Agilent N9320B RF Spectrum Analyzer

Technical Overview

Spectrum analysis from 9 kHz-3 GHz

- Measurement speed:
  minimum non-zero span sweep time: 10 ms
- RBW: 10 Hz to 1 MHz in 1-3-10 steps
- DANL: -148 dBm with preamp

Robust measurement features for characterizing your product easily

- Built-in power measurements:
  channel power, OBW, ACP, SEM and TOI
- Built-in power meter function with Agilent U2000 series power sensor support
- Optional tracking generator and preamplifier
- Remote control PC software

All the essentials of an Agilent spectrum analyzer with a price/performance that's easy to afford

Agilent Technologies

Agilent N9320B spectrum analyzer
– Built to perform, priced for you to compete

Regardless of whether your application is electronics' manufacture, bench repair, R&D projects, or RF related education, you need a spectrum analyzer that is equipped with the essential functionality and required performance at an affordable price. The N9320B is designed to be the right answer for you.

Power measurement and automated test programming features

- The accuracy of frequency selective power measurements when characterizing your products is very important. With a newly featured digital IF, the N9320B enables dramatic improvements in power measurement accuracy.
- Power meter functionality is also built-in with Agilent U2000 series power sensor support for highly accurate RF and MW power measurements.
- The built-in 1-button power measurement suite offers channel power, ACP, OBW, SEM and TOI measurements.
- For automated test programming, the N9320B provides industy standard SCPI language support and flexible connectivity choices with USB, LAN and GPIB. Plus, SCPI code compatibility with Agilent ESA-L series for easy instrument replacement.

Engineered for the best spectrum visibility

In your R&D, QA or university research lab, you want to know as much measurement detail as possible about your products and designs . The N9320B offers the best-in-class spectrum visibility. The 10 Hz minimum RBW distinguishes closely spaced signals easily, the -148 dBm DANL reveals low level signals clearly, and combined with the 4 trace display and 12 markers allows you to easily identify and compare signal details.

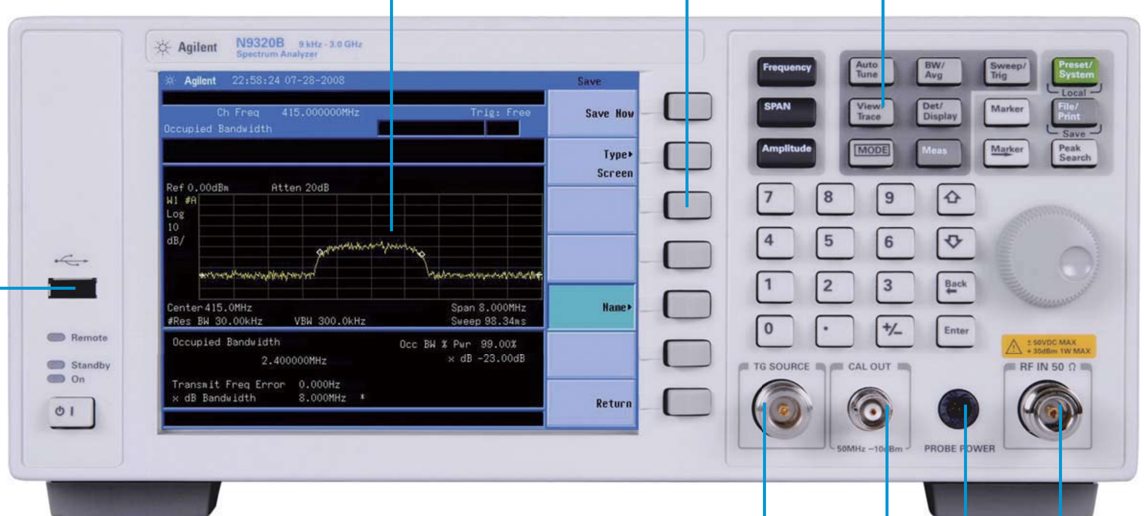
Integrated solution for the modern RF teaching lab

One of the best ways to improve students' learning efficiency for RF related curriculums is to combine lectures with hands-on labs. The N9320B is an excellent price-performance fit for educational purposes. Whether you wish to combine the N9320B analyzer with the Agilent N9310A RF signal generator for basic RF concept labs, or enhance your RF circuit labs with the N9320B and its optional RF training kit (option code: N9320B-TR1), you will find adopting Agilent's RF education solution efficient and effective.

