

DCM Test Report

| | | |
|--------------------------------|-----------------------------------|---|
| Cable Type : 4x2x24 x PE/PE | Factory Number : PHOENIX | Data File Name : DA097403.D3S |
| Cable I.D. : U/UTP#24X4P CABLE | Order Number : 11166 BLACK MR-2-1 | Specification File : CAT5e-305M.S3S |
| Temperature : 25.00 °C | Relative Humidity : 50 % | Test Date/Time : 11/12/2016 09:05:58 AM |
| Length : 305.00 m | Number of Pairs to Test : 4 | Operator : X 160714SM003002/R1 |
| Starting Position : 1 | | Analyzer Type : ENA |

Pass - Fail Test Certificate - 4 Pairs

High Frequency

| Test Type | Test Result |
|--|-------------|
| Input Impedance (Zin)(Ohms)(Terminated) | OK |
| Return Loss (RL)(dB) | OK |
| Insertion Loss (IL)(Curve Fit)(dB/100.0 m)@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: |
|------------|-----------|-------|

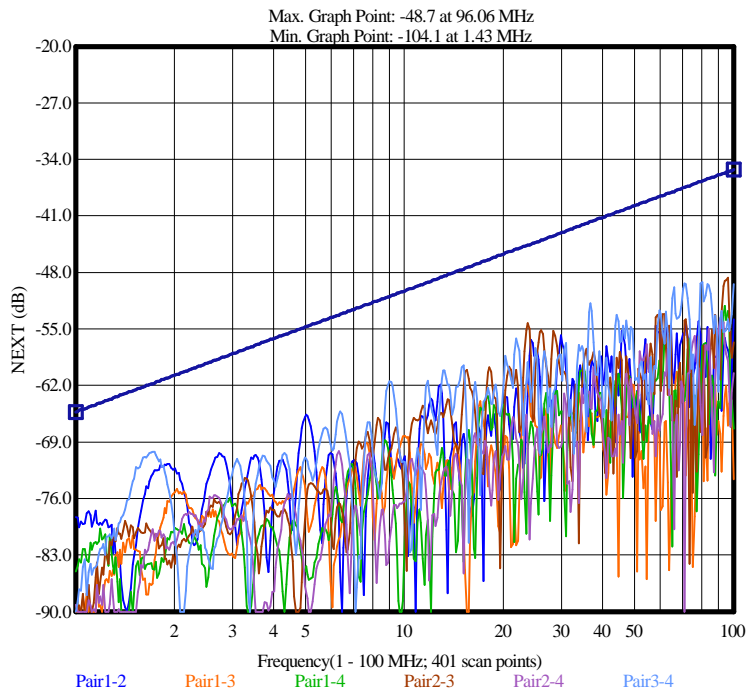
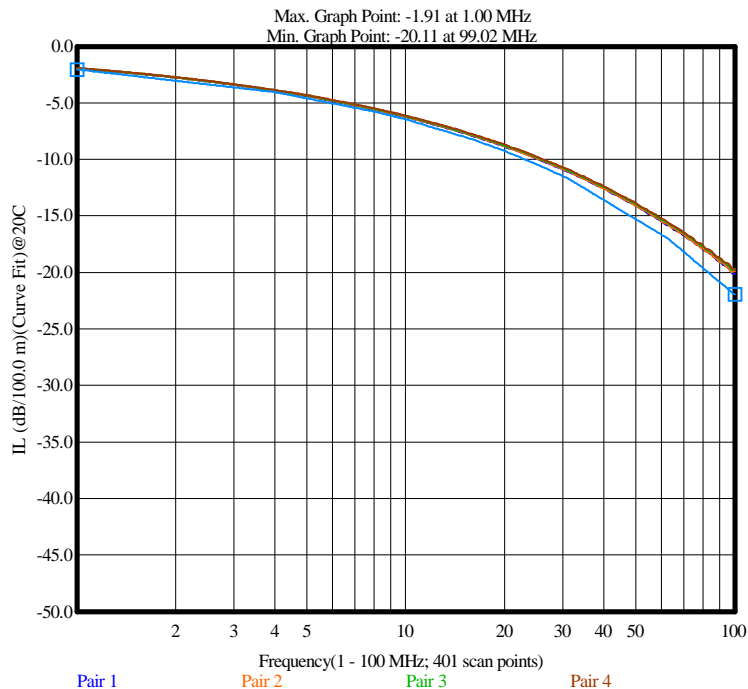
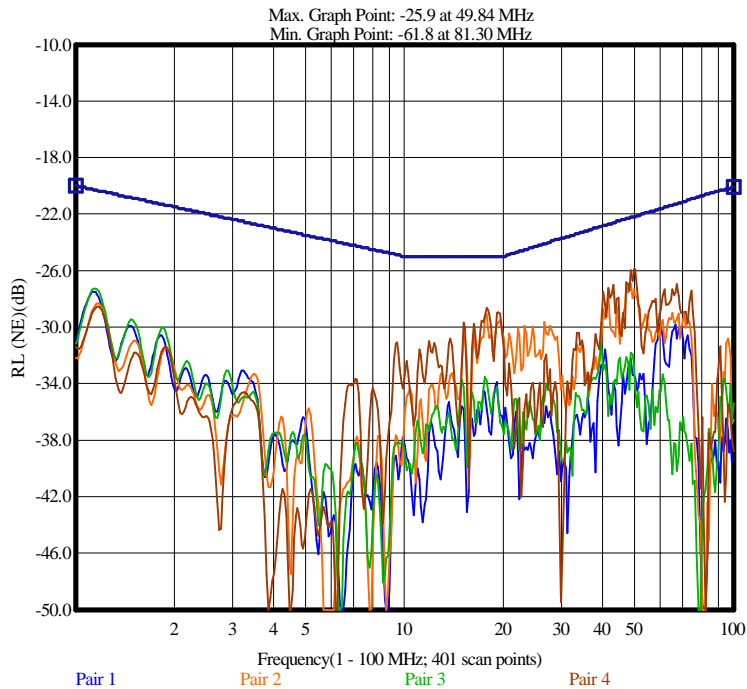
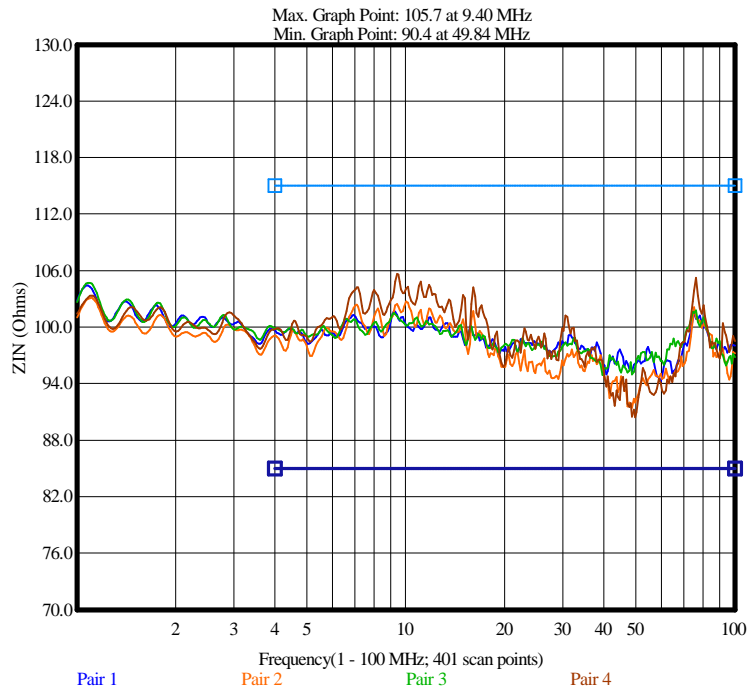
DCM Test Report

| | | |
|--------------------------------|-----------------------------------|---|
| Cable Type : 4x2x24 x PE/PE | Factory Number : PHOENIX | Data File Name : DA097403.D3S |
| Cable I.D. : U/UTP#24X4P CABLE | Order Number : 11166 BLACK MR-2-1 | Specification File : CAT5e-305M.S3S |
| Temperature : 25.00 °C | Relative Humidity : 50 % | Test Date/Time : 11/12/2016 09:05:58 AM |
| Length : 305.00 m | Number of Pairs to Test : 4 | Operator : X 160714SM003002/R1 |
| Starting Position : 1 | | Analyzer Type : ENA |

