

FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

EMI - TEST REPORT

- FCC Part 15.249, RSS210 -



Test Report No. :	T36410-00-01KJ	19. April 2013 Date of issue
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Type / Model Name : US-4042

Product Description : Mobile Reader – Wireless pH Monitoring System

Applicant : smaXtec animal care sales GmbH

Address : Wastiangasse 4

8010 GRAZ; AUSTRIA

Manufacturer : smaXtec animal care sales GmbH

Address : Wastiangasse 4

8010 GRAZ; AUSTRIA

Licence holder : smaXtec animal care sales GmbH

Address : Wastiangasse 4

8010 GRAZ; AUSTRIA

Test Result according to the standards listed in clause 1 test standards:	POSITIVE
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The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test results
without the written permission of the test laboratory.

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1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 15, Subpart A - General (September, 2012)

Part 15, Subpart A, Section 15.31	Measurement standards
Part 15, Subpart A, Section 15.33	Frequency range of radiated measurements
Part 15, Subpart A, Section 15.35	Measurement detector functions and bandwidths

FCC Rules and Regulations Part 15, Subpart C - Intentional Radiators (September, 2012)

Part 15, Subpart C, Section 15.109	Radiated emission
Part 15, Subpart C, Section 15.203	Antenna requirement
Part 15, Subpart C, Section 15.204	External radio frequency power amplifiers and antenna modifications
Part 15, Subpart C, Section 15.205	Restricted bands of operation
Part 15, Subpart C, Section 15.207	Conducted limits
Part 15, Subpart C, Section 15.209	Radiated emission limits, general requirements
Part 15, Subpart C, Section 15.249	Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz, 5725 - 5875 MHz, and 24.0 - 24.25 GHz

ANSI C63.4: 2009	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
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ANSI C95.1:2005	IEEE Standard for Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
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CISPR 16-4-2: 2003	Uncertainty in EMC measurement
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CISPR 22: 2005 EN 55022: 2006	Information technology equipment
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2 SUMMARY

2.1 Test result summery

The device using digital modulation:

Operating in the 902 MHz – 928 MHz band:

FCC Rule Part	RSS Rule Part	Description	Result
15.207(a)	RSS Gen, 7.2.4	AC power line conducted emissions	passed
15.215(c)	RSS Gen, 4.6.3	-20 dBc EBW	passed
15.249(a)	RSS-210, A8.4(4)	Field strength of fundamental	passed
15.249(d)	RSS-210, A8.5	Out-of-band emission, radiated	passed
15.205(a)	RSS-Gen, 7.2.2	Emissions in restricted bands	passed
15.35(c)	RSS-Gen, 4.5	Pulsed operation	passed
	RSS-Gen, 4.6.1	99 % Bandwidth	passed
15.109(a)	RSS-Gen, 4.10	Radiated emission	passed

The mentioned RSS Rule Parts in the above table are related to:

RSS Gen, Issue 3, December 2010

RSS 210, Issue 8, December 2010

RSS 102, Issue 4, March 2010

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2.2 GENERAL REMARKS:

The EUT provides only full power setting and the test mode TX continuous mode, modulated.
The EUT was set with test modulation to transmit data during the tests with a duty cycle (X) of assumed X = 1.
According to FCC Part 15.31(m), full test are only performed at 905.5 MHz.

PRODUCT	Mobile Reader – Wireless pH Monitoring System
MODEL NO.	US-4042
TYPE OF EQUIPMENT	Low power communication transceiver
MODULATION TYPE	Digital
MODULATION TECHNOLOGY	2-GFSK
TRANSFER RATE	19200 bps
FREQUENCY RANGE	905.5 MHz to 906.0 MHz
FREQUENCY TOLERANZ	±15 ppm (Crystal ABM11-32.000MHZ-B7G-T)
NUMBER OF CHANNEL	2
RATED RF OUTPUT POWER	31.6 mW (15 dBm)
CONDUCTED RF OUTPUT POWER	N/A
ANTENNA TYPE	Print Antenna, Monopol
ANTENNA STRUCTURE GAIN	-3.5 dBi

2.3 FINAL ASSESSMENT:

The equipment under test **fulfills** the EMI requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 08. October 2012

Testing concluded on : 19. April 2013

Checked by:

Tested by:

Klaus Gegenfurtner
Dipl. Ing.(FH)
Manager: Radio Group

Josef Knab
Radio Senior Expert

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3 EQUIPMENT UNDER TEST

3.1 Photo documentation of the EUT – Please see attachment A

3.2 Power supply system utilised

Power supply voltage : 3.6 V DC (lithium-ionen accu)

3.3 Short description of the equipment under test (EUT)

The EuT is used to detect the pH Boli in the radio area and to read the stored data. In order to display the data, the device must be connected via the USB cable to a PC/Laptop. The smaXtec pH Software enables the display of the measurement data and communication with this mobile readout equipment.

Number of tested samples: 1
Serial number: Prototype

EUT operation mode:

The equipment under test was operated during the measurement under the following conditions:

- cont. TX mode at 905.5 MHz (modulated)

- cont. RX mode

-

EUT configuration:

(The CDF filled by the applicant can be viewed at the test laboratory.)

The following peripheral devices and interface cables were connected during the measurements:

- Lifebook Fujitsu Siemens	Model : C1410
- AC/DC Adapter	Model : FW7713
-	Model :
-	Model :

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4 TEST ENVIRONMENT

4.1 Address of the test laboratory

mikes-testingpartners gmbh
Ohmstrasse 2-4
94342 STRASSKIRCHEN
GERMANY

4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 86-106 kPa

4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader may notice that tolerances within the calibration of the equipment and facilities may cause additional uncertainty. The measurement uncertainty is calculated for all measurements listed in this test report acc. to CISPR 16-4-2 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurement“ and documented in the mikes-testingpartners gmbh quality system acc. to DIN EN ISO/IEC 17025. For all measurements shown in this report, the measurement uncertainty of the test laboratory, mikes-testingpartners gmbh, is below the measurement uncertainty as defined by CISPR. Therefore, no special measures must be taken into consideration with regard to the limits according to CISPR. Furthermore, component diversity and modifications in production processes may result in additional deviation. If necessary, refer to the test lab for the actual measurement uncertainty for specific tests. The manufacturer has the sole responsibility of continued compliance of the EUT.

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4.4 Measurement protocol for FCC and IC

4.4.1 General information

4.4.1.1 Test methodology

Conducted and radiated disturbance testing is performed according to the procedures set out by the International Special Committee on Radio Interference (CISPR) Publication 22, European Standard EN 55022 as shown under section 1 of this report.

The Open Area test site is a listed Open Site under the Canadian Test-Sites File-No:

IC 3009A

In compliance with RSS 210 testing for RSS compliance may be achieved by following the procedures set out in ANSI C63.4 and applying the CISPR 22 limits.

4.4.1.2 Justification

The equipment under test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral using the appropriate impedance characteristic or left unterminated. Where appropriate, cables are manually manipulated with respect to each other thus obtaining maximum disturbances from the unit.

4.4.1.3 Details of test procedures

The test methods used comply with CISPR Publication 22, EN 55022 - "Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement" and with ANSI C63.4 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". In compliance with 47 CFR Part 15 Subpart A, Section 15.38 testing for FCC compliance may be achieved by following the procedures set out in ANSI C63.4 and applying the CISPR 22 limits.

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5 TEST CONDITIONS AND RESULTS

5.1 Conducted emissions

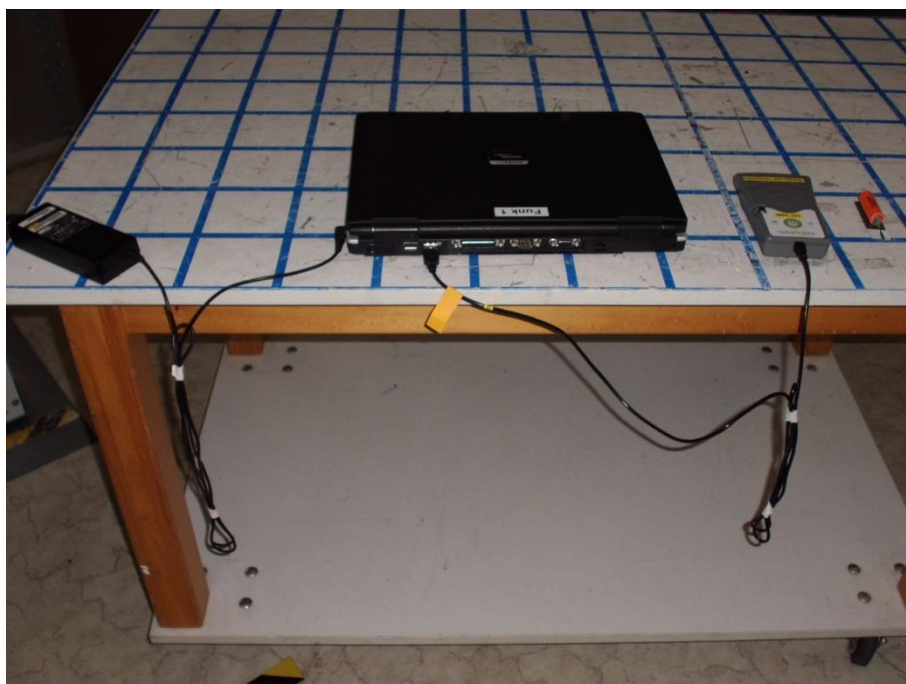
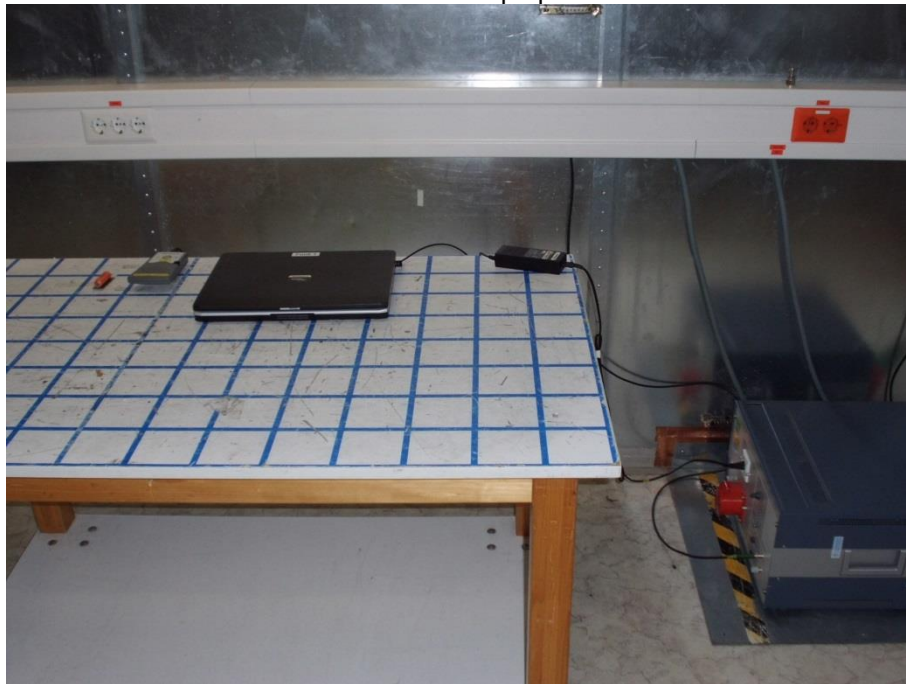
For test instruments and accessories used see section 6 Part A 4.

5.1.1 Description of the test location

Test location: Shielded Room S2

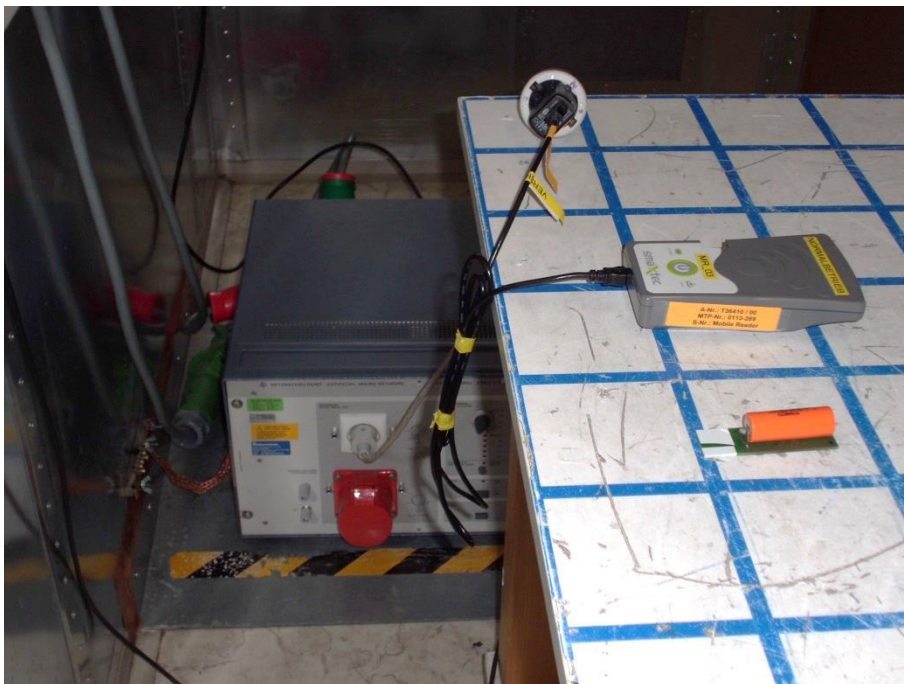
5.1.2 Photo documentation of the test set-up

Powered over USB / laptop connection



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Powered over charger unit



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5.1.3 Applicable standard

According to FCC Part 15, Section 15.207(a):

Except as shown in paragraphs (b) and (c) of this Section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the given limits.

