WATCHGUARD TECHNOLOGIES, INC. TEST REPORT

FOR THE

INTERNET FIREWALL, XP2E6W

**FCC PART 15 SUBPART C SECTIONS 15.247, 15.207 & 15.209,
SUBPART B SECTIONS 15.107 & 15.109 CLASS B,
SUBPART B SECTION 15.109 CLASS A (DIGITAL) AND RSS-210**

COMPLIANCE

DATE OF ISSUE: NOVEMBER 11, 2005

PREPARED FOR:

Watchguard Technologies, Inc.
505 Fifth Avenue South, Suite 500
Seattle, WA 98104-3892

PREPARED BY:

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CKC Laboratories, Inc.
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P.O. No.: 251470
W.O. No.: 83764

Date of test: October 4 - November 10, 2005

Report No.: FC05-069

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	October 4 - November 10, 2005
DATE OF RECEIPT:	October 4, 2005
MANUFACTURER:	Watchguard Technologies, Inc. 505 Fifth Avenue South, Suite 500 Seattle, WA 98104-3892
REPRESENTATIVE:	George Stults
TEST LOCATION:	CKC Laboratories, Inc. 5046 Sierra Pines Drive Mariposa, CA 95338
TEST METHOD:	ANSI C63.4 (2003), DA 02-2138 August 30, 2002, DA 00-705 March 30, 2000, KDB Publication No. 558074, RSS GEN and RSS-212
PURPOSE OF TEST:	To demonstrate the compliance of the Internet Firewall, XP2E6W, with the requirements for FCC Part 15 Subpart C Sections 15.247, 15.207, 15.209, Subpart B 15.107 and 15.109 Class B, Subpart B Section 15.109 Class A (Digital) and RSS-210 devices.

FCC TO CANADA STANDARD CORRELATION MATRIX

Canadian Standard	Canadian Section	FCC Standard	FCC Section	Test Description
RSS GEN	7.1.4	47CFR	15.203	Antenna Connector Requirements
RSS GEN	7.2.1	47CFR	15.35(c)	Pulsed Operation
RSS GEN	7.2.2	47CFR	15.207	AC Mains Conducted Emissions Requirement
RSS 210	2.1	47CFR	15.215(c)	Frequency Stability Recommendation
RSS 210	2.2	47CFR	15.205	Restricted Bands of Operation
RSS 210	2.6	47CFR	15.209	General Radiated Emissions Requirement
RSS 210	A8.2(1)	47CFR	15.247(a)(2)	Minimum 6dB Bandwidth
RSS 210	A8.2(2)	47CFR	15.247(e)	Peak Power Spectral Density
RSS 210	A8.4(4)	47CFR	15.247(b)(3)	RF Power Output
RSS 210	A8.4(5)	47CFR	15.247(c)(1)	Directional Gain Requirements
RSS 210	A8.4(6)	47CFR	15.247(c)(2)	Beam Steering Antennas
RSS 210	A8.5	47CFR	15.247(d)	Spurious Emissions
	IC 3082-D		784962	Site File No.

Notes: Rule Sections for RSS 210 are taken from RSS 210 Issue 6

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply.

APPROVALS

Steve Behm, Director of Engineering Services

QUALITY ASSURANCE:

Joyce Walker, Quality Assurance Administrative Manager

TEST PERSONNEL:

Mike Wilkinson, Lab Manager

Randy Clark, EMC Engineer

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The customer declares the EUT tested by CKC Laboratories was representative of a production unit.

FCC 15.31(e) Voltage Variations
No detectable change.

FCC 15.31(m) Number Of Channels
This device was tested on three channels.

FCC 15.33(a) Frequency Ranges Tested
15.107 Conducted Emissions: 150 kHz – 30 MHz
15.109 Radiated Emissions: 30 MHz – 12.5 GHz
15.207 Conducted Emissions: 150 kHz – 30 MHz
15.209/15.247 Radiated Emissions: 9 kHz – 26 GHz

FCC SECTION 15.35: ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	26 GHz	1 MHz

FCC 15.203 Antenna Requirements
The antenna has a reverse polarity SMA connector; therefore the EUT complies with Section 15.203 of the FCC rules.

