-

Electromagnetic Compatibility Test Report

Prepared in accordance with

FCC Part 15C, RSS-210 Issue 8

On

Wireless ceiling mounted occupancy sensor

CM PDT X WR P

Family of Devices

Sensor Switch, Inc.

900 Northrop Road

Wallingford, CT 06492 USA

Prepared by:

TUV Rheinland of North America, Inc.

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Manufacturer's statement - attestation

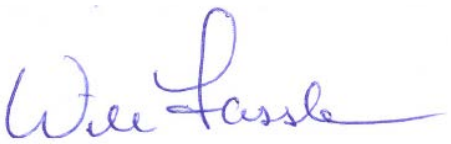
The manufacturer; Sensor Switch, Inc., as the responsible party for the equipment tested, hereby affirms:

a) That he has reviewed and concurs that the test shown in this report are reflective of the operational characteristics of the device for which certification is sought;

b) That the device in this test report will be representative of production units;

c) That all changes (in hardware and software/firmware) to the subject device will be reviewed.

d) That any changes impacting the attributes, functionality or operational characteristics documented in this report will be communicated to the body responsible for approving (certifying) the subject equipment.

William Fassbender	
Printed name of official	Signature of official
900 Northrop Road **Wallingford, CT 06492 USA**	**8 November 2013**
Address	Date
203-265-2842	**fozzy@sensorswitch.com**
Telephone number	Email address of official

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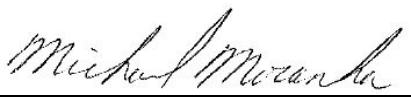
Client:	Sensor Switch, Inc. 900 Northrop Road Wallingford, CT 06492 USA	William Fassbender 203-265-2842 / 203-269-9621 fozzy@sensorswitch.com	
Identification:	Wireless ceiling mounted occupancy sensor	***Serial No.:***	Production Prototype
Test item:	CM PDT X WR P	***Date tested:***	5 Nov 2013
Testing location:	TUV Rheinland of North America 762 Park Avenue Youngsville, NC 27596-9470 U.S.A.	Tel: (919) 554-3668 Fax: (919) 554-3542	
Test specification:	**Emissions:** FCC Part 15, Subpart C, RSS-210 Issue 8: FCC Parts 15.207(a) and RSS-GEN 7.2.4, FCC Parts 15.249(d), 15.209, 15.215(c) and RSS-210 A2.9, RSS-GEN 7.2.1 FCC Part 15.249 and RSS-210 Annex 2.9, FCC Parts 15.249(a), 15.249(c), RSS-210 A2.9(a), FCC Part 2.1093 and RSS-102, Issue 4,		
Test Result	**The above product was found to be Compliant to the above test standard(s)**		

tested by: Mark Ryan	***reviewed by:*** Michael Moranha
06 December 2013  ***Date*** ***Signature***	06 December 2013  ***Date*** ***Signature***
Other Aspects:	**None**

Abbreviations: OK, Pass, Compliant, Complies = passed
Fail, Not Compliant, Does Not Comply = failed
N/A = not applicable

		Industry Canada
90552 and 100881	**Testing Cert #3331.05**	**2932H-1 and 2932H-2**

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1 General Information

1.1 Scope

This report is intended to document the status of conformance with the requirements of the FCC Part 15C, RSS-210 Issue 8 based on the results of testing performed on 5 Nov 2013 on the Wireless ceiling mounted occupancy sensor, Model No. CM PDT X WR P, manufactured by Sensor Switch, Inc. This report only applies to the specific samples tested under the stated test conditions. It is the responsibility of the manufacturer to assure that additional production units of this model are manufactured with identical or EMI equivalent electrical and mechanical components. This report is further intended to document changes and modifications to the EUT throughout its life cycle. All documentation will be included as a supplement.

1.2 Purpose

Testing was performed to evaluate the EMC performance of the EUT (Equipment Under Test) in accordance with the applicable requirements, procedures, and criteria defined in the application of regulations and application of standards listed in this report.

1.3 Revision History

Revision	Date	Description of Revision
--	8 Nov 2012	Initial Release
A	5 Dec 2013	Corrected Product Description.

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1.4 *Summary of Test Results*

Applicant	Sensor Switch, Inc. 900 Northrop Road Wallingford, CT 06492 USA	**Tel**	203-265-2842	**Contact**	William Fassbender
		Fax	203-269-9621	**e-mail**	fozzy@sensorswitch.com

Description	Wireless ceiling mounted occupancy sensor	**Model**	CM PDT X WR P
Serial Number	Production Prototype	**Test Voltage/Freq.**	3 VDC (Battery)
Test Date Completed:	5 Nov 2013	**Test Engineer**	Mark Ryan

Standards	Description	Severity Level or Limit	Worst-case Values	Test Result
FCC Part 15, Subpart C Standard	Radio Frequency Devices-Subpart C: Intentional Radiators	See called out parts below	See Below	**Complies**
RSS-210 Issue 8 Standard	Low-Power Licence-exempt Radiocommunication Devices Category I Equipment	See called out parts below	See Below	**Complies**
FCC Part 15.249 and RSS-210 Annex 2.9	Operation within the band 902 to 928 MHz	See called out parts below	See Below	Complies
FCC Parts 15.249(a), 15.249(c), RSS-210 A2.9(a)	Radiated Output Power for Fundamental and Harmonic Frequencies	Fund: Shall not exceed 50mV/m at 3m Harmonics: Shall not exceed 500µV/m (0.5 mV/m) at 3m, (unresticted bands)	25.91 mV/m 76.1 µV/m -	Complies
FCC Parts 15.249(d), 15.209, 15.215(c) and RSS-210 A2.9, RSS-GEN 7.2.1	Out-of-Band Spurious Emissions (EUT in Transmit Mode)	Below the applicable limits	31.37 dBµV	Complies
FCC Parts 15.207(a) and RSS-GEN 7.2.4	Conducted Emissions on AC Mains	NA, The EUT is battery operated only	NA	NA
RSS-210 A1.1.3	Occupied Bandwidth	99% BW ≤ 0.5% of center freq.	305 kHz	Complies
FCC Part 2.1093 and RSS-102, Issue 4	RF Exposure	SAR or MPE Requirements	0.74 mW	Complies

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2 Laboratory Information

2.1 Accreditations and Endorsements

2.1.1 US Federal Communications Commission

TUV Rheinland of North America located at 762 Park Avenue, Youngsville, NC 27596-9470 is accredited by the commission for performing testing services for the general public on a fee basis. This laboratory test facilities have been fully described in reports submitted to and accepted by the FCC (Registration No 90552 and 100881). The laboratory scope of accreditation includes: Title 47 CFR Part 15, and 18. The accreditation is updated every 3 years.

