Kalibrierschein / Calibration certificate

DAkkS Deutsche Akkreditierungsstelle D-K-15070-01-00

erstellt durch das Kalibrierlaboratorium
issued by the calibration laboratory

Testo Industrial Services GmbH
Gewerbestr. 3
79199 Kirchzarten

Kalibrierzeichen
Calibration mark

MUSTER
D-K-15070-01-00
2024-01

Gegenstand *Object*	V-LISN
Hersteller *Manufacturer*	Schwarzbeck Mess- Elektronik e
Typ *Type*	NSLK 8117
Fabrikat/Serien-Nr. *Serial no.*	12345
Equipment Nr. *Equipment no.*	12345678
Prüfmittel Nr. *Test equipment no.*	1234567
Auftraggeber *Customer*	Mustermann GmbH
	DE-12345 Musterhausen
Auftragsnummer *Order no.*	654321
Datum der Kalibrierung *Date of calibration*	03.01.2024
Datum der Rekalibrierung *Date of re-calibration*	03.01.2026
Konformitätsaussage *Conformity*	pass

Weitere Informationen auf Seite 15
Further information see page 15

Dieser Kalibrierschein dokumentiert die metrologische Rückführbarkeit auf das Internationalen Einheitensystem (SI). Die DAkkS ist Unterzeichner der multilateralen Übereinkommen der European co-operation for Accreditation (EA) und der International Laboratory Accreditation Cooperation (ILAC) zur gegenseitigen Anerkennung der Kalibrierscheine. Die Messergebnisse beziehen sich nur auf den kalibrierten Gegenstand.
Das Laboratorium gibt keine Empfehlung über das Kalibrierintervall. Für die Festlegung und Einhaltung von Fristen zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.

This calibration certificate documents the metrological traceability to the International System of Units (SI).The DAkkS is signatory to the multilateral agreements of the European co-operation for Accreditation (EA) and of the International Laboratory Accreditation Cooperation (ILAC) for the mutual recognition of calibration certificates. The measurement results refer only to the calibration object. The laboratory does not make any recommendation about the calibration interval. The user is obliged to have the object recalibrated at appropriate intervals.

V 8.03 / DE

Datum der Ausstellung *Date of issue*	Leiter des Kalibrierlaboratoriums *Head of the calibration laboratory*	Freigabe des Kalibrierscheins durch *Approval of the certificate of calibration by*
21.03.2025	Max Mustermann	Max Mustermann

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Kalibriergegenstand (KG) Calibration object

Gegenstand Object V-LISN

Inventar Nr. Inventory no. 123456

Standort Location ---

Kalibrierverfahren Calibration procedure

Die Kalibrierung erfolgt gemäß den Anforderungen der DIN EN 55016-1-2:2019-10
The calibration is performed according to the DIN EN 55016-1-2:2019-10 standard

Verwendete Kalibrierprozedur Used calibration procedure E:Schuko-:9k-30MHz:NNB:DAKKS / Rev.: 1.20

Umgebungsbedingungen Ambient conditions

Temperatur Temperature (23 ± 1) °C
Relative Luftfeuchte Relative humidity (20...70) %

Messeinrichtungen Measuring equipment

Referenz Reference	Rückführung Traceability	Rekal. Next cal.	Zertifikats Nr. Certificate-no.	Eq.-Nr. EQ-no.
GPS Controlled Frequency Standard 910	GPS locked	---	---	10640562
Network Analyser E5071C	15070-01-00	2024-07	E251447	14292834
ECAL Modul N4431B N4431B-ATO-61565	15070-01-00	2024-11	E264886	15087229

Referenzzertifikate sind auf www.primasonline.com abrufbar Reference certificates are available at www.primasonline.com

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Bezugswert Reference value	Messbedingung Measuring condition	Messwert KG Measured value UUT	Abweichung deviation	Zulässige Abweichung Allowed deviation	Ausnutzung der zul. Abw. in % Utilization of Allowed deviation %	Messunsicherheit (k=2) Measuring uncertainty (k=2)
Input Impedance						
DUT Specified Impedance = 50 µH + 5 Ohm || 50 Ohms						
RF Output / Receiver Port Connection: 50 Ohms						
Mains Connection: Short						
EuT Connection: VNA Port 1						
SCHUKO N0/N						
5.199 Ω	9 kHz	5.22 Ω	0.02 Ω	±1.044 Ω	2 % pass	0.65 Ω
21.902 °	9 kHz	26.55 °	4.6 °	±11.5 °	40 % pass	1.2 °
6.010 Ω	15 kHz	6.22 Ω	0.21 Ω	±1.244 Ω	17 % pass	0.65 Ω
36.795 °	15 kHz	38.41 °	1.6 °	±11.5 °	14 % pass	1.2 °
6.990 Ω	20 kHz	7.25 Ω	0.26 Ω	±1.45 Ω	18 % pass	0.65 Ω
43.918 °	20 kHz	44.97 °	1.1 °	±11.5 °	9 % pass	1.2 °
8.068 Ω	25 kHz	8.38 Ω	0.31 Ω	±1.676 Ω	19 % pass	0.65 Ω
48.459 °	25 kHz	49.39 °	0.9 °	±11.5 °	8 % pass	1.2 °
9.187 Ω	30 kHz	9.56 Ω	0.37 Ω	±1.912 Ω	20 % pass	0.65 Ω
51.402 °	30 kHz	52.33 °	0.9 °	±11.5 °	8 % pass	1.2 °
11.459 Ω	40 kHz	11.99 Ω	0.53 Ω	±2.398 Ω	22 % pass	0.65 Ω
54.528 °	40 kHz	55.43 °	0.9 °	±11.5 °	8 % pass	1.2 °
13.707 Ω	50 kHz	14.41 Ω	0.70 Ω	±2.882 Ω	24 % pass	0.65 Ω
55.606 °	50 kHz	56.40 °	0.8 °	±11.5 °	7 % pass	1.2 °
15.891 Ω	60 kHz	16.77 Ω	0.88 Ω	±3.354 Ω	26 % pass	0.65 Ω
55.598 °	60 kHz	56.23 °	0.6 °	±11.5 °	6 % pass	1.2 °
17.987 Ω	70 kHz	19.04 Ω	1.05 Ω	±3.808 Ω	28 % pass	0.65 Ω
54.970 °	70 kHz	55.40 °	0.4 °	±11.5 °	4 % pass	1.2 °
19.982 Ω	80 kHz	21.19 Ω	1.21 Ω	±4.238 Ω	29 % pass	0.65 Ω
53.970 °	80 kHz	54.19 °	0.2 °	±11.5 °	2 % pass	1.2 °
21.868 Ω	90 kHz	23.22 Ω	1.35 Ω	±4.644 Ω	29 % pass	0.65 Ω
52.746 °	90 kHz	52.77 °	0.0 °	±11.5 °	0 % pass	1.2 °
23.643 Ω	100 kHz	25.11 Ω	1.47 Ω	±5.022 Ω	29 % pass	0.65 Ω
51.401 °	100 kHz	51.22 °	-0.2 °	±11.5 °	2 % pass	1.2 °
30.919 Ω	150 kHz	34.29 Ω	3.37 Ω	±6.858 Ω	49 % pass	0.65 Ω
44.331 °	150 kHz	46.70 °	2.4 °	±11.5 °	21 % pass	1.2 °

