4959 Series
Microwave Analyzer

4959B/D/E/G/H/K
(9kHz/300kHz~9GHz/18GHz/26.5GHz/44GHz/50GHz/54GHz)

Ceyear Technologies Co., Ltd

Product Overview

The frequency range of Ceyear 4959 microwave analyzer product covers 9 kHz / 300 kHz ~ 54 GHz, with various measurement functions such as spectrum analysis, dual-port vector network analysis, antenna feeder analysis, vector voltmeter, USB CW/ pulse power measurement, OTDR, optical power meter, field strength measurement, IQ analysis, interference analysis, analog demodulation analysis, 40 MHz bandwidth real-time spectrum analysis, etc. The product is a handheld form, 10.1-inch LCD touch screen, working temperature is -20℃-55℃, support battery power supply, small size, light weight, easy to control, can be used in the field of electronic communication maintenance guarantee test of communication equipment.

Main Features

- **Wide frequency range coverage**
  9kHz/300kHz~54GHz(spectrum analyzer/VNA) wide band coverage
- **Excellent performance specifications**
  Dynamic Range (Vector Network Analysis): 113dB (10MHz<f≤20GHz, typical)
  Single Sideband Phase Noise (Spectrum Analysis): ≤-110dBc/Hz@100kHz Offset @1GHz Carrier (typical)
  Display Average Noise Level (Spectrum Analysis): ≤-163dBm/Hz (2MHz~6GHz, Front Release, Typical)
- **Abundant measurement functions**
  Standard: spectrum analysis, vector network analysis
  Optional: antenna feeder analysis, vector voltmeter, interference analysis (waterfall map, RSSI), channel scanning, field strength measurement, USB CW power measurement, USB peak power measurement, USB OTDR, analog demodulation analysis (AM, FM, PM), directional analysis, real-time spectrumanalysis (support digital afterglow spectrum and waterfall map display), IQ analysis, time gate scanning, etc
- **Excellent vector network analysis**
  Capable of measuring four S-parameters, amplitude and phase simultaneously
  It supports time domain analysis and mixed reflection S-parameter testing

Full two-port calibration, unknown pass-through calibration, waveguide calibration, electronic calibration (external), support for defining calibration kits

- **Practical antenna feeder analysis**
  It has the function of return loss and 1-port cable loss test
  It has the function of distance to fault (DTF) function.
  Supports TDR cable analysis to determine the location and nature of the fault (short circuit, open circuit, etc.)

- **Intuitive display of vector voltmeter**
  Amplitude, phase, and electrical length measurements
  A/B and B/A measurements to measure the amplitude and phase consistency of the receiver channel

- **Flexible OTDR and optical power meter**
  Fiber type of OTDR is G.652 Single-Mode 9/125, Measurement Wavelength 1310nm± 20nm & 1550nm±20nm, Typical Dynamic Range 38dB
  The calibration wavelength of the optical power meter is 850/980/1270/1300/1310/1490/1550/1577/1625/1650nm, and the typical measurement range is -50dBm ~+20dBm (sharing a single optical port with the OTDR)

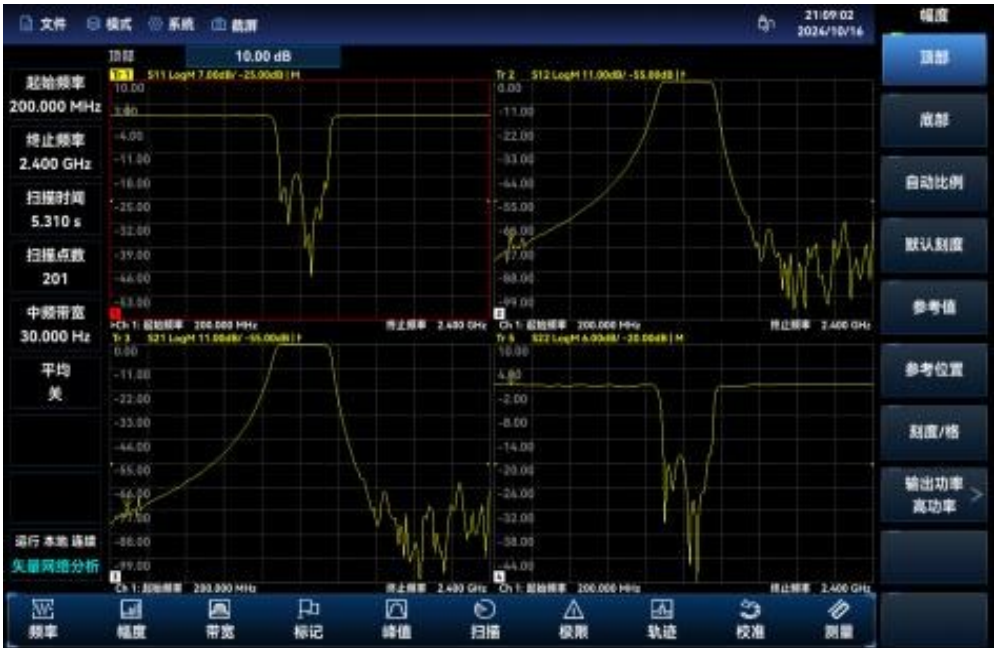
- **Variety of auxiliary interfaces**
  10MHz reference I/O interface
  GPS/Beidou antenna interface
  Zero-sweep wide IF output interface
  Wi-Fi wireless communication interface
  LAN, USB, MicroSD card and other interfaces

- **Excellent user experience**
  10.1-inch LCD and capacitive touch screen, support marker dragging
  Spectrum analysis mode: 6 independent markers, 3 display traces
  Vector network analysis: 8 independent cursors, 4 display windows, 8 trace displays

- **Fit for field test**
  The working temperature is -20°C~55°C, and the storage temperature is -50°C~70°C
  The weight of the whole machine without battery is about 3.7kg~3.9kg (varies by model)
  Three display modes are supported: default, outdoor, and night vision
  Built-in high-capacity lithium-ion battery with a typical battery life of 3 hours (varies by model and measurement mode)

