

Test Report

Fail

Test Configuration Details	
Application	
Name	D9010ETHC Ethernet
Version	2.62.0.0
Device Description	
Tests10BT	Yes
Tests100BT	Yes
Tests1000BT	No
Tests10BT_EEE	No
Tests100BT_EEE	No
Tests1000BT_EEE	No
DisturberSource	Use Keysight 33250A
ReturnLossTest	Use Vector Network Analyzer
Test Session Details	
Infiniium SW Version	06.40.01001
Infiniium Model Number	DS0S204A
Infiniium Serial Number	MY55510174
Debug Mode Used	No
Compliance Limits	IEEE Std. 802.3 Specification (official)
Probe (Channel 1)	Model: 1131A Serial: US55011277 Head: E2678A/B Atten: Calibrated (17 MAR 2023 16:40:03), Using Cal Atten (9.9521E+00) Skew: Not Calibrated, Using Default Skew
Probe (Channel 2)	Model: User Defined Probe Serial: No Serial Num Atten: Not Calibrated, Using Default Atten (1.0000E+00) Skew: Not Calibrated, Using Default Skew
Probe (Channel 3)	Model: User Defined Probe Serial: No Serial Num Atten: Not Calibrated, Using Default Atten (1.0000E+00) Skew: Not Calibrated, Using Default Skew
Probe (Channel 4)	Model: User Defined Probe Serial: No Serial Num Atten: Not Calibrated, Using Default Atten (1.0000E+00) Skew: Not Calibrated, Using Default Skew
Last Test Date	2023-06-26 16:03:24 UTC +09:00

Summary of Results

Test Statistics		Margin Thresholds	
Failed	1	Warning	< 2 %
Passed	16	Critical	< 0 %
Total	17		

Pass	# Failed	# Trials	Test Name (click to jump)	Actual Value	Margin	Pass Limits
✓	0	1	100 Base-TX, UTP +Vout Differential Output Voltage	1.0318 V	18.2	950.0 mV < VALUE < 1.0500 V
✓	0	1	100 Base-TX, UTP -Vout Differential Output Voltage	-1.0306 V	19.4	950.0 mV < VALUE < 1.0500 V
✓	0	1	100 Base-TX, UTP Signal Amplitude Symmetry	-1.001	47.5	980 m < VALUE < 1.020
✓	0	1	100 Base-TX, +Vout Overshoot	-800 m%	116.0	VALUE < 5.0 %
✓	0	1	100 Base-TX, -Vout Overshoot	-500 m%	110.0	VALUE < 5.0 %
✓	0	1	100 Base-TX, UTP AOI Template	0.000	100.0	No Mask Failures
✓	0	1	100 Base-TX, AOI +Vout Rise Time	3.550 ns	27.5	3.000 ns < VALUE < 5.000 ns
✓	0	1	100 Base-TX, AOI +Vout Fall Time	3.510 ns	25.5	3.000 ns < VALUE < 5.000 ns
✓	0	1	100 Base-TX, AOI +Vout Rise/Fall Symmetry	78.72 ps	84.3	VALUE < 500.00 ps
✓	0	1	100 Base-TX, AOI -Vout Rise Time	3.540 ns	27.0	3.000 ns < VALUE < 5.000 ns
✓	0	1	100 Base-TX, AOI -Vout Fall Time	3.500 ns	25.0	3.000 ns < VALUE < 5.000 ns
✓	0	1	100 Base-TX, AOI -Vout Rise/Fall Symmetry	69.90 ps	86.0	VALUE < 500.00 ps
✓	0	1	100 Base-TX, AOI Overall Rise/Fall Symmetry	87.95 ps	82.4	VALUE < 500.00 ps
✓	0	1	100 Base-TX, Transmit Jitter	418 ps	70.1	VALUE < 1.400 ns
✓	0	1	100 Base-TX, Duty Cycle Distortion	62.350 ps	87.5	VALUE <= 500.000 ps
✗	2	2	100 Base-TX, Transmitter Return Loss	-1.24 dB	-12.4	Overall = Pass
✓	0	1	100 Base-TX, Receiver Return Loss	650 mdB	6.5	Overall = Pass

Report Detail

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✓	100 Base-TX, UTP +Vout Differential Output Voltage			IEEE Std. 802.3 (ANSI X3.263-1995, Section 9.1.2.2)
	Vout is defined as the straight line best fit for amplitude. Here, Vout is measured over a 96ns pulse.			
	Actual Value Measurement Name: +Vout			
	Pass Limits: 950.0 mV < VALUE < 1.0500 V			
Actual Value	Margin	Mid Voltage	#Avgs (100 Base-TX Peak Voltage measurements)	
1.0318 V	18.2	0.000 V	128.0	

+Vout


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100 Base-TX, UTP -Vout Differential Output Voltage

IEEE Std. 802.3 (ANSI X3.263-1995, Section 9.1.2.2)

Vout is defined as the straight line best fit for amplitude. Here, Vout is measured over a 96ns pulse.

