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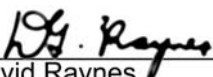
**Emissions Testing of the WaveRider EUM3006A
in accordance with FCC Part 15.247 (2004)
Spread Spectrum Operation 902 – 928 & 2400 – 2483.5 & 5725 – 5850 MHz.**

Test Personnel: T. Nguyen, H. Shahryar, D. Raynes, I. Romanov

Prepared for: WaveRider Communications Ltd.

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1.0 INTRODUCTION

1.1 SCOPE

The purpose of this report is to present the findings and results of compliance testing performed in accordance with CFR Title 47 FCC Part 15.247 (2004), Spread Spectrum Operation 902 - 928 & 2400 - 2483.5 & 5725 – 5850 MHz.

All test procedures, limits, and results defined in this document apply to the WaveRider Communications Ltd. Waverider EUM3006A unit, referred to herein as the Equipment Under Test (EUT).

The results contained in this report relate only to the item tested.

This report does not imply product endorsement by NVLAP or the Canadian or US governments.

1.2 APPLICANT

This test report has been prepared for WaveRider Communications Ltd., located in Calgary, Alberta, Canada.

1.3 TEST SAMPLE DESCRIPTION

The test sample provided for testing was a WaveRider EUM3006A:

Product Type:	Wireless Ethernet Modem
Model Number:	Waverider EUM3006A
Serial Number:	N/A
Cables:	Ethernet/Power
Power Requirements:	120 VAC, 50/60 Hz
Peripheral Equipment:	Personal Computer

More detailed information is provided by WaveRider Communications Ltd. in Appendix A.

1.4 GENERAL TEST CONDITIONS AND ASSUMPTIONS

The EUT was set up and exercised using the configurations, modes of operation and arrangements defined in this report only. All inputs and outputs to and from other equipment associated with the EUT were adequately simulated.

Where relevant, the EUT was only tested using the monitoring methods and test criteria defined in this report.

Environmental conditions are recorded for each test.

1.5 SCOPE OF TESTING

Testing was performed in accordance with FCC Part 15 Subpart C (2004), and ANSI C63.4 (2004).

1.5.1 VARIATIONS IN TEST METHODS

There were no variations from the test procedures outlined above.

1.5.2 TEST SAMPLE CONFIGURATION & MODIFICATIONS

The EUT met the requirements without modification.

2.0 MEASUREMENT UNCERTAINTY

For Radiated E-Field Emissions and Conducted Emissions, the uncertainties in the measurements were calculated using the methods outlined in the NAMAS document, NIS81: May 1984.

Frequency	= ± 1 kHz
Amplitude (RE)	= ± 4.01 dB
Amplitude (CE)	= ± 3.25 dB

3.0 TEST RESULTS

STATEMENT OF COMPLIANCE

The client equipment referred to in this report was found to comply with the requirements as stated below.

The EUT was subjected to the following tests. Compliance status is reported as **PASS** or **FAIL**. Test conditions that are not applicable to the EUT are marked **n/a**. If testing was not performed at this time, the appropriate field is marked **n/t**.

The following table summarizes the test results in terms of the specification and class or level applied, the unique test sample identification, the EUT modification state, and configuration as applicable.

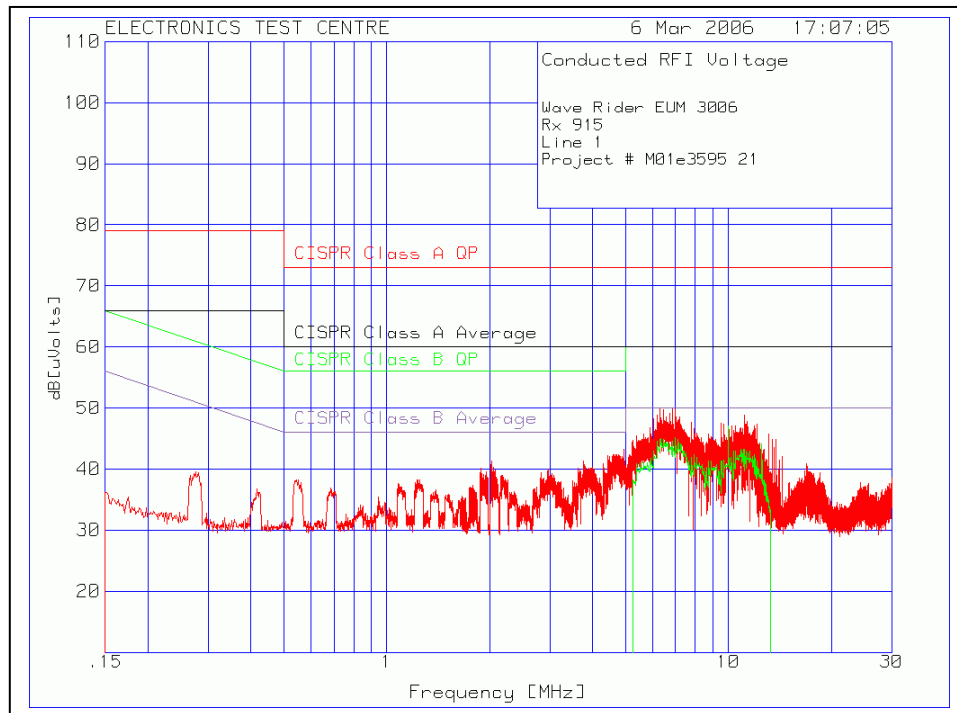
TEST CASE	TEST TYPE	SPECIFICATION	TEST SAMPLE	MOD. STATE	CONFIGURATION	RESULT
§ 3.1	Conducted Emissions at AC lines	FCC Part 15.107 and 15.207	WaveRider EUM3006A	nil	See § 1.5.2	PASS
§ 3.2	Conducted Emissions at Antenna Port	FCC Part 15.247	WaveRider EUM3006A	nil	See § 1.5.2	PASS
§ 3.3.1	Radiated Emissions (Rx Mode)	FCC Part 15.109	WaveRider EUM3006A	nil	See § 1.5.2	PASS
§ 3.3.2	Radiated Emissions (Tx Mode)	FCC Parts 2.1053, 15.205, 15.209 & 15.247	WaveRider EUM3006A	nil	See § 1.5.2	PASS

3.1 CONDUCTED EMISSIONS ON AC POWER LINES (15.107 & 15.207)

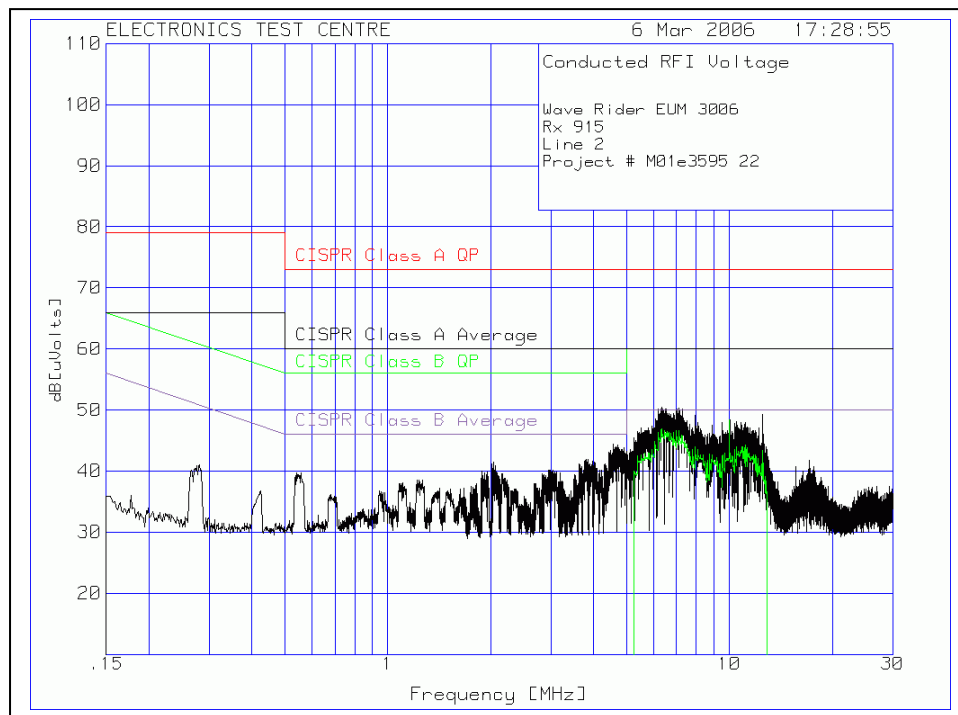
3.1.1 Receive Mode (Part 15.107)

Test Lab: Electronics Test Centre (Airdrie) Test Personnel: T. Nguyen, H. Shahryar Test Date: 6 March 2006	Product: WaveRider EUM3006A				
Test Result, WaveRider EUM3006A: PASS					
Objectives/Criteria The Conducted emissions produced by a system or sub-system shall not exceed the limits for the specifications as stated. The EUT was assessed against the requirements for Class B . Temperature = 19 °C Humidity = 25 %	Specification:				
	Frequency	Class A		Class B	
	(MHz)	QP	Avg	QP	Avg
	0.150 - 0.50	79	66	66 – 56	56 - 46
	0.50 – 5.0	73	60	56	46
5 – 30	73	60	60	50	
Units of measurement are dBµV.					
All QP measurements were below the specified Average limit. Refer to the test data and plots for more detail.					

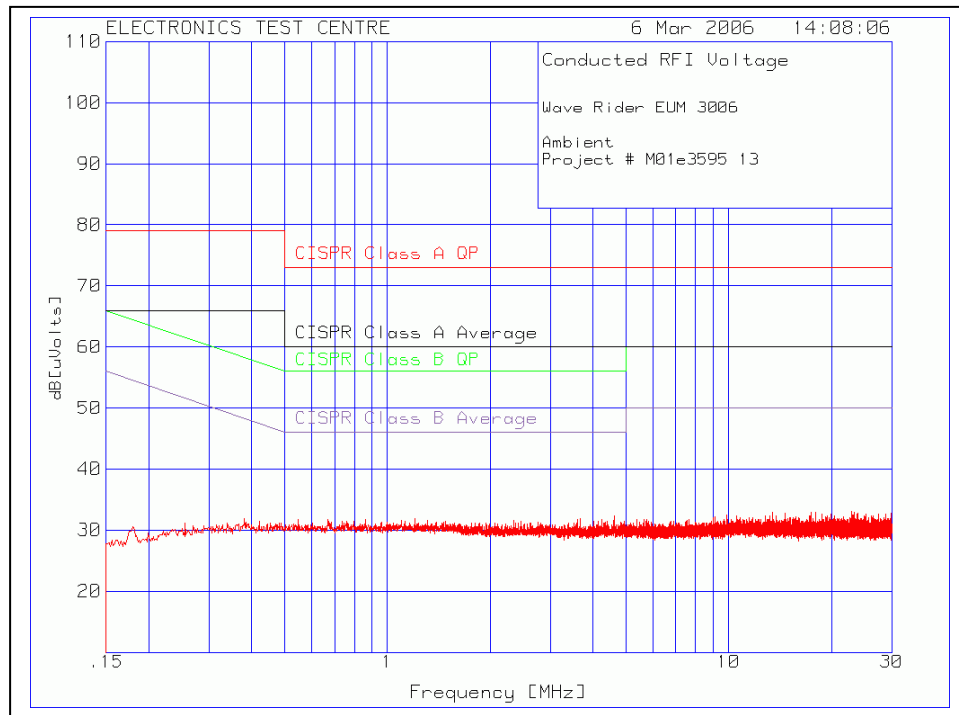
Plot of Conducted Emissions on AC Power Lines: Line 1



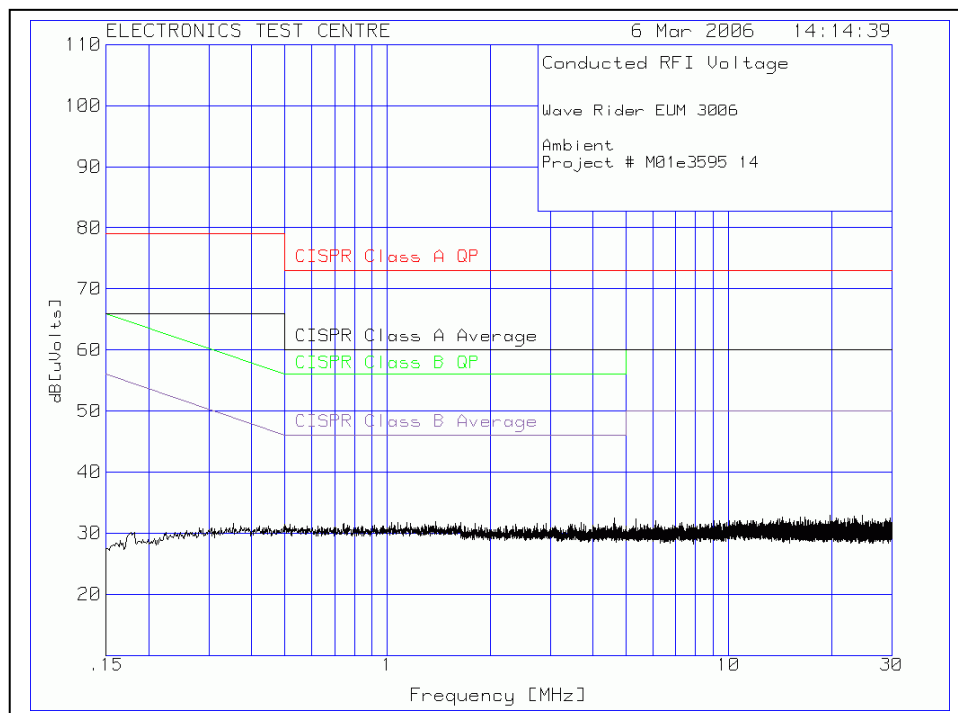
Plot of Conducted Emissions on AC Power Lines: Line 2



Plot of Conducted Emissions Test Chamber Ambient: (measurement noise floor): Line 1



Plot of Conducted Emissions Test Chamber Ambient: (measurement noise floor): Line 2

