

AV4992A Radio Test Set

(2MHz~1GHz/2.7GHz)



Product Overview

AV4992A Radio Test Set, which integrates multiple meters with the functions including RF transmitting and receiving analysis, audio source and analysis, can measure various performance of radios, interphones and audio equipment at the range of 2MHz~1GHz/2.7GHz, and test standing wave of communication cables and antennas. It is a comprehensive radio test set capable of overall functions at a small size.

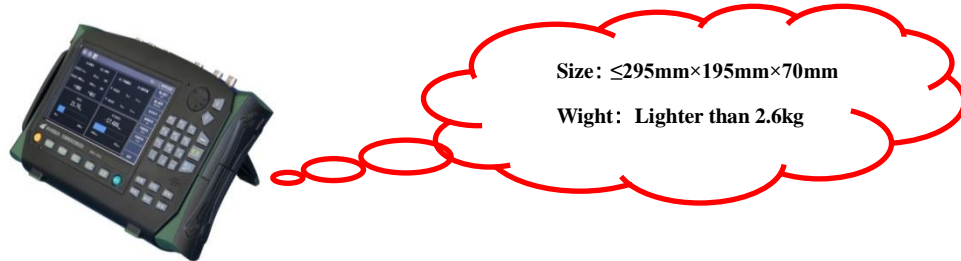
Featured with strong environment adaptability and rechargeable battery, the test set can be used for simple lab application, production and debugging of communication equipment, on-site installation, repair and maintenance in the sectors of civil communication, public security, military information technology construction, etc..

Main Characteristics

- **Handheld design, small size and light weight, easy for carry.**
- **Powerful environment adaptability, two supply modes, convenient outdoor tests at anywhere and anytime.**
- **Dual RF sources, superior spectrum purity, integrated solution of radio/interphone tests.**
- **Design of universal spectrum analysis modules, easier for signal search and analysis.**
- **USB and LAN interfaces, flexible remote control is available.**
- **Simplified Chinese/English menus, friendly and convenient for user operation.**

Small size, lightweight, on-site application can be easily accomplished

Implementing light plastic for shell, AV4992A Radio Test Set is the smallest and exquisite radio multimeter compared with other meters of the same performance. The built-in high-capacity rechargeable battery is easy for replacement. You can enjoy the performance of desktop equipment but at handheld convenience brought by the small size, large-capacity battery and multi-function carrying backpack. The test set is extremely suitable for on-site usage.



Super powerful capabilities of environmental adaption and dust-sand proof, handy for tests in sundry environments

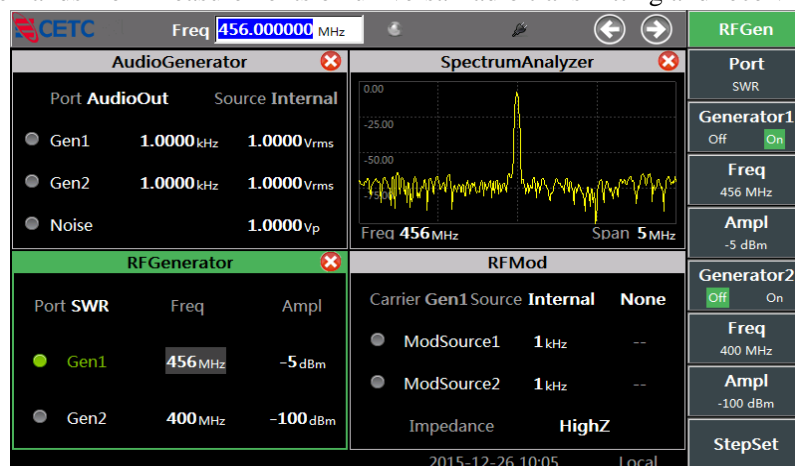
AV4992A applies the excellent design of low power consumption and heat radiation, which meets the third-class equipment standards regulated in GJB3947A, which are surpassed by the test set in several aspects in terms of the performance, such as usage in the outside temperature at $-10^{\circ}\text{C} \sim +50^{\circ}\text{C}$. It can maintain the high performance no matter how extreme the temperature is. Caps are used for protection of sensitive parts like connectors, which enables free operation.

