Agilent N9310A
RF Signal Generator

Technical Overview

All the capability and reliability of an Agilent instrument you need—at a price you've always wanted

N9310A RF Signal Generator

Agilent Technologies

Low-cost manufacturing

Needing to build today`s consumer electronics devices better , faster?

An increasing number of today`s consumer electronics devices incorporate sophisticated RF technologies. You`ll be trying hard to ensure the quality of their product design and production while simultaneously reducing costs and time to market.

This implies performing just sufficient performance checks to get the product finished and launched into the production as quickly as possible.

If you`re wondering how to reduce manufacturing test overheads without compromising quality, your answer is here.

You`ll even find an N9310A RF signal generator fits your budget for those mini R&D projects or when your need initiate a low-cost project for product enhancements and extensions.

Dual language options enhance usability anywhere

As manufacturing moves around the world, so will your engineers and technicians. Therefore, meeting the challenge of operating in a multi-lingual environment is essential.

Now, that`s easy with the N9310A RF signal generator.

It already provides built-in dual-language (English and Chinese) on-screen instructions, parameters and softkeys shortly, other languages will follow.

So, regardless of where you deploy your engineering and hardware resources, everyone will find operating an N9310A signal generator straightforward.

Agilent`s new low-cost, compact signal generator, the N9310A, finds application in low-cost R&D projects as well as high-volume electronics manufacturing.

When you want to make effortless automated tests, or use the generator remotely, simply connect your PC to the signal generatoruse through the built-in USB interfaces.

Low-cost ATE – for true, low-cost volume manufacturing

There`s often a need to integrate a number of signal generators into automated test systems. You`ll find this surprisingly affordable with N9310A RF signal generators. It is easy and inexpensive to add a number of these signal generators to your existing ATE systems.

Alternatively, you may simply want to operate your signal generator remotely. USB ports on back panels make interconnection easy.

Optional rack mount kit enables simple stacking with other test equipment in standard test racks. The rackmounted signal generator is full width and a compact, standard 3U height.

Multi-language display and instruction help ensure easy operation of your signal generator, no matter who`s using it.

Agilent`s new low-cost, compact signal generator provides a money-saving solution in high-volume manufacturing applications.

Now you know the signal generator to choose when you are ramping up your volume manufacturing. Moreover, you can be confident that the price and performance will please your management team, too.

Installation & maintenance

Handy, practical and easy to use in the field

Make the N9310A signal generator – one of Agilent new Value Plus range of testers – part of your solution to simple, economic professional test.

When you are out on the road or testing in the field, you will find the optional carrying case provides appropriate protection for your N9310A signal generator.

Signal generators are one of the essential basic test tools used during general purpose RF product development test.

Large, color display helps easy, remote set up and operation

To help check set up of output values and parameters when operating at a distance from the generator, users will welcome the large, color screen.

A clear, bright color screen with associated,easy-to-read soft keys helps users quickly set up signal output parameters.

When you are competing for the world market, you`ll want to win by supplying the best products, and at prices lower than those of your competitors.

You will want the world know you have the best. And part of that`best´ is using the best test equipment – equipment that the rest of the world has come to rely upon.

For years, Agilent test equipment has helped many top companies achieve these goals. Now, with the exceptionally low price of the N9310A signal generator, you can afford to own the test equipment you always wanted.

An effective, professional field installation and maintenance tool

It's not just in consumer electronics that demand is shifting toward lower-cost and just-enough performance of the test instruments. Many installation and maintenance tasks have the same demand.

Being small and lightweight, an N9310A signal generator is as convenient for field troubleshooting use as it is for bench-top use, where space is often at a premium.

The N9310A can become portable with handle and bumper. It makes it an ideal choice for installation and maintenance.

Performing general purpose installation and maintenance, or service and repair, but don`t want more test functionality than necessary – Agilent`s N9310A RF signal generator is your answer.

R&D

Performing essential R&D — yet to an ever tighter budget?

Just because your customers are forcing you to work to tighter margins, doesn`t mean they want you to compromise on quality.

