

# M8047A

PCI Express® Re-driver





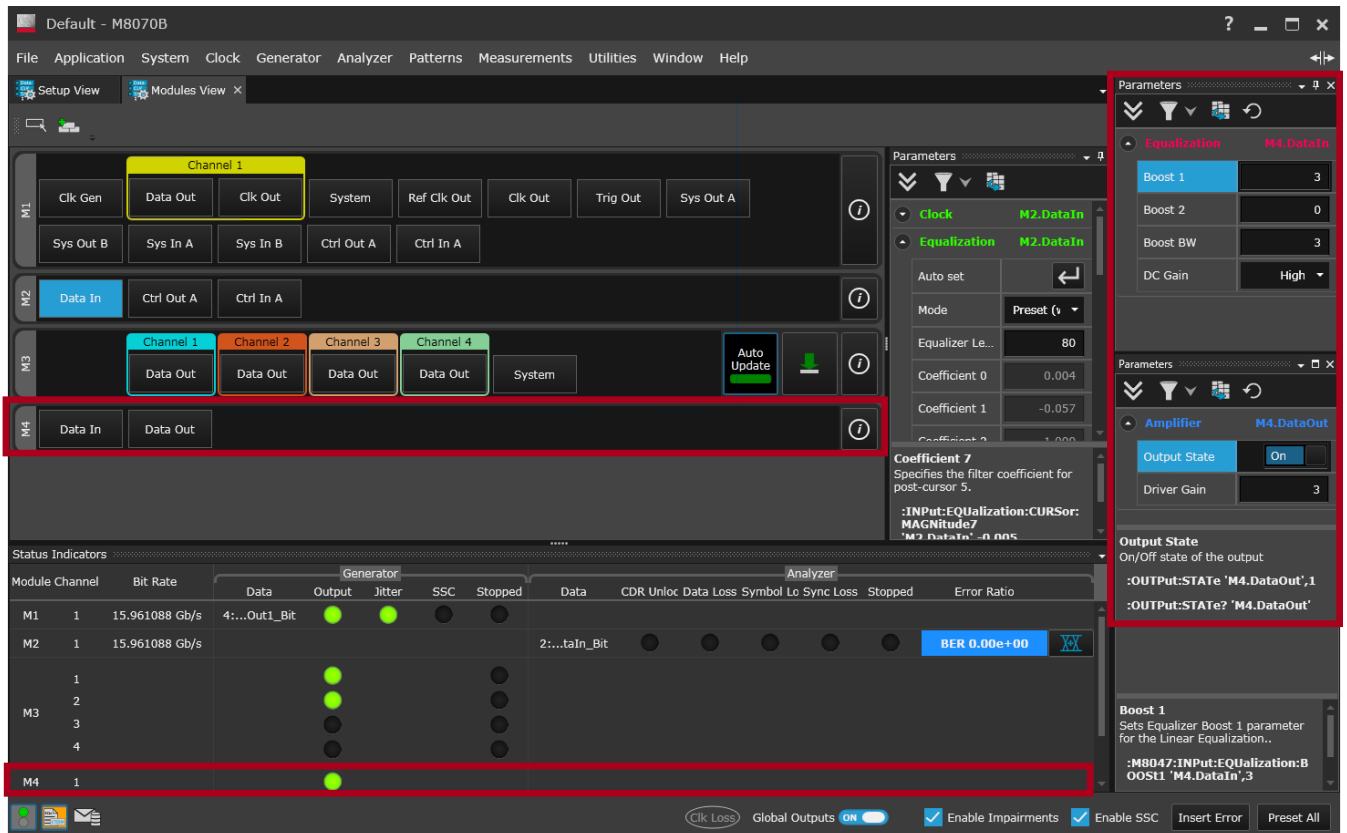


Figure 2: M8047A PCI Express Re-driver in combination with M8046A error detector built-in equalization enables error counting through the long backchannel of a PCI Express 4.0 16G server

## Features

- Extends back channel reach up to 17 dB
- Two-stage CTLE and linear output driver
- Integrated into M8070B software
- Controlled and powered through USB

