

EMC TEST REPORT	
FCC Title 47 CFR Part 15B, ISED ICES-003 Issue 7	
Report Reference No	G0M-2009-9279-EF0115B-V01
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation	    A2LA - Registration number: 1983.01 (ISED) ISED wireless device testing laboratory: CN 3470A DAkkS - Registration number : D-PL-12092-01-04 (FCC) FCC Filed Test Laboratory, Reg.-No.: 96970
Applicant	Dräger Safety AG & Co. KGaA
Address	Revalstraße 1 23560 Lübeck GERMANY
Test Specification Standard(s)	Title 47 CFR Part 15 Subpart B ISED ICES-Gen Issue 1 ; Amendment 1 (February 2021) ISED ICES-003 Issue 7 ANSI C63.4:2014+A1:2017
Non-Standard Test Method	None
Equipment under Test (EUT):	
Product Description	Fixed Gas Detector
Model(s)	Polytron 6100 EC WL
Additional Model(s)	Polytron Repeater WirelessISA
Brand Name(s)	--
Hardware Version(s)	RC002
Software Version(s)	Transmitter: P6100 V1.5.7, Centro FW v02.00.08, Bootloader V2.5.0, SW Telit BLT V3.12.002
FCC-ID	X6O-RC002
IC	5895F-RC002
Test Result	PASSED

Possible test case verdicts:		
required by standard but not tested	N/T	
not required by standard	N/R	
required by standard but not appl. to test object	N/A	
test object does meet the requirement	P(PASS)	
test object does not meet the requirement	F(FAIL)	
Testing:		
Date of receipt of test item	2022-06-15	
Report:		
Compiled by	Marko Neuner	
Tested by (+ signature) (Responsible for Test)	Marko Neuner	
Supervised by (+ signature) (Responsible for Test)	Matthias Handrik	
Approved by (+ signature) (Deputy Head of Lab)	Jens Marquardt	
Date of Issue	2022-12-08	
Total number of pages	83	
General Remarks:		
The test results presented in this report relate only to the object tested. The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.		

Additional Comments:
Statement concerning the uncertainty of the measurement systems used for decisions on conformity (decision rule):

The Decision Rule is applied on the basis of CISPR16-4-2 and/or IEC61000-4-x (TR61000-1-6) and their national publications. These standards provide guidance on how to calculate and apply measurement uncertainty whilst providing maximum uncertainties allowance. In all cases due consideration will be given to ILAC-G8:09/2019.

Compliance or non-compliance with a disturbance limit is determined in the following manner.

- If U_{lab} is less than or equal to U_{cisp} , then: compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit; non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.
- If U_{lab} is greater than U_{cisp} , then: compliance is deemed to occur if no measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit; non-compliance is deemed to occur if any measured disturbance level, increased by $(U_{lab} - U_{cisp})$, exceeds the disturbance limit.

Where appropriate for the test, for example for EMC pulsed immunity tests, the laboratory has demonstrated, by calibrating its equipment and facilities, that it complies with the above requirements and therefore no allowance of uncertainties has been given to the tolerances.

Additional models (tested and evaluated models)		
tested models	Description	
Additional Model 1	Product Type Description	Polytron Repeater Wireless ISA100
	Model name	Polytron Repeater Wireless ISA
	Brand name	--
	Hardware Version	RC002
	Software Version	Polytron Repeater V1.5.7, Centro FW v02.00.08, Bootloader V2.5.0, SW Telit BLT V3.12.002
Comment: Those named additional models above have been tested. Those additional models of the series have been declared by the manufacturer.		

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
BLE	Bluetooth low energy
EUT	Equipment Under Test
FCC	Federal Communications Commission
ISED	Innovation, Science and Economic Development Canada
T _{NOM}	Nominal operating temperature
V _{NOM}	Nominal supply voltage
WISA	Wireless ISA

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2022-12-08	Initial Release	-

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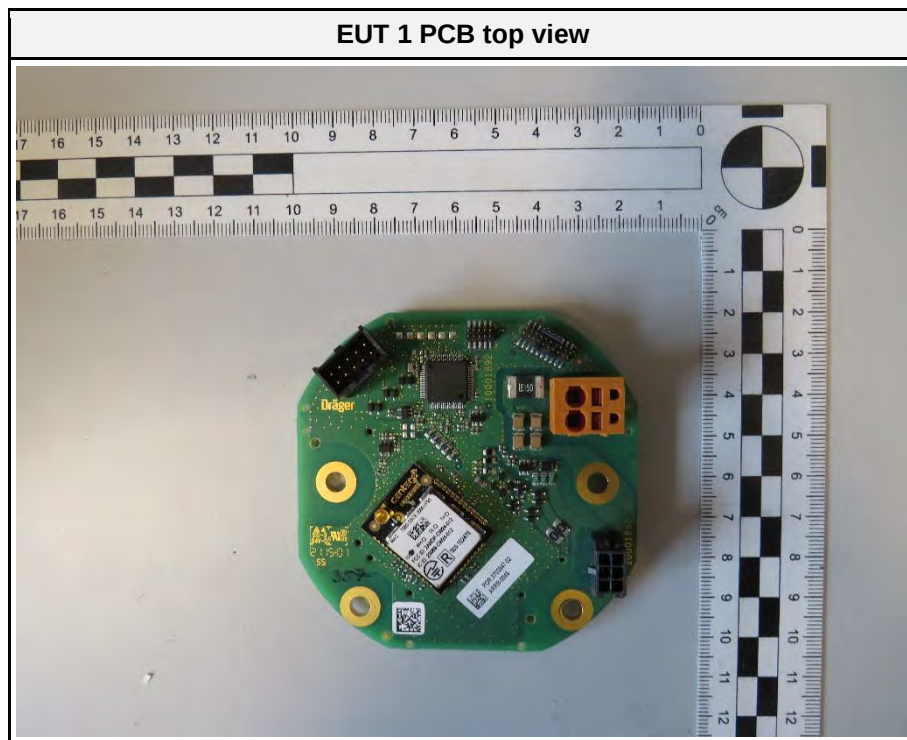
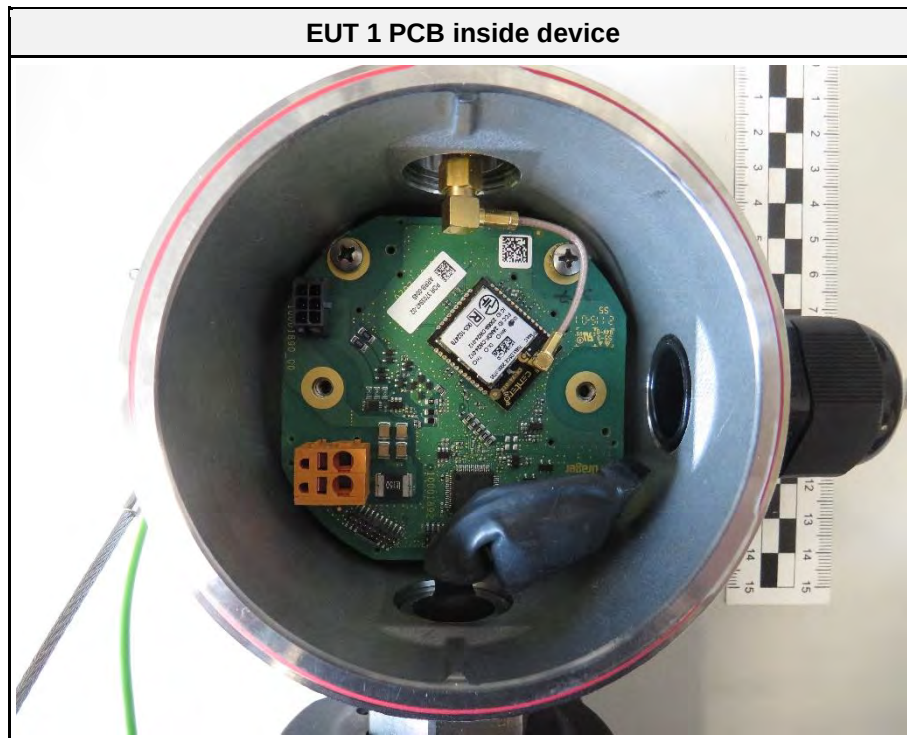
1 Equipment (Test Item) Under Test

Description	Fixed Gas Detector		
Intended Use	Wireless transmitter for detecting toxic gases and oxygen		
Intended Use Repeater	The repeater is used to relay data from other ISA100 Wireless™ network subscribers. The Dräger Polytron Repeater ISA is a version of the Dräger Polytron 6100 EC WL without measuring function.		
Model	Polytron 6100 EC WL		
Additional Model(s)	Polytron Repeater WirelessISA		
Brand Name(s)	--		
Hardware Version(s)	RC002		
Software Version(s)	Polytron Repeater V1.5.7, Centro FW v02.00.08, Bootloader V2.5.0, SW Telit BLT V3.12.002		
Number of tested samples	2		
Sample Identification	EUT #	Sample-ID	Serial Number
	EUT 1	40294	3714792
	EUT 2 (Repeater)	40297	37147920
EUT Dimensions [cm]	28x15x13		
FCC-ID	X6O-RC002		
IC	5895F-RC002		
Class	Class B		
Equipment type	Table top		
Highest internal frequency [MHz]	2481 (Bluetooth)		
Protective Earth	None		
Functional Earth	Yes		
Radio Module	Type	Bluetooth module	
	Model	BlueMod + S42 ATEX	
	Manufacturer	Telit Communication	
	FCC-ID	RFRMS42	
	IC	4957A-MS42	
	Hardware Version(s)	BE890D2SY3ATAI1	
	Software Version(s)	3.012.0002	
Radio Module (Repeater)	Type	Bluetooth module	
	Model	CW24-012	
	Manufacturer	Centro LLC	
	FCC-ID	2ANDP-CW24-012	
	IC	23069-CW24012	
Supply Voltage	V _{NOM}	24 VDC 14.4 VDC Battery box Dräger LBT 0300	
AC/DC-Adaptor	Model	None	
Manufacturer	Dräger Safety AG & Co. KGaA Revalstraße 1 23560 Lübeck GERMANY		

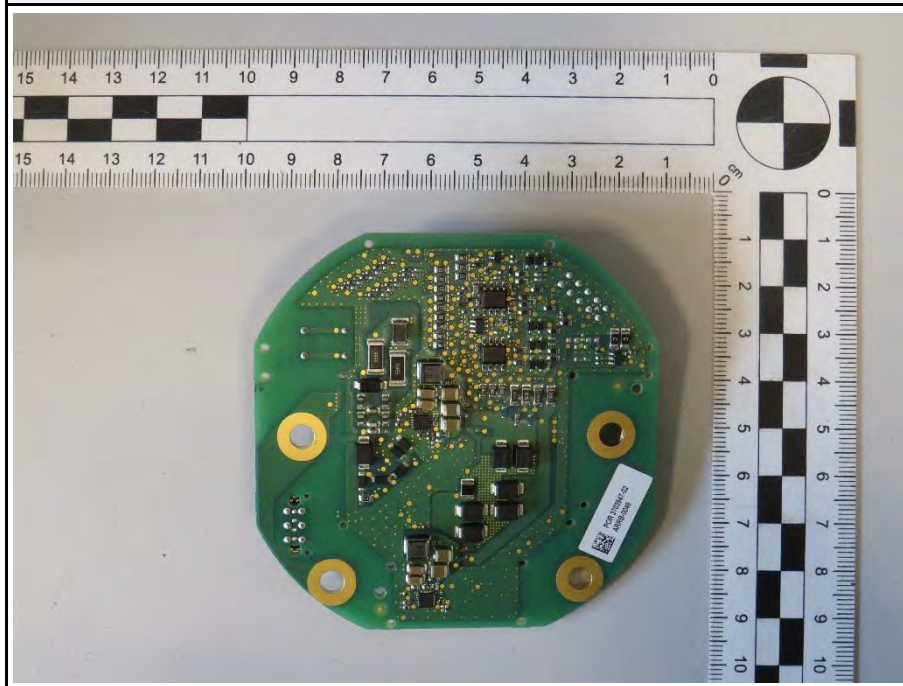
1.1 Equipment Ports

Name	Type	Attributes	Comment
Power	DC	Count: 1 Cable length [m]: >3 m Direction: IO Service only: No Shielded: No	Cable not defined, used parallel line for measurement
Enclosure	IO	Count: 2 Cable length [m]: - Direction: IO Service only: No Shielded: No	BLE and WISA connection
antenna port	AP	Count: 1 Direction: IO Max. cable length [m]: 20m Shielded: Yes Service only: No	Coax cable <=20m SE-Mont AS None signal wired connection
Description:			
AC	AC mains power input/output port		
DC	DC power input/output port		
BAT	DC power input port connected to external battery		
IO	Input/Output port		
TP	Telecommunication port		
NE	Non-electrical port		

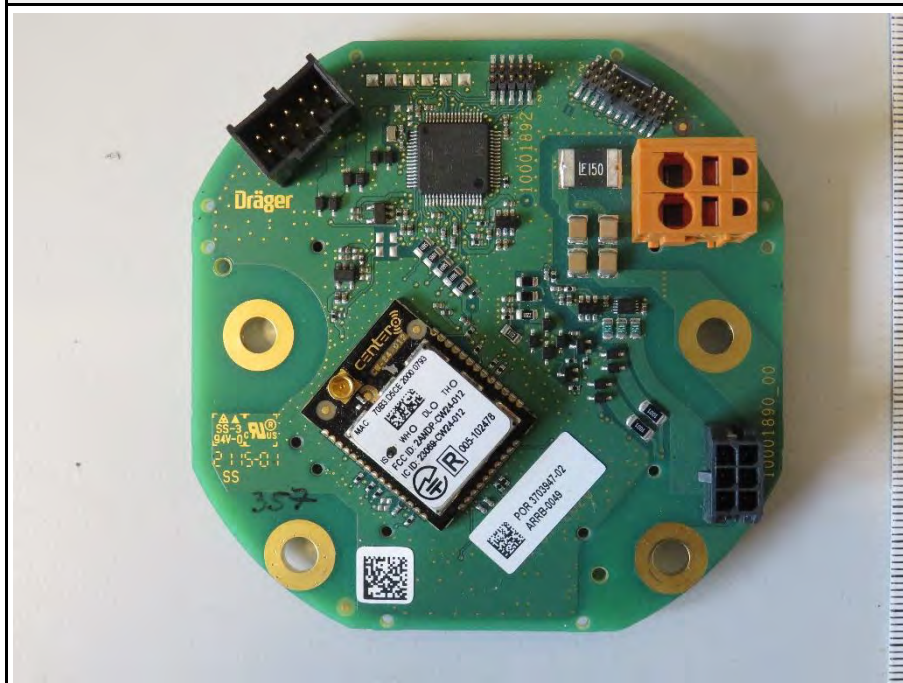
1.2 Equipment Photos - Internal



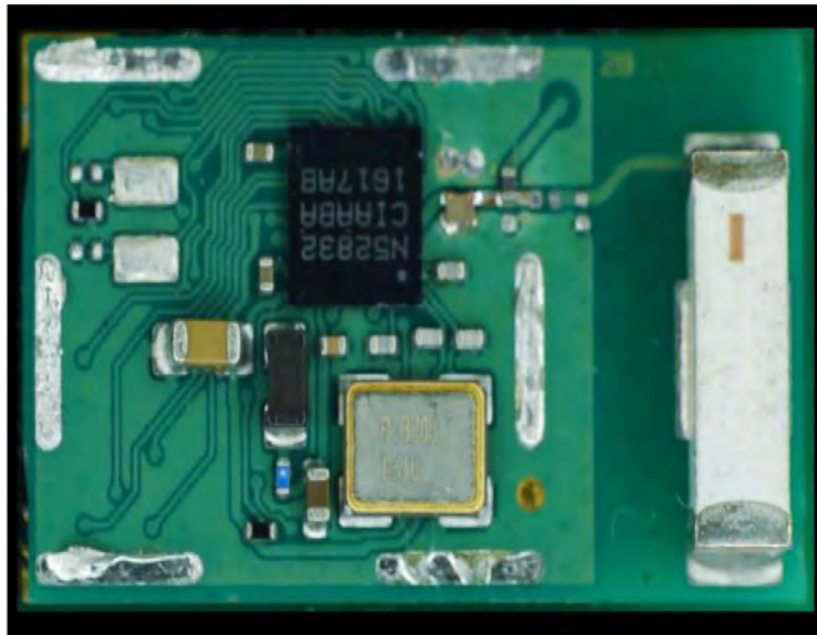
EUT 1 PCB bottom view



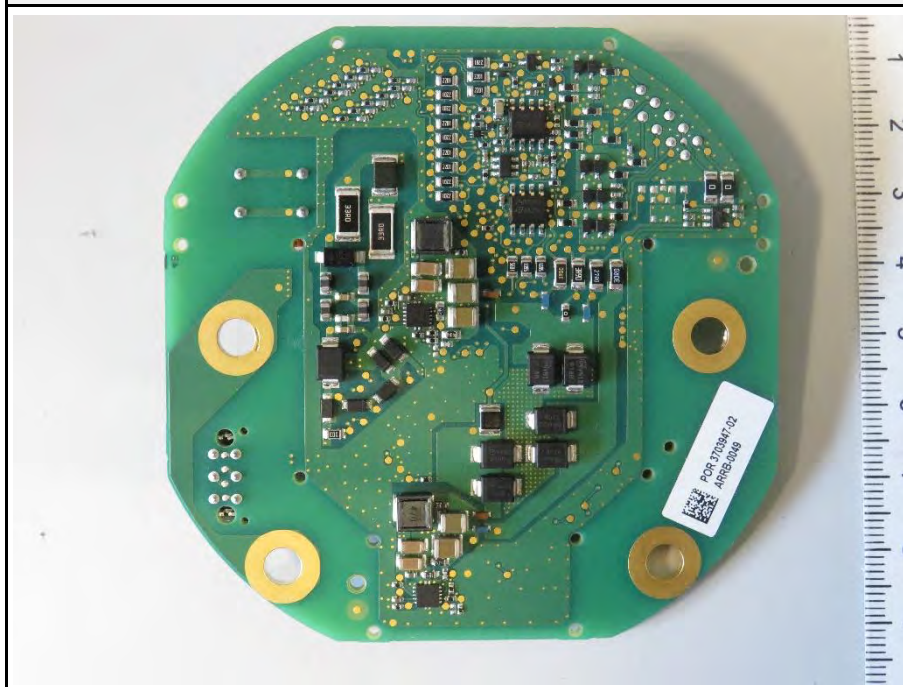
EUT 1 PCB top view assembly and label



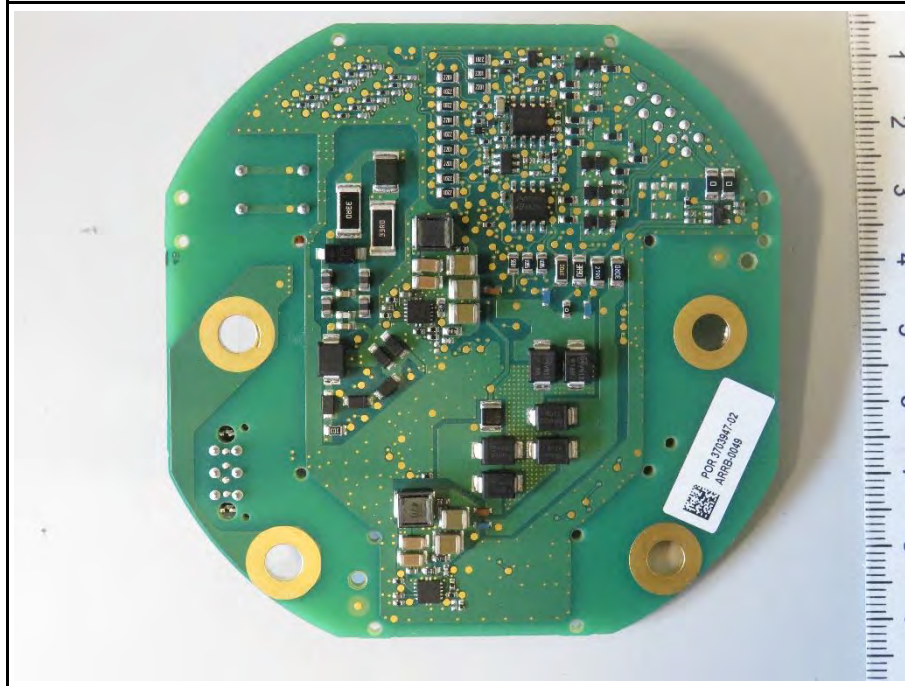
EUT 1 PCB bottom view modul open



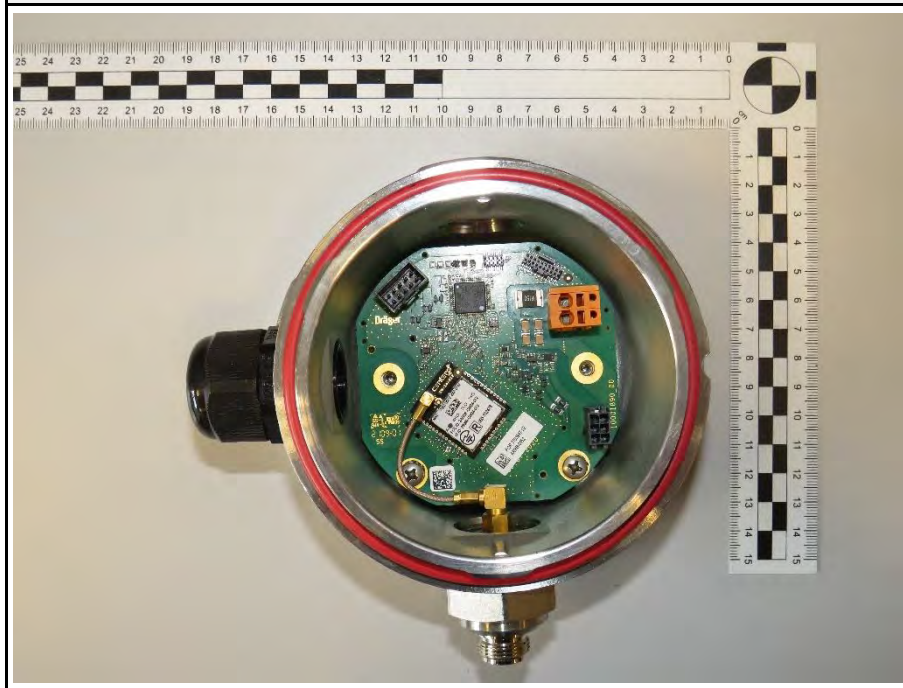
EUT 1 PCB bottom view assembly and label



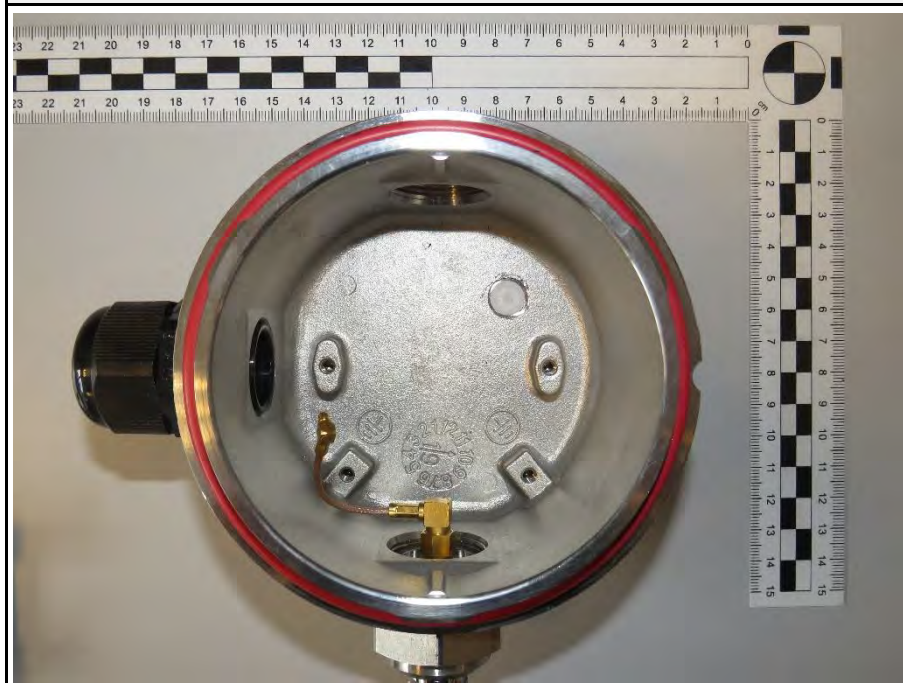
EUT 1 PCB bottom view assembly and label



