Underwriters Laboratories Inc.
333 Pfingsten Rd.
Northbrook, IL 60062

www.ul.com/emc
(847) 272-8800

Job Number:	1001145700
Project Number:	09CA32738A
File Number:	MC16272
Date:	October 05, 2009
Model:	LRA1720

Electromagnetic Compatibility Test Report

For

Philips Lighting Electronics N. A.

Test Report Details

Tests Performed By:	**Underwriters Laboratories Inc.** **333 Pfingsten Rd.** **Northbrook, IL 60062**
Tests Performed For:	**Philips Lighting Electronics N. A.** **10275 West Higgins Road** **Rosemont, IL 60018**
Applicant Contact: Phone: E-mail:	**Richard Haring** **(847) 390-5195** **richard.haring@philips.com**
Test Report Date:	**October 05, 2009**
Product Type:	**Wireless Wall Switch**
Product standards	**FCC Part 15, Subpart B**
Model Number:	LRA1720
EUT Category:	**Lighting Products**
Testing Start Date:	**September 21, 2009**
Date Testing Complete:	**September 24, 2009**
Overall Results:	**Compliant**

Report Directory

Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
None			

1.0 G E N E R A L - Product Description

1.1 Equipment Description

The Philips OccuSwitchTM Wireless Control System is an advanced wireless occupancy sensor system that automatically turns lights off when a workspace is unoccupied. The system consists of a wireless battery-powered ceiling mounted sensor that communicates to a wall switch. Multiple sensors and switches can be used for additional coverage. Compliance to California Title 24 Energy Efficiency Standards is easily accomplished with a configurable mode for manual-on / auto-off operation.

1.2 Device Configuration During Test

1.2.1 Equipment Used During Test:

Use	Product Type	Manufacturer	Model	Comments
EUT	OccuSwitch	Philips Lighting Electronics N. A.	LRA1720	None

Note: **EUT** - Equipment Under Test, **AE** - Auxiliary/Associated Equipment, or **SIM** - Simulator (Not Subjected to Test)

1.2.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None
1	Mains	AC	Y	N	None
2	Antenna	-	N	N	None

Note:
AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port (Not Involved in Process Control)
TP = Telecommunication Ports

1.2.3 EUT Internal Operating Frequencies:

Frequency (MHz)	Description
32	X-Tal Oscillator
0.032768	Sleep Timer Oscillator
0.032	RC - Oscillator

1.2.4 Power Interface:

Mode # /Rated	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
1	120	-	-	AC-60	1	None
2	277	-	-	AC-60	1	None

1.3 EUT Configurations

Mode #	Description
1	EUT was configured on 80cm wooden table and connected to LISNs. The AC output of the switch was not terminated into a load.
2	EUT was configured on 80cm Styrofoam with cable routed vertically into a power source. The AC output of the switch was not terminated into a load
3	EUT was configured on bench top with it's RF output connected directly into a measuring device (Oscilloscope or Spectrum Analyzer)

1.4 EUT Operation Modes

Mode #	Description
1	EUT was set to continuously transmit on a single channel with full output power.
2	EUT was set to receive on a single channel. This is also considered as standby mode.
3	EUT was loaded with normal software. A multiple attempts were made to create a link between different devices (other switch and a sensor) to produce the worst case duty cycle factor.

2.0 Summary

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by Underwriters Laboratories Inc. in accordance with the procedures stated in each test requirement and specification. The applicant determined the list of tests performed were applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

2.1 Deviations from standard test methods

None

2.2 Device Modifications Necessary for Compliance

None

2.3 Reference Standards

Product is considered Class A per Part 15, Subpart B

Standard Number	Standard Name	Standard Date
FCC Part 15, Subpart B & 15.247	Code of Federal Regulations, Part 15, Radio Frequency Devices	2009
RSS-210, Issue 7	Low-Power License-Exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment	June 2007
RSS-Gen, Issue 2	General Requirements and Information for the Certification of Radiocommunication Equipment	June 2007

2.4 Results Summary

Requirement – Test	References	Result (Compliant / Non-Compliant)*
Conducted Emissions - Mains	47 CFR Part 15.107, 15.207 RSS-Gen 7.2.2	Compliant
Radiated Emissions - Digital	47 CFR Part 15.209 RSS-Gen 7.2.3	Compliant
Spurious Emissions (Antenna Conducted and Radiated)	47 CFR Part 15.247(d) RSS-210, A8.5 RSS-Gen 7.2.1 and 7.2.3	Compliant
Bandedge Compliance	47 CFR Part 15.247(d) RSS-210, A8.5	Compliant
Duty Cycle and Duty Cycle Factor	47 CFR Part 15.35(c) RSS-Gen 4.5	Compliant
6dB Bandwidth	47 CFR Part 15.247(a)(2) RSS-210, A8.2(a)	Compliant
Peak Power	47 CFR Part 15.247(b)(3) RSS-210, A8.4(4)	Compliant
Power Spectral Density	47 CFR Part 15.247(e) RSS-210, A8.2(b)	Compliant
99% Occupied Bandwidth	RSS-Gen, 4.6.1	Compliant

Test Engineer:

Bartlomiej Mucha (Ext.41216)
Senior Project Engineer
International EMC Services
Conformity Assessment Services-

Reviewer:

Jack L. Steiner(Ext.42307)
Section Manager
International EMC Services
Conformity Assessment Services

3.0 Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or the manufacturers' recommendation, whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

4.0 EMISSIONS TEST RESULTS

The emissions tests were performed according to following regulations:

---------- United States ----------

Code of Federal Regulations Title 47	Part 15, Subpart B, Radio Frequency Devices

---------- Canada ----------

Industry Canada	Spectrum Management and Telecommunications Radio Standards Specifications

Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be verified at the time the test is conducted.

Ambient Temperature, °C	22.5 ± 2.5	Relative Humidity, %	45 ± 15	Barometric Pressure, mBar	950 ± 150

4.1 Test Conditions and Results – MAINS TERMINAL – CONDUCTED EMISSIONS

Test Description	Measurements were made on a ground plane. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.

Basic Standard	47 CFR Part 15.107, 15.207 RSS-Gen 7.2.2	
UL LPG	80-EM-S0026	
	Frequency range on each side of line	Measurement Point
Fully configured sample scanned over the following frequency range	150kHz to 30MHz	Mains

Limits - Class A

Frequency (MHz)	Limit (dBµV)	
	Quasi-Peak	Average
0.15-0.5	79	66
0.5-30	73	60

Supplementary information: None

Table 1 Conducted Emissions EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1 & 2	1	1

Supplementary information: None

Table 2 Conducted Emissions Test Equipment

Description	Manufacturer	Model	Identifier
EMI Test Receiver	Rohde & Schwarz	ESCI	EMC4328
Transient Limiter	Electro-Metrics	EM7600-2	EMC4224
HighPass Filter	Solar Electronics	2803-150	885551
Attenuator	HP	8494B	2831A00838
LISN - L1	Solar	8602-50-TS-50-N	EMC4052
LISN - L2	Solar	8602-50-TS-50-N	EMC4064
FILE USED FOR TESTING			
CISPR 22_11 w_ Dongle Line 1and2.TST			

Figure 1 Test Setup for Conducted Emissions

Figure 2 Conducted Emissions Graph 120V/60Hz

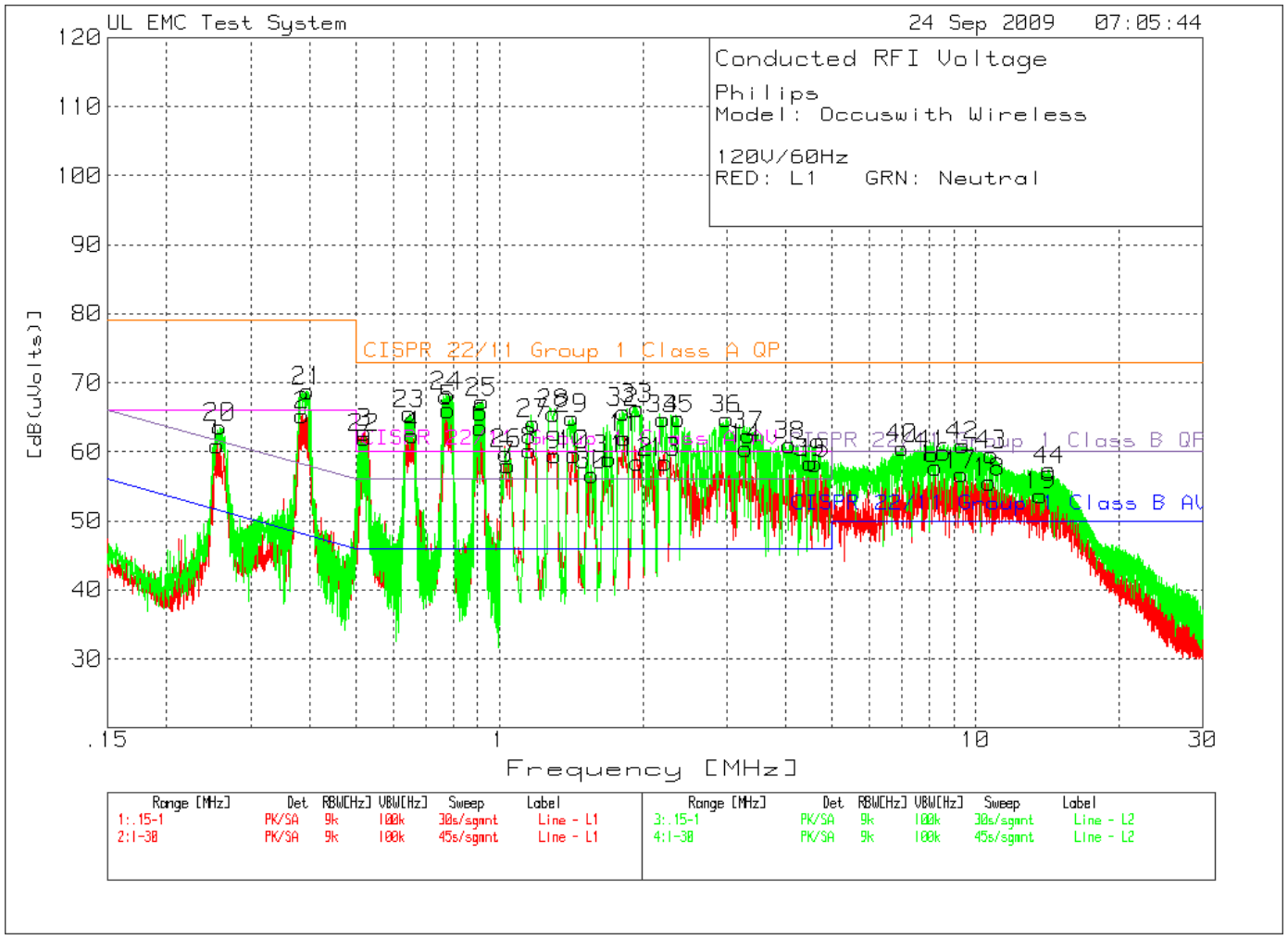


Table 3 Conducted Emissions Data Points 120V/60Hz

Philips
Model: Occuswith Wireless
120V/60Hz
RED: L1 GRN: Neutral

Line – Peak Scan Data

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
1	.25505	49.06 pk	11.1	.8	60.96	79	66	61.6	51.6	-	-
				Margin [dB]		-18.04	-5.04	-.64	9.36	-	-
2	.38444	54.05 pk	10.7	.5	65.25	79	66	58.2	48.2	-	-
				Margin [dB]		-13.75	-.75	7.05	17.05	-	-
3	.52064	51.9 pk	10.6	.3	62.8	73	60	56	46	-	-
				Margin [dB]		-10.2	2.8	6.8	16.8	-	-
4	.65655	51.62 pk	10.5	.3	62.42	73	60	56	46	-	-
				Margin [dB]		-10.58	2.42	6.42	16.42	-	-
5	.78028	55.42 pk	10.5	.2	66.12	73	60	56	46	-	-
				Margin [dB]		-6.88	6.12	10.12	20.12	-	-
6	.91279	52.86 pk	10.5	.2	63.56	73	60	56	46	-	-
				Margin [dB]		-9.44	3.56	7.56	17.56	-	-
7	1.04346	47.36 pk	10.5	.2	58.06	73	60	56	46	-	-
				Margin [dB]		-14.94	-1.94	2.06	12.06	-	-
8	1.15937	49.47 pk	10.5	.2	60.17	73	60	56	46	-	-
				Margin [dB]		-12.83	.17	4.17	14.17	-	-
9	1.30908	48.81 pk	10.5	.2	59.51	73	60	56	46	-	-
				Margin [dB]		-13.49	-.49	3.51	13.51	-	-
10	1.43464	48.89 pk	10.5	.2	59.59	73	60	56	46	-	-
				Margin [dB]		-13.41	-.41	3.59	13.59	-	-
11	1.83064	51.21 pk	10.6	.2	62.01	73	60	56	46	-	-
				Margin [dB]		-10.99	2.01	6.01	16.01	-	-
12	1.94655	47.69 pk	10.6	.2	58.49	73	60	56	46	-	-
				Margin [dB]		-14.51	-1.51	2.49	12.49	-	-
13	2.23147	47.72 pk	10.6	.2	58.52	73	60	56	46	-	-
				Margin [dB]		-14.48	-1.48	2.52	12.52	-	-
14	3.29392	49.69 pk	10.6	.2	60.49	73	60	56	46	-	-
				Margin [dB]		-12.51	.49	4.49	14.49	-	-
15	4.60749	47.51 pk	10.6	.2	58.31	73	60	56	46	-	-
				Margin [dB]		-14.69	-1.69	2.31	12.31	-	-
16	8.25362	46.68 pk	10.8	.3	57.78	73	60	60	50	-	-
				Margin [dB]		-15.22	-2.22	-2.22	7.78	-	-
17	9.33056	45.42 pk	10.9	.4	56.72	73	60	60	50	-	-
				Margin [dB]		-16.28	-3.28	-3.28	6.72	-	-
18	10.68759	44.32 pk	10.9	.4	55.62	73	60	60	50	-	-
				Margin [dB]		-17.38	-4.38	-4.38	5.62	-	-
19	13.71074	42.28 pk	11.1	.3	53.68	73	60	60	50	-	-
				Margin [dB]		-19.32	-6.32	-6.32	3.68	-	-

Neutral – Peak Scan Data

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
20	.25873	51.8 pk	11	.8	63.6	79	66	61.5	51.5	-	-
				Margin [dB]		-15.4	-2.4	2.1	12.1	-	-
21	.3952	57.7 pk	10.7	.4	68.8	79	66	58	48	-	-
				Margin [dB]		-10.2	2.8	10.8	20.8	-	-
22	.52035	51.21 pk	10.5	.3	62.01	73	60	56	46	-	-
				Margin [dB]		-10.99	2.01	6.01	16.01	-	-
23	.64692	54.82 pk	10.5	.2	65.52	73	60	56	46	-	-
				Margin [dB]		-7.48	5.52	9.52	19.52	-	-
24	.77377	57.38 pk	10.5	.2	68.08	73	60	56	46	-	-
				Margin [dB]		-4.92	8.08	12.08	22.08	-	-
25	.91817	56.53 pk	10.5	.2	67.23	73	60	56	46	-	-
				Margin [dB]		-5.77	7.23	11.23	21.23	-	-
26	1.03381	49.06 pk	10.5	.2	59.76	73	60	56	46	-	-
				Margin [dB]		-13.24	-.24	3.76	13.76	-	-
27	1.17868	53.52 pk	10.5	.1	64.12	73	60	56	46	-	-
				Margin [dB]		-8.88	4.12	8.12	18.12	-	-
28	1.29942	54.96 pk	10.5	.1	65.56	73	60	56	46	-	-
				Margin [dB]		-7.44	5.56	9.56	19.56	-	-
29	1.42015	54.28 pk	10.5	.1	64.88	73	60	56	46	-	-
				Margin [dB]		-8.12	4.88	8.88	18.88	-	-
30	1.56503	46.06 pk	10.5	.1	56.66	73	60	56	46	-	-
				Margin [dB]		-16.34	-3.34	.66	10.66	-	-
31	1.70025	48.38 pk	10.5	.1	58.98	73	60	56	46	-	-
				Margin [dB]		-14.02	-1.02	2.98	12.98	-	-
32	1.82098	55.05 pk	10.6	.1	65.75	73	60	56	46	-	-
				Margin [dB]		-7.25	5.75	9.75	19.75	-	-
33	1.94655	55.59 pk	10.6	.1	66.29	73	60	56	46	-	-
				Margin [dB]		-6.71	6.29	10.29	20.29	-	-
34	2.20733	54.07 pk	10.6	.1	64.77	73	60	56	46	-	-
				Margin [dB]		-8.23	4.77	8.77	18.77	-	-
35	2.38118	54.1 pk	10.6	.1	64.8	73	60	56	46	-	-
				Margin [dB]		-8.2	4.8	8.8	18.8	-	-
36	2.99933	54.02 pk	10.6	.1	64.72	73	60	56	46	-	-
				Margin [dB]		-8.28	4.72	8.72	18.72	-	-
37	3.33256	51.72 pk	10.6	.1	62.42	73	60	56	46	-	-
				Margin [dB]		-10.58	2.42	6.42	16.42	-	-
38	4.07144	50.3 pk	10.6	.1	61	73	60	56	46	-	-
				Margin [dB]		-12	1	5	15	-	-
39	4.49642	47.68 pk	10.6	.1	58.38	73	60	56	46	-	-
				Margin [dB]		-14.62	-1.62	2.38	12.38	-	-
40	7.02215	49.62 pk	10.7	.2	60.52	73	60	60	50	-	-
				Margin [dB]		-12.48	.52	.52	10.52	-	-
41	8.09426	48.67 pk	10.8	.2	59.67	73	60	60	50	-	-
				Margin [dB]		-13.33	-.33	-.33	9.67	-	-
42	9.40783	49.71 pk	10.9	.3	60.91	73	60	60	50	-	-
				Margin [dB]		-12.09	.91	.91	10.91	-	-
43	10.8035	48.29 pk	10.9	.4	59.59	73	60	60	50	-	-
				Margin [dB]		-13.41	-.41	-.41	9.59	-	-
44	14.29992	45.88 pk	11.2	.3	57.38	73	60	60	50	-	-
				Margin [dB]		-15.62	-2.62	-2.62	7.38	-	-

LIMIT 1: CISPR 22/11 Group 1 Class A QP
LIMIT 2: CISPR 22/11 Group 1 Class A AV
LIMIT 3: CISPR 22/11 Group 1 Class B QP
LIMIT 4: CISPR 22/11 Group 1 Class B AV

Philips
Model: Occuswith Wireless
120V/60Hz
RED: L1 GRN: Neutral

Quasi-Peak Measurements – Line Side

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
.25505	43.61 qp	11.1	.8	55.51	79	66	61.6	51.6	-	-
			Margin [dB]:		-23.49	-10.49	-6.09	3.91	-	-
.38444	48.7 qp	10.7	.5	59.9+	79	66	58.2	48.2	-	-
			Margin [dB]:		-19.1	-6.1	1.7	11.7	-	-
.52064	42.73 qp	10.6	.3	53.63	73	60	56	46	-	-
			Margin [dB]:		-19.37	-6.37	-2.37	7.63	-	-
.65655	46.81 qp	10.5	.3	57.61+	73	60	56	46	-	-
			Margin [dB]:		-15.39	-2.39	1.61	11.61	-	-
.78028	48.71 qp	10.5	.2	59.41+	73	60	56	46	-	-
			Margin [dB]:		-13.59	-.59	3.41	13.41	-	-
.91279	45.88 qp	10.5	.2	56.58+	73	60	56	46	-	-
			Margin [dB]:		-16.42	-3.42	.58	10.58	-	-
1.04346	42.02 qp	10.5	.2	52.72	73	60	56	46	-	-
			Margin [dB]:		-20.28	-7.28	-3.28	6.72	-	-
1.15937	45.37 qp	10.5	.2	56.07+	73	60	56	46	-	-
			Margin [dB]:		-16.93	-3.93	.07	10.07	-	-
1.30908	44.96 qp	10.5	.2	55.66	73	60	56	46	-	-
			Margin [dB]:		-17.34	-4.34	-.34	9.66	-	-
1.43464	42.46 qp	10.5	.2	53.16	73	60	56	46	-	-
			Margin [dB]:		-19.84	-6.84	-2.84	7.16	-	-
1.83064	44.44 qp	10.6	.2	55.24	73	60	56	46	-	-
			Margin [dB]:		-17.76	-4.76	-.76	9.24	-	-
1.94655	44.24 qp	10.6	.2	55.04	73	60	56	46	-	-
			Margin [dB]:		-17.96	-4.96	-.96	9.04	-	-
2.23147	43.84 qp	10.6	.2	54.64	73	60	56	46	-	-
			Margin [dB]:		-18.36	-5.36	-1.36	8.64	-	-
3.29392	41.64 qp	10.6	.2	52.44	73	60	56	46	-	-
			Margin [dB]:		-20.56	-7.56	-3.56	6.44	-	-
4.60749	37.48 qp	10.6	.2	48.28	73	60	56	46	-	-
			Margin [dB]:		-24.72	-11.72	-7.72	2.28	-	-
8.25362	37.17 qp	10.8	.3	48.27	73	60	60	50	-	-
			Margin [dB]:		-24.73	-11.73	-11.73	-1.73	-	-
9.33056	37.15 qp	10.9	.4	48.45	73	60	60	50	-	-
			Margin [dB]:		-24.55	-11.55	-11.55	-1.55	-	-
10.68759	36.61 qp	10.9	.4	47.91	73	60	60	50	-	-
			Margin [dB]:		-25.09	-12.09	-12.09	-2.09	-	-
13.71074	34.91 qp	11.1	.3	46.31	73	60	60	50	-	-
			Margin [dB]:		-26.69	-13.69	-13.69	-3.69	-	-

Philips
Model: Occuswith Wireless
120V/60Hz
RED: L1 GRN: Neutral

Quasi-Peak Measurements – Neutral Side

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
.25873	48.45 qp	11	.8	60.25	79	66	61.5	51.5	-	-
			Margin [dB]:		-18.75	-5.75	-1.25	8.75	-	-
.3952	54.73 qp	10.7	.4	65.83+	79	66	58	48	-	-
			Margin [dB]:		-13.17	-.17	7.83	17.83	-	-
.52035	44.45 qp	10.5	.3	55.25	73	60	56	46	-	-
			Margin [dB]:		-17.75	-4.75	-.75	9.25	-	-
.64692	50.98 qp	10.5	.2	61.68+	73	60	56	46	-	-
			Margin [dB]:		-11.32	1.68	5.68	15.68	-	-
.77377	54.17 qp	10.5	.2	64.87+	73	60	56	46	-	-
			Margin [dB]:		-8.13	4.87	8.87	18.87	-	-
.91817	52.58 qp	10.5	.2	63.28+	73	60	56	46	-	-
			Margin [dB]:		-9.72	3.28	7.28	17.28	-	-
1.03381	43.61 qp	10.5	.2	54.31	73	60	56	46	-	-
			Margin [dB]:		-18.69	-5.69	-1.69	8.31	-	-
1.17868	49.85 qp	10.5	.1	60.45+	73	60	56	46	-	-
			Margin [dB]:		-12.55	.45	4.45	14.45	-	-
1.29942	51.77 qp	10.5	.1	62.37+	73	60	56	46	-	-
			Margin [dB]:		-10.63	2.37	6.37	16.37	-	-
1.42015	48.8 qp	10.5	.1	59.4+	73	60	56	46	-	-
			Margin [dB]:		-13.6	-.6	3.4	13.4	-	-
1.56503	42.76 qp	10.5	.1	53.36	73	60	56	46	-	-
			Margin [dB]:		-19.64	-6.64	-2.64	7.36	-	-
1.70025	45.07 qp	10.5	.1	55.67	73	60	56	46	-	-
			Margin [dB]:		-17.33	-4.33	-.33	9.67	-	-
1.82098	50.51 qp	10.6	.1	61.21+	73	60	56	46	-	-
			Margin [dB]:		-11.79	1.21	5.21	15.21	-	-
1.94655	50.96 qp	10.6	.1	61.66+	73	60	56	46	-	-
			Margin [dB]:		-11.34	1.66	5.66	15.66	-	-
2.20733	47.82 qp	10.6	.1	58.52+	73	60	56	46	-	-
			Margin [dB]:		-14.48	-1.48	2.52	12.52	-	-
2.38118	48.56 qp	10.6	.1	59.26+	73	60	56	46	-	-
			Margin [dB]:		-13.74	-.74	3.26	13.26	-	-
2.99933	47.15 qp	10.6	.1	57.85+	73	60	56	46	-	-
			Margin [dB]:		-15.15	-2.15	1.85	11.85	-	-
3.33256	45.7 qp	10.6	.1	56.4+	73	60	56	46	-	-
			Margin [dB]:		-16.6	-3.6	.4	10.4	-	-
4.07144	44.99 qp	10.6	.1	55.69	73	60	56	46	-	-
			Margin [dB]:		-17.31	-4.31	-.31	9.69	-	-
4.49642	43.45 qp	10.6	.1	54.15	73	60	56	46	-	-
			Margin [dB]:		-18.85	-5.85	-1.85	8.15	-	-
7.02215	42.72 qp	10.7	.2	53.62	73	60	60	50	-	-
			Margin [dB]:		-19.38	-6.38	-6.38	3.62	-	-
8.09426	42.78 qp	10.8	.2	53.78	73	60	60	50	-	-
			Margin [dB]:		-19.22	-6.22	-6.22	3.78	-	-
9.40783	42.38 qp	10.9	.3	53.58	73	60	60	50	-	-
			Margin [dB]:		-19.42	-6.42	-6.42	3.58	-	-
10.8035	40.91 qp	10.9	.4	52.21	73	60	60	50	-	-
			Margin [dB]:		-20.79	-7.79	-7.79	2.21	-	-
14.29992	37.91 qp	11.2	.3	49.41	73	60	60	50	-	-
			Margin [dB]:		-23.59	-10.59	-10.59	-.59	-	-

NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

PK - Peak detector
QP - Quasi-Peak detector

LIMIT 1: CISPR 22/11 Group 1 Class A QP
LIMIT 2: CISPR 22/11 Group 1 Class A AV
LIMIT 3: CISPR 22/11 Group 1 Class B QP
LIMIT 4: CISPR 22/11 Group 1 Class B AV

Philips
Model: Occuswith Wireless
120V/60Hz
RED: L1 GRN: Neutral

Average Measurements – Line Side

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
.25505	32.55 AV	11.1	.8	44.45	79	66	61.6	51.6	-	-
			Margin [dB]:		-34.55	-21.55	-17.15	-7.15	-	-
.38444	37.79 AV	10.7	.5	48.99+	79	66	58.2	48.2	-	-
			Margin [dB]:		-30.01	-17.01	-9.21	.79	-	-
.52064	24.76 AV	10.6	.3	35.66	73	60	56	46	-	-
			Margin [dB]:		-37.34	-24.34	-20.34	-10.34	-	-
.65655	31.2 AV	10.5	.3	42	73	60	56	46	-	-
			Margin [dB]:		-31	-18	-14	-4	-	-
.78028	33.85 AV	10.5	.2	44.55	73	60	56	46	-	-
			Margin [dB]:		-28.45	-15.45	-11.45	-1.45	-	-
.91279	29.64 AV	10.5	.2	40.34	73	60	56	46	-	-
			Margin [dB]:		-32.66	-19.66	-15.66	-5.66	-	-
1.04346	22.09 AV	10.5	.2	32.79	73	60	56	46	-	-
			Margin [dB]:		-40.21	-27.21	-23.21	-13.21	-	-
1.15937	27.58 AV	10.5	.2	38.28	73	60	56	46	-	-
			Margin [dB]:		-34.72	-21.72	-17.72	-7.72	-	-
1.30908	26.74 AV	10.5	.2	37.44	73	60	56	46	-	-
			Margin [dB]:		-35.56	-22.56	-18.56	-8.56	-	-
1.43464	23.06 AV	10.5	.2	33.76	73	60	56	46	-	-
			Margin [dB]:		-39.24	-26.24	-22.24	-12.24	-	-
1.83064	24.56 AV	10.6	.2	35.36	73	60	56	46	-	-
			Margin [dB]:		-37.64	-24.64	-20.64	-10.64	-	-
1.94655	24.07 AV	10.6	.2	34.87	73	60	56	46	-	-
			Margin [dB]:		-38.13	-25.13	-21.13	-11.13	-	-
2.23147	21.33 AV	10.6	.2	32.13	73	60	56	46	-	-
			Margin [dB]:		-40.87	-27.87	-23.87	-13.87	-	-
3.29392	19.8 AV	10.6	.2	30.6	73	60	56	46	-	-
			Margin [dB]:		-42.4	-29.4	-25.4	-15.4	-	-
4.60749	16.61 AV	10.6	.2	27.41	73	60	56	46	-	-
			Margin [dB]:		-45.59	-32.59	-28.59	-18.59	-	-
8.25362	15.53 AV	10.8	.3	26.63	73	60	60	50	-	-
			Margin [dB]:		-46.37	-33.37	-33.37	-23.37	-	-
9.33056	15.1 AV	10.9	.4	26.4	73	60	60	50	-	-
			Margin [dB]:		-46.6	-33.6	-33.6	-23.6	-	-
10.68759	15.15 AV	10.9	.4	26.45	73	60	60	50	-	-
			Margin [dB]:		-46.55	-33.55	-33.55	-23.55	-	-
13.71074	14.35 AV	11.1	.3	25.75	73	60	60	50	-	-
			Margin [dB]:		-47.25	-34.25	-34.25	-24.25	-	-

Philips
Model: Occuswith Wireless
120V/60Hz
RED: L1 GRN: Neutral
Average Measurements – Neutral Side

Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
.25873	35.52 AV	11	.8	47.32	79	66	61.5	51.5	-	-
			Margin [dB]:		-31.68	-18.68	-14.18	-4.18	-	-
.3952	37.78 AV	10.7	.4	48.88+	79	66	58	48	-	-
			Margin [dB]:		-30.12	-17.12	-9.12	.88	-	-
.52035	26.06 AV	10.5	.3	36.86	73	60	56	46	-	-
			Margin [dB]:		-36.14	-23.14	-19.14	-9.14	-	-
.64692	33.5 AV	10.5	.2	44.2	73	60	56	46	-	-
			Margin [dB]:		-28.8	-15.8	-11.8	-1.8	-	-
.77377	35.57 AV	10.5	.2	46.27+	73	60	56	46	-	-
			Margin [dB]:		-26.73	-13.73	-9.73	.27	-	-
.91817	31.65 AV	10.5	.2	42.35	73	60	56	46	-	-
			Margin [dB]:		-30.65	-17.65	-13.65	-3.65	-	-
1.03381	22.01 AV	10.5	.2	32.71	73	60	56	46	-	-
			Margin [dB]:		-40.29	-27.29	-23.29	-13.29	-	-
1.17868	28.53 AV	10.5	.1	39.13	73	60	56	46	-	-
			Margin [dB]:		-33.87	-20.87	-16.87	-6.87	-	-
1.29942	30.29 AV	10.5	.1	40.89	73	60	56	46	-	-
			Margin [dB]:		-32.11	-19.11	-15.11	-5.11	-	-
1.42015	26.15 AV	10.5	.1	36.75	73	60	56	46	-	-
			Margin [dB]:		-36.25	-23.25	-19.25	-9.25	-	-
1.56503	18.87 AV	10.5	.1	29.47	73	60	56	46	-	-
			Margin [dB]:		-43.53	-30.53	-26.53	-16.53	-	-
1.70025	21.42 AV	10.5	.1	32.02	73	60	56	46	-	-
			Margin [dB]:		-40.98	-27.98	-23.98	-13.98	-	-
1.82098	26.98 AV	10.6	.1	37.68	73	60	56	46	-	-
			Margin [dB]:		-35.32	-22.32	-18.32	-8.32	-	-
1.94655	27.23 AV	10.6	.1	37.93	73	60	56	46	-	-
			Margin [dB]:		-35.07	-22.07	-18.07	-8.07	-	-
2.20733	23.61 AV	10.6	.1	34.31	73	60	56	46	-	-
			Margin [dB]:		-38.69	-25.69	-21.69	-11.69	-	-
2.38118	23.6 AV	10.6	.1	34.3	73	60	56	46	-	-
			Margin [dB]:		-38.7	-25.7	-21.7	-11.7	-	-
2.99933	21.32 AV	10.6	.1	32.02	73	60	56	46	-	-
			Margin [dB]:		-40.98	-27.98	-23.98	-13.98	-	-
3.33256	20.02 AV	10.6	.1	30.72	73	60	56	46	-	-
			Margin [dB]:		-42.28	-29.28	-25.28	-15.28	-	-
4.07144	20.53 AV	10.6	.1	31.23	73	60	56	46	-	-
			Margin [dB]:		-41.77	-28.77	-24.77	-14.77	-	-
4.49642	19.04 AV	10.6	.1	29.74	73	60	56	46	-	-
			Margin [dB]:		-43.26	-30.26	-26.26	-16.26	-	-
7.02215	18.82 AV	10.7	.2	29.72	73	60	60	50	-	-
			Margin [dB]:		-43.28	-30.28	-30.28	-20.28	-	-
8.09426	17.35 AV	10.8	.2	28.35	73	60	60	50	-	-
			Margin [dB]:		-44.65	-31.65	-31.65	-21.65	-	-
9.40783	18.29 AV	10.9	.3	29.49	73	60	60	50	-	-
			Margin [dB]:		-43.51	-30.51	-30.51	-20.51	-	-
10.8035	16.68 AV	10.9	.4	27.98	73	60	60	50	-	-
			Margin [dB]:		-45.02	-32.02	-32.02	-22.02	-	-
14.29992	15.69 AV	11.2	.3	27.19	73	60	60	50	-	-
			Margin [dB]:		-45.81	-32.81	-32.81	-22.81	-	-

NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

PK - Peak detector
QP - Quasi-Peak detector
AV - average detection

LIMIT 1: CISPR 22/11 Group 1 Class A QP
LIMIT 2: CISPR 22/11 Group 1 Class A AV
LIMIT 3: CISPR 22/11 Group 1 Class B QP
LIMIT 4: CISPR 22/11 Group 1 Class B AV

Figure 3 Conducted Emissions Graph 277V/60Hz

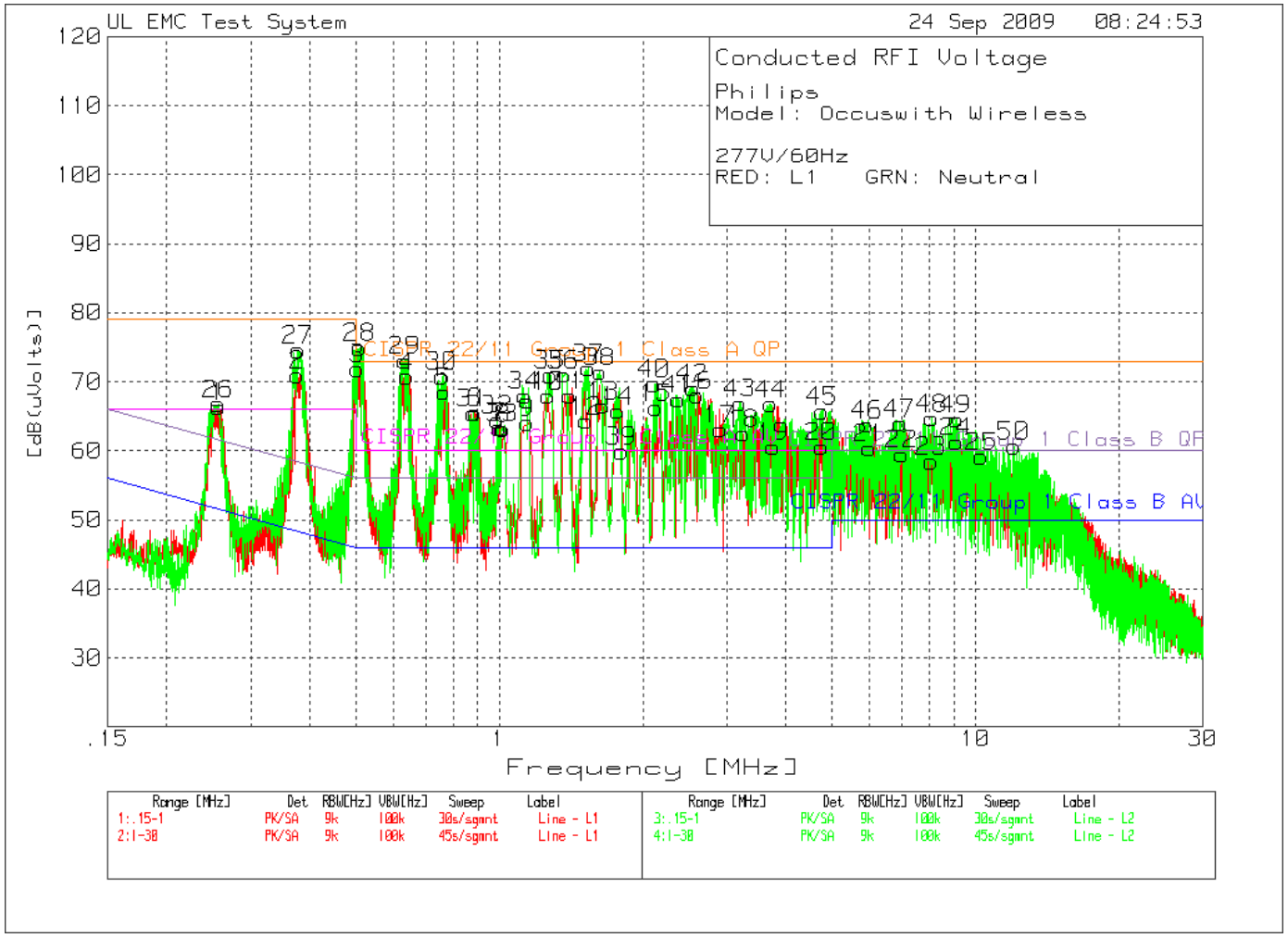


Table 4 Conducted Emissions Data Points 277V/60Hz

Philips
Model: Occuswith Wireless
277V/60Hz
RED: L1 GRN: Neutral

Peak Scan Data – Line side

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
1	.25675	54.47 pk	11.1	.8	66.37	79	66	61.5	51.5	-	-
					Margin [dB]	-12.63	.37	4.87	14.87	-	-
2	.37623	59.8 pk	10.7	.5	71	79	66	58.4	48.4	-	-
					Margin [dB]	-8	5	12.6	22.6	-	-
3	.50393	61.01 pk	10.6	.3	71.91	73	60	56	46	-	-
					Margin [dB]	-1.09	11.91	15.91	25.91	-	-
4	.63927	59.96 pk	10.5	.3	70.76	73	60	56	46	-	-
					Margin [dB]	-2.24	10.76	14.76	24.76	-	-
5	.76499	57.88 pk	10.5	.2	68.58	73	60	56	46	-	-
					Margin [dB]	-4.42	8.58	12.58	22.58	-	-
6	.88957	54.86 pk	10.5	.2	65.56	73	60	56	46	-	-
					Margin [dB]	-7.44	5.56	9.56	19.56	-	-
7	.9983	52.67 pk	10.5	.2	63.37	73	60	56	46	-	-
					Margin [dB]	-9.63	3.37	7.37	17.37	-	-
8	1.01932	52.49 pk	10.5	.2	63.19	73	60	56	46	-	-
					Margin [dB]	-9.81	3.19	7.19	17.19	-	-
9	1.14488	53.36 pk	10.5	.2	64.06	73	60	56	46	-	-
					Margin [dB]	-8.94	4.06	8.06	18.06	-	-
10	1.26561	57.24 pk	10.5	.2	67.94	73	60	56	46	-	-
					Margin [dB]	-5.06	7.94	11.94	21.94	-	-
11	1.40566	57.28 pk	10.5	.2	67.98	73	60	56	46	-	-
					Margin [dB]	-5.02	7.98	11.98	21.98	-	-
12	1.52157	53.63 pk	10.5	.2	64.33	73	60	56	46	-	-
					Margin [dB]	-8.67	4.33	8.33	18.33	-	-
13	1.65196	55.79 pk	10.5	.2	66.49	73	60	56	46	-	-
					Margin [dB]	-6.51	6.49	10.49	20.49	-	-
14	1.77269	54.97 pk	10.6	.2	65.77	73	60	56	46	-	-
					Margin [dB]	-7.23	5.77	9.77	19.77	-	-
15	2.13006	55.46 pk	10.6	.2	66.26	73	60	56	46	-	-
					Margin [dB]	-6.74	6.26	10.26	20.26	-	-
16	2.60333	57.26 pk	10.6	.2	68.06	73	60	56	46	-	-
					Margin [dB]	-4.94	8.06	12.06	22.06	-	-
17	2.90758	52.28 pk	10.6	.2	63.08	73	60	56	46	-	-
					Margin [dB]	-9.92	3.08	7.08	17.08	-	-
18	3.25529	51.71 pk	10.6	.2	62.51	73	60	56	46	-	-
					Margin [dB]	-10.49	2.51	6.51	16.51	-	-
19	3.76719	49.8 pk	10.6	.2	60.6	73	60	56	46	-	-
					Margin [dB]	-12.4	.6	4.6	14.6	-	-
20	4.74754	49.79 pk	10.6	.2	60.59	73	60	56	46	-	-
					Margin [dB]	-12.41	.59	4.59	14.59	-	-
21	5.98868	49.47 pk	10.7	.2	60.37	73	60	60	50	-	-
					Margin [dB]	-12.63	.37	.37	10.37	-	-
22	7.00283	48.5 pk	10.7	.3	59.5	73	60	60	50	-	-
					Margin [dB]	-13.5	-.5	-.5	9.5	-	-
23	8.0846	47.4 pk	10.8	.3	58.5	73	60	60	50	-	-
					Margin [dB]	-14.5	-1.5	-1.5	8.5	-	-
24	9.10841	50.12 pk	10.8	.4	61.32	73	60	60	50	-	-
					Margin [dB]	-11.68	1.32	1.32	11.32	-	-
25	10.29642	47.87 pk	10.9	.4	59.17	73	60	60	50	-	-
					Margin [dB]	-13.83	-.83	-.83	9.17	-	-

LIMIT 1: CISPR 22/11 Group 1 Class A QP
LIMIT 2: CISPR 22/11 Group 1 Class A AV
LIMIT 3: CISPR 22/11 Group 1 Class B QP
LIMIT 4: CISPR 22/11 Group 1 Class B AV

Philips
Model: Occuswith Wireless
277V/60Hz
RED: L1 GRN: Neutral

Peak Scan Data – Neutral side

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
26	.25675	55 pk	11	.8	66.8	79	66	61.5	51.5	-	-
				Margin [dB]		-12.2	.8	5.3	15.3	-	-
27	.37793	63.4 pk	10.7	.5	74.6	79	66	58.3	48.3	-	-
				Margin [dB]		-4.4	8.6	16.3	26.3	-	-
28	.50846	64.09 pk	10.6	.3	74.99	73	60	56	46	-	-
				Margin [dB]		1.99	14.99	18.99	28.99	-	-
29	.63305	62.38 pk	10.5	.2	73.08	73	60	56	46	-	-
				Margin [dB]		.08	13.08	17.08	27.08	-	-
30	.75735	60.13 pk	10.5	.2	70.83	73	60	56	46	-	-
				Margin [dB]		-2.17	10.83	14.83	24.83	-	-
31	.87938	54.77 pk	10.5	.2	65.47	73	60	56	46	-	-
				Margin [dB]		-7.53	5.47	9.47	19.47	-	-
32	.98981	53.79 pk	10.5	.2	64.49	73	60	56	46	-	-
				Margin [dB]		-8.51	4.49	8.49	18.49	-	-
33	1.01449	52.58 pk	10.5	.2	63.28	73	60	56	46	-	-
				Margin [dB]		-9.72	3.28	7.28	17.28	-	-
34	1.13039	57.4 pk	10.5	.1	68	73	60	56	46	-	-
				Margin [dB]		-5	8	12	22	-	-
35	1.2801	60.4 pk	10.5	.1	71	73	60	56	46	-	-
				Margin [dB]		-2	11	15	25	-	-
36	1.36703	60.42 pk	10.5	.1	71.02	73	60	56	46	-	-
				Margin [dB]		-1.98	11.02	15.02	25.02	-	-
37	1.54088	61.35 pk	10.5	.1	71.95	73	60	56	46	-	-
				Margin [dB]		-1.05	11.95	15.95	25.95	-	-
38	1.62781	60.81 pk	10.5	.1	71.41	73	60	56	46	-	-
				Margin [dB]		-1.59	11.41	15.41	25.41	-	-
39	1.8065	49.36 pk	10.5	.1	59.96	73	60	56	46	-	-
				Margin [dB]		-13.04	-.04	3.96	13.96	-	-
40	2.11557	59.04 pk	10.6	.1	69.74	73	60	56	46	-	-
				Margin [dB]		-3.26	9.74	13.74	23.74	-	-
41	2.37635	56.78 pk	10.6	.1	67.48	73	60	56	46	-	-
				Margin [dB]		-5.52	7.48	11.48	21.48	-	-
42	2.55021	58.39 pk	10.6	.1	69.09	73	60	56	46	-	-
				Margin [dB]		-3.91	9.09	13.09	23.09	-	-
43	3.20217	56.21 pk	10.6	.1	66.91	73	60	56	46	-	-
				Margin [dB]		-6.09	6.91	10.91	20.91	-	-
44	3.7189	56.1 pk	10.6	.1	66.8	73	60	56	46	-	-
				Margin [dB]		-6.2	6.8	10.8	20.8	-	-
45	4.76686	55.04 pk	10.6	.1	65.74	73	60	56	46	-	-
				Margin [dB]		-7.26	5.74	9.74	19.74	-	-
46	5.9259	52.98 pk	10.7	.1	63.78	73	60	60	50	-	-
				Margin [dB]		-9.22	3.78	3.78	13.78	-	-
47	6.94005	53.07 pk	10.7	.2	63.97	73	60	60	50	-	-
				Margin [dB]		-9.03	3.97	3.97	13.97	-	-
48	8.10391	53.69 pk	10.8	.2	64.69	73	60	60	50	-	-
				Margin [dB]		-8.31	4.69	4.69	14.69	-	-
49	9.11324	53.43 pk	10.8	.3	64.53	73	60	60	50	-	-
				Margin [dB]		-8.47	4.53	4.53	14.53	-	-
50	12.05429	49.26 pk	11	.4	60.66	73	60	60	50	-	-
				Margin [dB]		-12.34	.66	.66	10.66	-	-

LIMIT 1: CISPR 22/11 Group 1 Class A QP
LIMIT 2: CISPR 22/11 Group 1 Class A AV
LIMIT 3: CISPR 22/11 Group 1 Class B QP
LIMIT 4: CISPR 22/11 Group 1 Class B AV

