

Exhibit 6A

Test Report2

Part 15

The NextNet Wireless 2.4 GHz Customer Premise Equipment (CPE) (model OSU-2400-AV) has been tested for compliance to the FCC rules contained in 47CFR part 15.247 as of 20 August 2004.

FCC Rule Part	Description	Response
15.31(m)	Number of measurement frequencies	3 (low, middle, high)
15.215(c)	Stability Requirements	Pass See pages 36-39
15.247	Operation within the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz.	2401-2479 MHz
15.247(a)(2)	Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.	Pass See pages 4-8
15.247(b)(3)	The maximum peak output power of the intentional radiator shall not exceed the following: For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.	Pass See pages 9-13
15.247(b)(4)(i)	Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi. Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.	Pass See page 9
15.247(b)(4)(iii)	Fixed, point-to-point operation, as used in paragraphs (b)(3)(i) and (b)(3)(ii) of this section, excludes the use of point-to-multipoint systems, omnidirectional applications, and multiple co-located intentional radiators transmitting the same information. The operator of the spread spectrum intentional radiator or, if the equipment is professionally installed, the installer is responsible for ensuring that the system is used exclusively for fixed, point-to-point operations. The instruction manual furnished with the intentional radiator shall	Pass See "Exhibit 11 RF Exposure"

	contain language in the installation instructions informing the operator and the installer of this responsibility.	
15.247(b)(5)	Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See §1.1307(b)(1) of this chapter.	Pass See "Exhibit 11 RF Exposure Information".
15.247(c) RF Conducted	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required.	Pass See pages 14-30
15.247(c) Radiated Emissions	In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).	Pass See pages 40-64
15.247(d)	For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.	Pass See pages 31-35
15.247(e)	[Reserved]	Not Applicable
15.247(f)hybrid systems.....	Not Applicable
15.247(g)	Frequency hopping spread spectrum systems.....	Not Applicable
15.247(h)	The incorporation of intelligence within a frequency hopping spread spectrum system.....	Not Applicable

6dB Bandwidth

Rule Part Number: 15.247(a)(2)

The minimum 6 dB bandwidth shall be at least 500 kHz.

Test Procedure: The RF output is applied to a spectrum analyzer through a self calibrated coax and attenuator(s). The spectrum analyzer is adjusted as follows:

Fo = desired channel frequency

RF span = 7 MHz

Resolution bandwidth = 100 kHz

Video bandwidth = 300 kHz.

Sweep time = auto

Detector = peak

The 6 dB bandwidth is read directly from the spectrum analyzer display from the “x dB bandwidth” value where x has been set to 6 in the spectrum analyzer measurement setup.

The attenuation of the attenuators and coax has been measured and is included in the spectrum analyzer offset level. Measurements are performed for each of the modulation formats available, 4-QAM, 16-QAM, and 64-QAM. The Tx -6dB BW is measured at the RF connector on the PCB.

Test Conditions: Frequency = 2404, 2440, 2476 MHz

Temperature = 25 °C

Supply Voltage = 120 Vac / 60 Hz (19.5 VDC to OSU-2400-AV)

Test Results:

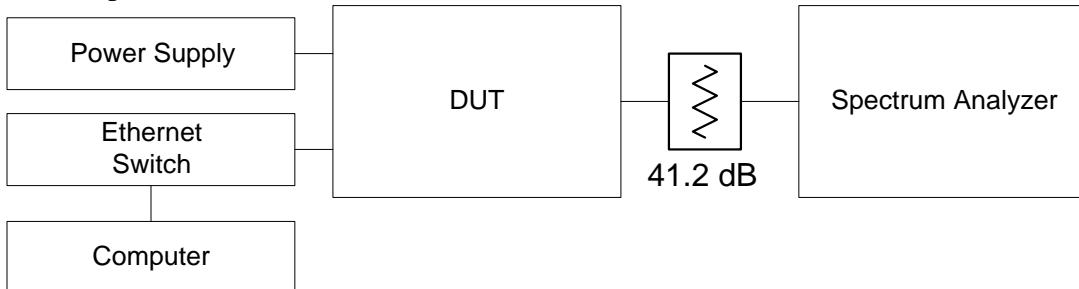
Freq (MHz)	-6dB BW (MHz)		
	4-QAM	16-QAM	64-QAM
2404	5.543	5.544	5.559
2440	5.559	5.529	5.539
2476	5.558	5.523	5.529

6dB Bandwidth

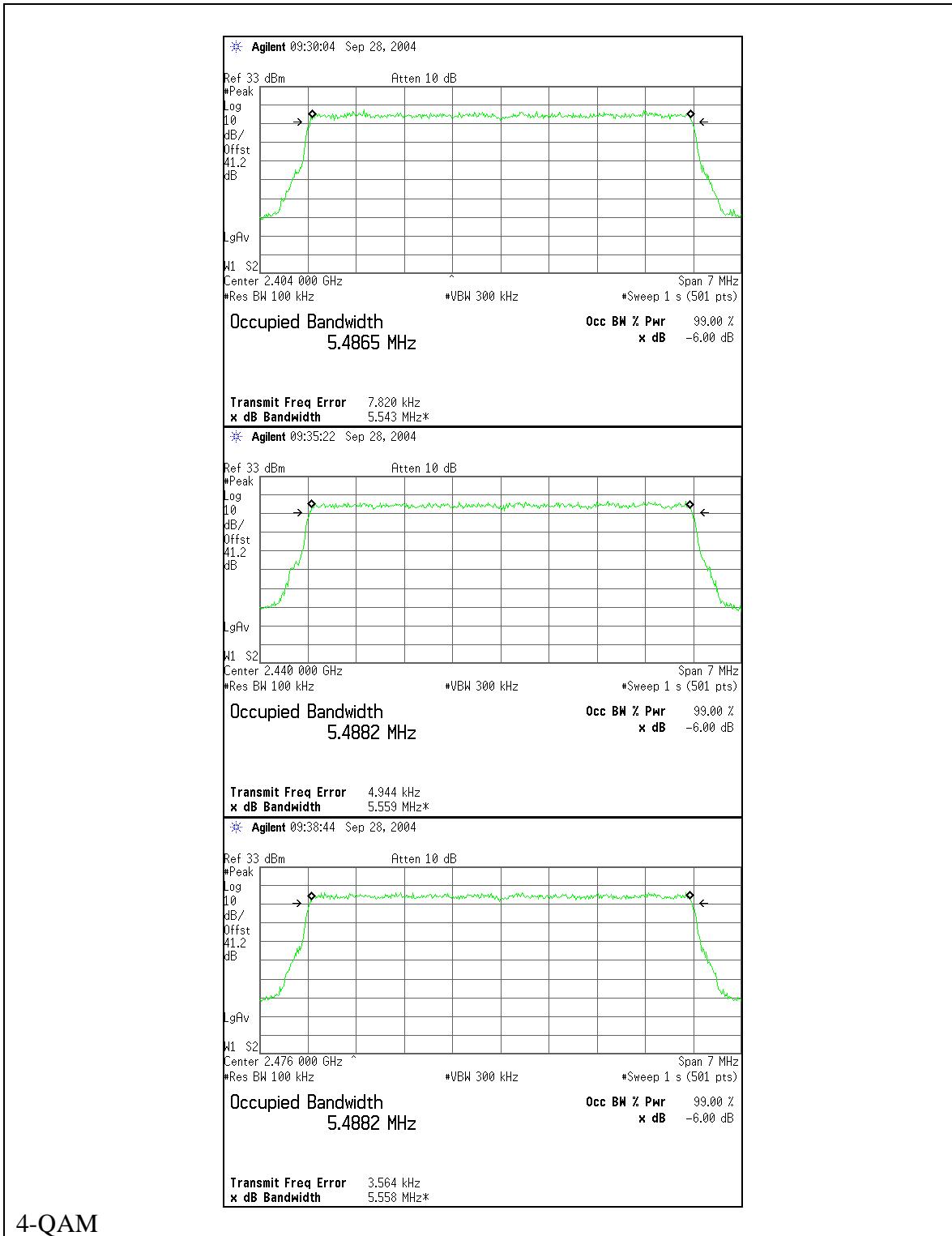
Test Equipment:

DUT	NextNet Wireless CPE (OSU-2400-AV) # 2008693
Spectrum Analyzer	Agilent E4440A S/N: MY44022791 Calibrated on: 05/30/2004 Cal due: 05/30/2006
Attenuator 2 x 20 dB	Pasternak Corporation Model: PE7005-20 (20 dB) Calibrated by user
Computer	Dell Inspiron 5000 Model: PPM S/N: 000832RM-12961-04R-0441
Ethernet Switch	D-Link Model: DSS-5+ 5 port 10/100Mbps S/N: B205335003175
Power Supply	Globetek Model: GT-21097-5024-4.5 19.5 Vdc / 2.56 A Limited Power Source S/N: 008988 23/04

Test Set-Up:

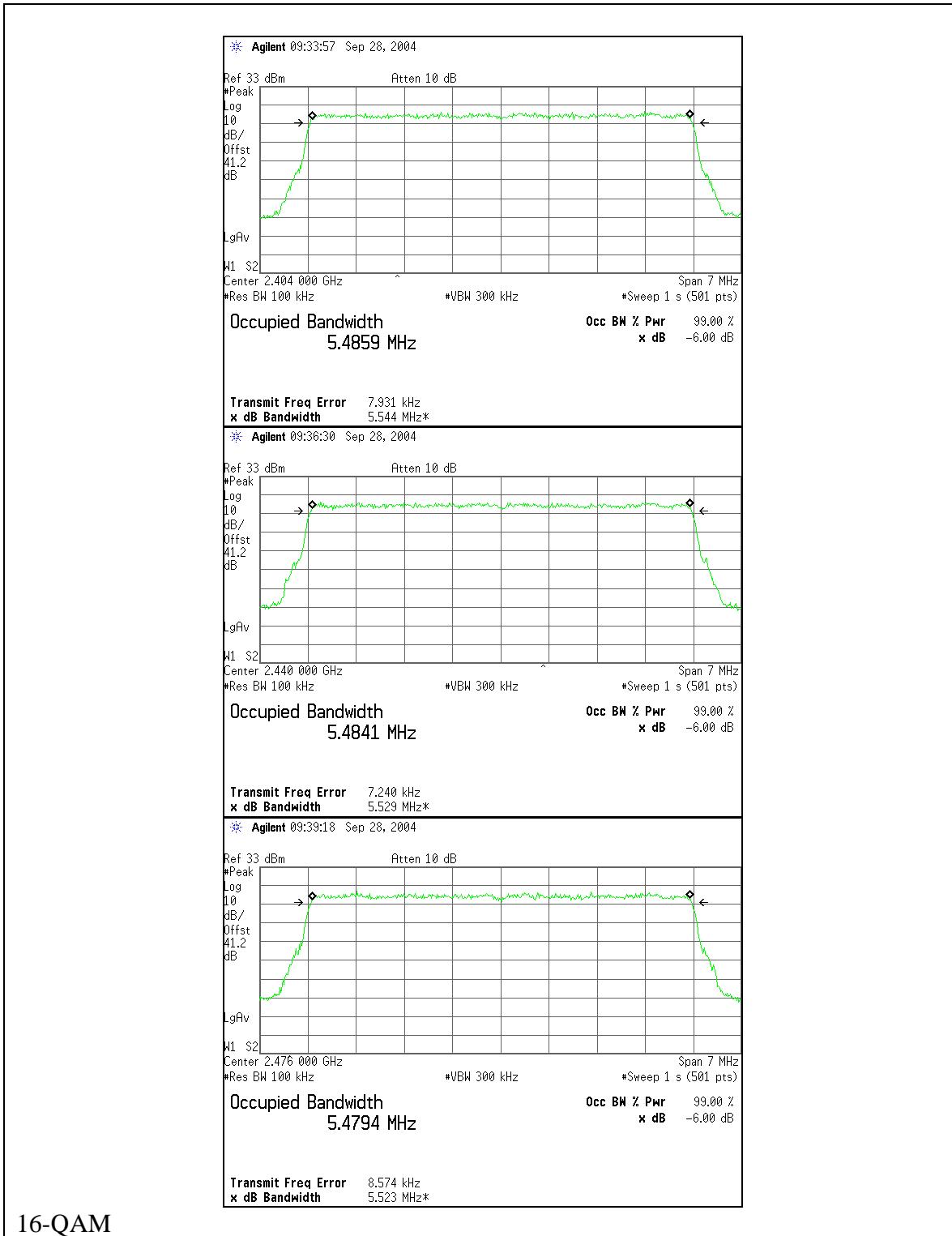


6dB Bandwidth



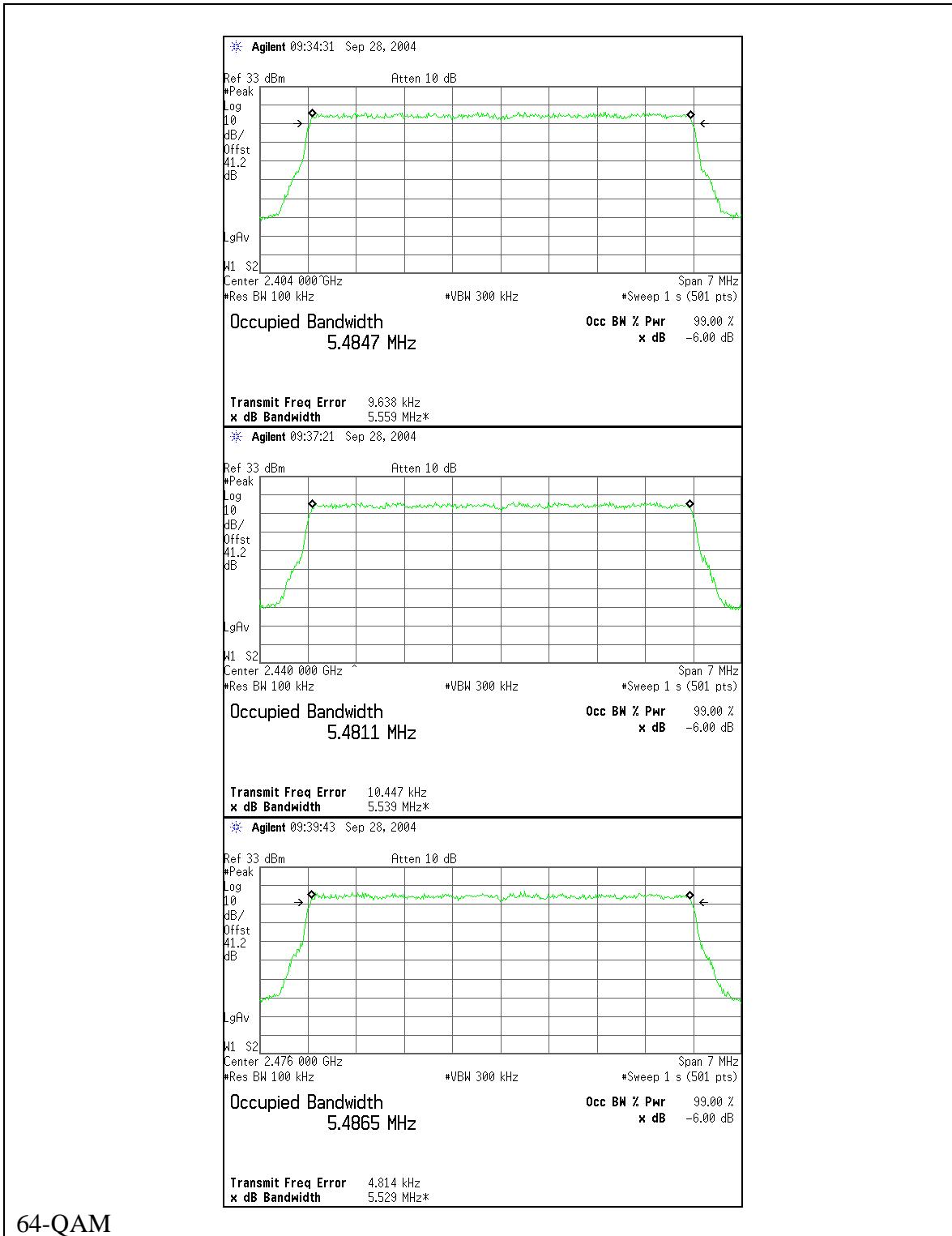
4-QAM

6dB Bandwidth



16-QAM

6dB Bandwidth



64-QAM

Maximum Peak Power Output

Rule Part Number: 15.247(b)(3), 15.247(b)(4)(i)
1 Watt, power reduced to 0.52 watts for 14.5 dBi antenna
(14.5 dBi – 6 dBi = 8.5 dBi above 6 dBi)
Max power = 30 dBm – (8.5/3) = 30 – 2.84
Max power = 27.16 dBm = 0.52 Watts

Test Procedure: The RF output is applied to a spectrum analyzer through a self calibrated coax and attenuator(s). The maximum power output is measured per “Guidance on Measurements for Digital Transmission Systems Section 15.247” option 2 found on the FCC web site. The spectrum analyzer is adjusted as follows:
Fo = desired channel frequency
RF span = 0 MHz
Resolution bandwidth = 8 MHz
Video bandwidth = 50 MHz.
Sweep time = 165 usec
Detector = sample
Trigger = Video
Trace average = 100
Peak power is defined as the peak of the resulting waveform

The attenuation of the attenuators and coax has been measured and is included in the spectrum analyzer offset level. Measurements are performed for each of the modulation formats available, 4-QAM, 16-QAM, and 64-QAM. The Tx power is measured at the RF connector on the PCB.

