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EMC TEST REPORT

FCC 47 CFR Part 15B
Industry Canada RSS-Gen

Electromagnetic compatibility - Unintentional radiators

Report Reference No. ..... :	G0M-1407-3996-EF0115B-V02
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 RSS-Gen, Issue 3, 2010-12 ANSI C63.4:2009
Equipment under test (EUT):	
Product description	Portable Alarm Amplifier
Model No.	AAC 00xx
Additional Models	None
Hardware version	8324825
Firmware / Software version	2.24
IDs	FCC-ID: X6O-AAC00XX IC: 5895F-AAC00XX
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 ..... :	2014-07-14
Date (s) of performance of tests ..... :	2014-07-22 - 2014-07-22
Compiled by..... :	Steffen Zunke
Tested by (+ signature)..... :	Steffen Zunke
Approved by (+ signature) ..... :	Jens Zimmermann
Date of issue..... :	2014-09-01
Total number of pages..... :	24

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.

Additional comments:

Version History

Version	Issue Date	Remarks	Revised by
V01	2014-07-25	Initial Release	
V02	2014-08-29	Replaced document: G0M-1407-3996-EF0115B-V01 Replaced by: G0M-1407-3996-EF0115B-V02 Reason: The IC ID was corrected.	A. Schladitz

REPORT INDEX

1 Equipment (Test item) Description

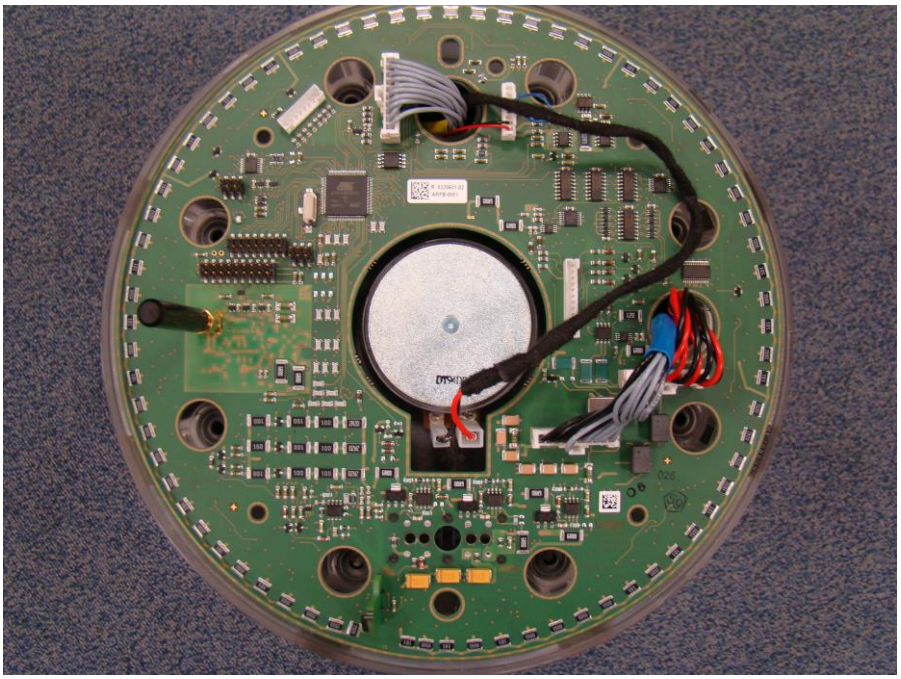
Description	Portable Alarm Amplifier
Model	AAC 00xx
Additional Models	None
Serial number	ARFH-0042
Hardware version	8324825
Software / Firmware version	2.24
FCC-ID	X6O-AAC00XX
IC-ID	5895F-AAC00XX
Power supply	15VDC via AC/DC Adapter
AC/DC-Adaptor	Model : FW7362/15 Manufacturer : Dräger Input : 100-240VAC / 50-60Hz Output : 15VDC / 2.0A
AC/DC-Adaptor	None
Manufacturer	Dräger Safety AG & Co. KGaA Revalstraße 1 23560 Lübeck GERMANY
Highest emission frequency	500 MHz - 1000 MHz (up to 5 GHz)
Device classification	Class B
Equipment type	Tabletop
Number of tested samples	1

