4024CA

Signal and Spectrum Analyzer

(9kHz ~ 9GHz)

Ceyear Technologies Co., Ltd.

Product Overview

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.

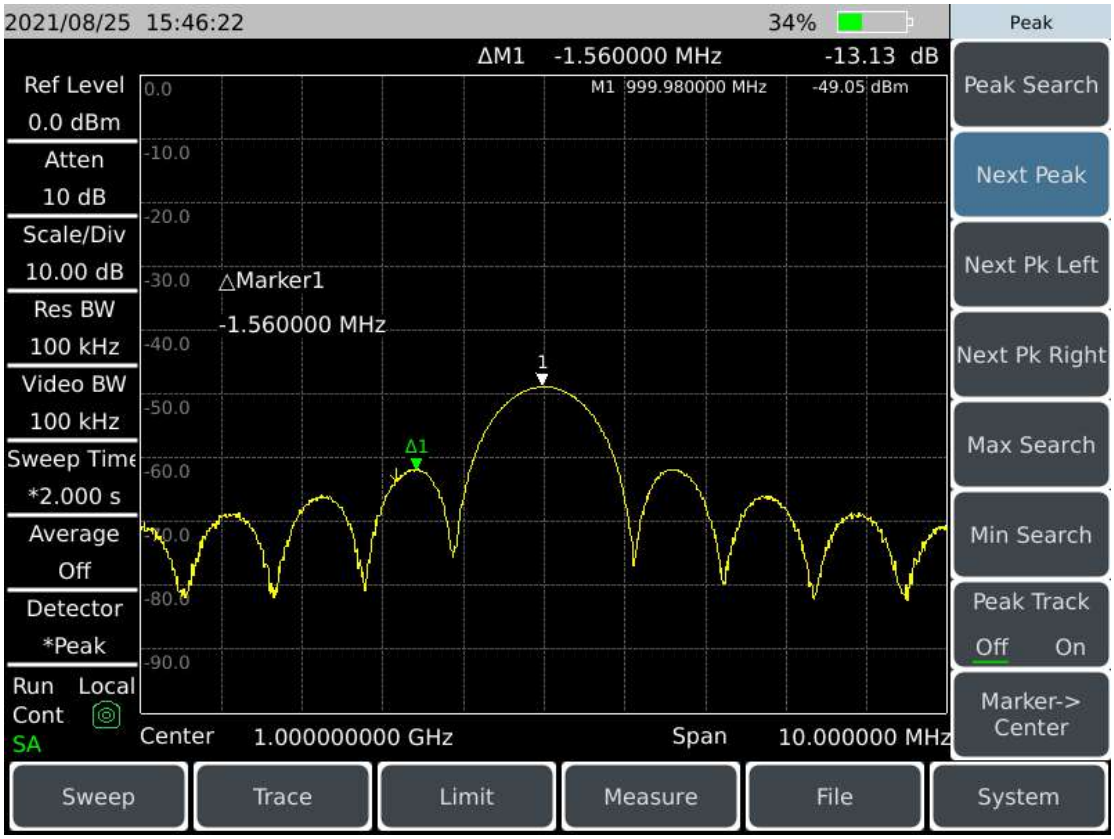
The 4024CA spectrum analyzer can be used for on-site debugging and installation and maintenance of mobile communications, wireless communications, radar, satellite communications and other equipment, wireless communication signal demodulation analysis, interference source direction finding and map positioning, 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

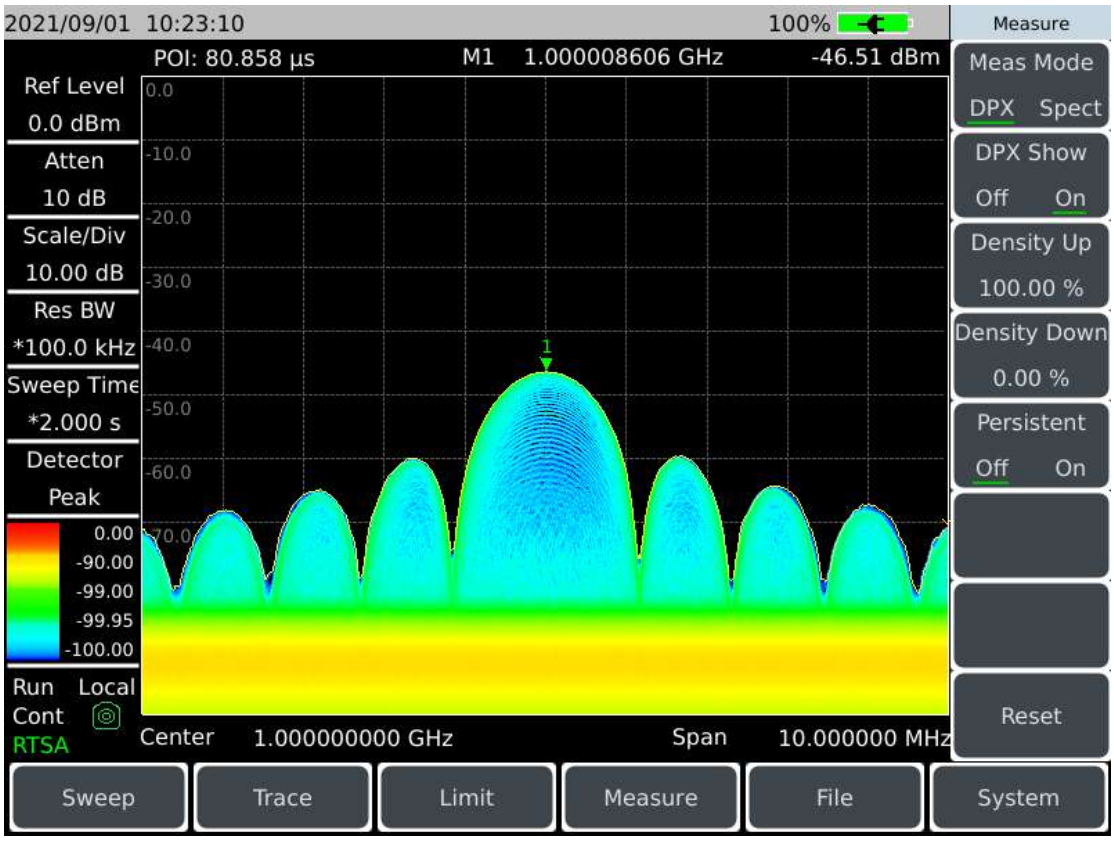
- Wide frequency range: from 9kHz to 9GHz
- Full-band preamplifiers configuration
- Low displayed average noise level: -163dBm@1Hz RBW(typical)
- Excellent RF specification performance:
- Phase noise performance: -115dBc/Hz@100kHz frequency offset@1GHz carrier
- Input TOI point: +13dBm (Typical)
- Amplitude accuracy: ±1.3dB
- Real-time spectrum analysis function
- Support persistence spectrum and waterfall display mode
- Maximum real-time analysis bandwidth: 120MHz
- RTSA with 5.8us POI
- Resolution bandwidth: 1Hz～10MHz(1/3 step), 20MHz
- 512MHz IQ waveform capture
- Various measurement functions: spectrum analyzer, interference analyzer (spectrogram, RSSI), RTSA, 5G NR demodulation, LTE FDD/TDD demodulation, GSM/EDGE demodulation function etc.
- 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 large font display, convenient capacitive touch screen operation, combination of LCD and touch screen, various display modes etc.
- Working temperature range: -10℃～+50℃
- Power supplied by battery or AC

