R&S®TE1
LIQUID-COOLED TRANSMITTER

Specifications

Specifications
Version 03.00

ROHDE&SCHWARZ

Make ideas real

CONTENTS

Definitions

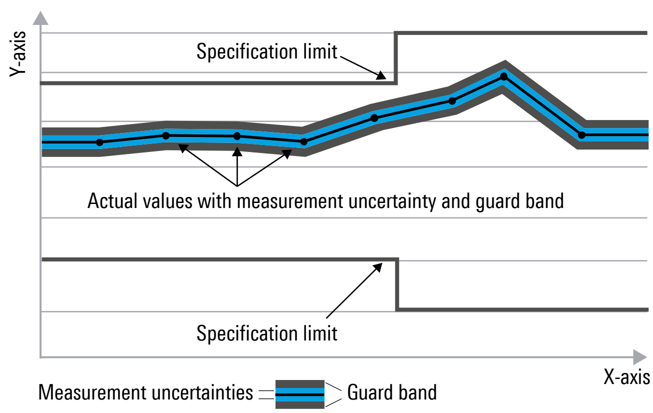
General

Product data applies under the following conditions:

- Three hours of storage at ambient temperature followed by 30 minutes of warm-up operation
- Specified environmental conditions met
- Recommended calibration interval adhered to
- All internal automatic adjustments performed, if applicable

Specifications with limits

Represent warranted product performance by means of a range of values for the specified parameter. These specifications are marked with limiting symbols such as <, ≤, >, ≥, ± or descriptions such as maximum, limit of, minimum. Compliance is ensured by testing or is derived from the design. Test limits are narrowed by guard bands to take into account measurement uncertainties, drift and aging, if applicable.



Non-traceable specifications with limits (n. trc.)

Represent product performance that is specified and tested as described under “Specifications with limits” above. However, product performance in this case cannot be warranted due to the lack of measuring equipment traceable to national metrology standards. In this case, measurements are referenced to standards used in the Rohde & Schwarz laboratories.

Specifications without limits

Represent warranted product performance for the specified parameter. These specifications are not specially marked and represent values with no or negligible deviations from the given value, e.g. dimensions or resolution of a setting parameter. Compliance is ensured by design.

Typical data (typ.)

Characterizes product performance by means of representative information for the given parameter. When marked with <, > or as a range, it represents the performance met by approximately 80 % of the instruments at production time. Otherwise, it represents the mean value.

Nominal values (nom.)

Characterize product performance by means of a representative value for the given parameter, e.g. nominal impedance. In contrast to typical data, a statistical evaluation does not take place and the parameter is not tested during production.

Measured values (meas.)

Characterize expected product performance by means of measurement results gained from individual samples.

Uncertainties

Represent limits of measurement uncertainty for a given measurand. Uncertainty is defined with a coverage factor of 2 and has been calculated in line with the rules of the Guide to the Expression of Uncertainty in Measurement (GUM), taking into account environmental conditions, aging, wear and tear.

Device settings and GUI parameters are designated with the format “parameter: value”.

Non-traceable specifications with limits, typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

In line with the 3GPP standard, chip rates are specified in million chips per second (Mcps), whereas bit rates and symbol rates are specified in billion bit per second (Gbps), million bit per second (Mbps), thousand bit per second (kbps), million symbols per second (Msps) or thousand symbols per second (ksps), and sample rates are specified in million samples per second (Msample/s). Gbps, Mcps, Mbps, Msps, kbps, ksps and Msample/s are not SI units.

Model overview

UHF DTV models			
Number of amplifiers per transmitter	**Output power (AVG) for COFDM and ATSC**	**Dimensions (W × H × D)**	**Number of cabinets**
2	3.6 kW	600 mm × 2000 mm × 1100 mm (23.62 in × 78.74 in × 43.31 in)	1
3	5.4 kW		
4	7.2 kW		
5	9.0 kW		
6	10.8 kW		
7	12.6 kW		
8	14.4 kW		
10	18.0 kW		
12	21.5 kW		
14	24.5 kW		
16	28.0 kW	1200 mm × 2000 mm × 1100 mm (47.24 in × 78.74 in × 43.31 in)	2
20	35.0 kW		
24	42.0 kW		
28	49.0 kW		
30	52.0 kW	1800 mm × 2000 mm × 1100 mm (70.87 in × 78.74 in × 43.31 in)	3
36	62.0 kW		
42	72.0 kW		
48	82.0 kW	2400 mm × 2000 mm × 1100 mm (94.49 in × 78.74 in × 43.31 in)	4
56	96.0 kW		

