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

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

Ceyear Technologies Co., Ltd.

Product Overview

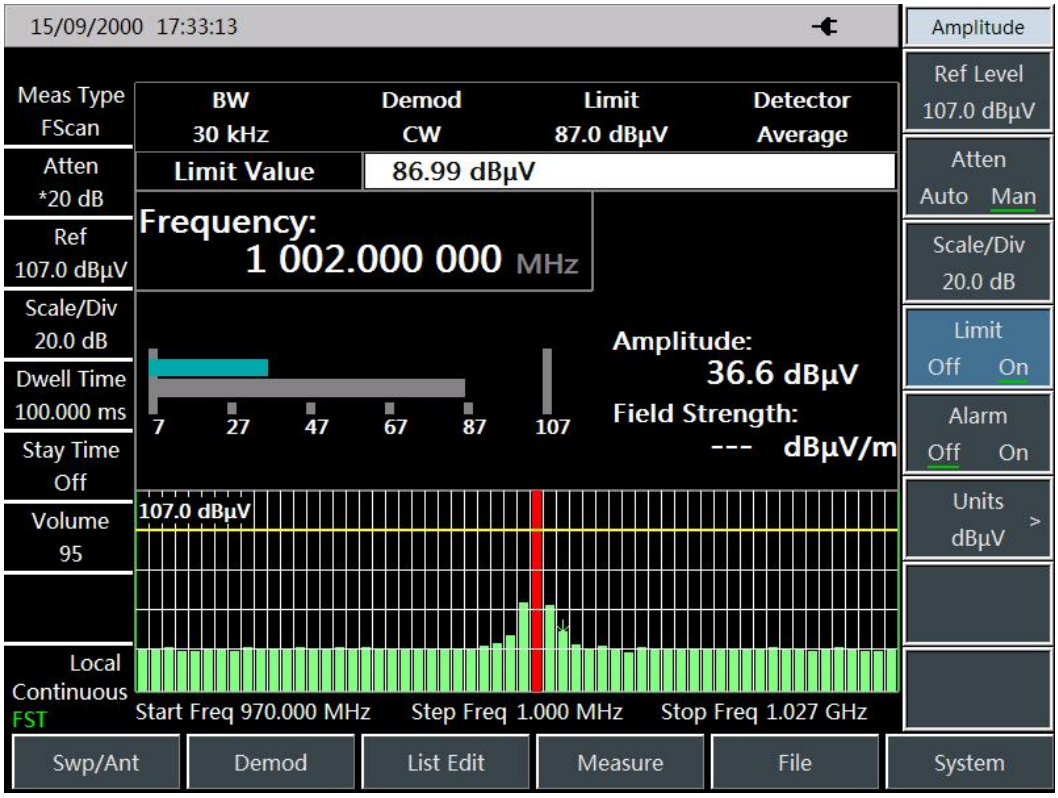
4024 series spectrum analyzer possesses many advantages: wide frequency range, high performance, high sweep speed, various functions, and easy operation. In terms of performance index, it has advantages of excellent displayed average noise level, low phase noise, and high sweep speed. In terms of measurement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

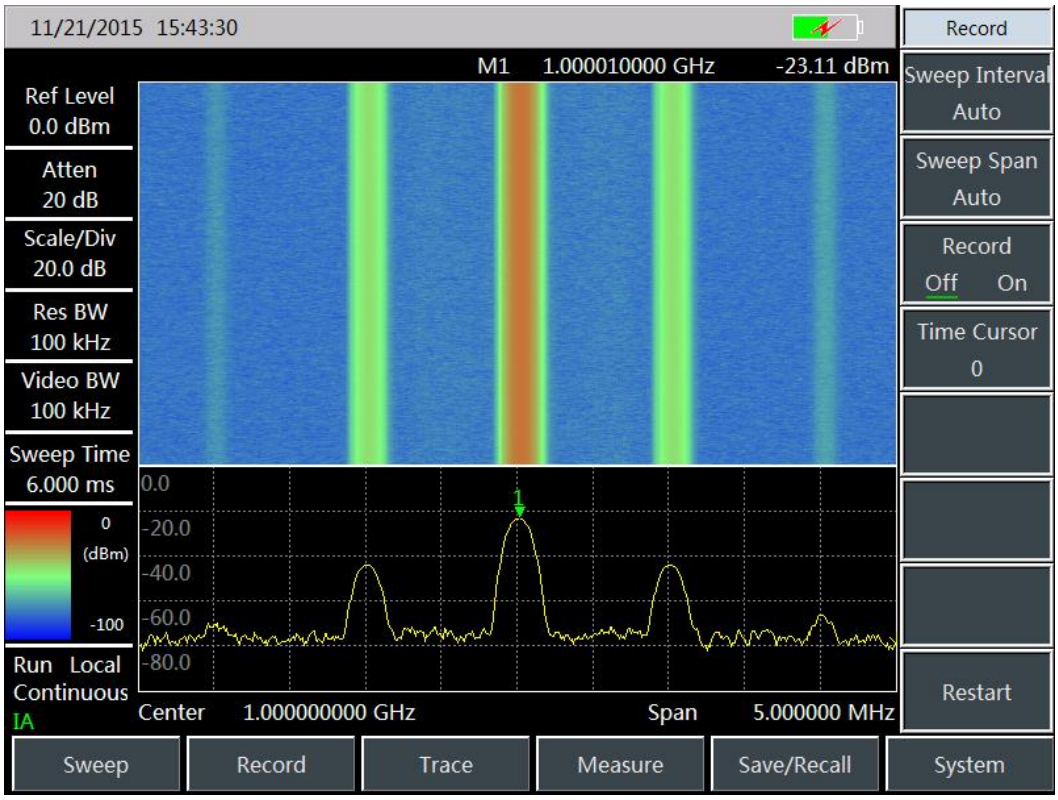
Main Characteristics

- **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 to 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℃ to 50℃, Power supplied by battery or adapter**