5.1.4 Description of Measurement

The measurements are performed following the procedures set out in ANSI C63.4 described under item 4.4.3. If the minimum limit margin appears to be less than 20 dB with a peak mode measurement, the emissions are remeasured using a tuned receiver with quasi-peak and average detection and recorded on the data sheets.

5.1.5 Test result

Frequency range: 0.15 MHz - 30 MHz

Min. limit margin > 10 dB

Limit according to FCC Part 15, Section 15.207(a):

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency

The requirements are **FULFILLED**.

Remarks: For detailed test result please refer to following test protocols.

Tested with laptop connection and charger unit.

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5.1.6 Test protocol

Test point: L1
 Operation mode: cont. TX mode at 905.5 MHz (modulated)
 Remarks: tested with laptop connection

Result: passed

Freq kHz	QP- L dB[μV]	D -Limit QP [dB]	Freq kHz	AV-L dB[μV]	D -Limit AV [dB]
150	48,3	-17,7	150	32,6	-23,4
200	19,3	-44,3	235	22,4	-29,9
235	39,2	-23,1	350	13,2	-35,8
350	36,5	-22,5	355	17,1	-31,7
355	37,7	-21,1	475	10,7	-35,7
435	33,3	-23,9	590	17	-29,0
585	25,2	-30,8	725	19	-27,0
720	30,9	-25,1	830	12,9	-33,1
945	30,4	-25,6	1185	18,8	-27,2
1220	30,2	-25,8	1425	20,8	-25,2
1425	34,1	-21,9	1785	22,7	-23,3
1815	31,6	-24,4	1910	17,6	-28,4
1910	32	-24,0	2020	24,8	-21,2
2115	33,3	-22,7	2960	16,9	-29,1
2965	32,8	-23,2	3685	12,5	-33,5

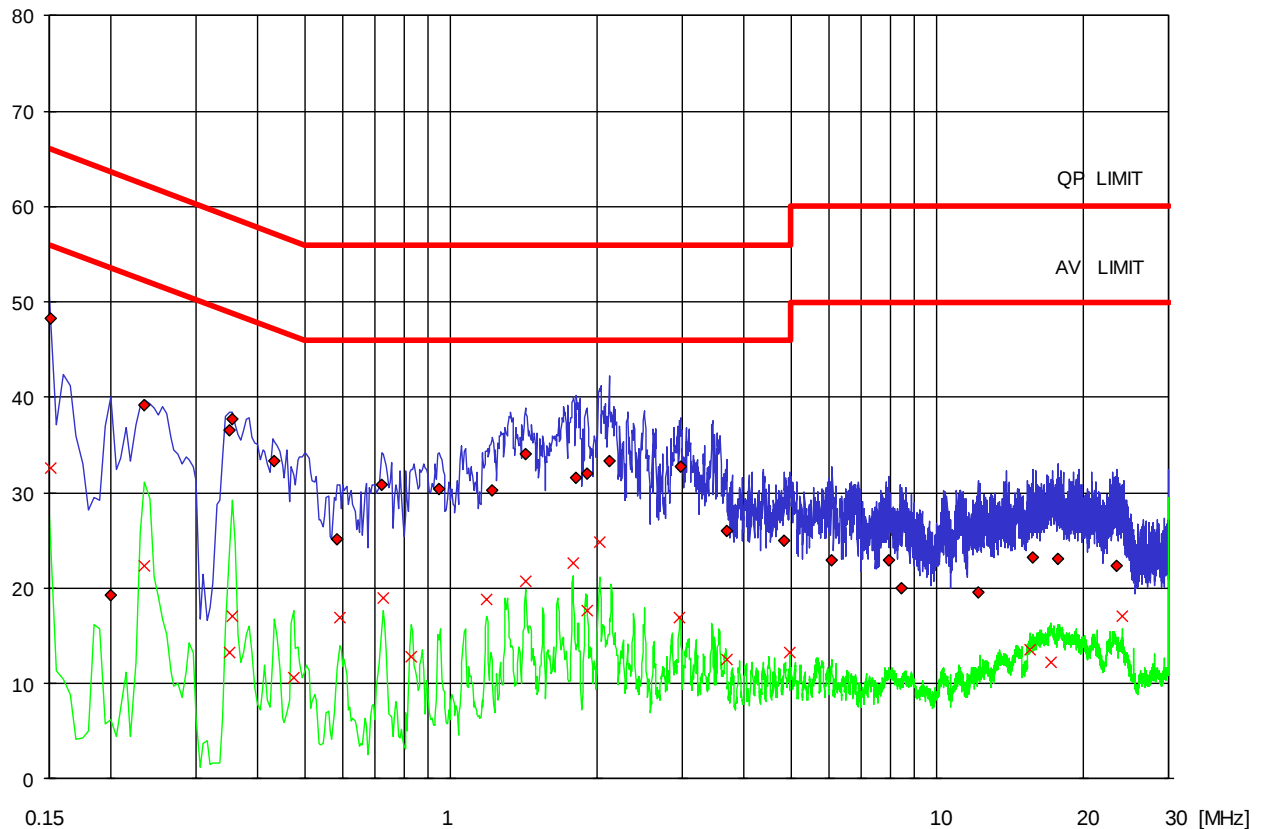
Freq kHz	QP- L dB[μV]	D -Limit QP [dB]	Freq kHz	AV-L dB[μV]	D -Limit AV [dB]
3700	26	-30,0	4980	13,2	-32,8
4860	25	-31,0	15485	13,5	-36,5
6090	22,9	-37,1	17170	12,3	-37,7
7980	23	-37,0	24045	17,1	-32,9
8475	20	-40,0	30000	29,4	-20,6
12125	19,6	-40,4			
15725	23,3	-36,7			
17760	23,1	-36,9			
23345	22,3	-37,7			
30000	30,5	-29,5			

dB [μV]

Legend

PK: — AV: —

Detector: QP: ♦ AV: ×



FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

Test point:	N
Operation mode:	cont. TX mode at 905.5 MHz (modulated)
Remarks:	tested with laptop connection

Result: passed

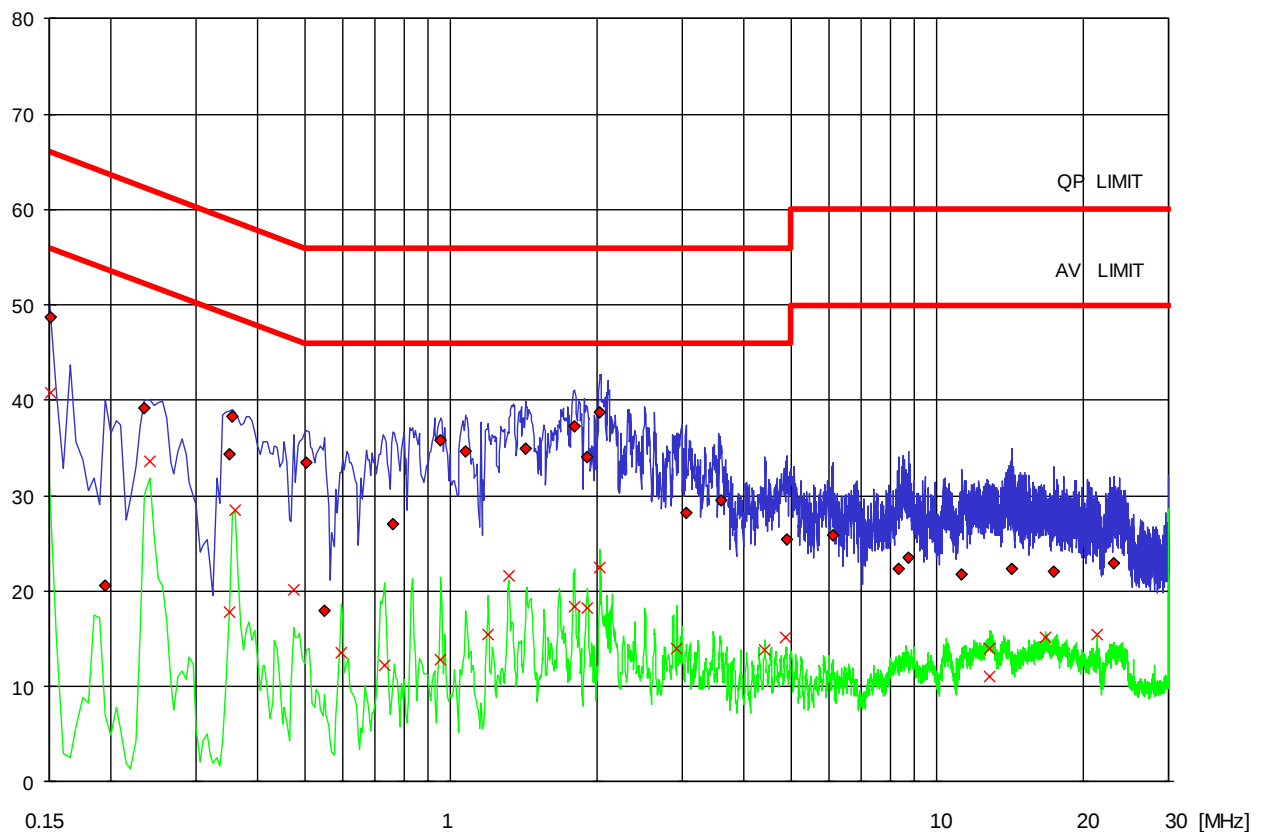
Freq kHz	QP- L dB[μV]	D -Limit QP [dB]	Freq kHz	AV-L dB[μV]	D -Limit AV [dB]
150	48,7	-17,3	150	40,8	-15,2
195	20,6	-43,2	240	33,7	-18,4
235	39,2	-23,1	350	17,8	-31,2
350	34,4	-24,6	360	28,5	-20,2
355	38,3	-20,5	475	20,1	-26,3
505	33,5	-22,5	595	13,5	-32,5
550	17,9	-38,1	730	12,3	-33,7
760	27	-29,0	955	12,9	-33,1
955	35,9	-20,1	1195	15,4	-30,6
1070	34,7	-21,3	1315	21,6	-24,4
1425	35	-21,0	1795	18,4	-27,6
1795	37,3	-18,7	1910	18,2	-27,8
1910	34	-22,0	2030	22,5	-23,5
2030	38,8	-17,2	2920	14	-32,0
3045	28,2	-27,8	4430	13,9	-32,1

[illegible]dB [μ V]

Legend

PK: AV:

Detector: QP:  AV: 



FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

Test point	L1
Operation mode:	cont. RX mode
Remarks:	tested with laptop connection

