



**FCC CFR47 PART 15 SUBPART C
INDUSTRY CANADA RSS-210 ISSUE 8**

CERTIFICATION TEST REPORT

FOR

REPEATER

MODEL NUMBER: SW-ATT-RTPR4

**FCC ID: QNP-433RPT
IC: 4676A-433RPT**

REPORT NUMBER: SR8786080-T002

**ISSUE DATE: 2012-06-11
REVISION DATE: 2012-06-28**

Prepared for
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Prepared by
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NVLAP LAB CODE 100255-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	2012-06-11	Initial Issue	B. DeLisi
1	2012-06-29	Model number was changed and update in report.	B. DeLisi

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: SECURE WIRELESS, INC
5817 DRYDEN PLACE, SUITE D
CARLSBAD, CA, 92008, USA

EUT DESCRIPTION: Repeater

MODEL: SW-ATT-RTPR4

SERIAL NUMBER: Non-serialized production unit

DATE TESTED: 2012-06-06 to 2012-06-11

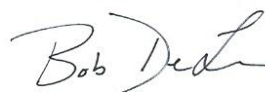
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	Pass
INDUSTRY CANADA RSS-210 Issue 8, Annex 1	Pass
INDUSTRY CANADA RSS-GEN Issue 3	Pass

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards, using test results reported in the test report documents referenced below and/or documentation furnished by the applicant. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations of these calculations. The results show that the equipment is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation, as described by the referenced documents. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL By:

Tested By:



Joe Danisi
Lead Engineering Associate
UL LLC

Bob DeLisi
Sr. Staff Engineer
UL LLC

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4:2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 1285 Walt Whitman Rd. Melville, NY 11747, USA.

UL Melville is accredited by NVLAP, Laboratory Code 100255-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/1002550.htm>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamplifier Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	± 3.3 dB
Radiated Disturbance, 30 to 1000 MHz	± 4.00 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a transceiver intended for security applications.

The model number was changed after testing commenced. All data in this report is applicable to the model number documented in Section 1 above

5.2. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an integral loaded $\frac{1}{4}$ wave antenna, with a maximum gain of -0 dBi (estimated).

5.3. WORST-CASE CONFIGURATION AND MODE

The EUT was configured by the manufacturer to continuously transmit at the fundamental frequency. The configuration for test was as would be in normal use.

5.4. MODIFICATIONS

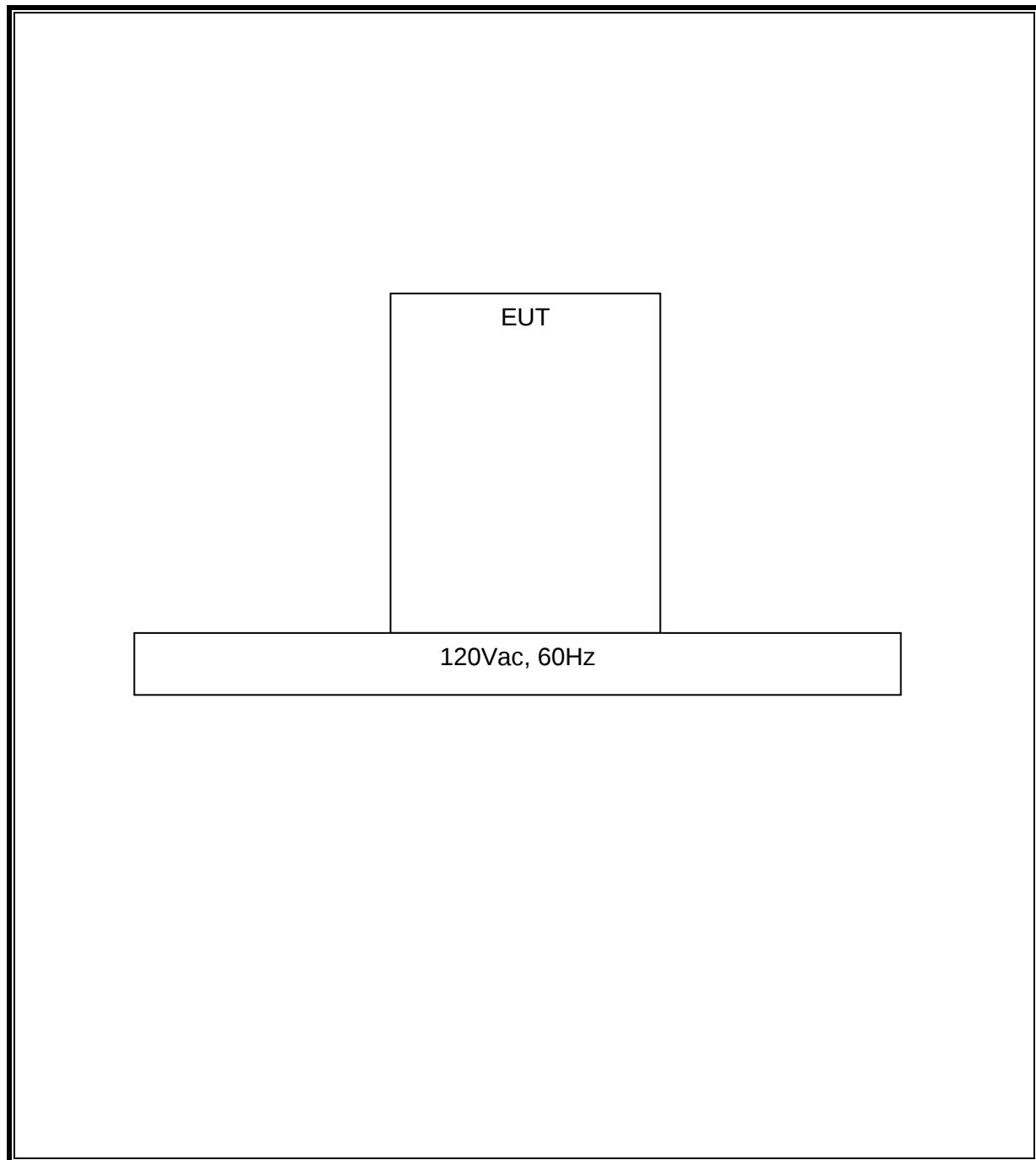
No modifications were made during testing.

5.5. DESCRIPTION OF TEST SETUP

TEST SETUP

The EUT was tested in the configuration that represents normal use as a stand-alone direct plug-in device.

SETUP DIAGRAM FOR TESTS



TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

Test Equipment Used – Radiated Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
30-1000MHz					
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081	2012-01-30	2013-01-30
Bicon Antenna	Schaffner	VBA6106A	54	2012-04-10	2013-04-10
Log-P Antenna	Schaffner	UPA6109	44067	2012-05-16	2013-05-16
Switch Driver	HP	11713A	ME7A-627	N/A	N/A
System Controller	Sunol Sciences	SC99V	44396	N/A	N/A
Camera Controller	Panasonic	WV-CU254	44395	N/A	N/A
RF Switch Box	UL	1	44398	N/A	N/A
Measurement Software	UL	Version 9.3	44740	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2010-12-07	2012-12-07
Multimeter	Fluke	83III	ME5B-305	2012-02-01	2013-02-28
Above 1GHz (Band Optimized System)					
EMI Receiver	Rohde & Schwarz	ESIB40	34968	2012-03-01	2013-03-01
Horn Antenna (1-2 GHz)	ETS	3161-01	51442	2008-03-28	See * below
Horn Antenna (2-4 GHz)	ETS	3161-02	48107	2007-09-27	See * below
Horn Antenna (4-8 GHz)	ETS	3161-03	48106	2007-09-27	See * below
Signal Path Controller	HP	11713A	50250	N/A	N/A
Gain Controller	HP	11713A	50251	N/A	N/A
RF Switch / Preamp Fixture	UL	BOMS1	50249	N/A	N/A
System Controller	UL	BOMS2	50252	N/A	N/A
Measurement Software	UL	Version 9.3	44740	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268	2010-12-07	2012-12-07
Multimeter	Fluke	83III	ME5B-305	2012-02-01	2013-02-28
* - Note: As allowed by the calibration standard ANSI C63.4 Section 4.4.2, standard gain horns need only a one-time calibration. Only if physical damage occurs will the horn antenna require re-calibration. * Gain standard horn antennas (sometimes called standard gain horn antennas) need not be calibrated beyond that which is provided by the manufacturer unless they are damaged or deterioration is suspected, or they are used at a distance closer than $2D^2/\lambda$. Gain standard horn antennas have gains that are fixed by their dimensions and dimensional tolerances.					