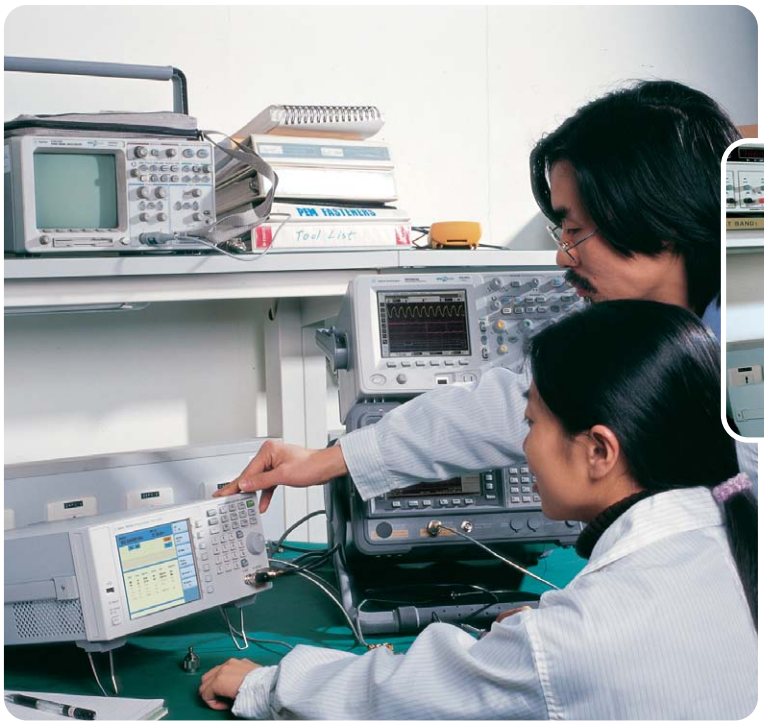
Even the simplest or most basic of today`s electronics products with RF content demand adequate and proper design verification.

Nevertheless, you know that it`s not every day that each of your development engineers needs the full functionality of a high-performance signal generator.

That`s the time to give them an Agilent N9310A RF signal generator.

They`ll be properly equipped to make all those essential tests and you can rely on Agilent`s experience, expertise, customer support and service, while continuing to grow your business.

If you`ve been wondering how to get the best out of your limited R&D budget, then it`s time to experience the new generation of Agilent`s test equipment.



Helps you move ahead of your competition

Education

Educating tomorrow`s technicians and engineers — but restricted on your capital spend?

Help your students and trainees gain the edge. Now you don`t need to compromise on the quality of their test equipment. Nor do you need to limit them to one piece of equipment to a class.

This signal generator, part of the low-cost series from Agilent Technologies allows you to put Agilent`s renowned quality and precision into every student`s hands.

Educators hold Agilent testers in the highest esteem. Therefore, you can be confident and proud of your standards in the classroom, and your students will have confidence in their experimental results.

Your students will be able to focus on RF circuit experimentation and exercises, because signal generator operation is straightforward. Yet you`ll find it has sufficient performance for many basic research projects, too, where you need a good, general-purpose local oscillator/signal source.

Affordable test instrumentation for every student

No compromise on Agilent support

Using Agilent test equipment in your educational establishment guarantees you are upholding the highest standards for the future, for tomorrow`s engineers.

Affordable, fast support

When you are relying on Agilent test equipment for your manufacturing process, installation procedures, or maintenance programs, you need to know that you can rely on superior customer support in case of problems.

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

Take a closer look — see what value with usability really means

One of Agilent Technologies new test instruments in the compact, low-cost series

Now that we`ve convinced you an Agilent N9310A RF signal generator has everything you need - check out availability- and buy with confidence.

You`ll find its performance and our delivery is as sharp as our price.

Specifications

Specifications apply under the following conditions:

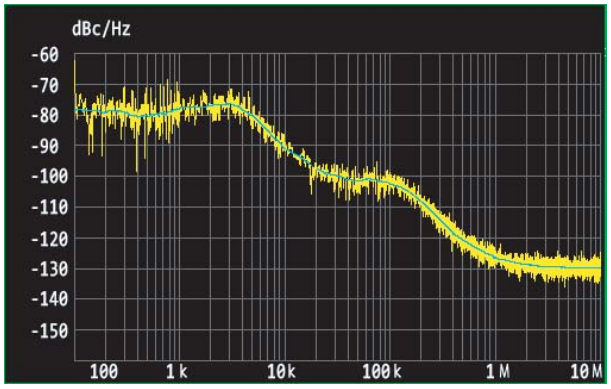
- After a warm-up time of 45 minutes
- At an ambient temperature specified in the data sheet, and within a valid calibration period
- Data designed as “typical” or “nominal” are not covered by product warranty

		Supplemental Information
Frequency		
Range:	9 kHz to 3.0 GHz	
Resolution:	0.1 Hz	
Switching speed:	< 10 ms	within 0.1 ppm of final frequency
Internal Reference Oscillator		
Stability:	< ±1ppm/year	Aging
	< ±1ppm	Temperature over 0 to 45 °C
Timebase Reference Output		
Frequency:	10 MHz	
Amplitude:	> 0.35 Vrms level into 50 Ω	
Connector:	BNC female	
External Reference Input		
Range:	2 MHz, 5 MHz, 10 MHz	
Amplitude:	0.5 ~ 2 Vrms	
Connector and impedance:	50 Ω ; BNC female	
Output		
Power:	–127 to +13 dBm	+20 dBm settable
Resolution:	0.1 dB	
Accuracy:	< ±1dB	Fc ≥ 100 kHz, -120 ≤ Level ≤ +13dBm, 20 to 30 °C
Switching speed:	< 10 ms	< 0.3 dB deviation
VSWR (typical) :	< 1.6	1.5 MHz ≤ Fc< 2.5 GHz
	< 1.8	2.5 GHz ≤ Fc ≤ 3 GHz
Output connector and impedance:	N-type; 50 Ω nominal	
Reversal Power Protection		
DC voltage:	30 V	
RF power:	+36 dBm	1 minute; the warning for reversed power protection is nominally at +25 dBm

