

**Aumictech**

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Data Sheet

August 14, 2026

AGILENT / KEYSIGHT

Agilent/Keysight E5503B

Agilent Keysight E5503B Phase Noise Measurement Solution 50 kHz to 18 GHz The Agilent E5503B is an E5500 B-series benchtop phase-noise solution covering 50 kHz to 18.0 GHz. OEM E5500 A/B-series data sheets list 0.01 Hz to 100 MHz offset on B models, typical system noise minus 180 dBc/Hz above 10 kHz, and plus or minus 2 dB accuracy below 1 MHz offset. E5505A later replaced E5503A/B among other E5500 systems. Absolute and residual SSB phase noise, AM noise, and spurious on VCOs, DROs, synthesizers, amplifiers, and converters through 18 GHz. Instrument Type: Phase noise measurement system Carrier Frequency Range: 50 kHz to 18.0 GHz Offset Frequency Range B Series: 0.01 Hz to 100 MHz A Series Sibling Offset: 0.01 Hz to 4 MHz on E5500 A models Downconverter Input Range: 1 GHz to 18 GHz (E5503B path)



MODEL

**Agilent / Keysight
E5503B**

CALIBRATION

**Available on
request**

CONDITION

Used

STATUS

In stock

RFQ / SKU

E5503B

LISTING

<https://aumictechlabs.com/products/e5503b-2/>

NIST-traceable cal

SAM registered

30-day returns

NAICS 423690 · 811210 · 541380

This unit

The Agilent/Keysight E5503B is a phase noise measurement system designed to characterize frequency sources including VCOs, DROs, crystal oscillators, and synthesizers across a wide frequency range. The instrument delivers sensitivity for one-port phase noise measurements and enables direct AM noise characterization. It operates as both a benchtop R&D tool and integrates into automated test equipment environments, reducing measurement time while maintaining

excellent repeatability and measurement integrity. Technical Specifications Frequency Range: 50 kHz to 18 GHz Offset Range: 0.01 Hz to 100 MHz (standard) Measurement Types: Phase noise (one-port), direct AM noise System Configuration: 70001A Mainframe, 70420A Opt. 001 Test Set, 70422A Downconverter Key Features measurement sensitivity across the full frequency range Direct AM noise measurement capability alongside phase noise analysis Wide offset range enabling both close-in and far-from-carrier characterization Real-time monitoring mode for live observation of phase noise and discrete spurs during device tuning Multiple output formats: single-sideband phase noise power plots, integrated noise power, and calculated Allan variance Typical Applications VCO characterization and optimization Crystal oscillator and DRO evaluation Frequency synthesizer phase noise assessment R&D benchtop phase noise testing Automated production testing of frequency sources Compatibility & Integration The E5503B operates with E5500 series phase noise measurement software running on a Pentium PC with 32 MB RAM, 1 GB hard drive, and Windows NT 4.0. Automated carrier measurement and real-time phase noise monitoring enable efficient device characterization. The system supports a defined upgrade path from Agilent 3048 systems.

E5503B Characteristics / Specifications

PARAMETER	VALUE
Instrument Type	Phase noise measurement system
Series Family	Agilent E5500 B-series
Carrier Frequency Range	50 kHz to 18.0 GHz
Offset Frequency RangeBSeries	0.01 Hz to 100 MHzASeries Sibling Offset: 0.01 Hz to 4 MHz on E5500 A models
Downconverter Input Range	1 GHz to 18 GHz (E5503B path)
Replacement System	E5505A (Keysight equivalent-system table)
Legacy Test Set	70420A replaced by N5500A
Legacy 18 Ghz Downconverter	70422A replaced by N5502A
Offset Frequency Range Standard	0.01 Hz to 2 MHz (PC digitizer; without swept analyzer)
Offset Frequency Range With Analyzer	0.01 Hz to 100 MHz with optional signal/spectrum analyzer
System Noise Response	minus 180 dBc/Hz typically (greater than 10 kHz offsets)
System Spurious Response	less than minus 120 dBc typically
Phase DetectorRInput	0 to plus 23 dBm (carrier less than 1.6 GHz)
Phase DetectorLInput	plus 15 to plus 23 dBm (carrier less than 1.6 GHz)
Measurement Accuracy Close	plus or minus 2 dB (offsets less than 1.0 MHz)
Measurement Accuracy Far	plus or minus 4 dB (offsets less than 100 MHz)
External Noise Input Port	0.01 Hz to 100 MHz
Baseband Test Set	N5500A included in all E5500 systems (replaces 70420A)
Low Frequency Carrier Range N5500A	50 kHz to 1.6 GHz
High Frequency Inputs N5500A	1.2 GHz to 26.5 GHz (Options 001/201)
Am Noise Carrier Range	50 kHz to 26.5 GHz (N5500A-001)
Tuning Voltage Output	plus or minus 10 V open circuit, 20 mA max, 50 ohm typical
N5500A Noise Floor Rf Detector 10 Khz	minus 170 dBc/Hz (50 kHz to 1.6 GHz detector, offsets greater than 10 kHz)
N5500A Noise Floor Mw Detector 32 Khz	minus 160 dBc/Hz (1.2 to 26.5 GHz detector, offsets greater than 32 kHz)

PARAMETER	VALUE
Operating Temperature N5500A	0 C to plus 55 C
Warm Up Time N5500A	20 minutes
Measurement Software	E5500 phase-noise software on Windows PC with GPIB
Operating temperature	N5500A: 0 C to plus 55 C

General Specifications & Supplementary Characteristics

PARAMETER	VALUE
Operating temperature	N5500A: 0 C to plus 55 C
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Warm Up Time N5500A	20 minutes
Measurement Software	E5500 phase-noise software on Windows PC with GPIB Notes Carrier 50 kHz-18 GHz and B-series 0.01 Hz-100 MHz offset from Agilent E5500 A/B-series data sheet (E5503A/B row). System noise, detector powers, and plus or minus 2/4 dB accuracy from Keysight E5500 Series Phase Noise Measurement Solutions 5989-0851 and the E5504B/E5500 family operating-characteristics table. Sensitivity is dominated by the installed reference source and downconverter.