Test Equipment Used – Conducted Emissions					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
Conducted Emissions – GP 1					
EMI Receiver	Rohde & Schwarz	ESIB26 ESCI7	ME5B-081 75141	2012-01-05	2013-01-05
LISN	Solar	9252-50-R-24- BNC	ME5A-636	2012-02-04	2013-02-28
Switch Driver	HP	11713A	44397	N/A	N/A
RF Switch Box	UL	4	44404	N/A	N/A
Measurement Software	UL	Version 9.3	44736	N/A	N/A
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43734	2012-03-13	2014-03-13
Multimeter	Fluke	83III	ME5B-305	2012-02-01	2013-02-28

Test Equipment Used – Occupied Bandwidth/Cease Operation/Duty Cycle					
Description	Manufacturer	Model	Identifier	Cal Date	Cal Due Date
Spectrum Analyzer	Agilent	E4446A	72823	2012-01-31	2013-02-29
Dipole Antenna	EMCO	3121C	3359	2011-12-16	2012-12-16
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43733	2012-03-13	2014-03-13
Multimeter	Fluke	87V	64386	2012-01-31	2013-02-29

6. ANTENNA PORT TEST RESULTS

6.1. 20 dB AND 99% BW

LIMITS

FCC §15.231 (c)

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

IC A1.1.3

For the purpose of Section A1.1, the 99% Bandwidth shall be no wider than 0.25% of the center frequency for devices operating between 70-900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency.

TEST PROCEDURE

ANSI C63.4

The transmitter output is connected to the spectrum analyzer.

20dB Bandwidth: The RBW is set to 10 KHz. The VBW is set to 100 KHz. The sweep time is coupled. Bandwidth is determined at the points 20 dB down from the modulated carrier.

99% Bandwidth: The RBW is set to 1% to 3% of the 99 % bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

No non-compliance noted:

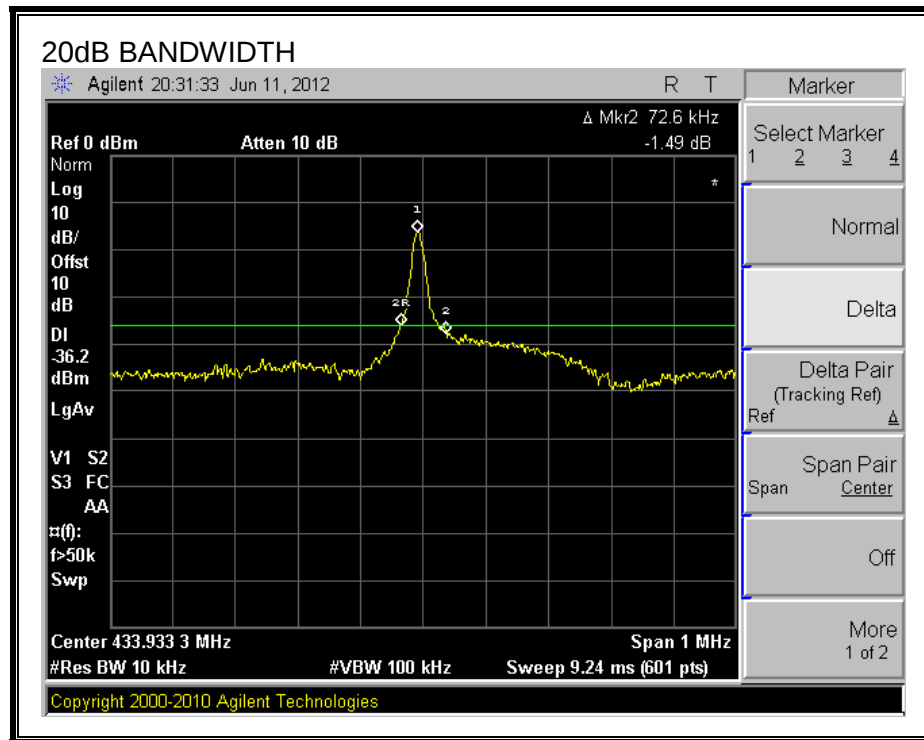
20dB Bandwidth

Frequency (MHz)	20dB Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
433.93	72.6	1084.825	-1012.225

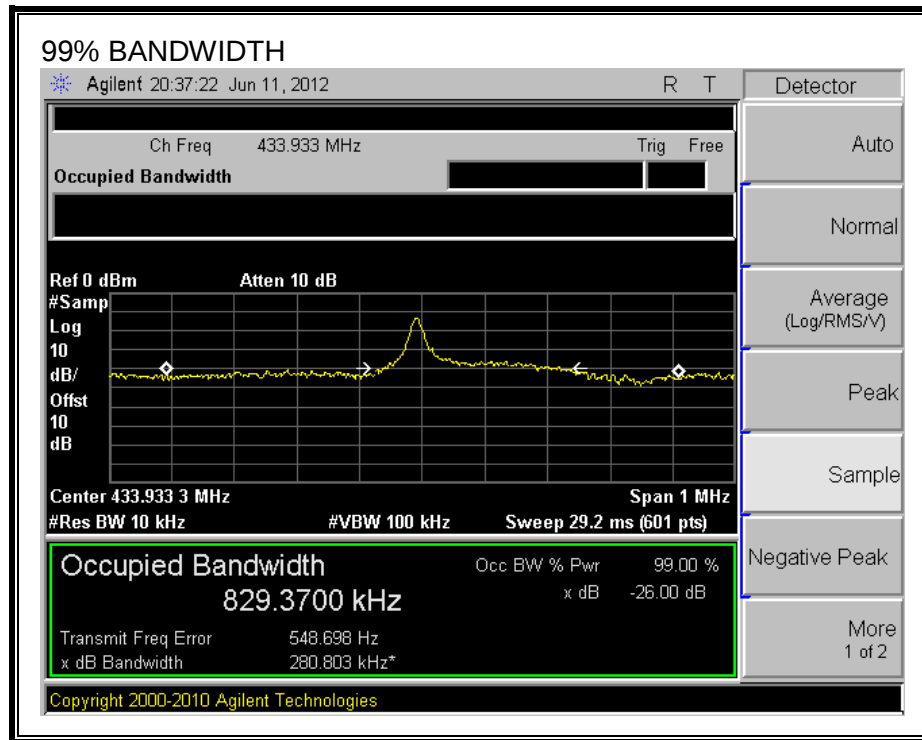
99% Bandwidth

Frequency (MHz)	99% Bandwidth (kHz)	Limit (kHz)	Margin (kHz)
433.93	829.37	1084.825	-255.455

20dB BANDWIDTH



99% BANDWIDTH



6.2. DUTY CYCLE

LIMITS

FCC §15.35 (c)

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.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer or radiated field strength. The RBW is set to 1 MHz and the VBW is set to 1 MHz. The sweep time is coupled and the span is set to 0 Hz. The number of pulses is measured and calculated in a 100 ms scan.

CALCULATION

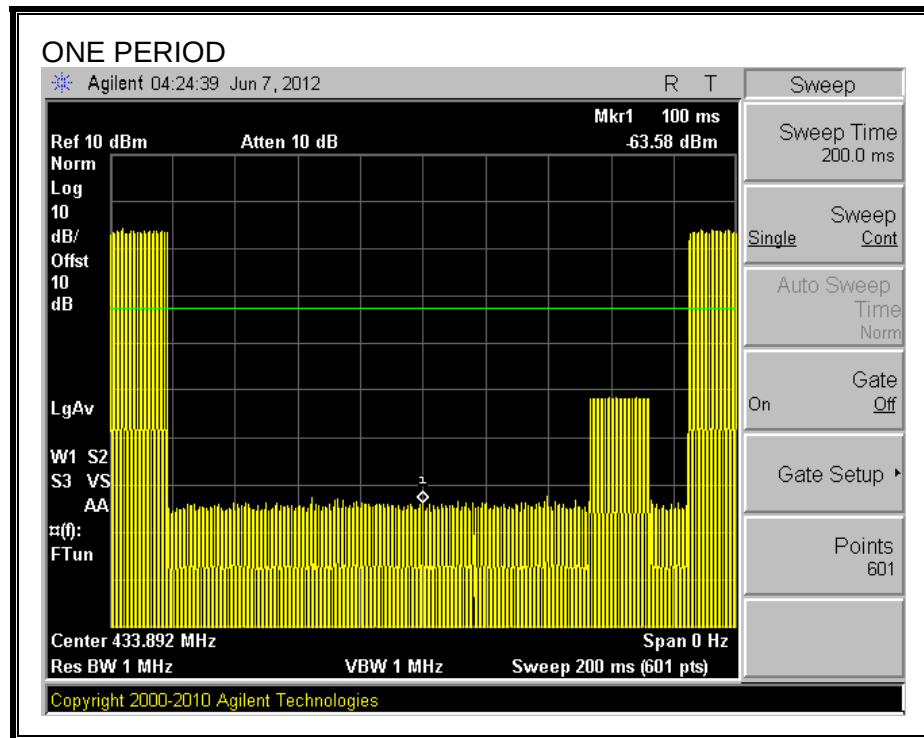
Average Reading = Peak Reading (dBuV/m) + 20log (Duty Cycle), Where Duty Cycle is (# of long pulses * long pulse width) + (# of short pulses * short pulse width) / 100 or T

