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MPB TECHNOLOGIES INC.

Test Report Prepared By:

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Emissions Testing of the EUM-IODU in accordance with FCC Part 15.247 (2004)

Spread Spectrum Operation 902 - 928 & 2400 - 2483.5 & 5725 - 5850 MHz.

Test Personnel: Jiaming Zhang, David Raynes

Prepared for: WaveRider Communications Inc.

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Authorized Signatory

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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.

1.2 APPLICANT

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

1.3 APPLICABILITY

All test procedures, limits, and results defined in this document apply to the WaveRider Communications Inc. EUM-IODU 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.

1.4 TEST SAMPLE DESCRIPTION

The test sample provided for testing was a EUM-IODU:

Product Type:	Wireless Ethernet modem
Model Number:	EUM-IODU
Serial Number:	N/A
Cables:	Ethernet – Cross cable
Power Requirements:	120 VAC 60Hz
Peripheral Equipment:	IBM laptop, Ault PW130 Power over Ethernet power injector

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

1.5 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.

1.6 SCOPE OF TESTING

Testing was performed in accordance with FCC Part 15 Subpart C (2004), and ANSI C63.4 (2003).

1.6.1 VARIATIONS IN TEST METHODS

There were no variations from the test procedures outlined above.

1.6.2 MARGINAL EMISSIONS MEASUREMENTS

As noted in Section 4, some emissions were measured to be within -6 dB of the specified limit:

1.6.3 TEST SAMPLE CONFIGURATION & MODIFICATIONS

The unit under test EUM-IODU was set up as shown in the photographs which are submitted separately.

Special test firmware permitted the EUT to be configured to transmit continuously on a selected channel. Configuration commands were issued by a support computer located outside the test chamber.

The EUT met the requirements without modifications.

2.0 ACRONYMS

AP -Average Peak
CE -Conducted Emissions
E -Field - Electric Field
H -Field - Magnetic Field
N/T -Not Tested
N/A -Not Applicable
PK -Peak
QP -Quasi Peak
RE -Radiated Emissions

3.0 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

4.0 TEST CONCLUSION

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**.

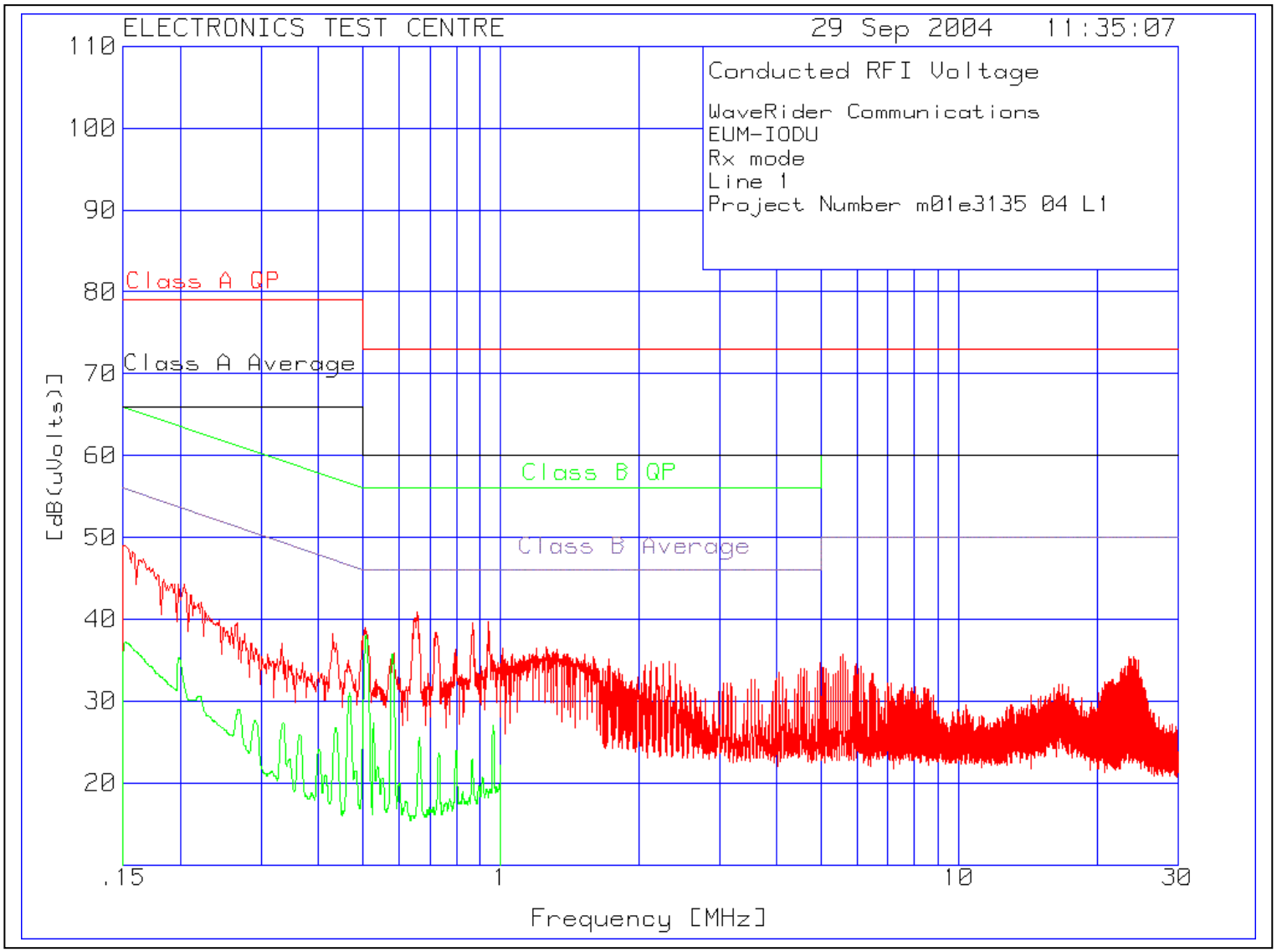
The following table summarizes the test results in terms of the specification and class or level applied, the unique test sample identification, the EUT modification state, and configuration as applicable.

TEST CASE	TEST TYPE	SPECIFICATION	TEST SAMPLE	MOD. STATE	CONFIGURATION	RESULT
§4.1	Conducted Emissions at AC lines	FCC Part 15.107 and 15.207	EUM-IODU	nil	See § 1.6.3	**PASS**
§4.2	Conducted Emissions at Antenna Port	FCC Part 15.247	EUM-IODU	nil	See § 1.6.3	**PASS**
§4.3a	Radiated Emissions (Rx Mode)	FCC Part 15.109	EUM-IODU	nil	See § 1.6.3	**PASS**
§4.3b	Radiated Emissions (Tx Mode)	FCC Parts 15.205, 15.209 and 15.247	EUM-IODU	nil	See § 1.6.3	**PASS**
§4.4	Frequency Stability	FCC Part 2.1055		nil	See § 1.6.3	**n/t**

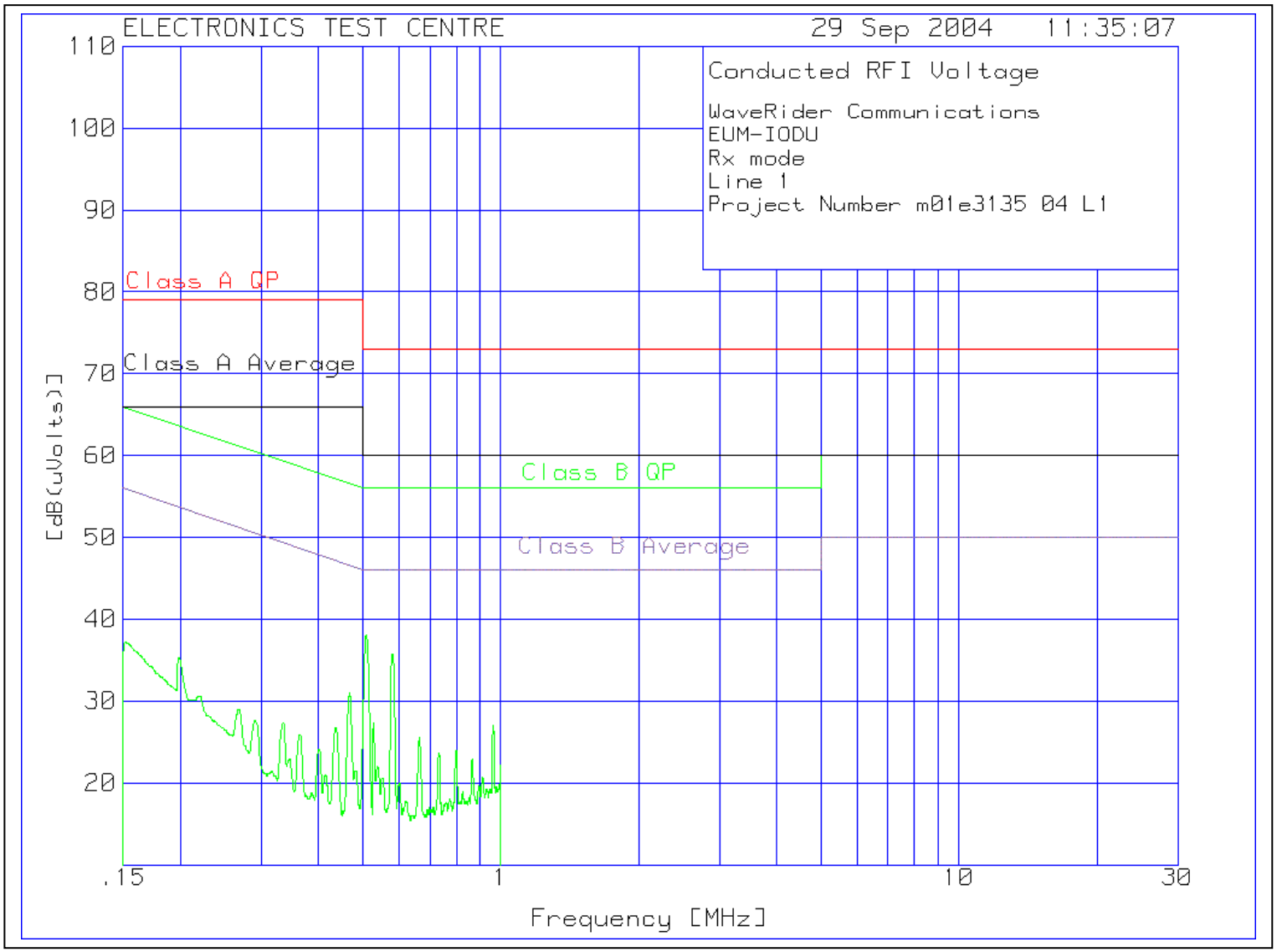
4.1 CONDUCTED EMISSIONS ON AC POWER LINES

Test Lab: Electronics Test Centre (Airdrie) Test Personnel: David Raynes Test Date: 29 September 2004	Product: EUM-IODU
Test Result, EUM-IODU: **PASS**	
Objectives/Criteria The Conducted emissions produced by a system or sub-system shall not exceed the limits for the specifications as stated. **Emission levels should meet the requirements with a margin of 6dB**. Temperature = 20 °C Humidity = 38 %	Specification: Part 15.107, Part 15.207 Frequency (MHz) QP Avg 0.150 - 0.50 66 – 56 56 - 46 0.50 – 5.0 56 46 5 – 30 60 50 Units of measurement are dBμV.
There were no more emissions measured within -10 dB of the specified limit. Refer to the test data and plots for more detail.	

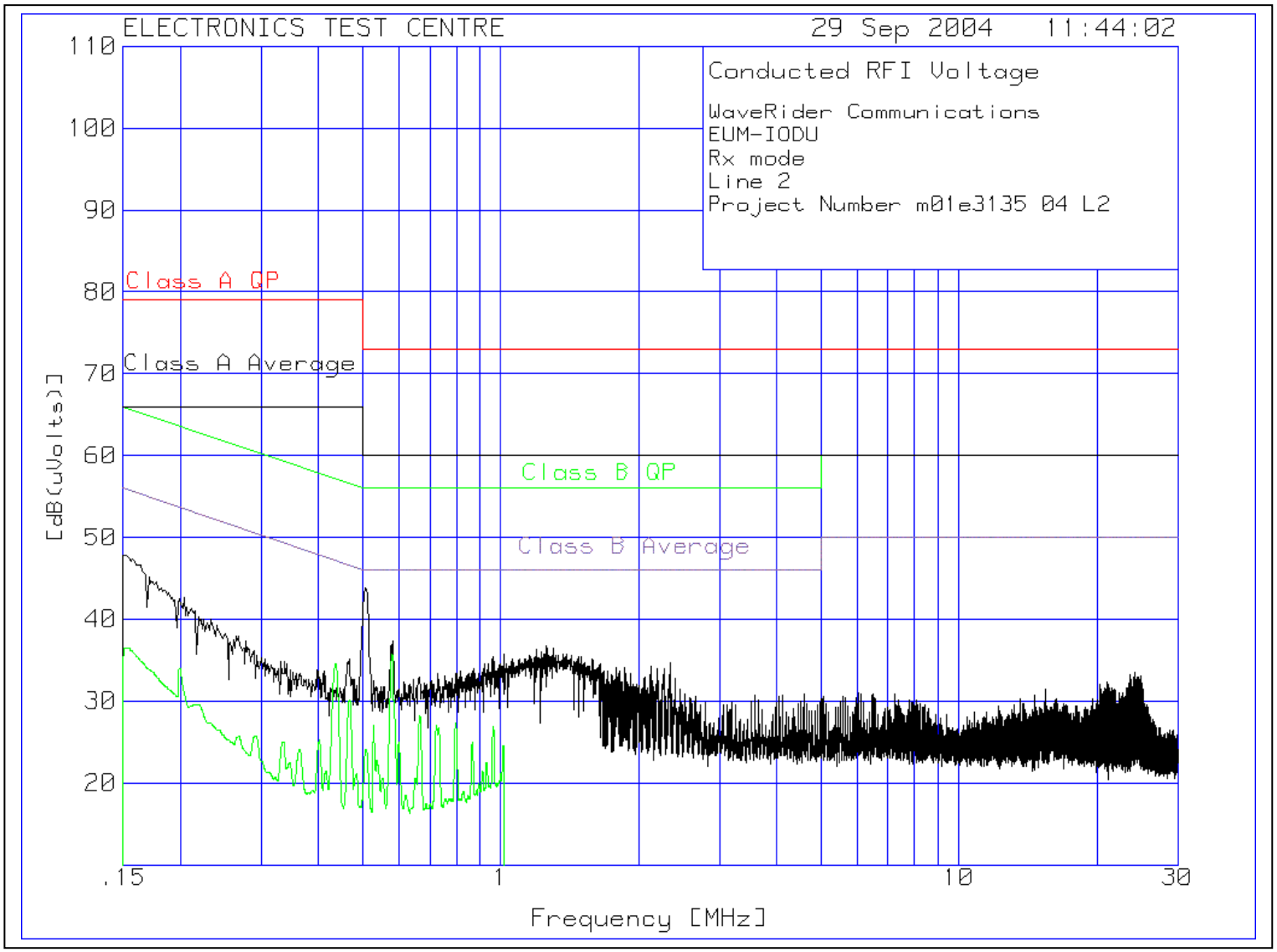
Plot of Conducted Emissions on AC Power Lines: green trace = quasi-peak data



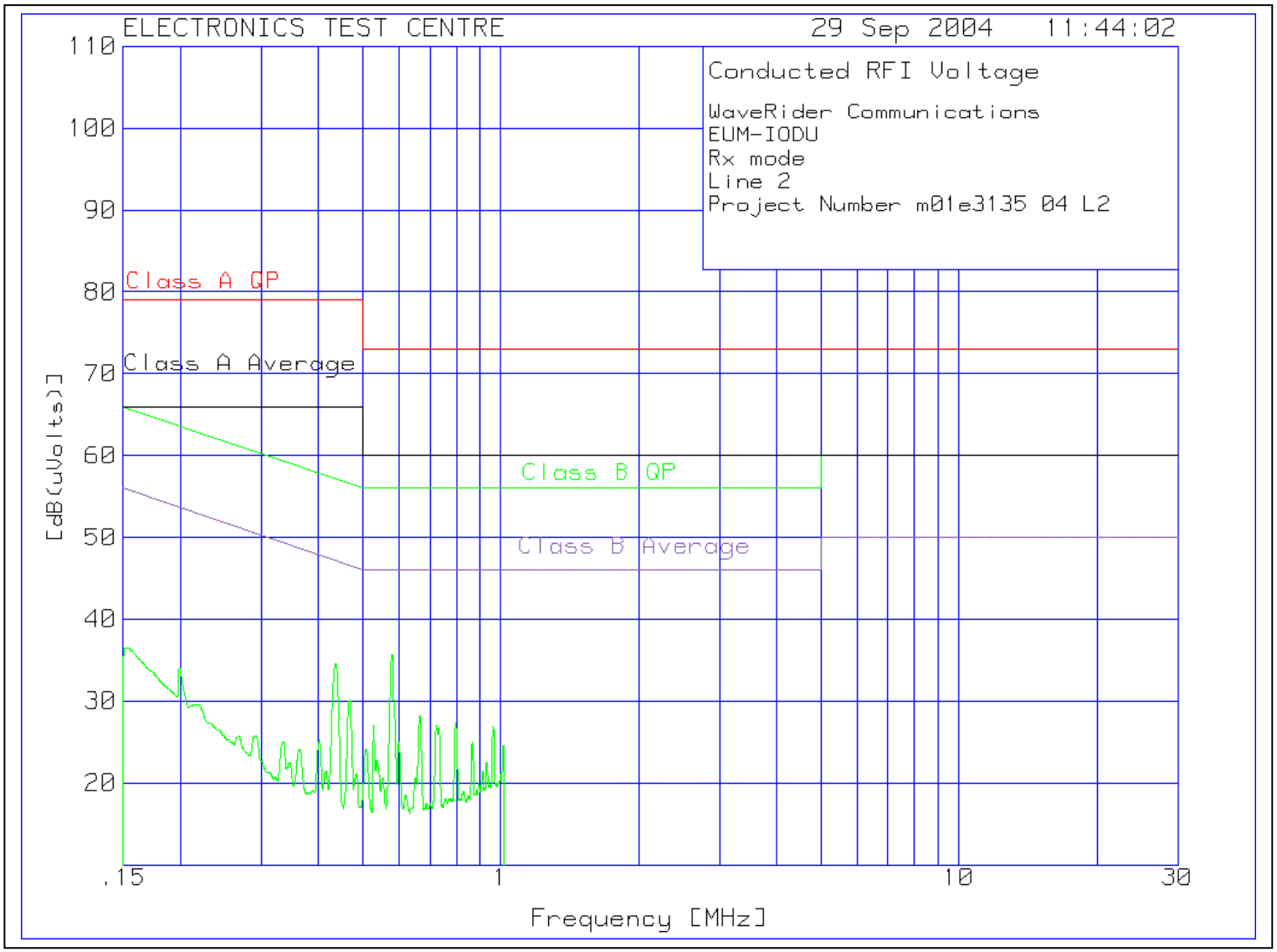
Plot of Conducted Emissions on AC Power Lines: green trace = quasi-peak data



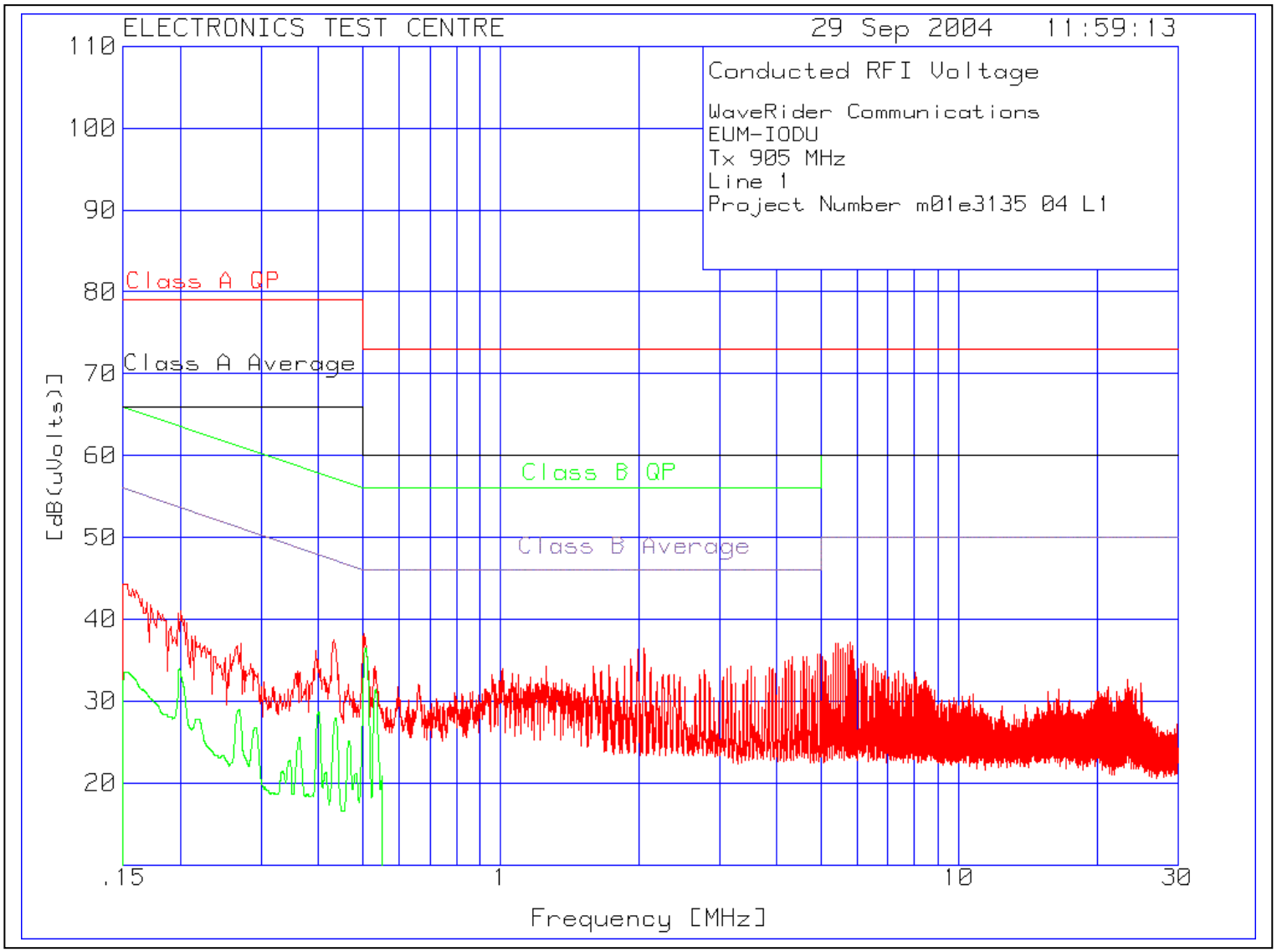
Plot of Conducted Emissions on AC Power Lines: green trace = quasi-peak data



