

R&S®FSx-K50

Spurious Measurement Application Specifications



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Definitions

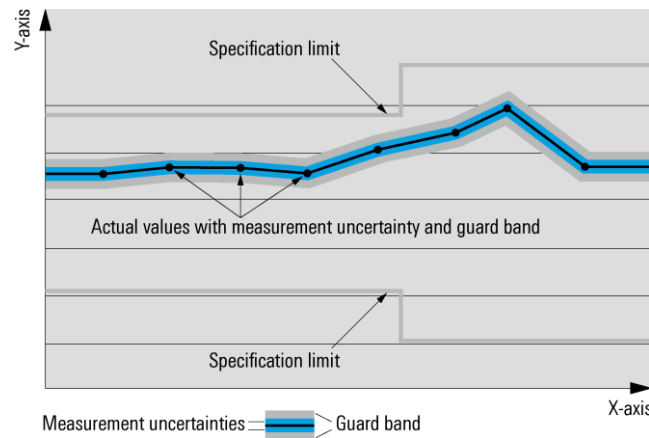
General

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 $<$, \leq , $>$, \geq , \pm , 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.

Device settings and GUI parameters are indicated as follows: "parameter: value".

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

Specifications

The specifications of the R&S®FSx-K50 spurious measurement application are based on the data sheet specifications of the R&S®FSW signal and spectrum analyzer and the R&S®FSWP phase noise analyzer, have not been checked separately and are not verified during instrument calibration. Measurement uncertainties are given as 95 % confidence intervals. The specified measurement uncertainties do not take into account systematic errors due to reduced signal-to-noise ratio (S/N).

Frequency

Frequency range	RF input	
	R&S®FSW-K50	same as R&S®FSW ¹
	R&S®FSWP-K50	same as R&S®FSWP ^{1, 2}
	external mixer IF input ³	
	R&S®FSW-K50	same as frequency range of used external mixer
	R&S®FSWP-K50	same as frequency range of used external mixer

Level

Level range	RF input	-70 dBm ⁴ to +30 dBm
Level setting		manual

Signal acquisition

Input	standard	RF
	R&S®FSW with R&S®FSW-B21 option or R&S®FSWP with R&S®FSWP-B21 option	external mixer
Output		trace
Triggering	RF input	free run, external, IF power, RF power,

Measurement capability (nom.)

Carrier reference level	measurement of carrier reference level	automatic peak measurement
		manual peak measurement
		peak search settings full span/custom span
	carrier guard interval	interval around the carrier where no spurs are detected
	setting of power values	absolute relative to carrier reference level
Measurement control	setting of frequency values	absolute relative to the carrier frequency
		spurious search type wide or directed
		residual marking/removing
		measurement steps that should be performed
	Wide search settings	ranges settings
start/stop of ranges		ranges may be defined anywhere between the start and stop frequencies of the device, must not overlap, may contain gaps
spur detection threshold		one value for start and stop frequencies of each range
		sloping character can be realized herewith range -30 dBm to -160 dBm
limit offset to detection threshold		limit line that follows the detection threshold, range 0 dB to 100 dB
peak excursion	signal level drop between two spurious frequencies that need to be recognized, range 0 dB to 100 dB	

¹ Restricted IF overload, IF power trigger and auto level functionality depend on carrier frequency and bandwidth at frequencies < 50 MHz.

² R&S®FSWP-B1 option required for use of R&S®FSWP-K50 option with the R&S®FSWP phase noise analyzer.

³ R&S®FSW26/43/50/67/85 with R&S®FSW-B21 option and external mixer or R&S®FSWP26/50 with R&S®FSWP-B1 and R&S®FSWP-B21 options and external mixer.

⁴ R&S®FSW with R&S®FSW-B24 or R&S®FSWP with R&S®FSWP-B24 RF preamplifier option.

	minimum spur SNR	minimum SNR at each true spurious frequency after the measurement is finished
	auto RBW (adaptive vs. frequency)	sets RBW automatically according to the signal and noise levels to achieve the spurious detection threshold
	maximum final RBW	RBW that the final spot search should at least be performed with
	detector	positive peak, RMS and average
	number of FFT averages	number of FFTs that are averaged for one FFT segment
	level settings	manual level settings for reference level, RF attenuation and preamplifier
Directed search settings	spur settings	up to 1000 spurious frequencies can be added to the table
	frequency	frequency to be searched at, may be anywhere between the start and stop frequencies of the device
	search span	spans of the frequencies must not overlap, may contain gaps
	detection threshold	one value for each complete search span range -30 dBm to -160 dBm
	minimum spur SNR	SNR that a true spurious frequency needs to be displayed with at least after the measurement is finished
	detection mode	measured: spurious frequencies coming from a previous measurement Entered: manually entered spurious frequencies
	conflict	shows overlapping search spans
	common settings	settings that are common for all frequencies: level settings: manual setting for reference level, RF attenuation and preamp limit offset to detection threshold, peak excursion, maximum final RBW, detector, number of FFT averages
Transfer	spur table	transfer the spurious frequencies of a previous measurement to the directed search settings table
	segment table	transfer segments to wide search settings for repeating the measurement with the same settings
Result configuration	spurious detection table configuration	turn on/off columns in the table
	result settings	turn on/off limit and detection threshold lines turn on/off display messages
		spectral overview noise floor estimation spurious detection spectrum spurious detection table marker table
Display configuration		
Remote control		GPIB LAN (VXI-11) control via SCPI command set and application-specific extensions

Measurement results (nom.)

