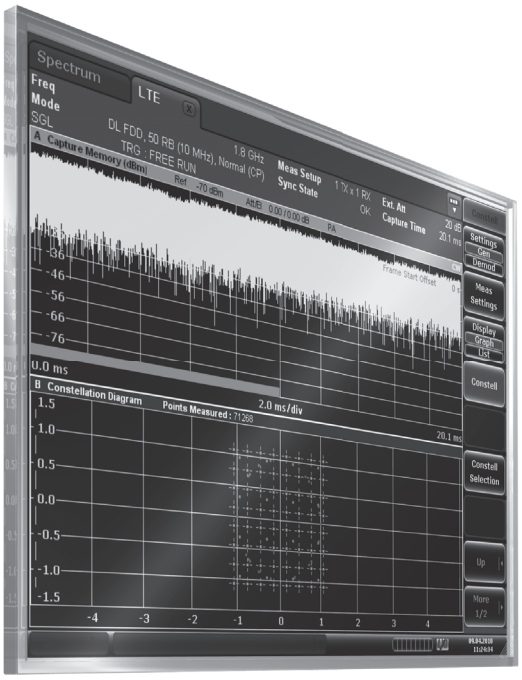
R&S®FSV-K101/105 EUTRA/LTE Uplink Measurement Application

Specifications



ROHDE&SCHWARZ

Test & Measurement

Data Sheet | 02.00

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The specifications of the R&S®FSV-K101/-K105 EUTRA/LTE uplink measurement application 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.

Specifications

EUTRA/LTE uplink measurement application

The R&S®FSV-K101/-K105 EUTRA/LTE uplink measurement application is compatible with the R&S®FSV signal and spectrum analyzer.

Frequency

Frequency range	RF input	
	R&S®FSV3	
	DC coupled	9 kHz to 3.6 GHz
	AC coupled	1 MHz to 3.6 GHz
	R&S®FSV7	
	DC coupled	9 kHz to 7 GHz
	AC coupled	1 MHz to 7 GHz
	R&S®FSV13	
	DC coupled	9 kHz to 13.6 GHz
	AC coupled	10 MHz to 13.6 GHz
	R&S®FSV30	
	DC coupled	9 kHz to 30 GHz
	AC coupled	10 MHz to 30 GHz
	R&S®FSV40	
	DC coupled	9 kHz to 40 GHz
	AC coupled	10 MHz to 40 GHz
Nominal channel bandwidth		1.4 MHz to 20 MHz

Level

Level range	RF input	–50 dBm to +30 dBm [1]
Level setting		auto [1], manual

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

Signal acquisition

Supported standards		EUTRA/LTE uplink in line with [1]
Result length	power versus time, power spectrum	20 ms to 50 ms (capture length)
	result summary, EVM versus symbol, EVM versus carrier, EVM versus subframe, inband emission, spectrum flatness, spectrum flatness difference, channel group delay, constellation diagram, DFT-precoded constellation diagram, CCDF, allocation summary list, bit stream	depending on the number of analyzed subframes
Sweep time	spectrum mask	auto
	adjacent channel leakage power ratio (ACLR)	500 ms
Trigger modes	RF input	free run, external, IF power [1]

Result display

Result summary		EVM PUSCH QPSK
		EVM PUSCH 16QAM
		EVM DMRS PUSCH QPSK
		EVM DMRS PUSCH 16QAM
		EVM PUCCH
		EVM DMRS PUCCH
		EVM physical channel
		EVM physical signal
		EVM all
		center frequency error
		sampling error
		I/Q offset
		I/Q gain imbalance
		I/Q quadrature error
		power
		crest factor
Power versus time		capture buffer
EVM		EVM versus carrier
		EVM versus symbol
		EVM versus subframe
Spectrum		power spectrum
		relative inband emission
		spectrum flatness
		spectrum flatness difference
		channel group delay
		spectrum mask
		ACLR
Constellation		constellation diagram
		DFT-precoded constellation diagram
Statistics		CCDF
		allocation summary list
		bit stream

