



electronic GmbH

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Prüfbericht / Test report

FCC
(Federal Communications Commission)
Test-Firm-Registration-Number: 90870

IC
(Industry Canada)
Company-Number: 6155A
Test site number 6155A-1

EMC
47 CFR part 15 subpart B, § 15.107 Conducted limits, class B, § 15.109 Radiated limits, class B
ICES-003, Issue 5 (CAN/CSA-CISPR 22-10)



**TESTED
IN GERMANY**

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Prüfbericht Nr./
Test report no.: **14/01-0047**

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1. CLIENT INFORMATION:

Name: IDENTEC SOLUTIONS AG
 Address: Millennium Park 2, 6890 LUSTENAU, AUSTRIA
 Name of contact: Mr. Adalgiso Castrignano
 Telephone: 0043 5577 87387 64
 Fax: 0043 5577 87387 15
 E-mail: acastrignano@identecsolutions.com

2. EQUIPMENT UNDER TEST (EUT):

2.1 Identification of the EUT

Equipment: ILR Mobile Reader
 Model: i-Port-USB-BT
 Brand name: -/-
 Serial no.: 14031U0004
 Manufacturer: IDENTEC SOLUTIONS AG
 Country of origin: Austria
 Rating: Operated with rechargeable battery, charging with 9 – 24 V DC, 50 mA or by USB.

2.2 Additional information about the EUT: Included Bluetooth module which is already certified (modular certification) with FCC ID: X3ZBTMOD5 and IC: 8828A-MOD4.
 The EUT is working on the frequencies:
 919 MHz Broadcast (only reception)
 920 MHz- Communication (transmitting/receiving of data), Frequency deviation ± 64 kHz @ 115200 bit/s
 921 MHz- Wakeup (transmitting), Frequency deviation ± 20 kHz @ 19200 bit/s

3. Conducted emission measurements

Test site

Measurements of conducted emission from EUT was made in the shielded chamber (Siemens DC-1 GHz).

Detector function selection and bandwidth

In conducted emissions measurement CISPR quasi-peak- and average-detector were used.

The bandwidth of the detector of instrument is 9 kHz over the frequency range of 150 kHz to 30 MHz. Conducted emissions to be measured are detected in CISPR quasi-peak- and average-mode.

Frequency range to be scanned

For conducted emission measurements, the spectrum in the range of 150 kHz to 30 MHz was investigated.

Test conditions and configuration of EUT

The EUT was configured and operated in charge mode with a host AC adaptor (120 V~, 60 Hz / 21 V DC out) and with USB connection and data transfer between a host PC and the EUT, so as to find the maximum conducted emission generated from EUT.

During test the peripherals were operated with rated Power (120 V~, 60 Hz). The EUT has no direct connection to the AC power line.

Measurements on neutral (N)- and live (L1)-wires of the peripherals had been performed.

Applied standards

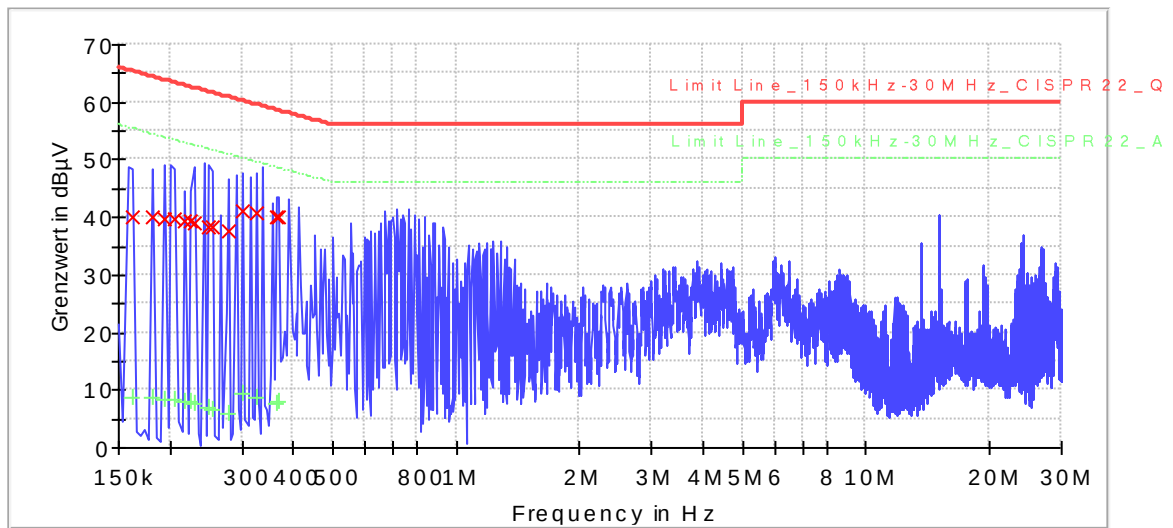
47 CFR part 15 subpart B, § 15.107 Conducted limits

ICES-003, Issue 5, Section 3(a), CAN/CSA-CISPR 22-10

Measurements

Charge mode:

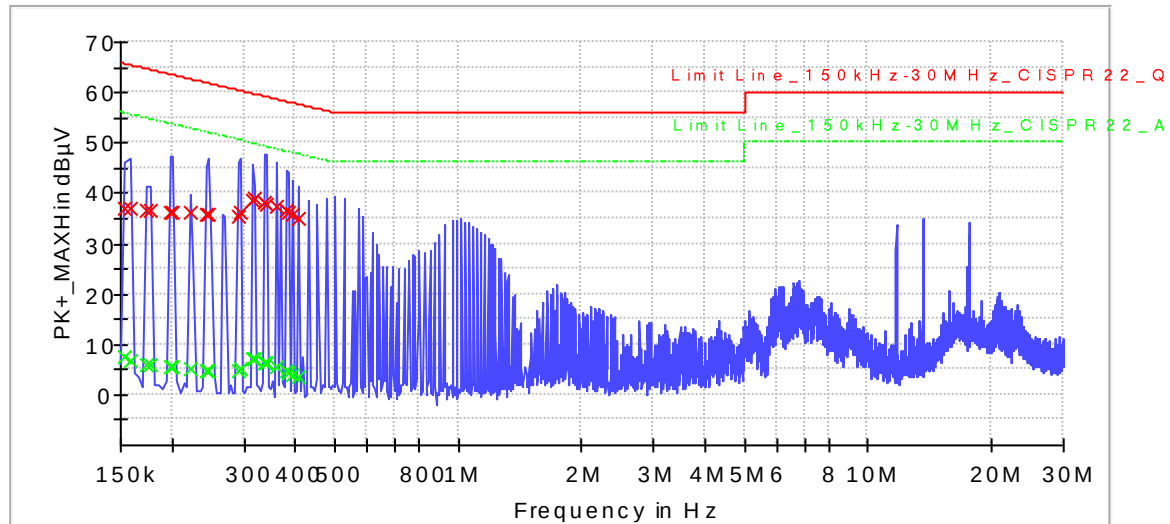
Tested on N



Limit and Margin Single N_QP_AV

Frequency (MHz)	MaxPeak (dBµV)	QuasiPeak (dBµV)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Margin - QPK (dB)	Limit - QPK (dBµV)	Margin - AVG (dB)	Limit - AVG (dBµV)
0.162000	48.8	39.9	8.8	1000.0	9.000	25.5	65.4	46.5	55.4
0.182000	48.6	40.0	8.8	1000.0	9.000	24.4	64.4	45.6	54.4
0.194000	48.3	39.7	8.4	1000.0	9.000	24.2	63.9	45.4	53.9
0.206000	49.0	39.6	8.5	1000.0	9.000	23.8	63.4	44.9	53.4
0.218000	49.3	39.4	8.1	1000.0	9.000	23.5	62.9	44.8	52.9
0.226000	48.6	39.3	7.9	1000.0	9.000	23.3	62.6	44.7	52.6
0.230000	44.5	39.1	7.7	1000.0	9.000	23.3	62.4	44.7	52.4
0.250000	44.6	38.4	6.9	1000.0	9.000	23.4	61.8	44.9	51.8
0.254000	48.7	38.2	6.7	1000.0	9.000	23.4	61.6	44.9	51.6
0.278000	49.3	37.5	6.0	1000.0	9.000	23.4	60.9	44.9	50.9
0.302000	49.2	41.0	9.3	1000.0	9.000	19.2	60.2	40.9	50.2
0.326000	48.0	40.9	8.6	1000.0	9.000	18.6	59.6	41.0	49.6
0.366000	46.6	40.2	7.7	1000.0	9.000	18.4	58.6	40.9	48.6
0.370000	47.5	40.1	8.0	1000.0	9.000	18.4	58.5	40.5	48.5

Tested on L1

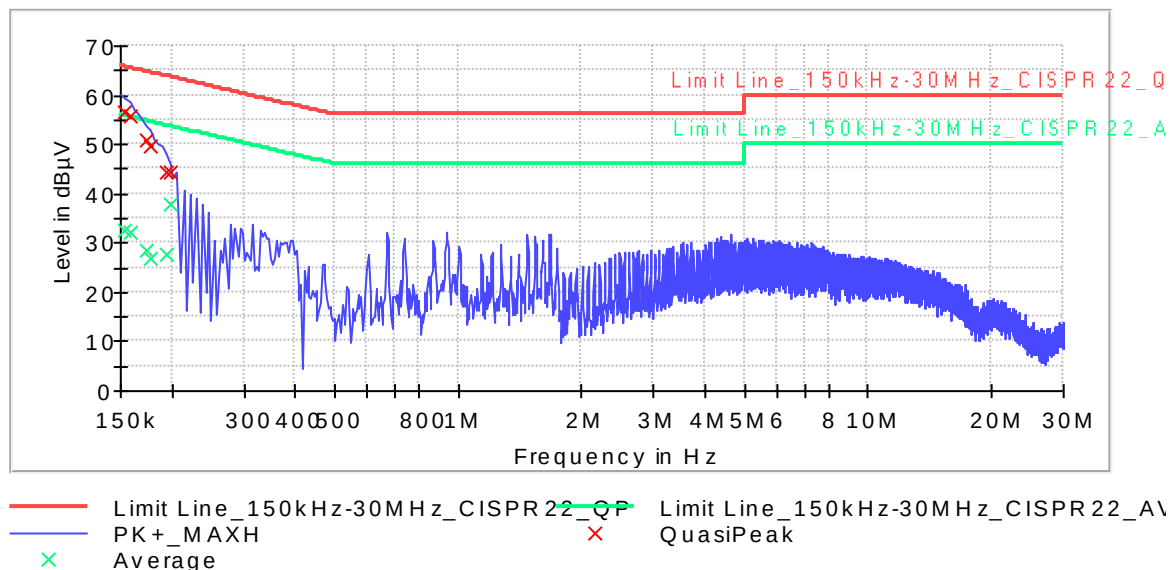


Limit and Margin_Single_L1_QP_AV

Frequency (MHz)	MaxPeak (dBµV)	QuasiPeak (dBµV)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Margin - QPK (dB)	Limit - QPK (dBµV)	Margin - AVG (dB)	Limit - AVG (dBµV)
0.154000	46.2	37.0	7.6	1000.0	9.000	28.8	65.8	48.2	55.8
0.158000	46.9	37.0	6.8	1000.0	9.000	28.6	65.6	48.7	55.6
0.174000	41.4	36.8	6.1	1000.0	9.000	28.0	64.8	48.7	54.8
0.178000	41.4	36.8	6.0	1000.0	9.000	27.8	64.6	48.6	54.6
0.198000	47.4	36.3	5.6	1000.0	9.000	27.4	63.7	48.1	53.7
0.202000	47.2	36.4	5.5	1000.0	9.000	27.2	63.5	48.0	53.5
0.222000	39.7	36.1	5.2	1000.0	9.000	26.6	62.7	47.5	52.7
0.242000	45.3	35.9	4.8	1000.0	9.000	26.2	62.0	47.3	52.0
0.246000	47.0	35.7	4.7	1000.0	9.000	26.2	61.9	47.2	51.9
0.290000	46.2	35.4	4.5	1000.0	9.000	25.1	60.5	46.0	50.5
0.294000	47.0	36.4	5.3	1000.0	9.000	24.1	60.4	45.1	50.4
0.314000	45.6	38.7	7.1	1000.0	9.000	21.1	59.9	42.8	49.9
0.318000	41.7	38.8	7.0	1000.0	9.000	21.0	59.8	42.8	49.8
0.338000	47.8	38.0	6.3	1000.0	9.000	21.3	59.3	43.0	49.3
0.342000	47.6	38.0	6.2	1000.0	9.000	21.2	59.2	43.0	49.2
0.362000	46.2	37.3	5.5	1000.0	9.000	21.4	58.7	43.2	48.7
0.382000	44.5	36.5	4.7	1000.0	9.000	21.8	58.2	43.6	48.2
0.386000	44.1	36.3	4.5	1000.0	9.000	21.9	58.1	43.6	48.1
0.394000	42.4	35.9	4.0	1000.0	9.000	22.1	58.0	44.0	48.0
0.406000	41.2	34.9	3.4	1000.0	9.000	22.8	57.7	44.3	47.7

