

Report on the FCC and IC Testing of the MK Versuchsanlagen GmbH & Co. KG.



Model: PTD2

In accordance with FCC 47 CFR Part 15 C
and ISED RSS-210 and ISED RSS-Gen

Prepared for: MK Versuchsanlagen GmbH & Co.
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COMMERCIAL-IN-CONFIDENCE

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RESPONSIBLE FOR	NAME	DATE	SIGNATURE
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Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

Engineering Statement:

This measurement shown in this report were made in accordance with the procedures described on test pages.

All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15 C and ISED RSS-210 and RSS-GEN.

The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Alex Fink	2026-01-14	 SIGN-ID 1101333

Laboratory Accreditation

DAkS Reg. No. D-PL-11321-11-03

DAkS Reg. No. D-PL-11321-11-04

Laboratory recognition

Registration No. BNetzA-CAB-16/21-15

Industry Canada test site registration

3050A-2

Executive Statement:

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15 C:2024 (partly) and ISED RSS-210 : 2024 (partly) and ISED RSS-Gen : 2018 + Amd.1 : 2019 + Amd.2 : 2021 (partly) in the tested parts.



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1 Report Summary

1.1 Modification Report

Alternations and additions of this report will be issued to the holders of each copy in the form of a complete document. The current version replaces all previous versions.

Revision	Description of changes	Date of Issue
0	---	2025-11-10
1	Retest of Radiated Emission in the 9 kHz – 30 MHz Frequency range.	2026-01-14

Table 1: Report of Modifications

1.2 Introduction

Applicant	MK Versuchsanlagen GmbH & Co. KG.
Manufacturer	MK Versuchsanlagen GmbH & Co. KG.
Model Number(s)	PTD2
Serial Number(s)	WOPS1409017
Hardware Version(s)	---
Software Version(s)	---
Number of Samples Tested	1
Test Specification(s) /	FCC 47 CFR Part 15 C : 2024 (partly)
Issue / Date	ISED RSS-210, Issue 11 : 2024 (partly)
	ISED RSS-Gen, Issue 5 : 2018
	+ Amd. 1 : 2019, Amd. 2 : 2021 (partly)
Order Number	---
Date	2025-09-17
Date of Receipt of EUT	2025-09-22
Start of Test	2025-09-24
Finish of Test	2025-09-25
Name of Engineer(s)	Alex Fink
Related Document(s)	ANSI C63.10:2013



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15 C and ISED RSS210 and RSSGen is shown below.

Section	Specification Clause	Test Description	Result
---	15.203	Antenna requirement	N/T
---	15.215(c)	Bandwidth of Signal	N/T
---	15.207	Conducted Disturbance at Mains Terminal	N/A – battery supply
2.1	15.209	Radiated Disturbance	Pass

Table 2: Results according to FCC 47 CFR Part 15 C

Section	Specification Clause	Test Description	Result
2.1	8.3	Radiated Emissions	Pass
---	7.3	AC Power Line Conducted Emissions	N/A – battery supply
---	B.6 b.	Frequency Tolerance	N/T

Table 3: Results according to ISED RSS210

Section	Specification Clause	Test Description	Result
---	6.7	Bandwidth of Signal	N/T
---	8.8	AC Power Line Conducted Emissions	N/A – battery supply
2.1	8.9, 8.10	Radiated Emissions	Pass
---	6.11	Frequency Tolerance	N/T

Table 4: Results according to ISED RSSGen



1.4 Product Information

1.4.1 Technical Description

PTD2 is glove leak testing device.

Frequency Band(s): 119 kHz to 135 kHz
2400 MHz to 2483.5 MHz
5150 MHz to 5350 MHz
5470 MHz to 5725 MHz

Supply Voltage: 3.6 V DC – Battery powered

Supply Frequency: ---

1.4.2 EUT Ports / Cables identification

Port	Max Cable Length specified	Usage	Type	Screened
---	---	---	---	---

Table 2



1.5 Test Configuration

DC power supplied – PTD2 is powered with 3.6 V DC lithium-ion battery.

1.6 Modes of Operation

Continuously reading RFID tag.

