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EMC TEST REPORT

FCC 47 CFR Part 15B
Industry Canada RSS-Gen

Electromagnetic compatibility - Unintentional radiators

Report Reference No. ..... :	G0M-1503-4568-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 ..... :	ELDAT GmbH
Address ..... :	Im Gewerbepark 14 15711 Königs Wusterhausen 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	Handsender, 916MHz, FSK
Model No.	RT44
Additional Models	None
Hardware version	None
Firmware / Software version	None
	FCC-ID: RZZNZ80248 IC: N/A
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 .....: 2015-03-03

Date (s) of performance of tests .....: 2015-03-25

Compiled by..... : Yu Yu

Tested by (+ signature)..... : Yu Yu .....

Approved by (+ signature)
(Deputy Head of Lab) ..... : Jens Marquardt .....

Date of issue..... : 2016-04-22

Total number of pages..... : 21

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	2015-03-26	Initial Release	
V02	2016-04-22	FCC ID added.	Yu Yu

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

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1 Equipment (Test item) Description

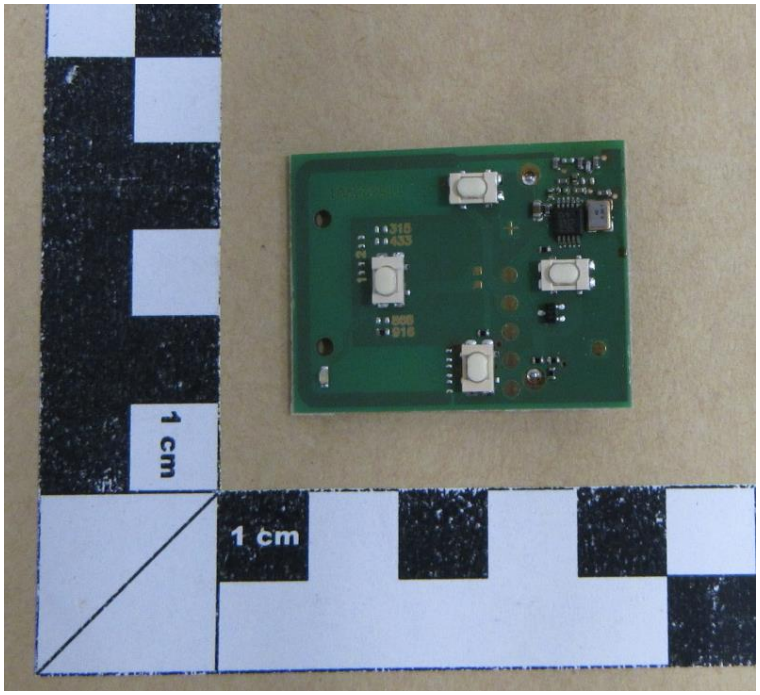
Description	Handsender, 916MHz, FSK	
Model	RT44	
Additional Models	None	
Serial number	None	
Hardware version	None	
Software / Firmware version	None	
FCC-ID	RZZNZ80248	
IC	N/A	
Power supply	3 VDC via non rechargeable Battery	
Radio module	Type	SRD Module
	Model	Integrated in RT44
	Manufacturer	ELDAT
Manufacturer	ELDAT GmbH Im Gewerbepark 14 15711 Königs Wusterhausen GERMANY	
Highest emission frequency	Fmax [MHz] = 916.5 MHz	
Device classification	Class B	
Equipment type	Tabletop	
Number of tested samples	1	