A colorful touch screen with back-light sensors

AV4992A deploys a 7 inch colorful touch screen to follow the latest test demands and trends. One window supports simultaneous display of multiple meters in rolling. The windows can be zoomed as per your needs. Touch parameters to update parameter setting. The built-in back-light sensing can adjust display light intensity automatically according to environmental light, so that operation comfort is largely enhanced.

Complete test functions give you outstanding and comprehensive test results

AV4992A integrates numerous meters containing RF source, audio source, cable tester, RF meter, audio meter, oscilloscope, demodulation meter, digital voltmeter, spectrum analyzer, etc., which can perform tests on over 20 parameters. As an engineers' right-hand equipment, it can satisfy almost all test demands from measurements on universal radio transmitting and receiving devices.



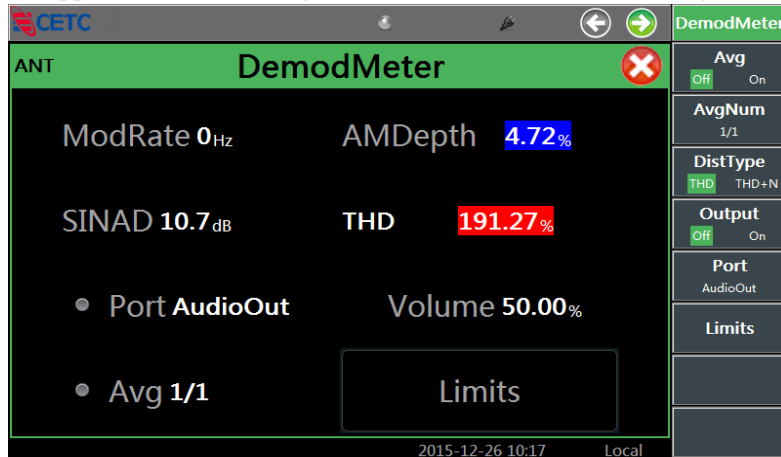
Flexible operation due to one-key integration/menu customization, provides you convenient test experience

AV4992A is capable of one-key integration to meet various testing needs of customers. You can configure it freely to eliminate complicated setup steps in relatively fixed test parts or conditions.

Instead, you can have a direct view on test results.

The built-in diagnosis “doctor”, offers you more direct and clear test outcomes

AV4992A sets up corresponding qualified test ranges against many test items based on application conditions. Once the test alarm function is on, the back-light color won't change if the result fits in the range, the back-light turns to blue if the result fails the lower limit and turns to red if the result is higher than the upper limit. Users can get clear and direct views of existing test results.



Chinese/English operation menu, on-line test support and breakdown analysis are available

The default menu of AV4992A is in Simplified Chinese. English version can also be set. Many shortcut keys lead you to the selection menu directly, which is simple for comprehension and operation. Without special training, users can master the test set through the rich functions of on-line support and trouble inquiries.

Manifold interfaces, handy for control

AV4992A Radio Test Set has a SD card slot besides RF and audio signals testing interfaces. Micro SD can extend the memory or copy internal data and documents. The interfaces available are LAN (local area network), Mini USB and USB Type-A. They can enable remote control over the whole equipment, data transmission and connection to SB peripheral devices, like USB storage devices, USB mouse, USB keyboards, etc..