Actual Value Measurement Name: -Vout

Pass Limits: 950.0 mV < [VALUE] < 1.0500 V

Actual Value	Margin	Mid Voltage	#Avgs (100 Base-TX Peak Voltage measurements)
-1.0306 V	19.4	0.000 V	128.0

-Vout


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100 Base-TX, UTP Signal Amplitude Symmetry

IEEE Std. 802.3 (ANSI X3.263-1995, Section 9.1.4)

The ratio of the +Vout magnitude to -Vout magnitude shall be between the limits of 0.98 and 1.02

Actual Value Measurement Name: Amplitude Symmetry

Pass Limits: 980 m < [VALUE] < 1.020

Actual Value	Margin	+Vout	-Vout	#Avgs (100 Base-TX Peak Voltage measurements)
-1.001	47.5	1.0318 V	-1.0306 V	128.0

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100 Base-TX, +Vout Overshoot

IEEE Std. 802.3 (ANSI X3.263-1995, Section 9.1.3)

We define overshoot as the percentage difference between the peak voltage of the waveform and the final adjusted value (Vout). The peak voltage is measured between the 50% transition crossing time from 0 to Vout and a point in time 8ns afterward. Overshoot 0s computed as (Vpeak - Vout)/Vout * 100 percent.

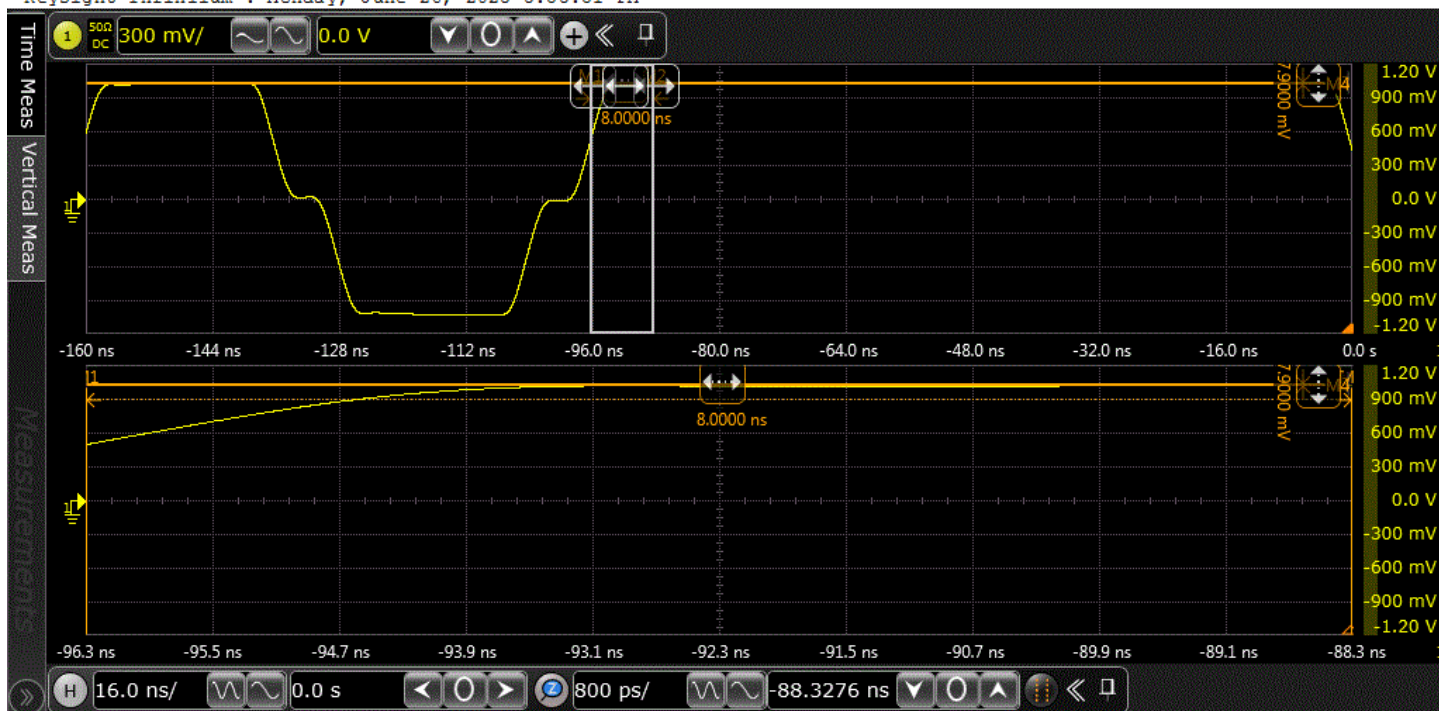
Actual Value Measurement Name: +Overshoot (%)

Pass Limits: VALUE < 5.0 %

Actual Value	Margin	VPeak	VOut	#Avgs (100 Base-TX overshoot)
-800 m%	116.0	1.0239 V	1.0318 V	128.0

+Overshoot (%)

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100 Base-TX, -Vout Overshoot

IEEE Std. 802.3 (ANSI X3.263-1995, Section 9.1.3)

We define overshoot as the percentage difference between the peak voltage of the waveform and the final adjusted value (VOut). The peak voltage is measured between the 50% transition crossing time from 0 to VOut and a point in time 8ns afterward. Overshoot 0s computed as (Vpeak - VOut)/VOut * 100 percent.

