HSSDC2 Cable Assemblies for InfiniBand™ and Fibre Channel Applications

Test 235
JF Sawdy, Manager, Signal Integrity Engineering
3/5/03

Scope of Testing:
Meritec's standard product offering of HSSDC2 cable assemblies were tested to determine suitability for 2.5 Gb/s InfiniBand™ and 2.125Gb/s double speed Fibre Channel applications.
S-parameters were extracted from TDR/TDT measurements. These S-parameters were then used within *Oculus* simulation software to produce eye patterns for the various lengths of cable assemblies.

Equipment Used:
Tektronix CSA-803/SD-24 TDR/TDT Signal Analyzer
atSpeed's *Oculus eXtractor* S-parameter extraction software
atSpeed's *Oculus VDPG* eye pattern generation software
Anritsu MP1701B 10Gb/s Pattern Generator
Meritec HSSDC2 test pc boards 601122, rev. A and 601123, rev. A

Standard Product Offering:

InfiniBand™	2.5 Gb/s	1/2,1,2,3,4,5 meters long
Double speed Fibre Channel	2.125 Gb/s	1/2,1,2,3,4,5 meters long

Results reported are for non-equalized assemblies. Meritec can provide passive equalization if required.

Acceptance Criteria:
The following is our interpretation of the eye pattern requirements of the InfiniBand™ and double speed Fibre Channel specifications:

	Input		Output	
	Eye height	Data rate	Eye height@0.5UI	Eye width
InfiniBand™	1000 mv p-p	2.5 Gb/s	316 mv p-p	300 psec
Fibre Channel	1100 mv p-p	2.125 Gb/s	400 mv p-p	203 psec

Both specifications require CJTPAT bit patterns. Our simulations were run using pseudo-random bit patterns, 2^{7-1} long.

Property of Meritec - © Meritec 2003

MERITEC • 1359 WEST JACKSON STREET • POST OFFICE BOX 8003 • PAINESVILLE, OHIO 44077
888-MERITEC (888-637-4832) / (440)-354-3148 • FAX: (440) 354-0509 • WWW.MERITEC.COM • INFO@MERITEC.COM

Summary of Results (for unequalized assemblies):

InfiniBand™ (using 28awg conductors)

	Output	
Length (meters)	Eye height @ 0.5UI (mv p-p)	Eye width (psec)
1/2	600	376
1	600	373
2	600	379
3	550	361
4	460	340
5	360	315

Double speed Fibre Channel (using 27awg conductors)

	Output	
Length (meters)	Eye height @ 0.5UI (mv p-p)	Eye width (psec)
1/2	580	432
1	600	425
2	700	442
3	600	437
4	560	432
5	500	425

These Fibre Channel simulations were done in a 100-ohm environment to and from the 150-ohm cable assembly. If the application is entirely 150 ohm, better results can be expected.

