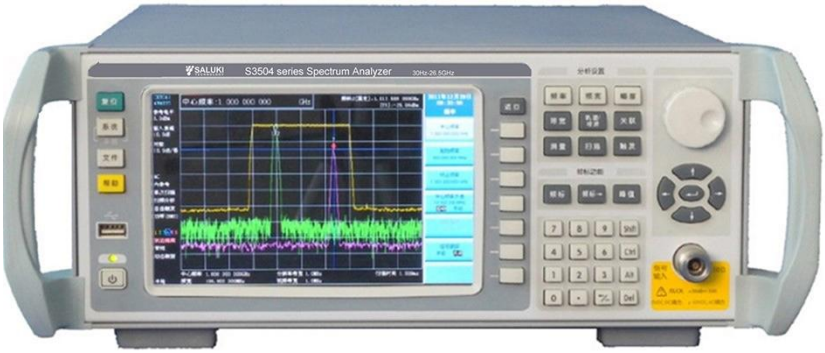
S3504M Series Spectrum Analyzer

Frequency Range: 9kHz – 3GHz / 6GHz / 13.2GHz / 18GHz / 26.5GHz



Key Features

- Wide frequency range, as low as 9kHz, up to 26.5GHz.
- Dynamic range, 1dB gain compression point 0dBm, TOI (third order intercept point) +10dBm, DANL (displayed average noise level) is better than -160dBm (internal preamplifier option, 1GHz at typical).
- Excellent phase noise performance, up to -110dBc / Hz (low phase noise option, typical) at 10 kHz offset.
- Scan a wide time range, zero bandwidth 1ms - 2000s, zero bandwidth 1us - 4000s.
- Fast test speed, test rates of up to 90 times per second.
- Fully digital frequency, high spectral resolution, the min. resolution bandwidth of 1Hz (FFT analysis option).
- Automatic calibration, environmental adaptability.
- Support analysis and FFT analysis of two swept spectrum analysis mode, you can test the speed and flexibility to optimize the dynamic range.
- Resolution bandwidth 1 ,2, 3, 5 steps can achieve the best combination of bandwidth and resolution bandwidth, optimize spectral resolution.
- Support regular, positive peak, negative peak, sampling a variety of video detection mode average value, users can test different types of signal flexibility to choose quickly achieve the desired results.
- Support up to six displays track, supports synchronous video detector test different ways under a plurality of tracks; provide up to 12 frequency standard, flexible reading mode, support for cross-track frequency standard logo.

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- Embedded computer and multi-tasking operating system to facilitate storage of test results, and print data sharing.
- 7-inch high-brightness color LCD screen micro reactor, high resolution, wide viewing angle, in the sunlight remains clear display.
- Menu is simple, comprehensive parameter setting, support for an external mouse, keyboard, VGA test operation.
- Support three USB2.0 interface, support removable storage devices and plug and play peripherals.
- Support 10M / 100M adaptive network interconnection.
- Support for GPIB, LAN programmable, programmed instruction set in line with SCPI 1999.0 specification. Provide compliance with regulatory requirements and through VISA and IVI instrument driver library rigorous testing, user-friendly automatic test system builds.

S3504M series Spectrum Analyzer give best solutions in balancing performance and cost. With up to 5 models, it give attention from Medium to Low end applications compared with S3504 Series. By adopting advanced and mature design, S3504M achieves an excellent comprehensive testing performance. Although giving priority to flexibility and convenient user experience, it also has stable performance, high testing speed, good repeatability of test data, and self- test and self-calibration function. It also enables an efficient programmed development, with VISA and SCPI command set and IVI instrument driver libraries.

The serialization product, by choosing different option spare part, meet customer's verified testing need. By equipped with 7-inch high-brightness and micro reactor color LCD screen, it gives users high resolution, wide viewing angle, to adapt to a variety of lighting conditions. A standard 3U rack makes it rugged and lightweight. S3504M is mainly used in electronic product development, production line on-line testing, and building automatic test systems.