EUT 2 PCB inside Device



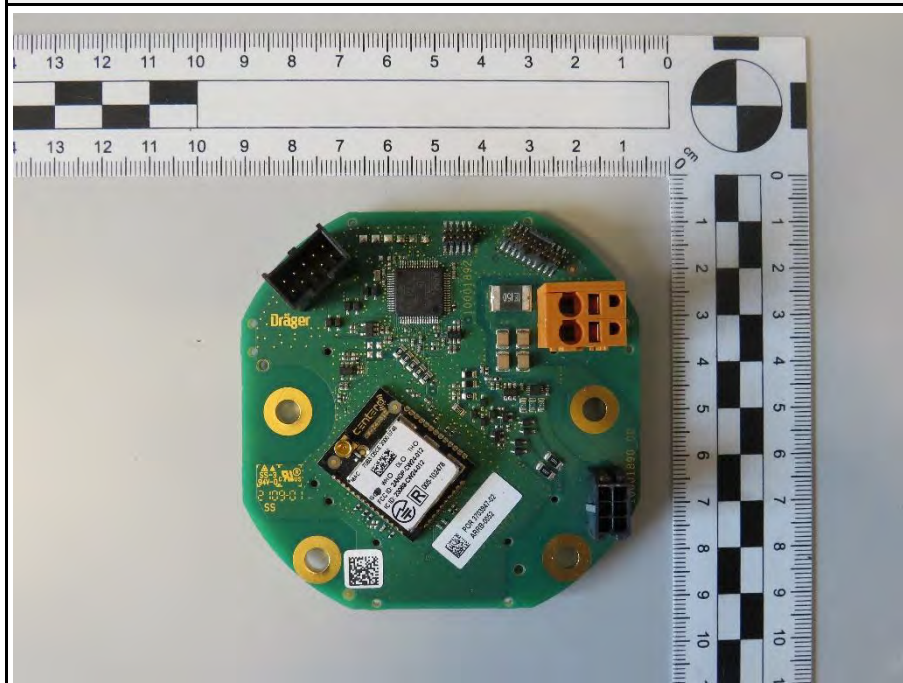
EUT 2 enclosure



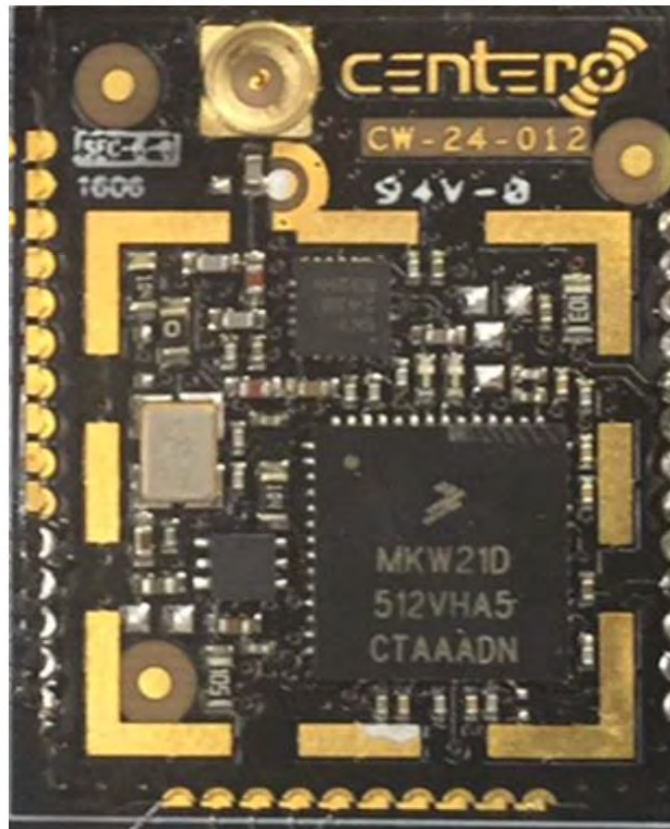
EUT 2 radio module



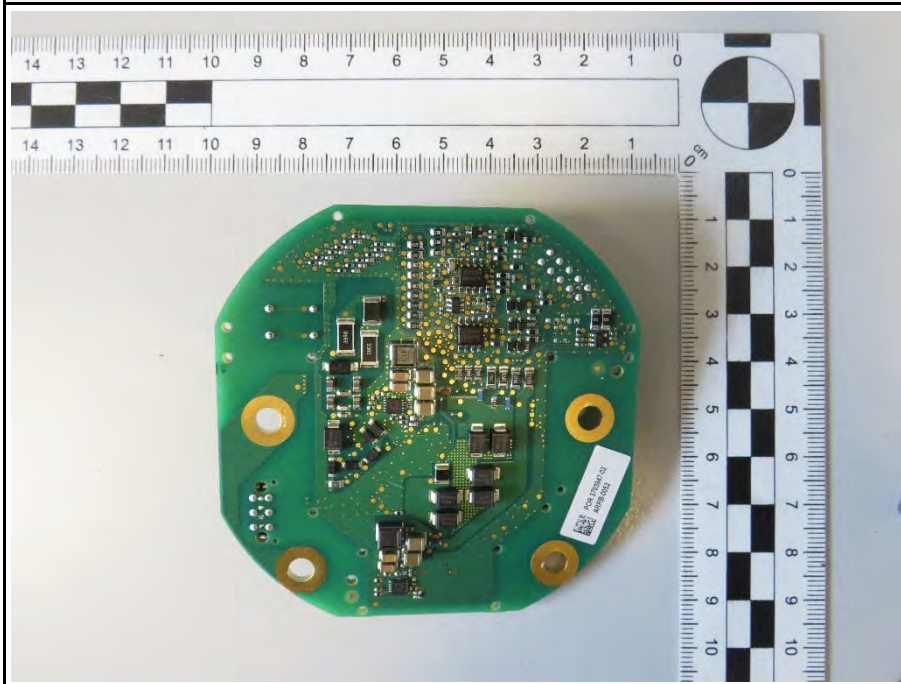
EUT 2 PCB top side

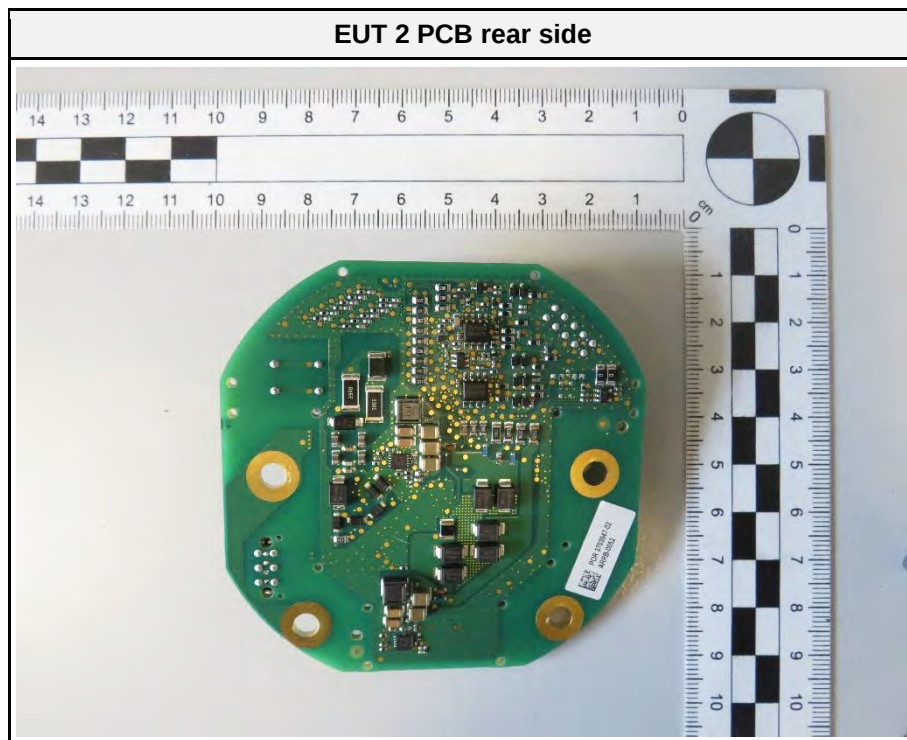


EUT 2 radio module open



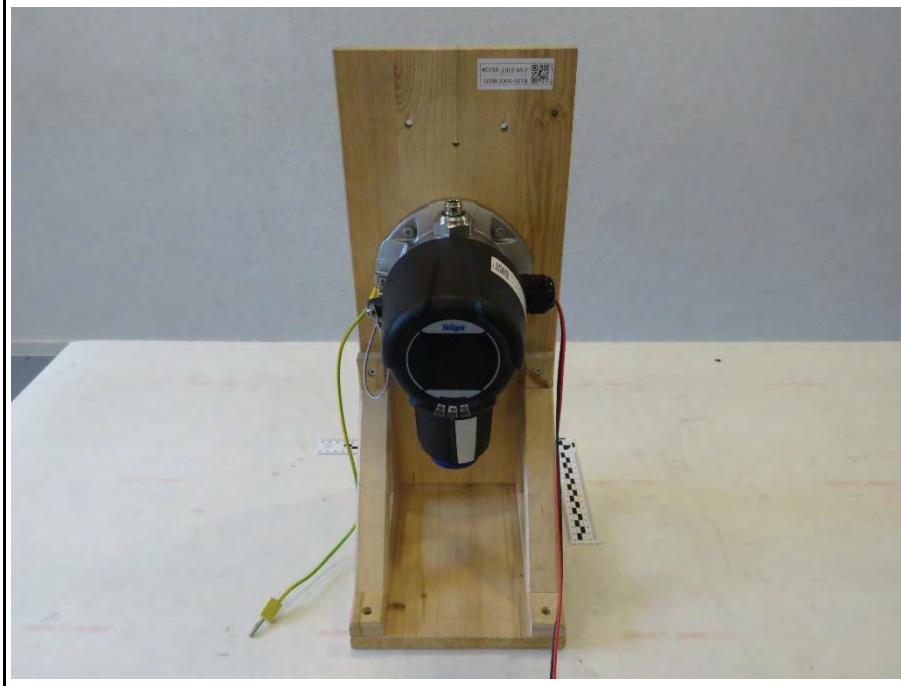
EUT 2 PCB rear side





1.3 Equipment Photos - External

EUT 1 on holder



EUT 1 front side



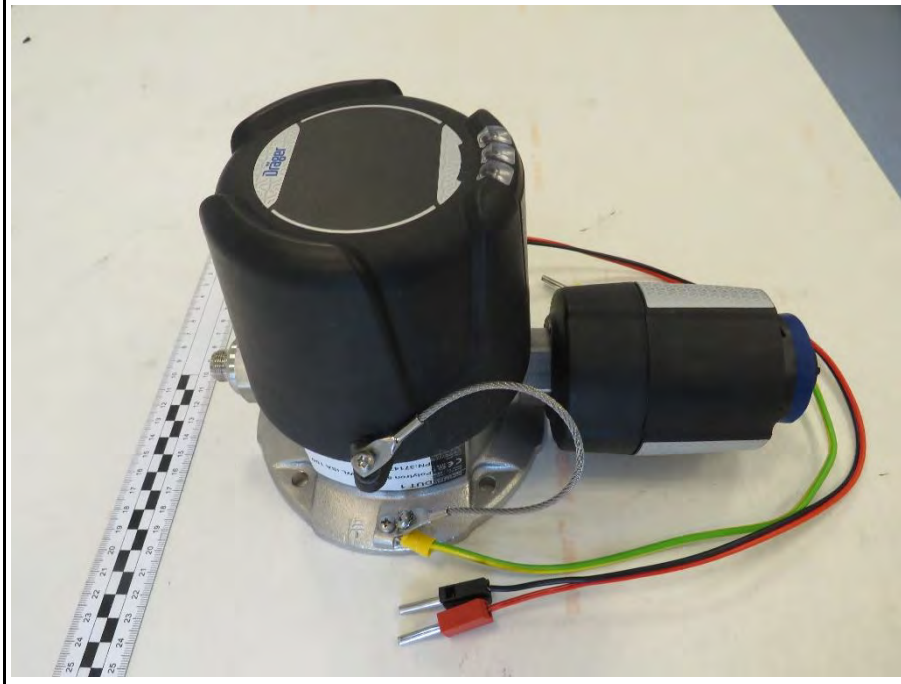
EUT 1 bottom side



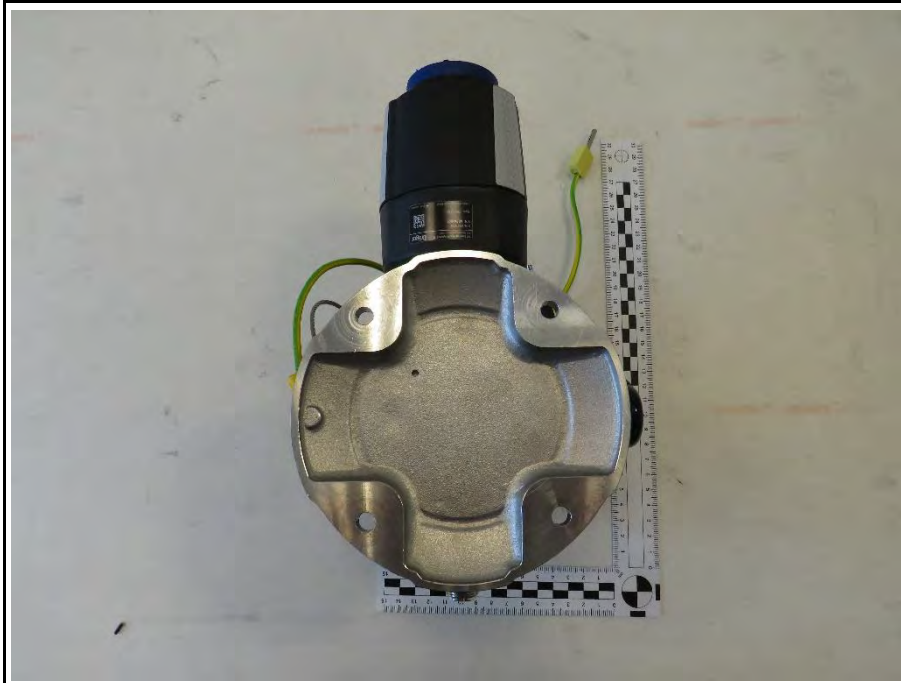
EUT 1 left side



EUT 1 right side



EUT 1 rear side



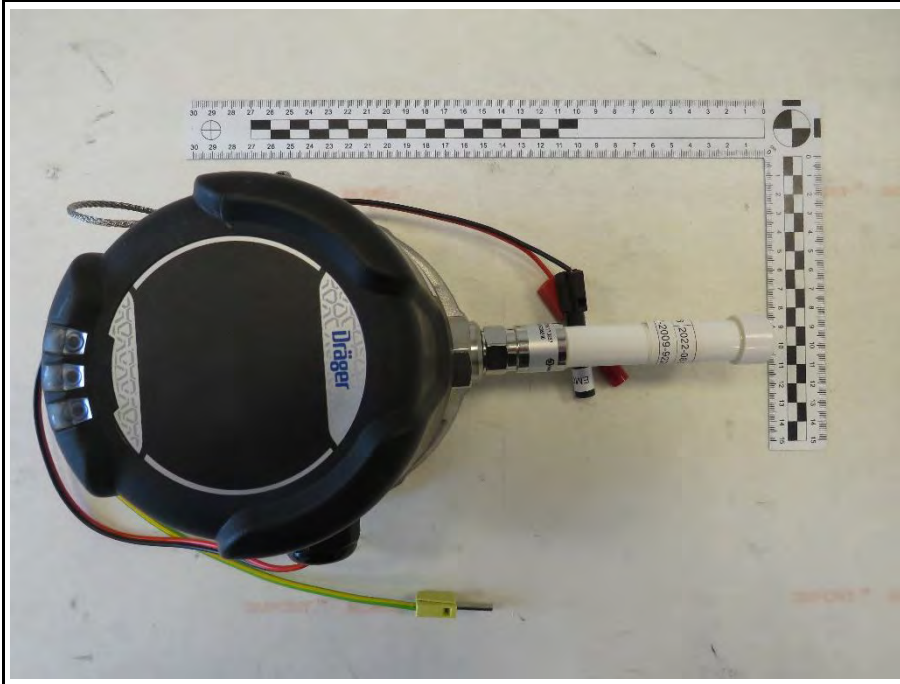
EUT 1 Top side



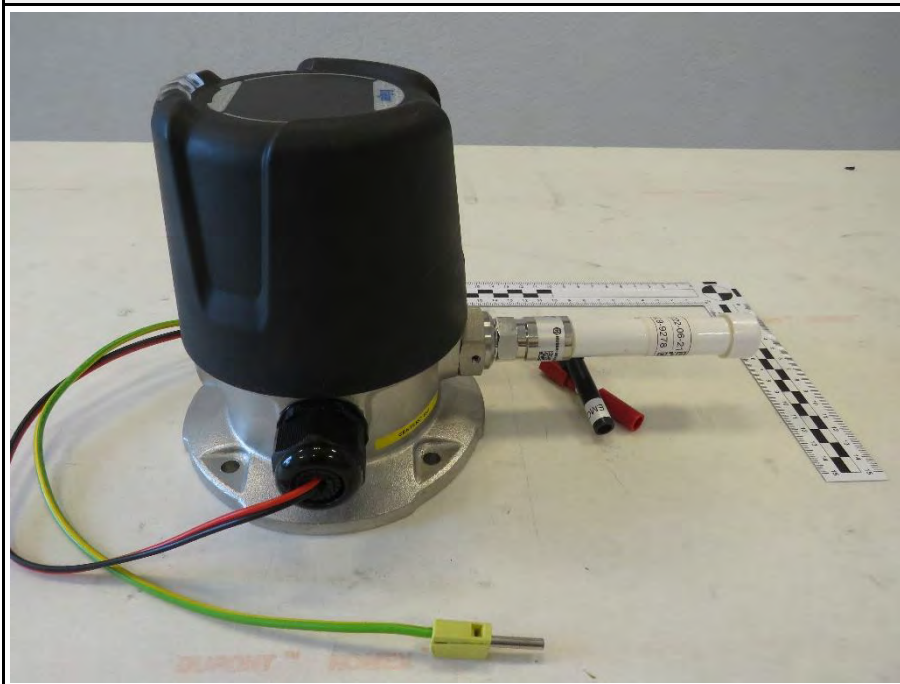
EUT 1 label



EUT 2 front



EUT 2 left



EUT 2 bottom



EUT 2 top



EUT 2 bottom



EUT 2 right



EUT 2 label



EUT 2 sample ID



EUT 2 Top without antenna



EUT 2 Top antenna connection



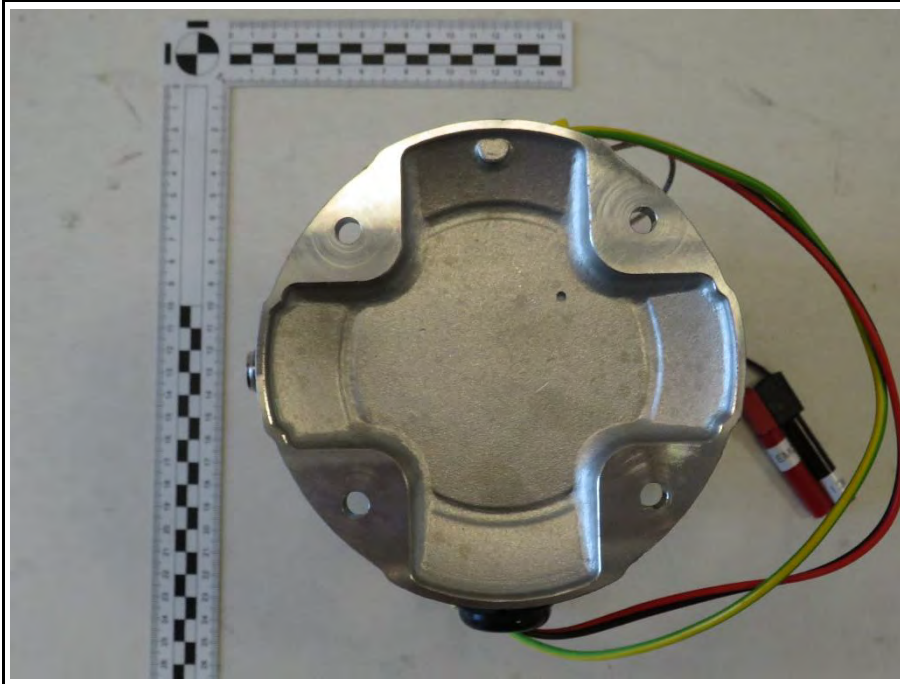
EUT battery



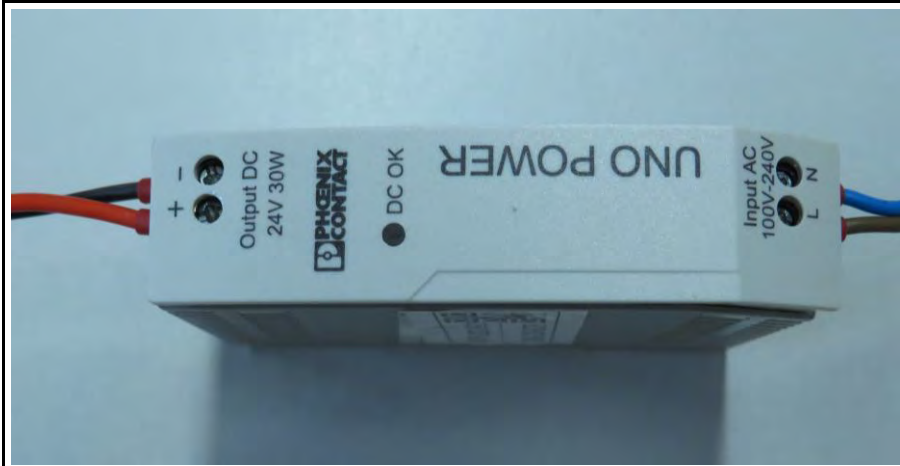
EUT battery inside



EUT 2 rear side



EUT power supply AC/DC-adapter



EUT antenna



1.4 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
AE	Laptop	Lenovo	T450	Eurofins Support Equipment
CBL	Coax cable	Se-Mont AS	RG213 - 50 Ohm – M-12-4 – 038-20-175	Customer Support Equipment 2m
CBL	Coax cable	Huber&Suhner	SPUMA 400 FR 50 AWM Style 1354 2333586	Customer Support Equipment 20m
AE	Gas Detector	Dräger	Polytron Repeater ISA 100-	Customer Support Equipment S/N 37147920
AE	Batterie	Dräger	Polytron 6xx0	Customer Support Equipment ARML-0044
AE	Batterie	Dräger	Polytron 6xx0	Customer Support Equipment ARML-0249
AE	Batterie	Dräger	Polytron 6xx0	Customer Support Equipment ARNB-0350
AE	Stabantenne	Huber&Suhner	1399.17.0237	Customer Support Equipment 2496205033
AE	Stabantenne	Huber&Suhner	1399.17.0237	Customer Support Equipment 2496205280
AE	Stabantenne	-	-	Customer Support Equipment black
AE	BLE-Dongle	Delock	-	Customer Support Equipment
AE	Field wireless access point	Yokogawa	YFGW 510	Customer Support Equipment
AE	Field wireless management station	Yokogawa	YFGW 410	Customer Support Equipment
CBL	Ethernet	-	-	Customer Support Equipment 0,5m; black
CBL	USB extension Cable	-	-	Eurofins Support Equipment 2m; USB 3.0 compliant
AE	BLE-Dongle	Delock	-	Customer Support Equipment
SW	Dräger intern software control and debug tool	Dräger	GasSecure Service Application v2.3.1274	Customer Support Equipment
SW	Yokogawa field wireless management console	Yokogawa	Configurator Version R2.01.06	Customer Support Equipment

SW	Yokogawa field wireless management console	Yokogawa	Monitor Version R2.01.06	Customer Support Equipment
MON	Spectrum analyser	R&S	FPL1007	Eurofins Support Equipment *
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
MON	Monitoring Equipment			
CBL	Connecting Cable			
Comment:				

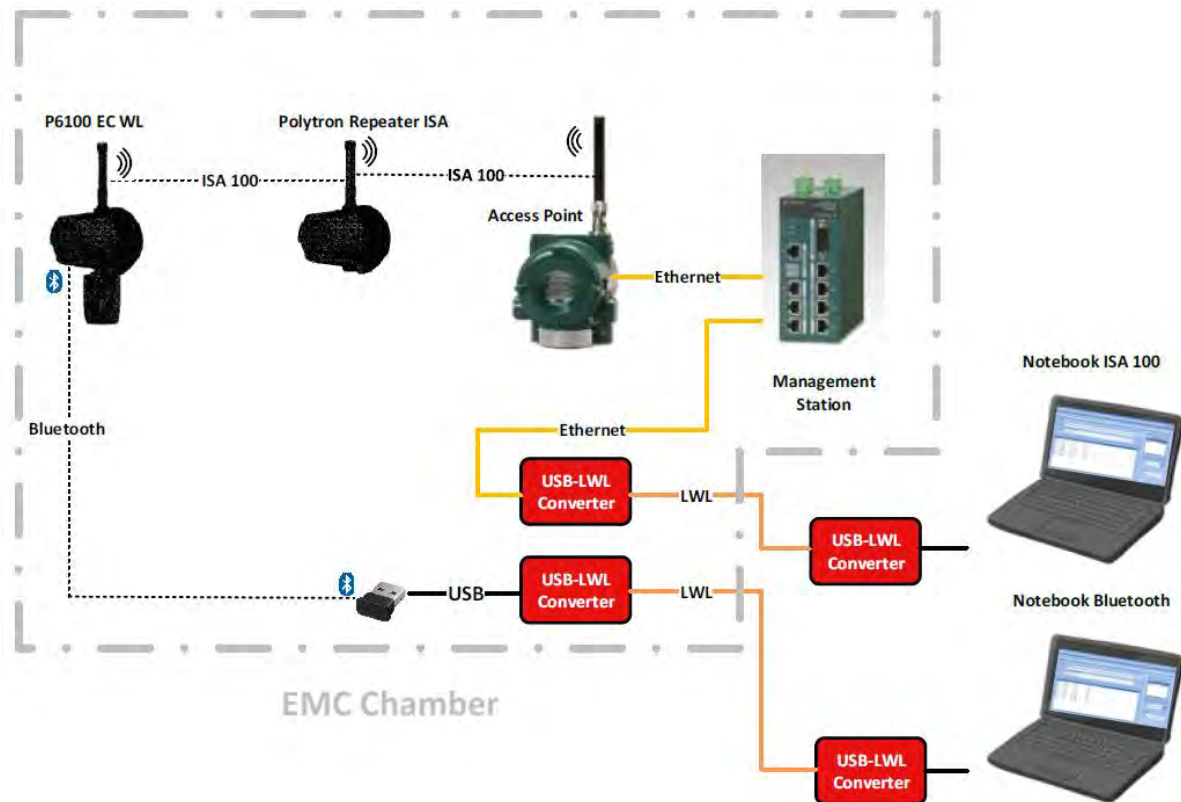
1.5 Operational Modes

Mode #	Description
1	Bluetooth LE operational, connection established, Wireless ISA connection established (ZigBee) over repeater Station
Comment:	

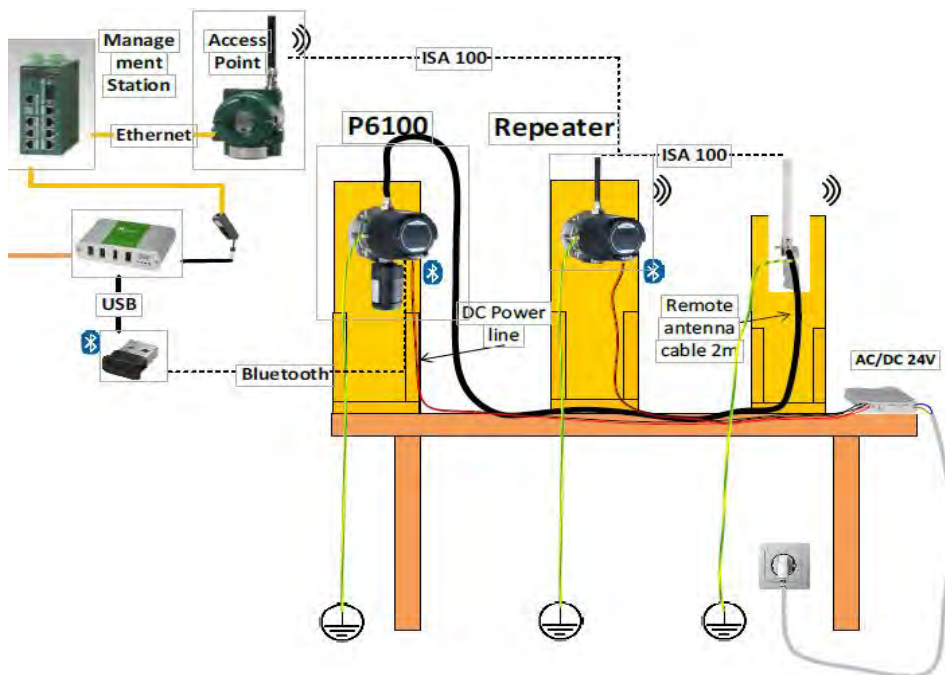
1.6 EUT Configuration

Configuration #	Description
1	EUT 1 powered with 24V DC, cable not specified, used parallel wire configuration, unshielded, functional earth connected (100 cm) Additional used a separated antenna with 150 cm antenna cable
2	EUT 1 battery 14.4V powered. Used internal battery Functional Earth connected (100 cm) Antenna direct mounted at device
3	EUT 2 powered with 24V DC, cable not specified, used parallel wire configuration, unshielded, functional earth connected (100 cm) Additional used a separated antenna with 150 cm antenna cable
4	EUT 2 battery 14.4V powered. Used internal battery Functional Earth connected (100 cm) Antenna direct mounted at device
Comment:	

Block diagram battery mode



Ground connection, specified by customer



1.7 Sample emission level calculation

The following is a description of terms and a sample calculation, as appears in the radiated emissions data table. The numbers used in the calculation are for example only. There is no direct correlation to the specific data taken for the product described in this document:

Reading:

This is the reading obtained on the spectrum analyser in dB μ V. Any external preamplifiers used are taken into account through internal analyser settings.

A.F.:

This is the antenna factor for the receiving antenna. It is a conversion factor, which converts electric fields strengths to voltages, which can be measured directly on the spectrum analyser. It is treated as a loss in dB. Cable losses have been included with the A.F. to simplify the calculations. The antenna factor is used in calculations as follows:

$$\text{Reading on Analyser (dB}\mu\text{V)} + \text{A.F. (dB/m)} = \text{Net field strength (dB}\mu\text{V/m)}$$

Net:

This is the net field strength measurement (as shown above).

Limit:

This is the FCC Class B radiated emission limit (in units of dB μ V/m). The FCC limits are given in units of μ V/m. The following formula is used to convert the units of μ V/m to dB μ V/m:

$$\text{Limit (dB}\mu\text{V/m)} = 20 \cdot \log (\mu\text{V/m})$$

Margin:

This is the margin of compliance below the FCC limit. The units are given in dB. A negative margin indicates the emission was below the limit. A positive margin indicates that the emission exceeds the limit.

