R&S®ETH
Handheld TV Analyzer
Portable digital TV signal analysis up to 3.6 GHz/8 GHz

ROHDE&SCHWARZ

Product Brochure | Version 06.00

R&S®ETH Handheld TV Analyzer

At a glance

The R&S®ETH handheld TV analyzer was specially developed for coverage measurements as well as for service and maintenance work on DVB-T, DVB-H and ISDB-T gap-filler and low-power transmitters. The universal capabilities of the R&S®ETH also make it useful in the repair and development of TV components.

Easy-to-replace battery.

The R&S®ETH handheld TV analyzer is the compact combination of a TV analyzer, spectrum analyzer and network analyzer. It supports the digital DVB-T, DVB-H and ISDB-T TV standards. Its functional versatility eliminates the need for other measuring equipment. The analyzer covers the frequency range up to 3.6 GHz or 8 GHz. The housing was specially designed for portable use and is therefore rugged and splash-proof. The large, daylight-friendly color display, the low weight and the replaceable lithium-ion battery enhance the analyzer's portability. To improve its receive sensitivity and selectivity, the R&S®ETH can be equipped with internal preselection followed by a preamplifier.

The core component of the R&S®ETH is an FPGA-based realtime digital TV demodulator that offers maximum measurement performance and provides a demodulated MPEG-2 transport stream at the TS-ASI output. The measurement results are displayed on straightforward measurement screens and can be stored in the internal memory or on external storage media such as SD card or USB memory stick.

The R&S®ETHView Windows PC software, which comes with the analyzer, allows easy documentation of measurement results. R&S®ETHView enables the user to edit and redefine the channel tables, measurement profiles, transducers and limit tables delivered with the instrument and to load them in the R&S®ETH. The data is transferred via the USB or LAN interface.

Key facts

- TV, spectrum and network analyzer in a single box
- Frequency range up to 3.6 GHz or 8 GHz
- High-precision demodulator (MER typ. 45 dB)
- Wide input level range (–76 dBm to +10 dBm) for quasi-error-free transport stream decoding
- Compact, lightweight, portable instrument that runs max. 4.5 hours on battery

R&S®ETH Handheld TV Analyzer

Benefits and key features

Model overview	
Frequency range	**Model**
100 kHz to 3.6 GHz	R&S®ETH, model .14
100 kHz to 8.0 GHz	R&S®ETH, model .18

R&S®ETH with fold-out stand for desktop use.

Comprehensive TV, spectrum and network analysis functionality

- Measurement of all DVB-T, DVB-H and ISDB-T signal parameters
- Display of constellation diagram, channel impulse response, OFDM spectrum with shoulder distance and MER(k)
- Wide input level range due to integrated preselection and preamplifier
- Full-featured spectrum analyzer
- Network analysis and distance-to-fault measurement by means of integrated tracking generator
- Frequency locked to external reference
- High-precision power measurement with external Rohde&Schwarz power sensors
- Field-strength measurement using isotropic antenna

▷ page 4

Fast and precise measurement due to realtime demodulation

- FPGA-based realtime digital TV demodulator for maximum measurement accuracy
- Reliable detection of short-time interference
- Measurement of digital TV signals with negative signal/noise ratio
- BER measurement and ASI transport stream output

▷ page 7

Optimized for field use

- Compact, lightweight instrument with rugged housing
- Splash-proof and dust-proof
- Easily accessible, well protected connectors
- Daylight-friendly, high-resolution color display
- Easy-to-replace lithium-ion battery for long battery operating time
- Frequency correction and positioning via GPS

▷ page 8

Easy operation

- Fast selection of functions via keypad and rotary knob
- Frequency setting using channel tables
- Easy testing based on limit tables
- Reproducible measurements using user-specific measurement profiles, transducers and cable models
- Storage of measurement data in internal memory, on SD card or USB memory stick

▷ page 9

Convenient data exchange with PC

- R&S®ETHView PC software for configuring channel tables, limit tables and measurement profiles
- R&S®ETHView for transferring measured data to PC via LAN or USB interface
- Remote control through SCPI commands via LAN or USB

▷ page 10

Comprehensive TV, spectrum and network analysis functionality

Measurement of all DVB-T, DVB-H and ISDB-T signal parameters

The R&S®ETH handheld TV analyzer measures all key parameters of the digital TV signal and displays them on its straightforward screen, providing the user with an overview of the quality of the received signal. In addition, the analyzer uses the parameters contained in the TPS [1] carriers or TMCC symbols to adjust its demodulator. At a keystroke, the R&S®ETH then displays the decoded TPS or TMCC information in a second list.

