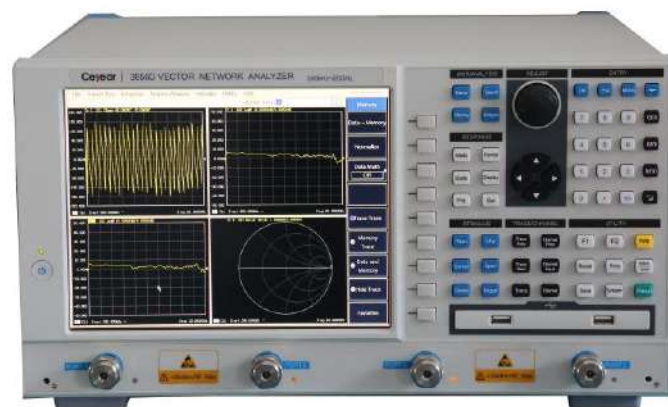




# 3656A/BA/B/D

## Vector Network Analyzer

(100kHz~3GHz/6.8GHz/8.5GHz/  
300kHz ~ 20 GHz)



**Ceyear Technologies Co., Ltd.**

## Product Overview

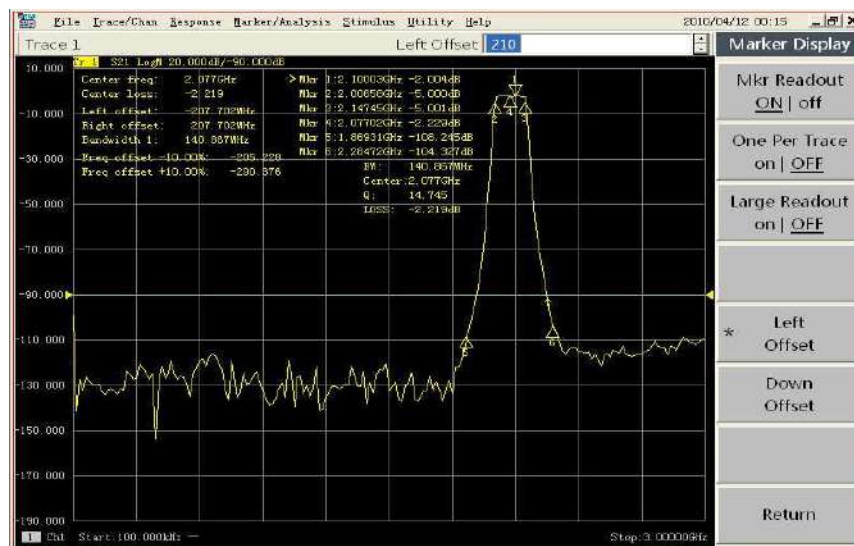
3656A/BA//B/D vector network analyzer is applicable to fields of radio communications, cable TV, teaching and automotive electronics etc. It can be used for performance measurement of RF components such as filter, amplifier, antenna, cable, and cable television sub connectors etc. It adopts Windows operating system, and has functions of error calibration, time domain and fixture simulator; It supports multiple display formats such as logarithmic amplitude, linear amplitude, standing wave, phase, group delay, Smith chart and polar coordinates etc.; It provides multiple calibration types including frequency response, single port, response isolation, enhanced response and full dual-port, rapid SOLT calibration and electrical calibration; It is capable of multi-channel and multi-window display; It is designed with USB interface, LAN interface, GPIB interface and VGA interface. It can rapidly and accurately measure the amplitude, phase and group delay characteristics of the DUT S-parameter, with efficient and powerful error correction capability.

## Main Features

- Dynamic range up to 125dB; accurate measurement on high rejection ratio devices
- 75Ω test port impedance option of 3656A for cable TV components measurement
- 3656A/B/D provide 4-port option which can accomplish all 16 S parameters test of 4-port net by a single connection
- Ultra-low trace noise which provide higher test accuracy
- Up to 64 independent measuring channels that can implement complex testing schemes rapidly
- Powerful data analysis functions, such as ripple test, bandwidth test and limit test, convenient for user to judge the conformity and improves the test efficiency
- Time domain analysis function as the standard configuration
- Fixture simulator can simulate various R&D situations to rapidly get the real-time test results
- LAN and GPIB interface, capable of remote control and system interconnection, 4 USB interfaces

