COMPLIANCE WORLDWIDE INC.
TEST REPORT 500-11

In Accordance with the Requirements of

Federal Communications Commission Part 15.247, Subpart C
Industry Canada RSS 210, Issue 8, Annex 8
Class II Permissive Change

Low Power License-Exempt Radio Communication Devices
Intentional Radiators

Issued to

The Coca Cola Company
1 Coca-Cola Plaza
Atlanta, GA 30313

for the

Freestyle Dispensing Machine
ValidFill Cup Reader

FCC ID: XQ4-GFS-SHEAR2
IC: 8593A-GFSSHEAR2

Report Issued on February 8, 2012

Tested by

Brian F. Breault

Reviewed by

Larry K. Stillings

Table of Contents

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1. Scope

This test report certifies that the Freestyle Dispensing Machine ValidFill cup reader, as tested, meets the FCC Part 15, Subpart C 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.

2. Product Details

2.1. Manufacturer: The Coca Cola Company

2.2. Model Number: Freestyle Dispensing Machine

2.3. Serial Number: ZPL0001136
Item Code: 45907

2.4. Description: The Freestyle dispenser is a free-standing ice-beverage combo fountain machine with a single nozzle that is capable of dispensing a substantially wider variety of beverages than is possible with any current dispenser. The machine contains closed-loop controls for dispensing macro fluids (water, soda and HFCS), 36 micro ingredient pumps (for brands and flavors), NNS pumps, cold-carbonation, ice handling (for ice dispensing and chilling the macro fluids) and a 15" touch screen LCD for Consumer interaction. All of the microingredients (including NNS) are stored within the machine and are automatically identified using a set of EPC Gen 2 RFID tag readers. There are 4 main RFID readers in the system; one in the door of the unit referred to as the Easy Access Reader, and one on each of the 3 micro ingredient shelves referred to as the Shelf Reader.
A second Easy Access Reader is mounted on the right sidewall of the unit near the dispenser and an antenna is mounted in the bottom of the dispenser to validate cups before they are filled by reading an RFID tag on the cup.

2.5. Power Source: 120 Volts, 60 Hz

2.6. Hardware Revs.:

UIM ESN	3-09	QPM - Top Left	3-01
Easy Access Reader	3-03	QPM - Top Middle	3-01
ADA Keypad		QPM - Top Right	3-01
PSM	3-00	QPM - Mid Left	3-01
Main	3-00	QPM - Mid Middle	3-01
Backplane	1-03	QPM - Mid Right	3-01
HFCS FCM	3-01	QPM - Bottom Left	3-01
Carb FCM	3-00	QPM - Bottom Middle	3-01
Water FCM	3-01	QPM - Bottom Right	3-01
		QPM - NNS	3-01
		Shelf - Top	3-01
		Shelf - Middle	3-01
		Shelf - Bottom	3-01

2.7. Software Rev.: 7.0.7

2.8. EMC Modifications: None.

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3. Product Configuration

3.1. Support Equipment

Device	Manufacturer	Model	Serial No.	Comment
No Support Equipment				

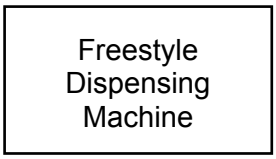
3.2. Cables

Cable Type	Length	Shield	From	To
No external cables other than the AC line cord	2M	No	EUT	120 VAC

3.3. Operational Characteristics & Software

1. Open the top door and toggle the green on/off stitch to the on position. The unit will begin a POST/Boot process similar to that of a PC.
2. Once the POST is complete, the touch screen will prompt: “Touch Screen.” Touching the screen places the Freestyle Dispensing Machine into its normal operating state.

3.4. Block Diagram



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
Spectrum Analyzer	Rohde & Schwarz	FSV40	100899	5/26/2012
Microwave Preamp	Hewlett Packard	8449B	3008A01323	12/1/2012
Bilog Antenna	Com-Power	AC-220	25509	8/30/2012
Horn Antenna	Electro-Metrics	EM-6961	6337	10/19/2012
Digital Barometer	Control Company	4195	ID236	11/9/2012

4.2. Measurement & Equipment Setup

Test Dates:	01/26/2012 – 02/03/2012
Test Engineers:	Brian Breault, Cody Merry
Normal Site Temperature (15 - 35°C):	21.2
Relative Humidity (20 -75%RH):	33
Frequency Range:	30 MHz to 9.6 GHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	120 kHz - 30 MHz to 1 GHz 1 MHz - Above 1 GHz
EMI Receiver Avg 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 (continued)

4.3. Measurement Procedure

The measurements detailed in this test report are based on the requirements in FCC Part 15, Section 15.247: Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz.

The test methods used to generate the data is this test report are 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.

Radiated emissions limits are based on the requirements detailed in FCC Part 15, Section 15.209: Radiated emission limits, general requirements. Conducted emissions limits are based on the requirements detailed in FCC Part 15, Section 15.207: Conducted Limits.

4.4. Measurement Uncertainty

The following uncertainties are expressed for an expansion/coverage factor of K=2.

RF Frequency	$\pm$ 1x10^{-8}
Radiated Emission of Transmitter	$\pm$ 4.55 dB
Radiated Emission of Receiver	$\pm$ 4.55 dB
Temperature	$\pm$ 0.91^{o} C
Humidity	$\pm$ 5%

5. Choice of Equipment for Test Suits

5.1 Choice of Model

This test report is based on the test samples supplied by the manufacturer and are reported by the manufacturer to be equivalent to the production units.

5.2 Presentation

This test sample was tested complete with all required ancillary equipment. Refer to Section 3 of this report for product equipment configuration.

5.3 Choice of Operating Frequencies

The Freestyle Dispensing Machine door reader employs 50 channels in the 903 MHz to 928 MHz frequency range. In accordance with ANSI C63.4, Section 13.1.1, three channels are detailed in this test report:

In accordance with ANSI C63.4-2009, section 13.2.1, the choice of operating frequencies selected for the testing outlined in this report was based on the lowest, middle and highest operating frequencies. The frequencies selected were:

- Low Channel – 902.250 MHz
- Middle Channel – 915.500 MHz
- High Channel – 927.750 MHz

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6. Measurement Summary

Test Requirement	FCC Part 15.247 Reference	IC RSS-210 Reference	Test Report Section	Result	Comment
Antenna Requirement	15.203	RSS-GEN 7.1.2	6.1	Compliant	RSS GEN 7.1.4
Frequency Hopping Requirements	15.247 (a)	A.8.1(c)	6.2	Compliant	RSS GEN 4.6.1
Minimum 6 dB Bandwidth		A.8.1(c)			
Number of Hopping Channels		A.8.1(c)			
Channel Separation		A.8.1(c)			
99% Bandwidth	N/A	RSS-GEN			
Maximum Peak Conducted Output Power	15.247 (b)	A.8.4	6.3	Compliant	
Operation with directional antenna gains greater than 6 dBi	15.247 (c)	A.8.4	6.4	N/A	Antenna gain <6 dBi
Lower and Upper Band Edge	15.247 (d), 15.209	N/A	6.5	Compliant	RSS GEN 4.9
Spurious Radiated Emissions		A.8.5	6.6	Compliant	
Spurious Radiated Emissions (> GHz) - Harmonic Measurements		A.8.5	6.7	Compliant	
Power Spectral Density	15.247(e)	NR	NR	Compliant	Frequency hopping device
Conducted Emissions	FCC 15.207	N/A	6.8	Compliant	RSS GEN 7.2.2
Public Exposure to Radio Frequency Energy Levels	1.1307 (b) (1)	RSS GEN 5.5 RSS 102	6.9	Compliant	

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7. Measurement Data

7.1. Antenna Requirement (Section 15.203, RSS GEN 7.1.4)

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.

Result: The unit under test employs an internal antenna which is non-user accessible. The reader connects to the cup reader using an MMBX connector.

7.2. Frequency Hopping Requirements (Section 15.247 (a), A.8.1(c))

Requirements: 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.

For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

7.2.1. 20 dB Bandwidth

Channel	Frequency (MHz)	20 dB Bandwidth (kHz)	Maximum 20 dB Bandwidth (kHz)	Result
Low	902.250	144.2	250	Compliant
Mid	915.500	145.6	250	Compliant
High	927.750	144.4	250	Compliant

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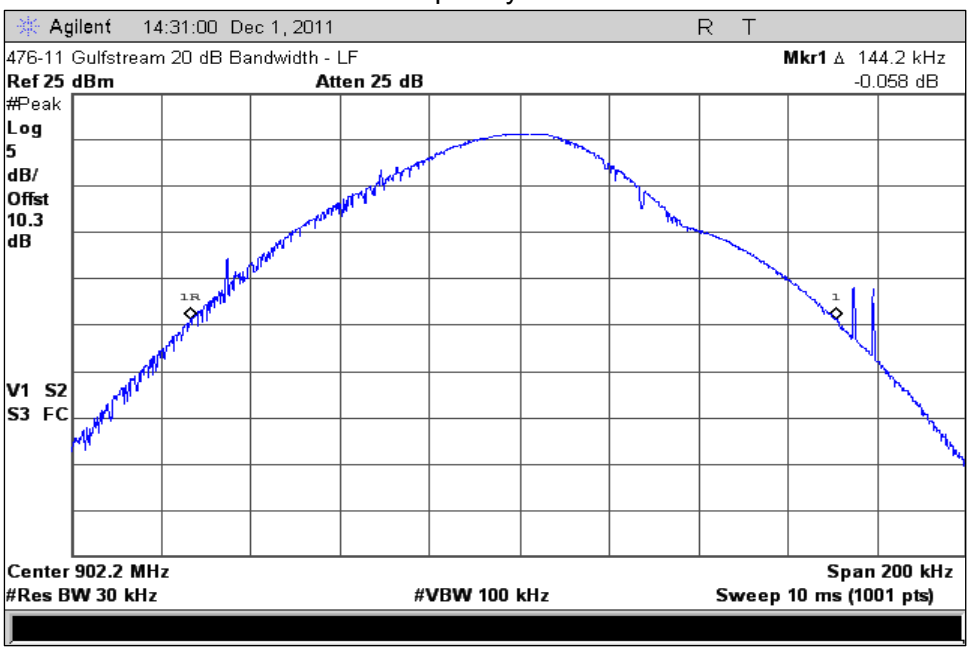
7. Measurement Data (continued)

