

DCM Test Report

| | | |
|--------------------------------|-------------------------------------|---|
| Cable Type : 4x2x24 x PE/LSZH | Factory Number : PHOENIX | Data File Name : DA039324.D3S |
| Cable I.D. : U/UTP#24X4P CABLE | Order Number : 6235 VI-15 180742356 | Specification File : CAT5e-305M.S3S |
| Temperature : 25.00 °C | Relative Humidity : 50 % | Test Date/Time : 07/29/2018 10:29:26 PM |
| Length : 305.00 m | Number of Pairs to Test : 4 | Operator : L 180729WE302003/3 |
| Starting Position : 13 | | 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: |
|------------|-----------|-------|

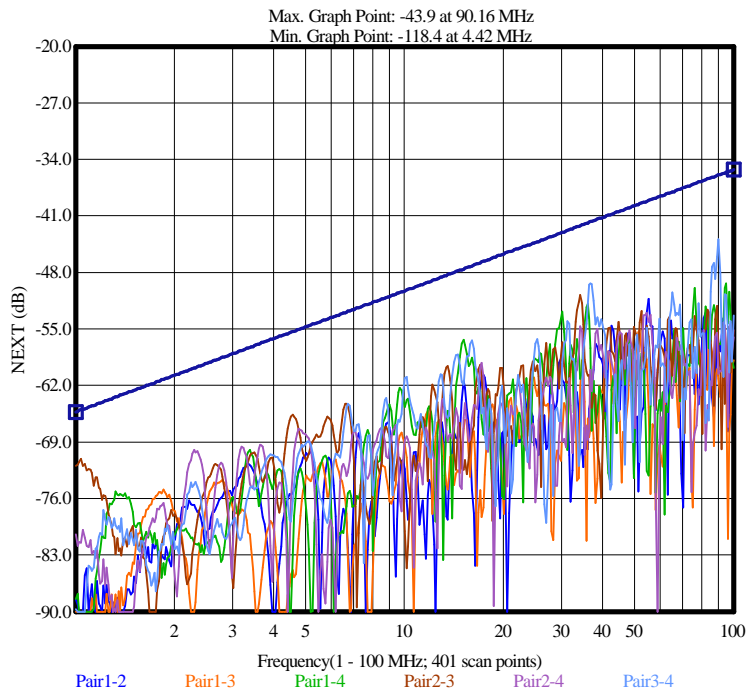
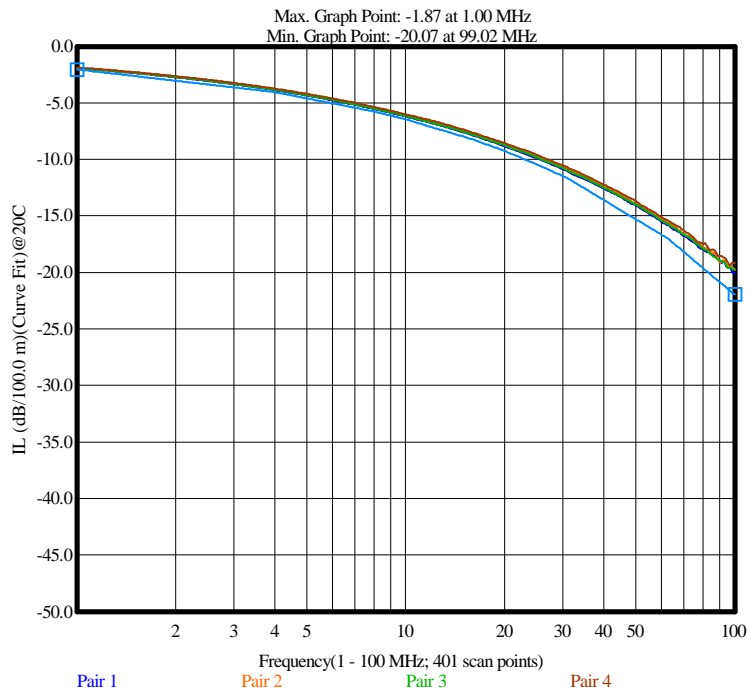
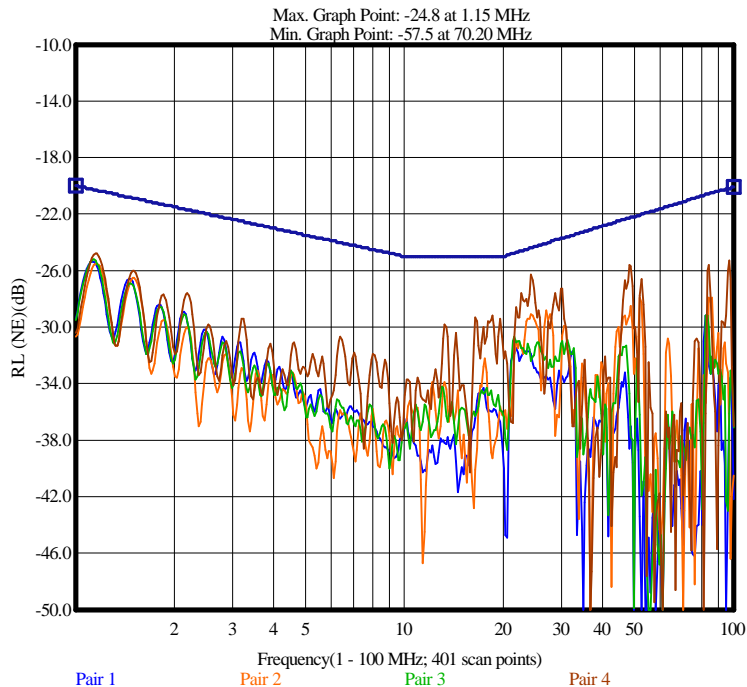
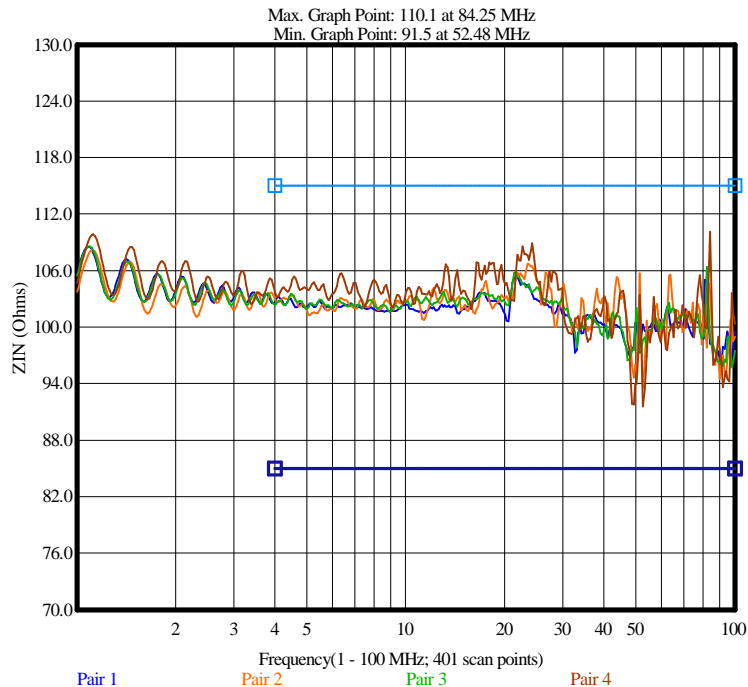
DCM Test Report

| | | |
|--------------------------------|-------------------------------------|---|
| Cable Type : 4x2x24 x PE/LSZH | Factory Number : PHOENIX | Data File Name : DA039324.D3S |
| Cable I.D. : U/UTP#24X4P CABLE | Order Number : 6235 VI-15 180742356 | Specification File : CAT5e-305M.S3S |
| Temperature : 25.00 °C | Relative Humidity : 50 % | Test Date/Time : 07/29/2018 10:29:26 PM |
| Length : 305.00 m | Number of Pairs to Test : 4 | Operator : L 180729WE302003/3 |
| Starting Position : 13 | | Analyzer Type : ENA |

