



COMPLIANCE WORLDWIDE INC.

TEST REPORT 472-09R1

In Accordance with the Requirements of
Federal Communications Commission Part 15.247, Subpart C
Industry Canada RSS 210, Issue 7, Annex 8

Low Power License-Exempt Radio Communication Devices
Intentional Radiators

Issued to

DEKA Research Inc.
340 Commercial Street
Manchester, NH 03101

for the
Freestyle Dispensing Machine

FCC ID: XQ4-GFS-SHEAR
IC: 8593A-GFSSHEAR

Report Issued on March 10, 2010
Original Report Issued on February 12, 2010

Tested by



Brian F. Breault

Reviewed by



Larry K. Stillings

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1. Scope

This test report certifies that the Freestyle Dispensing Machine, as tested, meets the FCC Part 15, Subpart C and Industry Canada RSS 210 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. R1 incorporates additional detail to facilitate FCC/IC certification.

2. Product Details

| | | | | |
|-----------------------------|--|------|---------------------|------|
| 2.1. Manufacturer: | DEKA Research Inc. | | | |
| 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. | | | |
| 2.5. Power Source: | 120 Volts, 60 Hz | | | |
| 2.6. Hardware Revs.: | UIM ESN | 3-02 | QPM - Top Left | 3-01 |
| | SOM | 3-03 | QPM - Top Middle | 3-01 |
| | CCB | 3-02 | QPM - Top Right | 3-01 |
| | IO Board | 3-04 | QPM - Mid Left | 3-01 |
| | Easy Access Reader | 1-04 | QPM - Mid Middle | 3-01 |
| | EAR Antenna Board | 1-01 | QPM - Mid Right | 3-01 |
| | ADA Keypad | | QPM - Bottom Left | 3-01 |
| | PSM | 3-00 | QPM - Bottom Middle | 3-01 |
| | Main | 3-00 | QPM - Bottom Right | 3-01 |
| | Backplane | 1-03 | QPM - NNS | 3-01 |
| | HFCS FCM | 3-01 | Shelf - Top | 1-08 |
| | Carb FCM | 3-00 | Shelf - Middle | 1-08 |
| | Water FCM | 3-01 | Shelf - Bottom | 1-08 |

2.7. Software Rev.: 6.0.15

2.8. EMC Modifications: The power line filter was changed from Corcom model 15EEJ1 to Corcom model 15EJT1. The cable from the processor board to the front panel display was changed from and unshielded to shielded version and its shield was bonded to the chassis ground.

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3. Product Configuration

3.1. Support Equipment

| Device | Manufacturer | Model | Serial No. | Comment |
|----------------------|--------------|-------|------------|---------|
| No Support Equipment | | | | |

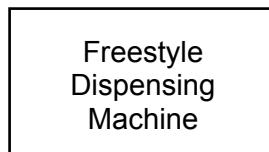
3.2. Cables

| 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 switch 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 | MY4510449 | 7/09/2010 |
| Microwave Preamp | Hewlett Packard | 8449B | 3008A01323 | 9/22/2010 |
| EMI Receiver | Hewlett Packard | 8546A | MY4510449 | 10/28/2010 |
| LISN | EMCO | 3825/2 | 9109-1860 | 7/7/2010 |
| Bilog Antenna | Com-Power | AC-220 | 25509 | 8/6/2010 |
| Horn Antenna | Electro-Metrics | EM-6961 | 6337 | 7/22/2010 |
| Band Pass Filter | Mini-Circuits | VHP-16 | 0341 | 11/27/2010 |

4.2. Measurement & Equipment Setup

| | |
|--------------------------------------|--|
| Test Dates: | 10/12/2009 - 2/11/2010 |
| Test Engineers: | Larry Stillings Brian Breault |
| Normal Site Temperature (15 - 35°C): | 21.6 |
| Relative Humidity (20 -75%RH): | 35 |
| Frequency Range: | 30 MHz to 9.6 GHz |
| Measurement Distance: | 3 Meters |
| EMI Receiver IF Bandwidth: | 100 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 in 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. Choice of Operating Frequencies

The Freestyle Dispensing Machine cartridges employ 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:

- Low Channel – 902.250 MHz
- Middle Channel – 915.590 MHz
- High Channel – 927.750 MHz

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5. Measurement Summary

| Test Requirement | FCC Part 15.247 Reference | IC RSS-210 Reference | Test Report Section | Result | Comment |
|---|---------------------------|----------------------|---------------------|-----------|--------------------------|
| Antenna Requirement | 15.203 | N/A | 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 | N/A | | | |
| 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 | 6.9 | Compliant | |

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6. Measurement Data

6.1. 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.

Status: The unit under test employs an internal antenna which is non-user accessible.

6.2. 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.

6.2.1. 20 dB Bandwidth

| Channel | Frequency (MHz) | 20 dB Bandwidth (kHz) | Maximum 20 dB Bandwidth (kHz) | Result |
|---------|-----------------|-----------------------|-------------------------------|-----------|
| Low | 902.250 | 136.0 | 250 | Compliant |
| Mid | 915.500 | 135.5 | 250 | Compliant |
| High | 927.750 | 132.5 | 250 | Compliant |

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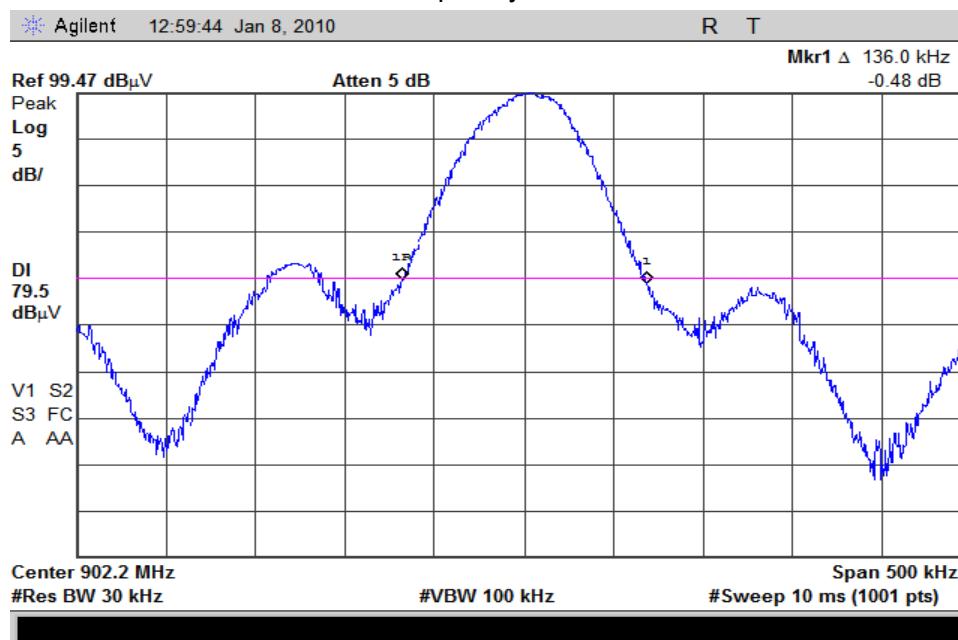
Issue Date: 3/10/2010

6. Measurement Data (continued)

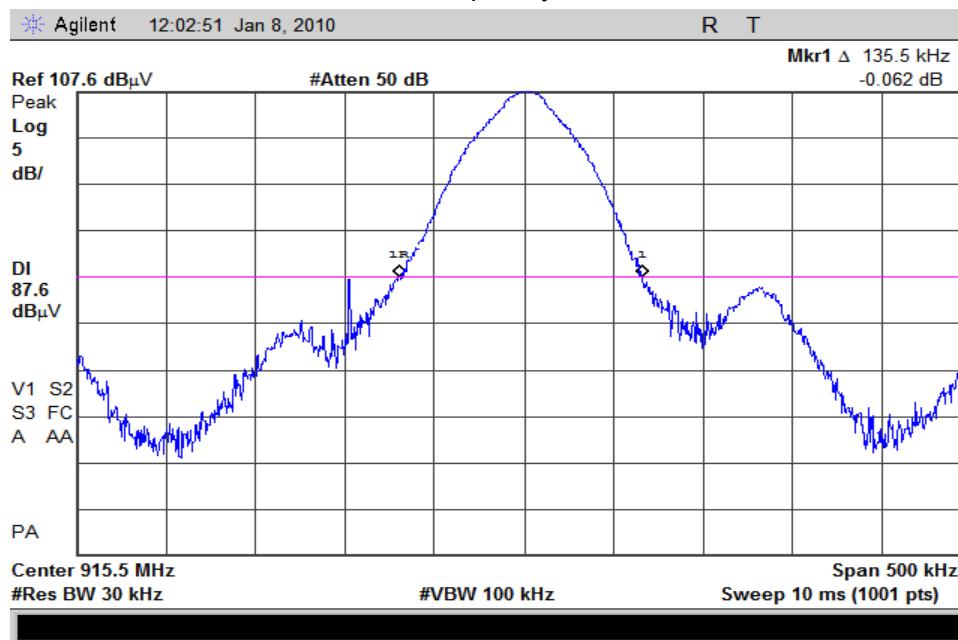
6.2. Frequency Hopping Requirements (Section 15.247 (a), A.8.1(c)) (continued)

