COMPLIANCE WORLDWIDE INC.
TEST REPORT 177-11R1

In Accordance with the Requirements of

FCC PART 15.247, SUBPART C
INDUSTRY CANADA RSS 210, ISSUE 8

Low Power License-Exempt Radio Communication Devices
Intentional Radiators

Issued to

Revolabs, Inc.
144 North Road, Suite 3250
Sudbury, MA 01776

for the

flx Handset
2.4 GHz Bluetooth Transmitter

on

August 5, 2001

FCC ID: T5V10FLXHNDNM
IC: 6455A-10FLXHNDNM

Tested by

Brian F. Breault

Reviewed by

Larry K. Stillings

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1. Scope

This test report certifies that the Revolabs, Inc. 2.4 GHz Bluetooth Handset, as tested, meets the FCC Part 15.247**,** and Industry Canada RSS 210, Issue 8 requirements. The scope of this test report is limited to the test sample provided by the client, only in as much as that sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required. Revision R1 added lower restricted band measurement plot to Section 6.7: Band Edge Measurements.

2. Product Details

2.1. Manufacturer: Revolabs, Inc.

2.2. Model Number: MBT-9162

2.3. Serial Number: 7010F0000435

2.4. Description: Bluetooth Conferencing Handset

2.5. Power Source: Internal 3.7 Volt Lithium Battery

2.6. EMC Modifications: None

3. Product Configuration

3.1. Operational Characteristics & Software

CSR BlueTest3 was used as the control software for the Bluetooth transmitter.
Once the software and driver were installed, the transmitter could be configured to function in a number of ways.

Notes: The default power settings set by the client were maintained throughout the testing.
A USB cable was attached to the Charger connector of the Bluetooth/DECT Conferencing Handset to facilitate setting the required test modes while operating through three orthogonal axes as required by ANSI C63.4-2003, section 13.4.1, c). This was necessary because the handset was incapable of operating in non-conventional modes as a standalone device.

TXSTART – The transmitter transmits a single carrier at a selected frequency from channel 0 to 78.

CFG HOPPING SEQ – Selects the channel(s) to be included in a hopping sequence.

TXDATA 2 – Initiates the hopping.

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3. Product Configuration (continued)

3.2. EUT Hardware

Device	Manufacturer	Model	Serial No.	Comment
flx Handset	Revolabs	MBT-9162	7010F0000283	Used for field strength measurements[1]

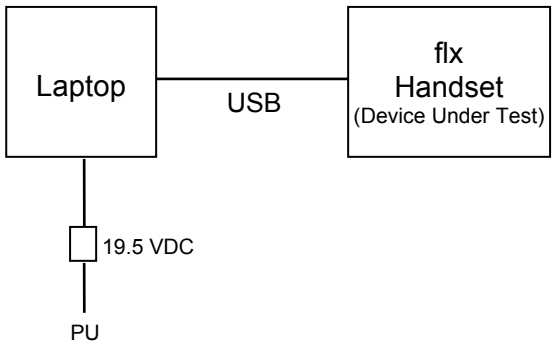
3.3. Support Equipment

Device	Manufacturer	Model	Serial No.	Comment
Laptop	Dell	PP18L Latitude D620	8181566785	Used for field strength measurements[1]

3.4. Cables

Part #	Shielded Y or N	Length	Function / Description
N/A	Y	1 m	USB to handset custom cable to facilitate operation.

3.5. Block Diagram



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4. Measurements Parameters

4.1. Measurement Equipment Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due
Spectrum Analyzer	Agilent	E4407B	MY45104493	12/22/2012
Microwave Preamp	Hewlett Packard	83050A	3331A00404	10/20/2011
Spectrum Analyzer	Agilent	E7405A	MY45115430	10/22/2011
Bilog Antenna	Com-Power	AC-220	25509	8/30/2011
Horn Antenna	Electro-Metrics	EM-6961	6337	10/19/2012
Horn Antenna	ComPower	AH-118	10078	7/23/2011
Horn Antenna	ComPower	AH-840	03075	7/20/2012
DMM / Temperature	Fluke	187	79690058	11/29/2011
RF Signal Generator	Hewlett Packard	8648C	3642U01557	7/16/2011
2.4 GHz BP Filter	Micro-Tronics	BRM50702	14	8/11/2011
RF Power Meter	Boonton	4220A	203603AA	5/28/2012
Power Sensor	Boonton	51100 (9E)	24221	5/29/2012
Digital Barometer	Control Company	4195	ID236	11/9/2011

4.2. Measurement & Equipment Setup

Test Dates:	Apr. 8th 2011 – Apr. 29nd, 2011
Test Engineer:	Brian Breault
Normal Site Temperature (15 - 35°C):	21.6
Relative Humidity (20 -75%RH):	35
Frequency Range:	30 MHz to 40 GHz
Measurement Distance:	3 Meters
EMI Receiver IF/Resolution Bandwidth:	100 kHz - 30 MHz to 1 GHz 1 MHz - Above 1 GHz
EMI Receiver Average/Video Bandwidth:	300 kHz - 30 MHz to 1 GHz 3 MHz - Above 1 GHz
Detector Function:	Peak, Quasi-Peak & Average

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4. Measurements Parameters

4.3. Measurement Procedure

Test measurements were made in accordance with FCC Part 15.247 and IC RSS-210 Annex II: Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz, 5725 - 5875 MHz, and 24.0 - 24.25 GHz.

The test methods used to generate the data in this test report is in accordance with ANSI C63.4: 2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

In accordance with ANSI C63.4-2009, section 13.4.1, c), the device under test was rotated through three orthogonal axes to determine which attitude produced the highest emission relative to the limit. The positions tested were the following:

- Position 1 - DUT on left side, front toward 0º (X axis)
- Position 2 - DUT front facing toward 0º, top up (Y axis)
- Position 3 - DUT front facing up, bottom toward 0º (Z axis)

All measurements detailed in this test report represent the attitude that produced the highest emission relative to a given limit.

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5. Measurements Summary

Test Requirement	FCC Rule Requirement	IC Rule Requirement	Report Section	Result
Antenna Requirement	15.203	RSS-GEN 7.1.2	6.1	Compliant
Number of hopping channels	15.247 (a) (1) (iii)	RSS-210 A8.1 (d)	6.2	Compliant
Hopping channel carrier frequency separation	15.247 (a) (1)	RSS-210 A8.1 (b)	6.3	Compliant
Minimum 20 dB bandwidth	15.247 (a) (1) (iii)	RSS-210 A8.1 (b)	6.4	Compliant
Average time of occupancy	15.247 (a) (1) (iii)	RSS-210 A8.1 (d)	6.5	Compliant
Maximum peak conducted output power	15.247 (b) (1)	RSS-210 A8.1 (b)	6.6	Compliant
Band edge	15.247 (d)	RSS-210 A8.5	6.7	Compliant
99% (occupied) bandwidth	N/A	RSS-GEN 4.6.1	6.8	Compliant
Spurious harmonic radiated emissions	ANSI C63.4 10.2.8.2	RSS-210 A8.9	6.9	Compliant
Spurious radiated emissions	15.209	RSS-GEN	6.10	Compliant
Receiver Spurious Radiated Emissions		RSS-GEN 4.10	6.11	Compliant
Power line conducted emissions	15.207	RSS-GEN	6.12	Compliant
Public exposure to radio frequency energy levels	15.247 (1) 1.1307 (b)(1)	RSS-GEN 5.5 RSS-102	6.13	Compliant

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6. Measurement Data

6.1. Antenna Requirement (15.203, RSS-GEN 7.1.2)

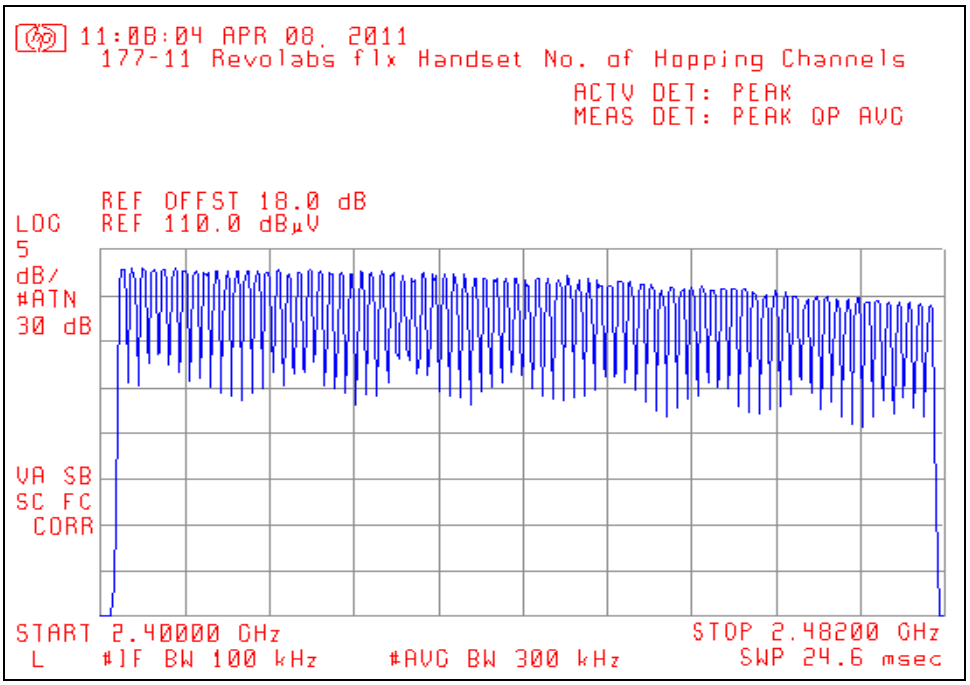
Requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section.

Status: The device under test utilized an internal antenna, inaccessible to the user.

6.2. Number of Hopping Channels (15.247 (a) (1) (iii), RSS-210 A8.1 (d))

Requirement: Systems Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels.

Status: The device under test utilizes 79 hopping channels from 2402 MHz to 2480 MHz.



Result: Compliant

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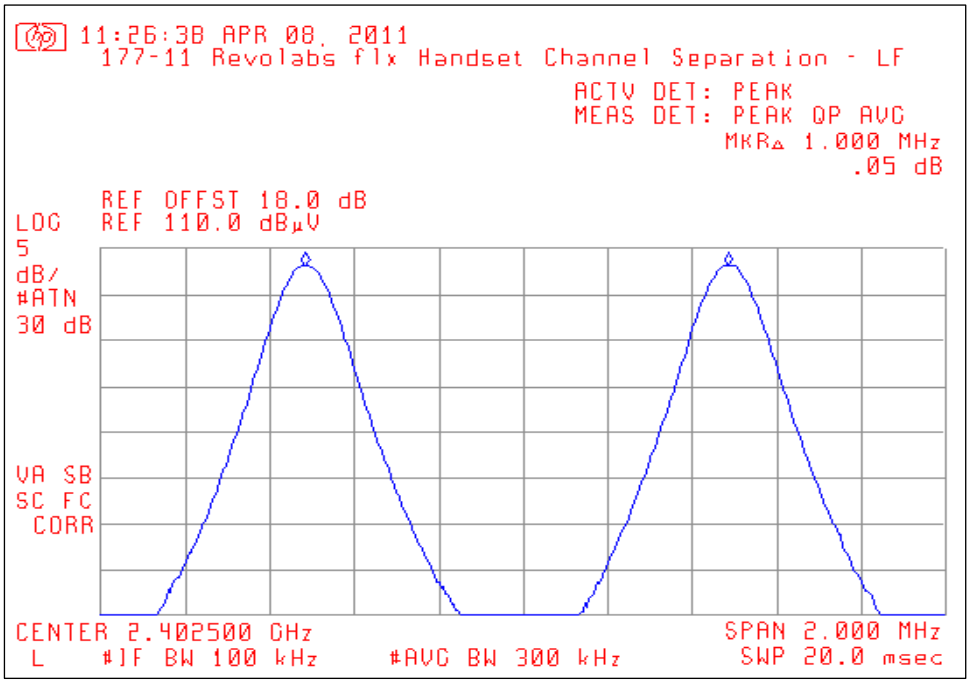
6. Measurement Data