Philips
Model: Occuswith Wireless
277V/60Hz
RED: L1 GRN: Neutral

Quasi-Peak Measurements – Line Side

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
.25675	50.25 qp	11.1	.8	62.15+	79	66	61.5	51.5	-	-
			Margin [dB]:		-16.85	-3.85	.65	10.65	-	-
.37623	56.15 qp	10.7	.5	67.35+	79	66	58.4	48.4	-	-
			Margin [dB]:		-11.65	1.35	8.95	18.95	-	-
.50393	56.87 qp	10.6	.3	67.77+	73	60	56	46	-	-
			Margin [dB]:		-5.23	7.77	11.77	21.77	-	-
.63927	55.31 qp	10.5	.3	66.11+	73	60	56	46	-	-
			Margin [dB]:		-6.89	6.11	10.11	20.11	-	-
.76499	52.86 qp	10.5	.2	63.56+	73	60	56	46	-	-
			Margin [dB]:		-9.44	3.56	7.56	17.56	-	-
.88957	48.64 qp	10.5	.2	59.34+	73	60	56	46	-	-
			Margin [dB]:		-13.66	-.66	3.34	13.34	-	-
.985	44.53 qp	10.5	.2	55.23	73	60	56	46	-	-
			Margin [dB]:		-17.77	-4.77	-.77	9.23	-	-
1.01932	45.97 qp	10.5	.2	56.67+	73	60	56	46	-	-
			Margin [dB]:		-16.33	-3.33	.67	10.67	-	-
1.14488	49.63 qp	10.5	.2	60.33+	73	60	56	46	-	-
			Margin [dB]:		-12.67	.33	4.33	14.33	-	-
1.26561	50.93 qp	10.5	.2	61.63+	73	60	56	46	-	-
			Margin [dB]:		-11.37	1.63	5.63	15.63	-	-
1.40566	52.23 qp	10.5	.2	62.93+	73	60	56	46	-	-
			Margin [dB]:		-10.07	2.93	6.93	16.93	-	-
1.52157	53.43 qp	10.5	.2	64.13+	73	60	56	46	-	-
			Margin [dB]:		-8.87	4.13	8.13	18.13	-	-
1.65196	53.42 qp	10.5	.2	64.12+	73	60	56	46	-	-
			Margin [dB]:		-8.88	4.12	8.12	18.12	-	-
1.77269	50.57 qp	10.6	.2	61.37+	73	60	56	46	-	-
			Margin [dB]:		-11.63	1.37	5.37	15.37	-	-
2.13006	47 qp	10.6	.2	57.8+	73	60	56	46	-	-
			Margin [dB]:		-15.2	-2.2	1.8	11.8	-	-
2.60333	48.53 qp	10.6	.2	59.33+	73	60	56	46	-	-
			Margin [dB]:		-13.67	-.67	3.33	13.33	-	-
2.90758	43.37 qp	10.6	.2	54.17	73	60	56	46	-	-
			Margin [dB]:		-18.83	-5.83	-1.83	8.17	-	-
3.25529	41.76 qp	10.6	.2	52.56	73	60	56	46	-	-
			Margin [dB]:		-20.44	-7.44	-3.44	6.56	-	-
3.76719	46.75 qp	10.6	.2	57.55+	73	60	56	46	-	-
			Margin [dB]:		-15.45	-2.45	1.55	11.55	-	-
4.74754	46.72 qp	10.6	.2	57.52+	73	60	56	46	-	-
			Margin [dB]:		-15.48	-2.48	1.52	11.52	-	-
5.98868	42.42 qp	10.7	.2	53.32	73	60	60	50	-	-
			Margin [dB]:		-19.68	-6.68	-6.68	3.32	-	-
7.00283	40.56 qp	10.7	.3	51.56	73	60	60	50	-	-
			Margin [dB]:		-21.44	-8.44	-8.44	1.56	-	-
8.0846	42.1 qp	10.8	.3	53.2	73	60	60	50	-	-
			Margin [dB]:		-19.8	-6.8	-6.8	3.2	-	-
9.10841	41.05 qp	10.8	.4	52.25	73	60	60	50	-	-
			Margin [dB]:		-20.75	-7.75	-7.75	2.25	-	-
10.29642	37.82 qp	10.9	.4	49.12	73	60	60	50	-	-
			Margin [dB]:		-23.88	-10.88	-10.88	-.88	-	-

NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

PK - Peak detector
QP - Quasi-Peak detector
AV - average detection

LIMIT 1: CISPR 22/11 Group 1 Class A QP
LIMIT 2: CISPR 22/11 Group 1 Class A AV
LIMIT 3: CISPR 22/11 Group 1 Class B QP
LIMIT 4: CISPR 22/11 Group 1 Class B AV

Philips
Model: Occuswith Wireless
277V/60Hz
RED: L1 GRN: Neutral

Quasi-Peak Measurements – Neutral Side

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
.25675	51.32 qp	11	.8	63.12+	79	66	61.5	51.5	-	-
			Margin [dB]:		-15.88	-2.88	1.62	11.62	-	-
.37793	59.82 qp	10.7	.5	71.02+	79	66	58.3	48.3	-	-
			Margin [dB]:		-7.98	5.02	12.72	22.72	-	-
.50846	60.7 qp	10.6	.3	71.6+	73	60	56	46	-	-
			Margin [dB]:		-1.4	11.6	15.6	25.6	-	-
.63305	58.3 qp	10.5	.2	69+	73	60	56	46	-	-
			Margin [dB]:		-4	9	13	23	-	-
.75735	55.12 qp	10.5	.2	65.82+	73	60	56	46	-	-
			Margin [dB]:		-7.18	5.82	9.82	19.82	-	-
.87938	46.67 qp	10.5	.2	57.37+	73	60	56	46	-	-
			Margin [dB]:		-15.63	-2.63	1.37	11.37	-	-
.985	44.6 qp	10.5	.2	55.3	73	60	56	46	-	-
			Margin [dB]:		-17.7	-4.7	-.7	9.3	-	-
1.015	47.33 qp	10.5	.2	58.03+	73	60	56	46	-	-
			Margin [dB]:		-14.97	-1.97	2.03	12.03	-	-
1.13039	53.71 qp	10.5	.1	64.31+	73	60	56	46	-	-
			Margin [dB]:		-8.69	4.31	8.31	18.31	-	-
1.2801	55.05 qp	10.5	.1	65.65+	73	60	56	46	-	-
			Margin [dB]:		-7.35	5.65	9.65	19.65	-	-
1.36703	54.97 qp	10.5	.1	65.57+	73	60	56	46	-	-
			Margin [dB]:		-7.43	5.57	9.57	19.57	-	-
1.54088	54.3 qp	10.5	.1	64.9+	73	60	56	46	-	-
			Margin [dB]:		-8.1	4.9	8.9	18.9	-	-
1.62781	53.89 qp	10.5	.1	64.49+	73	60	56	46	-	-
			Margin [dB]:		-8.51	4.49	8.49	18.49	-	-
1.8065	36.27 qp	10.5	.1	46.87	73	60	56	46	-	-
			Margin [dB]:		-26.13	-13.13	-9.13	.87	-	-
2.11557	51.85 qp	10.6	.1	62.55+	73	60	56	46	-	-
			Margin [dB]:		-10.45	2.55	6.55	16.55	-	-
2.37635	50.57 qp	10.6	.1	61.27+	73	60	56	46	-	-
			Margin [dB]:		-11.73	1.27	5.27	15.27	-	-
2.55021	50.46 qp	10.6	.1	61.16+	73	60	56	46	-	-
			Margin [dB]:		-11.84	1.16	5.16	15.16	-	-
3.20217	48.39 qp	10.6	.1	59.09+	73	60	56	46	-	-
			Margin [dB]:		-13.91	-.91	3.09	13.09	-	-
3.7189	48.74 qp	10.6	.1	59.44+	73	60	56	46	-	-
			Margin [dB]:		-13.56	-.56	3.44	13.44	-	-
4.76686	45.02 qp	10.6	.1	55.72	73	60	56	46	-	-
			Margin [dB]:		-17.28	-4.28	-.28	9.72	-	-
5.9259	44.29 qp	10.7	.1	55.09	73	60	60	50	-	-
			Margin [dB]:		-17.91	-4.91	-4.91	5.09	-	-
6.94005	45.27 qp	10.7	.2	56.17	73	60	60	50	-	-
			Margin [dB]:		-16.83	-3.83	-3.83	6.17	-	-
8.10391	41.36 qp	10.8	.2	52.36	73	60	60	50	-	-
			Margin [dB]:		-20.64	-7.64	-7.64	2.36	-	-
9.11324	42.7 qp	10.8	.3	53.8	73	60	60	50	-	-
			Margin [dB]:		-19.2	-6.2	-6.2	3.8	-	-
12.05429	39.23 qp	11	.4	50.63	73	60	60	50	-	-
			Margin [dB]:		-22.37	-9.37	-9.37	.63	-	-

NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

PK - Peak detector
QP - Quasi-Peak detector
AV - average detection

LIMIT 1: CISPR 22/11 Group 1 Class A QP
LIMIT 2: CISPR 22/11 Group 1 Class A AV
LIMIT 3: CISPR 22/11 Group 1 Class B QP
LIMIT 4: CISPR 22/11 Group 1 Class B AV

Philips
Model: Occuswith Wireless
277V/60Hz
RED: L1 GRN: Neutral

Average Measurements – Line Side

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
.25675	33.99 AV	11.1	.8	45.89	79	66	61.5	51.5	-	-
			Margin [dB]:		-33.11	-20.11	-15.61	-5.61	-	-
.37623	42.33 AV	10.7	.5	53.53+	79	66	58.4	48.4	-	-
			Margin [dB]:		-25.47	-12.47	-4.87	5.13	-	-
.50393	41.52 AV	10.6	.3	52.42+	73	60	56	46	-	-
			Margin [dB]:		-20.58	-7.58	-3.58	6.42	-	-
.63927	37.03 AV	10.5	.3	47.83+	73	60	56	46	-	-
			Margin [dB]:		-25.17	-12.17	-8.17	1.83	-	-
.76499	34.09 AV	10.5	.2	44.79	73	60	56	46	-	-
			Margin [dB]:		-28.21	-15.21	-11.21	-1.21	-	-
.88957	27.61 AV	10.5	.2	38.31	73	60	56	46	-	-
			Margin [dB]:		-34.69	-21.69	-17.69	-7.69	-	-
.985	21.85 AV	10.5	.2	32.55	73	60	56	46	-	-
			Margin [dB]:		-40.45	-27.45	-23.45	-13.45	-	-
1.01932	25.5 AV	10.5	.2	36.2	73	60	56	46	-	-
			Margin [dB]:		-36.8	-23.8	-19.8	-9.8	-	-
1.14488	29.44 AV	10.5	.2	40.14	73	60	56	46	-	-
			Margin [dB]:		-32.86	-19.86	-15.86	-5.86	-	-
1.26561	30.5 AV	10.5	.2	41.2	73	60	56	46	-	-
			Margin [dB]:		-31.8	-18.8	-14.8	-4.8	-	-
1.40566	29.24 AV	10.5	.2	39.94	73	60	56	46	-	-
			Margin [dB]:		-33.06	-20.06	-16.06	-6.06	-	-
1.52157	31.43 AV	10.5	.2	42.13	73	60	56	46	-	-
			Margin [dB]:		-30.87	-17.87	-13.87	-3.87	-	-
1.65196	30.99 AV	10.5	.2	41.69	73	60	56	46	-	-
			Margin [dB]:		-31.31	-18.31	-14.31	-4.31	-	-
1.77269	27.24 AV	10.6	.2	38.04	73	60	56	46	-	-
			Margin [dB]:		-34.96	-21.96	-17.96	-7.96	-	-
2.13006	23.9 AV	10.6	.2	34.7	73	60	56	46	-	-
			Margin [dB]:		-38.3	-25.3	-21.3	-11.3	-	-
2.60333	24.22 AV	10.6	.2	35.02	73	60	56	46	-	-
			Margin [dB]:		-37.98	-24.98	-20.98	-10.98	-	-
2.90758	18.52 AV	10.6	.2	29.32	73	60	56	46	-	-
			Margin [dB]:		-43.68	-30.68	-26.68	-16.68	-	-
3.25529	17.43 AV	10.6	.2	28.23	73	60	56	46	-	-
			Margin [dB]:		-44.77	-31.77	-27.77	-17.77	-	-
3.76719	21.08 AV	10.6	.2	31.88	73	60	56	46	-	-
			Margin [dB]:		-41.12	-28.12	-24.12	-14.12	-	-
4.74754	22.89 AV	10.6	.2	33.69	73	60	56	46	-	-
			Margin [dB]:		-39.31	-26.31	-22.31	-12.31	-	-
5.98868	18.14 AV	10.7	.2	29.04	73	60	60	50	-	-
			Margin [dB]:		-43.96	-30.96	-30.96	-20.96	-	-
7.00283	16.22 AV	10.7	.3	27.22	73	60	60	50	-	-
			Margin [dB]:		-45.78	-32.78	-32.78	-22.78	-	-
8.0846	17.75 AV	10.8	.3	28.85	73	60	60	50	-	-
			Margin [dB]:		-44.15	-31.15	-31.15	-21.15	-	-
9.10841	16.88 AV	10.8	.4	28.08	73	60	60	50	-	-
			Margin [dB]:		-44.92	-31.92	-31.92	-21.92	-	-
10.29642	14.48 AV	10.9	.4	25.78	73	60	60	50	-	-
			Margin [dB]:		-47.22	-34.22	-34.22	-24.22	-	-

NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

PK - Peak detector
QP - Quasi-Peak detector
AV - average detection

LIMIT 1: CISPR 22/11 Group 1 Class A QP
LIMIT 2: CISPR 22/11 Group 1 Class A AV
LIMIT 3: CISPR 22/11 Group 1 Class B QP
LIMIT 4: CISPR 22/11 Group 1 Class B AV

Philips
Model: Occuswith Wireless
277V/60Hz
RED: L1 GRN: Neutral

Average Measurements – Neutral Side

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4	5	6
.25675	32.05 AV	11	.8	43.85	79	66	61.5	51.5	-	-
				Margin [dB]:	-35.15	-22.15	-17.65	-7.65	-	-
.37793	41.03 AV	10.7	.5	52.23+	79	66	58.3	48.3	-	-
				Margin [dB]:	-26.77	-13.77	-6.07	3.93	-	-
.50846	40.45 AV	10.6	.3	51.35+	73	60	56	46	-	-
				Margin [dB]:	-21.65	-8.65	-4.65	5.35	-	-
.63305	38.19 AV	10.5	.2	48.89+	73	60	56	46	-	-
				Margin [dB]:	-24.11	-11.11	-7.11	2.89	-	-
.75735	33.73 AV	10.5	.2	44.43	73	60	56	46	-	-
				Margin [dB]:	-28.57	-15.57	-11.57	-1.57	-	-
.87938	25.17 AV	10.5	.2	35.87	73	60	56	46	-	-
				Margin [dB]:	-37.13	-24.13	-20.13	-10.13	-	-
.985	20.35 AV	10.5	.2	31.05	73	60	56	46	-	-
				Margin [dB]:	-41.95	-28.95	-24.95	-14.95	-	-
1.015	24.84 AV	10.5	.2	35.54	73	60	56	46	-	-
				Margin [dB]:	-37.46	-24.46	-20.46	-10.46	-	-
1.13039	30.88 AV	10.5	.1	41.48	73	60	56	46	-	-
				Margin [dB]:	-31.52	-18.52	-14.52	-4.52	-	-
1.2801	31.05 AV	10.5	.1	41.65	73	60	56	46	-	-
				Margin [dB]:	-31.35	-18.35	-14.35	-4.35	-	-
1.36703	31.76 AV	10.5	.1	42.36	73	60	56	46	-	-
				Margin [dB]:	-30.64	-17.64	-13.64	-3.64	-	-
1.54088	28.41 AV	10.5	.1	39.01	73	60	56	46	-	-
				Margin [dB]:	-33.99	-20.99	-16.99	-6.99	-	-
1.62781	29.46 AV	10.5	.1	40.06	73	60	56	46	-	-
				Margin [dB]:	-32.94	-19.94	-15.94	-5.94	-	-
1.8065	11.39 AV	10.5	.1	21.99	73	60	56	46	-	-
				Margin [dB]:	-51.01	-38.01	-34.01	-24.01	-	-
2.11557	26.96 AV	10.6	.1	37.66	73	60	56	46	-	-
				Margin [dB]:	-35.34	-22.34	-18.34	-8.34	-	-
2.37635	24.99 AV	10.6	.1	35.69	73	60	56	46	-	-
				Margin [dB]:	-37.31	-24.31	-20.31	-10.31	-	-
2.55021	22.77 AV	10.6	.1	33.47	73	60	56	46	-	-
				Margin [dB]:	-39.53	-26.53	-22.53	-12.53	-	-
3.20217	23.42 AV	10.6	.1	34.12	73	60	56	46	-	-
				Margin [dB]:	-38.88	-25.88	-21.88	-11.88	-	-
3.7189	24.63 AV	10.6	.1	35.33	73	60	56	46	-	-
				Margin [dB]:	-37.67	-24.67	-20.67	-10.67	-	-
4.76686	17.95 AV	10.6	.1	28.65	73	60	56	46	-	-
				Margin [dB]:	-44.35	-31.35	-27.35	-17.35	-	-
5.9259	17.06 AV	10.7	.1	27.86	73	60	60	50	-	-
				Margin [dB]:	-45.14	-32.14	-32.14	-22.14	-	-
6.94005	18.98 AV	10.7	.2	29.88	73	60	60	50	-	-
				Margin [dB]:	-43.12	-30.12	-30.12	-20.12	-	-
8.10391	15.2 AV	10.8	.2	26.2	73	60	60	50	-	-
				Margin [dB]:	-46.8	-33.8	-33.8	-23.8	-	-
9.11324	16.85 AV	10.8	.3	27.95	73	60	60	50	-	-
				Margin [dB]:	-45.05	-32.05	-32.05	-22.05	-	-
12.05429	14.34 AV	11	.4	25.74	73	60	60	50	-	-
				Margin [dB]:	-47.26	-34.26	-34.26	-24.26	-	-

NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

PK - Peak detector
QP - Quasi-Peak detector
AV - average detection

LIMIT 1: CISPR 22/11 Group 1 Class A QP
LIMIT 2: CISPR 22/11 Group 1 Class A AV
LIMIT 3: CISPR 22/11 Group 1 Class B QP
LIMIT 4: CISPR 22/11 Group 1 Class B AV

4.2 Test Conditions and Results – RADIATED EMISSIONS Digital

Test Description	Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter or 3-meter as noted. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.

Basic Standard	FCC Part 15, Subpart B	
UL LPG	80-EM-S0029	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	30MHz – 25GHz	(10 meter or 3 meter)

Limits - Class A

Frequency (MHz)	Limit (dBµV/m)	
	Quasi-Peak	Average
30-88	39.08	NA
88-216	43.52	NA
216-960	46.44	NA
960-1000	49.54	NA
Above 1GHz	NA	60 (at 3-meter)

Limits - Class B

Frequency (MHz)	Limit (dBµV/m)	
	Quasi-Peak	Average
30-88	29.54	NA
88-216	33.06	NA
216-960	35.56	NA
960-1000	43.52	NA
Above 1GHz	NA	54 (at 3-meter)

Supplementary information: In receive mode / digital mode measurements are only required up to 12.5GHz, however testing was conducted to 25GHz.

Table 5 Radiated Emissions EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1 & 2	2	2
Supplementary information: None		

Table 6 Radiated Emissions Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323
Bicon Antenna	Chase	VBA6106A	EMC4078
Log-P Antenna	Chase	UPA6109	EMC4313
Spectrum Analyzer	Rhode & Schwarz	FSEK	EMC4182
Antenna Array	UL	BOMS	EMC4276

Figure 4 Test setup for Radiated Emissions

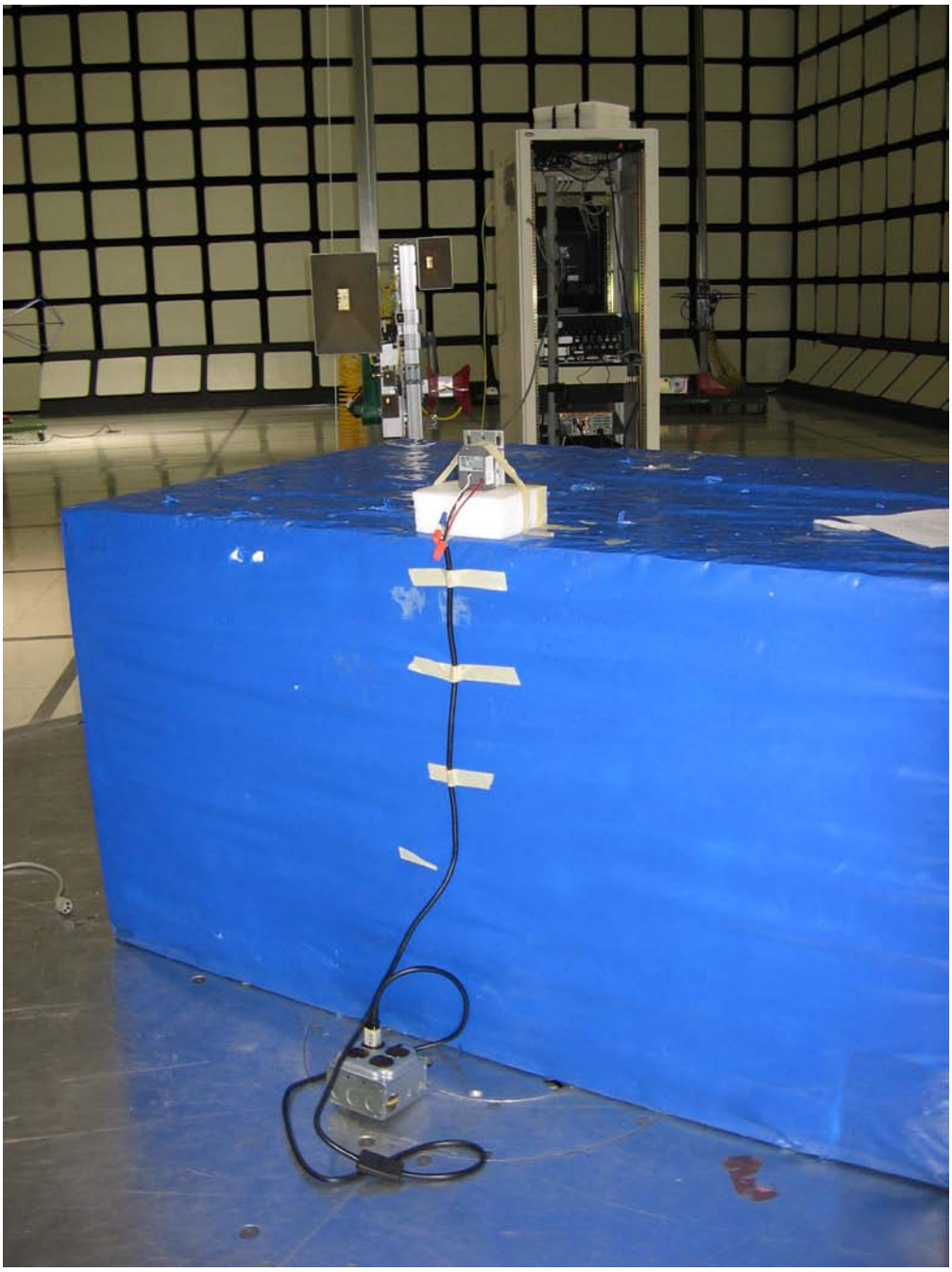
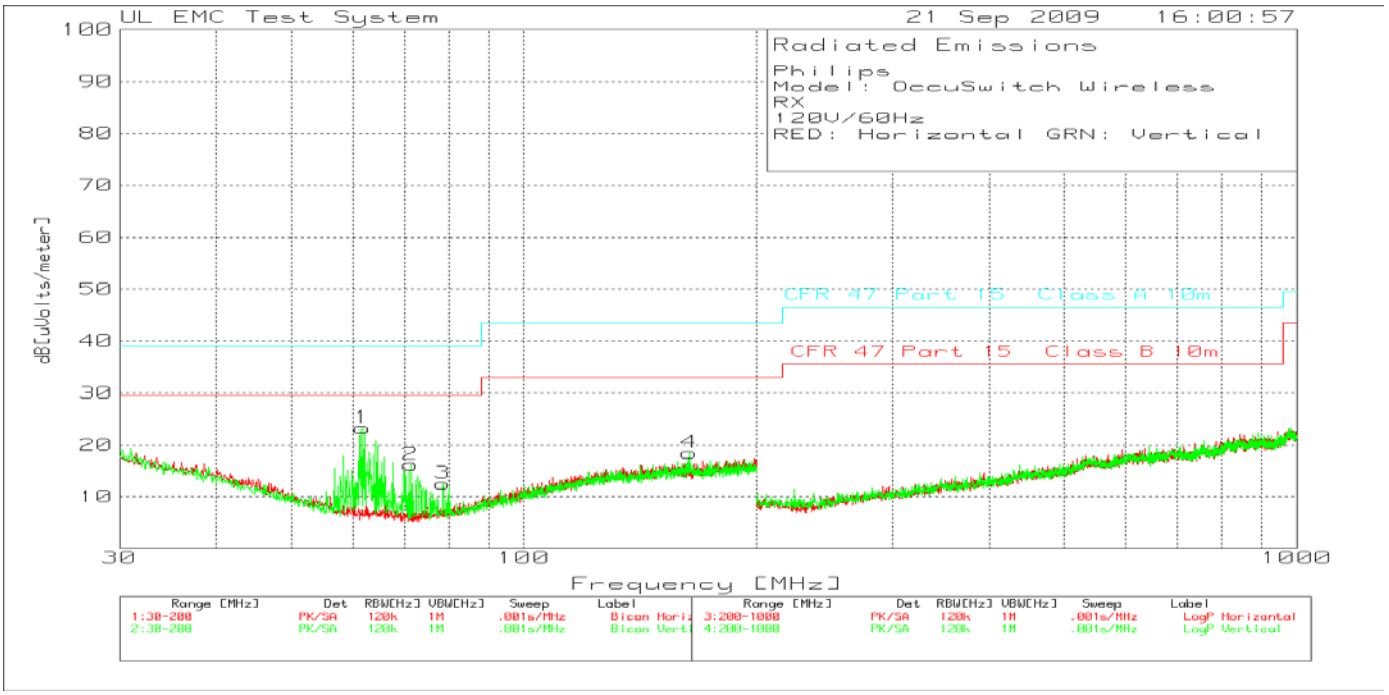


