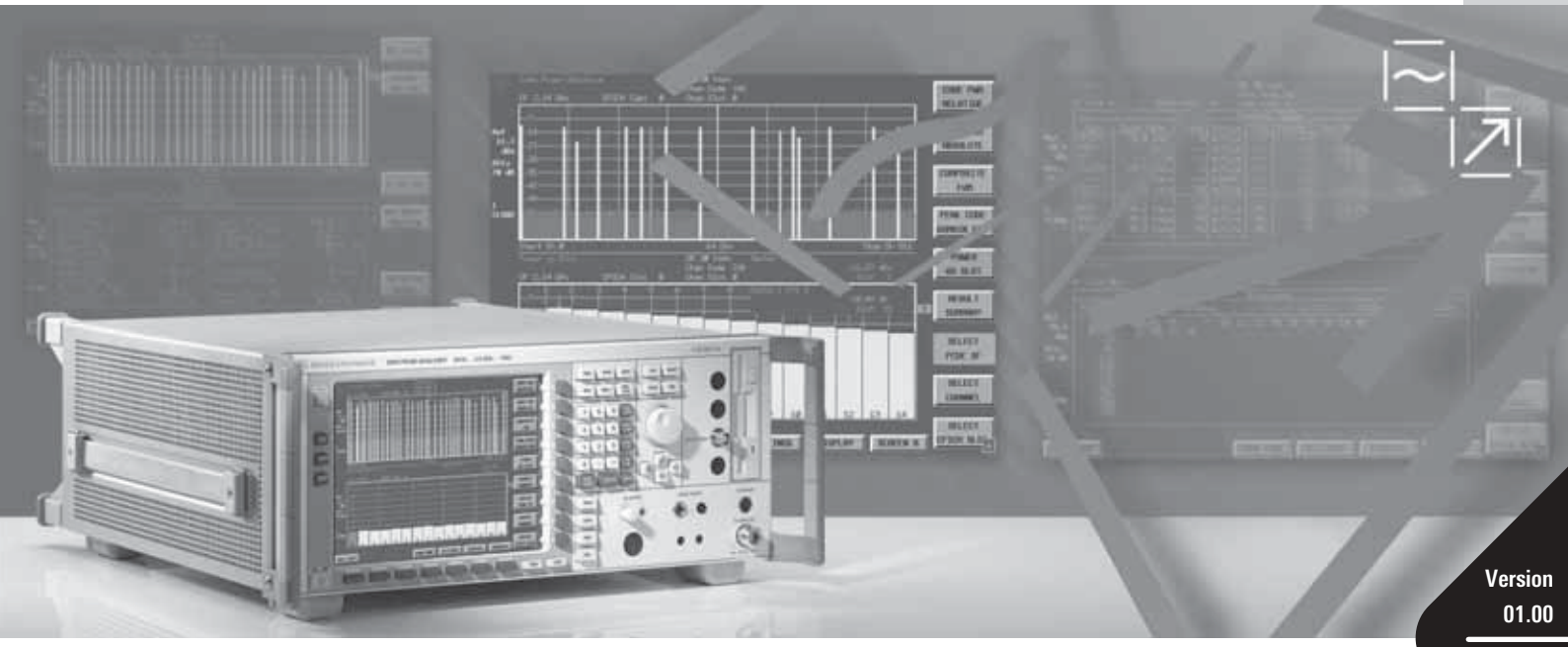
Specifications



Version 01.00

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WCDMA 3GPP Application Firmware R&S®FS-K72/-K73/-K74

Specifications

ROHDE&SCHWARZ

CONTENT

Specifications R&S FS-K72/R&S FS-K73/R&S FS-K74

The specifications below apply to the R&S FSQx (R&S FSQ3/8/26/40), R&S FSUx (R&S FSU3/8/26/46/50) and R&S FSPx (R&S FSP3/7/13/30/40). They are based on the data sheet specifications of the Spectrum Analyzers R&S FSQ, R&S FSU and R&S FSP and have not been checked separately. Specifications apply under the following conditions: frequency lower than 3.6 GHz (R&S FSU/FSQ) or 3 GHz (R&S FSP),15 minutes warm-up time at ambient temperature, specified environmental conditions met, calibration cycle adhered to and internal calibration performed. Data with tolerances are measurement uncertainties with a confidence level of 95%. The specified level measurement errors do not take into account systematic errors due to reduced S/N ratio.

Frequency

R&S FSQ	Range	R&S FSU	Range	R&S FSP	Range
R&S FSQ3	20 Hz to 3.6 GHz	R&S FSU3	20 Hz to 3.6 GHz	R&S FSP3	20 Hz to 3 GHz
R&S FSQ8	20 Hz to 8 GHz	R&S FSU8	20 Hz to 8 GHz	R&S FSP7	20 Hz to 8 GHz
R&S FSQ26	20 Hz to 26.5 GHz	R&S FSU26	20 Hz to 26.5 GHz	R&S FSP13	20 Hz to 13 GHz
R&S FSQ40	20 Hz to 40 GHz	R&S FSU46	20 Hz to 46 GHz	R&S FSP30	20 Hz to 30 GHz
—	—	R&S FSU50	20 Hz to 50 GHz	R&S FSP40	20 Hz to 40 GHz

R&S FS-K72 (3GPP FDD base station test)

The R&S FSPx analyzer has to be equipped with the options R&S FSP-B15 and R&S FSP-B70. Specifications apply at frequencies lower than 3.6 GHz (R&S FSU/FSQ) or 3 GHz (R&S FSP).

PMU = permissible measurement uncertainty in accordance with test specification 3GPP TS 25.141.

