4051A/B/C/D/E–S　Signal/Spectrum Analyzer

(3Hz～4GHz/9GHz/13.2GHz/18GHz/26.5GHz)

Product Overview

4051-S Series Signal/Spectrum Analyzers support incomparable spectrum measurement services of high price-performance ratio. The analyzers have excellent dynamic range, phase noise, amplitude precision and measurement speed, can supply ten measurement functions in total including high-performance spectrum analysis, standard power measurement modules conforming to relevant criteria etc. Capabilities of the analyzers can be greatly augmented. Multiple practical options are available like preamplifier, phase noise measurement, random IF output and so on. 4051 Series can be widely applied in signal and instrument tests relating to fields of aerospace, communication, EMC, radar detection, navigation, etc..

Main Characteristics

- **Incomparable Price-Performance Ratio**
- **5 Frequency Range, Up to 26.5GHz**
- **Excellent Measurement and Receiving Performance**
- **Overall spectrum analysis capability**
- **Practical Function Options**
- **Convenient Operation Characteristics**

Incomparable Price-Performance Ratio

● Economy price effectively reduce testing cost

● Offer outstanding performance and specifications which can only be provided by high end analyzers

5 Frequency Range, Up to 26.5GHz

● The max. coaxial frequency range of 26.5GHz

● 5 frequency ranges available, you can choose based on budgets

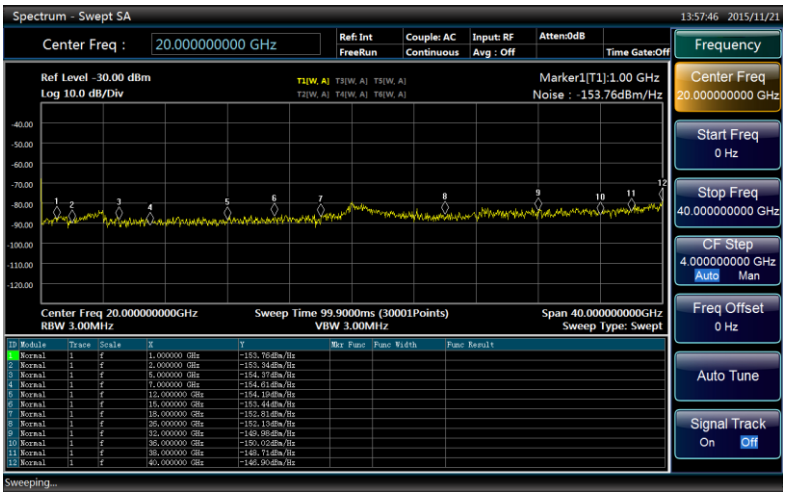
● Can supply broadband preamplifiers to match different frequency range

Excellent Measurement and Receiving Performances

● 1GHz testing DANL is -153dBm/Hz. If configured with preamplifier, the typical value is -166dBm/Hz.

● 26.5GHz testing DANL is -141dBm/Hz，configured with preamplifier, the typical value is -160dBm/Hz.

● All digital IF design, fine scale fidelity and IF error rate



Overall Spectrum Analysis Capabilities

● Support frequency sweep and FFT sweep

● Zero frequency band fast sweep, the fastest sweep time is 1μs

● Accurate frequency counting, counting resolution can be 0.001Hz

● Sweep points numbers can be arbitrarily selected among 101～30001

● 6 traces can be configured, with abundant marker operation functions

● 6 detector modes, 3 average types.

● Support time gate measurement

● Occupied bandwidth, channel power, adjacent channel power measurement functions

● Measurement functions of power statistics, burst power, harmonic distortion, TOI, spurious emission etc.

Practical Function Options

- Phase noise testing capability
- RF or full band preamplifiers
- 10MHz～160MHz random IF output, 1Hz steps, 4 auto gain control levels

Convenient Operation Characteristics

- Chinese/English are available
- Humanized automatic tuning and automatic scale
- One-button measurement
- 10.1 inch LCD, 1280*800 screen resolution，display more clear measurement results
- Support USB, LAN, GPIB, monitor etc., for your convenience.