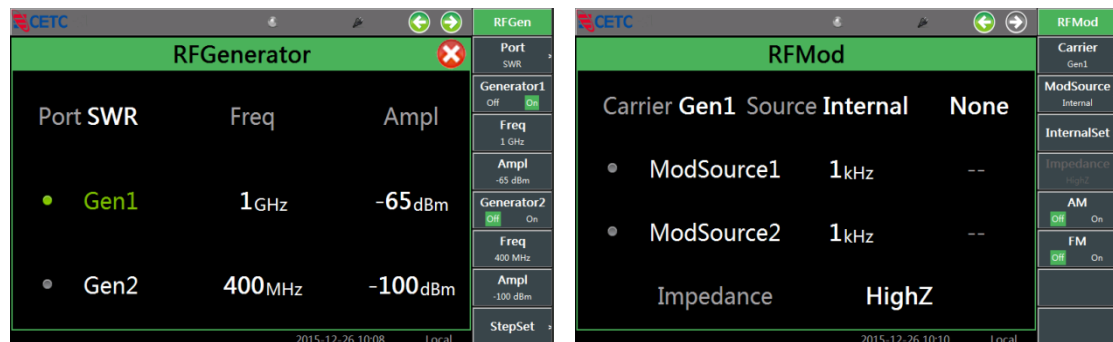


Main Functions

It offers fantastic solutions for performance and specification tests on equipment including radio, interphones and so on using the highly qualified RF source.

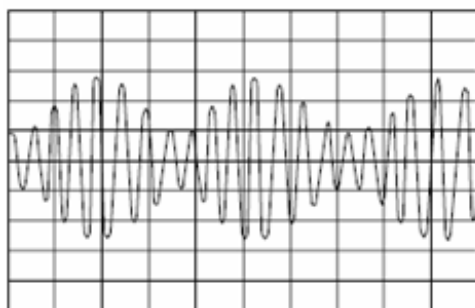
- **Integrates double RF sources and supplies a convenient integral test approach for evaluation of specifications covering inter-modulation of complete equipment, impedance, out-of-band suppression, etc..**

AV4992A owns two RF sources, 2MHz~1GHz/2.7GHz and 2MHz~400MHz, to respectively control output power in the modes of single output and combined output. Complexity and cost of tests can be greatly decreased when dual-source tests are required. Meanwhile, testing setup is facile.

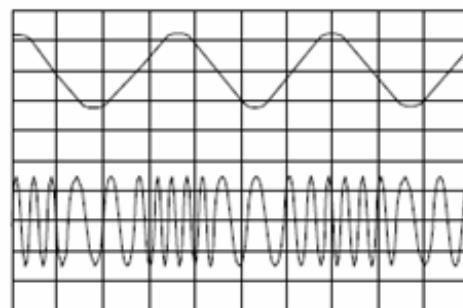


- **The built-in standard modulation source enables FM/AM modulation.**

AV4992A RF source can input modulation signals from outside and an internal modulation source is also accessible, and is equipped with AM and FM required by analog communication. Certain noise output can also be added to the internal modulation signals, to simulate actual signals more vividly and detect equipment performance.



