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FCC TEST REPORT

FCC 47 CFR Part 15C
Industry Canada RSS-210

Digital transmission systems operating within the 902 – 928 MHz band

Report Reference No. ..... :	G0M-1305-2845-TFC247D-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 ..... :	Multi Teknik Odense ApS
Address ..... :	Rosenvej 3 5250 Odense Denmark
Test specification:	
Standard..... :	47 CFR Part 15C KDB Publication No. 558074 RSS-210, Issue 8, 2010-12 RSS-Gen, Issue 3, 2010-12 ANSI C63.4:2009
Equipment under test (EUT):	
Product description	SRD
Model No.	Quick Pager System MP-D
Hardware version	GPE 1307
Firmware / Software version	Pagerpanel_Repeater_FW_915
	FCC-ID: 2AAFOHG915 IC: N/A
Test result	**Passed**

Possible test case verdicts:	
- neither assessed nor tested ..... :	N/N
- required by standard but not appl. to test object..... :	N/A
- required by standard but not tested..... :	N/T
- not required by standard for the test object ..... :	N/R
- test object does meet the requirement..... :	P (Pass)
- test object does not meet the requirement..... :	F (Fail)

Testing:

Date of receipt of test item ..... :	2013-05-21	
Date (s) of performance of tests ..... :	2013-05-21 – 2013-05-22	
Compiled by ..... :	Antje Bartusch	
Tested by (+ signature)..... : (Testing Manager)	Wilfried Treffke	.....
Approved by (+ signature) ..... : (Test Lab Manager)	Christian Weber	.....
Date of issue ..... :	2013-06-27	
Total number of pages ..... :	55	

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
01	2013-06-27	Initial Release	

REPORT INDEX

1 Equipment (Test item) Description

Description	SRD	
Model	Quick Pager System MP-D	
Serial number	None	
Hardware version	GPE 1307	
Software / Firmware version	Pagerpanel_Repeater_FW_915	
FCC-ID	2AAFOHG915	
IC	N/A	
Equipment type	End product	
Radio type	Transmitter and Receiver (different parts)	
Radio technology	custom	
Operating frequency range	915 MHz	
Assigned frequency band	902 - 928 MHz	
Frequency range	F_{MID}	915 MHz
Spreading	None	
Modulations	2FSK	
Number of channels	1	
Channel spacing	None	
Number of antennas	1	
Antenna	Type	external dedicated
	Model	14193
	Manufacturer	Smarteq Wireless
	Gain	+0.0 dBi
Manufacturer	Multi Teknik Odense ApS Rosenvej 3 5250 Odense Denmark	
Power supply	V_{NOM}	5.0 VDC
	V_{MIN}	4.75 VDC
	V_{MIN}	5.25 VDC
AC/DC-Adaptor	Model	N/A
	Vendor	N/A
	Input	N/A
	Output	N/A

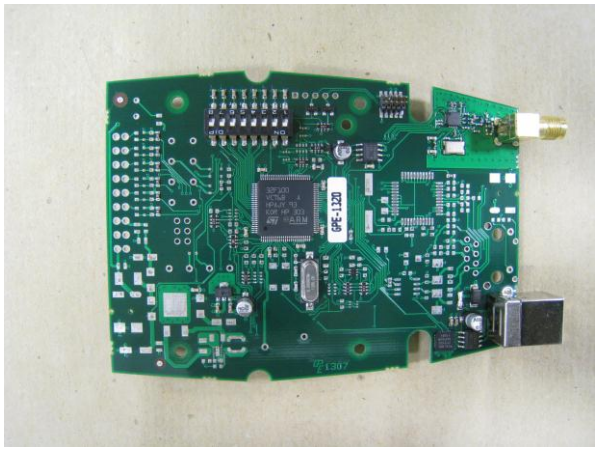
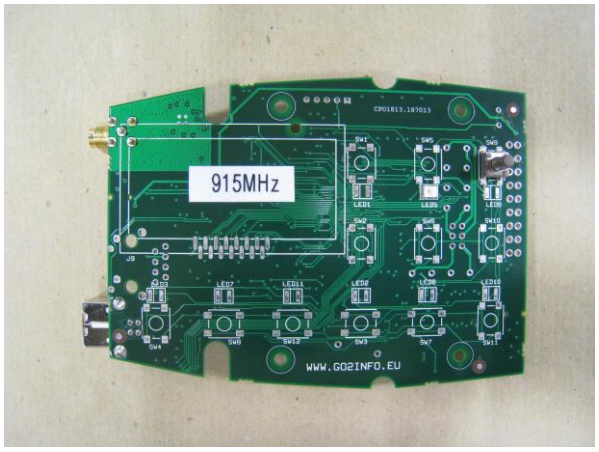
1.1 Photos – Equipment External

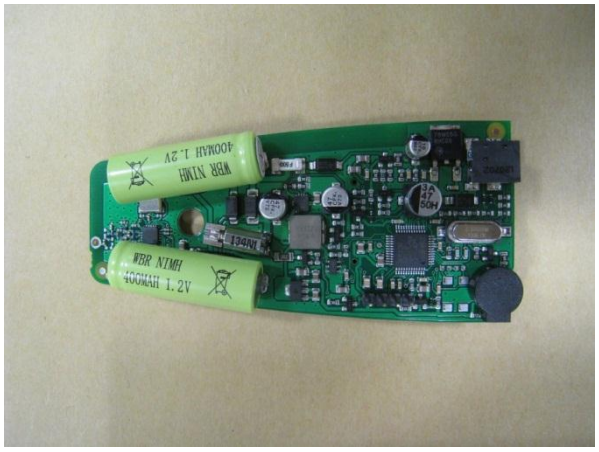
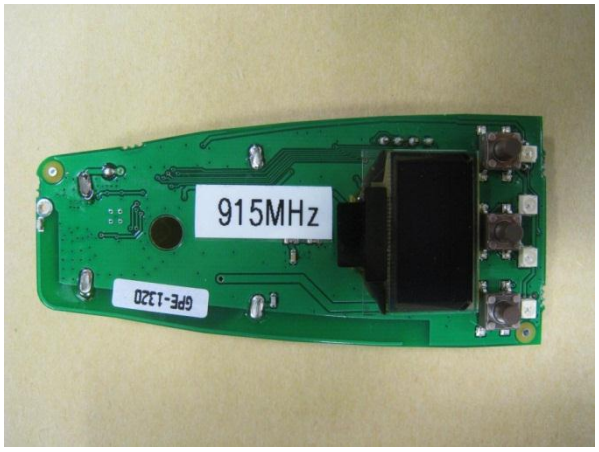
TRANSMITTER EUT TOP	TRANSMITTER EUT TOP WITH EXTERN ANTENNA
	

TRANSMITTER EUT BOTTOM	TRANSMITTER EUT FRONT
	

RECEIVER TOP	RECEIVER BOTTOM
	

1.2 Photos – Equipment internal

TRANSMITTER PCB TOP	TRANSMITTER PCB BOTTOM
	

RECEIVER PCB TOP	RECEIVER PCB BOTTOM
	

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				

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

AE : Auxiliary/Associated Equipment, or

SIM : Simulator (Not Subjected to Test)

CABL : Connecting cables

1.5 Test Modes

Mode #	Description	
Single	General conditions:	EUT powered by laboratory power supply
	Radio conditions:	Mode = standalone transmit Spreading = None Modulation = FSK Duty cycle = 10 % Power level = Maximum
Receive	General conditions:	EUT powered by laboratory power supply
	Radio conditions:	Mode = standalone receive Spreading = None Modulation = FSK
AC-Powerline	General conditions:	EUT powered by laboratory power supply
	Radio conditions:	Mode = standalone transmit Spreading = None Modulation = FSK Duty cycle = 10 % Power level = Maximum

1.6 Test Equipment Used During Testing

Occupied Bandwidth					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2013-01	2014-01

6dB Bandwidth					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2013-01	2014-01

Maximum peak conducted power					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2013-01	2014-01

Power spectral density					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2013-01	2014-01

Band edge compliance					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2013-01	2014-01

Conducted spurious emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Spectrum Analyzer	R&S	FSP 30	EF00312	2013-01	2014-01

Radiated spurious emissions					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Semi-anechoic chamber	Frankonia	AC 5	EF00395	calibration	calibration
Spectrum Analyzer	R&S	FSIQ26	EF00151	2012-12	2013-12
Biconical Antenna	R&S	HK 116	EF00012	2013-02	2016-02
LPD Antenna	R&S	HL 223	EF00187	2011-02	2014-02
LPD Antenna	R&S	HL 025	EF00327	2013-02	2016-02

AC powerline 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	2012-08	2013-08

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 15C, IC RSS-210				
Product Specific Standard Section	**Requirement – Test**	**Reference Method**	**Result**	**Remarks**
RSS-Gen 4.6.1	Occupied Bandwidth	RSS-Gen 4.6.1	N/R	Informational only
FCC § 15.247(a)(2) IC RSS-210 § A8.2	6 dB Bandwidth	KDB Publication No. 558074	PASS	
FCC § 15.247(b)(3) IC RSS-210 § A8.4	Maximum peak conducted power	KDB Publication No. 558074	PASS	
FCC § 15.247(e) IC RSS-210 § A8.2	Power spectral density	KDB Publication No. 558074	PASS	
47 CFR 15.207 RSS-Gen 7.2.4	AC power line conducted emissions	KDB Publication No. 558074 / ANSI C63.4	PASS	
FCC § 15.247(d) IC RSS-210 § A8.5	Band edge compliance	KDB Publication No. 558074	PASS	
FCC § 15.247(d) IC RSS-210 § A8.5	Conducted spurious emissions	KDB Publication No. 558074	PASS	
FCC § 15.247(d) FCC § 15.209 IC RSS-210 A8.5 IC RSS-Gen 4.9 IC RSS-Gen 7.2.5	Transmitter radiated spurious emissions	KDB Publication No. 558074 / ANSI C 63.4	PASS	
IC RSS-Gen 4.10 IC RSS-Gen 6.1	Receiver radiated spurious emissions	ANSI C 63.4	PASS	
Remarks:				

3 Test Conditions and Results

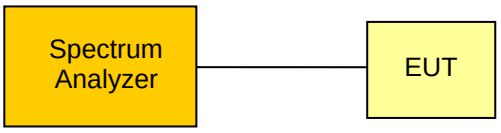
3.1 Test Conditions and Results – Occupied Bandwidth

Occupied Bandwidth acc. IC RSS-Gen	**Verdict: PASS**
Test according to measurement reference	Reference Method
	RSS-Gen 4.6.1
Test frequency range	Tested frequencies
	F_{MID}
EUT test mode	Single

Limits

None (Informational only)

Test setup



Test procedure

1. EUT set to test mode (Communication tester is used if needed)
2. Span set to at least twice the emission spectrum
3. Resolution bandwidth set to 1 % of span
4. Occupied Bandwidth (99 %) measurement with spectrum analyzer built in measurement function

Test results

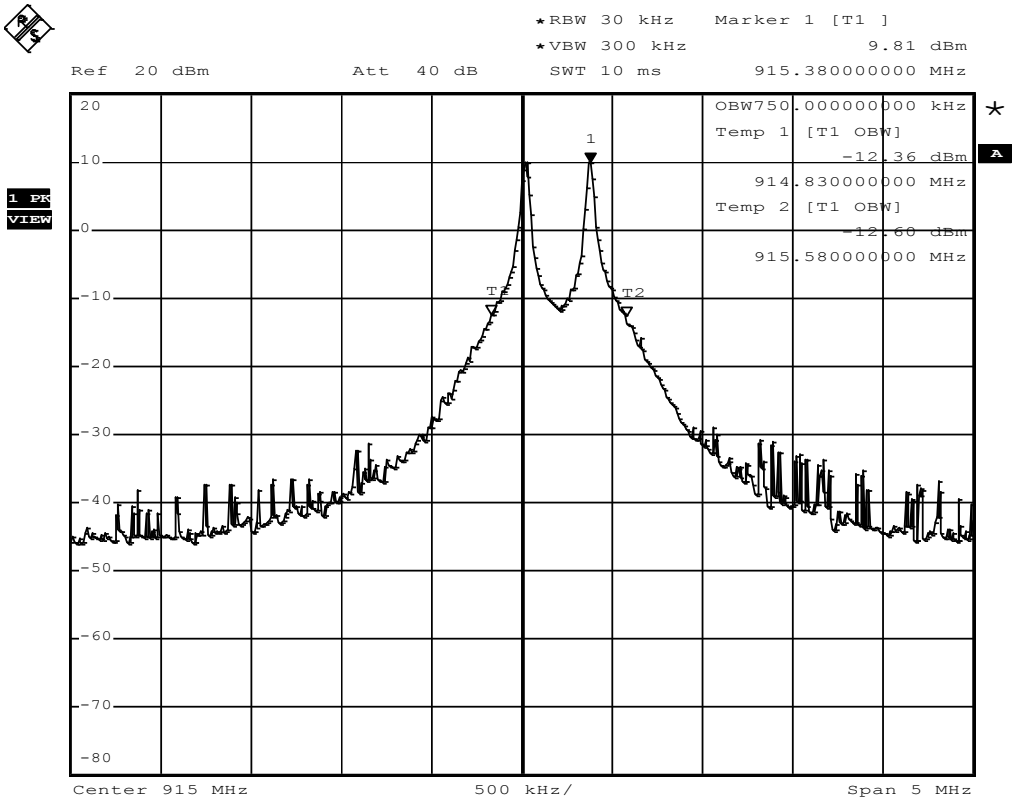
Channel	Frequency [MHz]	Occupied Bandwidth [kHz]
F_{MID}	915	750

Comments:

Occupied Bandwidth - F_{MID}

RSS Gen
Occupied Bandwidth

EUT	SRD
Model	Pager (transmitter) / Quick Pager System MP-D
Approval Holder	Multi Teknik Odense Aps
Temperature / Voltage	Tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	4.4.1 Occupied Bandwidth
Comment 1	Channel.: 915 MHz
Comment 2	A spectrum analyzer with an integrated 99% power bandwidth function is used



Comment: Occupied bandwidth: 750 KHz
Date: 22.MAY.2013 12:50:27

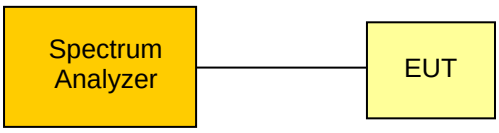
3.2 Test Conditions and Results – 6dB Bandwidth

6dB Bandwidth acc. FCC 15.247 / IC RSS-210	**Verdict: PASS**
EUT requirement rule parts and clause	Reference
	FCC 15.247(a)(2) / IC RSS-210 A8.2
Test according to measurement reference	Reference Method
	FCC KDB Publication No. 558074
Test frequency range	Tested frequencies
	F_{MID}
EUT test mode	Single

Limits

≥ 500 kHz

Test setup



Test procedure

1. EUT set to test mode (Communication tester is used if needed)
2. Span set to at least twice the emission spectrum
3. Detector set to peak and max hold
4. Envelope peak value of emission spectrum is selected
5. Marker on envelope of spectrum is set to level of -6 dB to the left of the peak
6. Marker on envelope of spectrum is set to level of -6 dB to the right of the peak
7. 6dB Bandwidth is determined by marker frequency separation