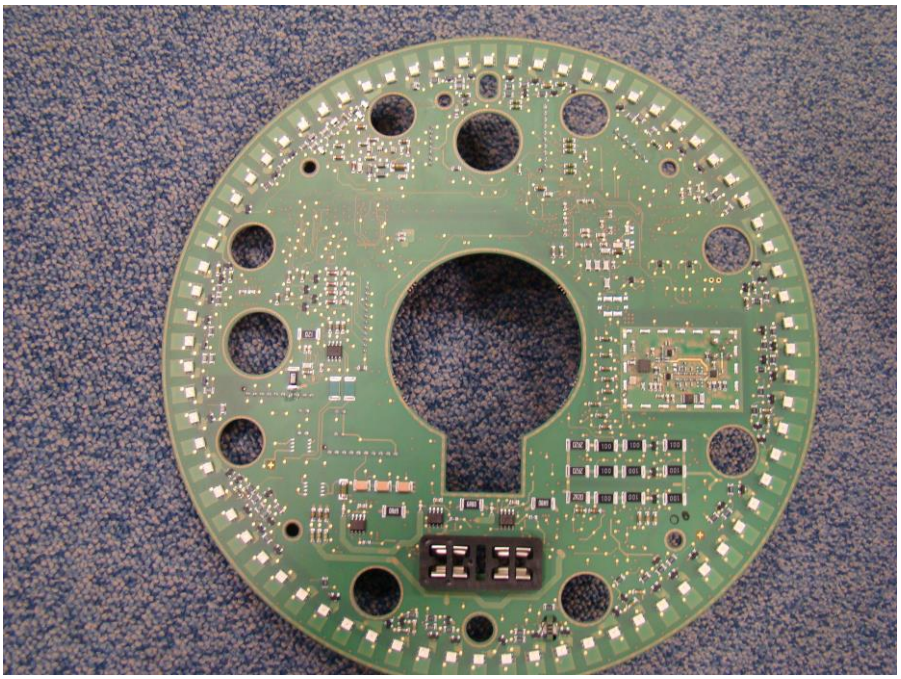
1.1 Photos – Equipment external

EUT Front


EUT Back


1.2 Photos – Equipment internal

EUT PCB Front


EUT PCB Back


1.3 Photos – Test setup

Test Setup : Radiated Emissions


Test Setup : Conducted Emissions


1.4 Supporting Equipment Used During Testing

Product Type*	Device	Manufacturer	Model No.	Comments
None				

1.5 Operating Modes

Mode #	Description
1	Charging mode

1.6 Test Equipment Used During Testing

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
LPD-Antenna	R&S	HL 025	EF00327	2013-02	2016-02
EMI Test Receiver	R&S	ESU8	EF00379	2014-03	2015-03
EMI Test Receiver	R&S	ESCS30	EF00295	2013-10	2014-10

Conducted emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
AMN	R&S	ESH2-Z5	EF00182	2012-10	2014-10
AMN	R&S	ESH3-Z5	EF00036	2012-11	2014-11
EMI Test Receiver	R&S	ESCS 30	EF00295	2013-10	2014-10

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 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 RSS-Gen				
Product Specific Standard	**Requirement – Test**	**Reference Method**	**Result**	**Remarks**
47 CFR 15.109 RSS-Gen 4.9 & 4.10	Radiated emissions	ANSI C 63.4	PASS	-
47 CFR 15.107 RSS-Gen 7.2.4	AC power line conducted emissions	ANSI C63.4	PASS	-
Remarks:				

3 Test Conditions and Results

3.1 Test Conditions and Results – Radiated emissions

Radiated emissions acc. FCC 47 CFR 15.109 / IC RSS-Gen		**Verdict: PASS**
Laboratory Parameters:	Required prior to the test	During the test
Ambient Temperature	15 to 35 °C	24°C
Relative Humidity	30 to 60 %	40
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	
	500 MHz - 1000 MHz (up to 5 GHz)	
Fully configured sample scanned over the following frequency range	Frequency range	
	30 MHz to 5 GHz	
Operating mode	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:

Spurious emissions under normal conditions according to FCC Part 15b

Project number: G0M-1407-3996

Manufacturer:	Dräger Safety AG & Co. KGaA
EUT Name:	Portable Alarm Amplifier
Model:	AAC 00xx
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 25°C, Unom: 120VAC
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3m
Mode:	charging mode
Test Date:	2014-07-22
Note:	

