

Test Report

Pass

Test Configuration Details




Application	
Name	D9020USBC USB3.2
Version	3.52.0.0
Device Description	
Test Mode	Host
10G	Yes
5G	No
Reference Clock Option	SSC
User defined S-parameter file	C:\Users\Public\Documents\Infiniium\Apps\USB3Test\TransferFunctions\U7242A_Deembed_USB3_TX_Host_Channel.tf4
User defined SSP S-parameter file	C:\Users\Public\Documents\Infiniium\Apps\USB3Test\TransferFunctions\N7015A_Deembed_TypC_TypC_14p1dbAt5GHz_Embed.tf4
Test Session Details	
Infiniium SW Version	11.50.00401
Infiniium Model Number	UXR0334A
Infiniium Serial Number	MY63040139
Debug Mode Used	No
Compliance Limits	USB 3.2 Specification version 1.0 (official)
Last Test Date	2024-04-12 13:09:20 UTC -05:00

Summary of Results

Test Statistics		Margin Thresholds	
Failed	0	Warning	< 5 %
Passed	22	Critical	< 0 %
Total	22		

Pass	# Failed	# Trials	Test Name (click to jump)	Actual Value	Margin	Pass Limits
✓	0	1	LFPS Peak-Peak Differential Output Voltage	831.8 mV	7.9 %	800.0 mV <= VALUE <= 1.2000 V
✓	0	1	LFPS Period (tPeriod)	64.0574 ns	44.9 %	20.0000 ns <= VALUE <= 100.0000 ns
✓	0	1	LFPS Burst Width (tBurst)	1.1436 µs	32.1 %	600.0 ns <= VALUE <= 1.4000 µs
✓	0	1	LFPS Repeat Time Interval (tRepeat)	10.0311 µs	49.6 %	6.0000 µs <= VALUE <= 14.0000 µs
✓	0	1	LFPS Rise Time	226.2 ps	94.3 %	VALUE <= 4.0000 ns
✓	0	1	LFPS Fall Time	228.6 ps	94.3 %	VALUE <= 4.0000 ns
✓	0	1	LFPS Duty cycle	49.9820 %	49.9 %	40.0000 % <= VALUE <= 60.0000 %
✓	0	1	LFPS AC Common Mode Voltage	21.9 mV	78.1 %	VALUE <= 100.0 mV
✓	0	1	10G TSSC-Freq-Dev-Min	-4.853167 kppm	27.9 %	-5.300000 kppm <= VALUE <= -3.700000 kppm
✓	0	1	10G TSSC-Freq-Dev-Max	158.103 ppm	23.6 %	TSSCmin ppm <= VALUE <= TSSCmax ppm
✓	0	1	10G SSC Modulation Rate	31.244021 kHz	41.5 %	30.000000 kHz <= VALUE <= 33.000000 kHz
✓	0	1	10G SSC df/dt	356.9 ppm/us	71.4 %	VALUE <= 1.2500 kppm/us
✓	0	1	10G Short Channel Template Test	0.000	100.0 %	VALUE = 0.000
✓	0	1	10G Short Channel Differential Output Voltage	232.3 mV	14.4 %	70.0 mV <= VALUE <= 1.2000 V
✓	0	1	10G Short Channel Extrapolated Eye Height	202.7 mV	189.6 %	VALUE >= 70.0 mV
✓	0	1	10G Short Channel Minimum Eye Width	67.1865 ps	40.0 %	VALUE >= 48.0000 ps
ⓘ	0	1	10G Far End Maximum Deterministic Jitter (CTLE ON)	17.052 ps	100.0 %	Information Only
ⓘ	0	1	10G Far End Total Jitter at BER-6 (CTLE ON)	29.788 ps	100.0 %	Information Only
✓	0	1	10G Far End Template Test (CTLE ON)	0.000	100.0 %	VALUE = 0.000
✓	0	1	Extrapolated Eye Height	109.6 mV	56.6 %	VALUE >= 70.0 mV
✓	0	1	Minimum Eye Width	70.2121 ps	46.3 %	VALUE >= 48.0000 ps
✓	0	1	10G Random Jitter	546 fs	45.4 %	VALUE <= 1.000 ps

