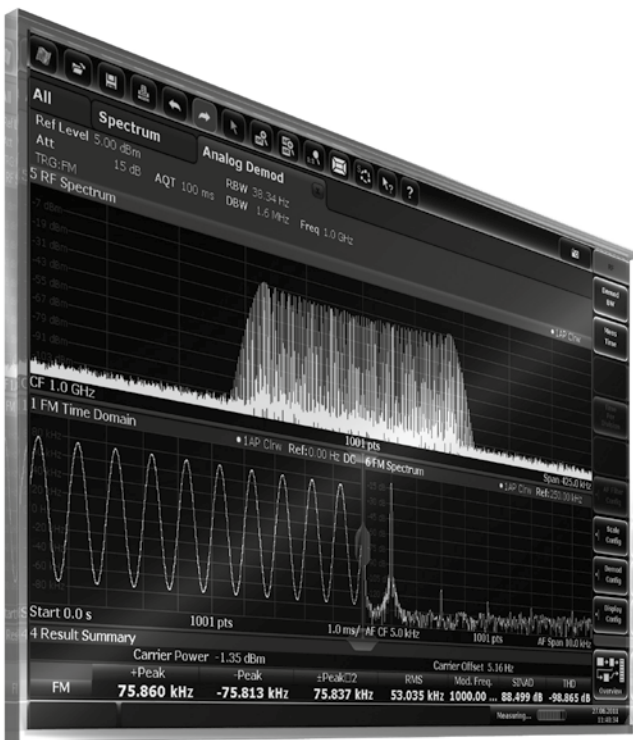


R&S®FSW-K7

Analog Modulation Analysis (AM/FM/φM)

Specifications



Definitions

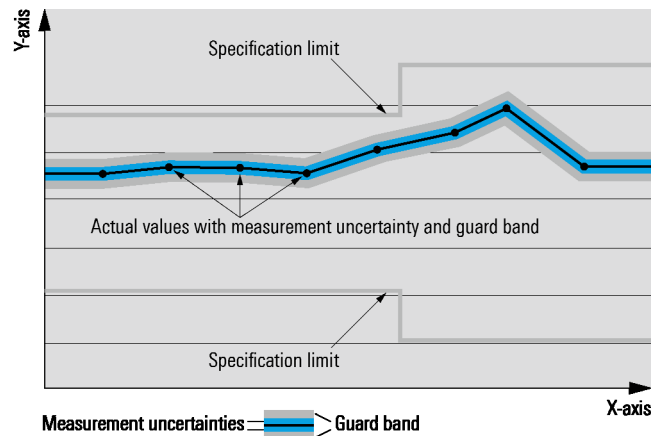
General

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.

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

Specifications

Measurement of analog modulation signals		
Demodulation bandwidth	binary steps	100 Hz to 6.4 kHz, 12.5 kHz to 1.6 MHz 3/5/8/10 MHz 18/28 MHz (R&S®FSW-B28 option) 18/28/40 MHz (R&S®FSW-B40 option) 18/28/40/80 MHz (R&S®FSW-B80 option)
Recording length	maximum	1600001 sample
Recording time	demodulation bandwidth	
	100 Hz	13107.2 s
	6.4 kHz	204.8 s
	12.5 kHz	102.4 s
	1.6 MHz	800 ms
	3 MHz	400 ms
	5 MHz	200 ms
	8 MHz	100 ms
	10 MHz, 18 MHz	50 ms
	28 MHz, 40 MHz	25 ms
	80 MHz	12.5 ms
Display	frequency versus time (FM), amplitude versus time (AM), phase versus time (ϕ M), RF power versus time, RF spectrum (FFT), AF spectrum (FFT), table with numeric values for: modulation deviation (peak, RMS), modulation frequency, carrier offset, carrier power (power of unmodulated carrier), THD, SINAD	

AF (modulation frequency)		
Range		5 MHz 14 MHz (R&S®FSW-B28 option) 20 MHz (R&S®FSW-B40 option) 40 MHz (R&S®FSW-B80 option) max. $0.5 \times$ demodulation bandwidth
Resolution		5 digits
Measurement uncertainty		0.1 %
AF filters		
Lowpass	demodulation bandwidth \leq 3 MHz	3 kHz
	demodulation bandwidth \leq 8 MHz	15 kHz, 23 kHz, 150 kHz
		5 %, 10 %, 25 % of demodulation bandwidth
Highpass	demodulation bandwidth \leq 1.6 MHz	20 Hz
	demodulation bandwidth \leq 3 MHz	50 Hz
	demodulation bandwidth \leq 8 MHz	300 Hz
Deemphasis		25 μ s, 50 μ s, 75 μ s, 750 μ s
Weighting filters	demodulation bandwidth \leq 3 MHz	ITU-T P.53
	demodulation bandwidth \leq 1.6 MHz	ITU-R unweighted
	demodulation bandwidth \leq 3 MHz	ITU-R weighted
	demodulation bandwidth \leq 800 kHz	A weighted