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Bezugswert Reference value	Messbedingung Measuring condition	Messwert KG Measured value UUT	Abweichung deviation	Zulässige Abweichung Allowed deviation	Ausnutzung der zul. Abw. in % Utilization of Allowed deviation %	Messunsicherheit (k=2) Measuring uncertainty (k=2)
33.158 Ω	170 kHz	36.50 Ω	3.34 Ω	±7.3 Ω	46 % pass	0.65 Ω
41.679 °	170 kHz	43.11 °	1.4 °	±11.5 °	12 % pass	1.2 °
35.936 Ω	200 kHz	39.12 Ω	3.18 Ω	±7.824 Ω	41 % pass	0.65 Ω
38.055 °	200 kHz	38.51 °	0.5 °	±11.5 °	4 % pass	1.2 °
39.365 Ω	250 kHz	42.18 Ω	2.82 Ω	±8.436 Ω	33 % pass	0.65 Ω
32.962 °	250 kHz	32.48 °	-0.5 °	±11.5 °	4 % pass	1.2 °
41.739 Ω	300 kHz	44.17 Ω	2.43 Ω	±8.834 Ω	28 % pass	0.65 Ω
28.897 °	300 kHz	27.95 °	-0.9 °	±11.5 °	8 % pass	1.2 °
43.414 Ω	350 kHz	45.52 Ω	2.11 Ω	±9.104 Ω	23 % pass	0.65 Ω
25.631 °	350 kHz	24.45 °	-1.2 °	±11.5 °	10 % pass	1.2 °
44.635 Ω	400 kHz	46.46 Ω	1.83 Ω	±9.292 Ω	20 % pass	0.65 Ω
22.985 °	400 kHz	21.70 °	-1.3 °	±11.5 °	11 % pass	1.2 °
46.231 Ω	500 kHz	47.65 Ω	1.42 Ω	±9.53 Ω	15 % pass	0.65 Ω
18.986 °	500 kHz	17.66 °	-1.3 °	±11.5 °	12 % pass	1.2 °
47.188 Ω	600 kHz	48.33 Ω	1.14 Ω	±9.666 Ω	12 % pass	0.65 Ω
16.149 °	600 kHz	14.86 °	-1.3 °	±11.5 °	11 % pass	1.2 °
47.803 Ω	700 kHz	48.76 Ω	0.96 Ω	±9.752 Ω	10 % pass	0.65 Ω
14.043 °	700 kHz	12.81 °	-1.2 °	±11.5 °	11 % pass	1.2 °
48.218 Ω	800 kHz	49.04 Ω	0.82 Ω	±9.808 Ω	8 % pass	0.66 Ω
12.426 °	800 kHz	11.25 °	-1.2 °	±11.5 °	10 % pass	1.2 °
48.510 Ω	900 kHz	49.24 Ω	0.73 Ω	±9.848 Ω	7 % pass	0.66 Ω
11.148 °	900 kHz	10.03 °	-1.1 °	±11.5 °	10 % pass	1.2 °
48.724 Ω	1 MHz	49.38 Ω	0.66 Ω	±9.876 Ω	7 % pass	0.66 Ω
10.116 °	1 MHz	9.04 °	-1.1 °	±11.5 °	9 % pass	1.2 °
49.010 Ω	1.2 MHz	49.57 Ω	0.56 Ω	±9.914 Ω	6 % pass	0.66 Ω
8.565 °	1.2 MHz	7.56 °	-1.0 °	±11.5 °	9 % pass	1.2 °
49.261 Ω	1.5 MHz	49.72 Ω	0.46 Ω	±9.944 Ω	5 % pass	0.66 Ω
7.028 °	1.5 MHz	6.06 °	-1.0 °	±11.5 °	8 % pass	1.2 °
49.530 Ω	2 MHz	49.84 Ω	0.31 Ω	±9.968 Ω	3 % pass	0.66 Ω
5.503 °	2 MHz	4.55 °	-1.0 °	±11.5 °	8 % pass	1.2 °
49.672 Ω	2.5 MHz	49.90 Ω	0.23 Ω	±9.98 Ω	2 % pass	0.67 Ω
4.541 °	2.5 MHz	3.64 °	-0.9 °	±11.5 °	8 % pass	1.2 °

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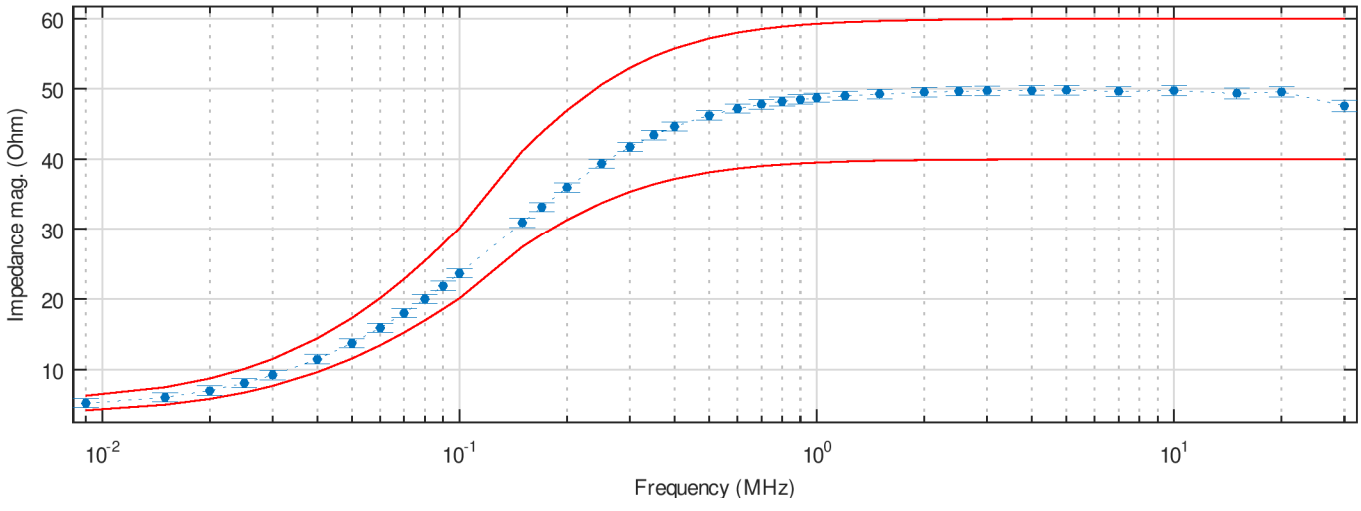
Bezugswert Reference value	Messbedingung Measuring condition	Messwert KG Measured value UUT	Abweichung deviation	Zulässige Abweichung Allowed deviation	Ausnutzung der zul. Abw. in % Utilization of Allowed deviation %	Messunsicherheit (*k*=2) Measuring uncertainty (*k*=2)
49.738 Ω	3 MHz	49.93 Ω	0.19 Ω	±9.986 Ω	2 % pass	0.67 Ω
3.912 °	3 MHz	3.04 °	-0.9 °	±11.5 °	8 % pass	1.2 °
49.788 Ω	4 MHz	49.96 Ω	0.17 Ω	±9.992 Ω	2 % pass	0.67 Ω
3.178 °	4 MHz	2.28 °	-0.9 °	±11.5 °	8 % pass	1.2 °
49.804 Ω	5 MHz	49.98 Ω	0.18 Ω	±9.996 Ω	2 % pass	0.68 Ω
2.784 °	5 MHz	1.82 °	-1.0 °	±11.5 °	8 % pass	1.2 °
49.645 Ω	7 MHz	49.99 Ω	0.34 Ω	±9.998 Ω	3 % pass	0.69 Ω
2.465 °	7 MHz	1.30 °	-1.2 °	±11.5 °	10 % pass	1.2 °
49.769 Ω	10 MHz	49.99 Ω	0.22 Ω	±9.998 Ω	2 % pass	0.71 Ω
2.473 °	10 MHz	0.91 °	-1.6 °	±11.5 °	14 % pass	1.2 °
49.347 Ω	15 MHz	50.00 Ω	0.65 Ω	±10 Ω	7 % pass	0.74 Ω
2.309 °	15 MHz	0.61 °	-1.7 °	±11.5 °	15 % pass	1.2 °
49.578 Ω	20 MHz	50.00 Ω	0.42 Ω	±10 Ω	4 % pass	0.77 Ω
6.703 °	20 MHz	0.46 °	-6.2 °	±11.5 °	54 % pass	1.2 °
47.588 Ω	30 MHz	50.00 Ω	2.41 Ω	±10 Ω	24 % pass	0.83 Ω
6.773 °	30 MHz	0.30 °	-6.5 °	±11.5 °	56 % pass	1.2 °