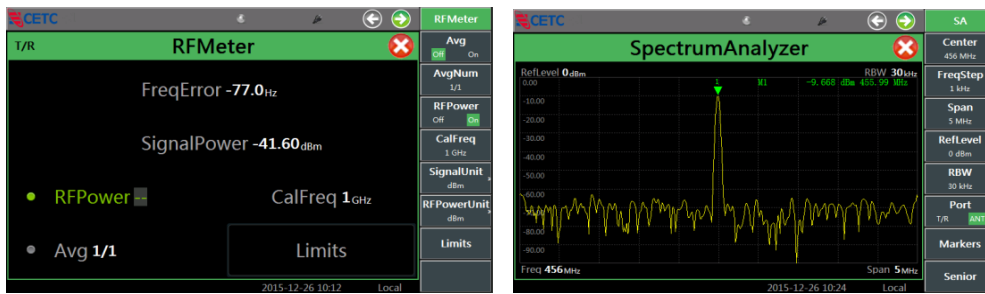
AM



FM

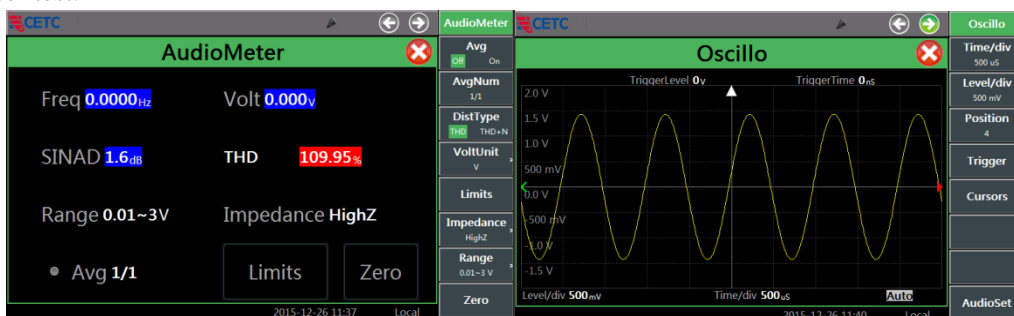
- **Effective RF signal analysis provides assessments over transmitter signals in several aspects.**

AV4992A RF analysis can carry out evaluation on transmission performance of your equipment in every aspect, such as monitoring and examination on transmission frequency error, RF power, signal receiving intensity, spectrum characteristics, etc.. RF signal measurement and analysis as well as spectrum monitoring are also available.



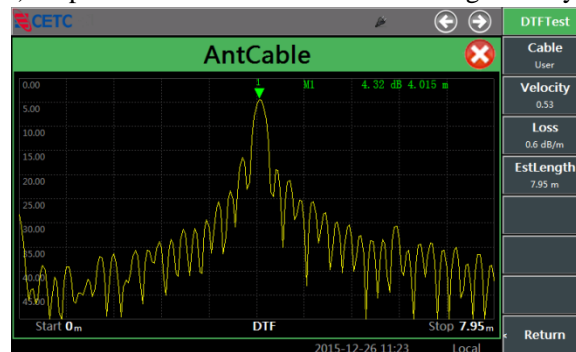
➤ **Accurate audio analysis, simple for overall analysis on LF signals**

The complete analysis of AV4992A on audio can accurately analyze audio frequency, voltage, SINAD, THD, etc.. The embedded DVM meter can measure signals containing DC component. We offer audio oscilloscope options for your direct observation and analysis on various signals under test.



➤ **Multiple cable specification testing functions, quickly locate breakdowns**

The antenna feeder test of AV4992A can examine performance of cable voltage-SW ratio, insertion loss, and return loss through measurement on SW ratio at SWR port. The ability of Distance-To-Fault (DTF) helps further isolate breakdowns during radio system repair.



Typical Applications

Out-field installation, debugging and maintenance of radio equipment

Highly integrated in design, AV4992A Radio Test Set intensively combines functions of several meters with the max. size of 295mm (W)×195mm (H)×70mm (D) and the total weight even lighter than 2.6kg. The rechargeable battery with large capacity is imbedded to give you a longer working duration. It is especially suitable for out-field installation, testing and maintenance of radio transmitting/receiving equipment. As a multimeter for RF measurement, the test set will surely become a necessity for radio engineers.



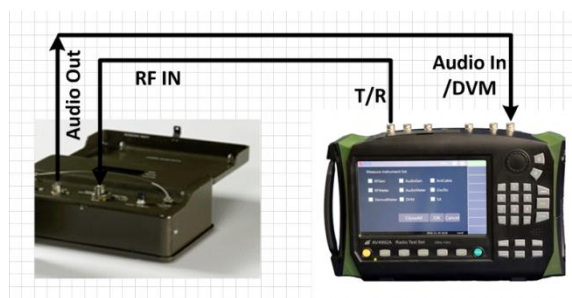
Examination on performance and mass production of radio stations/interphones

As the extensive application of radio communication, various military and civil stations and diversified communication tools, different test equipment is required for development and mass production, for instance, signal generators, spectrum analyzers, power meters, frequency meters, oscilloscopes and audio meters. A complete radio/interphone consists of a transmitter and a receiver. Users need to switch frequently between multiple devices to accomplish tests on whole performance and specifications, which consumes manpower, resources and a great amount of time.

AV4992A Radio Test Set gathers multifold meters for performance examination on various vehicle/commercial stations and wireless interphones. Test processes are simplified, which lowers cost and improves working efficiency. The built-in “Doctor” establishes corresponding qualified ranges against certain objectives under test; the back-light of data displayed will turn to different colors based on the limits set beforehand. The ability behaves a big advantage for mass production and routine maintenance of meters.

