

DCM Test Report

Cable Type : 4x2x23 x PE/LSZH	Factory Number : PHOENIX	Data File Name : DA054445.D3S
Cable I.D. : S/FTP#23X4P CABLE	Order Number : 8187 VI-15 200917517	Specification File : IEC CAT7-305M.S3S
Temperature : 25.00 °C	Relative Humidity : 50 %	Test Date/Time : 09/07/2020 10:35:27 AM
Length : 305.00 m	Number of Pairs to Test : 4	Operator : L 200801SM024001/R1
Starting Position : 25		Analyzer Type : ENA

Pass - Fail Test Certificate - 4 Pairs

High Frequency

Test Type	Test Result
Input Impedance(Zin)(Ohms)	OK
Return Loss (RL)(dB)	OK
Insertion Loss (IL)(Curve Fit)(dB/328.0 ft)@20C	OK
Near End Crosstalk Loss (NEXT)(dB)	OK
Power Sum NEXT(PSNEXT)(dB)	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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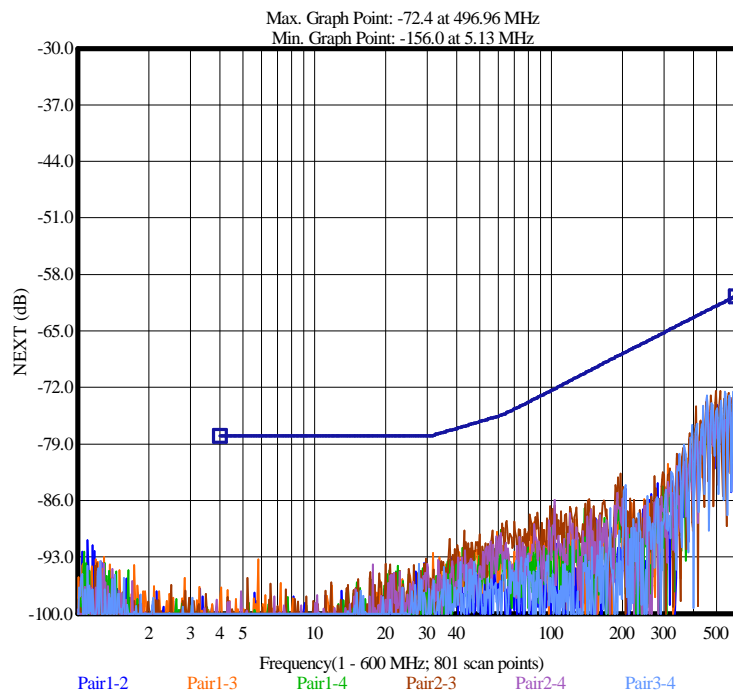
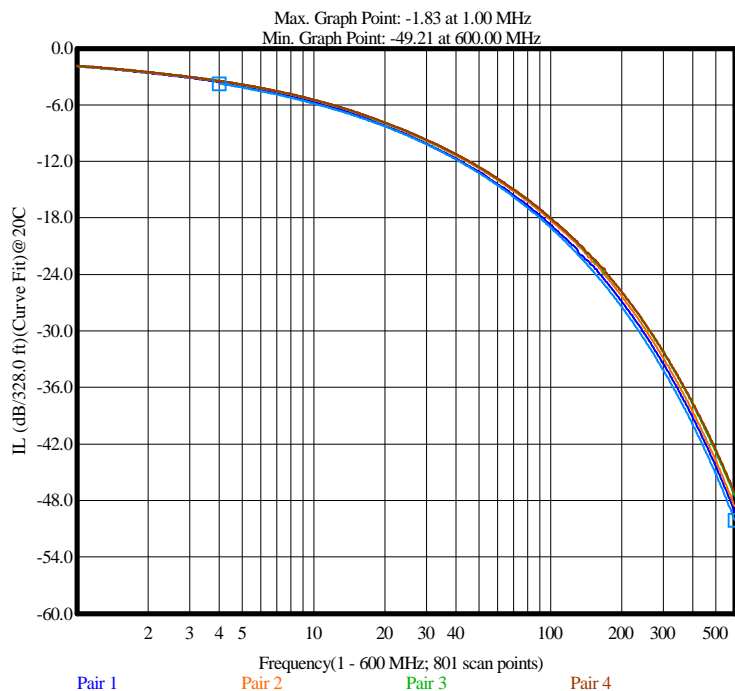
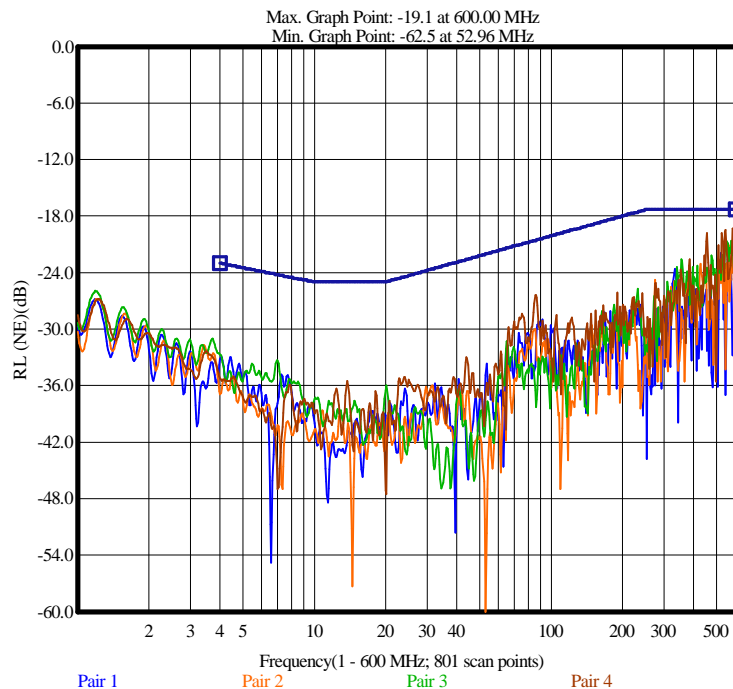
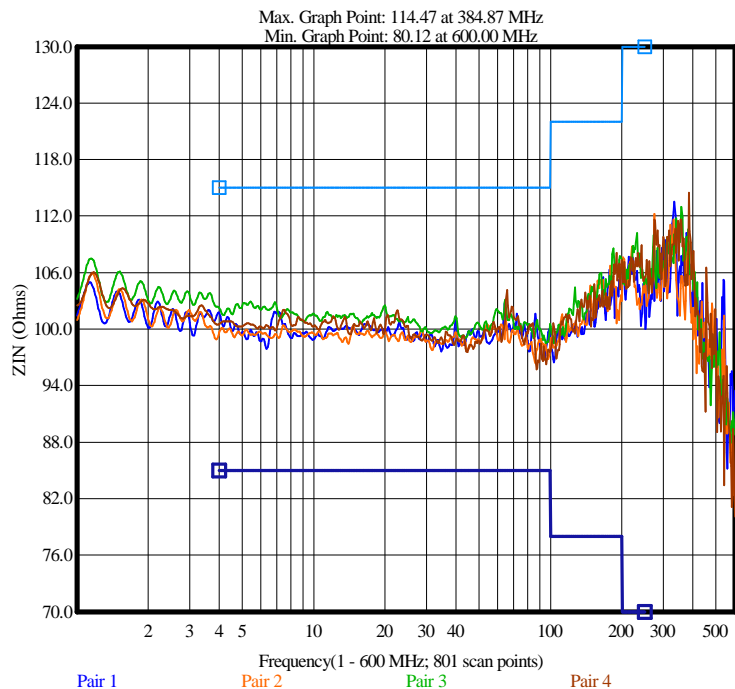
DCM Test Report