1.7 Deviations from Standard

none

1.8 EUT Modifications Record

The table below details modifications made to the EUT during the test programme.
The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
0	As supplied by the customer	Not Applicable	Not Applicable

Table 3

1.9 Test Location

TÜV SÜD Product Service conducted the following tests at our Straubing test laboratory:

Test Name	Name of Engineer(s)
Configuration in accordance with sections 1.5 and 1.6	
Radiated Emissions	Alex Fink

Office Address:

Äußere Frühlingstraße 45
94315 Straubing
Germany



2 Test Details

2.1 Radiated Emissions

2.1.1 Specification Reference

FCC 47 CFR Part 15 C, Clauses 15.205, 15.209
ISED RSS-210, Clause 8.3
ISED RSS-Gen, Clauses 8.9 and 8.10

2.1.2 Equipment under Test and Modification State

PTD2; S/N: WOPS1409017; Modification State 0

2.1.3 Date of Test

2025-09-24, 2025-09-25 and 2026-01-13

2.1.4 Environmental Conditions

Ambient Temperature	22 °C
Relative Humidity	51 %



2.1.5 Specification Limits

Radiated emission limits:					
Frequency Range (MHz)	Test distance (m)	Field strength		Field strength	
		($\mu\text{A/m}$)	($\text{dB}\mu\text{A/m}$)	($\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)
0.009 – 0.49	300	$6.37 / f$	$20*\lg(6.37 / f)$	$2400 / f$	$20*\lg(2400 / f)$
0.49 – 1.705	30	$63.7 / f$	$20*\lg(63.7 / f)$	$24000 / f$	$20*\lg(24000 / f)$
1.705 – 13.110	30	0.08	-21.94	30	29.54
13.110 – 13.410	30	0.283	-11.0	106	40.5
13.410 – 13.553	30	0.891	-1.0	334	50.5
13.553 – 13.567	30	42.26	32.5	15848	84
13.567 – 13.710	30	0.891	-1.0	334	50.5
13.710 – 14.010	30	0.283	-11.0	106	40.5
14.010 - 30	30	0.08	-21.94	30	29.54
30 – 88	3	---	---	100	40
88 – 216	3	--	---	150	43.5
126 – 960	3	--	---	200	46
above 960	3	--	---	500	54
Note 1: f in kHz					

Table 11 Radiated emission limits

At frequencies at or above 30 MHz, measurements may be performed at distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 m, unless it can be further demonstrated that measurements at a distance of 30 m or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempts should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade).

2.1.6 Test Method

The test was performed according to ANSI C63.10, sections 11.11 and 11.12

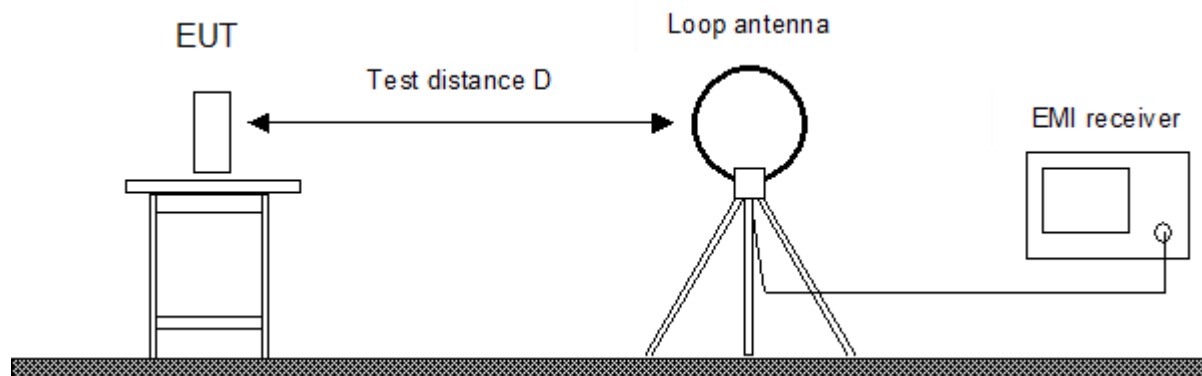
Prescans are performed in six positions of the EUT to get the full spectrum of emission caused by the EUT with the measuring antenna raised and lowered from 1 m to 4 m with vertical and horizontal polarisation to find the combination of table position, antenna height and antenna polarisation for the maximum emission levels.