Example only:

Reading + AF	= Net Reading	:	Net reading - FCC limit	= Margin
+21.5 dB μ V + 26 dB/m	= 47.5 dB μ V/m	:	47.5 dB μ V/m - 57.0 dB μ V/m	= -9.5 dB

2 Result Summary

Title 47 CFR Part 15B, ISED ICES-003 Issue 7				
Reference	Requirement	Reference Method	Result	Remarks
Emission				
FCC 15.109 ICES-003, 3.2.2	Radiated emissions	ANSI C63.4:2014 +A1:2017	PASS	-
FCC 15.107 ICES-003, 3.2.1	AC power line conducted emissions	ANSI C63.4:2014 +A1:2017	PASS	-
Comment:				

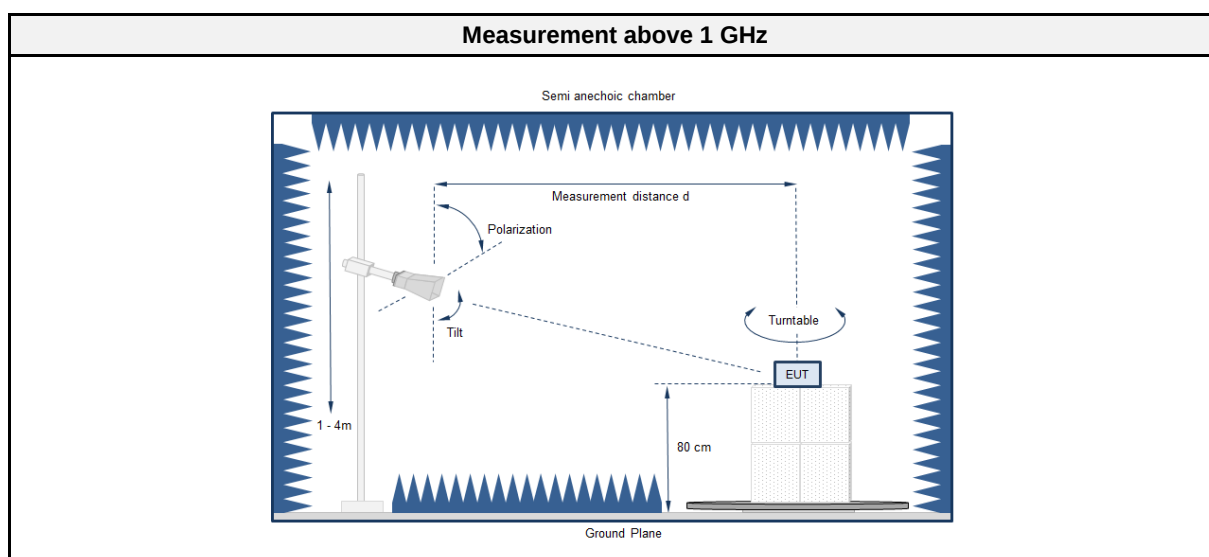
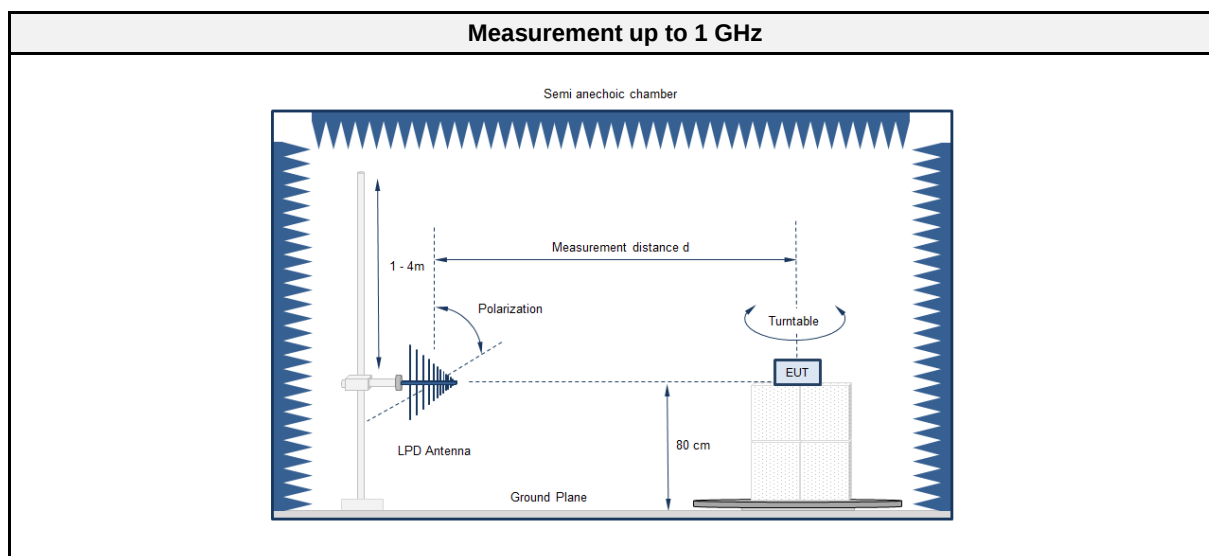
Possible Test Case Verdicts	
PASS	Test object does meet the requirements
FAIL	Test object does not meet the requirements
N/T	Required by standard but not tested
N/R	Not required by standard for the test object

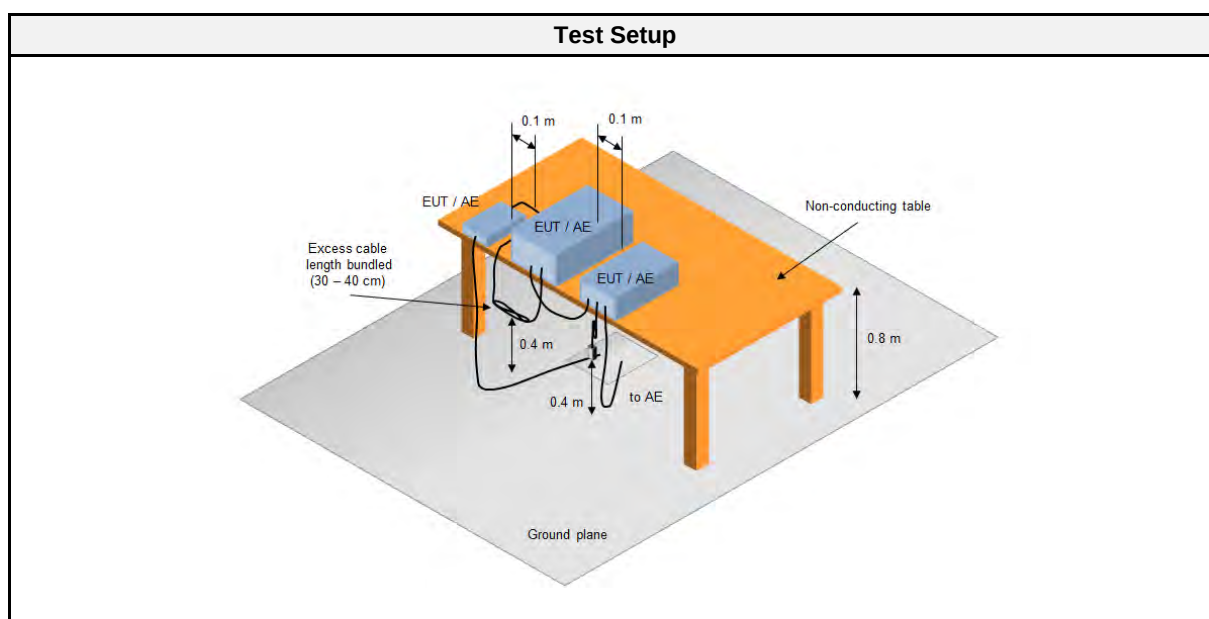
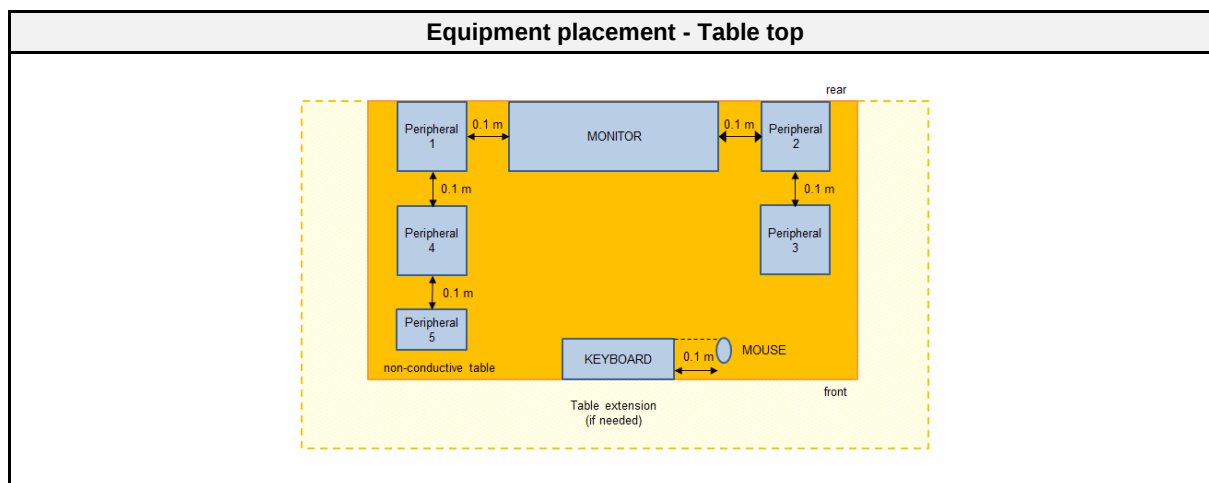
2.1 Test Conditions and Results - Radiated emissions acc. to ANSI C63.4

2.1.1 Information

Test Information	
Reference	FCC 15.109, ICES-003, 3.2.2
Reference method	ANSI C63.4:2014+A1:2017 Section 8
Equipment class	Class B
Equipment type	Table top
Highest internal frequency [MHz]	2481
Measurement range	30 MHz to 13000 MHz
Temperature [°C]	21 ±3
Humidity [%]	52 ±20
Operator	Marko Neuner
Date	2022-07-07 and 2022-07-15

2.1.2 Setup





2.1.3 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	Radimation	2020.1.8

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic chamber (NSA)	Frankonia	AC1	EF00062	2021-02	2024-02
Anechoic chamber (SVSWR)	Frankonia	AC 1	EF01011	2022-06	2025-06
Programmable AC Source	Chroma ATE Inc.	61604	EF01068	2021-07	2022-07
EMI Test Receiver	Keysight	N9038A-526/WXP	EF01070	2021-07	2022-07
Biconical Antenna	R&S	HK 116	EF00030	2021-05	2024-05
LPD Antenna	R&S	HL 223	EF00187	2022-06	2025-06
Horn Antenna	Schwarzbeck	BBHA9120D	EF00018	2019-10	2022-10
Climatic Sensor	Embedded Data Systems, LLC.	2800100000254 17E	EF01054	2022-04	2023-04

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Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

2.1.4 Procedure

Exploratory measurement	
1.	The EUT was placed on a non-conductive table at a height of 0.8m.
2.	The EUT and support equipment, if needed, were set up to simulate typical usage.
3.	Cables, of type and length specified by the manufacturer, were connected to at least one port of each type and were terminated by a device or simulating load of actual usage.
4.	The antenna was placed at a distance of 3 or 10 m.
5.	The received signal was monitored at the measurement receiver.
6.	This procedure has to be performed in both antenna polarizations, horizontal and vertical.
7.	The arrangement of the equipment with the maximum emission level is shown on the setup picture at item 2.1.2

Final measurement	
1.	The EUT was placed on a 0.8 m non-conductive table at a 3 m distance from the receive antenna. The antenna output was connected to the measurement receiver.
2.	A biconical antenna was used for the frequency range 30 – 200 MHz, a logarithmic periodical antenna was used for the frequency range from 200 – 1000 MHz. Above one 1 GHz a Double Ridged Broadband Horn antenna was used. The antenna was placed on an adjustable height antenna mast.
3.	The EUT and cable arrangement were based on the exploratory measurement results.
4.	Emissions were maximized at each frequency by rotating the EUT and adjusting the receive antenna height and polarization. The maximum values were recorded.
5.	The test data of the worst-case conditions were recorded and shown on the next pages.

2.1.5 Limits

Class B @ 3 m		
Frequency [MHz]	Detector	Limit [dB μ V/m]
30 - 88	Quasi-peak	40
88 - 216	Quasi-peak	43.5
216 - 960	Quasi-peak	46
960 - 1000	Quasi-peak	54
> 1000	Peak	74
	Average	54

Class A @ 10 m		
Frequency [MHz]	Detector	Limit [dB μ V/m]
30 - 88	Quasi-peak	39
88 - 216	Quasi-peak	43.5
216 - 960	Quasi-peak	46.5
960 - 1000	Quasi-peak	49.5
> 1000	Peak	69.5
	Average	49.5

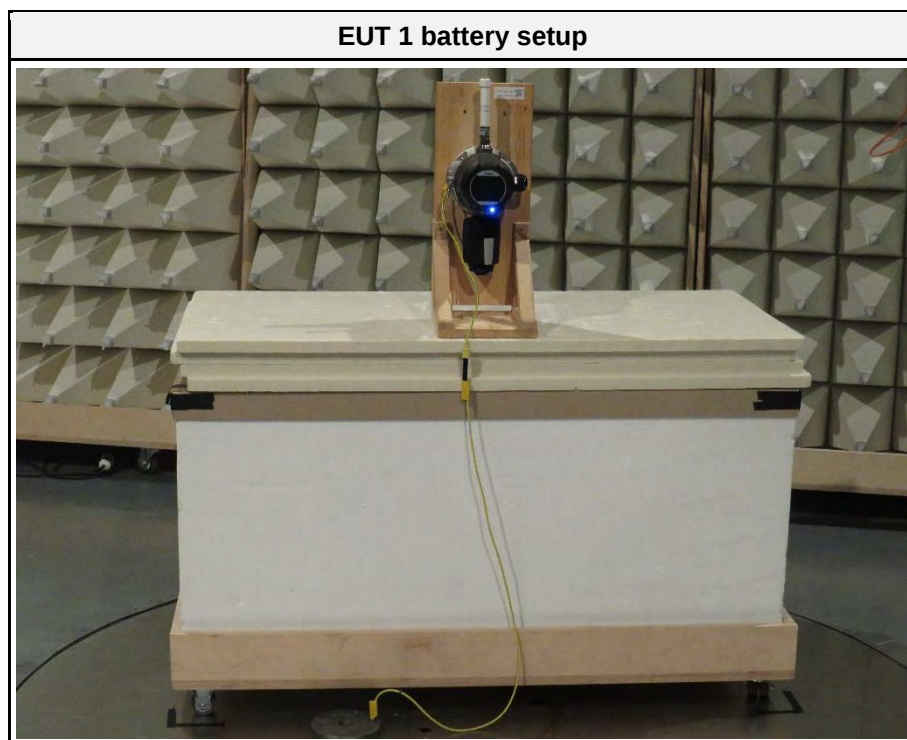
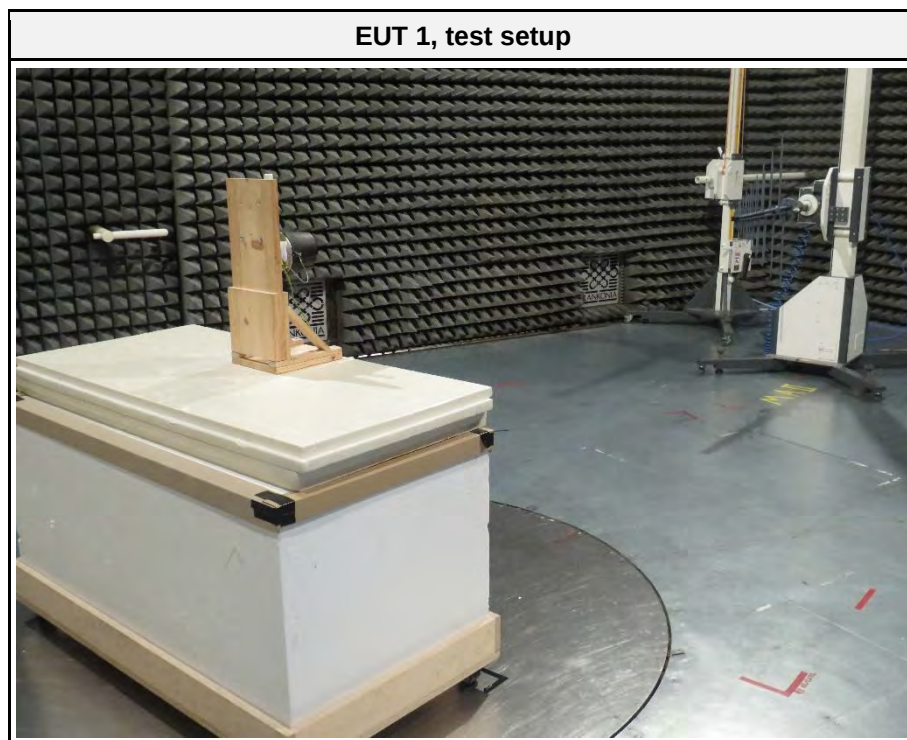
2.1.6 Results

Test Results			
Operational mode	EUT Configuration	Verdict	Remark
1	1	PASS	-
1	2	PASS	-
1	3	PASS	-
1	4	PASS	-

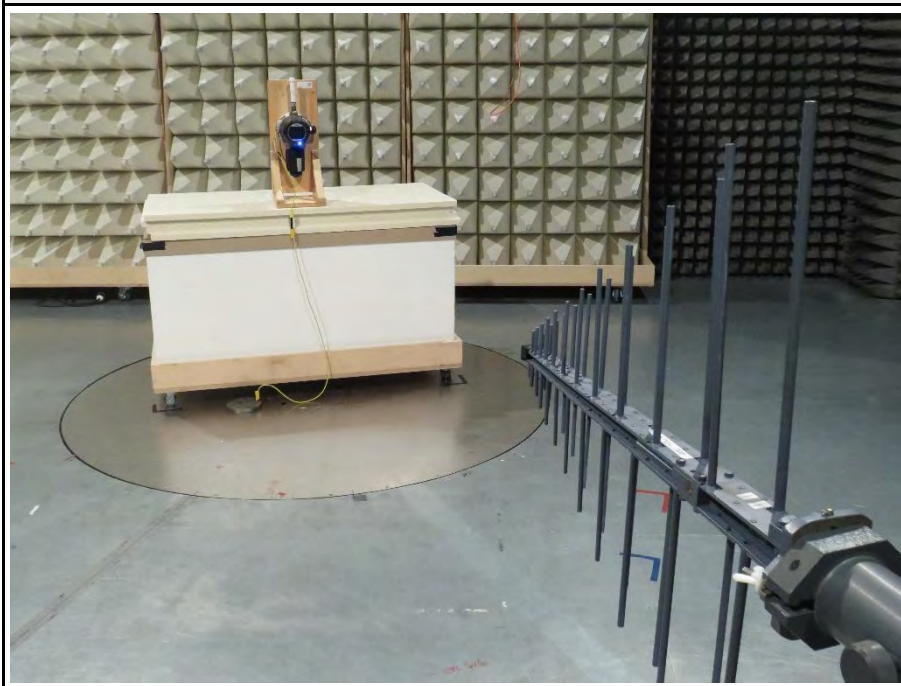
Test Report No.: G0M-2009-9279-EF0115B-V01

Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

2.1.7 Setup Photos



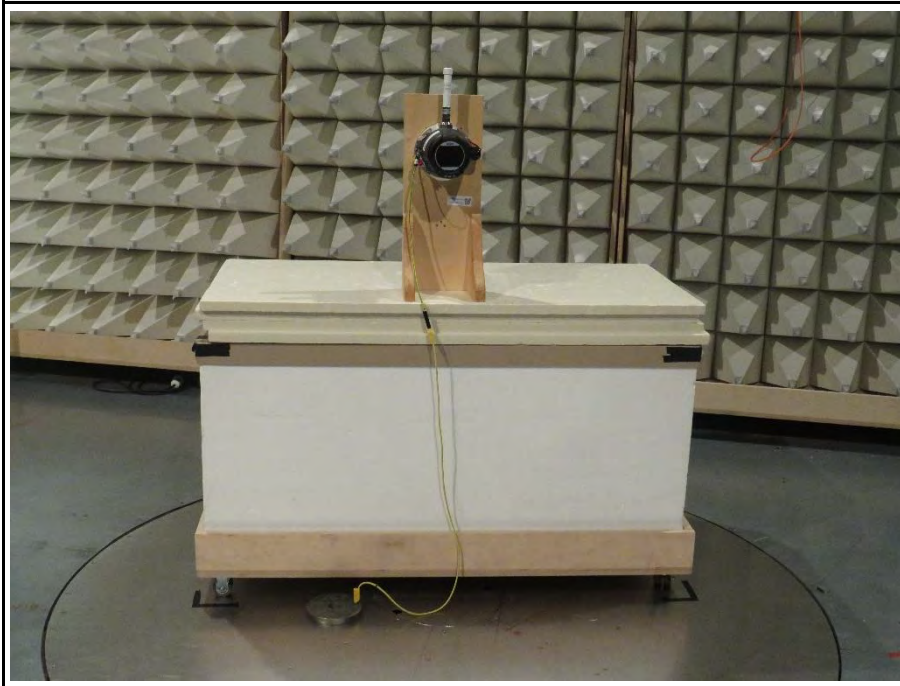
EUT 1 test setup 200 - 1000MHz vertical



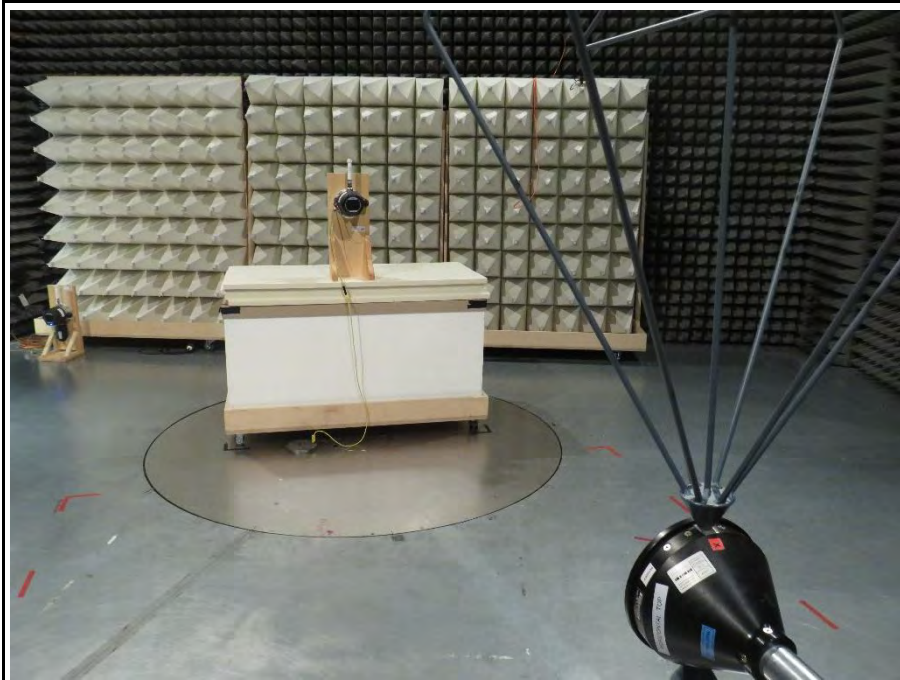
EUT 1 test setup 200 - 1000MHz horizontal