6.2.1. 20 dB Bandwidth (continued)

6.2.1.1. 20 dB Bandwidth – Low Frequency



6.2.1.2. 20 dB Bandwidth – Middle Frequency



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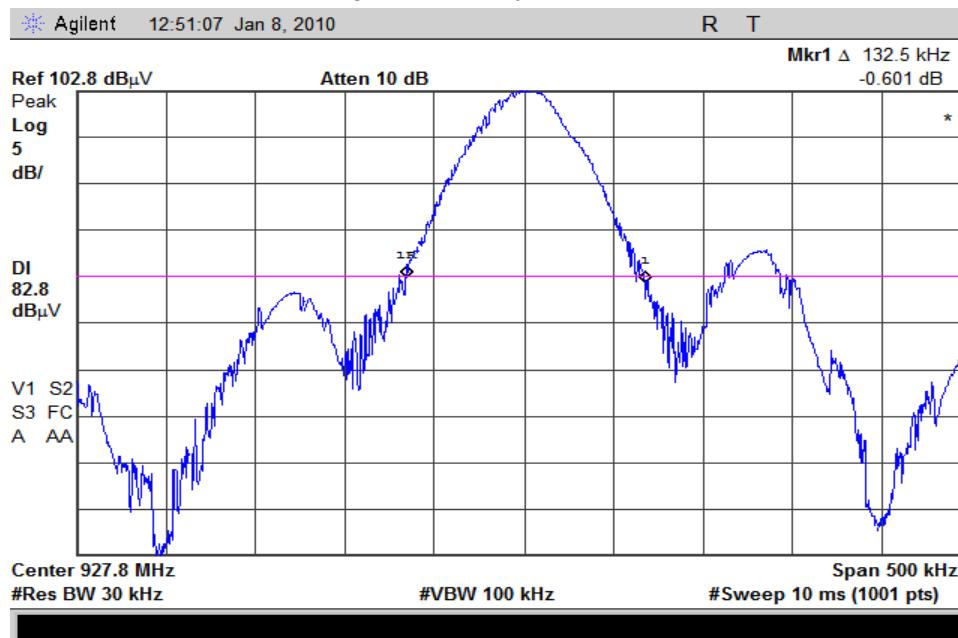
Issue Date: 3/10/2010

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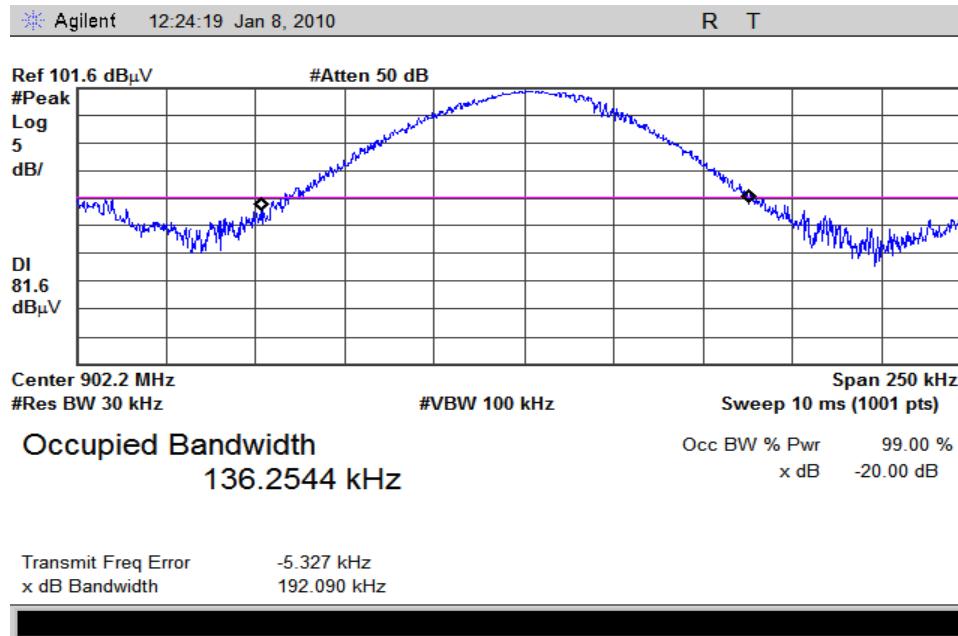
6.2. Frequency Hopping Requirements (Section 15.247 (a), A.8.1(c)) (continued)

6.2.1. 20 dB Bandwidth (continued)

6.2.1.3. 20 dB Bandwidth – High Frequency



6.2.1.4. 99% Bandwidth – Low Frequency



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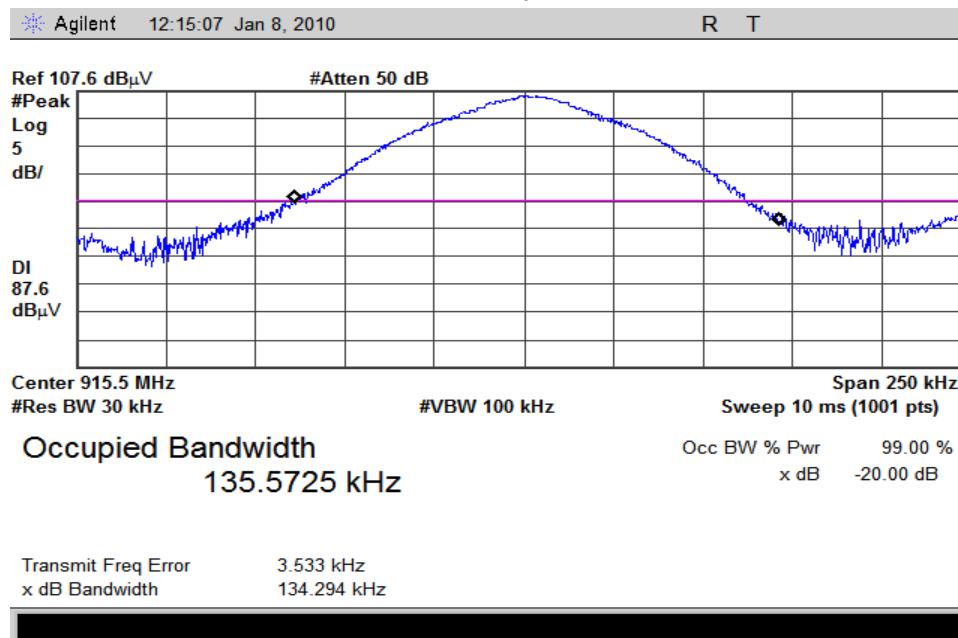
Issue Date: 3/10/2010

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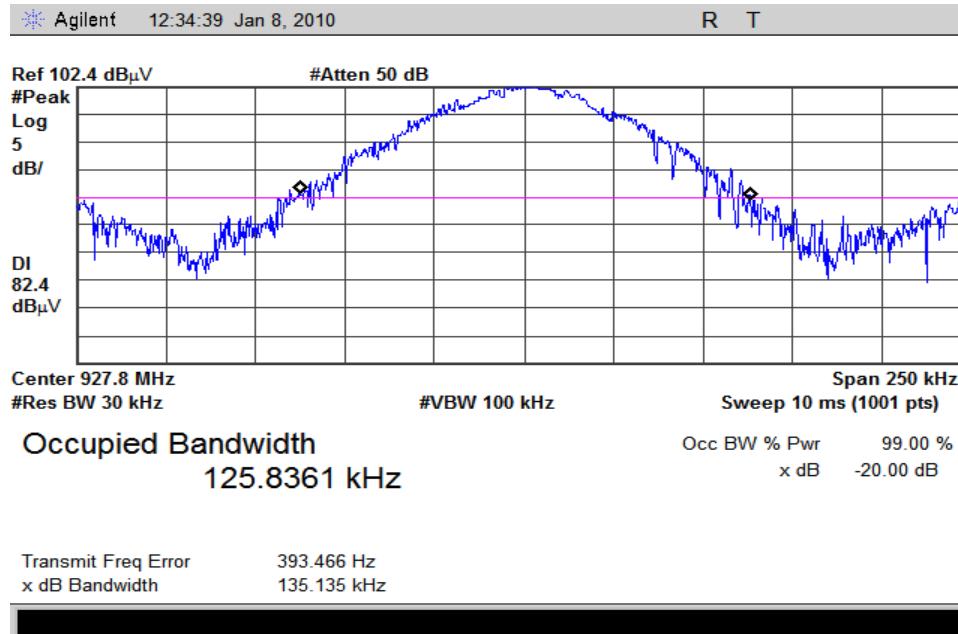
6.2. Frequency Hopping Requirements (Section 15.247 (a), A.8.1(c)) (continued)

