

# FCC PART 24 TYPE APPROVAL

## EMI MEASUREMENT AND TEST REPORT

For

### Novatel Wireless Technologies Ltd.

Suite 200, 6715 – 8th Street N.E.  
Calgary, Alberta  
Canada, T2E 7H7

**FCC ID: NBZNRM-U630**

<b>This Report Concerns:</b> <input checked="" type="checkbox"/> Original Report	<b>Equipment Type:</b> Transmitter, Portable
<b>Test Engineer:</b> Daniel Deng / 	
<b>Report No.:</b> R0408161	
<b>Report Date:</b> 2004-09-03	
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**Note:** The test report is specially limited to the above company and the product model only. It may not be duplicated without prior written consent of Bay Area Compliance Laboratory Corporation. This report **must not** be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the US Government.

**TABLE OF CONTENTS**

<b>GENERAL INFORMATION.....</b>	<b>4</b>
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) .....	4
OBJECTIVE .....	4
RELATED SUBMITTAL(S)/GRANT(S).....	4
TEST METHODOLOGY .....	4
TEST FACILITY .....	4
<b>SYSTEM TEST CONFIGURATION.....</b>	<b>6</b>
JUSTIFICATION .....	6
BLOCK DIAGRAM.....	6
EQUIPMENT MODIFICATIONS .....	6
LOCAL SUPPORT EQUIPMENT LIST AND DETAILS .....	6
EXTERNAL CABLES LIST AND DETAILS.....	6
POWER SUPPLY INFORMATION.....	6
CONFIGURATION OF TEST SYSTEM .....	7
TEST SETUP BLOCK DIAGRAM.....	7
<b>SUMMARY OF TEST RESULTS.....</b>	<b>8</b>
<b>§2.1047 - MODULATION CHARACTERISTIC .....</b>	<b>9</b>
APPLICABLE STANDARD .....	9
TEST PROCEDURE .....	9
TEST EQUIPMENT LIST AND DETAILS.....	9
ENVIRONMENTAL CONDITIONS .....	9
TEST RESULTS .....	9
<b>§2.1053 - SPURIOUS RADIATED EMISSIONS .....</b>	<b>12</b>
APPLICABLE STANDARD .....	12
TEST PROCEDURE .....	12
TEST EQUIPMENT LIST AND DETAILS.....	12
ENVIRONMENTAL CONDITIONS .....	12
TEST RESULT .....	13
<b>§2.1046, &amp; §24.232 - RF POWER OUTPUT.....</b>	<b>15</b>
APPLICABLE STANDARD .....	15
TEST PROCEDURE .....	15
TEST EQUIPMENT LIST AND DETAILS.....	16
ENVIRONMENTAL CONDITIONS .....	16
TEST RESULTS .....	16
<b>§2.1046, &amp; §24.232 – CONDUCTED OUTPUT POWER.....</b>	<b>17</b>
APPLICABLE STANDARD .....	17
TEST PROCEDURE .....	17
TEST EQUIPMENT LIST AND DETAILS.....	17
ENVIRONMENTAL CONDITIONS .....	17
TEST RESULTS .....	17
<b>§2.1049, &amp; §24.238 - OCCUPIED BANDWIDTH.....</b>	<b>20</b>
APPLICABLE STANDARD .....	20
TEST PROCEDURE .....	20
TEST EQUIPMENT LIST AND DETAILS.....	20
ENVIRONMENTAL CONDITIONS .....	20
TEST RESULTS .....	20
<b>§2.1051, &amp; §24.238(A) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS.....</b>	<b>24</b>
APPLICABLE STANDARD .....	24
TEST PROCEDURE .....	24
TEST EQUIPMENT LIST AND DETAILS.....	24
ENVIRONMENTAL CONDITIONS .....	24

TEST RESULTS .....	24
<b>§2.1055 (A), §2.1055 (D), &amp; §24.235 - FREQUENCY STABILITY .....</b>	<b>28</b>
APPLICABLE STANDARD .....	28
TEST PROCEDURE .....	28
TEST EQUIPMENT LIST AND DETAILS.....	28
ENVIRONMENTAL CONDITIONS.....	28
TEST RESULTS .....	29
<b>§24.238 – BAND EDGE.....</b>	<b>30</b>
APPLICABLE STANDARD .....	30
TEST PROCEDURE .....	30
TEST EQUIPMENT LIST AND DETAILS.....	30
ENVIRONMENTAL CONDITIONS.....	30
TEST RESULTS .....	30

## GENERAL INFORMATION

### Product Description for Equipment Under Test (EUT)

The *Novatel Wireless Technologies Ltd.* product, FCC ID:NBZNRM-U630 or the "EUT" as referred to in this report is a 3G Wireless PC card modem , which measures approximately 120mm(L) x 53mm(W) x 8mm(H). The EUT operates at the frequency of 1850.2 – 1909.8 MHz, maximum output power (EIRP) 29.2dBm (0.832W), frequency tolerance 0.054ppm and emission designator 253KGXW.

\* *The test data gathered are from typical production sample, serial number: Novatel0804, provided by the manufacturer.*

### Objective

This type approval report is prepared on behalf of *Novatel Wireless Technologies Ltd.* in accordance with Part 2, Subpart J, and Part 24 Subpart E of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC rules for output power, modulation characteristic, occupied bandwidth, spurious emission at antenna terminal, field strength of spurious radiation, frequency stability, band edge and radiated margin.

### Related Submittal(s)/Grant(s)

No Related Submittals

### Test Methodology

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 Part 2, Sub-part J as well as the following parts:

#### Part 24 Subpart E - PCS

Applicable Standards: TIA EIA 137-A, TIA EIA 98-C, ANSI 63.4-1992, and TIA/EIA-603A.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

### Test Facility

The Open Area Test site used by BACL Corp. to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA.

Test site at BACL Corp. has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules and Article 8 of the VCCI regulations. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-1992.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACLa is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The scope of the accreditation covers the FCC Method - 47 CFR Part 15 - Digital Devices, CISPR 22: 1997, Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment test methods.

## SYSTEM TEST CONFIGURATION

### Justification

The EUT was configured for testing according to TIA/EIA 603A.

The final qualification test was performed with the EUT operating at normal mode.

### Block Diagram

Please refer to Exhibit D.

### Equipment Modifications

No modifications were made to the EUT.

### Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Dell	Notebook	Latitude	CIF0B00227	DOC
HP	Printer	Thinkjet 2225C	2512S43681	BS46XU2225C
Everex	Modem	EV-945	None	E3E5UVEV-945

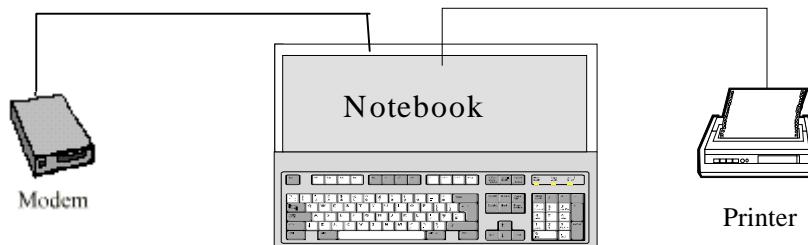
### External Cables List and Details

Cable Description	Length (M)	From	To
Unshielded Serial Cable	1.5	Modem Port/Host	Modem
Shielded Printer Cable	2	Parallel / Host	HP Printer

