3657 Series

Vector Network Analyzer

3657A/B/AM/BM

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

3657C/D/E/CM/DM/EM/CU/DU/EU

(300kHz to 14GHz/ 20GHz/ 26.5GHz)

3657A/B/C/D/E Vector Network Analyzer

3657AM/BM/CM/DM/EM Vector Network Analyzer

3657CU/DU/EU Vector Network Analyzer

Ceyear Technologies Co., Ltd.

Product Overview

The 3657 series vector network analyzer can be used in the fields of 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.

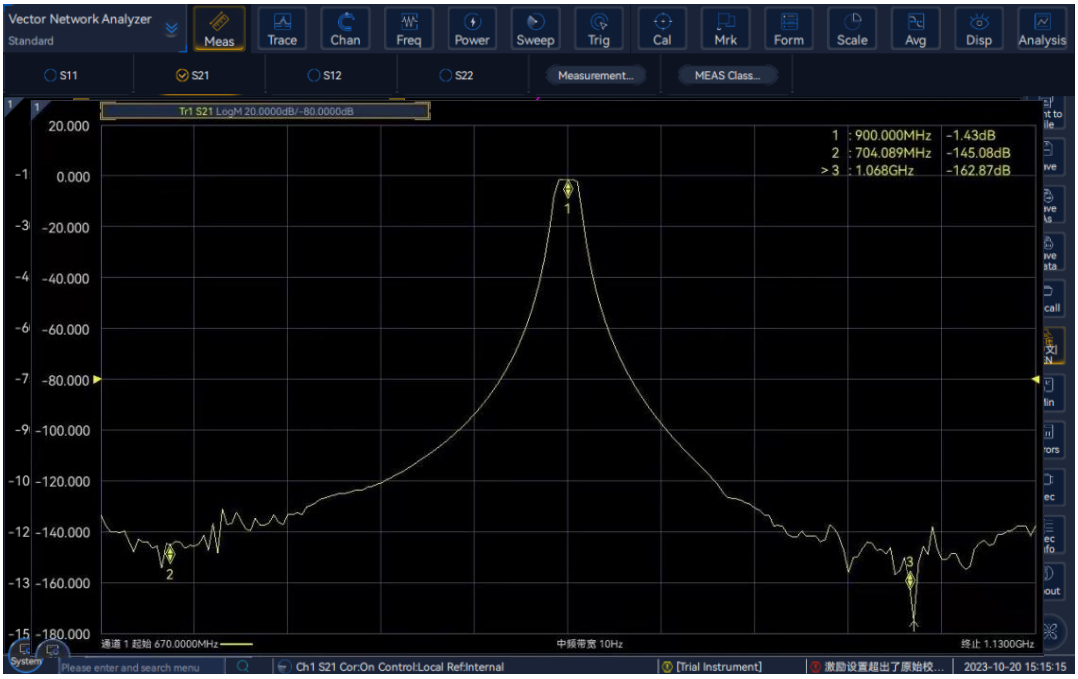
The product has such functions as error calibration, time domain, fixture simulator, automatic fixture removal, advanced time domain analysis, with many display formats such as logarithm magnitude, linear magnitude, standing wave, phase, group delay, Smith pie chart, polar coordinates, etc. for multi-channel 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 4 μs/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
- Smaller size and lighter weight
- It has three structures: 5U benchtop, 2U mountable module and USB Module;
- Thunderbolt interface for the USB modules, with the same testing speed as the benchtop solution.
- 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;
- Powerful data analysis capabilities, such as ripple test, bandwidth test, limit test and other functions, convenient for users to determine the qualification and improve the test efficiency
- It has a LAN interface for remote control and system integrations. USB interfaces are also available
- Rrecord 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 (3657A/B/C/D/E).

