4024A/B/C/D/E/F/G/H/L
Spectrum Analyzer

(9kHz～4GHz/6.5GHz/9GHz//20GHz/26.5GHz/32GHz/44GHz/50GHz/67GHz)

Ceyear Technologies Co., Ltd.

Product Overview

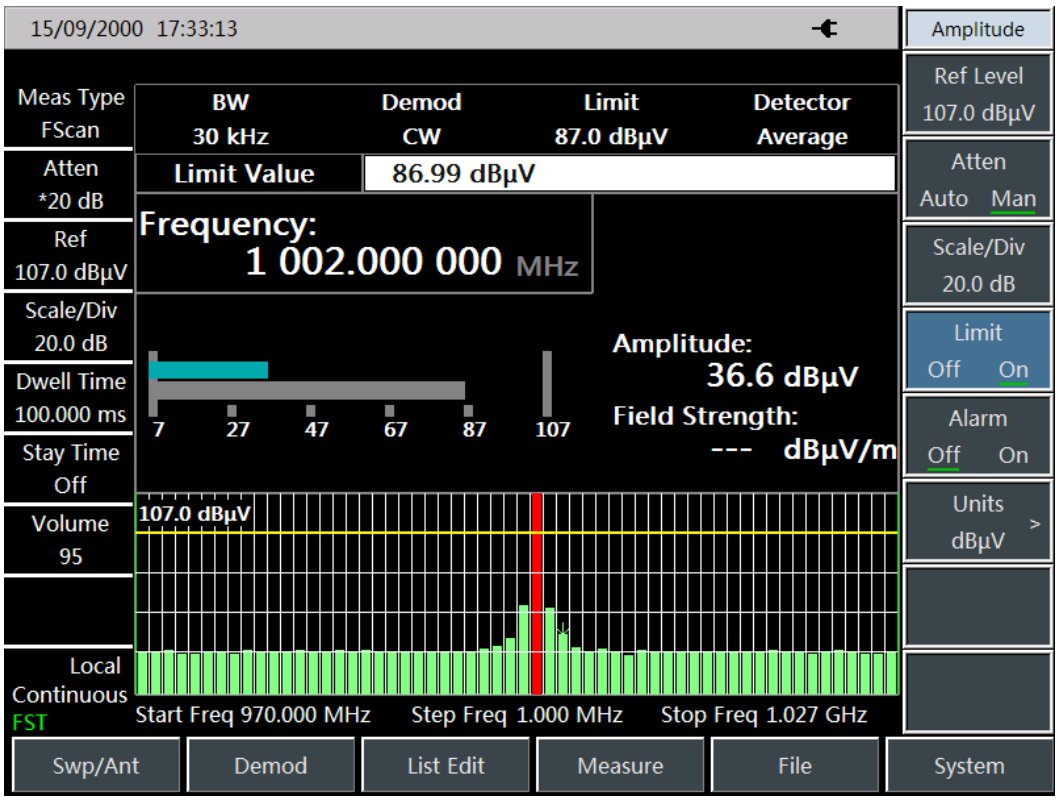
4024 series spectrum analyzer possesses many advantages: wide frequency range, high performance, high sweep speed, various functions, and easy operation. In terms of performance index, it has advantages of excellent displayed average noise level, low phase noise, and high sweep speed. In terms of measurement functions, it has measurement functions of spectrum analyzer, interference analyzer, AM/FM/PM analyzer, power meter, channel scanner etc., as well as intelligent measurement functions of channel power, occupied bandwidth, adjacent-channel power, tune & listen, emission mask, and carrier-to-noise ratio etc. 4024 adopts the integrated design of 8.4 inch LCD and capacitive touch screen, which improves the display definition and operation convenient. It is handheld, compact and light, with flexible power supply, which is very suitable for field work.

4024 can be used for signal and equipment test in the fields of aerospace, microwave & satellite communication, radio communication, radar monitoring, electronic countermeasures & reconnaissance, and precision guidance.

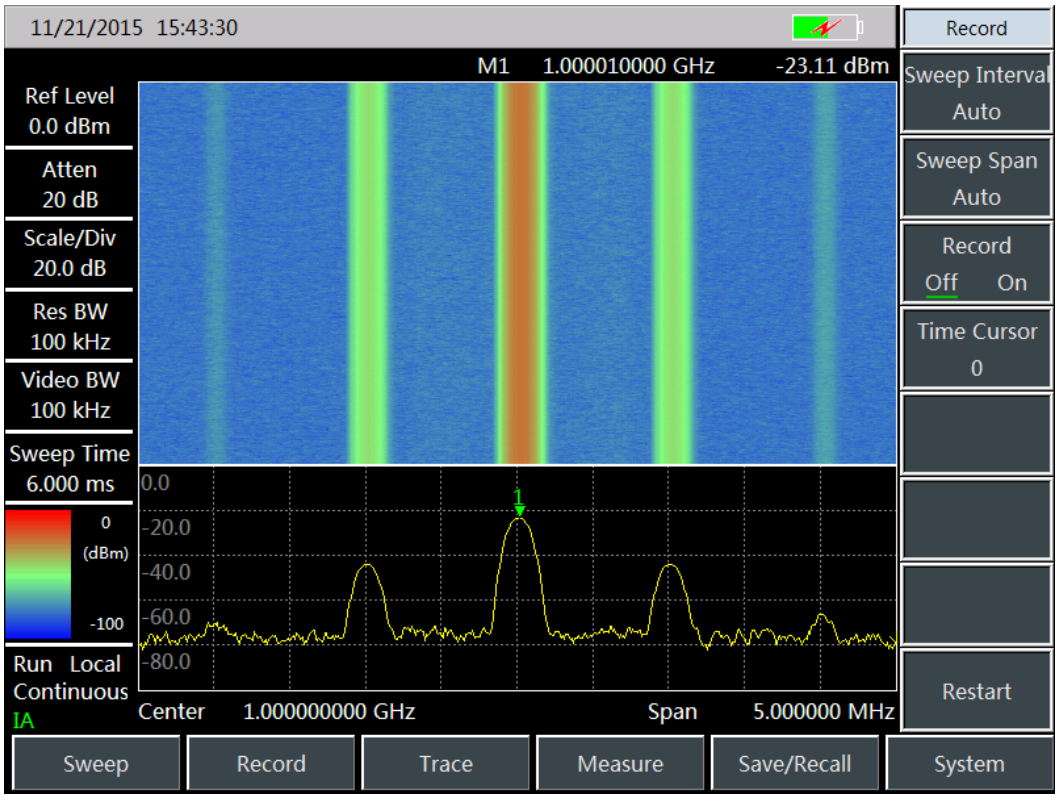
Main Characteristics

- **Wide frequency range: from 9kHz to 67GHz, 9 models**
- **Low displayed average noise level: -163dBm@1Hz RBW(typical)**
- **Excellent phase noise performance:**
  -112dBc/Hz@100kHz frequency offset@1GHz carrier (4024A/B/C)
  -106dBc/Hz@100kHz frequency offset@1GHz carrier (4024D/E/F/G/H/L)
- **High sweep speed: for 1GHz span, shortest sweep time <20ms**
- **Resolution bandwidth: 1Hz～10MHz**
- **Full-band pre-amplifier: standard configuration**
- **Various measurement functions: spectrum analyzer, interference analyzer (spectrogram, RSSI), AM/FM/PM analyzer, channel scanner, high accuracy power meter, signal analyzer etc.**
- **Various intelligent measurement functions: field strength measurement, channel power, occupied bandwidth, adjacent-channel power ratio, tune&listen, carrier-to-noise ratio, emission mask**
- **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 adapter**

