

R&S® ZNBT

Vector Network Analyzer

Network analysis with up to 24 test ports



R&S®ZNB Vector Network Analyzer At a glance

The R&S®ZNB is the first multiport vector network analyzer offering up to 24 integrated test ports. The instrument can simultaneously test multiple DUTs or measure one DUT with up to 24 ports.

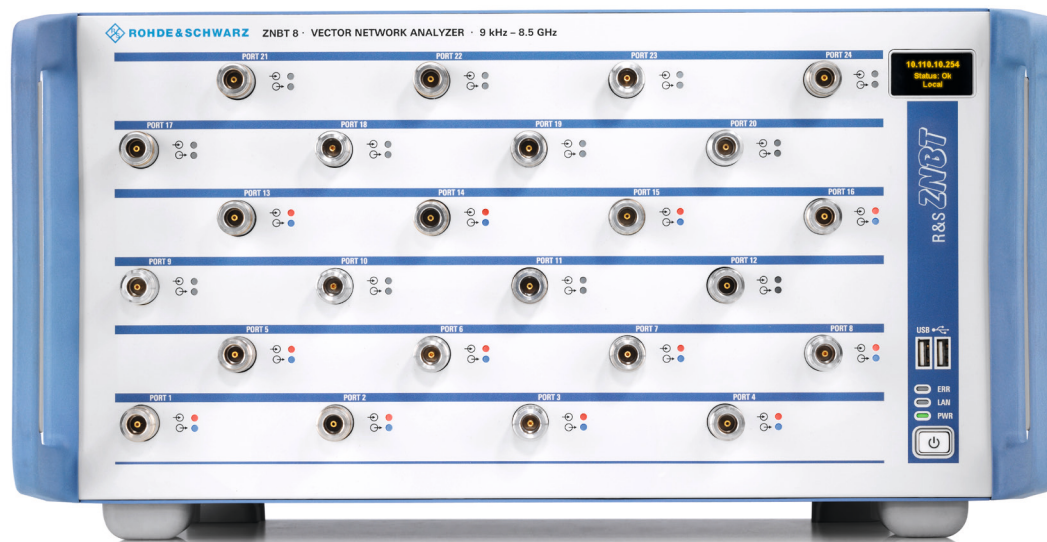
The R&S®ZNB offers short measurement times even in scenarios with a large number of ports. Other highlights include a wide dynamic range, high output power levels and inputs featuring high power-handling capacity. The instrument is available in two different frequency ranges: The R&S®ZNB8 operates in a range from 9 kHz to 8.5 GHz, the R&S®ZNB20 from 100 kHz to 20 GHz. These features make the R&S®ZNB ideal for applications in the mobile radio, wireless communications and electronic goods industries. The instrument is primarily used in the development and production of active and passive multiport components such as GPS, WLAN, Bluetooth® and frontend modules for multiband mobile phones. Its outstanding performance also allows efficient analysis of base station filters and other highly selective components.

The R&S®ZNB outperforms switch matrix based multiport systems. Its high integration density makes it a very compact solution for analyzing components with up to 24 ports (R&S®ZNB8) and up to 16 ports (R&S®ZNB20) while requiring no more rack space than an R&S®ZNB. The convenient user interface makes it easy to handle even very complex multiport measurements. The R&S®ZNB supports various remote control options and is easy to integrate into automated test systems, for example for carrying out phased-array antenna measurements.

Key facts

- Four-port R&S®ZNB8 base unit (upgradeable to 8, 12, 16, 20 or 24 ports)
- Eight-port R&S®ZNB20 base unit (upgradeable to 12 or 16 ports)
- Frequency range from 9 kHz to 8.5 GHz (R&S®ZNB8) and from 100 kHz to 20 GHz (R&S®ZNB20)
- Up to 24 (R&S®ZNB8) or 16 (R&S®ZNB20) fully phase-coherent receivers
- Wide dynamic range of up to 140 dB
- Short sweep times, e.g. 2.1 ms (R&S®ZNB8) and 2.5 ms (R&S®ZNB20) for a sweep across 201 points
- Wide power sweep range of up to 100 dB
- High power-handling capacity
- IF bandwidths from 1 Hz to 10 MHz
- High temperature stability of 0.01 dB/°K
- More than 100 traces and channels
- Simple configuration of multiport measurements
- Manual and automatic calibration methods optimized for multiport applications
- Status information
- Compatible with all vector network analyzers from the R&S®ZVA/R&S®ZVT and R&S®ZNx families

The R&S®ZNB8 with 24 ports.



R&S®ZNB

Vector Network Analyzer

Benefits and key features

Platform for demanding multiport measurements

- True multiport network analyzer
- Multiport measurements made easy
- Measurements at high power levels

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When speed counts

- Short test times even with a large number of ports
- Data transfer simultaneously with sweep
- Fast switchover between instrument setups
- Test sequence control via TTL signals
- Handler I/O interface for control of external parts handlers
- Simultaneous testing of multiple DUTs
- Segmented sweep for optimized speed and accuracy

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Excellent measurement characteristics

- Fast and accurate
- High long-term stability for long calibration intervals
- Calibration methods for every application
- Calibration units speed up multiport calibrations

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Complex analysis of active and passive components

- More than 100 traces and channels for characterizing complex components
- Wide range of virtual matching networks for realtime embedding/deembedding
- Frequency-converting measurements on amplifiers and mixers
- Simple and fast characterization of balanced DUTs
- Time domain analysis with gating function and display of eye diagrams
- Voltage and current measurements
- Measurements on frontend modules (FEM)

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The R&S®ZNB20 with 16 ports.