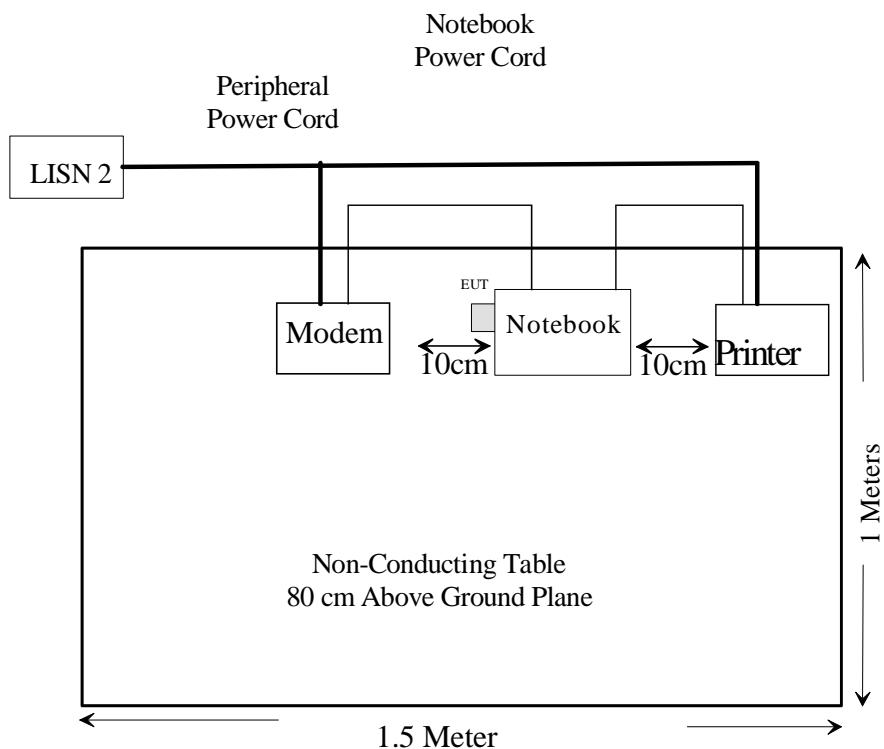
### Power Supply Information

Manufacturer	Description	Model	Serial Number	FCC ID
DELL	AC adapter	AA20031	CN-09364U-16291-13J-0E3F	DOC

## Configuration of Test System



## Test Setup Block Diagram



## SUMMARY OF TEST RESULTS

Results reported relate only to the product tested, serial number: *Novatel0804*.

FCC RULE	DESCRIPTION OF TEST	RESULT
§ 2.1047	Modulation Characteristics	Compliant
§ 2.1053	Field Strength of Spurious Radiation	Compliant
§2.1093	RF Exposure	Compliant
§ 2.1046, § 24.232	RF Output Power	Compliant
§ 2.1046, § 24.232	Conducted Output Power	Compliant
§ 2.1049 § 24.238	Out of Band Emission, Occupied Bandwidth	Compliant
§ 2.1051, § 24.238(a)	Spurious Emissions at Antenna Terminals	Compliant
§ 2.1055 (a) § 2.1055 (d) § 24.235	Frequency stability vs. temperature Frequency stability vs. voltage	Compliant
§24.238	Band Edge	Compliant

## §2.1047 - MODULATION CHARACTERISTIC

### Applicable Standard

Requirement: FCC § 2.1047.

### Test Procedure

UMTS digital mode is used by EUT.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	HP8564E	3943A01781	2004-08-01
HP	Plotter	HP7470A	2541A49659	Not Required

\* **Statement of Traceability:** BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

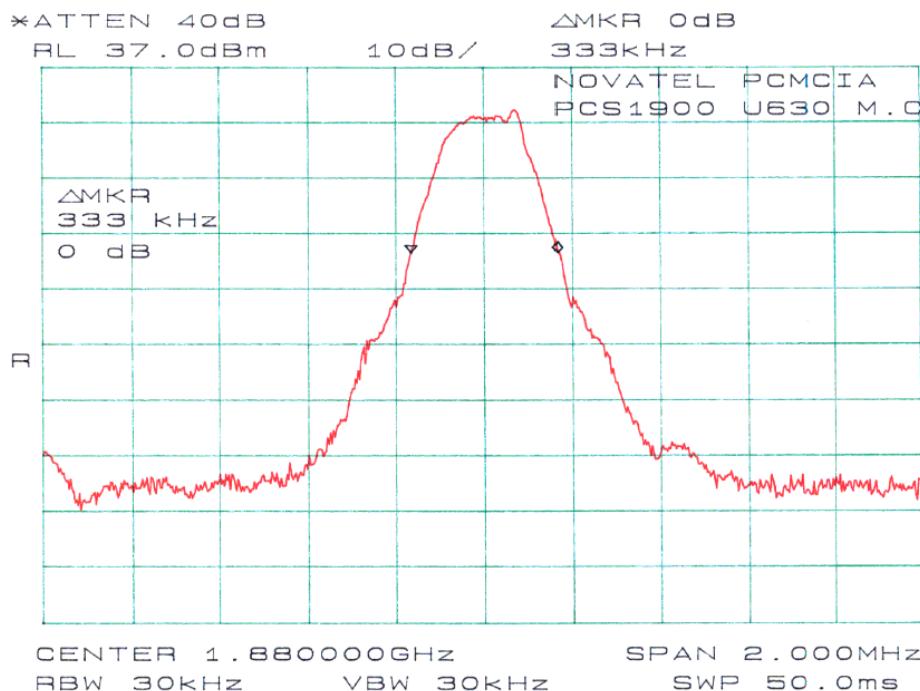
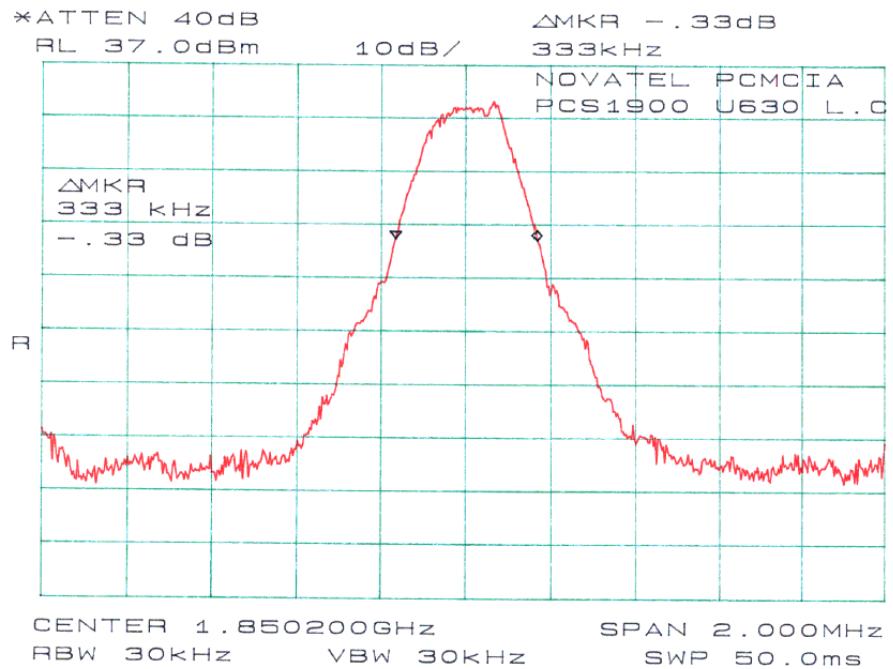
### Environmental Conditions

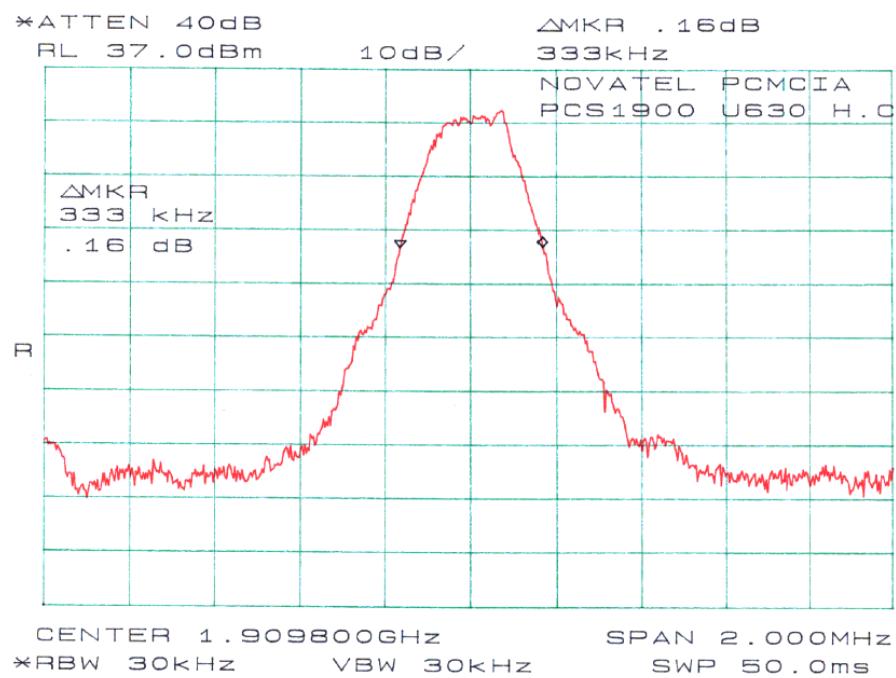
Temperature:	26° C
Relative Humidity:	35%
ATM Pressure:	1018 mbar

*The testing was performed by Daniel Deng on 2004-08-21*

### Test Results

Please refer to the hereinafter plots.





