



FIG 1 Vector Network Analyzer R&S®ZVT 8 – the world's first eight-port analyzer.

Vector Network Analyzer R&S®ZVT 8

Unrivaled – up to eight test ports in a single unit

Commercially available network analyzers offer two, three or four test ports, which are not always enough to provide complete characterization of components and modules. The new Vector Network Analyzer R&S®ZVT 8 does away with this limitation – it offers up to eight test ports in a single

unit.

Identical platform yields analyzer compatibility

The R&S®ZVT 8 is based on the same instrument platform as the R&S®ZVA and R&S®ZVB network analyzers. This means that the user interface and remote control commands are identical for the three instruments. Compatibility of the analyzer models enables identical instrument settings and provides comparable results. For example, the results from an R&S®ZVA in development can be compared to those yielded by an R&S®ZVB or an R&S®ZVT 8 in production.

The R&S®ZVT 8 has been optimized for production applications and is therefore supplied without a display. Yet it can be used for R&D applications as well. You merely need to connect a display, mouse

and keyboard to the analyzer, and it can be manually operated like the other units (FIG 1).

Customized solutions due to modular design

The R&S®ZVT 8 base model comes with two test ports. Further test ports can be added (FIG 2). Due to its modular design, the analyzer can be accurately scaled to a specific test application, which is of particular interest in production. You can buy exactly the number of ports you need. If you ever need more, for example to test new devices, you can add new ones up to a maximum configuration of eight.

Options for complex test setups

The R&S®ZVT8 can be equipped with options for direct generator and receiver access, e.g. for complex test setups including external components such as couplers or amplifiers (FIG 3). Options enabling time domain analysis and measurements on frequency-converting DUTs further enhance analyzer functionality.

Automatic eight-port calibration unit

The R&S®ZVT8 is the only network analyzer to offer full eight-port calibration. This is done with the automatic Calibration Unit R&S®ZV-Z58 (FIG 4), which is controlled by the R&S®ZVT8. Full eight-port calibration is necessary in order to extract S-parameter data in s8p format. It also enables all 64 S-parameters from s_{11} to s_{88} to be analyzed simultaneously, and thus for the first time allows the full characterization of components with five to eight test ports. While manual calibration is also possible, automatic calibration will save considerable time.

Parallel measurements save time

Each internal generator is connected to two test ports either in parallel or sequentially (FIG 2). If the test ports are connected in parallel, several DUTs can be measured simultaneously in realtime, since each test port is equipped with a separate measurement receiver and reference receiver.

The R&S®ZVT8 eight-port model, for example, can simultaneously measure two four-port DUTs, or four two-port DUTs, or eight one-port DUTs. This means that throughput in production can be quadrupled, for instance, by measuring four two-port DUTs in parallel. ▶

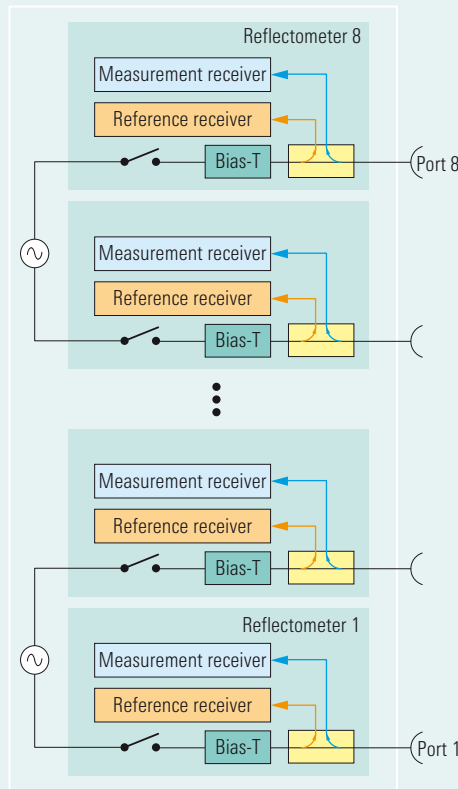


FIG 2
Block diagram of the R&S®ZVT8.