Platform for demanding multiport measurements

True multiport network analyzer

The R&S®ZNBT is a true multiport network analyzer featuring one reflectometer per test port. This design concept does away with the loss between the test ports and the measurement receivers and the instability typically encountered in switch matrix based multiport systems. As a result, the R&S®ZNBT delivers a wide dynamic range, high output power, low trace noise, and excellent raw directivity and load match. Multiport measurements with the R&S®ZNBT are thus highly stable, reproducible and precise. The analyzer's architecture is tailored for parallel signal and data acquisition. This means that the R&S®ZNBT not only measures S-parameters of multiport DUTs, but also performs phase-synchronous measurements of up to 24 signals. Thanks to the analyzer's modular design, the four-port R&S®ZNBT8 base unit can easily be upgraded to an instrument with 8, 12, 16, 20 or 24 ports, and the eight-port R&S®ZNBT20 base unit can be upgraded to include 12 or 16 ports.

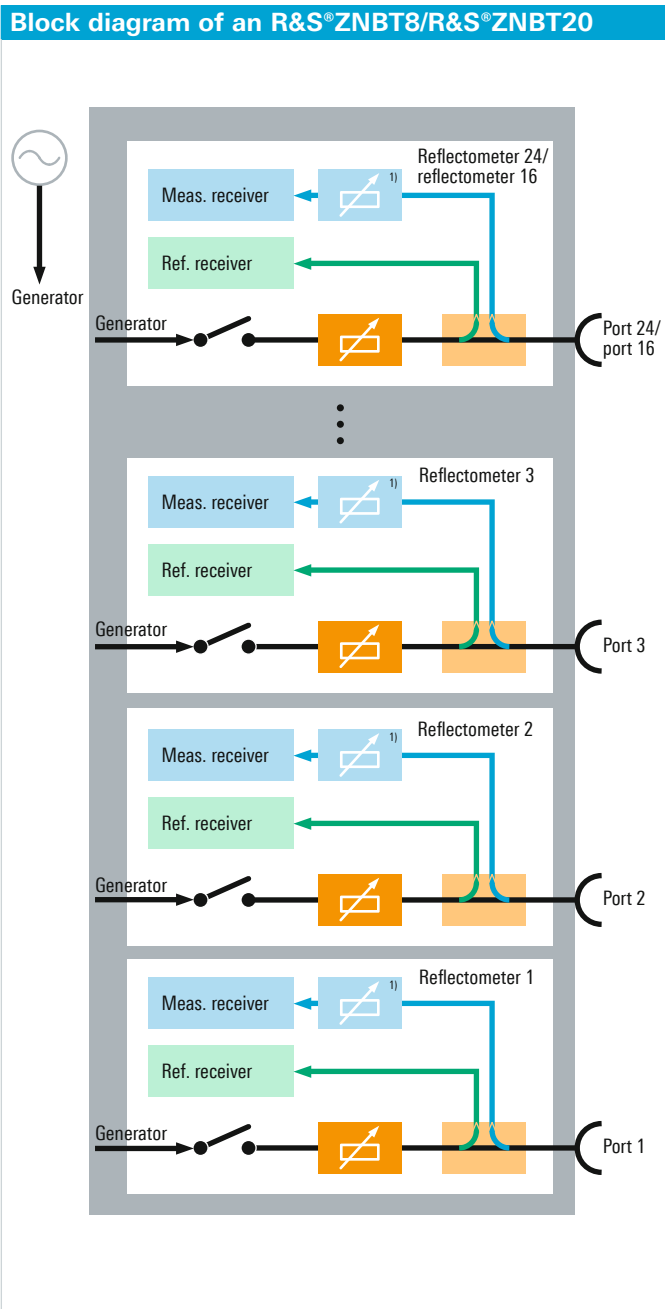
Multiport measurements made easy

The R&S®ZNBT is controlled via the same user interface as the R&S®ZNB. As an instrument without integrated display, it can be operated via a keyboard, mouse and external monitor, or via an external touchscreen. The instrument's software architecture was designed with a consistent focus on multiport applications. Measurement quantities such as S-parameters, wave quantities and wave quantity ratios are directly selected via the user interface. Test port indices can be entered directly for S-parameters and power levels. Each measurement quantity can be selected with a maximum of three operating steps, even when testing DUTs with a large number of ports. The R&S®ZNBT can be remotely controlled via a remote desktop connection and SCPI commands.

Measurements at high power levels

The R&S®ZNBT characterizes the small-signal behavior at low power levels and measures nonlinear parameters at high power levels. The electronically variable power range delivers typical output power levels from -85 dBm to +15 dBm for the R&S®ZNBT8 and from -60 dBm to +12 dBm for the R&S®ZNBT20. Electronic step attenuators¹⁾ increase the measurement receivers' power handling capacity even further. The electronic step attenuators have a high compression point, eliminating the need for additional attenuators at high power levels.

¹⁾ R&S®ZNBT8 only.



When speed counts

Short test times even with a large number of ports

Featuring large IF bandwidths, short sampling times and fast synthesizers with short frequency switching times, the R&S®ZNB8 measures 24 one-port DUTs in only 2.1 ms, and the R&S®ZNB20 measures 16 one-port DUTs in only 2.5 ms, both in a single frequency sweep over 201 points²⁾.