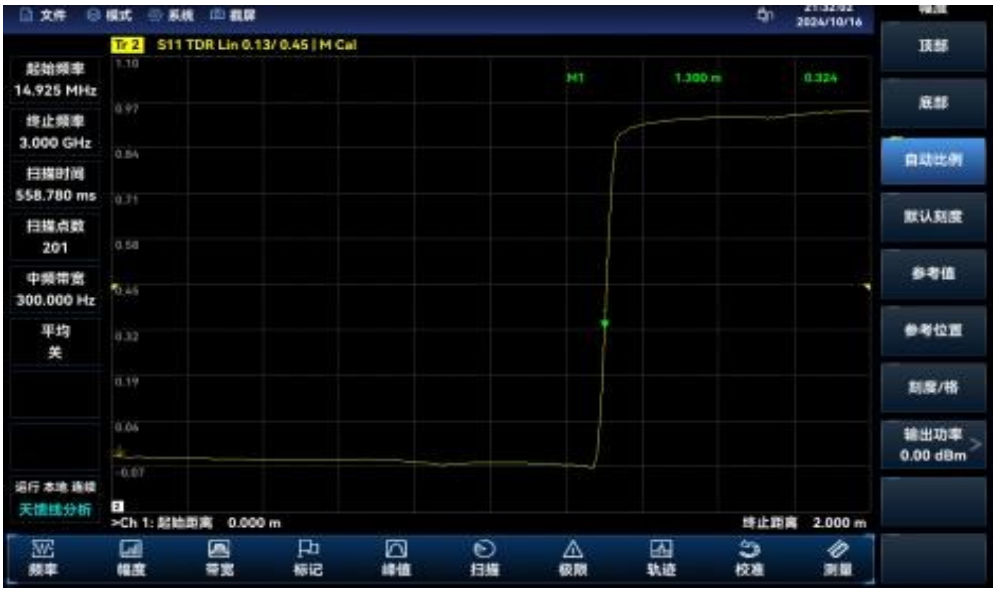
Vector network analysis:

The vector network analysis function of 4959 microwave analyzer provides standard four S parameter vector network analysis measurement ability, for amplifier, filter, attenuator, duplexer components S parameter test, support mixed reflection S parameter test, display format including logarithmic, linear, phase, group delay, Smith circle, polar coordinates, standing wave ratio, etc.



Antenna feeder analysis (option):

The antenna feeder analysis of the 4959 microwave analyzer can measure the echo loss, voltage standing wave ratio, impedance, cable loss and fault point distance of cables and feeders. The echo loss and fault point distance measurement will help you determine the specific reasons for the decrease of system performance in the antenna feeder system. The day feeder analysis function supports the TDR test, which can analyze the type of cable failure. In addition, the instrument is also built-in some commonly used cables, feeder parameters, easy to use.

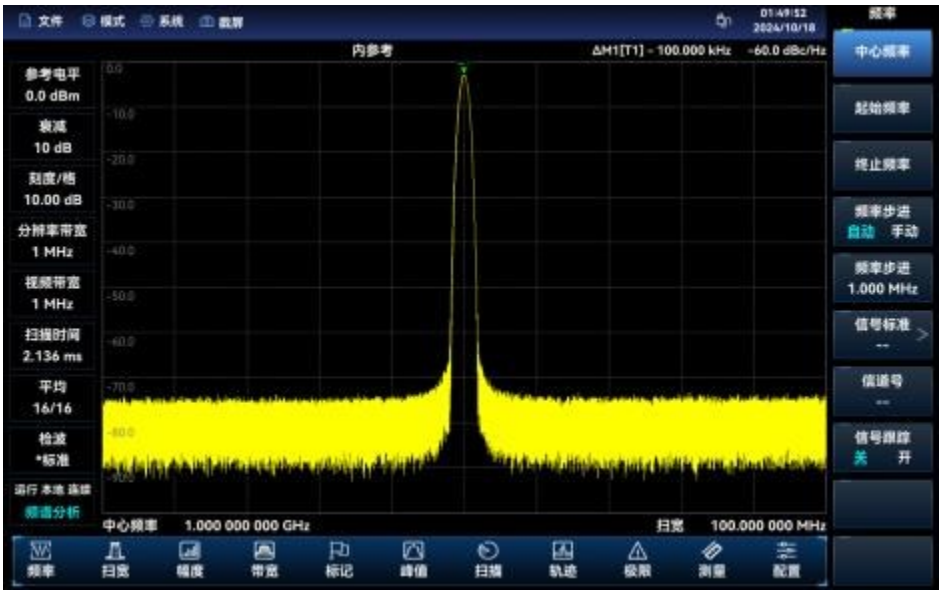


Vector voltage meter (option):

The vector voltmeter of 4959 microwave analyzer can match the electrical length and phase shift of the measured device, support A / B and B / A measurement functions, and can measure the amplitude phase consistency of the receiver.

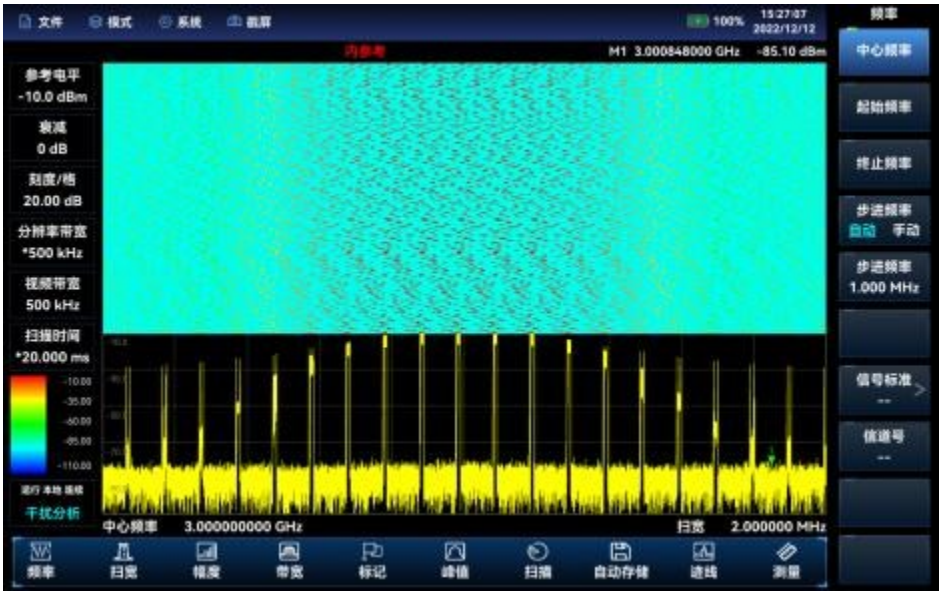
Spectrum analysis:

4959 microwave analyzer has standard channel power, occupied bandwidth, adjacent power, spectrum transmission template, load-to-noise ratio, audio demodulation, harmonic distortion, spectrum transmission template, carrier adjacent power, third order adjustable test function, with high sensitivity, scanning speed, large dynamic range, good phase noise index, etc.4959 microwave analyzer built-in a variety of predefined signal standard can be directly called, support noise marker and frequency counter function, can display three traces at the same time, and has the standard, positive peak, negative peak, sampling, mean and root rms different inspection mode, support signal tracking and peak tracking function, has the function of peak list.



