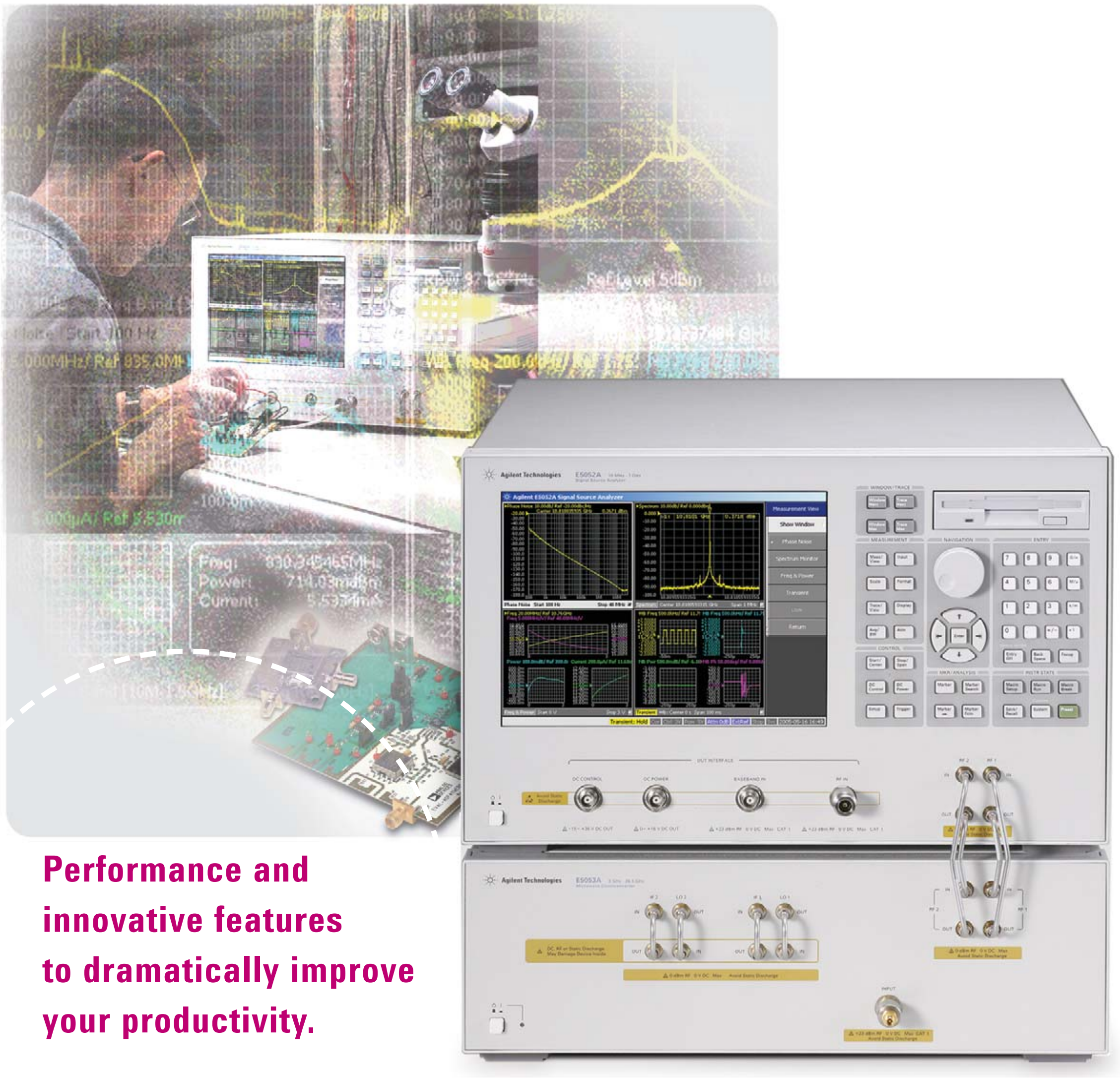
Agilent
E5052A Signal Source Analyzer

10 MHz to 7, 26.5, or 110 GHz

Everything you need for
signal source analysis



**Performance and
innovative features
to dramatically improve
your productivity.**

Agilent Technologies

Everything you need for signal source analysis in one instrument

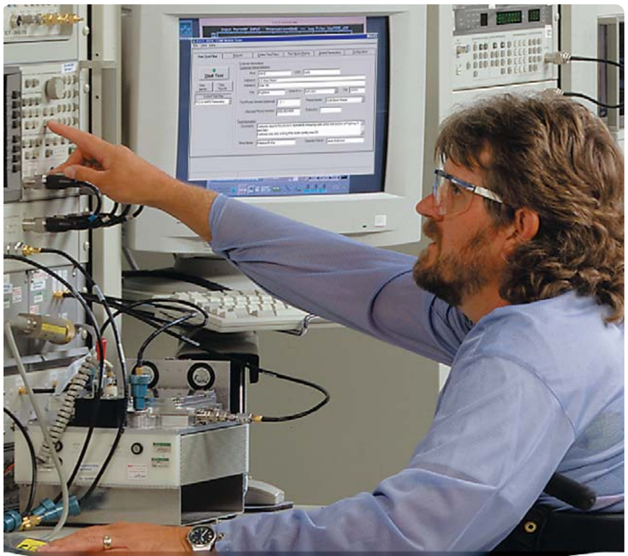
Testing the performance of next-generation signal sources such as voltage-controlled oscillators (VCOs), surface acoustic wave (SAW) oscillators, dielectric resonator oscillator (DROs), PLL synthesizers, RFICs, transmitters, and other devices can be challenging - especially with a bench full of instruments. Valuable time is spent learning to use multiple tools, determining the best tool to use, calibrating each instrument, setting up measurements, and then getting the right parameters. Capability restrictions in a number of the older instruments also make it difficult and time consuming to obtain the right parameters to get accurate measurements.

With Agilent Technologies' new Signal Source Analyzer (SSA), engineers no longer need a bench full of tools. All they need is one comprehensive test solution to perform next-generation signal source analysis.

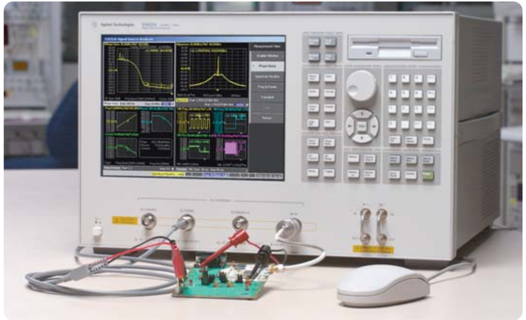
The Agilent E5052A Signal Source Analyzer:

- ✓ Performs all the critical signal source evaluations in one instrument
- ✓ Simplifies complicated, time-consuming measurements and dramatically reduces test time
- ✓ Provides excellent phase noise and transient measurements with performance to meet tough measurement challenges
- ✓ Has the right combination of performance and ease-of-use to significantly improve design and test productivity

Agilent's Signal Source Analyzer delivers unparalleled performance and versatility for a variety of signal sources in a wide range of industries such as wireless communications, aerospace & defense, satellite communications, automotive, education, and more.

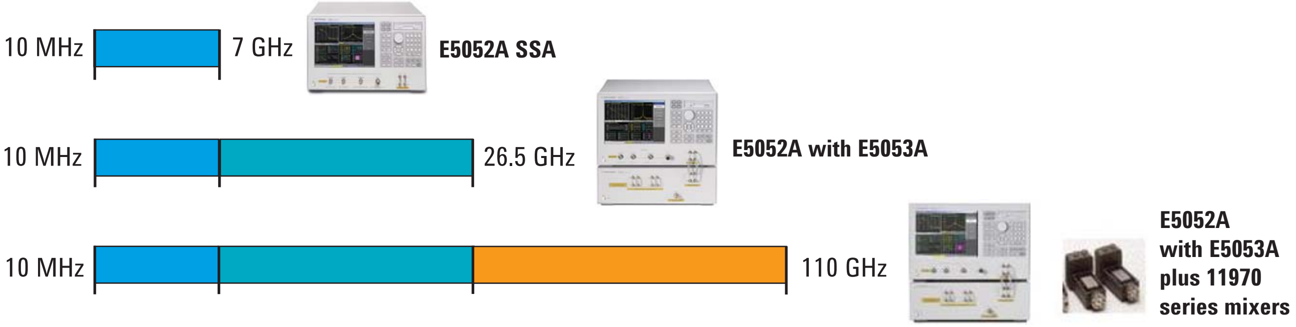


Engineers no longer need a bench full of tools to perform signal source analysis.



Today, engineers only need a single tool for signal source analysis.