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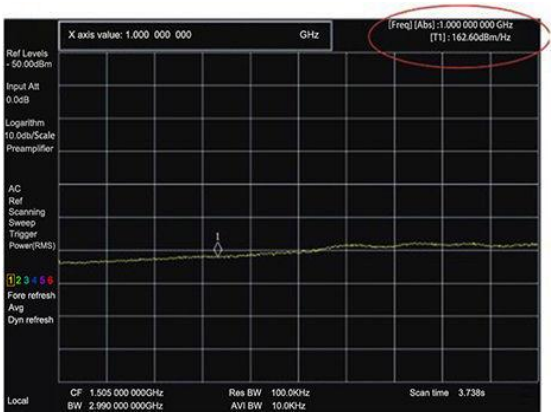
Features To Boost Your Efficiency

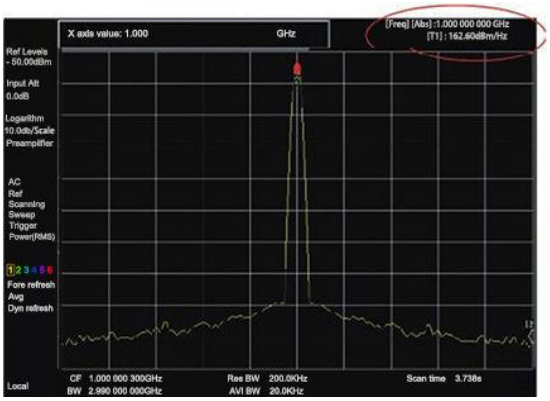
Low displayed average noise level

Display average noise level (DANL) as low as -160dBm / Hz (1GHz place, typical) when internal preamplifier on.



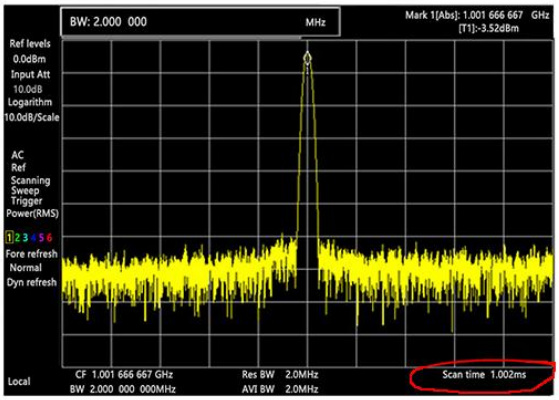
Excellent phase noise performance

This product has a domestic mid-range spectrum analyzer optimal phase noise performance, 1GHz carrier frequency offset 10kHz, the noise sidebands of -110dBc / Hz (typical).



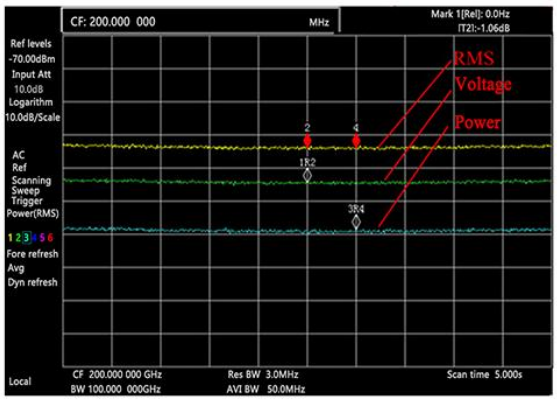
Fast measurement speed

This product has a domestic mid-range spectrum analyzer fastest test speed. Zero bandwidth scan time up to 1ms, has testing rated up to 90 times per second.