Test Conditions: Frequency = 2404, 2440, 2476 MHz
Temperature = 25 °C
Supply Voltage = 120 Vac / 60 Hz (19.5 VDC to OSU-2400-AV)

Test Results:

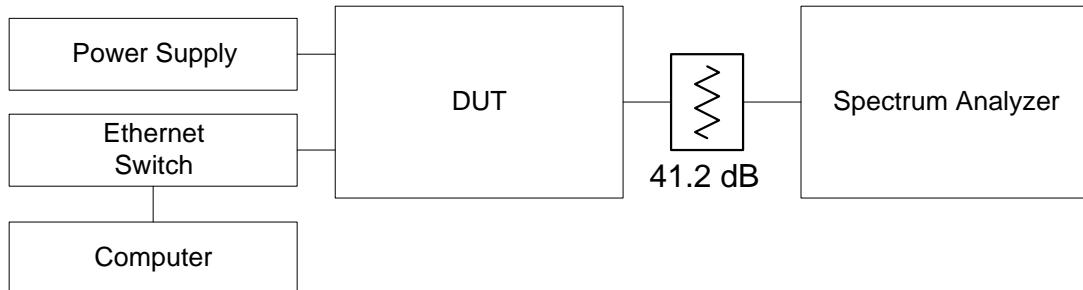
Maximum Peak Power (dBm)			
Freq (MHz)	4-QAM	16-QAM	64-QAM
2404	26.891	26.664	26.942
2440	26.486	26.930	26.912
2476	26.709	26.873	26.765

Maximum Peak Power Output

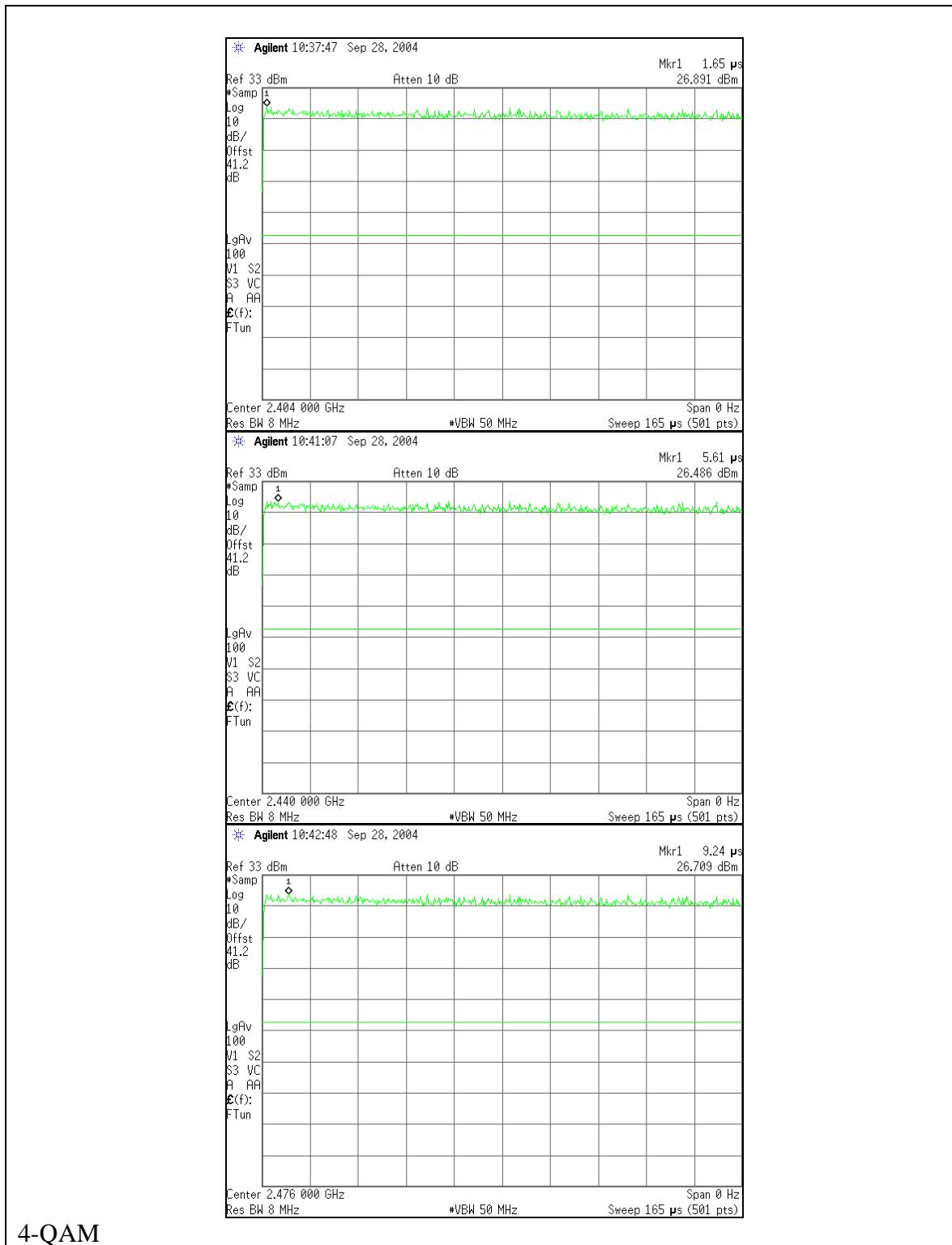
Test Equipment:

DUT	NextNet Wireless CPE (OSU-2400-AV) # 2008693
Spectrum Analyzer	Agilent E4440A S/N: MY44022791 Calibrated on: 05/30/2004 Cal due: 05/30/2006
Attenuator(s) 2 x 20 dB	Paternak Corporation Model: PE7005-20 (20 dB) Calibrated by user
Computer	Dell Inspiron 5000 Model: PPM S/N: 000832RM-12961-04R-0441
Ethernet Switch	D-Link Model: DSS-5+ 5 port 10/100Mbps S/N: B205335003175
Power Supply	Globetek Model: GT-21097-5024-4.5 19.5 Vdc / 2.56 A Limited Power Source S/N: 008988 23/04

Test Set-Up:

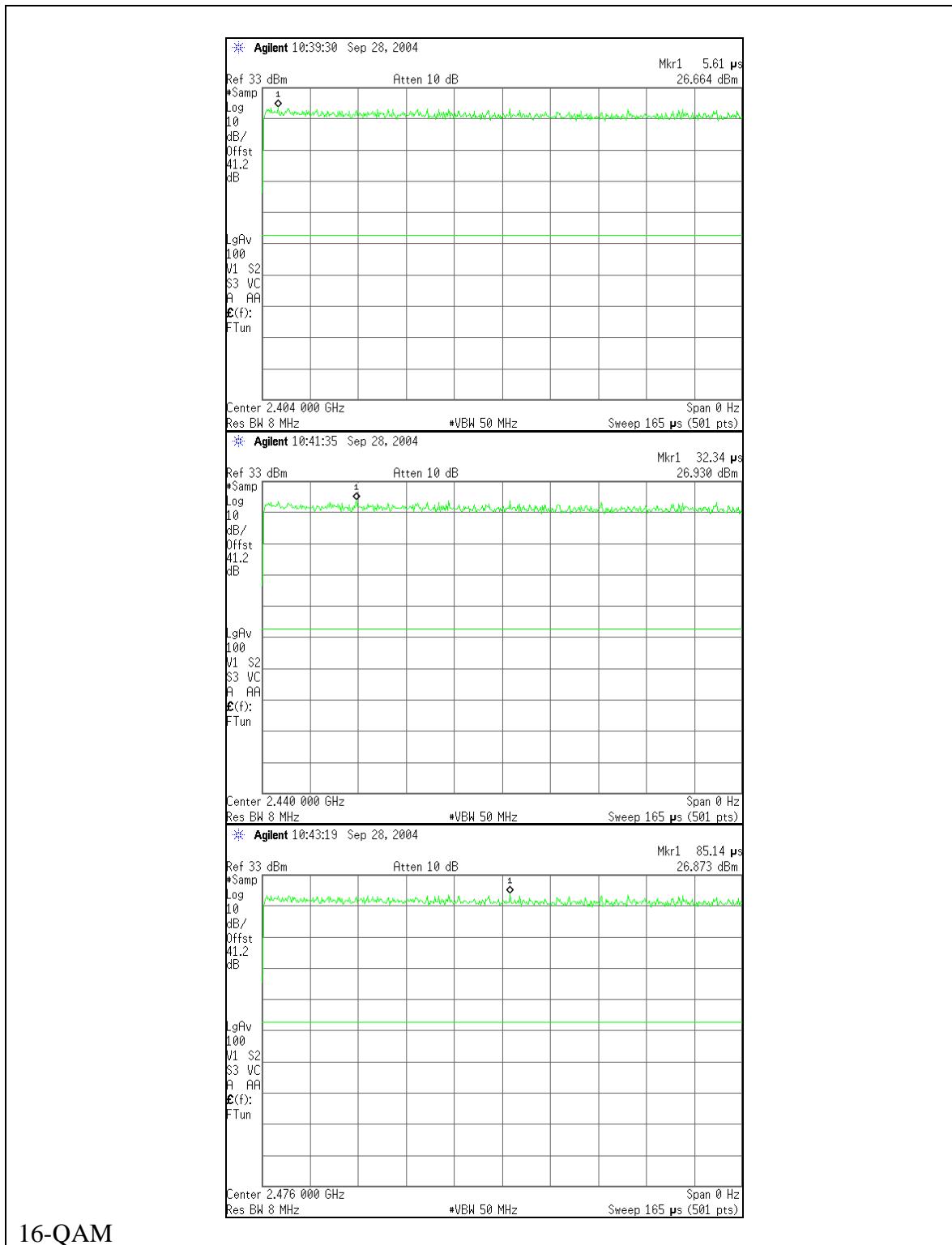


Maximum Peak Power Output



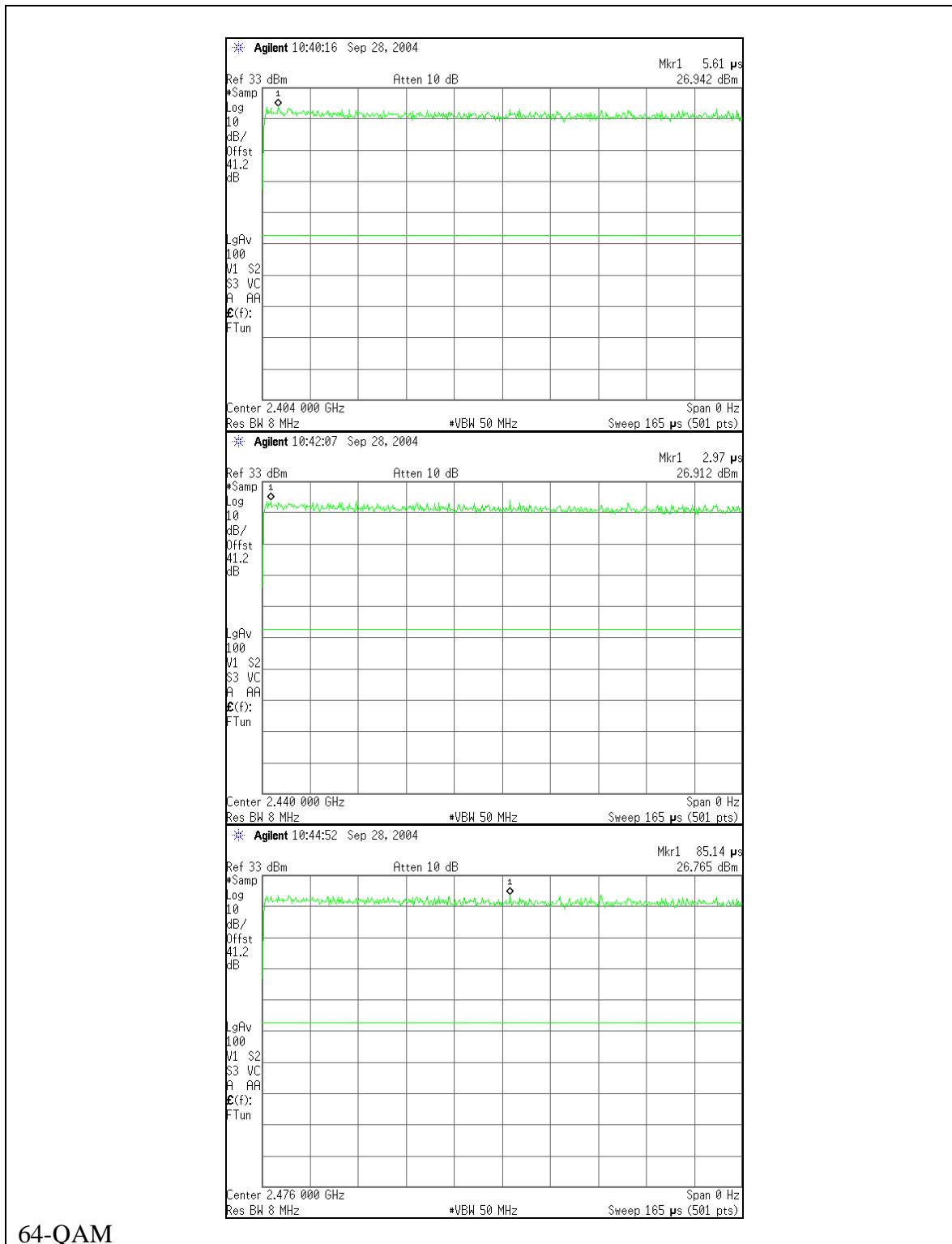
4-QAM

Maximum Peak Power Output



16-QAM

Maximum Peak Power Output



64-QAM

Spurious emissions at antenna terminals

Rule Part Number: 15.247(c)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Procedure: The RF output is applied to a spectrum analyzer through a self calibrated coax and attenuator(s). The spurious emissions at the antenna terminal are measured as per the guidelines found in "Guidance on Measurements for Digital Transmission Systems Section 15.247" found on the FCC web site. The spectrum analyzer is adjusted as follows:
Fo = desired channel frequency
RF span = varies MHz
Resolution bandwidth = 100 kHz
Video bandwidth = 300 kHz.
Sweep time = varies
Detector = peak below 1 GHz / average above 1 GHz
Trigger = Free run (100% TX duty cycle)
The attenuation of the attenuators and coax has been measured and is included in the spectrum analyzer offset level. Measurements are performed with 4-QAM modulation for each of the three test frequencies and test voltages. The Tx spurious is measured at the RF connector on the low pass filter board.

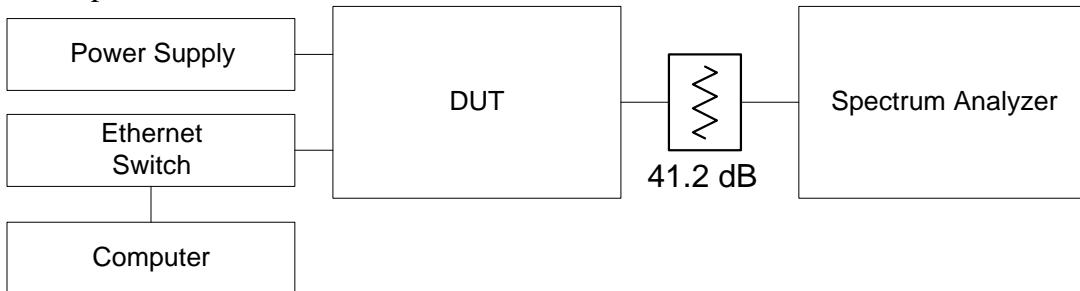
Test Conditions: Frequency = 2404, 2440, 2476 MHz
Temperature = 25 °C
Supply Voltage = 120 Vac / 60 Hz (19.5 VDC to OSU-2400-AV)

Spurious emissions at antenna terminals

Test Equipment:

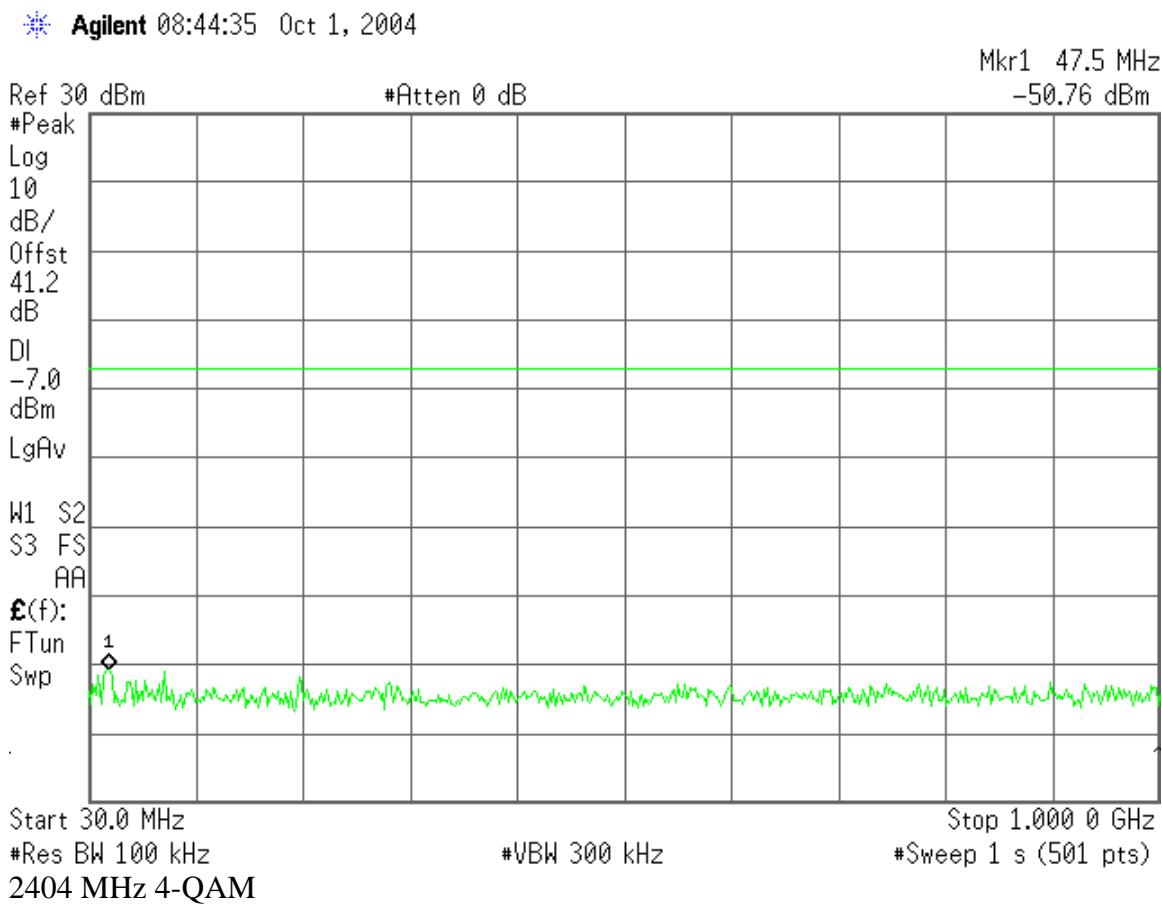
DUT	NextNet Wireless CPE (OSU-2400-AV) # 2008693
Spectrum Analyzer	Agilent E4440A S/N: MY44022791 Calibrated on: 05/30/2004 Cal due: 05/30/2006
Attenuator(s) 2 x 20 dB	Paternak Corporation Model: PE7005-20 (20 dB) Calibrated by user
Computer	Dell Inspiron 5000 Model: PPM S/N: 000832RM-12961-04R-0441
Ethernet Switch	D-Link Model: DSS-5+ 5 port 10/100Mbps S/N: B205335003175
Power Supply	Globetek Model: GT-21097-5024-4.5 19.5 Vdc / 2.56 A Limited Power Source S/N: 008988 23/04