Report Detail

LFPS Peak-Peak Differential Output Voltage						Summary	Next
 USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Rev 1.0, Section 6.9, Table 6-28)							
The purpose of this test is to verify that the peak-to-peak differential output voltage of the LFPS signal is within the conformance limits specified in Table 6-28 of the USB 3.2 Specification, version 1.0 Actual Value Measurement Name: LPFS PeakToPeakVoltage (5G) [2100] Pass Limits: 800.0 mV <= VALUE <= 1.2000 V							
Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute	Num Bursts Processed		
831.8 mV	7.9 %	(no value)	(no value)	(no value)	5		
						Summary	Previous Next
LFPS Period (tPeriod)						Summary	Previous Next
 USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Rev 1.0, Section 6.9, Table 6-28)							
The purpose of this test is to verify that the period of the LFPS signal is within the conformance limits specified in Table 6-28 of the USB 3.2 Specification, version 1.0 Actual Value Measurement Name: tPeriod (5G) [2105] Pass Limits: 20.0000 ns <= VALUE <= 100.0000 ns							
Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute	Num Bursts Processed		
64.0574 ns	44.9 %	(no value)	(no value)	(no value)	5		
						Summary	Previous Next
LFPS Burst Width (tBurst)						Summary	Previous Next
 USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Rev 1.0, Section 6.9, Table 6-29)							
The purpose of this test is to verify that the burst width (tBurst) of the Polling.LFPS signal is within the conformance limits specified in Table 6-29 of the USB 3.2 Specification, version 1.0 Actual Value Measurement Name: tBurst (5G) [2110] Pass Limits: 600.0 ns <= VALUE <= 1.4000 µs							
Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute	Num Bursts Processed		
1.1436 µs	32.1 %	(no value)	(no value)	(no value)	5		

Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute	Num Bursts Processed
1.1436 μ s	32.1 %	(no value)	(no value)	(no value)	5

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LFPS Repeat Time Interval (tRepeat)

USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Rev 1.0, Section 6.9, Table 6-29)

The purpose of this test is to verify that the time interval when the next LFPS burst is transmitted (tRepeat) is within the conformance limits specified in Table 6-29 of the USB 3.2 Specification, version 1.0
 Actual Value Measurement Name: tRepeat (5G) [2115]
 Pass Limits: 6.0000 μ s <= VALUE <= 14.0000 μ s

Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute	Num Bursts Processed
10.0311 μ s	49.6 %	(no value)	(no value)	(no value)	5

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LFPS Rise Time

USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Rev 1.0, Section 6.9, Table 6-28)

The purpose of this test is to verify that the rise time of the LFPS signal is within the conformance limits specified in Table 6-28 of the USB 3.2 Specification, version 1.0
 Actual Value Measurement Name: LFPS Rise Time (5G) [2120]
 Pass Limits: VALUE <= 4.0000 ns

Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute	Num Bursts Processed
226.2 ps	94.3 %	(no value)	(no value)	(no value)	5

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LFPS Fall Time

USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Rev 1.0, Section 6.9, Table 6-28)

The purpose of this test is to verify that the fall time of the LFPS signal is within the conformance limits specified in Table 6-28 of the USB 3.2 Specification, version 1.0
 Actual Value Measurement Name: LFPS Fall Time (5G) [2125]
 Pass Limits: VALUE <= 4.0000 ns

Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute	Num Bursts Processed
228.6 ps	94.3 %	(no value)	(no value)	(no value)	5

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LFPS Duty cycle

USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Rev 1.0, Section 6.9, Table 6-28)

The purpose of this test is to verify that the duty cycle of the LFPS signal is within the conformance limits specified in Table 6-28 of the USB 3.2 Specification, version 1.0
 Actual Value Measurement Name: LFPS Duty cycle (%) (5G) [2130]
 Pass Limits: 40.0000 % <= VALUE <= 60.0000 %

Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute	Num Bursts Processed
49.9820 %	49.9 %	(no value)	(no value)	(no value)	5

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LFPS AC Common Mode Voltage

USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Rev 1.0, Section 6.9, Table 6-28)

The purpose of this test is to verify that the maximum voltage from Txp + Txn for both time and amplitude is within the limits as specified in Table 6-28 of the USB 3.2 specification
 Actual Value Measurement Name: AC Common Mode Voltage (5G) [2140]
 Pass Limits: VALUE <= 100.0 mV

Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute
21.9 mV	78.1 %	(no value)	(no value)	(no value)

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10G TSSC-Freq-Dev-Min

USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Rev 1.0, Section 6.5.3, Table 6-16)