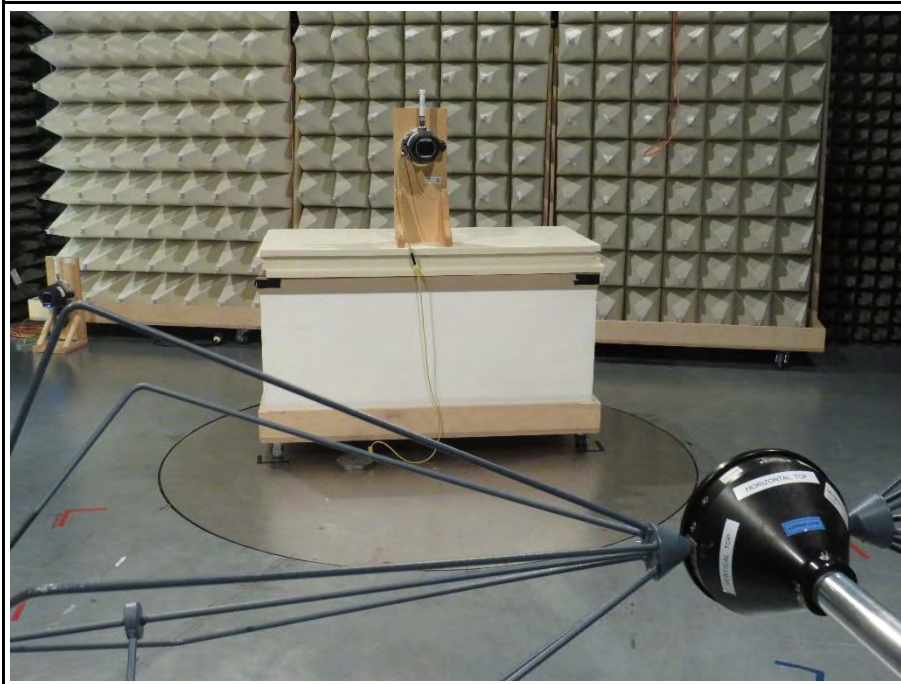
EUT 2 battery setup



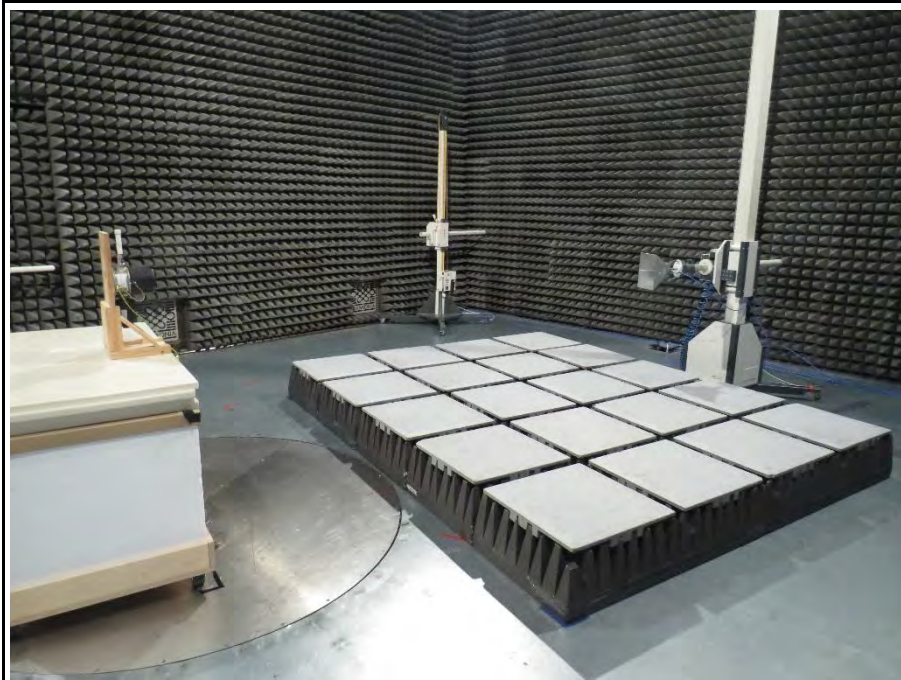
EUT 2 test setup 30 - 200MHz vertical



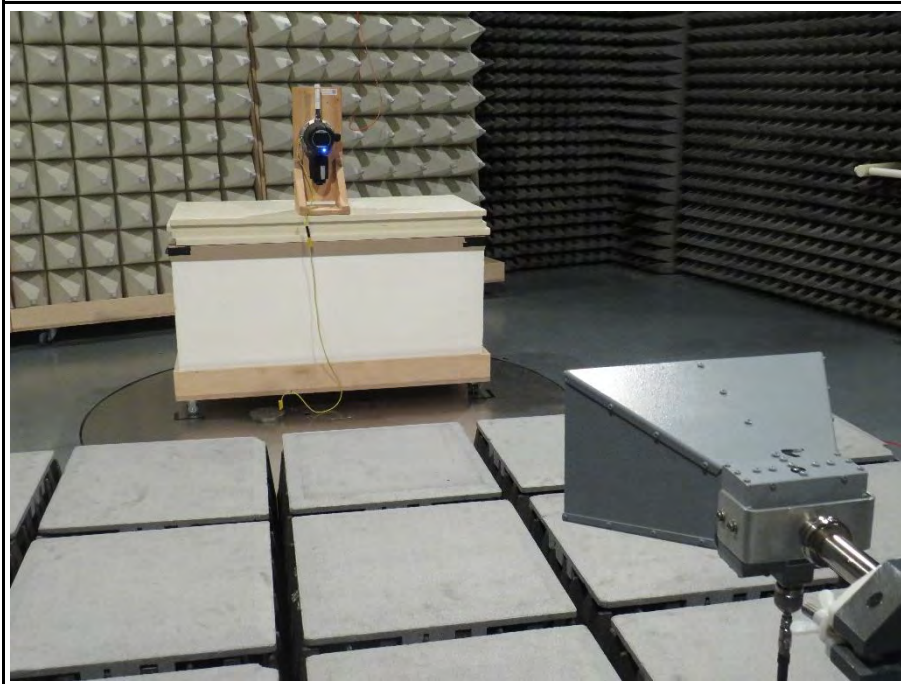
EUT 2 test setup 30 - 200MHz horizontal



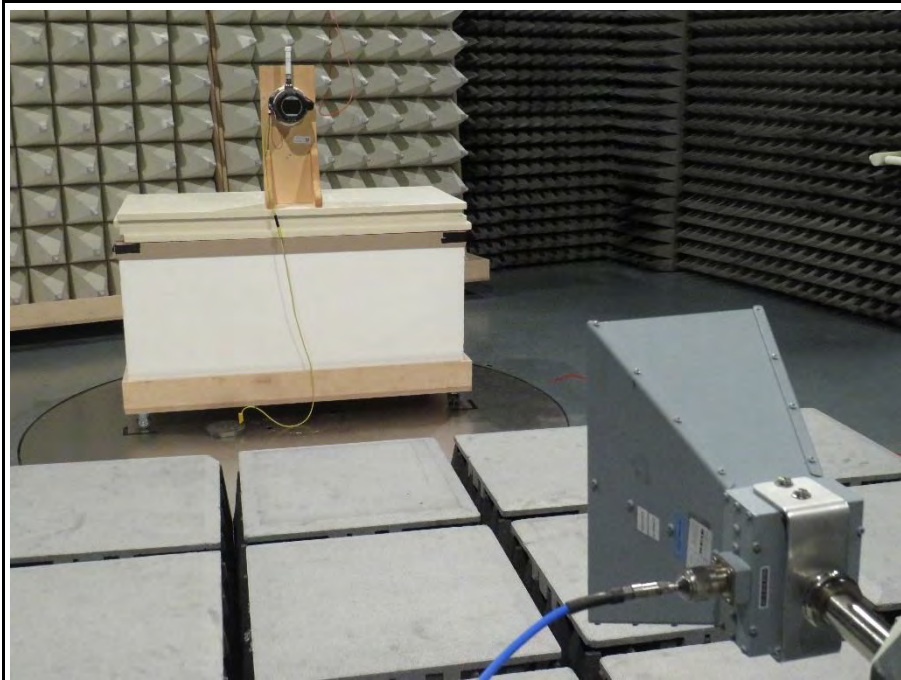
Test setup >1 GHz



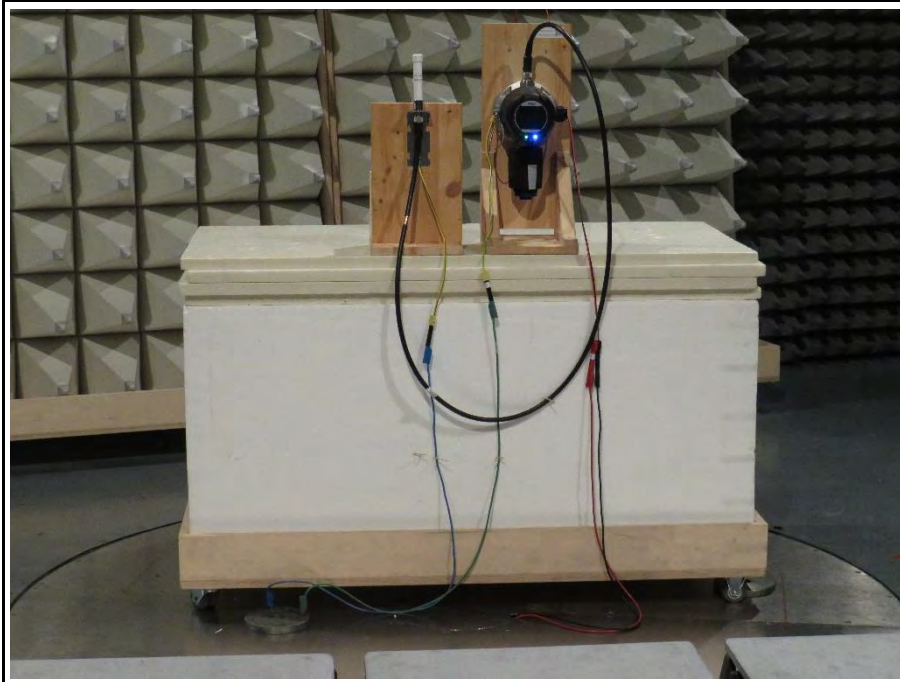
EUT 1 test setup >1 GHz vertical



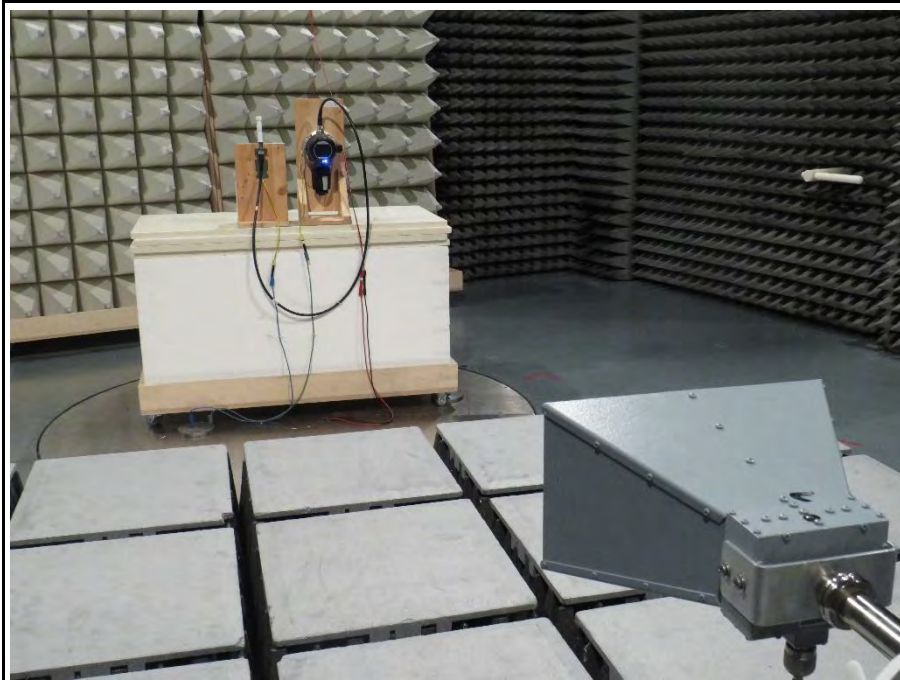
EUT 2 test setup >1 GHz horizontal



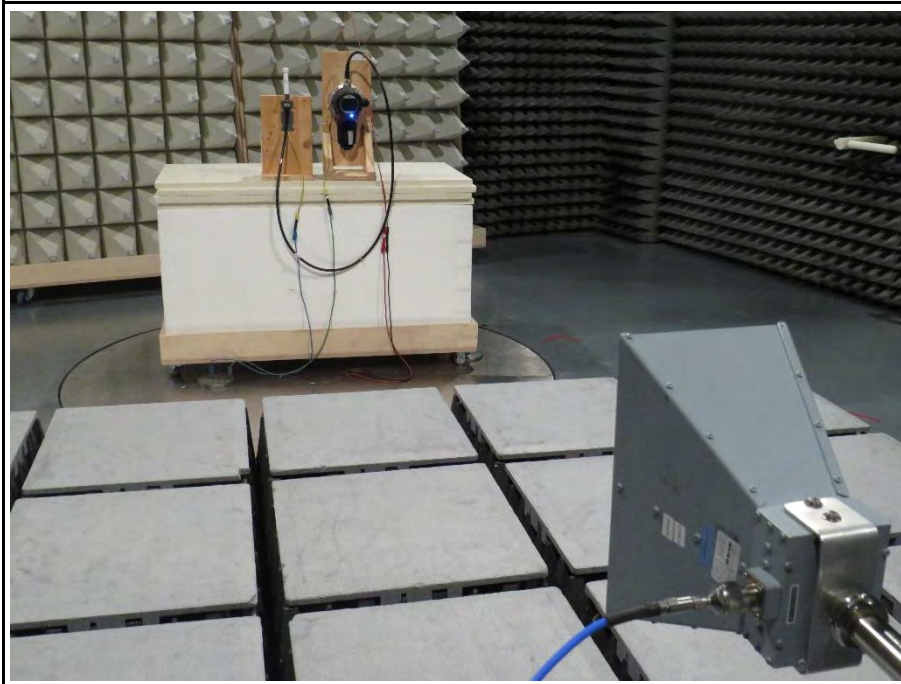
EUT 1, Configuration 1 sample setup



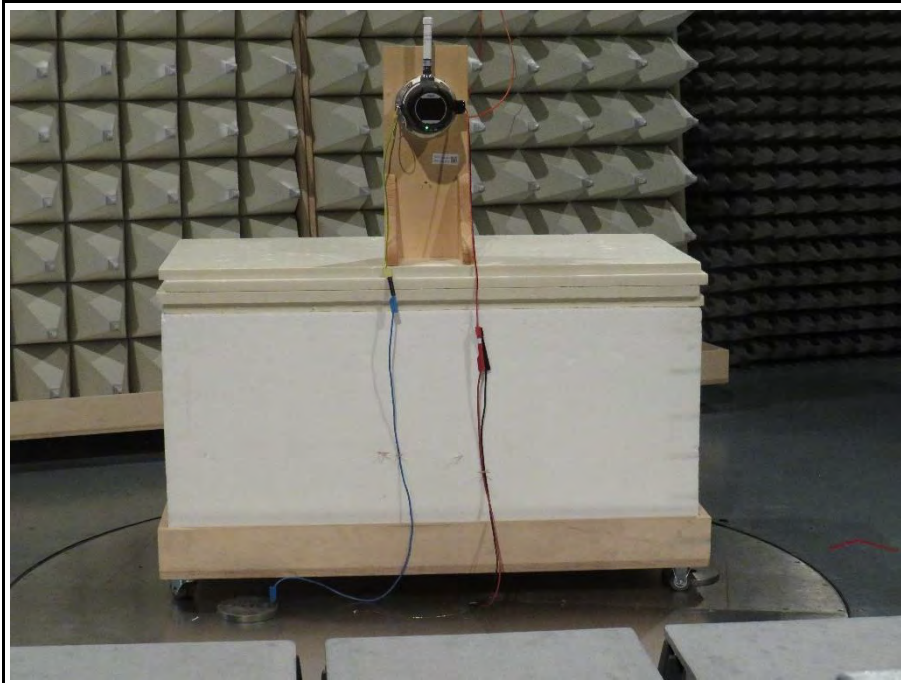
EUT 1, Configuration 1 test setup vertical



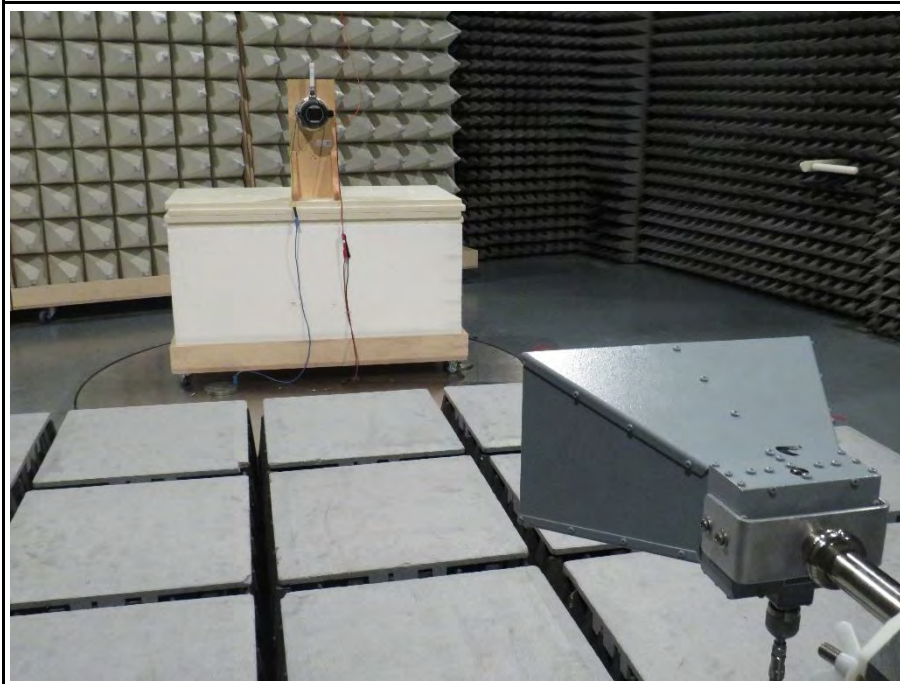
EUT 1, Configuration 1 test setup horizontal



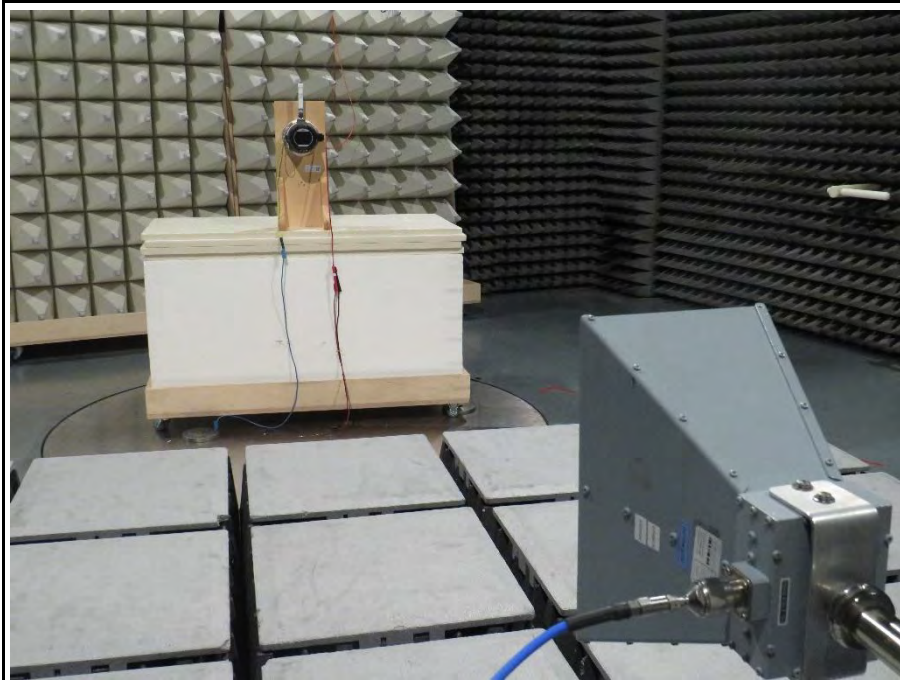
EUT 2, Configuration 3 sample setup



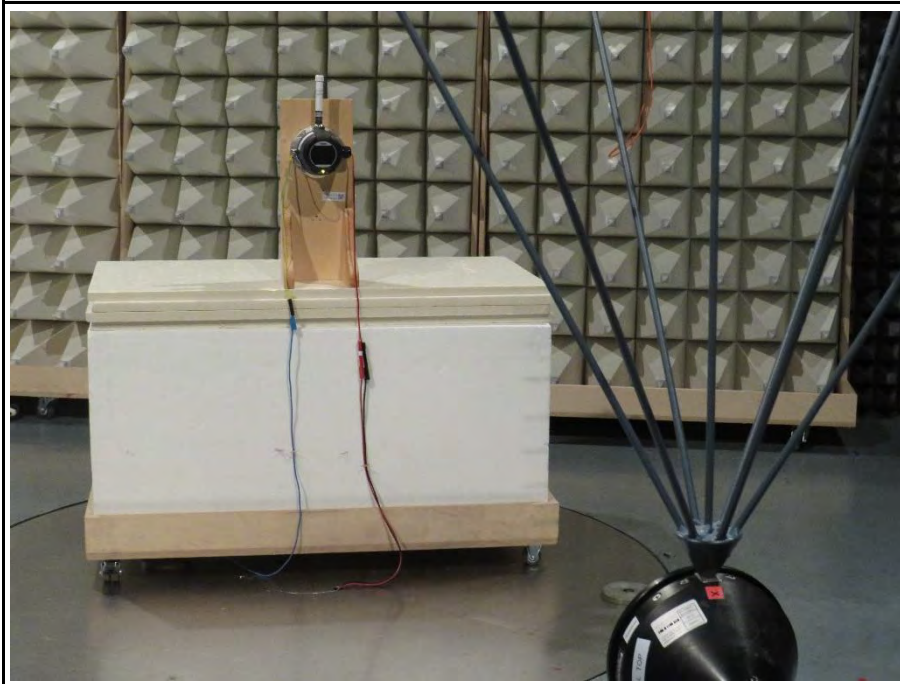
EUT 2, Configuration 3 test setup vertical



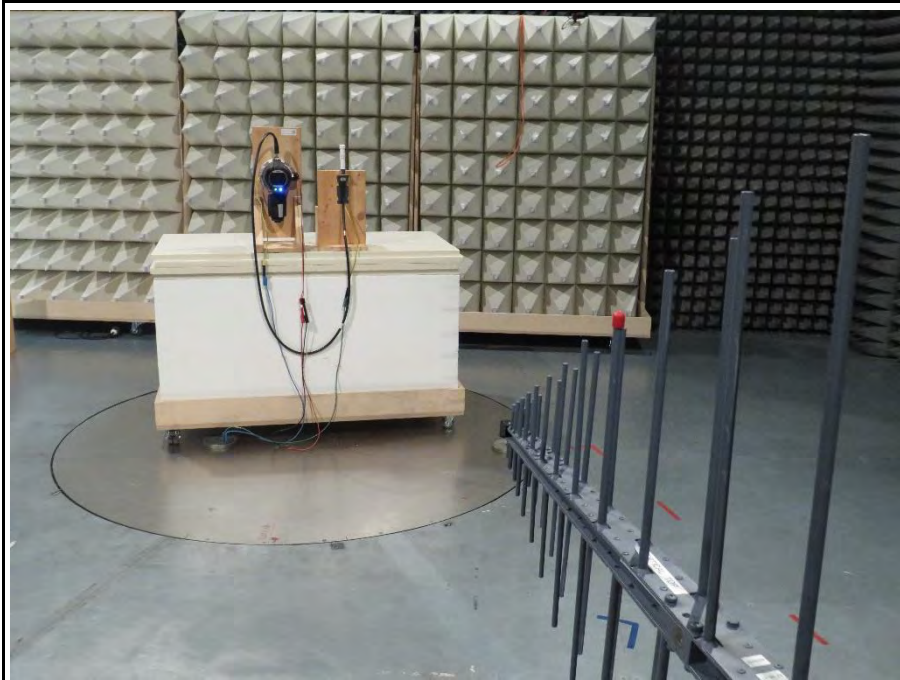
EUT 2, Configuration 3 test setup horizontal



EUT 2, Configuration 3, 30 - 200 MHz



EUT 2, Configuration 3, 200 - 1000 MHz



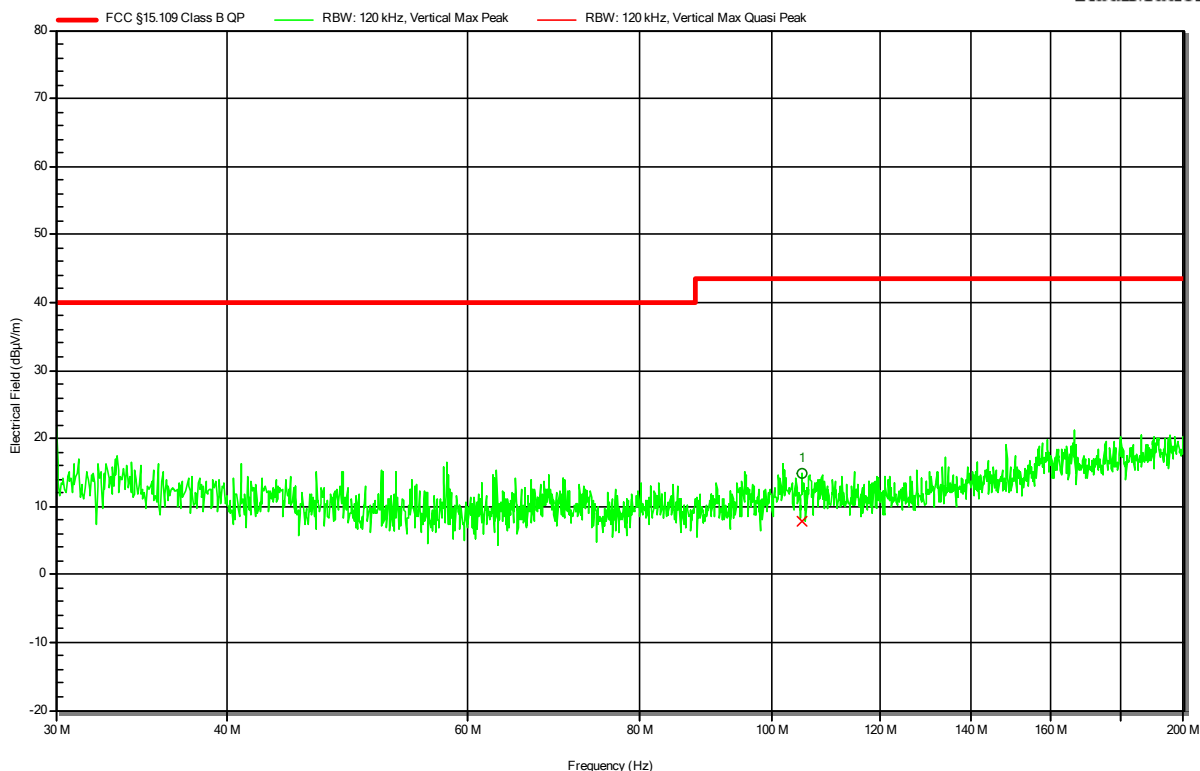
2.1.8 Records

Radiated emissions according to FCC part 15B

Project Number: G0M-2009-9279
 Applicant: Dräger Safety AG & Co. KGaA
 Model Description: Fixed Gas Detector
 Model: Polytron 6100 EC WL ISA 100
 Test Sample ID: 40294
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Neuner
 Test Date: 2022-07-15
 Operating Conditions: ambient temperature: 23 °Celsius
 power input: 120V/60Hz (AC/DC-adapter
 PHOENIX CONTACT UNO-PS/1AC24DC/30W)
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement Distance: 3m
 Operational Mode: Mode 1
 EUT Configuration: Configuration 1
 Note 1: Table 0°
 antenna 100 cm

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Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	105.285 MHz	7.84 dBμV/m	43.52 dBμV/m	-35.68 dB	Pass	0 degrees	1 m

Test Report No.: G0M-2009-9279-EF0115B-V01

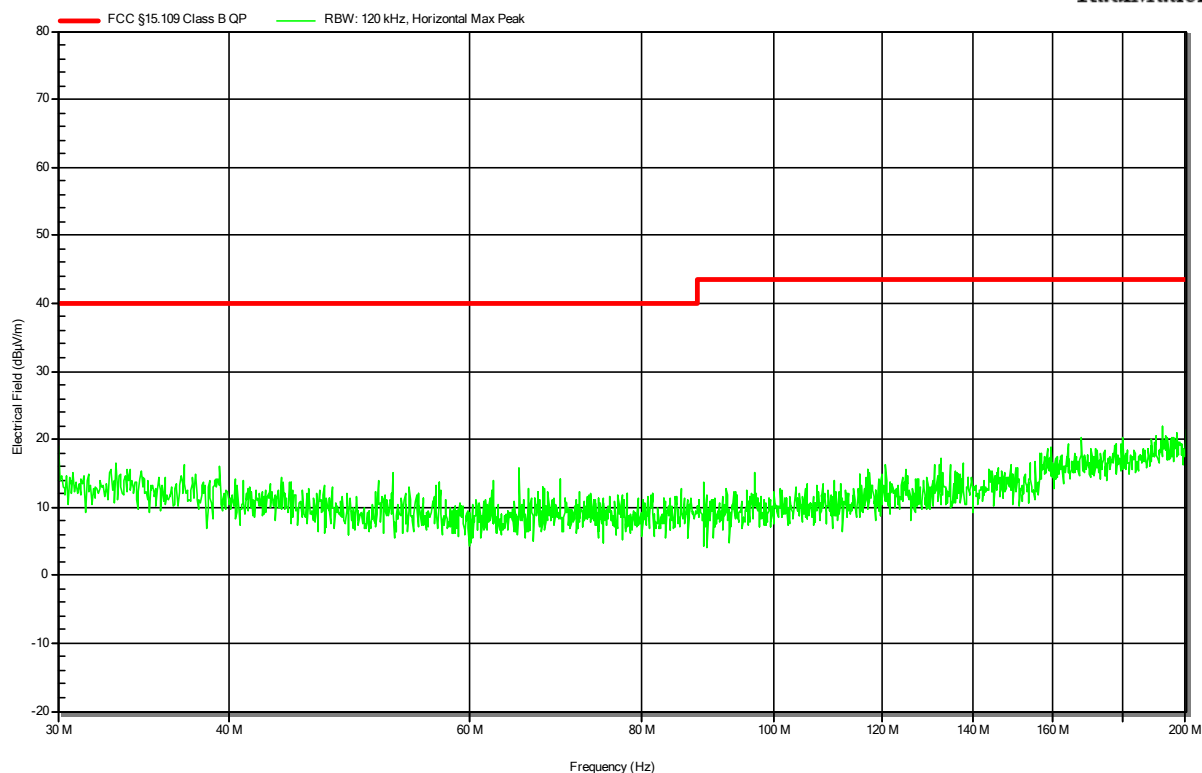
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated emissions according to FCC part 15B

Project Number:	G0M-2009-9279
Applicant:	Dräger Safety AG & Co. KGaA
Model Description:	Fixed Gas Detector
Model:	Polytron 6100 EC WL ISA 100
Test Sample ID:	40294
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Neuner
Test Date:	2022-07-15
Operating Conditions:	ambient temperature: 23 °Celsius power input: 120V/60Hz (AC/DC-adapter PHOENIX CONTACT UNO-PS/1AC24DC/30W)
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 1
Note 1:	Table 0° antenna 100 cm