The instrument's multiport architecture makes it possible to perform simultaneous measurements on all ports of a DUT. Data from all ports is captured synchronously and processed in parallel – from the RF test port through the IF stage to the display. This means a significant reduction in sweep time compared to switch matrix based multiport systems.

Data transfer simultaneously with sweep

The R&S®ZNB allows measurement data to be read out via LAN or GPIB while the next sweep is already in progress. The data transfer time is therefore practically negligible and does not increase the sweep time.

²⁾ R&S®ZNB8: 800 MHz start frequency, 1 GHz stop frequency, AGC auto, 500 kHz measurement bandwidth, swept mode, correction off.
R&S®ZNB20: 9 GHz start frequency, 10 GHz stop frequency, AGC auto, 500 kHz measurement bandwidth, swept mode, correction off.

Fast switchover between instrument setups

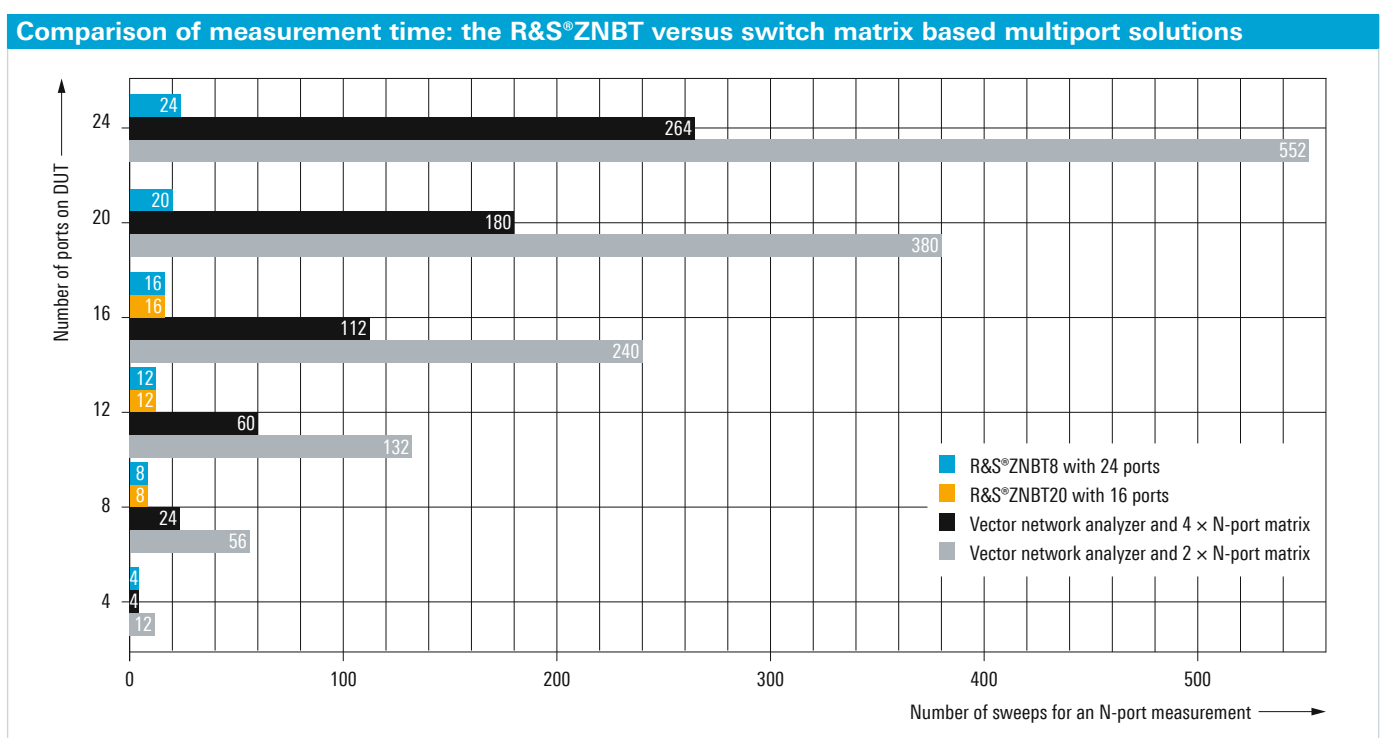
In complex scenarios involving measurements on DUTs using different analyzer setups, the R&S®ZNB does not waste time reloading the required setups from the hard disk. Once a setup has been loaded from the hard disk, it remains stored in the instrument's RAM along with the computed data for the test sequence to be executed. This allows activation of instrument setups via remote control virtually without delay.

Test sequence control via TTL signals

Various digital interfaces are available to boost the speed of automatic test cycles. For example, the user control port has special outputs that can be assigned different bit combinations (referred to as channel bits) that will be used for the currently active measurement channel. The channel bits are used to synchronize external components in a test setup or the settings of a DUT to the analyzer's internal test sequences in realtime.

Handler I/O interface for control of external parts handlers

Via the optional external handler I/O interface, the R&S®ZNB can communicate with an external parts handler. During a typical test cycle, a parts handler places the DUT into a holder and sends the start signal for the measurement. On completion of the measurement, the parts handler removes the DUT from the holder and sorts it according to predefined criteria. Then the handler places a new DUT in the holder, and the test cycle starts again. The R&S®ZNB can thus be used to deliver fast, reliable results in automated tests, which play a key role especially in production applications.