Connected to PC with data transfer over USB, charging over USB, tested on AC input of PC:

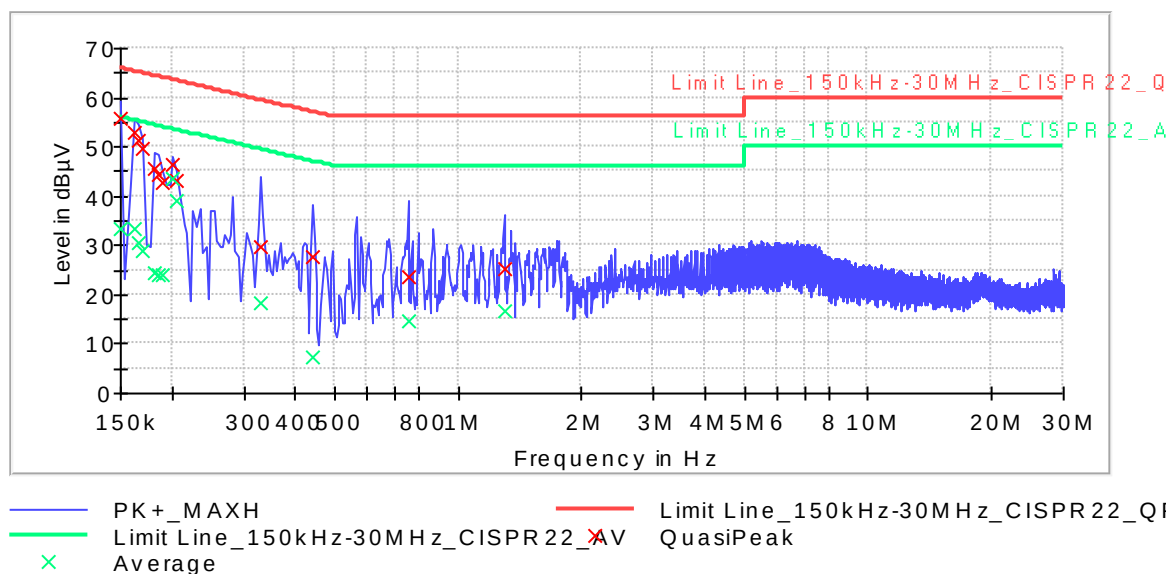
Tested on N



Limit and Margin Single_N_QP_AV

Frequency (MHz)	MaxPeak (dBµV)	QuasiPeak (dBµV)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Margin - QPK (dB)	Limit - QPK (dBµV)	Margin - AVG (dB)	Limit - AVG (dBµV)
0.154000	59.5	56.6	32.5	1000.0	9.000	9.2	65.8	23.3	55.8
0.158000	58.5	55.8	32.2	1000.0	9.000	9.7	65.6	23.4	55.6
0.174000	53.8	50.9	28.6	1000.0	9.000	13.9	64.8	26.2	54.8
0.178000	52.9	49.7	26.7	1000.0	9.000	14.9	64.6	27.8	54.6
0.194000	48.1	44.2	27.8	1000.0	9.000	19.7	63.9	26.1	53.9
0.198000	46.0	44.2	37.9	1000.0	9.000	19.5	63.7	15.8	53.7

Tested on L1



Limit and Margin Single L1 QP AV

Frequency (MHz)	MaxPeak (dBμV)	QuasiPeak (dBμV)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Margin - QPK (dB)	Limit - QPK (dBμV)	Margin - AVG (dB)	Limit - AVG (dBμV)
0.150000	59.3	55.7	33.4	1000.0	9.000	10.3	66.0	22.6	56.0
0.162000	55.7	53.0	33.5	1000.0	9.000	12.4	65.4	21.9	55.4
0.166000	54.4	51.4	30.4	1000.0	9.000	13.7	65.2	24.7	55.2
0.170000	51.6	49.6	28.9	1000.0	9.000	15.4	65.0	26.1	55.0
0.182000	48.8	45.7	24.3	1000.0	9.000	18.7	64.4	30.1	54.4
0.186000	48.5	44.3	24.2	1000.0	9.000	20.0	64.2	30.0	54.2
0.190000	45.1	42.9	23.9	1000.0	9.000	21.1	64.0	30.2	54.0
0.202000	47.9	46.4	43.4	1000.0	9.000	17.1	63.5	10.2	53.5
0.206000	45.4	43.3	39.1	1000.0	9.000	20.0	63.4	14.3	53.4
0.330000	44.1	29.7	18.3	1000.0	9.000	29.8	59.5	31.2	49.5
0.442000	38.3	27.8	7.3	1000.0	9.000	29.2	57.0	39.7	47.0
0.754000	39.0	23.6	14.5	1000.0	9.000	32.4	56.0	31.6	46.0
1.294000	36.1	25.2	16.8	1000.0	9.000	30.8	56.0	29.2	46.0

Results

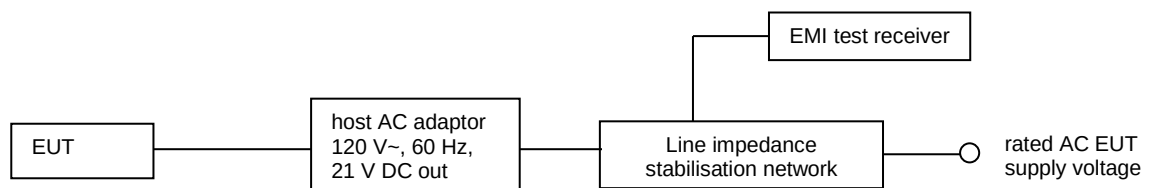
From the measurement data obtained, the tested sample was considered to have COMPLIED with the requirements for the conducted emission measurements.

Test equipment used:

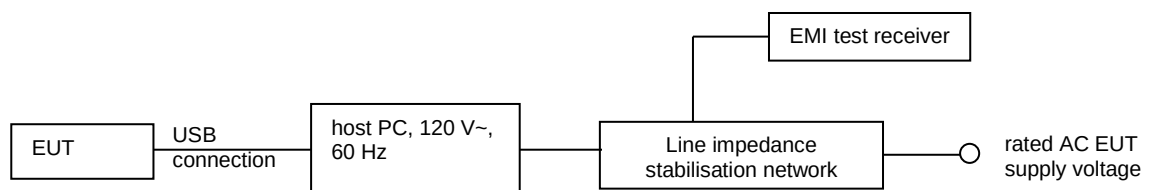
Bezeichnung/ Kind of equipment	Hersteller/ Manufacturer	Typ/ Type	PKM-Ident-Nr./ PKM-ident no.
EMI-Test-Receiver	Rohde & Schwarz	ESR7	11505
Line impedance stabilisation network	Rohde&Schwarz	ESH2-Z5	10139
Shielded room	Siemens	(3,7 x 3,4 x 2,1) m (l x w x h) DC – 1 GHz	10111

All measurements were made with measuring instruments, including any accessories that may affect test results, calibrated according to the requests of ISO/IEC 17025 according to which the test site is accredited. Measurement of conducted emissions was made with instruments conforming to American National Standard Specification, ANSI C63.4-2009.

Block diagram Conducted emissions for charge mode



Block diagram Conducted emissions for USB connection and data transfer to a host PC



Measurement uncertainty

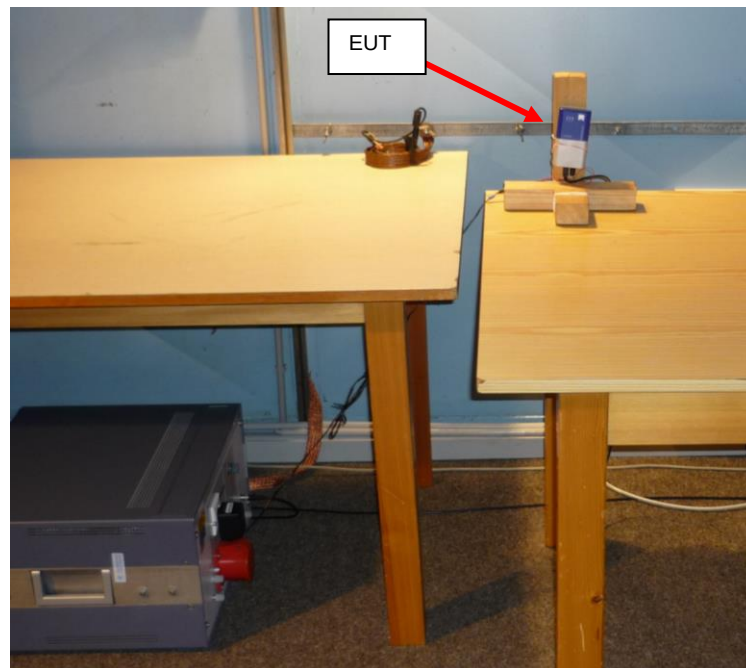
Parameter	PKM measurement uncertainty
Emissions conducted	±3.2 dB
Temperature	±0.72 °C
Humidity	±2.54 %
DC and low frequency voltages	±0.76 % (DC up to 40 V) ±1.74 % (AC 50 Hz/60 Hz up to 400 V)

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT in the above mentioned way.

The measurements uncertainty was calculated in accordance with CISPR 16-4-2, NAMAS NIS 81: "The treatment of uncertainty in EMC measurement" and "Guide to the Expression of Uncertainty in Measurement (GUM)".

The measurement uncertainty was given with a confidence of 95 %.

Photo(s) of test setup



4. Radiated emission measurements

Test site

Measurement of radiated emissions from EUT was made in the semi-anechoic chamber that has been found in compliance with Federal Communications Commissions (FCC) requirements of 47CFR2.948 according to ANSI C63.4-2009 on March 11, 2015 and which comply with the requirements in CISPR 16-1-4:2007 referenced in CAN/CSA-CISPR 22-10.

Detector function selection and bandwidth

In radiated emissions measurement, a field strength meter that have CISPR quasi-peak was used. The bandwidth of the detector of instrument is 120 kHz over frequency range of 30 to 1000 MHz, emissions to be measured are detected in CISPR quasi peak mode. In the frequency range 1 GHz – 5 GHz the used bandwidth was 1000 kHz and emissions to be measured are detected in peak and average mode.

Antennas

Measurements were made using a calibrated bilog antenna in the range of 30 to 1000 MHz to determine the emission characteristics of the EUT. Measurements were also made for both horizontal and vertical polarization.

The horizontal distance between the receiving antenna and the EUT was 3 meters and the limit had been corrected accordingly with 10 dB.

In the range of 1 GHz to 5 GHz measurements were made using a calibrated horn antenna to determine the emission characteristics of the EUT. Measurements were also made for both horizontal and vertical polarization.