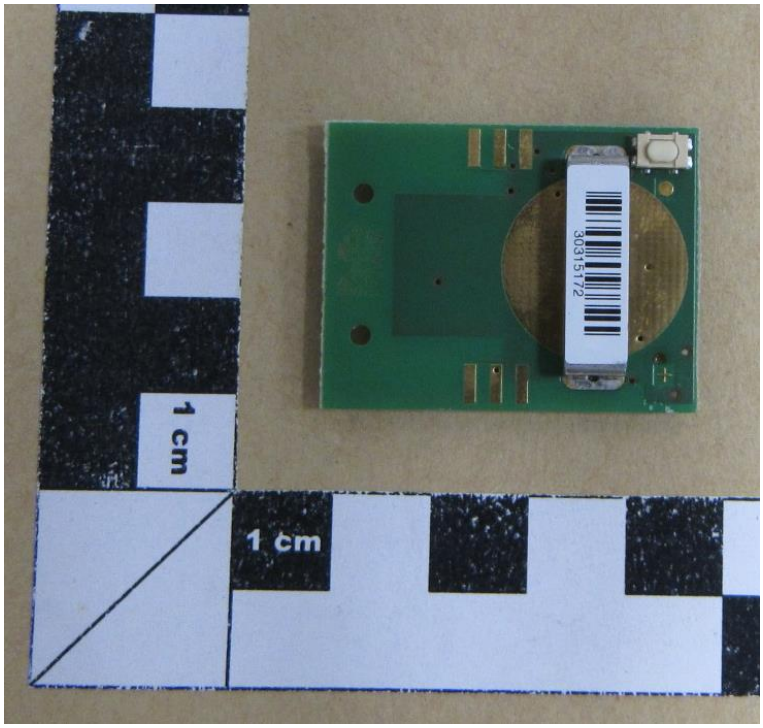
1.1 Photos – Equipment external

EUT Front

EUT Back

1.2 Photos – Equipment internal

EUT PCB Front


EUT PCB Back


1.3 Photos – Test setup

Test Setup : Radiated Emissions

1.5 Input / Output Ports

No Ports available.

1.6 Operating Modes and Configurations

Mode #	Description
1	Constant TX

Configuration #	EUT Configuration
1	Fully assembled EUT.

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 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	N/A	Powered via non rechargeable
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	23°C
Relative Humidity	30 to 60 %	31%
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] = 916.5 MHz	
Fully configured sample scanned over the following frequency range	Frequency range	
	30 MHz to 5 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-1503-4568

Manufacturer:	ELDAT GmbH
EUT Name:	Handsender, 916 MHz, FSK
Model:	RT44
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 3VDC via Battery
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3m
Mode:	constant TX
Test Date:	2015-03-25
Note:	

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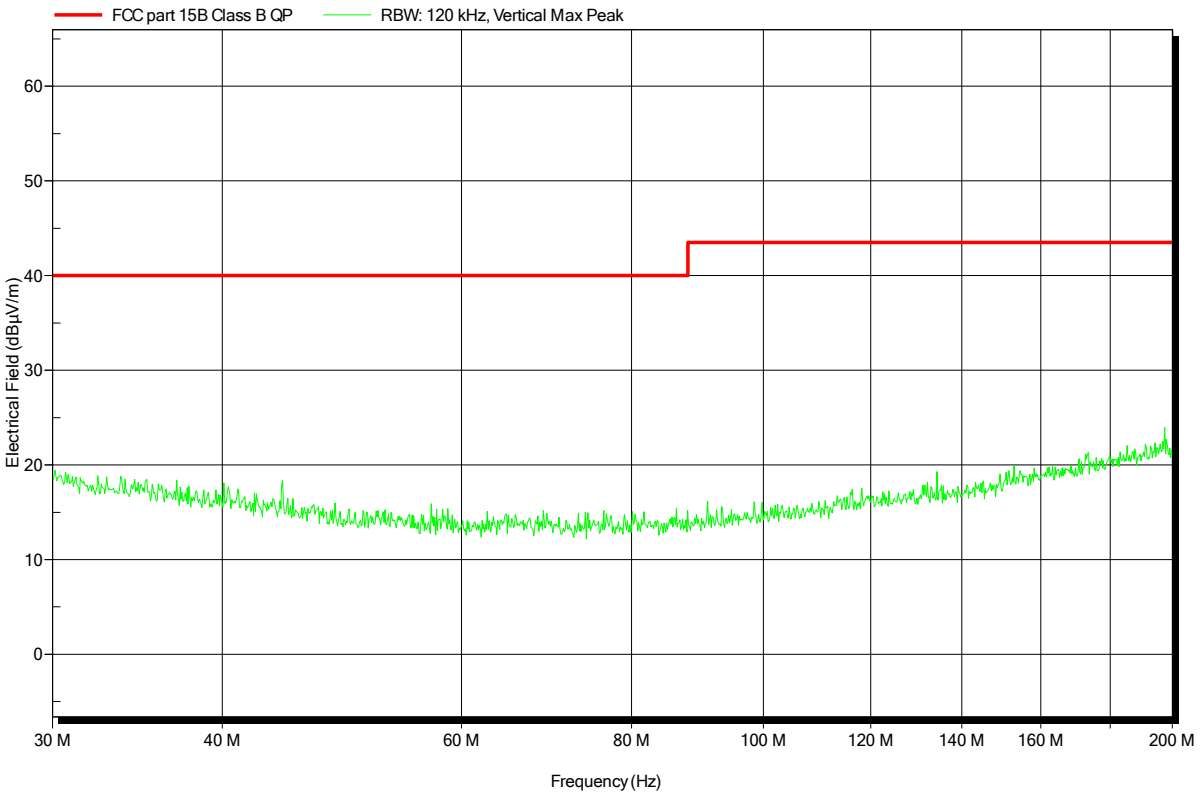

