S3503 Series Signal Analyzer

(Frequency Range: 3Hz - 4GHz/ 9GHz/ 13.2GHz/ 18GHz/ 26.5GHz/ 40GHz/ 45GHz/ 50GHz)

Key Features

- Frequency range from 3Hz to Max.50GHz
- 10.1 inch LCD touch screen display, 1280 x 800 screen resolution.
- 50GHz coaxial frequency coverage, 8 sorts of frequency band configuration, 325G external frequency expansion capacity
- Maximum 200MHz analysis bandwidth
- Excellent test reception capability
- Comprehensive spectrum analysis, supporting continuous scanner FFT step scanning.
- Multi-domain correlation analysis and signal playback
- Support phase noise test, analog demodulation test, multi-domain correlation analysis, pulse signal analysis and external frequency expansion
- Support analogous and digital signal output interface
- Support multiple assistant output junction including USB, LAN, GPIB and monitor.

Typical Applications

- Comprehensive Performance Evaluation of Electronic Systems including Radar and Communication
- Test and Debugging of Transmitter and Receiver
- Configuration of intricate testing diagnostic system, providing the system with signal output, data output and result analysis

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S3503 Series Signal Analyzer, featured with excellent dynamic range, phase noise, amplitude precision and testing speed, has multiple analytical functions including high-sensitivity spectrum analysis, spectrum power analysis, IQ analysis, multi-domain correlation analysis, pulse parameter analysis, audio analysis, analogue demodulation analysis and phase noise test, providing you with reliably excellent testing service.

The analyzer has good expansion capacity, and can improve the features by means of flexible configuration options and also can construct testing system or redevelop by means of the output interface of all digitals and analogue signals. The analyzer is applicable for signal and equipment test of fields including Aviation, aerospace, radar detection, communications, electromagnetic countermeasure, and navigation.

Features To Boost Your Efficiency

Wide frequency range

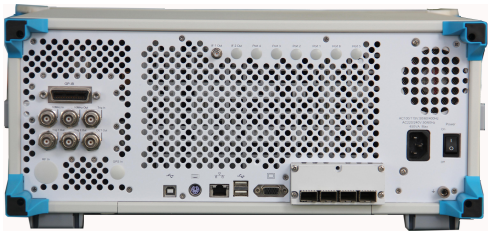
- ✧ Covering coaxial frequency range up to 50GHz.
- ✧ 8 optional frequency band configuration, more economical.
- ✧ Can be configured with broad frequency band preamplifier corresponding to the frequency band of main unit.
- ✧ The frequency can be extended up to 325GHz (with external frequency extension option).

Maximum 200MHz analyzing bandwidth

- ✧ Provide 3 analyzing bandwidth configuration: 10MHz (standard), 40MHz, 200MHz etc.
- ✧ The bandwidth can be flexibly selected: from 10Hz to 200MHz, more than 40 levels.
- ✧ According to the selected bandwidth, the seamless capture time differs from 1s to several hours.

Flexible analog & digital signal output interfaces

- ✧ 275MHz - 475MHz high / intermediate frequency output, 1 Hz frequency stepping.
- ✧ 10MHz - 160MHz IF output, 1Hz frequency stepping, 4-gear automatic gain control level.
- ✧ Digital reconstruction signal output, provide IF, AM/FM demodulation and IQ demodulation signal output.
- ✧ Digital signal output, 1X or 4X optical fiber output channel, real-time data interface to record broadband IQ data.
- ✧ External-built digital recorder, support two media type: SSD and HDD.



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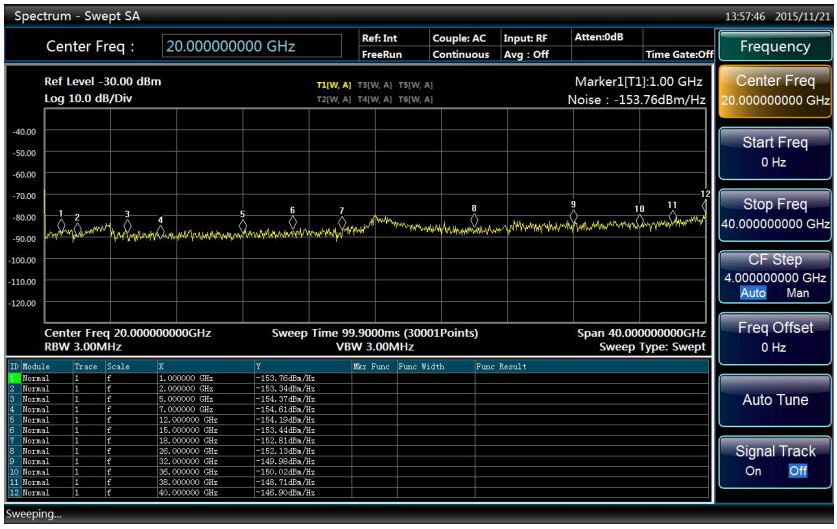
Excellent test & receiving performance

