

Product Datasheet - Technical Specifications



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4024CA

Signal and Spectrum Analyzer Real-Time Spectrum Analyzer

(9 kHz to 9 GHz)

5G, 4G/LTE, 3G Test Solution

Real-Time Spectrum Analysis



Ceyear Technologies Co., Ltd.

The 4024CA spectrum analyzer is a broadband handheld real-time spectrum analyzer designed for field testing. The maximum real-time analysis bandwidth reaches 120MHz. It has real-time spectrum analysis, 5G NR demodulation analysis, LTE FDD/TDD demodulation analysis, GSM/ EDGE demodulation analysis, directional analysis and other measurement function modes, as well as field strength measurement, channel power, occupied bandwidth, adjacent channel power, audio demodulation, harmonic distortion, spectral emission mask/spurious emission mask, indoor/outdoor map measurement. It adopts 8.4-inch large-screen LCD and capacitive touch screen integrated design to facilitate user operation. The structure adopts a

handheld chassis, which is small in size, light in weight, flexible in power supply, easy to maneuver, and is extremely suitable for on-site use.

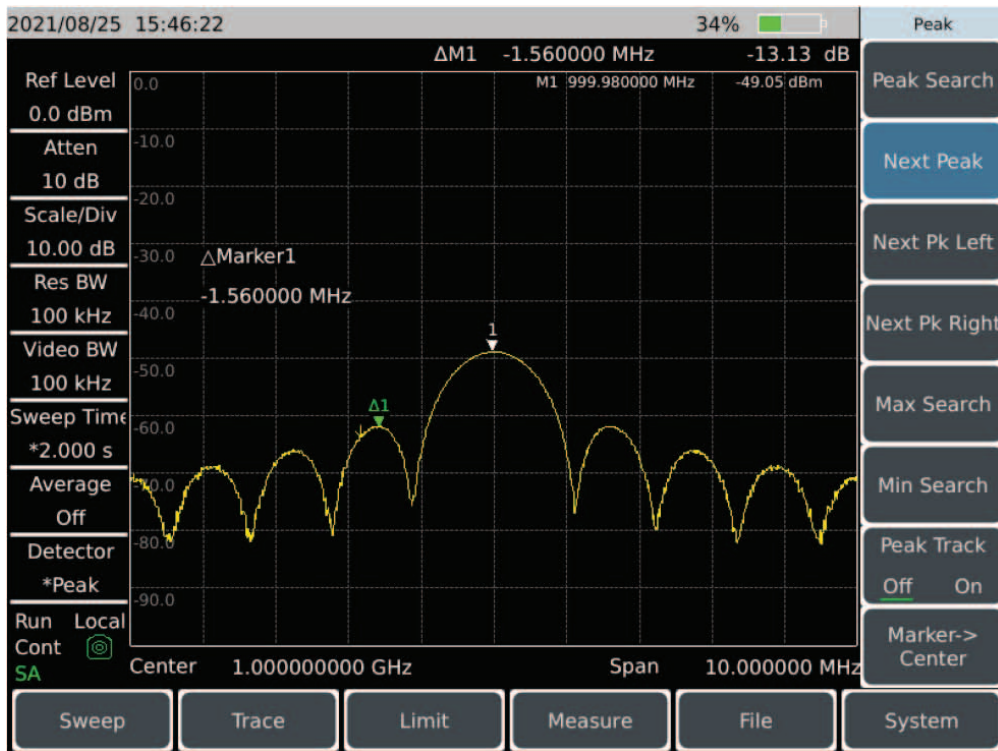
The 4024CA spectrum analyzer can be used for on-site debugging and installation and maintenance of mobile communications, wireless communications, radar, satellite communications and other equipment, wireless communication signal demodulation analysis, interference source direction finding and map positioning, broadband modulation or transient signal test analysis. In other fields, it can provide a relatively complete solution for the user's external field spectrum test.

Main Characteristics

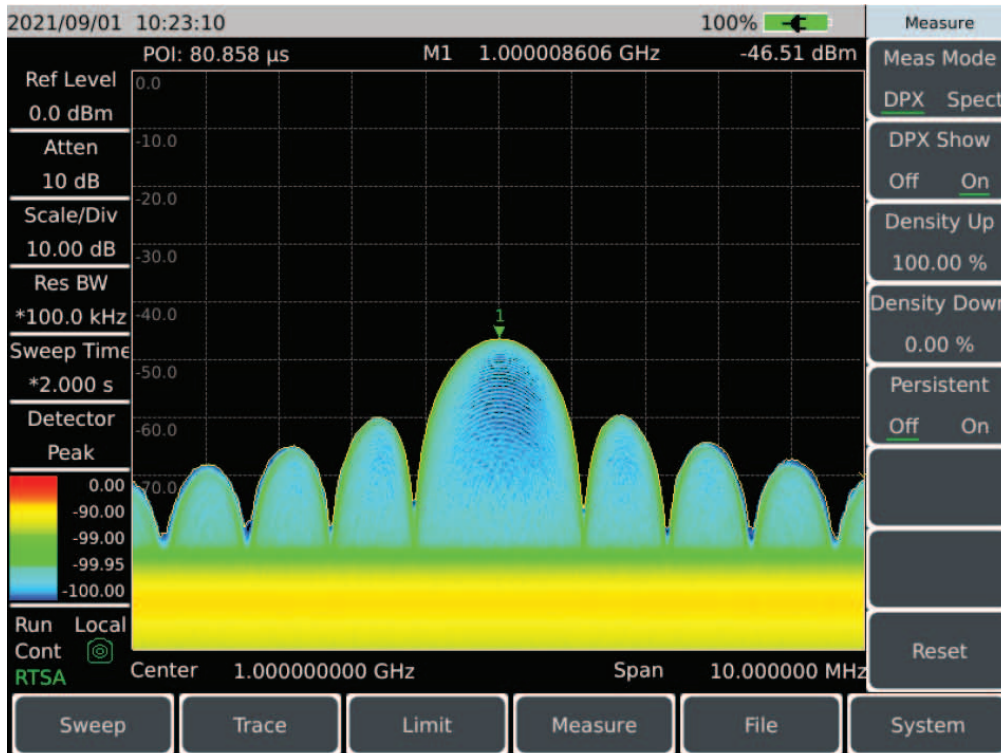
- Wide frequency range: from 9kHz to 9GHz
- Full-band preamplifier configuration
- Low displayed average noise level: -163dBm@1Hz RBW(typical)
- Excellent RF specification performance:
- Phase noise performance: -115dBc/Hz@100kHz frequency offset@1GHz carrier
- Input TOI point: +13dBm (Typical)
- Amplitude accuracy: dBm (Typical)
- Real-time spectrum analysis function
- Maximum real-time analysis bandwidth:120MHz
- RTSA with 5.8us POI
- Resolution bandwidth: 1Hz to 10MHz(1/3 step), 20MHz
- 512MHz IQ waveform capture
- Various measurement functions: spectrum analyzer, interference analyzer (spectrogram, RSSI), RTSA, 5G NR demodulation, LTEFDD/TDD demodulation, GSM/EDGE demodulation functionetc.
- Various intelligent measurement functions: field strength measurement, channel power, occupied bandwidth, adjacent-channel power ratio, tune&listen, carrier-to-noise ratio, emission mask, indoor/outdoor map measurement, Support GPS/BEIDOU positioning and frequency taming calibration function of the crystal oscillator in the machine
- Various auxiliary test interface: 10MHz reference input/output interface, GPS antenna interface, zero span IF output interface, external triggering input interface etc.
- Easy & convenient user operation: 8.4 inch high definition LCD and font display, convenient capacitive touch screen operation, combination of LCD and touch screen, various display modes etc.
- Working temperature range: -10 °C to +50 °C; Power supplied by battery or 100VACto 240VAC

