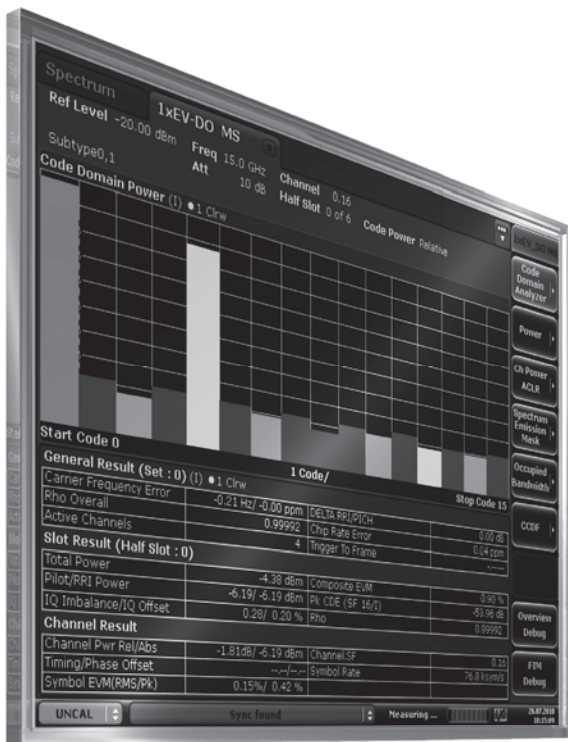


R&S® FSV-K85

Application Firmware for 1xEV-DO MS Measurement Application Specifications



Specifications

The specifications of the R&S®FSV-K85 application firmware for for 1xEV-DO MS (UL) analysis (application firmware) 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	50 MHz ¹ to 3.6 GHz
	R&S®FSV7	50 MHz ¹ to 7 GHz
	R&S®FSV13	50 MHz ¹ to 13.6 GHz
	R&S®FSV30	50 MHz ¹ to 30 GHz
	R&S®FSV40	50 MHz ¹ to 40 GHz

Level

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

Supported standards		1xEV-DO Subtype 0/1/2/3 in line with C.S0033 and C.S0024. For Subtype 3, "NoFeedback Multiplexing" mode is supported.
Capture length		up to 23584 slots
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		downlink (DL)
Modulation detection		BPSK, QPSK, 8PSK, 16QAM, Q2, Q4, B4, Q4Q2, E4E2
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.

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

Result displays

General results	clear write, MaxHold, MinHold, average, view	global results over all slots: carrier frequency error (reading in Hz and ppm), chip rate error, trigger to frame, rho of pilot channel over all slots, rho over all slots, number of active channels, ratio of RRI- and PICH-power (only for subtype 0/1) results for selected slot: total power, pilot power, RRI power, rho, composite EVM, peak code domain error, I/Q imbalance, I/Q offset
Channel results	clear write, MaxHold, MinHold, average, view	results for pilot channel: absolute power, peak code domain error, I/Q imbalance, I/Q offset results for selected channel: symbol rate, timing offset, spreading factor, symbol EVM (reading in % RMS and % peak), phase offset, absolute channel power, relative channel power, mapping results for the composite data channel: channel EVM (reading in peak and RMS)
Code domain power	clear write, MaxHold, MinHold, average, view	code domain power versus channel
Peak code domain error	clear write, MaxHold, MinHold, average, view	code domain error power versus channel
Channel table	clear write, MaxHold, MinHold, average, view	peak code domain error power versus slot
Composite EVM	clear write, MaxHold, MinHold, average, view	numeric result table for all active channels including the following readings per channel: channel type, channel number, spreading factor, symbol rate, mapping, absolute power, relative power, timing offset, phase offset, state
EVM versus symbol	clear write, MaxHold, MinHold, average, view	EVM versus slot
Power versus symbol	clear write, MaxHold, MinHold, average, view	EVM versus symbol for selected channel and slot
Channel constellation	clear write	power versus symbol for selected channel and slot
Composite constellation	clear write	constellation diagram for selected channel and slot
Bit stream	clear write	constellation diagram for composite signal
Composite channel bit stream	clear write	bit stream for selected channel and slot
Composite channel EVM	clear write, MaxHold, MinHold, average, view	bit stream of the composite data channel for Q4Q2 and E4E2 modulated signals
Composite channel constellation	clear write	EVM versus chip of composite data channel for Q4Q2 and E4E2 modulated signals
Output power	clear write, MaxHold, MinHold, average, view, blank	constellation diagram of the composite data channel for Q4Q2 and E4E2 modulated signals
Adjacent channel power, multicarrier adjacent channel power	clear write, MaxHold, MinHold, average, view, blank	integrated signal power over channel bandwidth
Spectrum emission mask	clear write, MaxHold, MinHold, average, view, blank	absolute and relative adjacent channel power
Occupied bandwidth	clear write, MaxHold, MinHold, average, view, blank	spectrum mask limit check
CCDF	clear write, view, blank	peak list evaluation
Power versus time	clear write, MaxHold, MinHold, average, view, blank	occupied bandwidth measured in frequency domain
		CCDF
		check averaged half slots against a limit mask in the time domain; check separate limits for full and idle slots

Measurement specification (nominal)

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

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

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

Peak code domain error (PCDE)		
Measurement range		0 dB to -50 dB
Inherent PCDE		< -50 dB

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

Rho		
Measurement uncertainty	composite EVM < 10 %	±0.0010
	composite EVM < 25 %	±0.0050

Occupied bandwidth		
Measurement uncertainty	99 % power bandwidth, span 4.2 MHz	±10 kHz

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

Adjacent channel leakage ratio		
Dynamic range ($P_{\text{total}} > -20 \text{ dBm}$) ²	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

² The specified dynamic range specification 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 1xEV-DO MS Measurement Application	R&S®FSV-K85	1310.8773.02
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
Recommended options and extras		
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
1xEV-DO BS (DL) Analysis	R&S®FSV-K84	1310.8803.02

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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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