## §2.1053 - SPURIOUS RADIATED EMISSIONS

### Applicable Standard

Requirements: CFR 47, § 2.1053.

### Test Procedure

The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB =  $10 \lg (\text{TXpwr in Watts}/0.001)$  – the absolute level

Spurious attenuation limit in dB =  $43 + 10 \log_{10} (\text{power out in Watts})$

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	8568B	2601A02165	2004-07-03
HP	Amplifier	8447E	2944A10187	2003-09-23
HP	Quasi-Peak Adapter	85650A	3019A05393	2004-06-13
EMCO	Biconical Antenna	3110B	9309-1165	2003-10-11
EMCO	Log Periodic Antenna	3146	2101	2003-10-11
AH System	Horn Antenna	SAS-200/511	261	2004-08-02
HP	Spectrum Analyzer	HP8564E	3943A01781	2004-08-01

\* **Statement of Traceability:** BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

### Environmental Conditions

Temperature:	26° C
Relative Humidity:	35%
ATM Pressure:	1018 mbar

*The testing was performed by Daniel Deng on 2004-08-21*

**Test Result****Antenna 1 – Internal Antenna**

Low Frequency: -31.9 dB at 1850.2 MHz  
 Middle Frequency: -33.5 dB at 1880.00 MHz  
 High Frequency: -29.3 dB at 1909.8 MHz

**Antenna 2 – External Antenna**

Low Frequency: -24.4 dB at 3700.4 MHz  
 Middle Frequency: -24.5 dB at 5640.00 MHz  
 High Frequency: -26.1 dB at 3819.6 MHz

**Antenna 1 – Internal Antenna**

Indicated Frequency MHz	EUT			Substitution		Generator			Standard		
	Ampl. dBuV/m	Table Angle Degree	Test Antenna Height Meter	Polar H/V	Frequency MHz	Level dBm	Antenna Gain Corrected	Cable Loss dB	Absolute Level dBm	FCC Limit dBm	FCC Margin dB
<b>Low Channel</b>											
1850.2	127.17	0	2	V	1850.2	21.5	8.3	1.2	28.6		
1850.2	126.83	0	1.3	H	1850.2	19.8	8.3	1.2	26.9		
3700.4	47.33	0	2	V	3700.4	-53.2	10.3	2	-44.9	-13	-31.9
5550.6	48.17	60	1.2	V	5550.6	-52.7	10.6	2.8	-44.9	-13	-31.9
3700.4	44.17	180	1.8	H	3700.4	-55.8	10.3	2	-47.5	-13	-34.5
5550.6	44.33	300	2.3	H	5550.6	-55.6	10.6	2.8	-47.8	-13	-34.8
<b>MIDDLE CHANNEL</b>											
1880	128.33	0	1.7	V	1880	22.1	8.3	1.2	29.2		
1880	126.87	0	1.6	H	1880	20.1	8.3	1.2	27.2		
5640	46.33	300	1.5	V	5640	-54.3	10.6	2.8	-46.5	-13	-33.5
3760	44.83	90	1.5	V	3760	-55.4	10.3	2	-47.1	-13	-34.1
3760	44.67	30	2.2	H	3760	-55.7	10.3	2	-47.4	-13	-34.4
5640	43.87	0	2.5	H	5640	-56.9	10.6	2.8	-49.1	-13	-36.1
<b>HIGH CHANNEL</b>											
1909.8	126.83	90	1.5	V	1909.8	20.1	8.3	1.2	27.2		
1909.8	126.17	0	1.5	H	1909.8	19.7	8.3	1.2	26.8		
3819.6	49.00	90	2.1	V	3819.6	-50.6	10.3	2.0	-42.3	-13	-29.3
5729.4	47.17	90	2.2	V	5729.4	-52.8	10.6	2.8	-45.0	-13	-32.0
3819.6	42.33	0	2.2	H	3819.6	-55.1	10.3	2.0	-46.8	-13	-33.8
5729.4	41.17	90	1.8	H	5729.4	-56.7	10.6	2.8	-48.9	-13	-35.9

## Antenna 2 – External Antenna

		EUT			Substitution		Generator			Standard	
Indicated	Table	Test Antenna			Antenna	Cable	Absolute	FCC	FCC		
Frequency MHz	Ampl. dBuV/m	Angle Degree	Height Meter	Polar H/V	Frequency MHz	Level dBm	Gain Corrected	Loss dB	Level dBm	Limit dBm	Margin dB
Low Channel											
1850.2	128.17	0	2.1	V	1850.2	22.1	8.3	1.2	29.2		
1850.2	127.5	0	1.5	H	1850.2	20.3	8.3	1.2	27.4		
3700.4	54.00	270	2.0	V	3700.4	-45.7	10.3	2.0	-37.4	-13	-24.4
5550.6	53.83	270	2.5	V	5550.6	-46.5	10.6	2.8	-38.7	-13	-25.7
5550.6	49.33	300	2.1	H	5550.6	-50.5	10.6	2.8	-42.7	-13	-29.7
3700.4	45.60	270	1.2	H	3700.4	-55.3	10.3	2.0	-47	-13	-34.0
MIDDLE CHANNEL											
1880	128.17	90	2	V	1880	22	8.3	1.2	29.1		
1880	127.17	30	1.5	H	1880	20.2	8.3	1.2	27.3		
5640	54.50	330	2.3	V	5640	-45.3	10.6	2.8	-37.5	-13	-24.5
3760	52.87	90	2.3	V	3760	-47.2	10.3	2.0	-38.9	-13	-25.9
5640	47.17	0	1.8	H	5640	-52.8	10.6	2.8	-45.0	-13	-32.0
3760	45.50	330	2.1	H	3760	-55.1	10.3	2.0	-46.8	-13	-33.8
HIGH CHANNEL											
1909.8	128	90	1.8	V	1909.8	21.9	8.3	1.2	29.0		
1909.8	126.5	270	1.6	H	1909.8	20.1	8.3	1.2	27.2		
3819.6	52.67	90	2.5	V	3819.6	-47.4	10.3	2.0	-39.1	-13	-26.1
5729.4	52.17	90	2.5	V	5729.4	-47.6	10.6	2.8	-39.8	-13	-26.8
3819.6	45.33	270	1.3	H	3819.6	-55.2	10.3	2.0	-46.9	-13	-33.9
5729.4	45.5	180	1.4	H	5729.4	-55.2	10.6	2.8	-47.4	-13	-34.4

## §2.1046, & §24.232 - RF POWER OUTPUT

### Applicable Standard

According to FCC §2.1046 and §24.232 (1), mobile/portable stations are limited to 2 watts EIRP.

### Test Procedure

1. On a test site, the EUT shall be placed at 1.5m height on a turn table, and in the position closest to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3m from EUT to correspond to the frequency of the transmitter.
3. The output of the test antenna shall be connected to the measuring receiver and the quasi-peak detector is used for the measurement.
4. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test.
5. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.
6. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
7. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
8. The maximum signal level detected by the measuring receiver shall be noted.
9. The transmitter shall be replaced by a horn (substitution antenna).
10. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
11. The substitution antenna shall be connected to a calibrated signal generator.
12. In necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
13. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
14. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, which is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
15. The input level to the substitution antenna shall be recorded as power level in dBm, corrected for any change of input attenuator setting of the measuring receiver.
16. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
17. The measure of the effective radiated power is the large of the two levels recorded, at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.

## Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	8568B	2601A02165	2004-07-03
HP	Amplifier	8447E	2944A10187	2003-09-23
HP	Quasi-Peak Adapter	85650A	3019A05393	2004-06-13
EMCO	Biconical Antenna	3110B	9309-1165	2003-10-11
EMCO	Log Periodic Antenna	3146	2101	2003-10-11
AH System	Horn Antenna	SAS-200/511	261	2004-08-02

\* **Statement of Traceability:** BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

## Environmental Conditions

Temperature:	26° C
Relative Humidity:	35%
ATM Pressure:	1018 mbar

The testing was performed by Daniel Deng on 2004-08-21

## Test Results

### Antenna 1 – Internal Antenna

FREQUENCY (MHZ)	SUBSTITUTION READING (dBm)	SUBSTITUTION ANTENNA GAIN	SUBSTITUTION CALBE LOSS (dB)	EIRP (dBm)
1850.2	21.5	8.3	1.2	28.6
1880.0	22.1	8.3	1.2	29.2
1909.8	20.1	8.3	1.2	27.2

### Antenna 2 – External Antenna

FREQUENCY (MHZ)	SUBSTITUTION READING (dBm)	SUBSTITUTION ANTENNA GAIN	SUBSTITUTION CALBE LOSS (dB)	EIRP (dBm)
1850.2	22.1	8.3	1.2	29.2
1880.0	22.0	8.3	1.2	29.1
1909.8	21.9	8.3	1.2	29.0

Sample calculation:

Absolute level = substitution reading + antenna gain - cable loss

For example:

$$22.1 + 8.3 - 1.2 = 29.2$$

## §2.1046, & §24.232 – CONDUCTED OUTPUT POWER

### Applicable Standard

According to FCC §2.1046 and §24.232 (b), Mobile/Portable Station are limited to 2 Watts e.i.r.p. Peak Power.

### Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	HP8564E	3943A01781	2004-08-01
HP	Plotter	HP7470A	2541A49659	Not Required
A.H. Systems	Horn Antenna	SAS200	261	2004-05-31
ETS	Logperiodic Antenna	3148	0004-1155	2003-10-11
EMCO	Biconical Antenna	3110B	9603-2315	2003-10-11

\* **Statement of Traceability:** BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

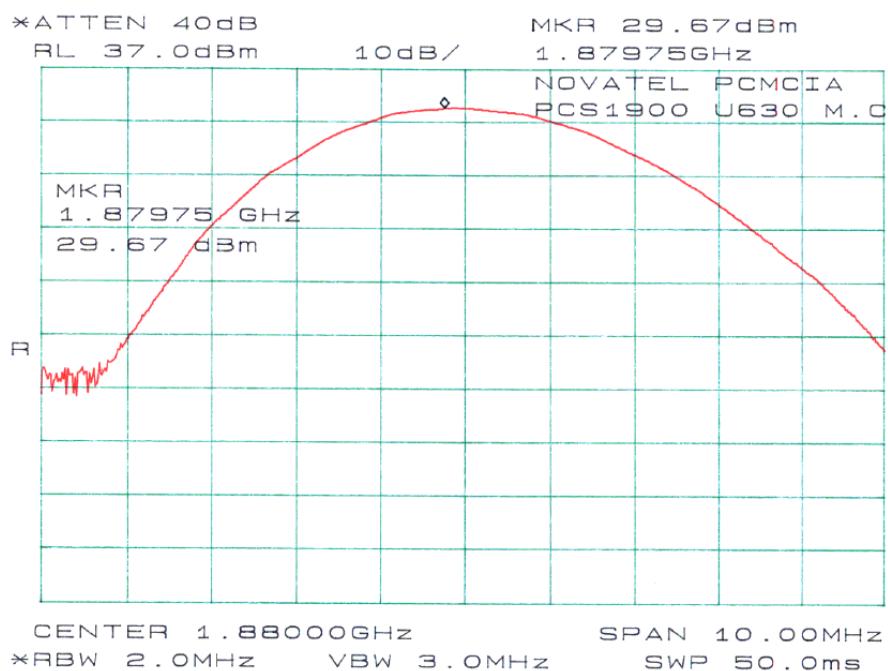
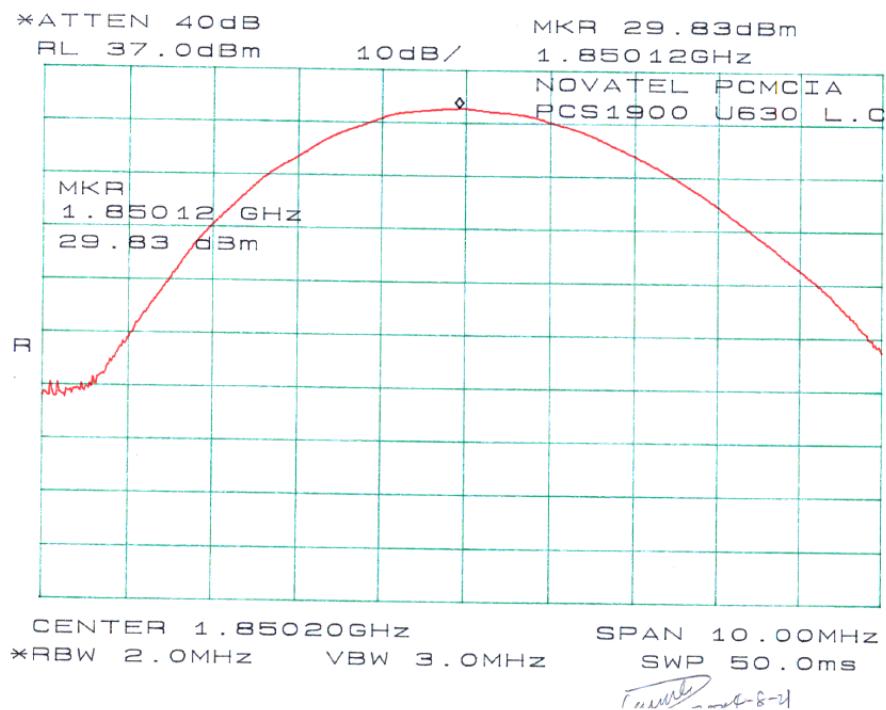
### Environmental Conditions

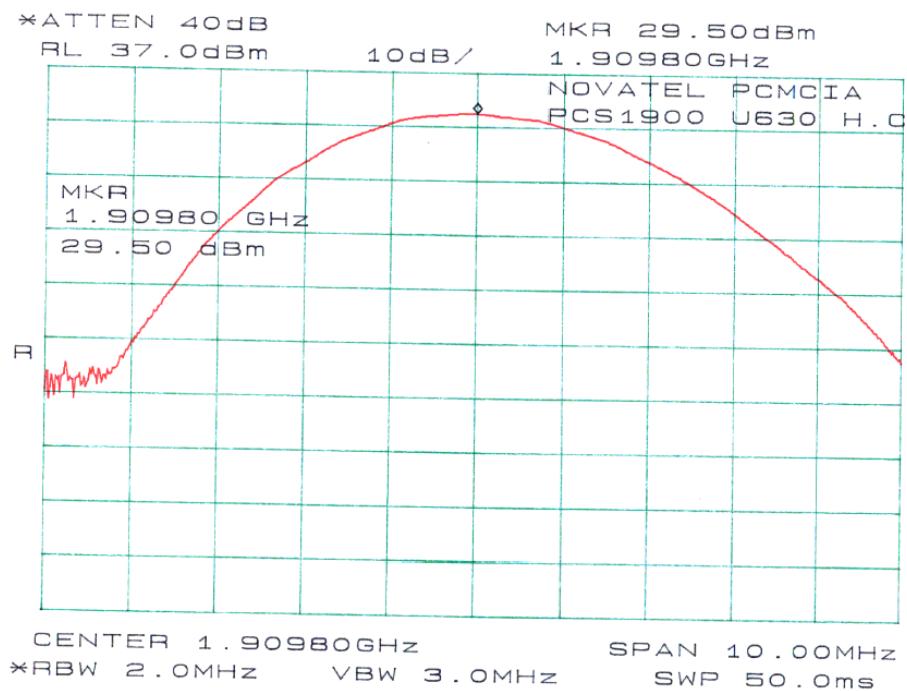
Temperature:	26° C
Relative Humidity:	35%
ATM Pressure:	1018 mbar

*The testing was performed by Daniel Deng on 2004-08-21*

### Test Results

Channel	Frequency (MHz)	Output Power in dBm	Output Power in W	Limit in W
LOW	1850.12	29.83	0.962	100
MIDDLE	1879.75	29.67	0.927	100
HIGH	1909.80	29.50	0.891	100





## **§2.1049, & §24.238 - OCCUPIED BANDWIDTH**

### **Applicable Standard**

Requirements: CFR 47, Section 2.1049, and Section 24.238.