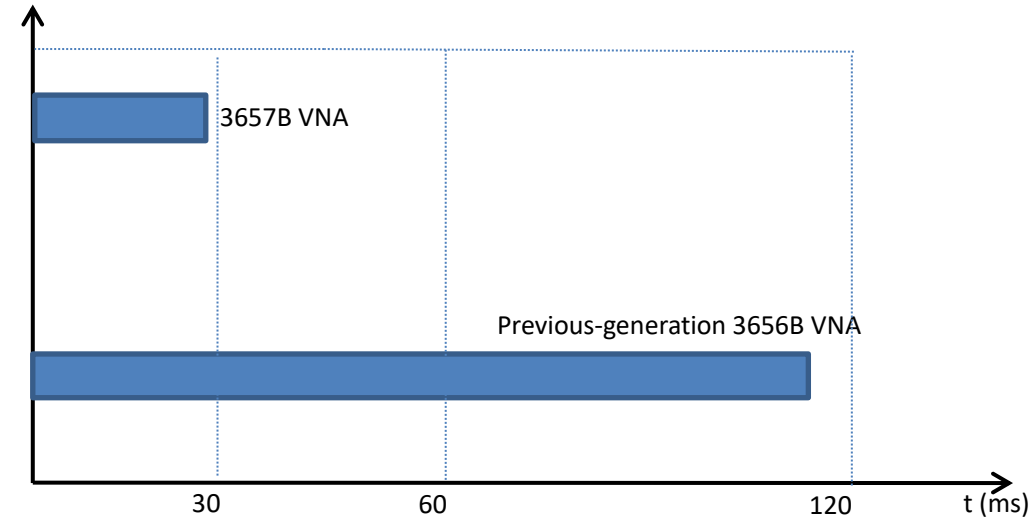
Wide Dynamic Range

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



Super Fast Sweep

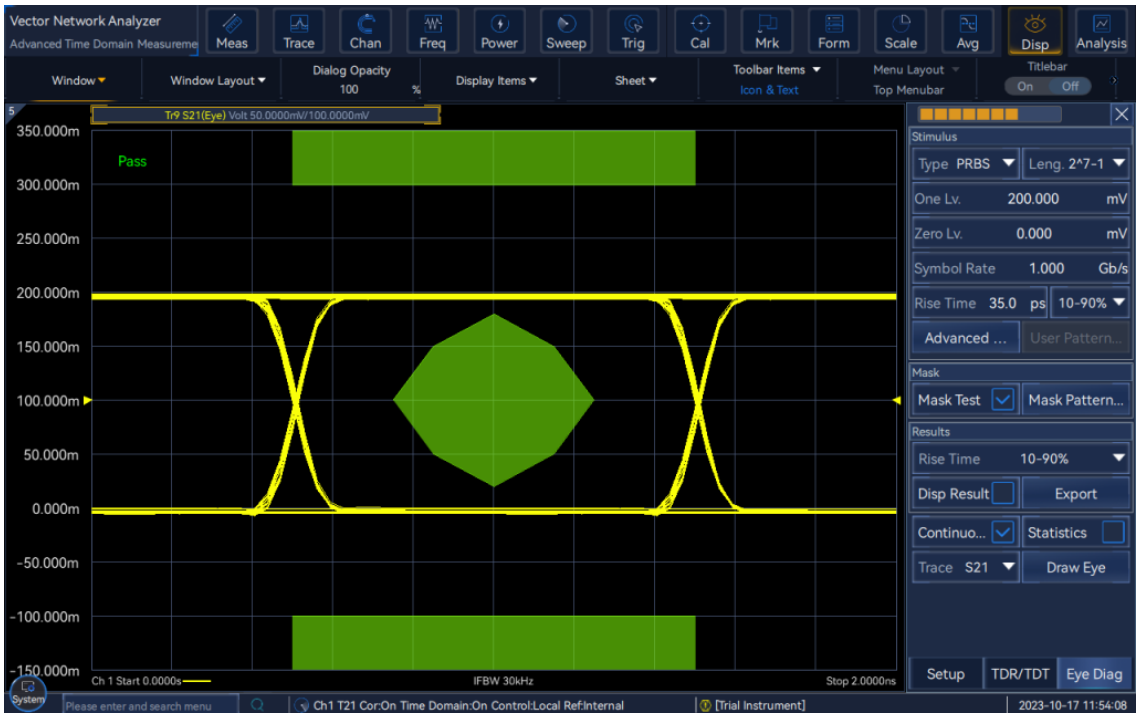
Its sweep speed is significantly improved compared with the previous-generation products, which can improve the measurement reaction speed and improve the measurement efficiency in high-speed cable testing, chip production line testing, filter commissioning and other fields.