FCC 15.205 Restricted Bands
The fundamental operating frequency lies outside the restricted bands and therefore complies with the requirements of Section 15.205 of the FCC rules. Any spurious emission coming from the EUT was investigated to determine if any portion lies inside the restricted band. If any portion of a spurious emissions signal was found to be within a restricted band, investigation was performed to ensure compliance with Section 15.209.

EUT Operating Frequency
The EUT was operating at 2412MHz – 2462MHz.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The customer declares the EUT tested by CKC Laboratories was representative of a production unit.

EQUIPMENT UNDER TEST

AC Adapter for EUT
Manuf: Globtek
Model: GT-41052-1512
Serial: NA

AC Adapter for EUT
Manuf: Leader Electronics Inc.
Model: 1415-2120125-WP
Serial: NA

Internet Firewall
Manuf: WatchGuard Technologies, Inc.
Model: XP2E6W
Serial: 100405-001

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

Host PC
Manuf: Toshiba
Model: PT810U
Serial: 60748626U

Internet Firewall
Manuf: WatchGuard Technologies, Inc.
Model: R6264S
Serial: 808005596-6641

Internet Firewall
Manuf: WatchGuard Technologies, Inc.
Model: MF16S32E10
Serial: 706600207-AD99

AC Adapter for Host PC
Manuf: Toshiba
Model: PA2444U
Serial: 1359480

Internet Firewall
Manuf: WatchGuard Technologies, Inc.
Model: MF16S32E10
Serial: 706600002-6EF8

Internet Firewall
Manuf: WatchGuard Technologies, Inc.
Model: MF16S32E10
Serial: 110

Laptop PC

Manuf:	Toshiba
Model:	PA1230U XCD
Serial:	02792218-3

Laptop PC

Manuf:	Dell
Model:	D600
Serial:	79GSC51

USB/Wireless Network Adapter

Manuf:	Linksys
Model:	WUSB54GS
Serial:	MI0004C09761

REPORT OF MEASUREMENTS

The following tables report the six highest worst case levels recorded during the tests performed on the EUT. All readings taken are peak readings unless otherwise noted. The data sheets from which these tables were compiled are contained in Appendix C.

Table 1: FCC 15.107 Six Highest Conducted Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Cable dB	Lisn dB	HPF dB	Att dB	CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
0.190724	37.5	0.1	0.3	0.2	10.2	48.3	54.0	-5.7	W-G
2.118999	27.1	0.2	0.4	0.1	10.3	38.1	46.0	-7.9	B-L
2.416690	27.5	0.3	0.4	0.1	10.3	38.6	46.0	-7.4	B-G
2.450712	29.8	0.3	0.3	0.1	10.3	40.8	46.0	-5.2	B-G
2.552777	28.1	0.3	0.3	0.1	10.3	39.1	46.0	-6.9	B-G
2.654843	27.0	0.3	0.3	0.1	10.3	38.0	46.0	-8.0	W-G

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart B Section 15.107 Class B

NOTES: B = Black Lead
W = White Lead
G = Globetek Power Supply
L = Leader Power Supply

COMMENTS: EUT is a wireless Firewall with VPN support. The EUT is running Montavista Linux. The EUT wireless card is pinging uni-directionally via 802.11b (11 Mb/sec) to an external Dell D600 Support PC using a Linksys wireless usb adapter. A Toshiba 8100 is connected using shielded serial cable to the EUT serial port at 115k to initialize the unit as needed and monitor ping status. All 6 EUT wan/Lan ports are pinging bi-directionally to external support PC's via UTP Cat 5 ethernet cables. Three ethernet cables are going to three separate WatchGuard FB X Edge units, and three ethernet cables are going to a single WatchGuard X2 unit. EUT Operational Mode: 802.11b @ 11MBs. Frequency Range Investigated: 150 kHz to 30 MHz. Temperature: 65ºF, Relative Humidity: 32%.