6.3. Frequency Hopping Channel Separation (15.247 (a) (1), RSS-210 A8.1 (b))

Channel Pair	Channel Pair	Channel Separation (kHz)	Required Channel Separation (kHz)	Result
Low	2402	1000	>885	Compliant
	2403			
Middle	2440	1000	>890	Compliant
	2441			
High	2479	1000	>855	Compliant
	2480			

6.3.1. Channel Separation – Low Frequency (2402/2403 MHz)



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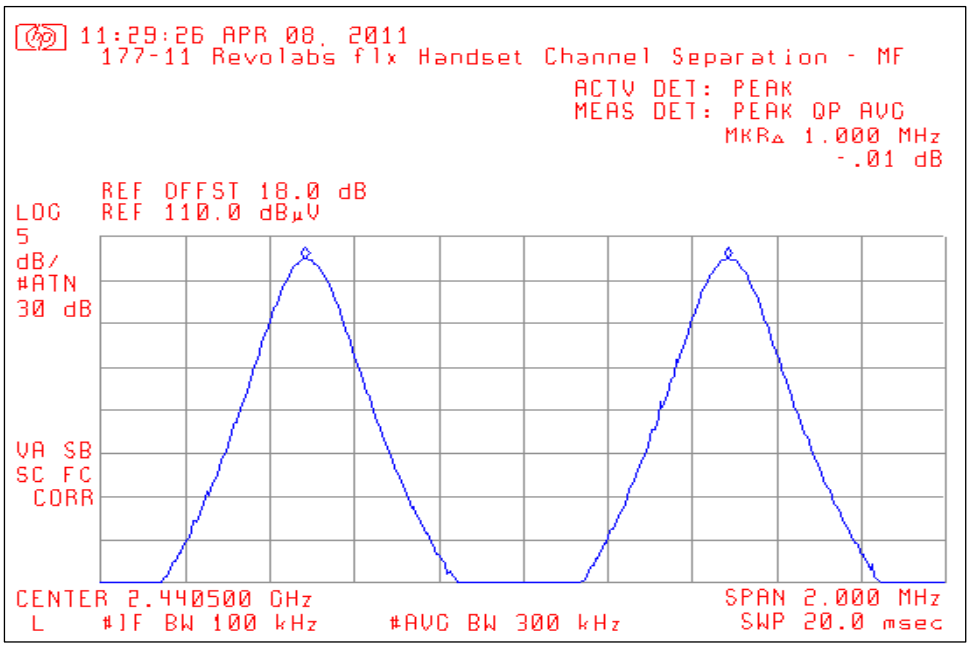
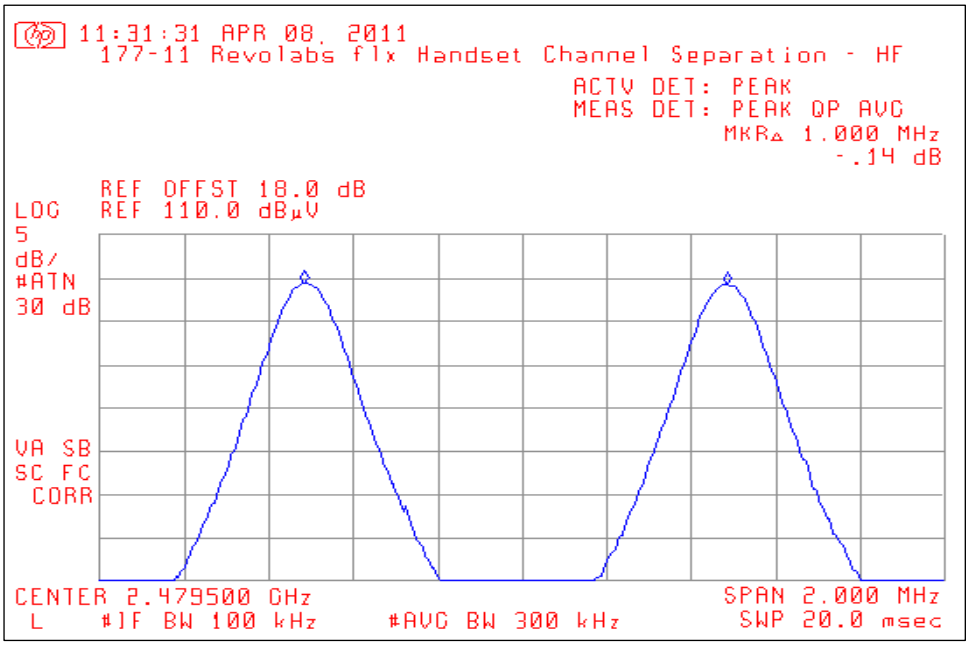
6. Measurement Data

6.4. Frequency Hopping Channel Separation (15.247 (a) (1), RSS-210 A8.1 (b))

6.3.2. Channel Separation – Middle Frequency (2441/2442 MHz)



6.3.3. Channel Separation – High Frequency (2479/2480 MHz)



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6. Measurement Data

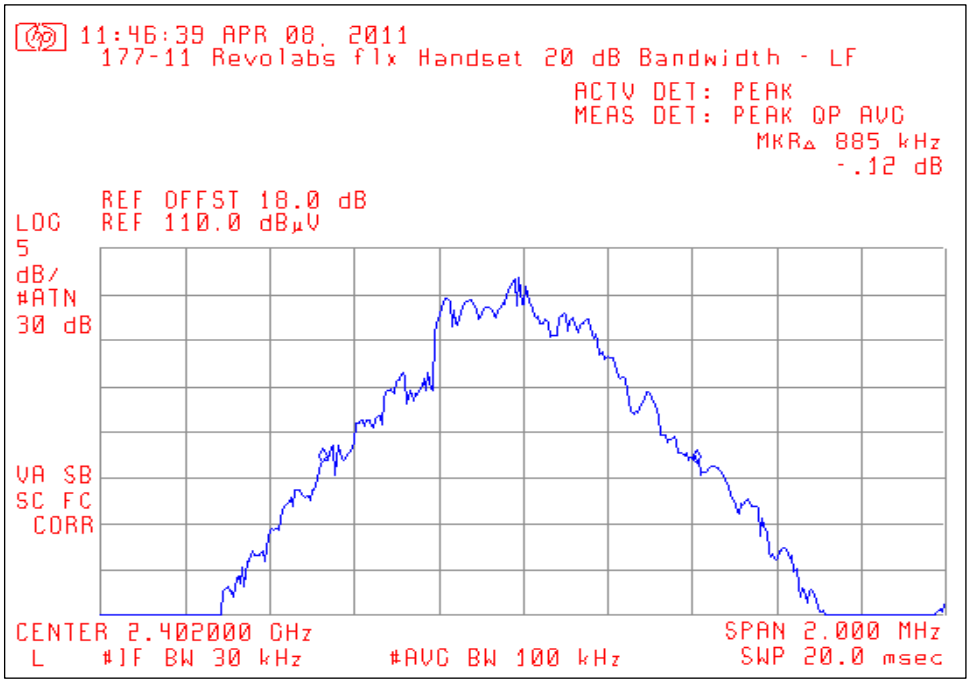
6.4. Minimum 20 dB Bandwidth (15.247 (a) (1), RSS-210 A8.1 (b))

Requirement: Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

Resolution Bandwidth : 30 kHz
Video Bandwidth : 100 kHz

Channel	Frequency (MHz)	-20 dB Bandwidth (kHz)
Low	2402	885.0
Middle	2441	890.0
High	2480	855.0

6.4.1. 20 dB Bandwidth – Low Frequency (2402 MHz)



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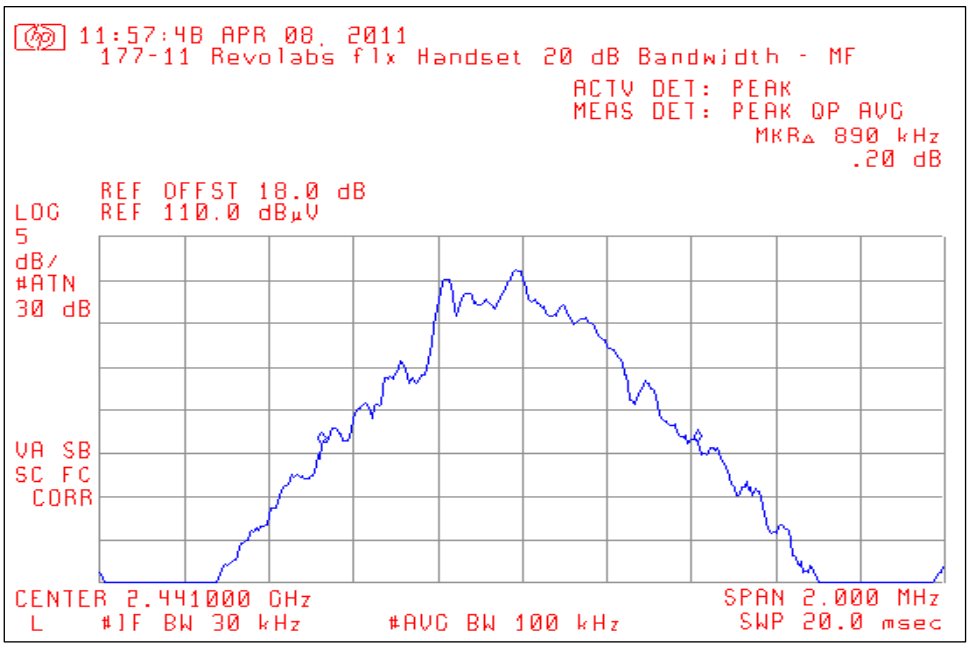
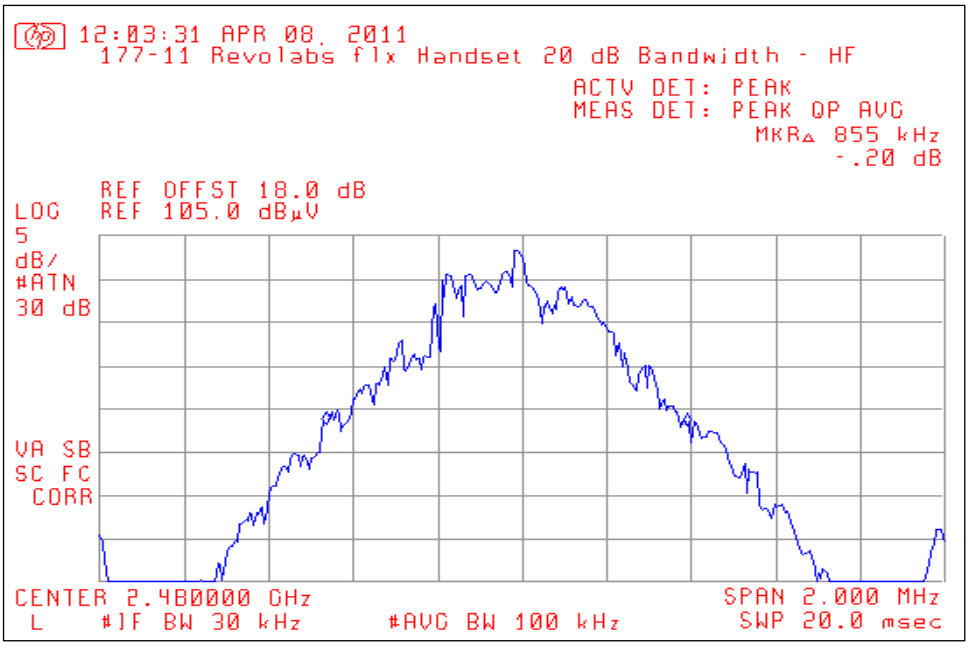
6. Measurement Data

6.4. Minimum 20 dB Bandwidth (15.247 (a) (1), RSS-210 A8.1 (b))

6.4.2. 20 dB Bandwidth – Middle Frequency (2441 MHz)