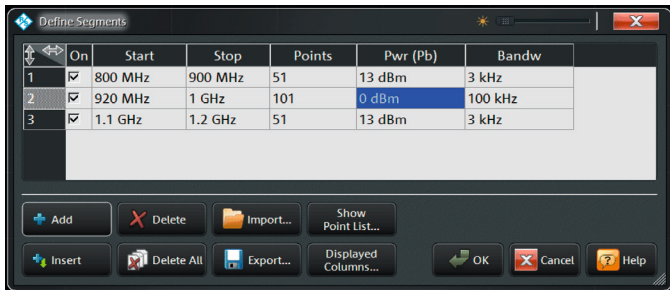
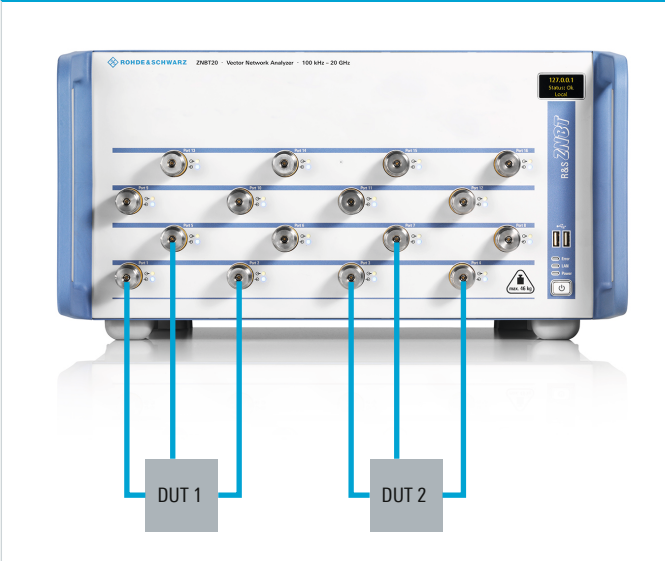
Simultaneous testing of multiple DUTs

The architecture of the R&S®ZNB allows stimulating multiple DUT ports simultaneously, making it possible to test multiple paths of one DUT or multiple DUTs in parallel. The R&S®ZNB organizes its test ports into groups, where test sequences for all groups are executed in parallel. A 24-port R&S®ZNB8, for example, can simultaneously test six DUTs with four ports each.

Segmented sweep for optimized speed and accuracy

Testing frequency-selective DUTs such as filters in front-end modules requires optimized output power levels in the passband to avoid errors due to compression. In the stopband, on the other hand, high output power levels and narrow IF bandwidths are needed to provide the required dynamic range. The instrument's segmented sweep function allows the sweep range to be divided into an almost unlimited number of segments. Sweep parameters such as test point spacing, IF bandwidth and generator power can be defined separately for each segment and accurately matched to the task at hand, optimizing measurement speed and accuracy.

Parallel testing of two DUTs



Filter measurement using segmented sweep.



The R&S®ZNB (here: the R&S®ZNB8) can be operated manually using a keyboard, mouse and external monitor, or via an external touchscreen.

Excellent measurement characteristics

Fast and accurate

Offering up to 140 dB dynamic range, the R&S®ZNBT is ideal for the fast characterization of frequency-selective multiport components. The R&S®ZNBT features a dynamic range higher than that of conventional multiport solutions. This means that, for the same dynamic range, the R&S®ZNBT can use a larger IF bandwidth and measure faster than conventional setups.

Due to the instrument's sensitive receivers, trace noise is negligible even when using large IF bandwidths.

High long-term stability for long calibration intervals

The instrument's excellent raw performance (directivity, load match and tracking) ensures good long-term thermal stability as well as high measurement accuracy after calibration. The R&S®ZNBT delivers stable results over several days without requiring recalibration.

Calibration methods for every application

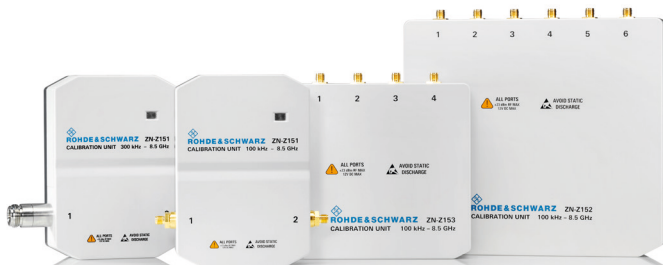
The R&S®ZNBT supports diverse calibration methods for coaxial applications, for testing DUTs in test fixtures and on printed boards, and for on-wafer applications.

- **TOSM** (Through, **O**pen, **S**hort, **M**atch): classic calibration method for coaxial test environments
- **TSM** (Through, **S**hort, **M**atch): full two-port calibration method requiring less calibration effort
- **TRL/LRL** (Through, **R**eject, **L**ine/**L**ine, **R**eject, **L**ine): calibration method for printed board based test structures and on-wafer applications
- **TRM/TNA** (Through, **R**eject, **M**atch/**T**hrough, **N**etwork, **A**ttenuation): calibration method for applications using test fixtures
- **UOSM** (**U**nknown Through, **O**pen, **S**hort, **M**atch): calibration method for DUTs using a mix of connectors

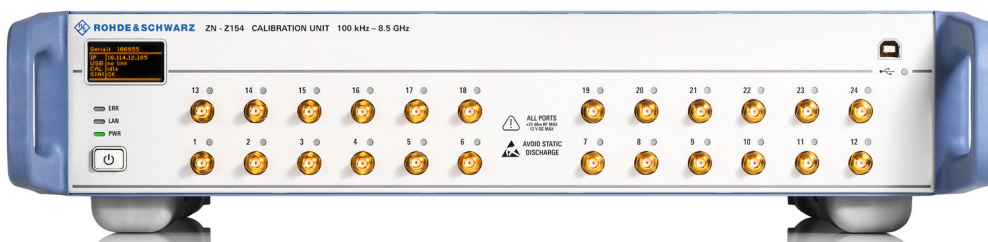
The above calibration methods have been optimized for multiport applications so that the through standard needs to be connected only a minimum number of times. The TSM method considerably reduces calibration time as it requires no open standard. TSM provides accuracy equivalent to that of TOSM and reduces the number of calibration standards to be connected to each port from four to three.

