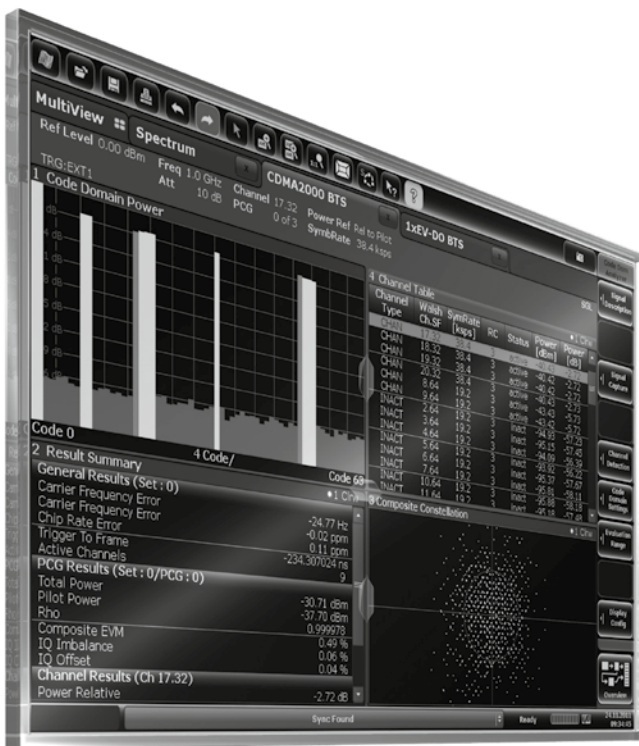


R&S®FSW-K82/-K83/ R&S®FSW-K84/-K85 Measurement Applications Specifications



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Specifications apply to the following measurement applications:

- R&S®FSW-K82 CDMA2000® BS measurement application
- R&S®FSW-K83 CDMA2000® MS measurement application
- R&S®FSW-K84 1xEV-DO BS measurement application
- R&S®FSW-K85 1xEV-DO MS measurement application

They are based on the R&S®FSW signal and spectrum analyzer data sheet specifications and have not been checked separately. They 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

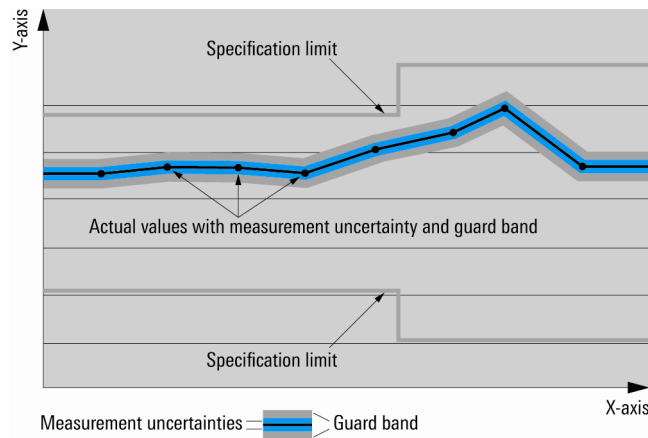
General

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 $<$, \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

Frequency

Frequency range	RF input	same as for R&S®FSW ¹
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Level

Level range	RF input	-40 dBm to +30 dBm ¹
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Signal acquisition

Supported standards	R&S®FSW-K82	in line with 3GPP2 C.S0011 Rev. C
	R&S®FSW-K83	in line with 3GPP2 C.S0010 Rev. C
	R&S®FSW-K84	in line with 3GPP2 C.S0032 Rev. B
	R&S®FSW-K85	in line with 3GPP2 C.S0033 Rev. B
Capture length	R&S®FSW-K82/-K83	up to 64000 PCGs
	R&S®FSW-K84	up to 48000 PCGs
	R&S®FSW-K85	up to 25920 PCGs
Sweep time	spectrum mask, ACLR (adjacent channel leakage power ratio)	max. 16000 s, auto
Sweep count		1 to 32767
Trigger modes	code domain analysis	free run, external
	RF measurements	free run, external, IF power ¹ , RF power ¹ , time, power sensor

Measurement parameters

Modulation detection	R&S®FSW-K82	automatic detection of BPSK, QPSK, 8PSK, 16QAM
	R&S®FSW-K83	BPSK
	R&S®FSW-K84	automatic detection of BPSK, QPSK, 8PSK, 16QAM
	R&S®FSW-K85	automatic detection of BPSK, QPSK, 8PSK, 16QAM, Q2, Q4, B4, Q4Q2, E4E2
Predefined channel table	code domain analyzer	allows the user to define the complete channel setup of the user signal for the code domain analyzer
Spectrum emission mask	standard	limits in line with 3GPP2 standard according to chosen band class
	user	spectrum emission mask measurement is performed according to either manual user setting or user-specified XML file