Test results

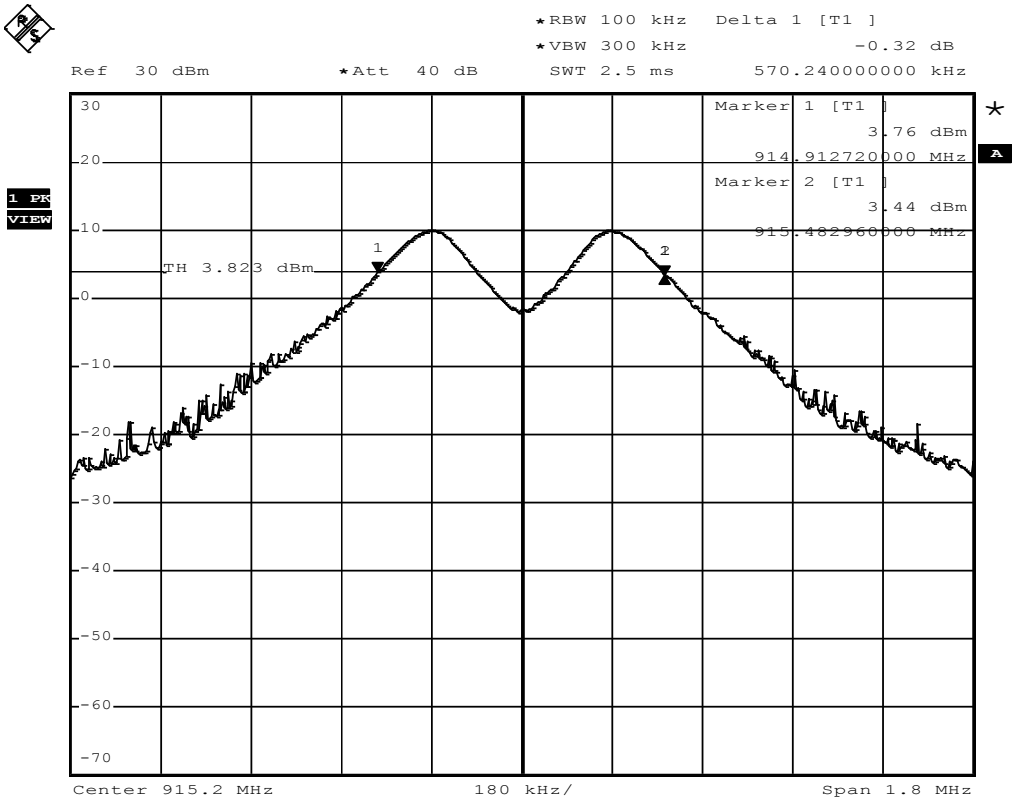
Channel	Frequency [MHz]	6 dB Bandwidth [kHz]	Limit [kHz]	Result
F_{MID}	915	570.24	≥ 500	PASS

Comments:

6dB Bandwidth - F_{MID}

FCC part 15.247 (a)2
Minimum 6 dB Bandwidth

EUT	SRD
Model	Pager (transmitter) / Quick Pager System MP-D
Approval Holder	Multi Teknik Odense Aps
Temperature / Voltage	Tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (a)2
Comment 1	Minimum 6 dB Bandwidth
Comment 2	Channel 915 MHz
Comment 3	procedure 8.1 DTS BW (558074 D01 DTS)



Comment: 6 dB bandwidth: 570.2 KHz > 500 KHz; verdict: PASS
Date: 22.MAY.2013 11:36:13

3.3 Test Conditions and Results – Maximum peak conducted power

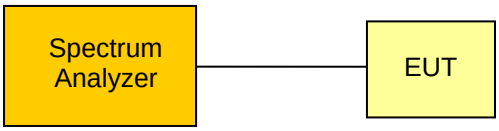
Maximum peak conducted power acc. FCC 15.247 / IC RSS-210	**Verdict: PASS**
EUT requirement rule parts and clause	Reference
	FCC 15.247(b)(3) / IC RSS-210 A8.4
Test according to measurement reference	Reference Method
	FCC KDB Publication No. 558074
Test frequency range	Tested frequencies
	F_{MID}
EUT test mode	Single
Measurement mode	Peak
Maximum antenna gain	0 dBi ⇒ Limit correction = 0 dB

Limits

1W (30dBm)

The conducted output power limit specified above is based on the use of antennas with directional gains that do not exceed 6dBi. If transmitting antennas of directional gain greater than 6dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in the table, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6dBi.

Test setup



Test procedure

1. EUT set to test mode (Communication tester is used if needed)
2. Center frequency set to test channel center frequency
3. Span is set to be larger than the 6 dB bandwidth and RBW is set to be at least the 6 dB bandwidth
4. Peak output power is determined from the maximum of the emission envelope

Test results

Channel	Frequency [MHz]	Voltage	Peak power [dbm]	Peak power [W]	Limit [dBm]	Margin [dB]	Result
F_{MID}	915	5.0 VDC	9.89	0.01	30	-20.11	PASS
F_{MID}	915	4.75 VDC	9.90	0.01	30	-20.10	PASS
F_{MID}	915	5.25 VDC	9.90	0.01	30	-20.10	PASS

Comments:

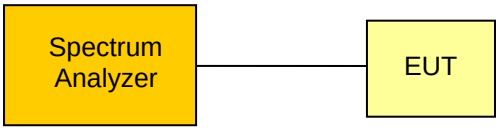
3.4 Test Conditions and Results – Power spectral density

Power spectral density acc. FCC 15.247 / IC RSS-210	**Verdict: PASS**
EUT requirement rule parts and clause	Reference
	FCC 15.247(e) / IC RSS-210 A8.2
Test according to measurement reference	Reference Method
	FCC KDB Publication No. 558074
Test frequency range	Tested frequencies
	F_{MID}
EUT test mode	Single
Measurement mode	Peak

Limits

8 dBm / 3 kHz

Test setup



Test procedure

1. EUT set to test mode (Communication tester is used if needed)
2. Center frequency set to test channel center frequency
3. Span is set large enough to capture maximum emissions in passband, RBW is set to 3 kHz
4. Peak power density is determined from peak emission of envelope

Test results

Channel	Frequency [MHz]	Voltage	Peak frequency [MHz]	Peak power density [dBm]	Limit [dBm/3kHz]	Margin [dB]	Result
F_{MID}	915	5.0 VDC	915.02	-5.44	8.0	-13.44	PASS

Comments:

3.5 Test Conditions and Results – AC power line conducted emissions

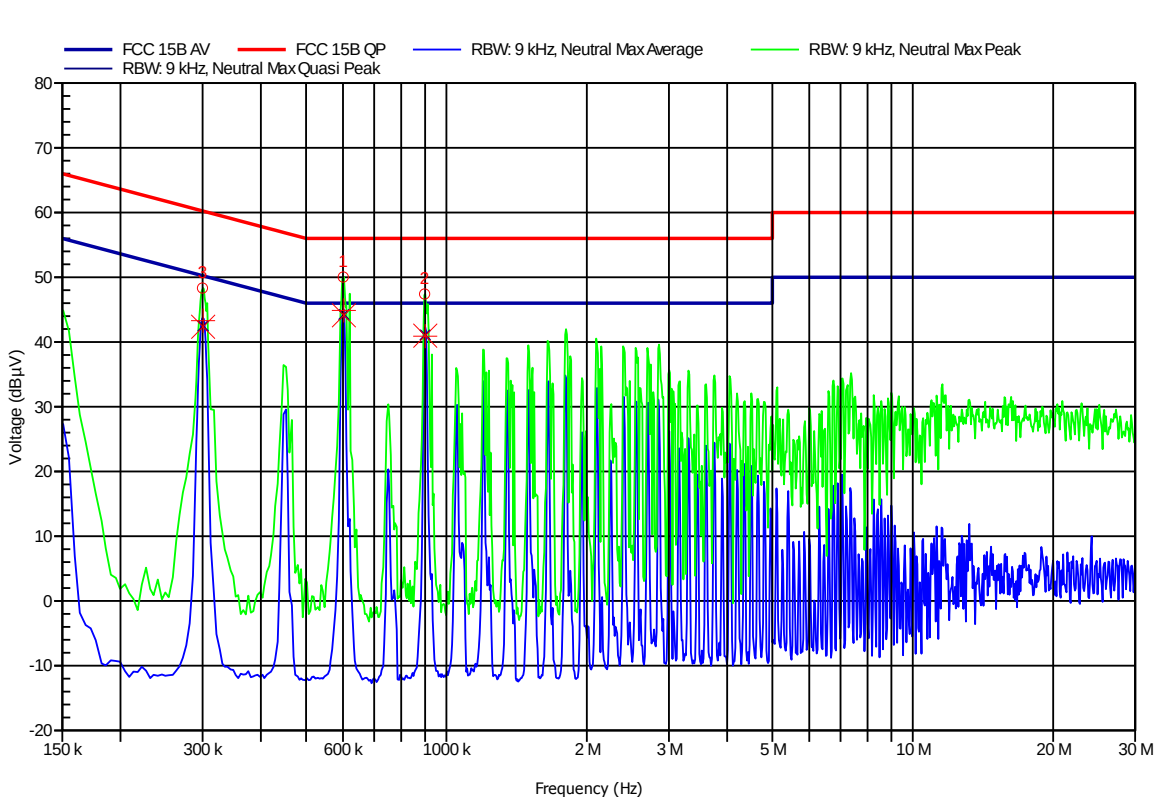
Power line conducted emissions acc. FCC 47 CFR 15.207 / IC RSS-Gen				**Verdict: PASS**
Test according referenced standards	Reference Method			
	ANSI C63.4			
Fully configured sample scanned over the following frequency range	Frequency range			
	0.15 MHz to 30 MHz			
Points of Application	Application Interface			
AC Mains	LISN			
EUT test mode	AC-Powerline			
Limits and results				
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.				

Conducted Emissions

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

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	SRD
Model:	Pager (transmitter)
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 22°C, Unom: 120 V AC
LISN:	ESH2-Z5 N
Mode:	active; TX: 915 MHz (test mode)
Test Date:	2013-05-21
Note:	



Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
299.85 kHz	42.45 dBµV	60.25 dBµV	-17.79 dB	Pass
600.9 kHz	44.21 dBµV	56 dBµV	-11.79 dB	Pass
897.9 kHz	41.07 dBµV	56 dBµV	-14.93 dB	Pass

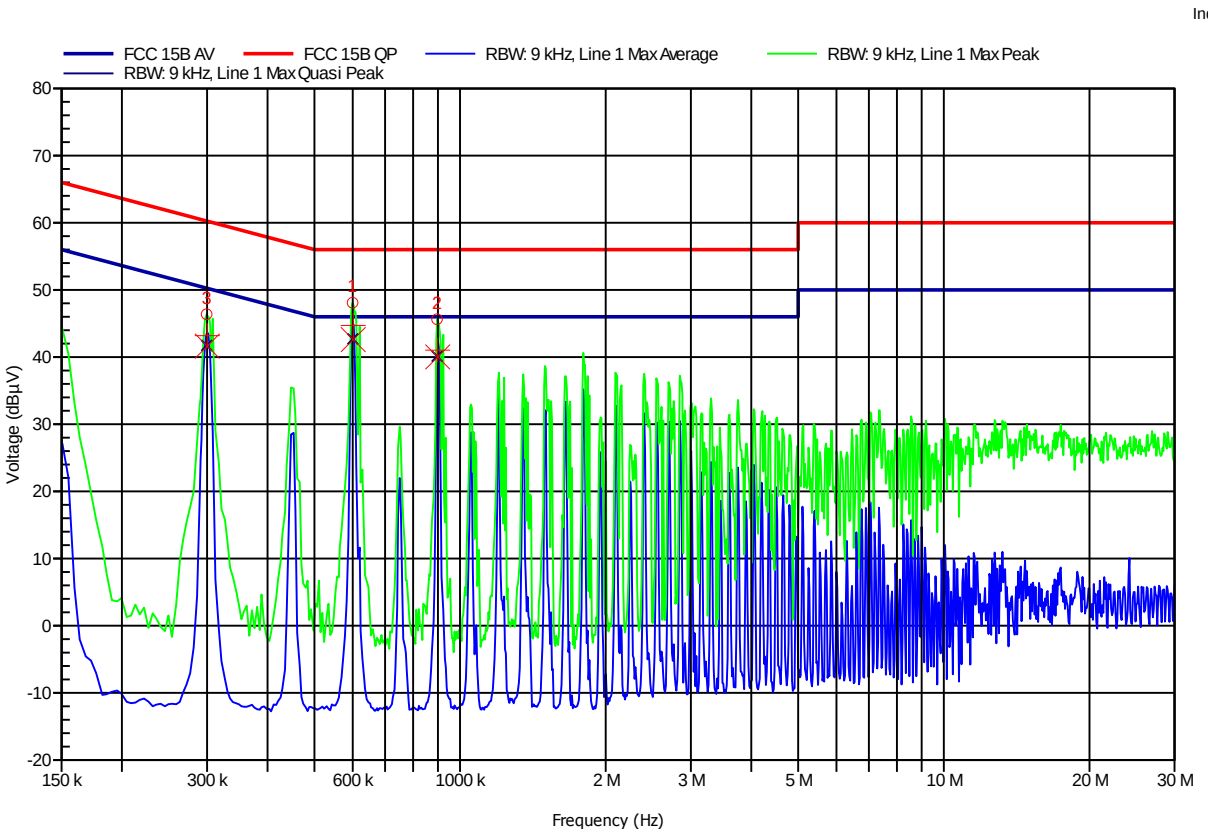
Frequency	Average	Average Limit	Average Difference	Average Status
299.85 kHz	43.39 dBµV	50.25 dBµV	-6.85 dB	Pass
600.9 kHz	44.97 dBµV	46 dBµV	-1.03 dB	Pass
897.9 kHz	41 dBµV	46 dBµV	-5 dB	Pass

Conducted Emissions

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

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	SRD
Model:	Pager (transmitter)
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Handrik
Test Conditions:	Tnom: 22°C, Unom: 120 V AC
LISN:	ESH2-Z5 L
Mode:	active; TX: 915 MHz (test mode)
Test Date:	2013-05-21
Note:	



Frequency	Quasi-Peak	Quasi-Peak Limit	Quasi-Peak Difference	Quasi-Peak Status
299.4 kHz	41.73 dBµV	60.26 dBµV	-18.53 dB	Pass
599.55 kHz	42.7 dBµV	56 dBµV	-13.3 dB	Pass
896.55 kHz	40.12 dBµV	56 dBµV	-15.88 dB	Pass

Frequency	Average	Average Limit	Average Difference	Average Status
299.4 kHz	43.29 dBµV	50.26 dBµV	-6.97 dB	Pass
599.55 kHz	44.8 dBµV	46 dBµV	-1.2 dB	Pass
896.55 kHz	41.13 dBµV	46 dBµV	-4.87 dB	Pass

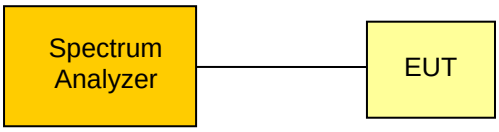
3.6 Test Conditions and Results – Band edge compliance

Band-edge compliance acc. FCC 15.247 / IC RSS-210	**Verdict: PASS**
EUT requirement rule parts and clause	Reference
	FCC 15.247(d) / IC RSS-210 A8.5
Test according to measurement reference	Reference Method
	FCC KDB Publication No. 558074
Test frequency range	Tested frequencies
	F_{MID}
EUT test mode	Single

Limits

Limit	Condition
≤ -20 dB / 100 kHz	Peak power measurement detector = Peak
≤ -30 dB / 100 kHz	Peak power measurement detector = RMS

Test setup



Test procedure

1. EUT set to test mode (Communication tester is used if needed)
2. Span set around lower band edge and detector is set to peak and max hold
3. Resolution bandwidth is set to 100 kHz
4. Markers are set to peak emission levels within frequency band and outside frequency band
5. Band edge attenuation is determined from level difference

