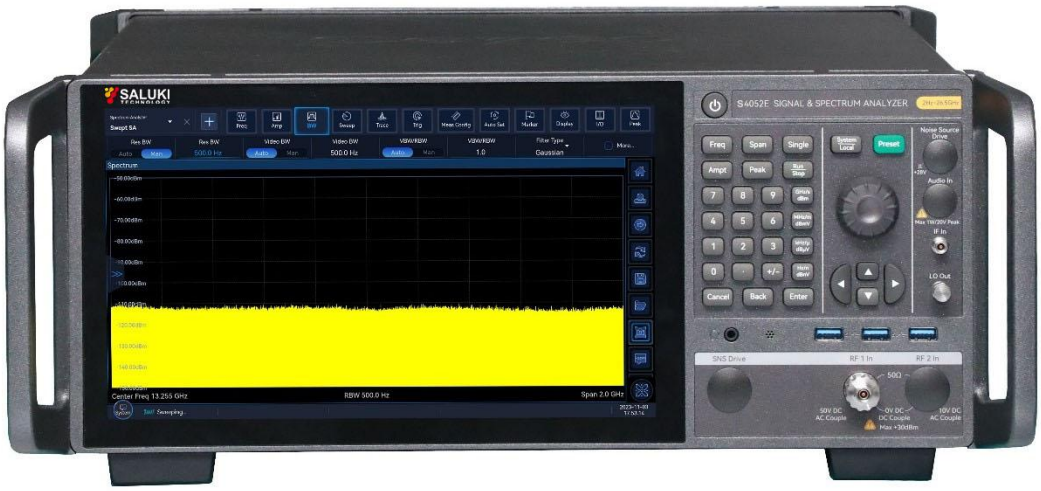
SALUKI TECHNOLOGY

S4052 Series

Signal/Spectrum Analyzer

S4052A/B/C/D/E/F/G/H

(2Hz – 4/8/13.6/18/26.5/40/45/50GHz)



Saluki Technology Inc.

Product Overview

S4052 series signal/spectrum analyzer is a new mid-range series of signal analyzers launched by Saluki Technology. The analyzer has excellent test dynamic range, phase noise, amplitude accuracy and measurement speed, and has rich test functions such as spectrum analysis, I/Q analysis, real-time spectrum analysis, transient analysis, vector signal analysis, pulse analysis, and audio analysis functions.

As a multifunctional general-purpose signal and spectrum analyzer, Saluki S4052 has good expansion capability and can build a test system or carry out secondary development through a variety of digital and analog output interfaces. With the perfect match of superior performance and flexible applications, it can meet your testing needs for rapid production of signals and equipment in wireless communications, automotive electronics, low-orbit satellites, Internet of Things, aerospace and defense and other fields.

Main Features

- Coaxial frequency coverage: 2Hz to 50GHz
- Amplitude range (Max): + 30 dBm
- Maximum 1.2GHz analysis bandwidth, optional analysis bandwidth from 10MHz to 1.2GHz
- Excellent phase noise performance: -120dBc/Hz at 1GHz carrier @10kHz offset
- 10 Gigabit network interface
- Full bandwidth of real-time recording and playback
- Powerful mobile communication, radar, satellite signal analysis function

First-class Spectrum Performance and Characteristics

Saluki S4052 has excellent test dynamic range, phase noise, amplitude accuracy and fast test speed.

Ultra-wide Frequency Coverage

The measurement frequency range ranges from 2Hz to 50GHz, with 8 optional frequency band configurations, meeting the test requirements from low frequency to millimeter wave requirements.

Excellent Phase Noise Performance

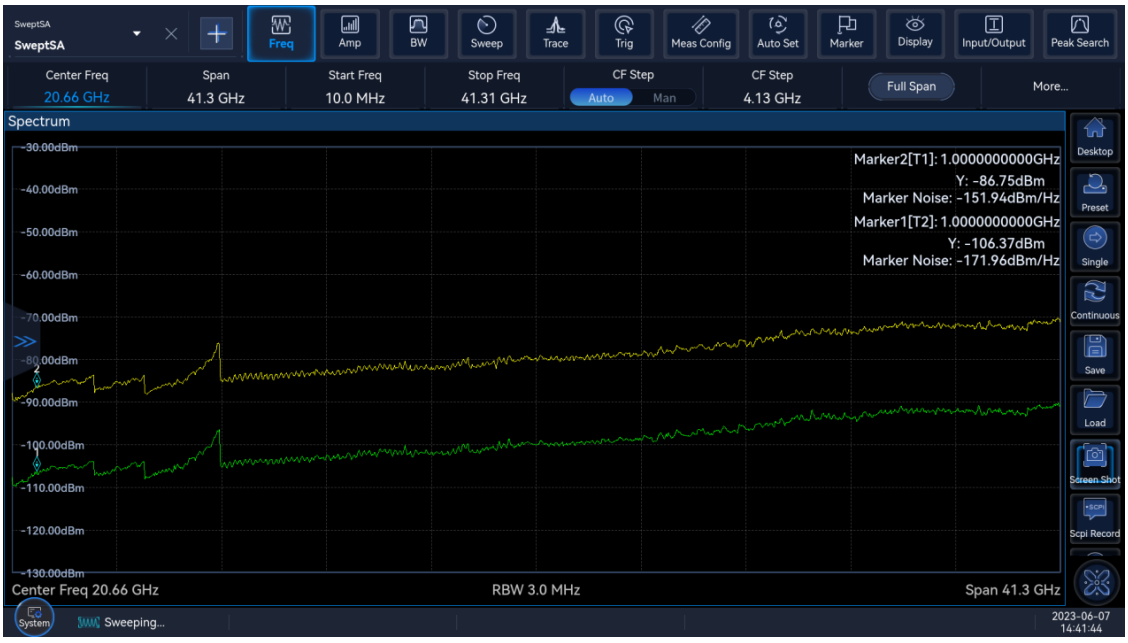
With excellent phase noise performance, it can meet the extreme requirements of users in radar and communication signal measurement. Under the condition of 1GHz carrier and 10kHz frequency offset, the phase noise is better than -120dBc/Hz.

