TEST REPORT

Report Number: 100181239MIN-001R
Project Number: G100181239

Testing performed on the
Model 20023
FCC ID: Y8G-WTL20023
Industry Canada ID: 9505A-WTL20023

to
47 CFR Part 15. 249:2009
RSS- 210, Issue 7, 2007
RSS- 310, Issue 2, 2007
47 CFR Part 15.109:2009 / RSS-GEN:2007

For
Wireless Tow Lights, Inc.

Test Performed by:	Test Authorized by:
Intertek Testing Services NA, Inc.	Wireless Tow Lights, Inc.
7250 Hudson Blvd., Suite 100	29000-2 Aura Road
Oakdale, MN 55128 USA	Solon, OH 44139, USA

Prepared by: Richard Blonigen — Date: December 22, 2010

Reviewed by: Norman Shpilsher — Date: December 22, 2010

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1.0 GENERAL DESCRIPTION

Model:	Model 20023, Wireless Tow Lights, which consists of Truck transceiver; Tow Lights Transceiver
Type of EUT:	Wireless Tow Lights
FCC ID:	Y8G-WTL20023
Industry Canada ID:	9505A-WTL20023
Related Submittal(s) Grants:	None
Company:	Wireless Tow Lights, Inc.
Customer:	Mr. Joe Tarver
Address:	29000-2 Aurora Road Solon, OH 44139, USA
Phone:	(440) 498-0001
Test Standards:	☒ 47 CFR, Part 15:2009, §15.249 ☒ RSS–210, Issue 7, 2007 ☒ RSS–310, Issue 2, 2007 ☒ RSS-Gen, Issue 2, 2007 ☒ 47 CFR, Part 15:2009, §15.109, Class B ☐ Other
Type of radio:	☒ Stand -alone ☐ Module ☐ Hybrid
Date Sample Submitted:	September 15, 2010
Test Work Started:	September 20, 2010
Test Work Completed:	December 22, 2010
Test Sample Conditions:	☐ Damaged ☐Poor (Usable) ☒ Good

1.1 Product Description; Test Facility

Product Description:	Wireless Tow Light
Operating Frequency	2400-2483.5 MHz
Modulation:	Frequency Modulation
Emission Designator:	7K88F1D
Antenna(s) Info:	Integral
Antenna Installation:	☐ User ☐ Professional ☒ Factory
Transmitter Power Configuration:	☐ Internal battery ☒ External power source ☐ 120VAC ☐ 230VAC ☐ 400VAC ☒ 12 VDC (Truck DC lines) Amp. ☐ 50Hz ☐ 60Hz
Special Test Arrangement:	
Test Facility Accreditation:	A2LA (Certificate No. 1427.01)
Test Methodology:	Measurements performed according to the procedures in ANSI C63.10-2009

1.2 EUT Configuration

The equipment under test was operated during the measurement under the following conditions:

☐ - Standby
☒ - Continuous
☐ - Continuous un-modulated
☐ - Test program (customer specific)
☐ -

Operating modes of the EUT:

No.	Description
1	EUT was pre-programmed and tested at lower, middle, and upper channel transmitting continuously; the EUT with normal operation was used for average correction factor measurements and calculations with one channel being transmitted at a given time; receiving / standby mode was used for receiver and unintentional radiation measurements
2	

Cables:

No.	Type	Length	Designation	Note
1	4-wire unshielded	2m	12VDC Power	
2				

Support equipment/Services:

No.	Item	Description
1	None	
2		

General Notes: Truck Transceiver and Tow Lights Transceiver utilize the identical RF portions and antennas, therefore, the Track Transceiver was tested only for FCC / IC certification

1.3 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

☐ **Normal**

Temperature: 15-35 ° C

Humidity: 30-60 %

Atmospheric pressure: 86-106 kPa

1.4 Measurement uncertainty

The expanded uncertainty (k = 2) for radiated emissions from 30 to 1000 MHz has been determined to be: ±4 dB at 10m and ±5.4 dB at 3m

The expanded uncertainty (k = 2) for conducted emissions from 150 kHz to 30 MHz has been determined to be:
±2.6 dB

1.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured emissions reading on the EMI Receiver.
The basic equation with a sample calculation is as follows:
FS = RA + AF + CF - AG

Where: FS = Field Strength in dB(μV/m)
RA = Receiver Amplitude in dB(μV)
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB(m^{-1})
AG = Amplifier Gain in dB

Assume a receiver reading of 48.1 dB(μV) is obtained. The antenna factor of 7.4 dB(m^{-1}) and cable factor of 1.6 dB is added and amplifier gain of 16.0 dB is subtracted giving field strength of 41.1 dB(μV/m).

RA = 48.1 dB(μV)
AF = 7.4 dB(m^{-1})
CF = 1.6 dB
AG = 16.0 dB
FS = RA + AF + CF - AG
FS = 48.1 + 7.4 + 1.6 – 16.0
FS = 41.1 dB(μV/m)

General notes:

2.0 TEST SUMMARY

Referring to the performance criteria and the operating mode during the tests specified in this report, the equipment complies with the requirements according to the following standards.

TEST SPECIFICATION	TEST PARAMETERS	RESULT
15.249(a) / RSS-210 A2.9(a)	Field strength of fundamental	Pass
15.249(a) / RSS-210 A2.9(a)	Field strength of harmonics	Pass
15.249(d) / RSS-210 A2.9(b)	Field strength of spurious emissions	Pass
15.215(c) / RSS- Gen 4.6.1	Bandwidth of the emission	Pass
15.207/RSS-Gen 7.2.2	Transmitter Power Line conducted emissions	N/A
15.109/ICES-003/ RSS-GEN 7.2.3/RSS-310 3.1	Receiver/digital device radiated emissions	Pass
15.107/ ICES-003	Digital device conducted emissions	N/A

3.0 TEST CONDITIONS AND RESULTS

3.1 Field strength of fundamental

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test distance: ☐ 10 meters ☒ 3 meters

Test result: **Pass**

Max. Emissions margin at fundamental: 7.6 dB below the limits

Notes: Test performed at low, middle and upper channel

Date:	December 22, 2010	**Result:** **Pass**
Standard:	FCC 15.249(a) / RSS-210 A2.9	
Tested by:	Richard Blonigen	
Test Point:	Enclosure with antenna	
Operation mode:	See Page 5	
Note:	None	

Table 3.1.1

Frequency	Antenna		Ant. CF	Cable loss	Pre-amp	Peak Reading	Total @ 3m	Average CF	Limit	Margin
MHz	Polarity	Hts(cm)	dB1/m	dB	Gain (dB)	dBµV	dBµV/m	dB	dBµV/m	dB
2433.10	V	178	28.5	3.6	0.0	46.0	78.1	0.0	94.0	-15.9
2433.10	H	196	28.5	3.6	0.0	53.6	85.7	0.0	94.0	-8.3
2443.10	V	133	28.5	3.6	0.0	45.7	77.8	0.0	94.0	-16.2
2443.10	H	210	28.5	3.6	0.0	54.3	86.4	0.0	94.0	-7.6
2453.10	V	178	28.6	3.6	0.0	44.5	76.6	0.0	94.0	-17.4
2453.10	H	174	28.6	3.6	0.0	54.3	86.4	0.0	94.0	-7.6

Comments:

3.2 Field strength of harmonics and spurious emissions

Test location: ☐ OATS ☒ Anechoic Chamber ☐ Other

Test distance: ☐ 10 meters ☒ 3 meters

Frequency range of measurements: 30MHz-25GHz

Test result: **Pass**

Max. margin of harmonics and spurious emissions: 1.2dB below the limits

Notes: No emissions were detected above ambient noise at 4th harmonic and beyond. Test performed at low, middle and upper channel.

Date:	December 20 & 22, 2010	**Result:** **Pass**
Standard:	FCC 15.249(a) and (d) / RSS-210 A2.9	
Tested by:	Richard Blonigen	
Test Point:	Enclosure with antenna	
Operation mode:	See Page 5	
Note:	Frequency Range: 30MHz-1GHz, Quasi-peak readings	

Table 3.2.1

Frequency	Antenna		Ant. CF	Cable loss	Pre-amp	QP Reading	Total @ 3m	Limit	Margin
MHz	Polarity	Hts(cm)	dB1/m	dB	Gain (dB)	dBµV	dBµV/m	dBµV/m	dB
Channel 0									
52.00	V	100	8.4	0.7	0.0	21.2	30.3	40.0	-9.7
156.00	V	320	10.9	1.3	0.0	22.3	34.5	43.5	-9.0
225.35	V	100	11.0	1.6	0.0	16.2	28.8	43.5	-14.7
52.00	H	400	8.4	0.7	0.0	14.3	23.4	40.0	-16.6
156.00	H	400	10.9	1.3	0.0	23.5	35.7	43.52	-7.8
225.35	H	400	11.0	1.6	0.0	15.6	28.2	46.0	-17.8
Channel 50									
52.00	V	100	8.4	0.7	0.0	22.5	31.6	40.0	-8.4
156.00	V	316	10.9	1.3	0.0	20.2	32.4	43.5	-11.1
543.88	V	100	19.0	2.7	0.0	13.1	34.8	46.0	-11.2
52.00	H	400	8.4	0.7	0.0	14.8	23.9	40.0	-16.1
156.00	H	400	10.9	1.3	0.0	25.2	37.4	43.5	-6.1
225.35	H	133	11.0	1.6	0.0	16.5	29.1	46.0	-16.9
Channel 100									
52.00	V	100	8.4	0.7	0.0	20.5	29.6	40.0	-10.4
156.00	V	320	10.9	1.3	0.0	22.6	34.8	43.5	-8.7
234.01	V	241	11.7	1.6	0.0	12.5	25.8	46.0	-20.2
52.00	H	400	8.4	0.7	0.0	12.0	21.1	40.0	-18.9
156.00	H	400	10.9	1.3	0.0	24.8	37.0	43.5	-6.5
234.01	H	165	11.7	1.6	0.0	16.8	30.1	46.0	-15.9

Comments:

Date:	December 22, 2010	**Result:** **Pass**
Standard:	FCC 15.249(a) and (d) / RSS-210 A2.9	
Tested by:	Richard Blonigen	
Test Point:	Enclosure with antenna	
Operation mode:	See Page 5	
Note:	Frequency Range: 1GHz-25GHz, Peak Readings	

Table 3.2.2

Frequency MHz	Antenna Polarity	Antenna Hts(cm)	Ant. CF dB1/m	Cable loss dB	Pre-amp Gain (dB)	Reading dBµV	Total @ 3m dBµV/m	Average C. F. (dB)	Limit dBµV/m	Margin dB
Channel 0										
4866.25	V	136	33.1	4.9	41.8	65.3	61.5	0.0	74.0	-12.4
7299.40	V	143	36.0	6.2	41.2	46.0	47.0	0.0	74.0	-27.0
4866.25	H	172	33.1	4.9	41.8	69.4	65.6	0.0	74.0	-8.3
7299.40	H	132	36.0	6.2	41.2	49.9	50.9	0.0	74.0	-23.1
Channel 50										
4886.25	V	120	33.1	4.9	41.8	63.6	59.9	0.0	74.0	-14.1
7330.00	V	144	36.1	6.2	41.2	44.9	46.0	0.0	74.0	-28.0
4886.25	H	167	33.1	4.9	41.8	68.8	65.1	0.0	74.0	-8.9
7330.00	H	115	36.1	6.2	41.2	46.9	48.0	0.0	74.0	-26.0
Channel 100										
4906.25	V	166	33.1	4.9	41.7	61.5	57.9	0.0	74.0	-16.1
5075.00	V	100	33.4	5.0	41.6	37.3	34.1	0.0	74.0	-39.9
7359.30	V	151	36.1	6.2	41.1	45.3	46.5	0.0	74.0	-27.5
4906.25	H	178	33.1	4.9	41.7	69.1	65.5	0.0	74.0	-8.5
5254.40	H	100	33.7	5.1	41.6	38.2	35.5	0.0	74.0	-38.5
7359.30	H	126	36.1	6.2	41.1	48.9	50.1	0.0	74.0	-23.9

Comments:

Date:	December 22, 2010	**Result:** **Pass**
Standard:	FCC 15.249(a) and (d) / RSS-210 A2.9	
Tested by:	Richard Blonigen	
Test Point:	Enclosure with antenna	
Operation mode:	See Page 5	
Note:	Frequency Range: 1GHz-25GHz, Average value readings	

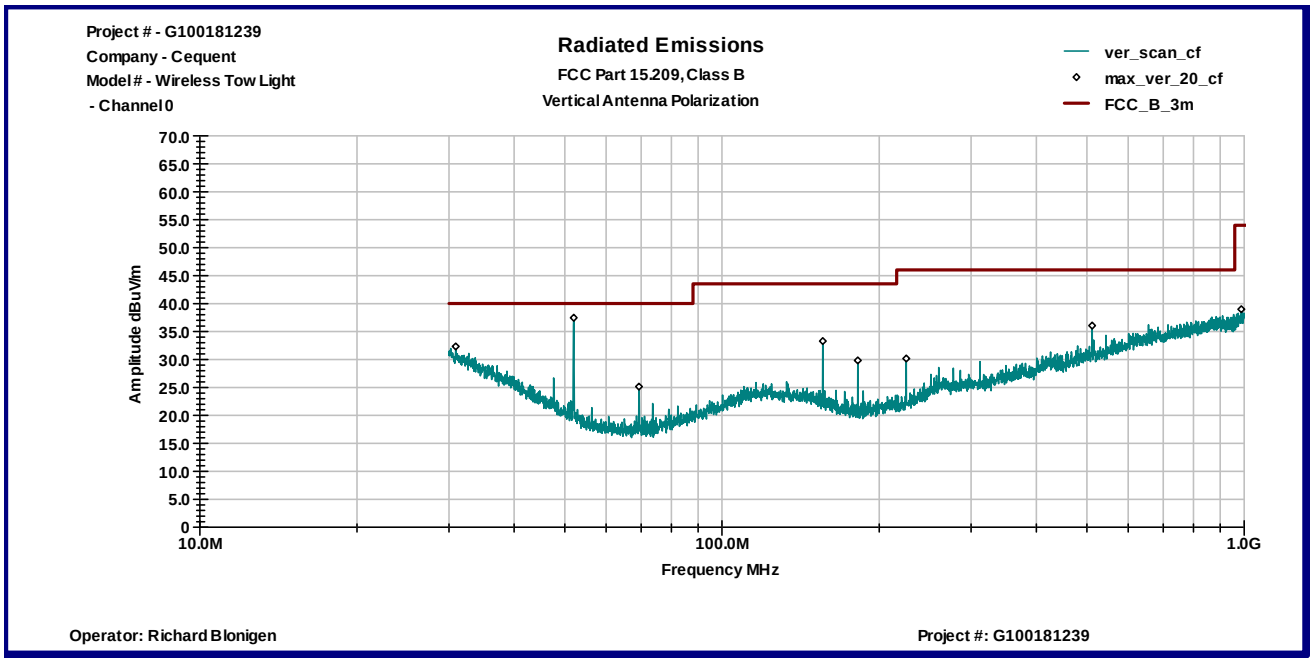
Table 3.2.3

Frequency MHz	Antenna Polarity	Antenna Hts(cm)	Ant. CF dB1/m	Cable loss dB	Pre-amp Gain (dB)	Reading dBµV	Total @ 3m dBµV/m	Average C. F. (dB)	Limit dBµV/m	Margin dB
Channel 0										
4866.25	V	136	33.1	4.9	41.8	65.3	61.5	12.9	54.0	-5.3
7299.40	V	143	36.0	6.2	41.2	46.0	47.0	12.9	54.0	-19.9
4866.25	H	172	33.1	4.9	41.8	69.4	65.6	12.9	54.0	-1.2
7299.40	H	132	36.0	6.2	41.2	49.9	50.9	12.9	54.0	-16.0
Channel 50										
4886.25	V	120	33.1	4.9	41.8	63.6	59.9	12.9	54.0	-7.0
7330.00	V	144	36.1	6.2	41.2	44.9	46.0	12.9	54.0	-20.9
4886.25	H	167	33.1	4.9	41.8	68.8	65.1	12.9	54.0	-1.8
7330.00	H	115	36.1	6.2	41.2	46.9	48.0	12.9	54.0	-18.9
Channel 100										
4906.25	V	166	33.1	4.9	41.7	61.5	57.9	12.9	54.0	-9.0
5075.00	V	100	33.4	5.0	41.6	37.3	34.1	12.9	54.0	-32.8
7359.30	V	151	36.1	6.2	41.1	45.3	46.5	12.9	54.0	-20.4
4906.25	H	178	33.1	4.9	41.7	69.1	65.5	12.9	54.0	-1.4
5254.40	H	100	33.7	5.1	41.6	38.2	35.5	12.9	54.0	-31.4
7359.30	H	126	36.1	6.2	41.1	48.9	50.1	12.9	54.0	-16.8

