



Data Rates and Loss vs. Distance - Meritec's Direct Attach 4X and 12X Cable Assemblies

Test 369e

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Samples Tested

Meritec's direct-attach 4X cable assemblies: 24, 26, 28 and 30 awg.

Test Equipment

Tektronix CSA803C Digital Sampling Oscilloscope with SD24 TDR Sampling Heads atSpeed's *Oculus*TM software for S-parameter extraction from TDT measurements and Eye Pattern simulations

Summary of Results

Because of Meritec's low crosstalk direct-attach design, these assemblies can transport serial data over long distances at Double and Quad data rates. The EPD criteria used for this testing is based on InfiniBandTM Architecture Specification Volume 2, Release 1.1 and Vol. 2 Errata published December 2003.

Basically, without any crosstalk, the output Eye Height at 0.5 UI (unit interval) must be greater than 316mv and the Jitter less than 0.25 UI when the cable is stimulated with a 1-volt Bit Stream. In the case of the InfiniBandTM specification, they require a CJTPAT pattern. This test report is based on a PBRs of 2⁷-1 which is slightly less stringent than CJTPAT but representative of many real world applications.

With Near End Crosstalk from 3 neighbors on one side of the lane under test, the output Eye Height at 0.5 UI must be greater than 196mv. 3 aggressors generate the crosstalk; each stimulated by a 1.5-volt Bit Stream with pulse risetimes of 0.25UI (20-80%).

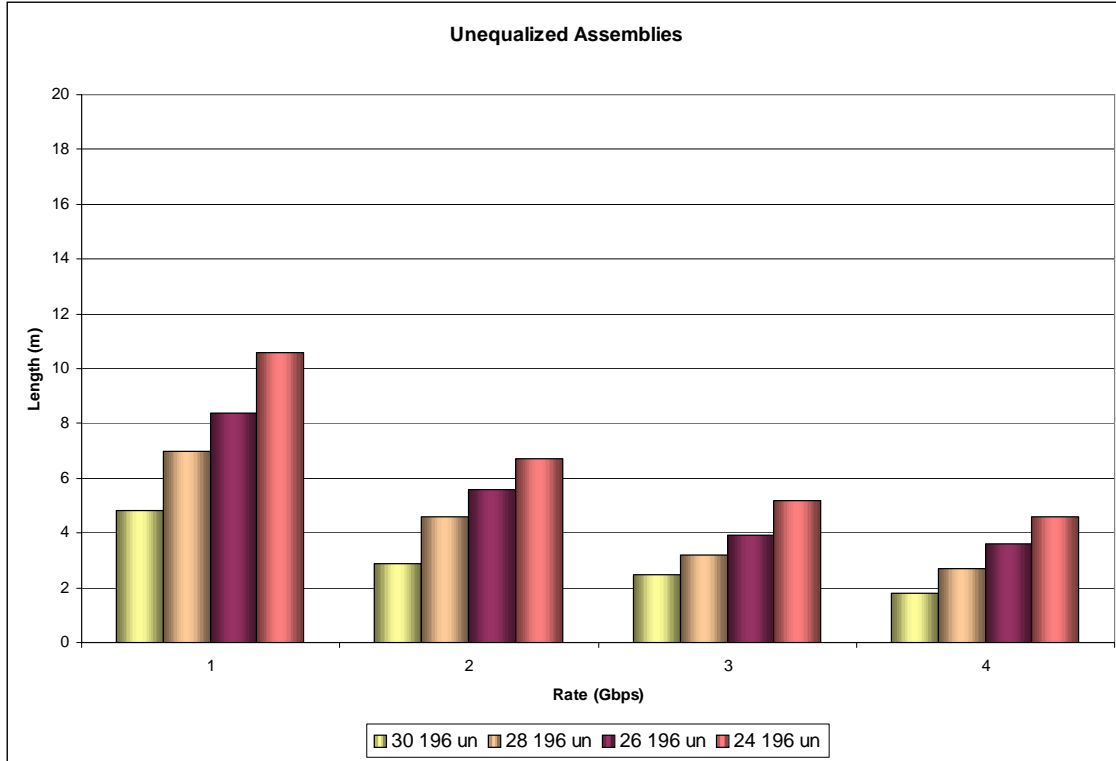
The first four plots that follow represent 4 different wire gauges: 30, 28, 26 and 24 awg, *unequalized* and *equalized* assemblies and two Eye Heights, 316 and 196mv. The InfiniBandTM standard makes the distinction between 316 mv and 196 mv to allow the crosstalk to subtract 120 mv from the Eye Height. Because Meritec's assemblies exhibit very low crosstalk, if one ignores the 316 mv requirement without crosstalk, much longer cables can be used and still comply with the final 196 mv Eye Height and meet the 0.25 UI maximum Jitter with Crosstalk.

