R&S®FSW-K40 Phase Noise Measurement Application Specifications

ROHDE&SCHWARZ

Test & Measurement

Data Sheet | 01.00

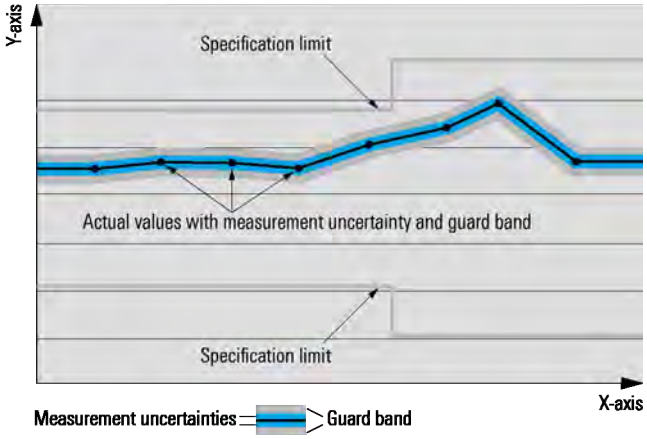
The specifications of the R&S®FSW-K40 phase noise measurement application are based on the data sheet specifications of the R&S®FSW signal and spectrum analyzer, have not been checked separately and are not verified during instrument calibration. Measurement uncertainties are given as 95 % confidence intervals. The specified level measurement errors do not take into account systematic errors due to reduced signal to noise ratio (S/N).

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.



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.

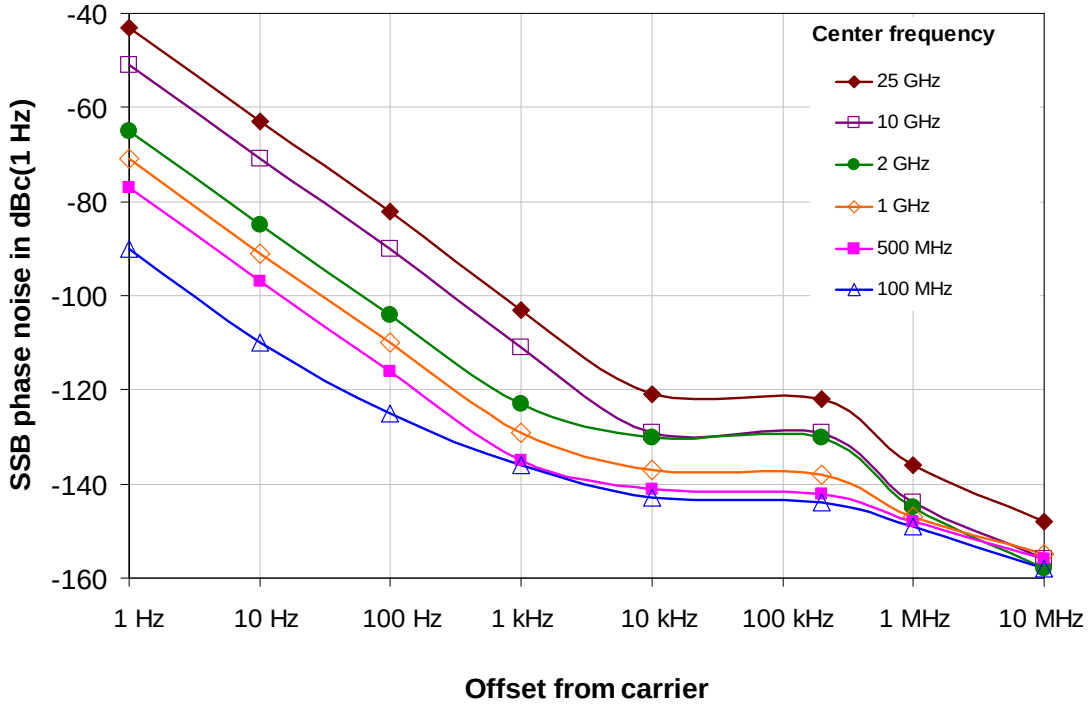
Typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

Specifications

Frequency range	RF input	same as R&S®FSW
Offset frequency range		1 Hz to 1 GHz (9 decades)

Phase noise measurement		
Measurement settings	frontend configuration	nominal frequency and level
		attenuator control (auto/manual)
		electronic attenuator control (auto/manual)
		coupling (AC/DC)
	verification and tracking functions	frequency verification and tracking
		level verification and tracking
		frequency and level tolerance values
	phase noise measurement	measurement range
		sweep direction
		sweep type (normal, fast, AVG, manual)
		for sweep type “manual”: setting of RBW, average count and mode individually for each half decade or globally
Result configuration	phase noise limit line	up to 5 ranges, configuration using: • thermal noise • range corner frequency and range slope
	limit lines	as in base instrument
	graphical	x-axis and y-axis scaling: automatic (once/always) or user-defined
	smoothing and spur removal	trace smoothing factor
		smoothing type (linear/logarithmic)
		spur removal ON/OFF, spur threshold
	trace configuration	up to 6 traces
		ClearWrite, Max, Min, Average, View
		smoothing ON/OFF
	numeric: residual noise	residual FM, residual φM, RMS jitter 4 measurement ranges: • 1 complete measurement range or user-definable range • 3 user-definable ranges with assignable trace
	numeric: spot noise	measurement on all 10^x Hz offset
		5 user-definable offset frequencies
	markers	4 markers (normal/delta) with assignable trace
Display		phase noise plot (dBc (1 Hz) versus logarithmic frequency)
		residual noise table
		spot noise table
Remote control		GPIB
		LAN (VXI-11)
		control via SCPI command set and application-specific extensions

Phase noise sensitivity (typical values) without noise correction Input level > 0 dBm, operating mode “averaged”, with R&S®FSW-B4 option						
Frequency offset	Input frequency, values in dBc (1 Hz)					
	100 MHz	500 MHz	1 GHz	2 GHz	10 GHz	25 GHz
1 Hz	−90	−77	−71	−65	−51	−43
10 Hz	−110	−97	−91	−85	−71	−63
100 Hz	−125	−116	−110	−104	−90	−82
1 kHz	−136	−135	−129	−123	−111	−103
10 kHz	−143	−141	−137	−130	−129	−121
200 kHz	−144	−142	−138	−130	−129	−122
1 MHz	−149	−148	−147	−145	−144	−136
10 MHz	−158	−156	−155	−158	−156	−148



Typical phase noise at different center frequencies (with the R&S®FSW-B4 option for offsets ≤ 10 Hz).

Ordering information

Designation	Type	Order No.
Phase Noise Measurement Application	R&S®FSW-K40	1313.1397.02

For R&S®FSW product brochure, see PD 5214.5984.12 and www.rohde-schwarz.com

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- Customized and flexible
- Uncompromising quality
- Long-term dependability

About Rohde&Schwarz

Rohde&Schwarz is an independent group of companies specializing in electronics. It is a leading supplier of solutions in the fields of test and measurement, broadcasting, radiomonitoring and radiolocation, as well as secure communications. Established more than 75 years ago, Rohde&Schwarz has a global presence and a dedicated service network in over 70 countries. Company headquarters are in Munich, Germany.

Environmental commitment

- Energy-efficient products
- Continuous improvement in environmental sustainability
- ISO 14001-certified environmental management system

Certified Quality System
ISO 9001

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