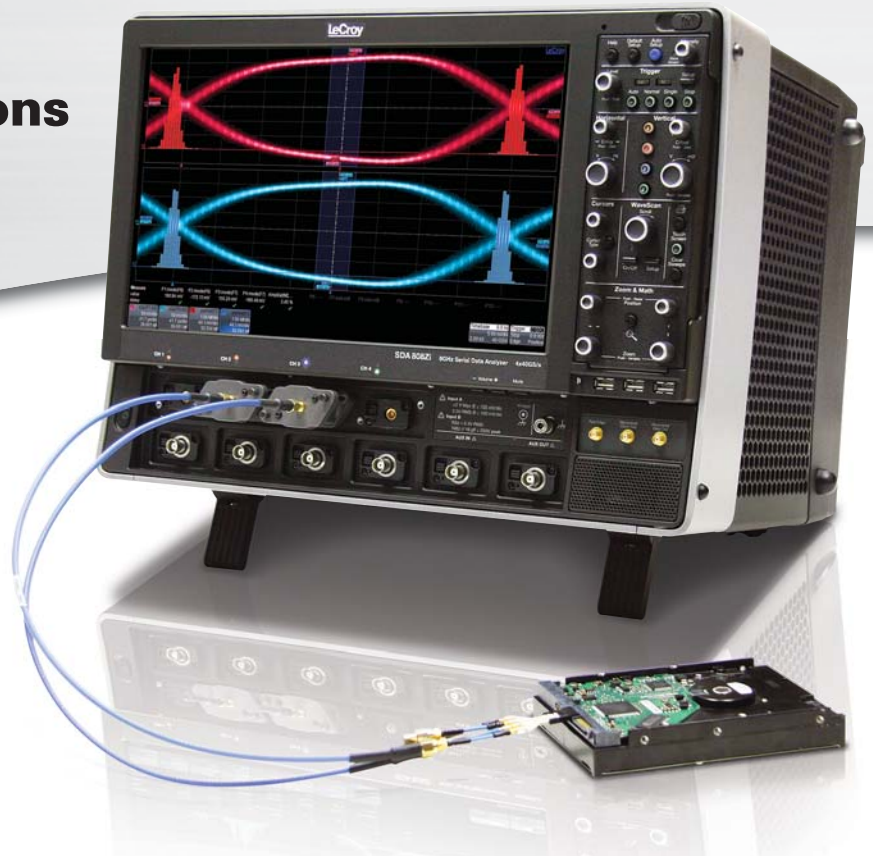




Serial ATA Test Solutions QPHY-SATA

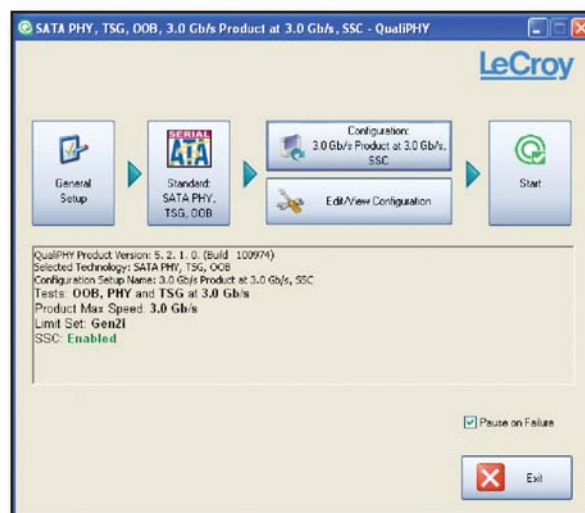


Key Features

- QPHY-SATA provides a highly automated and easy-to-use solution for Serial ATA Gen1 (1.5 Gb/s), Gen2 (3.0 Gb/s) and Gen3 (6.0 Gb/s) compliance testing
- Bandwidths and sample rates suited to the data and edge rates of today's highest speed devices
- Long memory to capture low-speed phenomena—such as Spread Spectrum Clocks (SSC)—embedded in high-speed data
- Powerful and flexible analysis tools offer unmatched insight for diagnosing and solving elusive problems
- Fast processing throughput maintains interactive operation even while performing complex calculations on long waveforms