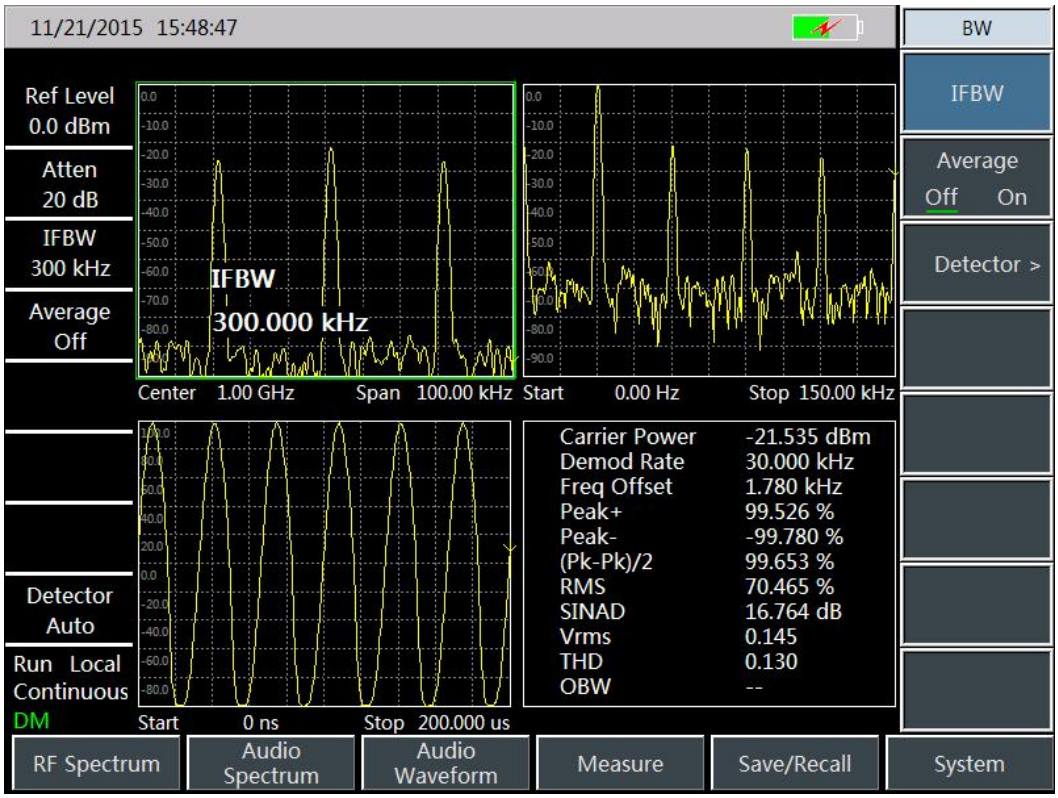
Various Measurement Functions



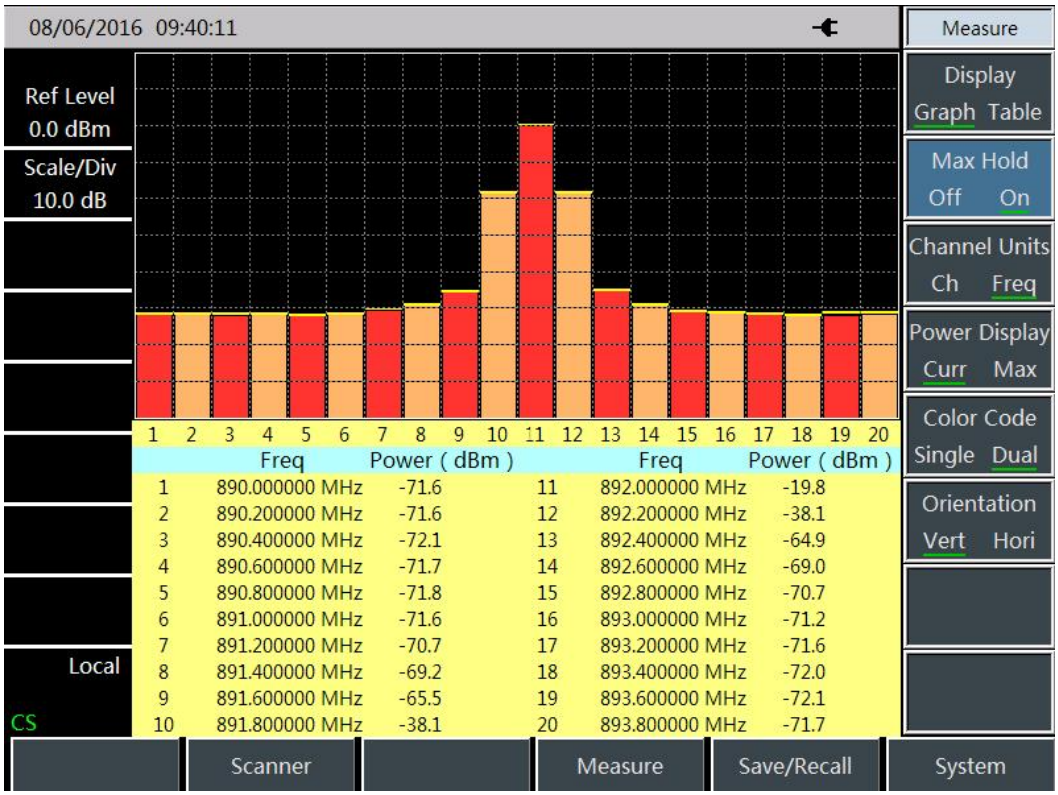
Field Strength



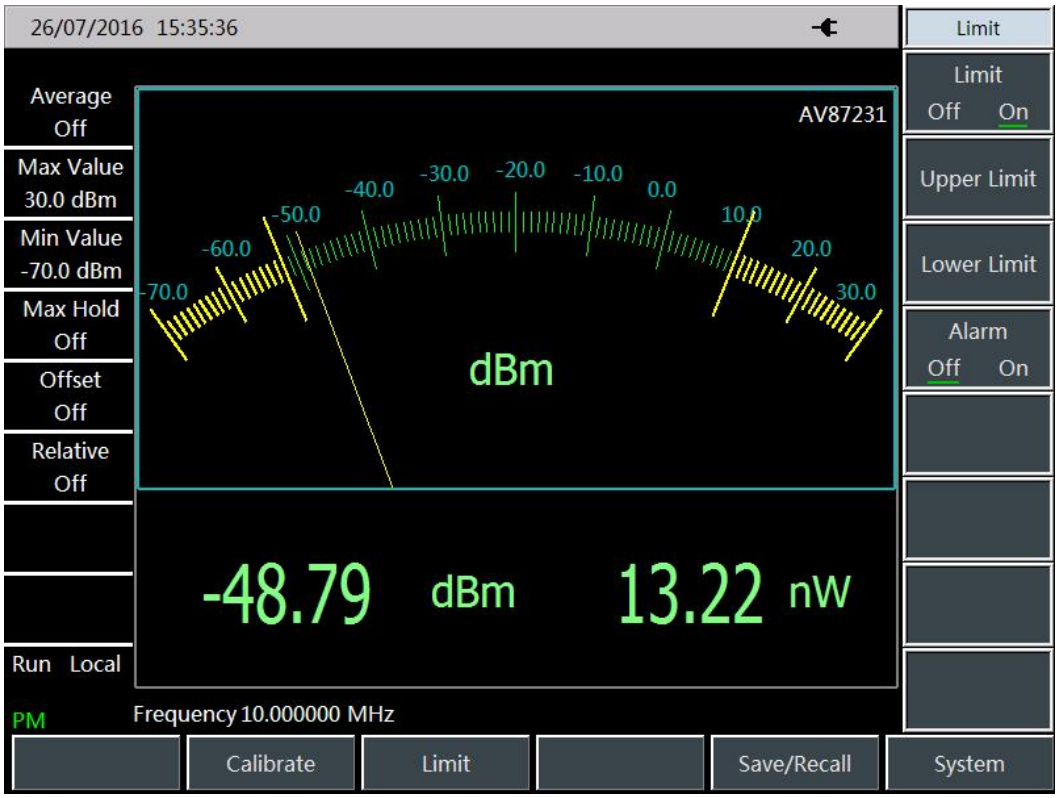
Interference Analyzer (Spectrogram)



