



Version
01.00

September
2005

Vector Network Analyzer R&S®ZVA

High-end network analyzer up to 8 GHz/24 GHz with two or four test ports

- ◆ High output power typ. >15 dBm
- ◆ Wide dynamic range typ. >135 dB
- ◆ High measurement speed
<3.5 μ s per test point
- ◆ Balanced measurements
- ◆ Linear and nonlinear amplifier and
mixer measurements
- ◆ Versatile calibration techniques
TOSM, TRL/LRL, TOM, TRM, TNA
- ◆ Automatic calibration unit

Versatile – powerful – future-proof – user-friendly

More than 100 channels and traces
Display of measurement parameters using a variety of stimulus conditions

Control by mouse or hardkeys/softkeys
Convenient user interface with wizards, context menus and extensive analysis functions

Undo/Redo
Cancels the last one to six entries

Online help
Context-sensitive including remote-control commands

Measurement wizard
Guides you step by step through the test setup you want

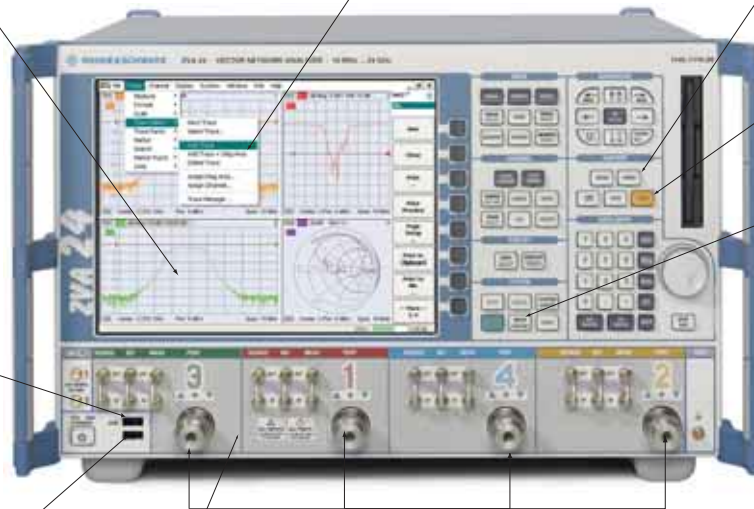
Connector for R&S®NRP
Power calibration and scalar network analysis

Connector for calibration unit
High-speed, error-free automatic calibration

Two independent generators
Simple test configuration and high speed for multitone measurements

Direct access to all generator and receiver paths
Enhanced sensitivity and dynamic range for the connection of external test sets, e.g. for high-power applications

Wide range of connectors and interfaces (rear panel)
LAN
IEEE
USB
VGA
USER CONTROL (for synchronizing external components, e.g. handlers, with the analyzer's internal measurement sequences)



Condensed data

Number of test ports	2 or 4
Frequency range	300 kHz to 8 GHz (R&S®ZVA 8) 10 MHz to 24 GHz (R&S®ZVA 24)
Measurement time per test point	<3.5 μs
Measurement time (201 test points)	4.5 ms
Data transfer time (201 test points)	
Via IEC/IEEE bus	<2.9 ms
Via VX11 over 100 Mbit/s LAN	<1.3 ms
Via RSIB over 100 Mbits/s LAN	<0.7 ms
Switching time	
Between channels	<1 ms
Between instrument setups	<10 ms

Dynamic range at 10 Hz measurement bandwidth	
Between test ports	typ. >135 dB
With direct receiver access	typ. >145 dB
Output power at test port	>13 dBm, typ. 15 dBm
Power sweep range	>40 dB, typ. 50 dB
IF bandwidths	1 Hz to 1 MHz
Number of channels, diagrams, traces	>100 each ¹⁾
Number of test points per trace	2 to 20001
Operating system	Windows XP Embedded

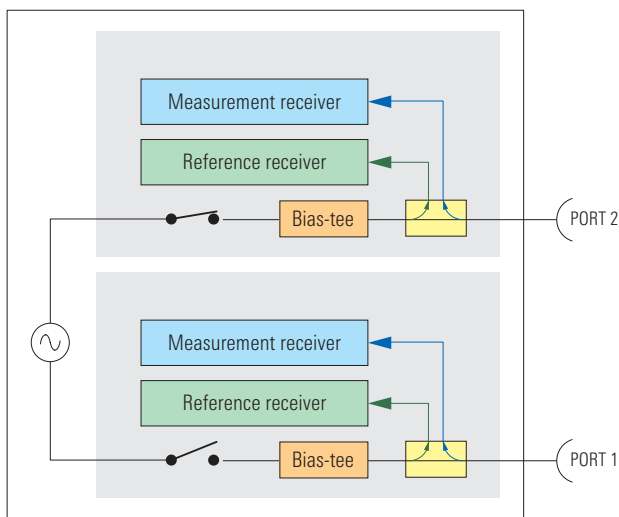
¹⁾ Limited by available RAM capacity.

Technological progress in RF and microwave engineering means that network analyzers in development and production continuously have to meet new demands for ease of operation, flexibility and performance.

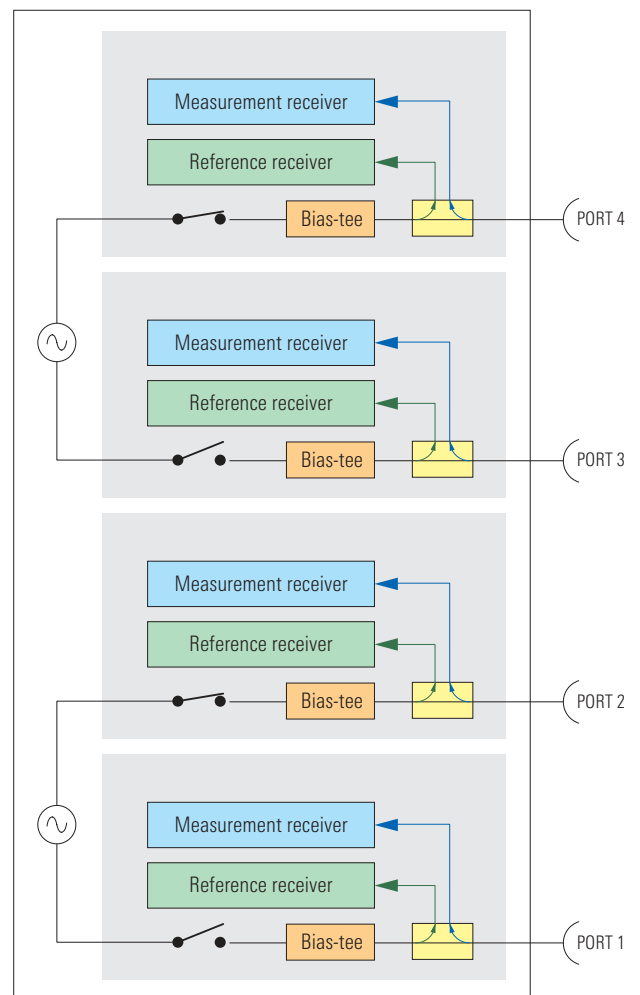
With its new R&S®ZVA family of vector network analyzers, Rohde & Schwarz is taking a future-oriented approach. The analyzers offer a perfect balance between measurement speed, dynamic range, flexibility and precision, making them ideal for present and future measurement tasks.