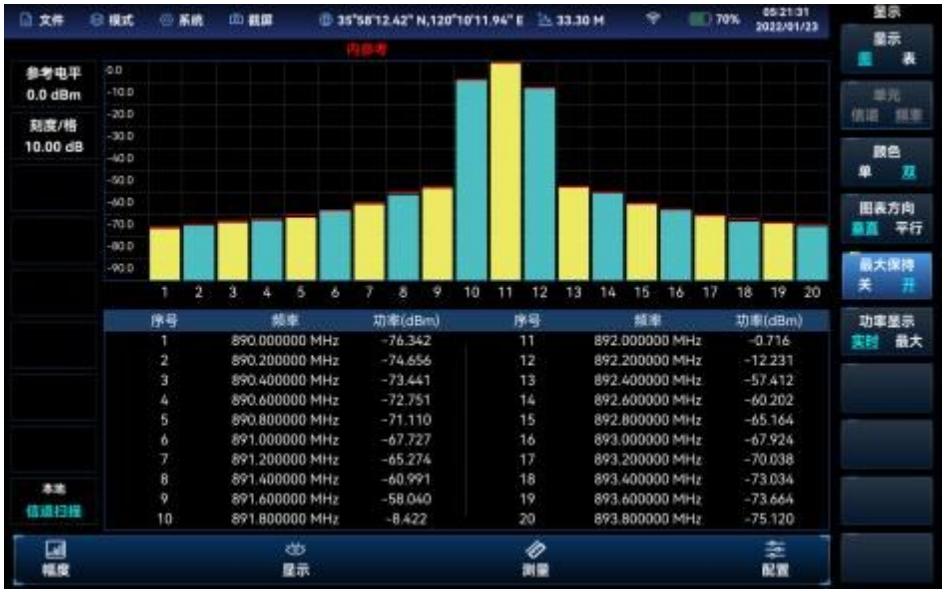
Interference analysis (option):

The interference analysis option has the function of spectrum measurement, waterfall map and RSSI measurement, where the waterfall map uses frequency-amplitude-time three-dimensional display, which can easily observe periodic or intermittent signals, and display the strength of the response signal amplitude of different colors in the waterfall map. RSSI (received signal intensity indication) is mainly used to measure the intensity change of a point frequency signal in a period of time, and the waterfall map and RSSI measurement support the signal automatic storage function.



Channel Scan (option):

The channel scan measurement mode provides a measurement of the signal power of the multiple channels. The signal power is displayed in the form of a bar chart or as a list, measuring the signal power of up to 20 channels. According to the way of channel setting channels, there are three measurement methods: channel scanning, frequency scanning and list scanning. The three measurement methods can set the bandwidth and the number of channels.



序号	频率	功率(dBm)	序号	频率	功率(dBm)
1	890.000000 MHz	-76.342	11	892.000000 MHz	-0.716
2	890.200000 MHz	-74.656	12	892.200000 MHz	-12.231
3	890.400000 MHz	-73.441	13	892.400000 MHz	-57.412
4	890.600000 MHz	-72.751	14	892.600000 MHz	-60.202
5	890.800000 MHz	-71.110	15	892.800000 MHz	-65.164
6	891.000000 MHz	-67.727	16	893.000000 MHz	-67.924
7	891.200000 MHz	-65.274	17	893.200000 MHz	-70.038
8	891.400000 MHz	-60.991	18	893.400000 MHz	-73.034
9	891.600000 MHz	-58.040	19	893.600000 MHz	-73.664
10	891.800000 MHz	-8.422	20	893.800000 MHz	-75.120

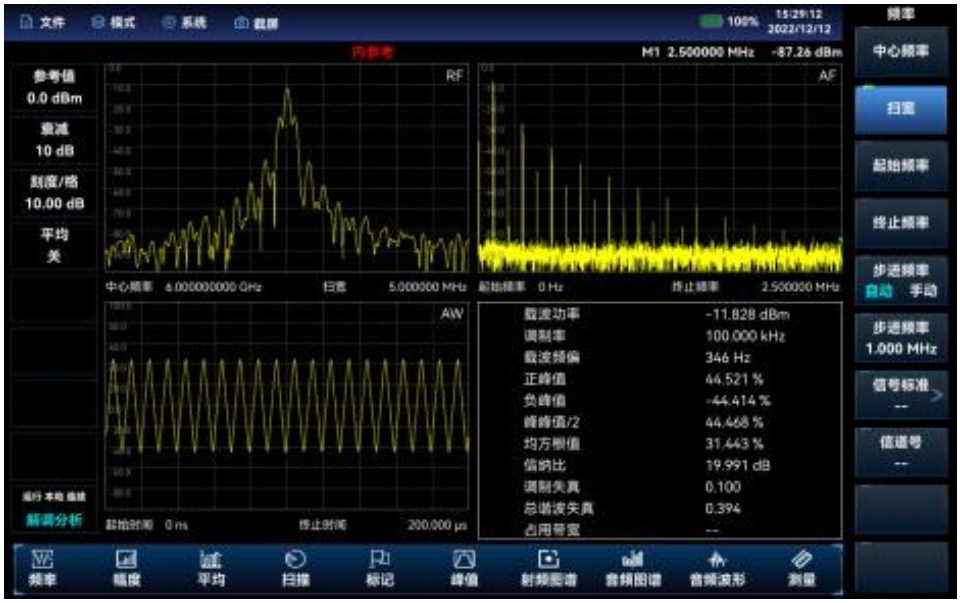
Analog demodulation analysis (option):

Demodulation analysis measurement mode provides display of the AM, FM, PM modulated signal atlas and analysis of related parameters. The main maps and associated parameters are measured as follows:

RF spectrum: similar to the spectrum analysis mode, showing the spectrum of the modulation signal, can measure the bandwidth. Audio atlas: a spectrum of the audio demodulated signal.

Audio waveform: displays the waveform of the audio signal in time domain.

Parameter analysis: the carrier power, modulation rate, carrier frequency bias, modulation depth (AM), modulation frequency bias (FM), modulation phase bias (PM), signal-a-nore ratio, modulation distortion, total harmonic distortion and other parameters can be measured and analyzed.



USB power measurement (option):

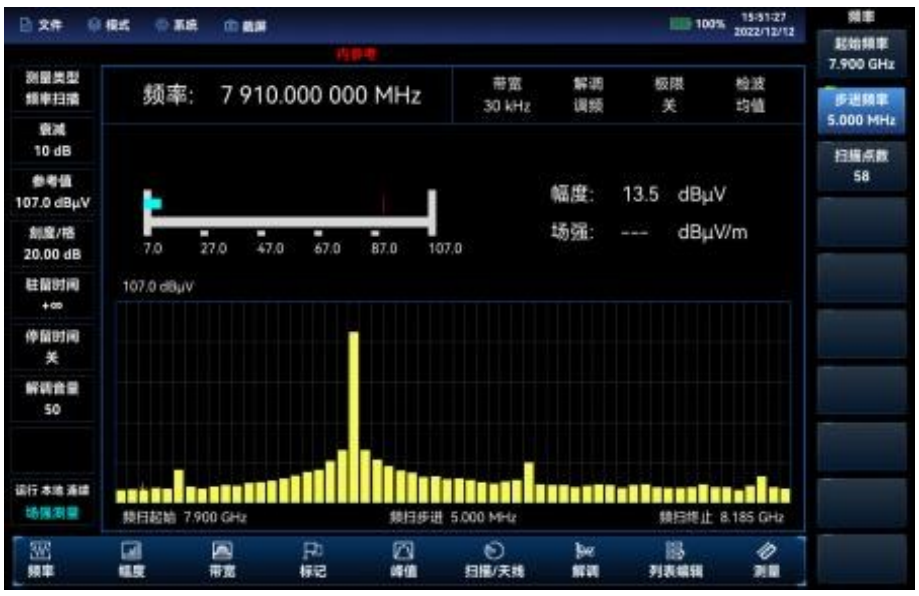
The USB power measurement function can measure CW signal power of up to 40GHz through the external Ceyear 8723X series external USB power sensor.