Worst Case Summary

High Frequency

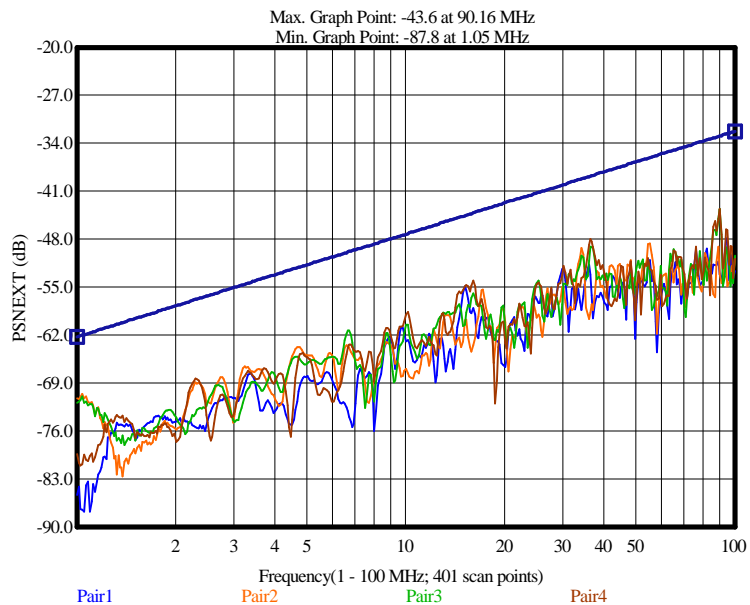
| Test Type | Specification | Measured (Pair) | Margin | @ Frequency (MHz) | Test Result |
|------------------------------------|---------------|------------------|--------|-------------------|-------------|
| Input Impedance (Zin)(Terminated) | 85.0 (Min) | 91.5 (Pair 4) | 6.5 | 52.48 | Passed |
| Input Impedance (Zin)(Terminated) | 115.0 (Max) | 110.1 (Pair 4) | 4.9 | 84.25 | Passed |
| Return Loss (RL) | 24.4 (Min) | 26.3 (Pair 4) | 1.9 | 24.24 | Passed |
| Insertion Loss (IL)(Curve Fit)@20C | 2.06 (Max) | 1.95 (Pair 1) | 0.11 | 1.01 | Passed |
| Near End Crosstalk Loss (NEXT) | 65.0 (Min) | 71.1 (Pairs 2-3) | 6.1 | 1.04 | Passed |
| Power Sum NEXT(PSNEXT) | 62.0 (Min) | 70.6 (Pair 2) | 8.6 | 1.04 | 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 | 9.30 | xxx | 9.06 | xxx | 9.16 | xxx | 0.091 | Passed |
| Resistance Unbalance(%) | 5.00 | 0.41 | xxx | 0.10 | xxx | 0.31 | xxx | 0.125 | Passed |
| Mutual Capacitance(nF/100.0 m)@1000Hz | 5.60 | 4.96 | xxx | 4.80 | xxx | 4.89 | xxx | 0.068 | Passed |
| Cap. Unbalance to Ground(pF/100.0 m)@1000Hz | 330.00 | 30.32 | xxx | 4.23 | xxx | 18.97 | xxx | 10.025 | 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 [13] | 9.30 | 9.26 | 0.41 | 4.96 | -30.32 | Passed |
| Pair 2 [14] | 9.08 | 9.07 | 0.10 | 4.85 | -15.65 | Passed |
| Pair 3 [15] | 9.23 | 9.20 | 0.39 | 4.95 | -25.68 | Passed |
| Pair 4 [16] | 9.09 | 9.06 | 0.34 | 4.80 | -4.23 | Passed |

