

Test Report

Fail

Test Configuration Details	
Application	
Name	AE69x0T Automotive Ethernet
Version	1.80.0.0
Device Description	
Technology Spec	IEEE
StandardType	100M
SignalSource	Two Channels
DisturbingSignalSource	33250A
VNA Calibration Type	Manual Calibration
SA Compensation Used	No
Spectral Measurement Device	Oscilloscope
Offline Mode Used	No
Test Session Details	
Infiniium SW Version	11.52.00301
Infiniium Model Number	MXR604A
Infiniium Serial Number	MY61310139
Debug Mode Used	No
Compliance Limits	IEEE 802.3bw-2015 (official)
Probe (Channel 1)	Model: User Defined Probe Serial: No Serial Num Atten: Calibrated (12 SEP 2024 13:09:50), Using Cal Atten (1.0066E+00) Skew: Calibrated (12 SEP 2024 13:09:57), Using Cal Skew
Probe (Channel 3)	Model: User Defined Probe Serial: No Serial Num Atten: Calibrated (12 SEP 2024 13:10:40), Using Cal Atten (1.0056E+00) Skew: Calibrated (12 SEP 2024 13:10:47), Using Cal Skew
Last Test Date	2024-09-12 14:17:47 UTC +08:00

Summary of Results

Test Statistics		Margin Thresholds	
Failed	1	Warning	< 5 %
Passed	6	Critical	< 0 %
Total	7		

Pass	# Failed	# Trials	Test Name (click to jump)	Actual Value	Margin	Pass Limits
✓	0	2	Transmitter Distortion (w/o Disturbing Signal)	9.065 mV	39.5667 %	VALUE <= 15.000 mV
✓	0	1	Transmitter +Vout Droop	18.68 %	58.4889 %	VALUE < 45.00 %
✓	0	1	Transmitter -Vout Droop	19.59 %	56.4667 %	VALUE < 45.00 %
✓	0	1	Transmit Clock Frequency (Master)	66.665265 MHz	39.4885 %	66.660000 MHz <= VALUE <= 66.673333 MHz
✓	0	1	MDI Output Jitter, JTXOUT (Master)	25.725 ps	48.5500 %	VALUE < 50.000 ps
✓	0	3	Transmitter Peak Differential Output	1.373 V	37.5909 %	VALUE < 2.200 V
✗	3	3	Transmitter Power Spectral Density	-1.117 dBm/Hz	-11.1700 %	Overall = Pass

Report Detail

Transmitter Distortion (w/o Disturbing Signal)		Summary	Next
	IEEE Std 802.3bw™-2015 (Section 96.5.4.2 (IEEE))		
The peak distortion values measured at minimum 10 different equally-spaced phases of a single symbol period should be less than 15mV. Actual Value Measurement Name: Peak Distortion (100Base-T1) Pass Limits: VALUE <= 15.000 mV			

Statistics & Details for all 2 Trials

Trial #	Actual Value	Margin
Avg	8.611 mV	42.59 %
StdDev	641.4 mmV	4.276 %
Range	907.1 mmV	6.047 %
Min	8.158 mV	39.57 %
Max	9.065 mV	45.61 %
Sum	17.22 mV	85.18 %
✓ 2 (Worst)	9.065 mV	39.6000%
✓ 1	8.158 mV	45.6000%

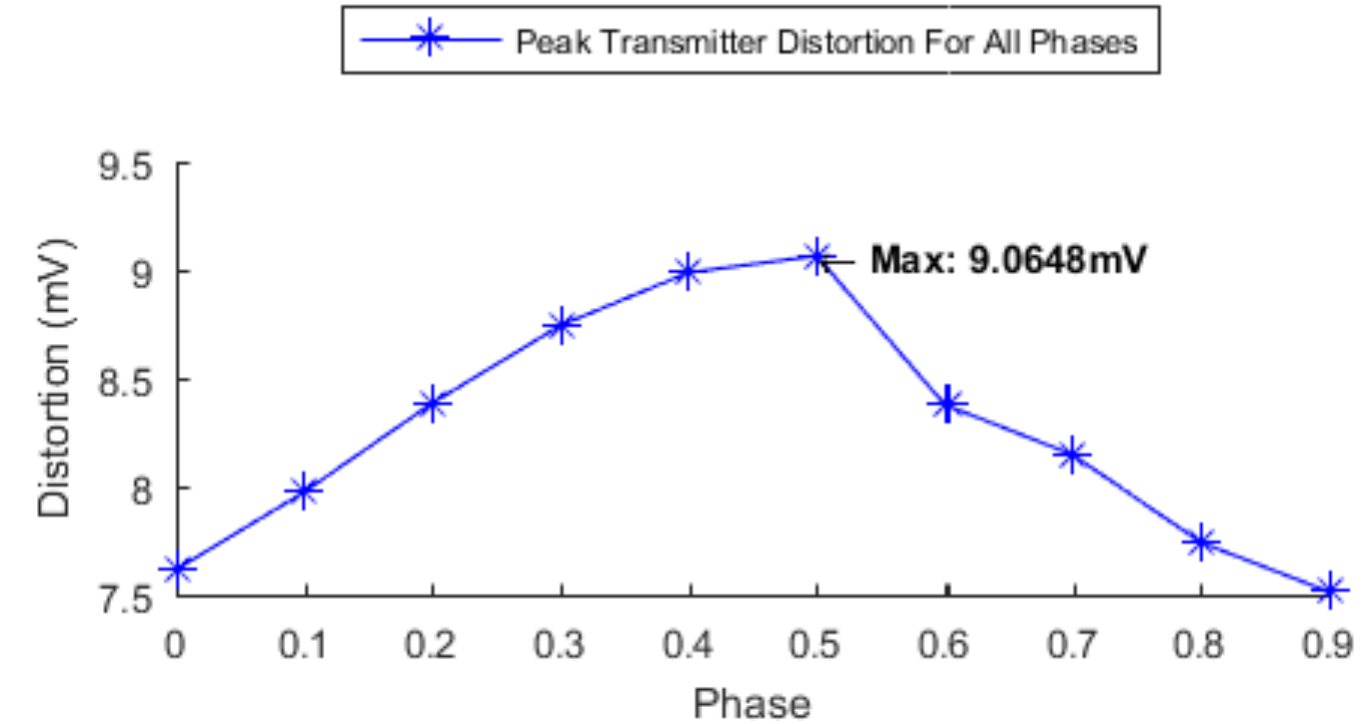
Trial #	WARNING
Avg	
StdDev	
Range	
Min	
Max	
Sum	
✓ 2 (Worst)	This test needs an external disturbing signal. Results of testing without an external disturbing signal should not be used for compliance qualification purposes.
✓ 1	This test needs an external disturbing signal. Results of testing without an external disturbing signal should not be used for compliance qualification purposes.

