R&S®ZN-Z3x
Inline Calibration System
Specifications

ROHDE&SCHWARZ

Data Sheet | Version 04.00

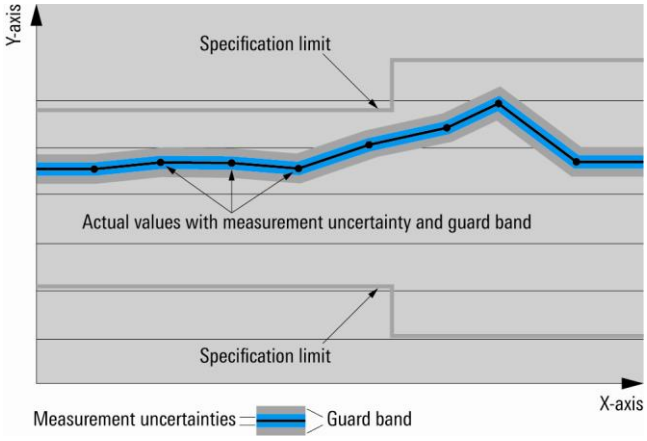
CONTENTS

Definitions

General
Product data applies under the following conditions:

- Three hours storage at ambient temperature followed by 30 minutes 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 indicated as follows: “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/3GPP2 standard, chip rates are specified in Mcps (million chips per second), whereas bit rates and symbol rates are specified in Mbps (million bits per second), kbps (thousand bits per second) or ksps (thousand symbols per second), and sample rates are specified in Msample/s (million samples per second). Mcps, kbps, ksps and Msample/s are not SI units.

Specifications

Measurement range

Impedance		50 Ω
Calibration port connector type	R&S®ZN-Z32	SMA (female)
	R&S®ZN-Z33	2.92 mm (female)
DUT port connector type	R&S®ZN-Z32	SMA (male)
	R&S®ZN-Z33	2.92 mm (male)
Number of calibration ports		1
Frequency range	R&S®ZN-Z32	10 MHz to 8.5 GHz
	R&S®ZN-Z33	10 MHz to 40 GHz
Nominal input level range		–45 dBm to +10 dBm
Damage level		+23 dBm
Damage DC voltage		12 V

Effective system data of the R&S®ZN-Z32

This data is valid at an ambient temperature between +18 °C and +28 °C, at a measurement bandwidth of 10 Hz and a nominal power of –10 dBm at the calibration port. Values for Load match and Transmission tracking apply for a combination of two R&S®ZN-Z32 Inline Calibration Units and a reciprocal through connection offering an insertion loss of less than 1 dB at 8.5 GHz.

		specification	**typical**
Directivity	10 MHz to 200 MHz	> 36 dB	40 dB
	200 MHz to 4 GHz	> 40 dB	42 dB
	4 GHz to 8.5 GHz	> 38 dB	40 dB
Source match	10 MHz to 200 MHz	> 30 dB	36 dB
	200 MHz to 4 GHz	> 36 dB	40 dB
	4 GHz to 8.5 GHz	> 32 dB	36 dB
Reflection tracking	10 MHz to 200 MHz	< 0.25 dB	0.05 dB
	200 MHz to 4 GHz	< 0.1 dB	0.05 dB
	4 GHz to 8.5 GHz	< 0.2 dB	0.1 dB
Load match	10 MHz to 200 MHz	> 30 dB	36 dB
	200 MHz to 4 GHz	> 36 dB	40 dB
	4 GHz to 8.5 GHz	> 32 dB	36 dB
Transmission tracking	10 MHz to 200 MHz	< 0.25 dB	0.05 dB
	200 MHz to 4 GHz	< 0.1 dB	0.05 dB
	4 GHz to 8.5 GHz	< 0.2 dB	0.1 dB

RF Performance of the R&S®ZN-Z32

		specification	**typical**
Insertion loss	10 MHz to 100 MHz	< 2 dB	1.0 dB
	100 MHz to 4 GHz	< 3 dB	2.2 dB
	4 GHz to 8.5 GHz	< 4.5 dB	3.0 dB
Return loss (at DUT port)	10 MHz to 100 MHz	> 8 dB	15 dB
	100 MHz to 4 GHz	> 14 dB	17 dB
	4 GHz to 8.5 GHz	> 8 dB	13 dB

			nominal
0.1 dB compression point	100 MHz to 3 GHz		> 16 dBm
	3 GHz to 8.5 GHz		> 20 dBm
1 dB compression point	100 MHz to 3 GHz		> 26 dBm
	3 GHz to 8.5 GHz		> 30 dBm
Third-order intercept point (TOI)	100 MHz to 200 MHz		> 36 dBm
	200 MHz to 8.5 GHz		> 43 dBm