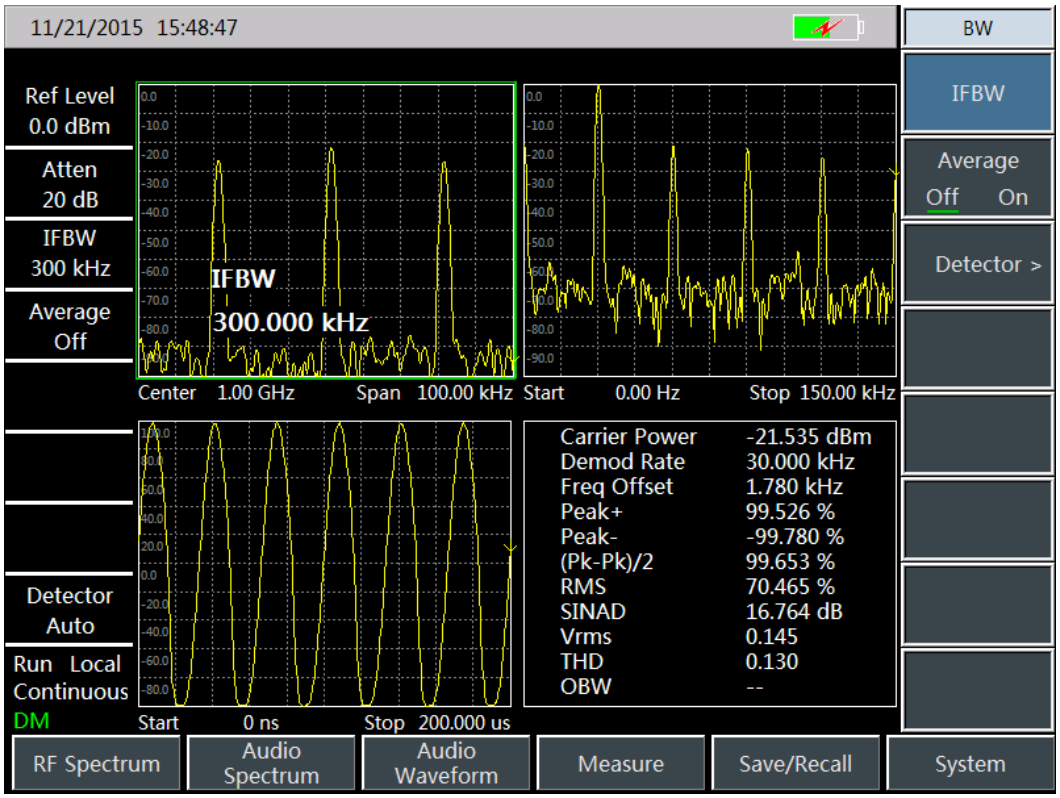
Various Measurement Functions



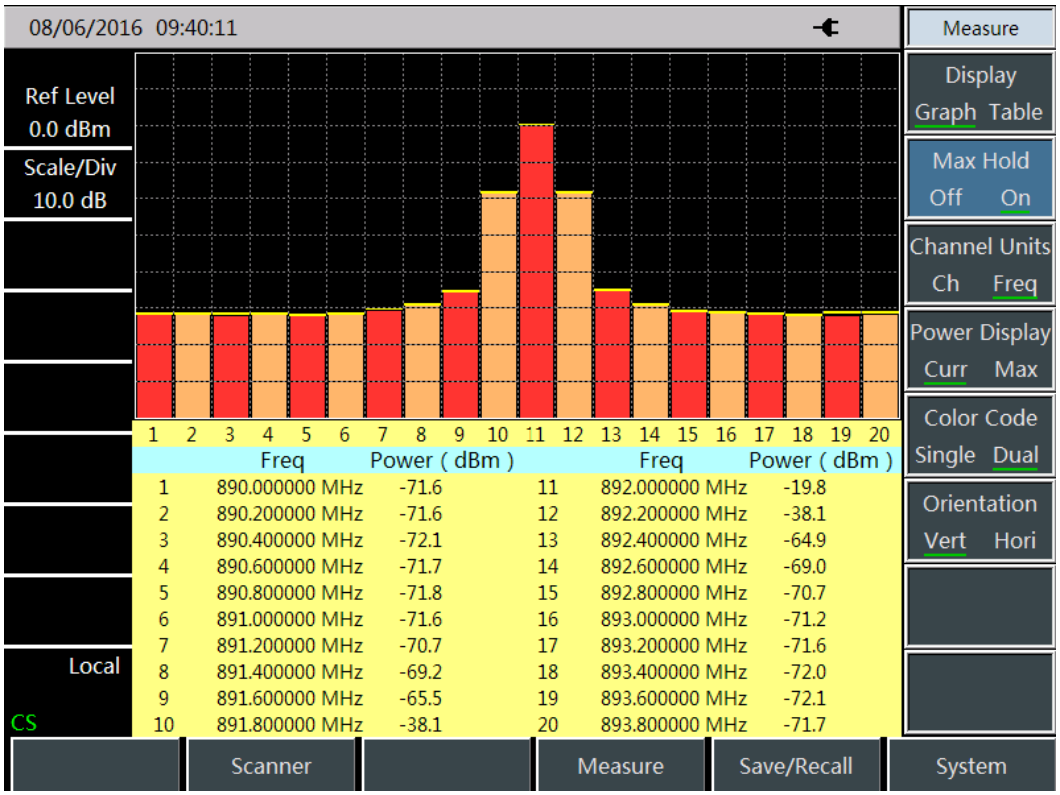
Field Strength



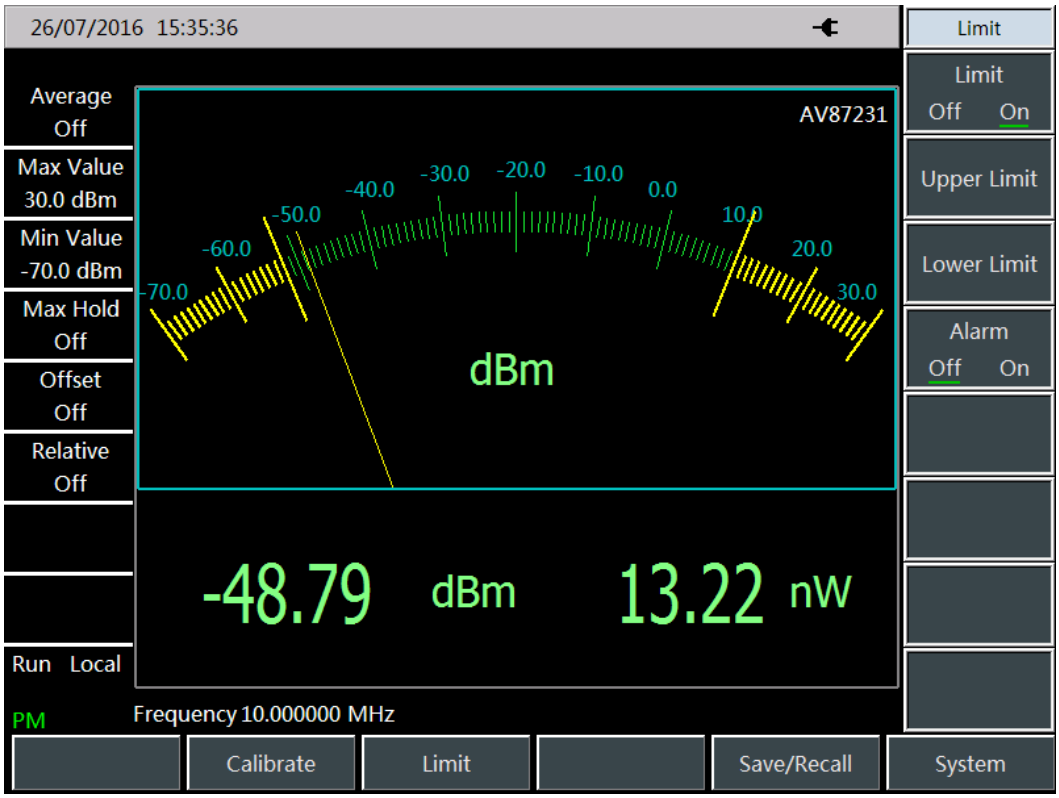
Interference Analyzer (Spectrogram)