Cable Type : 4x2x23 x PE/LSZH	Factory Number : PHOENIX	Data File Name : DA054445.D3S
Cable I.D. : S/FTP#23X4P CABLE	Order Number : 8187 VI-15 200917517	Specification File : IEC CAT7-305M.S3S
Temperature : 25.00 °C	Relative Humidity : 50 %	Test Date/Time : 09/07/2020 10:35:27 AM
Length : 305.00 m	Number of Pairs to Test : 4	Operator : L 200801SM024001/R1
Starting Position : 25		Analyzer Type : ENA

Worst Case Summary

High Frequency

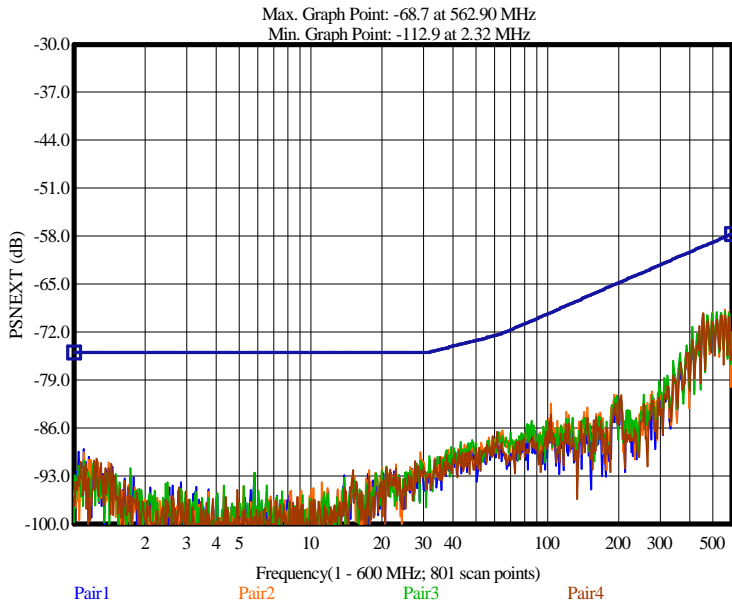
Test Type	Specification	Measured (Pair)	Margin	@ Frequency (MHz)	Test Result
Input Impedance(Zin)	85.00 (Min)	95.70 (Pair 4)	10.70	87.44	Passed
Input Impedance(Zin)	115.00 (Max)	104.15 (Pair 4)	10.85	65.67	Passed
Return Loss (RL)	17.3 (Min)	19.1 (Pair 4)	1.8	600.00	Passed
Insertion Loss (IL)(Curve Fit)@20C	10.51 (Max)	10.47 (Pair 1)	0.04	31.88	Passed
Near End Crosstalk Loss (NEXT)	61.9 (Min)	72.4 (Pairs 2-3)	10.5	496.96	Passed