The purpose of this test is to verify that the measured SSC deviation is within the conformance limits specified in Table 6-16 of the USB 3.2 Specification.
 Actual Value Measurement Name: SSC Deviation (ppm) (10G) [12307]
 Pass Limits: -5.300000 kppm <= VALUE <= -3.700000 kppm

Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute	Max UI (ppm)	Min UI (ppm)
-4.853167 kppm	27.9 %	(no value)	(no value)	(no value)	-4.853167 kppm	-4.845248 kppm

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10G TSSC-Freq-Dev-Max

USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Rev 1.0, Section 6.5.3, Table 6-16)

The purpose of this test is to verify that the measured SSC deviation is within the conformance limits specified in Table 6-16 of the USB 3.2 Specification.
 Actual Value Measurement Name: Worst SSC Deviation (ppm) (10G) [12311]
 Pass Limits: TSSCMin ppm <= VALUE <= TSSCMax ppm

Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute	Max UI (ppm)	Min UI (ppm)	PassLimit Min (TSSCMin)	PassLimit Max (TSSCMax)
158.103 ppm	23.6 %	(no value)	(no value)	(no value)	152.209 ppm	158.103 ppm	-300.000 ppm	300.000 ppm

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10G SSC Modulation Rate

USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Rev 1.0, Section 6.5.3, Table 6-16)

The purpose of this test is to verify that the measured SSC modulation rate is within the conformance limits specified in Table 6-16 of the USB 3.2 Specification.
 Actual Value Measurement Name: Modulation Rate (Hz) (10G) [12308]
 Pass Limits: 30.000000 kHz <= VALUE <= 33.000000 kHz

Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute	Modulation rate measurement
31.244021 kHz	41.5 %	(no value)	(no value)	(no value)	Success

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10G SSC df/dt

USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Rev 1.0, Section 6.7.1, Table 6-17)

The purpose of this test is to verify that the maximum df/dt is never exceeded as specified in Table 6-17 of the USB 3.2 Specification.
 Actual Value Measurement Name: SSC df/dt (ppm/us) (10G) [2512]
 Pass Limits: VALUE <= 1.2500 kppm/us

Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute	SSC df/dt measurement
356.9 ppm/us	71.4 %	(no value)	(no value)	(no value)	(no value)

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10G Short Channel Template Test

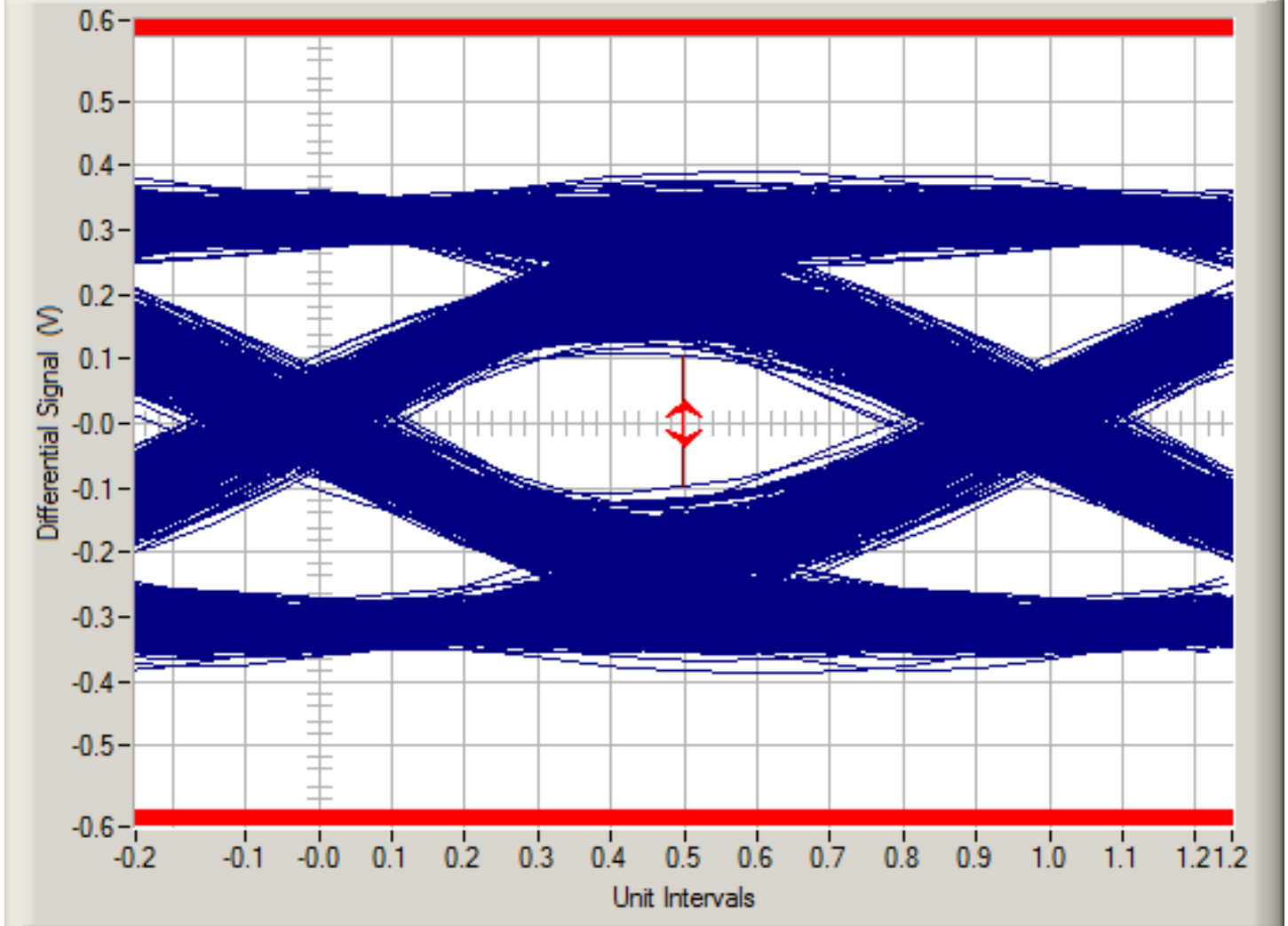
USB 3.2 Specification, Rev 1.0, Section 6.7.3, Table 6-19