6.5-inch high resolution screen provides vivid spectral view from any angle

logically arranged function keys and soft keys provides intuitive access for each operational step

USB interface offers convenient data storage via USB flash disk



Tracking generator output enables frequency response measurement

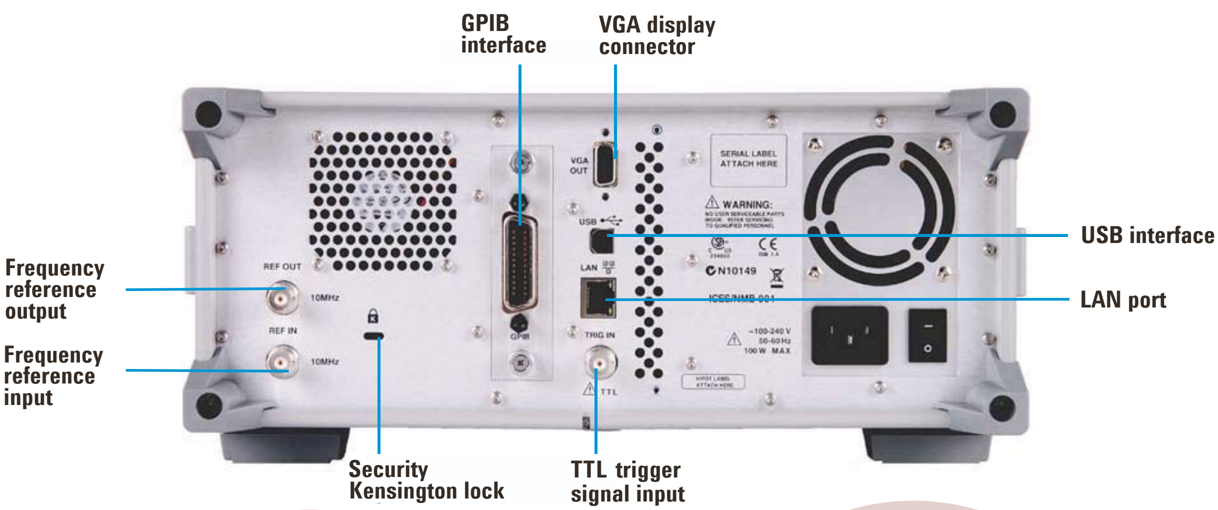
Cal Out (50 MHz, -10 dBm)

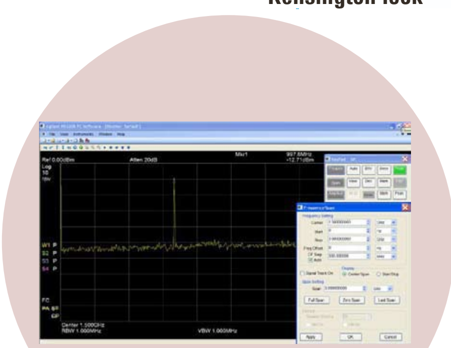
Probe power for high-impedance RF probes

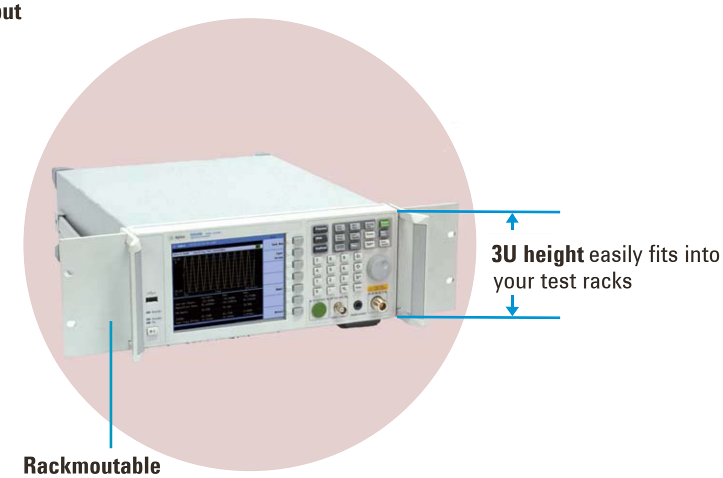
RF input (N type, female)

What's new on N9320B?

New Features	Overview	Option number
AM/FM demodulation metrics	Offers modulation data ,including carrier power, modulation rate, AM depth or FM deviation, SINAD and carrier frequency offset	N9320B-AMA
ASK/FSK demodulation metrics	Provides four display modes: symbol, waveform, ASK/FSK error and eye diagram	N9320B-DMA
EMI filter	Provides 200 Hz, 9 kHz, 120 kHz and 1 MHz RBW bandwidth (6 dB down)	N9320B-EMF
Power meter function	When connection with an Agilent U2000 series USB power senser, the N9320B can be used as a power meter for high accuracy power measurements	Standard feature
SCPI command compatibility for Agilent ESA-L series	Able to distinguish and interpret Agilent ESA-L SCPI commands, reducing programming effort for ESA-L replacement with N9320B	Standard feature
LAN interface	Provides LAN connection for auto test or remote control	Standard feature
GPIB interface	Privides GPIB connection for automated test	N9320B-G01
RF training kit	Special for educational purposes. The RF training kit consists of a transceiver trainer, control panel software and lab sheets	N9320B-TR1
Remote control PC software	Controls the spectrum scans and transfers data between N9320B and a PC via USB/LAN/GPIB	Standard feature




Remote control PC software



Electronics manufacturing

When you need faster and more cost effective RF analysis tools for testing today's consumer electronics products and components - look no further!