Worst Case Summary

High Frequency

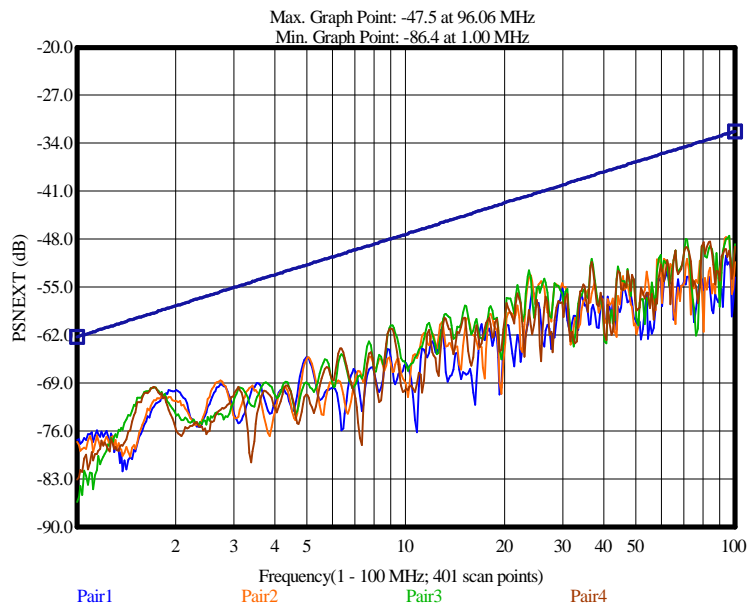
| Test Type | Specification | Measured (Pair) | Margin | @ Frequency (MHz) | Test Result |
|------------------------------------|---------------|------------------|--------|-------------------|-------------|
| Input Impedance (Zin)(Terminated) | 85.0 (Min) | 90.4 (Pair 4) | 5.4 | 49.84 | Passed |
| Input Impedance (Zin)(Terminated) | 115.0 (Max) | 105.7 (Pair 4) | 9.3 | 9.40 | Passed |
| Return Loss (RL) | 22.2 (Min) | 25.9 (Pair 4) | 3.7 | 49.84 | Passed |
| Insertion Loss (IL)(Curve Fit)@20C | 2.04 (Max) | 1.96 (Pair 1) | 0.08 | 1.00 | Passed |
| Near End Crosstalk Loss (NEXT) | 61.8 (Min) | 70.2 (Pairs 3-4) | 8.4 | 1.72 | Passed |
| Power Sum NEXT(PSNEXT) | 58.8 (Min) | 69.6 (Pair 4) | 10.8 | 1.72 | Passed |



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

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 xxx = No entry.

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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 | 8.88 | xxx | 8.69 | xxx | 8.77 | xxx | 0.065 | Passed |
| Resistance Unbalance(%) | 5.00 | 0.55 | xxx | 0.42 | xxx | 0.49 | xxx | 0.047 | Passed |
| Mutual Capacitance(nF/100.0 m)@1000Hz | 5.60 | 5.03 | xxx | 4.89 | xxx | 4.97 | xxx | 0.052 | Passed |
| Cap. Unbalance to Ground(pF/100.0 m)@1000Hz | 330.00 | 10.23 | xxx | 0.81 | xxx | 6.69 | xxx | 3.710 | 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 | 330.00 | |
| Min Spec | xxx | xxx | xxx | xxx | xxx | |
| Pair 1 [1] | 8.83 | 8.88 | 0.52 | 5.03 | 9.48 | Passed |
| Pair 2 [2] | 8.75 | 8.70 | 0.55 | 4.97 | -6.24 | Passed |
| Pair 3 [3] | 8.83 | 8.79 | 0.48 | 5.01 | 0.81 | Passed |
| Pair 4 [4] | 8.72 | 8.69 | 0.42 | 4.89 | -10.23 | Passed |