6.2.1. 20 dB Bandwidth (continued)

6.2.1.5. 99% Bandwidth – Middle Frequency



6.2.1.6. 99% Bandwidth – High Frequency



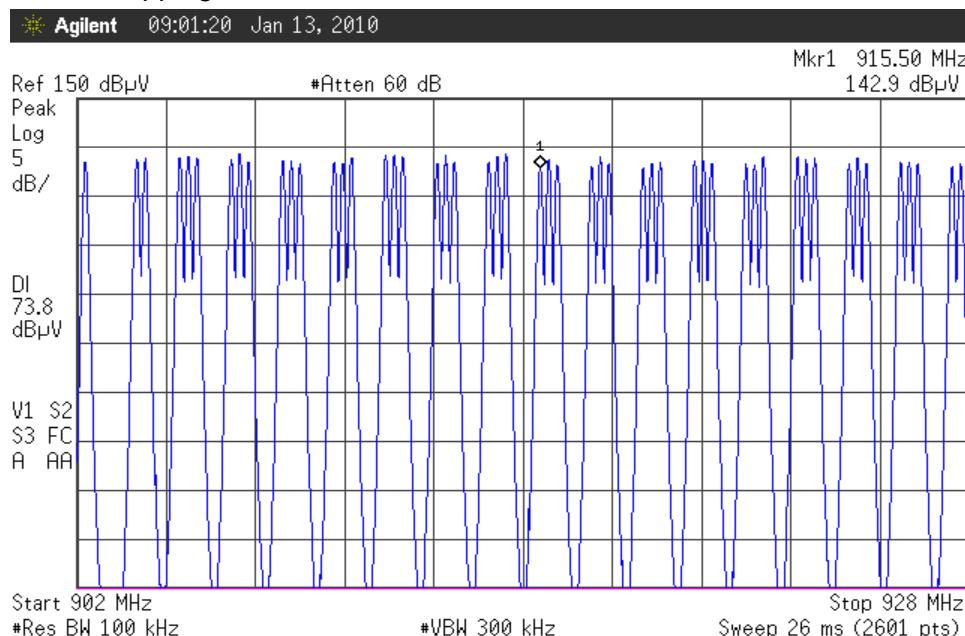
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6. Measurement Data (continued)

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

6.2.2. Number of Hopping Channels = 50



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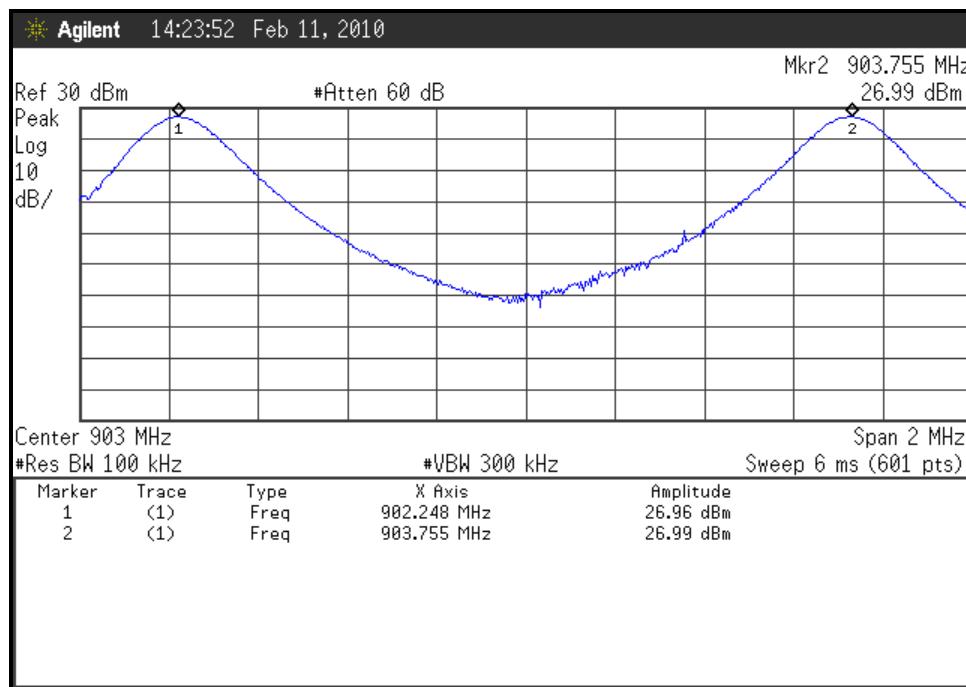
6. Measurement Data (continued)

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

6.2.3. Channel Separation

| Channel | Channel Pair | Channel Separation (MHz) | Required Channel Separation (MHz) | Result |
|---------|--------------|--------------------------|-----------------------------------|-----------|
| Low | 902.250 | 1.50 | 0.136 | Compliant |
| | 903.750 | | | |
| Middle | 915.500 | 0.25 | 0.136 | Compliant |
| | 915.750 | | | |
| High | 927.50 | 0.25 | 0.136 | Compliant |
| | 927.750 | | | |

6.2.3.1. Channel Separation - Low Channels



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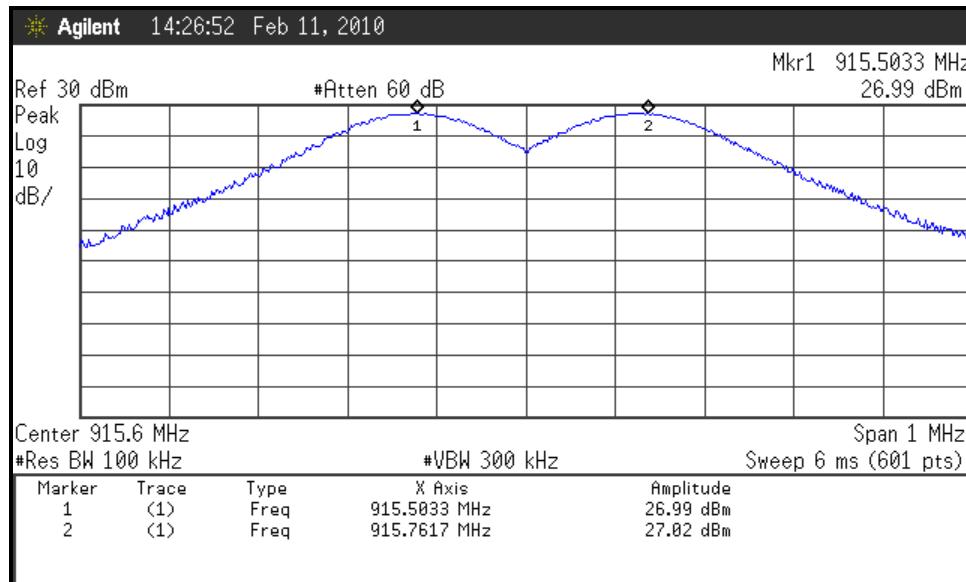
Issue Date: 3/10/2010

6. Measurement Data (continued)

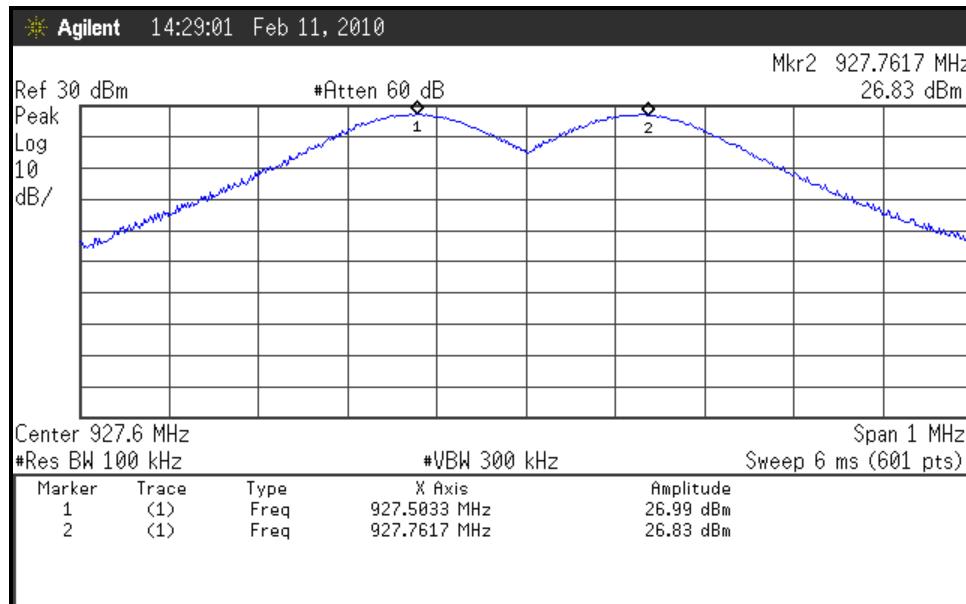
6.2. Frequency Hopping Requirements (Section 15.247 (a), A.8.1(c)) (continued)