Test results

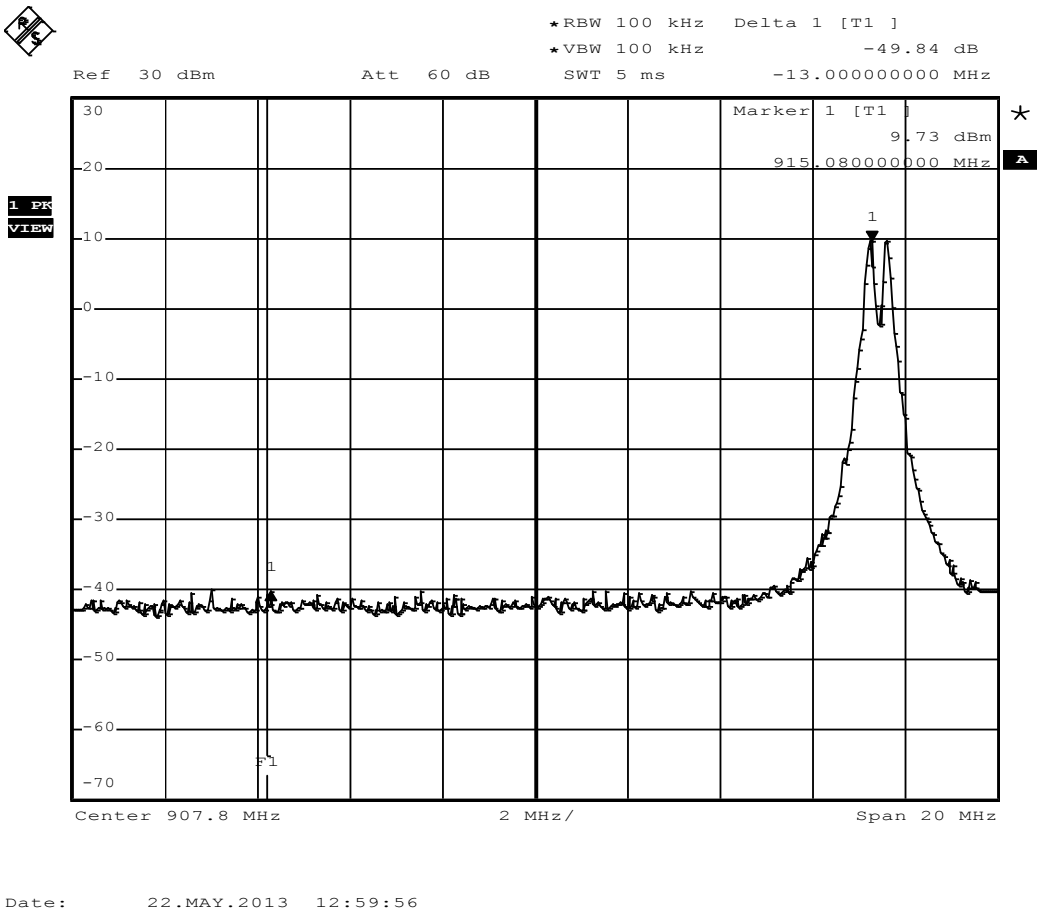
Channel	Frequency [MHz]	Mode	Level [dBc]	Limit [dBc]	Margin [dB]	Result
F_{MID}	915	Single	-49.84	-20	-29.84	PASS
F_{MID}	915	Single	-41.38	-20	-21.38	PASS

Comments:

Band-edge compliance – F_{MID} single – Lower Edge

FCC part 15.247
Band-edge compliance of RF conducted emissions

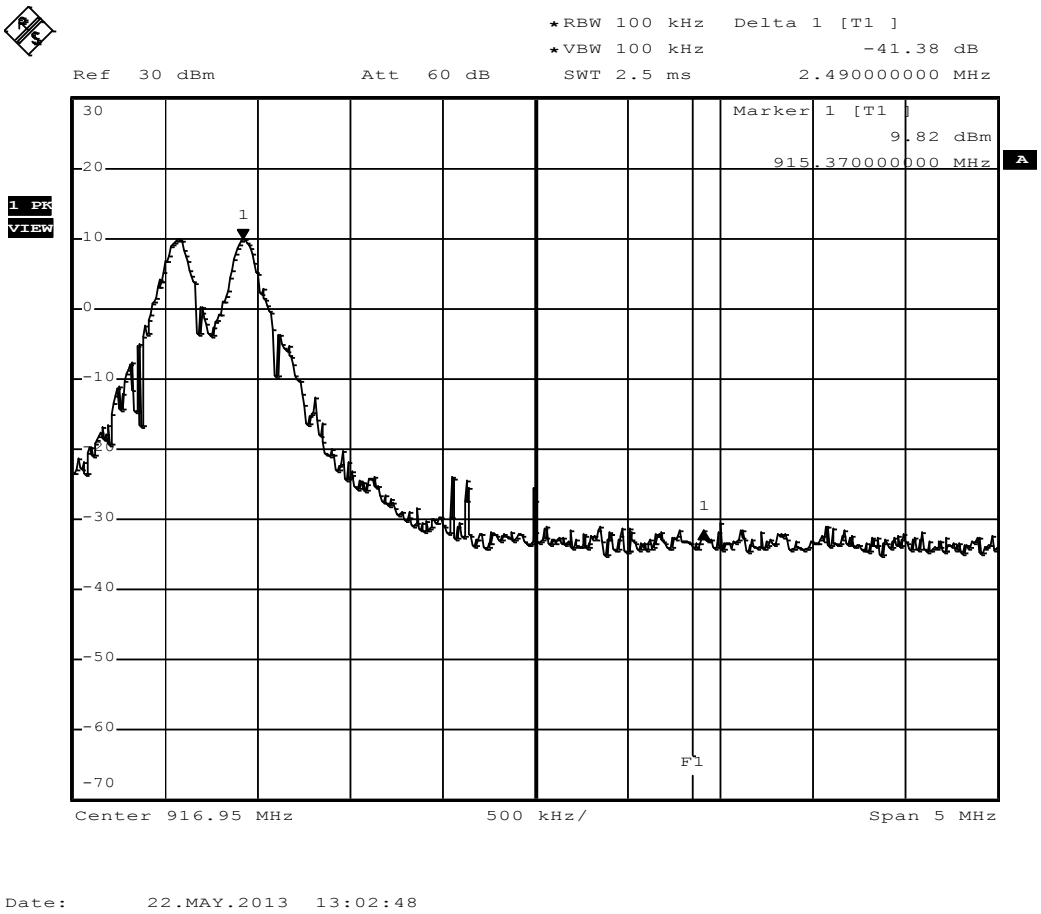
EUT	SRD
Model	Pager (transmitter) / Quick Pager System MP-D
Approval Holder	Multi Teknik Odense Aps
Temperature / Voltage	Tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15 section 247(c)
Comment 1	Band-edge compliance
Comment 2	Channel.: 915 MHz



Band-edge compliance – F_{MID} single – Upper Edge

FCC part 15.247
Band-edge compliance of RF conducted emissions

EUT	SRD
Model	Pager (transmitter) / Quick Pager System MP-D
Approval Holder	Multi Teknik Odense Aps
Temperature / Voltage	Tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15 section 247(c)
Comment 1	Band-edge compliance
Comment 2	Channel.: 915 MHz



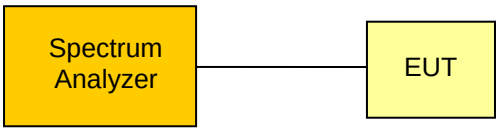
3.7 Test Conditions and Results – Conducted spurious emissions

Conducted spurious emissions acc. FCC 15.247 / IC RSS-210	**Verdict: PASS**
EUT requirement rule parts and clause	Reference
	FCC 15.247(d) / IC RSS-210 A8.5
Test according to measurement reference	Reference Method
	FCC KDB Publication No. 558074
Test frequency range	Tested frequencies
	10 MHz – 10th Harmonic
EUT test mode	Single

Limits

Limit	Condition
≤ -20 dB / 100 kHz	Peak power measurement detector = Peak
≤ -30 dB / 100 kHz	Peak power measurement detector = RMS

Test setup



Test procedure

1. EUT set to test mode (Communication tester is used if needed)
2. Span it set according to measurement range
3. Resolution bandwidth is set to 100 kHz and detector to peak and max hold
4. Markers are set to peak emission levels within frequency band
5. Emission level is determined by second marker on emission peak
6. Attenuation is determined from level difference

Test results

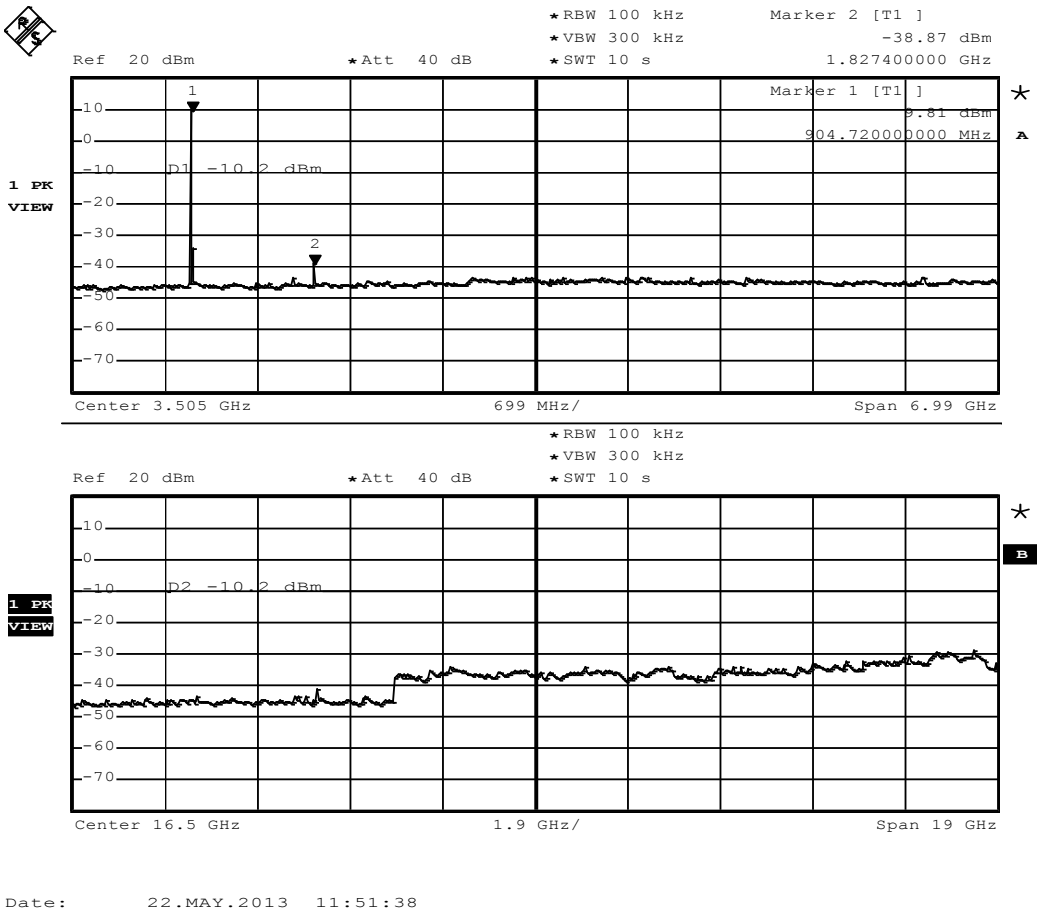
Channel	Frequency [MHz]	Emission [MHz]	Emission Level [dbm]	Peak power [dBm]	Limit [dBm]	Margin [dB]	Result
F_{MID}	902.4	1827.4	-38.87	9.81	-10.19	-28.68	PASS

Comments:

Conducted spurious emissions – F_{MID}

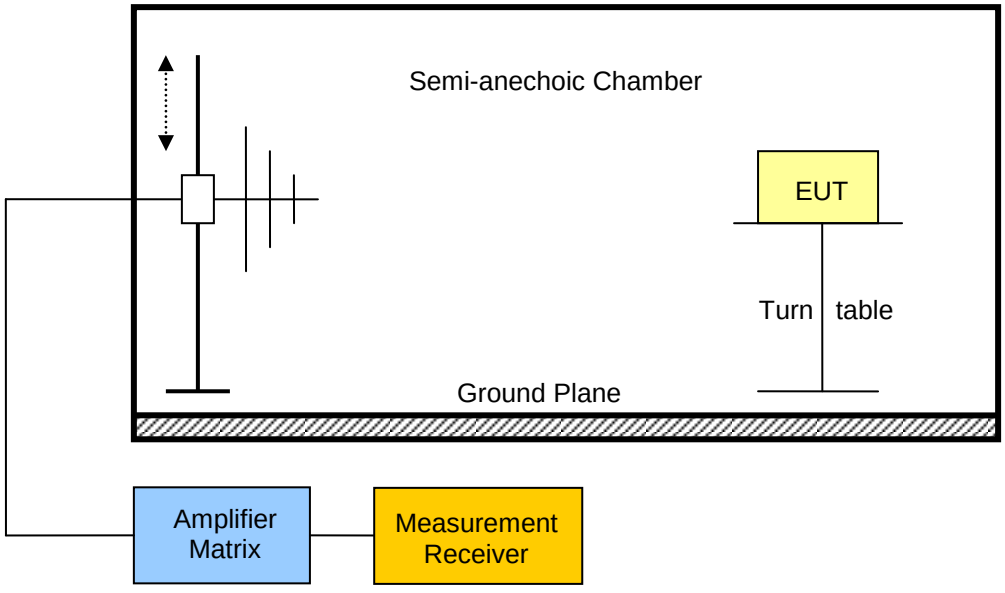
FCC part 15.247 (d)
Spurious Emissions

EUT	SRD
Model	Pager (transmitter) / Quick Pager System MP-D
Approval Holder	Multi Teknik Odense Aps
Temperature / Voltage	Tnom / Vnom
Test Site / Operator	Eurofins Product Service GmbH / Mr. Treffke
Test Specification	FCC part 15.247 (d)
Comment 1	Spurious Emissions conducted
Comment 2	Channel 915 MHz
Comment 3	Emissions in non-restricted frequency bands 558074 D01 Meas Guidance



3.8 Test Conditions and Results – Transmitter radiated emissions

Transmitter radiated emissions acc. FCC 47 CFR 15.247 / IC RSS-210				**Verdict: PASS**
Test according referenced standards	Reference Method			
	FCC 15.247(d) / IC RSS-210 A8.5			
Test according to measurement reference	Reference Method			
	FCC KDB Publication No. 558074 / ANSI C63.4			
Test frequency range	Tested frequencies			
	30 MHz – 10th Harmonic			
EUT test mode	Single			
Limits				
Frequency range [MHz]	Detector	Limit [µV/m]	Limit [dBµV/m]	Limit Distance [m]
30 – 88	Quasi-Peak	100	40	3
88 – 216	Quasi-Peak	150	43.5	3
216 – 960	Quasi-Peak	200	46	3
960 – 1000	Quasi-Peak	500	54	3
> 1000	Average	500	54	3
Radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)). When average radiated emission measurements are specified, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.				
Test setup				



Test procedure
1. EUT set to test mode (Communication tester is used if needed) 2. Span it set according to measurement range 3. Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1 MHz with peak/average detector is used above 1 GHz 4. Markers are set to peak emission levels within restricted bands

