

# R&S®RT-ZFxx

## Oscilloscope Test Fixtures

# Specifications

### R&S®RT-ZF1 USB 2.0 compliance test fixture set

The USB 2.0 compliance test fixture set contains a signal quality board and a load board for testing USB 2.0 (high speed), USB 1.1 (full speed) and USB 1.0 (low speed). It is used in combination with the R&S®RTO digital oscilloscope, the R&S®RTO-K21 option and the R&S®ScopeSuite software.

General data		
Temperature loading	operating temperature range	0 °C to +45 °C
	storage temperature range	-40 °C to +70 °C
Power supply		5.0 V DC ± 0.25 V via USB

### R&S®RT-ZF2 Ethernet compliance test fixture set

The Ethernet compliance test fixture set contains the test fixture board and a network analyzer calibration board for testing the physical layer of the Ethernet standards 10BASE-T, 100BASE-TX, 1000BASE-T and 10GBASE-T. It is used in combination with the R&S®RTO digital oscilloscope, the R&S®RTO-K22 option and the R&S®ScopeSuite software.

General data		
Temperature loading	operating temperature range	0 °C to +45 °C
	storage temperature range	-40 °C to +70 °C
Dimensions (W x H x L)	test fixture board	approx. 235 mm x 28 mm x 140 mm (9.3 in x 1.1 in x 5.5 in)
	calibration board	approx. 27 mm x 17 mm x 140 mm (1.1 in x 0.7 in x 5.5 in)

### R&S®RT-ZF2C Ethernet 1000BASE-T jitter test cable

The Ethernet 1000BASE-T jitter test cable contains the jitter test channel in line with IEEE 802.3-2008 chapter 40.6.1.1.1 for testing the transmitter timing jitter of the Ethernet standard 1000BASE-T with the required poor signal to echo ratio. It is used in combination with the R&S®RTO digital oscilloscope, the R&S®RTO-K22 option, the R&S®ScopeSuite software and the R&S®RT-ZF2 Ethernet compliance test fixture set.

General data		
Temperature loading	operating temperature range	0 °C to +45 °C
	storage temperature range	-40 °C to +70 °C
Dimensions (ø x H)	cable reel	approx. 450 mm x 120 mm (17.7 in x 4.7 in)

## R&S®RT-ZF3 frequency converter (100BASE-T1)

The frequency converter is intended to be used in combination with the BroadR-Reach®/100BASE-T1 compliance tests (R&S®RTO-K24), the R&S®RTO digital oscilloscope and the R&S®ScopeSuite software. It converts the BroadR-Reach® transmitter clock frequency of 66 2/3 MHz to the 10 MHz frequency clock used for the reference clock synchronization of measurement instruments.

General data		
Temperature loading	operating temperature range	+5 °C to +40 °C
	storage temperature range	–40 °C to +70 °C
Dimensions	W x H x L	approx. 54 mm x 22 mm x 140 mm (2.1 in x 0.7 in x 5.5 in)
Input	voltage range (at 50 Ω)	0.7 mV to 12 V
	expected frequency	66.666667 MHz
	frequency range	61 MHz to 69 MHz
	connector	1 SMA (50 Ω, female)
Output	voltage (at 50 Ω)	4.25 V ± 0.25 V
	frequency	input frequency/6.6667; resulting in 10 MHz at the expected input frequency of 66.666667 MHz
	connector	2 BNC (50 Ω, female)

## R&S®RT-ZF4 10BASE-Te energy efficient Ethernet test fixture

The 10BASE-Te energy efficient Ethernet test fixture is intended to be used in combination with the energy efficient Ethernet compliance tests (R&S®RTO-K86), the R&S®RTO digital oscilloscope and the R&S®ScopeSuite software. It implements resistive and inductive loads with or without a twisted pair model in line with IEEE standard 802.3az.

General data		
Temperature loading	operating temperature range	+5 °C to +40 °C
	storage temperature range	–40 °C to +70 °C
Dimensions	W x H x L	approx. 75 mm x 26 mm x 140 mm (3.0 in x 1.0 in x 5.5 in)

## R&S®RT-ZF5 Ethernet probing fixture

The Ethernet probing fixture is intended to be used as a general means of probing an Ethernet signal. Full duplex connections can be probed on separated directions.

