Feasibility of Augmented Category 6 UTP Cable Supporting 100m 10GBase-T Channels

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Tests Conducted

- ANEXT of 7 100m cables
- ANEXT of 7 two connector channels with 90m of horizontal cable
- Tested using UTP and ungrounded shielded category 6 jacks in the panel for channel tests
- Calculated power sum on each pair of the victim cable from 24 disturbers
- Calculated the PSANEXT to insertion loss ratio (AXTIR)
- Performed a Shannon capacity analysis based on the AXTIR results

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Measurement Setup

- All cables arranged in a 6 around 1 bundle test configuration with tie wraps every 4-6 inches to maintain the bundle configuration (victim cable in the center) to within 1m of the panel
- Tested in 30m metal conduit, in metal cable tray, and on the floor
- Keystone style patch panel was 2m from conduit for the channel testing
- Standard 2m category 6 UTP patch cords were used from the panel to the network analyzer

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Measurement Setup

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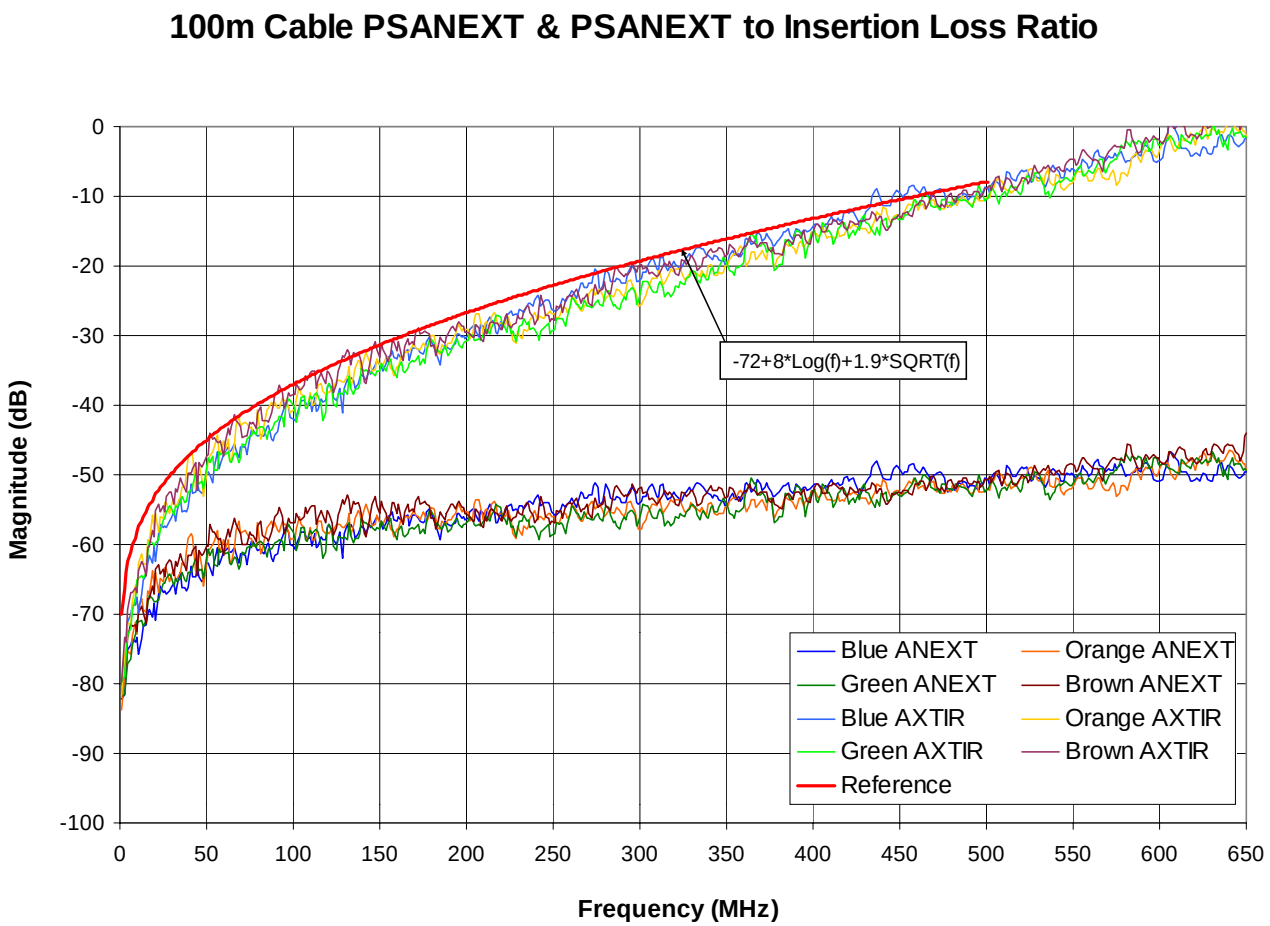
Results – 100m UTP Cables Only



