

KEYSIGHT TECHNOLOGIES (AGILENT HP)

N4903B

The Keysight (formerly Agilent) N4903B J-BERT is a high-performance serial bit error ratio tester (BERT) and jitter tolerance analyzer. Designed for validating next-generation gigabit serial interfaces, it provides an integrated platform for characterizing receiver performance. The N4903B features comprehensive jitter injection capabilities (including RJ, PJ, SJ, BUJ, and tunable ISI), built-in clock data recovery (CDR), and automated jitter tolerance testing for data rates up to 14.2 Gb/s. It is widely relied upon for compliance testing across industry standards such as PCIe, USB, SATA, and DisplayPort.

SPECIFICATIONS

General

Interfaces	GPIO (IEEE 488.2), LAN (10/100/1000Base-T), USB 2.0
Display	Integrated color touchscreen LCD

Physical

Power Supply	100 - 240 VAC, 50/60 Hz
Operating Temperature	5 to 40 °C

General System Specifications

Operating Data Rate Range	150 Mb/s to 7.0 Gb/s, 12.5 Gb/s, or 14.2 Gb/s (option dependent)
Number of Channels	1 (Differential Data Output, Differential Data Input)
Supported Data Formats	NRZ
PRBS Pattern Lengths	2 ⁷ -1, 2 ¹⁰ -1, 2 ¹¹ -1, 2 ¹⁵ -1, 2 ²³ -1, 2 ³¹ -1
Instrument Architecture	Integrated
Operating System	Windows

Pattern Generator (Data Output)

Output Impedance	50 Ω
Error Injection Modes	Single, Fixed Rate

Error Detector (Data Input)

Input Sensitivity	< 50 mVpp (typical)
Input Impedance	50 Ω
Clock Data Recovery (CDR)	Built-in, with tunable loop bandwidth (option dependent)
Auto-Alignment Capabilities	Automated voltage and phase alignment

Jitter and Interference Injection

Jitter Injection Sources	SJ, RJ, PJ, BUJ, DCD, ISI (configuration/option dependent)
Sinusoidal Jitter (SJ) Frequency Range	Up to 1 GHz
Inter-Symbol Interference (ISI) Injection	Built-in, tunable (via Option J20)
Spread Spectrum Clocking (SSC)	Supported

Measurement and Analysis Results

Automated Jitter Tolerance Testing	Supported (compliant with major serial bus standards)
Error Measurement Results	BER, Errored Seconds, Error-Free Seconds, Sync Loss Count
Bathtub Curve Analysis	Supported
Eye Contour Analysis	Supported
Fast Total Jitter (TJ) Measurement	Supported

Connectivity and Interfaces

Trigger Output	Supported
Pattern Sync Output	Supported

Configuration Options

Data Rate Configurations	150 Mb/s to 7 Gb/s (Option C07), 12.5 Gb/s (Option C13), or 14.2 Gb/s (Option C14)
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Jitter Injection

Periodic Jitter (PJ) Injection	Two independent PJ sources (with Option J20)
Bounded Uncorrelated Jitter (BUJ) Injection	Yes, PRBS generated (with Option J20)

Interference Injection

Sinusoidal Interference (SI)	Common-mode and differential-mode injection (with Option J20)
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Environmental

Storage Temperature Range	-40 °C to +70 °C
Operating Humidity	15% to 95% at +40 °C (non-condensing)

Performance

Available Data Rate Options	7 Gb/s (Option C07), 12.5 Gb/s (Option C13), 14.2 Gb/s (Option C14)
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Inputs & Outputs

Data Input/Output Configuration	Differential or single-ended
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Signal Conditioning

Pre-emphasis / De-emphasis	Supported via external N4916B De-emphasis Signal Converter
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Applications & Compliance

Target Serial Standards (J-Tol)	PCIe, USB, SATA/SAS, DisplayPort, Fibre Channel, QPI, CEI, 10GbE
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TECHNOLOGY

Bit Error Ratio Tester (BERT)

APPLICATIONS

Receiver Characterization, Jitter Tolerance Testing, Serial Data Compliance (PCIe, USB, SATA)

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