Figure 5 Radiated Emissions Graph 30MHz – 1GHz



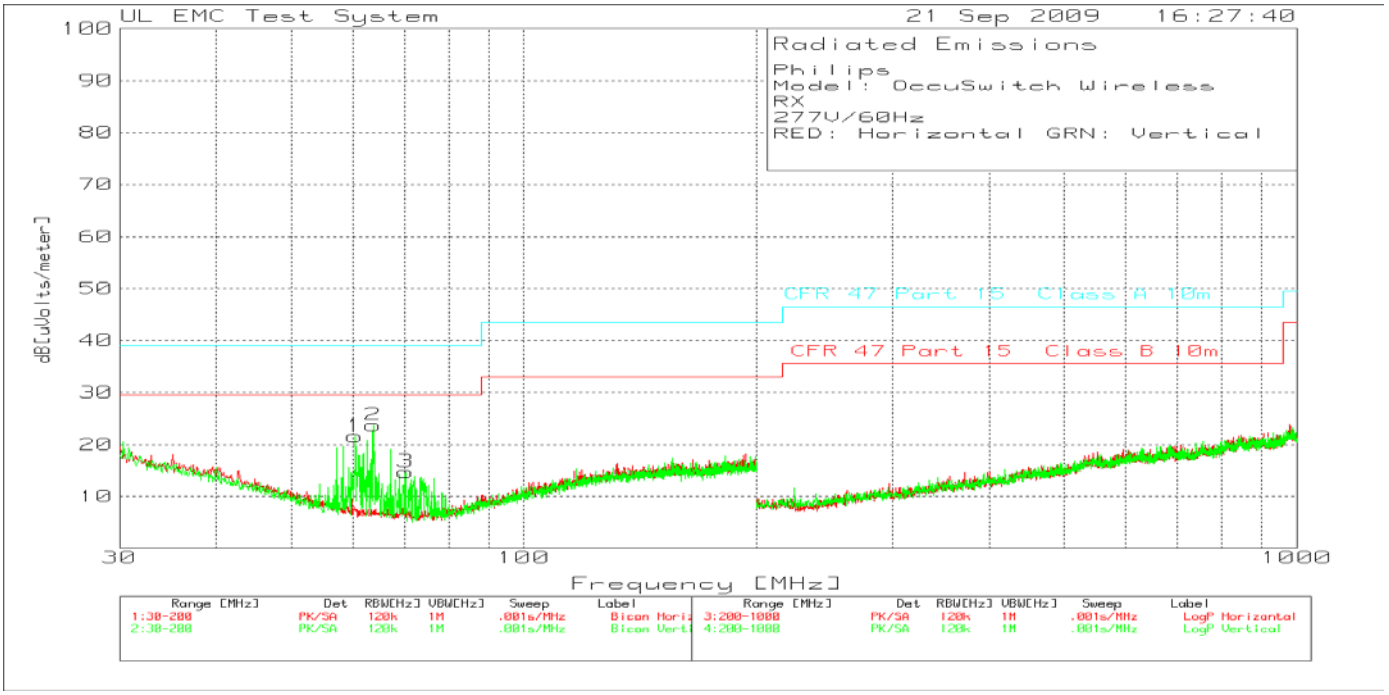


Table 7 Radiated Emissions Data Points 30MHz – 1GHz

Philips
Model: OccuSwitch Wireless
RX
120V/60Hz
RED: Horizontal GRN: Vertical

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 3	Margin 3[dB]	Limit 4	Margin 4[dB]	Height [cm]	Polarity
1	61.7741	46.94	pk	-30.3	6.6	23.24	39.1	-15.86	29.6	-6.36	100	Vert
2	71.3743	40.28	pk	-30.3	6.2	16.18	39.1	-22.92	29.6	-13.42	100	Vert
3	78.5957	35.84	pk	-30.2	6.9	12.54	39.1	-26.56	29.6	-17.06	100	Vert
4	163.7231	33.45	pk	-30.1	15.1	18.45	43.5	-25.05	33.1	-14.65	100	Vert

LIMIT 3: CFR 47 Part 15 Class A 10m
LIMIT 4: CFR 47 Part 15 Class B 10m

PK - Peak detector
QP - Quasi-Peak detector

Philips
Model: OccuSwitch Wireless
RX
277V/60Hz
RED: Horizontal GRN: Vertical

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 3	Margin 3[dB]	Limit 4	Margin 4[dB]	Height [cm]	Polarity
1	60.4998	45.12	pk	-30.3	6.7	21.52	39.1	-17.58	29.6	-8.08	100	Vert
2	63.8981	47.6	pk	-30.3	6.4	23.7	39.1	-15.4	29.6	-5.9	100	Vert
3	70.3548	38.84	pk	-30.3	6.2	14.74	39.1	-24.36	29.6	-14.86	100	Vert

LIMIT 3: CFR 47 Part 15 Class A 10m
LIMIT 4: CFR 47 Part 15 Class B 10m

PK - Peak detector
QP - Quasi-Peak detector

Figure 6 Radiated Emissions Graph 1GHz – 25GHz

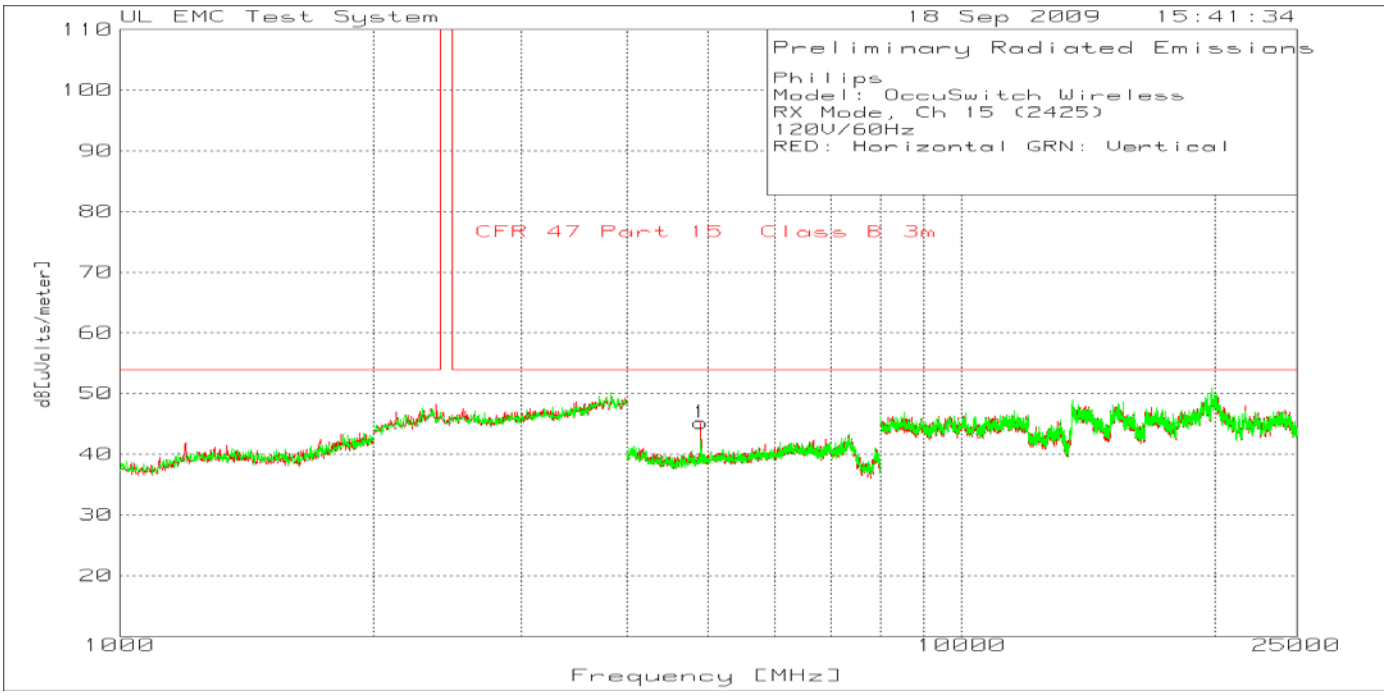


Table 8 Radiated Emissions Data Points 30MHz – 1GHz

Philips
Model: OccuSwitch Wireless
RX Mode, Ch 15 (2425)
120V/60Hz
RED: Horizontal GRN: Vertical

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
1	4899.266	68.55	pk	-51.08	27.7	45.17	54	-8.83	102	Horz

LIMIT 1: CFR 47 Part 15 Class B 3m

pk - Peak detector

4.3 Test Conditions and Results – SPURIOUS EMISSIONS (Antenna Conducted and Radiated)

Test Description	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, 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 Section15.205(c)).

Basic Standard	47 CFR Part 15.247(d) RSS-210, A8.5 RSS-Gen 7.2.1 and 7.2.3	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	30MHz – 1GHz	10 meter distance and / or antenna port
Fully configured sample scanned over the following frequency range	1GHz – 25GHz	3 meter distance and / or antenna port

Limits (Antenna Conducted)

All emissions must be 20dB below the level of the fundamental frequency.

Limits (Radiated – Restricted Bands Only)

Frequency (MHz)	Limit (dBµV/m)		
	Quasi-Peak	Average	
	General Emissions	Fundamental	Spurious
30 – 88	29.54	-	-
88 – 216	33.06	-	-
216-960	35.56	-	-
960-1000	43.52	-	-
1,000-25,000	-	-	54

Supplementary information: Below 1GHz, spectrum was checked. All emissions related to the transmitter below 1GHz are not in the restricted band therefore only antenna conducted limits apply (20dB below the peak level of the fundamental).

Table 9 SPURIOUS EMISSIONS EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1 & 2	2 & 3	1
Supplementary information: None		

Table 10 SPURIOUS CONDUCTED EMISSIONS Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323
Cable with Attenuator	Pasternack	10dB	none

Table 11 SPURIOUS RADIATED EMISSIONS Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323
Bicon Antenna	Chase	VBA6106A	EMC4078
Log-P Antenna	Chase	UPA6109	EMC4313
Spectrum Analyzer	Rhode & Schwarz	FSEK	EMC4182
Antenna Array	UL	BOMS	EMC4276

Test setup for SPURIOUS EMISSIONS – Antenna conducted

Test setup for SPURIOUS EMISSIONS – Radiated

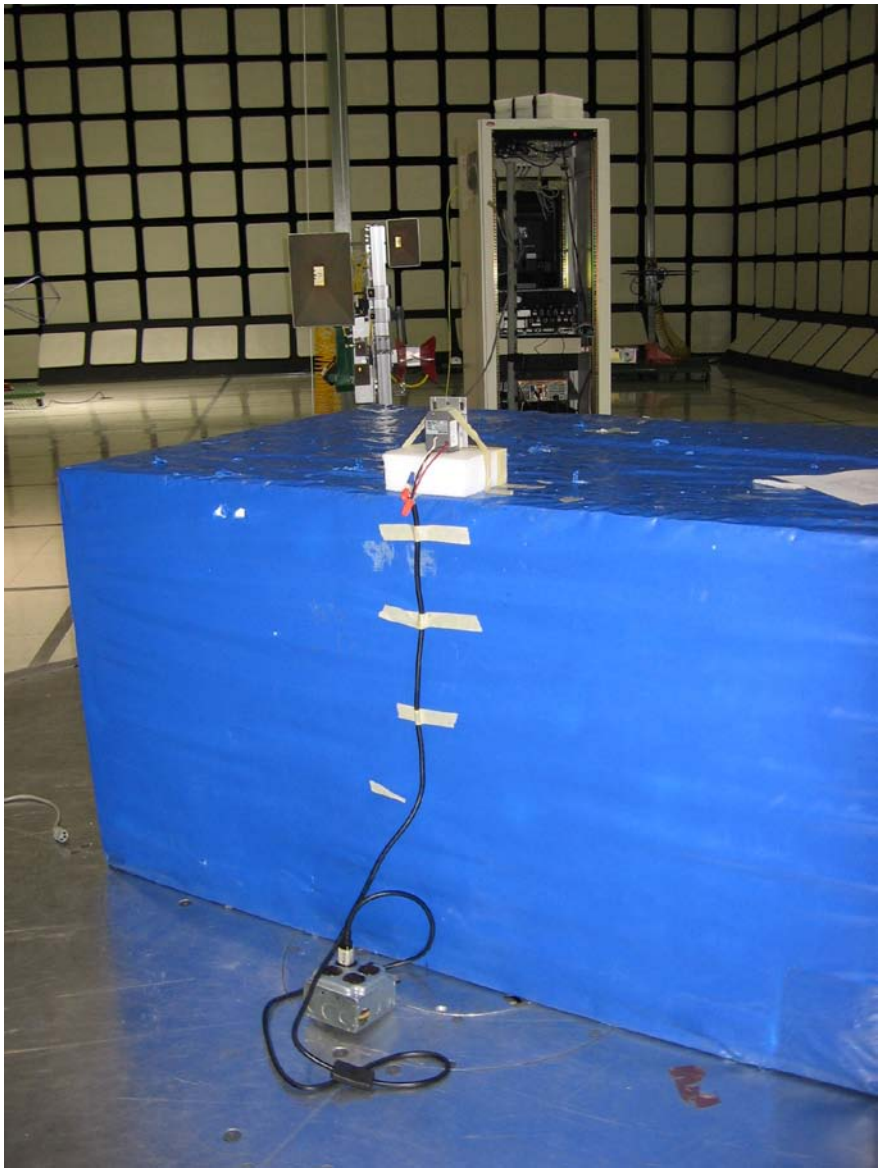
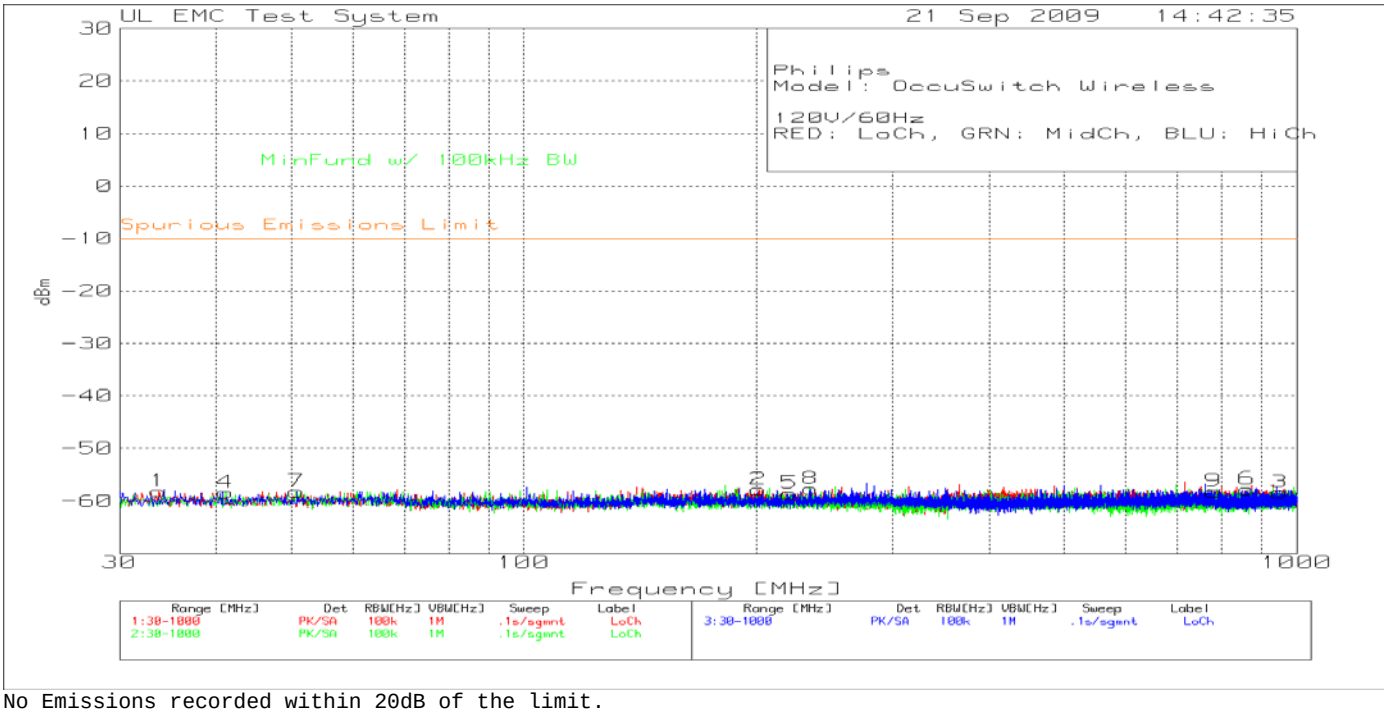


Figure 7 30MHz-1GHz Antenna Port Spurious Emissions Plots TX Mode, Low, Middle and High Channels.



No Emissions recorded within 20dB of the limit.

Figure 8 1GHz-10GHz Antenna Port Spurious Emissions Plots TX Mode, Low, Middle and High Channels.

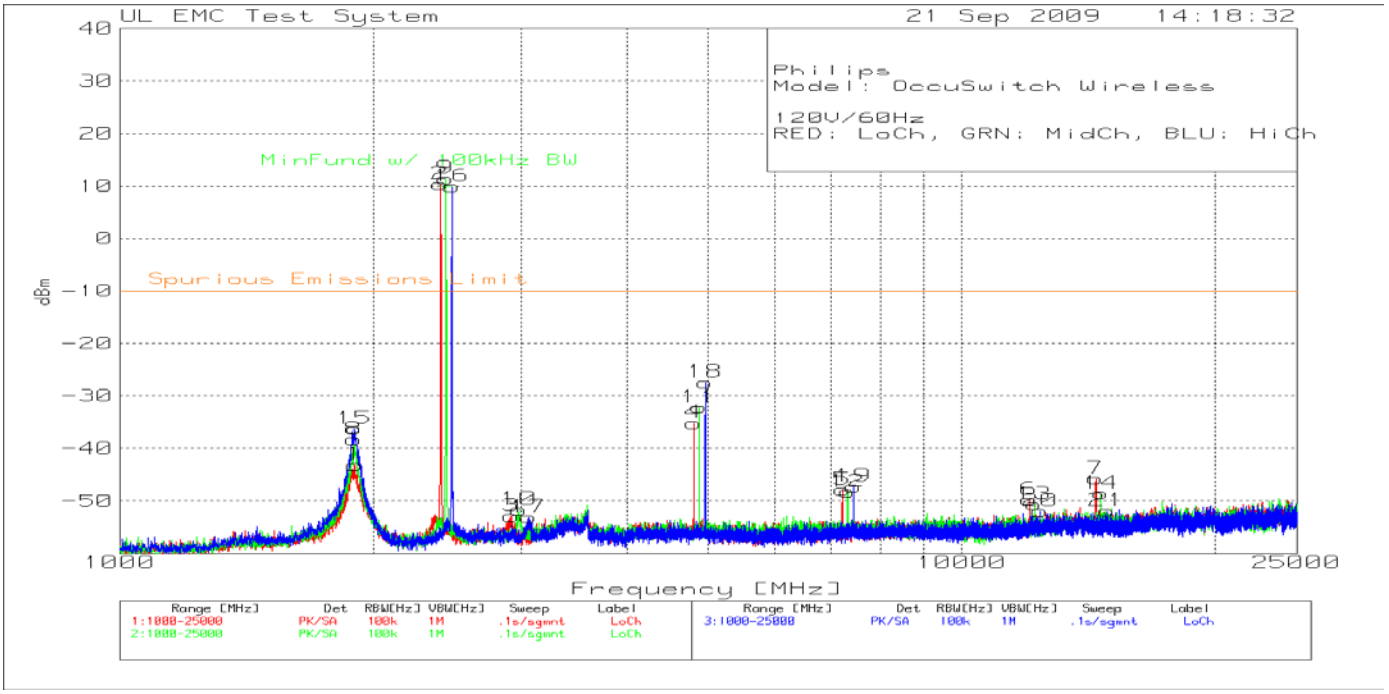


Table 12 Antenna Port Conducted Spurious Emissions Above 1GHz, Low Channel, Middle Channel and High Channel

Philips
Model: OccuSwitch Wireless
120V/60Hz
RED: LoCh, GRN: MidCh, BLU: HiCh

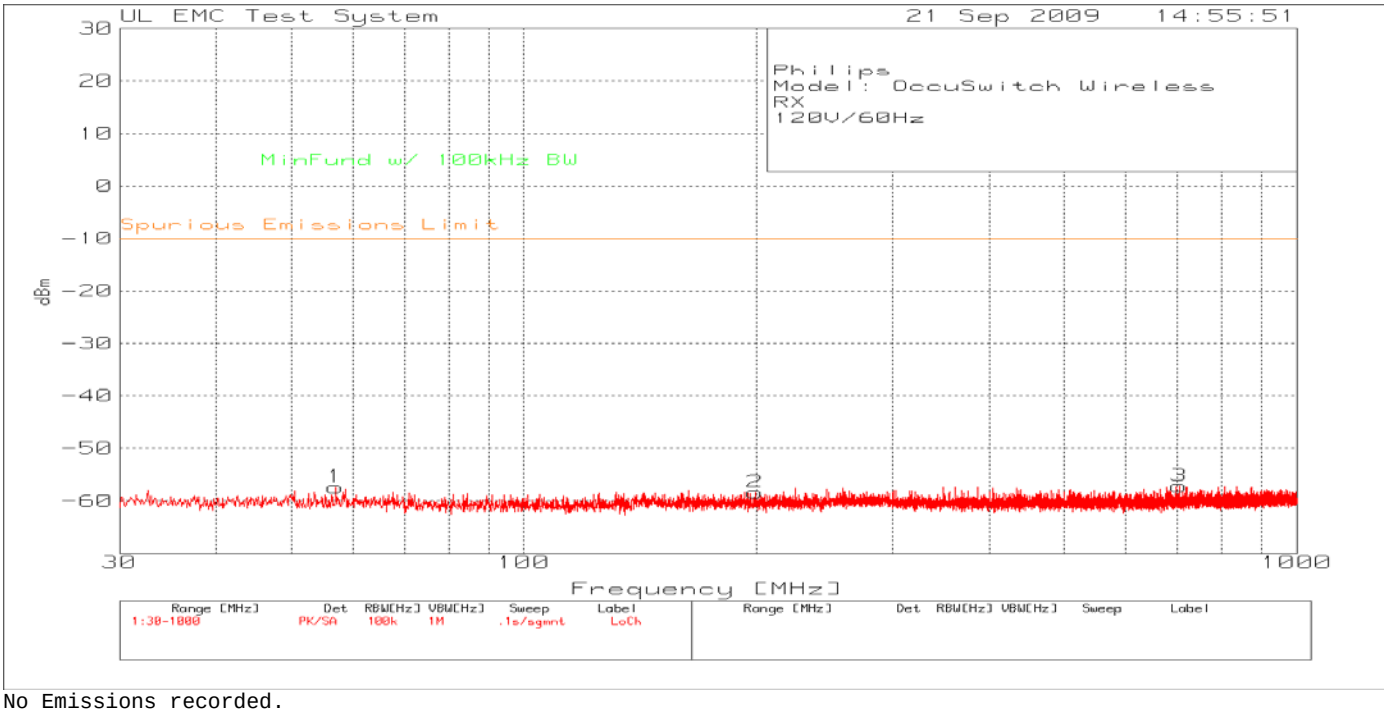
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dBm	Limit 1	Margin 1 [dB]	Limit 2	Margin 2 [dB]	Height [cm]	Polarity
Low Channel Markers												
1	1901.136	53.48	pk	10.4	-107	-43.12			-10	-33.12	100	Horz
2	2404.654	106.96	pk	10.4	-107	10.36	10	.36			100	Horz
3	2916.164	43.52	pk	10.6	-107	-52.88			-10	-42.88	100	Horz
4	4810.348	61.05	pk	10.8	-107	-35.15			-10	-25.15	100	Horz
5	7216.043	47.74	pk	11.4	-107	-47.86			-10	-37.86	100	Horz
6	12022.437	45.57	pk	11.7	-107	-49.73			-10	-39.73	100	Horz
7	14433.127	49.25	pk	12	-107	-45.75			-10	-35.75	100	Horz
Middle Channel Markers												
8	1899.138	58.46	pk	10.3	-107	-38.24			-10	-28.24	100	Horz
9	2439.62	108.13	pk	10.3	-107	11.43	10	1.43			100	Horz
10	2981.101	44.97	pk	10.4	-107	-51.63			-10	-41.63	100	Horz
11	4878.283	63.94	pk	10.9	-107	-32.16			-10	-22.16	100	Horz
12	7320.942	47.47	pk	11.3	-107	-48.23			-10	-38.23	100	Horz
13	12197.269	44.86	pk	11.5	-107	-50.64			-10	-40.64	100	Horz
14	14642.926	46.46	pk	12	-107	-48.54			-10	-38.54	100	Horz
High Channel Markers												
15	1900.137	60.34	pk	10.4	-107	-36.26			-10	-26.26	100	Horz
16	2479.582	106.46	pk	10.5	-107	9.96	10	-.04			100	Horz
17	3058.028	43.43	pk	10.5	-107	-53.07			-10	-43.07	100	Horz
18	4959.206	68.8	pk	10.8	-107	-27.4			-10	-17.4	100	Horz
19	7437.83	48.25	pk	11.5	-107	-47.25			-10	-37.25	100	Horz
20	12403.072	43.26	pk	11.8	-107	-51.94			-10	-41.94	100	Horz
21	14882.696	43.12	pk	12	-107	-51.88			-10	-41.88	100	Horz