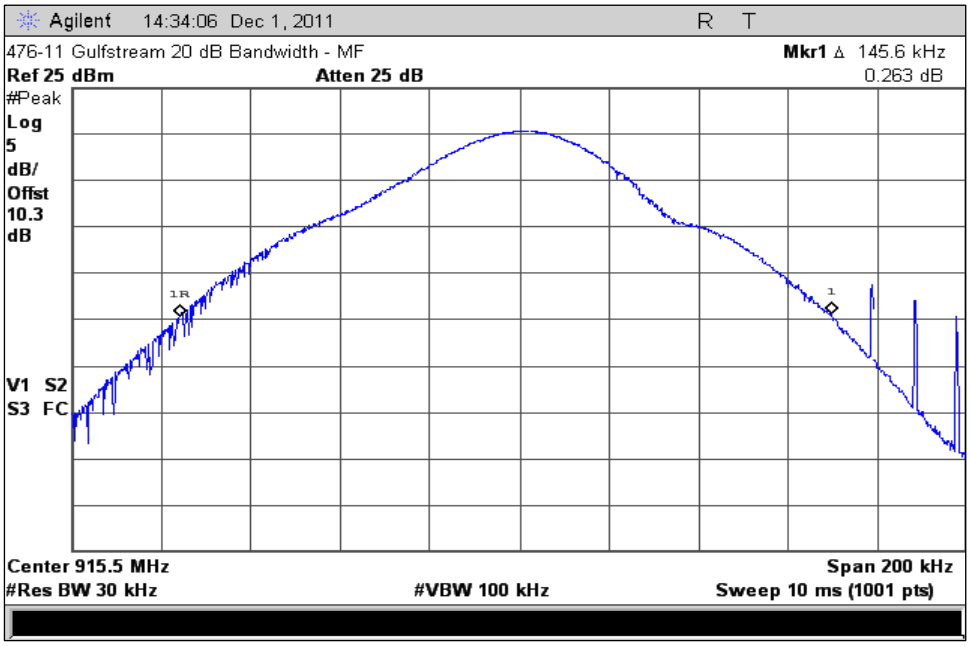
7.2. Frequency Hopping Requirements (Section 15.247 (a), A.8.1(c)) (continued)

7.2.1. 20 dB Bandwidth (continued)

7.2.1.1. 20 dB Bandwidth – Low Frequency



7.2.1.2. 20 dB Bandwidth – Middle Frequency



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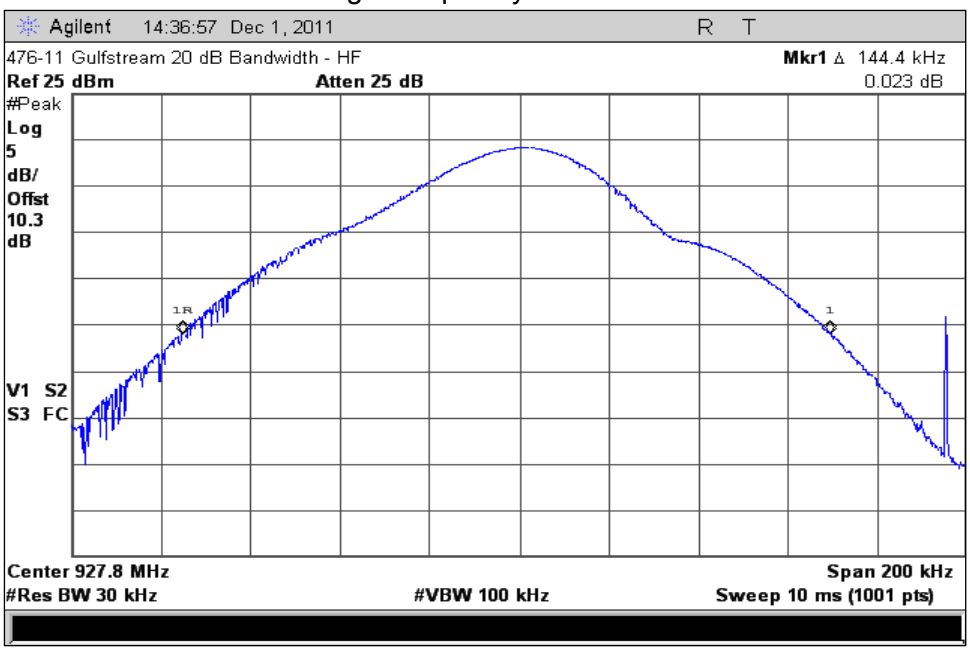
7. Measurement Data (continued)

7.2. Frequency Hopping Requirements (Section 15.247 (a), A.8.1(c)) (continued)

7.2.1. 20 dB Bandwidth (continued)

7.2.1.3. 20 dB Bandwidth – High Frequency



7.2.2. 99% Bandwidth

Channel	Channel Frequency (GHz)	99% Power Bandwidth (kHz)
Low	902.250	122.5487
Middle	915.500	125.5983
High	927.750	125.9126

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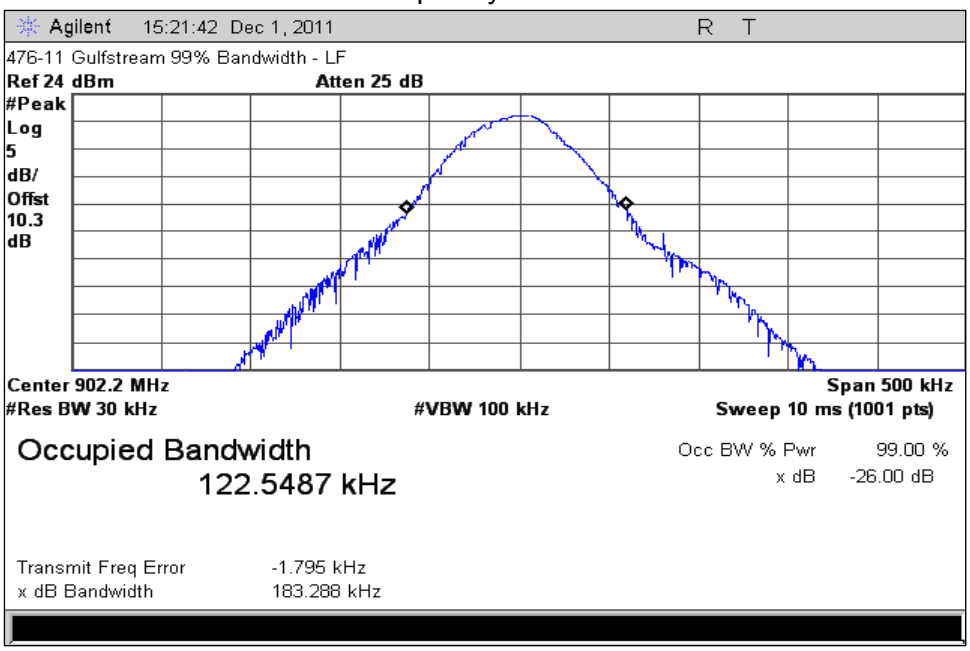
7. Measurement Data (continued)

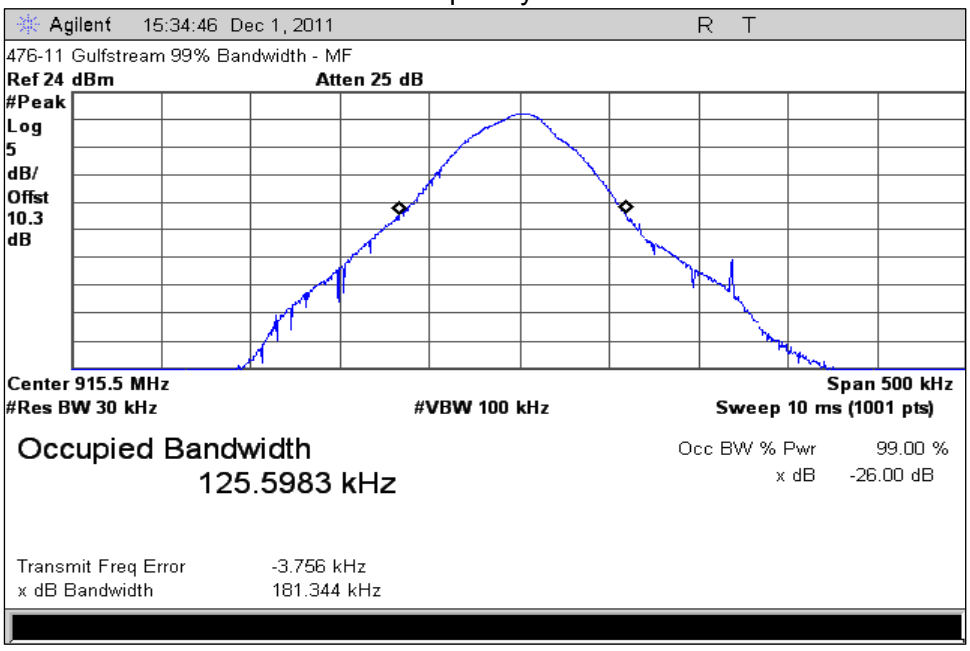
7.2. Frequency Hopping Requirements (Section 15.247 (a), A.8.1(c)) (continued)

7.2.2. 99% Bandwidth (continued)

7.2.2.1. 99% Bandwidth – Low Frequency



7.2.2.2. 99% Bandwidth – Middle Frequency



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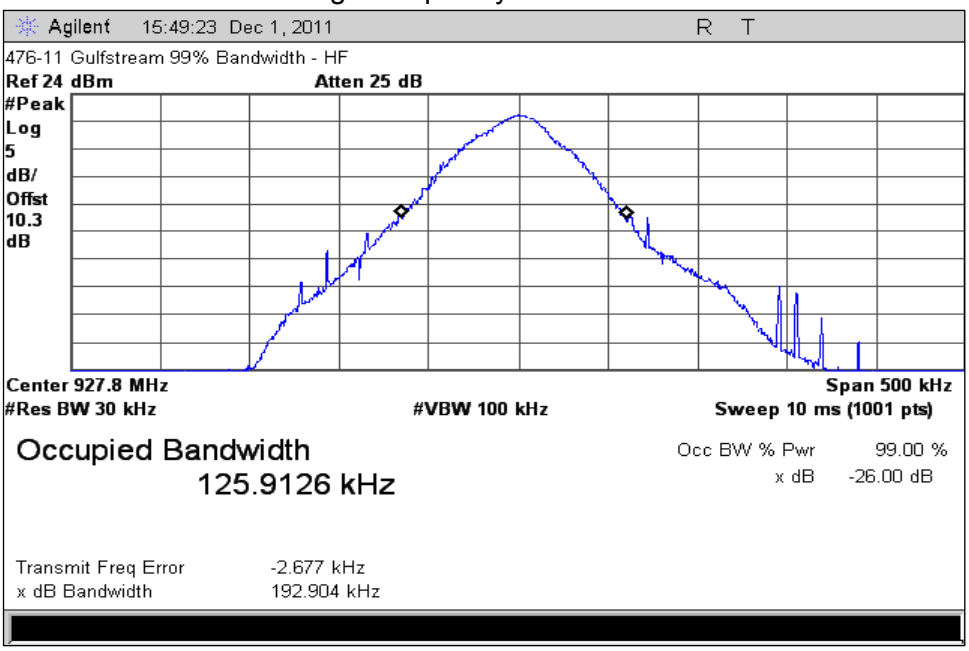
7. Measurement Data (continued)