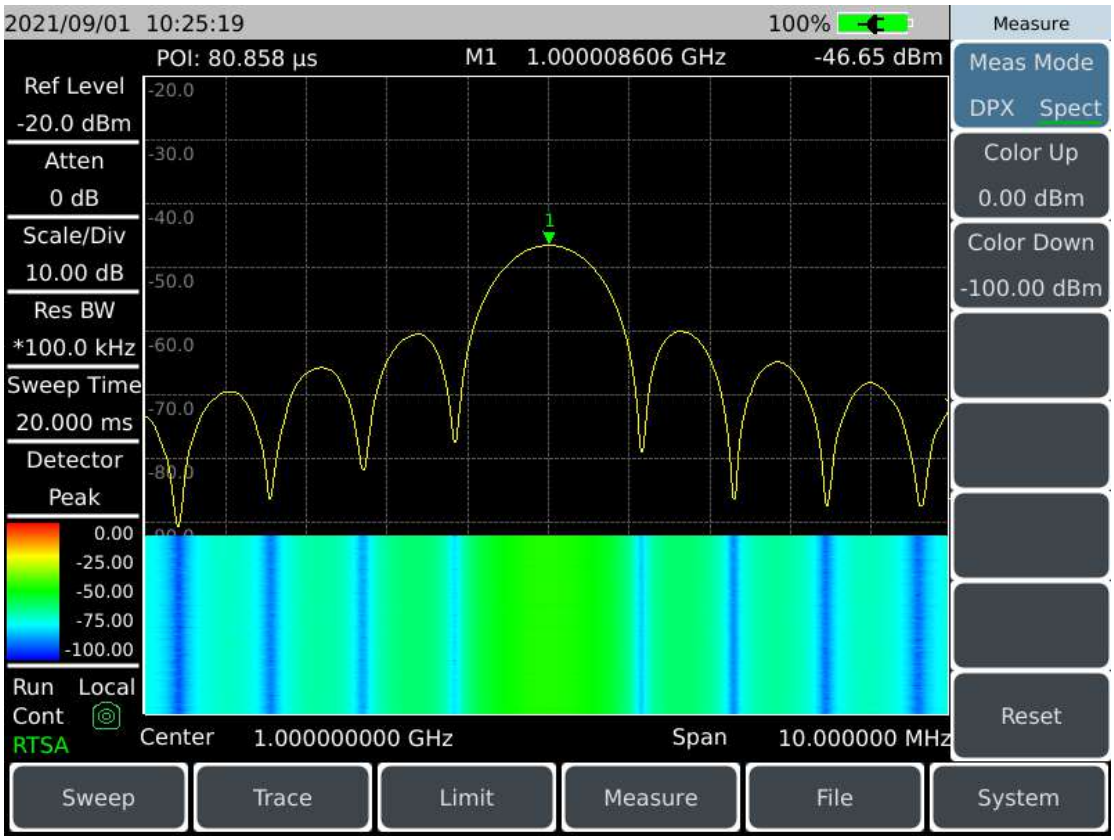
Various Measurement Functions



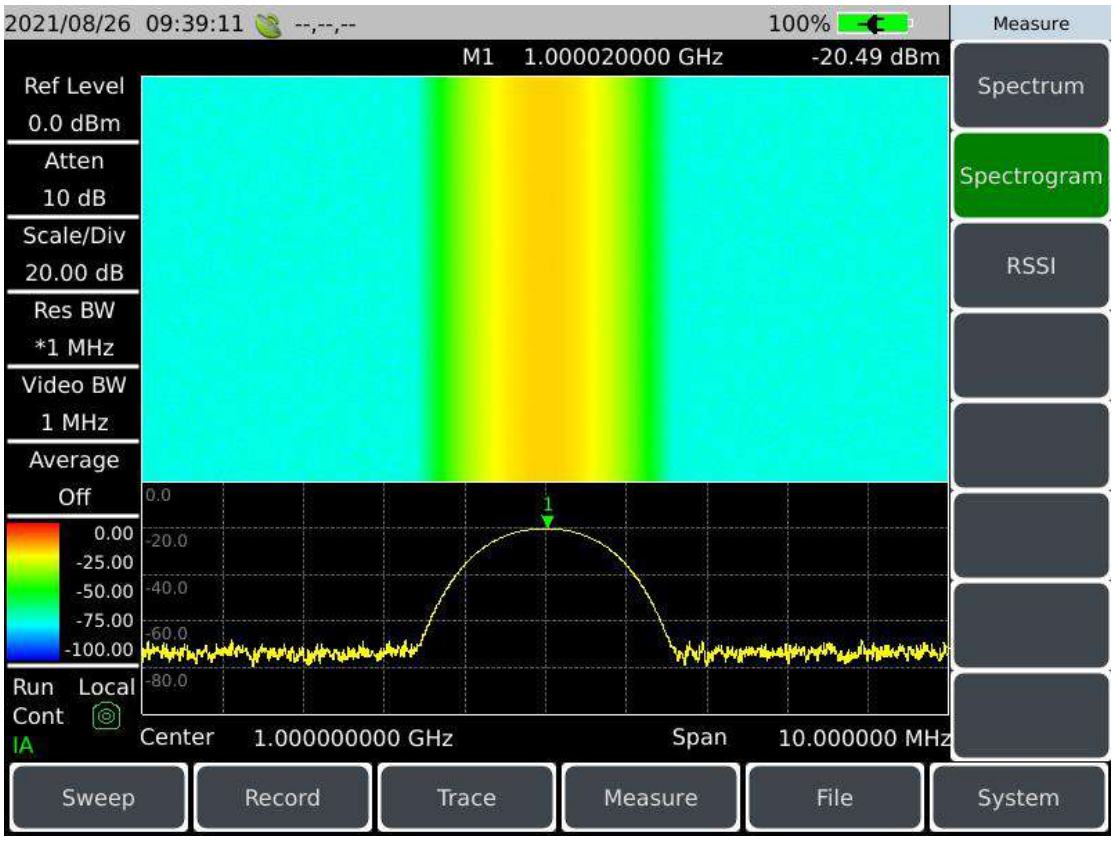
Spectrum Analysis Mode



RTSA Persistence Mode

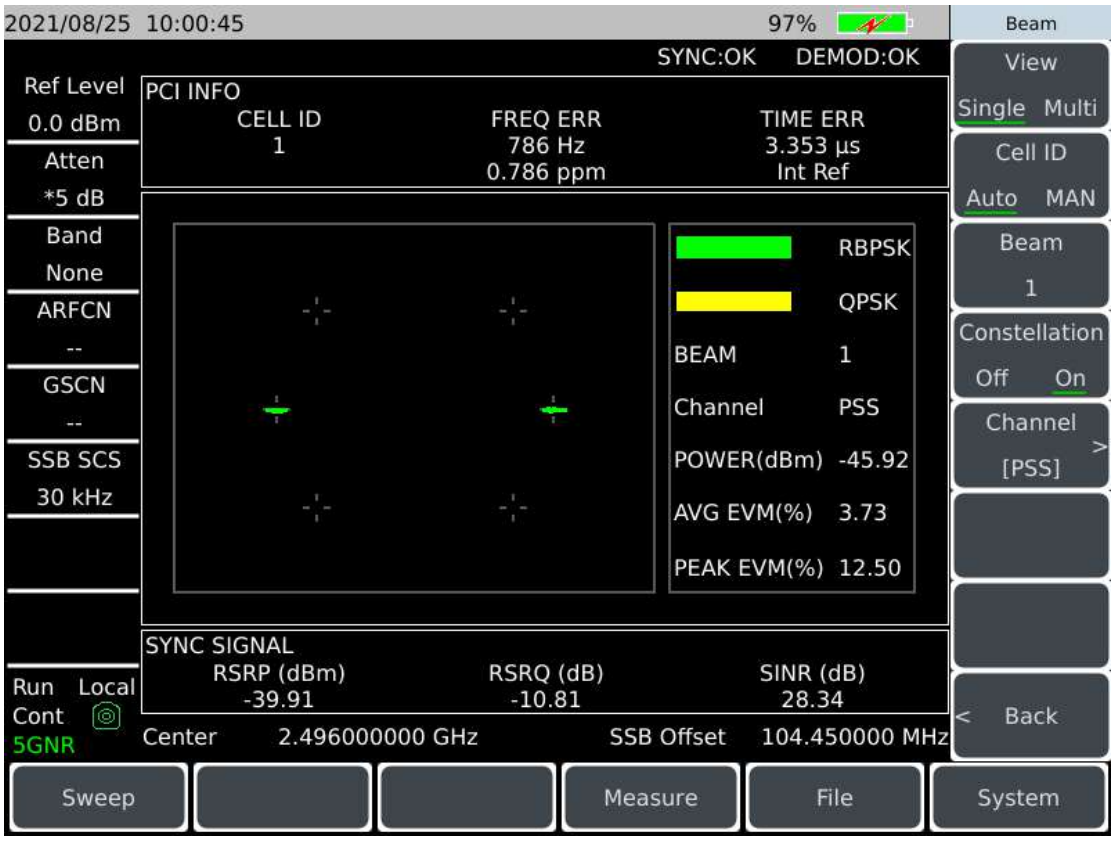