A variety of ways the average detector

Support 3 average detector modes: power (RMS), voltage and log power. Users can test the signal characteristics to select the appropriate average detector way to obtain accurate data on average. 图



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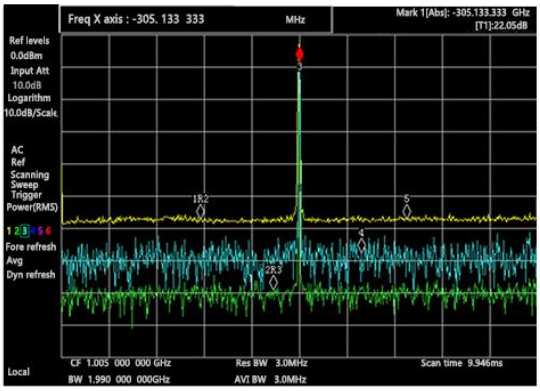
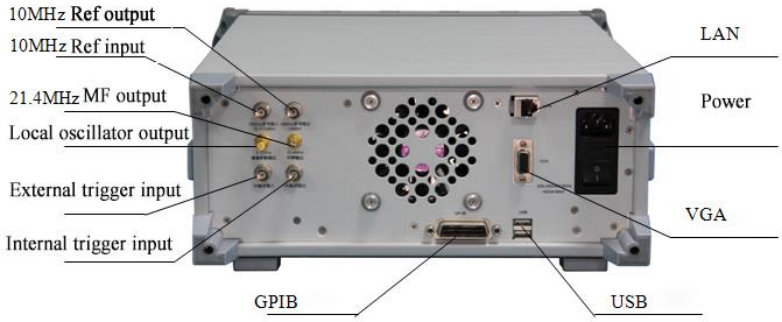
Multi-track simultaneous testing and flexible reading frequency standard

Support up to 6 tracks and 12 show the frequency scale. Support multiple users simultaneously activating tracks, and select a different video signal detection method for simultaneous testing. Its flexible frequency standard, enabling users on multiple tracks simultaneously activate multiple frequency standard, and support each other across the track frequency standard reference, relative parameter measurement.



Powerful interactive interface

In addition to basic time base and trigger interface, it also have USB, GPIB and LAN, three data communication interfaces to meet the transfer of data files and copy the programmable interconnect applications. VGA video interface provides a liquid crystal display synchronized to facilitate monitoring or presentation.



Typical Applications

Transmitter and oscillator source test

S3504M series spectrum analyzer can be used for testing frequency, power, spurious, harmonic distortion, phase noise, modulation indexes of all types of transmitter local oscillator, and the oscillator signal source in development, production and commissioning.

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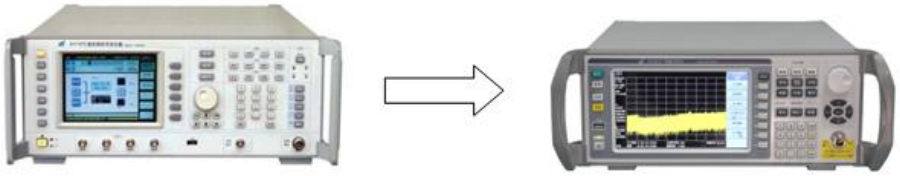
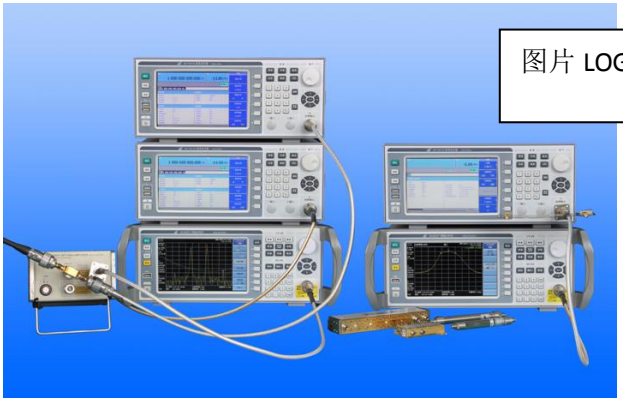


图片 LOGO

Components and parts Performance Testing



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In addition to conventional spectrum analyzer test applications, S3504M series spectrum analyzer with a synthetic source combinations, you can easily construct a large dynamic range scalar network test system, that can be used for testing the transmission parameters of gain, insertion loss, frequency response, bandwidth, harmonic distortion of filter, amplifiers, cables, connectors' components, it also can measure reflectance parameters with the bridge.