Calibration units speed up multiport calibrations

In coaxial multiport applications, it is advisable to use automatic calibration units in order to minimize the number of required connections and avoid lengthy calibration times as well as premature wear on ports and calibration standards. Rohde&Schwarz offers calibration units with up to 24 ports. Applications involving a large number of ports can be calibrated using a calibration unit with a lower number of ports and connecting it sequentially to the test ports in question. A software wizard guides the user step by step through the calibration.



R&S®ZN-Z151, R&S®ZN-Z152 and R&S®ZN-Z153 calibration units.



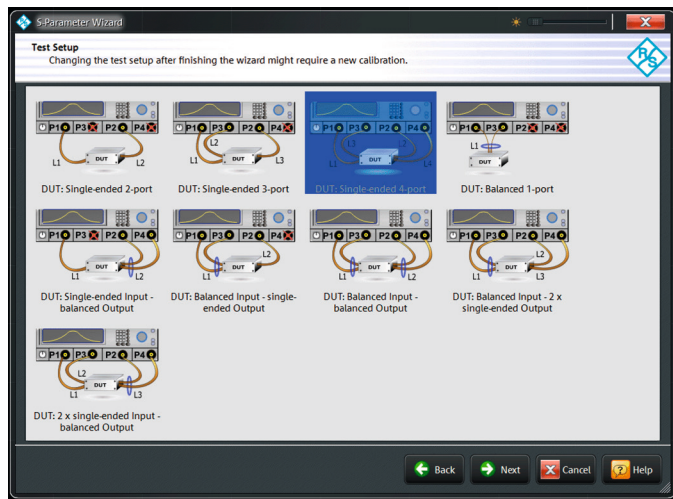
R&S®ZN-Z154 calibration unit.

Complex analysis of active and passive components

The demand for modules offering enhanced performance with ever smaller dimensions is driving the trend toward higher levels of integration and functional density in modern RF modules, especially for mobile radio and WLAN applications. These modules require complex testing of their small-signal and large-signal behavior during production. The R&S®ZNB-T performs these tests with high speed and accuracy.

More than 100 traces and channels for characterizing complex components

The R&S®ZNB-T supports a virtually unlimited number of traces and channels in order to execute and display complex measurements on multiport DUTs. The number of traces and channels is limited only by the instrument's



Topologies of balanced DUTs.

RAM. By successively processing several different channels, the R&S®ZNB-T characterizes a DUT under different conditions. For example, the instrument can test an amplifier on different port groups while applying different supply voltages and RF input power levels, and display all of the parameters measured – wasting no time on loading new setups. The names of traces and channels can be edited and replaced by user-specific names to make them easier to identify.

Wide range of virtual matching networks for realtime embedding/deembedding

Balanced and unbalanced components are often specified together with the networks that match them to the impedance of the surrounding circuit.

The R&S®ZNB-T offers a wide range of predefined, editable matching network topologies. Using special algorithms, the R&S®ZNB-T embeds the DUT into such networks, or deembeds it to eliminate parasitic effects caused by test fixtures, for example. Alternatively, user-defined networks can be imported in .SNP file format.

Frequency-converting measurements on amplifiers and mixers

The R&S®ZNB-T features independent synthesizers for its generators and receivers, enabling it to transmit and receive on different frequencies. This allows the R&S®ZNB-T to measure harmonics and intermodulation products on amplifiers, or conversion loss on mixers. External generators may sometimes be needed to generate a multitone signal or provide local oscillator functionality. The R&S®ZNB-T can control generators from Rohde&Schwarz or other suppliers via LAN or GPIB. Wizards for intermodulation and mixer measurements guide the user step by step to the desired test setup and through calibration, saving time and ensuring correct results.

Key features

Amplifier and mixer measurements

- High output power (up to +15 dBm for the R&S®ZNB-T8 and up to +12 dBm for the R&S®ZNB-T20) on all ports
- Large power sweep range (up to 100 dB for the R&S®ZNB-T8 and up to 72 dB for the R&S®ZNB-T20)
- Intermodulation, harmonics and compression measurements
- Absolute power measurements
- Four DC inputs for measuring supply voltages and power detector characteristics
- Power added efficiency (PAE) measurements
- Measurement of stability factors
- Determination of Y- and Z-parameters
- Conversion loss measurements

Filter measurements

- Wide dynamic range (up to 140 dB for the R&S®ZNB-T8 and up to 130 dB for the R&S®ZNB-T20)
- Display of filter parameters, e.g. center frequency, bandwidth, quality factor
- Determination of mixed-mode S-parameters of balanced DUTs
- Virtual matching networks for realtime embedding/deembedding of balanced and unbalanced DUTs, including embedding/deembedding of port pairs and ground loop inductance
- Impedance conversion
- Time domain analysis with gating function, e.g. for suppressing triple transit echo in SAW filters, and display of eye diagrams

Simple and fast characterization of balanced DUTs

To characterize a balanced DUT, the R&S®ZNB-T measures its unbalanced S-parameters and uses them to calculate the mixed-mode S-parameters. The S-parameter wizard assists the user in choosing the port topology, the S-parameters to be displayed and the appropriate calibration method.