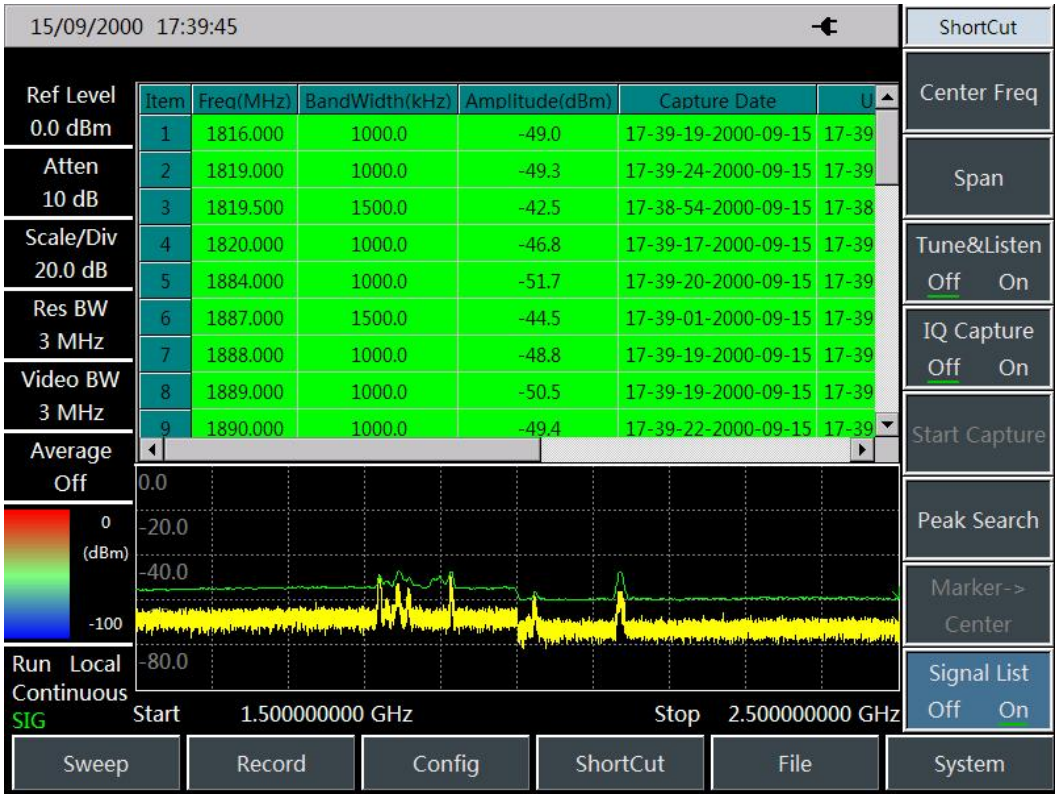
AM/FM/PM Demodulation



Channel Scanner

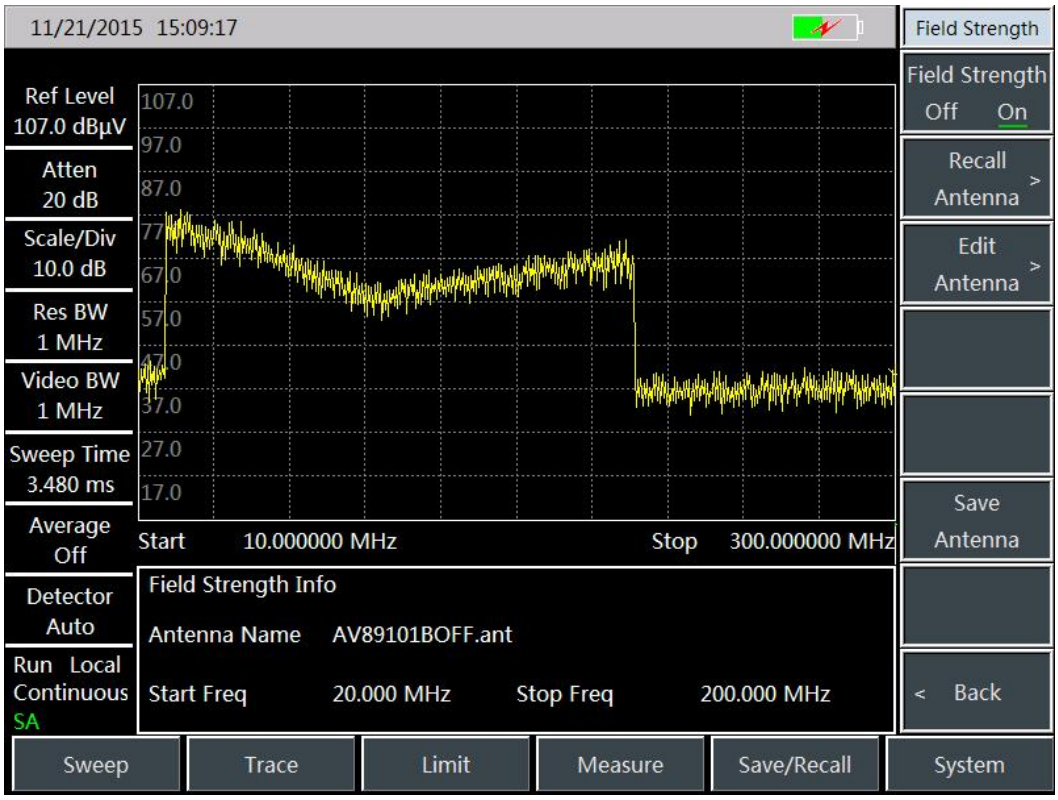


Power Meter (USB Power Probe)