[1] TPS: transmission parameter signaling.
TMCC: transmission multiplexing configuration control.

DVB-T/H Meas List My Meas Profile 14/06/10 11:19

RF	906 MHz
Channel / Band	75 / UHF 4/5
Channel Table	TV Europe
Gain Control / RF Attenuation	Auto Low Noise / 0 dB
OFDM Bw / Channel Bw	7.6071429 MHz / 8 MHz

Measurement Parameter	Result
Power	-25.87 dBm
Crest Factor	12.74 dB
Demodulator	locked
Sideband Position	normal
Transmission Parameter Signaling	8K 1/32 QAM64 NH
Carrier Frequency Offset	15.6 Hz
Symbol Rate Offset	0.0 ppm
Modulation Error Ratio	rms 44.3 dB peak 32.5 dB
Error Vector Magnitude	rms 0.40 % peak 1.55 %
FEC Decoder	locked
BER before Viterbi / Reed Solomon	0.0E-09 0.0E-09
Packet Error Ratio	0.0E-06
Packet Errors	0 /s
MPEG TS Bitrate	27.144386 Mbit/s

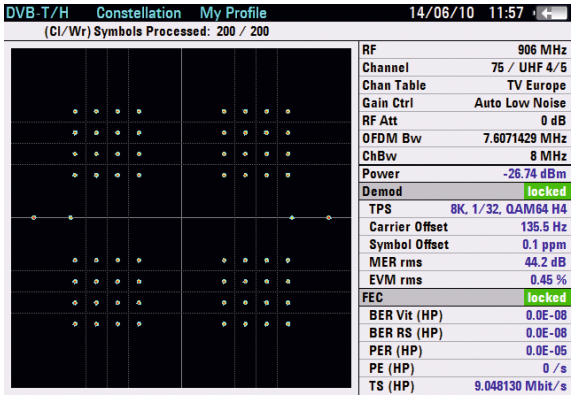
List display of DVB-T measurement results.

ISDB-T Meas List My Meas Profile 14/06/10 10:41

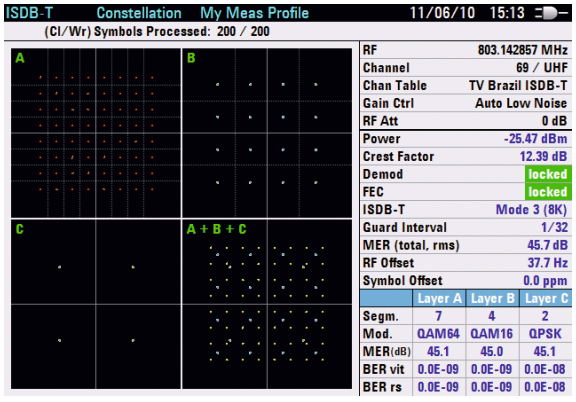
RF	803.142857 MHz
Channel / Band	69 / UHF
Channel Table	TV Brazil ISDB-T
Gain Control / RF Attenuation	Auto Low Noise / 0 dB

Measurement Parameter				
Power	-26.69 dBm	Crest Factor	12.26 dB	
OFDM Demodulator	locked	FEC Decoder	locked	
ISDB-T Mode	Mode 3 (8K)			
Guard Interval	1/32	MER (total,rms)	45.6 dB	
Sideband Position	normal	MER (total,peak)	27.7 dB	
RF Offset	39.5 Hz	MER TMCC	47.6 dB	
Symbol Rate Offset	0.0 ppm	MER AC	47.7 dB	
	Layer A	Layer B	Layer C	
MER (Layer,rms)	45.2	45.1	45.2	dB
BER before Viterbi	0.0E-08	0.0E-08	0.0E-07	
BER before Reed Solomon	0.0E-08	0.0E-08	0.0E-07	
BER after Reed Solomon	0.0E-03	0.0E-02	0.0E-02	
Packet Errors	0	0	0	/s
MPEG TS Bitrate	12.510993	4.085222	0.680870	Mbit/s