Regardless of whether you are manufacturing a wireless mouse, keyboards, GPS devices, or RF components such as mixers, filters or amplifiers, you need to measure their RF characteristics to insure they work properly within their design parameters like frequency bandwidth and output power range.
Too little RF power may decrease the wireless operating distance, while too much power can drain batteries quickly, reducing operation time and cause excessive heat in the device.

In today's competitive world, you need to verify your product's RF performance fast and accurately as well as lower your cost of ownership. The affordable N9320B is designed to help achieve all these goals. So, why not take a closer look at the N9320B spectrum analyzer?

Boost productivity by decreasing test time

The throughput rate of a test station is generally one of the key factors limiting the productivity of a manufacturing line. You almost always want to test your products in the shortest possible time. The sweep time of a spectrum analyzer is often the most important performance specification contributing to your RF analysis test time. The N9320B analyzer provides you with 10 ms non-zero span sweep time, the fastest in its class.

Testing and validating your products with confidence

The N9320B equipped with a new digital IF section tests your product with improved frequency and amplitude accuracy and stability. It provides essential information for your products' performance and characteristics with increased confidence.

We have optimized the N9320B to meet your needs in performance and cost

- 10 ms minimum, non-zero span sweep time
- ±1.5 dB overall amplitude accuracy, typical ±0.5 dB
- 10 Hz minimum resolution bandwidth
- Sensitivity is -148 dBm DANL with preamplifier
- Multiple language user interface improves ease-of-use and reduces training time by utilizing your local language

Accelerate time to market while simultaneously reducing costs.

Best-in-class performance ensures your test station is operating quickly without compromising quality

Simplify common measurement tasks

When you find yourself having repeatedly to make the same type of complex measurement or measurement sequence, it is useful to know that some shortcuts are available. That's what we have provided for you in the N9320B spectrum analyzer.

The N9320B spectrum analyzer continues the Agilent tradition that test equipment should be easy to set up and simple to use. Those familiar with other Agilent spectrum analyzers will find a similar user interface in the N9320B, allowing for a shorter learning curve and easier operation.

One button auto-tuning allows you to quickly find and accurately analyze the highest level signal anywhere in the analyzer's frequency range. Centering this signal on the screen, the analyzer simultaneously optimizes the frequency span, resolution and video bandwidths, auto-scales the amplitude, sets a marker on the signal peak and displays the measurement results.

Power measurements made easy using the one-button measurement suite

You will find that the one-button power measurement suite shortens routine test set up time by simplifying the keypad/menu selection.

Selecting these one-button routines directly from the softkey menu also helps ensure accuracy and repeatability of the test set up and measurement no matter who presses the button.

One of the most fundamental measurements performed by spectrum analyzers is the frequency domain measurement of RF power. However, detailed analysis of a signal often requires standards-defined spectral masks or more complex power/bandwidth/detector measurement combinations.

Channel power

Precise, rapid integrated channel power with computed power spectral density utilizing the RMS average detector.

Occupied bandwidth

Selecting the percentage of the signal's power to be measured places markers at the upper and lower frequencies of the waveform representing the bandwidth utilized by that percentage of power.

Adjacent channel power (ACP)

Fast, accurate simultaneous filtered RMS power measurement of a carrier relative to its leakage in up to six offset bands or channels.

Spectrum emission mask (SEM)

The spectrum emission mask (SEM) is a set of complex limit lines forming a mask for out-of-channel emissions measurement. The SEM is defined relatively to in-channel power. You can set the parameters of the main channel, out of channel frequency bands and the limit lines. Included is Pass/Fail testing for the overall spectrum emission mask and each individual out-of- channel frequency range.

Of course, you retain the flexibility to tailor each measurement task to your specific needs when necessary. And you'll find it easy to distinguish between signals having large level differences since the N9320B has one of the widest dynamic ranges for an analyzer in its price range.

High accuracy power measurements

The N9320B now supports high accuracy, USB plug-and-play power measurements as standard when connected to an Agilent U2000 series USB power sensor. Make true average power measurements for all signal types with wide dynamic range up to 18 GHz with just the push of a button. The Agilent U2000 series USB power sensors require no external power supplies and with internal zeroing eliminate the need for external calibration. Without the need for additional boxes, the user can easily set up, calibrate and control the power sensor via the analyzer's USB port. Two display modes are available: either the meter or the chart mode to log power measurements over time.

The combination of spectrum analyzer and power meter

Bench repair

— An effective, professional bench repair tool

Most bench repair tasks demand fast, cost effective test solutions. Being small and lightweight, the N9320B spectrum analyzer is as functional and indispensable in low-cost bench repair applications as it is for field troubleshooting.