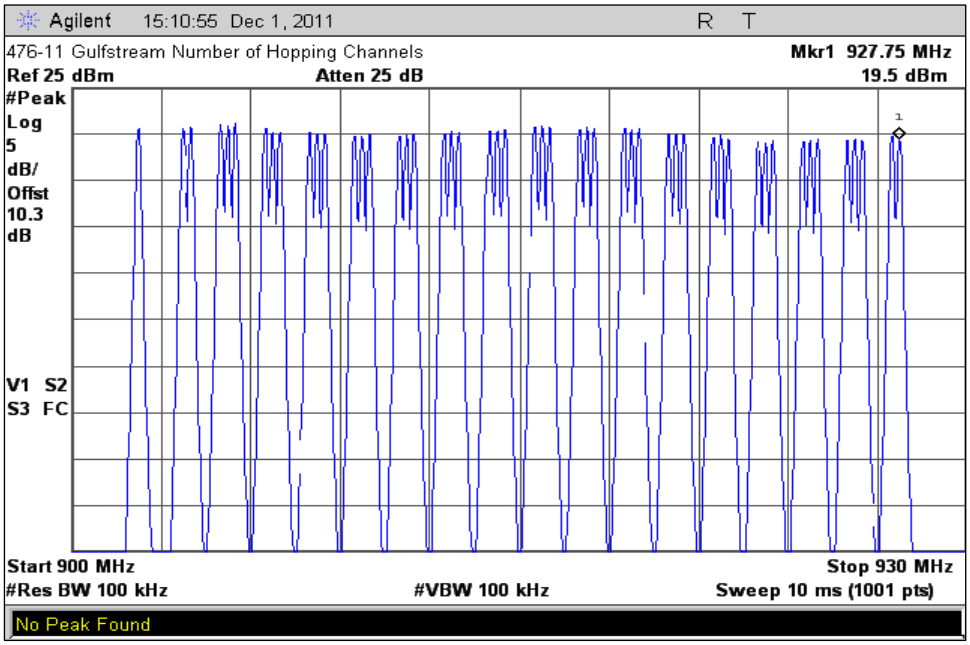
7.2. Frequency Hopping Requirements (Section 15.247 (a), A.8.1(c)) (continued)

7.2.2. 99% Bandwidth (continued)

7.2.2.3. 99% Bandwidth – High Frequency



7.2.3. Number of Hopping Channels = 50



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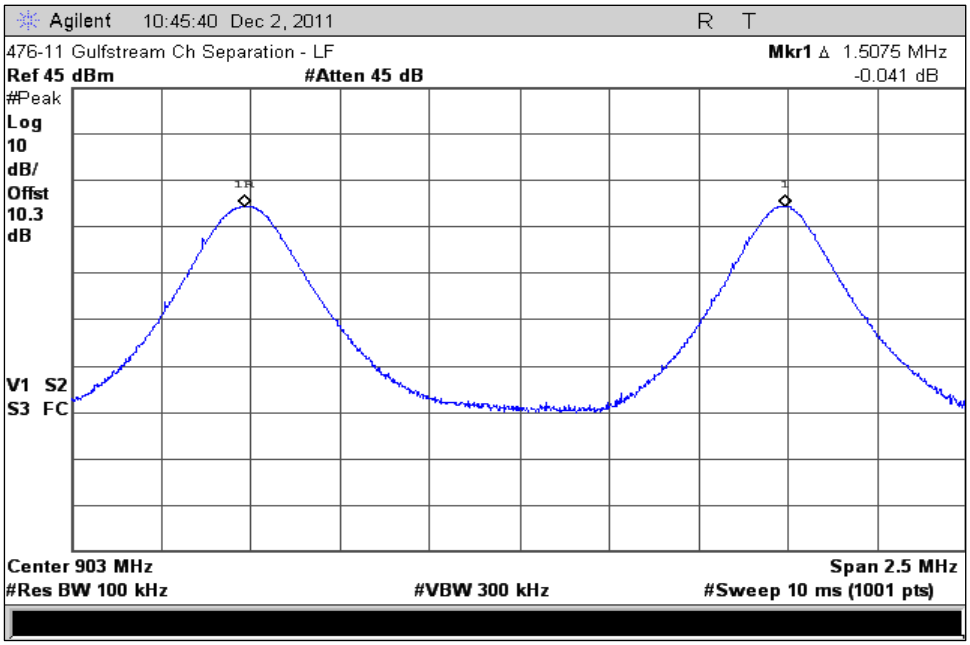
7. Measurement Data (continued)

7.2. Frequency Hopping Requirements (Section 15.247 (a), A.8.1(c)) (continued)

7.2.4. Channel Separation

Channel	Channel Pair	Channel Separation (kHz)	Required Channel Separation (kHz)	Result
Low	902.250	1507.5	146	Compliant
	903.750			
Middle	915.500	250.0	146	Compliant
	915.750			
High	927.500	250.0	146	Compliant
	927.750			

7.2.4.1. Channel Separation - Low Channels



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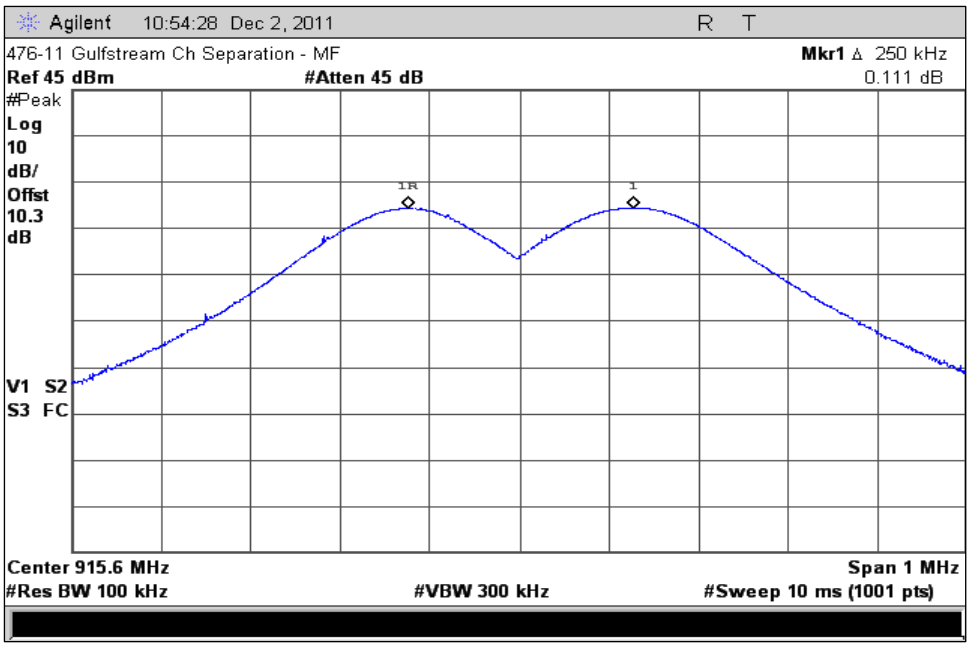
7. Measurement Data (continued)

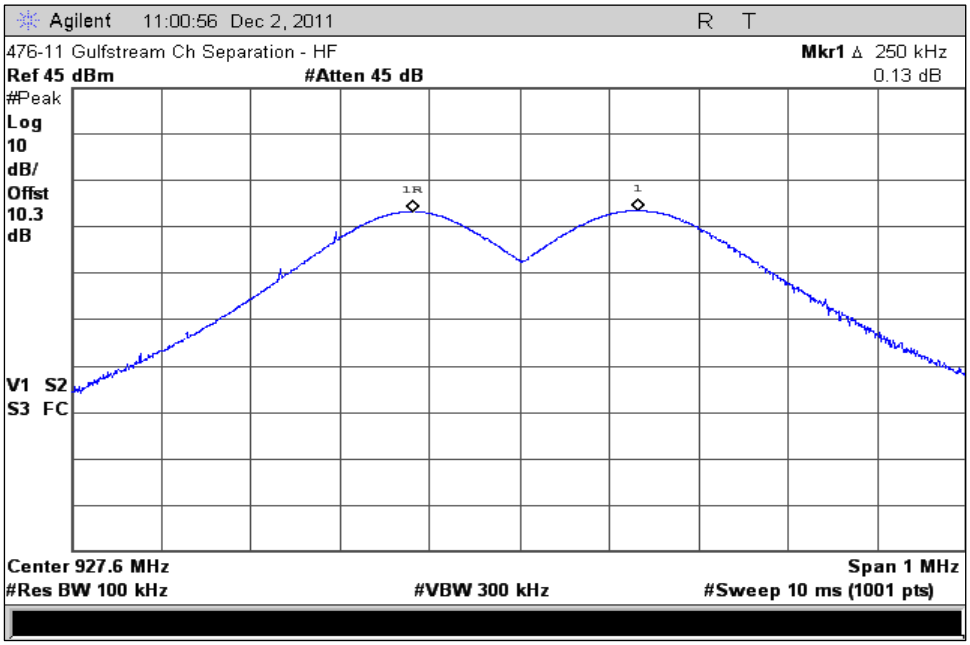
7.2. Frequency Hopping Requirements (Section 15.247 (a), A.8.1(c)) (continued)