Outstanding DANL Specification

The displayed average noise level at 1GHz is -154dBm/Hz, it can reach -165dBm/Hz after configuring the preamplifier, and it can reach -172dBm/Hz after the noise cancellation function is turned on.

High Precision Amplitude Measurement Error

With excellent amplitude measurement accuracy, the signal amplitude measurement accuracy in the frequency band below 8GHz is better than ±0.5dB.



DANL Specification with Pre-amplifier ON or OFF

1.2GHz Analysis Bandwidth

Saluki S4052 has an instantaneous analysis bandwidth of 1.2GHz, and provides 6 options from 10MHz (standard) to 1.2GHz (optional) to meet the application requirements of different test scenarios.

Multiple Analysis Bandwidth Configuration Options

Provide a total of 6 bandwidth configuration options of 10MHz/ 40MHz/ 200MHz/ 400MHz/ 600MHz/ 1.2GHz to meet flexible configuration in different test application scenarios such as broadband radar, 5G NR, and WLAN.

Superior Spurious Free Dynamic Range

The spurious-free dynamic range under the 200MHz analysis bandwidth is -75dBc, and the spurious-free dynamic range under the 1.2GHz analysis bandwidth is -65dBc.

1.2GHz Analysis Bandwidth Measurement

Comprehensive wireless communication protocol analysis capabilities

The mobile communication protocol analysis option of Saluki S4052 can quickly and intuitively test the signal characteristics of various wireless communication standards such as 5G NR, LTE, NB-IoT, WCDMA, and GSM.

5G NR Signal Analysis

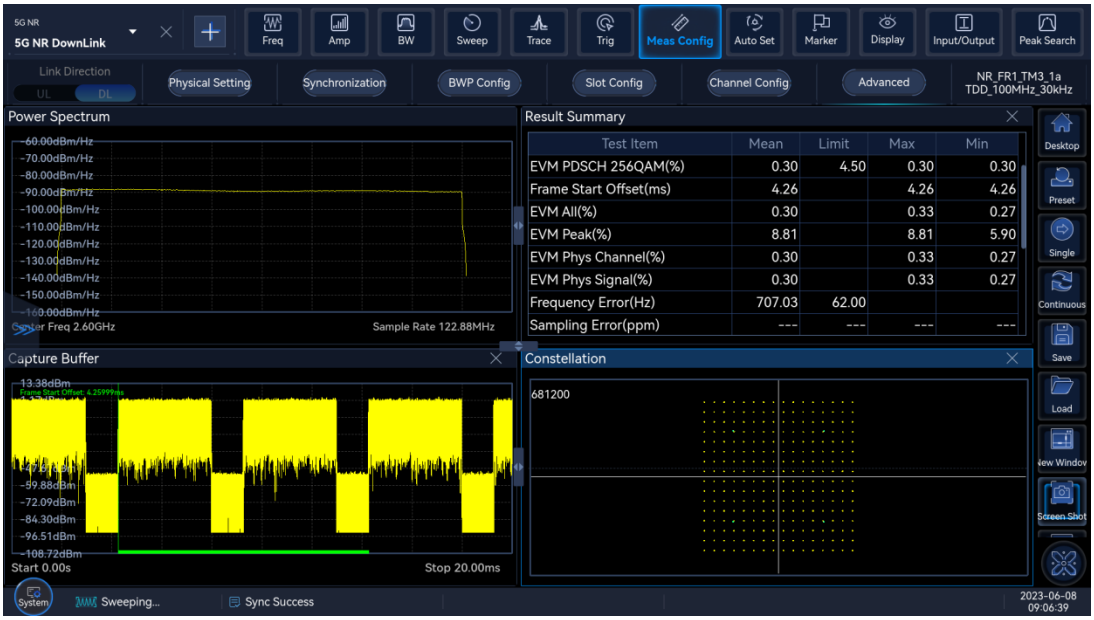
The 5G NR measurement function can perform in-band demodulation analysis of 5G NR uplink and downlink signals of 3GPP Rel 15 and Rel 16 versions, supports FDD and TDD duplex modes, supports QPSK to 256QAM modulation formats, supports Test Model and custom Parameter setting, support to provide measurement results such as error vector magnitude (EVM), frequency error and power of different channels and signals, with constellation diagram, error summary table, resource allocation and other display maps.

LTE, NB-IoT, WCDMA, GSM Signal Analysis

With Saluki's dedicated protocol analysis software, in-band modulation analysis can be performed on LTE, LTE-Advanced, NB-IoT, WCDMA, GSM, EDGE communication signals, providing a variety of measurement results such as EVM, constellation diagram, and frequency error.