Typical Applications

- RF performance assessment of electronic systems: as universal spectrum analyzers of multiple functions, 4051-S Series Signal/Spectrum analyzers can be widely used in RF performance evaluative of electronic systems in fields like radar, communication and so on. They can provide high sensitivity, wide dynamic range, and high precision and efficiency resolutions.

- Measurement and diagnosis of transmitter and receiver: 4051-S Series can furnish comprehensive common diagnosis services for transmitter and receiver by the multiple functions of spectrum analysis, spectral power testing, and phase noise Measurement and so on.

- Can be directly used for the integration of complex test and diagnosis systems, to get test results of spectrum characteristics and signal output.

Technical Specifications

Frequency Range	4051A-S	DC coupled 3Hz～4GHz	AC coupled 10MHz～4GHz

	4051B-S 3Hz～9GHz 10MHz～9GHz 4051C-S 3Hz～13.2GHz 10MHz～13.2GHz 4051D-S 3Hz～18GHz 10MHz～18GHz 4051E-S 3Hz～26.5GHz 10MHz～26.5GHz
10MHz Precision Frequency Reference	Frequency accuracy: ±（last calibration time × aging rate＋temp stability＋calibration accuracy） Aging rate: ± 1×10^{-7}/Y Temperature stability: ± 1×10^{-8}（20℃ ~ 30℃）± 5×10^{-8}（0℃ ~ 50℃） Calibration accuracy: ± 4×10^{-8}
Frequency Readout Accuracy	±（Frequency readout × frequency reference accuracy＋0.1% span ＋5% resolution bandwidth＋2Hz＋0.5 horizontal resolution *） *：Horizontal resolution = span /（sweep points-1）
Frequency Counting Accuracy	±（Frequency readout × frequency reference accuracy＋0.1Hz）
Span	Range：0Hz（zero span），10Hz～the max. frequency range of this model Accuracy: ±（0.1%×span＋span /（sweep points-1））
Sweep Time Range	span≥10Hz： 1ms～6000s span =0Hz： 1us～6000s
Resolution Bandwidth	Range: 1Hz～3MHz (1, 2, 3, 5 steps) 4, 5, 6, 8, 10, 20MHz Conversion uncertainty: 0.3dB 1Hz～10MHz 1.0dB 20MHz
Video Bandwidth	1Hz～3MHz (1, 2, 3, 5 steps) 4, 5, 6, 8, 10, 20MHz (nominal)
Trigger Source	Free, Line, Video, External Level (front panel), External Level (rear panel), Burst RF, Timer
Trace Detector	Normal, Positive Peak, Negative Peak, Sample, Video Average, Power Average, Voltage Average
Average Mode	Video Average, Power Average, Level Average
SSB Phase Noise（1GHz Carrier，20℃～30℃）	-92dBc/Hz 100Hz -105dBc/Hz 1kHz -118dBc/Hz 10kHz -123dBc/Hz 100kHz
Residual FM	≤(0.25 Hz x N) p-p，nominal value within 20 ms

（Central Frequency 1GHz，Resolution Bandwidth 10Hz，Video Bandwidth 10 Hz）	N is frequency multiplication times of LO
Displayed Average Noise Level (the Input End is Connected to Match Load, Sampling or Average Wave Detection. The Average Type is Logarithm, 0dB Input Attenuation, RF Gain Takes the DANL as the Priority, 20℃ ~ 30℃)	-153dBm 10MHz～1GHz -151dBm 1GHz～2GHz -150dBm 2GHz～3GHz -148dBm 3GHz～3.6GHz -145dBm 3.6GHz～4GHz -148dBm 4GHz～5GHz -150dBm 5GHz～9GHz -146dBm 9GHz～18GHz -141dBm 18GHz～26.5GHz
Frequency Response & Absolute Amplitude Accuracy （10dB Attenuation, 20℃ ~ 30℃）	Frequency response: ±1.0dB 3Hz～20MHz ±1.0dB 20MHz～2GHz ±1.0dB 2Hz～3.6GHz ±1.2dB 3.6GHz～4GHz ±1.5dB 4GHz～9GHz ±2.0dB 9GHz～18GHz ±3.0dB 18GHz～26.5GHz Absolute amplitude accuracy 10 dB Attenuation, 20℃ ~ 30℃，1 Hz ≤ Resolution bandwidth ≤ 1 MHz, Input signal-10 ～ -50 dBm）: ±0.24dB 500MHz ±（0.24dB＋Frequency response） All frequencies
1dB gain Compression	-3dBm 20MHz～40MHz 0dBm 40MHz～200MHz