Trial #	Distortion @ Phase 0.00	Distortion @ Phase 0.10	Distortion @ Phase 0.20	Distortion @ Phase 0.30	Distortion @ Phase 0.40
Avg	7.711 mV	7.860 mV	7.987 mV	8.045 mV	8.311 mV
StdDev	133.9 mmV	162.1 mmV	562.4 mmV	988.0 mmV	956.5 mmV

	Range	189.4 mmV	229.2 mmV	795.3 mmV	1.397 mV	1.353 mV
	Min	7.616 mV	7.745 mV	7.589 mV	7.346 mV	7.635 mV
	Max	7.805 mV	7.974 mV	8.385 mV	8.743 mV	8.988 mV
	Sum	15.42 mV	15.72 mV	15.97 mV	16.09 mV	16.62 mV
✔	2 (Worst)	7.616 mV	7.974 mV	8.385 mV	8.743 mV	8.988 mV
✔	1	7.805 mV	7.745 mV	7.589 mV	7.346 mV	7.635 mV

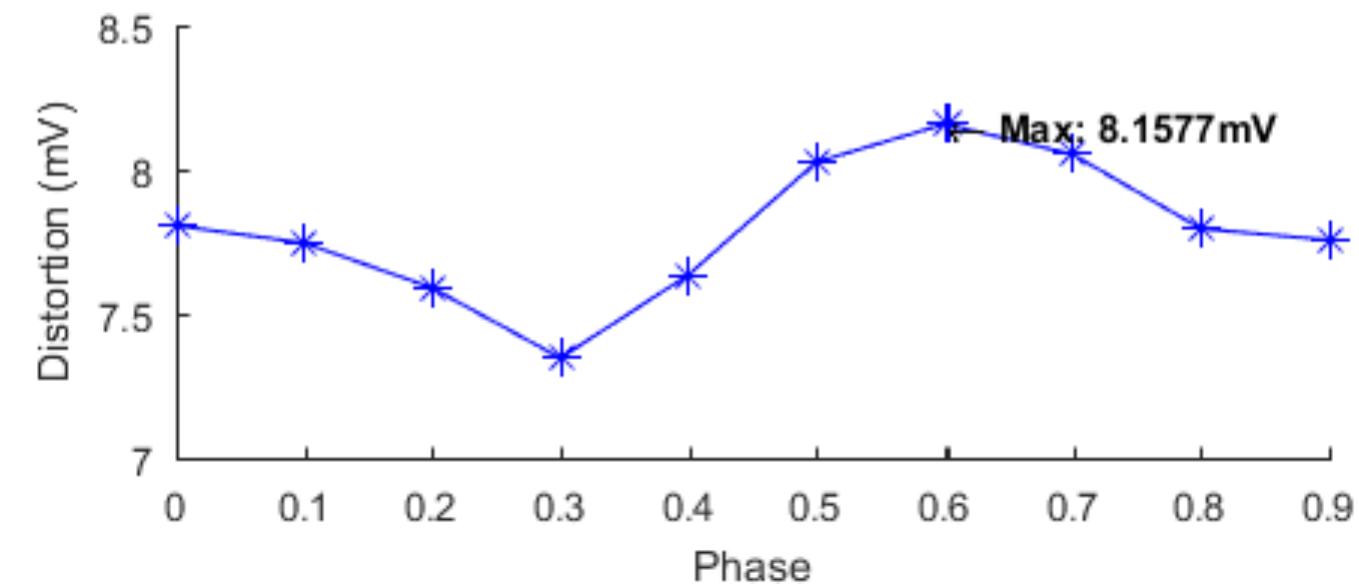
Trial #	Distortion @ Phase 0.50	Distortion @ Phase 0.60	Distortion @ Phase 0.70	Distortion @ Phase 0.80	Distortion @ Phase 0.90
Avg	8.545 mV	8.268 mV	8.099 mV	7.768 mV	7.635 mV
StdDev	734.6 mmV	155.6 mmV	66.20 mmV	38.00 mmV	170.7 mmV
Range	1.039 mV	220.1 mmV	93.62 mmV	53.74 mmV	241.4 mmV
Min	8.026 mV	8.158 mV	8.053 mV	7.741 mV	7.514 mV
Max	9.065 mV	8.378 mV	8.146 mV	7.795 mV	7.755 mV
Sum	17.09 mV	16.54 mV	16.20 mV	15.54 mV	15.27 mV
✔	2 (Worst)	8.378 mV	8.146 mV	7.741 mV	7.514 mV
✔	1	8.158 mV	8.053 mV	7.795 mV	7.755 mV