Power Sum NEXT(PSNEXT)	59.5 (Min)	69.3 (Pair 2)	9.8	455.74	Passed



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

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 ISTD



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Worst Case Summary

Low Frequency

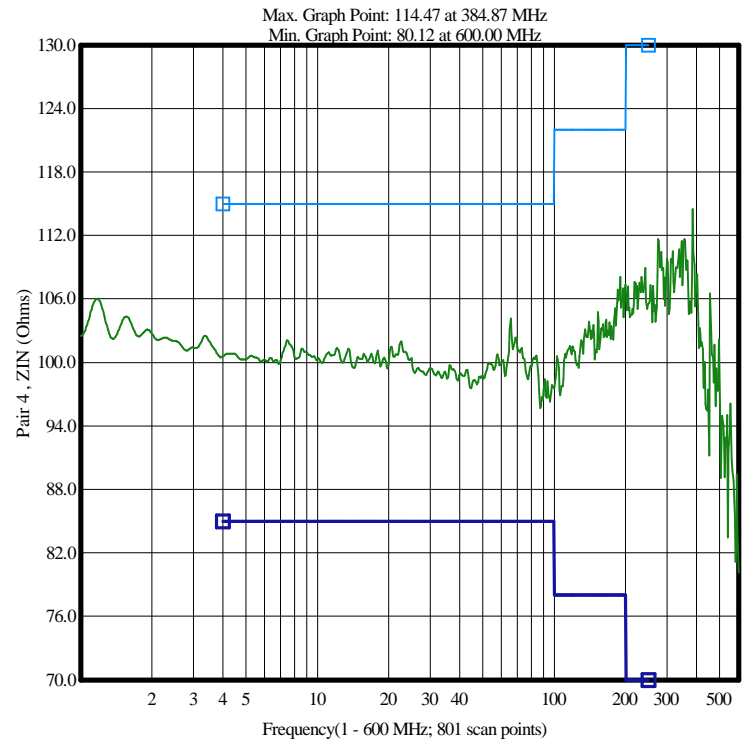
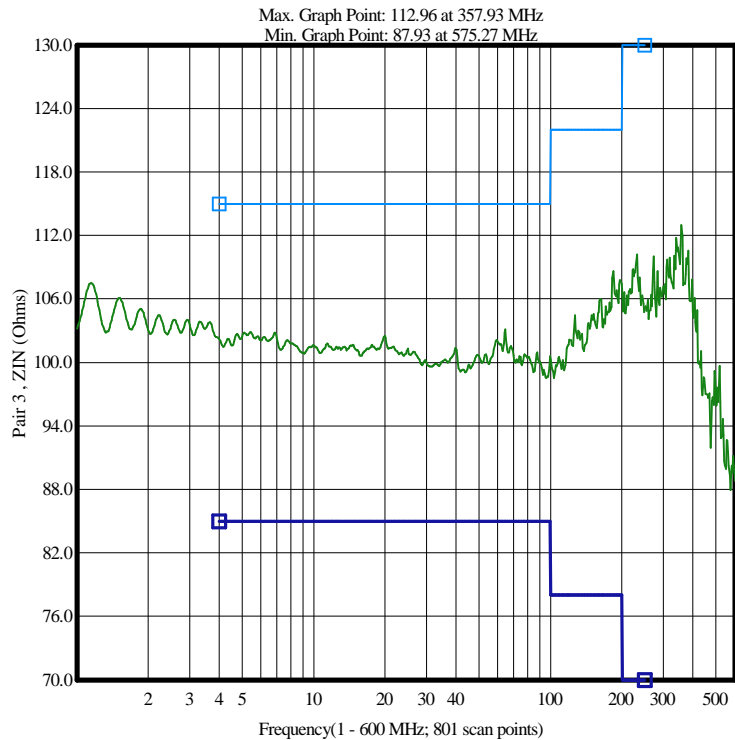
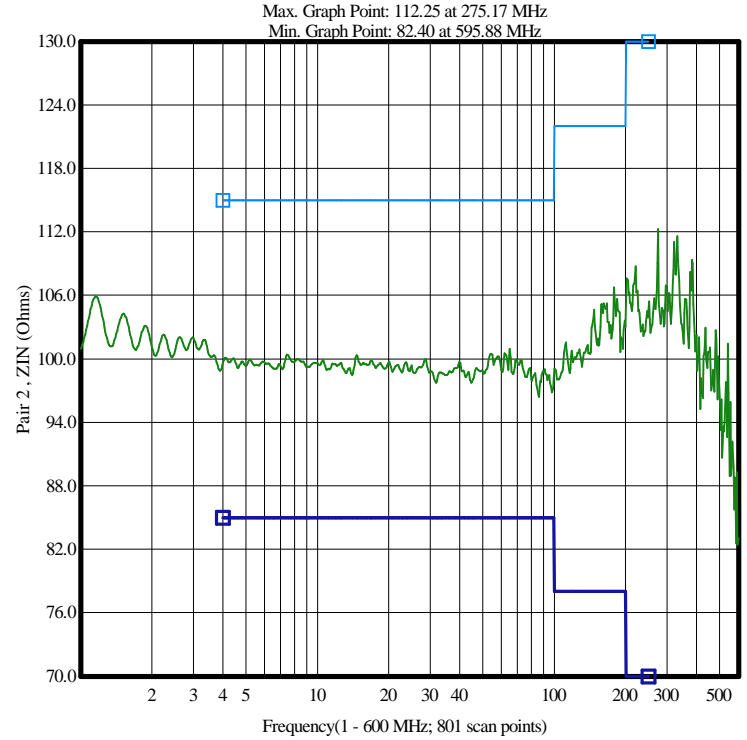
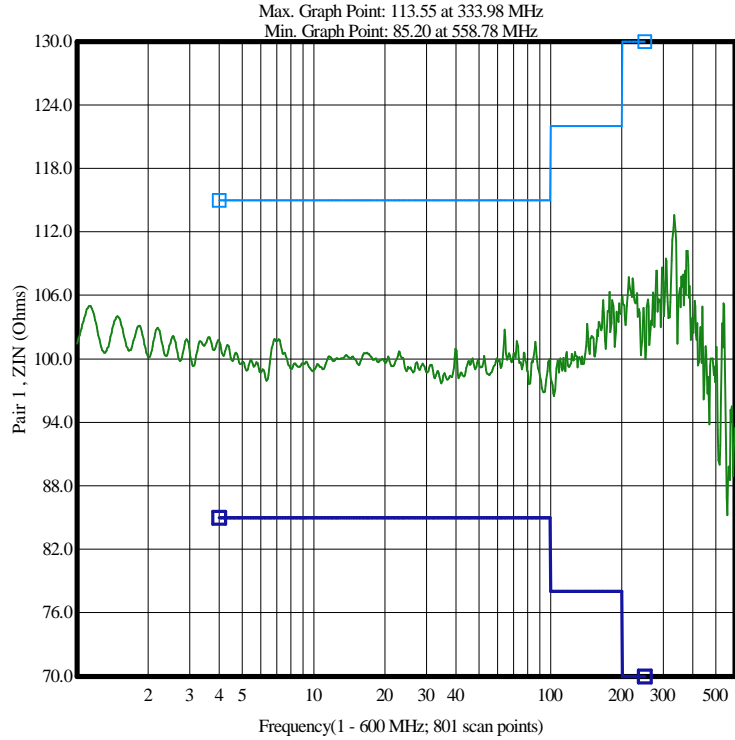
Statistical Parameter	Maximum		Minimum		Average Maximum		Standard Deviation		Result
	Spec Limit	Measured	Spec Limit	Measured	Spec Limit	Measured	Spec Limit	Measured	
Conductor Resistance(Ohms/100.0 m)@20C	9.38	6.80	xxx	6.67	xxx	6.74	xxx	0.050	Passed
Resistance Unbalance(%)	5.00	0.26	xxx	0.04	xxx	0.13	xxx	0.080	Passed
Mutual Capacitance(nF/100.0 m)@1000Hz	5.60	4.75	xxx	4.64	xxx	4.69	xxx	0.042	Passed
Cap. Unbalance to Ground(pF/100.0 m)@1000Hz	330	122	xxx	21	xxx	73	xxx	39.4	Passed