6.2.3. Channel Separation

6.2.3.2. Channel Separation - Middle Channels



6.2.3.3. Channel Separation - High Channels



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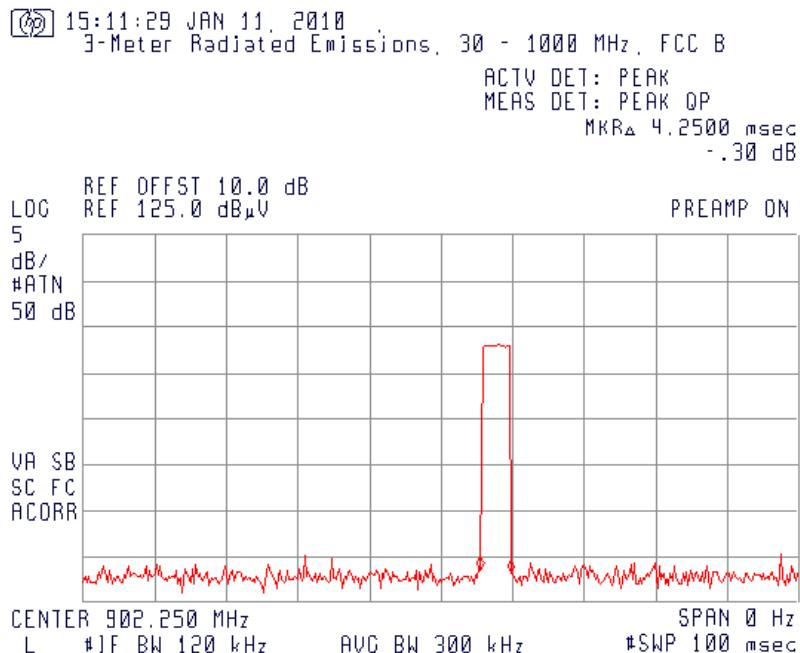
6. Measurement Data (continued)

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

6.2.4. 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 | 0.00425 | 0.00425 | 0.4 | Compliant |
| Middle | 915.500 | 0.00425 | 0.00425 | 0.4 | Compliant |
| High | 927.750 | 0.00425 | 0.00425 | 0.4 | Compliant |

6.2.4.1. Pulse Width - Low Channel



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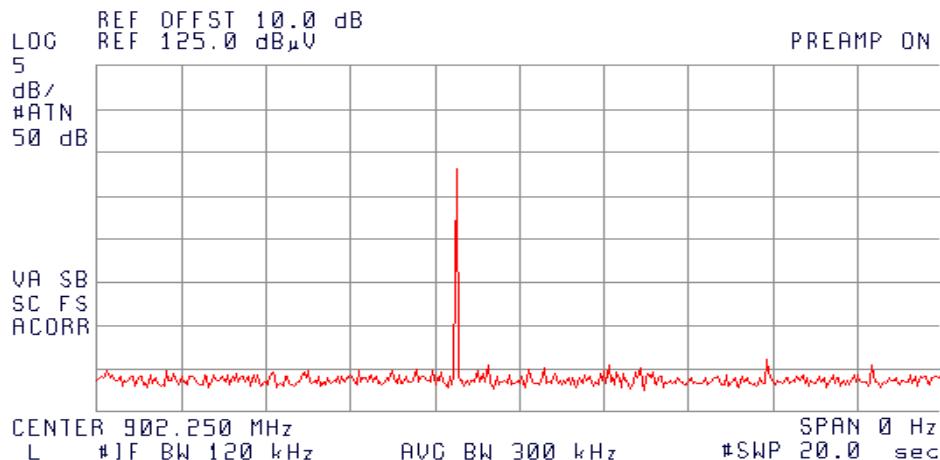
6. Measurement Data (continued)

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

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

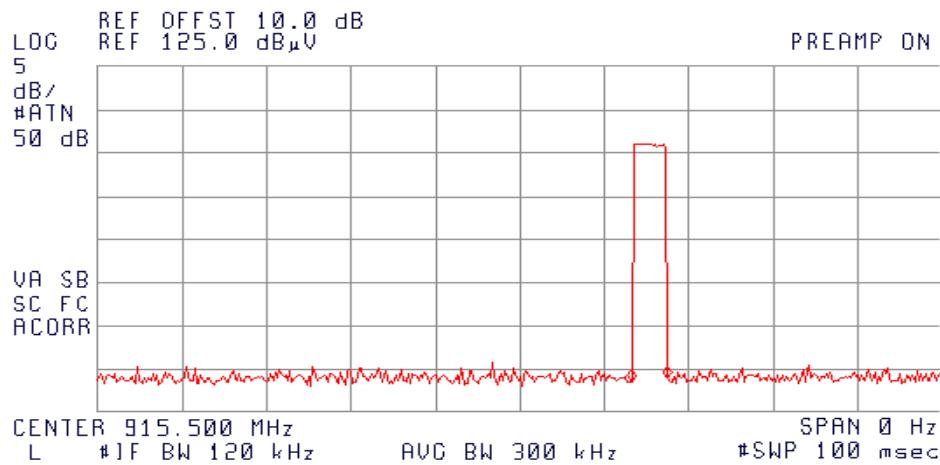
6.2.4.2. Pulses per 20 Second Period - Low Channel

15:21:51 JAN 11, 2010
 3-Meter Radiated Emissions, 30 - 1000 MHz, FCC B
 ACTV DET: PEAK
 MEAS DET: PEAK QP



6.2.4.3. Pulse Width - Middle Channel

15:15:27 JAN 11, 2010
 3-Meter Radiated Emissions, 30 - 1000 MHz, FCC B
 ACTV DET: PEAK
 MEAS DET: PEAK QP
 MKR_A 4.2500 msec
 .23 dB



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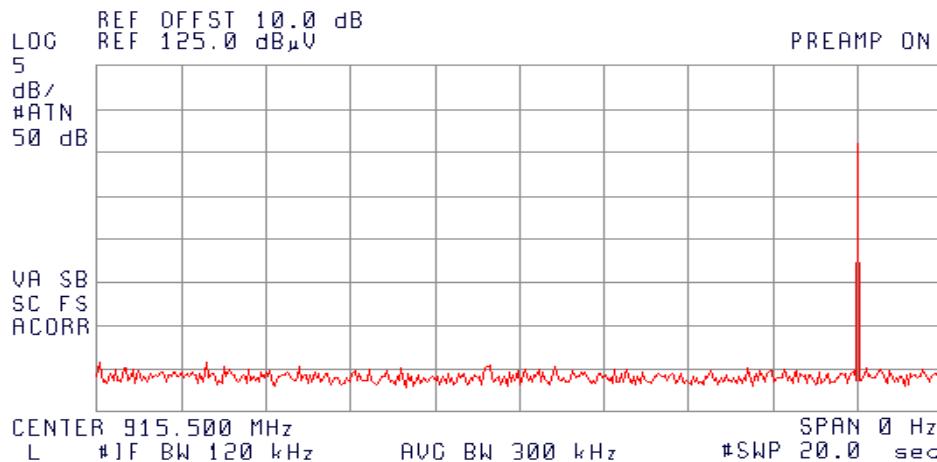
6. Measurement Data (continued)