6.4.3. 20 dB Bandwidth – High Frequency (2480 MHz)



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6. Measurement Data

6.5. Average Time of Occupancy (15.247 (a) (1) (iii), RSS-210 A8.1 (d))

Requirement: The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

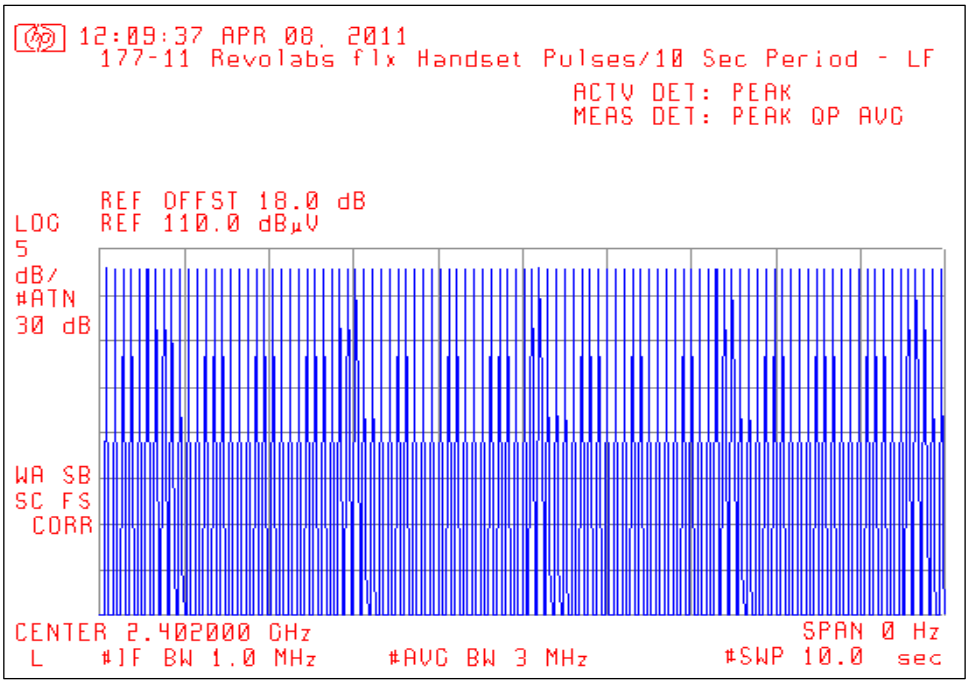
Test Note: A sweep time of 10 seconds was used to facilitate counting the pulses on a given frequency. This number was multiplied by 3.2 to determine the number of pulses in a 32 second interval.

79 Channels x 0.4 Seconds = 32 Seconds

Channel	Frequency (MHz)	Number of Pulses per 10s Period	Number of Pulses per 32s Period	Pulse Width (µS)	Dwell Time per Period (32 Seconds)	Maximum Dwell Time per Period	Result
Low	2402	102	326	392.9	0.1281	0.4	Compliant
Middle	2441	102	326	392.9	0.1281	0.4	Compliant
High	2480	102	326	394.3	0.1285	0.4	Compliant

6.5.1. Pulses per 10 Second Period

6.5.1.1. Pulses per 10 Second Period – Low Frequency (2402 MHz)



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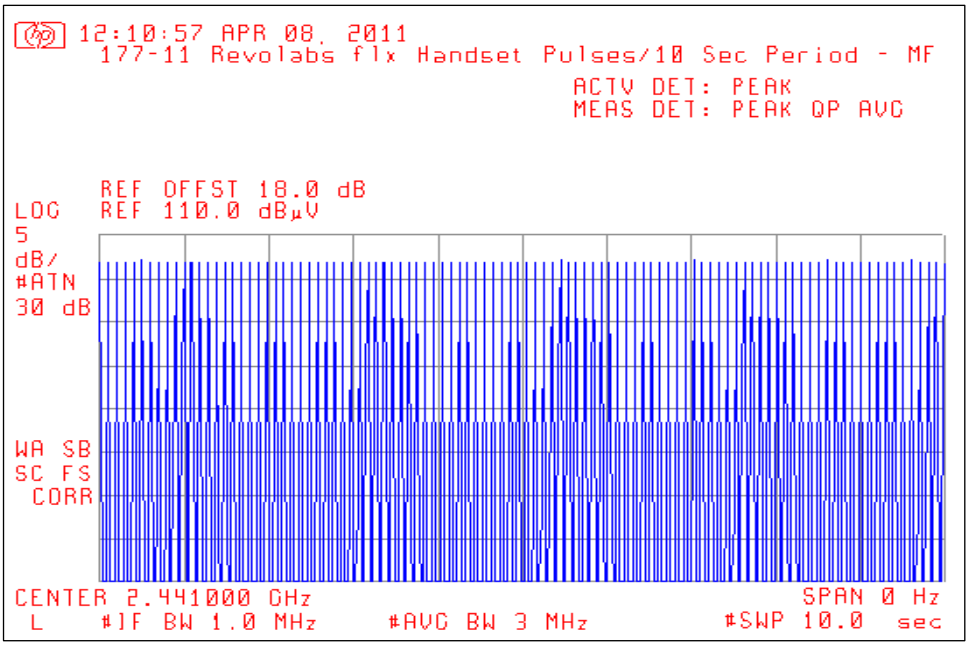
6. Measurement Data

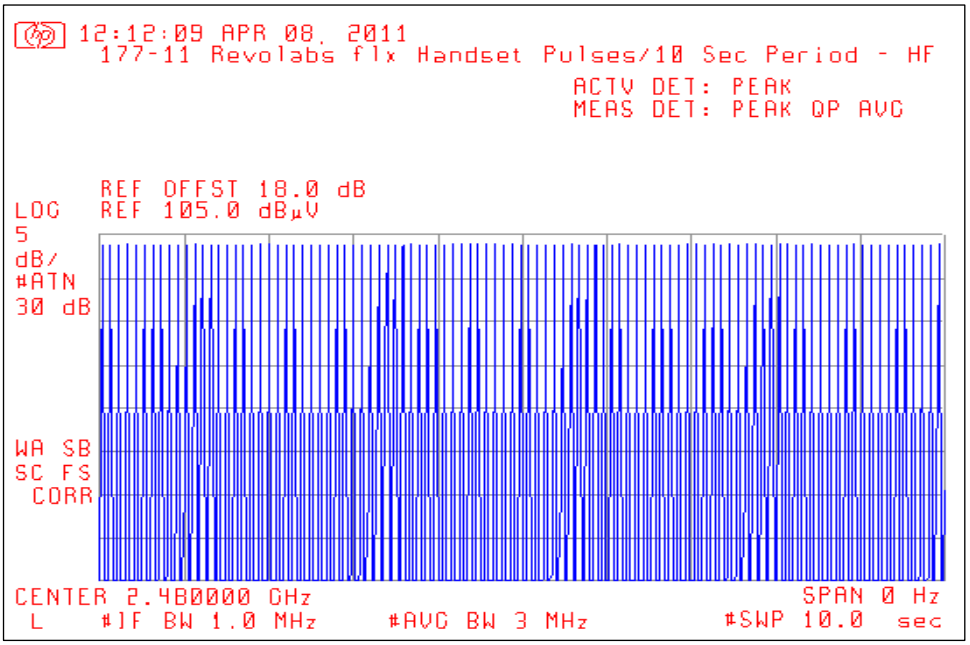
6.5. Average Time of Occupancy (15.247 (a) (1) (iii), RSS-210 A8.1 (d))

6.5.1. Pulses per 10 Second Period (continued)

6.5.1.2. Pulses per 10 Second Period – Middle Frequency (2441 MHz)



6.5.1.3. Pulses per 10 Second Period – High Frequency (2480 MHz)



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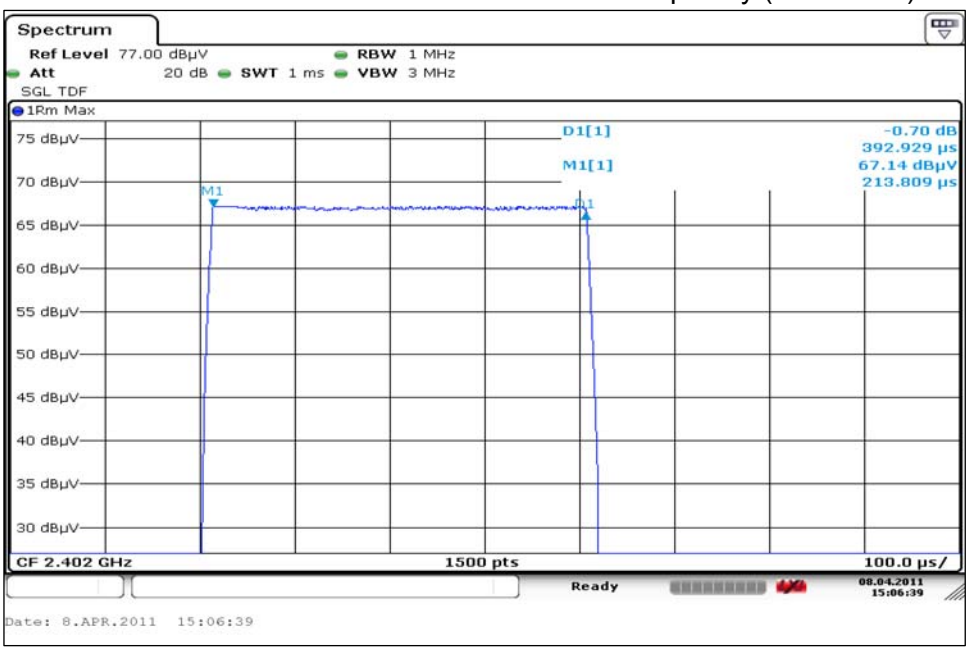
6. Measurement Data

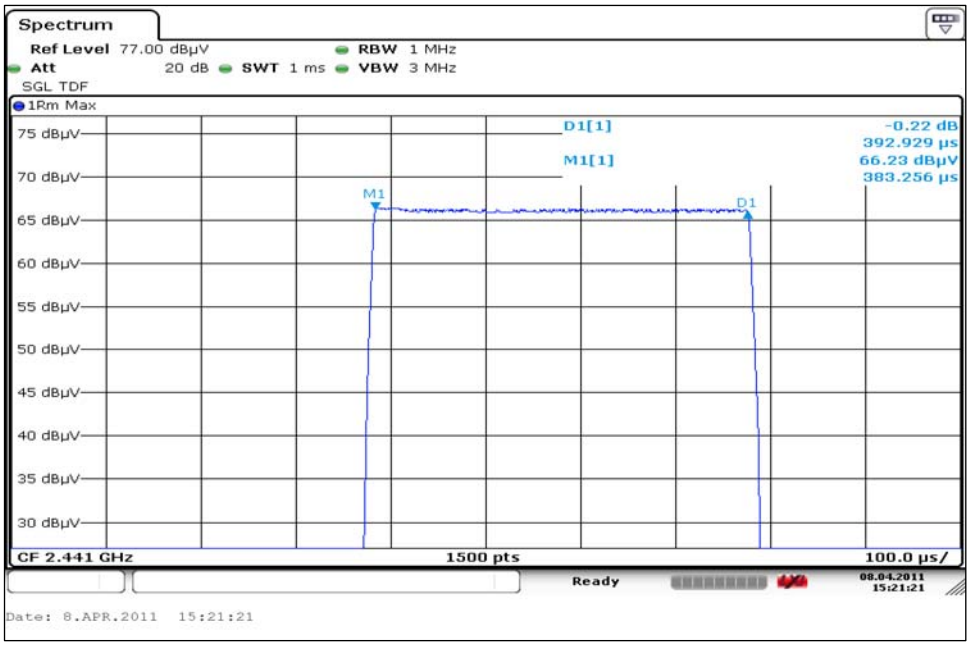
6.5. Average Time of Occupancy (15.247 (a) (1) (iii), RSS-210 A8.1 (d))