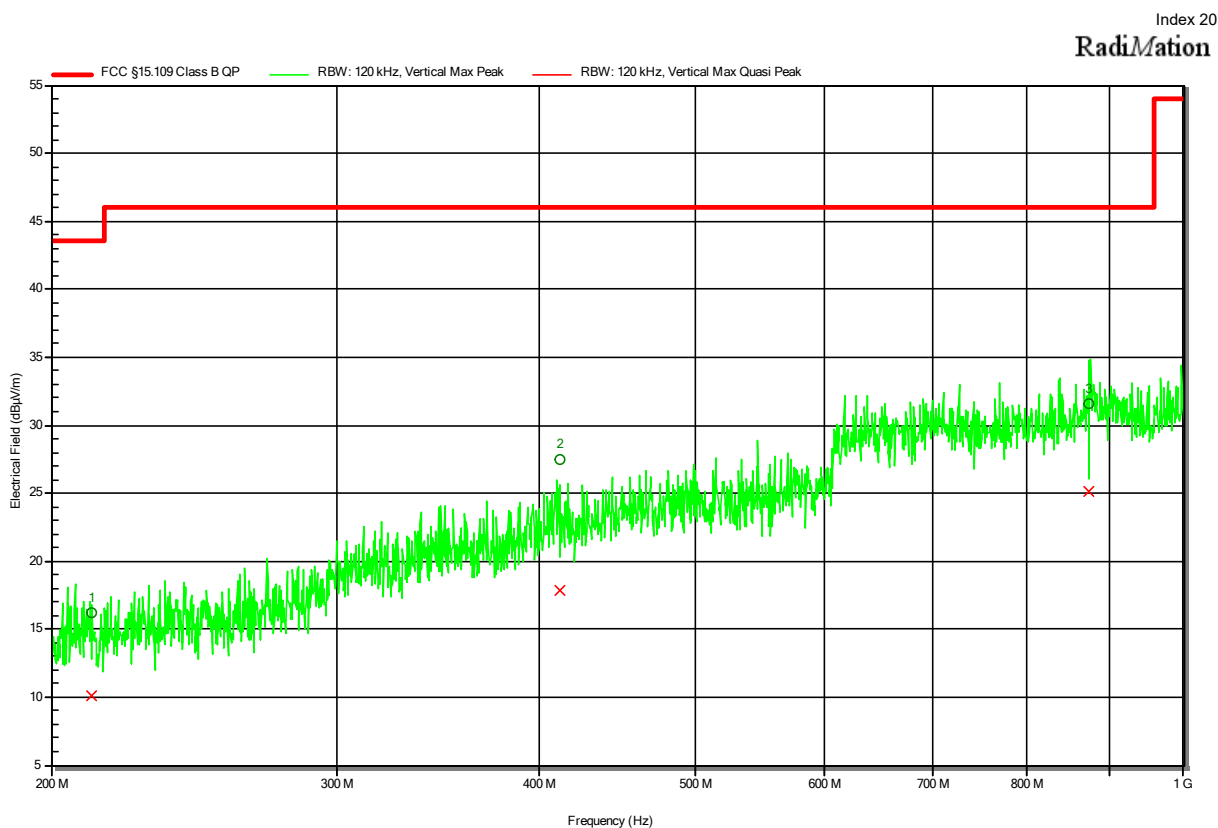
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RadiMation



Radiated emissions according to FCC part 15B

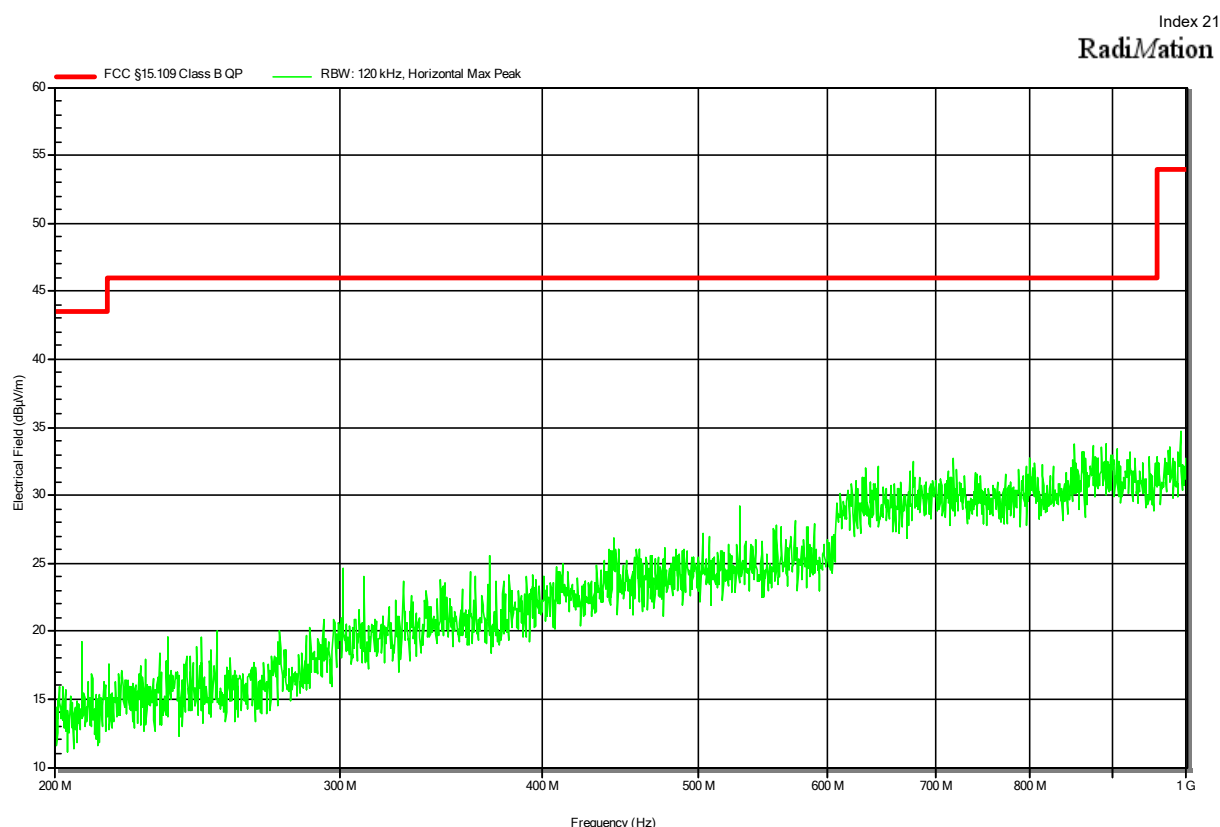
Project Number: G0M-2009-9279
 Applicant: Dräger Safety AG & Co. KGaA
 Model Description: Fixed Gas Detector
 Model: Polytron 6100 EC WL ISA 100
 Test Sample ID: 40294
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Neuner
 Test Date: 2022-07-15
 Operating Conditions: ambient temperature: 23 °Celsius
 power input: 120V/60Hz (AC/DC-adapter
 PHOENIX CONTACT UNO-PS/1AC24DC/30W)
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement Distance: 3m
 Operational Mode: Mode 1
 EUT Configuration: Configuration 1
 Note 1: Table 0°
 antenna 100 cm



Peak Number	Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status	Angle	Height
1	212.012 MHz	10.07 dBμV/m	43.52 dBμV/m	-33.45 dB	Pass	0 degrees	1 m
2	411.985 MHz	17.88 dBμV/m	46.02 dBμV/m	-28.14 dB	Pass	0 degrees	1 m
3	873.775 MHz	25.16 dBμV/m	46.02 dBμV/m	-20.86 dB	Pass	0 degrees	1 m

Radiated emissions according to FCC part 15B

Project Number:	G0M-2009-9279
Applicant:	Dräger Safety AG & Co. KGaA
Model Description:	Fixed Gas Detector
Model:	Polytron 6100 EC WL ISA 100
Test Sample ID:	40294
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Neuner
Test Date:	2022-07-15
Operating Conditions:	ambient temperature: 23 °Celsius power input: 120V/60Hz (AC/DC-adapter PHOENIX CONTACT UNO-PS/1AC24DC/30W)
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 1
Note 1:	Table 0° antenna 100 cm

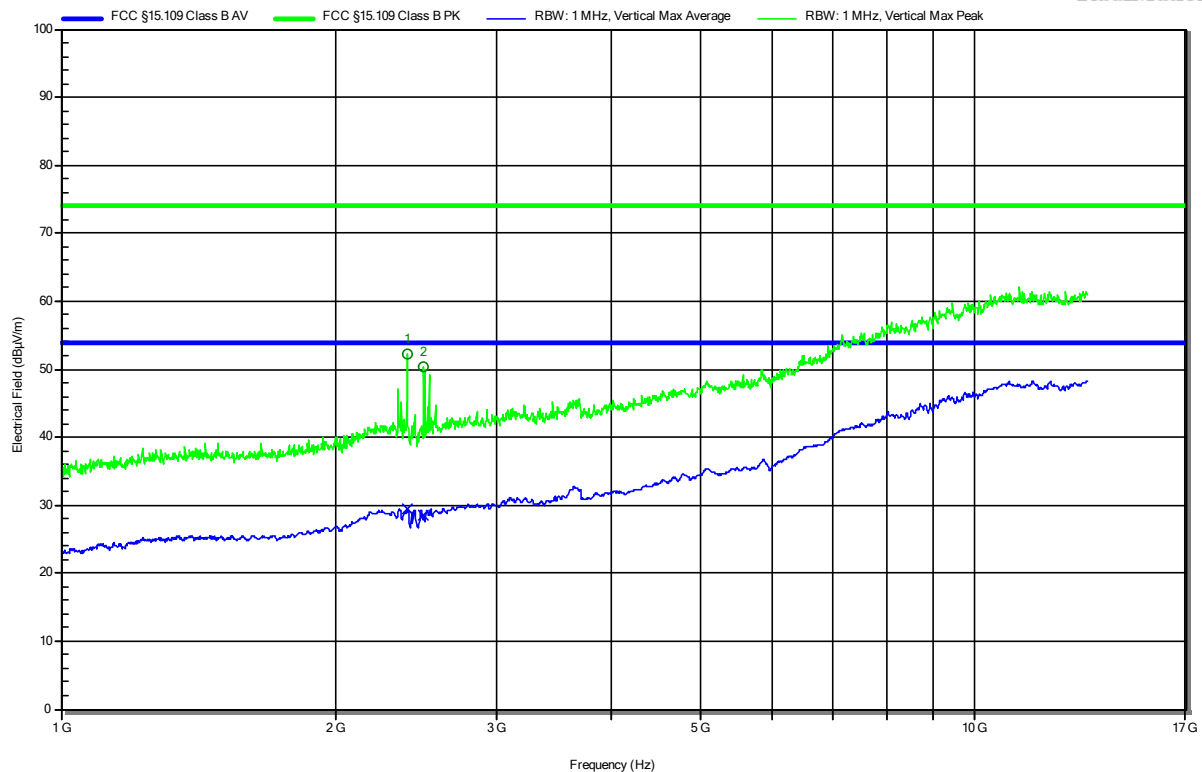


Radiated emissions according to FCC part 15B

Project Number: G0M-2009-9279
Applicant: Dräger Safety AG & Co. KGaA
Model Description: Fixed Gas Detector
Model: Polytron 6100 EC WL ISA 100
Test Sample ID: 40294
Test Site: Eurofins Product Service GmbH
Operator: Mr. Neuner
Test Date: 2022-07-15
Operating Conditions: ambient temperature: 21 °Celsius
power input: 120V/60Hz (AC/DC-adapter
PHOENIX CONTACT UNO-PS/1AC24DC/30W)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement Distance: 3m
Operational Mode: Mode 1
EUT Configuration: Configuration 1
Note 1: Table 0°
antenna 100 cm

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Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.393 GHz	52.22 dBμV/m	73.98 dBμV/m	-21.75 dB	Pass	0 degrees	1 m
2	2.493 GHz	50.4 dBμV/m	73.98 dBμV/m	-23.58 dB	Pass	0 degrees	1 m

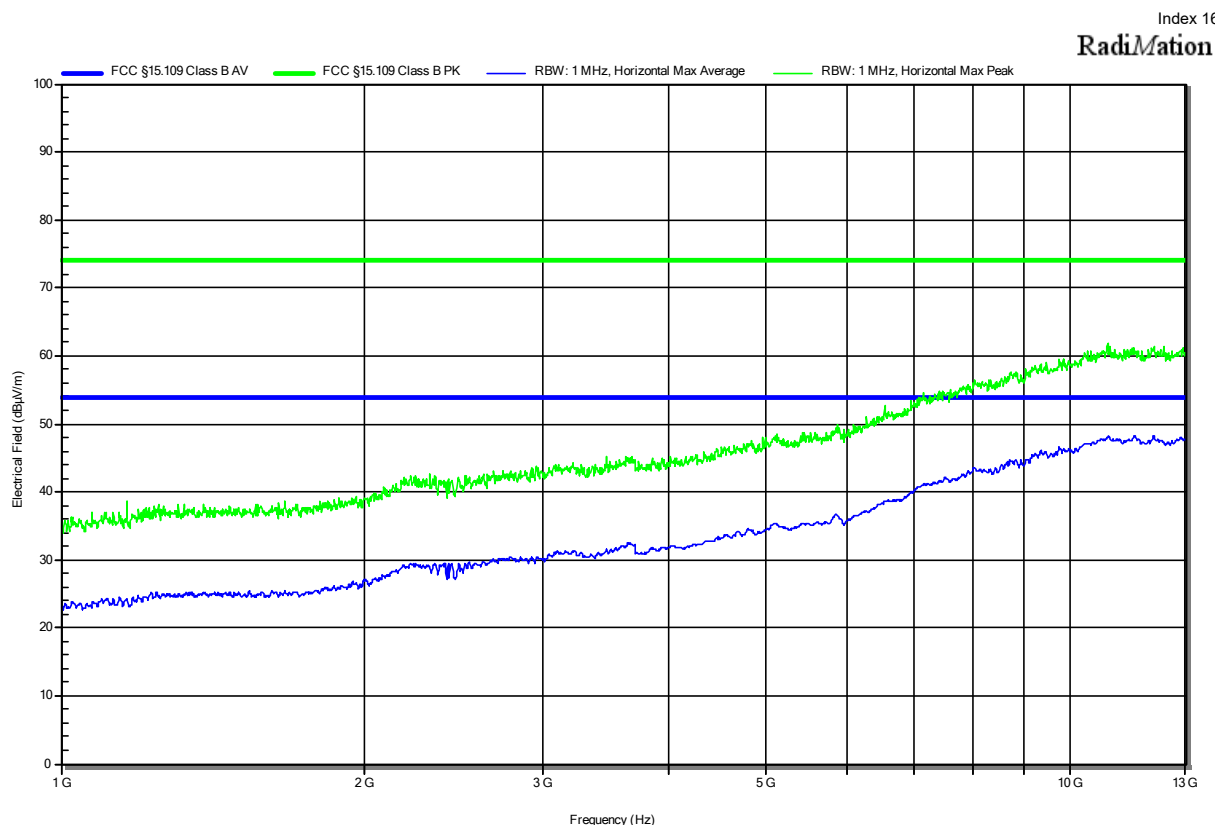
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	2.393 GHz	29.44 dBμV/m	53.98 dBμV/m	-24.53 dB	Pass	0 degrees	1 m
2	2.493 GHz	28.53 dBμV/m	53.98 dBμV/m	-25.45 dB	Pass	0 degrees	1 m

Test Report No.: G0M-2009-9279-EF0115B-V01

Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated emissions according to FCC part 15B

Project Number:	G0M-2009-9279
Applicant:	Dräger Safety AG & Co. KGaA
Model Description:	Fixed Gas Detector
Model:	Polytron 6100 EC WL ISA 100
Test Sample ID:	40294
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Neuner
Test Date:	2022-07-15
Operating Conditions:	ambient temperature: 21 °Celsius power input: 120V/60Hz (AC/DC-adapter PHOENIX CONTACT UNO-PS/1AC24DC/30W)
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 1
Note 1:	Table 0° antenna 100 cm

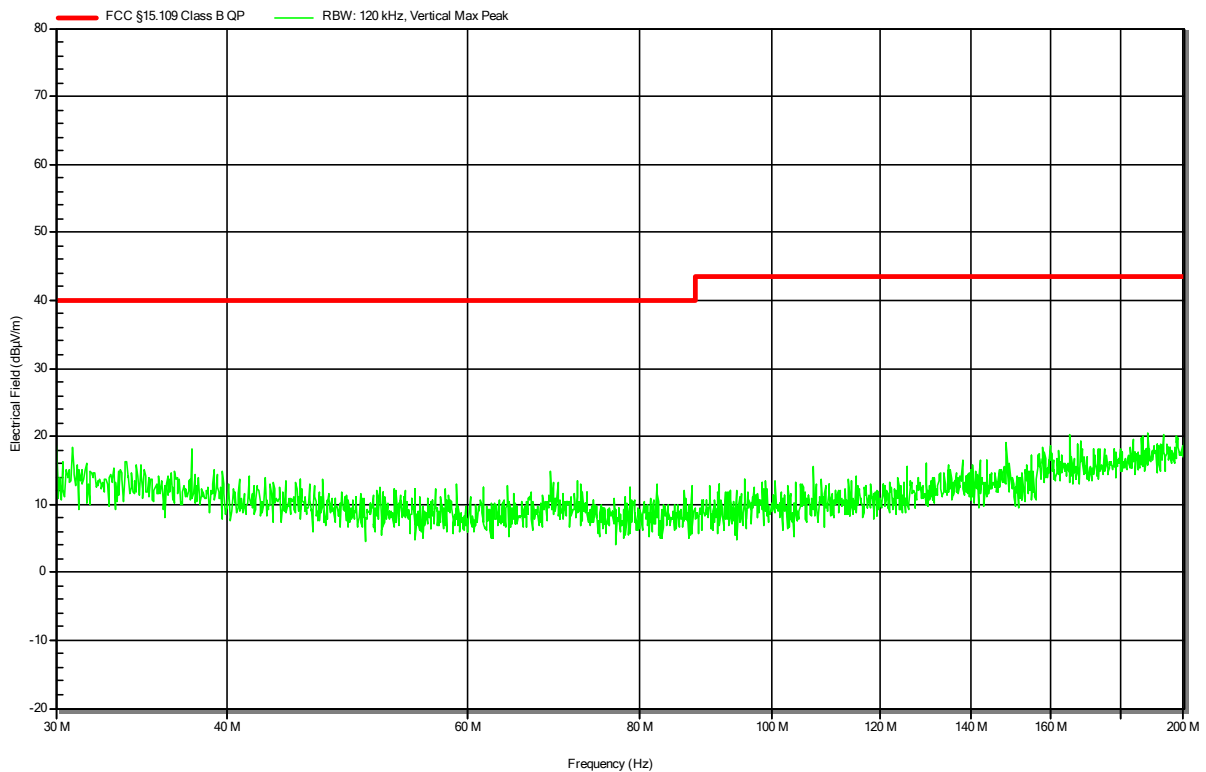


Radiated emissions according to FCC part 15B

Project Number:	G0M-2009-9279
Applicant:	Dräger Safety AG & Co. KGaA
Model Description:	Fixed Gas Detector
Model:	Polytron 6100 EC WL ISA 100
Test Sample ID:	40294
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Neuner
Test Date:	2022-07-07
Operating Conditions:	ambient temperature: 19 °Celsius power input: Battery box
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 2
Note 1:	Table 0° Antenna 100 cm

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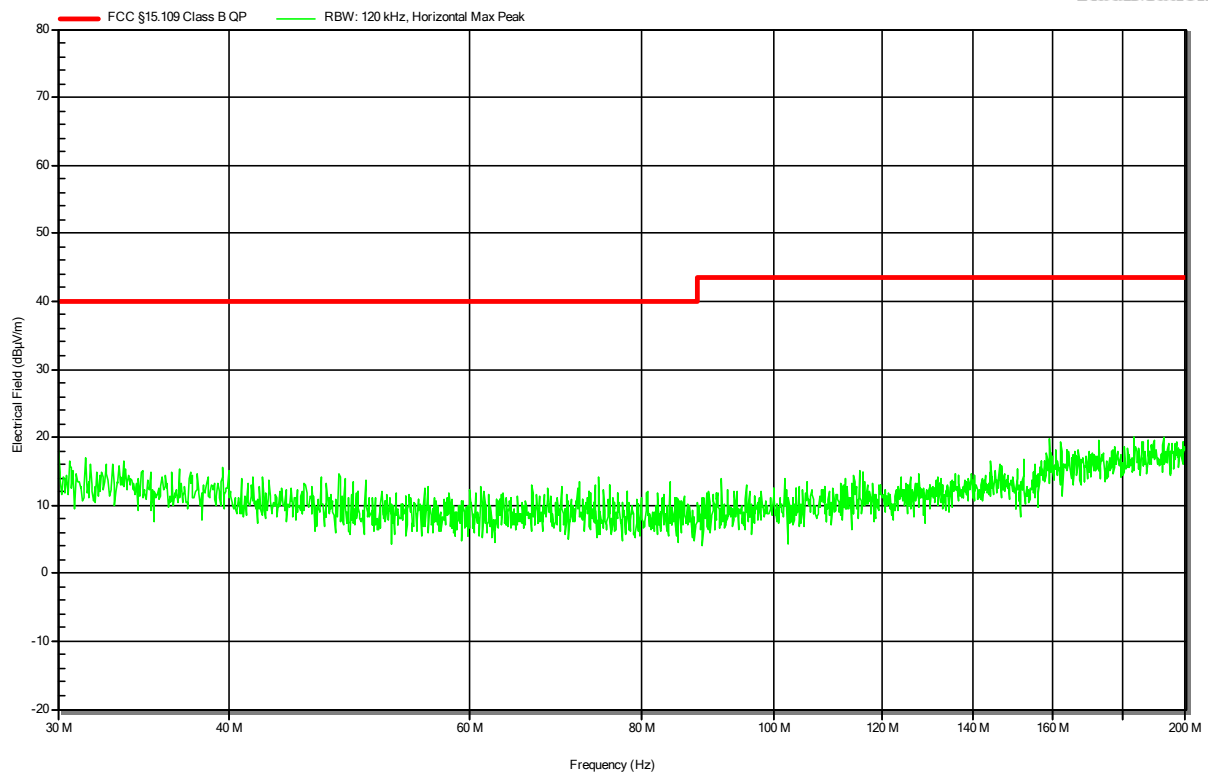


Radiated emissions according to FCC part 15B

Project Number:	G0M-2009-9279
Applicant:	Dräger Safety AG & Co. KGaA
Model Description:	Fixed Gas Detector
Model:	Polytron 6100 EC WL ISA 100
Test Sample ID:	40294
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Neuner
Test Date:	2022-07-07
Operating Conditions:	ambient temperature: 19 °Celsius power input: Battery box
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 2
Note 1:	Table -180° Antenna 100 cm

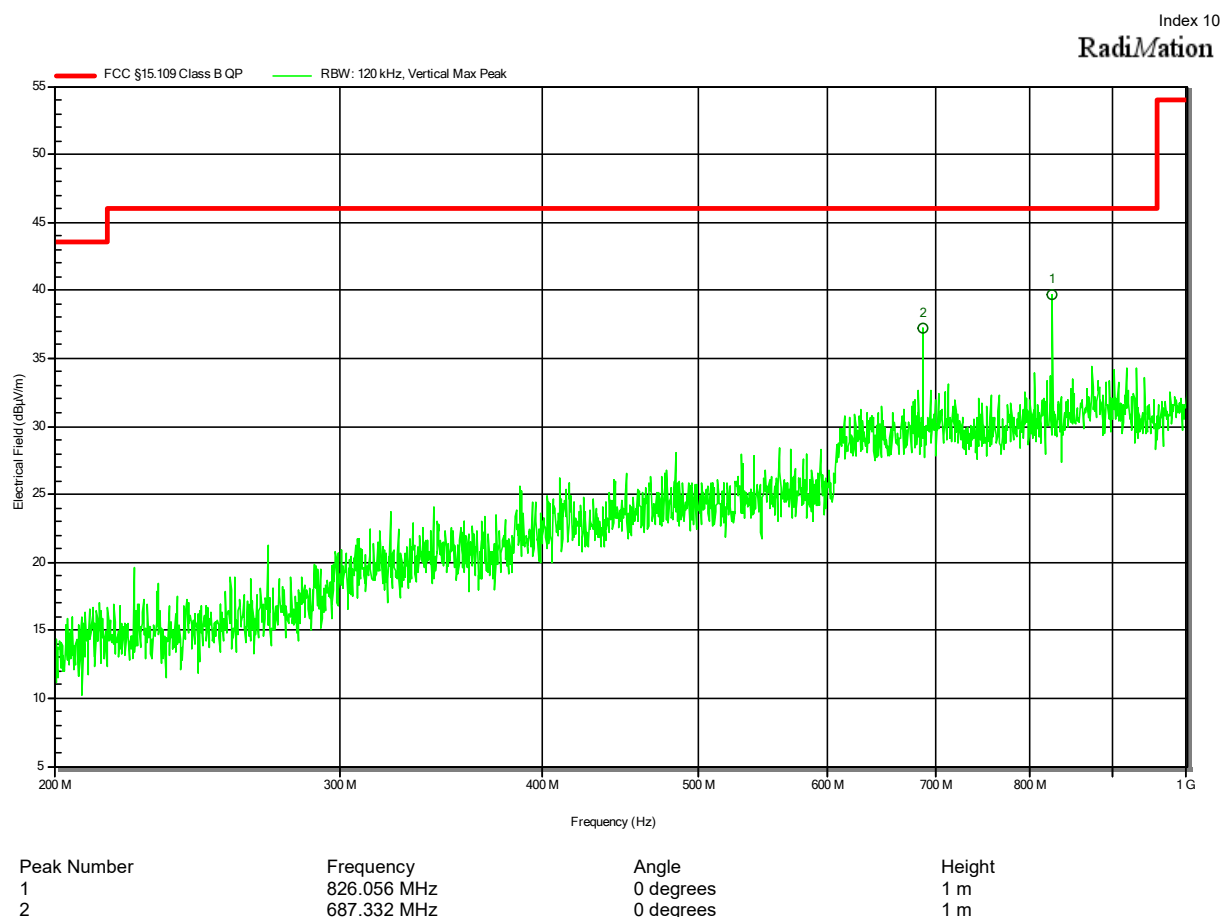
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RadiMation



**Radiated emissions
according to FCC part 15B**

Project Number: G0M-2009-9279
 Applicant: Dräger Safety AG & Co. KGaA
 Model Description: Fixed Gas Detector
 Model: Polytron 6100 EC WL ISA 100
 Test Sample ID: 40294
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Neuner
 Test Date: 2022-07-07
 Operating Conditions: ambient temperature: 19 °Celsius
 power input: Battery box
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement Distance: 3m
 Operational Mode: Mode 1
 EUT Configuration: Configuration 2
 Note 1: Table 0°
 Antenna 100 cm