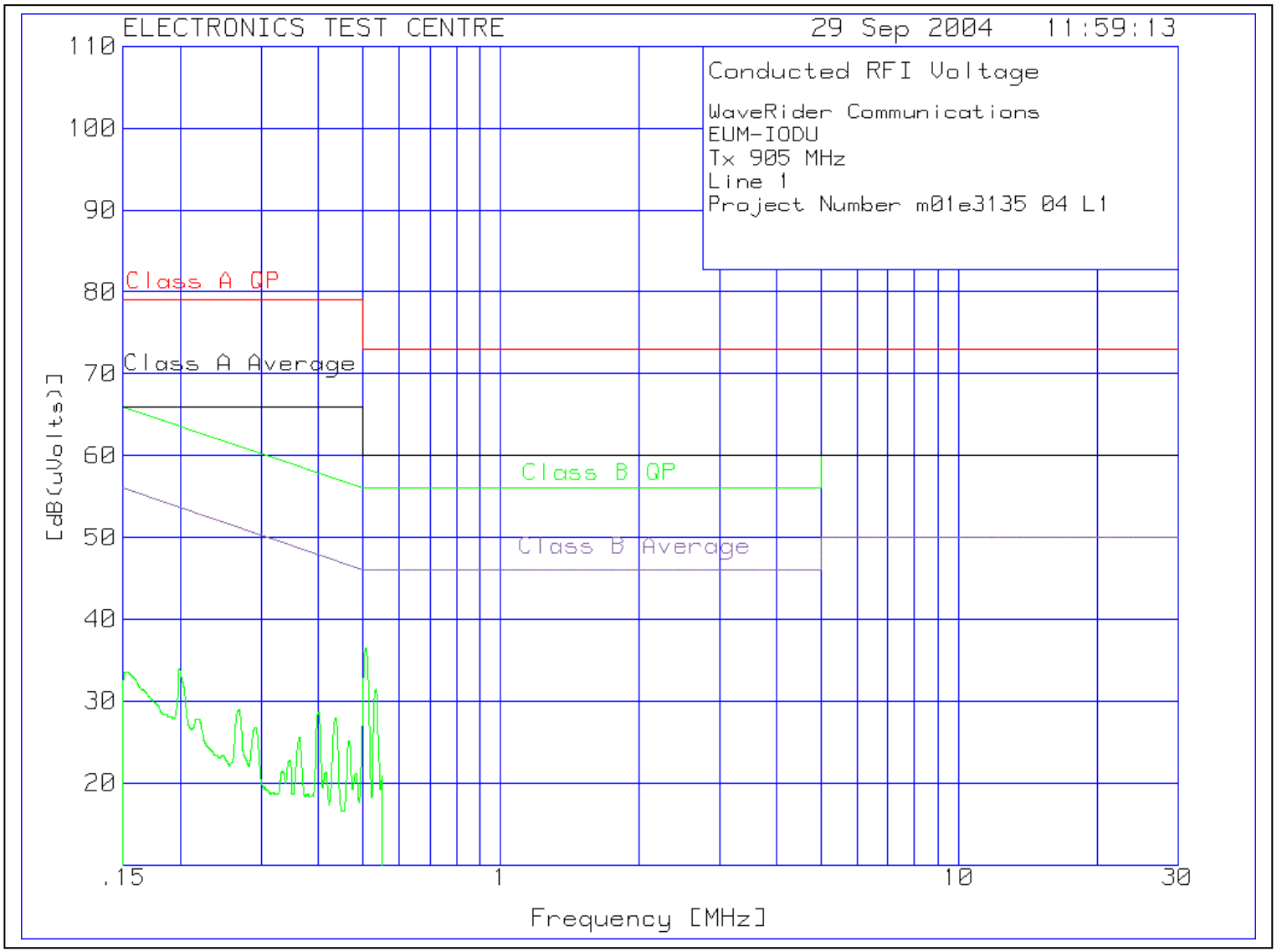
Plot of Conducted Emissions on AC Power Lines: green trace = quasi-peak data



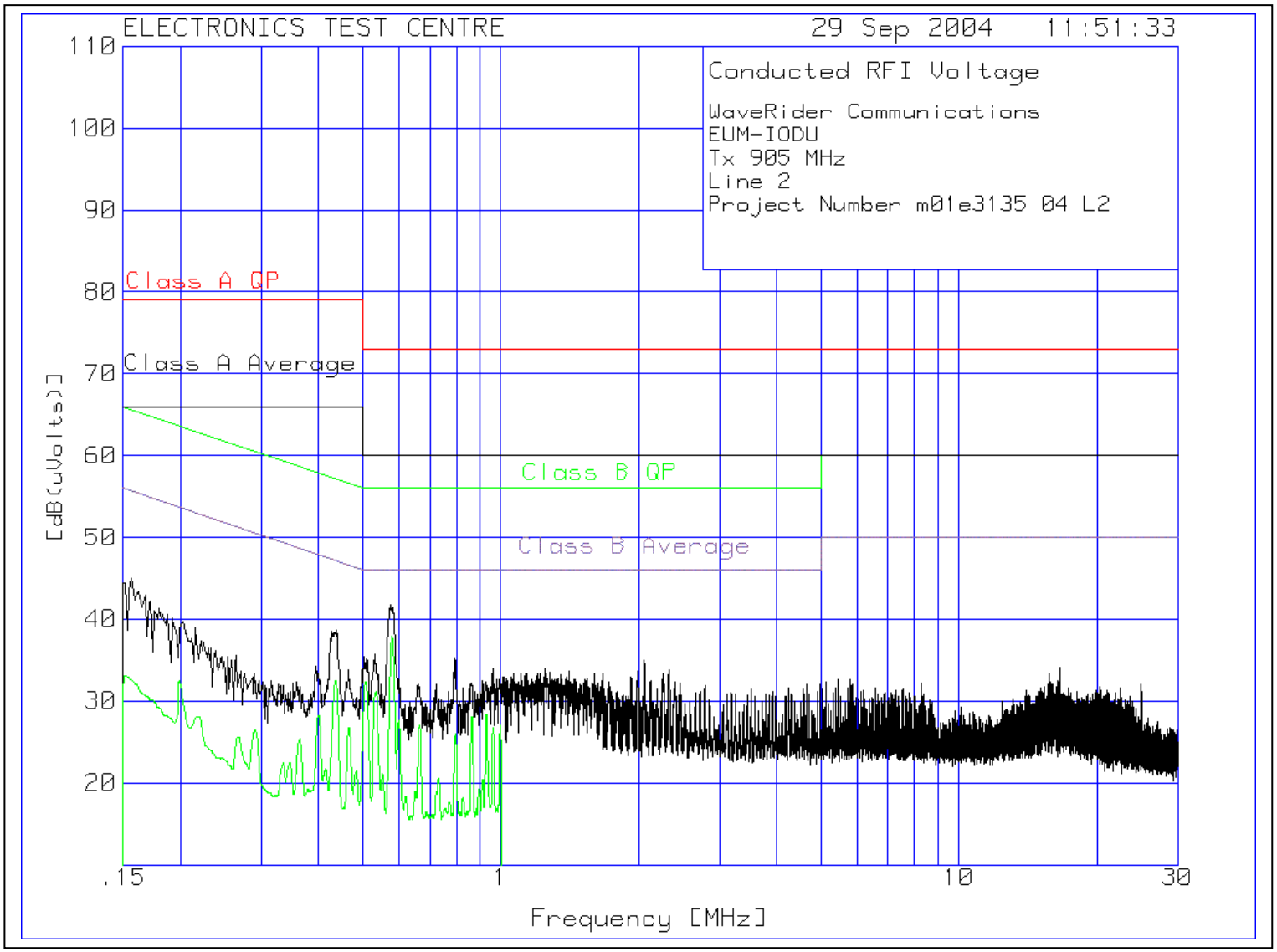
Plot of Conducted Emissions on AC Power Lines: green trace = quasi-peak data



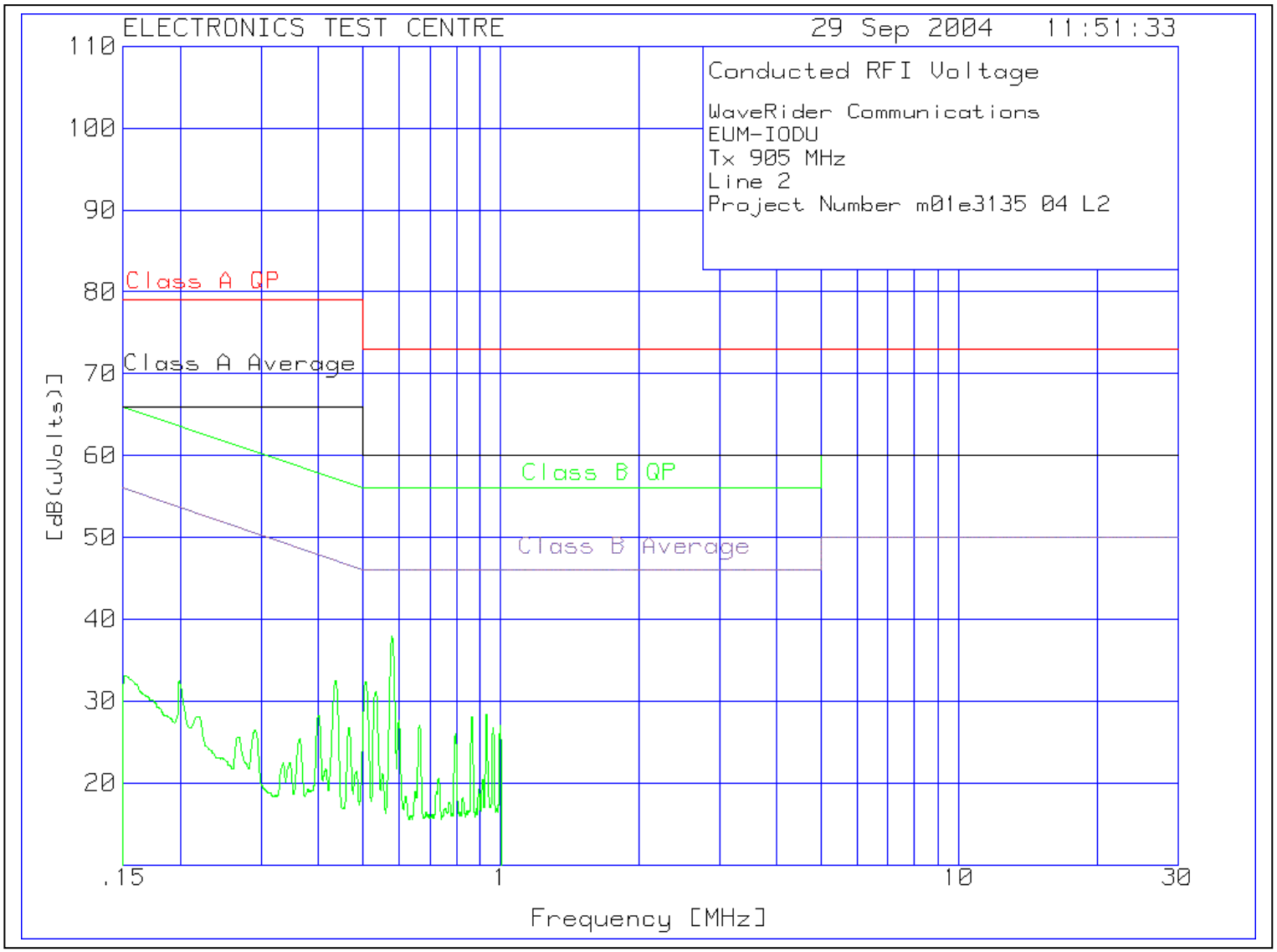
Plot of Conducted Emissions on AC Power Lines: green trace = quasi-peak data



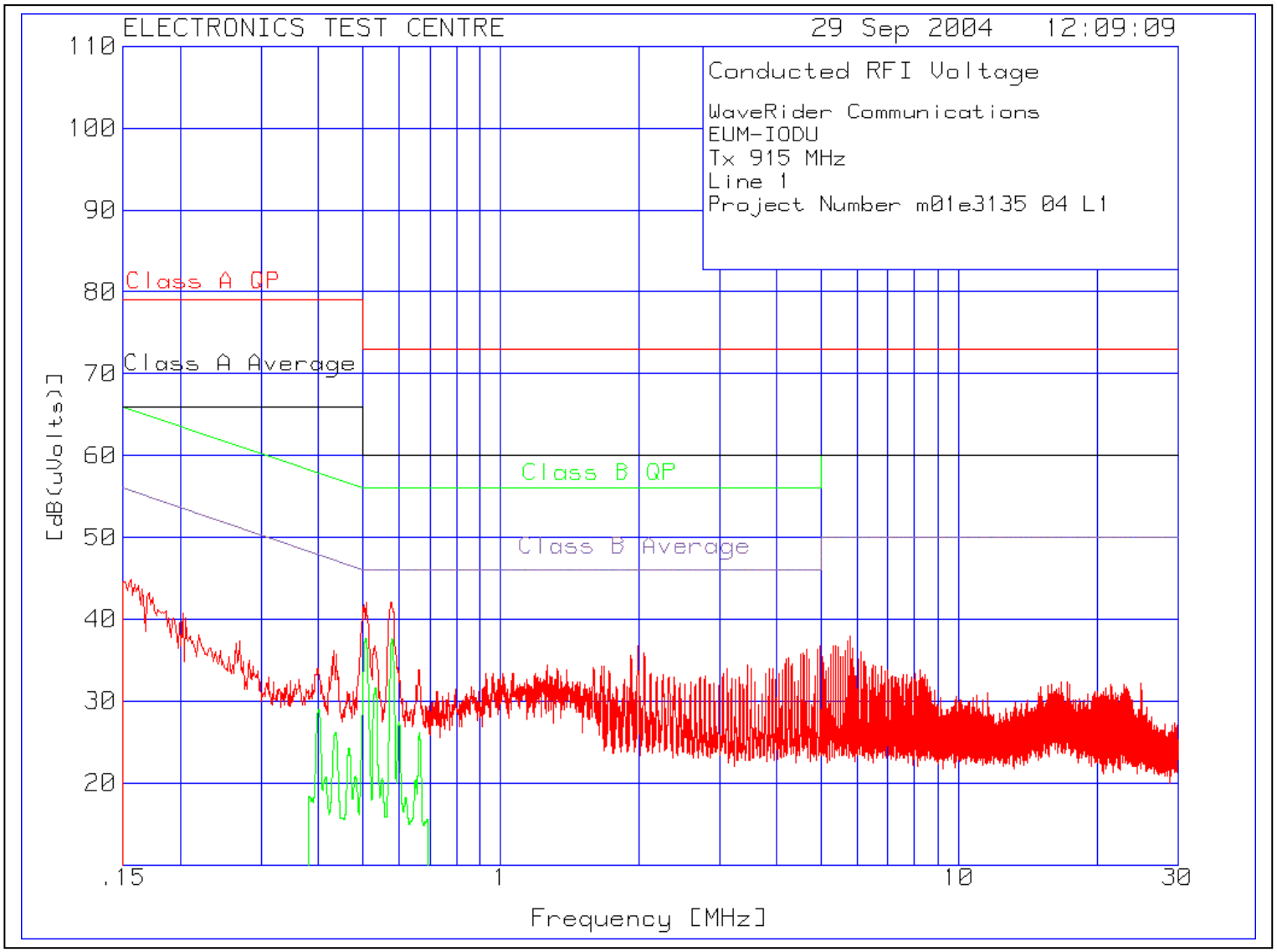
Plot of Conducted Emissions on AC Power Lines: green trace = quasi-peak data



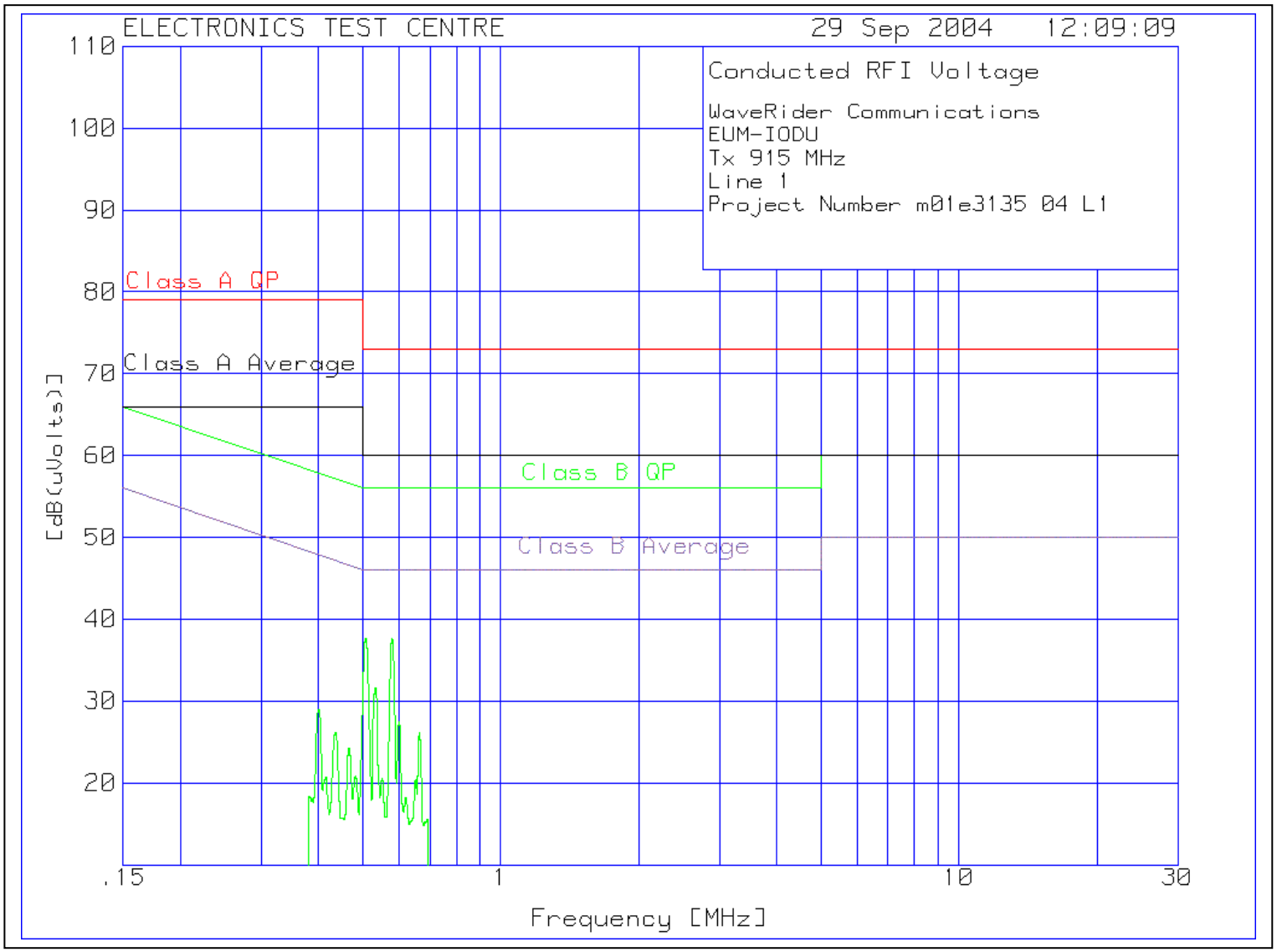
Plot of Conducted Emissions on AC Power Lines: green trace = quasi-peak data



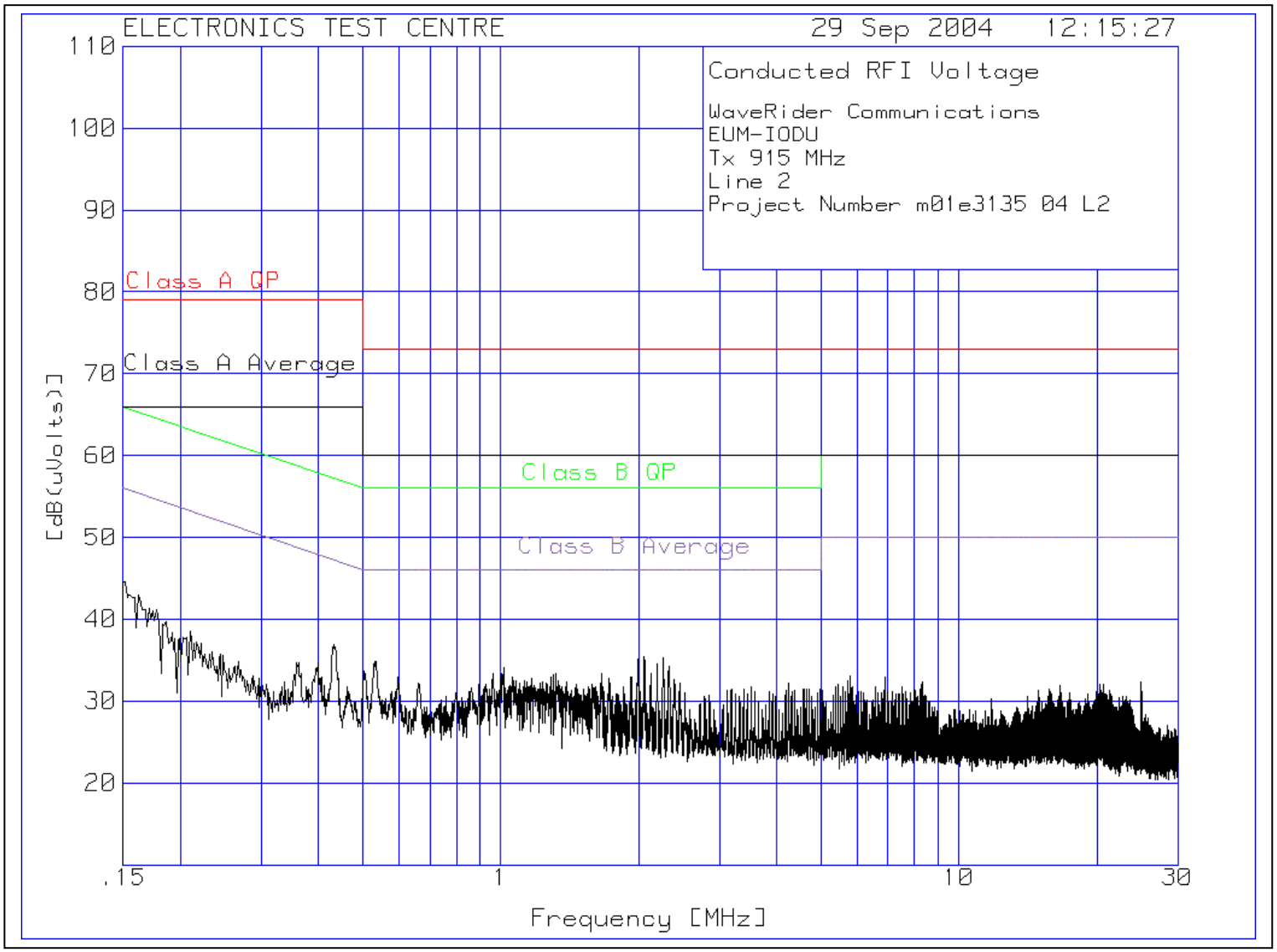
Plot of Conducted Emissions on AC Power Lines: green trace = quasi-peak data



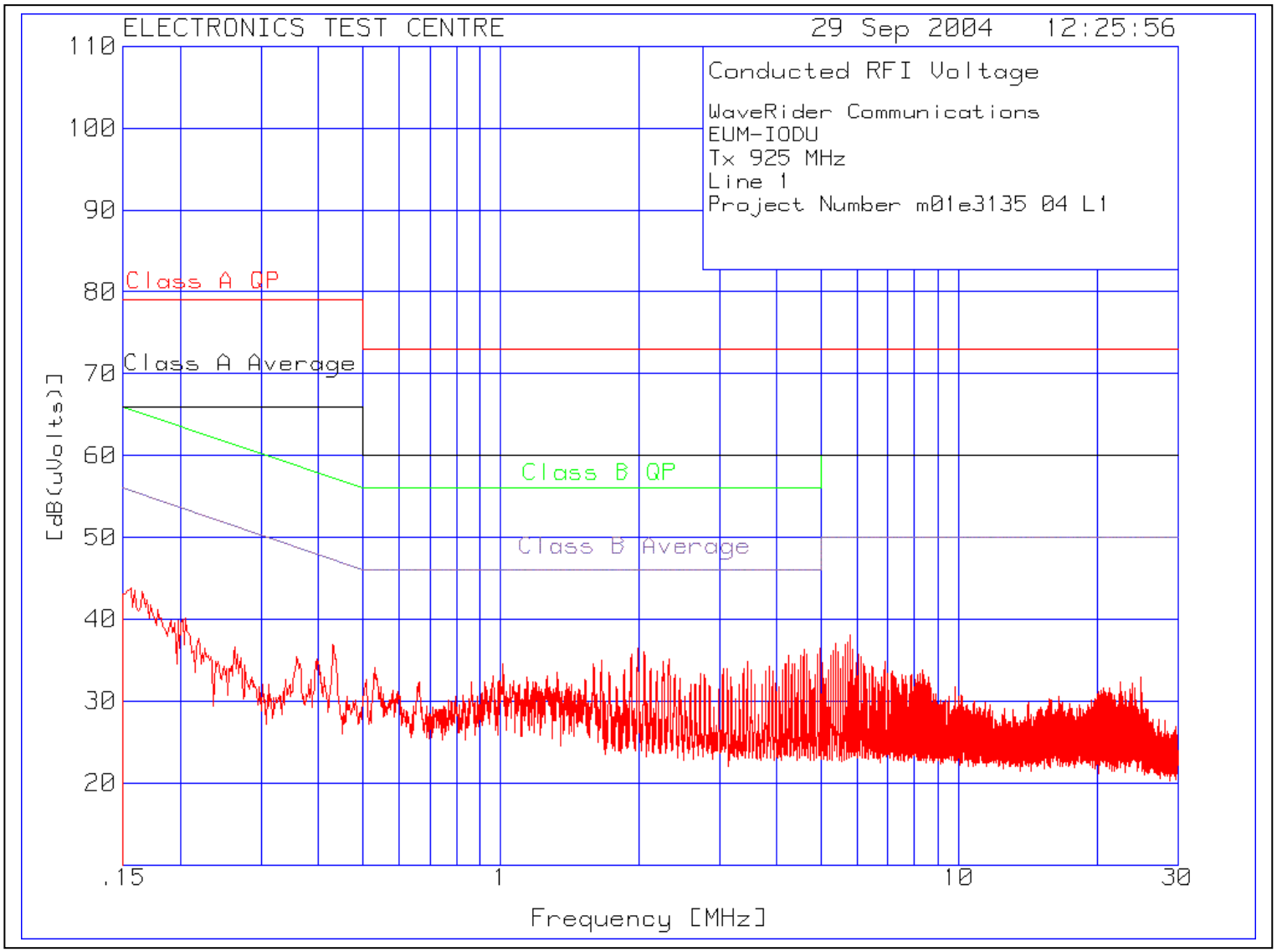
Plot of Conducted Emissions on AC Power Lines: green trace = quasi-peak data