USB peak power measurement (option):

The 87234 USB peak power sensor can test RF / microwave signals of up to 67GHz to achieve pulse power measurement in a large dynamic range.

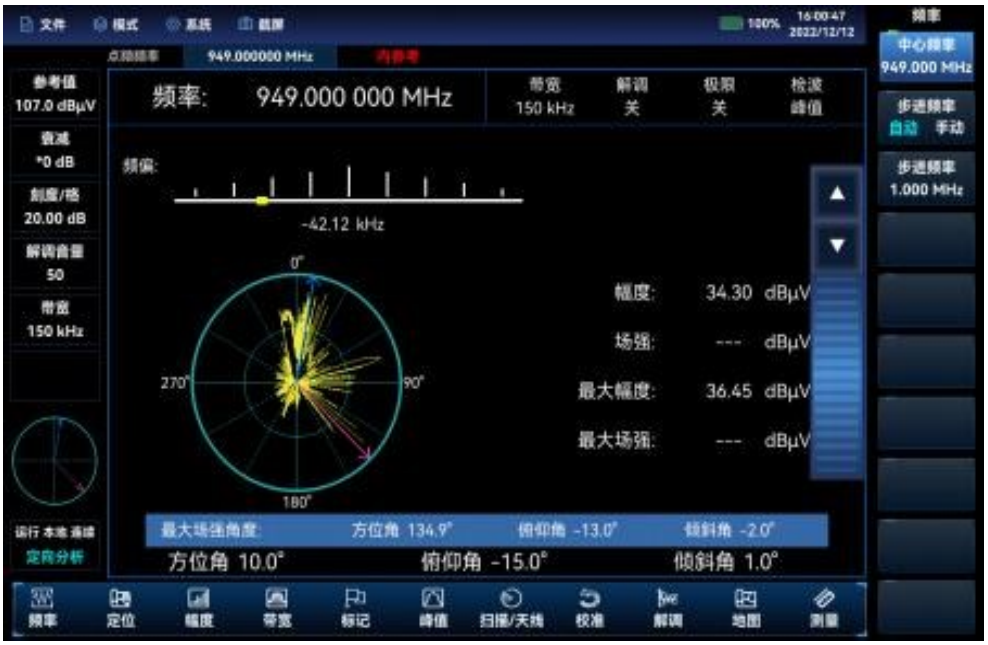
Field strength measurement (option):

The 4959 microwave analyzer and portable antenna can conduct field strength measurement for space electromagnetic environment monitoring and radio management. Support for users to directly call antenna files or custom antenna factors. Field strength measurement can be divided into three modes: point frequency measurement, frequency scan measurement and list scan measurement. The point frequency measurement observes the frequency bias, amplitude value and field strength value of the current point by setting the point frequency rate, observes the amplitude value and field strength value within a frequency range by setting the starting frequency, step frequency and the amplitude value and field strength value of the list frequency point by calling a pre-edited or saved list.



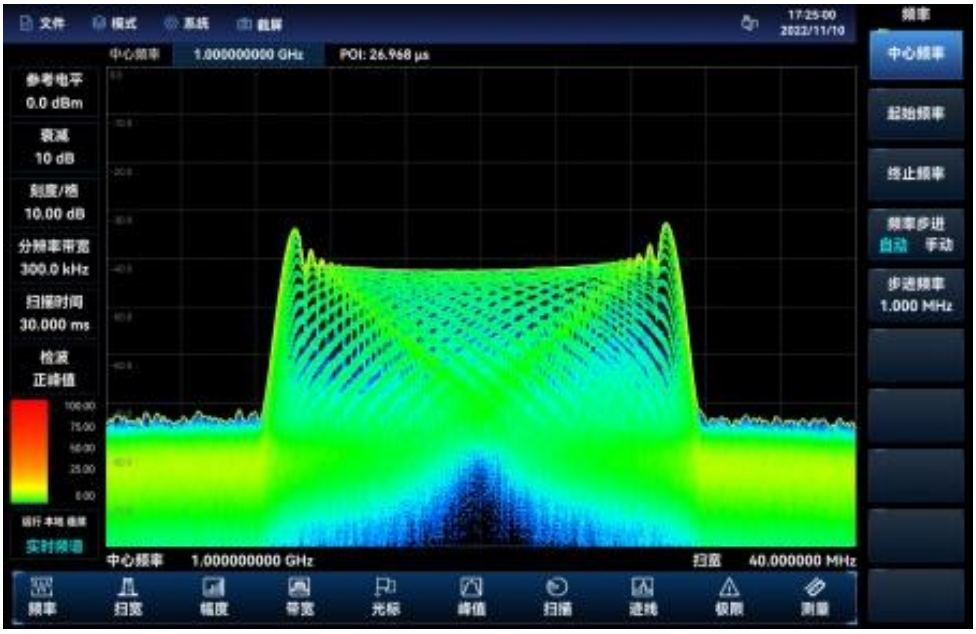
Directional analysis (option):

The directional analysis options should be equipped with directional antenna, electronic compass and GPS / Beidou options to realize the functions of direct interference signal search, horizontal scanning direction measurement and map cross-positioning. When selected with the ZE9080 series antenna and handheld handle, it is not necessary to be configured separately because of its built-in electronic compass.



Real-time spectrum analysis (option):

The real-time spectrum analysis function is mainly used for the capture and analysis of transient time-varying signals and burst signals. The real-time analysis bandwidth supports 40 MHz, which can realize the measurement function of transient signal digital afterglow and waterfall map.