AM Sensitivity test of radio stations

Set up AV4992 Test Set to generate RF AM signals and arrange the frequency together with receiving frequency, output frequency, modulation frequency and modulation depth of the radio station under test as per specific requirement. Choose T/R port as the RF output port. In this case, the radio station can get low power RF signals of -125dBm. Connect the audio output port of the station to the audio input port of AV4992A. Enable the Audio Meter to observe SINAD of the output signals from the station. Adjust power of the RF output signals until SINAD of the audio signals under test gets close to the requirement. Following such procedure, you can easily test sensitivity of the radio station under test.



Technical Specifications

Double independent RF Signal Sources

Double RF sources (you can choose one signal source for independent output, or combine the double sources inside then output them)

Frequency characteristics		Option 001 (default)	Option 002	
	Frequency Range	2MHz~1000MHz (Source 1)	2MHz~2700MHz (Source 1)	
		2MHz~400MHz (Source 2, ANT output)	2MHz~400MHz (Source 2, ANT Output)	
	Frequency Resolution	1Hz		
Precision	Identical frequency standard			
Amplitude characteristics	Output Level Range	-5dBm~-55dBm (SWR, Source 1)	-5dBm~-65dBm (SWR, Source 1, 2MHz~2.2GHz)	
			-10dBm~-65dBm (SWR, Source 1, 2.2GHz~2.7GHz)	
		-5dBm~-100dBm (ANT, Source 1)	-5dBm~-100dBm (ANT, Source 1, 2MHz~1.8GHz)	
			-15dBm~-100dBm (ANT, Source 1, 1.8GHz~2.7GHz)	
		-50dBm~-125dBm (T/R, Source 1)	-50dBm~-120dBm (T/R, Source 1, 2MHz~2.2GHz)	
			-55dBm~-120dBm (T/R, Source 1, 2.2GHz~2.7GHz)	
	0dBm~-100dBm (ANT, Source 2)	-5dBm~-100dBm (ANT, Source 2)		
Spectrum purity	Sideband Phase Noise	≤ -95 dBc/Hz (Frequency offset 20kHz)	≤ -90 dBc/Hz (1GHz@20KHz) ≤ -80 dBc/Hz (2.7GHz@20KHz)	
	Harmonic Spurious	≤ -30 dBc		
Internal AM characteristics	Frequency Range	30Hz~5kHz (20Hz~20kHz is available)		
	AM Range	0~100%		
	Modulation Accuracy	$\pm (5\% \times \text{modulation depth} + 2\%)$ (150Hz~5kHz modulation rate, 10%~90% modulation depth)		
External AM characteristics	Audio Input	Switching Load	150 Ω , 600 Ω , 1k Ω , High Z	
		Input Level	0.05Vp~3Vp	
		Frequency Range	300Hz~5kHz	
	Micro phone Input	Level Range	20mVrms~350mVrms	
		Frequency Range	300Hz~3kHz	
		AM Range	0~80%	
Internal FM	Frequency Range	30Hz~5kHz (20Hz~20kHz is available)		

characteristics	Frequency Offset Range		Max. 100kHz
	Precision		±5% (100kHz Frequency offset, 150Hz~5kHz modulation rate)
External FM characteristics	Audio Input	Switching Load	150Ω, 600Ω, 1kΩ, High Z
		Input Level	0.05Vp~3Vp
		Frequency Range	300Hz~5kHz
		Gradient	Positive voltage generates positive Frequency offset
	Micro phone Input	Level Range	20mVrms~350mVrms
		Frequency Range	300Hz~3kHz
		Frequency Offset	0Hz~80kHz
		Gradient	Positive voltage generates positive Frequency offset

Double audio sources (Audio 1and Audio 2)

