# 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

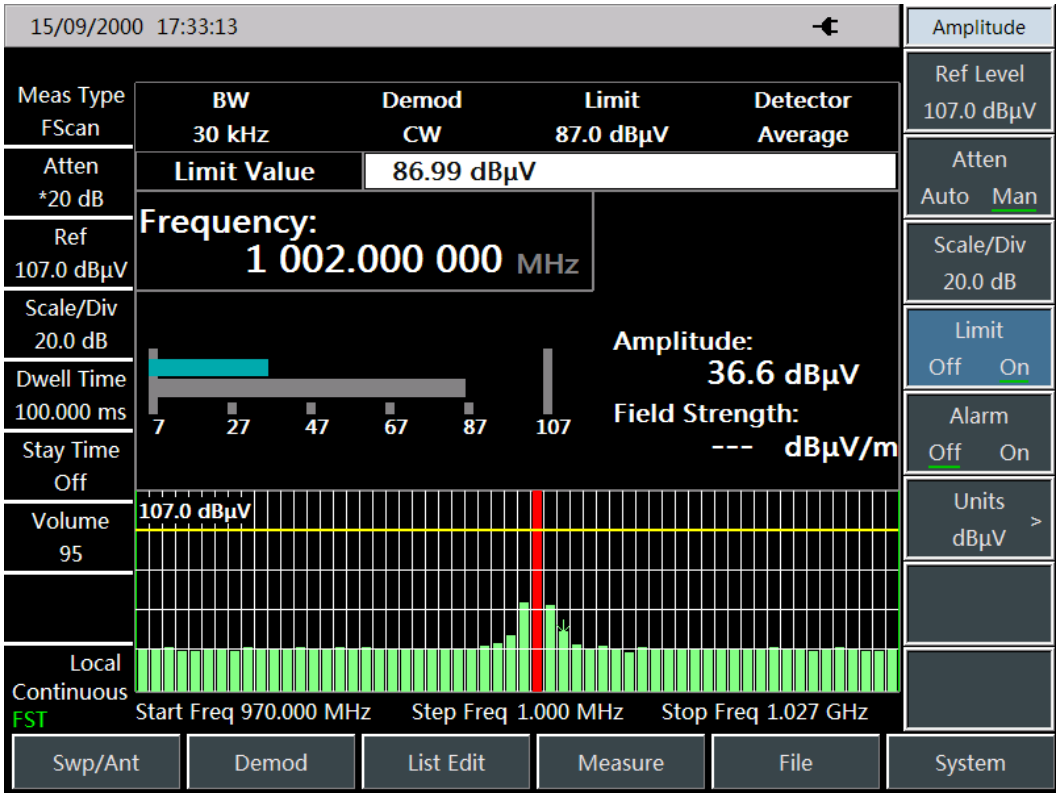
4024 series spectrum analyzer possesses many advantages: wide frequency range, high performance, high sweep speed, various functions, and easy operation. In terms of performance index, it has advantages of excellent displayed average noise level, low phase noise, and high sweep speed. In terms of measurement 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.