Spurious emissions under normal conditions according to FCC Part 15b

Project number: G0M-1503-4568

Manufacturer:	ELDAT GmbH
EUT Name:	Handsender, 916 MHz, FSK
Model:	RT44
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 3VDC via Battery
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3m
Mode:	constant TX
Test Date:	2015-03-25
Note:	

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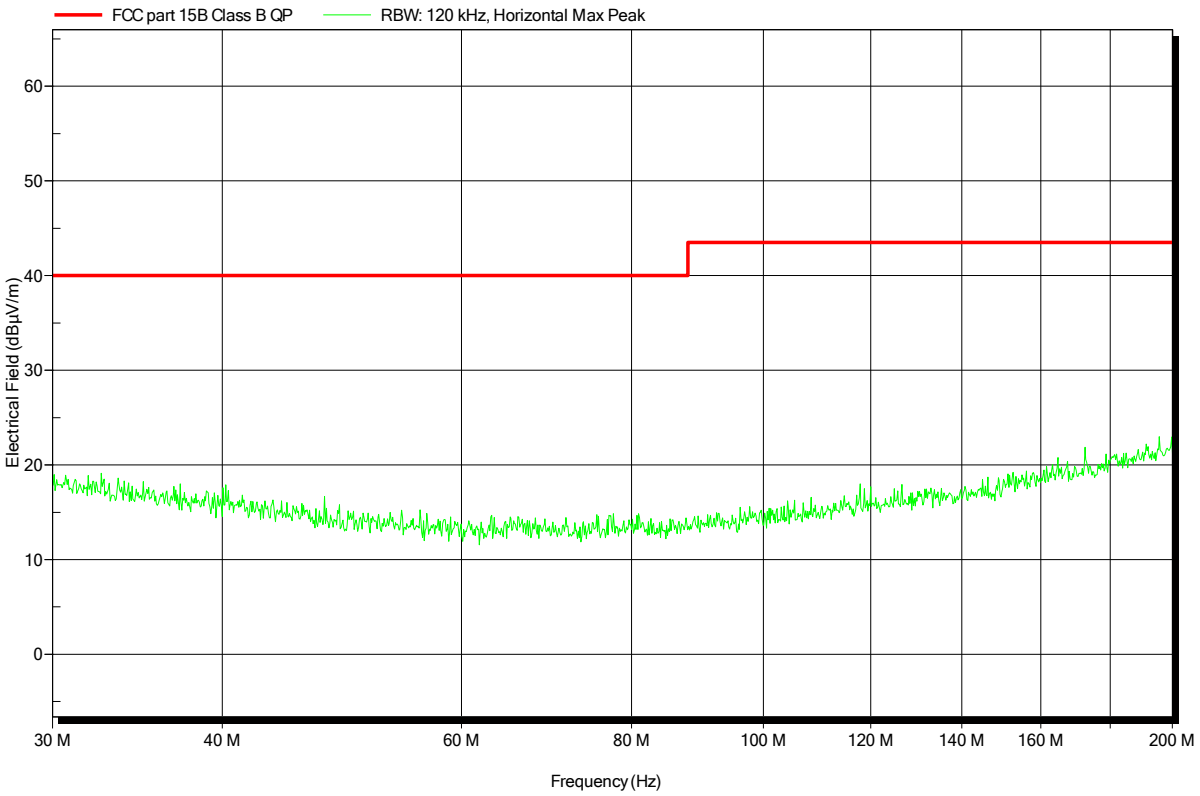
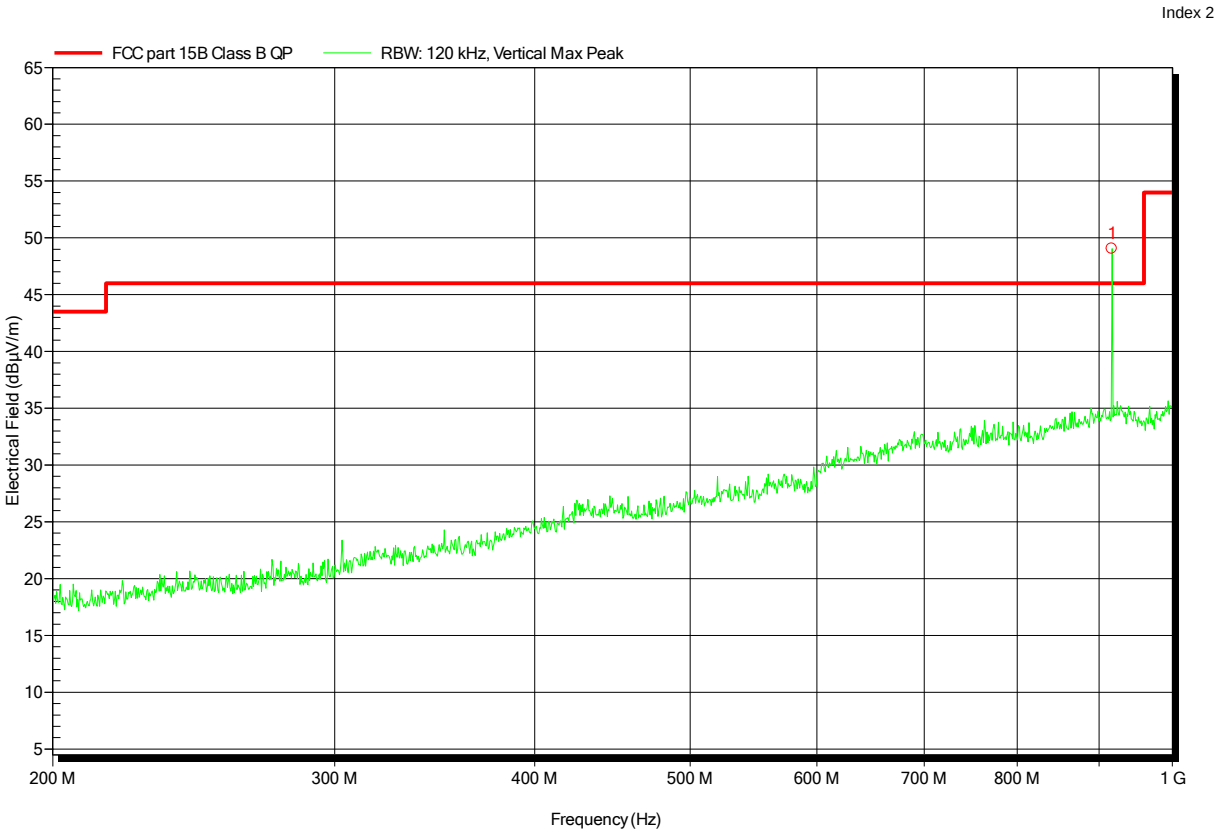