Test Setup



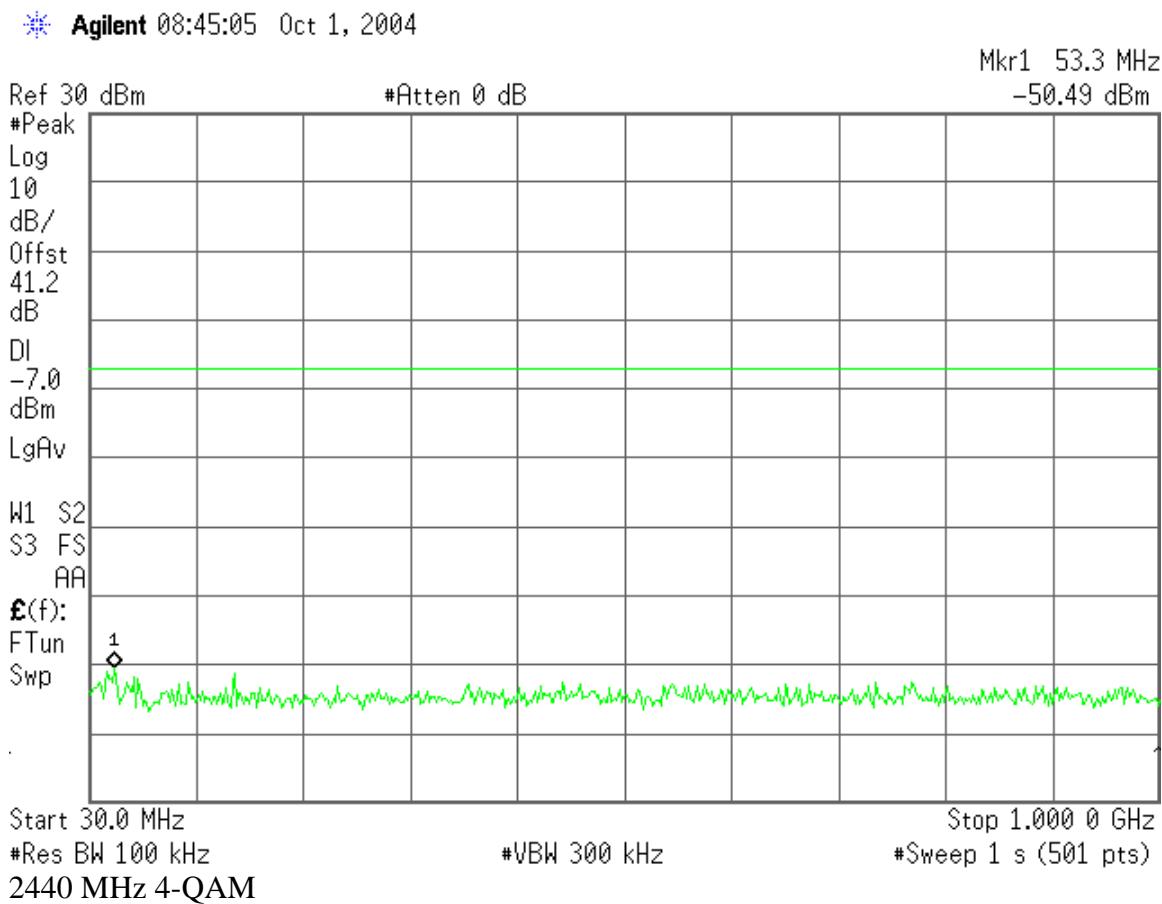
Spurious emissions at antenna terminals

30 MHz – 1 GHz



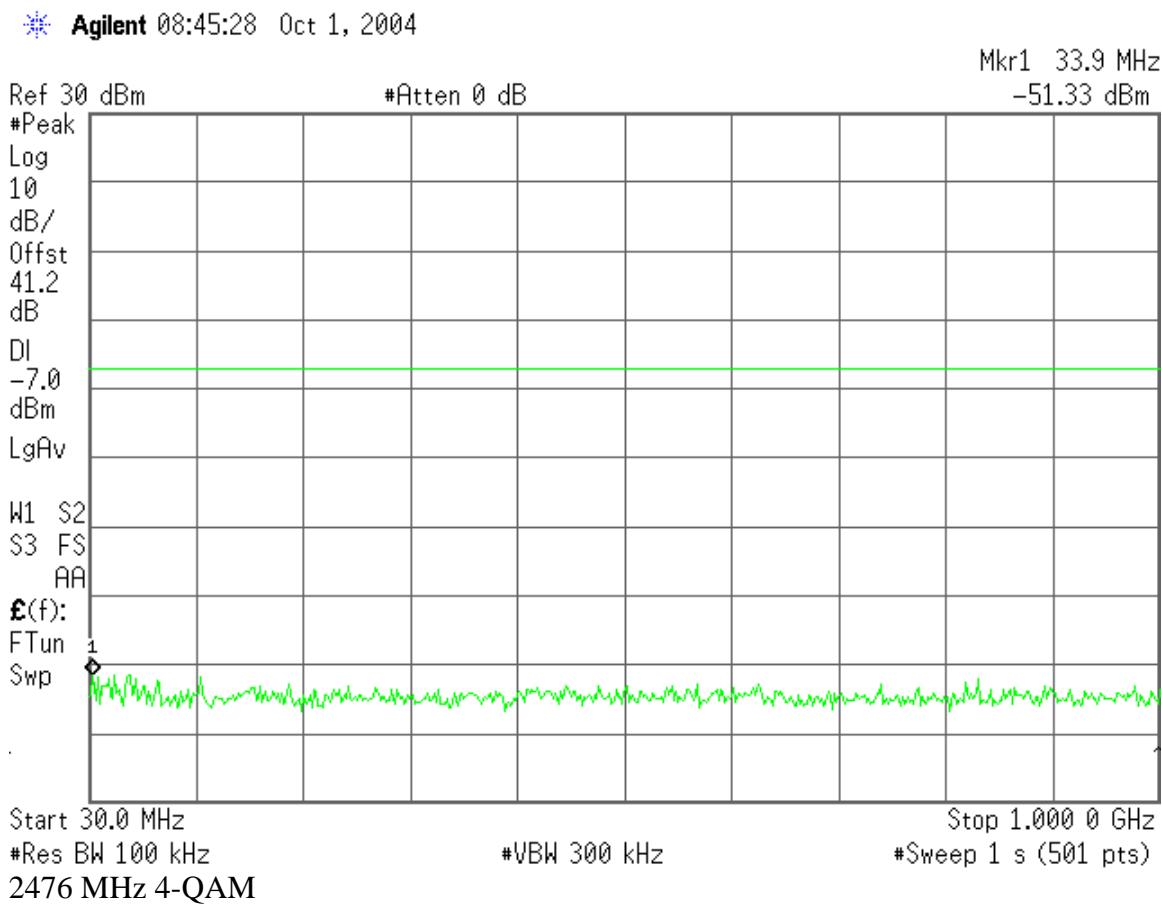
Spurious emissions at antenna terminals

30 MHz – 1 GHz



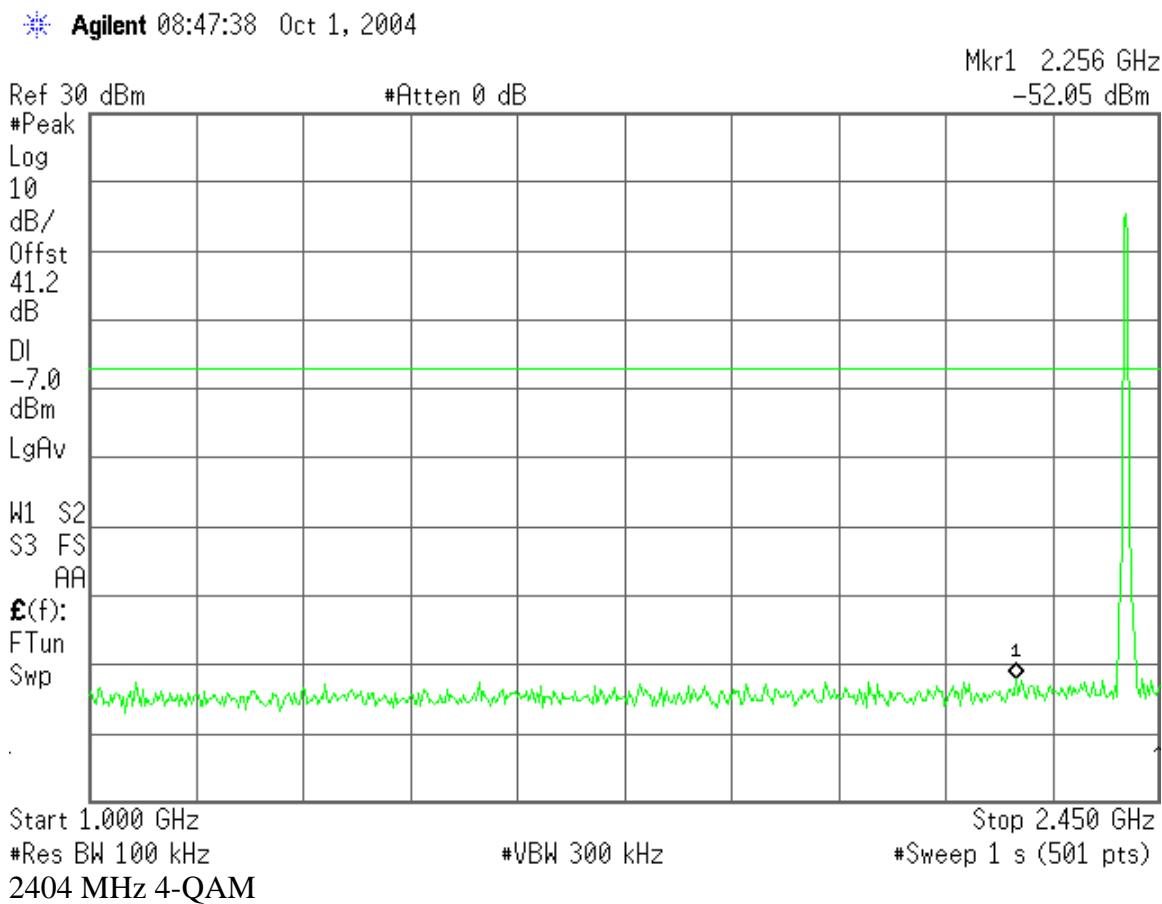
Spurious emissions at antenna terminals

30 MHz – 1 GHz



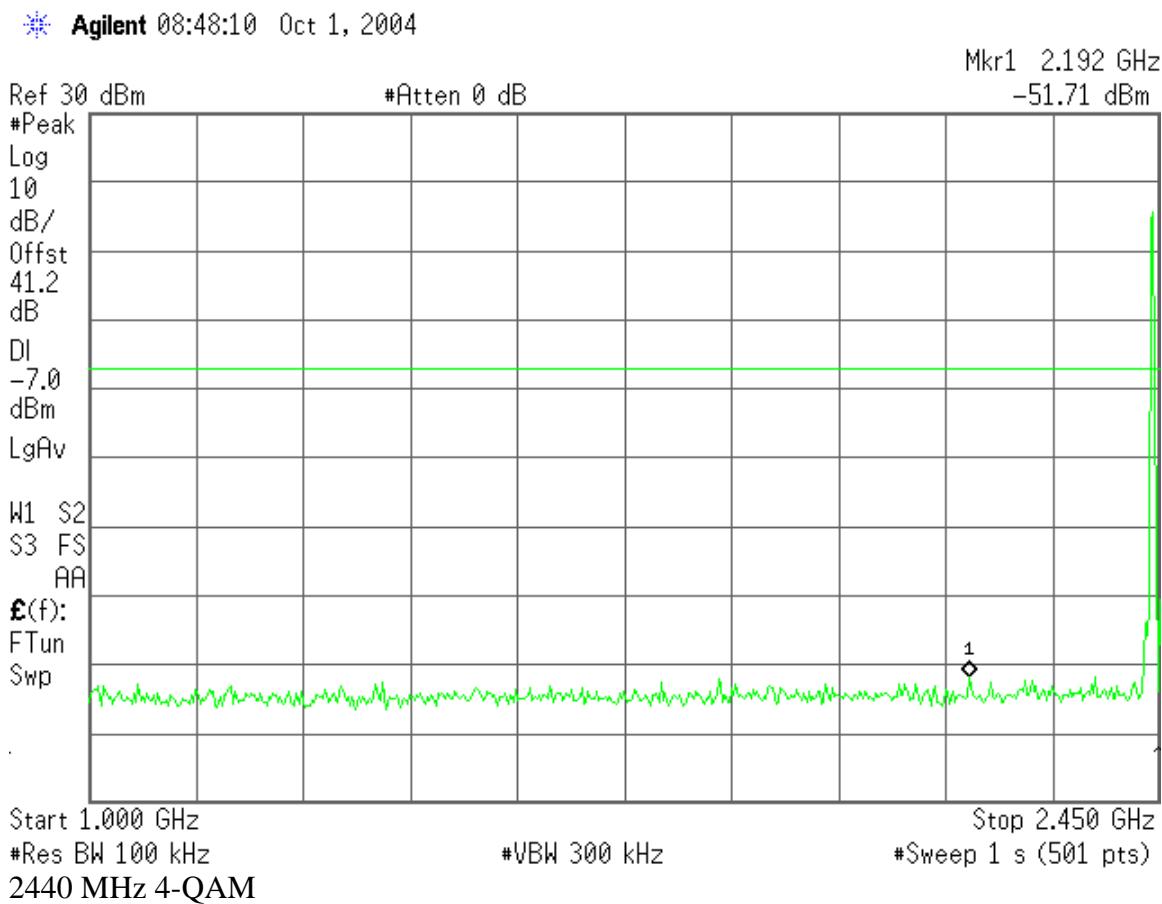
Spurious emissions at antenna terminals

1 GHz – 2.450 GHz



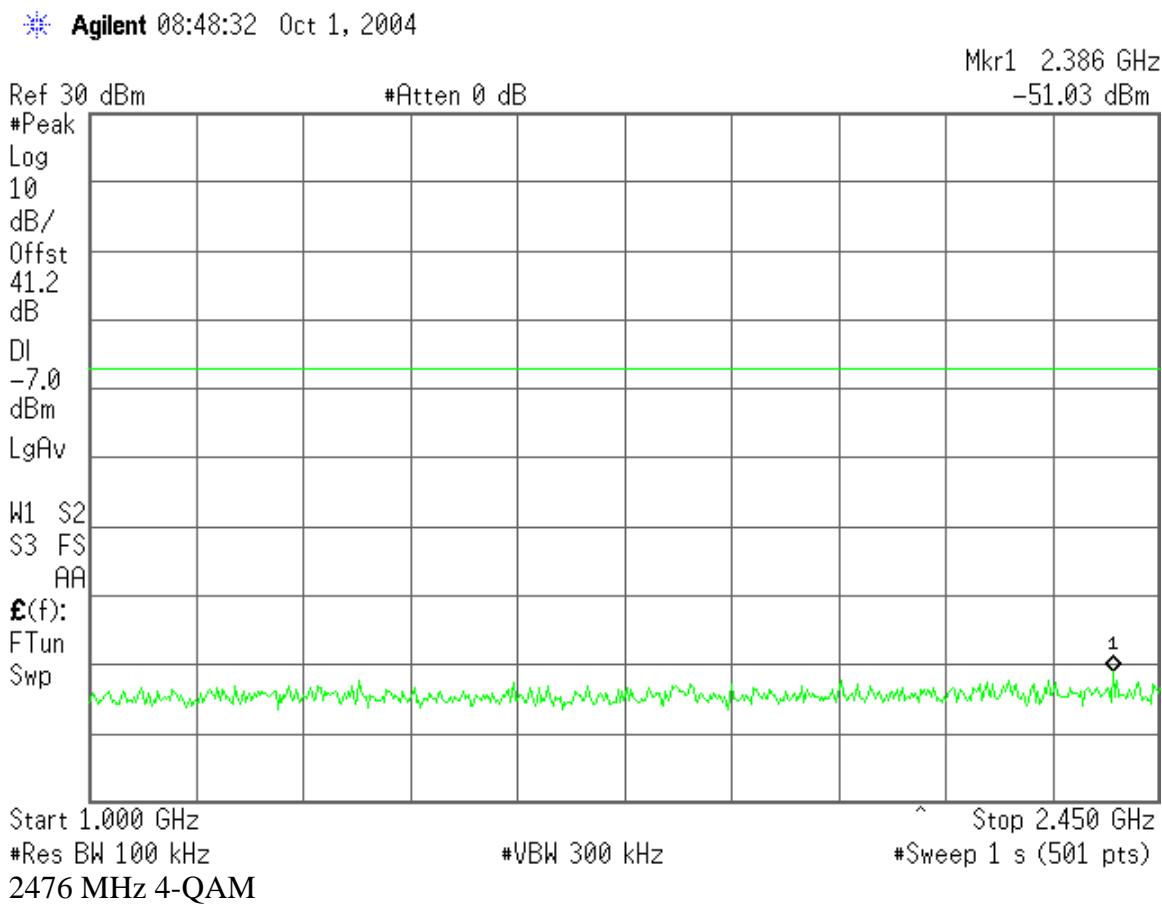
Spurious emissions at antenna terminals

1 GHz – 2.450 GHz



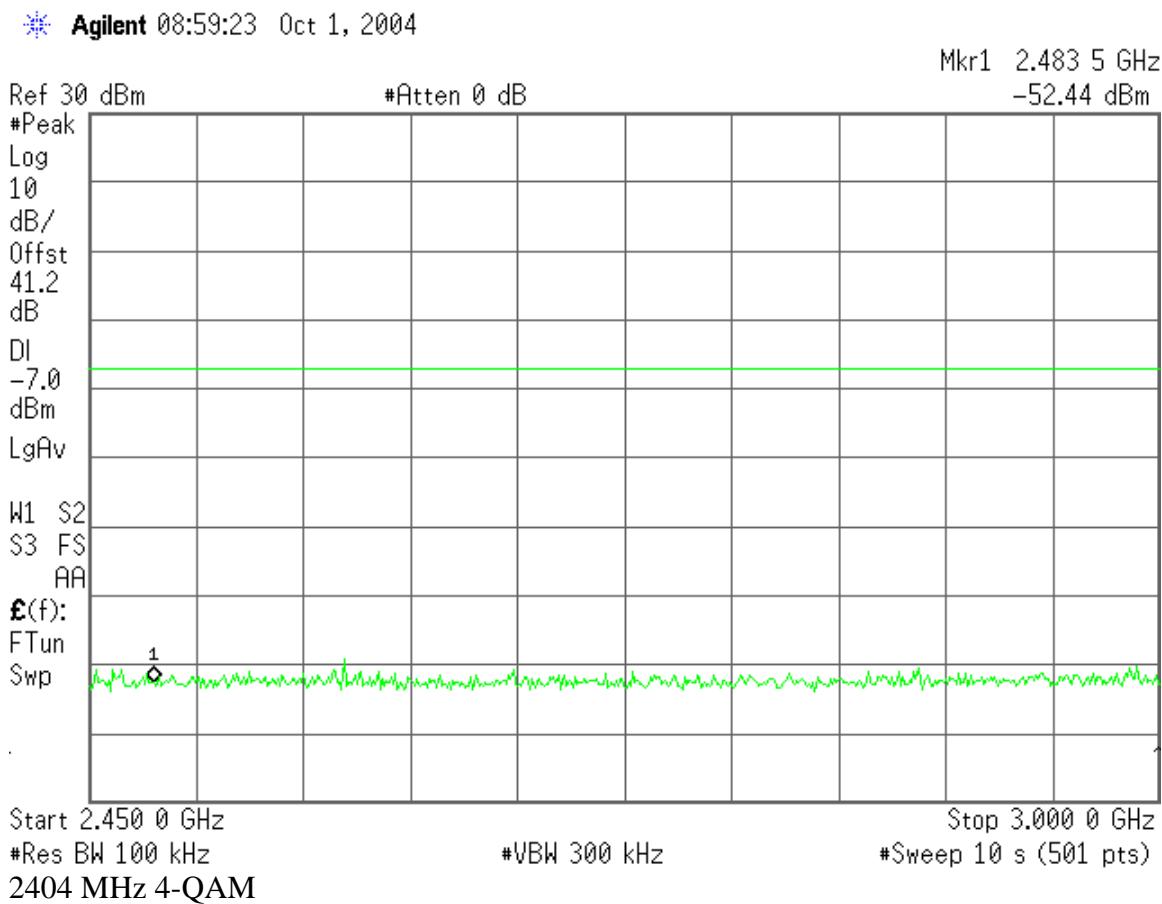
Spurious emissions at antenna terminals

1 GHz – 2.450 GHz



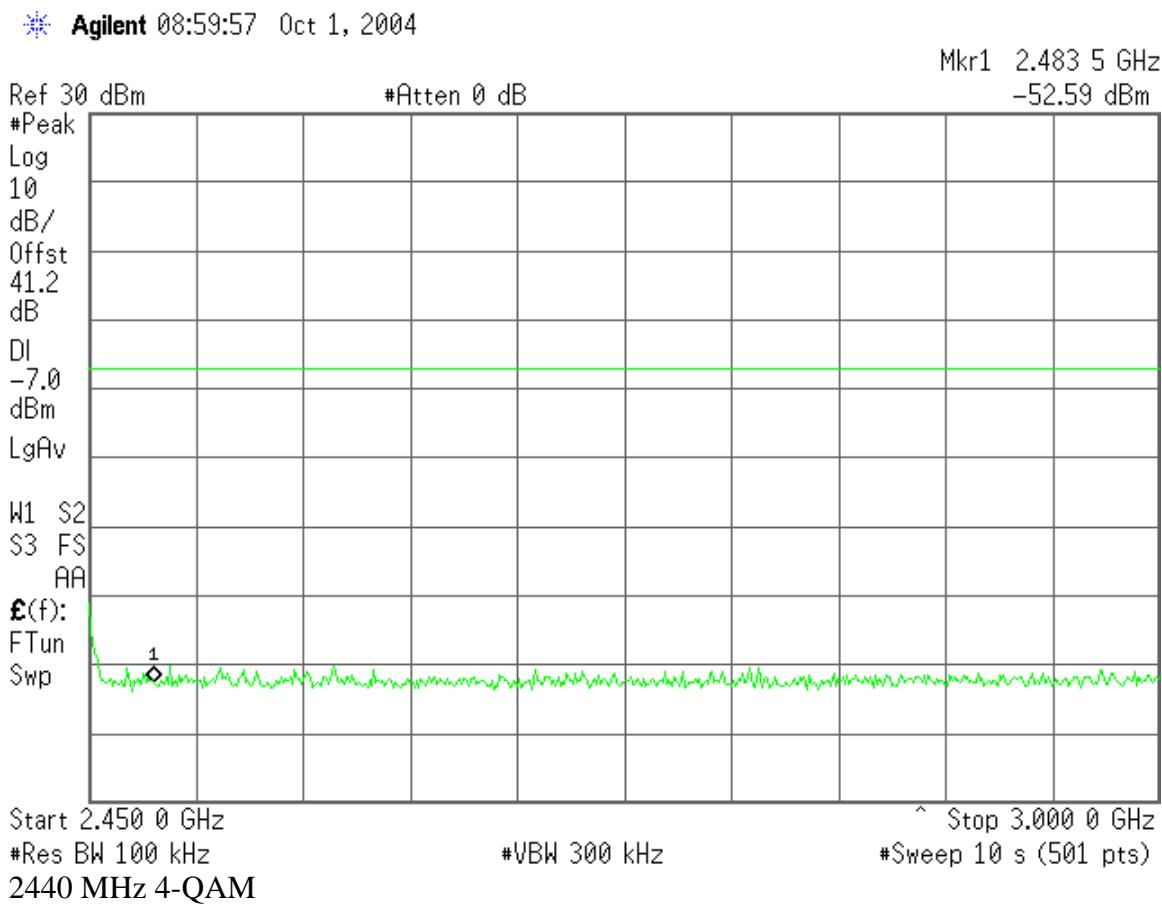
Spurious emissions at antenna terminals

2.450 GHz – 3.0 GHz



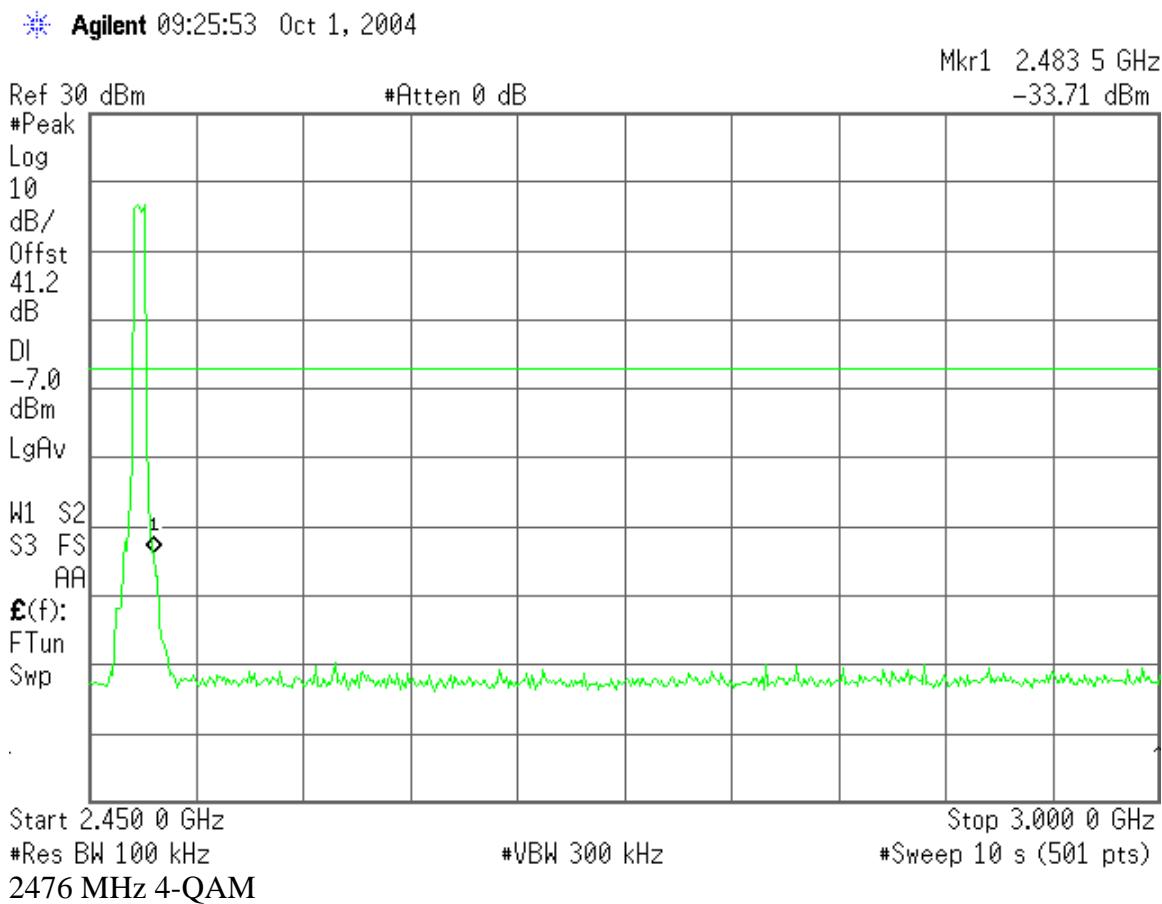
Spurious emissions at antenna terminals

2.450 GHz – 3.0 GHz



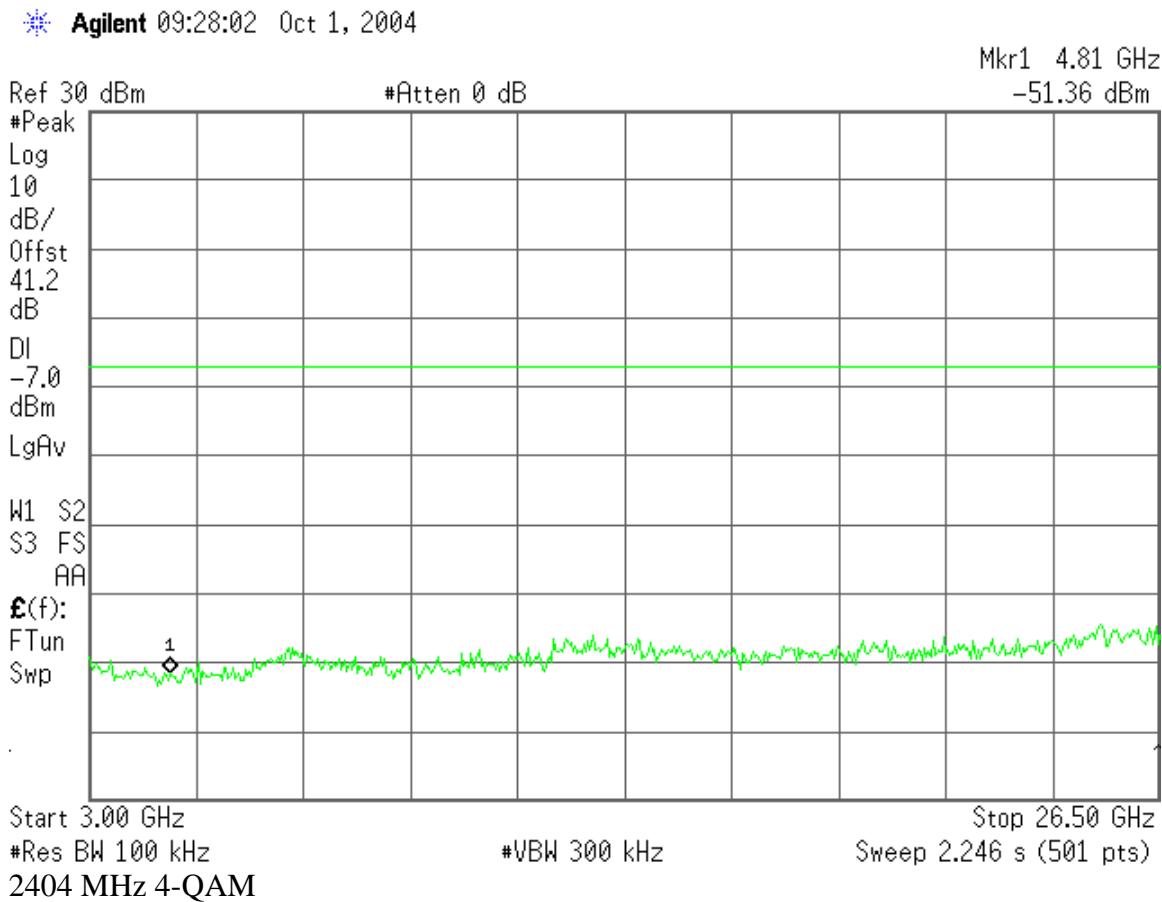
Spurious emissions at antenna terminals

2.450 GHz – 3.0 GHz



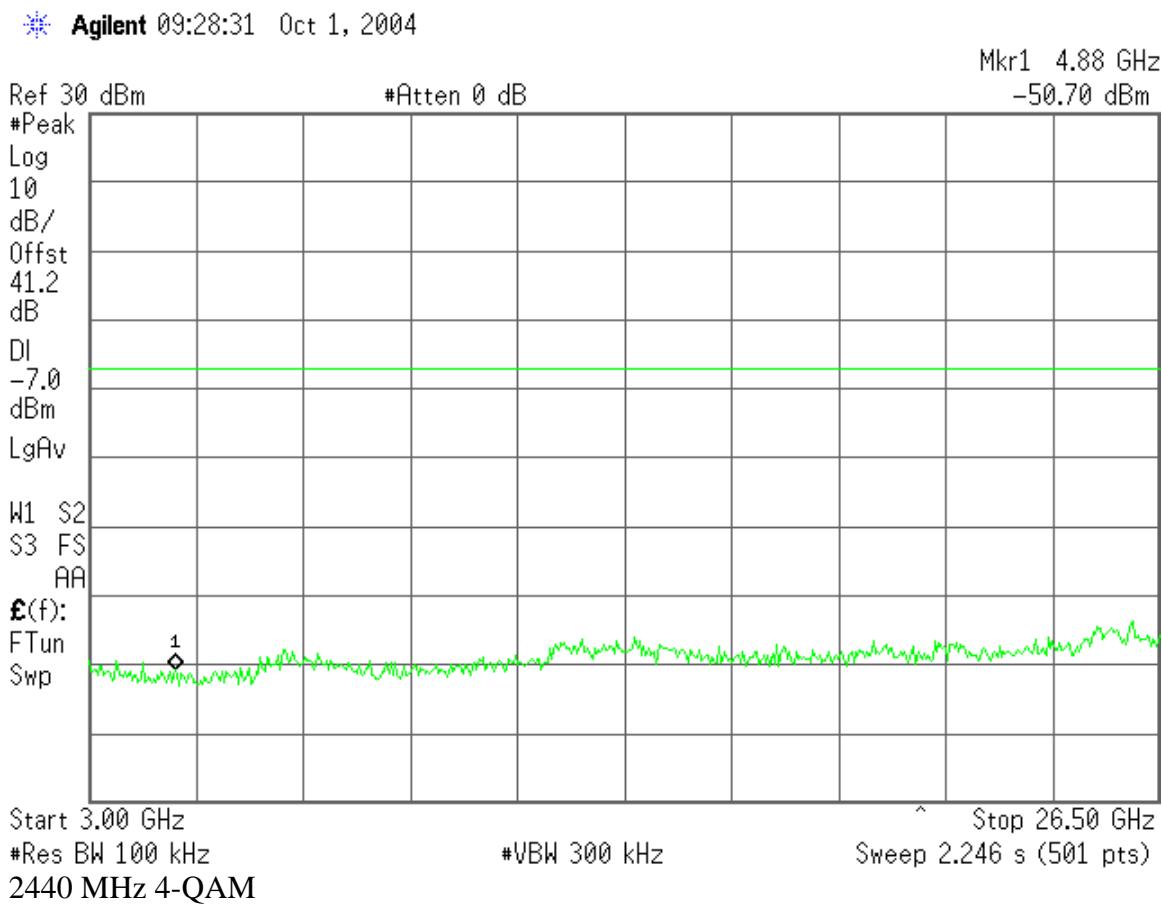
Spurious emissions at antenna terminals

3.0 GHz – 26.50 GHz



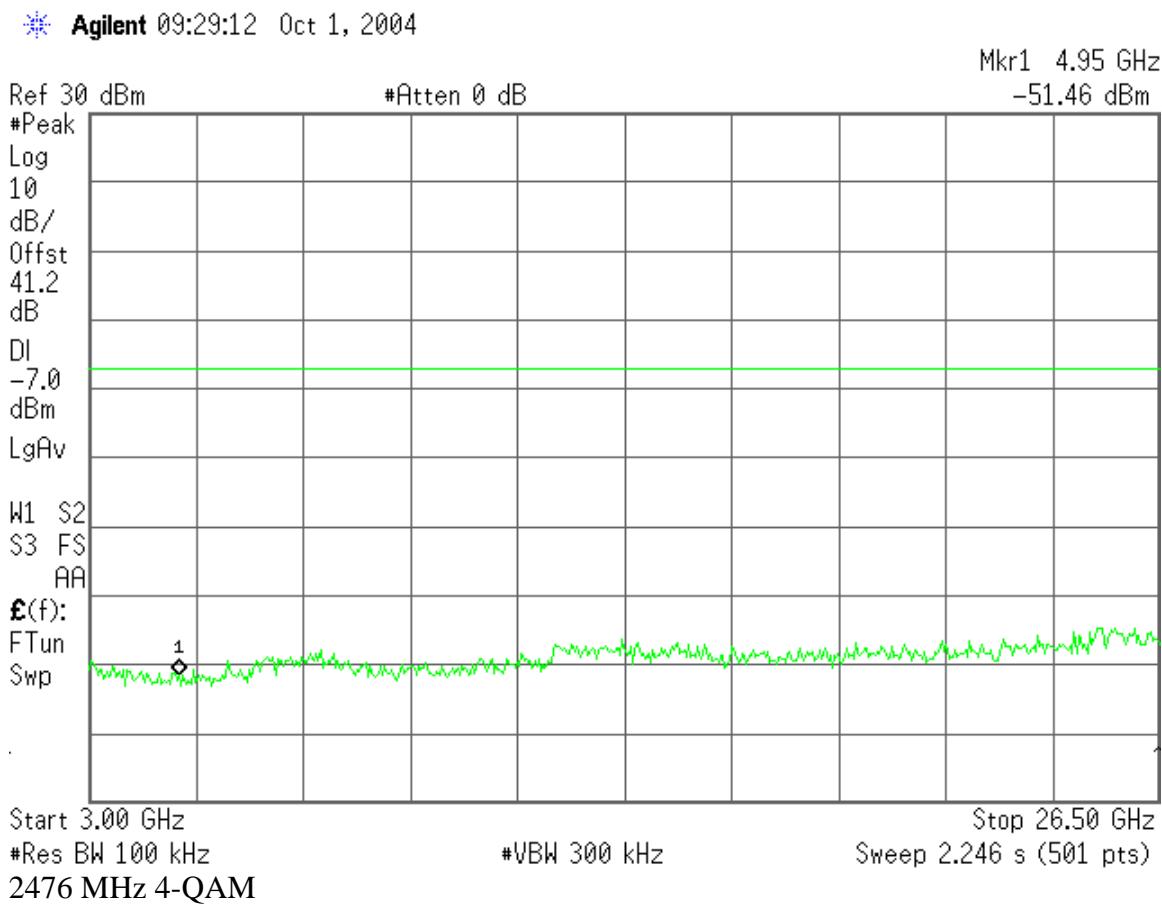
Spurious emissions at antenna terminals

