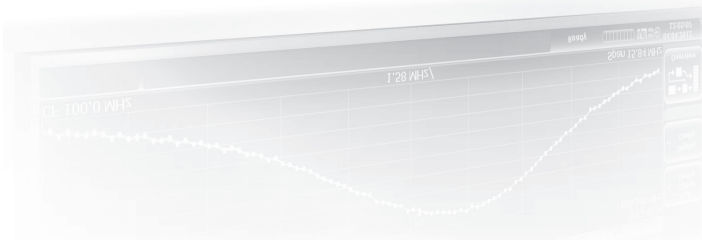
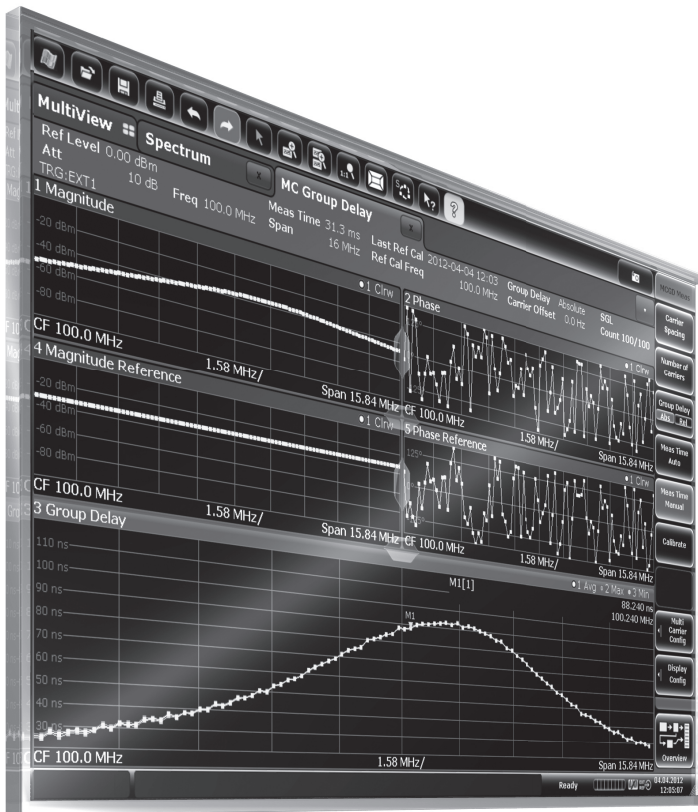


R&S®FSW-K17

Multicarrier Group Delay Measurements Specifications



CONTENTS

Definitions	3
Specifications.....	4
Frequency	4
Level	4
Measurement parameters.....	4
Display formats	5
Measurement accuracy (nominal).....	6
Ordering information	7

The R&S®FSW-K17 measurement specifications are based on the specifications in data sheet for the R&S®FSW signal and spectrum analyzer. They have not been checked separately and are not verified during instrument calibration. The specified group delay measurement errors do not take into account systematic errors due to reduced signal-to-noise ratio (S/N).

Definitions

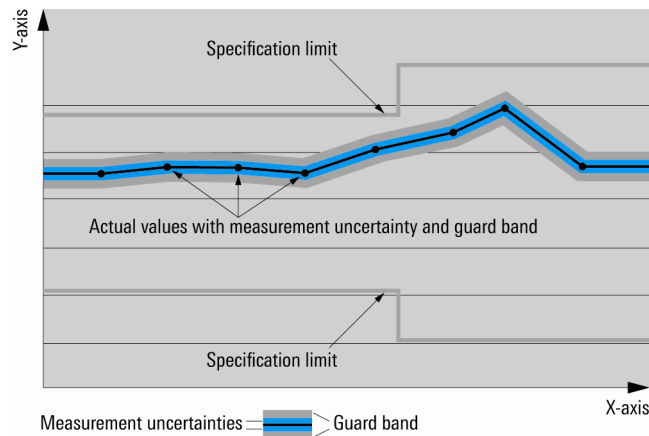
General

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.

