

Agilent N5980A 3.125 Gb/s Serial BERT

PRELIMINARY

Data Sheet

Version 0.9



Key Benefits

- Standard measurement rates between 155 Mb/s and 3.125 Gb/s
- Electrical and optical (SFP) interfaces
- PRBS, K28.5 pattern or clock generation and integrated clock data recovery
- Smallest BERT available today
- Easy-to-use and cost efficient
- Controlled from user software running on an external Windows XP PC connected by a USB 2.0 interface
- BERT can be fully programmed using remote software

The Agilent N5980A 3.125 Gb/s Serial BERT is ideal for manual or automated manufacturing test of electrical and optical devices running at speeds between 155 Mb/s to 3.125 Gb/s. It addresses all common standard speeds via selectable bit rates.

Easy-to-use and cost efficient

The software user interface has one standard or one advanced screen to ensure intuitive use for all classes of operators. It makes the instrument easy to use and easy to learn.

Twice the measurement throughput

By using both the electrical and optical (SFP) interfaces concurrently, you can double your measurement throughput (electrical in/optical out and vice versa).

Automation made easy

The remote programmability of the user interface, using the SCPI-1997 programming language, makes it simple to integrate the N5980A into other programs.

PRBS, K28.5 pattern or clock generation and integrated clock data recovery

The N5980A can generate standard PRBS polynomials, K28.5 ('Comma') characters and different sub-rate clocks ($/2$ to $/20$). It can also inject errors with an adjustable error ratio. The receiver has standard-compliant clock-data-recovery (CDR) built-in and differential inputs (SMA) for signals from 50 mV_{pp} to 2 V_{pp} amplitude.

Standard (SFP) optical module plug-in

The instrument has a standard SFP-female connector. This enables all different kind of user-selectable optical modules (e.g for multi-mode/single-mode fiber at 850 nm, 1310 nm and 1550 nm for the test set-up).

Small size

Its very small size allows the N5980A to fit on any bench and in any automated setup (WxHxD is 231 mm x 41 mm x 211 mm).



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System Specifications

Data rate

The same data rate applies for pattern generator electrical out and optical out, and for error detector electrical in and optical in.

Data rates

| | |
|-----------------------------|--------------|
| OC-3 | 155.52 Mb/s |
| OC-12 | 622.08 Mb/s |
| OC-48 | 2.48832 Gb/s |
| OC-48 with FEC | 2.66606 Gb/s |
| 1 x FC | 1.0625 Gb/s |
| 2 x FC | 2.125 Gb/s |
| 1 x Gigabit Ethernet | 1.25 Gb/s |
| XAUI | 3.125 Gb/s |
| Accuracy | ± 50 ppm |

Operating system

The software supplied runs on Windows XP with .NET v1.1, over a USB 2.0 interface.

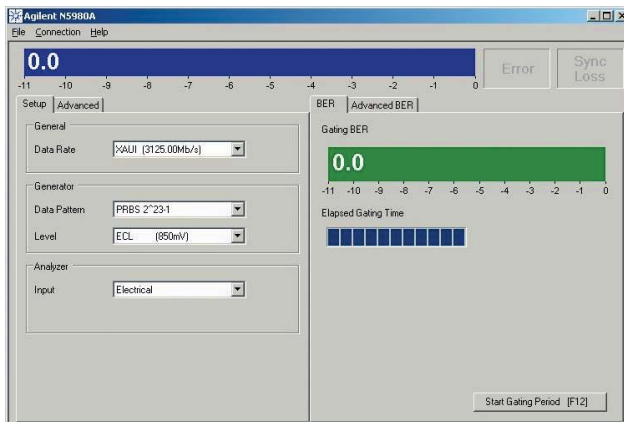


Figure 2: User interface: normal mode

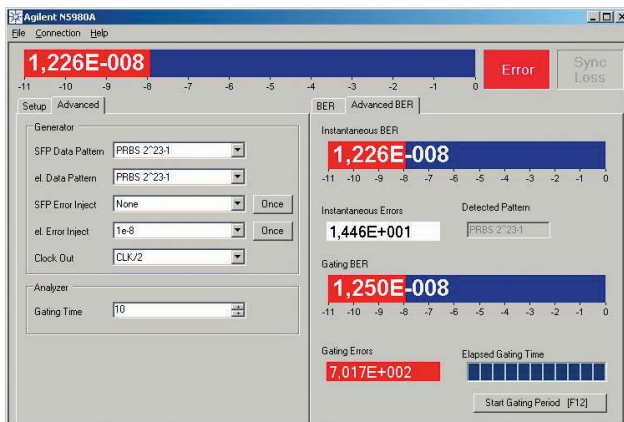


Figure 3: User interface: expert mode

Pattern Generator

Pattern

The following patterns are supported:

PRBS: 2^7-1 , $2^{15}-1$, $2^{23}-1$, $2^{31}-1$.