Result: passed

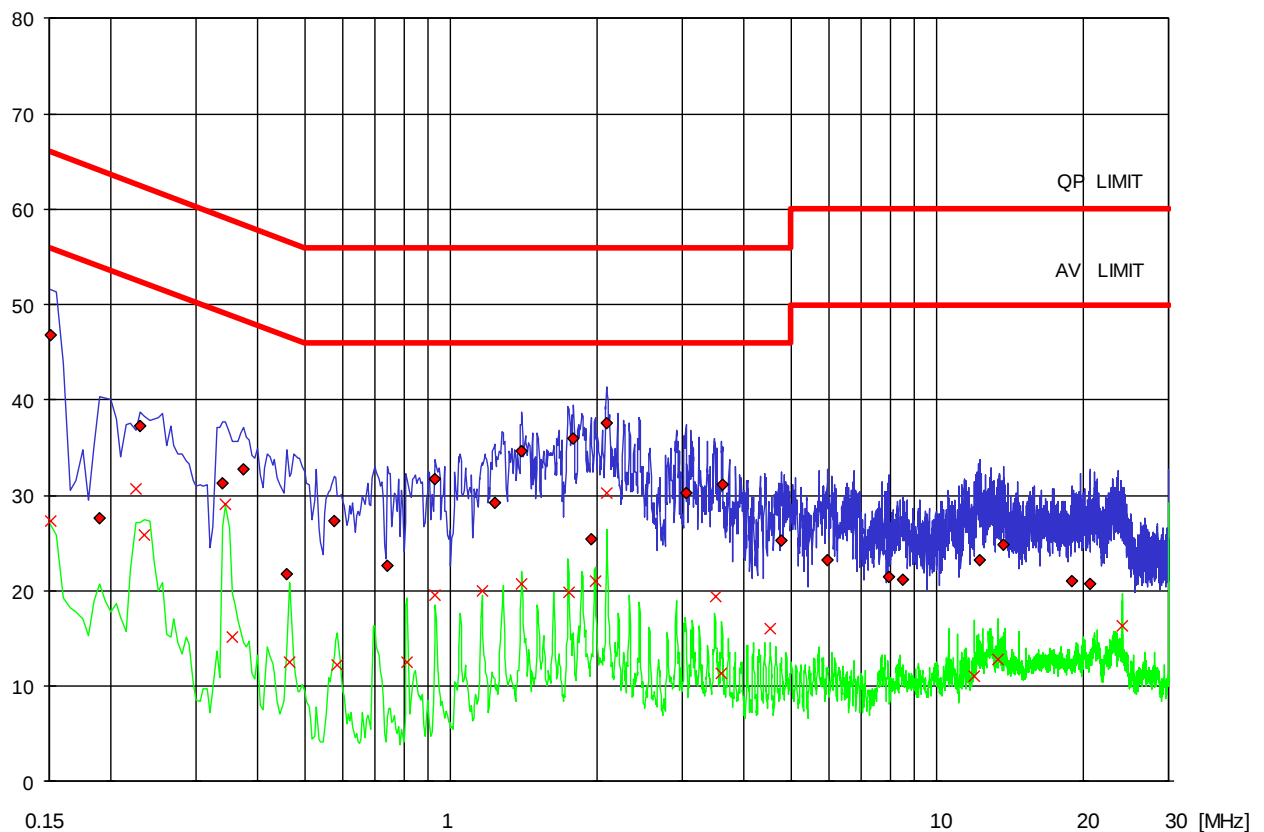
Freq kHz	QP- L dB[μV]	D -Limit QP [dB]	Freq kHz	AV-L dB[μV]	D -Limit AV [dB]
150	46,8	-19,2	150	27,4	-28,6
190	27,6	-36,4	225	30,7	-21,9
230	37,3	-25,1	235	25,9	-26,4
340	31,3	-27,9	345	29,1	-20,0
375	32,7	-25,7	355	15,2	-33,6
460	21,8	-34,9	465	12,5	-34,1
575	27,4	-28,6	585	12,2	-33,8
740	22,7	-33,3	815	12,5	-33,5
930	31,7	-24,3	930	19,5	-26,5
1230	29,3	-26,7	1160	20	-26,0
1400	34,6	-21,4	1400	20,8	-25,2
1790	36	-20,0	1745	19,8	-26,2
1945	25,5	-30,5	1980	21	-25,0
2090	37,6	-18,4	2095	30,2	-15,8
3045	30,2	-25,8	3495	19,4	-26,6

[illegible]dB [μ V]

Legend

PK: AV:

Detector: QP:  AV: 



FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

Test point: N
 Operation mode: cont. RX mode
 Remarks: tested with laptop connection

Result: passed

Freq kHz	QP- L dB[μV]	D -Limit QP [dB]	Freq kHz	AV-L dB[μV]	D -Limit AV [dB]
150	50,5	-15,5	155	39,3	-16,4
200	37	-26,6	190	26,1	-27,9
235	32,1	-30,2	255	14,6	-37,0
315	32,9	-26,9	320	25,9	-23,8
355	27,9	-30,9	380	12	-36,3
465	33,5	-23,1	470	23,4	-23,1
635	24,7	-31,3	645	21,3	-24,7
795	35	-21,0	795	26,4	-19,6
950	35,9	-20,1	945	24	-22,0
1065	26,8	-29,2	1120	15,4	-30,6
1510	26	-30,0	1275	24,8	-21,2
1740	37,5	-18,5	1745	25,8	-20,2
1910	27,9	-28,1	1930	19,3	-26,7
2065	35,8	-20,2	2075	21,7	-24,3
3025	34	-22,0	3025	18	-28,0

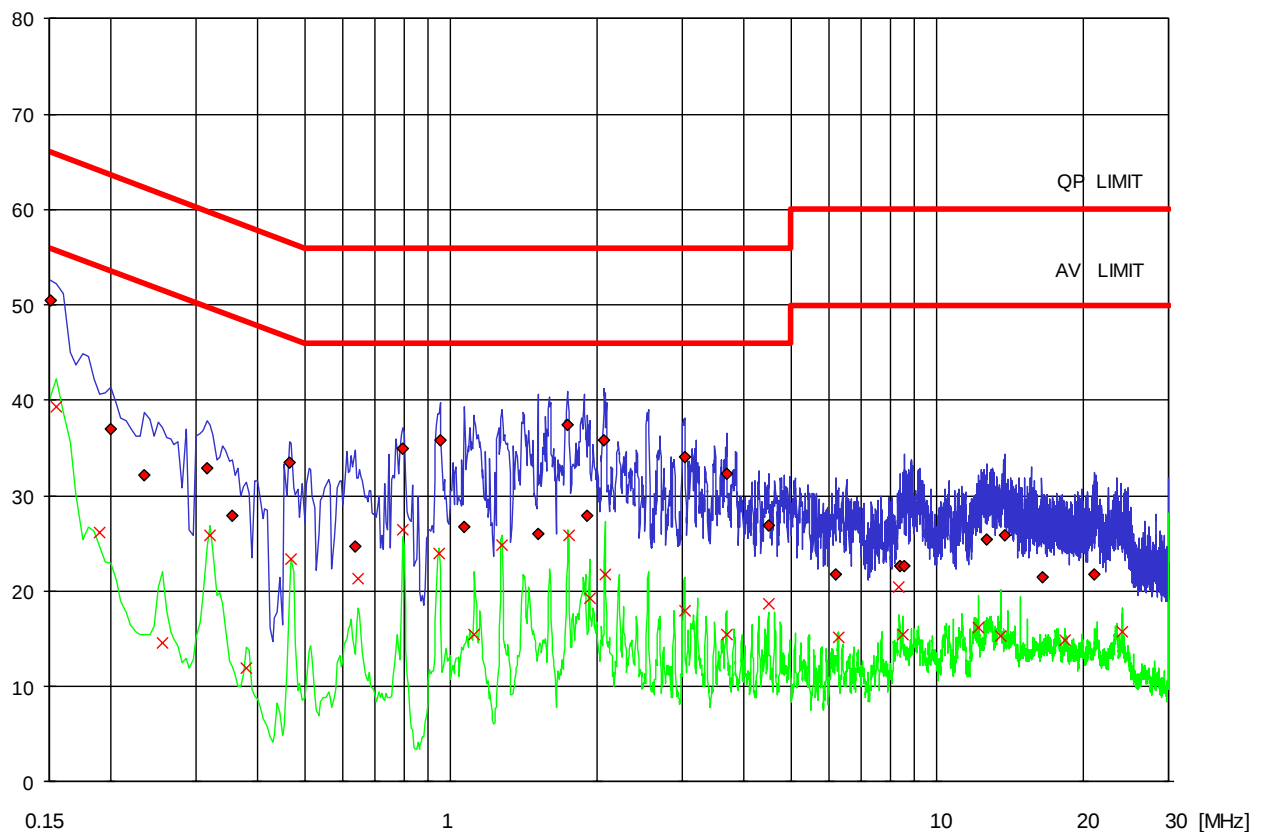
Freq kHz	QP- L dB[μV]	D -Limit QP [dB]	Freq kHz	AV-L dB[μV]	D -Limit AV [dB]
3700	32,3	-23,7	3690	15,5	-30,5
4505	26,9	-29,1	4495	18,7	-27,3
6200	21,8	-38,2	6260	15,1	-34,9
8400	22,6	-37,4	8360	20,5	-29,5
8560	22,6	-37,4	8495	15,5	-34,5
12620	25,4	-34,6	12150	16,2	-33,8
13800	25,9	-34,1	13510	15,3	-34,7
16430	21,4	-38,6	18315	14,9	-35,1
21090	21,7	-38,3	24000	15,7	-34,3
30000	29,4	-30,6	30000	28,2	-21,8

dB [μV]

Legend

PK: — AV: —

Detector: QP: ♦ AV: ×



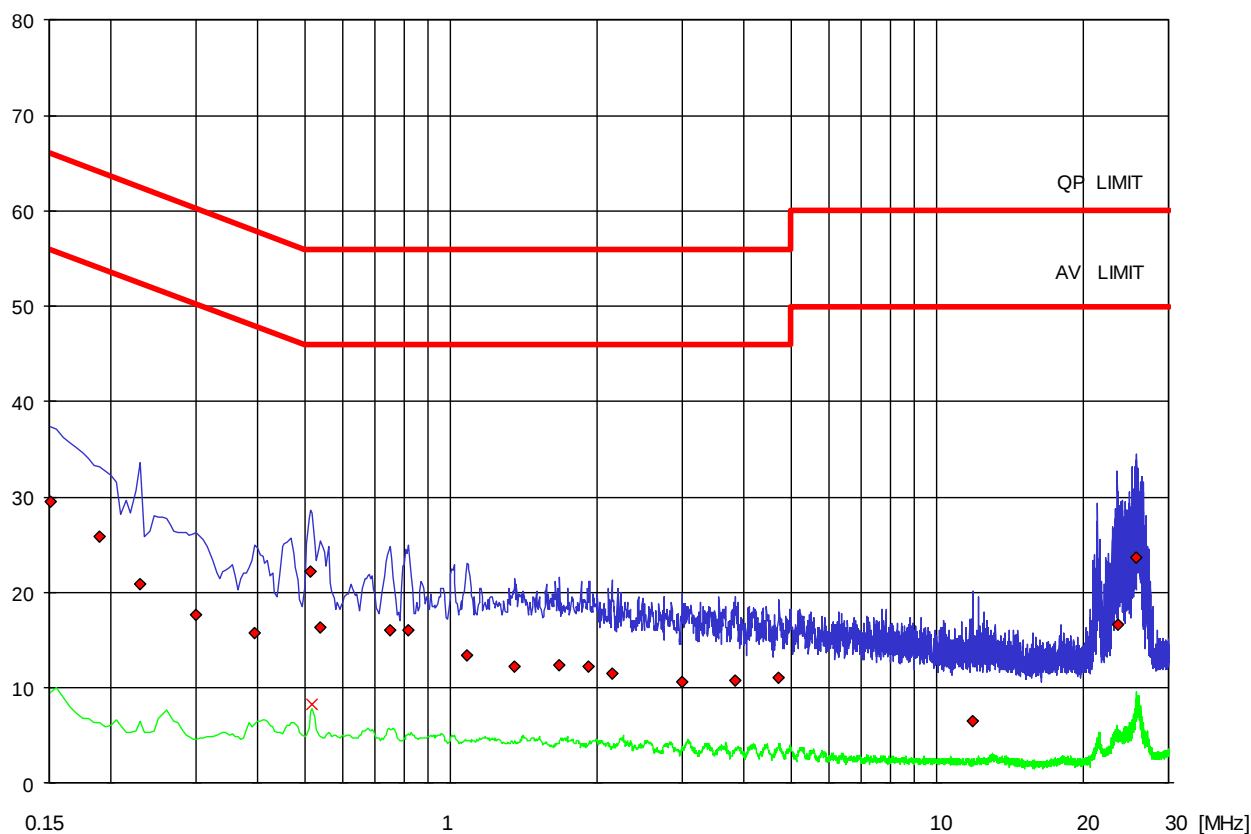
Test point	L1
Operation mode:	cont. TX mode at 905.5 MHz (modulated)
Remarks:	tested with charger unit

Result: passed

Freq	QP- L	D -Limit	Freq	AV-L	D -Limit
kHz	dB[μV]	QP [dB]	kHz	dB[μV]	AV [dB]
150	29,5	-36,5	520	8,3	-37,7
190	25,9	-38,1			
230	20,9	-41,5			
300	17,6	-42,6			
395	15,8	-42,2			
515	22,2	-33,8			
540	16,4	-39,6			
750	16,1	-39,9			
820	16	-40,0			
1080	13,4	-42,6			
1355	12,2	-43,8			
1675	12,4	-43,6			
1925	12,2	-43,8			
2145	11,5	-44,5			
2990	10,7	-45,3			

[illegible]

Detector: QP: ◆ AV: ✗



FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

Test point:	N
Operation mode:	cont. TX mode at 905.5 MHz (modulated)
Remarks:	tested with charger unit