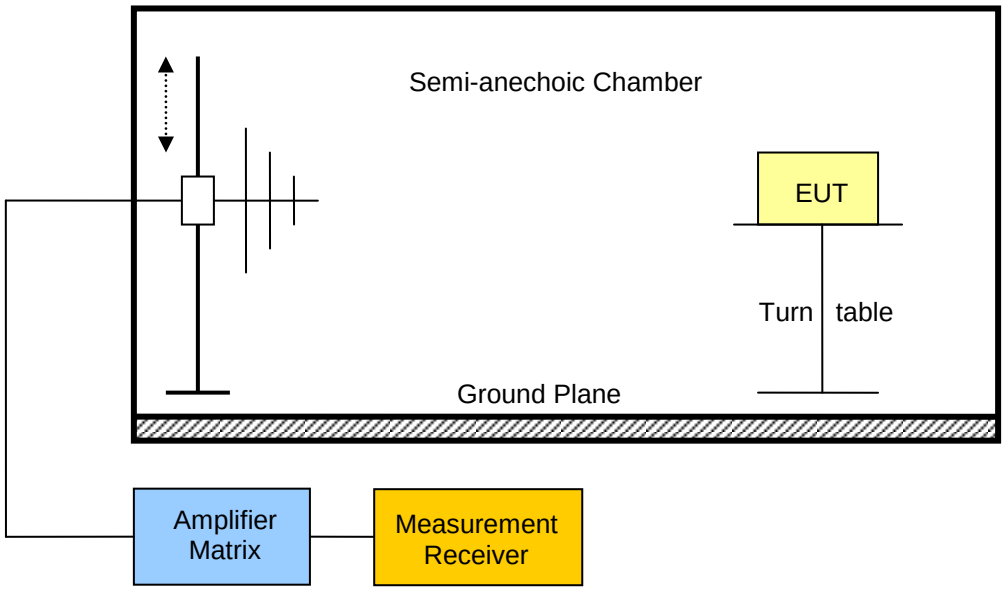
Test results

Channel	Frequency [MHz]	Emission [MHz]	Level [dbµV/m]	Detector	Pol.	Limit [dbµV/m]	Limit distance [m]*	Margin [dB]
F_{MID}	915	1054	43.91	pk	ver	74.00	3	-30.09
F_{MID}	915	2746	42.44	pk	ver	74.00	3	-31.56
F_{MID}	915	2746	44.31	pk	hor	74.00	3	-29.69
F_{MID}	915	8232	52.71	pk	ver	74.00	3	-21.29
F_{MID}	915	8232	48.20	pk	hor	74.00	3	-25.80
F_{MID}	915	9144	52.38	pk	hor	74.00	3	-21.62
F_{MID}	915	9152	51.09	pk	ver	74.00	3	-22.91
F_{MID}	915	10976	51.19	pk	ver	74.00	3	-22.81
F_{MID}	915	10984	48.70	pk	hor	74.00	3	-25.30
F_{MID}	915	11888	49.86	pk	ver	74.00	3	-24.14

Comments: * Physical distance between EUT and measurement antenna.

3.9 Test Conditions and Results – Receiver radiated emissions

Receiver radiated emissions acc. IC RSS-210				**Verdict: PASS**
Test according referenced standards	Reference Method			
	IC RSS-210 A8.5			
Test according to measurement reference	Reference Method			
	ANSI C63.4			
Test frequency range	Tested frequencies			
	30 MHz – 3th Harmonic			
EUT test mode	Receive			
Limits				
Frequency range [MHz]	Detector	Limit [µV/m]	Limit [dBµV/m]	Limit Distance [m]
30 – 88	Quasi-Peak	100	40	3
88 – 216	Quasi-Peak	150	43.5	3
216 – 960	Quasi-Peak	200	46	3
960 – 1000	Quasi-Peak	500	54	3
> 1000	Average	500	54	3
Test setup				



Test procedure
1. EUT set to receive mode (Communication tester is used if needed) 2. Span it set according to measurement range 3. Resolution bandwidth below 1 GHz is set according to CISPR 16 with peak/quasi-peak detector and RBW of 1 MHz with peak/average detector is used above 1 GHz 4. Markers are set to peak emission levels

Test results

Channel	Frequency [MHz]	Emission [MHz]	Emission Level [dbµV/m]	Emission Level [µV/m]	Det.	Limit [µV/m]	Margin [µV/m]
F_{MID}	915	38.84	33.07	45.03	pk	100.00	-54.97
F_{MID}	915	5489	48.22	257.63	pk	500.00	-242.37
F_{MID}	915	5493	48.99	281.51	pk	500.00	-218.49

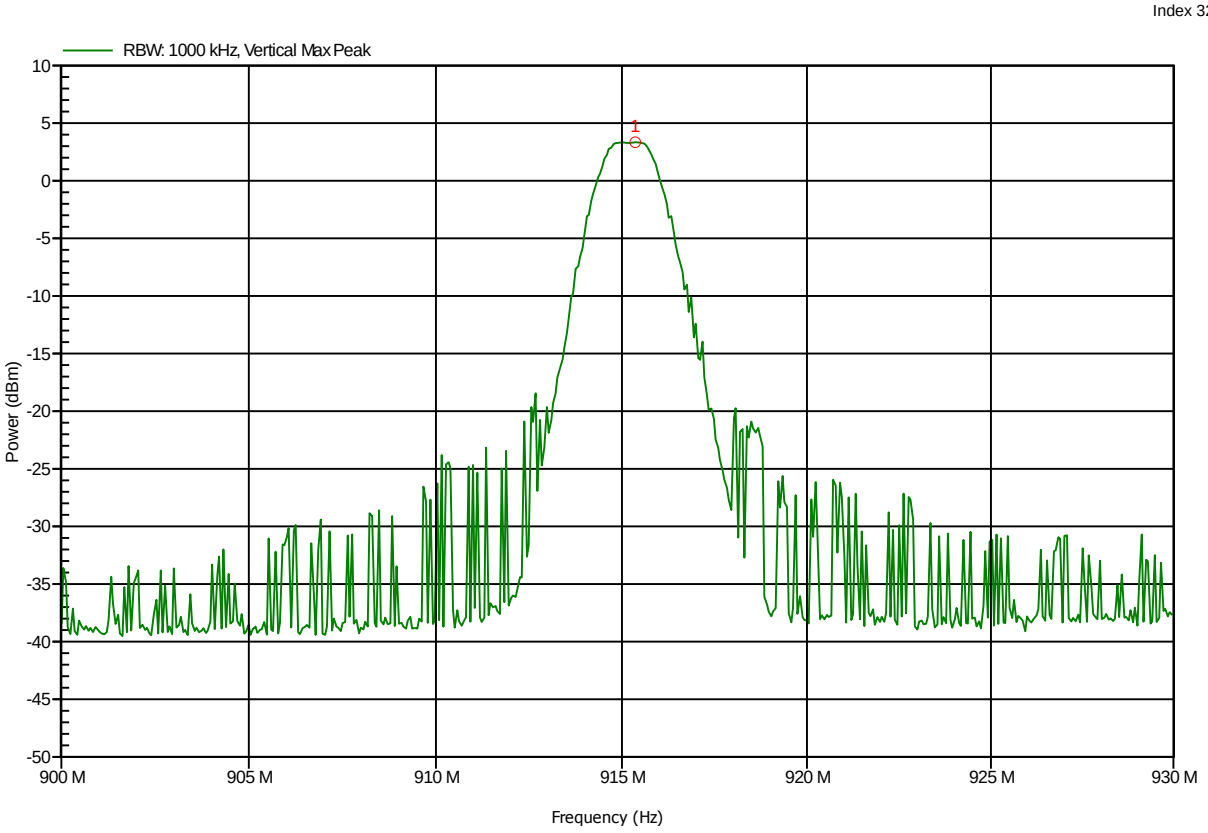
Comments:
* Physical distance between EUT and measurement antenna.

ANNEX A Transmitter radiated spurious emissions

Radiated power according to FCC 15.247

Order number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	Tx; CH: 915MHz; FSK
Test Date:	2013-05-21
Note:	EUT vertical



Frequency	Peak
915.36 MHz	3.3 dBm

Radiated power according to FCC 15.247

Order number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3 m
Mode:	Tx; CH: 915MHz; FSK
Test Date:	2013-05-21
Note:	EUT vertical

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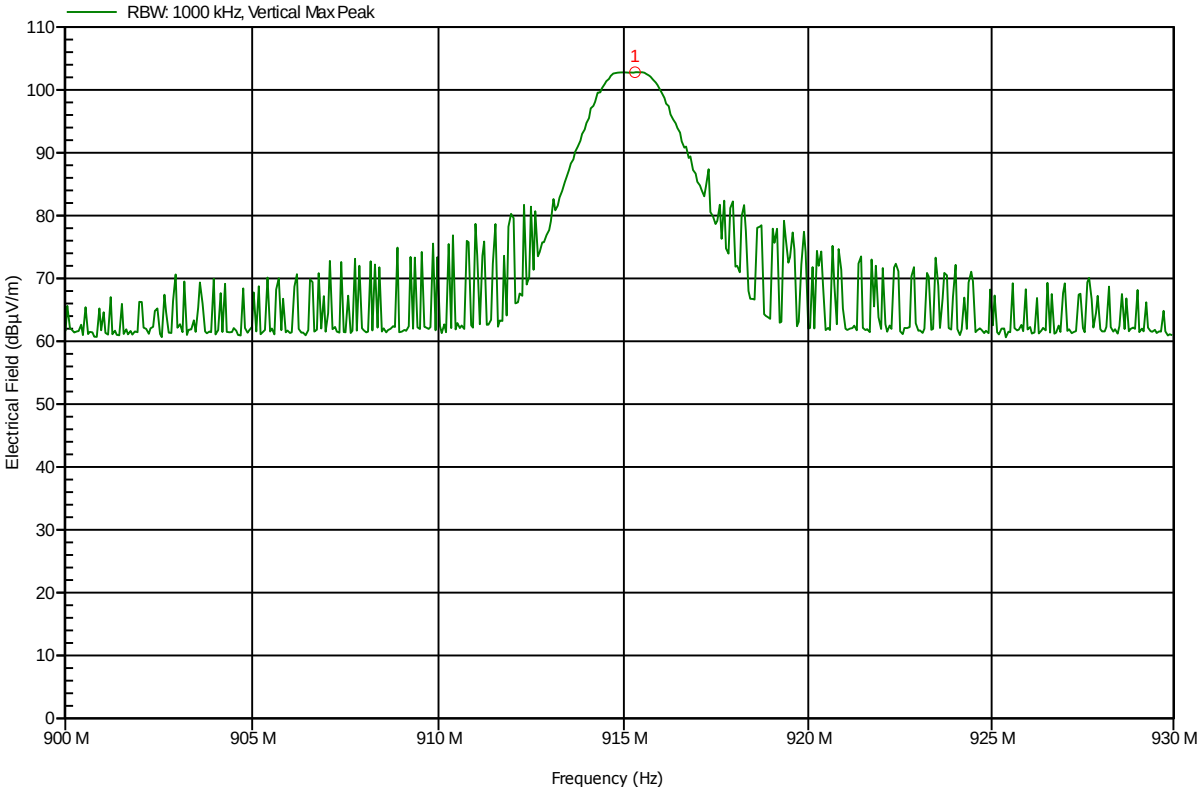

Frequency	Peak
915.3 MHz	102.8 dBµV/m

Spurious emissions according to FCC 15.247

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	TX; CH: 915MHz; FSK
Test Date:	2013-05-21
Note:	EUT vertical

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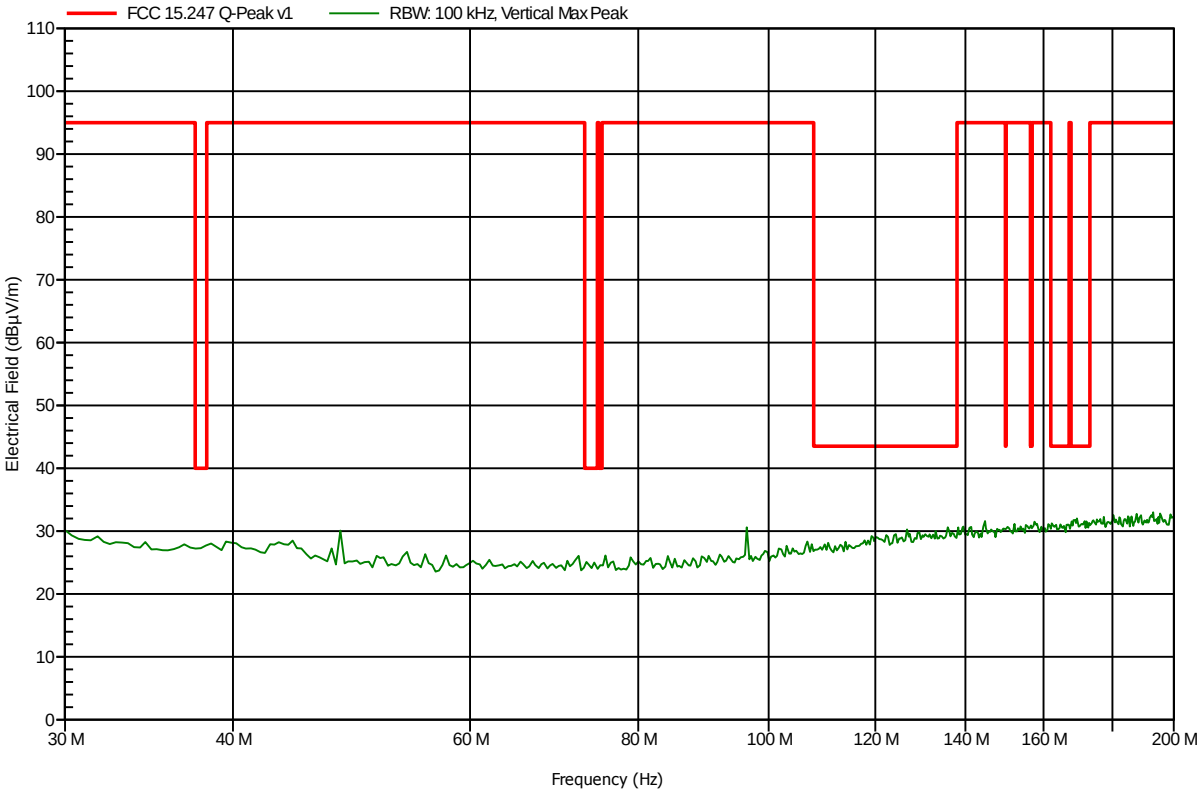

Spurious emissions according to FCC 15.247

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	TX; CH: 915MHz; FSK
Test Date:	2013-05-21
Note:	EUT vertical