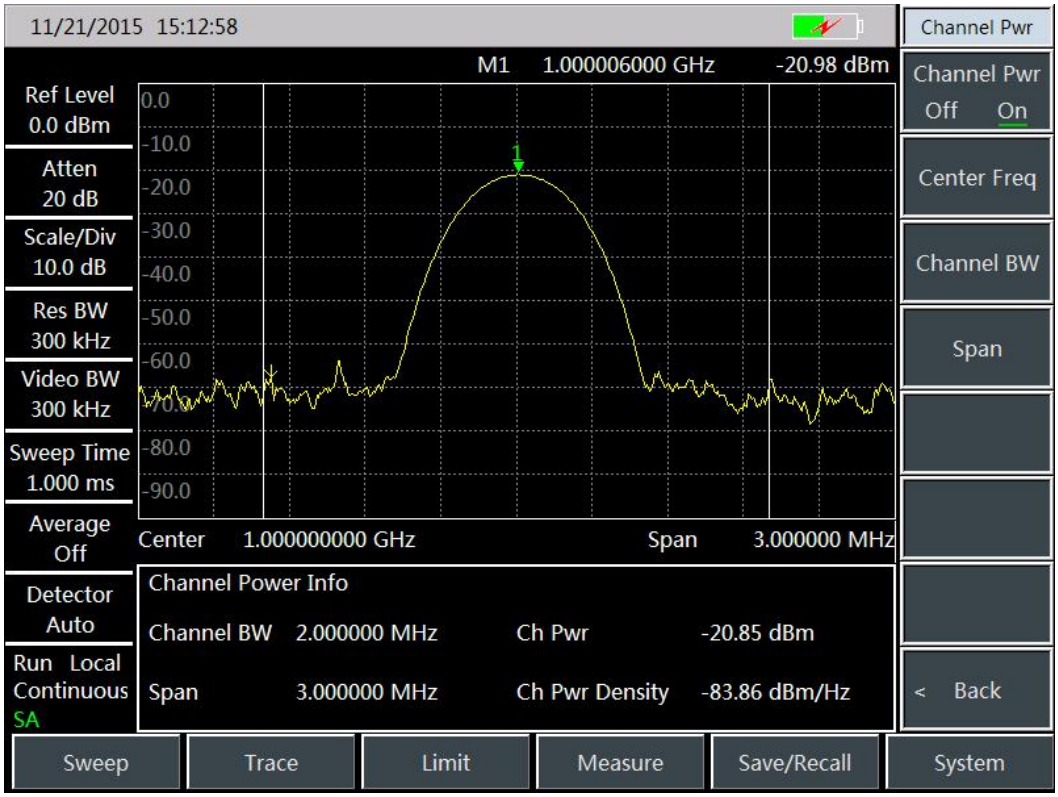


Signal Analyzer

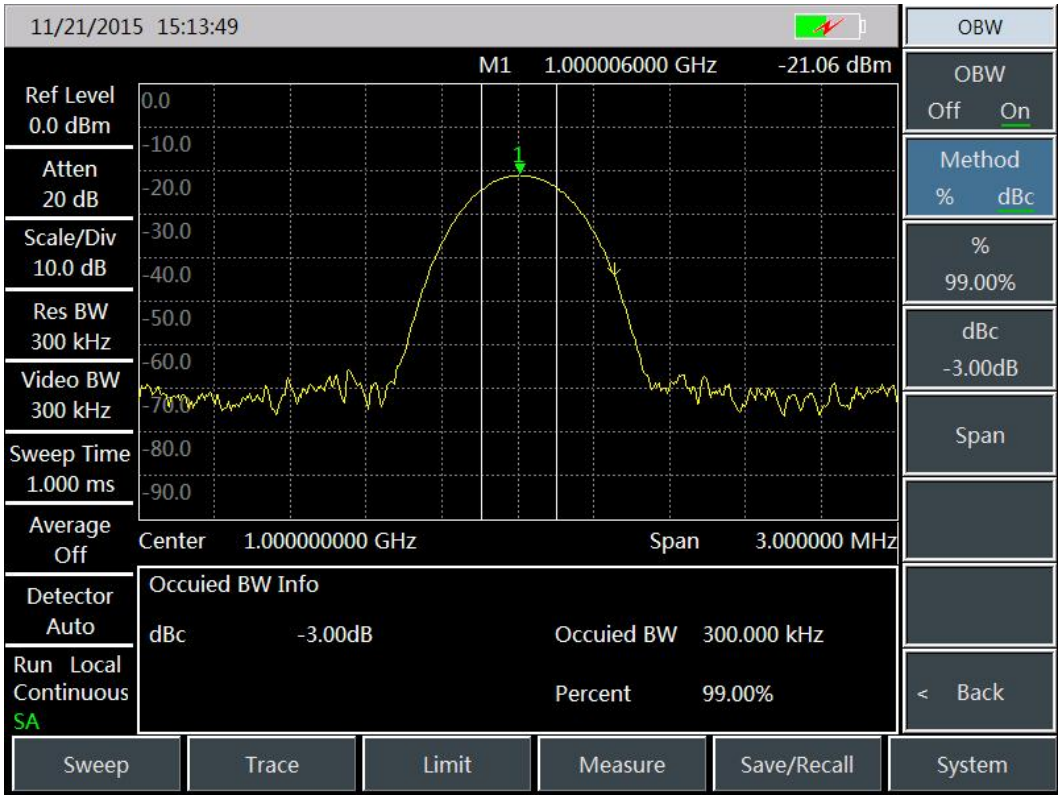
Comprehensive Intelligent Measurement Function



