23.01	24.52	25.00	25.00	25.00	24.32	23.64	21.54	20.11
Pair 1 [1]	30.46	28.25	45.85	32.71	39.56	33.40	32.44	35.64	43.69	36.72
Pair 2 [2]	27.17	27.48	29.51	29.08	32.49	29.72	29.89	32.68	54.19	29.62
Pair 3 [3]	28.57	27.02	33.38	28.29	31.22	33.84	32.57	31.89	53.15	33.11
Pair 4 [4]	26.61	28.11	28.87	30.42	35.87	30.80	30.05	30.31	40.90	32.64

Continue:Return Loss (RL)(dB)

Frequency	200.00	250.00	300.00	400.00	500.00					
Min Spec	18.00	17.32	16.77	15.89	15.21					
Pair 1 [1]	40.40	50.53	37.57	38.56	36.95					
Pair 2 [2]	32.00	31.11	42.50	30.60	30.73					
Pair 3 [3]	29.98	41.27	40.20	29.42	36.37					
Pair 4 [4]	34.49	36.64	40.51	28.55	29.65					

Detail Discrete Frequencies ---Return Loss (RL-FE)(dB)(Cat 6A): $RL \geq 20 + 5 * \log(f)$; 25; 25 - 7 * $\log(f/20)$

Frequency	1.00	4.00	8.00	10.00	16.00	20.00	25.00	31.25	62.50	100.00
Min Spec	20.00	23.01	24.52	25.00	25.00	25.00	24.32	23.64	21.54	20.11
Pair 1 [1]	32.11	28.89	34.35	33.31	36.51	32.92	34.44	34.04	31.80	57.23
Pair 2 [2]	28.80	27.52	29.52	30.41	31.20	31.22	31.90	34.73	31.89	40.53
Pair 3 [3]	30.17	27.47	31.91	29.62	31.22	35.15	34.47	33.71	30.08	38.06
Pair 4 [4]	28.24	28.02	28.98	32.07	32.78	31.80	33.36	31.69	34.26	36.16

Continue:Return Loss (RL-FE)(dB)

Frequency	200.00	250.00	300.00	400.00	500.00					
Min Spec	18.00	17.32	16.77	15.89	15.21					
Pair 1 [1]	35.92	34.27	28.93	41.75	32.69					
Pair 2 [2]	29.54	27.76	24.46	23.80	41.22					
Pair 3 [3]	32.71	27.70	26.41	29.76	28.04					
Pair 4 [4]	42.55	31.60	33.32	32.91	31.19					

Detail Discrete Frequencies ---Insertion Loss (IL)(dB/100.0 m)@20C(Cat 6A): $IL \leq 1.82 \sqrt{f} + 0.0091 * f + 0.25 / \sqrt{f}$ (Refer to manual)

Frequency	1.00	4.00	8.00	10.00	16.00	20.00	25.00	31.25	62.50	100.00
Max Spec	2.1	3.8	5.3	5.9	7.5	8.4	9.4	10.5	15.0	19.1
Pair 1 [1]	1.7	3.4	4.7	5.3	6.6	7.4	8.3	9.3	13.2	16.9
Pair 2 [2]	1.7	3.2	4.5	5.0	6.3	7.1	7.9	8.8	12.6	16.0
Pair 3 [3]	1.7	3.3	4.6	5.1	6.5	7.2	8.1	9.0	12.9	16.4
Pair 4 [4]	1.7	3.2	4.4	5.0	6.3	7.0	7.8	8.7	12.5	15.9

Continue:Insertion Loss (IL)(dB/100.0 m)@20C

Frequency	200.00	250.00	300.00	400.00	500.00					
Max Spec	27.6	31.1	34.3	40.1	45.3					
Pair 1 [1]	23.8	26.7	29.9	33.9	39.1					
Pair 2 [2]	22.5	25.4	28.3	32.0	37.2					
Pair 3 [3]	23.1	25.9	29.1	32.7	37.9					
Pair 4 [4]	22.3	25.0	28.0	31.9	36.5					

Detail Discrete Frequencies ---Near End Crosstalk Loss (NEXT)(dB)(Cat 6A): $NEXT \geq 44.3 - 15 * \log(f/100)$

