



# 3657 Series Vector Network Analyzers

(9kHz/100kHz to 4.5GHz/9GHz)



**Ceyear Technologies Co., Ltd.**

## Product Overview

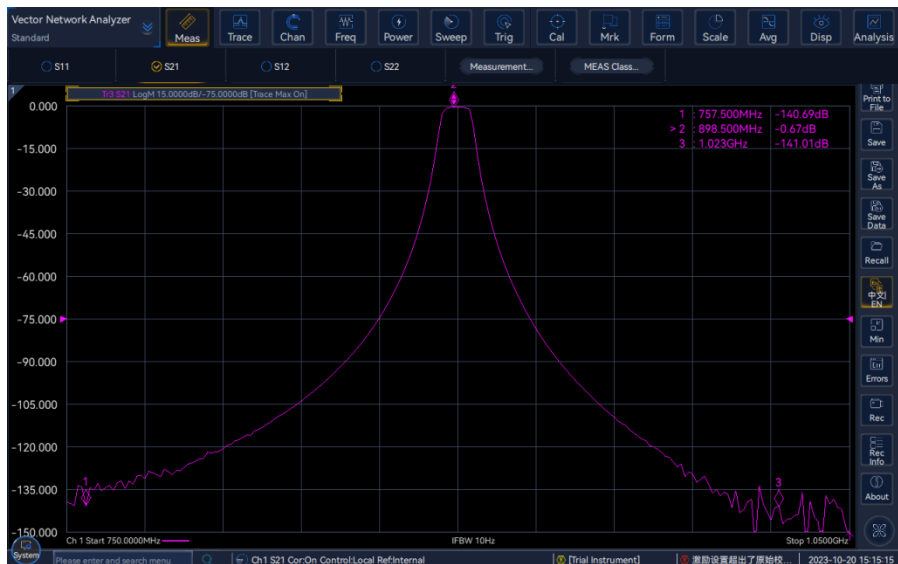
The 3657 series vector network analyzer can be used in such fields as wireless communication, cable TV, education and automotive electronics for measuring the performance of RF components such as filters, amplifiers, antennas, cables and cable TV taps. The product has such functions as error calibration, time domain, fixture simulator, automatic fixture removal, advanced time domain analysis, with many display formats such as logarithm magnitude, linear magnitude, standing wave, phase, group delay, Smith pie chart, polar coordinates, etc. for multi-channel and multi-window display, as well as many interfaces such as USB, LAN, HDMI and DP. It can quickly and accurately measure the amplitude, phase and group delay characteristics of the S-parameter of the DUT, and has efficient and powerful error correction capability.

## Main features

- It has a dynamic range of up to 140dB for accurate measurement of devices with high rejection ratio
- The test speed of 4us/point can greatly improve the production line test efficiency
- Higher stability can meet the needs of high-precision testing;
- Its functions are more abundant; in addition to the standard time domain analysis function, there are automatic fixture removal function and advanced time domain analysis function for selection
- It is smaller in size and lighter in weight, and more testing instruments can be arranged in the same footprint.
- It has two models, namely, overhead (2U) and desktop (5U);
- It has a four-port option, and a single connection can realize measurement of all 16 S-parameters of the four-port network, and measurement of balance parameters;
- It has powerful data analysis capabilities, such as ripple test, bandwidth test, limit test and other functions, which is convenient for users to determine the qualification and improve the test efficiency;
- It has a LAN interface for remote control and system interconnection and comes with six USB ports
- It can record SCPI instructions synchronously and generate scripts with one click.
- It uses 12.1-inch screen to display multi-parameters on the same screen, with multi-touch operation.