7.2.4. Channel Separation

7.2.4.2. Channel Separation - Middle Channels



7.2.4.3. Channel Separation - High Channels



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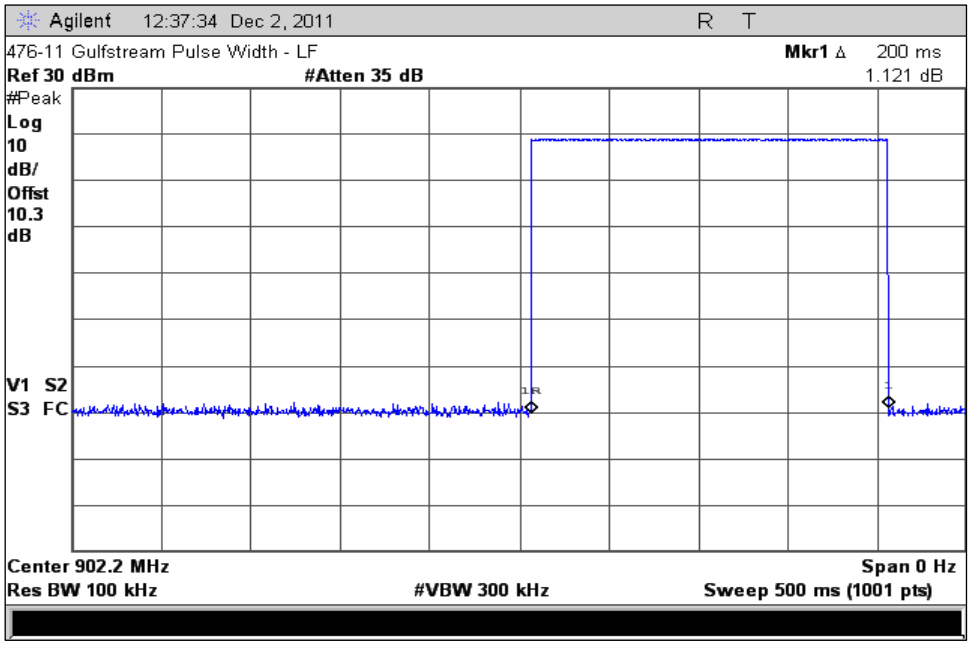
7. Measurement Data (continued)

7.2. Frequency Hopping Requirements (Section 15.247 (a), A.8.1(c)) (continued)

7.2.5. Average Time of Occupancy per Period (Period = 20 Seconds)

Channel	Frequency (MHz)	Pulse Width (Sec)	Avg Time per Period (20 Seconds)	Maximum Time per Period	Result
Low	902.250	0.200	0.200	0.4	Compliant
Middle	915.500	0.201	0.201	0.4	Compliant
High	927.750	0.201	0.201	0.4	Compliant

7.2.5.1. Pulse Width - Low Channel



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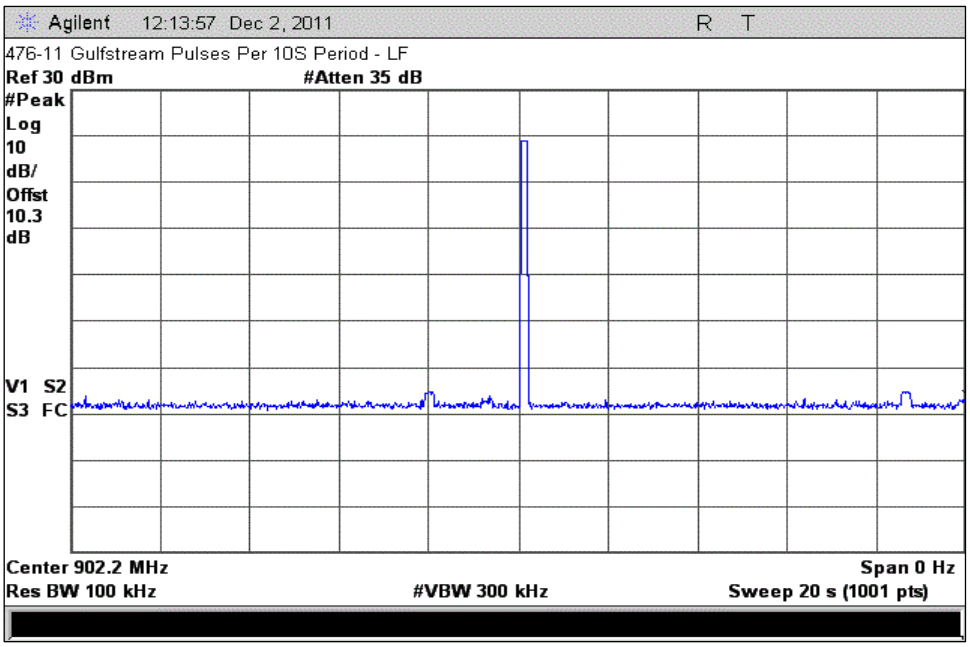
7. Measurement Data (continued)

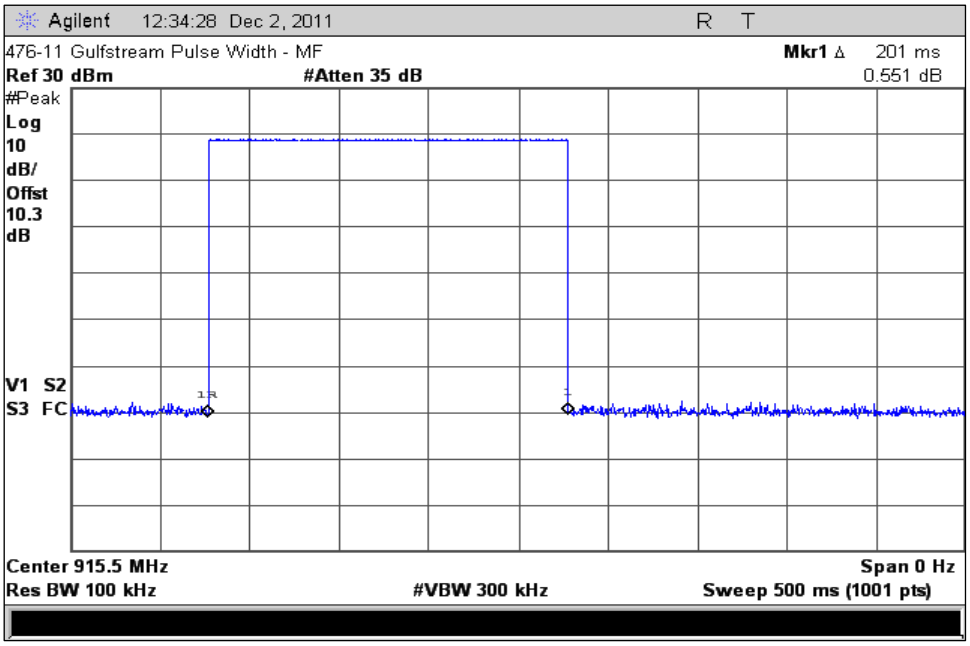
7.2. Frequency Hopping Requirements (Section 15.247 (a), A.8.1(c)) (continued)

7.2.5. Average Time of Occupancy per Period (Period = 20 Seconds)

7.2.5.2. Pulses per 20 Second Period - Low Channel



7.2.5.3. Pulse Width - Middle Channel



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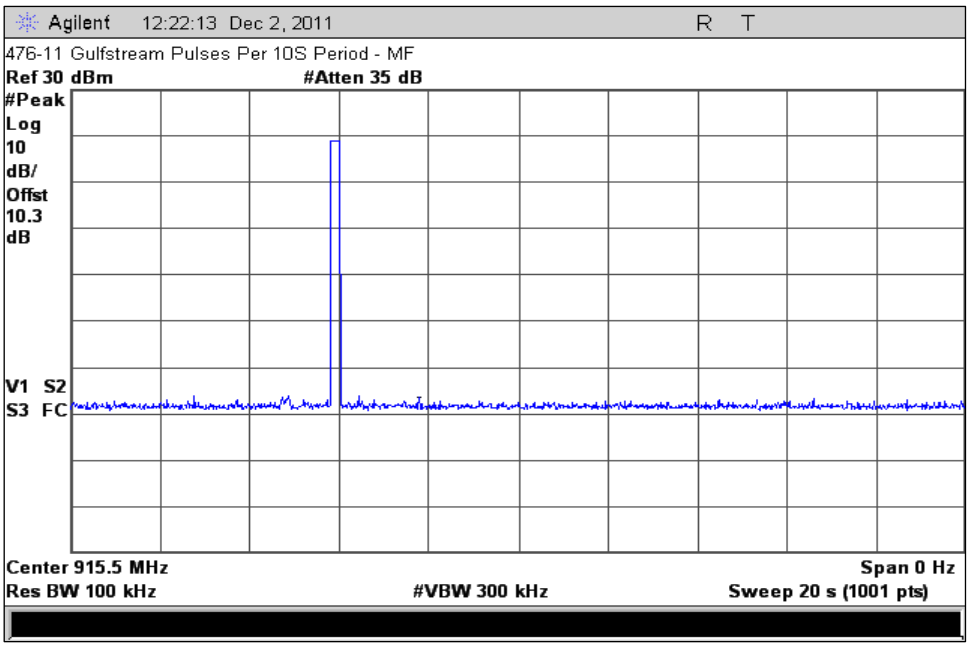
7. Measurement Data (continued)

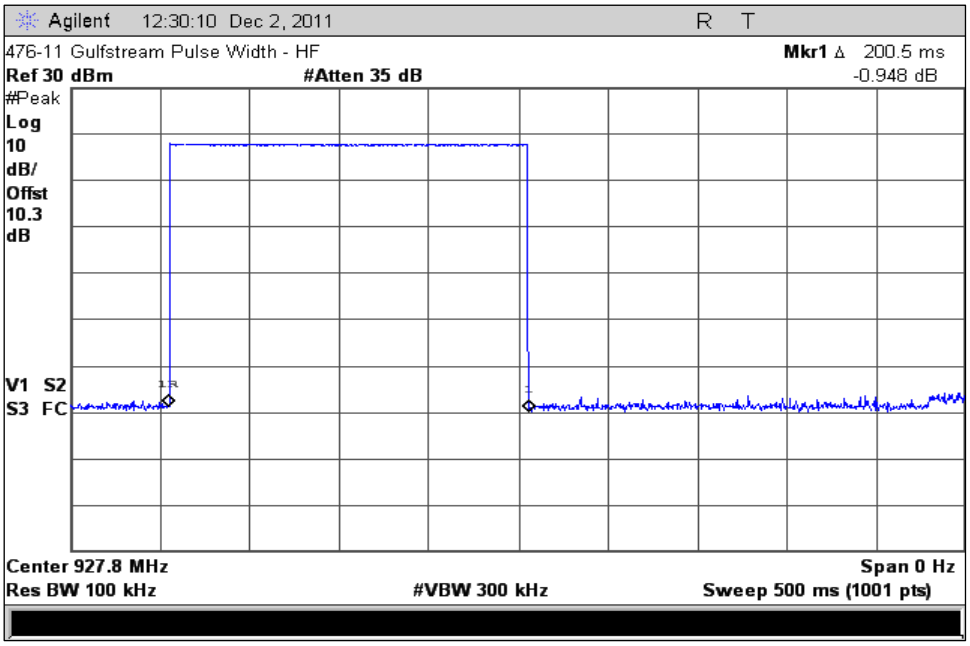
7.2. Frequency Hopping Requirements (Section 15.247 (a), A.8.1(c)) (continued)

