



# Модули переносчика частоты

## Серия АКИП-9902



## Product Overview

The AKIII-9902 Millimeter-Wave VNA Extender has reached the international level in measuring speed, dynamic range and measuring stability. In terms of hardware, this module adopts new design concepts and technical solutions, so that the key technical performance indicators of the whole unit are significantly improved; in terms of software, its spread spectrum system is based on the platform environment of Windows operating system, so that the interconnectivity and usability of the whole unit has been greatly improved.

The AKIII-9902 Millimeter-Wave VNA Extender can be used to compose a millimeter wave vector network analyzer system with a 3640A millimeter wave spread spectrum controller and a vector network analyzer, which can realize flexible configuration of 5mm, 3mm, 2mm, 1mm frequency band and an even higher frequency band, and the highest frequency can cover 500GHz. It has the features of simple system configuration, friendly user interface and high test precision, and realizes the measurement of all S parameters of millimeter wave measured network. The system is widely used in R&D and production testing for millimeter wave components, MMIC, antenna and RCS and materials.

## Main Features

- Frequency coverage: 40GHz~500GHz
- Windows 7 operating system, Chinese menu, as well as English menu options
- Various calibration methods such as frequency response, single port, response isolation, dual port, TRL and so on
- Compatible with different manufacturers of vector network analyzer
- Realizing frequency extender measurement of two-port vector network analyzer by 3640A
- Unified miniaturization and inclined panel design for different frequency bands
- Universal platform, easy to operate, can improve test efficiency
- Suitable for PNA-X 524X series and ZNA xx series products

## Typical Applications

It is mainly used for S-parameter testing of passive components such as millimeter-wave directional couplers, filters, and power dividers, and active components such as millimeter-wave mixers and amplifiers. The millimeter wave vector network analyzer can simultaneously obtain the amplitude response, phase response and group delay characteristics of the millimeter wave network under test, and can meet the requirements of wide frequency band, large dynamic range and fast real-time testing at the same time. It is essential for developing millimeter wave phased array radar, communication, electronic reconnaissance and other equipment test.



## Technical Specifications

Model Technical Indicators	АКИП-9902К	АКИП-9902NA	АКИП-9902N	АКИП-9902P	АКИП-9902QA
Frequency range	40GHz~ 60GHz	50GHz~ 75GHz	60GHz~ 90GHz	75GHz~ 110GHz	90GHz~ 140GHz
Port output power	+6dBm +8dBm(typ.)	+5dBm +7dBm(typ.)	+5dBm +10dBm(typ. )	5dBm +7dBm(typ.)	+3dBm +6dBm(typ.)
System dynamic range (intermediate frequency bandwidth 10Hz)	100dB 110(typ.)	100dB 110(typ.)	100dB 110(typ.)	100dB 110(typ.)	100dB 105(typ.)
Reflection tracking (dB)	0.12 0.05(typ.)	0.12 0.05(typ.)	≤0.12 0.05(typ.)	≤0.12 0.05(typ.)	≤0.15 0.08(typ.)
Transmission tracking (dB)	0.12 0.05(typ.)	0.12 0.05(typ.)	≤0.12 0.05(typ.)	≤0.12 0.05(typ.)	≤0.15 0.08(typ.)
Effective directivity (dB)	≤-35dB -40dB(typ.)	≤-35dB -40dB(typ.)	≤-35dB -40dB(typ.)	≤-35dB -40dB(typ.)	≤-35dB -40dB(typ.)
Payload matching (dB)	≤-35Db -40dB(typ.)	≤-35dB -40dB(typ.)	≤-35dB -40dB(typ.)	≤-35dB -40dB(typ.)	≤-35dB -40dB(typ.)
Port connector form	WR19	WR15	WR12	WR10	WR8.0
Working voltage	12VDC, ≤50W				
Outline dimension width × height × depth (mm)	120×90×240				