Trial 2 Images
100Base-T1 TM4 Transmitter Distortion



Trial 1 Images
100Base-T1 TM4 Transmitter Distortion

Peak Transmitter Distortion For All Phases



[Summary](#) [Previous](#) [Next](#)



Transmitter +Vout Droop

IEEE Std 802.3bw™-2015 (Section 96.5.4.1 (IEEE))

The magnitude of both the positive and negative droop measured with respect to an initial peak value after the zero crossing and the value 500ns after the initial peak, shall be less than 45%.

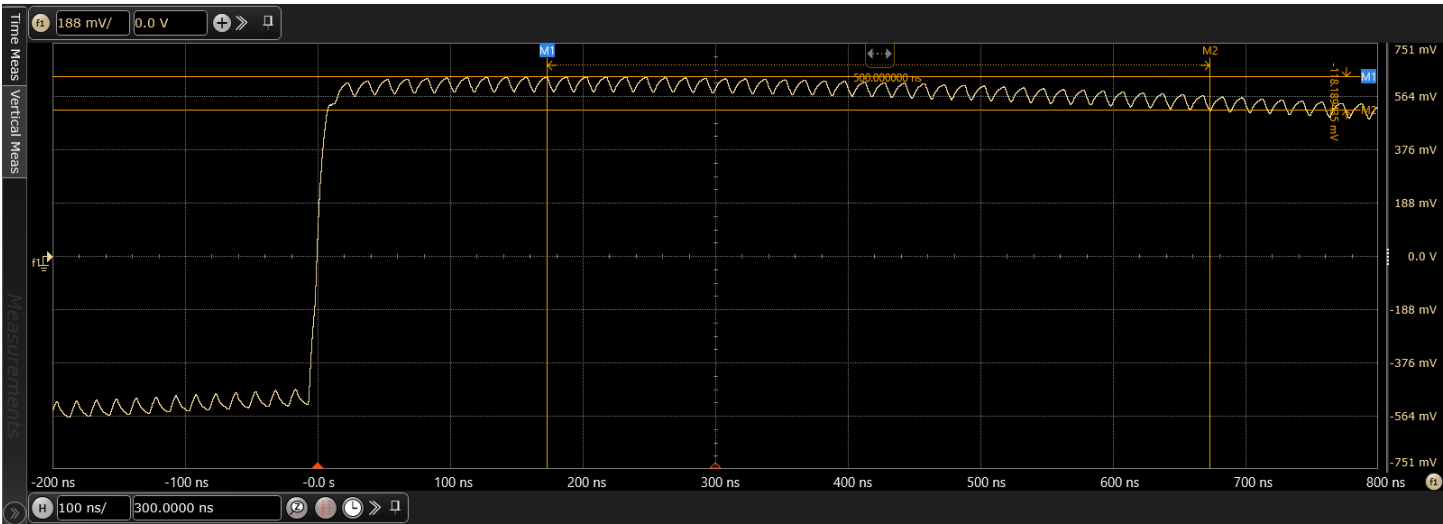
Actual Value Measurement Name: Transmitter +Vout Droop (100Base-T1)

Pass Limits: VALUE < 45.00 %

Actual Value	Margin	Vd	Vpk
18.68 %	58.4889 %	118 mV	633 mV

Transmitter +Vout Droop (100Base-T1)

Keysight Infiniium : Thursday, September 12, 2024 2:05:05 PM



[Summary](#) [Previous](#) [Next](#)



Transmitter -Vout Droop

IEEE Std 802.3bw™-2015 (Section 96.5.4.1 (IEEE))