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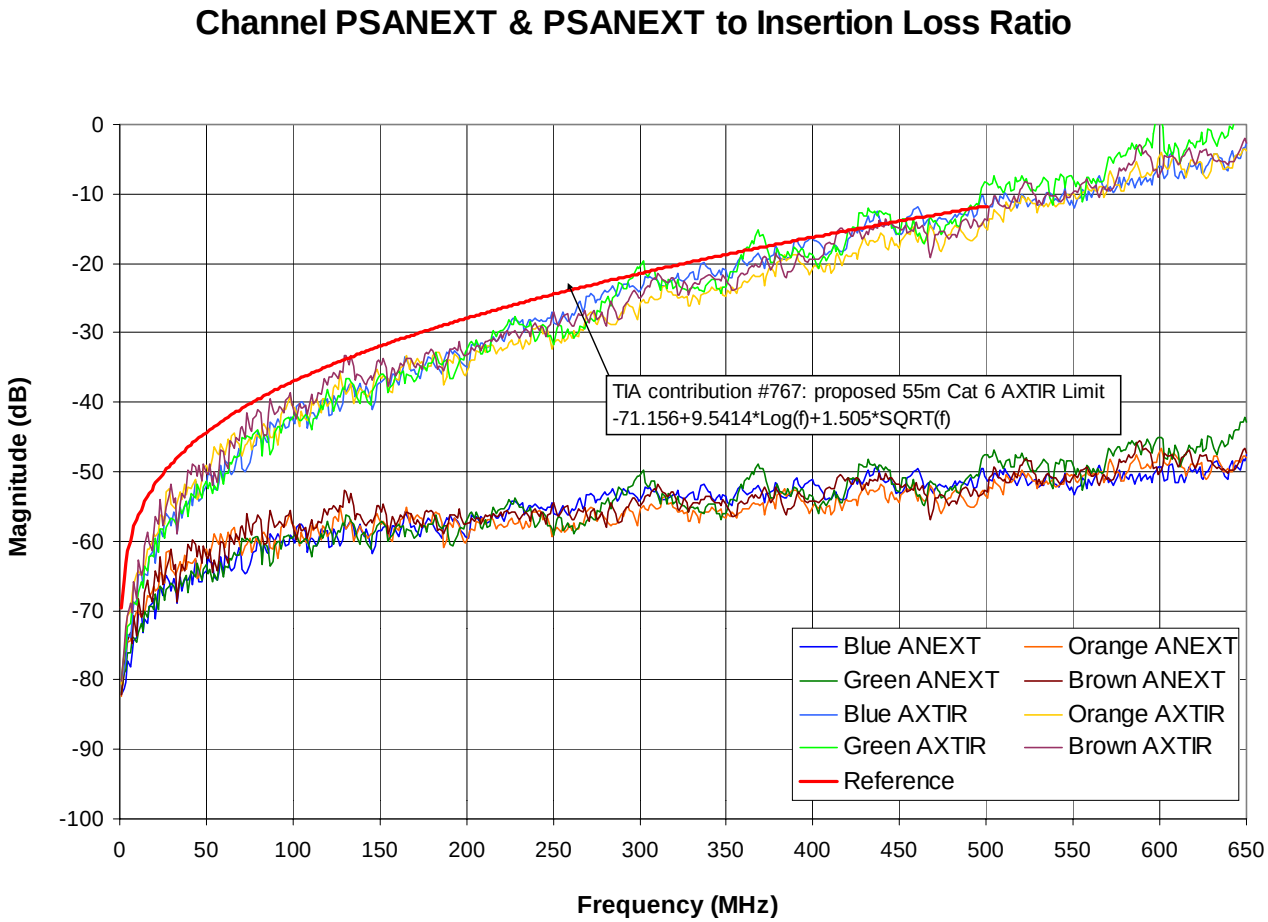
Results - Channels