7.2.5. Average Time of Occupancy per Period (Period = 20 Seconds)

7.2.5.4. Pulses per 20 Second Period - Middle Channel



7.2.5.5. Pulse Width - High Channel



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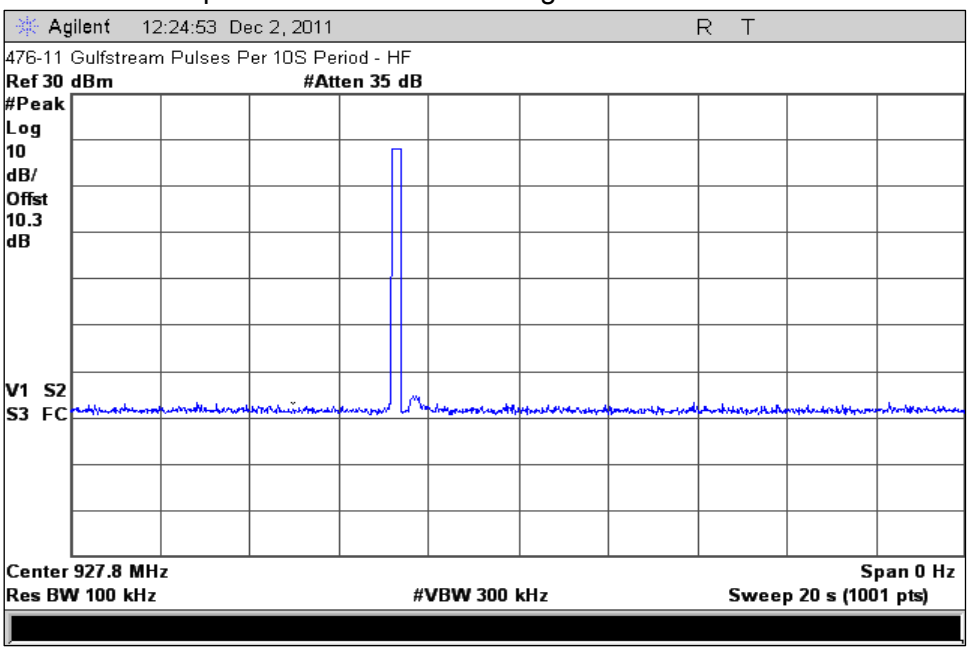
7. Measurement Data (continued)

7.2. Frequency Hopping Requirements (Section 15.247 (a), A.8.1(c)) (continued)

7.2.5. Average Time of Occupancy per Period (Period = 20 Seconds)

7.2.5.6. Pulses per 20 Second Period - High Channel



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7. Measurement Data (continued)

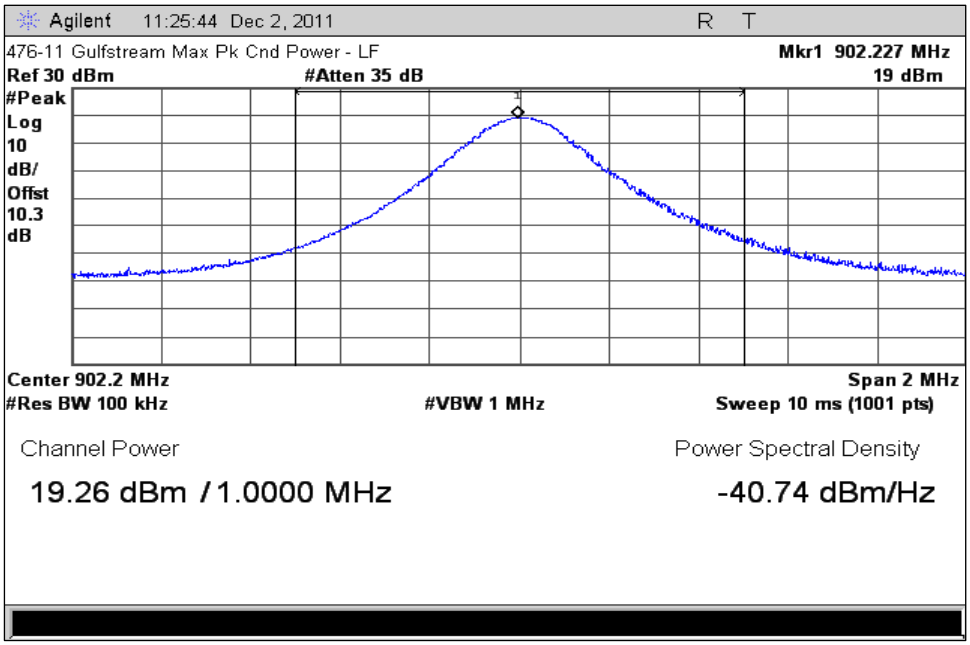
7.3. Maximum Peak Conducted Output Power (Section 15.247 (b), A.8.4)

Requirements: The maximum peak conducted output power of the intentional radiator shall not exceed the following: For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

Note: The manufacturer declares that the antenna used in the device under test has a gain of -15 dBi.

Channel	Frequency (MHz)	Max Peak Conducted Output Power (Watts)	Limit (Watts)	Result
Low	902.250	0.08	1	Compliant
Middle	915.500	0.10	1	Compliant
High	927.750	0.07	1	Compliant

7.3.1. Maximum Peak Conducted Output Power – Low Channel



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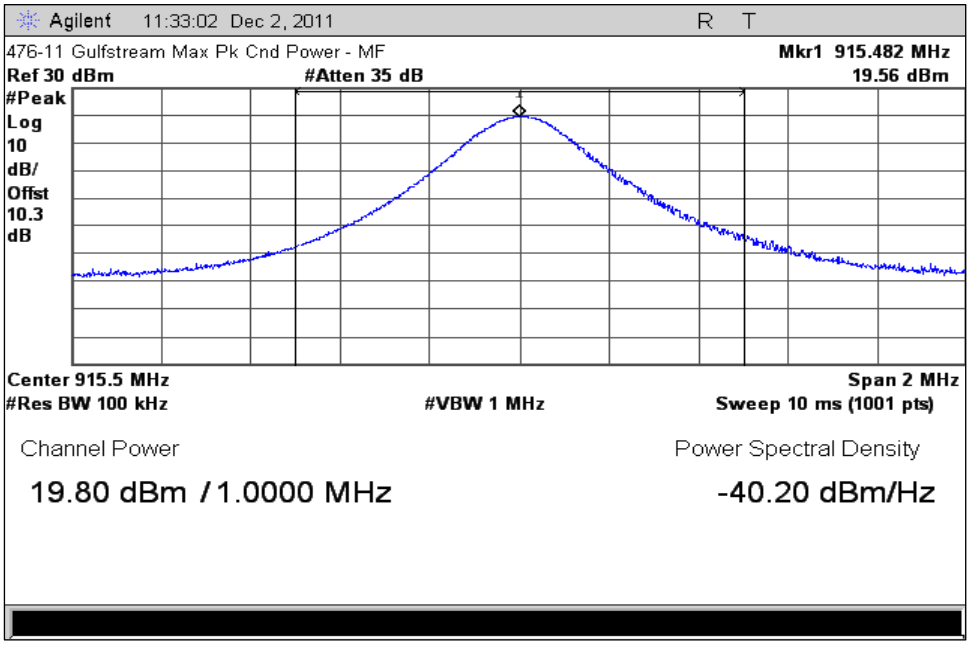
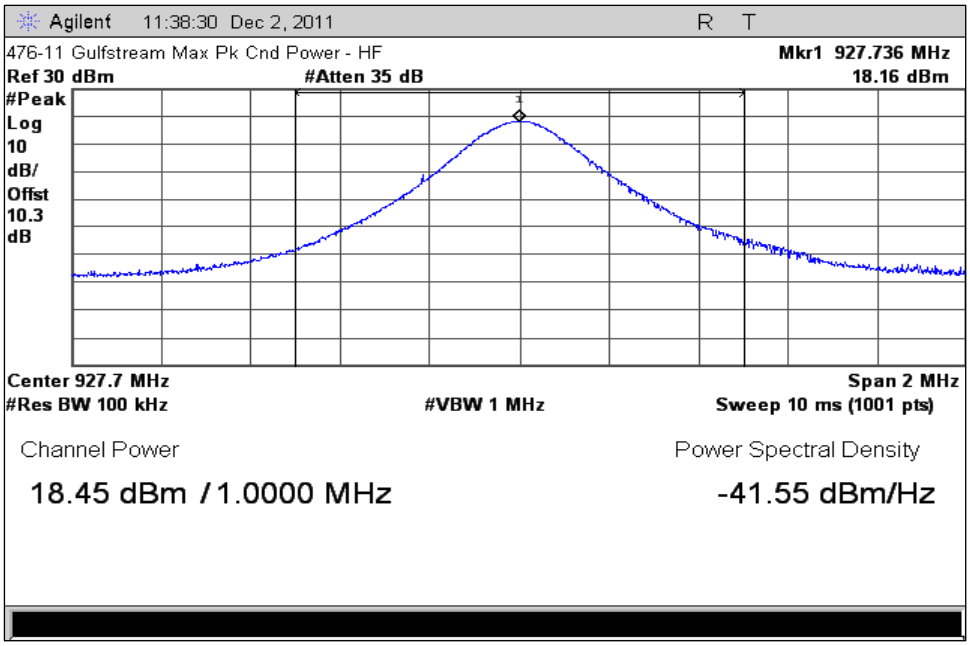
7. Measurement Data (continued)

7.3. Maximum Peak Conducted Output Power (Section 15.247 (b), A.8.4) (continued)

7.3.2. Maximum Peak Conducted Output Power – Middle Channel



7.3.3. Maximum Peak Conducted Output Power – High Channel



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7. Measurement Data (continued)

7.4. Operation with Directional Antenna Gains Greater than 6 dBi (Section 15.247 (c))

Status: Section 15.247 (c)) does not apply to the product under test.

7.5. Emissions Outside the Frequency Band (Section 15.247 (d, RSS GEN 4.9)

Requirements: 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.

Test Note: The measurement methodology detailed in FCC Office of Engineering and Technology Publication Number: 913591 is used to determine the band edge values.