### **Test Procedure**

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set at 30 KHz and the 26 dB bandwidth was recorded.

### **Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	HP8564E	3943A01781	2004-08-01
HP	Plotter	HP7470A	2541A49659	Not Required

\* **Statement of Traceability:** BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

### **Environmental Conditions**

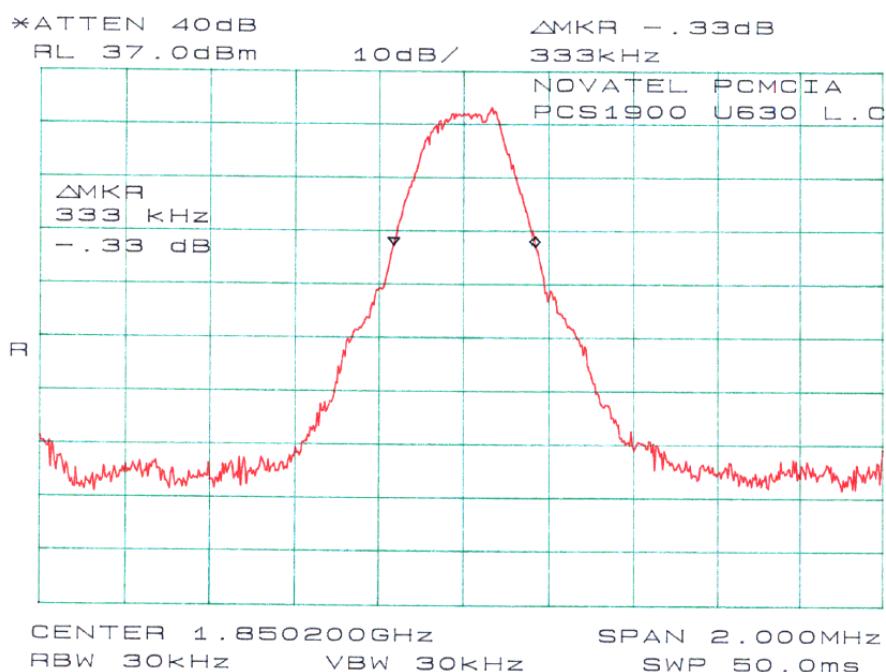
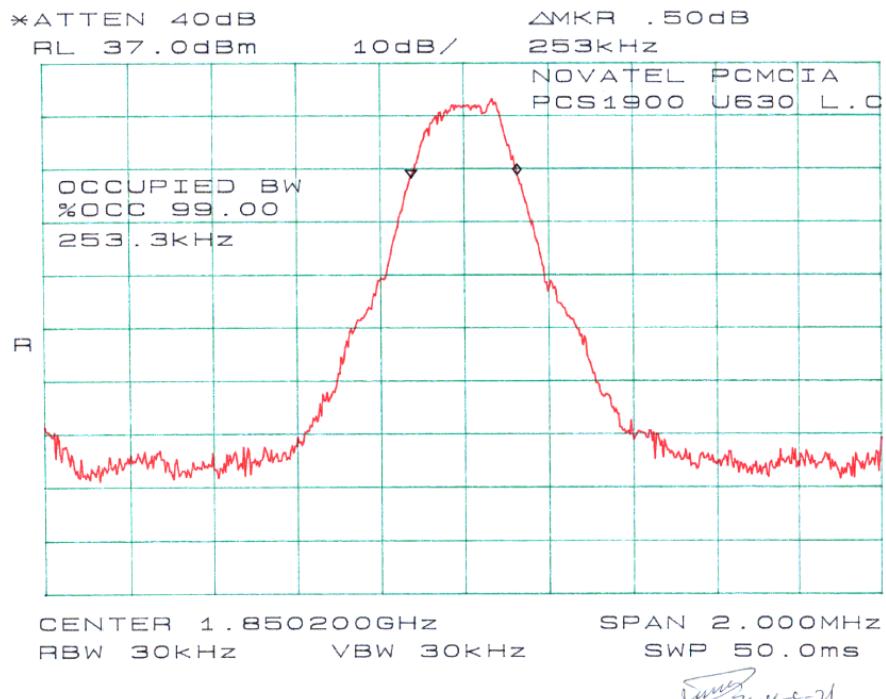
Temperature:	26° C
Relative Humidity:	35%
ATM Pressure:	1018 mbar

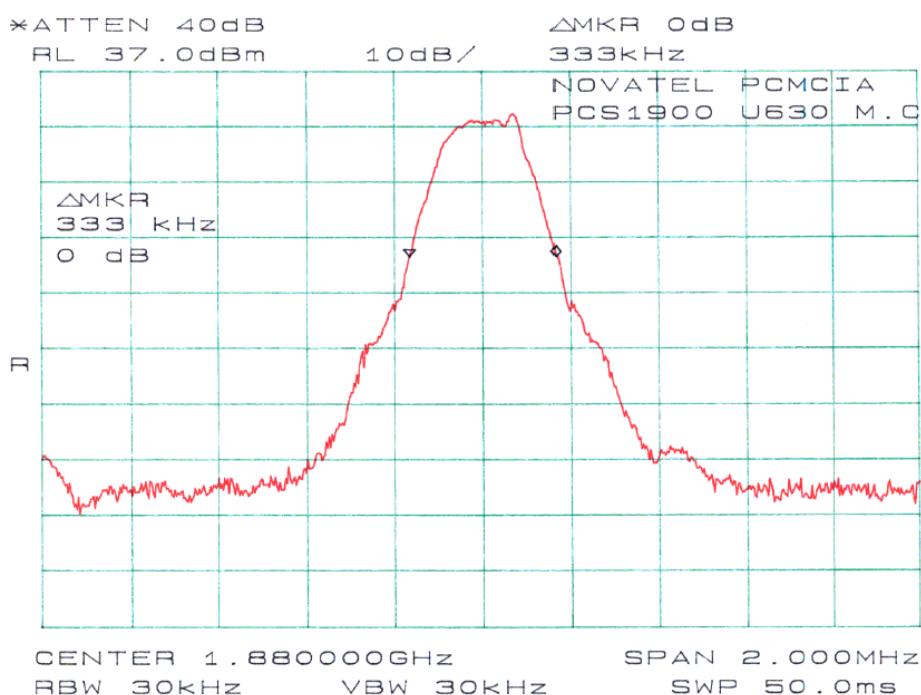
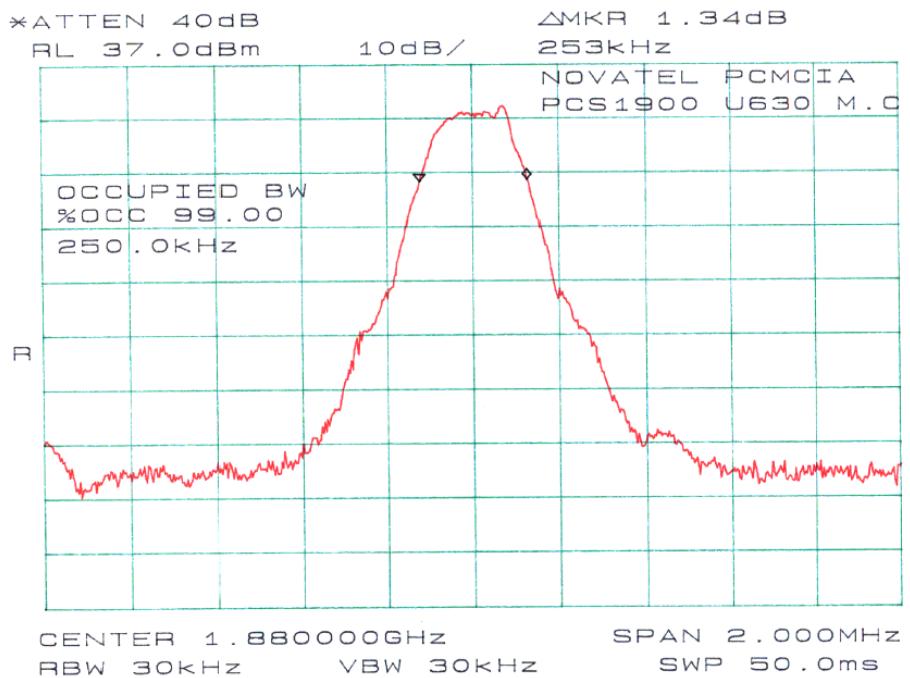
*The testing was performed by Daniel Deng on 2004-08-21*