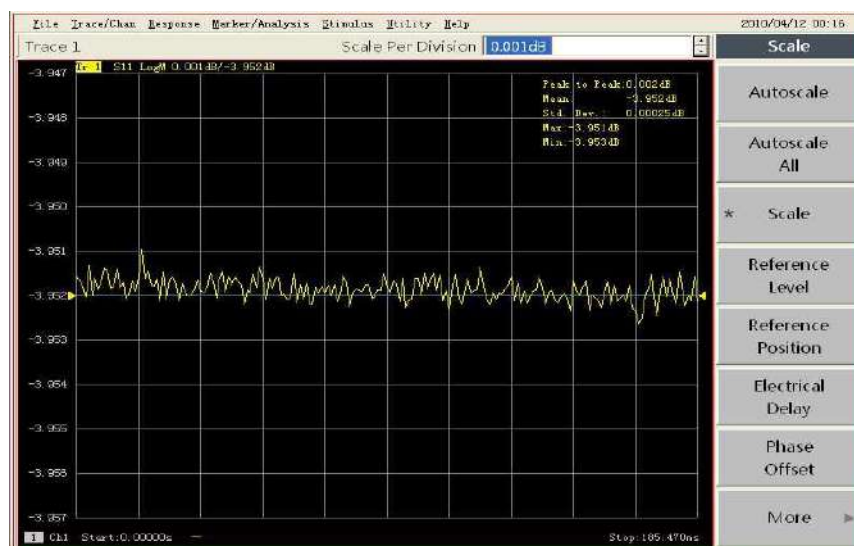
## Wide dynamic range

With dynamic range up to 125dB (IFBW=10Hz), 3656A/B/D is capable of accurate measurement on devices with high rejection ratio.



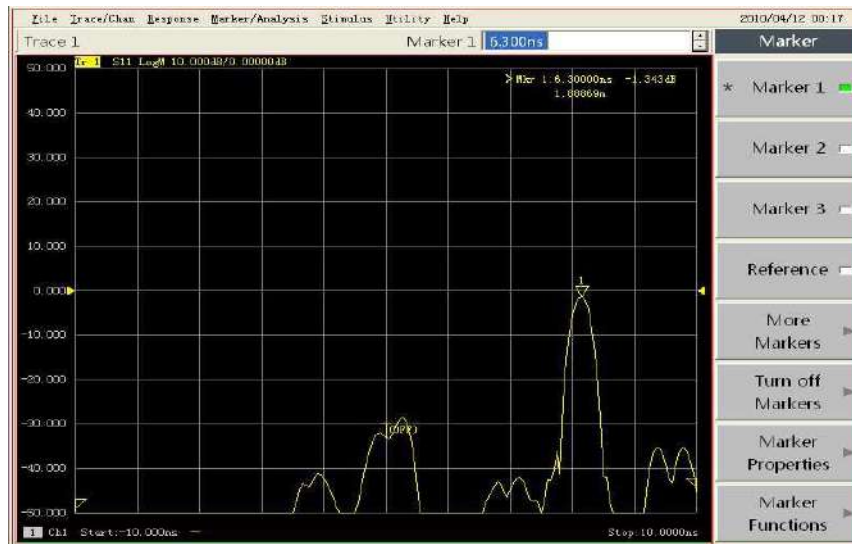
## Ultra -low trace noise

Trace noise of 3656A/BA/B/D is ultra-low, which minimizes measurement error.