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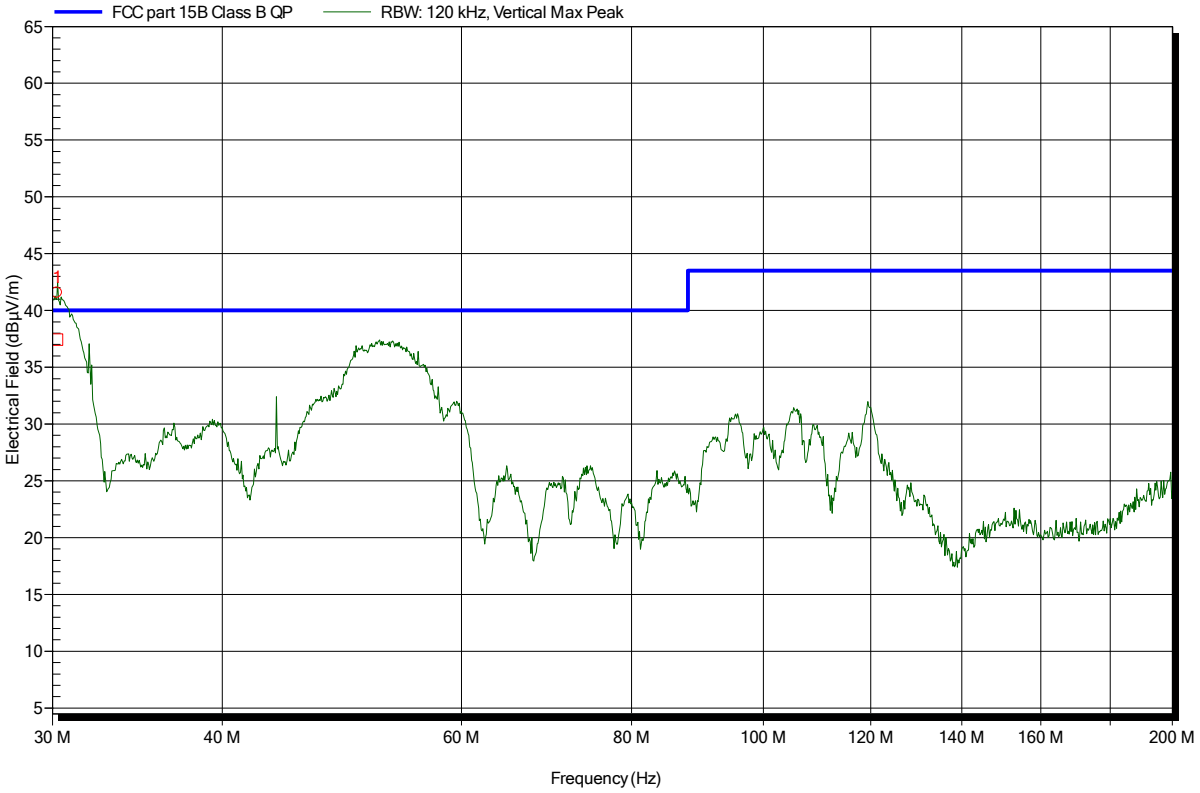

Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
30.24 MHz	37.42 dBµV/m	40 dBµV/m	-2.58 dB	Pass

Spurious emissions under normal conditions according to FCC Part 15b

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Operator:	Mr. Zunke
Test Conditions:	Tnom: 25°C, Unom: 120VAC
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3m
Mode:	charging mode
Test Date:	2014-07-22
Note:	