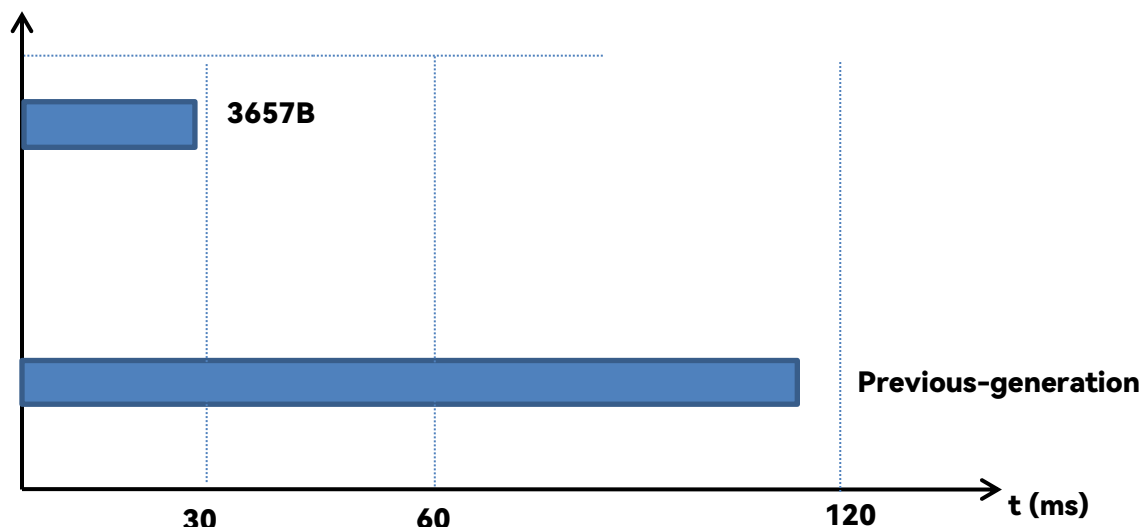
## Wide dynamic range

It has a dynamic range of up to 140dB (IFBW=10Hz) for accurate measurement of devices with high rejection ratio.



## Super Fast Sweep

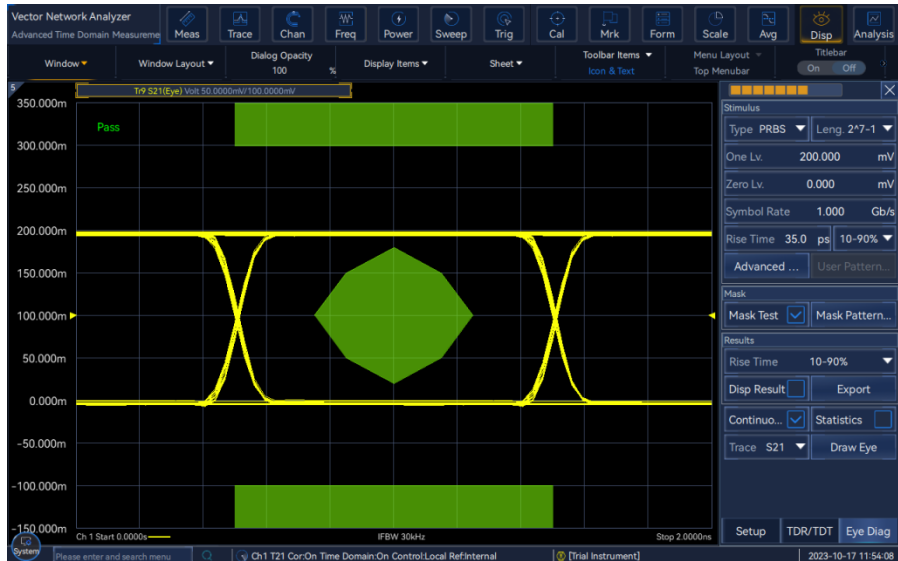
Its sweep speed is significantly improved compared with the previous-generation products, which can improve the measurement reaction speed and improve the measurement efficiency in high-speed cable testing, chip production line testing, filter commissioning and other fields.



Comparison of test time between 3657B and a filter of the previous-generation 3656B

## Fast Analysis of Signal Integrity

It has the function of generating and analyzing virtual eye diagram based on network parameters. Depending on the standard of high-speed digital communication, it can perform efficient Pass/Fail testing using a pre-defined eye diagram template. It can apply jitter, noise and other interference on the simulated eye diagram, and simulate the simulated eye diagram of different positions of high-speed link in real environment by adding correction algorithms such as pre-weighting and equalization.