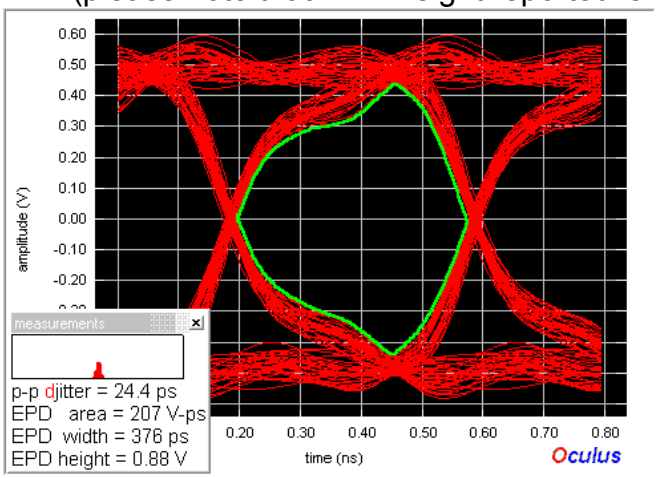
Property of Meritec - © Meritec 2003

MERITEC • 1359 WEST JACKSON STREET • POST OFFICE BOX 8003 • PAINESVILLE, OHIO 44077

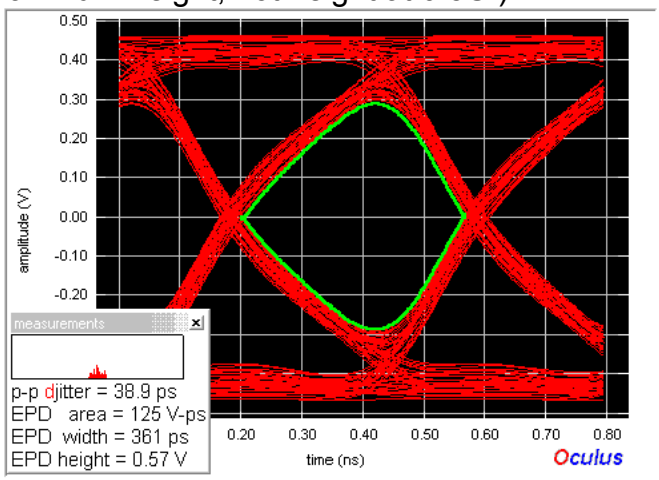
PHONE: 888-MERITEC or (888-637-4832) / (440)-354-3148 • FAX: (440) 354-0509 • WEBSITE: WWW.MERITEC.COM

InfiniBand™ 2.5 Gb/s

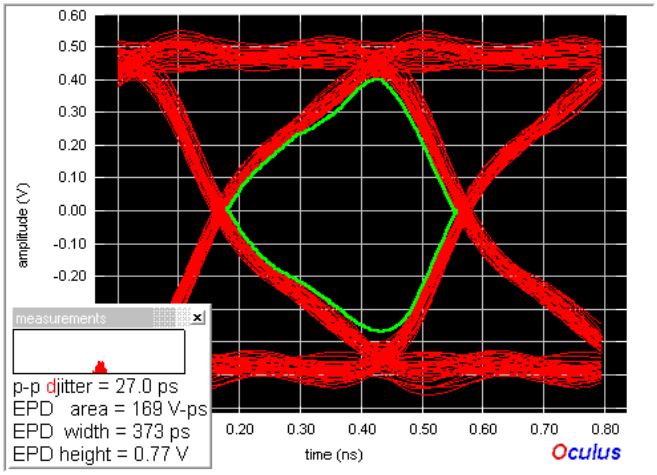
(please note that EPD height reported is maximum height, not height at 0.5UI)