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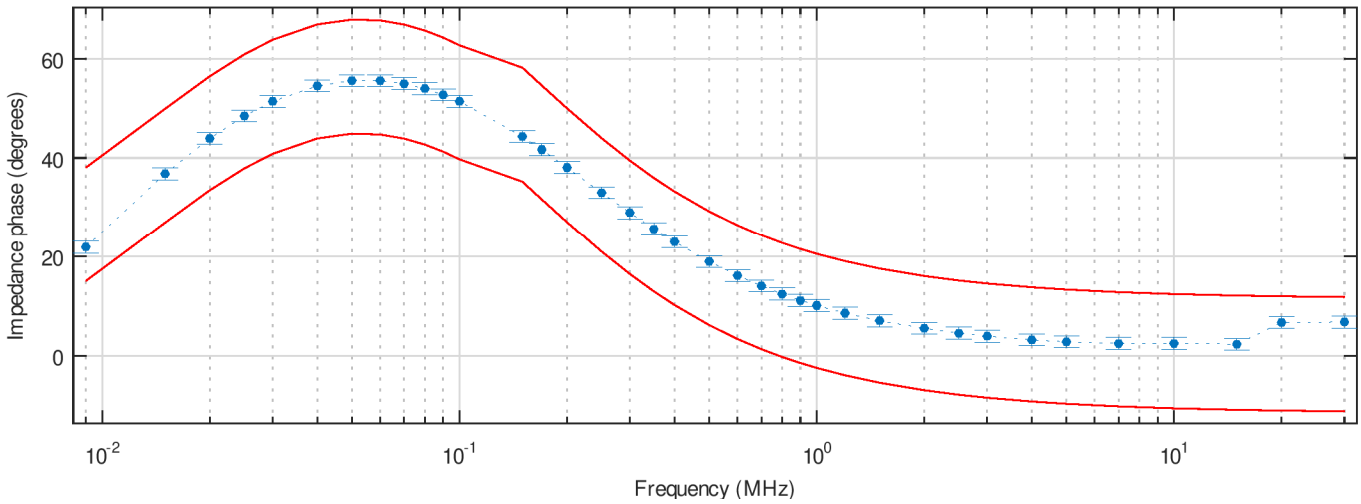

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Bezugswert Reference value	Messbedingung Measuring condition	Messwert KG Measured value UUT	Abweichung deviation	Zulässige Abweichung Allowed deviation	Ausnutzung der zul. Abw. in % Utilization of Allowed deviation %	Messunsicherheit (k=2) Measuring uncertainty (k=2)
SCHUKO L1/R						
5.222 Ω	9 kHz	5.22 Ω	0.00 Ω	±1.044 Ω	0 % pass	0.65 Ω
20.996 °	9 kHz	26.55 °	5.6 °	±11.5 °	48 % pass	1.2 °
6.016 Ω	15 kHz	6.22 Ω	0.20 Ω	±1.244 Ω	16 % pass	0.65 Ω
36.226 °	15 kHz	38.41 °	2.2 °	±11.5 °	19 % pass	1.2 °
6.988 Ω	20 kHz	7.25 Ω	0.26 Ω	±1.45 Ω	18 % pass	0.65 Ω
43.450 °	20 kHz	44.97 °	1.5 °	±11.5 °	13 % pass	1.2 °
8.059 Ω	25 kHz	8.38 Ω	0.32 Ω	±1.676 Ω	19 % pass	0.65 Ω
48.057 °	25 kHz	49.39 °	1.3 °	±11.5 °	12 % pass	1.2 °
9.171 Ω	30 kHz	9.56 Ω	0.39 Ω	±1.912 Ω	20 % pass	0.65 Ω
51.059 °	30 kHz	52.33 °	1.3 °	±11.5 °	11 % pass	1.2 °
11.432 Ω	40 kHz	11.99 Ω	0.56 Ω	±2.398 Ω	23 % pass	0.65 Ω
54.267 °	40 kHz	55.43 °	1.2 °	±11.5 °	10 % pass	1.2 °
13.669 Ω	50 kHz	14.41 Ω	0.74 Ω	±2.882 Ω	26 % pass	0.65 Ω
55.405 °	50 kHz	56.40 °	1.0 °	±11.5 °	9 % pass	1.2 °
15.844 Ω	60 kHz	16.77 Ω	0.93 Ω	±3.354 Ω	28 % pass	0.65 Ω
55.444 °	60 kHz	56.23 °	0.8 °	±11.5 °	7 % pass	1.2 °
17.931 Ω	70 kHz	19.04 Ω	1.11 Ω	±3.808 Ω	29 % pass	0.65 Ω
54.853 °	70 kHz	55.40 °	0.5 °	±11.5 °	5 % pass	1.2 °
19.920 Ω	80 kHz	21.19 Ω	1.27 Ω	±4.238 Ω	30 % pass	0.65 Ω
53.889 °	80 kHz	54.19 °	0.3 °	±11.5 °	3 % pass	1.2 °

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Bezugswert Reference value	Messbedingung Measuring condition	Messwert KG Measured value UUT	Abweichung deviation	Zulässige Abweichung Allowed deviation	Ausnutzung der zul. Abw. in % Utilization of Allowed deviation %	Messunsicherheit (k=2) Measuring uncertainty (k=2)
21.806 Ω	90 kHz	23.22 Ω	1.41 Ω	±4.644 Ω	30 % pass	0.65 Ω
52.700 °	90 kHz	52.77 °	0.1 °	±11.5 °	1 % pass	1.2 °
23.581 Ω	100 kHz	25.11 Ω	1.53 Ω	±5.022 Ω	30 % pass	0.65 Ω
51.368 °	100 kHz	51.22 °	-0.1 °	±11.5 °	1 % pass	1.2 °
30.852 Ω	150 kHz	34.29 Ω	3.44 Ω	±6.858 Ω	50 % pass	0.65 Ω
44.332 °	150 kHz	46.70 °	2.4 °	±11.5 °	21 % pass	1.2 °
33.094 Ω	170 kHz	36.50 Ω	3.41 Ω	±7.3 Ω	47 % pass	0.65 Ω
41.690 °	170 kHz	43.11 °	1.4 °	±11.5 °	12 % pass	1.2 °
35.876 Ω	200 kHz	39.12 Ω	3.24 Ω	±7.824 Ω	42 % pass	0.65 Ω
38.070 °	200 kHz	38.51 °	0.4 °	±11.5 °	4 % pass	1.2 °
39.312 Ω	250 kHz	42.18 Ω	2.87 Ω	±8.436 Ω	34 % pass	0.65 Ω
32.979 °	250 kHz	32.48 °	-0.5 °	±11.5 °	4 % pass	1.2 °
41.689 Ω	300 kHz	44.17 Ω	2.48 Ω	±8.834 Ω	28 % pass	0.65 Ω
28.914 °	300 kHz	27.95 °	-1.0 °	±11.5 °	8 % pass	1.2 °
43.369 Ω	350 kHz	45.52 Ω	2.15 Ω	±9.104 Ω	24 % pass	0.65 Ω
25.645 °	350 kHz	24.45 °	-1.2 °	±11.5 °	10 % pass	1.2 °
44.590 Ω	400 kHz	46.46 Ω	1.87 Ω	±9.292 Ω	20 % pass	0.65 Ω
22.995 °	400 kHz	21.70 °	-1.3 °	±11.5 °	11 % pass	1.2 °
46.184 Ω	500 kHz	47.65 Ω	1.47 Ω	±9.53 Ω	15 % pass	0.65 Ω
18.989 °	500 kHz	17.66 °	-1.3 °	±11.5 °	12 % pass	1.2 °
47.146 Ω	600 kHz	48.33 Ω	1.18 Ω	±9.666 Ω	12 % pass	0.65 Ω
16.145 °	600 kHz	14.86 °	-1.3 °	±11.5 °	11 % pass	1.2 °
47.759 Ω	700 kHz	48.76 Ω	1.00 Ω	±9.752 Ω	10 % pass	0.65 Ω
14.033 °	700 kHz	12.81 °	-1.2 °	±11.5 °	11 % pass	1.2 °
48.174 Ω	800 kHz	49.04 Ω	0.87 Ω	±9.808 Ω	9 % pass	0.66 Ω
12.412 °	800 kHz	11.25 °	-1.2 °	±11.5 °	10 % pass	1.2 °
48.467 Ω	900 kHz	49.24 Ω	0.77 Ω	±9.848 Ω	8 % pass	0.66 Ω
11.129 °	900 kHz	10.03 °	-1.1 °	±11.5 °	10 % pass	1.2 °
48.679 Ω	1 MHz	49.38 Ω	0.70 Ω	±9.876 Ω	7 % pass	0.66 Ω
10.096 °	1 MHz	9.04 °	-1.1 °	±11.5 °	9 % pass	1.2 °
48.966 Ω	1.2 MHz	49.57 Ω	0.60 Ω	±9.914 Ω	6 % pass	0.66 Ω
8.532 °	1.2 MHz	7.56 °	-1.0 °	±11.5 °	8 % pass	1.2 °