## Desktop Model (2U)

It is applicable to automatic testing, system integration, unmanned factory and other application scenarios.



## Typical applications

### Production test of mobile communication products

The frequency range of the 3657 series vector network analyzer can meet the production and testing needs of mobile communication products. It has the characteristics of fast sweep, large dynamic range, small size, etc., which can be applicable to the mass production test of the factory, and test of RF components such as filters, amplifiers, antennas, and cables.



### Test of passive multiport device and balanced device

The 3657 series vector network analyzer has the four-port test function, and a single connection can measure all 16 S-parameters of the four-port network, which is applicable to the mass production test of multi-port devices in the factory, with balance parameter measurement function.



# Technical specification

## 3657A/B/AM/BM/BS technical specifications

Model	3657A/B/AM/BM	3657BS
<b>Frequency characteristics</b>		
Frequency Range	9kHz/100kHz to 4.5GHz/9GHz	100kHz to 9GHz
Frequency Resolution	1Hz	1Hz
Frequency Accuracy	$\pm 5 \times 10^{-6} (23^{\circ}\text{C} \pm 3^{\circ}\text{C})$	$\pm 5 \times 10^{-6} (23^{\circ}\text{C} \pm 3^{\circ}\text{C})$
<b>Port power characteristics</b>		
Maximum Output Power	0dBm, typical values: +3dBm (9kHz to 100kHz) 10dBm, typical values: +13dBm (100kHz to 9GHz)	10dBm (100 kHz to 9 GHz)
<b>Network parameter characteristics</b>		
System Dynamic Range	98dB (9kHz to 100kHz) 110dB (100kHz to 10MHz) 140dB (10MHz to 6GHz) 136dB (6GHz to 9GHz)	100dB (100kHz to 10MHz) 130dB (10MHz to 6GHz) 126dB (6GHz to 9GHz)
Effective Directivity	40dB (9kHz to 100kHz) 46dB (100kHz to 3GHz) 40dB (3GHz to 6GHz) 38dB (6GHz to 9GHz)	46dB (100kHz to 3GHz) 40dB (3GHz to 6GHz) 38dB (6GHz to 9GHz)
Effective Source Match	36dB (9kHz to 100kHz) 36dB (100kHz to 3GHz) 35dB (3GHz to 6GHz) 33dB (6GHz to 9GHz)	36dB (100kHz to 3GHz) 35dB (3GHz to 6GHz) 33dB (6GHz to 9GHz)
Effective Load Match	40dB (9kHz to 100kHz) 44dB (100kHz to 3GHz) 40dB (3GHz to 6GHz) 38dB (6GHz to 9GHz)	44dB (100kHz to 3GHz) 40dB (3GHz to 6GHz) 38dB (6GHz to 9GHz)
Reflection tracking	$\pm 0.050\text{dB}$ (9kHz to 100kHz) $\pm 0.030\text{dB}$ (100kHz-3GHz) $\pm 0.030\text{dB}$ (3GHz-6GHz) $\pm 0.050\text{dB}$ (6GHz-9GHz)	$\pm 0.030\text{dB}$ (100kHz-3GHz) $\pm 0.030\text{dB}$ (3GHz-6GHz) $\pm 0.050\text{dB}$ (6GHz-9GHz)
Transmission Tracking	$\pm 0.050\text{dB}$ (9kHz-100kHz) $\pm 0.030\text{dB}$ (100kHz-3GHz) $\pm 0.030\text{dB}$ (3GHz-6GHz) $\pm 0.050\text{dB}$ (6GHz-9GHz)	$\pm 0.030\text{dB}$ (100kHz-3GHz) $\pm 0.030\text{dB}$ (3GHz-6GHz) $\pm 0.050\text{dB}$ (6GHz-9GHz)
<b>Trace noise</b>		
Amplitude Trace Noise (IFBW=100Hz, 9kHz to 10MHz)	0.0060dBrms (9 kHz to 100 kHz) 0.0060dBrms (100 kHz to 10 MHz) 0.0015dBrms (10 MHz to 3 GHz) 0.0020dBrms (3 GHz to 6 GHz)	0.0060dBrms (100 kHz to 10 MHz) 0.0015dBrms (10 MHz to 3 GHz) 0.0020dBrms (3 GHz to 6 GHz) 0.0030dBrms (6 GHz to 9 GHz)

