



Test Report

Overall Result: **FAIL**

Test Configuration Details	
Device Description	
ReturnLossTest	Use Vector Network Analyzer
DisturberSource	Use Keysight 33250A
Test Session Details	
Infiniium SW Version	06.20.00803
Infiniium Model Number	DSO9254A
Infiniium Serial Number	MY51260131
Application SW Version	2.50
Debug Mode Used	No
Compliance Limits (official)	IEEE Std. 802.3ae Specification
Probe (Channel 1)	Model: 1130A Serial: US49490597 Head: E2678A/B Atten: Not Calibrated, Using Default Atten (1.0000E+01) 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	2022-03-17 14:03:19 UTC -06:00

Summary of Results

Test Statistics	
Failed	5
Passed	10
Total	15

Margin Thresholds	
Warning	< 2 %
Critical	< 0 %

Pass	# Failed	# Trials	Test Name	Actual Value	Margin	Pass Limits
✘	1	1	100 Base-TX, UTP +Vout Differential Output Voltage	909.7 mV	-40.3 %	950.0 mV < VALUE < 1.0500 V
✔	0	1	100 Base-TX, UTP -Vout Differential Output Voltage	-979.8 mV	29.8 %	950.0 mV < VALUE < 1.0500 V
✘	1	1	100 Base-TX, UTP Signal Amplitude Symmetry	-928 m	-130.0 %	980 m < VALUE < 1.020
✔	0	1	100 Base-TX, +Vout Overshoot	1.5 %	70.0 %	VALUE < 5.0 %
✔	0	1	100 Base-TX, -Vout Overshoot	900 m%	82.0 %	VALUE < 5.0 %
✘	1	1	100 Base-TX, UTP AOI Template	9.453000 k	-945E+03 %	No Mask Failures
✔	0	1	100 Base-TX, AOI +Vout Rise Time	4.254 ns	37.3 %	3.000 ns < VALUE < 5.000 ns
✔	0	1	100 Base-TX, AOI +Vout Fall Time	4.144 ns	42.8 %	3.000 ns < VALUE < 5.000 ns
✔	0	1	100 Base-TX, AOI +Vout Rise/Fall Symmetry	322.74 ps	35.5 %	VALUE < 500.00 ps
✔	0	1	100 Base-TX, AOI -Vout Rise Time	4.063 ns	46.9 %	3.000 ns < VALUE < 5.000 ns
✔	0	1	100 Base-TX, AOI -Vout Fall Time	3.838 ns	41.9 %	3.000 ns < VALUE < 5.000 ns
✔	0	1	100 Base-TX, AOI -Vout Rise/Fall Symmetry	225.14 ps	55.0 %	VALUE < 500.00 ps
✔	0	1	100 Base-TX, AOI Overall Rise/Fall Symmetry	415.83 ps	16.8 %	VALUE < 500.00 ps
✘	1	1	100 Base-TX, Transmit Jitter	1.648 ns	-17.7 %	VALUE < 1.400 ns
✘	1	1	100 Base-TX, Duty Cycle Distortion	729.730 ps	-45.9 %	VALUE <= 500.000 ps

Report Detail

✘ 100 Base-TX, UTP +Vout Differential Output Voltage Reference: IEEE Std. 802.3ae ()

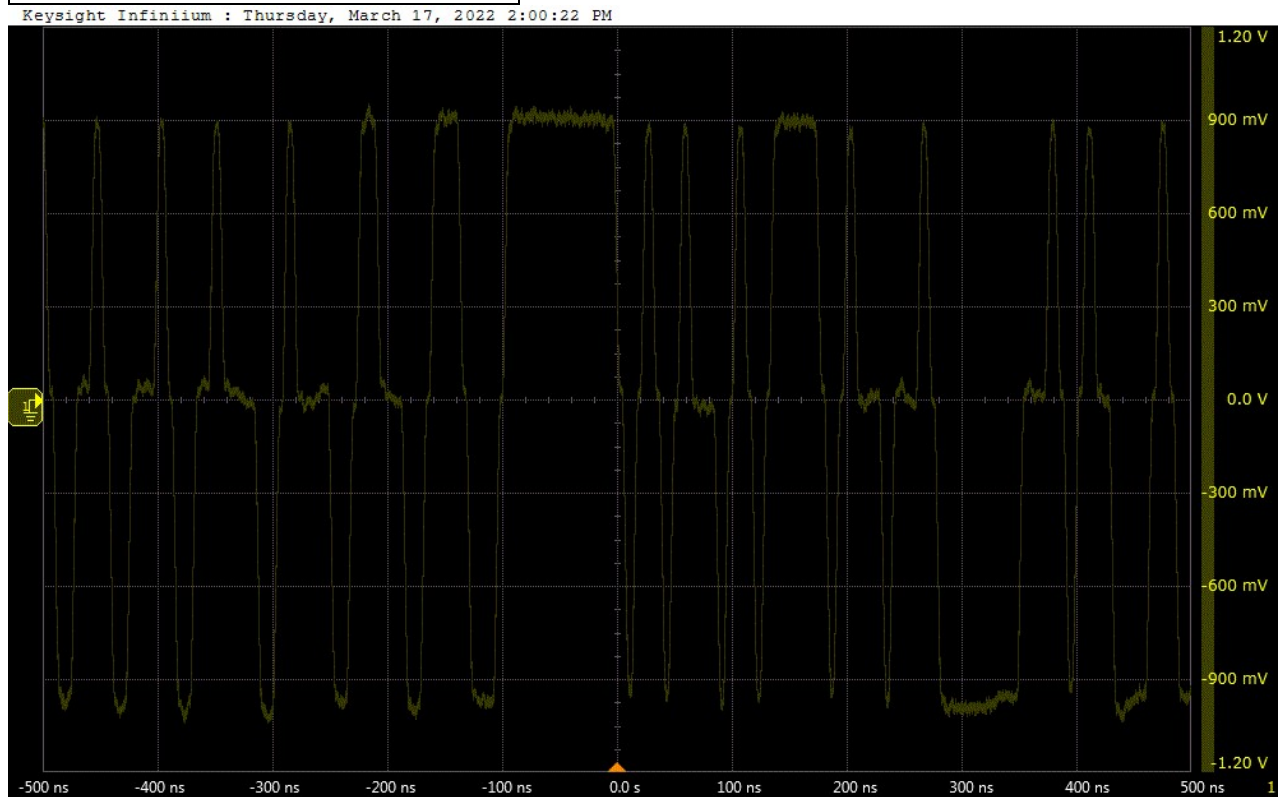
Test Summary: **FAIL** Test Description: Vout is defined as the straight line best fit for amplitude. Here, Vout is measured over a 96ns pulse.
Pass Limits: (950.0 mV to 1.0500 V) **+Vout** 909.7 mV