Base station output power

Base station output power	Test case 6.2.1	R&S FSQ	R&S FSU	R&S FSP	PMU
Level range		−70 dBm to +30 dBm	−70 dBm to +30 dBm	−70 dBm to +30 dBm	
Level uncertainty	total power P_{total} > −60 dBm	<0.25 dB	<0.3 dB	<0.5 dB	<0.7 dB

CPICH power accuracy	Test case 6.2.2	R&S FSQ	R&S FSU	R&S FSP	PMU
Level range of total power		−40 dBm to +30 dBm	−40 dBm to +30 dBm	−40 dBm to +30 dBm	
Level range of CPICH		−40 dB to 0 dB	−40 dB to 0 dB	−40 dB to 0 dB	
Level uncertainty (absolute power)	P_{CPICH} ≥ −10 dB P_{CPICH} ≥ −20 dB P_{CPICH} ≥ −30 dB P_{CPICH} ≥ −40 dB	<0.26 dB (σ = 0.003) <0.27 dB (σ = 0.010) <0.32 dB (σ = 0.034) <0.45 dB (σ = 0.100)	<0.31 dB (σ = 0.004) <0.32 dB (σ = 0.012) <0.37 dB (σ = 0.036) <0.54 dB (σ = 0.120)	<0.51 dB (σ = 0.005) <0.53 dB (σ = 0.012) <0.57 dB (σ = 0.036) <0.74 dB (σ = 0.120)	<0.8 dB
Level uncertainty (relative power)	P_{CPICH} ≥ −10 dB P_{CPICH} ≥ −20 dB P_{CPICH} ≥ −30 dB P_{CPICH} ≥ −40 dB	<0.010 dB (σ = 0.003) <0.020 dB (σ = 0.010) <0.070 dB (σ = 0.034) <0.200 dB (σ = 0.100)	<0.012 dB (σ = 0.004) <0.025 dB (σ = 0.012) <0.075 dB (σ = 0.036) <0.240 dB (σ = 0.10)	<0.014 dB (σ = 0.005) <0.030 dB (σ = 0.012) <0.080 dB (σ = 0.036) <0.260 dB (σ = 0.120)	<0.3 dB

Frequency error

Frequency error	Test case 6.3	R&S FSQ	R&S FSU	R&S FSP	PMU
Measurement range	CPICH synchronous	±5 kHz	±5 kHz	±5 kHz	±1 kHz
	SCH synchronous	±1.6 kHz	±1.6 kHz	±1.6 kHz	
Measurement uncertainty	SNR > 40 dB	<5 Hz + Δf_{ref} [1)] (σ = 2 Hz)	<5 Hz + Δf_{ref} [1)] (σ = 2 Hz)	<5 Hz + Δf_{ref} [1)] (σ = 2 Hz)	<12 Hz + Δf_{ref} [1)]

1) Δf_{ref} = uncertainty of reference frequency.

Output power dynamics

Power control steps	Test case 6.4.2 (test model 2)	R&S FSQ	R&S FSU	R&S FSP	PMU
Level range		−40 dBm to +30 dBm	−40 dBm to +30 dBm	−40 dBm to +30 dBm	
Relative level uncertainty	power dynamic range ≤30 dB 1 × 1 dB step 1 × 0.5 dB step 10 × 1 dB steps 10 × 0.5 dB steps	 <0.03 dB (σ = 0.01 dB) <0.03 dB (σ = 0.01 dB) <0.03 dB (σ = 0.01 dB) <0.03 dB (σ = 0.01 dB)	 <0.03 dB (σ = 0.01 dB) <0.03 dB (σ = 0.01 dB) <0.03 dB (σ = 0.01 dB) <0.03 dB (σ = 0.01 dB)	 <0.07 dB (σ = 0.02 dB) <0.07 dB (σ = 0.02 dB) <0.07 dB (σ = 0.02 dB) <0.07 dB (σ = 0.02 dB)	 <0.1 dB <0.1 dB <0.1 dB <0.1 dB
Number of frames		100	3	3	

Power control dynamic range	Test case 6.4.3 (test model 2)	R&S FSQ	R&S FSU	R&S FSP	PMU
Level range		−40 dBm to +30 dBm	−40 dBm to +30 dBm	−40 dBm to +30 dBm	
Absolute level uncertainty	total power P_{total} > −40 dBm relative channel power P_{rel} ≥ −30 dB	<0.5 dB (σ = 0.07 dB)	<0.5 dB (σ = 0.07 dB)	<0.7 dB (σ = 0.10 dB)	<1.1 dB
Relative level uncertainty	total power P_{total} > −40 dBm relative channel power $P_{channel}$ ≥ −30 dB	<0.3 dB (σ = 0.07 dB)	<0.3 dB (σ = 0.07 dB)	<0.3 dB (σ = 0.10 dB)	<1.1 dB
Number of frames		100	3	3	

Total power dynamic range	Test case 6.4.4	R&S FSQ	R&S FSU	R&S FSP	PMU
Level range		−70 dBm to +30 dBm	−70 dBm to +30 dBm	−70 dBm to +30 dBm	
Level uncertainty	total power P_{total} < −70 dBm dynamic range P_{dyn} < 30 dB	<0.07 dB (σ = 0.02 dB)	<0.10 dB (σ = 0.02 dB)	<0.2 dB (σ = 0.05 dB)	<0.3 dB

Output RF spectrum emissions

Occupied bandwidth	Test case 6.5.1	R&S FSQ	R&S FSU	R&S FSP	PMU
Measurement uncertainty	P > −40 dBm span ≤ 10 MHz	<38 kHz (σ = 18 kHz)	<38 kHz (σ = 18 kHz)	<38 kHz (σ = 18 kHz)	<100 kHz