## Specifications

### M8047A PCI Express Re-driver Parameters

Parameter	
Output	On / Off
Output driver gain settings	0 to 3
EQ Boost 1	0 to 7
EQ Boost 2	0 to 7
EQ Boost bandwidth	0 to 3
EQ DC gain	Low / High

### M8047A Example Settings for Backchannel Examples

Data Rate	Back Channel Loss <sup>1)</sup>	M8047A PCI Express Re-driver					M8041A EQ M8051A EQ	M8046A EQ
		Boost 1	Boost 2	Boost BW	DC Gain	Driver Gain		
8 Gb/s	15 dB	tbd	tbd	tbd	tbd	tbd	tbd	tbd
8 Gb/s	20 dB	tbd	tbd	tbd	tbd	tbd	tbd	tbd
10.3125 Gb/s	20 dB	tbd	tbd	tbd	tbd	tbd	tbd	tbd
10.3125 Gb/s	25 dB	tbd	tbd	tbd	tbd	tbd	tbd	tbd
12 Gb/s	15 dB	tbd	tbd	tbd	tbd	tbd	tbd	tbd
12 Gb/s	20 dB	tbd	tbd	tbd	tbd	tbd	tbd	tbd
16 Gb/s	20 dB	tbd	tbd	tbd	tbd	tbd	tbd	tbd
16 Gb/s	30 dB	tbd	tbd	tbd	tbd	tbd	tbd	tbd
20 Gb/s	20 dB	tbd	tbd	tbd	tbd	tbd	n/a	tbd
20 Gb/s	30 dB	tbd	tbd	tbd	tbd	tbd	n/a	tbd
22.5 Gb/s	20 dB	tbd	tbd	tbd	tbd	tbd	n/a	tbd
22.5 Gb/s	30 dB	tbd	tbd	tbd	tbd	tbd	n/a	tbd
25 Gb/s	20 dB	tbd	tbd	tbd	tbd	tbd	n/a	tbd
25 Gb/s	30 dB	tbd	tbd	tbd	tbd	tbd	n/a	tbd
28 Gb/s	20 dB	tbd	tbd	tbd	tbd	tbd	n/a	tbd
28 Gb/s	30 dB	tbd	tbd	tbd	tbd	tbd	n/a	tbd
32 Gb/s	tbd	tbd	tbd	tbd	tbd	tbd	n/a	tbd