7.5.1. Band Edge Measurements

Lower Band Edge

Lowest Channel (MHz)	Field Strength (dBµV/m)		Delta Offset peak to bandedge using 30 kHz	Band Edge Frequency (MHz)	Field Strength (dBµV/m)[1]		Part 15.209 Limit (dBµV/m)		Result
	Peak	Quasi-Peak			Peak	Quasi-Peak	Peak	Quasi-Peak	
902.250	98.80	98.00	55.34	902	43.46	42.66	66	46	Compliant

Upper Band Edge

Highest Channel (MHz)	Field Strength (dBµV/m)		Delta Offset peak to bandedge using 30 kHz	Band Edge Frequency (MHz)	Field Strength (dBµV/m)[1]		Part 15.209 Limit (dBµV/m)		Result
	Peak	Quasi-Peak			Peak	Quasi-Peak	Peak	Quasi-Peak	
927.750	95.50	95.00	55.36	928	40.14	39.64	66	46	Compliant

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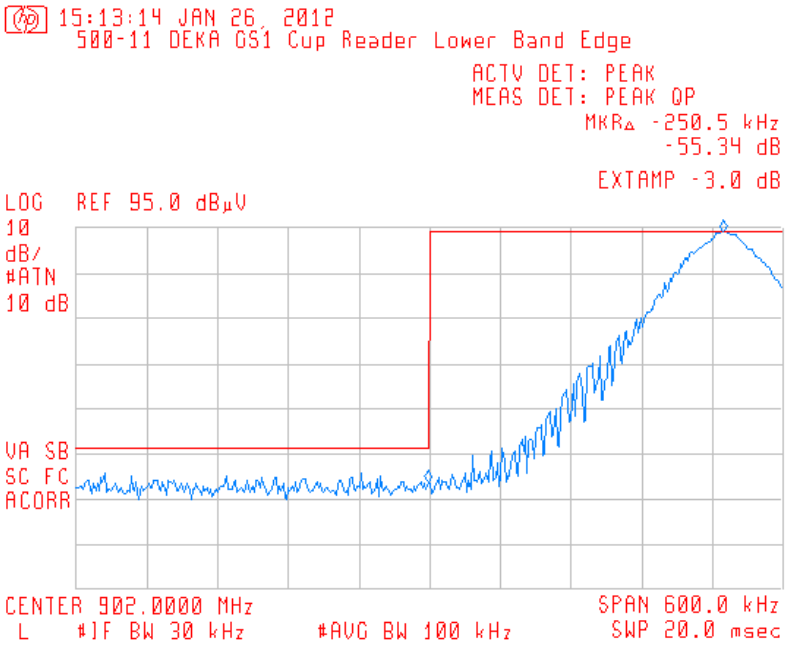
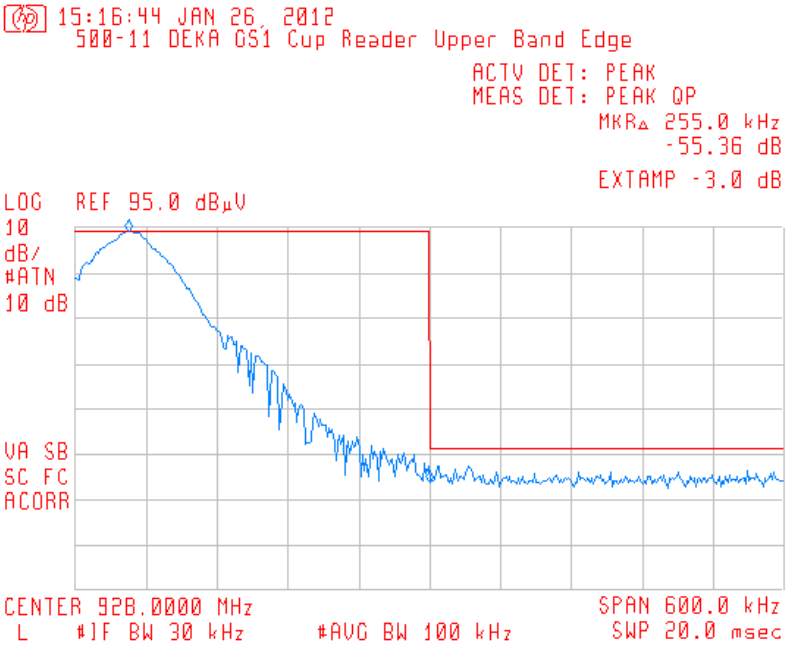
7. Measurement Data (continued)

7.5. Emissions outside the Frequency Band (15.247 (d), RSS GEN 4.9) (continued)

7.5.1.1. Lower Band Edge



7.5.1.2. Upper Band Edge



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7. Measurement Data (continued)

7.6. Transmitter Spurious Radiated Emissions (18 MHz to 25 GHz)

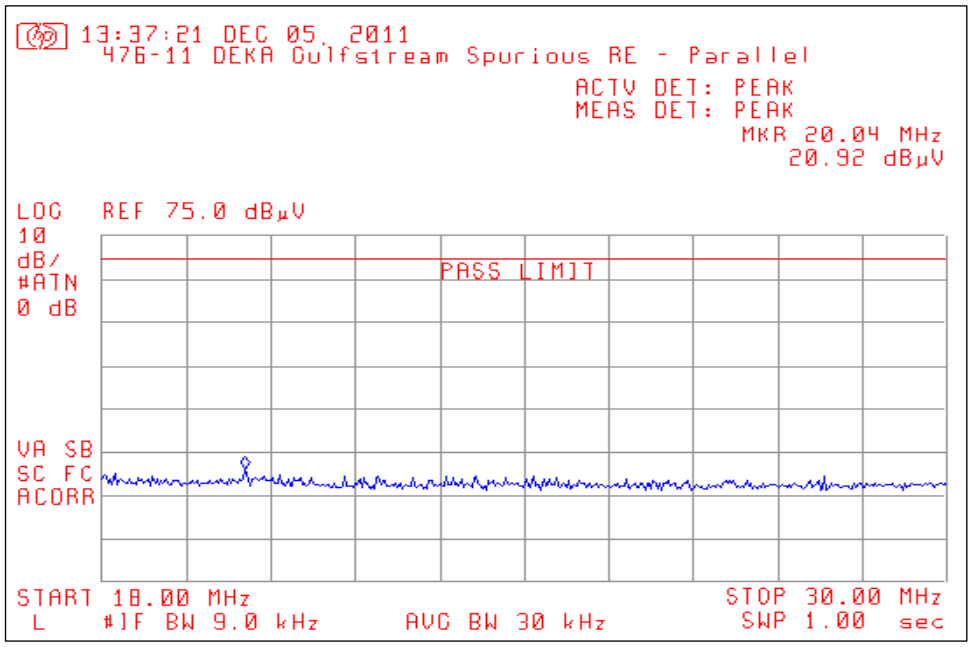
Note: The spurious emissions detailed in this section represent the combined worst case emissions of the low, middle and high operating frequencies.

7.6.1. Regulatory Limit: FCC Part 209, A.8.5 Quasi-Peak

Frequency Range (MHz)	Distance (Meters)	Limit (dBµV/m)
18 to 30	3	69.5
30 to 88	3	40.0
88 to 216	3	43.5
216 to 960	3	46.0
>960	3	54.0

7.6.2. Spurious Radiated Emissions (18 MHz to 30 MHz) Test Results

7.6.2.1. Measurement Results – Parallel



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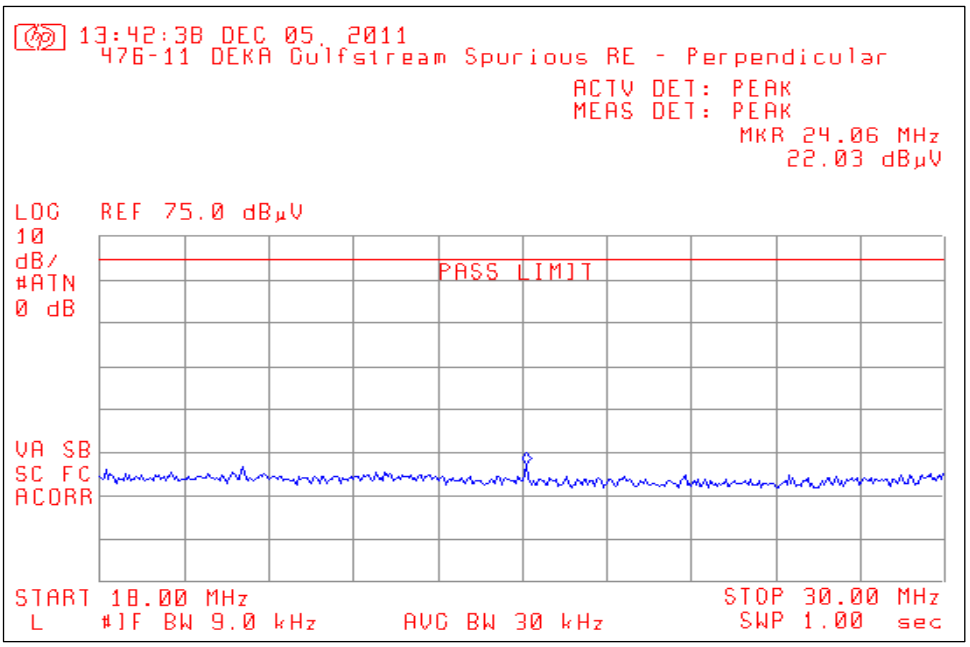
7. Measurement Data (continued)

7.6. Spurious Radiated Emissions (18 MHz to 25 GHz) (continued)

7.6.2. Spurious Radiated Emissions (18 MHz to 30 MHz) Test Results

7.6.2.2. Measurement Results – Perpendicular



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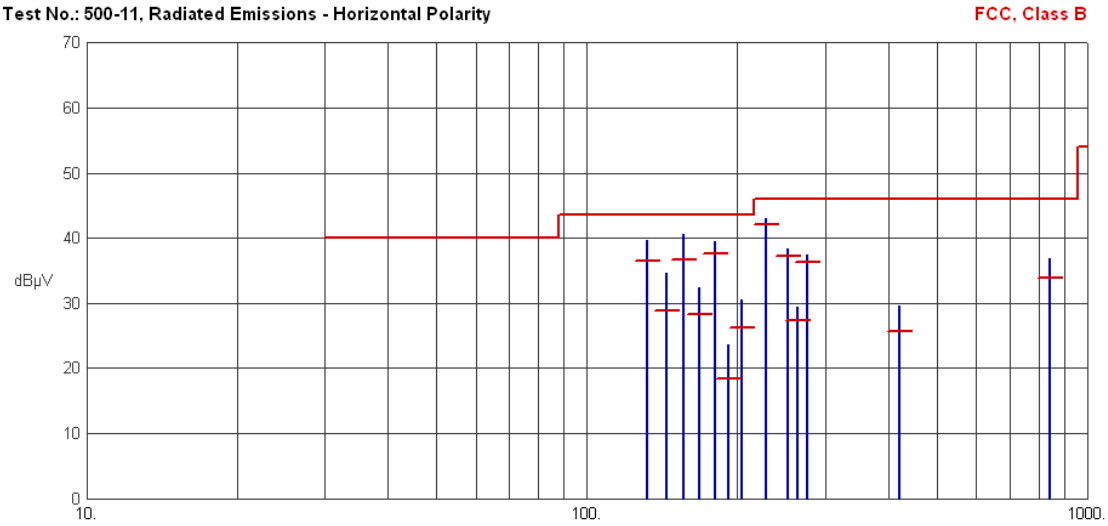
7.6. Spurious Radiated Emissions (18 MHz to 25 GHz) (continued)