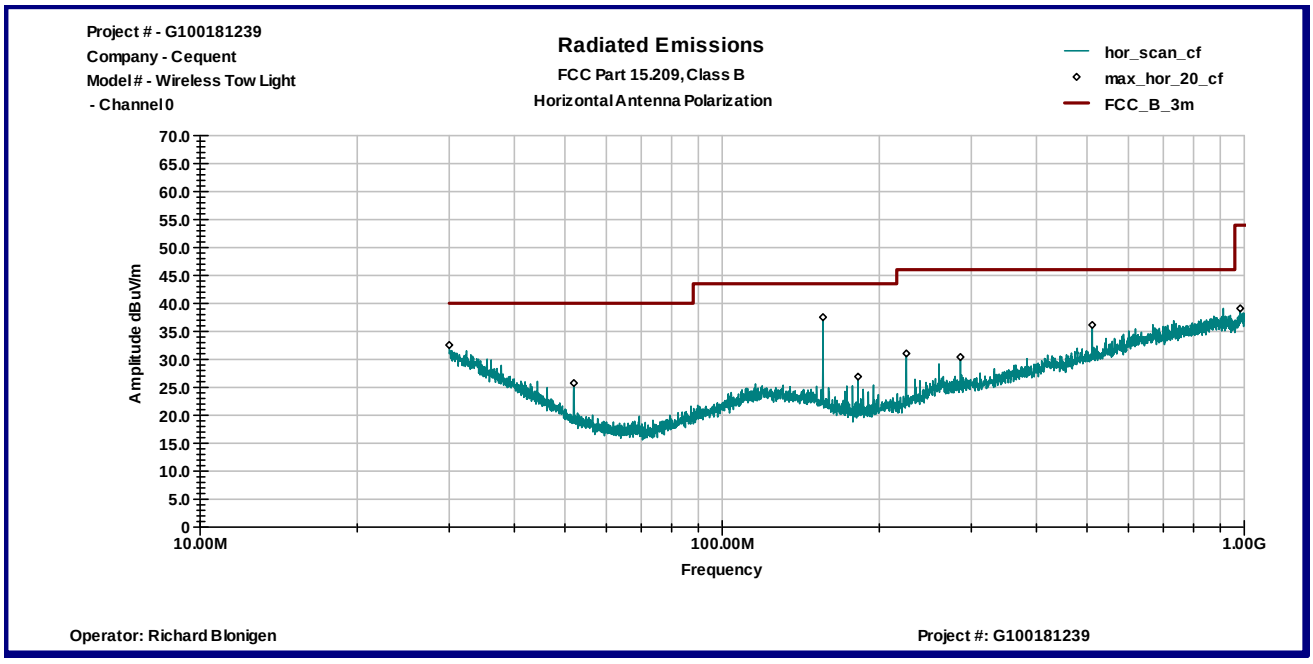
Comments:

Graph 3.2.1

Vertical antenna polarization

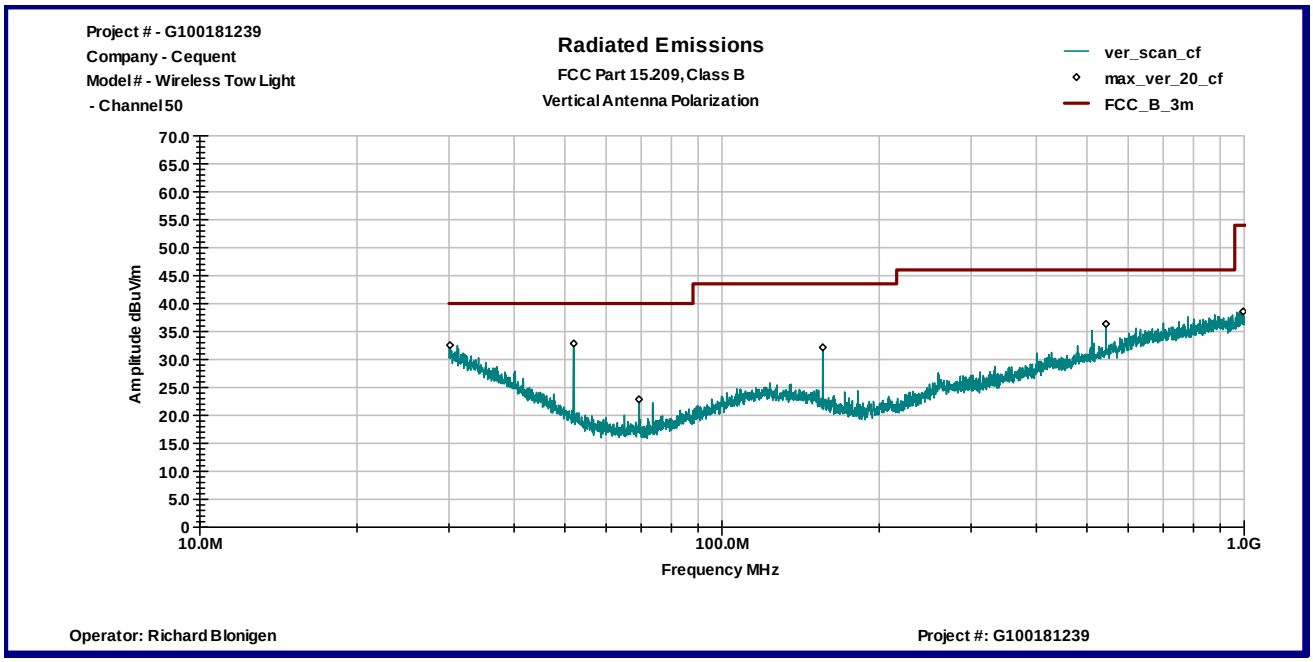


Horizontal antenna polarization

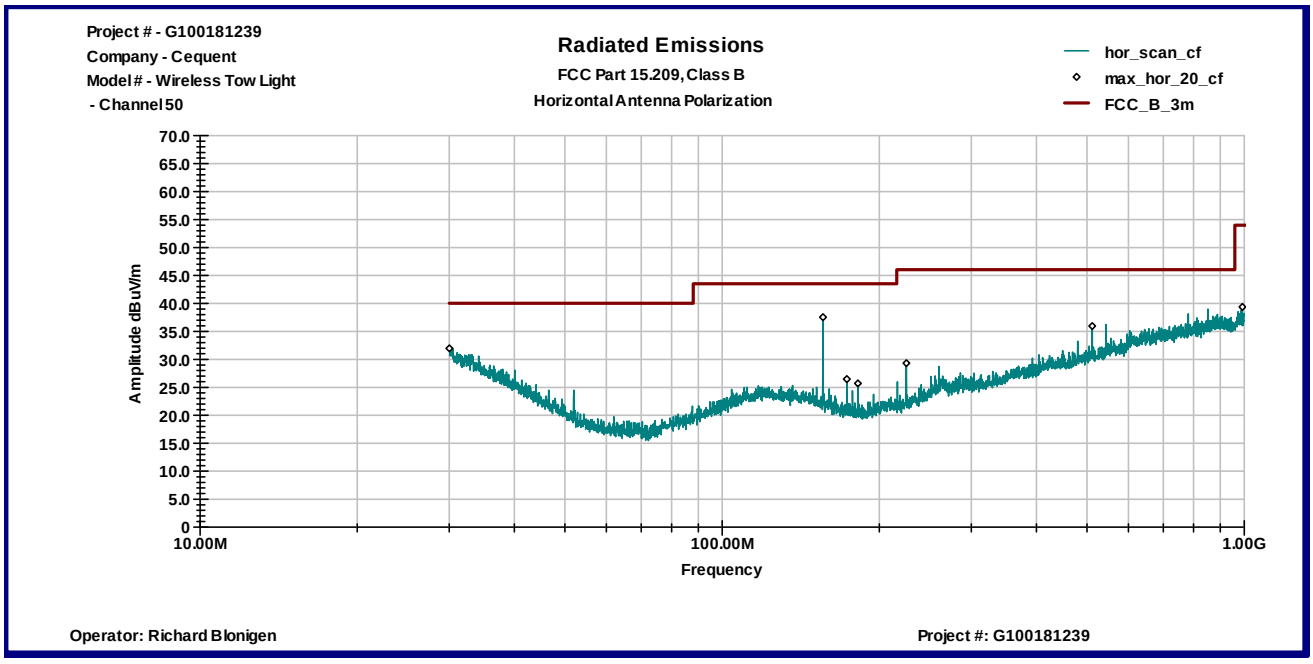


Graph 3.2.2

Vertical antenna polarization

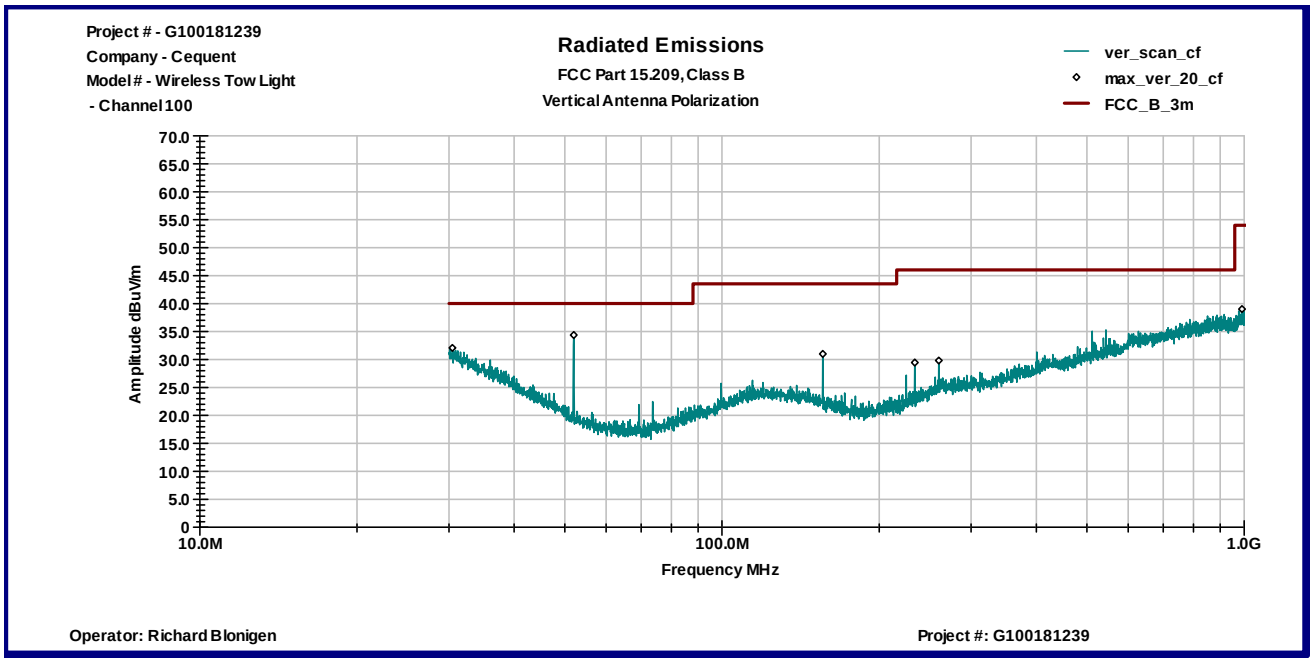


Horizontal antenna polarization

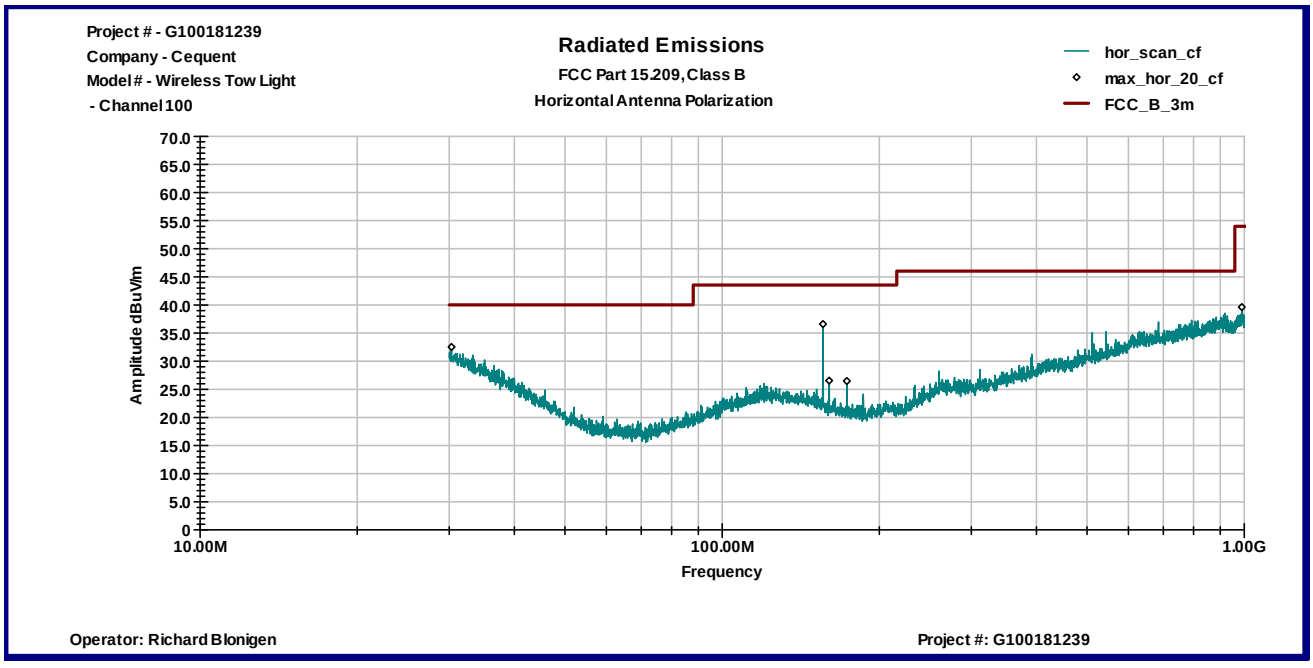


Graph 3.2.3

Vertical antenna polarization

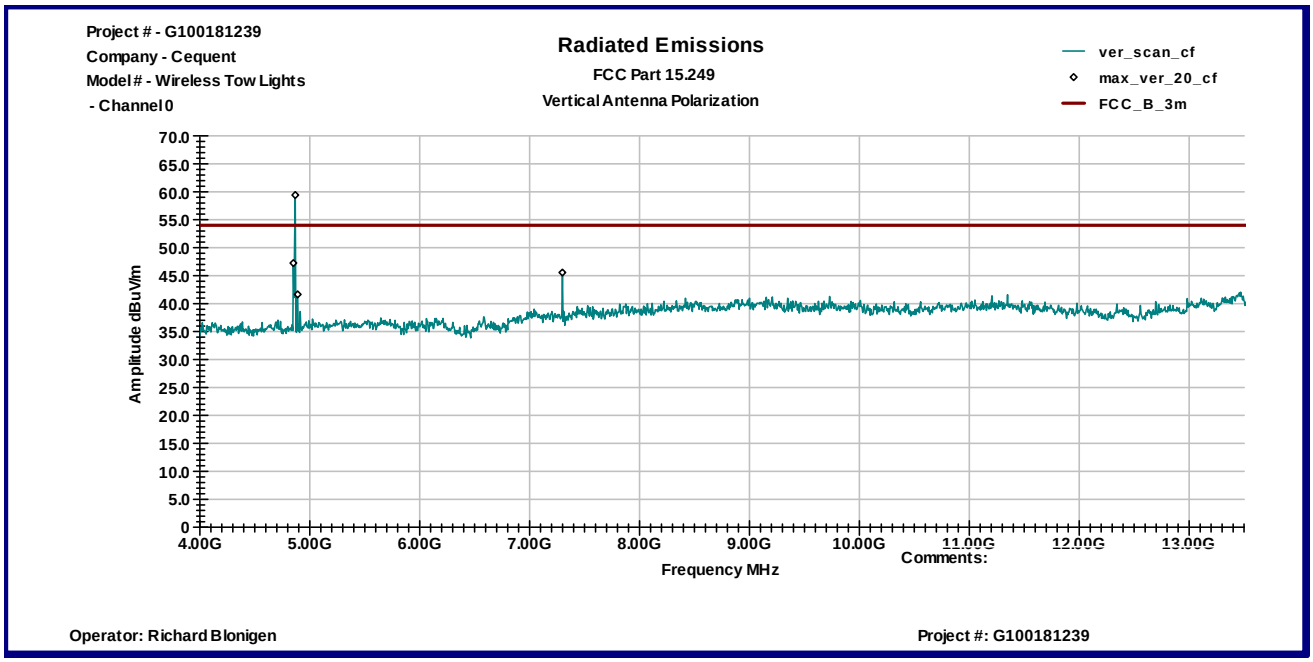


Horizontal antenna polarization

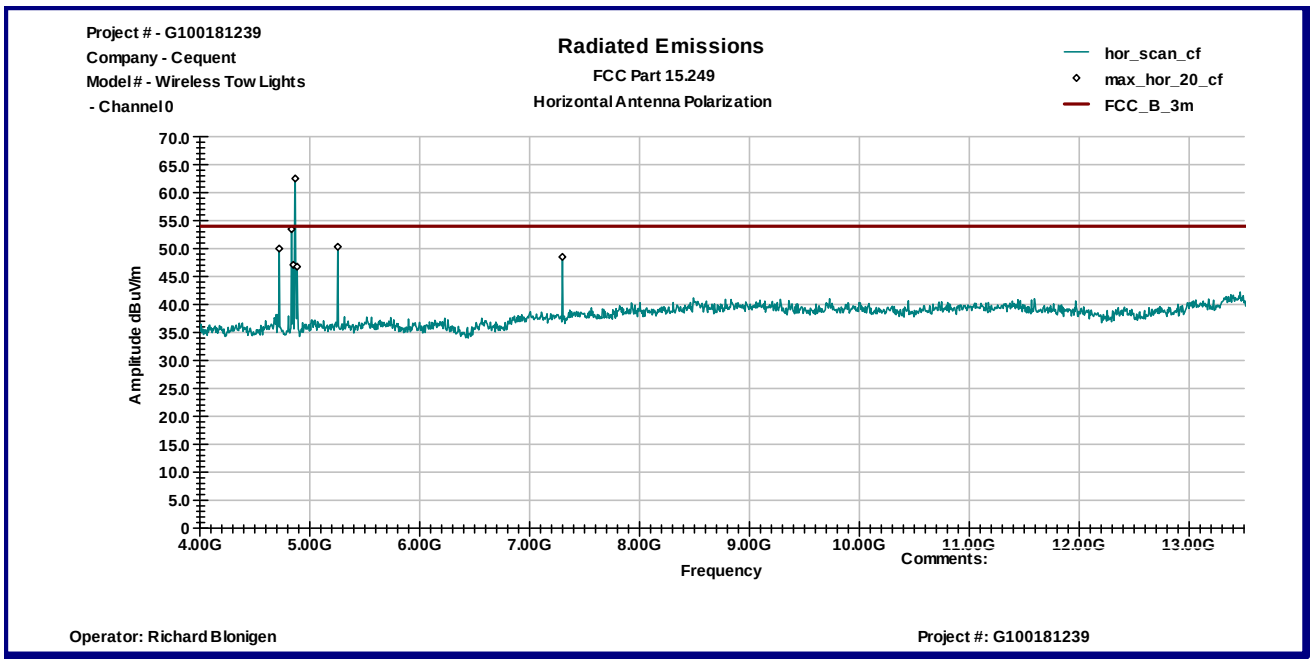


Graph 3.2.4

Vertical antenna polarization

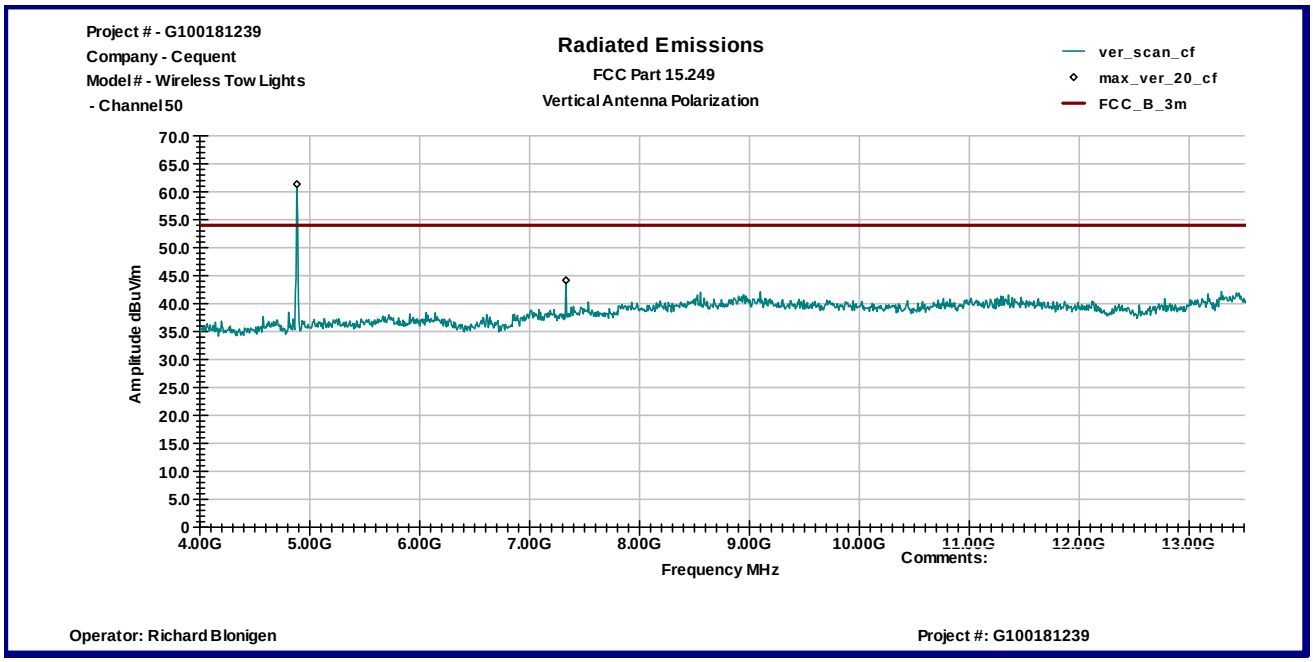


Horizontal antenna polarization

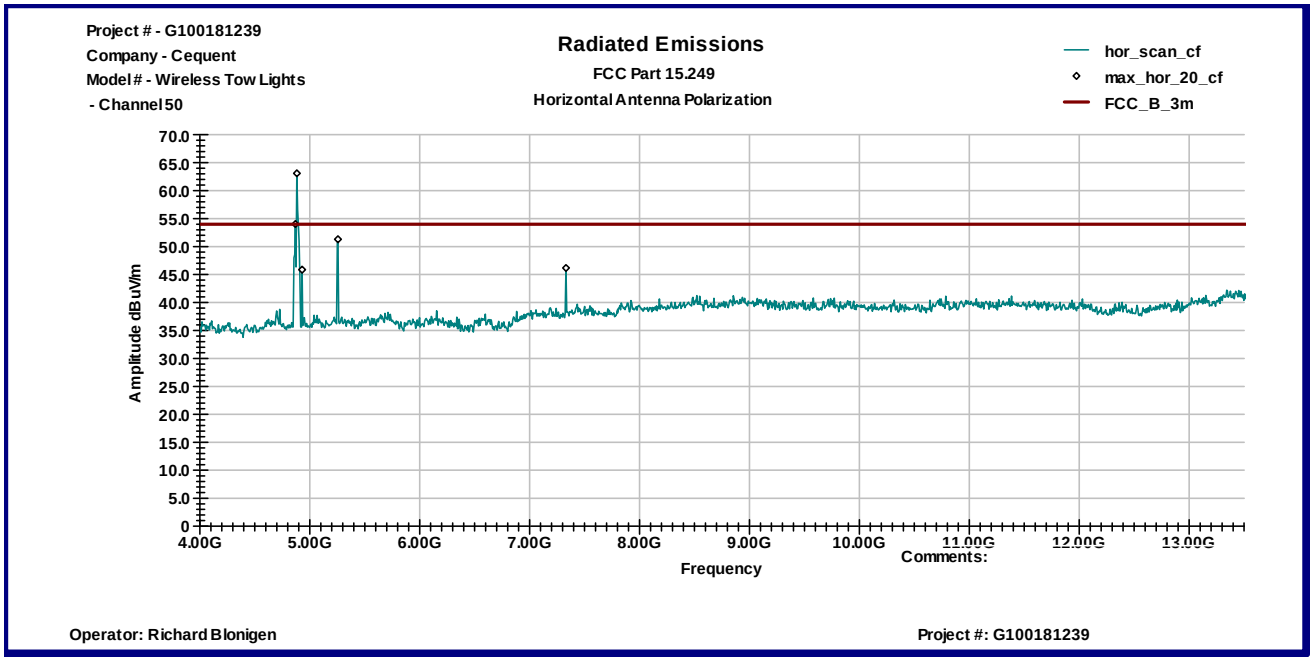


Graph 3.2.5

Vertical antenna polarization

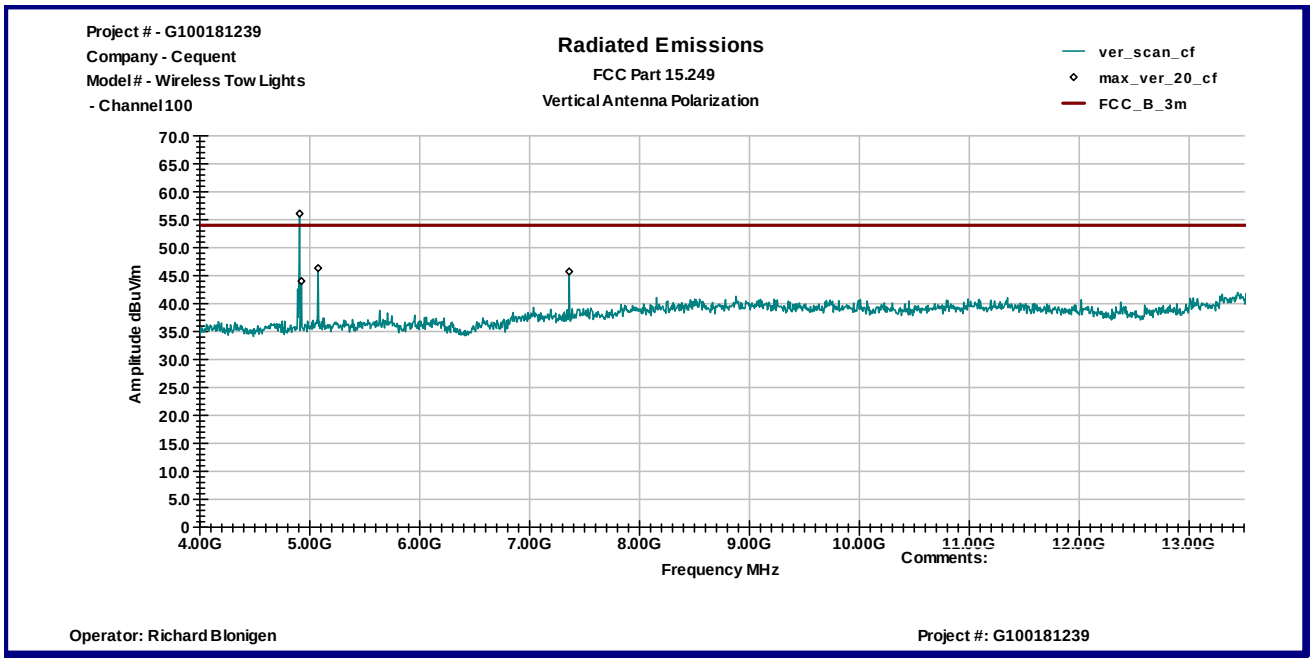