Result: passed

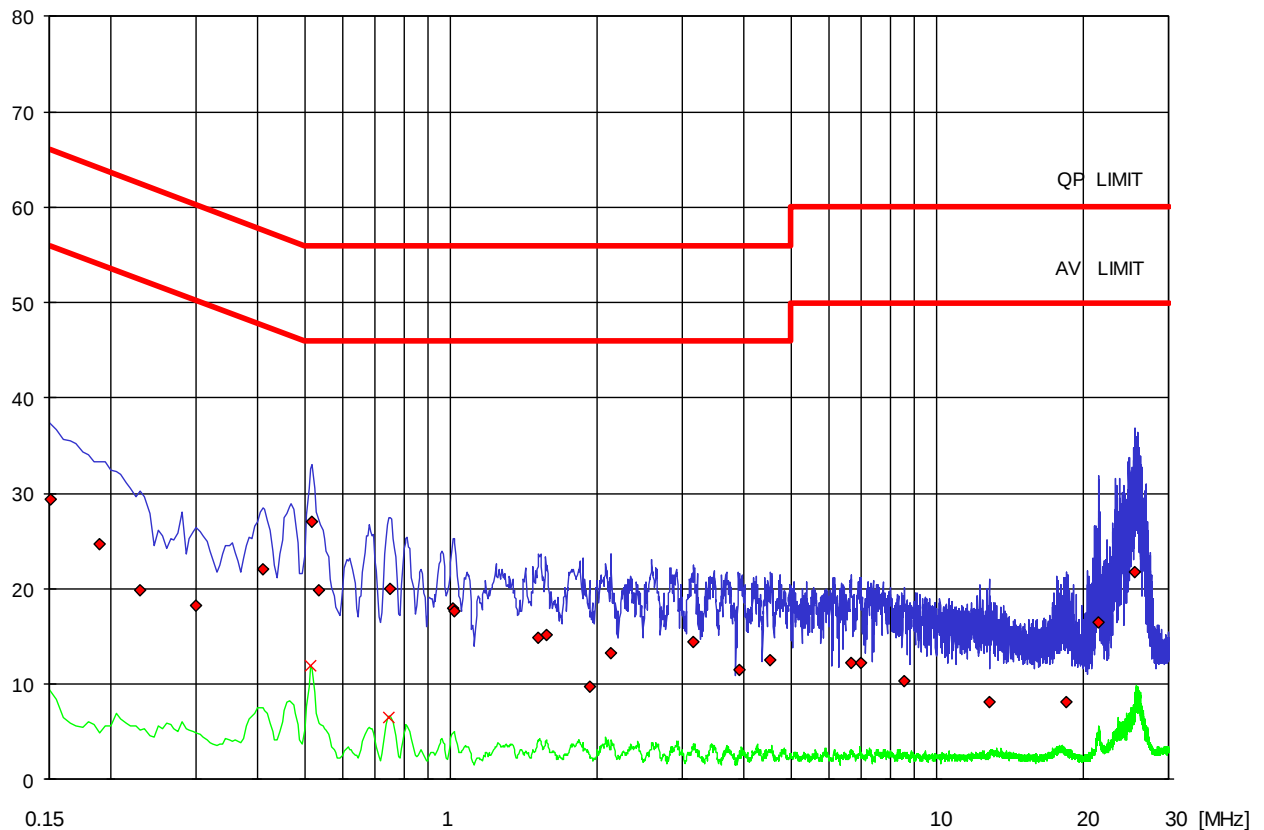
Freq kHz	QP- L dB[μV]	D -Limit QP [dB]	Freq kHz	AV-L dB[μV]	D -Limit AV [dB]
150	29,4	-36,6	515	12	-34,0
190	24,7	-39,3	745	6,5	-39,5
230	19,9	-42,5			
300	18,2	-42,0			
410	22	-35,6			
520	27,1	-28,9			
535	19,8	-36,2			
750	20	-36,0			
1010	17,9	-38,1			
1015	17,7	-38,3			
1515	14,9	-41,1			
1570	15,1	-40,9			
1930	9,7	-46,3			
2135	13,3	-42,7			
3160	14,5	-41,5			

[illegible]dB [μ V]

Legend

PK: █ AV: █

Detector: QP: ◆ AV: ✗



FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

Test point	L1
Operation mode:	cont. RX mode
Remarks:	tested with charger unit

Result: passed

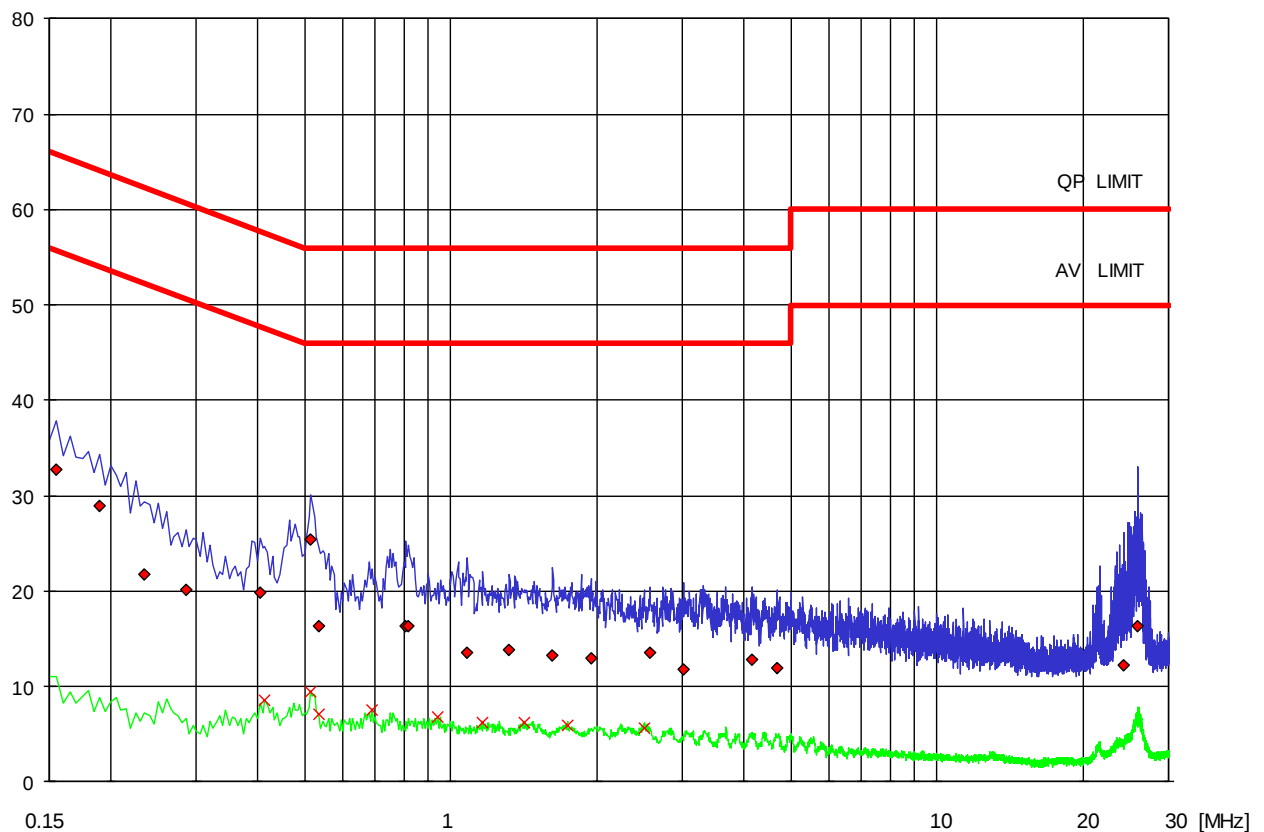
Freq kHz	QP- L dB[μV]	D -Limit QP [dB]	Freq kHz	AV-L dB[μV]	D -Limit AV [dB]
155	32,8	-32,9	415	8,6	-38,9
190	29	-35,0	515	9,4	-36,6
235	21,7	-40,6	535	7,1	-38,9
285	20,1	-40,6	690	7,5	-38,5
405	19,9	-37,9	940	6,8	-39,2
515	25,4	-30,6	1165	6,2	-39,8
535	16,3	-39,7	1415	6,2	-39,8
810	16,3	-39,7	1735	6	-40,0
820	16,4	-39,6	2495	5,6	-40,4
1080	13,6	-42,4			
1320	13,9	-42,1			
1620	13,2	-42,8			
1945	13	-43,0			
2565	13,6	-42,4			
3010	11,8	-44,2			

[illegible]dB [μ V]

Legend

PK: AV:

Detector: QP: ◆ AV: ✗



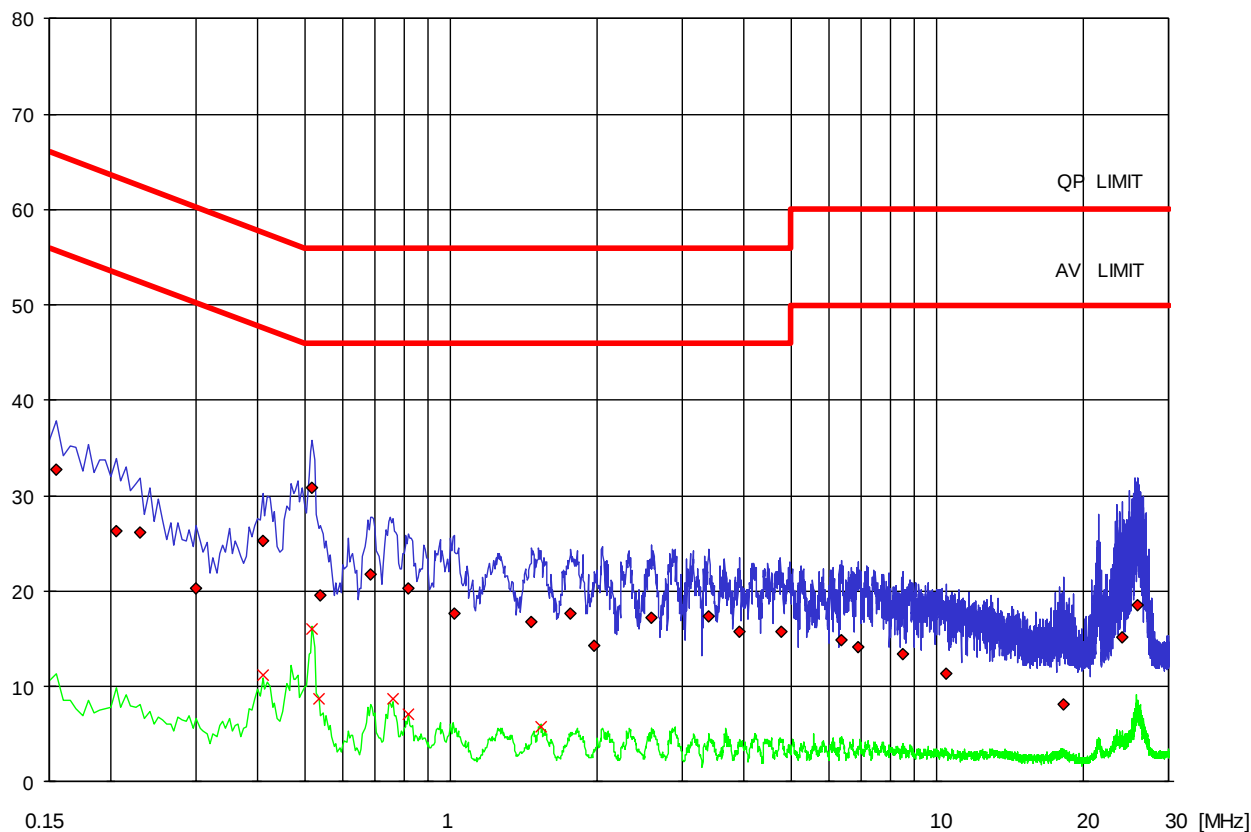
Test point	N
Operation mode:	cont. RX mode
Remarks:	tested with charger unit

Result: passed

Freq	QP- L	D -Limit	Freq	AV-L	D -Limit
kHz	dB[μV]	QP [dB]	kHz	dB[μV]	AV [dB]
155	32,7	-33,0	410	11,2	-36,4
205	26,3	-37,1	520	16,1	-29,9
230	26,1	-36,3	535	8,7	-37,3
300	20,3	-39,9	760	8,7	-37,3
410	25,3	-32,3	820	7,1	-38,9
520	30,8	-25,2	1530	5,8	-40,2
540	19,6	-36,4			
685	21,7	-34,3			
820	20,3	-35,7			
1015	17,7	-38,3			
1465	16,8	-39,2			
1765	17,6	-38,4			
1975	14,3	-41,7			
2585	17,2	-38,8			
3390	17,3	-38,7			

[illegible]

Detector: QP: ◆ AV: ✗



FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

5.2 Radiated emission of the fundamental wave

For test instruments and accessories used see section 6 Part CPR 3.

5.2.1 Description of the test location

Test location: OATS 1
Test distance: 3 m

5.2.2 Photo documentation of the test set-up

Powered over USB / laptop connection



FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2
5.2.1 Applicable standard

According to FCC Part 15C, Section 15.249(a):

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the effective limits.

5.2.2 Description of Measurement

The radiated field strength of the fundamental wave from the EUT is measured using a tuned EMI-receiver. The set up of the EUT and the measurement procedure is in accordance to ANSI C63.4, Item 8.3. The EUT is measured in TX continuous mode modulated under normal conditions.

