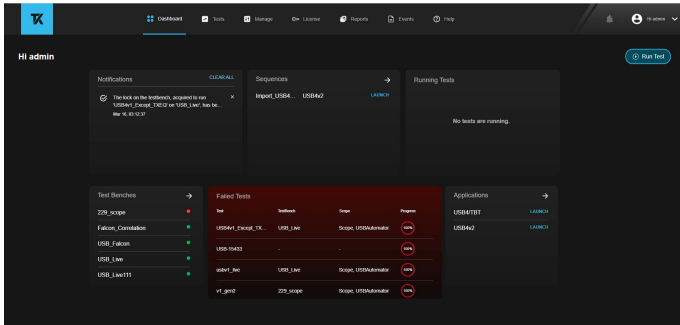
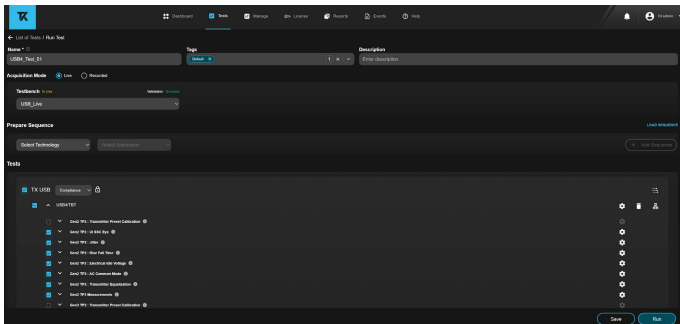


## Clarius Compliance USB4 Tx Test and Debug Solution Datasheet



The Tektronix USB4 Compliance and Debug solutions provide an easy way to validate and characterize the emerging USB4™ Router-Host, USB4™ Router- Device, and USB4™ Hubs as per the USB4™ Electrical Compliance Test Specification v1.0. Tektronix real-time Oscilloscope (bandwidth ≥ 23 GHz) supports the Tektronix USB4 Compliance and Debug solutions.



### Clarius Compliance USB4 Test Solution

The Clarius Compliance is our newest compliance test automation software solution that offers a range of features and benefits

- Higher asset utilization and faster test times - Disaggregated architecture to offload analysis from the oscilloscope.
- Easy workflow integration – Leverage REST API's and SDK for faster automation.
- Integrated data management for results, reports, and waveforms in the UI, along with a dashboard view.

### Key features

Tektronix USB4 Compliance and Debug solution provide a comprehensive toolset for the USB4™ Gen2 (10 Gbps), Gen3 (20 Gbps), Gen2 (10.3125 Gbps), and Gen3 (20.625 Gbps) verification, characterization, debug, and compliance testing.

- Tektronix USB4 solution (USB-IF approved the Tektronix oscilloscopes (SX and DX series) for the USB4 testing. Approval for the automation software is pending.) is compliant with the USB4™ Specification Ver1.0 and USB4™ Router Assembly Electrical Compliance Test Specification Rev 1.0.
- Tektronix DPOJET-USB4 Plug-in solution with setup files and MOI assists the root cause analysis.
- Tektronix USB4 solution supports the SigTest (USB-IF Analysis Tool).
- Tektronix USB4 solution supports the Wilder Technologies USB4 Controller and USB4 Electrical Test Tool (ETT).
- Tektronix Serial Data Link Analysis (SDLA) tool supports the De-emphasis, Embedding, Equalization (CTLE+DFE), and Custom Channel Characterization.
- The TekExpress USB4 Signal Validation feature validates the compliance pattern to ensure the accuracy of the results.
- The TekExpress USB4 Pre-Recorded Mode supports the offline analysis and baseline for future specification changes.
- The TekExpress USB4 Automatic DUT Control mode captures all the compliance test patterns. So the USB4 Transmitter testing completes without user intervention.
- Tektronix USB4 Automatic DUT Control supports both USB4 Discrete and Integrated (SoC) products.
- Complete both Lane 0 and Lane 1 Transmitter test without flipping the USB Type-C® connector or USB4 High-Speed fixture.
- Quickly validate test results with comprehensive reporting that details test margins, pass/fail results, and plots.