Effective system data of the R&S®ZN-Z33

This data is valid at an ambient temperature between +18 °C and +28 °C, at a measurement bandwidth of 10 Hz and a nominal power of –10 dBm at the calibration port. Values for Load match and Transmission tracking apply for a combination of two ZN-Z33 Inline Calibration Units and a reciprocal through connection offering an insertion loss of less than 2 dB at 40 GHz.

		specification	**typical**
Directivity	10 MHz to 700 MHz	> 36 dB	40 dB
	700 MHz to 20 GHz	> 36 dB	38 dB
	20 GHz to 40 GHz	> 30 dB	33 dB
Source match	10 MHz to 700 MHz	> 30 dB	35 dB
	700 MHz to 20 GHz	> 34 dB	37 dB
	20 GHz to 40 GHz	> 30 dB	35 dB
Reflection tracking	10 MHz to 700 MHz	< 0.15 dB	0.03 dB
	700 MHz to 20 GHz	< 0.1 dB	0.04 dB
	20 GHz to 40 GHz	< 0.15 dB	0.04 dB
Load match	10 MHz to 700 MHz	> 30 dB	35 dB
	700 MHz to 20 GHz	> 34 dB	37 dB
	20 GHz to 40 GHz	> 30 dB	35 dB
Transmission tracking	10 MHz to 700 MHz	< 0.15 dB	0.03 dB
	700 MHz to 20 GHz	< 0.1 dB	0.04 dB
	20 GHz to 40 GHz	< 0.15 dB	0.04 dB

RF Performance of the R&S®ZN-Z33

		specification	**typical**
Insertion loss	10 MHz to 100 MHz	< 6 dB	3.0 dB
	100 MHz to 3 GHz	< 3 dB	1.5 dB
	3 GHz to 10 GHz	< 3 dB	2.5 dB
	10 GHz to 30 GHz	< 4 dB	3.0 dB
	30 GHz to 40 GHz	< 6.5 dB	5.0 dB
Return loss (at DUT port)	10 MHz to 100 MHz	> 3 dB	10 dB
	100 MHz to 10 GHz	> 10 dB	20 dB
	10 GHz to 30 GHz	> 8 dB	15 dB
	30 GHz to 40 GHz	> 8 dB	10 dB

			nominal
0.1 dB compression point	100 MHz to 1 GHz		> 0 dBm
	1 GHz to 3 GHz		> 13 dBm
	3 GHz to 40 GHz		> 23 dBm
1 dB compression point	100 MHz to 1 GHz		> 8 dBm
	1 GHz to 3 GHz		> 22 dBm
	3 GHz to 40 GHz		> 32 dBm
Third-order intercept point (TOI)	100 MHz to 1 GHz		> 28 dBm
	1 GHz to 2 GHz		> 38 dBm
	2 GHz to 40 GHz		> 43 dBm

Vacuum-specific characteristics of the R&S®ZN-Z33

Outgassing parameters	total mass loss (TML)	< 0.1%
	return mass loss (RML)	< 0.01%
	water vapor release (WVR)	< 0.1%
	in line with ECSS-Q-TM-70-52A	

General features

Number of CAN bus interfaces		2
Number of ICUs per CAN Bus interface	any combination of R&S®ZN-Z32/ R&S®ZN-Z33 ICUs	24
Max. CAN bus cable length		40 m
CAN bus supply voltage		+24 V
Max. supply current per CAN bus interface		1.8 A

Remote control

USB	universal serial bus connector (type B)
LAN	local area network connector 10/100 BASE-T, RJ-45