RTSA Waterfall Mode

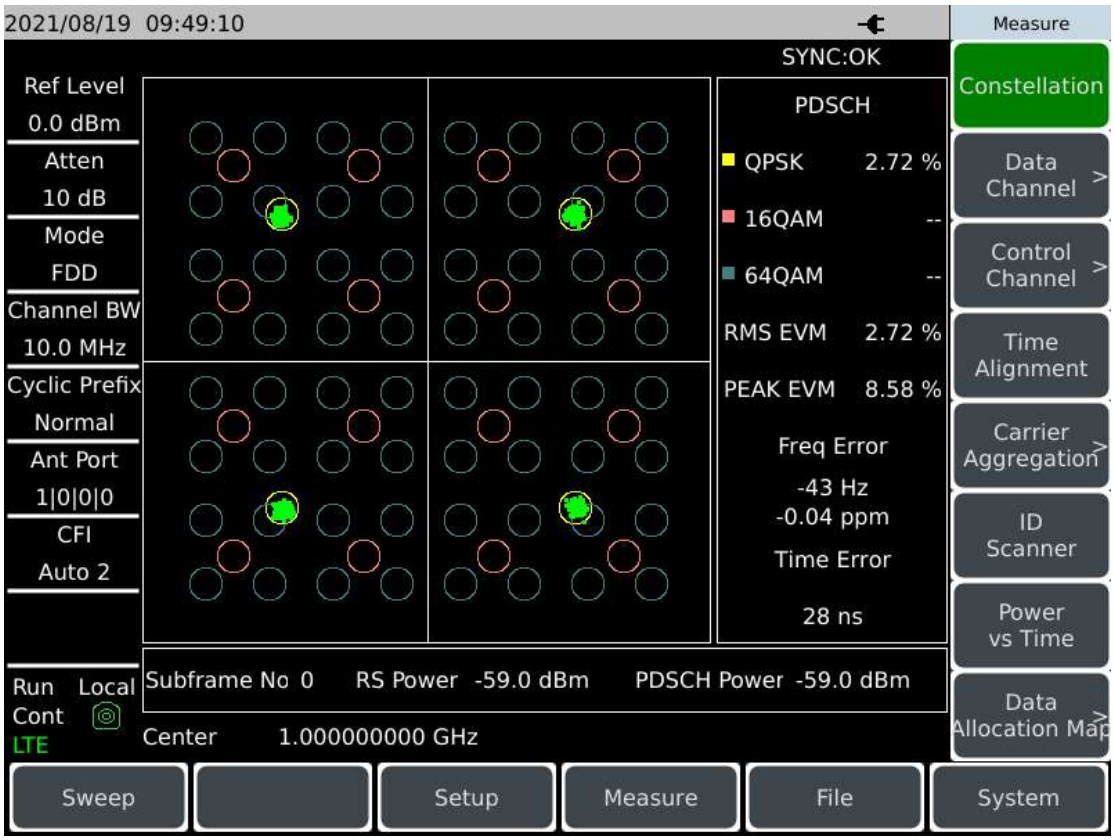


Interference Analysis Mode

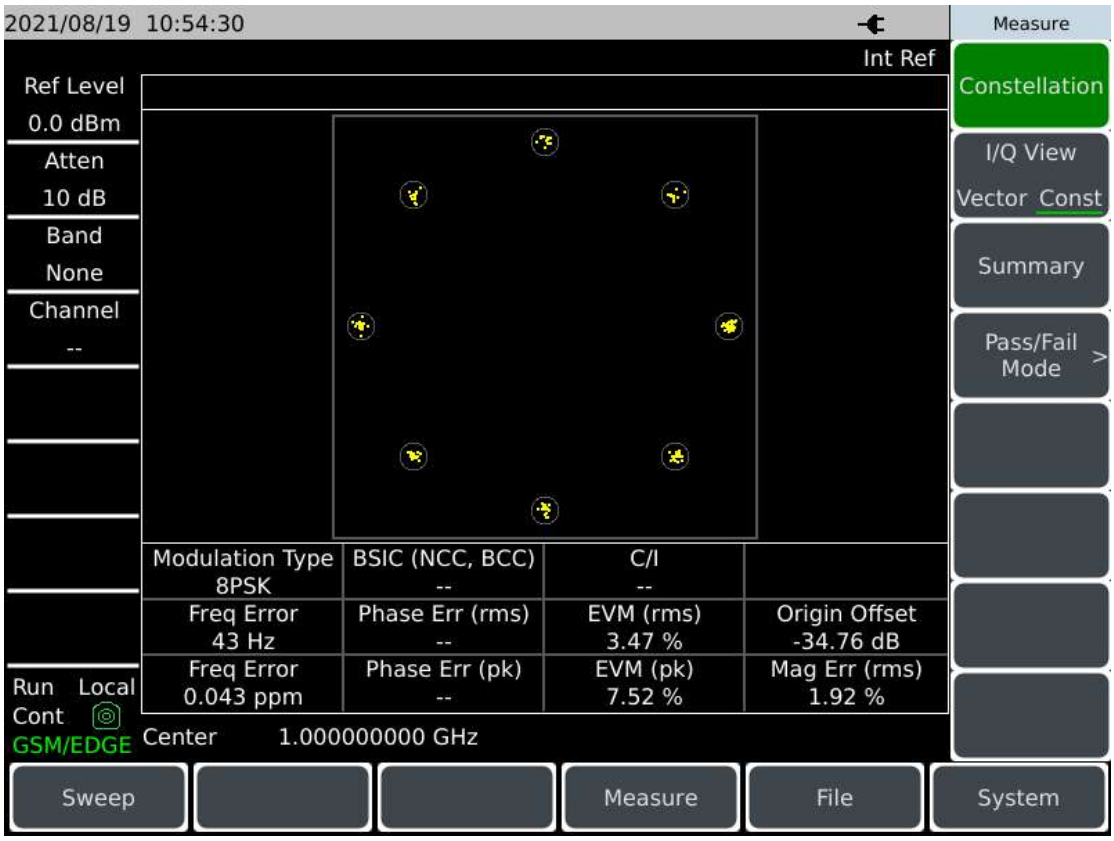
Directional Analysis Mode



5G NR Measurement