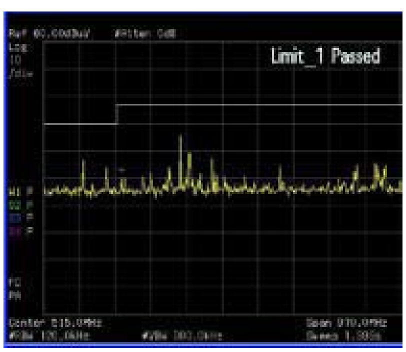
Detecting low signal levels while simultaneously resolving closely spaced frequencies is a fundamental requirement for RF testing. Employing one of the best combinations of sensitivity and narrow resolution bandwidths (RBW) ensures that an N9320B spectrum analyzer will readily handle these tasks.

EMI filters now available (Option EMF) New

One of the critical steps for product development in order to sell electronic products on the commercial market, is they must pass EMC (Electro Magnetic Compatibility) requirements. Waiting until the end of the development cycle to find out whether or not a product passes regulatory agency requirements can be an expensive gamble. Failing to pass can result in costly redesign, delays while waiting for additional EMC compliance testing and results and a postponement to your product introduction.

Therefore, it is important to perform EMI (Electro Magnetic Interference) pre-compliance tests to find potential EMC problems during the product development phase, where they can be more easily corrected, and prior to sending your product to a regulatory agency or EMC test facility for final verification. Pre-compliance measurements are intended to give you an approximation of the EMI performance of your products. This can provide you with higher confidence in passing regulatory agency requirements.

Now, the N9320B provides you with optional CISPR EMI filters (-6 dB), covering resolution bandwidths 200 Hz, 9 kHz, 120 kHz and 1 MHz for enhancing pre-compliance measurements. Installing option EMF enables EMI pre-compliance measurements in CISPR-specified bandwidths and these tests can be made using the N9320B's positive peak detector in a simple and fast way.

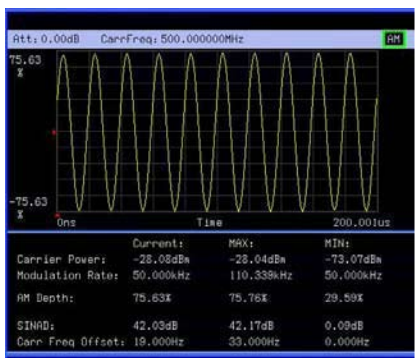


N9320B offers limit line for pass/fail

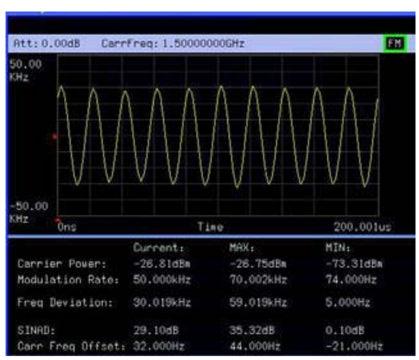
AM/FM demodulation analysis (Option AMA) New

When you are making modulation depth or frequency deviation measurements for AM or FM devices, the N9320B with its optional AM/FM modulation analysis shows the metrics you need, including carrier power, modulation rate, AM depth/FM deviation, SINAD and carrier frequency offset. User definable limits provide Pass/Fail indicators for carrier power, AM modulation index or FM deviation, and carrier frequency offset. The user can save the waveforms with metrics for reporting as well as the set-up parameters for future measurements or analysis.

Besides the AM/FM demodulation analysis (option AMA), the N9320B provides AM/FM tune and listen in spectrum analysis mode as a standard function.



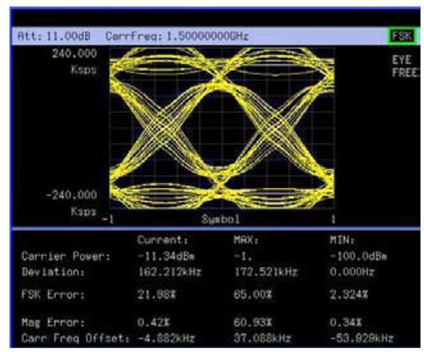
The detailed metrics provides you with the complete understanding of the AM signal



The detailed metrics provides you with the complete understanding of the FM signal

ASK/FSK demodulation analysis (Option DMA) New

Optional ASK/FSK modulation analysis is now available. Amplitude Shift Keying (ASK) is used in RFID and optical systems. Frequency Shift Keying (FSK) is used in many applications including cordless phone, paging systems and RFID. N9320B w/option DMA supports four display modes: Symbol, Waveform, ASK/FSK Error, and Eye Diagram. Included is Pass/Fail testing for carrier power, ASK modulation depth/FSK frequency deviation. The metrics you need are shown, including carrier power, ASK/FSK error, ASK depth/FSK frequency deviation, and ASK index etc. For reports and future measurements the waveform with metrics and setup parameters can be saved.



