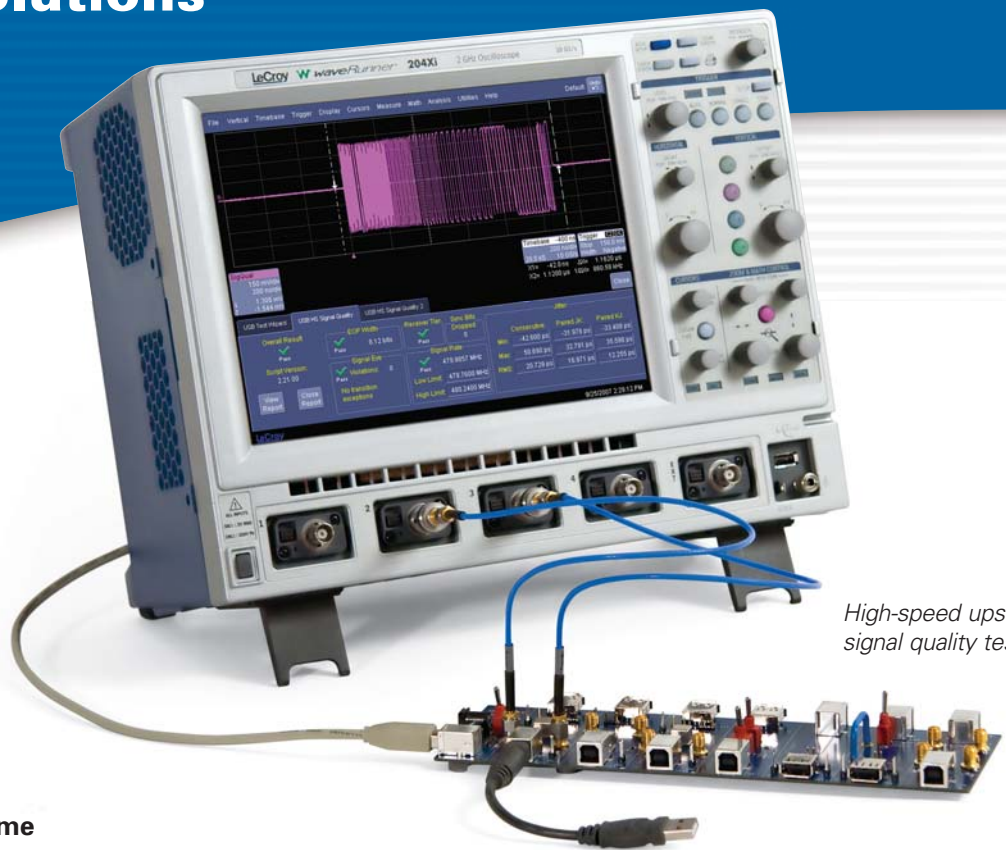


## USB Test Solutions QPHY-USB



*High-speed upstream  
signal quality test result.*

### Key Features

- Compliant with all real-time oscilloscope tests specified by the USB-IF procedures
- Support for host, device, and hub testing
- Simple and easy-to-use automated testing
- SMA cables used for high-speed upstream signal quality
- Supports 12 Loads for new higher port hubs
- Two boards for ease of connection
- No dangling cables
- Support for High-speed, Full-speed, and Low-speed testing included
- QualiPHY report generation—incorporates all oscilloscope and DVM tests

The USB package provides a complete acquisition and analysis system for USB 2.0 devices, hosts, and hubs, as specified in the USB-IF USB 2.0 Electrical Test Specification. The test software implements a full set of electrical tests for USB 2.0, including High-, Full-, and Low-speed tests and is supported by LeCroy's QualiPHY automated test and reporting software.

QualiPHY's connection diagrams provide a visual representation of probe and cable connections making it easy to ensure that the correct connections are made the first time.

The user is prompted when to change the test conditions and as how to interpret the test results.

Each measurement is indicated by its designation within the specification, and the allowed values for each parameter are shown, as well as a pass/fail indication.

