

DCM Test Report

| | | |
|--------------------------------|-------------------------------------|---|
| Cable Type : 4x2x24 x PE/LSZH | Factory Number : PHOENIX | Data File Name : DA060461.D3S |
| Cable I.D. : U/UTP#24X4P CABLE | Order Number : 5164 VI-15 190516520 | Specification File : CAT5e-305M.S3S |
| Temperature : 25.00 °C | Relative Humidity : 50 % | Test Date/Time : 05/07/2019 01:01:59 AM |
| Length : 305.00 m | Number of Pairs to Test : 4 | Operator : L 190504WE601004/3 |
| Starting Position : 21 | | 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: |
|------------|-----------|-------|

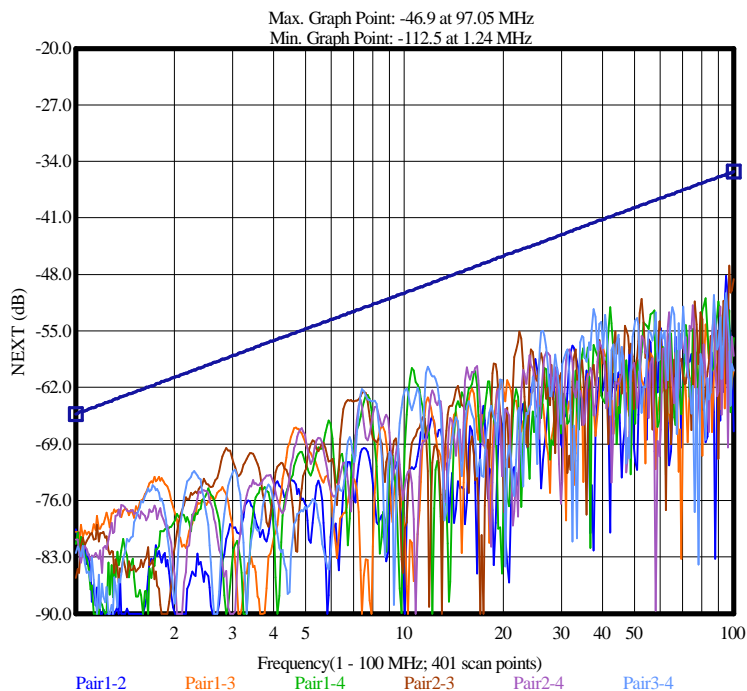
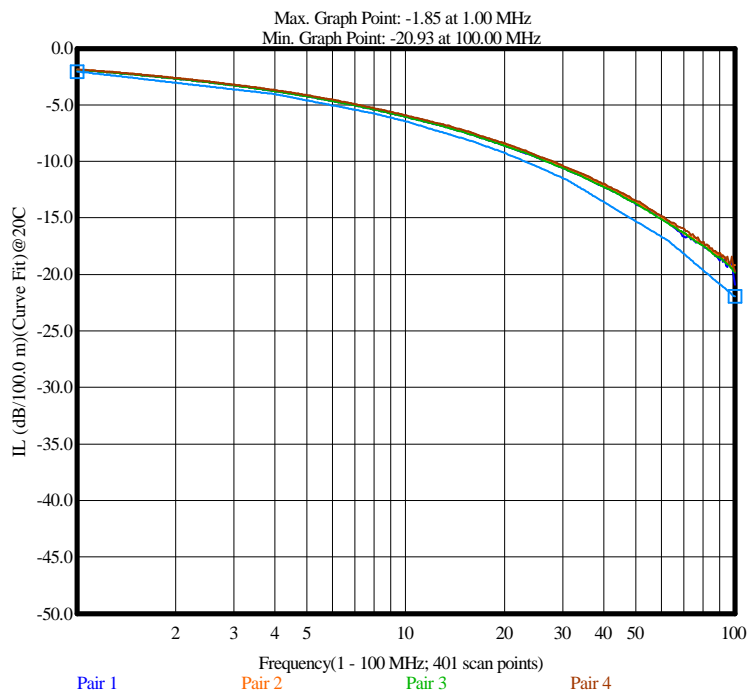
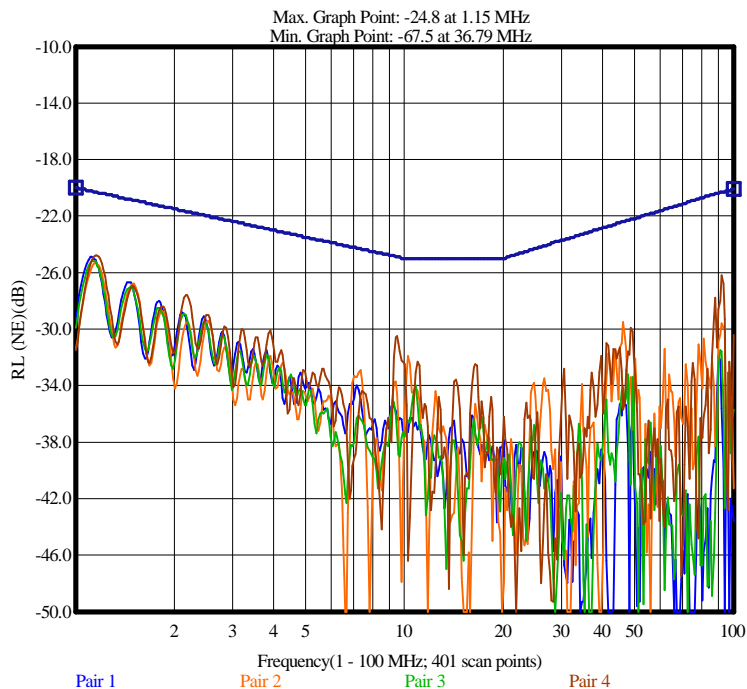
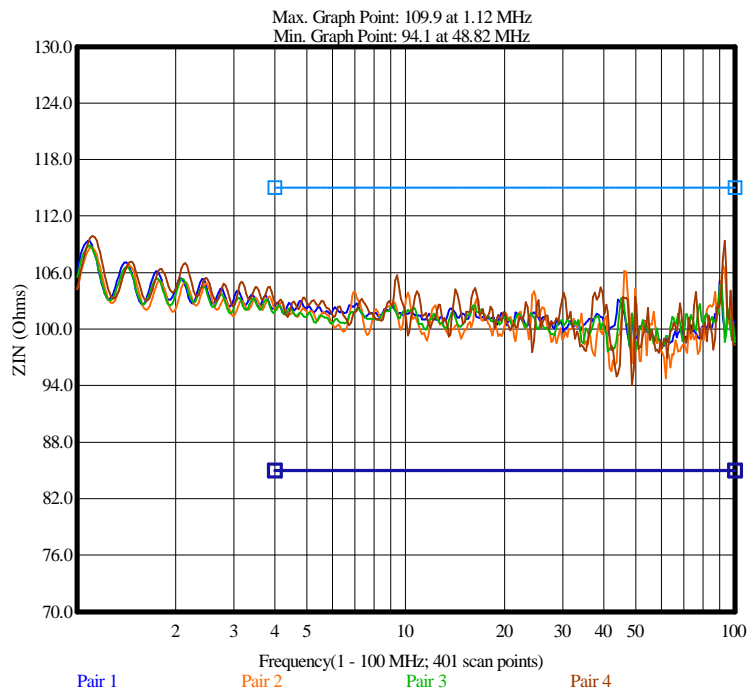
DCM Test Report

| | | |
|--------------------------------|-------------------------------------|---|
| Cable Type : 4x2x24 x PE/LSZH | Factory Number : PHOENIX | Data File Name : DA060461.D3S |
| Cable I.D. : U/UTP#24X4P CABLE | Order Number : 5164 VI-15 190516520 | Specification File : CAT5e-305M.S3S |
| Temperature : 25.00 °C | Relative Humidity : 50 % | Test Date/Time : 05/07/2019 01:01:59 AM |
| Length : 305.00 m | Number of Pairs to Test : 4 | Operator : L 190504WE601004/3 |
| Starting Position : 21 | | Analyzer Type : ENA |