The purpose of this test is to perform an eye mask test at TP1 using the eye mask template as specified in table 6-19 of the USB 3.2 specification.
 Actual Value Measurement Name: Mask Test Failures (10G) (Short Channel) [42210]
 Pass Limits: VALUE = 0.000

Actual Value	Margin	Number of UI for USB3 Gen2 testing	Extrapolated Eye Height (>70mV)	Non-Transition Failures	Transition Failures
0.000	100.0 %	2.000000000 M	203 m	0.000	0.000

Transition Eye Diagram (See image)	Total Failures 0.000	CTLE Index 1.000	DFE Tap 0.000	NonTrans Max Voltage 390 m	NonTrans Min Voltage -388 m	NonTrans Lower Margin Voltage -117 m
NonTrans Upper Margin Voltage 118 m	NonTrans Eye Height 305 m	Trans Max Voltage 384 m	Trans Min Voltage -382 m	Trans Lower Margin Voltage -79 m	Trans Upper Margin Voltage 83 m	
Trans Eye Height 232 m	Maximum Peak to Peak Jitter 40 p	Mean Recover UI 100.252	Min Eye Width 67.186	Composit Eye Height 203 m	Composit Eye Location 499 m	
Min Time Between CrossOver 90 p	Test Pattern CP9					
Template File C:\ProgramData\Keysight\Infinium\Apps\USB3Test\SigTest10G\templates\USB_3_10GB\USB_3_10Gb_CP9_Tx_Short.dat	ConfigChannel (no value)	ConfigLane (no value)	PDOPMute (no value)			

Transition Eye Diagram



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	10G Short Channel Differential Output Voltage	USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Rev 1.0, Section 6.7.3, Table 6-19)
The purpose of this test is to verify that the differential output voltage measured at TP1 meets the minimum eye height as specified in Table 6-19 of the USB 3.2 specification.		
Actual Value Measurement Name: PeakToPeakVoltage (10G) (Short Channel) [42241]		
Pass Limits: 70.0 mV <= VALUE <= 1.2000 V		

Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute
232.3 mV	14.4 %	(no value)	(no value)	(no value)

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	10G Short Channel Extrapolated Eye Height	USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Extrapolated eye height should more than 70mV)
The purpose of this test is to measure the extrapolated eye height		
Actual Value Measurement Name: Extrapolated Eye Height (10G) (Short Channel) [42292]		
Pass Limits: VALUE >= 70.0 mV		

Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute
202.7 mV	189.6 %	(no value)	(no value)	(no value)

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	10G Short Channel Minimum Eye Width	USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Eye width should more than 48ps)
The purpose of this test is to measure the Eye Width		
Actual Value Measurement Name: Eye Width (10G) (Short Channel) [42296]		
Pass Limits: VALUE >= 48.0000 ps		

Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute
67.1865 ps	40.0 %	(no value)	(no value)	(no value)

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	10G Far End Maximum Deterministic Jitter (CTLE ON)	USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Rev 1.0, Section 6.7.3, Table 6-19)
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The purpose of this test is to verify that the measured deterministic jitter, Dj measured at TP1 is within the limits as specified in Table 6-19 of the USB 3.2 specification.
 Actual Value Measurement Name: DJ (10G) (Far End) (CTLE ON) [26920]
 Pass Limits: Information Only

Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute	Number of UI for USB3 Gen2 testing	DJ_dd	Test Pattern	OptDeembedMode10G
17.052 ps	100.0 %	(no value)	(no value)	(no value)	2.000000000 M	17.052 ps	CP9	C to C

Embedded channel file
 N7015A_Deembed_TypC_TypC_14p1dbAt5GHz_Embed.tf4

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10G Far End Total Jitter at BER-6 (CTLE ON) USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Rev 1.0, Section 6.7.3, Table 6-19)

The purpose of this test is to verify that the measured total jitter, Tj measured at TP1 is within the limits as specified in Table 6-18 of the USB 3.2 specification.
 Actual Value Measurement Name: Tj at BER 10-6 (10G) (Far End) (CTLE ON) [26960]
 Pass Limits: Information Only

Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute	Number of UI for USB3 Gen2 testing	RJ Test Pattern	DJ Test Pattern
29.788 ps	100.0 %	(no value)	(no value)	(no value)	2.000000000 M	CP10	CP9

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10G Far End Template Test (CTLE ON) USB 3.2 Specification, Rev 1.0, Section 6.7.3, Table 6-19

The purpose of this test is to perform an eye mask test at TP1 using the eye mask template as specified in table 6-19 of the USB 3.2 specification.
 Actual Value Measurement Name: Mask Test Failures (10G) (Far End) (CTLE ON) [26100]
 Pass Limits: VALUE = 0.000

Actual Value	Margin	Number of UI for USB3 Gen2 testing	Extrapolated Eye Height (>70mV)	Non-Transition Failures	Transition Failures
0.000	100.0 %	2.000000000 M	110 m	0.000	0.000

Transition Eye Diagram (See image)	Total Failures	CTLE Index	DFE Tap	NonTrans Max Voltage	NonTrans Min Voltage	NonTrans Lower Margin Voltage
	0.000	3.000	50.000	195 m	-194 m	-24 m