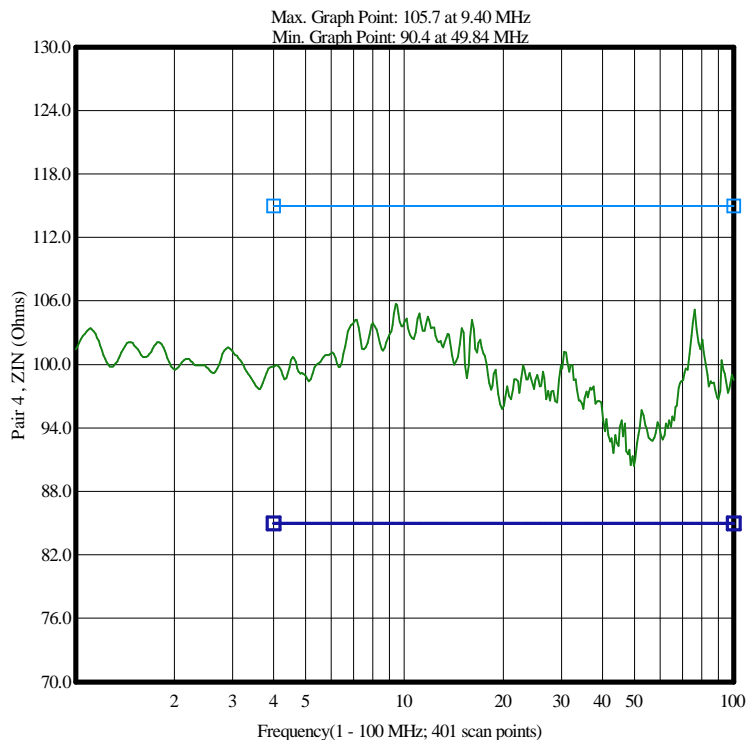
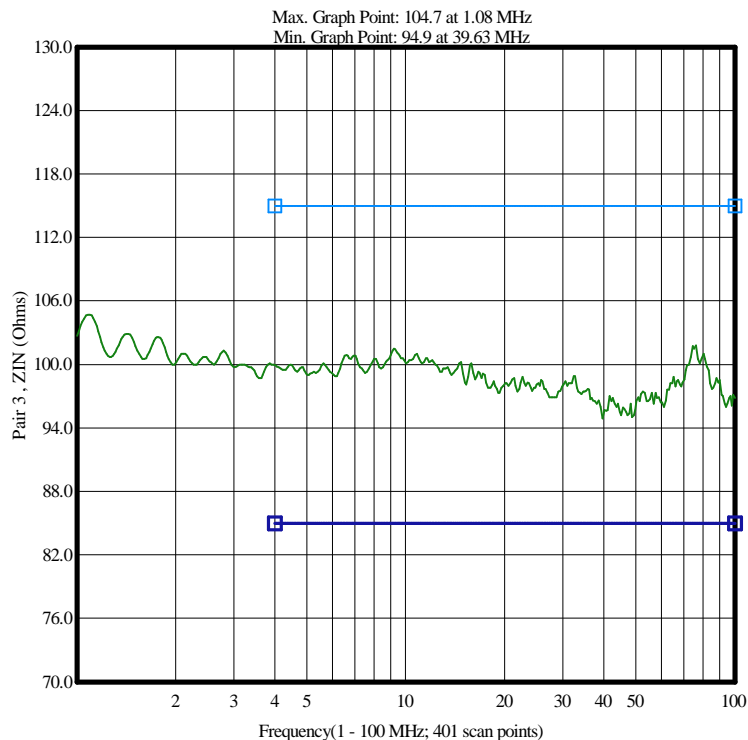
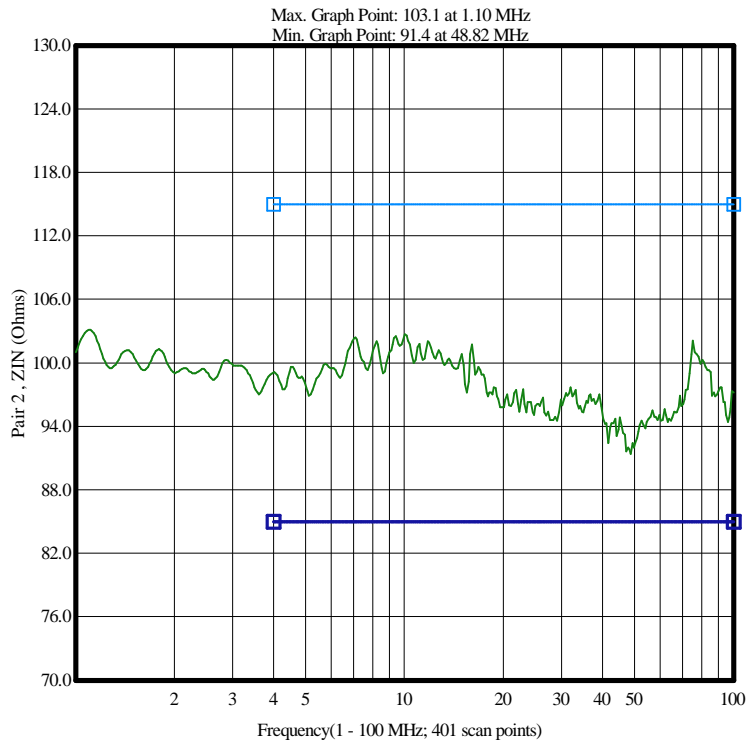
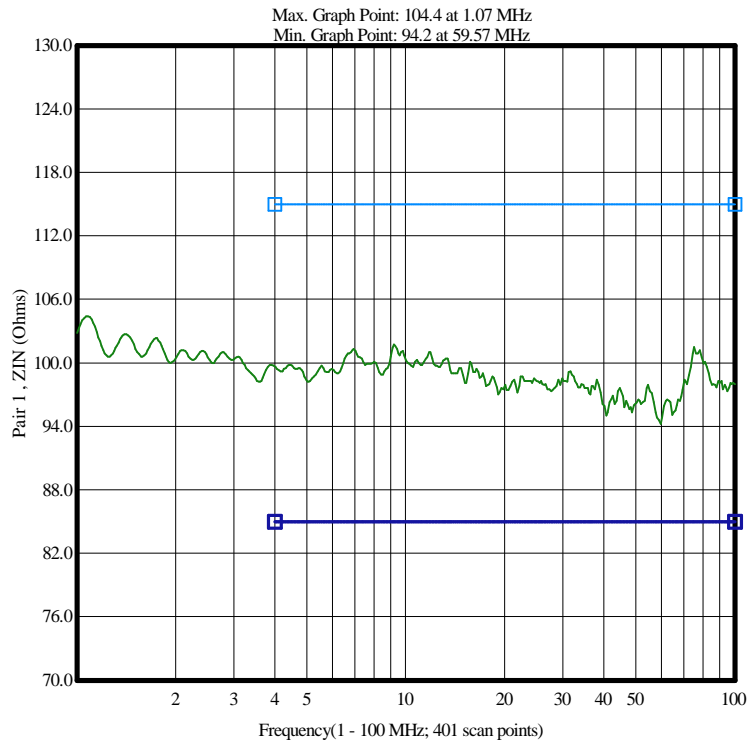
N/A = Not Applicable.
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Summary and Graphic: Input Impedance (Zin)(Terminated)

| Pair | Specification | | Measured(Ohms) | | Margin (Ohms) | | @ Frequency (MHz) | | Test Result |
|------------|---------------|---------|----------------|---------|---------------|---------|-------------------|---------|-------------|
| | Minimum | Maximum | Minimum | Maximum | Minimum | Maximum | Minimum | Maximum | |
| Pair 1 [1] | 85.0 | 115.0 | 94.2 | 101.7 | 9.2 | 13.3 | 59.57 | 9.20 | Passed |
| Pair 2 [2] | 85.0 | 115.0 | 91.4 | 102.7 | 6.4 | 12.3 | 48.82 | 10.00 | Passed |
| Pair 3 [3] | 85.0 | 115.0 | 94.9 | 101.8 | 9.9 | 13.2 | 39.63 | 76.38 | Passed |
| Pair 4 [4] | 85.0 | 115.0 | 90.4 | 105.7 | 5.4 | 9.3 | 49.84 | 9.40 | Passed |