Analysis of Out-of-Band Characteristics of Wireless Communication Signals

In terms of out-of-band measurement, it can provide a wide range of standard and limit line one-key setting capabilities, and efficiently perform adjacent channel leakage ratio (ACLR), spectrum emission mask (SEM) and other measurements.



5G NR Signal Analysis Measurement

Powerful Real-time Spectrum Analysis Function

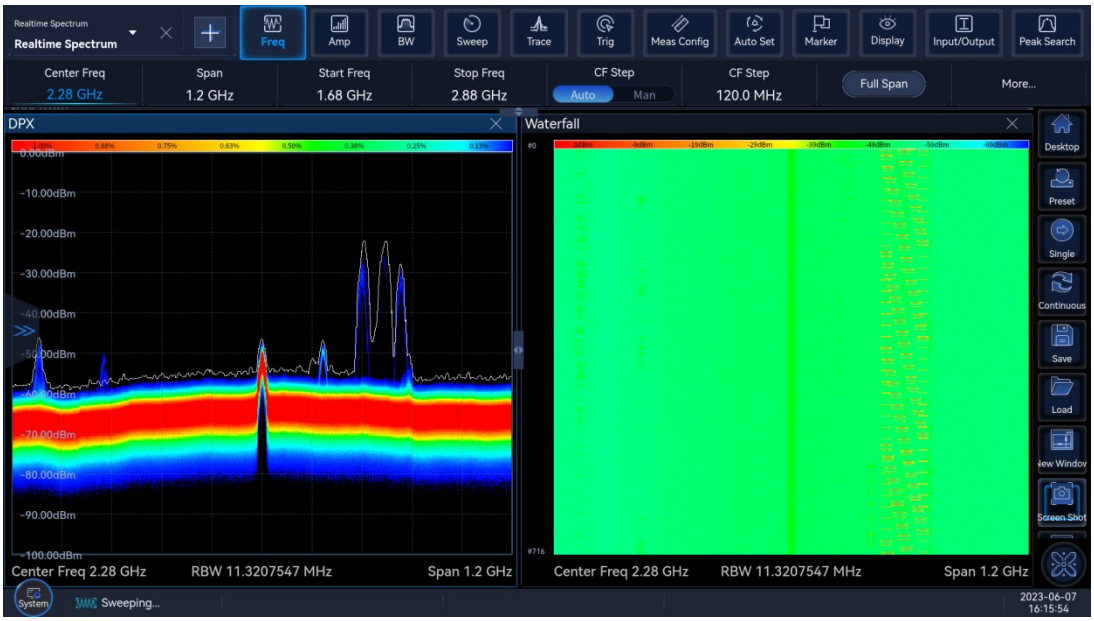
The real-time spectrum analysis function is an excellent test tool for time-varying signals such as bursty, agile, and frequency-hopping signals.

Burst Signal Capture

The real-time spectrum analysis function supports the discovery of transient and burst interference signals, the triggering and interception of transient signal data, and the time-domain and frequency-domain analysis of transient signal events.

Powerful High Bandwidth Realtime Processing Performance

The real-time analysis bandwidth is up to 400MHz, the 100% frequency domain intercepted signal duration is less than 0.6us, the time domain intercepted signal duration is less than 2ns, and the spectrum processing speed is as high as 1500000 times/second.



Real-time Spectrum Analysis Measurement

Full bandwidth data real-time recording and playback

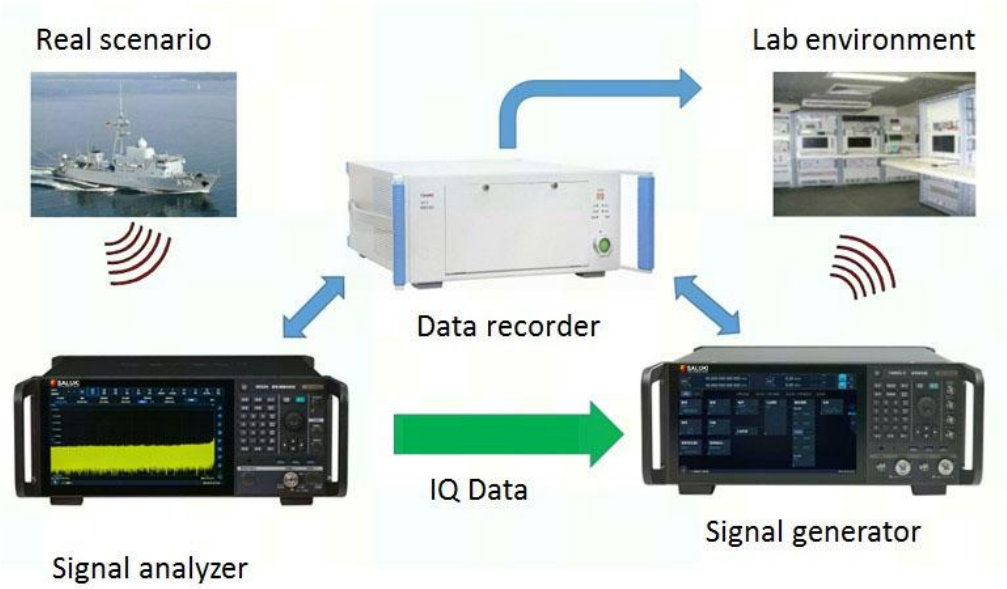
Real-time analysis of complex electromagnetic environments is extremely difficult. Long-term seamless recording of surrounding electromagnetic signals such as battlefields and positions and laboratory analysis are urgent needs of national defense users.