Comparison of a filter test time between 3657B and 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.

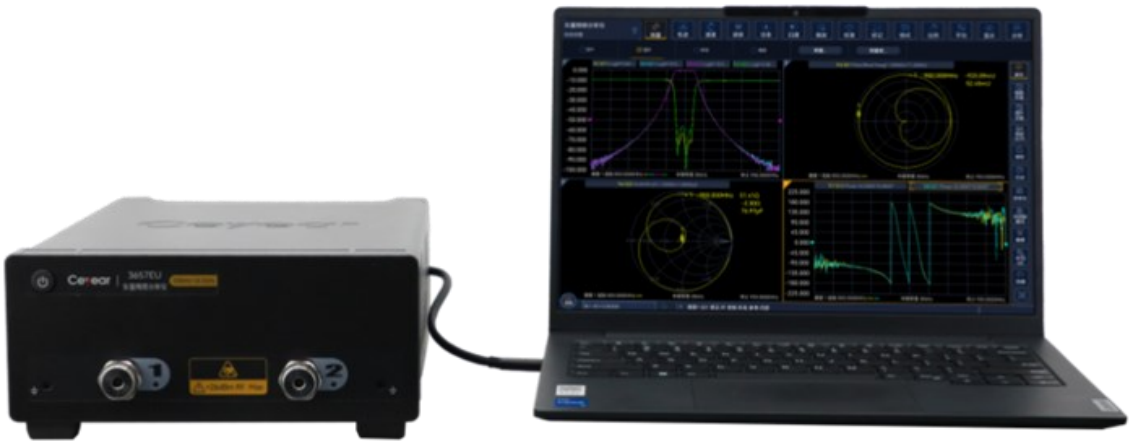


2U Height Bracket Mountable Model of 3657AM/BM/CM/DM/EM

The 2U height bracket mountable models have CPU inside and no computer is needed. It is suitable for automatic testing, system integration, unmanned factory, and other application scenarios.

USB Models of 3657CU/DU/EU

The USB model combines the advantages of high performance and portability, and is compact in size. It can be widely used in high-precision field tests and production environments that require mobile testing. The product is equipped with a TYPE-C Thunderbolt interface, which can be directly connected to a Thunderbolt interface computer. The core indicators such as scanning speed, dynamic range, and temperature stability are consistent with desktop instruments. It greatly saves space and can be easily integrated into the test system to meet the needs of more complex test scenarios.



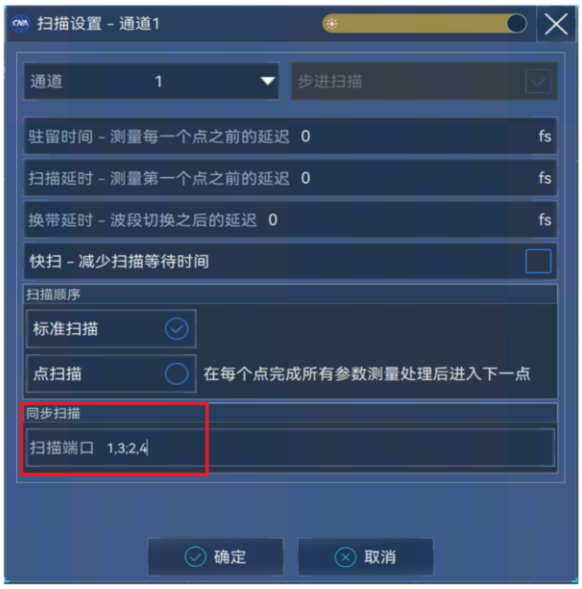
Cascading Test Function

The 3657BM VNA features flexible configuration, allowing two 4-port 3657BM units to be combined into an 8-port VNA. It has 4 signal sources and 16 receiver channels, enabling full 8-port calibration and testing, thus improving testing efficiency.