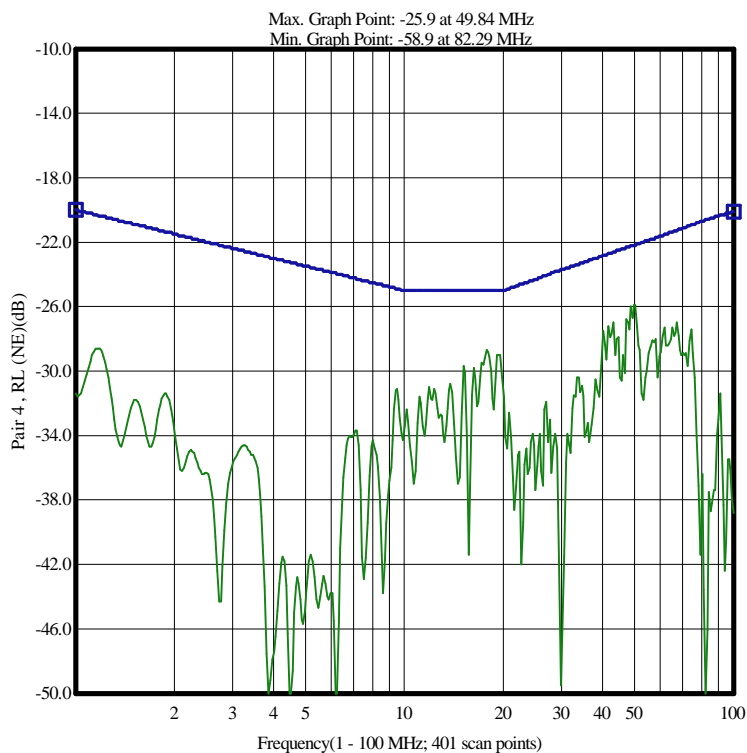
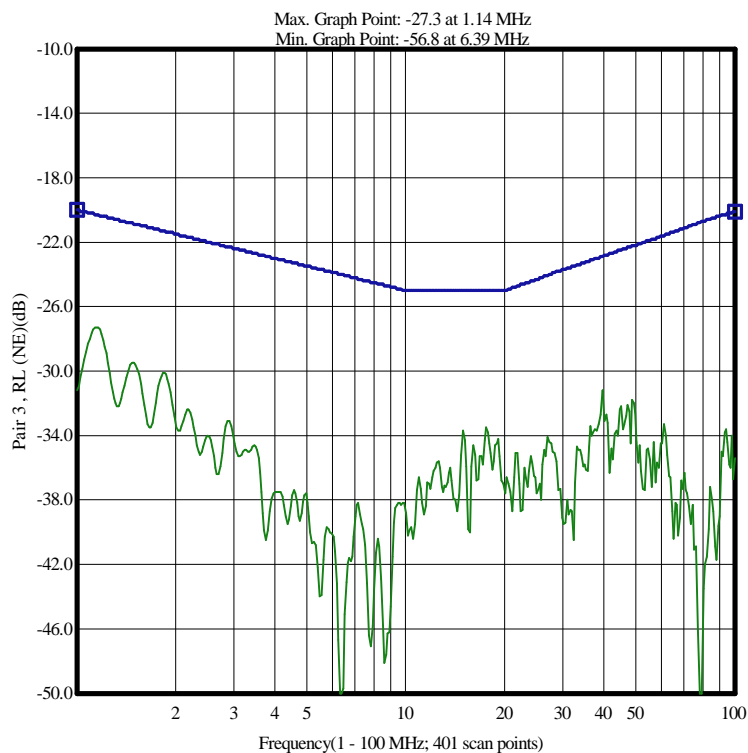
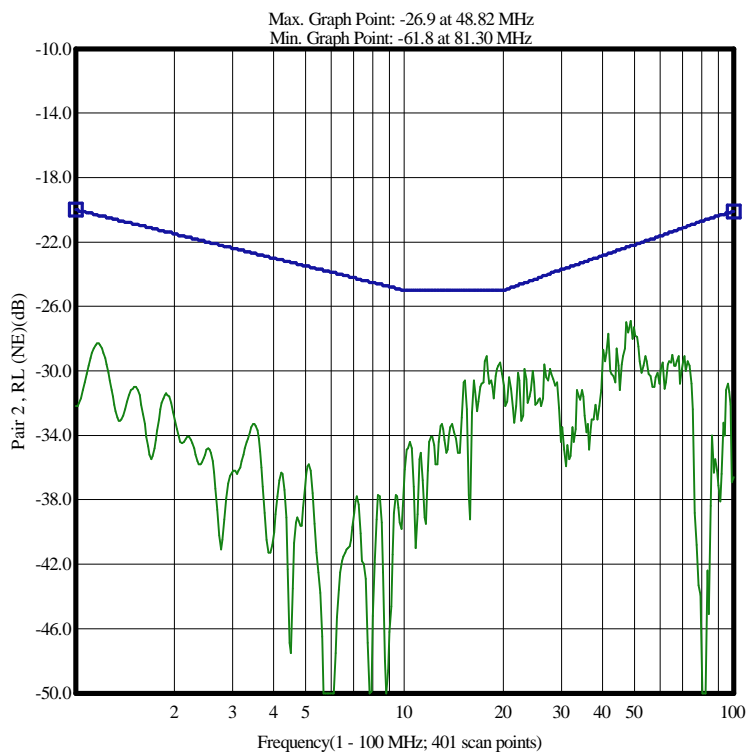
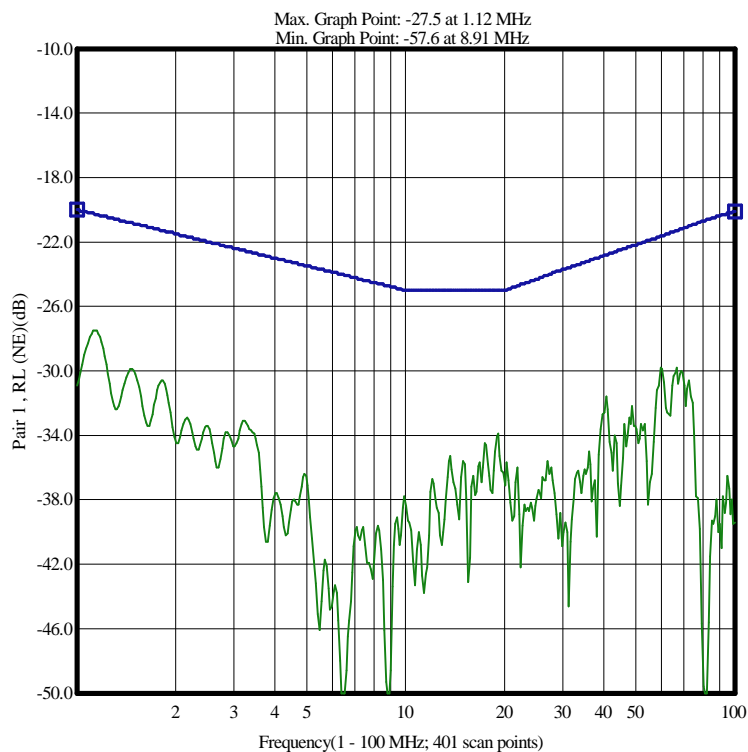
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Summary and Graphic: Return Loss (RL)

| Pair | Spec (Min)(dB) | Measured(dB) | Margin (dB) | @ Frequency (MHz) | Test Result |
|------------|----------------|--------------|-------------|-------------------|-------------|
| Pair 1 [1] | 20.3 | 27.5 | 7.2 | 1.14 | Passed |
| Pair 2 [2] | 25.0 | 29.1 | 4.1 | 17.76 | Passed |
| Pair 3 [3] | 20.3 | 27.3 | 7.0 | 1.14 | Passed |
| Pair 4 [4] | 22.2 | 25.9 | 3.7 | 49.84 | Passed |