Rohde & Schwarz previously set standards in RF and microwave measurements with its R&S®ZVR family of network analyzers, and now continues this success with the R&S®ZVA. The fundamental mixing concept employed by the analyzer's receivers ensures high sensitivity and a wide dynamic range. Extremely fast synthesizers make for short measurement times.

Its excellent characteristics, new functionality, sophisticated GUI and extremely high flexibility make the R&S®ZVA an indispensable tool for demanding measurement tasks in labs and production.



Block diagram of the R&S®ZVA two-port model



Block diagram of the R&S®ZVA four-port model

Display and analysis functions – user-friendly and flexible

State-of-the-art DUTs feature a steadily increasing number of complex functions and ports, which also places higher demands on the instrument's display capabilities. The R&S®ZVA provides highly versatile functions for displaying results in a straightforward manner.

Virtually unlimited number of channels and traces

Over 100 traces can be combined in any manner within the individual diagrams and assigned to over 100 different channels¹⁾. DUTs can thus be measured using a wide variety of stimulus conditions, and all parameters of interest can be displayed on the screen. The names of traces, channels and markers can be edited and replaced by user-specific names to make them easier to identify.

Convenient equation editor for complex trace mathematics

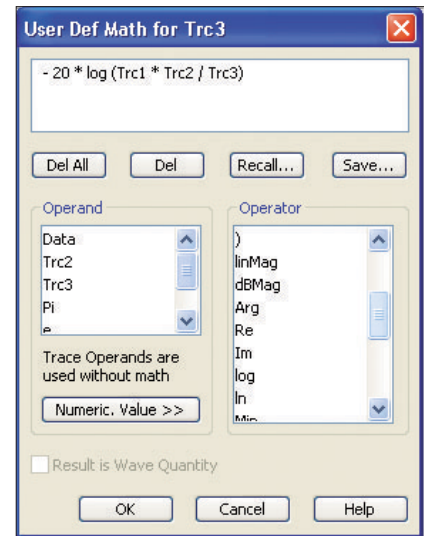
The R&S®ZVA includes a universal equation editor for trace mathematics with complex functions. Using these functions, you can link any active traces and stored traces in a variety of ways in realtime. This makes external analysis programs unnecessary. You can store the equations you have generated, process them by means of external tools and reload them as required.



Flexible channel and trace layout

Easy export and import of results

The use of the Windows XP Embedded operating system, in conjunction with a variety of interfaces, makes it easy to integrate measurement results into documentation by saving screen contents as *.bmp, *.png, *.jpg or *.emf files, and exporting these files into a text processing system. Trace data can be stored as *.snp, *.csv or *.dat files and subsequently analyzed and processed using other tools. In addition, *.snp and *.csv files created by means of external tools, for example, can be imported into the R&S®ZVA as stored trace data.



Equation editor

¹⁾ A channel designates an independent set of test parameters including, for example, the sweep mode, test point spacing, power, measurement bandwidth and calibration technique. The number of channels is limited only by the instrument's RAM capacity.

High measurement throughput

Wide dynamic range for fast and accurate measurements

The R&S®ZVA sets new standards in measurement speed. Its large IF bandwidths and fast synthesizers combine to yield short measurement times and thus high throughput in manual adjustments and automated production sequences. The measurement time per test point is less than 3.5 μ s in the CW mode; a frequency sweep over 200 test points takes less than 5 ms.

Due to the analyzer's wide dynamic range and low phase noise, this speed advantage does not compromise measurement accuracy.

With more than 100 independent channels and traces configurable on the R&S®ZVA, you can perform comprehensive function tests on complex components in a minimum of time. The time-consuming loading of new instrument setups is a thing of the past.

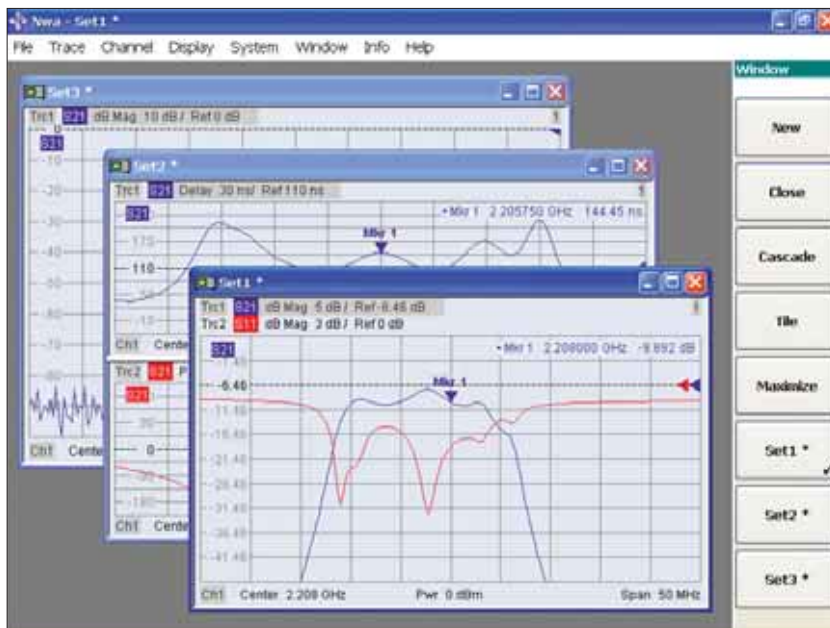


Dynamic range between test ports at 10 Hz IF bandwidth

Segmented sweep for optimized speed, accuracy and dynamic range

The segmented sweep function allows you to divide a sweep into a virtually unlimited number of segments. Sweep parameters such as test point spacing, measurement bandwidth and

generator power can be defined separately for each segment and thus accurately matched to the DUT characteristic. Measurement speed and accuracy can thus be further optimized.