3.0 GHz – 26.50 GHz



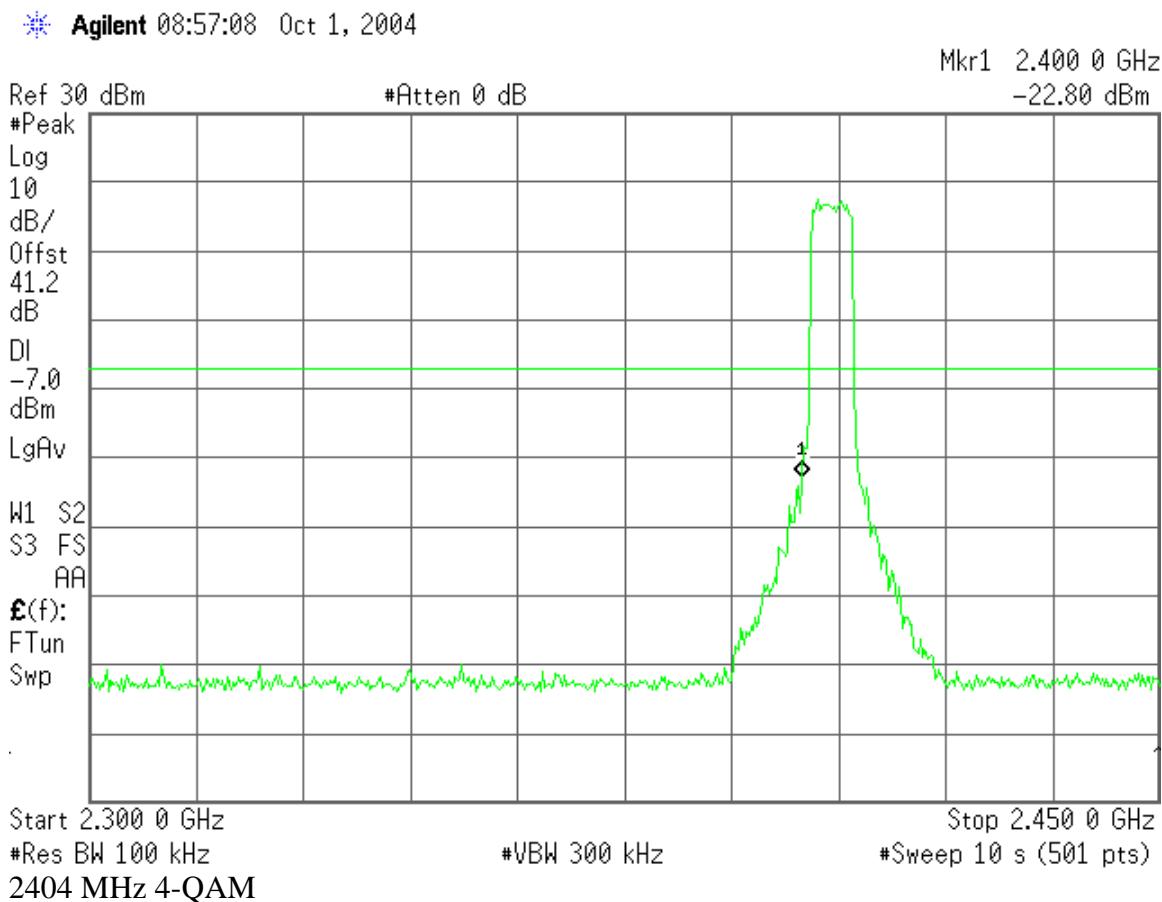
Spurious emissions at antenna terminals

3.0 GHz – 26.50 GHz



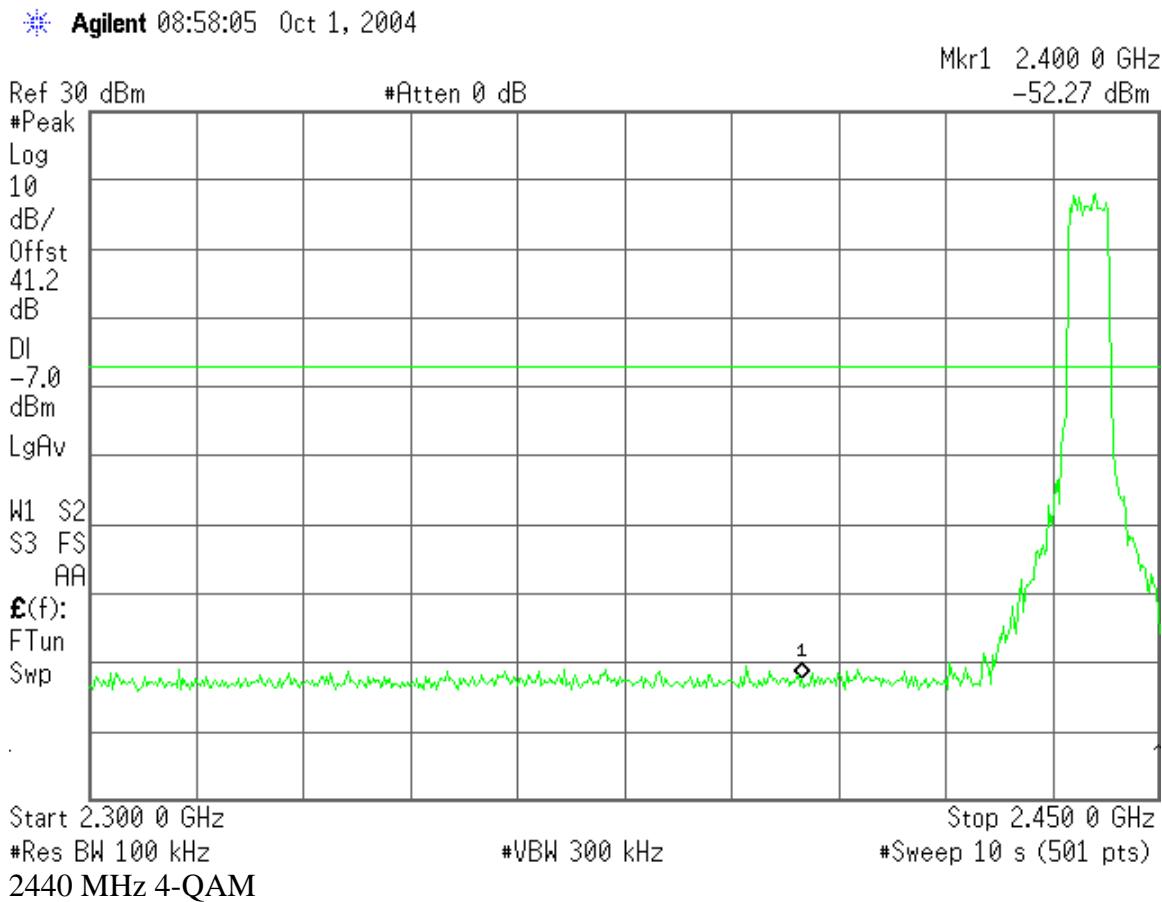
Spurious emissions at antenna terminals

2.300 GHz – 2.450 GHz



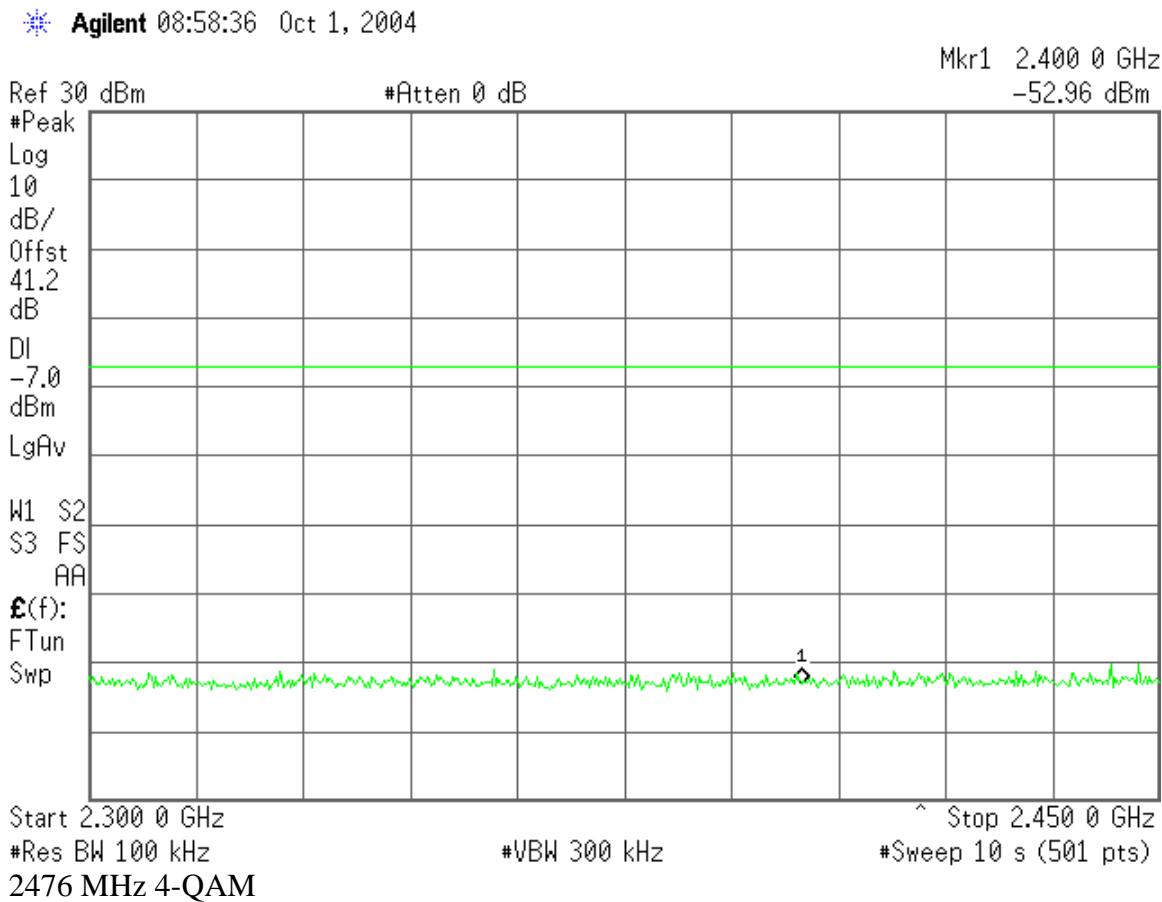
Spurious emissions at antenna terminals

2.300 GHz – 2.450 GHz



Spurious emissions at antenna terminals

2.300 GHz – 2.450 GHz



Peak Power Spectral Density

Rule Part Number: 15.247(d)

For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Test Procedure: The RF output is applied to a spectrum analyzer through a self calibrated coax and attenuator(s). The peak power spectral density at the antenna terminal is measured as per the guidelines found in "Guidance on Measurements for Digital Transmission Systems Section 15.247" found on the FCC web site.

The spectrum analyzer is adjusted as follows:

Fo = desired channel frequency

RF span = 6 MHz

Resolution bandwidth = 3 kHz

Video bandwidth = 30 kHz.

Sweep time = 2000 seconds

Detector = peak

