Engineering and Testing for EMC and Safety Compliance

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Certification Application Report
FCC Part 15.249 and RSS-210

Test Lab:	Applicant:
Rhein Tech Laboratories, Inc. Tel: 703-689-0368 360 Herndon Parkway Fax: 703-689-2056 Suite 1400 www.rheintech.com Herndon, VA 20170 E-Mail: atcbinfo@rheintech.com	Via One Networks LLC Tel: 212-219-2220 x203 525 Broadway, 5th Floor New York, NY 10012 Contact: Denee Clark

FCC ID/IC	XEZ-1000 / 8390A-1000	**Test Report Date**	October 17, 2009
Platform	Tri-band GSM Handset	**RTL Work Order Number**	2009194
Model	WP8	**RTL Quote Number**	QRTL09-269A
American National Standard Institute	ANSI C63.4: Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz		
FCC Classifications	DXT – Part 15 Low Power Transceiver, RX Verified		
FCC Rule Part	Part 15.249: Operation within the bands 920-928 MHz, 2400-2483.5 MHz and 5725-5875 MHz, and 24.0-24.25 GHz.		
IC Rule Part	RSS-210: Low-power Licence-exempt Radiocommunication Devices (all Frequency Bands): Category 1 Equipment		
Digital Interface Information	Digital Interface was found to be compliant		

Frequency Range (MHz)	**Output Power (W)**	**Frequency Tolerance (ppm)**	**Emission Designator**
2402 – 2480	N/A	N/A	N/A

I, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this test report. No modifications were made to the equipment during testing in order to achieve compliance with these standards. Furthermore, there was no deviation from, additions to, or exclusions from, the applicable parts of FCC Part 2, FCC Part 15, ANSI C63.4, and Industry Canada RSS-210.

Signature: _____ Date: October 17, 2009

Typed/Printed Name: Desmond A. Fraser Position: President

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1 General Information

1.1 Scope

Applicable Standards:

FCC Rules Part 15.249: Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5850 MHz, and 24.0-24.25 GHz.

IC RSS-210 Section A2.9: 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz.

All measurements contained in this application were conducted in accordance with the FCC Rules and Regulations CFR47 and Industry Canada RSS-210.

Note that the EUT is a composite device, and that data in this report pertains to the 2402 – 2480 MHz low power transceiver portion of the EUT. The data for the licensed PCS portion is contained in a separate report.

1.2 Description of EUT

Equipment Under Test	Cellular phone
Model	WP8 2400 MHz frequency hopping, tri-band GSM
Power Supply	3.7 VDC Li-Ion battery
Modulation Type	FHSS
Frequency Range	2402–2480 MHz Frequency Hopping
Antenna Connector Type	Internal
Antenna Type	Internal

1.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 2003).

1.4 Related Submittal(s)/Grant(s)

This is an original application for certification for Via One Networks, LLC. Model: WP8, FCC ID: XEZ-1000, IC: 8390A-1000.

1.5 Modifications

No modifications were required for compliance.

2 Test Information

2.1 Description of Test Modes

In accordance with FCC 15.31(m), and because the EUT utilizes an operating band greater than 10 MHz, the following frequencies were tested.

Table 2-1: Channels Tested for FHSS

Channel	Frequency
Low	2402
Middle	2441
High	2480

2.2 Exercising the EUT

The EUT was provided with various test functions using internal engineer codes to enter channel selection and mode while testing: either a continuous transmit on a specific channel, normal hopping operation using a test set, or receive mode.

There were no deviations from the test standard(s) and/or methods. The test results reported relate only to the item tested.

2.3 Test Result Summary

Table 2-2: Test Result Summary with FCC Rules and Regulations

Standard	Test	Pass/Fail or N/A
FCC 15.249(a)	Radiated Emissions	Pass
FCC 15.209; RSS-Gen	Unintentional/Receiver Radiated Emissions	Pass
FCC 15.207	AC Line Conducted Emissions	Pass
RSS-Gen	99% Bandwidth	Pass

2.4 Test System Details

The test sample was received on June 17, 2009. The FCC identifiers for all applicable equipment, plus descriptions of all cables used in the tested system, are identified in the following tables.