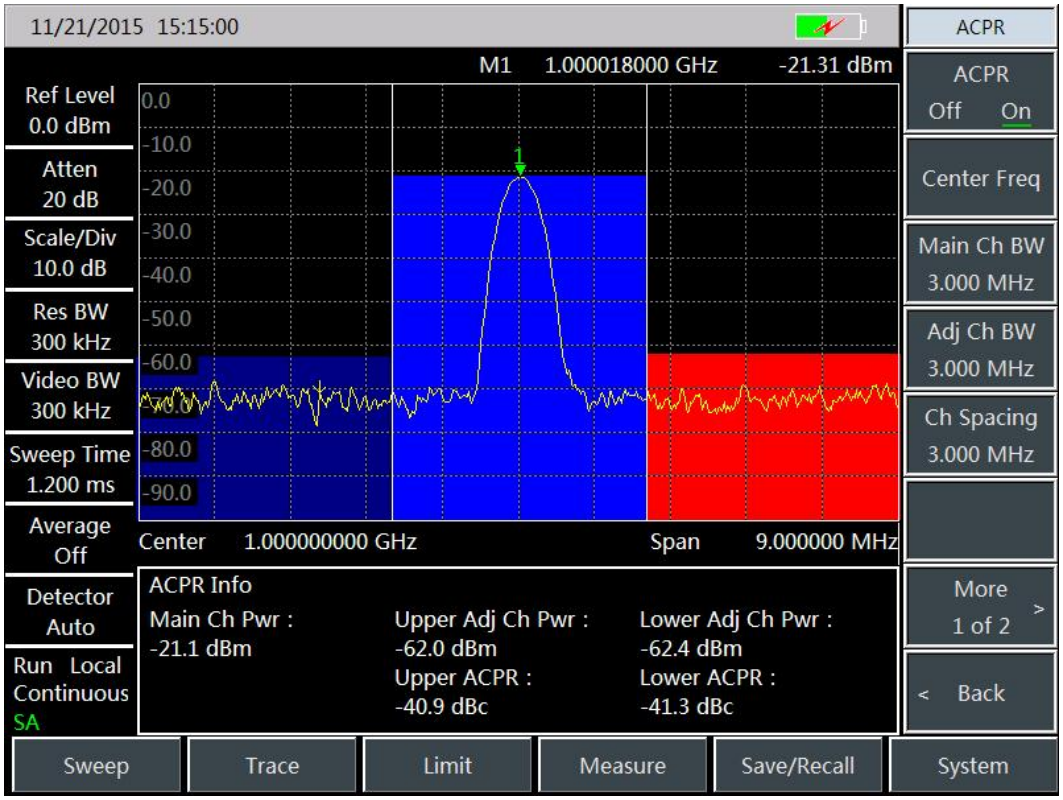
Field Strength Measurement



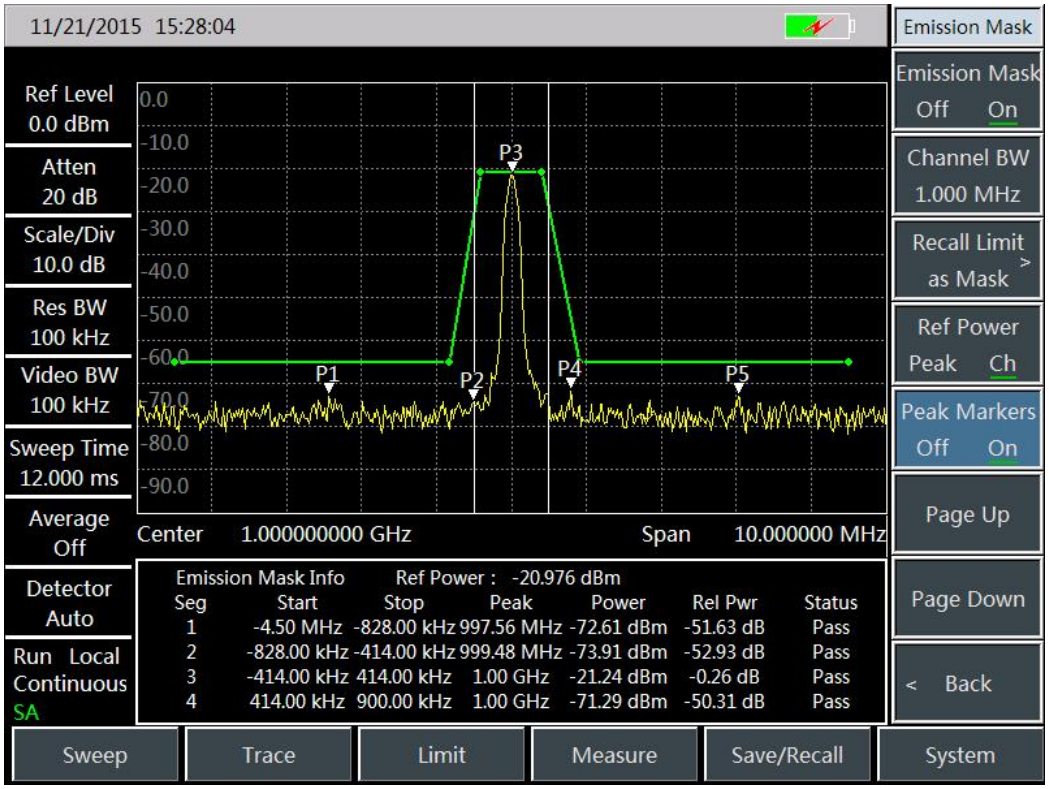
Channel Power



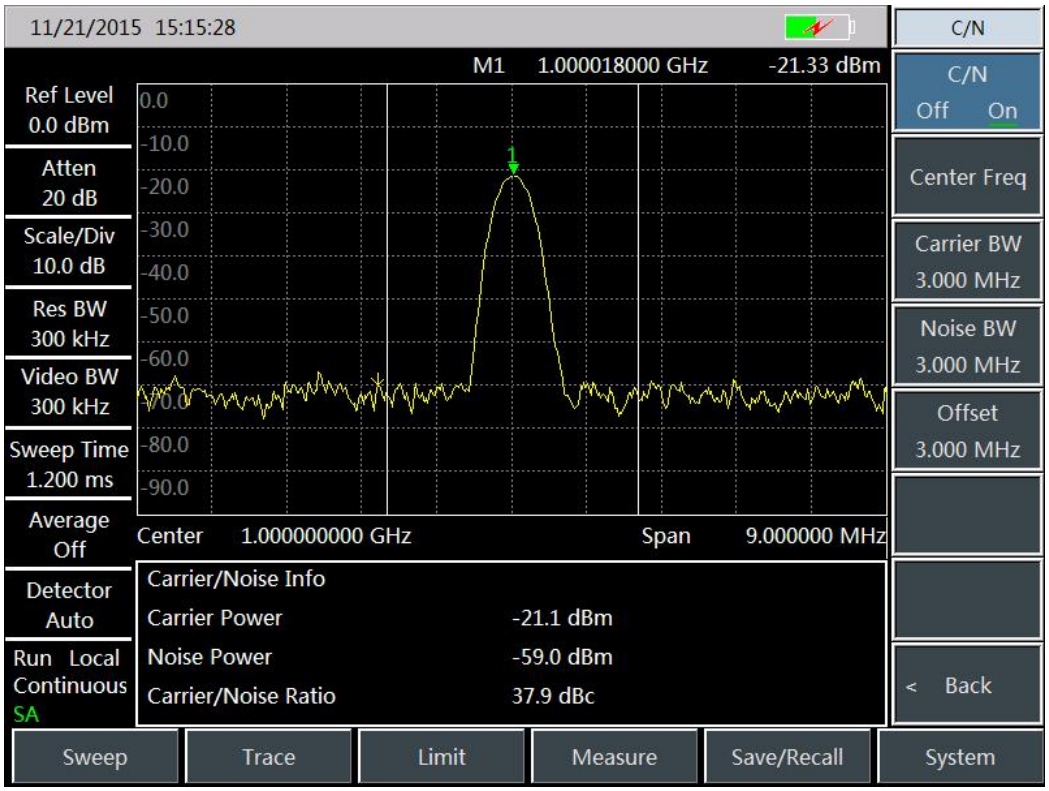
Occupied Bandwidth



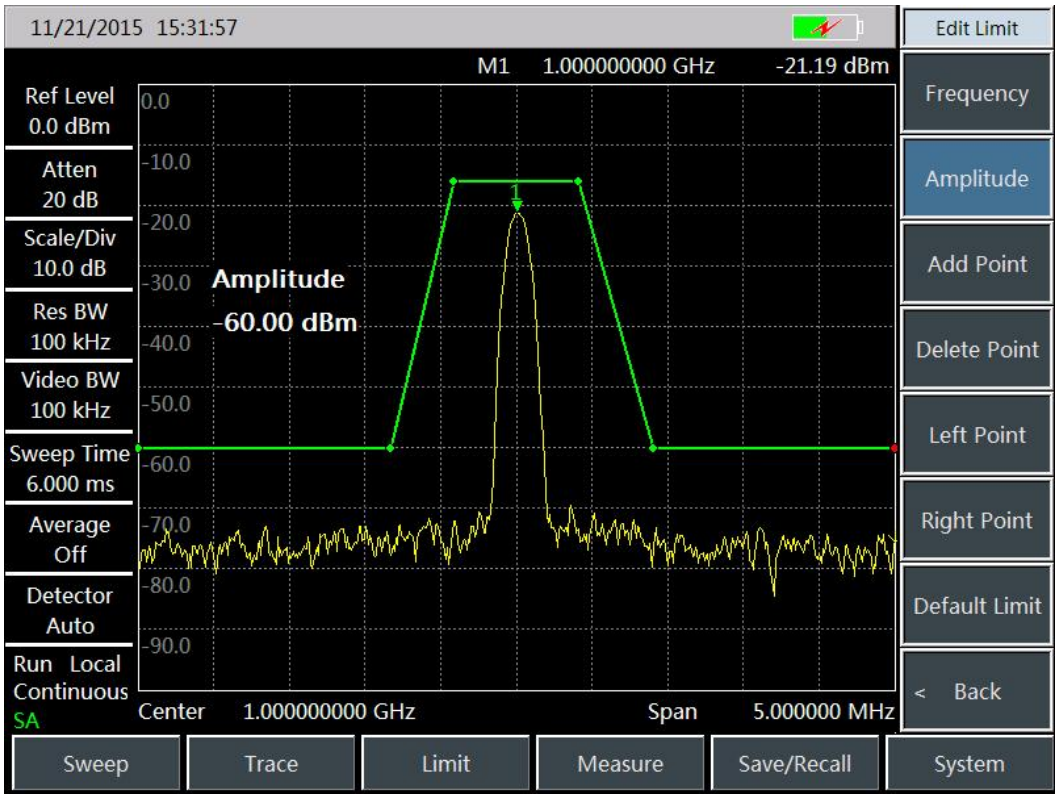