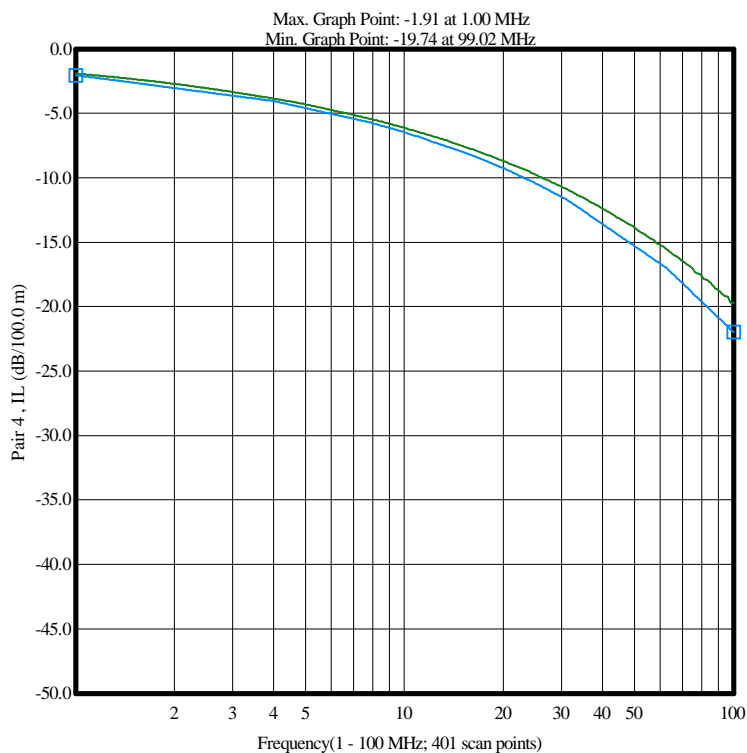
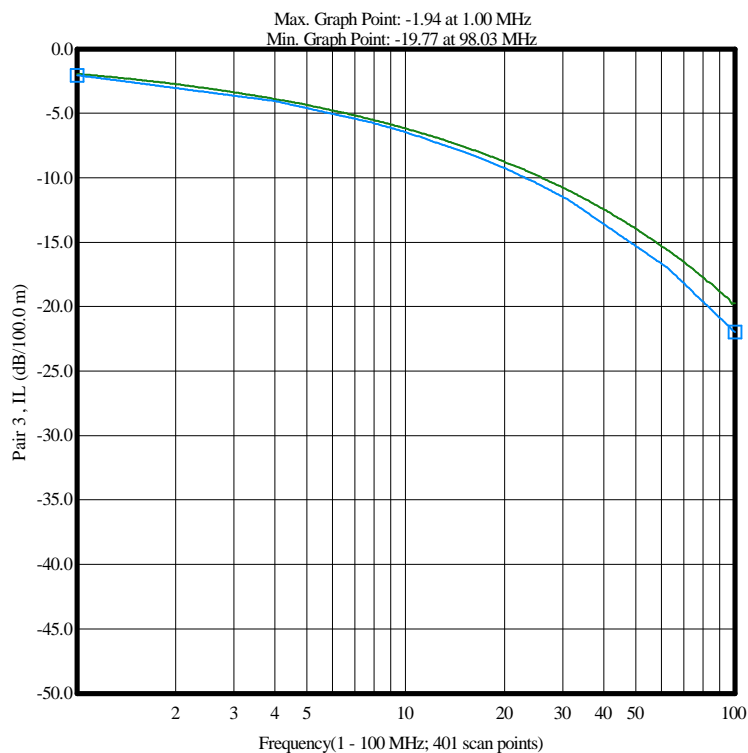
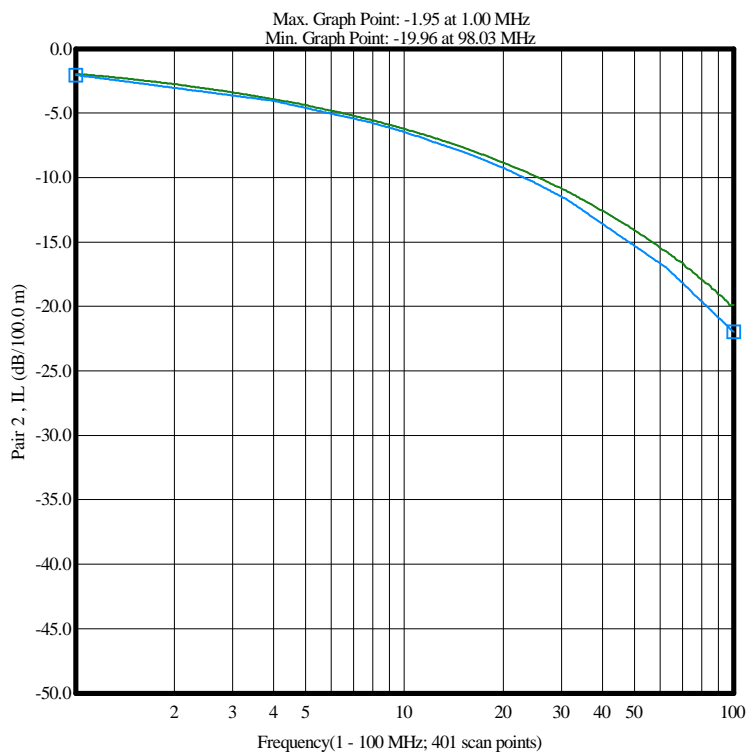
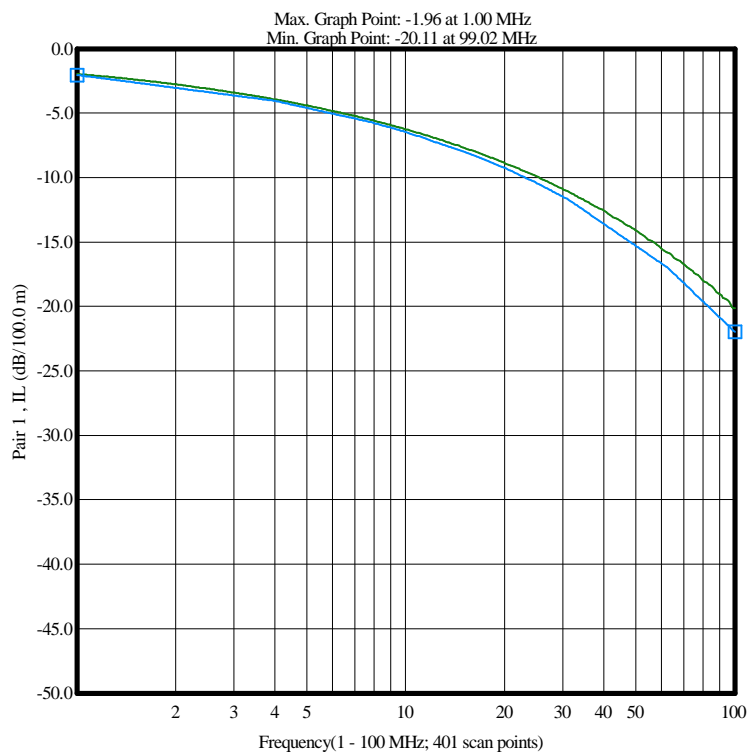
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Summary and Graphic: Insertion Loss (IL)(Curve Fit)@20C

| Pair | Spec (Max)(dB/100.0 m) | Measured(dB/100.0 m) | Margin (dB/100.0 m) | @ Frequency (MHz) | Test Result |
|------------|------------------------|----------------------|---------------------|-------------------|-------------|
| Pair 1 [1] | 2.04 | 1.96 | 0.08 | 1.00 | Passed |
| Pair 2 [2] | 2.04 | 1.95 | 0.09 | 1.00 | Passed |
| Pair 3 [3] | 2.04 | 1.94 | 0.10 | 1.00 | Passed |
| Pair 4 [4] | 2.08 | 1.95 | 0.13 | 1.03 | Passed |