What's more, with two synthesized signal source used in combination, it can be used for testing parameters of gain compression and third-order intermodulation distortions for amplifiers, mixers and other active or non-member components.

Electronics production line testing and field maintenance

S3504M series spectrum analyzer, as high-end spectrum analyzer, with features of fast test speed, high precision, reading flexible, etc., is very suitable for the production line online test. Meanwhile, its lightweight, small size, low power consumption and high performance index made it suitable for fielding testing, too, particularly for on-site troubleshooting and maintenance applications.

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Construction of Automatic Test System
S3504M series spectrum analyzer has a powerful communication capability, in line with its programmed instruction set SCPI 1999.0 specification. Provide compliance with regulatory requirements and through VISA and IVI instrument driver library rigorous testing.

Technical Specifications

Frequency and Time					
Frequency Range	**S3504MA**	**S3504MB**	**S3504MC**	**S3504MD**	**S3504ME**
	9kHz- 3GHz	9kHz -6GHz	9kHz -13.2GHz	9kHz -18GHz	9kHz -26.5GHz
10MHz Frequency Reference	Aging Rate	±1ppm/year (After 30 days of continuous appliances)			
	Temp. Stability	±1ppm (0℃ - +50℃,With respect to + 25℃)			
Frequency Readout Accuracy	±(Frequency readout × frequency reference error + (0.5% + 1 / (sweep points-1)) + frequency bandwidth + 5% resolution bandwidth + 10Hz)				
Frequency Counting Accuracy and Resolution Counts	Count Accuracy: ± (frequency indication × frequency reference error + frequency count resolution + residual FM)				
	Count Resolution: 1Hz to 10kHz optional, step 10 times optional				
Sweep width	S3504MA	0Hz,100Hz - 3 GHz			
	S3504MB	0Hz,100Hz - 6 GHz			
	S3504MC	0Hz,100Hz - 13.2 GHz			
	S3504MD	0Hz,100Hz - 18 GHz			
	S3504ME	0Hz,100Hz - 26.5 GHz			
	Accuracy: ±(0.5% + 2/(Scan Points-1))× frequency bandwidth				
Scan Time	1us - 4000s (bandwidth = 0Hz); 1ms - 2000s (bandwidth ≥ 100Hz				
	Accuracy: ±1% (bandwidth = 0 Hz, Sweep Analysis)				
Trigger mode	Free, Single, Video, External				
Resolution Bandwidth	10Hz-5MHz,1, 2, 3, 5 Stepping				
	Accuracy: ±5% (1Hz-3MHz), ±20% (5MHz)				
	Conversion error: ±0.5dB				