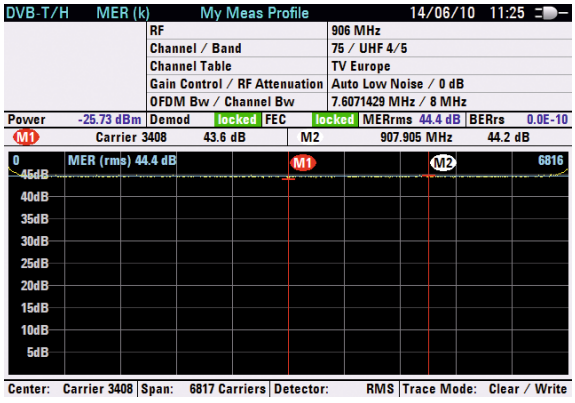
List display of ISDB-T measurement results.



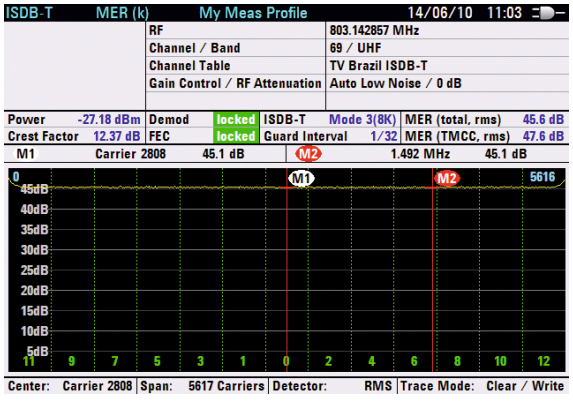
DVB-T constellation diagram with hierarchical modulation.



ISDB-T constellation diagram of layers A, B and C.



MER of the individual DVB-T OFDM carriers.



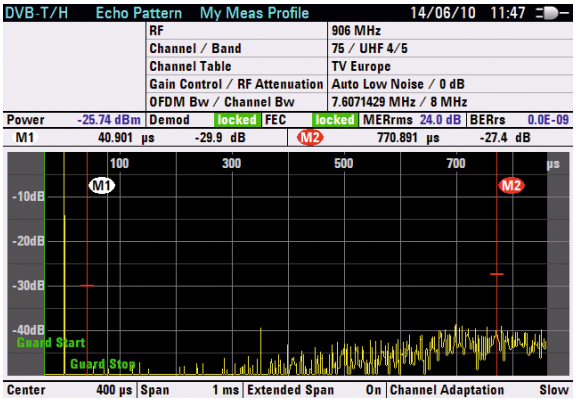
MER(k) measurement of the 13 segments of the ISDB-T spectrum.

Display of constellation diagram, channel impulse response, OFDM spectrum with shoulder distance and MER(k)

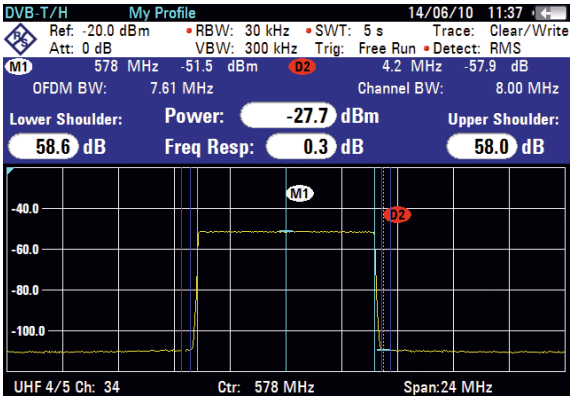
For visual analysis, the R&S®ETH can show the constellation diagram of the received TV signal. The signal parameters and measurement results are displayed together with the constellation diagram. This means that the user sees all important information at a single glance.