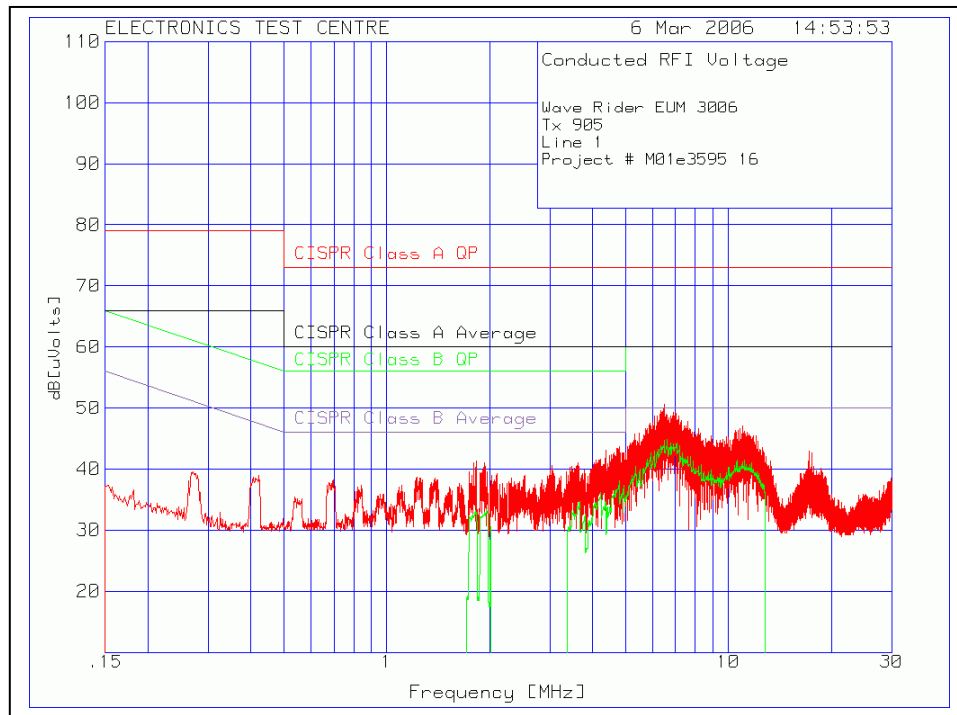


3.1.2 Transmit Mode (Part 15.207)

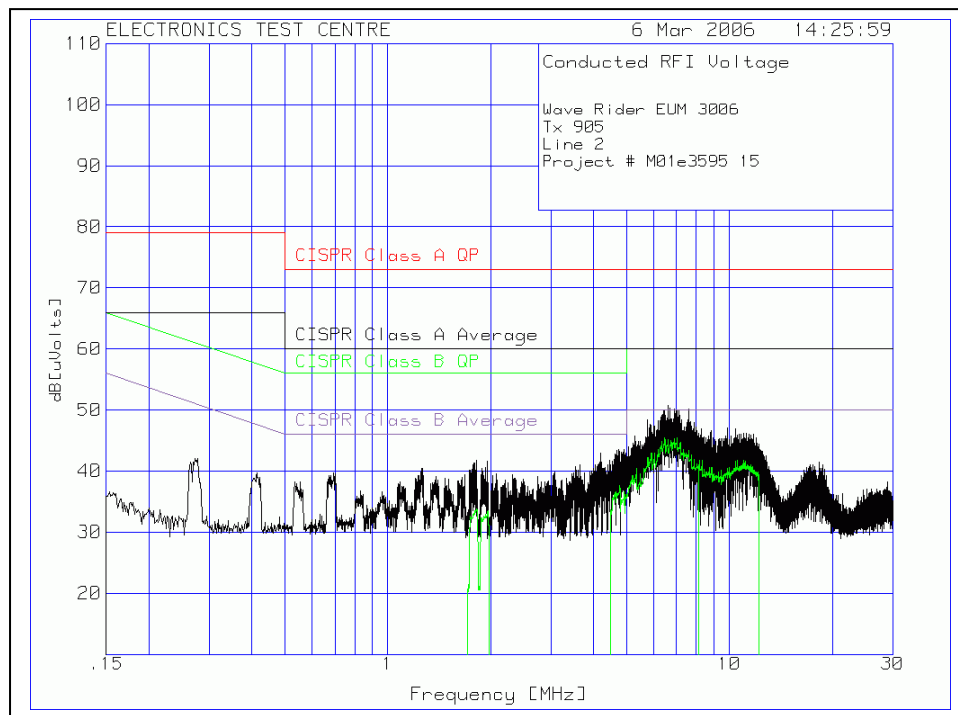
3.1.2.1 $f_c = 905$ MHz

Test Lab: Electronics Test Centre (Airdrie) Test Personnel: T.Nguyen, H. Shahryar, I. Romanov Test Date: 6 March 2006	Product: WaveRider EUM3006A																								
Test Result, WaveRider EUM3006A: PASS																									
Objectives/Criteria The Conducted emissions produced by a system or sub-system shall not exceed the limits for the specifications as stated. The EUT was assessed against the requirements for Class B . Temperature = 19 °C Humidity = 25 %	Specification: <table><tr><th rowspan="2">Frequency (MHz)</th><th colspan="2">Class A</th><th colspan="2">Class B</th></tr><tr><th>QP</th><th>Avg</th><th>QP</th><th>Avg</th></tr><tr><td>0.150 - 0.50</td><td>79</td><td>66</td><td>66 – 56</td><td>56 - 46</td></tr><tr><td>0.50 – 5.0</td><td>73</td><td>60</td><td>56</td><td>46</td></tr><tr><td>5 – 30</td><td>73</td><td>60</td><td>60</td><td>50</td></tr></table> Units of measurement are dB μ V.	Frequency (MHz)	Class A		Class B		QP	Avg	QP	Avg	0.150 - 0.50	79	66	66 – 56	56 - 46	0.50 – 5.0	73	60	56	46	5 – 30	73	60	60	50
Frequency (MHz)	Class A		Class B																						
	QP	Avg	QP	Avg																					
0.150 - 0.50	79	66	66 – 56	56 - 46																					
0.50 – 5.0	73	60	56	46																					
5 – 30	73	60	60	50																					
All QP measurements were below the specified Average limit. Refer to the test data and plots for more detail.																									

Plot of Conducted Emissions on AC Power Lines: Line 1



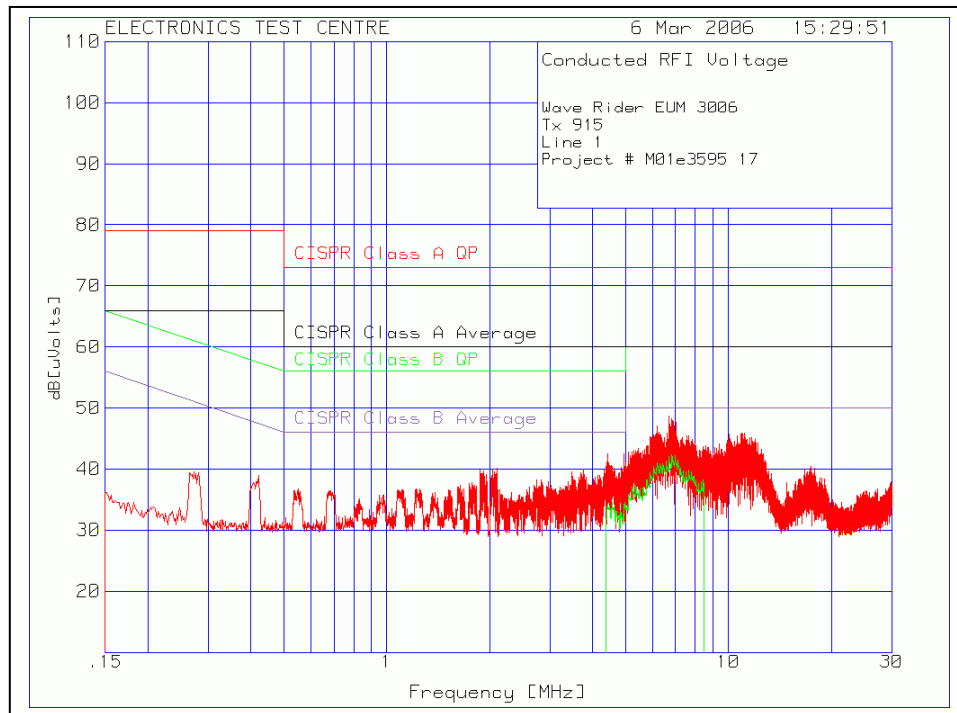
Plot of Conducted Emissions on AC Power Lines: Line 2



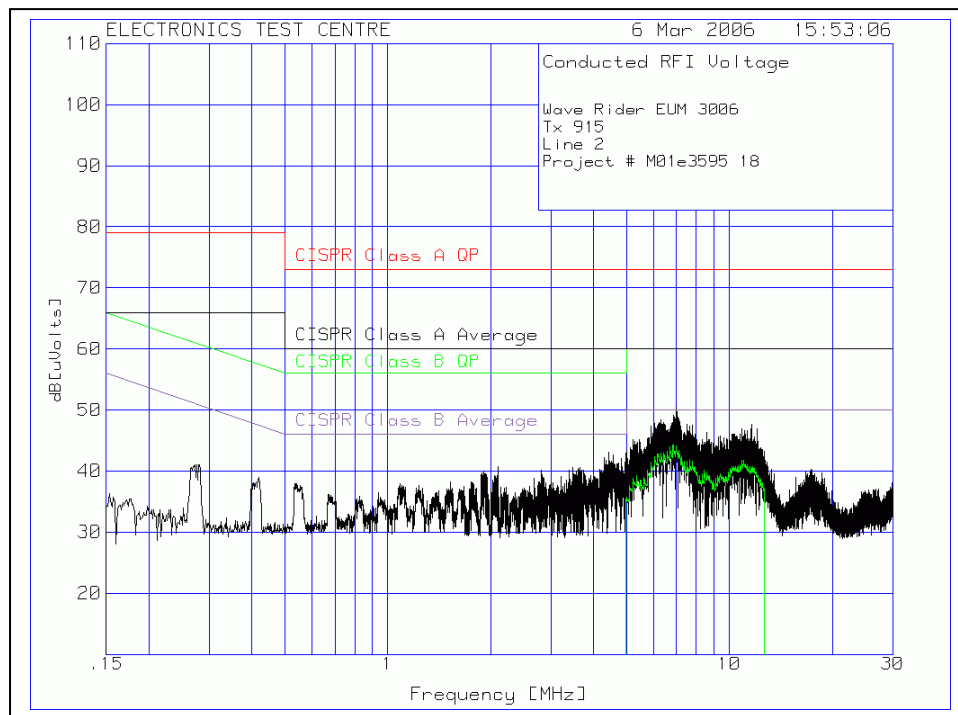
f_c = 915 MHz

Test Lab: Electronics Test Centre (Airdrie) Test Personnel: T. Nguyen, H. Shahryar, I. Romanov Test Date: 6 March 2006	Product: WaveRider EUM3006A																								
Test Result, WaveRider EUM3006A: PASS																									
Objectives/Criteria The Conducted emissions produced by a system or sub-system shall not exceed the limits for the specifications as stated. The EUT was assessed against the requirements for Class B . Temperature = 19 °C Humidity = 25 %	Specification: <table><tr><th rowspan="2">Frequency (MHz)</th><th colspan="2">Class A</th><th colspan="2">Class B</th></tr><tr><th>QP</th><th>Avg</th><th>QP</th><th>Avg</th></tr><tr><td>0.150 - 0.50</td><td>79</td><td>66</td><td>66</td><td>56 - 46</td></tr><tr><td>0.50 – 5.0</td><td>73</td><td>60</td><td>56</td><td>46</td></tr><tr><td>5 – 30</td><td>73</td><td>60</td><td>60</td><td>50</td></tr></table> Units of measurement are dBµV.	Frequency (MHz)	Class A		Class B		QP	Avg	QP	Avg	0.150 - 0.50	79	66	66	56 - 46	0.50 – 5.0	73	60	56	46	5 – 30	73	60	60	50
Frequency (MHz)	Class A		Class B																						
	QP	Avg	QP	Avg																					
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0.50 – 5.0	73	60	56	46																					
5 – 30	73	60	60	50																					
All QP measurements were below the specified Average limit. Refer to the test data and plots for more detail.																									

Plot of Conducted Emissions on AC Power Lines: Line 1



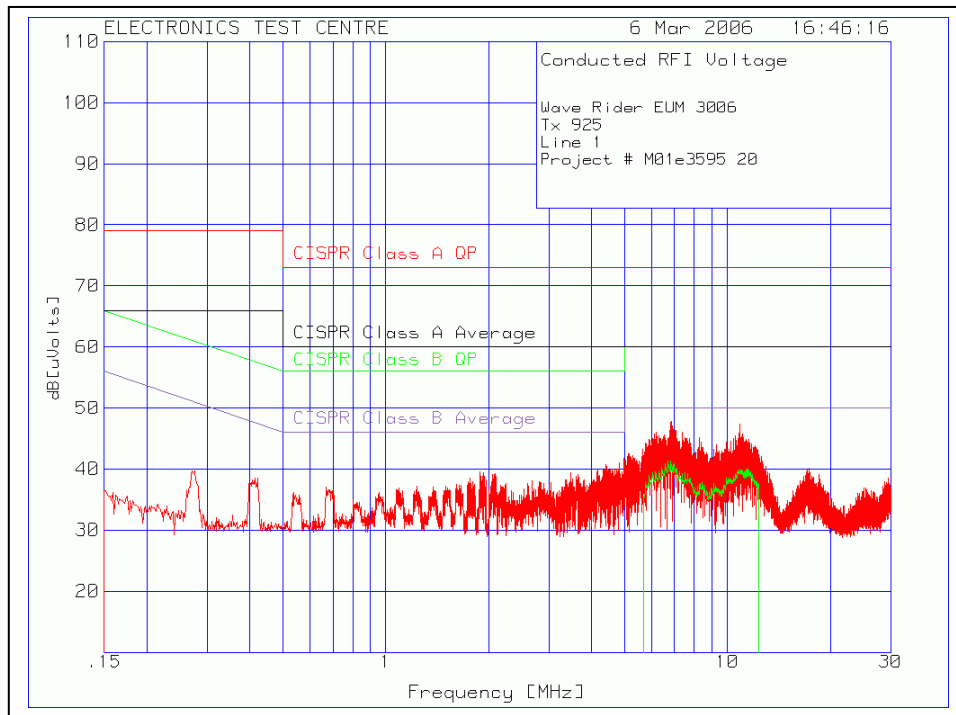
Plot of Conducted Emissions on AC Power Lines: Line 2



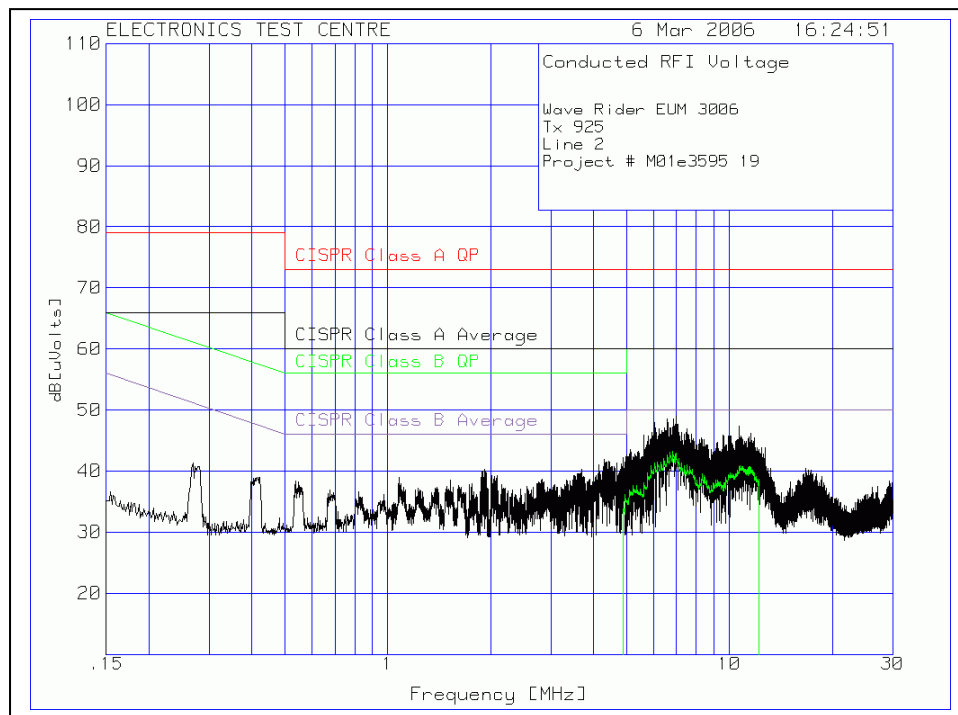
f_c = 925 MHz

Test Lab: Electronics Test Centre (Airdrie) Test Personnel: T. Nguyen, H. Shahryar, I. Romanov Test Date: 6 March 2006	Product: WaveRider EUM3006A																								
Test Result, WaveRider EUM3006A: PASS																									
Objectives/Criteria The Conducted emissions produced by a system or sub-system shall not exceed the limits for the specifications as stated. The EUT was assessed against the requirements for Class B . Temperature = 19 °C Humidity = 25 %	Specification: <table><tr><th rowspan="2">Frequency (MHz)</th><th colspan="2">Class A</th><th colspan="2">Class B</th></tr><tr><th>QP</th><th>Avg</th><th>QP</th><th>Avg</th></tr><tr><td>0.150 - 0.50</td><td>79</td><td>66</td><td>66</td><td>56 - 46</td></tr><tr><td>0.50 – 5.0</td><td>73</td><td>60</td><td>56</td><td>46</td></tr><tr><td>5 – 30</td><td>73</td><td>60</td><td>60</td><td>50</td></tr></table> Units of measurement are dB μ V.	Frequency (MHz)	Class A		Class B		QP	Avg	QP	Avg	0.150 - 0.50	79	66	66	56 - 46	0.50 – 5.0	73	60	56	46	5 – 30	73	60	60	50
Frequency (MHz)	Class A		Class B																						
	QP	Avg	QP	Avg																					
0.150 - 0.50	79	66	66	56 - 46																					
0.50 – 5.0	73	60	56	46																					
5 – 30	73	60	60	50																					
All QP measurements were below the specified Average limit. Refer to the test data and plots for more detail.																									

