

EMC TEST REPORT

FCC 47 CFR Part 15B
Industry Canada ICES-003

Electromagnetic compatibility - Unintentional radiators

Report Reference No. : G0M-1508-5001-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 : Spectralink Europe ApS

Address : Langmarksvej 34
8700 Horsens
DENMARK

Test specification:

Standard..... : 47 CFR Part 15 Subpart B
ICES-003, Issue 5:2012
ANSI C63.4:2014

Equipment under test (EUT):

Product description	DECT Handset 7522	
Model No.	K022b	
Additional Models	None	
Hardware version	PCS 07	
Firmware / Software version	PCS 14BA	
IDs	FCC-ID: PXA-K022B	IC: 4604A-K022B
Test result	Passed	

Test Report No.: G0M-1508-5001-EF0115B-V01

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

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 : 2015-09-04

Date (s) of performance of tests : 2015-09-04

Compiled by : Marcus Klein

Tested by (+ signature)..... : Marcus Klein

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

Date of issue : 2015-09-28

Total number of pages : 23



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	2015-09-28	Initial Release	

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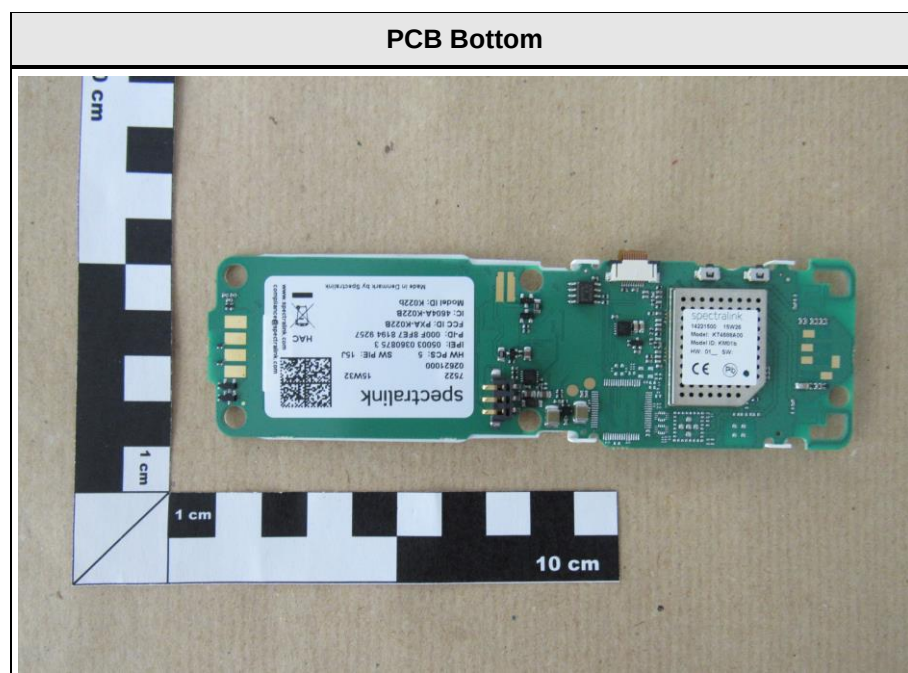
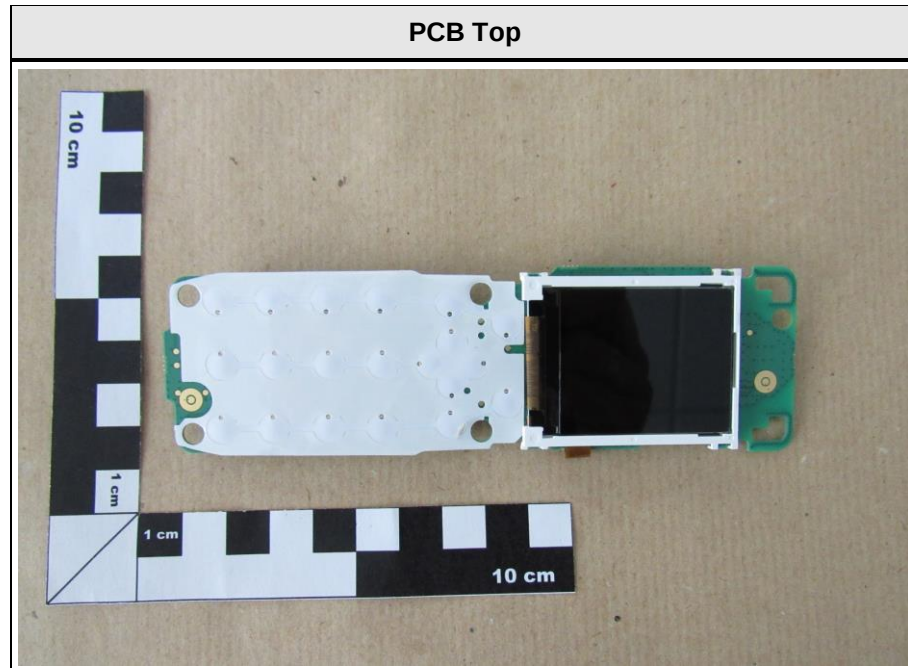
1 Equipment (Test item) Description