LIMIT 1: MinFund w/ 100kHz BW
LIMIT 2: Spurious Emissions Limit

PK - Peak detector

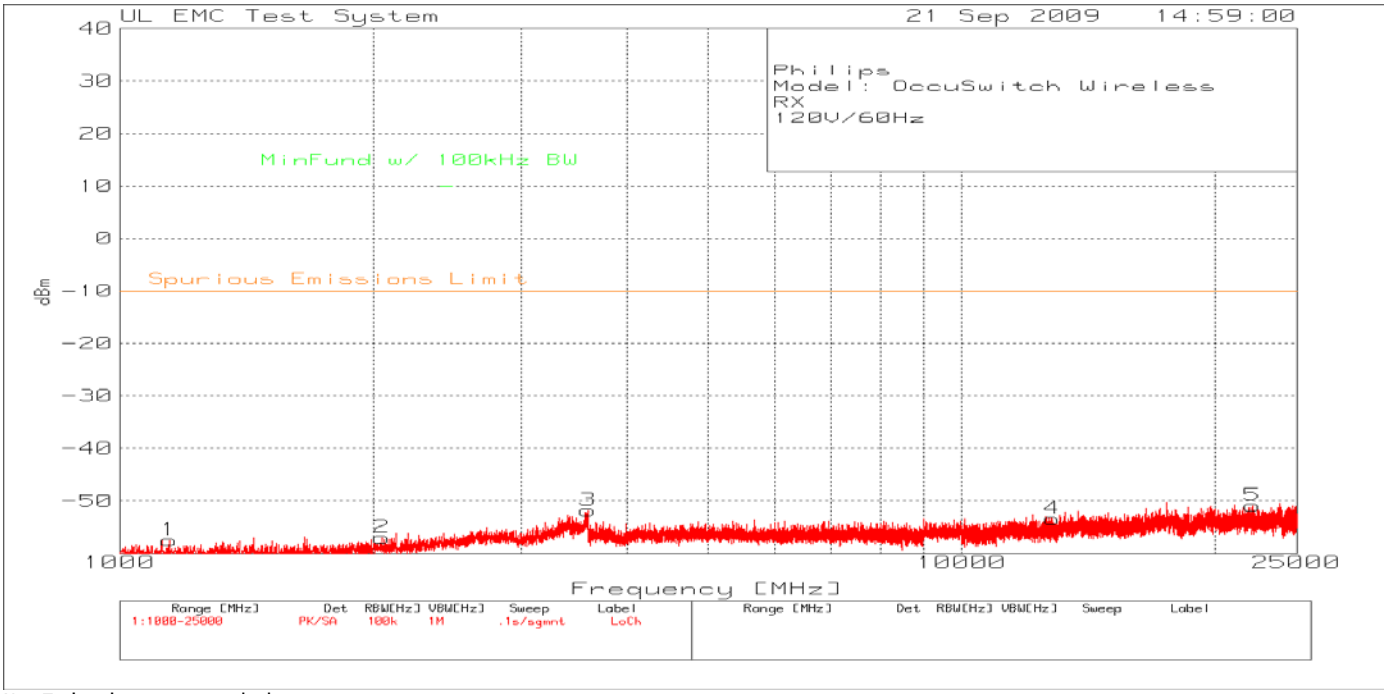
* - Fundamental frequency, not subject to limit

Figure 9 30MHz-1GHz Antenna Port Conducted Emissions Plots RX Mode, Single Channel.



No Emissions recorded.

Figure 10 1GHz-10GHz Antenna Port Conducted Emissions Plots RX Mode, Single Channel.



No Emissions recorded.

Figure 11 Radiated Spurious Emissions below 1GHz, Low Channel

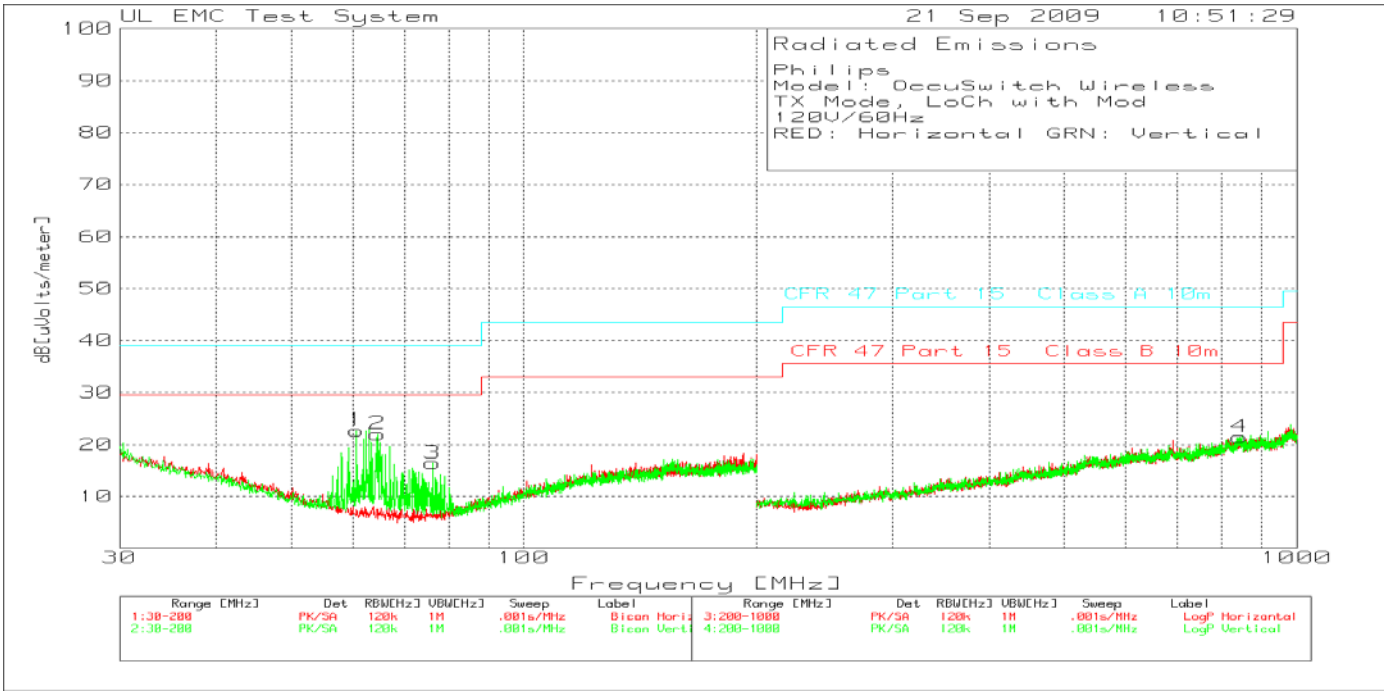


Figure 12 Radiated Spurious Emissions above 1GHz, Low Channel

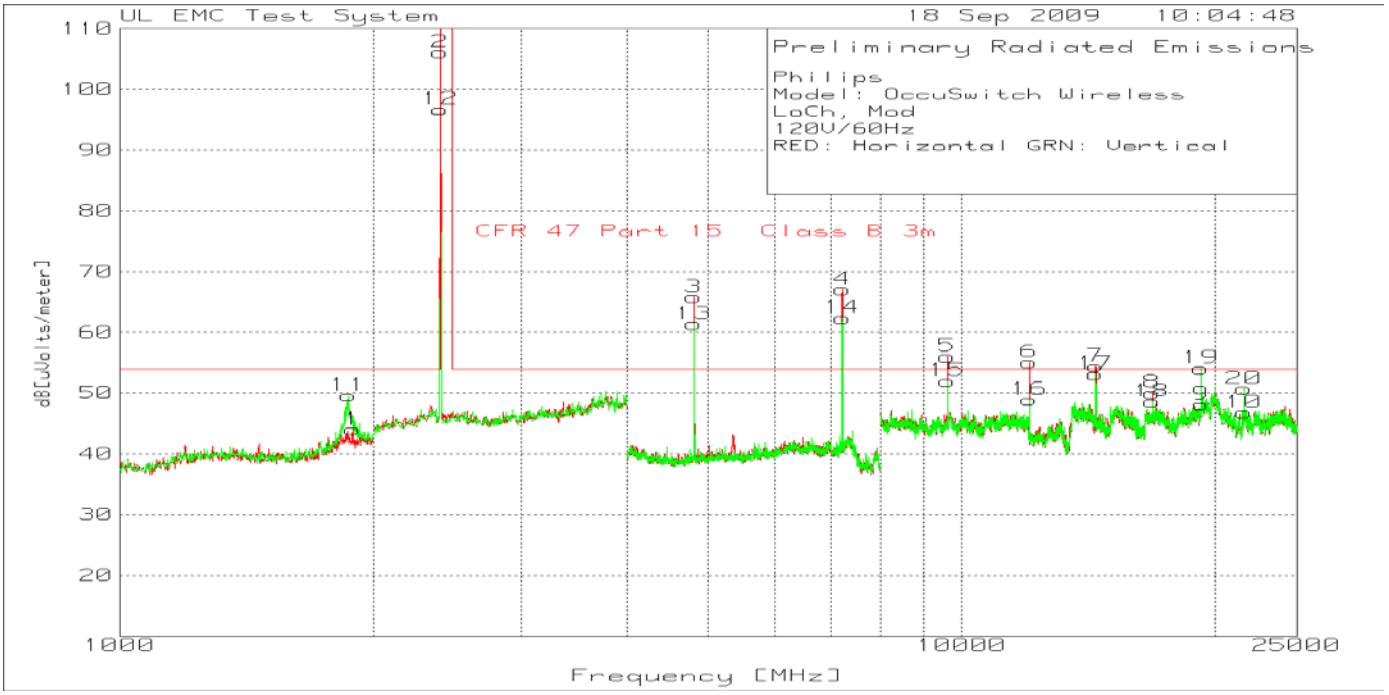


Table 13 Radiated Spurious Emissions below 1GHz, Low Channel

Philips
Model: OccuSwitch Wireless
TX Mode, LoCh with Mod
120V/60Hz
RED: Horizontal GRN: Vertical

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
1	60.7546	46.39 pk	-30.3	6.6	22.69	-	-	39.1	29.6	-	-
		Height:100 Vert		Margin [dB]		-	-	-16.41	-6.91	-	-
2	64.6627	45.99 pk	-30.3	6.3	21.99	-	-	39.1	29.6	-	-
		Height:100 Vert		Margin [dB]		-	-	-17.11	-7.61	-	-
3	76.2169	40.11 pk	-30.3	6.6	16.41	-	-	39.1	29.6	-	-
		Height:100 Vert		Margin [dB]		-	-	-22.69	-13.19	-	-
4	843.571	30.31 pk	-31.7	22.8	21.41	-	-	46.4	35.6	-	-
		Height:200 Vert		Margin [dB]		-	-	-24.99	-14.19	-	-

LIMIT 3: CFR 47 Part 15 Class A 10m
LIMIT 4: CFR 47 Part 15 Class B 10m

PK - Peak detector
QP - Quasi-Peak detector

Table 14 Radiated Spurious Emissions above 1GHz, Low Channel

Philips
Model: OccuSwitch Wireless
LoCh, Mod
120V/60Hz
RED: Horizontal GRN: Vertical

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit 1	Margin 1[dB]	Height [cm]	Polarity	Comments
1	1889.78	56.42	pk	-43.23	30.8	43.99	54	-10.01	150	Horz	Note 1
2	2404.81	79.89	pk	4.41	21.8	106.1			100	Horz	TX Frequency
3	4811.207	89.42	pk	-51.34	27.7	65.78	54	11.78	100	Horz	See table below
4	7215.477	84.27	pk	-47.03	29.8	67.04	54	13.04	100	Horz	See table below
5	9622.415	69.9	pk	-50.25	36.4	56.05	54	2.05	150	Horz	Note 1
6	12027.014	61.47	pk	-45.79	39.4	55.08	54	1.08	150	Horz	See table below
7	14428.214	52.94	pk	-38.28	39.8	54.46	54	.46	150	Horz	Note 1
8	16838.419	48.8	pk	-38.97	40.2	50.03	54	-3.97	150	Horz	Note 1
9	19267.634	65.75	pk	-57.92	40.3	48.13	54	-5.87	150	Horz	See table below
10	21648.824	59.46	pk	-53.08	40.4	46.78	54	-7.22	100	Horz	Note 1
11	1869.739	62.31	pk	-43.29	30.6	49.62	54	-4.38	150	Vert	Note 1
12	2404.81	70.51	pk	4.41	21.8	96.72			100	Vert	TX Frequency
13	4811.207	85.03	pk	-51.34	27.7	61.39	54	7.39	150	Vert	See table below
14	7215.477	79.59	pk	-47.03	29.8	62.36	54	8.36	100	Vert	See table below
15	9617.078	65.85	pk	-50.25	36.4	52	54	-2	150	Vert	Note 1
16	12027.014	55.32	pk	-45.79	39.4	48.93	54	-5.07	100	Vert	See table below
17	14425.213	51.7	pk	-38.33	39.8	53.17	54	-.83	150	Vert	Note 1
18	16832.416	47.41	pk	-38.99	40.2	48.62	54	-5.38	150	Vert	Note 1
19	19236.118	72.03	pk	-58.25	40.3	54.08	54	.08	101	Vert	See table below
20	21648.824	63.36	pk	-53.08	40.4	50.68	54	-3.32	101	Vert	Note 1

Note 1: Product of transmitter, not in restricted band, Radiated Emission Limits do not apply.
LIMIT 1: CFR 47 Part 15 Class B 3m

pk - Peak detector
av - Average detector

File: RE 1GHz-25GHz LoChMod.TXT

Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	RBW / VBW	Gain/Loss Factor [dB]	Transducer Factor [dB]	DC Factor dB	Level dB[uVolts/meter]	Limit 1	Margin 1[dB]	Azimuth [degs]	Height [cm]	Polarity	Comments
4810.9218	89.84	pk	1MHz/1MHz	-51.35	27.7	0	66.19	74	-7.81	334	110	Horz	None
4810.994	84.5	av	1MHz/10Hz	-51.34	27.7	-21.75	39.11	54	-14.89	334	110	Horz	None
4810.9098	85.81	pk	1MHz/1MHz	-51.35	27.7	0	62.16	74	-11.84	31	121	Vert	None
4809.1423	80.4	av	1MHz/10Hz	-51.36	27.7	-21.75	34.99	54	-19.01	31	121	Vert	None
7213.6353	78.28	pk	1MHz/1MHz	-47	29.8	0	61.08	74	-12.92	118	100	Vert	None
7213.7675	72.42	av	1MHz/10Hz	-47	29.8	-21.75	33.47	54	-20.53	118	100	Vert	None
7213.6593	84.58	pk	1MHz/1MHz	-47	29.8	0	67.38	74	-6.62	312	100	Horz	None
7213.6834	78.85	av	1MHz/10Hz	-47	29.8	-21.75	39.9	54	-14.1	312	100	Horz	None
12022.552	70.68	pk	1MHz/1MHz	-45.69	39.4	0	64.39	74	-9.61	0	120	Horz	None
12027.502	62.1	av	1MHz/10Hz	-45.8	39.4	-21.75	33.95	54	-20.05	0	120	Horz	None
12022.773	65.93	pk	1MHz/1MHz	-45.69	39.4	0	59.64	74	-14.36	295	106	Vert	None
12022.552	56.28	av	1MHz/10Hz	-45.69	39.4	-21.75	28.24	54	-25.76	295	106	Vert	None
19243.639	76.82	pk	1MHz/1MHz	-58.17	40.3	0	58.95	74	-15.05	14	101	Vert	None
19236.906	67.32	av	1MHz/10Hz	-58.25	40.3	-21.75	27.62	54	-26.38	14	101	Vert	None
19236.352	72.59	pk	1MHz/1MHz	-58.25	40.3	0	54.64	74	-19.36	64	100	Horz	None
19243.987	61.33	av	1MHz/10Hz	-58.17	40.3	-21.75	21.71	54	-32.29	64	100	Horz	None

LIMIT 1: CFR 47 Part 15 Class B 3m

pk - Peak detector
av - Average detector

Figure 13 Radiated Spurious Emissions below 1GHz, Middle Channel

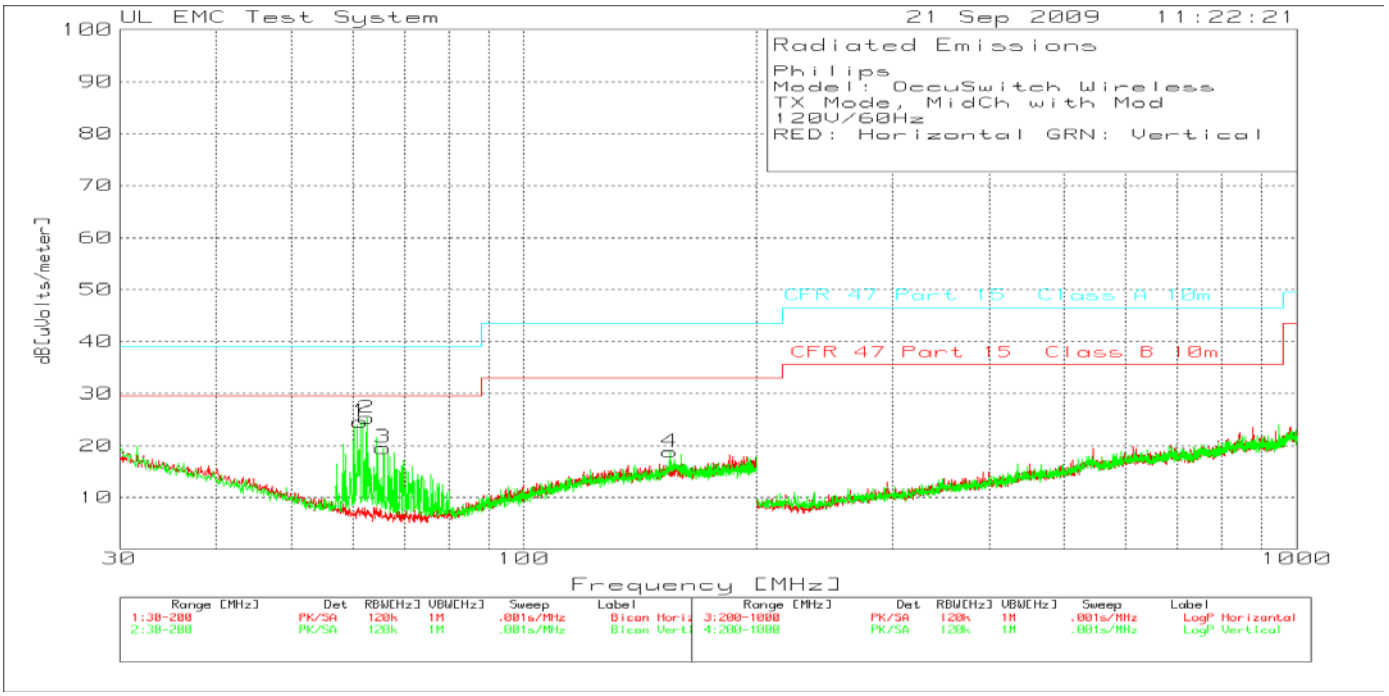


Figure 14 Radiated Spurious Emissions above 1GHz, Middle Channel

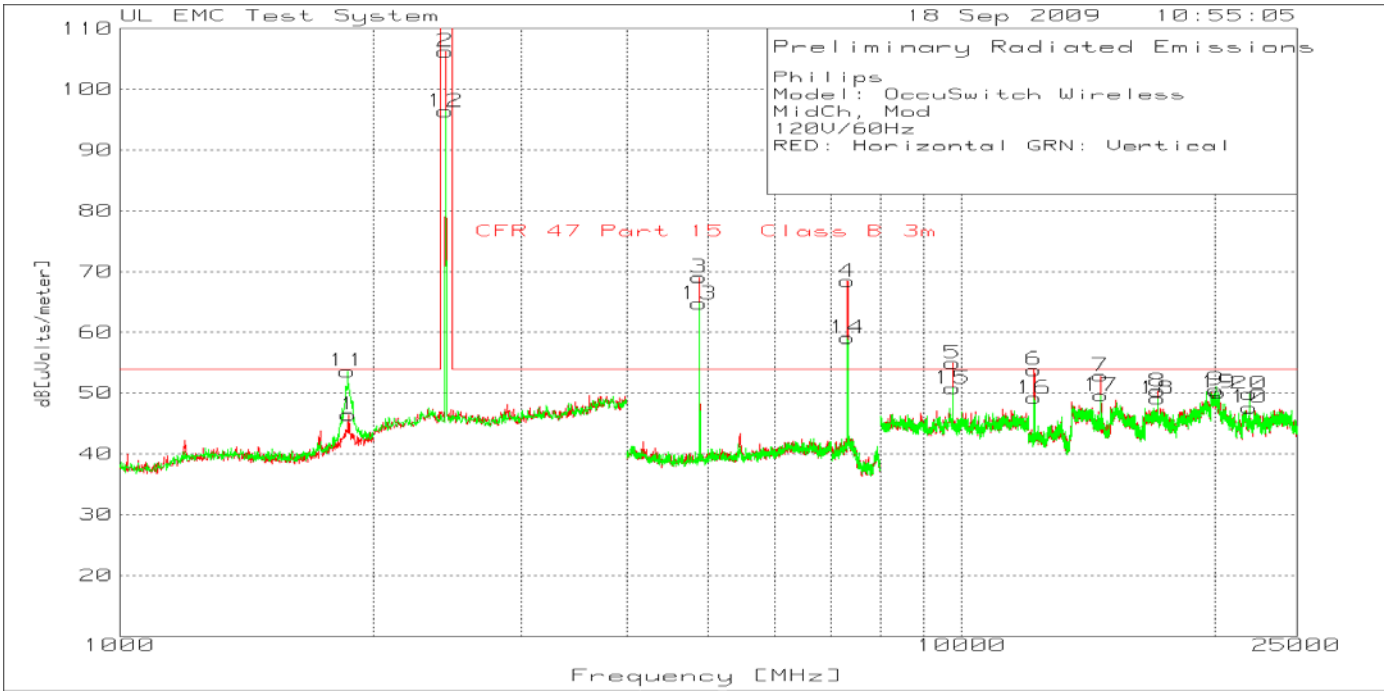


Table 15 Radiated Spurious Emissions below 1GHz, Middle Channel

Philips
Model: OccuSwitch Wireless
TX Mode, MidCh with Mod
120V/60Hz
RED: Horizontal GRN: Vertical

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
1	61.4343	48.27 pk	-30.3	6.6	24.57	-	-	39.1	29.6	-	-
		Height:100 Vert		Margin [dB]		-	-	-14.53	-5.03	-	-
2	62.7086	49.12 pk	-30.3	6.5	25.32	-	-	39.1	29.6	-	-
		Height:100 Vert		Margin [dB]		-	-	-13.78	-4.28	-	-
3	65.7671	43.58 pk	-30.3	6.3	19.58	-	-	39.1	29.6	-	-
		Height:100 Vert		Margin [dB]		-	-	-19.52	-10.02	-	-
4	154.5477	34.11 pk	-30.2	14.9	18.81	-	-	43.5	33.1	-	-
		Height:100 Vert		Margin [dB]		-	-	-24.69	-14.29	-	-

LIMIT 3: CFR 47 Part 15 Class A 10m
LIMIT 4: CFR 47 Part 15 Class B 10m

PK - Peak detector
QP - Quasi-Peak detector

Table 16 Radiated Spurious Emissions above 1GHz, Middle Channel

Philips
Model: OccuSwitch Wireless
MidCh, Mod
120V/60Hz
RED: Horizontal GRN: Vertical

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit 1	Margin 1 [dB]	Height [cm]	Polarity	Comments
1	1867.735	59.14	pk	-43.3	30.6	46.44	54	-7.56	100	Horz	Note 1
2	2436.874	80.46	pk	3.89	21.9	106.25			150	Horz	TX Frequency
3	4879.253	92.54	pk	-51.15	27.7	69.09	54	15.09	100	Horz	See table below
4	7319.546	84.18	pk	-46.37	30.6	68.41	54	14.41	100	Horz	See table below
5	9761.174	68.93	pk	-50.39	36.4	54.94	54	.94	150	Horz	Note 1
6	12195.098	60.5	pk	-46.07	39.4	53.83	54	-.17	149	Horz	See table below
7	14638.319	50.39	pk	-37.35	39.8	52.84	54	-1.16	149	Horz	Note 1
8	17078.539	48.81	pk	-38.78	40.3	50.33	54	-3.67	100	Horz	Note 1
9	20048.524	64.42	pk	-54.11	40.2	50.51	54	-3.49	150	Horz	Note 2
10	21963.982	59.59	pk	-52.37	40.4	47.62	54	-6.38	100	Horz	Note 1
11	1863.727	66.29	pk	-43.28	30.6	53.61	54	-.39	150	Vert	Note 1
12	2436.874	70.61	pk	3.89	21.9	96.4			100	Vert	TX Frequency
13	4880.587	88.15	pk	-51.13	27.7	64.72	54	10.72	101	Vert	See table below
14	7319.546	74.85	pk	-46.37	30.6	59.08	54	5.08	101	Vert	See table below
15	9758.506	64.76	pk	-50.38	36.4	50.78	54	-3.22	150	Vert	Note 1
16	12195.098	55.85	pk	-46.07	39.4	49.18	54	-4.82	101	Vert	See table below
17	14641.321	47.12	pk	-37.3	39.8	49.62	54	-4.38	101	Vert	Note 1
18	17084.542	47.53	pk	-38.73	40.3	49.1	54	-4.9	150	Vert	Note 1
19	20192.096	65.19	pk	-55.29	40.2	50.1	54	-3.9	101	Vert	Note 2
20	21967.484	61.87	pk	-52.37	40.4	49.9	54	-4.1	101	Vert	Note 1

Note 1: Product of transmitter, not in restricted band, Radiated Emission Limits do not apply.
Note 2: Product of the transmitter, restricted band, pre-scan peak level well under the limit. For average limit -21.75dB duty cycle factor may be applied.