Worst Case Summary

High Frequency

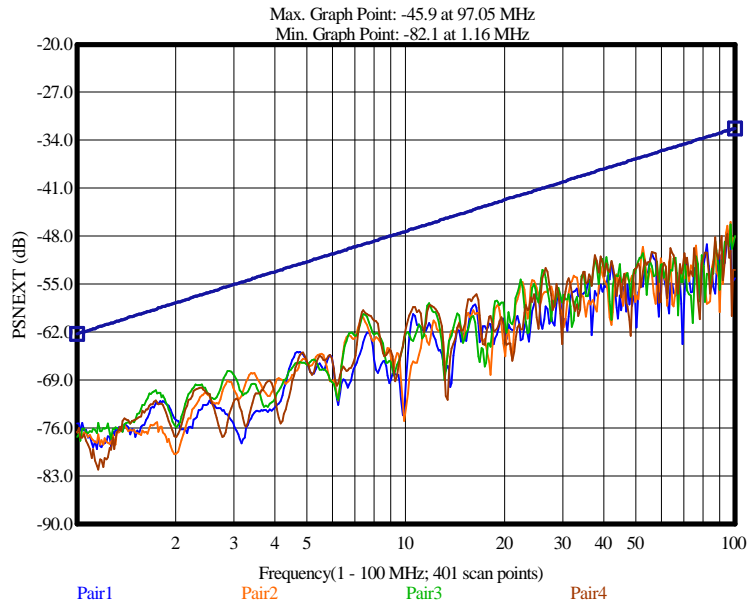
| Test Type | Specification | Measured (Pair) | Margin | @ Frequency (MHz) | Test Result |
|------------------------------------|---------------|------------------|--------|-------------------|-------------|
| Input Impedance (Zin)(Terminated) | 85.0 (Min) | 94.1 (Pair 4) | 9.1 | 48.82 | Passed |
| Input Impedance (Zin)(Terminated) | 115.0 (Max) | 109.4 (Pair 4) | 5.6 | 93.11 | Passed |
| Return Loss (RL) | 20.3 (Min) | 24.8 (Pair 4) | 4.5 | 1.15 | Passed |
| Insertion Loss (IL)(Curve Fit)@20C | 2.04 (Max) | 1.90 (Pair 1) | 0.14 | 1.00 | Passed |
| Near End Crosstalk Loss (NEXT) | 50.0 (Min) | 59.6 (Pairs 1-4) | 9.6 | 10.54 | Passed |
| Power Sum NEXT(PSNEXT) | 49.2 (Min) | 58.8 (Pair 4) | 9.6 | 7.44 | Passed |



N/A = Not Applicable.
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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 | 9.07 | xxx | 8.81 | xxx | 8.93 | xxx | 0.086 | Passed |
| Resistance Unbalance(%) | 5.00 | 0.72 | xxx | 0.44 | xxx | 0.56 | xxx | 0.108 | Passed |
| Mutual Capacitance(nF/100.0 m)@1000Hz | 5.60 | 4.99 | xxx | 4.85 | xxx | 4.93 | xxx | 0.059 | Passed |
| Cap. Unbalance to Ground(pF/100.0 m)@1000Hz | 330.00 | 32.84 | xxx | 4.90 | xxx | 12.65 | xxx | 11.675 | 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 [21] | 9.07 | 9.00 | 0.72 | 4.99 | -32.84 | Passed |
| Pair 2 [22] | 8.88 | 8.84 | 0.44 | 4.89 | -6.18 | |
| Pair 3 [23] | 9.00 | 8.94 | 0.60 | 4.98 | -6.69 | |
| Pair 4 [24] | 8.85 | 8.81 | 0.48 | 4.85 | -4.90 | |