The horizontal distance between the receiving antenna and the EUT was 3 meters

Frequency range to be scanned

For radiated emissions measurements, the spectrum in the range of 30 to 5 GHz was investigated as the highest frequency generated is less than 1000 MHz.

Test conditions and configuration of EUT

The EUT was configured and operated in all modes of operation (charging, transmitting, receiving, USB connected to PC with data transfer), so as to find the maximum radiated emission generated from EUT.

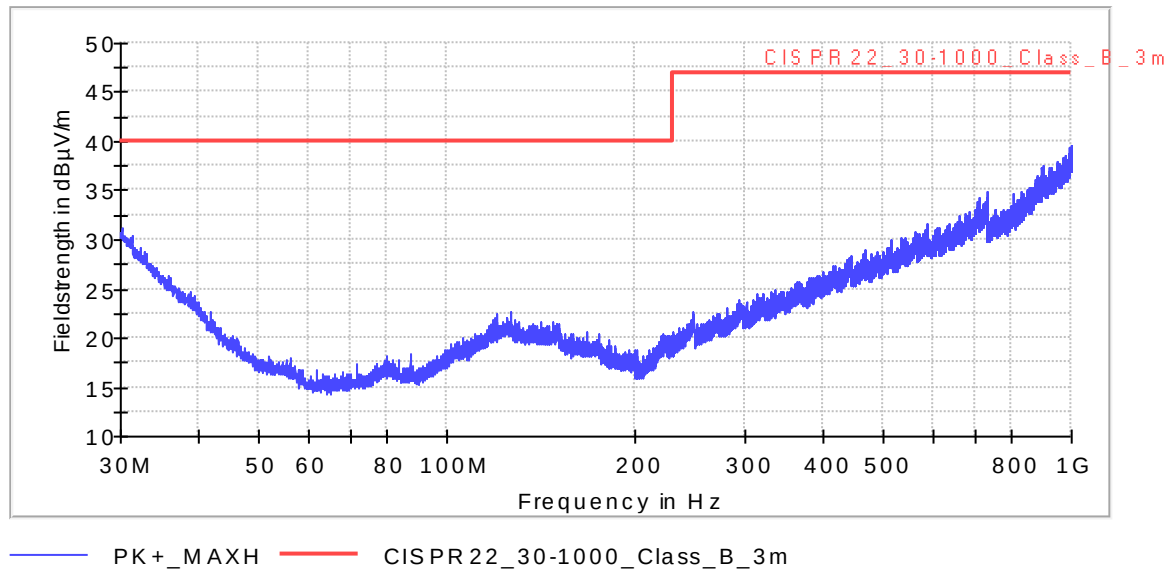
During test the EUT was operated with rated Power (120 V~, 60 Hz) for charging, while transmitting and receiving were performed battery operated with built-in battery pack. The EUT was placed on a 80 cm high non metallic 1 m diameter turntable. The EUT was rotated and the antenna height was varied between 1m to 4 m to find the maximum RF energy generated from EUT.

Applied standards

47 CFR part 15 subpart B, § 15.109 Radiated limits, Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, "Information Technology Equipment—Radio Disturbance Characteristics—Limits and Methods of Measurement," 1997, IBR approved for § 15.109
ICES-003, Issue 5, Section 3(a), CAN/CSA-CISPR 22-10

Measurements

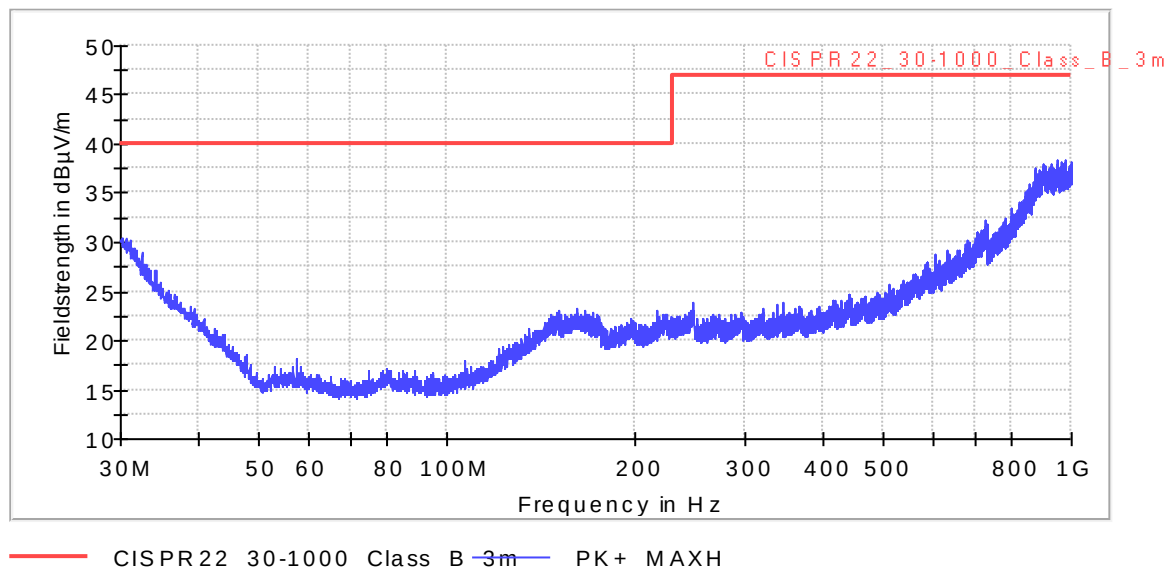
Charge - Horizontal



Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30-230	<34	--	1000.0	120.000	H	--	40.0
>230	<41	--	1000.0	120.000	H	--	47.0

No significant emission found above the noise threshold, all peak emissions at least or more than 6 dB below the Quasipeak limit.

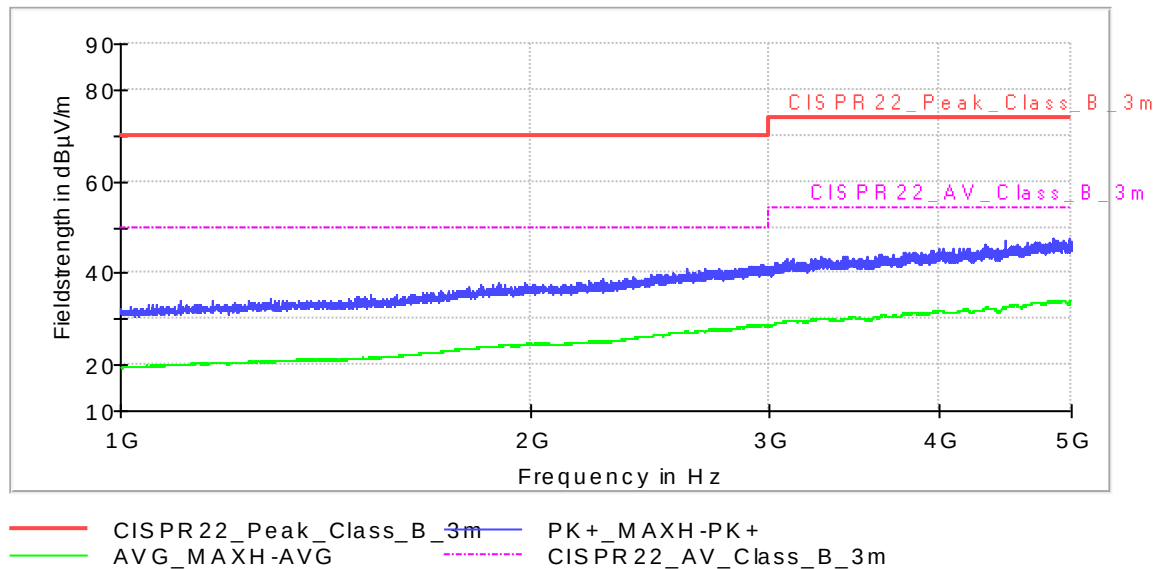
Charge - Vertical



Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30-230	<34	--	1000.0	120.000	V	--	40.0
>230	<41	--	1000.0	120.000	V	--	47.0

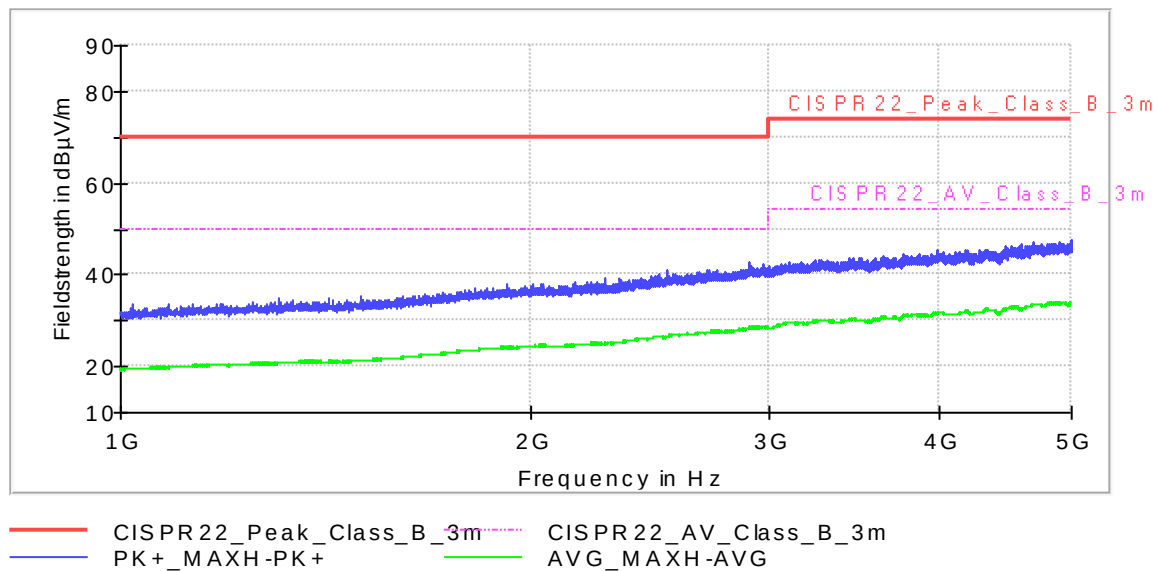
No significant emission found above the noise threshold, all peak emissions at least or more than 6 dB below the Quasipeak limit.

