

# PCI Express 5.0 Automated Physical-layer Testing

Signal Quality Analyzer-R MP1900A

## Outline

Previously, PCI Express devices were limited mainly to computing applications, but the rapid growth of data communications is starting to drive deployment of equipment with PCIe interfaces in data centers, such as transmission equipment, servers, storage, etc., to speed-up fast and large-capacity transfers. Base Specification 5.0 of the next PCIe Gen5 standard has been completed and increases data transfer speeds to 32 GT/s. As a result, development of equipment supporting this standard is urgently required.

With this release, Anritsu supports Gen5 Rx tests for IP and inspection of devices in the early standardization and development period with all-in-one Gen1 to Gen5 measurement support. Expansion of measurement functions to meet new emerging standards and trends will also help customers design inspection times.



## Features

### Shortening test times

- Automates complex receiver tests to reduce engineers' workloads

### Cuts equipment costs

- Supports customers' own real-time oscilloscopes from three main vendors
- Extensibility for PCI Express 1.0 to 5.0

### High performance BERT

- Jitter Addition (SJ, RJ, SSC), and Jitter Tolerance /Jitter Margin test
- Supports to generate Victim signal for Crosstalk

## Anritsu MP1900A

The Signal Quality Analyzer-R MP1900A is a Plug-in modular multi-channel bit error rate tester. It has a pulse pattern generator for outputting high-quality, wideband multi-channel NRZ signals at 2.4 Gbit/s to 32.1 Gbit/s, an error detector with high input sensitivity, Jitter modulation source and Noise Generator, and supports automatic measurement of jitter tolerance tests.

### 21G/32G bit/s SI PPG MU195020A

Bit Rate	2.4 Gbit/s to 32.1 Gbit/s (Opt-001)
Emphasis Taps	10 Tap (Opt-011)
Tr/Tf (20% to 80%)	12 ps (typ.)

### 21G/32G bit/s SI ED MU195040A

Bit Rate	2.4 Gbit/s to 32.1 Gbit/s (Opt-001)
Input Sensitivity	13 mV (Eye Height 21 Gbit/s) (typ.)
Clock Recovery	2.4 Gbit/s to 32.1 Gbit/s, SSC input (Opt-022)
CTLE	0 to -12 dB (Opt-011)

### Recommended Equipment List

Model	Name	Option
MP1900A	Signal Quality Analyzer-R	-
MU181000B	12.5GHz 4port Synthesizer	002
MU181500B	Jitter Modulation Source	-
MU195020A	21G/32G bit/s SI PPG	001,010,011,040 or 001,020,021,041 *1
MU195040A	21G/32G bit/s SI ED	001,010,011,022
MU195050A	Noise Generator	-

\*1: Support for crosstalk testing by 2ch PPG

### Recommended Software Options

Jitter Tolerance Test	MX183000A-PL001
PCIe Link Training Gen1-4	MX183000A-PL021

## Teledyne LeCroy Software

The QPHY software automates and controls the Teledyne LeCroy LabMaster 10ZI-A and Anritsu MP1900A BERT to implement compliance tests integrating PCI Express Tx tests (collection and analysis of transmitted waveforms for transmitter preset and signal quality tests, integrated Eye diagram and Jitter analysis tools) and Rx tests (Eye calibration, Link Training, LTSSM Analysis). Measurement reports can be created and saved as HTML or PDF files.

### Ordering Information

QPHY-PCIE-Tx-Rx *2	PCI Express Compliance Test Option
--------------------	------------------------------------

\*2: Supported Real-Time Oscilloscope LabMaster 10Zi-A series



700 Chestnut Ridge Road  
Chestnut Ridge, NY 10977-6499 USA  
+1 (800) 553-2769  
<https://teledynelecroy.com/>

## Granite River Labs Software

The GRL-PCIE4-RXA software supports data rates of 8 GT/s and 16 GT/s (PCI Express Gen3 and Gen4) and upgradable to 32GT/s (Gen5) for PCI Express Rx tests including automated Eye calibration for BASE and CEM. Measurement reports can be created and saved as PDF files.

### Ordering Information

GRL-PCIE4-BASE-RXA *3	PCIe 3.0/4.0 Base Specification Rx Test Software license
GRL-PCIE4-CEM-RXA *3	PCIe 3.0/4.0 CEM Specification Rx Test Software license
GRL-PCIE5-BASE-RXA *4*6	PCIe 5.0 Base Specification Rx Test Software license

\*3: Supported Real-Time Oscilloscope

Keysight: Infinium Q-series/Z-series/V-series(25GHz 以上)  
Tektronix: DPO70000SX and DX series(25GHz 以上)

\*4: Supported Real-Time Oscilloscope

Keysight: Infinium Q-series/Z-series/V-series(50GHz 以上)  
Tektronix: DPO70000SX and DX series(50GHz 以上)



Thomas Road, Suite A  
Santa Clara, CA 95054 USA  
+1 (408) 627-7608  
[www.graniteriverlabs.com](http://www.graniteriverlabs.com)

Refer to the release notes for details on verified oscilloscopes