Result Details

Mid Voltage 0.000 V **#Avgs** 128

Trial 1

Trial 1: +Vout



✔ 100 Base-TX, UTP -Vout Differential Output Voltage Reference: IEEE Std. 802.3ae (ANSI X3.263-1995, Section 9.1.2.2)

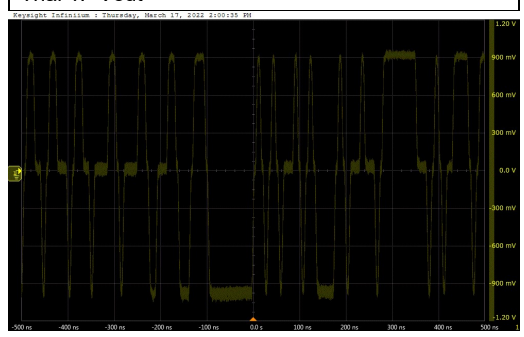
Test Summary: **Pass** Test Description: Vout is defined as the straight line best fit for amplitude. Here, Vout is measured over a 96ns pulse.
Pass Limits: (950.0 mV to 1.0500 V) **-Vout** -979.8 mV

Result Details

Mid Voltage 0.000 V **#Avgs** 128

Trial 1

Trial 1: -Vout



✘ 100 Base-TX, UTP Signal Amplitude Symmetry

Test Summary: **FAIL** Test Description: The ratio of the +Vout magnitude to -Vout magnitude shall be between the limits of 0.98 and 1.02
Pass Limits: (980 m to 1.020) **Amplitude Symmetry** -928 m

Result Details

+Vout 909.7 mV **-Vout** -979.8 mV **#Avgs** 128

✔ 100 Base-TX, +Vout Overshoot *Reference: IEEE Std. 802.3ae (ANSI X3.263-1995, Section 9.1.3)*

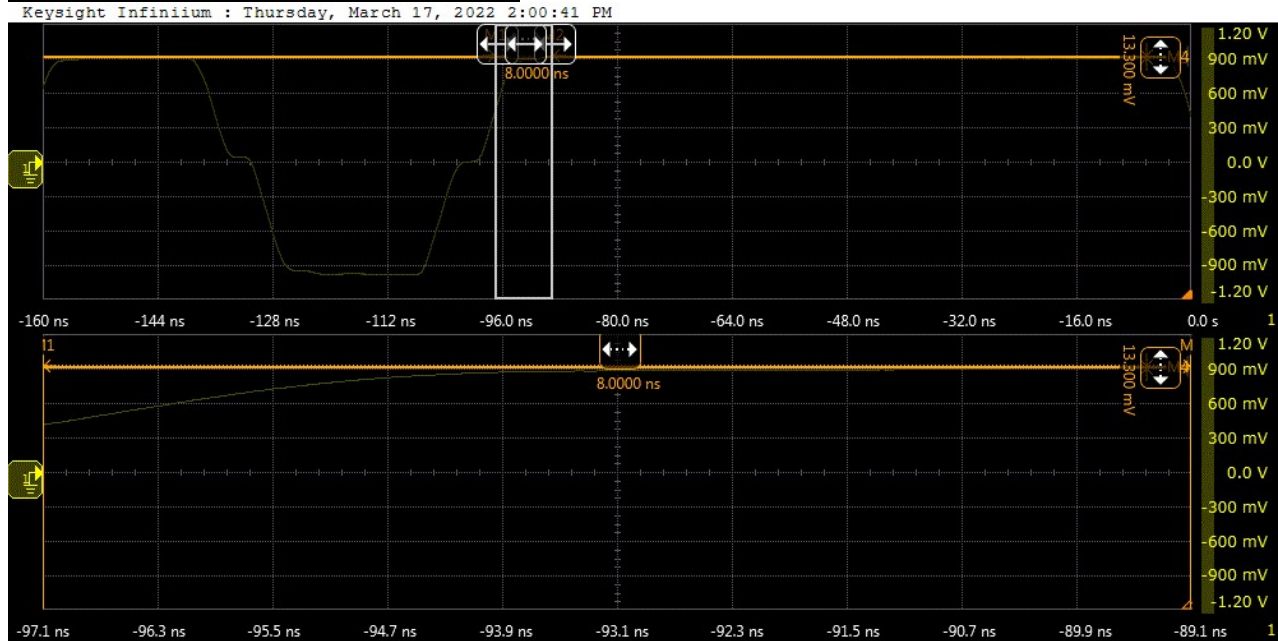
Test Summary: **Pass** Test Description: We define overshoot as the percentage difference between the peak voltage of the waveform and the final adjusted value (VOut). The peak voltage is measured between the 50% transition crossing time from 0 to VOut and a point in time 8ns afterward. Overshoot 0s computed as (Vpeak - VOut)/VOut * 100 percent.
Pass Limits: < 5.0 % **+Overshoot (%)** 1.5 %