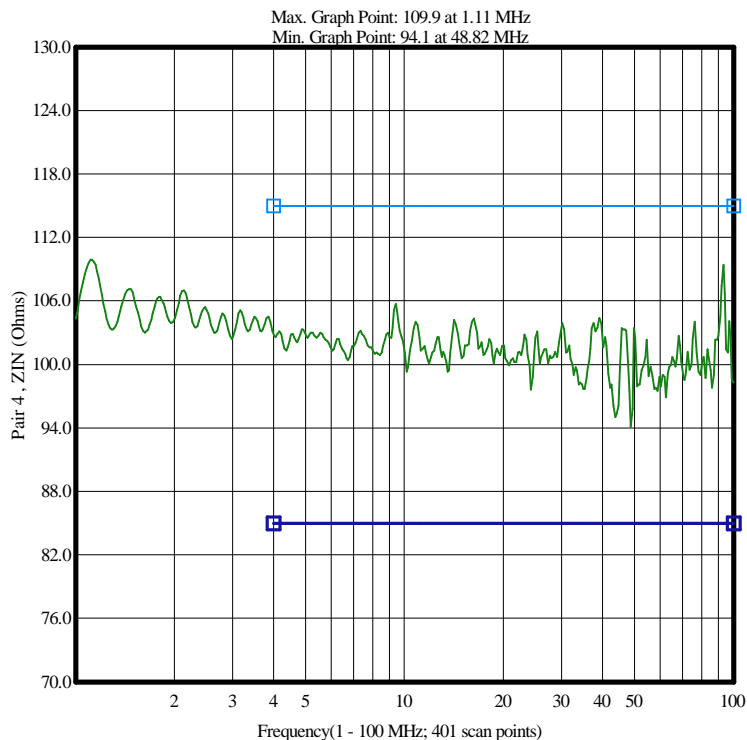
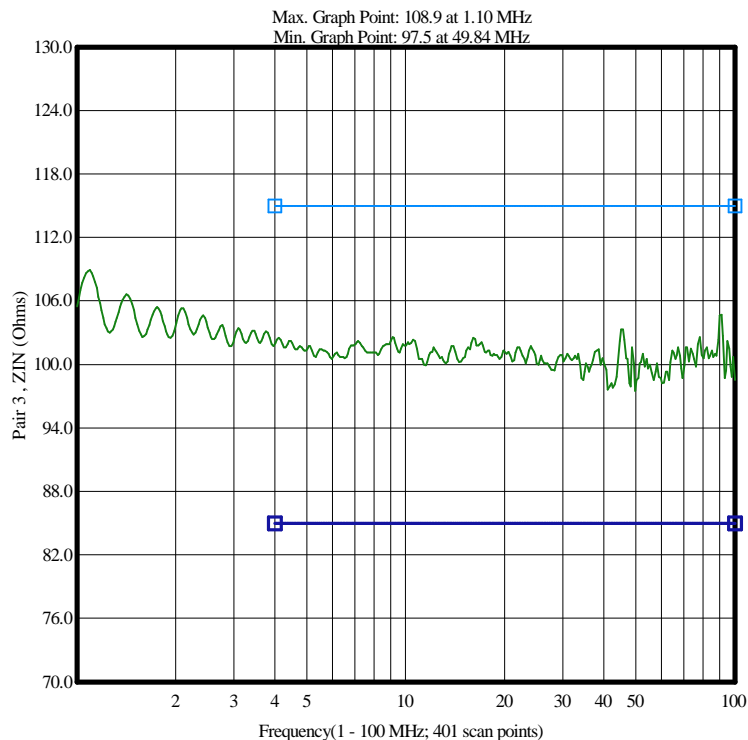
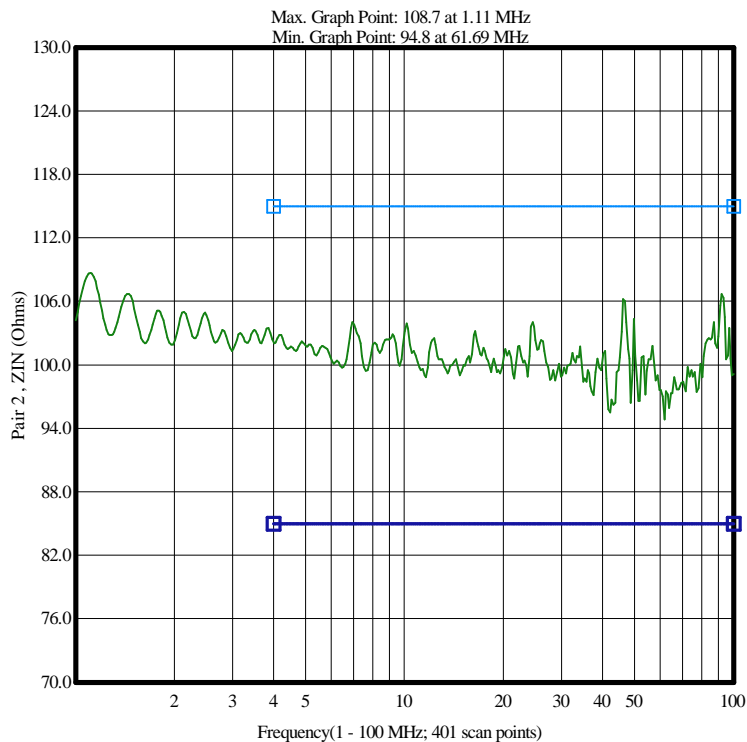
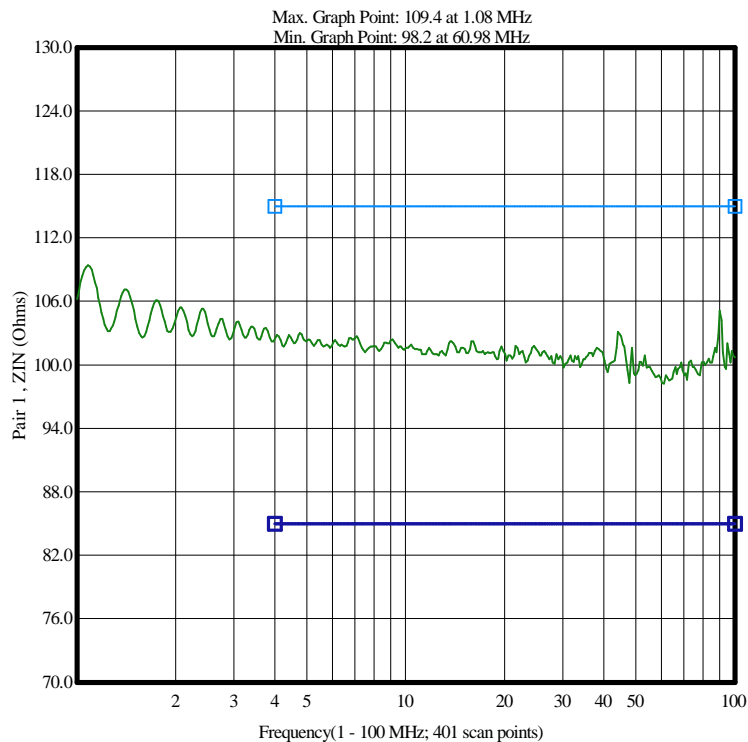
N/A = Not Applicable.
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Summary and Graphic: Input Impedance (Zin)(Terminated)

| Pair | Specification | | Measured(Ohms) | | Margin (Ohms) | | @ Frequency (MHz) | | Test Result |
|-------------|---------------|---------|----------------|---------|---------------|---------|-------------------|---------|-------------|
| | Minimum | Maximum | Minimum | Maximum | Minimum | Maximum | Minimum | Maximum | |
| Pair 1 [21] | 85.0 | 115.0 | 98.2 | 105.1 | 13.2 | 9.9 | 60.98 | 90.16 | Passed |
| Pair 2 [22] | 85.0 | 115.0 | 94.8 | 106.7 | 9.8 | 8.3 | 61.69 | 92.13 | Passed |
| Pair 3 [23] | 85.0 | 115.0 | 97.5 | 104.7 | 12.5 | 10.3 | 49.84 | 91.14 | Passed |
| Pair 4 [24] | 85.0 | 115.0 | 94.1 | 109.4 | 9.1 | 5.6 | 48.82 | 93.11 | Passed |