EMI test receiver settings:

30 MHz – 1000 MHz: RBW: 120 kHz

5.2.3 Test result

Frequency (MHz)	Level PK (dBμV)	Duty Cycle Correction (dB)	Level AV (dBμV)*	Correction factor (dB/m)	Corrected level PK dB(μV/m)	Corrected level AV dB(μV/m)	Limit PK dB(μV/m)	Limit AV dB(μV/m)	Delta (dB)
905.5	83.4	-20	63.4	28.5	111.9	91.9	114.0	94.0	-2.1

*) Average values were calculated from the subtraction of peak values minus correction duty cycle factor.

Note: The correction factor includes cable loss and antenna factor.

Average-Limit according to FCC Part 15C, Section 15.249(a):

Frequency (MHz)	Field strength of fundamental	
	(mV/m)	dB(μV/m)
902 - 928	50	94
2400 - 2483.5	50	94
5725-5875	50	94
24000 - 24250	250	108

Peak-Limit according to FCC Part 15C, Section 15.249(e):

However the peak fieldstrength shall not exceed the maximum permitted average limit by more than 20 dB.

The requirements are **FULFILLED**.

Remarks: The alternative measurement method accd. to FCC Part 15.35(a) where used.

The fundamental wave was only measured in combination with a laptop connection.

There are no differences between laptop and charger unit, because the EuT has a internal

voltage stabilisation.

FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

5.3 Spurious emissions radiated

For test instruments and accessories used see section 6 Part SER1, SER 2, SER 3.

5.3.1 Description of the test location

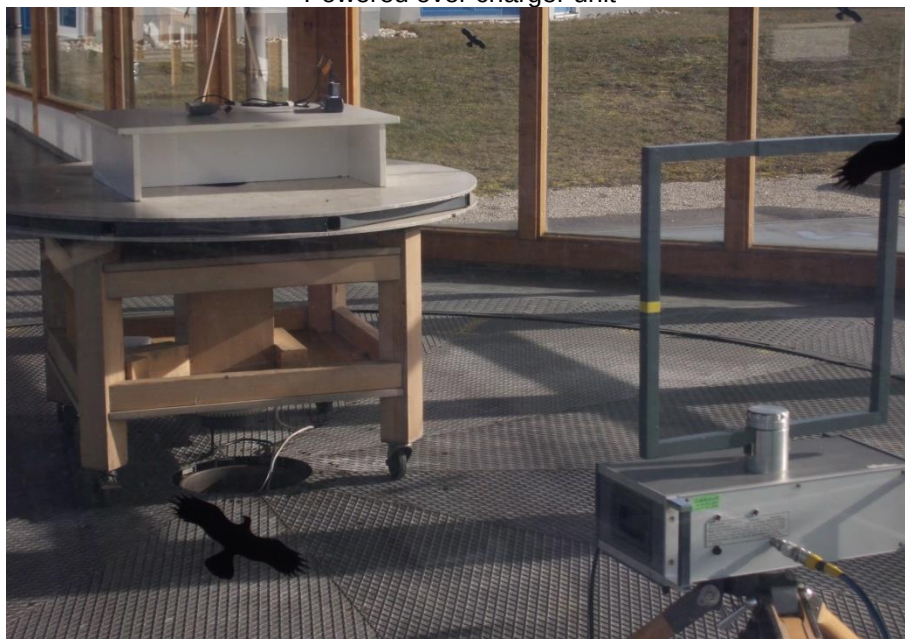
Test location: OATS 1
Test location: Anechoic chamber 2
Test distance: 3 m

5.3.2 Photo documentation of the test set-up

Powered over USB / laptop connection



Powered over charger unit



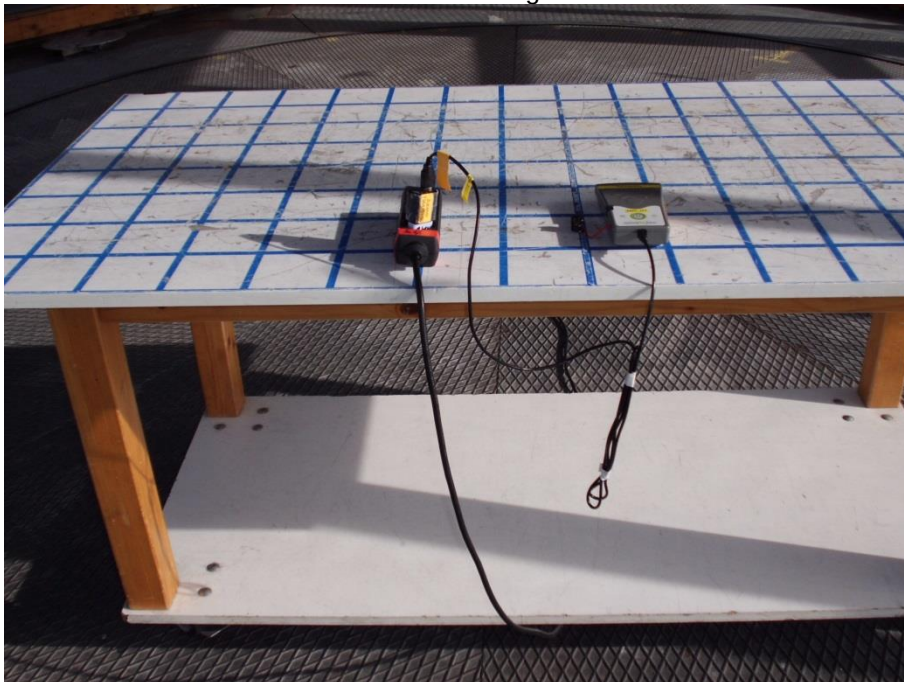
FCC ID: OHCMETDGS2

IC ID: 10671A-METDGS2

Powered over USB / laptop connection



Powered over charger unit



FCC ID: OHCMETDGS2

IC ID: 10671A-METDGS2

Powered over USB / laptop connection



5.3.3 Applicable standard

According to FCC Part 15C, Section 15.249 (d):

Emission radiated outside of the specified frequency bands, except harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated limit in FCC Part 15C, Section 15.209, whichever is the lesser attenuation.

5.3.4 Description of Measurement

The magnetic field strength of spurious emission from the EUT is measured in an open area test site in the frequency range of 9 kHz to 30 MHz using a tuned receiver and a shielded loop antenna. The set up of the EUT and the measurement procedure is in accordance to ANSI C63.4, Item 8.3.

The radiated power of the spurious emission from the EUT is measured in a test setup following the procedures set out in ANSI C63.4, Item 8.3.

The EUT is measured in TX continuous mode modulated under normal conditions.

EMI test receiver settings:

9 kHz – 150 kHz: RBW: 200 Hz

150 kHz – 30 MHz: RBW: 9 kHz

Spectrum analyser settings:

1000 MHz – 40 GHz RBW: 1 MHz

FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2
5.3.5 Test result $f < 1$ GHz

Powered over USB / laptop connection

Frequency (MHz)	Reading level QP (dB μ V)	Reading level AV (dB μ V)	Bandwidth (kHz)	Correction factor (dB/m)	Corrected level QP dB(μ V/m)	Corrected level AV dB(μ V/m)	Limit dB(μ V/m)	Delta (dB)
2*	33.0	-	9	20.0	53.0	-	69.5	-16.5
30*	11.1	-	120	12.6	23.7	-	40.0	-16.3
150*	-0.5	-	120	14.0	13.5	-	43.5	-30.0
300*	2.3	-	120	16.3	18.6	-	46.0	-27.4
450*	1.1	-	120	20.3	21.4	-	46.0	-24.6
736.0	15.5	-	120	26.0	41.5	-	46.0	-4.5
787.0	11.4	-	120	27.2	38.6	-	46.0	-7.4
841.5	17.0	-	120	27.9	44.9	-	46.0	-1.1
851.0	13.1	-	120	28.0	41.1	-	46.0	-4.9
873.5	13.2	-	120	28.7	41.9	-	46.0	-4.1
883.0	10.4	-	120	28.3	38.7	-	46.0	-7.3
969.5	6.0	-	120	29.0	35.0	-	54.0	-19.0

*) Ambient noise

Note: The correction factor includes cable loss and antenna factor.

Powered over charger unit

Frequency (MHz)	Reading level QP (dB μ V)	Reading level AV (dB μ V)	Bandwidth (kHz)	Correction factor (dB/m)	Corrected level QP dB(μ V/m)	Corrected level AV dB(μ V/m)	Limit dB(μ V/m)	Delta (dB)
2*	33.0	-	9	20.0	53.0	-	69.5	-16.5
30*	11.1	-	120	12.6	23.7	-	40.0	-16.3
150*	-0.5	-	120	14.0	13.5	-	43.5	-30.0
300*	2.3	-	120	16.3	18.6	-	46.0	-27.4
450*	1.1	-	120	20.3	21.4	-	46.0	-24.6
736.0	15.1	-	120	26.0	41.1	-	46.0	-4.9
787.0	11.4	-	120	27.2	38.6	-	46.0	-7.4
841.5	16.7	-	120	27.9	44.6	-	46.0	-1.4
851.0	13.6	-	120	28.0	41.6	-	46.0	-4.4
873.5	13.2	-	120	28.7	41.4	-	46.0	-4.6
883.0	10.3	-	120	28.3	38.6	-	46.0	-7.4
969.5	5.5	-	120	29.0	34.5	-	54.0	-19.5

*) Ambient noise

Note: The correction factor includes cable loss and antenna factor.

5.3.6 Test result $f > 1$ GHz

Powered over USB / laptop connection

Frequency (MHz)	Level PK (dB μ V)	Duty Cycle Correction (dB)	Level AV (dB μ V)*	Correction factor (dB/m)	Corrected level PK dB(μ V/m)	Corrected level AV dB(μ V/m)	Limit PK dB(μ V/m)	Limit AV dB(μ V/m)	Delta (dB)
1009.6	43.3	-20	-23.3	2.9	46.3	26.3	74.0	54.0	-27.7
1811.3	57.4	-20	-37.4	3.5	61.0	41.0	74.0	54.0	-13.0
2716.0	53.1	-20	-33.1	3.7	56.8	36.8	74.0	54.0	-17.2
3622.1	57.8	-20	-37.8	2.5	60.3	40.3	74.0	54.0	-13.7
4526.7	48.0	-20	-26.0	3.1	51.1	31.1	74.0	54.0	-22.9
5433.0	46.7	-20	-26.7	4.0	50.7	30.7	74.0	54.0	-23.3
6339.1	42.2	-20	-22.2	5.8	48.0	28.0	74.0	54.0	-26.0
8150.0	42.0	-20	-22.0	7.2	49.2	29.2	74.0	54.0	-24.8
9054.8	38.2	-20	18.2	8.1	46.3	26.3	74.0	54.0	-27.7

*) Average values were calculated from the subtraction of peak values minus correction duty cycle factor.

FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

Limit according to FCC Part 15C, Section 15.209:

Frequency (MHz)	15.209 Limits dB(μV/m)	Measurement distance (m)
0.009 - -0.49	2400/f(kHz)	300
0.49 – 1.705	24000/f(kHz)	30
1.705 – 30.0	30	30
30-88	40	3
88-216	43.5	3
216-960	46	3
Above 960	54	3

Average limit according to FCC Part 15C, Section 15.249(a):

Fundamental frequency (MHz)	Field strength of harmonics	
	(μV/m)	dB(μV/m)
902 - 928	500	54
2400 - 2483.5	500	54
5725-5875	500	54
24000 - 24250	2500	68

Peak-Limit according to FCC Part 15C, Section 15.249(e):

However the peak fieldstrength shall not exceed the maximum permitted average limit by more than 20 dB.

The requirements are **FULFILLED**.

Remarks: The measurement was performed up to the 10th harmonic (10000 MHz).

The spurious emission above 1 GHz wave was only measured in combination with a laptop

connection. There are no differences between laptop and charger unit, because the EuT has a

internal voltage stabilisation.

FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

5.4 20 dB bandwidth

For test instruments and accessories used see section 6 Part MB.

5.4.1 Description of the test location

Test location: AREA4

5.4.2 Photo documentation of the test set-up



5.4.3 Applicable standard

According to FCC Part 15, Section 15.215(c):

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in Section 15.217 through Section 15.257, must be designed to ensure that the 20 dB bandwidth of the emission is contained within the frequency band designated in the rule section under which the equipment is operated.

5.4.4 Description of Measurement

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio of -20 dB. The reference level is the level of the highest signal amplitude observed from the transmitter at the fundamental frequency. Alternative is the x-dB-down function of the analyser used. The EBW is then directly shown in the marker display. The measurement is performed radiated with normal modulation and a transfer rate means the worst case.