Plot of Conducted Emissions on AC Power Lines: Line 1



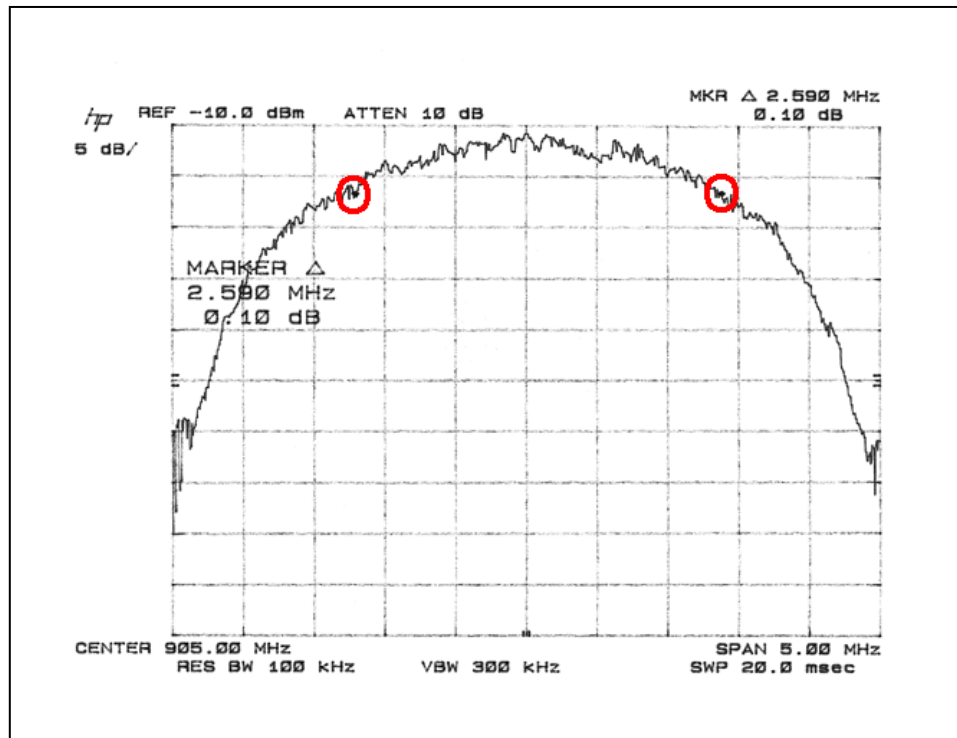
Plot of Conducted Emissions on AC Power Lines: Line 2



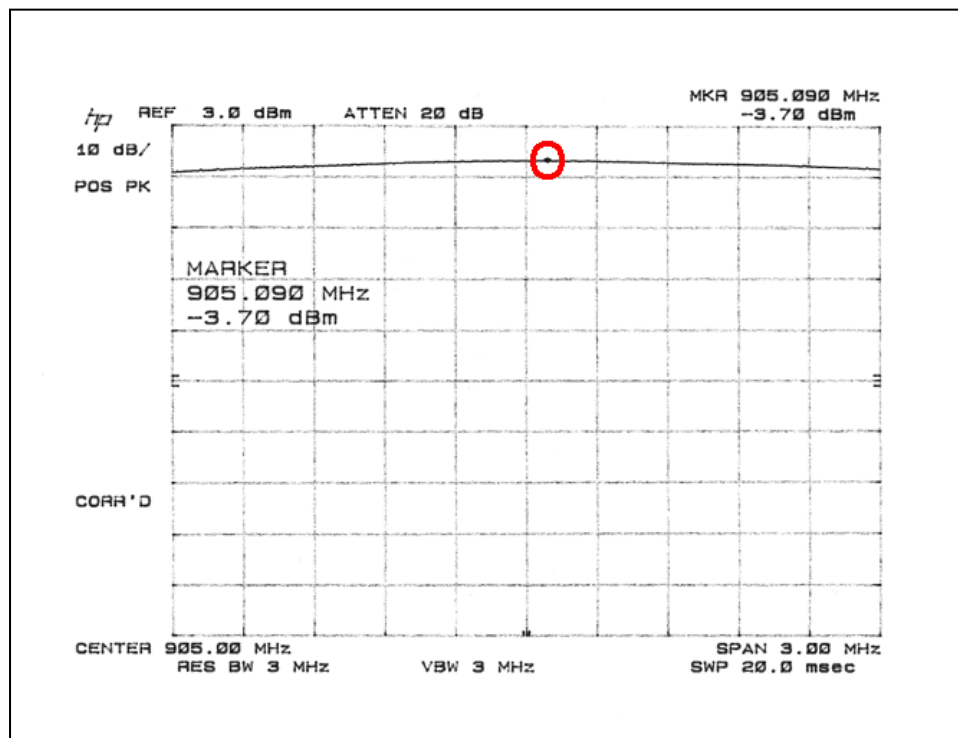
4.2 CONDUCTED EMISSIONS MEASURED AT ANTENNA PORT (PART 15.247 & 15.31)

Test Lab: Electronics Test Centre (Airdrie) Test Personnel: D. Raynes, I Romanov Test Date: 24 April 2006			Product: WaveRider EUM3006A		
Test Result, WaveRider EUM3006A : PASS					
Objectives/Criteria The Conducted emissions produced by a device shall meet the specifications as stated. Temperature = 22.5 °C Humidity = 25 %					
15.247(a): 6 dB BW ≥ 500 kHz			15.247(b): 1 Watt (30 dBm)		
Carrier Frequency [MHz]	Bandwidth [MHz]	Delta from limit [MHz]	Carrier Frequency [MHz]	RF Power [dBm]	Delta [dB from limit]
905	2.590	+ 2.090	905	26.3	- 3.7
915	2.620	+ 2.120	915	26.1	- 3.9
925	2.565	+ 2.065	925	24.9	- 5.1
15.31(e) RF output @ 85% supply voltage			15.31(e) RF output @ 115% supply voltage		
Carrier Frequency [MHz]	RF Power [dBm]	Delta [dB from 100% supply]	Carrier Frequency [MHz]	RF Power [dBm]	Delta [dB from 100% supply]
905	26.0	- 0.3	905	25.9	- 0.4
915	25.9	- 0.2	915	25.7	- 0.4
925	24.8	- 0.1	925	24.6	- 0.3
15.247(d): -20 dB fc			15.247(e): 8 dBm (115 dBμV)		
Carrier Frequency [MHz]			Carrier Frequency [MHz]	RF Power [dBm]	Delta [dB from limit]
905	There were no emissions measured within -10 dB of the specified limits.		905	6.50	- 1.50
915			5.75	- 2.25	
925			4.55	- 3.45	
Measurements were performed while the WaveRider EUM3006A was transmitting continuously. Refer to the test data and plots for more detail.					

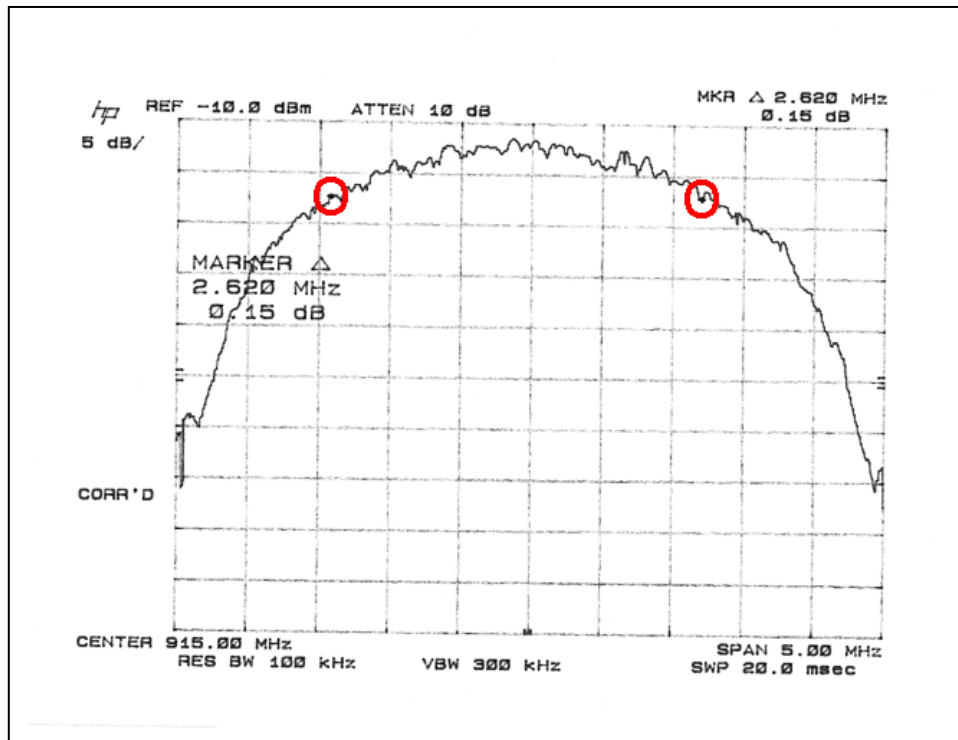
Spectrum Analyzer Plot of 6 dB Bandwidth: Tx @ 905 MHz



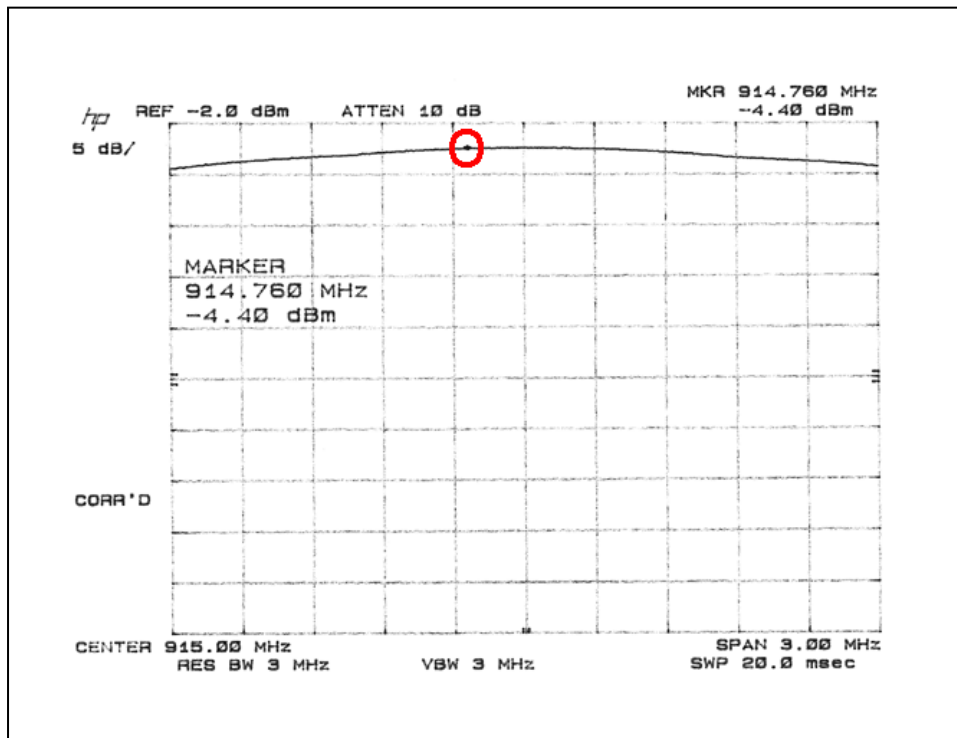
Spectrum Analyzer Plot of Maximum Peak Output Power: Tx @ 905 MHz
Attenuation = 30.0 dB $\Rightarrow$ 26.3 dBm



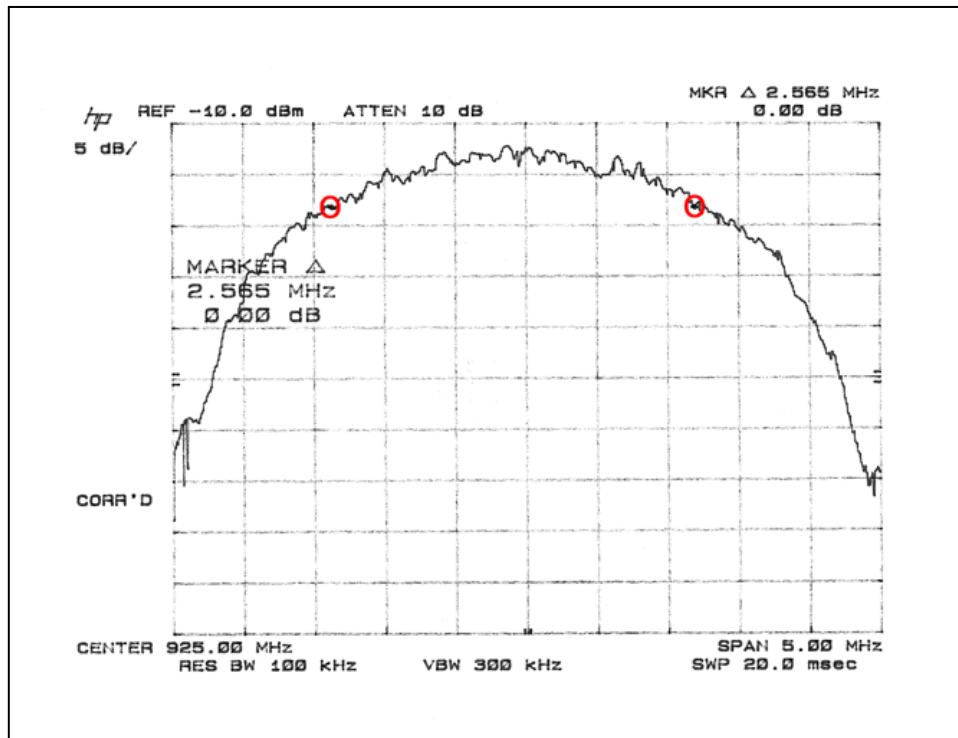
Spectrum Analyzer Plot of 6 dB Bandwidth: Tx @ 915 MHz