Spurious emissions under normal conditions according to FCC Part 15b

Project number: G0M-1503-4568

Manufacturer:	ELDAT GmbH
EUT Name:	Handsender, 916 MHz, FSK
Model:	RT44
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 3VDC via Battery
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3m
Mode:	constant TX
Test Date:	2015-03-25
Note:	

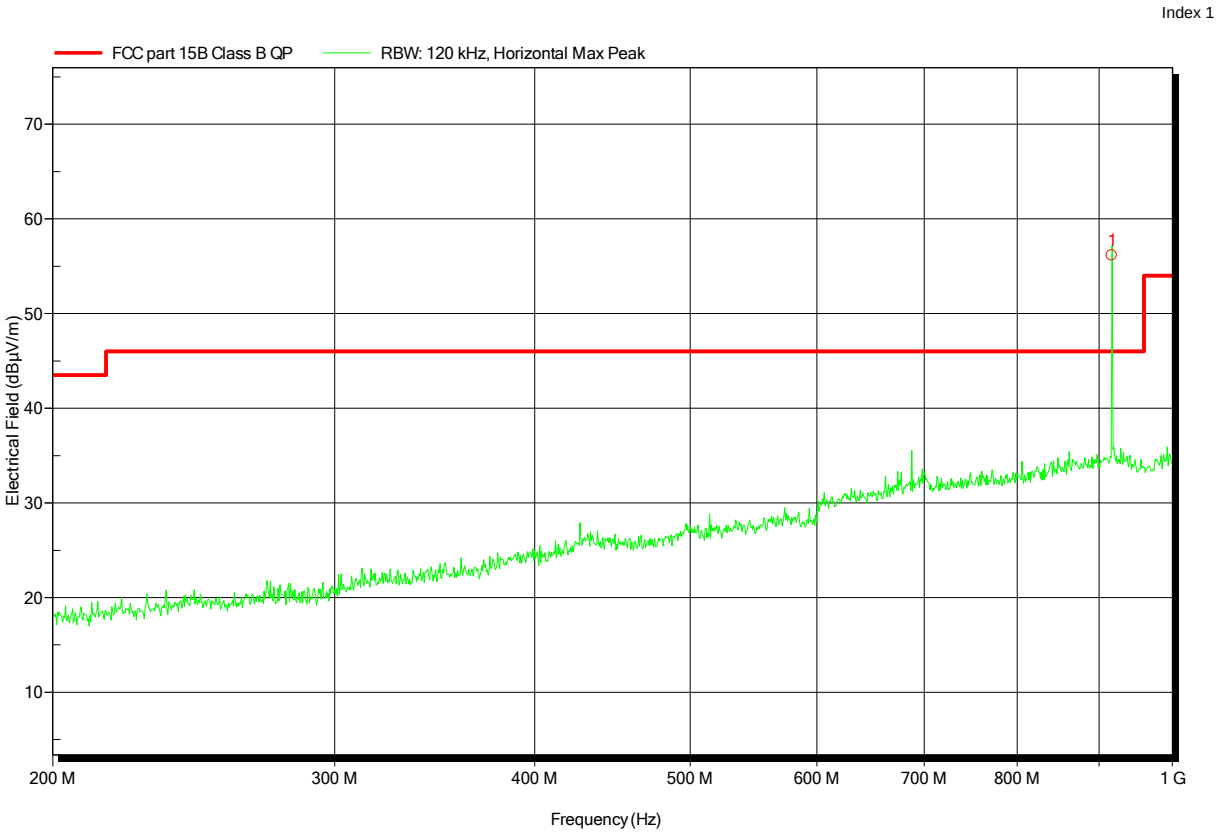


Frequency
916.52 MHz SRD Carrier

Spurious emissions under normal conditions according to FCC Part 15b

Project number: G0M-1503-4568

Manufacturer:	ELDAT GmbH
EUT Name:	Handsender, 916 MHz, FSK
Model:	RT44