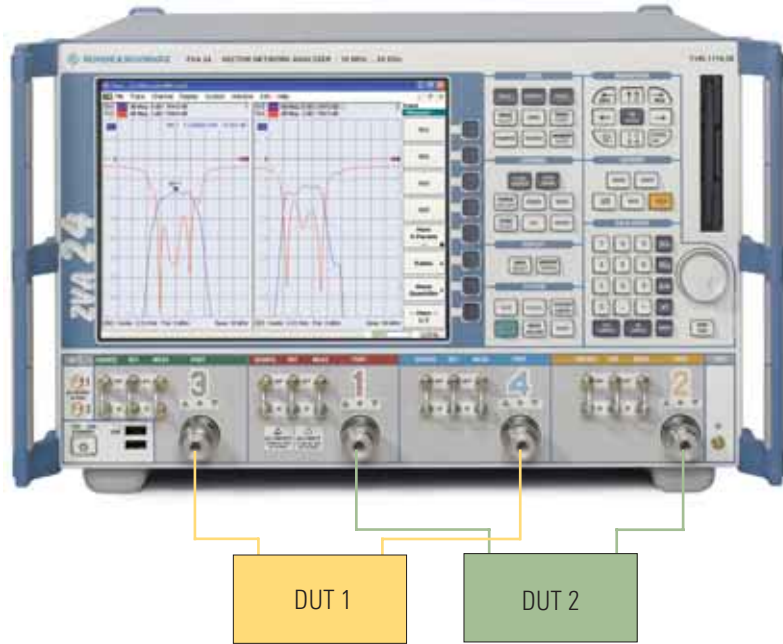
Switching between setups at the click of a mouse

Fast switching between instrument setups

When analyzing several DUTs, you no longer have to load the required instrument setups from the hard disk one after the other. Once called, setups remain available in RAM, including data to be calculated, e.g. calibration values to be obtained by interpolation. You can therefore switch between setups virtually without delay, i.e. in less than 10 ms. With conventional instruments, recalling setups can take up to one second. Each setup is represented by a separate measurement window. To select between windows, simply use the mouse or press a key.

Parallel measurements – up to four times faster

The generator concept of the R&S®ZVA allows each test port to be operated as a source and a receiver at the same time. Test ports can thus be organized in groups. The measurements carried out on the individual test port groups are synchronized with each other. Several DUTs, or several paths of one DUT, can thus be measured in parallel. Therefore, measurement speed will double when measuring two two-port DUTs in parallel and quadruple when measuring four one-port DUTs in parallel.



Data transfer simultaneous with sweep

Since trace data is transferred via the IEC/IEEE bus or LAN at the same time measured data is being captured, data transfer time on the R&S®ZVA is insignificant.

Channel bits – high-speed control of external components

To speed up automatic test cycles even further, a special port for trigger I/O signals is provided on the rear panel. These signals directly synchronize external components of a test setup or the settings of a DUT with the internal measurement sequences of the R&S®ZVA.

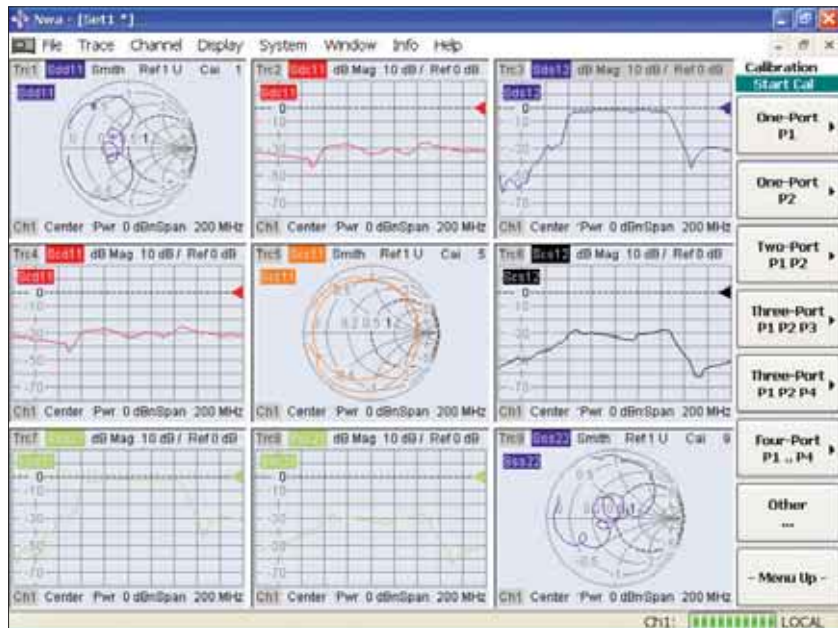
Measurements on multiports and balanced components

The R&S®ZVA characterizes balanced DUTs with one or two balanced ports quickly and accurately. The balanced DUT is directly connected to the analyzer test ports. Its unbalanced S-parameters are measured, and the mixed-mode S-parameters are calculated from these values. The numerous traces and diagrams offered by the R&S®ZVA provide

Parallel measurements

a quick and straightforward overview of all mixed-mode S-parameters of a DUT with balanced ports only or with mixed single-ended and balanced ports. No sophisticated settings are required on the part of the user.

Convenient marker search and analysis functions facilitate result evaluation especially in the case of filter measurements, for example by determining the filter parameters such as bandwidth, ripple, quality factor, etc.



Display of mixed-mode S-parameters of a SAW filter

Measurement wizard – step by step to the test setup you want

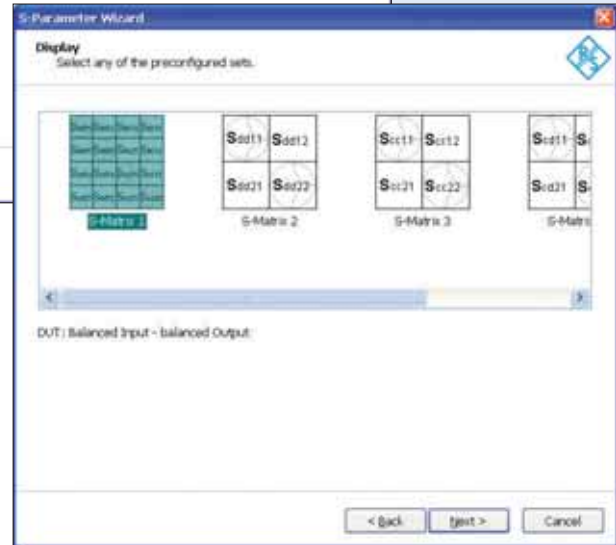
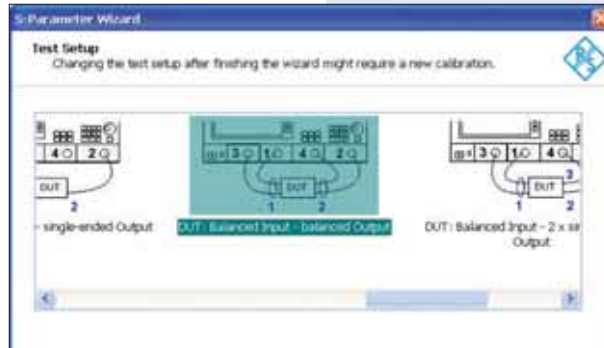
Measuring multiports and balanced DUTs by means of a network analyzer usually requires major configuration effort on the part of the user, for example for configuring the port topology, selecting the parameters to be displayed, setting the sweep mode or choosing the appropriate calibration technique. A measurement wizard guides you step by step through the test setup to create the configuration you want, queries all necessary inputs and offers default settings for the measurement task at hand. Using the wizard, you can completely configure the R&S®ZVA to display all 16 mixed-mode S-parameters of a balanced two-port in virtually no time.