Actual Value Measurement Name: -Overshoot (%)

Pass Limits: VALUE < 5.0 %

Actual Value	Margin	VPeak	VOut	#Avgs (100 Base-TX overshoot)
-500 m%	110.0	1.0251 V	1.0306 V	128.0

-Overshoot (%)

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100 Base-TX, UTP AOI Template

IEEE Std. 802.3 (ANSI X3.263-1995, Annex J)

The template is first centered vertically on the eye pattern baseline. It should be translated horizontally and scaled in amplitude for the best fit to the eye pattern. For UTP, the scaling factor must be between 0.95 and 1.05.

Actual Value Measurement Name: Total # Failures (100 Base-TX, UTP AOI Template)

Pass Limits: No Mask Failures

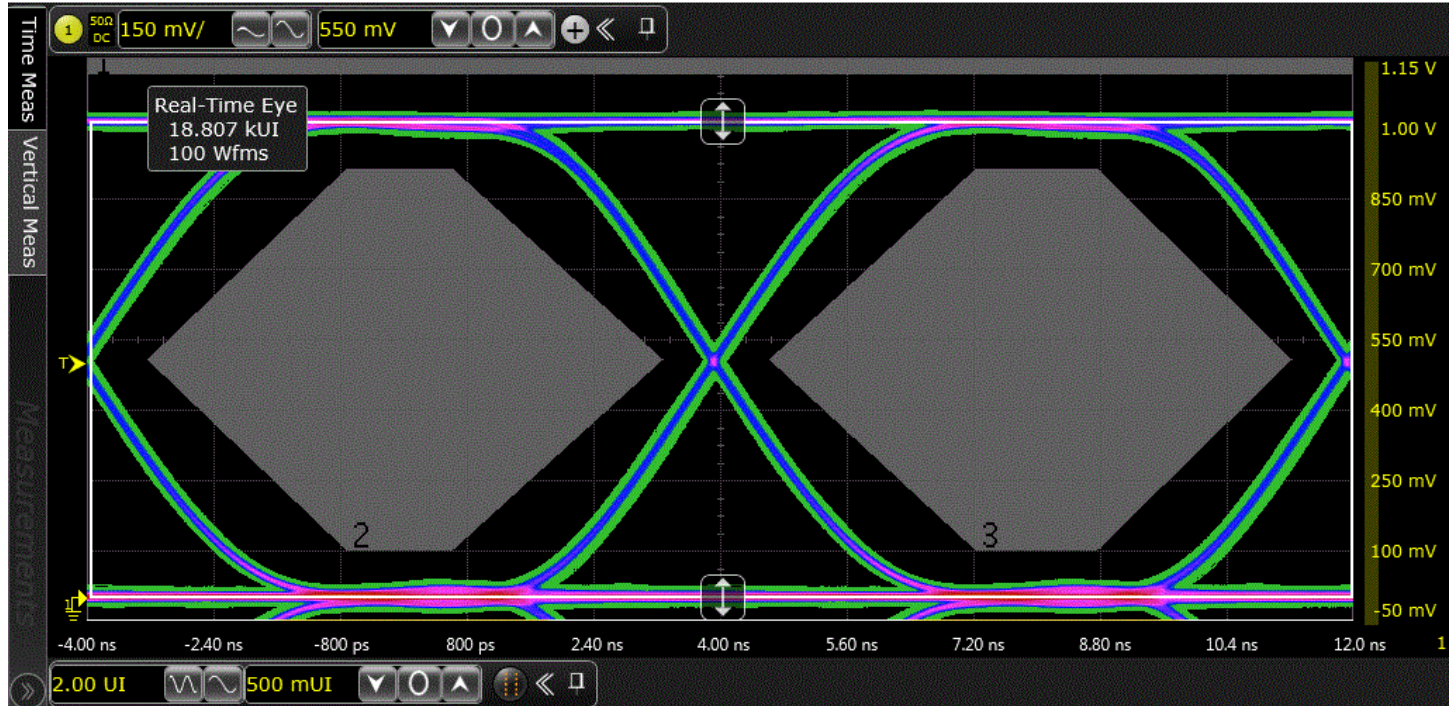
Actual Value	Margin	Eye TopAutofit Mask Scale	Eye Top -- #Waveforms Tested	Eye Top -- Failure Details	Eye Top
0.000	100.0	985 m	100.000	No Failure	(no value)
Eye BottomAutofit Mask Scale	Eye Bottom -- #Waveforms Tested	Eye Bottom -- Failure Details	Eye Bottom		
992 m	100.000	No Failure	(no value)		