Table 2: FCC 15.109 Six Highest Radiated Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
125.018	48.3	11.2	-26.7	2.5		35.3	43.5	-8.2	V
200.443	52.9	8.3	-26.5	3.3		38.0	43.5	-5.5	V
324.898	49.1	13.5	-26.4	4.3		40.5	46.0	-5.5	V
375.044	46.5	14.8	-26.7	4.8		39.4	46.0	-6.6	H
1170.050	50.7	24.7	-35.7	6.8		46.5	54.0	-7.5	V
1320.005	51.1	25.2	-35.5	7.3		48.1	54.0	-5.9	V

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart B Section 15.109 Class B
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: EUT is a wireless Firewall with VPN support. The EUT is running Montavista Linux. The EUT wireless card is pinging uni-directionally via 802.11b (11 Mb/sec) to an external Dell D600 Support PC using a Linksys wireless usb adapter. A Toshiba 8100 is connected using shielded serial cable to the EUT serial port at 115k to initialize the unit as needed and monitor ping status. All 6 EUT wan/Lan ports are pinging bi-directionally to external support PC's via UTP Cat 5 ethernet cables. Three ethernet cables are going to three separate WatchGuard FB X Edge units, and three ethernet cables are going to a single WatchGuard X2 unit. EUT Operational Mode: 802.11b Rx. Frequency Range Investigated: 30 MHz to 12.5 GHz. Temperature: 65°F, Relative Humidity: 32%.

Table 3: FCC 15.109 Six Highest Digital Radiated Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
47.817	57.1	8.9	-26.8	1.6	-10.0	30.8	39.1	-8.3	V
55.325	57.0	7.1	-26.8	1.7	-10.0	29.0	39.1	-10.1	V
200.443	52.9	8.3	-26.5	3.3	-10.0	28.0	43.5	-15.5	V
324.898	49.1	13.5	-26.4	4.3	-10.0	30.5	46.4	-15.9	V
1319.950	52.7	25.2	-35.5	7.3	-10.0	39.7	49.5	-9.8	V
1584.022	48.4	26.2	-35.2	8.0	-10.0	37.4	49.5	-12.1	V

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart B Section 15.109 Class A
Test Distance: 3 Meters

NOTES: V = Vertical Polarization

COMMENTS: EUT is a wireless Firewall with VPN support. The EUT is running Montavista Linux. The EUT wireless card is pinging uni-directionally via 802.11b (11 Mb/sec) to an external Dell D600 Support PC using a Linksys wireless usb adapter. A Toshiba 8100 is connected using shielded serial cable to the EUT serial port at 115k to initialize the unit as needed and monitor ping status. All 6 EUT wan/Lan ports are pinging bi-directionally to external support PC's via UTP Cat 5 ethernet cables. Three ethernet cables are going to three separate WatchGuard FB X Edge units, and three ethernet cables are going to a single WatchGuard X2 unit. EUT Operational Mode: 802.11b @ 11MBs. Rx. Frequency Range Investigated: 30 MHz to 2.0 GHz. Highest frequency used or generated is 266 MHz. Temperature: 65°F, Relative Humidity: 32%. All readings are with Globtek supply - Verified that the Globtek was worst case over the Leader supply.