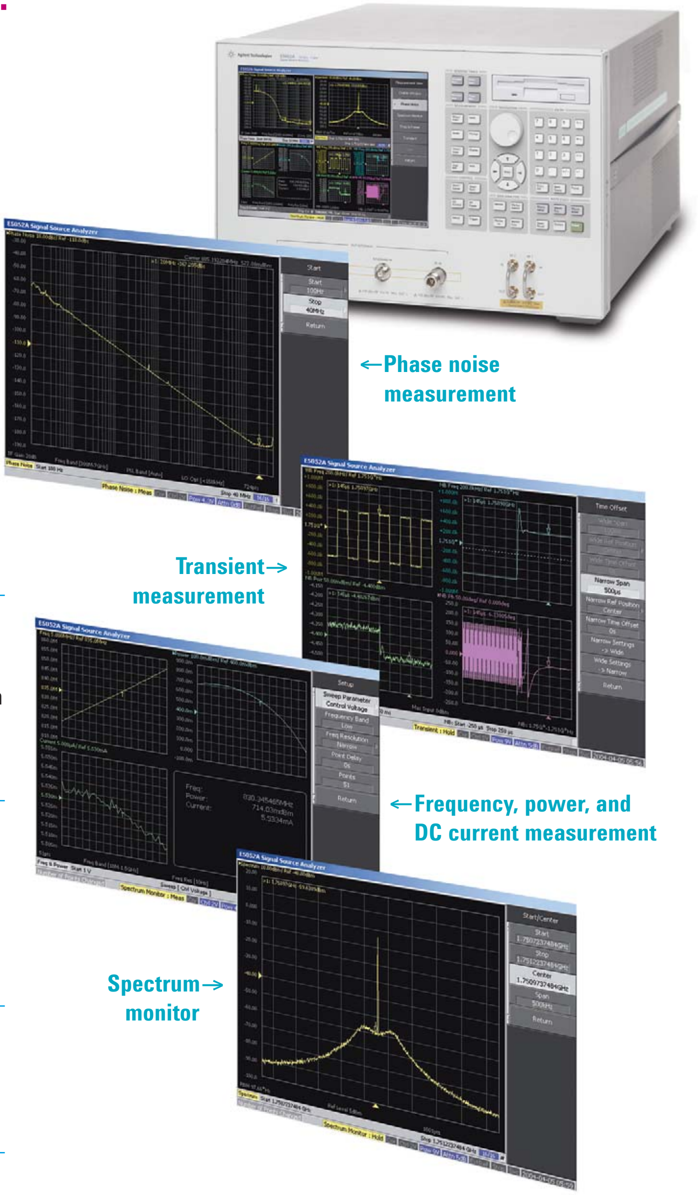
Signal source analyzer frequency options



One instrument does it all...

Agilent’s Signal Source Analyzer provides an indispensable set of measurements in one comprehensive tool:

- Phase noise
- Frequency, phase, and power, transients over time
- Frequency, RF power, and DC current
- Spectrum monitor



←Phase noise measurement

Transient→ measurement

←Frequency, power, and DC current measurement

Spectrum→ monitor

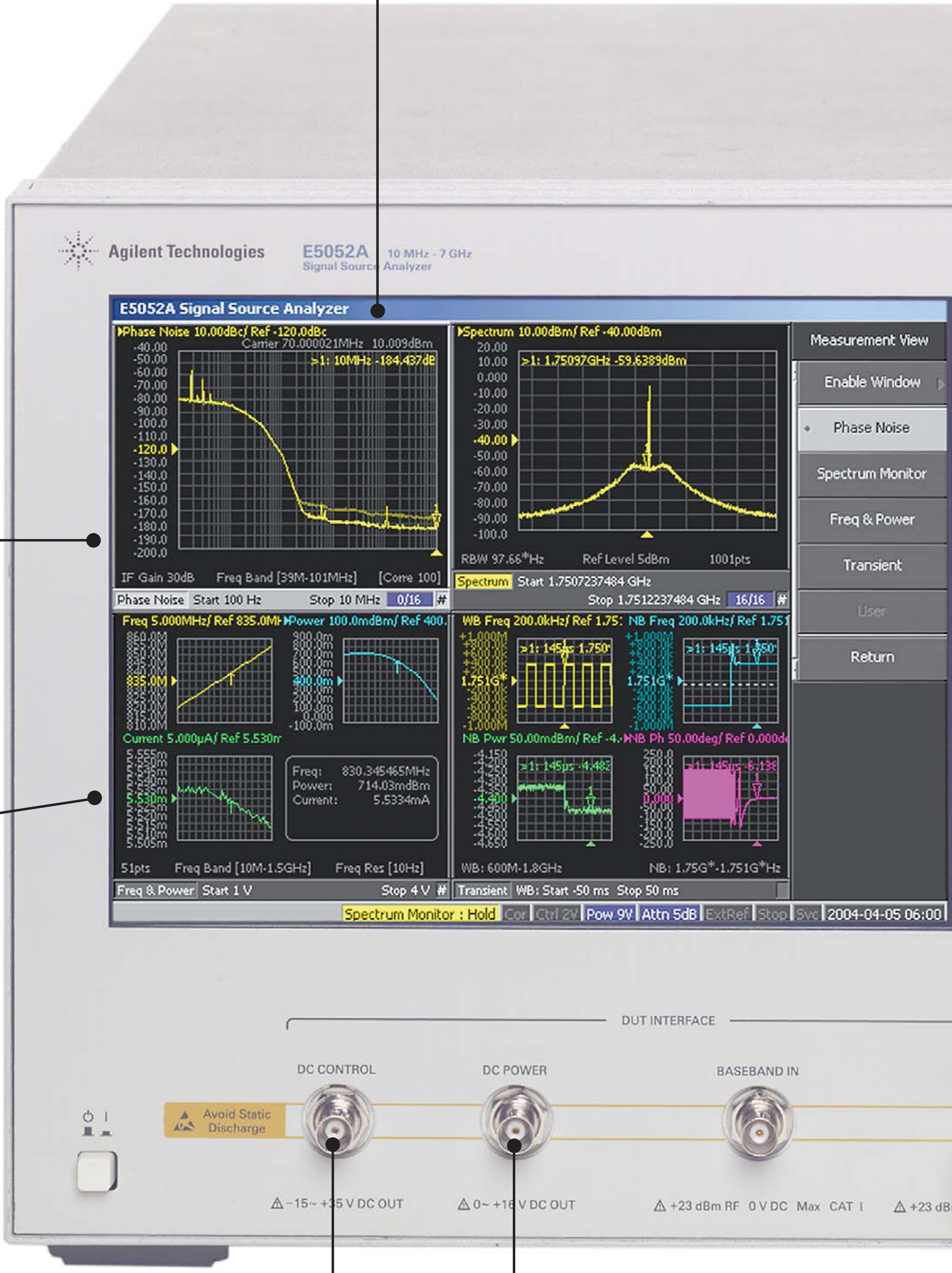
Features	Benefits
True single-connection for signal source evaluations	• Dramatically simplifies complicated measurement procedures and reduces test time by eliminating reconnection and set up of individual instruments.
One-step phase noise measurement	• Easy, one-step process eliminates time-consuming tasks and provides measurement speeds more than 10 times faster than conventional methods.
Built-in low-noise reference sources	• Fully-optimized for phase noise measurements and provides excellent phase noise sensitivity.
Cross-correlation technique	• Lowers system phase noise providing exceptional phase noise sensitivity.
Simultaneous transient measurements for frequency, phase, and power over time	• Provides a complete set of measurements to test frequency-switching sources. • Simultaneous measurements both in wideband and narrow-band. • Captures all behaviors of sources under test, allowing you to analyze very detailed information on signals.
10 nsec sampling resolution with better frequency resolution	• Enables high-speed switching source measurements with tighter tolerance of a settled frequency - even in a very short period.
Ultra low-noise DC sources	• Outstanding low-noise DC sources provide accuracy and flexibility to improve throughput.
Multiple measurement windows and versatile analysis capabilities	• Up to four measurement windows and a user window can be viewed simultaneously, allowing for faster analysis.
Built-in VBA® programming	• Simplifies complicated measurements and eases automated tests.

Industry-leading performance in one easy-to-use instrument

Agilent's Signal Source Analyzer is the ultimate tool for signal source analysis. Using the latest innovative technology, it is specifically designed to provide you with all the critical measurements and performance you need in a single instrument.

This all-in-one solution is optimized for efficient measurements, high reliability, and offers easy-to-use features to minimize training and increase productivity.

The SSA provides the right combination of performance and flexibility to meet your signal source test needs now and well into the future.



Windows® style interface with touch screen enables intuitive operation.