Charge - Horizontal



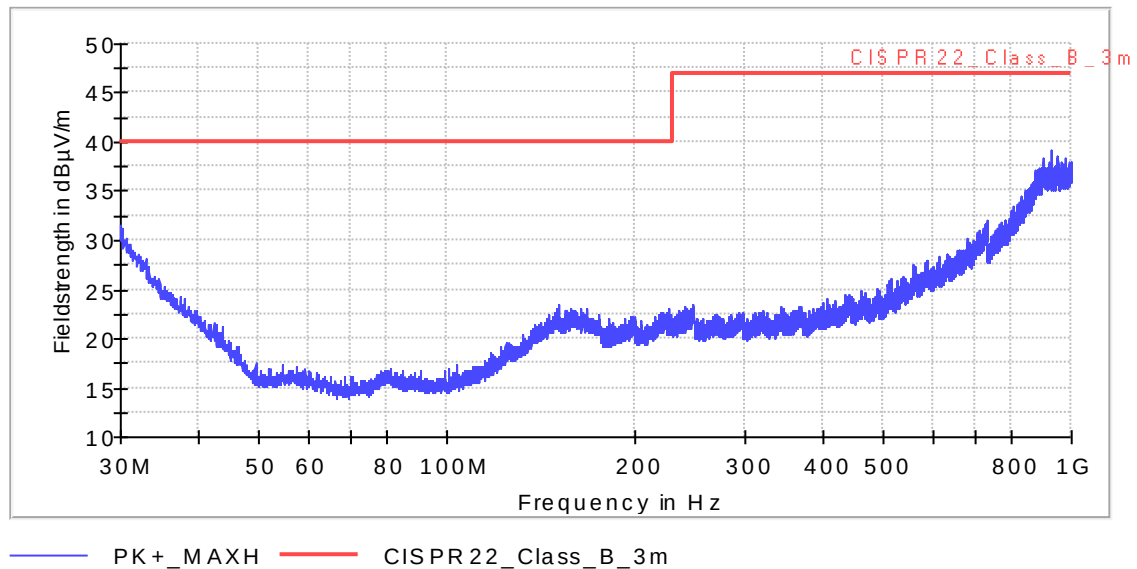
Frequency (MHz)	Peak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Margin - Peak (dB)	Limit - Peak (dBµV/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1000-3000	<50.0	<30.0	1000	>20	70.0	>20	50.0
>3000	<50.0	<30.0	1000	>24	74.0	>24	54.0

Charge - Vertical



Frequency (MHz)	Peak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Margin - Peak (dB)	Limit - Peak (dBµV/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1000-3000	<50.0	<30.0	1000	>20	70.0	>20	50.0
>3000	<50.0	<30.0	1000	>24	74.0	>24	54.0

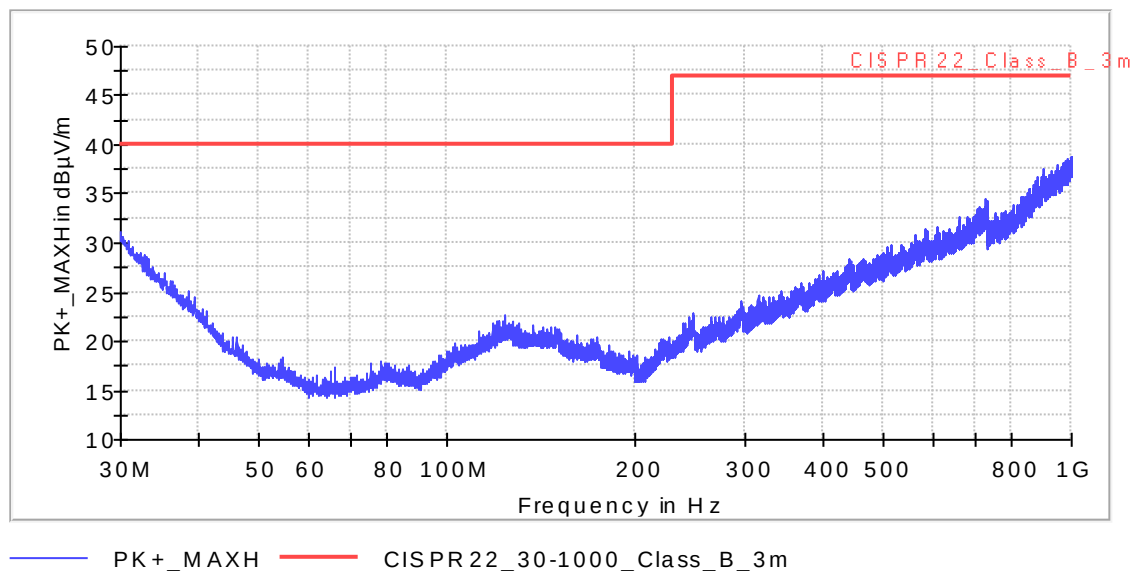
Receiving 919 MHz - Horizontal



Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30-230	<34	--	1000.0	120.000	H	--	40.0
>230	<41	--	1000.0	120.000	H	--	47.0

No significant emission found above the noise threshold, all peak emissions at least or more than 6 dB below the Quasipeak limit.

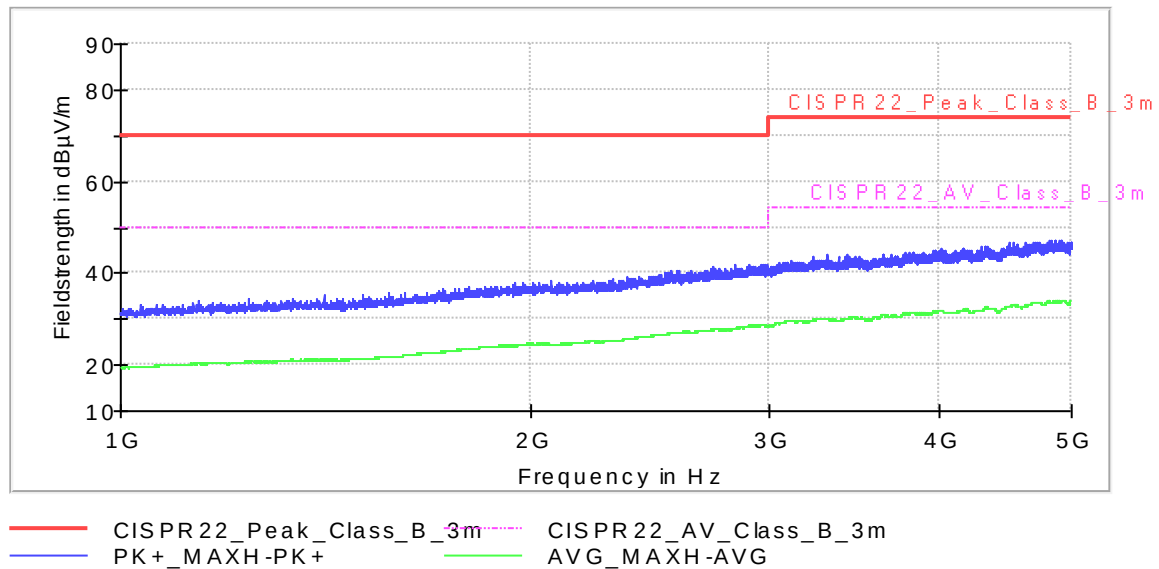
Receiving 919 MHz - Vertical



Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30-230	<34	--	1000.0	120.000	V	--	40.0
>230	<41	--	1000.0	120.000	V	--	47.0

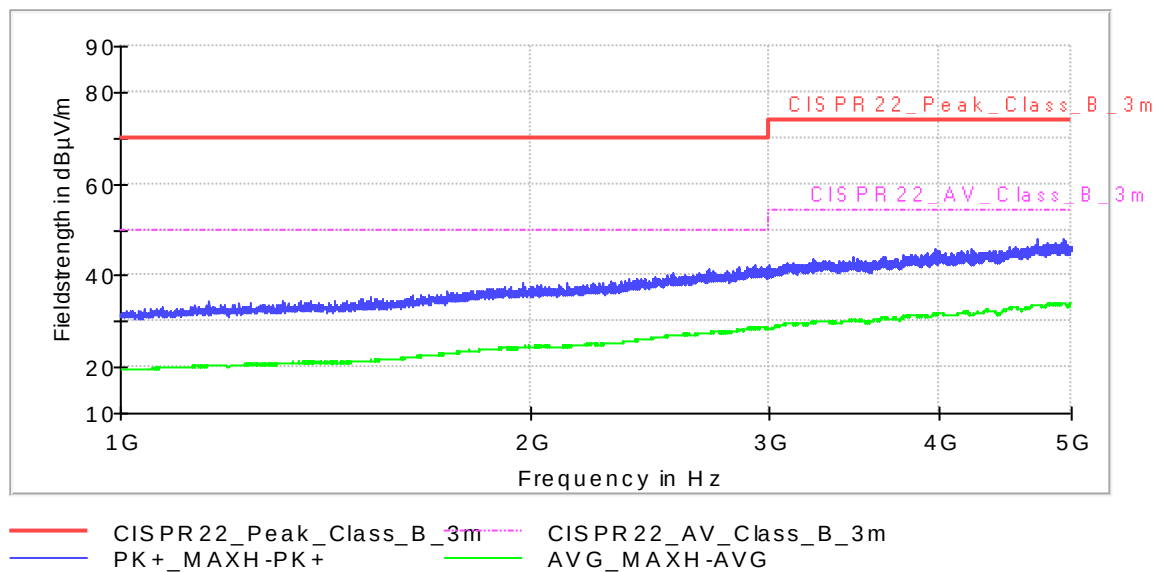
No significant emission found above the noise threshold, all peak emissions at least or more than 6 dB below the Quasipeak limit.

Receiving 919MHz - Horizontal



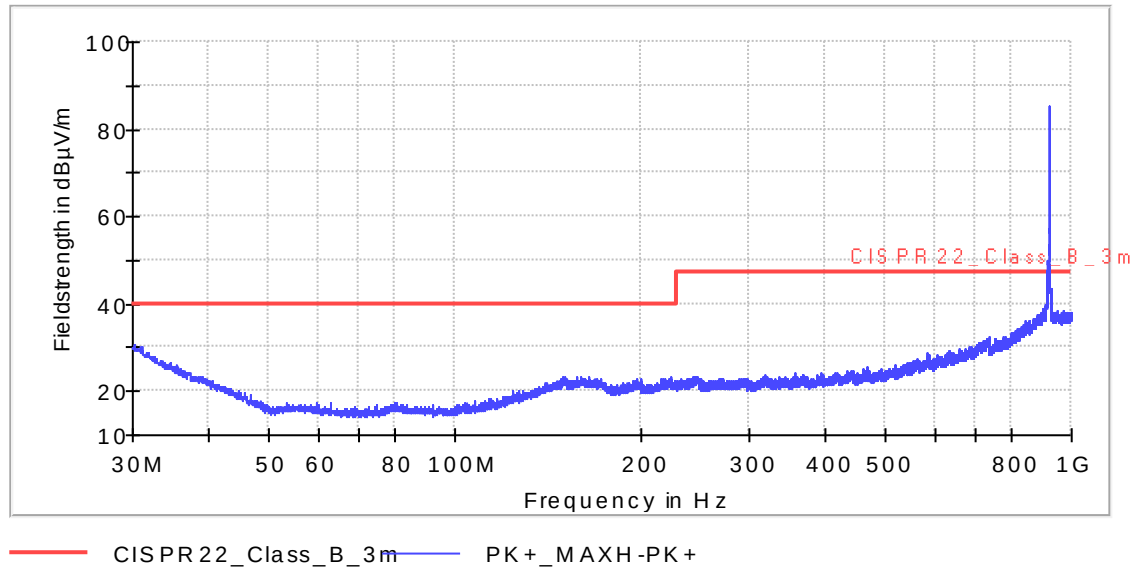
Frequency (MHz)	Peak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Margin - Peak (dB)	Limit - Peak (dBµV/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1000-3000	<50.0	<30.0	1000	>20	70.0	>20	50.0
>3000	<50.0	<30.0	1000	>24	74.0	>24	54.0

Receiving 919MHz - Vertical



Frequency (MHz)	Peak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Margin - Peak (dB)	Limit - Peak (dBµV/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1000-3000	<50.0	<30.0	1000	>20	70.0	>20	50.0
>3000	<50.0	<30.0	1000	>24	74.0	>24	54.0

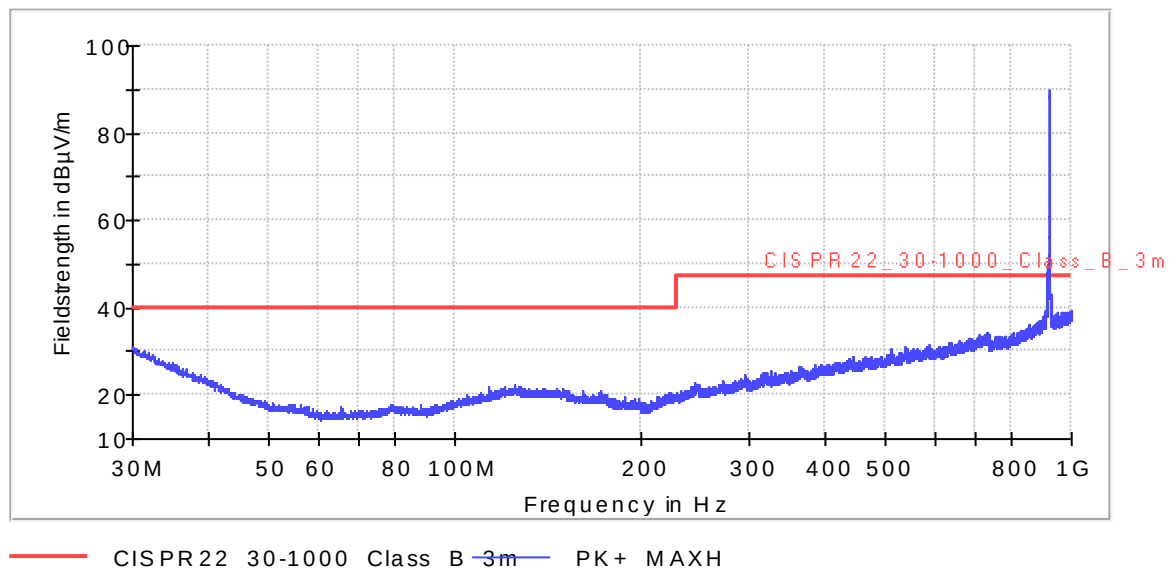
Transmitting 920MHz_Horizontal



Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30-230	<34	--	1000.0	120.000	H	--	40.0
230-902	<41	--	1000.0	120.000	H	--	47.0
928-1000	<41	--	1000.0	120.000	H	--	47.0

No significant spurious emission (other than fundamental) found above the noise threshold, all peak emissions at least or more than 6 dB below the Quasipeak limit.