8-port VNA using two units of 4-port 3656BM

Parallel testing capabilities

The 3657 series of 4-port products incorporate dual-source and eight-channel IF receivers. By setting scan port groups, dual-source parallel scanning can be achieved, allowing simultaneous testing of two dual-port devices under test with identical test settings.



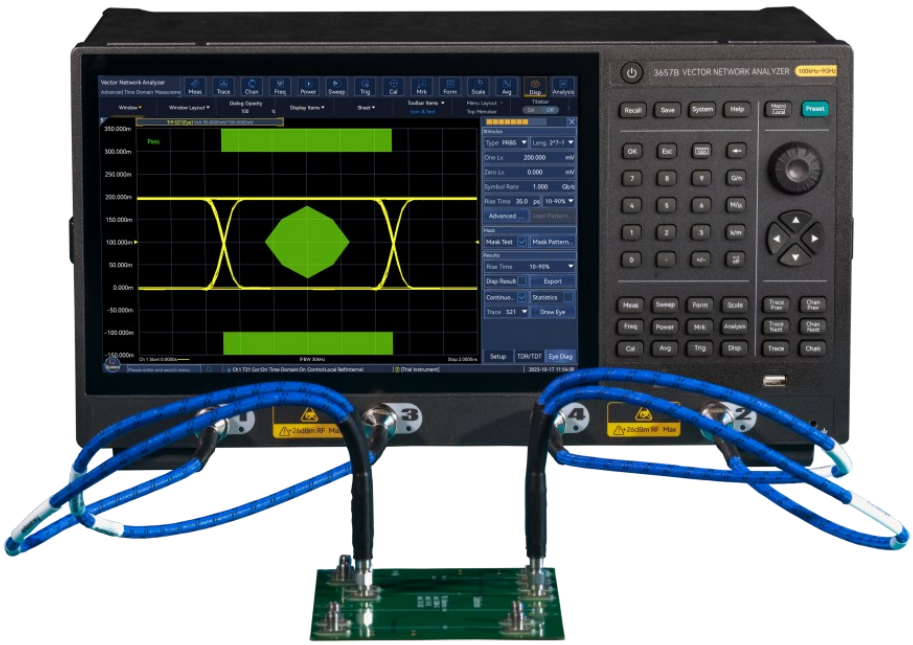
Typical Applications

Production test of wireless 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 multi-port 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