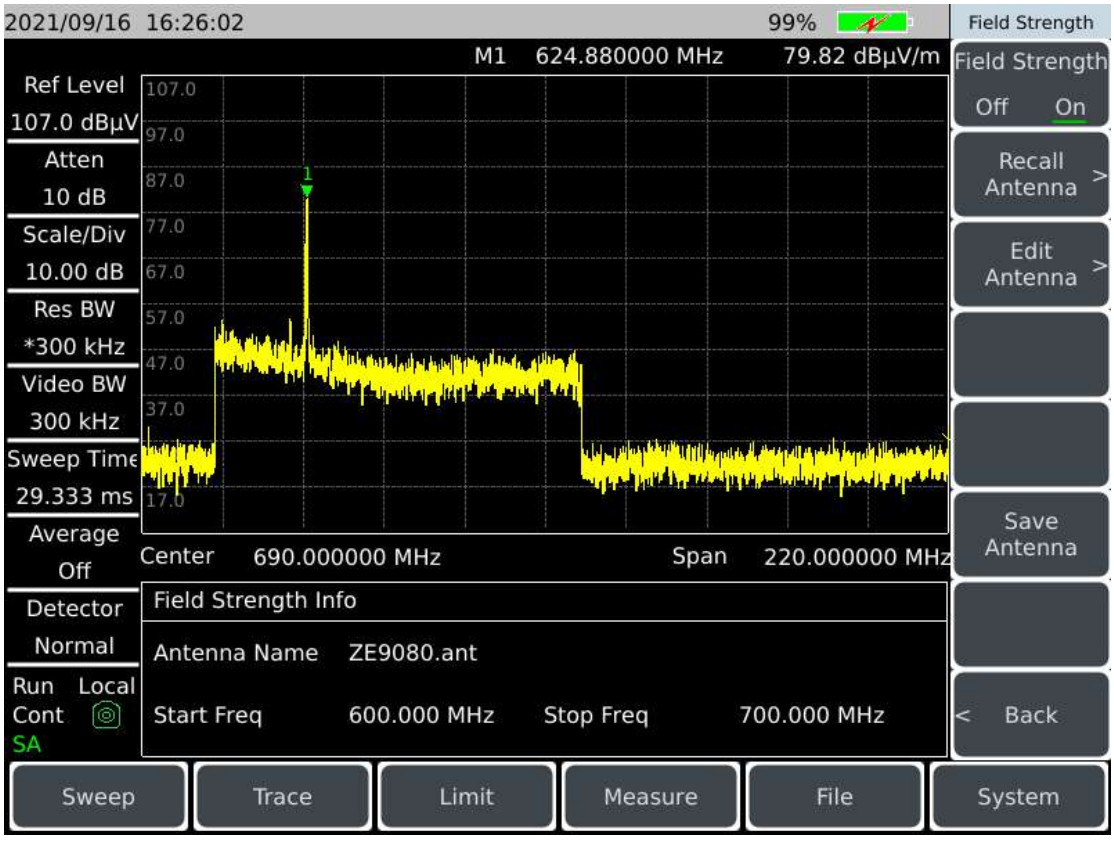


4G LTE Measurement

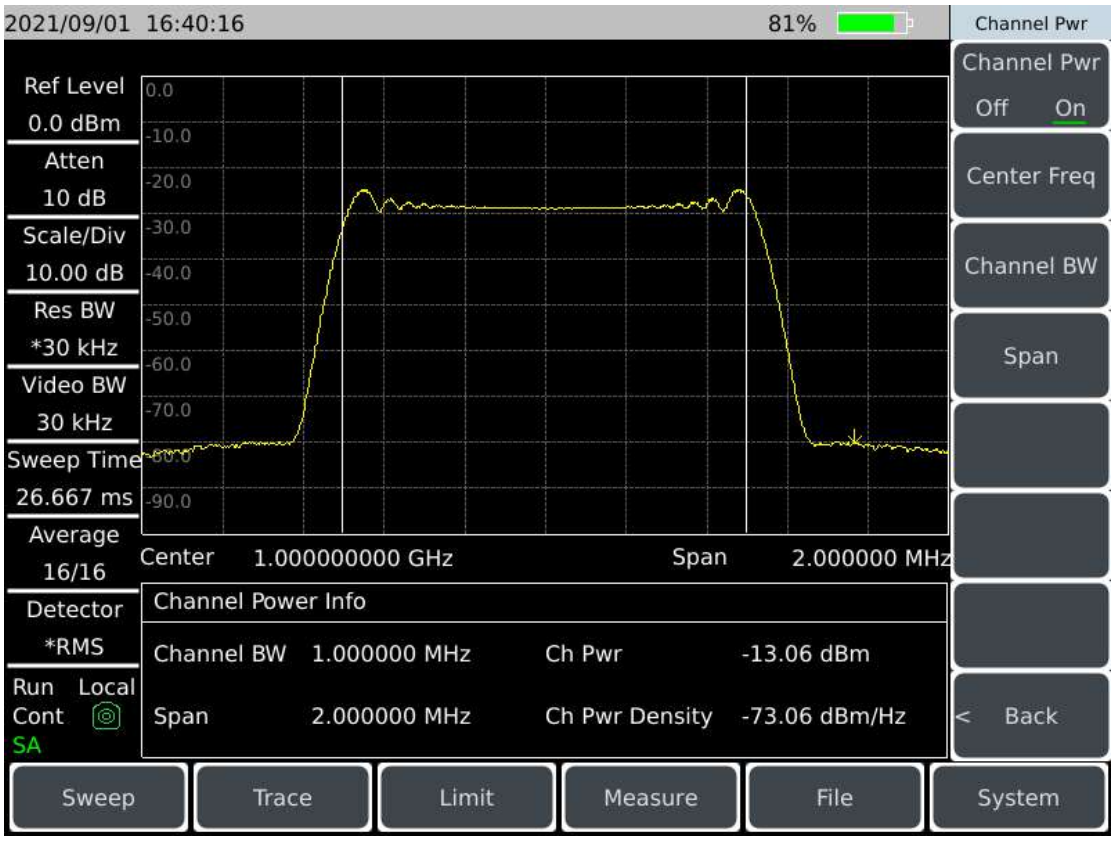


GSM/EDGE Measurement

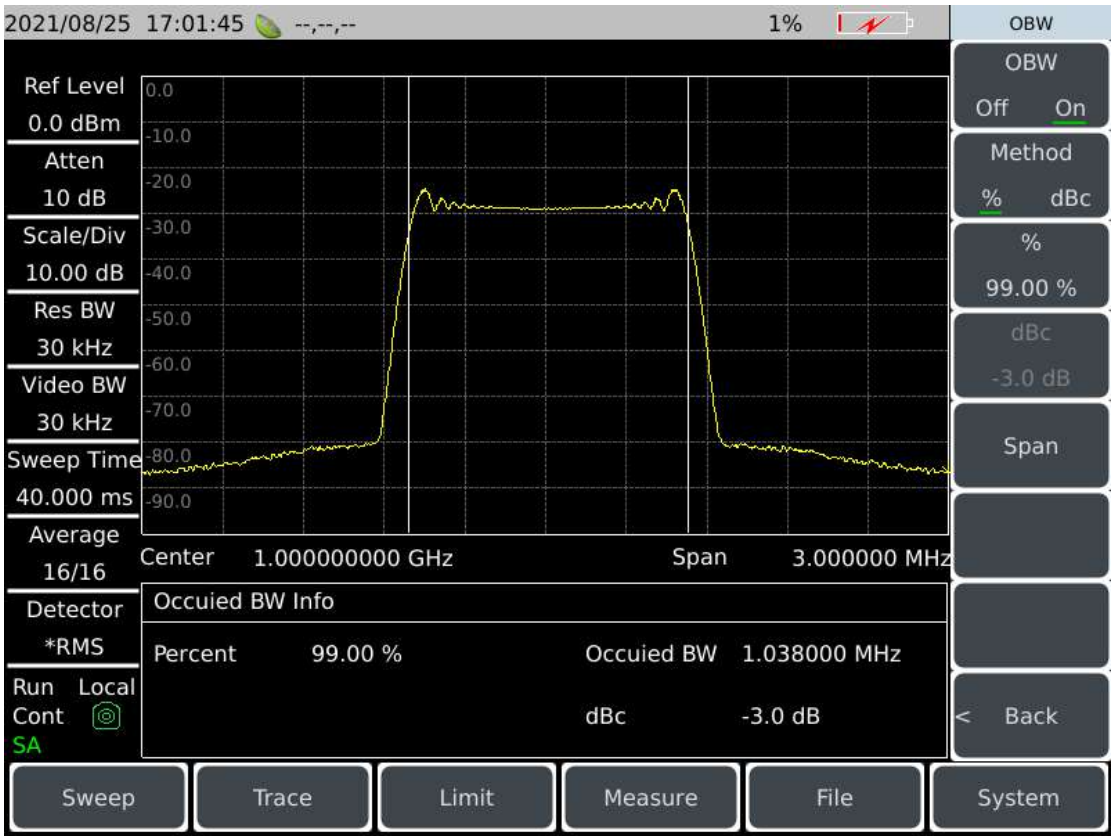
Comprehensive Intelligent Measurement Function