LIMIT 1: CFR 47 Part 15 Class B 3m

pk - Peak detector

Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	RBW / VBW	Gain/Loss Factor [dB]	Transducer Factor [dB]	DC Factor dB	Level dB[uVolts/meter]	Limit 1	Margin 1 [dB]	Azimuth [degs]	Height [cm]	Polarity
1868.4108	78.05	pk		-43.29	30.6	0	65.36	74	-8.64	320	115	Vert
1868.0501	66.35	av		-43.29	30.6	-21.75	31.91	54	-22.09	320	115	Vert
4878.996	92.65	pk		-51.15	27.7	0	69.2	74	-4.8	329	102	Horz
4879.0922	87.63	av		-51.15	27.7	-21.75	42.43	54	-11.57	329	102	Horz
4880.998	88.21	pk		-51.13	27.7	0	64.78	74	-9.22	25	136	Vert
4879.0982	83.18	av		-51.15	27.7	-21.75	37.98	54	-16.02	25	136	Vert
7318.3988	76.55	pk		-46.36	30.6	0	60.79	74	-13.21	288	117	Vert
7318.7475	70.32	av		-46.36	30.6	-21.75	32.81	54	-21.19	288	117	Vert
7318.495	85.63	pk		-46.36	30.6	0	69.87	74	-4.13	321	103	Horz
7318.7475	79.95	av		-46.36	30.6	-21.75	42.44	54	-11.56	321	103	Horz
12202.535	69.93	pk		-46.06	39.4	0	63.27	74	-10.73	0	108	Horz
12197.625	62.38	av		-46.09	39.4	-21.75	33.94	54	-20.06	0	108	Horz
12197.405	66.73	pk		-46.09	39.4	0	60.04	74	-13.96	259	108	Vert
12197.565	58.72	av		-46.09	39.4	-21.75	30.28	54	-23.72	259	108	Vert

LIMIT 1: CFR 47 Part 15 Class B 3m

pk - Peak detector
av - Average detector

Figure 15 Radiated Spurious Emissions below 1GHz, High Channel

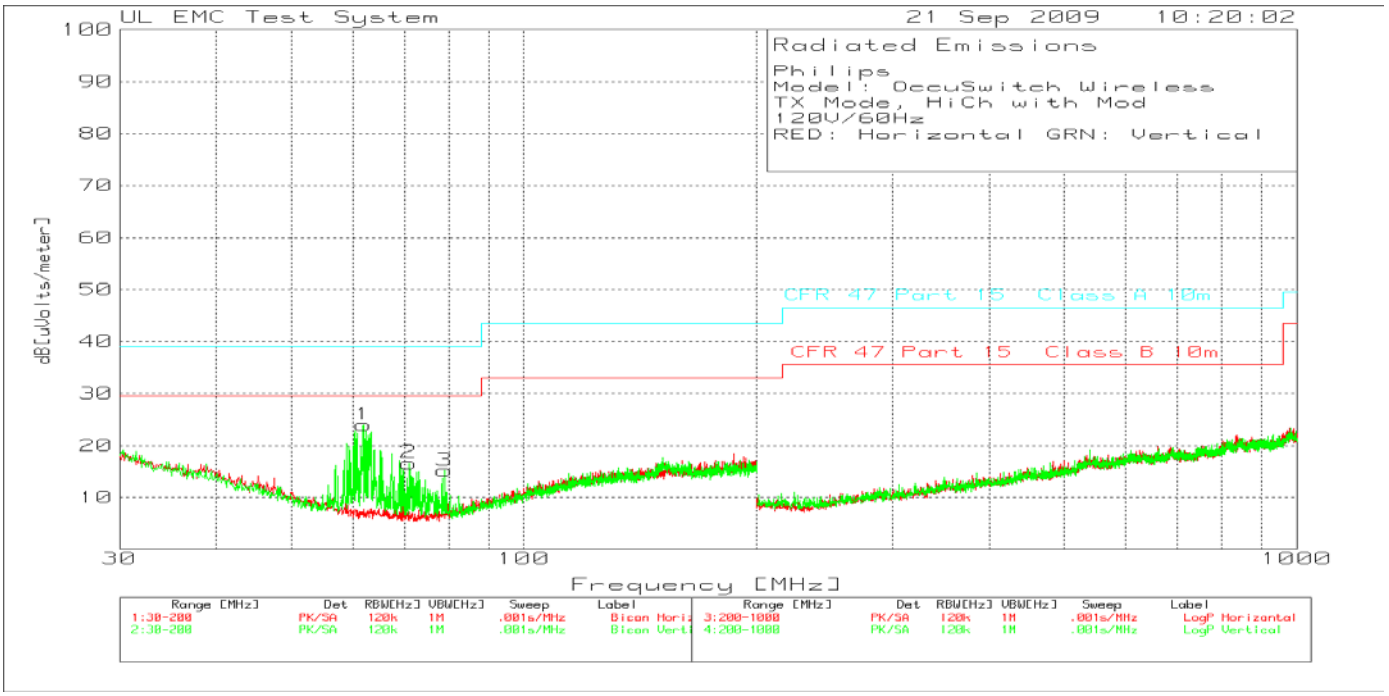


Figure 16 Radiated Spurious Emissions above 1GHz, High Channel

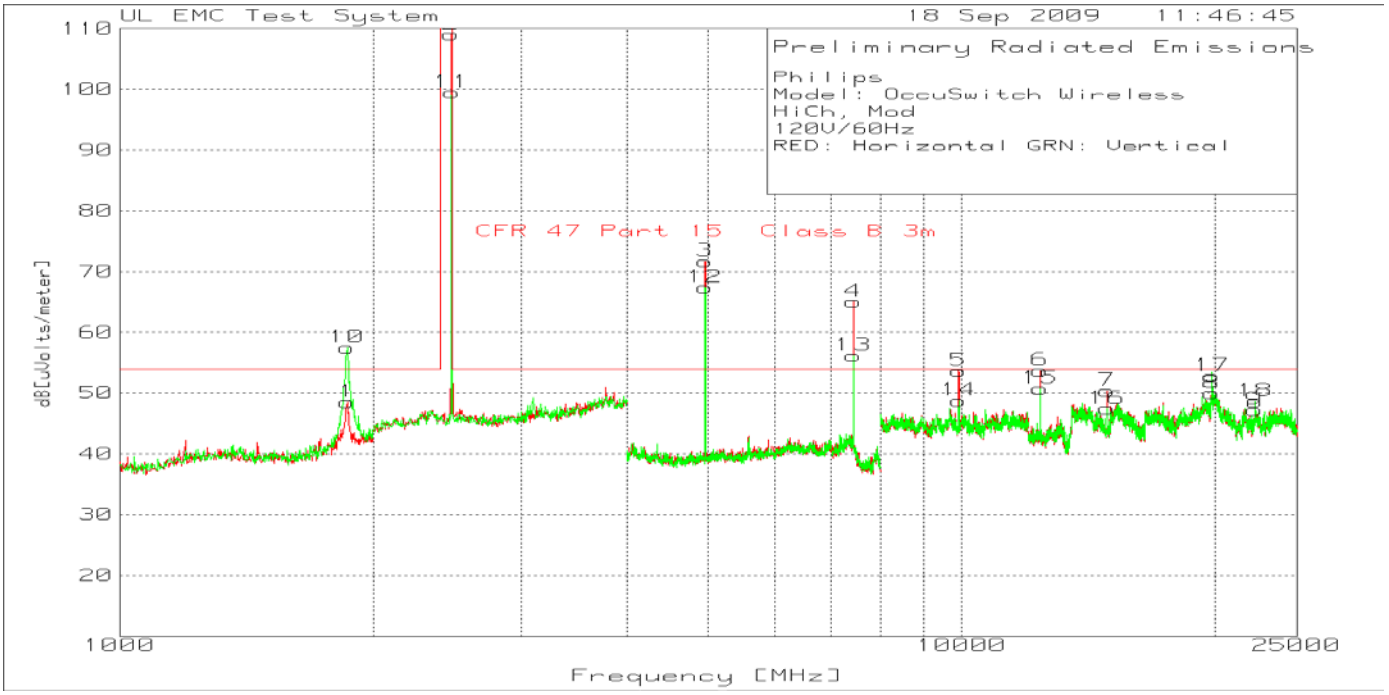


Table 17 Radiated Spurious Emissions below 1GHz, High Channel

Philips
Model: OccuSwitch Wireless
TX Mode, HiCh with Mod
120V/60Hz
RED: Horizontal GRN: Vertical

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4	5	6
1	62.029	47.68 pk	-30.3	6.6	23.98	-	-	39.1	29.6	-	-
		Height:100 Vert		Margin [dB]		-	-	-15.12	-5.62	-	-
2	70.9495	40.73 pk	-30.3	6.2	16.63	-	-	39.1	29.6	-	-
		Height:100 Vert		Margin [dB]		-	-	-22.47	-12.97	-	-
3	79.0205	38.49 pk	-30.2	6.9	15.19	-	-	39.1	29.6	-	-
		Height:100 Vert		Margin [dB]		-	-	-23.91	-14.41	-	-

LIMIT 3: CFR 47 Part 15 Class A 10m
LIMIT 4: CFR 47 Part 15 Class B 10m

PK - Peak detector
QP - Quasi-Peak detector
av - Linear average detector

Table 18 Radiated Spurious Emissions above 1GHz, High Channel

Philips
Model: OccuSwitch Wireless
HiCh, Mod
120V/60Hz
RED: Horizontal GRN: Vertical

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit 1	Margin 1 [dB]	Height [cm]	Polarity	Comments
1	1861.723	61.21	pk	-43.3	30.6	48.51	54	-5.49	150	Horz	Note 1
2	2476.954	82.88	pk	4.18	22	109.06			100	Horz	TX Frequency
3	4957.972	95.16	pk	-51.27	27.8	71.69	54	17.69	100	Horz	See table below
4	7439.626	81.77	pk	-47.31	30.6	65.06	54	11.06	100	Horz	See table below
5	9918.612	67.92	pk	-50.66	36.4	53.66	54	-.34	150	Horz	Note 1
6	12396.198	59.74	pk	-45.39	39.4	53.75	54	-.25	150	Horz	Note 2
7	14884.442	48.74	pk	-38.14	39.8	50.4	54	-3.6	150	Horz	Note 1
8	19810.405	65.09	pk	-55.4	40.3	49.99	54	-4.01	150	Horz	Note 2
9	22307.154	58.46	pk	-51.72	40.5	47.24	54	-6.76	150	Horz	Note 2
10	1861.723	70.18	pk	-43.3	30.6	57.48	54	3.48	150	Vert	See table below
11	2480.962	73.41	pk	4.08	22	99.49			100	Vert	TX Frequency
12	4957.972	90.87	pk	-51.27	27.8	67.4	54	13.4	100	Vert	See table below
13	7442.295	72.96	pk	-47.28	30.5	56.18	54	2.18	100	Vert	See table below
14	9921.281	62.96	pk	-50.58	36.4	48.78	54	-5.22	150	Vert	Note 1
15	12396.198	56.72	pk	-45.39	39.4	50.73	54	-3.27	150	Vert	Note 2
16	14878.439	45.85	pk	-38.2	39.8	47.45	54	-6.55	150	Vert	Note 1
17	19834.917	67.77	pk	-55.27	40.3	52.8	54	-1.2	100	Vert	Note 2
18	22324.662	59.54	pk	-51.36	40.5	48.68	54	-5.32	100	Vert	Note 2

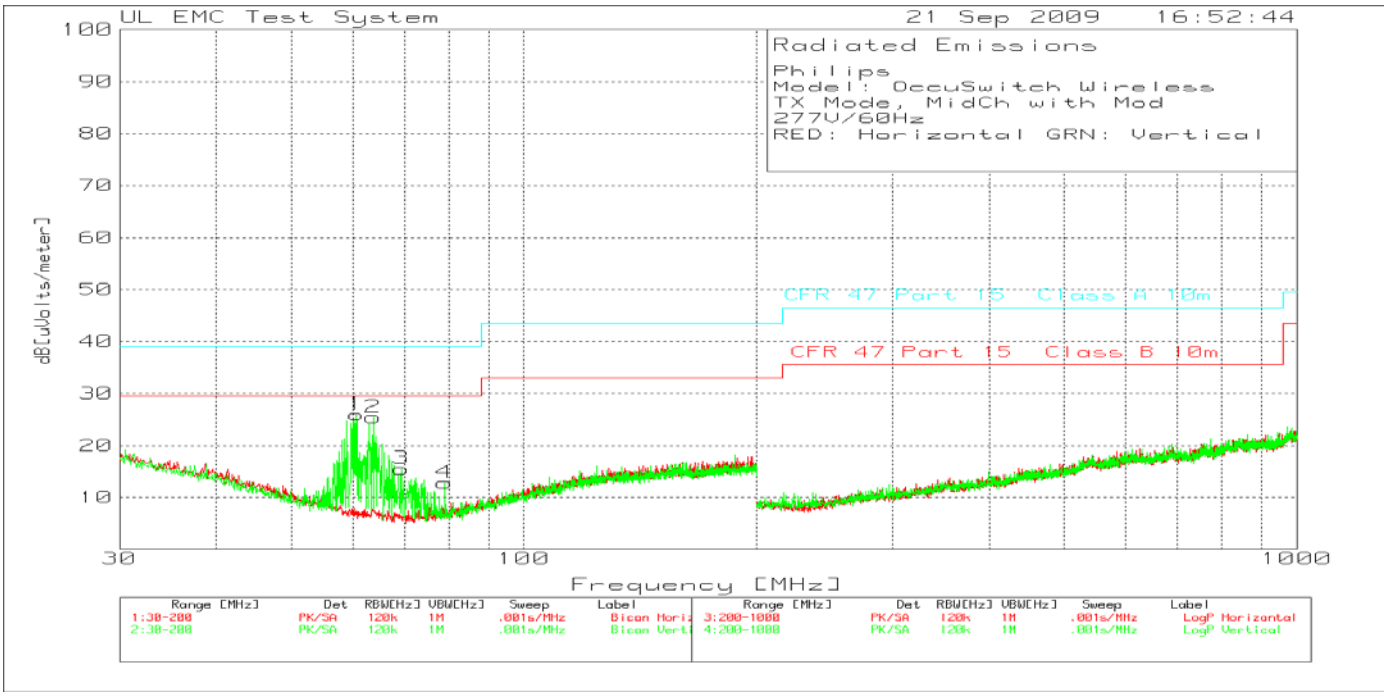
Note 1: Product of transmitter, not in restricted band, Radiated Emission Limits do not apply.
Note 2: Product of the transmitter, restricted band, pre-scan peak level well under the limit. For average limit -21.75dB duty cycle factor may be applied.

Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	RBW / VBW	Gain/Loss Factor [dB]	Transducer Factor [dB]	DC Factor dB	Level dB[uV/m]	Limit 1	Margin 1 [dB]	Azimuth [degs]	Height [cm]	Polarity
1860.9519	81.04	pk	1MHz/1MHz	-43.3	30.6	0	68.34	74	-5.66	321	111	Vert
1860.0701	70.47	av	1MHz/10Hz	-43.29	30.6	-21.75	36.03	54	-17.97	321	111	Vert
4958.9649	95.57	pk	1MHz/1MHz	-51.28	27.8	0	72.09	74	-1.91	331	100	Horz
4959.0852	90.52	av	1MHz/10Hz	-51.28	27.8	-21.75	45.29	54	-8.71	331	100	Horz
4959.013	92.68	pk	1MHz/1MHz	-51.28	27.8	0	69.2	74	-4.8	25	130	Vert
4959.0731	87.64	av	1MHz/10Hz	-51.28	27.8	-21.75	42.41	54	-11.59	25	130	Vert
7438.2605	81.11	pk	1MHz/1MHz	-47.37	30.6	0	64.34	74	-9.66	340	121	Vert
7438.7415	75.21	av	1MHz/10Hz	-47.35	30.6	-21.75	36.71	54	-17.29	340	121	Vert
7438.4228	83.93	pk	1MHz/1MHz	-47.37	30.6	0	67.16	74	-6.84	325	102	Horz
7438.7475	78.03	av	1MHz/10Hz	-47.35	30.6	-21.75	39.53	54	-14.47	325	102	Horz

LIMIT 1: CFR 47 Part 15 Class B 3m

pk - Peak detector
av - Average detector

Figure 17 Radiated Spurious Emissions below 1GHz, Middle Channel with 277V source



Only below 1GHz Radiated Emissions on middle channel were conducted. Based on the design, the change in input voltage will not change emissions above 1GHz. There is no significant differences in emissions below 1GHz as well therefore only middle channel data is provided as a reference.

Table 19 Radiated Spurious Emissions below 1GHz, Middle Channel with 277V source

Philips
Model: OccuSwitch Wireless
TX Mode, MidCh with Mod
277V/60Hz
RED: Horizontal GRN: Vertical

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit 3	Margin 3 [dB]	Limit 4	Margin 4 [dB]	Height [cm]	Polarity
1	60.7546	49.64	pk	-30.3	6.6	25.94	39.1	-13.16	29.6	-3.66	100	Vert
2	63.8981	49.32	pk	-30.3	6.4	25.42	39.1	-13.68	29.6	-4.18	100	Vert
3	69.4203	39.62	pk	-30.3	6.2	15.52	39.1	-23.58	29.6	-14.08	100	Vert
4	78.9355	36.1	pk	-30.2	6.9	12.8	39.1	-26.3	29.6	-16.8	100	Vert

LIMIT 3: CFR 47 Part 15 Class A 10m
LIMIT 4: CFR 47 Part 15 Class B 10m

PK - Peak detector
QP - Quasi-Peak detector

4.4 Test Conditions and Results – BAND EDGE COMPLIANCE

Test Description	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, 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 Section15.205(c)).

Basic Standard	47 CFR Part 15.247(d) RSS-210, A8.5	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	2400MHz – 2483.5MHz	Antenna Conducted

Limits	
Measurement Type	
Conducted	Antenna Conducted – 20dB below the fundamental
Radiated	Must meet the restricted band limit adjacent to the bandedge.
Supplementary information: Only Antenna Conducted Measurements required. No restricted bands close to the allocated frequency band.	