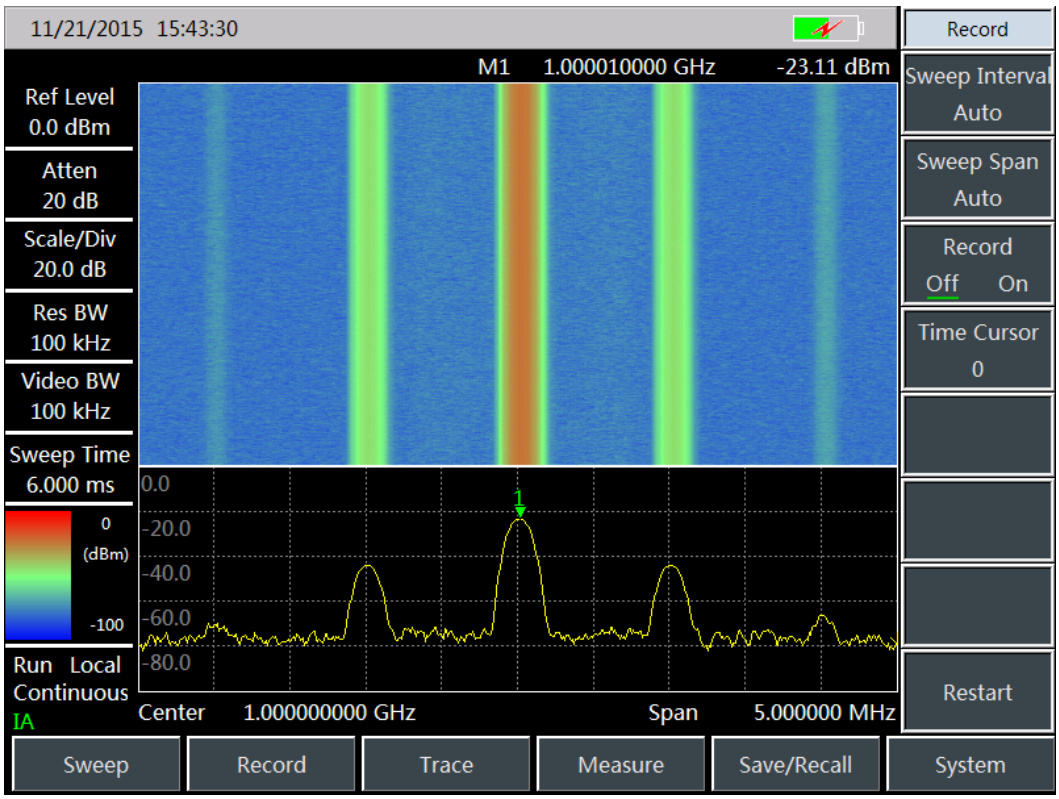
## Main Characteristics

- **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**

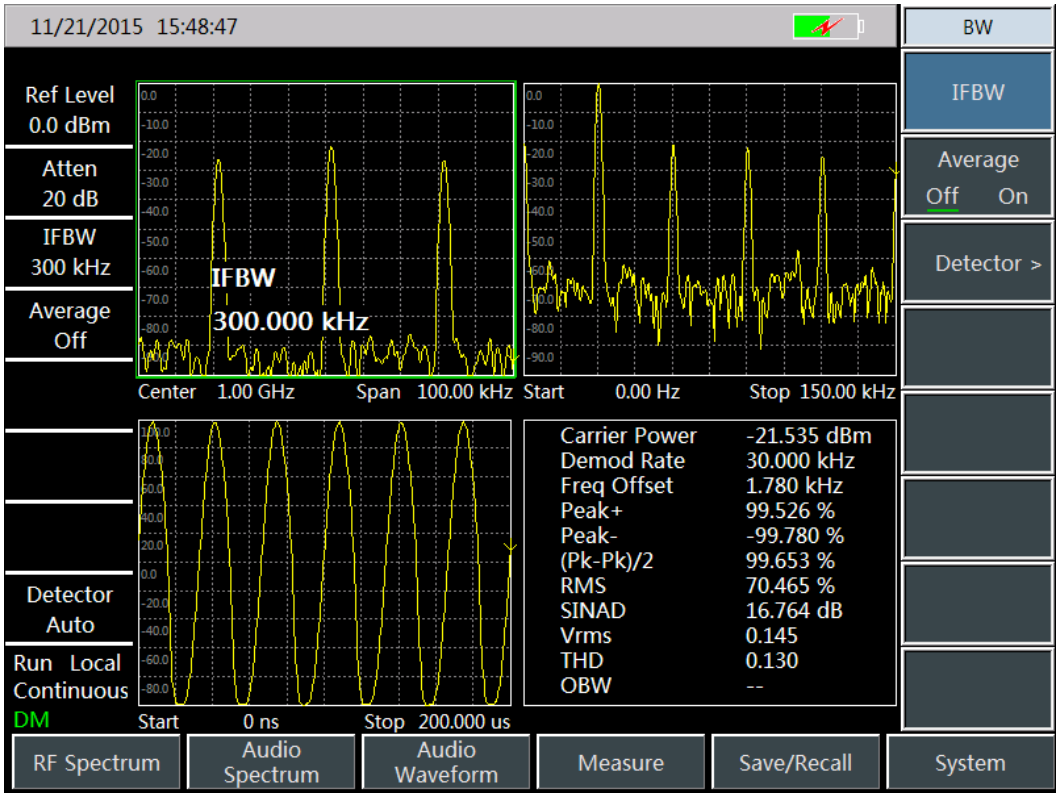
## Various Measurement Functions



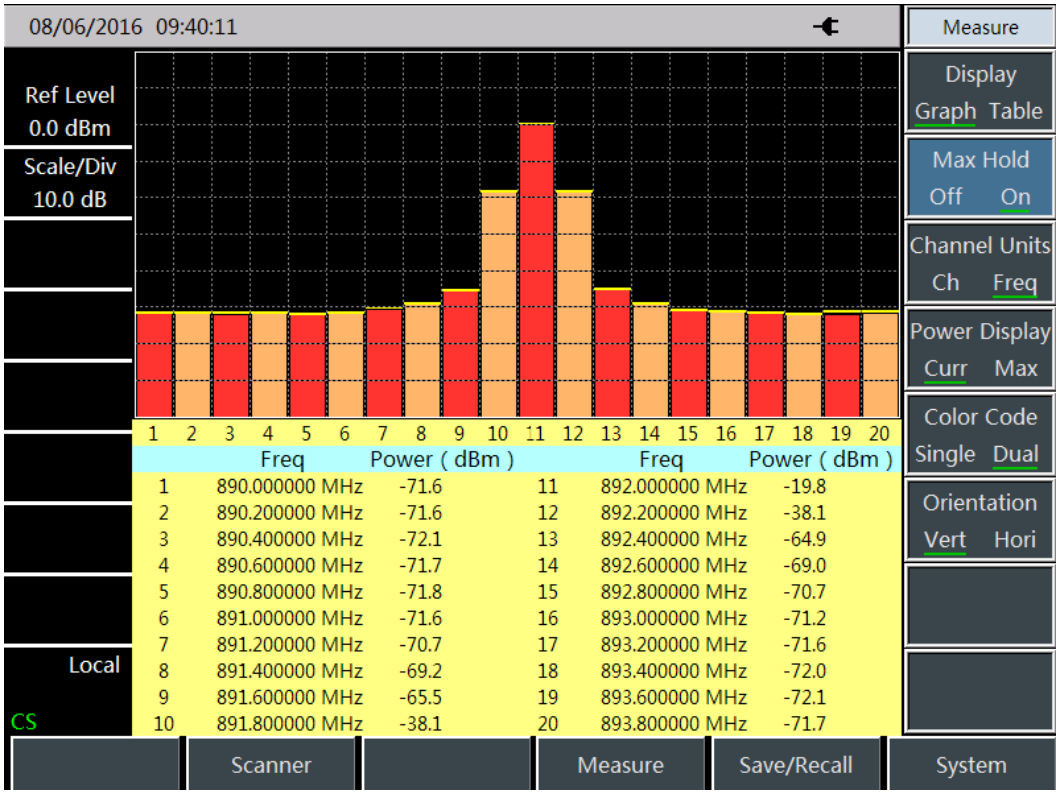

Field Strength



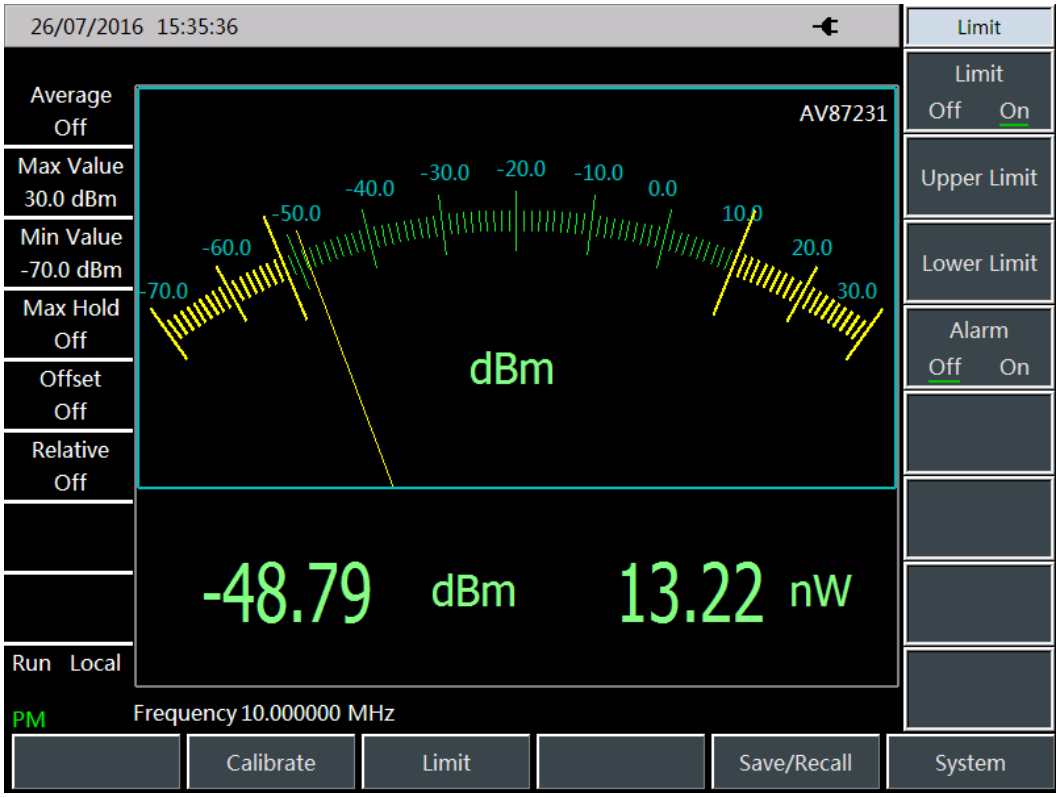

Interference Analyzer (Spectrogram)