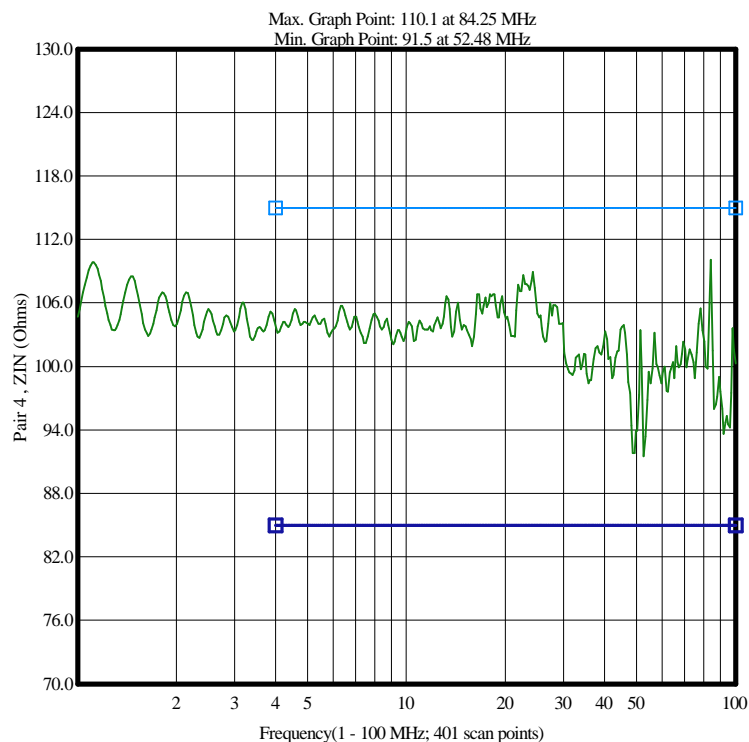
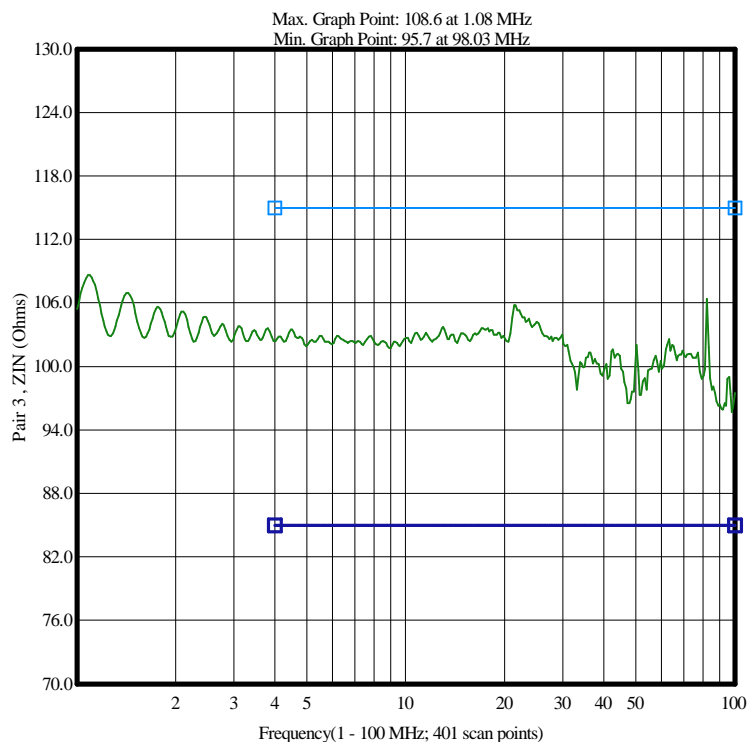
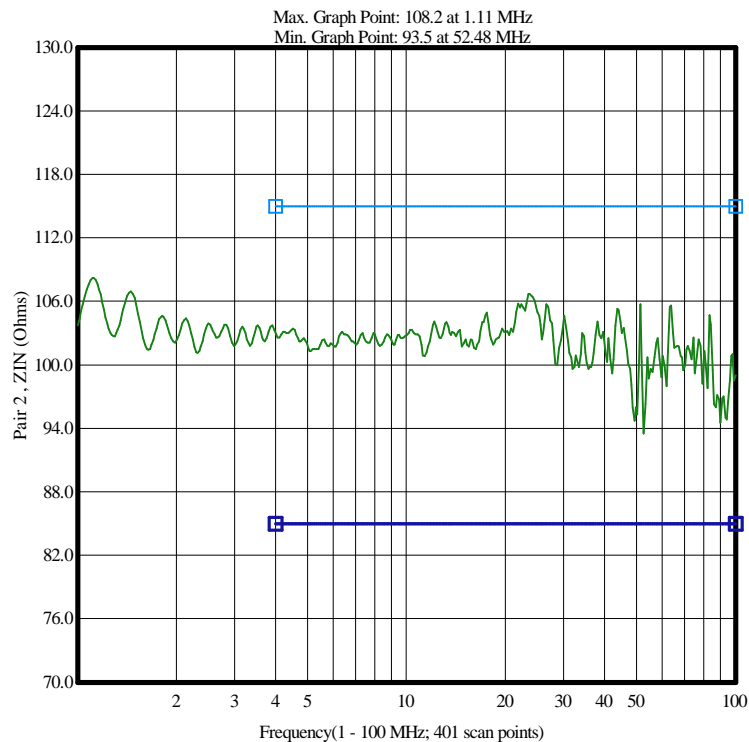
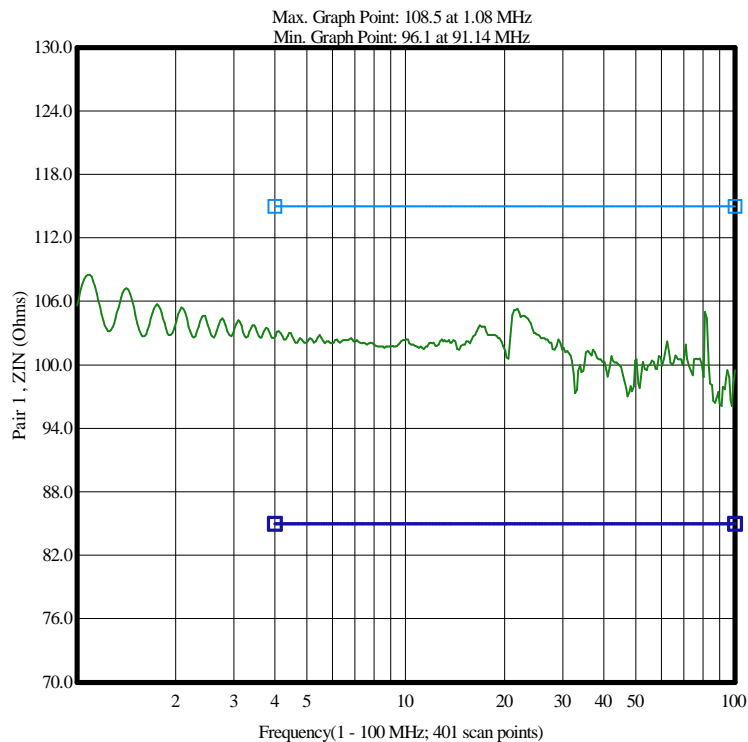
N/A = Not Applicable.
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Summary and Graphic: Input Impedance (Zin)(Terminated)

| Pair | Specification | | Measured(Ohms) | | Margin (Ohms) | | @ Frequency (MHz) | | Test Result |
|-------------|---------------|---------|----------------|---------|---------------|---------|-------------------|---------|-------------|
| | Minimum | Maximum | Minimum | Maximum | Minimum | Maximum | Minimum | Maximum | |
| Pair 1 [13] | 85.0 | 115.0 | 96.1 | 105.3 | 11.1 | 9.7 | 91.14 | 21.87 | Passed |
| Pair 2 [14] | 85.0 | 115.0 | 93.5 | 106.7 | 8.5 | 8.3 | 52.48 | 23.45 | Passed |
| Pair 3 [15] | 85.0 | 115.0 | 95.7 | 106.4 | 10.7 | 8.6 | 98.03 | 82.29 | Passed |
| Pair 4 [16] | 85.0 | 115.0 | 91.5 | 110.1 | 6.5 | 4.9 | 52.48 | 84.25 | Passed |