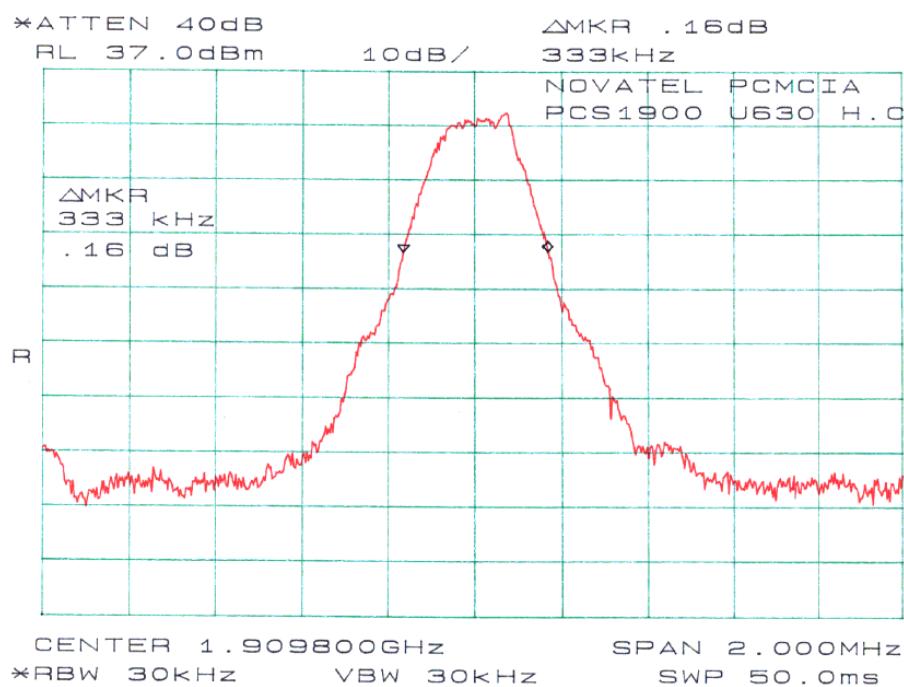
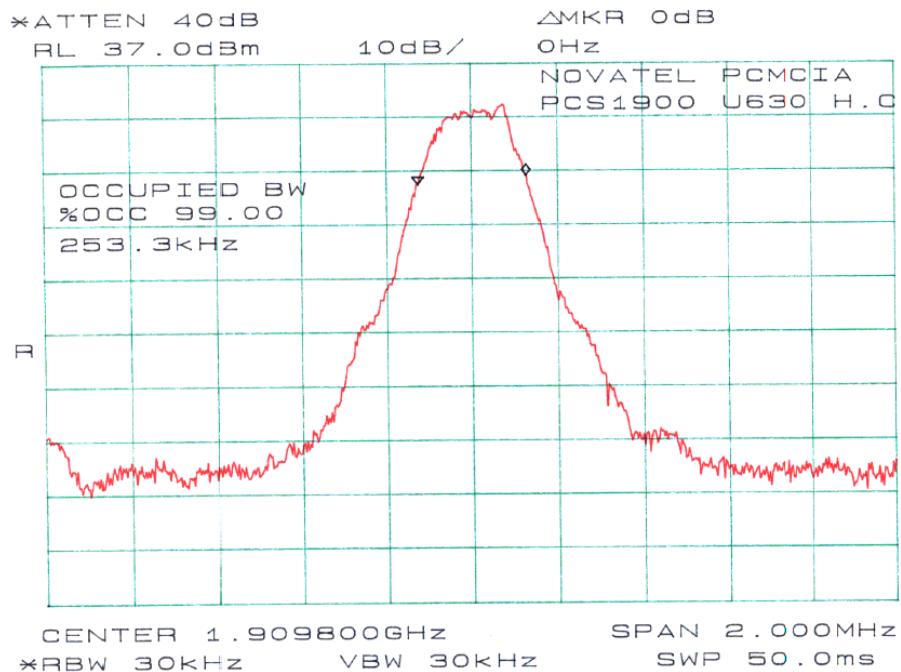
### **Test Results**

Channel	Frequency (Mhz)	Type	Measurement (KHz)	Result
Low	1850.20	Occupied Bandwidth	253	Compliant
		26dB Bandwidth	333	Compliant
Middle	1880.00	Occupied Bandwidth	253	Compliant
		26dB Bandwidth	333	Compliant
High	1907.60	Occupied Bandwidth	253	Compliant
		26dB Bandwidth	333	Compliant

Please refer to the hereinafter plots.







## §2.1051, & §24.238(a) - SPURIOUS EMISSIONS AT ANTENNA TERMINALS

### Applicable Standard

Requirements: CFR 47, § 2.1051 & §24.238(a).

The spectrum was to be investigated to the tenth harmonics of the highest fundamental frequency as specified in § 2.1057.

### Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10<sup>th</sup> harmonic.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	HP8564E	3943A01781	2004-08-01
HP	Plotter	HP7470A	2541A49659	Not Required

\* **Statement of Traceability:** BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

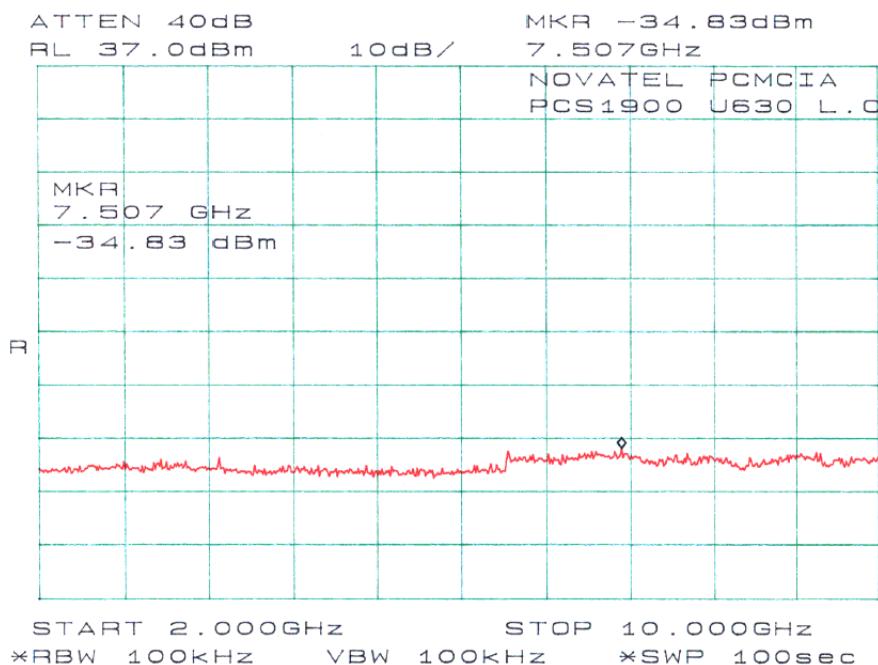
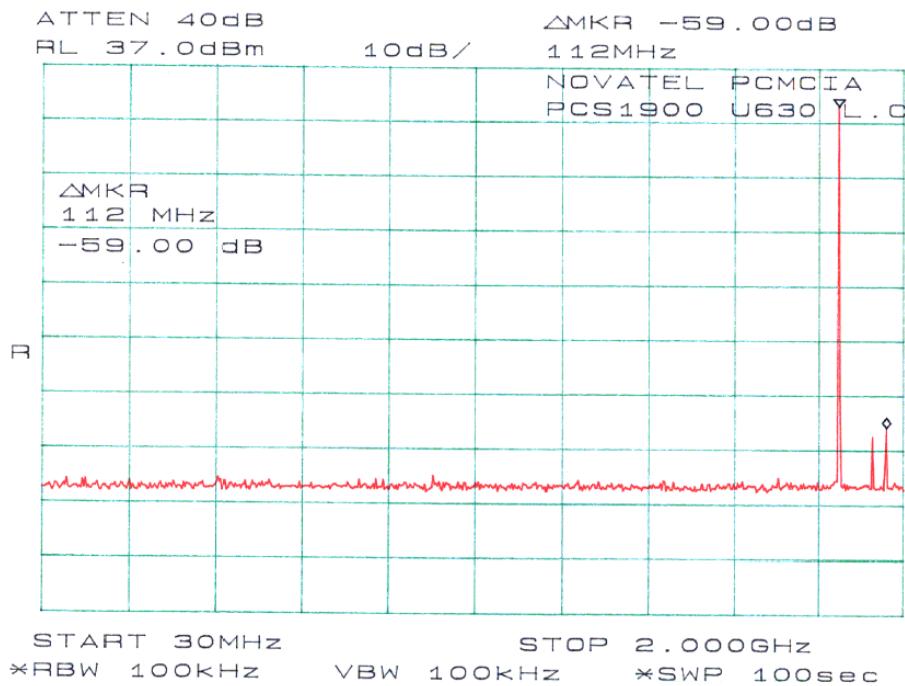
### Environmental Conditions