Result Details

VPeak 923.0 mV **VOut** 909.7 mV **#Avgs** 128

Trial 1

Trial 1: +Overshoot (%)



✔ 100 Base-TX, -Vout Overshoot *Reference: IEEE Std. 802.3ae (ANSI X3.263-1995, Section 9.1.3)*

Test Summary: **Pass** Test Description: 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.
Pass Limits: < 5.0 % **-Overshoot (%)** 900 m%

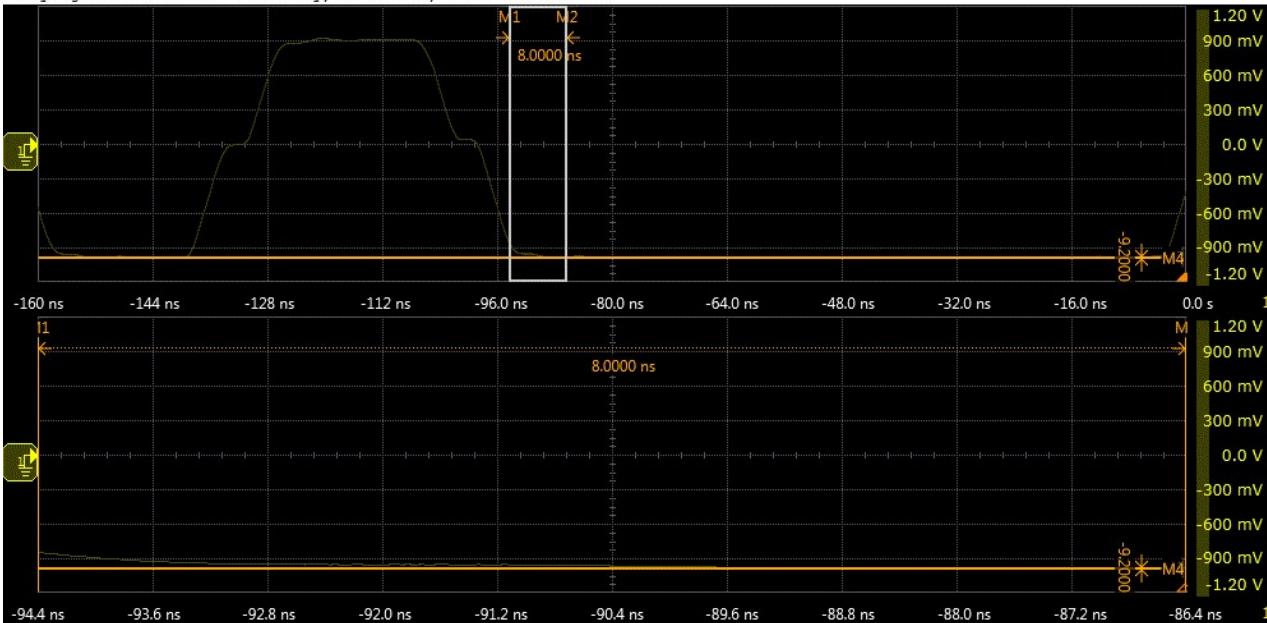
Result Details

VPeak 989.0 mV **VOut** 979.8 mV **#Avgs** 128

Trial 1

Trial 1: -Overshoot (%)

Keysight Infiniium : Thursday, March 17, 2022 2:00:47 PM



100 Base-TX, UTP AOI Template Reference: IEEE Std. 802.3ae (ANSI X3.263-1995, Annex J)

Test Summary: **FAIL** Test Description: 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.

Pass Limits: No Mask Failures Total # Failures 9.453000 k

Result Details

Eye TopAutofit Mask Scale 1.002 Eye Top -- #Waveforms Tested 100.0

Eye Top -- Failure Details REGION #FAILURES 1 0 2 3 715 3 5738 Eye Top (no value)