Waveforms (100 Base-TX AOI Template Test)

100.0

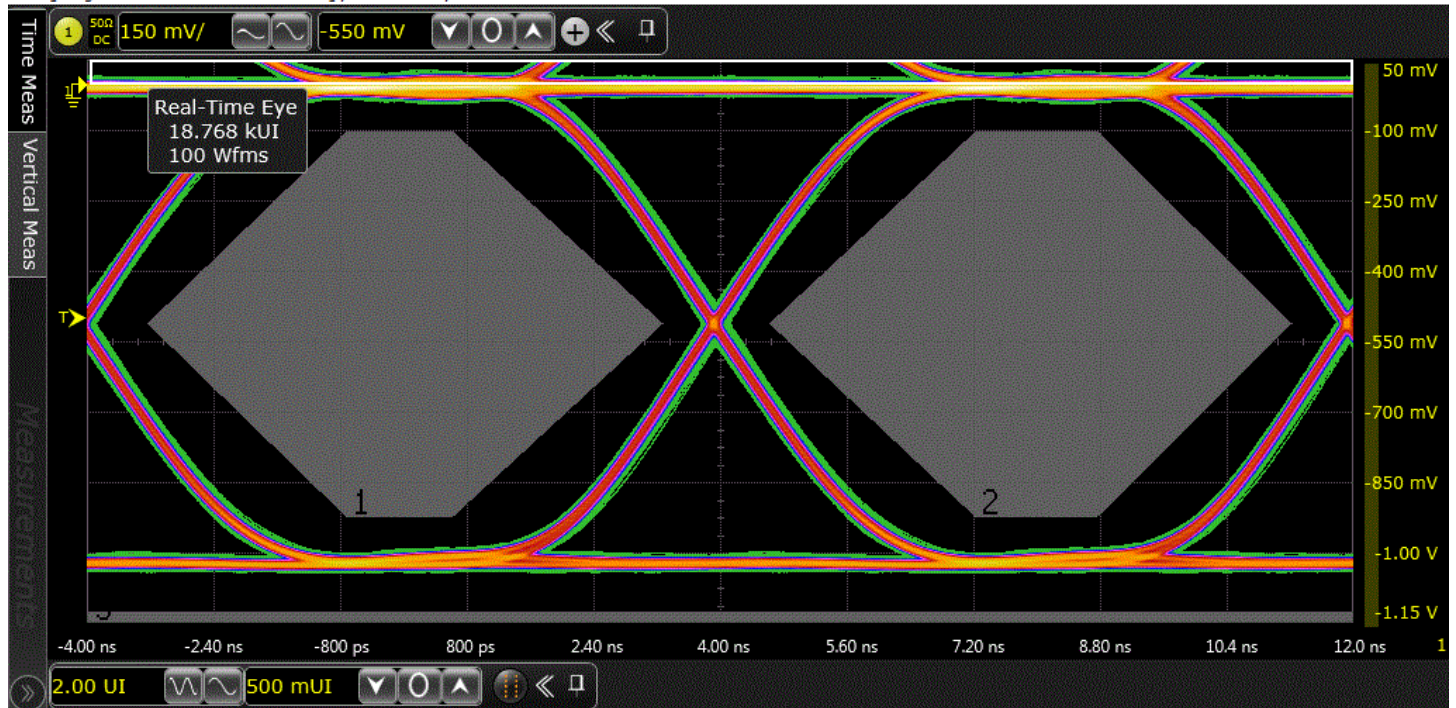
Eye Top -- No Failures

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Eye Bottom -- No Failures

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100 Base-TX, AOI +Vout Rise Time

IEEE Std. 802.3 (ANSI X3.263-1995, Section 9.1.6)

The AOI signal rise is defined as the transition from the baseline voltage (nominally 0V) to either +Vout or -Vout. The AOI rise and fall times (10/90) for +Vout and -Vout shall fall in the range of 3 to 5 ns. A number of rise/falltime measurements are made. The worst case is reported here.

Actual Value Measurement Name: Worst Case Risetime (AOI +Vout Rise Time)

Pass Limits: 3.000 ns < VALUE < 5.000 ns

Actual Value	Margin	Maximum Risetime	Minimum Risetime	Average Risetime	+Vout	# Rise/Fall Avgs	# Rise/Fall Meas
3.550 ns	27.5	3.579 ns	3.550 ns	3.561 ns	1.0318 V	128.0	100.0

One +Vout Signal Rise (of 100.0 total)


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100 Base-TX, AOI +Vout Fall Time

IEEE Std. 802.3 (ANSI X3.263-1995, Section 9.1.6)

The AOI signal fall is defined as the transition from the +Vout or -Vout to the baseline voltage (nominally 0V). The AOI rise and fall times (10/90) for +Vout and -Vout shall fall in the range of 3 to 5 ns. Note that this test uses 100 measurements. The reported "Actual Value" is the current/last measurement. The statistics (min/max) over 100 measurements are used to determine compliance.