RESULTS

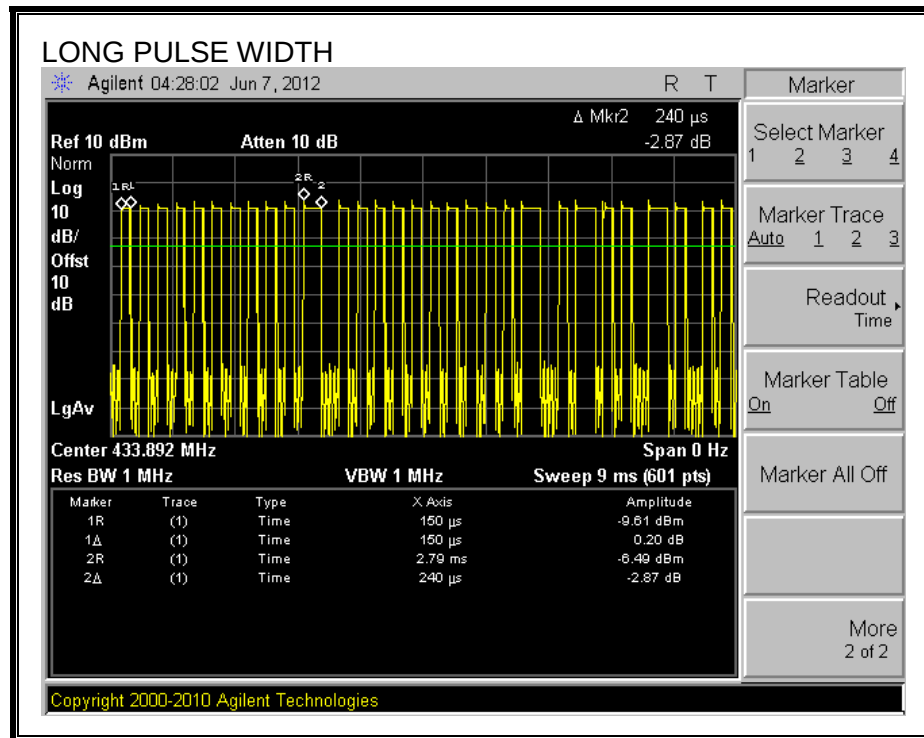
No non-compliance noted:

One Period (ms)	Long Pulse Width (ms)	# of Long Pulses	Short Width (ms)	# of Short Pulses	Duty Cycle	20*Log Duty Cycle (dB)
100	0.24	12	0.15	44	0.095	-20.46

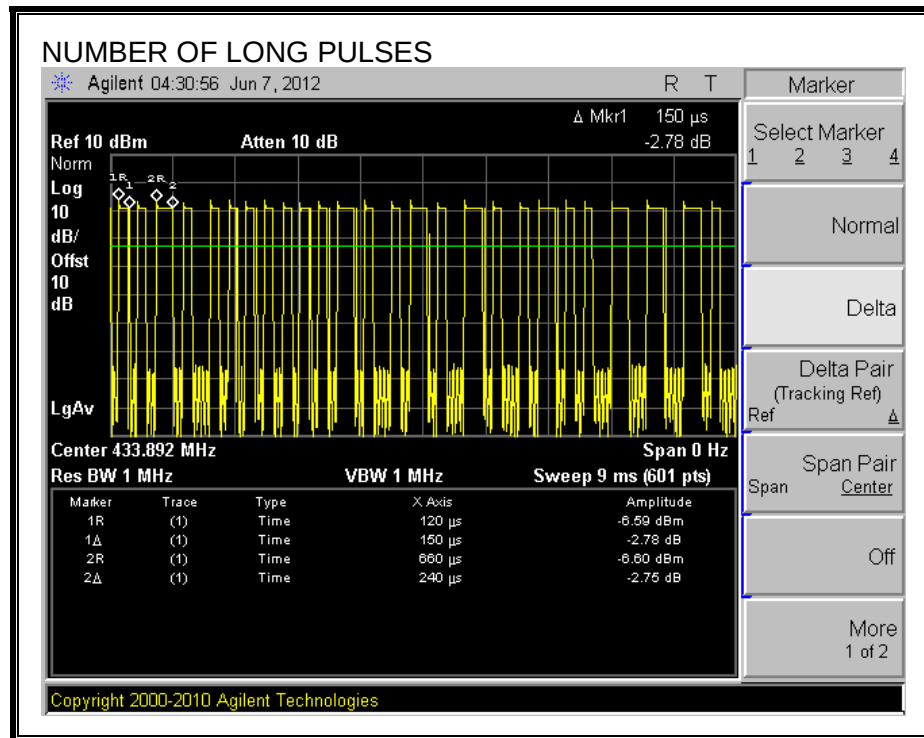
ONE PERIOD



NUMBER OF PULSES (1st Set)



NUMBER OF PULSES (2nd Set)



6.3. TRANSMISSION TIME

LIMITS

FCC §15.231 (a) (2)

IC A1.1.1 (b)

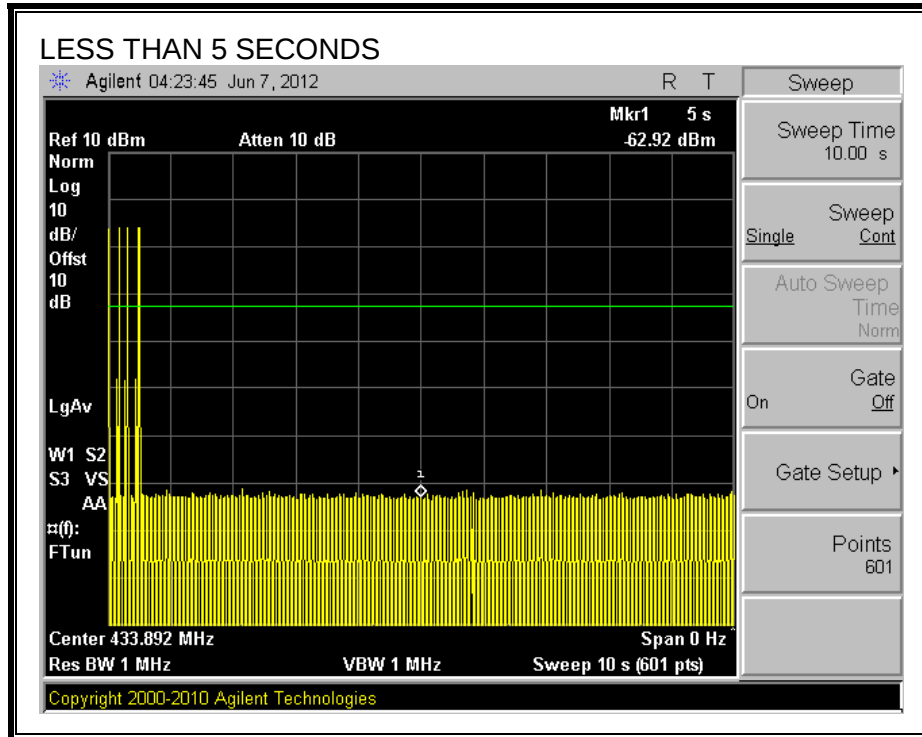
A transmitter activated automatically shall cease transmission within 5 seconds after activation.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer or radiated field strength. The RBW is set to 1 MHz and the VBW is set to 1 MHz. The sweep time is set to 10 seconds and the span is set to 0 Hz.