Main Characteristics

Various Measurement Functions



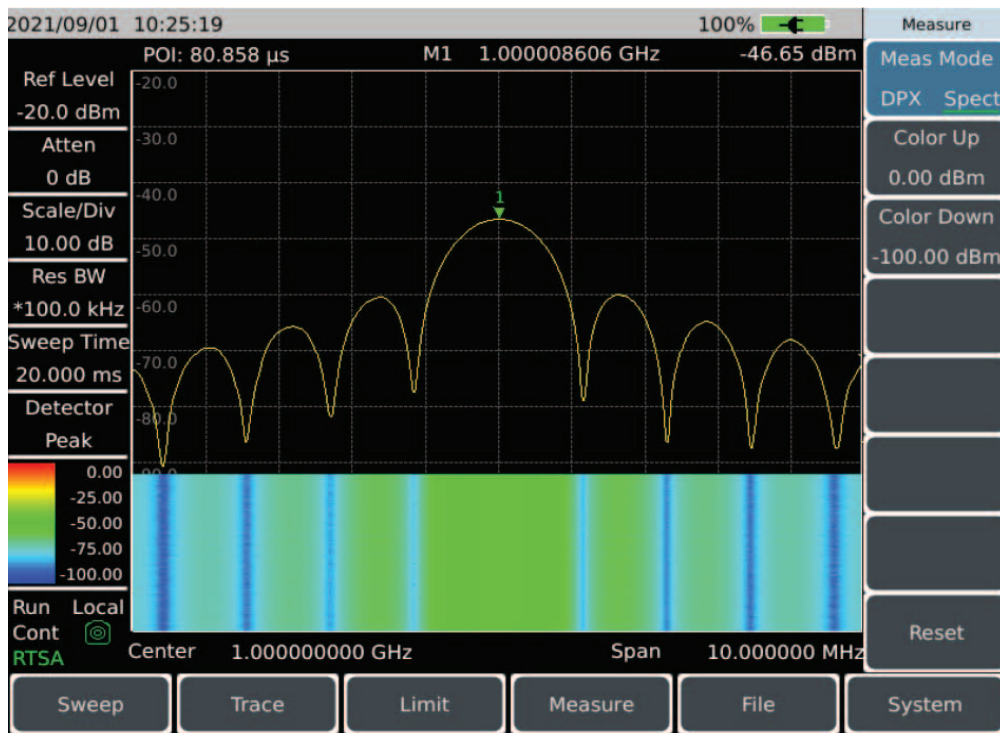
Spectrum Analysis Mode



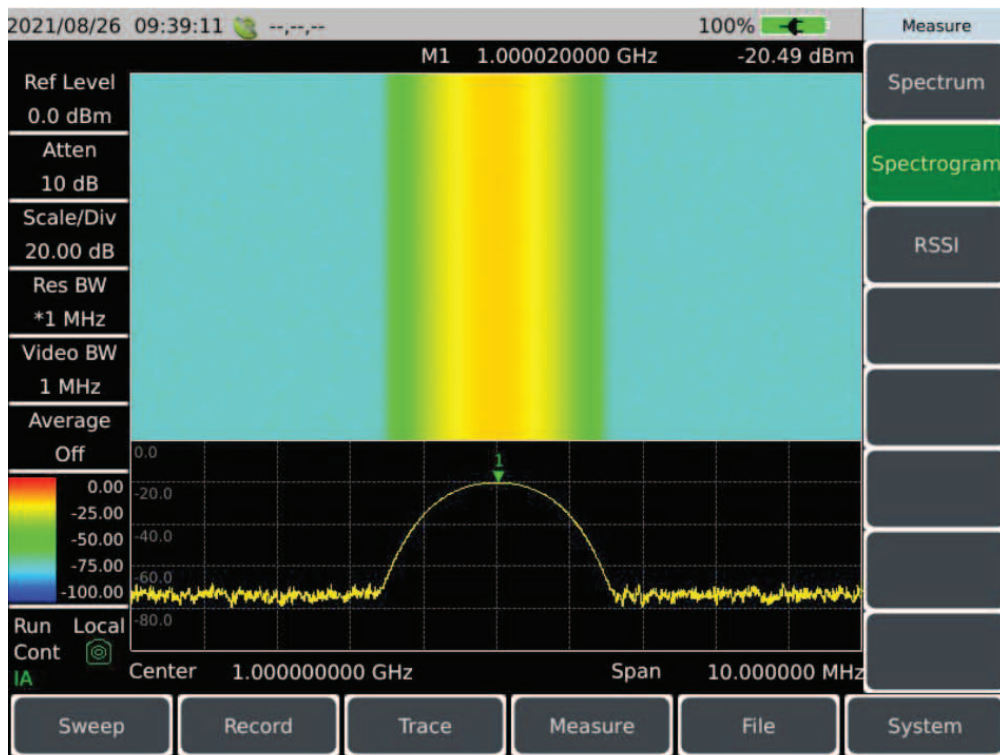
RTSA Persistence Mode

Main Characteristics

Various Measurement Functions



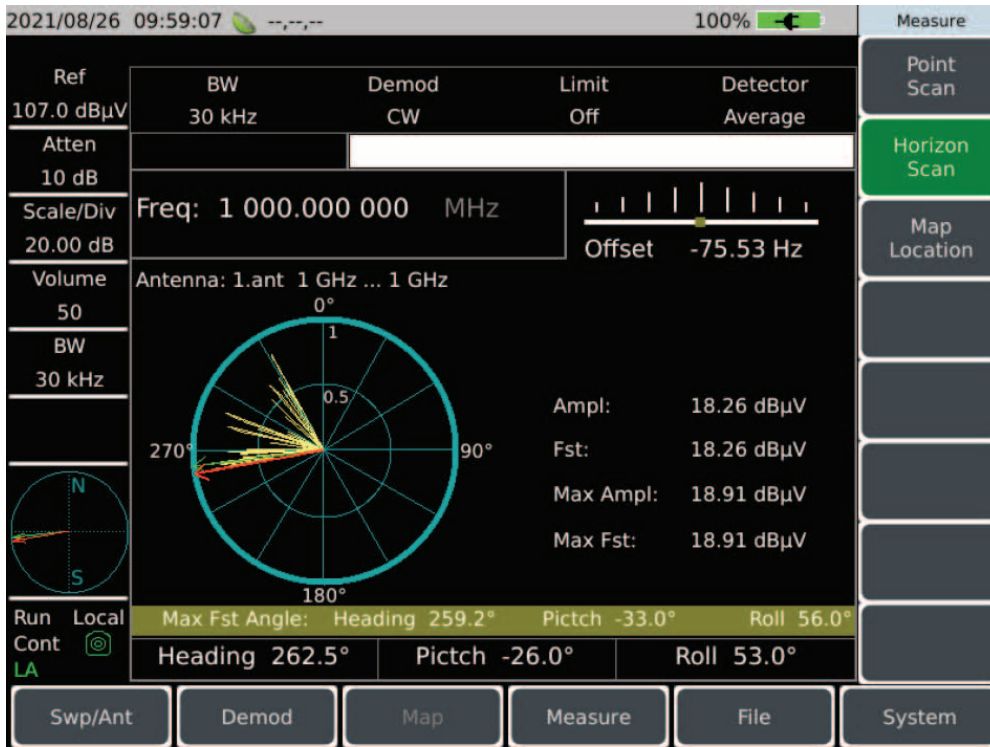
RTSA Waterfall Mode



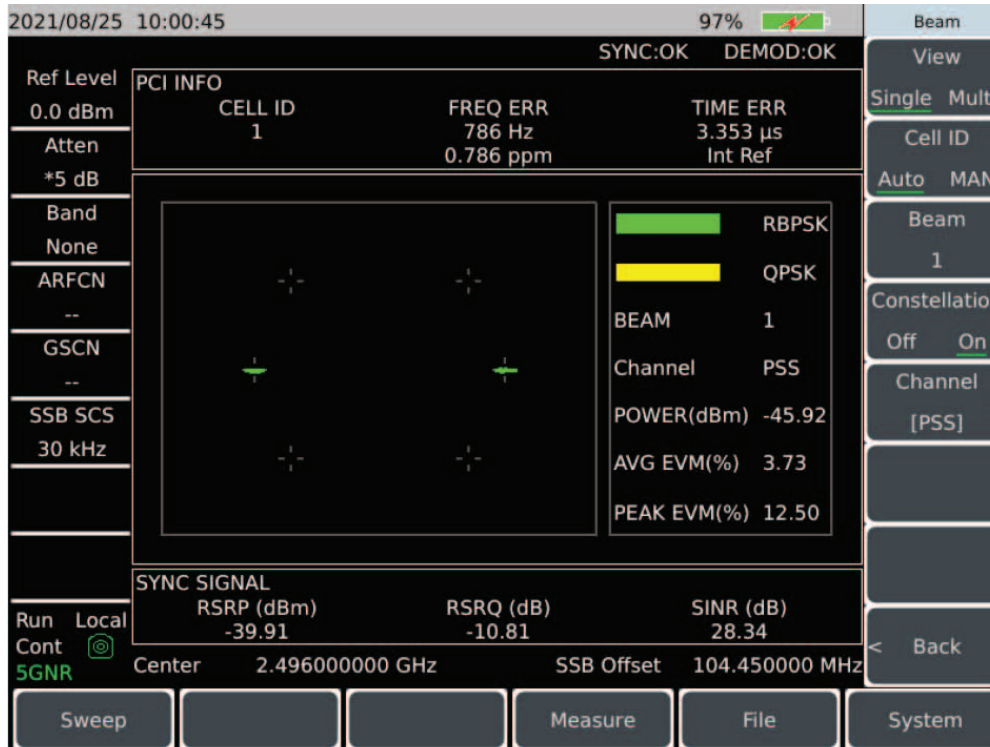
Interference Analysis Mode