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Video Bandwidth	1H -5MHz,1, 2, 3, 5 stepping, 50MHz		
Amplitude accuracy and Scope			
Reference Level	-150dBm - +30dBm, Minimum 0.01dB stepping (Stepping amount of 1% of the current display range)		
Reference Level Uncertainty	±0.3dB (10dB Input attenuation, 0--80dBm Reference level range conversion)		
Display scale fidelity	±0.5dB (-10dBm ≥ Mixer input signal level ≥ -90dBm)		
Frequency Response (10dB input attenuation, 20 - 30 ℃)	S3504MA & MB (Preamplifier off)	10MHz - 3GHz	±0.8dB
		3GHz - 6GHz	±1.0dB
	S3504MA & MB (Preamplifier on)	10MHz - 3GHz	±1.2dB
		3GHz - 6GHz	±1.5dB
	S3504MC & MD & ME	10MHz - 3.1GHz	±1.5dB
		3.1GHz - 6.5GHz	±2.0dB
		6.5GHz - 18GHz	±2.5dB
		18GHz - 26.5GHz	±4.0dB
Absolute Amplitude Accuracy of Measurement (50MHz, -25dBm)	±0.3dB		
Input Attenuator	S3504MA & MB	0-40dB,1dB stepping	
	S3504MC & MD & ME	0-70dB,10dB stepping	
	Conversion Uncertainty (50MHz,10dB input attenuation to the reference)		
	S3504MA & MB	±0.5dB	
	S3504MC & MD & ME	±(0.1dB+0.01dB × attenuator setting)	
RF input VSWR (Input attenuation ≥10dB)	S3504MA & MB (Preamplifier off)	50MHz - 4.8GHz	≤1.5:1
		4.8GHz - 6GHz	≤1.8:1
	S3504MC & MD & ME	50MHz - 6.5GHz	≤1.5:1
		6.5GHz - 13.2GHz	≤1.8:1
		13.2GHz - 26.5GHz	≤2.0:1
Maximum safe input level	CW power: +30dBm(1W) (≥10dB Input attenuation)		
	DC voltage: 0Vdc (DC coupling), ±50Vdc(AC coupling)		
Display scale	Logarithmic scale: 0.1, 0.2, 0.5dB/division and 1-20dB/division,1dB stepping, total 10 divisions		
	Linear Scale: 10 divisions		
	Amplitude units: dBm, dBmV, dBuV, Volts, Watts		

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Rectification	Conventionally, Positive peak, Negative peak, Average, Sampling		
Preamplifier Frequency Range	S3504MA	S3504MB	S3504MC & MD & ME
	100kHz - 3GHz	100kHz - 6GHz	Not Available
Dynamic Range			
1dB Gain Compression Point (Two-tone Test Method, the Mixer RF Input Signal Power)	S3504MA & MB	50MHz - 6GHz	>0dBm (Preamplifier off)
			>-15dBm (Preamplifier on)
	S3504MC&MD& ME	50MHz - 6.5GHz	> 0dBm
		6.5GHz - 13.2GHz	>-3dBm
		13.2GHz - 26.5GHz	>-5dBm
Displayed Average Noise Level (Input Terminated Matched Load, 0dB Input Attenuation, Sampling Detector)	S3504MA & MB	(10Hz RBW,1Hz VBW, Preamplifier off)	(10Hz RBW,1Hz VBW, Preamplifier On)
	100kHz - 1MHz	<-120dBm	<-135dBm
	1MHz - 10MHz	<-132dBm	<-145dBm
	10MHz - 3GHz	<-125dBm	<-141dBm
	3GHz - 6GHz	<-123dBm	<-140dBm
	S3504MC&MD&ME	(10Hz RBW,1Hz VBW)	
	1MHz - 10MHz	<-132dBm	
	10MHz - 3.1GHz	<-130dBm	
	3.1GHz - 6.5GHz	<-132dBm	
	6.5GHz - 13.2GHz	<-125dBm	
	13.2GHz - 18GHz	<-122dBm	
	18GHz - 26.5GHz	<-120dBm	
Second Harmonic Distortion (Tone signal input, 20 - 30 ℃)	S3504MA & MB	Second Harmonic Distortion (Tone signal input, 20 - 30 ℃)	
	10MHz - 200MHz	<-65dBc(Input mixer level -30dBm)	
	200MHz - 1.5GHz	<-80dBc(Input mixer level -30dBm)	
	1.5GHz - 3GHz	<-70dBc(Input mixer level -10dBm)	
	S3504MC&MD&ME	Second Harmonic Distortion (Tone signal input, 20 - 30 ℃)	
	10MHz - 1.55GHz	<-70dBc(Input mixer level -30dBm)	
	1.55GHz - 3.1GHz	<-80dBc(Input mixer level -10dBm)	
	>3.1GHz	<-100dBc(Input mixer level -10dBm)	