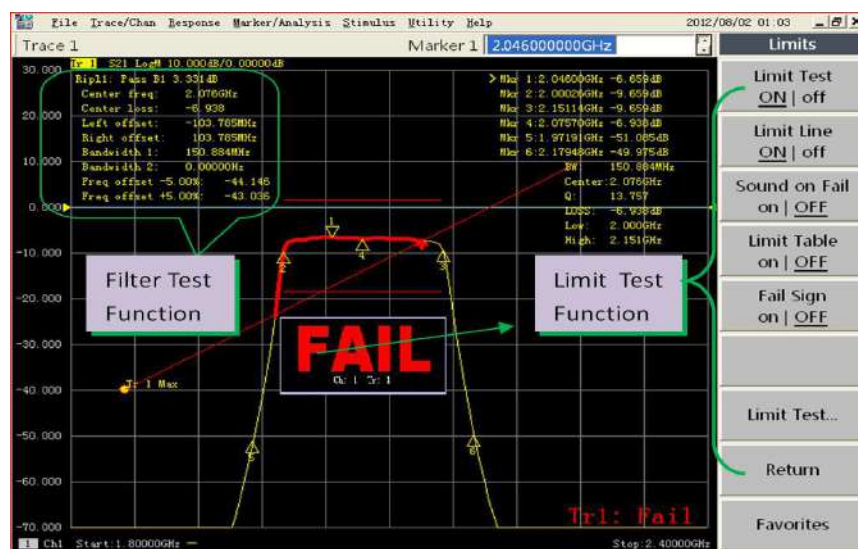
## Time-domain analysis function

The analyzer can conduct time-domain measurement on DUT via time-domain software so as to comprehensively test the performance indicators of DUT, such as cable fault location and length measurement.



## Powerful data analysis function

It has analysis functions such as limit test, ripple test and bandwidth test, filter automatic statistics etc., which can clearly test the loss, ripple and rejection and help for conduct hopping filter debugging.

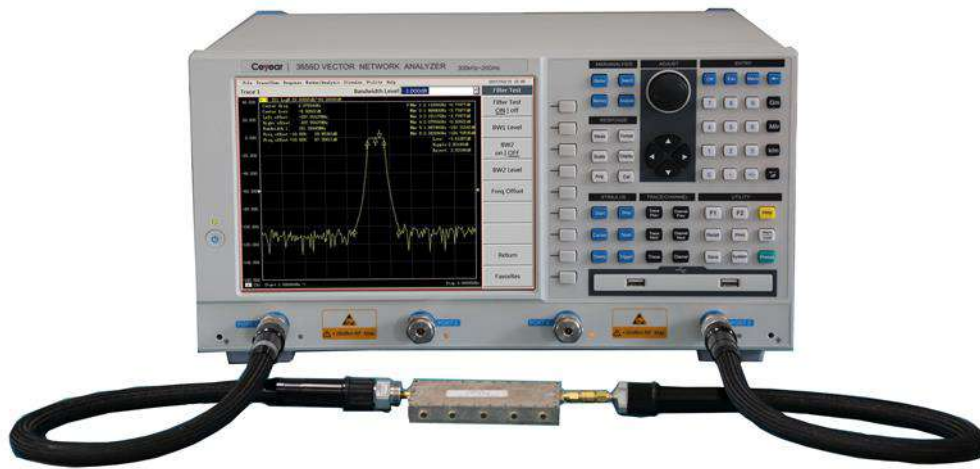


## Typical Applications

### Production test of mobile communication products

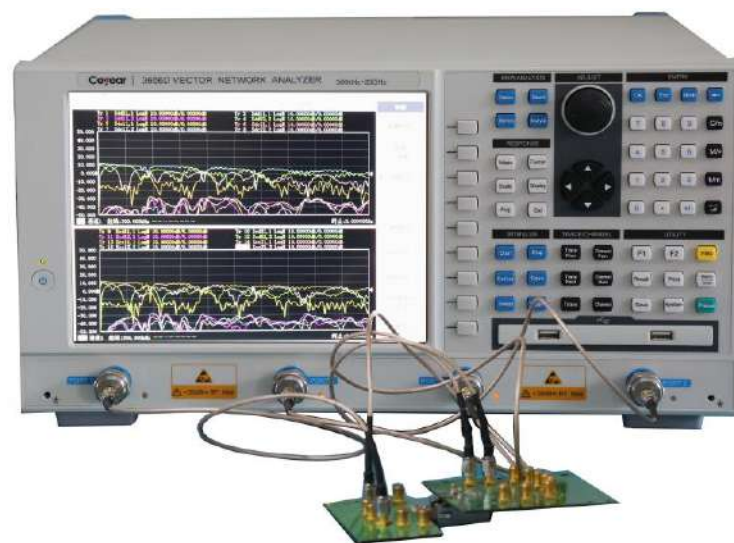
The frequency range of 3656A/BA/B/D vector network analyzer can meet the demand of production test on mobile communication products. It has advantages of high sweep speed, wide dynamic range and compact size which is very suitable for the test of mass production in factories.

3656A/B/D can be applied to the test of RF components such as filter, amplifier, antenna and cables. The 75 $\Omega$  test assembly of 3656A is also available for performance test of CATV devices.