General data

Environmental conditions		
Temperature	R&S®ZN-Z30, R&S®ZN-Z32, R&S®ZN-Z33	
	operating temperature range	+5 °C to +40 °C
	permissible temperature range	0 °C to +50 °C
	storage temperature range	–40 °C to +60 °C
	R&S®ZN-Z33 model .03 [1][2]	
	operating temperature range	–30 °C to +80 °C
	permissible temperature range	–50 °C to +100 °C
	storage temperature range	–50 °C to +100 °C
Damp heat		+25/+40 °C, 85 % rel. humidity, cyclic, in line with EN 60068-2-30; or in line with EN 60068-2-78 +40 °C, 85 % rel. humidity, steady state
Mechanical resistance		
Vibration	sinusoidal	5 Hz to 55 Hz, 0.15 mm amplitude const., 55 Hz to 150 Hz, 0.5 g const., in line with EN 60068-2-6
	random	10 Hz to 300 Hz, acceleration 1.2 g RMS, in line with EN 60068-2-64
Shock		40 g shock spectrum, in line with MIL-STD-810E, method 516.4, procedure I
Power rating		
Rated voltage		100 V to 240 V AC (± 10 %)
Rated frequency		50 Hz to 60 Hz (± 5 %)
Rated current		2.0 A to 1.0 A
Rated power		150 W
	standby (optional)	5 W
Product conformity		
Electromagnetic compatibility	EU: in line with EMC Directive 2004/108/EC	applied harmonized standards: EN 61326-1 (industrial environment), EN 61326-2-1, EN 55011 (class A), EN 61000-3-2, EN 61000-3-3
Electrical safety	EU: in line with Low Voltage Directive 2006/95/EC	applied harmonized standard: EN 61010-1
	USA	UL 61010-1
	Canada	CAN/CSA-C22.2 No. 61010-1
International safety approvals	VDE – Association for Electrical, Electronic and Information Technologies	GS mark
	CSA – Canadian Standards Association	CSA_{UL} mark

R&S®ZN-Z30

Calibration interval	for general test and measurement applications	36 months
Dimensions	W × H × D	100 mm × 110 mm × 260 mm (3.94 in × 4.33 in × 10.24 in
Weight		1.5 kg (3.30 lb)
Display		1.8" monochrome OLED display
Resolution		128 × 64 pixel

[1] Temperature data are valid in vacuum environments tbd.

[2] To operate the R&S®ZN-Z33 model .03 at an air pressure below 795 hPa the sensor has to be mounted onto a temperature-controlled baseplate. In this case, the temperature of the baseplate is regarded as the ambient temperature of the R&S®ZN-Z33 model .03.

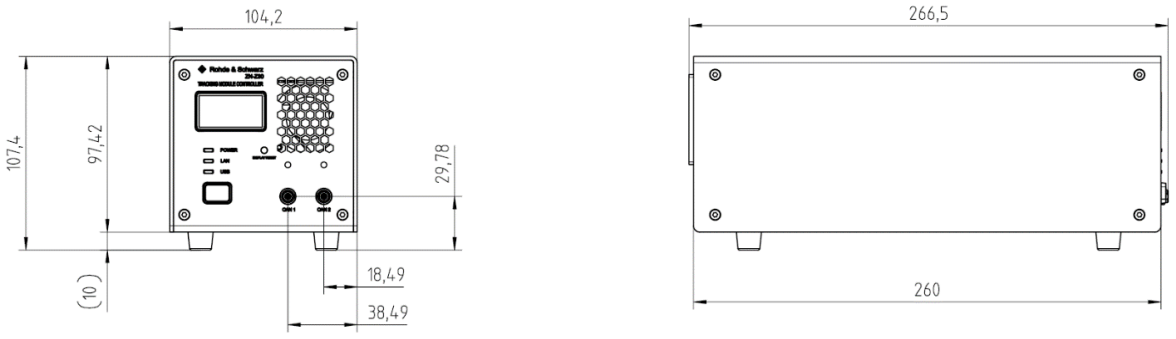
R&S®ZN-Z32

Calibration interval	for general test and measurement applications	12 months
Dimensions	W × H × D	50 mm × 12 mm × 92 mm (1.97 in × 0.47 in × 3.54 in)
Weight		200 g (0.44 lb)