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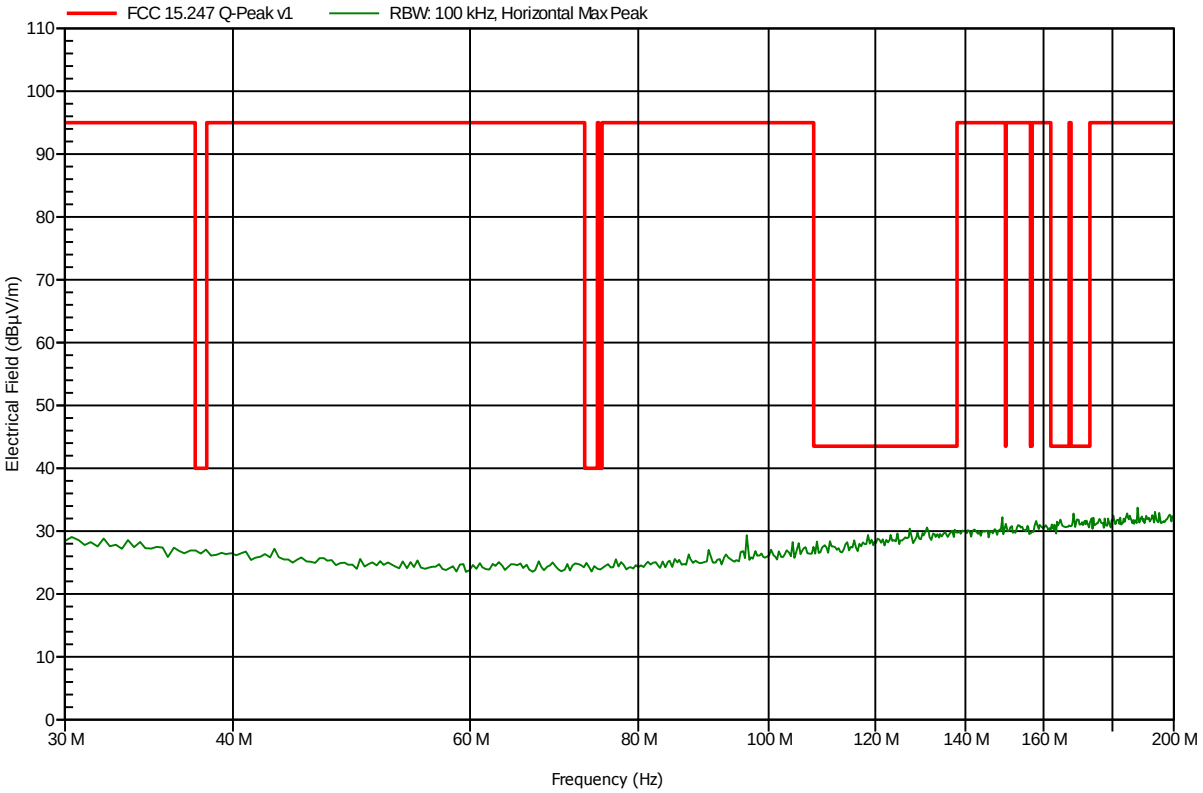

Spurious emissions according to FCC 15.247

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; CH: 915MHz; FSK
Test Date:	2013-05-21
Note:	EUT vertical

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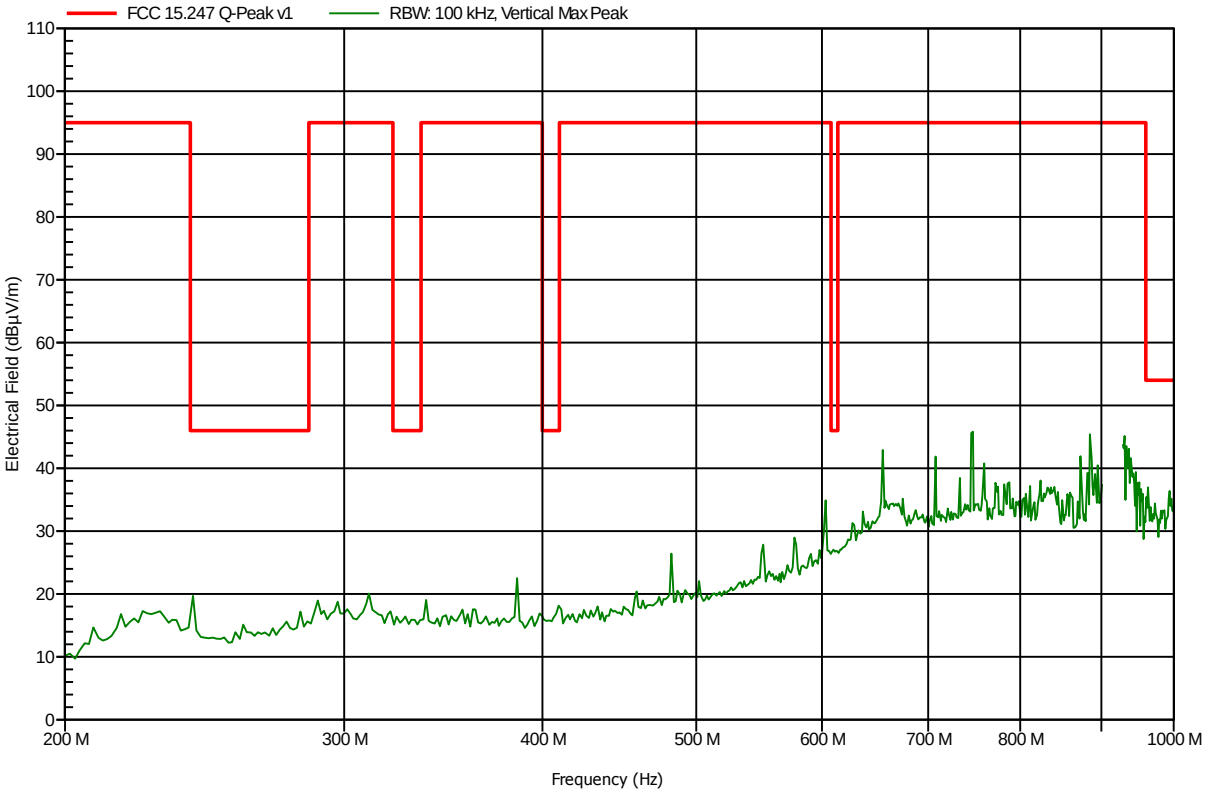
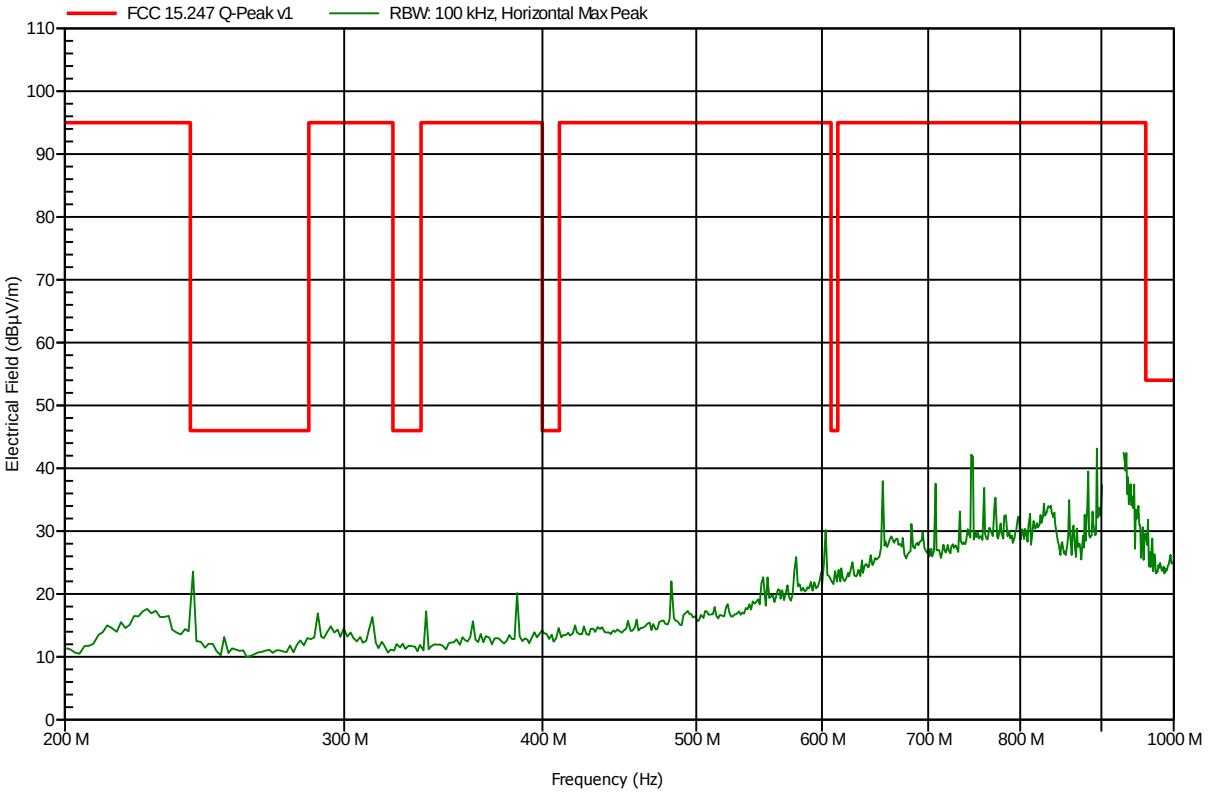


Spurious emissions according to FCC 15.247

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; CH: 915MHz; FSK
Test Date:	2013-05-21
Note:	EUT vertical

Index 15



Spurious emissions according to FCC 15.247

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	TX; CH: 915MHz; FSK
Test Date:	2013-05-21
Note:	EUT vertical

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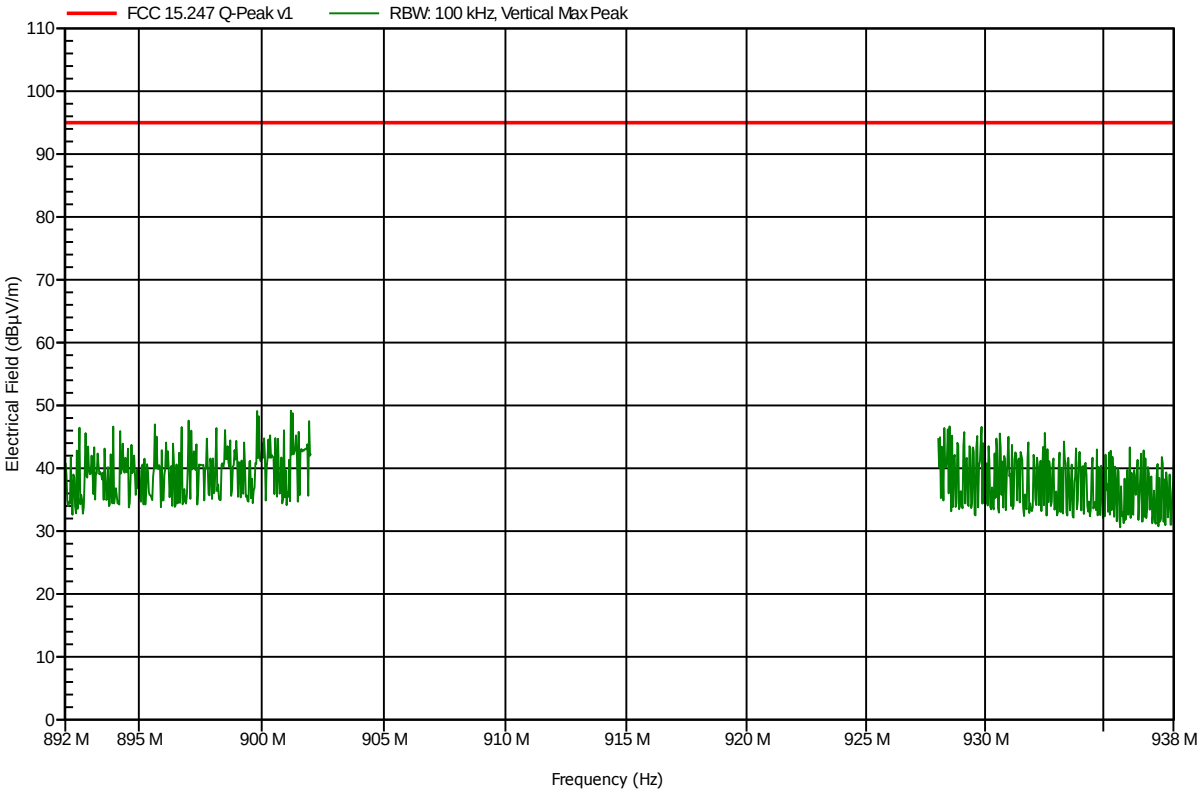

Spurious emissions according to FCC 15.247

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	TX; CH: 915MHz; FSK
Test Date:	2013-05-21
Note:	EUT vertical

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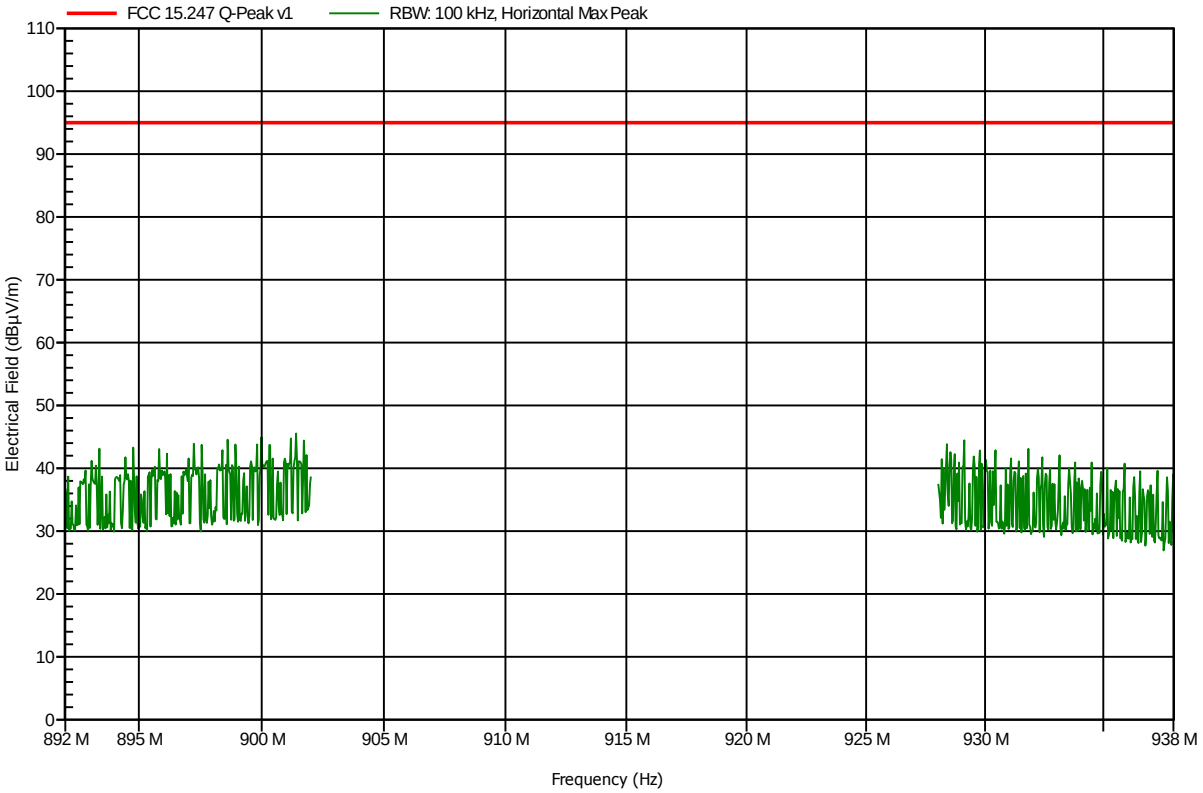

Spurious emissions according to FCC 15.247

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3 m
Mode:	TX; CH: 915MHz; FSK
Test Date:	2013-05-21
Note:	EUT vertical