Device settings and GUI parameters are designated with the format "parameter: value".

Typical data as well as nominal and measured values are not warranted by Rohde & Schwarz.

Specifications

Frequency

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

Level range	RF input	-40 dBm to +30 dBm ¹
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Measurement parameters

Max. span		10 MHz
		28 MHz (R&S®FSW-B28 option)
		40 MHz (R&S®FSW-B40 option)
		80 MHz (R&S®FSW-B80 option)
		160 MHz (R&S®FSW-B160 option)
Number of carriers		2 to 160001
Sweep count		1 to 32767
Group delay mode		absolute/relative
Carrier offset mode		estimated/fixed
Trigger modes		free run, external, IF power ¹ , RF power ¹ , I/Q power

¹ Restricted IF overload depending on carrier frequency and bandwidth at carrier frequencies < 50 MHz.

Display formats

Magnitude		multicarrier signal amplitude versus frequency of measurement signal
Magnitude reference		multicarrier signal amplitude versus frequency of calibration signal
Phase		multicarrier signal phase versus frequency of measurement signal
Phase reference		multicarrier signal phase versus frequency of calibration signal
Group delay		absolute/relative group delay
Marker table		marker result table

Measurement accuracy (nominal)

All measurement results obtained under the use of an external reference frequency. For absolute group delay measurements, the external trigger is applied. Generator total output power is ≥ -20 dBm, the reference level is properly adjusted. The group delay accuracy is defined as the deviation from group delay = 0 s after calibrating, and measuring against the calibration signal with measurement time mode "Auto". If averaging is applied, the same average count is used for the calibration as well as for the measurement.

Non-frequency-translating measurements (center frequency of calibration same as for group delay measurement)		
Measurement accuracy for relative group delay	center frequency = 100 MHz to 6 GHz carrier spacing \geq 100 kHz span = 60 MHz	\pm 300 ps
Measurement accuracy for absolute ² group delay (100 averages)	center frequency = 100 MHz to 6 GHz carrier spacing \geq 100 kHz span = 60 MHz	\pm 300 ps

Frequency-translating measurements		
Additional uncertainty for relative and absolute group delay measurements	center frequency = 100 MHz to 6 GHz carrier spacing \geq 100 kHz span = 25 MHz	400 ps
	center frequency = 100 MHz to 6 GHz carrier spacing \geq 100 kHz span = 40 MHz	600 ps
	center frequency = 100 MHz to 6 GHz carrier spacing \geq 100 kHz span = 60 MHz	700 ps
Additional constant offset between calibration and measurement for absolute group delay measurements	center frequency for calibration = 100 MHz center frequency for measurement = 1 GHz carrier spacing = 100 kHz span = 25 MHz	< 5 ns
	center frequency for calibration = 100 MHz center frequency for measurement = 2 GHz carrier spacing = 100 kHz span = 25 MHz	< 6 ns
	center frequency for calibration = 100 MHz center frequency for measurement = 4 GHz carrier spacing = 100 kHz span = 25 MHz	< 4 ns

² Not valid for detector boards with order number 1312.8175 and revision 04.07. or 06.02.
Please contact the central service of Rohde & Schwarz if upgrade is needed.

Ordering information

Designation	Type	Order No.
Multicarrier Group Delay Measurements	R&S®FSW-K17	1313.4150.02
Signal and Spectrum Analyzer	R&S®FSW8	1312.8000.08
Signal and Spectrum Analyzer	R&S®FSW13	1312.8000.13
Signal and Spectrum Analyzer	R&S®FSW26	1312.8000.26
Recommended options and extras		
28 MHz Analysis Bandwidth	R&S®FSW-B28	1313.1645.02
40 MHz Analysis Bandwidth	R&S®FSW-B40	1313.0861.02
80 MHz Analysis Bandwidth	R&S®FSW-B80	1313.0878.02
160 MHz Analysis Bandwidth	R&S®FSW-B160	1313.1668.02

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

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Subject to change

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