

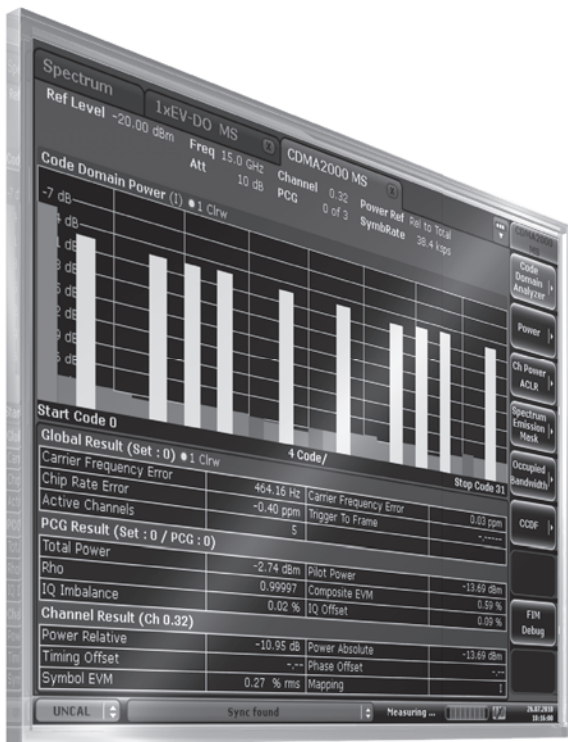
# R&S®FSV-K83

## Application Firmware

### for CDMA2000® MS

## Measurement Application

# Specifications



## Specifications

The specifications of the R&S®FSV-K83 application firmware for CDMA2000® MS (UL) analysis are based on the data sheet specifications of the R&S®FSV signal and spectrum analyzer, have not been checked separately and 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). 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.

"Typical values" are designated with the abbreviation "typ.". These values are verified during the final test but are not assured by Rohde & Schwarz.

"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.

In line with the 3GPP standard, chip rates are specified in Mcps (million chips per second), whereas bit rates and symbol rates are specified in kbps (thousand bits per second) or ksps (thousand symbols per second). Mcps, kbps and ksps are not SI units.

Data without tolerance limits is not binding.

## Frequency

Frequency range	R&S®FSV3	20 MHz to 3 GHz
	R&S®FSV7	20 MHz to 7 GHz
	R&S®FSV13	50 MHz <sup>1</sup> to 13.6 GHz
	R&S®FSV30	50 MHz <sup>1</sup> to 30 GHz
	R&S®FSV40	50 MHz <sup>1</sup> to 40 GHz

## Level

Level range	RF input	-60 dBm to +30 dBm
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## Signal acquisition

Supported standards		CDMA2000® MS in line with 3GPP2 C.S0010-C v2.0
Capture length		up to 31360 power control groups
Sweep time	spectrum mask, adjacent channel leakage power ratio (ACLR)	max. 16000 s, auto max. 16000 s
Sweep count		1 to 32767
Trigger modes	code domain analysis	free run, external
	RF measurements	free run, external, if power

## Measurement parameters

Frequency band	predefined bands	band classes 0 to 17
	unspecified	limits can be user-specified
Link mode		uplink (UL)
Predefined channel table	code domain analyzer	The predefined channel table makes it possible to configure the complete channel setup of the user signal for the code domain analyzer.
Spectrum emission mask	standard	in line with band classes 0 to 17
	user	The spectrum emission mask is measured in line with either the manual user setting or a user-specified XML file.

<sup>1</sup> 5 MHz to 50 MHz with restricted functionality (IF power trigger, auto level, IF overload).