The Eye diagram of FSK shows the metrics with detailed measurement results

R&D

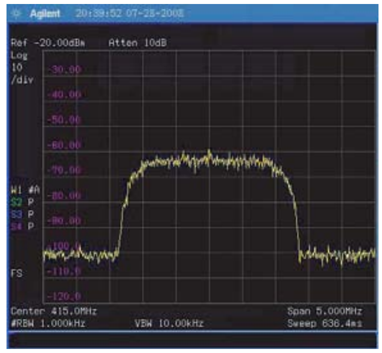
When it comes to receiving the best return from your R&D equipment budget, turn to Agilent's new generation of low-cost analyzers and sources.

Limited on your R&D budget?

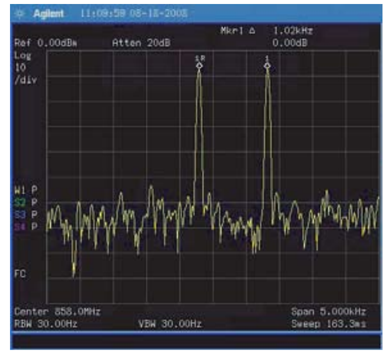
You'll find an N9320B spectrum analyzer equally versatile for budget sensitive R&D applications. It is also suitable for RF design verification or when initiating a low cost project for product enhancements and extensions.

Wherever you deploy your engineering resources, they will find operating an N9320B spectrum analyzer easy to use.

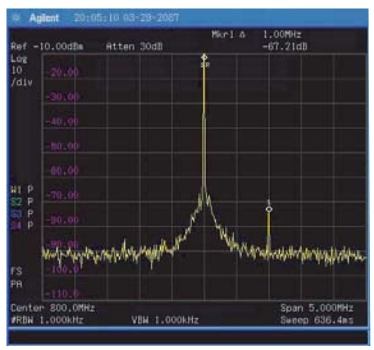
The low displayed average noise floor and narrow resolution bandwidths provide optimum spectral visibility and resolution of small signals.



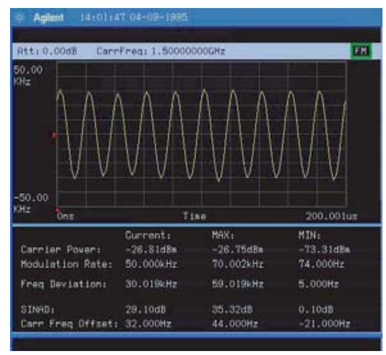
Scale indictor for quick vertical axis readout



Narrow RBW clearly distinguishes two close-in signals



Easy to distinguish low level signal



AM/FM demodulation metrics accurately reports the signal

Additional features that make spectrum analysis easier.

- Four traces and up to 12 markers allow optimum flexibility for complex troubleshooting in multi-signal environments
- Marker table lists the frequency and amplitude matrix from all active markers, including delta markers
- Frequency counter offers more accurate frequency readout
- USB flash memory stick support provides quick save or recall of measurement data

Education

Whether you are mentoring your graduate students for completion of an important research project, or leading under-graduates in hands-on experiments in your campus electronics lab, using Agilent test equipment in your educational institution guarantees you are upholding the highest standards for the future of tomorrow's engineers.

Learning how to use test instrumentation, and understanding how RF signals interact are fundamental to the study of electronics. Spectrum analysis is essential to RF circuit design. It sheds an intuitive light on signal interactions and mixing processes for students.

The combination of the affordable price and performance in the N9320B spectrum analyzer, part of the low-cost test equipment series from Agilent Technologies, means that you do not need to limit students access to professional RF equipment in the classroom.

Now you have the opportunity to put Agilent's renowned quality and precision into every student's hands. Help your students and trainees gain the edge. There is no longer a need to compromise on the performance of their test equipment.

Educators hold Agilent test equipment in the highest esteem. Therefore, you can be confident of upholding high standards in the classroom and insure your students will have confidence in their experimental results. In addition, they will be able to focus more time on RF circuit experimentation and signal analysis exercises, because Agilent spectrum analyzer operation is straightforward.

You'll find the N9320B has sufficient performance for many basic research projects, where you need an inexpensive, fast, high-quality, general-purpose RF signal analyzer.

Teacher's special: Display projection

When you are ready to show frequency domain phenomena to your students or even the instrument operation, you may want to display the instrument screen in a larger format for all the students in the lab or classroom to observe. The N9320B supports VGA output and can display the instrument's screen on a larger monitor or video projector simultaneously.

Affordable, fast support

Buying test equipment from Agilent's new low-cost series puts you in touch with top-line service and support should you need it. So, you can be confident that you are making the right choice for the right price.