The QualiPHY SATA software option for LeCroy oscilloscopes provides an extensive set of validation/verification and debug tools written in accordance with SATA Gen1 (1.5 Gb/s), SATA Gen2 (3.0 Gb/s) and SATA Gen3 (6.0 Gb/s) electrical specification. QPHY-SATA covers the interoperability tests defined by the SATA-IO including all the PHY General Requirements (PHY), PHY Transmitted Signal

Requirements (TSG), and PHY OOB Requirements (OOB) for internal SATA products as well as eSATA products. These capabilities make QPHY-SATA an all-inclusive automated test suite that meets the requirements for Gen1 (1.5 Gb/s), Gen2 (3.0 Gb/s) and Gen3 (6.0 Gb/s) Serial ATA transmitter compliance testing.



QPHY-SATA provides a highly automated and easy-to-use solution for Serial ATA Gen1 (1.5 Gb/s), Gen2 (3.0 Gb/s) and Gen3 (6.0 Gb/s) compliance testing in accordance with SATA-IO Logo requirements.



Powerful Debugging Tools

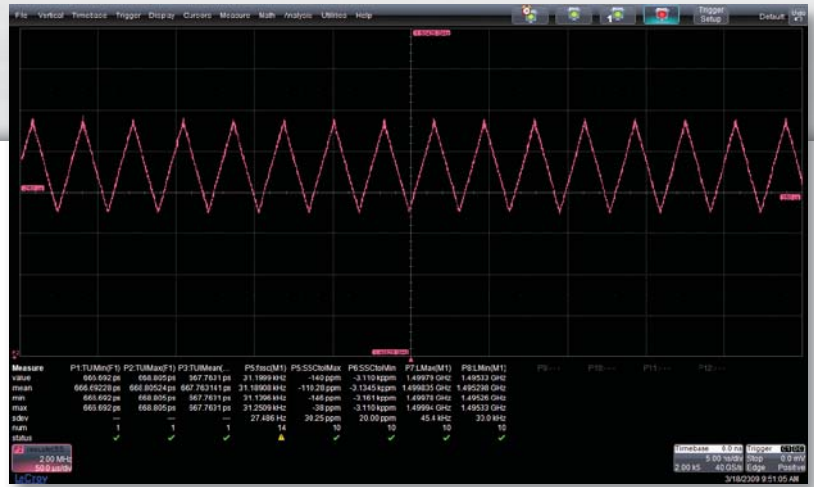
The use of Spread Spectrum Clocking (SSC) in transmitted signals is an optional feature of the SATA specification. When SSC is enabled, measurements such as frequency modulation rate and deviation must also be verified per the specification. The QPHY-SATA software works in conjunction with the deep memory and powerful analysis library of LeCroy oscilloscopes to greatly simplify this verification process. Clock recovery circuitry and clock extraction via Phase-Locked Loops (PLLs) is another significant design consideration. Flexible clock recovery options allow for the replication of virtually any real receiver PLL configuration, enabling the simulation of “what if” scenarios. Jitter results can be measured exactly as the receiver would see them.