# Clarius Compliance USB4 Tx Test and Debug Solution Datasheet



## Clarius Compliance USB4 Tx Test Report

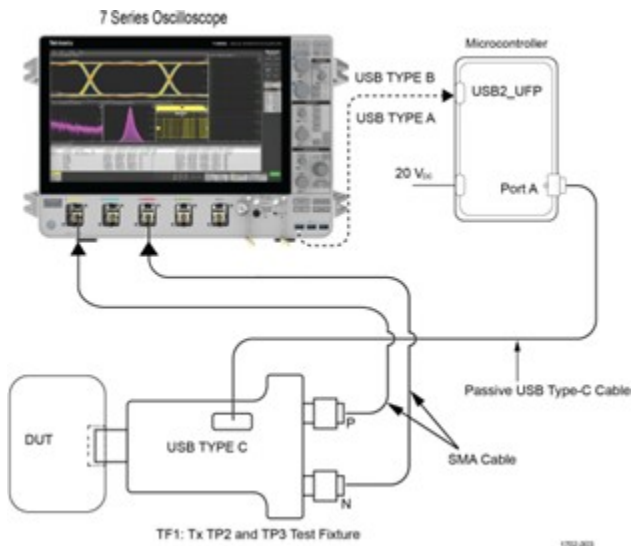
Setup Information						
Test Name	USB4_T_SignalTest_01	Scope Model Number	DPO770025X			
DUT ID	DUT001	Scope Serial Number	B322415			
Date and Time	2026-03-03 18:52:18.575	SPC: Factory Calibration	PASS - SPC completed successfully, -NA			
Overall Test Result	PASSED	Scope F/W Version	CF-91.1CT IV.10.15.0 Build 3			
Overall Execution Time	04:13:43	Clarius Version	4.0.0-master/97			
Execution Mode	LIVE	App Version	4.0.0-master/231			
DUT Name	Goshen Ridge	DUT Type	Device			
DUT Control	Automation	Test Mode	Compliance			
SigTest Version	0.99	Acquisitions Count	1			
CTS Version	v1.05	ETT Tool Version	1.1.2			
De-Embedding s4p File	Tek_40G_cable.s4p					
Probe and De-Skew Information						
Source	Probe Type	Probe Serial Number	De-Skew Value			
CH1	TCA292D	N/A	0 ps			
CH3	TCA292D	N/A	4.82 ps			
Lane0 Test Summary						
Gen2 TP2 : UI SSC Eye						
Iteration	Measurement Details	Measured Value	Unit	Test Result	Low Limit	High Limit
1	Minimum Unit Interval Min	99.985494	ps	PASS	99.97	100.03
1	Minimum Unit Interval Max	99.988164	ps	PASS	99.97	100.03
Iteration	Measurement Details	Measured Value	Unit	Test Result	Low Limit	High Limit
1	SSC Down Spread Range Min	0.471309	%	PASS	0.4	0.5
1	SSC Down Spread Range Max	0.476595	%	PASS	0.4	0.5
Iteration	Measurement Details	Measured Value	Unit	Test Result	Low Limit	High Limit
1	SSC Down Spread Rate Min	30.570013	KHz	PASS	30.0	33.0
1	SSC Down Spread Rate Max	30.646348	KHz	PASS	30.0	33.0
Iteration	Measurement Details	Measured Value	Unit	Test Result	Low Limit	High Limit
1	SSC Phase Deviation	19.150963	ns p.p.	PASS	2.5	22.0