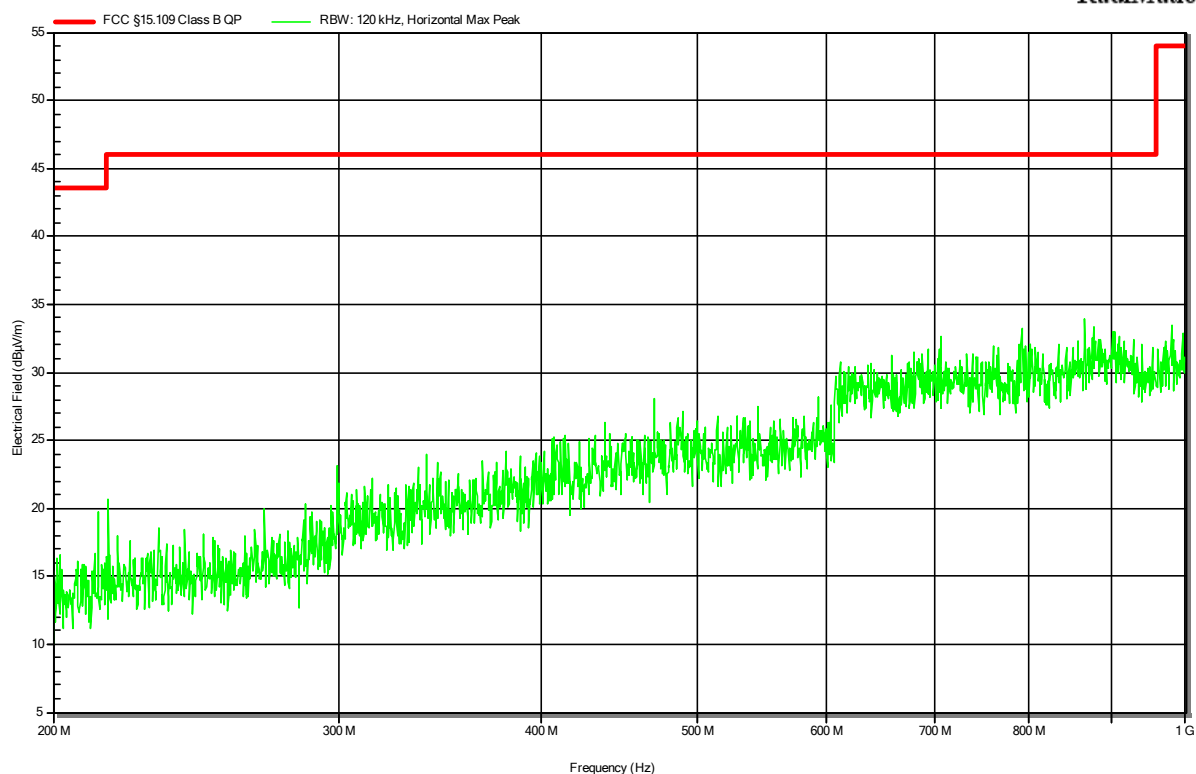


Radiated emissions according to FCC part 15B

Project Number:	G0M-2009-9279
Applicant:	Dräger Safety AG & Co. KGaA
Model Description:	Fixed Gas Detector
Model:	Polytron 6100 EC WL ISA 100
Test Sample ID:	40294
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Neuner
Test Date:	2022-07-07
Operating Conditions:	ambient temperature: 21 °Celsius power input: Battery box
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 2
Note 1:	Table 0° Antenna 100 cm

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RadiMation

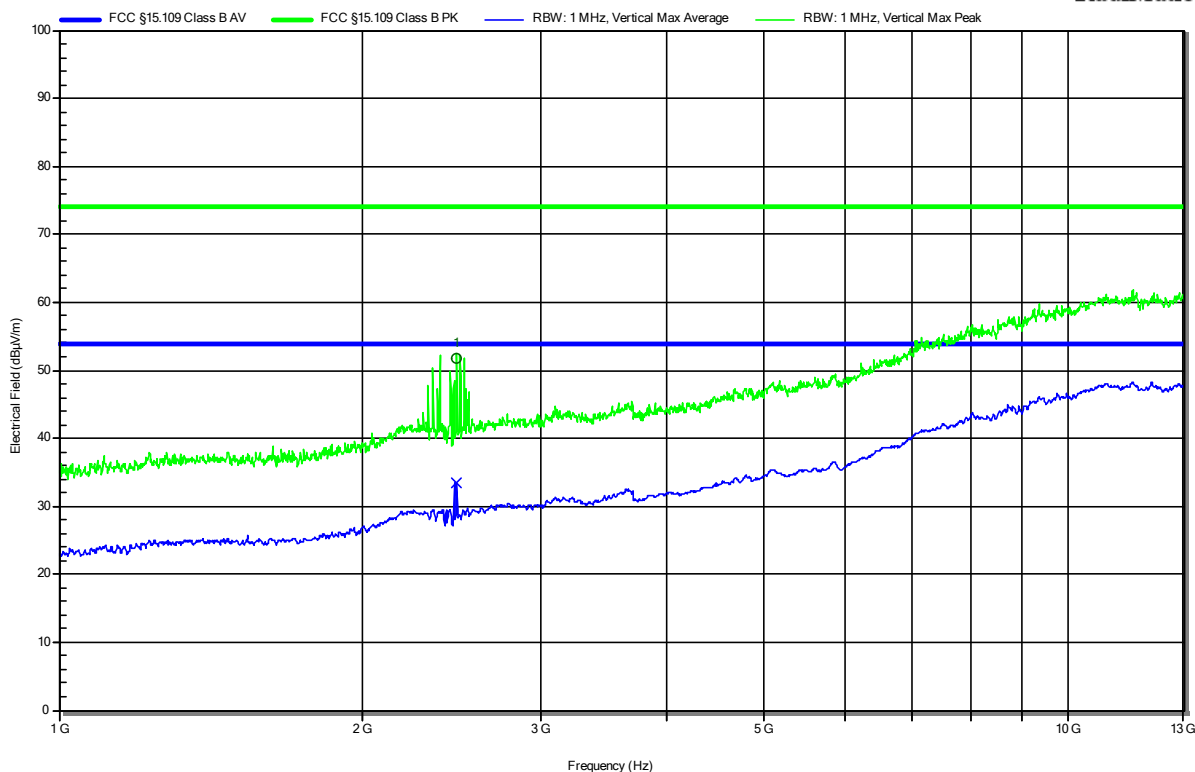


Radiated emissions according to FCC part 15B

Project Number: G0M-2009-9279
Applicant: Dräger Safety AG & Co. KGaA
Model Description: Fixed Gas Detector
Model: Polytron 6100 EC WL ISA 100
Test Sample ID: 40294
Test Site: Eurofins Product Service GmbH
Operator: Mr. Neuner
Test Date: 2022-07-07
Operating Conditions: ambient temperature: 22.7 °Celsius
power input: Battery box
Antenna: Schwarzbeck BBHA 9120D, Vertical / Horizontal (worst case)
Measurement Distance: 3m
Operational Mode: Mode 1
EUT Configuration: Configuration 2
Note 1: Table 0°
Antenna 100 cm

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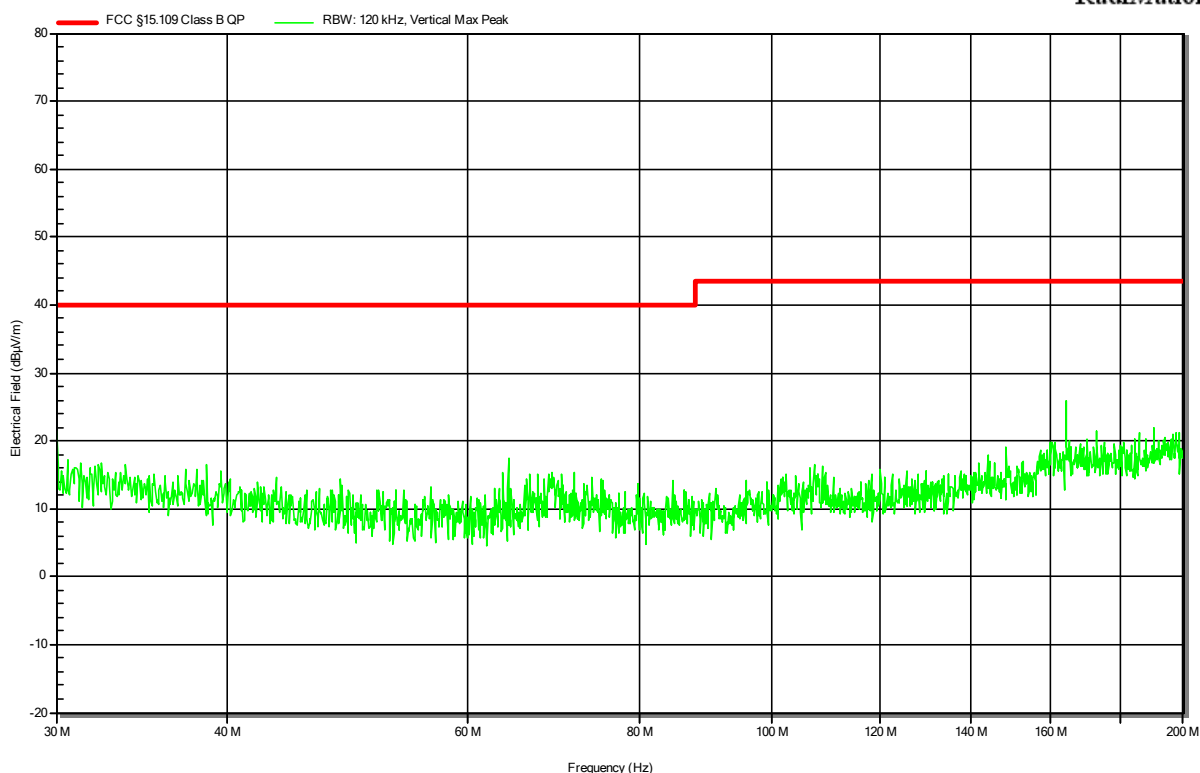
Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.477 GHz	51.73 dBμV/m	73.98 dBμV/m	-22.25 dB	Pass	0 degrees	1 m
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	2.477 GHz	33.45 dBμV/m	53.98 dBμV/m	-20.53 dB	Pass	0 degrees	1 m

Radiated emissions according to FCC part 15B

Project Number:	ORD-2103-5885
Applicant:	Dräger Safety AG & Co. KGaA
Model Description:	Polytron Repeater ISA100
Model:	Polytron Repeater ISA
Test Sample ID:	40297
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Neuner
Test Date:	2022-07-15
Operating Conditions:	ambient temperature: 21 °Celsius power input: 120V/60Hz (AC/DC-adapter PHOENIX CONTACT UNO-PS/1AC24DC/30W)
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 3
Note 1:	Table 0° antenna 100 cm

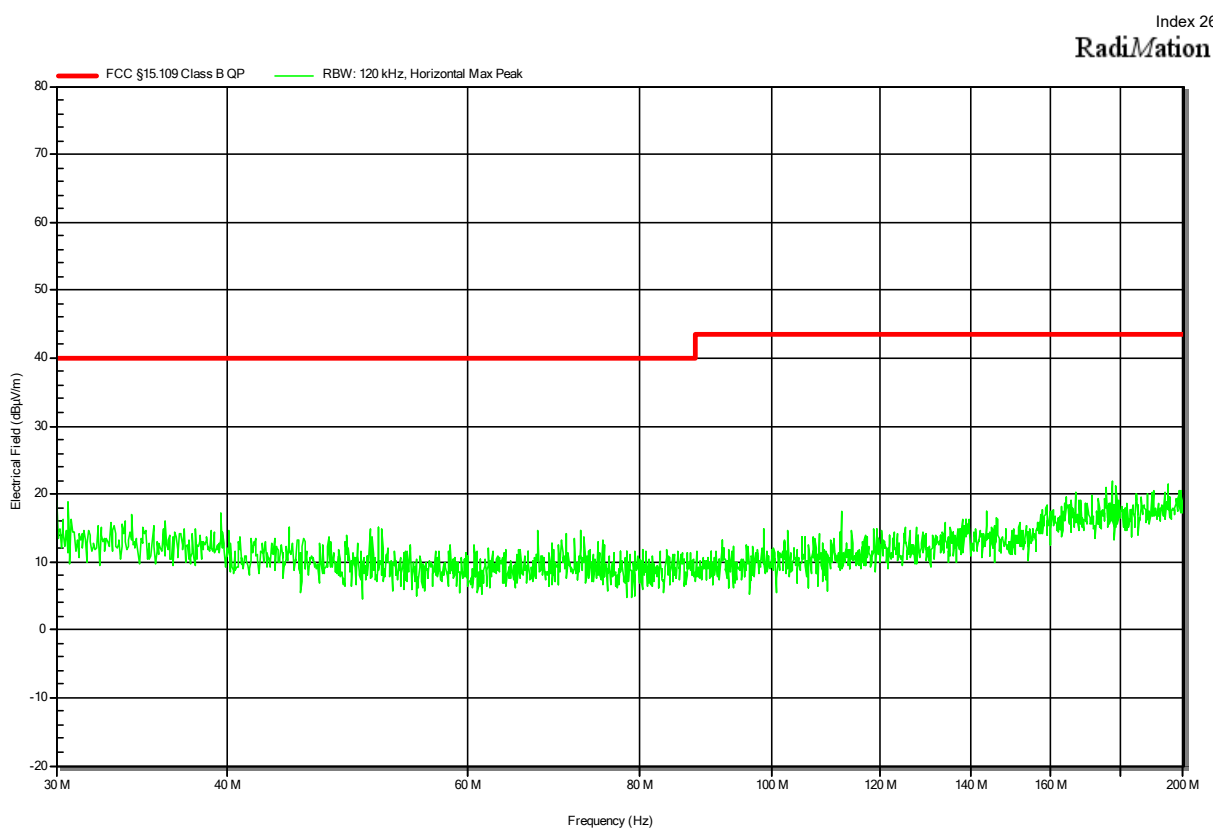
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RadiMation



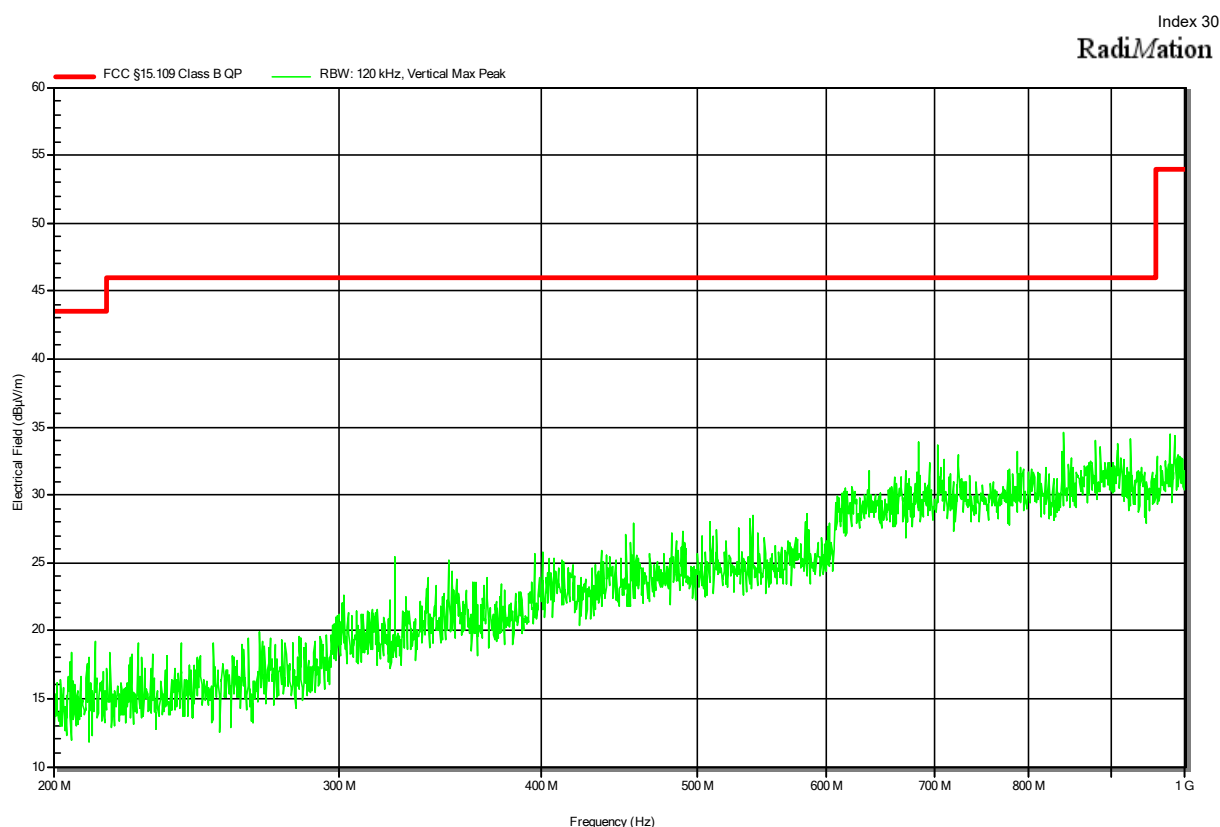
Radiated emissions according to FCC part 15B

Project Number:	ORD-2103-5885
Applicant:	Dräger Safety AG & Co. KGaA
Model Description:	Polytron Repeater ISA100
Model:	Polytron Repeater ISA
Test Sample ID:	40297
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Neuner
Test Date:	2022-07-15
Operating Conditions:	ambient temperature: 22 °Celsius power input: 120V/60Hz (AC/DC-adapter PHOENIX CONTACT UNO-PS/1AC24DC/30W)
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 3
Note 1:	Table 0° antenna 100 cm



Radiated emissions according to FCC part 15B

Project Number:	ORD-2103-5885
Applicant:	Dräger Safety AG & Co. KGaA
Model Description:	Polytron Repeater ISA100
Model:	Polytron Repeater ISA
Test Sample ID:	40297
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Neuner
Test Date:	2022-07-15
Operating Conditions:	ambient temperature: 23 °Celsius power input: 120V/60Hz (AC/DC-adapter PHOENIX CONTACT UNO-PS/1AC24DC/30W)
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 3
Note 1:	Table 0° antenna 100 cm

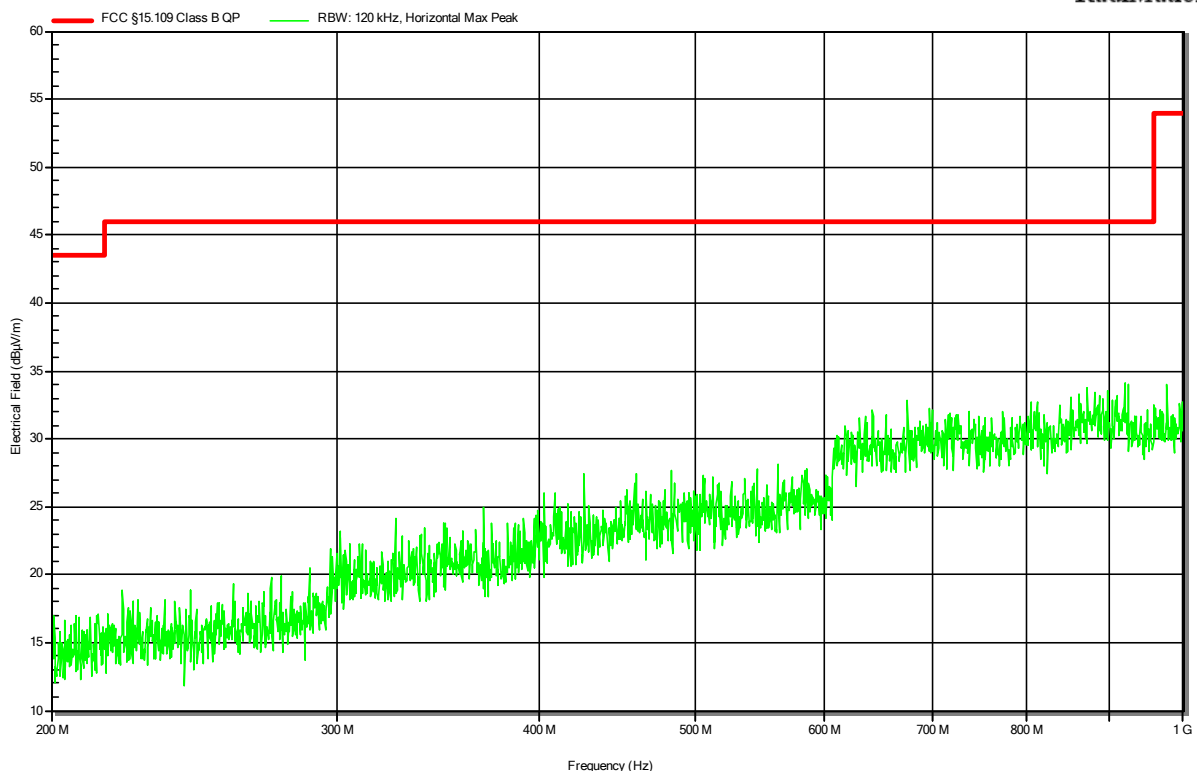


Radiated emissions according to FCC part 15B

Project Number:	ORD-2103-5885
Applicant:	Dräger Safety AG & Co. KGaA
Model Description:	Polytron Repeater ISA100
Model:	Polytron Repeater ISA
Test Sample ID:	40297
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Neuner
Test Date:	2022-07-15
Operating Conditions:	ambient temperature: 21 °Celsius power input: 120V/60Hz (AC/DC-adapter PHOENIX CONTACT UNO-PS/1AC24DC/30W)
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 3
Note 1:	Table 0° antenna 100 cm

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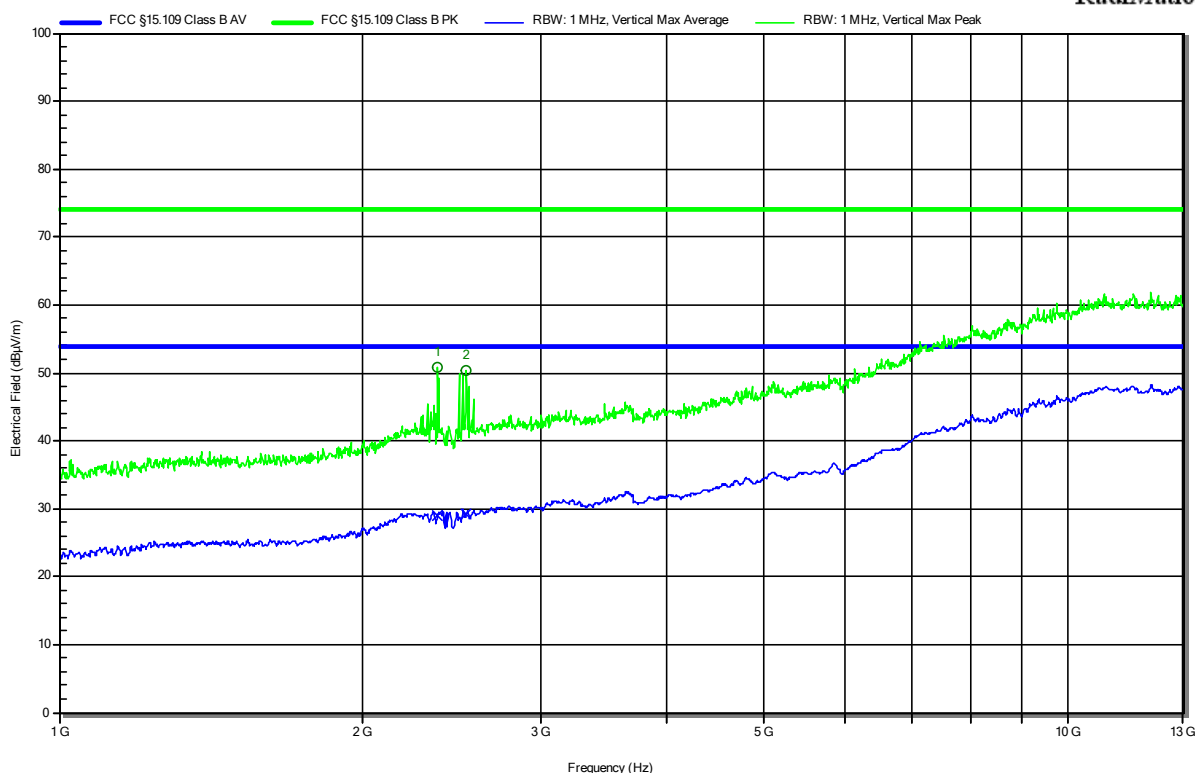


Radiated emissions according to FCC part 15B

Project Number: ORD-2103-5885
Applicant: Dräger Safety AG & Co. KGaA
Model Description: Polytron Repeater ISA100
Model: Polytron Repeater ISA
Test Sample ID: 40297
Test Site: Eurofins Product Service GmbH
Operator: Mr. Neuner
Test Date: 2022-07-15
Operating Conditions: ambient temperature: 21 °Celsius
power input: 120V/60Hz (AC/DC-adapter
PHOENIX CONTACT UNO-PS/1AC24DC/30W)
Antenna: Schwarzbeck BBHA 9120D, Vertical
Measurement Distance: 3m
Operational Mode: Mode 1
EUT Configuration: Configuration 3
Note 1: Table 0°
antenna 100 cm

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RadiMation



Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.37 GHz	50.81 dBµV/m	73.98 dBµV/m	-23.17 dB	Pass	0 degrees	1 m
2	2.532 GHz	50.39 dBµV/m	73.98 dBµV/m	-23.59 dB	Pass	0 degrees	1 m

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	2.37 GHz	28.93 dBµV/m	53.98 dBµV/m	-25.05 dB	Pass	0 degrees	1 m
2	2.532 GHz	29.2 dBµV/m	53.98 dBµV/m	-24.78 dB	Pass	0 degrees	1 m

Test Report No.: G0M-2009-9279-EF0115B-V01

Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

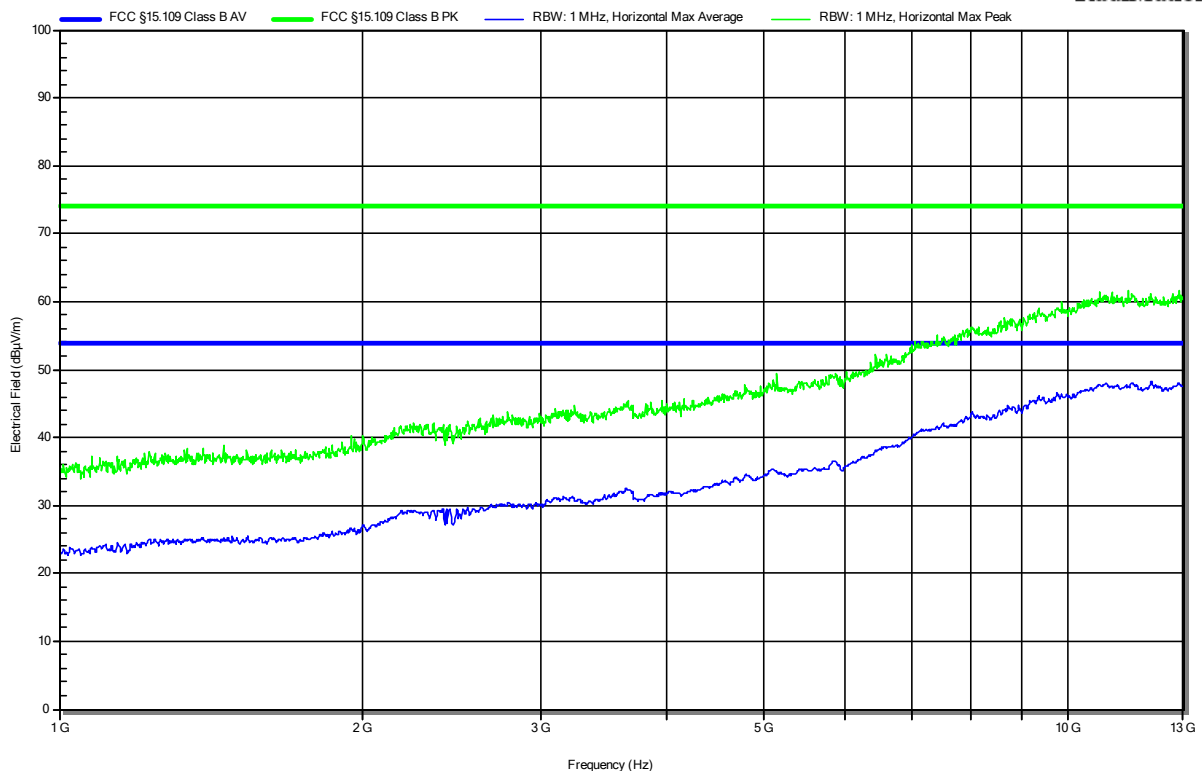
Radiated emissions according to FCC part 15B

Project Number: ORD-2103-5885
Applicant: Dräger Safety AG & Co. KGaA
Model Description: Polytron Repeater ISA100
Model: Polytron Repeater ISA
Test Sample ID: 40297
Test Site: Eurofins Product Service GmbH
Operator: Mr. Neuner
Test Date: 2022-07-15
Operating Conditions: ambient temperature: 21 °Celsius

Antenna: Schwarzbeck BBHA 9120D, Horizontal
Measurement Distance: 3m
Operational Mode: Mode 1
EUT Configuration: Configuration 3
Note 1: Table 0°
antenna 100 cm