Models	3657A/B/AM/BM	3657C/D/E/CM/DM/EM/CU/DU/EU
Frequency Characteristics		
Frequency Range	9kHz/100kHz ~ 4.5GHz/9GHz	300kHz ~ 14GHz/20GHz/26.5GHz
Frequency Resolution	0.1Hz	0.1Hz
Frequency Accuracy	±5×10^{-6}(23℃±3℃)	±5×10^{-6}(23℃±3℃)
Port Power Characteristics		
Maximum Output Power	0dBm(9kHz ~ 100kHz) 10dBm(100kHz ~ 9GHz)	10dBm(300kHz ~ 14GHz) 0dBm(14GHz ~ 26.5GHz)
Network Parameter Characteristics		
System Dynamic Range	98dB(9kHz ~ 100kHz) 110dB(100kHz ~ 10MHz) 140dB(10MHz ~ 6GHz) 136dB(6GHz ~ 9GHz)	95dB(300kHz ~ 18MHz) 140dB(18MHz ~ 6GHz) 130dB(6GHz ~ 9GHz) 120dB(9GHz ~ 14GHz) 110dB(14GHz ~ 20GHz) 100dB(20GHz ~ 26.5GHz)
Effective Directivity	40dB(9kHz ~ 100kHz) 46dB(100kHz ~ 3GHz) 40dB(3GHz ~ 6GHz) 38dB(6GHz ~ 9GHz)	42dB(300kHz ~ 3GHz) 38dB(3GHz ~ 6GHz) 36dB(6GHz ~ 20GHz) 32dB(20GHz ~ 26.5GHz)
Effective Source Match	36dB(9kHz ~ 100kHz) 36dB(100kHz ~ 3GHz) 35dB(3GHz ~ 6GHz) 33dB(6GHz ~ 9GHz)	34dB(300kHz ~ 3GHz) 31dB(3GHz ~ 6GHz) 26dB(6GHz ~ 20GHz) 24dB(20GHz ~ 26.5GHz)
Effective Load Match	40dB(9kHz ~ 100kHz) 44dB(100kHz ~ 3GHz) 40dB(3GHz ~ 6GHz) 38dB(6GHz ~ 9GHz)	42dB(300kHz ~ 3GHz) 38dB(3GHz ~ 6GHz) 36dB(6GHz ~ 20GHz) 32dB(20GHz ~ 26.5GHz)
Reflection tracking	±0.050dB(9kHz ~ 100kHz) ±0.030dB(100kHz ~ 3GHz) ±0.030dB(3GHz ~ 6GHz) ±0.050dB(6GHz ~ 9GHz)	±0.050dB(300kHz ~ 3GHz) ±0.050dB(3GHz ~ 6GHz) ±0.080dB(6GHz ~ 20GHz) ±0.080dB (20GHz ~ 26.5GHz)
Transmission Tracking	±0.050dB(9kHz ~ 100kHz) ±0.030dB(100kHz ~ 3GHz) ±0.030dB(3GHz ~ 6GHz) ±0.050dB(6GHz ~ 9GHz)	±0.050dB(300kHz ~ 3GHz) ±0.080dB(3GHz ~ 6GHz) ±0.100dB(6GHz ~ 20GHz) ±0.150dB (20GHz ~ 26.5GHz)
Trace Noise		
Amplitude Trace Noise (IFBW=100Hz, 9kHz to 10MHz)	0.0060dBrms(9kHz ~ 100kHz) 0.0060dBrms(100kHz ~ 10MHz) 0.0015dBrms(10MHz ~ 3GHz)	0.0300dBrms(300kHz ~ 10MHz) 0.0030dBrms(10MHz ~ 3GHz) 0.0050dBrms(3GHz ~ 9GHz)

(IFBW=1kHz, 10MHz to 26.5GHz)	0.0020dBrms(3GHz ~ 6GHz) 0.0030dBrms(6GHz ~ 9GHz)	0.0080dBrms(9GHz ~ 18GHz) 0.0120dBrms(18GHz ~ 26.5GHz)
Phase Trace Noise (IFBW=100Hz, 9kHz to 10MHz) (IFBW=1kHz, 10MHz to 26.5GHz)	0.300°rms(9kHz ~ 100kHz) 0.300°rms(100kHz ~ 10MHz) 0.045°rms(10MHz ~ 3GHz) 0.060°rms(3GHz ~ 6GHz) 0.090°rms(6GHz ~ 9GHz)	0.300°dBrms(300kHz ~ 10MHz) 0.045°dBrms(10MHz ~ 3GHz) 0.050°dBrms(3GHz ~ 9GHz) 0.080°dBrms(9GHz ~ 18GHz) 0.120°dBrms(18GHz ~ 26.5GHz)
IFBW	1Hz ~ 5MHz	
Amplitude Display Resolution	0.001dB/div	
Phase Display Resolution	0.001°/div	
General characteristics		
Port Connector Type	3657A/B/AM/BM: Type N (f), system impedance 50 ohms 3657C/D/E/ CM/DM/EM/CU/DU/EU: 3.5 NMD, system impedance 50 ohms	
Number of measurement ports	Standard configuration: Two Ports 3657A/B/C/D/E/AM/BM/CM/DM/EM-400 Option: 4 ports	
Peripheral Interface	3657A/B/C/D/E/AM/BM/CM/DM/EM: USB, LAN、HDMI, DP 3657CU/DU/EU: USB, Thunderbolt	
Display Mode	3657A/B/ C/D/E: 12.1 inch touch screen in the front panel 3657AM/BM/CM/DM/EM: No screen. A separate screen is needed. 3657 CU/DU/EU: No screen. A separate computer/laptop is needed.	
Dimensions	3657A/B: 435.5mm×235mm×296mm 3657AM/BM: 426mm×102mm×546mm 3657C/D/E: 435.5mm×235mm×302mm 3657CM/DM/EM: 426mm×102mm×552mm 3657CU/DU/EU: 213mm×99mm×352mm	
Max. power Consumption	3657A/B/AM/BM:150W; 3657C/D/E/CM/DM/EM:200W; 3657CU/DU/EU: 90W	
Power Supply	110VAC – 220VAC, 50/60Hz	
Max. weight	3657A/B/C/D/E: 13.5kg; 3657AM/BM/CM/DM/EM: 12.5kg; 3657CU/DU/EU: 4.5kg	