The channel impulse response measurement is essential for the analysis of receive problems. This measurement produces a graph showing echoes due to multipath propagation as well as the different signal delays of the transmitters in a single-frequency network (SFN). The marker functions of the R&S®ETH and the display of the echoes as lists with settable sensitivity threshold make it easy for the user to evaluate the measured channel impulse response.

The R&S®ETH also displays the spectrum of the received TV signal and measures the upper and lower shoulder distance in line with ETSI TR 101 290 as well as the channel power and the amplitude-frequency response of the OFDM spectrum.



Channel impulse response.



DVB-T spectrum with shoulder distance measurement.

The R&S®ETH measures the modulation error ratio (MER) of all OFDM carriers. In addition to indicating the RMS value and the worst value (peak), it also provides a graphical display of the MER values measured versus the OFDM carriers, i.e. MER(k). The marker functions are a user-friendly means of evaluation.

Wide input level range due to integrated preselection and preamplifier

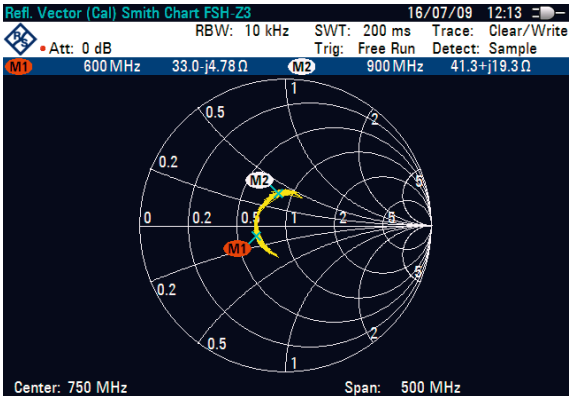
The R&S®ETH has an internal RF preselection that suppresses unwanted received signals and thereby increases the dynamic range. A low-noise amplifier that is connected after the preselection filter increases the sensitivity of the R&S®ETH when preselection is on. As a result, the R&S®ETH achieves a level range from –76 dBm to +10 dBm for quasi-error-free transport stream decoding.

Full-featured spectrum analyzer

The R&S®ETH handheld TV analyzer provides the full functionality of a spectrum analyzer with a wide resolution bandwidth from 100 Hz to 3 MHz. Comprehensive marker and trace functions make the user's job easier. The R&S®ETH also supports power measurements on pulsed signals as well as occupied bandwidth and channel power measurements.

Network analysis and distance-to-fault measurement by means of integrated tracking generator

The tracking generator converts the R&S®ETH into a network analyzer. It supports scalar and vector one-port and two-port measurements. Transfer functions such as filter traces, gain or insertion loss are measured by the base unit. An external VSWR bridge allows reflection measurements, e.g. for testing antenna matching. Using the same test setup, the R&S®ETH can also check cables for damage (distance-to-fault measurements). To do this, the R&S®ETH offers a separate display that shows the individual reflection spots in the cable versus cable length and maps them onto a straightforward list.



Vector network analysis.

Frequency locked to external reference

The R&S®ETH is equipped with a highly stable internal reference oscillator. If measurements on transmitters and transposers have to be carried out, the frequency reference of the R&S®ETH can be synchronized with an external 10 MHz reference signal. This capability makes it possible to measure any drift of the transmit frequency and of the symbol clock with extremely high accuracy.

High-precision power measurement with external Rohde&Schwarz power sensors

Broadband power measurements can be performed by combining Rohde&Schwarz power sensors with the R&S®ETH. The R&S®ETH supports both terminating and directional power sensors, which makes it a high-precision RF power meter.

Field-strength measurement using isotropic antenna

When equipped with the R&S®TS-EMF isotropic antenna, the R&S®ETH can determine the direction-independent resultant field strength in the frequency range from 30 MHz to 3 GHz. This capability is a great advantage especially for indoor coverage measurements. The isotropic antenna consists of three orthogonally arranged antenna elements. The R&S®ETH sequentially activates these antenna elements and calculates the resultant field strength, taking into account the antenna factors for each element and the cable loss of the connecting cable.