Specifications

Frequency range	UHF band V/IV	470 MHz to 700 MHz (700 MHz to 862 MHz on request)
Maximum installation height		2000 m above sea level (higher on request)
Operating temperature range	indoor	+1 °C to +45 °C
	heat exchanger	≤ +45 °C
Relative humidity	indoor	max. 95 %, noncondensing
	with R&S®SCP100 option	max. 90 %, noncondensing
Liquid cooling system	power amplifiers including power supplies and power combiner	liquid-cooling of all power components
	maximum operating pressure	≤ 3.5 bar, inside cabinet
	pressure relief valve rating for valve of the integrated pump unit	6 bar; a station cooling system requires the integration of a pressure relief valve
Dissipated heat into the room	per transmitter	
	1 to 3 amplifiers	< 600 W
	4 amplifiers or more	≤ 5 % of total power consumption
Mains voltage		230 V/400 V ± 15 % (L1/L2/L3/N/PE), 208 V ± 15 % (L1/L2/L3/PE), 220 V ± 15 % (L1/L2/L3/PE), 240 V + 10 %/– 15 % (L1/L2/L3/PE), 50 Hz to 60 Hz ± 5 %, OVC II (IEC 60664)
Mains power factor (PF)		> 0.95
Mains harmonics		I_{THD} < 20 %
Immunity	to fast transient and burst	
	AC mains supply, limited by internal type 2 SPD	< 4 kV
	signal inputs	< 1 kV
	to surges, limited by internal type 2 SPD	
	symmetrical	< 4 kV (e.g. L1 to N)
	asymmetrical	< 2 kV (e.g. L1 to L2)
VSWR	with full power	≤ 1:1.33
	with reduced power	1:1.33 ≤ VSWR ≤ 1:3.0
Noise	per transmitter	
	indoor	< 60 dBA, at +30 °C
	outdoor	< 45 dBA, at +20 °C
RF output connector	depending on number of amplifiers	EIA 1 3/8", EIA 1 5/8", EIA 3 1/8", EIA 4 1/2", EIA 4 1/16", EIA 6 1/8" (50 Ω)

Digital TV specifications

Standards		ATSC, ATSC3.0, ISDB-T, ISDB-T_B
Channel bandwidth	ATSC, ATSC3.0	6 MHz
	ISDB-T, ISDB-T_B	6 MHz, 8 MHz
Feeding interfaces	ATSC	2 × TSoIP (Gigabit Ethernet), 2 × SMPTE 310M or ASI (BNC, 75 Ω)
	ATSC3.0	2 × STL or TSoIP (Gigabit Ethernet)
	ISDB-T, ISDB-T_B	2 × TSoIP (Gigabit Ethernet), 2 × ASI (BNC, 75 Ω)

Synchronization

Reference interfaces		
Reference input	1 pps	1 Hz, TTL (BNC)
Reference via IP networks	precision time protocol (PTP)	PTPv2
GPS receiver		optional

Monitoring and control

Local operation		via web GUI (HTML5), exciter displays
	optional	system touch display, via smart devices (iOS, Android), provided by operator
Remote operation		SNMPv2, via web GUI (HTML5)
	optional	HTTPS (TLS v1.2 or older)
Parallel remote operation	optional	floating contacts for messages and commands

Protection mechanisms

Monitored states	on transmitter level	• mains • liquid temperature (inlet and outlet) • liquid flow • liquid pressure • RF output power (forward and reflected) • modulation inputs • main state of components
	on amplifier level	• mains • output (forward and reflected) • temperature • transistor failure • RF input failure • RF output failure • transistor currents • reflection • DC and AC voltages • power supply failure

Standards

General standards		in line with EN 300019-1-3 environmental conditions, indoor class 3.2, reduced temperature range, noncondensing, outdoor class 3.2, reduced temperature range
EMC standards		in line with EN 301489-1/EN 301489-53 electromagnetic compatibility
	with bandpass filter	EN 302296 radio spectrum
	< 16 A	EN 61000-3-2 mains harmonics
	> 16 A	EN 61000-3-12 mains harmonics
	Korea	KS C 9610-4-11:2020 EMC immunity testing
Safety standards		in line with EN 62368 safety requirements
EU legislation	for details, see user documentation	EU: in line with Data Act – Regulation (EU) 2023/2854

Ordering information

Designation	Type	Order No.
Liquid-cooled transmitter	R&S®TE1	2517.0006K02

Service at Rohde & Schwarz
You're in great hands

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

Rohde & Schwarz
The Rohde & Schwarz technology group is among the trailblazers when it comes to paving the way for a safer and connected world with its leading solutions in test & measurement, technology systems and networks & cybersecurity. Founded more than 90 years ago, the group is a reliable partner for industry and government customers around the globe. The independent company is headquartered in Munich, Germany and has an extensive sales and service network with locations in more than 70 countries.

www.rohde-schwarz.com

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

More certificates of Rohde & Schwarz

Rohde & Schwarz training
www.training.rohde-schwarz.com

Rohde & Schwarz customer support
www.rohde-schwarz.com/support

PD 3685.0628.22 | Version 03.00 | September 2025 (la)
R&S®TE1 Liquid-Cooled Transmitter
Data without tolerance limits is not binding | Subject to change