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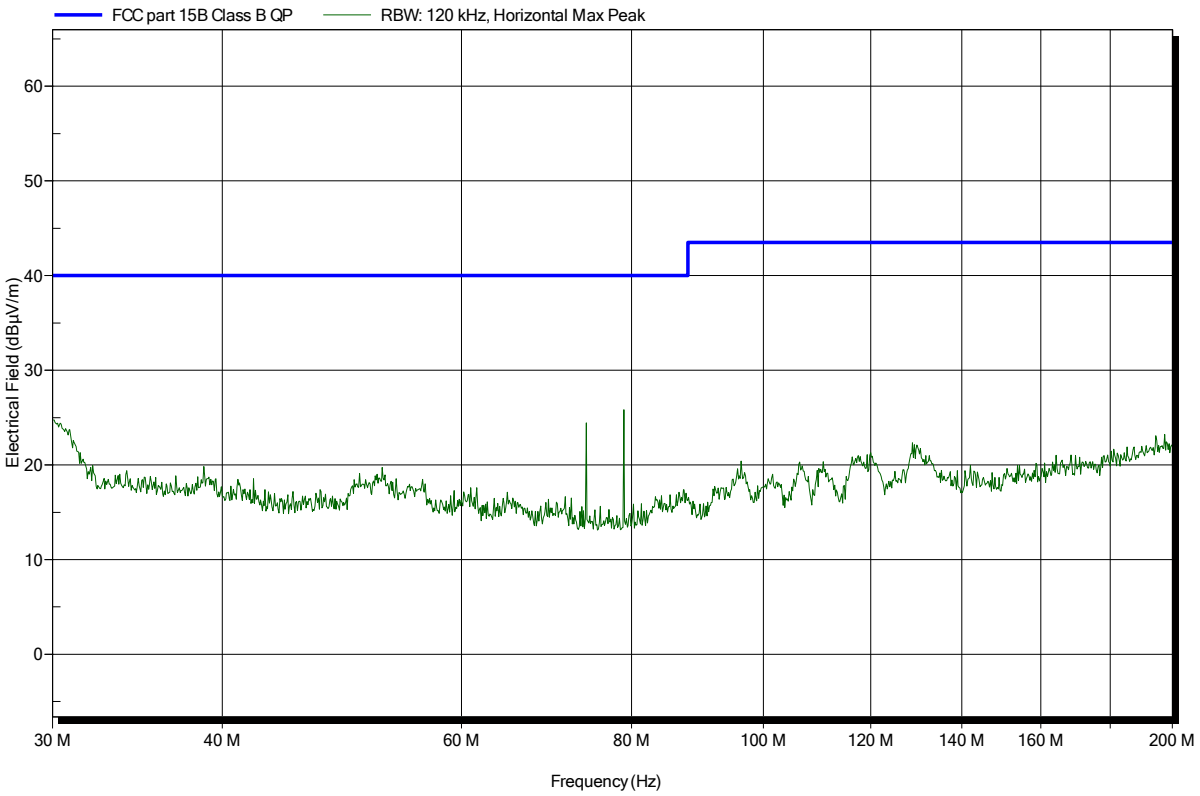

Spurious emissions under normal conditions according to FCC Part 15b

Project number: G0M-1407-3996

Manufacturer:	Dräger Safety AG & Co. KGaA
EUT Name:	Portable Alarm Amplifier
Model:	AAC 00xx
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 25°C, Unom: 120VAC
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3m
Mode:	charging mode
Test Date:	2014-07-22
Note:	

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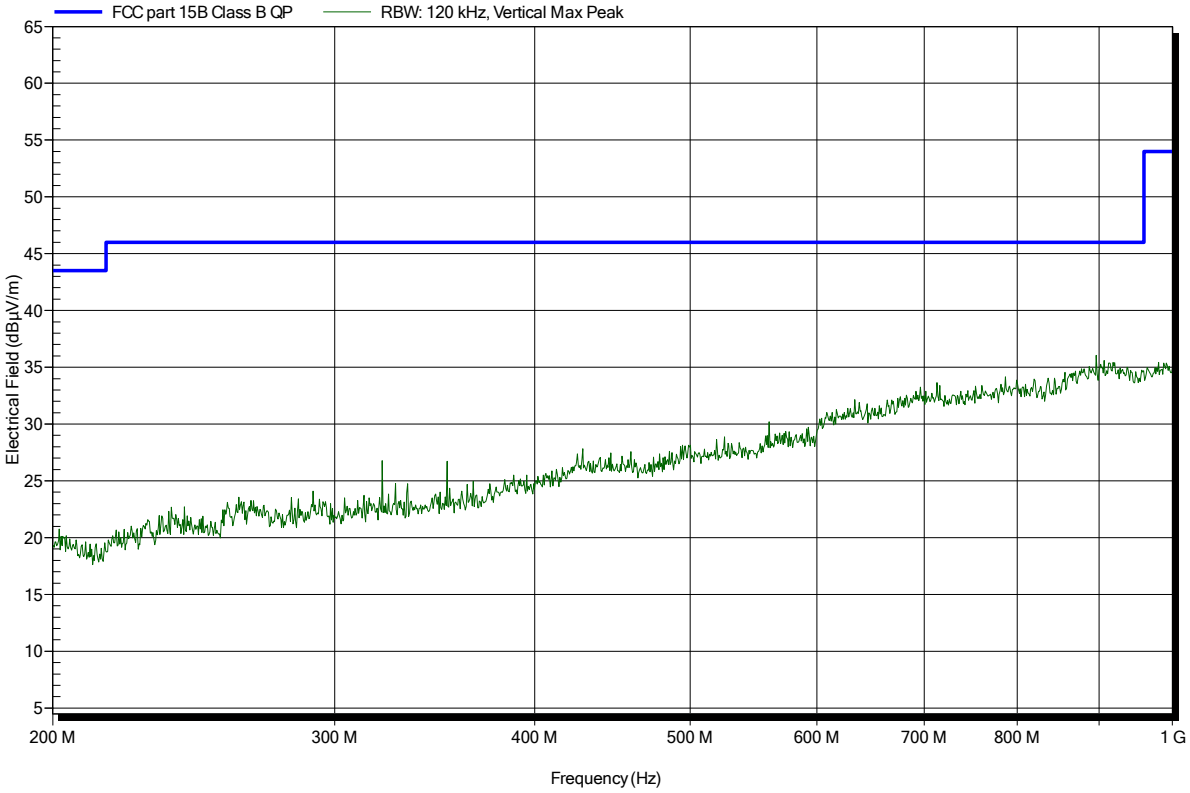