Table 2-3: Equipment Under Test

Part	Manufacturer	Model	Serial Number	FCC ID	Cable Description	RTL Bar Code
Tri-Band Cellular Portable Phone	Via One Networks LLC	WP8	355781020019242	XEZ-1000	N/A	18990
Tri-Band Cellular Portable Phone	Via One Networks LLC	WP8	N/A	XEZ-1000	N/A	19000
Tri-Band Cellular Portable Phone	Via One Networks LLC	WP8	N/A	XEZ-1000	N/A	19002
3.7V Li-ion Battery	Bleu	466X	XD0805504633	N/A	N/A	18995
3.7V Li-ion Battery	BenQ	MNC30	C10737XD004053	N/A	N/A	19003
3.7V Li-ion Battery	BenQ	MNC30	C10819XD002693	N/A	N/A	19005

2.5 Configuration of Tested System

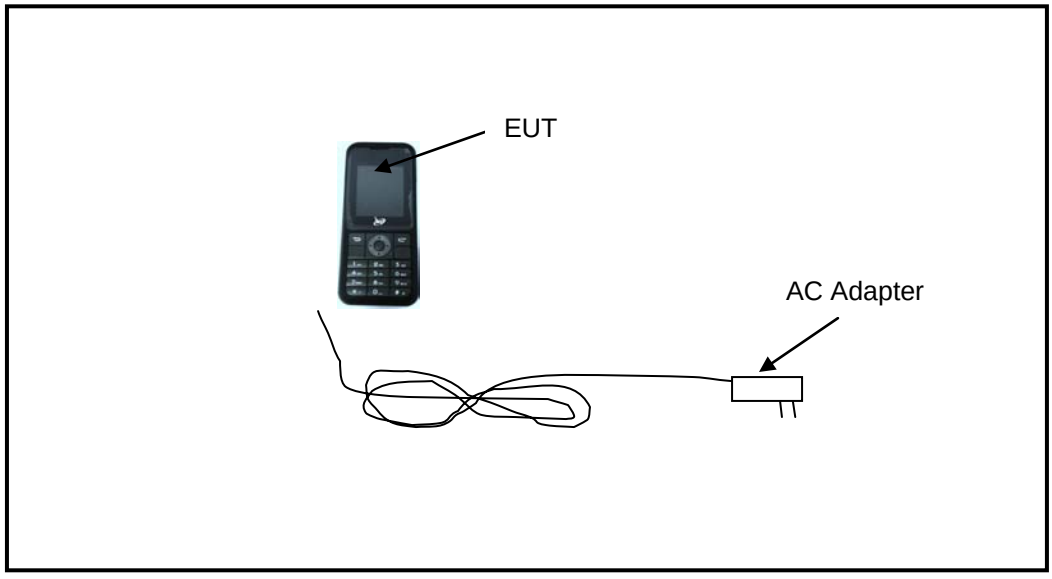


Figure 2-1: Configuration of System Under Test

3 Radiated Emissions - Fundamental – FCC §15.249 & IC RSS-210 §A2.9

3.1 Radiated Fundamental Emissions Test Procedure

Radiated emissions of the fundamentals were tested at three meters, and meet the average limit of 50 mV/m. Peak emissions were also investigated against the requirements of 15.35(b). The EUT was tested in all three orthogonal planes and the lowest, middle and highest frequencies were investigated and maximized; the worst case emissions are shown.

3.2 Radiated Fundamental Emissions Test Data

Table 3-1: Radiated Fundamental Emissions

Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dBm)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
2402	Pk	87.9	-0.8	87.1	114.0	-26.9	Pass
2402	Av	51.7	-0.8	50.9	94.0	-43.1	Pass
2441	Pk	90.1	0.4	90.5	114.0	-23.5	Pass
2441	Av	53.9	0.4	54.3	94.0	-39.7	Pass
2480	Pk	90.3	-0.3	90.0	114.0	-24.0	Pass
2480	Av	54.1	-0.3	53.8	94.0	-40.2	Pass

Note for peak measurements: RBW = VBW = 1 MHz, for average: RBW = 1MHz, VBW = 10 Hz

4 Radiated Emissions – Harmonic/Spurious - FCC §15.209; §15.249(d); RSS-210 §A8.5

As shown in 15.35(b), for frequencies above 1000 MHz, the field strength limits are based on average detector however, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any circumstances of modulation.