2.1.2 ILAC / A2LA

The laboratory has been assessed and accredited by A2LA in accordance with ISO Standard 17025:2005 (Certificate Number: 3331.05, Master Code: 134288). The scope of laboratory accreditation includes emission and immunity testing. The accreditation is updated annually.

2.1.3 Industry Canada

Registration No.: 2932H-1 The OATS has been accepted by Industry Canada to perform testing to 3 and to 10 meters, based on the test procedures described in ANSI C63.4-2009.

Registration No.: 2932H-2 The 5 meter chamber has been accepted by Industry Canada to perform testing to 3 meters, based on the test procedures described in ANSI C63.4-2009.

2.1.4 Japan – VCCI

The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) is a group that consists of Information Technology Equipment (ITE) manufacturers and EMC test laboratories. The purpose of the Council is to take voluntary control measures against electromagnetic interference from Information Technology Equipment, and thereby contribute to the development of a socially beneficial and responsible state of affairs in the realm of Information Technology Equipment in Japan. TUV Rheinland at the 762 Park Ave. Youngsville, N.C 27596 address has been assessed and approved in accordance with the Regulations for Voluntary Control Measures. (Laboratory Registration No: A-0034).

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2.1.5 Sample Calculation – radiated & conducted emissions

The field strength is calculated by subtracting the Amplifier Gain and adding the Cable Loss and Antenna Correction Factor to the measured reading. The basic equation is as follows:

Field Strength (dBμV/m) = RAW - AMP + CBL + ACF

Where: RAW = Measured level before correction (dBμV)

AMP = Amplifier Gain (dB)

CBL = Cable Loss (dB)

ACF = Antenna Correction Factor (dB/m)

$$\mu V/m = 10^{\frac{dB\mu V/m}{20}}$$

Sample radiated emissions calculation @ 30 MHz

Measurement +Antenna Factor–Amplifier Gain+Cable loss=Radiated Emissions (dBuV/m)

25 dBuV/m + 17.5 dB – 20 dB + 1.0 dB = 23.5 dBuV/m

2.2 Expanded Measurement Uncertainty Emissions

Per CISPR 16-4-2:2011	**U_{lab}**	**U_{cispr}**
Radiated Disturbance @ 3m, 10m		
30 MHz – 1,000 MHz	Horz. 3m = 4.52, Horz. 10m = 4.51	5.2 dB
1.0 GHz – 6.0 GHz	3m = 4.25	5.2 dB
6.0 GHz – 18.0 GHz	3m = 4.93	5.5 dB
The estimated combined standard uncertainty for harmonic current and flicker measurements; PM6000 is ± 2.5%.		Per CISPR 16-4-2

2.3 Calibration Traceability

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Measurement method complies with ANSI/NCSL Z540-1-1994 and ISO Standard 17025:2005. Equipment calibration records are kept on file at the test facility.

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2.4 Software Used

Manufacturer	Name	Version
Quantum Change/EMC Systems LLC.	Tile	3.2U
TUV	Alt "R"	1
TUV	Alt "C"	1

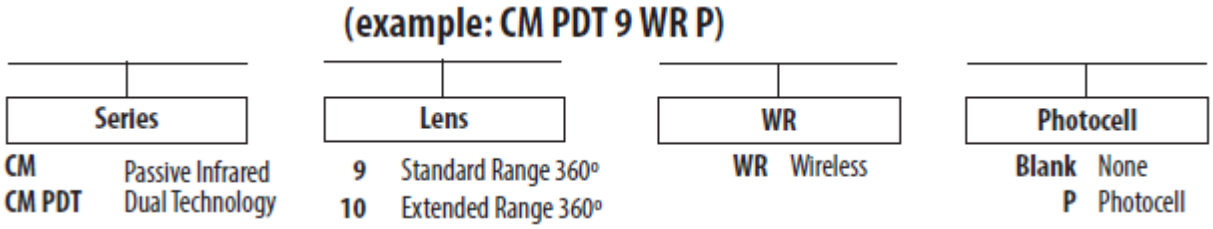
2.5 Measurement Equipment Used

Equipment	Manufacturer	Model #	Serial/Inst #	Last Cal dd/mm/yy	Next Cal dd/mm/yy
Radiated Emissions (5 Meter Chamber and Bench top)					
Receiver, EMI	Rohde & Schwarz	ESIB40	100043	13-Aug-13	13-Aug-14
Amplifier, preamp	Agilent Technologies	8449B	3008A01480	14-Aug-13	14-Aug-15
Ant. BiconiLog	EMCO	3142	1006	14-Nov-12	14-Nov-14
Antenna Horn 1-18GHz	EMCO	3115	5770	26-Sep-12	26-Sep-14
Cable, Coax	MicroCaox	MKR300C-0-0-1200-500500	002	14-Aug-13	14-Aug-14
Cable, Coax	MicroCaox	MKR300C-0-1968-500310	005	14-Aug-13	14-Aug-14
Cable, Coax	MicroCaox	UFB29C-1-5905-50U-50U	009	14-Aug-13	14-Aug-14
General Laboratory Equipment					
Meter, Multi/ Clamp	Fluke	381	14250057	13-Aug-13	13-Aug-14
Meter, Temp/Humid/Barom	ExTech	SD700	Q677933	06-May-13	06-May-14

3 Product Information

3.1 Product Description

The CM PDT X WR P is part of a family of eight wireless ceiling mountable occupancy sensors. The differences are in the type of sensor(s) and lens. The wireless portion of all devices is identical.



3.2 Equipment Modifications

No modifications were needed to bring product into compliance.