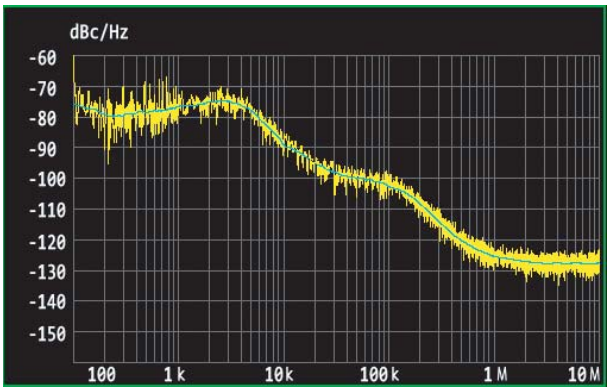
Spectral Purity

SSB Phase Noise:	< –95 dBc/Hz	Typical, Fc = 1 GHz; at 20 kHz offset
Residual FM:	< 30 Hz rms; < 90 Hz peak < 20 Hz rms	CW mode, Fc = 1 GHz; BW = 0.3 to 3 KHz ResFM optimized mode
Harmonics:	< –30 dBc	Level ≤ 0 dBm, Fc ≥1 MHz
Non-harmonics:	< –50 dBc	Level ≤ 0 dBm, >10 kHz from carrier

Characteristic SSB Phase Noise



fc = 1000 MHz



fc = 2000 MHz

Sweep Modes

RF and LF:

LF Sweep range: 20 Hz to 80 kHz
RF Sweep range: 9 kHz to 3 GHz
Sweep points: 2 to 1001
Dwell time: 10 ms to 1s

Amplitude:

Sweep range: –127 to +13 dBm
Sweep points: 2 to 1001
Dwell time: 10 ms to 1s

Simultaneous Modulation *

		AM		I/Q	FM		ΦM	Pulse	
		Internal	External		Internal	External		Internal	External
AM	Internal	–	•	–	•	•	•	–	–
	External	•	–	–	•	•	•	–	–
I/Q		–	–	–	•	•	•	•	•
FM	Internal	•	•	•	–	•	–	•	•
	External	•	•	•	–	–	–	•	•
ΦM		•	•	•	–	–	–	•	•
Pulse	Internal	–	–	•	•	•	•	–	–
	External	–	–	•	•	•	•	–	–

* N9310A only has one external modulation input connector. The simultaneous external modulations are applied to the same input signal.

Amplitude Modulation

(Fc ≥ 100 kHz)

Operating modes:	Internal, external AC	
Range:	0 to 100%	Envelope peak < maximum specified power
Resolution:	0.1%	
Rates:	20 Hz to 20 kHz	
Accuracy:	< ± (5 % of setting +0.2%)	1 kHz, 0 dBm and 80% modulation, 0.3 to 3 kHz bandwidth
Distortion:	< 2%	1 kHz, 0 dBm and 80% modulation, THD
External input:	MOD IN connector	
Sensitivity:	0.5 Vpeak	Input voltage for 100% modulation depth
Input impedance:	BNC; > 100 kΩ	Nominal

Frequency Modulation

(Fc ≥ 100 kHz)

Operating modes:	Internal, external AC	
Frequency deviation:	20 Hz to 100 kHz	
Resolution:	< 1%	Minimum 1Hz
Rates:	20 Hz to 80 kHz	
Distortion:	< 1%	1 kHz rate, THD, Deviation = 50 kHz
Deviation accuracy:	< ± (5 % of FM deviation +300 Hz)	1 kHz, 0 dBm and 50 kHz deviation, 0.3 to 3 kHz bandwidth
Carrier frequency		
Deviation:	< 200 Hz	Relative to carrier; external mode
External input:	MOD IN connector	
Sensitivity:	0.5 Vpeak	Input voltage for 100 kHz modulation deviation
Input impedance:	BNC; > 100 kΩ	Nominal

Phase Modulation

(Fc ≥ 100 kHz)