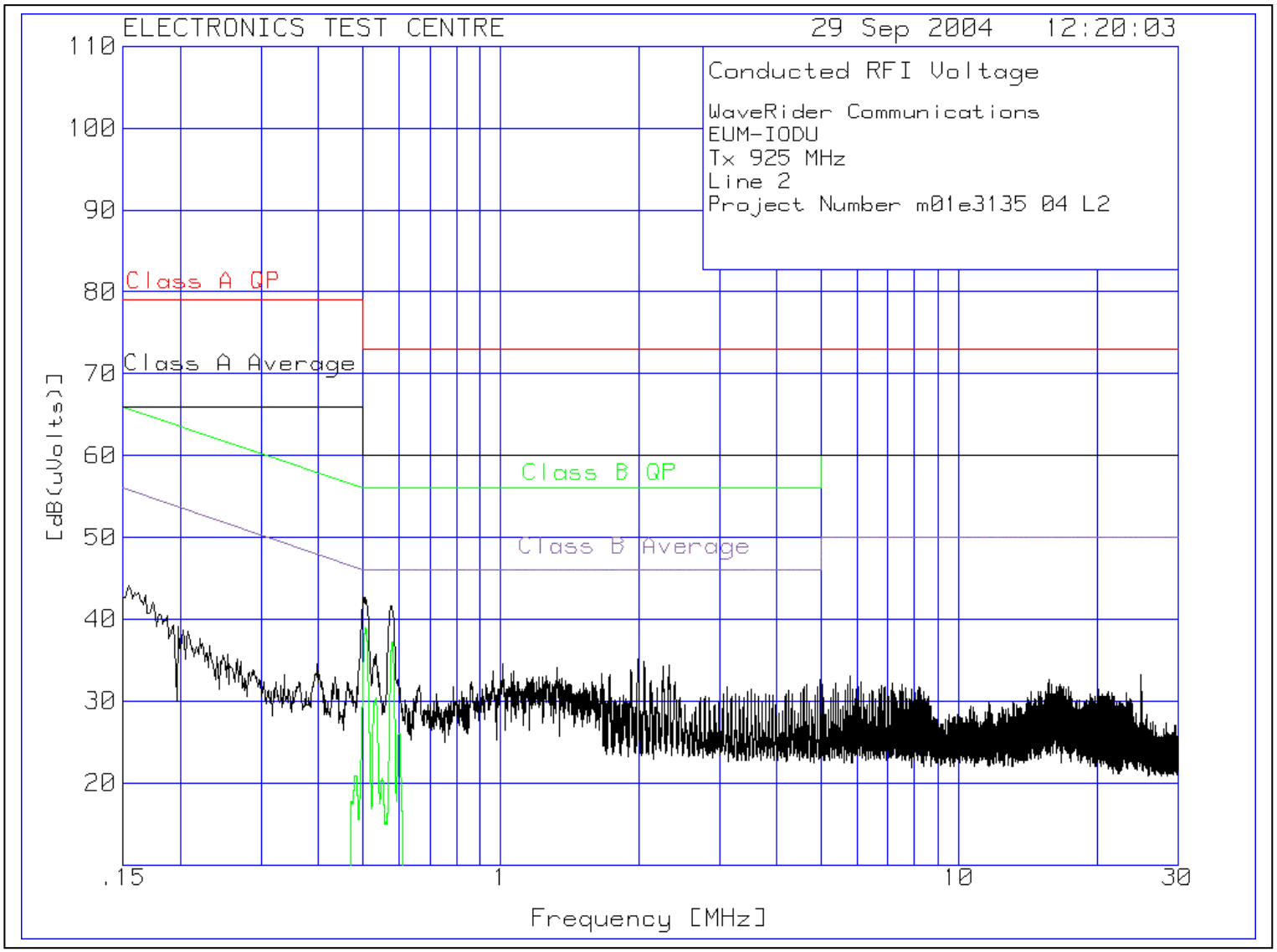
Plot of Conducted Emissions on AC Power Lines:



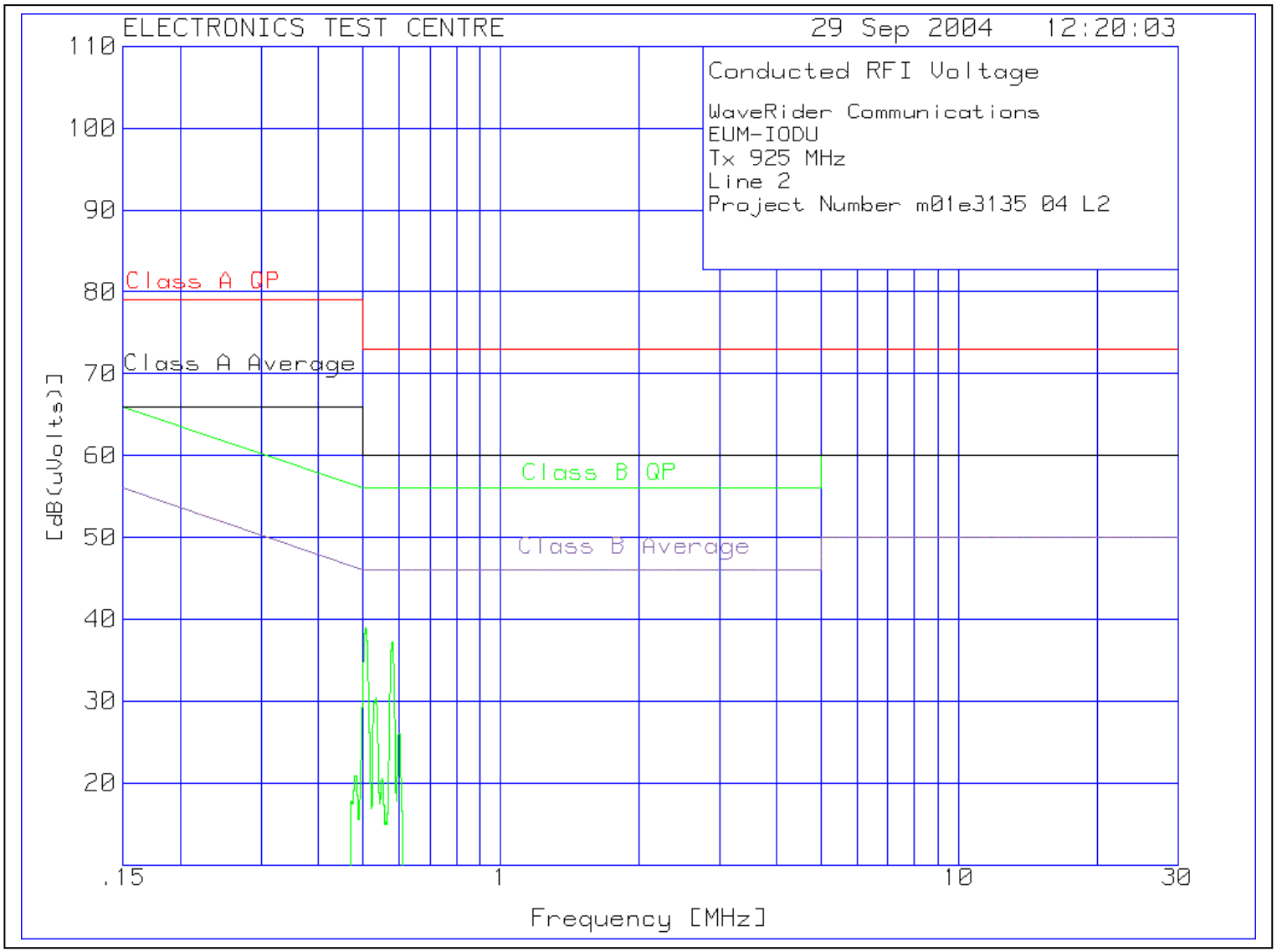
Plot of Conducted Emissions on AC Power Lines:



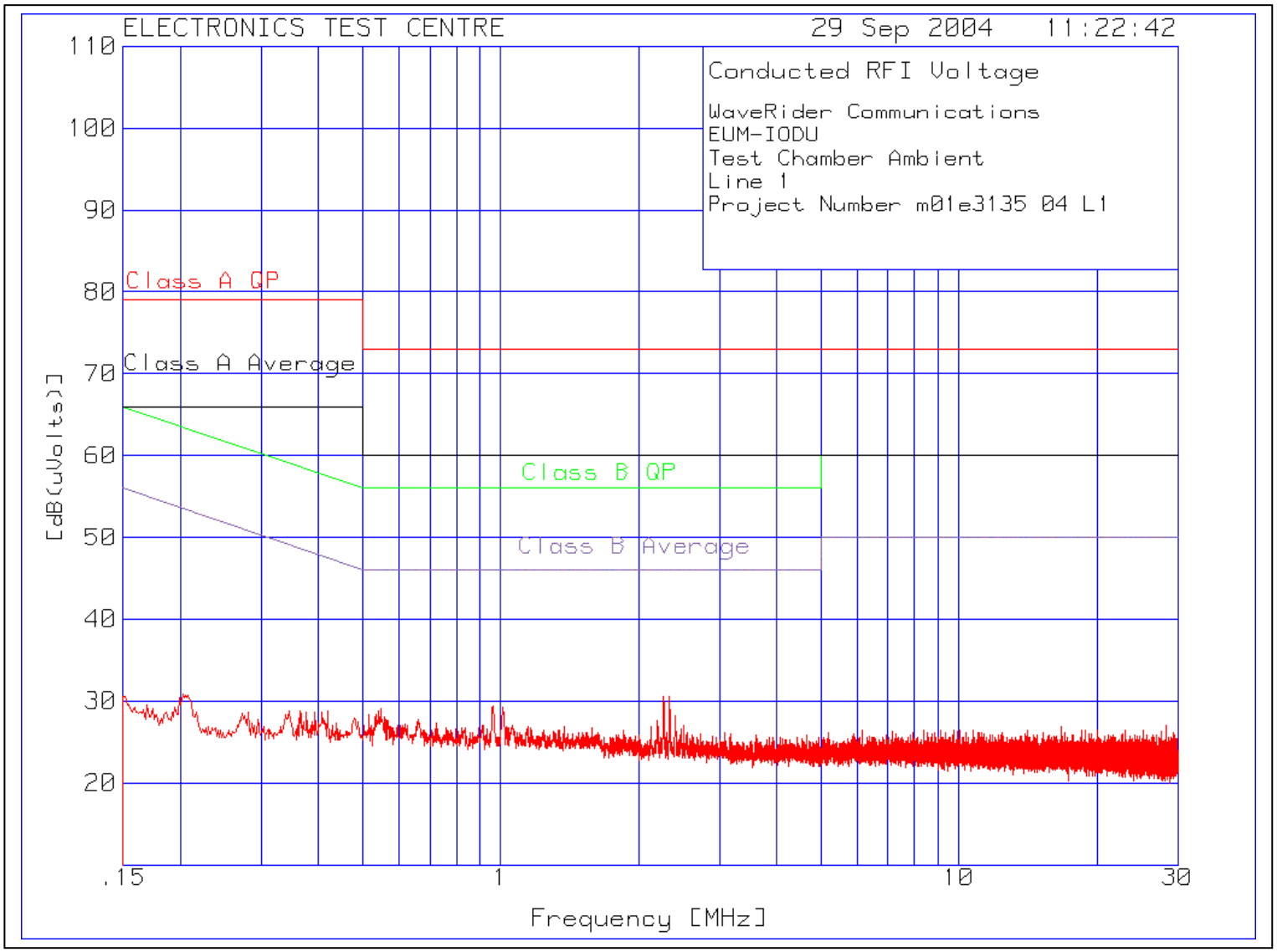
Plot of Conducted Emissions on AC Power Lines: green trace = quasi-peak data



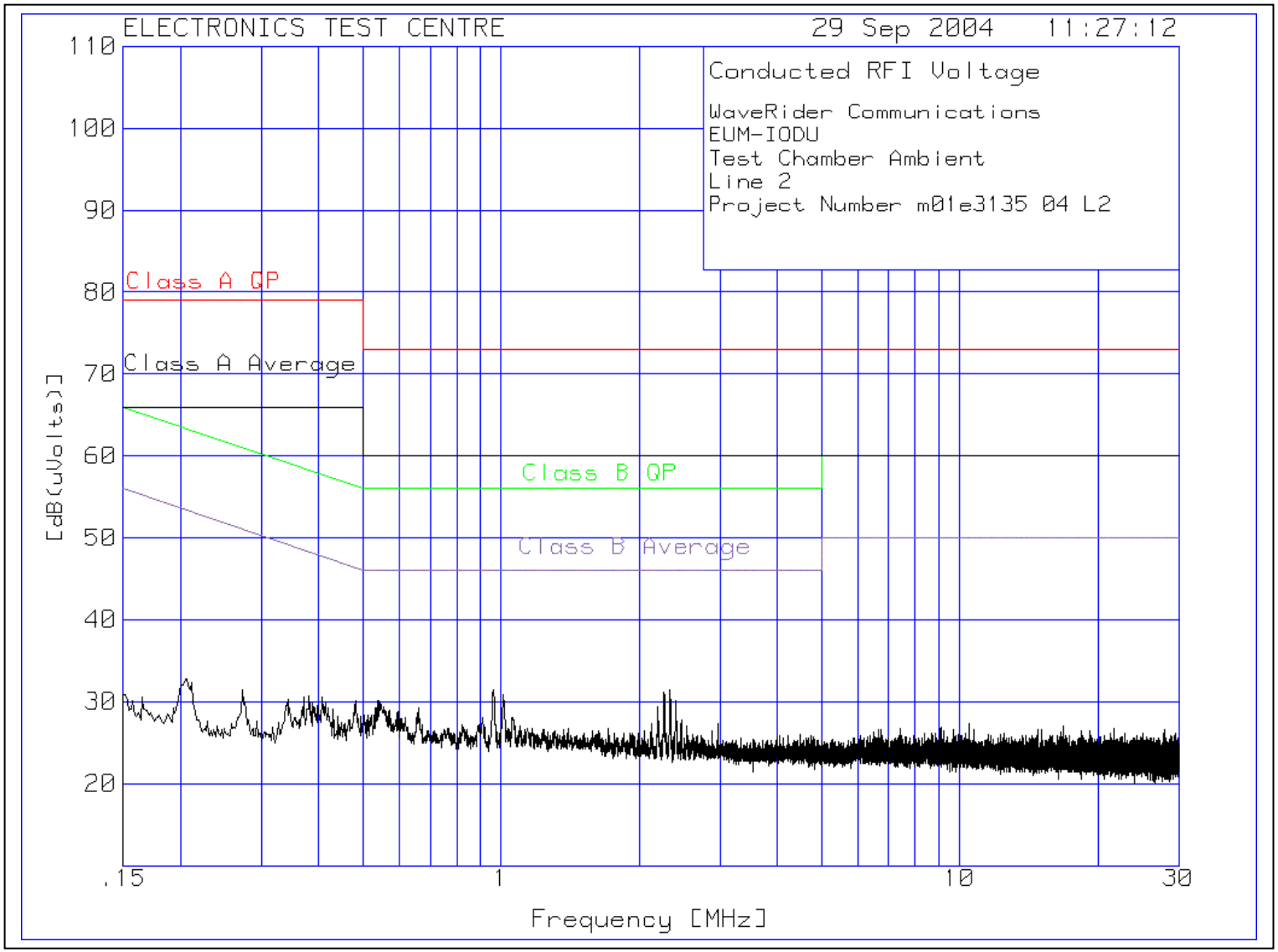
Plot of Conducted Emissions on AC Power Lines: green trace = quasi-peak data



Plot of Conducted Emissions on AC Power Lines Test Chamber Ambient:



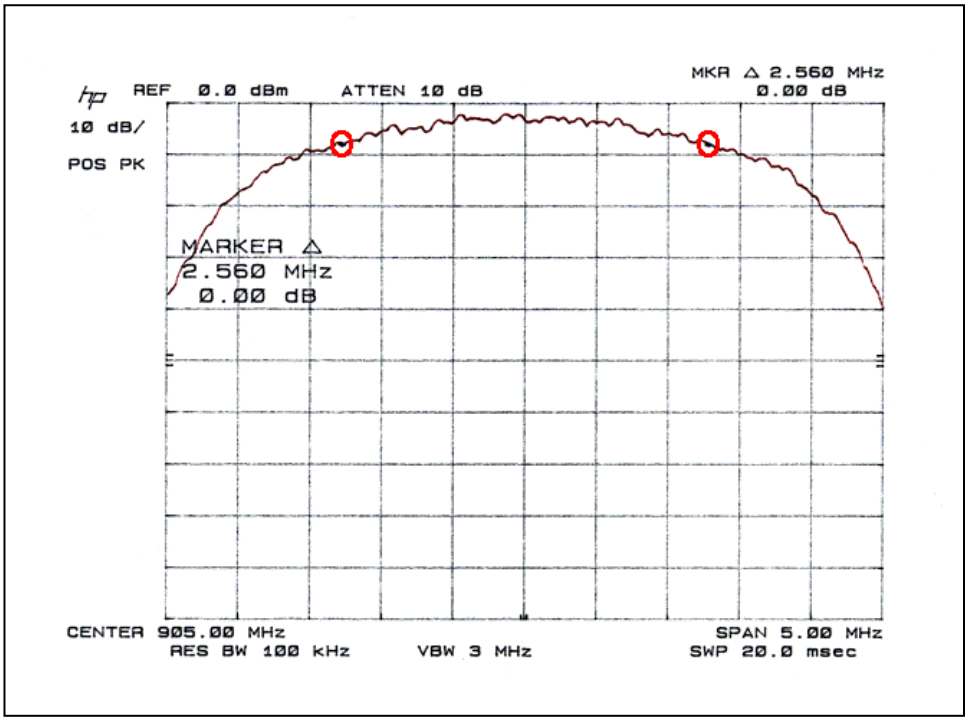
Plot of Conducted Emissions on AC Power Lines Test Chamber Ambient::



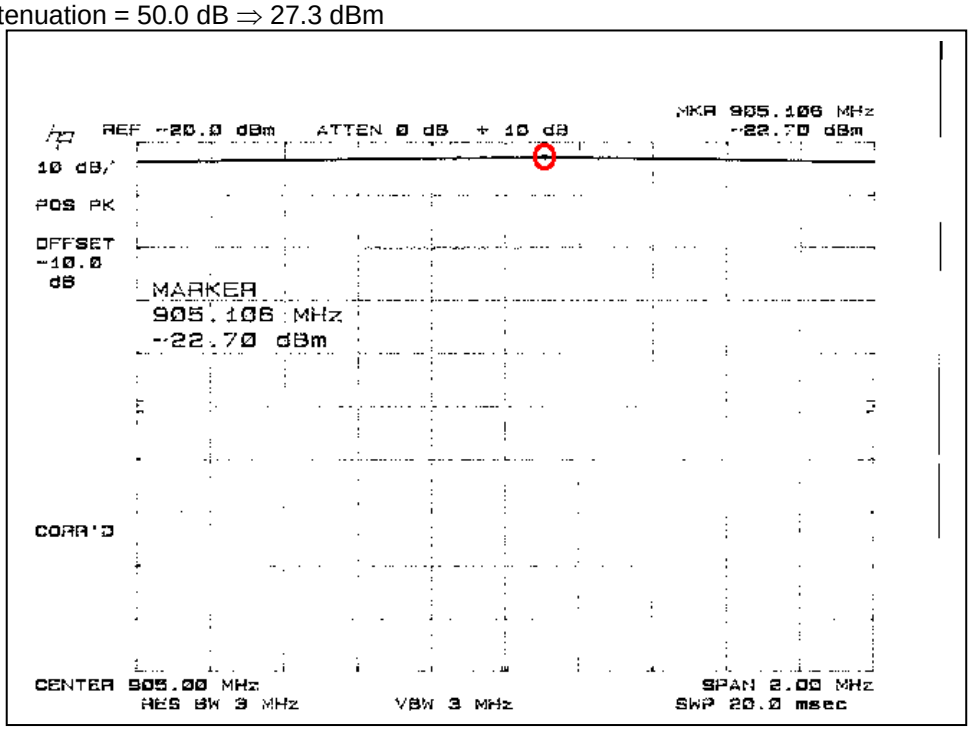
4.2 CONDUCTED EMISSIONS MEASURED AT ANTENNA PORT

Test Lab: Electronics Test Centre (Airdrie) Test Personnel: David Raynes Test Date: 29 September 2004	Product: EUM-IODU
Test Result, EUM-IODU: **PASS**	
Objectives/Criteria The Conducted emissions produced by a system or sub-system shall not exceed the limits for the specifications as stated. Temperature = 20°C Humidity = 38%	Specifications: FCC Part 15.247

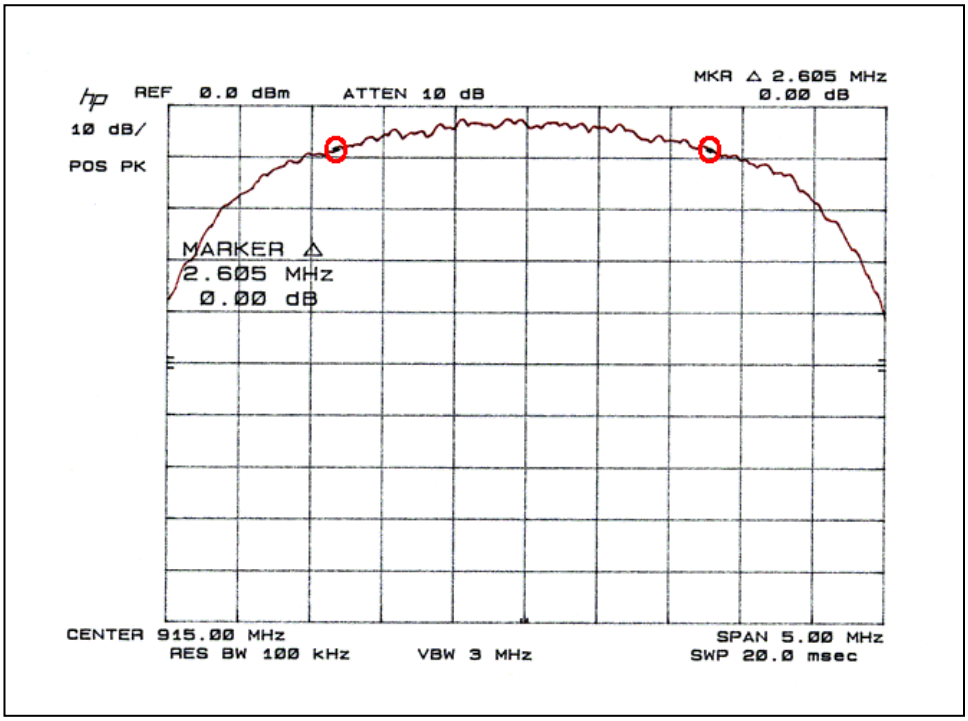
Spectrum Analyzer Plot of 6 dB Bandwidth: Tx @ 905 MHz