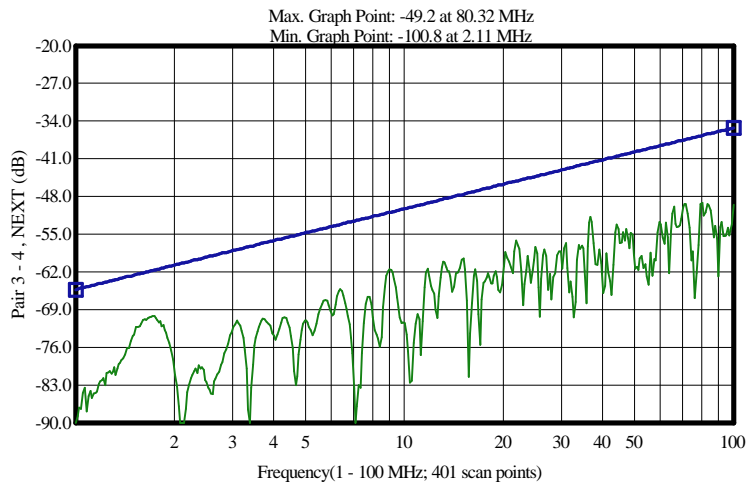
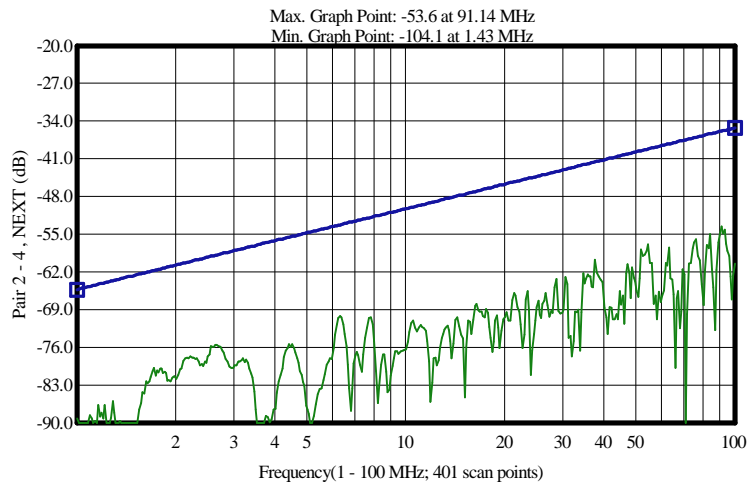
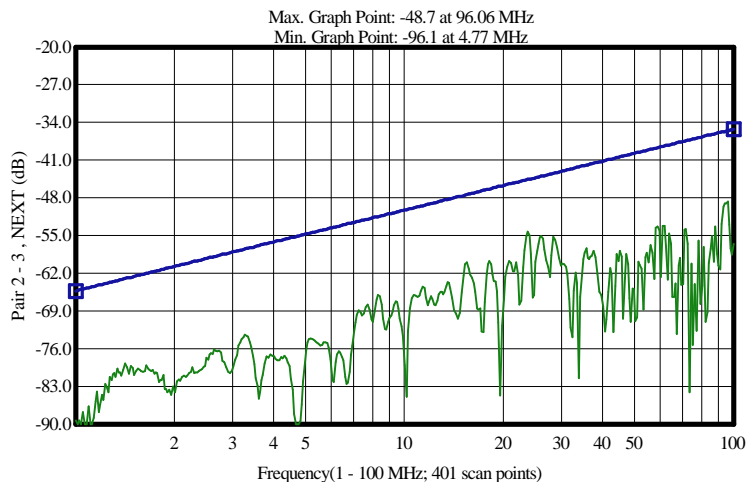
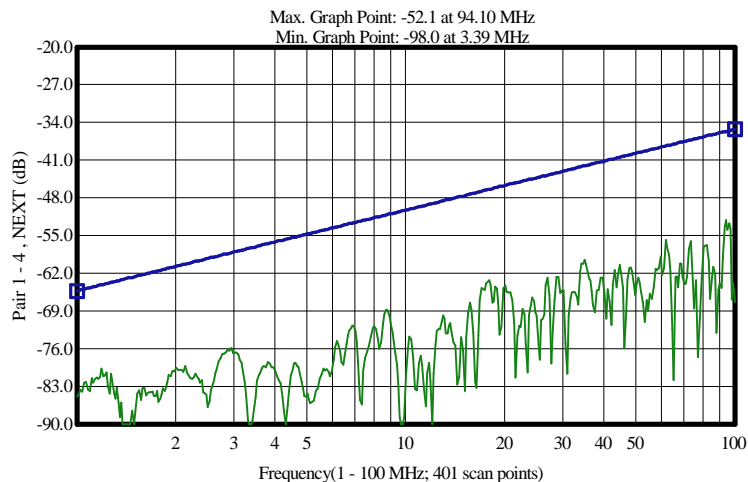
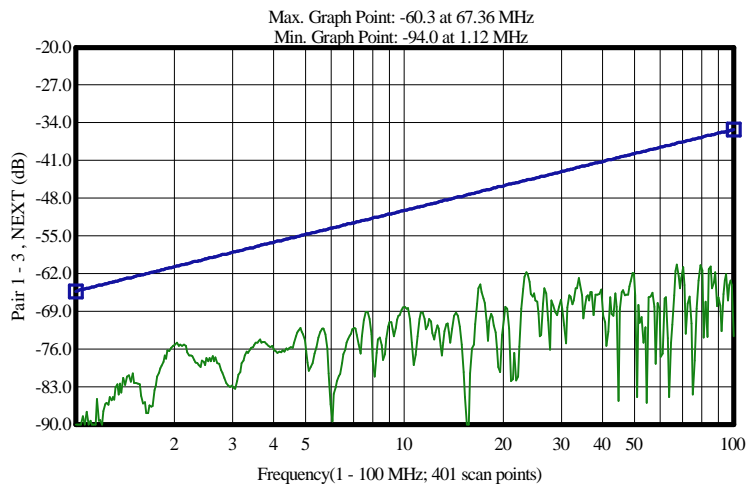
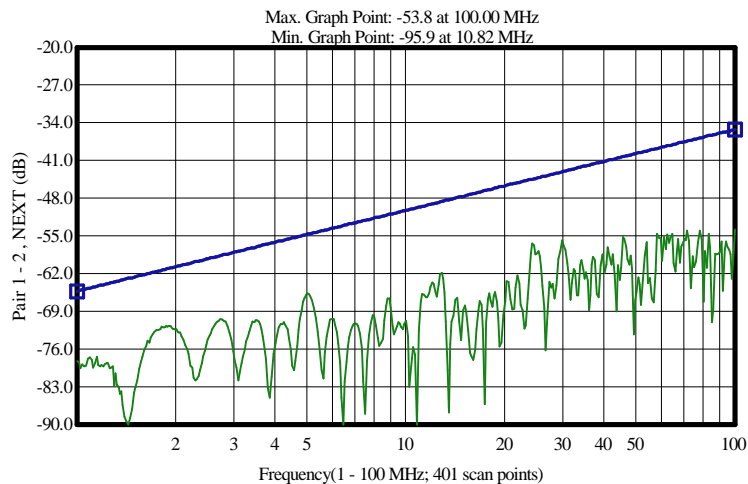
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Summary and Graphic: Near End Crosstalk Loss (NEXT)

| Pair | Spec (Min)(dB) | Measured(dB) | Margin (dB) | @ Frequency (MHz) | Test Result |
|------------|----------------|--------------|-------------|-------------------|-------------|
| Pair 1 - 2 | 61.4 | 71.9 | 10.5 | 1.81 | Passed |
| Pair 1 - 3 | 60.6 | 74.8 | 14.2 | 2.03 | Passed |
| Pair 1 - 4 | 64.2 | 79.7 | 15.5 | 1.19 | Passed |
| Pair 2 - 3 | 44.6 | 54.3 | 9.7 | 23.71 | Passed |
| Pair 2 - 4 | 58.9 | 75.6 | 16.7 | 2.63 | Passed |
| Pair 3 - 4 | 61.8 | 70.2 | 8.4 | 1.72 | Passed |