Spectrum emission mask	Test case 6.5.2.1	R&S FSQ	R&S FSU	R&S FSP	PMU
Dynamic range	total power P_{total} > −20 dBm	69 dB	68 dB	65 dB	
Relative level uncertainty		<0.15 dB + 2σ(T_{sweep})[1)]	<0.15 dB + 2σ(T_{sweep})[1)]	<0.2 dB + 2σ(T_{sweep})[1)]	<1.5 dB
Absolute level uncertainty		<0.4 dB + 2σ(T_{sweep})[1)]	<0.4 dB + 2σ(T_{sweep})[1)]	<0.7 dB + 2σ(T_{sweep})[1)]	<1.5 dB

[1)] The standard deviation σ(T_{sweep}) of Gaussian-distributed signals depends on the selected sweep time (T_{sweep}). Increasing the sweep time decreases the standard deviation (σ).

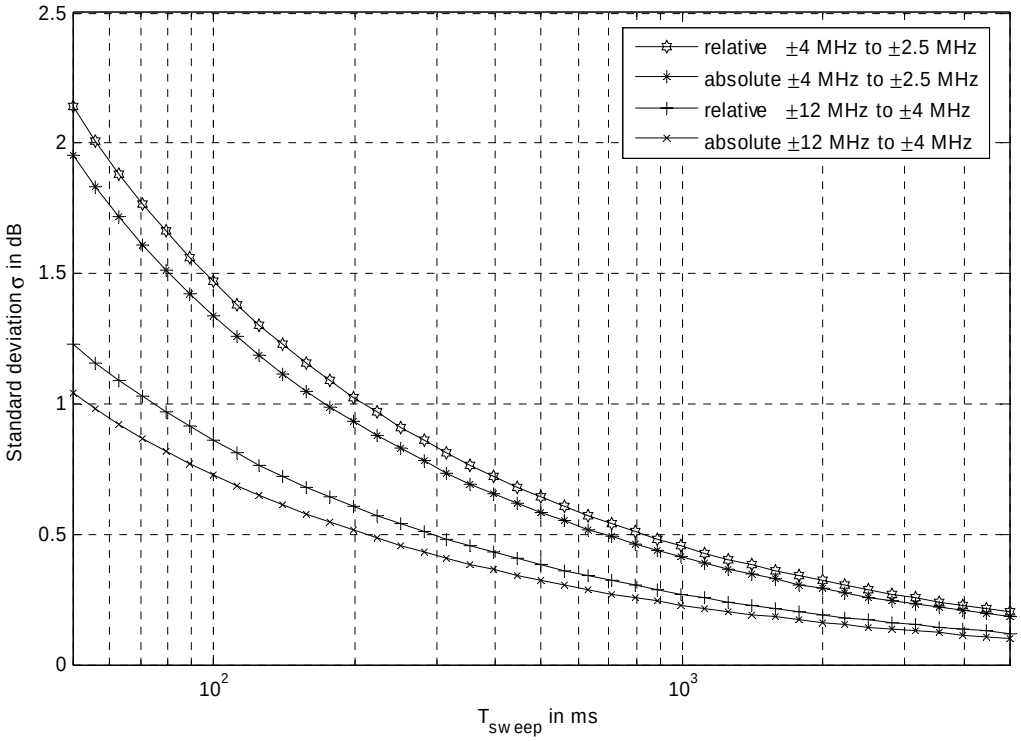

Figure 1: Standard deviation σ of spectrum emission mask measurement as a function of sweep time (T_{sweep})

Adjacent channel leakage ratio	Test case 6.5.2.2	R&S FSQ	R&S FSU	R&S FSP	PMU
Single carrier	**test model 1 with 64 DPCH**	**carrier power >−10 dBm**	**carrier power >−10 dBm**	**carrier power >−20 dBm**	
Dynamic range	noise correction OFF				
	1st adjacent	typ. 77 dB	typ. 76 dB	typ. 68 dB	
	2nd adjacent	typ. 78 dB	typ. 77 dB	typ. 69 dB	
	noise correction ON				
	1st adjacent	typ. 84 dB	typ. 84 dB	typ. 72 dB	
	2nd adjacent	typ. 85 dB	typ. 85 dB	typ. 73 dB	
Two carriers					
Dynamic range	noise correction OFF				
	1st adjacent	typ. 74 dB	typ. 71 dB	typ. 67 dB	
	2nd adjacent	typ. 78 dB	typ. 77 dB	typ. 69 dB	
	noise correction ON				
	1st adjacent	typ. 82 dB	typ. 81 dB	typ. 71 dB	
	2nd adjacent	typ. 84 dB	typ. 84 dB	typ. 72 dB	
Four carriers					
Dynamic range	noise correction OFF				
	1st adjacent	typ. 69 dB	typ. 67 dB	typ. 63 dB	
	2nd adjacent	typ. 72 dB	typ. 70 dB	typ. 63 dB	
	noise correction ON				
	1st adjacent	typ. 78 dB	typ. 76 dB	typ. 68 dB	
	2nd adjacent	typ. 78 dB	typ. 78 dB	typ. 68 dB	
Measurement uncertainty		0.15 dB + 2σ(T_{sweep})[1)]	0.15 dB + 2σ(T_{sweep})[1)]	0.2 dB + 2σ(T_{sweep})[1)]	<0.8 dB

[1)] The standard deviation σ(T_{sweep}) of Gaussian-distributed signals depends on the selected sweep time (T_{sweep}). Increasing the sweep time decreases the standard deviation (σ).