The fifth plot shows the Loss per Meter of Meritec's 4X and 12X *unequalized* cable assemblies for our three standard wire sizes. This chart is useful for those standards that specify S21 Attenuation limits at a specific frequency and do not allow for passive equalization within the cable assembly.

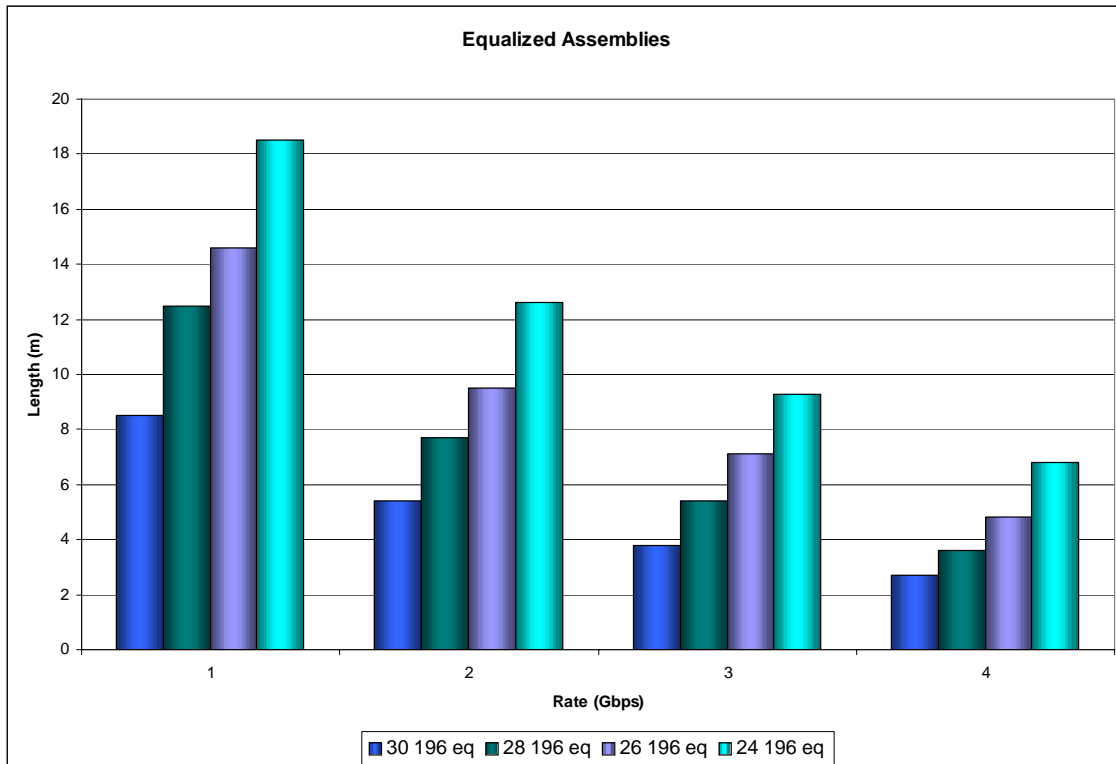
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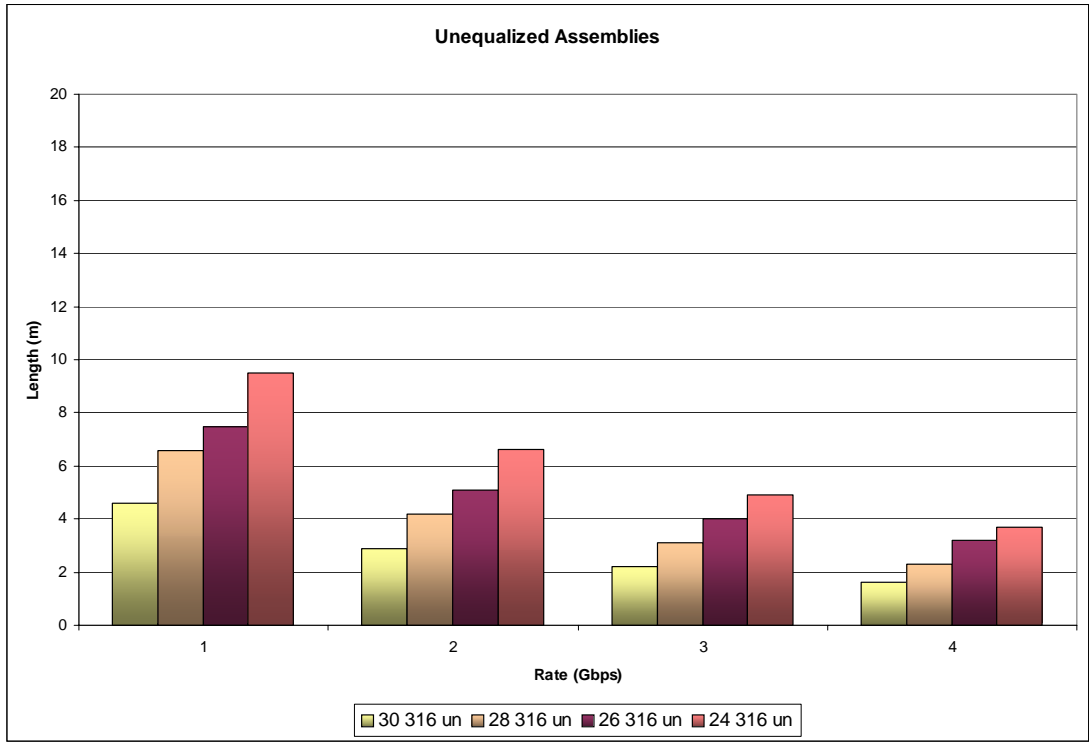