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	
Min Spec	xxx	xxx	xxx	xxx	xxx	
Pair 1 [25]	6.80	6.80	0.10	4.75	122	Passed
Pair 2 [26]	6.72	6.72	0.04	4.70	21	Passed
Pair 3 [27]	6.79	6.77	0.26	4.68	98	Passed
Pair 4 [28]	6.68	6.67	0.12	4.64	-51	Passed

Summary and Graphic: Input Impedance(Zin)

Pair	Specification		Measured(Ohms)		Margin (Ohms)		@ Frequency (MHz)		Test Result
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	
Pair 1 [25]	85.00	115.00	96.85	102.75	11.85	12.25	93.75	63.94	Passed
Pair 2 [26]	85.00	115.00	96.43	100.92	11.43	14.08	86.23	65.06	Passed
Pair 3 [27]	85.00	115.00	98.54	103.13	13.54	11.87	96.25	64.46	Passed
Pair 4 [28]	85.00	115.00	95.70	104.15	10.70	10.85	87.44	65.67	Passed



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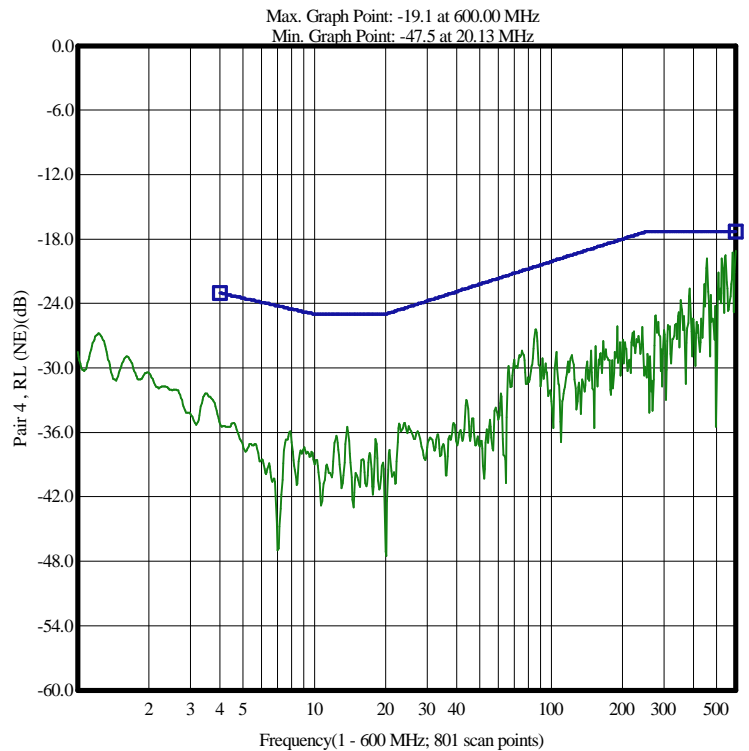
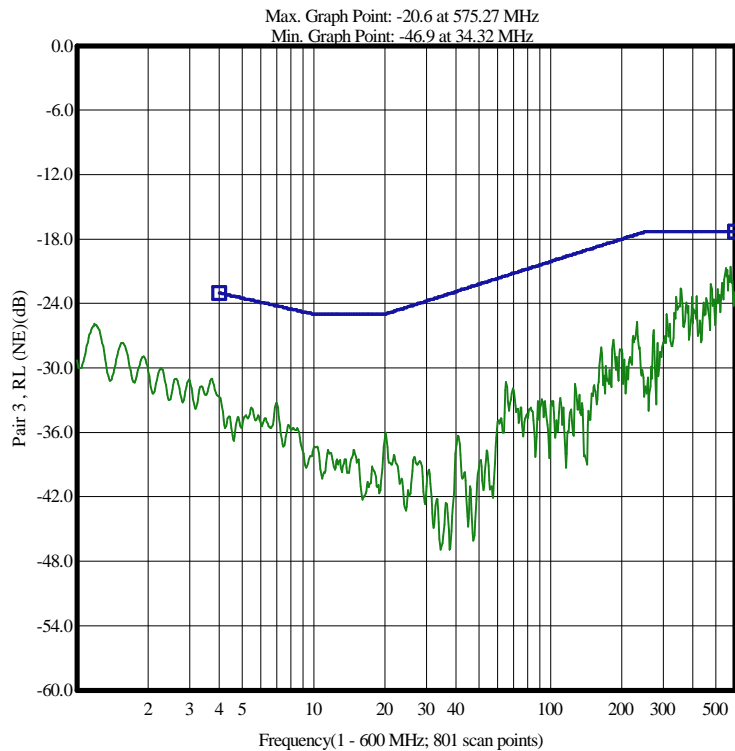
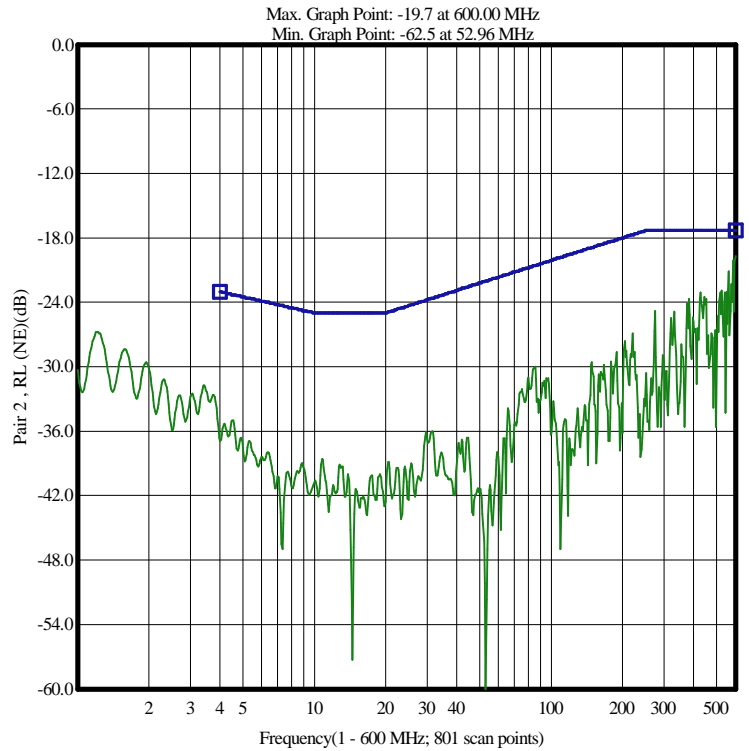
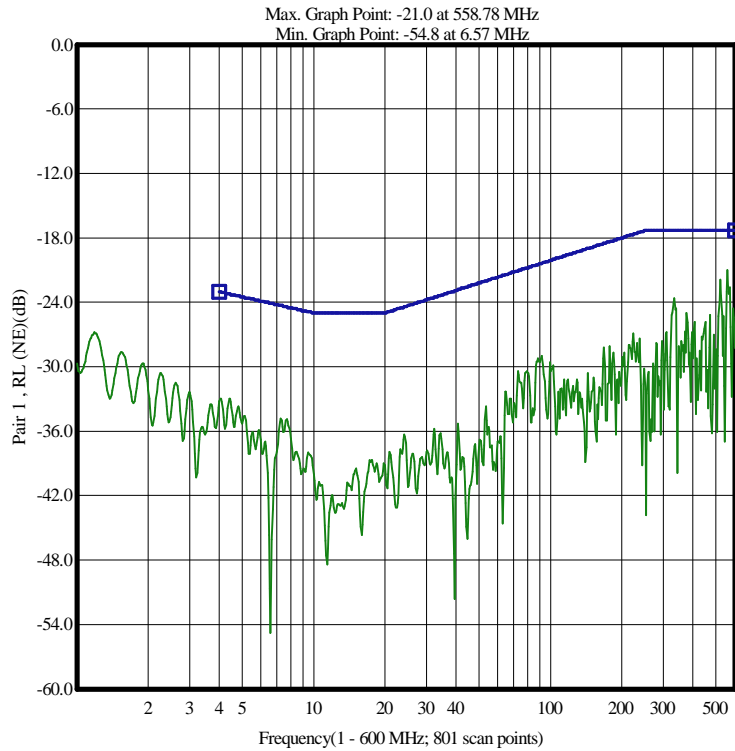
* = Measured value out of spec.
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ISTP

Summary and Graphic: Return Loss (RL)

(Formula): $RL \geq 20.0 + 5.0 * \text{Log}(f/1.0)$; $25.0 + 0.0 * \text{Log}(f/1.0)$; $25.0 - 7.0 * \text{Log}(f/20.0)$; $0.0 + 10.0 * \text{Log}(f/600.0)$; $0.0 + 0.0 * \text{Log}(f/1.0)$; Min=-17.3

Pair	Spec (Min)(dB)	Measured(dB)	Margin (dB)	@ Frequency (MHz)	Test Result
Pair 1 [25]	17.3	21.0	3.7	558.78	Passed
Pair 2 [26]	17.3	19.7	2.4	600.00	Passed
Pair 3 [27]	17.3	20.6	3.3	575.27	Passed
Pair 4 [28]	17.3	19.1	1.8	600.00	Passed