7.6.3. Spurious Radiated Emissions (30 MHz to 1 GHz) Test Results

7.6.3.1. Measurement Results – Horizontal



Frequency (MHz)	Pk Amp (dBµV/m)	QP Amp (dBµV/m)	QP Limit (dBµV/m)	Margin (dB)	Ant Ht (cm)	Table (Deg)	Comments
132.0946	39.68	36.50	43.50	-7.00	N/A	N/A	
144.1400	34.69	28.78	43.50	-14.72	N/A	N/A	
156.1542	40.63	36.72	43.50	-6.78	N/A	N/A	
168.1594	32.42	28.30	43.50	-15.20	N/A	N/A	
180.1868	39.37	37.60	43.50	-5.90	N/A	N/A	
192.1870	23.63	18.35	43.50	-25.15	N/A	N/A	
204.1927	30.49	26.20	43.50	-17.30	N/A	N/A	
228.2218	42.95	42.09	46.00	-3.91	N/A	N/A	
252.2474	38.38	37.15	46.00	-8.85	N/A	N/A	
264.2544	29.40	27.40	46.00	-18.60	N/A	N/A	
276.2731	37.34	36.27	46.00	-9.73	N/A	N/A	
420.4316	29.51	25.73	46.00	-20.27	N/A	N/A	
840.8190	36.76	33.90	46.00	-12.10	N/A	N/A	

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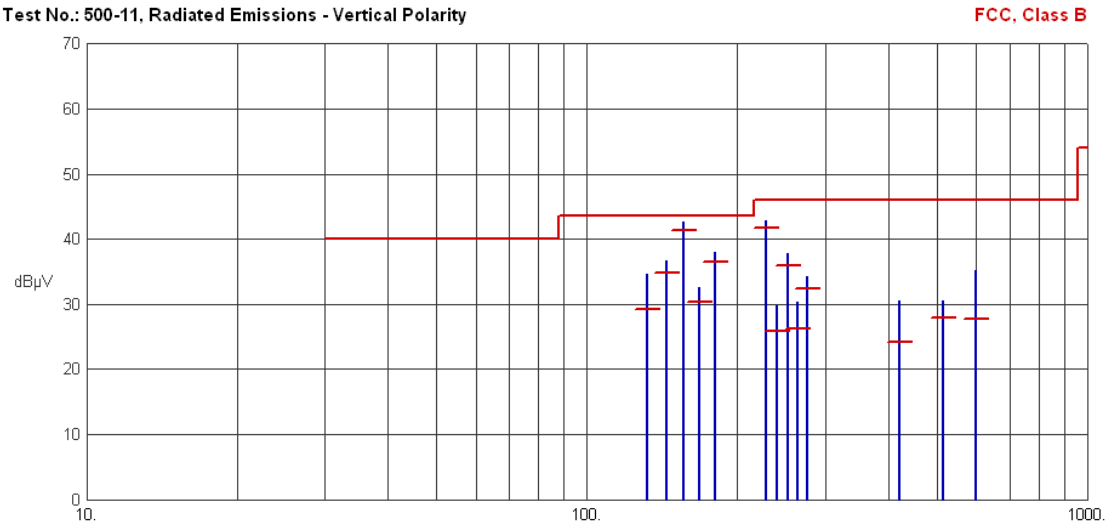
7. Measurement Data (continued)

7.6. Spurious Radiated Emissions (18 MHz to 25 GHz) (continued)

7.6.3. Spurious Radiated Emissions (30 MHz to 1 GHz) Test Results

7.6.3.2. Measurement Results – Vertical



Frequency (MHz)	Pk Amp (dBµV/m)	QP Amp (dBµV/m)	QP Limit (dBµV/m)	Margin (dB)	Ant Ht (cm)	Table (Deg)	Comments
132.1521	34.54	29.12	43.50	-14.38	N/A	N/A	
144.1418	36.69	34.88	43.50	-8.62	N/A	N/A	
156.1505	42.68	41.40	43.50	-2.10	N/A	N/A	
168.1663	32.58	30.30	43.50	-13.20	N/A	N/A	
180.1712	37.98	36.54	43.50	-6.96	N/A	N/A	
228.2201	42.79	41.78	46.00	-4.22	N/A	N/A	
240.2312	29.76	25.89	46.00	-20.11	N/A	N/A	
252.2508	37.85	35.92	46.00	-10.08	N/A	N/A	
264.2614	30.39	26.27	46.00	-19.73	N/A	N/A	
276.2659	34.17	32.36	46.00	-13.64	N/A	N/A	
420.4071	30.59	24.09	46.00	-21.91	N/A	N/A	
516.5178	30.52	27.89	46.00	-18.11	N/A	N/A	
600.5943	35.26	27.80	46.00	-18.20	N/A	N/A	

7.6.4. Spurious Emissions above 1 GHz

There were no measurable spurious emissions above 1 GHz other than the emissions tabled in section 6.7.

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7. Measurement Data (continued)

7.7. Spurious Radiated Emissions – Harmonic Emissions

Note: The harmonic emissions detailed in this section represent the combined worst case emissions of the low, middle and high operating frequencies.

7.7.1. Spurious Radiated Emissions (Harmonic Measurements) Test Results

Freq. (MHz)	Field Strength (dBµV/m)		Limit (dBµV/m)		Margin (dBµV/m)		Antenna Polarity (H/V)	Result
	Peak	Average	Peak	Average	Peak	Average		
1804.50	46.40	41.74	74.00	54.00	-27.60	-12.26	V	Compliant
1831.00	42.76	37.46	74.00	54.00	-31.24	-16.54	V	Compliant
1855.50	39.62	31.15	74.00	54.00	-34.38	-22.85	V	Compliant
2706.75	39.16	28.97	74.00	54.00	-34.84	-25.03	H	Compliant
2746.50	40.09	28.37	74.00	54.00	-33.91	-25.63	H	Compliant
2783.25	39.31	28.58	74.00	54.00	-34.69	-25.42	H	Compliant
3609.00	45.57	35.50	74.00	54.00	-28.43	-18.50	H	Compliant
3662.00	44.25	33.18	74.00	54.00	-29.75	-20.82	H	Compliant
3711.00	43.77	33.91	74.00	54.00	-30.23	-20.09	H	Compliant
4511.25	51.81	45.43	74.00	54.00	-22.19	-8.57	V	Compliant
4577.50	51.29	43.65	74.00	54.00	-22.71	-10.35	H	Compliant
4638.75	45.63	33.80	74.00	54.00	-28.37	-20.20	H	Compliant
5413.50	47.66	37.08	74.00	54.00	-26.34	-16.92	H	Compliant
5493.00	46.31	36.91	74.00	54.00	-27.69	-17.09	V	Compliant
5566.50	45.54	34.32	74.00	54.00	-28.46	-19.68	H	Compliant
6315.75	46.84	34.75	74.00	54.00	-27.16	-19.25	V	Compliant
6408.50	46.43	36.18	74.00	54.00	-27.57	-17.82	H	Compliant
6494.25	46.45	36.24	74.00	54.00	-27.55	-17.76	V	Compliant
7218.00	51.82	42.34	74.00	54.00	-22.18	-11.66	H	Compliant
7324.00	50.72	40.66	74.00	54.00	-23.28	-13.34	H	Compliant
7422.00	49.59	40.48	74.00	54.00	-24.41	-13.52	H	Compliant
8120.25	50.28	39.20	74.00	54.00	-23.72	-14.80	H	Compliant
8239.50	50.20	39.43	74.00	54.00	-23.80	-14.57	H	Compliant
8349.75	50.75	38.82	74.00	54.00	-23.25	-15.18	H	Compliant
9022.50	50.45	40.51	74.00	54.00	-23.55	-13.49	V	Compliant
9155.00	51.44	40.94	74.00	54.00	-22.56	-13.06	H	Compliant
9277.50	50.50	41.05	74.00	54.00	-23.50	-12.95	V	Compliant

[1] All correction factors are stored in the spectrum analyzer and applied to this column entry.

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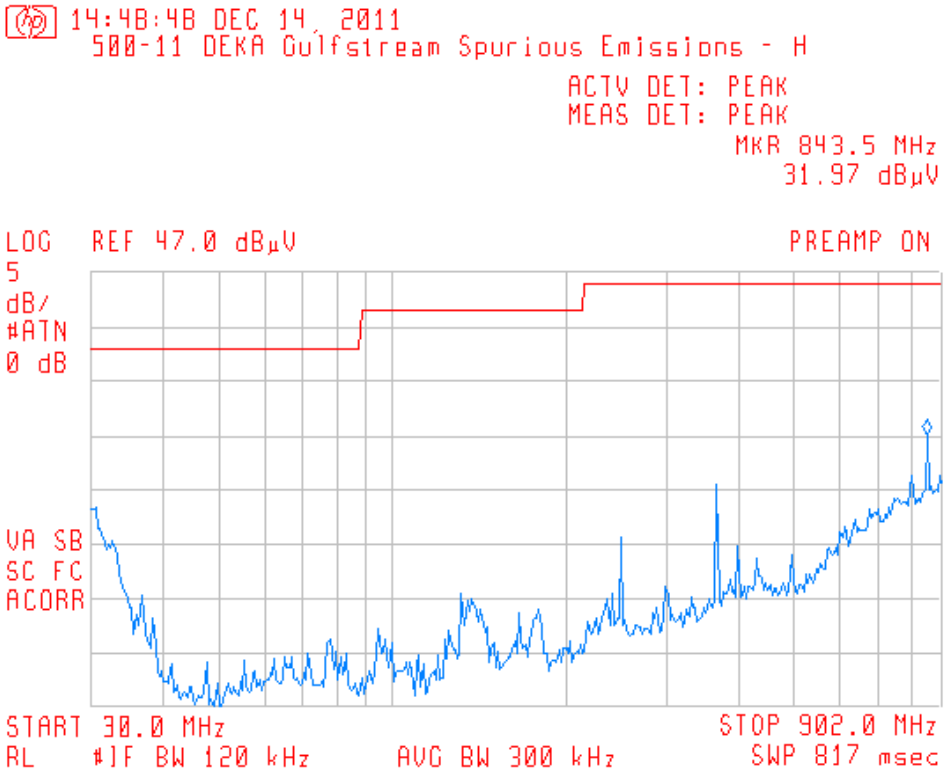
7. Measurement Data (continued)

7.8. Receiver Spurious Emissions (RSS 213 6.8, RSS-Gen 4.10 & 7.2.3.1)

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 using a calibrated open-area test site. 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.

