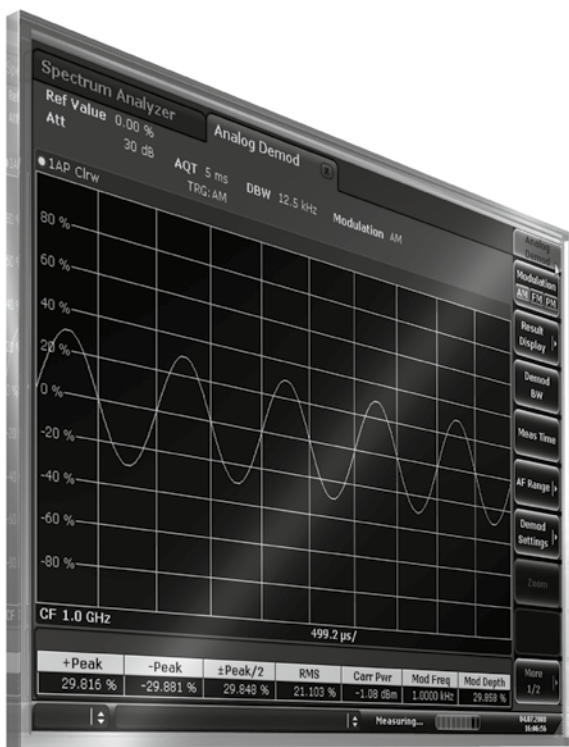


R&S® FSV-K7/ R&S® FSV-K7S Analog Modulation Analysis (AM/FM/φM)/ FM Stereo Measurement Application Specifications



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The specifications below apply to the R&S®FSV signal and spectrum analyzer. They are based on the specifications of the R&S®FSV signal and spectrum analyzer, have not been checked separately and are not verified during instrument calibration.

Specifications apply under the following conditions: 30 minutes warm-up time at ambient temperature, specified environmental conditions met, calibration cycle adhered to, and all internal automatic adjustments performed.

"Nominal values" are design parameters that are not assured by Rohde & Schwarz. These values are verified during product development but are not specifically tested during production.

Data without tolerance limits is not binding.

R&S®FSV-K7 AM/FM/φM analog modulation analysis

Measurement of analog modulation signals		
Demodulation bandwidth	binary steps	100 Hz to 6.4 kHz, 12.5 kHz to 1.6 MHz 3/5/8/10/18/28 MHz 40 MHz (R&S®FSV-B70 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	50 ms
	18 MHz	50 ms
	28 MHz, 40 MHz	25 ms
Display	frequency versus time (FM), amplitude versus time (AM), phase versus time (φM), 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		14 MHz, 20 MHz (R&S®FSV-B70 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, 300 Hz
Deemphasis		25 μs, 50 μs, 75 μs, 750 μs
Weighting filters	demodulation bandwidth \leq 3 MHz	ITU-T P.53
	demodulation bandwidth \leq 1.6 MHz	ITU-R unweighted

AM demodulation		
Measurement range	modulation depth	0 % to 100 %
Modulation depth uncertainty	AF \leq 1 MHz	$\pm(0.2 \% + 0.001 \times \text{measured value})$
Residual AM	demodulation bandwidth \leq 200 kHz, RMS, RF \leq 4 GHz, RF input level \geq (RF attenuation/dB – 30) dBm	0.1 %
Harmonic distortion	10 Hz \leq AF \leq 100 kHz	0.3 %
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	14 MHz, 20 MHz (R&S®FSV-B70 option) max. $0.5 \times$ demodulation bandwidth
Deviation uncertainty	AF \leq 1 MHz demodulation bandwidth $\geq 3.3 \times$ (AF + deviation) demodulation bandwidth $\leq 10 \times$ (AF + deviation)	$\pm(0.01 \times$ (AF + deviation) + 20 Hz)
Residual FM	demodulation bandwidth \leq 100 kHz, RMS, RF \leq 7 GHz, RF input level \geq (RF attenuation/dB -30) dBm	130 Hz
Harmonic distortion	10 Hz \leq AF \leq 100 kHz, deviation < 400 kHz	0.3 %
AM rejection	100 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 (phase deviation +1) $\leq 0.3 \times$ demodulation bandwidth	$\pm(0.02$ rad + 0.002 \times measured value)
Residual ϕ M	demodulation bandwidth \leq 100 kHz, RMS, RF \leq 1 GHz, highpass 300 Hz, RF input level \geq (RF attenuation/dB - 30) dBm	5 mrad

Carrier power versus time		
Display range		noise floor to +30 dBm
Measurement uncertainty	unmodulated carrier, S/N > 16 dB, RF: 50 kHz to 3 GHz	1 dB
Maximum dynamic range	demodulation bandwidth 200 kHz RF input level \geq (RF attenuation/dB - 10) dBm	75 dB
Display linearity	S/N > 16 dB	0.2 dB