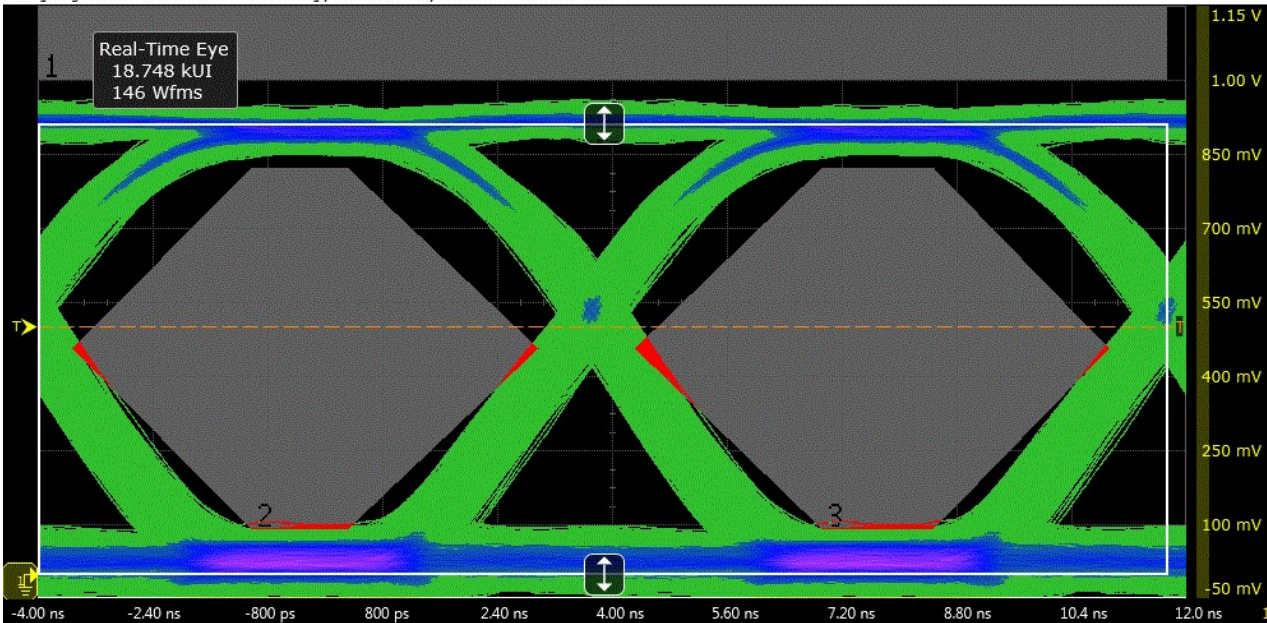
Eye BottomAutofit Mask Scale 1.049 Eye Bottom -- #Waveforms Tested 100.0

Eye Bottom -- Failure Details No Failure Eye Bottom (no value) # Waveforms 100

Trial 1

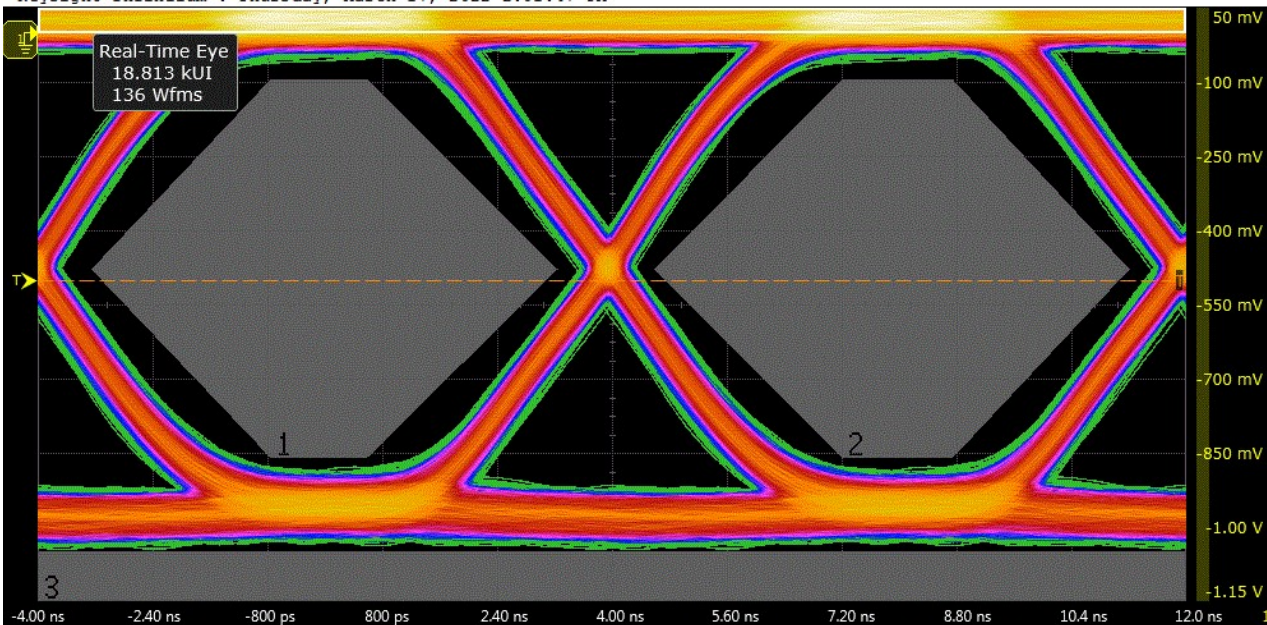
Trial 1: Eye Top--9453 Failures

Keysight Infiniium : Thursday, March 17, 2022 2:01:20 PM



Trial 1: Eye Bottom -- No Failures

Keysight Infiniium : Thursday, March 17, 2022 2:01:47 PM



✓ 100 Base-TX, AOI +Vout Rise Time Reference: IEEE Std. 802.3ae (ANSI X3.263-1995, Section 9.1.6)

Test Summary: Pass **Test Description:** 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.