Main Characteristics

Various Measurement Functions



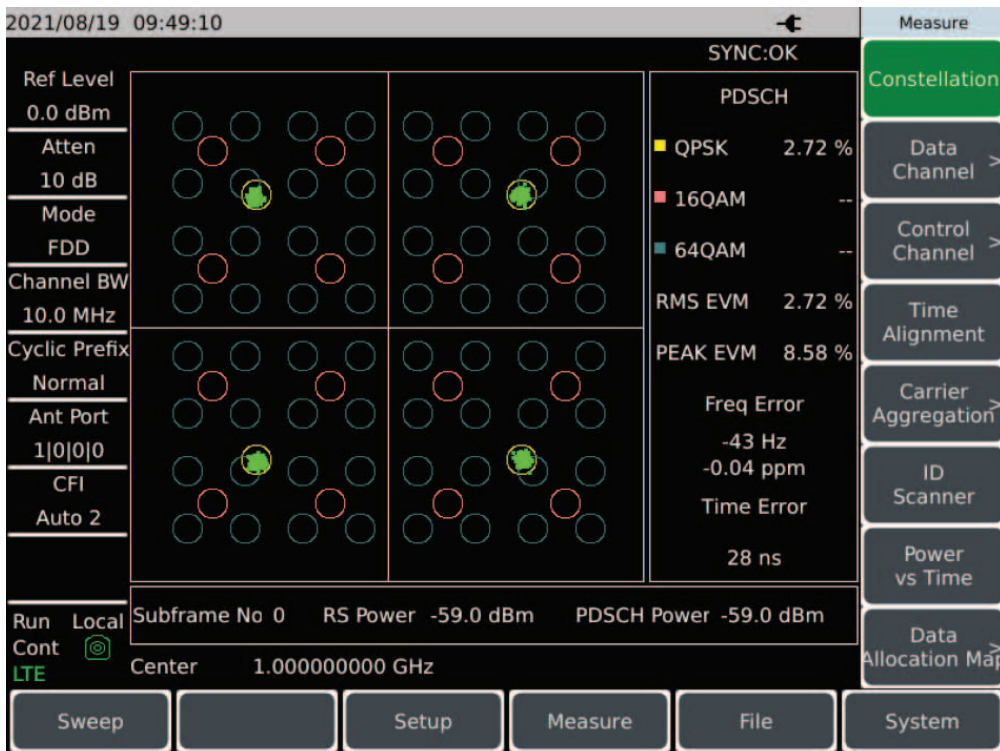
Directional Analysis Mode



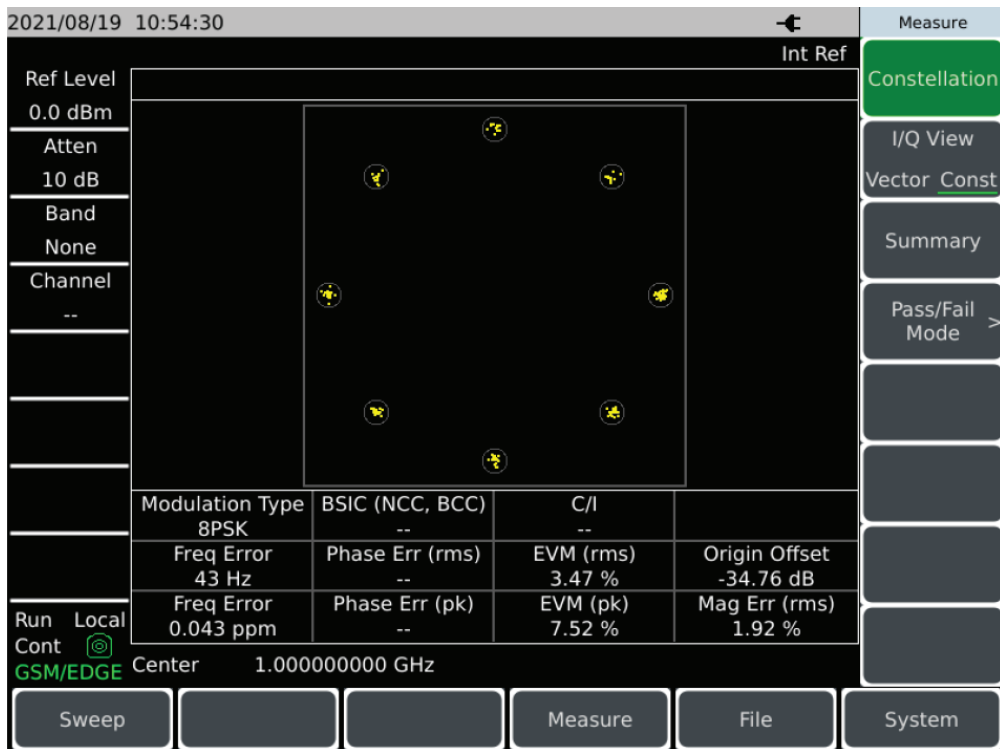
5G NR Measurement

Main Characteristics

Various Measurement Functions



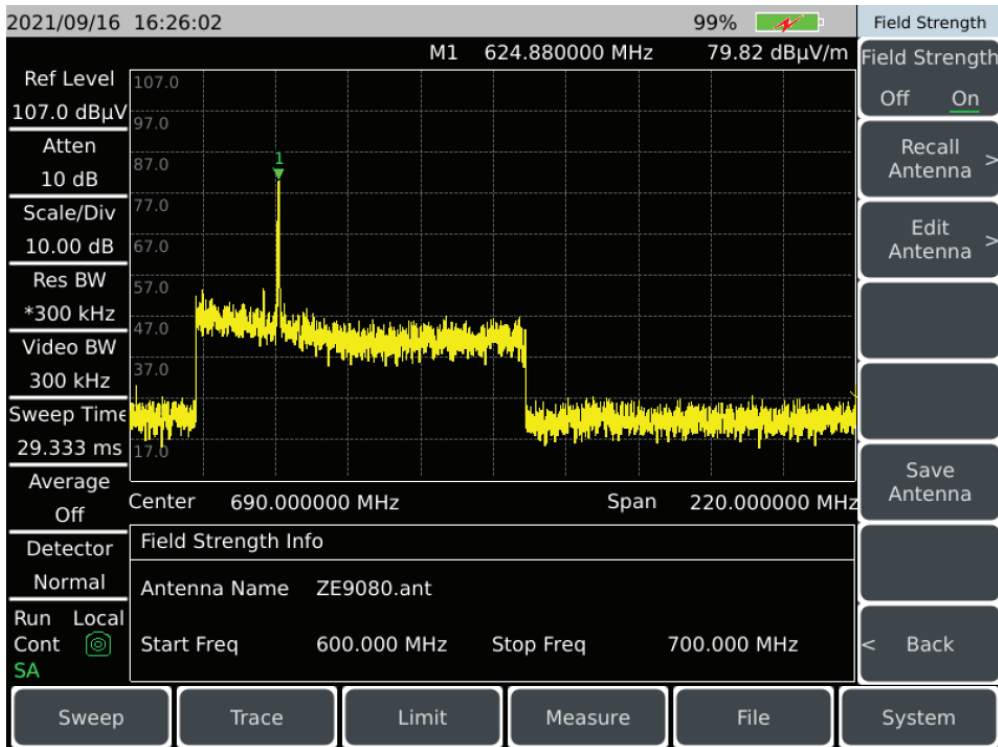
4G LTE Measurement



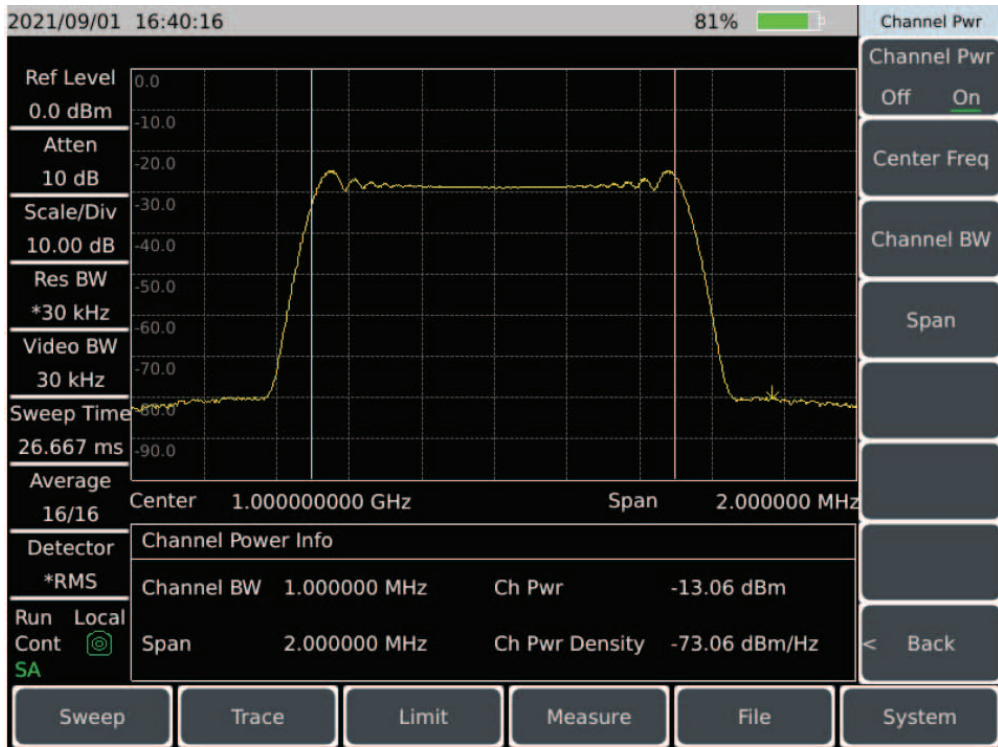
GSM/EDGE Measurement

Main Characteristics