Embedding/deembedding – impedance matching using virtual networks

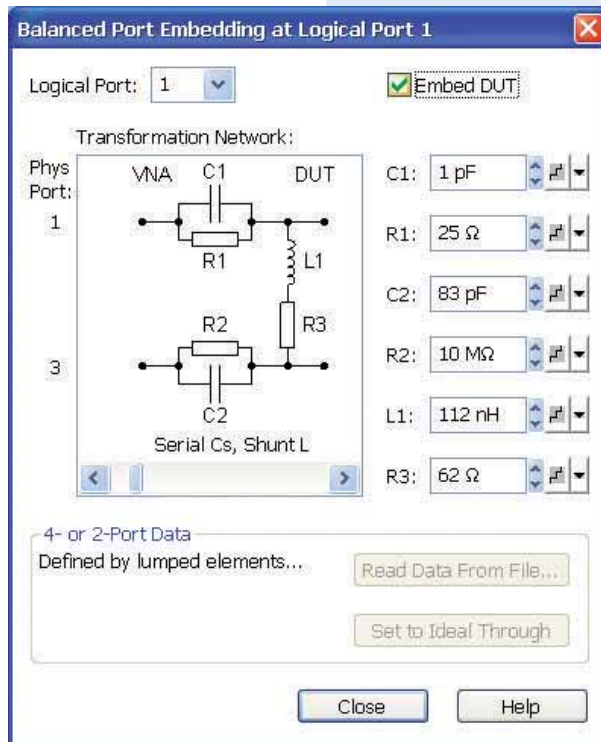
Coaxial and balanced components such as SAW filters, which are used in front-ends of mobile phones, for example, must be specified together with the networks that match them to the impedance of the surrounding circuit. Using special algorithms, the R&S®ZVA embeds the DUT in virtual matching networks, and also deembeds it to eliminate parasitic effects such as caused by strip lines.

The R&S®ZVA offers various types of transformation network. The values of the network elements can be edited. If you modify values of individual elements, the R&S®ZVA immediately recalculates the network and embeds the DUT in the new network in quasi-realtime.

Alternatively, you can read *.s2p and *.s4p files generated with CAE tools into the R&S®ZVA and use the data for embedding/deembedding.



Typical configuration steps with the measurement wizard



Parameterizable network for virtual impedance matching

Versatile calibration techniques for all fields of application

The R&S®ZVA not only offers classic TOSM calibration (Through, Open, Short, Match), but also a variety of other calibration techniques. Since each test port of the R&S®ZVA is equipped with a reference receiver of its own, modern 7-term calibration techniques can be used. These include TRL/LRL (Through, Reflect, Line/Line, Reflect, Line), TOM (Through, Open, Match), TNA (Through, Network, Attenuator) and TRM (Through, Reflect, Match), which are suitable for calibration in test fixtures or on wafers. Since calibration is performed directly on the DUT plane, any effects from the test fixture are eliminated.

Automatic calibration – fast, error-free and with high precision

While all manual calibration techniques such as TOSM, TRM and TRL can be used for multipoint measurements, they are time-consuming, error-prone and lead to excessive wear of the calibration standard. Rohde & Schwarz offers an automatic calibration unit for coaxial one-port and multipoint calibration. The unit is ready to operate immediately after being connected and performs complete four-port calibration covering 201 test points in less than 30 seconds.

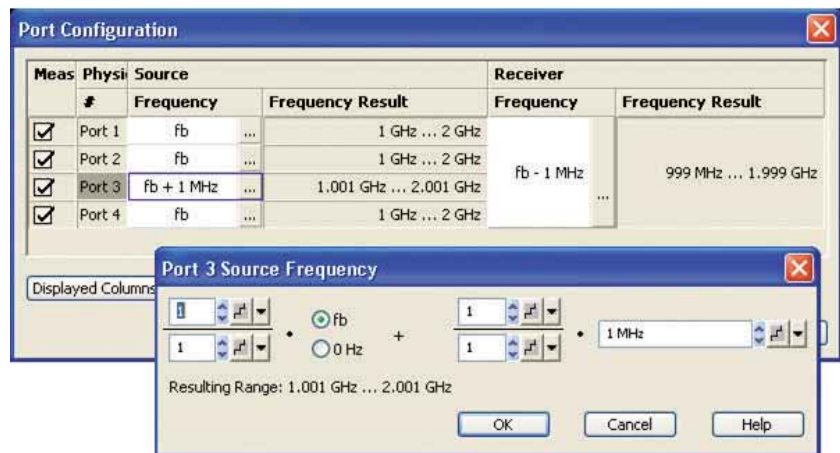
Amplifier and mixer measurements

The R&S®ZVA system concept, featuring independent synthesizers, enables measurements on frequency-converting DUTs such as amplifiers, mixers and frontends. The measurements stand out for their high versatility, wide dynamic range, high speed and accuracy.

Internal as well as several external generators can be configured, calibrated and controlled independently of one another. The high spectral purity of the source signals as well as the high intercept point and high sensitivity of the receivers eliminate the need for external filters in multi-tone measurements and measurements on frequency-converting DUTs.

Large- and small-signal behavior in a single sweep

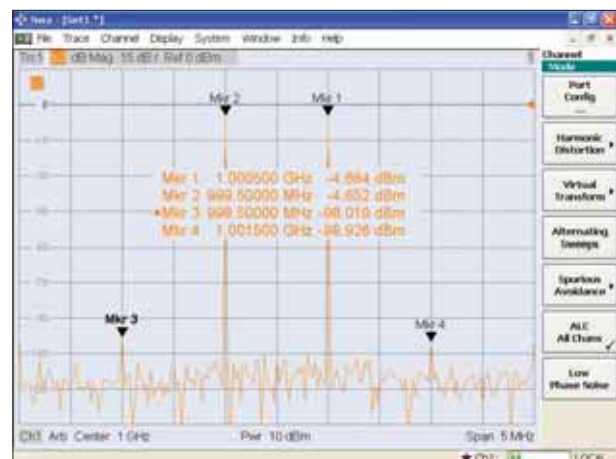
The R&S®ZVA's high output power and wide power sweep range of more than 40 dB (typ. 50 dB) allow the transmission and compression characteristics of amplifiers and mixers to be determined without any additional preamplifiers being required. This measurement is carried out simply and quickly versus frequency and power. The power sweep range is traversed wear-free and without interruption, since no mechanical attenuators have to be switched. The behavior of small and large signals can thus be displayed in a single sweep.