RESULTS

No non-compliance noted:



7. RADIATED EMISSION TEST RESULTS

7.1. TX RADIATED SPURIOUS EMISSION

LIMITS

FCC §15.231 (b)
IC A1.1.2

In addition to the provisions of § 15.205, the field strength of emissions from Intentional radiators operated under this section shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental Frequency (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66 - 40.70	2,250	225
70 - 130	1,250	125
130 - 174	1,250 to 3,7501	125 to 3751
174 - 260	3,750	375
260 - 470	3,750 to 12,5001	375 to 1,2501
Above 470	12,500	1,250

1 Linear interpolation

§15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

1 Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
2 Above 38.6

§15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 88	100 **	3
88 216	150 **	3
216 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54 72 MHz, 76 88 MHz, 174 216 MHz or 470 806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

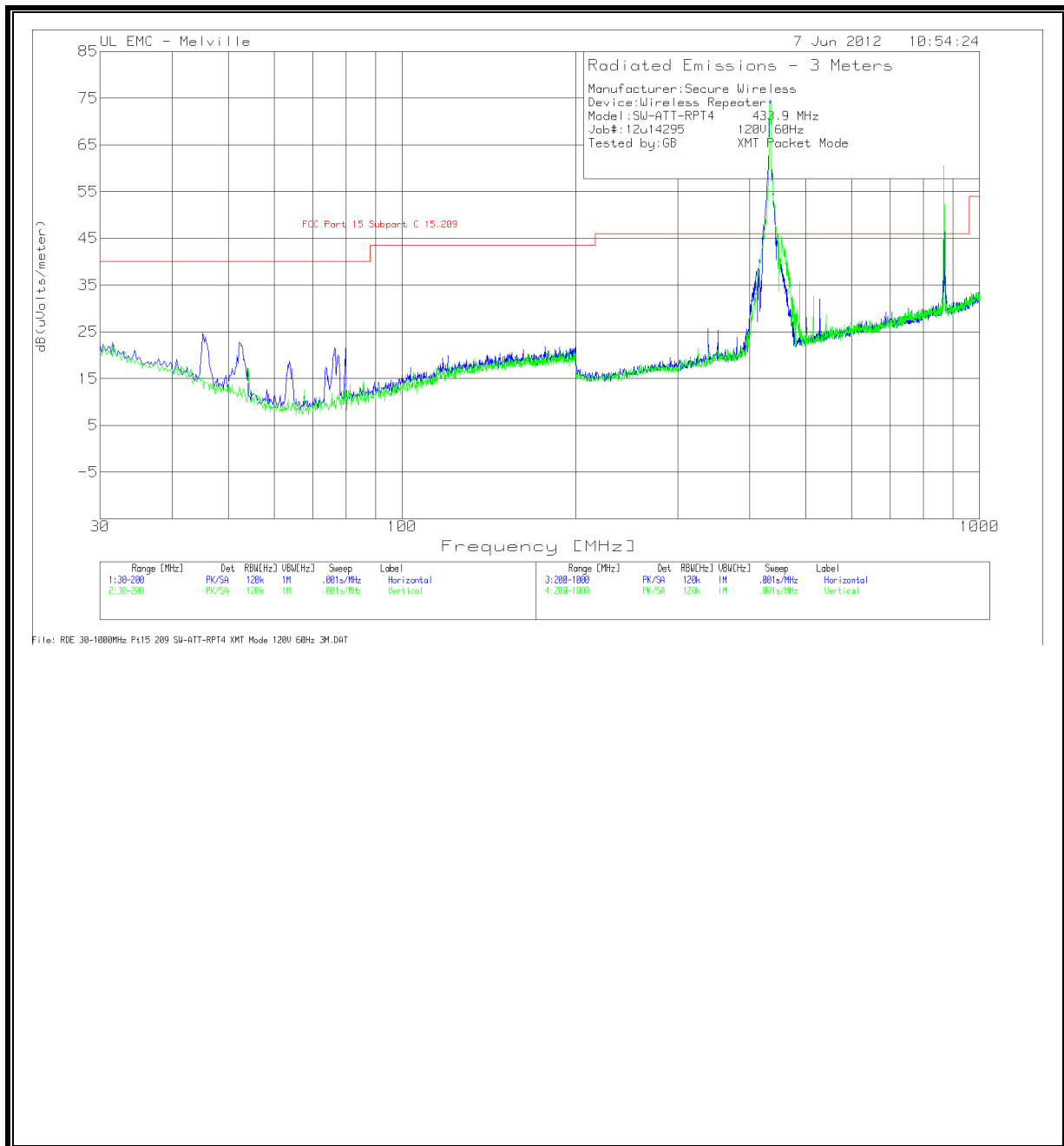
For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

RESULTS

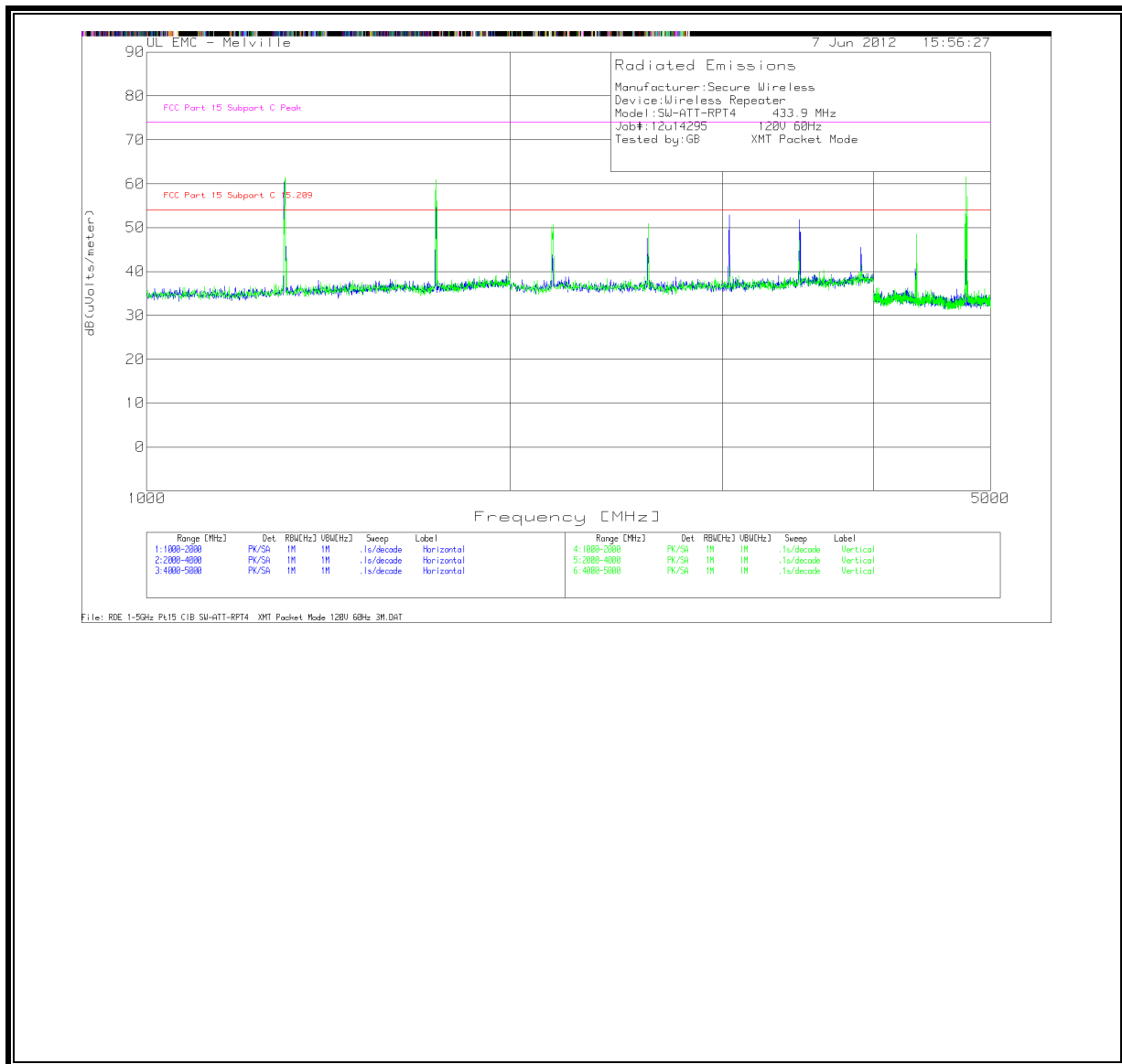
No non-compliance noted:

FUNDAMENTAL, HARMONICS AND TX SPURIOUS EMISSION (30 – 1000 MHz)