6.5.2. Transmitter Individual Pulse Width

6.5.2.1. Transmitter Individual Pulse Width – Low Frequency (2402 MHz)



6.5.2.2. Transmitter Individual Pulse Width – Middle Frequency (2441 MHz)



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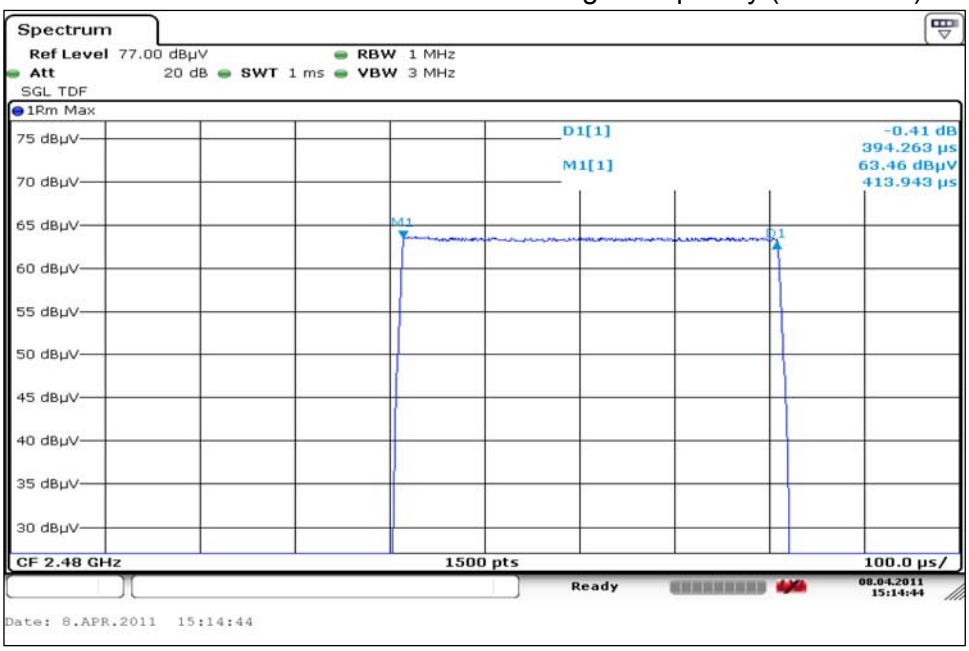
6. Measurement Data

6.5. Average Time of Occupancy (15.247 (a) (1) (iii), RSS-210 A8.1 (d))

6.5.2. Transmitter Individual Pulse Width (continued)

6.5.2.3. Transmitter Individual Pulse Width – High Frequency (2480 MHz)



6.5. Maximum Peak Conducted Output Power (15.247 (b) (1), RSS-210 A8.1 (b))

Requirement: The maximum peak conducted output power of the intentional radiator shall not exceed 1 watt for frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels.

Test Note: The device under test does not facilitate conducted power measurements. Radiated field strength measurements were made and converted to units of power.

Channel	Channel Frequency (MHz)	Max Peak Output Power (Watts)	Limit (Watts)	Result
Low	2402	0.0068	1	Compliant
Middle	2441	0.0076	1	Compliant
High	2480	0.0059	1	Compliant

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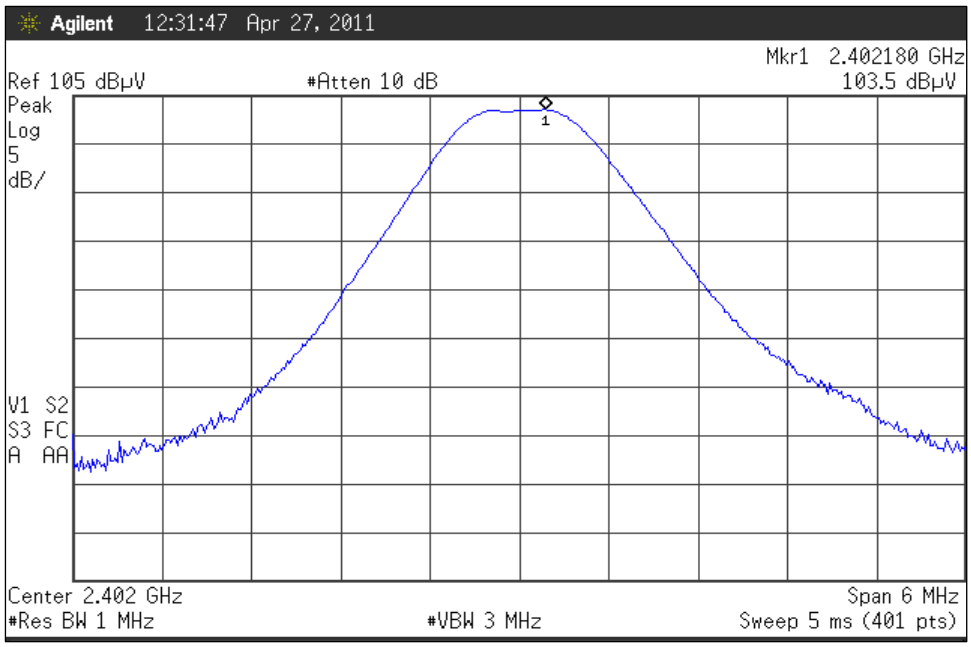
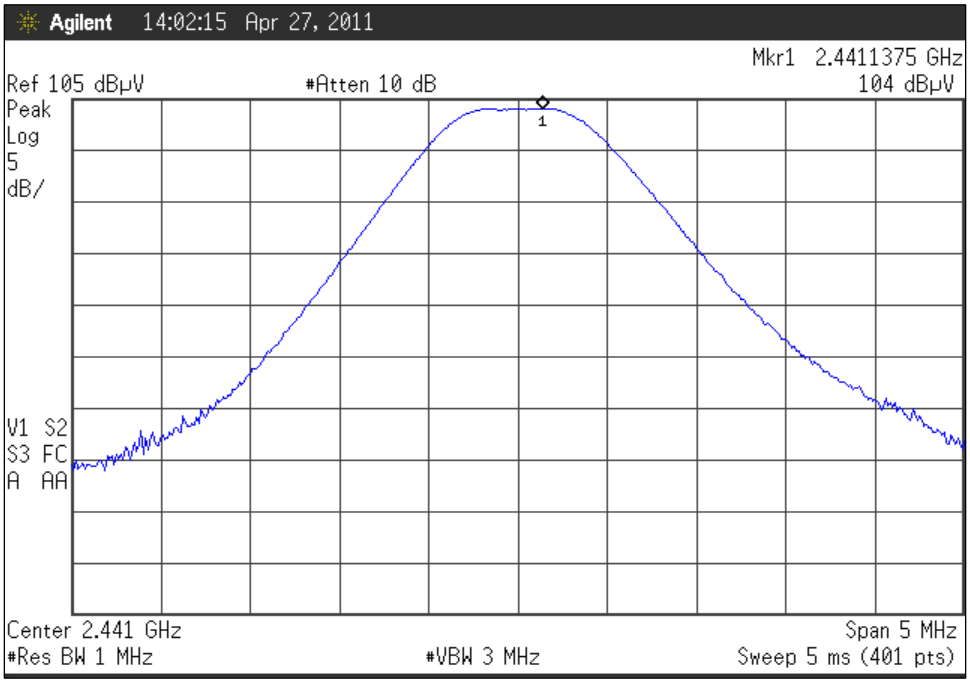
6. Measurement Data

6.6. Maximum Peak Conducted Output Power (15.247 (b) (1), RSS-210 A8.1

6.6.1. Maximum Peak Conducted Output Power – Low Frequency (2402 MHz)



6.6.2. Maximum Peak Conducted Output Power – Middle Frequency (2441 MHz)



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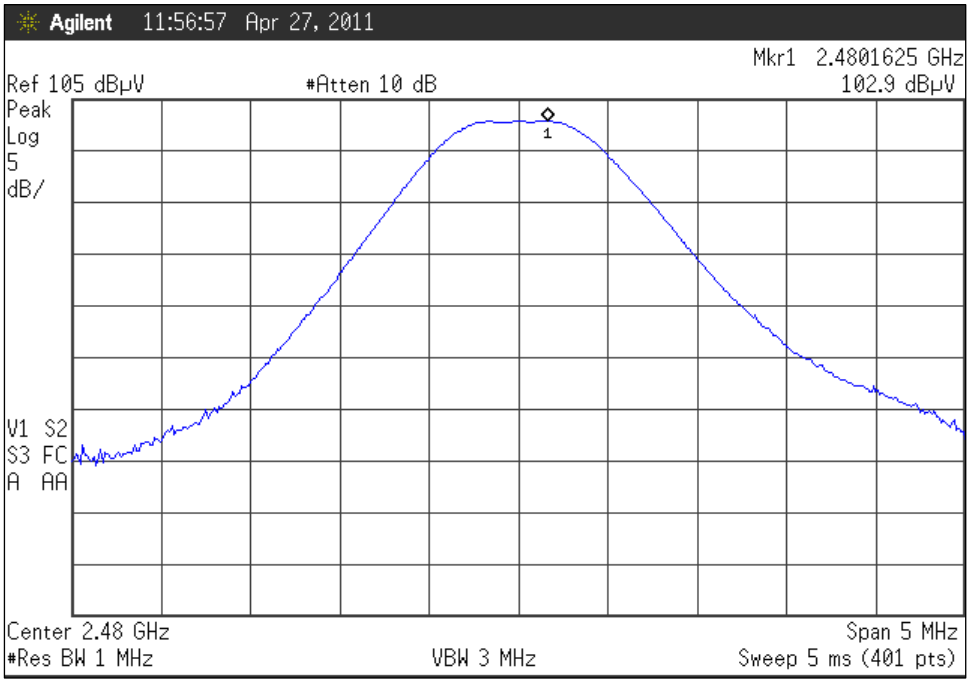
6. Measurement Data

6.6. Maximum Peak Conducted Output Power (15.247 (b) (1), RSS-210 A8.1 (b))

6.6.3. Maximum Peak Conducted Output Power – High Frequency (2480 MHz)



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6. Measurement Data

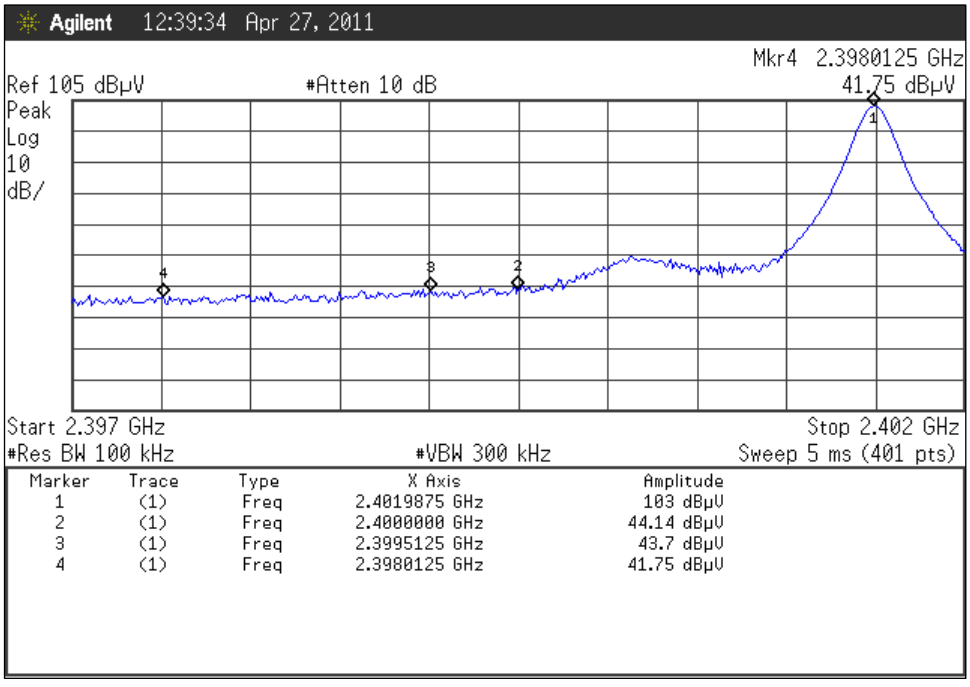
6.7. Band Edge (15.247 (d), RSS-210 A8.5)

Requirement: 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.