Horizontal antenna polarization

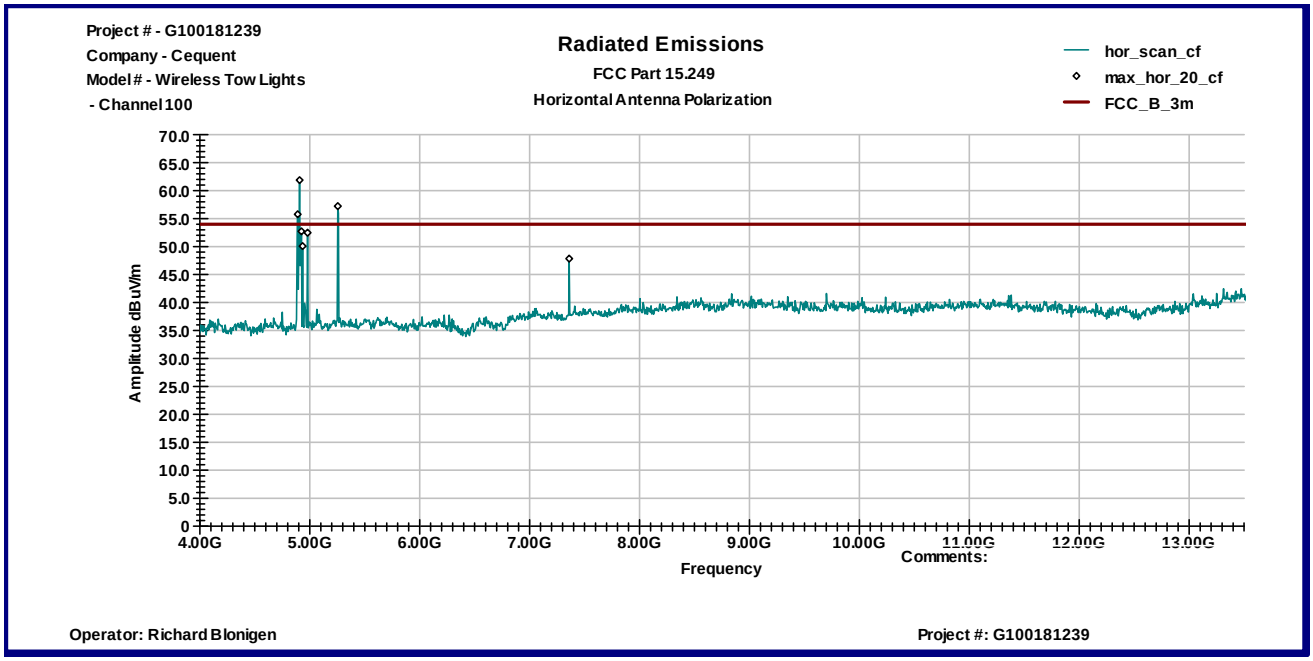


Graph 3.2.6

Vertical antenna polarization

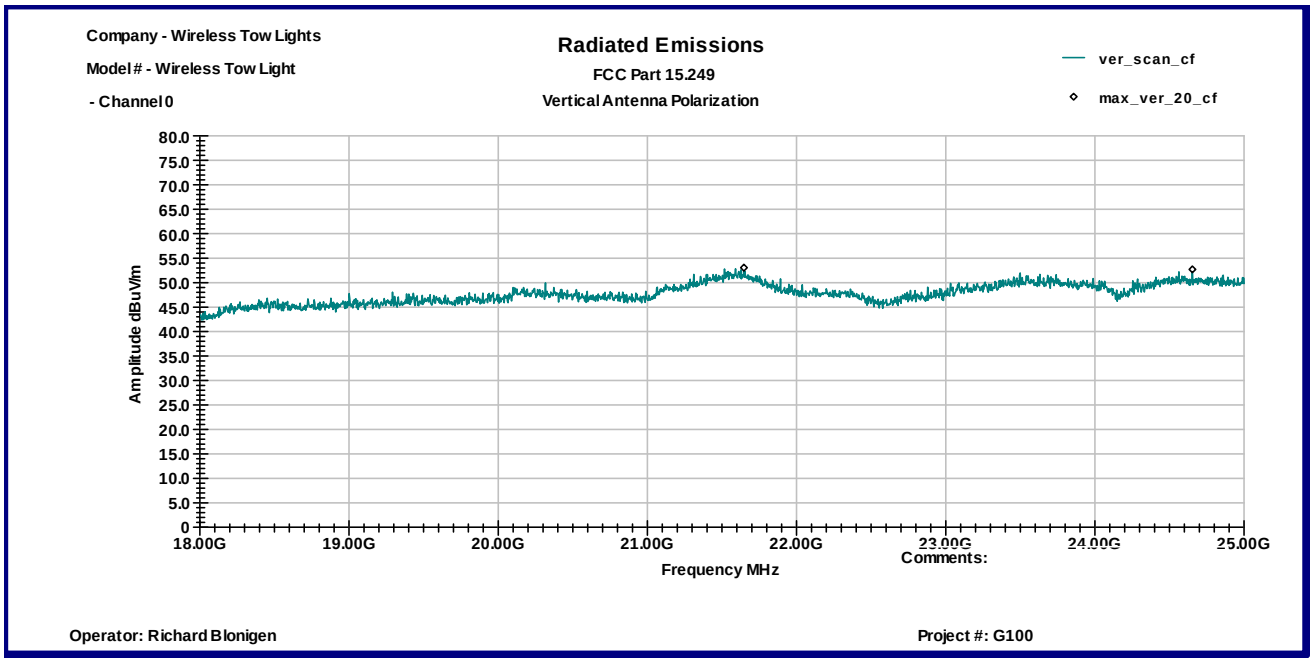


Horizontal antenna polarization

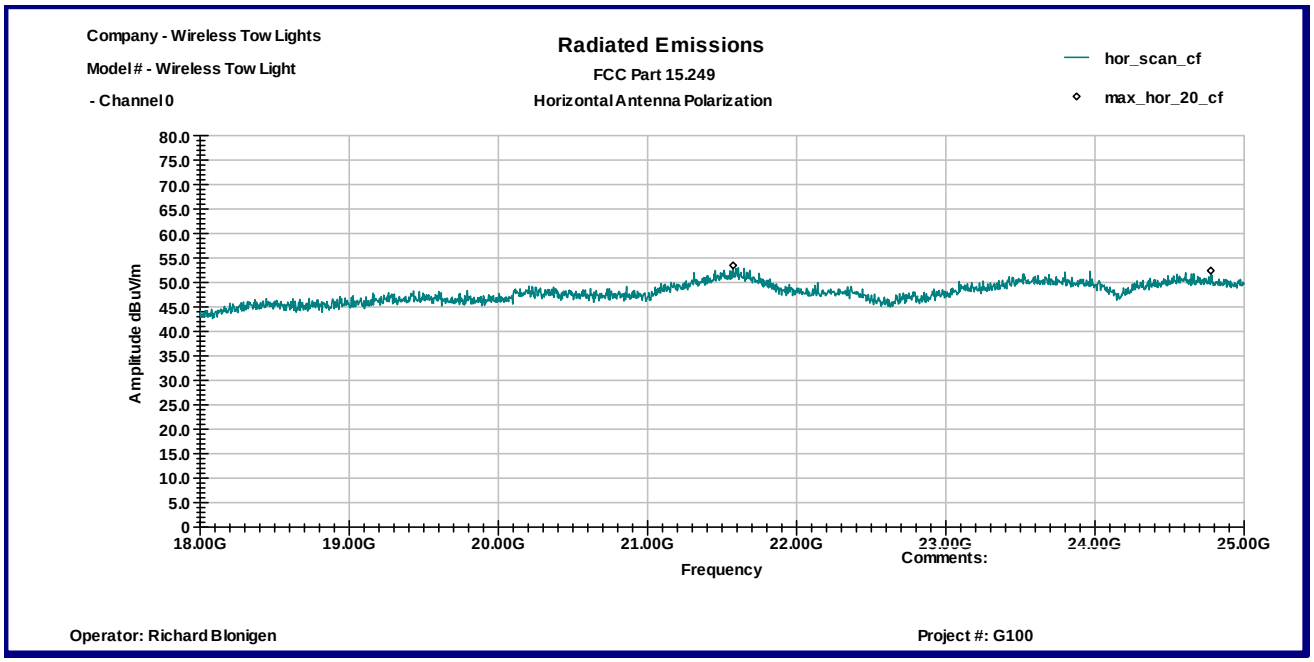


Graph 3.2.7

Vertical antenna polarization

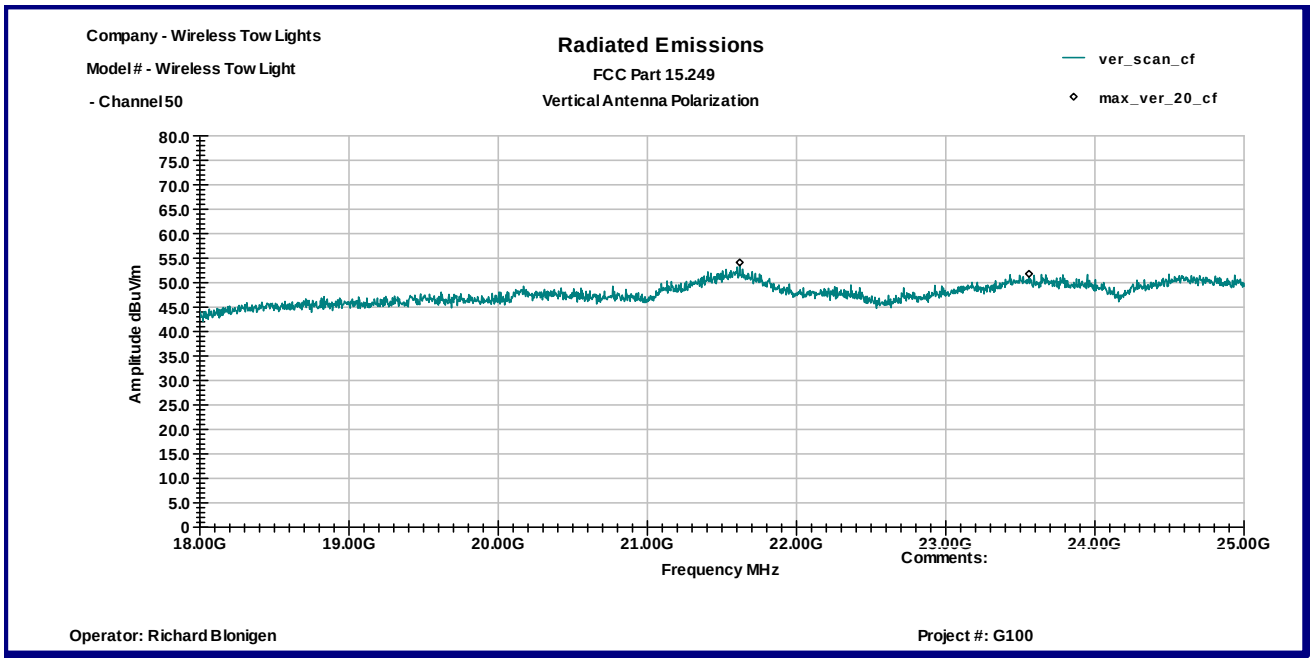


Horizontal antenna polarization

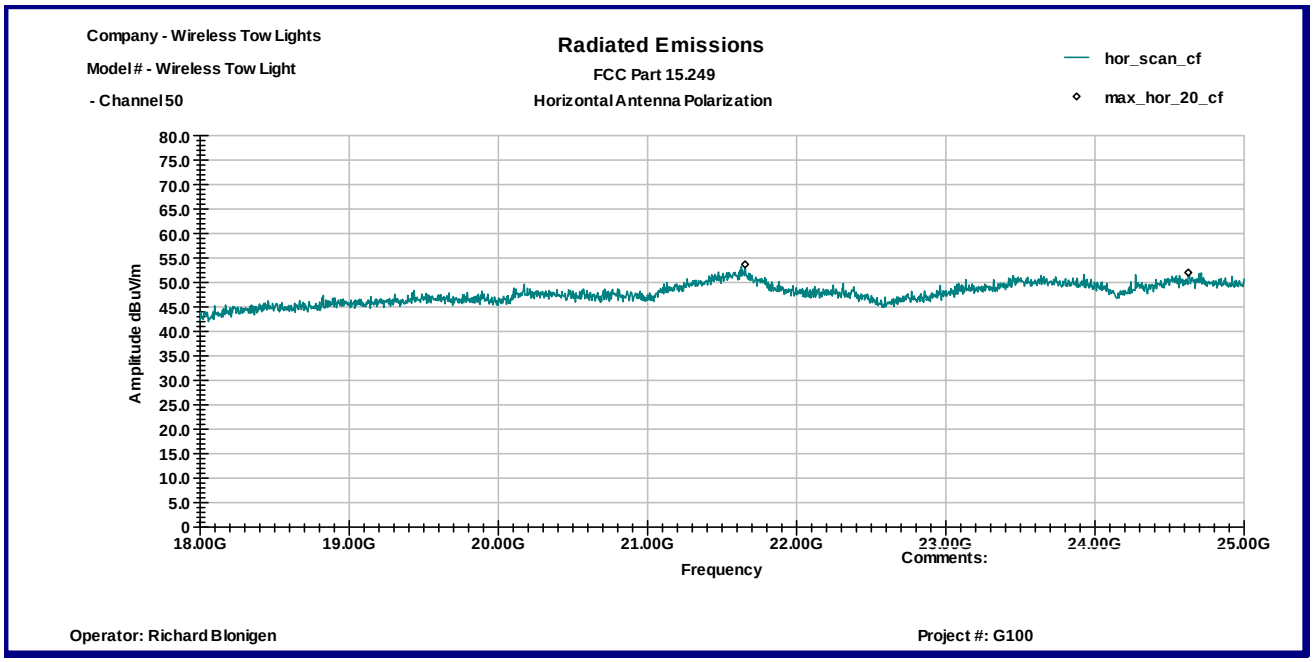


Graph 3.2.8

Vertical antenna polarization

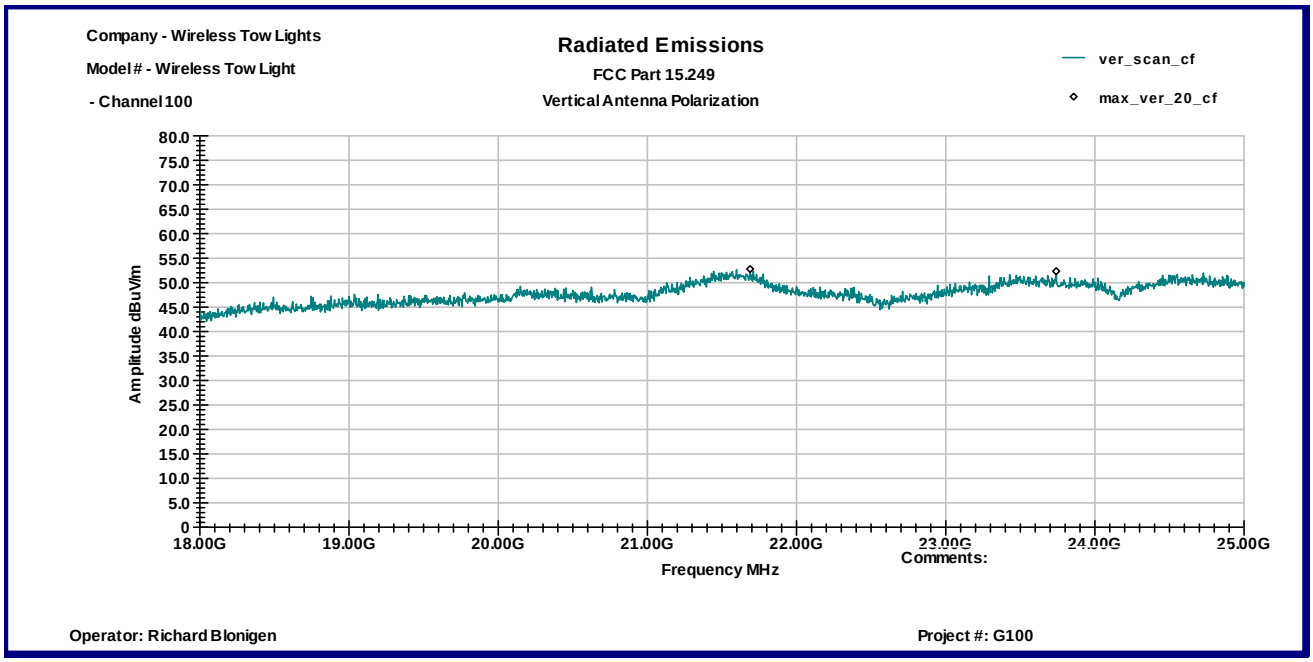


Horizontal antenna polarization

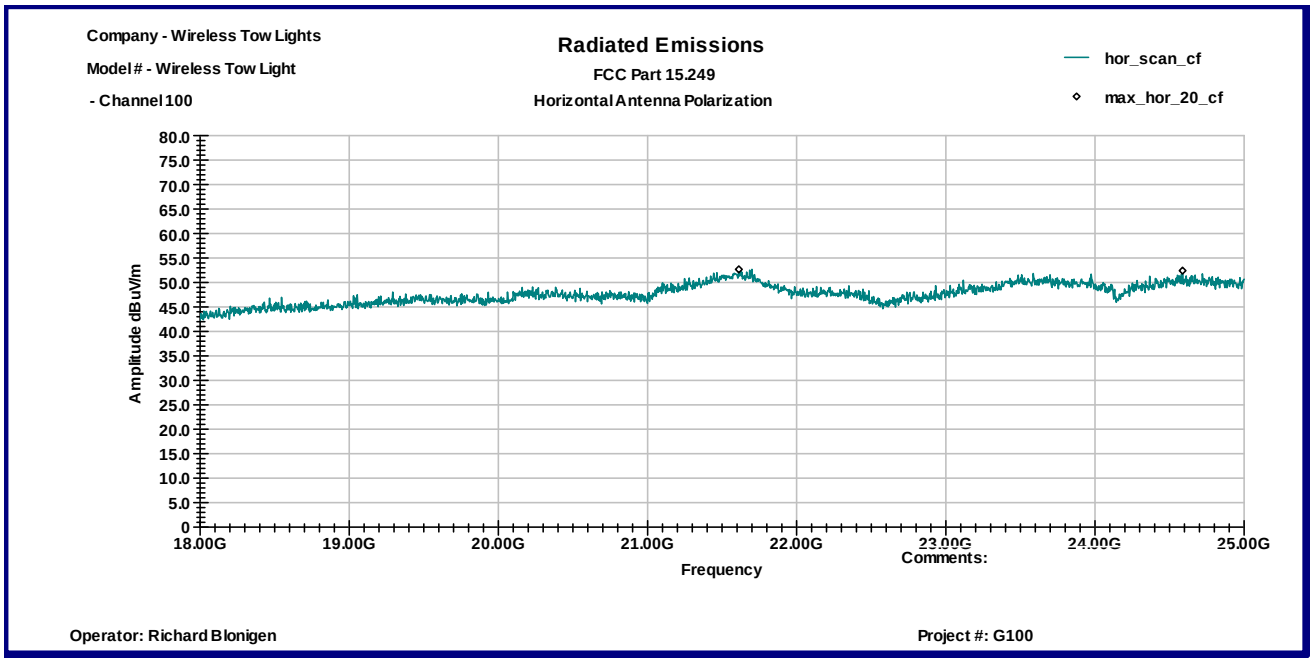


Graph 3.2.9

Vertical antenna polarization



Horizontal antenna polarization



3.2.1 Average correction factor calculation

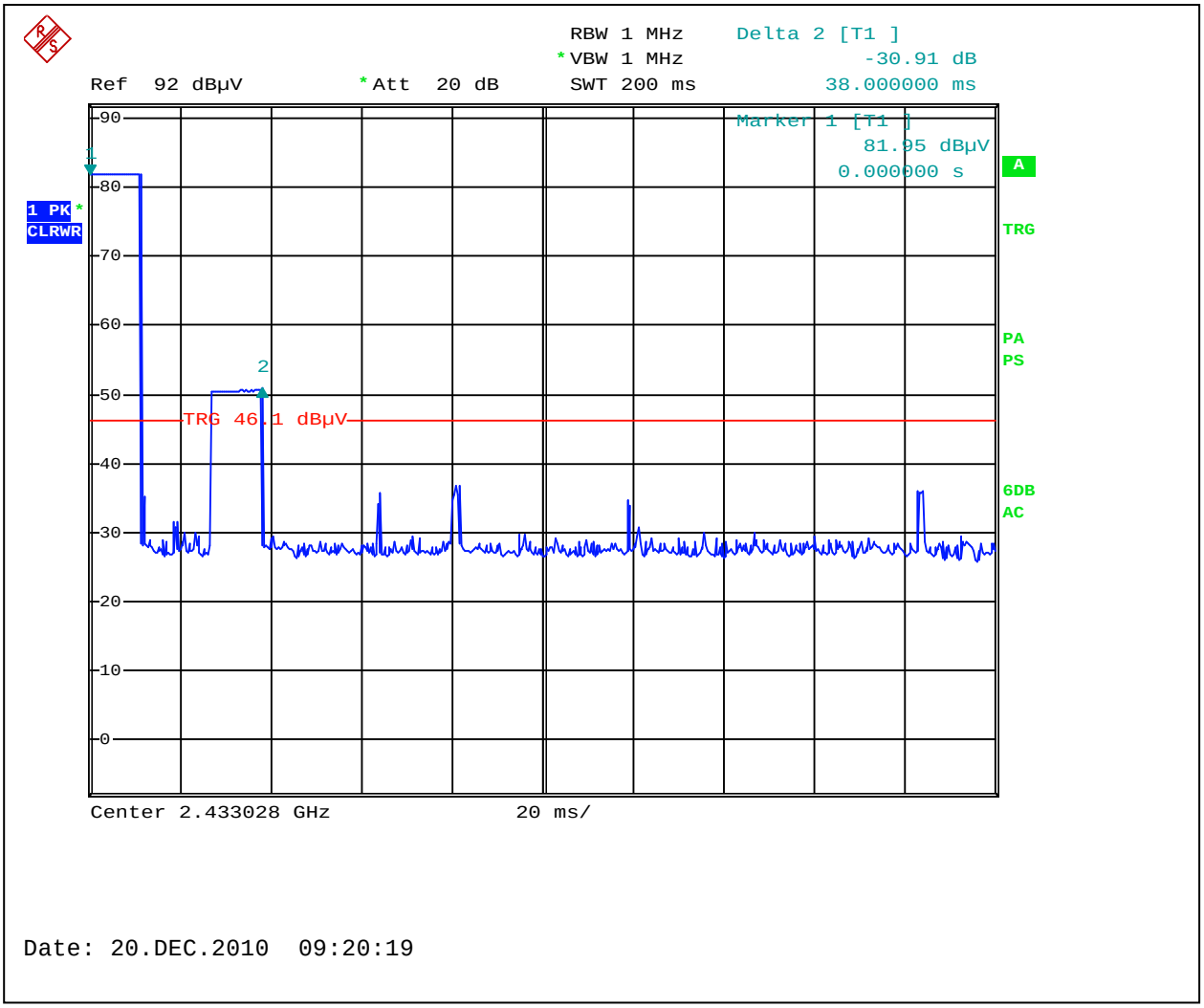