Comprehensive and Easy-to-read Test Reports

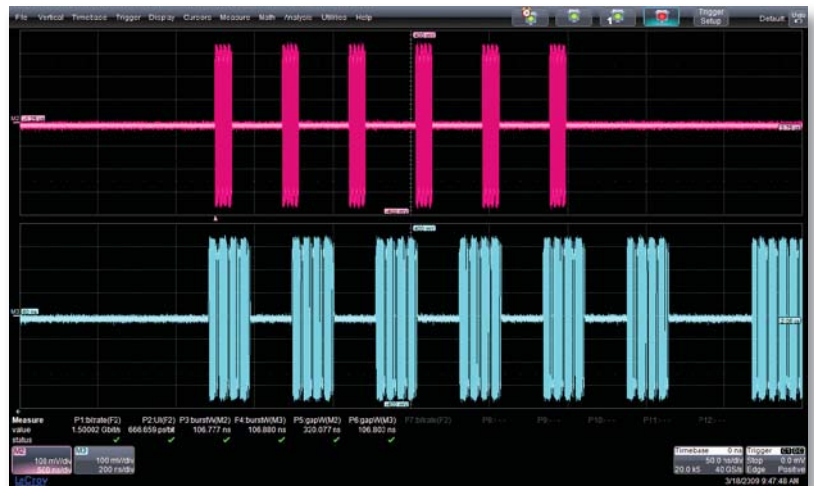
Measurement results often need to be summarized and tabulated to quickly verify specifications. This information, together with instrument and signal acquisition/test condition setups, results in a fully documented record. QPHY-SATA streamlines this process by incorporating an automatic HTML report generation engine. The created test reports contain tabulated numerical values for each individual test result, including PASS/FAIL and specification limit columns. Reports can also be saved as PDF, HTML or XML.

Advanced Debug Capability

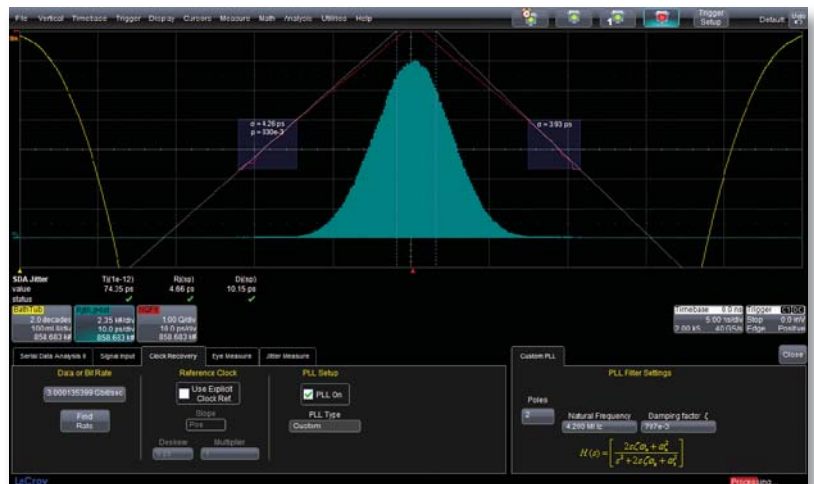
If a compliance failure is found, LeCroy’s SDA II serial data analysis package is available to help find the root cause quickly and easily. SDA II has the ability to perform Eye and Jitter



Spread Spectrum Clock (SSC) validation requires long memory and specialized analysis functions. LeCroy is the only manufacturer that can precisely track SSC profiles through multiple cycles in real time.



OOB timing measures COMINIT/COMRESET and COMWAKE bit rate, burst and gap widths.



Clock-to-data Jitter Measurements. Clock recovery options enable you to meet the Jitter Transfer Function (JTF) specification requirements. Industry-leading Q-Scale analysis provides the industry’s most precise breakdown of Random and Deterministic Jitter (Rj and Dj).