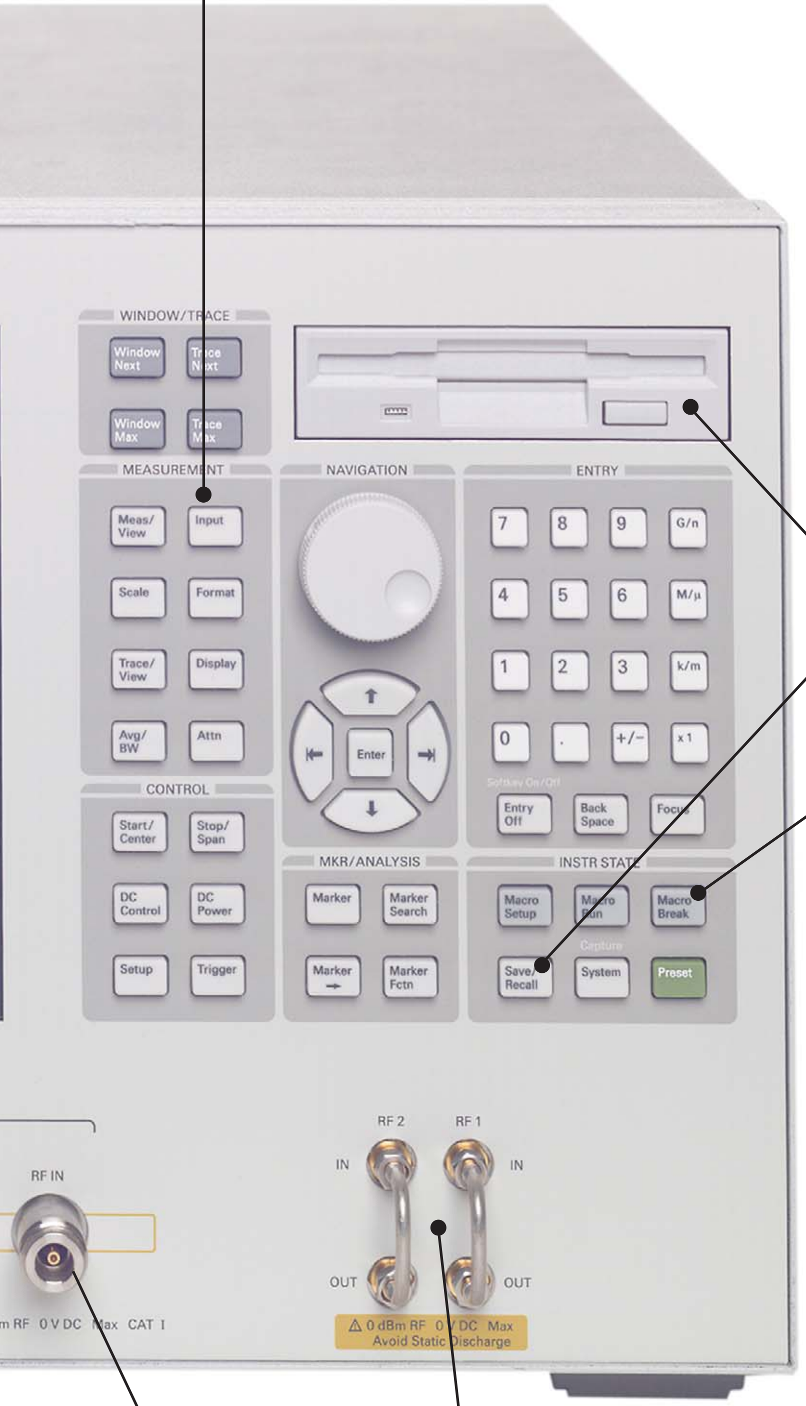
Multi-window display speeds your measurement evaluation and provides useful design insights by allowing you to view multiple results simultaneously.

Large (10.4-inch) color LCD clearly displays your measurements with the parameters you need.

Ultra-low-noise DC source enables accurate oscillator tests with a wide range of tuning voltage (-15 to 35 V).

Low-noise DC power supply operates oscillators and eases frequency pushing measurements (0 to 16 V).

An easy to use interface makes tasks simple.



Save/Recall (to floppy or hard drive)
- Instrument settings
- Screen capture in .bmp or .png
- Measured data pairs in .csv

Built-in VBA® programming simplifies complicated measurements and decreases operator error. Easily configure external automated measurements/procedures and create a graphic user interface tailored to your measurement needs.

E5053A Microwave Downconverter access.

Single RF input for all measurements.

Flexible connectivity (through rear-panel connectors)

24 bit I/O: high-speed handshake with parts handler or other instruments with user defined I/O signals

GPIB: robust instrument control

LAN: high-speed instrument control and data transfer

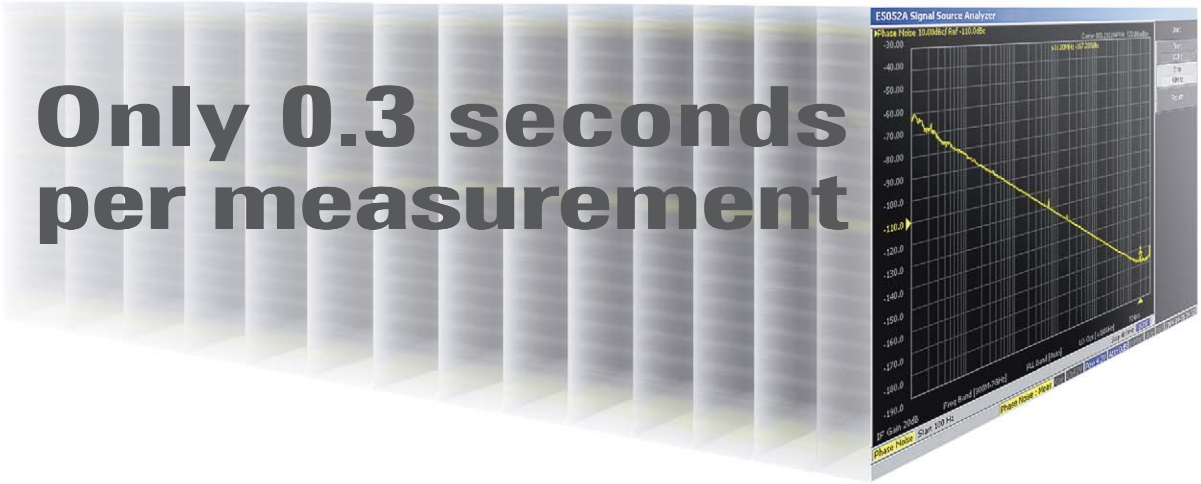
USB: controls external instruments and peripherals

Parallel: printer

VGA: external display

Frequency extension from 7 to 26.5 GHz with the E5053A Microwave Downconverter. Phase noise measurements up to 110 GHz with 11970 series harmonic mixers.

Phase noise measurements are now more than 10 times faster!

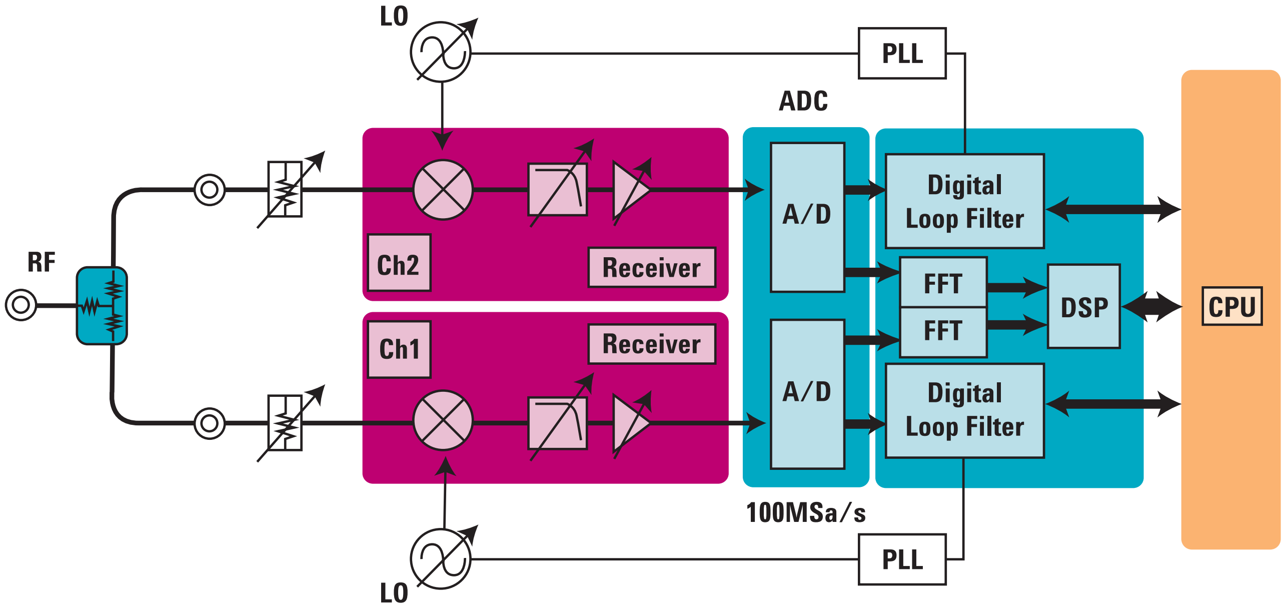


Easy one-step phase noise measurement

The Signal Source Analyzer provides a true one-step phase noise measurement. This eliminates time-consuming measurement set ups and system calibration. Built-in low-noise reference sources, lock the system to the carrier of the measured signal, automatically enabling and dramatically improving measurement speed. **Tedious phase noise measurements are now more than 10 times faster.**

Real-time phase noise measurement

The measurement speed is exceptionally fast. With a frequency offset range between 1 kHz to 40 MHz, measurements only take 0.3 seconds per measurement. Real-time phase noise measurements not only dramatically improve test time, they also quickly help identify the root cause of undesired behavior of a source-under-test.