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4 Radiated Emissions in Transmit mode

4.1 Radiated emissions - FCC Parts 15.249, RSS-210 A2.9(a)

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following limits:
Fundamental Frequency: 2400 to 2483.5 MHz – 50 mV/m (94 dB µV/m) at 3m.
Harmonic Frequencies – 500 µV/m (54 dB µV/m) at 3m.

4.1.1 Over View of Test

Results	**Complies** (as tested per this report)				**Date**	6 November 2013	
Standard	FCC Parts 15.205, 15.209, 15.215(c), 15.249(a), 15.249(c), 15.249(d) RSS-210 A2.9, and RSS-GEN 7.2.1						
Product Model	CM PDT X WR P			**Serial#**	Production Prototype		
Test Set-up	Tested in a 5m Semi Anechoic chamber, placed on a 1.0m x 1.5m non-conductive table 80cm above the ground plane on a turn-table.						
EUT Powered By	3 VDC (Battery)	**Temp**	72º F	**Humidity**	40%	**Pressure**	997 mbar
Perf. Criteria	(Below Limit)		**Perf. Verification**		Readings Under Limit		
Mod. to EUT	None		**Test Performed By**		Mark Ryan		

4.1.2 Test Procedure

Testing was performed in accordance with 47 CFR Part 15, ANSI C63.10:2009, RSS-GEN Issue 2.

These test methods are listed under the laboratory's A2LA Scope of Accreditation.

4.1.3 Deviations

Since all emissions outside the band are within the limits of FCC Part 15.209 and RSS-GEN 7.2.1, the emissions shown below are also compliant with FCC Parts 15.205, 15.209, 15.215(c), 15.249(d), RSS-210 A8.5, and RSS-GEN 7.2.1.

4.1.4 Final Test

All final radiated spurious emissions measurements were below (in compliance) the limits.

The worst –case emissions are shown below. All other emissions are on file at TUV Rheinland.

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4.1.4.1 Worst Case Emissions inside the Frequency Band

Emission Freq (MHz)	ANT Polar (H/V)	ANT Pos (m)	Table Pos (deg)	FIM Value (dBuV)	Amp Gain (dB)	Cable Loss (dB)	ANT Factor (dB/m)	E-Field Value (dBuV/m)
Orientation 1								
902.88	H	1.4	0	79.14	0.00	3.56	22.50	105.20
902.88	V	1.5	45	69.54	0.00	3.56	22.50	95.60
Orientation 2								
902.88	H	1.4	190	79.61	0.00	3.56	22.50	105.67
902.88	V	1.5	76	69.91	0.00	3.56	22.50	95.97
Orientation 3								
902.88	H	1.4	0	68.45	0.00	3.56	22.50	98.51
902.88	V	1	206	82.21	0.00	3.56	22.50	108.27
Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor ± Uncertainty								
Notes: This highlighted frequency and orientation was worst case								

The Highest measured emission (902.88 MHz) was 108.27 dBµV/m at 3m using a peak detector.

4.1.4.2 Maximum Time-weighted Emission:

Page 17 of the original test report, an averaging factor of -20 dB will be used. Refer to Nemko-CCL's test report number 224951-2.2 for the EnOcean Modular Device, FCCID: SZV-STM300U and ICID: 5713A--STM300U.

Using the worst case Peak field show in table above:

Emission Freq (MHz)	E-Field Peak Value (dBuV/m)	Averaging Factor (-20dB)	E-Field Avg. Value (dBuV/m)	Equivalent Avg Value (mV/m)	Spec Limit (mV)	Equivalent Spec Limit (dBuV/m)	Spec Margin (dB)	Spec Margin (mV)
902.88	108.27	-20	88.27	25.91	50.0	93.98	-5.71	-24.09

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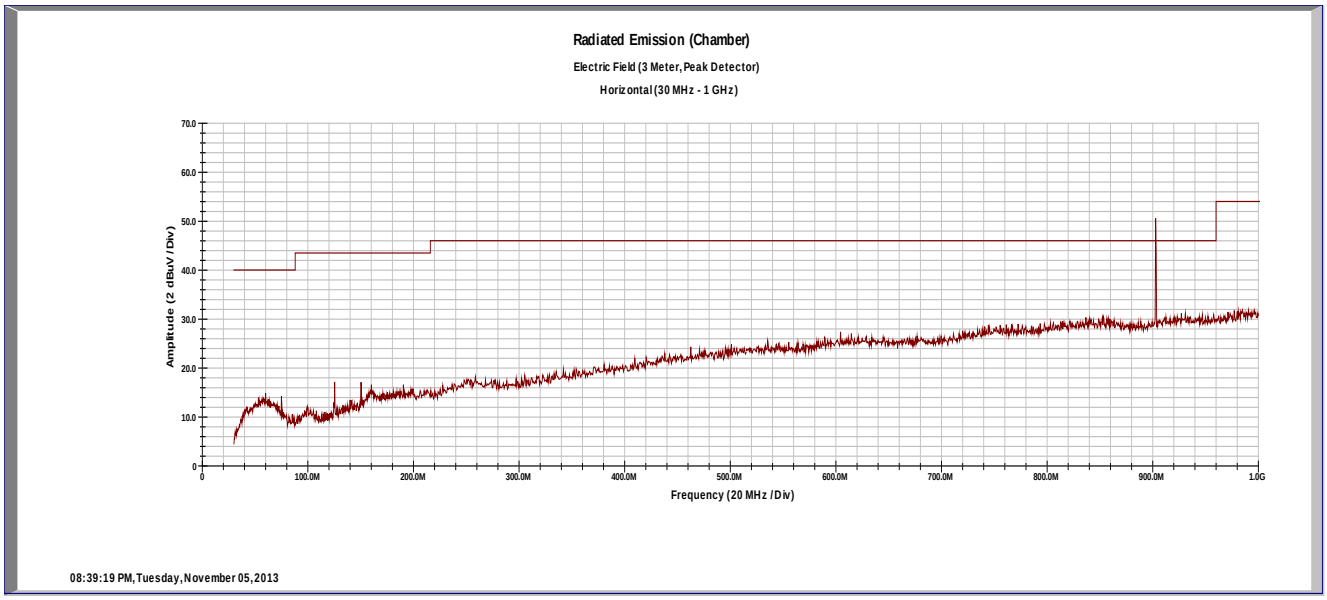
4.1.4.3 Emissions Outside the Frequency Band:

Radiated Emissions – 30 MHz to 1000 MHz
Horizontal



Emission Freq (MHz)	ANT Polar (H/V)	ANT Pos (m)	Table Pos (deg)	FIM Value (dBuV)	Amp Gain (dB)	Cable Loss (dB)	ANT Factor (dB/m)	E-Field Value (dBuV/m)	Spec Limit (dBuV/m)	Spec Margin (dB)

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 1.6dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes: All emissions were below the noise floor of the instrumentation.
The signals shown below 200 MHz are anomalies in the preamp of the measuring spectrum analyzer.
A notch filter at the transmitter fundamental frequency (902.875 MHz) was used.