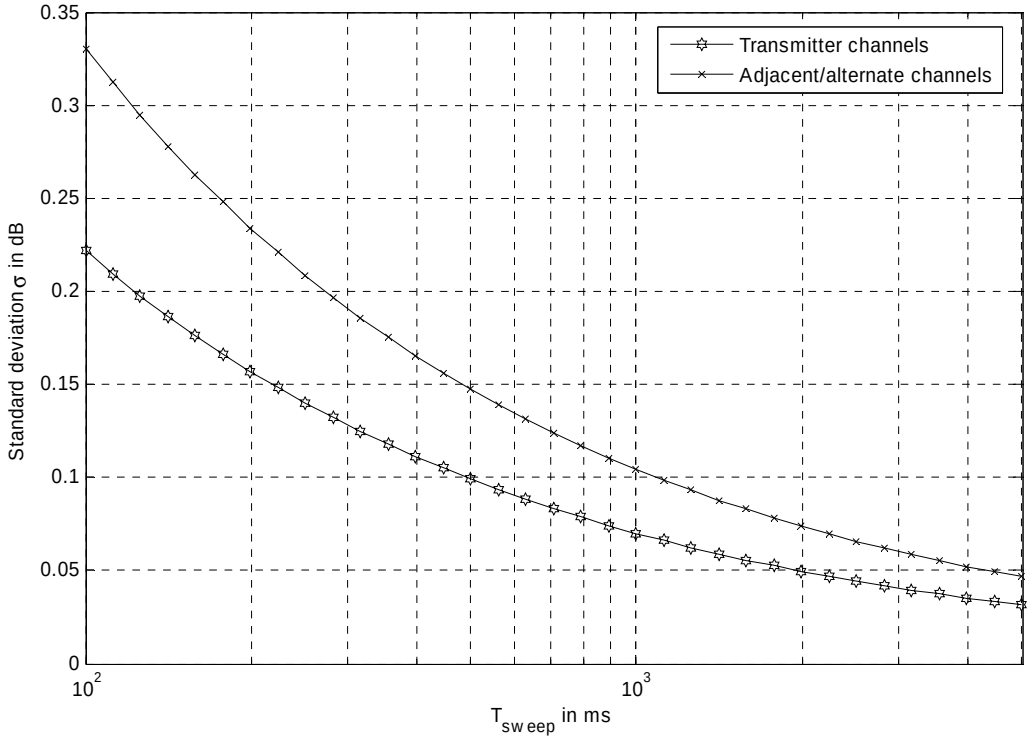

Figure 2: Standard deviation σ of adjacent channel leakage ratio measurement as a function of the selected sweep time (T_{sweep})

Spurious emissions	Test case 6.5.3	R&S FSQ	R&S FSU	R&S FSP	PMU
Measurement uncertainty	f < 10 MHz 10 MHz < f < 2.2 GHz 2.2 GHz < f < 3.6 GHz 3.6 GHz < f < 4 GHz 4 GHz < f < 8 GHz 8 GHz < f < 22 GHz	<0.5 dB (σ = 0.2 dB) <0.3 dB (σ = 0.1 dB) <0.3 dB (σ = 0.1 dB) <1.5 dB (σ = 0.5 dB) <1.5 dB (σ = 0.5 dB) <2.0 dB (σ = 0.7 dB)	<0.5 dB (σ = 0.2 dB) <0.3 dB (σ = 0.1 dB) <0.3 dB (σ = 0.1 dB) <1.5 dB (σ = 0.5 dB) <1.5 dB (σ = 0.5 dB) <2.0 dB (σ = 0.7 dB)	— — — — — —	<1.5 dB <1.5 dB <2.0 dB <2.0 dB <4.0 dB <4.0 dB
Measurement uncertainty	f < 50 kHz 50 kHz < f < 2.2 GHz 2.2 GHz < f < 3.0 GHz 3.0 GHz < f < 4 GHz 4 GHz < f < 7 GHz 7 GHz < f < 13 GHz 13 GHz < f < 30 GHz	— — — — — — —	— — — — — — —	<1.0 dB (σ = 0.3 dB) <0.5 dB (σ = 0.17 dB) <0.5 dB (σ = 0.17 dB) <2.0 dB (σ = 0.7 dB) <2.0 dB (σ = 0.7 dB) <2.5 dB <3.0 dB	<1.5 dB <1.5 dB <2.0 dB <2.0 dB <4.0 dB <4.0 dB <4.0 dB

Transmit intermodulation

Transmit intermodulation	Test case 6.6	R&S FSQ	R&S FSU	R&S FSP	PMU
Max. level	attenuator = 0 dB attenuator ≥ 10 dB	+20 dBm +30 dBm	+20 dBm +30 dBm	+20 dBm +30 dBm	—
Third order intercept (TOI)	300 MHz < f < 3.6 GHz	20 dBm	20 dBm	7 dBm	—
Level uncertainty	P > −120 dBm 2.0 GHz < f < 2.3 GHz 6.2 GHz < f < 6.6 GHz 10.4 GHz < f < 11.0 GHz	 <0.3 dB (σ = 0.1 dB) <1.5 dB (σ = 0.5 dB) <2.0 dB (σ = 0.7 dB)	 <0.3 dB (σ = 0.1 dB) <1.5 dB (σ = 0.5 dB) <2.0 dB (σ = 0.7 dB)	 <0.5 dB (σ = 0.17 dB) <2.0 dB (σ = 0.7 dB) <2.5 dB	 <1.5 dB <4.0 dB <4.0 dB
Measurements	adjacent channel leakage ratio spectrum emission mask spurious emissions				