### Test of passive multi-port device and balanced device

3656A/BA/B/D VNA provide 4-port test functions. It can test the whole 16 S parameters of 4-port network via one single connection, thus is very suitable for the mass production test of multi-port devices in factories. It has balanced parameter test function: after the full 3-port or full 4-port calibration using 3 or 4 test ports, choose the corresponding operation mode (single port-balanced network, single port-single port-balanced network, balanced-balanced network), then you can gain the mixed S-parameters of balanced devices.



## 3656A Technical Specifications:

|                        |                                                                                                 |                   |        |
|------------------------|-------------------------------------------------------------------------------------------------|-------------------|--------|
| Parameters             | 3656A                                                                                           |                   |        |
| Frequency range        | 100kHz ~ 3GHz                                                                                   |                   |        |
| Frequency resolution   | 1Hz                                                                                             |                   |        |
| Frequency accuracy     | ±5×10 <sup>-6</sup> (23℃±3℃)                                                                    |                   |        |
| System dynamic range   |                                                                                                 | (10Hz)            | (3kHz) |
|                        | 100kHz~1MHz                                                                                     | 90dB              | 60dB   |
|                        | 1MHz~10MHz                                                                                      | 110 dB            | 80 dB  |
|                        | 10MHz~3GHz                                                                                      | 125dB             | 95dB   |
| Reflection tracking    | 100kHz~10MHz                                                                                    | ±0.030dB          |        |
|                        | 10MHz~3GHz                                                                                      | ±0.020dB          |        |
| Transmission tracking  | 100kHz~10MHz                                                                                    | ±0.030dB          |        |
|                        | 10MHz~3GHz                                                                                      | ±0.020dB          |        |
| Effective directivity  | 100kHz~10MHz                                                                                    | 49 dB             |        |
|                        | 10MHz~3GHz                                                                                      | 46 dB             |        |
|                        | 100kHz~10MHz                                                                                    | 49dB (option H01) |        |
|                        | 10MHz~3GHz                                                                                      | 46dB (option H01) |        |
| Effective source match | 100kHz~10MHz                                                                                    | 44dB              |        |
|                        | 10MHz~3GHz                                                                                      | 40dB              |        |
|                        | 100kHz~10MHz                                                                                    | 43dB (option H01) |        |
|                        | 10MHz~3GHz                                                                                      | 21dB (option H01) |        |
| Effective load match   | 100kHz~10MHz                                                                                    | 49 dB             |        |
|                        | 10MHz~3GHz                                                                                      | 46 dB             |        |
|                        | 100kHz~10MHz                                                                                    | 48dB (option H01) |        |
|                        | 10MHz~3GHz                                                                                      | 41dB (option H01) |        |
| Test points            | 1 to 16001                                                                                      |                   |        |
| IF bandwidth           | Min. 1Hz; Max. 5MHz, in 1, 2, 3, 5, 7 step                                                      |                   |        |
| Port connector type    | Type-N (female), 50-ohm system impedance<br>Type-N (female), 75-ohm system impedance (3656-H01) |                   |        |
| Number of test ports   | 2                                                                                               |                   |        |
| Number of test         | 4                                                                                               |                   |        |

|                                      |                                                                                          |
|--------------------------------------|------------------------------------------------------------------------------------------|
| receivers                            |                                                                                          |
| Reference level<br>amplitude setting | Setting range: $\pm 500\text{dB}$<br>Setting resolution: $0.001\text{dB}$                |
| Reference phase<br>setting           | Setting range: $\pm 500^\circ$<br>Setting resolution: $0.01^\circ$                       |
| Time-base<br>reference output        | Output frequency: $10\text{MHz}$                                                         |
| Digital interface                    | GPIB, USB, Ethernet interface and VGA display interface                                  |
| Operation system                     | Windows XP                                                                               |
| Display                              | 10.4-inch high brightness LCD                                                            |
| Test domain                          | Frequency domain, Time domain                                                            |
| Dimensions                           | 435×233×348 (W×H×D) (including foot pad, foot, lateral stripping, input and output port) |
| Power<br>consumption                 | 150W                                                                                     |
| Power supply                         | 50Hz single phase 220V or 50Hz/60Hz single phase 110V AC                                 |
| Weight                               | 16kg                                                                                     |