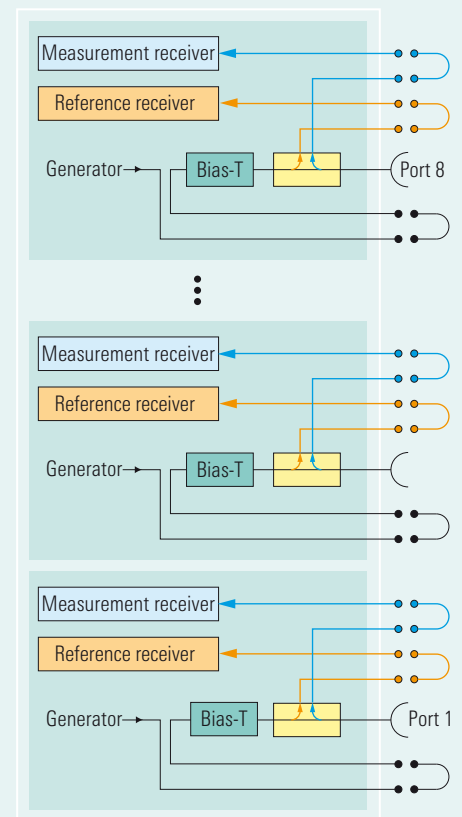


FIG 3
The R&S®ZVT8 with optional direct generator/
receiver access.

FIG 4 Automatic Calibration Unit R&S®ZV-Z58.



44381/3

► Mixer measurements without an external generator

The R&S®ZVT8 hardware concept enables mixer measurements without requiring an external generator to supply the LO signal. Mixer measurements require two generators. The R&S®ZVT8 three-port model already features two internal generators. Especially in the case of swept LO signals, internal generators are considerably faster than externally controlled sources.

Intermodulation measurements on amplifiers and mixers

Intermodulation measurements on amplifiers usually require two generators, whose signals are combined in a two-tone signal, which is taken to the amplifier. If equipped with three or more ports, the R&S®ZVT8 carries out intermodulation measurements on amplifiers without an external generator. Intermodulation measurements on mixers necessitate a third generator to supply the LO signal for the mixer. The R&S®ZVT8 is the only network analyzer to offer three or more internal sources (starting from the five-port model). It is thus capable of performing intermodulation measurements on mixers without the need for an external generator (FIGs 5 and 6).

Multipoint measurements

The trend toward integrating components into modules is leading to a greater demand for module tests – for example with antenna switching modules for mobile radio applications. The R&S®ZVT8 performs tests on such modules quickly and easily. FIG 7 shows a test setup for measuring such a module, with the analyzer directly controlling the internal DUT switch. Current measurements can be performed at the same time via the DC inputs on the R&S®ZVT8.

Another application of the R&S®ZVT8 involves the testing of switches equipped, for example, with one input and multiple outputs. Using the Direct Generator / Receiver Access options (R&S®ZVT-B16), the R&S®ZVT8 can even capture signals separately by means of all its measurement and reference receivers – i.e. up to sixteen in the case of the R&S®ZVT8 eight-port model.

For example, if a switch has one input and eight outputs, one port of the analyzer is connected to the input of the switch and six further ports to six outputs of the switch (FIG 8). Outputs seven and eight are directly connected to the

measurement and reference receiver inputs of port 8, which is fitted with the R&S®ZVT-B16 option. The eight receivers of a four-port analyzer can also be used for directly measuring wave quantities.

Technologies such as smart antennas and MIMO (multiple input, multiple output) are increasingly being used in mobile radio and other wireless communications systems such as WLAN. All these technologies open up new fields of application for multipoint measurements, for which the R&S®ZVT8 is the ideal choice.

Andreas Henkel

More information and data sheet at
www.rohde-schwarz.com
 (search term: ZVT)

Condensed data of the R&S®ZVT8

Number of test ports	2 to 8
Frequency range	300 kHz to 8 GHz
Measurement time per point	<3.5 µs
Measurement time (201 points)	4.5 ms
Data transfer time (201 points)	
Via IEC/IEEE bus	<2.9 ms
Via VX11 (LAN at 100 Mbit/s)	<1.3 ms
Via RSIB (LAN at 100 Mbit/s)	<0.7 ms
Switching time between channels	<1 ms
between instrument setups	<10 ms
Dynamic range at 10 Hz measurement bandwidth	
between test ports	>120 dB, typ. 130 dB
Output level at test port	>+13 dBm, typ. +15 dBm
Level sweep range	>40 dB, typ. 50 dB
IF bandwidths	1 Hz to 1 MHz
Number of channels, diagrams and traces	>100 (depending on available RAM)
Number of points per trace	2 to 20001
Operating system	Windows XP Embedded