Pass Limits: (3.000 ns to 5.000 ns) **Worst Case Risetime** 4.254 ns

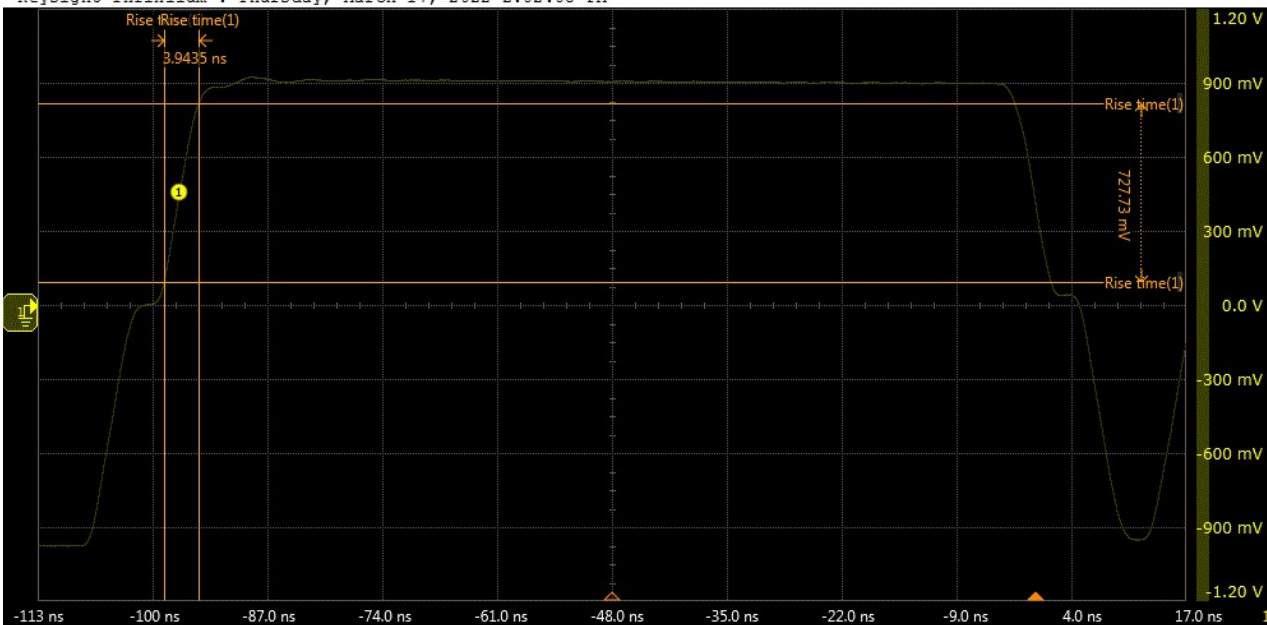
Result Details

Maximum Risetime 4.254 ns **Minimum Risetime** 3.931 ns **Average Risetime** 3.949 ns **+Vout** 909.7 mV
Rise/Fall Avgs 128 **# Rise/Fall Meas** 100

Trial 1

Trial 1: One +Vout Signal Rise (of 100.0 total)

Keysight Infiniium : Thursday, March 17, 2022 2:02:03 PM



✓ 100 Base-TX, AOI +Vout Fall Time Reference: IEEE Std. 802.3ae (ANSI X3.263-1995, Section 9.1.6)

Test Summary: Pass **Test Description:** 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.

Pass Limits: (3.000 ns to 5.000 ns) **Worst Case Falltime** 4.144 ns

Result Details

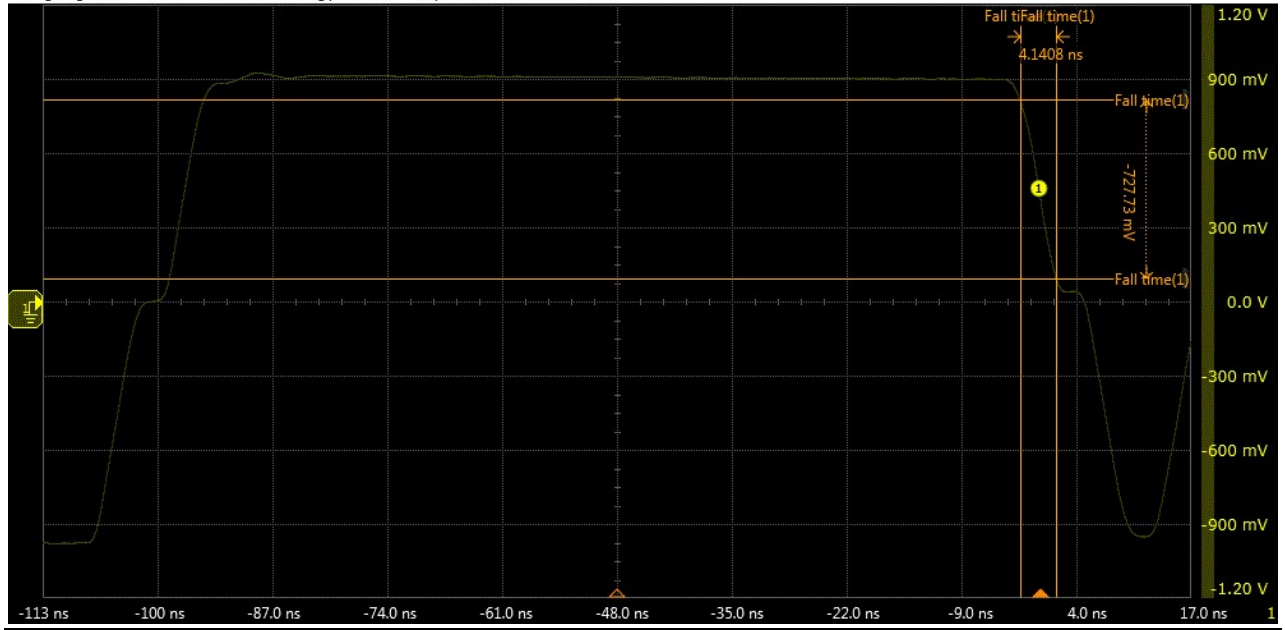
Maximum Falltime 4.144 ns **Minimum Falltime** 4.120 ns **Average Falltime** 4.132 ns **+Vout** 909.7 mV