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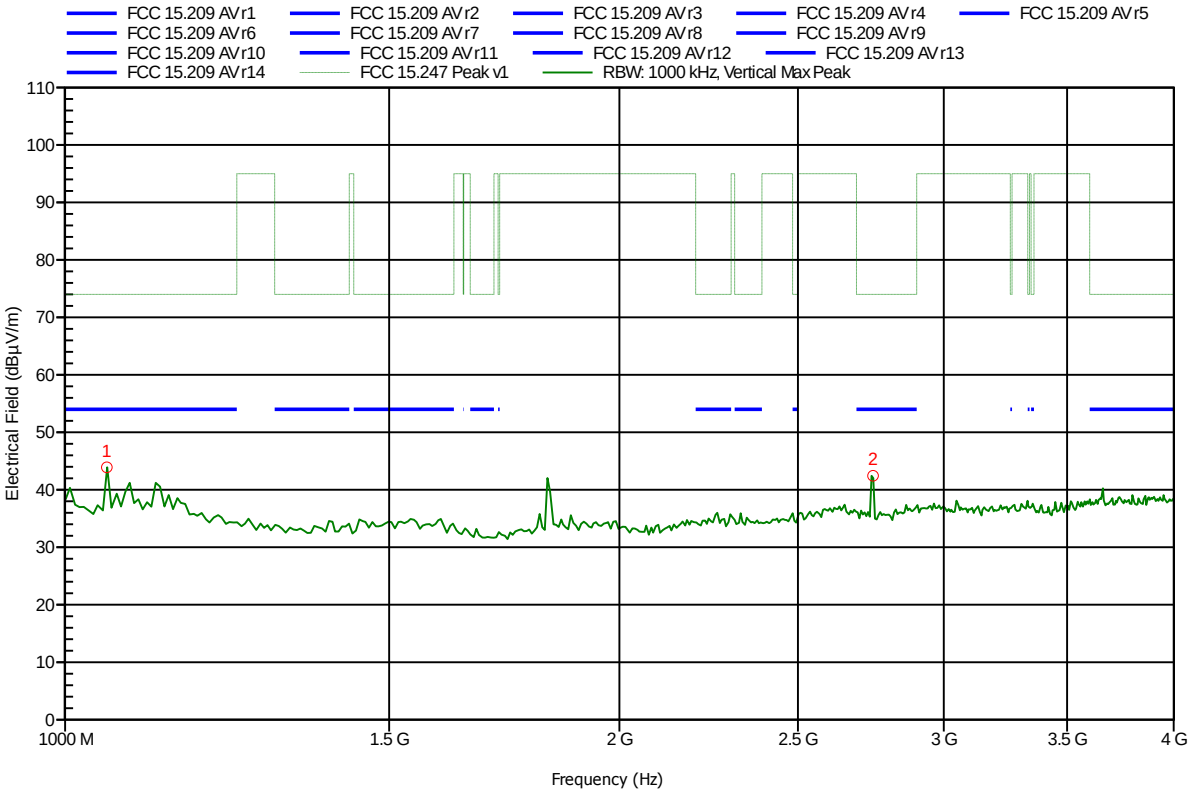

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
1.054 GHz	43.91 dBµV/m	74 dBµV/m	-30.09 dB	Pass
2.746 GHz	42.44 dBµV/m	74 dBµV/m	-31.56 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3 m
Mode:	TX; CH: 915MHz; FSK
Test Date:	2013-05-21
Note:	EUT vertical

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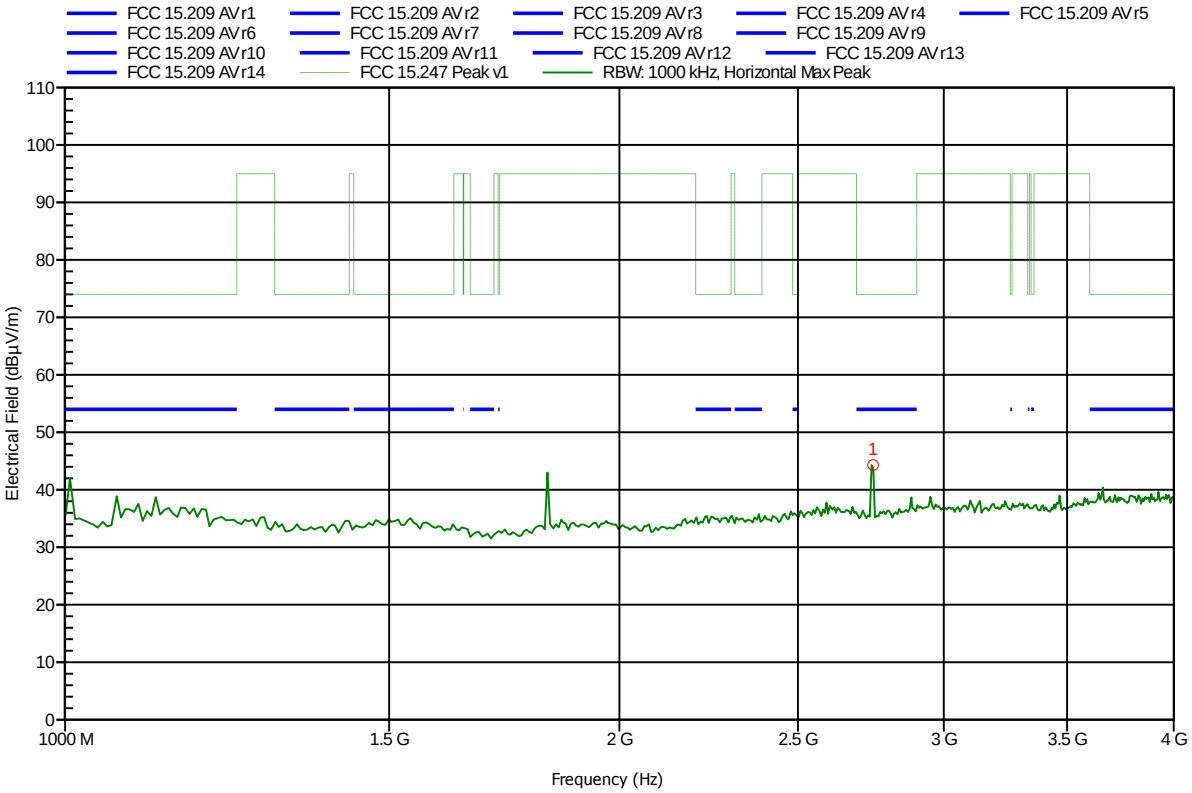

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
2.746 GHz	44.31 dBµV/m	74 dBµV/m	-29.69 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3 m
Mode:	TX; CH: 915MHz; FSK
Test Date:	2013-05-21
Note:	EUT vertical

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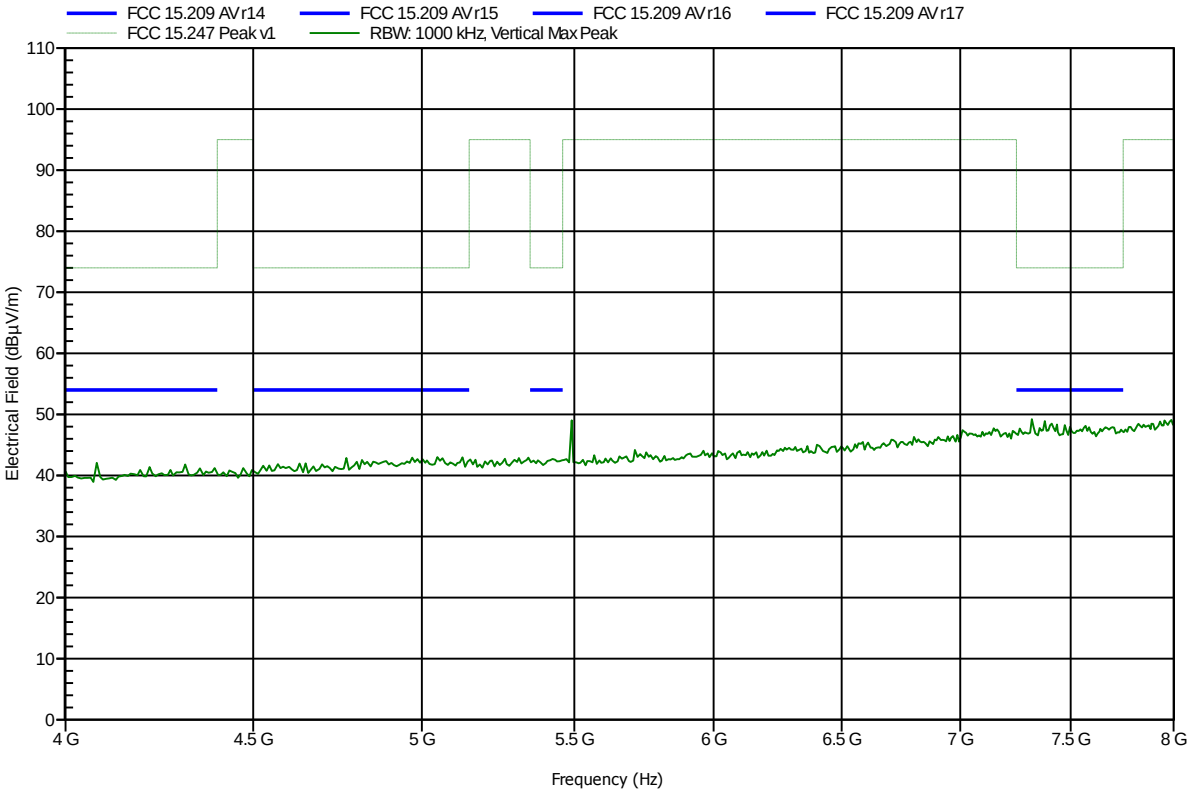

Spurious emissions according to FCC 15.247

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3 m
Mode:	TX; CH: 915MHz; FSK
Test Date:	2013-05-21
Note:	EUT vertical

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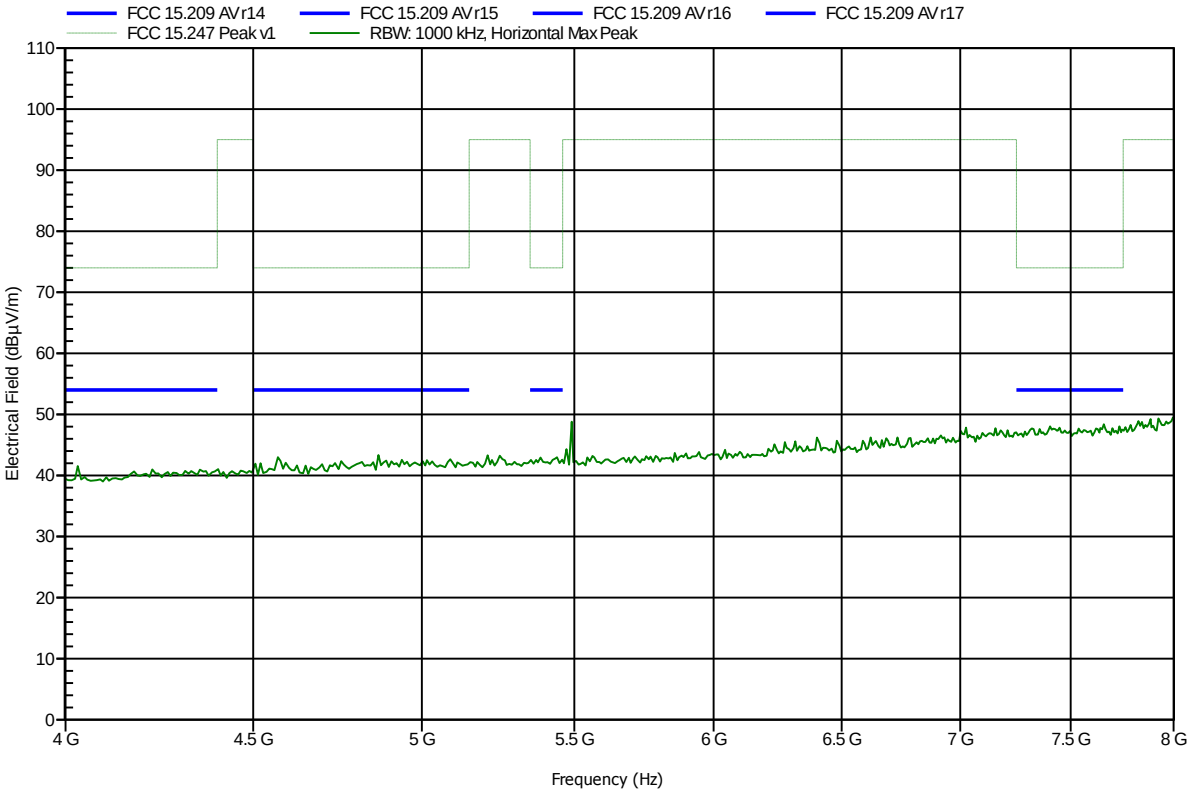

Spurious emissions according to FCC 15.247

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	100 cm converted to 3m
Mode:	TX; CH: 915MHz; FSK
Test Date:	2013-05-21
Note:	EUT vertical

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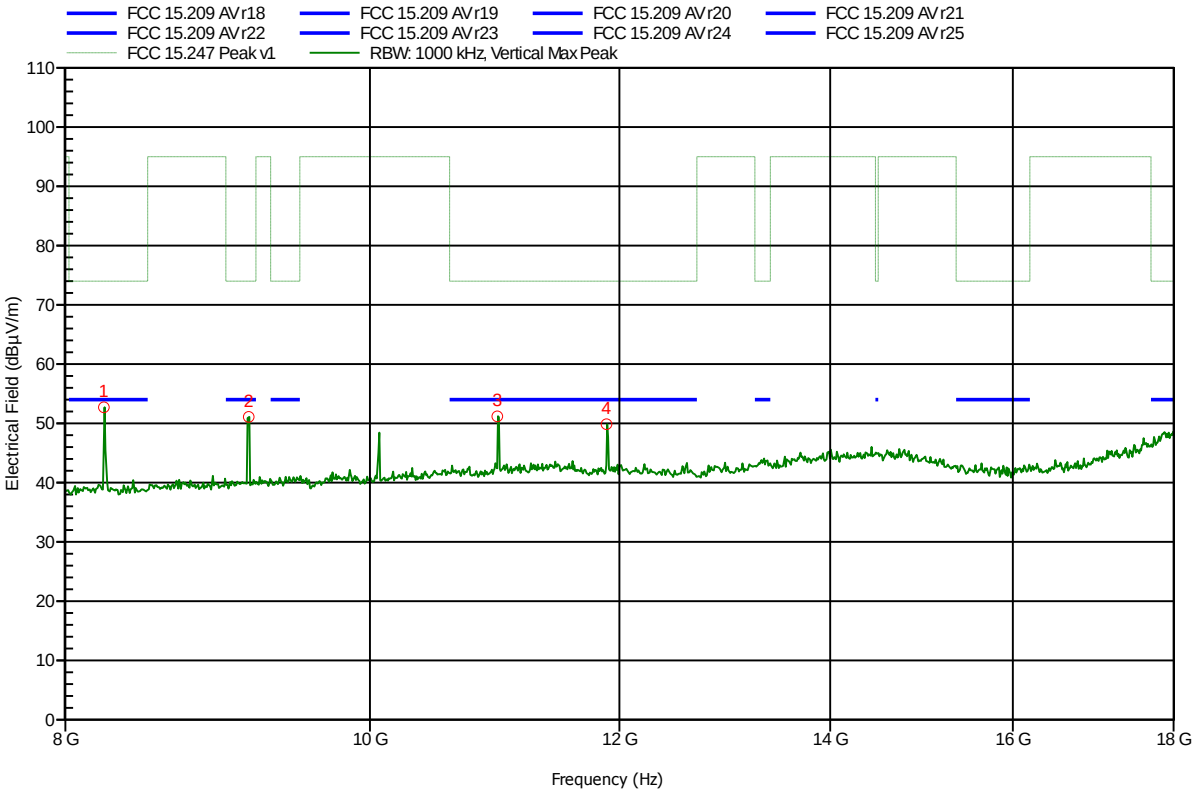