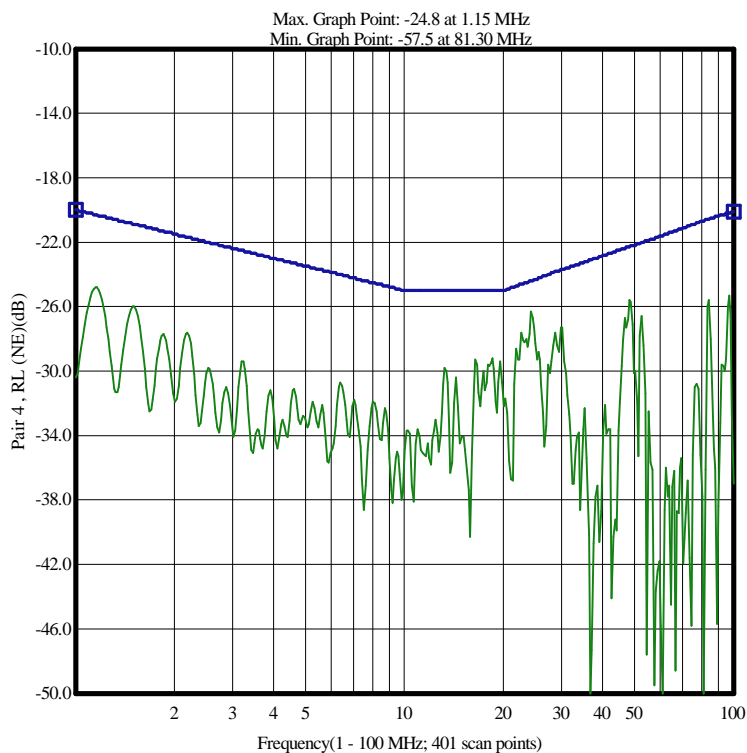
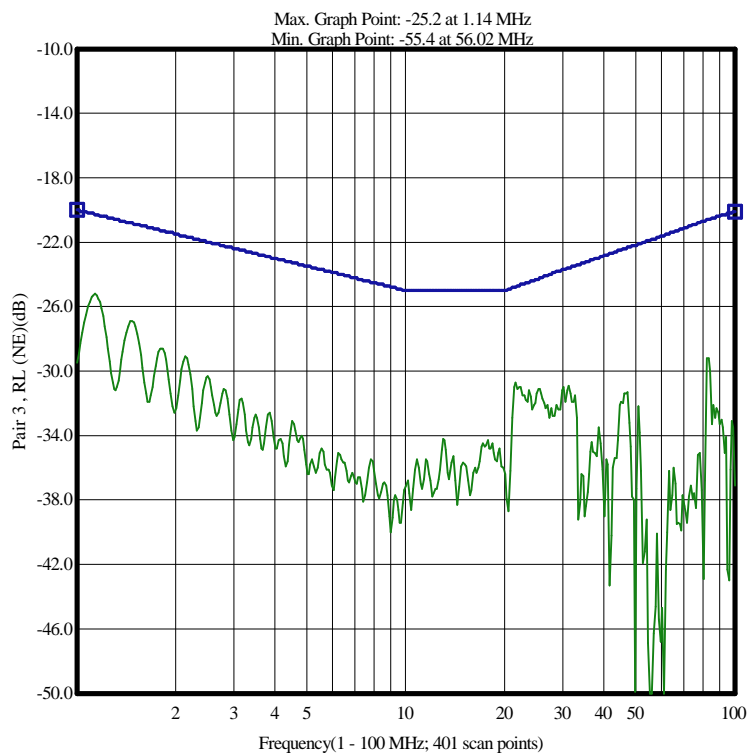
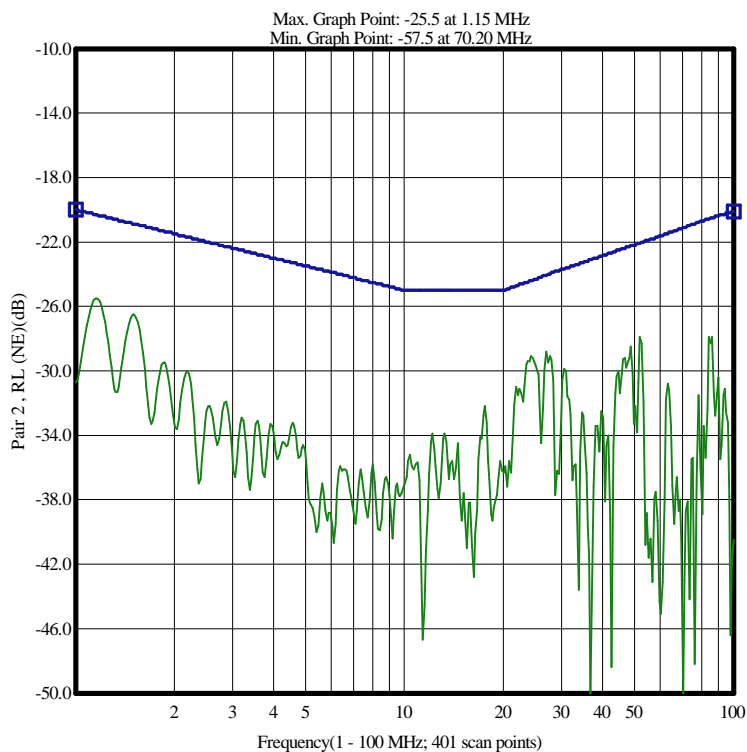
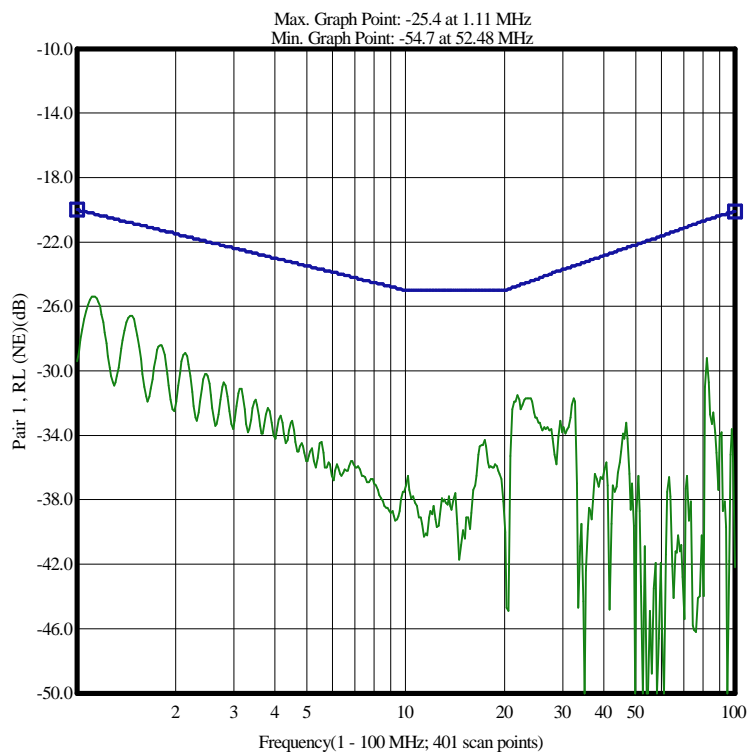
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Summary and Graphic: Return Loss (RL)

| Pair | Spec (Min)(dB) | Measured(dB) | Margin (dB) | @ Frequency (MHz) | Test Result |
|-------------|----------------|--------------|-------------|-------------------|-------------|
| Pair 1 [13] | 20.3 | 25.4 | 5.1 | 1.14 | Passed |
| Pair 2 [14] | 24.1 | 28.8 | 4.7 | 26.92 | Passed |
| Pair 3 [15] | 20.3 | 25.2 | 4.9 | 1.14 | Passed |
| Pair 4 [16] | 24.4 | 26.3 | 1.9 | 24.24 | Passed |