Comprehensive Intelligent Measurement Functions



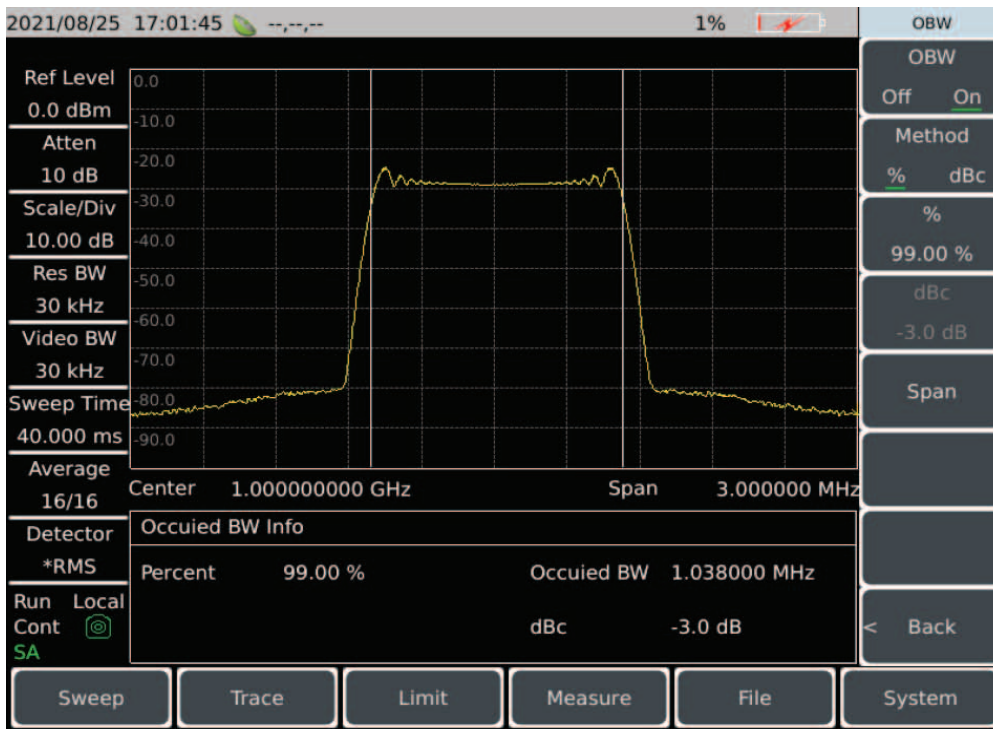
Field Strength Measurement



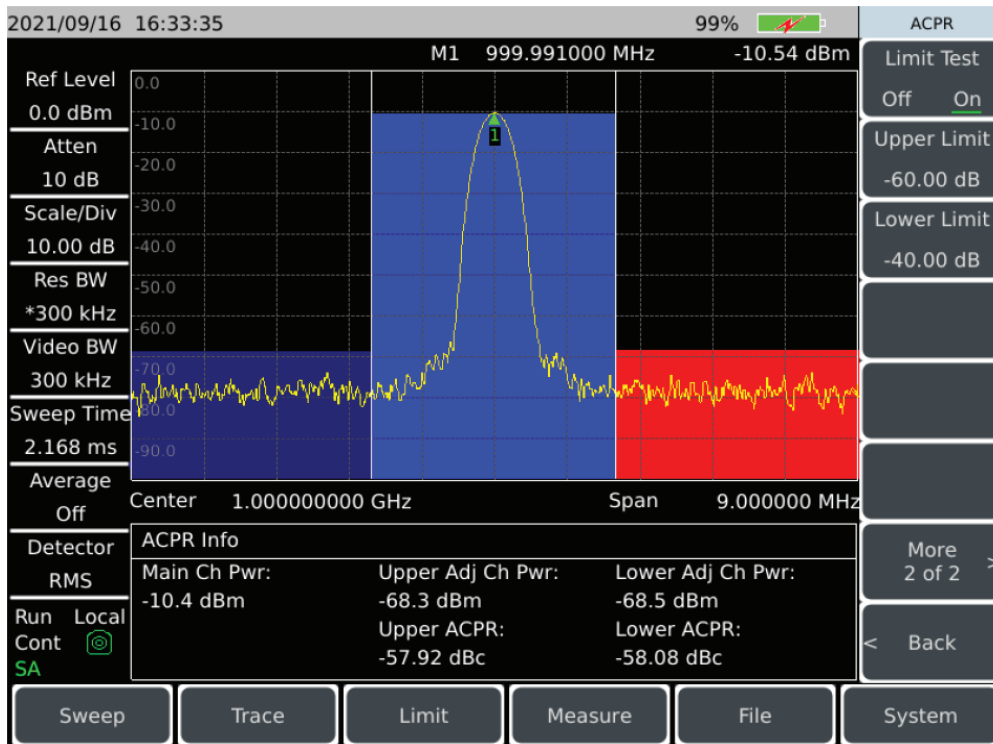
Channel Power

Main Characteristics

Comprehensive Intelligent Measurement Functions



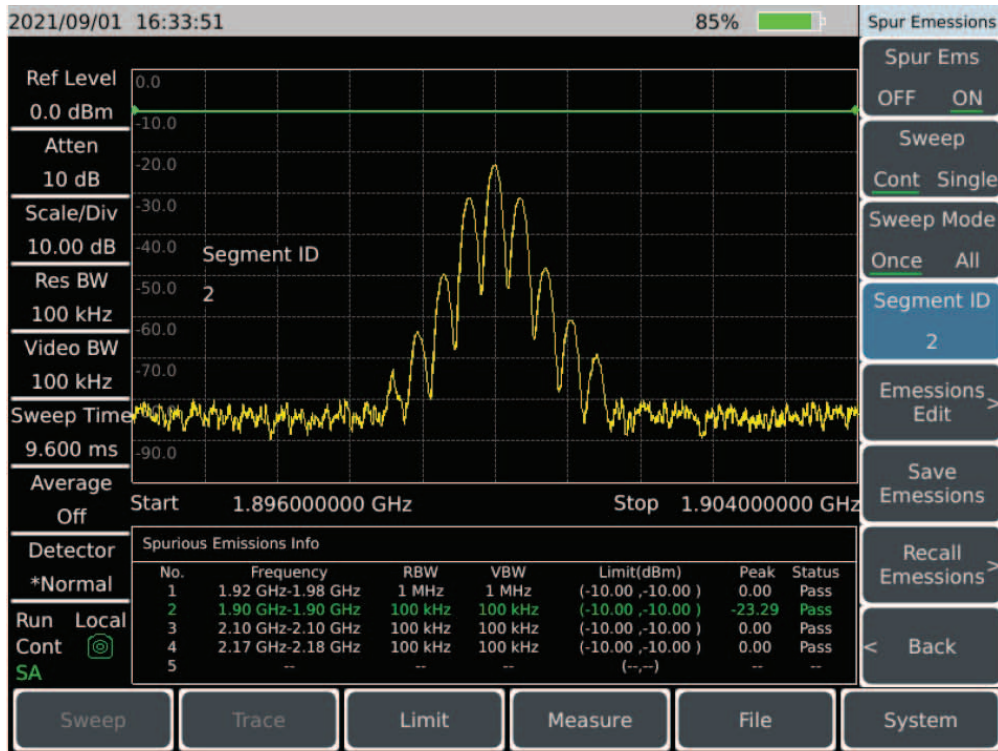
Occupied Bandwidth



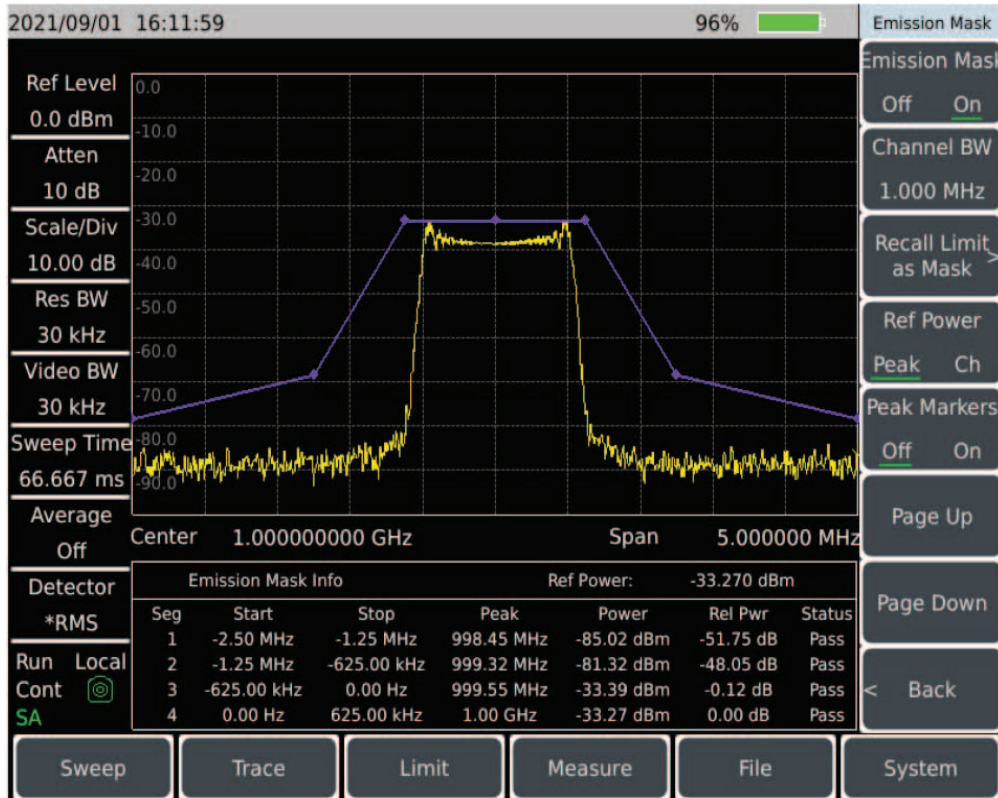