Spurious emissions under normal conditions according to FCC Part 15b

Project number: G0M-1407-3996

Manufacturer:	Dräger Safety AG & Co. KGaA
EUT Name:	Portable Alarm Amplifier
Model:	AAC 00xx
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 25°C, Unom: 120VAC
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3m
Mode:	charging mode
Test Date:	2014-07-22
Note:	

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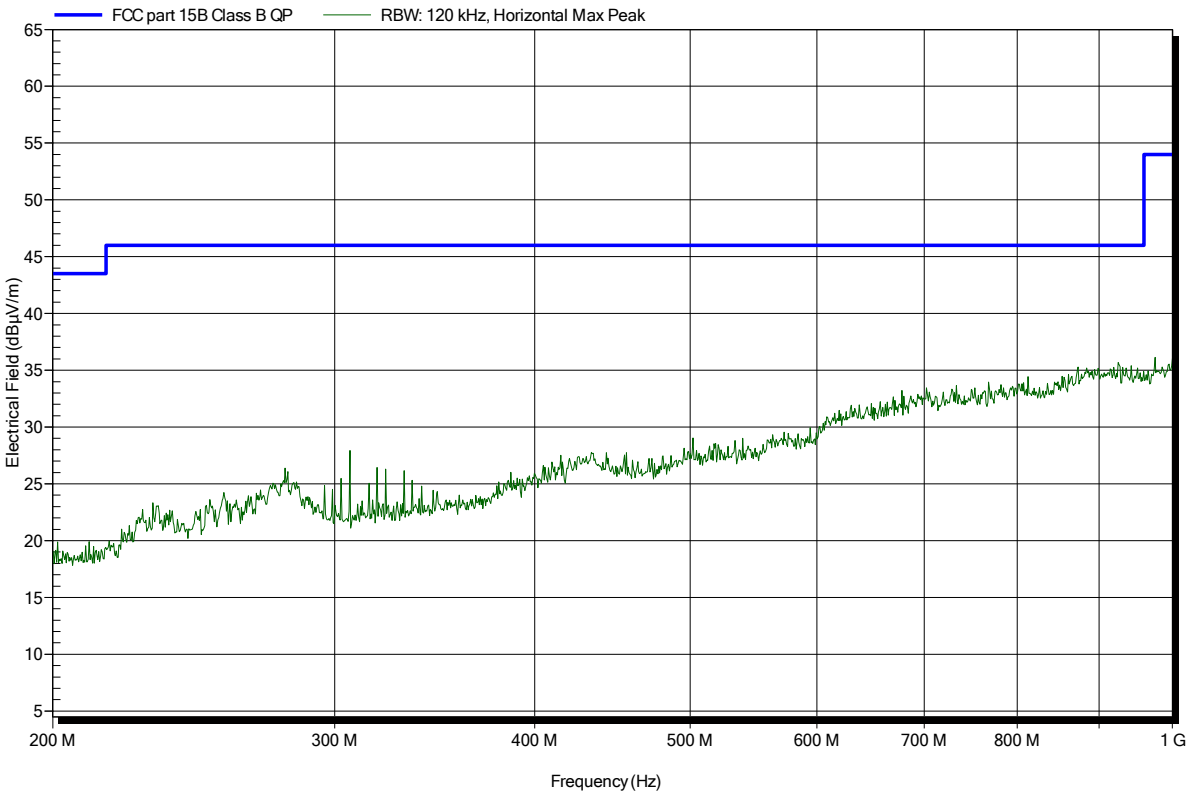