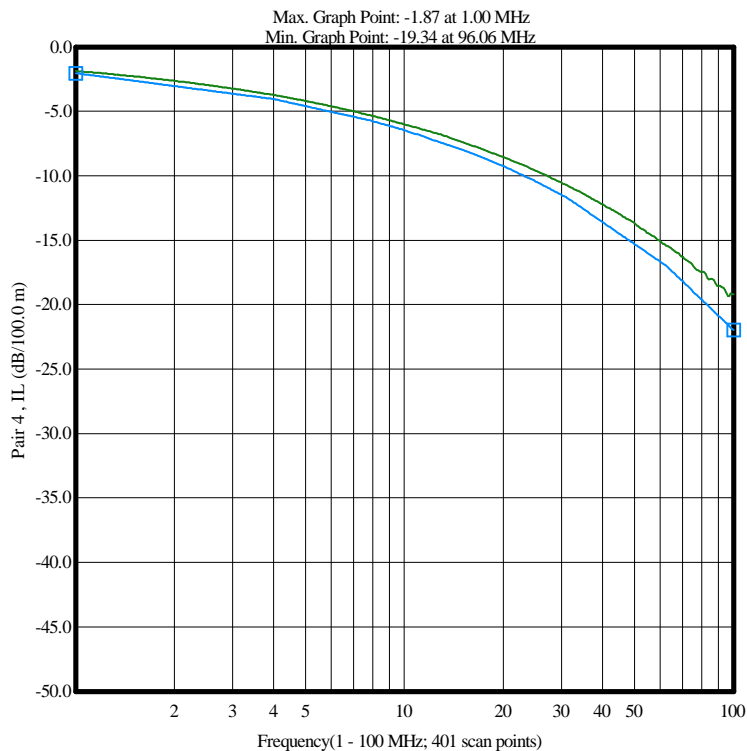
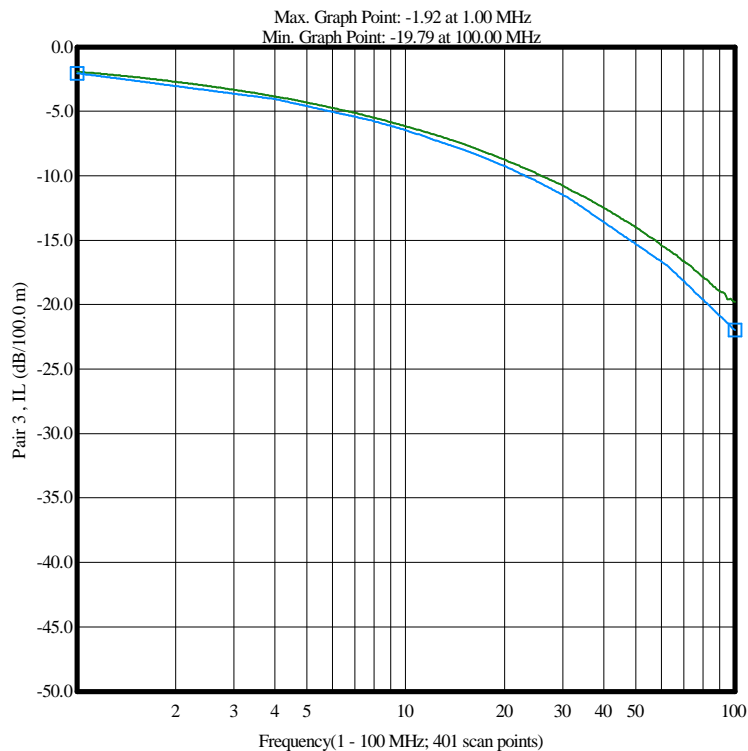
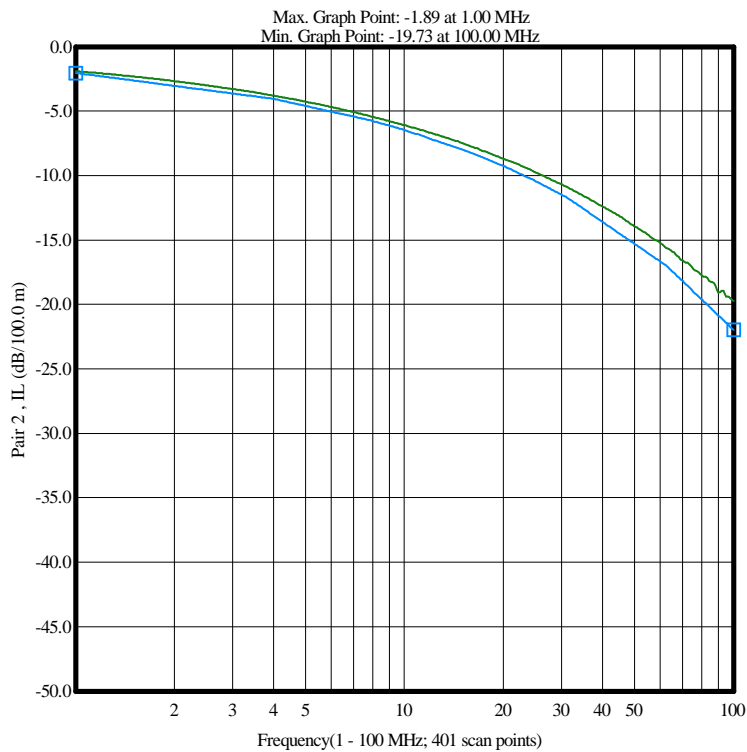
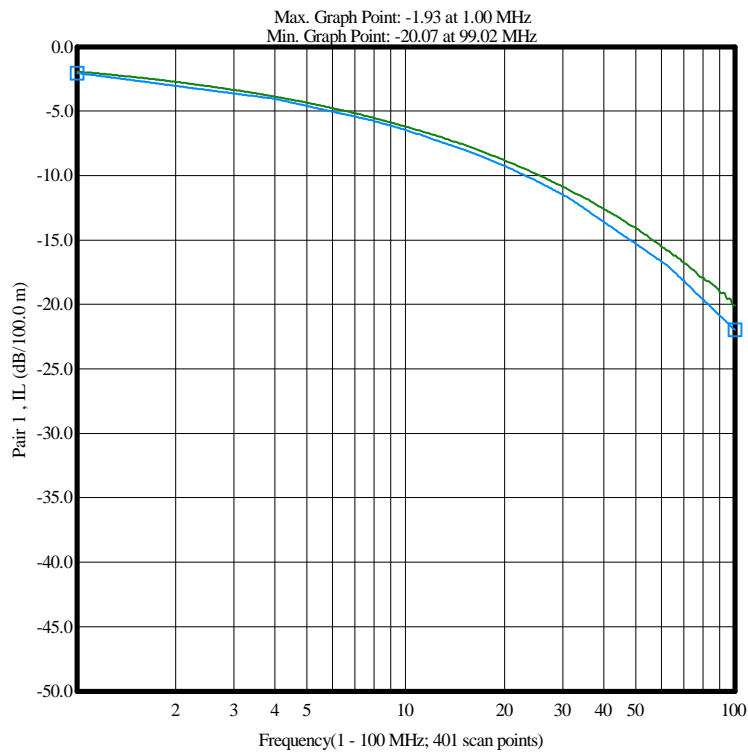
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Summary and Graphic: Insertion Loss (IL)(Curve Fit)@20C

| Pair | Spec (Max)(dB/100.0 m) | Measured(dB/100.0 m) | Margin (dB/100.0 m) | @ Frequency (MHz) | Test Result |
|-------------|------------------------|----------------------|---------------------|-------------------|-------------|
| Pair 1 [13] | 2.06 | 1.95 | 0.11 | 1.01 | Passed |
| Pair 2 [14] | 2.04 | 1.89 | 0.15 | 1.00 | Passed |
| Pair 3 [15] | 2.06 | 1.94 | 0.12 | 1.01 | Passed |
| Pair 4 [16] | 2.04 | 1.87 | 0.17 | 1.00 | Passed |