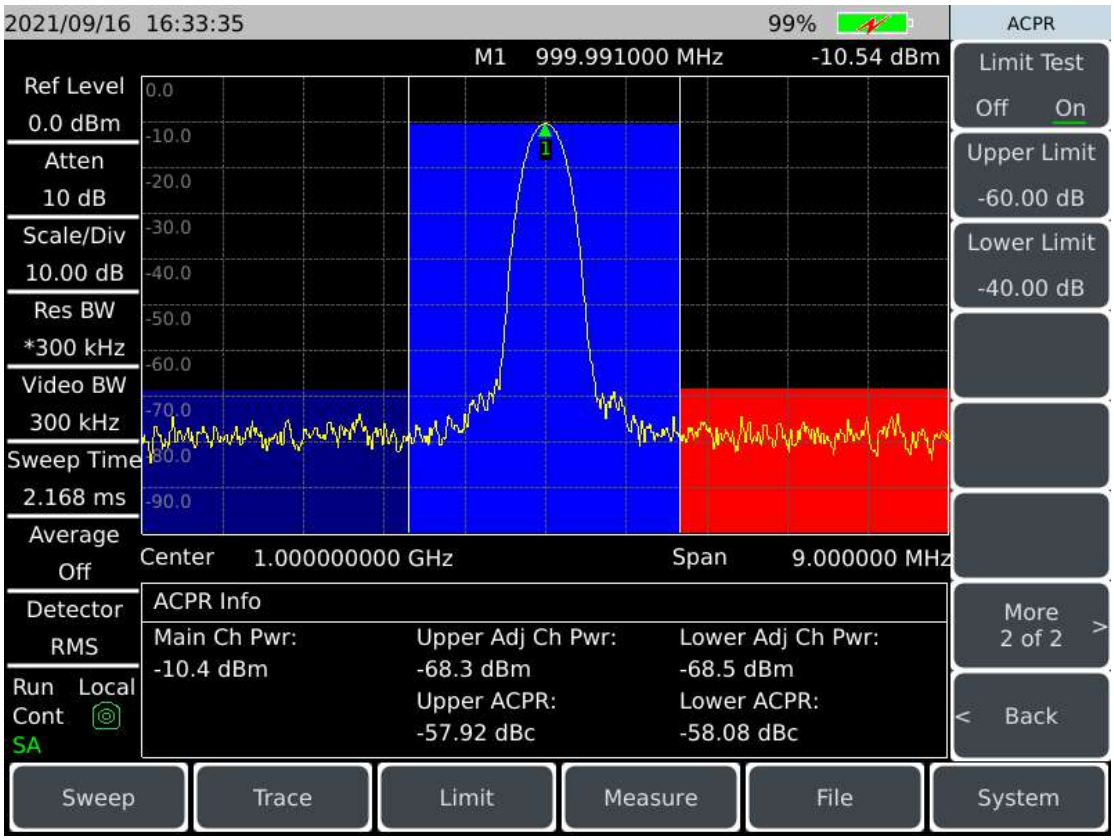
Field Strength Measurement



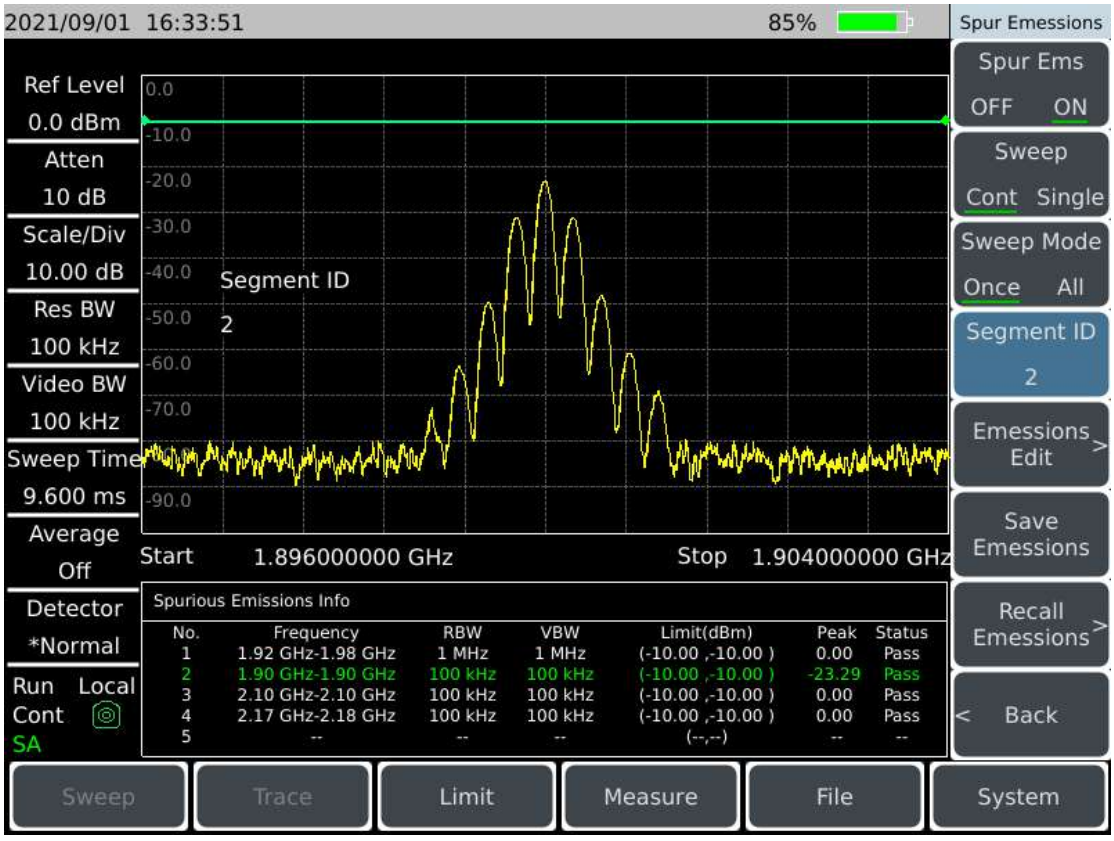
Channel Power



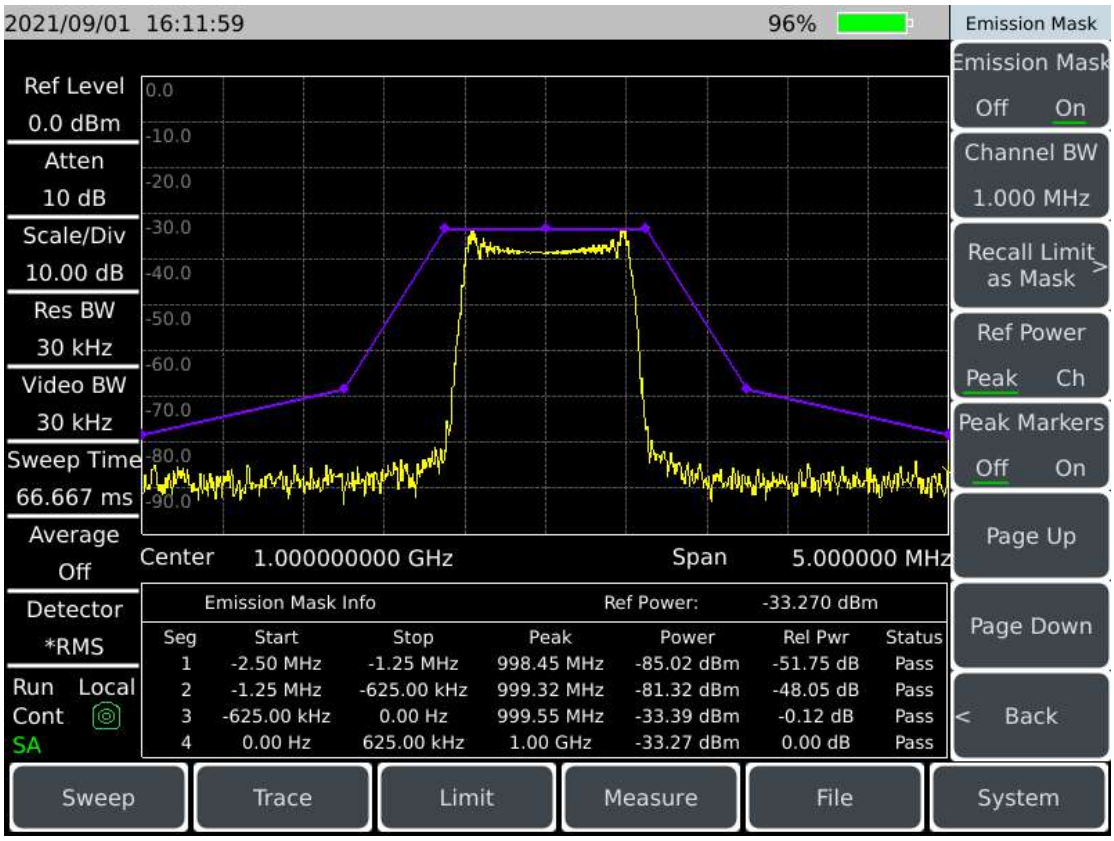
Occupied Bandwidth



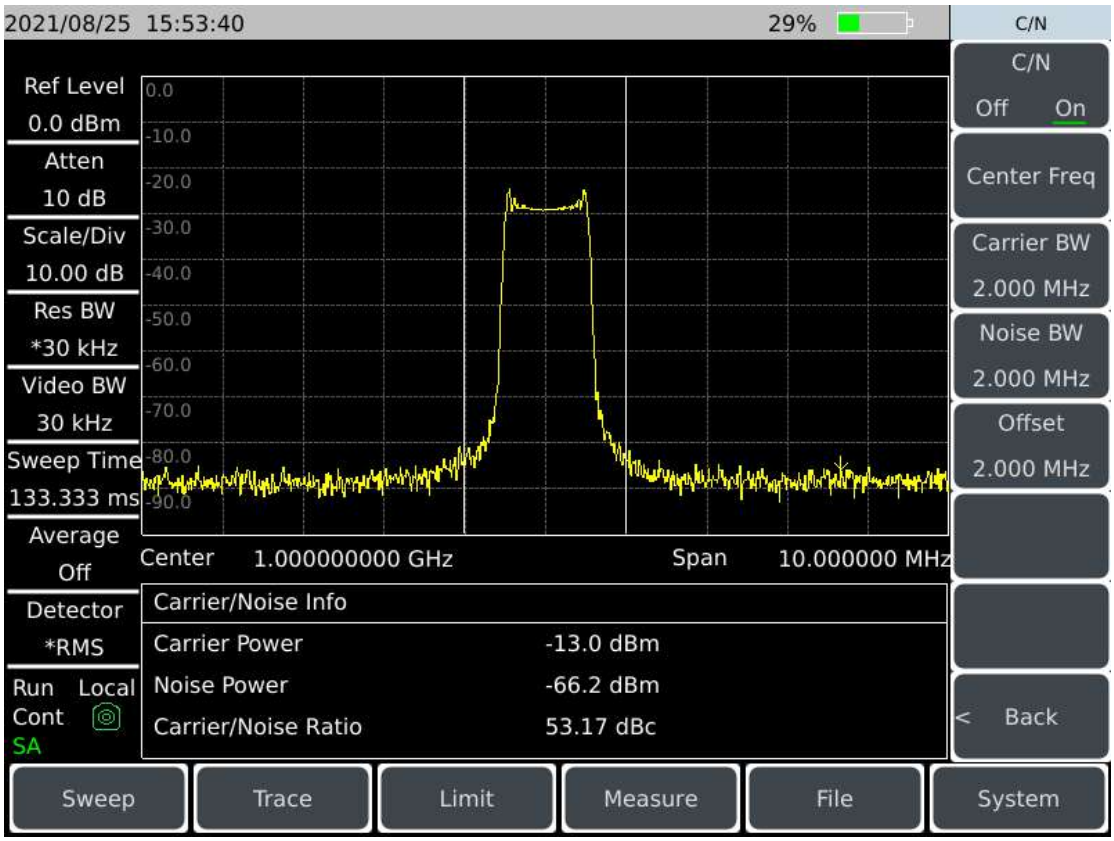
Adjacent-Channel Power Ratio



Spur Emission Mask

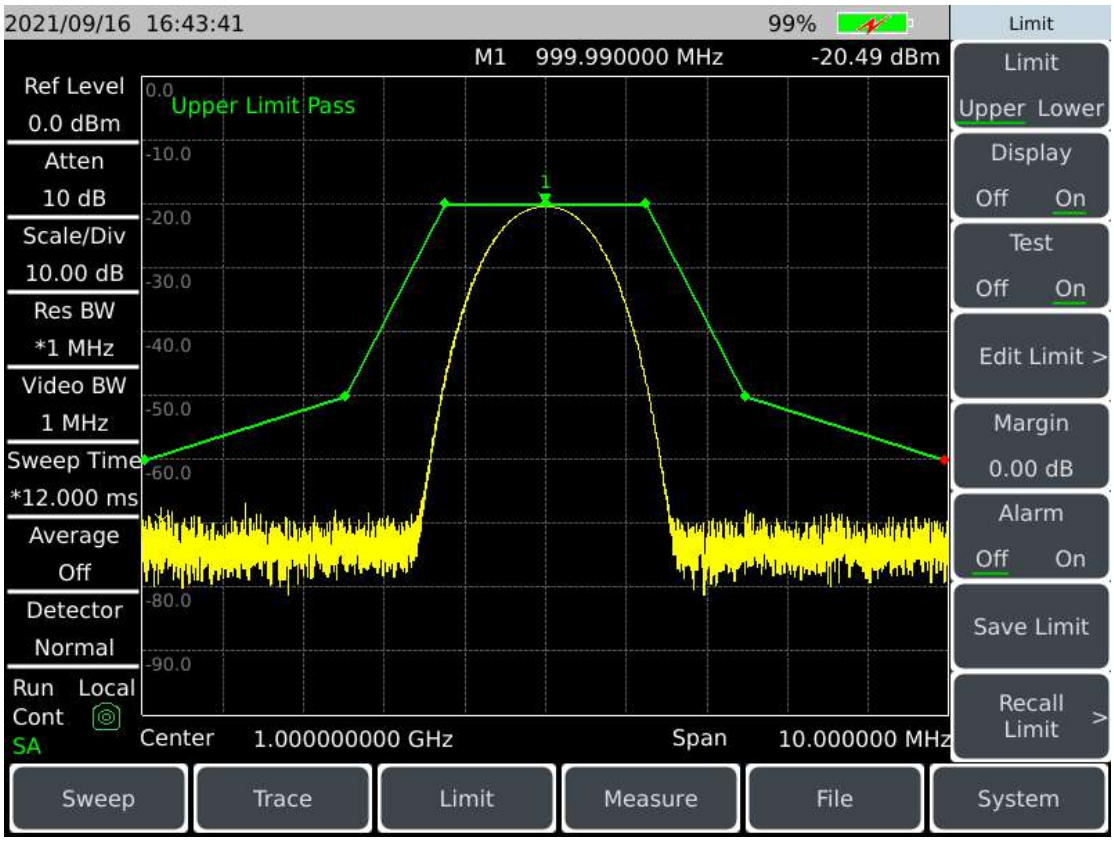


Emission Mask

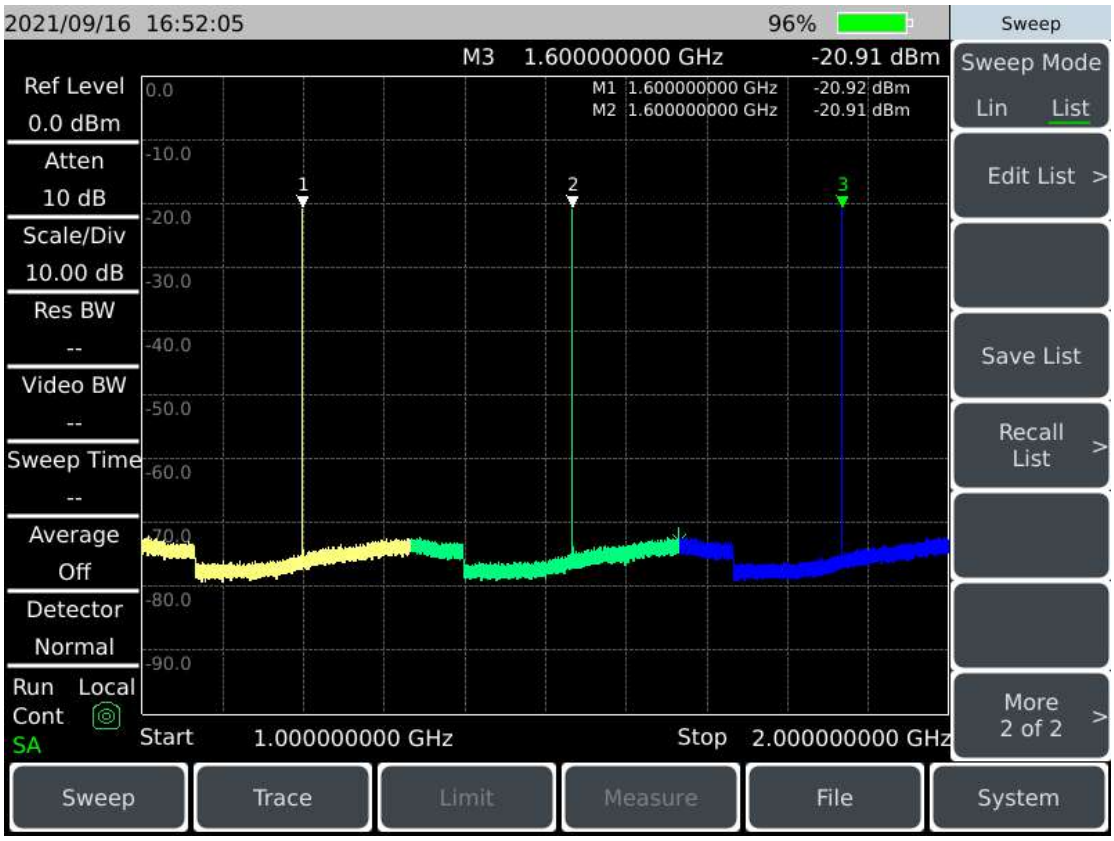


Carrier-to-Noise Ratio

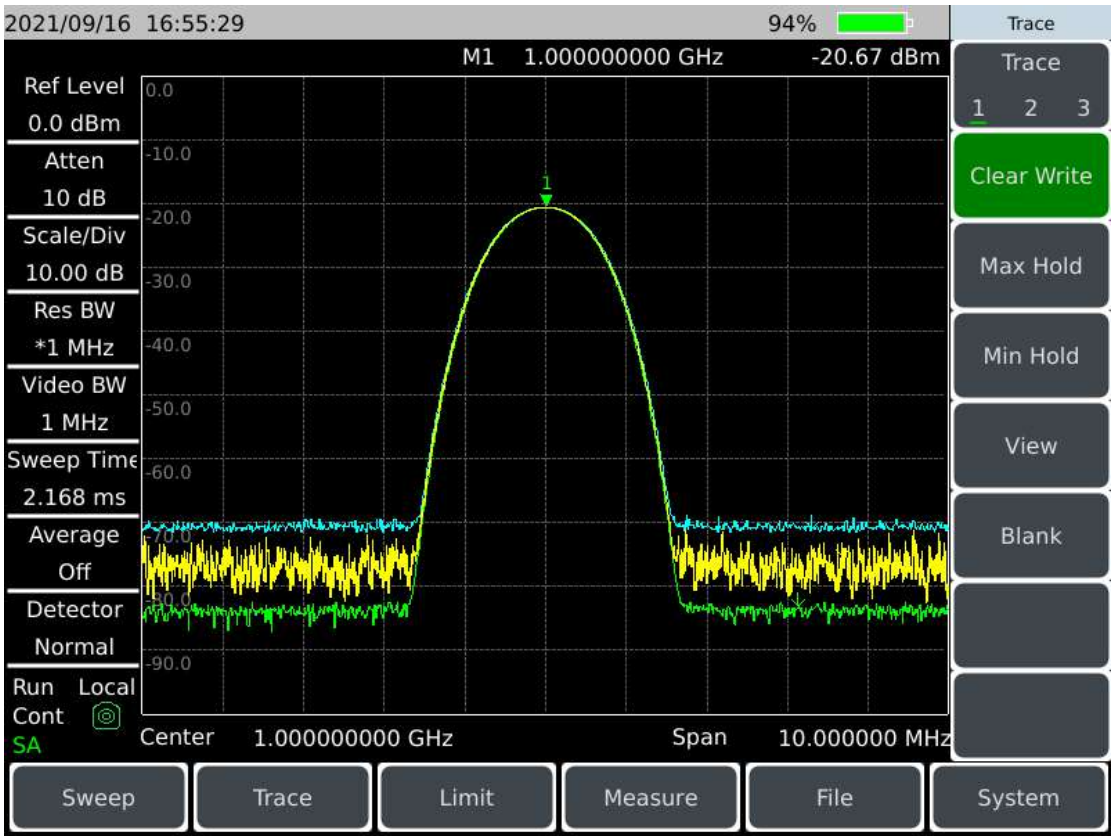
Harmonic Distortion



Limit Line

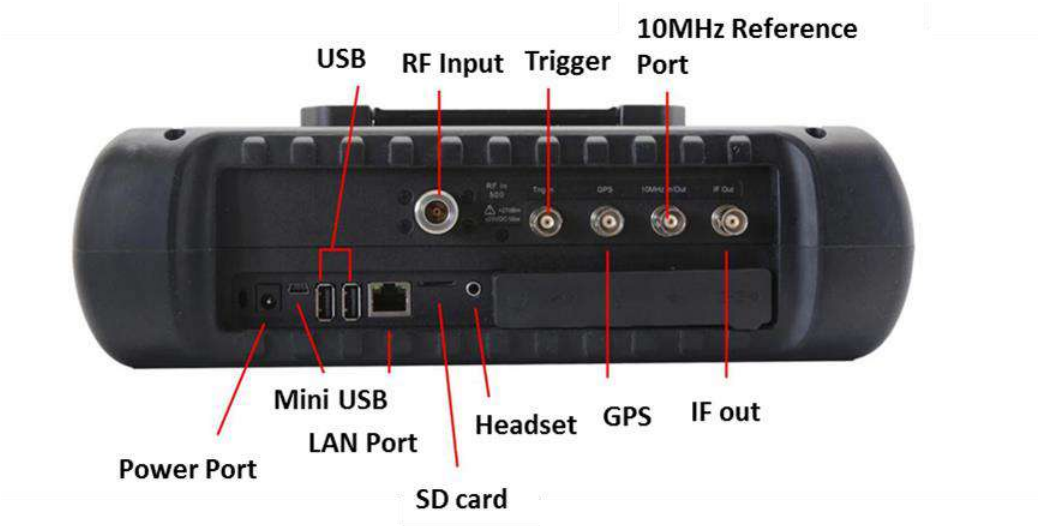


List Sweep



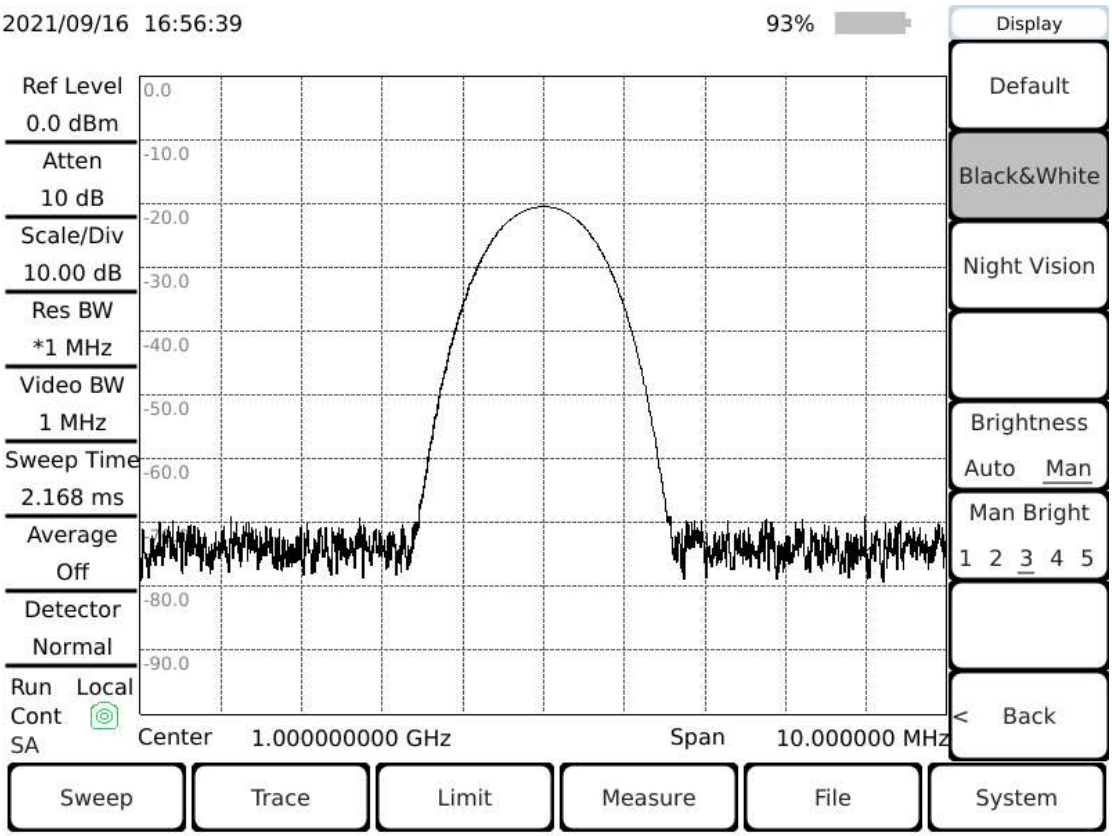
Multi-Traces

Various Auxiliary Test Interfaces

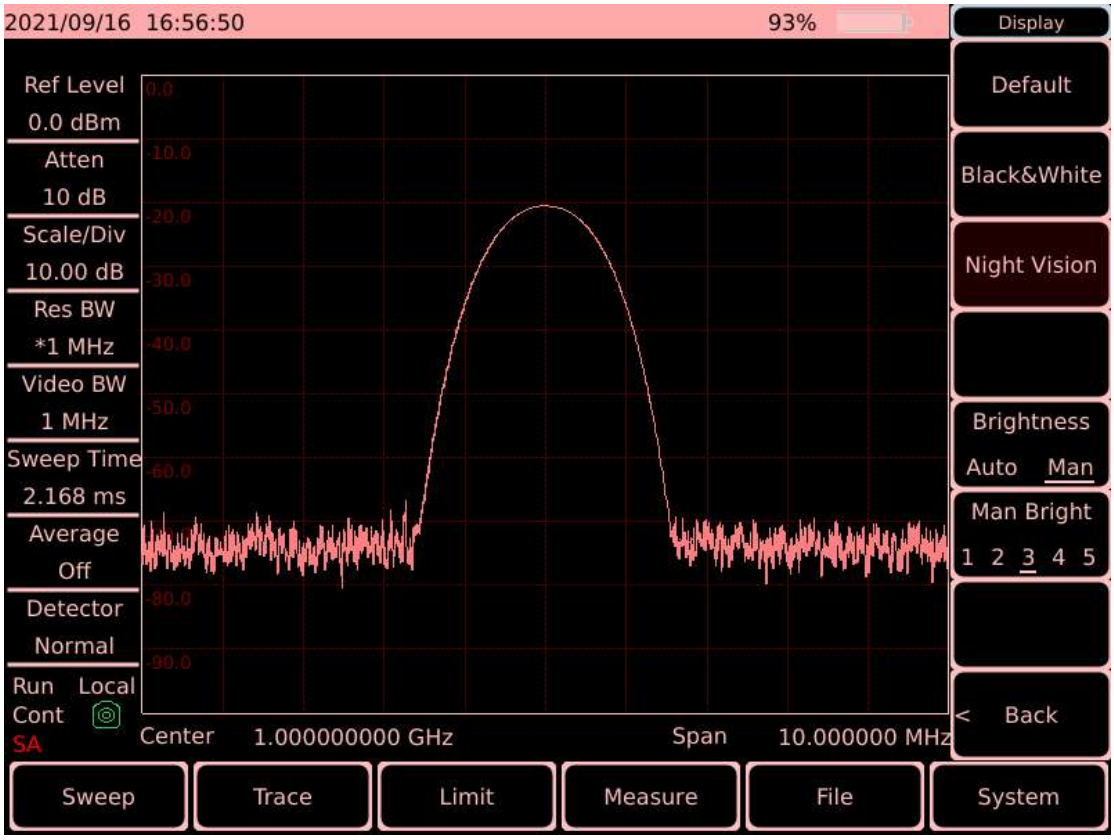


Easy & Convenient User Operation

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



Outdoor Mode



Night Vision Mode

Typical Applications

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 Frequency Resolution:1Hz
Frequency Reference	Frequency: 10MHz Aging Rate: ±0.5ppm/Year Initial Frequency Accuracy: ±0.3ppm Temperature Stability: ±0.1ppm(-10～50℃, Comparative to 25℃)
Sweep Time	Range: 10μs～6000s (Zero Span) Accuracy: ±2.00% (Zero Span)
Frequency Readout Accuracy	±(Frequency Readout× frequency Reference +2%× Span +10%× Resolution Bandwidth)
Frequency Span	Range: 100Hz～9GHz or 0Hz Accuracy: ±2.0%
Resolution Bandwidth	1Hz～10MHz (1-3 Times of Stepping), 20MHz
Video Bandwidth	1Hz～10MHz (1-3 Times of Stepping), 20MHz
SSB Phase Noise (Carrier 1GHz)	≤-108dBc/Hz@ Frequency Offset 10kHz ≤-110dBc/Hz@ Frequency Offset 100kHz ≤-118dBc/Hz@ Frequency Offset 1MHz ≤-129dBc/Hz@ Frequency Offset 10MHz
Displayed Average Noise Level (input port is connected with a 50Ω load, 0dB input attenuation, average detection, logarithm of video type, RBW normalized to 1Hz, tracking source off, 20℃~30℃)	Pre-amplifier Off: ≤-140dBm(2MHz～3GHz) ≤-138dBm(3GHz～9GHz) Pre-amplifier On: ≤-160dBm(2MHz～3GHz) ≤-157dBm(3GHz～9GHz)