Spectrum analyser settings:

RBW: 10 kHz

VBW: 30 kHz

Span: 200 kHz

Sweep time: Auto

Detector: Max. peak

Trace Mode: Max hold

FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2
5.4.5 Test result

Operating frequency band (MHz)	20 dB Bandwidth (MHz)
$f_{low} > 902$	$f_{low} = 905.47$
$f_{high} < 928$	$f_{high} = 905.52$

80% bandwidth of the permitted band:

20.8 MHz

Limit according to FCC Part 15C, Section 15.215(c):

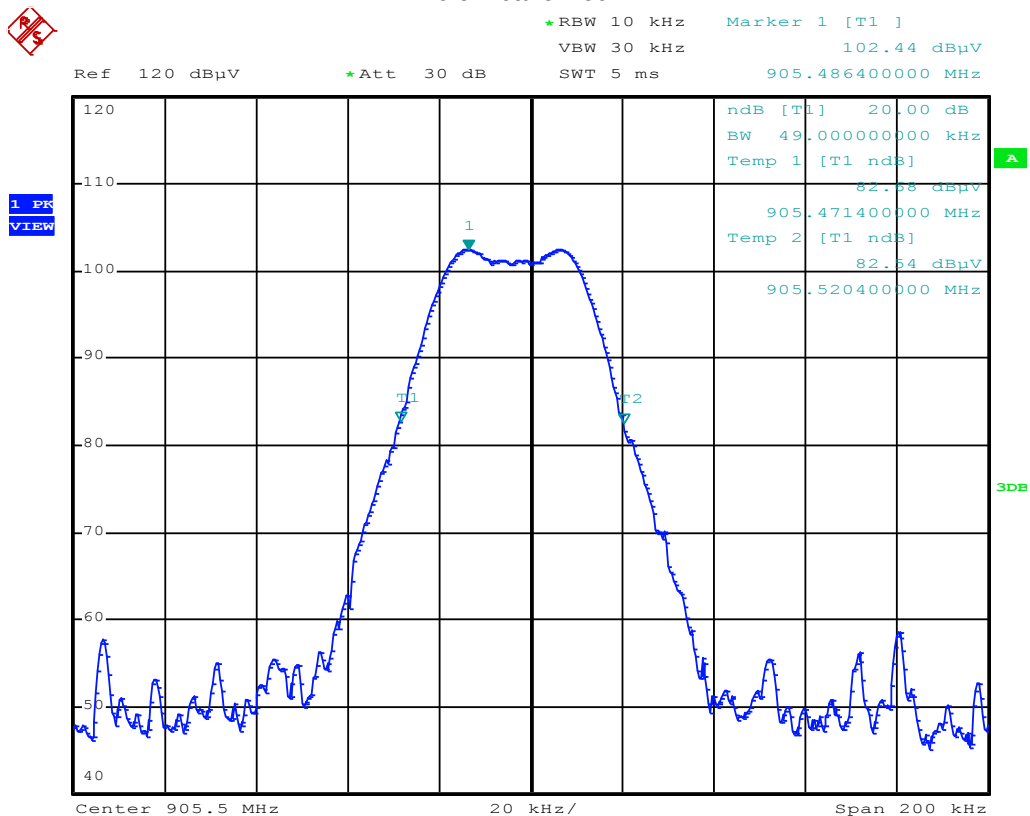
If frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

The requirements are **FULFILLED**.

Remarks: For detailed test result please refer to following test protocols.

5.4.6 Test protocols

20 dB bandwidth



FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

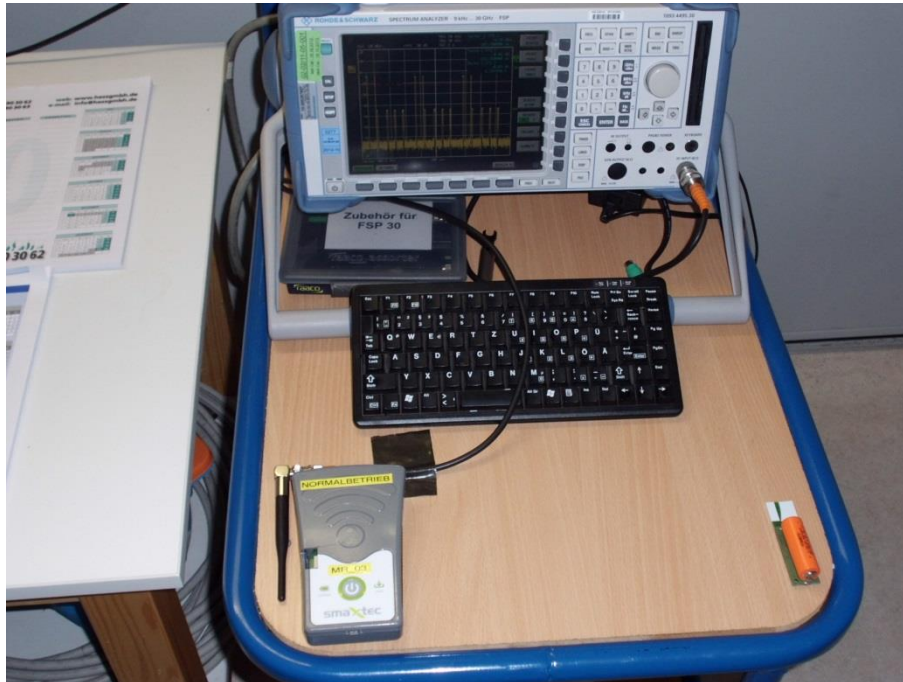
5.5 Correction for pulse operation (duty cycle)

For test instruments and accessories used see section 6 Part DC.

5.5.1 Description of the test location

Test location: AREA4

5.5.2 Photo documentation of the test set-up



5.5.3 Applicable standard

According to FCC Part 15A, Section 15.35(c):

When the radiated emission limits are expressed in terms of average value and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete puls train, including blanking intervals, as long as the pulse train does not exceed 0.1s. In cases where the puls train exceeds 0.1s, the measured field strength shall be determined from the average absolute voltage during a 0.1s interval during which the field strength is at its maximum. The exact method of calculating the average field strength shall be submitted.

FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2
5.5.4 Description of Measurement

The duty cycle factor (dB) is calculated applying the following formula:

$$K_E = 20 \log \frac{T_{ON}}{T_{PT}}$$

$$-20.18dB = 20 \log \frac{9.8ms}{100ms}$$

K_E : pulse operation correction factor (dB)

T_{ON} complete on time (ms)

T_{PT} complete pulse train (ms)

Spectrum analyser settings:

RBW: 10 kHz

VBW: 30 kHz

Span: zero span

Sweep time: Auto

Detector: Max. peak

Trace Mode: single sweep

5.5.5 Test result

T_{ON} (ms)	T_{PT} (ms)	K_E (dB)
9.8	100	-20.18

Remarks: The pulse train (T_w) exceeds 100 ms, therefore the duty cycle have been calculated by averaging the sum of the pulse widths over the 100 ms width with the highest average value.

The max. pulse operation correction factor is limited to -20 dB!

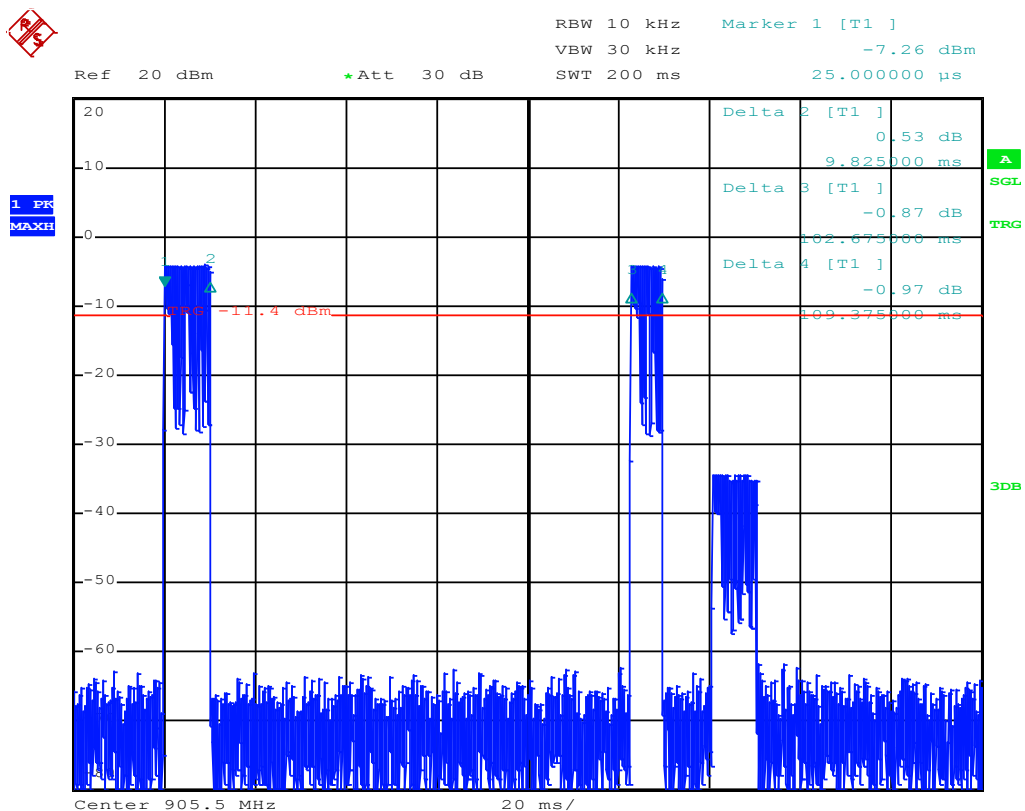
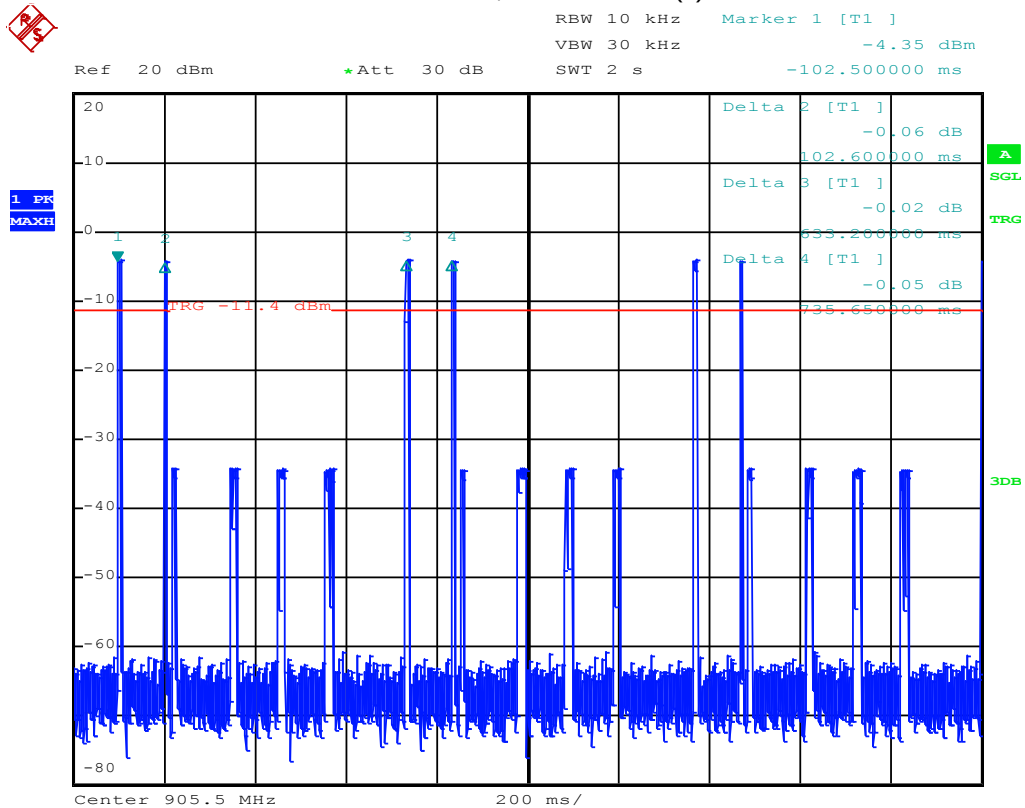
For detailed results, please see the test protocol below.

The lower transmission packakes are from the mobile unit (ph bolus).

FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

5.5.6 Test protocol

Correction for Pulse Operation (Duty Cycle) FCC Part 15A, Section 15.35(c)



FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

5.6 Antenna application

5.6.1 Applicable standard

According to FCC Part 15C, Section 15.203(a):

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section.

5.6.2 Result

The EUT use an integrated PCB antenna. No other antenna than that furnished by the responsible party or external power amplifier can be applied by a customer.

The antenna of the EUT meets the requirement of FCC Part 15C, Section 15.203 and 15.204.

FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

5.7 Receiver radiated emissions

For test instruments and accessories used see section 6 Part SER2 and SER3.