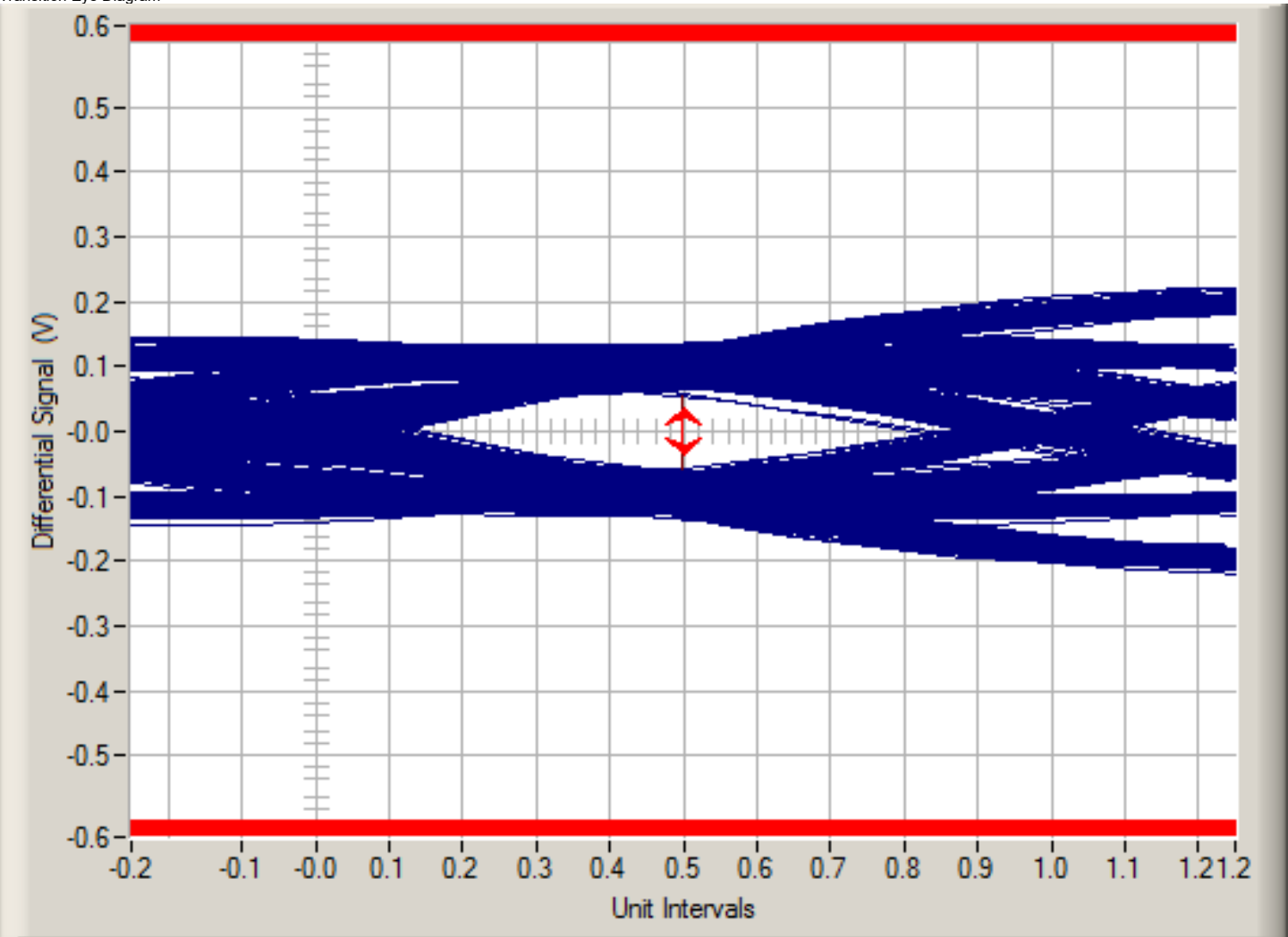
NonTrans Upper Margin Voltage	NonTrans Eye Height	Trans Max Voltage	Trans Min Voltage	Trans Lower Margin Voltage	Trans Upper Margin Voltage
25 m	118 m	169 m	-167 m	-30 m	31 m

Trans Eye Height	Maximum Peak to Peak Jitter	Mean Recover UI	Min Eye Width	Composit Eye Height	Composit Eye Location
130 m	30 p	100.249	70.212	110 m	499 m

Min Time Between CrossOver	Test Pattern	Template File
60 p	CP9	C:\ProgramData\Keysight\Infiniium\Apps\USB3Test\SigTest10G\templates\USB_3_10Gb\USB_3_10Gb_CP9_Tx.dat

OptDeembedMode10G	Embedded channel file (10G)	ConfigChannel	ConfigLane	PDOPMute
C to C	N7015A_Deembed_TypC_TypC_14p1dbAt5GHz_Embed.tf4	(no value)	(no value)	(no value)

Transition Eye Diagram




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Extrapolated Eye Height USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Extrapolated eye height should more than 70mV)

The purpose of this test is to measure the extrapolated eye height
 Actual Value Measurement Name: Extrapolated Eye Height [90002]
 Pass Limits: VALUE >= 70.0 mV


Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute
109.6 mV	56.6 %	(no value)	(no value)	(no value)

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	Minimum Eye Width	USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Eye width should more than 48ps)
<p>The purpose of this test is to measure the Eye Width Actual Value Measurement Name: Eye Width [90003] Pass Limits: VALUE >= 48.0000 ps</p>		

Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute
70.2121 ps	46.3 %	(no value)	(no value)	(no value)

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	10G Random Jitter	USB 3.2 Specification, Rev 1.0 (USB 3.2 Specification, Rev 1.0, Section 6.7.3, Table 6-19)
<p>The purpose of this test is to verify that the measured random jitter, Rj measured at TP1 is within the limits as specified in Table 6-19 of the USB 3.2 specification. Actual Value Measurement Name: RJ (10G) (Far End) (CTLE ON) [26820] Pass Limits: VALUE <= 1.000 ps</p>		

Actual Value	Margin	ConfigChannel	ConfigLane	PDOPMute	Number of UI for USB3 Gen2 testing	Rj_rms	Rj_Total	Test Pattern
546 fs	45.4 %	(no value)	(no value)	(no value)	2.00000000 M	546 fs	7.688 ps	CP10