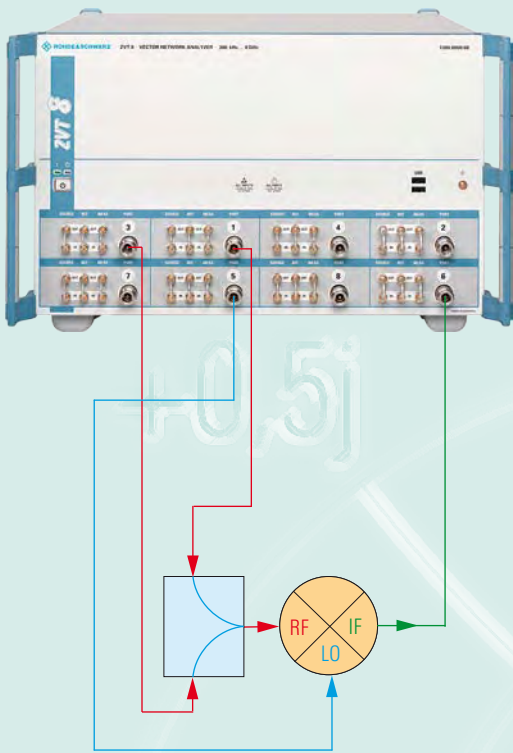


FIG 5 Test setup for an intermodulation measurement on a mixer.

FIG 6 Result of an intermodulation measurement performed on a mixer.

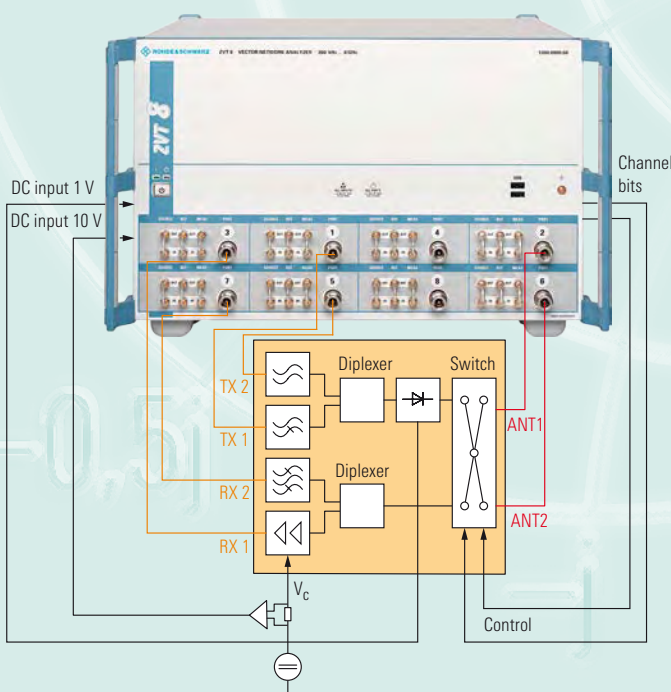


FIG 7 Measurement of a complex multiport module.

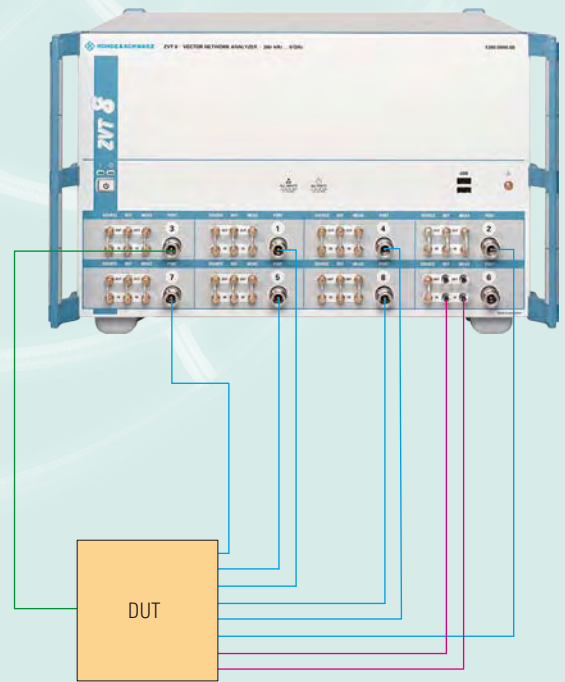


FIG 8 Measurements on a switch with one input and eight outputs pose no problems for the R&S® ZVT 8.