Data reduction is applied to these results to select those levels having less margin than 10 dB or exceeding the limit using subranges and limited number of maximums.

Further maximisation for adjusting the maximum position is following.

Equipment and cables are placed and moved within the range of position likely to find their maximum emissions.

2.1.6.1 Frequency range 9 kHz – 30 MHz

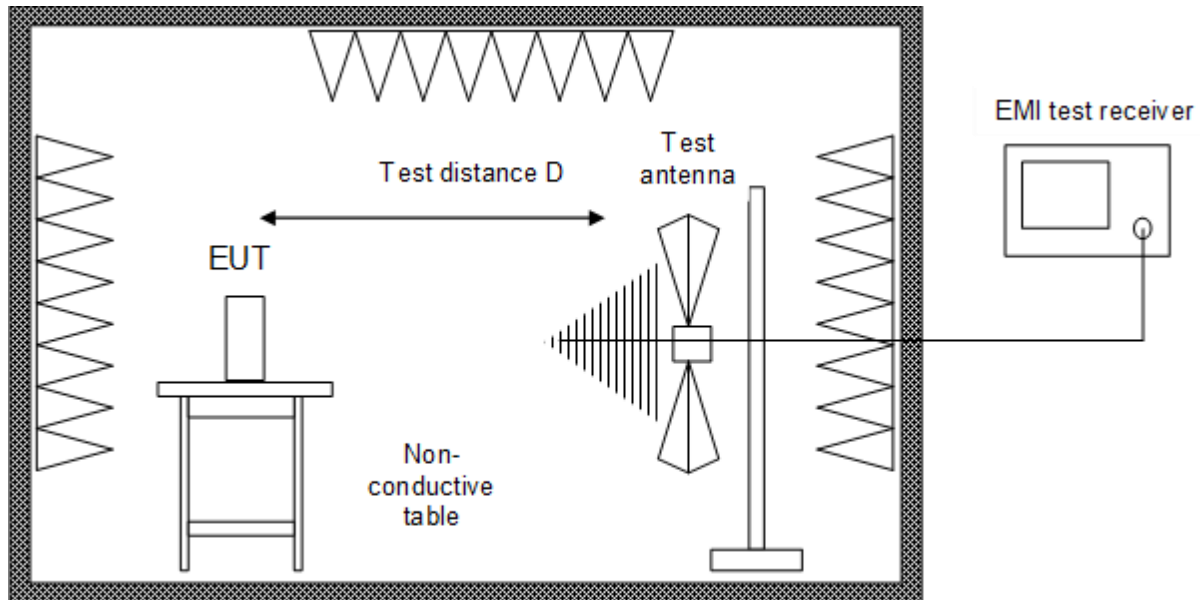


The EUT was placed on a non-conductive table, 0.8 m above the ground.

Radiated emissions in the frequency 9 kHz – 30 MHz is measured within a semi-anechoic room with an active loop antenna with the measurement detector set to peak. In addition in the frequency range 9 kHz to 490 kHz also an average detector was used. The measurement bandwidth of the receiver was set to 300 Hz in the frequency range 9 kHz to 150 kHz and 10 kHz in the frequency range 150 kHz to 30 MHz. Prescans were performed in six positions of the EUT.

For final measurements the detector was set to CISPR quasi-peak and in addition to CISPR average in the frequency range 9 kHz to 490 kHz with a resolution bandwidth 200 Hz in the frequency range 9 kHz to 150 kHz and 9 kHz in the frequency range 150 kHz to 30 MHz. Final tests were performed immediately after a final frequency and zoom (for drifting disturbances) and maximum adjustment.

2.1.6.2 Frequency range 30 MHz – 1 GHz



Alternate test site (semi anechoic room)