Table 20 Band Edge Compliance EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	2 & 3	1
Supplementary information: None		

Table 21 Bandedge CONDUCTED EMISSIONS Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323
Cable with Attenuator	Pasternack	10dB	none

Table 22 Bandedge RADIATED EMISSIONS Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323
Bicon Antenna	Chase	VBA6106A	EMC4078
Log-P Antenna	Chase	UPA6109	EMC4313
Spectrum Analyzer	Rhode & Schwarz	FSEK	EMC4182
Antenna Array	UL	BOMS	EMC4276

Figure 18 Test setup for Band Edge Compliance – Conducted

Figure 19 Test setup for Band Edge Compliance – Radiated

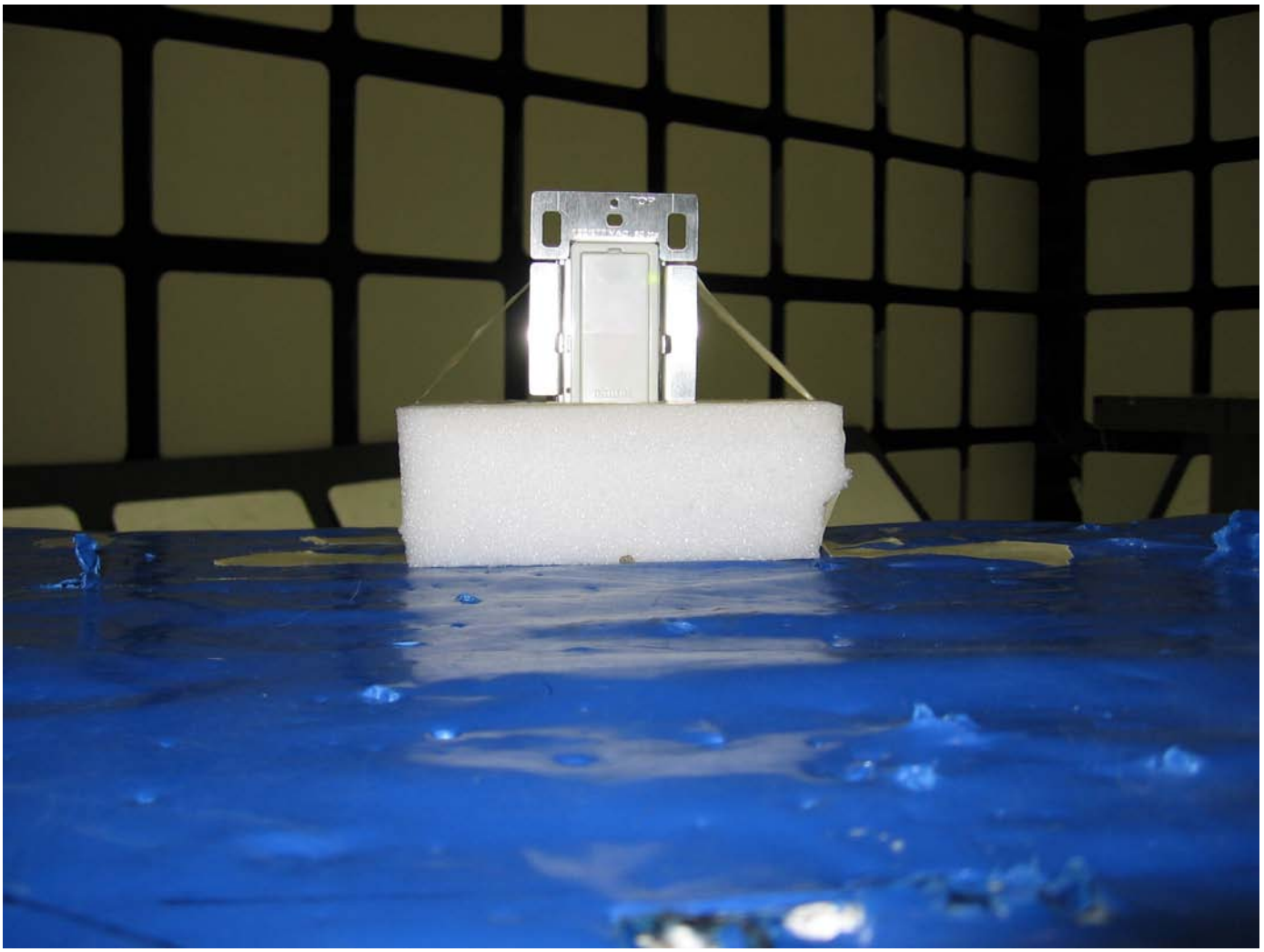


Figure 20 Antenna Conducted Band Edge Compliance Graph

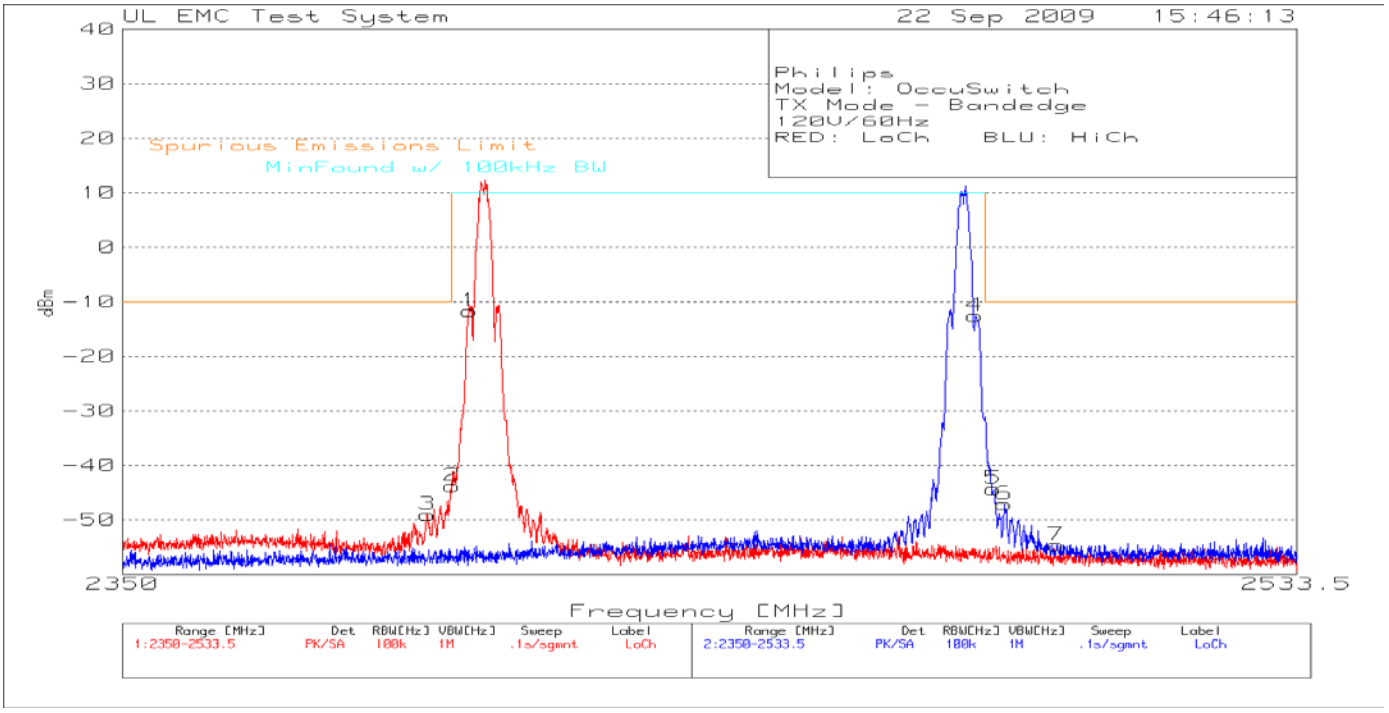


Table 23 Antenna Conducted Band Edge Compliance Data Points

Philips
Model: OccuSwitch
TX Mode - Bandedge
120V/60Hz
RED: LoCh BLU: HiCh

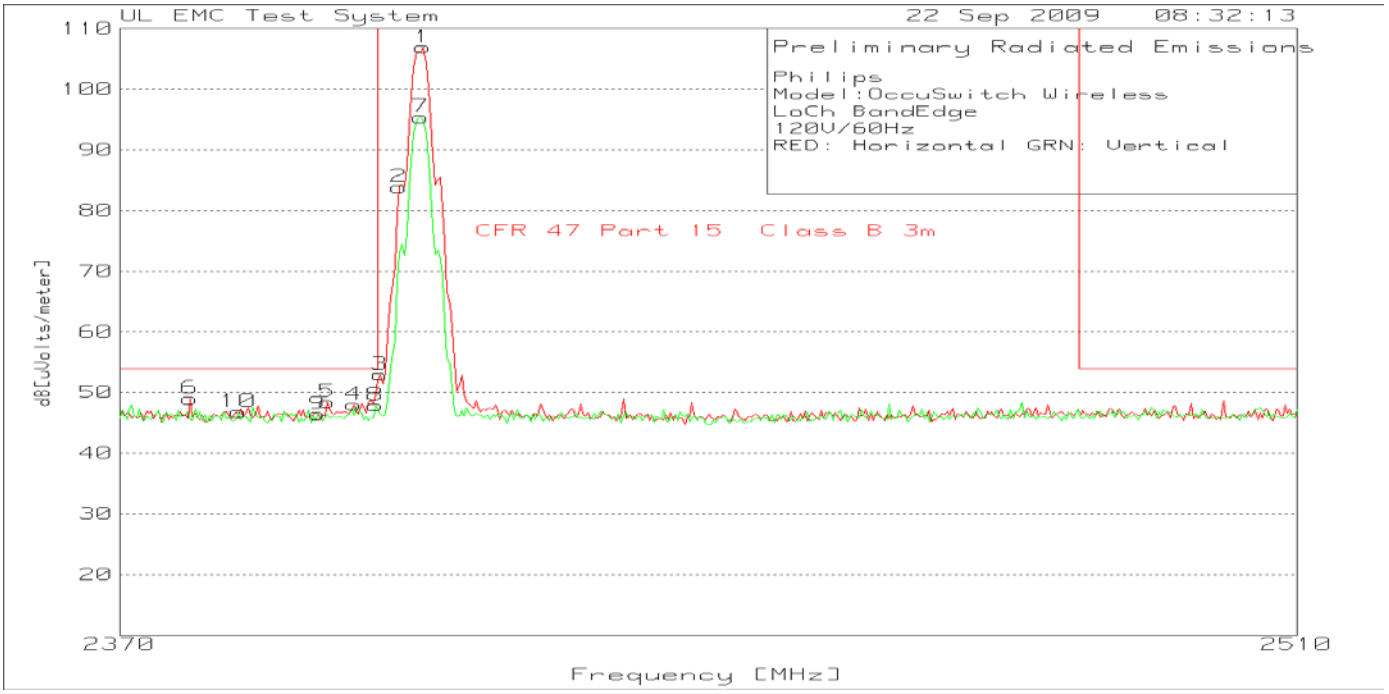
Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dBm	Limit 2	Margin 2 [dB]	Limit 3	Margin 3 [dB]
1	2402.813	84.98	pk	10.4	-107	-11.62	10	-21.62	10	-21.62
2	2400.123	52.89	pk	10.4	-107	-43.71	10	-53.71	10	-53.71
3	2396.333	47.53	pk	10.4	-107	-49.07	-10	-39.07	0	-49.07
4	2481.971	83.96	pk	10.5	-107	-12.54	10	-22.54	10	-22.54
5	2484.783	52.16	pk	10.5	-107	-44.34	-10	-34.34	0	-44.34
6	2486.616	49.38	pk	10.5	-107	-47.12	-10	-37.12	0	-47.12
7	2494.868	41.92	pk	10.5	-107	-54.58	-10	-44.58	0	-54.58

LIMIT 2: Spurious Emissions Limit
LIMIT 3: MinFound w/ 100kHz BW

PK - Peak detector

Figure 21 Radiated Band Edge Compliance Graph

Low channel



High Channel

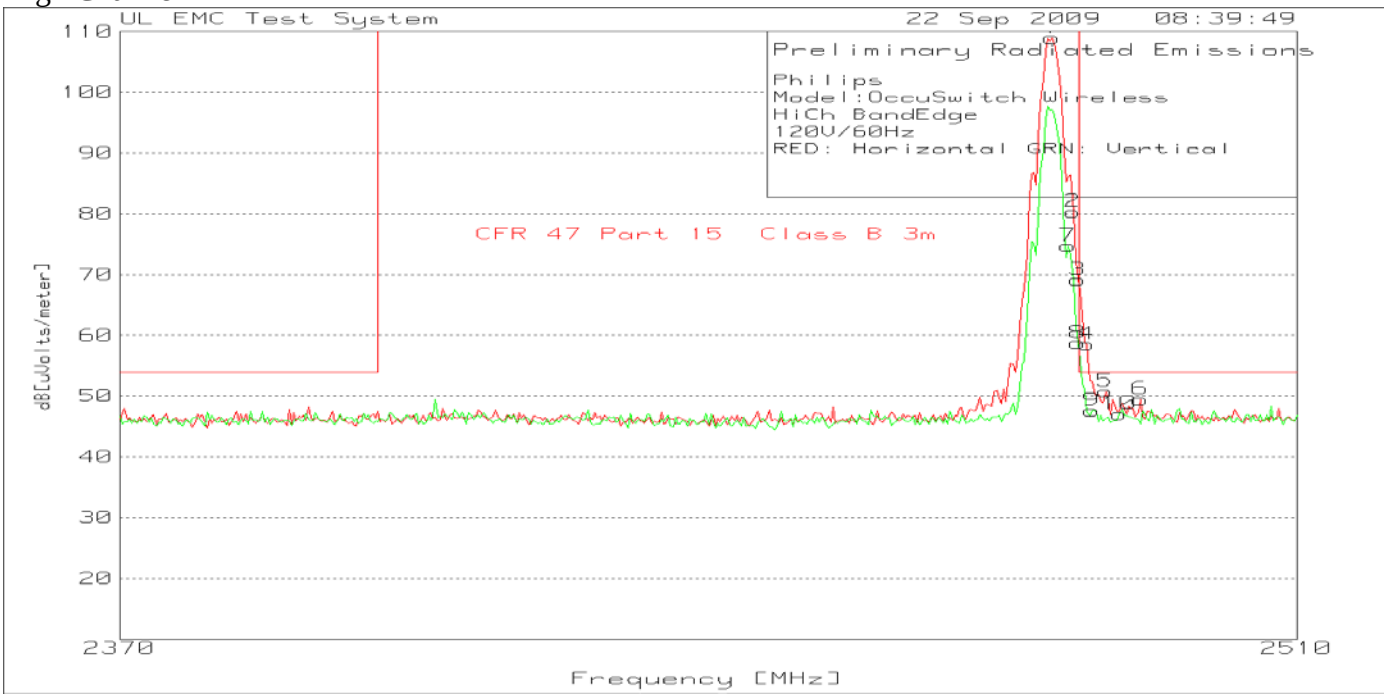


Table 24 Radiated Band Edge Compliance Data Points

Low Channel

Philips
Model:OccuSwitch Wireless
LoCh BandEdge
120V/60Hz
RED: Horizontal GRN: Vertical

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
1	2405.351	80.67	pk	4.42	21.8	106.89	X	X	100	Horz
2	2402.545	57.8	pk	4.32	21.8	83.92	X	X	100	Horz
3	2400.301	26.89	pk	4.26	21.8	52.95	X	X	150	Horz
4	2397.214	22	pk	4.2	21.8	48	54	-6	100	Horz
5	2394.128	22.51	pk	4.14	21.8	48.45	54	-5.55	100	Horz
6	2378.136	23.48	pk	3.72	21.8	49	54	-5	150	Horz
7	2405.07	69.22	pk	4.41	21.8	95.43	X	X	100	Vert
8	2399.739	21.85	pk	4.24	21.8	47.89	54	-6.11	100	Vert
9	2393.006	20.54	pk	4.11	21.8	46.45	54	-7.55	149	Vert
10	2383.747	21.21	pk	3.8	21.8	46.81	54	-7.19	149	Vert

Above table is a list of markers from trace data – no measurements are required.
LIMIT 1: CFR 47 Part 15 Class B 3m
pk - Peak detector

High Channel

Philips
Model:OccuSwitch Wireless
HiCh BandEdge
120V/60Hz
RED: Horizontal GRN: Vertical

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 1	Margin 1[dB]	Height [cm]	Polarity
1	2480.261	82.86	pk	4.1	22	108.96	X	X	100	Horz
2	2482.786	54.29	pk	4.05	22	80.34	X	X	100	Horz
3	2483.347	42.98	pk	4.04	22.1	69.12	X	X	100	Horz
4	2484.469	32.41	pk	4.04	22.1	58.55	54	4.55	100	Horz
5	2486.713	24.62	pk	4.04	22.1	50.76	54	-3.24	100	Horz
6	2490.922	23.31	pk	4.07	22.1	49.48	54	-4.52	100	Horz
7	2482.224	48.67	pk	4.06	22	74.73	X	X	101	Vert
8	2483.347	32.6	pk	4.04	22.1	58.74	X	X	101	Vert
9	2485.03	21.47	pk	4.03	22.1	47.6	54	-6.4	101	Vert
10	2488.397	20.89	pk	4.06	22.1	47.05	54	-6.95	101	Vert

Above table is a list of markers form the trace data – see measurements below.
LIMIT 1: CFR 47 Part 15 Class B 3m
pk - Peak detector

High Channel Bandedge Compliance Measurements.

Philips
Model:OccuSwitch Wireless
HiCh BandEdge
120V/60Hz
RED: Horizontal GRN: Vertical

Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 1	Margin 1[dB]	Azimuth [degs]	Height [cm]	Polarity
2479.4709	87.75	pk	4.12	22	113.87	X	X	11	120	Horz
2483.509	57.24	pk	4.04	22.1	83.38	74	9.38	11	120	Horz
2483.509	50.78	av	4.04	22.1	76.92	54	22.92	11	120	Horz
Marker-Delta measurement below used to show compliance.										
Fund with RBW=VBW=1MHz										
2479.4208	87.8	pk	4.12	22	113.92	X	X	11	120	Horz
Fund with RBW=1MHz VBW=10Hz										
2480.0421	85.49	av	4.11	22	111.6	X	X	11	120	Horz
Fund with 50kHz RBW										
2479.7515	83.25	pk	4.11	22	109.36	X	X	11	120	Horz
Bandedge with 50kHz RBW										
2483.509	40.12	pk	4.04	22.1	66.26	54	12.26	11	120	Horz
Delta between fundamental and band edge: 43.1dB **Peak Level for Bandedge based on Marker Delta Measurements: 70.82dBuV/m** **AV Level for Bandedge based on Makrer Delta Measurements: 68.5dBuV/m (must use Duty Cycle Factor for compliance)**										

LIMIT 1: CFR 47 Part 15 Class B 3m
pk - Peak detector
av - Average detector

Philips
Model:OccuSwitch Wireless
HiCh BandEdge
120V/60Hz
RED: Horizontal GRN: Vertical

Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uV/m]	Limit 1	Margin 1[dB]	Azimuth [degs]	Height [cm]	Polarity
2480.523	75.2	pk	4.09	22	101.29	X	X	127	102	Vert
2480.0521	73.03	av	4.11	22	99.14	X	X	127	102	Vert
2483.509	45.26	pk	4.04	22.1	71.4	74	-2.6	127	102	Vert
2483.509	38.58	av	4.04	22.1	64.72	54	10.72	127	102	Vert
The above average measurement can be corrected by using the worst case captured DC factor. The DC factor is -21.75dB and once applied the margin is -11.03dB										

LIMIT 1: CFR 47 Part 15 Class B 3m
pk - Peak detector
av - Average detector

4.5 Test Conditions and Results – Duty Cycle Correction

Test Description	Unless otherwise specified, *e.g.* Section 15.255(b), when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The exact method of calculating the average field strength shall be submitted with any application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.
Basic Standard	47 CFR Part 15.35(c) RSS-Gen 4.5

Table 25 Duty Cycle Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	3	3
Supplementary information: Duty cycle also measured/calculated for use in radiated spurious measurements. The EUT is using digital modulation technique. However, the TX time is very short thus the Duty cycle correction can be used. Multiple attempts were made to capture the Duty Cycle and worst case data is presented in this report.		

Table 26 Duty Cycle Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323
Cable with Attenuator	Pasternack	10dB	none
RF Detector	Alan	9128/50D1	none
Digital Oscilloscope	Agilent	54845A	EMC4207

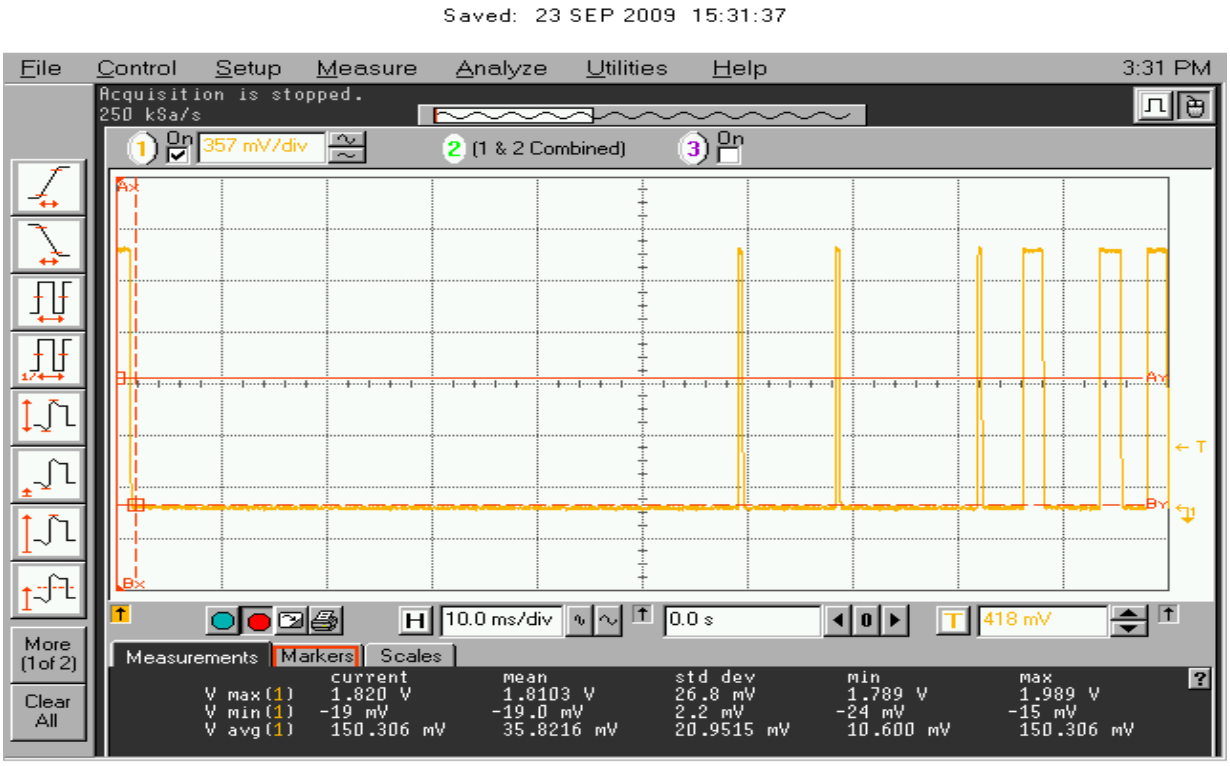
Table 27 Duty Cycle Results

Mode	V(max-min)	V(avg)	Duty Cycle Correction (dB) $20\times\log(\frac{V(avg)}{V(\max-\min)})$
TX Hopping Low Channel	1.839	0.150306	-21.75dB
Supplementary information: Because of the nature of how the swich communicates with another switch or a sensor multiple attempts were made to capture the worst case duty cycle. Since its not possible to predict the area where the worst case duty cycle will be present, using a spectrum analyzer in zero span with 100mS sweep was not practical. Instead, a digital storage oscilloscope with RF detector was used. The oscilloscope would not allow for multiple markers to be placed on the trace therefore the voltage (max-min) and voltage average values were used.			

Test Setup for Duty Cycle

Representative Photo Only – the EUT was connected to oscilloscope with RF detector in place of the attenuator.

Figure 22 Dwell Time Graphs



Acquisition
Sampling mode real time Configuration 8GSa/s
Memory depth manual Memory depth 65536pts
Sampling rate manual Sampling rate 250 kSa/s
Averaging off
9-bit BW Filter on Interpolation on

Channel 1
Scale 357 mV/div Offset 857 mV Coupling DC Impedance 1M Ohm
Attenuation 1.000 : 1 Atten units ratio Skew 0.0 s
Ext adapter None Ext coupler None
Ext gain 1.00E+00 Ext offset 0.0E+00

Time base
Scale 10.0 ms/div Position 0.0 s Reference left

Trigger
Mode edge Sweep triggered
Hysteresis normal Holdoff time 60 ns Coupling DC
Source channel 1 Trigger level 418 mV Slope rising

Measure

	current	mean	std dev	min	max
V max(1)	1.820 V	1.8103 V	26.8 mV	1.789 V	1.989 V
V min(1)	-19 mV	-19.0 mV	2.2 mV	-24 mV	-15 mV
V avg(1)	150.306 mV	35.8216 mV	20.9515 mV	10.600 mV	150.306 mV

Marker

	current	mean		X	Y
V max(1)	1.820 V	1.8103 V	A——(1) =	0.0 s	904 mV
V min(1)	-19 mV	-19.0 mV	B---(1) =	1.81818 ms	18 mV
V avg(1)	150.306 mV	35.8216 mV	Δ =	1.81818 ms	-886 mV
			1/ΔX =	550.000 Hz	

4.6 Test Conditions and Results – 6dB BANDWIDTH

Test Description	Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.
Basic Standard	47 CFR Part 15.247(a)(2) RSS-210, A8.2(a)

Table 28 6dB Bandwidth Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	3	1
Supplementary information: None		

Table 29 6dB Bandwidth Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323
Cable with Attenuator	Pasternack	10dB	none

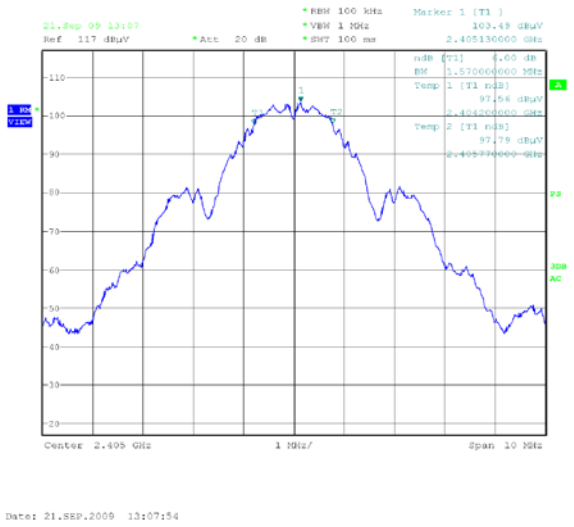
Table 30 20dB Bandwidth Results

Mode	Channel	20dB Bandwidth
TX	Low	1.570MHz
	Middle	1.590MHz
	High	1.580MHz

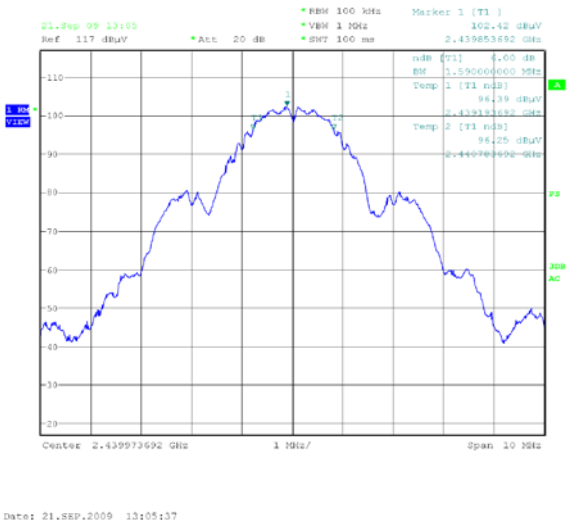
Test Setup for 6dB Bandwidth

Figure 23 20dB Bandwidth Graphs

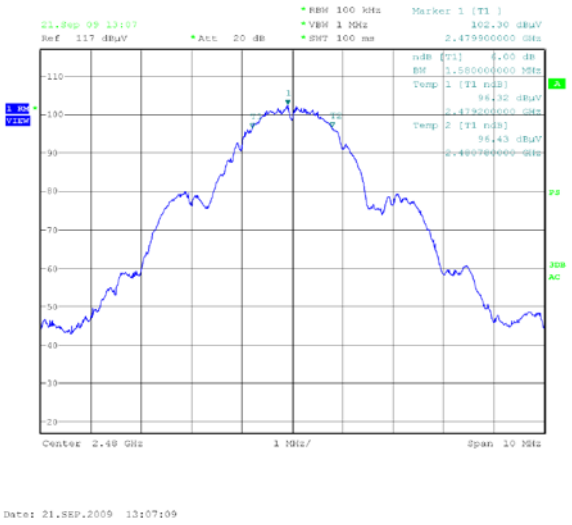
Low Channel



Middle Channel



High Channel



4.7 Test Conditions and Results – MAXIMUM PEAK OUTPUT POWER

Test Description	For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.	
Basic Standard	47 CFR Part 15.247(b)(3) RSS-210, A8.4(4)	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	2400MHz –2483.5MHz	Antenna Conducted
Limits		
Frequency (MHz)	Limit mW	
	Peak	
2400 – 2483.5	1,000	
Supplementary information: None		