An Average correction factor is calculated by averaging one complete pulse train.

One complete pulse train, including blanking intervals is more than 100ms therefore 100ms is used to calculate correction factor
Time with field strength is in its maximum value (length of pulses) =22.7 ms (11.3ms + 11.4ms)

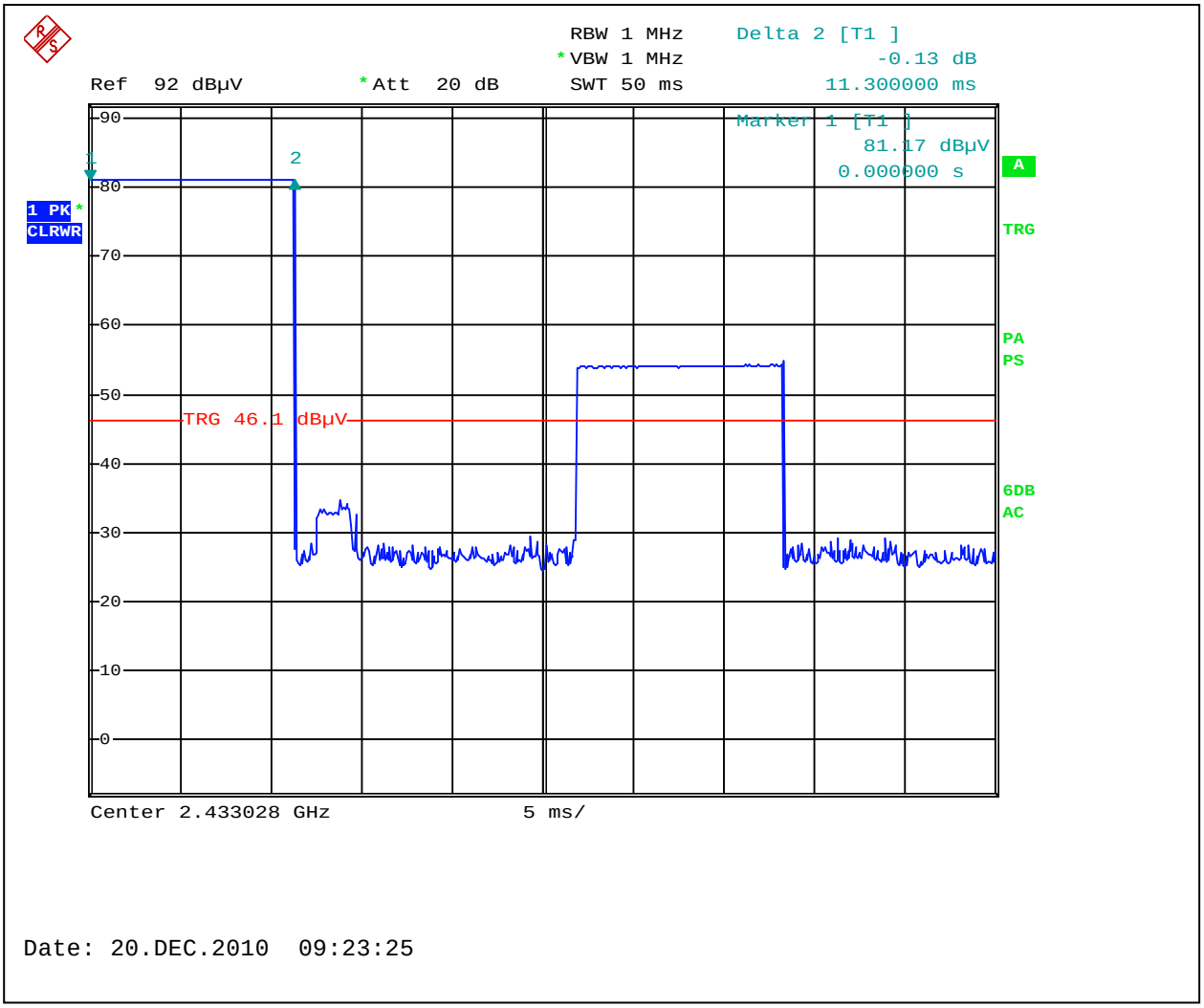
Average Correction Factor = 20Log(22.7ms/100ms) = -12.9dB

Graphs 3-2-3 to 3-2-5 show pulse train timing.

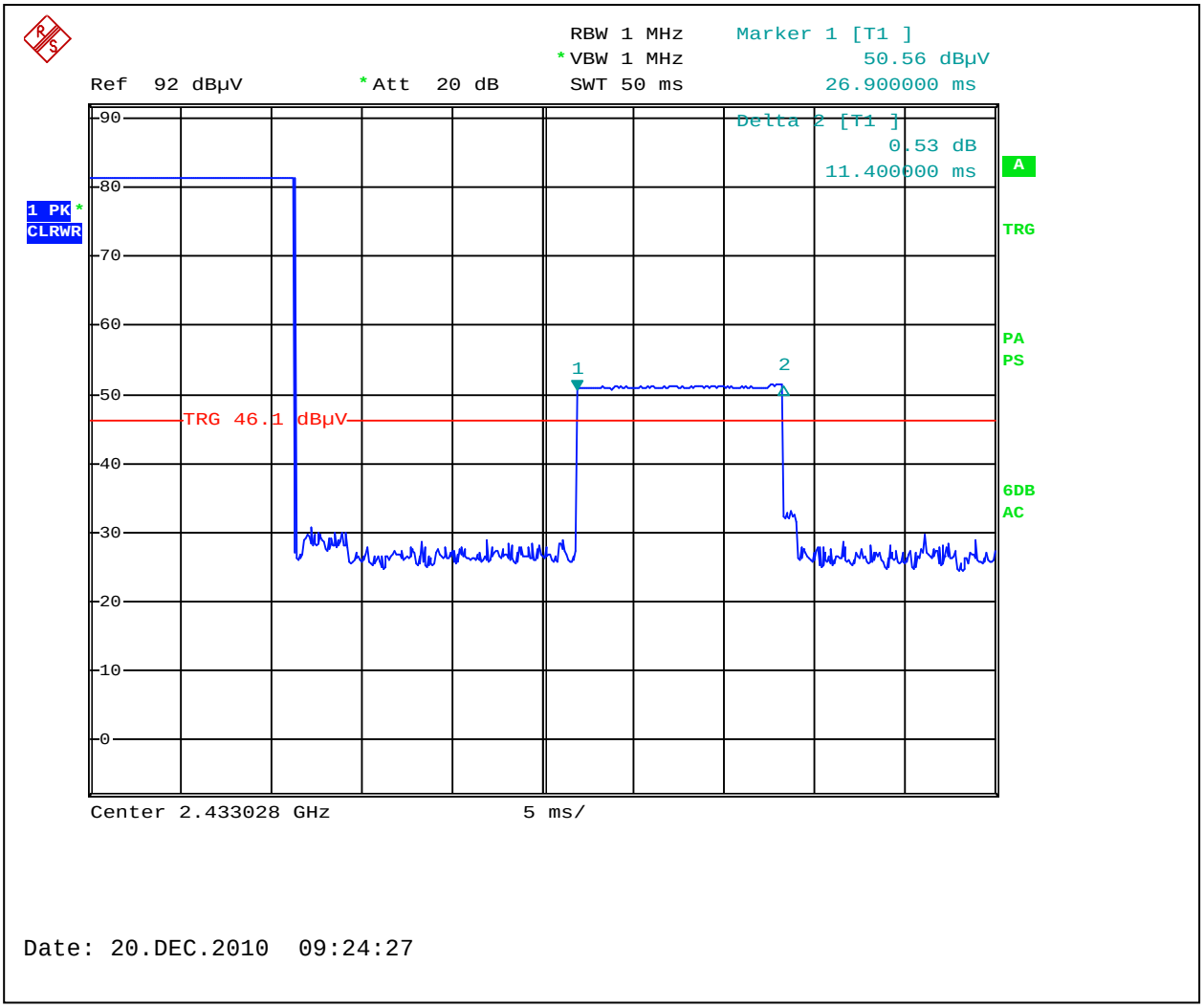
Graph 3.2.3


RBW 1 MHz
*VBW 1 MHz
SWT 200 ms
Delta 2 [T1]
-30.91 dB
38.000000 ms
Ref 92 dBµV
*Att 20 dB
Marker 1 [T1]
81.95 dBµV
0.000000 s
1 PK *
CLRWR
A
TRG
PA
PS
6DB
AC
TRG 46.1 dBµV
Center 2.433028 GHz
20 ms/
Date: 20.DEC.2010 09:20:19