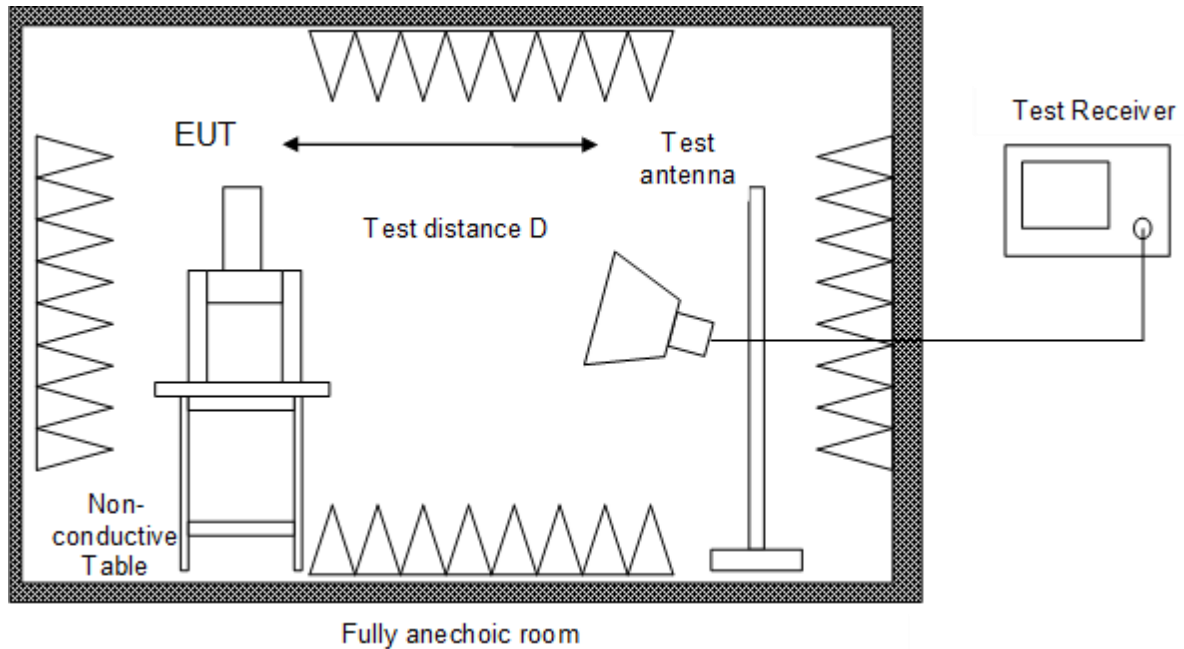
The EUT was placed on a non-conductive table, 0.8 m above the ground plane

Radiated emissions in the frequency range 30 MHz – 1 GHz is measured within a semi-anechoic room with groundplane complying with the NSA requirements of ANSI C63.4. for alternative test sites. A linear polarised logarithmic periodic antenna combined with a 4:1 broadband dipole ("Trilog broadband antenna") is used.

For prescan tests the test receiver is set to peak-detector with a bandwidth of 120 kHz.

With the measurement bandwidth of the test receiver set to 120 kHz CISPR quasi-peak detector is selected for final measurements following immediately after a final frequency zoom (for drifting disturbances) and maximum adjustment.

2.1.6.3 Frequency range above 1 GHz



The EUT was placed on a non-conductive table, 1.5 m above the ground plane

Radiated emission tests above 1 GHz are performed in a fully anechoic room with the S_{VSWR} requirements of ANSI C63.4. Measurements are performed both in the horizontal and vertical planes of polarisation using a test receiver with the detector function set to peak and average and the resolution bandwidth set to 1 MHz. Testing above 1 GHz is performed with horn antennas with the EUT in boresight of the antenna.

For prescan tests the test receiver is set to peak- and average-detector with a bandwidth of 1 MHz.

With the measurement bandwidth of the test receiver set to 1 MHz and peak- and CISPR average-detector is selected for final measurements following immediately after a final frequency zoom (for drifting disturbances) and maximum adjustment.



Product Service

2.1.7 Test Results

<i>Frequency range</i>	<i>Limit applied</i>	<i>Test distance</i>
9 kHz – 30 MHz	15.209	3 m
30 MHz – 1 GHz	15.209	3 m