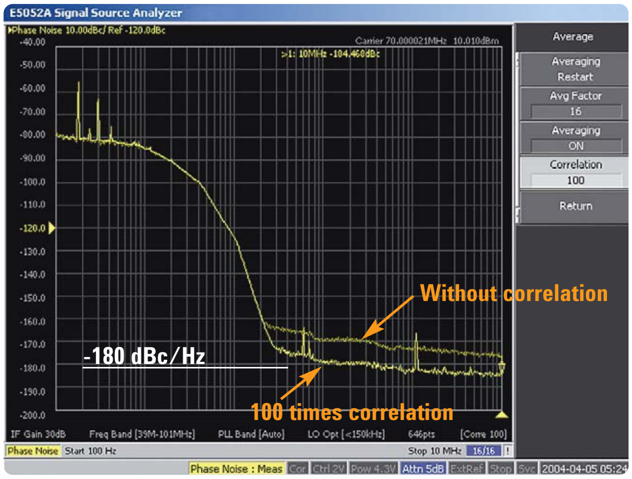


The Signal Source Analyzer's advanced architecture brings phase noise measurement to a new level.

Exceptional phase noise sensitivity

Cross-correlation technique provides exceptional phase noise sensitivity

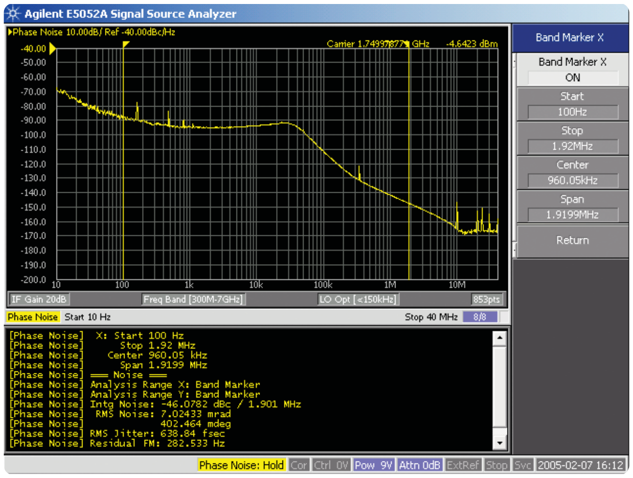
Dual channel receivers enable a “cross-correlation” technique to lower the instrument’s noise floor at all offset frequencies. Traditionally the phase noise of reference source used in the system limits the measurement sensitivity. However, this technique essentially cancels noises of built-in reference sources and overcomes the limitation. The amount of noise cancellation depends on the “number” of correlations. Correlations of up to 10,000-times produces a 20 dB phase noise sensitivity improvement.



Cross-correlation technique enhances phase noise sensitivity.

Trace integration and jitter conversion offers quick and accurate jitter analysis

Integrated phase noise between two points specified by the band marker function can be automatically calculated. Both rms jitter and residual FM are also displayed. This function allows you to evaluate the noise contribution in the communication channels or the random jitter of clock sources quickly and accurately. When compared to oscilloscopes, the SSA provides better sensitivity of random jitter measurements (as low as femto second).



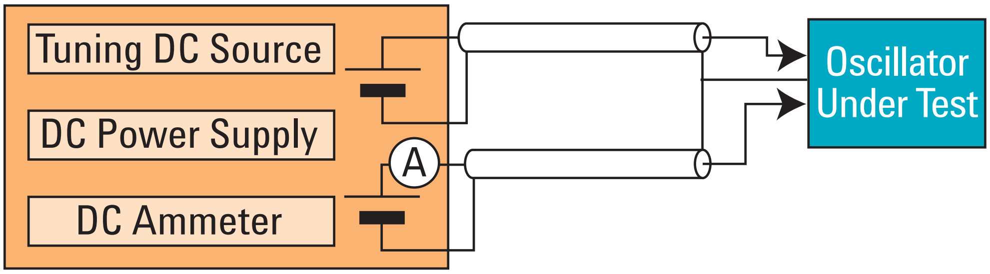
```
[Phase Noise]  X: Start 100 Hz
[Phase Noise]      Stop 1.92 MHz
[Phase Noise]    Center 960.05 kHz
[Phase Noise]      Span 1.9199 MHz
[Phase Noise] ═══ Noise ═══
[Phase Noise] Analysis Range X: Band Marker
[Phase Noise] Analysis Range Y: Band Marker
[Phase Noise] Intg Noise: -46.0782 dBc / 1.901 MHz
[Phase Noise]  RMS Noise: 7.02433 mrad
[Phase Noise]             402.464 mdeg
[Phase Noise] RMS Jitter: 638.84 fsec
[Phase Noise] Residual  FM: 282.533 Hz
```

SSA phase noise to jitter conversion analysis.

Outstanding low-noise DC sources provide accuracy and flexibility

The Signal Source Analyzer provides and controls the DC power supply as well as the DC control (tuning) voltage source. These DC sources are floated from the ground and isolated from external noise to ensure accuracy and repeatability.

In particular, the DC control voltage source supplies an ultra-low-noise DC signal (1nV/√Hz at 10 kHz offset) to measure free-running voltage controlled oscillators. This enables you to make measures without a low pass filter. This is superior to the conventional methods because it reduces noise on the control signal (controlling voltage quickly), while improving flexibility and total test throughput.



Built-in low-noise DC sources allow you to measure a voltage controlled oscillator without a low pass filter.

Versatility and performance to characterize high-speed frequency switching sources

Synthesizer measurement: Multiple measurement windows provide more data and enable faster analysis.

A complete set of transient measurements

The Signal Source Analyzer provides dual channel measurements to fully characterize switching signal sources. In the wideband mode, the entire behavior of frequency jumps can be observed. In the narrowband mode, you can analyze detailed information of frequency, phase, and power over time. All of these measurements can be done simultaneously and displayed as multiple traces.

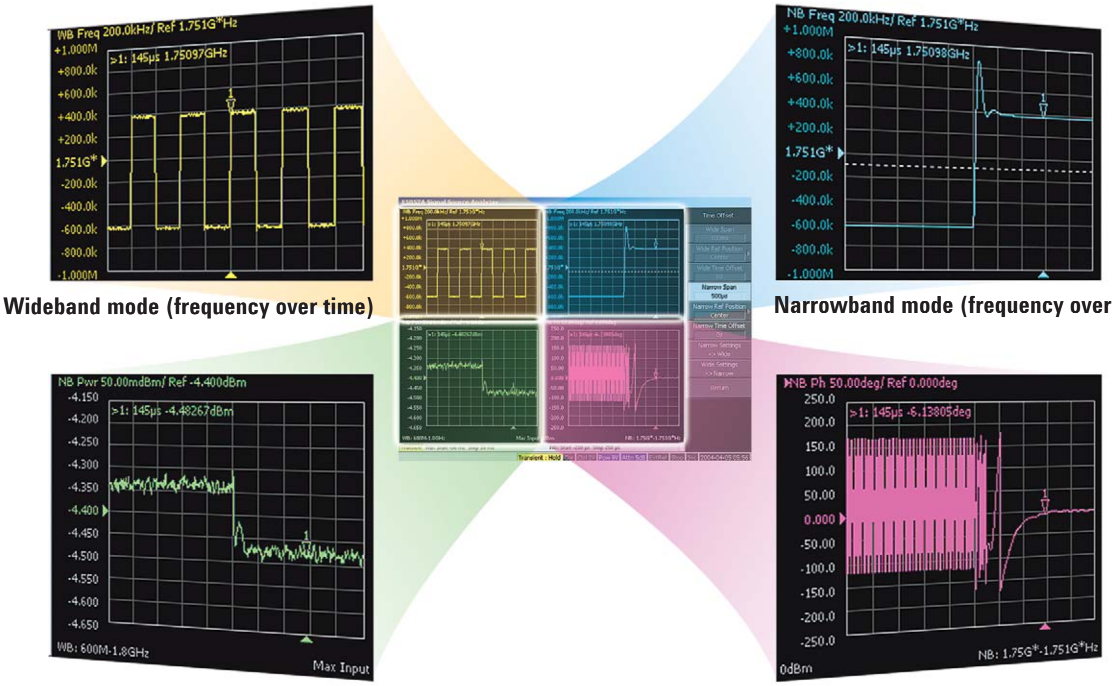
This enables designers to evaluate the dynamic response of synthesizers, LO circuits, and transmitters quickly.