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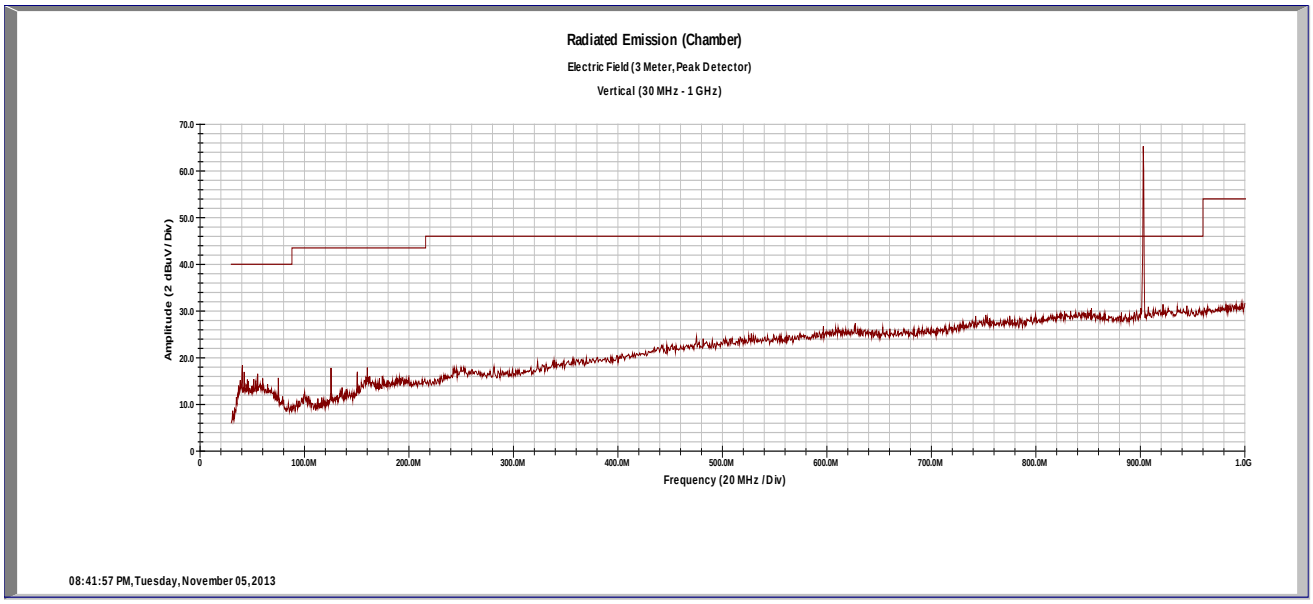
Radiated Emissions – 30 MHz to 1000 MHz

Vertical



Emission Freq (MHz)	ANT Polar (H/V)	ANT Pos (m)	Table Pos (deg)	FIM Value (dBuV)	Amp Gain (dB)	Cable Loss (dB)	ANT Factor (dB/m)	E-Field Value (dBuV/m)	Spec Limit (dBuV/m)	Spec Margin (dB)

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 1.6dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes: All emissions were below the noise floor of the instrumentation.
The signals shown below 200 MHz are anomalies in the preamp of the measuring spectrum analyzer.
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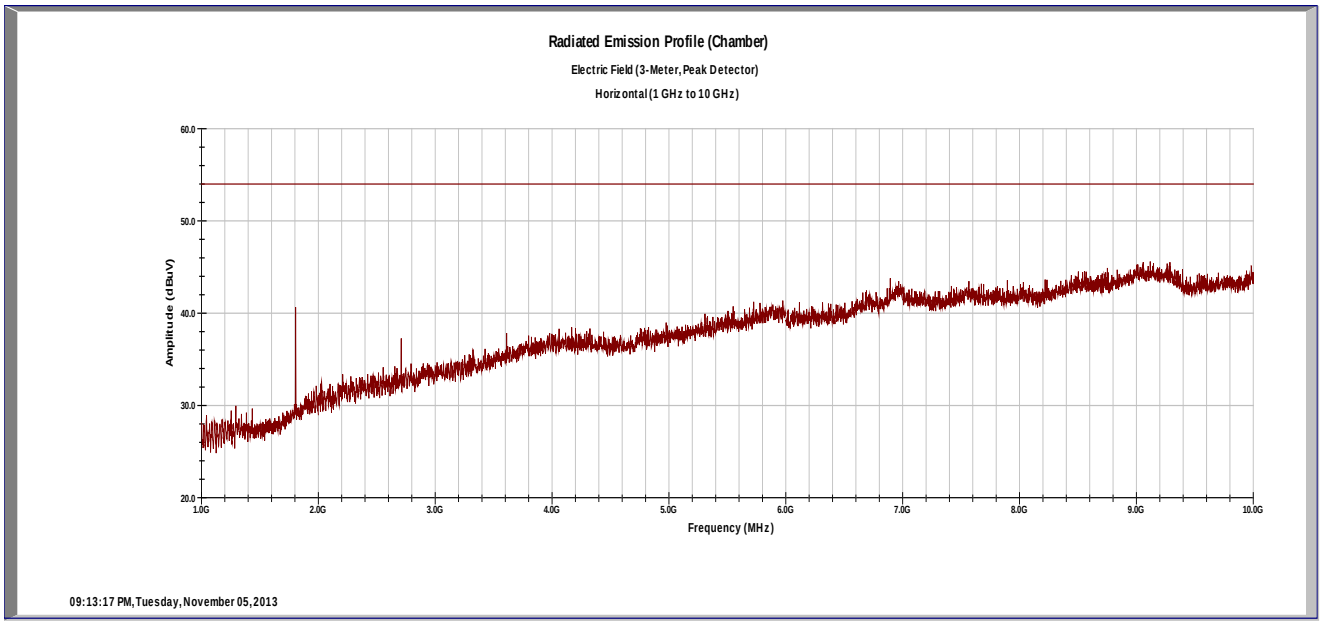
Worst Case Radiated Emissions: Ch 2 – 1 to 10 GHz
Horizontal