<b>(IFBW=1kHz, 10MHz to 9GHz)</b>	0.0030dBrms (6 GHz to 9 GHz)	
<b>Phase Trace Noise (IFBW=100Hz, 9kHz to 10MHz) (IFBW=1kHz, 10MHz to 9GHz)</b>	0.300° (9kHz to 100kHz) 0.300° (100kHz to 10MHz) 0.045° (10MHz to 3GHz) 0.060° (3GHz to 6GHz) 0.090° (6GHz to 9GHz)	0.300° (100kHz to 10MHz) 0.045° (10MHz to 3GHz) 0.060° (3GHz to 6GHz) 0.090° (6GHz to 9GHz)
<b>IFBW</b>	1Hz to 2MHz	
<b>Amplitude Display Resolution</b>	0.001dB/div	
<b>Phase Display Resolution</b>	0.001°/div	
<b>General characteristics</b>		
<b>Port Connector Type</b>	Type N (female end), system impedance 50 ohms	
<b>Number of measurement ports</b>	3657A/B/BS/AM/BM standard Configuration: 2 ports; 3657A/B/BS/AM/BM-400 option: 4 ports	
<b>Peripheral Interface</b>	USB interface, LAN interface, HDMI interface and DP interface	
<b>Display Mode</b>	12.1-inch high-resolution touch screen;	
<b>Dimensions</b>	Overall dimensions (width × height × depth), (host, excluding handle, led and padding block): 3657A/B/BS: 426mm×221.5mm×250mm 3657AM/BM: 426mm×88.1mm×500mm	
<b>Max. power Consumption</b>	150W	
<b>Power Supply</b>	50Hz single-phase 220V AC or 50Hz/60Hz single-phase 110V AC	
<b>Max. weight</b>	3657A/B/BS: 13.5kg; 3657AM/BM: 12.5kg	

## Order information

Host	Description
<b>3657A</b>	Vector network analyzer (100kHz to 4.5GHz) (model 5U, with screen)
<b>3657B</b>	Vector network analyzer (100kHz to 9GHz) (model 5U, with screen, better than 3657BS in respect of indicators)
<b>3657BS</b>	Vector network analyzer (100kHz to 9GHz) (model 5U, with screen)
<b>3657AM</b>	Vector network analyzer (100kHz to 4.5GHz) (model 2U, without screen)
<b>3657BM</b>	Vector network analyzer (100kHz to 9GHz) (model 2U, without screen)

### Standard configuration:

No.	Name	Description
1.	Standard 3-core power cord	1
2.	USB mouse	1
3.	Quick Start Guide	1 book
4.	Certificate of conformity	1

### General options:

No.	Option No.	Name	Function
1.	<b>3657-001</b>	Cabinet mounting kit	Special kit for installation to the cabinet. Applicable to 3657A/B/BS
2.	<b>3657-002</b>	Cabinet mounting kit	Special kit for installation to the cabinet. Applicable to 3657AM/BM
3.	<b>3657-003</b>	User's Manual in Chinese	Providing detailed User's Manual of hardcopy version in Chinese.
4.	<b>3657-004</b>	User's Manual in English	Providing detailed User Manual of hardcopy version in English.
5.	<b>3657-005</b>	Aluminum alloy transportation case	Facilitate instrument transportation. Applicable to 3657A/B/BS
6.	<b>3657-006</b>	English options	For setting language of front and rear panels and operating system to English.
7.	<b>3657-S07</b>	AFR	For automatic testing and removal of measurement fixtures for single-ended and balanced devices. Applicable to the full range.
8.	<b>3657-S11</b>	Advanced time domain analysis	For TDR impedance test, eye diagram analysis, etc. Applicable to the full range.
9.		20205 N-type 50Ω mechanical calibration kit	For overall calibration (DC to 3GHz)