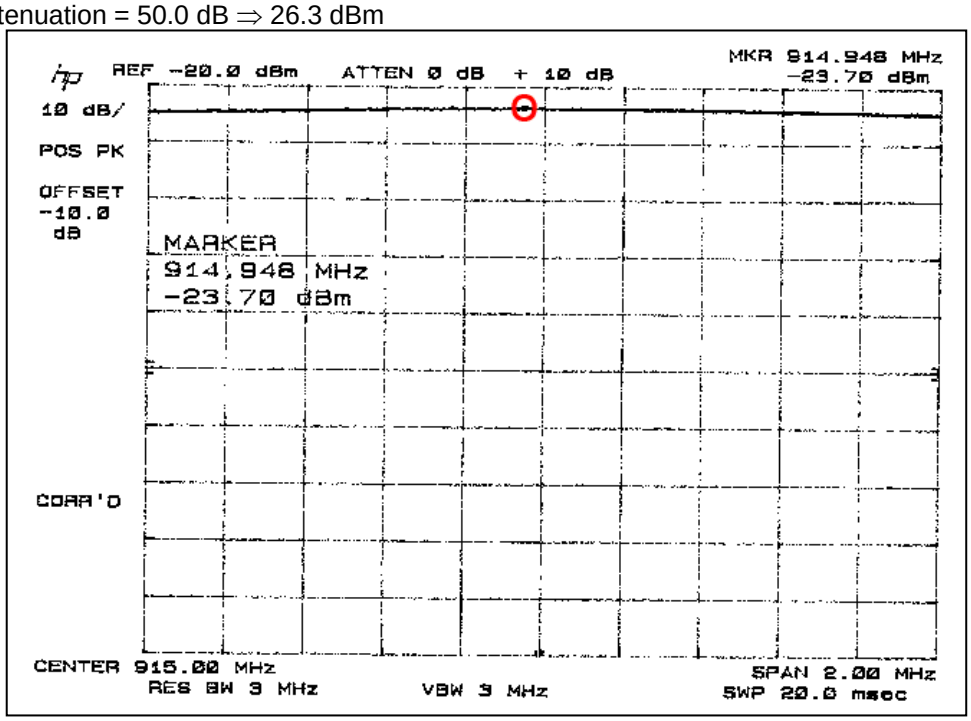
Spectrum Analyzer Plot of Maximum Peak Output Power: Tx @ 905 MHz
Attenuation = 50.0 dB ⇒ 27.3 dBm



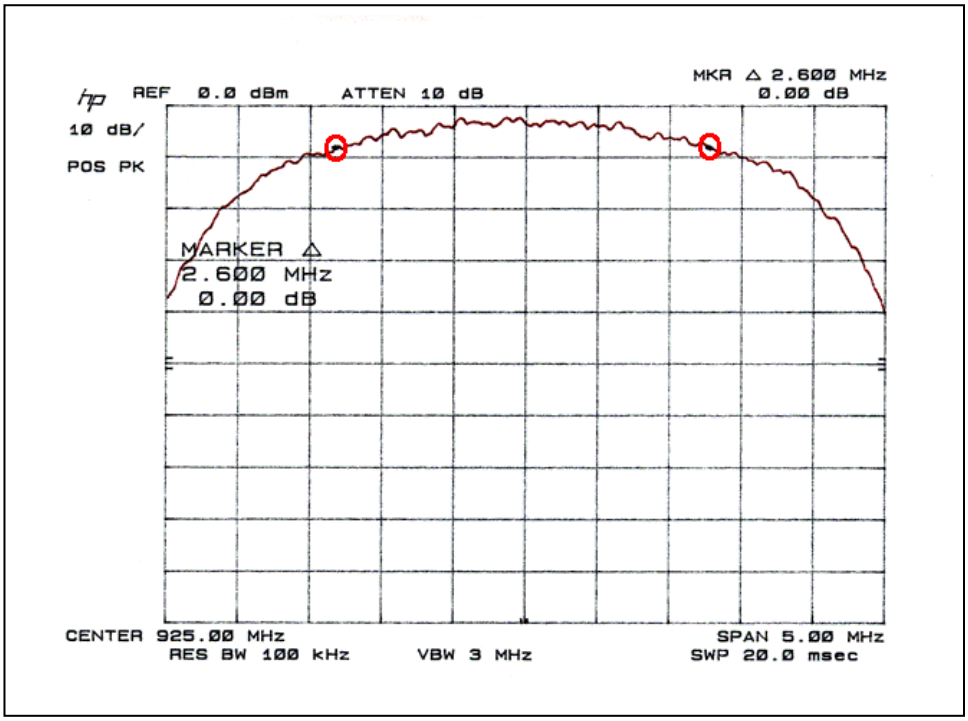
Spectrum Analyzer Plot of 6 dB Bandwidth: Tx @ 915 MHz



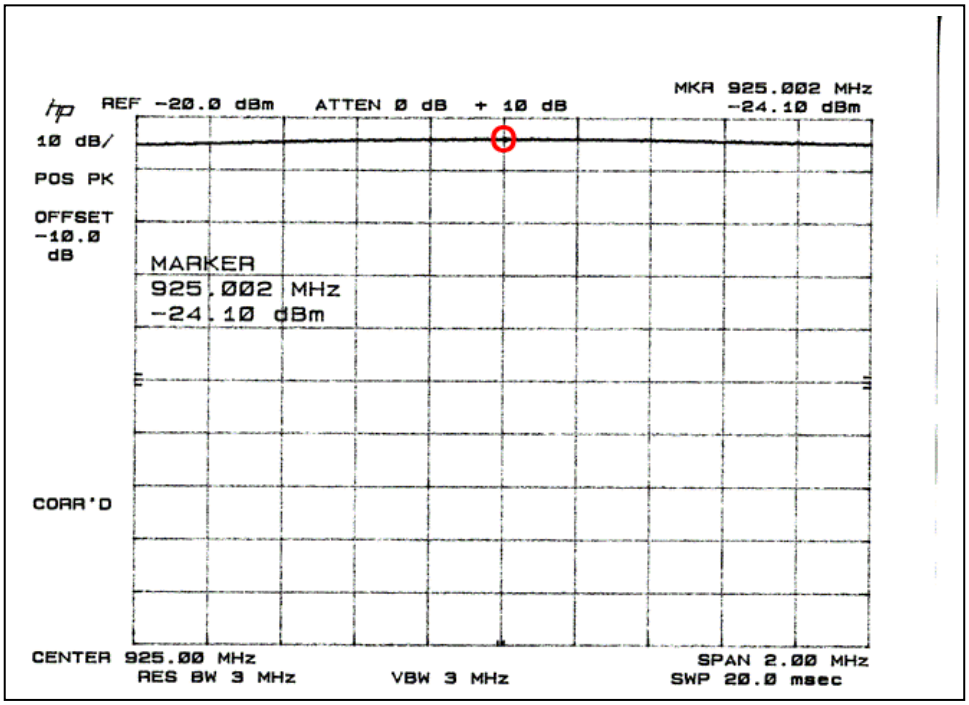
Spectrum Analyzer Plot of Maximum Peak Output Power: Tx @ 915 MHz
Attenuation = 50.0 dB ⇒ 26.3 dBm



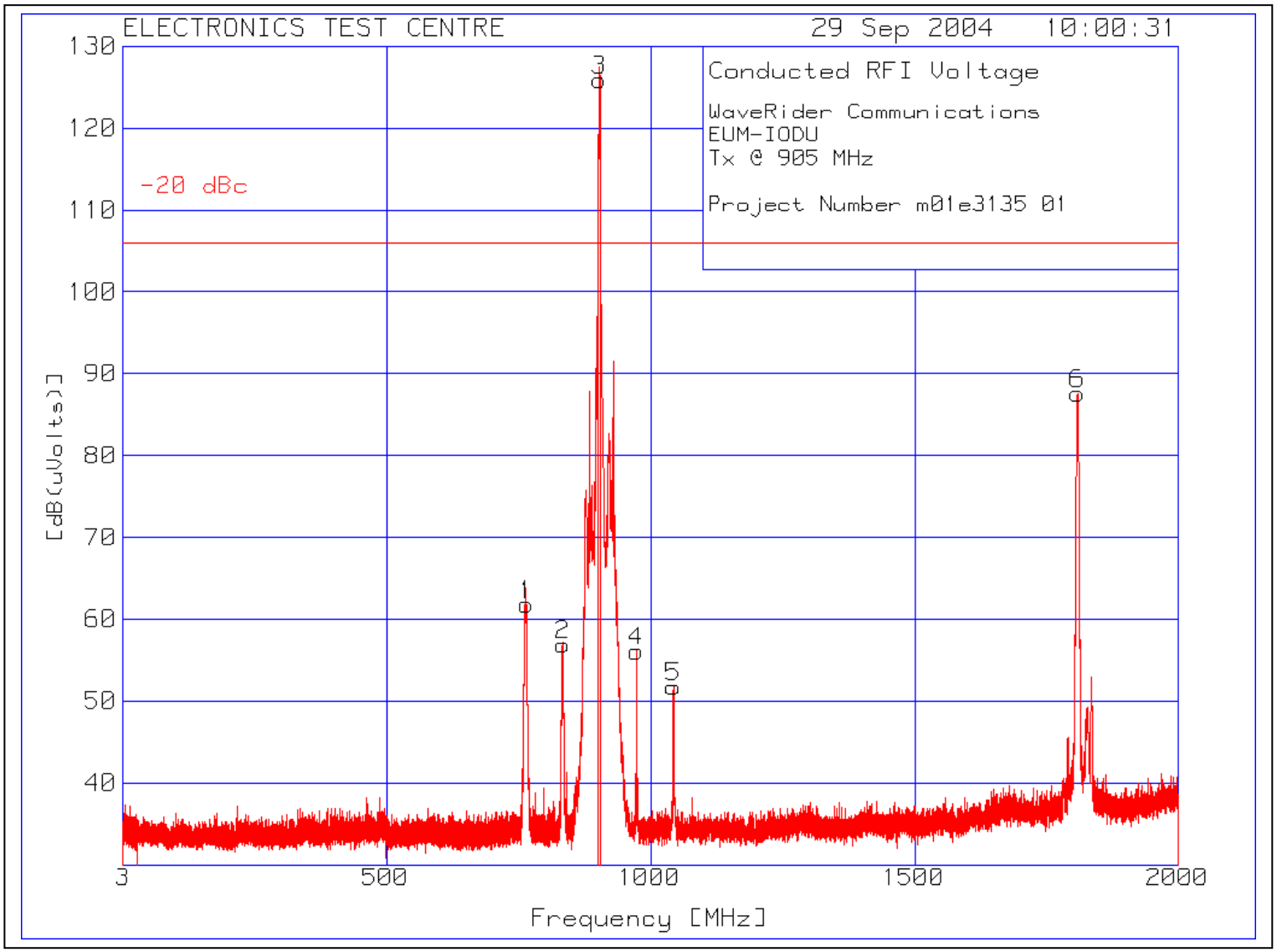
Spectrum Analyzer Plot of 6 dB Bandwidth: Tx @ 925 MHz



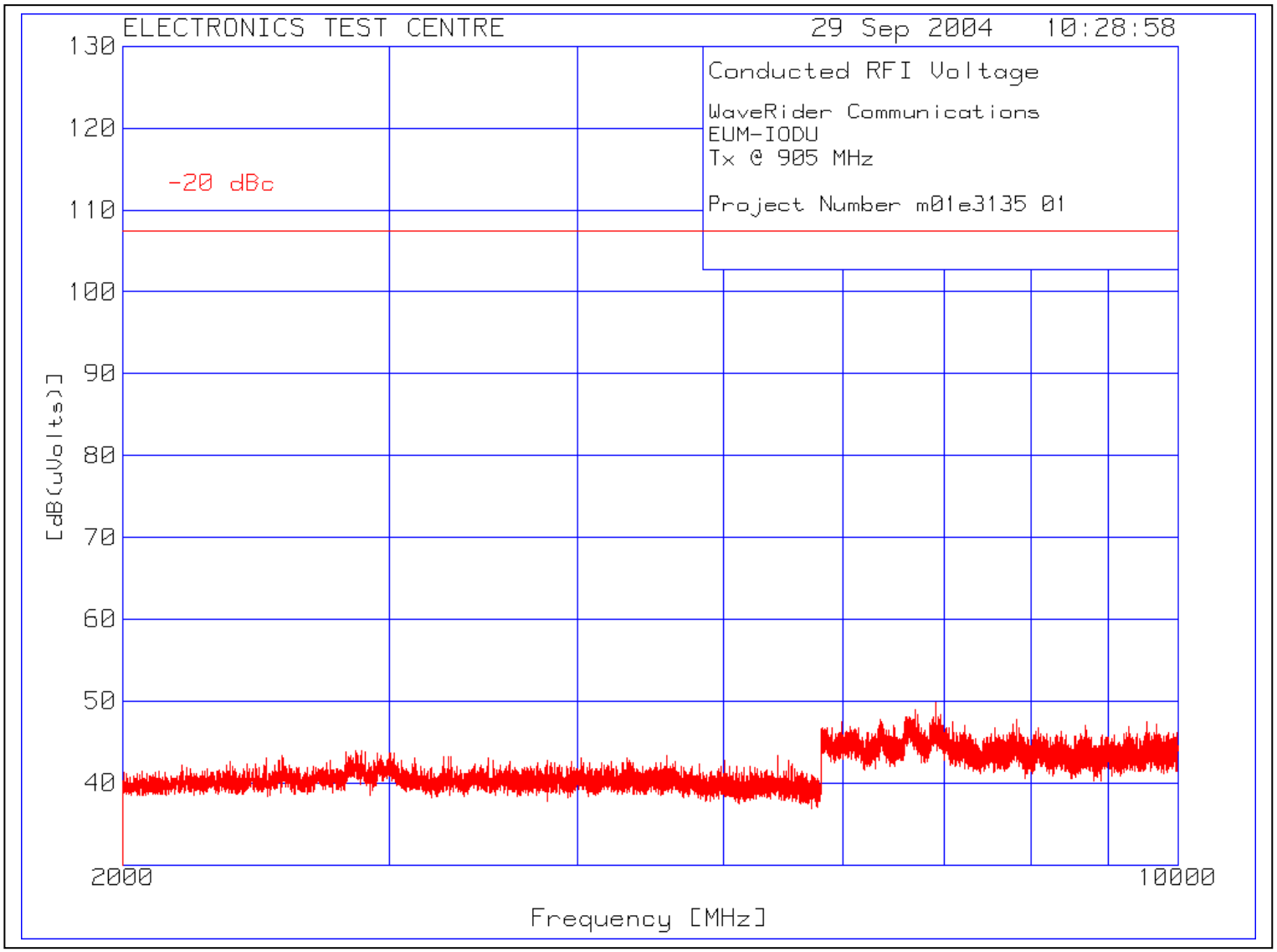
Spectrum Analyzer Plot of Maximum Peak Output Power: Tx @ 925 MHz
Attenuation = 50.0 dB ⇒ 25.9 dBm



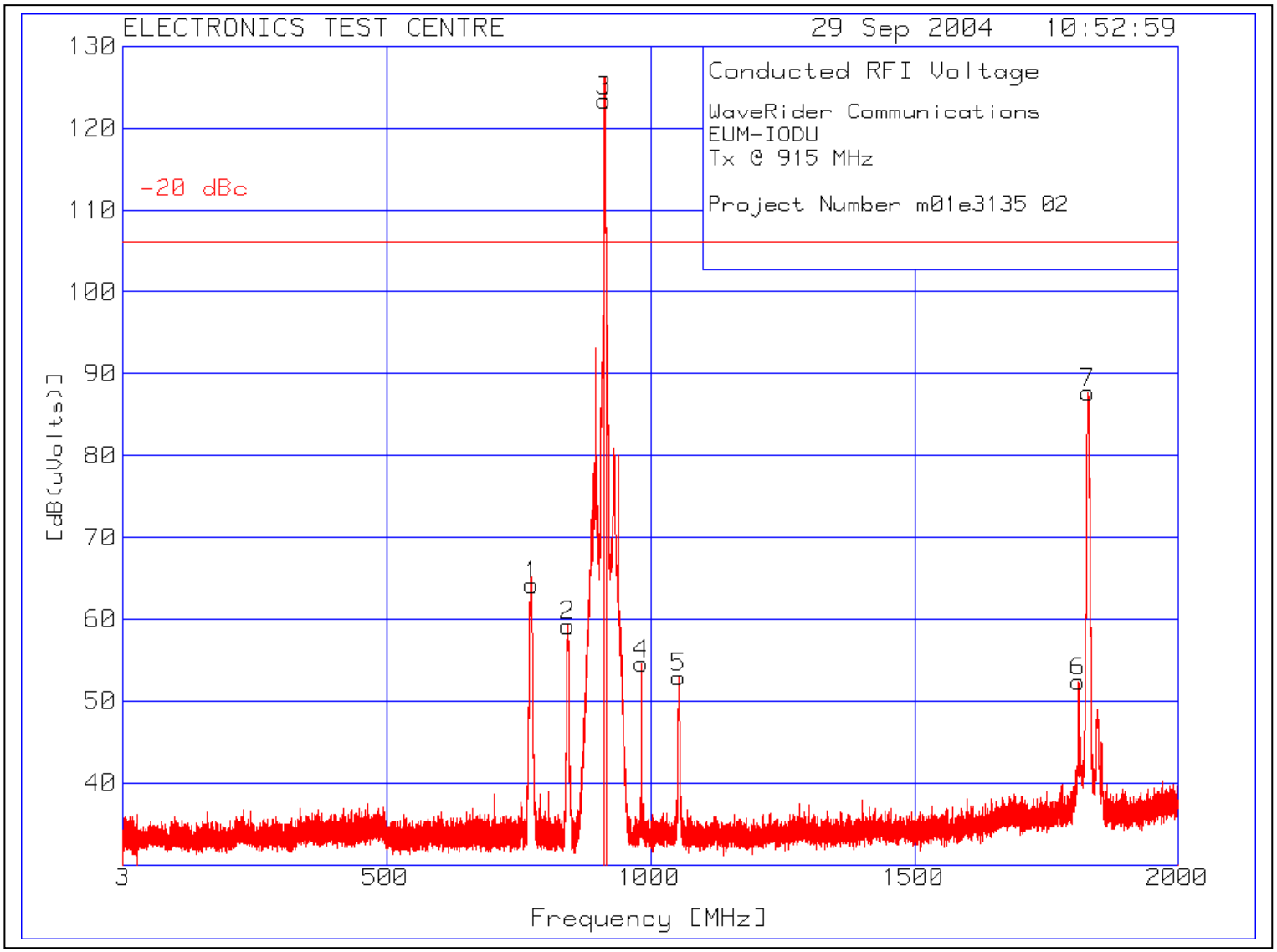
Plot of Conducted Emissions: RBW = 100 kHz, VBW = 3 MHz



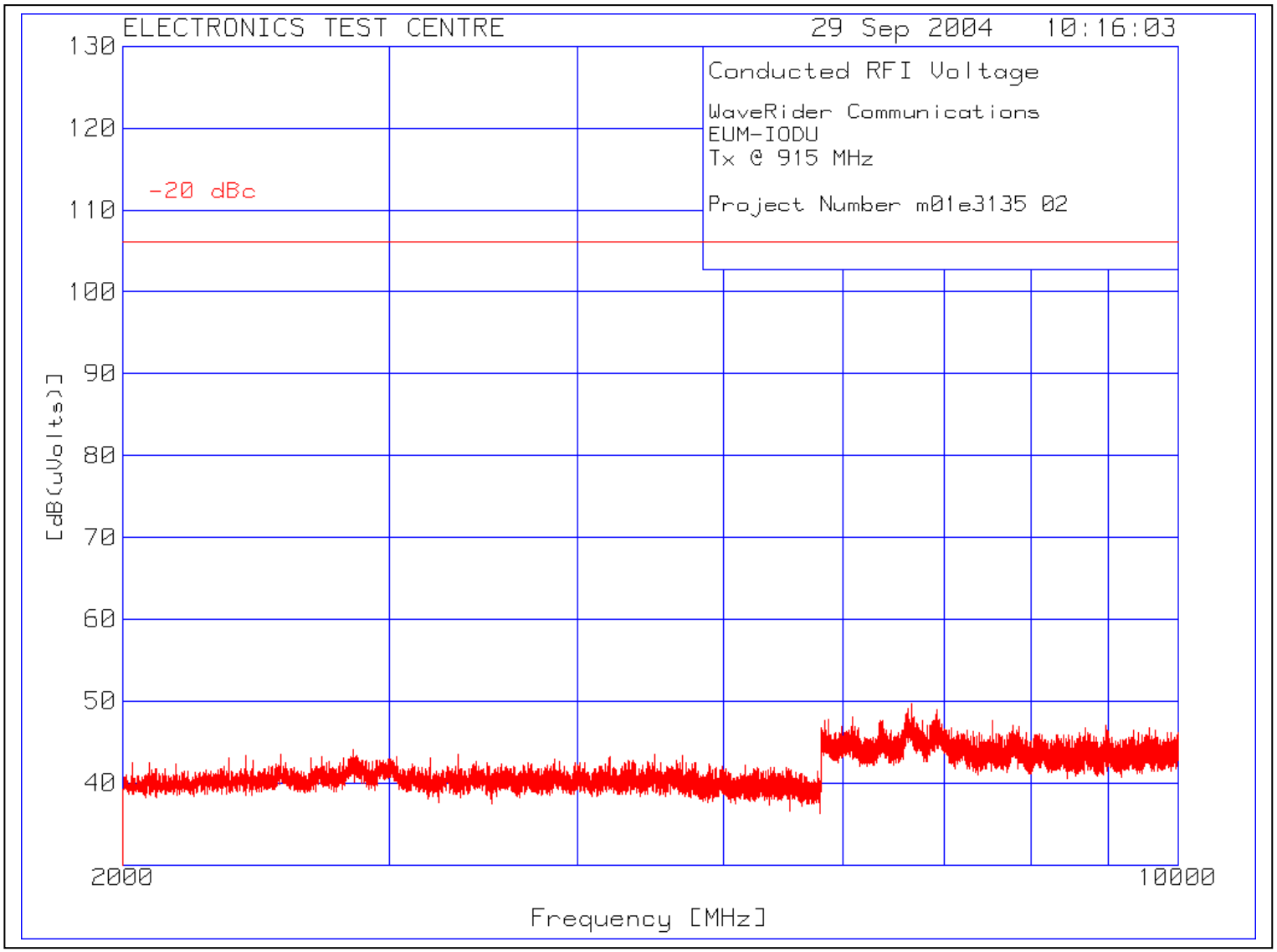
Plot of Conducted Emissions: RBW = 100 kHz, VBW = 3 MHz



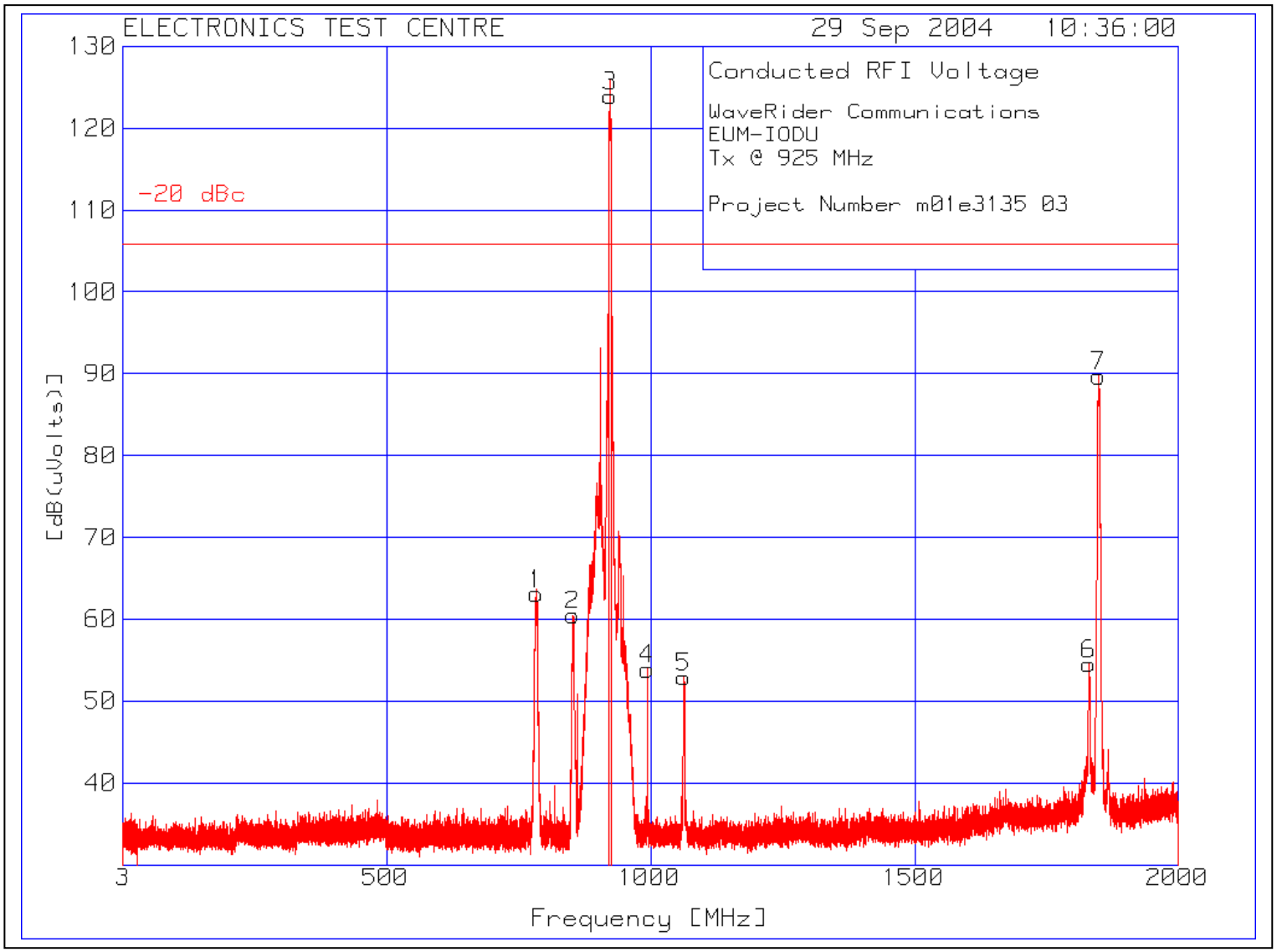
Plot of Conducted Emissions: RBW = 100 kHz, VBW = 3 MHz