Superior RF Performance

As a signal and spectrum analyzer with excellent performance, as the receiving front end of RF acquisition and recording, it has large dynamic range, low distortion, and high sensitivity. Combined with the powerful analysis function of Saluki S4052, it can also provide functions such as search, analysis and playback of complex signals.

Record and Playback

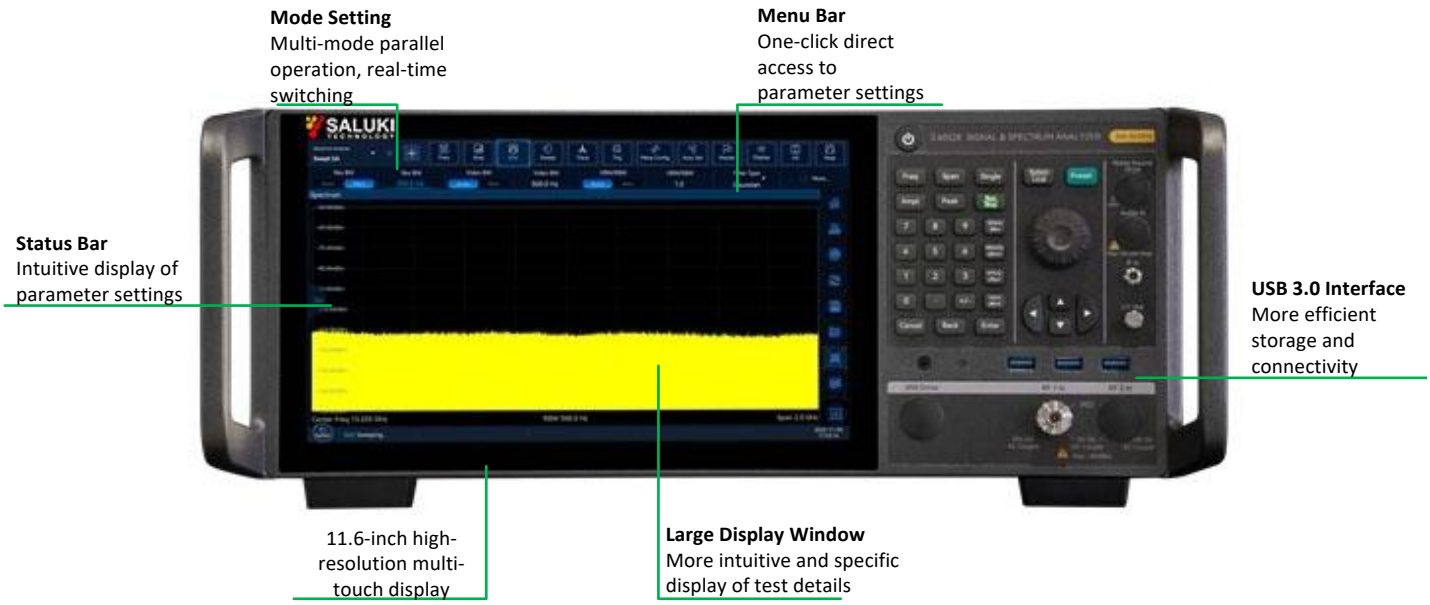
The recording signal bandwidth is up to 1200MHz, with the function of starting and stopping the acquisition, and the real-time preview analysis of the spectrum analysis mode.



Data record and playback solution

Advanced user interface, new interactive experience

Saluki S4052 adopts an 11.6-inch touch screen, and the test details are displayed more comprehensively and intuitively. The parameter setting menu is concise, one-key direct parameter setting. Parallel operation and display of multiple measurement modes, convenient and efficient mode switching.



Easy Interface Configuration

Saluki S4052 faces potential applications in the future, and is configured with 10 Gigabit network control interfaces, optical fiber interfaces with 1.2GHz bandwidth and other interfaces to meet various digital transformation challenges.

10 Gigabit Network Control Interface

Configure 10 Gigabit network interface to provide you with higher bandwidth, faster speed and more stable data transmission.

1.2GHz Bandwidth Fiber Interface

Equipped with 1.2GHz ultra-wideband digital interface, it can realize real-time broadband data acquisition and output with 1.2GHz bandwidth.

4TB built-in Electronic Hard Drive

Built-in 4TB electronic hard disk (optional) provides convenience for mass data storage during measurement.