5.7.1 Description of the test location

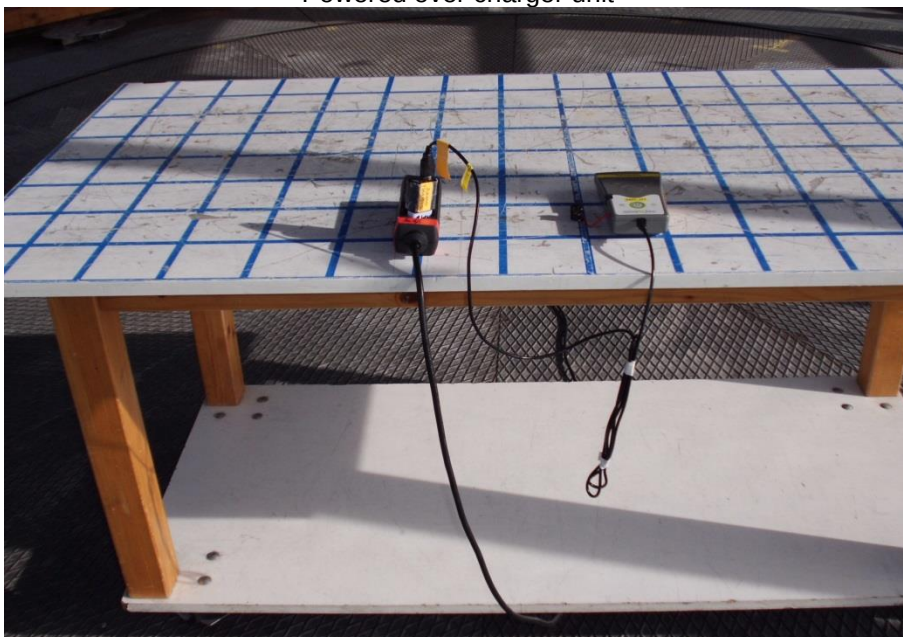
Test location: OATS 1
Test location: Anechoic chamber 2
Test distance: 3 m

5.7.2 Photo documentation of the test set-up

Powered over USB / laptop connection



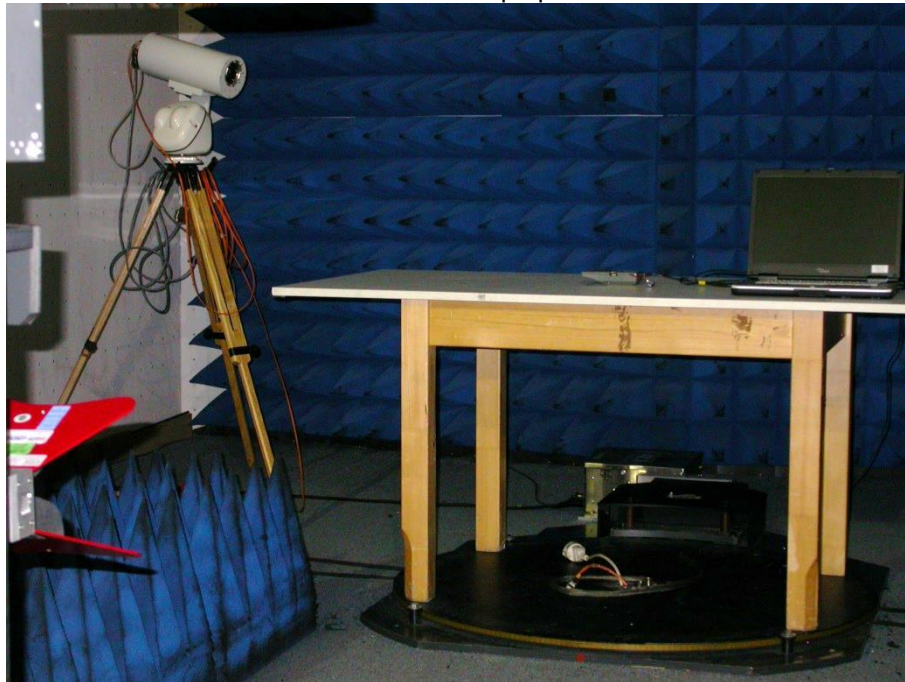
Powered over charger unit



FCC ID: OHCMETDGS2

IC ID: 10671A-METDGS2

Powered over USB / laptop connection



5.7.3 Applicable standard

According to FCC Part 15C, Section 15.109(a):

Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 m shall not exceed the given limit.

5.7.4 Description of Measurement

The field strength of radiated emissions from the EUT is measured in a test setup following the procedures set out in ANSI C63.4, Item 8.3.

The EUT is measured in RX continuous mode under normal conditions.

EMI test receiver settings:

150 kHz – 30 MHz: RBW: 9 kHz

Spectrum analyser settings:

1000 MHz – 40 GHz RBW: 1 MHz

5.7.5 Test result $f < 1$ GHz

Powered over USB / laptop connection

Frequency (MHz)	Reading level QP (dB μ V)	Reading level AV (dB μ V)	Bandwidth (kHz)	Correction factor (dB/m)	Corrected level QP dB(μ V/m)	Corrected level AV dB(μ V/m)	Limit dB(μ V/m)	Delta (dB)
30*	11.1	-	120	12.6	23.7	-	40.0	-16.3
150*	-0.5	-	120	14.0	13.5	-	43.5	-30.0
300*	2.3	-	120	16.3	18.6	-	46.0	-27.4
450*	1.1	-	120	20.3	21.4	-	46.0	-24.6
750*	-1.0	-	120	26.4	25.4	-	46.0	-20.6
1000*	-0.4	-	120	30.2	29.8	-	54.0	-24.2

*) Ambient noise

Note: The correction factor includes cable loss and antenna factor.

FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

Powered over charger unit

Frequency (MHz)	Reading level QP (dBμV)	Reading level AV (dBμV)	Bandwidth (kHz)	Correction factor (dB/m)	Corrected level QP dB(μV/m)	Corrected level AV dB(μV/m)	Limit dB(μV/m)	Delta (dB)
30*	11.1	-	120	12.6	23.7	-	40.0	-16.3
150*	-0.5	-	120	14.0	13.5	-	43.5	-30.0
300*	2.3	-	120	16.3	18.6	-	46.0	-27.4
450*	1.1	-	120	20.3	21.4	-	46.0	-24.6
750*	-1.0	-	120	26.4	25.4	-	46.0	-20.6
1000*	-0.4	-	120	30.2	29.8	-	54.0	-24.2

*) Ambient noise

Note: The correction factor includes cable loss and antenna factor.

5.7.6 Test result f > 1 GHz

Powered over USB / laptop connection

Frequency (MHz)	Level PK (dBμV)	Duty Cycle Correction (dB)	Level AV (dBμV)*	Correction factor (dB/m)	Corrected level PK dB(μV/m)	Corrected level AV dB(μV/m)	Limit PK dB(μV/m)	Limit AV dB(μV/m)	Delta (dB)
1500*	47.8	-	-	-15.1	32.7	-	74.0	54.0	-21.3
2500*	47.6	-	-	-9.8	37.8	-	74.0	54.0	-16.2
3500*	47.4	-	-	-9.2	38.2	-	74.0	54.0	-15.8
4500*	37.9	-	-	3.5	41.4	-	74.0	54.0	-12.6

*) Average values were calculated from the subtraction of peak values minus correction duty cycle factor.

Note: The correction factor includes cable loss and antenna factor.

Limit according to FCC Part 15C, Section 15.109:

Frequency (MHz)	15.109 Limits dB(μV/m)	Measurement distance (m)
30-88	40	3
88-216	43.5	3
216-960	46	3
Above 960	54	3

Peak-Limit according to FCC Part 15C, Section 15.35(b):

However the peak fieldstrength shall not exceed the maximum permitted average limit by more than 20 dB.

The requirements are **FULFILLED**.

Remarks: The measurement was performed up to the 5th harmonic (5000 MHz).

The spurious emission above 1 GHz wave was only measured in combination with a laptop connection. There are no differences between laptop and charger unit, because the EuT has a internal voltage stabilisation.

FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

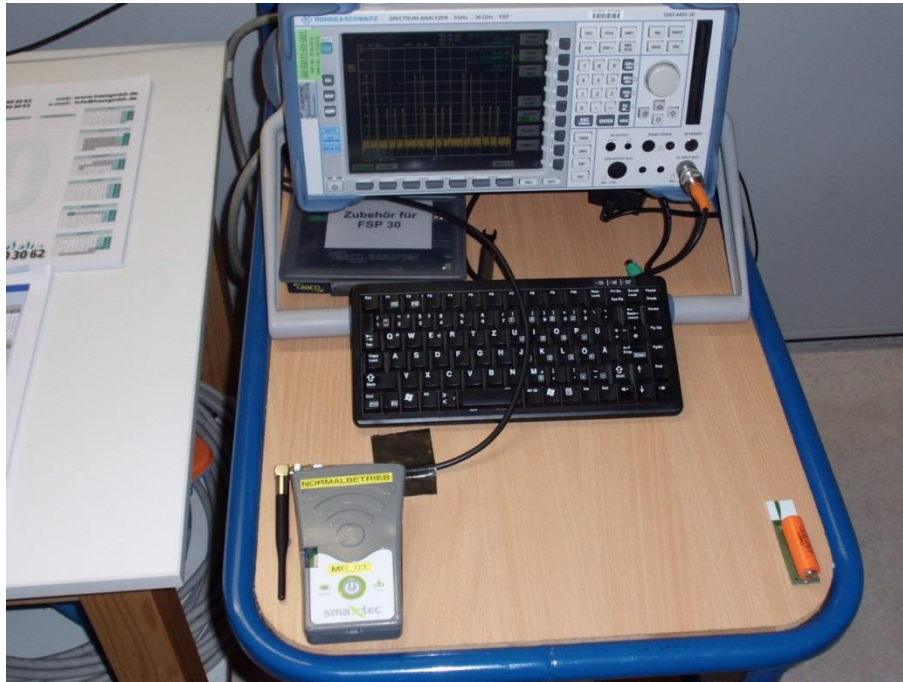
5.8 Occupied bandwidth

For test instruments and accessories used see section 6 Part MB.

5.8.1 Description of the test location

Test location: AREA4

5.8.2 Photo documentation of the test set-up



5.8.3 Applicable standard

According to RSS-Gen, 4.6.1:

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99 % emission bandwidth, as calculated or measured.

5.8.4 Description of Measurement

The bandwidth was measured with the function "bandwidth measurement" of the spectrum analyser. The measurement is performed radiated with normal modulation and a transfer rate means the worst case.

Spectrum analyser settings:

RBW: 10 kHz
Sweep time: Auto

VBW: 30 kHz
Detector: Max. peak

Span: 200 kHz
Trace Mode: Max hold

FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

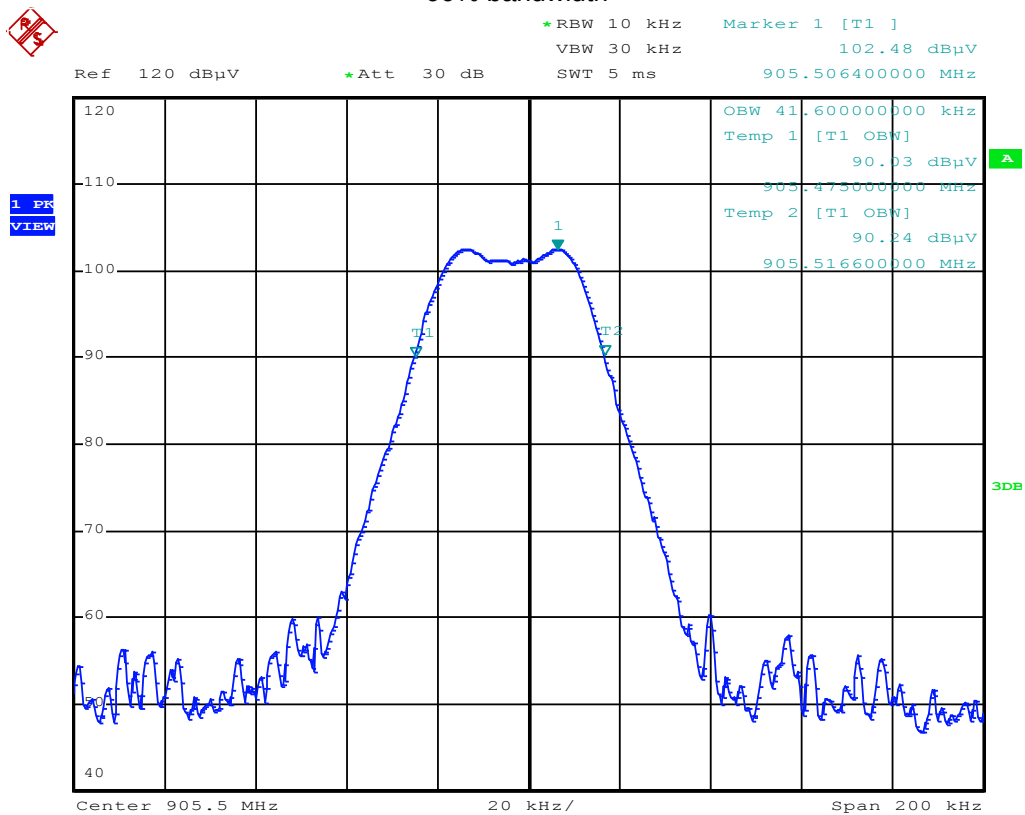
5.8.5 Test result

Fundamental frequency (MHz)	99 % Bandwidth (kHz)
905.5	41.6

Remarks: For detailed test result please refer to following test protocols. The RSS Gen defines no limit for the occupied bandwidth!