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49.215 Ω	1.5 MHz	49.72 Ω	0.51 Ω	±9.944 Ω	5 % pass	0.66 Ω
6.986 °	1.5 MHz	6.06 °	-0.9 °	±11.5 °	8 % pass	1.2 °
49.478 Ω	2 MHz	49.84 Ω	0.36 Ω	±9.968 Ω	4 % pass	0.66 Ω
5.447 °	2 MHz	4.55 °	-0.9 °	±11.5 °	8 % pass	1.2 °
49.622 Ω	2.5 MHz	49.90 Ω	0.28 Ω	±9.98 Ω	3 % pass	0.67 Ω
4.471 °	2.5 MHz	3.64 °	-0.8 °	±11.5 °	7 % pass	1.2 °
49.688 Ω	3 MHz	49.93 Ω	0.24 Ω	±9.986 Ω	2 % pass	0.67 Ω
3.825 °	3 MHz	3.04 °	-0.8 °	±11.5 °	7 % pass	1.2 °
49.735 Ω	4 MHz	49.96 Ω	0.22 Ω	±9.992 Ω	2 % pass	0.67 Ω
3.060 °	4 MHz	2.28 °	-0.8 °	±11.5 °	7 % pass	1.2 °
49.749 Ω	5 MHz	49.98 Ω	0.23 Ω	±9.996 Ω	2 % pass	0.68 Ω
2.643 °	5 MHz	1.82 °	-0.8 °	±11.5 °	7 % pass	1.2 °
49.593 Ω	7 MHz	49.99 Ω	0.40 Ω	±9.998 Ω	4 % pass	0.69 Ω
2.308 °	7 MHz	1.30 °	-1.0 °	±11.5 °	9 % pass	1.2 °
49.681 Ω	10 MHz	49.99 Ω	0.31 Ω	±9.998 Ω	3 % pass	0.71 Ω
2.224 °	10 MHz	0.91 °	-1.3 °	±11.5 °	11 % pass	1.2 °
49.295 Ω	15 MHz	50.00 Ω	0.71 Ω	±10 Ω	7 % pass	0.74 Ω
1.904 °	15 MHz	0.61 °	-1.3 °	±11.5 °	11 % pass	1.2 °
49.053 Ω	20 MHz	50.00 Ω	0.95 Ω	±10 Ω	9 % pass	0.77 Ω
6.045 °	20 MHz	0.46 °	-5.6 °	±11.5 °	49 % pass	1.2 °
47.236 Ω	30 MHz	50.00 Ω	2.76 Ω	±10 Ω	28 % pass	0.83 Ω
6.008 °	30 MHz	0.30 °	-5.7 °	±11.5 °	50 % pass	1.2 °

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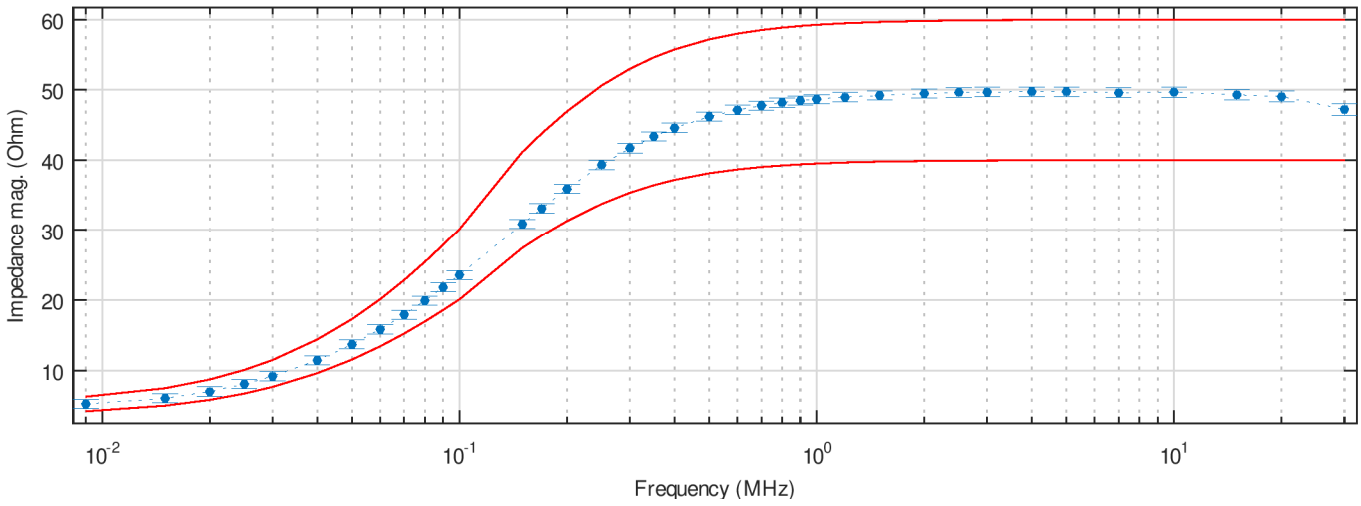