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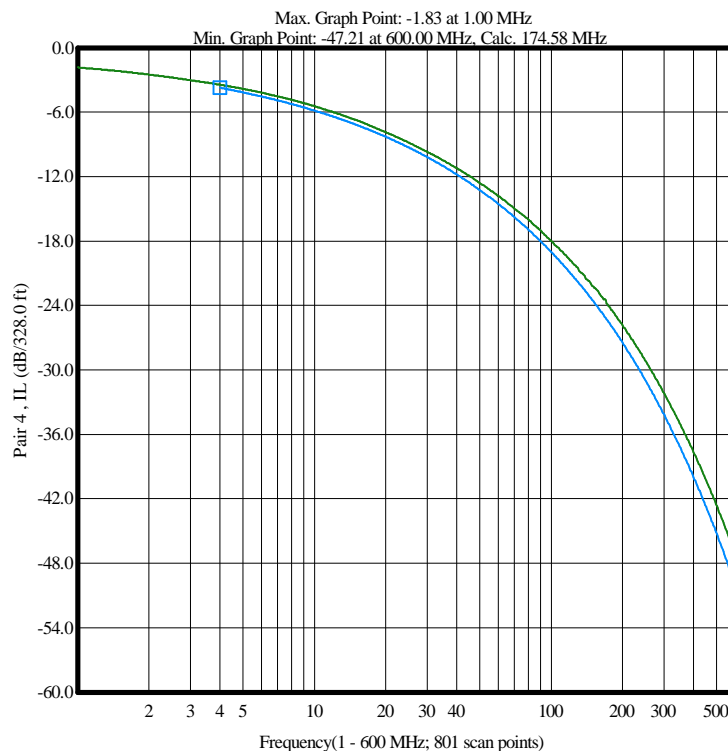
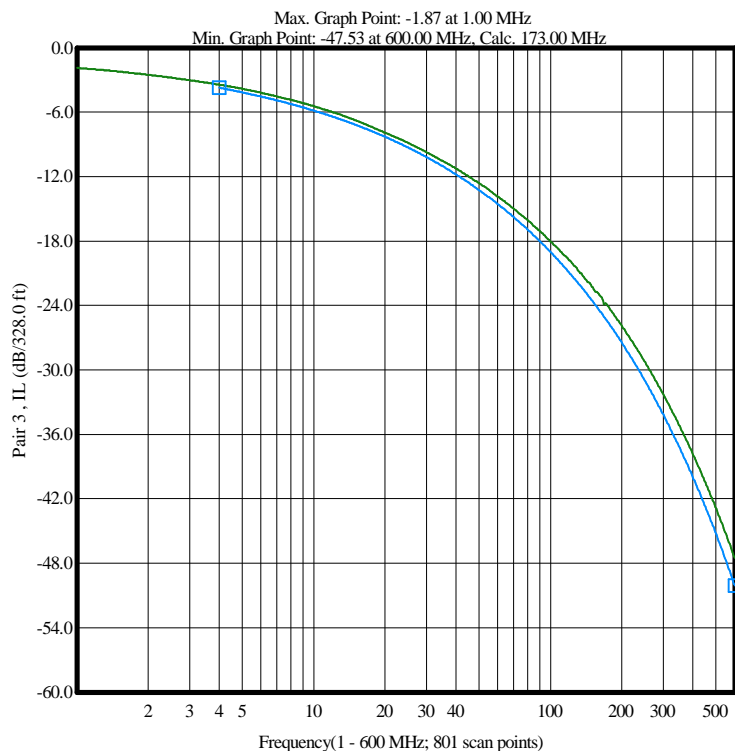
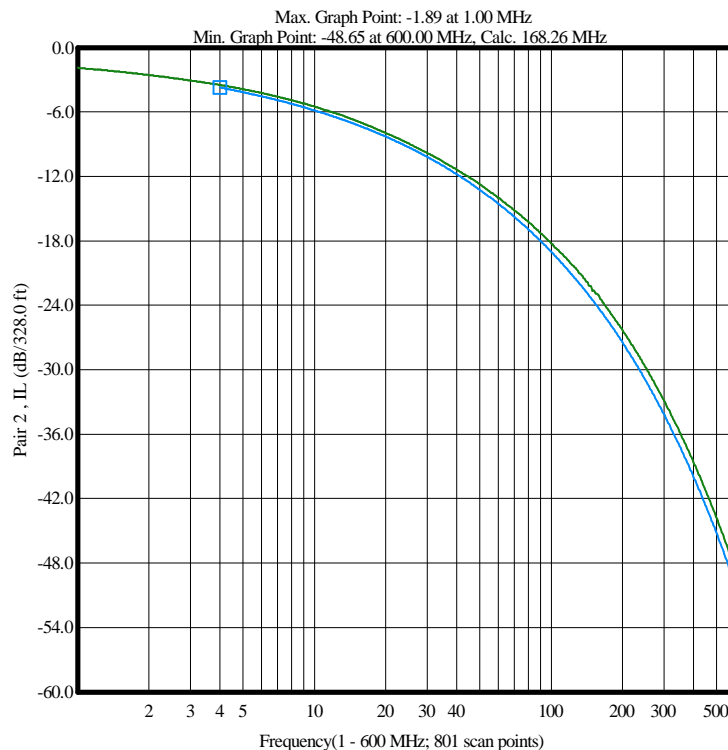
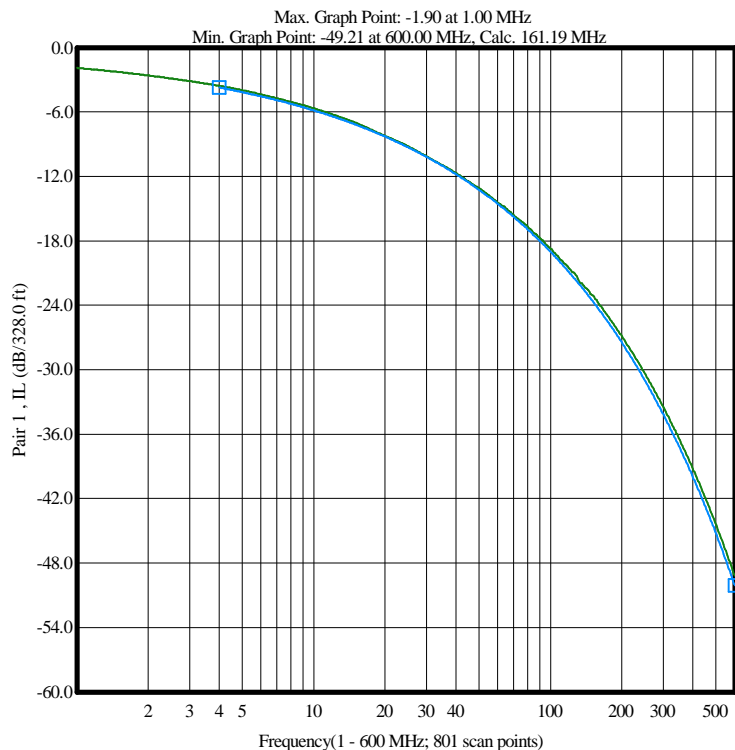
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ISTP

Summary and Graphic: Insertion Loss (IL)(Curve Fit)@20C

(Formula): $IL \leq [(1.800 * \sqrt{f}) + (0.010 * f) + (0.200 / \sqrt{f})] * 1.000 * \text{Stranded Factor}$ (Refer to manual)

Pair	Spec (Max)(dB/328.0 ft)	Measured(dB/328.0 ft)	Margin (dB/328.0 ft)	@ Frequency (MHz)	Test Result
Pair 1 [25]	10.51	10.47	0.04	31.88	Passed
Pair 2 [26]	3.75	3.51	0.24	4.03	Passed
Pair 3 [27]	3.75	3.46	0.29	4.03	Passed
Pair 4 [28]	3.75	3.47	0.28	4.03	Passed