Graph 3.2.4


RBW 1 MHz
*VBW 1 MHz
SWT 50 ms
Delta 2 [T1]
-0.13 dB
11.300000 ms
Ref 92 dBµV
*Att 20 dB
Marker 1 [T1]
81.17 dBµV
0.000000 s
1 PK *
CLRWR
A
TRG
PA
PS
6DB
AC
TRG 46.1 dBµV
90
80
70
60
50
40
30
20
10
0
Center 2.433028 GHz
5 ms/
Date: 20.DEC.2010 09:23:25

Graph 3.2.5


RBW 1 MHz
*VBW 1 MHz
SWT 50 ms
Marker 1 [T1]
50.56 dBµV
26.900000 ms
Delta 2 [T1]
0.53 dB
11.400000 ms
Ref 92 dBµV
*Att 20 dB
1 PK *
CLRWR
A
TRG
PA
PS
6DB
AC
TRG 46.1 dBµV
Center 2.433028 GHz
5 ms/
Date: 20.DEC.2010 09:24:27

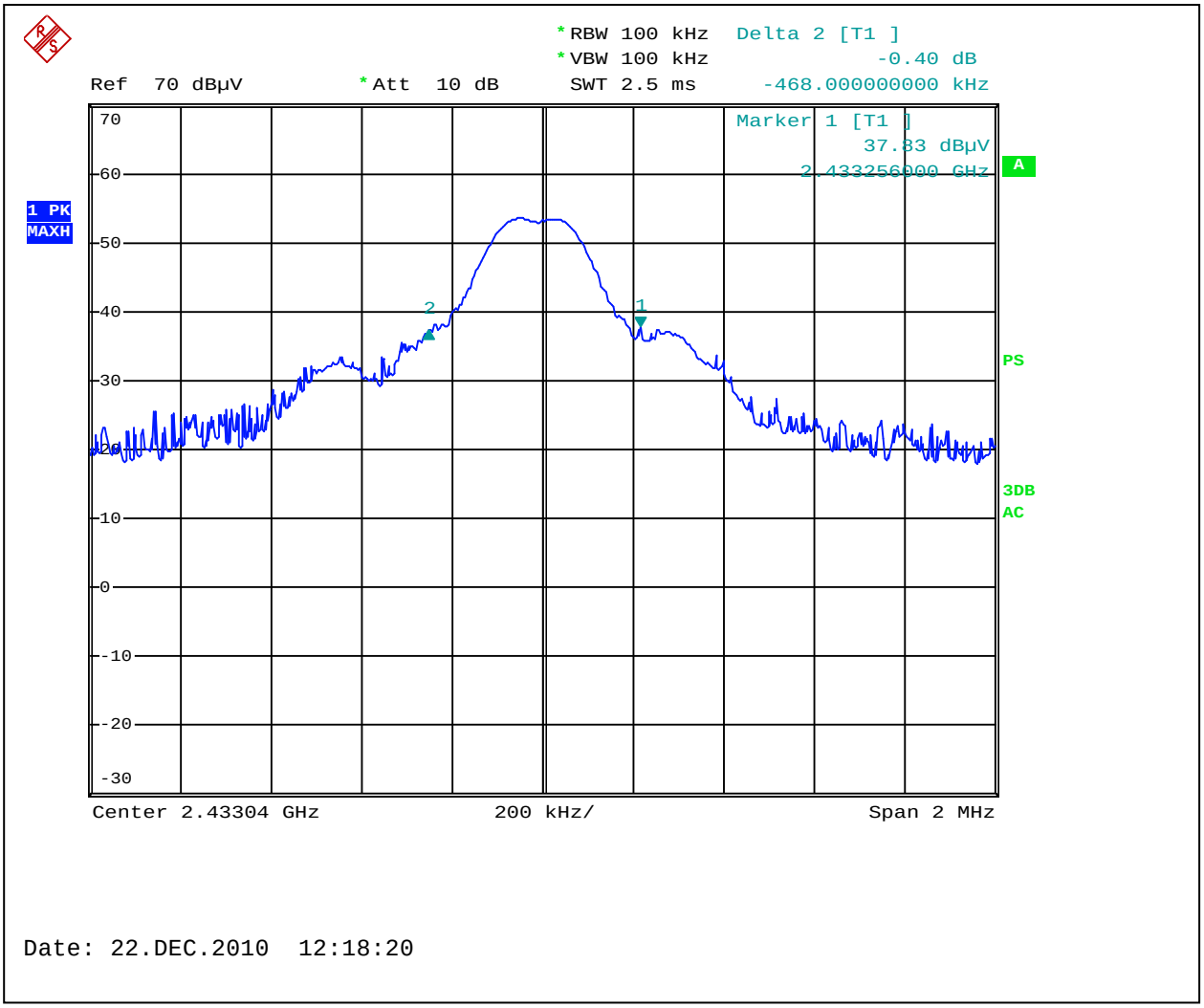
3.3 Bandwidth of Emissions

Center Frequency of operation MHz	Measured 20dB bandwidth kHz	Measured 99% bandwidth kHz
2433.10	468.00	764.00
2443.10	416.00	516.00
2453.10	440.00	788.00

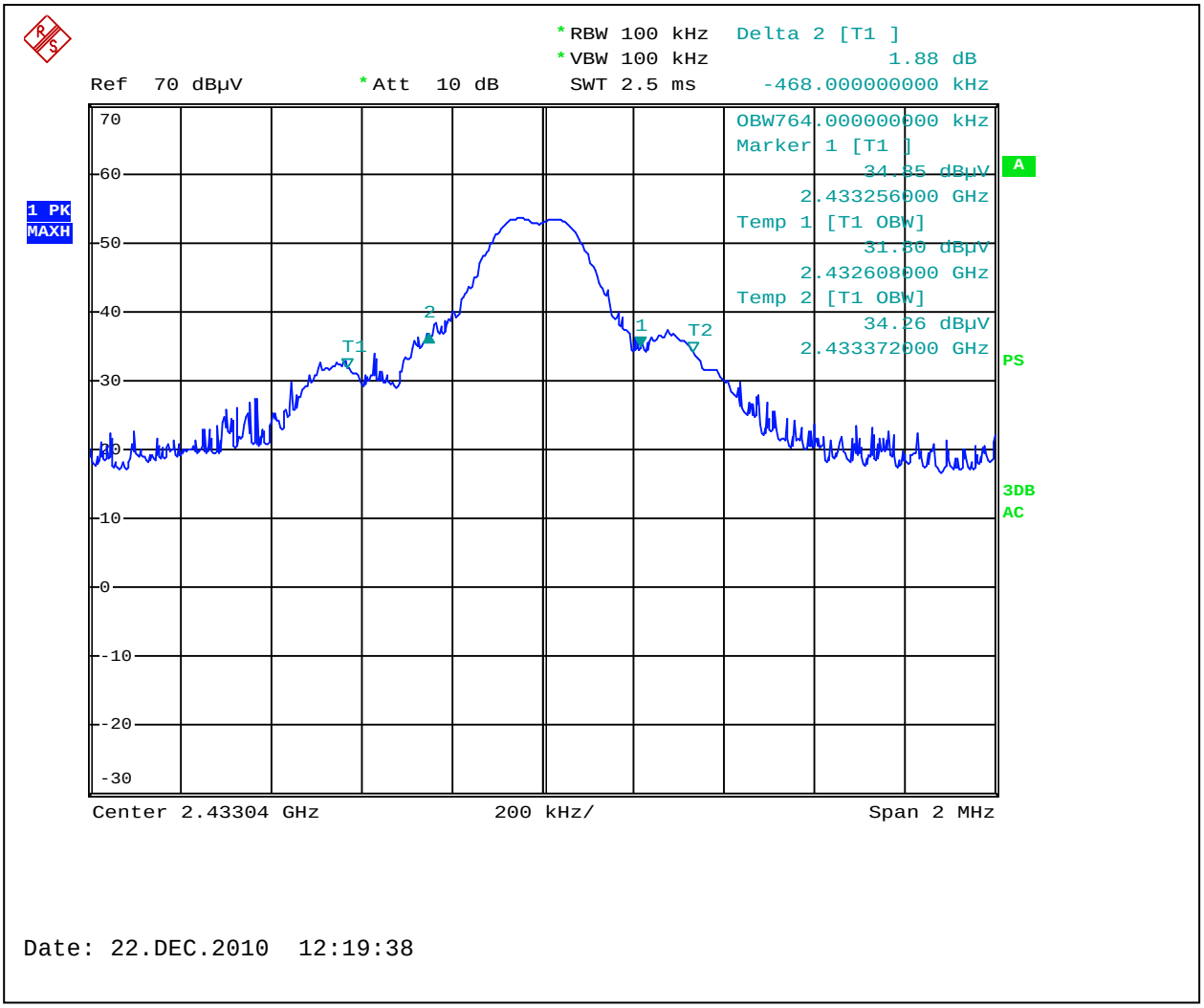
Graphs 3-3-1 through 3-3-6 show bandwidth of emissions

Notes: The bandwidth of emissions is contained within the frequency band of operation

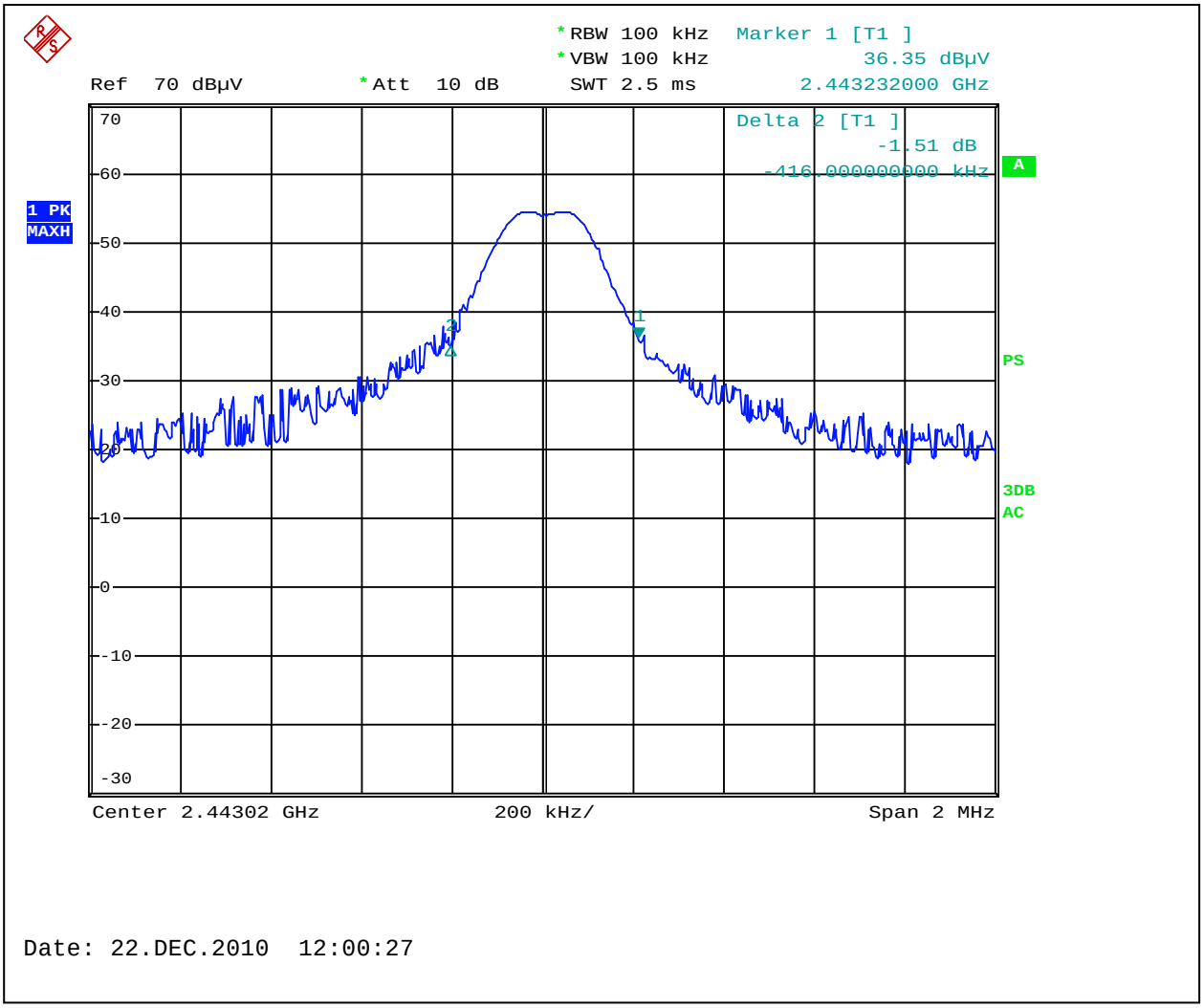
Graph 3.3.1


*RBW 100 kHz
*VBW 100 kHz
Delta 2 [T1]
-0.40 dB
-468.000000000 kHz
Ref 70 dBµV
*Att 10 dB
SWT 2.5 ms
Marker 1 [T1]
37.83 dBµV
2.433256000 GHz
1 PK
MAXH
A
PS
3DB
AC
70
60
50
40
30
20
10
0
-10
-20
-30
Center 2.43304 GHz
200 kHz/
Span 2 MHz
Date: 22.DEC.2010 12:18:20