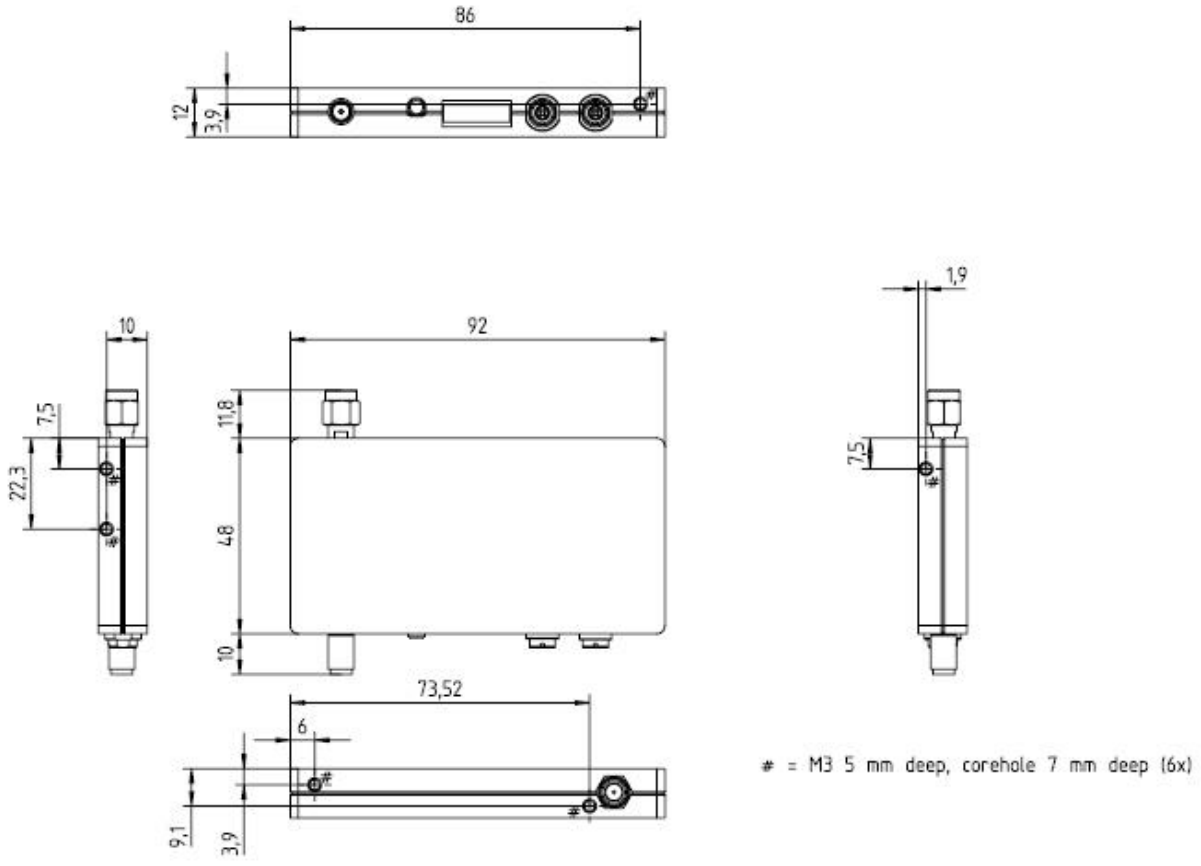
R&S®ZN-Z33

Calibration interval	for general test and measurement applications	12 months
Dimensions	W × H × D	30 mm × 12 mm × 92 mm (1.18 in × 0.47 in × 3.63 in)
Weight		50 g (0.11 lb)