LeCroy's TF-USB-B fixture provides sections for Signal Quality (Device & Host), Receiver Sensitivity, TDR (Device & Host), Disconnect, Inrush, Droop and 12 Loads to accommodate new higher port hubs. High-speed, Full-speed, and Low-speed tests are all supported.

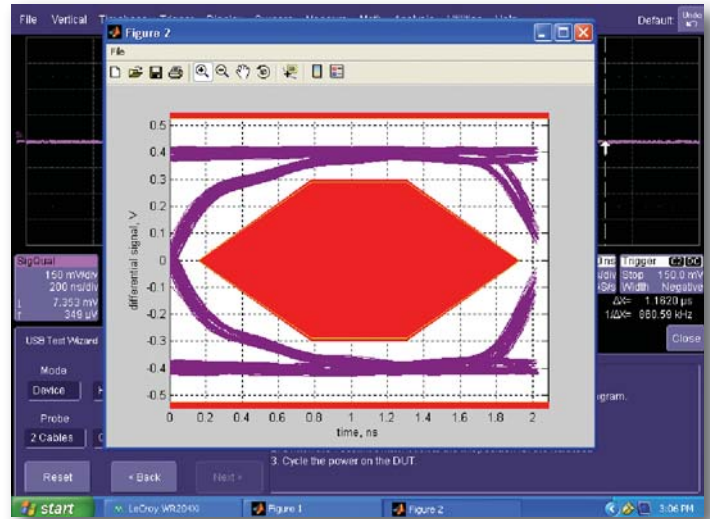
QPHY-USB is supported by 2 GHz or higher bandwidth oscilloscopes: WaveRunner,<sup>®</sup> WavePro,<sup>®</sup> WaveMaster,<sup>®</sup> SDA, or DDA.

# Compliance Testing for High-, Full-, and Low-speed Devices, Hosts, and Hubs



High-speed upstream signal quality test result.

In addition to QualiPHY, the QPHY-USB option also has easy to use step-by-step instructions embedded in the menu system of the application. These simple, step-by-step, instructions lead the user through the selected test. The user is directed as to the proper connection of probes as well as how to properly use the USB-IF



Eye diagram created using the integrated USB-IF MATLAB® test scripts.

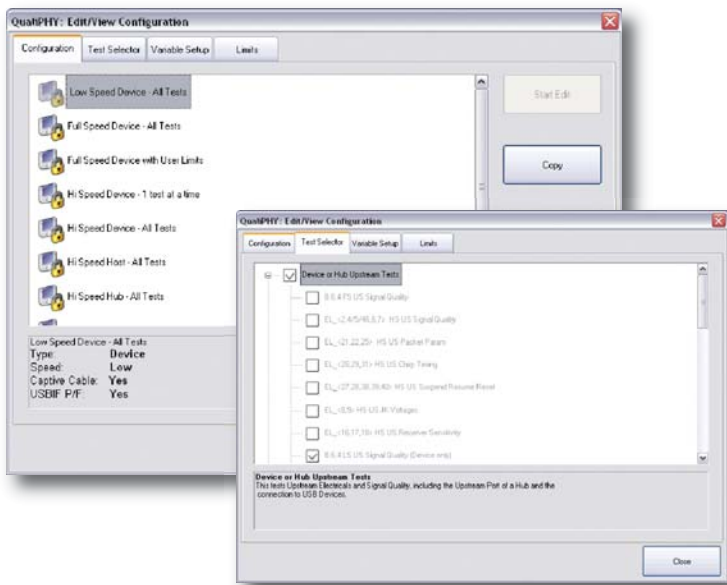
High-speed Electrical Tool. Results, indicating pass or fail, are displayed on the screen. This enables the solution to help with both compliance testing and debug. All High-speed, Full-speed and Low-speed compliance tests are supported in debug mode for Devices, Hosts and Hubs.