Adjacent-Channel Power Ratio

Main Characteristics

Comprehensive Intelligent Measurement Functions



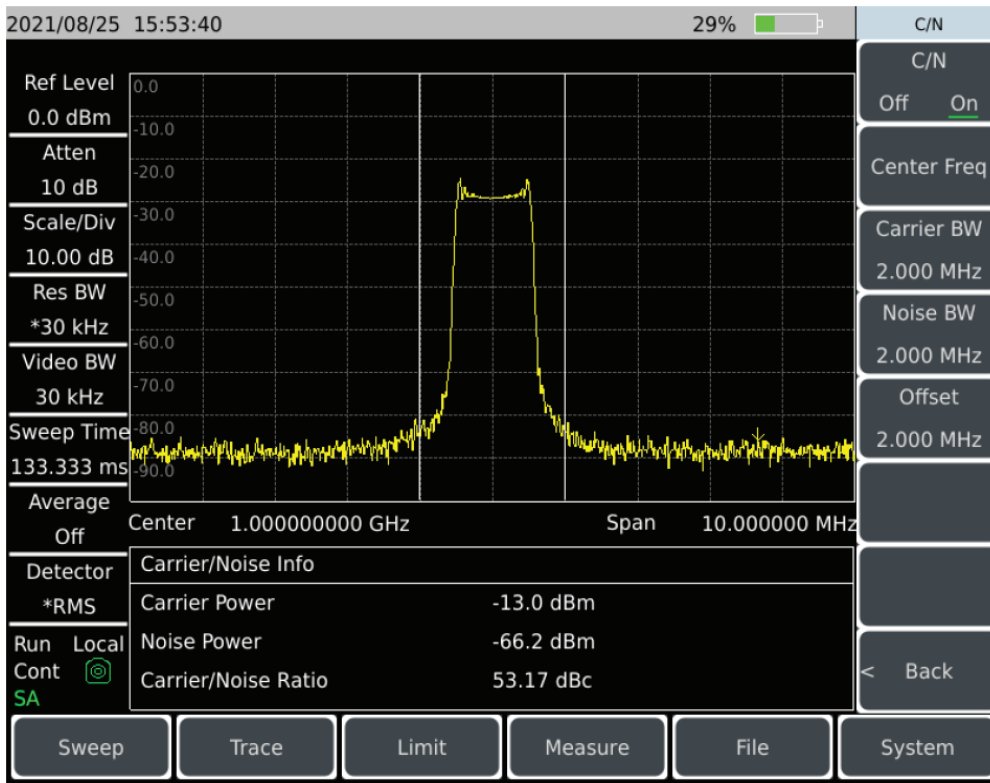
Spur Emission Mask



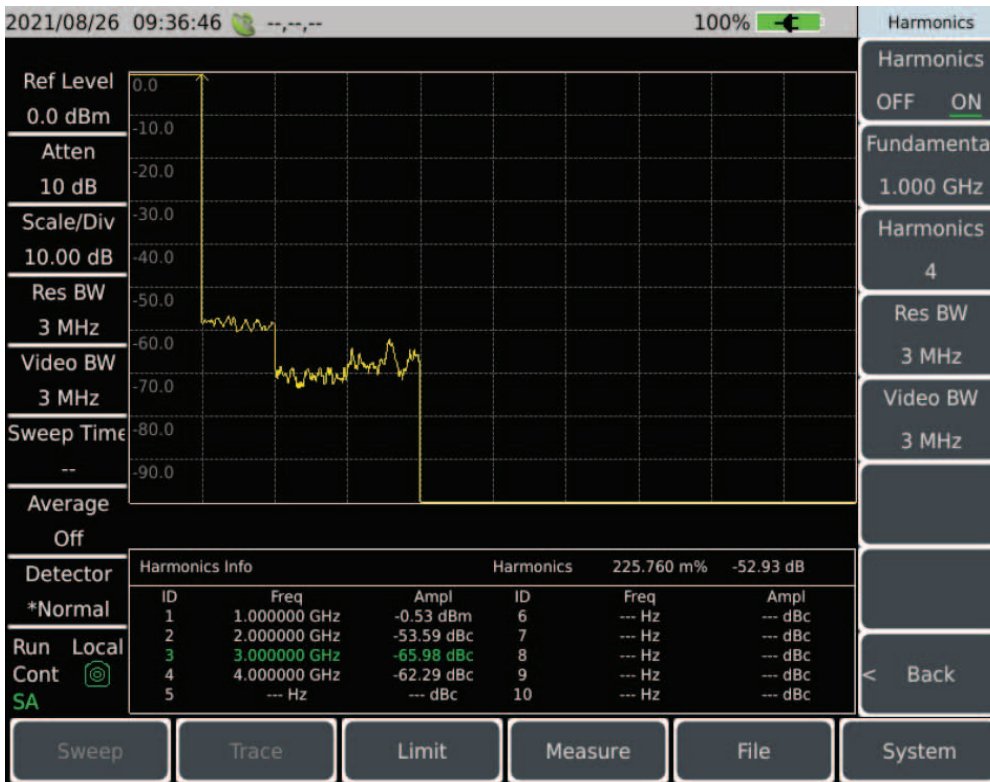
Emission Mask

Main Characteristics

Comprehensive Intelligent Measurement Functions



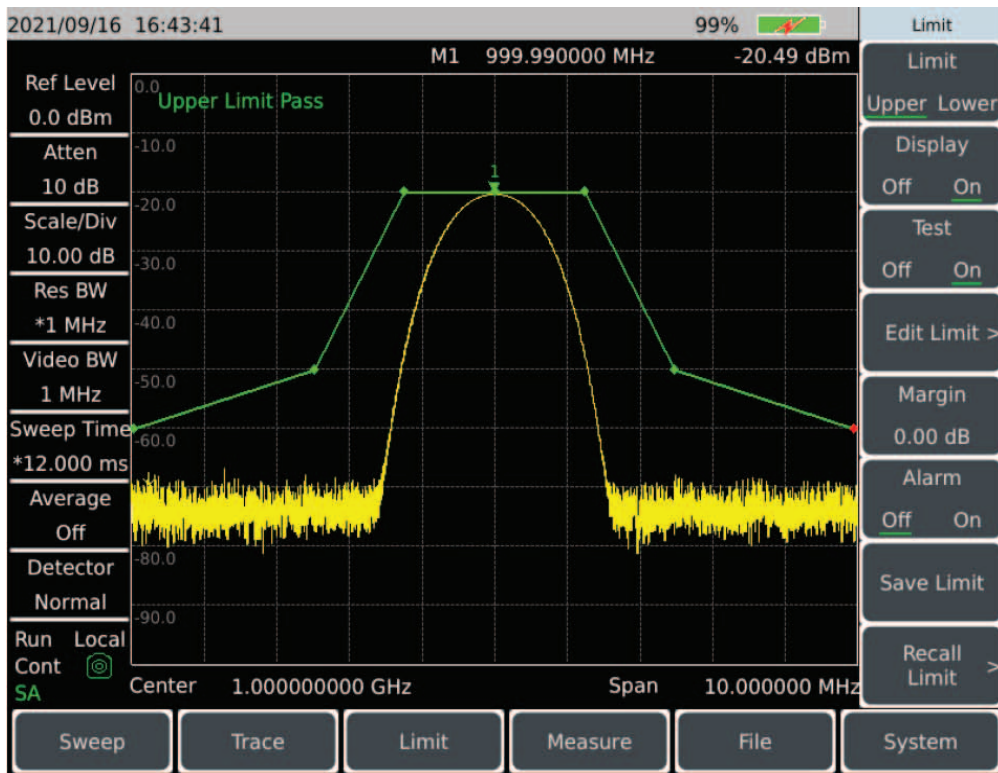
Carrier-to-Noise Ratio



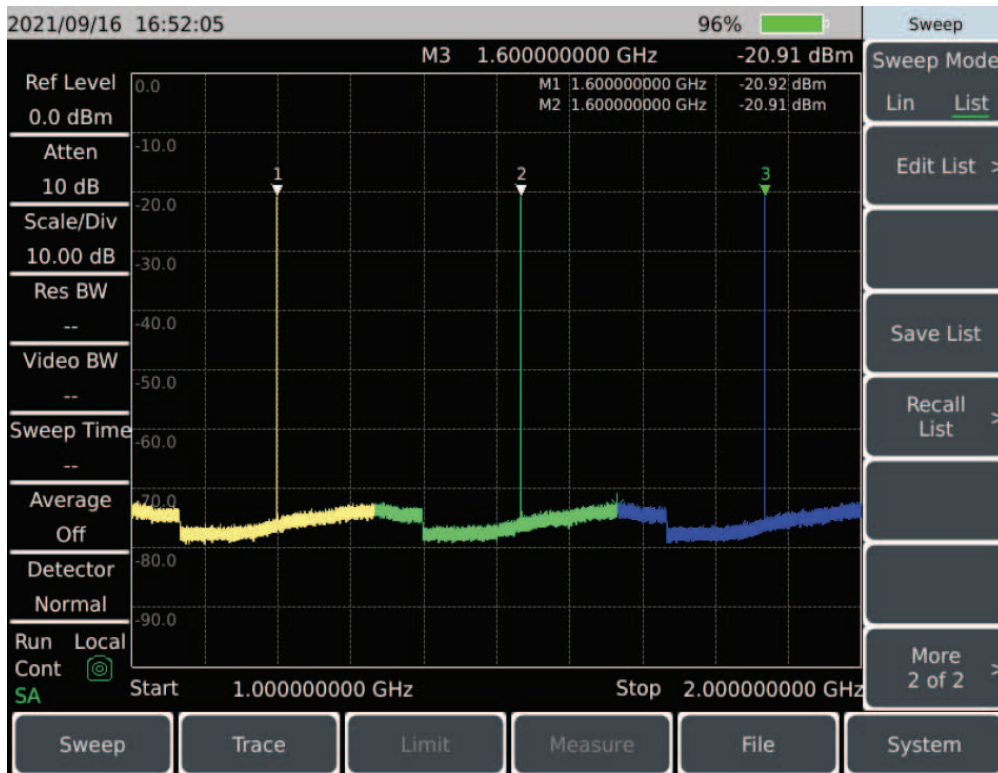