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

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

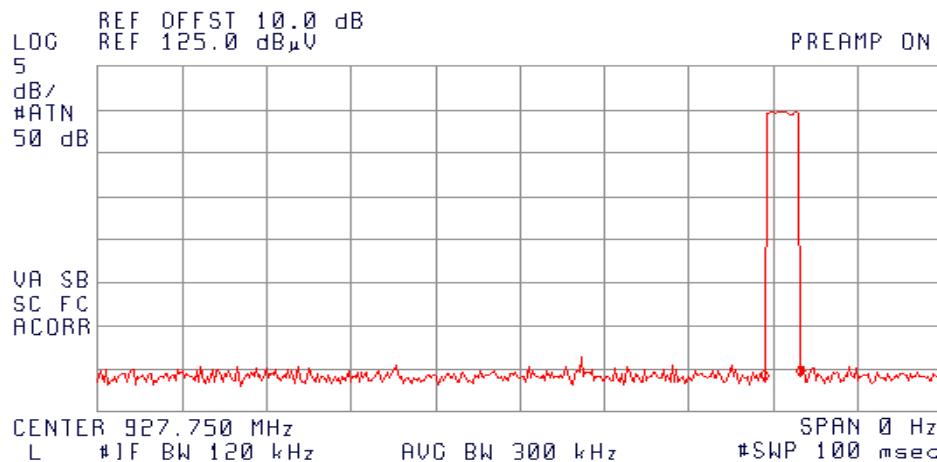
6.2.4.4. Pulses per 20 Second Period - Middle Channel

15:25:13 JAN 11, 2010
 3-Meter Radiated Emissions, 30 - 1000 MHz, FCC B
 ACTV DET: PEAK
 MEAS DET: PEAK QP



6.2.4.5. Pulse Width - High Channel

15:18:45 JAN 11, 2010
 3-Meter Radiated Emissions, 30 - 1000 MHz, FCC B
 ACTV DET: PEAK
 MEAS DET: PEAK QP
 MKR_A 4.2500 msec
 .67 dB



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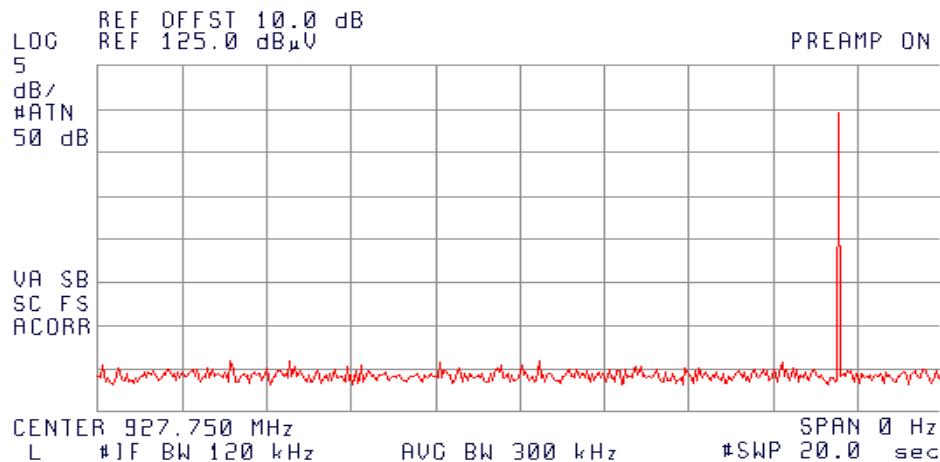
6. Measurement Data (continued)

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

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

6.2.4.6. Pulses per 20 Second Period - High Channel

15:26:45 JAN 11, 2010
3-Meter Radiated Emissions, 30 - 1000 MHz, FCC B
ACTV DET: PEAK
MEAS DET: PEAK DP



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6. Measurement Data (continued)

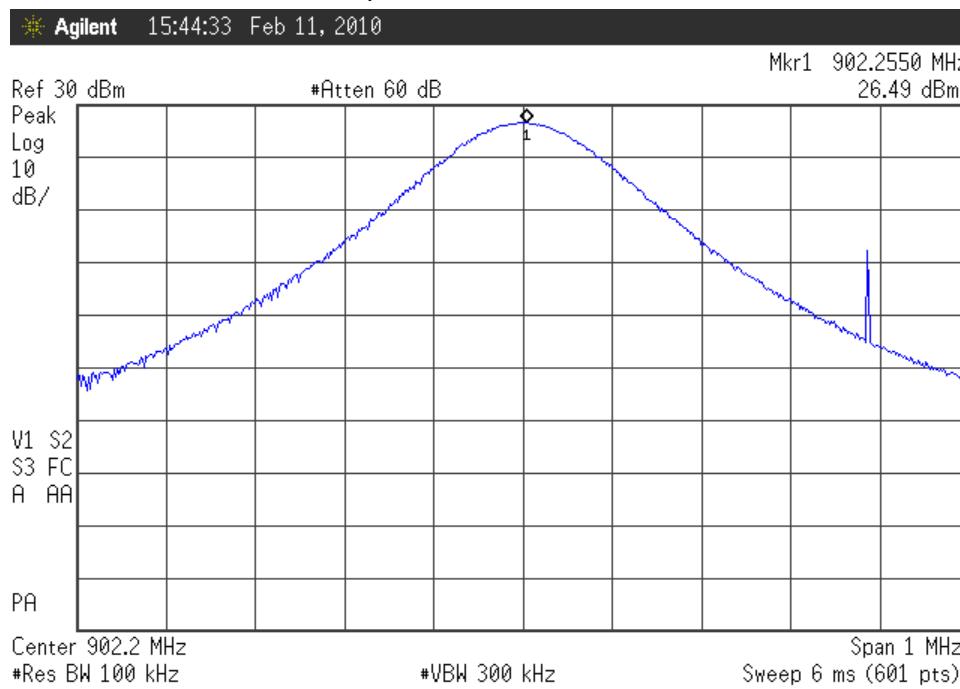
6.3. Maximum Peak Conducted Output Power (Section 15.247 (b), A.8.4)

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 | 0.45 | 1 | Compliant |
| Middle | 915.500 | 0.48 | 1 | Compliant |
| High | 927.750 | 0.47 | 1 | Compliant |

6.3.1. Maximum Peak Conducted Output Power – Low Channel



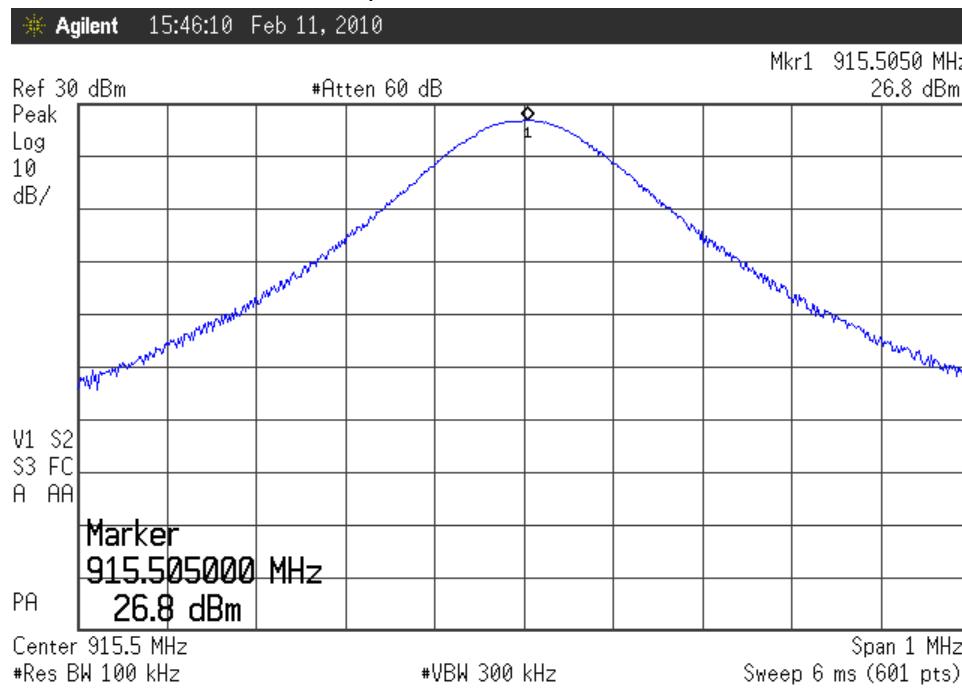
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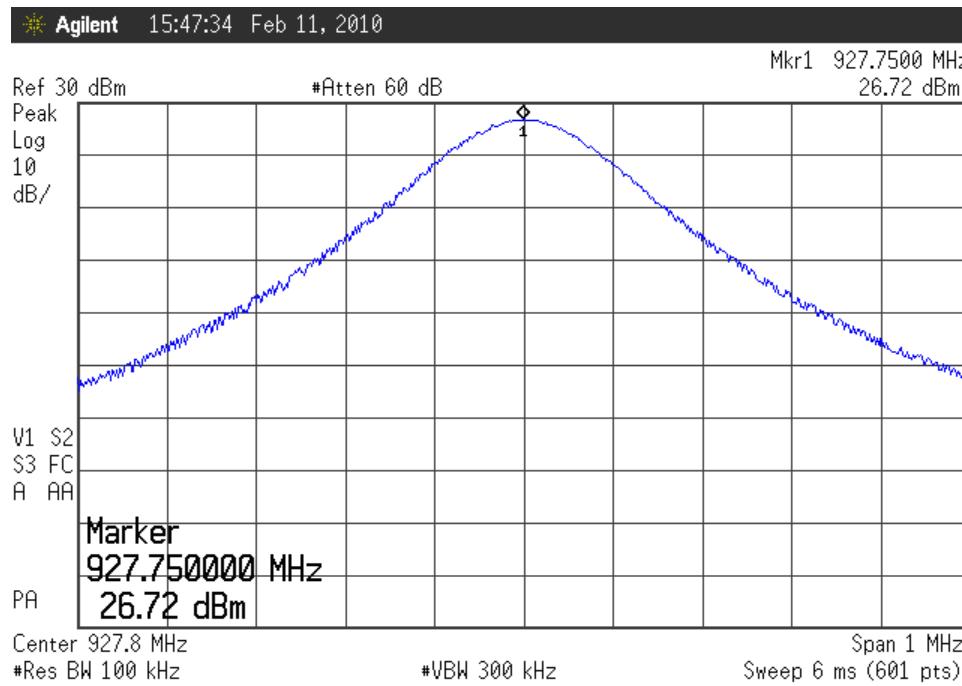
6. Measurement Data (continued)