Manufacturer:Secure Wireless														
Device:Wireless Repeater														
Model:SW-ATT-RPT4 433.9 MHz														
Job#:12u14295 120V 60Hz														
Tested by:GB XMT Packet Mode														
Test	Meter		AF-44067	GL-3M	dB(uVolts/		Corrected	FCC Part		FCC Part				
Frequency	Reading	Detector	[dB]	[dB]	meter)	DCF [dB]	Level (dBuV/m)	15 Subpart C 15.209	Margin	15 Subpart C 15.231	Margin	Azimuth [Degs]	Height [cm]	Polarity
Horizontal 200 - 1000MHz														
415.7	38.26	QP	16.6	-22.7	32.16	-	-	46	-13.84	-	-	232	282	Horz
433.9255	102.03	PK	17.1	-22.7	96.43	-20.46	75.97	46	-	80.8	-4.83	79	263	Horz
447.32	40.39	QP	17.1	-22.7	34.79	-	-	46	-11.21	-	-	299	242	Horz
296.5	22.28	QP	13.9	-23.1	13.08	-	-	46	-32.92	-	-	324	376	Horz
868	59.91	PK	23.1	-20.8	62.21	-20.46	41.75	46	-	60.8	-19.05	113	217	Horz
869.1	42.89	QP	23.1	-20.9	45.09	-	-	46	-0.91	-	-	278	211	Horz
871.9	24.52	QP	23.2	-20.8	26.92	-	-	46	-19.08	-	-	77	225	Horz
Vertical 200 - 1000MHz														
419.3	41.75	QP	16.5	-22.7	35.55	-	-	46	-10.45	-	-	261	252	Horz
433.9218	102.44	PK	16.6	-22.7	96.34	-20.46	75.88	46	-	80.8	-4.92	260	102	Horz
453.7	30.19	QP	17	-22.6	24.59	-	-	46	-21.41	-	-	29	205	Horz
460.5	31.52	QP	17.1	-22.6	26.02	-	-	46	-19.98	-	-	297	235	Horz
464.1	29.34	QP	17.1	-22.6	23.84	-	-	46	-22.16	-	-	292	201	Horz
867.8525	63.03	PK	23.2	-20.8	65.43	-20.46	44.97	46	-	60.8	-15.83	107	237	Horz
869.1	43.58	QP	23.2	-20.9	45.88	-	-	46	-0.12	-	-	78	210	Horz
869.53	41.11	QP	23.2	-20.9	43.41	-	-	46	-2.59	-	-	262	264	Horz
PK - Peak detector														
QP - Quasi-Peak detector														
LnAv - Linear Average detector														
LgAv - Log Average detector														
Av - Average detector														
CAV - CISPR Average detector														
RMS - RMS detection														
CRMS - CISPR RMS detection														

HARMONICS AND TX SPURIOUS EMISSIONS ABOVE 1GHz



Manufacturer:Secure Wireless													
Device:Wireless Repeater													
Model:SW-ATT-RPT4 433.9 MHz													
Job#:12u14295 120V 60Hz													
Tested by:GB XMT Packet Mode													
Test	Meter		AF-51442	BOMS			Corrected	FCC Part		FCC Part			
Frequency	Reading	Detector	[dB]	Factor	dB(uVolts/ meter)	DCF [dB]	Value	15	Subpart C	15	Subpart C	Azimuth	Height
Horizontal 1000 - 2000MHz							(dBuV/m)	15.209	Margin	Peak	Margin	[Degr]	[cm]
1301.814	89.3 PK		20.5	-44.72	65.08	-20.46	44.62	54	-9.38	74	-8.92	160	125 Horz
1735.7104	87.6 PK		20.8	-44.27	64.13	-20.46	43.67	54	-10.33	74	-9.87	10	206 Horz
Vertical 1000 - 2000MHz													
1301.814	86.2 PK		20.5	-44.72	61.98	-20.46	41.52	54	-12.48	74	-12.02	77	342 Vert
1735.7104	88.24 PK		20.8	-44.27	64.77	-20.46	44.31	54	-9.69	74	-9.23	157	131 Vert
Horizontal 2000 - 4000MHz													
2172.7756	78.25 PK		21.4	-43.86	55.79	-20.46	35.33	54	-18.67	74	-18.21	67	259 Horz
2603.4046	74.09 PK		21.3	-43.44	51.95	-20.46	31.49	54	-22.51	74	-22.05	259	290 Horz
3037.4979	74.34 PK		21.6	-42.83	53.11	-20.46	32.65	54	-21.35	74	-20.89	273	381 Horz
3471.3793	74.18 PK		22.2	-42.65	53.73	-20.46	33.27	54	-20.73	74	-20.27	200	200 Horz
3477.5381	73.83 PK		22.2	-43	53.03	-20.46	32.57	54	-21.43	74	-20.97	206	134 Horz
3905.3405	71.8 PK		22.6	-42.84	51.56	-20.46	31.1	54	-22.9	74	-22.44	337	316 Horz
Vertical 2000 - 4000MHz													
2172.7756	80.89 PK		21.4	-43.86	58.43	-20.46	37.97	54	-16.03	74	-15.57	355	184 Vert
2603.4046	72.87 PK		21.3	-43.44	50.73	-20.46	30.27	54	-23.73	74	-23.27	228	386 Vert
3037.4979	74.63 PK		21.6	-42.83	53.4	-20.46	32.94	54	-21.06	74	-20.6	203	363 Vert
3471.3793	71.58 PK		22.2	-42.65	51.13	-20.46	30.67	54	-23.33	74	-22.87	277	380 Vert
3905.3405	72.39 PK		22.6	-42.84	52.15	-20.46	31.69	54	-22.31	74	-21.85	93	323 Vert
Horizontal 4000 - 5000MHz													
4339.3203	79.25 PK		27.7	-51.8	55.15	-20.46	34.69	54	-19.31	74	-18.85	340	260 Horz
4339.3203	80.41 PK		27.7	-51.8	56.31	-20.46	35.85	54	-18.15	74	-17.69	360	180 Vert
4774.516	84.63 PK		27.1	-52.33	59.4	-20.46	38.94	54	-15.06	74	-14.6	77	188 Horz
4781.187	76.77 PK		27.1	-52.7	51.17	-20.46	30.71	54	-23.29	74	-22.83	109	318 Horz
Vertical 4000 - 5000MHz													
4773	84.27 PK		27.2	-52.37	59.1	-20.46	38.64	54	-15.36	74	-14.9	195	286 Vert
4763.843	82.53 PK		27.2	-52.52	57.21	-20.46	36.75	54	-17.25	74	-16.79	195	285 Vert
4768.512	83.15 PK		27.2	-52.46	57.89	-20.46	37.43	54	-16.57	74	-16.11	194	277 Vert
4777.852	84.08 PK		27.2	-52.57	58.71	-20.46	38.25	54	-15.75	74	-15.29	173	205 Vert
4781.187	85.28 PK		27.2	-52.7	59.78	-20.46	39.32	54	-14.68	74	-14.22	151	145 Vert
PK - Peak detector													
QP - Quasi-Peak detector													
LnAv - Linear Average detector													
LgAv - Log Average detector													
Av - Average detector													
CAV - CISPR Average detector													
RMS - RMS detection													
CRMS - CISPR RMS detection													

7.2. RX RADIATED SPURIOUS EMISSION

LIMITS

IC RSS-Gen Issue 2, section 7.2.3.2

All spurious emissions shall comply with the limits shown below:

Limits for radiated disturbance of Class B ITE at measuring distance of 3 m	
Frequency range (MHz)	Quasi-peak limits (dB μ V/m)
30 to 88	40
88 to 216	43.5
216 to 960	46
Above 960 MHz	54
Note: The lower limit shall apply at the transition frequency.	

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.4. The EUT is set to receive in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 1 MHz for peak measurements and 10 Hz for average measurements.