- ✧ 1GHz measurement sensitivity is -153dBm/Hz; configured with preamplifier, the typical value is -167dBm/Hz
- ✧ 50GHz measurement sensitivity is -133dBm/Hz; configured with preamplifier, the typical value is -151dBm/Hz
- ✧ Full digital IF design, excellent scale fidelity and IF error.



Comprehensive spectrum analysis capability

- ✧ Support frequency sweep and FFT sweep.
- ✧ Zero span fast sweep, the fastest sweep time is 1μs
- ✧ Accurate frequency counting, counting resolution achieves 0.001Hz
- ✧ Sweep points number can be arbitrarily selected among 101 - 30001
- ✧ Can be configured with 6 traces, have abundant marker operation functions
- ✧ 6 wave-detection modes, 3 average types
- ✧ Support time gate measurement
- ✧ Test functions of occupied bandwidth, channel power, adjacent channel power test.
- ✧ Test functions of power statistics, burst power, harmonic distortion, TOI, spurious emission etc.

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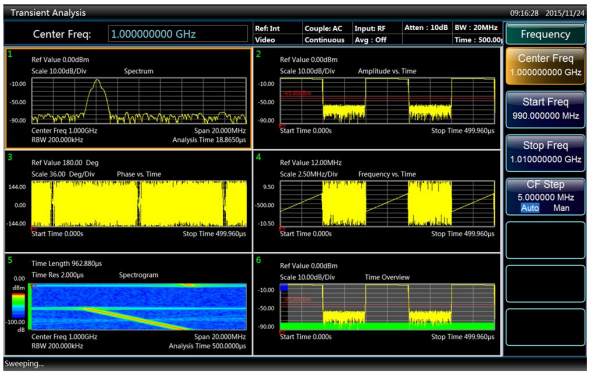
Transient analysis and signal playback analysis

- ✧ Frequency-domain and time-domain correlation test is helpful for understanding and deeply analyzing transient signal events.
- ✧ Waterfall diagram display, analyzing the macroscopic law of analysis signal spectrum changing over time.
- ✧ Simultaneously analyze the changes of analysis signal frequency, amplitude, and phase over time, to assist the test in the process of power control and frequency locking.
- ✧ Support 250M samples (64bits accuracy) seamless capture data storage
- ✧ Support multiple storage formats of signal files: CSV, DAT etc.
- ✧ Support the playback analysis of signal files



Plentiful optional functions

- ✧ Phase noise test function
- ✧ Analog demodulation analysis function
- ✧ Transient analysis function
- ✧ Pulse signal analysis function
- ✧ Audio frequency analysis
- ✧ External mixer test covering up to 325GHz

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Technical Specifications

Part NO.	A	B	C	D	E	F	G	H
Frequency Range	3Hz - 4GHz	3Hz- 9GHz	3Hz -13.2GHz	3Hz -18GHz	3Hz - 26.5GHz	3Hz -40GHz	3Hz -45GHz	3Hz -50GHz
10MHz Precision Frequency Reference	Frequency Accuracy	±（To the last calibration date × aging rate +temperature stability + Calibration Accuracy）						
	Aging rate	± $1x10^{-7}$ / Year						
	Temp. stability	± $1x10^{-8}$（20°C- 30°C）, ± $5x10^{-8}$（0°C- 55°C）（±$1.5x10^{-8}$）						
	Calibration Accuracy	± $7x10^{-8}$						
Frequency Readout Accuracy	±（Frequency indication × frequency reference accuracy＋0.1%Frequency Bandwidth＋5% RWB + 2Hz + 0.5*:Horizontal resolution Horizontal resolution = bandwidth / (scan points -1)							
Frequency Readout Accuracy	±（Frequency readout × frequency reference accuracy +0.1Hz)							
Frequency Bandwidth	Range: 0Hz, 10Hz - Max. frequency Accuracy: ± (0.1% × bandwidth + bandwidth / (scan points -1))							
Scan Time Range	Bandwidth≥10Hz: 1ms - 4000s, Bandwidth 0Hz: 1us - 6000s							
Resolution Bandwidth	Range: 1Hz - 3MHz （step by 1, 2, 3, 5), 4, 5, 6, 8, 10MHz Conversion Uncertainty: <±0.3dB							
Video Bandwidth	1Hz-3MHz (step by 1, 2, 3, 5), 4, 5, 6, 8MHz, 10MHz（Nominal）							
Signal Analysis Bandwidth	10Hz - 10MHz (Standard）, 40MHz（Optional）, 200MHz（Optional）							
Memory Capacity	250M Samples (64bit)							
Trigger Mode	Free, power, video, external level (front panel) external level (rear), timer							
Detector	Normal, positive peak, negative peak, sample, average, root mean square							
Average Type	Video Average, Power Average, Voltage Average							