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Results

- KRONE test lab measurements were correlated with SolarFlare test lab measurements
- SolarFlare assisted in performing the capacity analysis on the channel results
- The Shannon capacity of the channel was calculated with insertion loss scaled to 100m from the 94m measured channel
- Shannon capacity of the channel exceeds 20 Gbit

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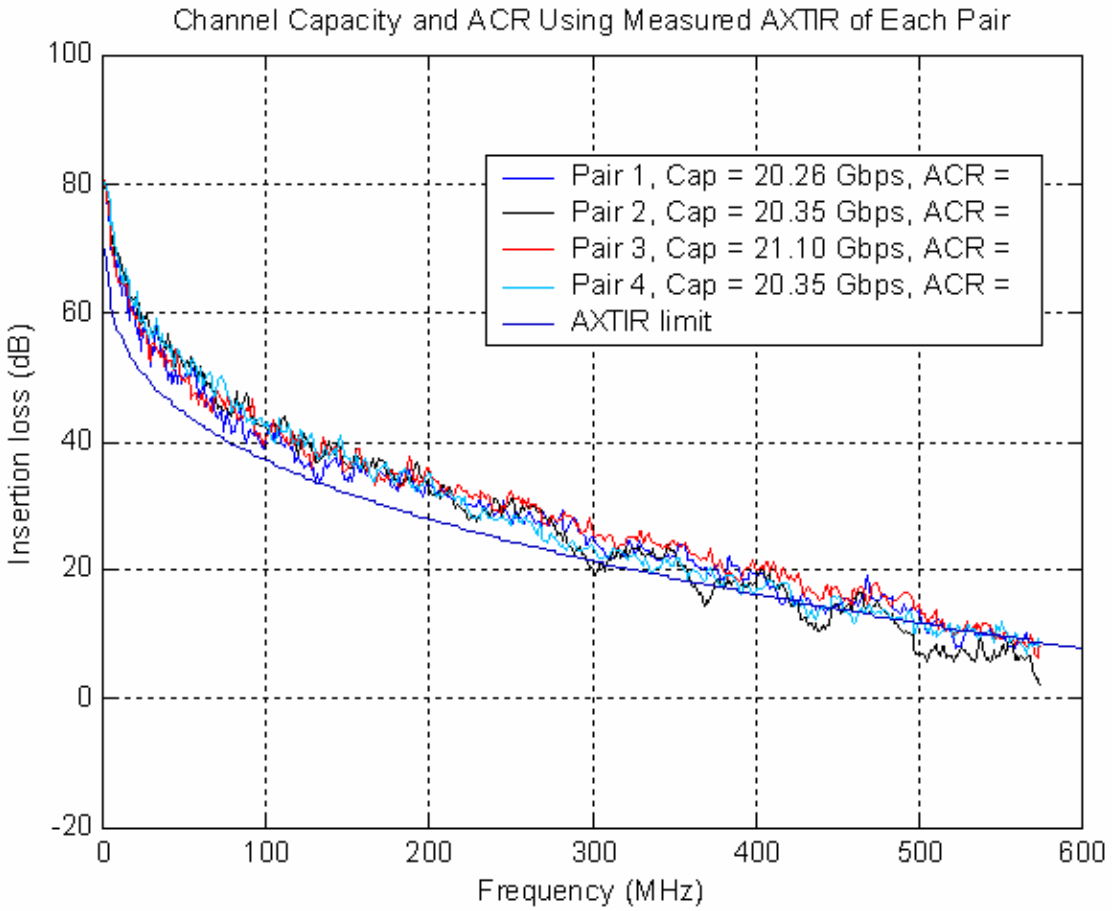
Results