Technical Specification

<table>
<tr><td>Frequency range</td><td>
<table>
<tr><th>Model</th><th>DC coupled</th><th>AC coupled</th></tr>
<tr><td>S4052A</td><td>2Hz to 4GHz</td><td>10MHz to 4GHz</td></tr>
<tr><td>S4052B</td><td>2Hz to 9GHz</td><td>10MHz to 8GHz</td></tr>
<tr><td>S4052C</td><td>2Hz to 13.2GHz</td><td>10MHz to 13.6GHz</td></tr>
<tr><td>S4052D</td><td>2Hz to 18GHz</td><td>10MHz to 18GHz</td></tr>
<tr><td>S4052E</td><td>2Hz to 26.5GHz</td><td>10MHz to 26.5GHz</td></tr>
<tr><td>S4052F</td><td>2Hz to 40GHz</td><td>10MHz to 40GHz</td></tr>
<tr><td>S4052G</td><td>2Hz to 45GHz</td><td>10MHz to 45GHz</td></tr>
<tr><td>S4052H</td><td>2Hz to 50GHz</td><td>10MHz to 50GHz</td></tr>
</table>
</td></tr>
<tr><td>10 MHz
Precise frequency reference</td><td>Frequency accuracy:
± (last calibration date × aging rate + temperature stability + calibration accuracy)
Aging rate: ±5 × 10-10/day
Temperature stability: ± 1.5×10-8(20°C ~ 30°C) ± 5×10-8(0°C ~ 50°C)
Calibration accuracy: ± 4×10-8</td></tr>
<tr><td>Frequency readout accuracy</td><td>± (frequency readout × frequency reference accuracy+0.1% frequency band+5% resolution bandwidth+2Hz+0.5 horizontal resolution*)
*: horizontal resolution = span/ (sweep points – 1)</td></tr>
<tr><td>Frequency counting accuracy</td><td>± (frequency readout × frequency reference accuracy+0.1Hz)</td></tr>
<tr><td>Span</td><td>Range: 0Hz (zero frequency span),10Hz to the highest frequency of the model
Accuracy: ± (0.1%× Frequency span+ Frequency span/ (sweep points-1))</td></tr>
<tr><td>Sweep time range</td><td>Frequency span ≥10Hz: 1ms to 16000s
Frequency span =0Hz: 1us to 16000s</td></tr>
<tr><td>Resolution bandwidth</td><td>Range: 0.1Hz to 20MHz (1,2,3,5 steps)
Conversion uncertainty: ±0.10dB 1Hz to 1 MHz (1,2,3,5 steps)
±0.30dB 5MHz to 20 MHz (1,2,3,5 steps)</td></tr>
<tr><td>Analysis bandwidth</td><td>Standard: 10MHz
OptionH38-40: 40MHz
OptionH38-200: 200MHz
OptionH38-400: 400MHz
OptionH38-600: 600MHz
OptionH38-1200: 1.2GHz</td></tr>
</table>

<table>
<tr><td>Video bandwidth</td><td>1Hz to 20MHz (1,2,3,5 steps)</td></tr>
<tr><td>Trigger source</td><td>Free, Line, video, external level (front panel), external level (back panel), burst RF, timer</td></tr>
<tr><td>Trace detector</td><td>Normal, positive peak, negative peak, sample, video average, power average, voltage average</td></tr>
<tr><td>SSB phase noise (1GHz carrier,20°C ~ 30°C)</td><td>Frequency offset — Specification
100Hz — -95dBc/Hz
1kHz — -112dBc/Hz
10kHz — -122dBc/Hz
100kHz — -122dBc/Hz
1MHz — -135dBc/Hz</td></tr>
<tr><td>Residual FM</td><td>≤(0.25 Hz x N) p-p, (10Hz resolution bandwidth, 10Hz video bandwidth, the rated value within 20ms
N is the number of frequency multiple times of LO)</td></tr>
<tr><td>Displayed average noise level (the input end is connected to match load, sample or average wave detection, the average type is logarithm, 0dBinput attenuation, RF gain takes the DANL as the priority, 20°C ~ 30°C)</td><td>
S4052A/B With preamplifier(OFF)
<table>
<tr><th>Frequency range</th><th>Specification</th><th>Typical</th></tr>
<tr><td>10MHz to 1GHz</td><td>-151dBm</td><td>-154dBm</td></tr>
<tr><td>1GHz to 2GHz</td><td>-149dBm</td><td>-154dBm</td></tr>
<tr><td>2GHz to 3GHz</td><td>-148dBm</td><td>-151dBm</td></tr>
<tr><td>3GHz to 4GHz</td><td>-144dBm</td><td>-148dBm</td></tr>
<tr><td>4GHz to 6GHz</td><td>-147dBm</td><td>-150dBm</td></tr>
<tr><td>6GHz to 8GHz</td><td>-145dBm</td><td>-149dBm</td></tr>
</table>
S4052A/B With preamplifier(ON)
<table>
<tr><th>Frequency range</th><th>Specification</th><th>Typical(H34A-XX)</th><th>Typical(H34-XX)</th></tr>
<tr><td>10MHz to 50MHz</td><td>-156dBm</td><td>-160dBm</td><td>-160dBm</td></tr>
<tr><td>50MHz to 4GHz</td><td>-161dBm</td><td>-164dBm</td><td>-164dBm</td></tr>
<tr><td>4GHz to 6GHz</td><td>-161dBm</td><td>-164dBm</td><td>-165dBm</td></tr>
<tr><td>6GHz to 8GHz</td><td>-157dBm</td><td>-160dBm</td><td>-163dBm</td></tr>
</table>
S4052C/D/E/F/G/H With preamplifier(OFF)
<table>
<tr><th>Frequency range</th><th>Specification</th><th>Typical</th></tr>
<tr><td>10MHz to 1GHz</td><td>-149dBm</td><td>-153dBm</td></tr>
<tr><td>1GHz to 2GHz</td><td>-147dBm</td><td>-152dBm</td></tr>
<tr><td>2GHz to 3GHz</td><td>-146dBm</td><td>-149dBm</td></tr>
<tr><td>3GHz to 4GHz</td><td>-141dBm</td><td>-146dBm</td></tr>
<tr><td>4GHz to 6GHz</td><td>-142dBm</td><td>-147dBm</td></tr>
<tr><td>6GHz to 8GHz</td><td>-139dBm</td><td>-143dBm</td></tr>
</table>
</td></tr>
</table>