Transmit modulation

Composite EVM	Test case 6.7.1	R&S FSQ	R&S FSU	R&S FSP	PMU
Measurement range		0.5 % to 25 %	0.5 % to 25 %	1.0 % to 25 %	
Inherent EVM		<0.7 %	<1.0 %	<1.5 %	
Measurement uncertainty	test models 1 to 4 P > −40 dBm	<0.4 % (σ = 0.1 %)	<0.5 % (σ = 0.1 %)	<1 % (σ = 0.3 %)	<2.5 %

Peak code domain error power (PCDEP)	Test case 6.7.2	R&S FSQ	R&S FSU	R&S FSP	PMU
Measurement range	−50 dB to 0 dB	0 dB to −60 dB	0 dB to −60 dB	0 dB to −50 dB	
Inherent PCDEP		<−60 dB (σ = 0.5 dB)	<−60 dB (σ = 0.5 dB)	<−50 dB (σ = 0.5 dB)	
Measurement uncertainty	−30 dB < PCDEP −40 dB < PCDEP < −30 dB −50 dB < PCDEP < −40 dB −60 dB < PCDEP < −50 dB	<0.10 dB (σ = 0.02 dB) <0.20 dB (σ = 0.05 dB) <0.50 dB (σ = 0.15 dB) <1.00 dB (σ = 0.35 dB)	<0.15 dB (σ = 0.05 dB) <0.40 dB (σ = 0.15 dB) <0.80 dB (σ = 0.30 dB) <1.20 dB (σ = 0.60 dB)	<0.15 dB (σ = 0.05 dB) <0.40 dB (σ = 0.15 dB) <0.80 dB (σ = 0.30 dB)	<1.0 dB <1.0 dB <1.0 dB <1.0 dB

R&S FS-K73 (3GPP FDD user equipment test)

The R&S FSPx analyzer has to be equipped with the option R&S FSP-B15. To analyze more than one slot, the R&S FSPx has to be equipped with the option R&S FSP-B70. Specifications apply at frequencies lower than 3.6 GHz (R&S FSU/FSQ) or 3 GHz (R&S FSP).

PMU = permissible measurement uncertainty in accordance with test specification 3GPP TS 25.141.

Output power

Maximum output power	**Test case 5.2**	**R&S FSQ**	**R&S FSU**	**R&S FSP**	**PMU**
Level range		−70 dBm to +30 dBm	−70 dBm to +30 dBm	−70 dBm to +30 dBm	
Level uncertainty	P > −60 dBm	<0.25 dB	<0.3 dB	<0.5 dB	<0.7 dB

Frequency error

Frequency error	**Test case 5.3**	**R&S FSQ**	**R&S FSU**	**R&S FSP**	**PMU**
Measurement range		±3 kHz	±3 kHz	±3 kHz	±1 kHz
Measurement uncertainty	SNR > 40 dB	<5 Hz + Δf_{ref} [1)] (σ = 2 Hz)	<5 Hz + Δf_{ref} [1)] (σ = 2 Hz)	<5 Hz + Δf_{ref} [1)] (σ = 2 Hz)	<10 Hz + Δf_{ref} [1)]

1) Δf_{ref} = uncertainty of reference frequency.

Output power dynamics

Code power accuracy		**R&S FSQ**	**R&S FSU**	**R&S FSP**	**PMU**
Level range of total power		−40 dBm to +30 dBm	−40 dBm to +30 dBm	−40 dBm to +30 dBm	
Level uncertainty (absolute power)	P_{chan} ≥ −10 dB P_{chan} ≥ −20 dB P_{chan} ≥ −30 dB P_{chan} ≥ −40 dB	<0.28 dB (σ = 0.01) <0.31 dB (σ = 0.02) <0.35 dB (σ = 0.04) <0.55 dB (σ = 0.10)	<0.33 dB (σ = 0.01) <0.36 dB (σ = 0.02) <0.40 dB (σ = 0.04) <0.60 dB (σ = 0.10)	<0.53 dB (σ = 0.01) <0.56 dB (σ = 0.02) <0.60 dB (σ = 0.04) <0.80 dB (σ = 0.10)	
Level uncertainty (relative power)	P_{chan} ≥ −10 dB P_{chan} ≥ −20 dB P_{chan} ≥ −30 dB P_{chan} ≥ −40 dB	<0.03 dB (σ = 0.01) <0.06 dB (σ = 0.02) <0.10 dB (σ = 0.04) <0.30 dB (σ = 0.10)	<0.03 dB (σ = 0.01) <0.06 dB (σ = 0.02) <0.10 dB (σ = 0.04) <0.30 dB (σ = 0.10)	<0.04 dB (σ = 0.01) <0.08 dB (σ = 0.03) <0.20 dB (σ = 0.05) <0.40 dB (σ = 0.15)	

Inner loop power control	**Test case 5.4.2**	**R&S FSQ**	**R&S FSU**	**R&S FSP**	**PMU**
Level range		−40 dBm to +30 dBm	−40 dBm to +30 dBm	−40 dBm to +30 dBm	
Relative level uncertainty	P_{dyn} ≤ 30 dB 1 × 1 dB step 1 × 2 dB step 1 × 3 dB step 10 × 1 dB steps 10 × 2 dB steps	 <0.03 dB (σ = 0.01 dB) <0.03 dB (σ = 0.01 dB) <0.04 dB (σ = 0.01 dB) <0.06 dB (σ = 0.02 dB) <0.06 dB (σ = 0.02 dB)	 <0.03 dB (σ = 0.01 dB) <0.03 dB (σ = 0.01 dB) <0.04 dB (σ = 0.01 dB) <0.06 dB (σ = 0.02 dB) <0.06 dB (σ = 0.02 dB)	 <0.04 dB (σ = 0.01 dB) <0.04 dB (σ = 0.01 dB) <0.05 dB (σ = 0.01 dB) <0.08 dB (σ = 0.02 dB) <0.08 dB (σ = 0.02 dB)	 <0.10 dB <0.15 dB <0.20 dB <0.30 dB <0.30 dB
Number of frames		100	3	3 (1 slot without R&S FSP-B70)	—