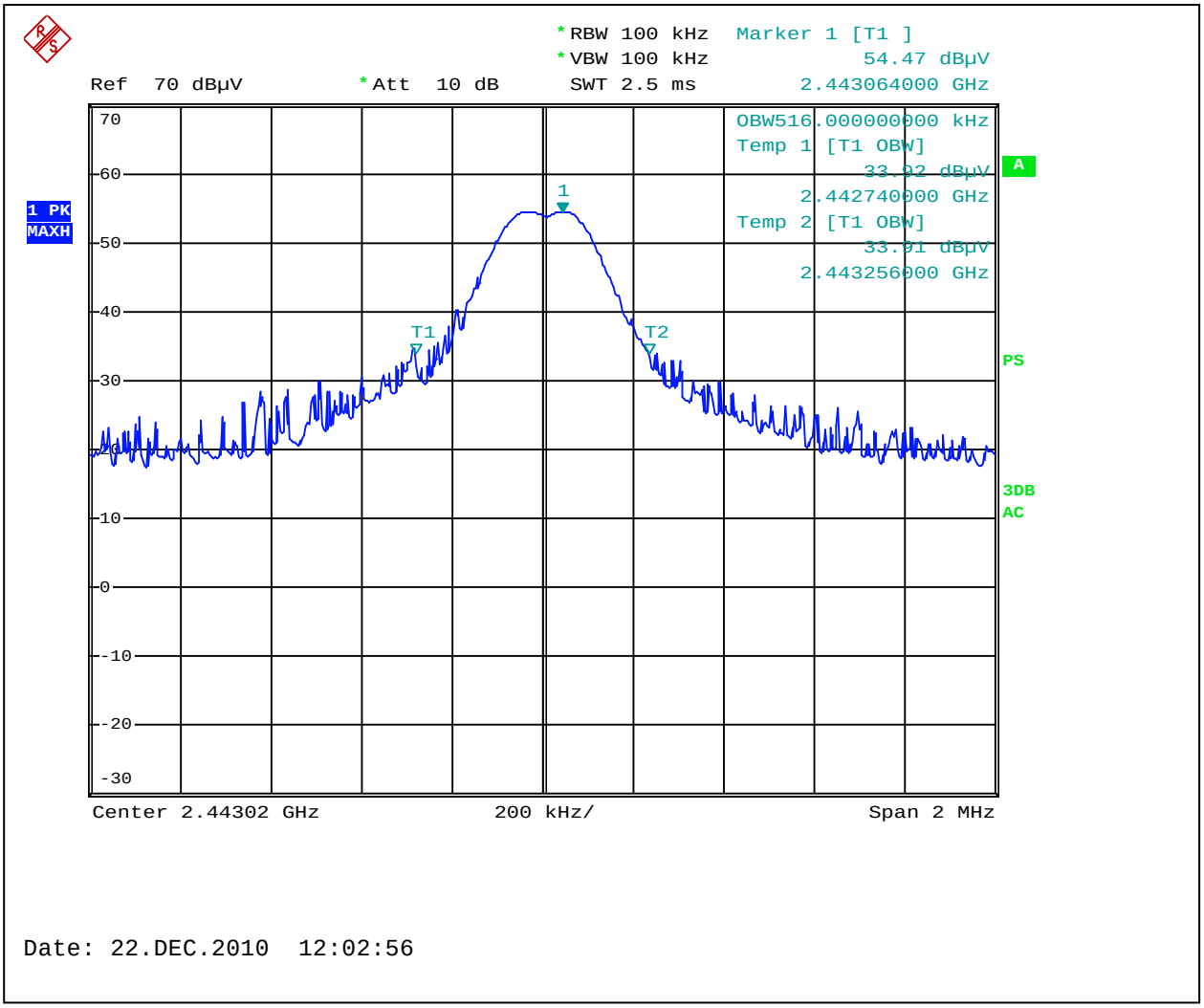
Graph 3.3.2


*RBW 100 kHz
*VBW 100 kHz
Ref 70 dBµV
*Att 10 dB
SWT 2.5 ms
Delta 2 [T1]
1.88 dB
-468.000000000 kHz
OBW764.000000000 kHz
Marker 1 [T1]
34.85 dBµV
2.433256000 GHz
Temp 1 [T1 OBW]
31.80 dBµV
2.432608000 GHz
Temp 2 [T1 OBW]
34.26 dBµV
2.433372000 GHz
1 PK
MAXH
A
PS
3DB
AC
70
60
50
40
30
20
10
0
-10
-20
-30
T1
T2
Center 2.43304 GHz
200 kHz/
Span 2 MHz
Date: 22.DEC.2010 12:19:38

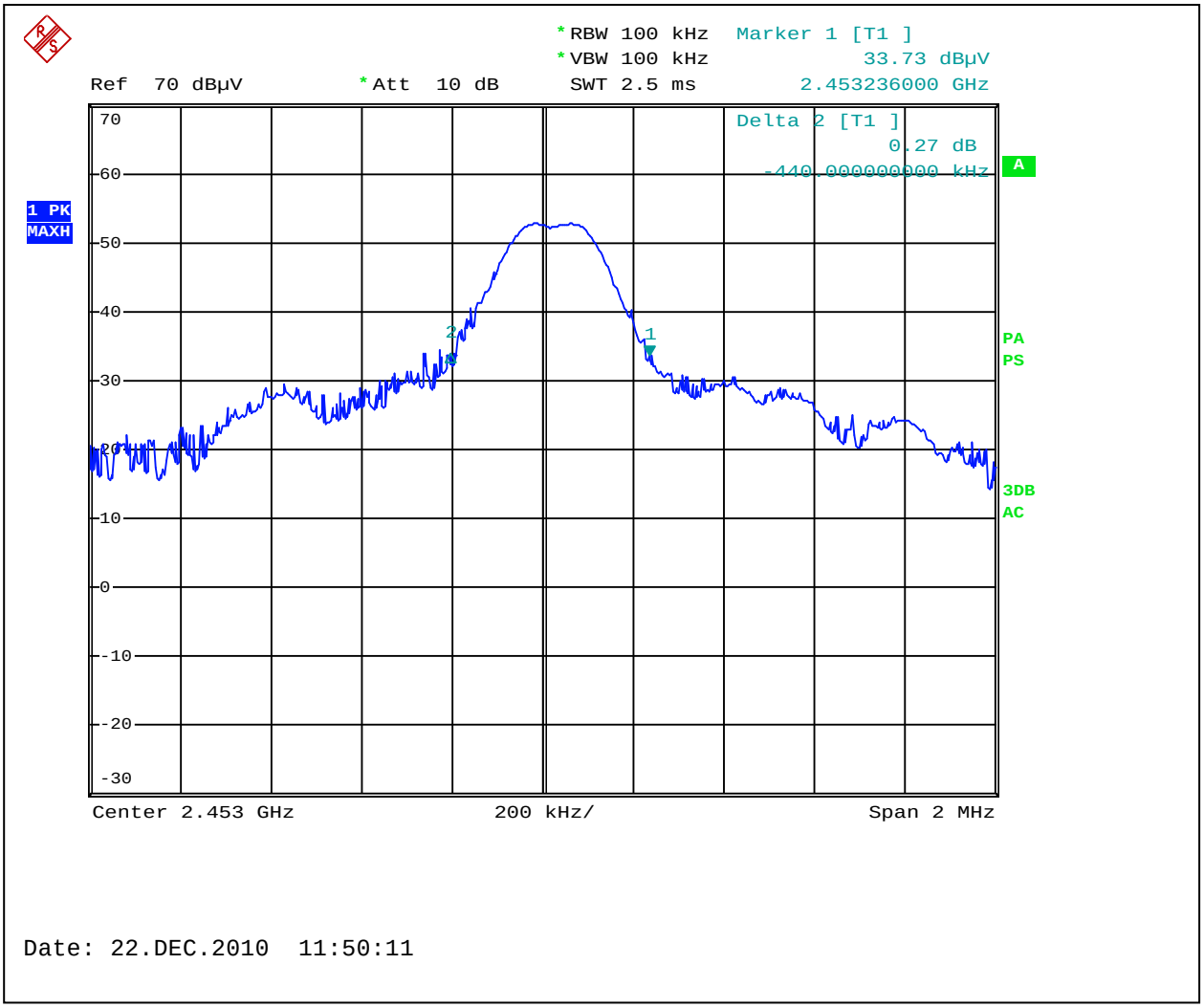
Graph 3.3.3


*RBW 100 kHz
*VBW 100 kHz
Marker 1 [T1]
36.35 dBµV
Ref 70 dBµV
*Att 10 dB
SWT 2.5 ms
2.443232000 GHz
Delta 2 [T1]
-1.51 dB
-416.000000000 kHz
A
1 PK
MAXH
PS
3DB
AC
70
60
50
40
30
20
10
0
-10
-20
-30
Center 2.44302 GHz
200 kHz/
Span 2 MHz
Date: 22.DEC.2010 12:00:27

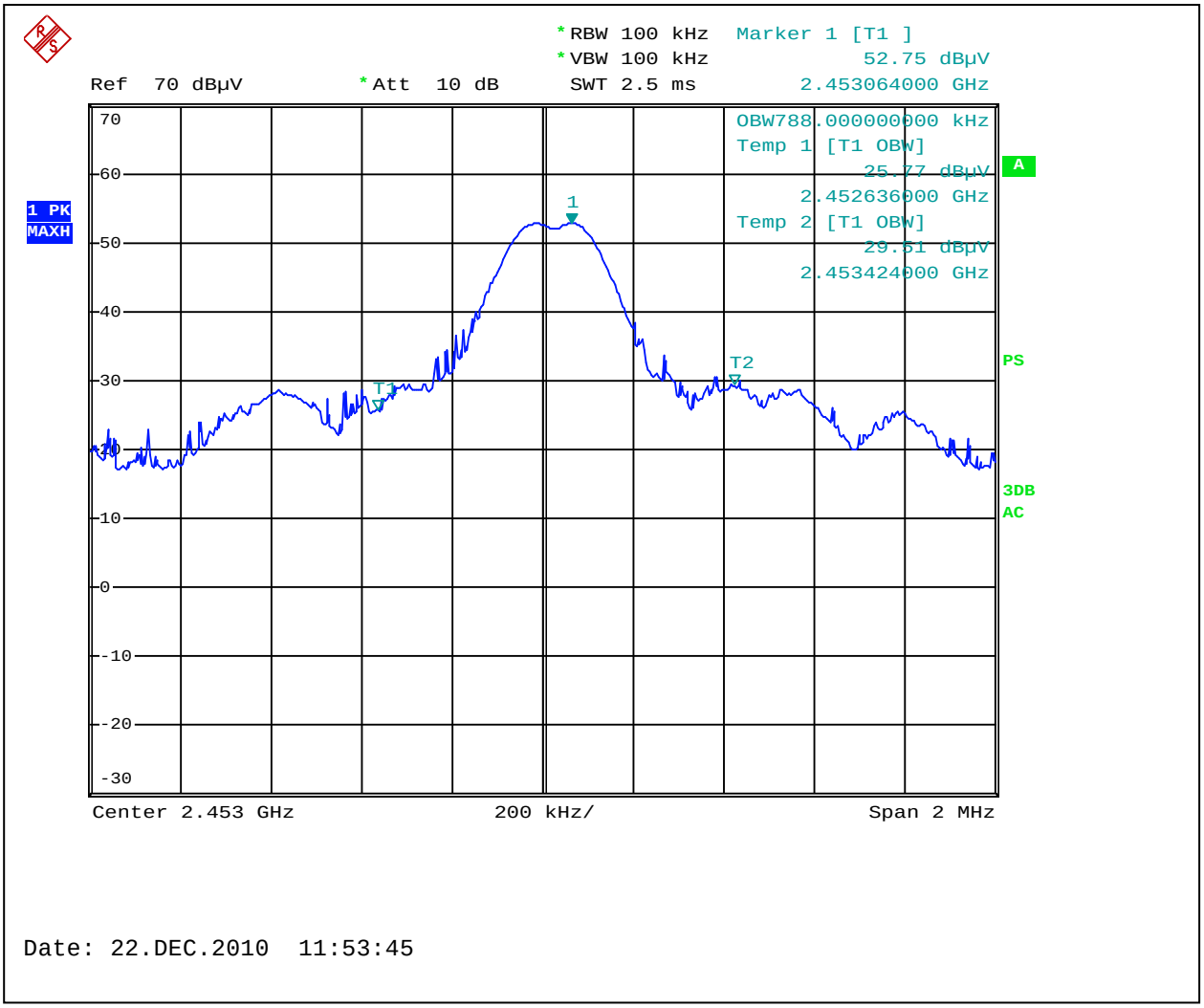
Graph 3.3.4


*RBW 100 kHz
*VBW 100 kHz
SWT 2.5 ms
Marker 1 [T1]
54.47 dBµV
2.443064000 GHz
Ref 70 dBµV
*Att 10 dB
OBW516.000000000 kHz
Temp 1 [T1 OBW]
33.02 dBµV
2.442740000 GHz
Temp 2 [T1 OBW]
33.91 dBµV
2.443256000 GHz
1 PK
MAXH
A
PS
3DB
AC
T1
T2
70
60
50
40
30
20
10
0
-10
-20
-30
Center 2.44302 GHz
200 kHz/
Span 2 MHz
Date: 22.DEC.2010 12:02:56

Graph 3.3.5


*RBW 100 kHz
*VBW 100 kHz
Marker 1 [T1]
33.73 dBµV
2.453236000 GHz
Ref 70 dBµV
*Att 10 dB
SWT 2.5 ms
Delta 2 [T1]
0.27 dB
-440.000000000 kHz
1 PK
MAXH
A
PA
PS
3DB
AC
70
60
50
40
30
20
10
0
-10
-20
-30
Center 2.453 GHz
200 kHz/
Span 2 MHz
Date: 22.DEC.2010 11:50:11

Graph 3.3.6


*RBW 100 kHz
*VBW 100 kHz
Ref 70 dBµV
*Att 10 dB
SWT 2.5 ms
Marker 1 [T1]
52.75 dBµV
2.453064000 GHz
OBW788.000000000 kHz
Temp 1 [T1 OBW]
25.77 dBµV
2.452636000 GHz
Temp 2 [T1 OBW]
29.51 dBµV
2.453424000 GHz
1 PK
MAXH
A
PS
3DB
AC
70
60
50
40
30
20
10
0
-10
-20
-30
Center 2.453 GHz
200 kHz/
Span 2 MHz
Date: 22.DEC.2010 11:53:45

3.4 Transmitter power line conducted emissions

Test location: ☐ OATS ☐ Anechoic Chamber ☐ Other

Test result: **N/A**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: dB below the limits

Notes: Testing not applicable as EUT is battery powered device.