Actual Value Measurement Name: Worst Case Falltime (AOI +Vout Fall Time)

Pass Limits: 3.000 ns < VALUE < 5.000 ns

Actual Value	Margin	Maximum Falltime	Minimum Falltime	Average Falltime	+Vout	# Rise/Fall Avgs	# Rise/Fall Meas
3.510 ns	25.5	3.588 ns	3.510 ns	3.539 ns	1.0318 V	128.0	100.0

One +Vout Signal Fall (of 100.0 total)


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100 Base-TX, AOI +Vout Rise/Fall Symmetry

IEEE Std. 802.3 (ANSI X3.263-1995, Section 9.1.6)

The difference between the maximum and minimum of all rise and fall times shall be less than or equal to 0.5ns. The statistics (min/max Rise/Falltime) over 100 measurements are used to determine compliance.

Actual Value Measurement Name: +Vout, Worst Case Delta (AOI +Vout Rise/Fall Symmetry)

Pass Limits: VALUE < 500.00 ps

Actual Value	Margin	Min Risettime	Max Risettime	Min Falltime	Max Falltime	+Vout	# Rise/Fall Avgs	# Rise/Fall Meas
78.72 ps	84.3	3.550 ns	3.579 ns	3.510 ns	3.588 ns	1.0318 V	128.0	100.0

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100 Base-TX, AOI -Vout Rise Time

IEEE Std. 802.3 (ANSI X3.263-1995, Section 9.1.6)

The AOI signal rise is defined as the transition from the baseline voltage (nominally 0V) to either +Vout or -Vout. The AOI rise and fall times (10/90) for +Vout and -Vout shall fall in the range of 3 to 5 ns. Note that this test uses 100 measurements. The reported "Actual Value" is the current/last measurement. The statistics (min/max) over 100 measurements are used to determine compliance.

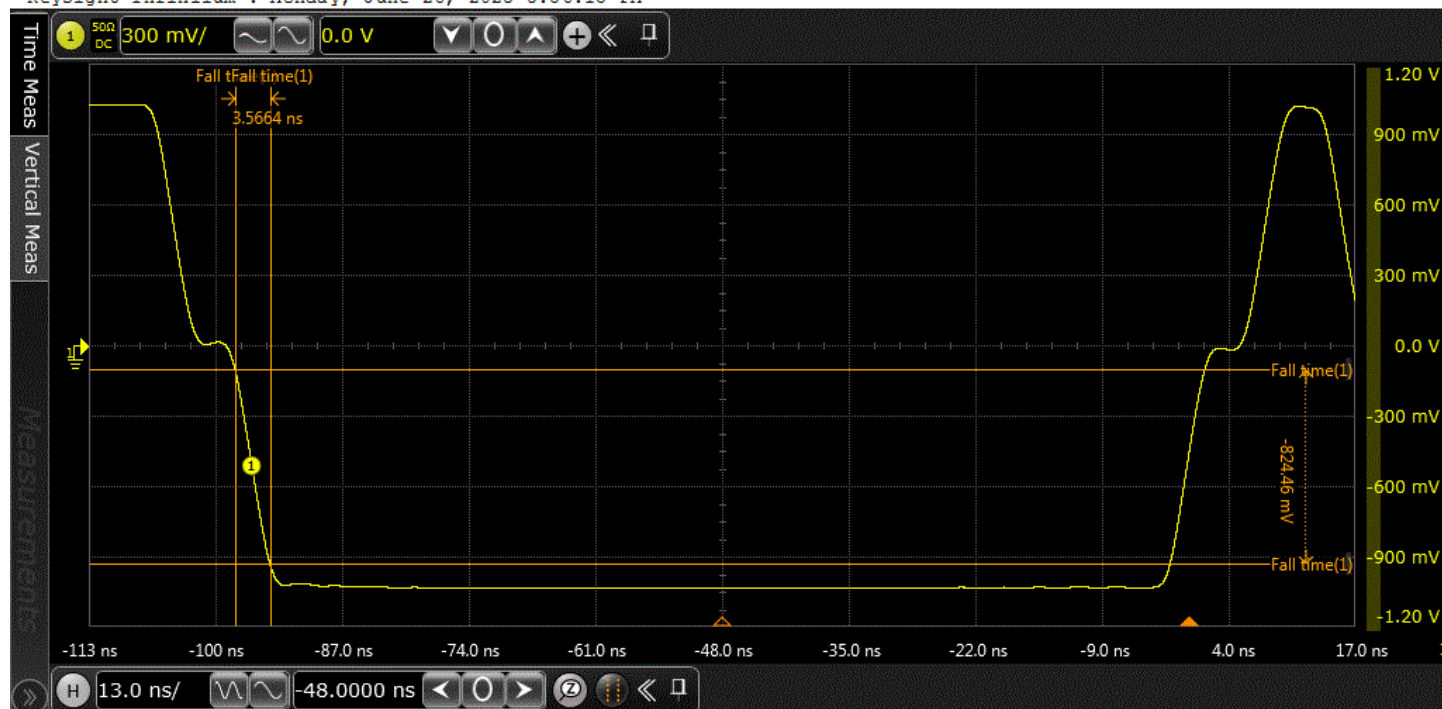
Actual Value Measurement Name: Worst Case Risetime (AOI -Vout Rise Time)