Dialog for configuring multitone measurements



Calibration unit



Intermodulation products of a frontend

Second internal source for quick and easy intermodulation measurements

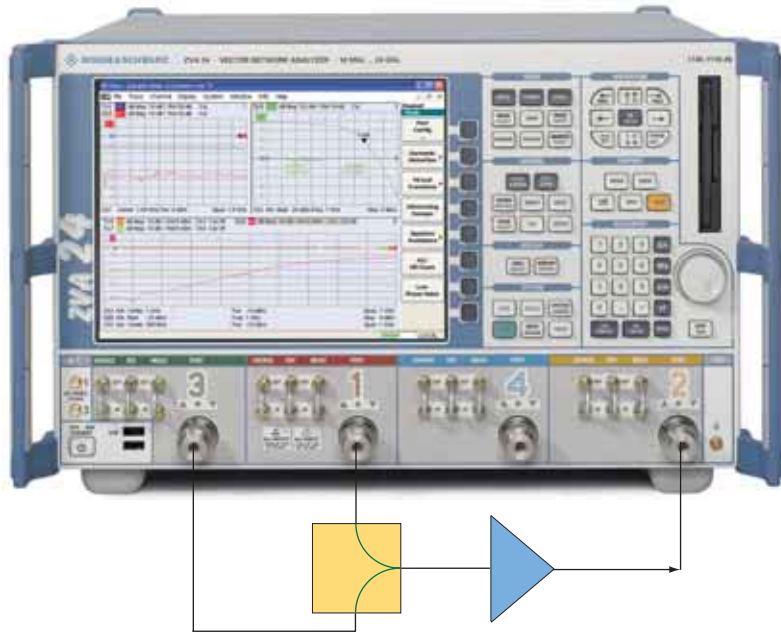
The R&S®ZVA four-port model provides a second independent source; therefore, intermodulation measurements on amplifiers and conversion gain measurements on mixers can be performed without an external generator. The R&S®ZVA receivers feature very good power-handling capability and low phase noise, which enables high-quality intermodulation measurements requiring only a minimum of external components.

Hot S-parameter measurements – optimization of amplifiers under load conditions

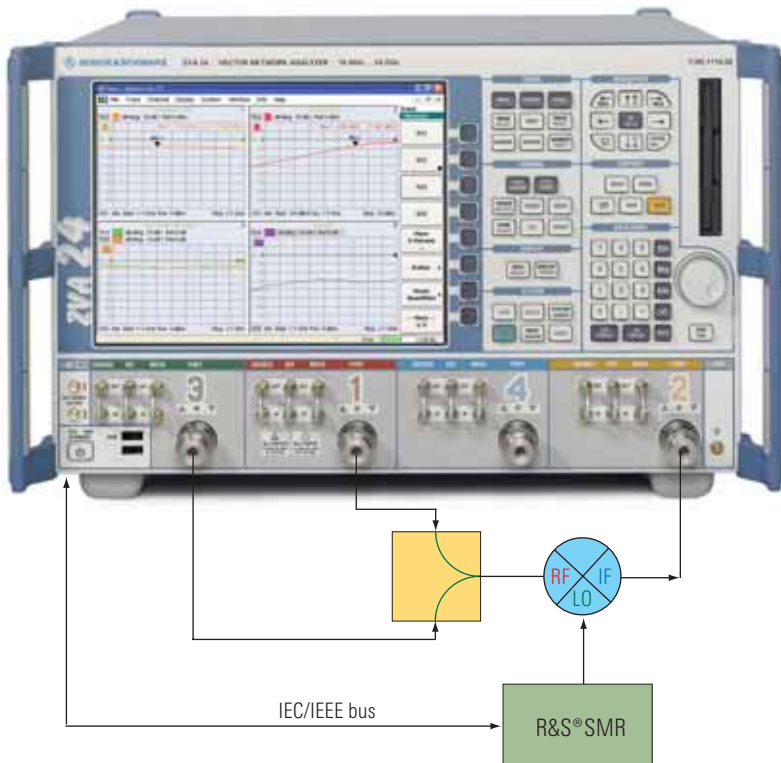
Power amplifiers must be characterized under full load condition to ensure that they are optimally matched to the load connected to their output. You can determine S22 by applying a signal with a small frequency offset to the DUT input while S22 is measured at the output. The R&S®ZVA performs this measurement with a wide dynamic range due to the robust automatic level control and the high selectivity and sensitivity of its receivers.

Conversion gain and intermodulation measurements on mixers at high speed and with wide dynamic range

The four-port R&S®ZVA requires only one additional external source to perform intermodulation measurements on mixers. The source is controlled via the analyzer’s LAN or IEC/IEEE bus interface. Using the frequency conversion option (R&S®ZVA-K4), you can display a mixer’s matching, conversion gain, isolation, group delay and intermodulation products versus frequency and power.



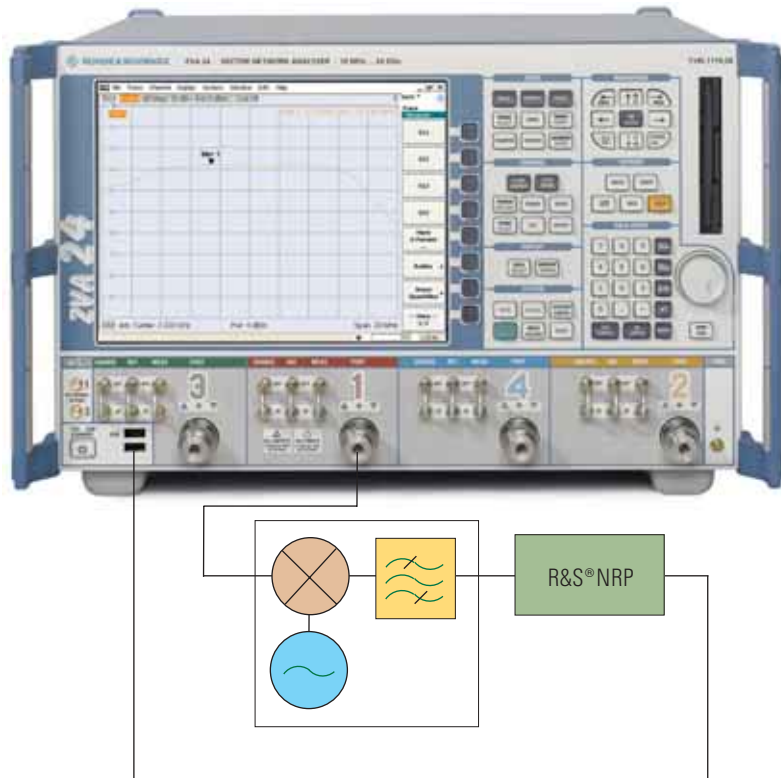
Test setup for an amplifier measurement - intermodulation products, S-parameters, compression and harmonics



Test setup for a mixer measurement – conversion loss, isolation, matching and intermodulation products

Scalar network analysis by means of the R&S®NRP

One or several power meters of the R&S®NRP series can be directly connected to the R&S®ZVA via the USB interface and are treated by the R&S®ZVA like additional test ports. The R&S®ZVA processes the measured values and displays them as a trace or traces versus frequency or power. This allows measurements on frequency-converting DUTs to be performed without access to, or knowledge of, the DUT's internal LO, same as with a scalar network analyzer.