The attenuation of the attenuators and coax has been measured and is included in the spectrum analyzer offset level. Measurements are performed for each of the modulation formats available, 4-QAM, 16-QAM, and 64-QAM. The peak power spectral density is measured at the RF connector on the PCB.

Test Conditions: Frequency = 2404, 2440, 2476 MHz
Temperature = 25 °C
Supply Voltage = 120 Vac / 60 Hz (19.5 VDC to OSU-2400-AV)

Test Results:

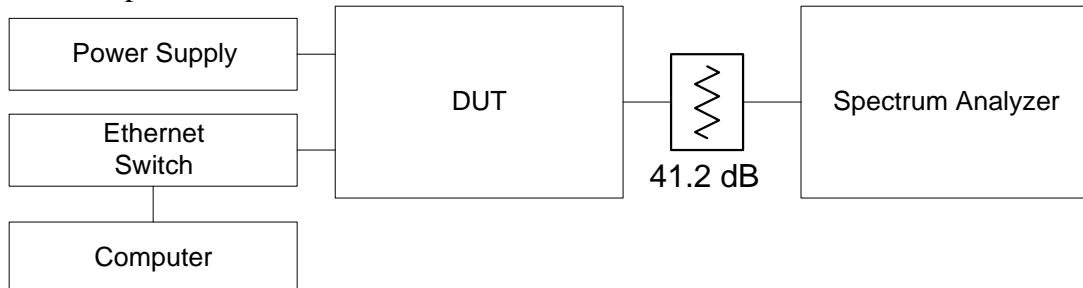
Peak Power Spectral Density (dBm)			
Freq (MHz)	4-QAM	16-QAM	64-QAM
2404	1.12	0.94	0.87
2440	-0.22	-0.39	-0.25
2476	-0.54	-0.46	-0.11

Peak Power Spectral Density

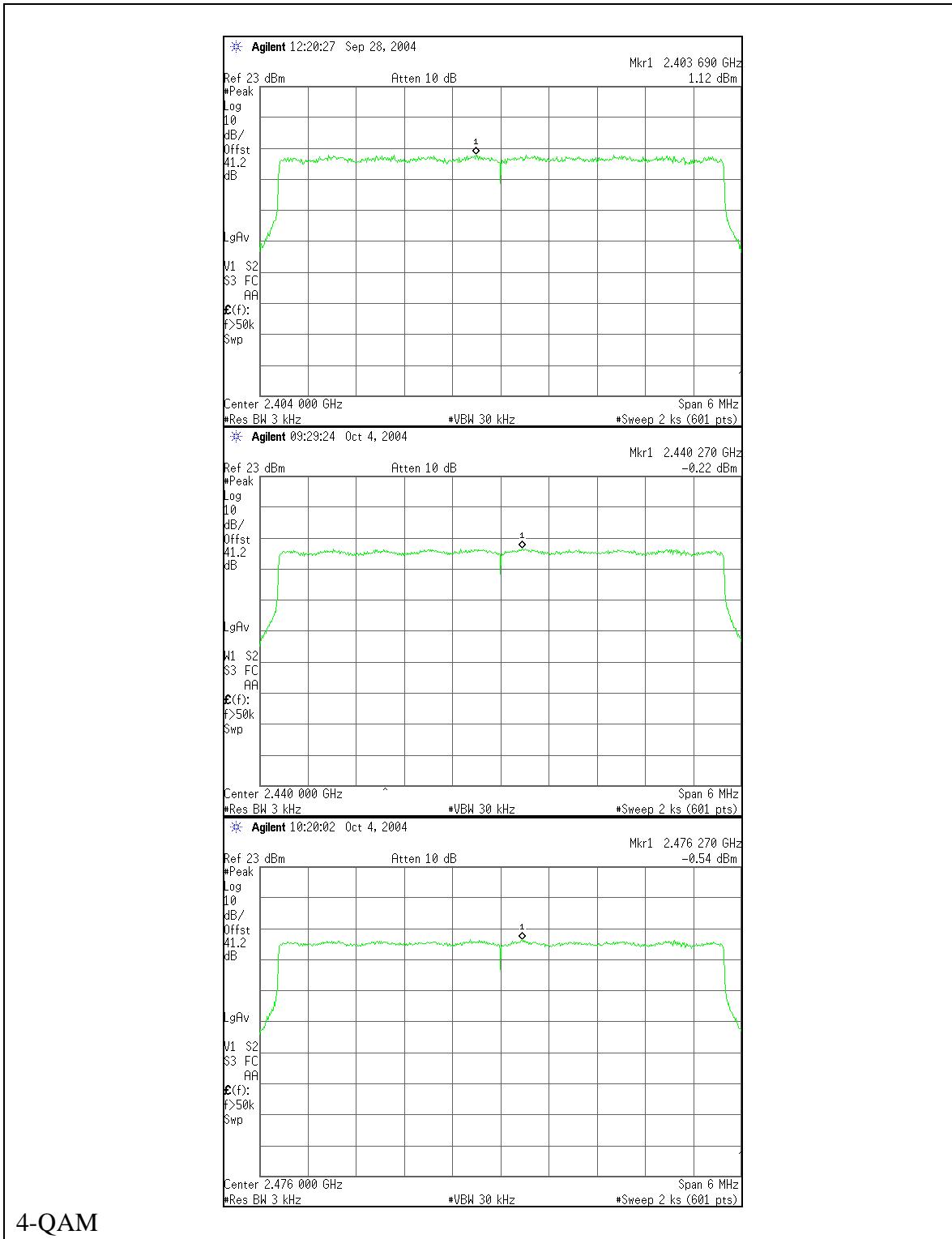
Test Equipment:

DUT	NextNet Wireless CPE (OSU-2400-AV) # 2008693
Spectrum Analyzer	Agilent E4440A S/N: MY44022791 Calibrated on: 05/30/2004 Cal due: 05/30/2006
Attenuator(s) 2 x 20 dB	Paternak Corporation Model: PE7005-20 (20 dB) Calibrated by user
Computer	Dell Inspiron 5000 Model: PPM S/N: 000832RM-12961-04R-0441
Ethernet Switch	D-Link Model: DSS-5+ 5 port 10/100Mbps S/N: B205335003175
Power Supply	Globetek Model: GT-21097-5024-4.5 19.5 Vdc / 2.56 A Limited Power Source S/N: 008988 23/04

Test Setup:

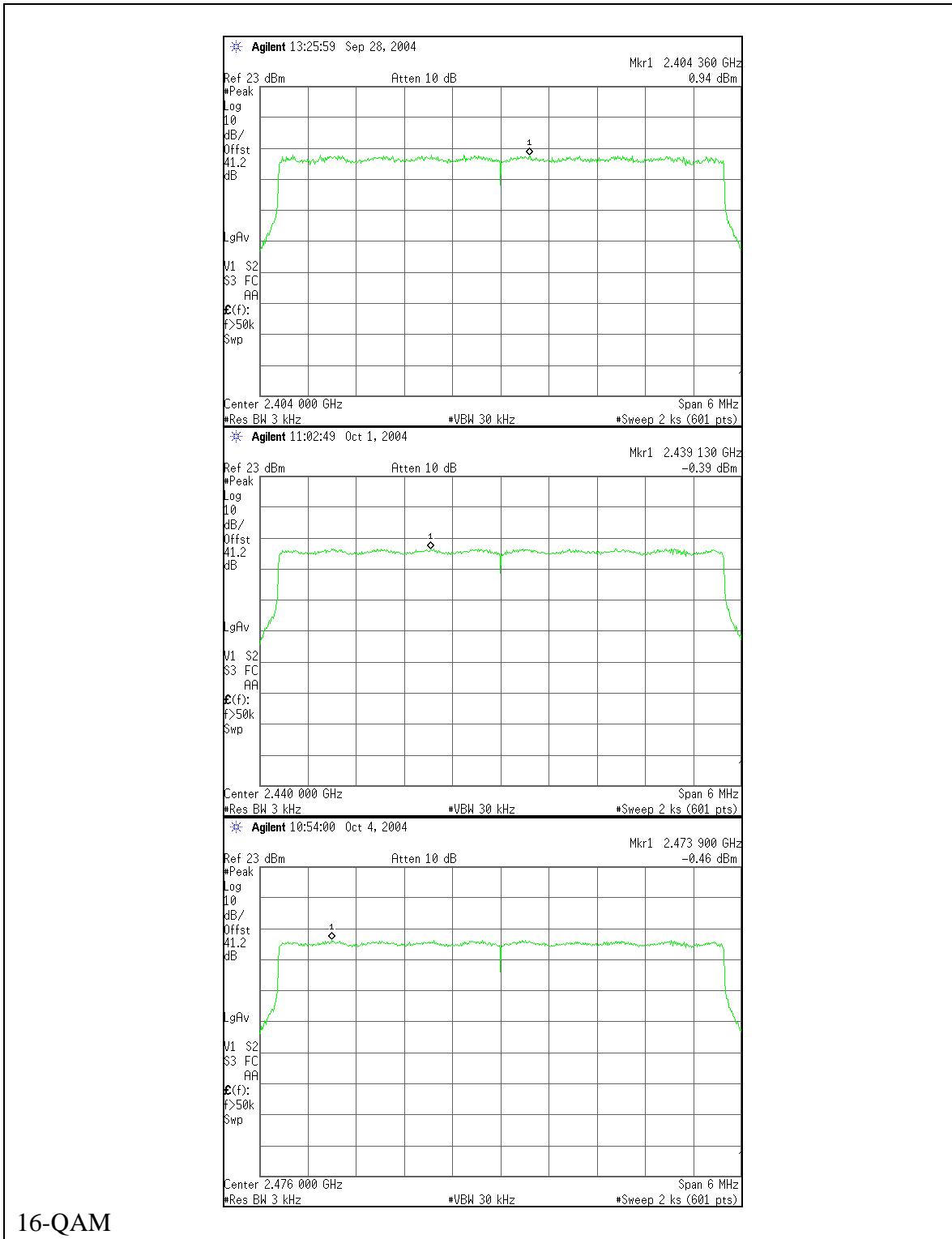


Peak Power Spectral Density



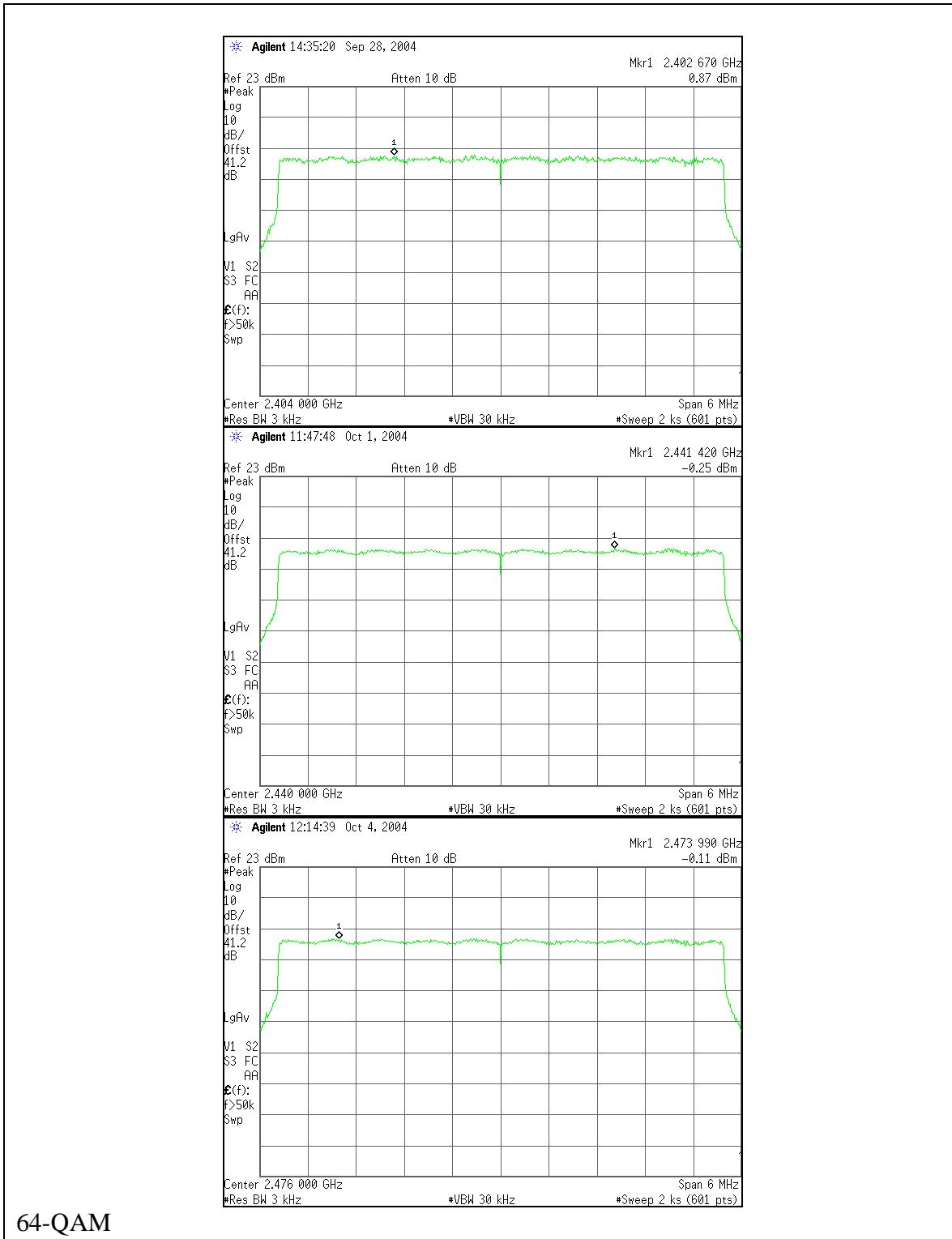
4-QAM

Peak Power Spectral Density



16-QAM

Peak Power Spectral Density



64-QAM

Frequency Stability

Rule Part Number: 15.215(c)

Stability Requirements: If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

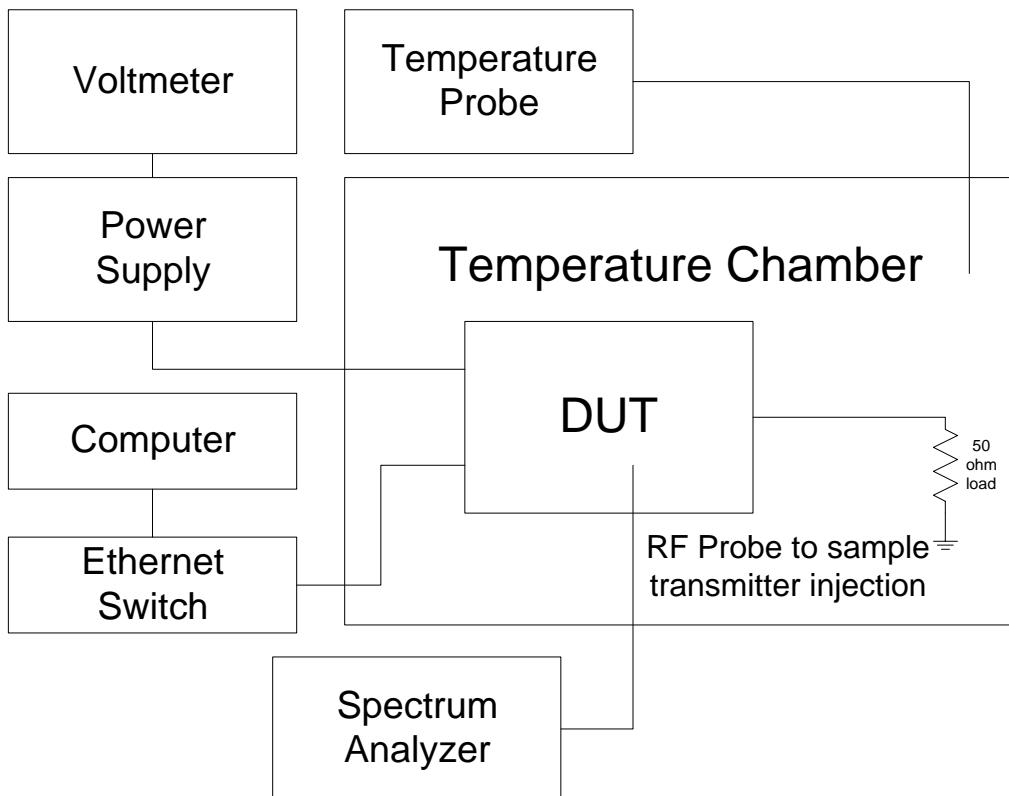
Test Procedure: The local oscillator signal that drives the transmit modulator was lightly coupled onto an RF probe and applied to a spectrum analyzer. The frequency of the RF VCO was monitored and recorded for changes due to temperature change and input voltage.

Test Equipment:

DUT	NextNet Wireless CPE (OSU-2400-AV) # 2008693
Spectrum Analyzer	Hewlett Packard HP8563E S/N: 3221A00143 Cal Date: 10-16-2003 Cal Due: 10-16-2005
Attenuator(s) 2 x 20 dB	Pasternak Corporation Model: PE7005-20 (20 dB) Calibrated by user
Computer	Dell Inspiron 5000 Model: PPM S/N: 000332RM-12561-93N-3144
Ethernet Switch	D-Link Model: DSS-5+ 5 port 10/100Mbps S/N: B205335003172
Power Supply	Globetek Model: GT-21097-5024-4.5 19.5 Vdc / 2.56 A Limited Power Source S/N: 008988 23/04
Multimeter	Fluke 87 III Voltmeter Calibration verified with HP 34401A Multimeter Cal Date: 08-03-2004 Cal Due: 08-03-06 S/N: 3146A58949
Variac	Lafayette Radio Electronics Corp. NO. TR-115

Frequency Stability

Test Set-Up:



Test Results:

The OSU-2400-AV product has adequate frequency stability to keep the fundamental emission within the ISM band.

Frequency Stability

Test Conditions: Frequency = 2404, 2440, 2476 MHz
Supply Voltage = 120 Vac (19.5 Vdc to OSU-2400-AV)

Test Results: Temperature Variation

Fo(Hz)=	2400000000					2440000000				
	Temp (°C)	Frequency (Hz)	Frequency Error (Hz)	Frequency Error (%)	Frequency Error (ppm)	Frequency (Hz)	Frequency Error (Hz)	Frequency Error (%)	Frequency Error (ppm)	
-30	2403996025	-3975	-0.000165	-1.65	2439995975	-4025	-0.000165	-1.65		
-20	2403997733	-2267	-0.000094	-0.94	2439997700	-2300	-0.000094	-0.94		
-10	2403998258	-1742	-0.000072	-0.72	2439998233	-1767	-0.000072	-0.72		
0	2403998833	-1167	-0.000049	-0.49	2439998817	-1183	-0.000048	-0.48		
10	2403999275	-725	-0.000030	-0.30	2439999267	-733	-0.000030	-0.30		
20	2403999575	-425	-0.000018	-0.18	2439999575	-425	-0.000017	-0.17		
30	2403999758	-242	-0.000010	-0.10	2439999758	-242	-0.000010	-0.10		
40	2404000125	125	0.000005	0.05	2440000125	125	0.000005	0.05		
50	2404000875	875	0.000036	0.36	2440000892	892	0.000037	0.37		
60	2404001783	1783	0.000074	0.74	2440001808	1808	0.000074	0.74		

Fo(Hz)=	2476000000				
	Temp (°C)	Frequency (Hz)	Frequency Error (Hz)	Frequency Error (%)	Frequency Error (ppm)
-30	2475995917	-4083	-0.000165	-1.65	
-20	2475997667	-2333	-0.000094	-0.94	
-10	2475998208	-1792	-0.000072	-0.72	
0	2475998800	-1200	-0.000048	-0.48	
10	2475999250	-750	-0.000030	-0.30	
20	2475999567	-433	-0.000017	-0.17	
30	2475999750	-250	-0.000010	-0.10	
40	2476000133	133	0.000005	0.05	
50	2476000908	908	0.000037	0.37	
60	2476001842	1842	0.000074	0.74	

Frequency Stability

Test Conditions: Frequency = 2404, 2440, 2476 MHz

Temperature = 20°C

Test Results: Supply Voltage Variation (102 – 138 Vac)

Fo(Hz)=	2400000000				2440000000			
	Source Voltage (VAC)	Frequency (Hz)	Frequency Error (Hz)	Frequency Error (%)	Frequency (ppm)	Frequency (Hz)	Frequency Error (Hz)	Frequency Error (%)
102.0	2403999500	-500	-0.000021	-0.208	2439999492	-508	-0.000021	-0.208
106.5	2403999500	-500	-0.000021	-0.208	2439999492	-508	-0.000021	-0.208
111.0	2403999500	-500	-0.000021	-0.208	2439999492	-508	-0.000021	-0.208
115.5	2403999508	-492	-0.000020	-0.205	2439999500	-500	-0.000020	-0.205
120.0	2403999508	-492	-0.000020	-0.205	2439999500	-500	-0.000020	-0.205
124.5	2403999508	-492	-0.000020	-0.205	2439999500	-500	-0.000020	-0.205
129.0	2403999508	-492	-0.000020	-0.205	2439999500	-500	-0.000020	-0.205
133.5	2403999508	-492	-0.000020	-0.205	2439999500	-500	-0.000020	-0.205
138.0	2403999508	-492	-0.000020	-0.205	2439999500	-500	-0.000020	-0.205

Fo(Hz)=	2476000000			
	Source Voltage (VAC)	Frequency (Hz)	Frequency Error (Hz)	Frequency Error (%)
102.0	2475999492	-508	-0.000021	-0.205
106.5	2475999492	-508	-0.000021	-0.205
111.0	2475999492	-508	-0.000021	-0.205
115.5	2475999492	-508	-0.000021	-0.205
120.0	2475999492	-508	-0.000021	-0.205
124.5	2475999492	-508	-0.000021	-0.205
129.0	2475999492	-508	-0.000021	-0.205
133.5	2475999492	-508	-0.000021	-0.205
138.0	2475999492	-508	-0.000021	-0.205

Field strength of spurious radiation

Rule Part Number: 15.33(a), 15.247(c)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Frequency Range = 30 MHz to 24.835 GHz

Measurement Frequency (MHz)	Field Strength (microvolts/meter)	Distance (meters)
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Test Procedure: The field strength of spurious radiation was measured at an open area test site with applicable measurement antennas, low noise amplifiers, and spectrum analyzers. Measurements were performed by TUV Product Service Inc – Taylors Falls on September 9th and 10th, 2004. Spurious signals were maximized for peak level by rotation of the test unit and elevation of the measurement antenna.

Test Conditions: Frequency: 2404, 2440, 2476 MHz
Tx power set to maximum level
Temperature = 23 °C
Supply Voltage = 120 Vac / 60 Hz (19.5 VDC to OSU-2400-AV)

Test Results: Pass, see attached TUV test report

Conducted Limits

Rule Part Number: 15.33(a), 15.207(a)

Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range = 150 kHz to 30 MHz

Frequency of emission (MHz)	Conducted limit (dBmV)	Quasi-peak	Average
0.15-0.5	66 to 56*	66 to 56*	56 to 46*
0.5-5	56	56	46
5-30	60	60	50

*Decreases with the logarithm of the frequency.

Test Procedure: The radio frequency voltage that is conducted back into the AC power mains was measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Measurements were performed by TUV Product Service Inc – Taylors Falls on September 9th and 10th, 2004 for transmit and receive modes.

Test Results: Pass, see attached TUV test report

Field strength of spurious radiation / Conducted Limits

Test Equipment: NextNet Wireless, Inc.

DUT	NextNet Wireless CPE (OSU-2400-AV) # 2008693
Attenuator(s) 2 x 20 dB	Pasternak Corporation Model: PE7005-20 (20 dB) Calibrated by user
Computer	Dell Inspiron 5000 Model: PPM S/N: 000832RM-12961-04R-0441
Ethernet Switch	D-Link Model: DSS-5+ 5 port 10/100Mbps S/N: B205335003175
Power Supply	Globetek Model: GT-21097-5024-4.5 19.5 Vdc / 2.56 A Limited Power Source S/N: 008988 23/04



EMC EMISSION - TEST REPORT

Test Report File No. : **WC404172.1**
Rev2 Date of issue: 20 October 2004

Model No. : **900-0045-1XXX**

Product Name : **Expedience**

Product Type : **ISM/MMDS Outdoor Customer Premise Equipment**

Applicant : **NextNet Wireless, Inc.**

Manufacturer : **NextNet Wireless, Inc.**

License holder : **NextNet Wireless, Inc.**

Address : **9555 James Avenue South, Suite 270**

: **Bloomington, MN 55431**

Test Result : **Positive Negative**

Test Project Number
Reference(s) : **WC404172.1**
Rev2

Total pages including
Appendices : **50**

TÜV Product Service Inc is a subcontractor to TÜV Product Service, GmbH according to the principles outlined in ISO/IEC Guide 25 and EN 45001.

TÜV Product Service Inc reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. TÜV Product Service Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV Product Service Inc issued reports.

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval. This report shall not be used by the client to claim product endorsement by NVLAP or any agency of the US government.

TÜV Product Service Inc and its professional staff hold government and professional organization certifications and are members of AAMI, ACIL, AEA, ANSI, IEEE, NVLAP, and VCCI

File No. WC404172.1 Rev2, Page 2 of 16

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0



EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to following regulations:

<input type="checkbox"/> - EN 50081-1 / 1991	<input type="checkbox"/> - Group 1	<input type="checkbox"/> - Group 2
<input type="checkbox"/> - EN 55011 / 1998 w/Amendment A1:1999	<input type="checkbox"/> - Class A	<input type="checkbox"/> - Class B
<input type="checkbox"/> - EN 55013 / 1990	- Household appliances and similar	
<input type="checkbox"/> - EN 55014 / 1987	<input type="checkbox"/> - Portable tools	
	<input type="checkbox"/> - Semiconductor devices	
<input type="checkbox"/> - EN 55014 / A2:1990	<input type="checkbox"/> - Household appliances and similar	
<input type="checkbox"/> - EN 55014 / 1993	<input type="checkbox"/> - Portable tools	
	<input type="checkbox"/> - Semiconductor devices	
<input type="checkbox"/> - EN 55015 / 1987	<input type="checkbox"/> - Class A	
<input type="checkbox"/> - EN 55015 / A1:1990	<input type="checkbox"/> - Class B	
<input type="checkbox"/> - EN 55015 / 1993	- FCC Part 15 Subpart C Section 15.247 – Spurious Radiated Emissions (Electric Field – Restricted Bands)	
<input type="checkbox"/> - EN 55022 / 1987	<input type="checkbox"/> - FCC Part 15 Subpart C Section 15.207 Conducted Emission Requirements	



File No. WC404172.1 Rev2, Page 5 of 16

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0



Environmental conditions in the lab:

	<u>Actual</u>
Temperature	: 22 °C
Relative Humidity	: 48 %
Atmospheric pressure	: 99.0 kPa
Power supply system	: 60 Hz – 115 VAC – 1 Phase

Sign Explanations:

- not applicable
 - applicable

File No. WC404172.1 Rev2, Page 6 of 16

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0



Emissions Test Conditions: CONDUCTED EMISSIONS (Interference Voltage)

The *CONDUCTED EMISSIONS (INTERFERENCE VOLTAGE)* measurements were performed at the following test location:

- Test not applicable

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)
- Oakwood Lab (Open Area Test Site)
- Wild River Lab Screen Room
- New Brighton Lab Shielded Room

Test equipment used:

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
<input checked="" type="checkbox"/> - 2416	3825/2	Electro-Mechanics (EMCO)	50 Ω LISN	8812-1437	Code B
<input checked="" type="checkbox"/> - 2534	ESHS-20	Rhode & Schwarz	EMI Receiver	837055/003	14-Jan-05

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

Emissions Test Conditions: RADIATED EMISSIONS (Magnetic Field)

The *RADIATED EMISSIONS (MAGNETIC FIELD)* measurements were performed at the following test location:

- Test not applicable

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)
- Oakwood Lab (Open Area Test Site)

at a test distance of :

- 3 meters
- 30 meters

File No. WC404172.1 Rev2, Page 7 of 16

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0



Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The *RADIATED EMISSIONS (ELECTRIC FIELD)* measurements, in the frequency range of 30 MHz-1000 MHz, were tested in a horizontal and vertical polarization at the following test location:

- Test not applicable

- Wild River Lab Large Test Site (Open Area Test Site) – NSA measurements made 2-03, due 2-05.
- Wild River Lab Small Test Site (Open Area Test Site)
- Oakwood Lab (Open Area Test Site)

at a test distance of :

- 3 meters
- 10 meters
- 30 meters

Test equipment used:

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
■ - 3204	EM-6917B	Electro-Metrics	Biconicalog Periodic	102	24-Oct-04
■ - 8052	8566B	Hewlett-Packard	Spectrum Analyzer	2115a00853	14-Aug-05
■ - 8051	85662A	Hewlett-Packard	Analyzer Display	2112A02220	14-Aug-05
■ - 2682	85650A	Hewlett-Packard	Quasi-Peak Adapter	2811A01127	14-Aug-05
■ - 3962	ZHL-1042J	Mini-Circuits	Preamplifier	D120403-2	Code B

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

Emissions Test Conditions: INTERFERENCE POWER

The *INTERFERENCE POWER* measurements were performed by using the absorbing clamp on the mains and interface cables in the frequency range 30 MHz - 300 MHz at the following test location :

- Test not applicable

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)
- Oakwood Lab (Open Area Test Site)
- Wild River Lab Screen Room
- New Brighton Lab Shielded Room

File No. WC404172.1 Rev2, Page 8 of 16

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0



Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The *EQUIVALENT RADIATED EMISSIONS* measurements in the frequency range 1 GHz – 26 GHz were performed in a horizontal and vertical polarization at the following test location:

- Test not applicable

- Wild River Lab Large Test Site (Open Area Test Site)
- Wild River Lab Small Test Site (Open Area Test Site)
- Oakwood Lab (Open Area Test Site)
- Wild River Lab Screen Room

at a test distance of:

- 1 meters
- 3 meters
- 10 meters

Test equipment used:

TUV ID	Model Number	Manufacturer	Description	Serial Number	Cal Due
■- 8052	8566B	Hewlett-Packard	Spectrum Analyzer	2115a00853	14-Aug-05
■- 8051	85662A	Hewlett-Packard	Analyzer Display	2112A02220	14-Aug-05
■- 3957	SL18B4020	Phase One Microwave	Preamplifier 1 – 18 GHz	0001	Code B
■- 2075	3115	Electro-Mechanics (EMCO)	Ridge Guide Ant. 1-18 GHz	9001-3275	19-Nov-04
■- 2127	11975A	Hewlett Packard	Amplifier 2- 8 GHz	2738A01200	Code B
■- 2662	11970K	Hewlett-Packard	Harm Mixer – 18-26.5 GHz	2332A01170	7-11-06
■- 2788	3116	Electro-Mechanics (EMCO)	Ridge Guide Ant 18-40 GHz	2005	9-11-04

Cal Code B = Calibration verification performed internally.