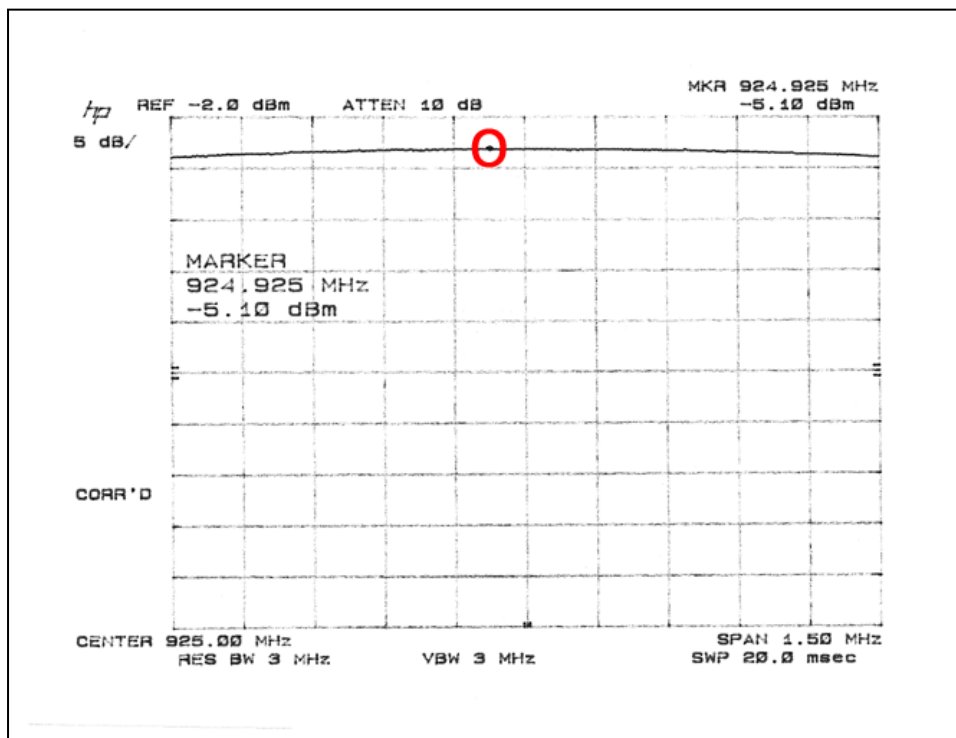
Spectrum Analyzer Plot of Maximum Peak Output Power: Tx @ 915 MHz
Attenuation = 30.5 dB $\Rightarrow$ 26.1 dBm



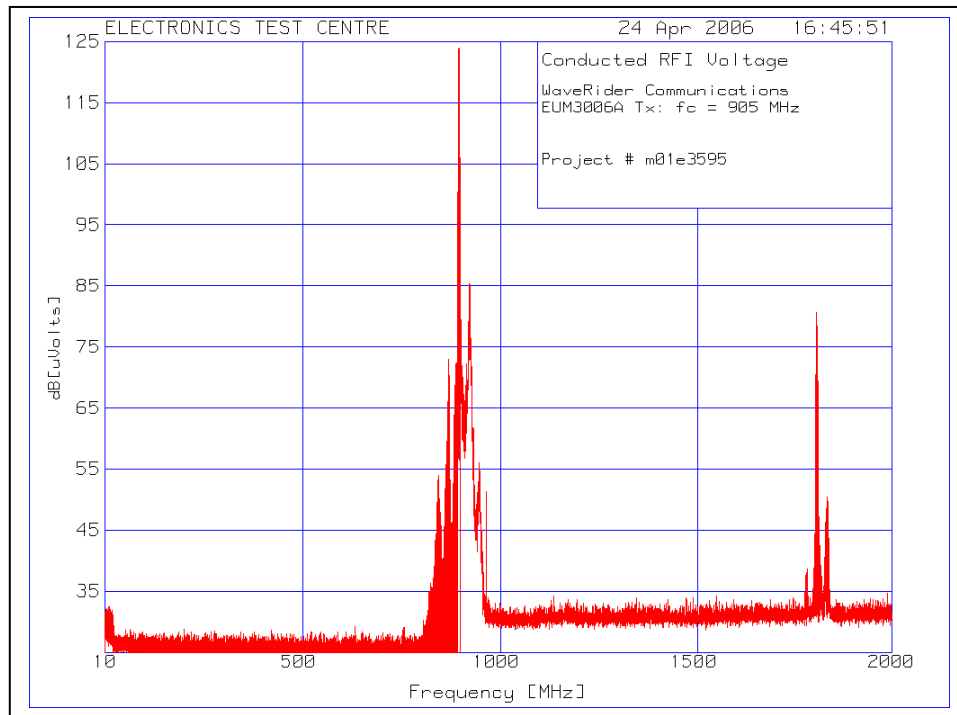
Spectrum Analyzer Plot of 6 dB Bandwidth: Tx @ 925 MHz



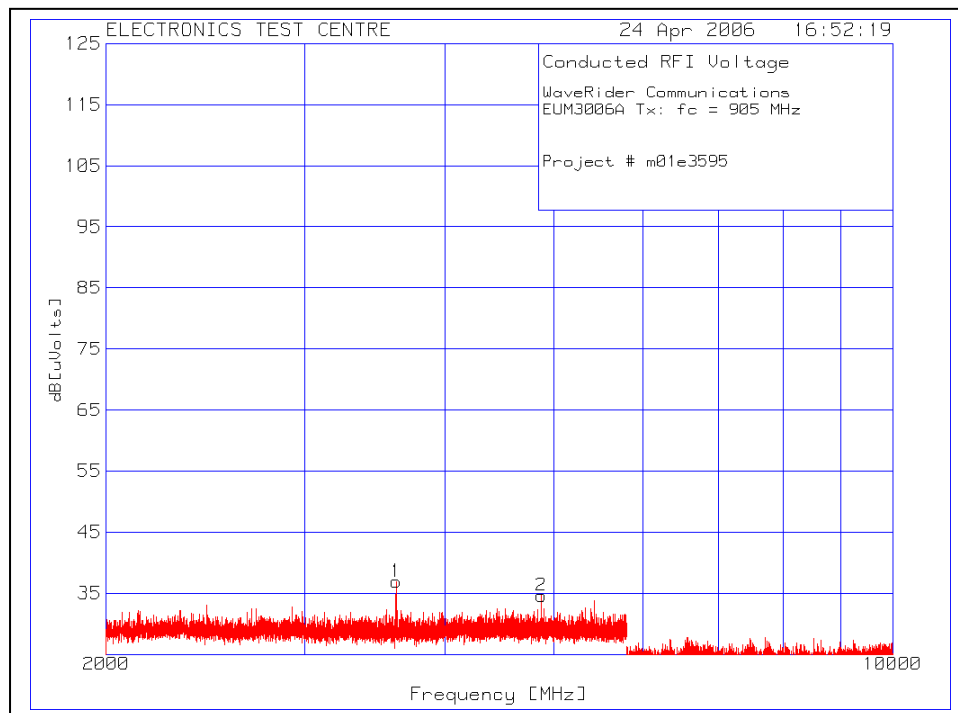
Spectrum Analyzer Plot of Maximum Peak Output Power: Tx @ 925 MHz
Attenuation = 30.0 dB $\Rightarrow$ 24.9 dBm



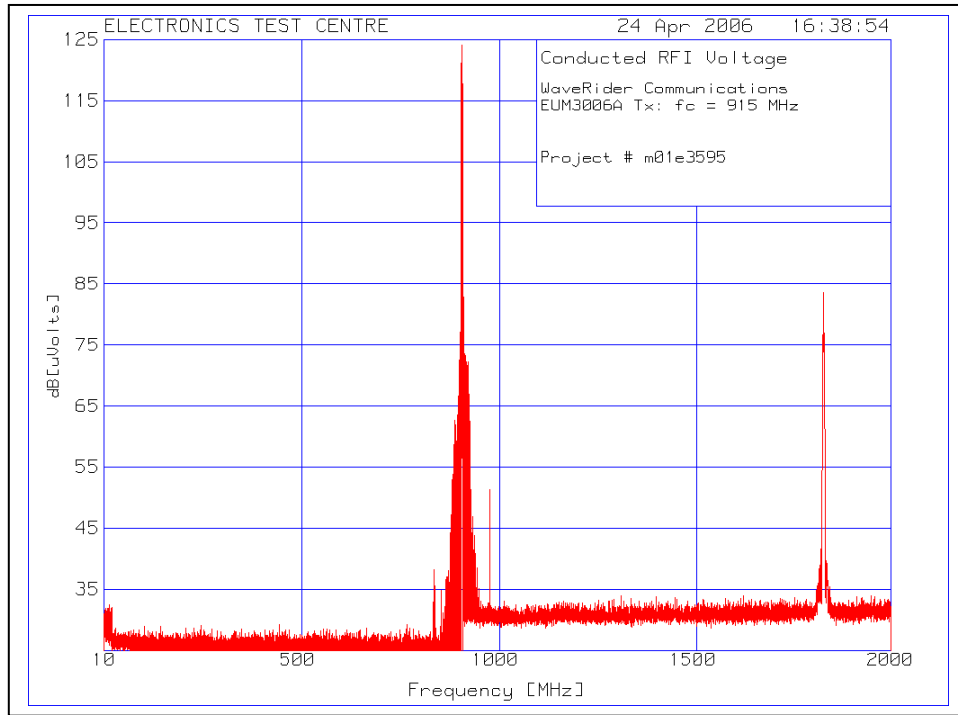
Plot of Conducted Emissions at Antenna Port:
RBW = 100 kHz. VBW = 300 kHz



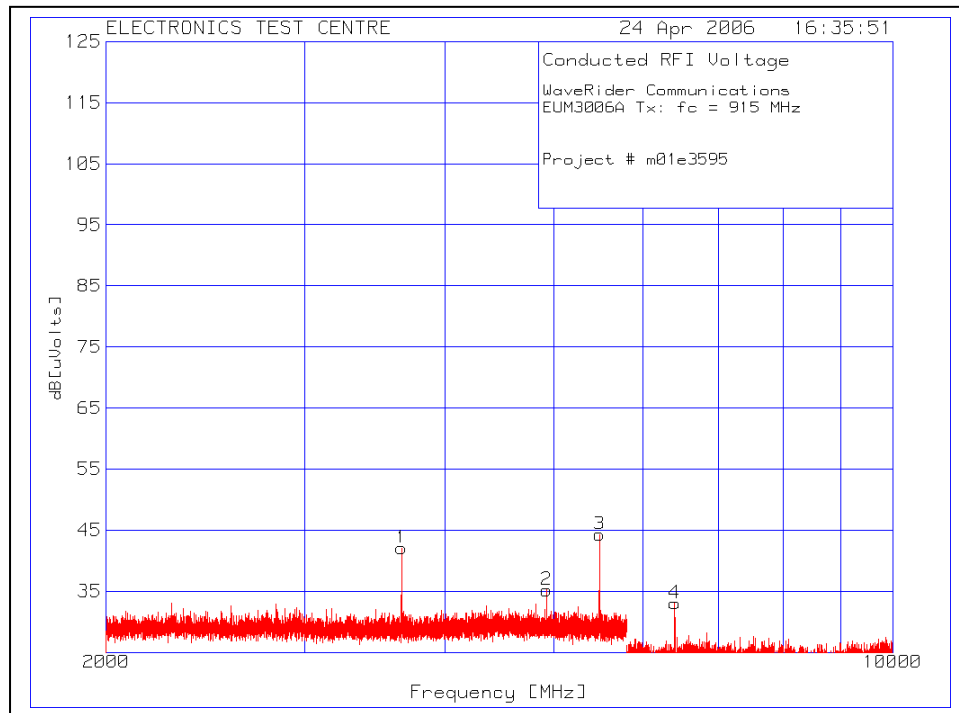
Plot of Conducted Emissions at Antenna Port:
RBW = 100 kHz. VBW = 300 kHz



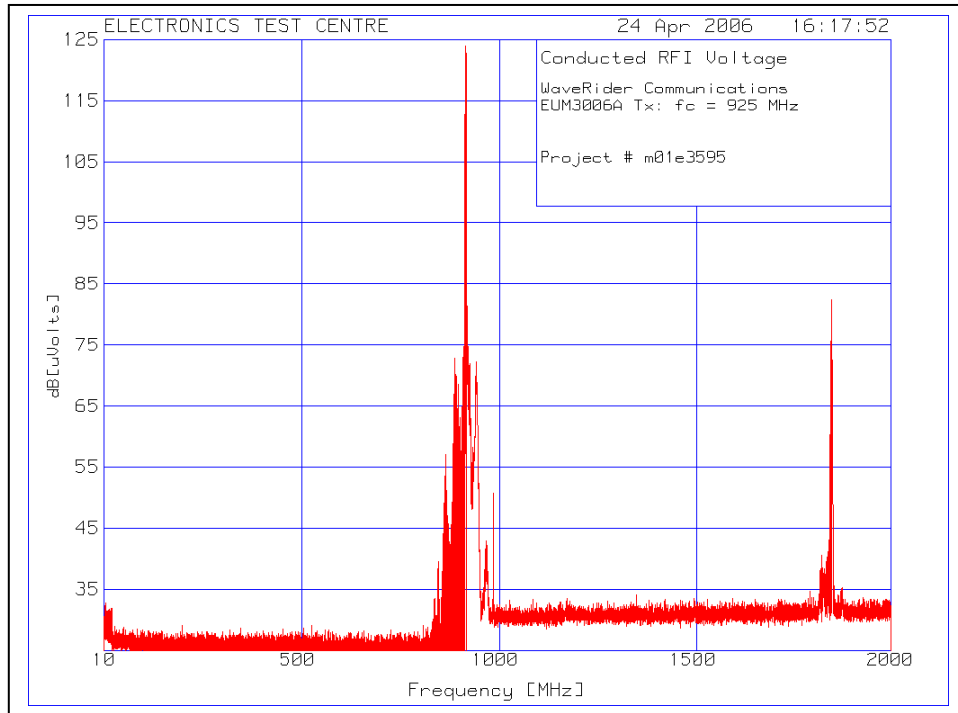
Plot of Conducted Emissions at Antenna Port:
RBW = 100 kHz. VBW = 300 kHz



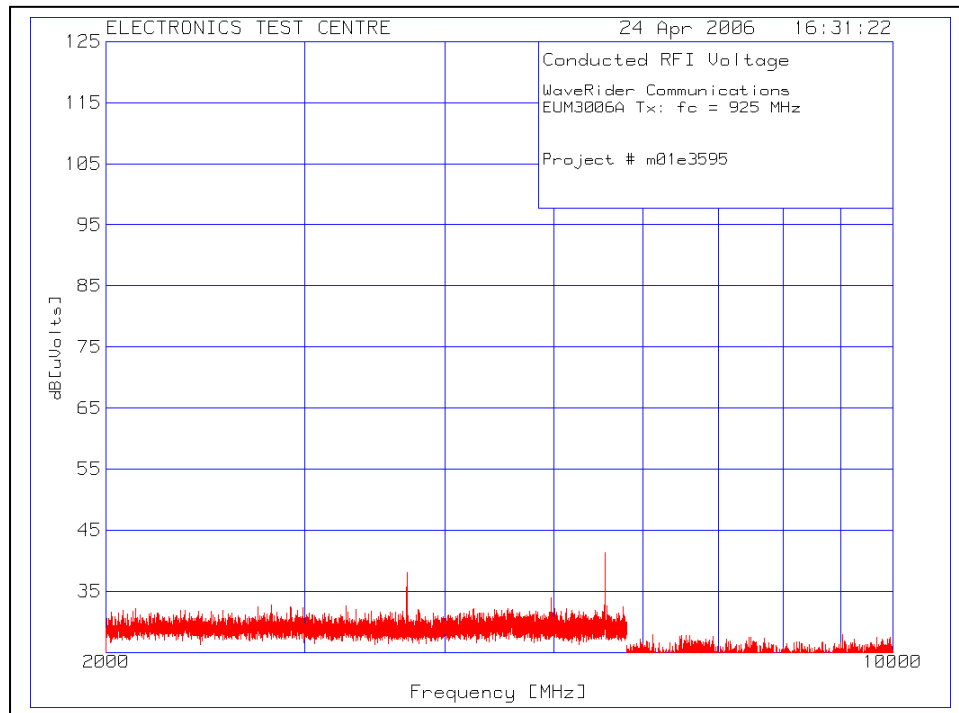
Plot of Conducted Emissions at Antenna Port:
RBW = 100 kHz. VBW = 300 kHz