Order information

Main Unit	Descriptions
3657A	Vector Network Analyzer (100kHz ~ 4.5GHz)(5U Structure, Touch Screen)
3657B	Vector Network Analyzer (100kHz ~ 9GHz)(5U Structure, Touch Screen

3657C	Vector Network Analyzer (300kHz ~ 14GHz)(5U Structure, Touch Screen)
3657D	Vector Network Analyzer (300kHz ~ 20GHz)(5U Structure, Touch Screen)
3657E	Vector Network Analyzer (300kHz ~ 26.5GHz)(5U Structure, Touch Screen)
3657AM	Vector Network Analyzer (100kHz ~ 4.5GHz)(2U Structure, No Screen)
3657BM	Vector Network Analyzer (100kHz ~ 9GHz)(2U Structure, No Screen)
3657CM	Vector Network Analyzer (300kHz ~ 14GHz)(2U Structure, No Screen)
3657DM	Vector Network Analyzer (300kHz ~ 20GHz)(2U Structure, No Screen)
3657EM	Vector Network Analyzer (300kHz ~ 26.5GHz)(2U Structure, No Screen)
3657CU	Vector Network Analyzer (300kHz ~ 14GHz)(USB Module,No CPU, No Screen, No 4-port option)
3657DU	Vector Network Analyzer (300kHz ~ 20GHz)(USB Module,No CPU, No Screen, No 4-port option)
3657EU	Vector Network Analyzer (300kHz ~ 26.5GHz)(USB Module,No CPU, No Screen, No 4-port option)

Standard Configuration:

No.	Name	Description
1.	Standard 3-core power cord	1
2.	USB mouse	1
3.	Quick start guide	1
4.	Certificate of conformity	1

General Options:

No.	Option	Name	Qty	Description
1.	3657-001	Rack mount kit	1	special kit for installation to the cabinet, applicable to 3657A/B/C/D/E
2.	3657-002	Rack mount kit	1	special kit for installation to the cabinet, applicable to 3657AM/BM/CM/DM/EM
3.	3657-004	User Manual	1	Paper version User Manual
4.	3657-005	Aluminum transportation case	1	Suitcase for instrument transportation, applicable to 3657A/B/C/D/E。
5.	3657-006	English option	1	for setting language of front and rear panels and operating system to English.
6.	3657-007	Laptop	1	Laptop computer with Thunderbolt interface to control the USB VNA module
7.	3657-S07	Automatic fixture removal function (AFR)	1	for automatic testing and removal of single-end and balance device measuring fixture.
8.	3657-S11	Advanced time domain analysis	1	for TDR time-domain impedance test, eye diagram analysis, etc. suitable for all models.
9.	3657A-JL	Metrology Service	1	Metrology service with certificate report. For 3657A/AM
10.	3657B-JL	Metrology Service	1	Metrology service with certificate report. For 3657B/BM
11.	3657C-JL	Metrology Service	1	Metrology service with certificate report. For 3657C/CM/CU
12.	3657D-JL	Metrology Service	1	Metrology service with certificate report. For 3657D/DM/DU
13.	3657E-JL	Metrology Service	1	Metrology service with certificate report. For 3657E/EM/EU
14.	3657A-EWT1	One year warranty after standard warranty period	1	Choose more than one to select more years of warranty
15.	3657B-EWT1	One year warranty after standard warranty period	1	Choose more than one to select more years of warranty
16.	3657C-EWT1	One year warranty after standard warranty period	1	Choose more than one to select more years of warranty
17.	3657D-EWT1	One year warranty after standard warranty period	1	Choose more than one to select more years of warranty
18.	3657E-EWT1	One year warranty after standard warranty period	1	Choose more than one to select more years of warranty
19.	3657AM-EWT1	One year warranty after standard warranty period	1	Choose more than one to select more years of warranty
20.	3657BM-EWT1	One year warranty after standard warranty period	1	Choose more than one to select more years of warranty

21.	3657CM-EWT1	One year warranty after standard warranty period	1	Choose more than one to select more years of warranty
22.	3657DM-EWT1	One year warranty after standard warranty period	1	Choose more than one to select more years of warranty
23.	3657EM-EWT1	One year warranty after standard warranty period	1	Choose more than one to select more years of warranty
24.	3657CU-EWT1	One year warranty after standard warranty period	1	Choose more than one to select more years of warranty
25.	3657DU-EWT1	One year warranty after standard warranty period	1	Choose more than one to select more years of warranty
26.	3657EU-EWT1	One year warranty after standard warranty period	1	Choose more than one to select more years of warranty
27.		20205 N Type 50Ω Mechanical Calibration Kit	1	To calibrate VNA (DC ~ 3GHz)
28.		20201 N Type 50Ω Mechanical Calibration Kit	1	To calibrate VNA (DC ~ 9GHz)
29.		31101 N Type 50Ω Mechanical Calibration Kit	1	To calibrate VNA (DC ~ 18GHz)
30.		31121A 3.5mm Mechanical Calibration Kit	1	To calibrate VNA (DC ~ 6GHz)
31.		20202 3.5mm Mechanical Calibration Kit	1	To calibrate VNA (DC ~ 9GHz)
32.		31121 3.5mm Mechanical Calibration Kit	1	To calibrate VNA (DC ~ 26.5GHz)
33.		20404EZ Electronical Calibration Kit (E-Cal)	1	To calibrate VNA (300MHz ~ 8.5GHz four port), One 4.3-10 adaptor, Three 3.5mm adaptor
34.		20402D Electronical Calibration Kit (E-Cal)	1	To calibrate VNA (100kHz ~ 18GHz, N Type, 2 port)
35.		20402E Electronical Calibration Kit (E-Cal)	1	To calibrate VNA (10MHz ~ 26.5GHz ,3.5mm, 2 ports)
36.		20404E Electronical Calibration Kit (E-Cal)	1	To calibrate VNA (10MHz ~ 26.5GHz 3.5mm, 4 ports)
37.		GORE-OSZKUZKU0240 N Type Gore Cable	1	Phase stable cable(N Type, male-male) Length 60cm
38.		GORE-OSZKUZKV0240 N Type Gore Cable	1	Phase stable cable(N Type, female-male) Length 60cm
39.		FB0HA0HB025.0 3.5mm Gore Cable	1	Phase stable cable(Testing end: 3.5m male) For 3657C/D/E/CM/DM/EM/CU/DU/EU
40.		FB0HA0HC025.0 3.5mm Gore Cable	1	Phase stable cable(Testing end: 3.5m femal) For 3657C/D/E/CM/DM/EM/CU/DU/EU
41.		87302AZ N Type Cable	1	Phase stable cable(N Type, male-male) Length 60cm
42.		87302BA N Type Cable	1	Phase stable cable(N Type, female-male) Length 60cm
43.		87302AY N-SMA Cable	1	Phase stable cable(N Type male – SMA female), Length 80cm
44.		87302AX N-SMA Cable	1	Phase stable cable(N Type male – SMA male), Length 80cm
45.		87601 Microwave Assistant (N Type	1	Coaxial adaptor kit (N type to 3.5mm, to 2.4mm etc.)
46.		87601A Microwave Assistant(3.5mm)	1	Coaxial adaptor kit (3.5mm to N type, to 2.4mm etc.)
47.		P2418HT screen	1	23.8-inch touch screen to display