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RadiMation

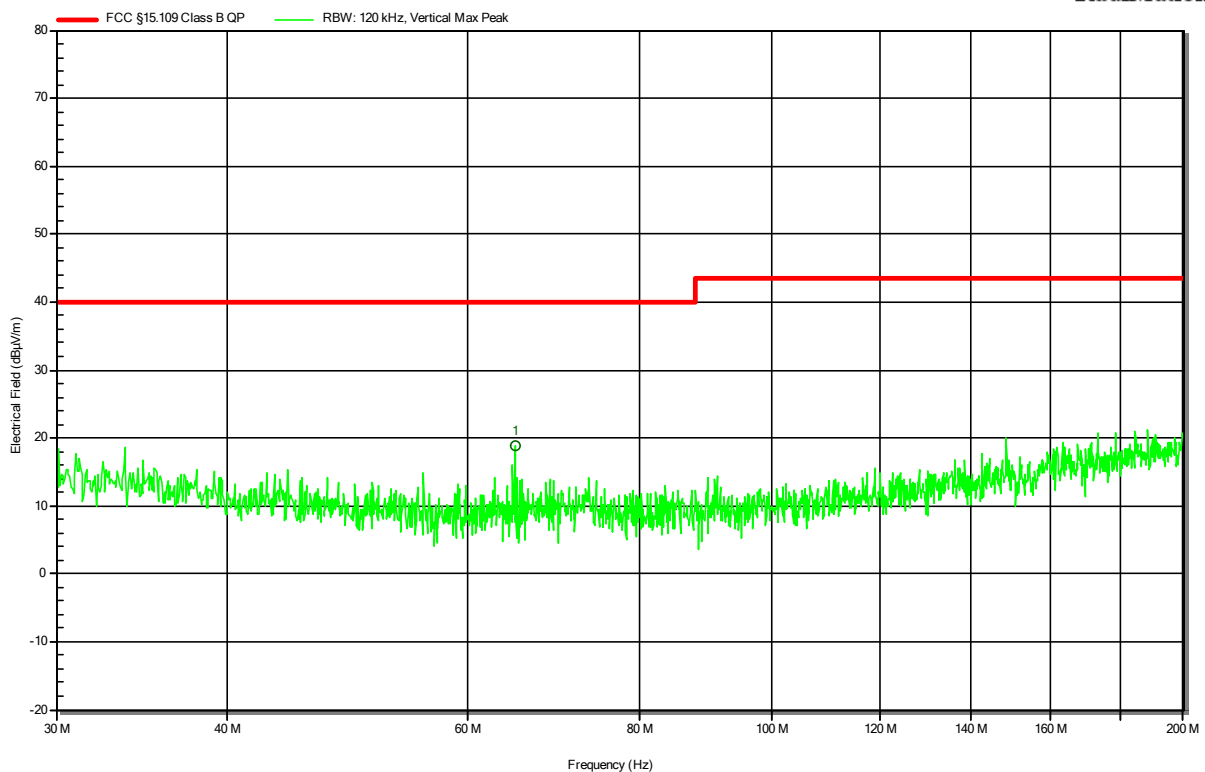


Radiated emissions according to FCC part 15B

Project Number: ORD-2103-5885
 Applicant: Dräger Safety AG & Co. KGaA
 Model Description: Polytron Repeater ISA100
 Model: Polytron Repeater ISA
 Test Sample ID: 40297
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Neuner
 Test Date: 2022-07-07
 Operating Conditions: ambient temperature: 21 °Celsius
 power input: Battery box
 Antenna: Rohde & Schwarz HK 116, Vertical
 Measurement Distance: 3m
 Operational Mode: Mode 1
 EUT Configuration: Configuration 4
 Note 1: Table 0°
 Antenna 100 cm

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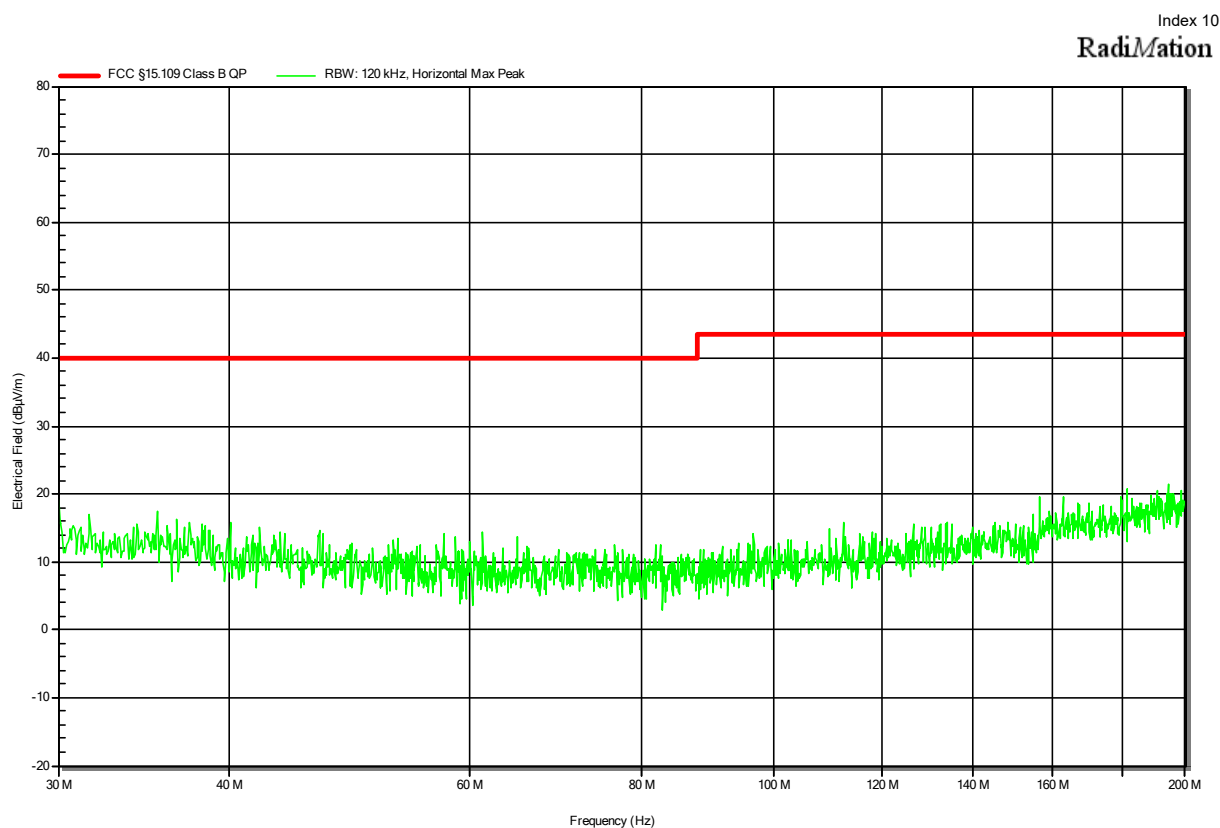
RadiMation



Peak Number	Frequency	Angle	Height
1	64.924 MHz	0 degrees	1 m

Radiated emissions according to FCC part 15B

Project Number:	ORD-2103-5885
Applicant:	Dräger Safety AG & Co. KGaA
Model Description:	Polytron Repeater ISA100
Model:	Polytron Repeater ISA
Test Sample ID:	40297
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Neuner
Test Date:	2022-07-07
Operating Conditions:	ambient temperature: 21 °Celsius power input: Battery box
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 4
Note 1:	Table 0° Antenna 100 cm

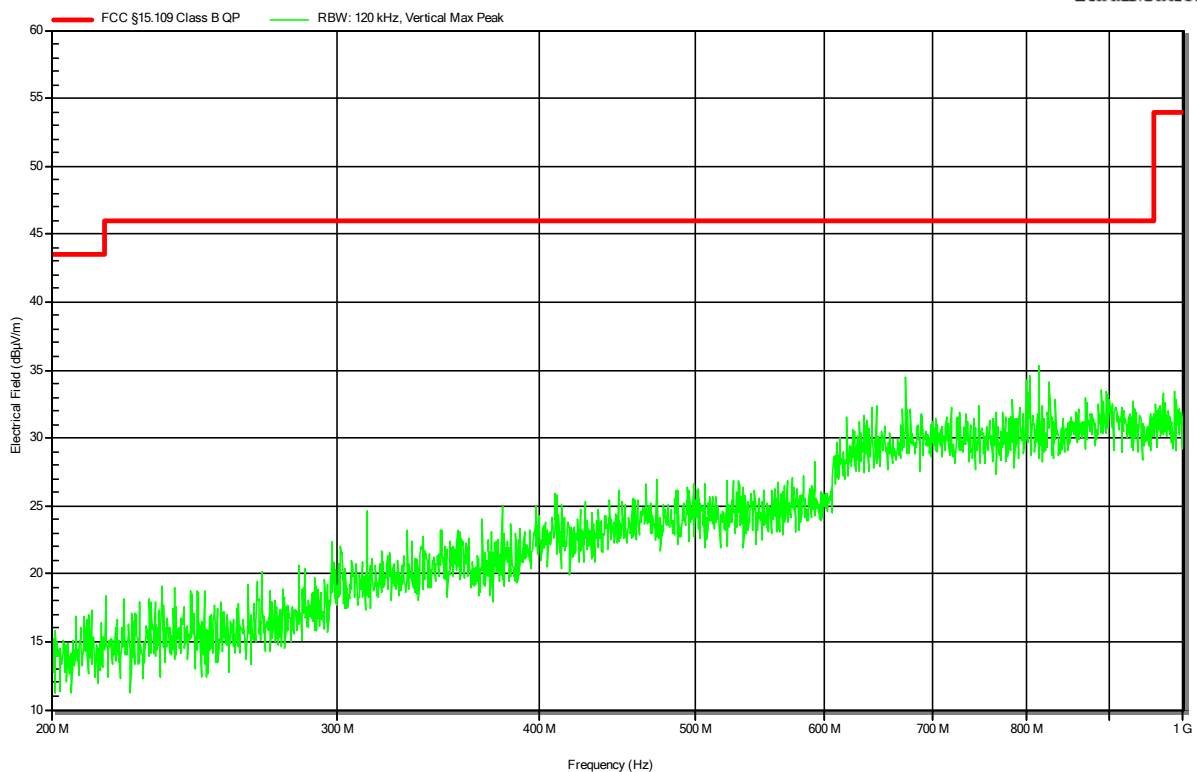


Radiated emissions according to FCC part 15B

Project Number: ORD-2103-5885
 Applicant: Dräger Safety AG & Co. KGaA
 Model Description: Polytron Repeater ISA100
 Model: Polytron Repeater ISA
 Test Sample ID: 40297
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Neuner
 Test Date: 2022-07-07
 Operating Conditions: ambient temperature: 22 °Celsius
 power input: Battery box
 Antenna: Rohde & Schwarz HL 223, Vertical
 Measurement Distance: 3m
 Operational Mode: Mode 1
 EUT Configuration: Configuration 4
 Note 1: Table 0°
 Antenna 100 cm

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RadiMation

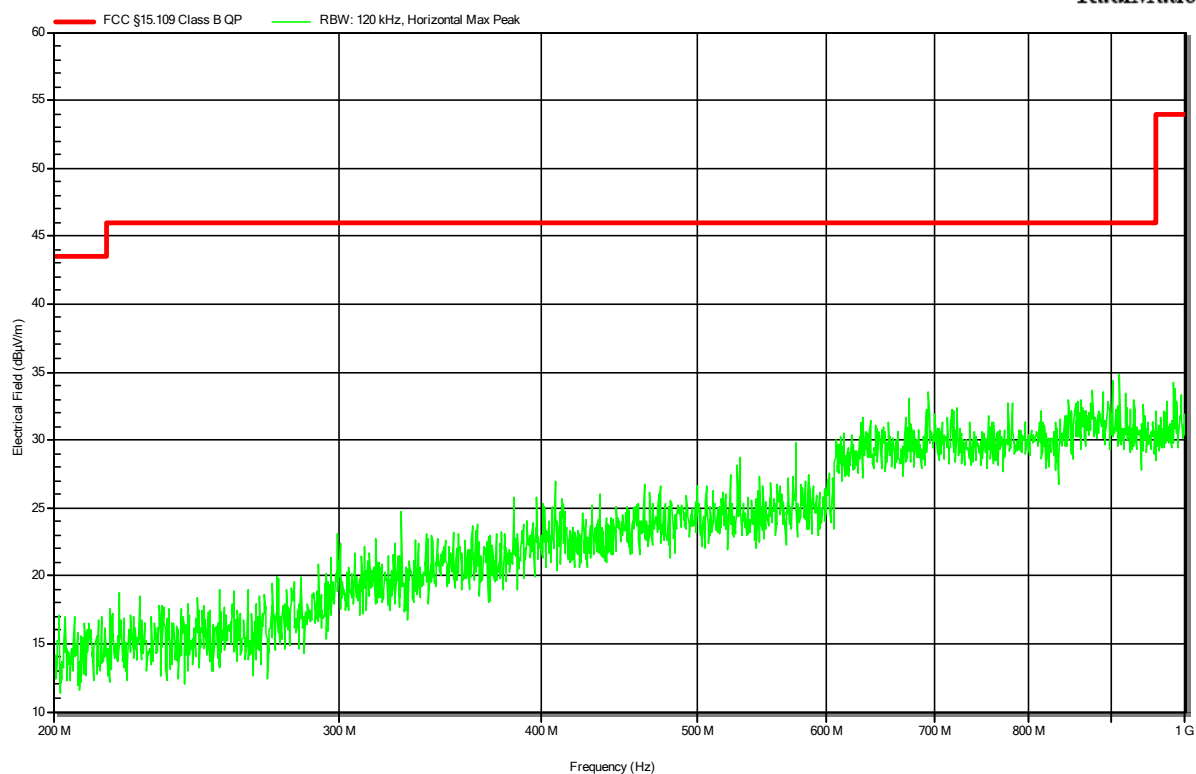


Radiated emissions according to FCC part 15B

Project Number:	ORD-2103-5885
Applicant:	Dräger Safety AG & Co. KGaA
Model Description:	Polytron Repeater ISA100
Model:	Polytron Repeater ISA
Test Sample ID:	40297
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Neuner
Test Date:	2022-07-07
Operating Conditions:	ambient temperature: 22 °Celsius power input: Battery box
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement Distance:	3m
Operational Mode:	Mode 1
EUT Configuration:	Configuration 4
Note 1:	Table 0° Antenna 100 cm

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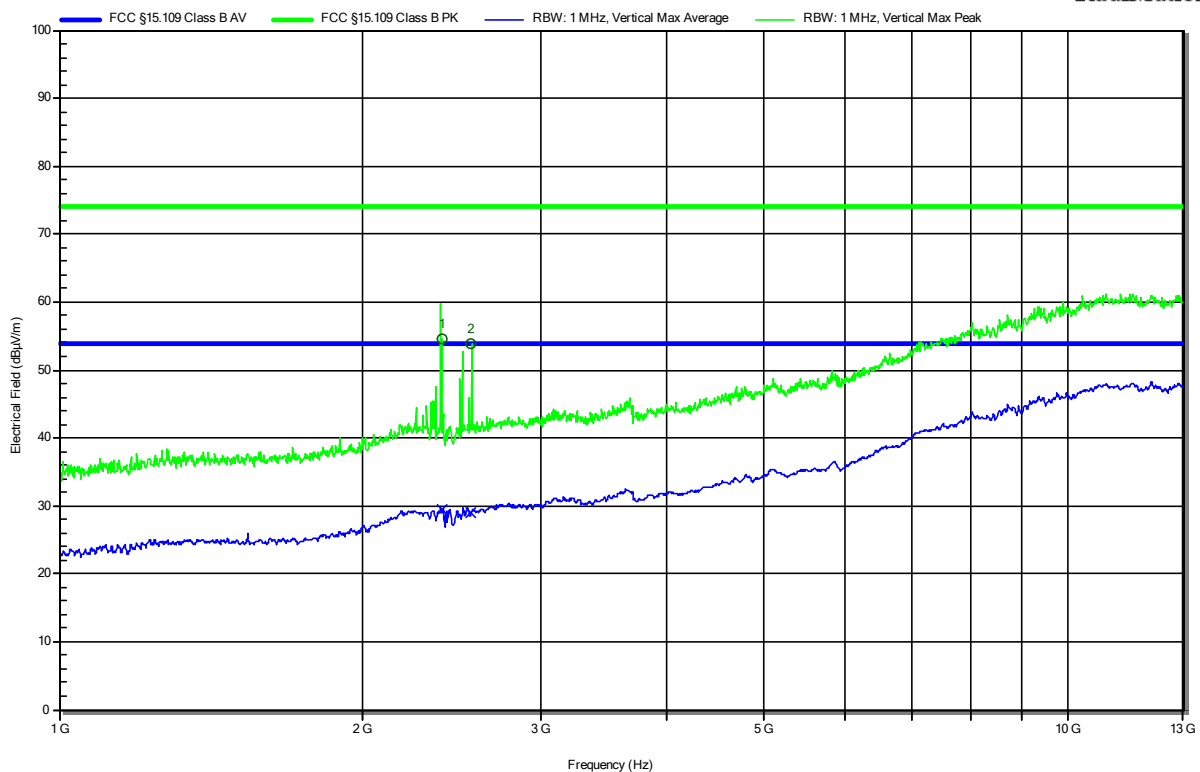


Radiated emissions according to FCC part 15B

Project Number: ORD-2103-5885
 Applicant: Dräger Safety AG & Co. KGaA
 Model Description: Polytron Repeater ISA100
 Model: Polytron Repeater ISA
 Test Sample ID: 40297
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Neuner
 Test Date: 2022-07-07
 Operating Conditions: ambient temperature: 22 °Celsius
 power input: Battery box
 Antenna: Schwarzbeck BBHA 9120D, Vertical
 Measurement Distance: 3m
 Operational Mode: Mode 1
 EUT Configuration: Configuration 4
 Note 1: Table 0°
 Antenna 100 cm

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Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.393 GHz	54.69 dBμV/m	73.98 dBμV/m	-19.29 dB	Pass	0 degrees	1 m
2	2.561 GHz	53.95 dBμV/m	73.98 dBμV/m	-20.03 dB	Pass	0 degrees	1 m

Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	2.393 GHz	29.5 dBμV/m	53.98 dBμV/m	-24.48 dB	Pass	0 degrees	1 m
2	2.561 GHz	28.99 dBμV/m	53.98 dBμV/m	-24.99 dB	Pass	0 degrees	1 m

Test Report No.: G0M-2009-9279-EF0115B-V01

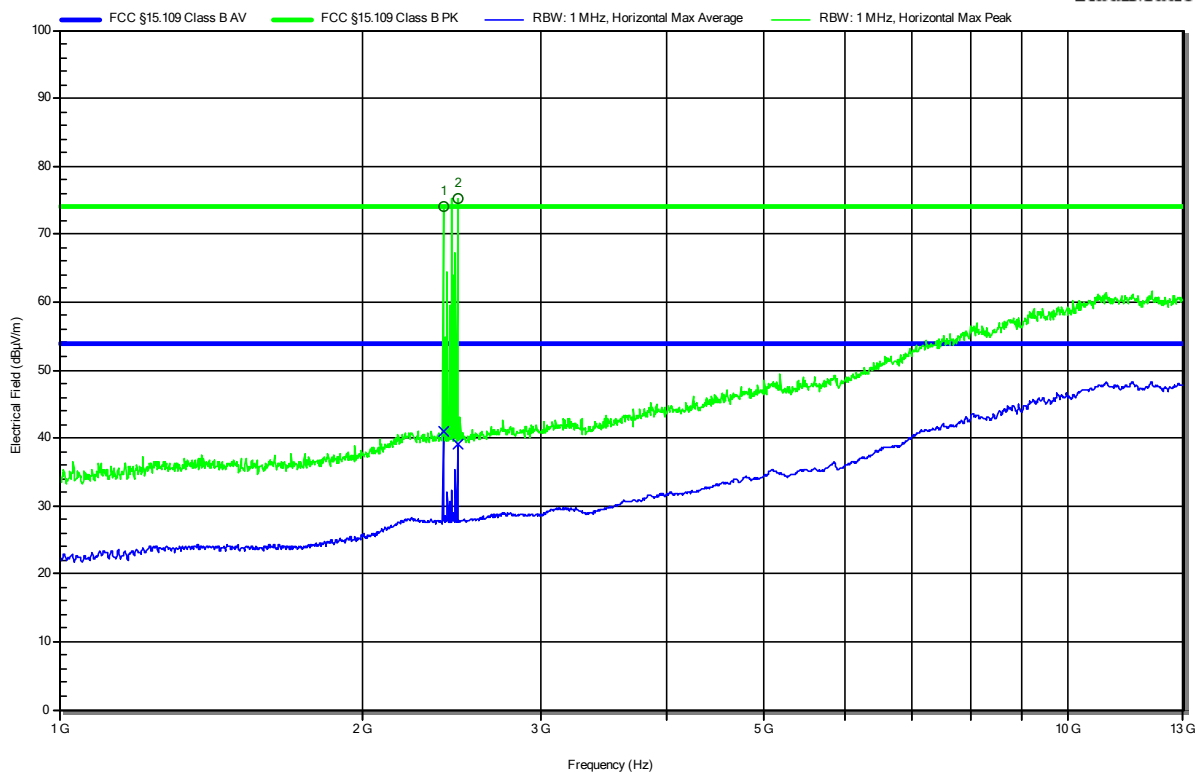
Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany

Radiated emissions according to FCC part 15B

Project Number: ORD-2103-5885
 Applicant: Dräger Safety AG & Co. KGaA
 Model Description: Polytron Repeater ISA100
 Model: Polytron Repeater ISA
 Test Sample ID: 40297
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Neuner
 Test Date: 2022-07-07
 Operating Conditions: ambient temperature: 22 °Celsius
 power input: Battery box
 Antenna: Schwarzbeck BBHA 9120D, Horizontal
 Measurement Distance: 3m
 Operational Mode: Mode 1
 EUT Configuration: Configuration 4
 Note 1: Table 0°
 Antenna 100 cm

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Peak Number	Frequency	Peak	Peak Limit	Peak Difference	Peak Status	Angle	Height
1	2.402 GHz	Bluetooth/Zigbee					
2	2.481 GHz	Bluetooth/Zigbee					

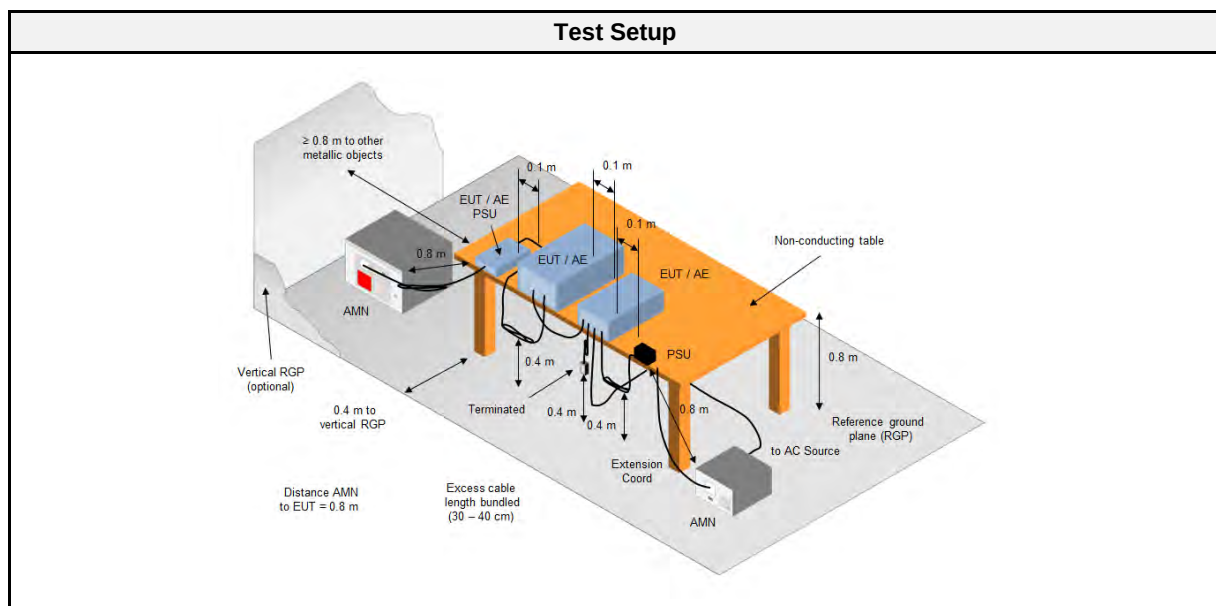
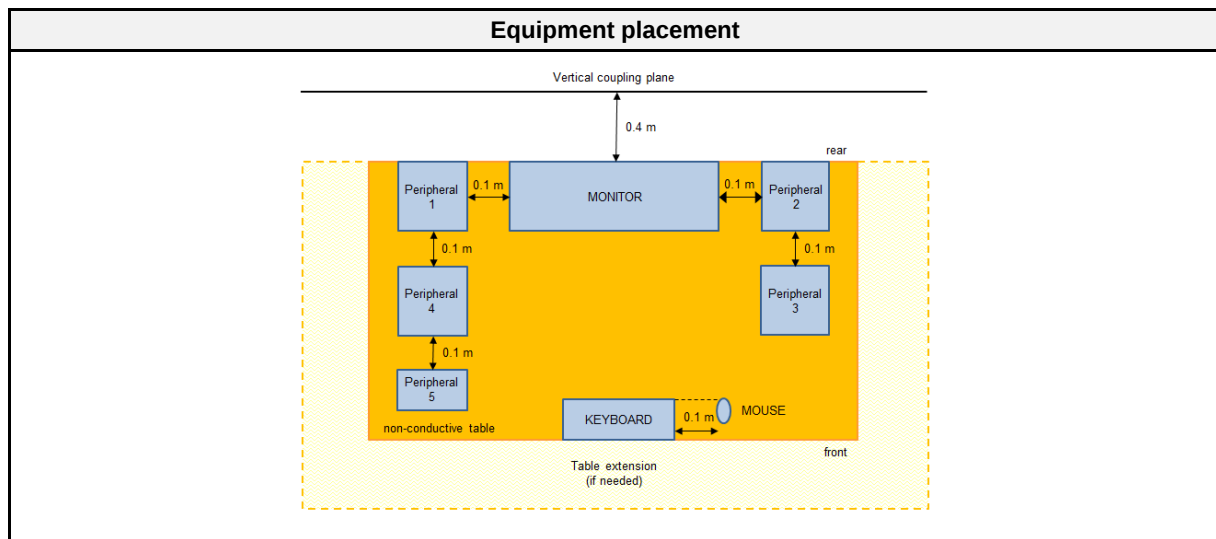
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	Angle	Height
1	2.402 GHz	Bluetooth/Zigbee					
2	2.481 GHz	Bluetooth/Zigbee					

2.2 Test Conditions and Results - Conducted emissions acc. to ANSI C63.4

2.2.1 Information

Test Information	
Reference	FCC 15.107, ICES-003, 3.2.1
Reference method	ANSI C63.4:2014+A1:2017 Section 12
Measurement range	150 kHz to 30 MHz
Equipment class	Class B
Equipment type	Table top
Temperature [°C]	23 ±5
Humidity [%]	52 ±10
Operator	Marko Neuner
Date	2022-06-27 and 2022-07-13

2.2.2 Setup



2.2.3 Equipment

Test Software			
Description	Manufacturer	Name	Version
EMC Software	DARE Instruments	Radimation	2020.1.8

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
AMN	Schwarzbeck	NSLK 8127	EF01592	2021-07	2022-07
AC & DC Power Supply	Chroma ATE Inc.	61604	EF01380	2021-07	2023-07
Pulse Limiter	R&S	ESH3-Z2	EF01222	2021-07	2022-07
EMI Test Receiver	R&S	ESR 7	EF00943	2021-08	2022-08
Climatic Sensor	Embedded Data Systems, LLC.	2800100000254 17E	EF01054	2022-04	2023-04