Adjacent-Channel Power Ratio



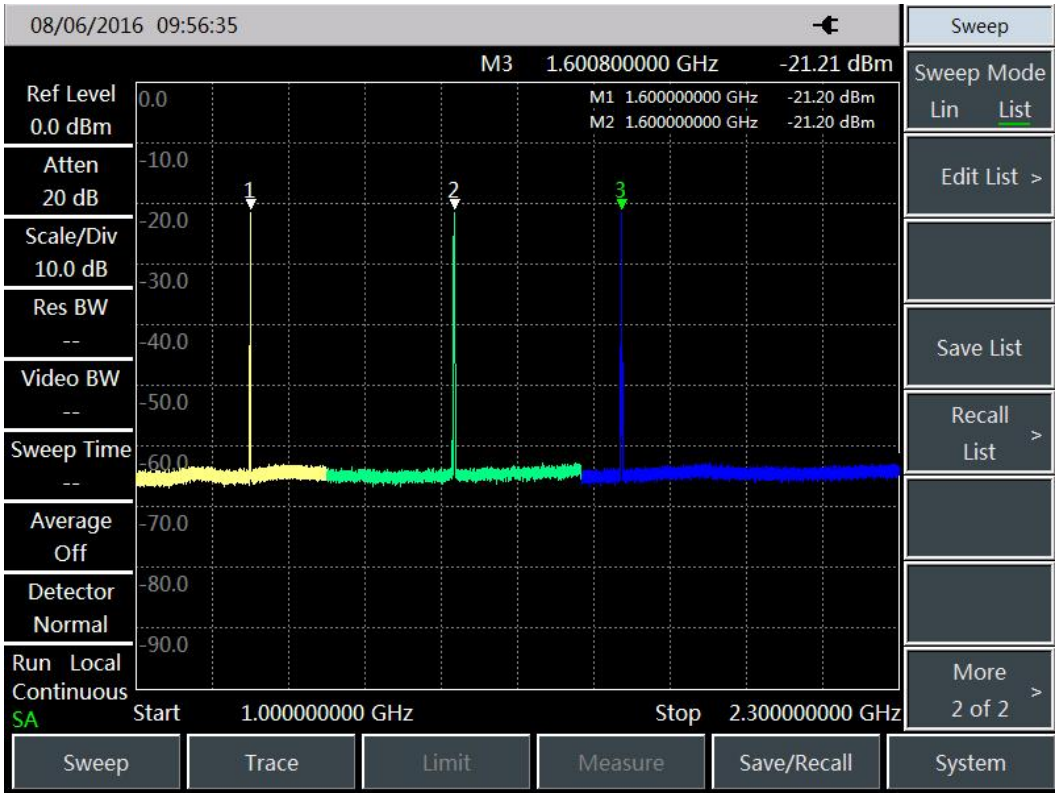
Emission Mask



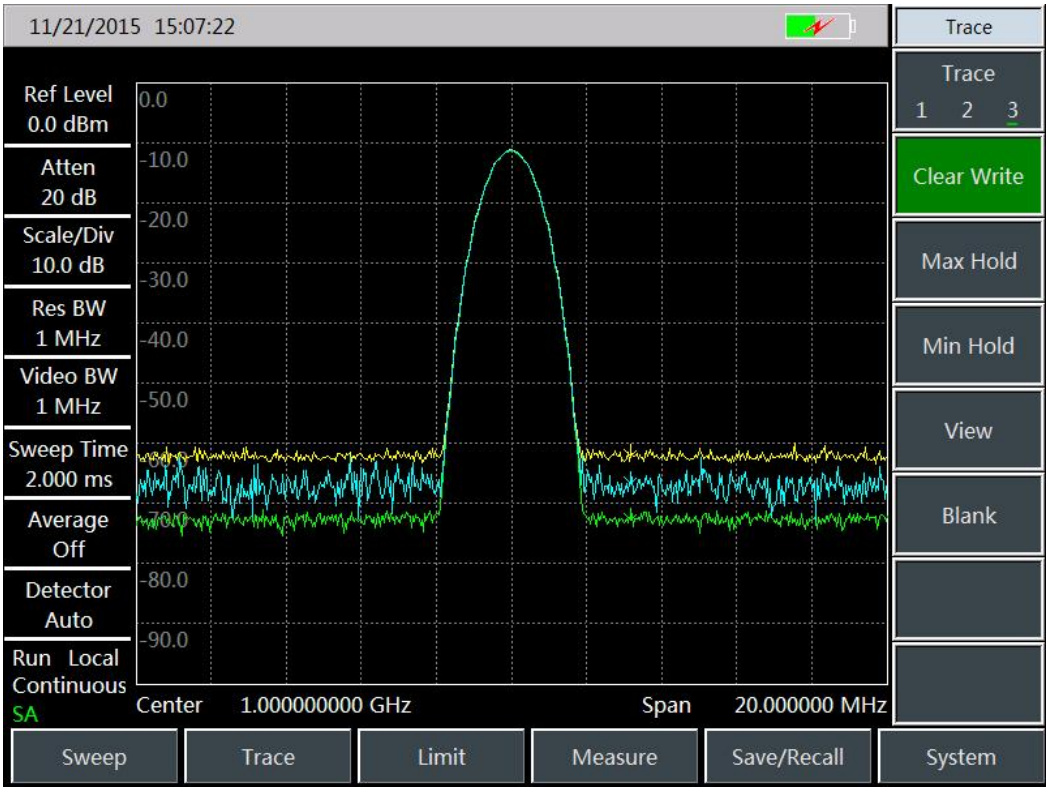
Carrier-to-Noise Ratio



Limit Line

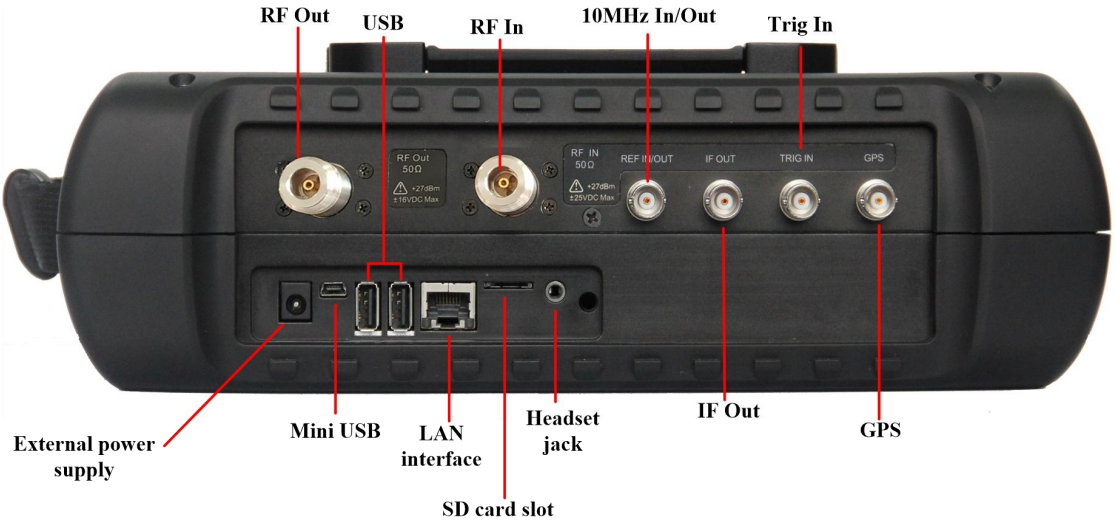


List Sweep