Measurement time 20 spurious frequencies to be detected in the frequency range, auto RBW, auto level, minimum spur SNR 10 dB, peak excursion 3 dB			
Spectral overview time		0.7 s/GHz	
Total measurement time ($f \leq 10$ GHz)		R&S®FSW ⁵	R&S®FSWP ⁶
	$P_{\text{THRESHOLD}}^7 > -110$ dBm	≤ 3 s/GHz	≤ 3 s/GHz
	-110 dBm $\geq P_{\text{THRESHOLD}}^7 > -120$ dBm	≤ 5 s/GHz	≤ 5 s/GHz
	-120 dBm $\geq P_{\text{THRESHOLD}}^7 > -130$ dBm	≤ 20 s/GHz	≤ 20 s/GHz
	-130 dBm $\geq P_{\text{THRESHOLD}}^7 > -140$ dBm	≤ 300 s/GHz	≤ 300 s/GHz
Total measurement time (10 GHz $\leq f \leq 25$ GHz)		R&S®FSW	R&S®FSWP
	$P_{\text{THRESHOLD}}^7 > -110$ dBm	≤ 3 s/GHz	≤ 3 s/GHz
	-110 dBm $\geq P_{\text{THRESHOLD}}^7 > -120$ dBm	≤ 5 s/GHz	≤ 5 s/GHz
	-120 dBm $\geq P_{\text{THRESHOLD}}^7 > -130$ dBm	≤ 30 s/GHz	≤ 30 s/GHz
	-130 dBm $\geq P_{\text{THRESHOLD}}^7 > -140$ dBm	≤ 400 s/GHz	≤ 400 s/GHz

Frequency selectivity (upper bound values for one spot search)		
Level range	signal peaks have to exceed detection threshold by	≥ 3 dB
Frequency selectivity	1 Hz \leq RBW ≤ 10 Hz	767 Hz
	10 Hz $<$ RBW ≤ 1 MHz	2.61 kHz
	1 MHz $<$ RBW	9.2 kHz

⁵ R&S®FSW8/13/26/43/50/67 with R&S®FSW-B24 option.

⁶ R&S®FSWP8/26/50 with R&S®FSWP-B1 and R&S®FSWP-B24 options.

⁷ Threshold used for the measurement, constant threshold value for the complete frequency range.

Ordering information

Designation	Type	Order No.
Spurious measurement application	R&S®FSW-K50	1325.2893.02
Spurious measurement application ⁸	R&S®FSWP-K50	1338.3588.02

R&S®FSW signal and spectrum analyzer		
Signal and spectrum analyzer, 2 Hz to 8 GHz	R&S®FSW8	1331.5003.08
Signal and spectrum analyzer, 2 Hz to 13.6 GHz	R&S®FSW13	1331.5003.13
Signal and spectrum analyzer, 2 Hz to 26.5 GHz	R&S®FSW26	1331.5003.26
Signal and spectrum analyzer, 2 Hz to 43.5 GHz	R&S®FSW43	1331.5003.43
Signal and spectrum analyzer, 2 Hz to 50 GHz	R&S®FSW50	1331.5003.50
Signal and spectrum analyzer, 2 Hz to 67 GHz	R&S®FSW67	1331.5003.67
Signal and spectrum analyzer, 2 Hz to 85 GHz	R&S®FSW85	1331.5003.85
Options for the R&S®FSW signal and spectrum analyzer		
LO/IF connections for external mixers (R&S®FSW26)	R&S®FSW-B21	1313.1100.26
LO/IF connections for external mixers (R&S®FSW43/50/67)	R&S®FSW-B21	1313.1100.43
LO/IF connections for external mixers (R&S®FSW85)	R&S®FSW-B21	1313.1100.85
RF preamplifier, 100 kHz to 13.6 GHz (for R&S®FSW8/13)	R&S®FSW-B24	1313.0832.13
RF preamplifier, 100 kHz to 26.5 GHz	R&S®FSW-B24	1313.0832.26
RF preamplifier, 100 kHz to 43.5 GHz	R&S®FSW-B24	1313.0832.43
RF preamplifier, 100 kHz to 50 GHz	R&S®FSW-B24	1313.0832.49
RF preamplifier, 100 kHz to 67 GHz	R&S®FSW-B24	1313.0832.66

R&S®FSWP phase noise analyzer		
Phase noise analyzer, 1 MHz to 8 GHz	R&S®FSWP8	1322.8003.08
Phase noise analyzer, 1 MHz to 26.5 GHz	R&S®FSWP26	1322.8003.26
Phase noise analyzer, 1 MHz to 50 GHz	R&S®FSWP50	1322.8003.50
Options for the R&S®FSWP phase noise analyzer		
LO/IF connections for external mixers (R&S®FSWP26/50)	R&S®FSWP-B21	1325.3848.02
RF preamplifier, 100 kHz to 8 GHz (R&S®FSWP8)	R&S®FSWP-B24	1325.3725.08
RF preamplifier, 100 kHz to 26.5 GHz (R&S®FSWP26)	R&S®FSWP-B24	1325.3725.26
RF preamplifier, 100 kHz to 50 GHz (R&S®FSWP50)	R&S®FSWP-B24	1325.3725.50
Mandatory options for the R&S®FSWP phase noise analyzer		
Spectrum analyzer, 10 Hz to 8 GHz	R&S®FSWP-B1	1322.9997.08
Spectrum analyzer, 10 Hz to 26.5 GHz	R&S®FSWP-B1	1322.9997.26
Spectrum analyzer, 10 Hz to 50 GHz	R&S®FSWP-B1	1322.9997.50

For R&S®FSW product brochure, see PD 5214.5984.12, for R&S®FSWP product brochure, see PD 3606.2090.12 and www.rohde-schwarz.com

⁸ R&S®FSWP-B1 option required for use of R&S®FSWP-K50 option with the R&S®FSWP phase noise analyzer.

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R&S®FSx-K50 Spurious Measurement Application

Data without tolerance limits is not binding | Subject to change

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