<sup>1)</sup>Includes package losses of transmitter

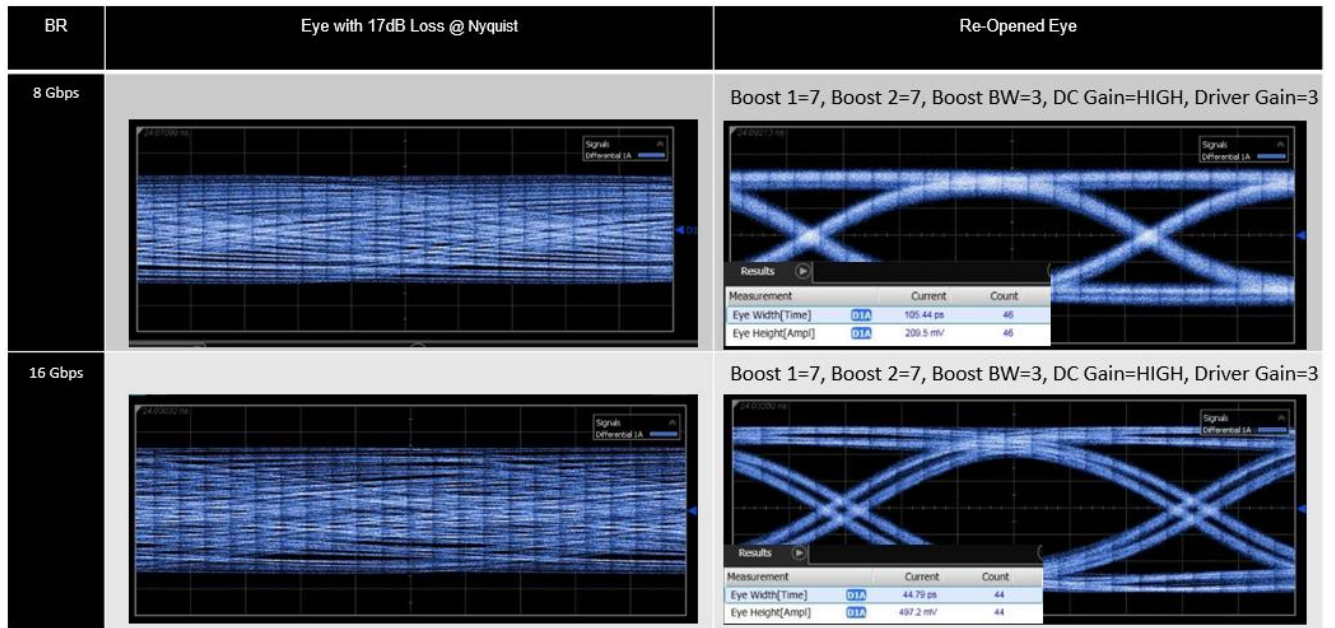


Figure 3: Eye opening of M8047A after 17 dB loss channel and transmit signals without any equalization – 8 Gb/s and 16 Gb/s

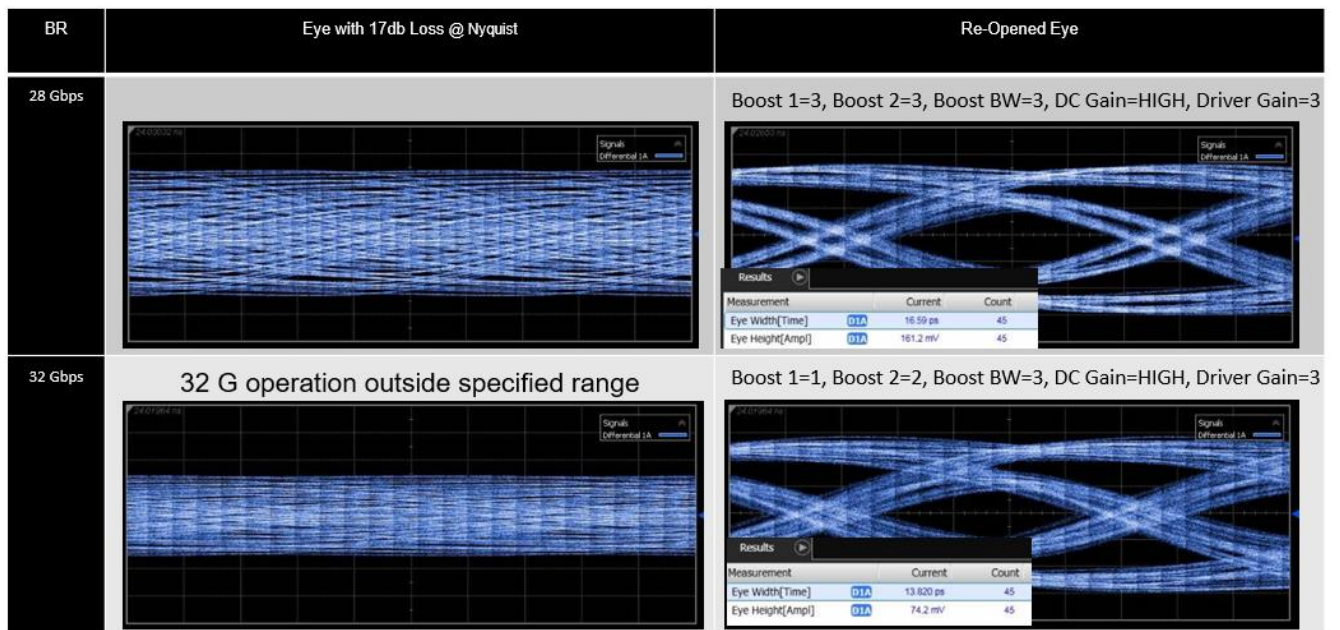


Figure 3: Eye opening of M8047A after 17 dB loss channel and transmit signals without any equalization – 28 Gb/s and 32 Gb/s