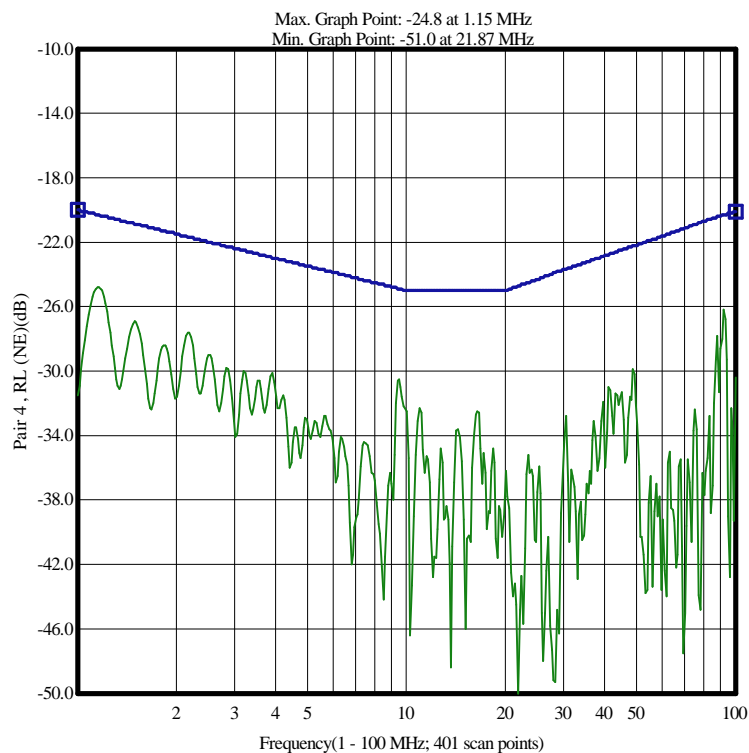
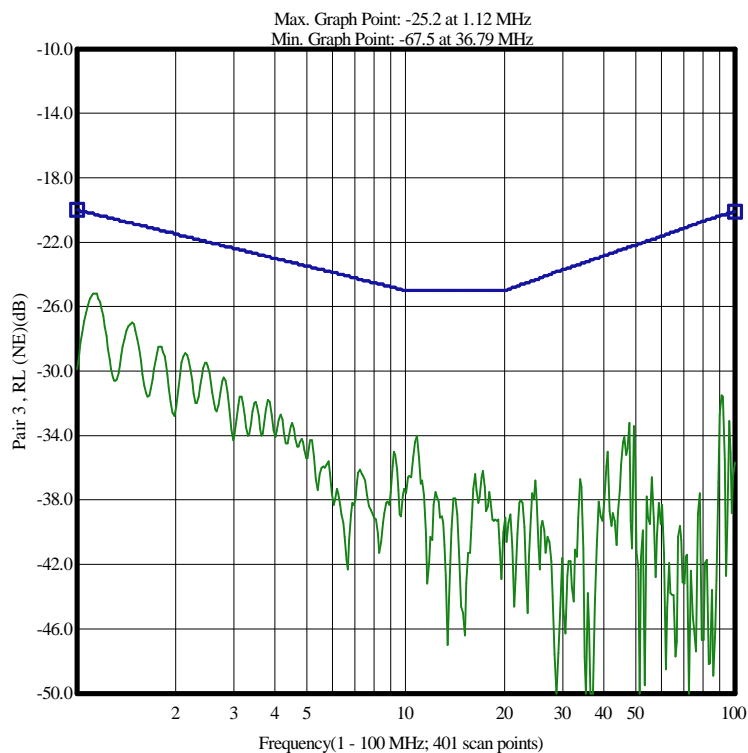
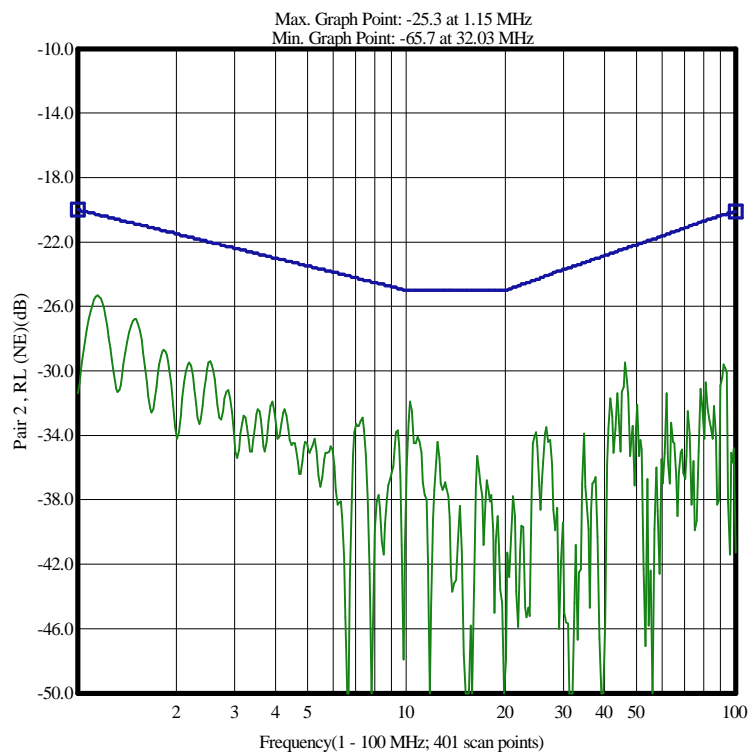
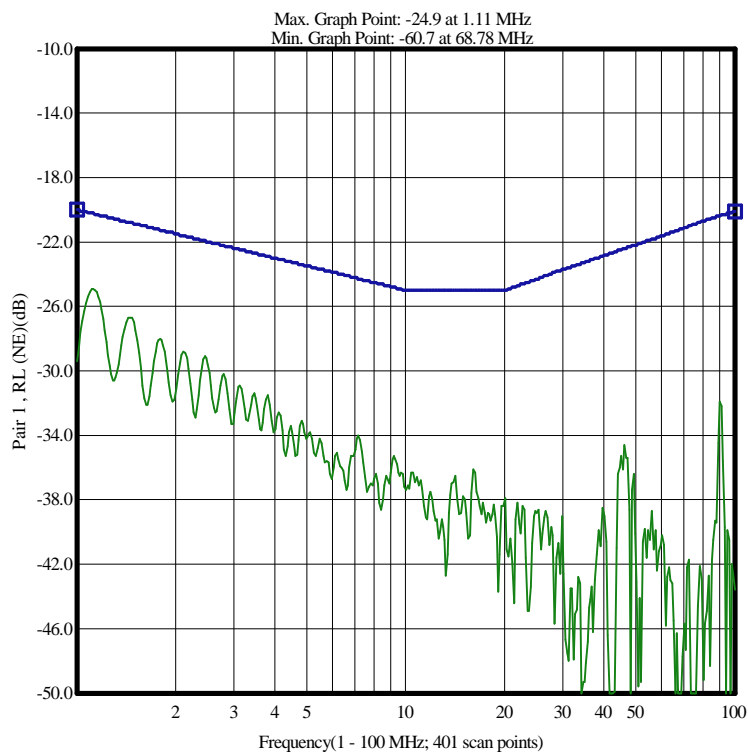
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Summary and Graphic: Return Loss (RL)

| Pair | Spec (Min)(dB) | Measured(dB) | Margin (dB) | @ Frequency (MHz) | Test Result |
|-------------|----------------|--------------|-------------|-------------------|-------------|
| Pair 1 [21] | 20.2 | 24.9 | 4.7 | 1.11 | Passed |
| Pair 2 [22] | 20.3 | 25.3 | 5.0 | 1.15 | Passed |
| Pair 3 [23] | 20.3 | 25.2 | 4.9 | 1.14 | Passed |
| Pair 4 [24] | 20.3 | 24.8 | 4.5 | 1.15 | Passed |