	8GHz to 18GHz -145dBm -148dBm 18GHz to 26.5GHz -141dBm -144dBm 26.5GHz to 40GHz -135dBm -140dBm 40GHz to 45GHz -134dBm -139dBm 45GHz to 50GHz -130dBm -136dBm **S4052C/D/E/F/G/H With preamplifier(ON)** **Frequency range Specification Typical(S4052-H34-XX)** 10MHz to 50MHz -156dBm -160dBm 50MHz to 4GHz -161dBm -164dBm 4GHz to 6GHz -161dBm -165dBm 6GHz to 8GHz -157dBm -163dBm 8GHz to 18GHz -157dBm -160dBm 18GHz to 26.5GHz -154dBm -158dBm 26.5GHz to 40GHz -151dBm -157dBm 45GHz to 50GHz -148dBm -154dBm
Frequency response & absolute amplitude accuracy (10dB attenuation, 20°C ~ 30°C)	**Frequency range With preamplifier(OFF) Specification** 10MHz to 4GHz ±0.40dB 4GHz to 8GHz ±0.50dB 8GHz to 18GHz ±1.50dB 18GHz to 26.5GHz ±2.00dB 26.5GHz to 45GHz ±2.50dB 45GHz to 50GHz ±3.00dB **Frequency range With preamplifier(ON) Specification** 10MHz to 4GHz ±1.00dB 4GHz to 8GHz ±1.50dB 8GHz to 18GHz ±2.50dB 18GHz to 45GHz ±3.00dB 45GHz to 50GHz ±3.50dB
	Absolute amplitude accuracy (10 dB attenuation, 20°C ~ 30°C, 1 Hz ≤resolution bandwidth≤ 1 MHz, input signal -10 to -50 dBm): ±0.24dB 500MHz ± (0.24dB+frequency response) all frequency except 500MHz frequency point
1dB gain compression (mixer level, dual-tone test, resolution bandwidth is	**Frequency range Specification** 10MHz to 100MHz 0dBm 100MHz to 1GHz 0dBm

5kHz, 3MHz frequency interval, 20°C ~ 30°C)	1GHz to 8GHz +5dBm 8GHz to 50GHz +5dBm
TOI distortion (input mixer 2 -10dBm signal test, frequency interval is 50kHz, 20°C ~ 30°C)	**Frequency range** **Specification** 10MHz to 200MHz +12dBm 200MHz to 4GHz +17dBm 4GHz to 8GHz +16dBm 8GHz to 50GHz +18dBm
Residual response (the input end is connected to match load, 0dB attenuation)	-90dBm 200kHz to 8GHz
Amplitude range(Max.)	+30dBm
IQ Data	Memory depth (IQ length): Analysis bandwidth≤40MHz: 500M IQ samples IQ bits length: 32 bits I, 32 bits Q Analysis bandwidth>40MHz: 1000M IQ samples IQ bits length: 32 bit I,32 bit Q
Dimensions	W (mm)×H (mm)×D (mm): (426±4)mm × (177±4)mm × (450±4)mm (excluding handle, foot-pad, bottom feet)
Weight	About 23kg (different configuration have different weights)
Power supply	Standard: AC 110~240V: 50~60Hz
Power consumption	Maximum 300W(Standard), 450W(H38/H41 or Real-time Option)
Temperature range	Operating temperature: 0°C ~ +50°C Storage temperature: -40°C ~ +70°C

Notes:

1. Rated values refer to the estimated performance, or the performance which is useful for the product beyond the warrant range.
2. Typical value refers to other performance information beyond the product guarantee range; when the performance is over the technical index, 80% of the samples will present 95% confidence within 20°C ~ 30°C temperature range; typical performance excludes test uncertainty.

Ording Information

- **Mainframe:**

Model	Description	Frequency range
S4052A	Signal/Spectrum Analyzer	2Hz to 4GHz
S4052B	Signal/Spectrum Analyzer	2Hz to 8GHz
S4052C	Signal/Spectrum Analyzer	2Hz to 13.6GHz
S4052D	Signal/Spectrum Analyzer	2Hz to 18GHz
S4052E	Signal/Spectrum Analyzer	2Hz to 26.5GHz
S4052F	Signal/Spectrum Analyzer	2Hz to 40GHz
S4052G	Signal/Spectrum Analyzer	2Hz to 45GHz
S4052H	Signal/Spectrum Analyzer	2Hz to 50GHz