Operating modes:	Internal	
Phase deviation:	0 to 10 rad	Rate ≤ 10 kHz
	0 to 5 rad	10 kHz < Rate ≤ 20 kHz
Resolution:	< 1%	
Rates:	300 Hz to 20 kHz	
Deviation accuracy:	< ± (5% of FM deviation +0.2 rad)	1 kHz rate, 0.3 to 3 kHz bandwidth
Distortion:	< 1.5%	1 kHz rate, THD, Deviation = 5 rad
Input impedance:	BNC; > 100 kΩ	Nominal

Pulse Modulation

Operating modes:	Internal, external	
On/Off ratio:	≥ 40 dB	
Rise/fall time:	< 3 µs	
Pulse width:	100 µs to 1s	Internal, external
Pulse period:	200 µs to 2s	Internal
Time resolution:	1 µs	
Input connector and voltage level:	BNC female; TTL	

Internal Modulation Source

Provides a modulation signal for AM, FM, phase modulation and LF out

Waveform:	Sine	
Frequency range:	20 Hz to 80 kHz	
Resolution:	0.1 Hz	
Accuracy:	0.005%	Typical

LF Out (Internal Modulation Source)

Amplitude:	0 to 3 Vpeak	Level to high impedance
Output voltage Resolution:	< 1%	1 mV minimum resolution
Frequency response:	< ± 0.2 dB	20 Hz to 20 kHz
Total Harmonic Distortion:	< 0.1%	Typical; 20 Hz to 20 kHz, 30 kHz low pass filter
Connector and impedance:	BNC female; < 1Ω	Front panel

I/Q Modulation (Option 001 only)

Operating mode:	External I/Q inputs	
VSWR:	< 1.5	
Full scale input:	$\sqrt{I^2 + Q^2} = 0.5 V_{rms}$	
Modulation frequency range:	DC to 40 MHz	At 3 dB points
Carrier suppression:	40 dBc	Typical; Modulation frequency = 10 kHz
QPSK EVM:	3%	Typical; 1Msps. 0.22 RRC Filter
GMSK Phase error:	1.2° rms	Typical; 1Msps. BT= 0.5
Connector and impedance:	BNC female; 50Ω	Rear panel

USB Connector

USB Host interface:	3 x A Plug	V 1.1 protocol
USB Device interface:	1 x B Plug	V 1.1 protocol

General

Power requirement:	100~240 Vac; 50~60 Hz	Auto-ranging
Power consumption:	65 W	
Temperature range:	5 ~ 45 °C	Operating
	-20 to 70 °C	Storage
Weight:	9.2 kg	Approximately
Dimensions:	132.5 x 320 x 400 mm	H x W x D

www.agilent.com
www.agilent.com/find/n9310a

Agilent Email Updates

www.agilent.com/find/emailupdates
Get the latest information on the products and applications you select.

Agilent Channel Partners

www.agilent.com/find/channelpartners
Get the best of both worlds: Agilent's measurement expertise and product breadth, combined with channel partner convenience.

Remove all doubt

Our repair and calibration services will get your equipment back to you, performing like new, when promised. You will get full value out of your Agilent equipment throughout its lifetime. Your equipment will be serviced by Agilent-trained technicians using the latest factory calibration procedures, automated repair diagnostics and genuine parts. You will always have the utmost confidence in your measurements. For information regarding self maintenance of this product, please contact your Agilent office.

Agilent offers a wide range of additional expert test and measurement services for your equipment, including initial start-up assistance, onsite education and training, as well as design, system integration, and project management.

For more information on repair and calibration services, go to:

www.agilent.com/find/removealldoubt

For more information on Agilent Technologies' products, applications or services, please contact your local Agilent office. The complete list is available at:

www.agilent.com/find/contactus

Americas

Canada	(877) 894 4414
Latin America	305 269 7500
United States	(800) 829 4444

Asia Pacific

Australia	1 800 629 485
China	800 810 0189
Hong Kong	800 938 693
India	1 800 112 929
Japan	0120 (421) 345
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Thailand	1 800 226 008

Europe & Middle East

Austria	43 (0) 1 360 277 1571
Belgium	32 (0) 2 404 93 40
Denmark	45 70 13 15 15
Finland	358 (0) 10 855 2100
France	0825 010 700*
	*0.125 €/minute
Germany	49 (0) 7031 464 6333
Ireland	1890 924 204
Israel	972-3-9288-504/544
Italy	39 02 92 60 8484
Netherlands	31 (0) 20 547 2111
Spain	34 (91) 631 3300
Sweden	0200-88 22 55
Switzerland	0800 80 53 53
United Kingdom	44 (0) 118 9276201

Other European Countries:
www.agilent.com/find/contactus

Revised: October 1, 2009

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

Printed in USA, March 3, 2010
5989-4466EN

Agilent Technologies