Outdoor map (option):

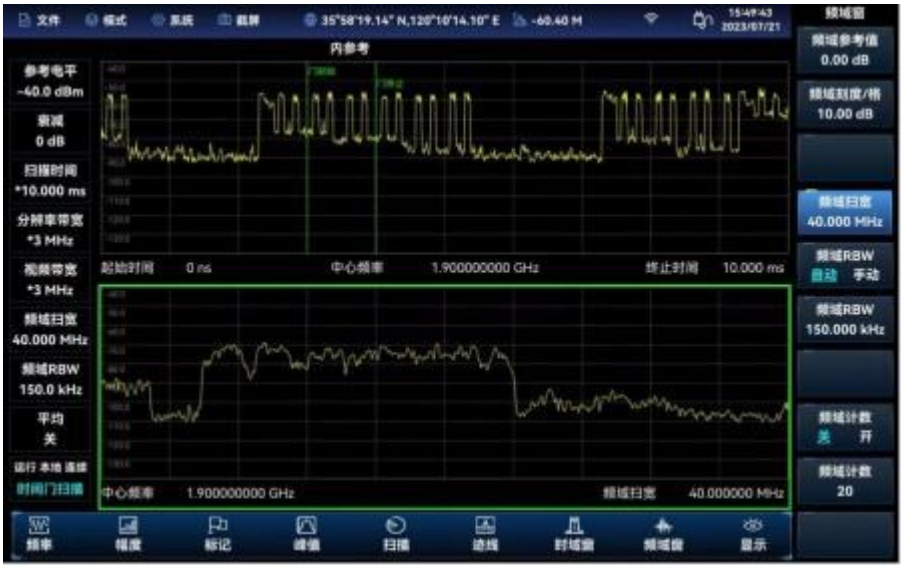
Outdoor map option is a measurement function in spectrum analysis mode, which can do the RSSI test of interference signal and the adjacent channel power ratio test, and the test results can be marked on the map in real time according to the time or distance. The test results marked on the map can be saved to the instrument for subsequent calls.

Indoor map (option):

The indoor map option can do RSSI test and adjacent channel power ratio test. Because the GPS signal cannot be received indoors, the user needs to manually move the position and mark the test results on the map. The test results marked on the map can be saved to the instrument to facilitate the later call to view. Users can store the plan in picture format into tile diagram to the instrument through special software (along with the selection).

Time gate function (option):

Time gate scanning function is used to screen for the time division signal, the time gate scanning function is divided into time domain window and frequency domain window, time domain window can select the frequency domain results will be displayed in the frequency domain window, time gate scanning mode is zero sweep wide state, with various parameter setting can be set from the domain, the uplink frames and downlink frames in the TDD signal are distinguished. By setting [gate delay] and [gate width], the uplink signal can be selected to achieve the effect of "filtering" the downlink signal (the downlink signal will affect the interference signal search).



OTDR (option):

The optical time domain reflector function of 4959 microwave analyzer can realize the external USB optical time domain reflector, and can realize optical power measurement.

Typical application

On-site comprehensive performance assessment of electronic equipment

4959 microwave analyzer has multiple advantages of high performance index, fast scanning speed, many test functions, easy operation and so on, etc., using hand-held structure, small size, light weight, strong environmental adaptability, can be battery power supply, can be applied to the field installation, debugging and maintenance of various electronic equipment.

Field test and diagnosis of the transmitter and receiver

4959 microwave analyzer has a variety of vector network analysis, antenna feeder test, spectrum analysis, real-time spectrum analysis, interference analysis, analog demodulation analysis, power measurement, channel scanning, field strength measurement and other measurement function modes, And has channel power, bandwidth, adjacent channel power, noise ratio, stray template, harmonic distortion and other intelligent measurement functions, Main performance parameter test of transmitting and receiving subsystem, Including the standing wave ratio, reflection coefficient, insertion loss, echo loss and impedance characteristics of the natural feeder subsystem system, The emission signal frequency and Spectrum characteristics of the transmitting subsystem, The center frequency, gain, differential loss, bandwidth, dynamic range of the receiving subsystem.

Cable TV, wireless communication and other fields of multi-parameter test

Cable TV, cellular telephone system, digital mobile communication operators and equipment manufacturers use 4959 microwave analyzer to test the spectrum distribution, antenna feeder contact performance, S parameters, feed pass power, etc.

Technical Specifications

Model		**4959B:9kHz /300kHz to 9GHz (SA/VNA)** **4959D:9kHz /300kHz~18GHz (SA/VNA)** **4959E:9kHz /300kHz~26.5GHz (SA/VNA)** **4959G:9kHz /300kHz~44GHz (SA/VNA)** **4959H:9kHz /300kHz to 50GHz (SA/VNA)** **4959K:9kHz /300kHz to 54GHz (SA/VNA)**
Spectrum analysis	Frequency reference accuracy	Nominal frequency: 10MHz Aging rate: ± 0.5ppm/year Initial calibration accuracy: ± 0.3ppm Temperature stability: ± 0.1ppm (-2 0℃ ~ + 55℃, relative to 2 5℃±10℃) Frequency reference accuracy = ± (to the last calibration date × aging rate + temperature stability + calibration accuracy)

	Accuracy of frequency readout	± (frequency reading x frequency reference accuracy + 1% x sweep width + 10% x resolution bandwidth)
	Sweep width	Range: 0Hz (zero sweep width), 10Hz~ corresponding to the upper limit of the model frequency range Accuracy: ±1.0%
	Sweep time	Range: 1μs~6000s (zero sweep width) Accuracy: ±1.0% (zero sweep width)
	Resolution bandwidth	Bandwidth range: 1Hz~20MHz (1-2-3-5-8 steps)
	Video bandwidth	Bandwidth range: 1Hz~20MHz (step 1-2-3-5-8)
	Sideband noise (Carrier 1GHz, + 15℃~+ 35℃)	≤-108dBc/Hz@10kHz; ≤-110dBc/Hz@100kHz; ≤-118dBc/Hz@1MHz; ≤-129dBc/Hz@10MHz
Spectrum analysis	Displays the average noise level (The input terminal is connected to the 50Ω load, the input attenuation is 0dB, the mean detection is performed, and the resolution bandwidth is normalized to 1Hz, + 15℃~+ 35℃)	4959B/D： Preamplifier on: ≤-120dBm (9kHz≤f<100kHz); ≤-140dBm (100kHz≤f<2MHz); ≤-157dBm (2MHz≤f≤9GHz); ≤-156dBm (9GHz<f<14GHz); ≤-154dBm (14GHz≤f≤18GHz) Preamplifier off: ≤-110dBm (9kHz≤f<100kHz); ≤-120dBm (100kHz≤f<2MHz); ≤-138dBm (2MHz≤f<9GHz); ≤-136dBm (9GHz<f<14GHz); ≤-136dBm (14GHz≤f≤18GHz) 4959E/G/H/K： Preamplifier on: ≤-110dBm (9kHz≤f<100kHz); ≤-120dBm (100kHz≤f<2MHz); ≤-157dBm (2MHz≤f≤9GHz); ≤-156dBm (9GHz<f<14GHz); ≤-154dBm (14GHz≤f<21GHz); ≤-154dBm (21GHz≤f<32GHz); ≤-152dBm (32GHz≤f<40GHz); ≤-148dBm (40GHz≤f≤44GHz); ≤-145dBm (44GHz<f≤50GHz); ≤-135dBm (50GHz<f≤54GHz) Preamplifier off: ≤-1 10 dBm (9kHz≤f<100kHz); ≤-1 20 dBm (100kHz≤f<2MHz); ≤-1 38 dBm (2MHz<f≤9GHz); ≤-13 6 dBm (9GHz<f<14GHz); ≤-1 36 dBm (14GHz≤f<21GHz); ≤-1 35 dBm (21GHz≤f<32GHz); ≤-1 33 dBm (32GHz≤f<40GHz); ≤-1 30 dBm (40GHz≤f≤44GHz); ≤-1 26 dBm (44GHz<f≤50GHz); ≤-1 23 dBm (50GHz<f≤54GHz)
	Second harmonic distortion (Attenuation 0dB, -30dBm input, preamplifier off)	≤-70dBc（50MHz~27GHz）