The R&S®ETH and the R&S®FSH-Z1 terminating power sensor.

Field-strength measurements using the R&S®TS-EMF isotropic antenna.

Fast and precise measurement due to realtime demodulation

RF input and tracking generator output on the top of the R&S®ETH.

FPGA-based realtime digital TV demodulator for maximum measurement accuracy

The core component of the R&S®ETH is an FPGA-based measurement demodulator that demodulates and decodes the received signal in realtime. Its implementation as an FPGA helps to ensure minimum tolerances and therefore high accuracy and reproducibility. The R&S®ETH achieves a MER value of typ. 45 dB at 500 MHz, which is excellent in its class.

Reliable detection of short-time interference

A key task in examining receive problems is the detection of irregularly occurring short-time interference. The R&S®ETH is ideal for this task due to its realtime signal processing unit and its high speed of eight measurements per second. Impulsive interference can be detected reliably.

Measurement of digital TV signals with negative signal/noise ratio

In a special operating mode, the demodulator of the R&S®ETH synchronizes to extremely noisy received signals. The analyzer detects very weak signals – even with a negative signal/noise ratio of as low as –3 dB. Coverage measurements can therefore be performed even under poor receive conditions.

BER measurement and ASI transport stream output

Realtime demodulation allows the continuous measurement of the bit error ratio (BER) of the received signal. The R&S®ETH indicates the BER before the Viterbi decoder and the Reed-Solomon decoder as well as the packet error ratio of the decoded transport stream, which enables the user to estimate the anticipated picture quality. In the case of DVB-T with hierarchical modulation, the BER can be displayed either for the high-priority bit stream or for the low-priority bit stream. For ISDB-T, the R&S®ETH simultaneously displays the BER for layers A, B and C. The R&S®ETH then makes the decoded transport stream available at the ASI output for further processing.

Optimized for field use

The connectors on the side are protected by a cap.

Portable and rugged

The R&S®ETH has been designed for field use, which becomes evident at first sight: The instrument is compact and handy, has a practical carrying handle and weighs only 3.3 kg including battery. The housing is rugged, splash-proof and dust-proof. The connectors on the side of the instrument as well as the RF connectors on its top are protected by caps. They can nevertheless be accessed easily and quickly. When equipped with its optional rain protection, the R&S®ETH complies with the IP 54 standard. The additional carrying strap frees up the user's hands for other work.

Daylight-friendly, high-resolution color display

The bright, clear-cut 6.5" VGA color display makes for good readability of the measurement results. The back-lighting of the display can be adapted to the ambient lighting conditions; a special monochrome mode ensures optimum contrast even under strong sunlight.

Easy-to-replace lithium-ion battery for long battery operating time

For field use, it is of major importance that the instrument can be battery-run for an extended period of time. One charge of its lithium-ion battery allows the R&S®ETH to operate up to 4.5 hours. If a special application requires a longer operating time, the battery can be replaced in a matter of seconds; spare batteries are available as accessory.

Frequency correction and positioning via GPS

For measurements in the field, the accuracy of the frequency measurement results of the R&S®ETH can be improved by applying the 1 pps signal of the optionally available external GPS receiver. Equipped with the GPS receiver, the R&S®ETH can furthermore display the geographic coordinates of the current position. This capability provides valuable support especially during test drives because it allows individual measurements to be allocated to local conditions later. The optional R&S®BCDRIVE software enables convenient analysis of drive tests on the computer.

Easy operation

Clear-cut operating controls: function keys, softkeys and rotary knob.

Fast selection of functions via keypad and rotary knob

The R&S®ETH can be conveniently operated using the keypad and the rotary knob with built-in Enter key. Basic functions are assigned to fixed function keys, while navigation in the menus of the different measurement screens is performed via softkeys. All controls are arranged such that they are easy to reach even in the case of portable use.