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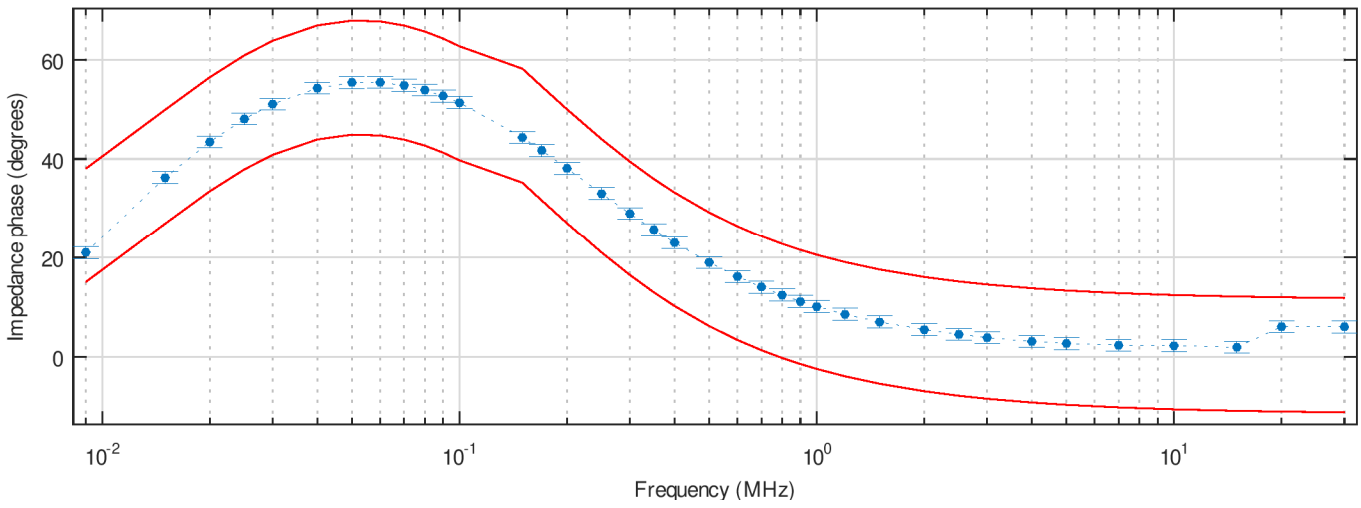

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Attenuation / Voltage Division Ratio

Path: EUT to Receiver Output

RF Output / Receiver Port Connection: VNA Port 2

Mains Connection: 50 Ohm Termination

EuT Connection: VNA Port 1

MUSTER
D-K-15070-01-00
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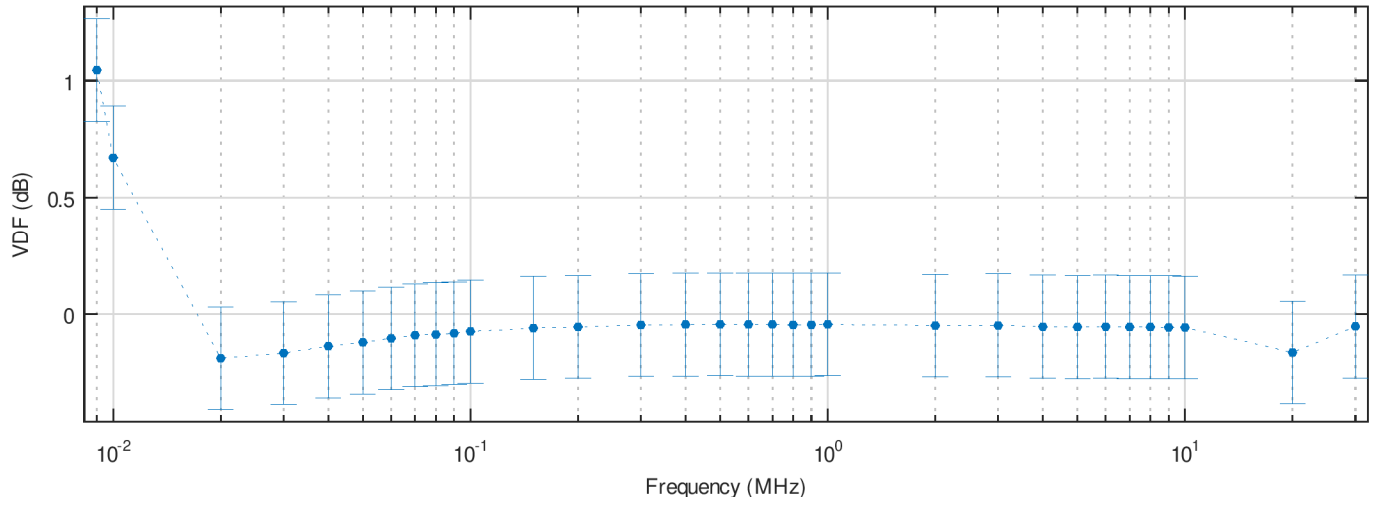
Kalibrierschein vom Calibration certificate dated 21.03.2025

Bezugswert Reference value	Messbedingung Measuring condition	Messwert KG Measured value UUT	Abweichung deviation	Zulässige Abweichung Allowed deviation	Ausnutzung der zul. Abw. in % Utilization of Allowed deviation %	Messunsicherheit (k=2) Measuring uncertainty (k=2)
SCHUKO N0/N						
1.045 dB	9 kHz	0.00 dB	-1.04 dB	--- dB	---	0.22 dB
0.671 dB	10 kHz	0.00 dB	-0.67 dB	--- dB	---	0.22 dB
-0.190 dB	20 kHz	0.00 dB	0.19 dB	--- dB	---	0.22 dB
-0.168 dB	30 kHz	0.00 dB	0.17 dB	--- dB	---	0.22 dB
-0.138 dB	40 kHz	0.00 dB	0.14 dB	--- dB	---	0.22 dB
-0.122 dB	50 kHz	0.00 dB	0.12 dB	--- dB	---	0.22 dB
-0.104 dB	60 kHz	0.00 dB	0.10 dB	--- dB	---	0.22 dB
-0.091 dB	70 kHz	0.00 dB	0.09 dB	--- dB	---	0.22 dB
-0.088 dB	80 kHz	0.00 dB	0.09 dB	--- dB	---	0.22 dB
-0.083 dB	90 kHz	0.00 dB	0.08 dB	--- dB	---	0.22 dB
-0.075 dB	100 kHz	0.00 dB	0.08 dB	--- dB	---	0.22 dB
-0.061 dB	150 kHz	0.00 dB	0.06 dB	--- dB	---	0.22 dB
-0.056 dB	200 kHz	0.00 dB	0.06 dB	--- dB	---	0.22 dB
-0.047 dB	300 kHz	0.00 dB	0.05 dB	--- dB	---	0.22 dB
-0.046 dB	400 kHz	0.00 dB	0.05 dB	--- dB	---	0.22 dB
-0.045 dB	500 kHz	0.00 dB	0.04 dB	--- dB	---	0.22 dB
-0.046 dB	600 kHz	0.00 dB	0.05 dB	--- dB	---	0.22 dB
-0.045 dB	700 kHz	0.00 dB	0.05 dB	--- dB	---	0.22 dB
-0.047 dB	800 kHz	0.00 dB	0.05 dB	--- dB	---	0.22 dB
-0.046 dB	900 kHz	0.00 dB	0.05 dB	--- dB	---	0.22 dB
-0.045 dB	1 MHz	0.00 dB	0.04 dB	--- dB	---	0.22 dB
-0.050 dB	2 MHz	0.00 dB	0.05 dB	--- dB	---	0.22 dB
-0.049 dB	3 MHz	0.00 dB	0.05 dB	--- dB	---	0.22 dB
-0.055 dB	4 MHz	0.00 dB	0.05 dB	--- dB	---	0.22 dB
-0.056 dB	5 MHz	0.00 dB	0.06 dB	--- dB	---	0.22 dB
-0.054 dB	6 MHz	0.00 dB	0.05 dB	--- dB	---	0.22 dB
-0.056 dB	7 MHz	0.00 dB	0.06 dB	--- dB	---	0.22 dB
-0.057 dB	8 MHz	0.00 dB	0.06 dB	--- dB	---	0.22 dB
-0.057 dB	9 MHz	0.00 dB	0.06 dB	--- dB	---	0.22 dB
-0.058 dB	10 MHz	0.00 dB	0.06 dB	--- dB	---	0.22 dB
-0.165 dB	20 MHz	0.00 dB	0.17 dB	--- dB	---	0.22 dB
-0.054 dB	30 MHz	0.00 dB	0.05 dB	--- dB	---	0.22 dB