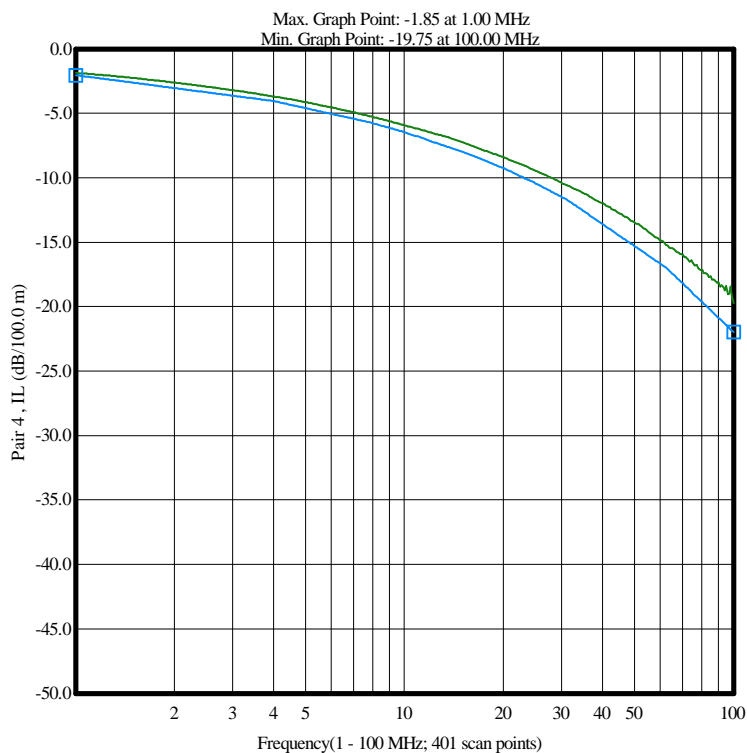
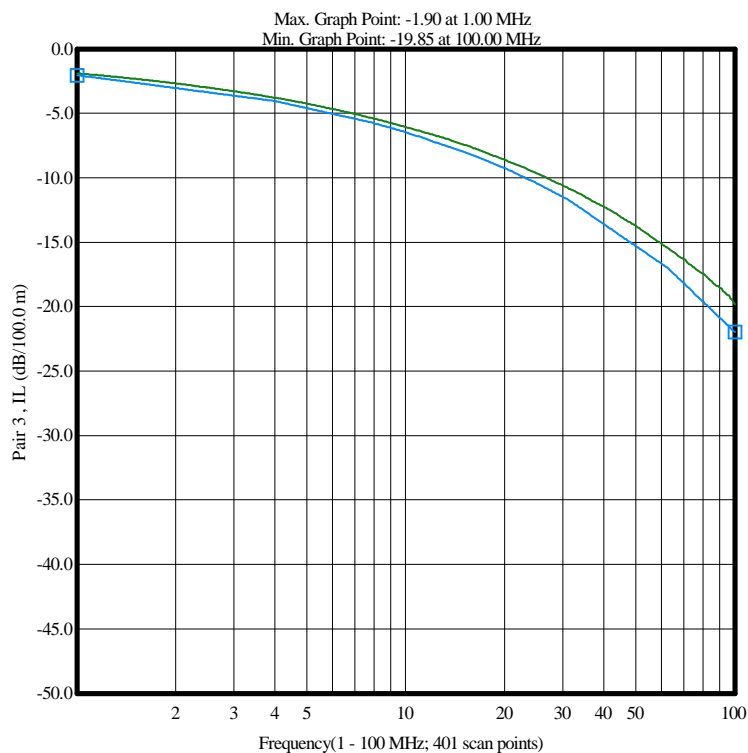
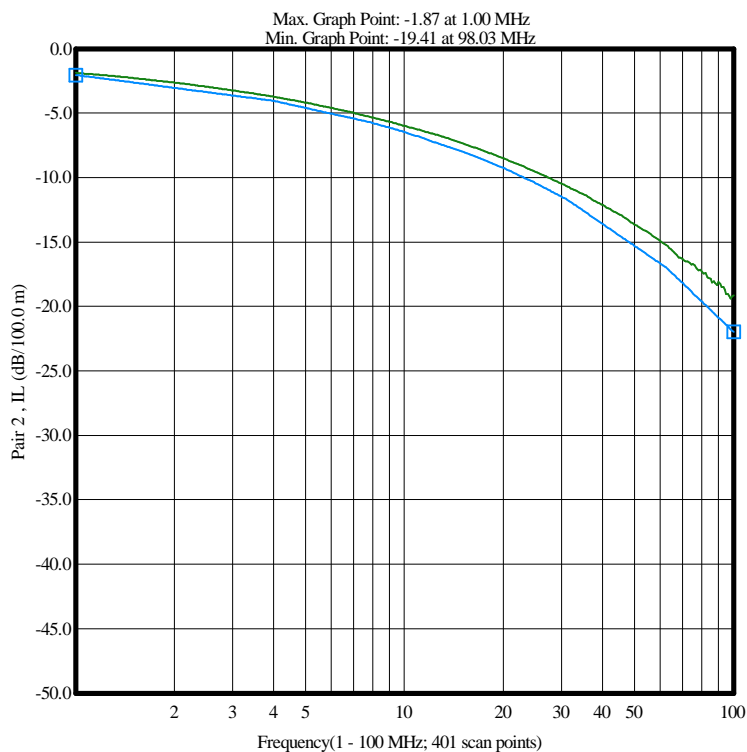
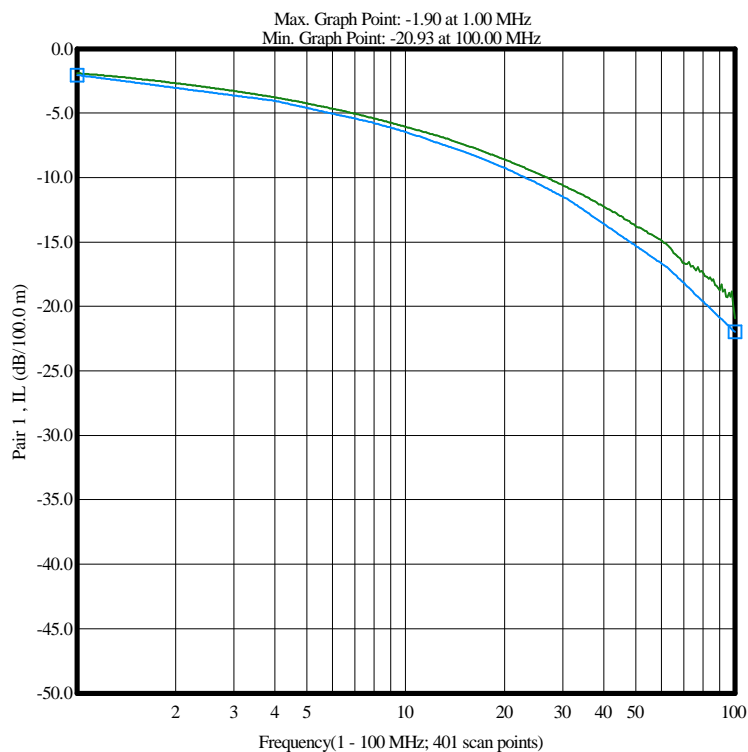
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Summary and Graphic: Insertion Loss (IL)(Curve Fit)@20C

| Pair | Spec (Max)(dB/100.0 m) | Measured(dB/100.0 m) | Margin (dB/100.0 m) | @ Frequency (MHz) | Test Result |
|-------------|------------------------|----------------------|---------------------|-------------------|-------------|
| Pair 1 [21] | 2.04 | 1.90 | 0.14 | 1.00 | Passed |
| Pair 2 [22] | 2.04 | 1.87 | 0.17 | 1.00 | Passed |
| Pair 3 [23] | 2.04 | 1.90 | 0.14 | 1.00 | Passed |
| Pair 4 [24] | 2.04 | 1.85 | 0.19 | 1.00 | Passed |