Frequency setting using channel tables

Especially in TV broadcasting, channels are normally identified by their channel number instead of their carrier frequency. The R&S®ETH supports both methods: It can be tuned to the wanted received signal by entering either the carrier frequency or the channel number. The TV channel tables of many different countries are already included in the instrument.

Easy testing based on limit tables

To check a TV transmitter against its specifications, a large number of parameters must be checked and compared to the permissible limit values. The R&S®ETH considerably simplifies this task by allowing the user to define limit values in tables. Any violation of these limit values is immediately highlighted in color so that the user can see at a glance whether the measurement is within the permissible limits.

Reproducible measurements using user-specific measurement profiles, transducers and cable models

When making coverage measurements, the characteristic of the antenna used must be taken into account. This characteristic can be saved in the R&S®ETH as a transducer, which will then be used for automatically correcting the displayed measurement values. The transducers for Rohde&Schwarz test antennas are already included in the instrument. The parameters of different cable types can also be saved in the R&S®ETH and loaded for distance-to-fault measurements. In addition, all the settings required for a specific measurement task can be saved as a user-specific measurement profile and called up when necessary. This considerably simplifies the time-consuming and error-prone manual entry of parameters.

Storage of measurement data in internal memory, on SD card or USB memory stick

The measurement data and the current device settings can be saved quickly and easily in the internal memory of the R&S®ETH, on an SD card or on a USB memory stick. A particularly helpful feature is the hardcopy function, which stores the current screen contents as a graphics file in the R&S®ETH with just one keystroke.

Convenient data exchange with PC

Configuration and documentation by means of the R&S®ETHView Windows PC software

The R&S®ETHView PC software is delivered with the R&S®ETH. It enables the user to perform convenient bidirectional data transfer between the R&S®ETH and a PC via USB or LAN interface. It includes editors for generating measurement profiles, limit values, transducers, cable models and channel tables and transfers them to the R&S®ETH. In addition, the software ensures the transmission of saved measurement results and hardcopy files from the R&S®ETH to the PC for documentation and further processing. R&S®ETHView furthermore permits remote monitoring of signals, e.g. in unattended transmitter sites. In this case, the R&S®ETH is remote-controlled via LAN; the software is used for transferring the current measurement values – also via LAN – to the PC and for displaying them.

Remote control through SCPI commands via LAN or USB

The R&S®ETH can be remote-controlled via the LAN or USB interface, which allows it to be integrated into automatic test systems. The SCPI remote control commands are activated by means of the R&S®ETH-K40 option.

The R&S®ETH with a laptop running R&S®ETHView.

Installation, maintenance and service of low-power transmitters

Although gap fillers have lower output power than high-power transmitters, they must fulfill identical signal quality requirements for MER, shoulder distance and interference. These requirements must also be met by the T&M equipment used for putting the gap fillers into operation and for maintaining them. Because gap fillers are often installed at difficult-to-access sites, a portable T&M instrument offers considerable advantages. The R&S®ETH is ideal for this application: The analyzer has the high measurement accuracy required and combines all the necessary measurement functions in a compact, portable box.

Checking a low-power transmitter by means of the R&S®ETH.

Detecting coverage gaps in digital TV networks

Network operators normally verify the coverage quality in the transmission area by using test vehicles. In many cases, however, these vehicles cannot reach locations where large numbers of people gather, e.g. airports, railway stations and pedestrian zones. All these locations require the use of a portable measuring instrument. The R&S®ETH is especially well suited for performing such measurements because of its compact design, low weight and long battery operating time. The built-in preselection ensures high sensitivity, and the characteristic of the test antenna can be automatically compensated for during the measurement.

Indoor coverage measurements.