Plot of Conducted Emissions at Antenna Port:
RBW = 100 kHz. VBW = 300 kHz



Plot of Conducted Emissions at Antenna Port:
RBW = 100 kHz. VBW = 300 kHz



WaveRider Communications
EUM3006A Tx: fc = 905 MHz
Project # m01e3595

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Li
=====						
Range: 1 2000 - 5800MHz -----						
1	3620.002	36.33 pk	.57	0	36.9	
2	4875.152	33.87 pk	.73	0	34.6	

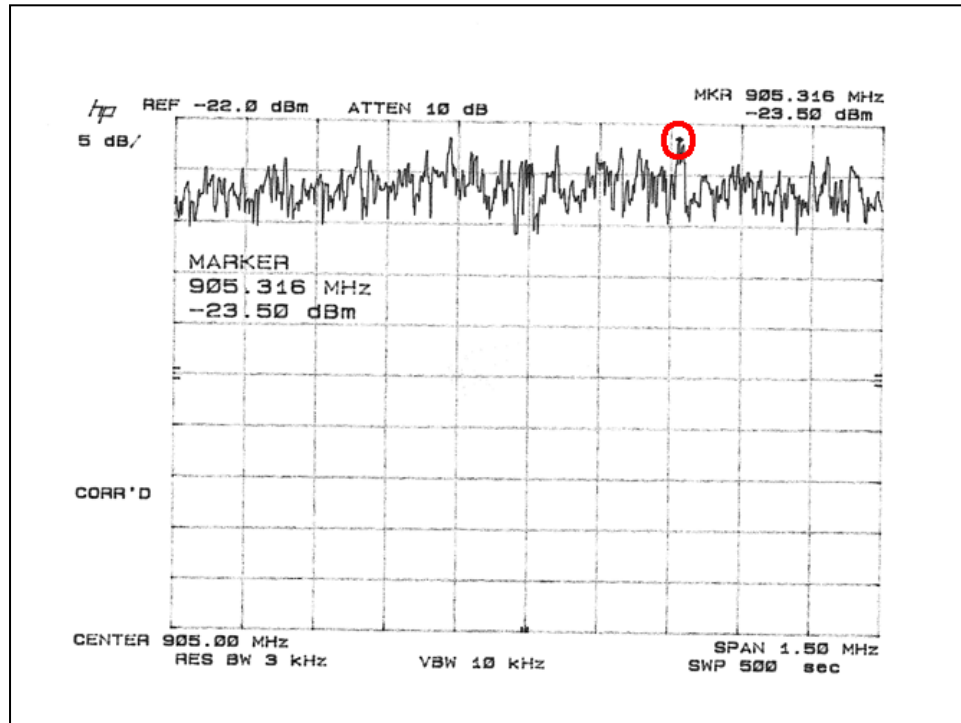
WaveRider Communications
EUM3006A Tx: fc = 915 MHz
Project # m01e3595

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Li
=====						
Range: 1 2000 - 5800MHz -----						
1	3659.866	41.52 pk	.58	0	42.1	
2	4925.267	34.46 pk	.74	0	35.2	
3	5490.199	43.49 pk	.81	0	44.3	
Range: 5800 - 10000MHz -----						
4	6403.869	32.07 pk	.93	0	33	

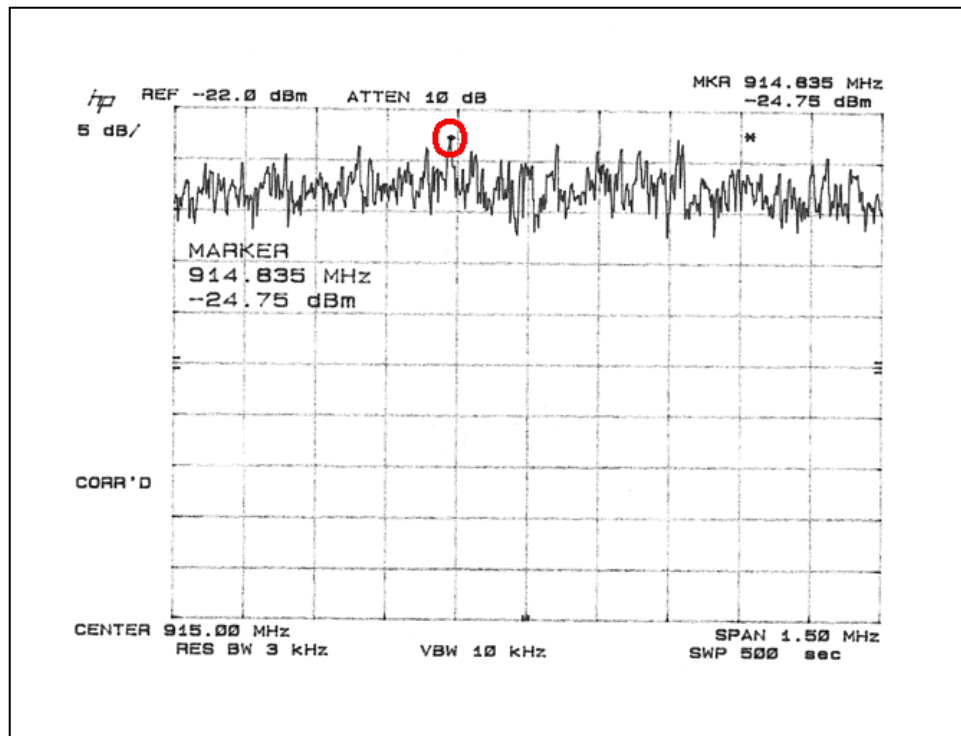
WaveRider Communications
EUM3006A Tx: fc = 925 MHz
Project # m01e3595

Test No.	Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Li
=====						
Range: 1 2000 - 5800MHz -----						
1	3700.11	37.42 pk	.58	0	38	
2	4975.002	33.25 pk	.75	0	34	
3	5550.185	40.48 pk	.82	0	41.3	

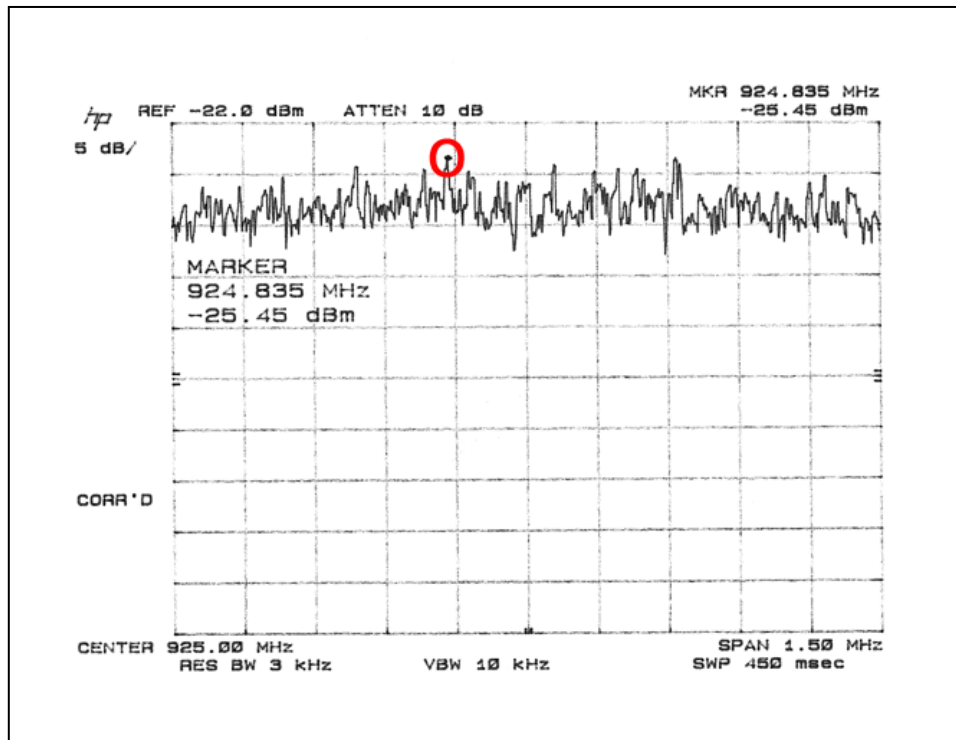
Spectrum Analyzer Plot of RF Power Spectral Density: Tx @ 905 MHz
Attenuation = 30.0 dB $\Rightarrow$ 6.50 dBm



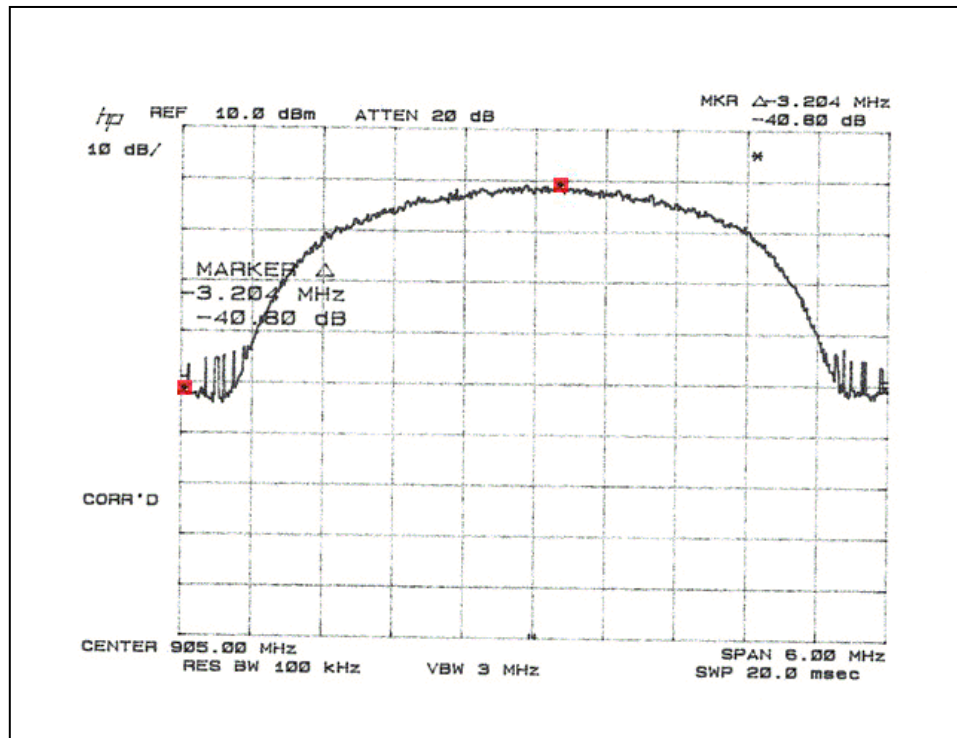
Spectrum Analyzer Plot of Power Spectral Density per Part 15.247(d): Tx @ 915 MHz:
Attenuation = 30.5 dB $\Rightarrow$ 5.75 dBm



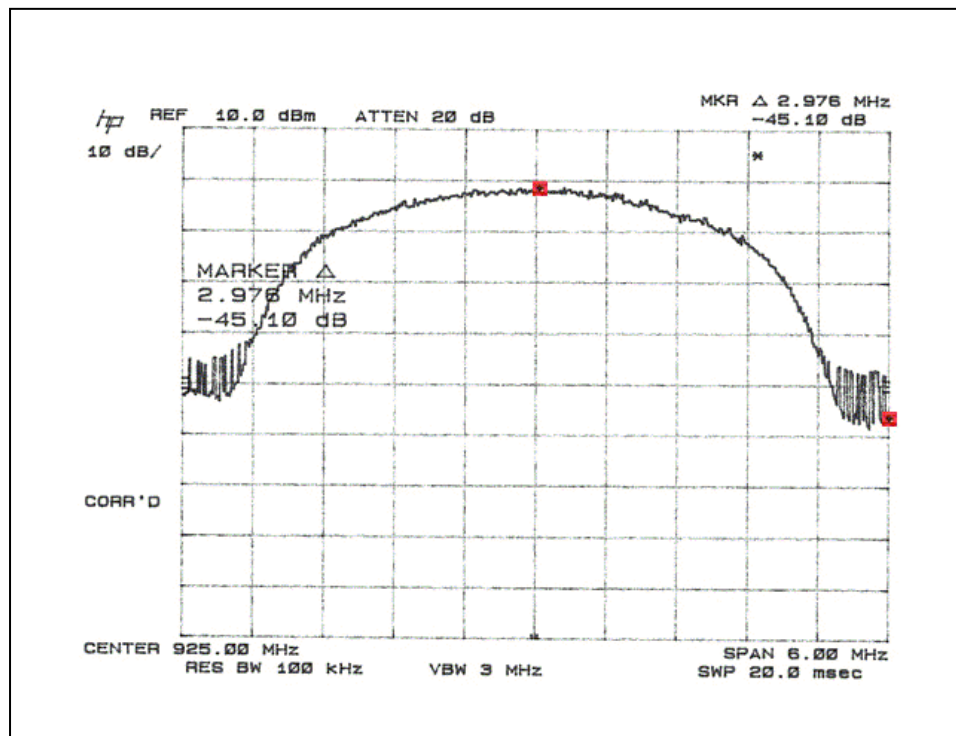
Spectrum Analyzer Plot of Power Spectral Density per Part 15.247(d): Tx @ 925 MHz
Attenuation = 30.0 dB $\Rightarrow$ 4.55 dBm



Plot of Conducted Emissions at Antenna Port: Lower Band Edge



Plot of Conducted Emissions at Antenna Port: Upper Band Edge



4.3 RADIATED EMISSIONS INCLUDING RESTRICTED BANDS OF OPERATION

4.3a Receive Mode (Part 15.109)

Test Lab: Electronics Test Centre (Airdrie) Test Personnel: T. Nguyen, H. Shahryar, I. Romanov Test Date: 24 April 2006			Product: WaveRider EUM3006A		
Test Result, WaveRider EUM3006A: PASS					
Objectives/Criteria The Radiated E-Field emissions produced by a system or sub-system, measured at a distance of 3m from the EUT, shall not exceed the limits for the specifications as stated. Emission levels should meet the requirements with a margin of 6dB. The EUT was assessed against the requirements of <u>Class B</u> . Temperature = 19 °C Humidity = 25 %			Specification: FCC Part 15 Subpart C		
			Frequency	Class A	Class B
			[MHz]	QP @ 3m	QP @ 3m
			30 – 88	49.54	40.00
			88 – 216	53.98	43.52
			216 – 960	56.90	46.02
			above 960	60.00	53.98
Horizontal:			Vertical:		
Frequency [MHz]	Field Strength [dBµV/m]	Delta [dB from limit]	Frequency [MHz]	Field Strength [dBµV/m]	Delta [dB from limit]
505.9250	44.95	- 1.07	461.9265	41.08	- 4.94
461.9249	40.83	- 5.19	505.9254	40.86	- 5.16
139.9259	43.52	- 11.57	149.9178	44.95	- 8.04
There were no more emissions measured within -10 dB of the specified limit. Refer to the test data and plots for more detail.					