2.2.4 Procedure

Exploratory measurement
- The EUT was placed on a nonconductive table 0.8 m above the reference ground plane and 0.4 m away from the vertical conducting plane (ANSI C63.4: 2014 item 7.3.1) - The power cord that is normally supplied or recommended by the manufacturer was connected to the LISN. - The distance between the outer edge of the EUT and the LISN shall be set to 0.8 m. A longer power cord shall be bundled to this length (bundling shall not exceed 40 cm in length). - The LISN measurement port was connected to a measurement receiver - I/O cables were bundled not longer than 0.4 m - Measurement was performed in the frequency range 0.15 – 30MHz on each current-carrying conductor - To maximize the emissions the cable positions were manipulated - The worst configuration of EUT and cables is shown on a test setup picture at item 2.2.2

Final measurement
- The EUT was placed on a nonconductive table 0.8 m above the reference ground plane and 0.4 m away from the vertical conducting plane (ANSI C63.4: 2014 item 7.3.1) - The power cord that is normally supplied or recommended by the manufacturer was connected to the LISN. - The distance between the outer edge of the EUT and the LISN shall be set to 0.8 m. A longer power cord shall be bundled to this length (bundling shall not exceed 40 cm in length). - The LISN measurement port was connected to a measurement receiver - The EUT and cable arrangement were based on the exploratory measurement results - The test data of the worst-case conditions were recorded and shown on the next pages

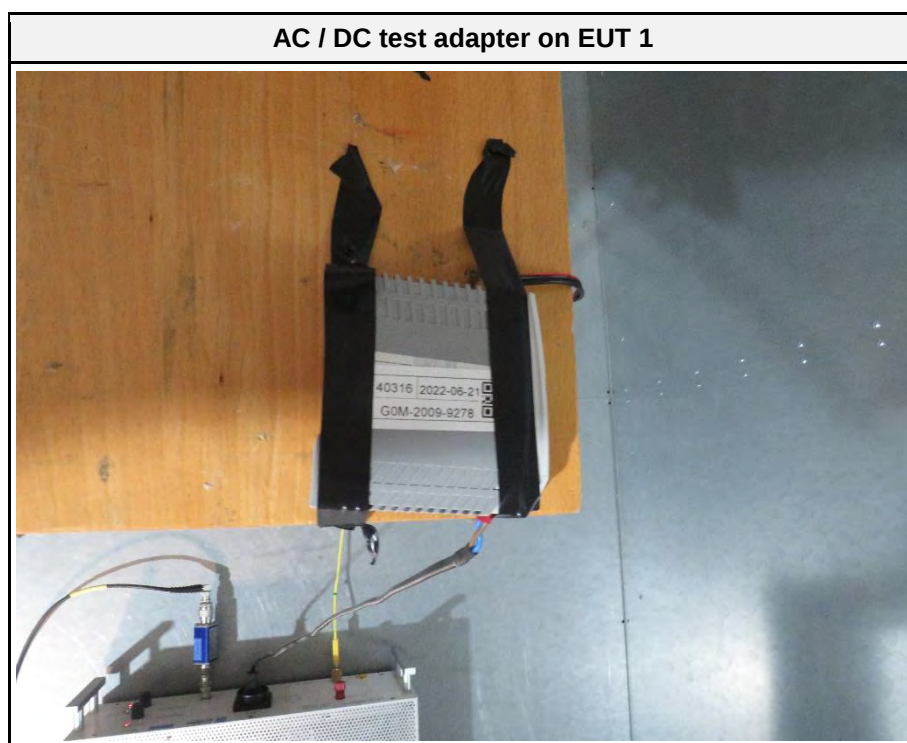
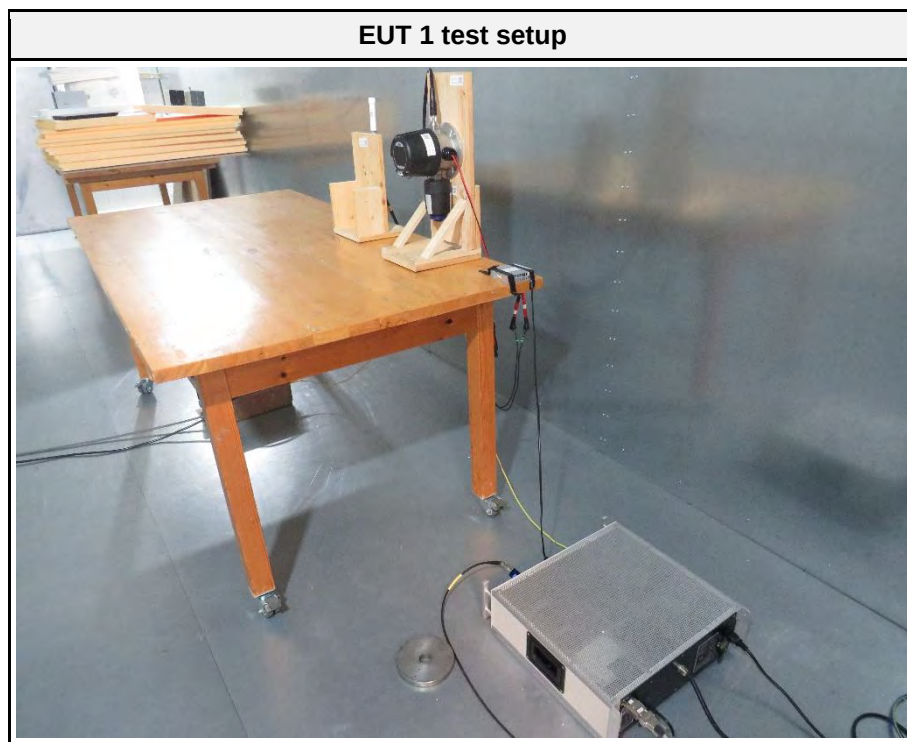
2.2.5 Limits

Class B		
Frequency [MHz]	Quasi-peak Limit [dBμV]	Average Limit [dBμV]
0.15 - 0.5	66 - 56 *	56 - 46 *
0.5 - 5	56	46
5 - 30	60	50
* Decreases with the logarithm of the frequency		

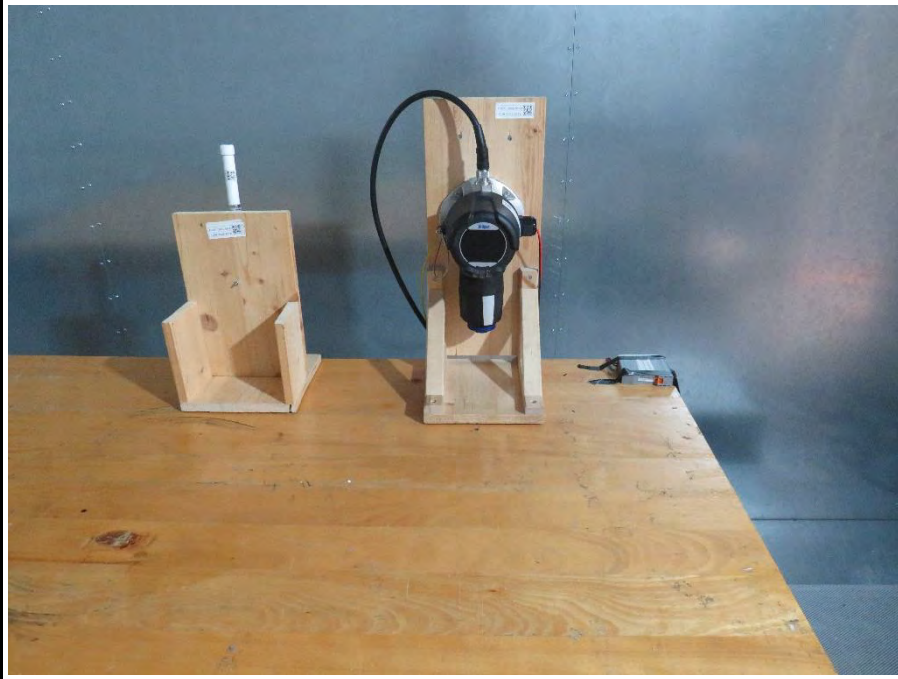
2.2.6 Results

AC power line conducted emissions					
Port	Coupling	Operational mode	EUT Configuration	Verdict	Remark
Power	AMN	1	1	PASS	-
Power	AMN	1	3	PASS	-

2.2.7 Setup Photos



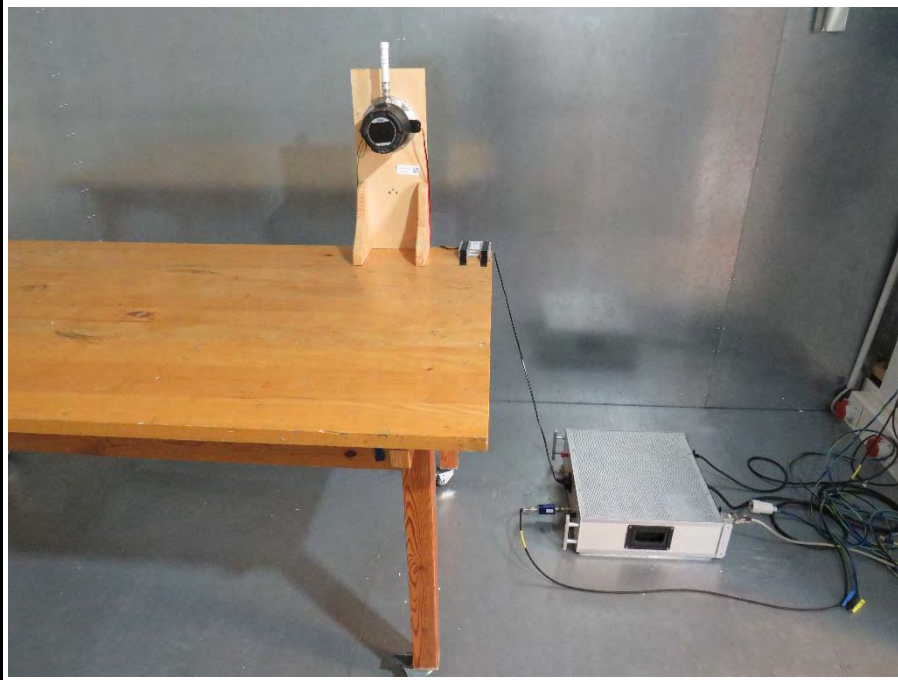
EUT 1 test setup, front view



EUT 1 cable configuration



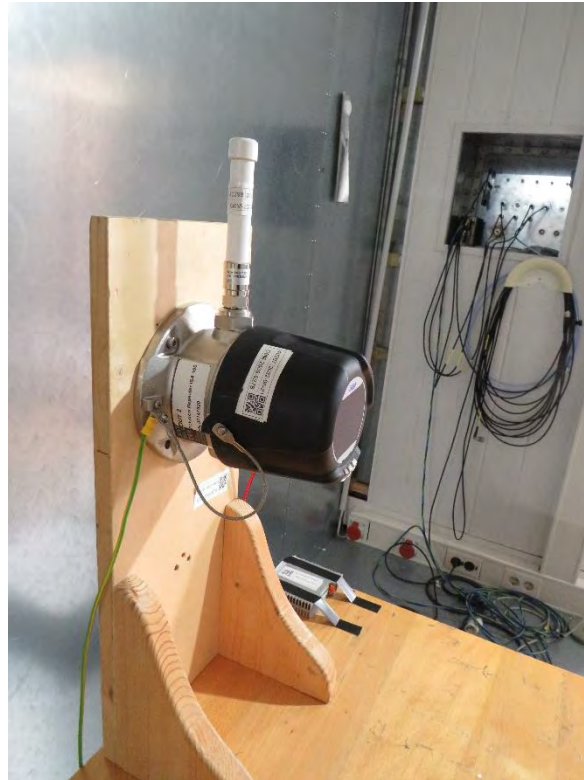
EUT 2 Test setup



EUT 2 Cable setup



EUT 2 Sample ID



EUT 2 AC/DC adapter



EUT 2 AC/DC adapter Sample ID



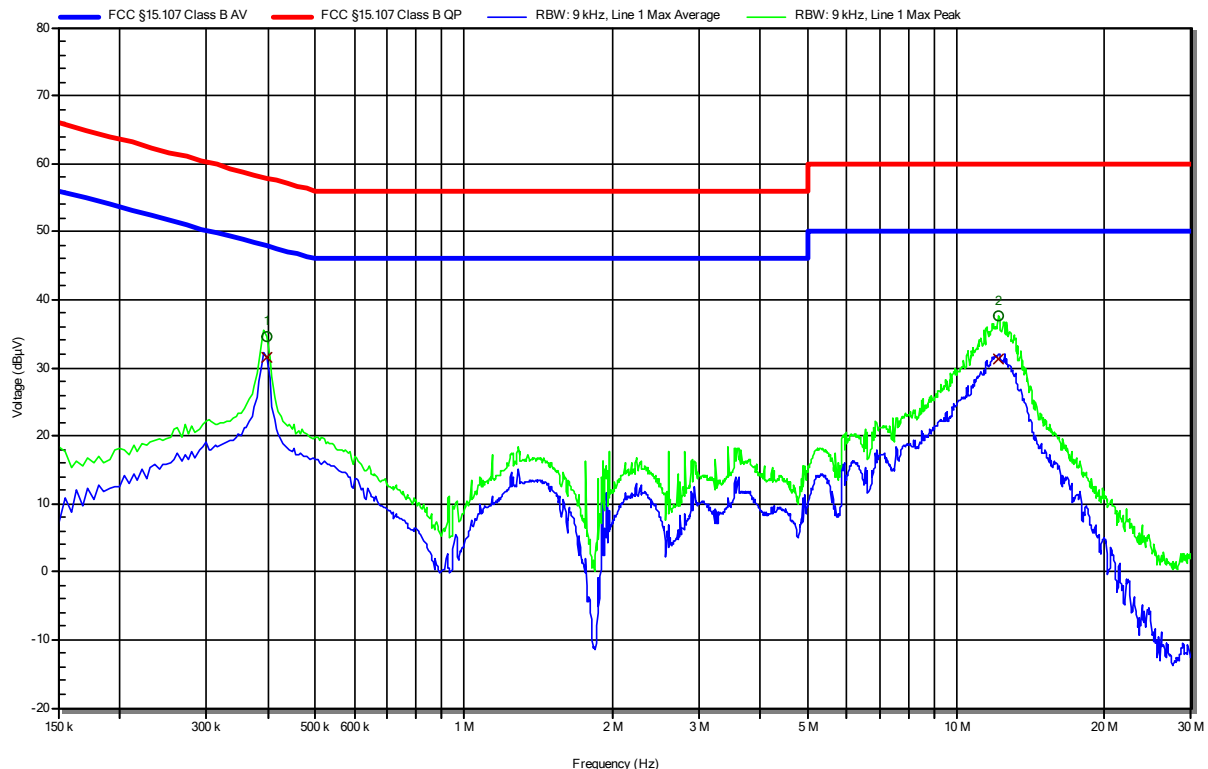
2.2.8 Records

Conducted emissions at the mains power port according to FCC 15B

Project Number: ORD-2009-5078
 Applicant: Dräger Safety AG & Co. KGaA
 Model Description: Fixed Gas Detector
 Model: Polytron 6100 EC WL
 Test Sample ID: 40294
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Neuner
 Test Date: 2022-06-27
 Operating Conditions: ambient temperature: 24.6 °Celsius
 power input: 120V/60Hz (AC/DC-adapter
 PHOENIX CONTACT UNO-PS/1AC24DC/30W)
 LISN: Schwarzbeck NSLK 8127 RC L1
 Operational Mode: Operational 1
 EUT Configuration: Config 1
 with detached antenna, with AC/DC Adapter
 Applied to Port: AC main port
 Note 1: 120V AC, 60Hz

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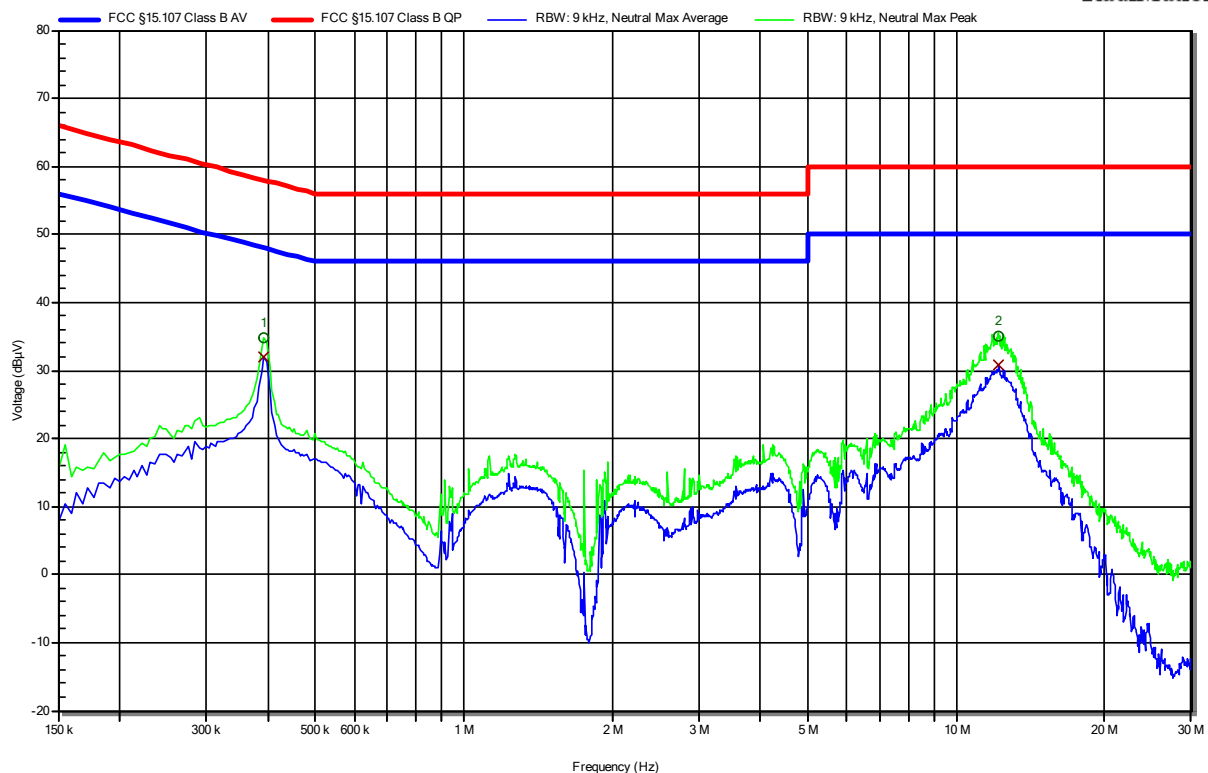
Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	397.5 kHz	31.61 dBμV	47.91 dBμV	-16.3 dB	Pass	Line 1
2	12.192 MHz	31.22 dBμV	50 dBμV	-18.78 dB	Pass	Line 1

Conducted emissions at the mains power port according to FCC 15B

Project Number: ORD-2009-5078
 Applicant: Dräger Safety AG & Co. KGaA
 Model Description: Fixed Gas Detector
 Model: Polytron 6100 EC WL
 Test Sample ID: 40294
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Neuner
 Test Date: 2022-06-27
 Operating Conditions: ambient temperature: 24.6 °Celsius
 power input: 120V/60Hz (AC/DC-adapter
 PHOENIX CONTACT UNO-PS/1AC24DC/30W)
 LISN: Schwarzbeck NSLK 8127 N
 Operational Mode: Operational 1
 EUT Configuration: Config 1
 with detached antenna, with AC/DC Adapter
 Applied to Port: AC main port
 Note 1: 120V AC, 60Hz

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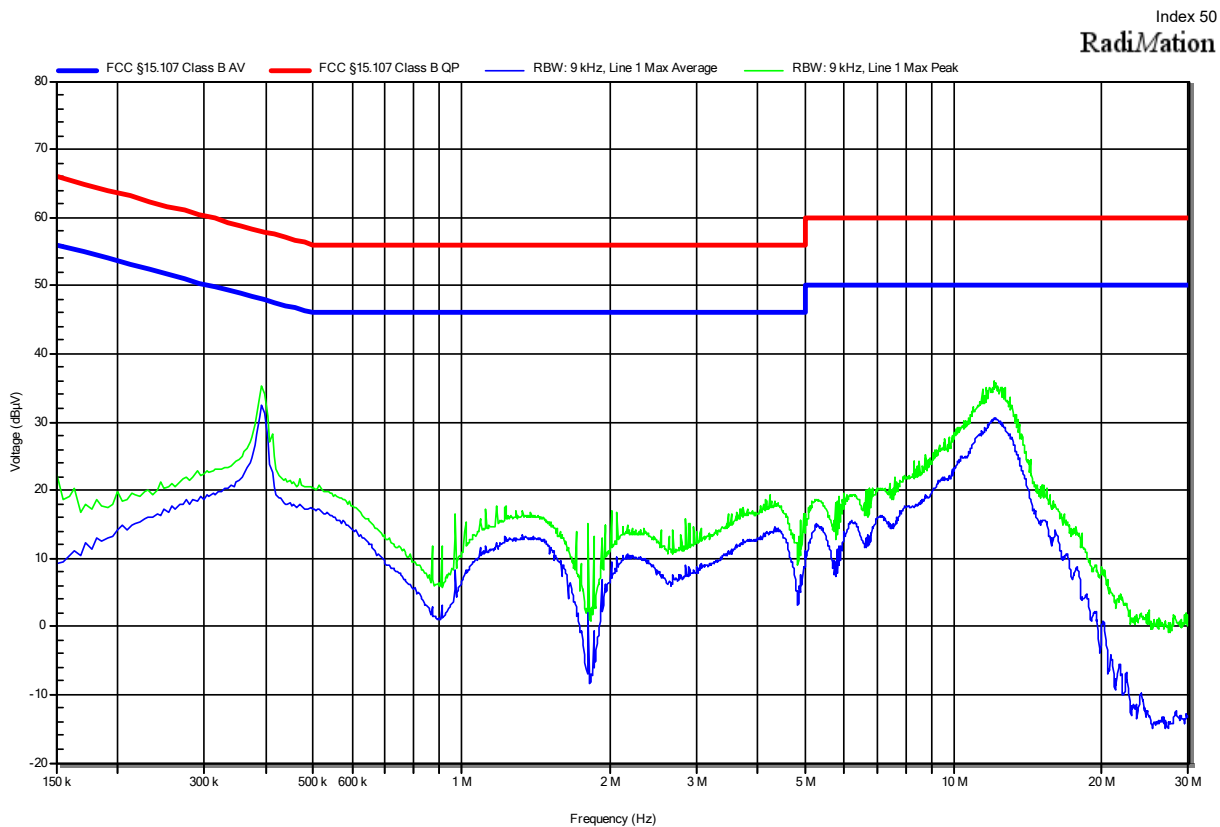
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Peak Number	Frequency	Average	Average Limit	Average Difference	Average Status	LISN
1	393 kHz	31.99 dBμV	48 dBμV	-16.01 dB	Pass	Neutral
2	12.174 MHz	30.75 dBμV	50 dBμV	-19.25 dB	Pass	Neutral

Conducted emissions at the mains power port according to FCC part 15B

Project Number:	ORD-2009-5078
Applicant:	Dräger Safety AG & Co. KGaA
Model Description:	Polytron Repeater ISA100
Model:	Polytron Repeater ISA
Test Sample ID:	40294
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Neuner
Test Date:	2022-07-13
Operating Conditions:	ambient temperature: 23 °Celsius power input: 120V/60Hz (AC/DC-adapter PHOENIX CONTACT UNO-PS/1AC24DC/30W)
LISN:	Schwarzbeck NSLK 8127 RC L1
Operational Mode:	Mode 1
EUT Configuration:	Config 3
Applied to Port:	AC Main Port
Note 1:	Repeater

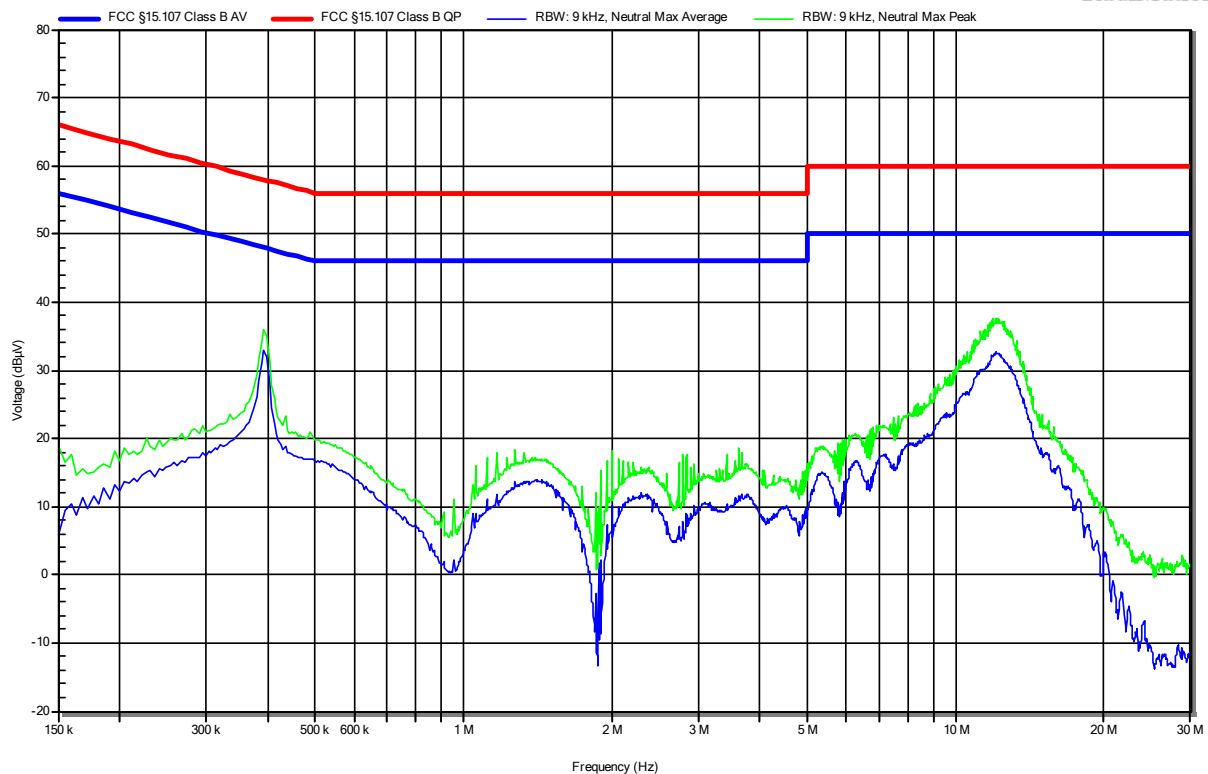


Conducted emissions at the mains power port according to FCC part 15B

Project Number:	ORD-2009-5078
Applicant:	Dräger Safety AG & Co. KGaA
Model Description:	Polytron Repeater ISA100
Model:	Polytron Repeater ISA
Test Sample ID:	40294
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Neuner
Test Date:	2022-07-13
Operating Conditions:	ambient temperature: 23 °Celsius power input: 120V/60Hz (AC/DC-adapter PHOENIX CONTACT UNO-PS/1AC24DC/30W)
LISN:	Schwarzbeck NSLK 8127 N
Operational Mode:	Mode 1
EUT Configuration:	Config 3
Applied to Port:	AC Main Port
Note 1:	Repeater

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3 Measurement Uncertainty

All test measurements carried out are traceable to national standards. The uncertainty of the measurement at a confidence level of approximately 95%, with a coverage factor of 2.

Test Name	Measurement Uncertainty
Conducted emissions at the mains power port	150kHz to 30MHz, 3.35dB
Radiated Emission	30MHz to 200MHz @ 3m, 5.1dB 200MHz to 1GHz @ 3m, 5.3dB >1GHz to 18GHz @3m, 5.95dB