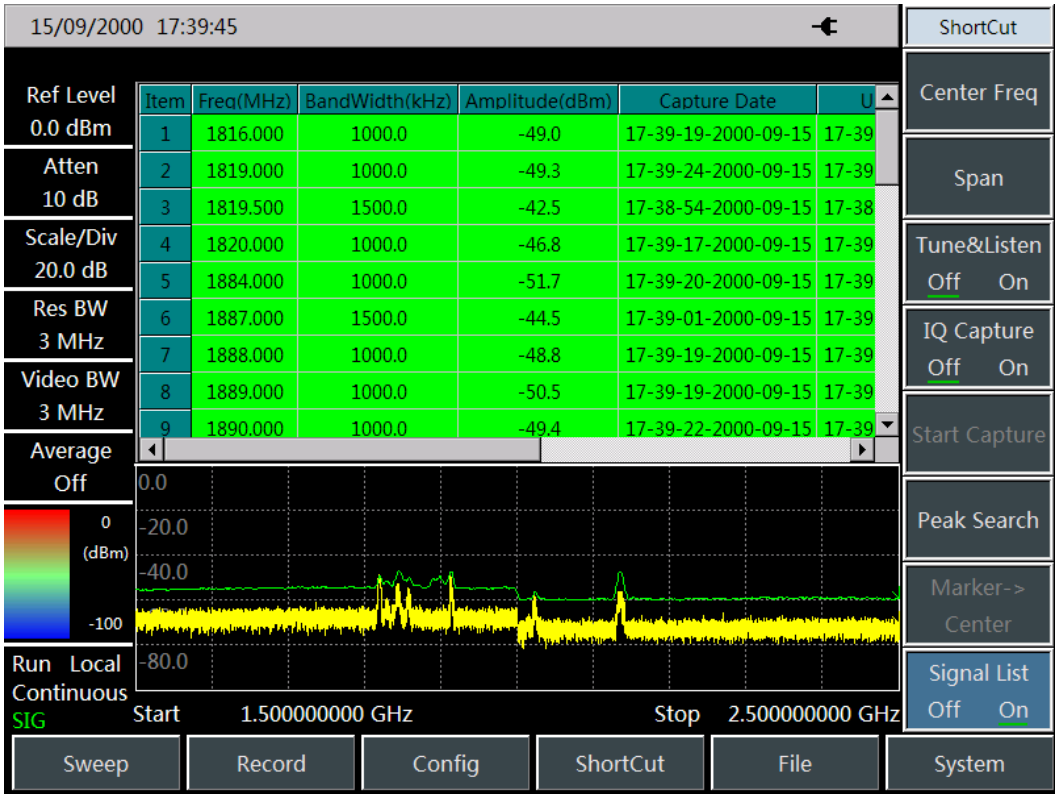
AM/FM/PM Demodulation



Channel Scanner

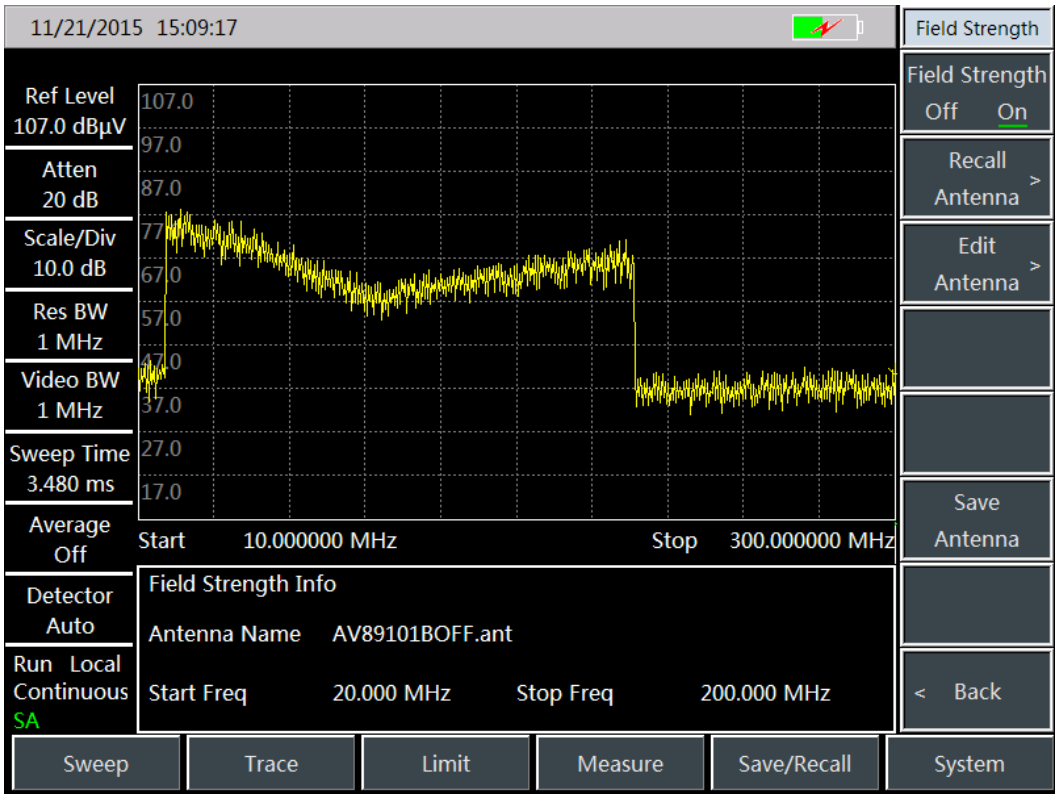


Power Meter (USB Power Probe)