Radiated Emissions Data:

The emissions data is presented in tabular form, showing the uncorrected spectrum analyzer reading, the correction factors applied, the net result, the value(s) of up to 4 limits at the frequency measured, and the margin between the result and the limit(s).

For example:

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB (uVolts)]	Limit:1 [dB(uVolts)]	2	3	4
94.0036	37.1 qp	2.2	8.5	47.8	54	43.5	50.5	40.5
Azimuth: 156	Height:113	Vert	Margin [dB]	-6.2	4.3	-2.7	7.3	

↓		The applicable Limit
Test Frequency [MHz]	94.0036	Test Frequency f = 94.0036 MHz
Meter Reading [dB (uV)]	37.1 qp	The reading with Quasi-Peak detector
Gain/Loss Factor [dB]	2.2	Net correction for preamp gain & cable loss
Transducer Factor [dB]	8.5	Correction for antenna loss
Level [dB (uVolts)]	47.8	Corrected value for field strength
Azimuth:	156	The turntable was 156 degrees CW from facing the antenna
Height:	113	The antenna was 113 cm above the ground
Limit: 1	54	The value of Limit 1 at 94.0036 MHz
Margin [dB]	-6.2	The field strength is 6.2 dB below Limit 1
Limit: 2	43.5	The value of Limit 2 at 94.0036 MHz
Margin [dB]	4.3	The field strength is 4.3 dB above Limit 2
Limit: 3	50.5	The value of Limit 3 at 94.0036 MHz
Margin [dB]	-2.7	The field strength is 2.7 dB below Limit 3
Limit: 4	40.5	The value of Limit 4 at 94.0036 MHz
Margin [dB]	7.3	The field strength is 7.3 dB above Limit 4

Meter Reading in dBuV + Gain/Loss Factor in dB + Transducer Factor in dB = Corrected Field Strength

Note: When a preamp is used, the resulting gain is compensated.

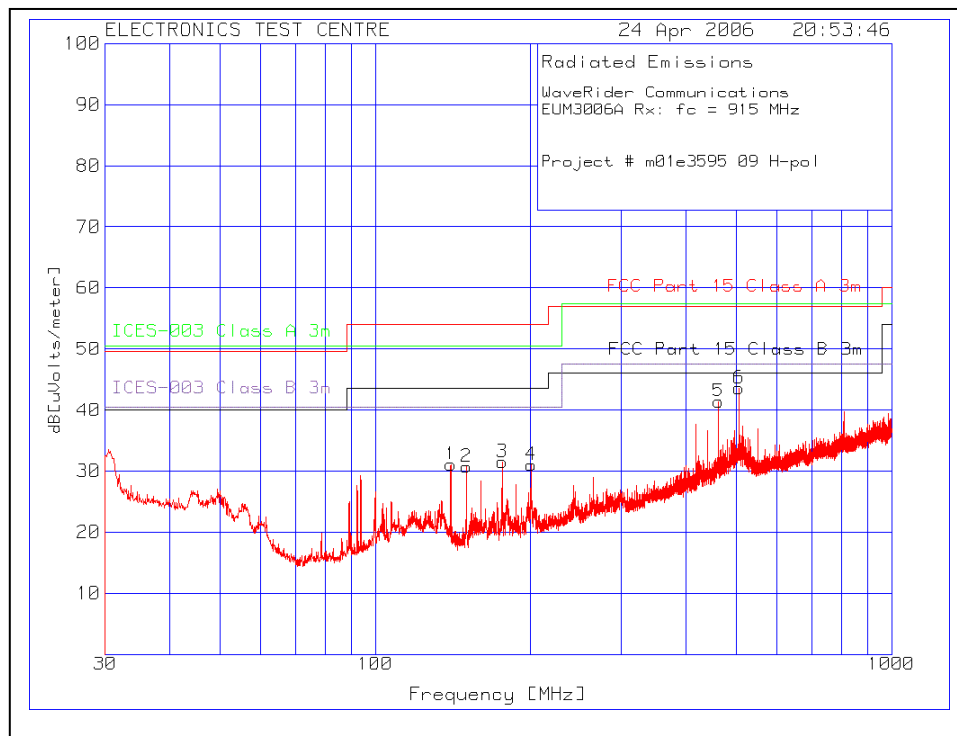
WaveRider Communications
EUM3006A Rx: fc = 915 MHz
Project # m01e3595 09

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
=====								
Range: 1 30 - 1000MHz								
139.9259	19.57 qp	2.4	9.98	31.95	53.98	50.46	43.52	40.46
Azimuth: 163	Height:142	Horz	Margin	[dB]:	-22.03	-18.51	-11.57	-8.51
149.9269	19.41 qp	2.4	9.23	31.04	53.98	50.46	43.52	40.46
Azimuth: 358	Height:154	Horz	Margin	[dB]:	-22.94	-19.42	-12.48	-9.42
175.9242	17.65 qp	2.72	9.91	30.28	53.98	50.46	43.52	40.46
Azimuth: 156	Height:120	Horz	Margin	[dB]:	-23.7	-20.18	-13.24	-10.18
199.9154	16.01 qp	2.9	10.78	29.69	53.98	50.46	43.52	40.46
Azimuth: 164	Height:111	Horz	Margin	[dB]:	-24.29	-20.77	-13.83	-10.77
461.9249	18.78 qp	4.54	17.51	40.83	56.9	57.46	46.02	47.46
Azimuth: 177	Height:138	Horz	Margin	[dB]:	-16.07	-16.63	-5.19	-6.63
505.925	22.11 qp	4.88	17.96	44.95	56.9	57.46	46.02	47.46
Azimuth: 26	Height:134	Horz	Margin	[dB]:	-11.95	-12.51	-1.07	-2.51
Range: 1 30 - 1000MHz								
149.9178	23.05 qp	2.4	10.03	35.48	53.98	50.46	43.52	40.46
Azimuth: 79	Height:102	Vert	Margin	[dB]:	-18.5	-14.98	-8.04	-4.98
461.9265	19.24 qp	4.54	17.3	41.08	56.9	57.46	46.02	47.46
Azimuth: 349	Height:99	Vert	Margin	[dB]:	-15.82	-16.38	-4.94	-6.38
505.9254	18.6 qp	4.88	17.38	40.86	56.9	57.46	46.02	47.46
Azimuth: 4	Height:103	Vert	Margin	[dB]:	-16.04	-16.6	-5.16	-6.6

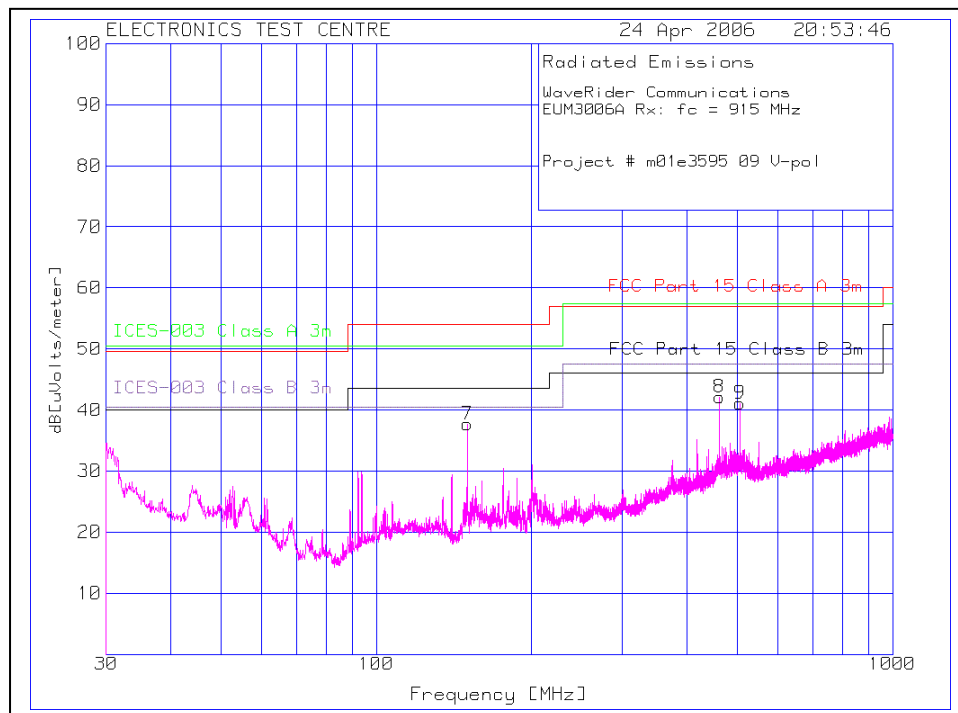
LIMIT 1: FCC Part 15 Class A 3m
LIMIT 2: ICES-003 Class A 3m
LIMIT 3: FCC Part 15 Class B 3m 
LIMIT 4: ICES-003 Class B 3m

qp - Quasi-Peak detector

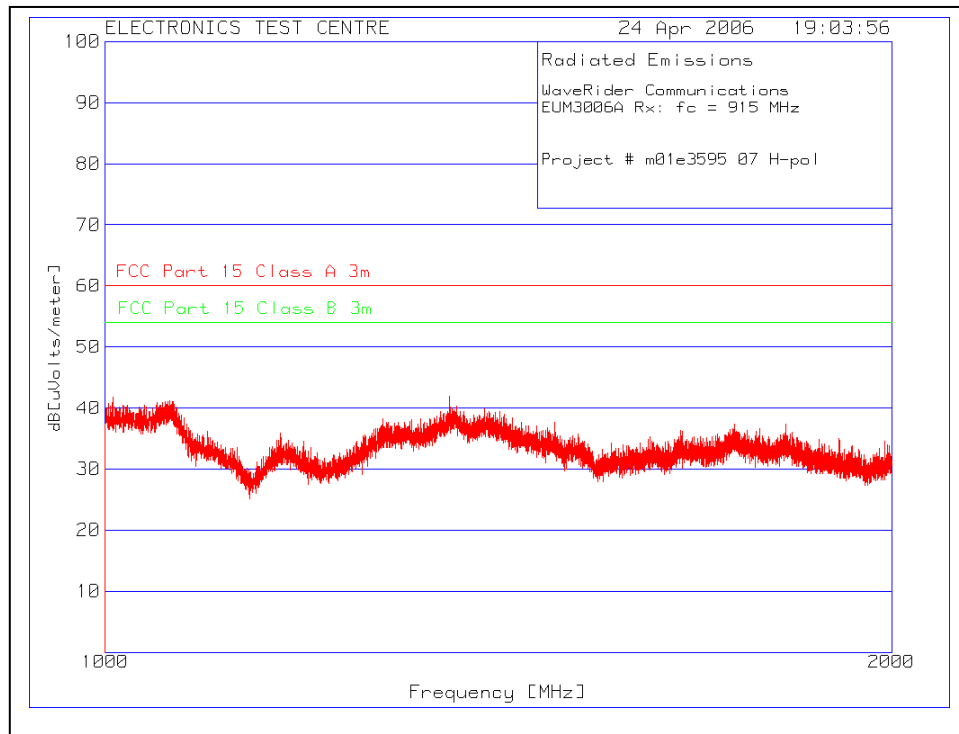
Plot of Radiated Emissions:



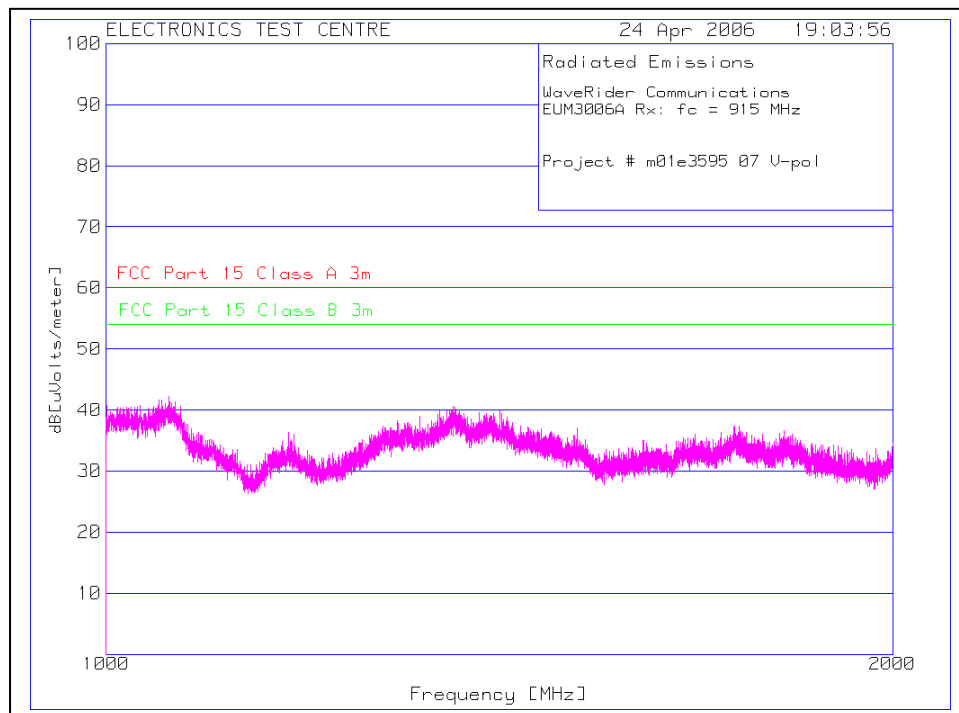
Plot of Radiated Emissions:



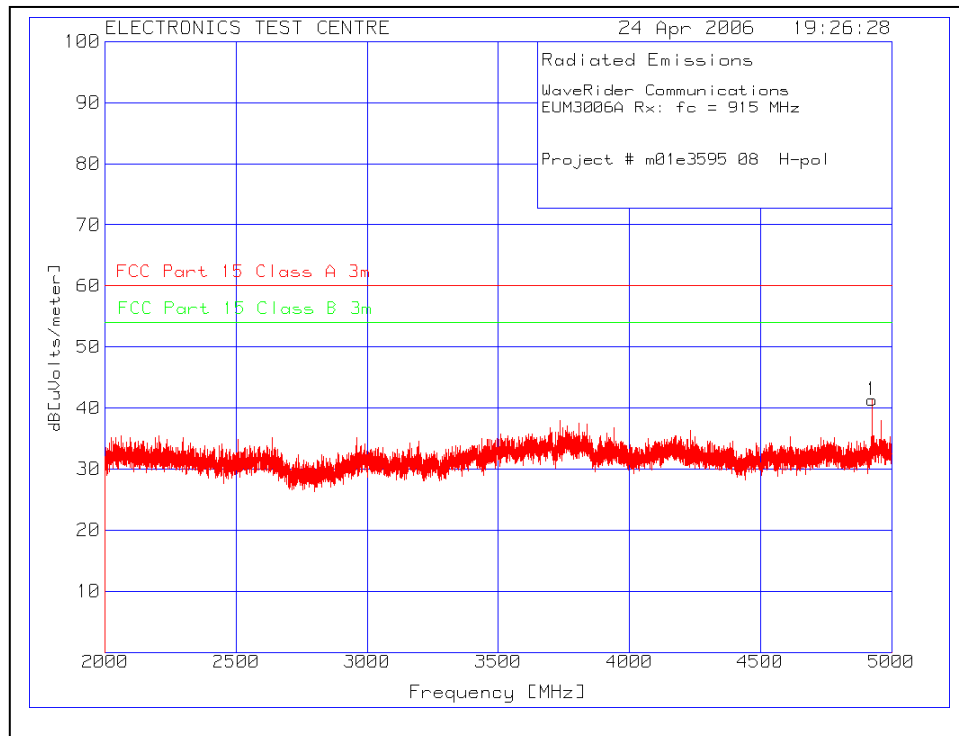
Plot of Radiated Emissions:



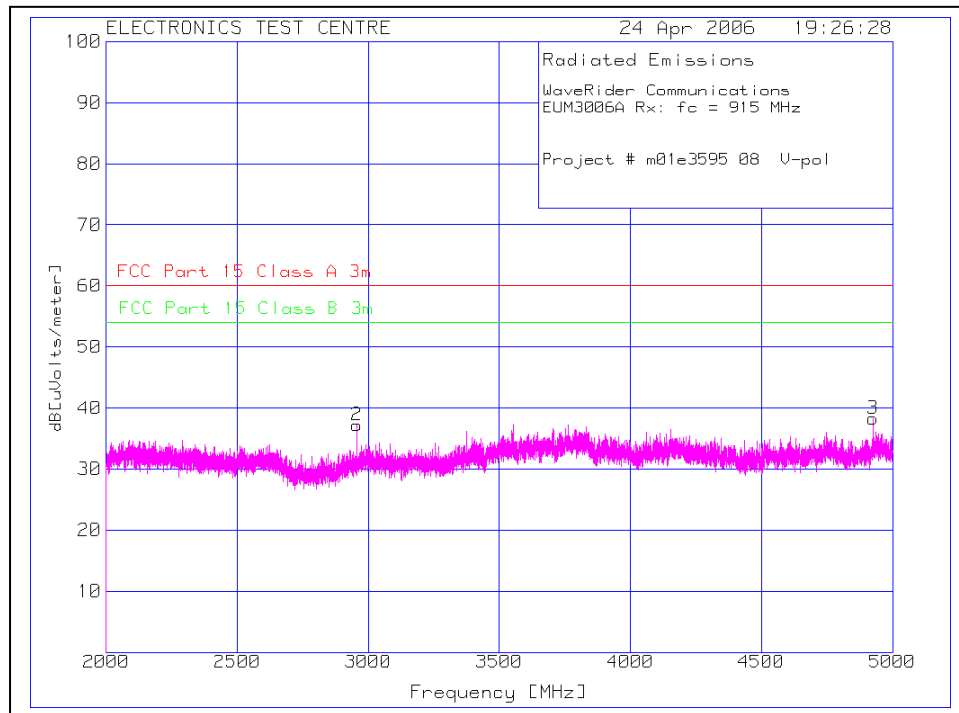
Plot of Radiated Emissions:



Plot of Radiated Emissions:



Plot of Radiated Emissions:



4.3b Transmit Mode (Part 2.1053, 15.205, 15.209 & 15.247)

Test Lab: Electronics Test Centre (Airdrie) Test Personnel: T. Nguyen, H. Shahryar, I. Romanov Test Date: 24 – 28 April 2006	Product: WaveRider EUM3006A																
Test Result, WaveRider EUM3006A: PASS																	
The Radiated E-Field emissions produced by EUT, measured at a distance of 3m, shall not exceed these limits within the restricted bands of operation. Any emissions lying outside these bands shall be at least 20 dB down from the level of the fundamental. Attenuation below the limits of 15.209 is not required.	<table> <tr> <th>Frequency [MHz]</th><th>Limit (QP @ 3m) [dBμV/m]</th></tr> <tr> <td>.009 – 0.490</td><td>88.5 – 53.8</td></tr> <tr> <td>.490 – 1.7</td><td>53.8 – 43</td></tr> <tr> <td>1.7 – 30</td><td>49.50</td></tr> <tr> <td>30 – 88</td><td>40.00</td></tr> <tr> <td>88 – 216</td><td>43.52</td></tr> <tr> <td>216 – 960</td><td>46.02</td></tr> <tr> <td>above 960</td><td>53.98</td></tr> </table>	Frequency [MHz]	Limit (QP @ 3m) [dBμV/m]	.009 – 0.490	88.5 – 53.8	.490 – 1.7	53.8 – 43	1.7 – 30	49.50	30 – 88	40.00	88 – 216	43.52	216 – 960	46.02	above 960	53.98
Frequency [MHz]	Limit (QP @ 3m) [dBμV/m]																
.009 – 0.490	88.5 – 53.8																
.490 – 1.7	53.8 – 43																
1.7 – 30	49.50																
30 – 88	40.00																
88 – 216	43.52																
216 – 960	46.02																
above 960	53.98																

Restricted Bands of Operation per Part 15.205:

MHz	MHz	MHz	MHz	MHz	GHz	GHz
0.0900000 – 0.1100000	8.2910000 - 8.2940000	16.804250 - 16.804750	162.01250 - 167.17000	1660.0000 – 1710.0000	3.6000000 – 4.4000000	14.470000 – 14.500000
0.4950000 - 0.5050000	8.3620000 - 8.3660000	25.500000 - 25.670000	167.72000 - 173.20000	1718.8000 – 1722.2000	4.5000000 – 5.1500000	15.350000 – 16.200000
2.1735000 - 2.1905000	8.3762500 - 8.3867500	37.500000 - 38.250000	240.00000 – 285.00000	2200.0000 – 2300.0000	5.3500000 – 5.4600000	17.700000 – 21.400000
4.1250000 - 4.1280000	8.4142500 - 8.4147500	73.000000 - 74.600000	322.00000 - 335.40000	2310.0000 – 2390.0000	7.2500000 – 7.7500000	22.010000 – 23.120000
4.1772500 - 4.1777500	12.290000 - 12.293000	74.800000 - 75.200000	399.90000 – 410.00000	2483.5000 – 2500.0000	8.0250000 – 8.5000000	23.600000 – 24.000000
4.2072500 - 4.2077500	12.519750 - 12.520250	108.00000 - 121.94000	608.00000 – 614.00000	2655.0000 – 2900.0000	9.0000000 – 9.2000000	31.200000 – 31.800000
5.6770000 - 5.6830000	12.576750 - 12.577250	123.00000 - 138.00000	960.00000 – 1240.0000	3260.0000 – 3267.0000	9.3000000 – 9.5000000	36.430000 – 36.500000
6.2150000 - 6.2180000	13.360000 - 13.410000	149.90000 - 150.05000	1300.0000 – 1427.0000	3332.0000 – 3339.0000	10.600000 – 12.700000	Above 38.600000
6.2677500 - 6.2682500	16.420000 - 16.423000	156.52475 - 156.52525	1435.0000 – 1626.5000	3345.8000 – 3358.0000	13.250000 – 13.400000	
6.3117500 - 6.3122500	16.694750 - 16.695250	156.70000 - 156.90000	1645.5000 – 1646.5000	3500.0000 – 3600.0000		

US only

** Canada 108 – 138 MHz

*** Canada 960 – 1427 MHz

**** Canada only

Radiated Emissions Data: Diversity Antenna, Horizontal polarization

Operation in Restricted Bands:

nominal f_c (MHz)	f (MHz)	Field Strength (dB μ V/m) Average	Limit (dB μ V/m) Average	Delta (dB)	Antenna Polarization	Antenna Height (cm)	Azimuth (Degrees)
905	3620.048	51.00	53.98	-2.98	H	105	33
905	3620.032	51.31	53.98	-2.67	V	100	337
905	4875.216	47.97	53.98	-6.01	H	196	31
905	4874.888	47.87	53.98	-6.11	V	257	5
915	3659.895	48.84	53.98	-5.14	H	158	41
915	3660.013	53.45	53.98	-0.53	V	104	349
915	4924.864	49.68	53.98	-4.30	H	140	282
915	4924.96	48.80	53.98	-5.18	V	101	11
915	5490.115	48.58	53.98	-5.40	H	134	30
915	5489.968	44.13	53.98	-9.85	V	151	32
915	6403.964	49.12	53.98	-4.86	H	137	15
915	6404.098	49.55	53.98	-4.43	V	162	329
925	3699.962	50.87	53.98	-3.11	H	149	41
925	3699.909	51.70	53.98	-2.28	V	100	352
925	4974.908	49.50	53.98	-4.48	H	187	297
925	4974.792	46.33	53.98	-7.65	V	209	110
925	5550.111	40.15	53.98	-13.83	H	187	297
925	5550.1753	40.81	53.98	-13.17	V	153	36

Notes: The EUT faces the measuring antenna at 0° of turntable azimuth.

Investigation was performed up to 9.5 GHz

All unreported Average emissions were more than 20 dB below the 53.98 dB μ V/m limit.

All unreported Peak emissions were more than 16 dB below the 73.98 dB μ V/m limit.

Radiated Emissions Data: Diversity Antenna, Vertical polarization.

Operation in Restricted Bands:

nominal f_c (MHz)	f (MHz)	Field Strength (dB μ V/m) Average	Limit (dB μ V/m) Average	Delta (dB)	Antenna Polarization	Antenna Height (cm)	Azimuth (Degrees)
905	3619.978	51.40	53.98	-2.58	H	103	20
905	3620.048	50.21	53.98	-3.77	V	100	337
905	4874.866	48.77	53.98	-5.21	H	174	29
905	4875.171	49.17	53.98	-4.81	V	264	9
915	3660.013	53.94	53.98	-0.04	H	157	46
915	3660.047	52.75	53.98	-1.23	V	122	352
915	4924.912	48.78	53.98	-5.20	H	116	340
915	4924.667	48.39	53.98	-5.59	V	101	12
915	5490.004	48.58	53.98	-5.40	H	124	28
915	5490.062	43.93	53.98	-10.05	V	150	41
915	6404.053	49.42	53.98	-4.56	H	145	18
915	6404.097	48.95	53.98	-5.03	V	163	321
925	3699.988	50.37	53.98	-3.61	H	152	40
925	3699.979	51.80	53.98	-2.18	V	100	352
925	4974.824	49.40	53.98	-4.58	H	193	296
925	4975.02	47.83	53.98	-6.15	V	191	330
925	5550.176	40.85	53.98	-13.13	H	187	297
925	5550.35	39.01	53.98	-14.97	V	150	285

Notes: The EUT faces the measuring antenna at 0° of turntable azimuth.

Investigation was performed up to 9.5 GHz

All unreported Average emissions were more than 20 dB below the 53.98 dB μ V/m limit.

All unreported Peak emissions were more than 16 dB below the 73.98 dB μ V/m limit.

Carrier and spurious emissions: nominal $f_c = 905$ MHz.
Diversity Antenna, Horizontal polarization.

Frequency (MHz)	Azimuth (Degrees)	Height (cm)	Ant. Pol.	Spectrum Analyzer Reading (dBuV)	Power Delivered To Tx Antenna (dBm)	Tx Antenna Gain (dBi)	EIRP (isotropic) (dBm)	ERP (dipole) (dBm)	ERP (W)	ERP Limit (W)	Delta (W)
904.8824	354	238	H	96.08 (peak)	24.51	5.9	30.41	28.26	0.67	4.00	- 3.33
905.1965	8	121	V	75.09 (peak)	6.34	4.4	10.74	8.59	0	4.00	- 4.00

Carrier and spurious emissions: nominal $f_c = 905$ MHz.
Diversity Antenna, Vertical polarization.

Frequency (MHz)	Azimuth (Degrees)	Height (cm)	Ant. Pol.	Spectrum Analyzer Reading (dBuV)	Power Delivered To Tx Antenna (dBm)	Tx Antenna Gain (dBi)	EIRP (isotropic) (dBm)	ERP (dipole) (dBm)	ERP (W)	ERP Limit (W)	Delta (W)
905.0563	329	127	H	81.96 (peak)	10.33	5.9	16.23	14.08	0.03	4.00	- 3.97
905.8881	0	128	V	103.51 (peak)	32.88	4.4	37.28	35.13	3.26	4.00	- 0.74

Frequency (MHz)	Azimuth (Degrees)	Height (cm)	Ant. Pol.	EUT Spectrum Analyzer Reading (dBuV)	Power Delivered To Tx Antenna (dBm)	Tx Antenna Gain (dBi)	EIRP (isotropic) (dBm)	ERP (dipole) (dBm)	ERP Limit (dBm)	Delta (dB)
1809.9410	335	106	H	64.9 (avg)	- 44.74	5.9	- 38.84	- 40.99	-13	- 27.99
1809.9680	359	100	V	61.6 (avg)	- 47.56	5.4	- 42.16	- 44.31	-13	- 31.31

Notes: The EUT faces the measuring antenna at 0° of turntable azimuth.

Investigation was performed up to 9.5 GHz

The carrier was measured with attenuation added to the system to prevent input saturation. Reported values are corrected for this attenuation.

All unreported emissions were found to be more than 20 dB below the applicable limit.

RBW = 1 MHz. VBW = 3 MHz.

Carrier and spurious emissions: nominal $f_c = 915$ MHz.
Diversity Antenna, Horizontal polarization.

Frequency (MHz)	Azimuth (Degrees)	Height (cm)	Ant. Pol.	Spectrum Analyzer Reading (dBuV)	Power Delivered To Tx Antenna (dBm)	Tx Antenna Gain (dBi)	EIRP (isotropic) (dBm)	ERP (dipole) (dBm)	ERP (W)	ERP Limit (W)	Delta (W)
914.9192	356	100	H	94.62 (peak)	22.59	5.8	28.39	26.24	0.42	4.00	- 3.58
914.8844	335	101	V	77.47 (peak)	7.79	4.3	12.09	9.94	0.01	4.00	- 3.99

Carrier and spurious emissions: nominal $f_c = 915$ MHz.
Diversity Antenna, Vertical polarization.

Frequency (MHz)	Azimuth (Degrees)	Height (cm)	Ant. Pol.	Spectrum Analyzer Reading (dBuV)	Power Delivered To Tx Antenna (dBm)	Tx Antenna Gain (dBi)	EIRP (isotropic) (dBm)	ERP (dipole) (dBm)	ERP (W)	ERP Limit (W)	Delta (W)
914.8888	333	123	H	84.55 (qp)	13.37	5.8	19.17	17.02	0.05	4.00	- 3.95
914.8867	0	122	V	102.12 (peak)	27.29	4.3	31.59	33.74	2.37	4.00	- 1.63

Frequency (MHz)	Azimuth (Degrees)	Height (cm)	Ant. Pol.	EUT Spectrum Analyzer Reading (dBuV)	Power Delivered To Tx Antenna (dBm)	Tx Antenna Gain (dBi)	EIRP (isotropic) (dBm)	ERP (dipole) (dBm)	ERP Limit (dBm)	Delta (dB)
1829.9690	341	100	H	60.20 (avg)	- 48.95	5.6	- 43.35	- 45.5	-13	- 32.5
1830.0540	16	104	V	59.40 (avg)	- 49.58	5.4	- 44.18	- 46.33	-13	- 33.33

Notes: The EUT faces the measuring antenna at 0° of turntable azimuth.

Investigation was performed up to 9.5 GHz

The carrier was measured with attenuation added to the system to prevent input saturation. Reported values are corrected for this attenuation.

All unreported emissions were found to be more than 20 dB below the applicable limit.