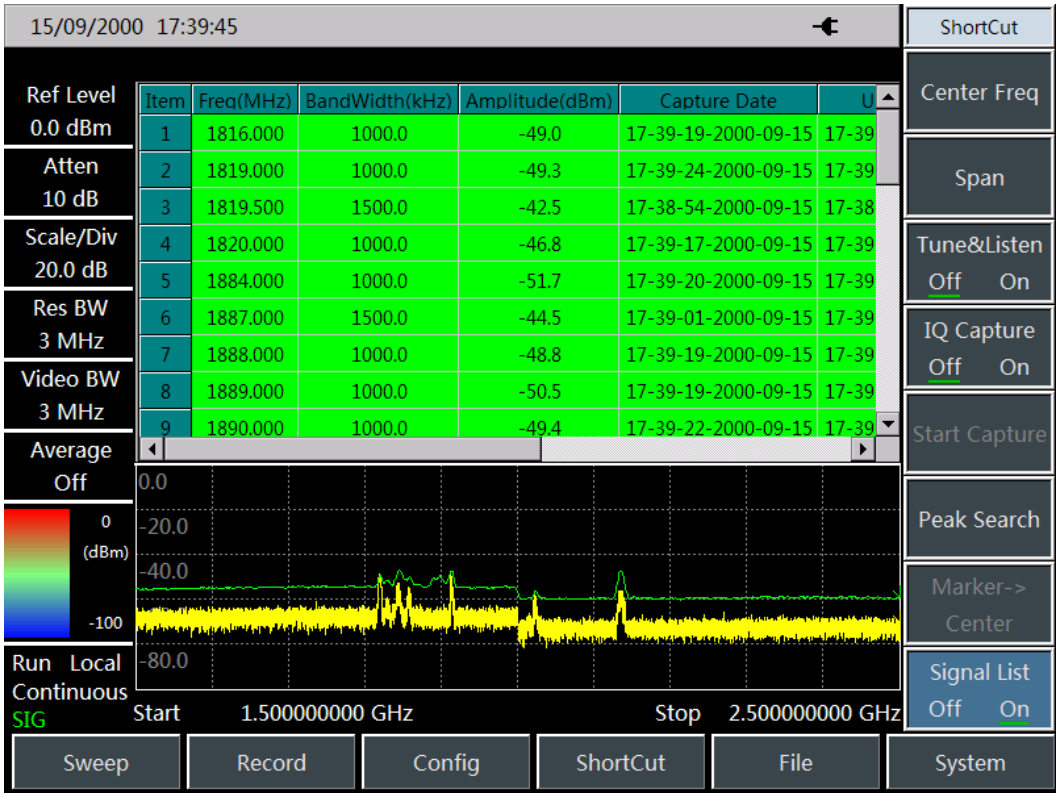

AM/FM/PM Demodulation




Channel Scanner

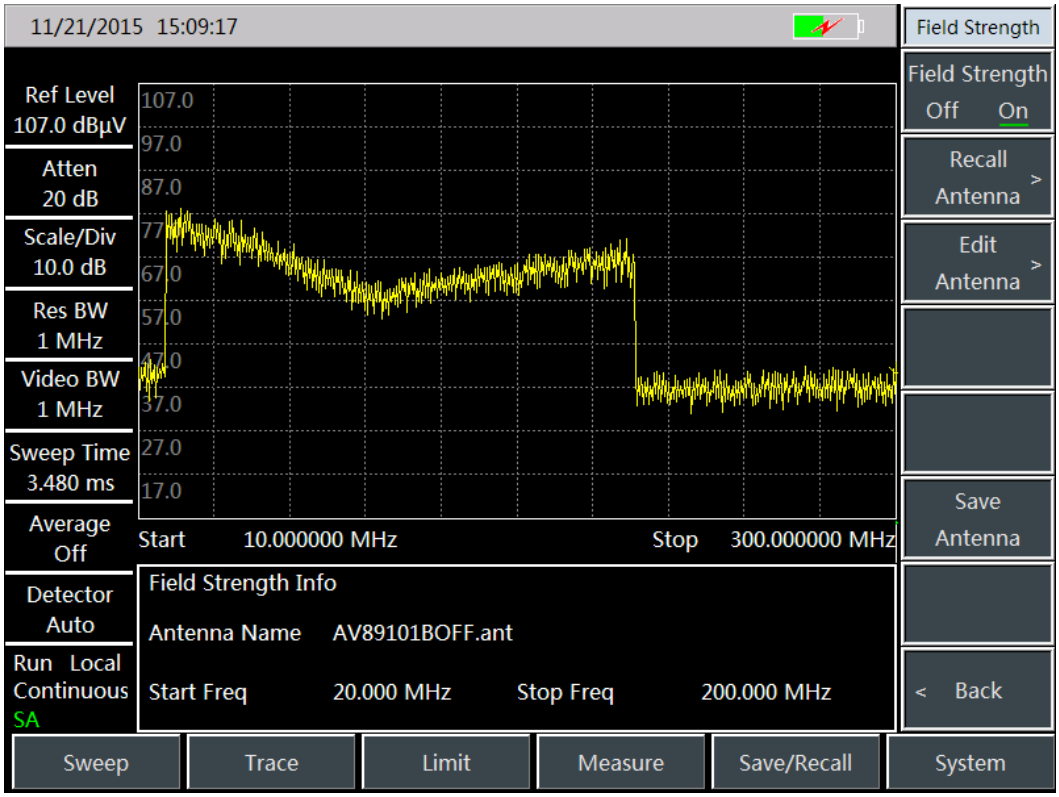



Power Meter (USB Power Probe)