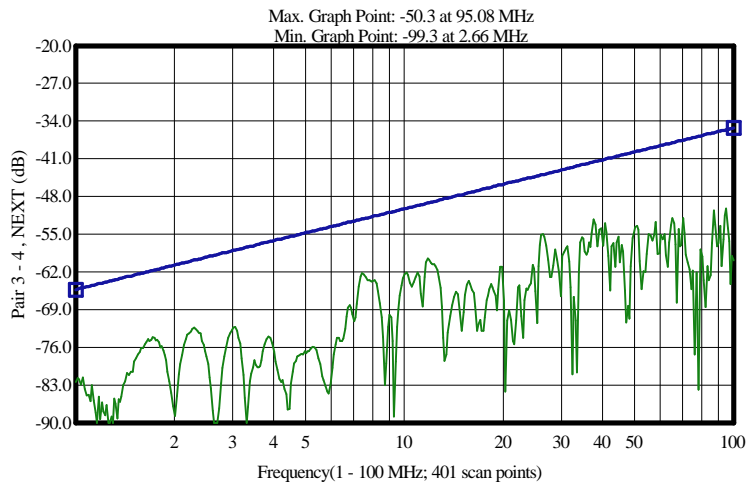
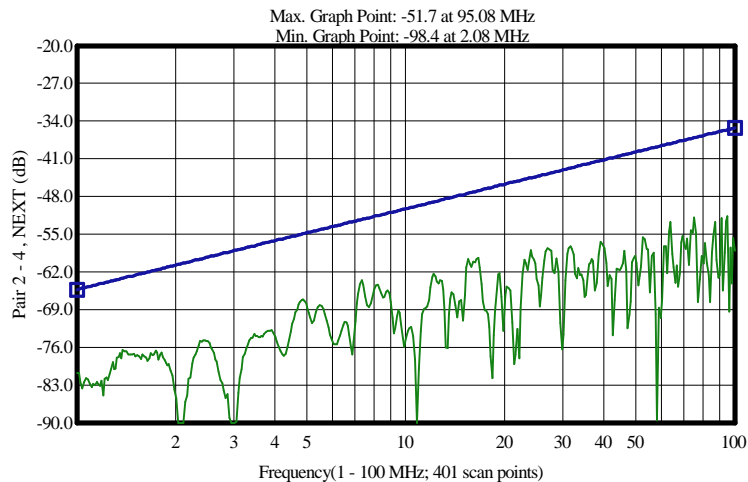
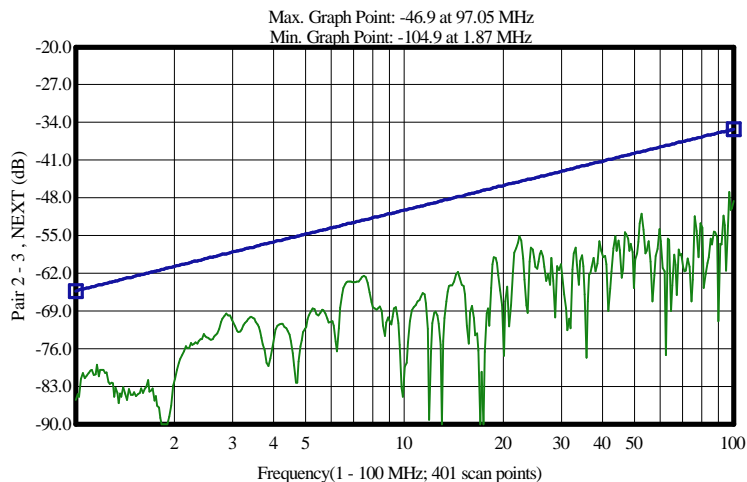
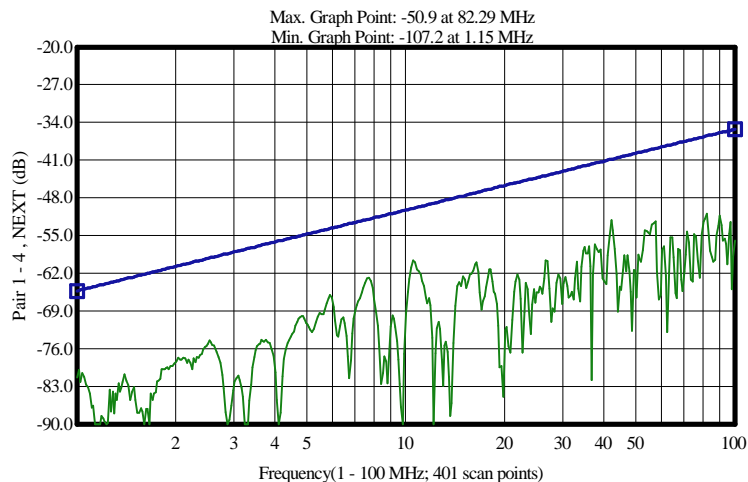
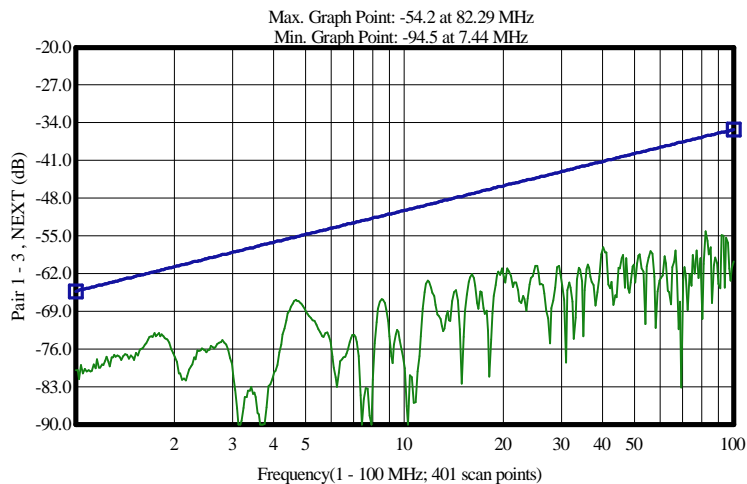
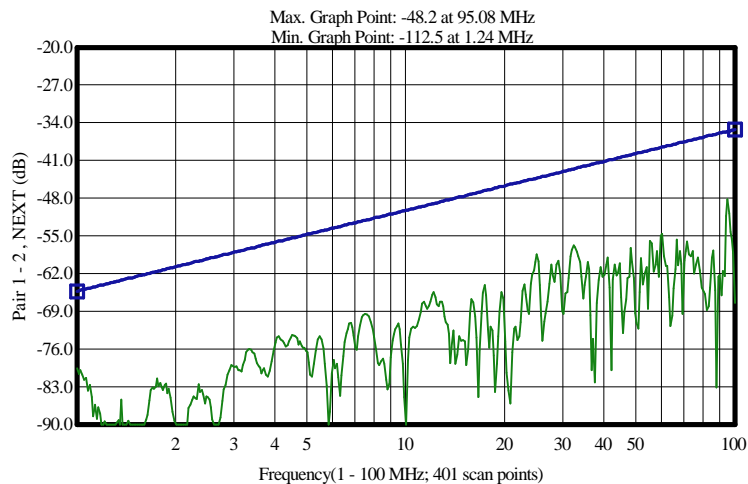
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Summary and Graphic: Near End Crosstalk Loss (NEXT)