## Technical Specifications (continued)

Model Technical Indicators	АКИП-9902Q	АКИП-9902SA	АКИП-9902R	АКИП-9902S	АКИП-9902ТА	АКИП-9902В
Frequency range	110GHz~ 170GHz	140GHz~ 220GHz	170GHz~ 260GHz	220GHz~ 325GHz	260GHz~ 400GHz	325GHz~ 500GHz
Port output power	-1dBm +3dBm(typ.)	-9dBm -5dBm(typ.)	-10dBm -5dBm(typ.)	-13dBm -10dBm(typ.)	-20dBm -10dBm(typ.)	-23dBm -20dBm(typ.)
System dynamic range (intermediate frequency bandwidth 10Hz)	100dB 105(typ.)	100dB 105(typ.)	100dB 105(typ.)	95dB 100(typ.)	80dB 95(typ.)	80dB 90(typ.)
Reflection tracking (dB)	0.25 0.1(typ.)	0.25 0.15(typ.)	0.2 0.1(typ.)	0.2 0.1(typ.)	0.3 0.15(typ.)	0.3 0.2(typ.)
Transmission tracking (dB)	0.15 0.1(typ.)	0.25 0.15(typ.)	0.2 0.1(typ.)	0.2 0.1(typ.)	0.3 0.15(typ.)	0.3 0.2(typ.)
Effective directivity (dB)	≤-34dB -40dB(typ.)	≤-30dB -35dB(typ.)	≤-25dB -30dB(typ.)	≤-25dB -30dB(typ.)	≤-20dB -30dB(typ.)	≤-20dB -25dB(typ.)
Payload matching (dB)	≤-35dB -40dB(typ.)	≤-30dB -35dB(typ.)	≤-25dB -30dB(typ.)	≤-25dB -30dB(typ.)	≤-20dB -30dB(typ.)	≤-20dB -25dB(typ.)
Port connector	WR6.5	WR5.1	WR4.3	WR3.4	WR2.8	WR2.2
Working voltage	12VDC, ≤50W					
Dimension width × height × depth (mm)	120×90×240					

3640A millimeter wave spread spectrum controller, compatible with 3672X series and PNA-X series vector network analyzers.



## Technical Specifications

Technical Indicators Model	Frequency range	Output power	Control interface	Power output	Power supply	Outline dimension width × height × depth (mm)
3640A	8GHz~20GHz	10±1dBm	Test device interface	12VDC@2A	Self-adaption power supply: AC220/240V; 50/60Hz; 100/115V; 50/60/400Hz;	426×177×460 (without handles, pad, feet)

## Ordering Information

### System Instrument List

Model	Instrument Name	Main Indicators	Quantity	Remarks
3672B/C/D/E	Vector network analyzer	10MHz~26.5GHz/40GHz /50GHz/67GHz	1 set	S80 option S06 option
3640A	Millimeter wave spread spectrum controller	8GHz~20GHz	1 set	For 2-port VNA
71802	DC Block	/	4 set	For 4-port VNA essential
71514B	Attenuator	10dB attenuation	4 set	3643K/3643NA/3643N/3643P for 4-port VNA essential
3643K	Millimeter-wave VNA extender	40GHz~60GHz	2 sets	
3643NA	Millimeter-wave VNA extender	50GHz~75GHz	2 sets	-
3643N	Millimeter-wave VNA extender	60GHz~90GHz	2 sets	-
3643P	Millimeter-wave VNA extender	75GHz~110GHz	2 sets	-
3643QA	Millimeter-wave VNA extender	90GHz~140GHz	2 sets	-
3643Q	Millimeter-wave VNA extender	110GHz~170GHz	2 sets	-
3643SA	Millimeter-wave VNA extender	140GHz~220GHz	2 sets	-
3643R	Millimeter-wave VNA extender	170GHz~260GHz	2 sets	-
3643S	Millimeter-wave VNA extender	220GHz~325GHz	2 sets	-
3643TA	Millimeter-wave VNA extender	260GHz~400GHz	2 sets	
3649B	Millimeter-wave VNA extender	325GHz~500GHz	2 sets	-