Table 4

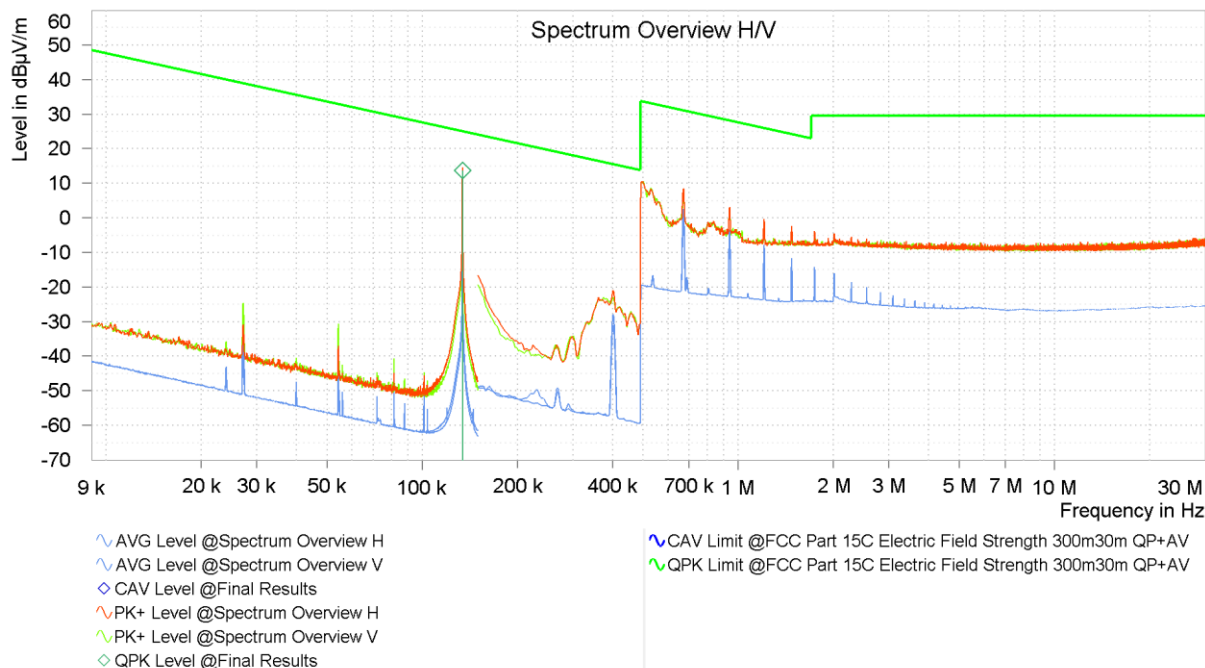
Sample calculation:

Final Value (dB μ V/m) = Reading Value (dB μ V) + (Cable attenuation (dB)
+ Antenna Transducer (dB(1/m)))



Continuously reading RFID tag

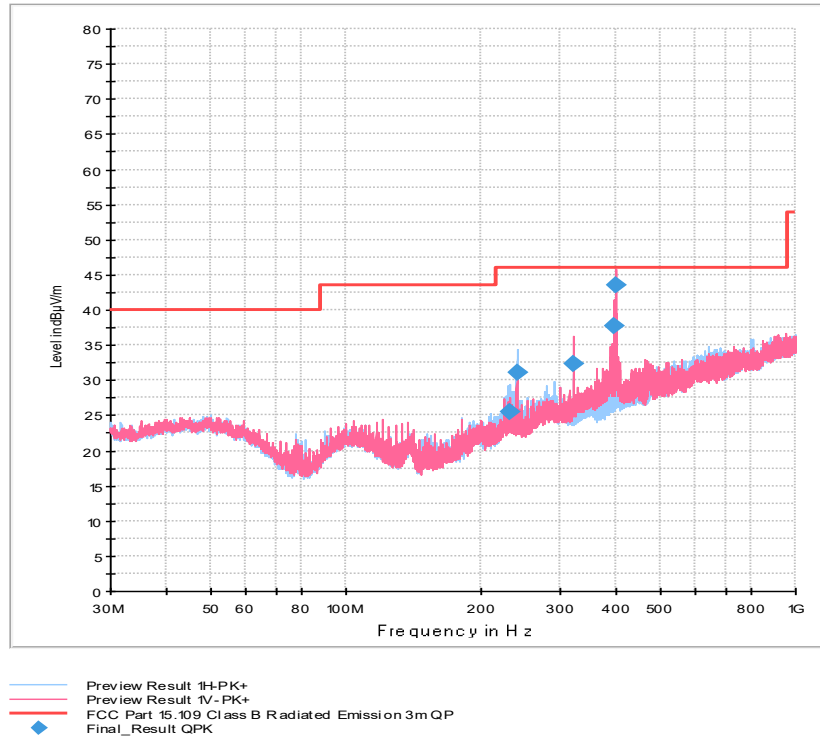
Frequency range 9 kHz – 30 MHz:



Rg	Frequency [MHz]	QPK Level [dBµV/m]	QPK Limit [dBµV/m]	QPK Margin [dB]	CAV Level [dBµV/m]	CAV Limit [dBµV/m]	CAV Margin [dB]	Correction [dB]	Polarization	Azimuth [deg]	Antenna Height [m]	Meas. BW [kHz]	Meas. Time [s]
1	0.134	13.72	25.05	11.33	---	---	---	-60.63	H	90	1.00	0.200	1.000



Frequency range 30 MHz – 1 GHz:



Frequency MHz	QuasiPeak dBµV/m	Limit dBµV/m	Margin dB	Meas. Time ms	Band- width kHz	Height cm	Pol	Azi- muth deg	Corr. dB/m
232.200000	25.43	46.02	20.59	1000.0	120.000	105.0	H	-18.0	20.8
240.000000	31.12	46.02	14.90	1000.0	120.000	120.0	H	-4.0	21.1
320.010000	32.43	46.02	13.59	1000.0	120.000	174.0	V	59.0	22.8
393.630000	37.62	46.02	8.40	1000.0	120.000	124.0	V	-124.0	24.7
399.990000	43.61	46.02	2.41	1000.0	120.000	120.0	V	-146.0	25.0



2.1.8 Test Location and Test Equipment

The test was carried out in a semi anechoic room cabin no. 3 and cabin no 11.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Loop antenna	Schwarzbeck	FMZB 1519 C	72526	36	2028-01-31
EMI test receiver	Rohde & Schwarz	ESW26	26268	12	2026-07-31
EMI test receiver	Rohde & Schwarz	ESW44	39897	12	2026-03-31
TRILOG Broadband Antenna	Rohde & Schwarz	VULB 9163	19691	36	2027-04-30
Attenuator for 6 dB for VULB9163-233	Schwarzbeck	DGA 9552 N	67422	36	2027-04-30
Semi anechoic room	Frankonia	Cabin No. 3	56331	---	---
Semi anechoic room	Frankonia	Cabin No. 11	42961	---	---
EMC measurement software	Rohde & Schwarz	EMC32 Emission	42986	---	---

Table 5



3 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

<i>Radio Interference Emission Testing</i>		
<i>Test Name</i>	<i>kp</i>	<i>Expanded Uncertainty</i>
Conducted Voltage Emission		
9 kHz to 150 kHz (50Ω/50μH AMN)	2	± 3.8 dB
150 kHz to 30 MHz (50Ω/50μH AMN)	2	± 3.4 dB
100 kHz to 200 MHz (50Ω/5μH AMN)	2	± 3.6 dB
Discontinuous Conducted Emission		
9 kHz to 150 kHz (50Ω/50μH AMN)	2	± 3.8 dB
150 kHz to 30 MHz (50Ω/50μH AMN)	2	± 3.4 dB
Conducted Current Emission		
9 kHz to 200 MHz	2	± 3.5 dB
Magnetic Fieldstrength		
9 kHz to 30 MHz (with loop antenna)	2	± 3.9 dB
9 kHz to 30 MHz (large-loop antenna 2 m)	2	± 3.5 dB
Radiated Emission		
30 MHz to 300 MHz	2	± 4.9 dB
300 MHz to 1 GHz	2	± 5.0 dB
1 GHz to 6 GHz	2	± 4.6 dB
Test distance 10 m		
30 MHz to 300 MHz	2	± 4.9 dB
300 MHz to 1 GHz	2	± 4.9 dB
The expanded uncertainty reported according to CISPR16-4-2: 2011 + A1 + A2 + Cor1 is based on a standard uncertainty multiplied by a coverage factor of $k_p = 2$, providing a level of confidence of $p = 95.45\%$		

Table 6 Measurement uncertainty based on CISPR 16-4-2

The measurement uncertainty in the laboratory is less than or equal to the maximum measurement uncertainty according to CISPR16-4-2: 2011 + A1 + A2 + Cor1 (U_{CISPR}). This normative regulation means that the measured value is also the value to be assessed in relation to the limit value.



4 Photographs of Test Setups