Description	DECT Handset 7522	
Model	K022b	
Additional Models	None	
Serial number	None	
Hardware version	PCS 07	
Software / Firmware version	PCS 14BA	
FCC-ID	PXA-K022B	
IC-ID	4604A-K022B	
Power supply	3.7 VDC via rechargeable Battery	
AC/DC-Adaptor	Model : UE08WCP-060100SPA Manufacturer : Fuhua Input : 100-240VAC / 50-60Hz Output : 6VDC / 1.0A	
Radio module	Type	DECT module
	Model	KT4588A00
	Manufacturer	Spectralink
	HW Version	PCS 04
	SW Version	PCS 14A
	FCC-ID	-
	IC	-
Manufacturer	Spectralink Europe ApS Langmarksvej 34 8700 Horsens DENMARK	
Highest emission frequency	Fmax [MHz] = 20.736	
Device classification	Class B	
Equipment type	Tabletop	
Number of tested samples	1	

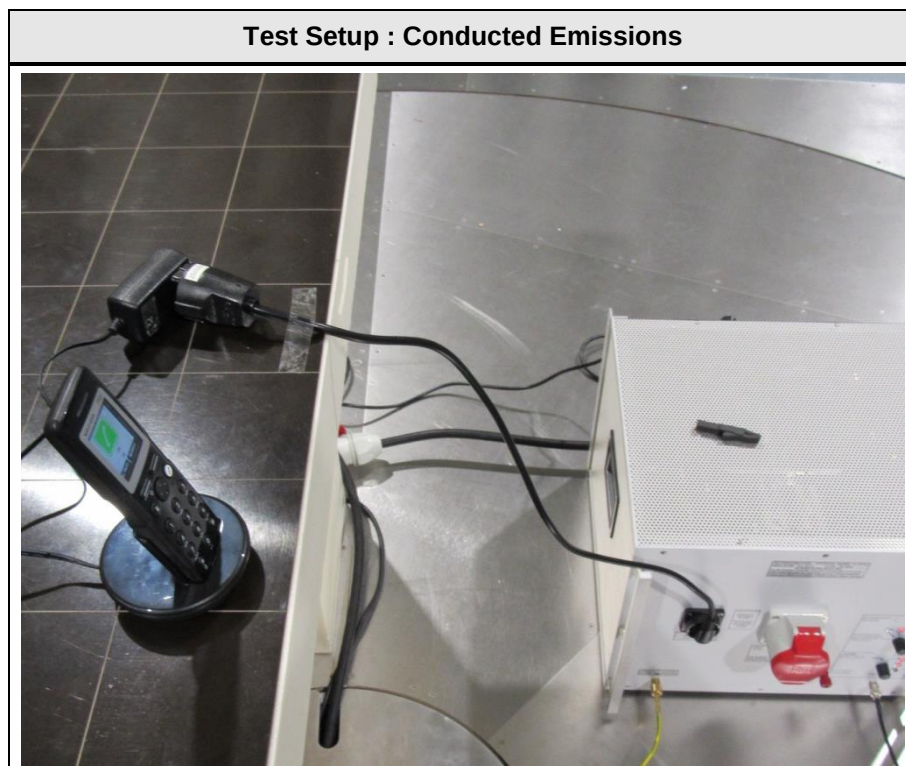
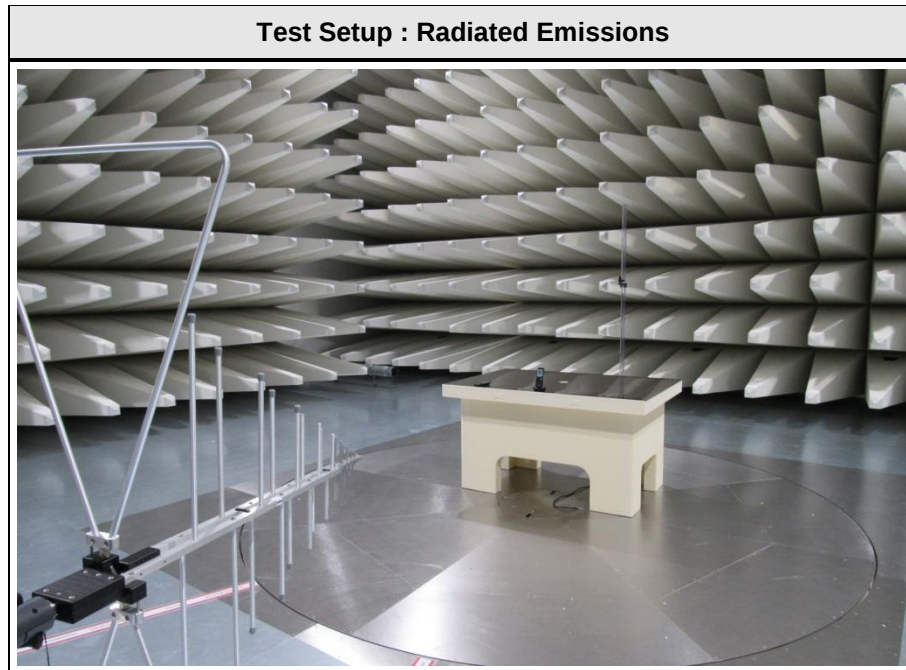
1.1 Photos – Equipment external



1.2 Photos – Equipment internal



1.3 Photos – Test setup



1.4 Supporting Equipment Used During Testing

Product Type*	Device	Manufacturer	Model No.	Comments
AE	Handset companion	Spectralink	K022b	
AE	IP-DECT Server 400	Spectralink	K005	
EUT	Charger, single, USB	Spectralink	8462473	
EUT	AC/DC Adapter	Fuhua	UE08WCP-060100SPA	

***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
1	AC Mains	AC	>3m	No	

***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	DECT link to companion device, charging via AC/DC Adapter
2	DECT link to companion device, battery powered

Configuration #	EUT Configuration
1	Normal configuration, using DECT antenna 1, DECT test mode

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
TRILOG Broadband Antenna	Schwarzbeck	VULB 9162	EF00978	2014-12	2015-12
Double-Ridged Guide Antenna	ETS-Lindgren	3117	EF00976	2015-01	2016-01
EMI Test Receiver	Keysight	MY51210111	EF01070	2015-08	2016-08

Conducted emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
LISN	Schwarzbeck	NSLK 8128	EF00975	2014-12	2015-12
EMI Test Receiver	Keysight	MY51210111	EF01070	2015-08	2016-08
Pulse Limiter	R&S	ESH3-Z2	EF01063	2015-05	2016-05

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:

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

Net:

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

Limit:

This is the FCC Class B radiated emission limit (in units of 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:

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

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 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	PASS	
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		23°C		
Relative Humidity		30 to 60 %		41%		
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] = 20.736				
Fully configured sample scanned over the following frequency range		Frequency range				
		30 MHz to 1 GHz				
Operating mode		1 / 2				
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:

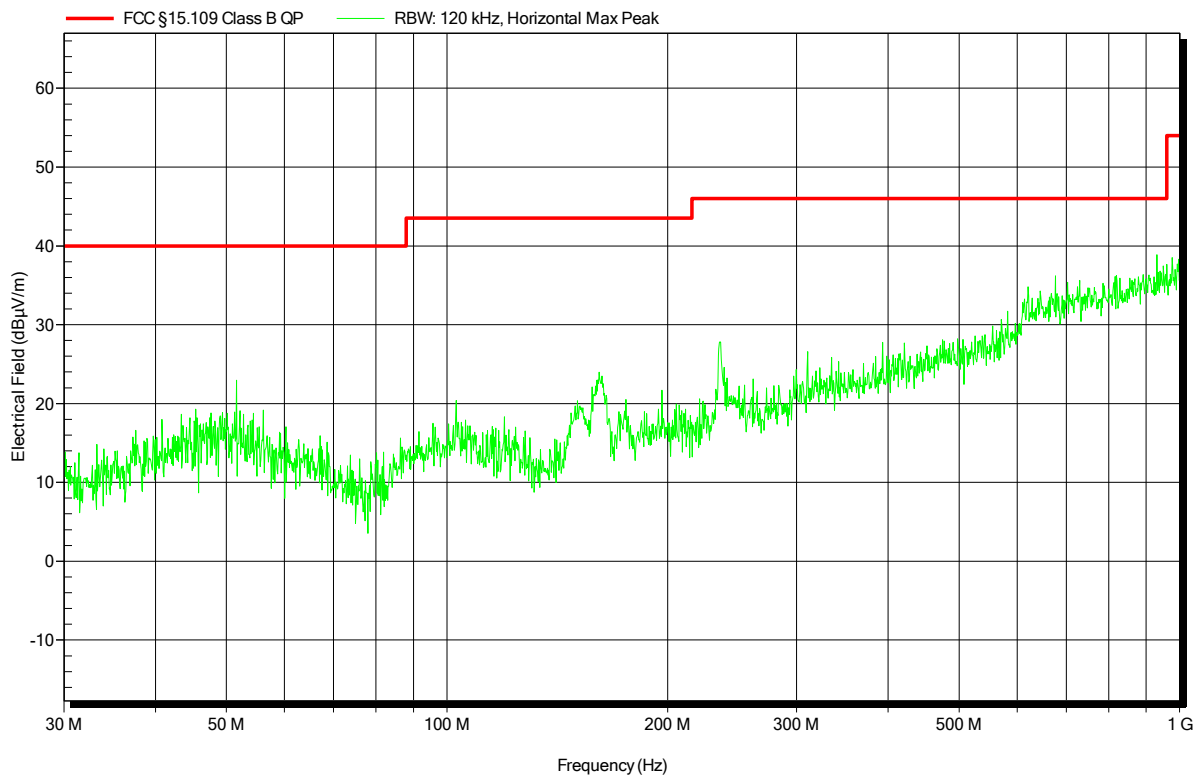
- 1) The EUT was placed on a 0.8 m non conductive table at a 3 m distance from the receive antenna (ANSI C63.4: 2009 item 6.2)
- 2) The antenna output was connected to the measurement receiver
- 3) A biconical antenna was used for the frequency range 30 – 200 MHz, a logarithmic periodical antenna was 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 15B

Project number: G0M-1508-5001

Applicant:	Spectralink Europe ApS
EUT Name:	DECT handset 7522
Model:	K022b
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Klein
Test Conditions:	Tnom: 23°C, Unom: 120 VAC
Antenna:	VULB 9162, Horizontal
Measurement distance:	3m
Mode:	link to base / companion device, charging
Test Date:	2015-09-04
Note:	