6.7.1. Lower Band Edge

6.7.1.1. Unmodulated Carrier

Lowest Channel	Field Strength (dBµV/m)		Band Edge Frequency	Field Strength (dBµV/m)		Limit	Margin (dB)	Result
(MHz)	Peak	Average	(MHz)	Peak	Average			
2402.	103	---	2400	44.14	---	>20 dB	-58.90	Compliant



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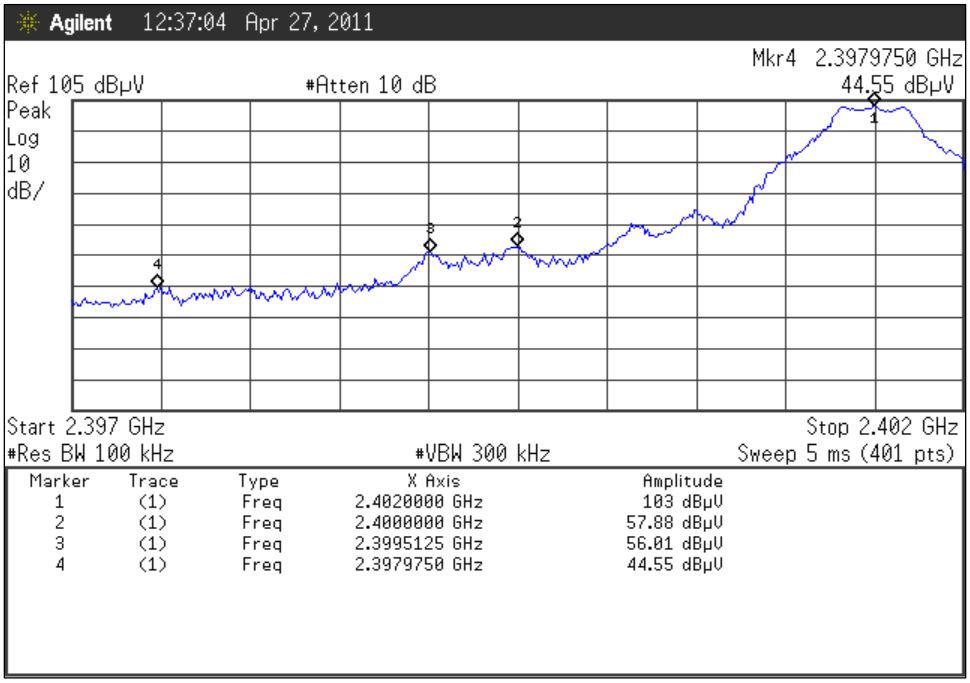
6. Measurement Data (continued)

6.7. Band Edge (15.247 (d), RSS-210 A8.5)

6.7.1. Lower Band Edge

6.7.1.2. Frequency Hopping

Lowest Channel	Field Strength (dBm)		Band Edge Frequency	Field Strength (dBm)		Limit	Margin (dB)	Result
(MHz)	Peak	Average	(MHz)	Peak	Average			
2402.	103	---	2400	44.1	---	>20 dB	-58.9	Compliant



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6. Measurement Data

6.7. Band Edge (15.247 (d), RSS-210 A8.5)

6.7.2. Upper Band Edge

6.7.2.1. Unmodulated Carrier

Band Edge

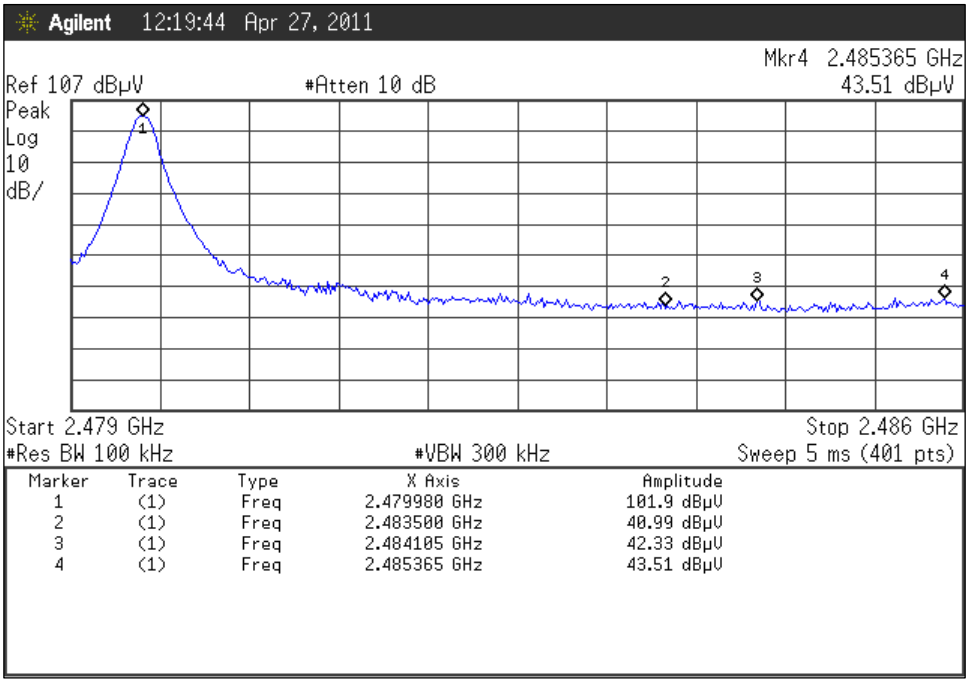
Highest Channel	Field Strength (dBµV/m)		Band Edge Frequency	Field Strength (dBµV/m)		15.209 Limit (dB)	Margin (dB)	Result
(MHz)	Peak	Average[1]	(MHz)	Peak	Average[1]	Average		
2480	101.90	N/A	2483.5	48.99	N/A	54	-5.01	Compliant

[1] The Peak measurement meets the average limit.

Worst-case Out of Band

Frequency	Field Strength (dBµV/m)		15.209 Limit (dB)	Margin (dB)	Result
(MHz)	Peak	Average[1]	Average[1]	Average	
2483.578	43.51	N/A	54	-10.49	Compliant

[1] The Peak measurement meets the average limit.



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6. Measurement Data

6.7. Band Edge (15.247 (d), RSS-210 A8.5)

6.7.2. Upper Band Edge

6.7.2.2. Modulated Carrier

Band Edge

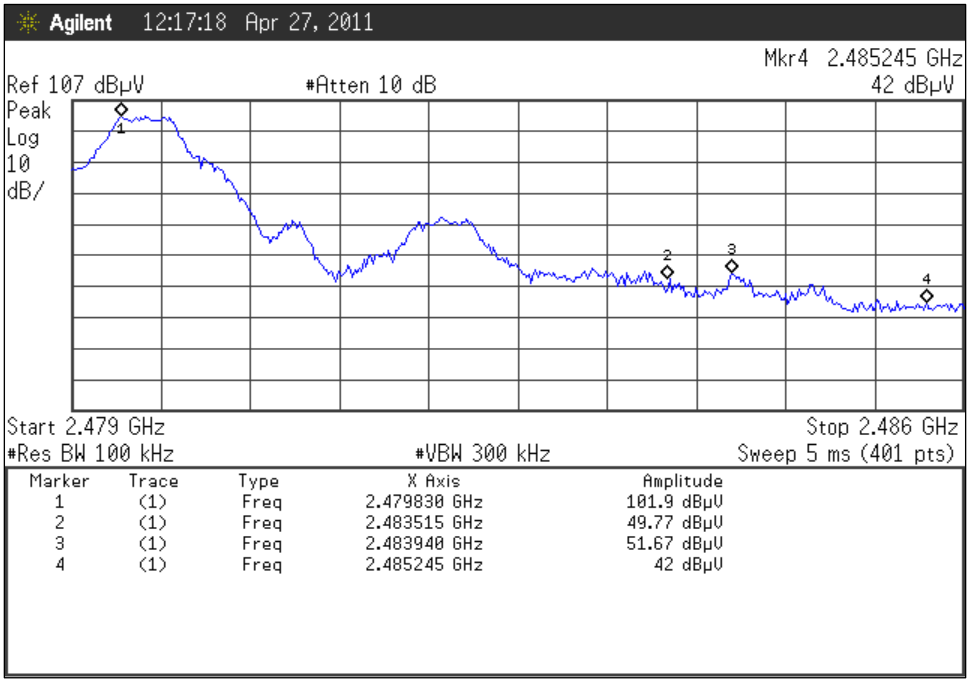
Highest Channel	Field Strength (dBµV/m)		Band Edge Frequency	Field Strength (dBµV/m)		15.209 Limit (dB)	Margin (dB)	Result
(MHz)	Peak	Average[1]	(MHz)	Peak	Average[1]	Average		
2480	101.90	N/A	2483.5	49.77	N/A	54	-4.23	Compliant

[1] The Peak measurement meets the average limit.

Worst-case Out of Band

Frequency	Field Strength (dBµV/m)		15.209 Limit (dB)	Margin (dB)	Result
(MHz)	Peak	Average[1]	Average[1]	Average	
2483.940	51.67	N/A	54	-2.33	Compliant

[1] The Peak measurement meets the average limit.



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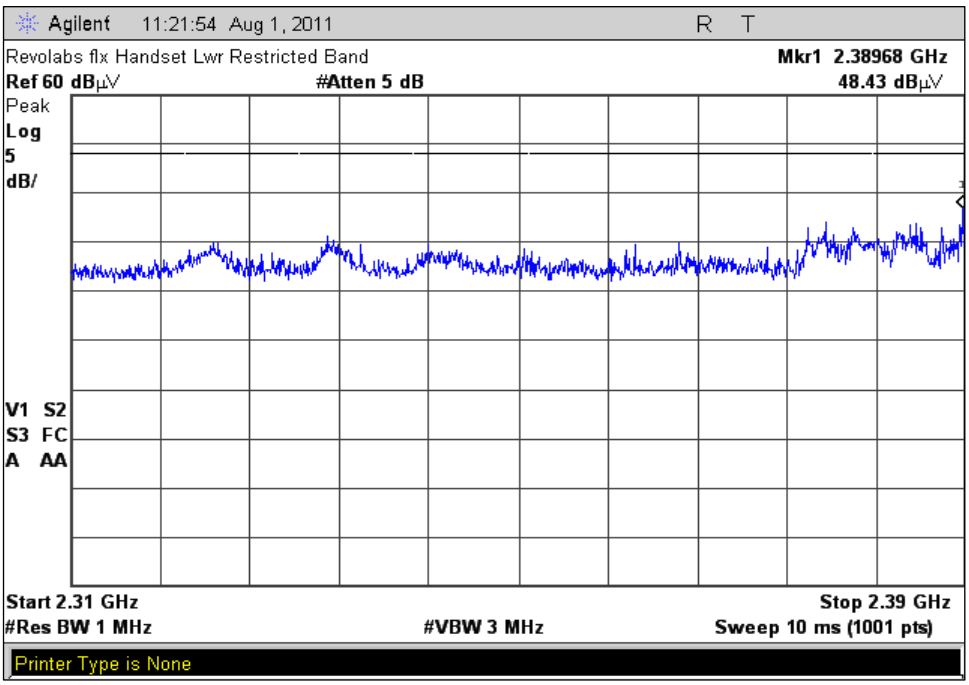
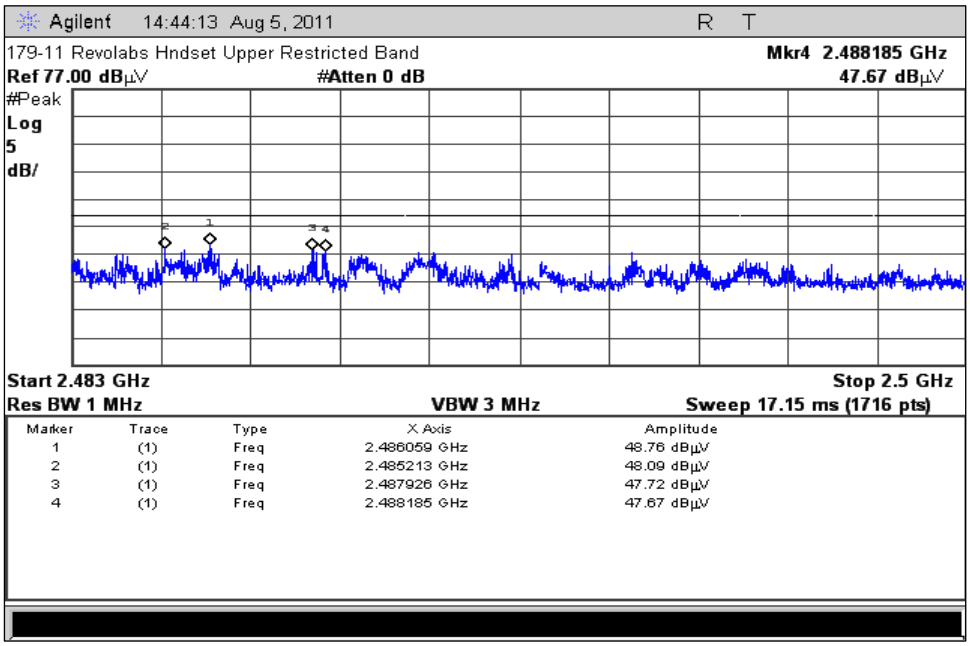
6. Measurement Data