Test setup for a scalar mixer measurement

Features for amplifier measurements	Features for mixer measurements
<ul style="list-style-type: none"> ◆ Bias-tees at all test ports ◆ High output power at all test ports ◆ Wide power sweep range ◆ High 0.1 dB compression point ◆ RMS and peak detector ◆ Determination of n-dB compression point ◆ Second independent source (four-port model) for conversion gain and intermodulation measurements ◆ Power added efficiency (PAE) measurement ◆ Measurement of efficiency and stability factors ◆ DC inputs for measuring supply currents and power detector characteristics ◆ Intermodulation measurement versus frequency and power (R&S®ZVA-K4) ◆ Hot S-parameter measurements (R&S®ZVA-K4) ◆ Generator and receiver step attenuators for expanding the usable power range (R&S®ZVA-B2x/-B3x) ◆ Power measurement with the R&S®NRP 	<ul style="list-style-type: none"> ◆ Conversion loss/gain, compression, intermodulation, isolation and matching measurements versus frequency and power ◆ Relative phase and group delay measurements ◆ Second internal source available as LO for conversion gain measurements ◆ Control of external generators from Rohde & Schwarz and other manufacturers ◆ Editable ASCII driver file for creating customized drivers ◆ Scalar network analysis by means of the R&S®NRP

Options for enhanced flexibility, power and dynamic range

Direct generator and receiver access for all ports

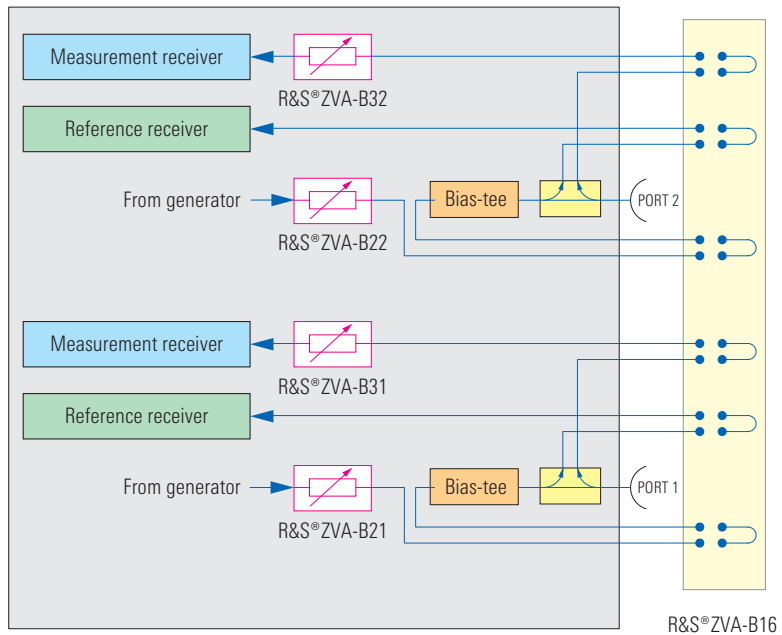
With the direct generator/receiver access options, the signal paths of the receivers and generators are taken directly to the front panel. You have direct access to the generators and receivers of all reflectometers, since the internal couplers are bypassed. With a fully configured R&S®ZVA, i.e. with four ports, all eight receivers can capture and process measurement data in parallel.

Generator and receiver step attenuators are optionally available for each port to expand the usable generator and receiver power ranges for compression and intermodulation measurements. The output power range at the test port will then be -100 dBm to $+13\text{ dBm}$, for example; the compression-free input power range of the receiver will increase to $+27\text{ dBm}$.

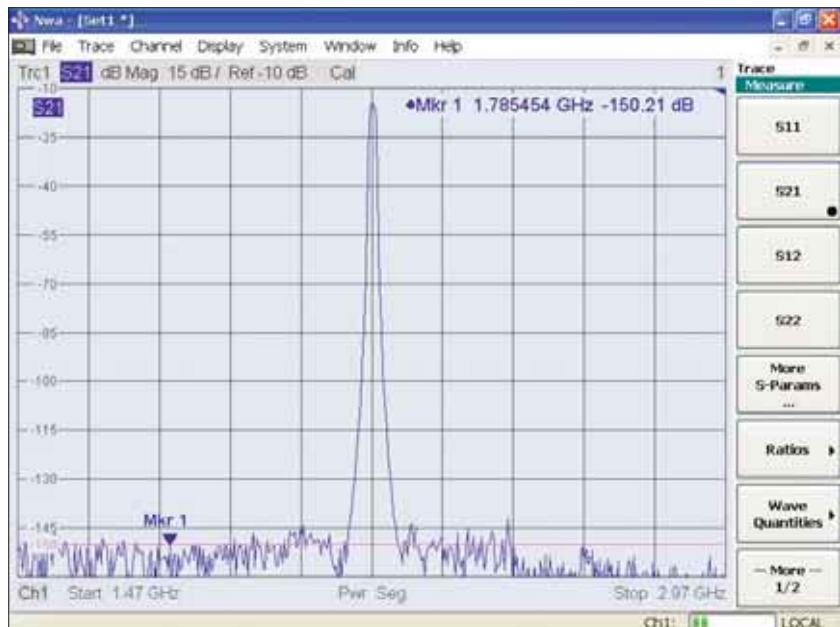
Up to 150 dB dynamic range with direct receiver access

Since the couplers are bypassed and therefore introduce no attenuation, sensitivity is increased by up to 10 dB in the "direct mode". This means that high-blocking DUTs can be measured with a dynamic range of 150 dB at 1 Hz IF bandwidth.

By connecting suitable external directional couplers, one- and two-port calibration techniques can be used to enhance measurement accuracy without any significant loss in dynamic range.



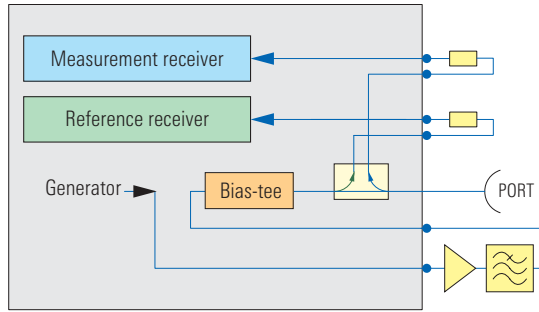
Direct generator and receiver access options (blue); generator and receiver step attenuator options (red)



Typical dynamic range with direct receiver access

Output power boosted to +20 dBm for amplifier measurements

Direct access to all generator and receiver paths allows the flexible configuration of complex external test sets. Such test sets may include filters for improved harmonic suppression or amplifiers for boosting the output power. The output power can be increased to +20 dBm by connecting an amplifier to each test port.



