

## **R&S®RTP-K101: COMPLIANCE TEST FOR USB 3.2 GEN 1&2** For R&S®RTP oscilloscopes



The perfect choice for

TX compliance	Precompliance testing
Signal integrity debugging	Protocol debugging

Rohde & Schwarz offers an automated compliance test solution for USB 2.0 and USB 3.2 Gen1 and Gen 2 interfaces in line with USB-IF test specifications. The test wizard of the R&S<sup>®</sup>ScopeSuite compliance test software guides you via illustrated step-by-step instructions and produces a configurable test report.

Your benefit	Features	
Complete test solution	<ul> <li>Integrated generator option to toggle compliance pattern of the DUT</li> <li>Channel embedding for long channel tests without additional options</li> <li>R&amp;S®RT-ZB2 test fixture for USB 3.2 Gen1 precompliance</li> </ul>	
Easy to use	<ul> <li>Predefined, automated test steps</li> <li>Step-by-step test wizard</li> </ul>	
Clear and comprehensive test documentation	R&S <sup>®</sup> ScopeSuite produces a customizable report of the test results, which can include numerical result data and oscilloscope screenshots – depending on the user's preferences. The available output formats are PDF, DOC and HTML	



## Signal integrity debugging - jitter and noise analysis

144 a.V	Constitu		-	-	-	-	Jitter analysis 1	a Unit Ab	solute 💌
72 mV	Synth	etic Data	Eye						abs/pp
30	USB3.	2 Gen1					Event count		116270
J 2 Hrs							TJØBER		45.178 ps
					_		RJ + (O)BUJ	2.1845 ps	18.66 ps
0 110							10	3.7953 ps	30.791 ps
0,mV -+0,ps 0,s	40 ps 00, ps	120 ps	100 ps	200 ps	240 ps	300 pi	DJ	2.9584 ps	45.786 ps
		_					DDJ	2.3995 ps	14.221 ps
17 40							DCD		2.2414 ps
They moundly than a .	Periodic	Jitter S	pectru	m			PJ	1.4061 ps	7.5907 ps
a water a data water a data water	NAAAA NAAAA					~~^AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA	ISI		13.142 ps
05 dBs	AUAAUA.						(O)BUJ	1.0719 ps	5.7889 ps
43 dBs 500 MHz 750 M	Hz OHz	25, OH2 1.5	OHz 1.75		tr 2.25 0	Hz 2.5 OHz	RJ	2.1789 ps	
							EH@BER		222.79 mV
T1 D1 DD1 R1+C	BUI PI	125 %	<b>EN</b>	DDN RN	LOBU	DN	RN + (O)BUN	4.7872 mV	42.57 mV
		100.00		i kin	10001		TN	25.644 m¥	121.21 mV
·		100 %					DN	25.216 m¥	200.07 mV
•		87.6 %					DDN	25.216 m¥	97.617 m¥
		75 %	1 marca				LD		2.3366 mV
		02.5 %	19 H H H				PN	738.67 µV	5.2554 mV
·····		d0 %					ISIN		97.617 mV
×		07.5 %					(O)BUN	73.333 µV	293.42 µV
		25 %					RN	4.7872 m¥	
and the second second	10 10 10		- Balay		made	57.5 ml			
A CONTRACT OF	1000 and 100	in the second second		11.11.22.11.12	I BREAK STATE	and the first			
		1+2					570 mV		
							504 mV		
Jitter		A 100		Moise					
Ratistub				nonse			380 mV		
				Bathtu				1~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
curve		16.5		cuve			288 MV	0	
		-					216 mV	Ste	p
		1.67					- 144 mV	Reg	nonse
		1 1.00					77. 101		
							74 114		
		Te-11							
							-72 mV		
50 ps 100 ps	140 ps 200	14 1 to 14	-26.2 V	0.0		00 V	-166 mV -800 ps	0.6 80	2

## Gain more insights into your design

- ► Calculation of common jitter and noise components
- ► Highly accurate results thanks to signal model based approach
- ► Display of step response, BER bathtub curves
- ► Synthetic eyes with deterministic jitter and noise
- Display of jitter and noise components as histogram, track or in spectrum view

## Signal integrity debugging – eye diagram



# Rohde & Schwarz GmbH & Co. KG (www.rohde-schwarz.com) Rohde & Schwarz customer support (www.rohde-schwarz.com/support) Rohde & Schwarz customer support (www.rohde-schwarz.com/support) Rohde & Schwarz training (www.training.rohde-schwarz.com) ReS<sup>®</sup> is a registered trademark of Rohde & Schwarz GmbH & Co. KG | PD 3609.6812.32 | Version 01.01 | March 2021 (ph) Trade names are trademarks of the owners | R&S<sup>®</sup>RTP-K101: Compliance test for USB 3.2 Gen 1&2 | Data without tolerance limits is not binding Subject to change | © 2021 Rohde & Schwarz GmbH & Co. KG | 81671 Munich, Germany

## Protocol triggering and decoding



## USB 2.0 / 3.2 Gen 1 and 2

- Bus setup within seconds
- ► Color-coded protocol elements
- ► Strong triggering capabilities on various protocol elements
- ► Powerful search, navigate recorded acquisitions

### Fast eye diagram analysis

- ► Real-time 16 Gbps serial pattern trigger with HW CDR
- Real-time mask and histogram
- Real-time deembedding
- Real-time differential signal math

Model configuration information	
Designation	Туре
<b>16 GHz oscilloscope</b> For USB 3.2 Gen 2	R&S®RTP-164
Compliance test for USB 3.2 Gen 1 and 2	R&S®RTP-K101 1)
Arbitrary waveform generator For toggling compliance pattern	R&S®RTP-B6
16 GHz differential pulse source For channel deskewing	R&S®RTP-B7
Precision BNC to SMA adapter For cable connection	R&S®RTP-ZA16
Matched pair SMA cable for TDR measurements For differential signals	R&S®RTP-ZA17
Compliance test fixture Order from <u>www.usb.org/estore</u>	

Recommended extras	
Designation	Туре
Signal integrity debug bundle	R&S®RTP-SIBNDL <sup>2)</sup>
Jitter and noise decomposition	R&S®RTP-K134
USB 1.0/1.1/2.0/HSIC triggering and decoding	R&S®RTP-K60
USB 3.1 Gen 1 triggering and decoding	R&S®RTP-K61
USB 3.1 Gen 2 triggering and decoding	R&S®RTP-K62
USB power delivery triggering and decoding	R&S®RTP-K63

<sup>1)</sup> Includes R&S<sup>®</sup>RTP-K21 USB2.0 compliance test

 $^{\rm 2)}$  Includes basic jitter analysis, zone trigger, 16 Gbps serial pattern trigger with HW CDR, deembedding option with HW acceleration