Time domain analysis with gating function and display of eye diagrams

Using the time domain analysis option, users can analyze discontinuities in test fixtures and cables or the triple transit echo in SAW filters and use gating to eliminate

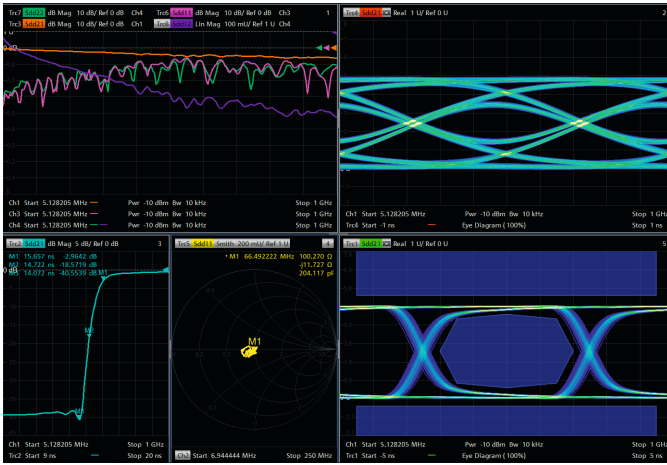
such unwanted effects. The extended time domain analysis option makes it possible to display eye diagrams for different bit patterns simultaneously with measurements in the frequency and time domain.

Voltage and current measurements

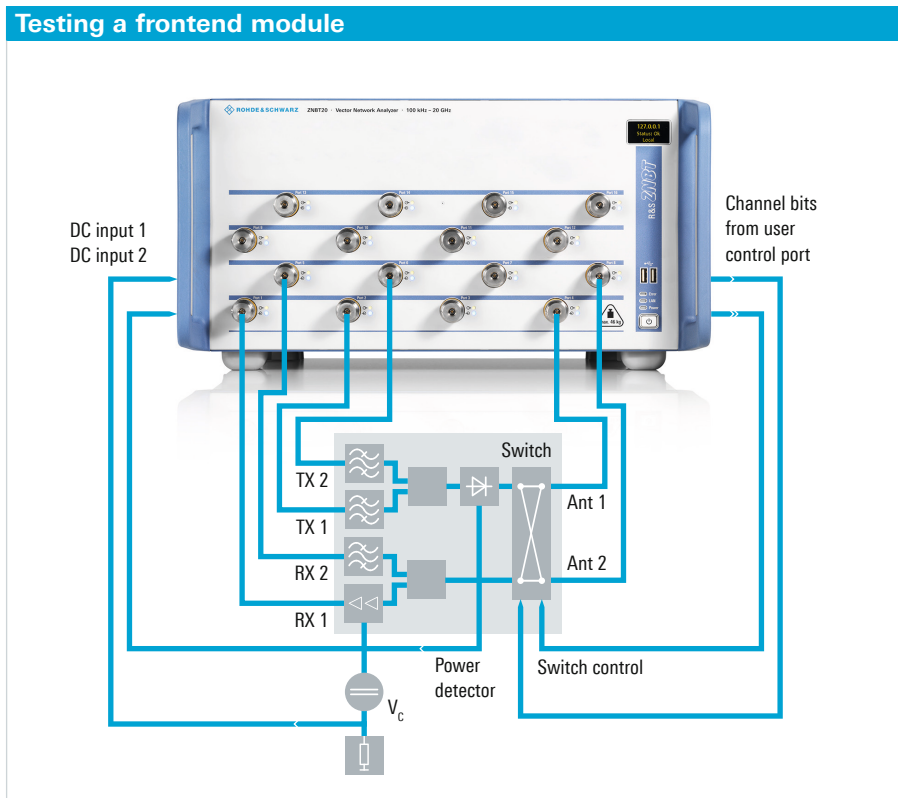
In addition to the RF test ports, the instrument has four DC test inputs on its rear panel for measuring DC supply voltages or voltages proportional to supply currents during frequency and power sweeps. These measurements are performed synchronously with the sweep and can be used to determine power added efficiency (PAE) or measure the characteristics of power detectors.

Measurements on frontend modules (FEM)

The lower figure shows a typical measurement performed with the R&S®ZNB-T between the RF ports of a frontend module. The instrument's first DC input is used to determine the supply current to the amplifier versus frequency and level. The second DC input is used to measure the power detector characteristic versus frequency and level. Channel bits from the analyzer's user control port are used to control the DUT's switch in order to select the required measurement paths. The TX → Ant and RX → Ant paths are measured in parallel, i.e. simultaneously, using test port groups. This cuts the sweep time in half without any loss of performance.



Simultaneous display of eye diagrams and measurements in the frequency and time domain.