AM demodulation		
Measurement range	modulation depth	0 % to 100 %
Modulation depth uncertainty	AF \leq 1 MHz	$\pm(0.2 \% + 0.001 \times$ measured value)
Residual AM	demodulation bandwidth \leq 200 kHz, RMS, RF \leq 8 GHz, RF input level \geq (RF attenuation/dB – 30) dBm	0.03 %
Harmonic distortion	10 Hz \leq AF \leq 1 MHz	0.05 %
FM rejection	AF \leq 1 MHz, deviation \leq 1 MHz and AF + deviation \leq $0.3 \times$ demodulation bandwidth	1 % + residual AM

FM demodulation		
Measurement range	frequency deviation	5 MHz 14 MHz (R&S®FSW-B28 option) 20 MHz (R&S®FSW-B40 option) 40 MHz (R&S®FSW-B80 option) max. $0.5 \times$ demodulation bandwidth
Deviation uncertainty	$AF \leq 1$ MHz demodulation bandwidth $\geq 3.3 \times (AF + \text{deviation})$ demodulation bandwidth $\leq 10 \times (AF + \text{deviation})$	$\pm(0.003 \times (AF + \text{deviation}) + 2 \text{ Hz})$
Residual FM	demodulation bandwidth ≤ 100 kHz, RMS, RF ≤ 8 GHz, RF input level \geq (RF attenuation/dB – 30) dBm	10 Hz
Harmonic distortion	$10 \text{ Hz} \leq AF \leq 1$ MHz, deviation ≤ 500 kHz	0.1 %
AM rejection	$100 \text{ Hz} \leq AF \leq 1$ kHz, modulation depth 50 %	30 Hz + residual FM

ϕM demodulation		
Measurement range	phase deviation	5000 rad max. $0.5 \times$ demodulation bandwidth/AF
Phase deviation uncertainty	$AF \leq 1$ MHz and $AF \times (\text{phase deviation} + 1) \leq 0.3 \times$ demodulation bandwidth	$\pm(0.002 \text{ rad} + 0.002 \times \text{measured value})$
Residual ϕ M	demodulation bandwidth ≤ 100 kHz, RMS, RF ≤ 1 GHz, highpass 300 Hz, RF input level \geq (RF attenuation/dB – 30) dBm	0.3 mrad

Carrier power versus time		
Display range		noise floor to +30 dBm
Measurement uncertainty	unmodulated carrier, S/N > 16 dB, RF: 9 kHz to 8 GHz	1 dB
Maximum dynamic range	demodulation bandwidth 200 kHz, RF input level \geq (RF attenuation/dB – 10) dBm	90 dB
Display linearity	S/N > 16 dB	0.1 dB

AF spectrum		
Span		≤ 5 MHz ≤ 14 MHz (R&S®FSW-B28 option) ≤ 20 MHz (R&S®FSW-B40 option) ≤ 40 MHz (R&S®FSW-B80 option)
Resolution bandwidth		1 Hz to 10 MHz

RF spectrum		
Span		≤ 10 MHz ≤ 28 MHz (R&S®FSW-B28 option) ≤ 40 MHz (R&S®FSW-B40 option) ≤ 80 MHz (R&S®FSW-B80 option)
Resolution bandwidth		1 Hz to 10 MHz
Shape factor	60 dB:3 dB	2.5 (nom.)

Modulation distortion		
Measurement functions		THD, SINAD
Measurement range		-100 dB to 0 dB
Resolution		0.01 dB
Measurement uncertainty		0.5 dB
AF frequency range		10 Hz to 5 MHz

Trigger		
Trigger functions		RF level, AM, FM, ϕ M demodulation

Ordering information

Designation	Type	Order No.
Analog Modulation Analysis (AM/FM/ ϕ M)	R&S [®] FSW-K7	1313.1339.02

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

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- | Continuous improvement in environmental sustainability
- | ISO 14001-certified environmental management system

Certified Quality System
ISO 9001

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PD 5214.6080.22 | Version 01.00 | June 2011 | R&S®FSW-K7
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5214608022