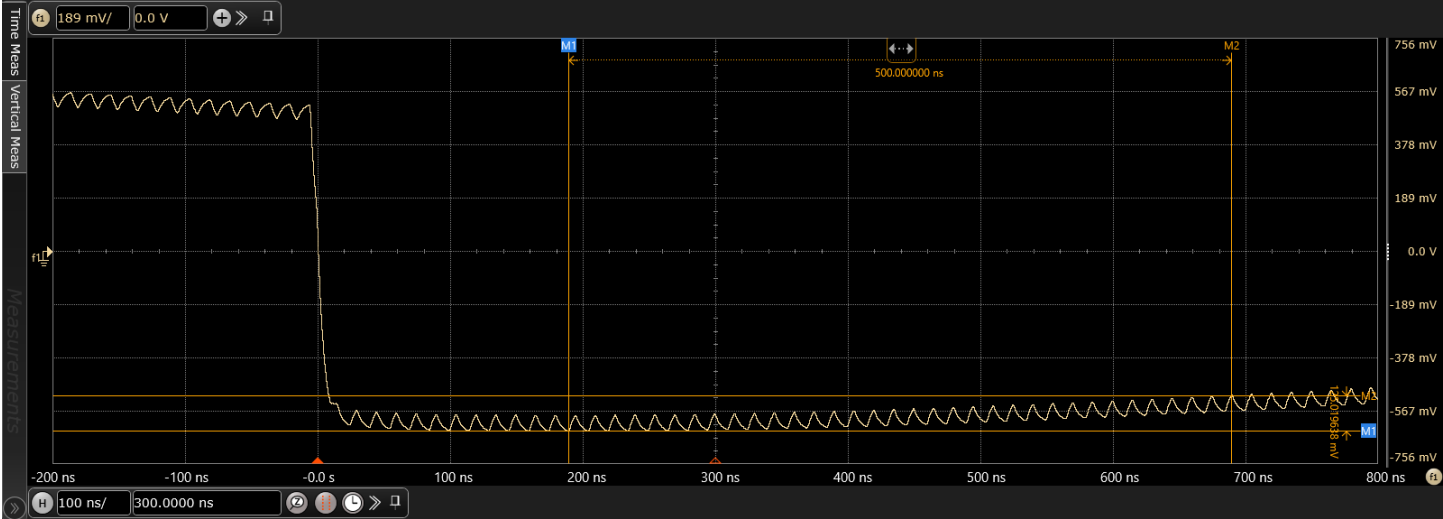
The magnitude of both the positive and negative droop measured with respect to an initial peak value after the zero crossing and the value 500ns after the initial peak, shall be less than 45%.

Actual Value Measurement Name: Transmitter -Vout Droop (100Base-T1)

Pass Limits: VALUE < 45.00 %

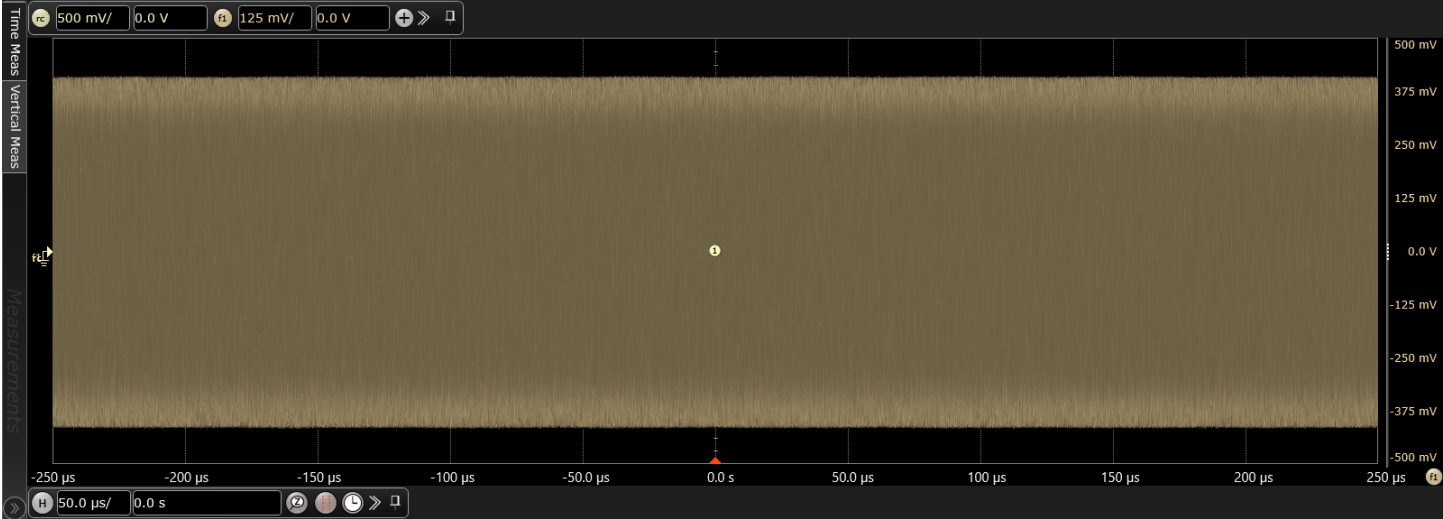
Actual Value	Margin	Vd	Vpk
19.59 %	56.4667 %	125 mV	638 mV

Transmitter -Vout Droop (100Base-T1)