Ordering information

Designation	Type	Frequency range	Order No.
Base unit			
Vector Network Analyzer, 4 ports, 8.5 GHz, N ¹⁾	R&S®ZNBT8	9 kHz to 8.5 GHz	1318.7006.24
Vector Network Analyzer, 8 ports, 20 GHz, 3.5 mm ¹⁾	R&S®ZNBT20	100 kHz to 20 GHz	1332.9002.24
Hardware options			
Additional Ports 5 to 8 for the R&S®ZNBT8	R&S®ZNBT8-B108	9 kHz to 8.5 GHz	1319.4200.02
Additional Ports 9 to 12 for the R&S®ZNBT8 (requires ports 5 to 8)	R&S®ZNBT8-B112	9 kHz to 8.5 GHz	1319.4217.02
Additional Ports 13 to 16 for the R&S®ZNBT8 (requires ports 5 to 12)	R&S®ZNBT8-B116	9 kHz to 8.5 GHz	1319.4223.02
Additional Ports 17 to 20 for the R&S®ZNBT8 (requires ports 5 to 16)	R&S®ZNBT8-B120	9 kHz to 8.5 GHz	1319.4230.02
Additional Ports 21 to 24 for the R&S®ZNBT8 (requires ports 5 to 20)	R&S®ZNBT8-B124	9 kHz to 8.5 GHz	1319.4246.02
Additional Ports 9 to 12 for the R&S®ZNBT20	R&S®ZNBT20-B112	100 kHz to 20 GHz	1332.9454.02
Additional Ports 13 to 16 for the R&S®ZNBT20 (requires ports 9 to 12)	R&S®ZNBT20-B116	100 kHz to 20 GHz	1332.9460.02
Receiver Step Attenuators for Ports 1 to 4 for the R&S®ZNBT8	R&S®ZNBT8-B361	9 kHz to 8.5 GHz	1319.4317.02
Receiver Step Attenuators for Ports 5 to 8 (R&S®ZNBT8-B108) ²⁾	R&S®ZNBT8-B362	9 kHz to 8.5 GHz	1319.4323.02
Receiver Step Attenuators for Ports 9 to 12 (R&S®ZNBT8-B112) ²⁾	R&S®ZNBT8-B363	9 kHz to 8.5 GHz	1319.4330.02
Receiver Step Attenuators for Ports 13 to 16 (R&S®ZNBT8-B116) ²⁾	R&S®ZNBT8-B364	9 kHz to 8.5 GHz	1319.4346.02
Receiver Step Attenuators for Ports 17 to 20 (R&S®ZNBT8-B120) ²⁾	R&S®ZNBT8-B365	9 kHz to 8.5 GHz	1319.4352.02
Receiver Step Attenuators for Ports 21 to 24 (R&S®ZNBT8-B124) ²⁾	R&S®ZNBT8-B366	9 kHz to 8.5 GHz	1319.4369.02
Extended Power Range for Ports 1 to 4 (R&S®ZNBT8)	R&S®ZNBT8-B21	9 kHz to 8.5 GHz	1319.4252.02
Extended Power Range for Ports 5 to 8 (R&S®ZNBT8-B108)	R&S®ZNBT8-B22	9 kHz to 8.5 GHz	1319.4269.02
Extended Power Range for Ports 9 to 12 (R&S®ZNBT8-B112)	R&S®ZNBT8-B23	9 kHz to 8.5 GHz	1319.4275.02
Extended Power Range for Ports 13 to 16 (R&S®ZNBT8-B116)	R&S®ZNBT8-B24	9 kHz to 8.5 GHz	1319.4281.02
Extended Power Range for Ports 17 to 20 (R&S®ZNBT8-B120)	R&S®ZNBT8-B25	9 kHz to 8.5 GHz	1319.4298.02
Extended Power Range for Ports 21 to 24 (R&S®ZNBT8-B124)	R&S®ZNBT8-B26	9 kHz to 8.5 GHz	1319.4300.02
Extended Power Range for Ports 1 to 4 (R&S®ZNBT20)	R&S®ZNBT20-B21	100 kHz to 20 GHz	1332.9348.02
Extended Power Range for Ports 5 to 8 (R&S®ZNBT20)	R&S®ZNBT20-B22	100 kHz to 20 GHz	1332.9354.02
Extended Power Range for Ports 9 to 12 (R&S®ZNBT20-B112)	R&S®ZNBT20-B23	100 kHz to 20 GHz	1332.9360.02
Extended Power Range for Ports 13 to 16 (R&S®ZNBT20-B116)	R&S®ZNBT20-B24	100 kHz to 20 GHz	1332.9377.02
Precision Frequency Reference	R&S®ZNBT-B4		1332.9477.02
DC Inputs	R&S®ZNBT-B81		1332.9502.02
GPIB Interface	R&S®ZNBT-B10		1332.9483.02
Device Control	R&S®ZNBT-B12		1332.9490.02
Software options (firmware)			
Time Domain Analysis (TDR)	R&S®ZNBT-K2		1318.8425.02
Extended Time Domain Analysis	R&S®ZNBT-K20		1319.4400.02
Frequency Conversion ³⁾	R&S®ZNBT-K4		1318.8431.02
Intermodulation Measurements ⁴⁾	R&S®ZNBT-K14		1318.8448.02
10 MHz Receiver Bandwidth	R&S®ZNBT-K17		1318.8454.02
1 mHz Frequency Resolution	R&S®ZNBT-K19		1319.4000.02
External Handler I/O Interface	R&S®ZNBT-Z14		1326.6640.05
Accessories			
Calibration kits (manual calibration)			
Calibration Kit, N, 50 Ω	R&S®ZV-Z270	0 Hz to 18 GHz	5011.6536.02
Calibration Kit, 3.5 mm	R&S®ZV-Z235	0 Hz to 26.5 GHz	5011.6542.02
Calibration Kit, N (m)	R&S®ZV-Z170	0 Hz to 9 GHz	1317.7683.02
Calibration Kit, N (f)	R&S®ZV-Z170	0 Hz to 9 GHz	1317.7683.03
Calibration Kit, 3.5 mm (m)	R&S®ZV-Z135	0 Hz to 15 GHz	1317.7677.02
Calibration Kit, 3.5 mm (f)	R&S®ZV-Z135	0 Hz to 15 GHz	1317.7677.03