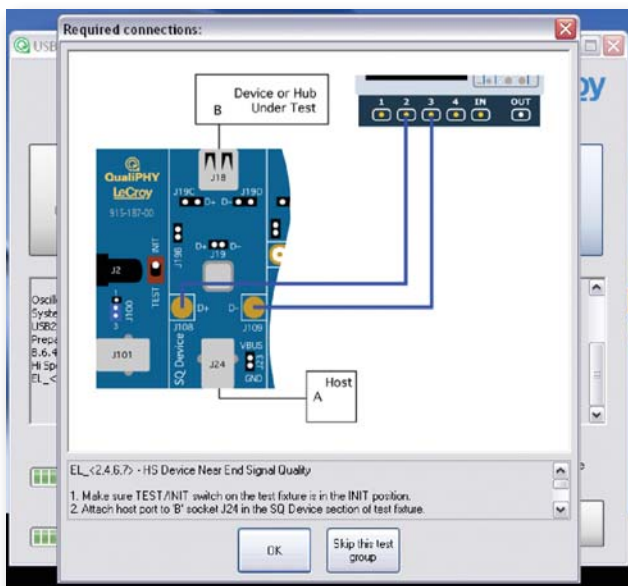
High-speed chirp timing test.



High-speed packet parameter test.



QualiPHY has many preset compliance configurations but also enables users to create their own test and limit sets.



Connection diagram for high-speed signal quality.

QualiPHY has many predefined configurations that allow users to run complete compliance test. (All High-speed Device Tests, All Full-speed Hub Tests, etc.) In addition, users can create their own custom test groups and limit sets. When the tests are complete, QualiPHY will generate a full test report in PDF, HTML, or XML formats (including eye diagrams and other screenshots).

### Host Tests

- HS signal quality
- HS packet parameters
- HS chirp timing
- HS suspend/resume/reset
- HS disconnect
- FS downstream signal quality
- LS downstream signal quality

### Device Tests

- HS signal quality
  - HS far-end for tethered devices
  - HS near-end for untethered devices
- HS packet parameters
- HS chirp timing
- HS suspend/resume/reset
- HS receiver sensitivity
- FS upstream signal quality
- LS upstream signal quality
- Inrush current

### Hub Tests

- HS signal quality (upstream/downstream)
  - HS far-end for tethered hubs
  - HS near-end for untethered hubs
- HS packet parameters
- HS chirp timing
- HS suspend/resume/reset
- HS receiver sensitivity
- HS downstream repeater
- HS upstream repeater
- FS signal quality (upstream/downstream)
- LS signal quality (upstream/downstream)
- Inrush current

**LeCroy** **QualiPHY**

**USB Test Report**  
Overall result: **Pass**

DUT:   
 Comment:   
 Time of test: 2025/09/14 10:54   
 Operator:   
 Temperature: 23 C

Configuration in use: H Speed Device - All Tests   
 Link in use: USB   
 Standard in use: USB   
 Qualification Name: LCR4053M10790 Model: INF024X   
 Qualification Serial #: LCR4053M11702   
 Computer:   
 Qualitelligence Firmware version: 3.0.0.0 (Build 08/20/11)   
 QualiPHY Core version: 5.10.0.0 (Build 07/20/11)   
 QualiPHY script version: 5.9.3   
 Refreshed version: 1.0

Pass/Fail from USBIF driver: Yes   
 Record to Database: Yes   
 Starting Procedure: 1   
 USB-IF Manual script version: 2.21.00