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
8.232 GHz	52.71 dBµV/m	74 dBµV/m	-21.29 dB	Pass
9.152 GHz	51.09 dBµV/m	74 dBµV/m	-22.91 dB	Pass
10.976 GHz	51.19 dBµV/m	74 dBµV/m	-22.81 dB	Pass
11.888 GHz	49.86 dBµV/m	74 dBµV/m	-24.14 dB	Pass

Spurious emissions according to FCC 15.247

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	100 cm converted to 3m
Mode:	TX; CH: 915MHz; FSK
Test Date:	2013-05-21
Note:	EUT vertical

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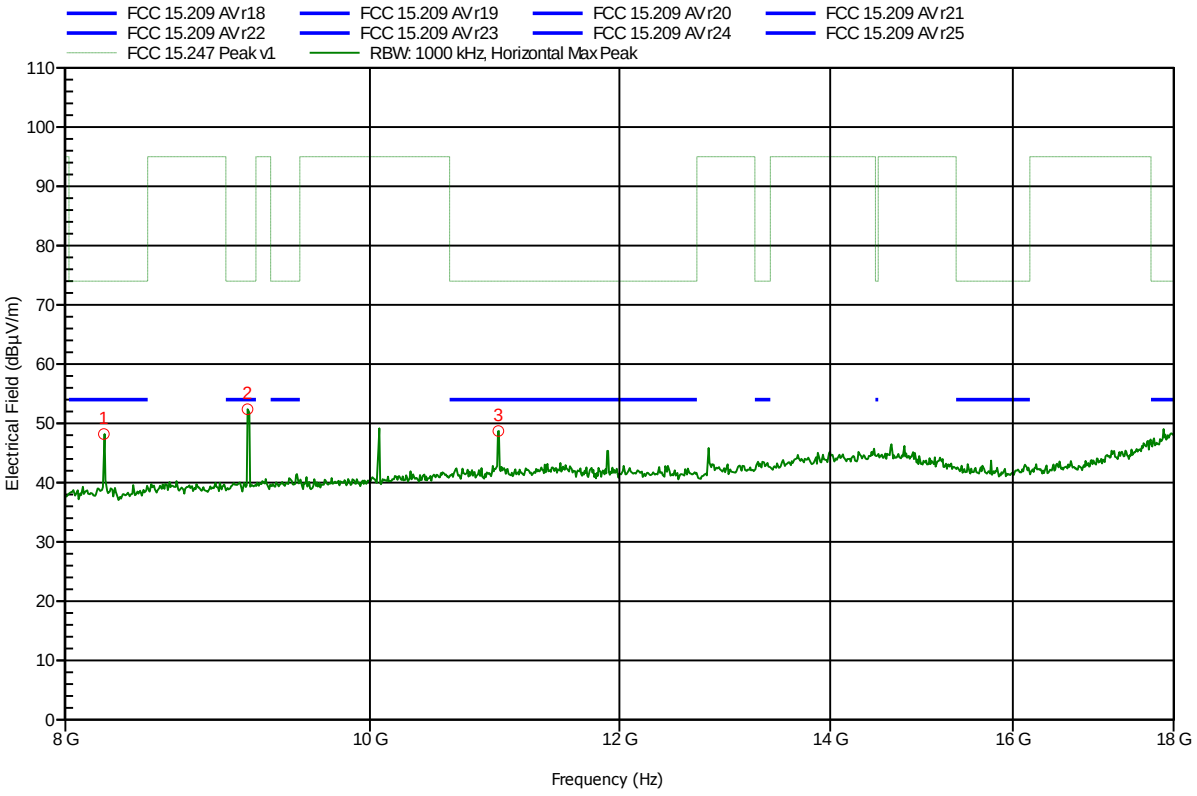

Frequency	Peak	Peak Limit	Peak Difference	Peak Status
8.232 GHz	48.2 dBµV/m	74 dBµV/m	-25.8 dB	Pass
9.144 GHz	52.38 dBµV/m	74 dBµV/m	-21.62 dB	Pass
10.984 GHz	48.7 dBµV/m	74 dBµV/m	-25.3 dB	Pass

ANNEX B Receiver radiated spurious emissions

Spurious emissions according to RSS-GEN

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Rohde & Schwarz HK 116, Vertical
Measurement distance:	3 m
Mode:	RX; CH: 915MHz; Standby mode
Test Date:	2013-05-21
Note:	EUT vertical

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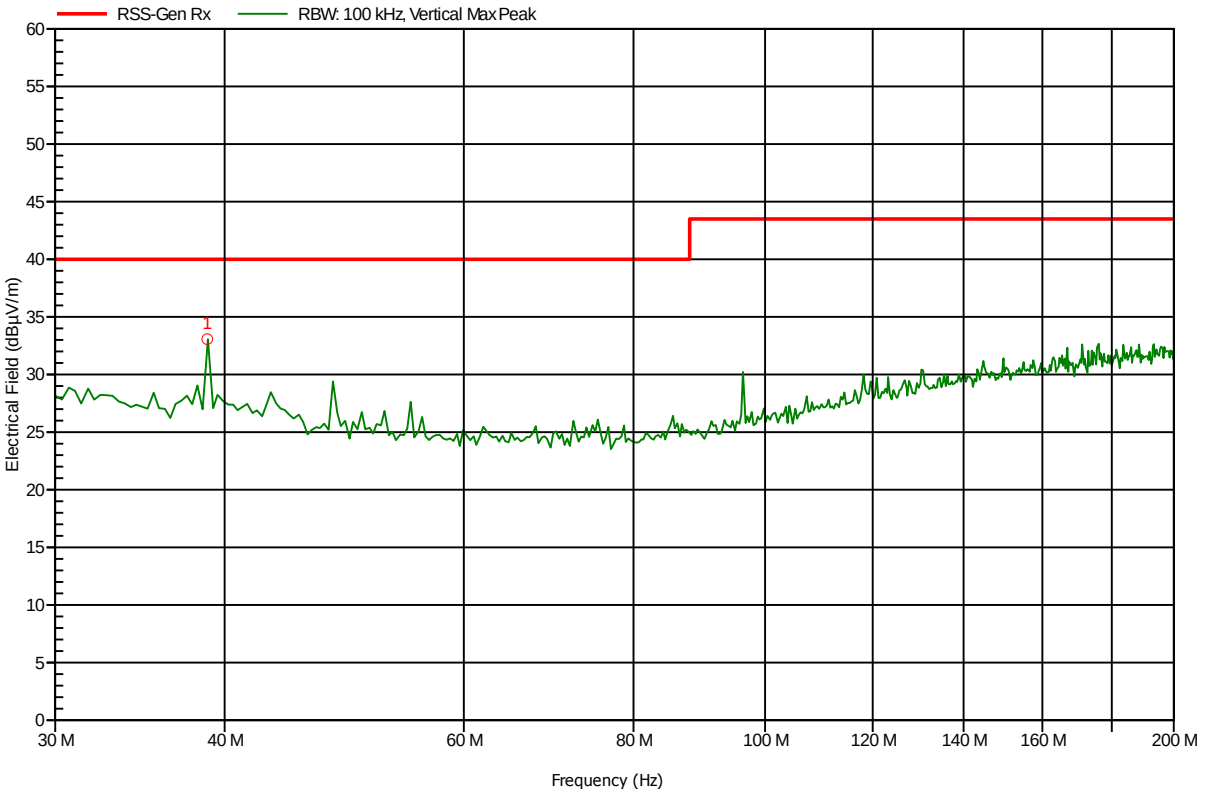

Frequency	Peak	Peak Limit	Peak Difference	Status
38.84 MHz	33.07 dBµV/m	40 dBµV/m	-6.93 dB	Pass

Spurious emissions according to RSS-GEN

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Rohde & Schwarz HK 116, Horizontal
Measurement distance:	3 m
Mode:	RX; CH: 915MHz; Standby mode
Test Date:	2013-05-21
Note:	EUT vertical

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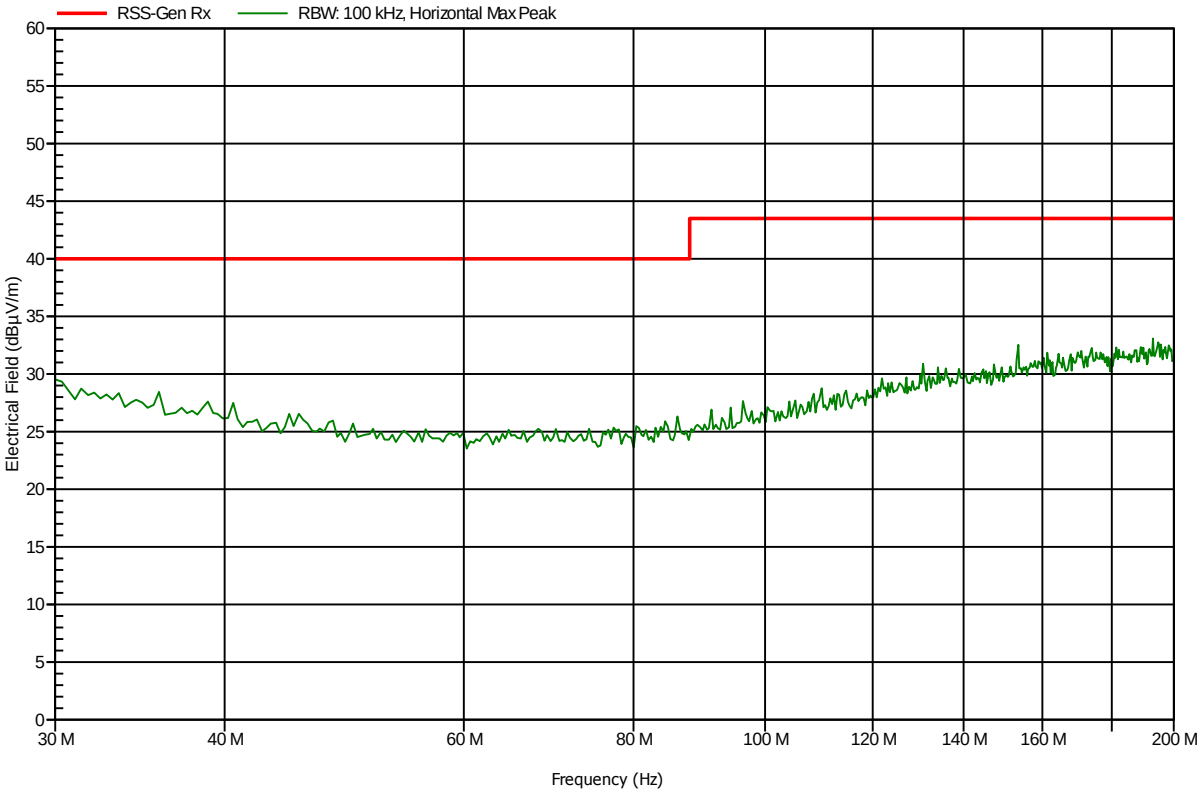

Spurious emissions according to RSS-GEN

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Rohde & Schwarz HL 223, Vertical
Measurement distance:	3 m
Mode:	RX; CH: 915MHz; Standby mode
Test Date:	2013-05-21
Note:	EUT vertical

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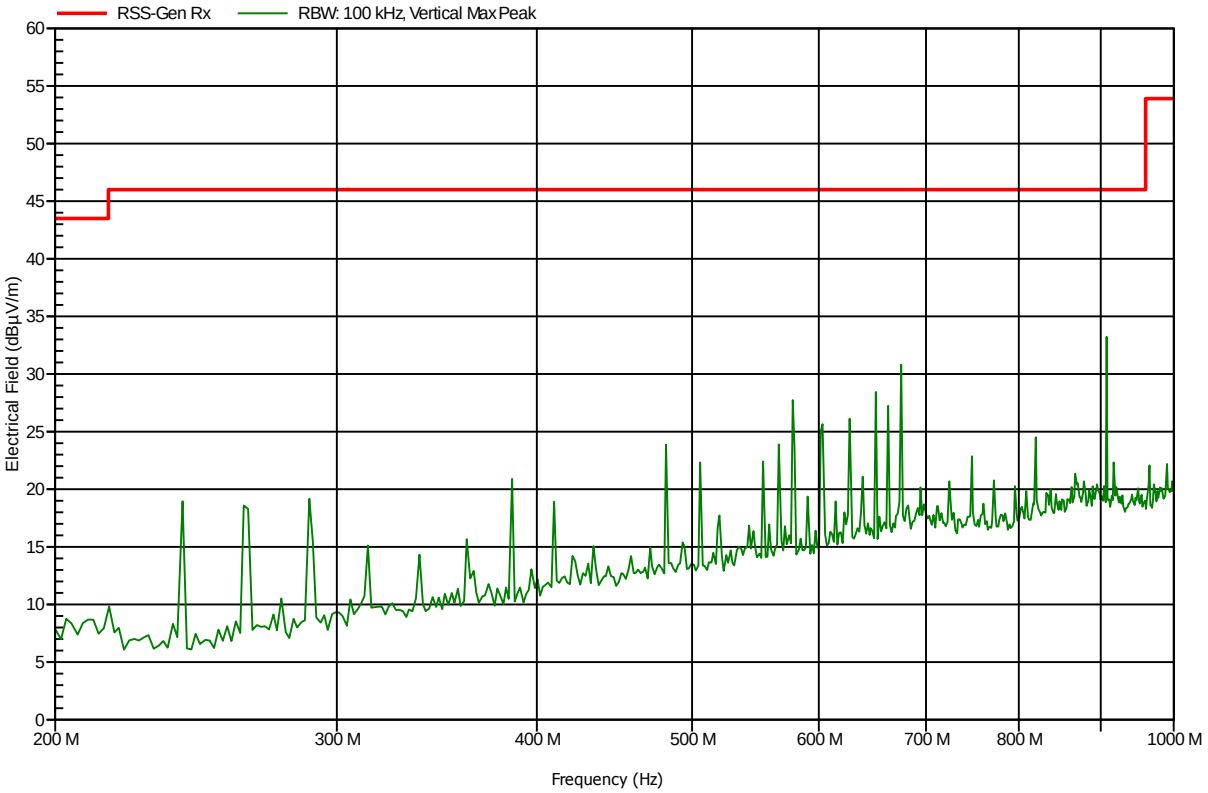

Spurious emissions according to RSS-GEN

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Rohde & Schwarz HL 223, Horizontal
Measurement distance:	3 m
Mode:	RX; CH: 915MHz; Standby mode
Test Date:	2013-05-21
Note:	EUT vertical