Rise/Fall Avgs 128 **# Rise/Fall Meas** 100

Trial 1

Trial 1: One +Vout Signal Fall (of 100.0 total)

Keysight Infiniium : Thursday, March 17, 2022 2:02:13 PM



✓ 100 Base-TX, AOI +Vout Rise/Fall Symmetry
Reference: IEEE Std. 802.3ae (ANSI X3.263-1995, Section 9.1.6)

Test Summary: Pass **Test Description:** 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.

Pass Limits: < 500.00 ps **+Vout, Worst Case Delta** 322.74 ps

Result Details

Min Risetime 3.931 ns **Max Risetime** 4.254 ns **Min Falltime** 4.120 ns **Max Falltime** 4.144 ns **+Vout** 909.7 mV

Rise/Fall Avgs 128 **# Rise/Fall Meas** 100

✓ 100 Base-TX, AOI -Vout Rise Time
Reference: IEEE Std. 802.3ae (ANSI X3.263-1995, Section 9.1.6)

Test Summary: Pass **Test Description:** 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.

Pass Limits: (3.000 ns to 5.000 ns) **Worst Case Risetime** 4.063 ns

Result Details

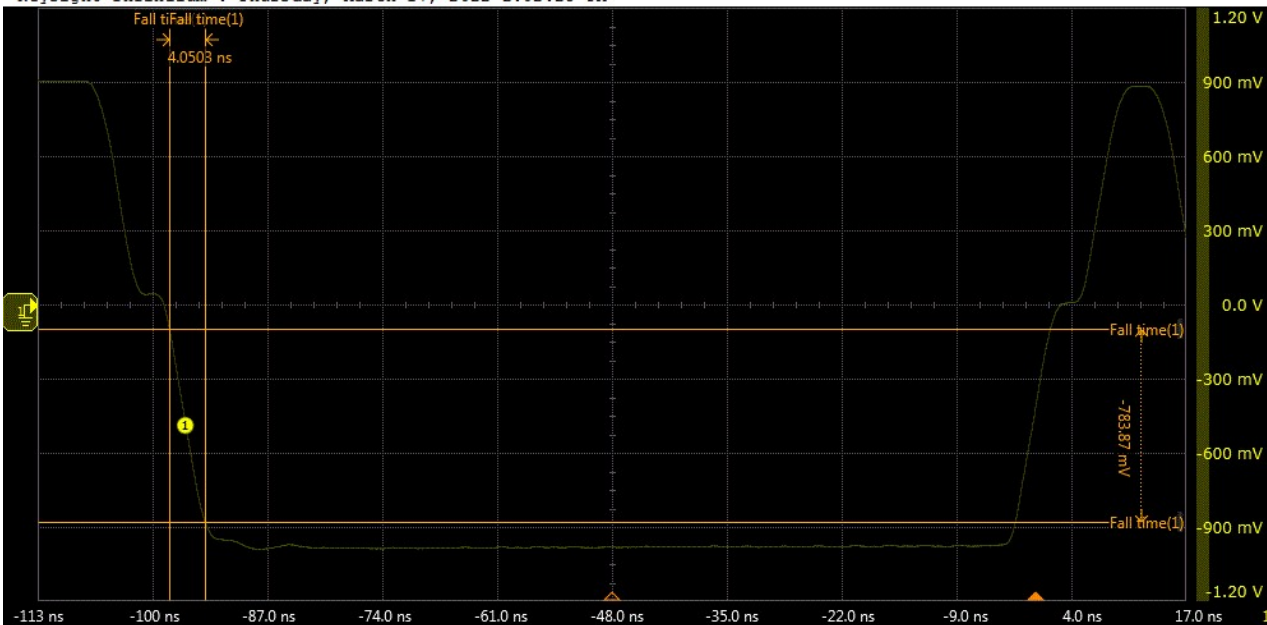
Maximum Risetime 4.063 ns **Minimum Risetime** 4.051 ns **Average Risetime** 4.058 ns **-Vout** -979.8 mV

Rise/Fall Avgs 128 **# Rise/Fall Meas** 100

Trial 1

Trial 1: One -Vout Signal Rise (of 100.0 total)

Keysight Infiniium : Thursday, March 17, 2022 2:02:23 PM



✓ 100 Base-TX, AOI -Vout Fall Time Reference: IEEE Std. 802.3ae (ANSI X3.263-1995, Section 9.1.6)

Test Summary: **Pass**

Test Description: 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.