Emission Freq (MHz)	ANT Polar (H/V)	ANT Pos (m)	Table Pos (deg)	FIM Value (dBuV)	Amp Gain (dB)	Cable Loss (dB)	ANT Factor (dB/m)	E-Field Value (dBuV/m)	Spec Limit (dBuV/m)	Spec Margin (dB)
1805.75	V	1	246	38.06	34.23	6.79	27.01	37.63	54.00	-16.37
1805.75	V	1	246	49.12	34.23	6.79	27.01	48.69	74.00	-25.31
2708.63	V	1.1	211	29.13	34.24	8.32	29.01	32.22	54.00	-21.78
2768.63	V	1.1	211	42.14	34.22	8.42	29.06	45.40	74.00	-28.60
3611.50	V	1	355	25.66	33.79	9.70	31.69	33.25	54.00	-20.75
3611.50	V	1	355	38.13	33.79	9.70	31.69	45.72	74.00	-28.28

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 1.6dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes: The highlighted signal shows the worst case average emission. It is a harmonic at **37.63 dBµV /m** (avg) which is equivalent to **76.1 µV/m** (at 3m)

The **GREEN** emissions are using the Average detector
The **Blue** emissions are using the Peak detector

All spurious and harmonic emissions are below the level of Part 15.209, including those not in restricted bands.
This orientation provided the worst case Harmonic and Spurs radiation
A tunable notch filter at the transmitter fundamental frequency was used.

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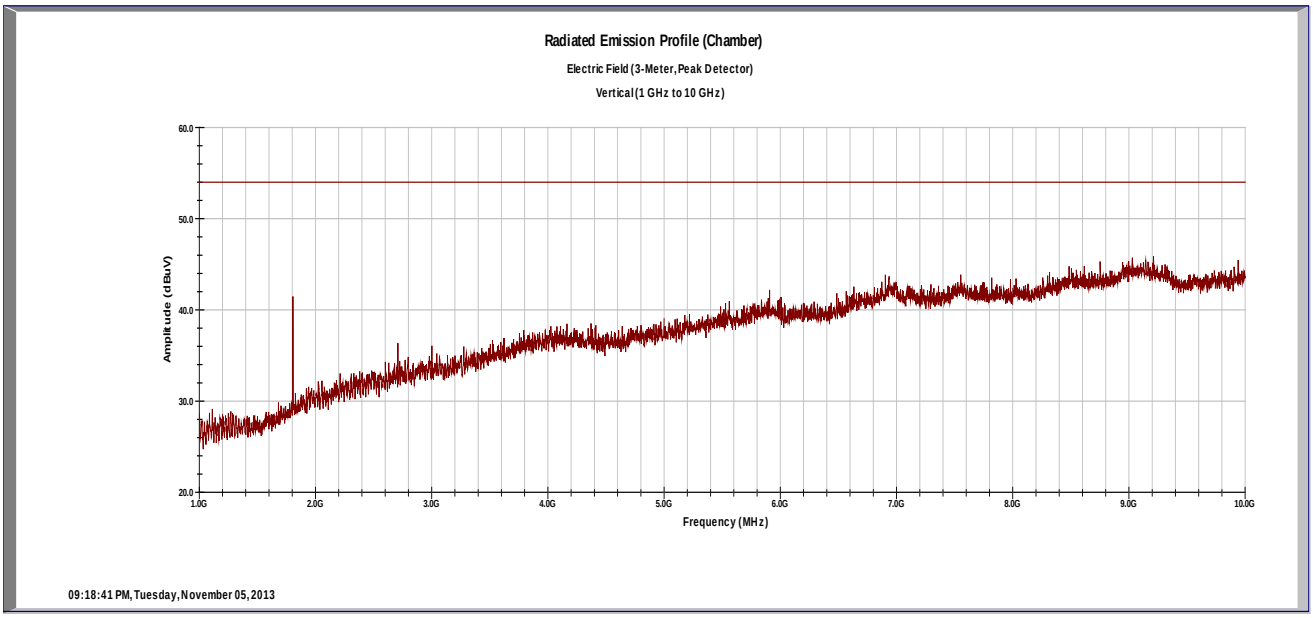
Worst Case Radiated Emissions: Ch 2 – 1 to 10 GHz

Vertical



Emission Freq (MHz)	ANT Polar (H/V)	ANT Pos (m)	Table Pos (deg)	FIM Value (dBuV)	Amp Gain (dB)	Cable Loss (dB)	ANT Factor (dB/m)	E-Field Value (dBuV/m)	Spec Limit (dBuV/m)	Spec Margin (dB)
1805.75	V	1.1	46	36.60	34.23	6.79	27.01	36.17	54.00	-17.83
1805.75	V	1.1	76	48.08	34.23	6.79	27.01	47.65	74.00	-26.35
2708.63	V	1	297	28.18	34.24	8.32	29.01	31.27	54.00	-22.73
2768.63	V	1	297	41.08	34.22	8.42	29.06	44.34	74.00	-29.66

Spec Margin = E-Field Value - Limit, E-Field Value = FIM Value - Amp Gain + Cable Loss + ANT Factor ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 1.6dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Notes:

The **GREEN** emissions are using the Average detector
The **Blue** emissions are using the Peak detector

All spurious and harmonic emissions are below the level of Part 15.209, including those not in restricted bands.
This orientation provided the worst case Harmonic and Spurs radiation
A tunable notch filter at the transmitter fundamental frequency was used.