### 3656BA/B Technical Specifications:

| Parameters              | 3656BA                                                                                                                                                                       | 3656B                                                                                                                                                                         |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency range         | 100kHz ~ 6.8GHz                                                                                                                                                              | 100kHz ~ 8.5GHz                                                                                                                                                               |
| Frequency<br>resolution | 1Hz                                                                                                                                                                          | 1Hz                                                                                                                                                                           |
| Frequency<br>accuracy   | $\pm 5 \times 10^{-6} (23^\circ\text{C} \pm 3^\circ\text{C})$                                                                                                                | $\pm 5 \times 10^{-6} (23^\circ\text{C} \pm 3^\circ\text{C})$                                                                                                                 |
| System dynamic<br>range | <div> <div>(10Hz) (3kHz)</div> <div>100kHz~20MHz 110dB 80dB</div> <div>20MHz~3GHz 125 dB 95dB</div> <div>3GHz~6GHz 123dB 93dB</div> <div>6GHz~6.8GHz 118dB 88dB</div> </div> | <div> <div>(10Hz) (3kHz)</div> <div>100kHz~20MHz 110dB 80dB</div> <div>20MHz~3GHz 125 dB 95 dB</div> <div>3GHz~6GHz 123dB 93dB</div> <div>6GHz~8.5GHz 118dB 88dB</div> </div> |
| Reflection track        | <div>100kHz~3GHz <math>\pm 0.030\text{dB}</math></div> <div>3GHz~6GHz <math>\pm 0.040\text{dB}</math></div> <div>6GHz~6.8GHz <math>\pm 0.050\text{dB}</math></div>           | <div>100kHz~3GHz <math>\pm 0.030\text{dB}</math></div> <div>3GHz~6GHz <math>\pm 0.040\text{dB}</math></div> <div>6GHz~8.5GHz <math>\pm 0.050\text{dB}</math></div>            |
| Transmission<br>track   | <div>100kHz~3GHz <math>\pm 0.030\text{dB}</math></div> <div>3GHz~6GHz <math>\pm 0.040\text{dB}</math></div> <div>6GHz~6.8GHz <math>\pm 0.050\text{dB}</math></div>           | <div>100kHz~3GHz <math>\pm 0.030\text{dB}</math></div> <div>3GHz~6GHz <math>\pm 0.040\text{dB}</math></div> <div>6GHz~8.5GHz <math>\pm 0.050\text{dB}</math></div>            |

|                                   |                                                                                            |      |             |      |
|-----------------------------------|--------------------------------------------------------------------------------------------|------|-------------|------|
| Effective directivity             | 100kHz~3GHz                                                                                | 46dB | 100kHz~3GHz | 46dB |
|                                   | 3GHz~6GHz                                                                                  | 40dB | 3GHz~6GHz   | 40dB |
|                                   | 6GHz~6.8GHz                                                                                | 38dB | 6GHz~8.5GHz | 38dB |
| Effective source match            | 100kHz~3GHz                                                                                | 36dB | 100kHz~3GHz | 36dB |
|                                   | 3GHz~6GHz                                                                                  | 35dB | 3GHz~6GHz   | 35dB |
|                                   | 6GHz~6.8GHz                                                                                | 33dB | 6GHz~8.5GHz | 33dB |
| Effective load match              | 100kHz~3GHz                                                                                | 44dB | 100kHz~3GHz | 44dB |
|                                   | 3GHz~6GHz                                                                                  | 40dB | 3GHz~6GHz   | 40dB |
|                                   | 6GHz~6.8GHz                                                                                | 36dB | 6GHz~8.5GHz | 36dB |
| Test points                       | 1 to 16001                                                                                 |      |             |      |
| IF bandwidth                      | Min. 1Hz; Max. 5MHz, in 1, 2, 3, 5, 7 steps                                                |      |             |      |
| Port connector type               | Type-N (female), 50-ohm system impedance                                                   |      |             |      |
| Number of test ports              | 2                                                                                          |      |             |      |
| Number of test receivers          | 4                                                                                          |      |             |      |
| Reference level amplitude setting | Setting range: $\pm 500\text{dB}$                                                          |      |             |      |
|                                   | Setting resolution: 0.001dB                                                                |      |             |      |
| Reference phase setting           | Setting range: $\pm 500^\circ$                                                             |      |             |      |
|                                   | Setting resolution: 0.01°                                                                  |      |             |      |
| Time-base reference output        | Output frequency: 10MHz                                                                    |      |             |      |
| Digital interface                 | GPIB, USB, Ethernet interface and VGA display interface                                    |      |             |      |
| Operation system                  | Windows XP                                                                                 |      |             |      |
| Display                           | 10.4-inch high brightness LCD                                                              |      |             |      |
| Test domain                       | Frequency domain, Time domain                                                              |      |             |      |
| Dimensions                        | 436×236.5×345 (W×H×D) (including foot pad, foot, lateral stripping, input and output port) |      |             |      |
| Power consumption                 | 150W                                                                                       |      |             |      |
| Power supply                      | 50Hz single phase 220V or 50Hz/60Hz single phase 110V AC                                   |      |             |      |
| Weight                            | 16kg                                                                                       |      |             |      |