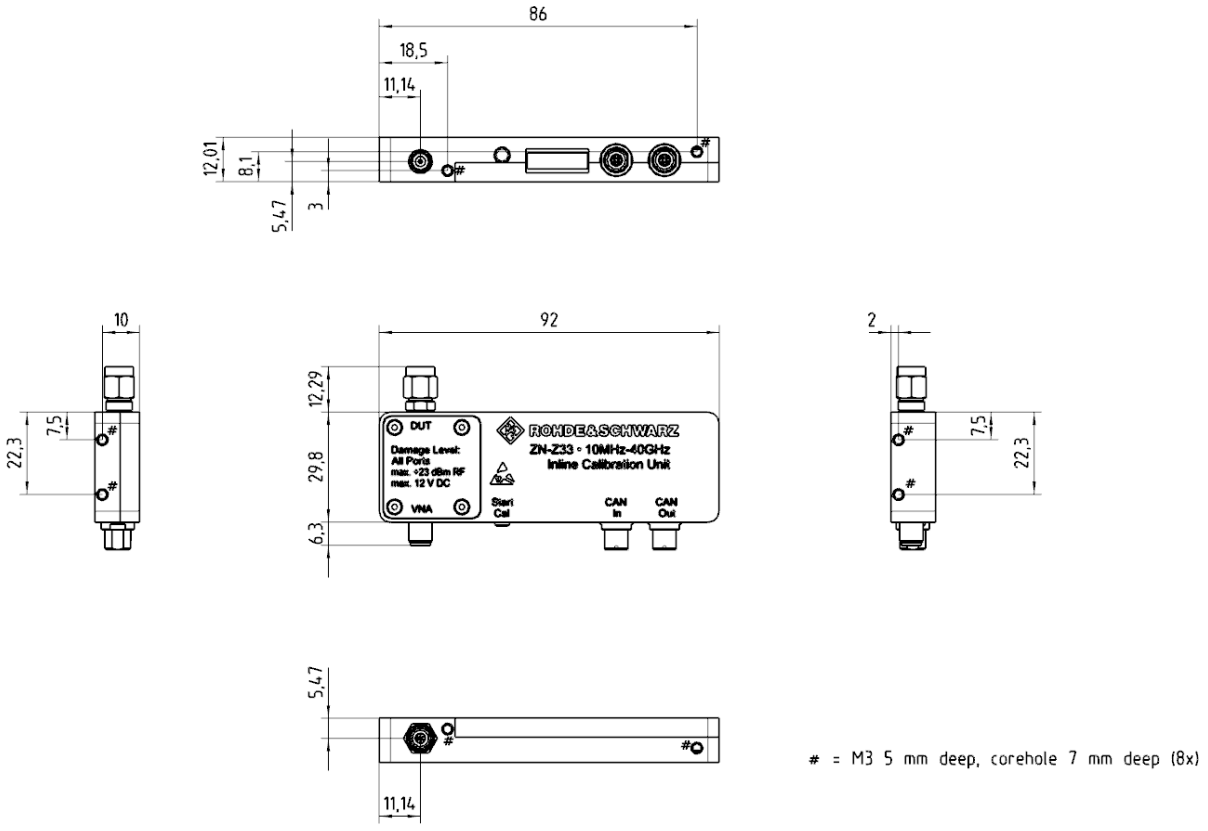
Dimensions (in mm)



R&S®ZN-Z30 – all dimensions are in mm; tolerances according to ISO 2768-f.



R&S®ZN-Z32 – all dimensions are in mm; tolerances according to ISO 2768-f.



R&S®ZN-Z33 – all dimensions are in mm; tolerances according to ISO 2768-f.

Ordering information

Designation	Type	Order No.
Inline Calibration Unit Controller	R&S®ZN-Z30	1328.7609.02
Inline Calibration Unit 8.5 GHz	R&S®ZN-Z32	1328.7638.02
Inline Calibration Unit 40 GHz	R&S®ZN-Z33	1328.7644.02
Inline Calibration Unit 40 GHz TVAC	R&S®ZN-Z33	1328.7644.03

Service 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, three years	R&S®WE3	
Extended Warranty, four years	R&S®WE4	
Extended Warranty with Calibration Coverage, one year	R&S®CW1	
Extended Warranty with Calibration Coverage, two years	R&S®CW2	
Extended Warranty with Calibration Coverage, three years	R&S®CW3	
Extended Warranty with Calibration Coverage, four years	R&S®CW4	

Extended warranty with a term of one to four years (WE1 to WE4)
Repairs carried out during the contract term are free of charge [3]. Necessary calibration and adjustments carried out during repairs are also covered. Simply contact the forwarding agent we name; your product will be picked up free of charge and returned to you in top condition a couple of days later.

Extended warranty with calibration (CW1 to CW4)
Enhance your extended warranty by adding calibration coverage at a package price. This package ensures that your Rohde & Schwarz product is regularly calibrated, inspected and maintained during the term of the contract. It includes all repairs [1] and calibration at the recommended intervals as well as any calibration carried out during repairs or option upgrades.

[3] Excluding defects caused by incorrect operation or handling and force majeure. Wear-and-tear parts are not included.

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

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