Table 31 Maximum Peak Output Power EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	3	1
Supplementary information: None		

Table 32 Maximum Peak Output Power Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323
Cable with Attenuator	Pasternack	10dB	none

Table 33 Maximum Peak Output Power Results

Channel	Declared Antenna Gain (dBi)	Limit (dBm)	Power dBm	Power W
Low Channel	5.38	30	15.74	0.0375
Middle Channel	4.33	30	15.06	0.0321
High Channel	3.93	30	14.76	0.0299

Figure 24 Test setup for Maximum Peak Output Power

Figure 25 Maximum Peak Output Power Graph

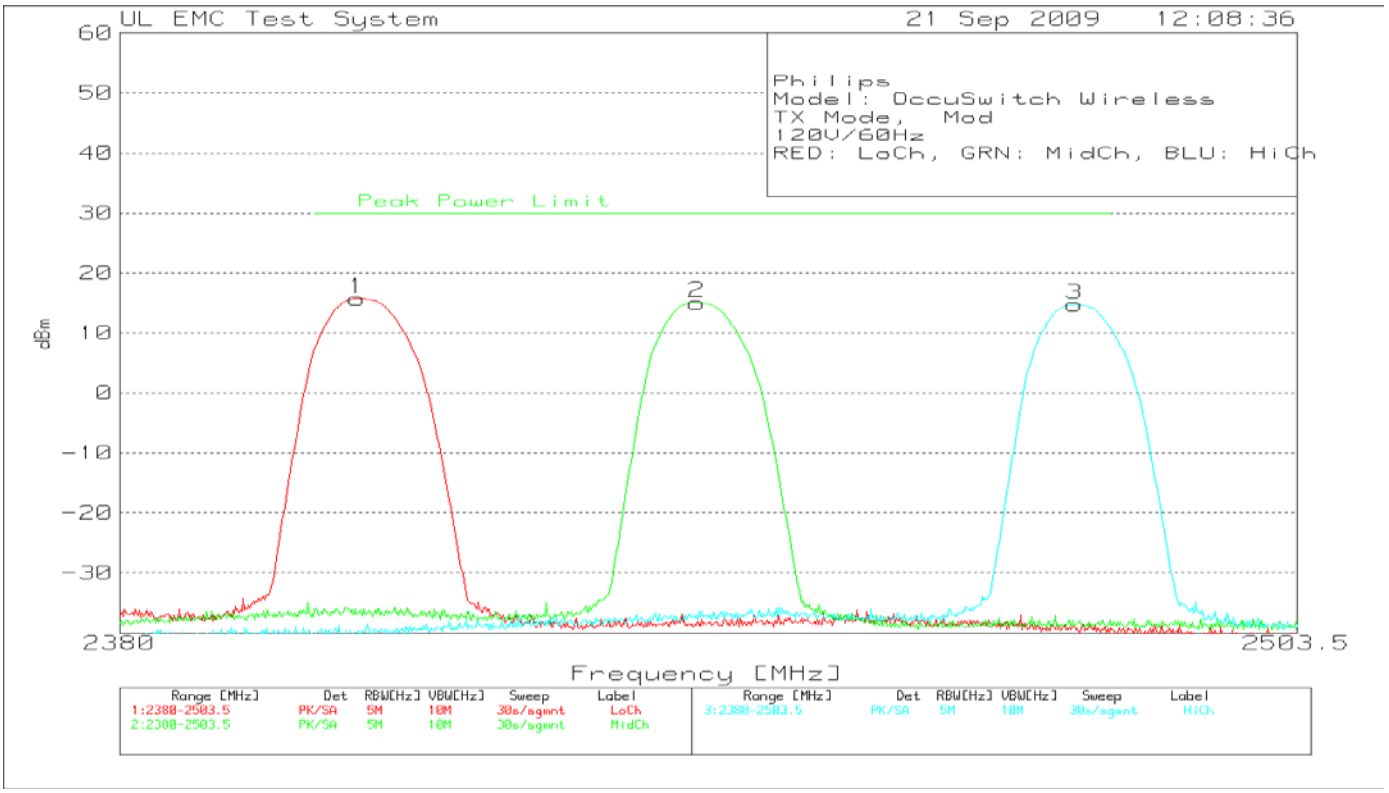


Table 34 Maximum Peak Output Power Emissions Data Points

Philips
Model: OccuSwitch Wireless
TX Mode, Mod
120V/60Hz
RED: LoCh, GRN: MidCh, BLU: HiCh

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dBm	Limit 1	Margin 1[dB]
1	2404.453	112.34	pk	10.4	-107	15.74	30	-14.26
2	2439.836	111.76	pk	10.3	-107	15.06	30	-14.94
3	2479.726	111.26	pk	10.5	-107	14.76	30	-15.24

LIMIT 1: Peak Power Limit
PK - Peak detector

4.8 Test Conditions and Results – POWER SPECTRAL DENSITY

Test Description	For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.	
Basic Standard	47 CFR Part 15.247(e) RSS-210, A8.2(b)	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	2400MHz –2483.5MHz	Antenna Conducted
Limits		
Frequency (MHz)	Limit mW	
	Peak	
2400 – 2483.5	8dBm (0.00631mW)	
Supplementary information: None		

Table 35 Power Spectral Density EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	3	1
Supplementary information: None		

Table 36 Power Spectral Density Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323
Cable with Attenuator	Pasternack	10dB	none

Table 37 Power Spectral Density Power Results

Channel	Limit (dBm)	Power Density dBm
Low Channel	8	1.01
Middle Channel	8	0.80
High Channel	8	0.04

Figure 26 Test setup for Power Spectral Density

Figure 27 Power Spectral Density Graph – Low Channel

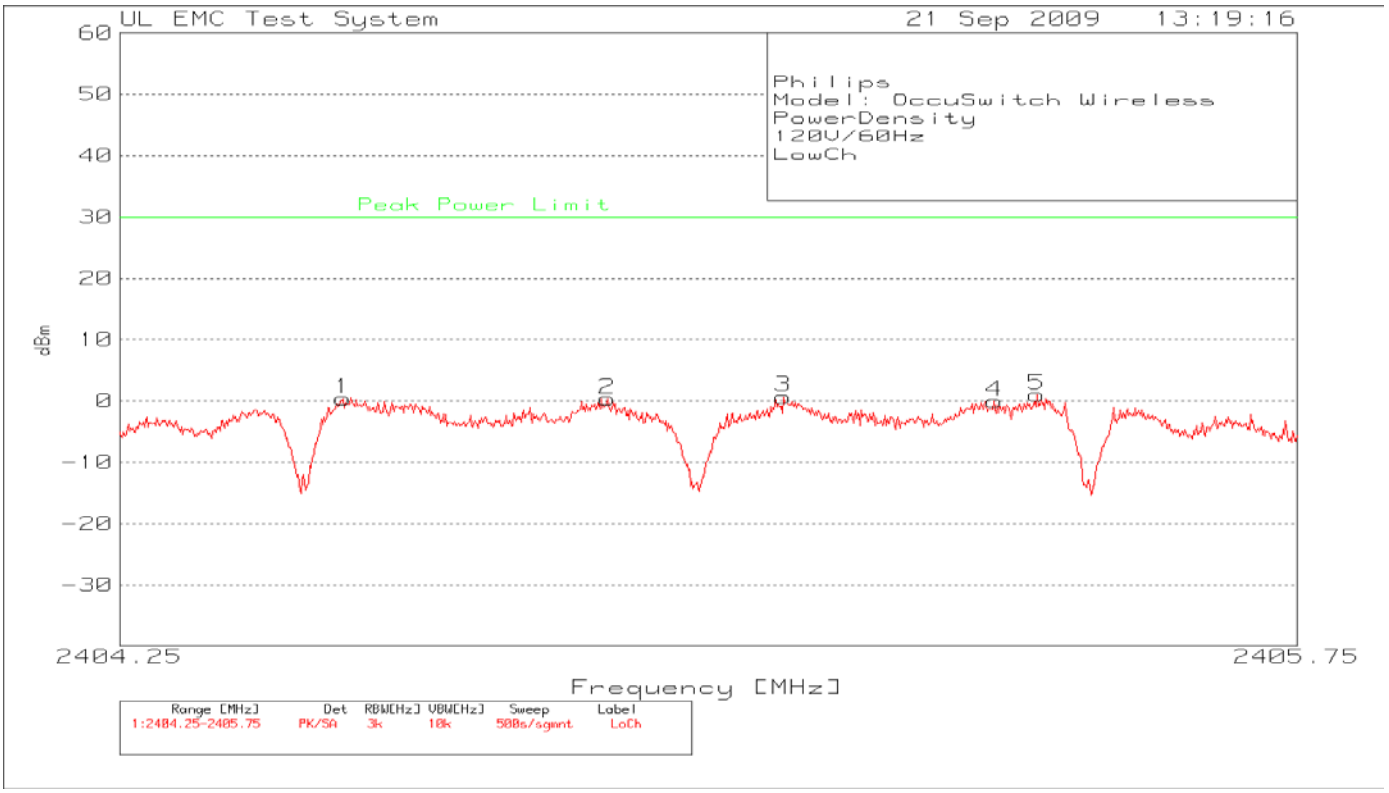


Table 38 Power Spectral Density Data Points – Low Channel

Philips
Model: OccuSwitch Wireless
PowerDensity
120V/60Hz
LowCh

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dBm
1	2404.535	96.99	pk	10.4	-107	.39
2	2404.871	96.96	pk	10.4	-107	.36
3	2405.096	97.28	pk	10.4	-107	.68
4	2405.365	96.56	pk	10.4	-107	-.04
5	2405.419	97.61	pk	10.4	-107	1.01

PK - Peak detector

Figure 28 Power Spectral Density Graph – Middle Channel

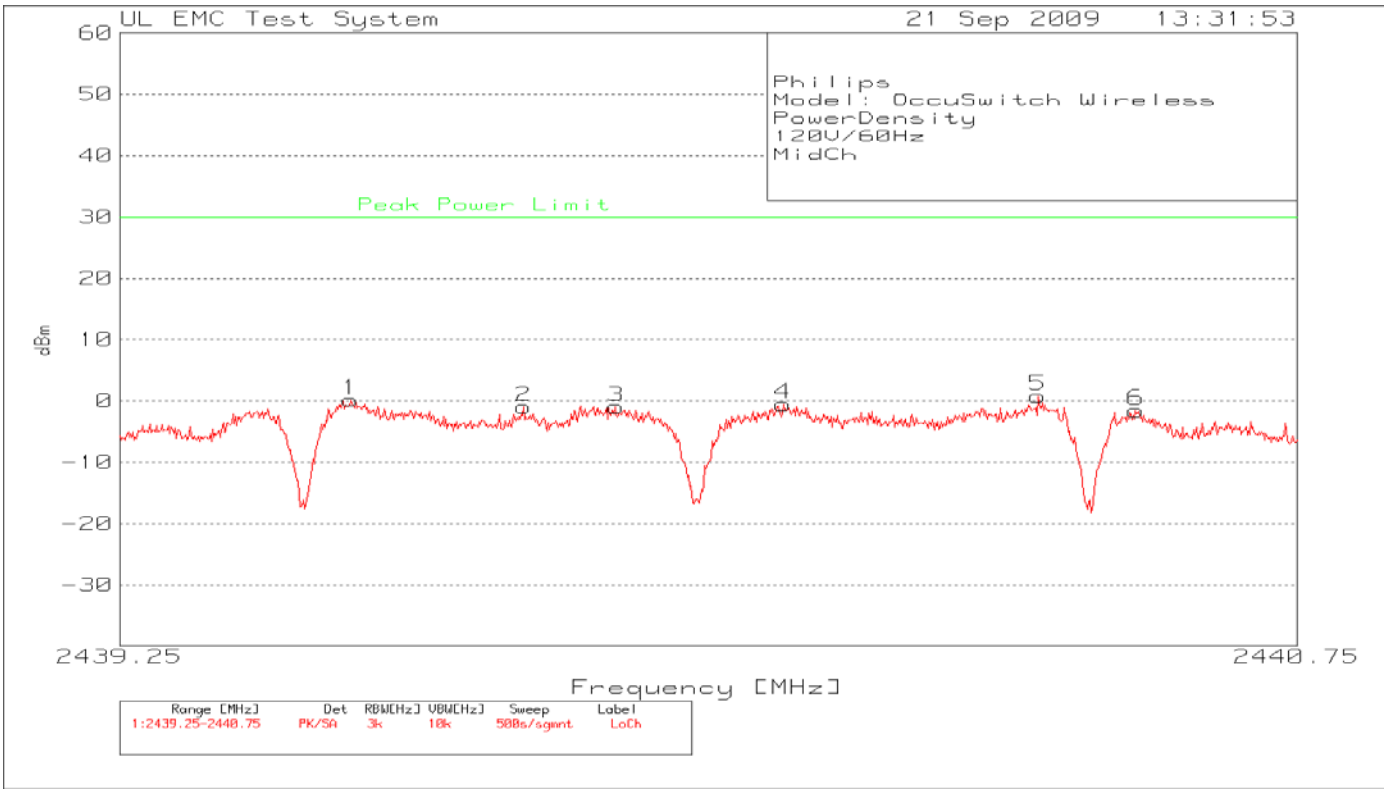


Table 39 Power Spectral Density Data Points – Middle Channel

Philips
Model: OccuSwitch Wireless
PowerDensity
120V/60Hz
MidCh

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dBm
1	2439.544	96.91	pk	10.3	-107	.21
2	2439.765	95.79	pk	10.3	-107	-.91
3	2439.882	95.76	pk	10.3	-107	-.94
4	2440.096	96.22	pk	10.3	-107	-.48
5	2440.42	97.5	pk	10.3	-107	.8
6	2440.545	95.18	pk	10.3	-107	-1.52

PK - Peak detector

Figure 29 Power Spectral Density Graph – High Channel

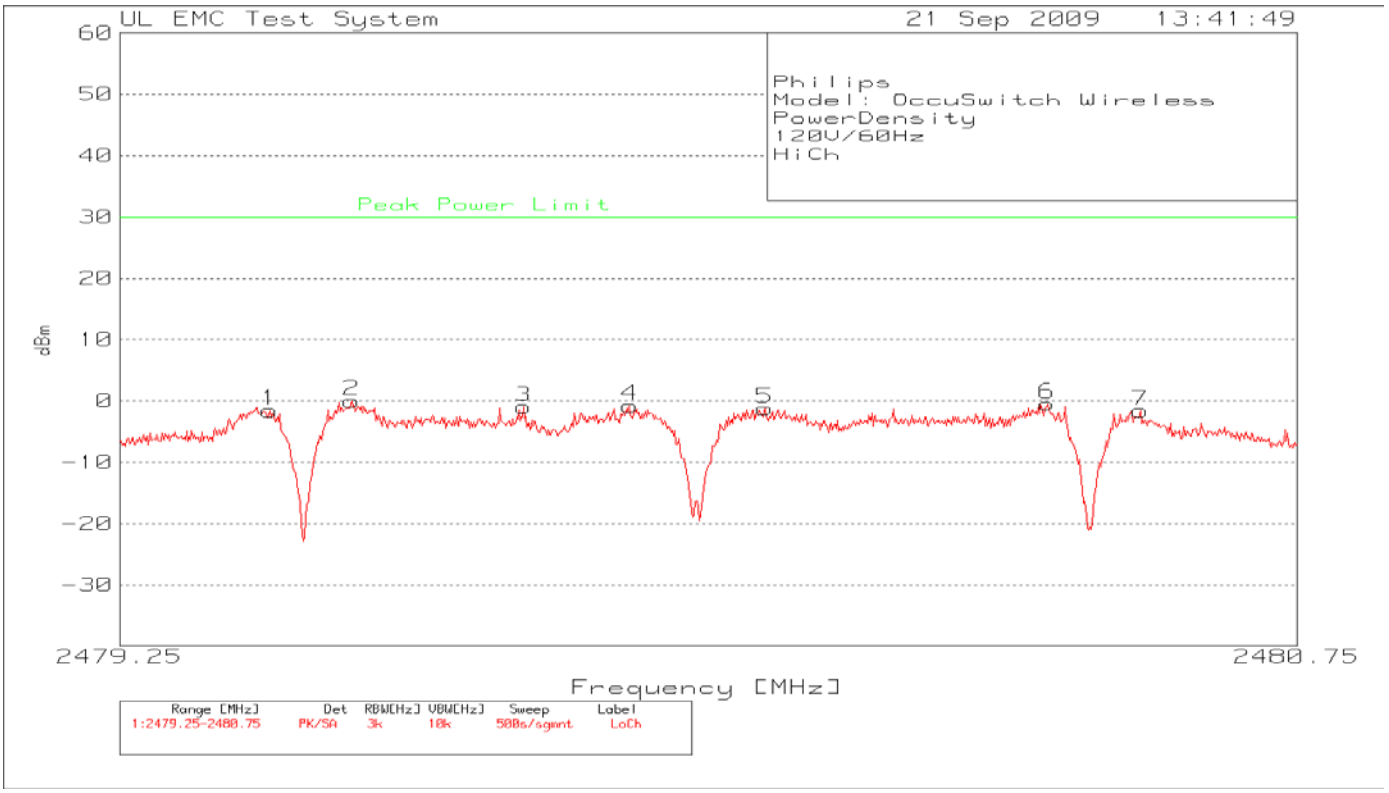


Table 40 Power Spectral Density Data Points – High Channel

Philips
Model: OccuSwitch Wireless
PowerDensity
120V/60Hz
HiCh

Marker Number	Test Frequency [MHz]	Meter Reading [dB(uV)]	Detector Type	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dBm
1	2479.441	94.98	pk	10.5	-107	-1.52
2	2479.546	96.54	pk	10.5	-107	.04
3	2479.765	95.56	pk	10.5	-107	-.94
4	2479.9	95.75	pk	10.5	-107	-.75
5	2480.072	95.28	pk	10.5	-107	-1.22
6	2480.432	96.05	pk	10.5	-107	-.45
7	2480.551	94.91	pk	10.5	-107	-1.59

PK - Peak detector

4.9 Test Conditions and Results – 99% Power BANDWIDTH

Test Description	When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.
Basic Standard	RSS-Gen, 4.6.1

Table 41 99% Power Bandwidth Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	3	1
Supplementary information: None		

Table 42 99% Power Bandwidth Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
EMI Test Receiver	Rohde & Schwarz	ESU	EMC4323
Cable with Attenuator	Pasternack	10dB	none

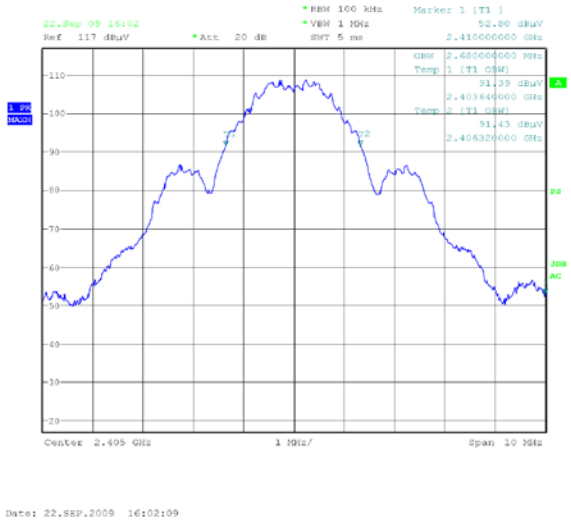
Table 43 99% Power Bandwidth Results

Mode	Channel	99% Power Bandwidth
TX	Low	2.680MHz
	Middle	2.680MHz
	High	2.720MHz

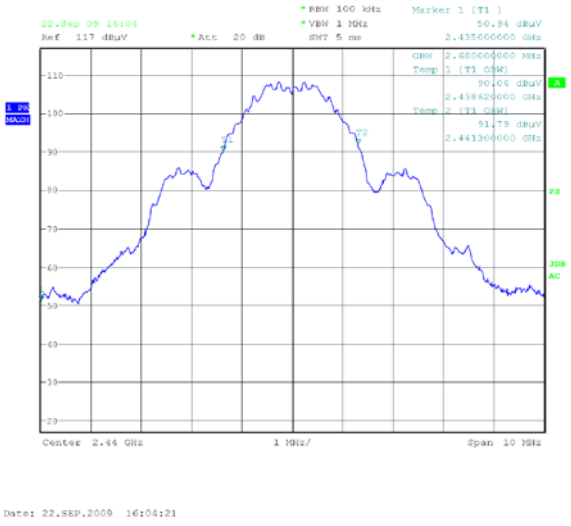
Test Setup for 99% Power Bandwidth

Figure 30 99% Power Bandwidth Graphs

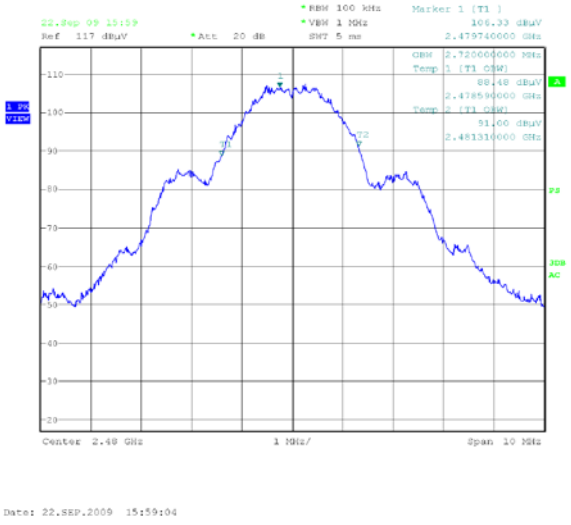
Low Channel



Middle Channel



High Channel



5.0 IMMUNITY TEST RESULTS

Immunity testing was non conducted nor is required by the standard.

Appendix A

Accreditations and Authorizations

NVLAP Lab code: 100414-0

NVLAP: The National Institute of Standards and Technology (NIST) administers the National Voluntary Laboratory Accreditation Program (NVLAP). NVLAP is comprised of laboratory accreditation programs (LAPs) which are established on the basis of requests and demonstrated need. Each LAP includes specific calibration and/or test standards and related methods and protocols assembled to satisfy the unique needs for accreditation in a field of testing or calibration. NVLAP accredits public and private laboratories based on evaluation of their technical qualifications and competence to carry out specific calibrations or tests. Accreditation criteria are established in accordance with the U.S. Code of Federal Regulations (CFR, Title 15, Part 285), NVLAP Procedures and General Requirements, and encompass the requirements of ISO/IEC 17025. For a full scope listing see http://ts.nist.gov/ts/htdocs/210/214/scopes/1004140.htm

FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland (Ref. No. 91044).

Industry Canada Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3. File #: IC 2180

VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.: Radiated Emissions R-621, Conducted Emissions C-642.

ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).

NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 89/336/EEC, Article 10 (2). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.
NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).
NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6