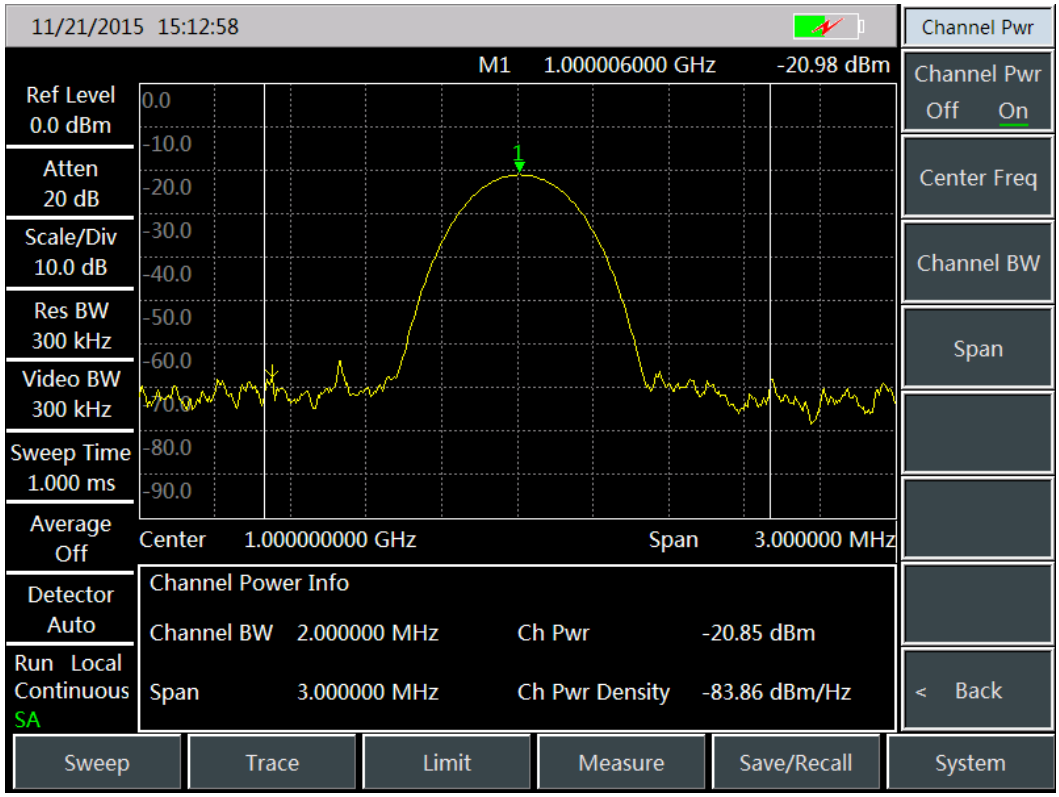



Signal Analyzer

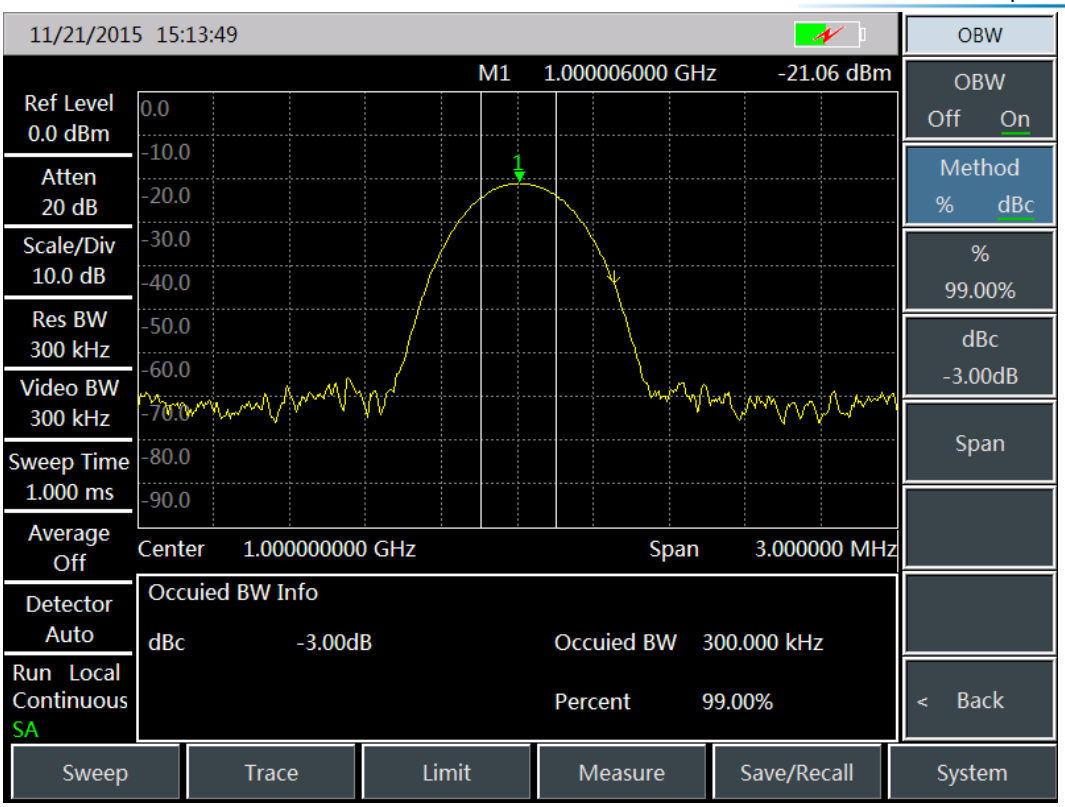
## Comprehensive Intelligent Measurement Function