- **Option:**

No.	Description	Functions
S4052-H02	Auxiliary High IF output	Output second IF signal, the frequency is 425MHz,750MHz,1.5GHz
S4052-H08	Wideband Log detection signal output	Output a logarithmic detection signal reflecting the level characteristics of the input signal
S4052-H11	10 Gigabit Ethernet Control and Data Interface	Optical fiber based 10 gigabit network interface
S4052-H17-E	Enhanced processor(CPU)	Update to I7 series processor
S4052-H19-2T	Local memory expansion	Supports up to 2TB storage memory (electronic hard disk)
S4052-H19-4T	Local memory expansion	Supports up to 4TB storage memory (electronic hard disk)
S4052-H33-08	Electronic attenuator	Frequency range: 9kHz to 8GHz,attenuation range: 30dB,in 0.5dB steps
S4052-H34-04	Low-noise preamplifier	The preamplifier is selected according to the frequency upper limit of the signal analyzer Example: S4052A frequency upper limit is 4GHz,Pre-amplifier need to select option H34-04
S4052-H34-08	Low-noise preamplifier	The preamplifier is selected according to the frequency upper limit of the signal analyzer Example: S4052B frequency upper limit is 8.4GHz,Pre-

		amplifier need to select option H34-08
S4052-H34-13	Low-noise preamplifier	The preamplifier is selected according to the frequency upper limit of the signal analyzer. Example: S4052C frequency upper limit is 13.2GHz,Pre-amplifier need to select option H34-13.
S4052-H34-18	Low-noise preamplifier	The preamplifier is selected according to the frequency upper limit of the signal analyzer. Example: S4052D frequency upper limit is 18GHz,Pre-amplifier need to select option H34-18.
S4052-H34-26	Low-noise preamplifier	The preamplifier is selected according to the frequency upper limit of the signal analyzer. Example: S4052E frequency upper limit is 26.5GHz, Pre-amplifier need to select option H34-26.
S4052-H34-40	Low-noise preamplifier	The preamplifier is selected according to the frequency upper limit of the signal analyzer. Example: S4052F frequency upper limit is 40GHz,Pre-amplifier need to select option H34-40.
S4052-H34-45	Low-noise preamplifier	The preamplifier is selected according to the frequency upper limit of the signal analyzer. Example: S4052G frequency upper limit is 45GHz,Pre-amplifier need to select option H34-45.
S4052-H34-50	Low-noise preamplifier	The preamplifier is selected according to the frequency upper limit of the signal analyzer. Example: S4052H frequency upper limit is 50GHz,Pre-amplifier need to select option H34-50.
S4052-H34A-04	Low-noise preamplifier	Only S4052A mainframe can be configured, and S4052-H34-04 is not optional at the same time.
S4052-H34A-08	Low-noise preamplifier	Only S4052B mainframe can be configured, and S4052-H34-08 is not optional at the same time.
S4052-H36	Pre-selector Bypass	The tracking pre-selector in the bypass receiving channel.
S4052-H38-40	40MHz Analysis bandwidth	Support 10Hz to 40MHz Analysis bandwidth
S4052-H38-200	200MHz Analysis bandwidth	Support10Hz to 200MHz Analysis bandwidth
S4052-H38-400	400MHz Analysis bandwidth	Support10Hz to 400MHz Analysis bandwidth
S4052-H38-600	600MHz Analysis bandwidth	Support10Hz to 600MHz Analysis bandwidth
S4052-H38-1200	1.2GHz Analysis bandwidth	Support10Hz to 1.2GHz Analysis bandwidth
S4052-H39	Audio analyzer	Audio signal parameters test, distortion test and waveform analysis
S4052-H40	External frequency extender	To extend the frequency range using external frequency mixing method. This option provides LO output and IF input, as well as signal recognition ability. (Notes: this option can be selected when the main unit is not S4052A and S4052B: the extended frequency range depends on the selected extension modules; the frequency extension module needs to buy additionally)

S4052-H41-200	Real-time spectrum analysis	This option provides digital phosphor spectrum and seamless waterfall, including frequency template trigger, which can support real-time spectrum analysis of 200MHz bandwidth.
S4052-H41-400	Real-time spectrum analysis	This option provides digital phosphor spectrum and seamless waterfall, including frequency template trigger, which can support real-time spectrum analysis of 400MHz bandwidth.
S4052-H48	Noise figure analysis	Provide noise source drive and noise figure measurement function. S4052N/P only support maximum 67GHz noise figure measurement.(note: the option need to select low-noise pre-amplifier option and corresponding 1660X noise source to finish the noise figure measurement. This Option and H39 audio analysis cannot be selected simultaneously)
S4052-H96	User manual (paper publication)	Provide a detailed user manual in hard copy
S4052-H97	Mounting rack	handles and accessories for S4052 mounting on standard racks
S4052-H98	English Option	English panel, English manual, English operation interface and English operating system
S4052-H99-1	Aluminum transportation case	High-strength lightweight aluminum transportation case, with handle and roller, convenient for transportation
S4052-H99-2	Plastic safety rod pulley packing case	High strength plastic safety tie rod with wheel packing box, with handle and roller, easy to transport.
S4052-S01	Absolute Power Measurement	The RF signal power is measured with high precision by means of an external USB power sensor. (The corresponding S8723X series power sensor is required.)
S4052-S02	Noise power ratio Measurement	Provide noise power ratio parameters measurement
S4052-S04	Phase noise measurement	SSB phase noise curves and single-point phase noise measurement
S4052-S05	EMC Pre-Compliance	Provide EMC pre-compliance measurement function
S4052-S09	Analog Demodulation Option	The modulation characteristics and distortion characteristics of AM, FM and ΦM signals are analyzed
S4052-S10	Transient analyzer	To realize the measurement & analysis of transient parameters, spectrum, and time-varying characteristics of signals, support playback of the recorded data.
S4052-S10H	Frequency hopping signal analysis	Provides automatic measurement of frequency hopping signal residence time, switching time, frequency and error characteristics. (S10 option required).
S4052-S10F	FMCW Signal Analysis	Provides automatic measurement of FMCW signal slope, deviation, power and other characteristics. (S10 option required)
S4052-S12	Vector signal analyzer	This option provides flexible demodulation functions of multiple single-carrier digital modulation signals. It can provide vector charts, constellation diagrams, eye diagrams, spectrum diagrams, etc., to analyze the characteristics of the modulation signal. The modulation error of the signal can be obtained by demodulation, which helps to judge the cause of the signal error.