AF spectrum		
Span		\leq 14 MHz \leq 20 MHz (R&S®FSV-B70 option)
Resolution bandwidth		1 Hz to 10 MHz

RF spectrum		
Span		\leq 28 MHz \leq 40 MHz (R&S®FSV-B70 option)
Resolution bandwidth		1 Hz to 10 MHz
Shape factor	60 dB:3 dB	2.5, nominal

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

R&S®FSV-K7S FM stereo measurement application

Frequency

Frequency range	FM stereo mode	
	specified frequency range	85 MHz to 110 MHz
	usable frequency range	same as instrument frequency range
Frequency tuning		automatic, manual

Frequency counter

Frequency counter resolution		1 Hz
Count accuracy	S/N > 25 dB	±1 Hz + R&S®FSV frequency uncertainty (see R&S®FSV reference frequency)

Level

Input level range		-60 dBm to +30 dBm
Level resolution		0.01 dB
Level setting		autorange, manual
Level measurement uncertainty		see R&S®FSV total measurement uncertainty

Signal acquisition

Measurement bandwidth		400 kHz
Measurement time		2 ms to 3.2 s
Trigger		free run, external, IF power, time, demodulated signals: left, right, MPX, mono, stereo, RDS, pilot, RF power

Result display

Result summary table		carrier power
		carrier frequency
		reference deviation
	left/right/MPX/mono/stereo/RDS/ pilot signal	deviation
		relative result
		modulation frequency
		SINAD
		THD (total harmonic distortion)
Demodulated AF signal	left/right/MPX/mono/stereo/RDS/ pilot signal	AF signal versus time
		AF spectrum
RF signal		RF power versus time
		RF spectrum

AF spectrum		
Span		500 Hz to 200 kHz
Resolution bandwidth		1.2 Hz to 1.9 kHz

RF spectrum		
Span		500 Hz to 400 kHz
Resolution bandwidth		1.2 Hz to 1.9 kHz
Shape factor	60 dB:3 dB	2.5, nominal

Detection, audio filter, weighting

Detection	numerical results	+peak, -peak, \pm peak/2, RMS ITU-R quasi peak
	trace detector	max peak, min peak, sample, average
Lowpass		3 kHz, 15 kHz, 23 kHz, 150 kHz
		5 %, 10 %, 25 % of demodulation bandwidth
Highpass		20 Hz, 50 Hz, 300 Hz
Deemphasis		25 μ s, 50 μ s, 75 μ s, 750 μ s
Weighting filters		CCITT P.53, equal to ITU-T rec. O.41
		CCIR unweighted, equal to ITU-R 468-4 CCIR weighted

Measurement uncertainty

Frequency modulation measurement		
Maximum deviation range	frequency deviation	200 kHz
Resolution		1 Hz
Deviation uncertainty	AF \leq 15 kHz and deviation \leq 40 kHz	1 % of reading
Residual FM	RMS, RF input level \geq (RF attenuation/dB -30) dBm	130 Hz
Harmonic distortion	10 Hz \leq AF \leq 100 kHz, deviation < 400 kHz	0.3 %

Audio frequency counter (modulation frequency)		
Range		20 Hz to 200 kHz
Resolution		0.1 %
Measurement uncertainty		0.1 %

Stereo S/N ratio	weighted to ITU-R, 40 kHz deviation	60 dB
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Stereo crosstalk	AF 30 Hz to 15 kHz	-50 dB
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Intermodulation distortion analysis

Measurement functions		intermodulation and differential frequency distortion
Measurement range		-80 dB to 0 dB, 0.01 % to 100 %
Readout unit		dB, %
Resolution		0.01 dB
Measurement uncertainty		0.5 dB
AF frequency range		10 Hz to 15 kHz

Ordering information

Designation	Type	Order No.
Analog Modulation Analysis (AM/FM/ ϕ M)	R&S [®] FSV-K7	1310.8103.02
FM Stereo Measurement Application (requires R&S [®] FSV-K7)	R&S [®] FSV-K7S	1310.8126.02

For product brochure, see PD 5214.0499.12 and www.rohde-schwarz.com

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Certified Quality System
ISO 9001

Rohde & Schwarz GmbH & Co. KG

www.rohde-schwarz.com

Regional contact

- | Europe, Africa, Middle East
+49 89 4129 123 45
customersupport@rohde-schwarz.com
- | North America
1 888 TEST RSA (1 888 837 87 72)
customer.support@rsa.rohde-schwarz.com
- | Latin America
+1 410 910 79 88
customersupport.la@rohde-schwarz.com
- | Asia/Pacific
+65 65 13 04 88
customersupport.asia@rohde-schwarz.com

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