SATA PHY, TSG, OOB Test Report

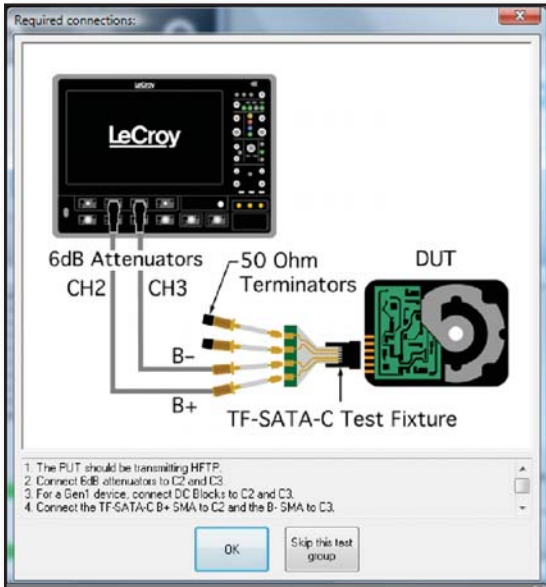
Overall result: **Pass**

DUT: Demo
 Comment: 11/30/2007 18:17:29
 Time of test: LeCroy Test
 Operator: 0° C
 Temperature: Demo of 3.0 Gb/s tests without SSC
 Limits in use: Gen2
 Standard in use: SATA PHY, TSG, OOB
 Oscilloscope Name: LCRY0409N11978 Model: SDA11000
 Oscilloscope Serial #: LCRY0409N11978
 Computer: LeCroy Test
 Oscilloscope firmware version: 5.2.2.1 (Build 100943)
 QualiPHY core version: 5.2.1.0 (Build 100974)
 QualiPHY script version: 1.1.5
 Stylesheet version: 1.1
 Waveform path on oscilloscope: D:\Waveforms\SATA

Summary Table

[Hide Table]

Pass	Test	Measurement	Current Value	Test Criteria
?	PHY-01	Unit Interval Min	333.295 ps	Informational Only
?	PHY-01	Unit Interval Max	333.347 ps	Informational Only
✓	PHY-01	Unit Interval Mean	333.318 ps	333.217 ps <= n <= 335.117 ps
✓	PHY-02	ftol	45.17 ppm	-350.00 ppm <= n <= 350.00 ppm
?	TSG-01	UH HFTP	323.3 mV	Informational Only
?	TSG-01	LH HFTP	-328.4 mV	Informational Only
✓	TSG-01	DH HFTP	651.7 mV	>= 400.0 mV
?	TSG-01	UM MFTP	302.7 mV	Informational Only
?	TSG-01	LM MFTP	-307.3 mV	Informational Only
✓	TSG-01	DM MFTP	610.0 mV	>= 400.0 mV
?	TSG-01	A LBP	299.3 mV	Informational Only
?	TSG-01	B LBP	-305.8 mV	Informational Only



Connection Diagrams prompt the user to set the DUT to output specific test patterns.

Compliance Reports contain all of the tested values, the specific test limits and screen captures. Compliance Reports can be created as HTML, PDF or XML.

measurements simultaneously and is fully integrated into the oscilloscope application software. In addition, SDA II provides insight into the measured Eye and Jitter parameters making it easier to identify the sources of problems.

QualiPHY

QualiPHY is designed to reduce the time, effort and specialized knowledge needed to perform compliance testing on high-speed serial buses.

- Guides the user through each test setup
- Performs each measurement in accordance with the relevant test procedure
- Compares each measured value with the applicable specification limits
- Fully documents all results
- QualiPHY helps the user perform testing the right way—every time!

SPECIFICATIONS AND ORDERING INFORMATION

Specifications

Real Time Oscilloscope Tests

PHY General Requirements

Test PHY-01 – Unit Interval
Test PHY-02 – Frequency Long-term Accuracy
Test PHY-03 – Spread Spectrum Modulation Frequency
Test PHY-04 – Modulation Deviation

PHY Transmitted Signal Requirements

Test TSG-01 – Differential Output Voltage (all VdiffMin, VdiffMax)
Test TSG-02 – Rise/Fall Times
Test TSG-03 – Differential Skew
Test TSG-04 – AC Common Mode Voltage
Test TSG-05 – Rise/Fall Imbalance
Test TSG-06 – Amplitude Imbalance
Test TSG-09 – Gen1 (1.5 Gb/s) TJ at Connector, fbaud/500
Test TSG-10 – Gen1 (1.5 Gb/s) DJ at Connector, fbaud/500

PHY Transmitted Signal Requirements (cont'd)

