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EMC TEST REPORT

FCC 47 CFR Part 15B
Industry Canada ICES-003

Electromagnetic compatibility - Unintentional radiators

Report Reference No. ..... :	G0M-1504-4714-EF0115B-V01
Testing Laboratory ..... :	Eurofins Product Service GmbH
Address ..... :	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation ..... :	A2LA Accredited Testing Laboratory, Certificate No.: 1983.01 FCC Filed Test Laboratory, Reg.-No.: 96970 IC OATS Filing assigned code: 3470A
Applicant's name ..... :	Dräger Safety AG & Co. KGaA
Address ..... :	Revalstraße 1 23560 Lübeck GERMANY
Test specification:	
Standard..... :	47 CFR Part 15 Subpart B ICES-003, Issue 5:2012 ANSI C63.4:2014
Equipment under test (EUT):	
Product description	Powered Air Purifying Respirator
Model No.	R59500
Additional Models	None
Hardware version	V05.00
Firmware / Software version	V00.26
IDs	FCC-ID: X6O-XPLORE8500 IC: 5895F-XPLORE8500
Test result	**Passed**

Possible test case verdicts:	
- not applicable 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 ..... :	2015-05-07	
Date (s) of performance of tests ..... :	2015-09-14	
Compiled by..... :	Marcus Klein	
Tested by (+ signature)..... :	Yu Yu / Marcus Klein	.....
Approved by (+ signature) ..... : Deputy Head of Lab	Jens Marquardt	.....
Date of issue..... :	2015-10-09	
Total number of pages..... :	20	

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:

Version History

Version	Issue Date	Remarks	Revised by
V01	2015-10-09	Initial Release	

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

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1 Equipment (Test item) Description

Description	Powered Air Purifying Respirator	
Model	R59500	
Additional Models	None	
Serial number	None	
Hardware version	V05.00	
Software / Firmware version	V00.26	
FCC-ID	X6O-XPLORE8500	
IC-ID	5895F-XPLORE8500	
Power supply	10.8 VDC Battery	
AC/DC-Adaptor	None	
Radio module	Type	Bluetooth Module
	Model	PAN1026
	Manufacturer	Panasonic
	HW Version	None
	SW Version	None
	FCC-ID	T7VPAN10
	IC	216Q-PAN10
Manufacturer	MSC Technologies Systems GmbH Munzingerstr. 3 79111 Freiburg Germany	
Highest emission frequency	Fmax [MHz] = 18.432	
Device classification	Class B	
Equipment type	Tabletop	
Number of tested samples	1	

1.4 Supporting Equipment Used During Testing

Product Type*	Device	Manufacturer	Model No.	Comments
AE	X-Plore 8000	Dräger	R59585	
AE	X-Plore 8000	Dräger	R59620	
AE	X-Plore 8000	Dräger	6739535	

***Note:** Use the following abbreviations:

AE : Auxiliary/Associated Equipment, or

SIM : Simulator (Not Subjected to Test)

CABL : Connecting cables

1.5 Input / Output Ports

Port #	Name	Type*	Max. Cable Length	Cable Shielded	Comments
No relevant ports available					

***Note:** Use the following abbreviations:

AC : AC power port

DC : DC power port

N/E : Non electrical

I/O : Signal input or output port

TP : Telecommunication port

1.6 Operating Modes and Configurations

Mode #	Description
1	Purifying + RFID reading + Bluetooth

Configuration #	EUT Configuration
1	Normal configuration

1.7 Test Equipment Used During Testing

Measurement Software			
Description	Manufacturer	Name	Version
EMC Test Software	Dare Instruments	Radimation	2014.1.15

Radiated emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Biconical Antenna	R&S	HK 116	EF00012	2013-02	2016-02
LPD-Antenne	R&S	HL 223	EF00187	2014-03	2017-03
Horn antenna	Schwarzbeck	BBHA 9120D	EF00018	2013-09	2016-09
EMI Test Receiver	R&S	ESU26	EF00887	2015-01	2016-01

1.8 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 analyzer in dBµV. Any external preamplifiers used are taken into account through internal analyzer 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 analyzer. 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:

Reading on Analyzer (dBµV) + A.F. (dB) = Net field strength (dBµV/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 dBµV/m). The FCC limits are given in units of µV/m. The following formula is used to convert the units of µV/m to dBµV/m:

Limit (dBµV/m) = 20*log (µV/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 dBµV	+	26 dB	=	47.5 dBµV/m	:	47.5 dBµV/m - 57.0 dBµV/m	= -9.5 dB

2 Result Summary

FCC 47 CFR Part 15B, Industry Canada ICES-003				
Product Specific Standard	**Requirement – Test**	**Reference Method**	**Result**	**Remarks**
47 CFR 15.109 ICES-003 Item 6.2	Radiated emissions	ANSI C 63.4	PASS	
47 CFR 15.107 ICES-003 Item 6.1	AC power line conducted emissions	ANSI C63.4	N/A	No relevant port available
Remarks:				

3 Test Conditions and Results

3.1 Test Conditions and Results – Radiated emissions

Radiated emissions acc. FCC 47 CFR 15.109 / ICES-003						**Verdict: PASS**
Laboratory Parameters:	Required prior to the test		During the test			
Ambient Temperature	15 to 35 °C		22°C			
Relative Humidity	30 to 60 %		35%			
Test according referenced standards	Reference Method					
	ANSI C63.4					
Sample is tested with respect to the requirements of the equipment class	Equipment class					
	Class B					
Test frequency range determined from highest emission frequency	Highest emission frequency					
	Fmax [MHz] = 18.432					
Fully configured sample scanned over the following frequency range	Frequency range					
	30 MHz to 1 GHz					
Operating mode	1					
Configuration	1					
Limits and results Class B						
Frequency [MHz]	Quasi-Peak [dBµV/m]	Result	Average [dBµV/m]	Result	Peak [dBµV/m]	Result
30 – 88	40	PASS	-		-	-
88 – 216	43.5	PASS	-		-	-
216 – 960	46	PASS	-		-	-
960 – 1000	54	PASS	-		-	-
> 1000	-	-	54	PASS	74	PASS
Comments:						

Test Procedure:

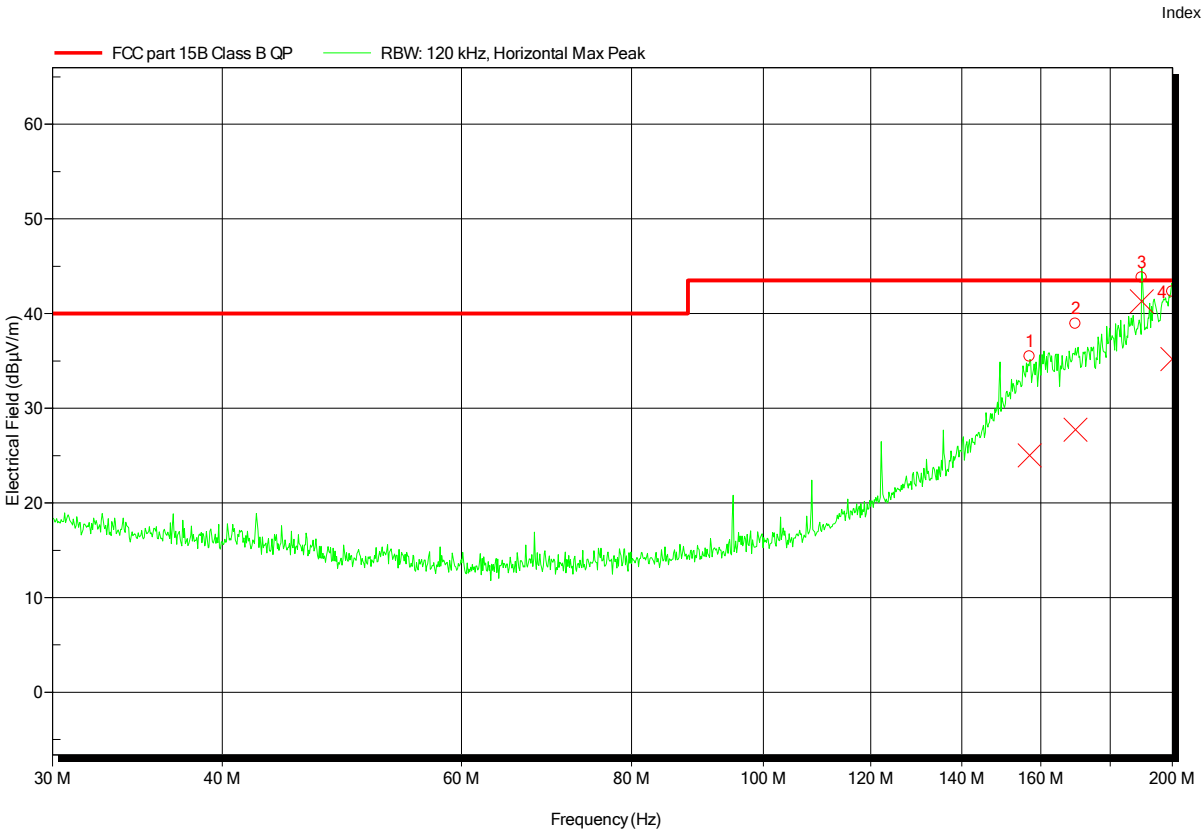
The test site is in accordance with ANSI C63-4:2009 requirements and is listed by FCC.
The measurement procedure is as follows:

1) The EUT was placed on a 0.8 m non conductive table at a 3 m distance from the receive antenna (ANSI C63.4: 2009 item 6.2)
2) The antenna output was connected to the measurement receiver
3) 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
4) Emissions were maximized at each frequency by rotating the EUT and adjusting the receive antenna height and polarization. The maximum values were recorded.

Spurious emissions under normal conditions according to FCC Part 15b

Project number: G0M-1504-4714

Applicant:	Dräger Safety AG & Co. KGaA
EUT Name:	Powered Air Purifying Respirator
Model:	R59500
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Yu
Test Conditions:	Tnom: 22°C, Unom: 10.8VDC Battery
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3m
Mode:	1
Test Date:	2015-09-14
Note:	

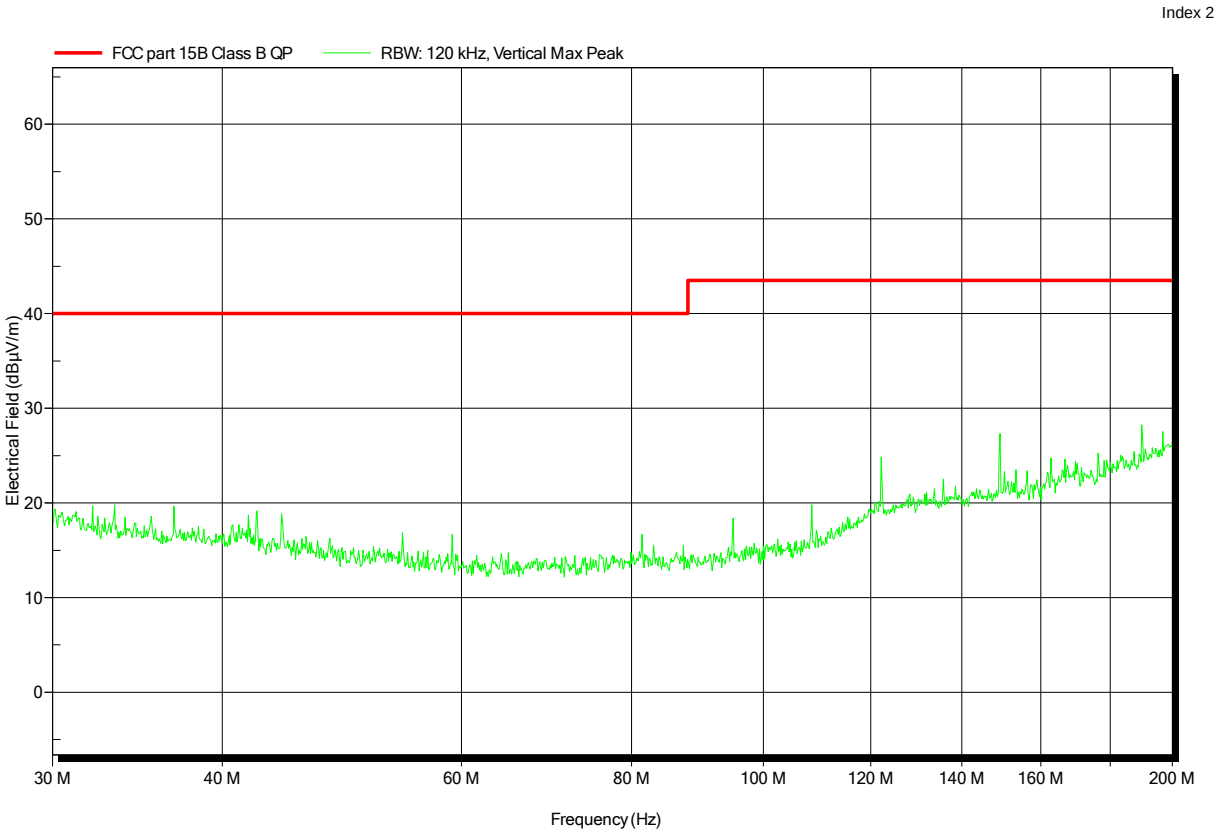


Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
157.02 MHz	25.01 dBµV/m	43.5 dBµV/m	-18.49 dB	Pass
169.74 MHz	27.72 dBµV/m	43.5 dBµV/m	-15.78 dB	Pass