10.		20201 N-type 50Ω mechanical calibration kit	For overall calibration (DC to 9GHz)
11.		31101 N-type 50Ω mechanical calibration kit	For overall calibration (DC to 18GHz)
12.		31121A 3.5mm mechanical calibration kit	For overall calibration (DC to 6GHz)
13.		20202 3.5mm mechanical calibration kit	For overall calibration (DC to 9GHz)
14.		31121 3.5mm mechanical calibration kit	For overall calibration (DC to 26.5GHz)
15.		20404EZ electronic calibration kit	It is used for overall calibration (300MHz to 8.5GHz four-port) One 4.3-10 port and three 3.5mm ports
16.		20402 electronic calibration piece	It is used for overall calibration (300kHz ~ 18GHz N-type two-port)
17.		20403 electronic calibration piece	It is used for overall calibration (10MHz ~ 26.5GHz 3.5mm two-port)
18.		20405 electronic calibration piece	It is used for overall calibration (10MHz ~ 20GHz 3.5mm four-port)
19.		GORE-OSZKUZKU0240 N-type Gore test cable	It is used for overall measurement (test end N-type male) Length: 60cm
20.		GORE-OSZKUZKV0240 N-type Gore test cable	It is used for overall measurement (test end N-type female) Length: 60cm
21.		87302AZ N-type test cable	It is used for overall measurement (test end N-type male) Length: 60cm
22.		87302BA N-type test cable	It is used for overall measurement (test end N-type female) Length: 60cm
23.		87302AY N-SMA test cable	It is used for overall measurement (test end SMA-type male) Length: 80cm
24.		87302AX N-SMA test cable	It is used for overall measurement (test end SMA-type female) Length: 80cm
25.		87601 microwave aid (N-type)	Coaxial adapter set (N-type interface converted to 3.5mm, 2.4mm interface, etc.)
26.		87601A microwave aid (3.5mm)	Coaxial adapter set (3.5mm interface converted to N type, 2.4mm interface, etc.)
27.		P2418HT display	23.8-inch touch display

### 3657B option

No.	Option No.	Name	Function
1.	3657B-221	2-port 9kHz low frequency expansion	For extending the lower limit of the frequency range to 9kHz.
2.	3657B-400	Four-port measurement	For configuring a dual-source stimulus four-port vector network analyzer with a frequency range of 100kHz ~ 9GHz.
3.	3657B-421	4-port 9kHz low frequency expansion	For extending the lower limit of the frequency range to 9kHz. 400 is required.

### 3657A option

No.	Option No.	Name	Function
1.	3657A-221	2-port 9kHz low frequency expansion	For extending the lower limit of the frequency range to 9kHz.
2.	3657A-400	Four-port measurement	For configuring a dual-source stimulus four-port vector network analyzer with a frequency range of 100kHz ~ 4.5GHz.
3.	3657A-421	4-port 9kHz low frequency expansion	For extending the lower limit of the frequency range to 9kHz. 400 is required.

### 3657BM option

No.	Option No.	Name	Function
1.	3657BM-221	2-port 9kHz low frequency expansion	For extending the lower limit of the frequency range to 9kHz.
2.	3657BM-400	Four-port measurement	For configuring a dual-source stimulus four-port vector network analyzer with a frequency range of 100kHz ~ 9GHz.
3.	3657BM-421	4-port 9kHz low frequency expansion	For extending the lower limit of the frequency range to 9kHz. 400 is required.

### 3657AM option

No.	Option No.	Name	Function
1.	3657AM-221	2-port 9kHz low frequency expansion	For extending the lower limit of the frequency range to 9kHz.
2.	3657AM-400	Four-port measurement	For configuring a dual-source stimulus four-port vector network analyzer with a frequency range of 100kHz ~ 4.5GHz.
3.	3657AM-421	4-port 9kHz low frequency expansion	For extending the lower limit of the frequency range to 9kHz. 400 is required.

### 3657BS option

No.	Option No.	Name	Function
1.	3657BS-400	Four-port measurement	For configuring a dual-source stimulus four-port vector network analyzer with a frequency range of 100kHz ~ 9GHz.