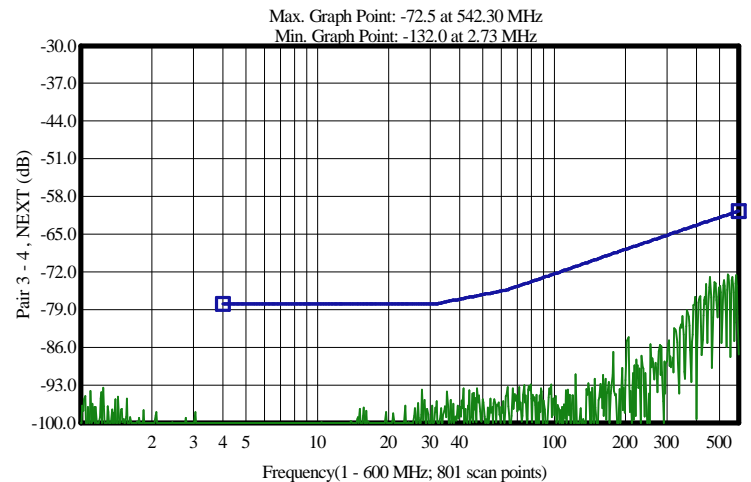
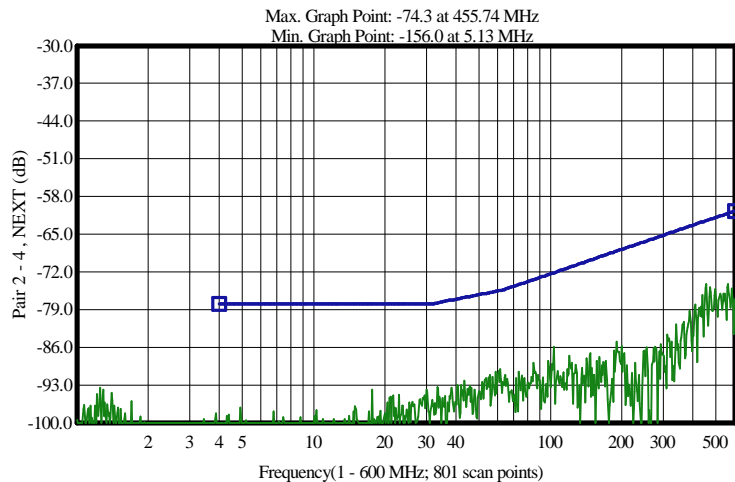
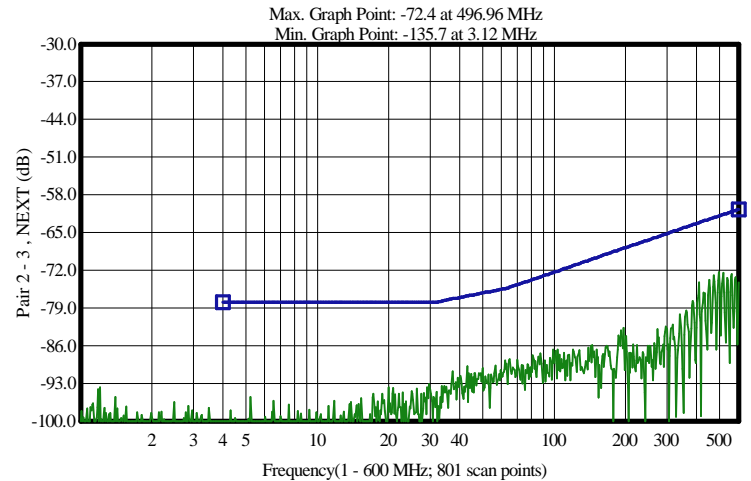
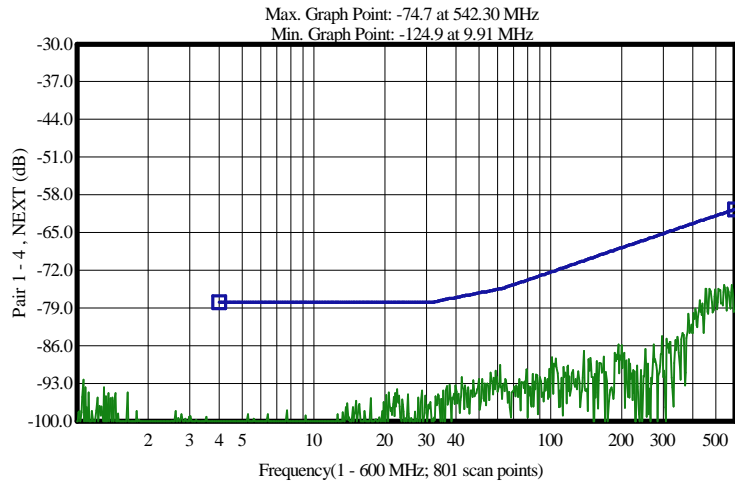
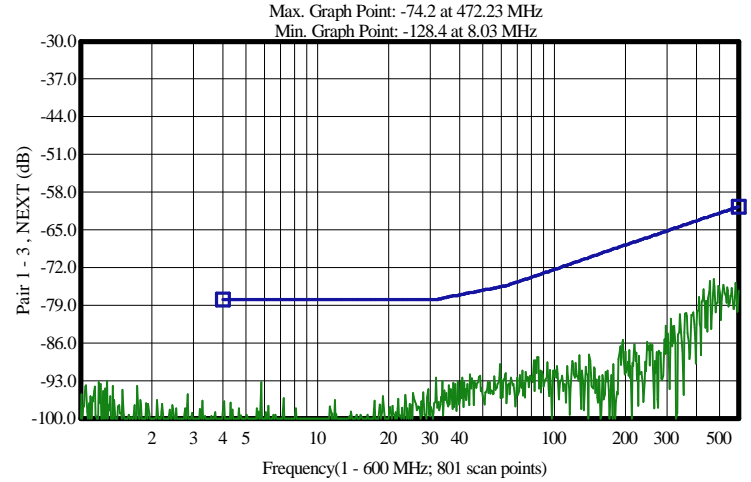
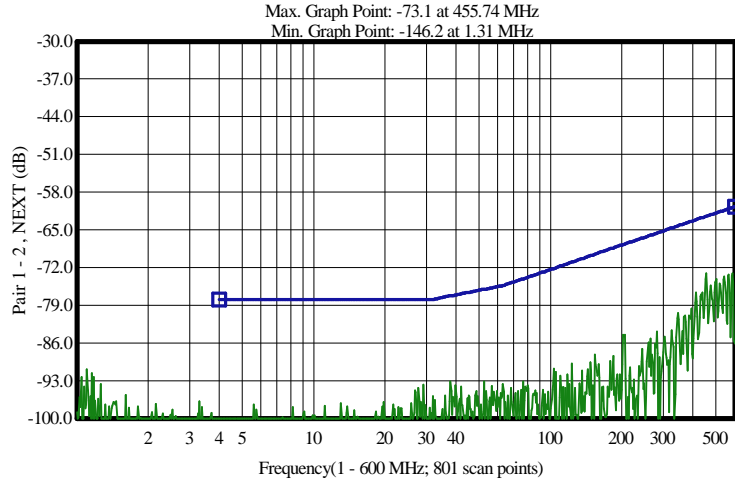
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ISTP

Summary and Graphic: Near End Crosstalk Loss (NEXT)

Pair	Spec (Min)(dB)	Measured(dB)	Margin (dB)	@ Frequency (MHz)	Test Result
Pair 1 - 2	62.5	73.1	10.6	455.74	Passed
Pair 1 - 3	62.3	74.2	11.9	472.23	Passed
Pair 1 - 4	62.5	75.4	12.9	451.62	Passed
Pair 2 - 3	61.9	72.4	10.5	496.96	Passed
Pair 2 - 4	62.5	74.3	11.8	455.74	Passed
Pair 3 - 4	62.5	73.0	10.5	455.74	Passed