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4.2 Band Edge requirements - FCC Part 15.249(d), RSS-210 2.2

4.2.1 Test Over View

Results	**Complies** (as tested per this report)				**Date**	6 November 2013	
Standard	FCC Part 15.249(d), RSS 210 2.2						
Product Model	CM PDT X WR P		**Serial#**	Production Prototype			
Test Set-up	Direct Measurement from antenna port						
EUT Powered By	3 VDC (Battery)	**Temp**	72º F	**Humidity**	35%	**Pressure**	1015 mbar
Perf. Criteria	(Below Limit)		**Perf. Verification**		Readings Under Limit		
Mod. to EUT	None		**Test Performed By**		Mark Ryan		

4.2.2 Test Procedure

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Sec. 15.209, whichever is the lesser attenuation.

4.2.3 Deviations

There were no deviations from the test methodology listed in the test plan.

4.2.4 Final Test

The EUT met the performance criteria requirement as specified in the standards.

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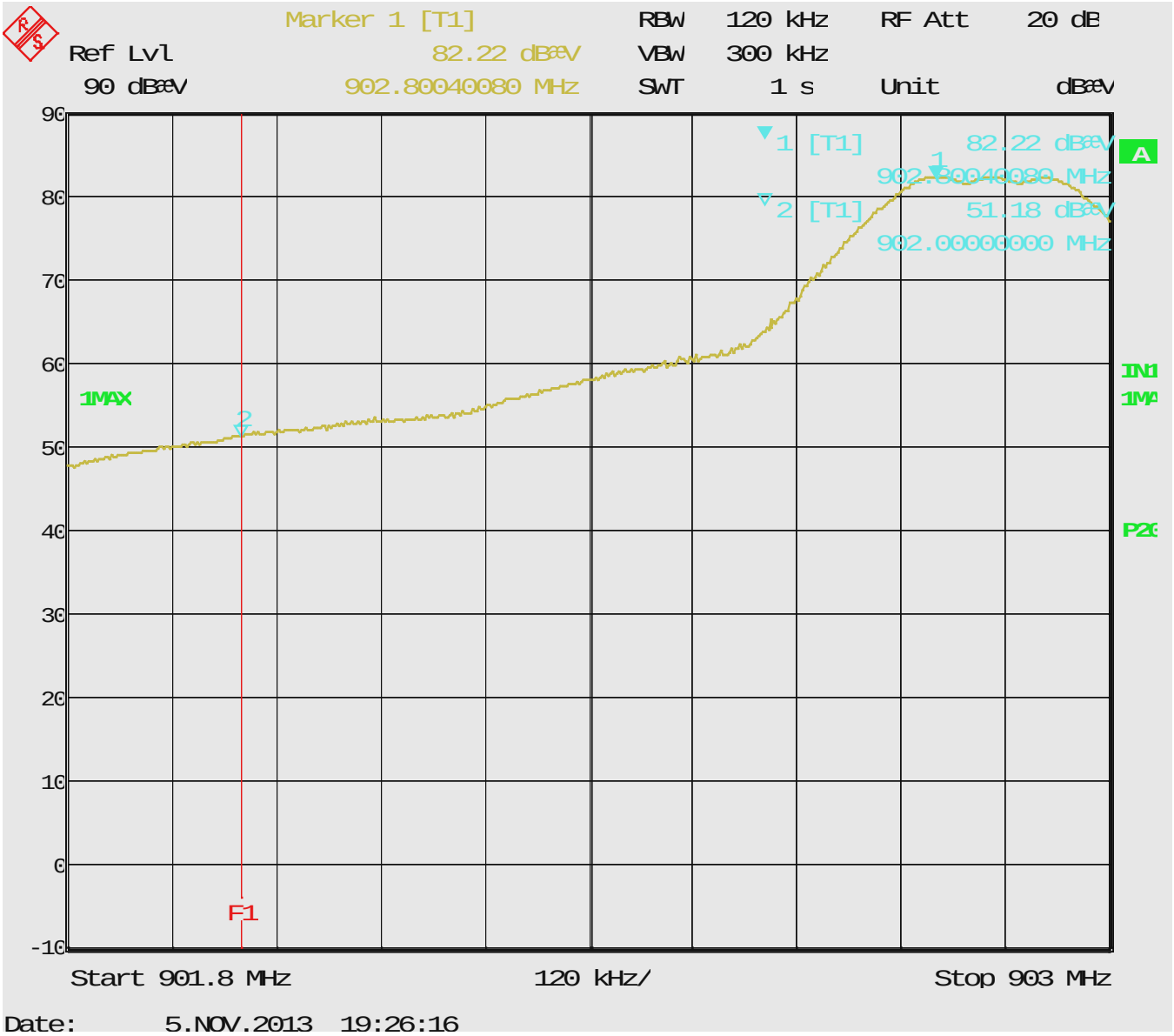

Notes: Measured using the Peak detector. Band Edge is at 902 MHz (Marker 2 and Line F1).

The nearest restricted band (614 MHz) is 288 MHz below the band edge

The emissions at the band edge is more than -31dBc at 902 MHz.

Figure 1: Lower Band Edge Measurement (Radiated Emission)