Harmonic Distortion

Main Characteristics

Comprehensive Intelligent Measurement Functions



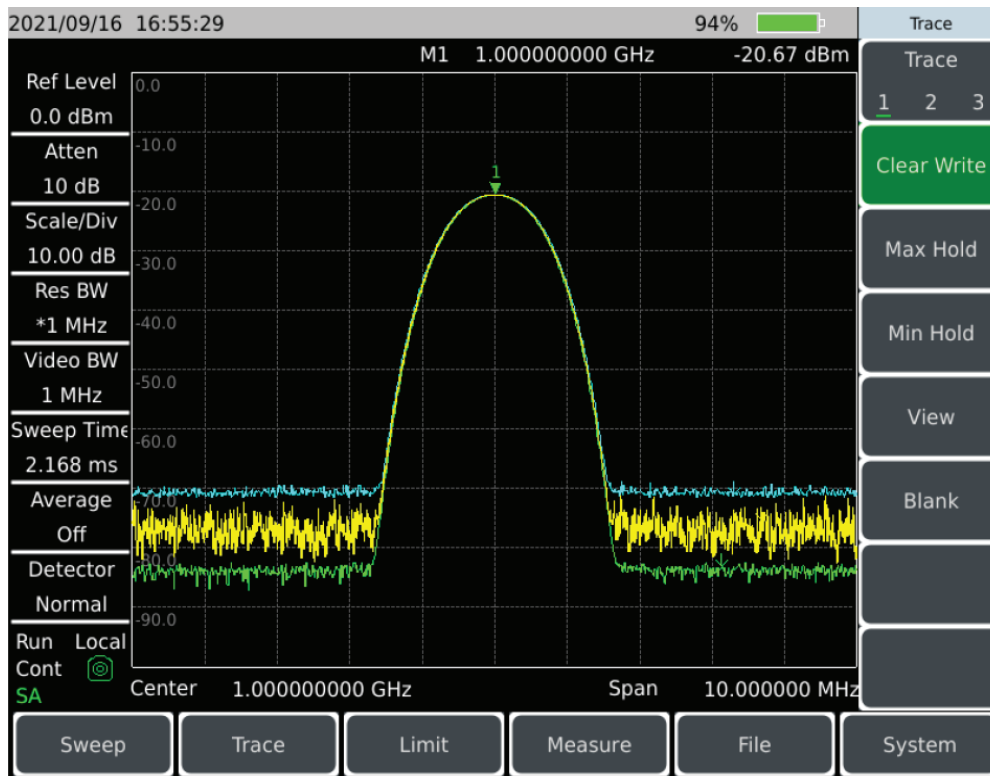
Limit Line



List Sweep

Main Characteristics

Comprehensive Intelligent Measurement Functions

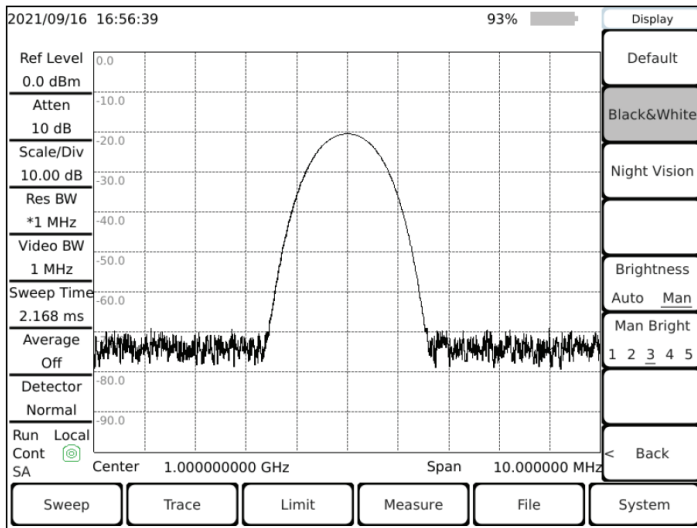


Multi-Traces

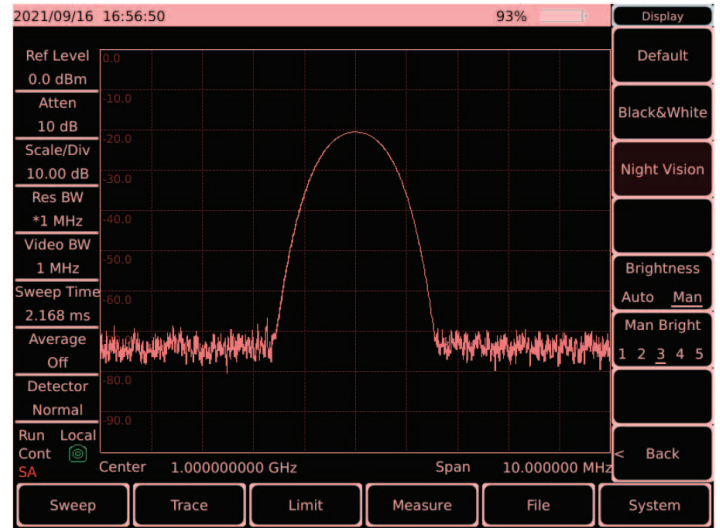
Main Characteristics

Easy and Convenient User Operation

- One-click quick measurement
- Storage and recall of state and data
- Combination of 8.4 inch LCD and capacitive touch screen, smaller light refraction and clearer display
- Convenient capacitive touch screen operation
- Various display modes, better experience under outdoor light and night vision
- Backlight keys enable easy viewing in darkness