Pass Limits: (3.000 ns to 5.000 ns)

Worst Case Falltime 3.838 ns

Result Details

Maximum Falltime 3.992 ns

Minimum Falltime 3.838 ns

Average Falltime 3.980 ns

-Vout -979.8 mV

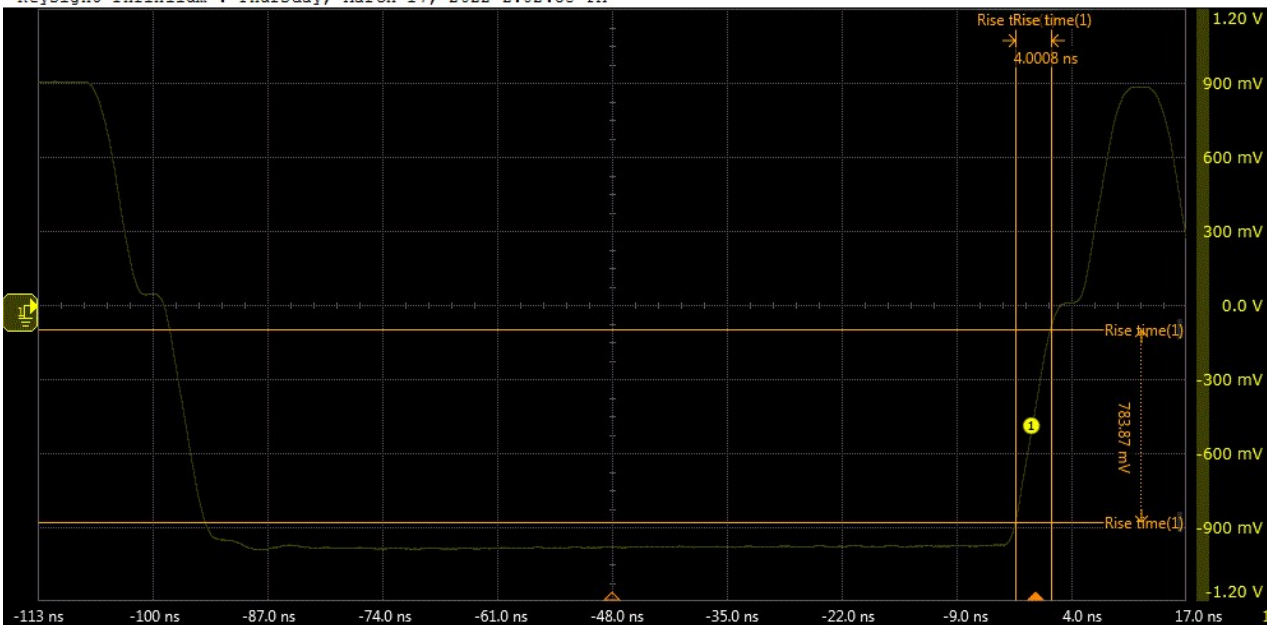
Rise/Fall Avgs 128

Rise/Fall Meas 100

Trial 1

Trial 1: One -Vout Signal Fall (of 100.0 total)

Keysight Infiniium : Thursday, March 17, 2022 2:02:38 PM



✓ 100 Base-TX, AOI -Vout Rise/Fall Symmetry Reference: IEEE Std. 802.3ae (ANSI X3.263-1995, Section 9.1.6)

Test Summary: **Pass** Test Description: 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.

Pass Limits: < 500.00 ps **-Vout Worst Case Delta** 225.14 ps

Result Details

-Vout -979.8 mV **Minimum Risettime** 4.051 ns **Maximum Risettime** 4.063 ns **Minimum Falltime** 3.838 ns

Maximum Falltime 3.992 ns **# Rise/Fall Avgs** 128 **# Rise/Fall Meas** 100

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

Test Summary: **Pass** Test Description: 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.

Pass Limits: < 500.00 ps **+Vout, Worst Case Delta** 415.83 ps

Result Details

Min Rise/Falltime 3.838 ns **Max Rise/Falltime** 4.254 ns **# Rise/Fall Avgs** 128 **# Rise/Fall Meas** 100

✗ 100 Base-TX, Transmit Jitter
Reference: IEEE Std. 802.3ae (ANSI X3.263-1995, Section 9.1.9)

Test Summary: **FAIL** Test Description: Total Transmit jitter, including contributions from duty cycle distortion and Baseline Wander shall not exceed 1.4 ns peak-to-peak.