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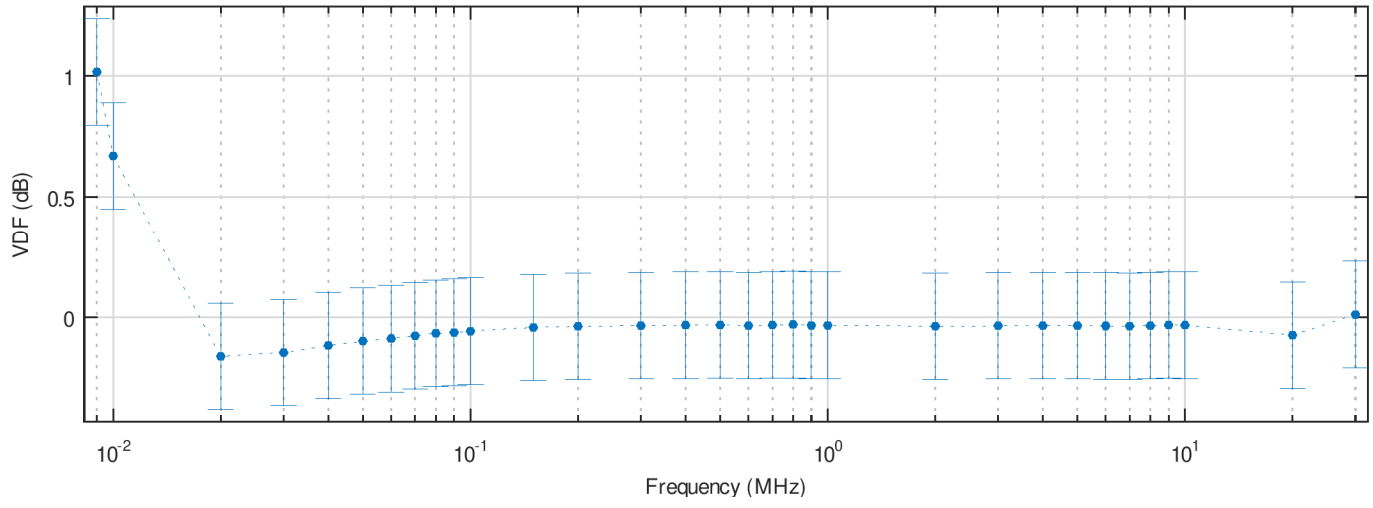
2024-01

Kalibrierschein vom Calibration certificate dated 21.03.2025

Bezugswert Reference value	Messbedingung Measuring condition	Messwert KG Measured value UUT	Abweichung deviation	Zulässige Abweichung Allowed deviation	Ausnutzung der zul. Abw. in % Utilization of Allowed deviation %	Messunsicherheit (k=2) Measuring uncertainty (k=2)
SCHUKO L1/R						
1.017 dB	9 kHz	0.00 dB	-1.02 dB	--- dB	---	0.22 dB
0.670 dB	10 kHz	0.00 dB	-0.67 dB	--- dB	---	0.22 dB
-0.162 dB	20 kHz	0.00 dB	0.16 dB	--- dB	---	0.22 dB
-0.146 dB	30 kHz	0.00 dB	0.15 dB	--- dB	---	0.22 dB
-0.117 dB	40 kHz	0.00 dB	0.12 dB	--- dB	---	0.22 dB
-0.099 dB	50 kHz	0.00 dB	0.10 dB	--- dB	---	0.22 dB
-0.089 dB	60 kHz	0.00 dB	0.09 dB	--- dB	---	0.22 dB
-0.077 dB	70 kHz	0.00 dB	0.08 dB	--- dB	---	0.22 dB
-0.067 dB	80 kHz	0.00 dB	0.07 dB	--- dB	---	0.22 dB
-0.063 dB	90 kHz	0.00 dB	0.06 dB	--- dB	---	0.22 dB
-0.058 dB	100 kHz	0.00 dB	0.06 dB	--- dB	---	0.22 dB
-0.042 dB	150 kHz	0.00 dB	0.04 dB	--- dB	---	0.22 dB
-0.038 dB	200 kHz	0.00 dB	0.04 dB	--- dB	---	0.22 dB
-0.035 dB	300 kHz	0.00 dB	0.03 dB	--- dB	---	0.22 dB
-0.033 dB	400 kHz	0.00 dB	0.03 dB	--- dB	---	0.22 dB
-0.032 dB	500 kHz	0.00 dB	0.03 dB	--- dB	---	0.22 dB
-0.035 dB	600 kHz	0.00 dB	0.04 dB	--- dB	---	0.22 dB
-0.033 dB	700 kHz	0.00 dB	0.03 dB	--- dB	---	0.22 dB
-0.031 dB	800 kHz	0.00 dB	0.03 dB	--- dB	---	0.22 dB
-0.034 dB	900 kHz	0.00 dB	0.03 dB	--- dB	---	0.22 dB
-0.034 dB	1 MHz	0.00 dB	0.03 dB	--- dB	---	0.22 dB
-0.037 dB	2 MHz	0.00 dB	0.04 dB	--- dB	---	0.22 dB
-0.036 dB	3 MHz	0.00 dB	0.04 dB	--- dB	---	0.22 dB
-0.035 dB	4 MHz	0.00 dB	0.04 dB	--- dB	---	0.22 dB
-0.035 dB	5 MHz	0.00 dB	0.04 dB	--- dB	---	0.22 dB
-0.036 dB	6 MHz	0.00 dB	0.04 dB	--- dB	---	0.22 dB
-0.036 dB	7 MHz	0.00 dB	0.04 dB	--- dB	---	0.22 dB
-0.036 dB	8 MHz	0.00 dB	0.04 dB	--- dB	---	0.22 dB
-0.033 dB	9 MHz	0.00 dB	0.03 dB	--- dB	---	0.22 dB
-0.033 dB	10 MHz	0.00 dB	0.03 dB	--- dB	---	0.22 dB
-0.074 dB	20 MHz	0.00 dB	0.07 dB	--- dB	---	0.22 dB
0.011 dB	30 MHz	0.00 dB	-0.01 dB	--- dB	---	0.22 dB



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Kalibrierschein vom Calibration certificate dated 21.03.2025