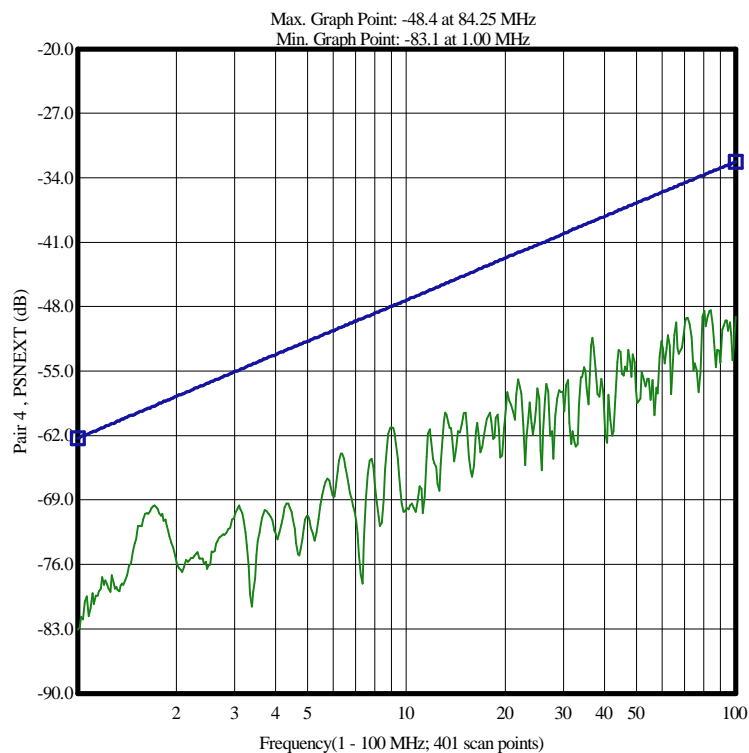
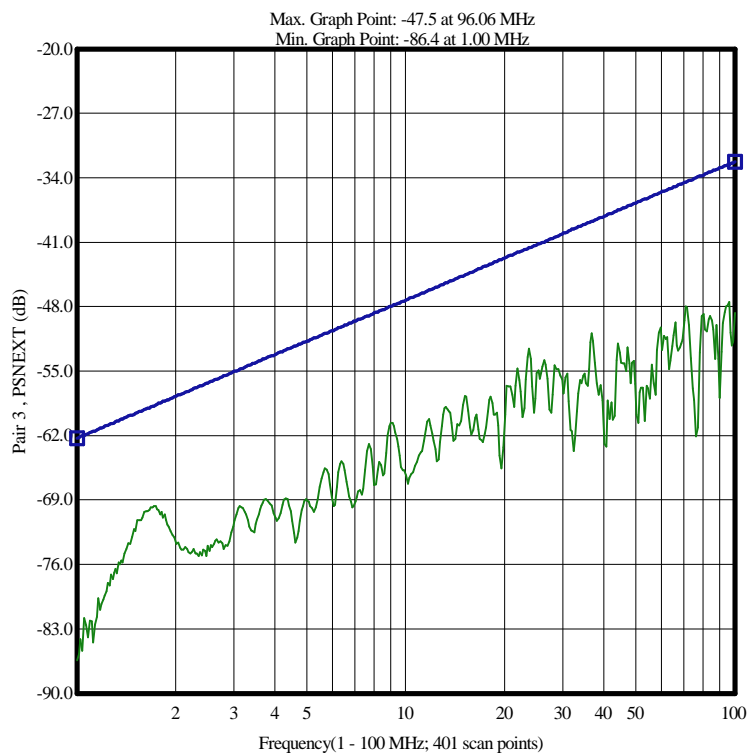
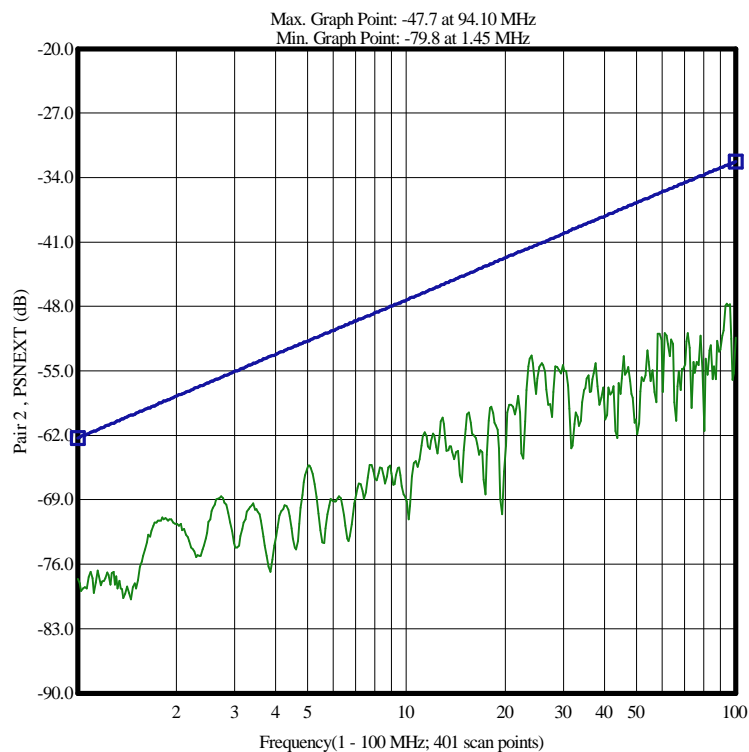
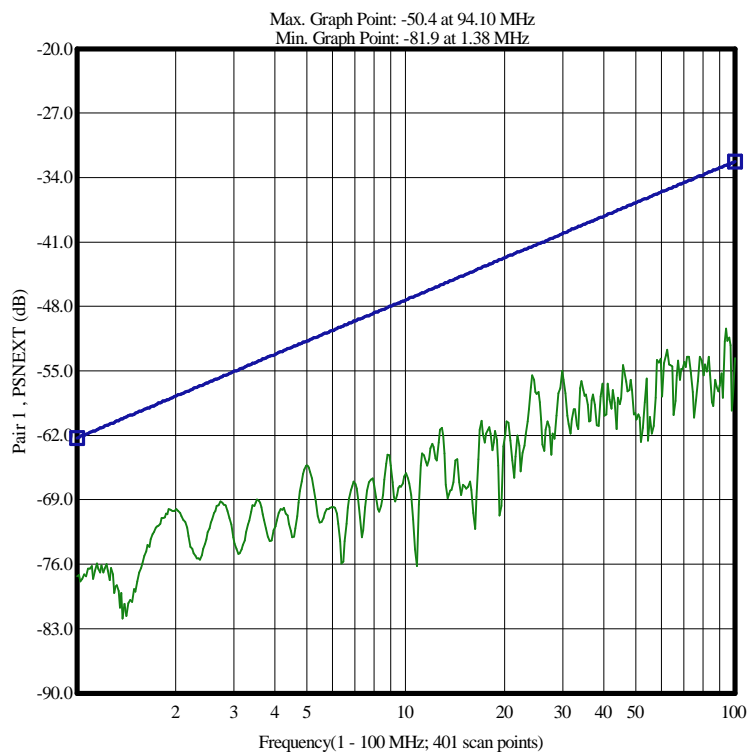
N/A = Not Applicable.
--- = Disable/Bypassed Pair.

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xxx = No entry.