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

6.3.2. Maximum Peak Conducted Output Power – Middle Channel



6.3.3. Maximum Peak Conducted Output Power – High Channel



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6. Measurement Data (continued)

6.4. 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.

6.5. 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.

6.5.1. Band Edge Measurements

Lower Band Edge

| Lowest Channel (MHz) | Measured Power (dBm) | Band Edge Frequency (MHz) | Measured Power (dBm) | Requirement (-20 dB) | Margin (dB) | Result |
|----------------------|----------------------|---------------------------|----------------------|----------------------|-------------|-----------|
| | Peak | | Peak | Peak | | |
| 902.250 | 26.64 | 902 | -2.938 | 6.64 | -9.58 | Compliant |

Upper Band Edge

| Highest Channel (MHz) | Measured Power (dBm) | Band Edge Frequency (MHz) | Measured Power (dBm) | Requirement (-20 dB) | Margin (dB) | Result |
|-----------------------|----------------------|---------------------------|----------------------|----------------------|-------------|-----------|
| | Peak | | Peak | Peak | | |
| 927.750 | 26.98 | 928 | -0.13 | 6.98 | -7.11 | Compliant |

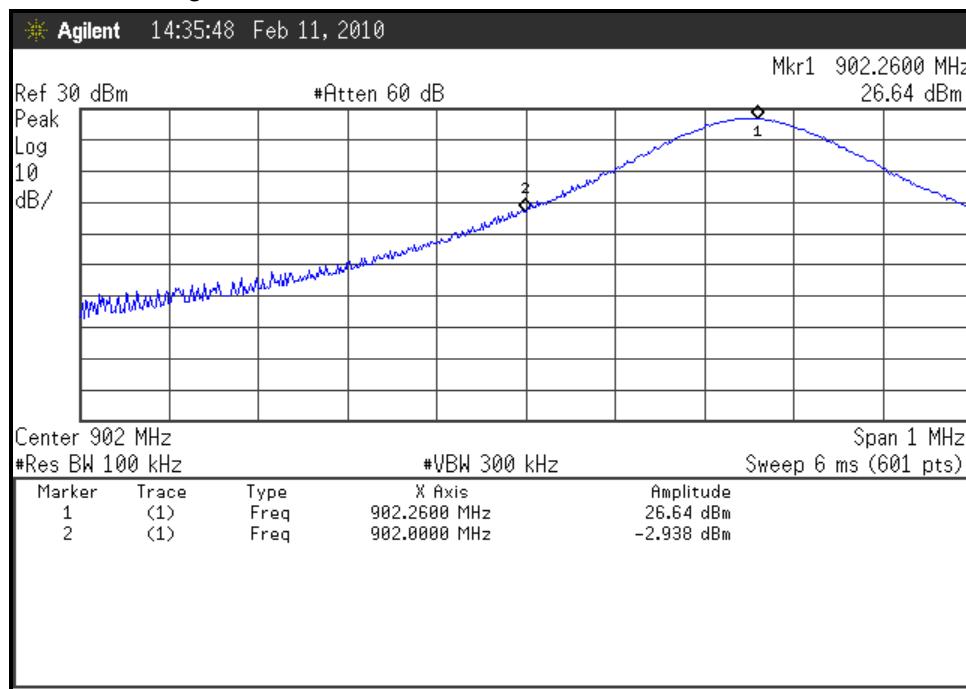
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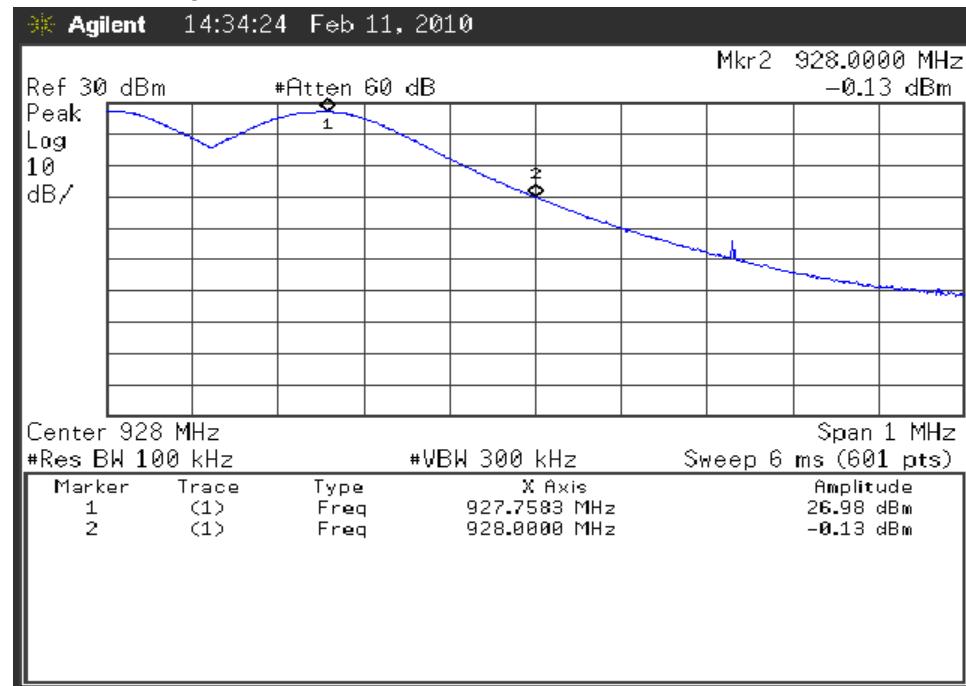
6. Measurement Data (continued)

6.5. Emissions Outside the Frequency Band (15.247 (d), RSS GEN 4.9) (continued)

6.5.1.1. Lower Band Edge



6.5.1.2. Upper Band Edge



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6. Measurement Data (continued)

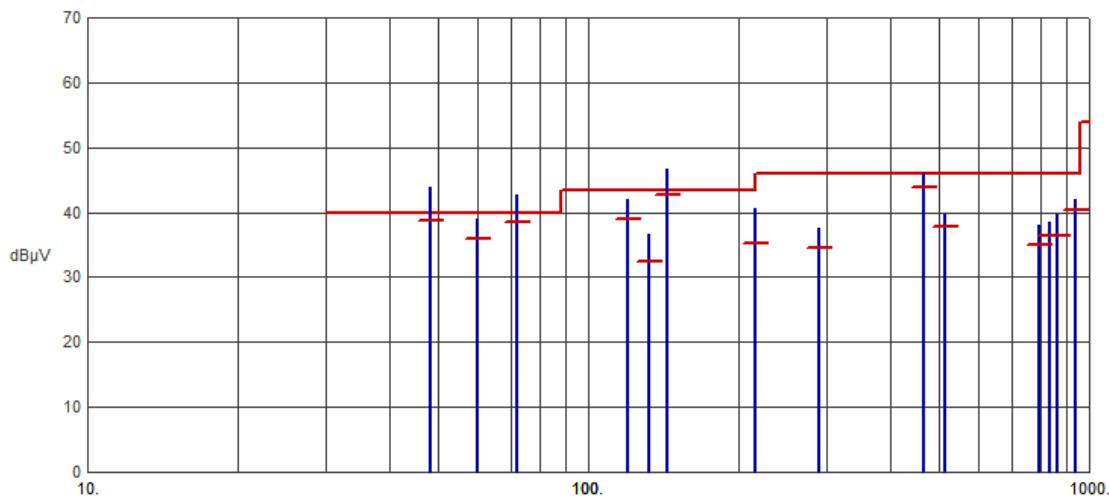
6.6. Spurious Radiated Emissions (30 MHz to 40 GHz)