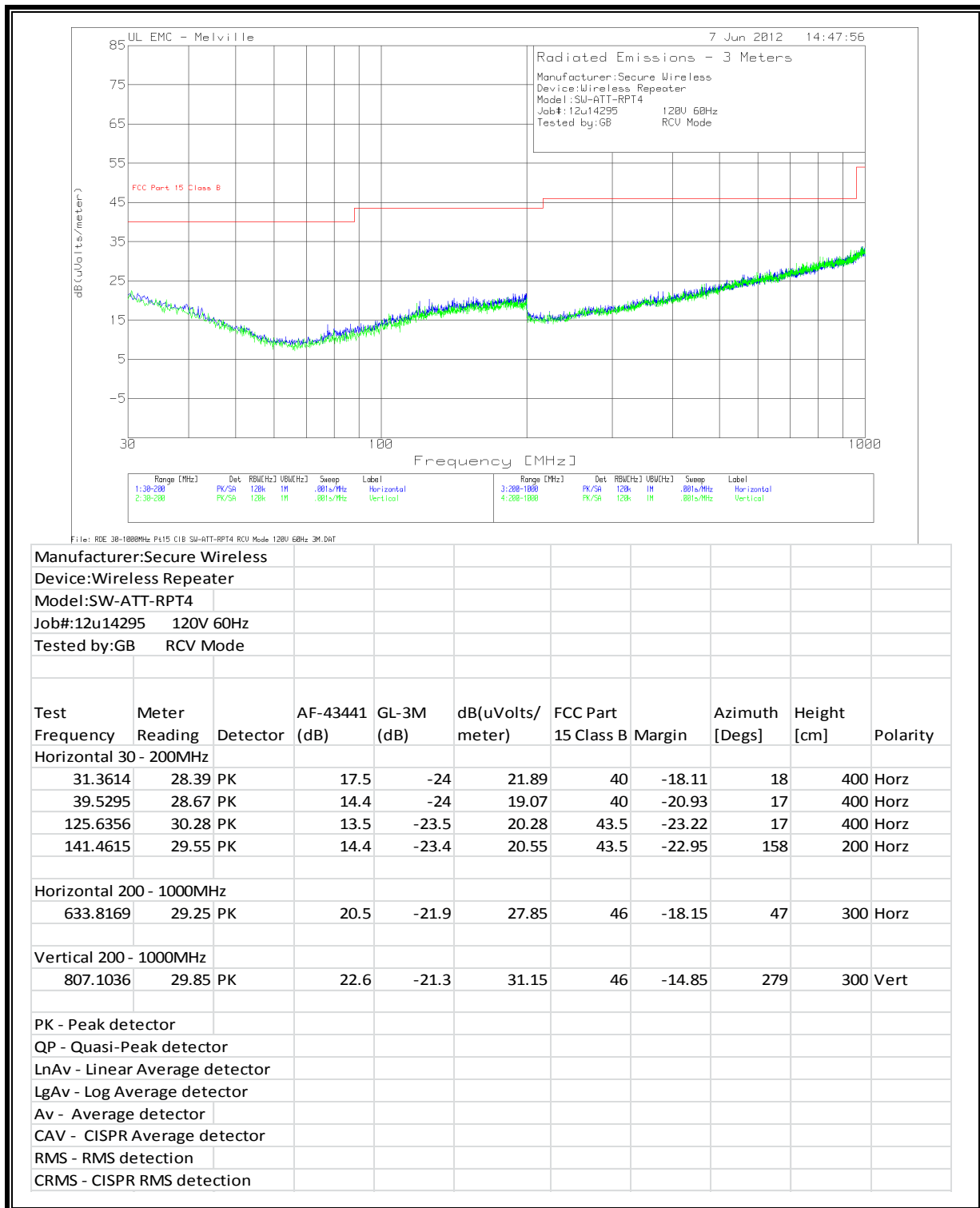
The spectrum from 30 MHz to 5th harmonic is investigated with the transmitter set to the middle channel.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

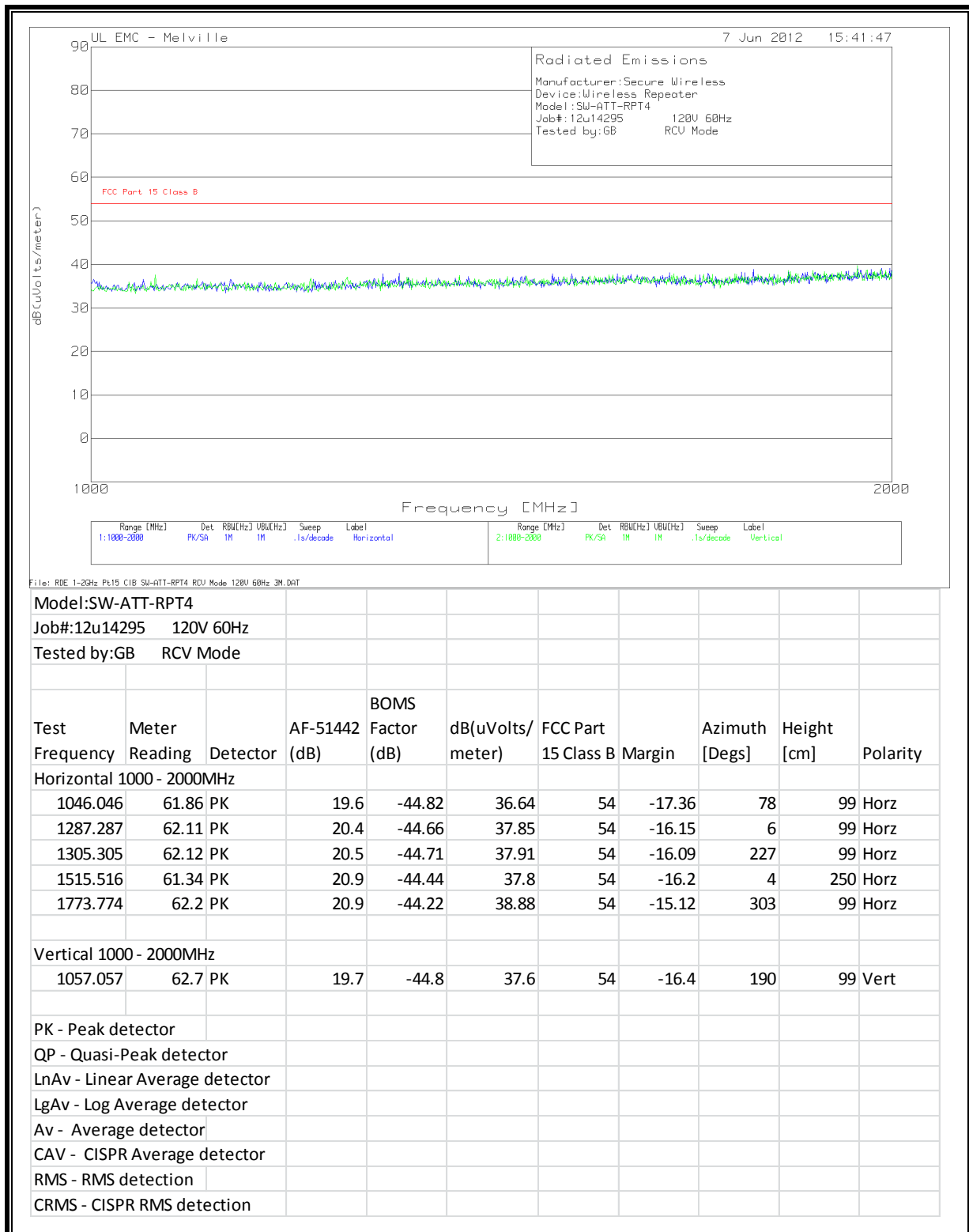
RESULTS

No non-compliance noted:

RECEIVER SPURIOUS EMISSION (30MHz - 1GHz)



RECEIVER SPURIOUS EMISSION ABOVE 1GHz



8. AC MAINS LINE CONDUCTED EMISSIONS

LIMITS

§15.207 (a)
IC RSS-GEN, Section 7.2.2

Frequency of emission (MHz)	Conducted Limit (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50
* Decreases with the logarithm of the frequency.		