Data pattern: K28.5.

Clock pattern: data rate: 2:4:8:10:16:20.

The pattern can be **individually** adjusted for pattern generator electrical out and optical out.

Error injection

Adjustable error rates:

$10E-3$; $10E-4$; $10E-5$; $10E-6$; $10E-7$; $10E-8$; $10E-9$.

Single error injection. Separate error rates can be adjusted for pattern generator electrical out and optical out.

Pattern generator electrical out

A differential electrical output is provided on the front-panel.

Out/Out

| | |
|-----------------------|---|
| Output type | differential, AC-coupled, external 100 Ω differential termination |
| Amplitude, selectable | |
| ECL: | 850 mV _{pp} typ., single-ended 1700 mV _{pp} typ., differential |
| LVDS: | 400 mV _{pp} typ., single-ended 800 mV _{pp} typ., differential |
| Jitter peak-peak | 0.05 UI typ. @ OC-12 0.08 UI typ. @ GbE 0.15 UI typ. @ OC-48 |
| Connector | SMA, front panel |

Pattern generator optical out

A standard SFP housing is provided. Minimum number of insertion/deinsertion cycles: 200.

Trigger output

A single-ended, electrical output is provided on the front-panel.

Trigger out

| | |
|------------------------|---------------------------------|
| Output type | single-ended |
| Impedance | 50 Ω nominal, AC-coupled |
| Amplitude | 850 mV typ. |
| Clock rate, selectable | |
| data rate | 2:4:8:10:16:20 |
| Connector | SMA, front Panel |

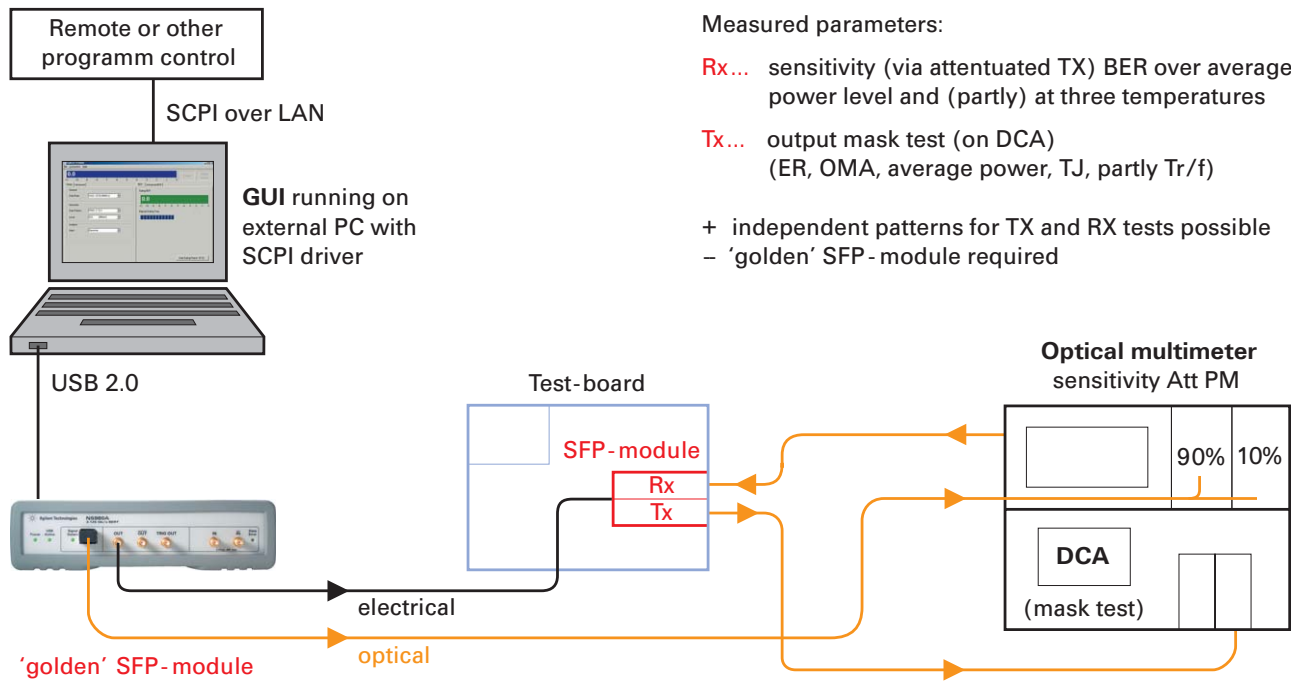
Error detector

A differential electrical input is provided on the front-panel. Data rate is the same as pattern generator.