Spurious emissions under normal conditions according to FCC Part 15b

Project number: G0M-1407-3996

Manufacturer:	Dräger Safety AG & Co. KGaA
EUT Name:	Portable Alarm Amplifier
Model:	AAC 00xx
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 25°C, Unom: 120VAC
Antenna:	Rohde & Schwarz HL 025, Vertical
Measurement distance:	3m
Mode:	charging mode
Test Date:	2014-07-22
Note:	

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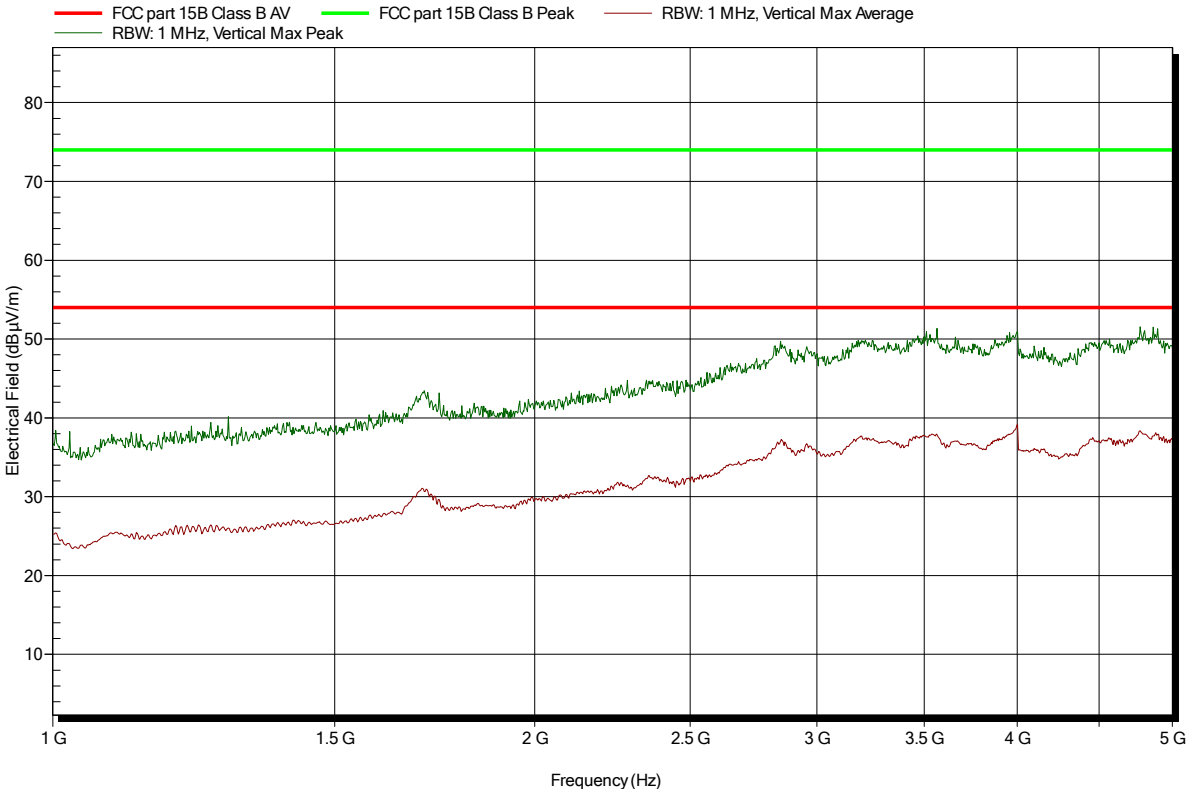