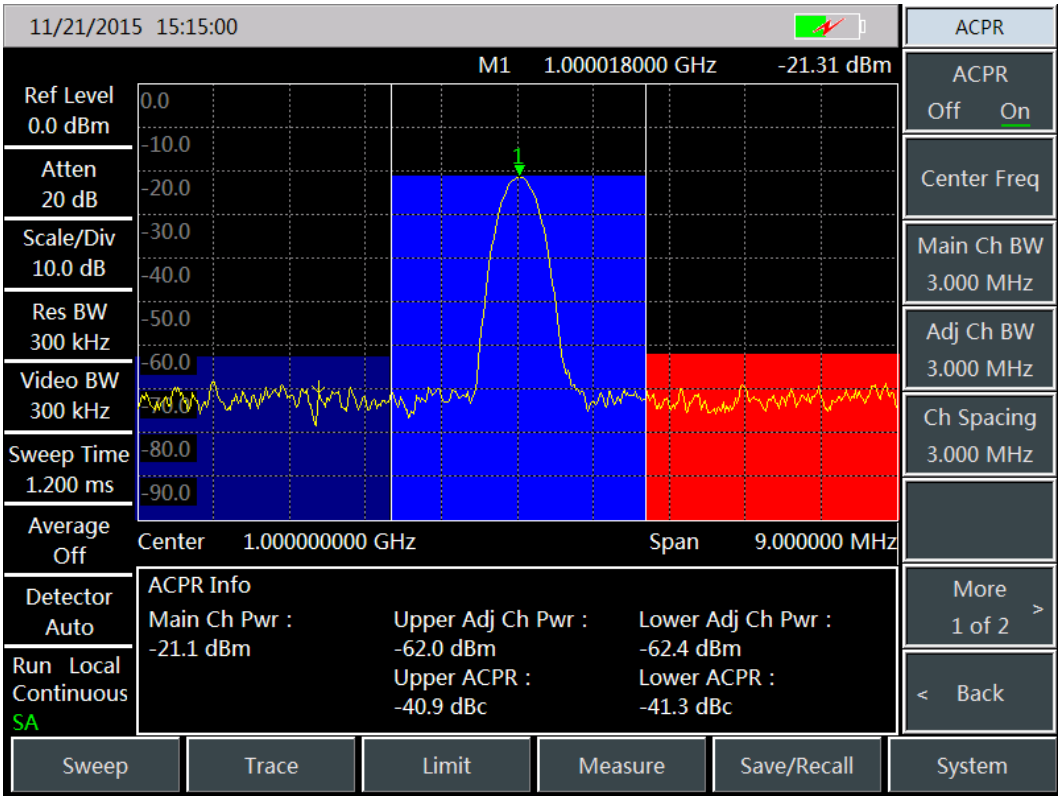

Field Strength Measurement



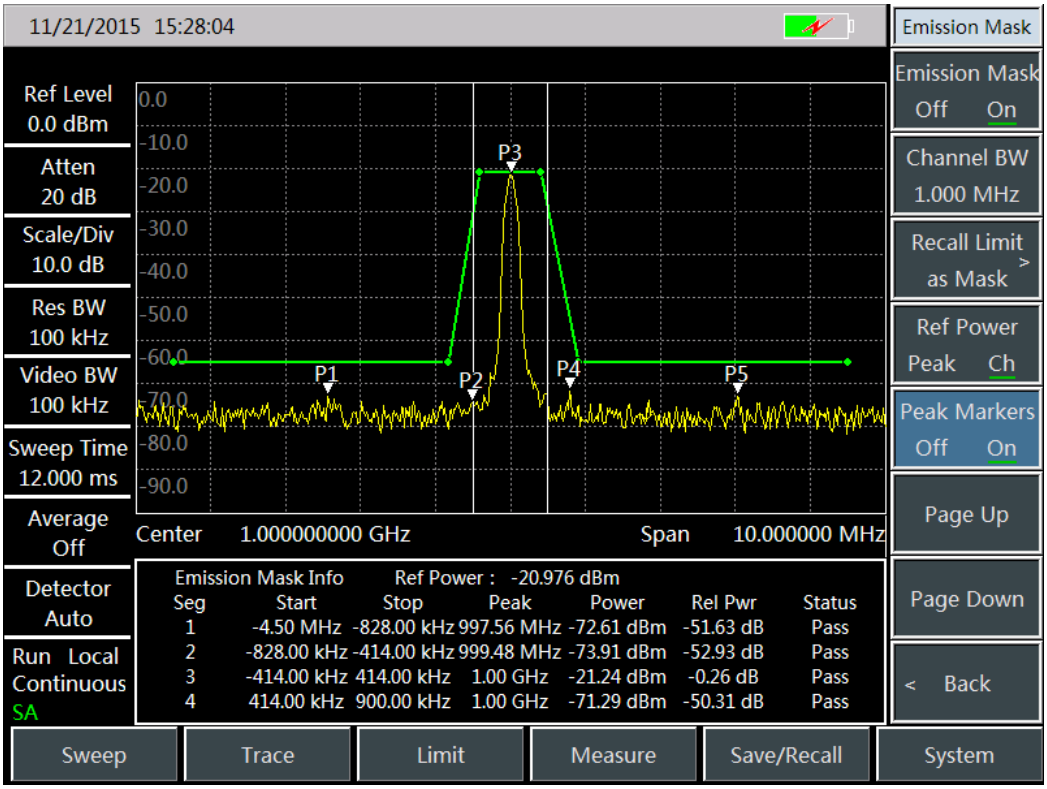

Channel Power



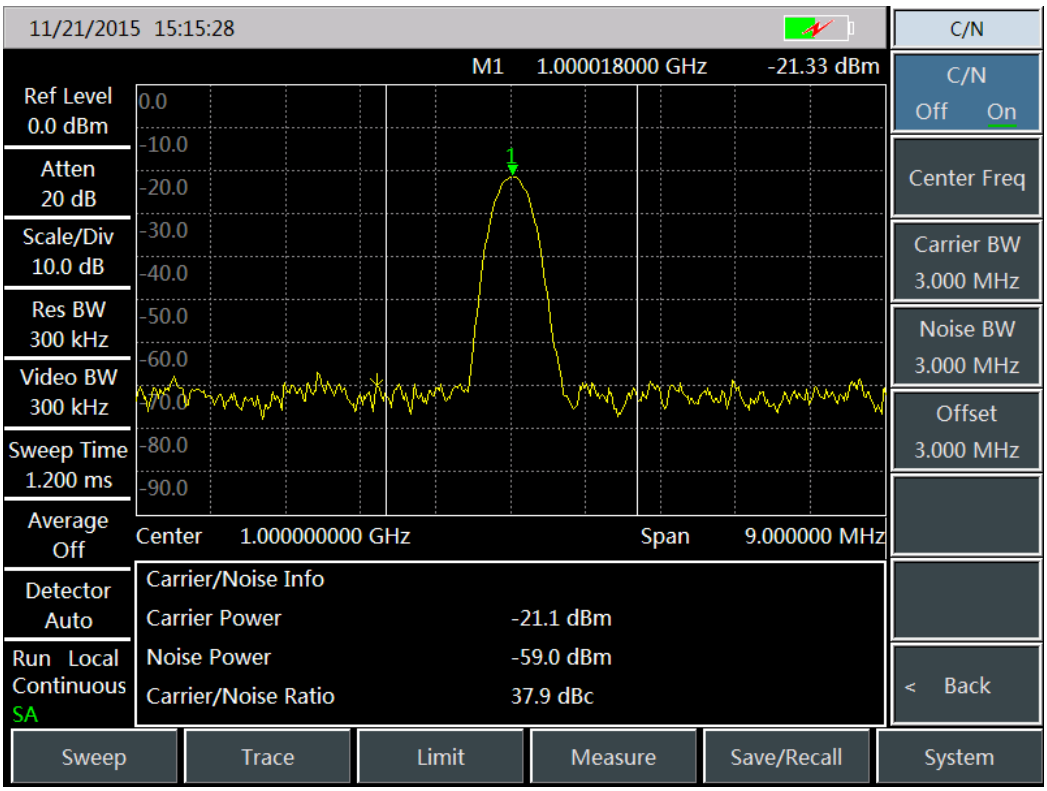

Occupied Bandwidth



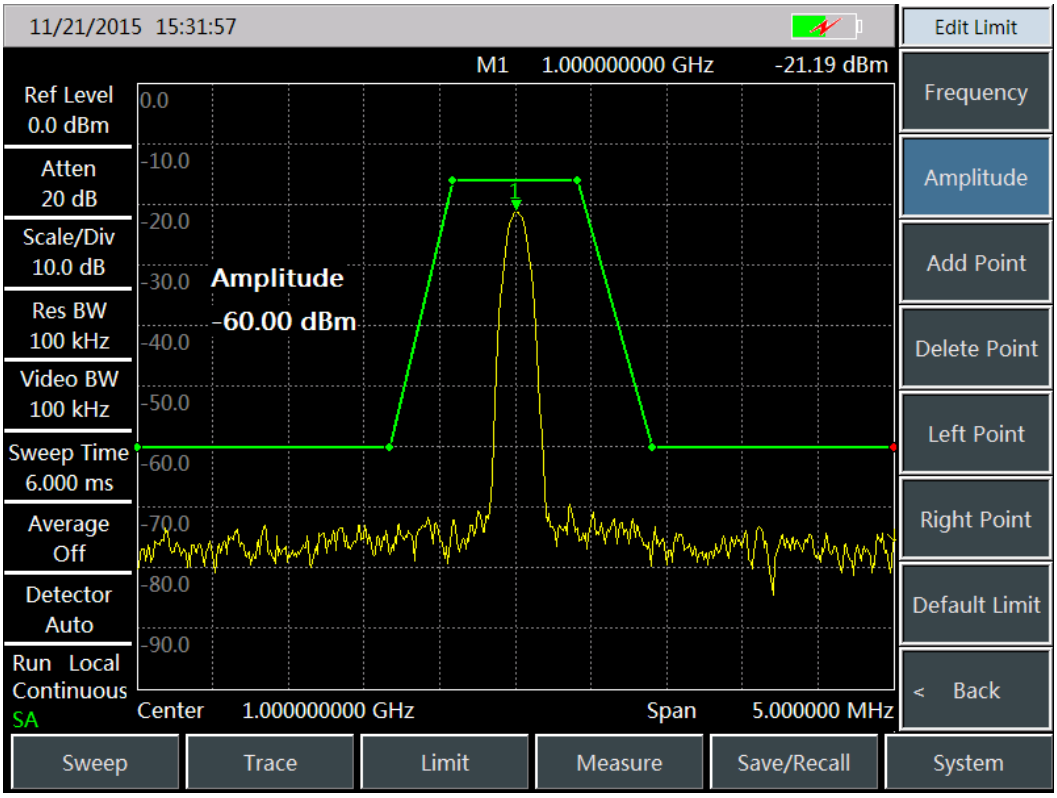

Adjacent-Channel Power Ratio



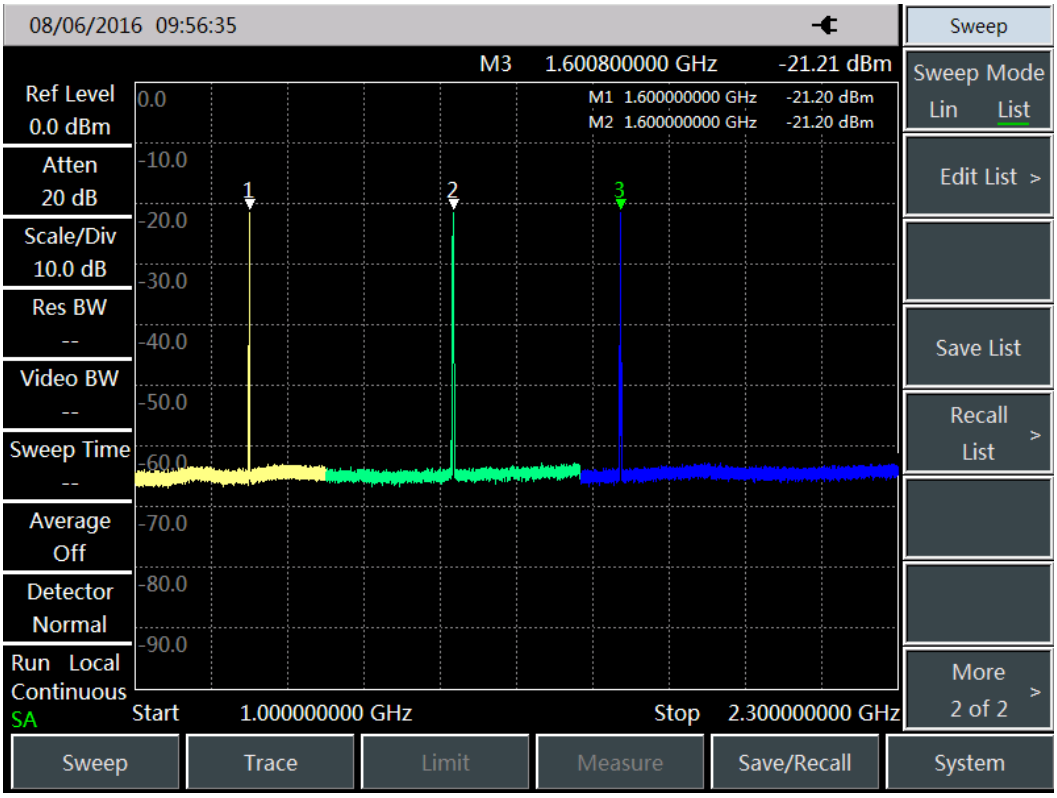

Emission Mask



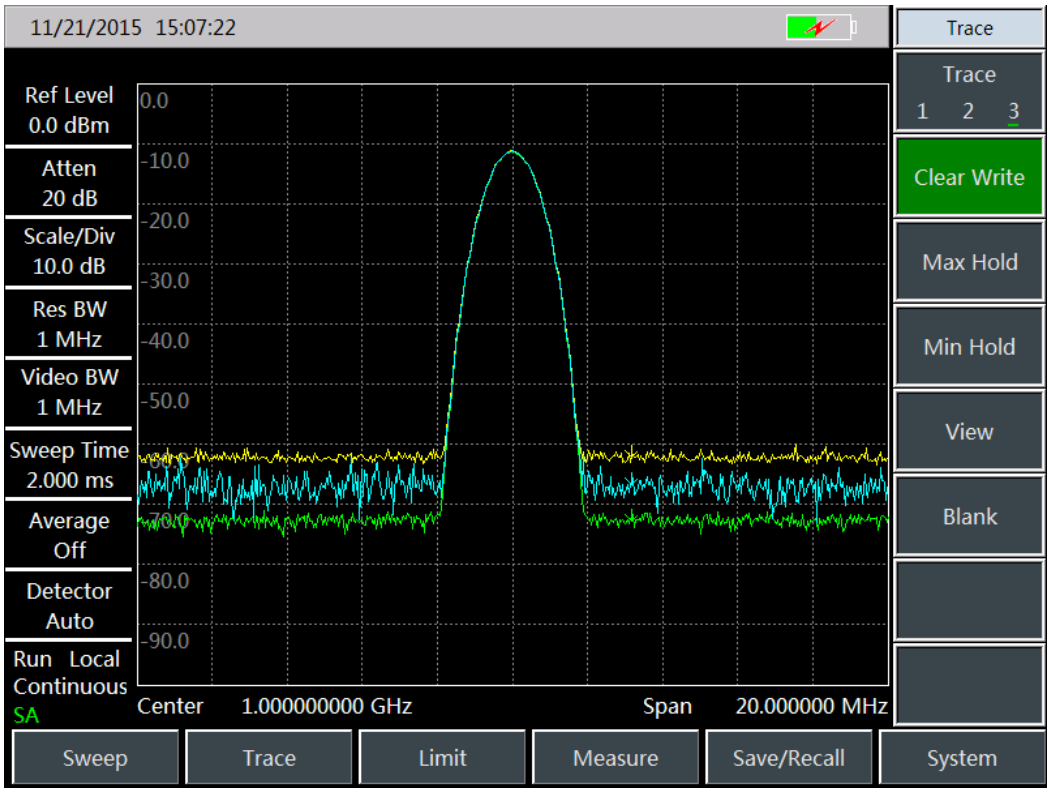

Carrier-to-Noise Ratio




Limit Line

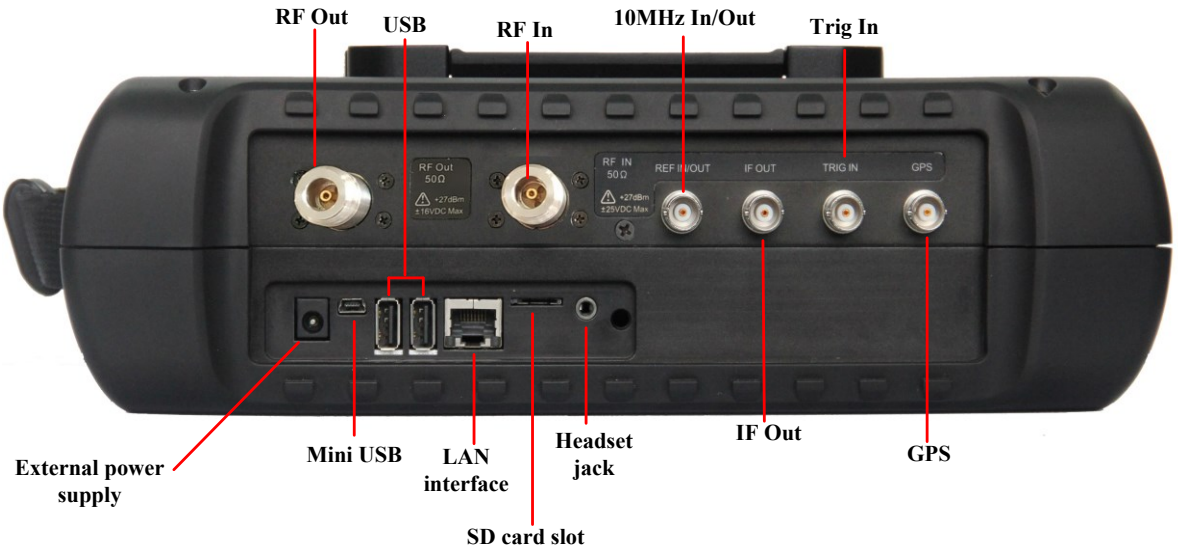



List Sweep



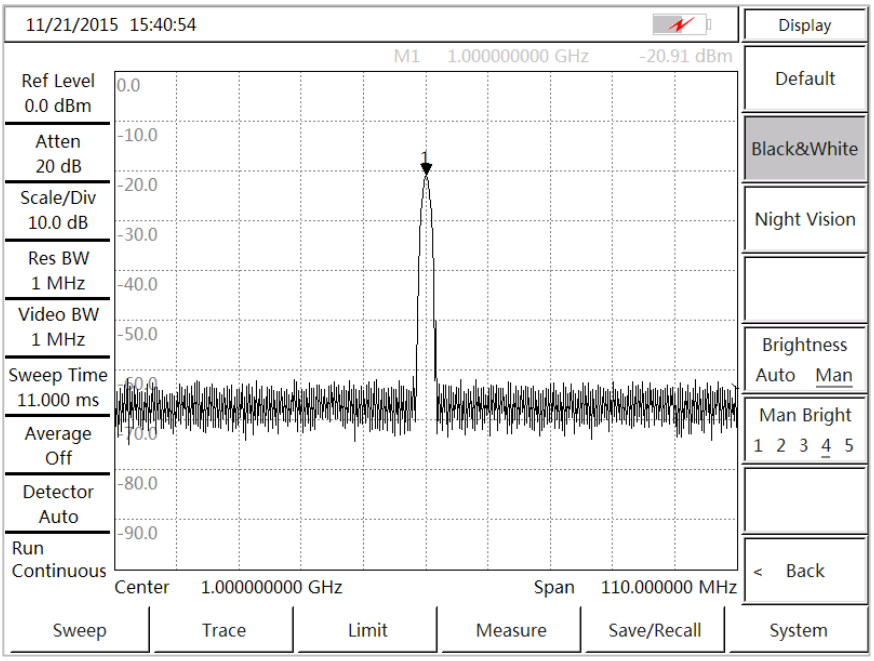

Multi-Traces

## Various Auxiliary Test Interfaces

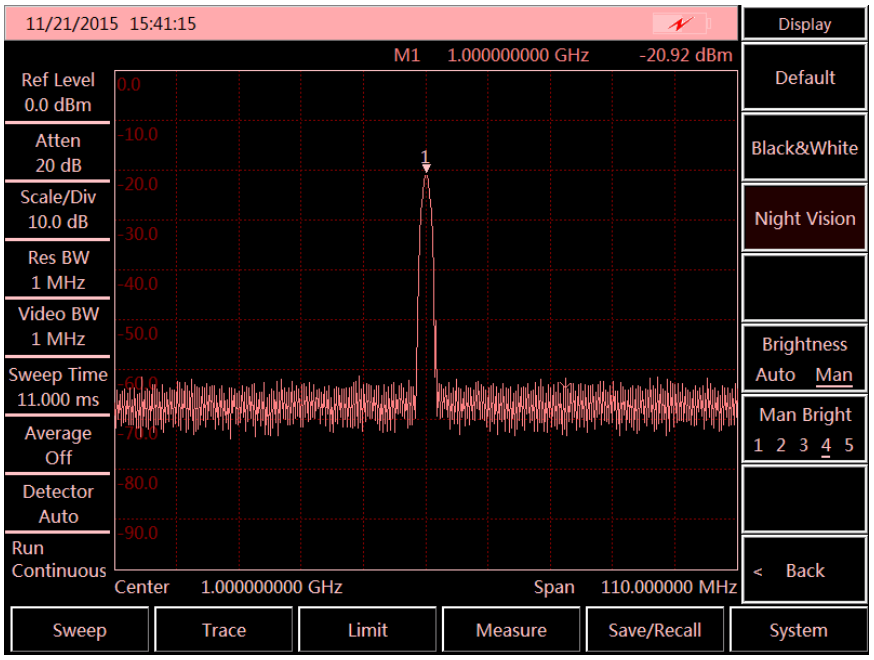


## Easy & Convenient User Operation

- 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 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<br>4024C:9kHz～9GHz 4024D:9kHz～20GHz<br>4024E:9kHz～26.5GHz 4024F:9kHz～32GHz<br>4024G:9kHz～44GHz 4024H:9kHz～50GHz<br>4024L:9kHz～67GHz<br>Tuning Resolution:1Hz |
| Frequency Reference | Frequency: 10MHz<br>Aging: ±0.5ppm/Year<br>Initial Frequency Accuracy: ±0.3ppm<br>Temperature Stability:±0.1ppm(-10～50℃, Comparative to 25℃) |
| Sweep Time | Range: 10μs～600s (Zero Span)<br>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<br>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<br>(Carrier 1GHz)</td><td>4024A/B/C:<br>≤-108dBc/Hz@ Frequency Offset 10kHz<br>≤-112dBc/Hz@ Frequency Offset 100kHz<br>≤-118dBc/Hz@ Frequency Offset 1MHz<br>≤-129dBc/Hz@ Frequency Offset 10MHz</td><td>4024D/E/F/GH/L:<br>≤-102dBc/Hz@ Frequency Offset 10kHz<br>≤-106dBc/Hz@ Frequency Offset 100kHz<br>≤-111dBc/Hz@ Frequency Offset 1MHz<br>≤-123dBc/Hz@ Frequency Offset 10MHz</td></tr>
<tr><td rowspan="2">Displayed Average Noise Level<br>(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:<br>Pre-amp Off:<br>≤-140dBm(10MHz～3GHz)<br>≤-138dBm(3GHz～9GHz)<br><br>Pre-amp On:<br>≤-160dBm(10MHz～3GHz)<br>≤-157dBm(3GHz～9GHz)</td><td>4024D/E/F/G:<br>Pre-amp Off:<br>≤-138dBm(10MHz～20GHz)<br>≤-135dBm(20GHz～32GHz)<br>≤-127dBm(32GHz～40GHz)<br>Pre-amp On:<br>≤-157dBm(10MHz～20GHz)<br>≤-154dBm(20GHz～32GHz)<br>≤-148dBm(32GHz～40GHz)</td></tr>
<tr><td colspan="2">4024H/L:<br>Pre-amp Off:<br>≤-135dBm(10MHz～20GHz) ≤-134dBm(20GHz～32GHz)<br>≤-129dBm(32GHz～40GHz) ≤-120dBm(40GHz～46GHz)<br>≤-114dBm(46GHz～50GHz) ≤-114dBm(50GHz～60GHz)<br>≤-100dBm(60GHz～67GHz)<br><br>Pre-amp On:<br>≤-153dBm(10MHz～20GHz) ≤-152dBm(20GHz～32GHz)<br>≤-147dBm(32GHz～40GHz) ≤-142dBm(40GHz～46GHz)<br>≤-132dBm(46GHz～50GHz) ≤-132dBm(50GHz～60GHz)<br>≤-118dBm(60GHz～67GHz)</td></tr>
<tr><td>Residual Response</td><td>4024A/B/C (exceptional frequency: 3.2GHz):<br>Pre-amp Off:<br>≤-82dBm（10MHz～9GHz）<br>Pre-amp On:<br>≤-95dBm（10MHz～9GHz）</td><td>4024D/E/F/G (exceptional frequency: 3.2GHz):<br>Pre-amp Off:<br>≤-90dBm(10MHz～13GHz)<br>≤-85dBm (13GHz～20GHz)<br>≤-80dBm (20GHz～44GHz)<br>Pre-amp On:<br>≤-100dBm (10MHz ～ 32GHz)<br>≤-95dBm (32GHz～44GHz)</td></tr>