Better sampling rate, better frequency resolution

One of today's measurement challenges is testing fast frequency switching sources. These sources lock up within sub-micro seconds and are used in high-speed wireless data communication and aerospace/defense radars. To meet this requirement, the Signal Source Analyzer offers a 10 nsec sampling rate with an internal 100 MHz ADC. This provides enhanced sampling resolution and better frequency resolution to meet the requirements of future high-speed switching source characterization (7 kHz of frequency resolution at 10 nsec sampling rate, and 0.2 Hz of frequency resolution at 25.6 usec sampling rate).

Hardware trigger, video, and pre-trigger capabilities

The hardware trigger input port is provided with the analyzer to synchronize the source- under-test to change with the measurement trigger. Pre-trigger capability is available to observe phenomena before and after events. Video trigger capability is also useful to quickly check the behavior of frequency jumps at your bench.



Wideband mode (frequency over time)

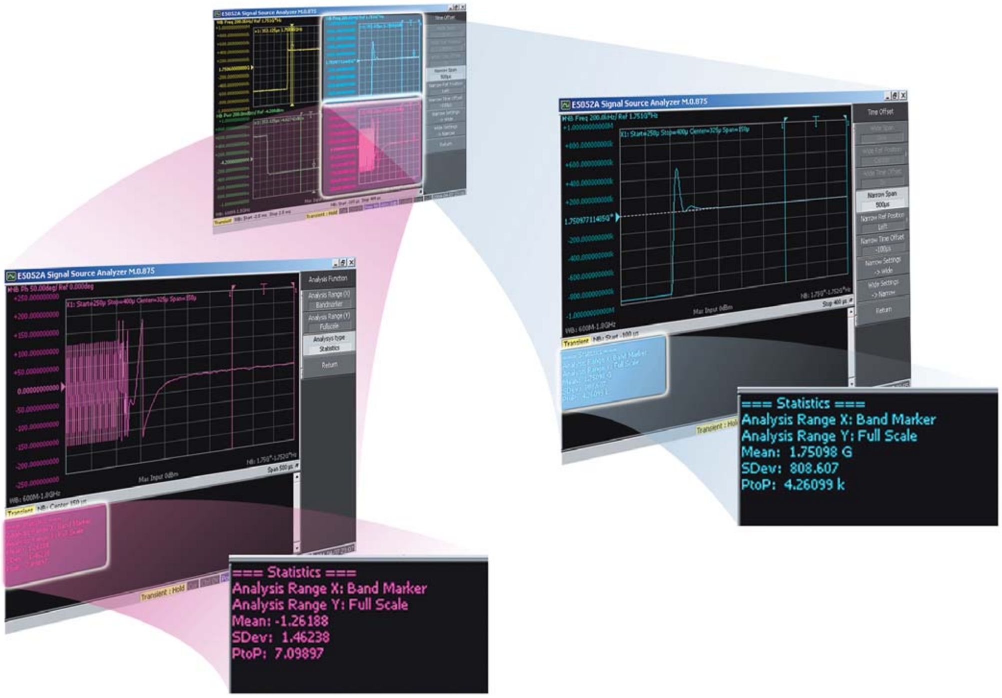
Narrowband mode (frequency over time)

Narrowband mode (power over time)

Narrowband mode (phase over time)

Simultaneous measurements, both in wide and narrow bandwidth, allow you to analyze detailed information of frequency, phase, and power over time.

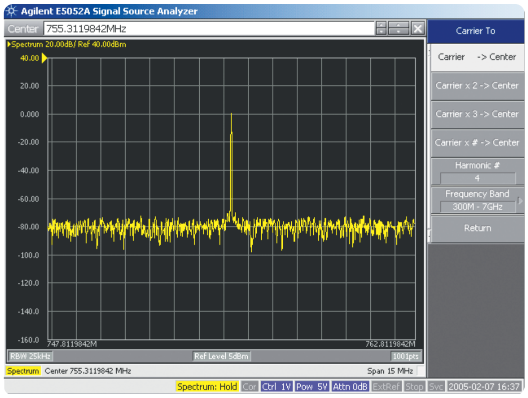
Powerful analysis capabilities provide valuable design insights



```
=== Statistics ===
Analysis Range X: Band Marker
Analysis Range Y: Full Scale
Mean: 1.75098 G
SDev: 808.607
PtoP: 4.26099 k
```

```
=== Statistics ===
Analysis Range X: Band Marker
Analysis Range Y: Full Scale
Mean: -1.26188
SDev: 1.46238
PtoP: 7.09897
```

Detailed frequency and phase measurements over time with the band marker function, provide a quick and comprehensive analysis.



Center 755.3119842MHz

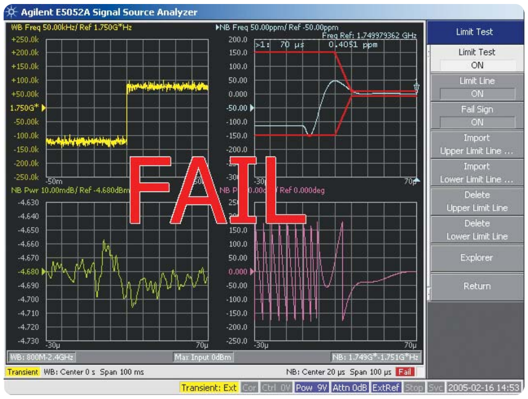
Spectrum 20.00dB/ Ref 40.00dBm

RBW 25kHz
Ref Level 5dBm
1001pts

Spectrum Center 755.3119842 MHz Span 15 MHz

Spectrum: Hold Cor Ctrl 1V Pow 5V Attn 0dB ExtRef Stop Svc 2005-02-07 16:37

Now you can quickly check close-in-carrier spurious in a PLL synthesizer with the spectrum monitor function.



WB Freq 50.00kHz/ Ref 1.750G*Hz

NB Freq 50.00ppm/ Ref -50.00ppm

Freq Ref: 1.749979362 GHz

>1: 70 μs 0.4051 ppm

NB Pwr 10.00mdB/ Ref -4.680dBm

Ref 0.000deg

WB: 800M-2.4GHz
Max Input 0dBm
NB: 1.749G*-1.751G*Hz

Transient WB: Center 0 s Span 100 ms NB: Center 20 μs Span 100 μs Fail

Transient: Ext Cor Ctrl 0V Pow 9V Attn 0dB ExtRef Stop Svc 2005-02-16 14:53

Limit line and pass/fail testing display.

Powerful analysis and band marker

Measurement results require quick and clear observation. The analyzer's unique band marker function allows you to define the range of measurement data you want to analyze on the X- and the Y-axis.

In the frequency over time measurement trace, delta-Hz, percent of the y-axis reference frequency, or ppm formats are supported; as well as limit line testing. Up to 6 markers can be used on one trace to search for peak/maximum/minimum/target values allowing for detailed analysis. Markers on all traces can be coupled in the time axis allowing you to quickly evaluate PLL's lockup time with different parameters in frequency, phase, and power simultaneously.

Spectrum monitor function

The spectrum monitor function is tuned for measuring close-in spurious measurements with up to a 15 MHz span. This function helps you check unfavorable signals such as spurious products in a PLL synthesizer very quickly. The carrier/harmonics search function provides the center frequency of the spectrum monitor to the carrier frequency automatically. This allows you to quickly check the carrier signal, as well as the harmonics of your signal.