Assemblies that comply with 196mv Eye opening with crosstalk.

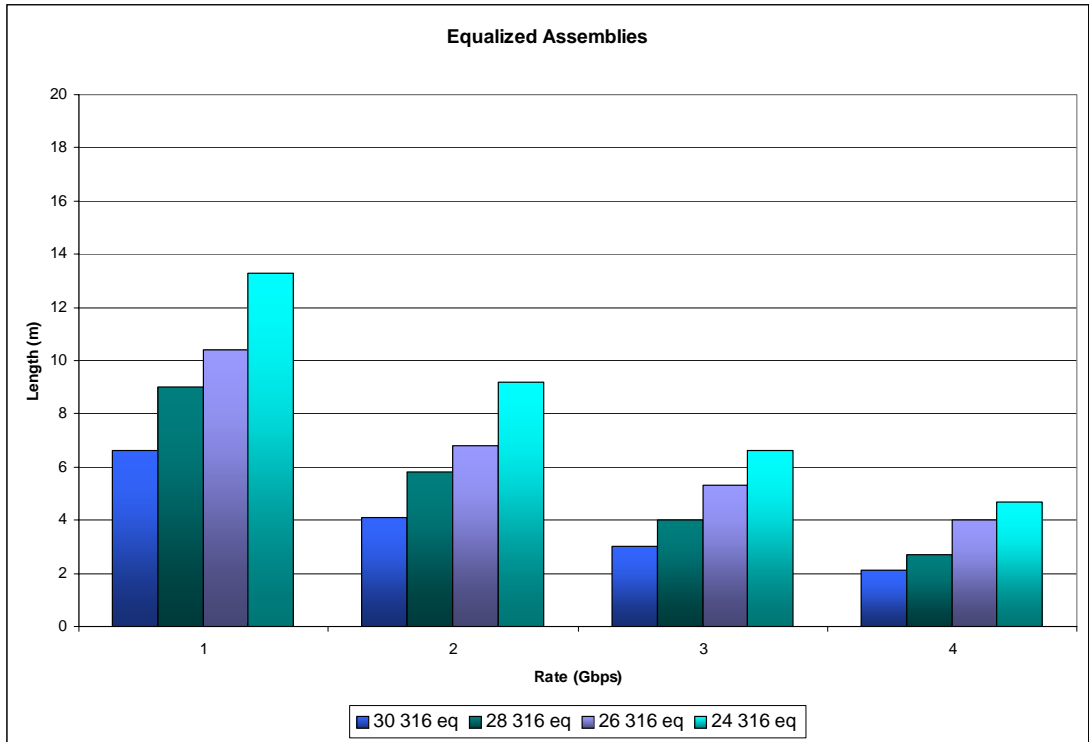


Assemblies that comply with 196mv Eye opening with crosstalk.