Specifications in brief

Specifications in brief		
DVB-T/DVB-H receiver (R&S®ETH-K140 option) and ISDB-T receiver (R&S®ETH-K160 option)		
Quasi-error-free input level range	RF = 500 MHz, RF preselection ON	typ. –76 dBm to +10 dBm
Inherent modulation error ratio (MER)	RF = 500 MHz	
	RF preselection OFF, level = –30 dBm	> 43 dB, typ. 46 dB
	RF preselection ON, level = –45 dBm	> 41 dB, typ. 44 dB
Phase noise	RF = 500 MHz	
	Δf = 30 kHz	< 98 dBc (1 Hz)
	Δf = 100 kHz	< 100 dBc (1 Hz)
	Δf = 1 MHz	< 125 dBc (1 Hz)
Noise figure	RF = 500 MHz, RF attenuation 0 dB	
	RF preselection OFF	< 22 dB, typ. 18 dB
	RF preselection ON	< 14 dB, typ. 11 dB
Third-order intermodulation (TOI)	RF attenuation 0 dB	
	RF preselection OFF	typ. +7 dBm
	RF preselection ON	typ. –6 dBm
Second harmonic intercept point (SHI)	50 MHz < RF < 1.5 GHz, RF attenuation 0 dB	
	RF preselection OFF	typ. +30 dBm
	RF preselection ON	typ. +60 dBm
Signal level uncertainty	RF < 3.6 GHz	< 1.0 dB, typ. < 0.5 dB
Frequency uncertainty	internal reference	2×10^{-6}
	with the R&S®HA-Z240 GPS receiver	2.5×10^{-8}
Spectrum analysis		
Displayed average noise level (DANL)	10 MHz < RF < 2 GHz, RF attenuation 0 dB	
	RF preselection OFF	typ. –156 dBm (1 Hz)
	RF preselection ON	typ. –165 dBm (1 Hz)
Resolution bandwidths (RBW)		100 Hz to 3 MHz in 1/3 sequence
Video bandwidths		10 Hz to 3 MHz in 1/3 sequence
Trace detectors		auto peak, max. peak, min. peak, sample, RMS
Network analysis		
Tracking generator output level		–40 dBm to 0 dBm in 1 dB steps
Data points		631
Dynamic range for transmission measurements	300 kHz to 3.6 GHz	> 70 dB, typ. 90 dB
Reflection measurements	R&S®FSH-Z2	10 MHz to 3 GHz
	R&S®FSH-Z3	30 MHz to 6 GHz
Power meter		
Terminating power sensors	R&S®FSH-Z1	25 MHz to 1 GHz
	R&S®FSH-Z18	30 MHz to 18 GHz
Directional power sensors	R&S®FSH-Z14	10 MHz to 8 GHz
	R&S®FSH-Z44	200 MHz to 4 GHz
General data		
Operating temperature range	with battery	0 °C to +50 °C
Battery operating time	receiver mode	2.5 h
	spectrum analyzer mode	4.5 h
Dimensions (W × H × D)	with handle	194 mm × 300 mm × 144 mm (76 in × 118 in × 57 in)
	without handle	194 mm × 300 mm × 69 mm (76 in × 118 in × 28 in)
Weight		3.3 kg (6.6 lb)