Residual Response	(exceptional frequency: 3.15GHz): Pre-amplifier Off: ≤-82dBm（10MHz～9GHz） Pre-amplifier On: ≤-95dBm（10MHz～9GHz）
Second Harmonic Distortion (0dB attenuation, -30dBm input signal)	50MHz~2GHz: <-65dBc 2GHz~4.5GHz: <-70dBc
TOI(-15dBm two-tone signal, 100kHz span, pre-amplifier off)	50MHz~5.2GHz ≥+10dBm 5.2GHz~9GHz ≥+12dBm
Absolute Amplitude Accuracy (input signal 0dBm~-50dBm,	±1.3dB (10MHz～9GHz)

all settings are automatic couplings, 20℃~30℃, 30 minutes of preheating)	
Input Attenuator	Attenuation Range: 0dB～30dB, 5dB Steps
Maximum Continuous Input	+27dBm Peak Typical(≥10dB Attenuation) +20dBm Peak Typical(<10dB Attenuation) +10dBm Peak Typical(Pre-amp On)
Reference Level	Range: -150dBm～+30dBm Conversion Uncertainty: ±1.20dB
Dimension	314mm (W)×218mm (H)×91mm (D) (Excluding Handle, Stand) 338mm(W)×218mm (H)×100mm (D) (Including Handle, Stand)
Weight	≤4.6kg
Working Temperature	-10℃～+50℃ (the battery operation temperature is 0℃～+45℃)
Storage Temperature	-40℃～+70℃ (the battery storage temperature is -20℃～+60℃)
Electromagnetic Compatibility	Conforms to GJB3947A-2009 3.9.1 Requirements
Power Supply	AC 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

Ordering Information

Main Unit: 4024CA Spectrum Analyzer

Standard Package

No.	Description
1	Power Supply: Standard 3-Phase Power Cord, Power Adapter and Rechargeable Lithium Ion Battery
2	Instrument Quick guide
3	USB Remote Control Cable
4	Certificate of Conformity

Options

Serial No.	Description	Function
4024CA-001	Optional Accessories of English Version	English Signs、Keys、Menu
4024CA-002	User Manual (Chinese)	--
4024CA-003	User Manual (English)	--
4024CA-004	Programming Manual (Chinese)	--
4024CA-005	Programming Manual (English)	--
4024CA-006	Power Adapter	Power Adapter
4024CA-007	Rechargeable Lithium Ion Battery	Standby Battery