Oscillator characterization made easy

Measure a wide variety of oscillator characteristics

The Signal Source Analyzer's frequency, power, and DC current measurement functions are tuned for characterizing oscillators (from fixed to voltage controlled oscillators). Frequency, RF power, and DC current (at DC power voltage port) measurements are synchronized with the voltage sweep on either DC control voltage or DC power voltage. The trace curve of each parameter is shown on the display with a single cabling hookup. The following parameters can be measured:

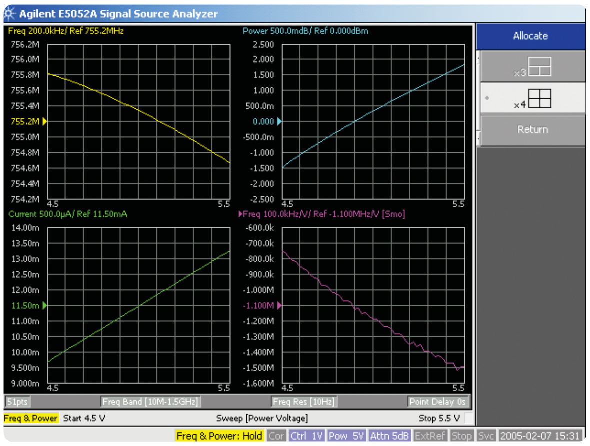
- Frequency versus DC control (tuning) voltage
- Tuning sensitivity (differential of frequency versus DC tuning voltage)
- Frequency versus DC power voltage
- Frequency pushing (differential of frequency versus DC power voltage)
- RF power versus DC control (tuning) voltage
- RF power versus DC power voltage
- DC current (at DC power voltage port)

A true single-connection measurement for a voltage controlled oscillator speeds set-up time.

Real-time monitoring of frequency, RF power, and DC current

The "tester mode" provides real-time monitoring of frequency, RF power, and DC current (at DC power voltage port). The numerical data appears on the display like a frequency counter, power meter, and DC ammeter, enabling high-speed manufacturing test in a single point measurement.

Oscillator characterization is comprehensive and simple



Agilent E5052A Signal Source Analyzer

Freq 200.0kHz/ Ref 755.2MHz

Power 500.0mdB/ Ref 0.000dBm

Current 500.0µA/ Ref 11.50mA

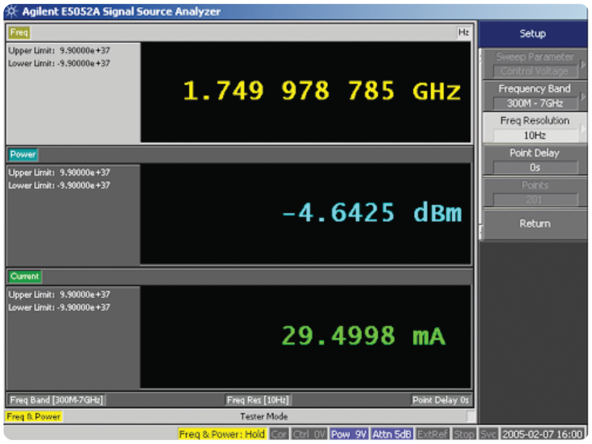
Freq 100.0kHz/V/ Ref -1.100MHz/V [Smo]

51pts | Freq Band [10M-1.5GHz] | Freq Res [10Hz] | Point Delay 0s

Freq & Power Start 4.5 V Sweep [Power Voltage] Stop 5.5 V

Freq & Power: Hold Cor Ctrl 1V Pow 5V Attn 5dB ExtRef Stop Svc 2005-02-07 15:31

SSA analyzer mode



Agilent E5052A Signal Source Analyzer

Freq Hz
Upper Limit: 9.90000e+37
Lower Limit: -9.90000e+37
1.749 978 785 GHz

Power
Upper Limit: 9.90000e+37
Lower Limit: -9.90000e+37
-4.6425 dBm

Current
Upper Limit: 9.90000e+37
Lower Limit: -9.90000e+37
29.4998 mA

Freq Band [300M-7GHz] | Freq Res [10Hz] | Point Delay 0s

Freq & Power Tester Mode

Freq & Power: Hold Cor Ctrl 0V Pow 9V Attn 5dB ExtRef Stop Svc 2005-02-07 16:00

Sweep Parameter: Control Voltage
Frequency Band: 300M - 7GHz
Freq Resolution: 10Hz
Point Delay: 0s
Points: 201

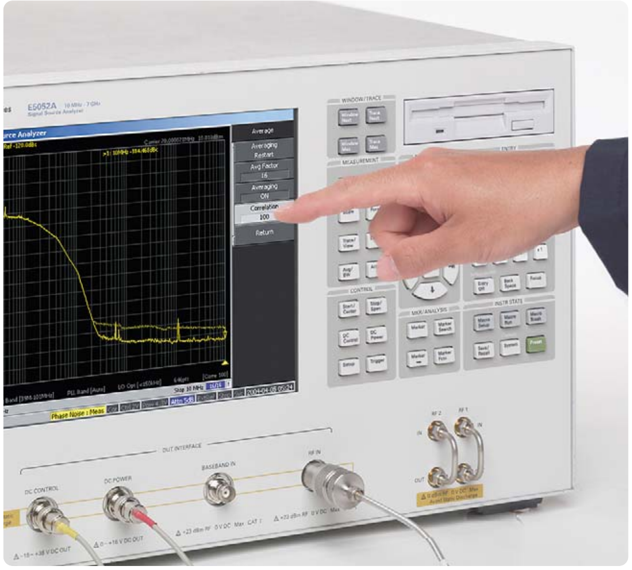
Tester mode display

Exceeding expectations in productivity with enhanced usability

Modern connectivity and flexible programming

Design characterization often requires you to analyze measured data on an external PC. The Signal Source Analyzer allows you to easily connect to external PCs, additional test equipment and other peripherals such as keyboards, mice, and printers through GPIB, LAN and USB ports.

The Signal Source Analyzer is equipped with various interfaces to help you maximize productivity, such as different views for measurement results and external test equipment controls. It is easily controlled from an external PC using your preferred programming language and method such as Socket or SICL over LAN.



Intuitive operation

A large 10.4-inch LCD display provides a clear view of multiple traces in multiple windows. In addition, a touch screen eases interactive operation and minimizes operational errors.

Dedicated keys are available to select and maximize a display window or trace, allowing you to quickly enlarge measurement results.

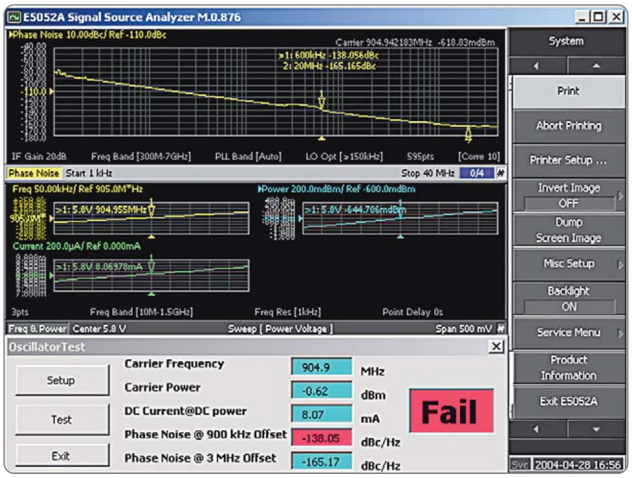
The Signal Source Analyzer supports a variety of I/O interfaces to provide maximum flexibility.

Gain a competitive advantage with powerful automation tools

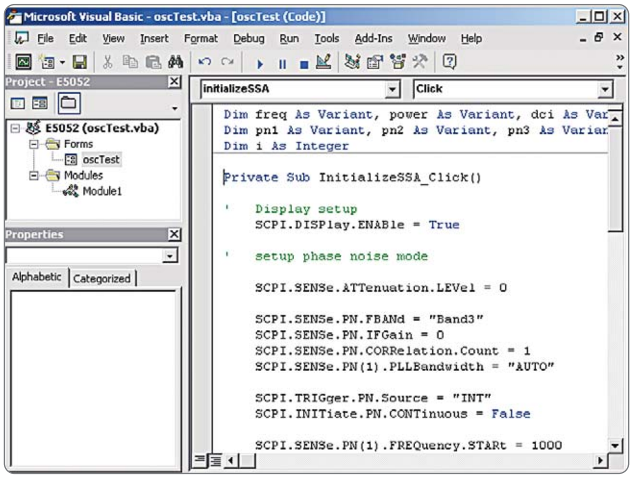
The Signal Source Analyzer provides unprecedented simplicity to maximize your productivity.

Fast, accurate and integrated

The Signal Source Analyzer offers unparalleled performance. With fast, high-quality, repeatable measurements it's well-suited for the demanding requirements of high-speed manufacturing test. All this performance provides an integrated solution to help simplify your test procedures. Unlike "rack and stack" measurement systems, this comprehensive solution is compact, easy-to-use and saves valuable space on the manufacturing floor.