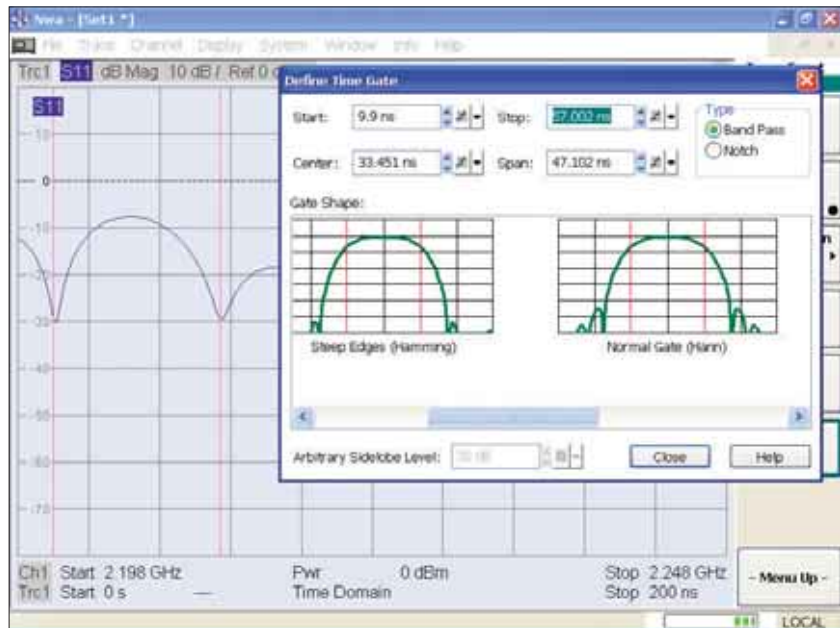
R&S®ZVA with an external test set including an amplifier and a harmonics filter

By connecting external components (e.g. amplifiers) ahead of the reference path, drift and temperature response are eliminated in S-parameter measurements. Moreover, all calibration techniques are available, and the user fully benefits from the advantages of high measurement accuracy and long-term stability.

High-speed time domain analysis for filter adjustments and discontinuity location

Using the time domain option, you can, for example, locate discontinuities in test fixtures and cables and eliminate them by way of gating. You can display impedance versus length, which is of interest in cable measurements. Due to the R&S®ZVA's high computing power, the time domain option does not slow down sweep speed. Cavity resonator filters can therefore be adjusted quickly and easily using this option.

The time domain option can be used in conjunction with various window functions such as Hamming, Hann, Bohman or Dolph-Chebyshev.



Filter adjustment with the time domain option

Options

Designation	Type	Function
Oven Quartz (OCXO)	R&S®ZVAB-B4	Enhanced frequency accuracy
Time Domain (TDR)	R&S®ZVAB-K2	Location of discontinuities or determination of impedance characteristic versus time/length, reflection and transmission measurements, gating function for eliminating discontinuities
Generator Step Attenuator for Port 1/2/3/4	R&S®ZVA8-B21/22/23/24 R&S®ZVA24-B21/22/23/24	Generator step attenuators for test ports 1 to 4; 70 dB in steps of 10 dB; $P_{min} = <-100$ dBm
Receiver Step Attenuator for Port 1/2/3/4	R&S®ZVA8-B31/32/33/34 R&S®ZVA24-B31/32/33/34	Receiver step attenuators for test ports 1 to 4; 35 dB in steps of 5 dB; $P_{max} = 27$ dBm
Direct Generator/Receiver Access (all ports), 2-/4-Port Model	R&S®ZVA8-B16 R&S®ZVA24-B16	Direct access to the R&S®ZVA internal generators and receivers for all ports of the analyzer (internal couplers are bypassed)
Frequency Conversion	R&S®ZVA-K4	Measurements on frequency-converting DUTs: conversion gain, harmonics and intermodulation measurements on mixers and amplifiers; Option R&S®ZVAB-B44 recommended for control of external generators
USB-to-IEC/IEEE Adapter	R&S®ZVAB-B44	For controlling external generators with an IEC/IEEE or LAN interface by means of the R&S®ZVA

Functions (overview)

Function	Description
Active test set (PORT BIAS)	Input of DC power or voltage for supply of amplifiers via inner conductor of test port; requires external DC power supply
DC MEAS inputs	Measurement inputs for DC voltage, e.g. for determining supply currents and voltages; allows power added efficiency (PAE) measurements
Segmented sweep, lin/log sweep	Optimization of sweep speed and accuracy by focusing on frequency bands of interest
Marker functions, trace statistics	Automatic determination of filter parameters, statistical trace analysis
Limit lines	Generation of limit lines from traces; import and export of data for limit lines
Compression measurement	Display of n-dB compression point
CW mode	Fast measurements of less than 3.5 μ s per test point; for measurements on pulsed components
Trigger functions	Starting of a sweep, sweep segment, test point or partial measurement by a trigger event
Power calibration	Enhanced absolute power accuracy of generators and receivers through calibration using external power meters
Control of external generators	Control of SCPI-compatible Rohde & Schwarz or Agilent generators (e.g. R&S®SMR, R&S®SMP, R&S®SML, R&S®SMU, Agilent ESG, etc); for mixer and intermodulation measurements ¹⁾
Control of external power meters	Control of R&S®NRP; for exact power measurements, power calibration and scalar network analysis
External tools	Generation of macros as well as control and analysis programs
Online support functions	Online help for current function; UNDO function for resetting the last entries; Windows XP key for accessing the operating system; complete listing of current instrument setup including calibration

¹⁾ The user can create customized driver files for controlling devices not supported by the R&S®ZVA.

Interface description

Interface	Function
LAN 1	Control of the R&S®ZVA or subnetwork with the R&S®ZVA as the master, 8-pin RJ-45 connector
LAN 2	Control of the R&S®ZVA or subnetwork with the R&S®ZVA as the master, 8-pin RJ-45 connector
IEC-BUS	Remote control of the R&S®ZVA
PORT BIAS	Input of DC power for supply of amplifiers via inner conductor of test port; one input and fuse per RF port; BNC connectors
USB	Standard 1.1 USB double port (for mouse, keyboard, printer, storage media, etc)
10 MHz REF	Reference frequency I/O: 10 MHz reference can be input from, or output to, external devices; BNC connector
DC MEAS	Measurement inputs for DC voltage and PAE measurements; input voltage ranges ± 1 V and ± 10 V; Mini DIN connectors; required cable: R&S®ZV-Z71 (option)
MONITOR	For external VGA monitors; standard VGA connector
USER CONTROL	TTL I/O signals: sweep status indication, pass/fail indication, indication of active test port, indication of active channel by channel bits, trigger signals for fast control of external devices, e.g. generators, handshake with handlers, sequence control without programming effort; 25-pin D-Sub connector
EXT TRIGGER	Input of external TTL trigger signal for starting a sweep, sweep segment, test point or partial measurement; BNC connector