## TEST REPORT

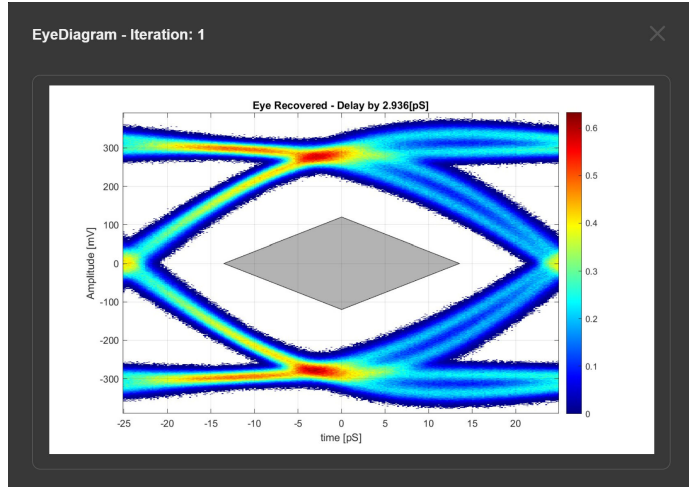
## Applications

### USB transmitter testing

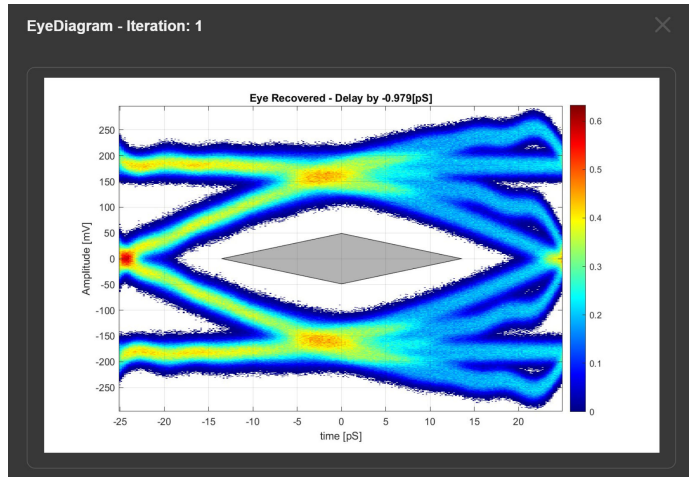
- USB4 Silicon Testing: Host, Device, and Hub
- USB4 Peripheral Testing: Host, Device, and Hub
- Manufacturing testing