TEST PROCEDURE

ANSI C63.4

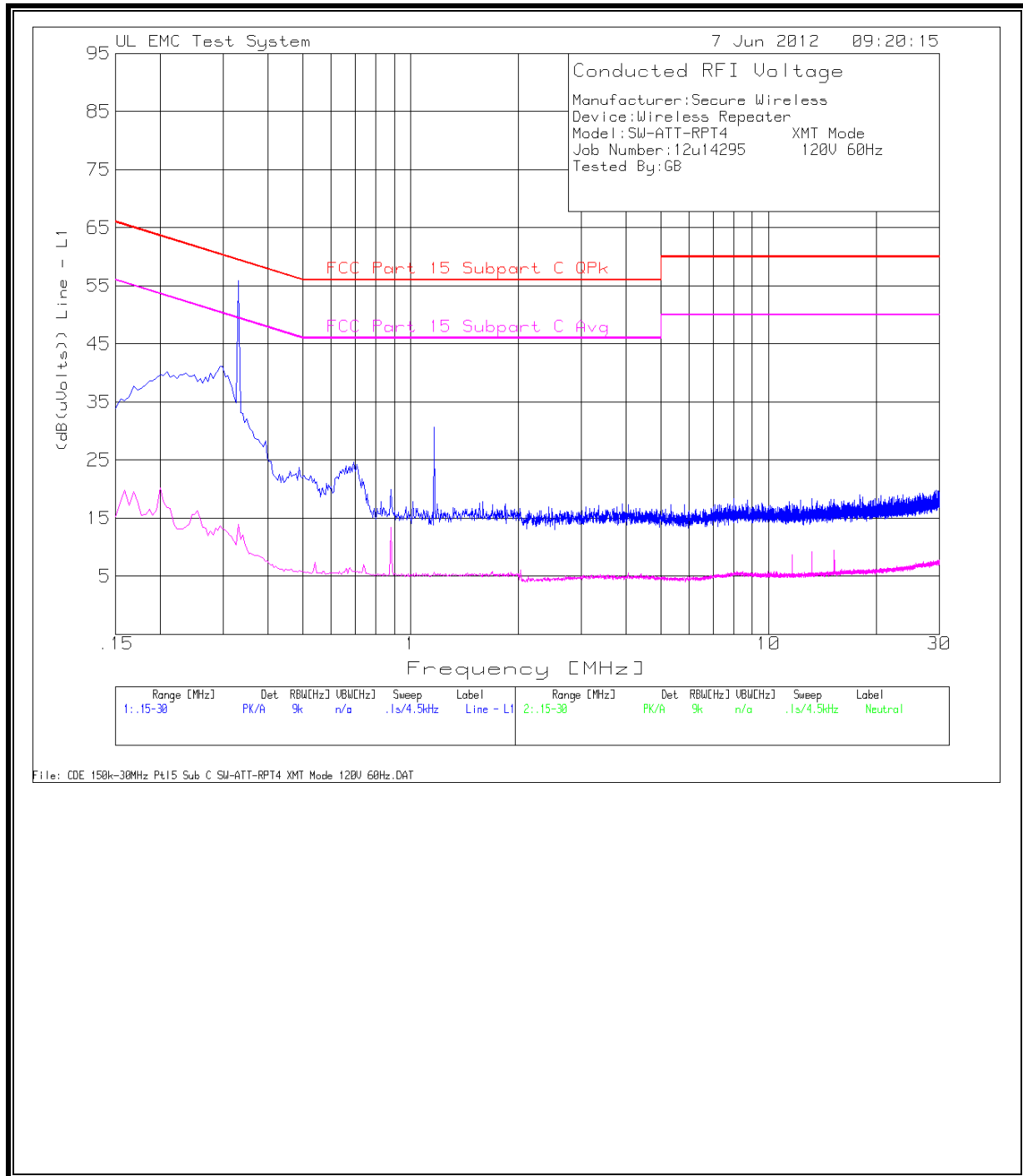
RESULTS

No non-compliance noted:

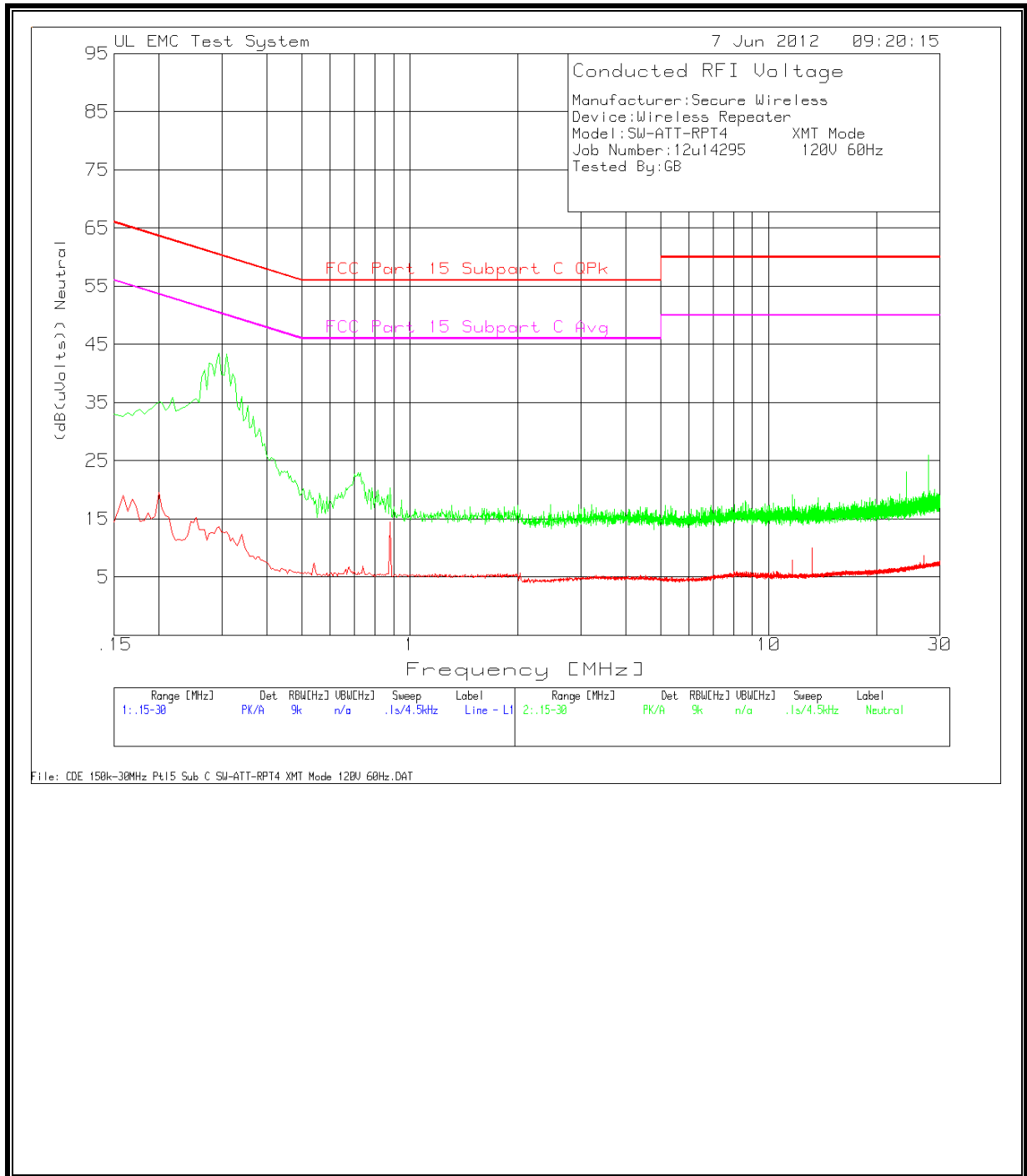
6 WORST EMISSIONS

Model:SW-ATT-RPT4		XMT Mode						
Job Number:12u14295		120V 60Hz						
Tested By:GB								
Test	Meter		LISN 5A636		FCC Part		FCC Part	
Frequency	Reading	Detector	Line 1 Cab		15		15	
			L1 SW TL		Subpart C		Subpart C	
			(dB)	(dB(uVolts))	QPk	Margin	Avg	Margin
Line - L1 .15 - 30MHz								
0.33	3.86	Av	10.1	13.96	59.5	-45.54	49.5	-35.54
0.366	-1.42	Av	10	8.58	58.6	-50.02	48.6	-40.02
0.6945	-4.28	Av	10.1	5.82	56	-50.18	46	-40.18
1.1625	-4.36	Av	10.1	5.74	56	-50.26	46	-40.26
5.8065	-5.57	Av	10.3	4.73	60	-55.27	50	-45.27
18.006	-5.69	Av	11.3	5.61	60	-54.39	50	-44.39
29.454	-5	Av	12.2	7.2	60	-52.8	50	-42.8
Neutral .15 - 30MHz								
0.294	3.63	Av	10.1	13.73	60.4	-46.67	50.4	-36.67
0.339	2.38	Av	10	12.38	59.2	-46.82	49.2	-36.82
0.717	-4.32	Av	10.1	5.78	56	-50.22	46	-40.22
0.879	4.38	Av	10.1	14.48	56	-41.52	46	-31.52
24.2115	-5.1	Av	11.6	6.5	60	-53.5	50	-43.5
27.9285	-4.79	Av	12	7.21	60	-52.79	50	-42.79
Line - L1 .15 - 30MHz								
0.3264	32.57	QP	10	42.57	59.54	-16.97	49.54	-6.97
0.3624	29.97	QP	10	39.97	58.67	-18.7	48.67	-8.7
0.6918	4.38	QP	10.1	14.48	56	-41.52	46	-31.52
1.1616	-2.05	QP	10.1	8.05	56	-47.95	46	-37.95
5.8065	-1.07	QP	10.3	9.23	60	-50.77	50	-40.77
18.0051	-1.1	QP	11.3	10.2	60	-49.8	50	-39.8
29.4585	-0.15	QP	12.2	12.05	60	-47.95	50	-37.95
Neutral .15 - 30MHz								
0.2904	36.13	QP	10	46.13	60.51	-14.38	50.51	-4.38
0.3363	31.85	QP	10	41.85	59.29	-17.44	49.29	-7.44
0.7161	3.73	QP	10.1	13.83	56	-42.17	46	-32.17
0.8772	5.51	QP	10.1	15.61	56	-40.39	46	-30.39
24.2151	-0.68	QP	11.6	10.92	60	-49.08	50	-39.08
27.924	-0.41	QP	12	11.59	60	-48.41	50	-38.41
PK - Peak detector								
QP - Quasi-Peak detector								
LnAv - Linear Average detector								
LgAv - Log Average detector								
Av - Average detector								
CAV - CISPR Average detector								
RMS - RMS detection								
CRMS - CISPR RMS detection								