6.7. Band Edge (15.247 (d), RSS-210 A8.5)

6.7.3. Lower Restricted Band (2310 MHz to 2390 MHz)



6.7.4. Upper Restricted Band (2483.5 MHz to 2500 MHz)



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6. Measurement Data (continued)

6.8. 99% (Occupied) Bandwidth (RSS-GEN 4.6.1)

Requirement: For devices operating above 900 MHz, the 99% bandwidth shall be no wider than 0.5% of the center frequency.

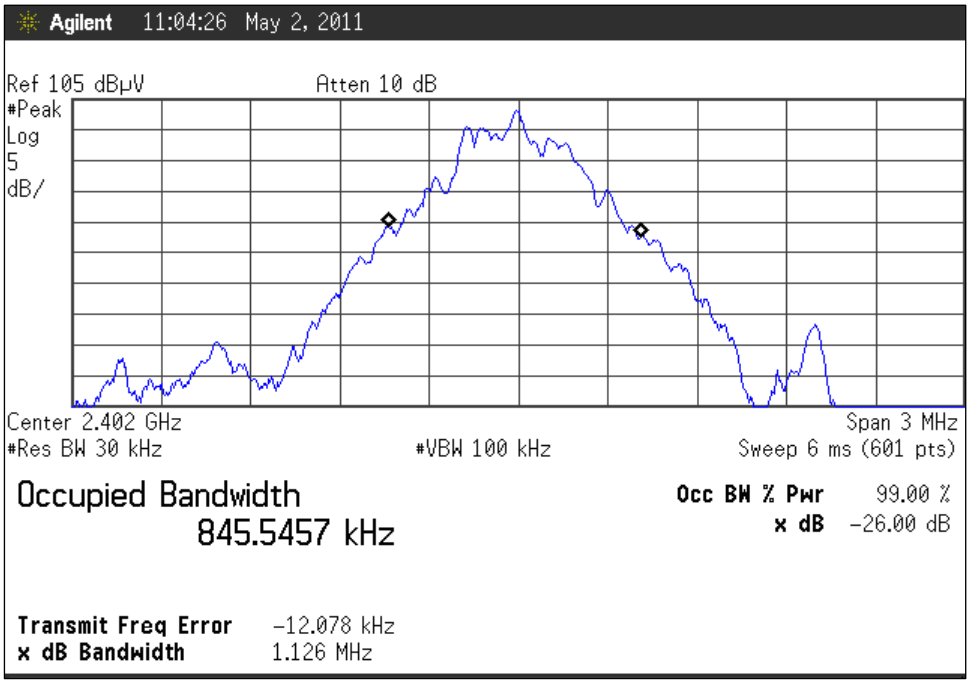
The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth.

Resolution Bandwidth : 30 kHz
Video Bandwidth : 100 kHz

6.8.1. Measurement Results

Channel	Channel Frequency (MHz)	99% Power Bandwidth (MHz)	Acceptable Bandwidth (MHz)	Result
Low	2401.060	0.8455	12.0	Compliant
Middle	2442.320	0.8306	12.2	Compliant
High	2482.252	0.8445	12.4	Compliant

6.8.1.1. 99% Power Bandwidth – Low Frequency (2402 MHz)



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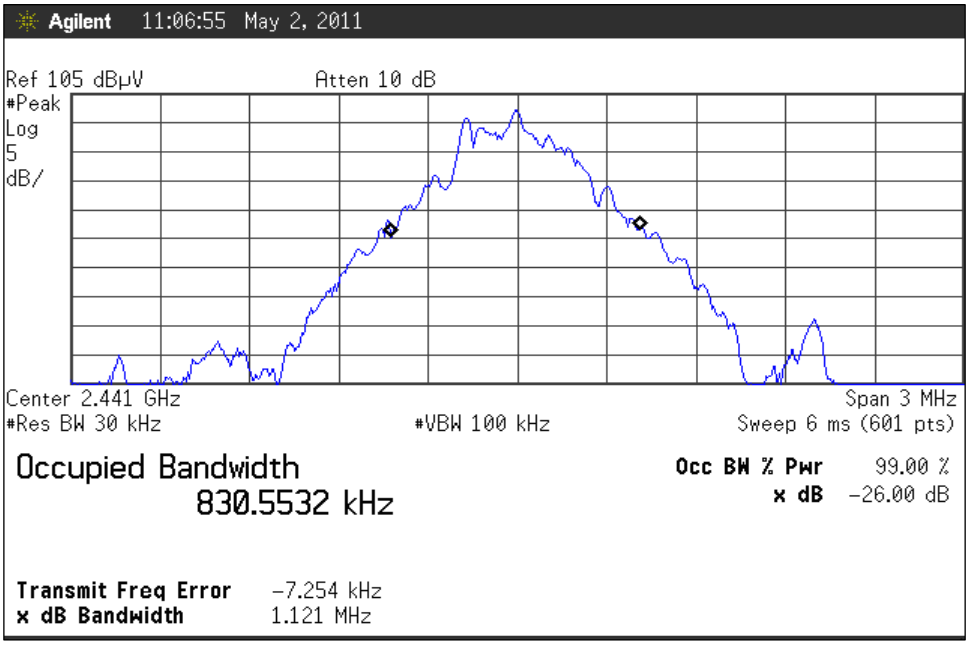
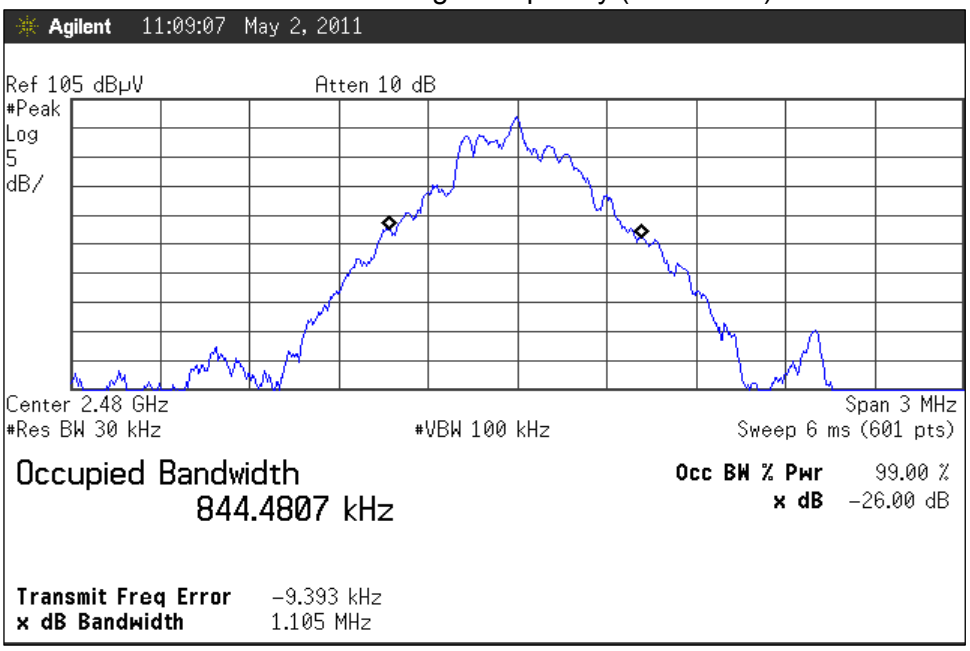
6. Measurement Data (continued)

6.8. 99% Bandwidth (RSS 210)

6.8.1.2. 99% Power Bandwidth – Middle Frequency (2441 MHz)



6.8.1.3. 99% Power Bandwidth – High Frequency (2480 MHz)



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6. Measurement Data (continued)

6.9. Combined Spurious Harmonic Radiated Emissions (ANSI C63.4 Section 10.2.8.2, RSS-210 A8.9)

Resolution Bandwidth : 1 MHz
Video Bandwidth : 3 MHz

6.9.1. Low Transmit Frequency 2402 – Channel 0

Frequency (MHz)	Field Strength (dBµV/m)[1]		Limit (dBµV/m)		Margin (dB)		Pol (H/V)	Ht (cm)	TT Pos (Deg)	Notes	Results
	Peak	Avg	Peak	Avg	Peak	Avg					
4804	50.26	44.02	74.00	54.00	-23.74	-9.98	H	142	82	X-Axis	Compliant
7206	51.52	42.14	74.00	54.00	-22.48	-11.86	H	100	0	Y-Axis	Compliant
9608	53.29	41.73	74.00	54.00	-20.71	-12.27	H	165	214	X-Axis	Compliant
12010	57.39	44.10	74.00	54.00	-16.61	-9.90	H	100	0	Y-Axis	Compliant
14412	62.43	50.39	74.00	54.00	-11.57	-3.61	H	100	0	Y-Axis	Compliant
16814	60.08	47.79	74.00	54.00	-13.92	-6.21	H	100	0	Z-Axis	Compliant
19216	57.38	43.62	74.00	54.00	-16.62	-10.38	H	100	0	X-Axis	Compliant
21618	57.29	45.51	74.00	54.00	-16.71	-8.49	H	100	0	X-Axis	Compliant
24020	63.29	50.37	74.00	54.00	-10.71	-3.63	H	100	0	X-Axis	Compliant

6.9.2. Middle Transmit Frequency 2441 – Channel 39

Frequency (MHz)	Field Strength (dBµV/m)[1]		Limit (dBµV/m)		Margin (dB)		Pol (H/V)	Ht (cm)	TT Pos (Deg)	Notes	Results
	Peak	Avg	Peak	Avg	Peak	Avg					
4882	58.78	45.89	74.00	54.00	-15.22	-8.11	H	113	210	Y-Axis	Compliant
7323	51.81	38.21	74.00	54.00	-22.19	-15.79	H	100	0	X-Axis	Compliant
9764	53.91	41.65	74.00	54.00	-20.09	-12.35	V	100	0	Y-Axis	Compliant
12205	55.59	43.78	74.00	54.00	-18.41	-10.22	V	100	0	Y-Axis	Compliant
14646	62.50	50.23	74.00	54.00	-11.50	-3.77	V	100	0	Y-Axis	Compliant
17087	62.23	50.76	74.00	54.00	-11.77	-3.24	H	100	0	X-Axis	Compliant
19528	56.32	44.23	74.00	54.00	-17.68	-9.77	H	100	0	Y-Axis	Compliant
21969	58.34	46.64	74.00	54.00	-15.66	-7.36	H	100	0	Y-Axis	Compliant
24410	63.44	51.19	74.00	54.00	-10.56	-2.81	H	100	0	X-Axis	Compliant

[1] All correction factors are included in the measurement values.