Table 4: FCC 15.207 Six Highest Conducted Emission Levels

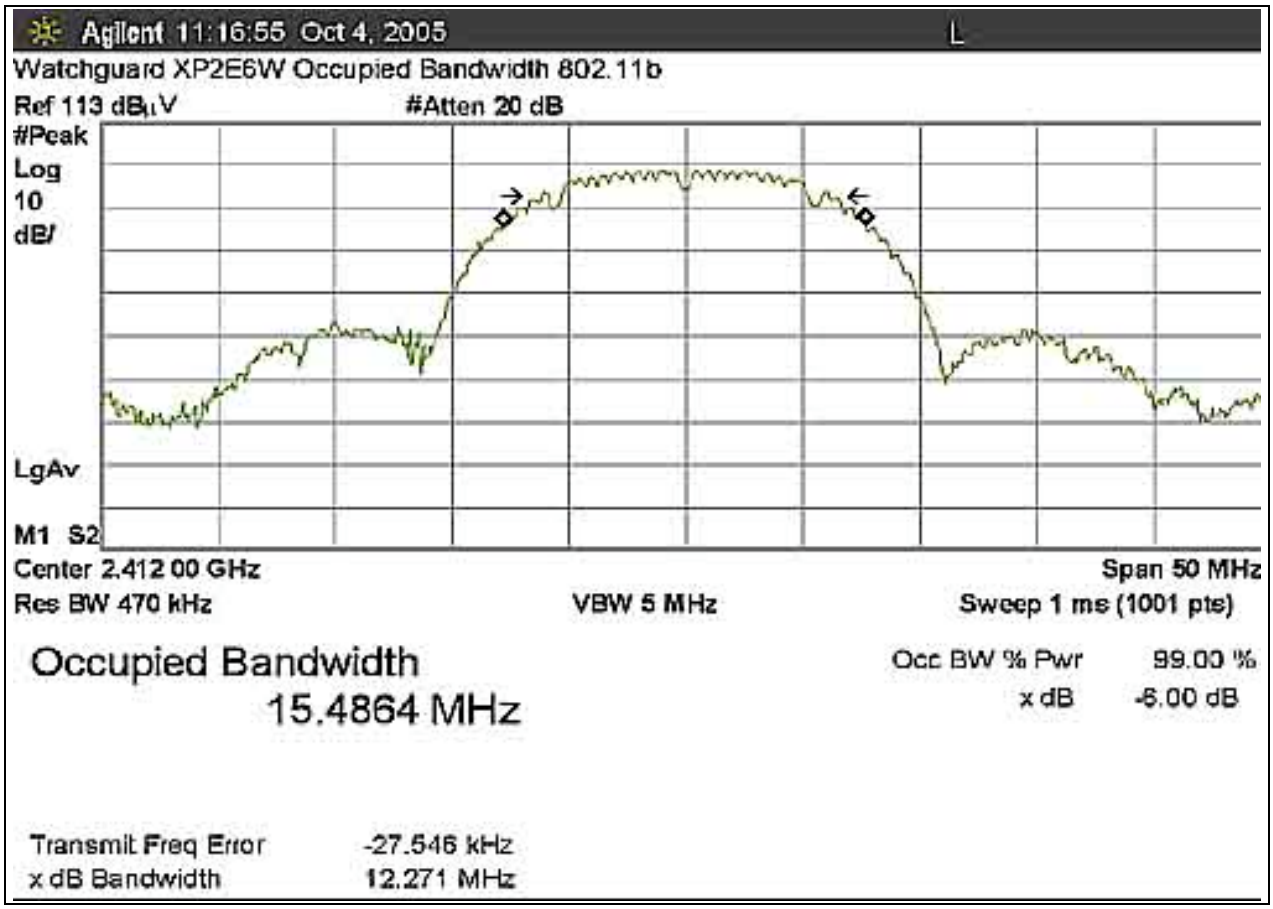
FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Cable dB	Lisn dB	HPF dB	Att dB	CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
0.190724	37.5	0.1	0.3	0.2	10.2	48.3	54.0	-5.7	W-G
2.118999	27.1	0.2	0.4	0.1	10.3	38.1	46.0	-7.9	B-L
2.416690	27.5	0.3	0.4	0.1	10.3	38.6	46.0	-7.4	B-G
2.450712	29.8	0.3	0.3	0.1	10.3	40.8	46.0	-5.2	B-G
2.552777	28.1	0.3	0.3	0.1	10.3	39.1	46.0	-6.9	B-G
2.654843	27.0	0.3	0.3	0.1	10.3	38.0	46.0	-8.0	W-G