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Sideband Noise (CF=1GHz)	< -96dBc/Hz, offset @100Hz; < -115dBc/Hz offset@1kHz < -125Bc/Hz, offset @10kHz; < -125dBc/Hz offset@100kHz		
Residual FM (center frequency=1GHz, RBW=10Hz, VBW=10Hz)	< (0.25Hz ×N)p-p,(Nom. In 20ms) N: harmonic number		
Displayed Average Noise Level (Pre-amplifier off)	10MHz - 1GHz	-153dBm/Hz	
	1GHz - 3GHz	-151dBm/Hz	
	2GHz - 3GHz	-150dBm/Hz	
	3GHz - 3.6GHz	-148dBm/Hz	
	3.6GHz - 4GHz	-145dBm/Hz	
	4GHz - 4.4GHz	-148dBm/Hz	
	4.4GHz - 9GHz	-150dBm/Hz	
	9GHz - 18GHz	-148dBm/Hz	
	18GHz - 26.5GHz	-143dBm/Hz	
	26.5GHz - 40GHz	-138dBm/Hz	
	40GHz - 50GHz	-133dBm/Hz	
Frequency Response & Absolute Amplitude Accuracy (10 dB Attenuation, 20 - 30 ℃)	Frequency Response (Pre-amplifier off)	3Hz - 20MHz	<±0.7dB
		20MHz - 2GHz	<±0.5dB
		2GHz - 3.6GHz	<±0.7dB
		3.6Hz - 4GHz	<±1dB
		4GHz - 9GHz	<±1.5dB
		9GHz - 18GHz	<±2.0dB
		18GHz - 26.5GHz	<±2.5dB
		26.5GHz - 50GHz	<±3.0dB
	Absolute Amplitude Accuracy (10 dB attenuation, 20 - 30 ℃, 1 Hz ≤ RBW ≤ 1 MHz, input signal: -10 - -50dBm)	±0.24dB 500MHz ±（0.24dB＋Frequency Response）All Frequency	

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1dB Gain Compression (mixer level, two tunes, RBW=5KHz)	20MHz - 40mHz	-3dBm
	40MHz - 200MHz	+1dBm
	200MHz - 4GHz	+3dBm
	4GHz - 9GHz	-1dBm
	9GHz - 50GHz	+1dBm
Third-order Inter modulation Distortion (TOI-30dBm)	10MHz - 4GHz	> +13dBm
	4GHz - 9GHz	> +11dBm
	9GHz - 50GHz	> +13dBm
Residual Response	200kHz - 9GHz	-100dBm
	Other Frequency	-100dBm (Nom.)
Input Interface	S3503A / B / C / D	N (F), impedance 50Ω
	S3503E	3.5mm (M), impedance 50Ω
	S3503F / G / H	2.4mm (M), impedance 50Ω

General Information

Power Supply	AC 220/240V: 50/60Hz
Power	Stand by: < 20W, Operating: < 400W
Weight	25kg
Dimension	L×W×H = 510×190×534 (Including handles, pad foot and footing) L×W×H = 426×177×460(handles, pad foot and footing are not included)

Standard Package

Item	Name	Qty
1	S3503 Series Signal Analyzer	1 Set
2	Standard Three-Wire Power Cord	1 PC
3	USB Mouse	1 PC
4	User Guide	1 PC
5	Programmable Manual	1 PC

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Main machine

Part No.	Frequency Range
S3503A	3Hz - 4GHz
S3503B	3Hz - 9GHz
S3503C	3Hz - 13.2GHz
S3503D	3Hz - 18GHz
S3503E	3Hz - 26.5GHz
S3503F	3Hz - 40GHz
S3503G	3Hz - 45GHz
S3503H	3Hz - 50GHz