For data sheet, see 5213.9592.22 and www.rohde-schwarz.com

Ordering information

Designation	Type	Order No.
Base unit		
Handheld TV Analyzer, 100 kHz to 3.6 GHz, with tracking generator, model .14	R&S®ETH	2114.1508.14
Handheld TV Analyzer, 100 kHz to 8 GHz, with tracking generator model .18	R&S®ETH	2114.1508.18
Accessories supplied		
Li-ion battery, plug-in power supply, LAN cable, USB cable, USB adapter, quick start guide, CD with R&S®ETHView Windows PC software and documentation		
Software options		
DVB-T/DVB-H Analyzer	R&S®ETH-K140	2114.1708.02
ISDB-T Analyzer	R&S®ETH-K160	2114.1743.02
Preselection, up to 3.6 GHz	R&S®ETH-K1	2114.1608.04
Preselection, up to 8 GHz	R&S®ETH-K1	2114.1608.08
Remote Control	R&S®ETH-K40	2114.1814.02
Distance-to-Fault Measurement	R&S®FSH-K41	1304.5612.02
Vector Network Analysis	R&S®FSH-K42	1304.5629.02
Broadcast Drive Test Software	R&S®BCDRIVE	2115.1360.03
External accessories [1] (PC software, additional equipment, peripherals, etc.)		
Directional Power Sensor, 25 MHz to 1 GHz	R&S®FSH-Z14	1120.6001.02
Directional Power Sensor, 200 MHz to 4 GHz	R&S®FSH-Z44	1165.2305.02
Combined Open/Short/50 Ω Load Calibration Standard, DC to 8 GHz	R&S®FSH-Z28	1300.7810.03
Combined Open/Short/50 Ω Load Calibration Standard, DC to 3.6 GHz	R&S®FSH-Z29	1300.7510.03
Matching Pad 75 Ω, L section	R&S®RAM	0358.5414.02
Matching Pad 75 Ω, L section, N to BNC	R&S®FSH-Z38	1300.7740.02
Matching Pad 75 Ω, series resistor 25 Ω	R&S®RAZ	0358.5714.02
Spare Power Supply, incl. mains plug for EU, GB, US	R&S®HA-Z201	1309.6100.00
12 V Car Adapter	R&S®HA-Z202	1309.6117.00
Battery Charger for Li-ion battery pack, 4.5 Ah/6.75 Ah	R&S®HA-Z203	1309.6123.00
Li-Ion Battery Pack, 6.75 Ah	R&S®HA-Z206	1309.6146.00
Spare Ethernet Cable, length: 1.5 m	R&S®HA-Z210	1309.6152.00
Spare USB Cable, length: 1.5 m, A/mini B connector	R&S®HA-Z211	1309.6169.00
Soft Carrying Bag (W × H × D: 260 mm × 360 mm × 280 mm/10.23 in × 14.17 in × 11 in)	R&S®HA-Z220	1309.6175.00
Hard Case	R&S®HA-Z221	1309.6181.00
Carrying Holster, including chest harness and rain cover	R&S®HA-Z222	1309.6198.00
SD Memory Card, 2 Gbyte	R&S®HA-Z232	1309.6217.00
GPS Receiver	R&S®HA-Z240	1309.6700.02
Near-Field Probe Set	R&S®HZ-15	1147.2736.02
Preamplifier for R&S®HZ-15	R&S®HZ-16	1147.2720.02

[1] Selection. For a complete list of available accessories, visit www.rohde-schwarz.com.

Warranty		
Base unit		3 years
All other items[2)]		1 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	
Extended Warranty with Accredited Calibration Coverage, one year	R&S®AW1	
Extended Warranty with Accredited Calibration Coverage, two years	R&S®AW2	

[2)] For options that are installed, the remaining base unit warranty applies if longer than 1 year. Exception: all batteries have a 1 year warranty.

Your Rohde&Schwarz sales partner will be glad to help you find the optimal solution that exactly meets your requirements. Your local contact can be found at
www.sales.rohde-schwarz.com

Service that adds value

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

Rohde&Schwarz

The Rohde&Schwarz electronics group offers innovative solutions in the following business fields: test and measurement, broadcast and media, secure communications, cybersecurity, monitoring and network testing. 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
www.training.rohde-schwarz.com

Regional contact

- Europe, Africa, Middle East | +49 89 4129 12345
  customersupport@rohde-schwarz.com
- North America | 1 888 TEST RSA (1 888 837 87 72)
  customer.support@rsa.rohde-schwarz.com
- Latin America | +1 410 910 79 88
  customersupport.la@rohde-schwarz.com
- Asia Pacific | +65 65 13 04 88
  customersupport.asia@rohde-schwarz.com
- China | +86 800 810 82 28 | +86 400 650 58 96
  customersupport.china@rohde-schwarz.com

R&S® is a registered trademark of Rohde&Schwarz GmbH&Co. KG
Trade names are trademarks of the owners

PD 5213.9592.12 | Version 06.00 | November 2017 (fi)
R&S®ETH Handheld TV Analyzer

Data without tolerance limits is not binding | Subject to change
© 2008 - 2017 Rohde&Schwarz GmbH&Co. KG | 81671 Munich, Germany

5213959212

5213.9592.12 06.00 PDP 1 en