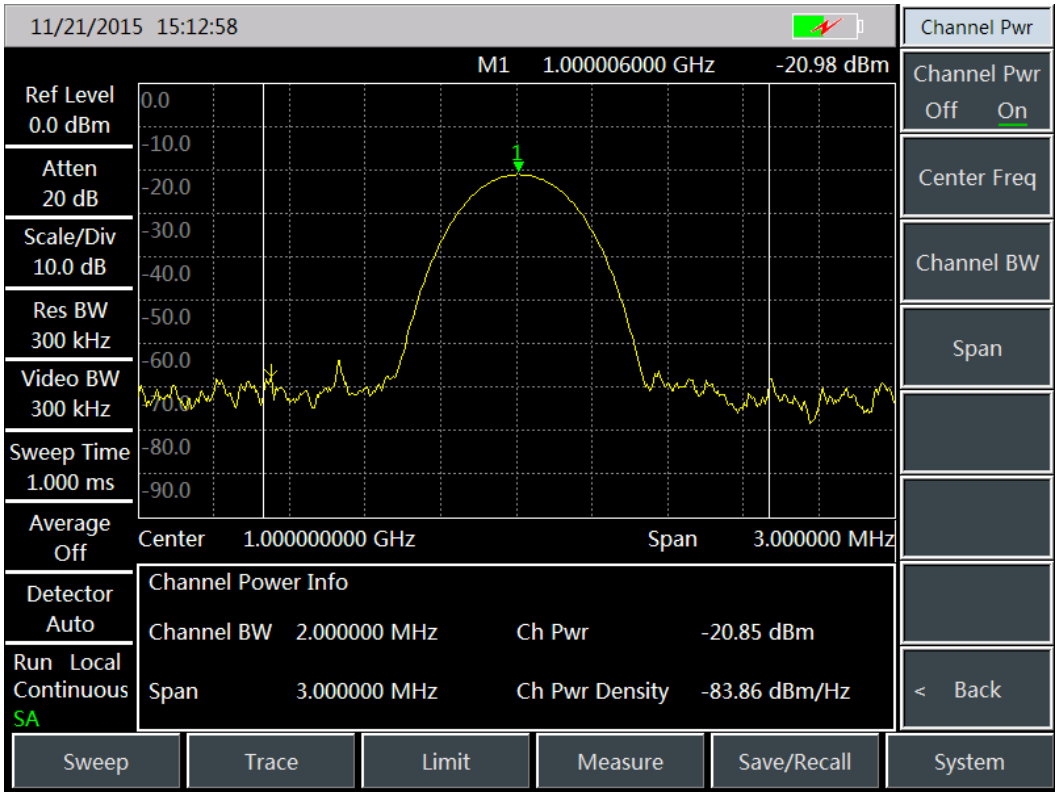


Signal Analyzer

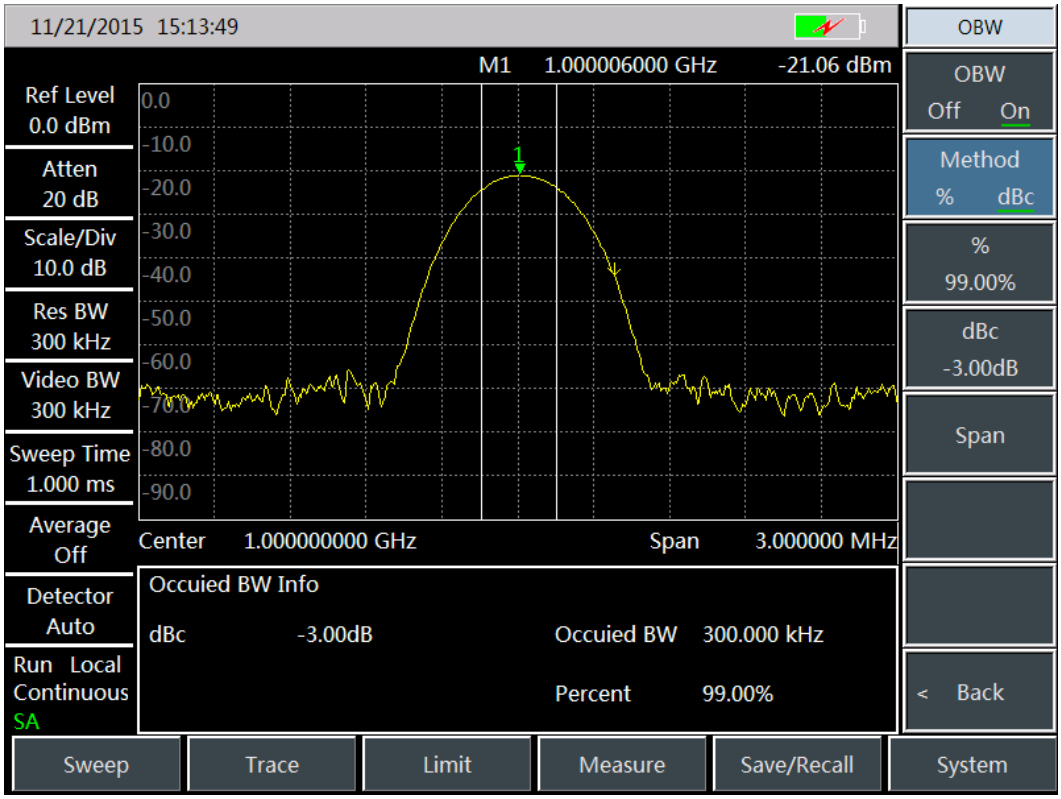
Comprehensive Intelligent Measurement Function