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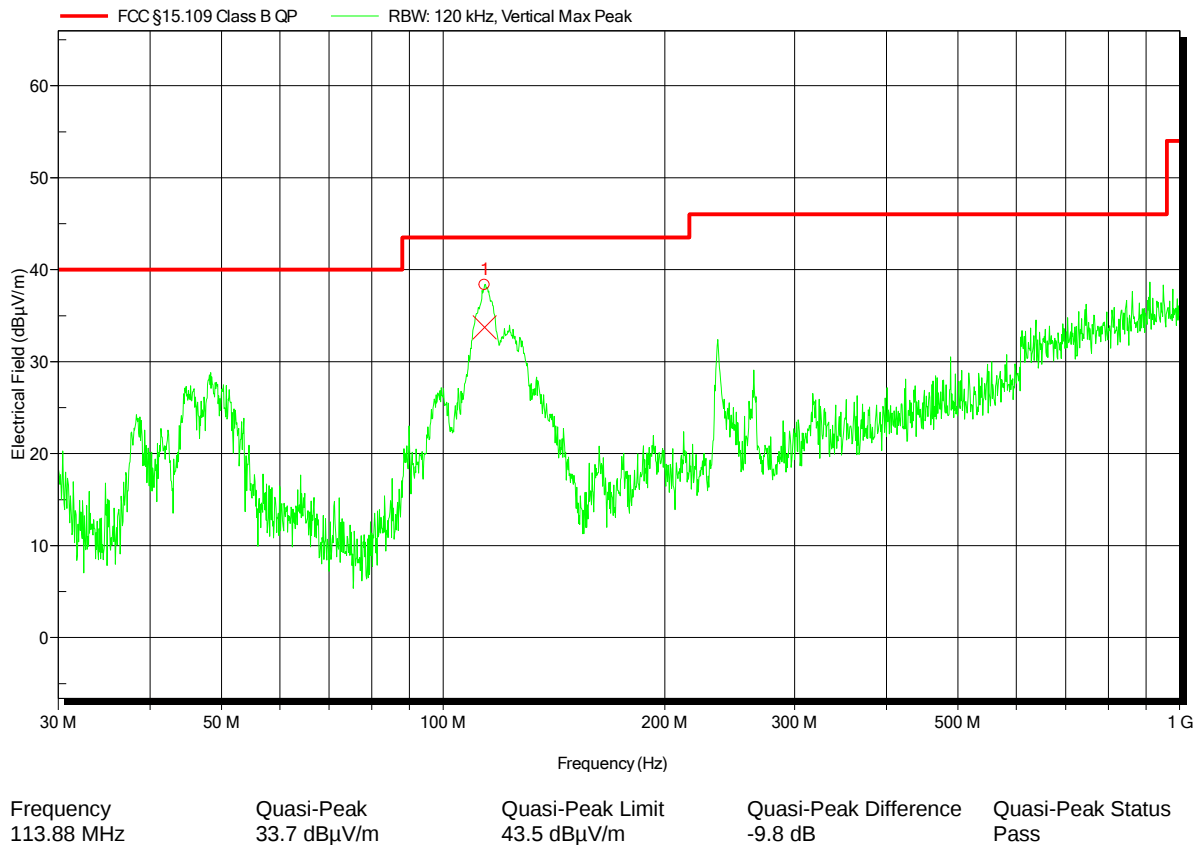


Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1508-5001

Applicant: Spectralink Europe ApS
 EUT Name: DECT handset 7522
 Model: K022b
 Test Site: Eurofins Product Service GmbH
 Operator: Mr. Klein
 Test Conditions: Tnom: 23°C, Unom: 120 VAC
 Antenna: VULB 9162, Vertical
 Measurement distance: 3m
 Mode: link to base / companion device, charging
 Test Date: 2015-09-04
 Note:

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Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1508-5001

Applicant:	Spectralink Europe ApS
EUT Name:	DECT handset 7522
Model:	K022b
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Klein
Test Conditions:	Tnom: 23°C, Unom: Battery
Antenna:	VULB 9162, Horizontal
Measurement distance:	3m
Mode:	link to base / companion device
Test Date:	2015-09-04
Note:	