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

Result diagrams

Result summary	global results	total power, carrier frequency error, chip rate error, trigger to frame, I/Q imbalance, I/Q offset, composite error vector magnitude, rho, average power of inactive channels, peak code domain error, average relative code domain error power of all channels with 64QAM, number of active channels
	results for selected channel	symbol rate, channel code, number of pilot bits, relative channel power, absolute channel power, relative code domain error power, timing offset of selected channel to CPICH, channel slot number, modulation type, symbol error vector magnitude
Code domain power		code domain power versus code
Code domain error power		code domain error power versus code
Peak code domain error		peak code domain error power versus slot/halfslot/PCG
Channel table	numeric result table for all channels including the following readings per channel	channel type, channel number, spreading factor, symbol rate, state, absolute power, relative power, timing offset, phase offset, mapping and modulation type
Composite EVM (RMS)		averaged (RMS) EVM of selected frame versus slot
Composite constellation		constellation diagram for composite signal
Power versus slot/halfslot/PCG		power versus slots/halfslots/PCGs of selected frame
Power versus symbol		power of selected channel and slot versus symbol
Symbol constellation		constellation diagram for selected channel and slot
Symbol EVM		symbol EVM for selected channel and slot
Bitstream		demodulated bits of selected channel and slot/halfslot/PCG
Power versus chip		power of selected slot/halfslot/PCG versus chip
Composite channel bit stream (R&S [®] FSW-K85 with subtypes 2 and 3 only)		bit stream of composite data channel for Q4Q2 and E4E2 modulated signals
Composite channel EVM (R&S [®] FSW-K85 with subtypes 2 and 3 only)		EVM versus chip of composite data channel for Q4Q2 and E4E2 modulated signals
Composite channel constellation (R&S [®] FSW-K85 with subtypes 2 and 3 only)		constellation diagram for composite data channel for Q4Q2 and E4E2 modulated signals
Output power		integrated signal power over channel bandwidth
Adjacent channel power, multicarrier adjacent channel power		absolute and relative adjacent channel power
Spectrum emission mask		spectrum mask limit check peak list evaluation
Occupied bandwidth		occupied bandwidth measured in frequency domain
CCDF		CCDF

Measurement specification (nominal)

For 700 MHz < center frequency < 2.7 GHz and with external reference frequency applied

Specifications for R&S® FSW-K82/-K83/-K84/-K85

CPICH power accuracy (test case 6.2.1)		
Level uncertainty, total power	$P_{total} > -20$ dBm	< 0.3 dB
Level uncertainty, pilot power	$P_{total} > -20$ dBm	< 0.4 dB
Level uncertainty, channel power	$P_{total} > -20$ dBm	
	absolute	< 0.4 dB
	relative	< 0.1 dB

Composite EVM		
Measurement range		1 % to 25 %
Inherent EVM		< 1 %
Measurement uncertainty	test models 1 to 4, $P_{total} > -40$ dBm	< 0.25 %

Adjacent channel leakage power ratio (compares the integrated channel power against a frequency offset with 30 kHz integration bandwidth; measured with 100 ms FFT sweep, RMS detector and signal level -10 dBm, noise correction on)		
Dynamic range	offset 750 kHz	> 90 dB
	offset 1980 kHz	> 93 dB

Spectrum emission mask		
Dynamic range	$P_{total} > -10$ dBm, offset 2.515 MHz	> 78 dB

Trigger to frame		
Measurement range		± 500 μ s
Uncertainty	relative	< 20 ns

Specifications for R&S® FSW-K82/-K83/-K85 only

Frequency error		
Measurement range	CPICH synchronous	± 1 kHz
	SCH synchronous	± 1.2 kHz
Measurement uncertainty		< 1.5 Hz + Δf_{ref}

Peak code domain error power		
Measurement range		0 dB to -60 dB
Inherent PkCDEP		< -60 dB
Measurement uncertainty	$P_{total} > -20$ dBm	< 1 dB

Specifications for R&S® FSW-K84 only

Frequency error		
Measurement range	CPICH synchronous	± 8 kHz
Measurement uncertainty		< 1.5 Hz + Δf_{ref}

Peak code domain error power		
Measurement range		0 dB to -58 dB
Inherent PkCDEP	pilot	-55 dB
	MAC	-58 dB
	data	-52 dB
	preamble	-55 dB
Measurement uncertainty	$P_{total} > -20$ dBm	< 1 dB

Ordering information

Designation	Type	Order No.
CDMA2000 [®] BS Measurement Application	R&S [®] FSW-K82	1313.1468.02
CDMA2000 [®] MS Measurement Application	R&S [®] FSW-K83	1313.1474.02
1xEV-DO BS Measurement Application	R&S [®] FSW-K84	1313.1480.02
1xEV-DO MS Measurement Application	R&S [®] FSW-K85	1313.1497.02
Signal and Spectrum Analyzer	R&S [®] FSW8	1312.8000.08
Signal and Spectrum Analyzer	R&S [®] FSW26	1312.8000.26
Recommended options and extras		
see the R&S [®] FSW data sheet (PD 5214.5984.22)		

For product brochure, see PD 5214.5984.12 and www.rohde-schwarz.com

Service you can rely on

- ▮ Worldwide
- ▮ Local and personalized
- ▮ 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

Rohde & Schwarz GmbH & Co. KG

www.rohde-schwarz.com

Regional contact

- ▮ Europe, Africa, Middle East | +49 89 4129 12345
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
- ▮ China | +86 800 810 8228/+86 400 650 5896
customersupport.china@rohde-schwarz.com

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Subject to change

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