Optional Package

Part No.	Name	Description
S3503-H01	Rear Panel RF Input	Postposition of RF signal input interface1
S3503-H02	High/Middle Frequency Output	Output the second IF signal, the output frequency range 275MHz - 475MHz, step resolution 1Hz.
S3503-H03	Middle Frequency Output	Output the third IF signal, the output frequency rang 10MHz - 160MHz, step resolution 1Hz.
S3503-H04A	IF Reconstruction / Video Signal Output	To achieve signal output of any IF, AM / FM or I / Q by means of digital reconstruction, with the bandwidth upper limit 40MHz. (Note: H04A&H04B are available for options)
S3503-H04B	Broadband Reconstruction IF/ Video Signal Output	To achieve signal output of any IF, AM / FM or I / Q by means of digital reconstruction, with the bandwidth ranging from 50MHz to 100MHz. (Note: H04B is only available when H38B 200MHz broadband option is selected; H04A & H04B are available for options.)
S3503-H08	Broadband Logarithmic Detector Output	Output logarithmic detector signal that presents the level characteristics of input signal.

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S3503-H12A	40MHz Bandwidth Digital Interface	To output real-time signal acquisition data through optical fiber and support signal data output with maximum 40MHz bandwidth. (Note: H12A is forbidden to choose when H38B is selected; H12B is forbidden to choose when this option is selected, H39 is not available)
S3503-H12B	200MHz Bandwidth Digital Interface	To output instantaneous broadband data by means of optical fiber, support maximum 200MHz bandwidth signal data output. (Note: H12B is only available for selection when H38B 200MHz broadband option is selected; H12A and H39 are not available for selection when this option is selected.)
S3503-H15	+24V DC Power Supply	Use +24V DC Power Supply
S3503-H22A	SAV4711 Data Recorder	Equipping SDD data recorder that has the same interface characteristics to achieve the instantaneous large-number record of signal data. (Note: H22A can only be selected after H12A or H12B digital interface is selected, the capacity selection of the recorded is shown in SAV4711 Recorder files)
S3503-H22B	SAV4712 Data Recorder	Equipping HDD data recorder that has the same interface characteristics to achieve the instantaneous large-number record of signal data. (Note: H22A can only be selected after H12A or H12B digital interface is selected, the capacity selection of the recorded is shown in SAV4712 Recorder files)
S3503-H33	Electronic Attenuator	Frequency Range 3Hz - 4GHz, attenuation range 30db,1db stepping.

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S3503-H34-04 S3503-H34-09 S3503-H34-13 S3503-H34-18 S3503-H34-26 S3503-H34-40 S3503-H34-45 S3503-H34-50	Low-Noise Preamplifier	Either Low-band preamplifier or full-band amplifier is available for option. Under the circumstance when full-band preamplifier is chosen, and noise optimization path of 4GHz or above frequency is provided.(Note: Low-wave preamplifier number is H34-04, full-band preamplifier is selected according to the frequency limit of the selected signal analyzer. eg,S3503E frequency range up to26.5GHz should choose S3603-H34-26.
S3503-H36	Pre-selector Bypass	Bypass receives the tracking pre-selector in the channel (Note: H36 Pre-selector Bypass shall be chosen when H38A or H38B is chosen in order to provide the optimal broadband signal reception characteristics)
S3503-H38A	40MHz Analysis Bandwidth	Support 10Hz~40MHz Analysis Bandwidth (Note: Whenever H38A is chosen, H36 Pre-selector Bypass shall be chosen in order to provide the optimal broadband signal reception features; H38A is unnecessary when H38B is chosen)
S3503-H38B	200MHz Analysis Bandwidth	Support 10Hz-200MHz analysis bandwidth (Note: Whenever H38B is selected, H36 pre-selector bypass option should be chosen in order to provide the most optimal broadband signal reception features)
S3503-H39	Audio Analysis	Fulfill audio signal parameter test, distortion test and waveform analysis. (Note: H12A& H12B are unavailable when this option is selected)
S3503-H40	External Spectrum Range Expansion	Provide external mixing methods to extend range measurement capability. This option provides local oscillator input, IF input function and signal-recognition function.（only available for S3503A, Extended frequency depends on the selected extending module, extending module is optional part）
S3503-S04	Phase Noise Test	Provide unilateral band phase noise curve and one-point band phase noise testing capability.

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S3503-S09	Analogous Demodulation Analysis	Fulfill modulation and distortion characteristics analysis of AM, FM, PM signals.
S3503-S10	Multi-domain Correlation Analysis	Fulfill the testing analysis of signals' instantaneous parameter spectrum, spectrum range and all sorts of modulation features; support the playback of recorded data.
S3503-S13	Pulse Signal Analysis	Automatically measure time, electrical level and modulation parameters of pulse wave and statistical analysis of pulse sequence.
S3503-H99	Aluminum Alloy Aviation Case	/

Note: *Information will conduct the necessary updates, the contents of this document are subject to change without notice*

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