

R&S® SMATE-K63/
R&S® SMU-K63
User-Defined
I/Q Frequency Response
Compensation
Specifications



User-defined I/Q frequency response compensation (R&S[®]SMU-K63, R&S[®]SMATE-K63 option)

This option enables the user to define RF frequency response and image compensation for the internal baseband sources of the R&S[®]SMU200A and R&S[®]SMATE200A. It considerably enhances signal quality as regards frequency response and image rejection of wideband signals. External components that follow such as amplifiers, mixers or filters can also be compensated. Compensation is performed by hardware correction filters and is, therefore, independent of the baseband signal applied.

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.

Prerequisite for installation – R&S[®]SMU200A

At least one R&S[®]SMU-B13 baseband main module must be installed. If two R&S[®]SMU-B13 modules are installed (paths A and B), the compensation can be activated either on path A or B with one R&S[®]SMU-K63 option. For simultaneous compensation on paths A and B, two R&S[®]SMU-K63 options must be installed. Furthermore, at least one of the following options is required in order to generate baseband signals that can be compensated: R&S[®]SMU-B9/-B10/-B11 I/Q baseband generators, R&S[®]SMU-B17 analog/digital baseband input (for feeding in external I/Q signals) or R&S[®]SMU-K62 AWGN.

This option is only supported by the R&S[®]SMU200A with RFM modules revision 2.65 or later (see Setup → Hardware Config → RF Assembly).

Prerequisite for installation – R&S[®]SMATE200A

At least one R&S[®]SMATE-B13 baseband main module must be installed. If two R&S[®]SMATE-B13 modules are installed (paths A and B), the compensation can be activated either on path A or B with one R&S[®]SMATE-K63 option. For simultaneous compensation on paths A and B, two R&S[®]SMATE-K63 options must be installed. Furthermore, at least one of the following options is required in order to generate baseband signals that can be compensated: R&S[®]SMATE-B9/-B10/-B11 I/Q baseband generators or R&S[®]SMATE-K62 AWGN.

This option is only supported by the R&S[®]SMU200A with RFM modules revision 2.65 or later (see Setup → Hardware Config → RF Assembly).

Additional specifications for the R&S[®]SMU200A, R&S[®]SMATE200A

Correction data sets	A correction data set contains definable level and frequency ranges and optionally parameters related to external components.	
	storage	hard disk
	additional settling time for frequency and level with activated compensation	
	Normal mode	50 ms
	List mode	0 ms
Compensation filters	recommended calibration interval	8 h (or after temperature change of >5 °C)
	RF response	13 taps (complex)
	RF image	17 taps (complex)
	filter design	minimum mean square error (MMSE) algorithm
Resulting relative errors (only R&S [®] SMU200A, R&S [®] SMATE200A, no external devices)	level ≤-30 dBm	
	RF response (±40 MHz)	
	accuracy	
	low	amplitude typ. <1 dB phase typ. <5°
	normal	amplitude typ. <0.3 dB phase typ. <5°
	high	amplitude typ. <0.1 dB phase typ. <2°
	image rejection (±40 MHz)	
	accuracy	
	low	typ. >55 dB
normal	typ. >60 dB	
high	typ. >65 dB	

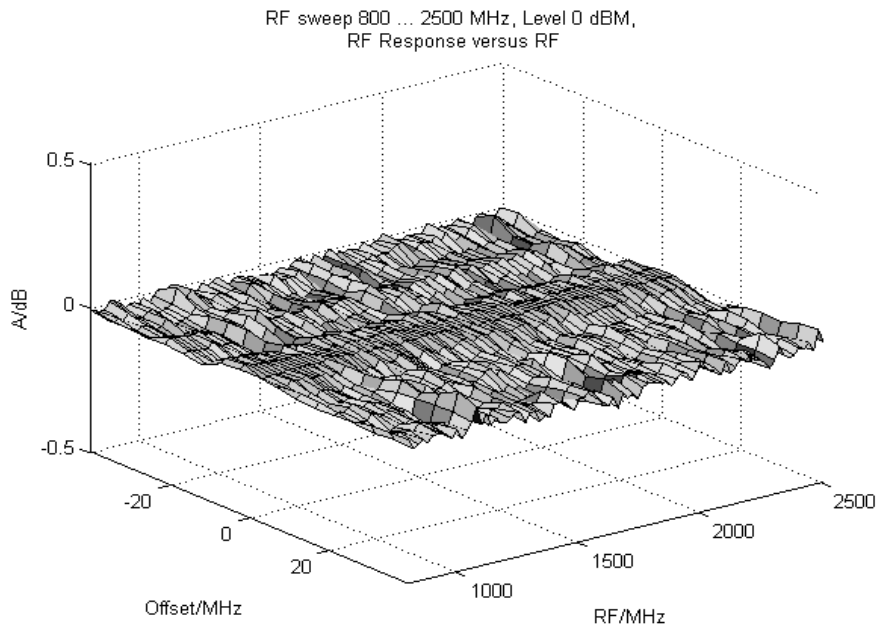
R&S® SMx RF and baseband correction toolkit (external PC program)

This program enables the user to generate and manage correction data records for the R&S®SMU200A and R&S®SMATE200A. The program can only be used if the R&S®SMU-K63 or R&S®SMATE-K63 option is installed.