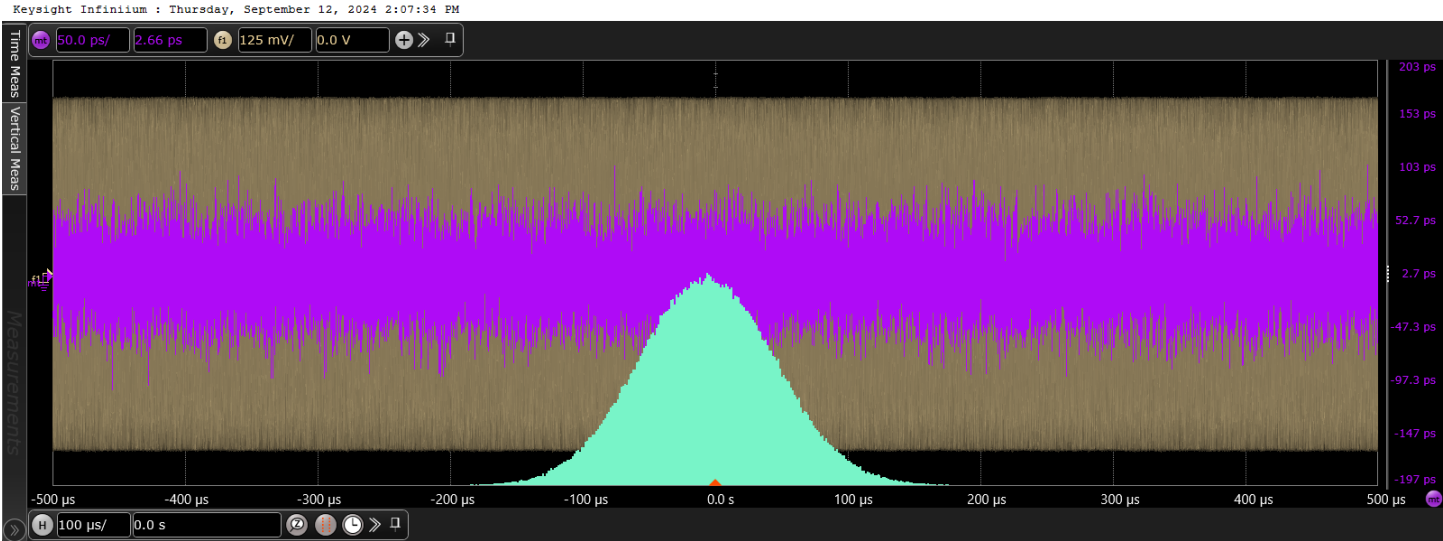
SummaryPreviousNext	
✓ Transmit Clock Frequency (Master) IEEE Std 802.3bw™-2015 (Section 95.5.4.5 (IEEE))	
The symbol transmission rate of the MASTER PHY shall be within the range of 66 2/3 MHz ± 100ppm. Actual Value Measurement Name: TX_TCLK Frequency (Master) 100Base-T1 Pass Limits: 66.660000 MHz <= VALUE <= 66.673333 MHz	
Actual Value	Margin
66.665265 MHz	39.4885 %

TX_TCLK Frequency (Master) 100Base-T1



SummaryPreviousNext	
✓ MDI Output Jitter, JTXOUT (Master) IEEE Std 802.3bw™-2015 (Section 96.5.4.3 (IEEE))	
The RMS (Root Mean Square) value of the MDI output jitter, JTXOUT, relative to an unjittered reference shall be less than 50ps. Actual Value Measurement Name: MDI Output Jitter, JTXOUT (Master) 100Base-T1 Pass Limits: VALUE < 50.000 ps	
Actual Value	Margin
25.725 ps	48.5500 %

MDI Output Jitter, JTXOUT (Master) 100Base-T1



Transmitter Peak Differential Output

IEEE Std 802.3bw™-2015 (Section 96.5.6 (IEEE))

The Peak Differential Voltage obtained must conform to the requirements specified in IEEE802.3bw-2015 Sub-clause 96.5.6. When measured with 100 Ohm termination, transmit differential signal at MDI shall be less than 2.2 V peak-to-peak.

Actual Value Measurement Name: Transmitter Peak Differential Output (100Base-T1)