Minimum output power	**Test case 5.4.3**	**R&S FSQ**	**R&S FSU**	**R&S FSP**	**PMU**
Level range		−70 dBm to +30 dBm	−70 dBm to +30 dBm	−70 dBm to +30 dBm	
Level uncertainty	P_{total} > −40 dBm	<0.25 dB	<0.3 dB	<0.5 dB	<1.0 dB

Output RF spectrum emissions

Occupied bandwidth	Test case 5.8	R&S FSQ	R&S FSU	R&S FSP	PMU
Measurement uncertainty	P > −40 dBm span ≤ 10 MHz	<38 kHz (σ = 18 kHz)	<38 kHz (σ = 18 kHz)	<38 kHz (σ = 18 kHz)	<100 kHz

Spectrum emission mask	Test case 5.9	R&S FSQ	R&S FSU	R&S FSP	PMU
Dynamic range	P > −20 dBm	69 dB	68 dB	65 dB	
Relative level uncertainty		<0.15 dB + 2σ(T_{sweep})[1)]	<0.15 dB + 2σ(T_{sweep})[1)]	<0.2 dB + 2σ(T_{sweep})[1)]	<1.5 dB
Absolute level uncertainty		<0.4 dB + 2σ(T_{sweep})[1)]	<0.4 dB + 2σ(T_{sweep})[1)]	<0.7 dB + 2σ(T_{sweep})[1)]	<1.5 dB

1) The standard deviation σ(T_{sweep}) of Gaussian-distributed signals depends on the selected sweep time (T_{sweep}). Increasing the sweep time decreases the standard deviation (σ).

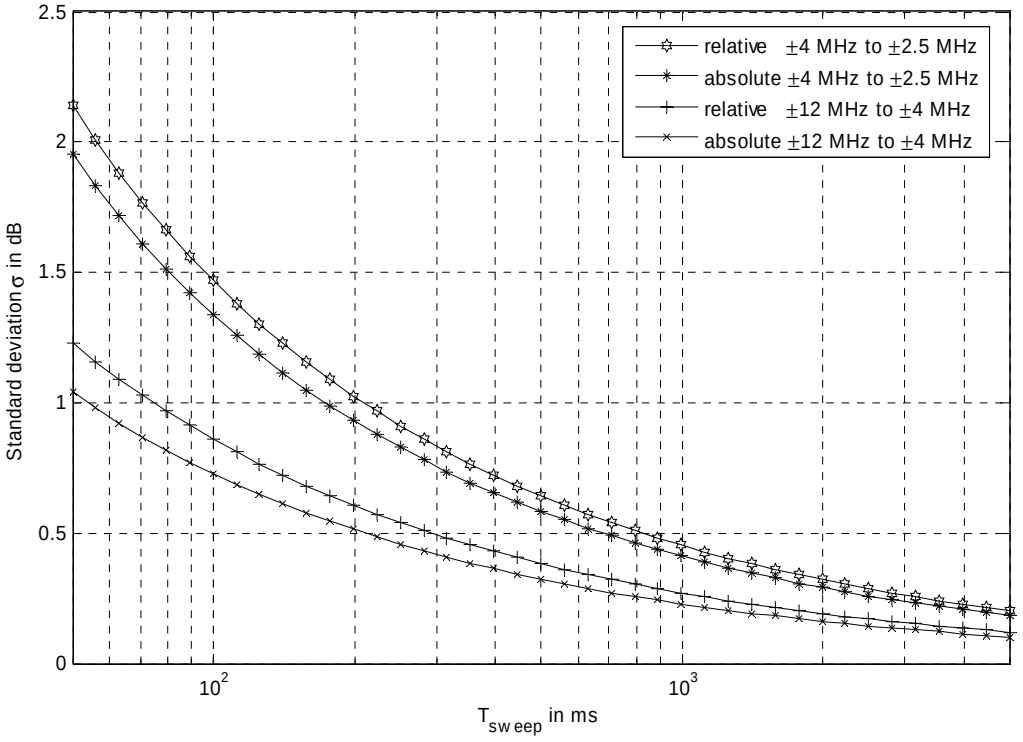

Figure 3: Standard deviation σ of spectrum emission mask measurement as a function of sweep time (T_{sweep})

Adjacent channel leakage ratio	Test case 5.10	R&S FSQ	R&S FSU	R&S FSP	PMU
Single carrier ACP		P > −10 dBm	P > −10 dBm	P > −20 dBm	
Dynamic range	noise correction OFF 1st adjacent 2nd adjacent noise correction ON 1st adjacent 2nd adjacent	 typ. 77 dB typ. 78 dB typ. 84 dB typ. 85 dB	 typ. 76 dB typ. 77 dB typ. 84 dB typ. 85 dB	 typ. 68 dB typ. 69 dB typ. 72 dB typ. 73 dB	
Measurement uncertainty		0.15 dB + 2σ(T_{sweep})[1)]	0.15 dB + 2σ(T_{sweep})[1)]	0.2 dB + 2σ(T_{sweep})[1)]	<0.8 dB

1) The standard deviation σ(T_{sweep}) of Gaussian-distributed signals depends on the selected sweep time (T_{sweep}). Increasing the sweep time decreases the standard deviation (σ).