| Pair | Spec (Min)(dB) | Measured(dB) | Margin (dB) | @ Frequency (MHz) | Test Result |
|------------|----------------|--------------|-------------|-------------------|-------------|
| Pair 1 - 2 | 35.6 | 48.2 | 12.6 | 95.08 | Passed |
| Pair 1 - 3 | 61.7 | 73.1 | 11.4 | 1.74 | Passed |
| Pair 1 - 4 | 50.0 | 59.6 | 9.6 | 10.54 | Passed |
| Pair 2 - 3 | 45.0 | 55.1 | 10.1 | 22.39 | Passed |
| Pair 2 - 4 | 52.3 | 63.6 | 11.3 | 7.34 | Passed |
| Pair 3 - 4 | 52.2 | 62.2 | 10.0 | 7.44 | Passed |



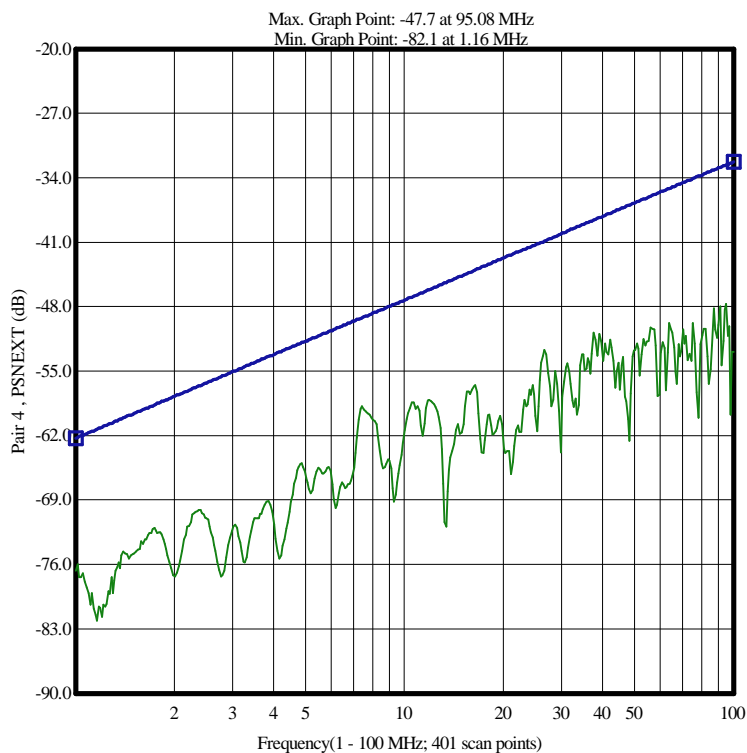
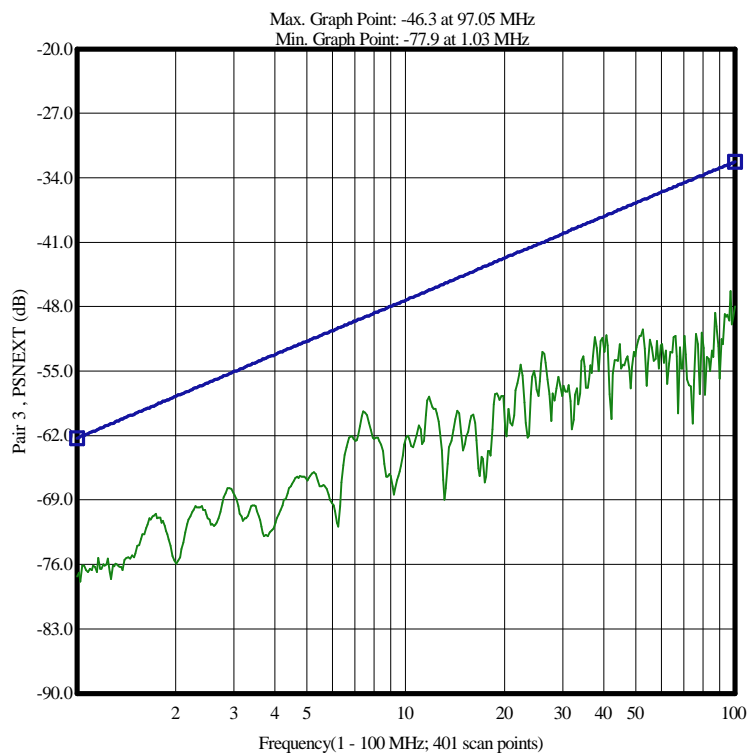
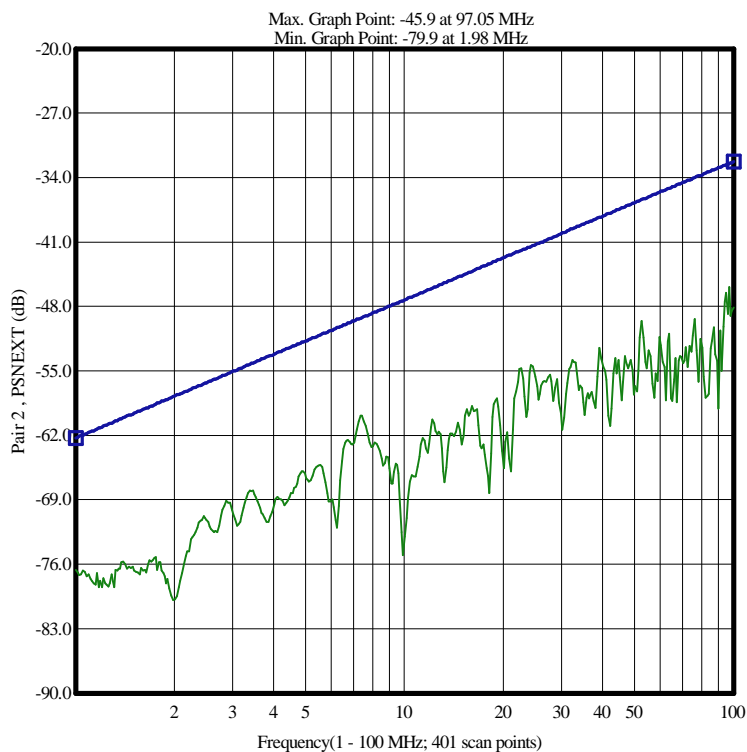
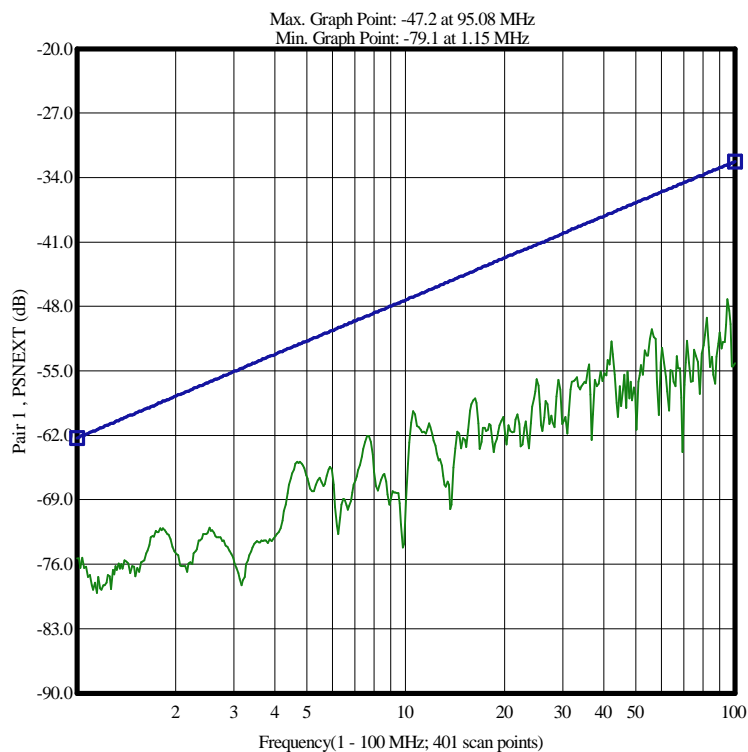
N/A = Not Applicable.
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xxx = No entry.