Frequency range	20Hz~20kHz
Frequency resolution	0.1Hz
Frequency precision	Frequency standard ±2Hz
Output level	20mVrms~1.57Vrms
Output level resolution	0.01Vrms
Output level precision	± (5%+5mV)
Harmonic distortion	<3% (1kHz, 1Vrms)
Output current	<15mA
Output	Single-tone, dual-tone, noise, single-tone + noise

RF meter

RF Power Meter	(T/R broadband input RF power)
Measurement Range	10dBm~43dBm (0.01~20W)
Max. Input Level	At +25°C and 20W/43dBm, continues for 10 min., or sends out alarm when overheat
Precision	±1dB(20~43dBm)(Built-in attenuator)
RF Frequency Error Meter	
Capture Range	±200kHz
Resolution	1Hz
Accuracy	Time base ±2Hz
Intensity Meter Of Signals Received	

Measurement Range	dBm	-110dBm~+43dBm	
Available RF Level Range	T/R port	-50dBm~+43dBm	
	ANT port	Option 001	Option 002
		-110dBm~-10dBm	-110dBm~-10dBm (2MHz~1GHz)
Precision	±3dB		

Demodulation meter

AM Modulation Depth Meter	
Range	5%~100%
Resolution	1%
Precision	±5%, 1kHz modulation rate, 30%~90% modulation, 3kHz LPF
FM Frequency offset meter	
Frequency offset range	500Hz~100kHz
Resolution	1Hz
Precision	±5%, 1kHz~10kHz Frequency offset, 150Hz~1kHz modulation rate

Spectrum analyzer (options)

	Option 001 (Default)	Option 002
Frequency Range	2MHz~1GHz	2MHz~2.7GHz
Sweep Width	10kHz~998MHz	10kHz~2698MHz
Reference Level Range	-80dBm~+50dBm	
Resolution Bandwidth Range	10Hz~30kHz (1, 3, 10 steps)	
Average Noise Level Displayed	-120dBm (typical value, 10kHz Frequency width)	

Audio meter

Signal source under measurement	Audio input, demodulation signals
Audio Frequency	
Resolution	0.1Hz
Precision	±1Hz
Audio voltage	
Audio input level	20mVp~3Vp (Measurement range 1)
	2Vp~30Vp (Measurement range 2)
Precision	± (5%×measurement value+5mV) (Measurement range 1)
Distortion (THD)	
Display range	0~100%
Resolution	0.1%
Precision	± (5%× measurement value +0.1%) , (within 1%~20%)
SINAD	

Display Range	0~40dB
Resolution	0.1dB
Precision	±1.5dB, (within 8dB~35dB)

DVM meter

Input Frequency Range	DC~20kHz
Input Impedance	1MΩ
Coupling	AC, DC
Input Level	20mVp~3Vp (Measurement range 1)
	2Vp~30Vp (Measurement range 2)
Precision	±10% (Measurement range 1)

Audio oscilloscope (option)

Signal source	External audio, DVM input, demodulation signals	
Sweep line	1	
Marker	2	
Trigger	Type	Auto, standard, single
	Pulse edge	Rising edge, falling edge
	Level can be triggered	-60V~+60V (setting depends on measurement range)
Horizontal	Range	0.2ms/lattice to 50ms/lattice, in the sequence of 1/2/5
	Precision	±3%
Vertical	Range	10mV~20V/lattice, in the sequence of 1/2/5
	Precision	±10%, within the whole range
Coupling	Audio input	AC
	DVM input	AC, DC
Input Impedance	Audio input	150Ω, 600Ω, 1kΩ, high impedance
	DVM input	1MΩ
Bandwidth	20kHz	

Cable test

Frequency resolution	0.1MHz
Marker	3
Test Type	Measurement on standing-wave ratio (SWR), return loss (RL), cable loss (LOSS), Distance-To-Fault (DTF)
DTF Measurement	Range: 1m~100m Resolution: 0.01m Speed rate: 0.00~1.00, auto choice or manual input based on cable types Measurement accuracy: ±10%