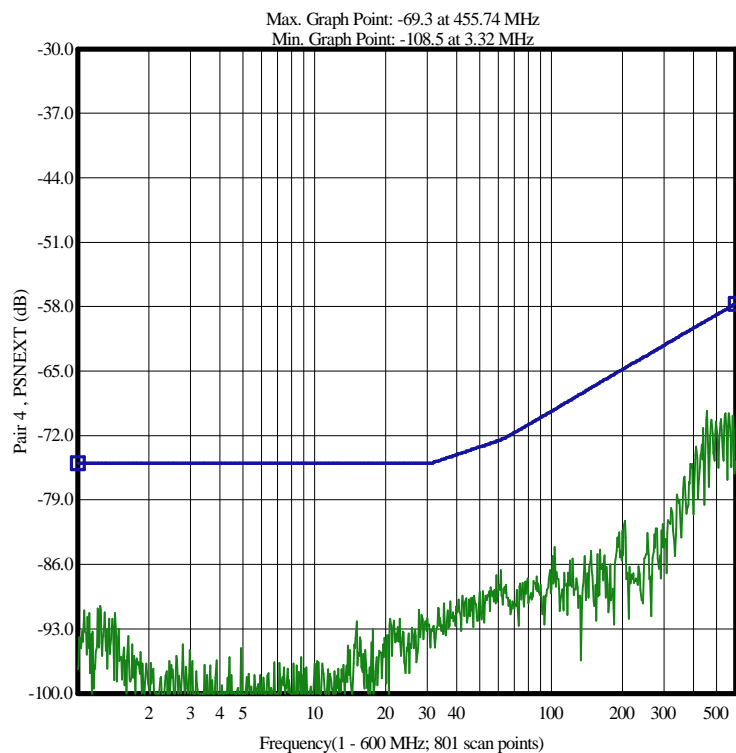
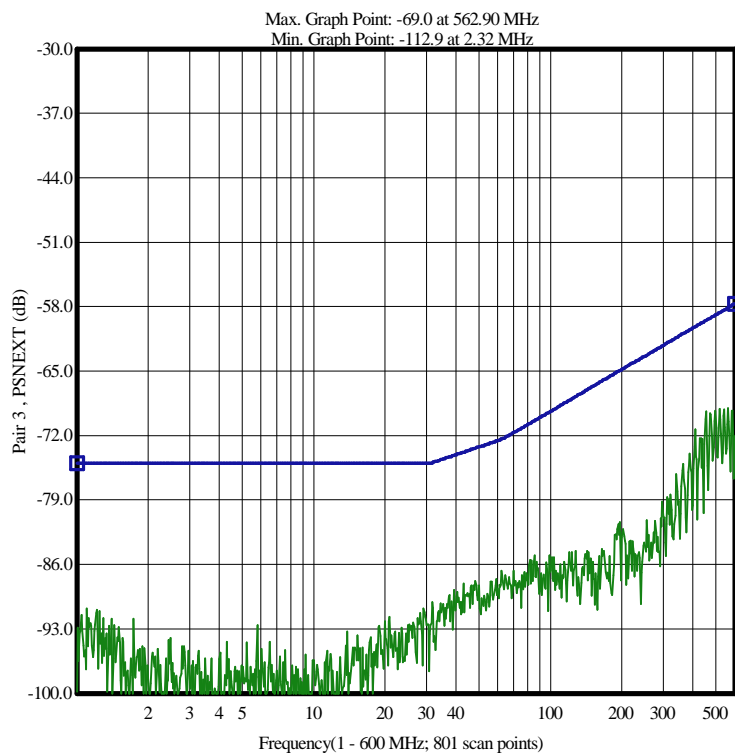
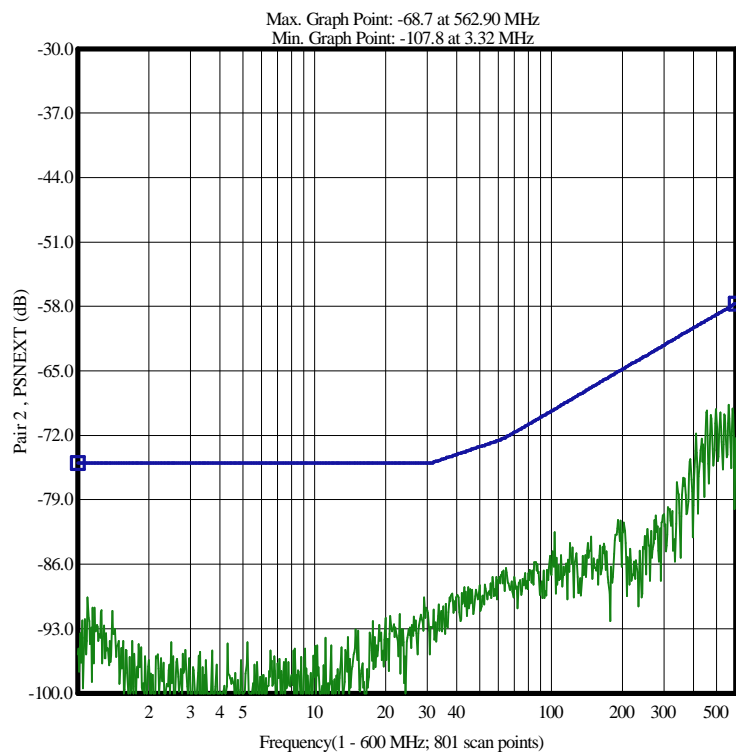
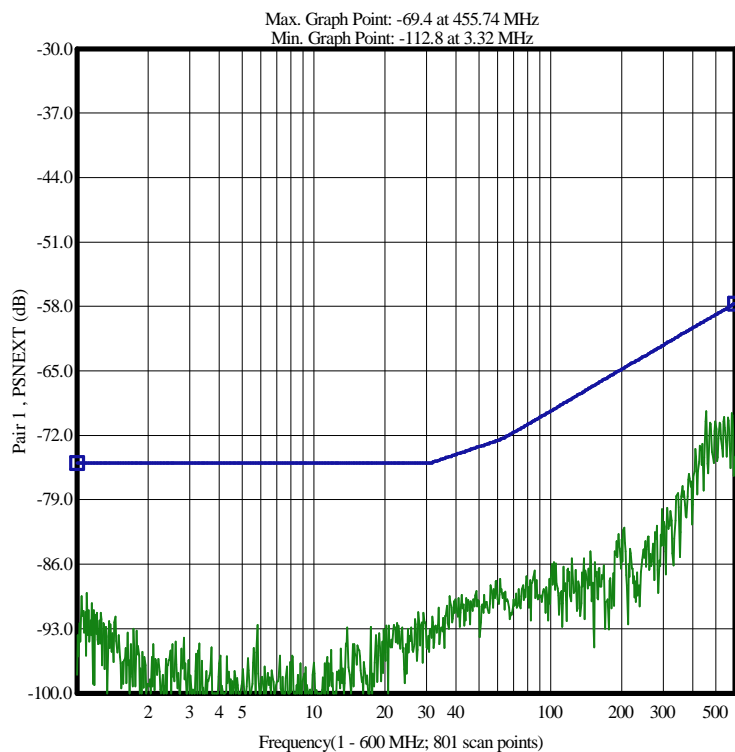
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ISTP

Summary and Graphic: Power Sum NEXT(PSNEXT)

Pair	Spec (Min)(dB)	Measured(dB)	Margin (dB)	@ Frequency (MHz)	Test Result
Pair 1 [25]	59.5	69.4	9.9	455.74	Passed
Pair 2 [26]	59.5	69.3	9.8	455.74	Passed
Pair 3 [27]	59.5	69.4	9.9	455.74	Passed
Pair 4 [28]	59.5	69.3	9.8	455.74	Passed



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NEXT SWEEP - Worst Margin (dB) (Negative sign indicates a failure.)