（Mixer Level, Dual-Tone Testing, Resolution Bandwidth of 5kHz，Frequency Interval of 3MHz,20℃ ~ 30℃）	+1dBm 200MHz～4GHz - 1dBm 4GHz～9GHz 0dBm 9GHz～26.5GHz
Tri-Order Intermodulation Distortion （TOI） （Input mixer 2 -10dBm signal tes, Frequency Interval is 50kHz, 20℃～30℃）	+12dBm 10MHz ～ 200MHz +12dBm 200MHz～ 4GHz +10dBm 4GHz ～ 9GHz +12dBm 9GHz ～ 18GHz +13dBm 18GHz ～ 26.5GHz
Residual Response （The Input End is Connected to Match Load, 0dB Attenuation）	-100dBm 200kHz～9GHz -100dBm (nominal) Other frequencies
Size	W×H×D= 510mm×192mm×534mm (with handles, foot-pads, stand) W×H×D= 426mm×177mm×460mm (without handles, foot-pads, stand)
Weight	Approx. 25kg (different options, different weight)
Power	Standard： AC 220~240V：50~60Hz 4051-H98：AC 100~240V：50~60Hz
Power Consumption	Standby: less than 20W; operating: less than 400W
Temperature Range	Operating temperature: 0℃ ~ +50℃ ; Storage temperature: -40℃ ~ +70℃

Input Connector	4051A-S/4051B-S /4051C-S /4051D-S: type N（F），Impedance 50Ω 4051E-S: 3.5mm（M），Impedance 50Ω

Notes:

1. Nominal value refers to the estimated performance, or the performance which is useful for the product beyond the quality guarantee scope.

2. Typical value refers to other performance information when typical values stay beyond the quality guarantee scope. When performance surpasses technical specifications, 80% of samples will present 95% confidence within 20℃ ~ 30℃ temperature range. Typical performance excludes test uncertainty.

Ordering Information

Main Unit: 4051A-S Spectrum Analyzer 3Hz～4GHz
4051B-S Spectrum Analyzer 3Hz～9GHz
4051C-S Spectrum Analyzer 3Hz～13.2GHz
4051D-S Spectrum Analyzer 3Hz～18GHz
4051E-S Spectrum Analyzer 3Hz～26.5GHz

Standard Package

No.	Description	Remarks
1	Power Cord	Standard tri-prong power cord
2	USB Mouse	--
3	User Manual	--
4	Programming Manual	--

Options

No.	Description	Functions
4051-H03	IF Output	Output third IF signal, output frequency range is 10MHz ~ 160MHz, step resolution is 1Hz.
4051-H08	Wide Log Detect Output	To output the logarithm wave-detection signal which can reflect the input signal level characteristics.
4051-H34-04 4051-H34-09 4051-H34-13 4051-H34-18 4051-H34-26	Low-Noise Preamplifier	Can select low waveband preamplifier or full waveband preamplifier. Under full waveband preamplifier, the analyzer provide above 4GHz frequency band noise optimization path. (Note: the No. of low waveband preamplifier is H34-04. The full waveband preamplifier should be selected according to the frequency upper limit of the main unit. For instance, the max. frequency of 4051E-S is 26.5GHz, then the full waveband preamplifier H34-26 should be selected).

4051-S04	Phase Noise Measurement	SSB phase noise curves and single-point phase noise measurement.
4051-H97	Mounting Suit	Handles and accessories for 4051 mounting on standard racks.
4051-H98	English Options	English panels, user manual, operation interface, and operation system. Power supply: AC 100~240V：50~60Hz.
4051-H99	Aluminum Transportation Case	High-strength lightweight aluminum transportation case, with handle and roller, convenient for transportation.