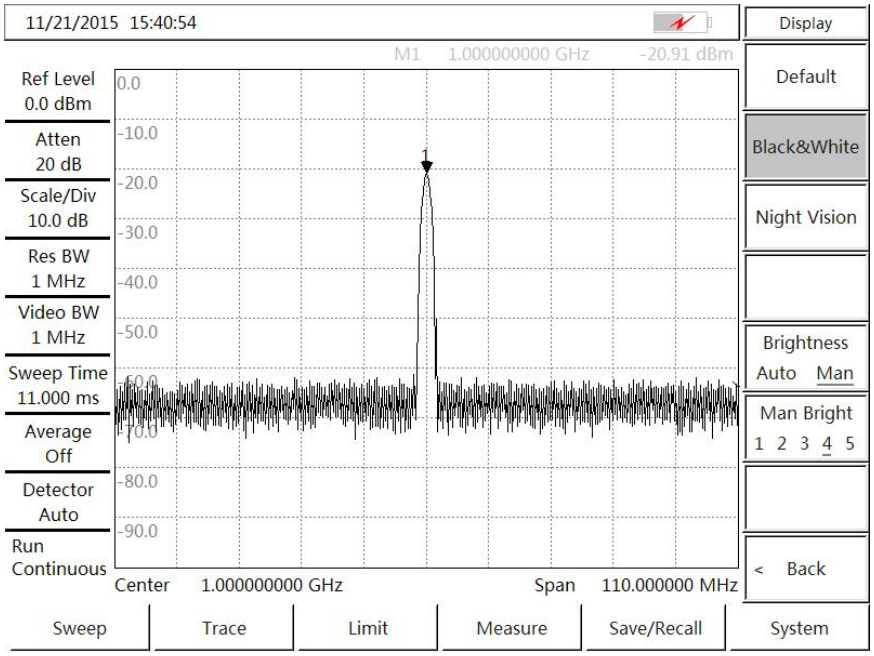
Multi-Traces

Various Auxiliary Test Interfaces

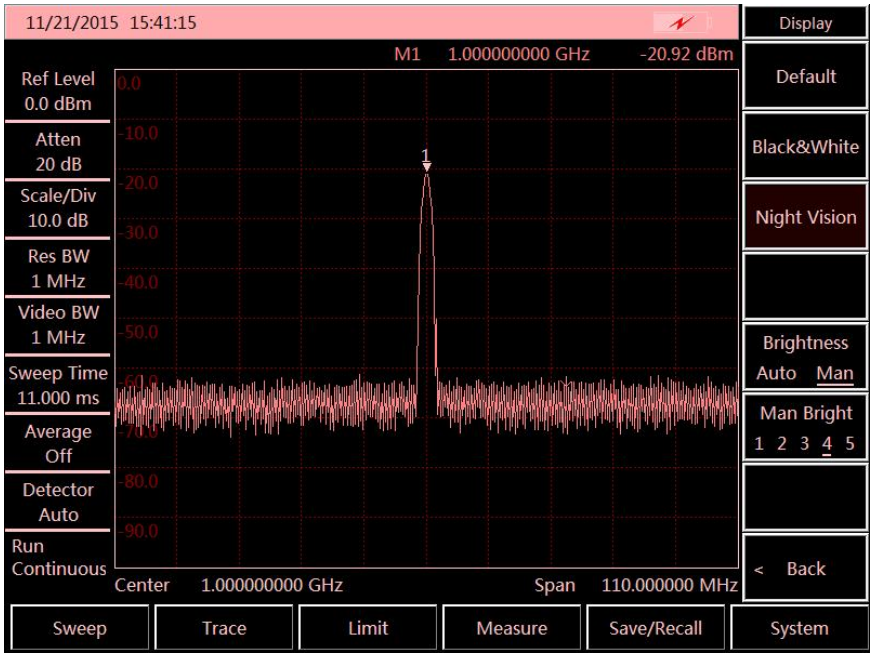


Easy & Convenient User Operation

- 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)