Pass Limits: 3.000 ns < VALUE < 5.000 ns

Actual Value	Margin	Maximum Risetime	Minimum Risetime	Average Risetime	-Vout	# Rise/Fall Avgs	# Rise/Fall Meas
3.540 ns	27.0	3.570 ns	3.540 ns	3.565 ns	-1.0306 V	128.0	100.0

One -Vout Signal Rise (of 100.0 total)

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IEEE Std. 802.3 (ANSI X3.263-1995, Section 9.1.6)

The AOI signal fall is defined as the transition from the +Vout or -Vout to the baseline voltage (nominally 0V). The AOI rise and fall times (10/90) for +Vout and -Vout shall fall in the range of 3 to 5 ns. Note that this test uses 100 measurements. The reported "Actual Value" is the current/last measurement. The statistics (min/max) over 100 measurements are used to determine compliance.

Actual Value Measurement Name: Worst Case Falltime (AOI -Vout Fall Time)

Pass Limits: 3.000 ns < VALUE < 5.000 ns

Actual Value	Margin	Maximum Falltime	Minimum Falltime	Average Falltime	-Vout	# Rise/Fall Avgs	# Rise/Fall Meas
3.500 ns	25.0	3.563 ns	3.500 ns	3.542 ns	-1.0306 V	128.0	100.0

One -Vout Signal Fall (of 100.0 total)

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IEEE Std. 802.3 (ANSI X3.263-1995, Section 9.1.6)

Actual Value Measurement Name: -Vout Worst Case Delta
Pass Limits: VALUE < 500.00 ps

Rise/Fall Meas
100.0

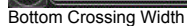
100 Base-TX, AOI Overall Rise/Fall Symmetry
IEEE Std. 802.3 (ANSI X3.263-1995, Section 9.1.6)

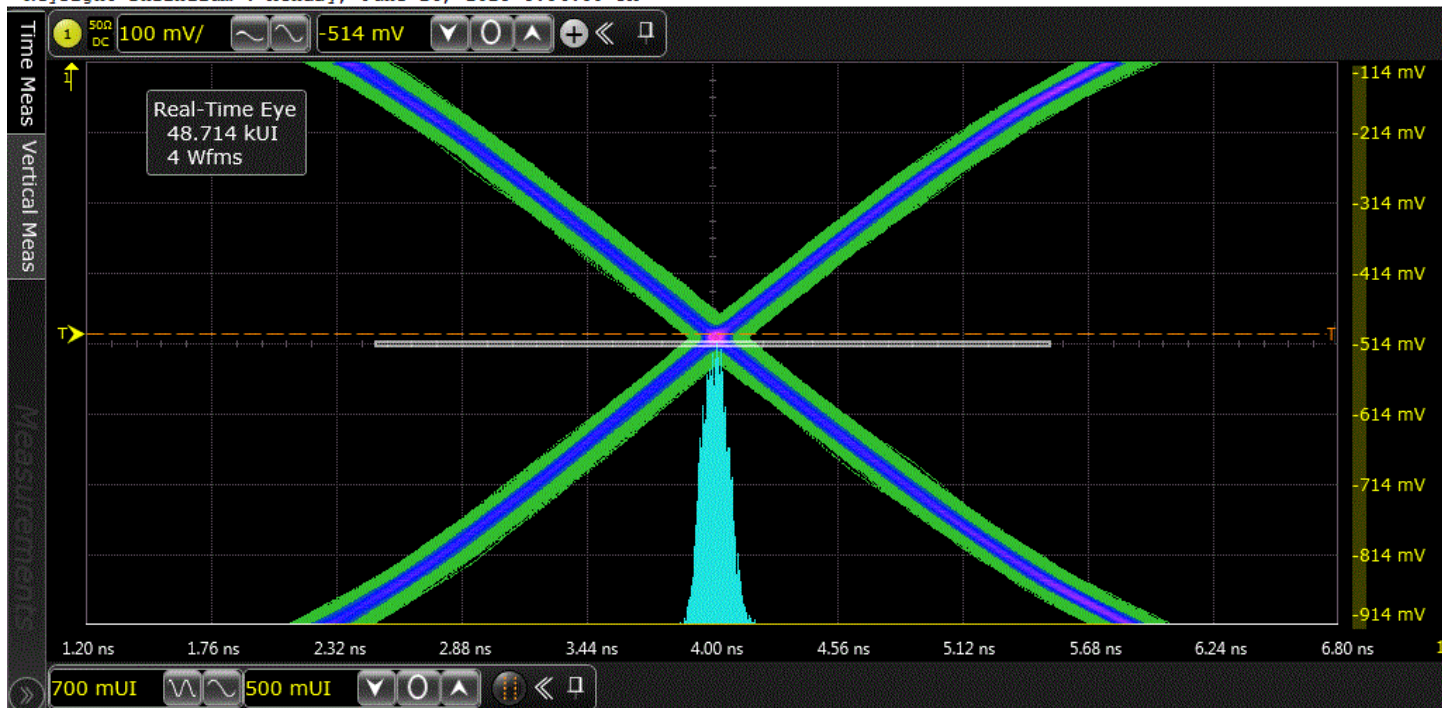
Actual Value Measurement Name: +Vout, Worst Case Delta (AOI Overall Rise/Fall Symmetry)
Pass Limits: VALUE < 500.00 ps