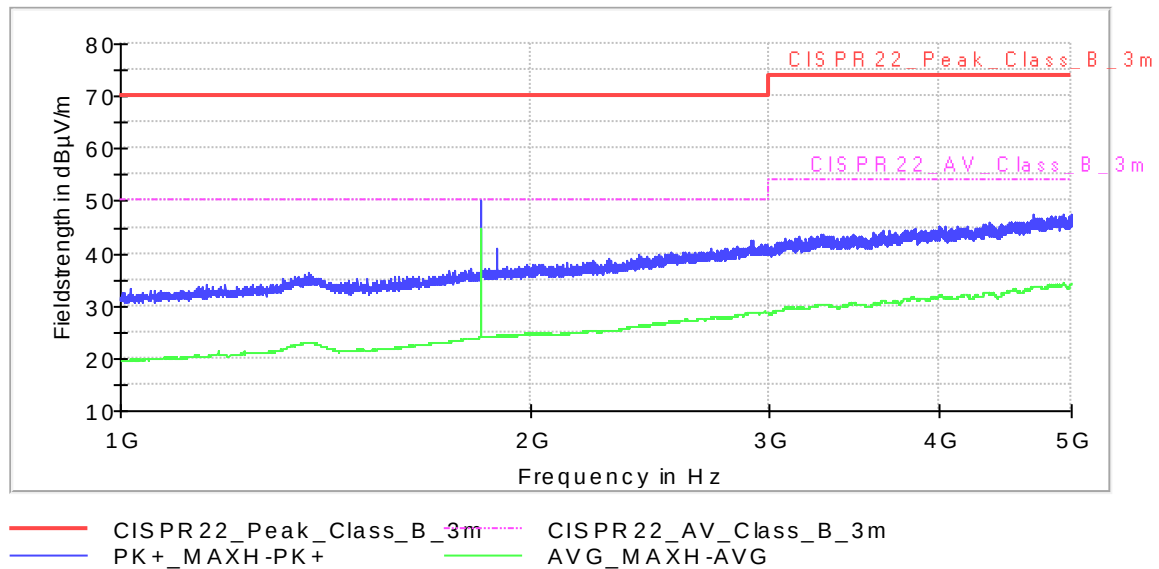
Transmitting 920MHz_Vertical



Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30-230	<34	--	1000.0	120.000	V	--	40.0
230-902	<41	--	1000.0	120.000	V	--	47.0
928-1000	<41	--	1000.0	120.000	V	--	47.0

No significant spurious emission (other than fundamental) found above the noise threshold, all peak emissions at least or more than 6 dB below the Quasipeak limit.

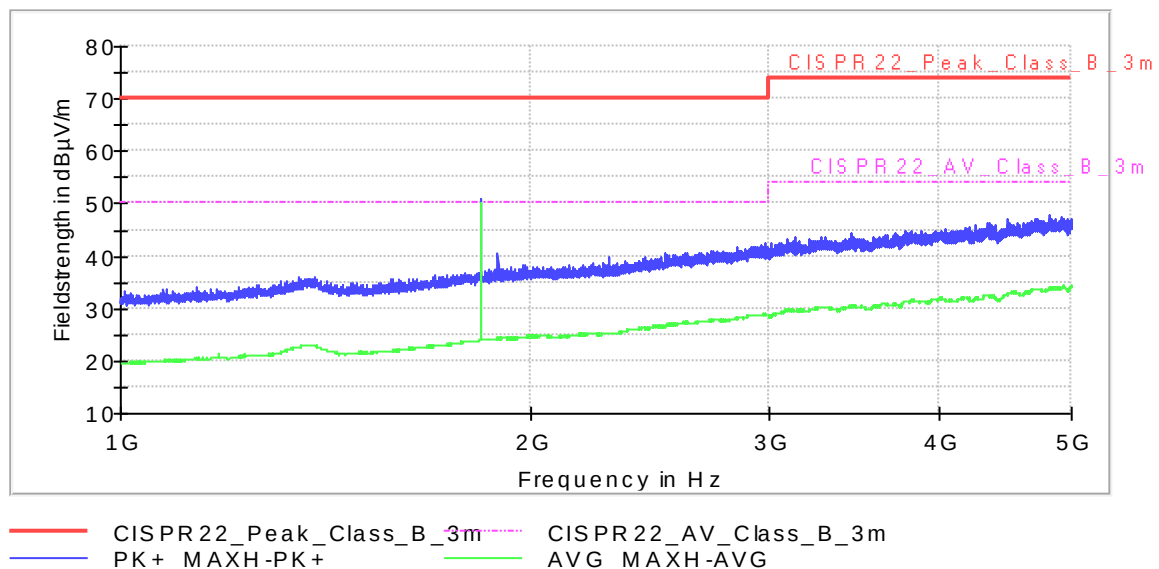
Transmitting 920MHz-Horizontal



Frequency (MHz)	Peak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Margin - Peak (dB)	Limit - Peak (dBµV/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1000-3000	<50.0	<30.0	1000	>20	70.0	>20	50.0
>3000	<50.0	<30.0	1000	>24	74.0	>24	54.0

No significant spurious emission (other than harmonics) found, all emissions at least or more than 6 dB below the relevant limits.

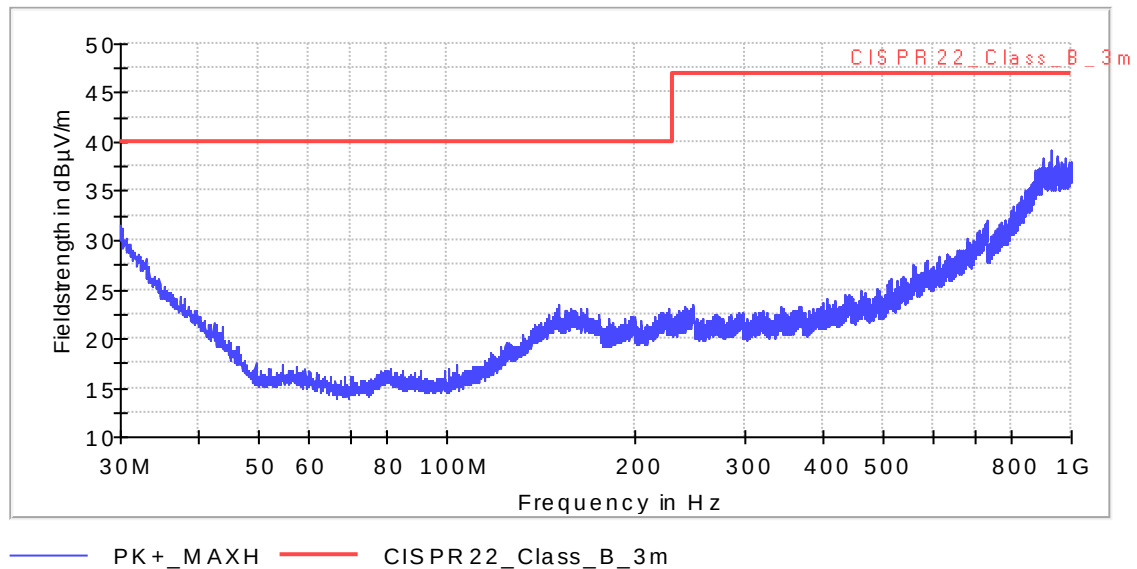
Transmitting 920MHz-Vertical



Frequency (MHz)	Peak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Margin - Peak (dB)	Limit - Peak (dBµV/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1000-3000	<50.0	<30.0	1000	>20	70.0	>20	50.0
>3000	<50.0	<30.0	1000	>24	74.0	>24	54.0

No significant spurious emission (other than harmonics) found, all emissions at least or more than 6 dB below the relevant limits.

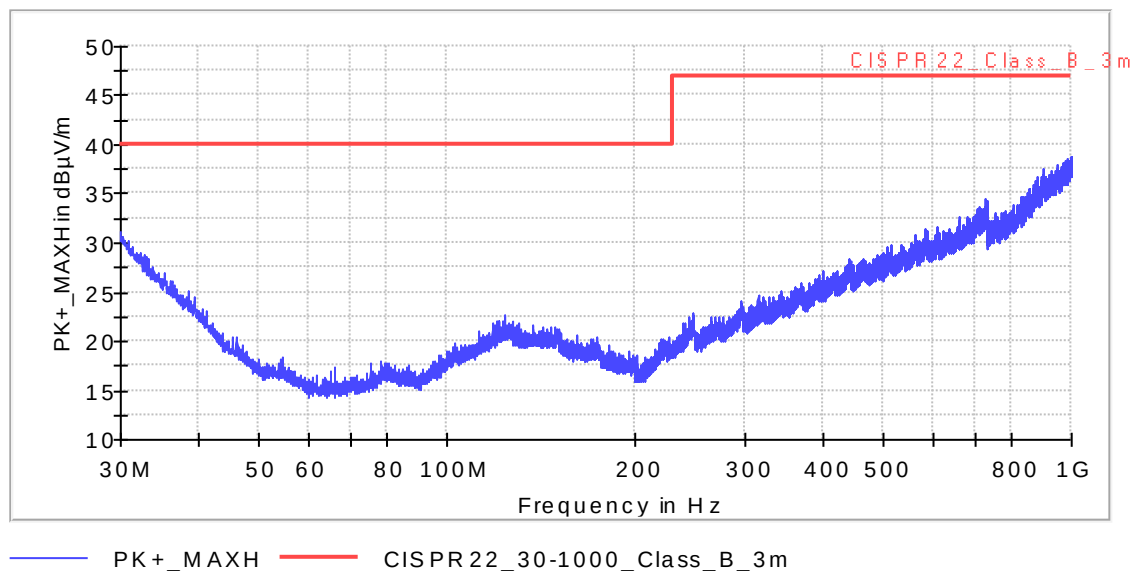
Receiving 920 MHz - Horizontal



Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30-230	<34	--	1000.0	120.000	H	--	40.0
>230	<41	--	1000.0	120.000	H	--	47.0

No significant emission found above the noise threshold, all peak emissions at least or more than 6 dB below the Quasipeak limit.