## Result diagrams

Result summary	min./mean/current/max. values	global results: carrier frequency error (reading in Hz and ppm), chip rate error, trigger to frame, number of active channels results for selected power control group: total power, pilot power, rho, composite EVM, I/Q imbalance, I/Q offset results for selected channel: symbol rate, spreading factor, absolute power, relative power, symbol EVM RMS, symbol EVM peak modulation type, timing offset, phase offset
Code domain power	clear write, MaxHold, MinHold, average, view	code domain power versus channel, code domain error power versus channel
Peak code domain error	clear write, MaxHold, MinHold, average, view	peak code domain error power versus power control group
Power versus power control group	clear write, MaxHold, MinHold, average, view	power versus power control group for selected channel
Channel table	clear write, MaxHold, MinHold, average, view	numeric result table for all channels including the following readings per channel: channel type, channel number, spreading factor, symbol rate, radio configuration, state, absolute power, relative power, timing offset, phase offset
Composite EVM	clear write, MaxHold, MinHold, average, view	EVM versus power control group
EVM versus symbol	clear write, MaxHold, MinHold, average, view	EVM versus symbol for selected channel and power control group
Power versus symbol	clear write, MaxHold, MinHold, average, view	power versus symbol for selected channel and power control group
Channel constellation	clear write	constellation diagram for selected channel and power control group
Composite constellation	clear write	constellation diagram for composite signal
Bit stream	clear write	bit stream for selected channel and power control group
Output power	clear write, MaxHold, MinHold, average, view, blank	integrated signal power over channel bandwidth
Adjacent channel power, multicarrier adjacent channel power	clear write, MaxHold, MinHold, average, view, blank	absolute and relative adjacent channel power
Spectrum emission mask	clear write, MaxHold, MinHold, average, view, blank	spectrum mask limit check, peak list evaluation
Occupied bandwidth	clear write, MaxHold, MinHold, average, view, blank	occupied bandwidth measured in frequency domain
CCDF	clear write, view, blank	CCDF

## Measurement specification (nominal)

<b>Code domain power</b>		
Level uncertainty, total power		< 0.5 dB
Level uncertainty, pilot power	absolute	< 0.6 dB
Level uncertainty, channel power	absolute	< 0.6 dB
	relative	< 0.1 dB

<b>Composite EVM</b>		
Measurement range		0.6 % to 25 %
Inherent EVM		< 0.6 %
Measurement uncertainty	composite EVM < 10%	< 0.6 %
	composite EVM > 10%	< 1.0 %

<b>Frequency error measurement</b>		
Lock range		±1 kHz
Measurement uncertainty		2 Hz + reference frequency uncertainty (see R&S®FSV frequency uncertainty)

<b>Peak code domain error (PCDE)</b>		
Measurement range		0 dB to -55 dB
Inherent PCDE		< -55 dB

<b>Trigger to frame</b>		
Measurement range		< ±500 µs
Accuracy	relative	< 210 ns

<b>Rho</b>		
Measurement uncertainty	composite EVM < 10 %	±0.0010
	composite EVM < 25 %	±0.0030

<b>Occupied bandwidth</b>		
Measurement uncertainty	99 % power bandwidth, span 4.2 MHz	±10 kHz

<b>Spectrum emission mask</b>		
Dynamic range ( $P_{\text{total}} > -20 \text{ dBm}$ ) <sup>2</sup>		> 81.4 dB

<b>Adjacent channel leakage ratio</b>		
Dynamic range ( $P_{\text{total}} > -20 \text{ dBm}$ ) <sup>2</sup>	noise correction OFF (nominal)	> 81.4 dB
	noise correction OFF (average result of 100 sweeps)	> 84.3 dB
	noise correction ON (nominal)	> 82.0 dB
	noise correction ON (average result of 100 sweeps)	> 87.0 dB (with noise correction)

<sup>2</sup> The specified dynamic range is the ratio of the channel power to the power at an offset of 750 kHz, measured with 30 kHz integration bandwidth.

## Ordering information

Designation	Type	Order No.
Application Firmware for CDMA2000® MS Measurement Application	R&S®FSV-K83	1310.8755.02
Signal and Spectrum Analyzer, 9 kHz to 3.6 GHz	R&S®FSV3	1307.9002.03
Signal and Spectrum Analyzer, 9 kHz to 7 GHz	R&S®FSV7	1307.9002.07
Signal and Spectrum Analyzer, 9 kHz to 13.6 GHz	R&S®FSV13	1307.9002.13
Signal and Spectrum Analyzer, 9 kHz to 30 GHz	R&S®FSV30	1307.9002.30
Signal and Spectrum Analyzer, 9 kHz to 40 GHz	R&S®FSV40	1307.9002.40
<b>Recommended options and extras</b>		
See also the specifications for the R&S®FSV signal and spectrum analyzer (PD 5214.0499.22)		
Digital Baseband Interface	R&S®FSV-B17	1310.9568.02
CDMA2000® BS (DL) Analysis	R&S®FSV-K82	1310.8703.02

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## Environmental commitment

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

Certified Quality System  
**ISO 9001**

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