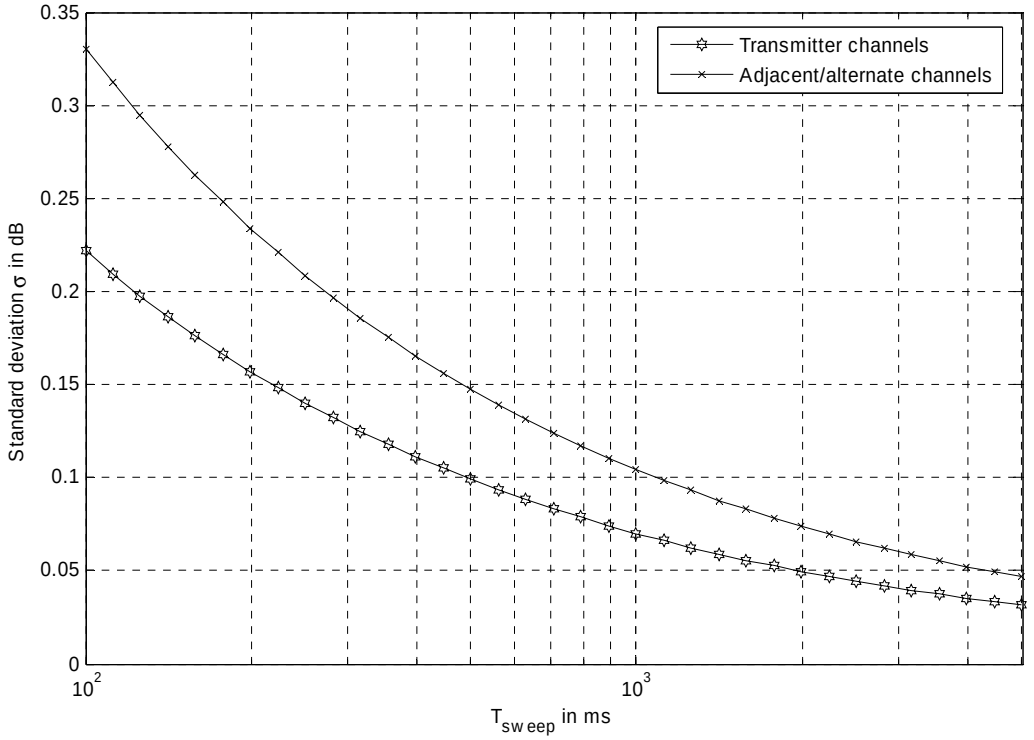

Figure 4: Standard deviation σ of adjacent channel leakage ratio measurement as a function of the selected sweep time (T_{sweep})

Spurious emissions	Test case 6.5.3	R&S FSQ	R&S FSU	R&S FSP	PMU
Measurement uncertainty	f < 10 MHz 10 MHz < f < 2.2 GHz 2.2 GHz < f < 3.6 GHz 3.6 GHz < f < 4 GHz 4 GHz < f < 8 GHz 8 GHz < f < 22 GHz	<0.5 dB (σ = 0.2 dB) <0.3 dB (σ = 0.1 dB) <0.3 dB (σ = 0.1 dB) <1.5 dB (σ = 0.5 dB) <1.5 dB (σ = 0.5 dB) <2.0 dB (σ = 0.7 dB)	<0.5 dB (σ = 0.2 dB) <0.3 dB (σ = 0.1 dB) <0.3 dB (σ = 0.1 dB) <1.5 dB (σ = 0.5 dB) <1.5 dB (σ = 0.5 dB) <2.0 dB (σ = 0.7 dB)	— — — — — —	<1.5 dB <1.5 dB <2.0 dB <2.0 dB <4.0 dB <4.0 dB
Measurement uncertainty	f < 50 kHz 50 kHz < f < 2.2 GHz 2.2 GHz < f < 3.0 GHz 3.0 GHz < f < 4 GHz 4 GHz < f < 7 GHz 7 GHz < f < 13 GHz 13 GHz < f < 30 GHz	— — — — — — —	— — — — — — —	<1.0 dB (σ = 0.3 dB) <0.5 dB (σ = 0.17 dB) <0.5 dB (σ = 0.17 dB) <2.0 dB (σ = 0.7 dB) <2.0 dB (σ = 0.7 dB) <2.5 dB <3.0 dB	<1.5 dB <1.5 dB <2.0 dB <2.0 dB <4.0 dB <4.0 dB <4.0 dB

Transmit intermodulation

Transmit intermodulation	Test case 6.6	R&S FSQ	R&S FSU	R&S FSP	PMU
Max. level	attenuator = 0 dB attenuator ≥ 10 dB	+20 dBm +30 dBm	+20 dBm +30 dBm	+20 dBm +30 dBm	—
Third order intercept (TOI)	300 MHz < f < 3.6 GHz	20 dBm	20 dBm	7 dBm	—
Level uncertainty	P > −120 dBm 1.8 GHz < f < 2.1 GHz 5.6 GHz < f < 6.1 GHz 9.5 GHz < f < 10.0 GHz	 <0.3 dB (σ = 0.1 dB) <1.5 dB (σ = 0.5 dB) <2.0 dB (σ = 0.7 dB)	 <0.3 dB (σ = 0.1 dB) <1.5 dB (σ = 0.5 dB) <2.0 dB (σ = 0.7 dB)	 <0.5 dB (σ = 0.17 dB) <2.0 dB (σ = 0.7 dB) <2.5 dB	 <1.5 dB <4.0 dB <4.0 dB
Measurement	adjacent channel leakage ratio spectrum emission mask spurious emissions				