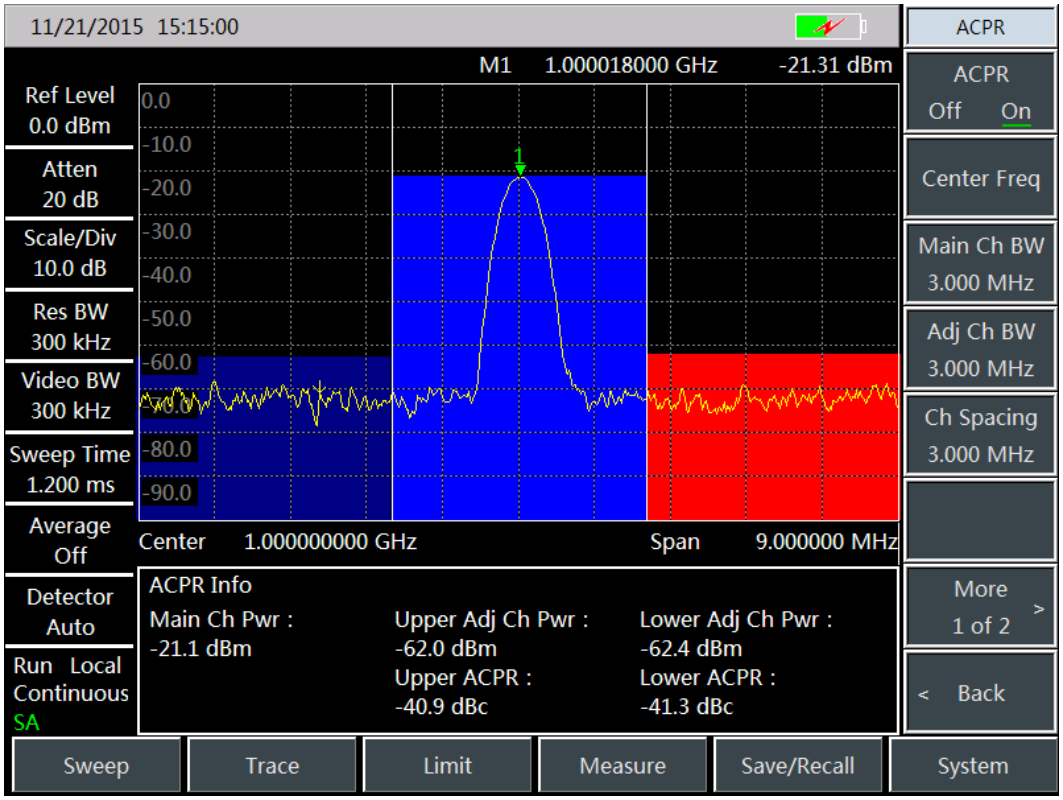
Field Strength Measurement



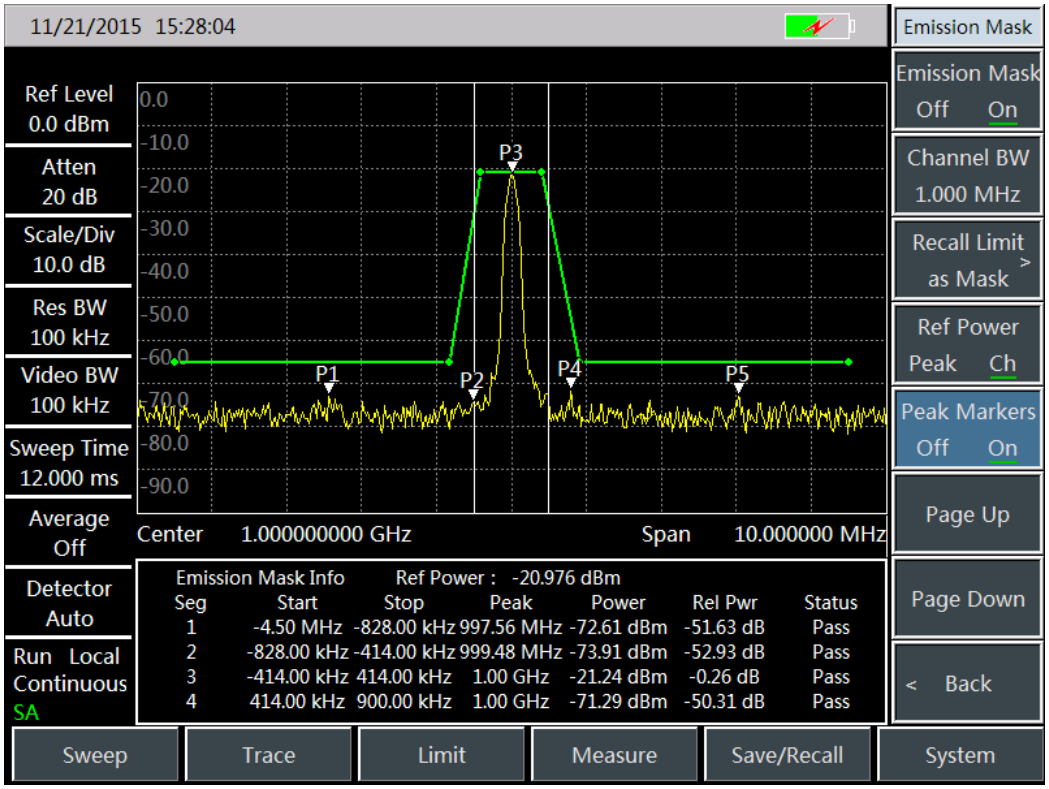
Channel Power



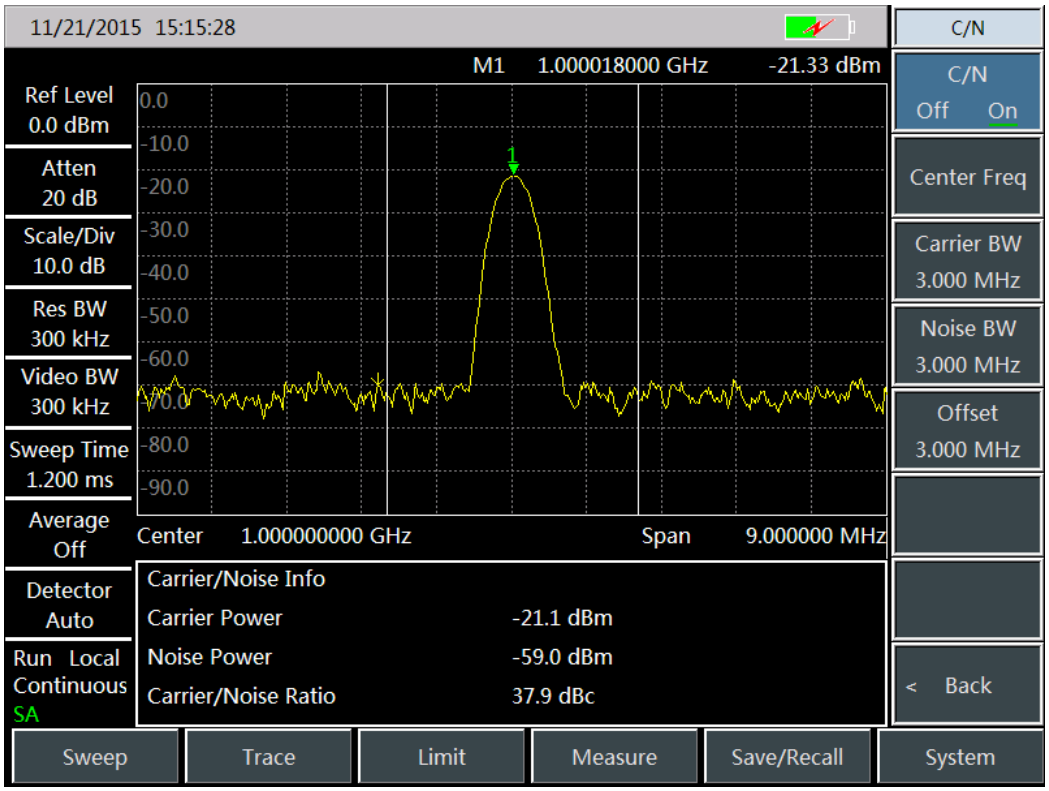
Occupied Bandwidth



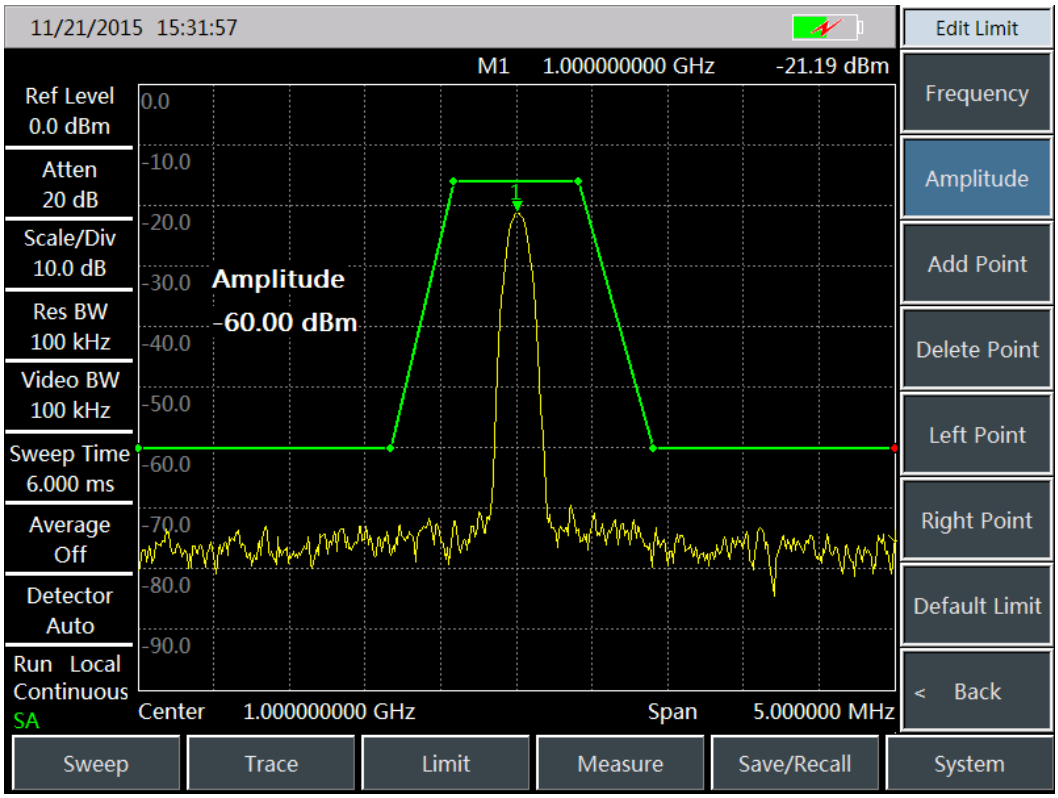
Adjacent-Channel Power Ratio



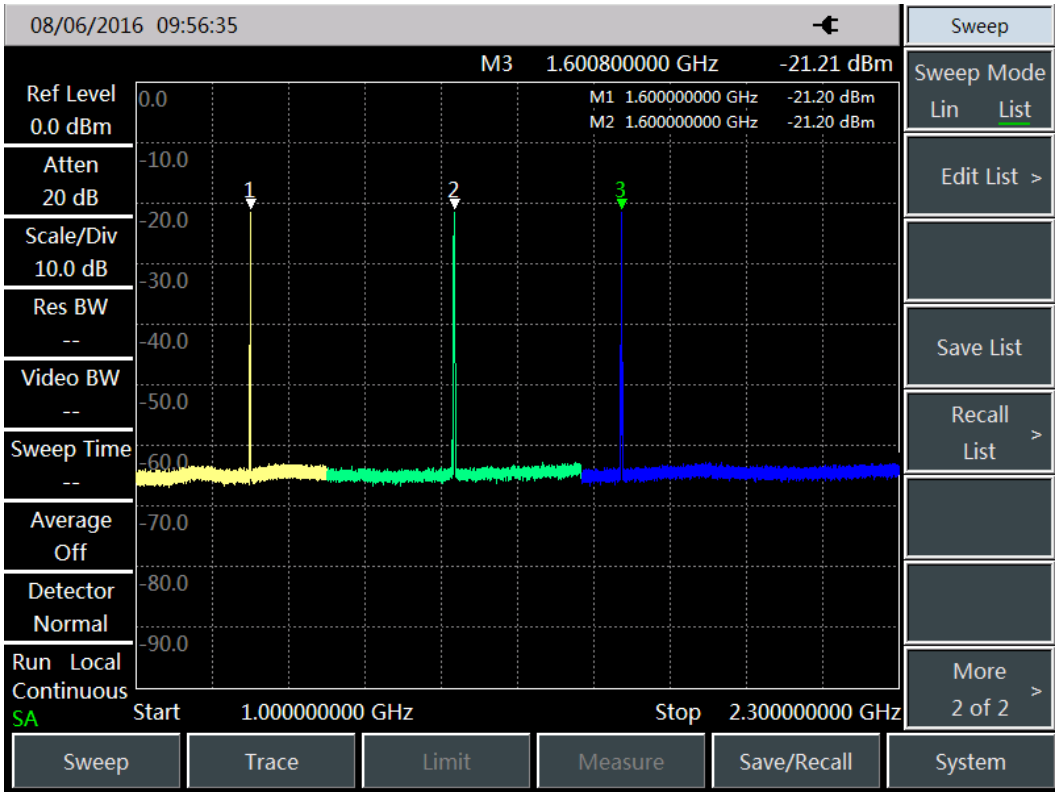
Emission Mask



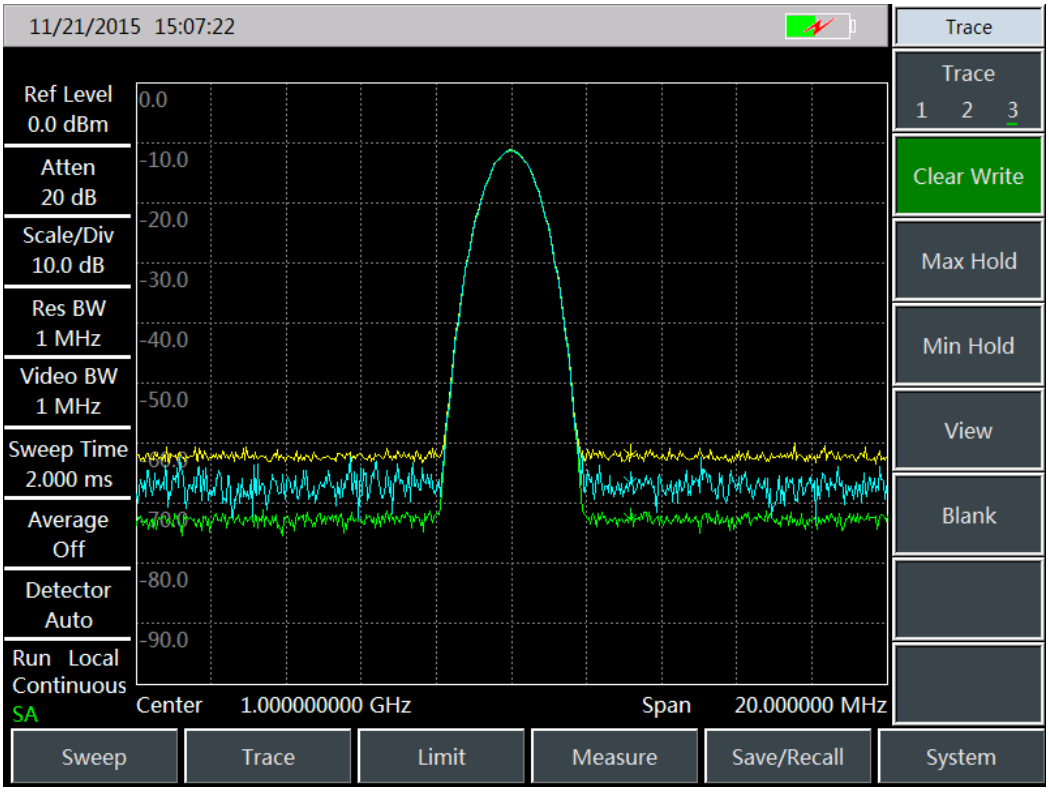
Carrier-to-Noise Ratio



Limit Line

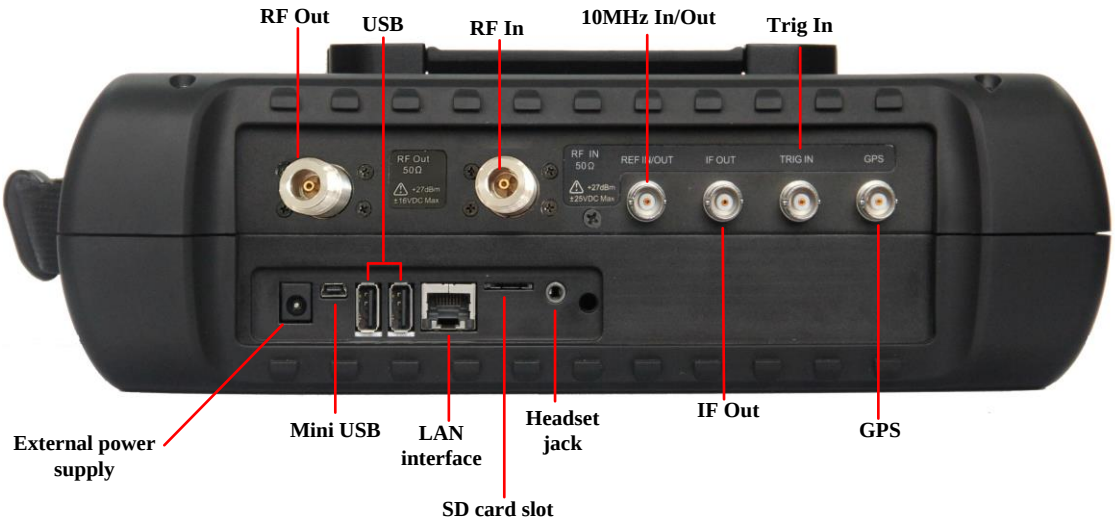


List Sweep



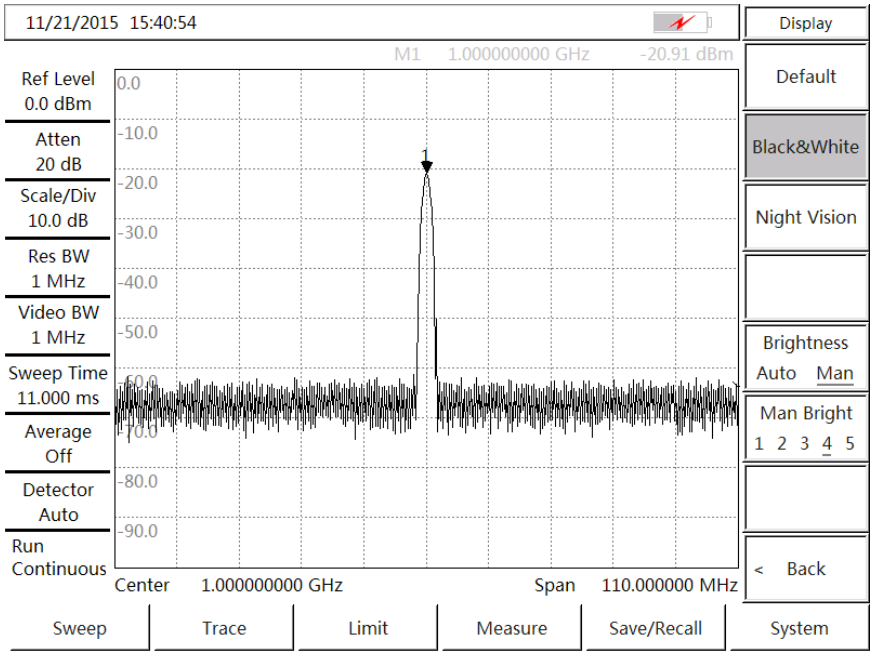
Multi-Traces

Various Auxiliary Test Interfaces

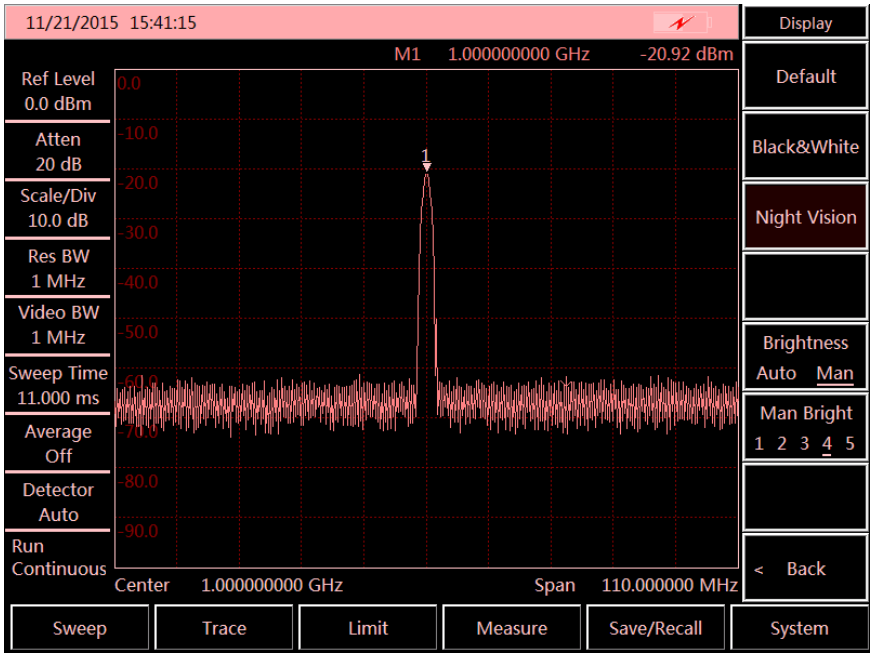


Easy & Convenient User Operation

- One-click quick measurement
- Storage and invocation 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 Vision Mode

Typical Applications

Comprehensive Performance Evaluation of Electronic Weapon Equipment

4024 series spectrum analyzer has advantages of wide frequency range, high performance index, high sweep speed, multiple test functions, and easy operation. It is handheld, compact and light, which can be power supplied by battery. It can be used for the field installation & calibration, repair & maintenance of electronic weapon equipment in fields of radar, communication, electronic countermeasures & reconnaissance, and precision guidance etc.

Field Test and Diagnosis of Transmitter and Receiver