Carrier Frequency	904.9	MHz
Carrier Power	-0.62	dBm
DC Current@DC power	8.07	mA
Phase Noise @ 900 kHz Offset	-138.05	dBc/Hz
Phase Noise @ 3 MHz Offset	-165.17	dBc/Hz



```
Dim freq As Variant, power As Variant, dci As Var
Dim pn1 As Variant, pn2 As Variant, pn3 As Variar
Dim i As Integer

Private Sub InitializeSSA_Click()

'   Display setup
    SCPI.DISPlay.ENABle = True

'   setup phase noise mode

    SCPI.SENSe.ATTenuation.LEVel = 0

    SCPI.SENSe.PN.FBANd = "Band3"
    SCPI.SENSe.PN.IFGain = 0
    SCPI.SENSe.PN.CORRelation.Count = 1
    SCPI.SENSe.PN(1).PLLBandwidth = "AUTO"

    SCPI.TRIGger.PN.Source = "INT"
    SCPI.INITiate.PN.CONTinuous = False

    SCPI.SENSe.PN(1).FREQuency.STARt = 1000
```

Built-in VBA allows you to tailor and automate measurements to speed your test time.

Powerful built-in VBA for customization

Signal Source Analyzer's built-in VBA® programming function allows you to automate measurement procedures and easily create a graphic user interface, tailored to your measurement needs. In addition, test programs can be developed using a built-in editor.

Automation to reduce your test time

Automated test is yet another method to eliminate valuable seconds from your test processes. Use the analyzer's flexible automation environment to simplify your measurement procedures and lower your cost of test. A 24-bit interface is provided for faster handshaking with parts handler and can be customized using SCPI commands for your automated test environment needs.

Key Specifications[1]

E5052A Signal Source Analyzer

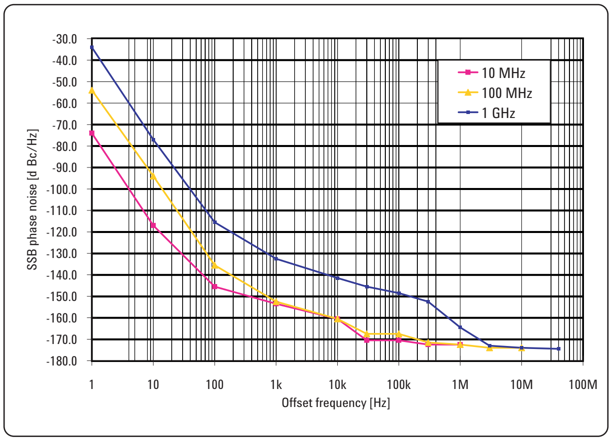
Frequency range	10 MHz to 7 GHz 10 MHz to 26.5 GHz with E5053A Downconverter (up to 110 GHz with an external downconverter and harmonic mixer)
Input power level	-20 dBm to +20 dBm (RF input)

Measurement Parameters

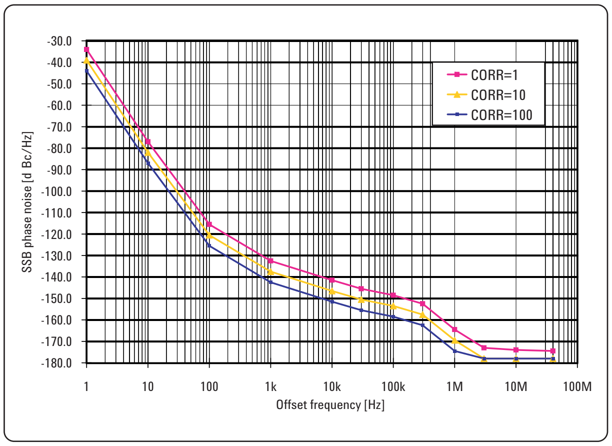
Frequency, RF power, and DC current

- Measurement parameters:
  - Tester mode
    - Frequency, RF power, DC current
  - Analyzer mode (standard model ONLY)
    - Frequency versus DC control voltage (tuning sensitivity)
    - Frequency versus DC power voltage (frequency pushing)
    - RF power versus DC control or power voltage
    - DC current versus DC control or power voltage

RF power	
Resolution:	0.01 dB
Accuracy:	± 0.5 dB
Frequency	
Resolution:	10 Hz, 1 kHz, 64 kHz
Accuracy:	± (frequency resolution + time base accuracy)
Phase noise	
Offset frequency range:	1 Hz to 40 MHz (standard model) 10 Hz to 40 MHz (Option E5052A-011)
Phase noise sensitivity:	See figures on phase noise plots
Enhanced phase noise sensitivity technique:	Cross-correlation (1 to 10,000 times) Up to 20 dB improvement (standard model ONLY)
Accuracy:	+/- 4 dB at 1 Hz to 1 kHz +/- 2 dB at 1 kHz to 1 MHz +/- 3 dB at 1 MHz to 40 MHz
Measurement time:[2]	0.07 sec (1 kHz to 40 MHz offset) 0.56 sec (100 Hz to 40 MHz offset) 4.40 sec (10 Hz to 40 MHz offset) 17.7 sec (1 Hz to 40 MHz offset)
Transient	
Measurement parameters:	Frequency over time, phase over time, power over time
Time span:	10 usec to 10 sec, 1, 2, 5 step
Time resolution:	10 nsec minimum
Input frequency range:	50 MHz to 7 GHz (wideband mode) 10 MHz to 7 GHz (narrowband mode)
Transient frequency range:	Frequency min.: Frequency max. = 1: 3 (wideband mode) 25.6 MHz, 1.6 MHz, 200 kHz, 25 kHz, or 3.125 kHz (narrowband mode)



SSB phase noise sensitivity (typical)
(standard, correlation = 1, start offset = 1 Hz, + 5 dBm input)



Phase noise improvement with 1, 10, 100 correlation at 1 GHz carrier (typical)

Frequency resolution:	
Narrowband, 3.125 kHz:	0.0004 Hz rms at 10.25 msec time resolution
Narrowband, 25 kHz:	0.0095 Hz rms at 12.8 msec time resolution
Narrowband, 200 kHz:	0.2 Hz rms at 25.6 usec time resolution
Narrowband, 1.6 MHz:	5 Hz rms at 8 usec time resolution
Narrowband, 25.6 MHz:	313 Hz rms at 1 usec time resolution
Phase transient accuracy:	0.1 deg/GHz (0.1 deg min.)
Power transient accuracy:	+/- 2 dB
Resolution:	0.01 dB
Spectrum monitor	15 MHz max Span, RBW = 1 Hz to 100 kHz
DC sources:	
Control voltage:	-15 to +35 volt, 20 mAmax
Power voltage:	0 to 16 volt, 80 mAmax
Noise density:	1nV/√Hz at 10 kHz offset (control voltage) 10nV/√Hz at 10 kHz offset (power voltage)

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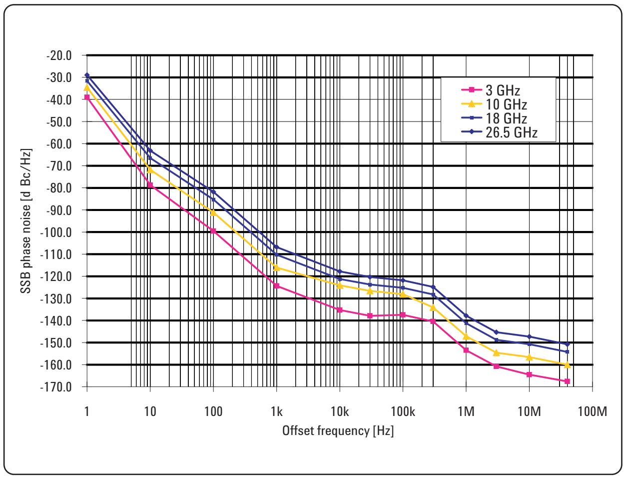
1. For additional specification details see the Agilent E5052A Signal Source Analyzer Data Sheet (literature number 5989-0903EN) available on our Web site: **www.agilent.com/find/ssa**
2. Measurement time (sec) = 0.2 plus the above value x number of correlation when applying cross-correlation function (standard model ONLY). For E5052A-011, number of correlation = 1

Beyond RF to microwave and millimeter-wave frequencies

If your signal source design and test requires microwave or millimeter-wave frequencies, you can extend the frequency range of the instrument simply by adding mixers and a downconverter. Adding the E5053A Microwave Downconverter, as illustrated below, will extend your frequency range up to 26.5 GHz. Additionally, the E5053A Microwave Downconverter, used in conjunction with a pair of Agilent 11970 series harmonic mixers and an external power divider, will allow you to extend your frequency range up to 110 GHz.

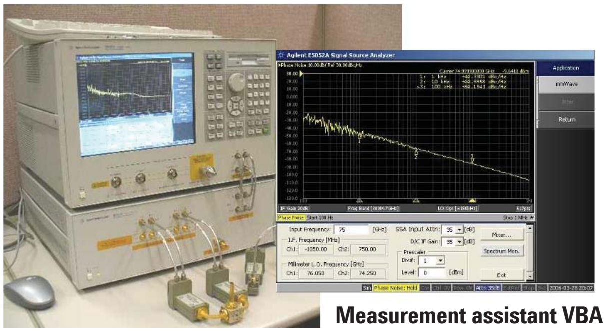
The cross-correlation technique, which offers exceptional phase noise sensitivity, can also be expanded to microwave and millimeter wave frequencies. All functions of the E5052A SSA are seamlessly integrated into the instrument's user interface.