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 3VDC via Battery
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3m
Mode:	constant TX
Test Date:	2015-03-25
Note:	



Frequency
916.5 MHz SRD Carrier

Spurious emissions under normal conditions according to FCC Part 15b

Project number: G0M-1503-4568

Manufacturer:	ELDAT GmbH
EUT Name:	Handsender, 916 MHz, FSK
Model:	RT44
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 3VDC via Battery
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3m
Mode:	constant TX
Test Date:	2015-03-25
Note:	

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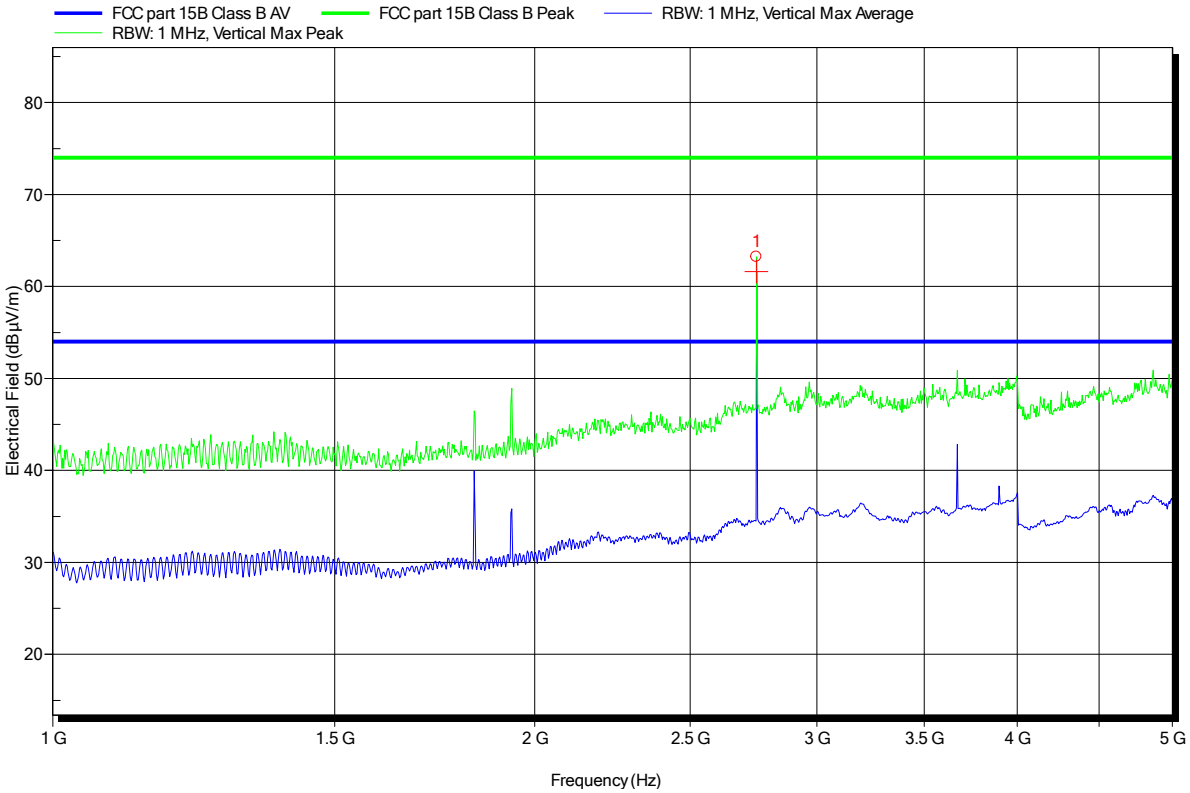