Measurement parameters

Input		RF
	R&S®FSV-B17 option required	digital baseband interface
Data capture settings	capture time	max. 50 ms
	overall frame count	ON/OFF
	number of frames to analyze	1 to 100
	auto in line with standard	ON/OFF
Duplexing		FDD [2], TDD [3]
Channel bandwidth	sampling rate (F_s) and N_{FFT} are set depending on the channel bandwidth	1.4/3/5/10/15/20 MHz and user-defined number of resource blocks (6 to 110)
Cyclic prefix modes		normal, extended, auto
Physical layer cell identity	cell ID	0 to 503
	cell identity group	group 0 to 167
	identity	0, 1, 2
TDD [3]	UL/DL allocations	configuration 0 to 6
Demodulation reference signal	relative power PUSCH/PUCCH	–25 dB ≤ relative power ≤ 12 dB
	group hopping	ON/OFF
	sequence hopping	ON/OFF
	enable n_PRS	ON/OFF
	n_DMRS	0 to 11
	delta sequence shift	0 to 29
Sounding reference signal		ON/OFF
	relative power	–25 dB ≤ relative power ≤ 12 dB
	SRS subframe conf	0 to 14 for FDD, 0 to 13 for TDD
	SRS bandwidth B_SRS	0 to 3
	frequency domain pos. n_RRC	0 to 65k
	SRS BW configuration C_SRS	0 to 7
	trans. comb. k_TC	0 to 1
	SRS cyclic shift N_CS	0 to 7
	configuration index I_SRS	0 to 636 for FDD, 1 to 644 for TDD
	hopping BW b_hop	0 to 3
PUSCH	frequency hopping mode	OFF, inter-/intra-subframe
	number of subbands	0 to 100
	hopping offset	0 to 6
	information in hopping bits	0 to 3
PUCCH	number of RBs for PUCCH	0 to 100
	delta shift	1 to 3
	N_PUCCH	0 to 107
	format	F1 normal/shortened, F1a normal/shortened, F1b normal/shortened, F2, F2a, F2b
	N(1)_cs	0 to 7
	N(2)_RB	0 to 99
Resource allocation		one frame can be allocated
	modulation	QPSK, 16QAM, 64QAM
	allocation settings	enable PUCCH, PRB offset, PRB size, boosting
Phase tracking		OFF, pilot only, pilot and payload
Timing tracking		ON/OFF
Channel estimation range		pilot only, pilot and payload
Compensate DC offset		ON/OFF
Scrambling of coded bits		ON/OFF
Auto demodulation		ON/OFF
UE ID/n_RNTI		0 to 65535
Suppressed interference synchronization		ON/OFF
Adjacent channel leakage power ratio (ACLR)	assumed adjacent channel carrier	EUTRA of same bandwidth, 1.28 Mcps UTRA, 3.84 Mcps UTRA, 7.68 Mcps UTRA
	noise correction	ON/OFF

[2] R&S®FSV-K101 required.

[3] R&S®FSV-K105 required.

Measurement uncertainty (nominal)

UE output power

UE output power	R&S®FSV	AUTS [4]
Level uncertainty	same as R&S®FSV (see R&S®FSV total measurement uncertainty)	0.7 dB

Transmitted signal quality

EVM		R&S®FSV	AUTS
Residual EVM	FDD, 10 MHz, Normal Cyclic Prefix, no SRS, no PUCCH, one allocation with 16 QAM on all PRBs level –25 dBm to +15 dBm input = RF (0.6 GHz < f < 2.7 GHz) channel estimation: pilot and payload phase tracking: OFF timing tracking: OFF	< –45 dB	
Frequency error			
Uncertainty		1 Hz + R&S®FSV frequency uncertainty (see R&S®FSV reference frequency)	15 Hz

References

[1] 3GPP TS 36.211 V8.9.0 (2009-12), 3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Evolved Universal Terrestrial Radio Access (E-UTRA); Physical Channels and Modulation (Release 8).

[4] Acceptable uncertainty of test system, in line with 3GPP TS 36.521-1 V8.4.0.

Ordering information

Designation	Type	Order No.
EUTRA/LTE FDD Uplink Measurement Application	R&S®FSV-K101	1310.9100.02
EUTRA/LTE TDD Uplink Measurement Application	R&S®FSV-K105	1309.9780.02
Signal Analyzer, 9 kHz to 3.6 GHz	R&S®FSV3	1307.9002.03
Signal Analyzer, 9 kHz to 7 GHz	R&S®FSV7	1307.9002.07
Signal Analyzer, 9 kHz to 13.6 GHz	R&S®FSV13	1307.9002.13
Signal Analyzer, 9 kHz to 30 GHz	R&S®FSV30	1307.9002.30
Signal Analyzer, 9 kHz to 40 GHz	R&S®FSV40	1307.9002.40
Recommended options and extras		
Digital Baseband Interface	R&S®FSV-B17	1310.9568.02
See also specifications for the R&S®FSV signal analyzer (PD 5214.0499.22)		

The product brochure containing further information is available under PD 5214.0499.12 and at www.rohde-schwarz.com.

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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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PD 5214.4388.22 | Version 02.00 | August 2011 | R&S®FSV-K101/-K105

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