Typical RF teaching lab solution

- **N9320B RF spectrum analyzer**
- **N9310A RF signal generator**
- **N9320B-TR1: RF training kit**

N9320B-TR1

RF education solution from Agilent

One of the best ways to improve your students' learning efficiency for RF related curriculums is to combine teaching with hands-on labs. We also suspect you may want to save precious instructor time by leveraging an RF teaching lab that's already well designed and yet inexpensive. The N9320B spectrum analyzer and its educational kit (Ordering code: N9320B-TR1), together with Agilent's basic signal generator N9310A offer a new and systematic RF teaching environment for you and your students. You can design or deploy almost any RF circuit experiment for your students, from transmitters and receivers to key individual RF components, such as mixers, amplifier and filters.

The RF training kit consists of two boards. One acts as a TX circuit, another one acts as a RX circuit. The major RF components on each board can be separately used as standalone components. We designed the flexibility into the kit and you'll find using Agilent's RF education solution convenient, time saving and cost effective.
When you talk about the concept of frequency domain, carrier frequency and its harmonics or frequency selective power measurements, you can use the N9320B spectrum analyzer and N9310A RF signal generator as the basic configuration in your RF/microwave lab.
When you need to communicate the features of a typical RF circuit, such as the TX and RX paths, and how they deliver signals, simply use the RF training kit and its courseware to design an effective hands-on lab for your students.
When your students need to take a closer look at those RF components, such as mixer, filters and amplifiers, the RF training kit allows you to separately utilize its individual components

Specifications

Specifications apply under the following conditions:
- *After a warm-up time of 30 minutes,*
- *At an ambient temperature specified in the data sheet, and within a valid calibration period.*
- *Data designated as "typical" or "nominal" are not covered by product warranty.*

Frequency

		Supplemental information
Frequency		
Range:	9 kHz to 3 GHz	AC coupled
	100 kHz to 3 GHz	Preamp on
Resolution:	1 Hz	
Internal 10 MHz frequency reference		
Aging rate:	±1 ppm / year	
Temperature stability:	±1 ppm	0 °C to +50 °C; reference 25 °C
Supply voltage stability:	± 0.3 ppm	± 5 %
Frequency readout accuracy (start, stop, center, marker)		
Marker resolution:	(frequency span)/(number of sweep points – 1)	
Uncertainty:	± (frequency indication x frequency reference uncertainty*+1% x span + 20% x resolution bandwidth + marker resolution)	
Sweep points:	461, fixed	
Marker frequency counter		
Resolution:	1 Hz, 10 Hz, 100 Hz, 1 kHz	Selectable
Accuracy:	±{(marker frequency) (frequency reference uncertainty*) + (counter resolution)}	RBW/span ≥ 0.02; Marker level to displayed noise level>30 dB(RBW≥1 kHz) Marker level to displayed noise level>40 dB (RBW<1 kHz)
	**Frequency reference uncertainty = (aging rate)(period since adjustment) + (Supply voltage stability) + (temperature stability).*	
Frequency span		
Range:	0 Hz (zero span), 100 Hz to 3 GHz.	
Resolution:	1 Hz	
Accuracy:	±span/(sweep points– 1)	
Phase noise		
Offset from CW signal:		f_c = 1 GHz; RBW=1 kHz, VBW=10 Hz and sample detctor
10 kHz:	< –88 dBc/Hz	
	< –90 dBc/Hz	*Typical*
100 kHz:	< –100 dBc/Hz	
	< –102 dBc/Hz	*Typical*
1 MHz:	< –110 dBc/Hz	
	< –112 dBc/Hz	*Typical*
Residual FM	≤ 100 Hz peak to peak in 100 ms	1 kHz RBW, 1 kHz VBW

Resolution bandwidth (RBW)	10 Hz to 1 MHz in 1-3-10 sequence	–3 dB bandwidth
Accuracy:	±5 %	Nominal
Resolution filter shape factor:	< 5:1	Nominal
Video bandwidth (VBW)	1 Hz to 1 MHz in 1-3-10 sequence	–3 dB bandwidth

Amplitude

Measurement range	10 MHz - 3 GHz: Displayed average noise level (DANL) to +30 dBm 1 MHz - 10 MHz: DANL up to 23 dBm 100 kHz - 1 MHz: DANL up to 20 dBm	
Input attenuator range	0 to 70 dB, in 1 dB steps	
Maximum damage level		
Average continuous power:	≥ +40 dBm	Input attenuator setting ≥ 10 dB
Peak pulse power:	≥ +50 dBm (100 W)	For <10 µsec pulse width, <1 % duty cycle, and input attenuation≥ 40 dB)
DC voltage:	50 VDC maximum *Input protection switch opens at >33 dBm with ≥ 10 dB input attenuation*	
1 dB gain compression		
Total power at input mixer:	> 0 dBm	*Typical*; f_c ≥ 50 MHz; preamp off
Total power at the preamp:	> –20 dBm	*Typical*; f_c ≥ 50 MHz; preamp on

Mixer power level (dBm) = input power (dBm) - input attenuation (dB).
Total power at the preamp (dBm) = total power at the input (dBm) - input attenuation (dB).