Spurious emissions under normal conditions according to FCC Part 15b

Project number: G0M-1407-3996

Manufacturer:	Dräger Safety AG & Co. KGaA
EUT Name:	Portable Alarm Amplifier
Model:	AAC 00xx
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 25°C, Unom: 120VAC
Antenna:	Rohde & Schwarz HL 025, Horizontal
Measurement distance:	3m
Mode:	charging mode
Test Date:	2014-07-22
Note:	

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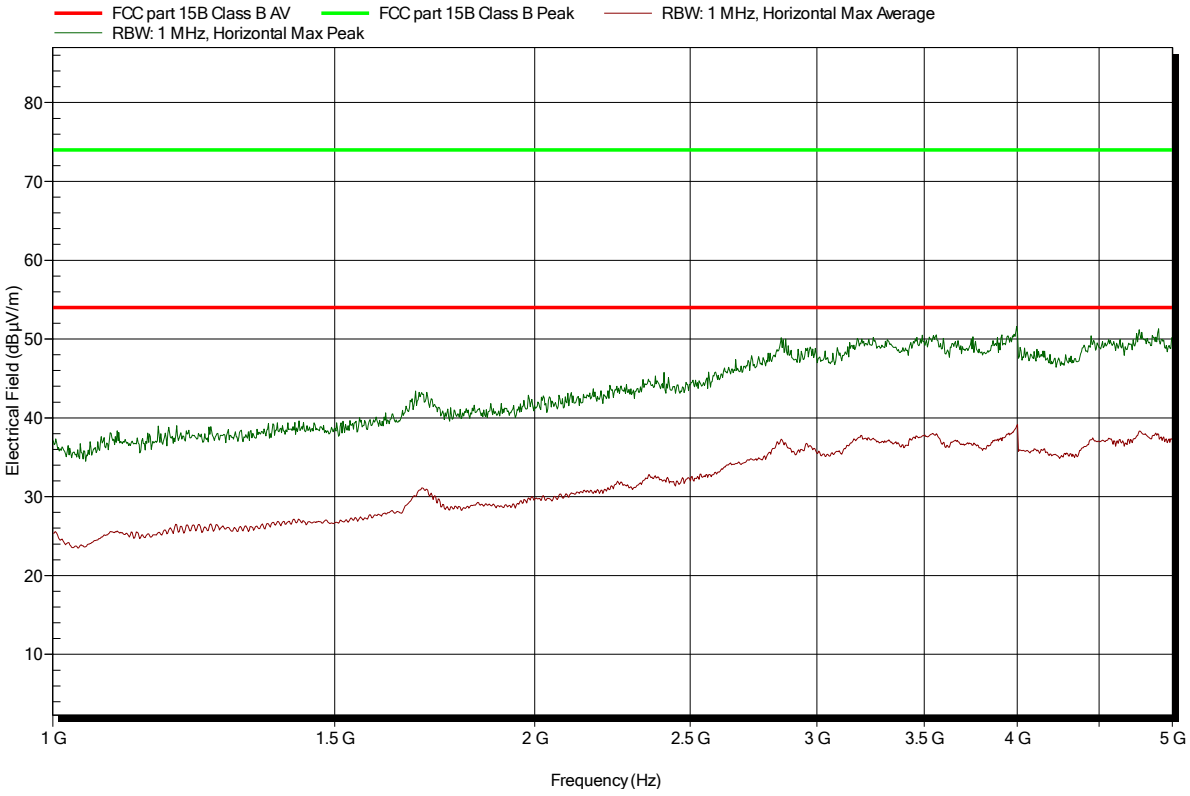