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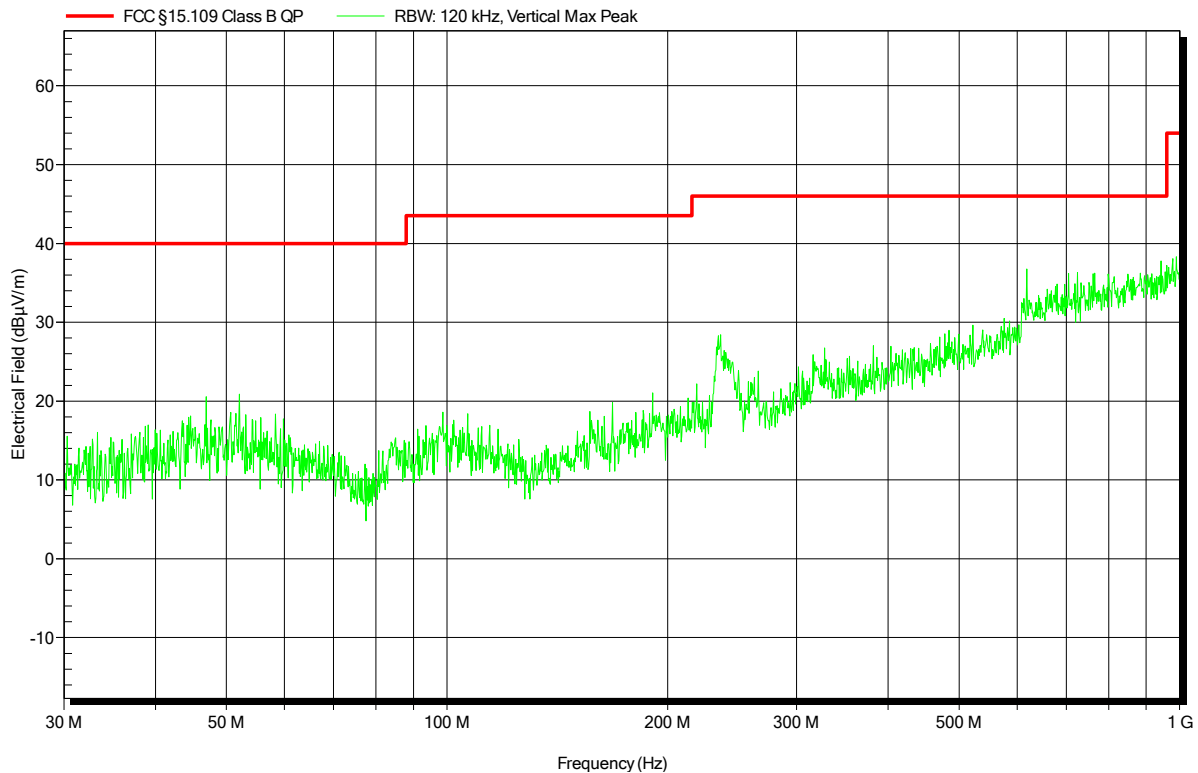


Spurious emissions under normal conditions according to FCC 15B

Project number: G0M-1508-5001

Applicant:	Spectralink Europe ApS
EUT Name:	DECT handset 7522
Model:	K022b
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Klein
Test Conditions:	Tnom: 23°C, Unom: Battery
Antenna:	VULB 9162, Vertical
Measurement distance:	3m
Mode:	link to base / companion device
Test Date:	2015-09-04
Note:	

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3.2 Test Conditions and Results – AC power line conducted emissions

Conducted emissions acc. FCC 47 CFR 15.107 / ICES-003			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 %		41%
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		
Configuration		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.				