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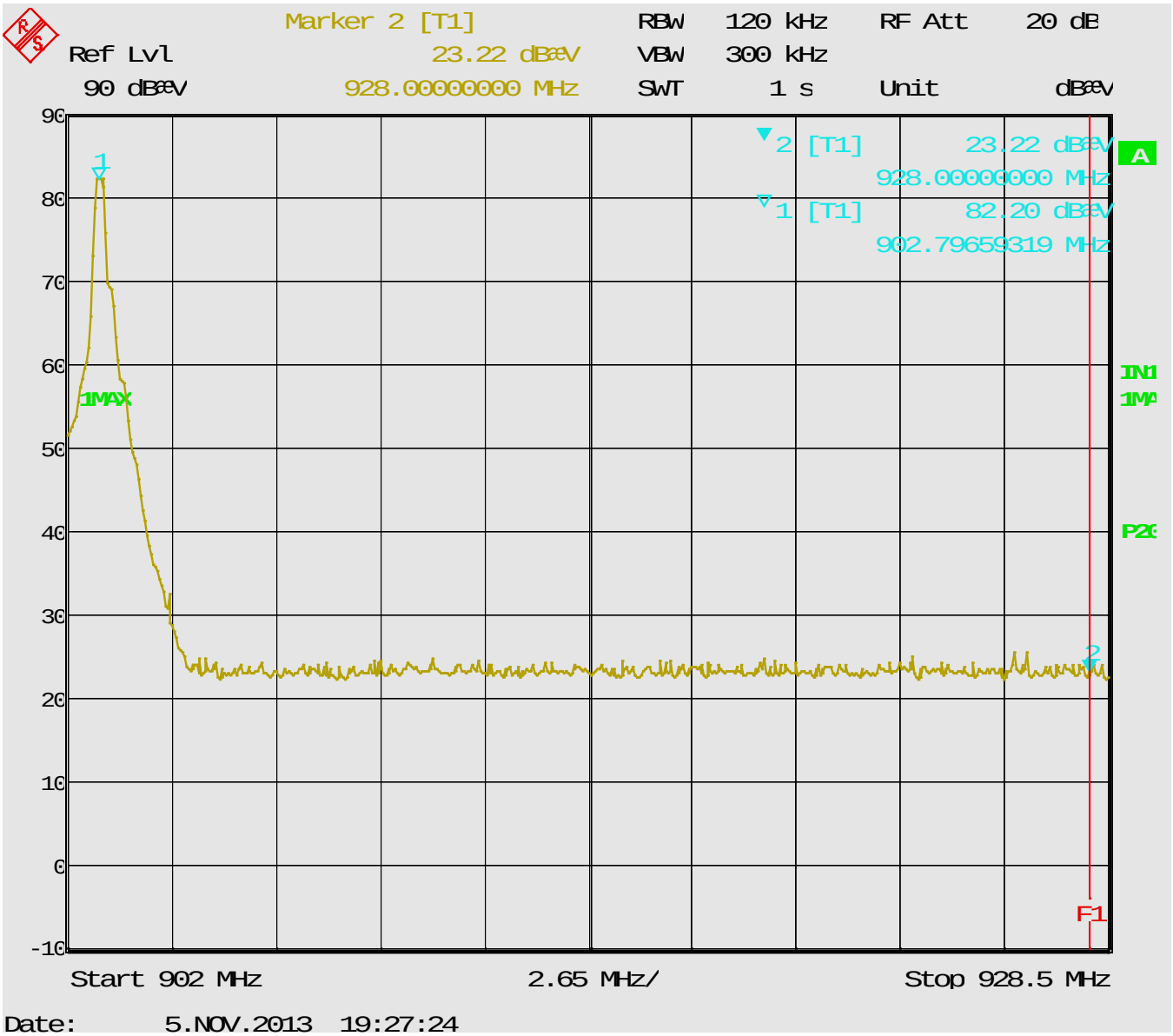

Notes: Measured using the Peak detector. Band Edge is at 928 MHz (Line F1 and Marker 2).

The nearest restricted band (960 MHz) which is 32 MHz above the band edge

The emission at the band edge is more than -58dBc at 928 MHz.

Figure 2: Upper Band Edge Measurement (Radiated Emission)

The EUT is compliant with the rules.

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4.3 Conducted Emissions on AC Mains – FCC 207(a) and RSS-GEN 7.2.4

This test measures the electromagnet levels of spurious signals generated by the EUT on the AC power line that may affect the performance of other nearby electronic equipment.

4.3.1 Over View of Test

Results	**NA** EUT is battery operated only				**Date**	NA	
Standard	FCC Parts 15.207(a) and RSS-GEN 7.2.4						
Product Model	CM PDT X WR P			**Serial#**	NA		
Test Set-up	Tested in shielded room. EUT placed on table, see test plans for details						
EUT Powered By	3 VDC (Battery)	**Temp**	NA	**Humidity**	NA	**Pressure**	NA
Frequency Range	150 kHz – 30 MHz						
Perf. Criteria	(Below Limit)	**Perf. Verification**	Readings Under Limit for L1 & Neutral				
Mod. to EUT	None	**Test Performed By**	NA				

4.3.2 Test Procedure

Conducted emissions tests were performed using the procedures of ANSI C64.4: 2009, including methods for signal maximizations and EUT configuration. The photos included with the report show the EUT in its maximized configuration.

4.3.3 Deviations

The Test sample is battery operated only. It does not have provision for external power of any kind.

4.3.4 Final Test

This this is not applicable for the device submitted for testing

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4.4 99% Power Bandwidth

For the purpose of Section A1.1, the 99% bandwidth shall be no wider than .25% of the center frequency for devices operating between 70-900MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. This device operates above 900 MHz.

4.4.1 Test Over View

Results	**Complies** (as tested per this report)					**Date**	6 November 2013
Standard	RSS-210 Section A1.1.3						
Product Model	Wireless ceiling mounted occupancy sensor			**Serial#**	Production Prototype		
Test Set-up	Direct Measurement from antenna port						
EUT Powered By	3 VDC (Battery)	**Temp**	72º F	**Humidity**	35%	**Pressure**	1015 mbar
Perf. Criteria	(Below Limit)		**Perf. Verification**		Readings Under Limit		
Mod. to EUT	None		**Test Performed By**		Mark Ryan		

4.4.2 Test Procedure

Using the procedures of RSS-GEN section 4.6.1, the 3 kHz resolution bandwidth is 1% of the 300 kHz span. The 10 kHz video bandwidth is over 3 times that of the resolution bandwidth.

The limit of the bandwidth would be 0.5% of 902.875 MHz or 4.51 MHz.

4.4.3 Deviations

None.

4.4.4 Final Results

The measured 99% Power Bandwidth is 305 kHz, which is well below the 4.51 MHz bandwidth limit.

The EUT met the performance criteria requirement as specified in the test plan of this report and in the standards.