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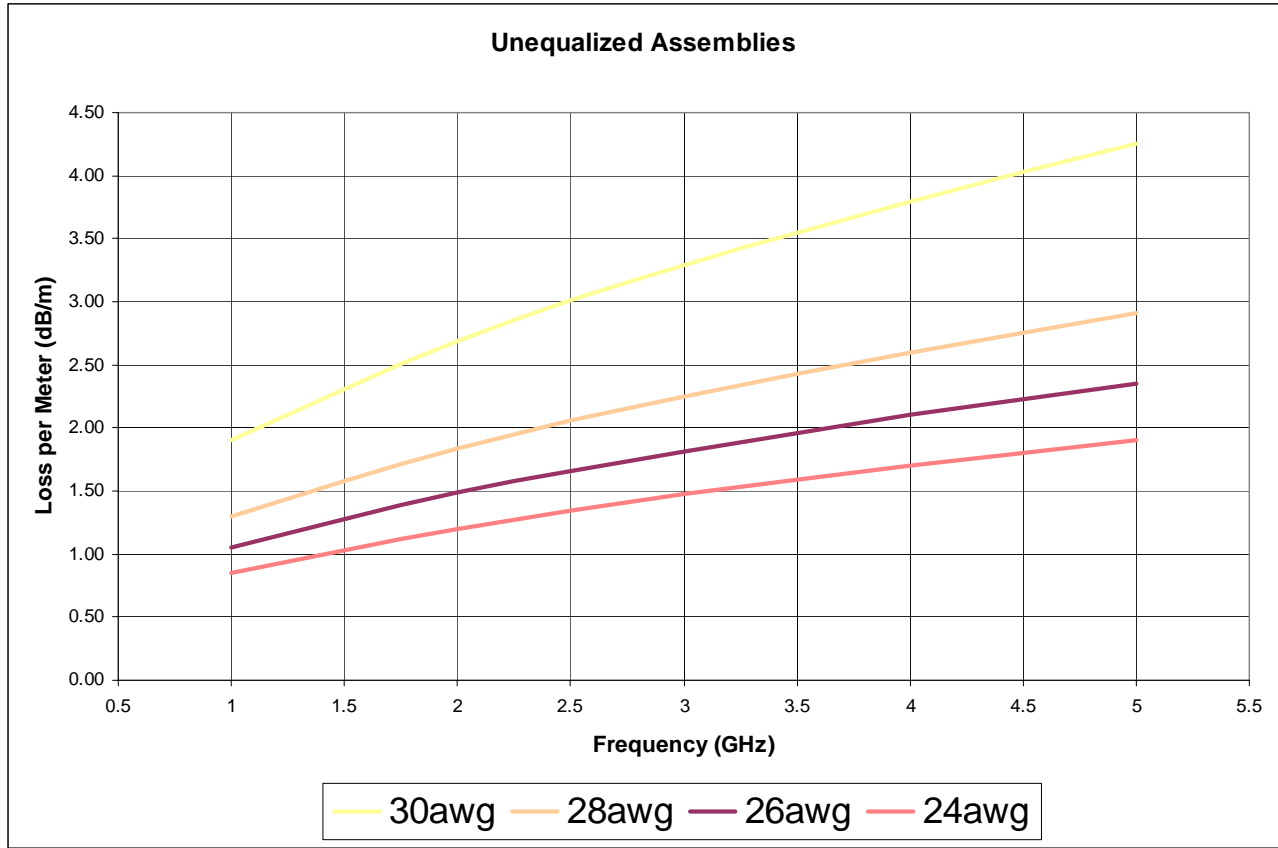


Assemblies that comply with 316mv Eye opening without crosstalk.



Assemblies that comply with 316mv Eye opening without crosstalk.

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Loss per Meter Chart

This graph shows the Loss per Meter of Meritec's 4X and 12X cable assemblies for our four standard wire sizes. This chart is useful for those standards that specify S21 Attenuation limits at a specific frequency. To calculate the loss for a particular application, select the frequency of interest on the X-axis. Find the corresponding loss per meter on the Y-axis. Multiply the loss per meter times the desired cable length in meters. The result represents the total loss of the assembly at the frequency of interest.