Displayed average noise level		
Preamp off:		
9 kHz to 100 kHz	< –90 dBm	Nominal
100 kHz to 1 MHz	< –90 dBm – 3 x (f /100kHz) dB	
1 MHz to 10 MHz	< –124 dBm	
10 MHz to 3 GHz	< –130 dBm + 3 x (f /1 GHz) dB	

0 dB RF attenuation; RBW 10 Hz; VBW 1 Hz, sample detector; reference level –60 dBm.

Preamp on:		
100 kHz to 1 MHz	< –108 dBm – 3 x (f /100kHz) dB	
1 MHz to 10 MHz	< –142 dBm	
10 MHz to 3 GHz	< –148 dBm + 3 x (f /1 GHz) dB	

0 dB RF attenuation; RBW 10 Hz; VBW 1 Hz, sample detector; reference level –70 dBm.

Level display range		
Log scale units:	dBm, dBmV, dBµV, dBµA	
Linear scale and units:	µV, mV, V, µA, mA, A, µW, mW, W	
Marker level readout:	0.01 dB	Log scale
resolution:	0.01 % of reference level	Linear scale
Number of traces:	4	
Detectors:	Positive-peak, negative-peak, sample, normal, RMS	
Trace functions:	Clear/write; maximum hold; average; minimum hold; view	

Frequency response

200 kHz to 2.0 GHz:	± 0.5 dB	10 dB attenuation, reference: 50 MHz,
2.0 GHz to 3.0 GHz:	± 0.7 dB	20 to 30 °C.
Preamp off		
1 MHz to 2.0 GHz:	± 0.6 dB	10 dB attenuation, reference: 50 MHz,
2.0 GHz to 3.0 GHz:	± 0.8 dB	20 to 30°C.
Preamp on		

Input attenuation switching uncertainty at 50 MHz

Attenuator setting:	0 to 70 dB in 1 dB steps	
0 to 60 dB attenuation:	±0.4 dB	Reference 10 dB

Absolute amplitude accuracy

Preamp off:	± 0.3 dB	Reference level –10 dBm; input attenuation 10 dB
Preamp on:	± 0.4 dB	Reference level –30 dBm; input attenuation 10 dB

Center frequency 50 MHz; RBW1 kHz; VBW 1 kHz; amplitude scale log; span 100 kHz; sweep time coupled, peak detector, signal at reference level.

Level measurement uncertainty

Overall amplitude accuracy:	± 1.5 dB	20 to 30 °C; frequency > 1 MHz; signal input 0 to –50 dBm; reference level 0 to –50 dBm; input attenuation 20 dB; RBW 1 kHz; VBW 1 kHz; after calibration; preamplifier off
	± 0.5 dB	Typical

Spurious response

Second harmonic distortion: (second harmonic intercept)	+30 dBm +35 dBm +43 dBm	10 MHz < f_c < 200 MHz 200 MHz ≤ f_c < 500 MHz 500 MHz ≤ f_c < 3 GHz Preamplifier off; signal input –30 dBm; 0 dB RF attenuation
Third-order intermodulation: (third order intercept)	+10 dBm	+13 dBm nominal; 300 MHz to 3 GHz preamplifier off; signal input –30 dBm; 0 dB RF attenuation
Input related spurious:	< –60 dBc	–30 dBm signal at input mixer; 20 to 30 °C
Residual response: (inherent)	< –83 dBm	Input terminated and 0 dB RF attenuation, preamplifier off

Sweep

Sweep time

Range:	10 ms to 1000 s	Span > 0 Hz
	6 μs to 200 s	Span = 0 Hz (minimum resolution = 6 μs)
Sweep mode:	Continuous; single	
Trigger source:	Free run; video; external	
Trigger slope:	Positive or negative edge; selectable	

Front panel input/output

RF Input

Connector and impedance:	N-type female; 50 ohm	
VSWR:	<1.5 : 1	300 kHz to 3.0 GHz, input attenuator: ≥10 dB

Calibration output

Amplitude:	–10 dBm ± 0.3 dB
Frequency:	50 MHz
Accuracy:	Same as frequency reference
Connector and impedance:	BNC-type female; 50 ohm

Probe power

Voltage/current:	+15 V, 150 mA max
	–12.6 V, 150 mA max

USB host

Connector and protocol:	A plug; Version 1.1

Rear panel input/output connections

10 MHz reference output

Output amplitude:	>0 dBm
Connector and Output Impedance:	BNC-type female; 50 ohm

10 MHz reference input

Input amplitude:	–5 dBm to +10 dBm
Frequency lock range:	±5 ppm of specified external reference input frequency
Connector and input impedance:	BNC-type female; 50 ohm