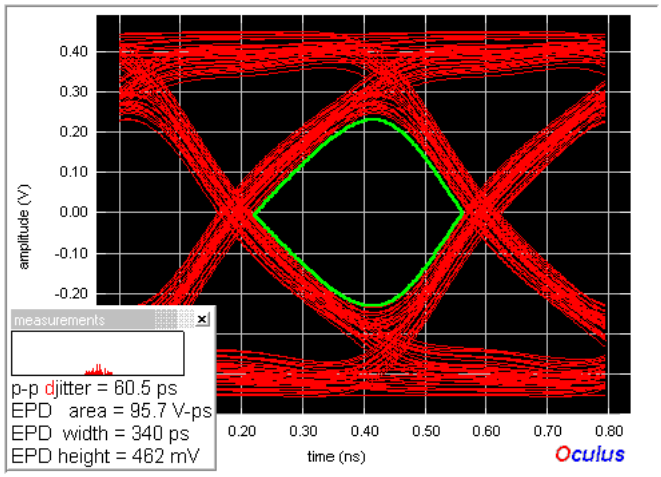
1/2 meter



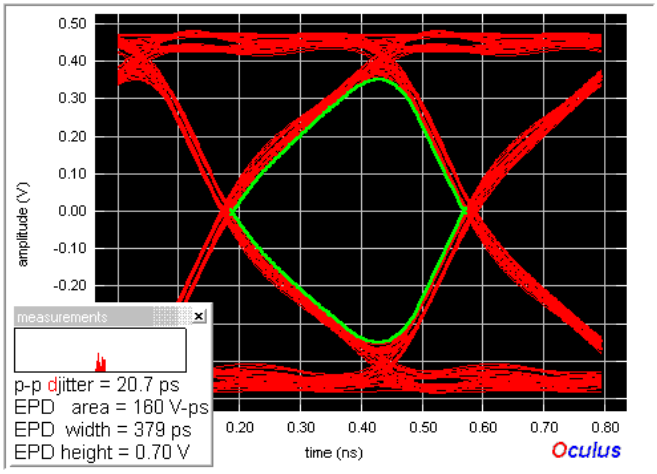
3 meter



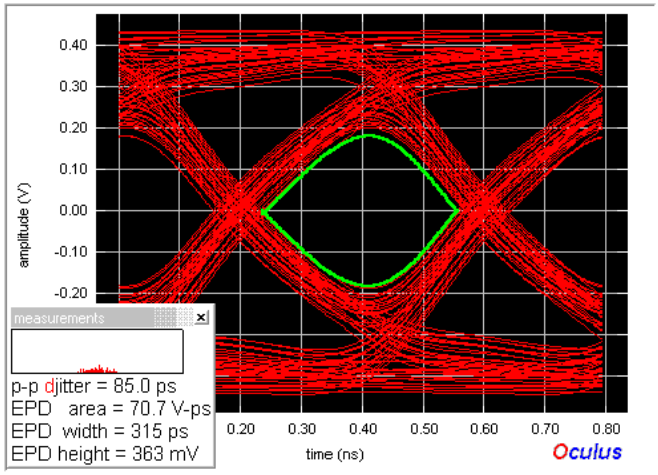
1 meter



4 meter



2 meter



5 meter

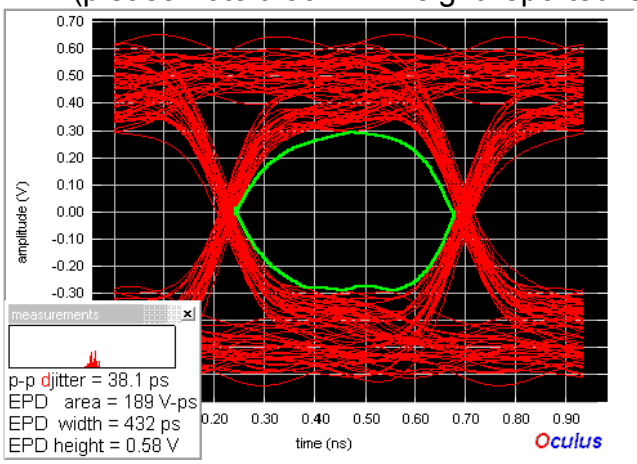
Property of Meritec - © Meritec 2003

MERITEC • 1359 WEST JACKSON STREET • POST OFFICE BOX 8003 • PAINESVILLE, OHIO 44077

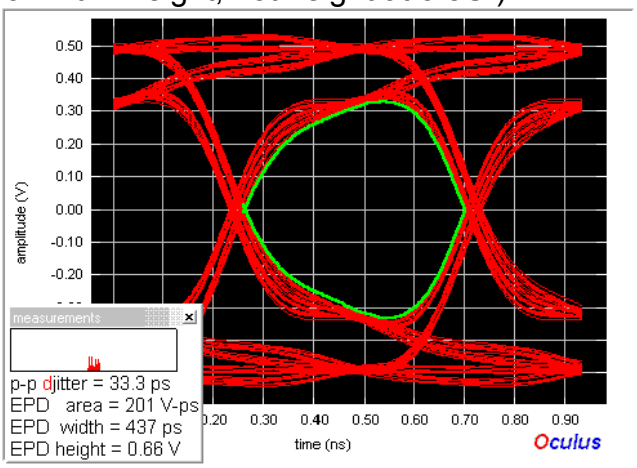
PHONE: 888-MERITEC or (888-637-4832) / (440)-354-3148 • FAX: (440) 354-0509 • WEBSITE: WWW.MERITEC.COM