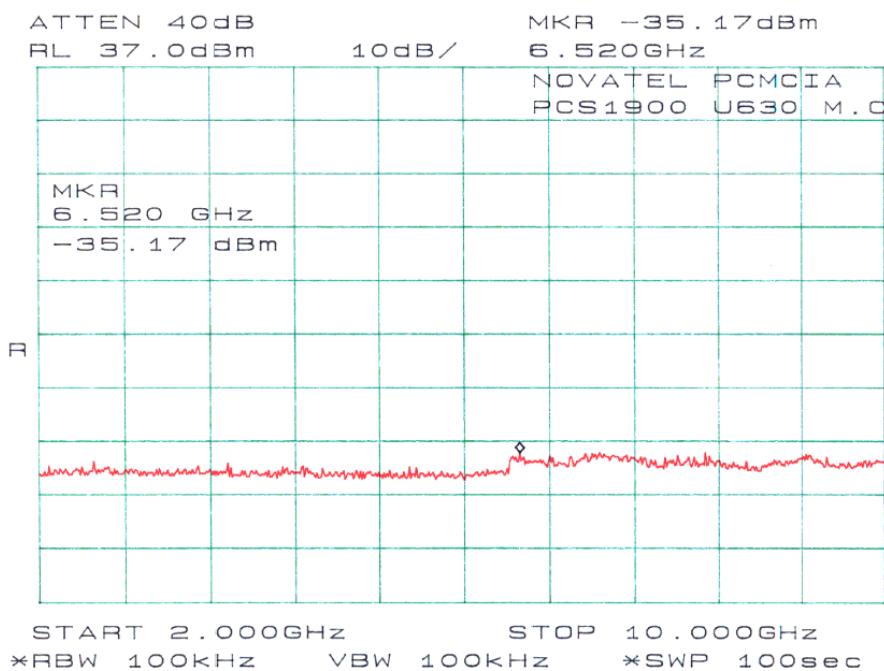
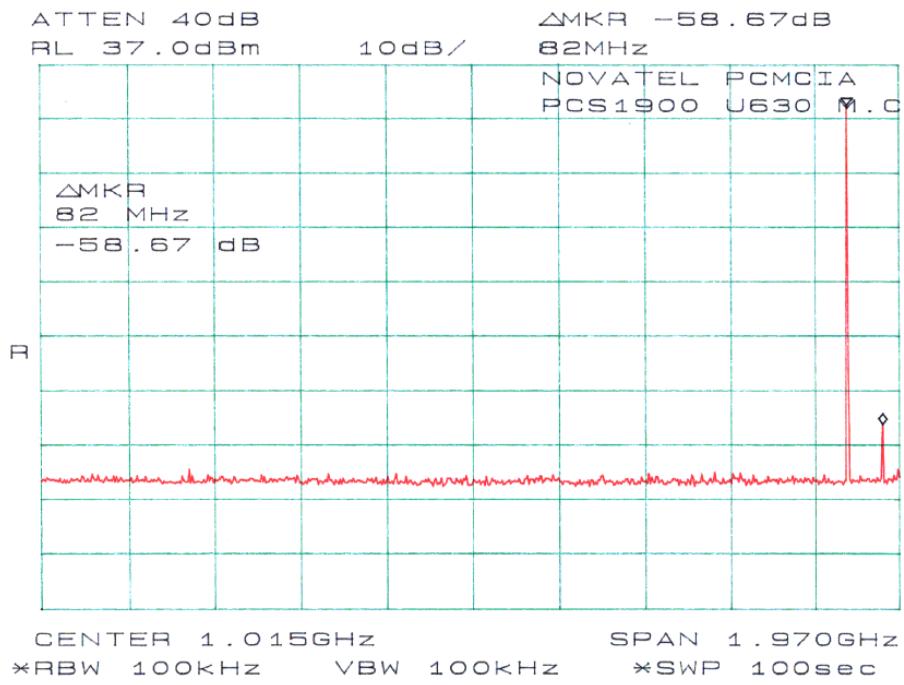
Temperature:	26° C
Relative Humidity:	35%
ATM Pressure:	1018 mbar

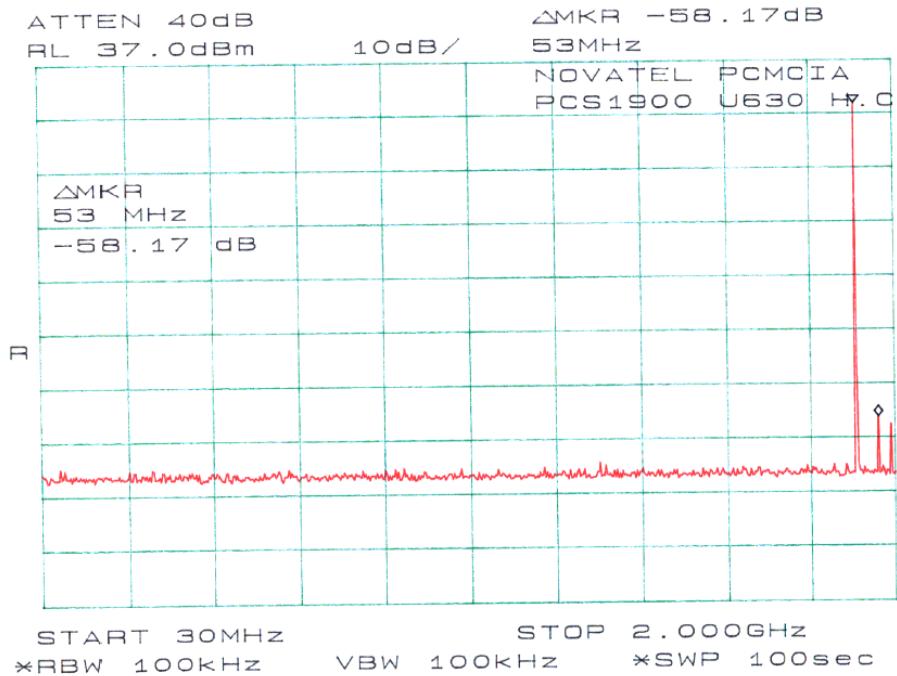
*The testing was performed by Daniel Deng on 2004-08-21*