Frequency
2.75 GHz SRD Harmonics

Spurious emissions under normal conditions according to FCC Part 15b

Project number: G0M-1503-4568

Manufacturer:	ELDAT GmbH
EUT Name:	Handsender, 916 MHz, FSK
Model:	RT44
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Zunke
Test Conditions:	Tnom: 23°C, Unom: 3VDC via Battery
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3m
Mode:	constant TX
Test Date:	2015-03-25
Note:	

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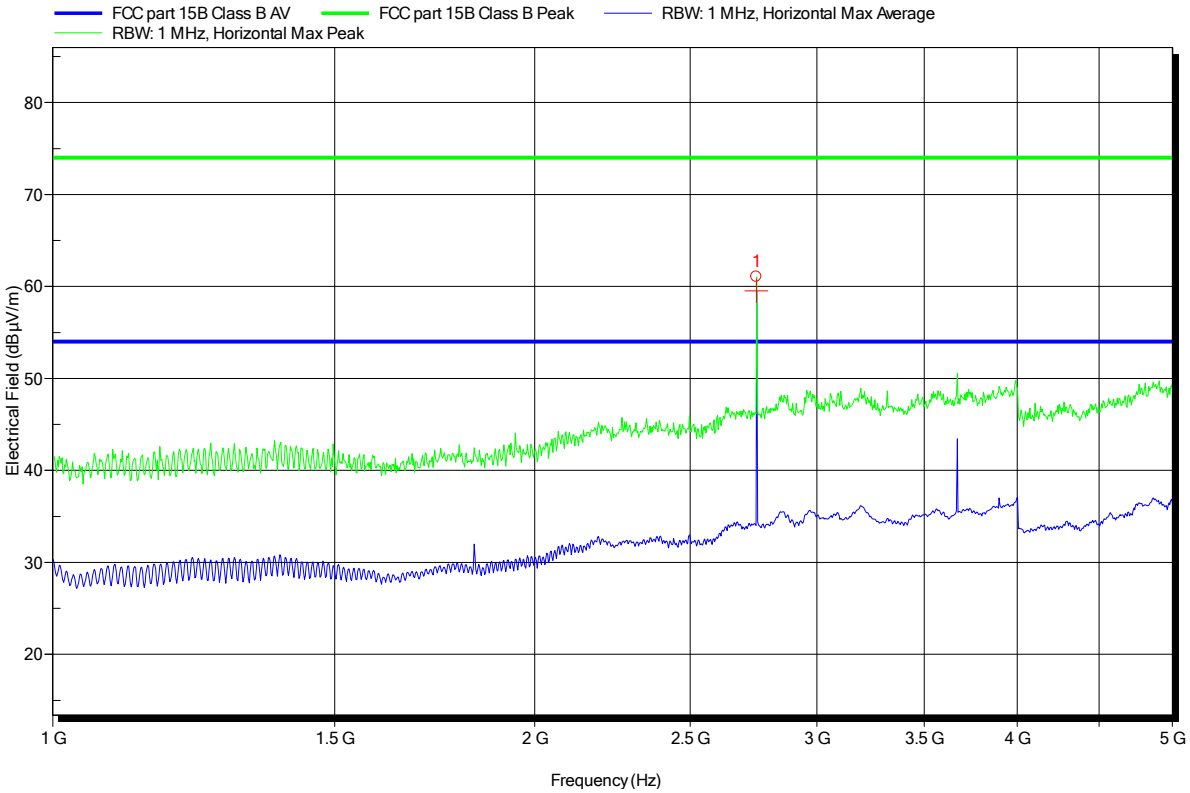

Frequency
2.75 GHz SRD Harmonics