Transmit modulation

Composite EVM	Test case 5.13.1	R&S FSQ	R&S FSU	R&S FSP	PMU
Measurement range		0.5 % to 25 %	0.5 % to 25 %	1.0 % to 25 %	
Inherent EVM		<0.7 %	<1.0 %	<1.5 %	
Measurement uncertainty	test model 1 to 4 P > −40 dBm	<0.4 % (σ = 0.1 %)	<0.5 % (σ = 0.1 %)	<1 % (σ = 0.3 %)	<2.5 %

Peak code domain error power (PCDEP)	Test case 5.13.2	R&S FSQ	R&S FSU	R&S FSP	PMU
Measurement range	−50 dB to 0 dB	0 dB to −60 dB	0 dB to −60 dB	0 dB to −50 dB	
Inherent PCDEP		<−60 dB (σ = 0.5 dB)	<−60 dB (σ = 0.5 dB)	<−50 dB (σ = 0.5 dB)	
Measurement uncertainty	−30 dB < PCDEP −40 dB < PCDEP < −30 dB −50 dB < PCDEP < −40 dB −60 dB < PCDEP < −50 dB	<0.10 dB (σ = 0.02 dB) <0.20 dB (σ = 0.05 dB) <0.50 dB (σ = 0.15 dB) <1.00 dB (σ = 0.35 dB)	<0.15 dB (σ = 0.05 dB) <0.40 dB (σ = 0.15 dB) <0.80 dB (σ = 0.30 dB) <1.20 dB (σ = 0.60 dB)	<0.15 dB (σ = 0.05 dB) <0.40 dB (σ = 0.15 dB) <0.80 dB (σ = 0.30 dB)	<1.0 dB <1.0 dB <1.0 dB <1.0 dB

R&S FS-K74 (HSDPA Application Firmware)

The R&S FSQx, R&S FSUx and R&S FSPx have to be equipped with HSDPA Application Firmware R&S-FS-K74.
The R&S FSPx analyzer has to be equipped with the options R&S FSP-B15 and R&S FSP-B70. All specifications of R&S FS-K72 also apply to R&S FS-K74. In addition, all measurements are supported for HS-SCCH and HS-PDSCH using QPSK or 16QAM modulation. Specifications apply at frequency lower than 3.6 GHz (R&S FSU/FSQ) or 3 GHz (R&S FSP).

PMU = permissible measurement uncertainty in accordance with test specification 3GPP TS 25.141.

Transmit modulation

Composite EVM	Test case 6.7.1	R&S FSQ	R&S FSU	R&S FSP	PMU
Measurement range		0.5 % to 25 %	0.5 % to 25 %	1.0 % to 25 %	
Inherent EVM		<0.7 %	<1.0 %	<1.5 %	
Measurement uncertainty	test model 5[1)] P > −40 dBm	<0.4 % (σ = 0.1 %)	<0.5 % (σ = 0.1 %)	<1 % (σ = 0.3 %)	<2.5 %

1) EVM for base stations supporting HS-SCCH and HS-PDSCH transmission using 16QAM or QPSK modulation.

Configuration overview

Option	Base station			User equipment (UE)		
	R&S FSQ	R&S FSU	R&S FSP	R&S FSQ	R&S FSU	R&S FSP
R&S FS-K72	●	●	●			
R&S FS-K73				●	●	●
R&S FS-K74	●	●	●			
R&S FSP-B15			●			●
R&S FSP-B70			●			○[1)]

1) Extends measurement range from one slot to three frames.

Ordering information

R&S FS-K72

Application Firmware R&S FS-K72 can be integrated into any member of the R&S FSU and R&S FSQ families. Options R&S FSP-B70 and R&S FSP-B15 are prerequisites for operating the application firmware on any member of the R&S FSP spectrum analyzer family.

Designation	Type	Order No.
WCDMA 3GPP Application Firmware	R&S FS-K72	1154.7000.02
Pulse Calibrator for R&S FSP	R&S FS-B15	1155.1006.02
Demodulator Hardware for R&S FSP	R&S FS-B70	1157.0559.02

R&S FS-K73

Application Firmware R&S FS-K73 can be integrated into any member of the R&S FSU and R&S FSQ families. Option R&S FSP-B15 is a prerequisite for operating the application firmware on any member of the R&S FSP spectrum analyzer family.

Designation	Type	Order No.
WCDMA 3GPP Application Firmware	R&S FS-K73	1154.7252.02
Pulse Calibrator for R&S FSP	R&S FS-B15	1155.1006.02

R&S FS-K74

Application Firmware R&S FS-K74 can be integrated into any member of the R&S FSU and R&S FSQ families. Option R&S FS-K72 is a prerequisite for operating the application firmware on any member of the R&S FSU and R&S FSQ families. Options R&S FS-K72, R&S FSP-B70 and R&S FSP-B15 are prerequisites for operating the application firmware on any member of the R&S FSP spectrum analyzer family.

Designation	Type	Order No.
HSDPA Application Firmware	R&S FS-K74	1154.7252.02
WCDMA 3GPP Application Firmware	R&S FS-K72	1154.7000.02
Pulse Calibrator for R&S FSP	R&S FS-B15	1155.1006.02
Demodulator Hardware for R&S FSP	R&S FS-B70	1157.0559.02

For product brochure, see PD 0758.2260.12
and www.rohde-schwarz.com
(search term: FS-K72/FS-K73/FS-K74)

Certified Quality System
ISO 9001
DQS REG. NO 1954 QM

Certified Environmental System
ISO 14001
DQS REG. NO 1954 UM

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www.rohde-schwarz.com
Europe: Tel. +49 1805 12 4242, e-mail: customersupport@rohde-schwarz.com · USA: Tel. +1 410-910-7988, e-mail: customer.support@rsa.rohde-schwarz.com
Asia: Tel. +65 68463710, e-mail: customer-service@rssg.rohde-schwarz.com