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Total Transmit jitter, including contributions from duty cycle distortion and Baseline Wander shall not exceed 1.4 ns peak-to-peak.
Actual Value Measurement Name: PKPk Transmit Jitter (ns)
Pass Limits: VALUE < 1.400 ns

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100 Base-TX, Duty Cycle Distortion

IEEE Std. 802.3 (ANSI X3.263-1995, Section 9.1.8)

The deviations of the 50 crossing times from a best fit to a time grid of 16 ns spacing shall not exceed +/- 0.25 ns. The peak-to-peak Duty Cycle Distortion shall not exceed 0.5ns

Actual Value Measurement Name: PkPk Duty Cycle Distortion

Pass Limits: VALUE <= 500.000 ps

Actual Value	Margin	t1-t0	t2-t1	t3-t2
62.350 ps	87.5	15.937650 ns	16.057530 ns	15.959180 ns

DCD Waveform (PkPk DCD=6.235000e+001ps)


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100 Base-TX, Transmitter Return Loss

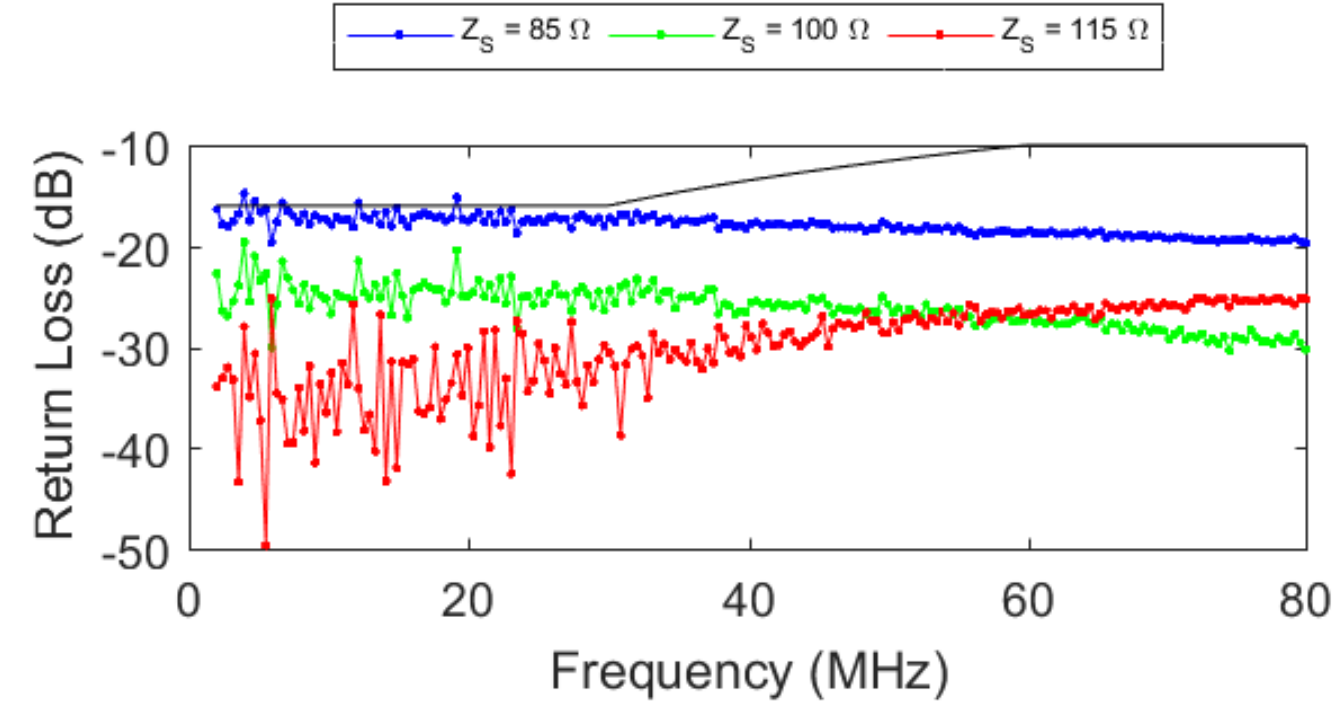
IEEE Std. 802.3 (ANSI X3.263-1995, Section 9.1.5)