4.1 Radiated Emissions Measurement Test Procedure

Before final measurements of radiated emissions were made on the open-field three/ten meter range, the EUT was scanned indoors at one and three meter distances. This was done in order to determine its emissions spectrum signature. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emissions measurements on the open-field range, at each frequency, in order to ensure that maximum emission amplitudes were attained.

Final radiated emissions measurements were made on the three meter, open-field test site. The EUT was placed on a nonconductive turntable 0.8 meters above the ground plane. The spectrum was examined from 9 kHz to the 10^{th} harmonic of the highest fundamental transmitter frequency.

At each frequency, the EUT was rotated 360° and positioned in three dimensions, and the antenna was raised and lowered from 1 to 4 meters in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations. For frequencies between 30 and 1000 MHz, the spectrum analyzer's 6 dB bandwidth was set to 120 kHz, and the analyzer was operated in the CISPR quasi-peak detection mode. For emissions above 1000 MHz, emissions were measured using a minimum resolution bandwidth of 1 MHz. No video filter less than 10 times the resolution bandwidth was used. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report. For the substitution measurements for the cellular and PCS bands, a substitution antenna replaced the EUT and an amplitude was achieved to match the initial analyzer level and was further corrected for comparison to the limit.

4.2 Spurious Radiated Emissions Test Results

No spurious emissions were found which were within 20 dB of the limits; per FCC 15.31(o), no data is being reported.

4.3 Radiated Emissions Test Equipment

Table 4-1: Radiated Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901365	MITEQ	JS4-00102600-41-5P	Amplifier, 0.1-26 GHz, 30 dB gain	N/A	3/4/10
901215	Hewlett Packard	8596EM	Spectrum Analyzer (9 kHz - 12.8 GHz)	3826A00144	10/23/09
900878	Rhein Tech Laboratories	AM3-1197-0005	3 meter antenna mast, polarizing	Outdoor Range 1	Not Required
901426	Insulated Wire Inc.	KPS-1503-3600-KPS	RF cable, 30'	NA	10/17/09
901516	Insulated Wire, Inc.	KPS-1503-2400-KPS-09302008	RF cable, 20'	NA	10/17/09
901517	Insulated Wire Inc.	KPS-1503-360-KPS-09302008	RF cable 36"	NA	10/17/09
901242	Rhein Tech Laboratories	WRT-000-0003	Wood rotating table	N/A	Not Required
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	6/14/10
900321	EMCO	3161-03	Horn Antennas (4 - 8,2 GHz)	9508-1020	6/14/10
900323	EMCO	3160-7	Horn Antennas (8,2 - 12,4 GHz)	9605-1054	6/14/10
900356	EMCO	3160-08	Horn Antenna (12.4 - 18 GHz)	9607-1044	6/14/10
900325	EMCO	3160-9	Horn Antennas (18 - 26.5 GHz)	9605-1051	6/14/10
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	7/31/09

Test Personnel:

Daniel W. Baltzell		July 22, 2009
EMC Test Engineer	Signature	Date Of Test

5 Radiated Emissions – Receive - FCC 15.209; IC RSS-Gen

5.1 Radiated Emissions Measurements

5.1.1 Site and Test Description

Before final radiated emissions measurements were made on the OATS, the EUT was scanned indoors at both one and three meter distances. This was done in order to determine its emission spectrum signal. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emission measurements on the OATS, at each frequency, in order to ensure that maximum emission amplitudes were measured. Final radiated emissions measurements were made on the OATS at a distance of 3 meters. The EUT was placed on a non-conductive turntable. At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the emissions maximum levels. Measurements were taken using both horizontal and vertical antenna polarization. The spectrum analyzer's 6 dB bandwidth was set to 120 kHz, and the analyzer was operated in the quasi-peak detection mode. No video filter less than 10 times the resolution bandwidth was used. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

5.1.2 Field Strength Calculations

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FI\left(dB\mu V/m\right) = SAR\left(dB\mu V\right) + SCF\left(dB/m\right)$$

FI = Field Intensity

SAR = Spectrum Analyzer Reading

SCF = Site Correction Factor

The Site Correction Factor (SCF) used in the above equation is determined empirically, and is expressed in the following equation:

$$SCF\left(dB/m\right) = -PG\left(dB\right) + AF\left(dB/m\right) + CL\left(dB\right)$$