SSB phase noise sensitivity
(standard, correlation = 1, start offset = 1 Hz)

Specifications: E5052A Signal Source Analyzer with E5053A Microwave Downconverter

Key measurements	Specification
Carrier frequency range	10 MHz to 26.5 GHz, to 110 GHz[1]
Measurement Capabilities	Frequency, power, DC current, frequency versus control voltage (tuning sensitivity) frequency versus power voltage (frequency pushing), phase noise, frequency/phase/power over time (transient), spectrum
Input power range	-10 dBm to + 10 dBm
Phase noise sensitivity (typical)	See figures on phase noise plots
Transient measurement range	500 MHz max (wideband) 25.6 MHz, 1.6 MHz or 200 kHz (narrowband)



Measurement assistant VBA

SSA millimeter wave phase noise configuration

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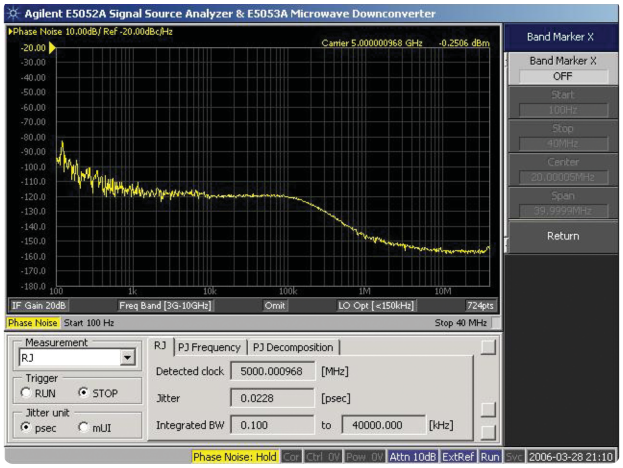
1. Requires a pair of 11970 mixers and an external power divider. Please contact your local Agilent sales office for more details.

Precision clock Jitter Analysis

As the need to characterize clock jitter used in the digital communication systems increases, so increases the demand for the right measurement tools to measure jitter accurately. Agilent's E5052A Signal Source Analyzer offers a new tool delivering a powerful analysis capability on both random jitter (RJ) and periodic jitter (PJ) on a clock source.

Ultra-low random jitter measurement through phase noise

The Agilent E5052A SSA provides exceptional low jitter measurement capability through phase noise measurement technique. For a 10 giga-bit clock rate, the random jitter noise floor reaches 9 femto seconds and representing 100 times the sensitivity of a high performance sampling oscilloscope.


Agilent E5052A Signal Source Analyzer & E5053A Microwave Downconverter

Phase Noise 10.00dB/ Ref -20.00dBc/Hz

Carrier 5.000000968 GHz -0.2506 dBm

IF Gain 20dB | Freq Band [3G-10GHz] | Omit | LO Opt [<150kHz] | 724pts

Phase Noise Start 100 Hz Stop 40 MHz

Measurement: RJ

Trigger: ○ RUN ● STOP

Jitter unit: ● psec ○ mUI

Detected clock 5000.000968 [MHz]

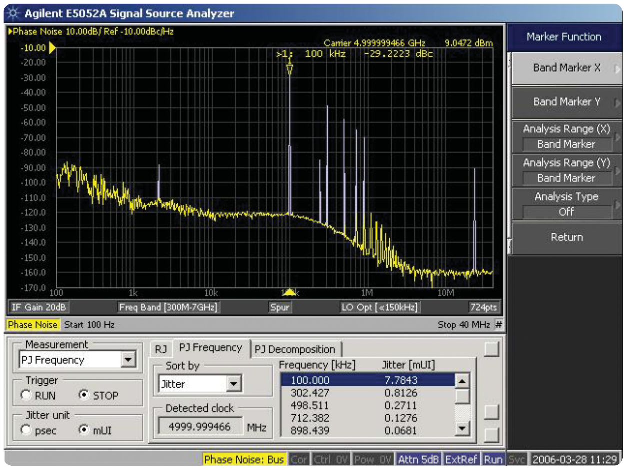
Jitter 0.0228 [psec]

Integrated BW 0.100 to 40000.000 [kHz]

Phase Noise: Hold | Cor | Ctrl OV | Pow OV | Attn 10dB | ExtRef | Run | Svc | 2006-03-28 21:10

Jitter spectrum analysis

The Agilent E5052A SSA makes identifying the periodic jitter on a clock under test simple. Periodic jitter components are displayed in the PJ spectrum view. The periodic jitter frequency can help us better understand the jitter source of the periodic jitter and give more insights for designing clock signal quality better.


Agilent E5052A Signal Source Analyzer

Phase Noise 10.00dB/ Ref -10.00dBc/Hz

Carrier 4.999999466 GHz 9.0472 dBm

>1: 100 kHz -29.2223 dBc

IF Gain 20dB | Freq Band [300M-7GHz] | Spur | LO Opt [<150kHz] | 724pts

Phase Noise Start 100 Hz Stop 40 MHz

Measurement: PJ Frequency

Trigger: ○ RUN ● STOP

Jitter unit: ○ psec ● mUI

Sort by: Jitter

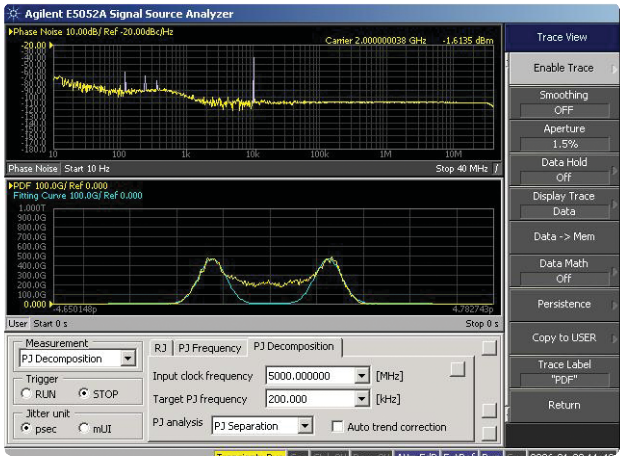
Detected clock 4999.999466 MHz

Frequency [kHz]	Jitter [mUI]
100.000	7.7843
302.427	0.8126
498.511	0.2711
712.382	0.1276
898.439	0.0681

Phase Noise: Bus | Cor | Ctrl OV | Pow OV | Attn 5dB | ExtRef | Run | Svc | 2006-03-28 11:29

Precision RJ and PJ separation

By providing views of jitter trend, jitter histogram, and random and periodic jitter separation, you'll gain a clearer picture of your system's clock jitter characteristics enabling you to separate random jitter and periodic jitter from the total jitter on your system clock.


Agilent E5052A Signal Source Analyzer

Phase Noise 10.00dB/ Ref -20.00dBc/Hz

Carrier 2.000000038 GHz -1.6135 dBm

Phase Noise Start 10 Hz Stop 40 MHz

PDF 100.0G/ Ref 0.000

Fitting Curve 100.0G/ Ref 0.000

User Start 0 s Stop 0 s

Measurement: PJ Decomposition

Trigger: ○ RUN ● STOP

Jitter unit: ● psec ○ mUI

Input clock frequency 5000.000000 [MHz]

Target PJ frequency 200.000 [kHz]

PJ analysis: PJ Separation ☐ Auto trend correction

Ordering Information

Signal Source Analyzer Series

E5052A Signal Source Analyzer	10 MHz to 7 GHz
E5053A Microwave Downconverter	3 GHz to 26.5 GHz

Options

E5052A-011	Delete functions
E5052AU-012	Add standard functions
E5052AU-018	Add hard disk drive kit

Signal Source Analysis Software

E5001A	SSA-J Precision Clock Jitter Analysis

Harmonic mixers

11970 series harmonic mixers can be used with the E5053A Microwave Downconverter or N5507A Downconverter.

11970A	26.5 to 40 GHz
11970Q	33 to 50 GHz
11970U	40 to 60 GHz
11970V	50 to 75 GHz
11970W	75 to 110 GHz

Accessories

82357A	USB-GPIB converter

Web Resources

Visit our Signal Source Analyzer Web site for additional product information and literature.
www.agilent.com/find/ssa

Phase noise measurements
www.agilent.com/find/phasenoise

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Our Promise means your Agilent test and measurement equipment will meet its advertised performance and functionality. When you are choosing new equipment, we will help you with product information, including realistic performance specifications and practical recommendations from experienced test engineers. When you receive your new Agilent equipment, we can help verify that it works properly and help with initial product operation.

Your Advantage

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www.agilent.com/find/contactus

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