Tektronix USB4 Transmitter connection diagram



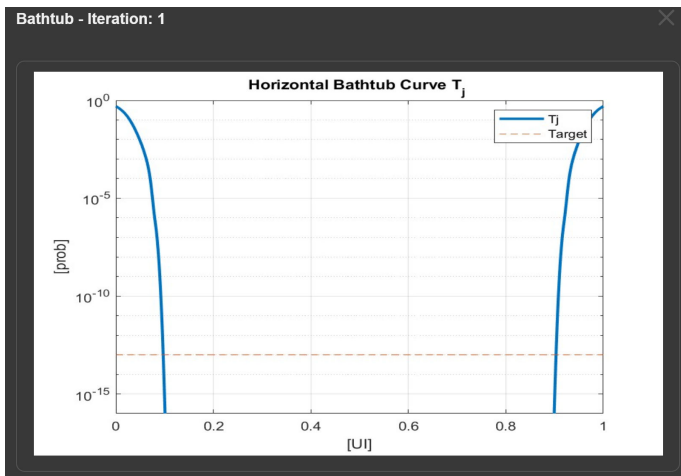
USB4 Gen3 (20 Gbps) TP2 Eye diagram



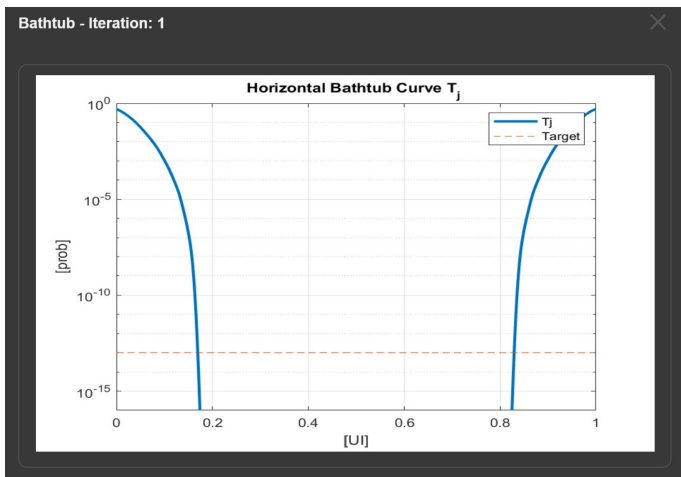
Gen3\_TP3\_EyeDiagram

Tektronix® TekExpress USB4 Transmitter Test Report							
Setup Information							
DUT ID	DUT001	Scope Model	DPO714A				
Date /Time	5/14/2025 1:08:20 AM	Scope Serial Number	QU200029				
Acquisition Mode	Live	Scope F/W Version	2.17.314-develop.4383+2bed06870				
DUT Control	Automated	SPC: Factory S/W Calibration	PASS				
Snag Lane	None	TekExpress USB4 TX	10.1.0.9				
DUT Type	Device	TekExpress Framework	5.11.0.11				
Test Method	SigTest	SigTest Version	0.95				
De-embedded RF Cable	Tek_40G_cable.s4p	CTS Version	v1.03				
Total Acquisition Time	00:03:43.53	ETT Version	vl.1.2				
Total Analysis Time	00:00:28.16	Port Number	1				
Over All Test Result	Pass						
DUT COMMENT:	General Comment - USB4 Transmitter DUT						
Rise Fall Time							
Measurement Details	Data Rates	Lane	Measured Value	Test Result	Margin	Low Limit	High Limit
RiseTime Min	10G	Lane 0	38.096 ps	Pass	LL: NA, HL:	10 ps	NA
FallTime Min	10G	Lane 0	38.34 ps	Pass	LL: NA, HL: NA	10 ps	NA
COMMENTS							

Tektronix USB4 Transmitter Compliance Report in MHT format



**USB4 Gen3 (20Gbps) TP2 Tj Bathtub**



**USB4 Gen3 (20Gbps) TP3 Tj Bathtub**

## Specifications

### High-Speed electrical tests supported in Tektronix USB4 solution

Test	Speed				Pattern	Test Points	
	Gen2 (10 Gbps)	Gen3 (20 Gbps)	Gen2 (10.3125Gbps)	Gen3 (20.625Gbps)		TP2	TP3
Transmitter Preset Calibration	✓	✓	✓	✓	PRBS15	✓	
Transmitter Equalization	✓	✓	✓	✓	SQ128	✓	

## Clarius Compliance USB4 Tx Test and Debug Solution Datasheet

Minimum Unit Interval	✓	✓	✓	✓	PRBS31	✓	
SSC Down Spread Range	✓	✓	✓	✓		✓	
SSC Down Spread Rate	✓	✓	✓	✓		✓	
SSC Phase Deviation	✓	✓	✓	✓		✓	
SSC Slew Rate	✓	✓	✓	✓		✓	
Rise/Fall Time	✓	✓	✓	✓	SQ128	✓	
Total Jitter (TJ)	✓	✓	✓	✓	PRBS15	✓	✓
Uncorrelated Jitter (UJ)	✓	✓	✓	✓		✓	✓
Uncorrelated Deterministic Jitter (UDJ)	✓	✓	✓	✓		✓	✓
Data Dependent Jitter (DDJ)	✓	✓	✓	✓		✓	✓
Low-Frequency UDJ (LF UDJ)	✓	✓	✓	✓		✓	
DCD (Even-Odd Jitter)	✓	✓	✓	✓		✓	
Eye Diagram	✓	✓	✓	✓	PRBS31	✓	✓
AC Common Mode	✓	✓	✓	✓	PRBS31	✓	
Electrical Idle Voltage	✓	✓	✓	✓	Idle	✓	

## Ordering information

### Hardware requirements

Item	Description	Vendor	Quantity
7 Series DPO or DPO/ MSO70000SX/DX	<ul style="list-style-type: none"> <li>7 Series oscilloscope model DPO714AX 25 GHz</li> <li>Tektronix DPO (Digital Phosphor Oscilloscope) or MSO (Mixed Signal Oscilloscope) Oscilloscopes – 23 GHz and above</li> </ul>	Tektronix	1
Host PC/Laptop	Refer to System requirements.	-	-
Microcontroller (with power supply)	USB4-TPA-UC   640-0962-000	Wilder	1

## Clarius Compliance USB4 Tx Test and Debug Solution Datasheet

Item	Description	Vendor	Quantity
Fixture	USB4-TPAC-TF-LSX-CBL-FK   640-1020-500	Wilder	1
SMA cable pair (40 GHz)	PMCABLE1M	Tektronix	