Bezugswert Reference value	Messbedingung Measuring condition	Messwert KG Measured value UUT	Abweichung deviation	Zulässige Abweichung Allowed deviation	Ausnutzung der zul. Abw. in % Utilization of Allowed deviation %		Messunsicherheit (k=2) Measuring uncertainty (k=2)
Isolation							
Path: Mains to Receiver Output							
RF Output / Receiver Port Connection: VNA Port 2							
Mains Connection: VNA Port 1							
EuT Connection: 50 Ohm							
Schuko N0/N							
20.79 dB	9 kHz	0.0 dB	-20.79 dB	---/ +0 dB	---	pass	0.25 dB
32.16 dB	15 kHz	11.9 dB	-20.26 dB	---/ +0 dB	---	pass	0.25 dB
37.59 dB	20 kHz	18.6 dB	-18.99 dB	---/ +0 dB	---	pass	0.25 dB
41.73 dB	25 kHz	23.8 dB	-17.93 dB	---/ +0 dB	---	pass	0.25 dB
45.04 dB	30 kHz	28.1 dB	-16.94 dB	---/ +0 dB	---	pass	0.25 dB
50.60 dB	40 kHz	34.8 dB	-15.80 dB	---/ +0 dB	---	pass	0.25 dB
55.37 dB	50 kHz	40.0 dB	-15.37 dB	---/ +0 dB	---	pass	0.25 dB
59.83 dB	60 kHz	40.0 dB	-19.83 dB	---/ +0 dB	---	pass	0.25 dB
64.39 dB	70 kHz	40.0 dB	-24.39 dB	---/ +0 dB	---	pass	0.25 dB
69.48 dB	80 kHz	40.0 dB	-29.48 dB	---/ +0 dB	---	pass	0.25 dB
75.35 dB	90 kHz	40.0 dB	-35.35 dB	---/ +0 dB	---	pass	0.25 dB
77.44 dB	100 kHz	40.0 dB	-37.44 dB	---/ +0 dB	---	pass	0.25 dB
68.10 dB	150 kHz	40.0 dB	-28.10 dB	---/ +0 dB	---	pass	0.25 dB
65.23 dB	200 kHz	40.0 dB	-25.23 dB	---/ +0 dB	---	pass	0.25 dB
61.15 dB	500 kHz	40.0 dB	-21.15 dB	---/ +0 dB	---	pass	0.25 dB
60.26 dB	700 kHz	40.0 dB	-20.26 dB	---/ +0 dB	---	pass	0.25 dB
59.50 dB	1 MHz	40.0 dB	-19.50 dB	---/ +0 dB	---	pass	0.25 dB
58.37 dB	2 MHz	40.0 dB	-18.37 dB	---/ +0 dB	---	pass	0.25 dB
55.26 dB	5 MHz	40.0 dB	-15.26 dB	---/ +0 dB	---	pass	0.25 dB
53.87 dB	7 MHz	40.0 dB	-13.87 dB	---/ +0 dB	---	pass	0.25 dB
52.38 dB	10 MHz	40.0 dB	-12.38 dB	---/ +0 dB	---	pass	0.25 dB
51.00 dB	12 MHz	40.0 dB	-11.00 dB	---/ +0 dB	---	pass	0.25 dB
51.21 dB	14 MHz	40.0 dB	-11.21 dB	---/ +0 dB	---	pass	0.25 dB
49.23 dB	16 MHz	40.0 dB	-9.23 dB	---/ +0 dB	---	pass	0.25 dB
47.59 dB	18 MHz	40.0 dB	-7.59 dB	---/ +0 dB	---	pass	0.25 dB
47.96 dB	20 MHz	40.0 dB	-7.96 dB	---/ +0 dB	---	pass	0.25 dB
49.06 dB	22 MHz	40.0 dB	-9.06 dB	---/ +0 dB	---	pass	0.25 dB
50.85 dB	24 MHz	40.0 dB	-10.85 dB	---/ +0 dB	---	pass	0.25 dB
52.23 dB	26 MHz	40.0 dB	-12.23 dB	---/ +0 dB	---	pass	0.25 dB
49.94 dB	28 MHz	40.0 dB	-9.94 dB	---/ +0 dB	---	pass	0.25 dB
45.30 dB	30 MHz	40.0 dB	-5.30 dB	---/ +0 dB	---	pass	0.25 dB

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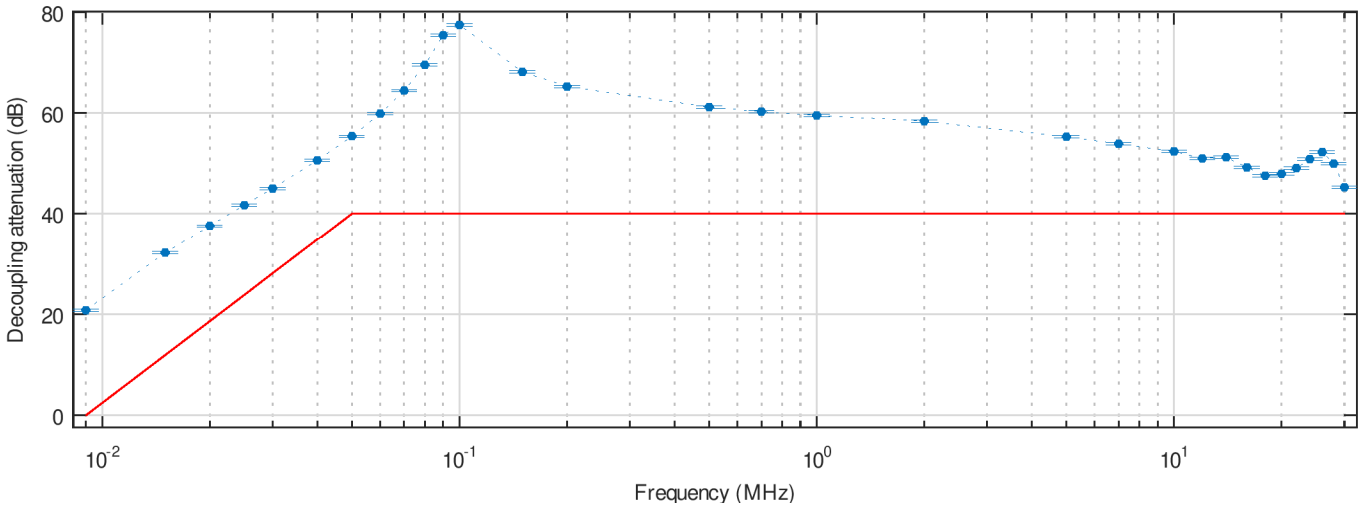

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Schuko L1/R1

Bezugswert Reference value		Messbedingung Measuring condition	Messwert KG Measured value UUT	Abweichung deviation	Zulässige Abweichung Allowed deviation	Ausnutzung der zul. Abw. in % Utilization of Allowed deviation %		Messunsicherheit (k=2) Measuring uncertainty (k=2)
20.24 dB	9 kHz	0.0 dB	-20.24 dB	---/ +0 dB	---	pass	0.25	dB
31.45 dB	15 kHz	11.9 dB	-19.55 dB	---/ +0 dB	---	pass	0.25	dB
36.75 dB	20 kHz	18.6 dB	-18.15 dB	---/ +0 dB	---	pass	0.25	dB
40.71 dB	25 kHz	23.8 dB	-16.91 dB	---/ +0 dB	---	pass	0.25	dB
43.79 dB	30 kHz	28.1 dB	-15.69 dB	---/ +0 dB	---	pass	0.25	dB
48.67 dB	40 kHz	34.8 dB	-13.87 dB	---/ +0 dB	---	pass	0.25	dB
52.37 dB	50 kHz	40.0 dB	-12.37 dB	---/ +0 dB	---	pass	0.25	dB
55.29 dB	60 kHz	40.0 dB	-15.29 dB	---/ +0 dB	---	pass	0.25	dB
57.55 dB	70 kHz	40.0 dB	-17.55 dB	---/ +0 dB	---	pass	0.25	dB
59.35 dB	80 kHz	40.0 dB	-19.35 dB	---/ +0 dB	---	pass	0.25	dB
60.82 dB	90 kHz	40.0 dB	-20.82 dB	---/ +0 dB	---	pass	0.25	dB
61.87 dB	100 kHz	40.0 dB	-21.87 dB	---/ +0 dB	---	pass	0.25	dB
64.91 dB	150 kHz	40.0 dB	-24.91 dB	---/ +0 dB	---	pass	0.25	dB
66.33 dB	200 kHz	40.0 dB	-26.33 dB	---/ +0 dB	---	pass	0.25	dB
70.41 dB	500 kHz	40.0 dB	-30.41 dB	---/ +0 dB	---	pass	0.25	dB
71.79 dB	700 kHz	40.0 dB	-31.79 dB	---/ +0 dB	---	pass	0.25	dB
72.70 dB	1 MHz	40.0 dB	-32.70 dB	---/ +0 dB	---	pass	0.25	dB
73.29 dB	2 MHz	40.0 dB	-33.29 dB	---/ +0 dB	---	pass	0.25	dB
77.39 dB	5 MHz	40.0 dB	-37.39 dB	---/ +0 dB	---	pass	0.25	dB
77.71 dB	7 MHz	40.0 dB	-37.71 dB	---/ +0 dB	---	pass	0.25	dB
77.06 dB	10 MHz	40.0 dB	-37.06 dB	---/ +0 dB	---	pass	0.25	dB
75.96 dB	12 MHz	40.0 dB	-35.96 dB	---/ +0 dB	---	pass	0.25	dB
75.97 dB	14 MHz	40.0 dB	-35.97 dB	---/ +0 dB	---	pass	0.25	dB
71.08 dB	16 MHz	40.0 dB	-31.08 dB	---/ +0 dB	---	pass	0.25	dB
68.78 dB	18 MHz	40.0 dB	-28.78 dB	---/ +0 dB	---	pass	0.25	dB
75.76 dB	20 MHz	40.0 dB	-35.76 dB	---/ +0 dB	---	pass	0.25	dB
82.81 dB	22 MHz	40.0 dB	-42.81 dB	---/ +0 dB	---	pass	0.25	dB
83.41 dB	24 MHz	40.0 dB	-43.41 dB	---/ +0 dB	---	pass	0.25	dB
77.82 dB	26 MHz	40.0 dB	-37.82 dB	---/ +0 dB	---	pass	0.25	dB
68.03 dB	28 MHz	40.0 dB	-28.03 dB	---/ +0 dB	---	pass	0.25	dB
60.78 dB	30 MHz	40.0 dB	-20.78 dB	---/ +0 dB	---	pass	0.25	dB