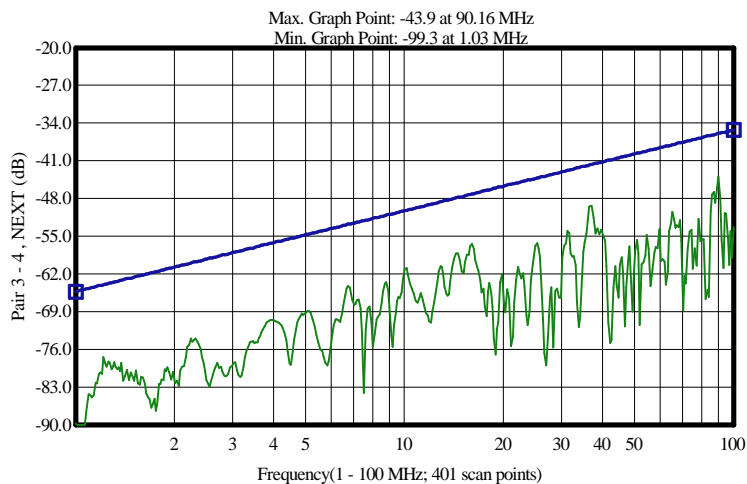
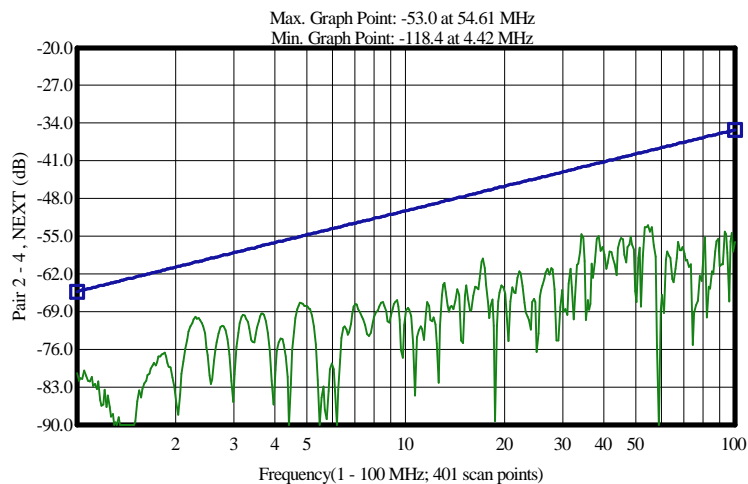
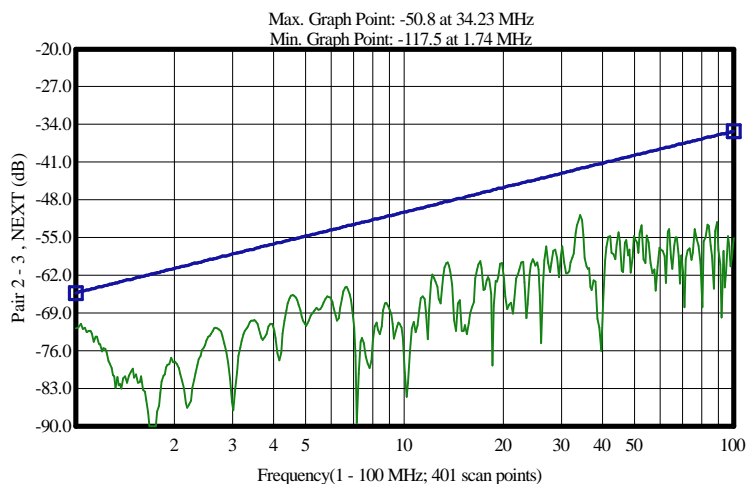
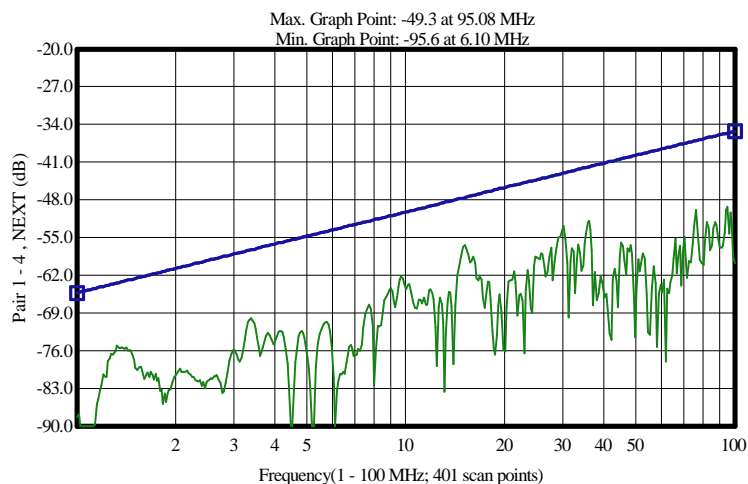
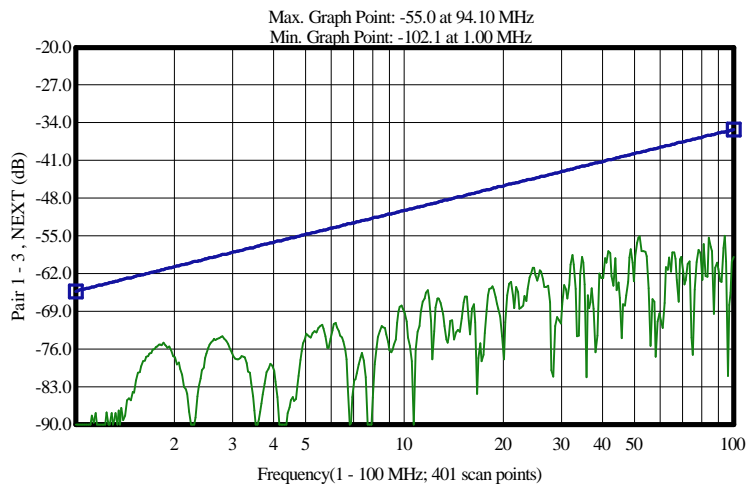
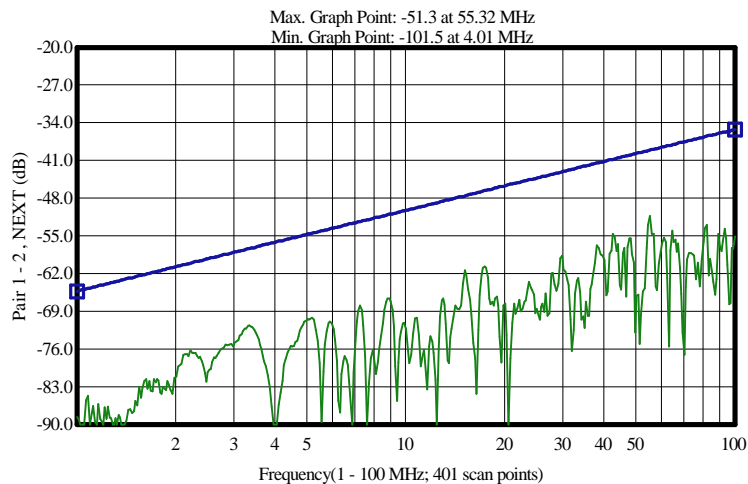
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Summary and Graphic: Near End Crosstalk Loss (NEXT)