Cal Code Y = Calibration not required when used with other calibrated equipment.

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST) and is calibrated annually.

File No. WC404172.1 Rev2, Page 9 of 16

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0



Emission Test Results Continued:

FCC 15.207 - Conducted emissions 150 kHz - 30 MHz

The requirements are	<input checked="" type="checkbox"/> - MET	<input type="checkbox"/> - NOT MET
Minimum margin of compliance	17 dB	at 150.0 kHz
Maximum margin of non-compliance	dB	at MHz

Remarks: _____

Spurious radiated emissions (electric field) 30 MHz - 1000 MHz (restricted bands)

The requirements are	<input checked="" type="checkbox"/> - MET	<input type="checkbox"/> - NOT MET
Minimum margin of compliance	1 dB	at 179.34 MHz
Maximum margin of non-compliance	dB	at MHz

Remarks: _____

Spurious conducted emissions 30 MHz – 25 GHz

The requirements are	<input type="checkbox"/> - MET	<input type="checkbox"/> - NOT MET
Minimum margin of compliance	dB	at MHz
Maximum margin of non-compliance	dB	at MHz

Remarks: Test not performed at this time. _____

Equivalent Radiated emissions 1 GHz – 12.5 GHz (restricted bands)

The requirements are	<input checked="" type="checkbox"/> - MET	<input type="checkbox"/> - NOT MET
Minimum margin of compliance	0.6 dB	at 2404.0 MHz
Maximum margin of non-compliance	dB	at MHz

Remarks: _____

File No. WC404172.1 Rev2, Page 12 of 16

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0



DEVIATIONS FROM STANDARD:

None

GENERAL REMARKS:

SUMMARY:

The requirements according to the technical regulations are

- met
- **not** met.

The device under test does

- fulfill the general approval requirements mentioned on page 3.
- **not** fulfill the general approval requirements mentioned on page 3.

Testing Start Date: 09 September 2004

Testing End Date: 10 September 2004

- TÜV PRODUCT SERVICE INC -

Thomas K. Swanson

T. K. Swanson
Technical Writer

J. C. Sausen

Tested By:
J. C. Sausen

File No. WC404172.1 Rev2, Page 13 of 16

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev. No 1.0

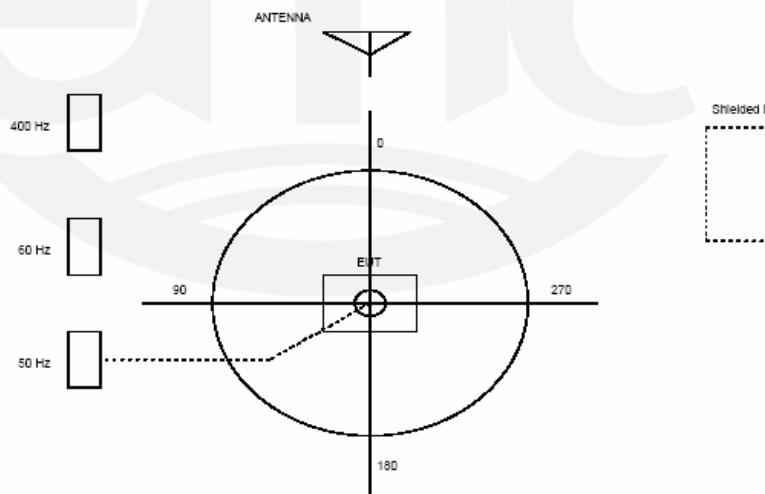


TEST SETUP FOR EMISSIONS TESTING

WILD RIVER LAB
Large Test Site

Notes:

1. Items shown in dotted lines are located on the floor below the test area. It is 5 meters vertically from the ground floor to the test area.
2. 50 Hz, 60 Hz, and 400 Hz are power panels for alternating current.
3. The antenna may be positioned horizontally 3, 10 or 30 meters from the center of the turntable.
4. The circle is a 6.7 meter diameter turntable.
5. A ground plane is in the plane of this sheet.
6. The test sample is shown in the azimuthal position representing zero degrees.



File No. WC404172.1 Rev2, Page A2 of A24

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0

CONDUCTED EMISSIONS



Test Report #: WC404172 Run 4 Test Area: LTS
EUT Model #: OSU-2400-AV Date: 9/10/04
EUT Serial #: EUT Power: 60 Hz / 110 VAC Temperature: 22.0 °C
Test Method: FCC B Air Pressure: 99.0 kPa
Customer: NextNet Rel. Humidity: 48.0 %
EUT Description: ISM/MMDS Outdoor Customer Premise Equipment
Notes: EUT in Transmit mode.
Data File Name: 4172.dat Page: 1 of 4

List of measurements for run #: 4

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	EUT Lead	DELTA1 EN55022 B Qp	DELTA2 EN55022 B Avg
150.0 kHz	45.58 Qp	0.1/3.0/0.0/0.0	48.68	N	-17.32	n/a
150.0 kHz	14.81 Av	0.1/3.0/0.0/0.0	17.91	N	n/a	-38.09
220.0 kHz	40.49 Qp	0.1/1.9/0.0/0.0	42.49	N	-20.33	n/a
220.0 kHz	10.37 Av	0.1/1.9/0.0/0.0	12.37	N	n/a	-40.45
420.0 kHz	28.69 Qp	0.1/0.9/0.0/0.0	29.69	N	-27.76	n/a
420.0 kHz	-0.53 Av	0.1/0.9/0.0/0.0	0.47	N	n/a	-46.98
453.72 kHz	30.19 Qp	0.1/0.73/0.0/0.0	31.02	N	-25.79	n/a
453.72 kHz	21.08 Av	0.1/0.73/0.0/0.0	21.91	N	n/a	-24.9
1.166 MHz	16.55 Qp	0.2/0.05/0.0/0.0	16.8	N	-39.2	n/a
1.164 MHz	13.5 Av	0.2/0.05/0.0/0.0	13.75	N	n/a	-32.25
2.984 MHz	8.44 Qp	0.3/0.05/0.0/0.0	8.79	N	-47.21	n/a
2.984 MHz	-0.82 Av	0.3/0.05/0.0/0.0	-0.47	N	n/a	-46.47
18.244 MHz	20.62 Qp	0.9/0.09/0.0/0.0	21.61	N	-38.39	n/a
18.244 MHz	14.27 Av	0.9/0.09/0.0/0.0	15.26	N	n/a	-34.74
30.0 MHz	12.4 Qp	1.25/0.1/0.0/0.0	13.75	N	-46.25	n/a
30.0 MHz	9.09 Av	1.25/0.1/0.0/0.0	10.44	N	n/a	-39.56
150.0 kHz	44.72 Qp	0.1/3.0/0.0/0.0	47.82	L1	-18.18	n/a
150.0 kHz	15.38 Av	0.1/3.0/0.0/0.0	18.48	L1	n/a	-37.52
220.0 kHz	39.73 Qp	0.1/1.9/0.0/0.0	41.73	L1	-21.09	n/a
220.0 kHz	9.57 Av	0.1/1.9/0.0/0.0	11.57	L1	n/a	-41.25
420.0 kHz	25.29 Qp	0.1/0.9/0.0/0.0	26.29	L1	-31.16	n/a
420.0 kHz	-1.35 Av	0.1/0.9/0.0/0.0	-0.35	L1	n/a	-47.8
453.72 kHz	30.76 Qp	0.1/0.73/0.0/0.0	31.59	L1	-25.22	n/a
453.72 kHz	21.71 Av	0.1/0.73/0.0/0.0	22.54	L1	n/a	-24.27
1.164 MHz	15.35 Qp	0.2/0.05/0.0/0.0	15.8	L1	-40.4	n/a
1.164 MHz	12.71 Av	0.2/0.05/0.0/0.0	12.96	L1	n/a	-33.04

Tested by: J. C. Sausen

Printed

Signature

Reviewed
by: TKS

Printed

Signature

File No. WC404172.1 Rev2, Page A7 of A24

CONDUCTED EMISSIONS



Test Report #: WC404172 Run 4 Test Area: LTS
EUT Model #: OSU-2400-AV Date: 9/10/04
EUT Serial #: EUT Power: 60 Hz / 110 VAC Temperature: 22.0 °C
Test Method: FCC B Air Pressure: 99.0 kPa
Customer: NextNet Rel. Humidity: 48.0 %
EUT Description: ISM/MMDS Outdoor Customer Premise Equipment
Notes: EUT in Transmit mode.
Data File Name: 4172.dat Page: 2 of 4

List of measurements for run #: 4

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	EUT Lead	DELTA1 EN55022 B Qp	DELTA2 EN55022 B Avg
2.984 MHz	6.84 Qp	0.3 / 0.05 / 0.0 / 0.0	7.19	L1	-48.81	n/a
2.984 MHz	-5.22 Av	0.3 / 0.05 / 0.0 / 0.0	-4.87	L1	n/a	-50.87
18.244 MHz	18.08 Qp	0.9 / 0.09 / 0.0 / 0.0	19.07	L1	-40.93	n/a
18.244 MHz	14.13 Av	0.9 / 0.09 / 0.0 / 0.0	15.12	L1	n/a	-34.88
30.0 MHz	13.12 Qp	1.25 / 0.1 / 0.0 / 0.0	14.47	L1	-45.53	n/a
30.0 MHz	8.83 Av	1.25 / 0.1 / 0.0 / 0.0	10.18	L1	n/a	-39.82

Tested by: J. C. Sausen

Printed

Signature

Reviewed
by: TKS

Printed

Signature

File No. WC404172.1 Rev2, Page A8 of A24

CONDUCTED EMISSIONS



Test Report #: WC404172 Run 4 Test Area: LTS
EUT Model #: OSU-2400-AV Date: 9/10/04
EUT Serial #: EUT Power: 60 Hz / 110 VAC Temperature: 22.0 °C
Test Method: FCC B Air Pressure: 99.0 kPa
Customer: NextNet Rel. Humidity: 48.0 %
EUT Description: ISM/MMDS Outdoor Customer Premise Equipment
Notes: EUT in Transmit mode.
Data File Name: 4172.dat Page: 3 of 4

Measurement summary for limit1: EN55022 B Qp (Qp)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	EUT Lead	DELTA1 EN55022 B Qp
150.0 kHz	45.58 Qp	0.1/3.0/0.0/0.0	48.68	N	-17.32
220.0 kHz	40.49 Qp	0.1/1.9/0.0/0.0	42.49	N	-20.33
453.72 kHz	30.76 Qp	0.1/0.73/0.0/0.0	31.59	L1	-25.22
420.0 kHz	28.69 Qp	0.1/0.9/0.0/0.0	29.69	N	-27.76
18.244 MHz	20.62 Qp	0.9/0.09/0.0/0.0	21.61	N	-38.39
1.166 MHz	16.55 Qp	0.2/0.05/0.0/0.0	16.8	N	-39.2
30.0 MHz	13.12 Qp	1.25/0.1/0.0/0.0	14.47	L1	-45.53
2.984 MHz	8.44 Qp	0.3/0.05/0.0/0.0	8.79	N	-47.21

Measurement summary for limit2: EN55022 B Avg (Av)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	EUT Lead	DELTA2 EN55022 B Avg
453.72 kHz	21.71 Av	0.1/0.73/0.0/0.0	22.54	L1	-24.27
1.164 MHz	13.5 Av	0.2/0.05/0.0/0.0	13.75	N	-32.25
18.244 MHz	14.27 Av	0.9/0.09/0.0/0.0	15.26	N	-34.74
150.0 kHz	15.38 Av	0.1/3.0/0.0/0.0	18.48	L1	-37.52
30.0 MHz	9.09 Av	1.25/0.1/0.0/0.0	10.44	N	-39.56
220.0 kHz	10.37 Av	0.1/1.9/0.0/0.0	12.37	N	-40.45
2.984 MHz	-0.82 Av	0.3/0.05/0.0/0.0	-0.47	N	-46.47
420.0 kHz	-0.53 Av	0.1/0.9/0.0/0.0	0.47	N	-46.98

Tested by: J. C. Sausen

Printed

Signature

Reviewed
by: TKS

Printed

Signature

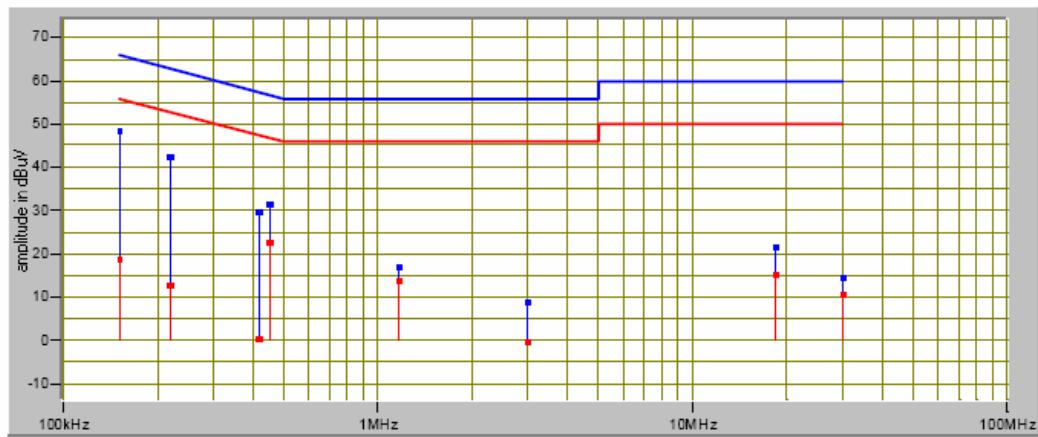
File No. WC404172.1 Rev2, Page A9 of A24

CONDUCTED EMISSIONS



Test Report #: WC404172 Run 4 Test Area: LTS
EUT Model #: OSU-2400-AV Date: 9/10/04
EUT Serial #: EUT Power: 60 Hz / 110 VAC Temperature: 22.0 °C
Test Method: FCC B Air Pressure: 99.0 kPa
Customer: NextNet Rel. Humidity: 48.0 %
EUT Description: ISM/MMDS Outdoor Customer Premise Equipment
Notes: EUT in Transmit mode.
Data File Name: 4172.dat Page: 4 of 4

Graph:



Tested by: J. C. Sausen

Printed

Signature

Reviewed
by: TKS

Printed

Signature

File No. WC404172.1 Rev2, Page A10 of A24

RADIATED EMISSIONS



Test Report #: WC404172 Run 2 Test Area: LTS
 EUT Model #: OSU-2400-AV Date: 9/9/04
 EUT Serial #: EUT Power: 60 Hz / 110 VAC Temperature: 22.0 °C
 Test Method: FCC B Air Pressure: 99.0 kPa
 Customer: NextNet Rel. Humidity: 48.0 %
 EUT Description: ISM/MMDS Outdoor Customer Premise Equipment
 Notes: EUT in transmit mode:
 Data File Name: 4172.dat Page: 1 of 7

List of measurements for run #: 2

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC-B <1GHz 3m	DELTA2 FCC B >1GHz 3m
* DENOTES PEAK MEASUREMENT COMPARED TO AVERAGE LIMIT.						
2.404 GHz maxed:						
2.404 GHz	53.55 Pk	4.31 / 30.49 / 0.0 / 0.0	88.35	V / 1.30 / 176	n/a	34.35*
2.44 GHz	53.4 Pk	4.33 / 30.57 / 0.0 / 0.0	88.3	V / 1.00 / 198	n/a	34.3*
2.476 GHz	52.75 Pk	4.35 / 30.65 / 0.0 / 0.0	87.75	V / 1.00 / 145	n/a	33.75*
2.593 GHz	70.05 Pk	4.42 / 30.89 / 0.0 / 0.0	105.35	V / 1.07 / 145	n/a	51.35*
2.593 GHz	68.65 Pk	4.42 / 30.89 / 0.0 / 0.0	103.95	H / 1.51 / 138	n/a	49.95*
2.476 GHz	56.2 Pk	4.35 / 30.65 / 0.0 / 0.0	91.2	H / 1.28 / 180	n/a	37.2*
2.44 GHz	57.2 Pk	4.33 / 30.57 / 0.0 / 0.0	92.1	H / 1.11 / 175	n/a	38.1*
2.404 GHz	61.05 Pk	4.31 / 30.49 / 0.0 / 0.0	95.85	H / 1.19 / 190	n/a	41.85*
Above measurements are of the fundamental and will not be included in the measurement summary. The rest of the scan and the data in the measurement summary are of spurious emissions.						
4.808 GHz	53.85 Pk	6.33 / 34.56 / 44.11 / 0.79	51.42	H / 1.00 / 180	n/a	-2.58*
4.808 GHz	50.35 Pk	6.33 / 34.56 / 44.11 / 0.79	47.92	V / 1.00 / 180	n/a	-6.08*
7.212 GHz	49.25 Pk	8.1 / 37.22 / 44.1 / 0.58	51.06	V / 1.00 / 180	n/a	-2.94*
7.212 GHz	47.8 Pk	8.1 / 37.22 / 44.1 / 0.58	49.61	H / 1.00 / 180	n/a	-4.39*
4.88 GHz	45.0 Pk	6.39 / 34.76 / 44.04 / 0.38	42.49	H / 1.00 / 0	n/a	-11.51*
4.88 GHz	43.0 Pk	6.39 / 34.76 / 44.04 / 0.38	40.49	V / 1.00 / 0	n/a	-13.51*
7.32 GHz	41.95 Pk	8.1 / 37.44 / 44.06 / 0.63	44.06	V / 1.00 / 0	n/a	-9.94*
7.32 GHz	41.9 Pk	8.1 / 37.44 / 44.06 / 0.63	44.01	H / 1.00 / 0	n/a	-9.99*
4.952 GHz	36.15 Pk	6.46 / 34.97 / 44.0 / 0.4	33.97	H / 1.00 / 0	n/a	-20.03*

Tested by: J. C. Sausen

Printed

Signature

Reviewed
by: TKS

Printed

Signature

File No. WC404172.1 Rev2, Page A18 of A24

RADIATED EMISSIONS



Test Report #: WC404172 Run 2 Test Area: LTS
 EUT Model #: OSU-2400-AV Date: 9/9/04
 EUT Serial #: EUT Power: 60 Hz / 110 VAC Temperature: 22.0 °C
 Test Method: FCC B Air Pressure: 99.0 kPa
 Customer: NextNet Rel. Humidity: 48.0 %
 EUT Description: ISM/MMDS Outdoor Customer Premise Equipment
 Notes: EUT in transmit mode:
 Data File Name: 4172.dat Page: 2 of 7