Frequency Span	Range: 100Hz～Upper Frequency Limit of Corresponding Model or 0Hz Accuracy: ±2.0%	
Resolution Bandwidth	1Hz～10MHz (1-3 Times of Stepping)	
Video Bandwidth	1Hz～10MHz (1-3 Times of Stepping)	
SSB Phase Noise (Carrier 1GHz)	4024A/B/C: ≤-108dBc/Hz@ Frequency Offset 10kHz ≤-112dBc/Hz@ Frequency Offset 100kHz ≤-118dBc/Hz@ Frequency Offset 1MHz ≤-129dBc/Hz@ Frequency Offset 10MHz	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
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℃)	4024A/B/C: Pre-amp Off: ≤-140dBm(10MHz～3GHz) ≤-138dBm(3GHz～9GHz) Pre-amp On: ≤-160dBm(10MHz～3GHz) ≤-157dBm(3GHz～9GHz)	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)
	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)	
Residual Response	4024A/B/C (exceptional frequency: 3.2GHz): Pre-amp Off: ≤-82dBm（10MHz～9GHz） Pre-amp On: ≤-95dBm（10MHz～9GHz）	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)

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 safety input level	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 ℃ to +70 ℃ (the battery storage temperature is -20 ℃ to +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 to 4GHz)
Main Unit: 4024B Spectrum Analyzer (9kHz to 6.5GHz)
Main Unit: 4024C Spectrum Analyzer (9kHz to 9GHz)
Main Unit: 4024D Spectrum Analyzer (9kHz to 20GHz)
Main Unit: 4024E Spectrum Analyzer (9kHz to 26.5GHz)
Main Unit: 4024F Spectrum Analyzer (9kHz to 32GHz)
Main Unit: 4024G Spectrum Analyzer (9kHz to 44GHz)
Main Unit: 4024H Spectrum Analyzer (9kHz to 50GHz)
Main Unit: 4024L Spectrum Analyzer (9kHz to 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	English option	English front & back panel, operating system
4024-003	User manual	--
4024-005	Programming manual	--
4024-006	Power adapter	spare power adapter
4024-007	Rechargeable lithium battery	spare battery
4024-008	Purple HSYV	point to point, 2 meters long
4024-009	Micro SD Card	Class4, 8G capacity
4024-010	GPS option	GPS external antenna (BNC), internal GPS module and software
4024-011	USB Power measurement	power measurement function of the USB interface (USB power sensor is needed)
4024-012	87230 USB CW power sensor	for power calibration (9kHz-6GHz)
4024-013	87231 USB CW power sensor	for power calibration (10MHz-18GHz)
4024-014	87232 USB CW power sensor	for power calibration

		(50MHz-26.5GHz)
4024-015	87233 USB CW power sensor	for power calibration (50MHz-40GHz)
4024-016	Interference analysis	provide waterfall chart, RSSI measurement function etc
4024-017	Analog demodulation	modulation characteristic analysis of AM/FM/PM signal
4024-018	Signal channel scanning function option	signal power measurement in multi channel or frequency
4024-019	List scanning function option	continuous scanning measurement of multi frequency bands
4024-020	Zero sweep width IF output	output IF signal at zero sweep width
4024-021	ZE9080 directional antenna A	frequency range: 9kHz to 20MHz (option 025 is needed)
4024-022	ZE9080 directional antenna B	frequency range: 20MHz to 200MHz (option 025 is needed)
4024-023	ZE9080 directional antenna C	frequency range: 200MHz to 500MHz (option 025 is needed)
4024-024	ZE9080 directional antenna D	frequency range: 500MHz to 8GHz (option 025 is needed)
4024-025	ZE9080 antenna amplifier	frequency range: 9kHz to 8GHz, N(f), 050 option is included (option 021, 022, 023, 024 are needed)
4024-026	89901 antenna	frequency range: 1GHz to 18GHz, N(f)
4024-027	89902 antenna	frequency range: 18GHz to 40GHz, 2.92mm(f)
4024-028	Functional bag	to protect the instrument
4024-029	Backpack	easy to carry
4024-030	Safety instrument shipment case	High-tensile portable shipment case, with handle, used for shipment
4024-031	89901 Antenna handle	work with 89901 antenna (option 026)
4024-032	89902 Antenna handle	work with 89902 antenna (option 027)
4024-033	Signal analysis	quick analysis the interference signal, and audio demodulation and IQ acquision .
4024-034	Field strength measurement	field test functions like point frequency, frequency scan, list sweep, etc.
4024-035	4GHz tracking generator	frequency range: 100kHz to 4GHz (for 4024A only)

4024-036	6.5GHz tracking generator	frequency range: 100kHz to 6.5GHz (for 4024B only)
4024-037	9GHz tracking generator	frequency range: 100kHz to 9GHz (for 4024C only)
4024-038	Location analysis	built-in software, option 010, 050 and directional antenna are needed
4024-039	Interference map	built-in software, option 010 is needed
4024-041	Whip omnidirectional antenna	700MHz to 2700MHz, for communication frequency range
4024-042	700MHz to 4GHz directional antenna	active log-periodic antenna, 700MHz to 4GHz
4024-043	700MHz to 6GHz directional antenna	active log-periodic antenna, 700MH to 6GHz
4024-044	680MHz to 10GHz directional antenna	active log-periodic antenna, 680MH to 10GHz
4024-045	680MHz to 20GHz directional antenna	active log-periodic antenna, 680MHz to 20GHz
4024-046	400MHz to 4GHz directional antenna	active log-periodic antenna, 400MHz to 4GHz
4024-047	400MHz to 6GHz directional antenna	active log-periodic antenna，400MHz～6GHz
4024-048	380MHz to 10GHz directional antenna	active log-periodic antenna, 380MHz to 10GHz
4024-049	380MHz to 20GHz directional antenna	active log-periodic antenna, 380MHz to 20GHz
4024-050	USB electronic compass	external USB electronic coompass, work with option 038
4024-051	6GHz omni antenna	portable omni antena, 680MHz to 6GHz
4024-052	8GHz omni antenna	portable omni antena, 300MHz to 8GHz
4024-053	VHF/UHF retractable whip antenna	140MHz/430MHz
4024-054	Passive directional antenna(700MHz to 4GHz)	passive logarithmic periodic antenna, 700MHz to 4GHz
4024-055	Passive directional antenna(700MHz to 6GHz)	passive logarithmic periodic antenna, 700MHz to 6GHz
4024-056	Passive directional antenna(680MHz to 10GHz)	passive logarithmic periodic antenna, 680MHz to 10GHz
4024-057	Passive directional antenna(680MHz to 18GHz)	passive logarithmic periodic antenna, 680MHz to 18GHz
4024-058	Passive directional antenna(680MHz to 25GHz)	passive logarithmic periodic antenna, 680MHz to 25GHz

4024-059	Passive directional antenna (680MHz to 35GHz)	passive logarithmic periodic antenna, 680MHz to 35GHz
4024-060	N/SMA-JJ RF cable (2m)	N/SMA dual-male RF coaxial cable, DC to 18GHz, 2m length
4024-061	N/SMA-JJ RF cable (1m)	N/SMA dual-male RF coaxial cable, DC to 18GHz, 1m length
4024-067	ZE9080 antenna shipping case	for ZE9080 antenna, one full set ZE9080 antenna and amplifier can be put in, including option 021, 022,023, 024, 025

Typical Accessories

Ceyear
Focus on measurement
Explore the future

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