Test TSG-11 – Gen2 (3.0 Gb/s) TJ at Connector, fbaud/500
Test TSG-12 – Gen2 (3.0 Gb/s) DJ at Connector, fbaud/500
Test TSG-13 – Gen3 Transmit Jitter
Test TSG-14 – Gen3 TX Maximum Differential Voltage
Test TSG-15 – Gen3 TX Minimum Differential Voltage
Test TSG-16 – Gen3 TX AC Common Mode Voltage

PHY OOB Requirements

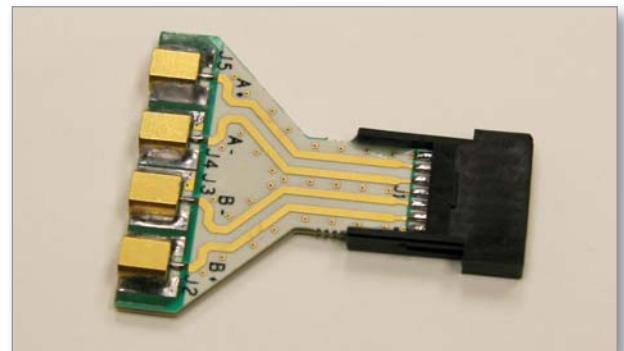
Test OOB-01 – Signal Detection Threshold
Test OOB-02 – UI During OOB (bit rate)
Test OOB-03 – COMINIT and COMWAKE Burst Length
Test OOB-04 – COMINIT Gap Length
Test OOB-05 – COMWAKE Gap Length
Test OOB-06 – COMWAKE Gap Detection
Test OOB-07 – COMINIT Gap Detection

Ordering Information

Product Description

Product Code

QualiPHY Enabled SATA Software Option	QPHY-SATA
SATA 1.5 Gb/s, 3.0 Gb/s and 6.0 Gb/s Compliance Test Fixture	TF-SATA-C
Includes: TF-SATA-C Test Fixture Four 2 Inch SSMP to SMA Cables Two SMA 6 dB Attenuators Multiwrench Tool	
SATA 1.5 Gb/s, 3.0 Gb/s and 6.0 Gb/s Compliance Test Fixture Measure Kit	TF-SATA-C-KIT
Includes: TF-SATA-C Test Fixture TF-SATA-C Measurement Fixture Eight 2 Inch SSMP to SMA Cables Two SMA 6 dB Attenuators Two SMA 50 Ω Terminators Two 18 Inch SMA to SMA Cables Multiwrench Tool	



TF-SATA-C Test Fixture Kit provides high-performance signal integrity measurements for Gen1, Gen2 and Gen3.

Compatible Oscilloscopes

- WaveMaster®/SDA/DDA 806Zi or higher bandwidth* (Gen1 (1.5 Gb/s) only)
- WaveMaster®/SDA/DDA 813Zi or higher bandwidth* (Gen1 (1.5 Gb/s), Gen2 (3.0 Gb/s) and Gen3 (6.0 Gb/s))
- WavePro®/SDA/DDS 760Zi* (Gen1 (1.5 Gb/s) only)
- SDA 6000A XXL[†] (Gen1 (1.5 Gb/s) only)
- SDA 6020[†] (Gen1 (1.5 Gb/s) only)
- SDA 9000[†] (Gen1 (1.5 Gb/s) only)
- SDA 11000[†] (Gen1 (1.5 Gb/s) or Gen2 (3.0 Gb/s))
- SDA 13000[†] (Gen1 (1.5 Gb/s), Gen2 (3.0 Gb/s) or Gen3 (6.0 Gb/s))

* SDA II is required for QPHY-SATA. [†]ASDA software option required.

Recommended Additional Equipment

SAS Tracer/Trainer 3G 1 Port Analyzer/ Exerciser System (Includes CATC platform, SAS Tracer 3G 1 Port Module, SAS Trainer 3G Traffic Generator Module)	SS001APA-X
Sierra M6-2 SAS/SATA Platform	SAS-M006-002-X
2 GB Memory	

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
www.lecroy.com

Local sales offices are located throughout the world.
Visit our website to find the most convenient location.