General data		
Temperature loading	operating temperature range	+5 °C to +40 °C
	storage temperature range	–40 °C to +70 °C
Dimensions	W x H x L	approx. 140 mm x 22 mm x 160 mm (5.5 in x 0.9 in x 6.3 in)
Sections	directional probe	separation of forward and reverse direction of a full duplex signal; input and output: RJ-45; coupled: 4 SMA (50 Ω, female) per lane
	load and probe	100 Ω termination and probe pins input: RJ-45
	DUT and link partner	line tab with probe pins; input and output: RJ-45

## R&S®RT-ZF6 frequency converter (1000BASE-T1)

The frequency converter is intended to be used in combination with the 1000BASE-T1 compliance tests (R&S®RTO-K87), the R&S®RTO digital oscilloscope and the R&S®ScopeSuite software. It converts the 1000BASE-T1 transmitter clock frequency of 125 MHz to the 10 MHz frequency clock used for the reference clock synchronization of measurement instruments.

General data		
Temperature loading	operating temperature range	+5 °C to +40 °C
	storage temperature range	−40 °C to +70 °C
Dimensions	W x H x L	approx. 54 mm x 22 mm x 140 mm (2.1 in x 0.7 in x 5.5 in)
Input	voltage range (at 50 Ω)	7 mV to 12 V
	expected frequency	125 MHz
	frequency range	122 MHz to 128 MHz
	connector	1 SMA (50 Ω, female)
Output	voltage (at 50 Ω)	4 V ± 0.25 V
	frequency	input frequency/12.5; resulting in 10 MHz at the expected input frequency of 125 MHz
	connector	2 BNC (50 Ω, female)

## R&S®RT-ZF20 probe deskew and calibration test fixture

The probe deskew and calibration test fixture is used to deskew any combination of Rohde & Schwarz probes. It can be used with any Rohde & Schwarz oscilloscope.

Step voltage swing	large loop	4.5 V (meas.)
	small loop	2.5 V (meas.)
Step current swing	large loop	900 mA (meas.)
	small loop	240 mA (meas.)
Step rise time (10 % to 90 %)	large loop	290 ns (meas.)
	small loop	80 ns (meas.)
Step fall time (20 % to 80 %)	large loop	40 ns (meas.)
	small loop	4 ns (meas.)

General data		
Temperature loading	operating temperature range	0 °C to +50 °C
	storage temperature range	−40 °C to +70 °C
Altitude	operation	up to 3000 m
	transport	up to 4600 m
EMC		in line with EMC Directive 2004/108/EC
Power supply		5.0 V DC ± 0.25 V via USB
Dimensions		
Probe deskew and calibration test fixture	W x H x L	approx. 78 mm x 36 mm x 124 mm (3.1 in x 1.4 in x 4.9 in)
Large loop current probe	cutout (W x L)	approx. 28 mm x 28 mm (1.1 in x 1.1 in)
	core diameter	≥ 20 mm (0.79 in)
Small loop current probe	cutout (W x L)	approx. 9.5 mm x 14.5 mm (0.37 in x 0.57 in)
	core diameter	≥ 5 mm (0.20 in)
Voltage probe connectors (both loops)	pin diameter	0.64 mm (25 mil) square pins and ø 2 mm (79 mil) clamp-on connectors
	pin distance	2.54 mm (0.10 in) and 5.12 mm (0.20 in)

## Ordering information

Designation	Type	Order No.
USB 2.0 Compliance Test Fixture Set Incl. signal quality board; load board; 1.3 m USB 2.0 A to B cable (2); 20 cm USB 2.0 A to B cable (2); USB A to mini adapter; USB A to micro B adapter; 1.0 m SMA cable (2); carrying case; operating manual	R&S®RT-ZF1	1317.3420.02
Ethernet Compliance Test Fixture Set Incl. test fixture board; calibration board; 250 mm S/FTP Ethernet cable, SMA termination (3); carrying case; operating manual	R&S®RT-ZF2	1317.5522.02
Ethernet 1000BASE-T Jitter Test Cable	R&S®RT-ZF2C	1317.5639.02
Frequency Converter (100BASE-T1)	R&S®RT-ZF3	5025.0670.02
10BASE-Te Energy Efficient Ethernet Test Fixture	R&S®RT-ZF4	1333.0880.02
Ethernet Probing Fixture	R&S®RT-ZF5	1333.0896.02
Frequency Converter (1000BASE-T1)	R&S®RT-ZF6	1337.8579.02
Probe Deskew and Calibration Test Fixture Incl. test board; 1.3 m USB 2.0 A to B cable; carrying case; operating manual	R&S®RT-ZF20	1800.0004.02

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