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

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

| Frequency Range (MHz) | Distance (Meters) | Limit (dB μ V/m) |
|-----------------------|-------------------|----------------------|
| 30 to 88 | 3 | 40.0 |
| 88 to 216 | 3 | 43.5 |
| 216 to 960 | 3 | 46.0 |
| >960 | 3 | 54.0 |

6.6.2. Radiated Emissions, Horizontal Polarity

Test No.: 472-09, Radiated Emissions - Horizontal Polarity
FCC, Class B


| Frequency (MHz) | Pk Amp (dB μ V/m) | QP Amp (dB μ V/m) | QP Limit (dB μ V/m) | Margin (dB) | Ant Ht (cm) | Table (Deg) | Comments |
|-----------------|-----------------------|-----------------------|-------------------------|-------------|-------------|-------------|----------|
| 48.4442 | 43.92 | 38.79 | 40.00 | -1.21 | N/A | N/A | |
| 60.0358 | 39.04 | 35.99 | 40.00 | -4.01 | N/A | N/A | |
| 72.0280 | 42.75 | 38.52 | 40.00 | -1.48 | N/A | N/A | |
| 120.0915 | 41.96 | 39.07 | 43.50 | -4.43 | N/A | N/A | |
| 132.1162 | 36.74 | 32.36 | 43.50 | -11.14 | N/A | N/A | |
| 143.9796 | 46.78 | 42.73 | 43.50 | -.77 | N/A | N/A | |
| 215.9704 | 40.62 | 35.29 | 43.50 | -8.21 | N/A | N/A | |
| 287.9847 | 37.62 | 34.63 | 46.00 | -11.37 | N/A | N/A | |
| 468.4193 | 46.02 | 43.93 | 46.00 | -2.07 | N/A | N/A | |
| 516.4831 | 39.66 | 37.69 | 46.00 | -8.31 | N/A | N/A | |
| 792.0067 | 38.14 | 35.09 | 46.00 | -10.91 | N/A | N/A | |
| 832.0020 | 38.39 | 36.42 | 46.00 | -9.58 | N/A | N/A | |
| 863.9930 | 39.56 | 36.36 | 46.00 | -9.64 | N/A | N/A | |
| 935.9902 | 42.11 | 40.43 | 46.00 | -5.57 | N/A | N/A | |

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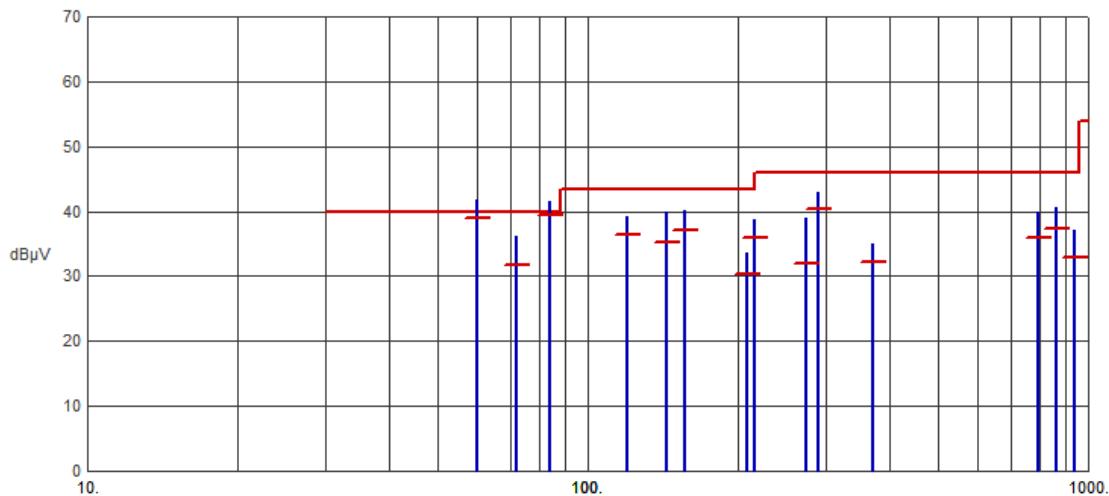
6. Measurement Data (continued)

6.6. Spurious Radiated Emissions (30 MHz to 40 GHz)

6.6.3. Radiated Emissions, Vertical Polarity

Test No.: 472-09, Radiated Emissions - Vertical Polarity

FCC, Class B



| Frequency (MHz) | Pk Amp (dB μ V/m) | QP Amp (dB μ V/m) | QP Limit (dB μ V/m) | Margin (dB) | Ant Ht (cm) | Table (Deg) | Comments |
|-----------------|-----------------------|-----------------------|-------------------------|-------------|-------------|-------------|----------|
| 60.0411 | 41.70 | 38.92 | 40.00 | -1.08 | N/A | N/A | |
| 72.0444 | 36.14 | 31.75 | 40.00 | -8.25 | N/A | N/A | |
| 84.0668 | 41.58 | 39.54 | 40.00 | -.46 | N/A | N/A | |
| 120.0947 | 39.29 | 36.31 | 43.50 | -7.19 | N/A | N/A | |
| 143.9948 | 39.99 | 35.33 | 43.50 | -8.17 | N/A | N/A | |
| 155.9883 | 40.09 | 37.07 | 43.50 | -6.43 | N/A | N/A | |
| 207.9878 | 33.61 | 30.31 | 43.50 | -13.19 | N/A | N/A | |
| 216.0012 | 38.81 | 36.02 | 46.00 | -9.98 | N/A | N/A | |
| 273.2097 | 38.94 | 31.89 | 46.00 | -14.11 | N/A | N/A | |
| 288.0072 | 42.82 | 40.33 | 46.00 | -5.67 | N/A | N/A | |
| 372.3342 | 34.91 | 32.28 | 46.00 | -13.72 | N/A | N/A | |
| 792.0028 | 39.80 | 36.05 | 46.00 | -9.95 | N/A | N/A | |
| 863.9807 | 40.52 | 37.36 | 46.00 | -8.64 | N/A | N/A | |
| 935.9672 | 37.02 | 32.85 | 46.00 | -13.15 | N/A | N/A | |

6.6.4. 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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6. Measurement Data (continued)

6.7. 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.

6.7.1. Spurious Radiated Emissions (Harmonic Measurements) Test Results

| Frequency (MHz) | Peak (dB μ V/m) ¹ | Avg (dB μ V/m) ¹ | Limit (dB) | Margin (dB) | Pol (H/V) | Ht (cm) | TT Pos (Deg) | Notes | Results |
|-----------------|----------------------------------|---------------------------------|------------|-------------|-----------|---------|--------------|--------------|-----------|
| 2706.75 | 66.87 | 46.87 | 54 | -7.13 | H | 101 | 0 | Low Channel | Compliant |
| 2746.50 | 65.44 | 45.44 | 54 | -8.56 | H | 119 | 20 | Mid Channel | Compliant |
| 2783.25 | 61.39 | 41.39 | 54 | -12.61 | V | 100 | 0 | High Channel | Compliant |
| 3662.00 | 67.06 | 47.06 | 54 | -6.94 | V | 100 | 0 | Mid Channel | Compliant |
| 3711.00 | 59.37 | 39.37 | 54 | -14.63 | V | 100 | 10 | High Channel | Compliant |
| 4511.25 | 56.46 | 36.46 | 54 | -17.54 | V | 100 | 0 | Low Channel | Compliant |
| 4577.50 | 60.89 | 40.89 | 54 | -13.11 | H | 126 | 300 | Mid Channel | Compliant |
| 4638.75 | 58.10 | 38.10 | 54 | -15.90 | V | 100 | 0 | High Channel | Compliant |
| 5413.50 | 56.43 | 36.43 | 54 | -17.57 | H | 100 | 0 | Low Channel | Compliant |
| 7324.00 | 60.08 | 40.08 | 54 | -13.92 | V | 100 | 0 | Mid Channel | Compliant |
| 7422.00 | 59.65 | 39.65 | 54 | -14.35 | V | 100 | 0 | High Channel | Compliant |
| 8120.25 | 57.90 | 37.90 | 54 | -16.10 | V | 100 | 0 | Low Channel | Compliant |
| 8239.50 | 60.62 | 40.62 | 54 | -13.38 | V | 100 | 0 | Mid Channel | Compliant |
| 8349.75 | 59.63 | 39.63 | 54 | -14.37 | V | 100 | 0 | High Channel | Compliant |
| 9022.50 | 58.14 | 38.14 | 54 | -15.86 | H | 100 | 0 | Low Channel | Compliant |
| 9155.00 | 60.28 | 40.28 | 54 | -13.72 | V | 100 | 0 | Mid Channel | Compliant |