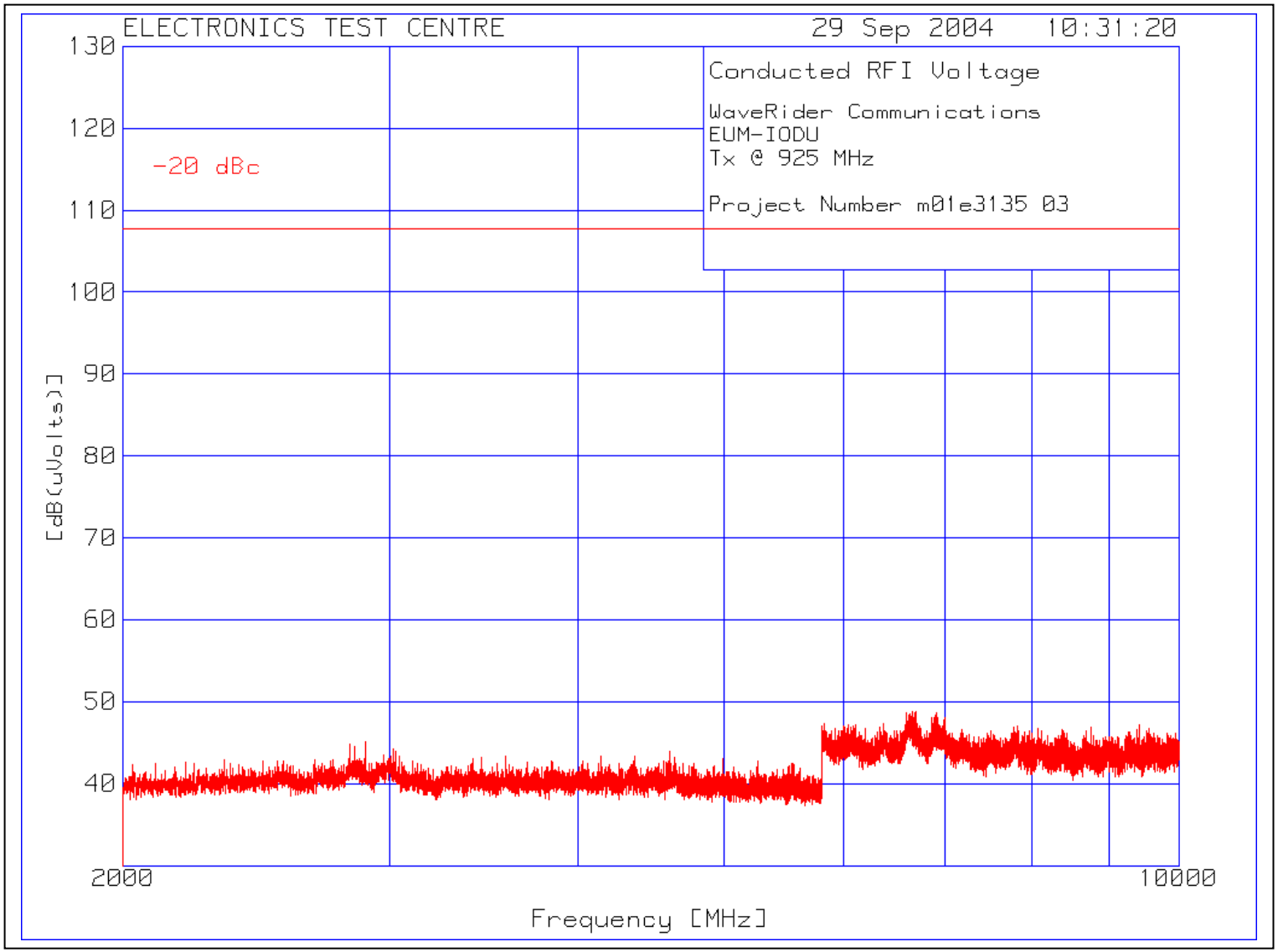
Plot of Conducted Emissions: RBW = 100 kHz, VBW = 3 MHz



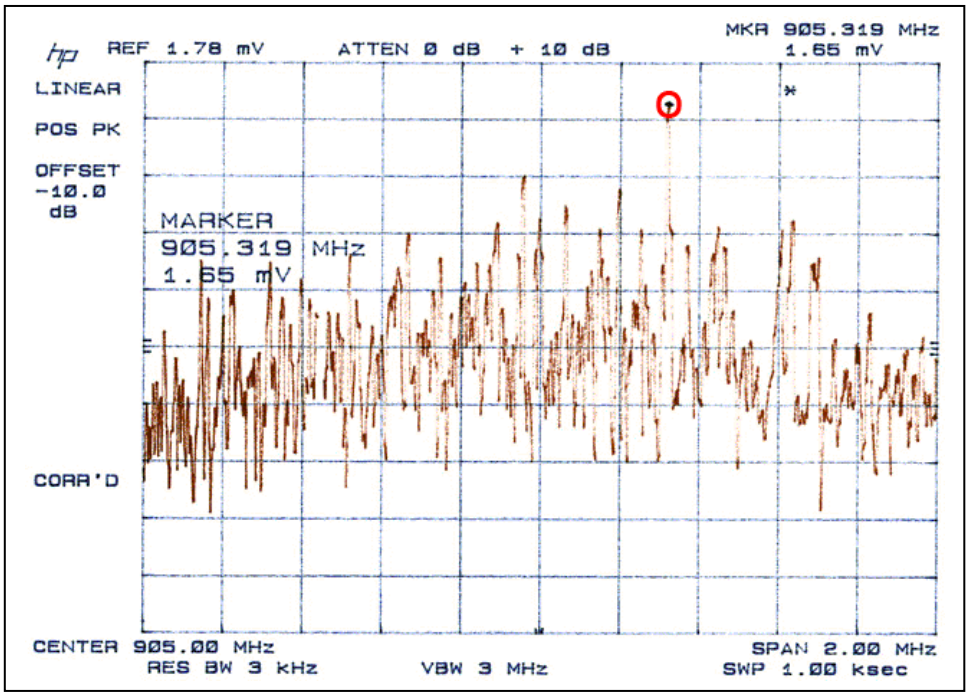
Plot of Conducted Emissions: RBW = 100 kHz, VBW = 3 MHz



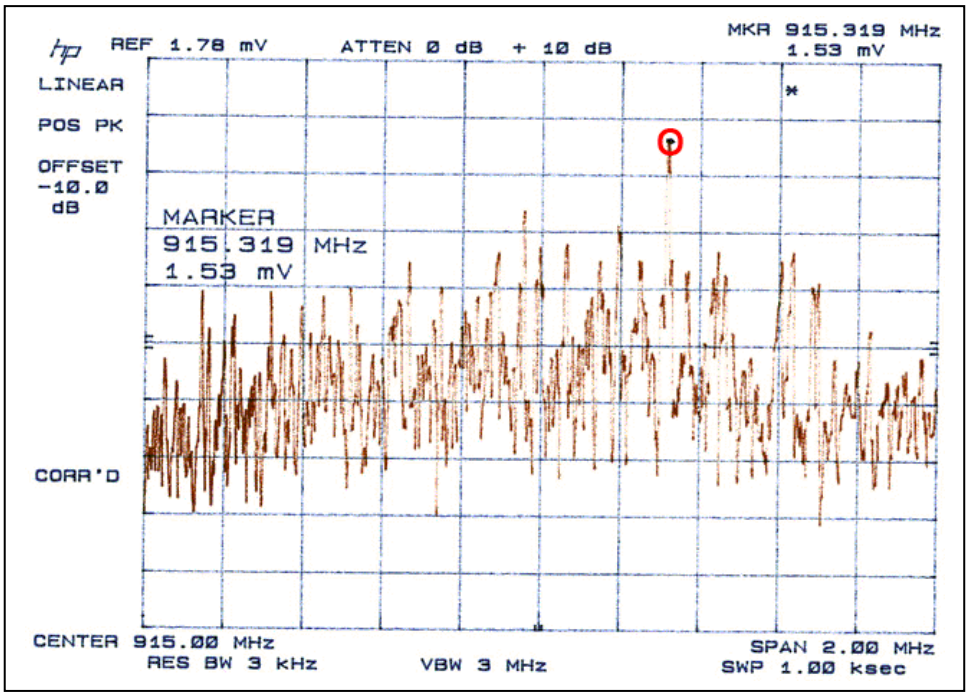
Plot of Conducted Emissions: RBW = 100 kHz, VBW = 3 MHz



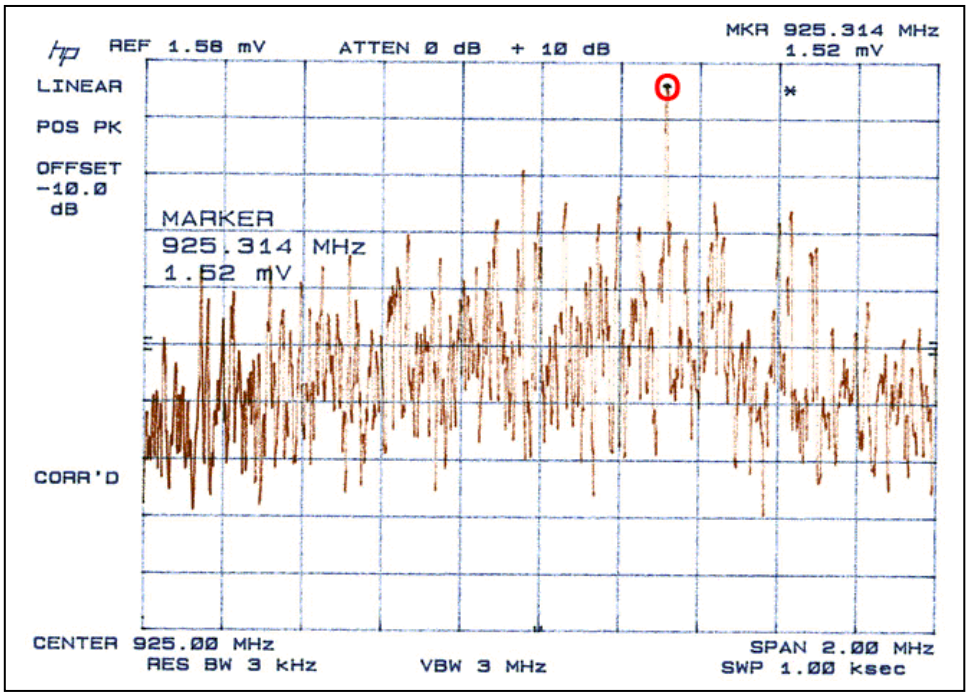
Spectrum Analyzer Plot of Power Spectral Density per Part 15.247(d): Tx @ 905 MHz
Attenuation = 50.0 dB ⇒ 7.35 dBm



Spectrum Analyzer Plot of Power Spectral Density per Part 15.247(d): Tx @ 915 MHz:
Attenuation = 50.0 dB ⇒ 6.69 dBm



Spectrum Analyzer Plot of Power Spectral Density per Part 15.247(d): Tx @ 925 MHz
Attenuation = 50.0 dB ⇒ 6.64 dBm



4.3 RADIATED EMISSIONS INCLUDING RESTRICTED BANDS OF OPERATION

4.3a Receive Mode

Test Lab: MPB Technologies Inc. Airdrie Test Personnel: David Raynes Test Date: 15 October 2004	Product: EUM-IODU

Test Result, EUM-IODU: **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 **Class B**. Temperature = 19 °C Humidity = 38 %	Specification: FCC Part 15 Subpart C Frequency [MHz] / Class A QP @ 3m / Class B 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:

Frequency [MHz]	Field Strength [dBμV/m]	Delta [dB from limit]
219.9497	35.68	-10.34

Vertical:

Frequency [MHz]	Field Strength [dBμV/m]	Delta [dB from limit]
175.9486	39.94	-3.58
219.9491	39.46	-6.56
197.9522	36.04	-7.48
164.9530	32.94	-10.58
136.425	32.64	-10.88

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	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.
Highlighting indicates a margin of less than 6 dB.

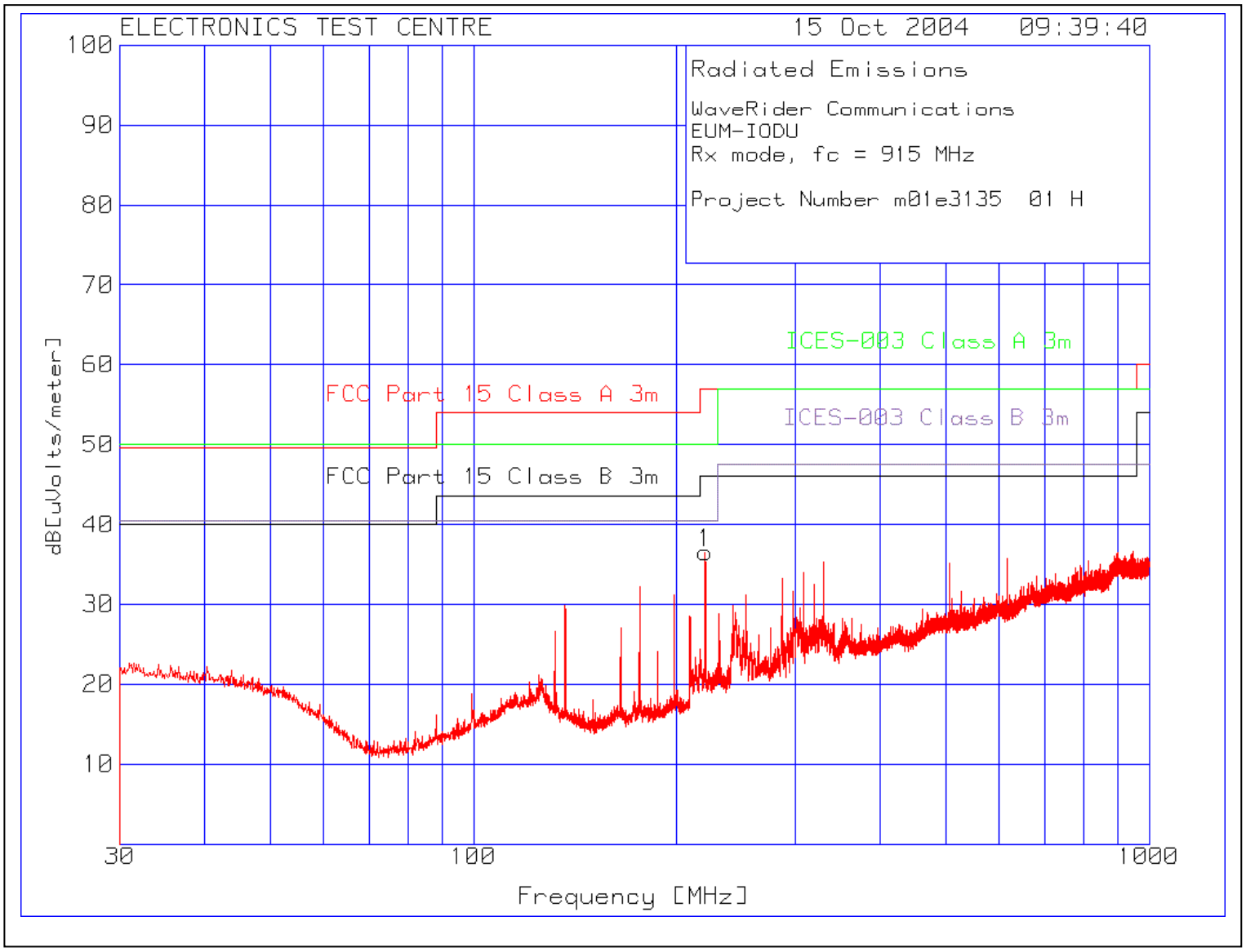
WaveRider Communications
EUM-IODU
Rx mode, fc = 915 MHz
Project Number m01e3135 01 V

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								
219.9497	21.12 qp	4.13	10.43	35.68	56.9	50	46.02	40.46
Azimuth: 283	Height:108 Horz		Margin [dB]:		-21.22	-14.32	-10.34	-4.78
Range: 2 30 - 1000MHz								
136.425	20.44 qp	3.21	8.99	32.64	53.98	50	43.52	40.46
Azimuth: 56	Height:101 Vert		Margin [dB]:		-21.34	-17.36	-10.88	-7.82
164.953	20.3 qp	3.41	9.23	32.94	53.98	50	43.52	40.46
Azimuth: 123	Height:102 Vert		Margin [dB]:		-21.04	-17.06	-10.58	-7.52
175.9486	27.43 qp	3.68	8.83	39.94	53.98	50	43.52	40.46
Azimuth: 58	Height:100 Vert		Margin [dB]:		-14.04	-10.06	-3.58	-.52
197.9522	23.07 qp	3.89	9.08	36.04	53.98	50	43.52	40.46
Azimuth: 354	Height:105 Vert		Margin [dB]:		-17.94	-13.96	-7.48	-4.42
219.9491	24.8 qp	4.13	10.53	39.46	56.9	50	46.02	40.46
Azimuth: 79	Height:102 Vert		Margin [dB]:		-17.44	-10.54	-6.56	-1

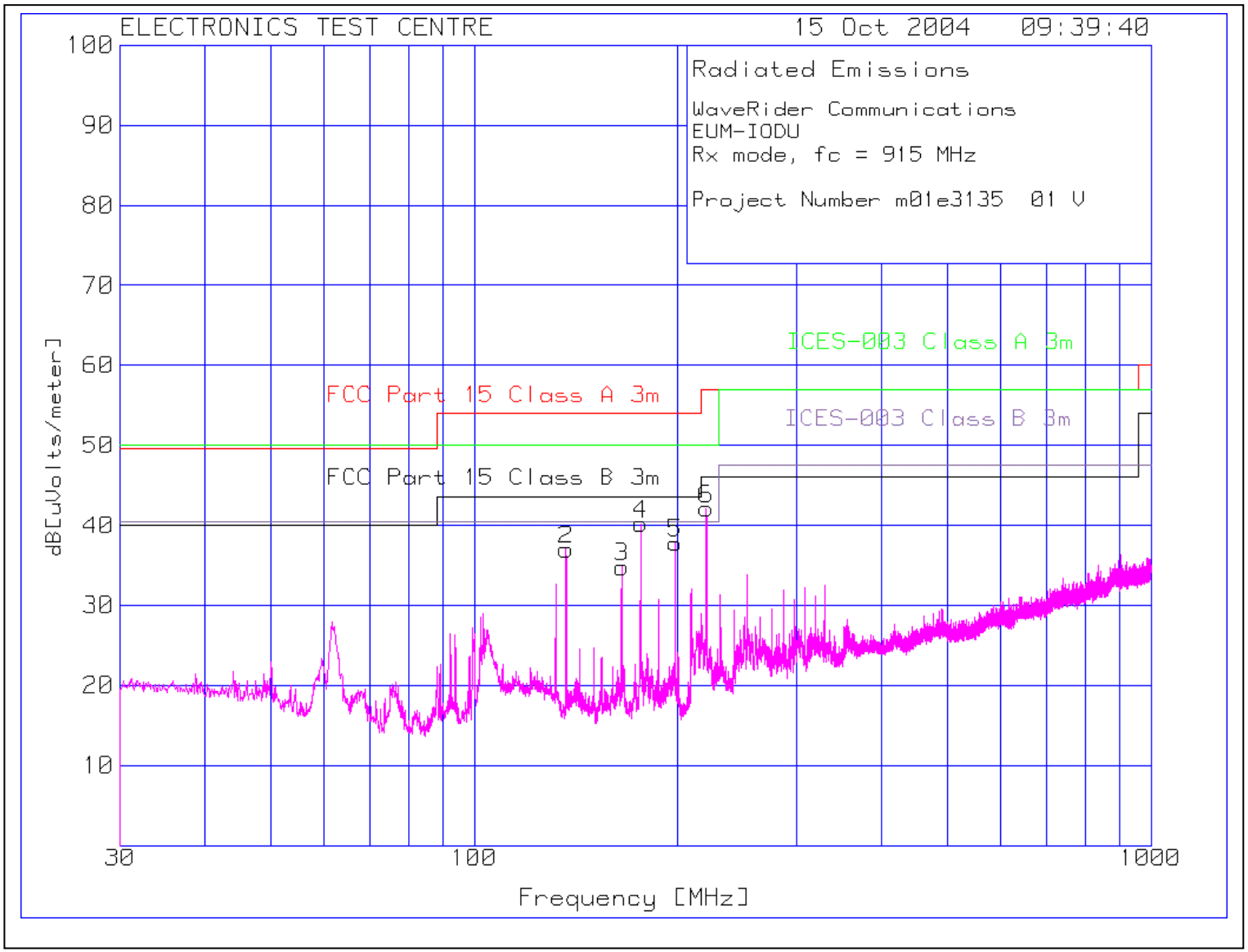
LIMIT 1: FCC Part 15 Class A 3m
LIMIT 2: ICES-003 Class A 3m
LIMIT 3: FCC Part 15 Class B 3m ⇐
LIMIT 4: ICES-003 Class B 3m

qp - Quasi-Peak detector

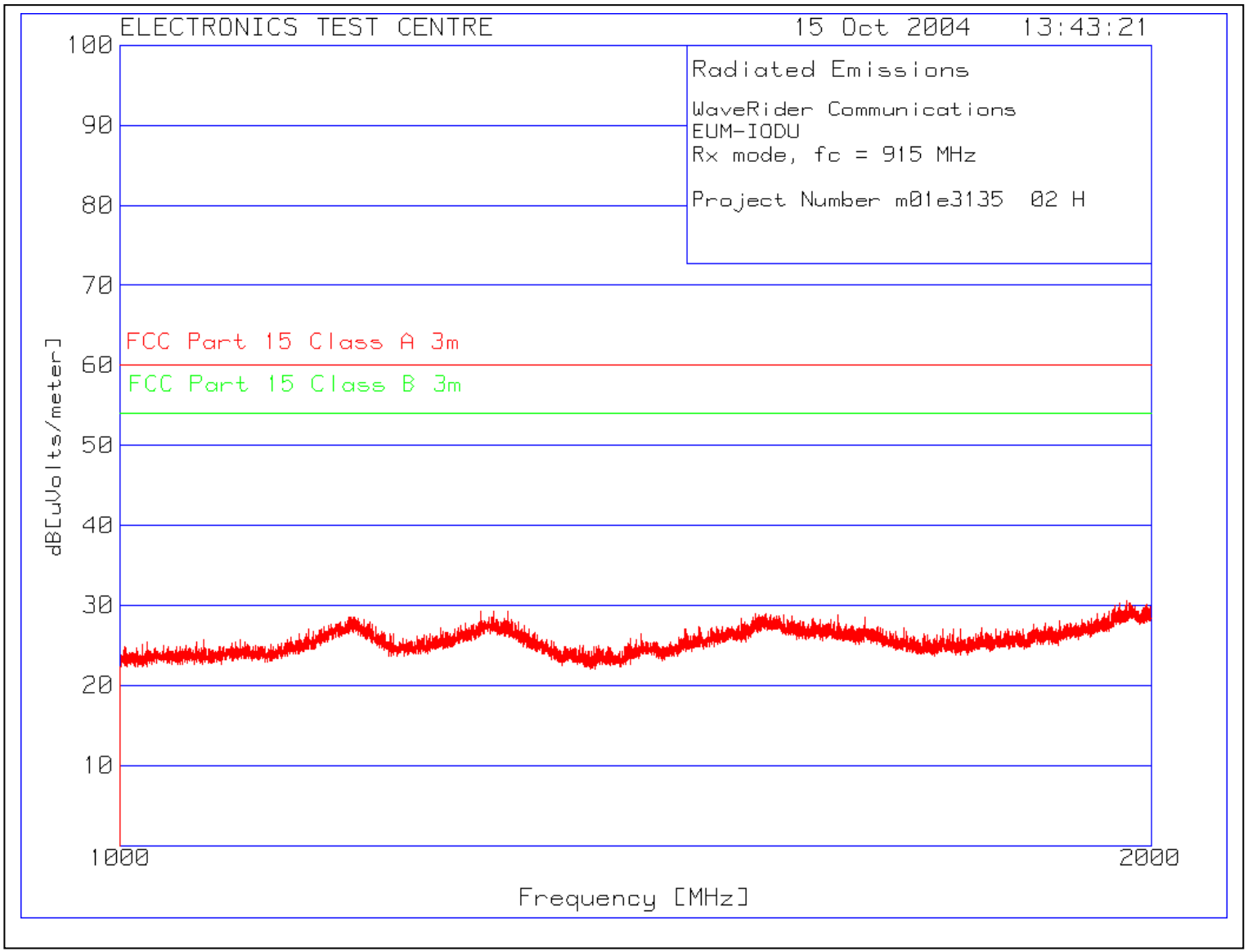
Plot of Radiated Emissions:



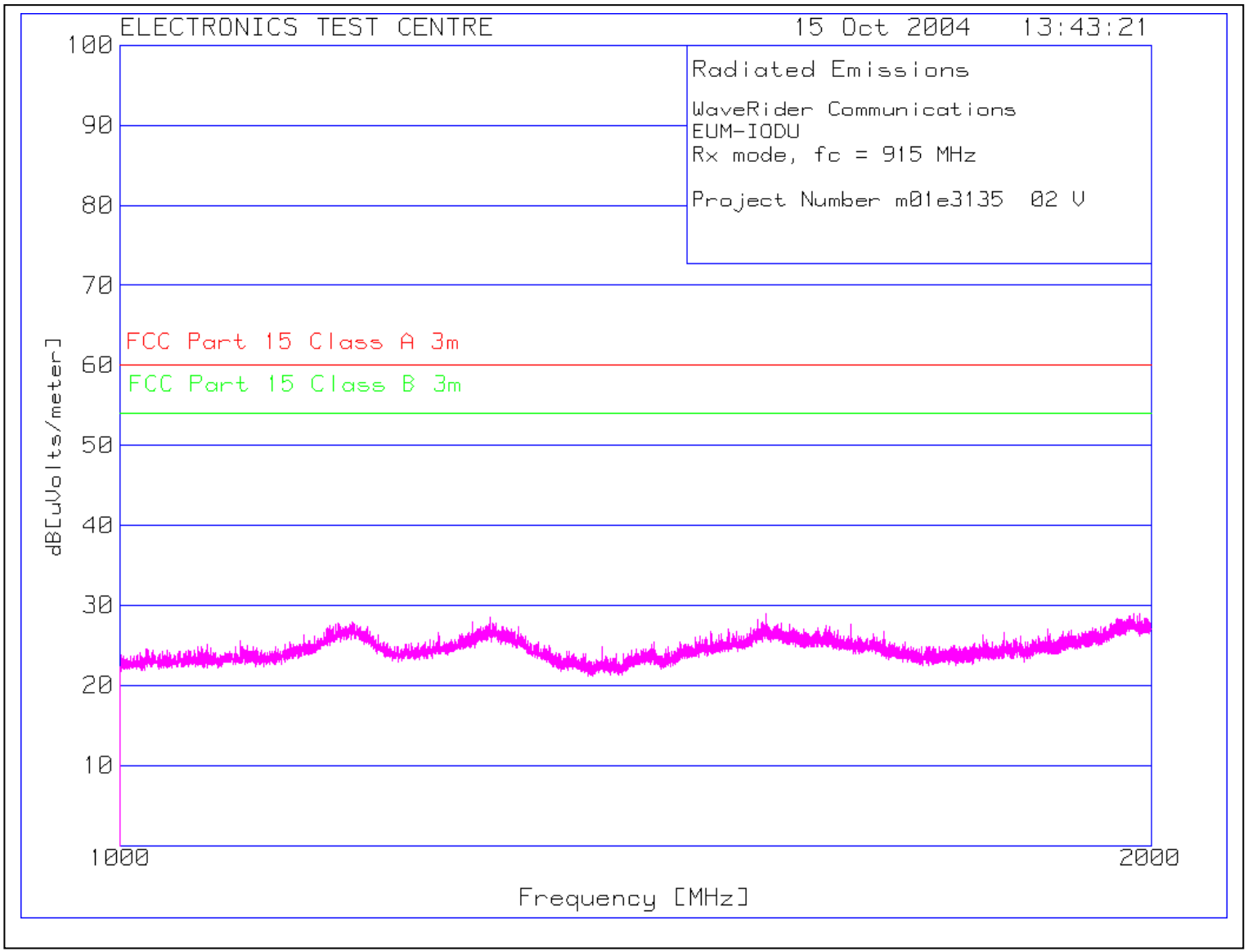
Plot of Radiated Emissions:



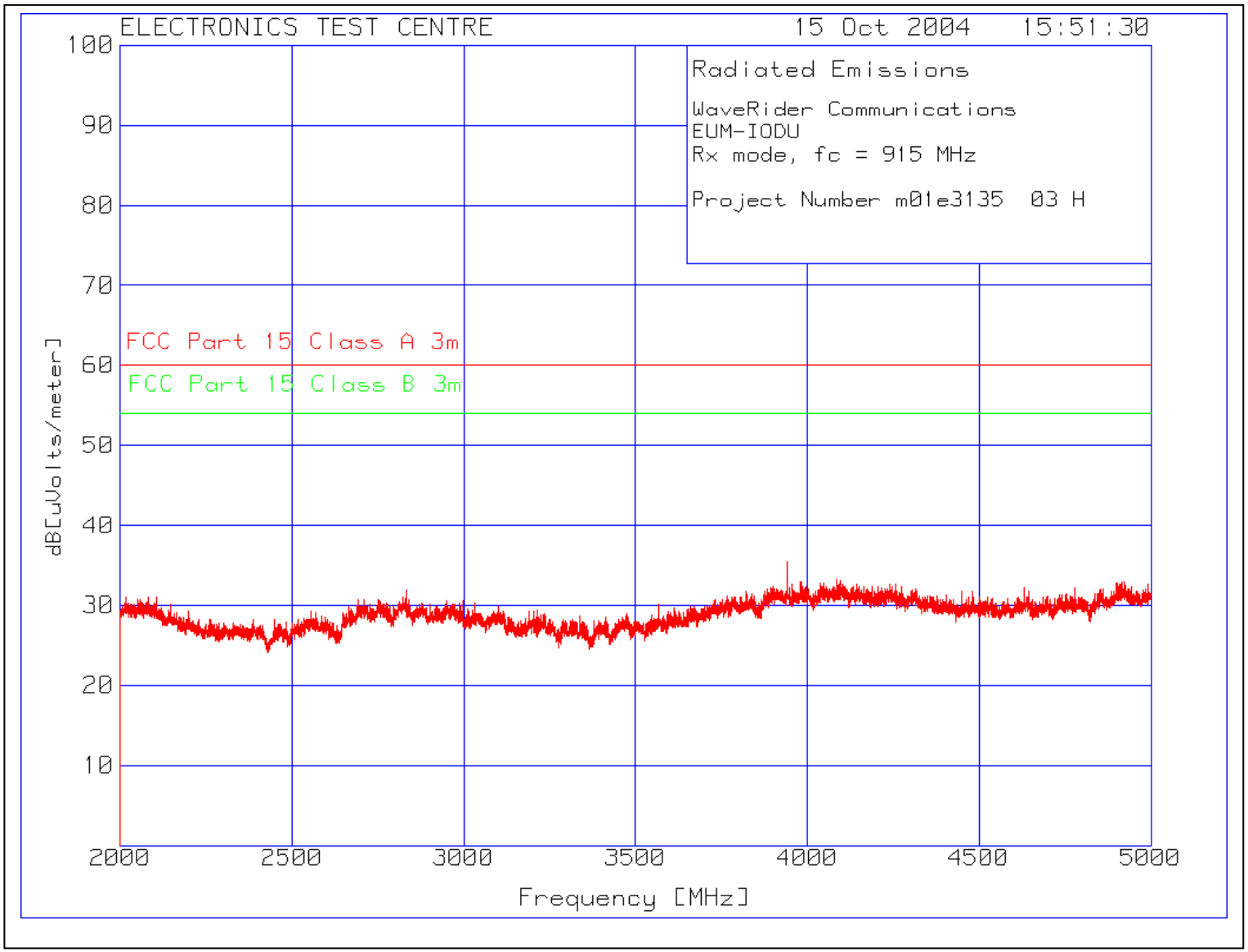
Plot of Radiated Emissions:



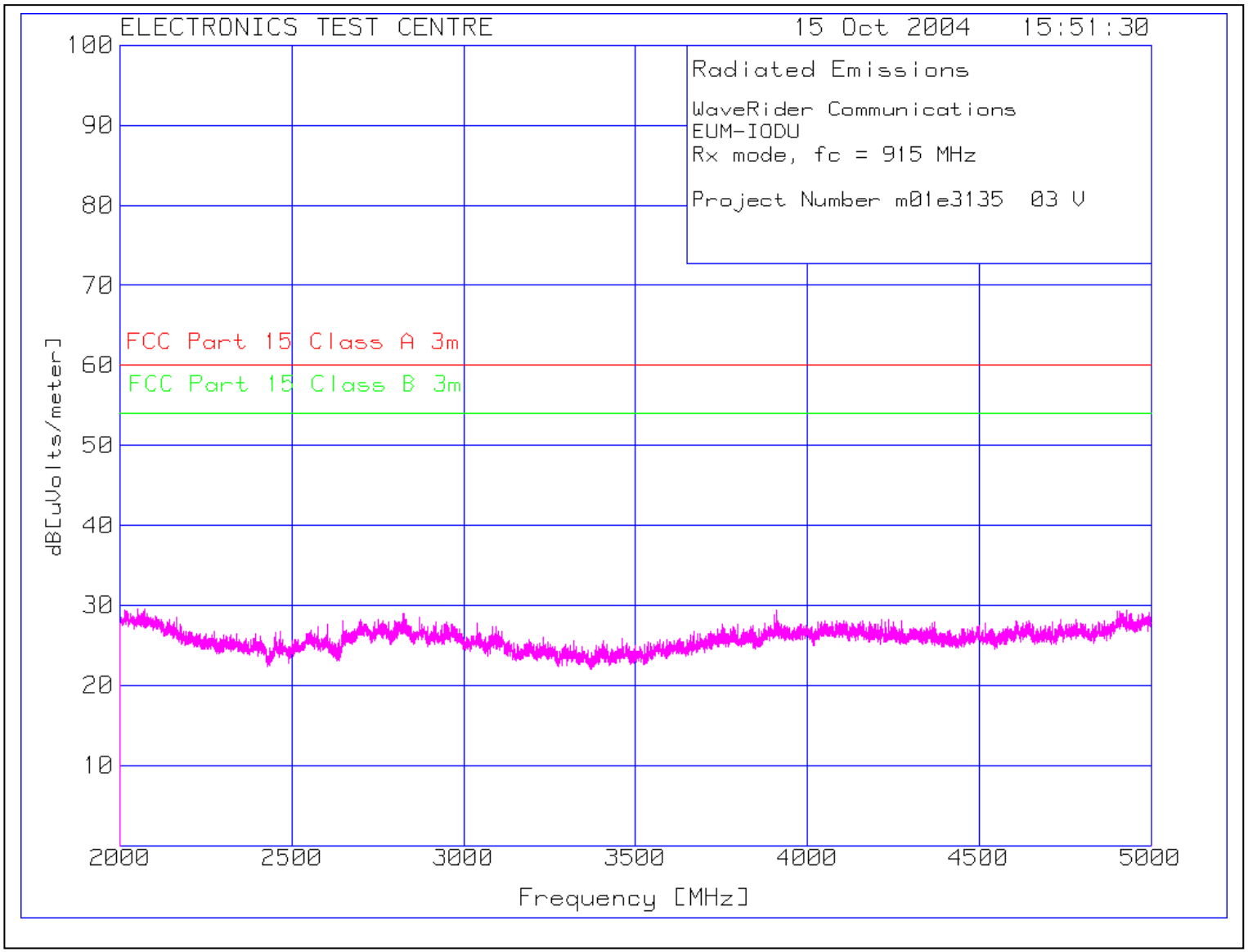
Plot of Radiated Emissions:



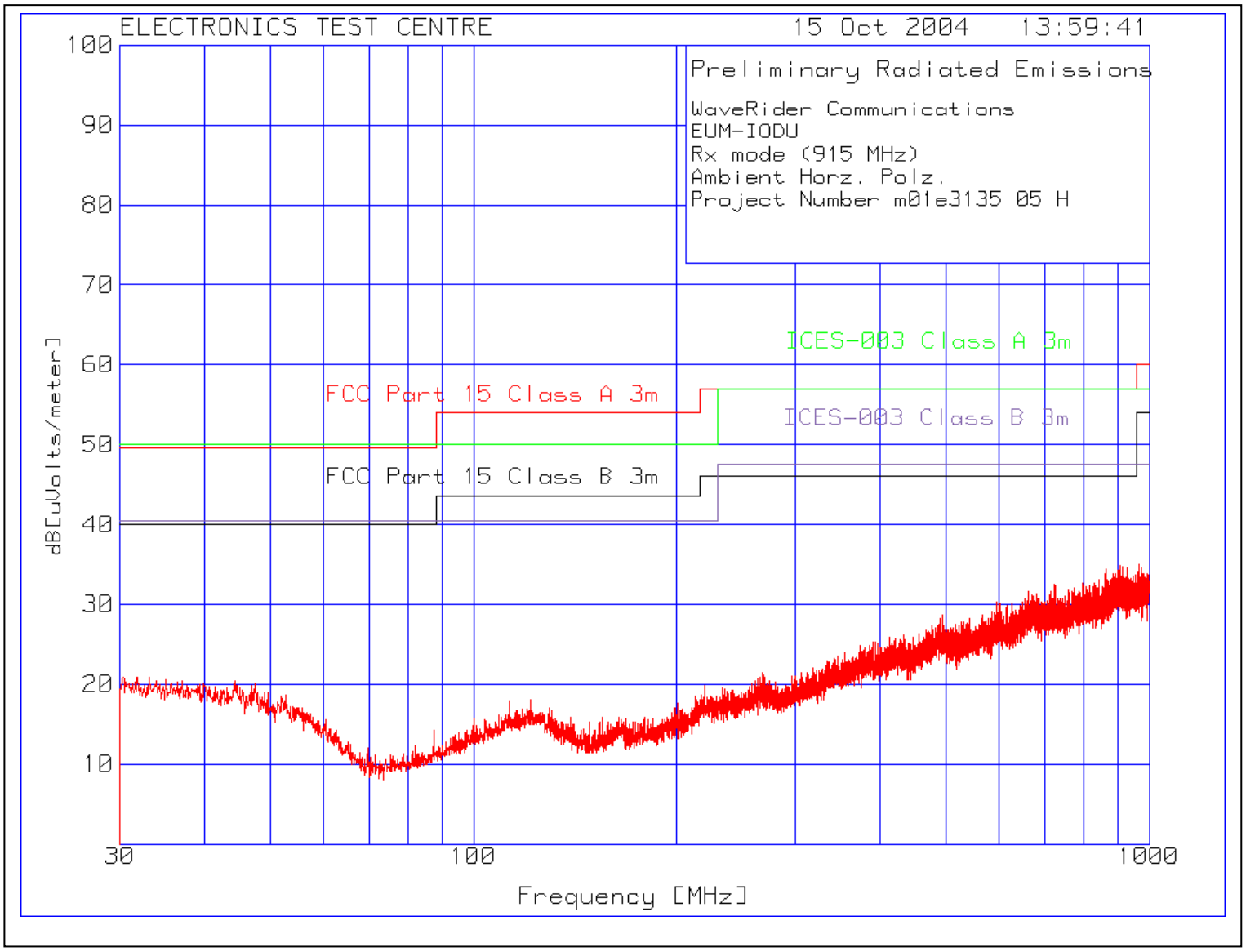
Plot of Radiated Emissions:



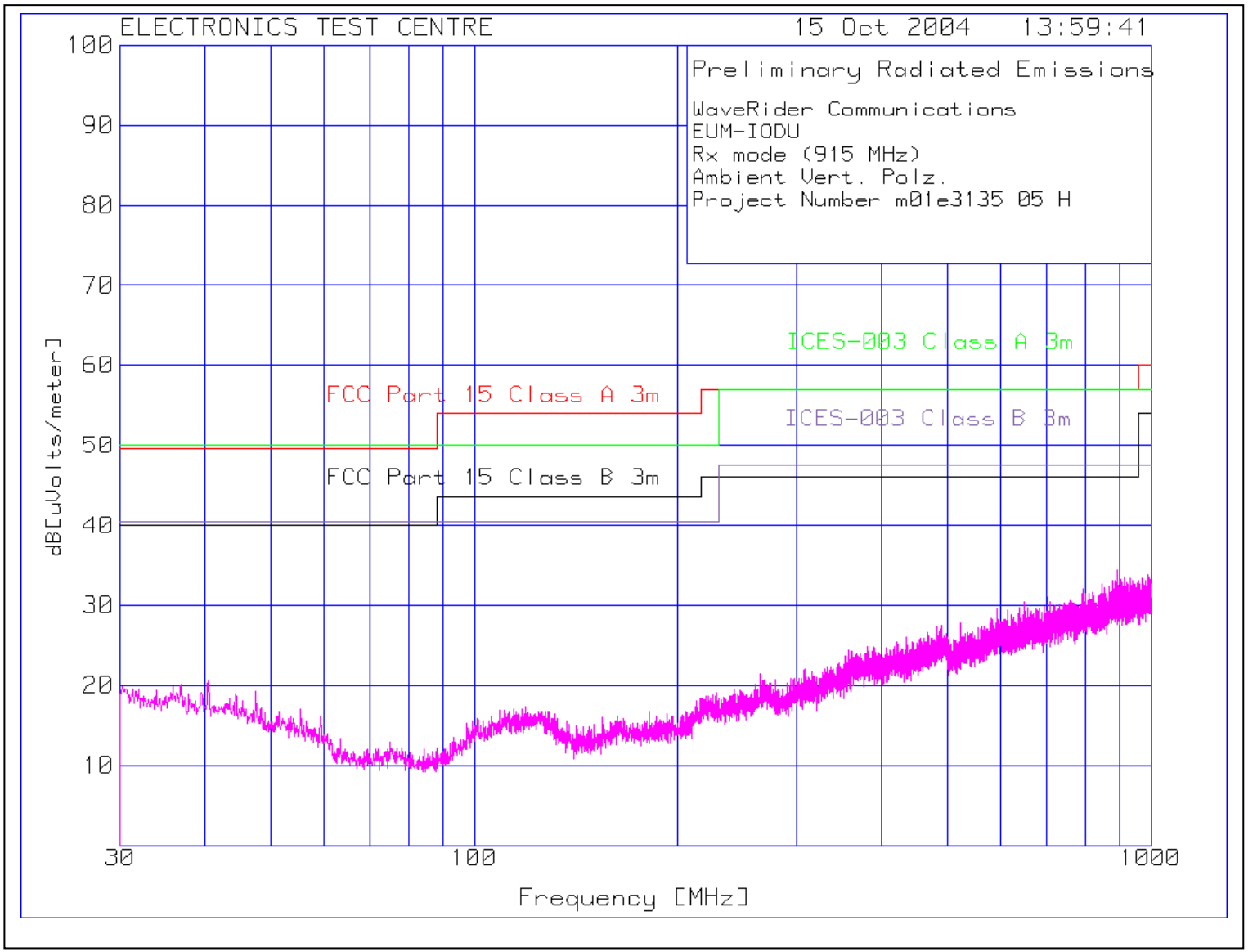
Plot of Radiated Emissions:



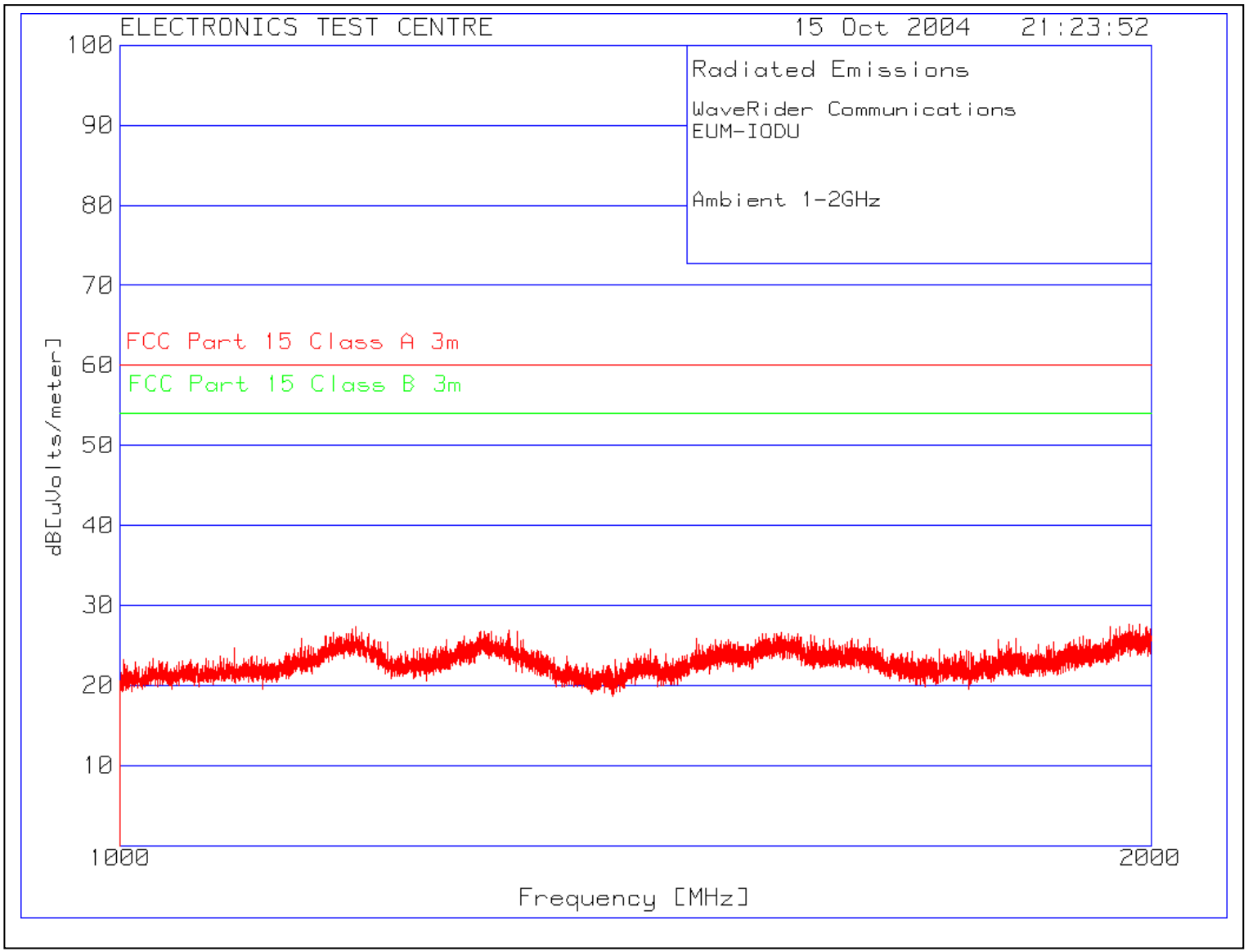
Plot of Radiated Emissions Test Chamber Ambient:



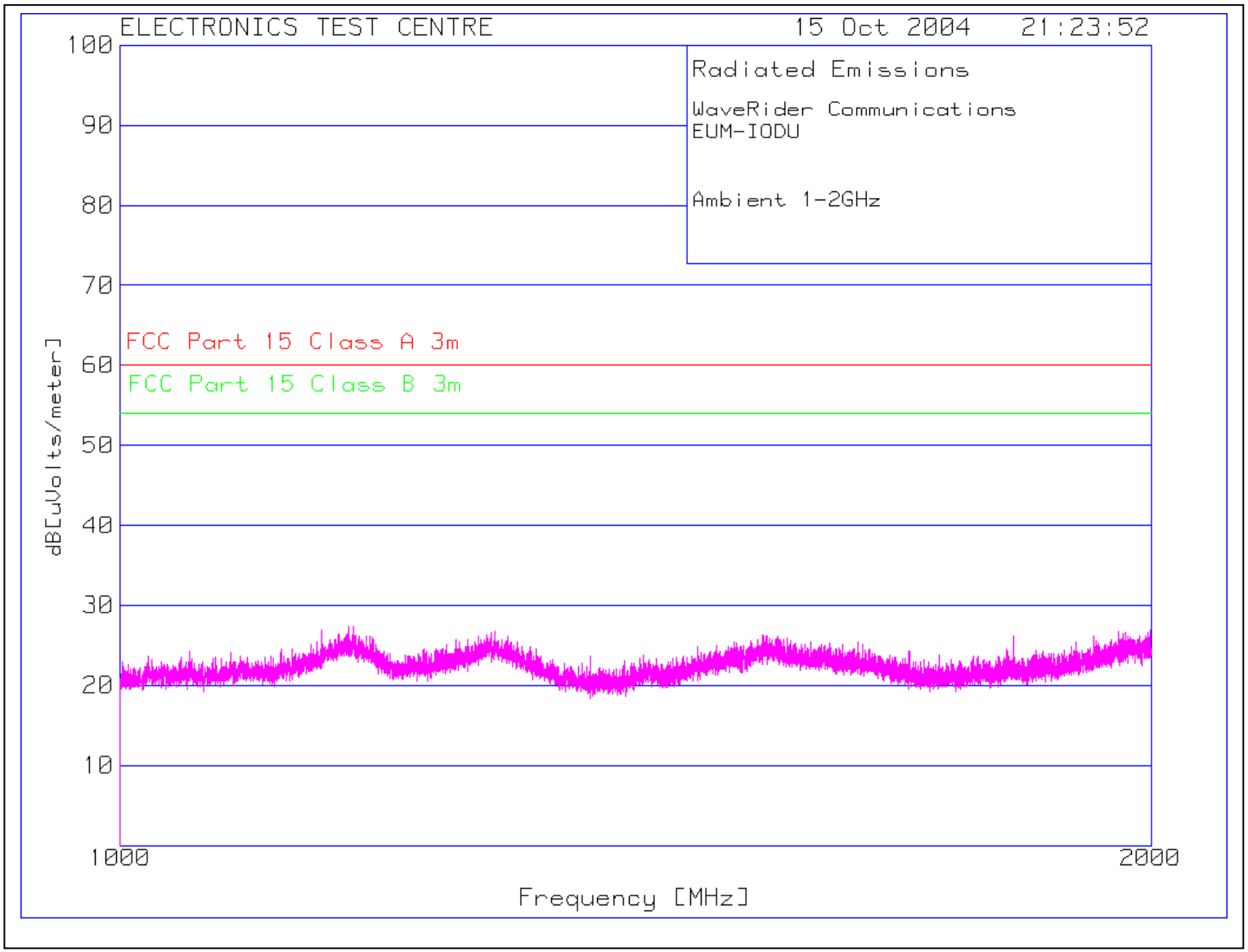
Plot of Radiated Emissions Test Chamber Ambient:



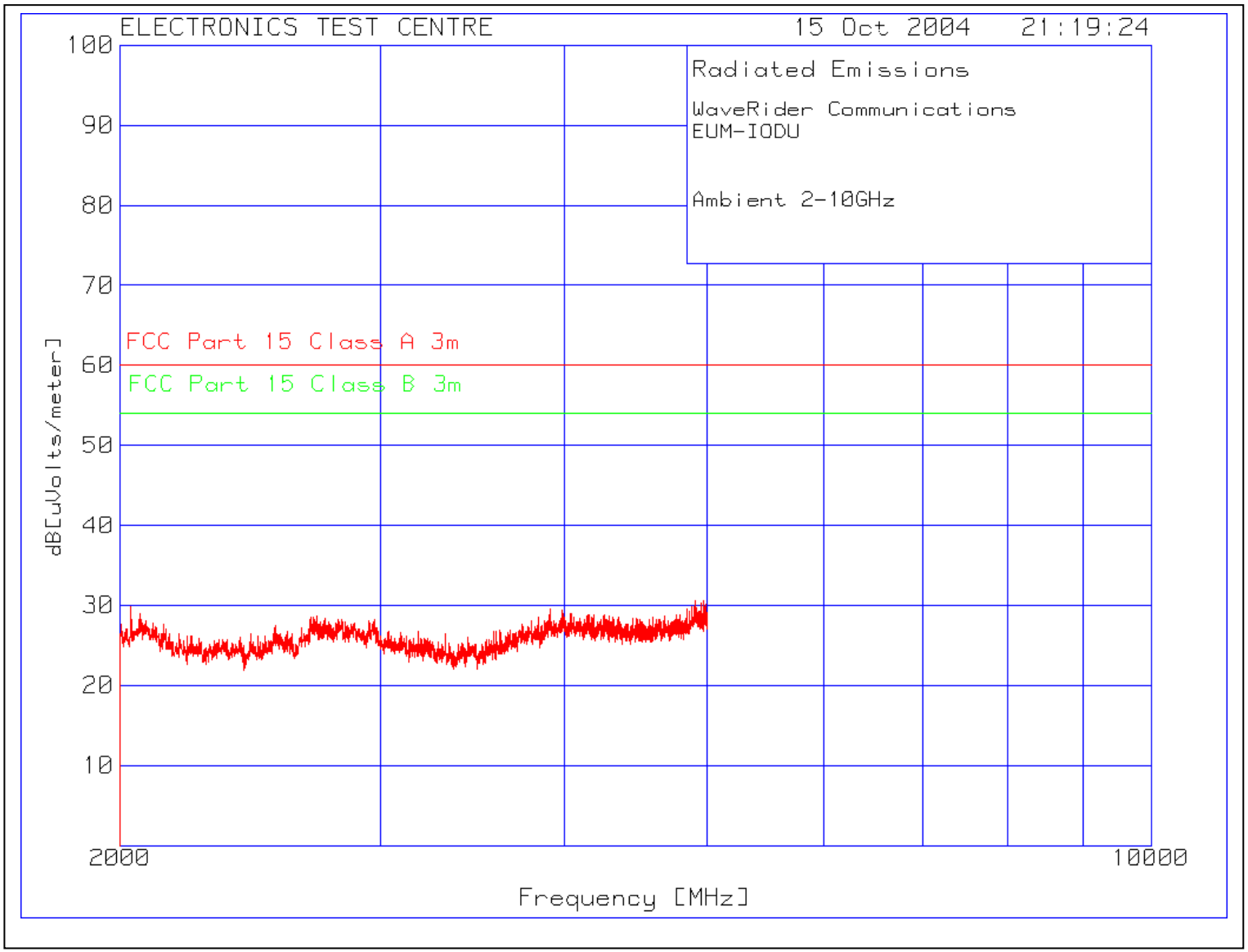
Plot of Radiated Emissions Test Chamber Ambient:



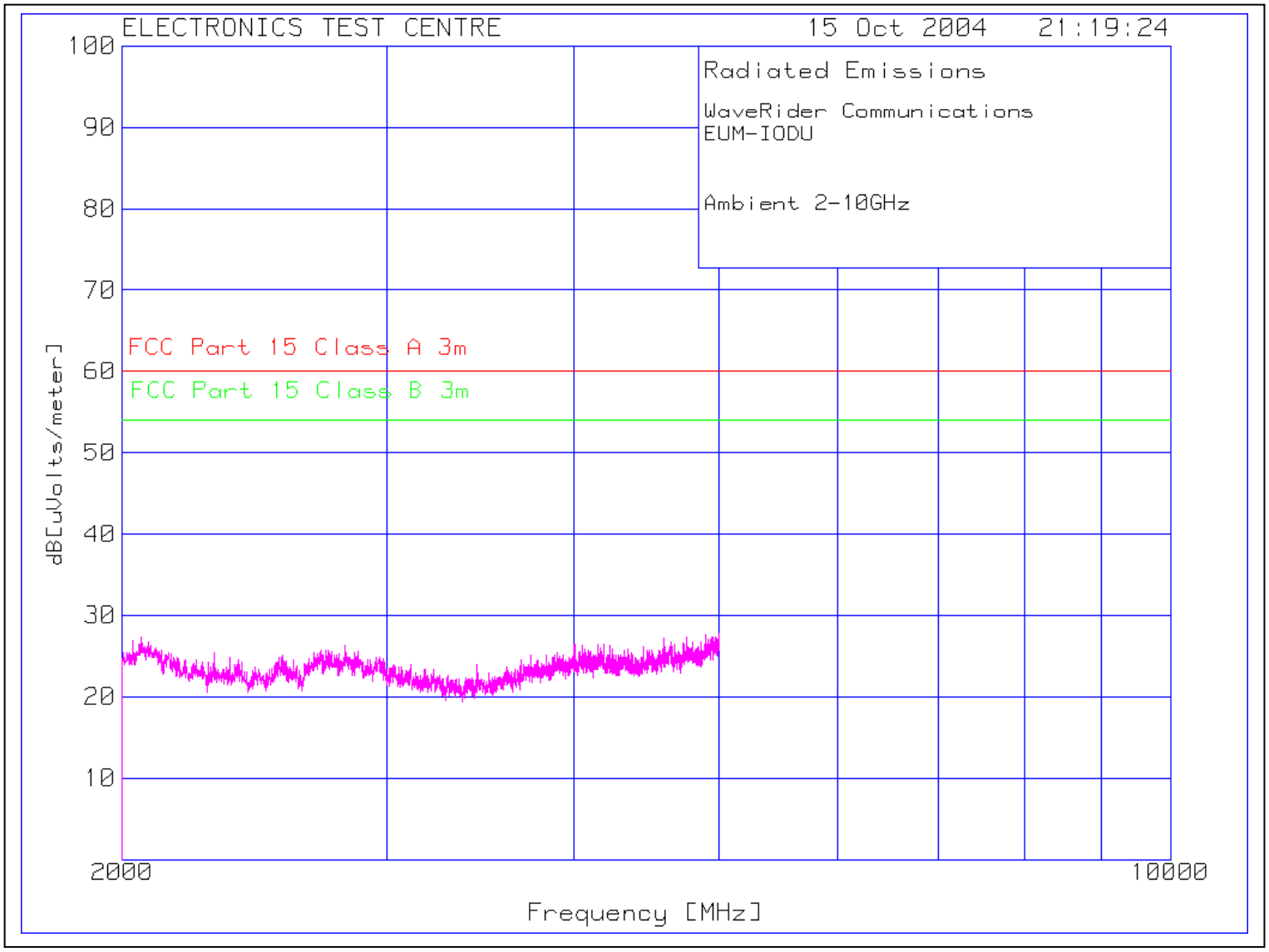
Plot of Radiated Emissions Test Chamber Ambient:



Plot of Radiated Emissions Test Chamber Ambient:



Plot of Radiated Emissions Test Chamber Ambient:



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4.3b Transmit Mode

Test Lab: Electronics Test Centre (Airdrie) Test Personnel: David Raynes Jiaming Zhang Test Date: 2004/09/29 – 2004/11/01	Product: EUM-IODU
Test Result, EUM-IODU: **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. **Emission levels should meet the requirements with a margin of 6dB.**	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:

Operation in Restricted Bands:

nominal f_c (MHz)	**f** (MHz)	Field Strength (dBμV/m)	Limit (dBμV/m)	Delta (dB)	Measuring Antenna Polarization	Antenna Height (cm)	Azimuth (Degrees)
905 H	974.9949	53.67	53.98	-0.31	H	122	124
905 H	974.998	45.75	53.98	-8.23	V	100	97
905 V	164.9506	33.62	43.52	-9.90	V	100	118
905 V	974.9479	50.62	53.98	-3.36	V	159	121
915 H	984.9968	53.33	53.98	-0.65	H	125	123
915 H	164.9971	34.66	43.52	-8.86	V	102	358
915 H	984.8126	50.62	53.98	-3.36	V	159	121
925 H	330.0097	34.56	46.02	-11.46	H	100	146
925 H	165.0002	34.69	43.52	-8.83	V	100	0
925 H	994.9962	51.57	53.98	-2.41	V	110	3
925 V	164.9816	36.19	43.52	-7.33	V	100	117
925 V	994.9775	51.77	53.98	-2.21	V	108	120

Note: Investigation was performed up to 10 GHz. All other emissions were below the measuring equipment noise floor.

WaveRider Communications
EUM-IODU
Tx mode, fc = 905 MHz
Horizontal Tx polarization
Project Number m01e3135 18 H

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								
307.9989	16.03 qp	4.76	12.88	33.67	56.9	57	46.02	47.46
Azimuth: 173	Height:100 Horz		Margin [dB]:		-23.23	-23.33	-12.35	-13.79
527.9957	13.42 qp	6.51	17.19	37.12	56.9	57	46.02	47.46
Azimuth: 127	Height:138 Horz		Margin [dB]:		-19.78	-19.88	-8.9	-10.34
763.2503	15.28 qp	7.45	19.74	42.47	56.9	57	46.02	47.46
Azimuth: 105	Height:172 Horz		Margin [dB]:		-14.43	-14.53	-3.55	-4.99
834.2936	9.84 qp	7.81	20.63	38.28	56.9	57	46.02	47.46
Azimuth: 118	Height:158 Horz		Margin [dB]:		-18.62	-18.72	-7.74	-9.18
904.8824	75.02 qp	8.18	22.29	105.49	56.9	57	46.02	47.46
Azimuth: 114	Height:238 Horz		Margin [dB]:		48.59	48.49	59.47	58.03
930.9962	40.97 qp	8.33	21.48	70.78	56.9	57	46.02	47.46
Azimuth: 67	Height:130 Horz		Margin [dB]:		13.88	13.78	24.76	23.32
974.9949	23.5 qp	8.59	21.58	53.67	60	57	53.98	47.46
Azimuth: 124	Height:122 Horz		Margin [dB]:		-6.33	-3.33	-.31	6.21

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

WaveRider Communications
EUM-IODU
Tx mode, fc = 905 MHz
Horizontal Tx polarization
Project Number m01e3135 18 V

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3 ⇓	4
Range: 2 30 - 1000MHz								
54.4148	2.82 qp	2.29	9.83	14.94	49.54	50	40	40.46
Azimuth: 358	Height:101 Vert			Margin [dB]:	-34.6	-35.06	-25.06	-25.52
99.367	20.12 qp	2.62	9.08	31.82	53.98	50	43.52	40.46
Azimuth: 305	Height:100 Vert			Margin [dB]:	-22.16	-18.18	-11.7	-8.64
131.9958	18.45 qp	3.16	10.21	31.82	53.98	50	43.52	40.46
Azimuth: 337	Height:103 Vert			Margin [dB]:	-22.16	-18.18	-11.7	-8.64
139.9999	25.06 qp	3.28	8.59	36.93	53.98	50	43.52	40.46
Azimuth: 105	Height:100 Vert			Margin [dB]:	-17.05	-13.07	-6.59	-3.53
164.9987	19.74 qp	3.41	9.22	32.37	53.98	50	43.52	40.46
Azimuth: 333	Height:100 Vert			Margin [dB]:	-21.61	-17.63	-11.15	-8.09
175.9991	20.5 qp	3.68	8.83	33.01	53.98	50	43.52	40.46
Azimuth: 354	Height:102 Vert			Margin [dB]:	-20.97	-16.99	-10.51	-7.45
186.999	19.65 qp	3.94	8.74	32.33	53.98	50	43.52	40.46
Azimuth: 344	Height:100 Vert			Margin [dB]:	-21.65	-17.67	-11.19	-8.13
197.9984	24.07 qp	3.89	9.08	37.04	53.98	50	43.52	40.46
Azimuth: 46	Height:101 Vert			Margin [dB]:	-16.94	-12.96	-6.48	-3.42
219.9976	21.81 qp	4.13	10.53	36.47	56.9	50	46.02	40.46
Azimuth: 20	Height:100 Vert			Margin [dB]:	-20.43	-13.53	-9.55	-3.99
764.8354	15.78 qp	7.47	19	42.25	56.9	57	46.02	47.46
Azimuth: 122	Height:122 Vert			Margin [dB]:	-14.65	-14.75	-3.77	-5.21
905.1965	75.14 qp	8.18	20.8	104.12	56.9	57	46.02	47.46
Azimuth: 128	Height:121 Vert			Margin [dB]:	47.22	47.12	58.1	56.66
930.9948	38.85 qp	8.33	20.68	67.86	56.9	57	46.02	47.46
Azimuth: 95	Height:100 Vert			Margin [dB]:	10.96	10.86	21.84	20.4
974.998	16.24 qp	8.59	20.92	45.75	60	57	53.98	47.46
Azimuth: 97	Height:100 Vert			Margin [dB]:	-14.25	-11.25	-8.23	-1.71

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

WaveRider Communications
EUM-IODU
Tx mode, fc = 905 MHz
Vertical Tx polarization
Project Number m01e3135 04 H

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								
139.9488	21.81 qp	3.28	8.87	33.96	53.98	50	43.52	40.46
Azimuth: 278	Height:155 Horz			Margin [dB]:	-20.02	-16.04	-9.56	-6.5
175.951	22.49 qp	3.68	8.6	34.77	53.98	50	43.52	40.46
Azimuth: 278	Height:146 Horz			Margin [dB]:	-19.21	-15.23	-8.75	-5.69
219.9473	21.13 qp	4.13	10.43	35.69	56.9	50	46.02	40.46
Azimuth: 285	Height:104 Horz			Margin [dB]:	-21.21	-14.31	-10.33	-4.77
878.8285	11.81 qp	8.15	21.12	41.08	56.9	57	46.02	47.46
Azimuth: 121	Height:118 Horz			Margin [dB]:	-15.82	-15.92	-4.94	-6.38
879.677	10.48 qp	8.15	21.19	39.82	56.9	57	46.02	47.46
Azimuth: 122	Height:136 Horz			Margin [dB]:	-17.08	-17.18	-6.2	-7.64
904.5723	61.78 qp	8.18	22.27	92.23	56.9	57	46.02	47.46
Azimuth: 163	Height:266 Horz			Margin [dB]:	35.33	35.23	46.21	44.77
930.9468	25.44 qp	8.33	21.49	55.26	56.9	57	46.02	47.46
Azimuth: 110	Height:234 Horz			Margin [dB]:	-1.64	-1.74	9.24	7.8

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

WaveRider Communications
EUM-IODU
Tx mode, fc = 905 MHz
Vertical Tx polarization
Project Number m01e3135 04 V

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								
139.9505	26.87 qp	3.28	8.59	38.74	53.98	50	43.52	40.46
Azimuth: 32	Height:101 Vert		Margin [dB]:		-15.24	-11.26	-4.78	-1.72
164.9506	20.98 qp	3.41	9.23	33.62	53.98	50	43.52	40.46
Azimuth: 118	Height:100 Vert		Margin [dB]:		-20.36	-16.38	-9.9	-6.84
175.9504	29.11 qp	3.68	8.83	41.62	53.98	50	43.52	40.46
Azimuth: 52	Height:100 Vert		Margin [dB]:		-12.36	-8.38	-1.9	1.16
197.9481	23.31 qp	3.89	9.08	36.28	53.98	50	43.52	40.46
Azimuth: 350	Height:101 Vert		Margin [dB]:		-17.7	-13.72	-7.24	-4.18
219.9502	26.82 qp	4.13	10.53	41.48	56.9	50	46.02	40.46
Azimuth: 254	Height:219 Vert		Margin [dB]:		-15.42	-8.52	-4.54	1.02
764.7874	15.24 qp	7.47	19	41.71	56.9	57	46.02	47.46
Azimuth: 137	Height:167 Vert		Margin [dB]:		-15.19	-15.29	-4.31	-5.75
879.1998	29.83 qp	8.15	20.4	58.38	56.9	57	46.02	47.46
Azimuth: 133	Height:115 Vert		Margin [dB]:		1.48	1.38	12.36	10.92
886.9544	36.22 qp	8.09	20.6	64.91	56.9	57	46.02	47.46
Azimuth: 129	Height:115 Vert		Margin [dB]:		8.01	7.91	18.89	17.45
904.5745	81.89 qp	8.18	20.77	110.84	56.9	57	46.02	47.46
Azimuth: 115	Height:103 Vert		Margin [dB]:		53.94	53.84	64.82	63.38
930.9464	47.42 qp	8.33	20.69	76.44	56.9	57	46.02	47.46
Azimuth: 132	Height:110 Vert		Margin [dB]:		19.54	19.44	30.42	28.98
974.9479	21.11 qp	8.59	20.92	50.62	60	57	53.98	47.46
Azimuth: 121	Height:159 Vert		Margin [dB]:		-9.38	-6.38	-3.36	3.16

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

WaveRider Communications
EUM-IODU
Tx mode, fc = 915 MHz
Horizontal Tx polarization
Project Number m01e3135 19 H

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								
774.8373	17.01 qp	7.64	20.06	44.71	56.9	57	46.02	47.46
Azimuth: 108	Height:173 Horz			Margin [dB]:	-12.19	-12.29	-1.31	-2.75
845.1638	14.28 qp	8.01	20.6	42.89	56.9	57	46.02	47.46
Azimuth: 117	Height:145 Horz			Margin [dB]:	-14.01	-14.11	-3.13	-4.57
897.0214	47.19 qp	8.1	22.15	77.44	56.9	57	46.02	47.46
Azimuth: 119	Height:131 Horz			Margin [dB]:	20.54	20.44	31.42	29.98
914.8833	75.31 qp	8.25	21.88	105.44	56.9	57	46.02	47.46
Azimuth: 116	Height:100 Horz			Margin [dB]:	48.54	48.44	59.42	57.98
940.9942	34.9 qp	8.35	21.45	64.7	56.9	57	46.02	47.46
Azimuth: 71	Height:129 Horz			Margin [dB]:	7.8	7.7	18.68	17.24
984.9968	23.08 qp	8.6	21.65	53.33	60	57	53.98	47.46
Azimuth: 123	Height:125 Horz			Margin [dB]:	-6.67	-3.67	-.65	5.87

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

WaveRider Communications
EUM-IODU
Tx mode, fc = 915 MHz
Horizontal Tx polarization
Project Number m01e3135 19 V

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								
139.9978	25.62 qp	3.28	8.59	37.49	53.98	50	43.52	40.46
Azimuth: 61	Height:100 Vert		Margin [dB]:		-16.49	-12.51	-6.03	-2.97
164.9971	22.03 qp	3.41	9.22	34.66	53.98	50	43.52	40.46
Azimuth: 358	Height:102 Vert		Margin [dB]:		-19.32	-15.34	-8.86	-5.8
175.9984	27.82 qp	3.68	8.83	40.33	53.98	50	43.52	40.46
Azimuth: 76	Height:100 Vert		Margin [dB]:		-13.65	-9.67	-3.19	-.13
197.999	23.71 qp	3.89	9.08	36.68	53.98	50	43.52	40.46
Azimuth: 324	Height:257 Vert		Margin [dB]:		-17.3	-13.32	-6.84	-3.78
219.9963	27.06 qp	4.13	10.53	41.72	56.9	50	46.02	40.46
Azimuth: 55	Height:250 Vert		Margin [dB]:		-15.18	-8.28	-4.3	1.26
774.8437	16.18 qp	7.64	19.06	42.88	56.9	57	46.02	47.46
Azimuth: 120	Height:114 Vert		Margin [dB]:		-14.02	-14.12	-3.14	-4.58
897.0131	38.65 qp	8.1	20.7	67.45	56.9	57	46.02	47.46
Azimuth: 92	Height:102 Vert		Margin [dB]:		10.55	10.45	21.43	19.99
914.8844	76.54 qp	8.25	20.78	105.57	56.9	57	46.02	47.46
Azimuth: 95	Height:101 Vert		Margin [dB]:		48.67	48.57	59.55	58.11
940.9935	30.36 qp	8.35	20.7	59.41	56.9	57	46.02	47.46
Azimuth: 117	Height:100 Vert		Margin [dB]:		2.51	2.41	13.39	11.95
984.8126	-.37 qp	8.6	21.14	29.37	60	57	53.97	47.46
Azimuth: 359	Height:129 Vert		Margin [dB]:		-30.63	-27.63	-24.6	-18.09

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

WaveRider Communications
EUM-IODU
Tx mode, fc = 915 MHz
Vertical Tx polarization
Project Number m01e3135 17 H

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									
219.9974	23.46	qp	4.13	10.43	38.02	56.9	50	46.02	40.46
Azimuth: 262	Height:110	Horz			Margin [dB]:	-18.88	-11.98	-8	-2.44
897.0047	27.89	qp	8.1	22.15	58.14	56.9	57	46.02	47.46
Azimuth: 94	Height:150	Horz			Margin [dB]:	1.24	1.14	12.12	10.68
914.8828	66.37	qp	8.25	21.88	96.5	56.9	57	46.02	47.46
Azimuth: 88	Height:151	Horz			Margin [dB]:	39.6	39.5	50.48	49.04
940.9962	19.88	qp	8.35	21.45	49.68	56.9	57	46.02	47.46
Azimuth: 159	Height:267	Horz			Margin [dB]:	-7.22	-7.32	3.66	2.22