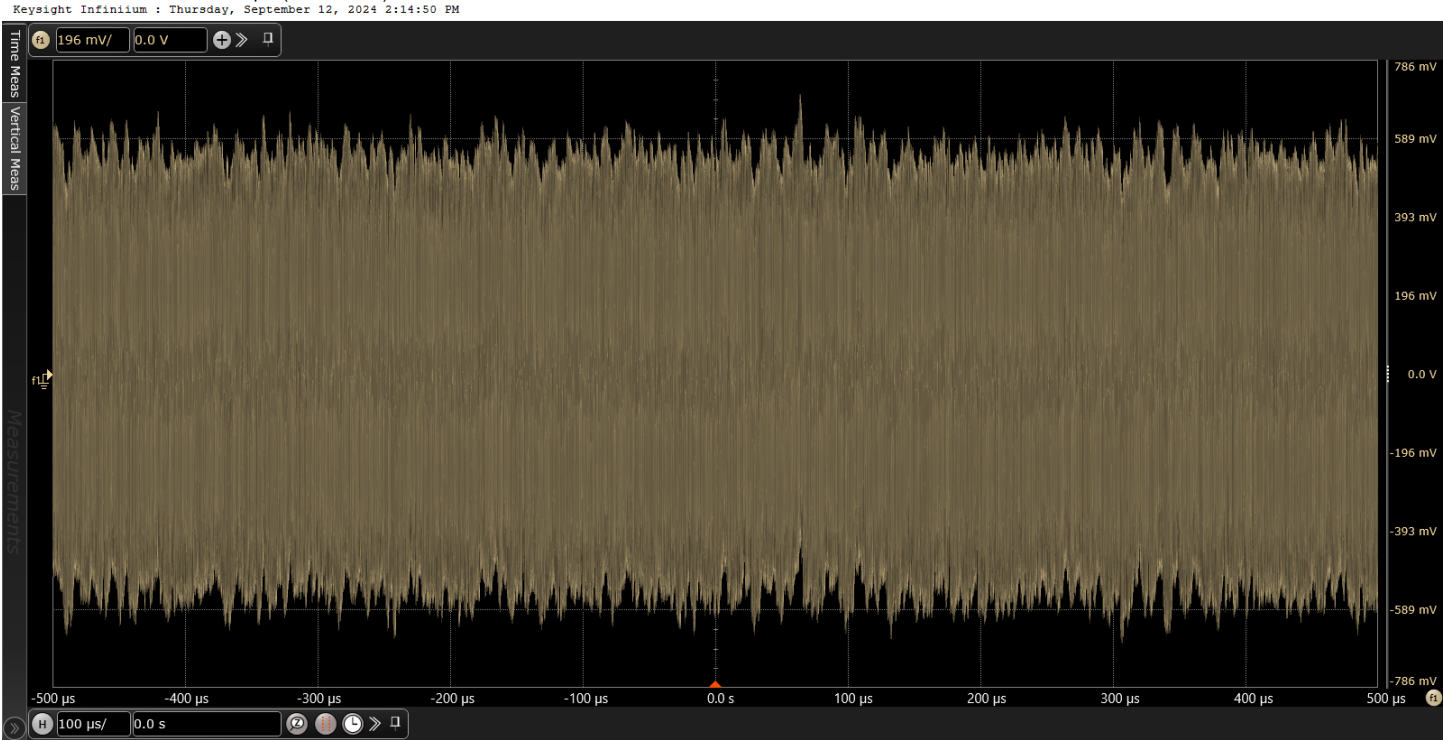
Pass Limits: VALUE < 2.200 V

Statistics & Details for all 3 Trials

Trial #	Actual Value	Margin
Avg	1.368 V	37.80 %
StdDev	8.127 mV	367.4 m%
Range	14.16 mV	636.4 m%
Min	1.359 V	37.59 %
Max	1.373 V	38.23 %
Sum	4.104 V	113.4 %
2 (Worst)	1.373 V	37.6000%
1	1.373 V	37.6000%
3	1.359 V	38.2000%