### Test Results

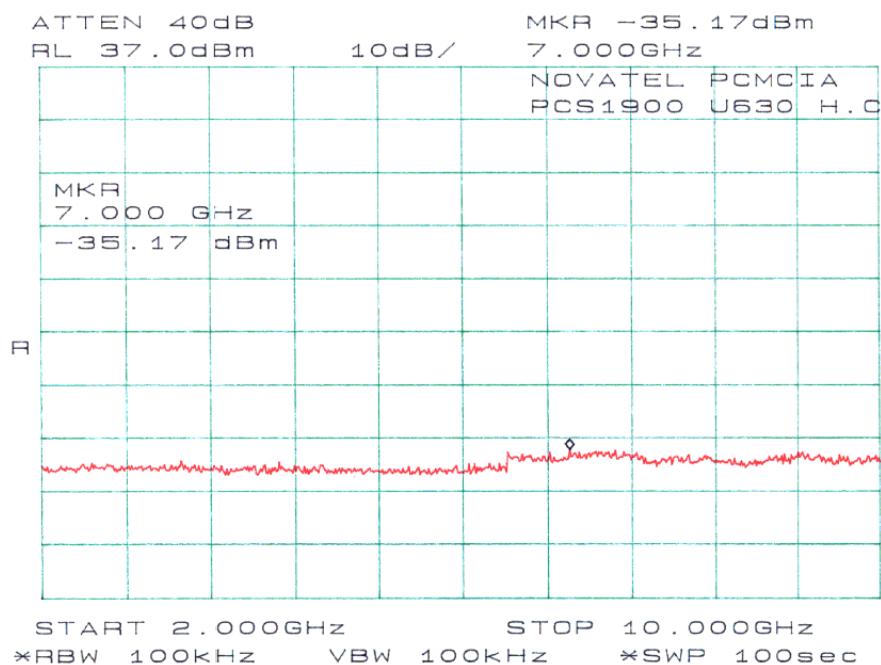
Please refer to the hereinafter plots.







*1 week 2004-8-21*



*1 week 2004-8-21*

## **§2.1055 (a), §2.1055 (d), & §24.235 - FREQUENCY STABILITY**

### **Applicable Standard**

Requirements: FCC § 2.1055 (a), § 2.1055 (d) & following:

According to §24.235, The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### **Test Procedure**

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to a frequency counter via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the counter.

Frequency Stability vs. Voltage: An external variable DC power supply was connected to the battery terminals of the equipment under test. The voltage was set to 115% of the nominal value and was then decreased until the transmitter light no longer illuminated; i.e., the battery end point. The output frequency was recorded for each battery voltage.

### **Test Equipment List and Details**

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	HP8564E	3943A01781	2004-08-01
HP	Plotter	HP7470A	2541A49659	Not Required
HP	Temperature Oven	7475A	2541A49659	N/R

\* **Statement of Traceability:** BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

### **Environmental Conditions**

Temperature:	26° C
Relative Humidity:	35%
ATM Pressure:	1018 mbar

*The testing was performed by Daniel Deng on 2004-08-21*

## Test Results

### *Frequency Stability Versus Temperature*

Reference Frequency: 1880 MHz, Limit: 2.5ppm			
Environment Temperature (°C)	Power Supplied (Vdc)	Frequency Measure with Time Elapsed	
		MHz	PPM Error
50	120	1879.999968	-0.017
40	120	1879.999972	-0.015
30	120	1880.000018	0.01
20	120	1879.999981	-0.01
10	120	1880.000013	0.007
0	120	1880.000033	0.018
-10	120	1880.000054	0.029
-20	120	1880.000101	0.054
-30	120	1879.999937	-0.034

### *Frequency Stability Versus Battery Voltage*

Reference Frequency: 1880MHz, Limit: 2.5ppm			
Power Supplied (Vdc)	Environment Temperature(°C)	MHz	ppm
102	20	1879.999974	-0.014
138	20	1879.999968	-0.017

## §24.238 – BAND EDGE

### Applicable Standard

According to §24.238, the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

### Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

The center of the spectrum analyzer was set to block edge frequency, RBW set to 30KHz.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
HP	Spectrum Analyzer	HP8564E	3943A01781	2004-08-01
HP	Plotter	HP7470A	2541A49659	Not Required

\* **Statement of Traceability:** BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

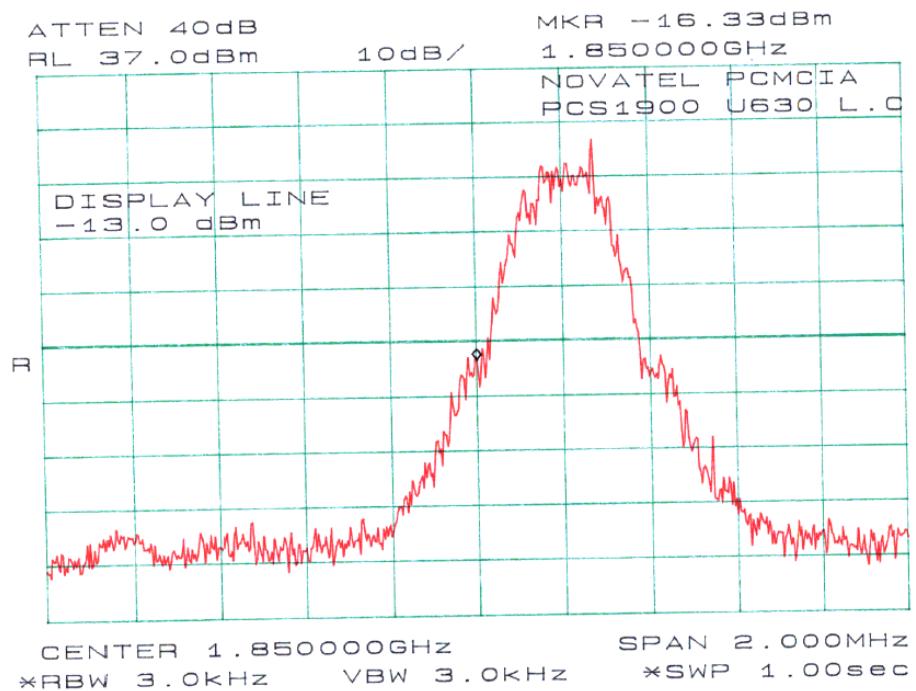
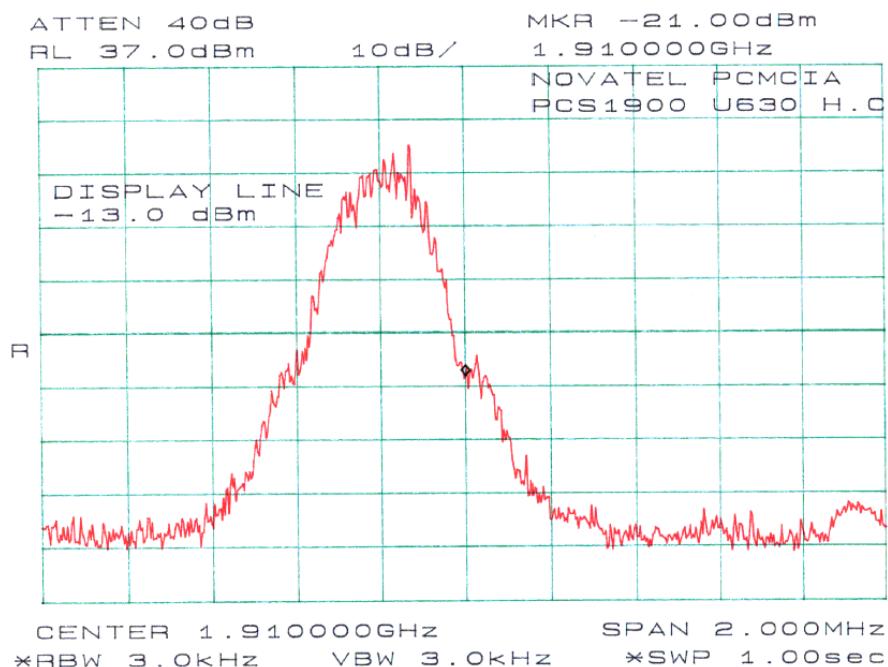
### Environmental Conditions

Temperature:	26° C
Relative Humidity:	35%
ATM Pressure:	1018 mbar

*The testing was performed by Daniel Deng on 2004-08-21*

### Test Results

Please refer to the following plots.

*Levitt 2004-8-21**Levitt 2004-8-21*