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Third-order Intermodulation Distortion, (Freq. interval ≥50kHz Dual-tone Signal Input Mixer Level -30dBm, 20 - 30 ℃)	S3504MA & MB	Third-order intermodulation distortion	
	100MHz - 3GHz	<-80dBc	
	3GHz - 6GHz	<-80dBc	
	S3504MC & MD & ME	Third-order intermodulation distortion	
	100MHz - 3.1GHz	<-80dBc	
	3.1GHz - 6.5GHz	<-80dBc	
	6.5GHz -13.2GHz	<-74dBc	
	13.2GHz - 26.5GHz	<-74dBc	
Enter The Relevant Spurious Response (Tone Signals Input Mixer Level -10dBm)	Band response (from the carrier> 30kHz)	Band response:	
	<-60dBc	<-80dBc	
The Remaining Response (RF Input Match, 0dB Input Attenuation)	S3504MA & MB	S3504MC & MD & ME	
	Preamplifier off: < -90dBm	< -90dBm	
	Preamplifier on: < -105dBm		
	Exceptions frequency: 2.9572GHz, 3.6GHz, 4.1572GHz, 6GHz		
Noise Sidebands (Center Frequency 1GHz)	Low Phase Noise Option of S3504M Series	Offset>1kHz	≤-90dBc/Hz
		Offset>10kHz	≤-105dBc/Hz
		Offset>100kHz	≤-110dBc/Hz
	Standard package of S3504M Series	Offset＞10kHz	≤-90dBc/Hz
		Offset＞30kHz	≤-100dBc/Hz
		Offset＞100kHz	≤-110dBc/Hz
Residual FM	1kHz resolution bandwidth, 1kHz video bandwidth, 100ms peak to peak)		
	≤ 100Hz×N (N is the number of harmonic mixing)		

General Information

Power Supply	50Hz single-phase AC power supply, rated voltage 220V. Steady state voltage range: nominal ± 10%. Steady state frequency permissible range: nominal ± 5%	
Power	S3504MA & MB	<100W
	S3504MC & MD & ME	<150W

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Working Temp.	0℃ - +50℃
Storage Temp.	Storage: -40℃ - +70℃
Security	Comply with Rule 3.10 of GJB 3947A-2009
Electromagnetic Compatibility	Comply with Rule 3.9 of GJB 3947A-2009
Input Interface	N(F), impedance 50Ω
Weight	S3504MA & B : approx. 11.5 kg
	S3504MC & MD & ME: approx.12 .5kg
Dimension	Without handle, corner, side belts: 320 mm×133 mm×400 mm (W×H×D)
	With handle, corner, side belts: 393 mm×144 mm×465 mm (W×H×D)

Ordering Information

Main Machine

Part No.	Frequency Range
S3504MA	9kHz - 3GHz
S3504MB	9kHz - 6GHz
S3504MC	9kHz - 13.2GHz
S3504MD	9kHz - 18GHz
S3504ME	9kHz - 26.5GHz

Standard Package

Item	Name	Qty
1	Power Cord (standard 10A , three-wire power cord)	1 Set
2	User Manual	1 PC
3	Programmable Manual	1 PC
4	Product Quality Certificate	1 PC

Optional Package

Item	Name	Function
S3504-S01	FFT Analysis	Support FFT analysis mode, to achieve the narrowest resolution bandwidth of 1Hz to improve measurement speed of narrow resolution bandwidth

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S3504-H01	Low Phase Noise	Optimization of the local oscillator phase noise and residual FM proximal performance
S3504-H02	Precision Frequency Reference	The machine provides high stability frequency reference signal, the frequency accuracy of the measurement data can be an order of magnitude
S3504-H03	Internal Preamplifier	Significant improvement in overall noise figure of the receive channel, amplitude measurement sensitivity can be increased by about 15dB

Option adaptation information table for S3504 Series

Part No.	FFT Analysis Option	Low Phase Noise Option	Precision Frequency Reference Option	Internal Preamplifier Option
S3504MA	Optional	Optional	Optional	Optional
S3504MB	Optional	Optional	Optional	Optional
S3504MC	Optional	Optional	Optional	N/A
S3504MD	Optional	Optional	Optional	N/A
S3504ME	Optional	Optional	Optional	N/A

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

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