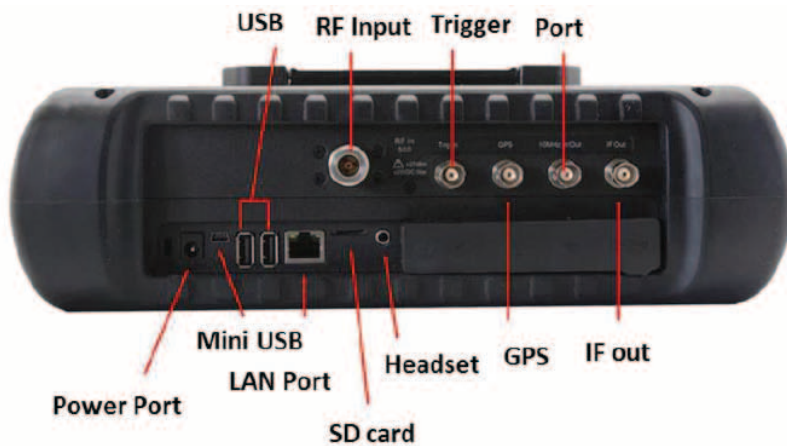


Outdoor Mode



Night Mode

Various Auxiliary Test Interfaces



- Comprehensive performance evaluation of wireless communication base stations

4024CA spectrum analyzer has 5G NR, LTE FDD/TDD, GSM/EDGE and other wireless communication signal demodulation analysis and 120MHz bandwidth real-time spectrum analysis function, adopts a handheld structure, small size, light weight, battery-powered , Can be applied to the field installation and commissioning of wireless communication base stations and maintenance support.

- Field test and diagnosis of transmitter and receiver

4024CA spectrum analyzer has various measurement function modes like spectrum analyzer, interference analyzer, Real-time spectrum analyzer, etc., as well as various intelligent measurement functions such as indoor/outdoor map measurement, channel power, occupied bandwidth, adjacent-channel power ratio, carrier-to-noise ratio, field strength measurement, emission mask etc. It can provide comprehensive spectrum analysis and diagnosis service for the field test of transmitter and receiver.

- Broadband spectrum monitoring, interference recognition

Connected with external directive antenna, 4024CA spectrum analyzer can be used for electromagnetic environment detection, radio interference analysis, electromagnetic environment background assessment, spectrum monitoring and illegal channel interference signal recognition.

Technical Specifications

Model	4024CA
Frequency Range	4024CA:9kHz 9GHz FrequencyResolution:1Hz
Frequency Reference	Frequency: 10MHz Aging: $\pm 0.5\text{ppm}/\text{Year}$ Initial Frequency Accuracy: $\pm 0.3\text{ppm}$ Temperature Stability: $\pm 0.1\text{ppm}(-10\sim 50^{\circ}\text{C}, \text{Comparative to } 25^{\circ}\text{C})$
Sweep Time	Range: $10\mu\text{s}\sim 600\text{s}$ (Zero Span) Accuracy: $\pm 2.00\%$ (Zero Span)
Frequency Readout Accuracy	$\pm(\text{Frequency Readout}\times \text{frequency Reference} + 2\%\times \text{Span} + 10\%\times \text{Resolution Bandwidth})$
Frequency Span	Range: $100\text{Hz}\sim 9\text{GHz}$ or 0Hz Accuracy: $\pm 2.0\%$
Resolution Bandwidth	$1\text{Hz}\sim 10\text{MHz}$ (1-3 Times of Stepping), 20 MHz
Video Bandwidth	$1\text{Hz}\sim 10\text{MHz}$ (1-3 Times of Stepping), 20 MHz
SSB Phase Noise (Carrier 1GHz)	$\leq -108\text{dBc}/\text{Hz}$ @ Frequency Offset 10kHz $\leq -110\text{dBc}/\text{Hz}$ @ Frequency Offset 100kHz $\leq -118\text{dBc}/\text{Hz}$ @ Frequency Offset 1MHz $\leq -129\text{dBc}/\text{Hz}$ @ Frequency Offset 10MHz
Displayed Average Noise Level	Pre-amp Off: $\leq -140\text{dBm}(2\text{MHz}\sim 3\text{GHz})$ $\leq -138\text{dBm}(3\text{GHz}\sim 9\text{GHz})$ Pre-amp On: $\leq -160\text{dBm}(2\text{MHz}\sim 3\text{GHz})$ $\leq -157\text{dBm}(3\text{GHz}\sim 9\text{GHz})$
Residual Response	(exceptional frequency: 3.15GHz): Pre-amp Off: $\leq -82\text{dBm}$ (10MHz \sim 9GHz) Pre-amp On: $\leq -95\text{dBm}$ (10MHz \sim 9GHz)
Second Harmonic Distortion	50MHz \sim 2GHz: $< -65\text{dBc}$ 2GHz \sim 4.5GHz: $< -70\text{dBc}$
TOI	50MHz \sim 5.2GHz $\geq +10\text{dBm}$ 5.2GHz \sim 9GHz $\geq +12\text{dBm}$
Absolute Amplitude Accuracy	$\pm 1.3\pm 1.3\text{ dB}$ (10MHz dB (10MHzdB (10MHz \sim 9GHz)
Input Attenuator	Attenuation Range: $0\text{dB}\sim 30\text{dB}$, 5dB Steps
Maximum Continuous Input	+27dBm Peak Typical ($\geq 10\text{dB}$ Attenuation) +20dBm Peak Typical ($< 10\text{dB}$ Attenuation) +10dBm Peak Typical (Pre-amp ON)
Reference Level	Range: $-150\text{dBm}\sim +30\text{dBm}$ Conversion Uncertainty: $\pm 1.20\text{dB}$

Technical Specifications

Dimension	314mm (W)×218mm (H)×91mm (D) (Excluding Handle, Stand) 338mm(W)×218mm (H)×100mm (D) (Including Handle, Stand)
Weight	≤4.6 kg
Working Temperature	-10°C~ +50°C (the battery operation temperature is 0°C...+45°C)
Storage Temperature	-40°C~ +70°C (the battery storage temperature is 0°C...+60°C)
Electromagnetic Compatibility	Conforms to GJB3947A-2009 3.9.1 Requirements
Power supply	power adapter: input 100 to 240VAC, 50/60Hz Output 15VDC, 4A Lithium-ion battery: 10.8V
Battery operation time	2h (typical)
Power Consumption	≤40W
Test Interface	RF input: Type-N Connector (female)
Other Interfaces	10MHz Reference Input/Output: BNC (female) Connector External Triggering Input: BNC (female) Connector IF Output: BNC (female) Connector GPS Antenna Input: BNC (female) Connector