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4.4.5 Final Data

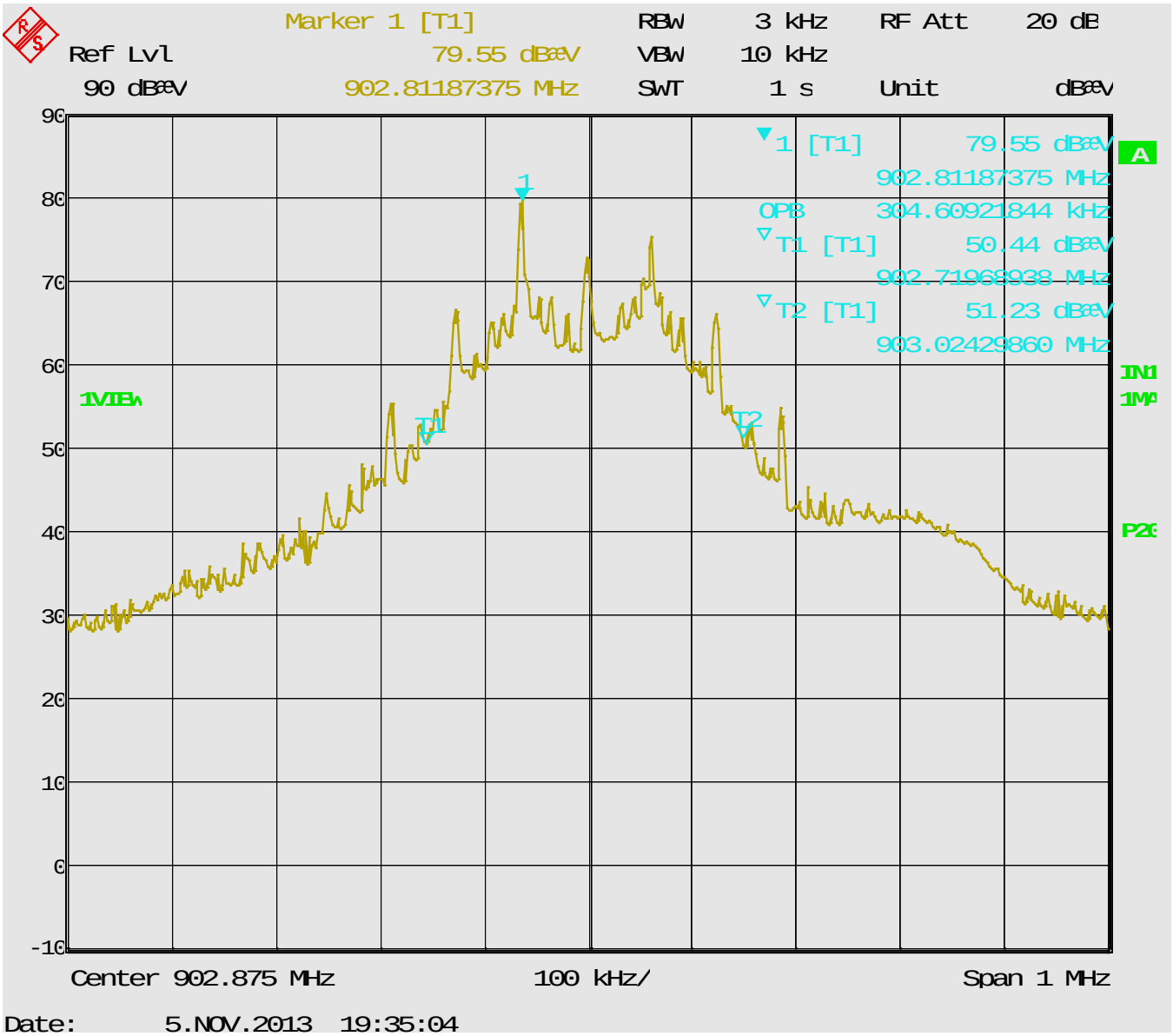

Figure 3 – 99% Power Bandwidth = 305 kHz

Span = 300 kHz, RBW = 3 kHz, VBW = 10 KHz

The EUT is compliant to the requirements of RSS-210 A1.1.3

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5 RF Exposure

5.1 Exposure Requirements – FCC KDB # 447498 DO1 and RSS-102 Issue 4

FCC KDB # 447498 DO1 v05r01 - Mobile and Portable Device RF Exposure and Procedures and Equipment Authorization Policies, Appendix A illustrates a table of approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances.

RSS-102 section 2.5.1 states that a device is exempt from SAR evaluation if the frequency is from 3 kHz up to 1 GHz inclusively, and with output power (i.e. the higher of the conducted or radiated (EIRP.) source-based, time-averaged output power) that is less than or equal to 200 mW for general public use…".

5.1.1 Test Procedure determination

If the antenna is located > 20cm from the user, then an MPE calculation is acceptable.

If the antenna is located < 20cm from the user, then a SAR evaluation is required.

5.1.2 Evaluation

The EUT is a ceiling mounted device that is normally separated from human contact, however it does utilize a pairing switch which will require human contact of less than 20cm from the user, therefore a SAR evaluation is required.

5.1.2.1 Evaluation for FCC

FCC 447498 D01 Mobile Portable RF Exposure v05r01, Appendix A lists a SAR test exclusion threshold of 16mW at 900MHz for a worst-case separation distance of 5mm.

The minimum power that requires SAR testing is at 900 MHz at 5mm distance is; 16 mW (Worst case).

The maximum EIRP peak power output of the EUT is: -1.28 dBm which is equivalent to 0.74 mW.

The EUT is well below the 16 mW power level required for SAR Testing.

5.1.2.2 Evaluation for Industry Canada

The time averaged peak power output of the EUT is: -1.28 dBm which is equivalent to 0.74 mW.

The EUT is well below the 200mW power level required for SAR Testing.

5.1.3 Conclusion

SAR testing is not required for either FCC or Industry Canada.

Note: the -1.28 dBm power level has been time-averaged, see page 11 of this report.

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5.1.4 Calculated EIRP Level

Notes: The EUT does not have a means to make direct measurements.

Using the maximum time averaged field of = 93.98 dBµV/m at 3m (See page 11 of this report).

Per the equation in section 5.4.2 of FCC Document # 558074 D01 Meas Guidance v01;

EIRP = E + 20Log(d) - 104.8, where:

EIRP = the equivalent isotropic radiated power in dBm,

E = time averaged electric field strength in dBµV /m; E = 93.98 dBµV /m, or 0.050 V/m

d = measurement distance in meters; d = 3,

EIRP = 93.98 + 20Log(3) – 9 = 93.98 + 9.54 - 104.8 = **-1.28 dBm** which is equivalent to: **0.74 mW**.

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