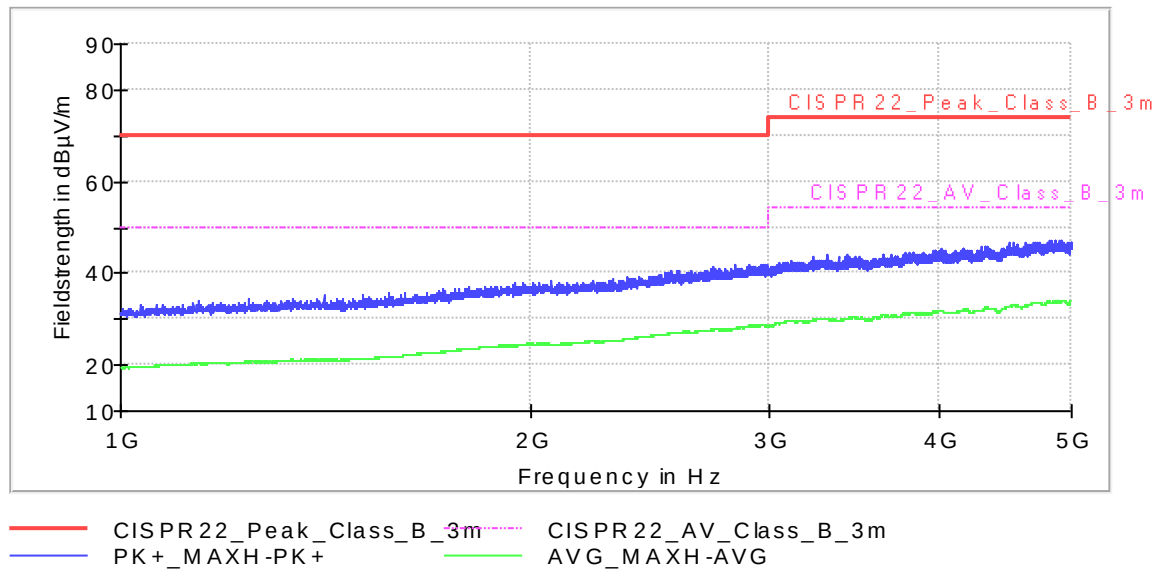
Receiving 920 MHz - Vertical



Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30-230	<34	--	1000.0	120.000	V	--	40.0
>230	<41	--	1000.0	120.000	V	--	47.0

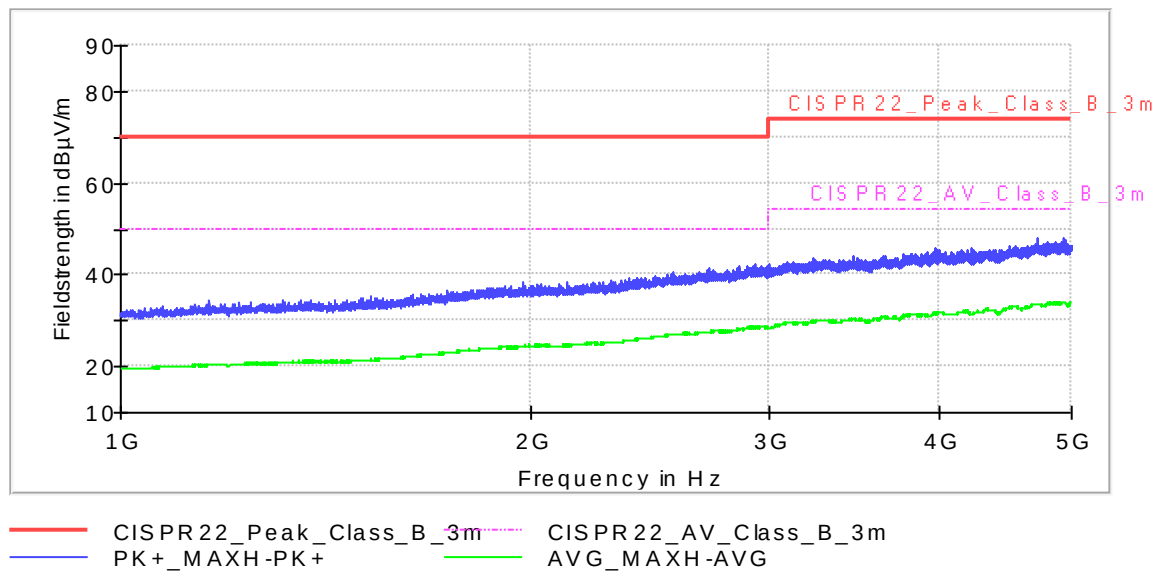
No significant emission found above the noise threshold, all peak emissions at least or more than 6 dB below the Quasipeak limit.

Receiving 920MHz - Horizontal



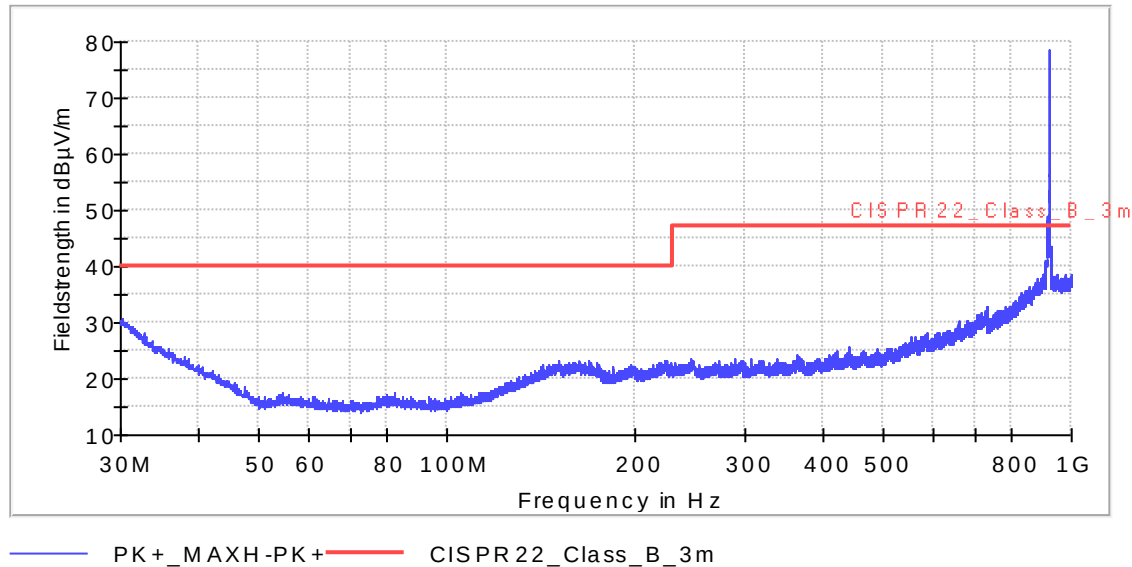
Frequency (MHz)	Peak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Margin - Peak (dB)	Limit - Peak (dBµV/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1000-3000	<50.0	<30.0	1000	>20	70.0	>20	50.0
>3000	<50.0	<30.0	1000	>24	74.0	>24	54.0

Receiving 920MHz - Vertical



Frequency (MHz)	Peak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Margin - Peak (dB)	Limit - Peak (dBµV/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1000-3000	<50.0	<30.0	1000	>20	70.0	>20	50.0
>3000	<50.0	<30.0	1000	>24	74.0	>24	54.0

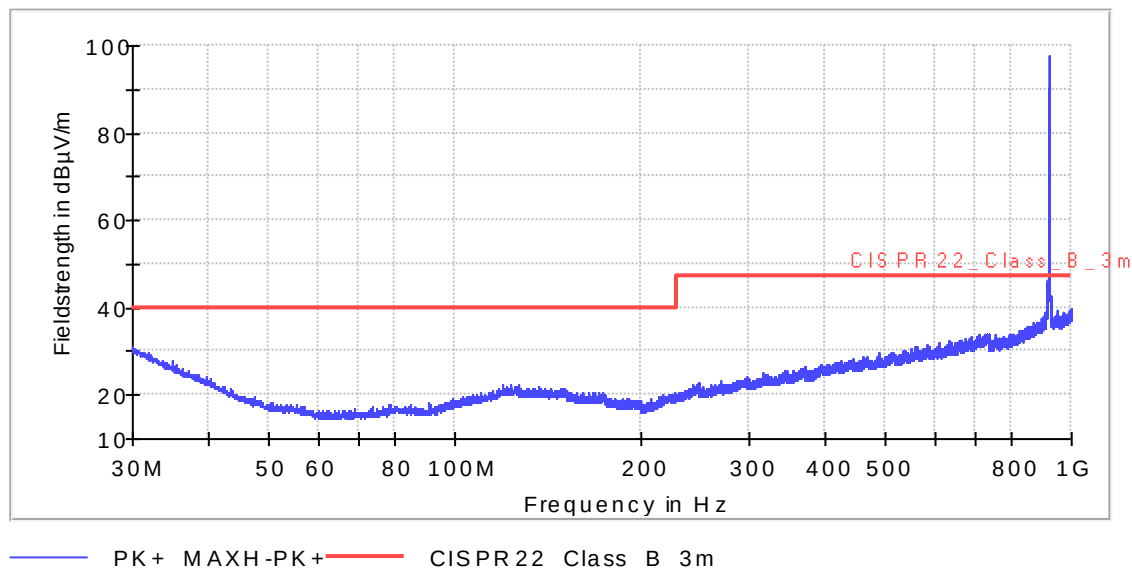
Transmitting 921MHz_Horizontal



Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30-230	<34	--	1000.0	120.000	H	--	40.0
230-902	<41	--	1000.0	120.000	H	--	47.0
928-1000	<41	--	1000.0	120.000	H	--	47.0

No significant spurious emission (other than fundamental) found above the noise threshold, all peak emissions at least or more than 6 dB below the Quasipeak limit.

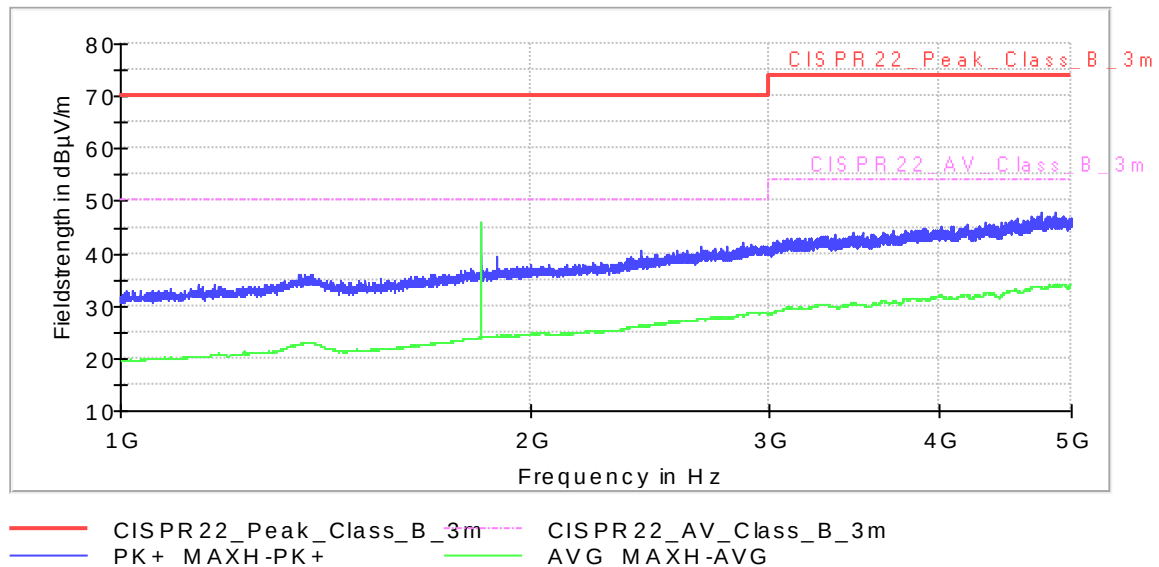
Transmitting 921MHz_Vertical



Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30-230	<34	--	1000.0	120.000	V	--	40.0
230-902	<41	--	1000.0	120.000	V	--	47.0
928-1000	<41	--	1000.0	120.000	V	--	47.0

No significant spurious emission (other than fundamental) found above the noise threshold, all peak emissions at least or more than 6 dB below the Quasipeak limit.