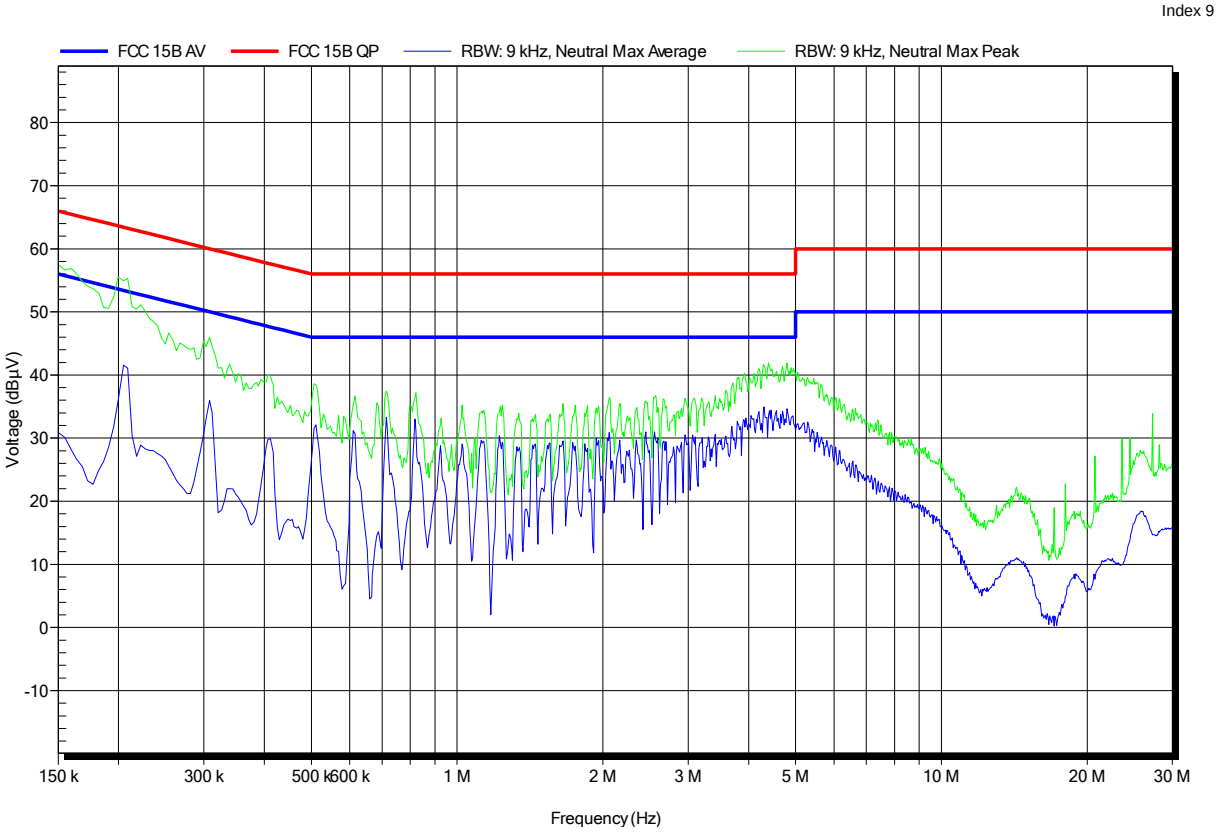
3.2 Test Conditions and Results – AC power line conducted emissions

Conducted emissions acc. FCC 47 CFR 15.107 / IC RSS-Gen				**Verdict: PASS**
Laboratory Parameters:	Required prior to the test	During the test		
Ambient Temperature	15 to 35 °C	24°C		
Relative Humidity	30 to 60 %	40%		
Test according referenced standards	Reference Method			
	ANSI C63.4			
Fully configured sample scanned over the following frequency range	Frequency range			
	0.15 MHz to 30 MHz			
Sample is tested with respect to the requirements of the equipment class	Equipment class			
	Class B			
Points of Application	Application Interface			
AC Mains	LISN			
Operating mode	1			
Limits and results Class B				
Frequency [MHz]	Quasi-Peak [dBµV]	Result	Average [dBµV]	Result
0.15 to 5	66 to 56*	PASS	56 to 46*	PASS
0.5 to 5	56	PASS	46	PASS
5 to 30	60	PASS	50	PASS
Comments: * Limit decreases linearly with the logarithm of the frequency.				

EMI voltage test in the ac-mains according to FCC Part 15b

Project number: G0M-1407-3996

Manufacturer:	Dräger Safety AG & Co. KGaA
EUT Name:	Portable Alarm Amplifier
Model:	AAC 00xx
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 25°C, Unom: 120VAC
LISN:	ESH2-Z5 N
Mode:	charging mode
Test Date:	2014-07-22
Note:	



EMI voltage test in the ac-mains according to FCC Part 15b

Project number: G0M-1407-3996

Manufacturer:	Dräger Safety AG & Co. KGaA
EUT Name:	Portable Alarm Amplifier
Model:	AAC 00xx
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 25°C, Unom: 120VAC
LISN:	ESH2-Z5 L
Mode:	charging mode
Test Date:	2014-07-22
Note:	

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