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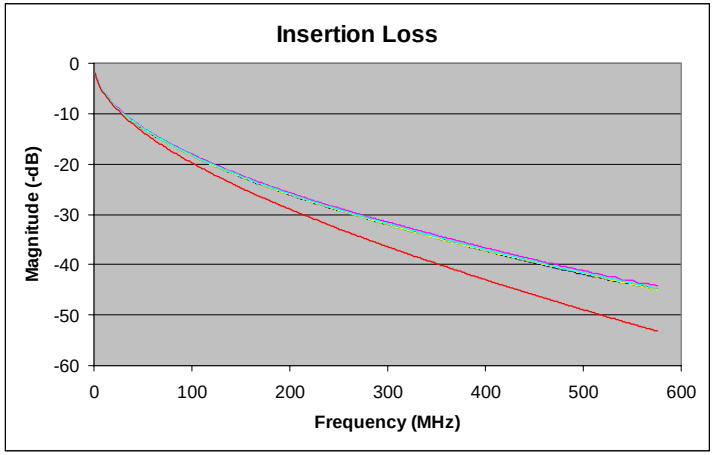
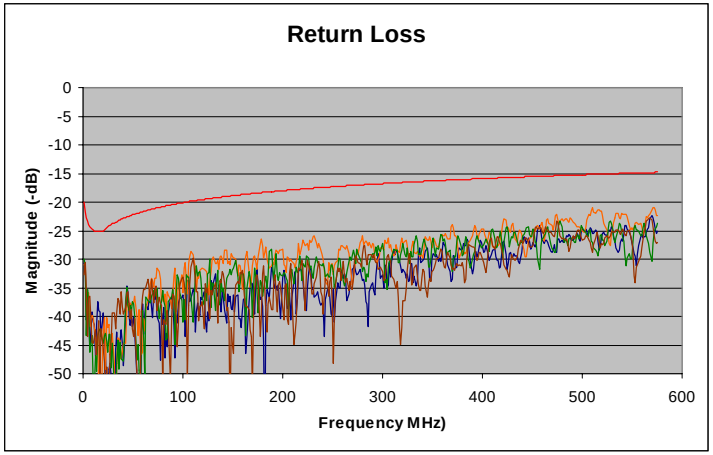
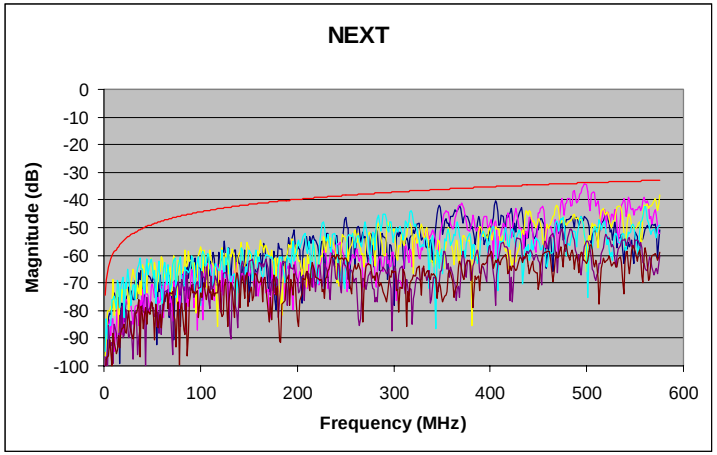
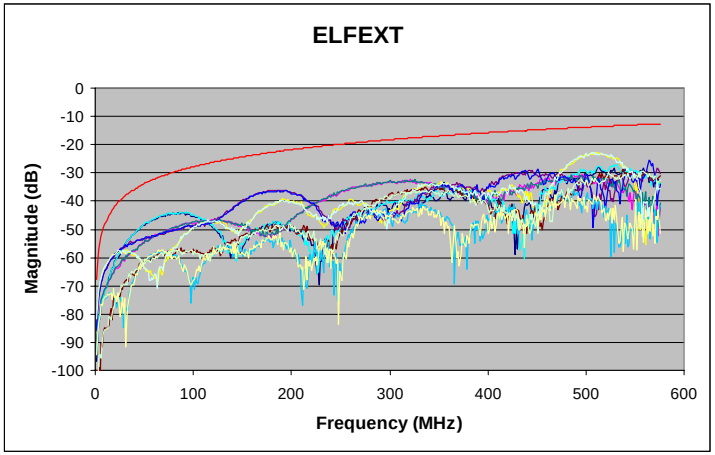
Internal Cable Performance
To extended TIA/EIA Category 6 Limits









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Conclusions & Observations

- The UTP panel had an adverse affect on alien crosstalk performance of adjacent ports
- 100m UTP cable has a Shannon capacity in excess of 20 Gbit
- The measured channel has a Shannon capacity in excess of 20 Gbit
- Further improvements can be made to the cable design to improve the channel performance
- Based on a target Shannon capacity of 18 Gbit, 100m channels on improved UTP cable are feasible without alien crosstalk mitigation

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