## 3656D Technical Specifications:

|                                            |                                                                                                                                           |        |        |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|
| Parameters                                 | 3656D                                                                                                                                     |        |        |
| Frequency range                            | 300kHz ~ 20GHz                                                                                                                            |        |        |
| Frequency resolution                       | 1Hz                                                                                                                                       |        |        |
| Frequency accuracy                         | $\pm 1 \times 10^{-6} (23^{\circ}\text{C} \pm 3^{\circ}\text{C})$                                                                         |        |        |
| System dynamic range<br>IF bandwidth(10Hz) | Frequency range                                                                                                                           | 2-port | 4-port |
|                                            | 300kHz~100MHz                                                                                                                             | 95dB   | 90 dB  |
|                                            | 100MHz~1GHz                                                                                                                               | 110dB  | 100 dB |
|                                            | 1GHz~6GHz                                                                                                                                 | 120dB  | 115 dB |
|                                            | 6GHz~8GHz                                                                                                                                 | 117dB  | 110 dB |
|                                            | 8GHz~10GHz                                                                                                                                | 115dB  | 105 dB |
|                                            | 10GHz~15GHz                                                                                                                               | 110dB  | 100 dB |
|                                            | 15GHz~20GHz                                                                                                                               | 100dB  | 90 dB  |
| Reflection tracking                        | 300kHz~10MHz $\pm 0.030\text{dB}$<br>10MHz~3GHz $\pm 0.040\text{dB}$<br>3GHz~20GHz $\pm 0.050\text{dB}$                                   |        |        |
| Transmission tracking                      | 300kHz~10MHz $\pm 0.030\text{dB}$<br>10MHz~3GHz $\pm 0.040\text{dB}$<br>3GHz~6GHz $\pm 0.100\text{dB}$<br>6GHz~20GHz $\pm 0.150\text{dB}$ |        |        |
| Effective directivity                      | 300kHz~10MHz    46dB<br>10MHz~3GHz    42dB<br>3GHz~6GHz    38dB<br>6GHz~20GHz    36dB                                                     |        |        |
| Effective source match                     | 300kHz~10MHz    37dB<br>10MHz~3GHz    37dB<br>3GHz~6GHz    31dB<br>6GHz~20GHz    28dB                                                     |        |        |
| Effective load match                       | 300kHz~10MHz    44dB<br>10MHz~3GHz    42dB<br>3GHz~6GHz    38dB<br>6GHz~20GHz    36dB                                                     |        |        |
| Test points                                | 1 to 16001                                                                                                                                |        |        |
| IF bandwidth                               | Min. 1Hz; Max. 5MHz, in 1, 2, 3, 5, 7 steps                                                                                               |        |        |
| Port connector                             | 3.5mm (male), 50-ohm system impedance                                                                                                     |        |        |

|                                   |                                                                                            |
|-----------------------------------|--------------------------------------------------------------------------------------------|
| type                              |                                                                                            |
| Number of test ports              | 2/4                                                                                        |
| Number of test receivers          | 2/4                                                                                        |
| Reference level amplitude setting | Setting range: $\pm 500\text{dB}$<br>Setting resolution: $0.001\text{dB}$                  |
| Reference phase setting           | Setting range: $\pm 500^\circ$<br>Setting resolution: $0.01^\circ$                         |
| Time-base reference output        | Output frequency: $10\text{MHz}$                                                           |
| Digital interface                 | GPIO, USB, Ethernet interface and VGA display interface                                    |
| Operation system                  | Windows XP                                                                                 |
| Display                           | 10.4-inch high brightness LCD                                                              |
| Test domain                       | Frequency domain, Time domain                                                              |
| Dimensions                        | 436×236.5×410 (W×H×D) (including foot pad, foot, lateral stripping, input and output port) |
| Power consumption                 | 150W                                                                                       |
| Power supply                      | 50Hz single phase 220V or 50Hz/60Hz single phase 110V AC                                   |
| Weight                            | 19.5kg                                                                                     |