SCF = Site Correction Factor

PG = Pre-Amplifier Gain

AF = Antenna Factor

CL = Cable Loss

The field intensity in microvolts per meter can then be determined according to the following equation:

$$FI\left(\mu V/m\right) = 10^{FI\left(dB\mu V/m\right)/20}$$

For example, assume a signal frequency of 125 MHz has a received level measured as 49.3 dBuV. The total Site Correction Factor (antenna factor plus cable loss minus preamplifier gain) for 125 MHz is –11.5 dB/m. The actual radiated field strength is calculated as follows:

$$49.3dB\mu V - 11.5dB/m = 37.8dB\mu V/m$$

$$10^{37.8/20} = 10^{1.89} = 77.6\mu V/m$$

5.1.3 Test Limits

FCC Class B Radiated Emissions	
Frequency (MHz)	**At 3m (dBμV/m)**
30-88	40.0
88-216	43.5
216-960	46.0
>1000	54

Table 5-1: Radiated Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900905	Rhein Tech Laboratories, Inc.	PR-1040	Amplifier	900905	4/10/10
900791	Chase	CBL6111B	Bilog antenna (30 MHz – 2000 MHz)	N/A	12/12/10
900930	Hewlett Packard	85662A	Spectrum Analyzer Display Section	3144A20839	6/23/10
N/A	Rhein Tech Laboratories, Inc.	Automated Emission Tester	Emissions testing software	Rev. 14.0.2	N/A

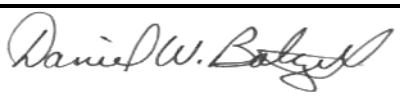
5.1.4 Receiver Radiated Emissions Data

Table 5-2: Receiver Radiated Emissions Test Data

Temperature: 87°F Humidity: 55%										
Emission Frequency (MHz)	**Test Detector**	**Antenna Polarity (H/V)**	**Turntable Azimuth (deg)**	**Antenna Height (m)**	**Analyzer Reading (dBuV)**	**Site Correction Factor (dB/m)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Pass/ Fail**
208.0	Qp	V	0	1.0	41.5	-19.3	22.2	43.5	-21.3	Pass
416.0	Qp	V	0	1.0	24.4	-17.5	6.9	46.0	-39.1	Pass
624.0	Qp	V	0	1.0	22.8	-13.2	9.6	46.0	-36.4	Pass
832.0	Qp	H	0	1.0	17.2	-10.4	6.8	46.0	-39.2	Pass
1040.0	Av	V	0	1.0	26.4	-2.0	24.4	54.0	-29.6	Pass
1248.0	Av	V	0	1.0	25.7	-0.1	25.6	54.0	-28.4	Pass

Note: For average measurements >1000 MHz RBW = 1 MHz, VBW = 10 Hz

Test Personnel:

Daniel Baltzell		July 20, 2009
Test Engineer	Signature	Date Of Test

6 AC Conducted Emissions - FCC Rules and Regulations Part 15 §15.207

6.1 Site and Test Description

The power line conducted emissions measurements were performed in a Series 81 type shielded enclosure manufactured by Rayproof. The EUT was assembled on a wooden table 80 centimeters high. Power was fed to the EUT through a 50-ohm/50 microhenry Line Impedance Stabilization Network (LISN). The EUT LISN was fed power through an A.C. filter box on the outside of the shielded enclosure. The filter box and EUT LISN housing are bonded to the ground plane of the shielded enclosure. A second LISN, the peripheral LISN, provides isolation for the EUT test peripherals. This peripheral LISN was also fed A.C. power. A metal power outlet box, which is bonded to the ground plane and electrically connected to the peripheral LISN, powers the EUT host peripherals.

The spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the EUT LISN was connected to the spectrum analyzer input through a Solar 100 kHz high-pass filter. The filter is used to prevent overload of the spectrum analyzer from noise below 100 kHz. Conducted emission levels were measured on each current-carrying line with the spectrum analyzer operating in the CISPR quasi-peak mode (or peak mode if applicable).