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Summary and Graphic: Power Sum NEXT(PSNEXT)

| Pair | Spec (Min)(dB) | Measured(dB) | Margin (dB) | @ Frequency (MHz) | Test Result |
|-------------|----------------|--------------|-------------|-------------------|-------------|
| Pair 1 [21] | 47.0 | 59.4 | 12.4 | 10.54 | Passed |
| Pair 2 [22] | 49.3 | 59.9 | 10.6 | 7.34 | Passed |
| Pair 3 [23] | 49.2 | 59.4 | 10.2 | 7.44 | Passed |
| Pair 4 [24] | 49.2 | 58.8 | 9.6 | 7.44 | Passed |



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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 [21] | 29.4 | 33.6 | 37.4 | 36.5 | 37.9 | 38.8 | 40.6 | 47.9 | 42.7 | 47.2 |
| Pair 2 [22] | 31.4 | 33.2 | 35.8 | 46.8 | 48.8 | 34.6 | 41.8 | 53.0 | 35.8 | 33.6 |
| Pair 3 [23] | 29.9 | 34.0 | 37.6 | 37.9 | 39.2 | 37.9 | 43.0 | 41.9 | 44.3 | 46.7 |
| Pair 4 [24] | 31.5 | 31.4 | 32.5 | 34.5 | 36.5 | 37.8 | 35.4 | 40.0 | 35.6 | 37.2 |

Continue:Return Loss (RL)(dB)

| | | | | | | | | | | |
|-------------|--------|--|--|--|--|--|--|--|--|--|
| Frequency | 100.00 | | | | | | | | | |
| Min Spec | 20.1 | | | | | | | | | |
| Pair 1 [21] | 43.6 | | | | | | | | | |
| Pair 2 [22] | 41.3 | | | | | | | | | |
| Pair 3 [23] | 35.7 | | | | | | | | | |
| Pair 4 [24] | 30.4 | | | | | | | | | |

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 [21] | 1.90 | 3.79 | 5.41 | 6.07 | 7.68 | 8.62 | 9.65 | 10.82 | 15.24 | 20.93 |
| Pair 2 [22] | 1.87 | 3.74 | 5.34 | 6.00 | 7.59 | 8.51 | 9.54 | 10.68 | 15.25 | 19.14 |
| Pair 3 [23] | 1.90 | 3.80 | 5.41 | 6.07 | 7.68 | 8.62 | 9.65 | 10.82 | 15.44 | 19.85 |
| Pair 4 [24] | 1.85 | 3.70 | 5.29 | 5.93 | 7.50 | 8.43 | 9.45 | 10.60 | 15.21 | 19.75 |

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 | 79.6 | 75.2 | 90.8 | 67.2 | 73.8 | 58.6 | 69.2 | 63.2 | 61.4 | 65.1 |
| Pair 1 - 3 | 79.9 | 80.6 | 79.6 | 62.3 | 62.5 | 60.7 | 63.4 | 67.1 | 60.9 | 66.8 |
| Pair 1 - 4 | 81.4 | 79.7 | 69.4 | 61.7 | 73.8 | 65.8 | 66.0 | 66.2 | 71.4 | 53.2 |
| Pair 2 - 3 | 85.6 | 74.4 | 79.4 | 68.4 | 76.5 | 60.6 | 61.2 | 72.0 | 74.2 | 53.3 |
| Pair 2 - 4 | 80.8 | 74.0 | 74.2 | 60.3 | 67.1 | 63.0 | 75.2 | 57.7 | 61.1 | 60.0 |
| Pair 3 - 4 | 82.5 | 76.5 | 62.4 | 65.0 | 66.8 | 65.2 | 63.3 | 57.4 | 59.2 | 58.8 |

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

| | | | | | | | | | | |
|------------|--------|--|--|--|--|--|--|--|--|--|
| Frequency | 100.00 | | | | | | | | | |
| Min Spec | 35.3 | | | | | | | | | |
| Pair 1 - 2 | 67.5 | | | | | | | | | |
| Pair 1 - 3 | 59.8 | | | | | | | | | |
| Pair 1 - 4 | 55.9 | | | | | | | | | |
| Pair 2 - 3 | 48.6 | | | | | | | | | |
| Pair 2 - 4 | 58.1 | | | | | | | | | |
| Pair 3 - 4 | 59.9 | | | | | | | | | |

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 [21] | 75.4 | 73.0 | 68.9 | 58.3 | 61.8 | 56.0 | 60.7 | 60.1 | 57.5 | 52.5 |
| Pair 2 [22] | 76.6 | 69.7 | 73.0 | 59.0 | 65.4 | 55.5 | 60.4 | 56.5 | 57.3 | 52.2 |
| Pair 3 [23] | 77.3 | 71.6 | 62.2 | 59.8 | 61.0 | 56.9 | 57.2 | 56.6 | 56.1 | 52.0 |
| Pair 4 [24] | 76.7 | 71.4 | 61.4 | 57.1 | 63.2 | 59.6 | 61.2 | 54.3 | 56.5 | 51.4 |

Continue:Power Sum NEXT(PSNEXT)(dB)

| | | | | | | | | | | |
|-------------|--------|--|--|--|--|--|--|--|--|--|
| Frequency | 100.00 | | | | | | | | | |
| Min Spec | 32.3 | | | | | | | | | |
| Pair 1 [21] | 54.2 | | | | | | | | | |
| Pair 2 [22] | 48.1 | | | | | | | | | |
| Pair 3 [23] | 48.0 | | | | | | | | | |
| Pair 4 [24] | 52.9 | | | | | | | | | |

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