*** = Measured value is invalid.

Summary and Graphic: Power Sum NEXT(PSNEXT)

| Pair | Spec (Min)(dB) | Measured(dB) | Margin (dB) | @ Frequency (MHz) | Test Result |
|------------|----------------|--------------|-------------|-------------------|-------------|
| Pair 1 [1] | 58.1 | 70.0 | 11.9 | 1.91 | Passed |
| Pair 2 [2] | 41.6 | 53.3 | 11.7 | 23.97 | Passed |
| Pair 3 [3] | 58.8 | 69.7 | 10.9 | 1.72 | Passed |
| Pair 4 [4] | 58.8 | 69.6 | 10.8 | 1.72 | Passed |



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

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xxx = No entry.

*** = Measured value is invalid.

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

| | | | | | | | | | | |
|------------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Frequency | 1.00 | 4.00 | 10.00 | 16.00 | 20.00 | 25.00 | 30.00 | 31.25 | 62.50 | 80.00 |
| Min Spec | 20.0 | 23.0 | 25.0 | 25.0 | 25.0 | 24.3 | 23.7 | 23.6 | 21.5 | 20.7 |
| Pair 1 [1] | 30.9 | 37.7 | 38.4 | 36.7 | 37.0 | 38.0 | 40.5 | 43.9 | 32.6 | 48.4 |
| Pair 2 [2] | 32.2 | 40.2 | 36.1 | 34.4 | 30.8 | 31.9 | 34.0 | 34.8 | 30.6 | 51.8 |
| Pair 3 [3] | 31.2 | 37.5 | 38.8 | 35.0 | 37.5 | 37.5 | 39.3 | 38.8 | 35.4 | 45.9 |
| Pair 4 [4] | 31.4 | 47.5 | 33.4 | 33.0 | 31.5 | 37.1 | 48.2 | 34.1 | 28.4 | 38.0 |

Continue:Return Loss (RL)(dB)

| | | | | | | | | | | |
|------------|--------|--|--|--|--|--|--|--|--|--|
| Frequency | 100.00 | | | | | | | | | |
| Min Spec | 20.1 | | | | | | | | | |
| Pair 1 [1] | 39.4 | | | | | | | | | |
| Pair 2 [2] | 36.6 | | | | | | | | | |
| Pair 3 [3] | 35.4 | | | | | | | | | |
| Pair 4 [4] | 38.8 | | | | | | | | | |

Detail Discrete Frequencies ---Insertion Loss (IL)(dB/100.0 m)(Curve Fit)@20C

| | | | | | | | | | | |
|------------|------|------|------|-------|-------|-------|-------|-------|-------|--------|
| Frequency | 1.00 | 4.00 | 8.00 | 10.00 | 16.00 | 20.00 | 25.00 | 31.25 | 62.50 | 100.00 |
| Max Spec | 2.04 | 4.05 | 5.76 | 6.46 | 8.24 | 9.26 | 10.42 | 11.72 | 16.99 | 21.97 |
| Pair 1 [1] | 1.96 | 3.94 | 5.59 | 6.26 | 7.93 | 8.88 | 9.93 | 11.11 | 15.80 | 20.11 |
| Pair 2 [2] | 1.95 | 3.93 | 5.57 | 6.23 | 7.91 | 8.85 | 9.90 | 11.08 | 15.75 | 19.91 |
| Pair 3 [3] | 1.94 | 3.90 | 5.53 | 6.18 | 7.84 | 8.78 | 9.82 | 10.99 | 15.62 | 19.75 |
| Pair 4 [4] | 1.91 | 3.87 | 5.48 | 6.14 | 7.78 | 8.70 | 9.76 | 10.90 | 15.54 | 19.70 |

Detail Discrete Frequencies ---Near End Crosstalk Loss (NEXT)(dB)

| | | | | | | | | | | |
|------------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Frequency | 1.00 | 4.00 | 10.00 | 16.00 | 20.00 | 25.00 | 30.00 | 31.25 | 62.50 | 80.00 |
| Min Spec | 65.3 | 56.2 | 50.3 | 47.2 | 45.7 | 44.3 | 43.1 | 42.8 | 38.3 | 36.7 |
| Pair 1 - 2 | 78.3 | 75.4 | 70.8 | 77.9 | 67.4 | 58.3 | 56.2 | 61.9 | 55.0 | 63.5 |
| Pair 1 - 3 | 92.3 | 76.1 | 68.2 | 77.1 | 70.8 | 66.8 | 67.6 | 69.3 | 67.5 | 61.1 |
| Pair 1 - 4 | 85.0 | 80.1 | 80.8 | 71.9 | 64.4 | 69.9 | 65.2 | 71.6 | 57.5 | 59.0 |
| Pair 2 - 3 | 89.3 | 77.5 | 79.1 | 62.7 | 67.4 | 60.6 | 60.5 | 62.0 | 57.8 | 65.4 |
| Pair 2 - 4 | 89.2 | 87.5 | 76.4 | 71.6 | 70.3 | 68.8 | 69.3 | 72.8 | 60.3 | 66.9 |
| Pair 3 - 4 | 92.9 | 73.8 | 71.5 | 69.3 | 61.3 | 57.7 | 59.6 | 60.6 | 53.3 | 49.2 |

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

| | | | | | | | | | | |
|------------|--------|--|--|--|--|--|--|--|--|--|
| Frequency | 100.00 | | | | | | | | | |
| Min Spec | 35.3 | | | | | | | | | |
| Pair 1 - 2 | 53.8 | | | | | | | | | |
| Pair 1 - 3 | 73.6 | | | | | | | | | |
| Pair 1 - 4 | 67.4 | | | | | | | | | |
| Pair 2 - 3 | 56.6 | | | | | | | | | |
| Pair 2 - 4 | 60.5 | | | | | | | | | |
| Pair 3 - 4 | 49.5 | | | | | | | | | |

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

| | | | | | | | | | | |
|------------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| Frequency | 1.00 | 4.00 | 10.00 | 16.00 | 20.00 | 25.00 | 30.00 | 31.25 | 62.50 | 80.00 |
| Min Spec | 62.3 | 53.2 | 47.3 | 44.2 | 42.7 | 41.3 | 40.1 | 39.8 | 35.3 | 33.7 |
| Pair 1 [1] | 77.3 | 72.0 | 66.1 | 69.7 | 62.0 | 57.5 | 55.4 | 60.7 | 52.9 | 55.0 |
| Pair 2 [2] | 77.6 | 73.2 | 69.2 | 61.9 | 63.4 | 56.0 | 54.7 | 58.7 | 52.3 | 59.4 |
| Pair 3 [3] | 86.4 | 70.8 | 66.3 | 61.5 | 60.0 | 55.5 | 56.6 | 57.9 | 51.8 | 48.9 |
| Pair 4 [4] | 83.1 | 72.7 | 69.9 | 65.6 | 59.2 | 57.1 | 58.2 | 59.9 | 51.3 | 48.7 |

Continue:Power Sum NEXT(PSNEXT)(dB)

| | | | | | | | | | | |
|------------|--------|--|--|--|--|--|--|--|--|--|
| Frequency | 100.00 | | | | | | | | | |
| Min Spec | 32.3 | | | | | | | | | |
| Pair 1 [1] | 53.6 | | | | | | | | | |
| Pair 2 [2] | 51.4 | | | | | | | | | |
| Pair 3 [3] | 48.7 | | | | | | | | | |
| Pair 4 [4] | 49.1 | | | | | | | | | |

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