Designation	Type	Frequency range	Order No.
Calibration units (automatic calibration)			
Calibration Unit, 4 ports, 3.5 mm (f)	R&S°ZN-Z51	100 kHz to 8.5 GHz	1319.5507.34
Calibration Unit, 2 ports, 3.5 mm (f)	R&S°ZN-Z51	100 kHz to 8.5 GHz	1319.5507.32
Calibration Unit, 4 ports, N (f) ⁵⁾	R&S°ZN-Z51	100 kHz to 8.5 GHz	1319.5507.74
Calibration Unit, 2 ports, N (f) ⁵⁾	R&S°ZN-Z51	100 kHz to 8.5 GHz	1319.5507.72
Calibration Unit, 2 ports, N (f)	R&S°ZN-Z151	300 kHz to 8.5 GHz	1317.9134.73
Calibration Unit, 2 ports, N (f)	R&S°ZN-Z151	100 kHz to 8.5 GHz	1317.9134.72
Calibration Unit, 6 ports, SMA (f)	R&S°ZN-Z152	100 kHz to 8.5 GHz	1319.6003.36
Calibration Unit, 4 ports, SMA (f)	R&S°ZN-Z153	100 kHz to 8.5 GHz	1319.6178.34
Calibration Unit, 6 ports, SMA (f)	R&S°ZN-Z154	100 kHz to 8.5 GHz	1319.5120.02
Additional Ports 7 to 12, SMA (f)	R&S°ZNZ154-B22	100 kHz to 8.5 GHz	1319.5136.22
Additional Ports 13 to 18, SMA (f)	R&S°ZNZ154-B32	100 kHz to 8.5 GHz	1319.5136.32
Additional Ports 19 to 24, SMA (f)	R&S°ZNZ154-B42	100 kHz to 8.5 GHz	1319.5136.42
Calibration Unit, 4 ports, 3.5 mm (f)	R&S°ZV-Z52	10 MHz to 24 GHz	1164.0521.30
Torque Wrench, 8 mm width, 0.9 Nm	R&S°ZN-ZTW		1328.8534.35
Torque Wrench, 20 mm width, 1.5 Nm	R&S°ZN-ZTW		1328.8534.71
Test cables			
N (m)/N (m), 50 Ω, length: 0.6 m/1 m	R&S°ZV-Z91	0 Hz to 18 GHz	1301.7572.25/38
N (m)/N (m), 50 Ω, length: 0.6 m/0.9 m	R&S°ZV-Z191	0 Hz to 18 GHz	1306.4507.24/36
N (m)/3.5 mm (m), 50 Ω, length: 0.6 m/1 m	R&S°ZV-Z92	0 Hz to 18 GHz	1301.7589.25/38
N (m)/3.5 mm (m), 50 Ω, length: 0.6 m/0.9 m	R&S°ZV-Z192	0 Hz to 18 GHz	1306.4513.24/36
Hardware add-ons			
19" Rackmount Kit	R&S°ZZA-KN5		1175.3040.00
USB-to-IEC/IEEE Adapter	R&S°ZVAB-B44		1302.5544.02
Additional Removable Hard Disk, LPW10	R&S°ZNBT-B19		1332.9283.10
Additional Removable Hard Disk, LPW11	R&S°ZNBT-B19		1332.9283.11

¹⁾ External monitor, mouse and keyboard or external touchscreen required for manual operation.

²⁾ R&S°ZNBT8 only.

³⁾ Requires R&S°ZVAB-B44 to control external generators via IEC/IEEE bus. Second internal source is included with R&S°ZNBT8-B112.

⁴⁾ Requires R&S°ZNBT-K4.

⁵⁾ Can also be configured with other connector systems.

Warranty		
Base unit		three years
All other items		one year
Options		
Extended Warranty, one year	R&S°WE1	Please contact your local Rohde & Schwarz sales office.
Extended Warranty, two years	R&S°WE2	
Extended Warranty with Calibration Coverage, one year	R&S°CW1	
Extended Warranty with Calibration Coverage, two years	R&S°CW2	

For data sheet, see PD 3606.9727.22 and www.rohde-schwarz.com

Your local Rohde & Schwarz expert will help you determine the optimum solution for your requirements.

To find your nearest Rohde & Schwarz representative, visit

www.sales.rohde-schwarz.com

Service that adds value

- | Worldwide
- | Local and personalized
- | Customized and flexible
- | Uncompromising quality
- | Long-term dependability

About Rohde & Schwarz

The Rohde & Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, radiomonitoring and radiolocation. Founded more than 80 years ago, the independent company which is headquartered in Munich, Germany, has an extensive sales and service network with locations in more than 70 countries.

Sustainable product design

- | Environmental compatibility and eco-footprint
- | Energy efficiency and low emissions
- | Longevity and optimized total cost of ownership

Certified Quality Management

ISO 9001

Certified Environmental Management

ISO 14001

Rohde & Schwarz GmbH & Co. KG

www.rohde-schwarz.com

Rohde & Schwarz training

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R&S®ZNB Vector Network Analyzer

Data without tolerance limits is not binding | Subject to change

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