3657A Options

No.	Options	Name	Functions
1.	3657A-221	Low frequency expansion of 9kHz at both ports	The lower limit of the frequency range can be extended to 9kHz.
2.	3657A-400	Four-port measurement	Dual source excitation four-port vector network analyzer configuration, frequency range 100kHz~4.5GHz.
3.	3657A-421	Four port 9kHz low frequency expansion	The lower limit of the frequency range can be extended to 9kHz. The optional 400 is required.

3657B Options

No.	Options	Name	Functions
1.	3657B-221	Low frequency expansion of 9kHz at both ports	The lower limit of the frequency range can be extended to 9kHz.
2.	3657B-400	Four-port measurement	The dual-source excitation four-port vector network analyzer is configured with a frequency range of 100kHz to 9GHz.
3.	3657B-421	Four port 9kHz low frequency expansion	The lower limit of the frequency range can be extended to 9kHz. The optional 400 is required.

3657C Options

No.	Options	Name	Functions
1.	3657C-400	Four-port measurement	The dual-source excitation four-port vector network analyzer is configured with a frequency range of 300kHz to 14GHz.

3657D Options

No.	Options	Name	Functions
1.	3657D-400	Four-port measurement	The dual-source excitation four-port vector network analyzer is configured with a frequency range of 300kHz to 20GHz.

3657E Options

No.	Options	Name	Functions
1.	3657E-400	Four-port measurement	The dual-source excitation four-port vector network analyzer is configured with a frequency range of 300kHz to 26.5GHz.

3657AM Options

No.	Options	Name	Functions
1.	3657AM-221	Low frequency expansion of 9kHz at both ports	The lower limit of the frequency range can be extended to 9kHz.

2.	3657AM-400	Four-port measurement	Dual source excitation four-port vector network analyzer configuration, frequency range 100kHz~4.5GHz.
3.	3657AM-421	Four port 9kHz low frequency expansion	The lower limit of the frequency range can be extended to 9kHz. The optional 400 is required.

- **3657BM Options**

No.	Options	Name	Functions
1.	3657BM-221	Low frequency expansion of 9kHz at both ports	The lower limit of the frequency range can be extended to 9kHz.
2.	3657BM-400	Four-port measurement	The dual-source excitation four-port vector network analyzer is configured with a frequency range of 100kHz to 9GHz.
3.	3657BM-421	Four port 9kHz low frequency expansion	The lower limit of the frequency range can be extended to 9kHz. The optional 400 is required.

- **3657CM Options**

No.	Options	Name	Functions
1.	3657CM-400	Four-port measurement	The dual-source excitation four-port vector network analyzer is configured with a frequency range of 300kHz to 14GHz.

- **3657DM Options**

No.	Options	Name	Functions
1.	3657DM-400	Four-port measurement	The dual-source excitation four-port vector network analyzer is configured with a frequency range of 300kHz to 20GHz.

- **3657EM Options**

No.	Options	Name	Functions
1.	3657EM-400	Four-port measurement	The dual-source excitation four-port vector network analyzer is configured with a frequency range of 300kHz to 26.5GHz.