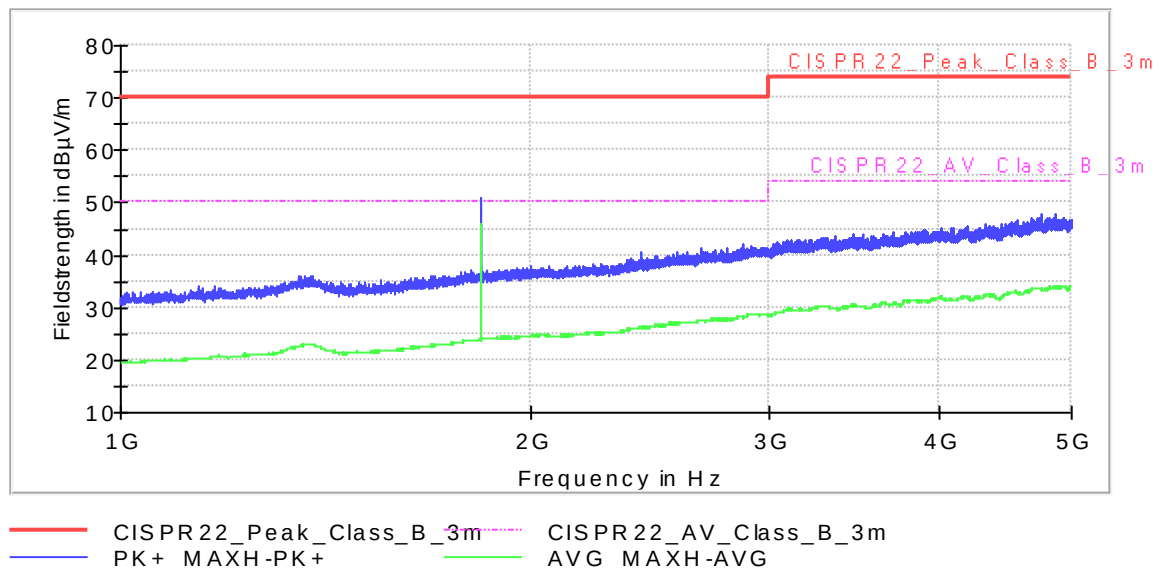
Transmitting 921MHz_Horizontal



Frequency (MHz)	Peak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Margin - Peak (dB)	Limit - Peak (dBµV/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1000-3000	<50.0	<30.0	1000	>20	70.0	>20	50.0
>3000	<50.0	<30.0	1000	>24	74.0	>24	54.0

No significant spurious emission (other than harmonics) found, all emissions at least or more than 6 dB below the relevant limits.

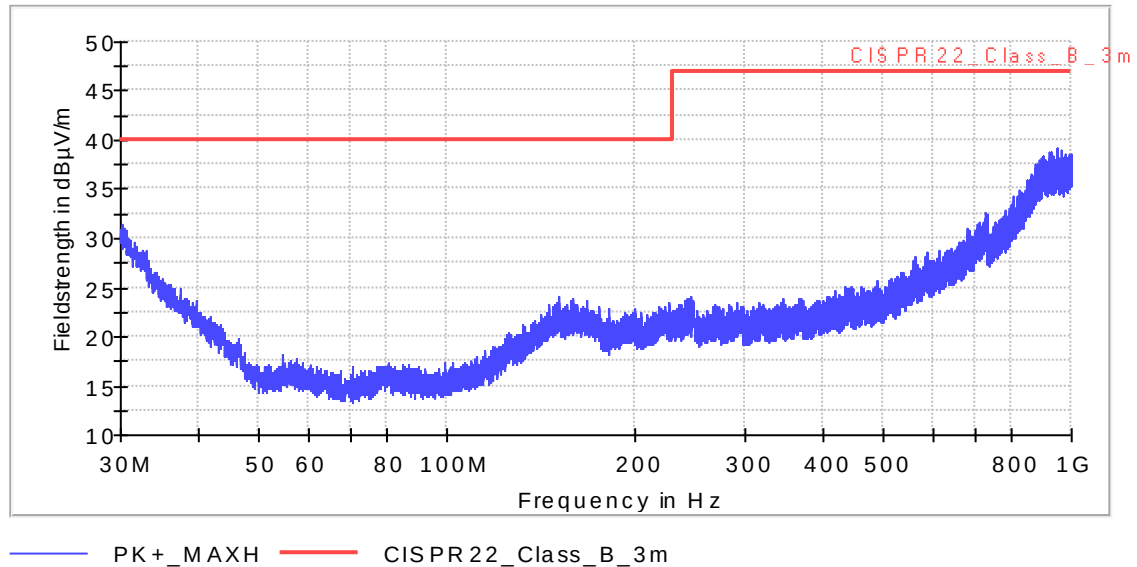
Transmitting 921MHz_Vertical



Frequency (MHz)	Peak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Margin - Peak (dB)	Limit - Peak (dBµV/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1000-3000	<50.0	<30.0	1000	>20	70.0	>20	50.0
>3000	<50.0	<30.0	1000	>24	74.0	>24	54.0

No significant spurious emission (other than harmonics) found, all emissions at least or more than 6 dB below the relevant limits.

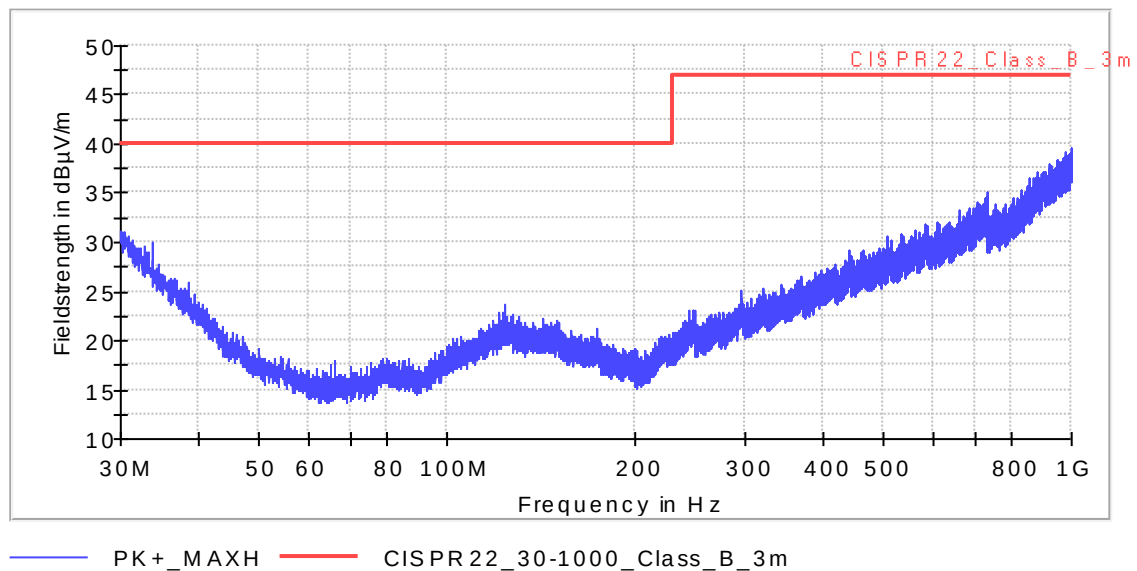
USB connection to PC with data transfer - Horizontal



Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30-230	<34	--	1000.0	120.000	H	--	40.0
>230	<41	--	1000.0	120.000	H	--	47.0

No significant emission found above the noise threshold, all peak emissions at least or more than 6 dB below the Quasipeak limit.

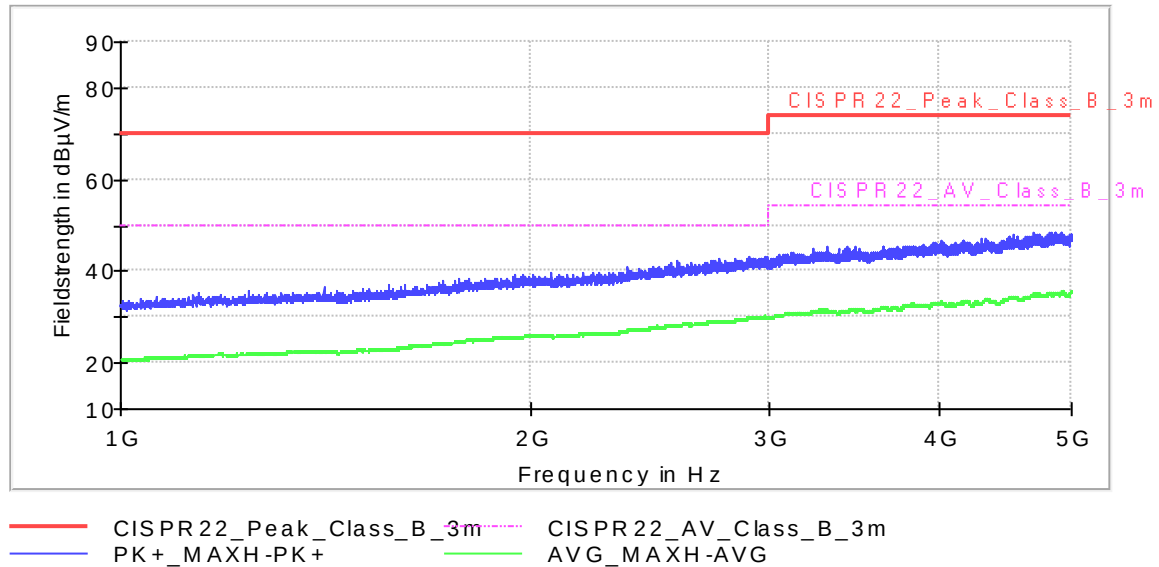
USB connection to PC with data transfer - Vertical



Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
30-230	<34	--	1000.0	120.000	V	--	40.0
>230	<41	--	1000.0	120.000	V	--	47.0

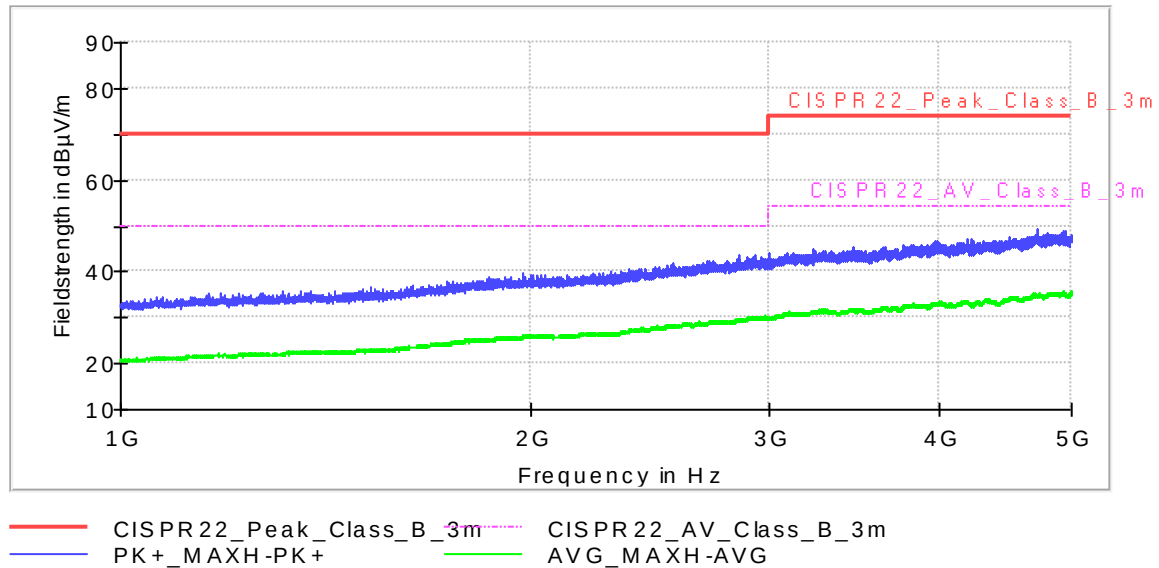
No significant emission found above the noise threshold, all peak emissions at least or more than 6 dB below the Quasipeak limit.