Rear view of the R&S®ZVA24

Ordering information

Designation	Type	Frequency range	Order No.
Base units¹⁾			
Vector Network Analyzer, 2 ports, 24 GHz	R&S®ZVA24	10 MHz to 24 GHz	1145.1110.24
Vector Network Analyzer, 4 ports, 24 GHz	R&S®ZVA24	10 MHz to 24 GHz	1145.1110.26
Vector Network Analyzer, 2 ports, 8 GHz	R&S®ZVA8	300 kHz to 8 GHz	1145.1110.08
Vector Network Analyzer, 4 ports, 8 GHz	R&S®ZVA8	300 kHz to 8 GHz	1145.1110.10
Options			
Direct Generator/Receiver Access, 2-Port Model, 24 GHz	R&S®ZVA24-B16	10 MHz to 24 GHz	1164.0209.24
Direct Generator/Receiver Access, 4-Port Model, 24 GHz	R&S®ZVA24-B16	10 MHz to 24 GHz	1164.0209.26
Direct Generator/Receiver Access, 2-Port Model, 8 GHz	R&S®ZVA8-B16	300 kHz to 8 GHz	1164.0209.08
Direct Generator/Receiver Access, 4-Port Model, 8 GHz	R&S®ZVA8-B16	300 kHz to 8 GHz	1164.0209.10
Generator Step Attenuator, Port 1, for R&S®ZVA24	R&S®ZVA24-B21	10 MHz to 24 GHz	1164.0109.02
Generator Step Attenuator, Port 2, for R&S®ZVA24	R&S®ZVA24-B22	10 MHz to 24 GHz	1164.0115.02
Generator Step Attenuator, Port 3, for R&S®ZVA24	R&S®ZVA24-B23	10 MHz to 24 GHz	1164.0121.02
Generator Step Attenuator, Port 4, for R&S®ZVA24	R&S®ZVA24-B24	10 MHz to 24 GHz	1164.0138.02
Generator Step Attenuator, Port 1, for R&S®ZVA8	R&S®ZVA8-B21	300 kHz to 8 GHz	1164.0009.02
Generator Step Attenuator, Port 2, for R&S®ZVA8	R&S®ZVA8-B22	300 kHz to 8 GHz	1164.0015.02
Generator Step Attenuator, Port 3, for R&S®ZVA8	R&S®ZVA8-B23	300 kHz to 8 GHz	1164.0021.02
Generator Step Attenuator, Port 4, for R&S®ZVA8	R&S®ZVA8-B24	300 kHz to 8 GHz	1164.0038.02
Receiver Step Attenuator, Port 1, for R&S®ZVA24	R&S®ZVA24-B31	10 MHz to 24 GHz	1164.0144.02
Receiver Step Attenuator, Port 2, for R&S®ZVA24	R&S®ZVA24-B32	10 MHz to 24 GHz	1164.0150.02
Receiver Step Attenuator, Port 3, for R&S®ZVA24	R&S®ZVA24-B33	10 MHz to 24 GHz	1164.0167.02
Receiver Step Attenuator, Port 4, for R&S®ZVA24	R&S®ZVA24-B34	10 MHz to 24 GHz	1164.0173.02
Receiver Step Attenuator, Port 1, for R&S®ZVA8	R&S®ZVA8-B31	300 kHz to 8 GHz	1164.0044.02
Receiver Step Attenuator, Port 2, for R&S®ZVA8	R&S®ZVA8-B32	300 kHz to 8 GHz	1164.0050.02
Receiver Step Attenuator, Port 3, for R&S®ZVA8	R&S®ZVA8-B33	300 kHz to 8 GHz	1164.0067.02
Receiver Step Attenuator, Port 4, for R&S®ZVA8	R&S®ZVA8-B34	300 kHz to 8 GHz	1164.0073.02
Oven Quartz (OCXO)	R&S®ZVAB-B4		1164.1757.02
Time Domain (TDR)	R&S®ZVAB-K2		1164.1657.02
Frequency Conversion ²⁾	R&S®ZVA-K4		1164.1863.02
USB-to-IEC/IEEE Adapter (for control of external generators via IEC/IEEE bus)	R&S®ZVAB-B44		1302.5544.02
Extras			
Calibration Unit, 4 Ports, 3.5 mm (f), 8 GHz	R&S®ZV-Z51	300 kHz to 8 GHz	1164.0515.30
Calibration Unit, 4 Ports, N (f), 8 GHz	R&S®ZV-Z51	300 kHz to 8 GHz	1164.0515.70
Test Cable			
N (m)/N (m), 50 Ω, 0.6 m/1 m ³⁾	R&S®ZV-Z91	0 Hz to 18 GHz	1301.7572.25/38
N (m)/3.5 mm, 50 Ω, 0.6 m/1 m ³⁾	R&S®ZV-Z92	0 Hz to 18 GHz	1301.7589.25/38
3.5 mm (f)/3.5 mm (m), 0.6 m/1 m ³⁾	R&S®ZV-Z93	0 Hz to 26.5 GHz	1301.7595.25/38

¹⁾ Operating manual on CD ROM and quick start guide supplied as standard with the R&S®ZVA.

²⁾ Option R&S®ZVAB-B44 recommended for control of external generators.

³⁾ One cable.

Calibration Kits			
N 50 Ω	R&S® ZCAN	0 Hz to 3 GHz	0800.8515.52
N 50 Ω	R&S® ZV-Z21	0 Hz to 18 GHz	1085.7099.02
3.5 mm	R&S® ZV-Z32	0 Hz to 26.5 GHz	1128.3501.02
3.5 mm (incl. sliding matches)	R&S® ZV-Z33	0 Hz to 26.5 GHz	1128.3518.02
TRL Supplementary Calibration Kit, N 50 Ω	R&S® ZV-Z26	0.4 Hz to 18 GHz	1085.7318.02
TRL Supplementary Calibration Kit, 3.5 mm	R&S® ZV-Z27	0.4 Hz to 26.5 GHz	1085.7401.02
Sliding Matches			
N (m), 50 Ω	R&S® ZV-Z41	1.7 GHz to 18 GHz	1085.8095.02
N (f), 50 Ω	R&S® ZV-Z41	1.7 GHz to 18 GHz	1085.8095.03
3.5 mm (m/f pair)	R&S® ZV-Z42	2 GHz to 26.5 GHz	1128.3524.02
Hardware and measurement add-ons			
USB Keyboard	R&S® PSL-Z2		1157.6870.03
USB Mouse	R&S® PSL-Z10		1157.7060.02
Cable for DC Input	R&S® ZV-Z71		1164.1005.02
19" Rack Adapter	R&S® ZZA-611		1096.3302.00
Manual (in printed form)			1145.1084.12



For specifications, see PD 5213.5680.22
and www.rohde-schwarz.com
(search term: ZVA)



www.rohde-schwarz.com

Europe: +49 1805 12 4242, customersupport@rohde-schwarz.com
USA and Canada: 1-888-837-8772, customer.support@rsa.rohde-schwarz.com
Asia: +65 68463710, customersupport.asia@rohde-schwarz.com