Pass Limits: < 1.400 ns **PkPk Transmit Jitter (ns)** 1.648 ns

Result Details

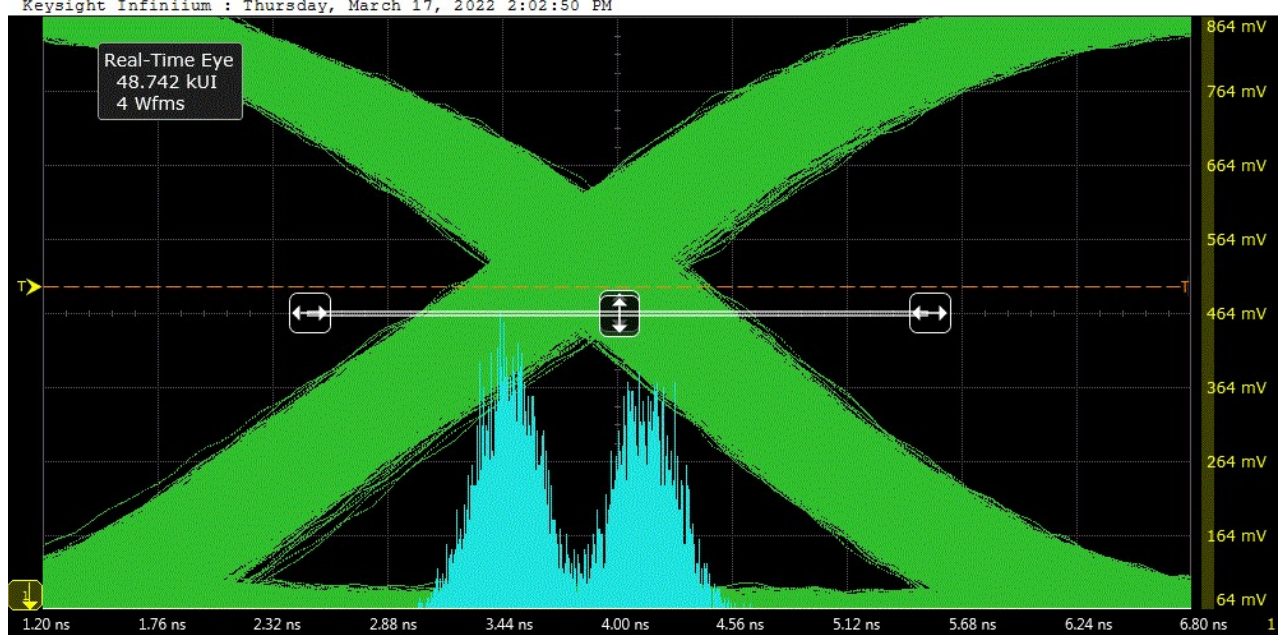
Top Crossing Min -980.2 ps **Top Crossing Max** 667.6 ps **Top Crossing Width** 1.648 ns

Bottom Crossing Min -561.6 ps **Bottom Crossing Max** 400.3 ps **Bottom Crossing Width** 962 ps

Total UI Measured 1.024960e+005 (2.434000e+004 actual crossings) **Minimum #Jitter UI requested** 100,000

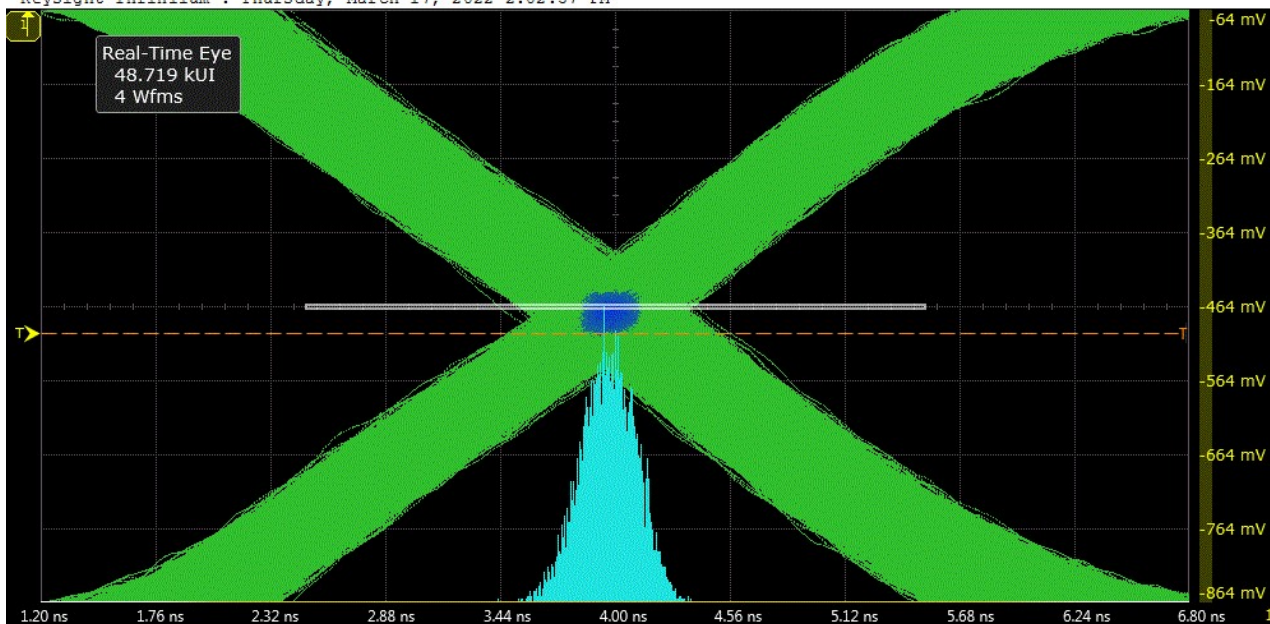
Trial 1

Trial 1: Top Crossing Width



Trial 1: Bottom Crossing Width

Keysight Infiniium : Thursday, March 17, 2022 2:02:57 PM



100 Base-TX, Duty Cycle Distortion *Reference: IEEE Std. 802.3ae (ANSI X3.263-1995, Section 9.1.8)*

Test Summary: FAIL Test Description: 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

Pass Limits: <= 500.000 ps **PkPk Duty Cycle Distortion** 729.730 ps

Result Details

t1-t0 16.729730 ns **t2-t1** 15.729550 ns **t3-t2** 15.768440 ns

Trial 1

Trial 1: DCD Waveform (PkPk)
DCD=7.297300e+002ps

Keysight Infiniium : Thursday, March 17, 2022 2:03:18 PM