32121K	6mm waveguide calibration kit	40GHz~60GHz	1 box	-
32156	5mm waveguide calibration kit	50GHz~75GHz	1 box	-
32155N	60-90 waveguide calibration kit	60GHz~90GHz	1 box	-
32141	3mm waveguide calibration kit	75GHz~110GHz	1 box	-
32155Q	90-140 waveguide calibration kit	90GHz~140GHz	1 box	-
32155	2mm waveguide calibration kit	110GHz~170GHz	1 box	-
20301	1mm waveguide calibration kit	140GHz~220GHz	1 box	-
32155S	170-260 waveguide calibration kit	170GHz~260GHz	1 box	-
20302	1mm waveguide calibration kit	220GHz~325GHz	1 box	-
20301T	0.5THz waveguide calibration kit	325GHz~500GHz	1 box	-

### System Cable Configuration Option

Model	Description	Function	Remarks
364X-001	System cable for 3640A controller	connected with the controller, VNA and the S parameter module	1 set. See the table below for details
364X-002	System cable for 3672B VNA (4-PORT)	Frequency extender connection for 3672B VNA (4-PORT)	1 set. See the table below for details
364X-003	System cable for 3672C/D/E VNA (4-PORT)	Frequency extender connection for 3672 C/D/E VNA (4-PORT)	1 set. See the table below for details

### Cable List of 3640A millimeter wave spread spectrum controller

No.	Cable Name and Function	Length (meter)	Connector	Quantity	Remarks
Microwave Cable					
A1	RF output of network analyzer to RF input of control machine	0.6	3.5mm/3.5mm-JJ	1	Low loss cable
A2	Local oscillator output of network analyzer to local oscillator input of control machine	0.6	3.5mm/3.5mm-JJ	1	Low loss cable
A3/A4	RF output of control machine to input of millimeter-wave VNA extender.	1.2/1.5/2	3.5mm/3.5mm-JJ	2	Low loss cable, length optional
A5/A6	Local oscillator output of control machine to local oscillator input of millimeter-wave VNA extender.	1.2/1.5/2	3.5mm/3.5mm-JJ	2	Low loss cable, length optional
IF Cable					
C1	IF output of control machine to outer IF input of control machine	0.6	SMA/SMA	4	IF cable
C2	IF output of millimeter-wave	1.2/1.5/2	SMA/SMA	4	IF cable, length

	VNA extender to IF input of control machine				optional
Communication/Power Cable					
D1	Interface of network analyzer test device to interface of control machine test device	1	PCL-10125	1	Test device cable
D2	Control machine power output to millimeter-wave VNA extender power input	1.2/1.5/2	Circular connection cable	2	Power cable, length optional

### **Cable List of 3672B Vector Network Analyzer (Four-Port) Spread Spectrum System**

No.	Cable Name and Function	Length (meter)	Connector	Quantity	Remarks
Microwave Cable					
A1-A4	RF/LO input	1.2	3.5mm/3.5mm-KJ	4	Low loss cable
B1-B4	IF output	1.8	3.5mm/3.5mm-JJ	4	IF cable
Power Supply					
C1/C2	Adapter power output to millimeter-wave VNA extender power input	/	Seven core	2	Power adapter

### **Cable List of 3672C/D/E Vector Network Analyzer (Four-Port) Spread Spectrum System**

No.	Cable Name and Function	Length (meter)	Connector	Quantity	Remarks
Microwave Cable					
A1-A4	RF/LO input	1.2	2.4mm/3.5mm-KJ	4	Low loss cable
B1-B4	IF output	1.8	3.5mm/3.5mm-JJ	4	IF cable
Power Supply					
C1/C2	Adapter power output to millimeter-wave VNA extender power input	/	Seven core	2	Power adapter