3.5 Receiver/digital device radiated emissions

Test location: ☐ OATS ☒ Anechoic Chamber

Test distance: ☐ 10 meters ☒ 3 meters

Test result: **Pass**

Frequency range: 30MHz-12.5GHz

Max. Emissions margin: dB below the limits

Notes: The Radiated Emissions test was performed in the Anechoic chamber at 3m measurement distance (see Table 3.11.1 and Graphs 3.11.1 and 3.11.2)

Date:	September 20, 2010	**Result:** **Pass**
Standard:	FCC Part 15.109, Class B / RSS-310 3.1	
Tested by:	Richard Blonigen	
Test Point:	Enclosure	
Operation mode:	See Page 5	
Note:	Frequency Range 30-1000MHz	

Table 3.5.1

Frequency	Ant. Polarity	Peak Reading dBµV	Ant.Factor dB1/m	Total at 3m dBµV/m	QP Limit dBµV/m	Margin dB
30.175 MHz	V	11.7	20.7	32.3	40.0	-7.7
51.996 MHz	V	21.0	9.4	30.3	40.0	-9.7
110.88 MHz	V	12.9	13.4	26.3	43.5	-17.2
980.29 MHz	V	12.8	26.4	39.2	54.0	-14.8
30.0 MHz	H	12.2	20.8	32.9	40.0	-7.1
117.05 MHz	H	13.3	13.9	27.3	43.5	-16.3
972.89 MHz	H	13.2	26.0	39.2	54.0	-14.8

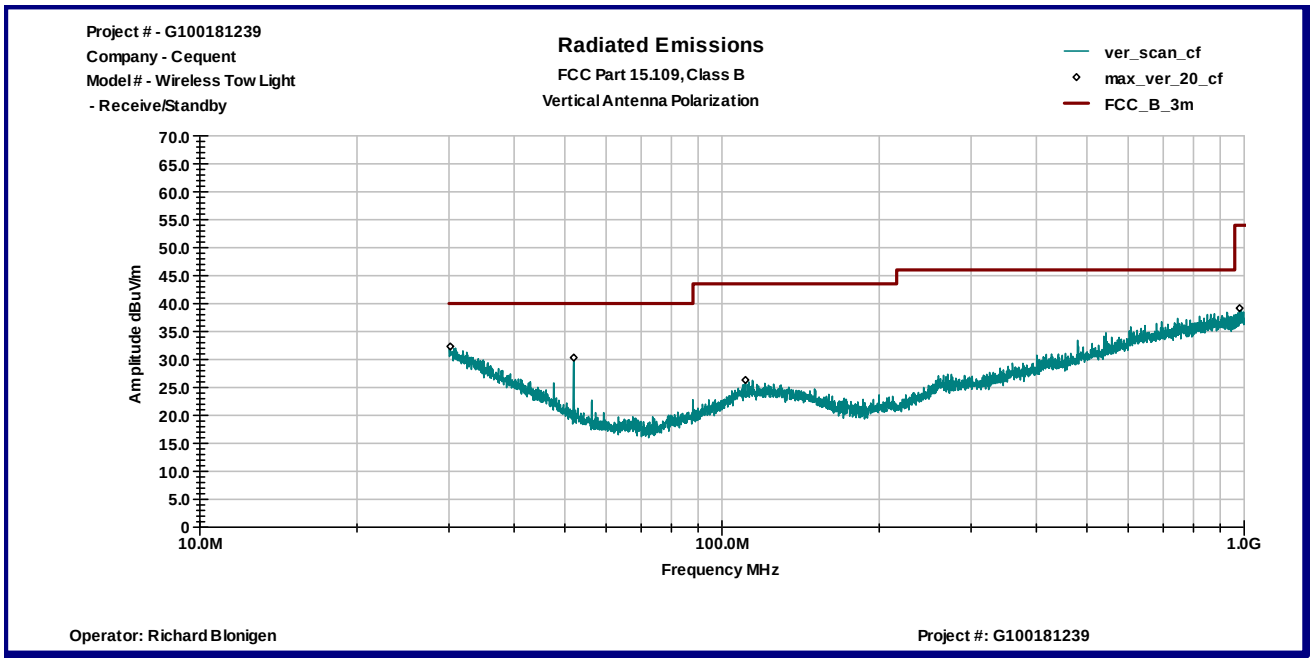
Date:	September 20, 2010	**Result:** **Pass**
Standard:	FCC Part 15.109, Class B / RSS-310 3.1	
Tested by:	Richard Blonigen	
Test Point:	Enclosure	
Operation mode:	See Page 5	
Note:	Frequency Range 1-12.5GHz	

Table 3.5.2

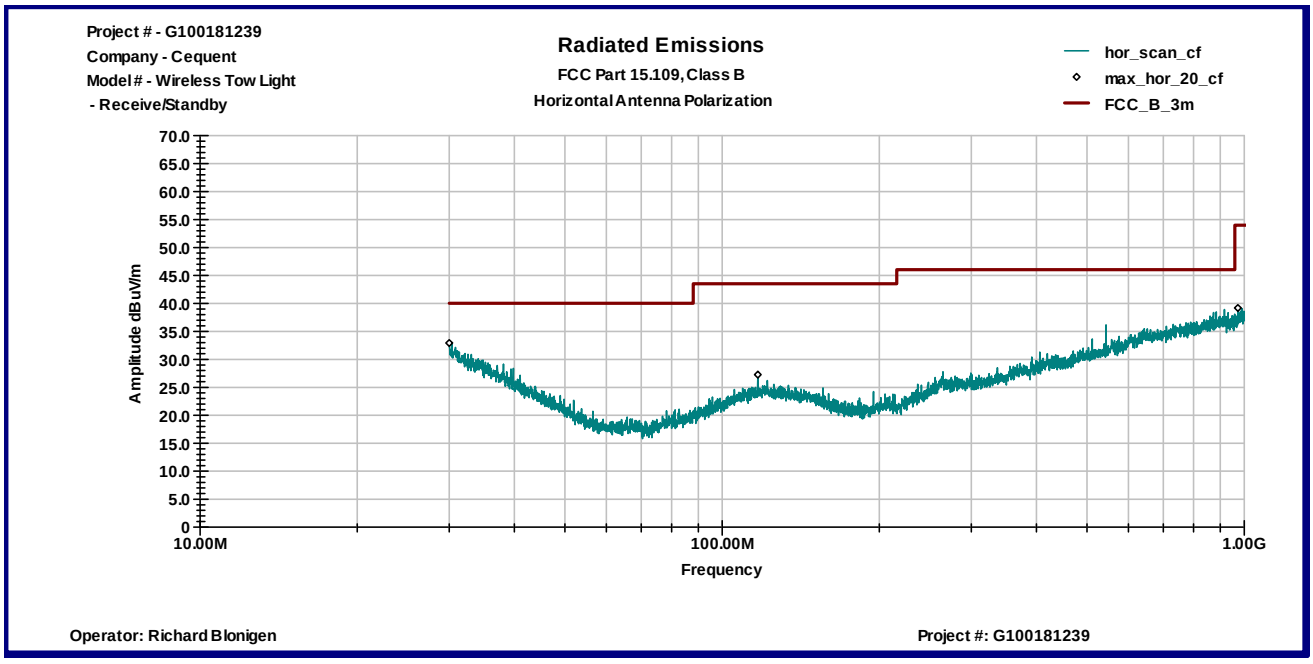
Frequency MHz	Antenna Polarity	Reading dBµV	Total C.F. dB1/m	Pre-Amp. Gain (dB)	Total at 3m dBµV/m	QP Limit dBµV/m	Margin dB
1.2853 GHz	V	49.6	27.3	38.9	37.9	54.0	-16.1
1.3307 GHz	V	50.6	27.5	38.9	39.1	54.0	-14.9
1.3467 GHz	V	49.7	27.5	38.9	38.3	54.0	-15.7
1.3733 GHz	V	49.7	27.6	38.9	38.4	54.0	-15.6
1.4507 GHz	V	48.9	27.9	38.9	37.8	54.0	-16.2
2.456 GHz	V	45.8	31.9	37.8	40.0	54.0	-14.0
1.296 GHz	H	51.1	27.3	38.9	39.4	54.0	-14.6
1.304 GHz	H	50.4	27.3	38.9	38.8	54.0	-15.2
1.3147 GHz	H	50.1	27.4	38.9	38.5	54.0	-15.5
1.3227 GHz	H	50.8	27.4	38.9	39.2	54.0	-14.8
1.3307 GHz	H	49.9	27.4	38.9	38.4	54.0	-15.6
1.3467 GHz	H	49.8	27.5	38.9	38.3	54.0	-15.7

Graph 3.5.1

Vertical antenna polarization

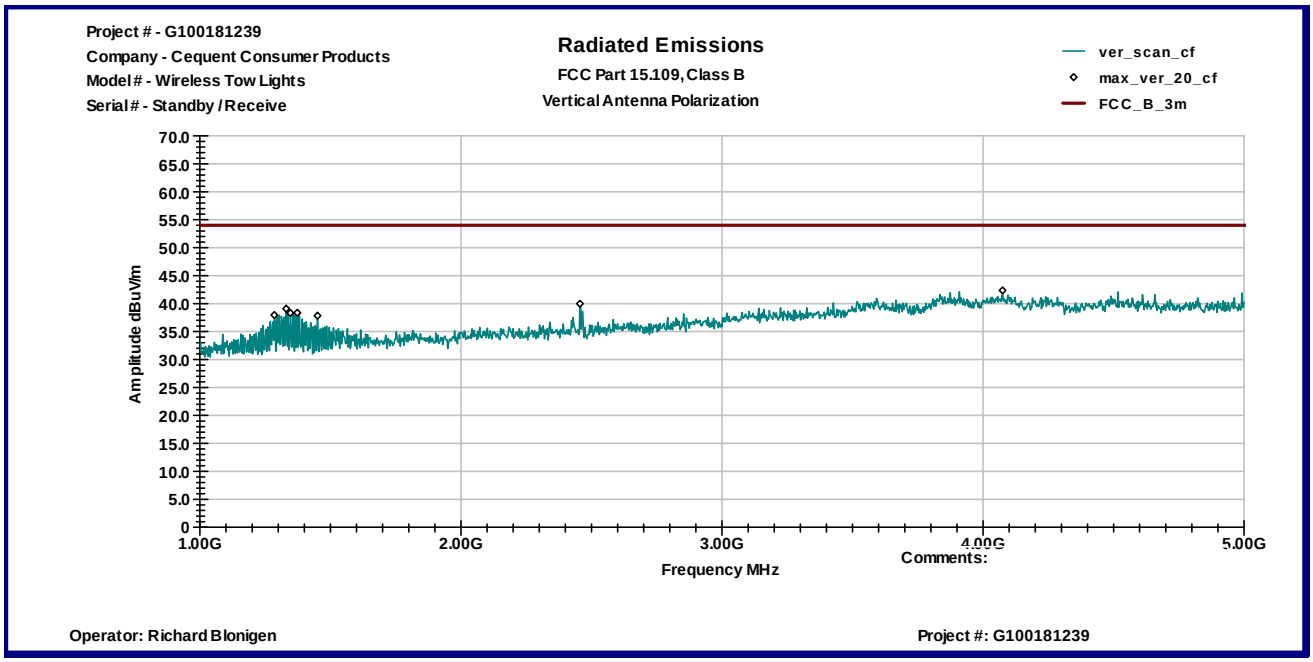


Horizontal antenna polarization

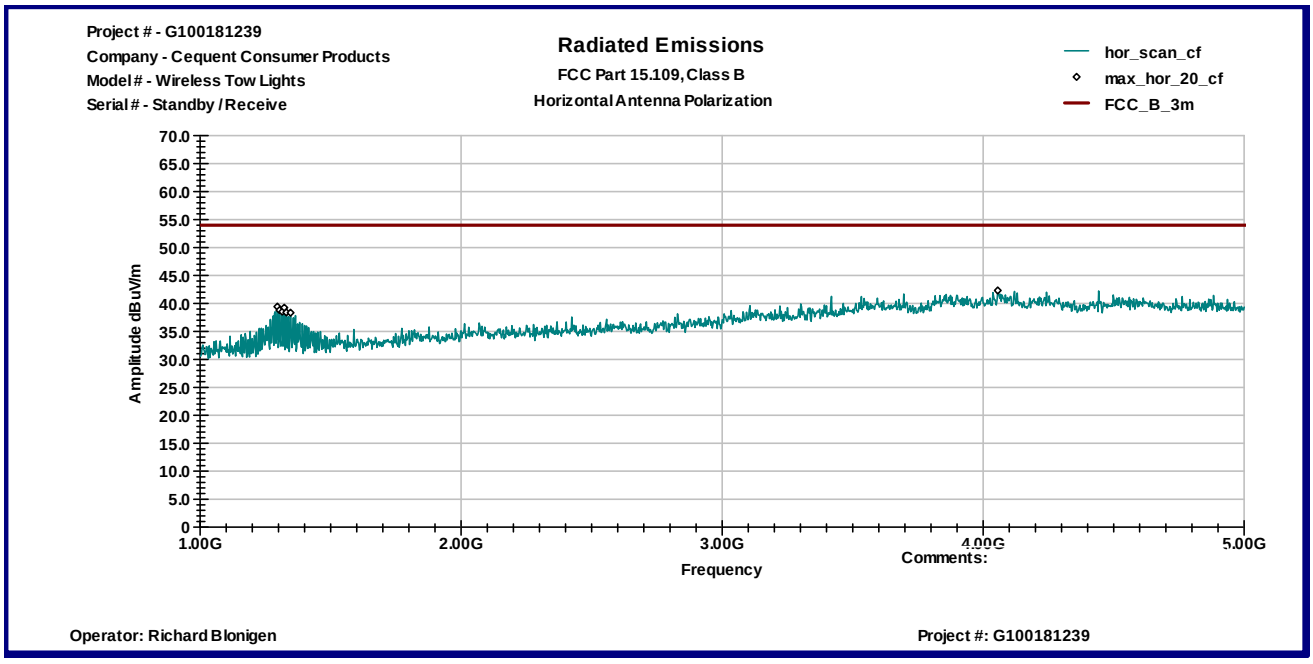


Graph 3.5.2

Vertical antenna polarization



Horizontal antenna polarization



3.6 Digital device conducted emissions

Test location: ☐ OATS ☐ Anechoic Chamber ☐ Other

Test result: **N/A**

Frequency range: 0.15MHz-30MHz

Max. Emissions margin: dB below the limits

Notes: It was determined from consideration of the electrical characteristics and usage of particular apparatus that Conducted Emissions testing is inappropriate and therefore unnecessary (as battery operated equipment).

4.0 TEST EQUIPMENT

DESCRIPTION	MANUFACTURER	MODEL	SERIAL NO.	INTERTEK ID	CAL DUE	USED
Spectrum Analyzer	R & S	FSP 40	100024	12559	12/07/2011	☒
Spectrum Analyzer	R & S	ESCI	100358	12909	07/12/2011	☒
Bicono-Log Antenna	Schaffner-Chase	CBL 6112 B	2468	14459	10/18/2011	☒
Horn Antenna	EMCO	3115	9507-4513	9936	04/13/2011	☒
Pre-Amplifier	MITEQ	AMF-5D-00501800-28-13P	1122951	13475	10/06/2011	☒
Waveguide Horn Antenna	EMCO	3116	9904-2423	9705	10/04/2011	☒
Pre-Amplifier	MITEQ	AMF-6F-16002600-25-10P	1222383	MIN-0065	10/06/2011	☒
System	TILE! Instrument Control		Ver. 3.4.K.29	15259	VBU	☒