Frequency	1.00	4.00	8.00	10.00	16.00	20.00	25.00	31.25	62.50	100.00
Min Spec	74.3	65.3	60.8	59.3	56.2	54.8	53.3	51.9	47.4	44.3
Pair 1 - 2	83.6	89.3	82.3	84.9	92.9	83.0	79.7	73.0	71.5	70.6
Pair 1 - 3	91.5	78.9	83.0	85.2	83.8	99.4	89.1	83.0	92.3	75.3
Pair 1 - 4	86.4	84.3	79.3	88.2	85.1	78.4	91.1	77.1	72.2	67.8
Pair 2 - 3	80.5	84.8	82.2	82.0	71.9	72.8	65.6	78.5	63.6	65.4
Pair 2 - 4	78.1	82.8	87.5	91.0	87.5	82.1	85.5	78.6	82.3	69.7
Pair 3 - 4	83.7	86.3	82.7	82.5	82.6	80.3	75.3	92.7	65.4	63.8

N/A = Not Applicable.
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Continue:Near End Crosstalk Loss (NEXT)(dB)

Frequency	200.00	250.00	300.00	400.00	500.00					
Min Spec	39.8	38.3	37.1	35.3	33.8					
Pair 1 - 2	59.9	58.5	51.3	58.2	55.7					
Pair 1 - 3	73.8	64.8	70.4	73.7	67.1					
Pair 1 - 4	62.2	67.4	63.9	61.0	62.1					
Pair 2 - 3	62.2	63.8	71.4	58.6	52.7					
Pair 2 - 4	62.0	62.9	53.4	71.2	65.7					
Pair 3 - 4	71.1	65.3	64.9	68.9	62.2					

Detail Discrete Frequencies ---ACR to FEXT Ratio (ACRF)(dB)

(Cat 6A): ACRF >= 27.8 - 20 * log(f/100) (Refer to manual)

Frequency	1.00	4.00	8.00	10.00	16.00	20.00	25.00	31.25	62.50	100.00
Min Spec	67.8	55.8	49.7	47.8	43.7	41.8	39.8	37.9	31.9	27.8
Pair 1 - 2	80.5	80.8	82.6	83.1	79.2	78.0	77.2	74.2	77.7	57.2
Pair 1 - 3	76.4	87.9	83.0	89.0	83.1	81.6	79.6	80.2	75.6	65.3
Pair 1 - 4	90.1	83.7	80.9	93.1	85.6	82.3	75.8	70.3	60.8	56.6
Pair 2 - 3	111.4	77.9	76.0	94.4	83.1	79.1	75.0	71.0	59.2	55.7
Pair 2 - 4	81.6	80.3	81.8	84.6	80.1	78.7	73.8	74.9	66.0	58.9
Pair 3 - 4	78.7	78.9	70.2	70.7	66.1	64.8	63.1	61.5	59.4	63.6

Continue:ACR to FEXT Ratio (ACRF)(dB)

Frequency	200.00	250.00	300.00	400.00	500.00					
Min Spec	21.8	19.8	18.3	15.8	13.8					
Pair 1 - 2	64.6	51.2	56.0	58.7	47.9					
Pair 1 - 3	67.9	60.5	53.5	49.7	62.3					
Pair 1 - 4	47.4	50.0	55.0	43.6	43.2					
Pair 2 - 3	53.4	63.1	48.4	51.5	40.5					
Pair 2 - 4	57.3	57.7	58.3	45.4	45.2					
Pair 3 - 4	45.7	51.8	44.3	61.8	46.7					

Detail Discrete Frequencies ---Power Sum NEXT(PSNEXT)(dB)

(Cat 6A): PSNEXT >= 42.3 - 15 log(f/100)

Frequency	1.00	4.00	8.00	10.00	16.00	20.00	25.00	31.25	62.50	100.00
Min Spec	72.3	63.3	58.8	57.3	54.2	52.8	51.3	49.9	45.4	42.3
Pair 1 [1]	81.3	77.5	75.9	81.1	81.0	77.0	78.8	71.1	68.6	65.3
Pair 2 [2]	75.4	79.9	77.3	79.8	71.8	71.9	65.4	71.0	62.8	62.9
Pair 3 [3]	78.6	77.0	77.5	78.2	71.3	72.2	65.1	77.0	61.4	61.2
Pair 4 [4]	76.6	78.9	76.8	81.0	79.8	75.2	74.8	74.7	64.4	61.7