| Pair | Spec (Min)(dB) | Measured(dB) | Margin (dB) | @ Frequency (MHz) | Test Result |
|------------|----------------|--------------|-------------|-------------------|-------------|
| Pair 1 - 2 | 39.1 | 51.3 | 12.2 | 55.32 | Passed |
| Pair 1 - 3 | 61.3 | 74.9 | 13.6 | 1.85 | Passed |
| Pair 1 - 4 | 47.6 | 56.4 | 8.8 | 15.10 | Passed |
| Pair 2 - 3 | 65.0 | 71.1 | 6.1 | 1.04 | Passed |
| Pair 2 - 4 | 59.8 | 70.0 | 10.2 | 2.29 | Passed |
| Pair 3 - 4 | 41.8 | 49.5 | 7.7 | 36.42 | Passed |



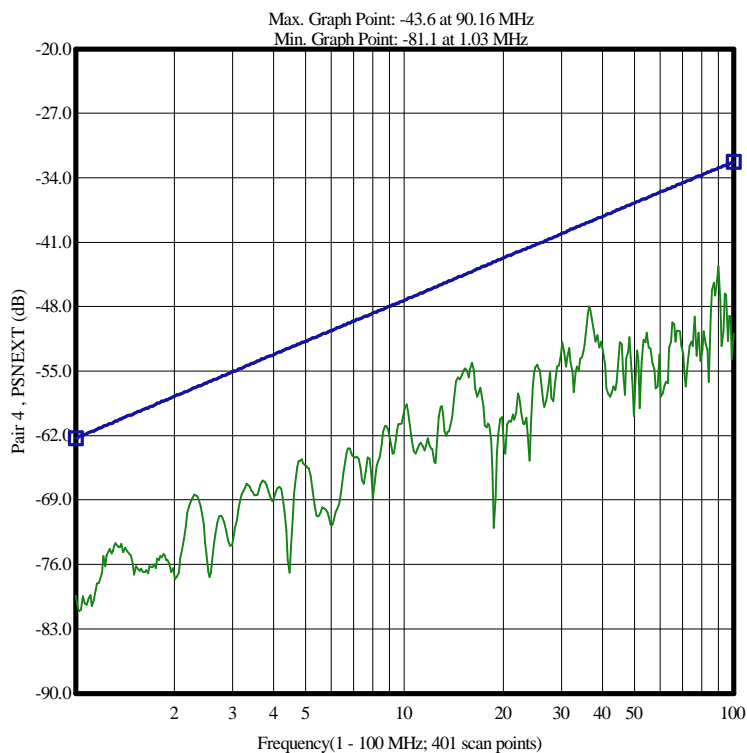
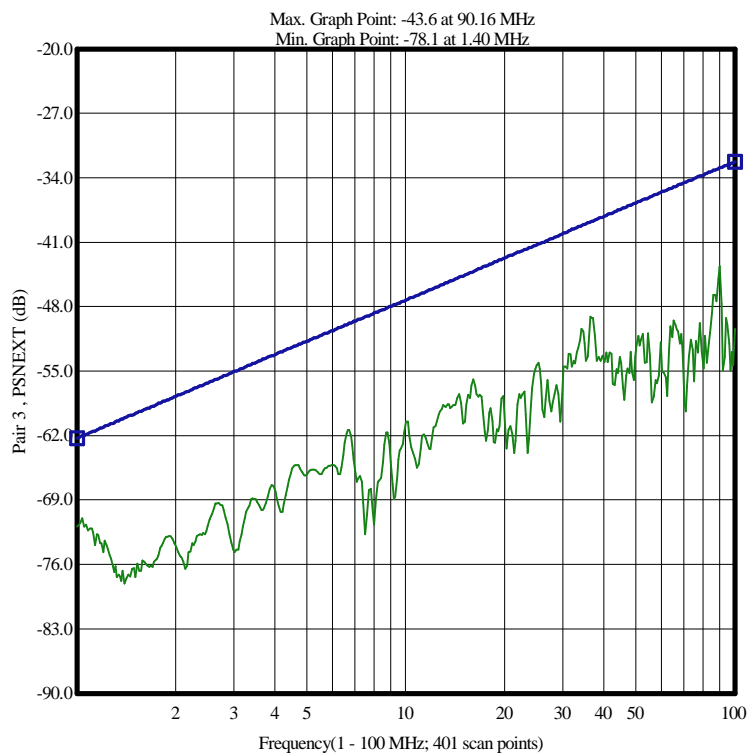
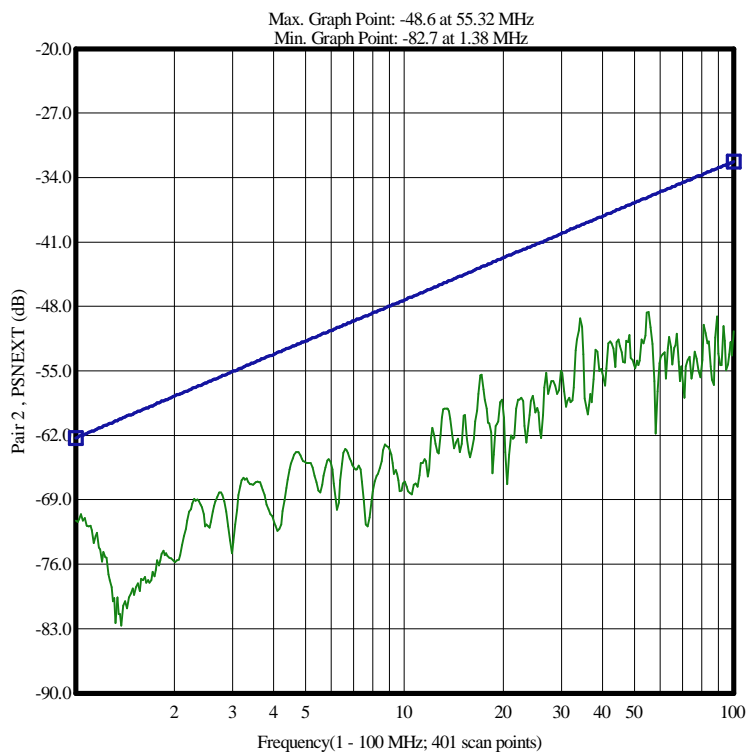
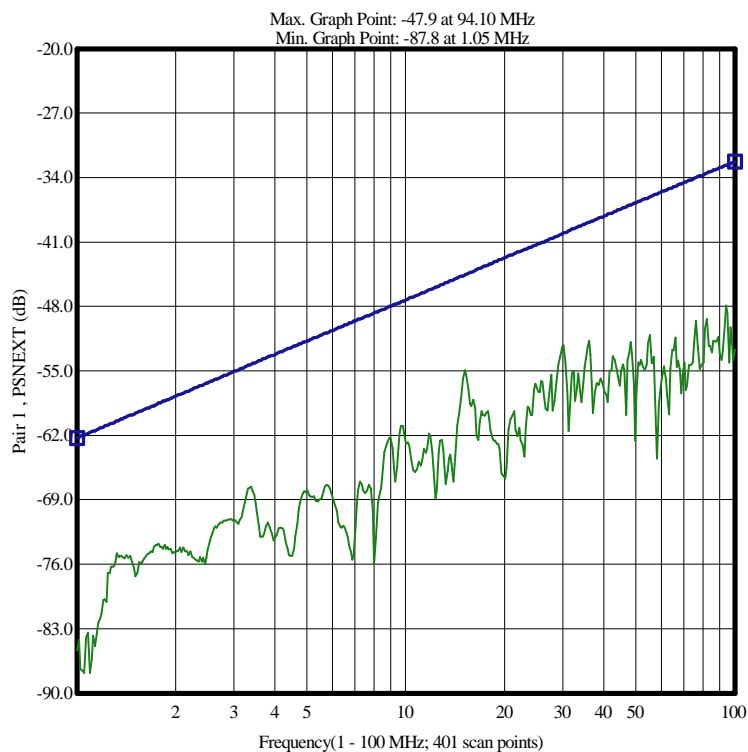
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Summary and Graphic: Power Sum NEXT(PSNEXT)