4024CA-009	Micro SD Card	Class4, Capacity: 8G
4024CA-010	GPS and BEIDOU function	GPS exposed Antenna
4024CA-016	Interference Analyzer Option	Provide Spectrogram, RSSI Measurement etc. Functions
4024CA-019	List Sweep Option	To Realize Continuous Sweep Measurement of Various Frequency Bands
4024CA-020	Zero Span IF Output	Output the Third or Fourth IF Signal (Choose One of Two)
4024CA-021	ZE9080 Directional Antenna A	Frequency Range:9kHz ～ 20MHz,N(f) (Requires Option 025)
4024CA-022	ZE9080 Directional Antenna B	Frequency Range:20MHz～200MHz, N(f) (Requires Option 025)
4024CA-023	ZE9080 Directional Antenna C	Frequency Range:200MHz ～ 500MHz, N(f) (Requires Option 025)
4024CA-024	ZE9080 Directional Antenna D	Frequency Range:500MHz ～ 8GHz, N(f) (Requires Option 025)
4024CA-025	ZE9080 Antenna Amplifier	Frequency Range:10kHz ～ 8GHz,N(m), include option 050 (Requires Option 021/022/023/024)
4024CA-028	Functional Bag	Protect the Instrument
4024CA-029	Backpack	Easy to Carry
4024CA-030	Safety Instrument Carrying Case	Used to Carry
4024CA-038	Location Analyzer Option	Internal software which requires option 010, option 050 and directional antenna for function

		realization
4024CA-041	Omnidirectional Whip Antenna	Frequency Range: 700MHz ～ 2700MHz, suitable for communication frequency band
4024CA-042	700MHz～4GHz Directional Antenna	Active Log Periodic Antenna, Frequency Range: 700MHz～4GHz
4024CA-043	700MHz～6GHz Directional Antenna	Active Log Periodic Antenna, Frequency Range: 700MHz～6GHz
4024CA-044	680MHz～10GHz Directional Antenna	Active Log Periodic Antenna, Frequency Range: 680MHz ～ 10GHz
4024CA-046	400MHz～4GHz Directional Antenna	Active Log Periodic Antenna, Frequency Range: 400MHz～4GHz
4024CA-047	400MHz～6GHz Directional Antenna	Active Log Periodic Antenna, Frequency Range: 400MHz～6GHz
4024CA-048	380MHz～10GHz Directional Antenna	Active Log Periodic Antenna, Frequency Range: 380MHz ～ 10GHz