Test Procedure:

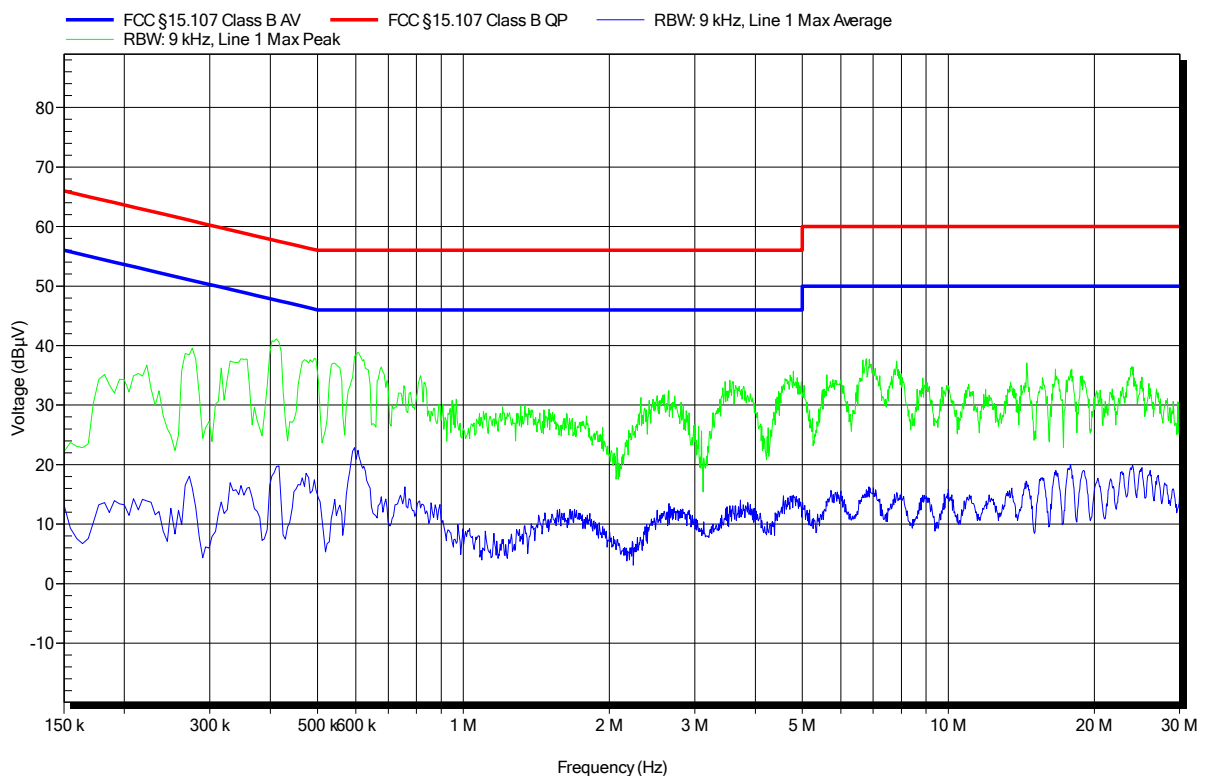
- 1) The EUT was placed on a non conductive table 0.8 m above the reference ground plane and 0.4 m away from the vertical conducting plane (ANSI C63.4: 2009 item 7.3.1)
- 2) The power cord that is normally supplied or recommended by the manufacturer was connected to the LISN.
- 3) The distance between 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).
- 4) The LISN measurement port was connected to a measurement receiver
- 5) I/O cables were bundled not longer than 0.4 m
- 6) Measurement was performed in the frequency range 0.15 – 30MHz on each current-carrying conductor

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

Project number: G0M-1508-5001

Applicant:	Spectralink Europe ApS
EUT Name:	DECT handset 7522
Model:	K022b
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Klein
Test Conditions:	Tnom: 23°C, Unom: 120 VAC
LISN:	Schwarzbeck NSLK 8128
Mode:	link to base / companion device, charging
Test Date:	2015-09-04
Note:	

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

Project number: G0M-1508-5001

Applicant:	Spectralink Europe ApS
EUT Name:	DECT handset 7522
Model:	K022b
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Klein
Test Conditions:	Tnom: 23°C, Unom: 120 VAC
LISN:	Schwarzbeck NSLK 8128
Mode:	link to base / companion device, charging
Test Date:	2015-09-04
Note:	

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