<tr><td>Second Harmonic</td><td colspan="2">4024A/B/C/H/L: <-65dBc</td></tr>
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| | | | |
|---|---|---|---|
| Distortion (0dB attenuation, -30dBm input signal) | 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)<br>±2.3dB (13GHz～40GHz)<br>±2.7dB (40GHz～50GHz)<br>±3.0dB (50GHz～67GHz) | | |
| Input Attenuator | 4024A/B/C/H/L:<br>Attenuation Range: 0dB ～ 30dB, 5dB Stepping | 4024D/E/F/G:<br>Attenuation Range: 0dB ～ 50dB, 10dB Stepping | |
| Maximum Continuous Input | 4024A/B/C/H/L:<br>+27dBm Peak Typical(≥10dB Attenuation)<br>+20dBm Peak Typical(<10dB Attenuation)<br>+10dBm Peak Typical(Pre-amp On) | 4024D/E/F/G:<br>+30dBm Peak Typical(≥10dB Attenuation)<br>+23dBm Peak Typical(<10dB Attenuation)<br>+13dBm Peak Typical(Pre-amp On) | |
| Reference Level | Range: -120dBm～+30dBm<br>Conversion Uncertainty: ±1.20dB | | |
| Dimension | 314mm (W)×218mm (H)×91mm (D) (Excluding Handle, Stand)<br>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:<br>about 2.5h | 4024H/L:<br>2h (typical) |
| | 4024A/B/C: ≤25W | 4024D/E/F/G: ≤33W | 4024H/L: ≤38W |
| Test Interface | RF input:<br>4024A/B/C/D/E: Type-N Connector（female）<br>4024F/G: 2.4mm Connector(male)<br>4024H/L: 1.85mm Connector(male)<br>RF output:<br>Test interface of tracking generator option for 4024A/B/C:<br>Type-N Connector（female） | | |