	Third-order intermodulation distortion (-15dBm dual tone signal, 100kHz interval, 0dB attenuation, preamplifier off)	≥+10dBm（50MHz~54GHz）
	Mirror, multiple and out-of-band response (-10dBm mixer level)	<-65dBc（10MHz≤f<7.5GHz）;<-60dBc（7.5GHz≤f<10.5GHz）; <-65dBc（10.5GHz≤f≤50GHz）;<-60dBc（50GHz<f≤54GHz）
Spectrum analysis	Residual response (RF input terminal connected to 50Ω load, 0dB input attenuation)	Preamplifier on: ≤-100dBm （10MHz≤f<3GHz）; ≤-100dBm （3GHz≤f≤9GHz）; ≤-95dBm （9GHz<f<12GHz）; ≤-95dBm （12GHz≤f<20GHz）; ≤-90dBm （20GHz≤f≤54GHz）
	Reference level	Range: logarithmic scale-150dBm to +30dBm Conversion error: ±0.70dB (reference level 0dBm~-60dBm)
	Total level uncertainty (Working temperature 15℃~35℃, attenuation 10dB, input 0dBm~-50dBm, preamplifier off, resolution bandwidth 1kHz, other parameters automatic)	±1.30dB (10MHz≤f≤20GHz); ±1.80dB (20GHz<f≤44GHz); ±2.50dB (44GHz<f≤50GHz); ±2.80dB (50GHz<f≤54GHz)
	Input attenuator	The attenuation range is 0~30dB with a step of 2dB
	Maximum safe input level (CW, attenuation more than 10dB, preamplifier off)	4959B/D: +27dBm continuous wave (input frequency> 50MHz) 4959E/G/H/K: + 25dBm continuous wave (input frequency> 50MHz)
	Scale display	Log scale: 0.1~10dB per grid, minimum 0.1dB step (10 grids display) Unit of scale: V, A, W, dBm, dBW, dBV, dBmV, dBμV, dBA, dBmA, dBμA
	Detection method	Standard, positive peak, negative peak, sampling, mean, root mean square
Vector network analysis	Frequency accuracy	±0.9ppm
	Frequency resolution	1Hz
	IFBW	3Hz、10Hz、30Hz、100Hz、300Hz、1kHz、3kHz、10kHz、30kHz、100kHz
	Power rating	Set the power high, low or manually
	Port output power	high power: ≥-8.0dBm (300kHz≤f≤10MHz); ≥3.0dBm (10MHz<f≤9GHz); ≥0.0dBm (9GHz<f≤20GHz); ≥-2.0dBm (20GHz<f≤26.5GHz); ≥-8.0dBm (26.5GHz<f≤44GHz); ≥-8.0dBm (44GHz<f≤50GHz); ≥-12.0dBm (50GHz<f≤54GHz) low power: ≤-35dBm (10MHz≤f≤54GHz)

	Port output power accuracy	Note: -10dBm output, 23±5℃ ±2.0dB (300kHz≤f≤26.5GHz); ±2.5dB (26.5GHz<f≤50GHz); ±3.0dB (50GHz<f≤54GHz)
	Effective directivity	≥42dB (300kHz≤f≤4GHz); ≥34dB (4GHz<f≤20GHz); ≥26dB (20GHz<f≤54GHz)
Vector network analysis	Reflection tracking	±0.06dB (300kHz≤f≤20GHz); ±0.08dB (20GHz<f≤50GHz); ±0.12dB (50GHz<f≤54GHz)
	Effective load matching	≥30dB (300kHz≤f≤4GHz); ≥27dB (4GHz<f≤26.5GHz); ≥23dB (26.5GHz<f≤54GHz)
	Transmission tracking	±0.08dB (300kHz≤f≤4GHz); ±0.16dB (4GHz<f≤26.5GHz); ±0.24dB (26.5GHz<f≤50GHz); ±0.28dB (50GHz<f≤54GHz)
	System dynamic range	≥90dB (300kHz≤f≤10MHz); ≥103dB (10MHz<f≤20GHz); ≥93dB (20GHz<f≤26.5GHz); ≥90dB (26.5GHz<f≤40GHz); ≥81dB (40GHz<f≤50GHz); ≥80dB (50GHz<f≤54GHz)
	Trace noise	Note: The output power of the port in the band 300kHz<=f<=10MHz is set to-5dBm, and the output power of the port in the band 10MHz<=f<=54GHz is set to 0dBm. The intermediate frequency bandwidth is 100Hz, S21 and S12. Range track noise (dB rms): 0.0040 (300kHz≤f≤10MHz); 0.0015 (10MHz<f≤10GHz); 0.0018 (10GHz<f≤20GHz); 0.0040 (20GHz<f≤26.5GHz); 0.0050 (26.5GHz<f≤36GHz); 0.0050 (36GHz<f≤50GHz); 0.0100 (50GHz<f≤54GHz) Phase trace noise (deg rms): 0.0600 (300kHz≤f≤10MHz); 0.0200 (10MHz<f≤10GHz); 0.0270 (10GHz<f≤20GHz); 0.0500 (20GHz<f≤26.5GHz); 0.0600 (26.5GHz<f≤36GHz); 0.1200 (36GHz<f≤50GHz); 0.5000 (50GHz<f≤54GHz)
Dimension		316.5mm (wide) x 236.5mm (high) x 75mm (deep) (excluding side handle, panel connector and interface plug, closed rear bracket)
Weight		4959B/D:≤3.7kg (without built-in battery) 4959E/G/H/K:≤3.9kg (without built-in battery)
Working temperature		-20℃~+55℃ (battery discharge temperature-20℃~+55℃, charging temperature +10℃~+45℃)
Storage temperature		-50℃~+70℃ (where the storage temperature of the battery is-20℃~+50℃, and the storage time is less than 1 month)
Electromagnetic compatibility		Comply with the relevant requirements of item 3.9.1 of GJB 3947A-2009
Power input form		Alternating current power adapter: input voltage 100V to 240V AC, 50Hz/60Hz; Output voltage 19V DC,4.7A Built-in lithium ion battery: nominal voltage 10.8V
Battery life		Typical value 3h