## Data Input and Data Output

Data Input	
Data rate	Up to 28 Gb/s <sup>1)</sup>
Data format	NRZ
Absolut maximum input voltage	Min. -0.5 V, max. 2.75 V
Differential input amplitude linear range <sup>2)</sup>	850 mV <sub>pp</sub> to 1250 mV <sub>pp</sub>
Integrated AC-coupling at Input	yes
Connector	Differential 2.4 mm (f)

<sup>1)</sup>Operation with higher data rates is possible but not guaranteed

<sup>2)</sup>Depends on the gain setting used

Data Output	
Minimum differential output amplitude	185 mV <sub>pp</sub> to 360 mV <sub>pp</sub>
Maximum differential output amplitude	705 mV <sub>pp</sub> to 1260 mV <sub>pp</sub>
Integrated AC-coupling at Output	Yes
Connector	Differential 2.4 mm (f)

## Status Indicators, General Characteristics, Physical Dimensions and Regulatory

Status Indicators	
Location of Status Indicator LEDs	On top of instrument
LED 1	Output enabled Solid green indicates outputs are enabled
LED 2	Instrument status Solid green indicates instrument is ready Blinking green is used to identify the instrument Solid red indicates an instrument error

General Characteristics and Physical Dimensions	
Operating Temperature	5 °C to 40 °C (41 °F to + 104 °F)
Storage Temperature	-40 °C to 70 °C (-40 °F to + 158 °F)
Operating Humidity	15% to 95% relative humidity at 40 °C (non-condensing)
Storage Humidity	4% to 90% relative humidity at 68 °C (non-condensing)
Power Requirements	Max. 2.5 W
Physical dimensions instrument (W x H x D)	110 mm x 80 mm x 170 mm
Weight Net	0.28 kg
Weight Shipping	0.85 kg
Connection to control PC	USB Type C

## Regulatory Standards

EMC	IEC 61326-1
Safety	IEC 61010-1
Quality Management	ISO 9001, 14001

## System Requirements

### Software

The M8047A PCI Express Re-driver is controlled through the M8070B software. It requires at least version 7.2. The M8070B software will allow control of a M8047A PCI Express Re-driver only if an AXIe module of the M8000 BERT Series or a M8195A, M8196A or M8194A AWG AXIe module is present.

### Remote Programming

The M8047A can be remote programmed the M8070B software like any other module which is controlled by the M8070B software.

## Related Products

The M8047A PCI Express Re-Driver complements the [M8040A 64 Gbaud High-performance BERT](#) as well as the [J-BERT M8020A High-Performance BERT](#).

The [M8100 series Arbitrary Waveform Generators](#) enable the set up of complex real-world signals.

Receiver test automation for PCI Express, CCIX and SAS is provided by the [N5991 Receiver Compliance Test Automation Platform for servers](#).

Automated transmitter compliance testing is available. [N5939G PCI Express Electrical Performance Validation and Compliance Software](#) covers PCI Express specification up to PCI Express 4.0. [D9050PCIC PCI Express 5.0 Transmitter Electrical Performance Validation and Compliance Software](#) covers PCI Express 5.0 specifications. The [N5412E Serial Attached SCSI – 4 \(SAS-4\) Transmitter Test Application](#) covers SAS transmitter testing for 1.5G, 3G, 6G, 12G and 22.5G.

The [N1085A PAM4 Measurements Application for Ethernet and OIF-CEI](#) for the sampling oscilloscopes and the [N6473A OIF-CEI 4.0 Compliance Application for Infinium real-time oscilloscopes](#) offer automated transmitter testing for CEI-56G-VSR host or module, CEI-56G-MR and CEI-56G-LR outputs. Automated electrical receiver testing for 400G and 100G is offered by [M809256PA](#), [M8091BSPA](#) and [M809228XA](#).

The [N4917BSCA Optical Receiver Stress Test Application](#) addresses test needs for optical input test of transceiver modules for 400GBASE-LR8/-FR8 as well as 200GBASE-LR4/-FR4/-DR4

For more information, please visit: [www.keysight.com/find/M8047A](http://www.keysight.com/find/M8047A)

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