4024 serious spectrum analyzers have various measurement function modes like spectrum analyzer, interference analyzer, AM/FM/PM analyzer, power meter, channel scanner etc., as well as various intelligent measurement functions such as 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, 4024 series 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	4024A/B/C/D/E/F/G/H/L
Frequency Range	4024A:9kHz～4GHz 4024B:9kHz～6.5GHz 4024C:9kHz～9GHz 4024D:9kHz～20GHz 4024E:9kHz～26.5GHz 4024F:9kHz～32GHz 4024G:9kHz～44GHz 4024H:9kHz～50GHz 4024L:9kHz～67GHz Tuning Resolution:1Hz
Frequency Reference	Frequency: 10MHz Aging: ±0.5ppm/Year Initial Frequency Accuracy: ±0.3ppm Temperature Stability: ±0.1ppm(-10～50℃, Comparative to 25℃)
Sweep Time	Range: 10μs～600s (Zero Span) Accuracy: ±2.00% (Zero Span)
Frequency Readout Accuracy	±(Frequency Readout× frequency Reference +2%× Span +10%× Resolution Bandwidth)

<table>
<tr><td>Frequency Span</td><td colspan="2">Range: 100Hz～Upper Frequency Limit of Corresponding Model or 0Hz
Accuracy: ±2.0%</td></tr>
<tr><td>Resolution Bandwidth</td><td colspan="2">1Hz～10MHz (1-3 Times of Stepping)</td></tr>
<tr><td>Video Bandwidth</td><td colspan="2">1Hz～10MHz (1-3 Times of Stepping)</td></tr>
<tr><td>SSB Phase Noise
(Carrier 1GHz)</td><td>4024A/B/C:
≤-108dBc/Hz@ Frequency Offset 10kHz
≤-112dBc/Hz@ Frequency Offset 100kHz