The Return Loss obtained must conform to the requirements specified in ANSI X3.263-1995, Section 9.1.5. Pass limits shall be > 16 dB from 2 MHz to 30 MHz, > (16 – 20 log(f / 30 MHz)) dB from 30 MHz to 60 MHz, > 10 dB from 60 MHz to 80 MHz
Actual Value Measurement Name: Worst Margin (100 Base-TX, Transmitter Return Loss)
Pass Limits: Overall = Pass

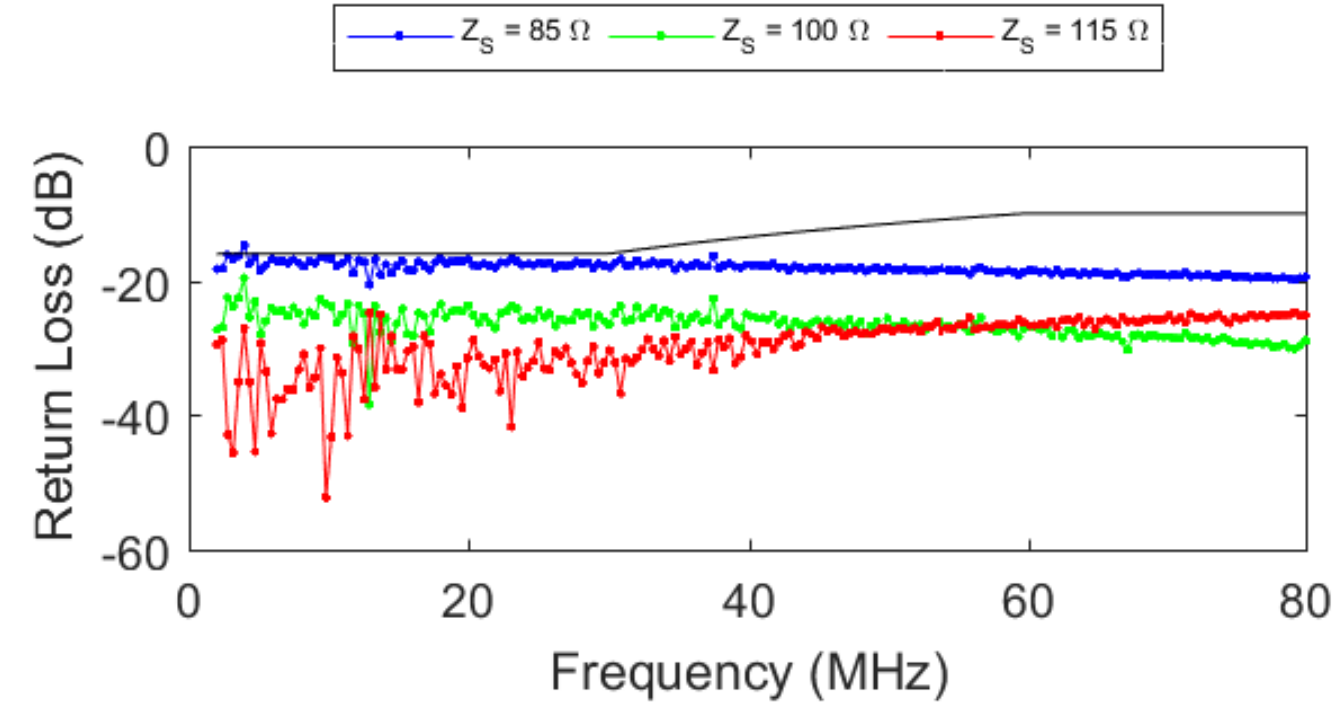
Statistics & Details for all 2 Trials

Trial #	Actual Value	Margin	Data File	Return Loss vs. Frequency
Avg	-1.234 dB	-12.35 %		
StdDev	11.74 mdB	70.71 m%		
Range	16.60 mdB	100.0 m%		
Min	-1.243 dB	-12.40 %		
Max	-1.226 dB	-12.30 %		
Sum	-2.469 dB	-24.70 %		
2 (Worst)	-1.24 dB	-12.4%	Using VNA.	(See image)
1	-1.23 dB	-12.3%	Using VNA.	(See image)

Trial 2 Images
Return Loss vs. Frequency



Trial 1 Images
Return Loss vs. Frequency



The Return Loss obtained must conform to the requirements specified in ANSI X3.263-1995, Section 9.2.2. Pass limits shall be > 16 dB from 2 MHz to 30 MHz, > (16 – 20 log(f / 30 MHz)) dB from 30 MHz to 60 MHz, > 10 dB from 60 MHz to 80 MHz
Actual Value Measurement Name: Worst Margin (100 Base-TX, Receiver Return Loss)
Pass Limits: Overall = Pass

Actual Value	Margin	Data File	Return Loss vs. Frequency
650 mdB	6.5	Using VNA.	(See image)

Return Loss vs. Frequency