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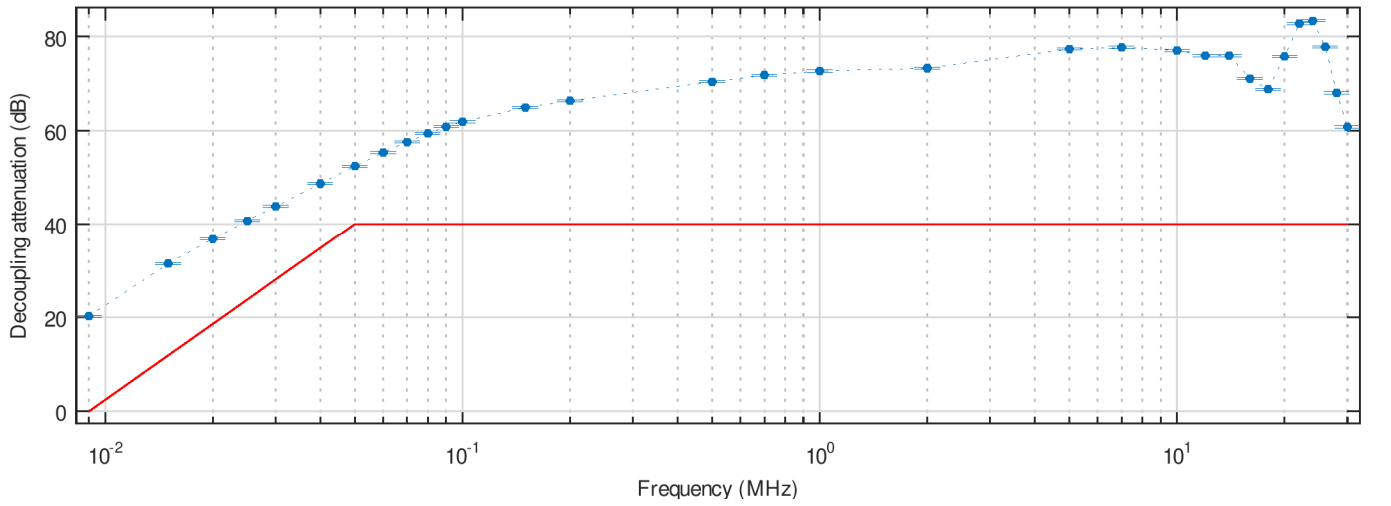
Bezugswert Reference value	Messbedingung Measuring condition	Messwert KG Measured value UUT	Abweichung deviation	Zulässige Abweichung Allowed deviation	Ausnutzung der zul. Abw. in % Utilization of Allowed deviation %	Messunsicherheit (*k*=2) Measuring uncertainty (*k*=2)



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Artificial Hand

Capacitance						
215.3 pF	1 MHz	220 pF	4.69 pF	±44 pF	11 % pass	10 pF
Impedance						
495.9 Ω	1 MHz	510 Ω	14.07 Ω	±51 Ω	28 % pass	0.87 Ω

Messunsicherheit Measuring uncertainty

Angegeben ist die erweiterte Messunsicherheit, die sich aus der Standardmessunsicherheit durch Multiplikation mit dem Erweiterungsfaktor k = 2 ergibt. Sie wurde gemäß EA-4/02 M: 2022 ermittelt. Der Wert der Messgröße liegt mit einer Wahrscheinlichkeit von etwa 95 % im zugeordneten Werteintervall. Ein Anteil für die Langzeit-Instabilität ist nicht enthalten. Die dimensionslosen Anteile der Messunsicherheit sind als relative Messunsicherheiten bezogen auf den Messwert zu verstehen.

The expanded uncertainty of measurement corresponding to the measurement results is stated as the standard uncertainty of measurement multiplied by the coverage factor k = 2. This was determined in accordance with EA-4/02 M: 2022. Usually the true value is located in the corresponding interval with a probability of approximately 95%. The non-dimensional fractions of the measuring uncertainty are relative values in relation to the indicated value.

Bemerkungen Special remarks

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Bewertung der Konformität Determination of conformity

Gesamtkonformität: Overall conformity:

Alle Messergebnisse liegen innerhalb der zulässigen Abweichung

All measurement results are within the allowed deviation

¹) Die Konformitätsaussage erfolgt gemäß der Entscheidungsregel 'Vertrauensniveau 50' mit einer Konformitätswahrscheinlichkeit größer 50%. Zulässige Abweichung abgeschätzt durch Testo Industrial Services GmbH.

¹) The statement of conformity is made according to the decision rule 'confidence level 50' with a probability of conformity greater than 50%. Allowed deviation estimated by Testo Industrial Services.

Die Einhaltung der Spezifikation wird im Kalibrierzertifikat wie folgt angezeigt:

The compliance to specification is represented on the calibration certificate as follows:

Messwert und Messunsicherheit innerhalb der zulässigen Abweichung Measured value and measurement uncertainty within specification	pass	
Messwert innerhalb und Messunsicherheit außerhalb der zulässigen Abweichung. Measured value within and measurement uncertainty outside the specification.	pass	
Messwert außerhalb und Messunsicherheit teilweise innerhalb der zulässigen Abweichung Measured value outside and measurement uncertainty partly within the specification.	fail	
Messwert und Messunsicherheit außerhalb der zulässigen Abweichung Measured value and measurement uncertainty outside specification.	fail	

Ausnutzung der zulässigen Abweichung in % = |Abweichung| / Zulässige Abweichung

Utilization of allowed deviation % = |deviation| / allowed deviation

Die Angabe der Toleranzausnutzung in % ist bei logarithmischen Einheiten nicht sinnvoll und wird mit "---" entwertet.

The indication of the tolerance utilization in % is not applicable for logarithmic units and is invalidated with "---".

The German original text is valid in case of doubt.

- Ende des Kalibrierscheins -

- End of the calibration certificate. -