Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-K-17805-01-00 according to DIN EN ISO/IEC 17025:2005

Period of validity: 07.07.2016 to 28.04.2018 Date of issue: 07.07.2016

Holder of certificate:

Rosenberger Hochfrequenztechnik GmbH & Co. KG
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Head:	Joachim Schubert
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Accredited since: 29.04.2013

Calibrations in the fields:

Electrical quantities
High frequency quantities
- **HF impedance (reflection factor)**

Permanent Laboratory

Measured quantity / Calibration item	Range	Measurement conditions / procedure	Best measurement capability [1)]	Remarks
HF-impedance (reflection factor) Magnitude $\|\Gamma\|$	0 to 1	9 kHz to < 50 MHz	$0{,}0060 + 0{,}0090 \cdot \|\Gamma\|^2$	N-Connector 50 Ω[*)] The stated uncertanties are given in absolute quantities.
		50 MHz to 2 GHz	$0{,}0060 + 0{,}0060 \cdot \|\Gamma\|^2$	
		> 2 GHz to 8 GHz	$0{,}0060 + 0{,}0075 \cdot \|\Gamma\|^2$	
		> 8 GHz to 12 GHz	$0{,}0075 + 0{,}0095 \cdot \|\Gamma\|^2$	
		> 12 GHz to 18 GHz	$0{,}0075 + 0{,}0105 \cdot \|\Gamma\|^2$	
HF-impedance (reflection factor) Magnitude $\|\Gamma\|$	0 to 1	10 MHz to < 50 MHz	$0{,}0070 + 0{,}0190 \cdot \|\Gamma\|^2$	PC3.5-Connector[*)] The stated uncertanties are given in absolute quantities.
		50 MHz to 8 GHz	$0{,}0060 + 0{,}0080 \cdot \|\Gamma\|^2$	
		> 8 GHz to 18 GHz	$0{,}0065 + 0{,}0090 \cdot \|\Gamma\|^2$	
		> 18 GHz to 20 GHz	$0{,}0070 + 0{,}0100 \cdot \|\Gamma\|^2$	
		> 20 GHz to 26,5 GHz	$0{,}0100 + 0{,}0110 \cdot \|\Gamma\|^2$	
HF-impedance (reflection factor) Magnitude $\|\Gamma\|$	0 to 1	10 MHz to < 50 MHz	$0{,}0080 + 0{,}0210 \cdot \|\Gamma\|^2$	PC2.92-Connector[*)] The stated uncertanties are given in absolute quantities.
		50 MHz to 4 GHz	$0{,}0070 + 0{,}0120 \cdot \|\Gamma\|^2$	
		> 4 GHz to < 10 GHz	$0{,}0100 + 0{,}0100 \cdot \|\Gamma\|^2$	
		10 GHz to 16 GHz	$0{,}0100 + 0{,}0120 \cdot \|\Gamma\|^2$	
		> 16 GHz to 20 GHz	$0{,}0110 + 0{,}0120 \cdot \|\Gamma\|^2$	
		> 20 GHz to 40 GHz	$0{,}0120 + 0{,}0160 \cdot \|\Gamma\|^2$	
HF-impedance (reflection factor) Magnitude $\|\Gamma\|$	0 to 1	10 MHz to < 50 MHz	$0{,}0070 + 0{,}0065 \cdot \|\Gamma\|^2$	N-Connector 75 Ω[*)] The stated uncertanties are given in absolute quantities.
		50 MHz to 2 GHz	$0{,}0060 + 0{,}0065 \cdot \|\Gamma\|^2$	
		> 2 GHz to 4 GHz	$0{,}0060 + 0{,}0075 \cdot \|\Gamma\|^2$	
		> 4 GHz to 8 GHz	$0{,}0100 + 0{,}0095 \cdot \|\Gamma\|^2$	
		> 8 GHz to 12 GHz	$0{,}0100 + 0{,}0130 \cdot \|\Gamma\|^2$	

[1)] The calibration and measurement capabilities are stated according to DAkkS-DKD-3 (EA-4/02). These are expanded uncertainties of measurement with a coverage probability of 95 % and have a coverage factor of $k = 2$ unless stated otherwise. Uncertainties without unit are relative uncertainties referring to the measurement value unless stated otherwise.

Measured quantity / Calibration item	Range	Measurement conditions / procedure	Best measurement capability [1)]	Remarks
HF-impedance (reflection factor) Magnitude $\lvert\Gamma\rvert$	0 to 1	10 MHz to < 50 MHz	$0{,}0080 + 0{,}0070 \cdot \lvert\Gamma\rvert^2$	7/16-Connector[*)] The stated uncertanties are given in absolute quantities.
		50 MHz to 4 GHz	$0{,}0070 + 0{,}0070 \cdot \lvert\Gamma\rvert^2$	
		> 4 GHz to 8 GHz	$0{,}0085 + 0{,}0095 \cdot \lvert\Gamma\rvert^2$	
HF-impedance (reflection factor) Phase angle φ	-180° to +180°	9 kHz to 40 GHz	$U(\varphi) = \arcsin\left(\frac{U(\lvert\Gamma\rvert)}{\lvert\Gamma\rvert}\right) \cdot \frac{180°}{\pi}$	All connector systems

*) Other connector systems increase the uncertainty.

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