### System requirements

Prerequisites	Minimum requirements
Operating system	Windows 10 Enterprise and Pro (version 21H2 and above) or Windows 11 Enterprise and Pro (version 21H2 and above)  <b>Language:</b> English (United States) only.
CPU cores	16
RAM	64 GB
Disk space	800 GB HDD/SSD of free disk space
Browser	Microsoft Edge (default) or Google Chrome
Additional software	<ul style="list-style-type: none"> <li>▪ Python 3.13.x</li> </ul> <hr/> <p><b>NOTE:</b> Python installation is required for SDK and DUT control automator.</p> <hr/> <ul style="list-style-type: none"> <li>▪ Download the <a href="#">USB4 SigTest Tool</a>.</li> <li>▪ Install the 64 bit MATLAB runtime compiler.                             <ul style="list-style-type: none"> <li>• Version R2024a (24.1) for SigTest version 0.95</li> <li>• Version R2023b (24.b) for SigTest version 0.99</li> </ul> </li> </ul>

### Software requirements

#### Compliance

Item	Description	Vendor	Quantity
Clarius USB4v1 Compliance Test Application	Refer to USB4v1 license details.	Tektronix	1

#### License options

License terms	License option	License type
<b>Subscription</b>	AT-USB4-TX-NS1	1 Year, Node-locked
	AT-USB4-TX-NS3	3 Years, Node-locked
	AT-USB4-TX-FS1	1 Year, Floating
	AT-USB4-TX-FS3	3 Years, Floating

**NOTE:** The license can be used for the duration of the subscription term.

**License types:**

- Node Locked: Tied to a specific computer.
- Floating: License can be moved from one computer to another to share between labs/geography.

**Certification**

Tektronix is registered to ISO 9001:2015 and ISO 14001:2015.

## Contact Information:

**Australia** 1 800 709 465  
**Austria\*** 00800 2255 4835  
**Balkans, Israel, South Africa and other ISE Countries** +41 52 675 3777  
**Belgium\*** 00800 2255 4835  
**Brazil** +55 (11) 3530-8901  
**Canada** 1 800 833 9200  
**Central East Europe / Baltics** +41 52 675 3777  
**Central Europe / Greece** +41 52 675 3777  
**Denmark** +45 80 88 1401  
**Finland** +41 52 675 3777  
**France\*** 00800 2255 4835  
**Germany\*** 00800 2255 4835  
**Hong Kong** 400 820 5835  
**India** 000 800 650 1835  
**Indonesia** 007 803 601 5249  
**Italy** 00800 2255 4835  
**Japan** 81(3) 6714 3086  
**Luxembourg** +41 52 675 3777  
**Malaysia** 1 800 22 55835  
**Mexico, Central/South America and Caribbean** 52 (55) 88 69 35 25  
**Middle East, Asia, and North Africa** +41 52 675 3777  
**The Netherlands\*** 00800 2255 4835  
**New Zealand** 0800 800 238  
**Norway** 800 16098  
**People's Republic of China** 400 820 5835  
**Philippines** 1 800 1601 0077  
**Poland** +41 52 675 3777  
**Portugal** 80 08 12370  
**Republic of Korea** +82 2 565 1455  
**Russia / CIS** +7 (495) 6647564  
**Singapore** 800 6011 473  
**South Africa** +41 52 675 3777  
**Spain\*** 00800 2255 4835  
**Sweden\*** 00800 2255 4835  
**Switzerland\*** 00800 2255 4835  
**Taiwan** 886 (2) 2656 6688  
**Thailand** 1 800 011 931  
**United Kingdom / Ireland\*** 00800 2255 4835  
**USA** 1 800 833 9200  
**Vietnam** 12060128

\* European toll-free number. If not accessible, call: +41 52 675 3777

Find more valuable resources at [TEK.COM](http://TEK.COM)

**Tektronix**<sup>®</sup>

Copyright © Tektronix. All rights reserved. Tektronix products are covered by U.S. and foreign patents, issued and pending. Information in this publication supersedes that in all previously published material. Specification and price change privileges reserved. TEKTRONIX and TEK are registered trademarks of Tektronix, Inc. All other trade names referenced are the service marks, trademarks or registered trademarks of their respective companies.

61W-74238-0 7 Apr 2026