The analyzer's 6 dB bandwidth was set to 9 kHz. Video filter less than 10 times the resolution bandwidth is not used. Average measurements are performed in linear mode using a 10 kHz resolution bandwidth, a 1 Hz video bandwidth, and by increasing the sweep time in order to obtain a calibrated measurement. The emission spectrum was scanned from 150 kHz to 30 MHz. The highest emission amplitudes relative to the appropriate limits were measured and have been recorded.

6.2 Test Limits

Line-Conducted Emissions		
	Limit (dBµV)	
Frequency (MHz)	**Quasi-Peak**	**Average**
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5.00	56	46
5.00 to 30.00	60	50

Table 6-1: Conducted Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900913	Hewlett Packard	85462A	EMI Receiver RF Section, (9 KHz - 6.5 GHz)	3325A00159	6/15/10
900914	Hewlett Packard	85460A	RF Filter Section, (100 KHz - 6.5 GHz)	3330A00107	6/15/10
901082	AFJ International	LS16/110VAC	16A LISN	16010020081	2/23/10

6.3 Conducted Emissions Test Data

Table 6-2: Conducted Emissions Test Data - Neutral Side – Receive Mode

Temperature: 74°F Humidity: 30%									
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)	Pass/ Fail
0.264	Pk	49.5	0.2	49.7	61.3	-11.6	51.3	-1.6	Pass
0.398	Pk	39.1	0.3	39.4	57.9	-18.5	47.9	-8.5	Pass
0.530	Qp	43.4	0.4	43.8	56.0	-12.2	46.0	-2.2	Pass
0.660	Qp	42.3	0.4	42.7	56.0	-13.3	46.0	-3.3	Pass
0.807	Pk	43.6	0.5	44.1	56.0	-11.9	46.0	-1.9	Pass
0.935	Pk	42.2	0.5	42.7	56.0	-13.3	46.0	-3.3	Pass

Table 6-3: Conducted Emissions Test Data – Hot Side – Receive Mode

Temperature: 74°F Humidity: 30%									
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)	Pass/ Fail
0.264	Pk	49.1	0.2	49.3	61.3	-12.0	51.3	-2.0	Pass
0.400	Pk	39.6	0.3	39.9	57.9	-18.0	47.9	-8.0	Pass
0.533	Qp	45.5	0.4	45.9	56.0	-10.1	46.0	-0.1	Pass
0.533	Av	39.4	0.4	39.8	56.0	-16.2	46.0	-6.2	Pass
0.675	Qp	38.1	0.4	38.5	56.0	-17.5	46.0	-7.5	Pass
0.810	Pk	41.8	0.5	42.3	56.0	-13.7	46.0	-3.7	Pass
1.075	Pk	41.6	0.6	42.2	56.0	-13.8	46.0	-3.8	Pass

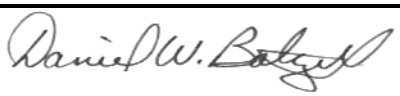
Table 6-4: Conducted Emissions Test Data - Neutral Side – Transmit Mode

Temperature: 74°F Humidity: 30%									
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	QP Limit (dBuV)	QP Margin (dBuV)	AV Limit (dBuV)	AV Margin (dBuV)	Pass/ Fail
0.249	Pk	47.7	0.2	47.9	61.8	-13.9	51.8	-3.9	Pass
0.362	Qp	36.1	0.3	36.4	58.7	-22.3	48.7	-12.3	Pass
0.406	Pk	47.1	0.3	47.4	57.7	-10.3	47.7	-0.3	Pass
0.518	Qp	37.4	0.3	37.7	56.0	-18.3	46.0	-8.3	Pass
0.597	Qp	35.4	0.4	35.8	56.0	-20.2	46.0	-10.2	Pass
1.481	Pk	43.0	0.8	43.8	56.0	-12.2	46.0	-2.2	Pass
3.320	Pk	35.8	1.3	37.1	56.0	-18.9	46.0	-8.9	Pass