≤-118dBc/Hz@ Frequency Offset 1MHz
≤-129dBc/Hz@ Frequency Offset 10MHz</td><td>4024D/E/F/GH/L:
≤-102dBc/Hz@ Frequency Offset 10kHz
≤-106dBc/Hz@ Frequency Offset 100kHz
≤-111dBc/Hz@ Frequency Offset 1MHz
≤-123dBc/Hz@ Frequency Offset 10MHz</td></tr>
<tr><td rowspan="2">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℃)</td><td>4024A/B/C:
Pre-amp Off:
≤-140dBm(10MHz～3GHz)
≤-138dBm(3GHz～9GHz)

Pre-amp On:
≤-160dBm(10MHz～3GHz)
≤-157dBm(3GHz～9GHz)</td><td>4024D/E/F/G:
Pre-amp Off:
≤-138dBm(10MHz～20GHz)
≤-135dBm(20GHz～32GHz)
≤-127dBm(32GHz～40GHz)
Pre-amp On:
≤-157dBm(10MHz～20GHz)
≤-154dBm(20GHz～32GHz)
≤-148dBm(32GHz～40GHz)</td></tr>
<tr><td colspan="2">4024H/L:
Pre-amp Off:
≤-135dBm(10MHz～20GHz) ≤-134dBm(20GHz～32GHz)
≤-129dBm(32GHz～40GHz) ≤-120dBm(40GHz～46GHz)
≤-114dBm(46GHz～50GHz) ≤-114dBm(50GHz～60GHz)
≤-100dBm(60GHz～67GHz)

Pre-amp On:
≤-153dBm(10MHz～20GHz) ≤-152dBm(20GHz～32GHz)
≤-147dBm(32GHz～40GHz) ≤-142dBm(40GHz～46GHz)
≤-132dBm(46GHz～50GHz) ≤-132dBm(50GHz～60GHz)
≤-118dBm(60GHz～67GHz)</td></tr>
<tr><td>Residual Response</td><td>4024A/B/C (exceptional frequency: 3.2GHz):
Pre-amp Off:
≤-82dBm（10MHz～9GHz）
Pre-amp On:
≤-95dBm（10MHz～9GHz）</td><td>4024D/E/F/G (exceptional frequency: 3.2GHz):
Pre-amp Off:
≤-90dBm(10MHz～13GHz)
≤-85dBm (13GHz～20GHz)
≤-80dBm (20GHz～44GHz)
Pre-amp On:
≤-100dBm (10MHz ～ 32GHz)
≤-95dBm (32GHz～44GHz)</td></tr>
</table>