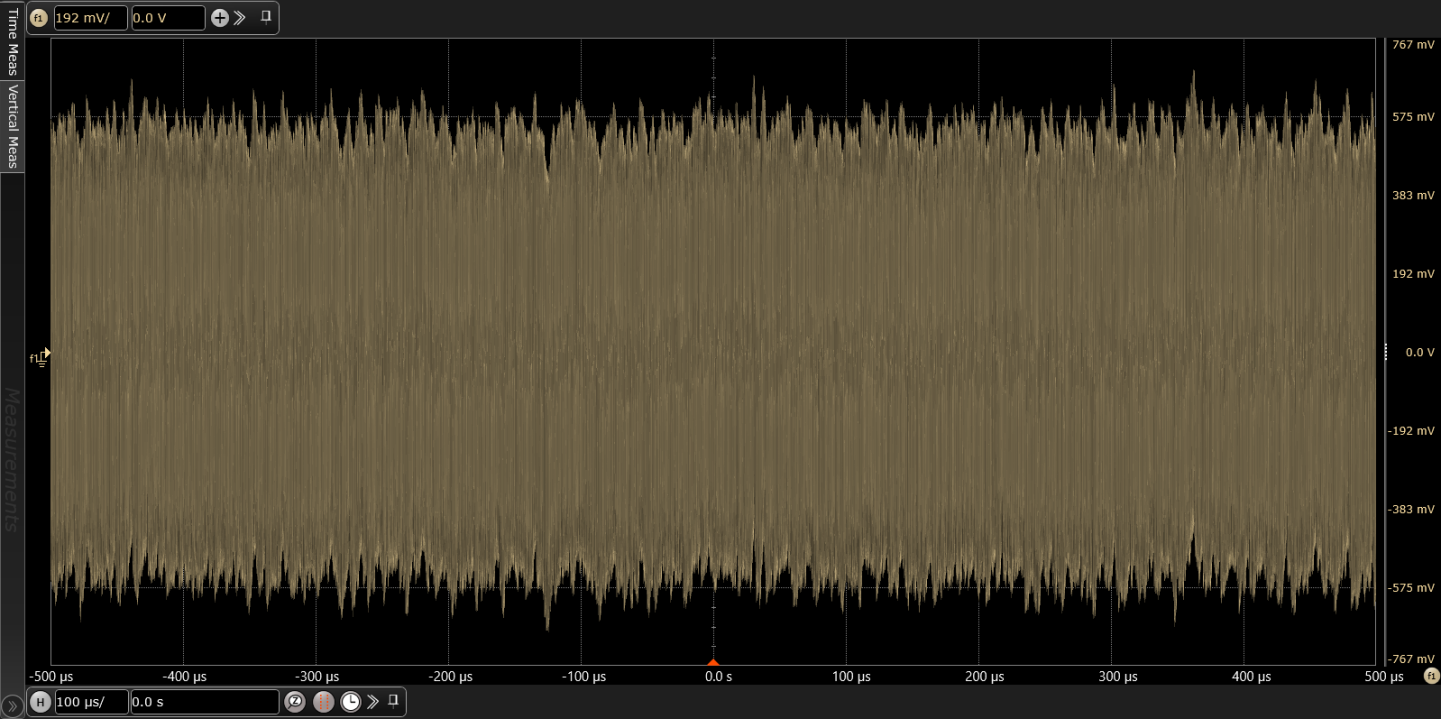
Trial 2 Images

Transmitter Peak Differential Output (100Base-T1)



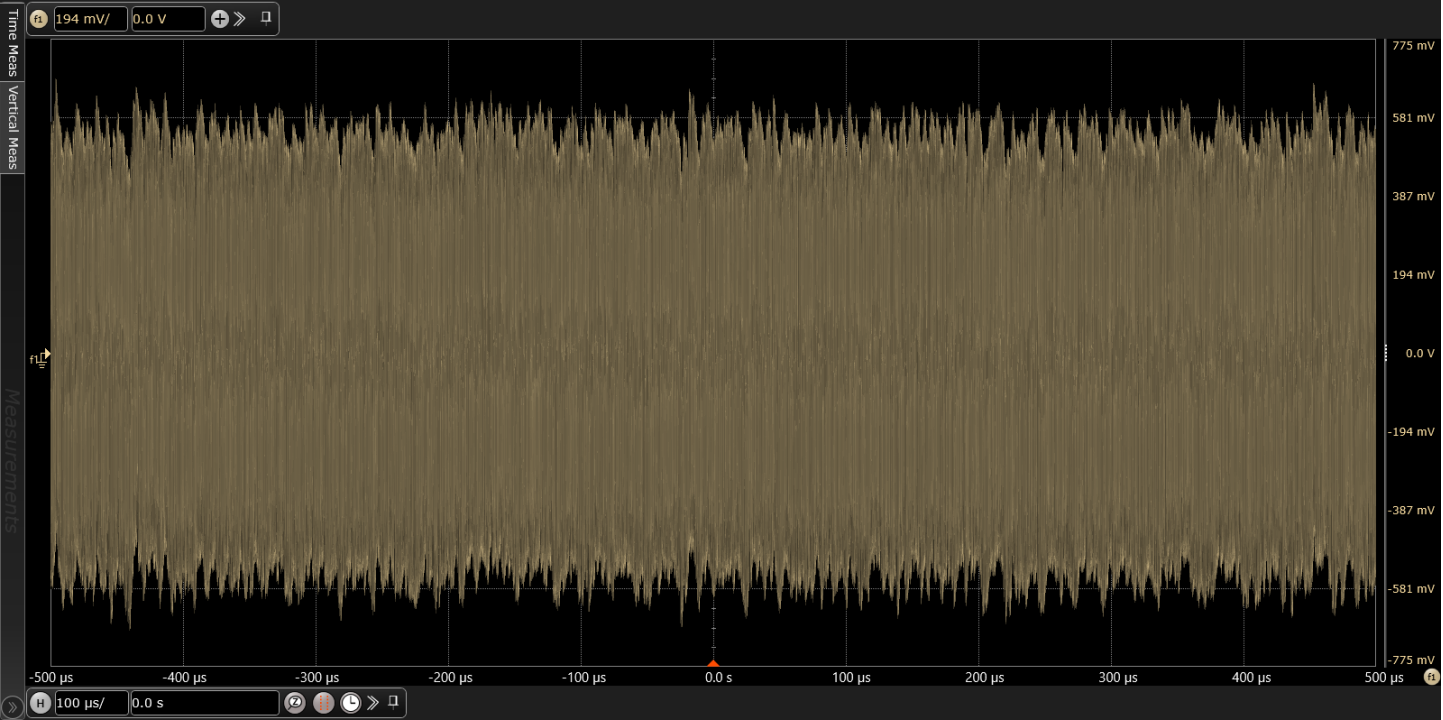
Trial 1 Images

Transmitter Peak Differential Output (100Base-T1)



Trial 3 Images

Transmitter Peak Differential Output (100Base-T1)



[Summary](#) [Previous](#)

Transmitter Power Spectral Density

IEEE Std 802.3bw™-2015 (Section 96.5.4.4 (IEEE))

In test mode 5, the power spectral density (PSD) of the transmitter, shall be between the upper and lower limits specified in Equation (96-4) and Equation (96-5) Sub-clause 96.5.4.4 of the IEEE 802.3bw.