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6. Measurement Data (continued)

6.9. Combined Spurious Harmonic Radiated Emissions (ANSI C63.4 Section 10.2.8.2, RSS-210 A8.9) (continued)

6.9.3. High Transmit Frequency 2480 – Channel 79

Frequency (MHz)	Field Strength (dBµV/m)[1]		Limit (dBµV/m)		Margin (dB)		Pol (H/V)	Ht (cm)	TT Pos (Deg)	Notes[2 & 3]	Results
	Peak	Avg	Peak	Avg	Peak	Avg					
4960	57.10	44.27	74.00	54.00	-16.90	-9.73	H	109	208	Y-Axis	Compliant
7440	51.69	38.76	74.00	54.00	-22.31	-15.24	H	100	0	Y-Axis	Compliant
9920	54.00	41.94	74.00	54.00	-20.00	-12.06	V	100	0	X-Axis	Compliant
12400	56.12	43.75	74.00	54.00	-17.88	-10.25	H	100	0	Y-Axis	Compliant
14880	59.75	49.34	74.00	54.00	-14.25	-4.66	V	100	0	Z-Axis	Compliant
17360	65.67	53.11	74.00	54.00	-8.33	-0.89	H	100	0	Z-Axis	Compliant
19840	56.55	43.79	74.00	54.00	-17.45	-10.21	H	100	0	X-Axis	Compliant
22320	58.82	46.96	74.00	54.00	-15.18	-7.04	H	100	0	X-Axis	Compliant
24800	61.79	49.95	74.00	54.00	-12.21	-4.05	V	100	0	X-Axis	Compliant

[1] All correction factors are included in the measurement values.

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6. Measurement Data (continued)

6.10. Spurious Radiated Emissions Test Results (15.209), IC RSS-GEN

6.10.1. Regulatory Limit: FCC Part 15.209

Frequency Range (MHz)	Distance (Meters)	Limit (dBµV/m)
30 to 88	3	40.0
88 to 216	3	43.5
216 to 960	3	46.0
960 to 1000	3	54.0
> 1000	3	54.0

6.10. 2. Test Procedure

Test measurements were made in accordance with ANSI C63.4-2003, Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz.

6.10.3. Measurement Results – 30 MHz to 1 GHz

Test Note:

The host PC that was required to control the DUT had to be co-located with the DUT during spurious radiated emissions testing. To determine if the device under test was the source of any observed emissions, at the end of each test the host PC was observed with the DUT battery removed.

Conclusion: Compliant

It was determined that the device under test did not produce any measureable spurious emissions from 30 MHz to 1 GHz.

6.10.4. Measurement Results – 1 GHz to 25 GHz

Conclusion: Compliant

Measurable emissions from 1 GHz to 2 GHz were determined to be generated by the host PC. There were no measurable emissions above 2 GHz.

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6. Measurement Data (continued)

6.11. Receiver Spurious Emissions (RSS 213 6.8, RSS-GEN 4.10)

Requirement: RSS 213 6.8 - Receiver spurious emissions shall comply with the limits specified in RSS-Gen.

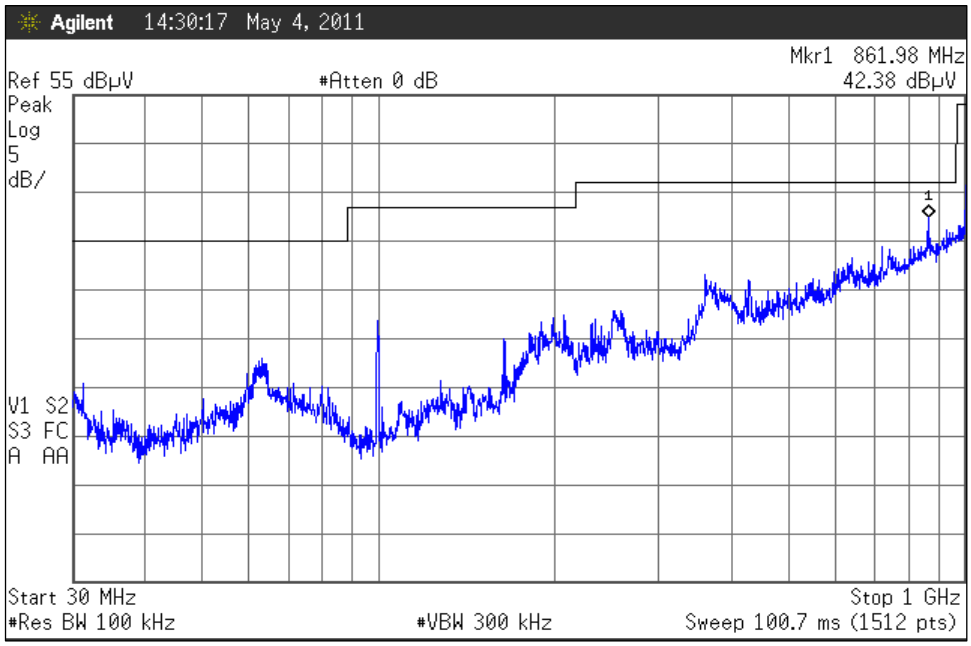
RSS-GEN 4.10 – Radiated emission measurements are to be performed on a test site registered with Industry Canada. As an alternative, the conducted measurement method may be used when the antenna is detachable. In such a case, the receiver spurious signal may be measured at the antenna port.

For either method, the search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is higher, to at least 3 times the highest tunable or local oscillator frequency, whichever is higher, without exceeding 40 GHz.

The limits for this measurement were taken from RSS-GEN Section 6.1, Table 2:

Freq MHz	µV/m	dBµV/m
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

6.11.1. Receiver Spurious Emissions, 30 MHz to 1 GHz, Horizontal Polarity



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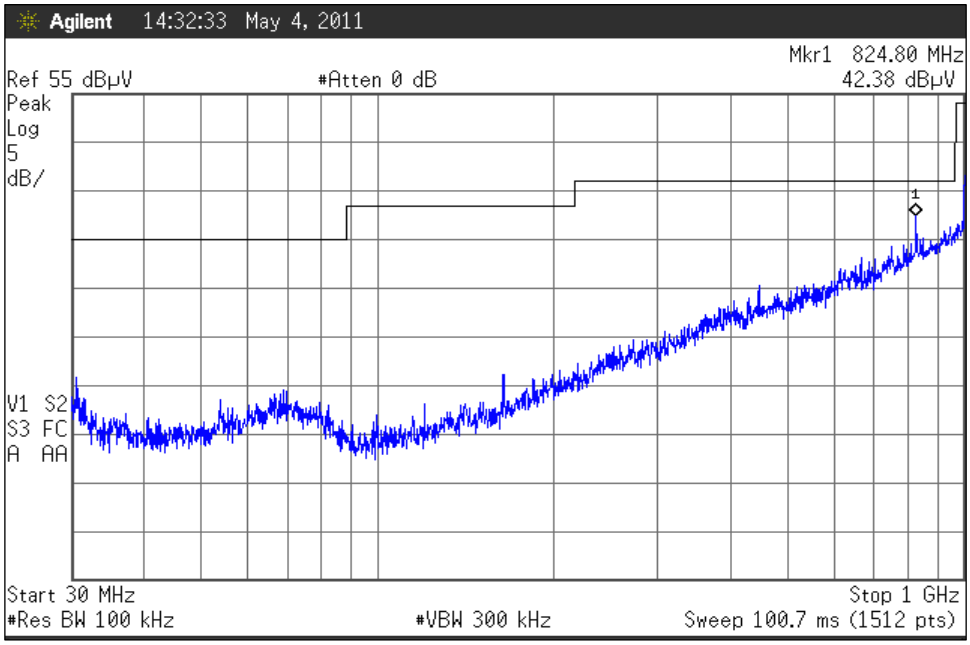
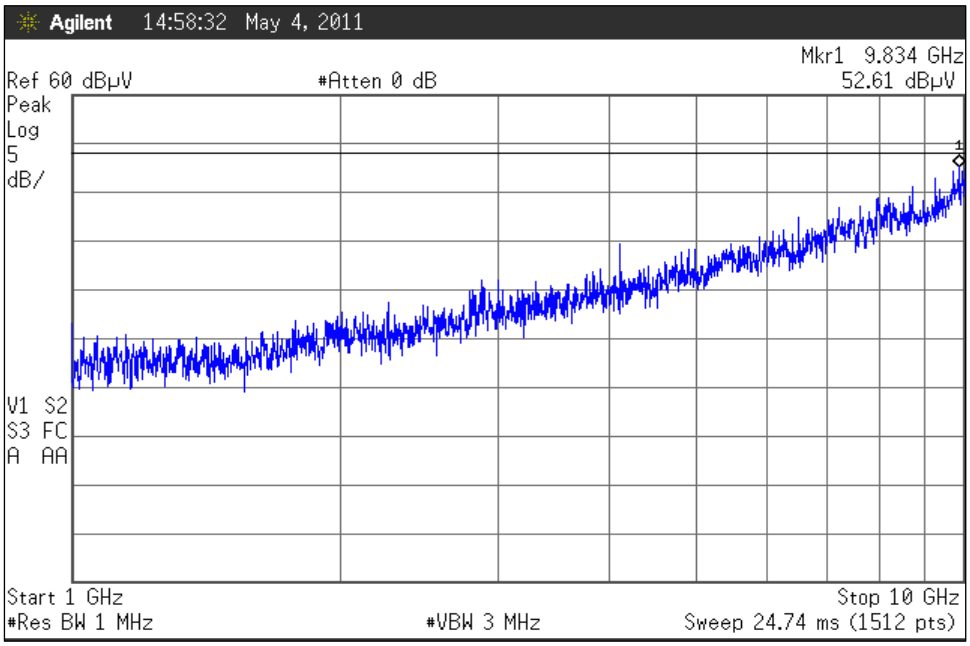
6. Measurement Data (continued)

6.11. Receiver Spurious Emissions (RSS 213 6.8, RSS-GEN 4.10)

6.11.2. Receiver Spurious Emissions, 30 MHz to 1 GHz, Vertical Polarity



6.11.3. Receiver Spurious Emissions above 1 GHz, Horizontal Polarity



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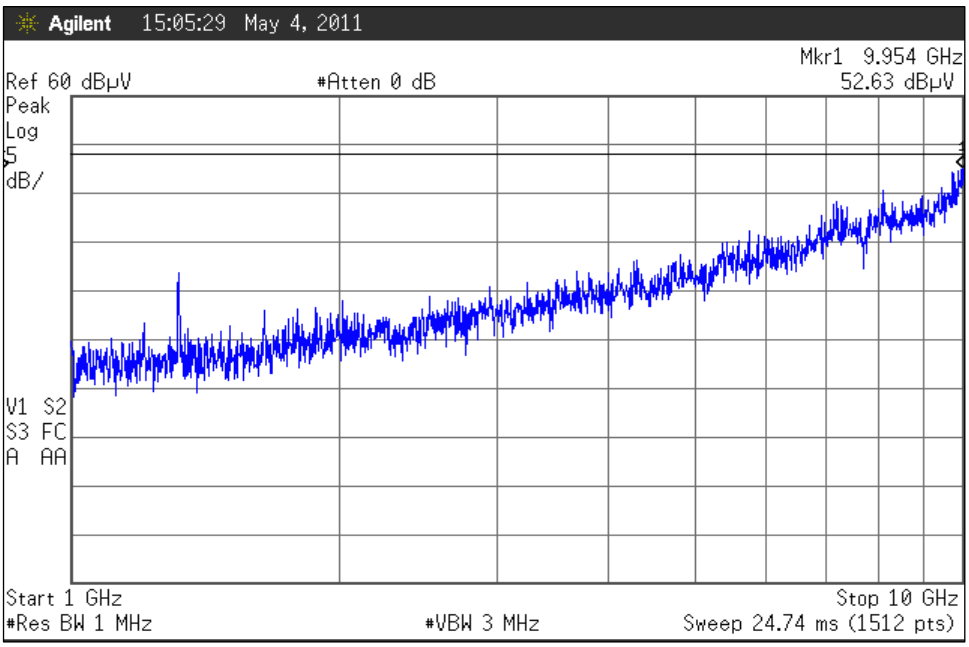
6. Measurement Data (continued)

6.11. Receiver Spurious Emissions (RSS 213 6.8, RSS-GEN 4.10)

6.11.4. Receiver Spurious Emissions above 1 GHz, Vertical Polarity



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6. Measurement Data (continued)

6.12. Power Line Conducted Emissions (15.207), IC RSS-GEN

Requirement: For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

Test Note: The Revolabs flx Handset, minus the modification outlined in Section 3.1, was placed into the Charger Base to facilitate conducted emissions testing.