Second Harmonic Distortion (0dB attenuation, -30dBm input signal)	4024A/B/C/H/L: <-65dBc 4024D/E/F/G: <-60dBc		
Absolute Amplitude Accuracy (input signal 0dBm~-50dBm, all settings are automatic couplings, 20℃~30℃, 30 minutes of preheating)	±1.8dB (10MHz～13GHz) ±2.3dB (13GHz～40GHz) ±2.7dB (40GHz～50GHz) ±3.0dB (50GHz～67GHz)		
Input Attenuator	4024A/B/C/H/L: Attenuation Range: 0dB～30dB, 5dB Stepping	4024D/E/F/G: Attenuation Range: 0dB～50dB, 10dB Stepping	
Maximum Continuous Input	4024A/B/C/H/L: +27dBm Peak Typical(≥10dB Attenuation) +20dBm Peak Typical(<10dB Attenuation) +10dBm Peak Typical(Pre-amp On)	4024D/E/F/G: +30dBm Peak Typical(≥10dB Attenuation) +23dBm Peak Typical(<10dB Attenuation) +13dBm Peak Typical(Pre-amp On)	
Reference Level	Range: -120dBm～+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	4024A/B/C: ≤4.5kg	4024D/E/F/G: ≤5.1kg	4024H/L: ≤5.3kg
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		
Battery operation time	4024A/B/C: about 3h	4024D/E/F/G: about 2.5h	4024H/L: 2h (typical)
Power Consumption	4024A/B/C: ≤25W	4024D/E/F/G: ≤33W	4024H/L: ≤38W
Test Interface	RF input: 4024A/B/C/D/E: Type-N Connector（female） 4024F/G: 2.4mm Connector(male) 4024H/L: 1.85mm Connector(male) RF output: Test interface of tracking generator option for 4024A/B/C: 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: 4024A Spectrum Analyzer (9kHz～4GHz)
Main Unit: 4024B Spectrum Analyzer (9kHz～6.5GHz)
Main Unit: 4024C Spectrum Analyzer (9kHz～9GHz)
Main Unit: 4024D Spectrum Analyzer (9kHz～20GHz)
Main Unit: 4024E Spectrum Analyzer (9kHz～26.5GHz)
Main Unit: 4024F Spectrum Analyzer (9kHz～32GHz)
Main Unit: 4024G Spectrum Analyzer (9kHz～44GHz)
Main Unit: 4024H Spectrum Analyzer (9kHz～50GHz)
Main Unit: 4024L Spectrum Analyzer (9kHz～67GHz)

Standard Package

No.	Description
1	Standard 3-Phase Power Cord
2	Power Adapter
3	Quick guide
4	USB Cable
5	Built-In Rechargeable Lithium Ion Battery
6	Certificate of Conformity

Options

Serial No.	Description	Function
4024-001	Optional Accessories of English Version	English Signs、Keys、Menu
4024-002	User Manual (Chinese)	--
4024-003	User Manual (English)	--
4024-004	Programming Manual (Chinese)	--
4024-005	Programming Manual (English)	--
4024-006	Power Adapter	Power Adapter
4024-007	Rechargeable Lithium Ion Battery	Standby Battery
4024-008	Purple Cat5e Cable	Point to Point, 2 Meters
4024-009	Micro SD Card	Class4, Capacity: 8G
4024-010	GPS Antenna	GPS exposed Antenna
4024-011	USB Power Meter Option	Provide USB Power Measurement Function (Requires USB Power Probe:012/013/014/015)
4024-012	87230 USB CW Power Probe	9kHz～6GHz Power Probe
4024-013	87231 USB CW Power Probe	10MHz～18GHz Power Probe
4024-014	87232 USB CW Power Probe	50MHz～26.5GHz Power Probe
4024-015	87233 USB CW Power Probe	50MHz～40GHz Power Probe

4024-016	Interference Analyzer Option	Provide Spectrogram, RSSI Measurement etc. Functions
4024-017	AM/FM/PM Analyzer Option	To Realize Modulation Characteristics Analysis of AM/FM/PM Signals
4024-018	Channel Scanner Option	To Realize Signal Power Measurement of Multiple Channels and Frequency
4024-019	List Sweep Option	To Realize Continuous Sweep Measurement of Various Frequency Bands
4024-020	Zero Span IF Output	Output the Third or Fourth IF Signal (Choose One of Two)
4024-021	89101A Antenna	Frequency Range:10kHz～20MHz (Requires Option 025)
4024-022	89101B Antenna	Frequency Range:20MHz～200MHz (Requires Option 025)
4024-023	89101C Antenna	Frequency Range:200MHz～500MHz (Requires Option 025)
4024-024	89101D Antenna	Frequency Range:500MHz～4GHz (Requires Option 025)
4024-025	89401 Antenna Amplifier	Frequency Range:10kHz～4GHz,N(f) (Requires Option 021/022/023/024)
4024-026	89901 Antenna	Frequency Range:1GHz～18GHz,N(f)
4024-027	89902 Antenna	Frequency Range:18GHz～40GHz,2.92mm(f)
4024-028	Functional Bag	Protect the Instrument
4024-029	Backpack	Easy to Carry
4024-030	Safety Instrument Carrying Case	Used to Carry
4024-031	89901 Antenna handle	Requires Option 026
4024-032	89902 Antenna handle	Requires Option 027
4024-034	Field Strength Option	Provide Pscan, Fscan, MScan etc. Functions
4024-035	4GHz Tracking Generator	Frequency Range 100kHz~4GHz (Only For 4024A)
4024-036	6.5GHz Tracking Generator	Frequency Range 100kHz~6.5GHz (Only For 4024B)
4024-037	9GHz Tracking Generator	Frequency Range 100kHz~9GHz (Only For 4024C)
4024-038	Location Analyzer Option	Internal software which requires option 010, option 050 and

		directional antenna for function realization
4024-039	Interference Map	Internal software which requires option 010 for function realization
4024-041	Omnidirectional Whip Antenna	Frequency Range: 700MHz～2700MHz, suitable for communication frequency band
4024-042	700MHz～4GHz Directional Antenna	Active Log Periodic Antenna, Frequency Range: 700MHz～4GHz
4024-043	700MHz～6GHz Directional Antenna	Active Log Periodic Antenna, Frequency Range: 700MHz～6GHz
4024-044	680MHz～10GHz Directional Antenna	Active Log Periodic Antenna, Frequency Range: 680MHz～10GHz
4024-045	680MHz～20GHz Directional Antenna	Active Log Periodic Antenna, Frequency Range: 680MHz～20GHz
4024-046	400MHz～4GHz Directional Antenna	Active Log Periodic Antenna, Frequency Range: 400MHz～4GHz
4024-047	400MHz～6GHz Directional Antenna	Active Log Periodic Antenna, Frequency Range: 400MHz～6GHz
4024-048	380MHz～10GHz Directional Antenna	Active Log Periodic Antenna, Frequency Range: 380MHz～10GHz
4024-049	380MHz～20GHz Directional Antenna	Active Log Periodic Antenna, Frequency Range: 380MHz～20GHz
4024-050	External Electronic Compass	External USB electronic compass, requires option 038 for function realization
4024-051	6GHz Omnidirectional Antenna	Portable Omnidirectional Antenna, Frequency Range: 680MHz～6GHz
4024-052	8GHz Omnidirectional Antenna	Portable Omnidirectional Antenna, Frequency Range: 300MHz～8GHz
4024-053	VHF/UHF Extension-Type Whip Antenna	Frequency Range: 140MHz/430MHz
4024-054	Passive Directional Antenna(700MHz～4GHz)	Passive Log Periodic Antenna, Frequency Range: 700MHz～4GHz
4024-055	Passive Directional Antenna(700MHz～6GHz)	Passive Log Periodic Antenna, Frequency Range: 700MHz～6GHz
4024-056	Passive Directional Antenna(680MHz～10GHz)	Passive Log Periodic Antenna, Frequency Range: 680MHz～10GHz

4024-057	Passive Directional Antenna(680MHz～18GHz)	Passive Log Periodic Antenna, Frequency Range: 680MHz～18GHz
4024-058	Passive Directional Antenna(680MHz～25GHz)	Passive Log Periodic Antenna, Frequency Range: 680MHz～25GHz
4024-059	Passive Directional Antenna (680MHz～35GHz)	Passive Log Periodic Antenna, Frequency Range: 680MHz～35GHz
4024-060	N/SMA-JJ RF Cable (2m)	N/SMA RF Coaxial Cable (m-m), DC～18GHz, 2m length
4024-061	N/SMA-JJ RF Cable (1m)	N/SMA RF Coaxial Cable (m-m), DC～18GHz, 1m length
4024-067	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

Typical Accessories

Optional Antenna Sets

- Antenna Amplifier

- 10kHz – 20MHz Antenna

- 20MHz – 200MHz Antenna

- 200MHz – 500MHz

- 500MHz – 4GHz

- 1GHz – 18GHz

- 18GHz – 40GHz

Option 30

HARD CASE

Option 29

SOFT BAG

Ceyear

Focus on measurement
Explore the future

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