Continue:Power Sum NEXT(PSNEXT)(dB)

Frequency	200.00	250.00	300.00	400.00	500.00					
Min Spec	37.8	36.3	35.1	33.3	31.8					
Pair 1 [1]	57.6	56.9	51.0	56.0	53.9					
Pair 2 [2]	56.4	55.3	49.1	55.1	50.6					
Pair 3 [3]	60.9	59.7	63.0	57.9	52.0					
Pair 4 [4]	58.5	60.0	52.7	60.0	58.0					

Detail Discrete Frequencies ---Power Sum ACRF (PSACRF)(dB)

(Cat 6A): PSACRF >= 24.8 - 20 * Log(f/100) (Refer to manual)

Frequency	1.00	4.00	8.00	16.00	20.00	25.00	31.25	62.50	100.00	200.00
Min Spec	64.8	52.8	46.7	40.7	38.8	36.8	34.9	28.9	24.8	18.8
Pair 1 [1]	74.8	78.4	74.9	77.0	75.4	72.5	68.5	60.6	53.5	47.3
Pair 2 [2]	78.0	74.4	74.1	75.7	73.8	70.3	68.2	58.3	52.4	51.5
Pair 3 [3]	74.4	74.6	68.8	65.9	64.5	62.8	61.0	56.2	54.7	45.0
Pair 4 [4]	76.7	75.7	69.2	65.9	64.5	62.6	60.8	56.5	54.1	43.3

Continue:Power Sum ACRF (PSACRF)(dB)

Frequency	250.00	300.00	400.00	500.00						
Min Spec	16.8	15.3	12.8	10.8						
Pair 1 [1]	47.4	50.0	42.2	40.5						
Pair 2 [2]	50.0	47.2	43.2	38.5						

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Continue:Power Sum ACRF (PSACRF)(dB)

Frequency	250.00	300.00	400.00	500.00						
Min Spec	16.8	15.3	12.8	10.8						
Pair 3 [3]	50.9	42.5	44.9	39.2						
Pair 4 [4]	47.3	43.8	41.4	39.9						

Detail Discrete Frequencies ---Propagation Delay (DELAY)(ns/100m)

(Cat 6A): DELAY <= 534 + 36 / sqrt(f)

Frequency	1.00	4.00	8.00	10.00	16.00	20.00	25.00	31.25	62.50	100.00
Max Spec	570.00	552.00	546.73	545.38	543.00	542.05	541.20	540.44	538.55	537.60
Pair 1 [1]	512.82	498.02	493.67	492.56	490.60	489.82	489.12	488.48	486.87	486.04
Pair 2 [2]	488.36	474.48	470.38	469.33	467.47	466.73	466.07	465.47	463.93	463.14
Pair 3 [3]	500.65	486.37	482.18	481.08	479.19	478.43	477.75	477.13	475.57	474.76
Pair 4 [4]	481.89	468.19	464.11	463.09	461.25	460.52	459.86	459.27	457.75	456.97

Continue:Propagation Delay (DELAY)(ns/100m)

Frequency	200.00	250.00	300.00	400.00	500.00					
Max Spec	536.55	536.28	536.08	535.80	535.61					
Pair 1 [1]	485.08	484.89	484.75	484.41	484.33					
Pair 2 [2]	462.23	462.05	461.91	461.60	461.53					
Pair 3 [3]	473.83	473.64	473.50	473.19	473.10					
Pair 4 [4]	456.08	455.89	455.76	455.45	455.37					

Detail Discrete Frequencies ---Propagation Delay Skew (SKEW)(ns/100m)

Frequency	1.00	100.00	250.00	500.00						
Max Spec	45.00	45.00	45.00	45.00						
Pair 1 - 2	24.46	22.90	22.84	22.80						
Pair 1 - 3	12.17	11.28	11.25	11.23						
Pair 1 - 4	30.93	29.07	29.00	28.96						
Pair 2 - 3	12.29	11.62	11.59	11.57						
Pair 2 - 4	6.47	6.17	6.16	6.16						
Pair 3 - 4	18.76	17.79	17.75	17.73						