Double speed Fibre Channel 2.125 Gb/s

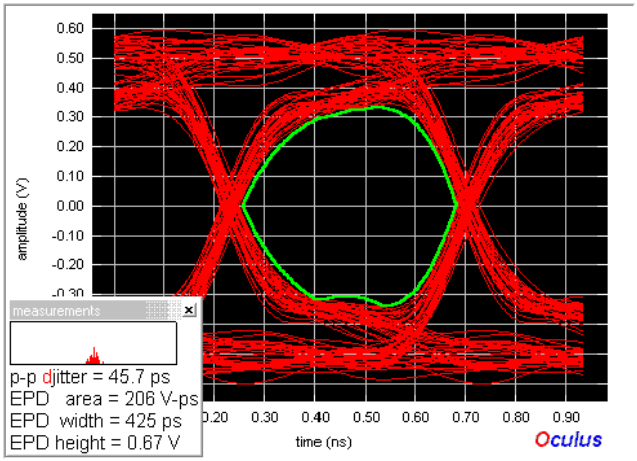
(please note that EPD height reported is maximum height, not height at 0.5UI)



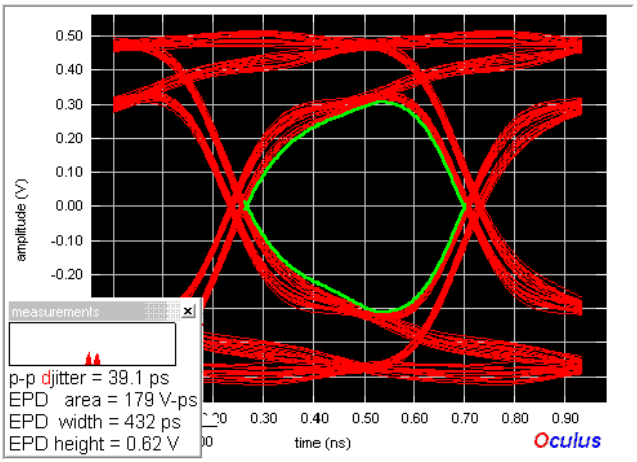
1/2 meter



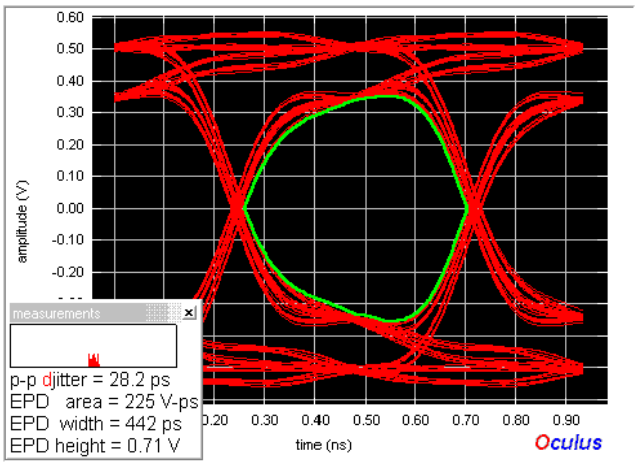
3 meter



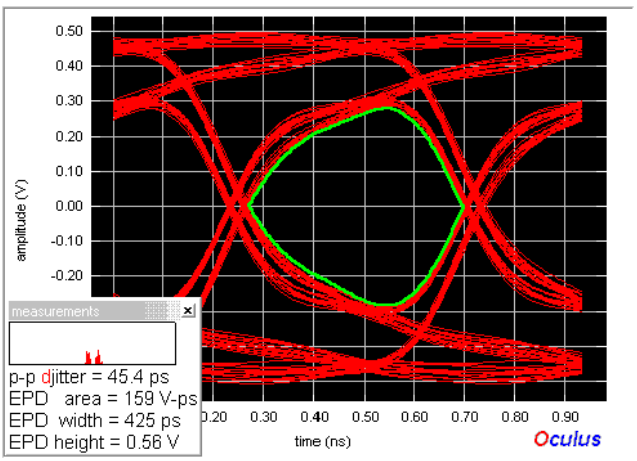
1 meter



4 meter



2 meter



5 meter

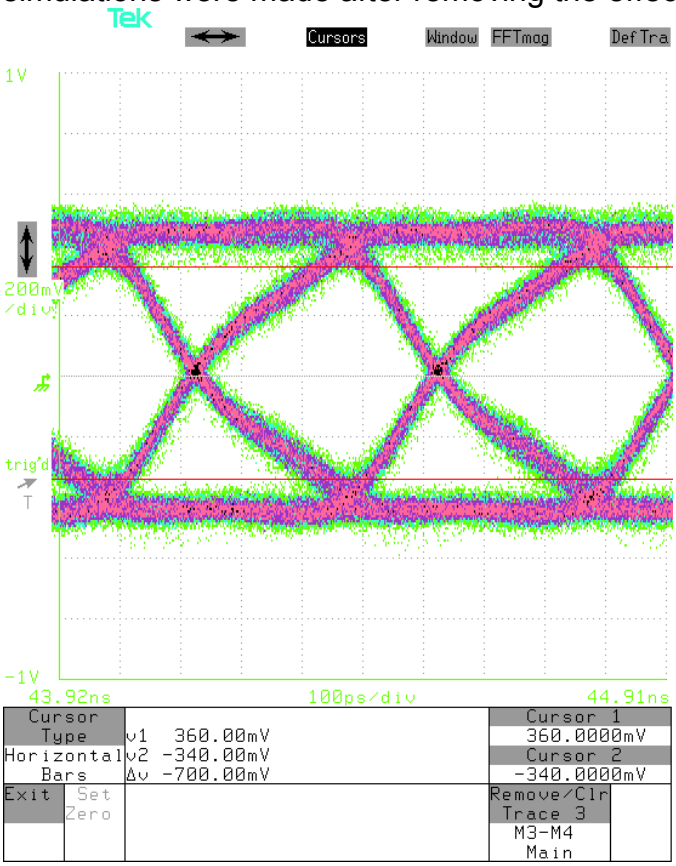
Property of Meritec - © Meritec 2003

MERITEC • 1359 WEST JACKSON STREET • POST OFFICE BOX 8003 • PAINESVILLE, OHIO 44077

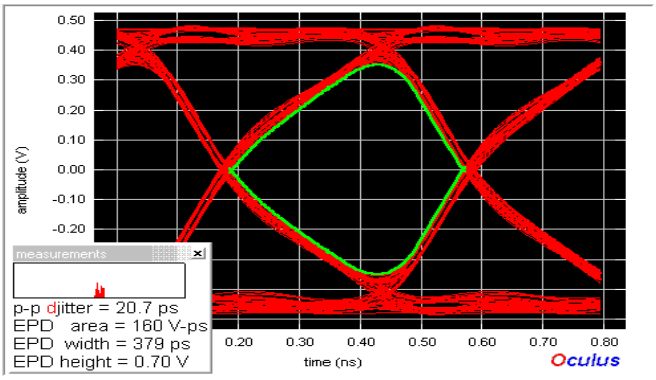
888-MERITEC (888-637-4832) / (440)-354-3148 • FAX: (440) 354-0509 • WWW.MERITEC.COM • INFO@MERITEC.COM

Appendix

The following eye pattern measurement is included to show the correlation of measurement to simulation. The example is for the 2 meter InfiniBand™ cable assembly. Note that this measurement shows slightly more attenuation and jitter than the simulation because the measurement includes the mating test pc boards and test cables in the signal path and it includes the jitter from the Anritsu pattern generator. The simulations were made after removing the effects of these interfaces.



Measurement



Simulation

Property of Meritec - © Meritec 2003

MERITEC • 1359 WEST JACKSON STREET • POST OFFICE BOX 8003 • PAINESVILLE, OHIO 44077

888-MERITEC (888-637-4832) / (440)-354-3148 • FAX: (440) 354-0509 • WWW.MERITEC.COM • INFO@MERITEC.COM