List of measurements for run #: 2

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC-B <1GHz 3m	DELTA2 FCC B >1GHz 3m
4.952 GHz	39.55 Pk	6.46 / 34.97 / 44.0 / 0.4	37.37	V / 1.00 / 0	n/a	-16.63*
7.428 GHz	40.25 Pk	8.12 / 37.66 / 44.01 / 0.67	42.68	V / 1.00 / 0	n/a	-11.32*
7.428 GHz	38.3 Pk	8.12 / 37.66 / 44.01 / 0.67	40.73	H / 1.00 / 0	n/a	-13.27*
5.186 GHz	50.5 Pk	6.61 / 35.4 / 44.0 / 0.47	48.98	H / 1.00 / 0	n/a	-5.02*
5.186 GHz	51.0 Pk	6.61 / 35.4 / 44.0 / 0.47	49.48	V / 1.00 / 0	n/a	-4.52*
7.779 GHz	42.9 Pk	8.25 / 37.63 / 43.71 / 0.7	45.77	V / 1.00 / 0	n/a	-8.23*
7.779 GHz	43.4 Pk	8.25 / 37.63 / 43.71 / 0.7	46.27	H / 1.00 / 0	n/a	-7.73*
179.364 MHz	50.0 Qp	1.1 / 9.43 / 26.14 / 0.0	34.38	V / 1.00 / 180	-9.12	n/a
180.384 MHz	52.5 Qp	1.1 / 9.51 / 26.15 / 0.0	36.96	V / 1.00 / 180	-6.54	n/a
180.63 MHz	52.55 Qp	1.1 / 9.54 / 26.15 / 0.0	37.03	V / 1.00 / 180	-6.47	n/a
224.0 MHz	50.3 Qp	1.28 / 11.1 / 26.3 / 0.0	36.38	V / 1.00 / 180	-9.62	n/a
90.314 MHz	52.0 Qp	0.8 / 7.85 / 25.85 / 0.0	34.8	V / 1.00 / 180	-8.7	n/a
89.726 MHz	49.55 Qp	0.8 / 7.75 / 25.84 / 0.0	32.25	V / 1.00 / 180	-11.25	n/a
269.08 MHz	46.2 Qp	1.45 / 12.41 / 26.43 / 0.0	33.63	V / 1.00 / 180	-12.37	n/a
269.374 MHz	46.05 Qp	1.45 / 12.4 / 26.43 / 0.0	33.47	V / 1.00 / 180	-12.53	n/a
270.994 MHz	44.8 Qp	1.46 / 12.4 / 26.44 / 0.0	32.22	V / 1.00 / 180	-13.78	n/a
168.0 MHz	61.2 Qp	1.07 / 9.1 / 26.05 / 0.0	45.32	V / 1.00 / 180	1.82	n/a
Tightened ethernet connection. Moved cables to max emission level position.						
168.0 MHz	52.9 Qp	1.07 / 9.1 / 26.05 / 0.0	37.02	V / 1.00 / 180	-6.48	n/a
168 MHz maxed:						
168.0 MHz	57.55 Qp	1.07 / 9.1 / 26.05 / 0.0	41.67	V / 1.00 / 10	-1.83	n/a
336.002 MHz	37.65 Qp	1.57 / 14.27 / 26.7 / 0.0	26.79	V / 1.00 / 10	-19.21	n/a
269.416 MHz	37.3 Qp	1.45 / 12.4 / 26.43 / 0.0	24.72	V / 1.00 / 10	-21.28	n/a

Tested by: J. C. Sausen

Printed

Signature

Reviewed
by: TKS

Printed

Signature

File No. WC404172.1 Rev2, Page A19 of A24

RADIATED EMISSIONS



Test Report #: WC404172 Run 2 Test Area: LTS
 EUT Model #: OSU-2400-AV Date: 9/9/04
 EUT Serial #: EUT Power: 60 Hz / 110 VAC Temperature: 22.0 °C
 Test Method: FCC B Air Pressure: 99.0 kPa
 Customer: NextNet Rel. Humidity: 48.0 %
 EUT Description: ISM/MMDS Outdoor Customer Premise Equipment
 Notes: EUT in transmit mode:
 Data File Name: 4172.dat Page: 3 of 7

List of measurements for run #: 2

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC-B <1GHz 3m	DELTA2 FCC B >1GHz 3m
271.006 MHz	40.4 Qp	1.46 / 12.4 / 26.44 / 0.0	27.82	V / 1.00 / 10	-18.18	n/a
290.206 MHz	32.9 Qp	1.5 / 13.21 / 26.54 / 0.0	21.08	V / 1.00 / 10	-24.92	n/a
308.002 MHz	42.8 Qp	1.5 / 13.9 / 26.62 / 0.0	31.58	V / 1.00 / 10	-14.42	n/a
336.005 MHz	37.7 Qp	1.57 / 14.27 / 26.7 / 0.0	26.84	V / 1.00 / 10	-19.16	n/a
289.439 MHz	34.3 Qp	1.5 / 13.17 / 26.53 / 0.0	22.44	V / 1.00 / 10	-23.56	n/a
217.319 MHz	41.7 Qp	1.24 / 11.0 / 26.3 / 0.0	27.64	V / 1.00 / 10	-18.36	n/a
224.005 MHz	47.55 Qp	1.29 / 11.1 / 26.3 / 0.0	33.64	V / 1.00 / 10	-12.36	n/a
140.0 MHz	49.6 Qp	1.0 / 9.26 / 26.02 / 0.0	33.85	V / 1.00 / 10	-9.65	n/a
89.702 MHz	50.75 Qp	0.8 / 7.74 / 25.84 / 0.0	33.45	V / 1.00 / 270	-10.05	n/a
90.314 MHz	52.8 Qp	0.8 / 7.85 / 25.85 / 0.0	35.6	V / 1.00 / 270	-7.9	n/a
335.998 MHz	46.0 Pk	1.57 / 14.27 / 26.7 / 0.0	35.14	V / 1.00 / 180	-10.86*	n/a
140.0 MHz	49.4 Qp	1.0 / 9.26 / 26.02 / 0.0	33.65	V / 1.00 / 180	-9.85	n/a
335.998 MHz	46.3 Qp	1.57 / 14.27 / 26.7 / 0.0	35.44	V / 1.00 / 180	-10.56	n/a
224.0 MHz	54.0 Qp	1.28 / 11.1 / 26.3 / 0.0	40.08	V / 1.00 / 90	-5.92	n/a
308.002 MHz	44.25 Qp	1.5 / 13.9 / 26.62 / 0.0	33.03	V / 1.00 / 90	-12.97	n/a
308.002 MHz	41.9 Qp	1.5 / 13.9 / 26.62 / 0.0	30.68	V / 3.00 / 90	-15.32	n/a

Maxed 224 Mhz. No higher level noted.

89.702 MHz	51.6 Qp	0.8 / 7.74 / 25.84 / 0.0	34.3	H / 3.00 / 270	-9.2	n/a
89.702 MHz	49.8 Qp	0.8 / 7.74 / 25.84 / 0.0	32.5	H / 3.00 / 90	-11.0	n/a
308.002 MHz	48.3 Qp	1.5 / 13.9 / 26.62 / 0.0	37.08	H / 1.00 / 0	-8.92	n/a
224.0 MHz	54.35 Qp	1.28 / 11.1 / 26.3 / 0.0	40.43	H / 1.00 / 90	-5.57	n/a
289.439 MHz	35.9 Qp	1.5 / 13.17 / 26.53 / 0.0	24.04	H / 1.00 / 90	-21.96	n/a
290.206 MHz	35.5 Qp	1.5 / 13.21 / 26.54 / 0.0	23.68	H / 1.00 / 90	-22.32	n/a
308.002 MHz	54.85 Qp	1.5 / 13.9 / 26.62 / 0.0	43.63	H / 1.00 / 90	-2.37	n/a

Tested by: J. C. Sausen

Printed

Signature

Reviewed
by:

TKS

Printed

Signature

File No. WC404172.1 Rev2, Page A20 of A24

RADIATED EMISSIONS



Test Report #: WC404172 Run 2 Test Area: LTS
EUT Model #: OSU-2400-AV Date: 9/9/04
EUT Serial #: EUT Power: 60 Hz / 110 VAC Temperature: 22.0 °C
Test Method: FCC B Air Pressure: 99.0 kPa
Customer: NextNet Rel. Humidity: 48.0 %
EUT Description: ISM/MMDS Outdoor Customer Premise Equipment
Notes: EUT in transmit mode:
Data File Name: 4172.dat Page: 4 of 7

List of measurements for run #: 2

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC-B <1GHz 3m	DELTA2 FCC B >1GHz 3m
179.364 MHz	53.6 Qp	1.1 / 9.43 / 26.14 / 0.0	37.98	H / 1.00 / 180	-5.52	n/a
180.384 MHz	54.0 Qp	1.1 / 9.51 / 26.15 / 0.0	38.46	H / 1.00 / 180	-5.04	n/a
180.63 MHz	53.95 Qp	1.1 / 9.54 / 26.15 / 0.0	38.43	H / 1.00 / 180	-5.07	n/a
Maxed 308 MHz. No higher levels noted.						
Maxed 224 MHz. No higher levels noted.						
Maxed 180.6 MHz:						
180.63 MHz	53.15 Qp	1.1 / 9.54 / 26.15 / 0.0	37.63	H / 1.50 / 205	-5.87	n/a

Tested by: J. C. Sausen

Printed

J C Sausen

Signature

Reviewed
by: TKS

Printed

Thomas K. Sausen

Signature

File No. WC404172.1 Rev2, Page A21 of A24

RADIATED EMISSIONS



Test Report #: WC404172 Run 2 Test Area: LTS
EUT Model #: OSU-2400-AV Date: 9/9/04
EUT Serial #: EUT Power: 60 Hz / 110 VAC Temperature: 22.0 °C
Test Method: FCC B Air Pressure: 99.0 kPa
Customer: NextNet Rel. Humidity: 48.0 %
EUT Description: ISM/MMDS Outdoor Customer Premise Equipment
Notes: EUT in transmit mode:
Data File Name: 4172.dat Page: 5 of 7

Measurement summary for limit1: FCC-B <1GHz 3m (Qp)					
FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC-B <1GHz 3m
168.0 MHz	57.55 Qp	1.07 / 9.1 / 26.05 / 0.0	41.67	V / 1.00 / 10	-1.83
308.002 MHz	54.85 Qp	1.5 / 13.9 / 26.62 / 0.0	43.63	H / 1.00 / 90	-2.37
180.384 MHz	54.0 Qp	1.1 / 9.51 / 26.15 / 0.0	38.46	H / 1.00 / 180	-5.04
180.63 MHz	53.95 Qp	1.1 / 9.54 / 26.15 / 0.0	38.43	H / 1.00 / 180	-5.07
179.364 MHz	53.6 Qp	1.1 / 9.43 / 26.14 / 0.0	37.98	H / 1.00 / 180	-5.52
224.0 MHz	54.35 Qp	1.28 / 11.1 / 26.3 / 0.0	40.43	H / 1.00 / 90	-5.57
90.314 MHz	52.8 Qp	0.8 / 7.85 / 25.85 / 0.0	35.6	V / 1.00 / 270	-7.9
89.702 MHz	51.6 Qp	0.8 / 7.74 / 25.84 / 0.0	34.3	H / 3.00 / 270	-9.2
140.0 MHz	49.6 Qp	1.0 / 9.26 / 26.02 / 0.0	33.85	V / 1.00 / 10	-9.65
335.998 MHz	46.3 Qp	1.57 / 14.27 / 26.7 / 0.0	35.44	V / 1.00 / 180	-10.56
269.08 MHz	46.2 Qp	1.45 / 12.41 / 26.43 / 0.0	33.63	V / 1.00 / 180	-12.37
269.374 MHz	46.05 Qp	1.45 / 12.4 / 26.43 / 0.0	33.47	V / 1.00 / 180	-12.53
270.994 MHz	44.8 Qp	1.46 / 12.4 / 26.44 / 0.0	32.22	V / 1.00 / 180	-13.78
217.319 MHz	41.7 Qp	1.24 / 11.0 / 26.3 / 0.0	27.64	V / 1.00 / 10	-18.36
289.439 MHz	35.9 Qp	1.5 / 13.17 / 26.53 / 0.0	24.04	H / 1.00 / 90	-21.96
290.206 MHz	35.5 Qp	1.5 / 13.21 / 26.54 / 0.0	23.68	H / 1.00 / 90	-22.32
335.998 MHz	46.0 Pk	1.57 / 14.27 / 26.7 / 0.0	35.14	V / 1.00 / 180	-10.86*

Tested by: J. C. Sausen

Printed

Signature

Reviewed
by: TKS

Printed

Signature

File No. WC404172.1 Rev2, Page A22 of A24

RADIATED EMISSIONS



Test Report #: WC404172 Run 2 Test Area: LTS
EUT Model #: OSU-2400-AV Date: 9/9/04
EUT Serial #: EUT Power: 60 Hz / 110 VAC Temperature: 22.0 °C
Test Method: FCC B Air Pressure: 99.0 kPa
Customer: NextNet Rel. Humidity: 48.0 %
EUT Description: ISM/MMDS Outdoor Customer Premise Equipment
Notes: EUT in transmit mode:
Data File Name: 4172.dat Page: 6 of 7

Measurement summary for limit2: FCC B >1GHz 3m (Av)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA2 FCC B >1GHz 3m
4.808 GHz	53.85 Pk	6.33 / 34.56 / 44.11 / 0.79	51.42	H / 1.00 / 180	-2.58*
7.212 GHz	49.25 Pk	8.1 / 37.22 / 44.1 / 0.58	51.06	V / 1.00 / 180	-2.94*
4.88 GHz	45.0 Pk	6.39 / 34.76 / 44.04 / 0.38	42.49	H / 1.00 / 0	-11.51*
7.32 GHz	41.95 Pk	8.1 / 37.44 / 44.06 / 0.63	44.06	V / 1.00 / 0	-9.94*
4.952 GHz	39.55 Pk	6.46 / 34.97 / 44.0 / 0.4	37.37	V / 1.00 / 0	-16.63*
7.428 GHz	40.25 Pk	8.12 / 37.66 / 44.01 / 0.67	42.68	V / 1.00 / 0	-11.32*
5.186 GHz	51.0 Pk	6.61 / 35.4 / 44.0 / 0.47	49.48	V / 1.00 / 0	-4.52*
7.779 GHz	43.4 Pk	8.25 / 37.63 / 43.71 / 0.7	46.27	H / 1.00 / 0	-7.73*

Tested by: J. C. Sausen

Printed

Signature

Reviewed
by: TKS

Printed

Signature

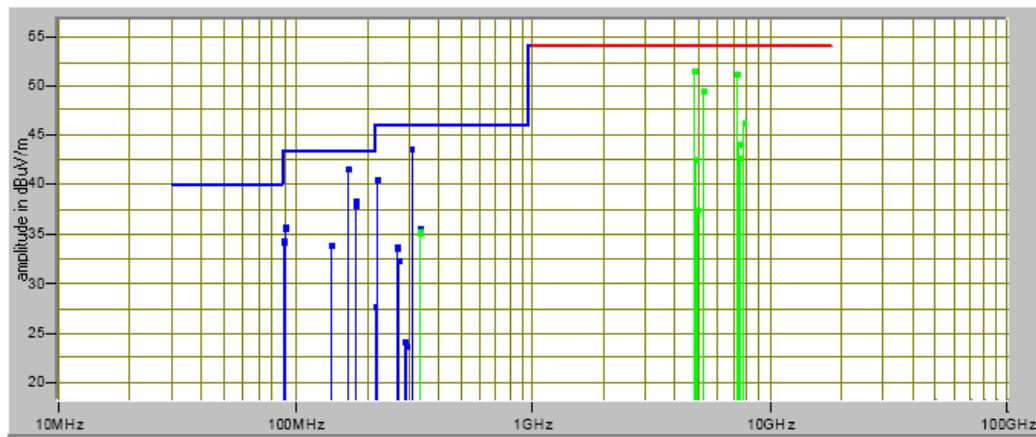
File No. WC404172.1 Rev2, Page A23 of A24

RADIATED EMISSIONS



Test Report #: WC404172 Run 2 Test Area: LTS
EUT Model #: OSU-2400-AV Date: 9/9/04
EUT Serial #: EUT Power: 60 Hz / 110 VAC Temperature: 22.0 °C
Test Method: FCC B Air Pressure: 99.0 kPa
Customer: NextNet Rel. Humidity: 48.0 %
EUT Description: ISM/MMDS Outdoor Customer Premise Equipment
Notes: EUT in transmit mode:
Data File Name: 4172.dat Page: 7 of 7

Graph:



Tested by: J. C. Sausen

Printed

Signature

Reviewed
by: TKS

Printed

Signature

File No. WC404172.1 Rev2, Page A24 of A24



Appendix C

MEASUREMENT PROTOCOL

GENERAL INFORMATION

Test Methodology

Conducted and radiated emission testing is performed according to the procedures in ANSI C63.4-2001.

Measurement Uncertainty

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. These test systems have a measurement uncertainty of ± 4.8 dB. The equipment comprising the test systems are calibrated on an annual basis.

Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into its characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

CONDUCTED EMISSIONS

The final level, expressed in dB μ V, is arrived at by taking the reading directly from the EMI receiver. This level is compared directly to the FCC limit.

To convert between dB μ V and μ V, the following conversions apply:

$$\text{dB}\mu\text{V} = 20(\log \mu\text{V})$$

$$\mu\text{V} = \text{Inverse log}(\text{dB}\mu\text{V}/20)$$

RADIATED EMISSIONS

The final level, expressed in dB μ V/m, is arrived at by taking the reading from the spectrum analyzer (Level dB μ V), adding the antenna correction factor and cable loss factor (Factor dB) to it, then subtracting the preamp gain. This result then has the FCC limit subtracted from it to provide the Delta which gives the tabular data as shown in the data sheets in Attachment A.

Example:

FREQ (MHz)	LEVEL (dB μ V)	CABLE/ANT/PREAMP (dB)	FINAL (dB μ V/m)	POL/HGT/AZ (m) (deg)	DELTA1 FCC
60.80	42.5Qp	+ 1.2 + 10.9 - 25.5 =	29.1	V 1.0 0.0	-10.9

File No. WC404172.1 Rev2, Page C1 of C2

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0



DETAILS OF TEST PROCEDURES

General Standard Information

The test methods used comply with ANSI C63.4-2001 - "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz."

Conducted Emissions

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EUT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection, and a Line Impedance Stabilization Network (LISN), with 50 Ω/50 μH (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeters above the floor and is positioned 40 centimeters from the vertical ground plane (wall) of the screen room. In some cases, a pre-scan using a spectrum analyzer is initially performed on the units comprising the system under test to locate the highest emissions. If the minimum passing margin appears to be less than 20 dB with a peak mode measurement, the emissions are re-measured using a tuned receiver or spectrum analyzer with quasi-peak and average detection and recorded on the data sheets.

Radiated Emissions

Radiated emissions from the EUT are measured in the frequency range of 30 to 26000 MHz using a spectrum analyzer and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and peak detection. Table top equipment is placed on a 1.0 X 1.5 meter non-conducting table 80 centimeters above the ground plane. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna is positioned 3, 10 or 30 meters horizontally from the EUT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT are rotated 360 degrees. The transmitter is rotated through 3 orthogonal axes in order to determine the maximum emission levels.

File No. WC404172.1 Rev2, Page C2 of C2

TÜV PRODUCT SERVICE INC 19333 Wild Mountain Road Taylors Falls MN 55084-1758 Tel: 651 638 0297 Fax: 651 638 0298 Rev.No 1.0