| Other Interfaces | 10MHz Reference Input/Output: BNC (female) Connector<br>External Triggering Input: BNC (female) Connector<br>IF Output: BNC (female) Connector<br>GPS Antenna Input: BNC (female) Connector | | |

# Ordering Information

| | | |
|---|---|---|
| 4024A | Spectrum Analyzer | (9kHz～4GHz) |
| 4024B | Spectrum Analyzer | (9kHz～6.5GHz) |
| 4024C | Spectrum Analyzer | (9kHz～9GHz) |
| 4024D | Spectrum Analyzer | (9kHz～20GHz) |
| 4024E | Spectrum Analyzer | (9kHz～26.5GHz) |
| 4024F | Spectrum Analyzer | (9kHz～32GHz) |
| 4024G | Spectrum Analyzer | (9kHz～44GHz) |
| 4024H | Spectrum Analyzer | (9kHz～50GHz) |
| 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 |

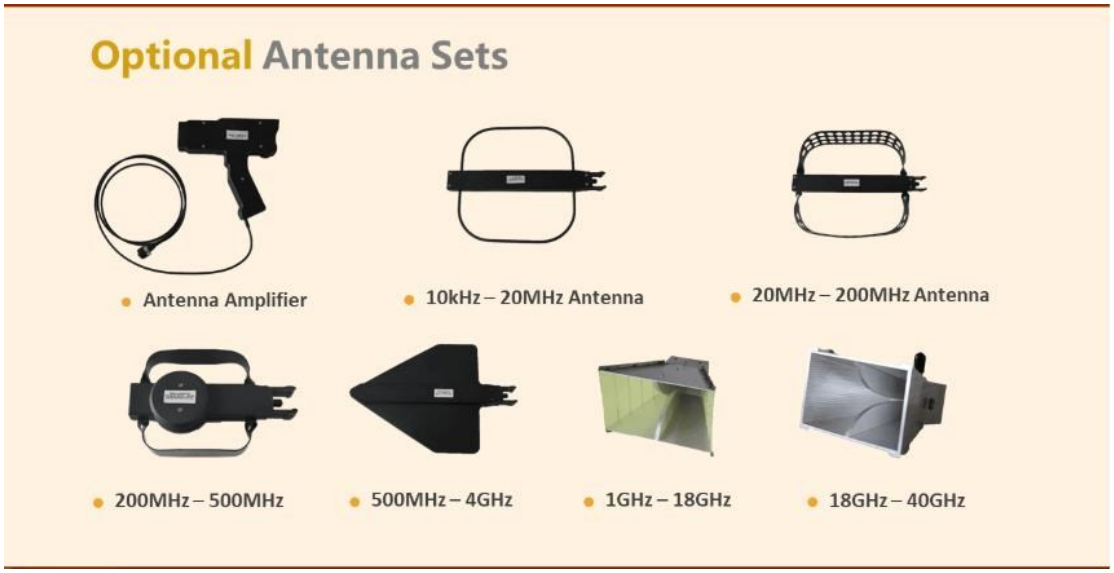
Options

| 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 |
| 4024-033 | 4024-033 Signal analysis | Fast analysis of the interference signals. Provide voice demodulation and IQ capture functions. |
| 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 | Interference 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


Ceyear
Focus on Measurement
Explore the Future

**CEYEAR TECHNOLOGIES CO., LTD**
No. 98, Xiangjiang Road, Huangdao District, Qingdao (266555), China
Tel: +86 532 86896691
Email: sales@ceyear.com
https://www.ceyear.com