| Pair | Spec (Min)(dB) | Measured(dB) | Margin (dB) | @ Frequency (MHz) | Test Result |
|-------------|----------------|--------------|-------------|-------------------|-------------|
| Pair 1 [13] | 44.6 | 54.9 | 10.3 | 15.10 | Passed |
| Pair 2 [14] | 62.0 | 70.6 | 8.6 | 1.04 | Passed |
| Pair 3 [15] | 62.0 | 71.0 | 9.0 | 1.04 | Passed |
| Pair 4 [16] | 38.8 | 48.0 | 9.2 | 36.42 | 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 [13] | 29.4 | 34.2 | 37.1 | 37.8 | 39.8 | 32.9 | 33.7 | 33.5 | 37.4 | 42.8 |
| Pair 2 [14] | 30.7 | 33.9 | 37.0 | 40.2 | 36.3 | 29.6 | 32.2 | 31.4 | 31.7 | 38.0 |
| Pair 3 [15] | 29.5 | 34.6 | 37.1 | 36.6 | 36.4 | 31.5 | 31.1 | 30.9 | 39.5 | 41.1 |
| Pair 4 [16] | 30.4 | 32.7 | 34.8 | 36.4 | 32.1 | 28.2 | 27.3 | 31.3 | 36.2 | 37.0 |

Continue:Return Loss (RL)(dB)

| | | | | | | | | | | |
|-------------|--------|--|--|--|--|--|--|--|--|--|
| Frequency | 100.00 | | | | | | | | | |
| Min Spec | 20.1 | | | | | | | | | |
| Pair 1 [13] | 42.2 | | | | | | | | | |
| Pair 2 [14] | 40.5 | | | | | | | | | |
| Pair 3 [15] | 37.1 | | | | | | | | | |
| Pair 4 [16] | 37.0 | | | | | | | | | |

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 [13] | 1.93 | 3.88 | 5.54 | 6.21 | 7.87 | 8.84 | 9.90 | 11.10 | 15.81 | 20.07 |
| Pair 2 [14] | 1.89 | 3.81 | 5.44 | 6.10 | 7.74 | 8.70 | 9.75 | 10.91 | 15.62 | 19.73 |
| Pair 3 [15] | 1.92 | 3.85 | 5.50 | 6.17 | 7.82 | 8.77 | 9.83 | 11.02 | 15.72 | 19.79 |
| Pair 4 [16] | 1.87 | 3.74 | 5.36 | 6.02 | 7.64 | 8.56 | 9.60 | 10.76 | 15.41 | 19.18 |

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 | 88.6 | 99.3 | 72.3 | 73.5 | 67.7 | 68.7 | 59.8 | 64.1 | 64.5 | 57.2 |
| Pair 1 - 3 | 102.1 | 79.8 | 69.4 | 69.8 | 77.5 | 62.2 | 69.7 | 66.4 | 60.9 | 61.6 |
| Pair 1 - 4 | 88.4 | 74.2 | 64.6 | 58.8 | 76.0 | 58.7 | 53.3 | 68.5 | 64.6 | 60.0 |
| Pair 2 - 3 | 71.9 | 71.9 | 80.1 | 68.2 | 62.4 | 60.1 | 57.6 | 61.7 | 62.1 | 65.3 |
| Pair 2 - 4 | 80.4 | 81.4 | 68.8 | 66.7 | 65.6 | 75.5 | 66.7 | 64.7 | 57.9 | 59.7 |
| Pair 3 - 4 | 89.8 | 70.7 | 61.1 | 56.6 | 66.9 | 57.0 | 63.2 | 54.4 | 63.7 | 55.7 |

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

| | | | | | | | | | | |
|------------|--------|--|--|--|--|--|--|--|--|--|
| Frequency | 100.00 | | | | | | | | | |
| Min Spec | 35.3 | | | | | | | | | |
| Pair 1 - 2 | 55.1 | | | | | | | | | |
| Pair 1 - 3 | 58.9 | | | | | | | | | |
| Pair 1 - 4 | 59.8 | | | | | | | | | |
| Pair 2 - 3 | 55.1 | | | | | | | | | |
| Pair 2 - 4 | 56.1 | | | | | | | | | |
| Pair 3 - 4 | 53.3 | | | | | | | | | |

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 [13] | 85.4 | 73.1 | 62.9 | 58.3 | 66.7 | 56.8 | 52.3 | 60.9 | 58.0 | 54.2 |
| Pair 2 [14] | 71.3 | 71.3 | 67.0 | 63.7 | 59.9 | 59.4 | 55.1 | 58.4 | 55.4 | 54.4 |
| Pair 3 [15] | 71.9 | 68.0 | 60.5 | 56.1 | 61.0 | 54.4 | 56.2 | 53.3 | 57.0 | 54.1 |
| Pair 4 [16] | 79.4 | 68.8 | 59.0 | 54.3 | 62.9 | 54.7 | 52.6 | 53.6 | 56.2 | 53.1 |

Continue:Power Sum NEXT(PSNEXT)(dB)

| | | | | | | | | | | |
|-------------|--------|--|--|--|--|--|--|--|--|--|
| Frequency | 100.00 | | | | | | | | | |
| Min Spec | 32.3 | | | | | | | | | |
| Pair 1 [13] | 52.7 | | | | | | | | | |
| Pair 2 [14] | 50.7 | | | | | | | | | |
| Pair 3 [15] | 50.4 | | | | | | | | | |
| Pair 4 [16] | 50.9 | | | | | | | | | |

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