189.84 MHz	41.31 dBµV/m	43.5 dBµV/m	-2.19 dB	Pass
199.92 MHz	35.21 dBµV/m	43.5 dBµV/m	-8.29 dB	Pass

Spurious emissions under normal conditions according to FCC Part 15b

Project number: G0M-1504-4714

Applicant:	Dräger Safety AG & Co. KGaA
EUT Name:	Powered Air Purifying Respirator
Model:	R59500
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Yu
Test Conditions:	Tnom: 22°C, Unom: 10.8VDC Battery
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3m
Mode:	1
Test Date:	2015-09-14
Note:	



Spurious emissions under normal conditions according to FCC Part 15b

Project number: G0M-1504-4714

Applicant:	Dräger Safety AG & Co. KGaA
EUT Name:	Powered Air Purifying Respirator
Model:	R59500
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Yu
Test Conditions:	Tnom: 22°C, Unom: 10.8VDC Battery
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3m
Mode:	1
Test Date:	2015-09-14
Note:	

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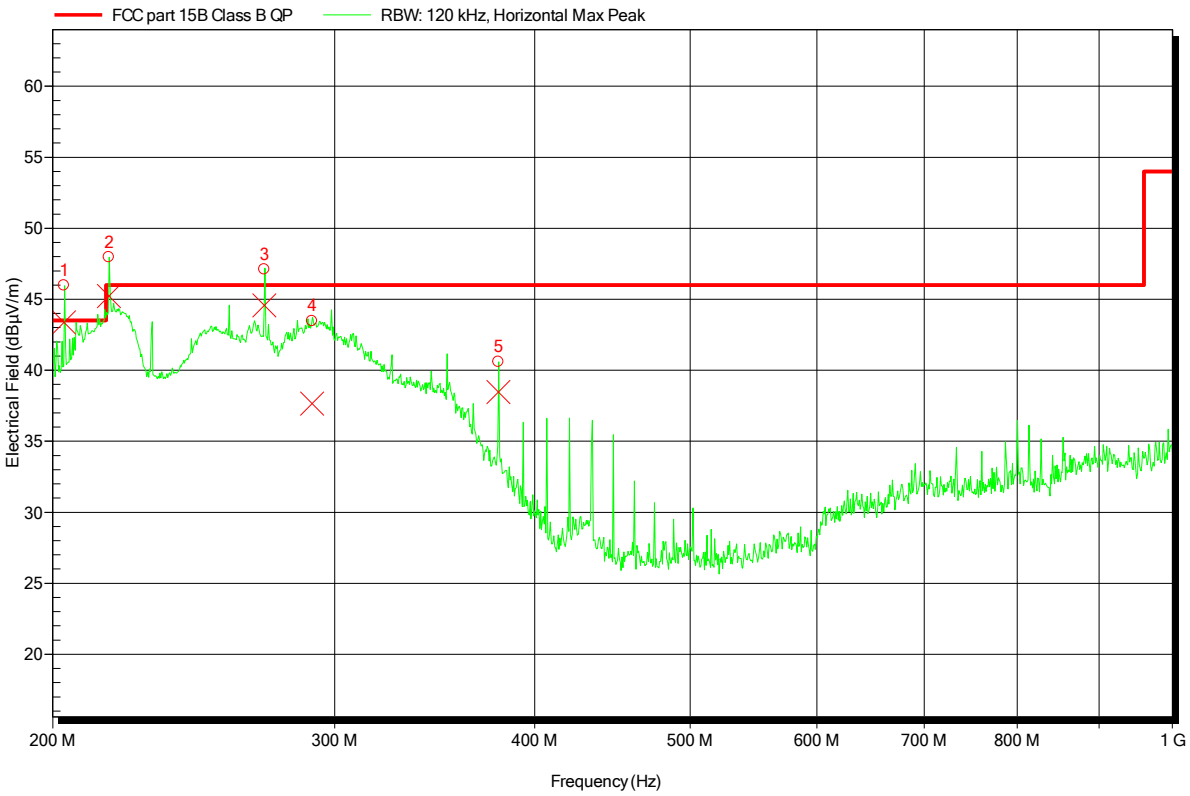

Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
203.402 MHz	43.38 dBµV/m	43.5 dBµV/m	-0.12 dB	Pass
216.962 MHz	45.23 dBµV/m	46 dBµV/m	-0.77 dB	Pass
271.208 MHz	44.57 dBµV/m	46 dBµV/m	-1.43 dB	Pass
290.42 MHz	37.66 dBµV/m	46 dBµV/m	-8.34 dB	Pass
379.676 MHz	38.46 dBµV/m	46 dBµV/m	-7.54 dB	Pass

Spurious emissions under normal conditions according to FCC Part 15b

Project number: G0M-1504-4714

Applicant:	Dräger Safety AG & Co. KGaA
EUT Name:	Powered Air Purifying Respirator
Model:	R59500
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Yu
Test Conditions:	Tnom: 22°C, Unom: 10.8VDC Battery
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3m
Mode:	1
Test Date:	2015-09-14
Note:	

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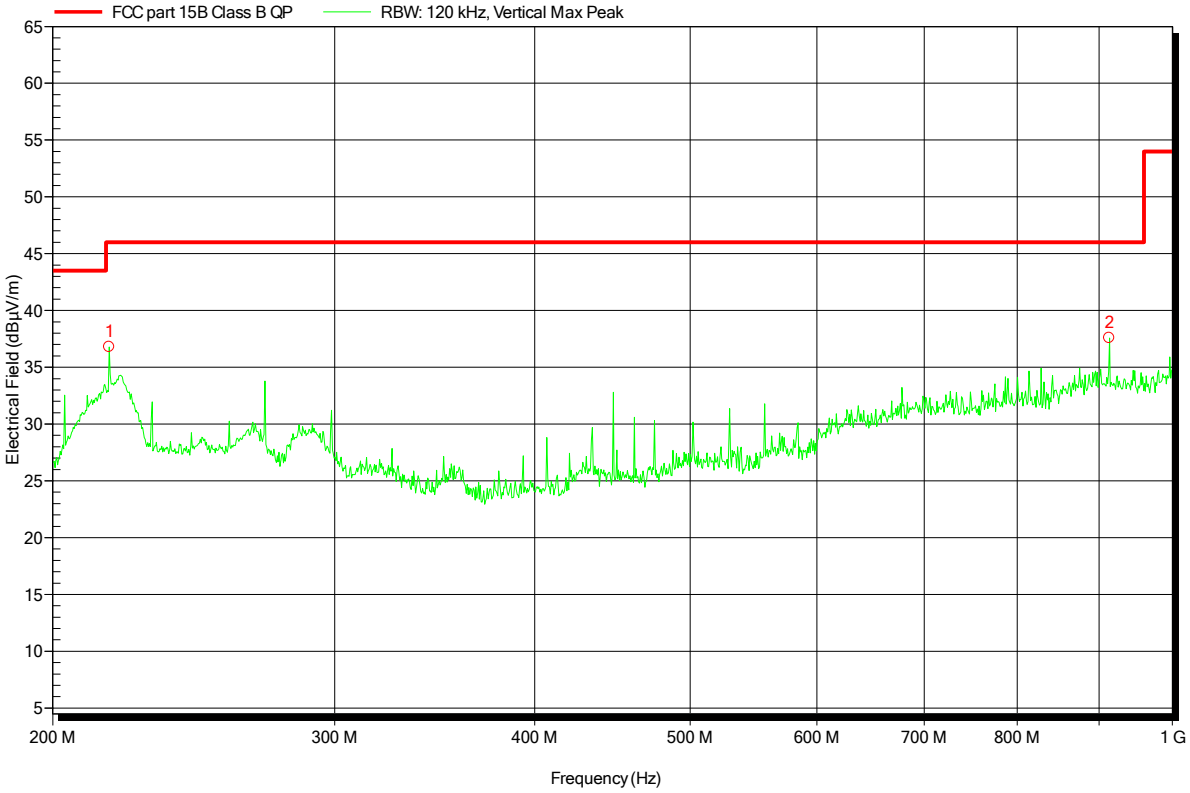

Frequency
216.98 MHz
913.34 MHz