### Ordering Information:

| Main unit | Description                            |
|-----------|----------------------------------------|
| 3656A     | Vector Network Analyzer(100kHz-3GHz)   |
| 3656BA    | Vector Network Analyzer(100kHz-6.8GHz) |
| 3656B     | Vector Network Analyzer(100kHz-8.5GHz) |
| 3656D     | Vector Network Analyzer(100kHz-20GHz)  |

## 3656A Ordering Information:

### ●Main Unit: 3656A Vector Network Analyzer

|                        | No.      | Standard Configuration/Option                                                                                                                     |
|------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Standard Configuration | 1        | Power cord ,1 piece                                                                                                                               |
|                        | 2        | USB mouse, 1 piece                                                                                                                                |
|                        | 3        | Quick start guide, 1 piece                                                                                                                        |
|                        | 4        | Certificate of conformity, 1 piece                                                                                                                |
| Option                 | 3656-H01 | 75Ω port impedance system<br>Notes: After choosing this option, the main unit will not have 50Ω port impedance system                             |
|                        | 3656-H02 | Type-N testing cable (GORE-OSZKU0240, dual male, 60cm)                                                                                            |
|                        | 3656-H03 | Type-N testing cable (GORE-OSZKUV0240, female male, 60cm)                                                                                         |
|                        | 3656-H04 | English options (Button, front panel, label)<br>Notes: After choosing this option, the main unit will not have Chinese button, front panel, label |
|                        | 3656-H05 | 20205 Type-N calibration kit (DC~3GHz)                                                                                                            |
|                        | 3656-H06 | 20204 Type-N 75Ω calibration kit                                                                                                                  |
|                        | 3656-H07 | Economical stable phase testing cable CETC41-N/J.SMA/J.197C-800(N to 3.5mm connector, dual male, 80cm)                                            |
|                        | 3656-H08 | Economical stable phase testing cable CETC41-N/J. N/K.197C-800(N type connector, female-male, 80cm)                                               |
|                        | 3656-H09 | Economical stable phase testing cable CETC41-N/J. N/J.197C-800(N type connector, dual male, 80cm)                                                 |
|                        | 3656-H10 | 75Ω testing cable 24-0800-51M1-51M1                                                                                                               |
|                        | 3656-H11 | 20402 Electronic calibration kit (300kHz~18GHz, Type-N (female-male), 2-port)                                                                     |
|                        | 3656-H12 | 20403 Electronic calibration kit (10MHz~26.5GHz, 3.5mm (female-male), 2-port)                                                                     |
|                        | 3656-H13 | 20405 Electronic calibration kit (10MHz~20GHz, 3.5mm (female), 4-port)                                                                            |
|                        | 3656-H14 | 3656 series user manuals in Chinese                                                                                                               |
|                        | 3656-H15 | 3656 series user manuals in English                                                                                                               |
|                        | 3656-H16 | Aluminum alloy transportation case                                                                                                                |
|                        | 3656-H17 | Front panel jumper (Supports 4-port extension and receiver through test)                                                                          |
|                        | 3656-H19 | Rackmount kit, easy to build system                                                                                                               |