Internal time base

Aging Rate	1×10^{-6} /year
Temperature Stability	1×10^{-6}

Universal characteristics

➤ Working characteristics

Operating Temperature	-10°C~+50°C	
Storage Temperature	-40°C~+70°C	
Size	295mm (W)×195mm (H)×70mm (D)	
Weight	≤2.6kg	
Power Consumption	≤25W (exclude battery recharging)	
Type of Power Input	AC, Standard Adapter	Input of the adapter: 100~240V, DC of 50/60Hz
	DC	Voltage: 12V~18V (without the battery) 15V~18V (with the battery) Current: 4A (min.)
	Built-In Battery(Standard)	Nominal voltage: 10.8V Nominal capacity: ≥7000mAh

➤ Input and output ports

Description	Sign	Interface type
RF Input /Output Interface	ANT	BNC
	T/R	BNC
RF Output Interface	SWR	BNC
Audio Output Interface	Audio Out	BNC
Audio/DVM Input Interface	Audio In/DVM	BNC
GPS Signal Input Interface	GPS	BNC
Audio Cassette Interface	Audio set	Special 10-core interface





Ordering information

Main Unit: AV4992A Radio Test Set (2MHz~1GHz/2.7GHz)

Standard Package

No.	Description	Remarks
1	Power Cord Assembly	Standard tri-prong power cord Power adapter (15.0V/4.0A)
2	Quick Start Guide	2 copies
3	CD	1 pc
4	USB Cable	1 pc
5	Built-In Rechargeable Lithium-Ion Battery	Included in the main unit
6	Car-Mounted Charger	1 pc
7	Certificate of Conformity	1 pc

Options

Serial No.	Description	Functions	Diagram
AV4992A-001	1GHz Option	Frequency range: 2MHz~1GHz Defaulted option	
AV4992A-002	2.7GHz Option	Frequency range: 2MHz~2.7GHz	
AV4992A-003	English Option	Language multiplication (with keys, tags, and software)	
AV4992A-S01	Function of an oscilloscope		
AV4992A-S02	Function of a spectrum analyzer		
AV4992A-H01	User Manual in Simplified Chinese		
AV4992A-H02	User Manual in English		
AV4992A-H03	Programming Manual in Simplified Chinese		
AV4992A-H04	Programming Manual in English		
AV4992A-H05	20dB Attenuator -50W	To extend high power measurement (connector type: N (J, K))	
AV4992A-H06	20dB Attenuator -150W	To extend high power measurement (connector type: N (J, K))	
AV4992A-H07	20dB Attenuator -200W	To extend high power measurement (connector type: N (J, K))	
AV4992A-H08	Audio Cassette Option	For conversation to the outside, built-in speaker, microphone and cable.	

(To be continued)

Serial No.	Description	Functions	Diagram
AV4992A-H09	AV20201Ae Type N Low-Cost Male Cal Kit	Tests and calibration of cables	
AV4992A-H10	AV20201Be Type N Low-Cost Female Cal Kit	Tests and calibration of cables	
AV4992A-H11	BNC/SMA Adapter	Interface extension (BNC/SMA-JK,BNC/SMA-JJ: one for each)	
AV4992A-H12	N/BNC Adapter	Interface extension (N/BNC-JJ,N/BNC-KJ: one for each)	
AV4992A-H13	High Impedance Passive Oscilloscope Sensor	For tests of audio input /DVM	
AV4992A-H14	External GPS Antenna	GPS localization	
AV4992A-H15	BNC Cable (80cm)	Extension of testing port	
AV4992A-H16	Purple UTP Cable	Network interface control, 2M, point-to-point cable	
AV4992A-H17	MicroSD Class4	Storage extension (capacity:8G)	
AV4992A-H18	Rechargeable Lithium-Ion Battery	Spare battery group	
AV4992A-H19	Power Adapter	Spare power adapter	
AV4992A-H20	Multifunction Bag	Protects the equipment. The harnesses fix the equipment at the neck and the waist, and free hands for equipmentoperation.	
AV4992A-H21	Backpack	Contain the main equipment, power adapter, power cord, testing cable, and various adapters; it is a backpack and handbag.	
AV4992A-H22	Safe transit case	To fix packing during transportation.	