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

WaveRider Communications
EUM-IODU
Tx mode, fc = 915 MHz
Vertical Tx polarization
Project Number m01e3135 17 V

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								
56.6507	.41 qp	2.3	9.24	11.95	49.54	50	40	40.46
Azimuth: 358	Height:99 Vert			Margin [dB]:	-37.59	-38.05	-28.05	-28.51
64.3693	5.28 qp	2.26	6.73	14.27	49.54	50	40	40.46
Azimuth: 149	Height:99 Vert			Margin [dB]:	-35.27	-35.73	-25.73	-26.19
69.1005	4.16 qp	2.32	6.61	13.09	49.54	50	40	40.46
Azimuth: 121	Height:104 Vert			Margin [dB]:	-36.45	-36.91	-26.91	-27.37
106.9424	5.75 qp	2.82	9.64	18.21	53.98	50	43.52	40.46
Azimuth: 358	Height:99 Vert			Margin [dB]:	-35.77	-31.79	-25.31	-22.25
139.9992	25.92 qp	3.28	8.59	37.79	53.98	50	43.52	40.46
Azimuth: 65	Height:102 Vert			Margin [dB]:	-16.19	-12.21	-5.73	-2.67
175.9999	25.36 qp	3.68	8.83	37.87	53.98	50	43.52	40.46
Azimuth: 355	Height:100 Vert			Margin [dB]:	-16.11	-12.13	-5.65	-2.59
186.9988	24.4 qp	3.94	8.74	37.08	53.98	50	43.52	40.46
Azimuth: 71	Height:101 Vert			Margin [dB]:	-16.9	-12.92	-6.44	-3.38
197.9983	27.15 qp	3.89	9.08	40.12	53.98	50	43.52	40.46
Azimuth: 52	Height:100 Vert			Margin [dB]:	-13.86	-9.88	-3.4	-.34
219.9986	26.69 qp	4.13	10.53	41.35	56.9	50	46.02	40.46
Azimuth: 11	Height:224 Vert			Margin [dB]:	-15.55	-8.65	-4.67	.89
774.765	23.25 qp	7.64	19.06	49.95	56.9	57	46.02	47.46
Azimuth: 109	Height:122 Vert			Margin [dB]:	-6.95	-7.05	3.93	2.49
845.7561	17.41 qp	8.01	19.8	45.22	56.9	57	46.02	47.46
Azimuth: 110	Height:122 Vert			Margin [dB]:	-11.68	-11.78	-.8	-2.24
897.0026	47.01 qp	8.1	20.7	75.81	56.9	57	46.02	47.46
Azimuth: 111	Height:110 Vert			Margin [dB]:	18.91	18.81	29.79	28.35
914.8834	82.74 qp	8.25	20.78	111.77	56.9	57	46.02	47.46
Azimuth: 112	Height:113 Vert			Margin [dB]:	54.87	54.77	65.75	64.31
940.9955	30.3 qp	8.35	20.7	59.35	56.9	57	46.02	47.46
Azimuth: 18	Height:100 Vert			Margin [dB]:	2.45	2.35	13.33	11.89

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

WaveRider Communications
EUM-IODU
Tx mode fc = 925MHZ
Horizontal Tx polarization
Project Number m01e3135 21 H

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								
198.0016	20.04 qp	3.89	9.6	33.53	53.98	50	43.52	40.46
Azimuth: 350	Height:119	Horz		Margin [dB]:	-20.45	-16.47	-9.99	-6.93
220.0001	23.34 qp	4.13	10.43	37.9	56.9	50	46.02	40.46
Azimuth: 148	Height:109	Horz		Margin [dB]:	-19	-12.1	-8.12	-2.56
307.998	18.39 qp	4.76	12.88	36.03	56.9	57	46.02	47.46
Azimuth: 81	Height:100	Horz		Margin [dB]:	-20.87	-20.97	-9.99	-11.43
330.0097	15.92 qp	5.11	13.53	34.56	56.9	57	46.02	47.46
Azimuth: 146	Height:100	Horz		Margin [dB]:	-22.34	-22.44	-11.46	-12.9
784.7665	10.08 qp	7.64	20.3	38.02	56.9	57	46.02	47.46
Azimuth: 339	Height:100	Horz		Margin [dB]:	-18.88	-18.98	-8	-9.44
898.1623	24.6 qp	8.1	22.2	54.9	56.9	57	46.02	47.46
Azimuth: 37	Height:175	Horz		Margin [dB]:	-2	-2.1	8.88	7.44
907.0028	19.95 qp	8.21	22.3	50.46	56.9	57	46.02	47.46
Azimuth: 152	Height:102	Horz		Margin [dB]:	-6.44	-6.54	4.44	3
924.8829	75.05 qp	8.29	20.7	104.04	56.9	57	46.02	47.46
Azimuth: 297	Height:201	Horz		Margin [dB]:	47.14	47.04	58.02	56.58
955.3906	11.91 qp	8.37	21.37	41.65	56.9	57	46.02	47.46
Azimuth: 358	Height:156	Horz		Margin [dB]:	-15.25	-15.35	-4.37	-5.81

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

WaveRider Communications
EUM-IODU
Tx mode fc = 925MHZ
Horizontal Tx polarization
Project Number m01e3135 21 V

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								
132.0022	18.43 qp	3.16	10.21	31.8	53.98	50	43.52	40.46
Azimuth: 201	Height:102 Vert		Margin [dB]:		-22.18	-18.2	-11.72	-8.66
139.9998	26.24 qp	3.28	8.59	38.11	53.98	50	43.52	40.46
Azimuth: 307	Height:100 Vert		Margin [dB]:		-15.87	-11.89	-5.41	-2.35
165.0002	22.06 qp	3.41	9.22	34.69	53.98	50	43.52	40.46
Azimuth: 0	Height:100 Vert		Margin [dB]:		-19.29	-15.31	-8.83	-5.77
175.9996	26.57 qp	3.68	8.83	39.08	53.98	50	43.52	40.46
Azimuth: 245	Height:101 Vert		Margin [dB]:		-14.9	-10.92	-4.44	-1.38
187.0008	21.89 qp	3.94	8.74	34.57	53.98	50	43.52	40.46
Azimuth: 320	Height:100 Vert		Margin [dB]:		-19.41	-15.43	-8.95	-5.89
198.0003	23.27 qp	3.89	9.08	36.24	53.98	50	43.52	40.46
Azimuth: 268	Height:102 Vert		Margin [dB]:		-17.74	-13.76	-7.28	-4.22
220.0001	25.81 qp	4.13	10.53	40.47	56.9	50	46.02	40.46
Azimuth: 253	Height:271 Vert		Margin [dB]:		-16.43	-9.53	-5.55	.01
784.8373	23.52 qp	7.64	19.2	50.36	56.9	57	46.02	47.46
Azimuth: 5	Height:123 Vert		Margin [dB]:		-6.54	-6.64	4.34	2.9
854.8789	18.91 qp	7.95	19.9	46.76	56.9	57	46.02	47.46
Azimuth: 358	Height:124 Vert		Margin [dB]:		-10.14	-10.24	.74	-.7
865.3353	16.19 qp	7.95	20.1	44.24	56.9	57	46.02	47.46
Azimuth: 352	Height:118 Vert		Margin [dB]:		-12.66	-12.76	-1.78	-3.22
896.9151	45.1 qp	8.1	20.7	73.9	56.9	57	46.02	47.46
Azimuth: 3	Height:115 Vert		Margin [dB]:		17	16.9	27.88	26.44
907.0346	44.56 qp	8.21	20.8	73.57	56.9	57	46.02	47.46
Azimuth: 0	Height:113 Vert		Margin [dB]:		16.67	16.57	27.55	26.11
924.8851	74.95 qp	8.29	21.6	104.84	56.9	57	46.02	47.46
Azimuth: 218	Height:99 Vert		Margin [dB]:		47.94	47.84	58.82	57.38
954.9964	34.06 qp	8.36	20.55	62.97	56.9	57	46.02	47.46
Azimuth: 7	Height:111 Vert		Margin [dB]:		6.07	5.97	16.95	15.51
994.9962	21.56 qp	8.61	21.4	51.57	60	57	53.98	47.46
Azimuth: 3	Height:110 Vert		Margin [dB]:		-8.43	-5.43	-2.41	4.11

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

WaveRider Communications
EUM-IODU
Tx mode, fc = 925 MHz
Vertical Tx polarization
Project Number m01e3135 20 H

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								
219.9783	15.81 qp	4.13	10.43	30.37	56.9	50	46.02	40.46
Azimuth: 5	Height:266 Horz			Margin [dB]:	-26.53	-19.63	-15.65	-10.09
615.98	11.02 qp	6.7	18.29	36.01	56.9	57	46.02	47.46
Azimuth: 160	Height:114 Horz			Margin [dB]:	-20.89	-20.99	-10.01	-11.45
783.1281	4.87 qp	7.64	20.3	32.81	56.9	57	46.02	47.46
Azimuth: 147	Height:181 Horz			Margin [dB]:	-24.09	-24.19	-13.21	-14.65
896.7992	20.35 qp	8.1	22.14	50.59	56.9	57	46.02	47.46
Azimuth: 10	Height:353 Horz			Margin [dB]:	-6.31	-6.41	4.57	3.13
906.9763	18.85 qp	8.21	22.3	49.36	56.9	57	46.02	47.46
Azimuth: 217	Height:158 Horz			Margin [dB]:	-7.54	-7.64	3.34	1.9
924.8834	64.76 qp	8.29	21.6	94.65	56.9	57	46.02	47.46
Azimuth: 138	Height:188 Horz			Margin [dB]:	37.75	37.65	48.63	47.19
954.1616	10.18 qp	8.36	21.32	39.86	56.9	57	46.02	47.46
Azimuth: 101	Height:235 Horz			Margin [dB]:	-17.04	-17.14	-6.16	-7.6

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

WaveRider Communications
EUM-IODU
Tx mode, fc = 925 MHz
Vertical Tx polarization
Project Number m01e3135 20 V

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								
60.8428	6.82 qp	2.28	7.4	16.5	49.54	50	40	40.46
Azimuth: 298	Height:102 Vert			Margin [dB]:	-33.04	-33.5	-23.5	-23.96
99.3552	20.12 qp	2.62	9.07	31.81	53.98	50	43.52	40.46
Azimuth: 293	Height:115 Vert			Margin [dB]:	-22.17	-18.19	-11.71	-8.65
139.9802	25.25 qp	3.28	8.59	37.12	53.98	50	43.52	40.46
Azimuth: 244	Height:108 Vert			Margin [dB]:	-16.86	-12.88	-6.4	-3.34
164.9816	23.55 qp	3.41	9.23	36.19	53.98	50	43.52	40.46
Azimuth: 117	Height:100 Vert			Margin [dB]:	-17.79	-13.81	-7.33	-4.27
175.9791	29.89 qp	3.68	8.83	42.4	53.98	50	43.52	40.46
Azimuth: 45	Height:100 Vert			Margin [dB]:	-11.58	-7.6	-1.12	1.94
197.9795	22.69 qp	3.89	9.08	35.66	53.98	50	43.52	40.46
Azimuth: 338	Height:263 Vert			Margin [dB]:	-18.32	-14.34	-7.86	-4.8
219.9794	26.93 qp	4.13	10.53	41.59	56.9	50	46.02	40.46
Azimuth: 359	Height:264 Vert			Margin [dB]:	-15.31	-8.41	-4.43	1.13
784.5946	19 qp	7.64	19.2	45.84	56.9	57	46.02	47.46
Azimuth: 121	Height:110 Vert			Margin [dB]:	-11.06	-11.16	-.18	-1.62
896.2622	44.56 qp	8.1	20.7	73.36	56.9	57	46.02	47.46
Azimuth: 122	Height:117 Vert			Margin [dB]:	16.46	16.36	27.34	25.9
924.8839	83.93 qp	8.29	20.7	112.92	56.9	57	46.02	47.46
Azimuth: 119	Height:109 Vert			Margin [dB]:	56.02	55.92	66.9	65.46
954.4073	33.49 qp	8.36	20.57	62.42	56.9	57	46.02	47.46
Azimuth: 120	Height:110 Vert			Margin [dB]:	5.52	5.42	16.4	14.96
994.9775	21.76 qp	8.61	21.4	51.77	60	57	53.98	47.46
Azimuth: 120	Height:108 Vert			Margin [dB]:	-8.23	-5.23	-2.21	4.31

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

4.4 FREQUENCY STABILITY (§ 2.1055)

Test Lab: Electronics Test Centre (Airdrie) Test Personnel: n/a Test Date: n/a	Product: EUM-IODU
Test Result, EUM-IODU: **Not Tested**	
The EUM-IODU was not tested for frequency stability at this time.	

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.

In accordance with WaveRider Communications Inc. specifications, the EUT was not grounded.

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

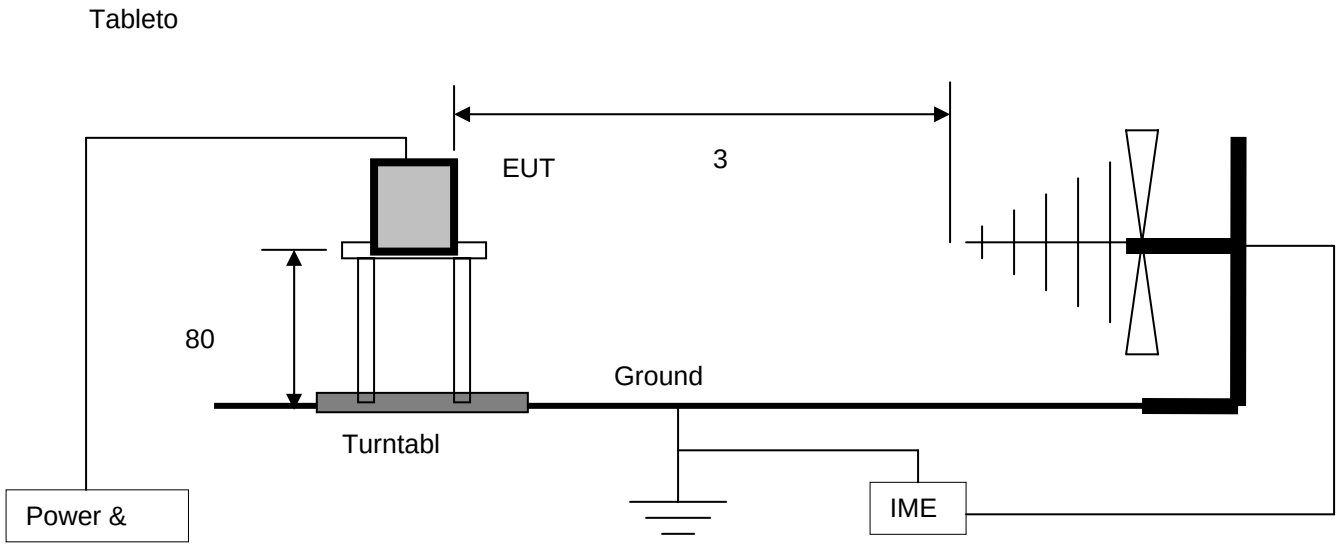
Ambient conducted and radiated electromagnetic emission profiles were generated throughout the tests and are included in the test data.

5.5 TEST CONFIGURATION

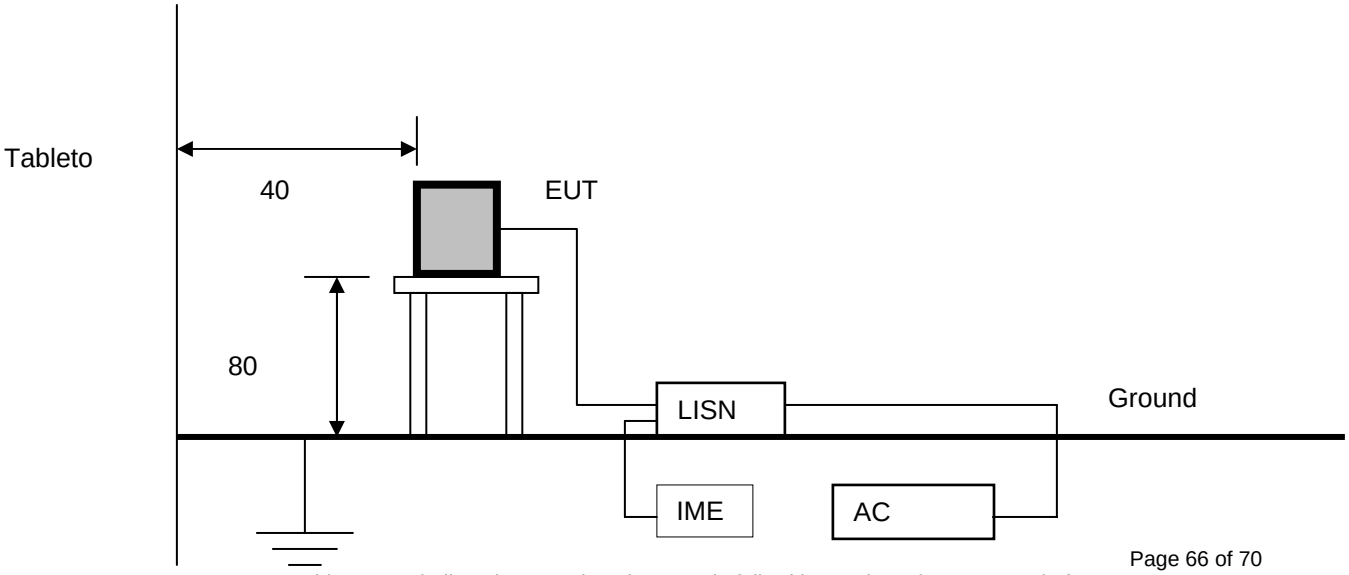
5.5.1 Tabletop Equipment

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

Radiated



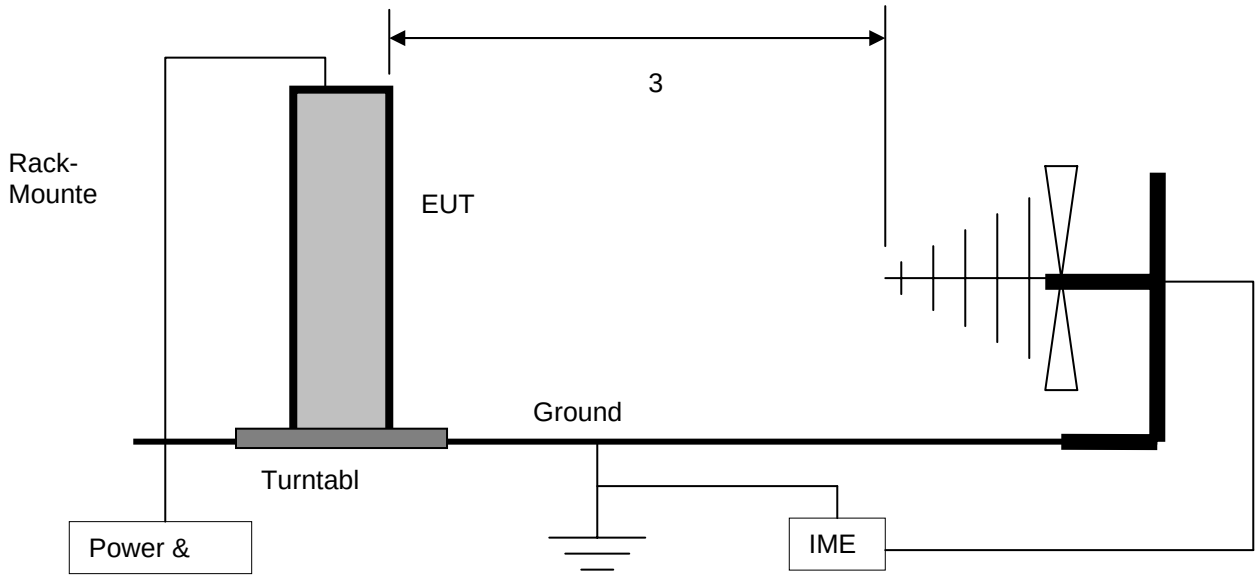
Conducted



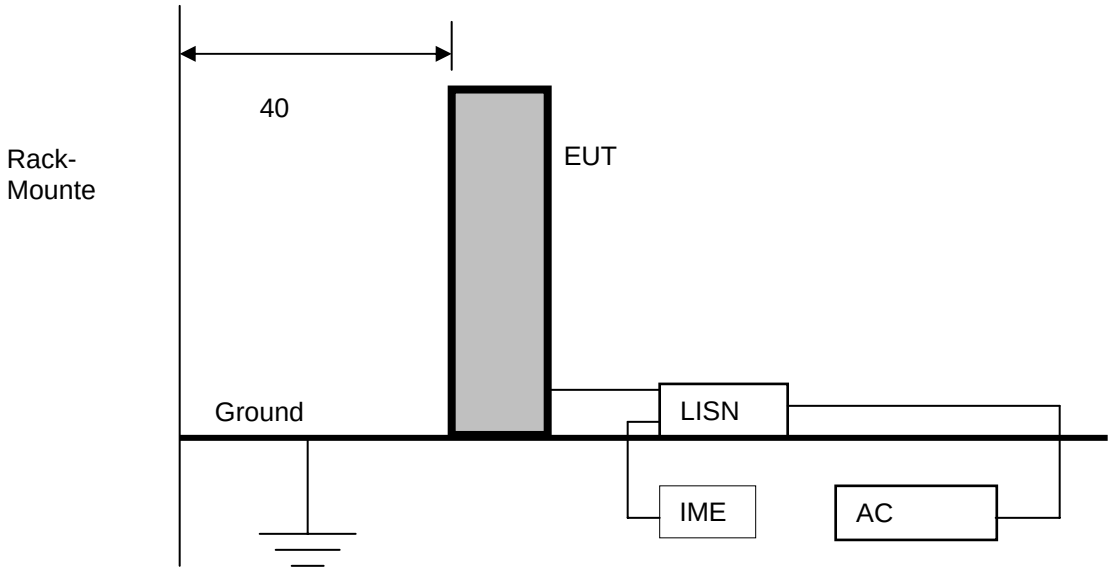
5.5.2 Rack Mount

The following diagrams illustrate the configuration of the EUT test and measurement equipment for Radiated and Conducted Emissions Testing of rack mounted 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 μH
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

The equipment used in the tests was selected from the following list.

Instrument	Manufacturer	Model No.	Asset No.	Calibration Due
Spectrum Analyzer & Display	Hewlett Packard	8566B & 85662	9565	20 April 2005
Spectrum Analyzer & Display	Hewlett Packard	8566B & 85662	9168	17 August 2005
RF Preselector	Hewlett Packard	85685A	9728	19 August 2005
Quasi-Peak Adapter	Hewlett Packard	85650A	4411	20 August 2005
Measurement System Software	Underwriters Laboratories	Version 6.0	4443	n/a
Line Impedance Stabilization Network	EMCO	3825/2r	9331	2 November 2005
Line Impedance Stabilization Network	EMCO	3825/2r	9259	2 November 2005
Biconilog Antenna	ARA	Lpb-2520/A	4318	2 August 2005
Dual Ridged Guide Antenna	EMCO	3115	9588	2 August 2005
Low Noise Amplifier	MITEQ	JS43-01001800-21-5P	4354	3 November 2004

Appendix A

EUM-IODU

Test Sample Description

(from data provided by WaveRider Communications Inc.)

Product Application	**Product Category**	
Commercial ✗ Military o	Telecommunications o Information Technology ✗ Surface Transportation o	Aerospace o Test & Measurement o Other o _____
Product Name	EUM-IODU	
Part/Model No.	EUM-IODU	
Serial Number	n/a	
Power Requirements: **(Voltage, AC/DC, Hz, Current)**	120 VAC, 60 Hz	
Typical Installation Instructions or Configuration	Wireless Ethernet modem	
Ground Connection **(in addition to power cord)**	nil	
Internally Generated Frequencies	11 MHz: DSSS BBP reference 22 MHz: microprocessor reference 25 MHz: Ethernet reference 44 MHz: reference oscillator	70 MHz: Intermediate frequency 140 MHz: IF oscillator 905 – 925 MHz: Tx frequency 975 – 995 MHz RF local oscillator
Peripheral Support Equipment	Personal computer	
Description and number of interconnecting Leads & Cables	Ethernet	
Brief Functional Description	Wireless Ethernet modem	