## 3656B Ordering Information

### ●Main Unit: 3656B Vector Network Analyzer

|                        | No.      | Standard Configuration/Option                                                                                                                       |
|------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Standard Configuration | 1        | Power cord ,1 piece                                                                                                                                 |
|                        | 2        | USB mouse, 1 piece                                                                                                                                  |
|                        | 3        | Quick start guide, 1 piece                                                                                                                          |
|                        | 4        | Certificate of conformity, 1 piece                                                                                                                  |
| Option                 | 3656-H02 | Type-N testing cable ( GORE-OSZKU0240, dual male, 60cm )                                                                                            |
|                        | 3656-H03 | Type-N testing cable ( GORE-OSZKUV0240, female-male, 60cm )                                                                                         |
|                        | 3656-H07 | Economical stable phase testing cable CETC41-N/J.SMA/J.197C-800(Type-N to 3.5mm connector, dual male, 80cm)                                         |
|                        | 3656-H08 | Economical stable phase testing cable CETC41-N/J. N/K.197C-800(Type-N connector, female-male, 80cm)                                                 |
|                        | 3656-H09 | Economical stable phase testing cable CETC41-N/J. N/J.197C-800(Type-N connector, dual male, 80cm)                                                   |
|                        | 3656-H11 | 20402 Electronic calibration kits ( 300kHz~18GHz, Type-N (female-male), 2 port )                                                                    |
|                        | 3656-H12 | 20403 Electronic calibration kits ( 10MHz~26.5GHz, 3.5mm (female-male) , 2 port )                                                                   |
|                        | 3656-H13 | 20405 Electronic calibration kits ( 10MHz~20GHz, 3.5mm (female) , 4 port )                                                                          |
|                        | 3656-H14 | 3656 series user manuals in Chinese                                                                                                                 |
|                        | 3656-H15 | 3656 series user manuals in English                                                                                                                 |
|                        | 3656-H16 | Aluminum transportation case                                                                                                                        |
|                        | 3656-H19 | Rackmount kit, Easy to build system                                                                                                                 |
|                        | 3656-H20 | English options ( Button, front panel, label )<br>Notes: After choosing this option, the main unit will not have Chinese button, front panel, label |
|                        | 3656-H21 | 20201 Type-N calibration kit ( DC~9GHz )                                                                                                            |
|                        | 3656-H22 | 20202 3.5mm calibration kit ( DC~9GHz )                                                                                                             |
|                        | 3656-H23 | 32111 waveguide calibration kit ( 1.72~2.61GHz )                                                                                                    |
|                        | 3656-H24 | 32112 waveguide calibration kit ( 2.60~3.95GHz )                                                                                                    |
|                        | 3656-H25 | 32113 waveguide calibration kit ( 3.94~6.00GHz )                                                                                                    |
|                        | 3656-H26 | 32114 waveguide calibration kit ( 4.64~7.05GHz )                                                                                                    |
|                        | 3656-H27 | 32115 waveguide calibration kit ( 5.88~8.17GHz )                                                                                                    |
|                        | 3656-H28 | 32116 waveguide calibration kit ( 7.00~10.0GHz )                                                                                                    |
|                        | 3656-H29 | Front panel jumper ( Supports 4-port extension and receiver through test )                                                                          |
|                        | 3656-S01 | Production test software (optional for 3656B vector network analyzer)                                                                               |

## 3656D Ordering Information

### ●Main Unit: 3656D Vector Network Analyzer

|                        | No.      | Standard Configuration/Option                                                                                                                       |
|------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Standard Configuration | 1        | Power cord ,1 piece                                                                                                                                 |
|                        | 2        | USB mouse, 1 piece                                                                                                                                  |
|                        | 3        | Quick start guide, 1 piece                                                                                                                          |
|                        | 4        | Certificate of conformity, 1 piece                                                                                                                  |
| Option                 | 3656-H12 | 20403 Electronic calibration kits                                                                                                                   |
|                        | 3656-H13 | 20405 Electronic calibration kits                                                                                                                   |
|                        | 3656-H14 | 3656 series user manuals in Chinese                                                                                                                 |
|                        | 3656-H15 | 3656 series user manuals in English                                                                                                                 |
|                        | 3656-H19 | Rackmount kit                                                                                                                                       |
|                        | 3656-H30 | 31121 3.5mm calibration kits                                                                                                                        |
|                        | 3656-H31 | 87308 3.5NMD/3.5mm-KJ testing cable                                                                                                                 |
|                        | 3656-H32 | 87308A 3.5NMD/3.5mm-KK testing cable                                                                                                                |
|                        | 3656-H33 | FB0HA0HB025.0 3.5mm GORE testing cable                                                                                                              |
|                        | 3656-H34 | FB0HA0HC025.0 3.5mm GORE testing cable                                                                                                              |
|                        | 3656-H35 | English options ( Button, front panel, label )<br>Notes: After choosing this option, the main unit will not have Chinese button, front panel, label |
|                        | 3656-H36 | 20GHz 4-port option                                                                                                                                 |
|                        | 3656-H37 | 20GHz 4-port English option                                                                                                                         |
|                        | 3656-H38 | Aluminum transportation case                                                                                                                        |

**Ceyear**  
Focus on Measurement  
Explore the Future

**CEYEAR TECHNOLOGIES CO., LTD**

Tel: +86 532 86896691  
Email: [sales@ceyear.com](mailto:sales@ceyear.com)  
<http://www.ceyear.com>