LINE 1 RESULTS



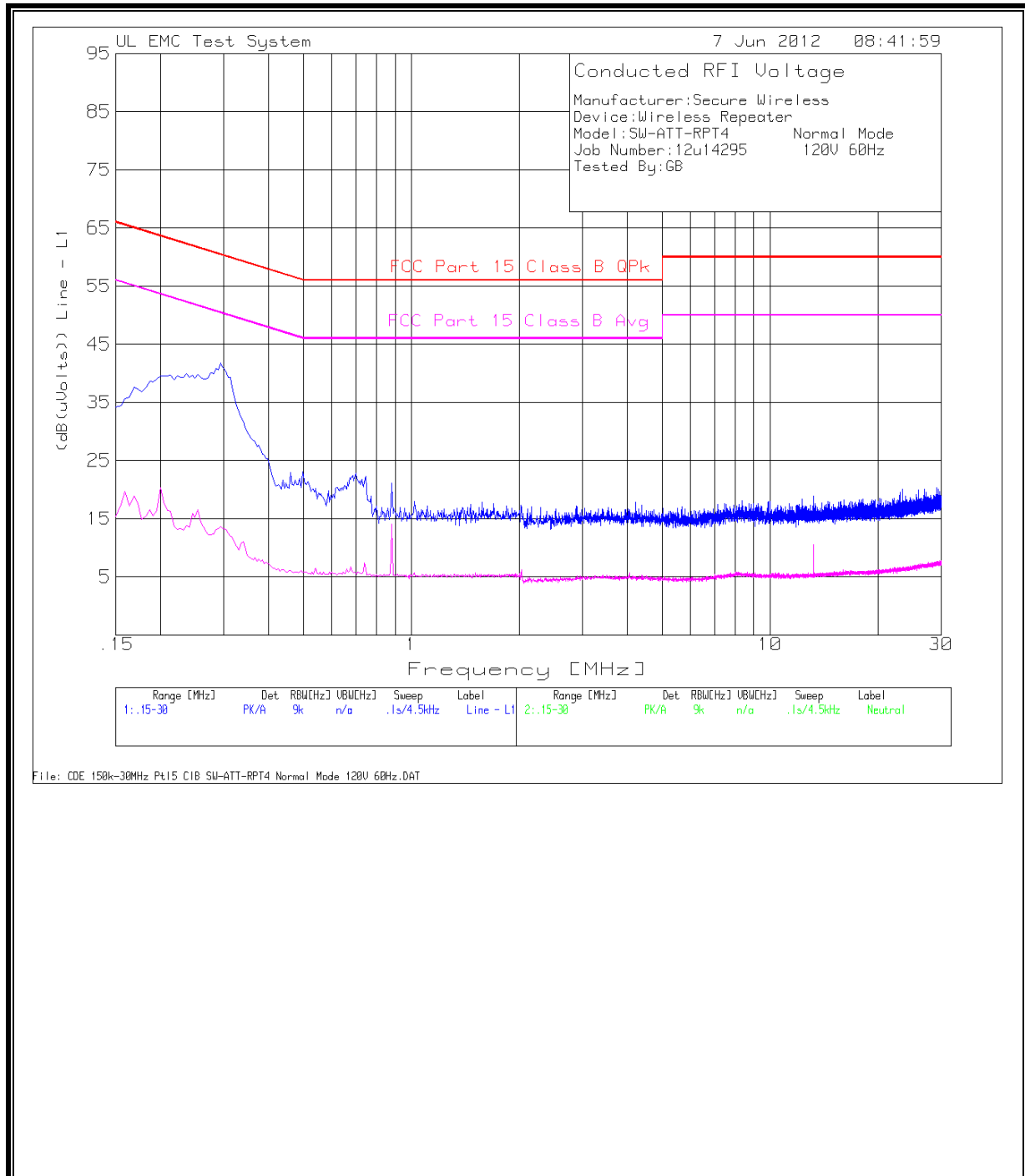
LINE 2 RESULTS



6 WORST EMISSIONS (Rx Mode)

Manufacturer:Secure Wireless									
Device:Wireless Repeater									
Model:SW-ATT-RPT4 Normal Mode									
Job Number:12u14295 120V 60Hz									
Tested By:GB									
LISN 5A636									
Line 1 Cab									
L1 SW TL									
Test	Meter				FCC Part		FCC Part		
Frequency	Reading	Detector	(dB)	(dB(uVolts))	15 Class B	Margin	15 Class B	Margin	
					QPk		Avg		
Line - L1 .15 - 30MHz									
0.294	31.61	PK	10.1	41.71	60.4	-18.69	50.4	-8.69	
0.294	3.53	Av	10.1	13.63	60.4	-46.77	50.4	-36.77	
0.4605	12.83	PK	10.1	22.93	56.7	-33.77	46.7	-23.77	
0.4605	-4.07	Av	10.1	6.03	56.7	-50.67	46.7	-40.67	
0.4965	12.93	PK	10.1	23.03	56.1	-33.07	46.1	-23.07	
0.4965	-4.41	Av	10.1	5.69	56.1	-50.41	46.1	-40.41	
0.699	12.72	PK	10.1	22.82	56	-33.18	46	-23.18	
0.699	-4.57	Av	10.1	5.53	56	-50.47	46	-40.47	
0.879	10.98	PK	10.1	21.08	56	-34.92	46	-24.92	
0.879	3.98	Av	10.1	14.08	56	-41.92	46	-31.92	
13.227	7.93	PK	10.9	18.83	60	-41.17	50	-31.17	
13.227	-0.33	Av	10.9	10.57	60	-49.43	50	-39.43	
Neutral .15 - 30MHz									
0.24	27.56	PK	10.1	37.66	62.1	-24.44	52.1	-14.44	
0.24	2.21	Av	10.1	12.31	62.1	-49.79	52.1	-39.79	
0.303	30.15	PK	10	40.15	60.2	-20.05	50.2	-10.05	
0.303	1.58	Av	10	11.58	60.2	-48.62	50.2	-38.62	
0.735	10.82	PK	10.1	20.92	56	-35.08	46	-25.08	
0.735	-4.24	Av	10.1	5.86	56	-50.14	46	-40.14	
2.6475	10.76	PK	10.1	20.86	56	-35.14	46	-25.14	
2.6475	-5.45	Av	10.1	4.65	56	-51.35	46	-41.35	
6.7335	9.16	PK	10.3	19.46	60	-40.54	50	-30.54	
6.7335	-5.44	Av	10.3	4.86	60	-55.14	50	-45.14	
20.7015	8.16	PK	11.4	19.56	60	-40.44	50	-30.44	
20.7015	-5.37	Av	11.4	6.03	60	-53.97	50	-43.97	
PK - Peak detector									
QP - Quasi-Peak detector									
LnAv - Linear Average detector									
LgAv - Log Average detector									
Av - Average detector									
CAV - CISPR Average detector									
RMS - RMS detection									

LINE 1 RESULTS (Rx Mode)



LINE 2 RESULTS (Rx Mode)