4024CA-050	USB Electronic Compass	External USB electronic compass, requires option 038 for function realization
4024CA-051	6GHz Omnidirectional Antenna	Portable Omnidirectional Antenna, Frequency Range: 680MHz～6GHz
4024CA-052	8GHz Omnidirectional Antenna	Portable Omnidirectional Antenna, Frequency Range: 300MHz～8GHz
4024CA-053	VHF/UHF Extension-Type Whip Antenna	Frequency Range: 140MHz/430MHz
4024CA-054	Passive Directional Antenna(700MHz～4GHz)	Passive Log Periodic Antenna, Frequency Range: 700MHz～4GHz
4024CA-055	Passive Directional Antenna(700MHz～6GHz)	Passive Log Periodic Antenna, Frequency Range: 700MHz～6GHz
4024CA-056	Passive Directional Antenna(680MHz～10GHz)	Passive Log Periodic Antenna, Frequency Range: 680MHz ～ 10GHz
4024CA-060	N/SMA-JJ RF Cable (2m)	N/SMA RF Coaxial Cable (m-m), DC～18GHz, 2m length
4024CA-061	N/SMA-JJ RF Cable (1m)	N/SMA RF Coaxial Cable (m-m), DC～18GHz, 1m length
4024CA-067	ZE9080 Antenna Transportation Case	Special case for ZE9080 antenna, for the whole set of ZE9080 antenna and antenna amplifier, including option 021, 022, 023, 024, 025

4024CA-068	Real-time spectrum analysis	Provide real-time spectrum analysis function, including digital fluorescence and waterfall chart
4024CA-069	5G NR measurement	Can perform demodulation analysis of 5G NR signals
4024CA-070	Time gated measurement	Perform time slot signal analysis
4024CA-071	LTE measurement	Perform 4G LTE FDD/TDD demodulation analysis
4024CA-072	GSM/EDGE measurement	Perform 2G GSM/EDGE demodulation analysis
4024CA-073	120MHz analysis bandwidth	The analog bandwidth is extended to 120MHz, affecting the zero-span IF output, IQ data acquisition, and real-time spectrum analysis functions
4024CA-074	Indoor/outdoor map measurement	Built-in software, including indoor/outdoor maps, need to be used with 010 option