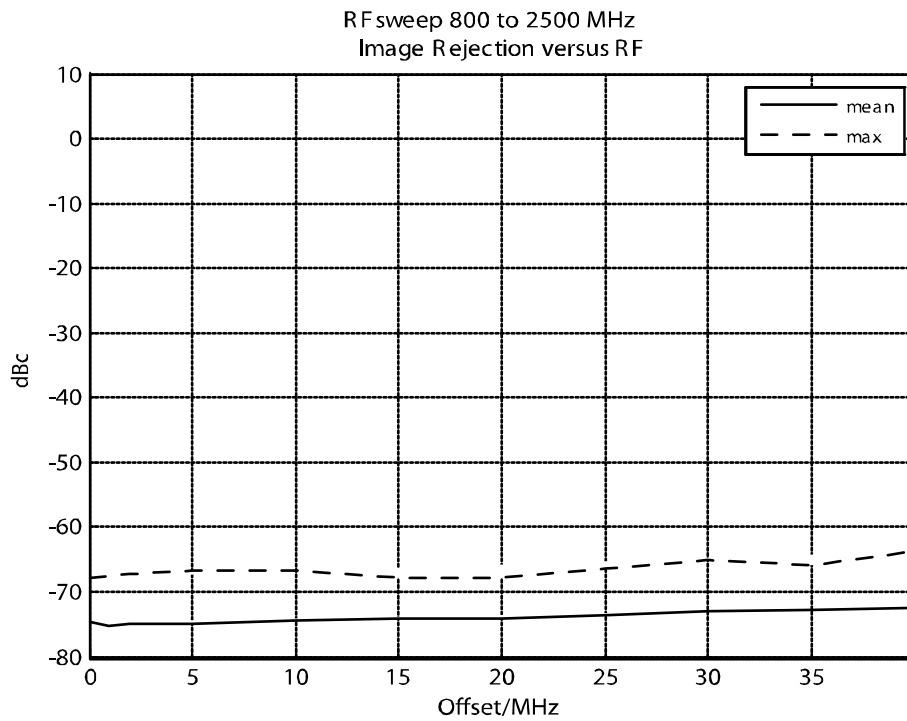
Remote interface ¹	depends on the Rohde & Schwarz instrument and options	IEEE-488 GPIB, Ethernet, USB
Required analyzing instruments	In order to perform correction, a spectrum analyzer or power meter is required in addition to the instrument that is to be compensated.	spectrum analyzers: R&S®FSQ8/26/40 with option R&S®FSQ-B72 model 12 R&S®FSQ8/26/40 R&S®FSU8/26/43 R&S®FSP7/13/30 R&S®FSL6/18 power meters: R&S®NRP with R&S®NRP-Z11/21/22/23/24/91 sensors R&S®NRP-Z11/21/22/23/24/91 sensors connected to a PC or to the R&S®SMU200A, R&S®SMATE200A
Compensation modes	depends on the analyzing instrument	
	R&S®FSQ8/26/40 with option R&S®FSQ-B72 model 12	RF response (amplitude and phase), RF image rejection, RF response and image rejection
	all spectrum analyzers	RF response (amplitude), RF image rejection, RF response and image rejection
	power meters	RF response (amplitude)
Accuracy		low, normal, high
RF parameters	RF start	≥80 MHz
	RF stop	depends on the frequency option of the R&S®SMU200A or R&S®SMATE200A
Level parameters	level start	≥-120 dBm
	level stop	depends on the frequency and high power output options of the R&S®SMU200A or R&S®SMATE200A
External device parameters	This function allows the correction of additional external components such as amplifiers, mixers and filters.	
	Bandwidth	full RF range or 5 MHz to 80 MHz
	RF offset	depends on the maximum RF frequency of the spectrum analyzer or power meter
	level offset	external power attenuator pad may be required
	spectrum analyzers	-20 dB to 30 dB
	power meters	-10 dB to 30 dB
Correction time	RF response, normal accuracy	typ. 1.5 min/GHz
	RF image rejection, normal accuracy	typ. 1.5 min/GHz

¹ The VISA driver is delivered with the I/Q baseband generator options since September 1, 2006.

Typical characteristics



RF amplitude response flatness, high accuracy



Statistic image rejection, high accuracy

Ordering information

Designation	Type	Order No.
User-Defined I/Q Frequency Response Compensation	R&S®SMU-K63	1161.0866.02
User-Defined I/Q Frequency Response Compensation	R&S®SMATE-K63	1404.7400.02

Service you can rely on

- | In 70 countries
- | Person-to-person
- | Customized and flexible
- | Quality with a warranty
- | No hidden terms

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