Full OEM specifications

Complete technical content extracted from the manufacturer datasheet. Sparse OEM tables are reconstructed as tables below; other text is preserved as paragraphs.

Specifications	
Technical Specifications	
PARAMETER	VALUE
Instrument Type	Phase noise measurement system
Series Family	Agilent E5500 B-series
Carrier Frequency Range	50 kHz to 18.0 GHz
Offset Frequency Range B Series	0.01 Hz to 100 MHz
A Series Sibling Offset	0.01 Hz to 4 MHz on E5500 A models
Downconverter Input Range	1 GHz to 18 GHz (E5503B path)
Replacement System	E5505A (Keysight equivalent-system table)
Legacy Test Set	70420A replaced by N5500A
Legacy 18 Ghz Downconverter	70422A replaced by N5502A
Offset Frequency Range Standard	0.01 Hz to 2 MHz (PC digitizer; without swept analyzer)
Offset Frequency Range With Analyzer	0.01 Hz to 100 MHz with optional signal/spectrum analyzer
System Noise Response	minus 180 dBc/Hz typically (greater than 10 kHz offsets)
System Spurious Response	less than minus 120 dBc typically
Phase Detector R Input	0 to plus 23 dBm (carrier less than 1.6 GHz)
Phase Detector L Input	plus 15 to plus 23 dBm (carrier less than 1.6 GHz)
Measurement Accuracy Close	plus or minus 2 dB (offsets less than 1.0 MHz)
Measurement Accuracy Far	plus or minus 4 dB (offsets less than 100 MHz)
External Noise Input Port	0.01 Hz to 100 MHz
Baseband Test Set	N5500A included in all E5500 systems (replaces 70420A)
Low Frequency Carrier Range N5500A	50 kHz to 1.6 GHz
High Frequency Inputs N5500A	1.2 GHz to 26.5 GHz (Options 001/201)
Am Noise Carrier Range	50 kHz to 26.5 GHz (N5500A-001)
Tuning Voltage Output	plus or minus 10 V open circuit, 20 mA max, 50 ohm typical
N5500A Noise Floor Rf Detector 10 Khz	minus 170 dBc/Hz (50 kHz to 1.6 GHz detector, offsets greater than 10 kHz)
N5500A Noise Floor Mw Detector 32 Khz	minus 160 dBc/Hz (1.2 to 26.5 GHz detector, offsets greater than 32 kHz)

PARAMETER	VALUE
Operating Temperature N5500A	0 C to plus 55 C
Warm Up Time N5500A	20 minutes

Specifications

PARAMETER	VALUE
Instrument Type	Phase noise measurement system
Series Family	Agilent E5500 B-series
Carrier Frequency Range	50 kHz to 18.0 GHz
Offset Frequency RangeBSeries	0.01 Hz to 100 MHzASeries Sibling Offset: 0.01 Hz to 4 MHz on E5500 A models
Downconverter Input Range	1 GHz to 18 GHz (E5503B path)
Replacement System	E5505A (Keysight equivalent-system table)
Legacy Test Set	70420A replaced by N5500A
Legacy 18 Ghz Downconverter	70422A replaced by N5502A
Offset Frequency Range Standard	0.01 Hz to 2 MHz (PC digitizer; without swept analyzer)
Offset Frequency Range With Analyzer	0.01 Hz to 100 MHz with optional signal/spectrum analyzer
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N5500A Noise Floor Rf Detector 10 Khz	minus 170 dBc/Hz (50 kHz to 1.6 GHz detector, offsets greater than 10 kHz)
N5500A Noise Floor Mw Detector 32 Khz	minus 160 dBc/Hz (1.2 to 26.5 GHz detector, offsets greater than 32 kHz)
Operating Temperature N5500A	0 C to plus 55 C
Warm Up Time N5500A	20 minutes

Optional Millimeter Extension: 110 GHz with 11970-series harmonic mixers
Measurement Software: E5500 phase-noise software on Windows PC with GPIB

Notes

Carrier 50 kHz-18 GHz and B-series 0.01 Hz-100 MHz offset from Agilent E5500 A/B-series data sheet (E5503A/B row). System noise, detector powers, and plus or minus 2/4 dB accuracy from Keysight E5500 Series Phase Noise Measurement Solutions 5989-0851 and the E5504B/E5500 family operating-characteristics table. Sensitivity is dominated by the installed reference source and downconverter.

Available from Aumictech

Used and refurbished unit evaluated in-house. Calibration: Available on request. Used · In stock.

Request a quote: sales@aumictech.com · +1 (484) 841-9341

Aumictech

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NIST-traceable calibration · SAM registered ·
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Technical content from manufacturer specifications. Unit photo/stock from Aumictech listing when available. Specifications subject to OEM documentation and unit condition.