6.12.1 Power Line Conducted Emissions Test Setup

6.12.1.1 Regulatory Limit: (FCC Part 15.207)

Frequency Range (MHz)	Limits (dBµV)	
	Quasi-Peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5.0	56	46
5.0 to 30.0	60	50
* Decreases with the logarithm of the frequency.		

6.12.1.2. Test Procedure

Test measurements were made in accordance with ANSI C63.4-2009, Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz.

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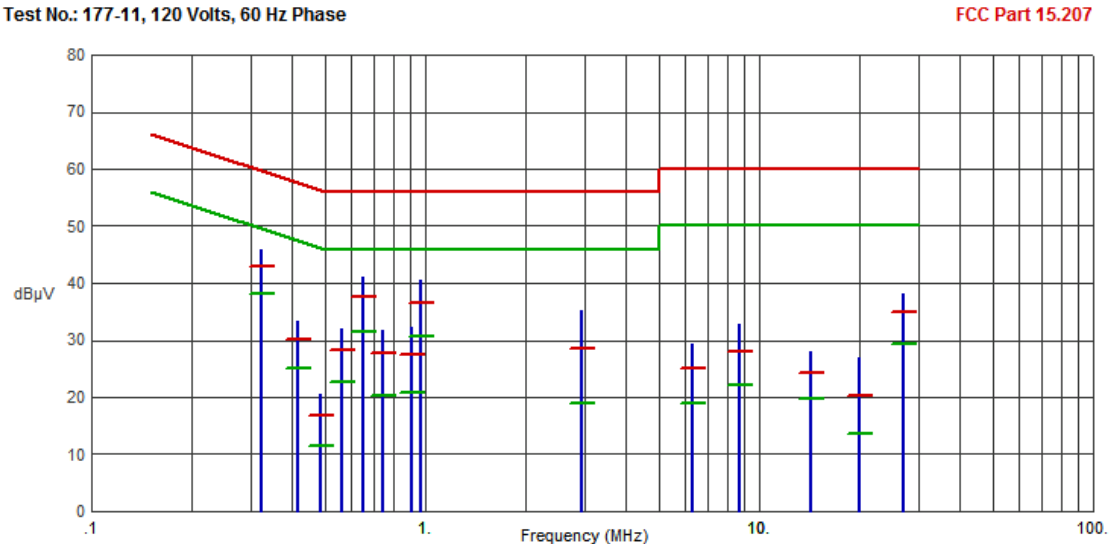
6. Measurement Data (continued)

6.12. Power Line Conducted Emissions (15.207, IC RSS-GEN)

6.12.2 Conducted Emissions Test Data

6.12.2.1 120 Volts, 60 Hz Phase



Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.3243	45.96	42.90	59.60	-16.70	38.21	49.60	-11.39	
.4133	33.24	30.21	57.58	-27.37	25.19	47.58	-22.39	
.4876	20.53	16.81	56.21	-39.40	11.40	46.21	-34.81	
.5645	31.99	28.24	56.00	-27.76	22.66	46.00	-23.34	
.6503	41.09	37.56	56.00	-18.44	31.49	46.00	-14.51	
.7471	31.84	27.63	56.00	-28.37	20.26	46.00	-25.74	
.9077	32.14	27.38	56.00	-28.62	20.68	46.00	-25.32	
.9712	40.46	36.45	56.00	-19.55	30.70	46.00	-15.30	
2.9403	35.10	28.63	56.00	-27.37	18.82	46.00	-27.18	
6.3412	29.33	25.12	60.00	-34.88	18.97	50.00	-31.03	
8.7455	32.78	27.95	60.00	-32.05	22.12	50.00	-27.88	
14.3402	28.07	24.34	60.00	-35.66	19.67	50.00	-30.33	
19.9379	26.85	20.29	60.00	-39.71	13.51	50.00	-36.49	
27.1178	38.18	34.83	60.00	-25.17	29.22	50.00	-20.78	

Result: Compliant

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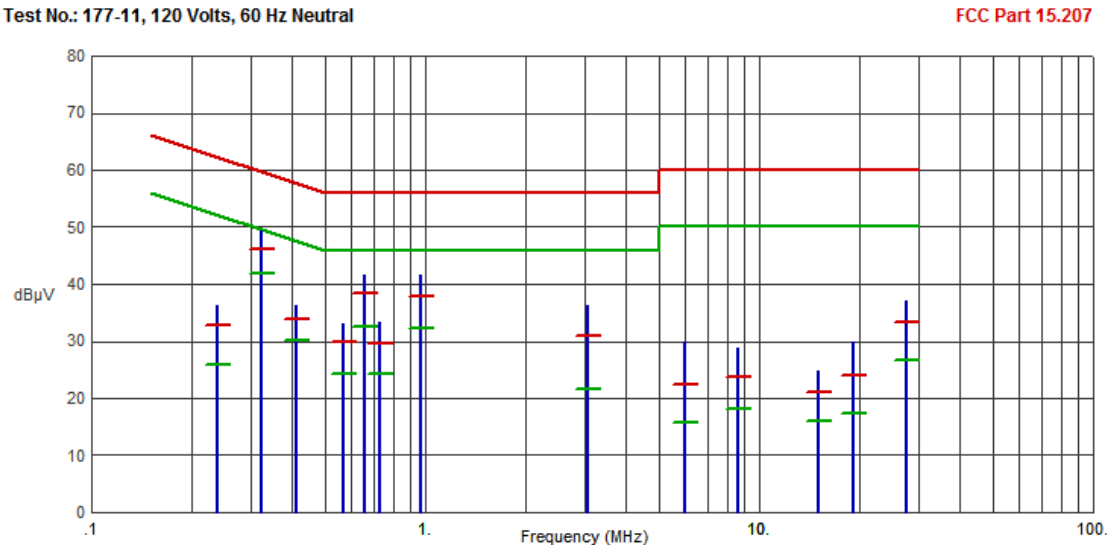
6. Measurement Data (continued)

6.12. Power Line Conducted Emissions (15.207), IC RSS-GEN

6.12.2. Conducted Emissions Test Data (continued)

6.12.2.2 120 Volts, 60 Hz Neutral



Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.2392	36.36	32.91	62.12	-29.21	25.96	52.12	-26.16	
.3242	49.35	46.12	59.60	-13.48	41.98	49.60	-7.62	
.4108	36.30	33.93	57.63	-23.70	30.11	47.63	-17.52	
.5653	33.00	29.77	56.00	-26.23	24.28	46.00	-21.72	
.6549	41.53	38.39	56.00	-17.61	32.54	46.00	-13.46	
.7298	33.31	29.69	56.00	-26.31	24.30	46.00	-21.70	
.9686	41.47	37.87	56.00	-18.13	32.16	46.00	-13.84	
3.0566	36.25	30.80	56.00	-25.20	21.57	46.00	-24.43	
5.9906	29.94	22.48	60.00	-37.52	15.66	50.00	-34.34	
8.6441	28.74	23.82	60.00	-36.18	18.10	50.00	-31.90	
15.0810	24.84	21.08	60.00	-38.92	16.07	50.00	-33.93	
19.0683	29.95	24.05	60.00	-35.95	17.44	50.00	-32.56	
27.6600	37.18	33.22	60.00	-26.78	26.79	50.00	-23.21	

Result: Compliant

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6. Measurement Data (continued)

6.13. Public Exposure to Radio Frequency Energy Levels (15.247(i) (1.1307 (b)(1)) RSS-GEN 5.5, RSS 102

Channel Frequency	MPE Distance (cm)	DUT Output Power (dBm)	DUT Antenna Gain (dBi)	Power Density		Limit (mW/cm2)	Result
				(mW/cm2)	(W/m2)		
	(1)	(2)	(3)	(4)		(5)	
2402	2.5	8.300	2.0	0.1370598	1.3705981	1	Compliant
2441	2.5	8.800	2.0	0.1537836	1.5378363	1	Compliant
2480	2.5	7.700	2.0	0.1193741	1.1937410	1	Compliant

$$PD = \frac{OP + AG}{(4 \times \pi \times d^2)}$$

- **PD = Power Density (mW/cm^2)**
- **OP = DUT Output Power (dBm)**
- **AG = DUT Antenna Gain (dBi)**
- **d = MPE Distance (cm)**

1. Reference CFR 2.1093(b): For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 2.5 centimeters of the body of the user.
2. Section 6.6 of this test report.
3. Antenna gain value for this product was reported by the client.
4. Power density is calculated from power measurement and antenna gain.
5. Reference CFR 1.1310, Table 1: Limits for Maximum Permissible Exposure (MPE), Section (B): Limits for General Population/Uncontrolled Exposure.

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6. Measurement Data (continued)

6.13. Public Exposure to Radio Frequency Energy Levels (15.247(i) (1.1307 (b)(1)) RSS-GEN 5.5, RSS 102

The calculated output power can be referenced in column 6 of the table below. The calculated peak output power is greater than the 24.19 mW requirement for performing SAR testing using the formula: 60 / F (GHz).

Channel	Frequency	Peak Field Strength	Distance	Antenna Gain[1]	Measured Output Power
	(MHz)	(dBµV/m)	(m)	(dBi)	(mW)
Low	2402	103.50	3.0	2.0	4.238
Middle	2441	104.00	3.0	2.0	4.755
High	2480	102.90	3.0	2.0	3.691

RSS-102 Section 2.5, 2.5.1 & 2.5.2 Requirements:

2.5 - All transmitters are exempt from routine SAR and RF exposure evaluations provided that output power complies with the power levels of sections 2.5.1 or 2.5.2. If the equipment under test (EUT) meets the requirements of sections 2.5.1 or 2.5.2, applicants are only required to submit a properly signed declaration of compliance (see Annex C).

2.5.1 - SAR evaluation is required if the separation distance between the user and the radiating element of the device is less than or equal to 20 cm, except when the device operates as follows:

- above 2.2 GHz and up to 3 GHz inclusively, and with output power (i.e. the higher of the conducted or radiated (e.i.r.p.) source-based, time-averaged output power) that is less than or equal to 20 mW for general public use and 100 mW for controlled use

2.5.2 - RF exposure evaluation is required if the separation distance between the user and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- at or above 1.5 GHz and the maximum e.i.r.p. of the device is equal to or less than 5 W.

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7. Test Site Description

Compliance Worldwide is located at 357 Main Street in Sandown, New Hampshire. The test sites at Compliance Worldwide are used for conducted and radiated emissions testing in accordance with Federal Communications Commission (FCC) and Industry Canada standards. A description of the test sites is on file with the FCC (registration number **96392**) and Industry Canada (file number **IC 3023A-1)**.

The radiated emissions test site is a 3 and 10 meter enclosed open area test site (OATS). Personnel, support equipment and test equipment are located in the basement beneath the OATS ground plane.

The conducted emissions site is part of a 16' x 20' x 12' ferrite tile chamber and uses one of the walls for the vertical ground plane required by EN 55022.

Both sites are designed to test products or systems 1.5 meter W x 1.5 meter L x 2.0 meter H, floor standing or table top.

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