Pattern

The following patterns are supported:

PRBS: 2^7-1 , $2^{15}-1$, $2^{23}-1$, $2^{31}-1$.



Measured parameters:

Rx... sensitivity (via attenuated TX) BER over average power level and (partly) at three temperatures

Tx... output mask test (on DCA) (ER, OMA, average power, TJ, partly Tr/f)

- + independent patterns for TX and RX tests possible
- 'golden' SFP-module required

Figure 4: Typical manufacturing tests of SFP-modules

In/In

| | |
|----------------------|--|
| Input type | differential, AC-coupled |
| Max. input amplitude | 1 V _{pp} , single-ended 2 V _{pp} , differential |
| Impedance | 100Ω nominal |
| Sensitivity | < 50 mV |
| Clocking mode | internal CDR |
| Synchronization | Automatically on level, polarity, phase, bit and pattern |
| Connector | SMA, front panel |

General

General

| | |
|------------------------|---|
| Power supply | 100 to 240 V, 50-60 Hz 100 to 127 V, 50-400 Hz |
| Power consumption | 25 VA peak (7 watts) |
| Operating temp. | 0°C to 55°C |
| Operating altitude | up to 3000 m |
| Storage temp. | -30°C to 70°C |
| Interface | USB 2.0 standard |
| Language | SCPI-1997 |
| Dimensions (W x H x D) | |
| Bench top | 228 x 59 x 237 mm |
| Rack mount | 1/2" 19" width, 1U height |
| Weight | 1.6 kg |
| Safety designed to | EN61010-1, CSA1010.1, UL-311-1 |
| EMC tested to | EN55011, IEC-1326-1 |
| Vibration and shock | MIL-T-28800E, Type III, Class 5 |
| Warm-up time | 10 min |
| Warranty | 3 years standard |

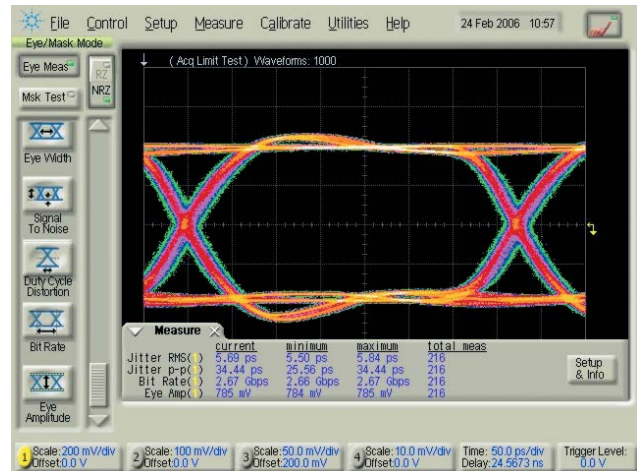


Figure 5: Typical eye diagram at 2.66 Gb/s

Ordering Information

Agilent N5980A

Serial 3.125 Gb/s BERT with standard 3-years return-to-Agilent warranty.

Accessories Included

CD which includes:

- Quick reference guide
 - Programming reference
 - Connectivity software
- Local power cord.

Optional accessories

Opt. XXX Rack mount kit.
Option number available May 2006

Related Literature

Publication Number

www.agilent.com

| | |
|--|---------------|
| J-BERT N4903A High-Performance Serial BERT Brochure | 5989-3882EN |
| J-BERT N4903A High-Performance Serial BERT Data Sheet | 5989-2899EN |
| N4906B Serial BERT 12.5 Gb/s Data Sheet | 5989-2406EN |
| Physical Layer Test Brochure | 5988-9514EN |
| ParBERT 81250 Product Overview | 5968-9188E |
| Infiniium DCA-J Wide-Bandwidth Oscilloscope Data Sheet | 5989-0278EN |
| Infiniium 8000 Series Data Sheet | 5989-1487ENUS |
| Fast Total Jitter Test Solution Application Note | 5989-3151EN |

www.agilent.com/find/manufacturing_BERT

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