Table 6-5: Conducted Emissions Test Data – Hot Side – Transmit Mode

Temperature: 74°F Humidity: 30%									
Emission Frequency (MHz)	**Test Detector**	**Analyzer Reading (dBuV)**	**Site Correction Factor (dB)**	**Emission Level (dBuV)**	**QP Limit (dBuV)**	**QP Margin (dBuV)**	**AV Limit (dBuV)**	**AV Margin (dBuV)**	**Pass/ Fail**
0.260	Pk	49.2	0.2	49.4	61.4	-12.0	51.4	-2.0	Pass
0.405	Pk	46.5	0.3	46.8	57.8	-11.0	47.8	-1.0	Pass
0.521	Qp	40.9	0.3	41.2	56.0	-14.8	46.0	-4.8	Pass
0.535	Qp	39.5	0.4	39.9	56.0	-16.1	46.0	-6.1	Pass
0.945	Qp	36.3	0.5	36.8	56.0	-19.2	46.0	-9.2	Pass
3.320	Pk	35.5	1.3	36.8	56.0	-19.2	46.0	-9.2	Pass

Test Personnel:

Daniel W. Baltzell		July 20, 2009
Test Engineer	Signature	Date of Tests

7 99% Bandwidth – IC RSS-Gen

7.1 99% Bandwidth Test Procedure

The minimum 99% bandwidths were measured using a 50 ohm spectrum analyzer. The carrier was adjusted on the analyzer so that it was displayed entirely on the spectrum analyzer. The sweep time was set to auto and allowed through several sweeps with the max hold function used in peak detector mode. The resolution bandwidth was set to 100 kHz, and the video bandwidth set at 300 kHz. The minimum 20 dB bandwidths were measured using the spectrum analyzer set to -20 dBc. The table below contains the bandwidth measurement results.

7.2 99% Bandwidth Test Equipment

Table 7-1: 99% Bandwidth Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	7/31/09
900913	Hewlett Packard	85462A	EMI Receiver	3325A00159	6/8/10
900819	Weinschel Corp	2	10 dB Attenuator; 5 W	BF0830	12/3/09