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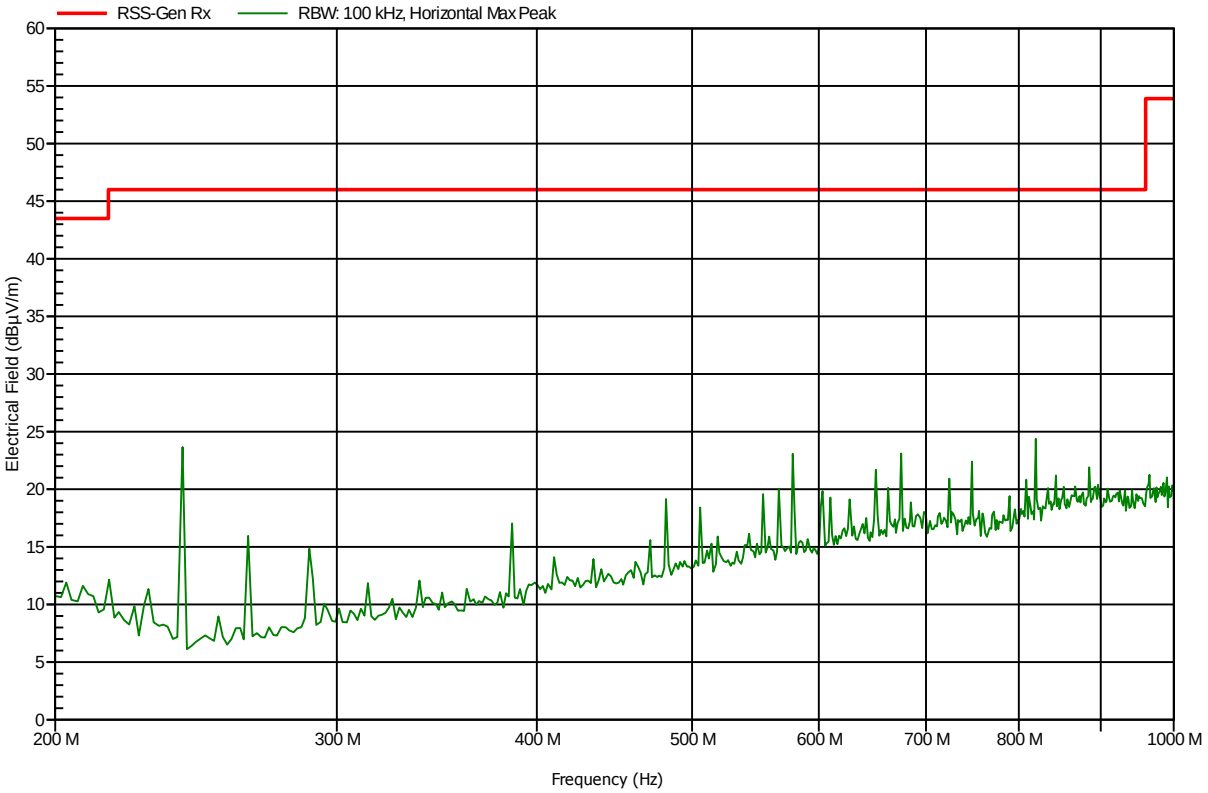

Spurious emissions according to RSS-GEN

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Treffke
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3 m
Mode:	RX; CH: 915MHz; Standby mode
Test Date:	2013-05-21
Note:	EUT vertical

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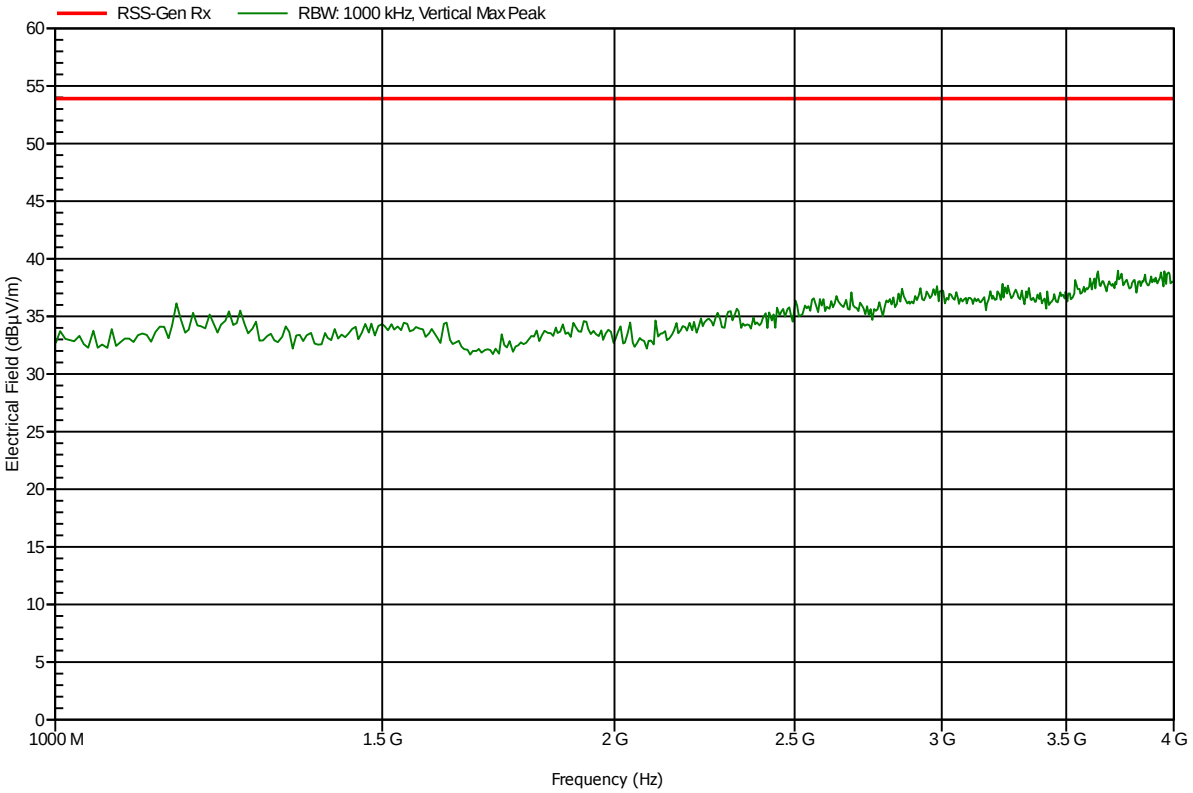

Spurious emissions according to RSS-GEN

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3 m
Mode:	RX; CH: 915MHz; Standby mode
Test Date:	2013-05-21
Note:	EUT vertical

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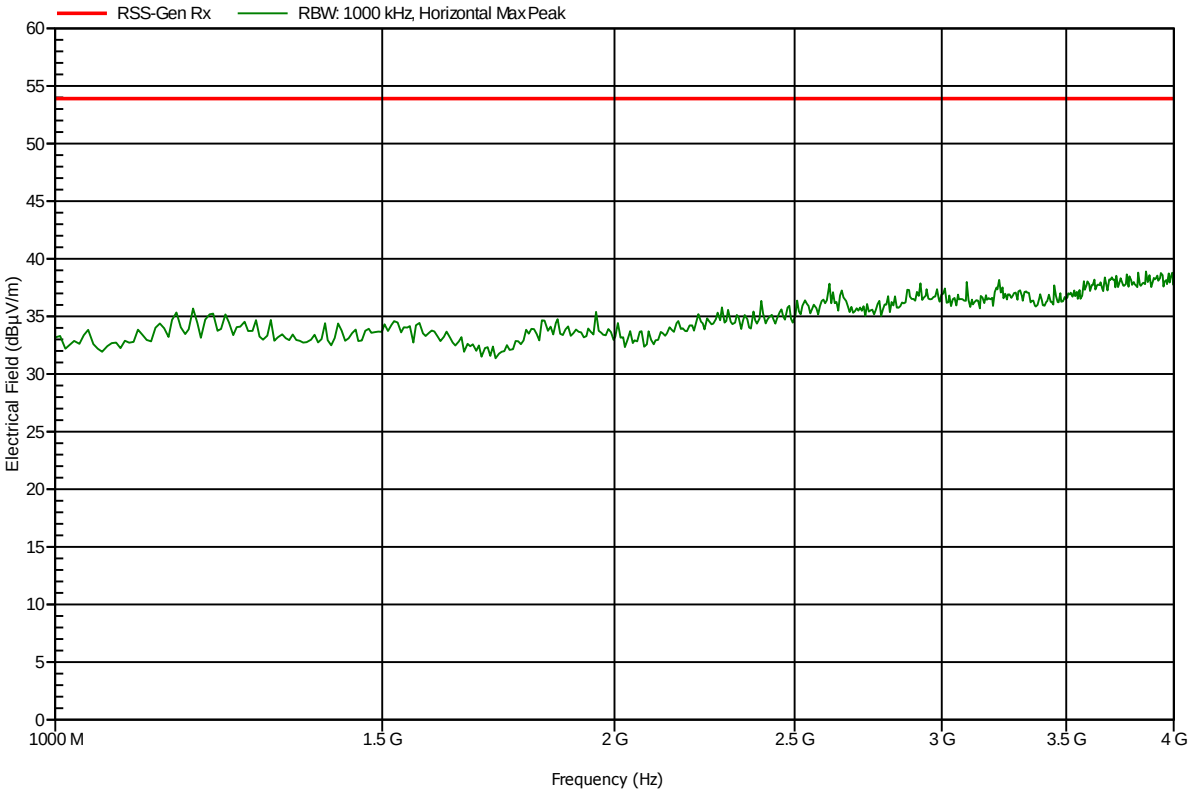

Spurious emissions according to RSS-GEN

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Schwarzbeck BBHA 9120D, Vertical
Measurement distance:	3 m
Mode:	RX; CH: 915MHz; Standby mode
Test Date:	2013-05-21
Note:	EUT vertical

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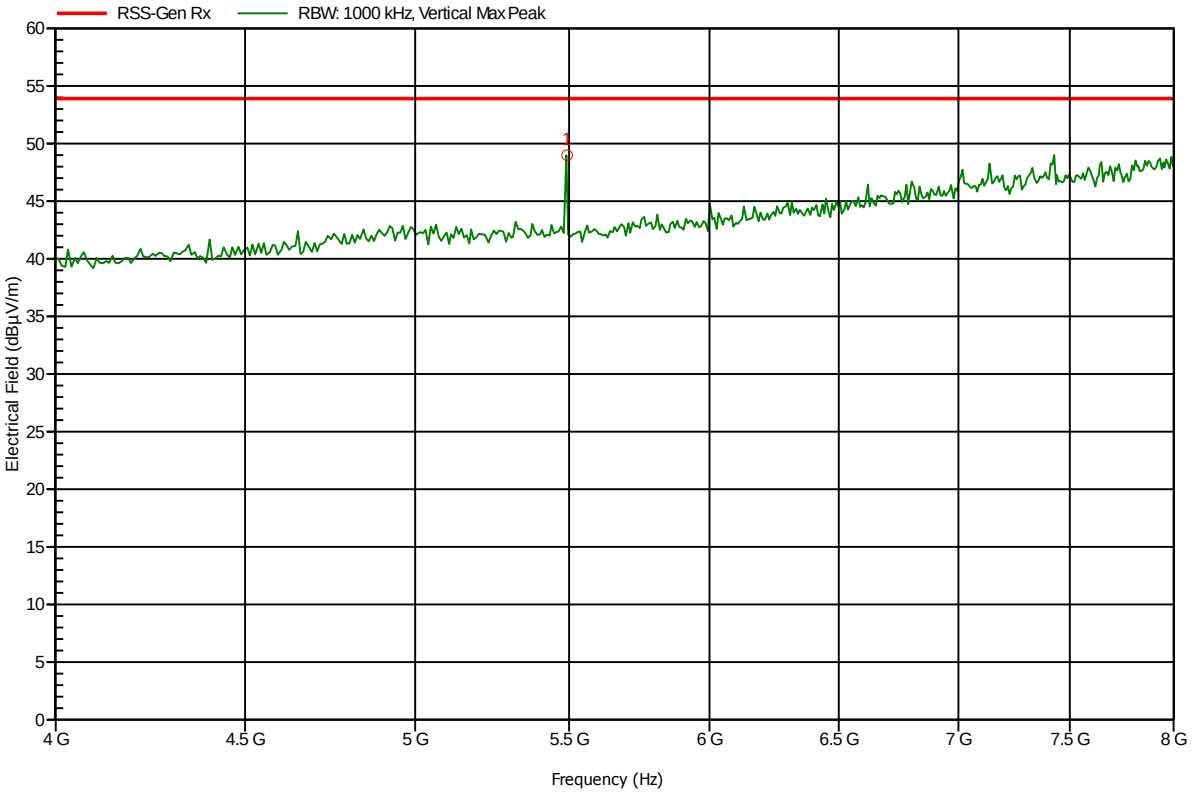

Frequency	Peak	Peak Limit	Peak Difference	Status
5.493 GHz	48.99 dBµV/m	53.9 dBµV/m	-4.91 dB	Pass

Spurious emissions according to RSS-GEN

Project number: G0M-1305-2845

Manufacturer:	Bolls ApS
EUT Name:	Quick Pager System
Model:	MP-D
Test Site:	Eurofins Product Service GmbH
Operator:	Mr. Pudell
Test Conditions:	Tnom: 24°C, Vnom: 5.0V DC USB powered
Antenna:	Schwarzbeck BBHA 9120D, Horizontal
Measurement distance:	3 m
Mode:	RX; CH: 915MHz; Standby mode
Test Date:	2013-05-21
Note:	EUT vertical

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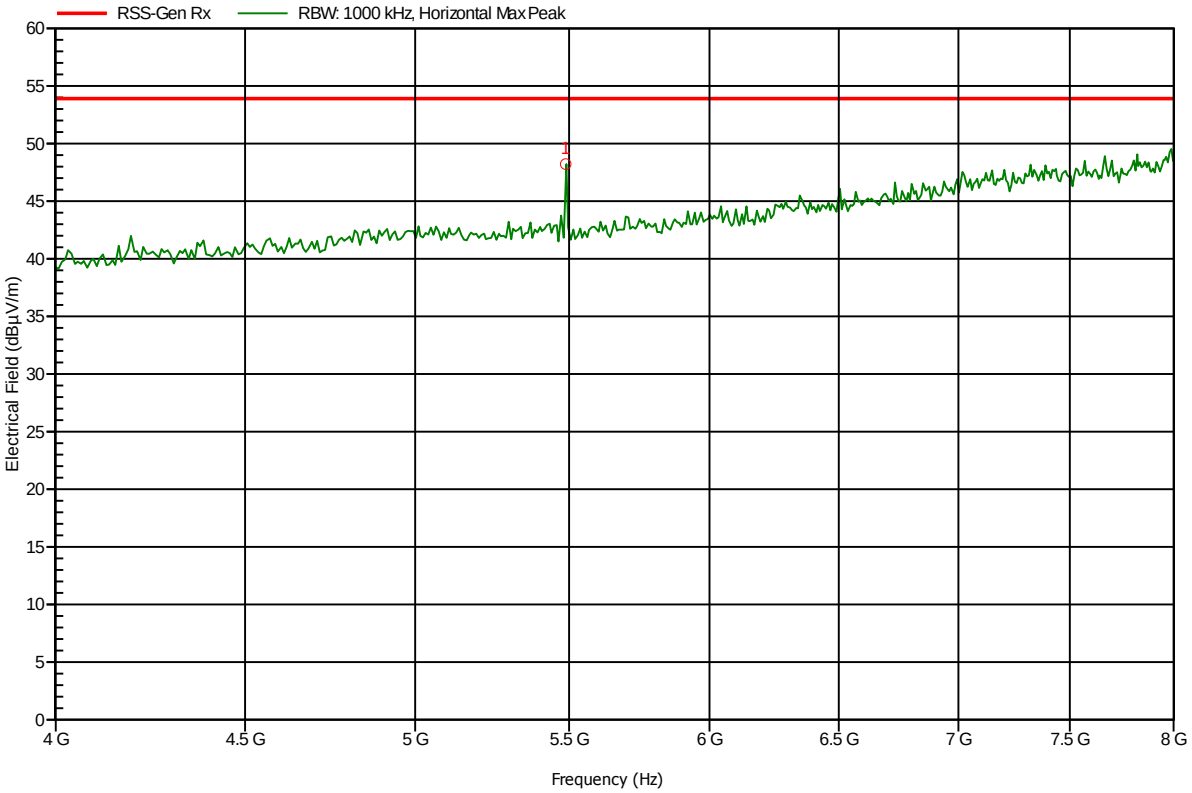

Frequency	Peak	Peak Limit	Peak Difference	Status
5.489 GHz	48.22 dBµV/m	53.9 dBµV/m	-5.68 dB	Pass