USB device

Connector and protocol:	B plug; version 1.1

LAN TCP/IP interface	10 Base, RJ-45 connector	

GPIB interface	IEEE-488 bus connector	Option G01 installed

External trigger input

Input amplitude:	5 V TTL level	
Connector and Input impedance:	BNC female; 10 k ohm	

VGA output:	VGA analog RGB	31.5 kHz horizontal, 60 Hz vertical sync rates; non-interlaced
Connector:	D-sub 15-pin female	VGA compatible
Screen resolution:	640 x 480	

General

Internal data storage:	16 MB nominal	
Power supply:	100-240 VAC; 50 to 60 Hz	Auto-ranging
Power consumption:	< 65 W	
Warm-up time:	30 minute	
Temperature range:	+5 °C to + 45 °C	Operating
	–20 °C to + 70 °C	Storage
Weight:	8.4 kg (18 lb)	Net approximately; without options
Dimensions:	132.5 x 320 x 400 mm 5.2 x 12.6 x 15.7 in	Approximately; without handle

Options

RF preamplifier

Frequency range:	1 MHz to 3 GHz	
Peak pulse power:	18 dB	*Nominal*

Tracking generator source output

Warm-up:	45 minutes	
Output frequency range:	100 kHz to 3.0 GHz	9 kHz settable
Output power level Range:	–30 dBm to 0 dBm in 0.1 dB steps	
Absolute accuracy:	± 0.75 dB	20 to 30 °C, at 50 MHz with coupled source attenuator, referenced to –20 dBm
Output flatness:		Referenced to 50 MHz, –20 dBm
100 kHz to 10 MHz	± 3 dB	
10 MHz to 3 GHz	± 2 dB	
Connector and impedance:	N-type female; 50 ohm	
VSWR:	< 1.5 : 1	300 kHz to 3.0 GHz, input attenuator: ≥12 dB

Demodulation

Frequency range:	10 MHz to 3 GHz	
Carrier power accuracy:	±2 dB	
	±1 dB	*Typical*
Input power:	–30 to + 20 dBm	Auto attentuation
Carrier power displayed resolution:	0.01 dBm	

AM measurement

Modulation rate:	20 Hz to 100 kHz	
Accuracy:	1 Hz, nominal	Modulation rate < 1 kHz
	<0.1% modulation rate, nominal	Modulation rate ≥ 1 kHz
Depth:	5 to 95%	
Accuracy:	±4%	*Nominal*

FM measurement

Modulation rate:	20 Hz to 200 kHz	Modulation rate < 1 kHz
Accuracy:	1 Hz, nominal	
	<0.1% modulation rate, nominal	Modulation rate ≥ 1 kHz
Deviation:	20 Hz to 400 kHz	20 to 30 °C.
Accuracy:	±4%	*Nominal*

ASK measurement

Symbol rate range:	200 Hz to 100 kHz	
Modulation depth/index		
Range:	10% to 90%	
Accuracy:	±4% of reading nominal	
Displayed resolution:	0.1%	

FSK measurement

Symbol rate range:	1 kHz to 100 kHz	
FSK deviation		
Range:	1 kHz to 400 kHz	
Accuracy:	±4% of reading nominal	ß ≥1 and ß ≤4, ß is the ratio of frequency deviation to symbol rate
Displayed resolution:	0.01 Hz	

EMI Filter

Resolution bandwidth:	200 Hz, 9 kHz, 120 kHz, 1 MHz	–6 dB
Accuracy:	±10%	*Nominal*
Resolution filter shape factor:	< 5:1	*Nominal;* 60 dB / 6 dB bandwidth ratio

Ordering information

Model number	Description
N9320B	Spectrum analyzer 9 kHz to 3.0 GHz Accessories supplied as standard with each analyzer: · Quick Start Guide · Documentation CD-ROM · USB cable (A-B) · N-BNC adapter · BNC cable · Power cord
Manuals and CD	
N9320B-AB2	Chinese User's Guide
N9320B-ABA	English User's Guide
Options	
N9320B-PA3	3 GHz preamplifier
N9320B-TG3	3 GHz tracking generator
N9320B-AMA	AM/FM demodulation metrics
N9320B-TR1	RF training kit
N9320B-1HB	Handle and bumpers
N9320B-1CM	Rack-mount kit
N9320B-1TC	Hard transit case
N9320B-UK6	Commerical calibration certificate with testing data
N9320B-G01	GPIB interface
N9320B-EMF	EMI filter
N9320B-DMA	ASK/FSK demolulation metrics
Warranty and service	Standard warranty is one year.
R-51B-001-3C	1-year return-to-Agilent warranty extended to 3 years
Calibration	
R-50C-011-3	Agilent calibration upfront support plan, 3-year coverage

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Product specifications and descriptions in this document subject to change without notice.

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