Test port	4959B/D: N-type male; 4959E: 3.5mm male; 4959G/H: 2.4mm male; 4959K: 1.85mm male.
Other interfaces	10MHz reference input/output: SMA female; External trigger input interface: SMA female; GPS antenna interface: SMA female (optional); Medium frequency output interface: SMA female (optional); Wi-Fi/4G antenna interface: SMA female (optional, where the 4G antenna input interface is reserved and not supported for the time being)
Communication and auxiliary interfaces	USB interface: 2 USB3.0 Type A interfaces, 1 USB2.0 Type C interface, 1 USB3.0 Type B port (reserved). LAN interface: standard RJ-45 type. Headphone jack: standard 3.5mm. Memory card/SIM card: Micro SD card and SIM card (reserved for 4G option) slot

Ording Information

● Mainframe:

Model	Item	Frequency range
4959B	Microwave Analyzer	9kHz/300kHz ~ 9GHz
4959D	Microwave Analyzer	9kHz/300kHz ~ 18GHz
4959E	Microwave Analyzer	9kHz/300kHz ~ 26.5GHz
4959G	Microwave Analyzer	9kHz/300kHz ~ 44GHz
4959H	Microwave Analyzer	9kHz/300kHz ~ 50GHz
4959K	Microwave Analyzer	9kHz/300kHz ~ 54GHz

● Standard:

No.	Description	Remarks
1	Power cord	/
2	9000mAh rechargeable lithium ion battery	
3	Power adapter	
4	Quick start guide	
5	The product certificate of conformity	/

● Option:

Option No.	Description	Function and performance
4959-01	English option	Includes English signs, menus and quick use guides.
4959-03	English user manual	English version of user manual.
4959-05	Programming Manual in English	Programming Manual in English.
4959-S01	USB CW power measurement	Power measurement function is provided and should be used with external USB continuous wave power probe

Option No.	Description	Function and performance
		87230/87231 /87232/87233.
4959-S02	USB peak power measurement	Provides peak power measurement function, which needs to be combined. The 87234D/E/F/LUSB peak/average power meter is used.
4959-S03	Interference analysis	Provides waterfall charts, RSSI measurements, and more.
4959-S04	Channel scanning	Provides signal power measurements for multiple channels.
4959-S05	Field strength measurement	Used for measuring the electric field radiation intensity of the measured equipment.
4959-S06	Outdoor map	The RSSI test and adjacent channel power ratio test can be performed under the outdoor interference map, and the test results can be marked on the map in real time according to time or distance. It should be used with 4959-H01 option.
4959-S07	Indoor map	RSSI and adjacent channel power ratio tests can be performed under the indoor map, and the test results can be correlated with color through signal strength
4959-S08	Analog demodulation analysis	It can realize the analysis and measurement function of AM, FM and PM modulation signals.
4959-S09	Zero span IF output	When the zero sweep width is wide, the output analog intermediate frequency signal is generated.
4959-S10	Time gate function	Used for time division interference signal test, air interface wireless signal test needs to be used in conjunction with 4959-H01 option.
4959-S11	Directional analysis	For locating external interference sources or unknown signals, it should be used in conjunction with 4959-H01 option, USB electronic compass option and directional antenna option.
4959-S12	Real-time spectrum analysis with 40MHz bandwidth	Provides real-time spectrum analysis with 40MHz bandwidth.
4959-S13	List sweep	Continuous scanning measurement of multiple frequency bands is realized.
4959-S14	IQ analysis	Achieve the capture and display function of IQ data.
4959-S18	Vector signal analysis	It has a variety of single carrier digital modulation signal demodulation and analysis functions, which can provide spectrum diagram, vector diagram, constellation diagram, eye diagram, error/symbol table and other display Windows to analyze the characteristics of modulation signals.
4959-S19	EMI analysis	Support EMI scanning, point frequency scanning and list scanning functions, with CISPR average, CISPR effective value and quasi peak detection mode.
4959-S20	Phase noise measurement	Provide single sideband phase noise curve and single point phase noise test.
4959-S30	Antenna feeder analysis	Used for cable, feeder and other echo loss, standing wave ratio, breakpoint testing.
4959-S31	Vector voltmeter	Used for cable phase shift and electrical length test.
4959-S32	TDR	Used to analyze the fault nature of cable fault point location.
4959-S33	Electronic calibration kit support	Software options require additional electronic calibration components for vector network analysis, antenna feeder analysis, vector voltmeter calibration, etc.

Option No.	Description	Function and performance
4959-S34	OTDR	Provides optical time domain reflectometer and optical power meter functions.
4959-S35	Mixed S parameters	Used for differential S parameter measurement.
4959-S36	VNA time domain measurement	Used for vector network analysis mode time domain measurement.
4959-H01	GPS/Beidou function	GPS or Beidou positioning function can be realized by external antenna.
4959-H02	WiFi wireless communication	It can communicate with external devices for wireless data transmission.
4959-H03	Pole aluminum alloy box	Rack aluminum alloy box.
4959-H04	Pole transport box	Pole transport box.
4959-H05	Portable backpack	Portable backpack.
4959-H06	Power adapter	Power adapter.
4959-H08	9000mAh rechargeable lithium ion battery	Backup battery pack, nominal voltage 10.8V, battery capacity 9000mAh, can be carried by air transportation.
4959-H09	Vehicle power adapter	The vehicle-mounted charger has an input voltage of 12~24V and an output voltage of 19V, which can supply power to handheld measuring instruments.
4959-H10	Smart battery charging dock	Lithium ion battery charging dock.
4959-H11	Memory card	Mrico SD Card, capacity 128G.
87230	USB CW power sensor	Frequency range 9kHz~6GHz, interface type N (m).
87231	USB CW power sensor	Frequency range 10MHz~18GHz, interface type N (m).
87232	USB CW power sensor	Frequency range 50MHz~26.5GHz, interface type 3.5mm (m).
87233	USB CW power sensor	Frequency range 50MHz~40GHz, interface type 2.4mm (m).
87234D	USB peak/average power sensor	Frequency range 50MHz~18GHz, interface type N (m).
87234E	USB peak/average power sensor	Frequency range 50MHz~26.5GHz, interface type 3.5mm (m).
87234F	USB peak/average power sensor	Frequency range 50MHz~40GHz, interface type 2.4mm (m).
87234L	USB peak/average power sensor	Frequency range 500MHz~67GHz, interface type 1.85mm (m).
4959-H20	ZE9080 Directional antenna A	Frequency range 9kHz~20MHz, interface type N (f). (It is recommended to use H24 option)
4959-H21	ZE9080 Directional antenna B	Frequency range 20MHz~200MHz, interface type N (f).
4959-H22	ZE9080 Directional antenna C	Frequency range 200MHz~500MHz, interface type N (f). (It is recommended to use H24 option)
4959-H23	ZE9080 Directional antenna D	Frequency range: 500MHz~8GHz, interface type N (f). (It is recommended to use H24 option)
4959-H24	ZE9080 Antenna amplifier	Frequency range: 9kHz~8GHz, N(f), Used in conjunction with the ZE9080 antenna module A/B/C/D options, it