S4052-S13	Pulse signal analyzer	Automatic measurement on time, level and modulation parameters of pulse waveform and statistical analysis of pulse sequence
S4052-S16	Multicarrier group delay measurement	Provides absolute and relative group delay measurement capability for wideband signals
S4052-S40	WLAN 802.11a/b/g measurement	Broadband wireless local area network protocol physical layer test (802.11a/ b/g), covering radio frequency, modulation analysis, and modulation quality testing.
S4052-S40N	WLAN 802.11n measurement	Broadband wireless local area network protocol physical layer test (802.11n), covering radio frequency, modulation analysis, and modulation quality testing.
S4052-S40AC	WLAN 802.11ac measurement	Broadband wireless local area network protocol physical layer test (802.11ac), covering radio frequency, modulation analysis, and modulation quality testing.
S4052-S40AX	WLAN 802.11ax measurement	Broadband wireless local area network protocol physical layer test (802.11ax), covering radio frequency, modulation analysis, and modulation quality testing.
S4052-S41D	LTE/LTE-A : TDD downlink signal analysis	support downlink signal modulation analysis; support modulation analysis of each subframe configuration type of TDD; support custom parameter configuration modulation analysis; support downlink E-TM mask modulation analysis; support EVM, switching power, frequency error, power and other parameter measurements; provides view outputs such as capture storage, power spectral density, constellation diagrams, result summary tables, EVM vs. carriers, and more.
S4052-S41U	LTE/LTE-A: TDD uplink signal analysis	support upstream signal modulation analysis, support custom parameter configuration modulation analysis; support EVM, frequency error, power and other parameter measurements; provides view outputs such as capture storage, power spectral density, constellation diagrams, result summary tables, EVM vs. carriers, and more.
S4052-S42D	LTE/LTE-A: FDD downlink signal analysis	support downlink signal modulation analysis; support custom parameter configuration modulation analysis; support downlink E-TM mask modulation analysis; support EVM, frequency error, power and other parameter measurements; provides view outputs such as capture storage, power spectral density, constellation diagrams, result summary tables, EVM vs. carriers, and more.
S4052-S42U	LTE/LTE-A FDD uplink signal analysis	support uplink signal modulation analysis; support custom parameter configuration modulation analysis; support EVM, frequency error, power and other parameter measurements; provides view outputs such as capture storage, power spectral density, constellation diagrams, result summary tables, EVM vs. carriers, and more.
S4052-S46D	5G NR Downlink signal measurement	Support 5G NR Downlink signal demodulation, EVM, spectrum flatness, time alignment error; Support ACP, spectrum emission template, transmit on/off, CCDF and other power measurement; Support multiple bandwidth and multiple TM.

S4052-S46U	5G NR Uplink signal measurement	Support 5G NR UPlink signal demodulation, EVM, spectrum flatness, time alignment error; Support ACP, spectrum emission template, transmit on/off, CCDF and other power measurement; Support multiple bandwidth and multiple TM.

- **USB Power Sensor Option(Requires S4052-S01 option):**

Model	Frequency Range
S87230 USB CW Power Sensor	9kHz ~ 6GHz Power Sensor
S87231 USB CW Power Sensor	10MHz ~ 18GHz Power Sensor
S87232 USB CW Power Sensor	50MHz ~ 26.5GHz Power Sensor
S87233 USB CW Power Sensor	50MHz ~ 40GHz Power Sensor

- **Spectrum Frequency Extender Modules (Requires S4052-H40 option):**

Model	Frequency Range
S82407NA Spectrum Analyzer Extender	50GHz ~ 75GHz
S82407NC Spectrum Analyzer Extender	60GHz ~ 90GHz
S82407PA Spectrum Analyzer Extender	75GHz ~ 110GHz
S82407QA Spectrum Analyzer Extender	90GHz ~ 140GHz
S82407QB Spectrum Analyzer Extender	110GHz ~ 170GHz
S82407RA Spectrum Analyzer Extender	140GHz ~ 220GHz
S82407SA Spectrum Analyzer Extender	170GHz ~ 260GHz
S82407S Spectrum Analyzer Extender	220GHz ~ 325GHz
S82407TA Spectrum Analyzer Extender	260GHz ~ 400GHz
S82407R Spectrum Analyzer Extender	325GHz ~ 500GHz
S82407U Spectrum Analyzer Extender	500GHz ~ 750GHz

- **Noise Source Option(Requires S4052-H48 and S4052-H43 option):**

Model	Frequency Range
S16603DB Noise Source	10MHz ~ 18GHz
S16603EB Noise Source	10MHz ~ 26.5GHz
S16603FB Noise Source	10MHz ~ 40GHz
S16603HB Noise Source	10MHz ~ 50GHz
S16604DB Smart Noise Source	10MHz ~ 18GHz
S16604EB Smart Noise Source	10MHz ~ 26.5GHz
S16604FB Smart Noise Source	10MHz ~ 40GHz
S16604HB Smart Noise Source	10MHz ~ 50GHz

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