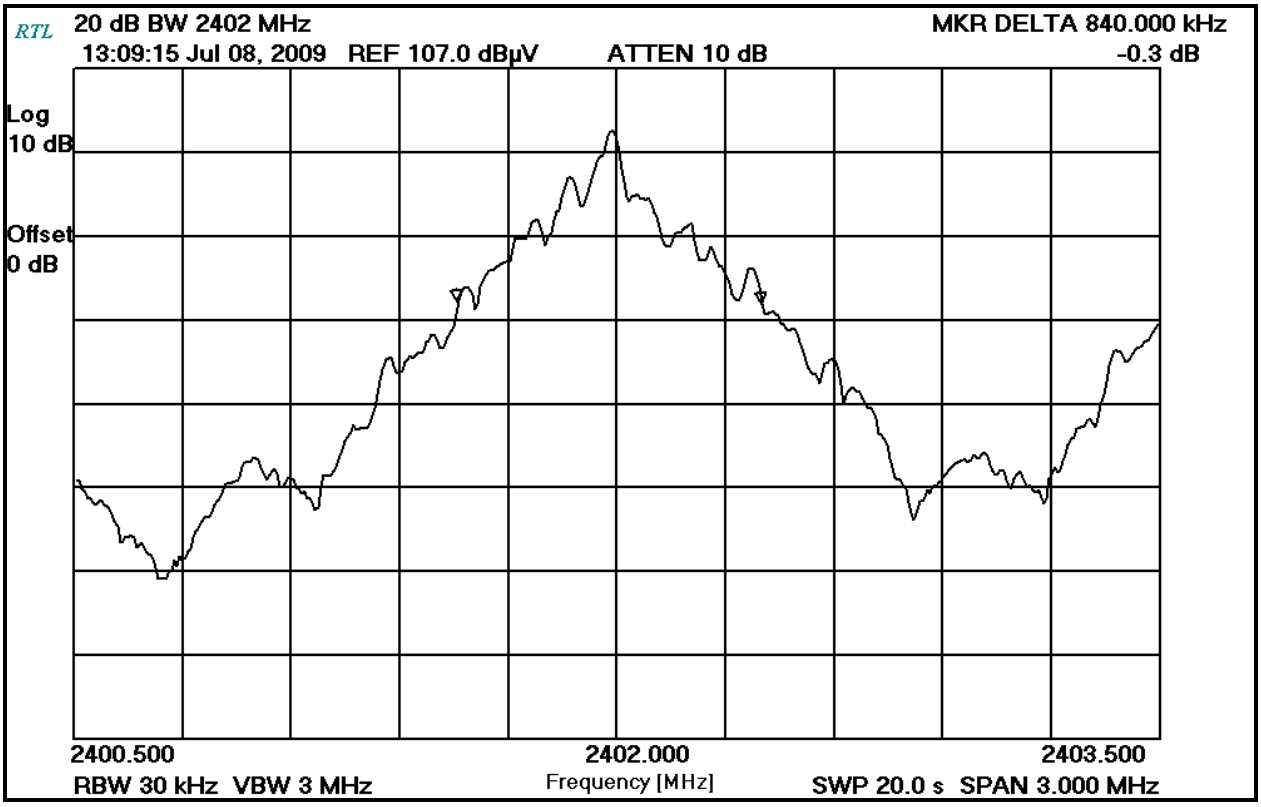
7.3 99% Modulated Bandwidth Test Data

Table 7-2: 99% Modulated Bandwidth

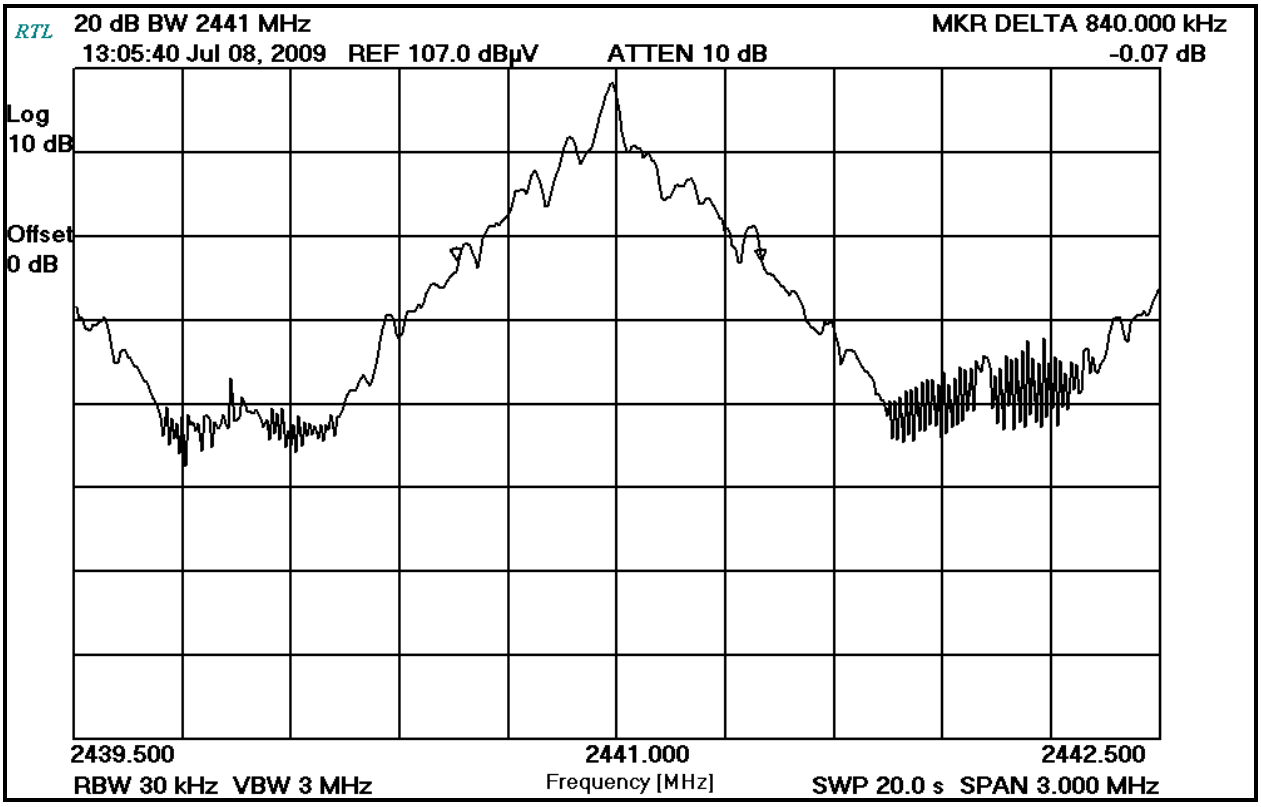
Minimum 99% Bandwidths

Frequency (MHz)	99% Bandwidth (kHz)
2402	840
2441	840
2480	833

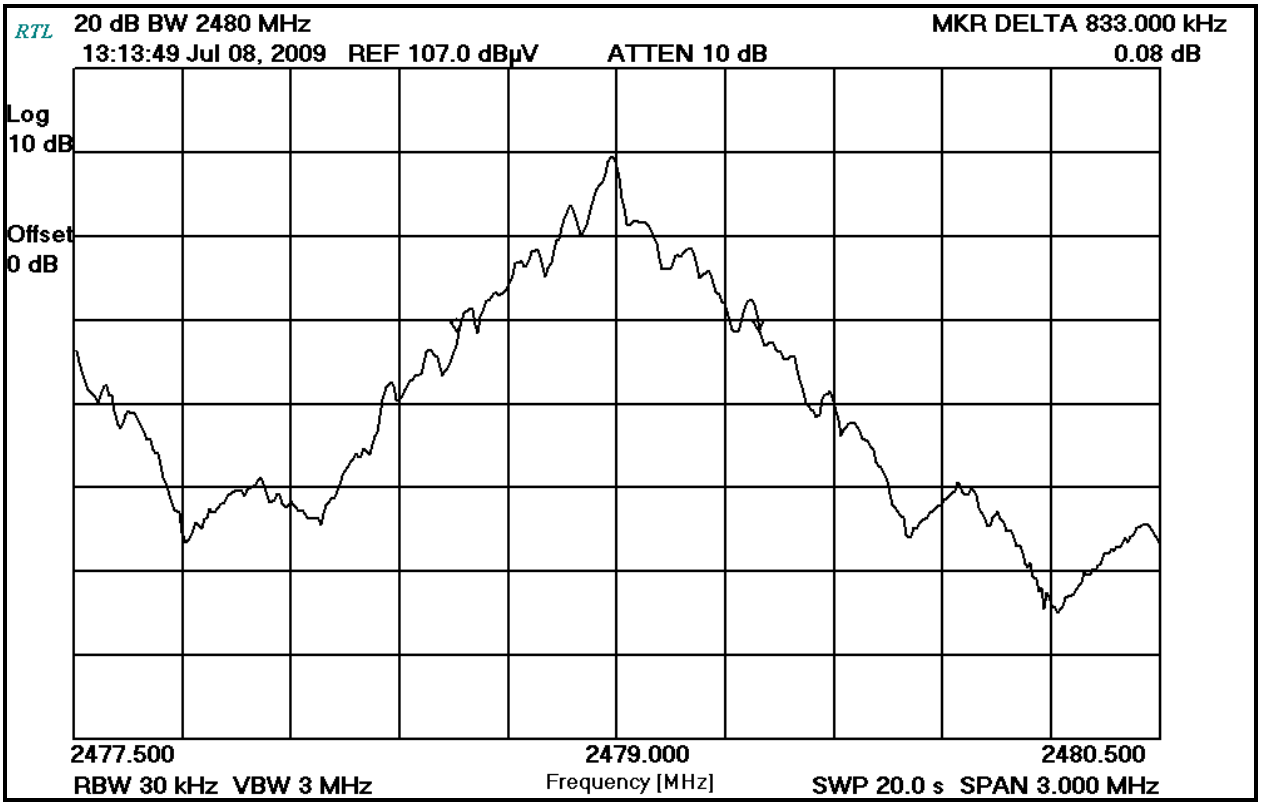
Plot 7-1: 99% Bandwidth - 2402 MHz



Plot 7-2: 99% Bandwidth - 2441 MHz



Plot 7-3: 99% Bandwidth - 2480 MHz



Test Personnel:

Daniel W. Baltzell	Daniel W. Baltzell	July 8, 2009
Test Engineer	Signature	Date Of Tests

8 Conclusion

The data in this measurement report shows that the Via One Networks, LLC Model: WP8, FCC ID: XEZ-1000, IC: 8390A-1000 complies with all the requirements of Parts 2, and 15 of the FCC Rules and Industry Canada RSS-210.