Option No.	Description	Function and performance
		contains an amplifier and electronic compass.
4959-H25	ZE9080 Antenna transport box	ZE9080 Special transport box for antenna, which can be used to place ZE9080 antenna modules A/B/C/D and ZE9080 antenna amplifier.
4959-H26	700MHz~6GHz directional antenna	Active log-periodic antenna, frequency 700MHz~6GHz, interface type SMA (f).
4959-H27	680MHz~10GHz directional antenna	Active log-periodic antenna, frequency 680MHz ~10GHz, interface type SMA (f).
4959-H28	680MHz~20GHz directional antenna	Active log-periodic antenna, frequency 680MHz ~20GHz, interface type SMA (f).
4959-H29	6GHz omnidirectional antenna	Portable omnidirectional antenna, frequency 680MHz~6GHz, interface type SMA (m).
4959-H30	8GHz omnidirectional antenna	Portable omnidirectional antenna, frequency 300MHz~8GHz, interface type SMA (m).
4959-H31	700MHz~6GHz passive directional antenna	Passive log-periodic antenna, frequency 700MHz~6GHz, interface type SMA (f).
4959-H34	USB electronic compass	External USB electronic compass, which can be used in conjunction with H45/H46/H47 options and 4959-S11 options.
4959-H35	N/SMA-JJ RF cable (2m)	N/SMA dual-port RF coaxial cable, DC~18GHz, 2m long.
4959-H36	PBS1 near-field probe	The maximum operating frequency is up to 9GHz, including 1 electric field probe and 1 magnetic field probe of 6mm, 12mm, 25mm and 50mm, the interface type is SMB (m).
4959-H38	Handheld directional antenna	Passive log-periodic antenna, frequency range 380MHz~20GHz, including built-in electronic compass and RF test cable (interface type: N type positive).
4959-H39	Handheld high-gain direction finding antenna	Whistle antenna, frequency range 18GHz~40GHz, including built-in electronic compass and RF test cable (interface type: 2.92mm positive).
31101A	Coaxial calibration kit	N type positive head, DC-18GHz, used for vector network analysis, antenna feeder testing, vector voltmeter calibration.
31101B	Coaxial calibration kit	N type negative head, DC-18GHz, used for vector network analysis, antenna feeder testing, vector voltmeter calibration.
31121	Coaxial calibration kit	3.5mm,DC-26.5GHz, used for vector network analysis, antenna feeder testing, vector voltmeter calibration.
31123A	Coaxial calibration kit	2.4mm, DC-50GHz, for vector network analysis Antenna feeder line test, vector voltmeter calibration.
20209LB	Coaxial calibration kit	1.85mm，DC-67GH.
20402D	Electronic calibration kit	300kHz to 18GHz (Type N)
20402E	Electronic calibration kit	10MHz ~ 26.5GHz(3.5mm)
20402H	Electronic calibration kit	10MHz ~ 50GHz(2.4mm)
20402L	Electronic calibration kit	10MHz ~ 67GHz(1.85mm)
4959-H49	N type male-male	Calibrate or test cables

Option No.	Description	Function and performance
	calibration cable GORE-OSZKUZKU0240	
4959-H50	N type male-female calibration cable GORE-OSZKUZKV0240	Calibrate or test cables
4959-H51	3.5mm female-female calibration cable GORE-0RD02D02024.0	Calibrate or test cables
4959-H52	3.5mm male-female calibration cable GORE-0RD01D02024.0	Calibrate or test cables
4959-H53	2.4mm female-female calibration cable GORE-0K0CK0CK024.0	Calibrate or test cables
4959-H54	2.4mm male-female calibration cable GORE-0K0CJ0CK024.0	Calibrate or test cables
4959-H55	2.4mm male-female 50GHz calibration cable 0Z0CJ0CK024.0	Calibrate or test cables
4959-H56	2.4mm female-female 50GHz calibration cable 0Z0CK0CK024.0	Calibrate or test cables
4959-H57	1.85mm male-female 67GHz calibration cable 0F0CB0CA024.0	Calibrate or test cables
4959-H58	1.85mm female-female 67GHz calibration cable 0F0CA0CA024.0	Calibrate or test cables
87302FZ	test cable	3.5/3.5-KK Test cable (0.6 m)
87302FE	test cable	3.5/3.5-KJ Test cable (0.6m)
87302AZ	test cable	N / N-JJ Test cable (0.6 m)
87302BA	test cable	N / N-KJ Test cable (0.6m)
4959-H63	AL50-35FNM-01.00M Test cables	3.5mm / N-KJ test cable (1.0m)
4959-H64	AL50-35MNM-01.00M Test cables	3.5mm / N-JJ test cable (1.0m)
4959-H65	AL50-24F35F-01.00M Test cables	2.4mm/3.5mm-KK Test cable (1.0m)
4959-H66	AL50-24F35M-01.00M Test cables	2.4mm/3.5mm-KJ Test cable (1.0m)
4959-H67	USB OTDR	
4959B-JL	Calibration service	Provides metrological calibration services and metrological reports, which are only applicable to 4959B.
4959D-JL	Calibration service	Provides metrological calibration services and provides metrological reports, which are only applicable to 4959D.
4959E-JL	Calibration service	Provides metrological calibration services and provides metrological reports, which are only applicable to 4959E.
4959G-JL	Calibration service	Provides metrological calibration services and reports, which are only applicable to 4959G.

Option No.	Description	Function and performance
4959H-JL	Calibration service	Provides metrological calibration services and provides metrological reports, which are only applicable to 4959H.
4959K-JL	Calibration service	Provides metrological calibration services and provides metrological reports, which are only applicable to 4959K.
4959B-EWT1	The warranty period is extended for 1 year beyond the warranty period	The warranty period is extended for 1 year beyond the warranty period. 2 years of extended warranty can be selected in 2 options, and so on. The service does not include calibration, only one-way goods are included
4959D-EWT1	The warranty period is extended for 1 year beyond the warranty period	The warranty period is extended for 1 year beyond the warranty period. 2 years of extended warranty can be selected in 2 options, and so on. The service does not include calibration, only one-way freight charges.
4959E-EWT1	The warranty period is extended for 1 year beyond the warranty period	The warranty period is extended for 1 year beyond the warranty period. 2 years of extended warranty can be selected in 2 items, and so on. The service does not include calibration, only one-way freight.
4959G-EWT1	The warranty period is extended for 1 year beyond the warranty period	The warranty period is extended for 1 year beyond the warranty period. 2 years of extended warranty can be selected in 2 options, and so on. The service does not include calibration, only one-way freight charges.
4959H-EWT1	The warranty period is extended for 1 year beyond the warranty period	The warranty period is extended for 1 year beyond the warranty period. 2 years of extended warranty can be selected in 2 options, and so on. The service does not include calibration, only one-way freight of goods is included.
4959K-EWT1	The warranty period is extended for 1 year beyond the warranty period	The warranty period is extended for 1 year beyond the warranty period. 2 years of extended warranty can be selected in 2 options, and so on. The service does not include calibration, only one-way freight charges.

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