USB connected to pc with data transfer - Horizontal



Frequency (MHz)	Peak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Margin - Peak (dB)	Limit - Peak (dBµV/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1000-3000	<50.0	<30.0	1000	>20	70.0	>20	50.0
>3000	<50.0	<30.0	1000	>24	74.0	>24	54.0

USB connected to pc with data transfer - Vertical



Frequency (MHz)	Peak (dBµV/m)	Average (dBµV/m)	Bandwidth (kHz)	Margin - Peak (dB)	Limit - Peak (dBµV/m)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
1000-3000	<50.0	<30.0	1000	>20	70.0	>20	50.0
>3000	<50.0	<30.0	1000	>24	74.0	>24	54.0

Results

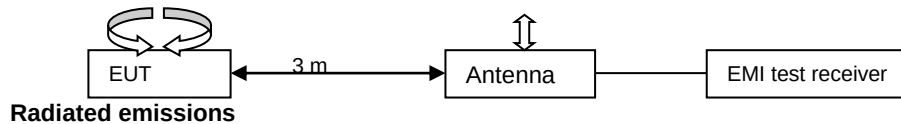
From the measurement data obtained, the tested sample was considered to have COMPLIED with the requirements for the radiated emission measurements.

Test equipment used:

Bezeichnung/ Kind of equipment	Hersteller/ Manufacturer	Typ/ Type	PKM-Ident-Nr./ PKM-ident no.
EMI-Test-Receiver	Rohde & Schwarz	ESR7	11505
Antenna	Schaffner	CBL6111C	10977
Antenna	Electro Metric	RGA50/60	10273
Antenna mast system	Schwarzbeck	AM9104	10099
Shielded room	Siemens	Semi-Anechoic-Chamber (13 x 10 x 5,1) m (l x w x h)	10114
Turntable	Heinrich Deisel	DT312	10774
AC-linefilter	Timonta	FV2-10-D	10755

All measurements were made with measuring instruments, including any accessories that may affect test results, calibrated according to the requests of ISO/IEC 17025 according to which the test site is accredited. Measurement of radiated emissions was made with instruments conforming to American National Standard Specification, ANSI C63.4-2009.

Block diagram



Measurement uncertainty

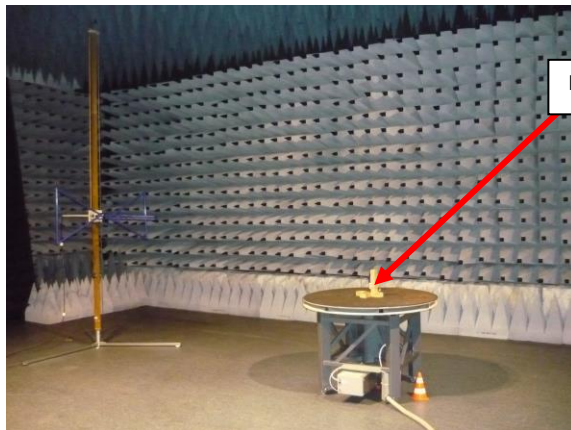
Parameter	PKM measurement uncertainty
Emissions radiated	±4.2 dB
Temperature	±0.72 °C
Humidity	±2.54 %
DC and low frequency voltages	±0.76 % (DC up to 40 V) ±1.74 % (AC 50 Hz/60 Hz up to 400 V)

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT in the above mentioned way.

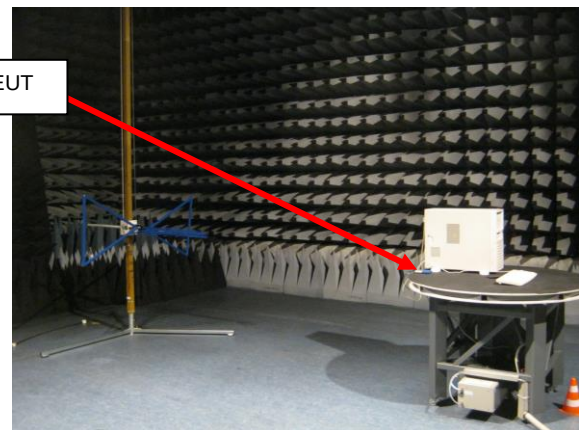
The measurements uncertainty was calculated in accordance with CISPR 16-4-2, NAMAS NIS 81: "The treatment of uncertainty in EMC measurement" and "Guide to the Expression of Uncertainty in Measurement (GUM)".

The measurement uncertainty was given with a confidence of 95 %.

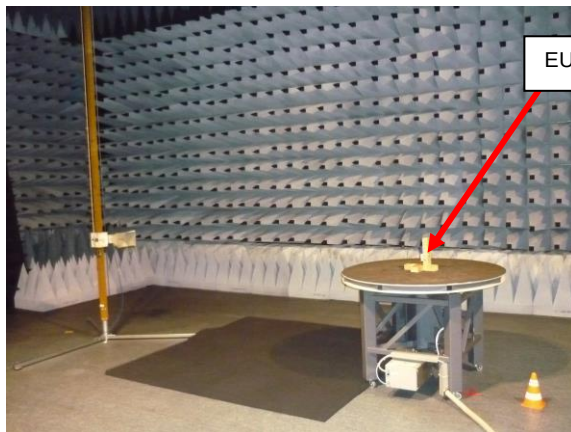
Photo(s) of test setup



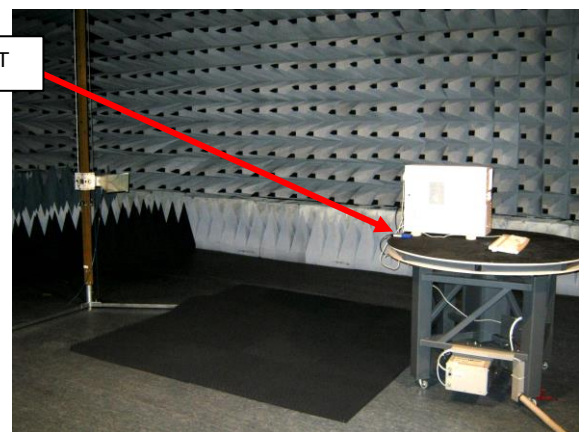
receiving/transmitting
tested frequency range 30 MHz – 1000 MHz



USB connected to PC



receiving/transmitting
tested frequency range 1 GHz – 5 GHz



USB connected to PC

5. CONCLUSIONS

From the measurement data obtained, the tested sample was considered to have **COMPLIED** with the requirements for the relevant clauses of Federal Communications Commission Rules for unintentional radiators 47 CFR part 15 subpart B

§ 15.107 Conducted limits, class B

§ 15.109 Radiated limits, class B, Third Edition of the International Special Committee on Radio Interference (CISPR), Pub. 22, "Information Technology Equipment—Radio Disturbance Characteristics—Limits and Methods of Measurement," 1997, IBR approved for § 15.109.

From the measurement data obtained, the tested sample was considered to have **COMPLIED** with the requirements for the relevant clauses of Canadian ICES-003, Issue 5, August 2012. The compliance with ICES-003, Issue 5 is demonstrated by complying with the conducted and radiated emissions limits and employing the methods of measurement contained in the publication referenced in Section 3(a) of ICES-003, Issue 5 (CAN/CSA-CISPR 22-10) class B.



June 18, 2015

Erstellt am/prepared on

W. Eckereder, Laboratory Engineer

(Name/name / Stellung/position)

Wolfgang Eckereder
(Unterschrift/signature)

June 18, 2015

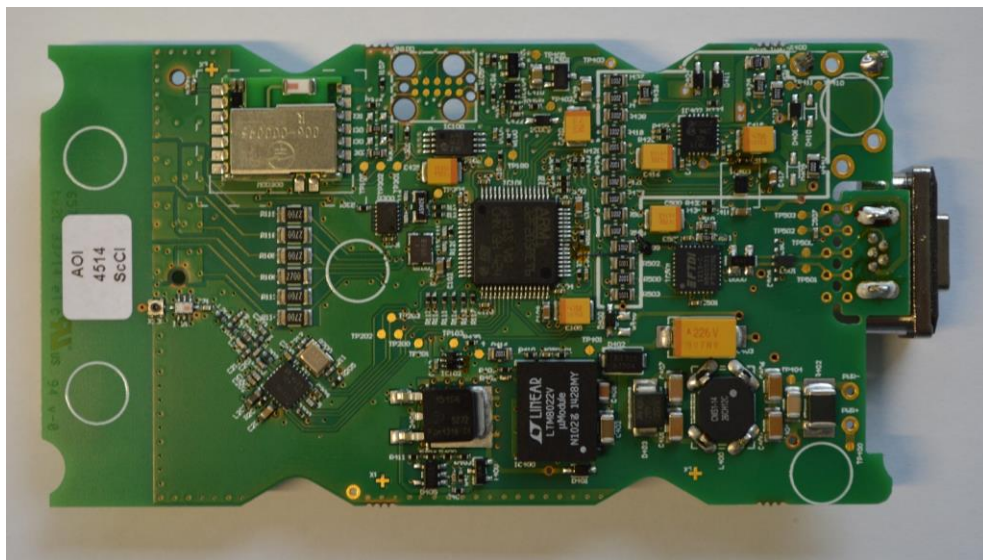
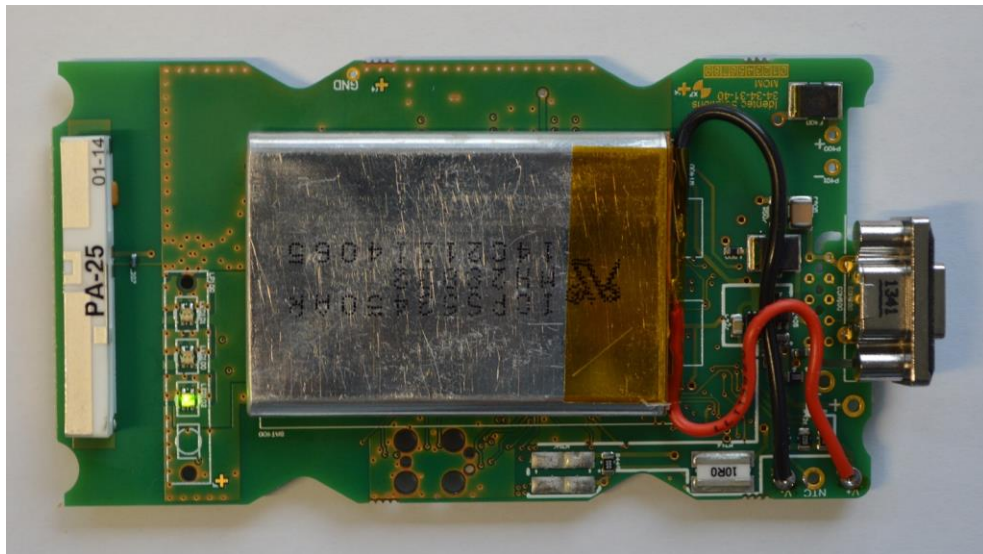
Freigabe am/released on

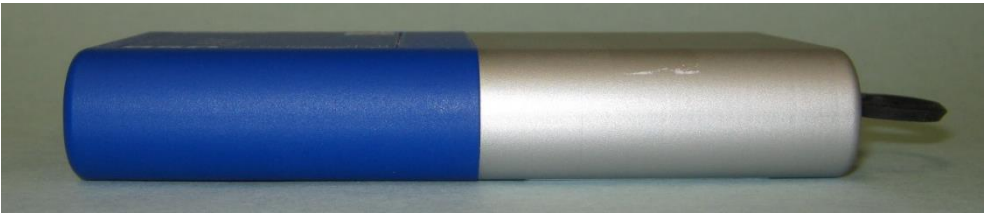
G. Raithel Dipl.-Ing. (FH), Head of Laboratory

(Name/name / Stellung/position)

G. Raithel
(Unterschrift/signature)

6. Photos





End of test report