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

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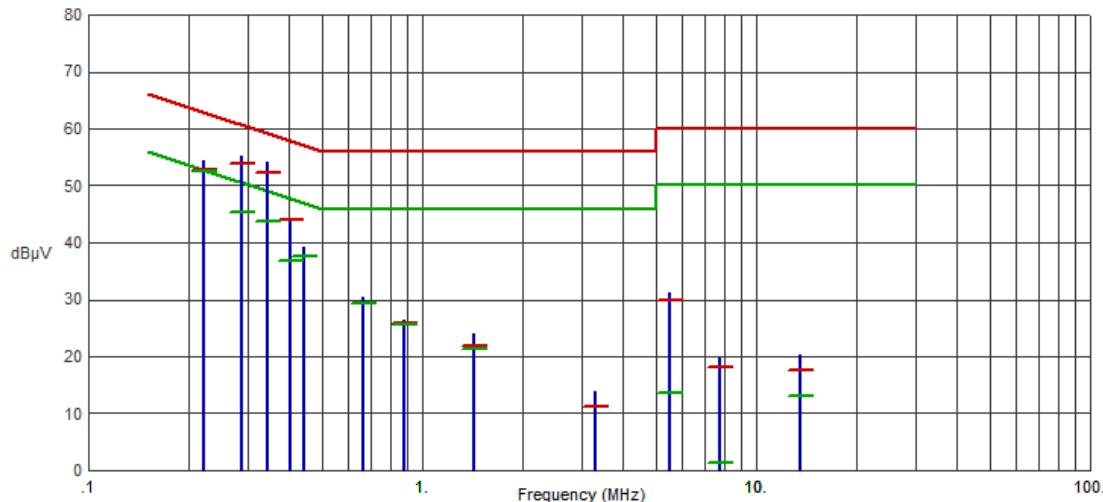
6. Measurement Data (continued)

6.8. Conducted Emissions

6.8.1. 120 Volts, 60 Hz Phase

Test No.: 472-09, 120 Volts, 60 Hz Phase

FCC, Class B



| Frequency (MHz) | Pk Amp (dB μ V) | QP Amp (dB μ V) | QP Limit (dB μ V) | QP Margin (dB) | Avg Amp (dB μ V) | Avg Limit (dB μ V) | Avg Margin (dB) | Comments |
|-----------------|---------------------|---------------------|-----------------------|----------------|----------------------|------------------------|-----------------|----------|
| .2205 | 54.30 | 52.83 | 62.80 | -9.97 | 52.65 | 52.80 | -0.15 | |
| .2876 | 55.24 | 53.97 | 60.59 | -6.62 | 45.39 | 50.59 | -5.20 | |
| .3442 | 54.19 | 52.16 | 59.10 | -6.94 | 43.63 | 49.10 | -5.47 | |
| .4019 | 44.29 | 43.97 | 57.81 | -13.84 | 36.86 | 47.81 | -10.95 | |
| .4409 | 39.27 | 37.61 | 57.04 | -19.43 | 37.47 | 47.04 | -9.57 | |
| .6620 | 30.28 | 29.46 | 56.00 | -26.54 | 29.35 | 46.00 | -16.65 | |
| .8820 | 26.37 | 25.81 | 56.00 | -30.19 | 25.71 | 46.00 | -20.29 | |
| 1.4329 | 24.01 | 21.94 | 56.00 | -34.06 | 21.22 | 46.00 | -24.78 | |
| 3.3066 | 13.98 | 11.32 | 56.00 | -44.68 | -4.24 | 46.00 | -50.24 | |
| 5.4951 | 31.30 | 29.90 | 60.00 | -30.10 | 13.60 | 50.00 | -36.40 | |
| 7.7477 | 19.85 | 18.05 | 60.00 | -41.95 | 1.40 | 50.00 | -48.60 | |
| 13.5641 | 20.36 | 17.70 | 60.00 | -42.30 | 12.94 | 50.00 | -37.06 | |

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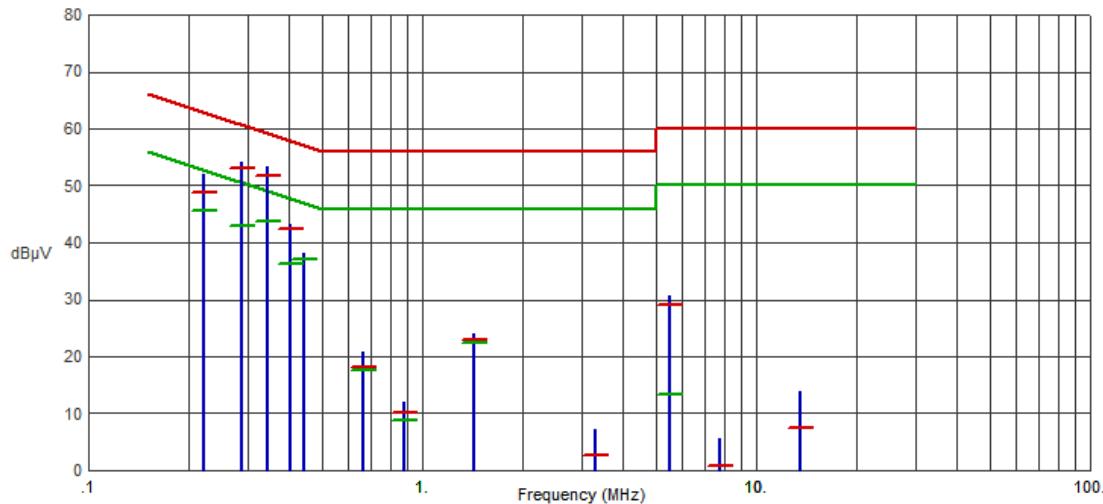
6. Measurement Data (continued)

6.8. Conducted Emissions

6.8.2. 120 Volts, 60 Hz Neutral

Test No.: 472-09, 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 |
|-----------------|---------------|---------------|-----------------|----------------|----------------|------------------|-----------------|----------|
| .2205 | 52.08 | 48.76 | 62.80 | -14.04 | 45.57 | 52.80 | -7.23 | |
| .2876 | 54.26 | 53.01 | 60.59 | -7.58 | 42.86 | 50.59 | -7.73 | |
| .3442 | 53.45 | 51.65 | 59.10 | -7.45 | 43.86 | 49.10 | -5.24 | |
| .4019 | 43.29 | 42.30 | 57.81 | -15.51 | 36.17 | 47.81 | -11.64 | |
| .4409 | 38.11 | 37.00 | 57.04 | -20.04 | 36.94 | 47.04 | -10.10 | |
| .6620 | 20.74 | 18.21 | 56.00 | -37.79 | 17.64 | 46.00 | -28.36 | |
| .8820 | 12.04 | 10.01 | 56.00 | -45.99 | 8.68 | 46.00 | -37.32 | |
| 1.4329 | 24.03 | 23.05 | 56.00 | -32.95 | 22.40 | 46.00 | -23.60 | |
| 3.3066 | 7.28 | 2.58 | 56.00 | -53.42 | -7.08 | 46.00 | -53.08 | |
| 5.4951 | 30.75 | 29.18 | 60.00 | -30.82 | 13.20 | 50.00 | -36.80 | |
| 7.7477 | 5.64 | .93 | 60.00 | -59.07 | -5.46 | 50.00 | -55.46 | |
| 13.5641 | 13.87 | 7.45 | 60.00 | -52.55 | -0.06 | 50.00 | -50.06 | |

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6. Measurement Data (continued)

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

Requirement:

| 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) | | |
| 902.250 | 20.0 | 26.49 | -15.0000 | 0.0028037 | 0.0280369 | 1 | Compliant |
| 915.500 | 20.0 | 26.80 | -15.0000 | 0.0030111 | 0.0301113 | 1 | Compliant |
| 927.750 | 20.0 | 26.72 | -15.0000 | 0.0029562 | 0.0295618 | 1 | Compliant |

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

PD = Power Density

OP = DUT Output Power (dBm)

AG = Antenna Gain (dBi)

D = MPE Distance

| | |
|----|---|
| 1. | Reference CFR 2.1093(b): Although the device under test is not a portable device, it is conceivable that the radiating structure(s) of the device can be within 20 centimeters of the body of the user. |
| 2. | Section 6.3 of this test report. |
| 3. | DUT Antenna gain was supplied by the manufacturer. |
| 4. | Power density is calculated from conducted power output 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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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.