RBW = 1 MHz. VBW = 3 MHz

Carrier and spurious emissions: nominal $f_c = 925$ MHz.
Diversity Antenna, Horizontal polarization.

Frequency (MHz)	Azimuth (Degrees)	Height (cm)	Ant. Pol.	Spectrum Analyzer Reading (dBuV)	Power Delivered To Tx Antenna (dBm)	Tx Antenna Gain (dBi)	EIRP (isotropic) (dBm)	ERP (dipole) (dBm)	ERP (W)	ERP Limit (W)	Delta (W)
924.2950	335	207	H	93.85 (peak)	21.90	5.9	27.80	25.65	0.37	4.00	- 3.36
924.8821	357	201	V	78.29 (peak)	8.84	4.3	13.14	10.99	0.01	4.00	- 3.99

Carrier and spurious emissions: nominal $f_c = 925$ MHz.
Diversity Antenna, Vertical polarization.

Frequency (MHz)	Azimuth (Degrees)	Height (cm)	Ant. Pol.	Spectrum Analyzer Reading (dBuV)	Power Delivered To Tx Antenna (dBm)	Tx Antenna Gain (dBi)	EIRP (isotropic) (dBm)	ERP (dipole) (dBm)	ERP (W)	ERP Limit (W)	Delta (W)
924.8871	334	123	H	86.05 (peak)	15.00	5.9	20.90	18.75	0.12	4.00	- 3.88
924.8879	8	120	V	101.64 (peak)	31.29	4.3	35.59	33.44	2.21	4.00	- 1.79

Frequency (MHz)	Azimuth (Degrees)	Height (cm)	Ant. Pol.	EUT Spectrum Analyzer Reading (dBuV)	Power Delivered To Tx Antenna (dBm)	Tx Antenna Gain (dBi)	EIRP (isotropic) (dBm)	ERP (dipole) (dBm)	ERP Limit (dBm)	Delta (dB)
1849.9940	360	124	H	57.9 (avg)	- 52.56	5.7	- 46.86	- 49.01	-13	- 36.01
1849.9878	35	104	V	57.6 (avg)	- 53.19	5.6	- 47.59	- 49.74	-13	- 36.74

Notes: The EUT faces the measuring antenna at 0° of turntable azimuth.

Investigation was performed up to 9.5 GHz

The carrier was measured with attenuation added to the system to prevent input saturation. Reported values are corrected for this attenuation.

All unreported emissions were found to be more than 20 dB below the applicable limit.

RBW = 1 MHz. VBW = 3 MHz.

5.0 TEST FACILITY

5.1 LOCATION

The EUT was tested for Electromagnetic Compatibility at the Electronics Test Centre, located in Airdrie, Alberta, Canada.

The RF Anechoic Chamber (RFAC) is identified as Chamber 1, located in the main building complex at the Electronics Test Centre. Its usable working space measures 10.6 m long x 7.3 m wide x 6.5 m high.

This test site is listed with the FCC under Registration Number 99541. Measurements taken at this site are accepted by Industry Canada per file number IC 2046-1.

The floor, walls and ceiling consist of annealed steel panels. The walls and ceiling are covered with ferrite tile, augmented by RF absorbant foam material on the end wall nearest the turntable, and on the adjacent walls and the ceiling. The chamber floor supports a 15 cm high internal floor, constructed of annealed steel panels, that forms the ground plane, and is bonded to the chamber walls.

The 3-m diameter turntable is flush-mounted with the floor. A sub-floor cable-way is provided to route cables between the turntable pit and EUT support equipment. Cables reach the EUT through an opening in the centre of the turntable.

Test instrumentation and EUT support equipment is located in two shielded vestibules located at the side of the main room. Cables are routed through bulkhead panels between the rooms as required. Power feeds are routed into the main room and vestibules through line filters providing at least 100 dB of attenuation between 10 kHz and 10 GHz.

5.2 GROUNDING PLAN

The EUT was located on a wooden table 80 cm above the ground plane.

The EUT was grounded in accordance with WaveRider Communications Ltd. specifications.

5.3 POWER

AC power was supplied via an Underwriter's Laboratories ULW100-69, 100 dB, 100 Ampere wall mounted filter. Bonding to ground is implemented at the chamber wall.

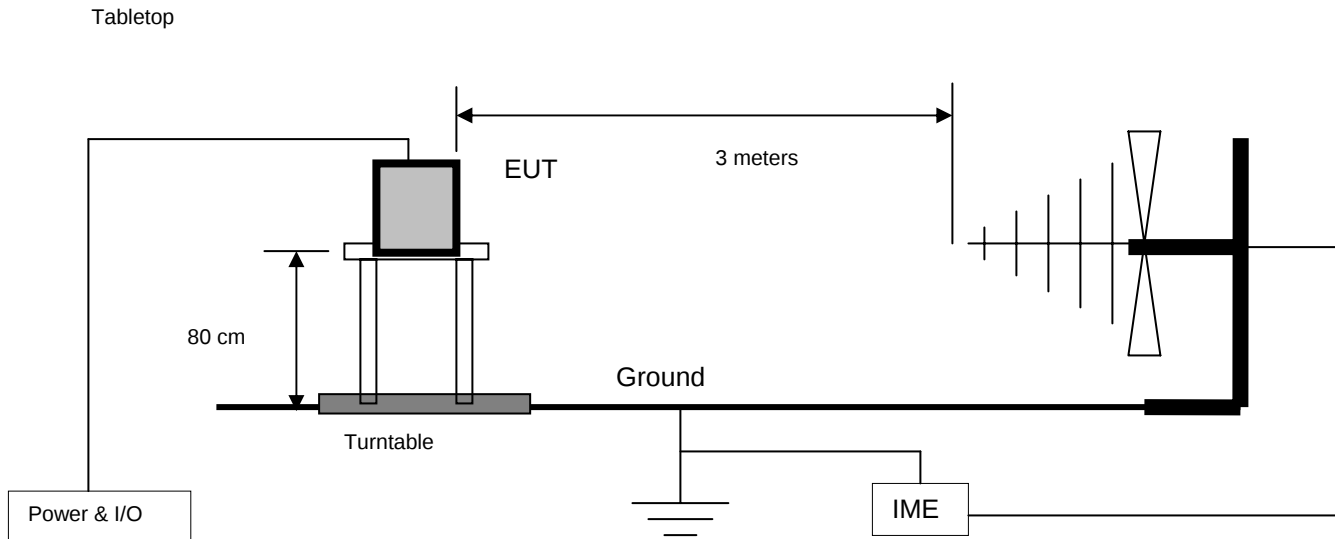
5.4 EMISSIONS PROFILE

Ambient conducted and radiated electromagnetic emission profiles were generated throughout the tests and are included in the test data.

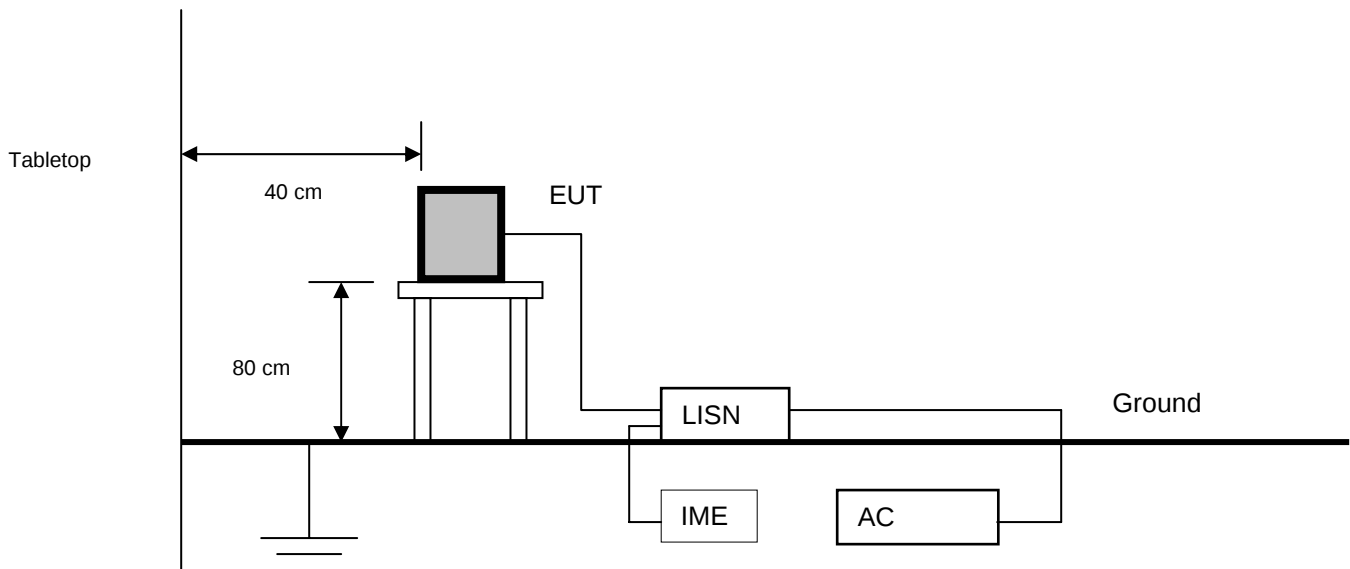
5.5 TEST CONFIGURATION

The following diagrams illustrate the configuration of the EUT test and measurement equipment for Radiated and Conducted Emissions Testing of tabletop equipment.

Radiated



Conducted



6.0 TEST EQUIPMENT

The following equipment was used for this procedure. All measurement devices are calibrated annually, traceable to NIST.

6.1 RADIATED EMISSIONS

- a) Spectrum Analyzer with RF Preselector
- b) CISPR Quasi-peak Adapter
- c) Power Isolation Transformers
- d) Biconilog antenna (20 MHz to 2 GHz)
- e) DRG horn antenna (1 – 18 GHz)
- f) Antenna mast positioner and controller
- g) Flush-mounted turntable and controller
- h) Personal Computer and EMC software

6.2 CONDUCTED EMISSIONS

- a) Spectrum Analyzer with RF Preselector
- b) Line Impedance Stabilization Network, 50 μ H
- c) CISPR Quasi-peak Adapter
- d) Power Isolation Transformers
- e) Personal Computer and EMC software

6.3 CALIBRATION

All measurement instrumentation conforms to ANSI C63.2. Calibration is maintained in accordance with manufacturer recommendations. Each measurement device is labeled with its ETC asset number and calibration due date.

6.3.1 CALIBRATION ACCURACY

Test equipment used to provide quantitative measurements are calibrated with standards traceable to the National Research Council, National Institute of Standards and Technology or other national standards. Instrumentation systems for emissions measurements have the following accuracies:

Frequency = ± 1 kHz
Amplitude (RE) = ± 4.01 dB
Amplitude (CE) = ± 3.25 dB

6.3.2 TEST EQUIPMENT DESCRIPTION

Testing was performed with equipment selected from the following list.

Instrument	Manufacturer	Model No.	Asset No.	Calibration Due
Spectrum Analyzer & Display	Hewlett Packard	8566B & 85662	9168	7 September 2006
RF Preselector	Hewlett Packard	85685A	9728	8 September 2006
Quasi-Peak Adapter	Hewlett Packard	85650A	9243	8 September 2006
Measurement System Software	Underwriters Laboratories	Version 6.0	4443	n/a
Inverter (single phase)	California Instruments	5000iX	4378	6 September 2007
Low Noise Amplifier	MITEQ	JS43-01001800-21-5P	4354	7 January 2007
Line Impedance Stabilization Network	EMCO	3825/2r	9331	5 January 2007
Line Impedance Stabilization Network	EMCO	3825/2r	9259	5 January 2007
Line Impedance Stabilization Network	EMCO	38100/1SPEC	9331	5 January 2007
Line Impedance Stabilization Network	EMCO	38100/1SPEC	9259	5 January 2007
Active Monopole	EMCO	3301B	9764	21 July 2007
Biconilog Antenna	ARA	LPB-2520/A	4318	7 January 2007
Biconical Antenna	EMCO	3104	9257	12 January 2007
Log-periodic Array	EMCO	3147	20721	18 January 2007
DRG Horn	EMCO	3106	9699	10 August 2007
DRG Horn	Tensor	4106	9576	11 January 2007
DRG Horn	EMCO	3115	9588	5 January 2007
Low Noise Amplifier	MITEQ	JS43-01001800-21-5P	4354	7 January 2007

Appendix A

Waverider EUM3006A

Test Sample Description

(from data provided by WaveRider Communications Ltd.)

Product Name: Waverider EUM3006A			
Part/Model # : EUM3006A		Serial # :	
Product Application	Designated Marketplaces		
Commercial ☒	Canada ☒	Other ☐	
Military ☐	United States of America ☒		
	European Union ☐		

GENERAL INFORMATION REQUIRED FOR ALL PRODUCTS

Dimensions (L x W x H) 8.3"X5.8"X2.0"		Weight: __2__ lbs.			
Power Requirements: AC X Voltage: __120__ VAC # of AC phases: _1_ current: ____ Amps frequency: __60__ Hz					
Product Intended Application		Wireless Ethernet modem			
Product Deployment Environments		Outdoors -40C to 50C			
Description of interconnecting leads & cables (Attach separate sheet, if required)	Type:	Cable 1	Cable 2	Cable 3	Cable 4
	Connectors:	Cross-over Ethernet cable			
	Terminations :	RJ-45			
	Shielding:	None			
	Length:	None			
List of internally generated frequencies: Crystal / Oscillator / Switcher / LO			11 MHz (DSSS BBP reference) 22 MHz (Microprocessor reference) 25 MHz (Ethernet reference) 22 MHz (Reference oscillator) 70 MHz (Intermediate frequency) 140 MHz (IF Oscillator) 905 – 925 MHz (Desired frequency) 975 – 995 MHz (Radio Frequency Local Oscillator)		

CLIENT SAMPLE DESCRIPTION
WIRELESS PRODUCT INFORMATION

Type of Radio Device (check all applicable Equipment Configurations)

Intentional transmitter	X	Receiver	X	Transceiver	☐
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Type of Radio Operating License

Unlicensed Personal Communication	X	Unlicensed National Information Infrastructure	☐	Ultra-Wideband Operation	☐	Licensed	☐
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Type of Modulation of Radio Device

CDMA	☐	TDMA	☐	Other	☐
Spread Spectrum Technology	X	Direct sequencer	☐	Frequency hopper	☐
Transmitter Power Output : 32.2 dBm EIRP, 26dBm conducted		Emission Designator : 4M25G1D: 4M25= 4.25 MHz OBW; G = Phase modulated Carrier, 1 = Single channel with digital info.; D = Data transmission			

Information on Radio Frequencies

Transmitter Operating Frequency(s) & Bandwidth	905 – 925 MHz, 5MHz BW
Transmitter Channel Frequencies & separations (If required, attach a separate sheet)	905, 915 and 925 to be used for testing
Receiver Operating Frequency(s) & Bandwidth	905 – 925 MHz, 5MHz BW
Receiver Channel Frequencies & separations (If required, attach a separate sheet)	905, 915 and 925 to be used for testing

Information on Antenna(s)

Is the antenna removable?	YES X NO ☐	Antenna Connector Type : Tensolite	Number of Antennas : 1 (diversity antenna)
Gain of Each Antenna (and tolerance)	6.2 ± 0.5 dBi and 2 ± 0.5 dBi (vertical and horizontal polarization, respectively)		
Activity and State of Digital Circuitry during ON Time	Active		

Radio Transmission Type

Continuous	X	Intermittent	☐	ON Time/ OFF Time :
Activity and State of Digital Circuitry during OFF Time	Active			