Actual Value Measurement Name: Power Spectral Density (100Base-T1)

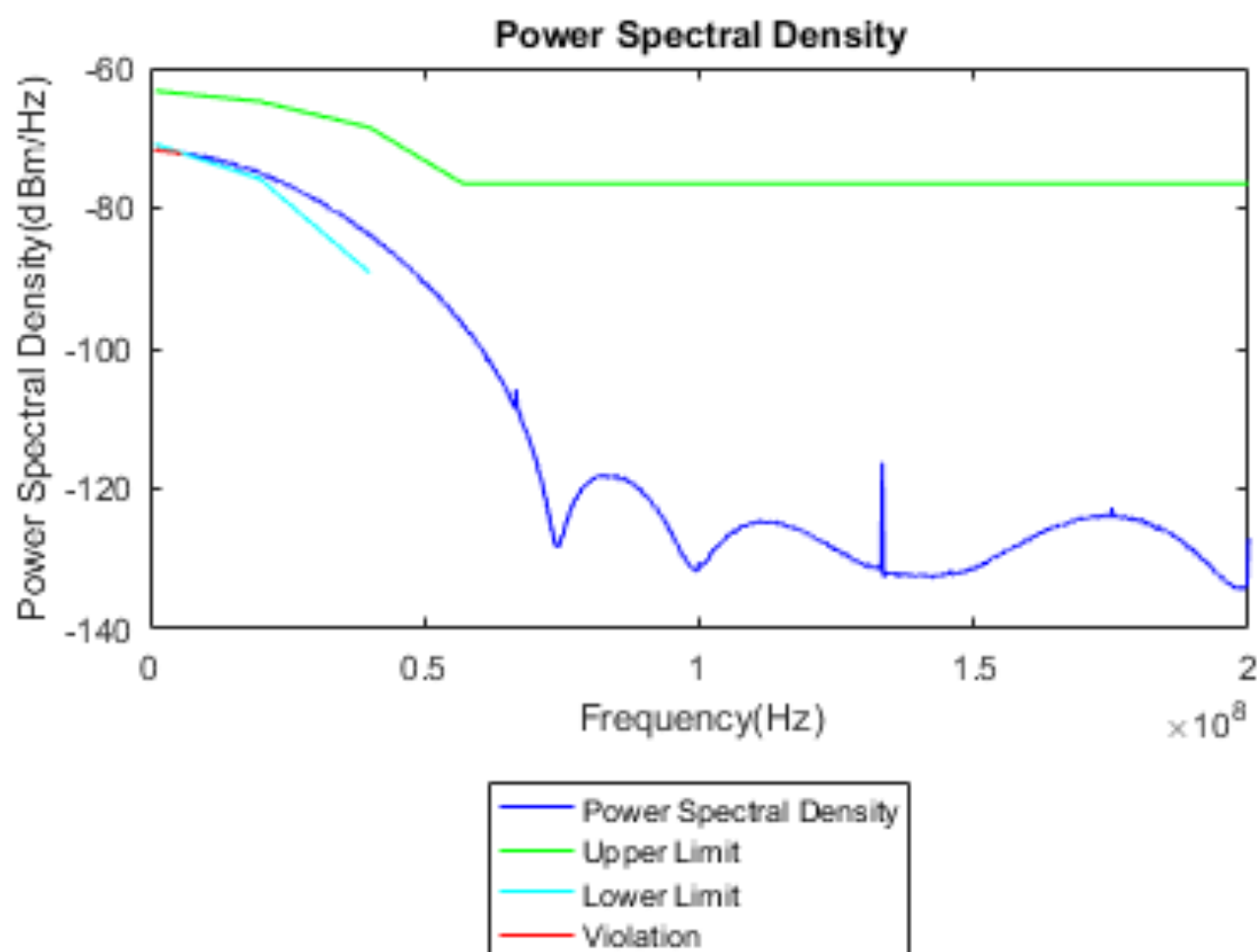
Pass Limits: Overall = Pass

Statistics & Details for all 3 Trials

	Trial #	Actual Value	Margin	Measurement Device
	Avg	-1.008 dBm/Hz	-10.08 %	
	StdDev	110.0 mdBm/Hz	1.100 %	
	Range	220.0 mdBm/Hz	2.200 %	
	Min	-1.117 dBm/Hz	-11.17 %	
	Max	-896.8 mdBm/Hz	-8.970 %	
	Sum	-3.025 dBm/Hz	-30.25 %	
	2 (Worst)	-1.117 dBm/Hz	-11.2000%	Oscilloscope
	3	-1.011 dBm/Hz	-10.1000%	Oscilloscope
	1	-897 mdBm/Hz	-9.00000%	Oscilloscope

Trial 2 Images

Power Spectral Density



Trial 3 Images
Power Spectral Density