5.8.6 Test protocols

99% bandwidth



FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

6 USED TEST EQUIPMENT AND ACCESSORIES

All test instruments used are calibrated and verified regularly. The calibration history is available on request.

Test ID	Model Type	Equipment No.	Next Calib.	Last Calib.	Next Verif.	Last Verif.
A 4	ESHS 30	02-02/03-05-002	11/07/2013	11/07/2012		
	ESH 2 - Z 5	02-02/20-05-004	12/05/2013	12/05/2012	23/07/2013	23/01/2013
	N-4000-BNC	02-02/50-05-138				
	N-1500-N	02-02/50-05-140				
	ESH 3 - Z 2	02-02/50-05-155			02/04/2013	02/10/2012
CPR 2	ESVS 30	02-02/03-05-006	26/06/2013	26/06/2012		
	VULB 9168	02-02/24-05-005	16/03/2013	16/03/2012	08/04/2013	08/10/2012
	S10162-B	02-02/50-05-031				
	NW-2000-NB	02-02/50-05-113				
	KK-EF393/U-16N-21N20 m	02-02/50-12-018				
DC	FSP 40	02-02/11-11-001	18/09/2013	18/09/2012		
	RF Antenna	02-02/24-05-032				
MB	FSP 40	02-02/11-11-001	18/09/2013	18/09/2012		
	RF Antenna	02-02/24-05-032				
SER 1	FMZB 1516	01-02/24-01-018			14/02/2014	14/02/2013
	ESCI	02-02/03-05-005	03/12/2013	03/12/2012		
	S10162-B	02-02/50-05-031				
	KK-EF393-21N-16	02-02/50-05-033				
	NW-2000-NB	02-02/50-05-113				
SER 2	ESVS 30	02-02/03-05-006	26/06/2013	26/06/2012		
	VULB 9168	02-02/24-05-005	16/03/2013	16/03/2012	08/04/2013	08/10/2012
	S10162-B	02-02/50-05-031				
	NW-2000-NB	02-02/50-05-113				
	KK-EF393/U-16N-21N20 m	02-02/50-12-018				
SER 3	FSP 40	02-02/11-11-001	18/09/2013	18/09/2012		
	AFS4-01000400-10-10P-4	02-02/17-05-003				
	AMF-4F-04001200-15-10P	02-02/17-05-004				
	AFS5-12001800-18-10P-6	02-02/17-06-002				
	3117	02-02/24-05-009	18/12/2013	18/12/2012		
	Sucoflex N-1600-SMA	02-02/50-05-073				
	Sucoflex N-2000-SMA	02-02/50-05-075				

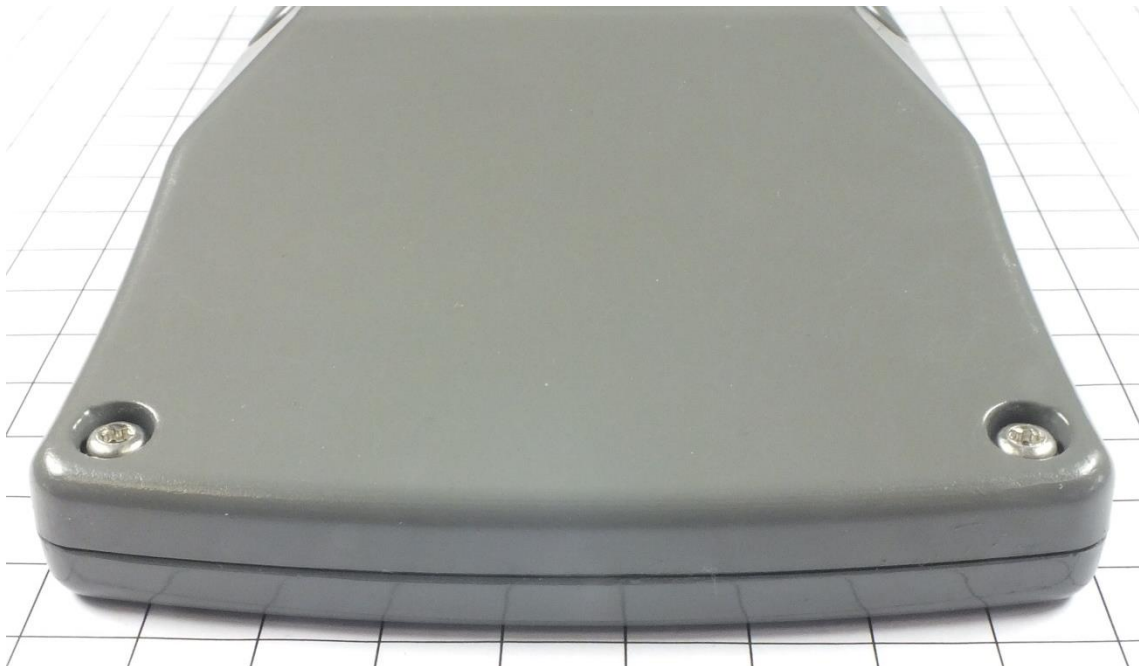
FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

7 Attachment A

7.1 External photos of the EuT



FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

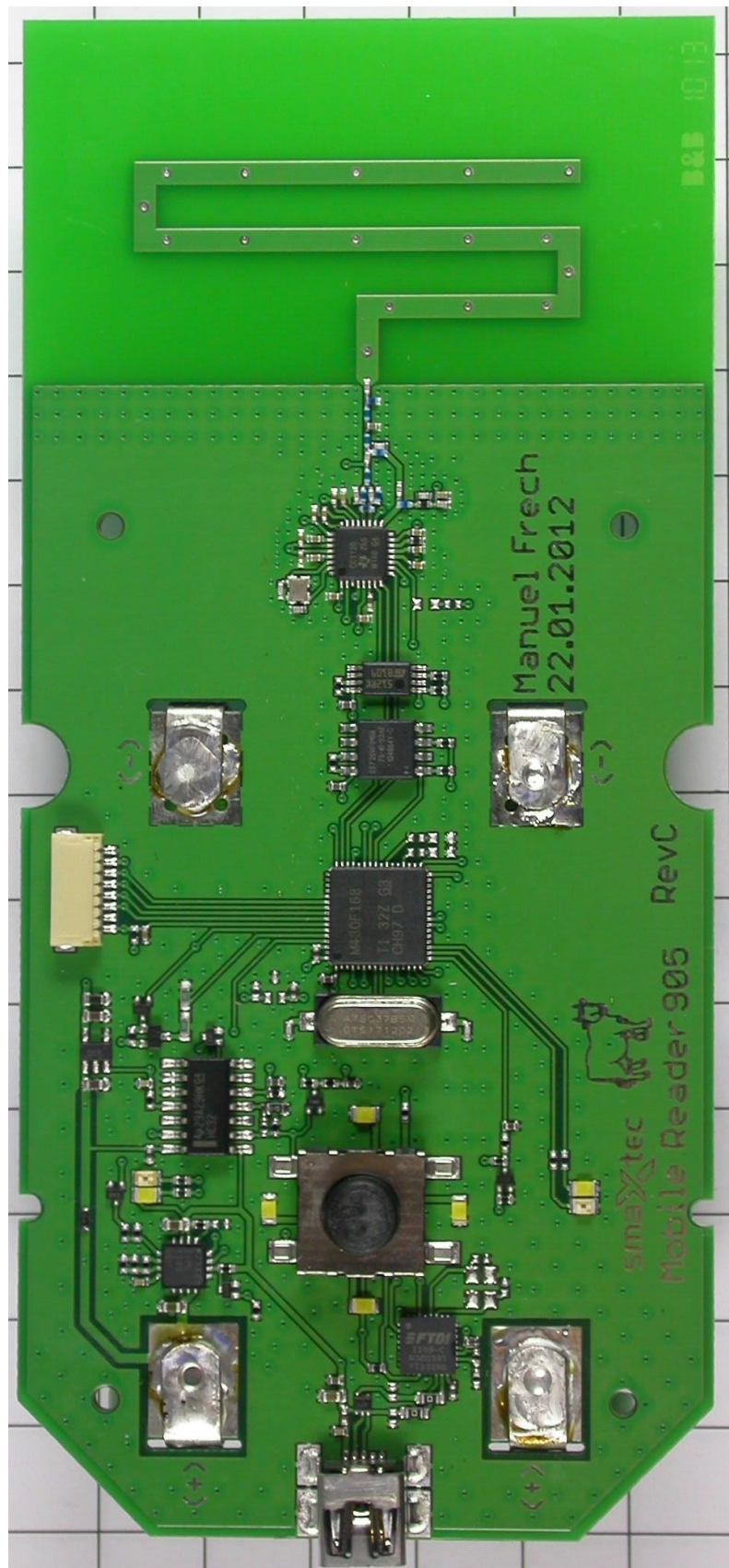


FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

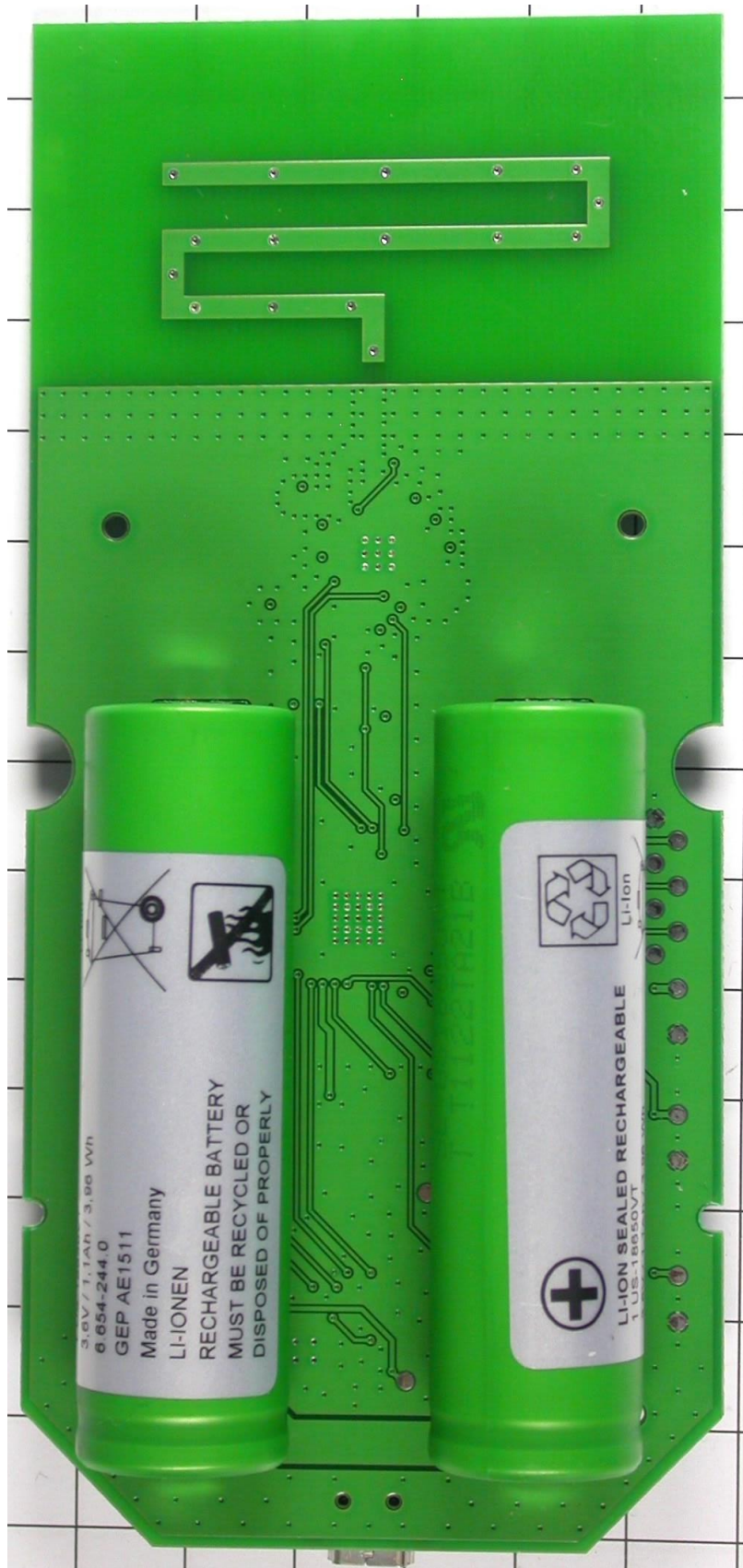


FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

7.2 Internal photos of the EuT



FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2



FCC ID: OHCMETDGS2 IC ID: 10671A-METDGS2