7.8.1. Measurement Results – Horizontal



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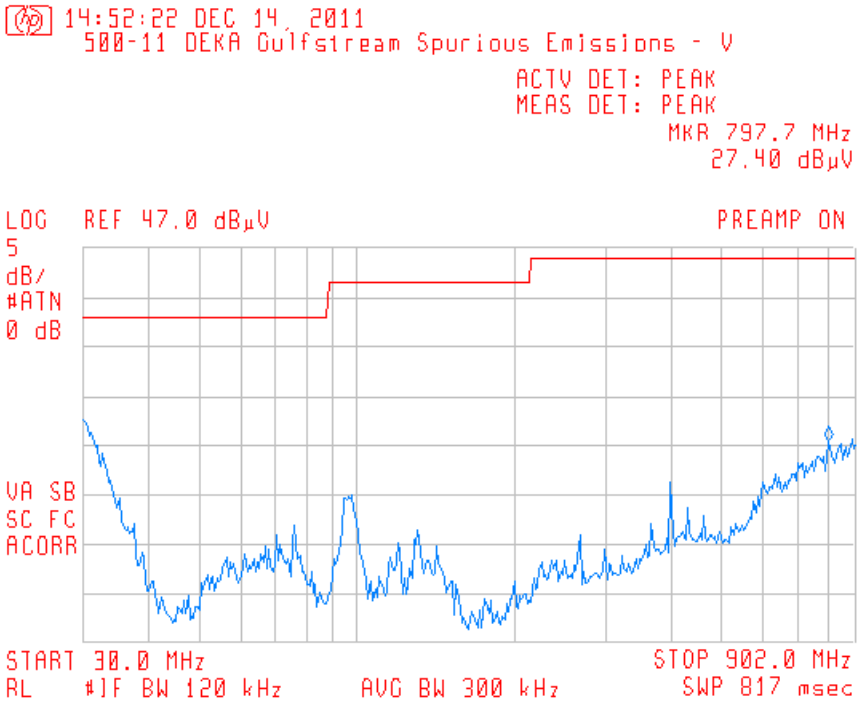
7. Measurement Data (continued)

7.8. Receiver Spurious Emissions (RSS 213 6.8, RSS-Gen 4.10 & 7.2.3.1)

7.8.2. Measurement Results – Vertical



7.8.3. Measurement Results – Above 1 GHz

There were no measurable receiver spurious emissions above 1 GHz.

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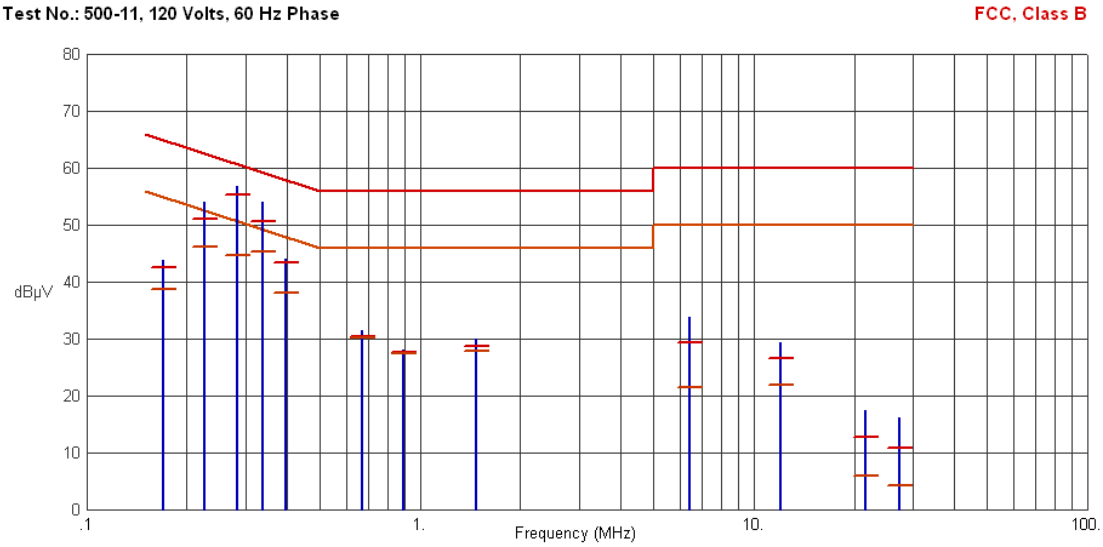
7. Measurement Data (continued)

7.9. Conducted Emissions

7.9.1. 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
.1697	43.74	42.48	64.98	-22.50	38.60	54.98	-16.38	
.2261	53.99	51.14	62.59	-11.45	46.15	52.59	-6.44	
.2832	56.91	55.41	60.72	-5.31	44.68	50.72	-6.04	
.3373	54.11	50.56	59.27	-8.71	45.30	49.27	-3.97	
.3958	44.08	43.48	57.94	-14.46	38.14	47.94	-9.80	
.6725	31.48	30.37	56.00	-25.63	30.14	46.00	-15.86	
.8955	28.13	27.53	56.00	-28.47	27.40	46.00	-18.60	
1.4711	30.01	28.64	56.00	-27.36	27.93	46.00	-18.07	
6.4329	33.73	29.34	60.00	-30.66	21.49	50.00	-28.51	
12.0116	29.23	26.47	60.00	-33.53	21.87	50.00	-28.13	
21.5647	17.35	12.66	60.00	-47.34	5.90	50.00	-44.10	
27.2979	16.00	10.76	60.00	-49.24	4.22	50.00	-45.78	

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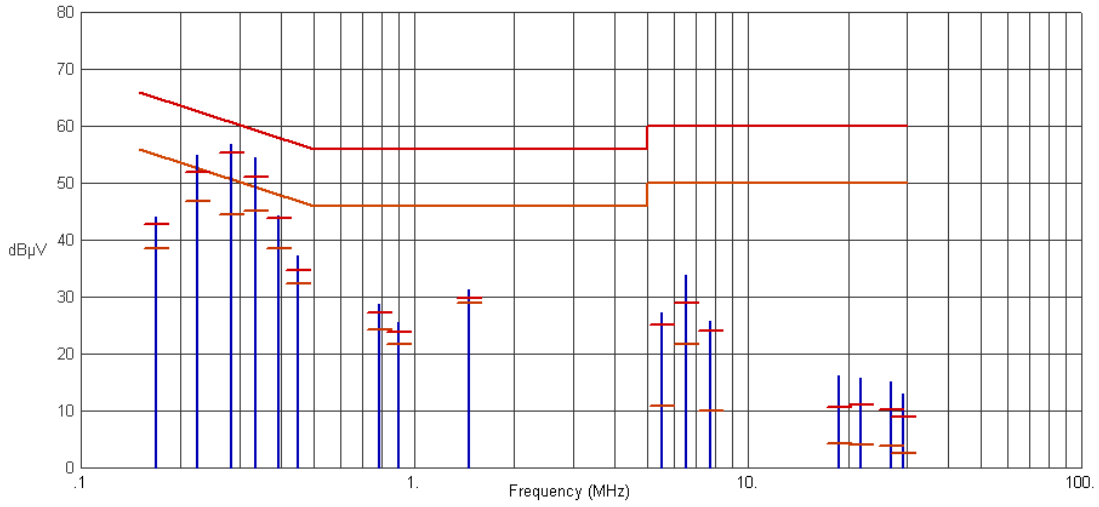
7. Measurement Data (continued)

7.9. Conducted Emissions

7.9.2. 120 Volts, 60 Hz Neutral

Test No.: 500-11, 120 Volts, 60 Hz Neutral FCC, Class B



Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.1688	43.94	42.79	65.02	-22.23	38.56	55.02	-16.46	
.2243	54.88	51.97	62.66	-10.69	46.83	52.66	-5.83	
.2828	56.84	55.23	60.73	-5.50	44.55	50.73	-6.18	
.3364	54.40	51.13	59.29	-8.16	45.08	49.29	-4.21	
.3944	44.32	43.73	57.97	-14.24	38.40	47.97	-9.57	
.4485	37.19	34.69	56.90	-22.21	32.24	46.90	-14.66	
.7860	28.74	27.17	56.00	-28.83	24.26	46.00	-21.74	
.9006	25.44	23.83	56.00	-32.17	21.59	46.00	-24.41	
1.4664	31.33	29.79	56.00	-26.21	28.90	46.00	-17.10	
5.5266	27.09	25.03	60.00	-34.97	10.74	50.00	-39.26	
6.5328	33.86	28.95	60.00	-31.05	21.67	50.00	-28.33	
7.7306	25.76	24.06	60.00	-35.94	9.87	50.00	-40.13	
18.7039	16.10	10.61	60.00	-49.39	4.11	50.00	-45.89	
21.9102	15.70	11.04	60.00	-48.96	3.99	50.00	-46.01	
26.9099	15.08	10.14	60.00	-49.86	3.74	50.00	-46.26	
29.3304	13.00	8.87	60.00	-51.13	2.55	50.00	-47.45	

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7. Measurement Data (continued)

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

Frequency (MHz)	MPE Distance (cm)	DUT Output Power (dBm)	Measured DUT Antenna Gain (dBi)	Power Density		Limit (mW/cm2)	Result
				(mW/cm2)	(W/m2)		
	(1)	(2)	(3)	(4)		(5)	
902.250	20.0	19.26	-15.66	0.0004558	0.0045575	1	Compliant
915.500	20.0	19.80	-18.60	0.0002623	0.0026226	1	Compliant
927.750	20.0	18.45	-18.15	0.0002132	0.0021317	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 20 centimeters of the body of the user.
2. Section 7.4 of this test report.
3. Calculated Gain of antenna, conducted power vs field strength measured at 3 meters
4. Time Averaging Duty Cycle Correction Factor.
5. Power density is calculated from field strength measurement and antenna gain.
6. Reference CFR 1.1310, Table 1: Limits for Maximum Permissible Exposure (MPE), Section (B): Limits for General Population/Uncontrolled Exposure.

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8. 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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