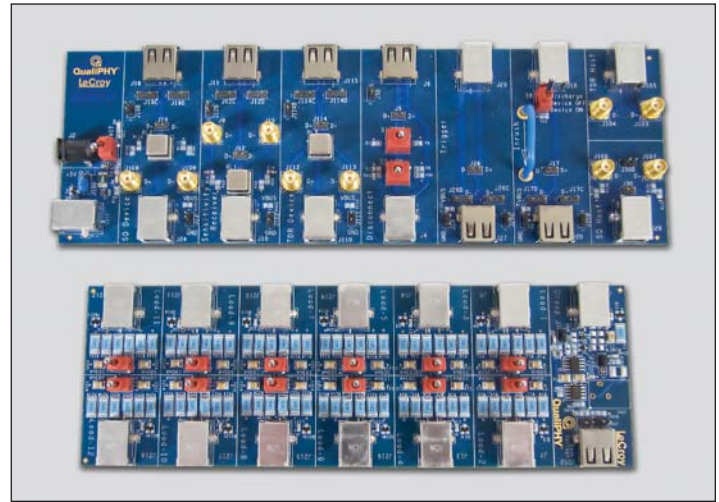
**Summary Table**

Pass/Fail	Test	Speed	Direction	Port	Measurement	Current Value	Test Criteria
✓	EL_2.4.5.6.7b	H	Upstream	IN	Control HS Signal Quality	Pass	Pass/Fail
✓	FL_3	H	Upstream	IN	FS Signal Rate Reset	Pass	Pass/Fail
✓	EL_3	H	Upstream	IN	FS Signal Rate	479 984/70 Mbps	Informational Only
✓	FL_4	H	Upstream	IN	FS Signal Eye Reset	Pass	Pass/Fail
✓	EL_4	H	Upstream	IN	FS Signal Eye Voltage	3	Informational Only
✓	EL_4	H	Upstream	IN	FS Eye Acquisition	No Transition	Informational Only
✓	EL_4	H	Upstream	IN	FS Connection After	-42.632 us	Informational Only
✓	EL_4	H	Upstream	IN	FS Connection After	50.892 us	Informational Only
✓	EL_4	H	Upstream	IN	FS HS0 Jitter	25.729 us	Informational Only

# Specifications and Ordering Information

## TF-USB-B

TF-USB-B is required to test High-, Full-, and Low-speed Devices, Hosts, and Hubs. The accessories include two matched SMA cables, two SMA-BNC adapters, two SMA terminators, USB-A Male to Mini-B Male adapter, USB-A Female to B Female adapter, USB-A Male to Micro B Male adapter, USB-A Male to Micro AB Female adapter, and ten 6" USB-A to USB-B cables. TF-USB-B contains 12 Loads for new higher port hubs. These Loads are on a separate board to allow for easy connections.



TF-USB-B: Signal integrity board and load board are separate to ease connections.

## Ordering Information

### Recommended System Configuration

#### High-speed / Full-speed / Low-speed Tests

SDA (Serial Data Analyzer) Series  
DDA (Disk Drive Analyzer) Series  
WaveMaster Series  
WavePro 7300A, 7200A  
WaveRunner 204Xi  
WaveRunner 6200A

#### Recommended Accessories

Two x 2.5 GHz, 0.7 pF, 100 k $\Omega$ , Active Probe ( $\div 10$ ), Small Form Factor	HFP2500
WaveLink ProBus Probe Body (WaveRunner or WavePro only)	WL300
WaveLink ProLink Probe Body (WaveMaster, SDA, and DDA only)	WL600
WaveLink 7 GHz, Small Tip Module (Second Differential Probe Needed for Hub Tests)	D600ST*
Single Ended Probe (Passive or Active)	Oscilloscope Dependent
30 A; 50 MHz Current Probe – AC/DC; 30 A <sub>rms</sub> ; 50 A <sub>peak</sub> Pulse	CP030
USB 2.0 Testing Compliance Test Fixture	TF-USB-B

\*For a complete probe, order a WL300 or WL600 Probe Body with the Probe Tip Module.

#### Full-speed / Low-speed Tests

WavePro 7100A, 7000A  
WaveRunner 104Xi, 64Xi, 62Xi, 44Xi  
WaveRunner 6100A, 6050A, 6051A

### Product Description

USB Application Software Package	QPHY-USB*
USB 2.0 Testing Compliance Test Fixture	TF-USB-B

\*TF-USB-B required.

### Customer Service

LeCroy oscilloscopes and probes are designed, built, and tested to ensure high reliability. In the unlikely event you experience difficulties, our digital oscilloscopes are fully warranted for three years and our probes are warranted for one year.

This warranty includes:

- No charge for return shipping
- Long-term 7-year support
- Upgrade to latest software at no charge



1-800-5-LeCroy **Local sales offices are located throughout the world.**  
www.lecroy.com **To find the most convenient one visit www.lecroy.com**

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