Dv/Rc	2	3	4
1	10.6	11.9	12.9
2	...	10.5	11.8
3	10.5

NEXT SWEEP - Worst Frequency (MHz)

Dv/Rc	2	3	4
1	456	472	452
2	...	497	456
3	456

Detail Discrete Frequencies ---Input Impedance(Zin)(Ohms)

Frequency	4.00	8.00	10.00	16.00	20.00	25.00	31.25	62.50	99.90	100.00
Max Spec	115.00	115.00	115.00	115.00	115.00	115.00	115.00	115.00	115.00	122.00
Min Spec	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	85.00	78.00
Pair 1 [25]	101.66	99.09	98.92	100.13	99.64	99.21	99.42	99.40	98.61	98.53
Pair 2 [26]	99.68	99.73	99.56	99.49	99.68	99.27	98.05	100.40	98.54	98.65
Pair 3 [27]	102.21	101.77	101.63	100.72	102.45	101.21	99.60	101.38	100.45	100.41
Pair 4 [28]	100.55	100.61	100.29	100.47	100.00	100.24	98.88	98.80	97.59	97.60

Continue:Input Impedance(Zin)(Ohms)

Frequency	125.00	155.00	199.90	200.00	250.00					
Max Spec	122.00	122.00	122.00	132.00	132.00					
Min Spec	78.00	78.00	78.00	68.00	68.00					
Pair 1 [25]	99.84	100.49	105.64	105.66	102.07					
Pair 2 [26]	100.39	101.27	103.10	103.27	104.54					
Pair 3 [27]	102.02	103.67	107.36	107.31	104.98					
Pair 4 [28]	99.79	102.30	107.30	107.23	105.51					

Detail Discrete Frequencies ---Return Loss (RL)(dB)

(Formula): $RL >= 20.0 + 5.0 * \text{Log}(f/1.0)$; $25.0 + 0.0 * \text{Log}(f/1.0)$; $25.0 + -7.0 * \text{Log}(f/20.0)$; $0.0 + 10.0 * \text{Log}(f/600.0)$; $0.0 + 0.0 * \text{Log}(f/1.0)$; Min=-17.3

Frequency	4.00	8.00	10.00	16.00	20.00	25.00	31.25	62.50	100.00	200.00
Min Spec	23.0	24.5	25.0	25.0	25.0	24.3	23.6	21.5	20.1	18.0
Pair 1 [25]	33.2	36.4	40.0	45.3	39.4	41.2	39.0	40.9	30.0	30.2
Pair 2 [26]	36.9	41.1	40.7	42.2	42.2	42.1	36.1	39.2	36.2	35.7
Pair 3 [27]	32.7	35.7	37.4	42.1	36.4	41.5	41.1	35.1	34.7	28.3
Pair 4 [28]	35.2	36.6	39.0	38.5	47.2	35.4	36.6	36.0	32.7	27.6

Continue:Return Loss (RL)(dB)

Frequency	250.00	300.00	350.00	400.00	500.00	600.00				
Min Spec	17.3	17.3	17.3	17.3	17.3	17.3				
Pair 1 [25]	31.0	31.1	28.3	29.1	28.7	28.3				
Pair 2 [26]	32.4	31.1	32.7	25.9	28.9	19.7				
Pair 3 [27]	32.3	27.6	24.3	25.7	24.3	22.9				
Pair 4 [28]	30.2	26.7	26.6	25.6	30.8	19.1				

Detail Discrete Frequencies ---Insertion Loss (IL)(dB/328.0 ft)(Curve Fit)@20C

(Formula): $IL <= [(1.800 * \text{SQRT}(f)) + (0.010 * f) + (0.200 * \text{SQRT}(f))] * 1.000 * \text{Stranded Factor}$ (Refer to manual)

Frequency	4.00	8.00	10.00	16.00	20.00	25.00	31.25	62.50	100.00	125.00
Max Spec	3.74	5.24	5.85	7.41	8.29	9.29	10.41	14.88	19.02	21.39
Pair 1 [25]	3.58	5.06	5.66	7.26	8.23	9.19	10.36	14.71	18.72	20.94
Pair 2 [26]	3.49	4.90	5.50	7.05	7.96	8.94	10.03	14.32	18.23	20.40
Pair 3 [27]	3.45	4.86	5.45	6.99	7.91	8.85	9.95	14.16	18.05	20.23
Pair 4 [28]	3.45	4.85	5.45	6.98	7.87	8.83	9.91	14.11	17.99	20.18

Continue:Insertion Loss (IL)(dB/328.0 ft)(Curve Fit)@20C

Frequency	155.00	200.00	250.00	300.00	350.00	400.00	500.00	600.00		
Max Spec	23.97	27.46	30.97	34.18	37.18	40.00	45.25	50.09		
Pair 1 [25]	23.42	26.88	30.32	33.49	36.45	39.23	44.42	49.21		
Pair 2 [26]	22.89	26.32	29.75	32.90	35.85	38.64	43.84	48.65		
Pair 3 [27]	22.71	25.89	29.23	32.29	35.15	37.86	42.88	47.53		
Pair 4 [28]	22.47	25.84	29.14	32.18	35.01	37.67	42.63	47.21		

N/A = Not Applicable.
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Detail Discrete Frequencies ---Near End Crosstalk Loss (NEXT)(dB)

Frequency	4.00	8.00	10.00	16.00	20.00	25.00	31.25	62.50	100.00	200.00
Min Spec	78.0	78.0	78.0	78.0	78.0	78.0	78.0	75.4	72.4	67.8
Pair 1 - 2	104.8	101.0	103.2	106.9	100.8	106.1	100.0	95.9	99.4	94.2
Pair 1 - 3	98.4	116.3	101.6	108.7	99.5	98.6	97.2	91.7	91.7	88.0
Pair 1 - 4	105.4	103.2	100.2	102.0	102.5	95.8	97.8	95.2	93.2	86.3
Pair 2 - 3	101.8	102.7	101.3	102.0	94.9	94.6	96.3	89.8	89.0	85.7
Pair 2 - 4	113.4	108.5	105.4	103.7	100.2	100.5	97.6	94.0	92.6	86.3
Pair 3 - 4	106.1	112.4	100.9	101.7	100.4	108.8	99.1	96.0	97.1	91.8

Continue:Near End Crosstalk Loss (NEXT)(dB)

Frequency	250.00	300.00	400.00	500.00	600.00					
Min Spec	66.4	65.2	63.3	61.9	60.7					
Pair 1 - 2	98.5	86.9	88.7	74.4	86.2					
Pair 1 - 3	87.0	86.4	82.4	76.6	76.3					
Pair 1 - 4	89.6	91.4	83.4	77.3	79.5					
Pair 2 - 3	87.4	84.5	82.4	75.5	74.3					
Pair 2 - 4	88.6	87.6	83.8	77.4	77.0					
Pair 3 - 4	98.6	87.7	98.6	74.7	87.4					

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

Frequency	1.00	4.00	8.00	10.00	16.00	20.00	25.00	31.25	62.50	100.00
Min Spec	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	72.4	69.4
Pair 1 [25]	98.0	96.8	98.4	96.7	98.6	95.7	93.5	93.3	89.1	88.9
Pair 2 [26]	95.8	99.8	98.1	98.2	97.9	92.9	93.2	92.9	87.7	87.1
Pair 3 [27]	99.8	96.3	100.5	96.4	98.3	92.7	92.9	92.5	87.0	86.7
Pair 4 [28]	97.4	102.3	101.3	96.8	96.9	95.8	94.3	93.1	90.1	88.8

Continue:Power Sum NEXT(PSNEXT)(dB)

Frequency	200.00	250.00	300.00	400.00	500.00	600.00				
Min Spec	64.8	63.4	62.2	60.3	58.9	57.7				
Pair 1 [25]	83.5	84.5	82.9	79.3	71.1	74.3				
Pair 2 [26]	82.6	84.7	81.1	79.4	70.7	72.3				
Pair 3 [27]	83.0	83.9	80.9	79.4	70.7	72.0				
Pair 4 [28]	82.6	85.1	83.8	80.4	71.5	74.8				

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