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart C Section 15.207

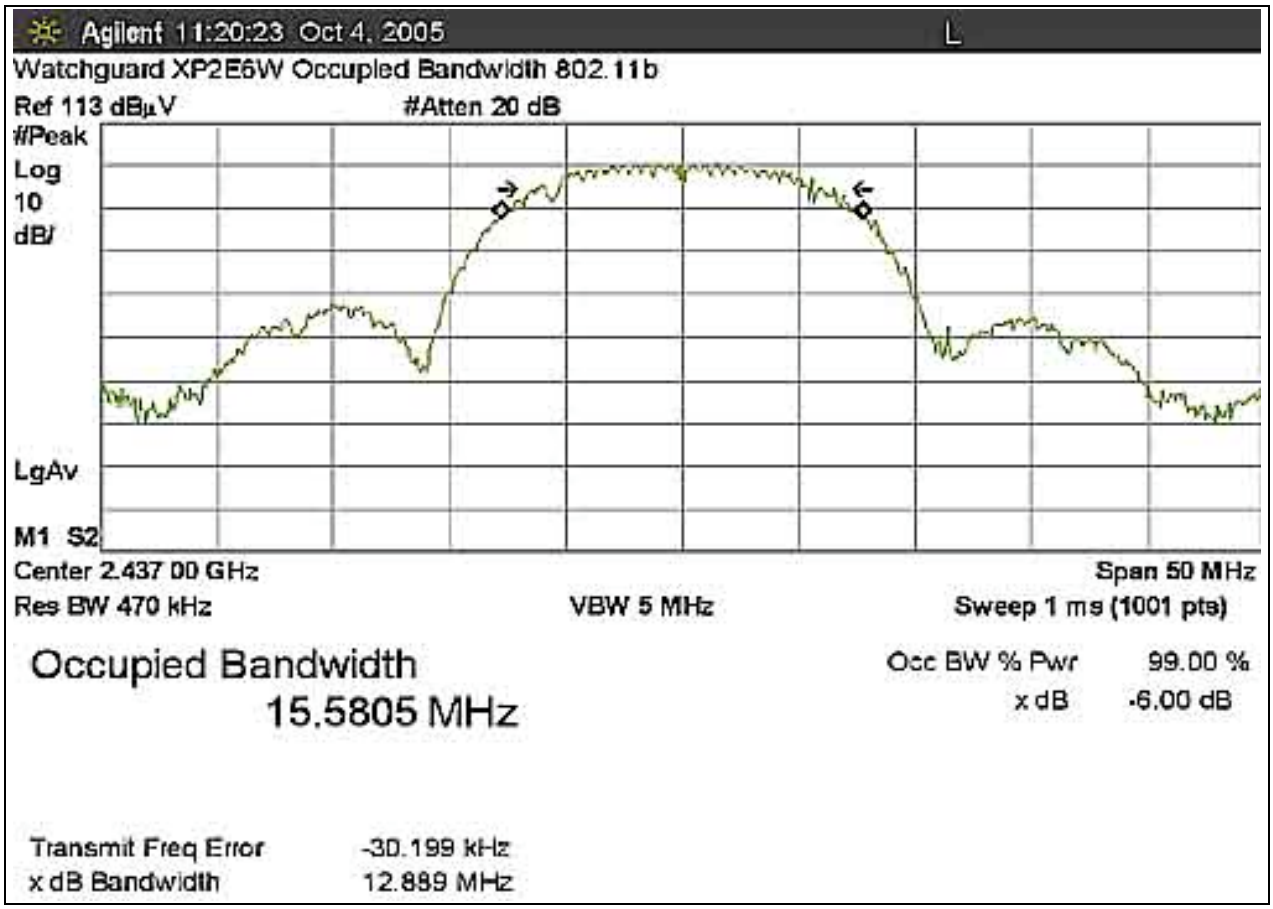
NOTES: B = Black Lead
W = White Lead
G = Globetek Power Supply
L = Leader Power Supply

COMMENTS: EUT is a wireless Firewall with VPN support. The EUT is running Montavista Linux. The EUT wireless card is pinging uni-directionally via 802.11b (11 Mb/sec) to an external Dell D600 Support PC using a Linksys wireless usb adapter. A Toshiba 8100 is connected using shielded serial cable to the EUT serial port at 115k to initialize the unit as needed and monitor ping status. All 6 EUT wan/Lan ports are pinging bi-directionally to external support PC's via UTP Cat 5 ethernet cables. Three ethernet cables are going to three separate WatchGuard FB X Edge units, and three ethernet cables are going to a single WatchGuard X2 unit. EUT Operational Mode: 802.11b @ 11MBs. Low Channel = 2412 MHz. Frequency Range Investigated: 150 kHz to 30 MHz. Temperature: 65ºF, Relative Humidity: 32%.

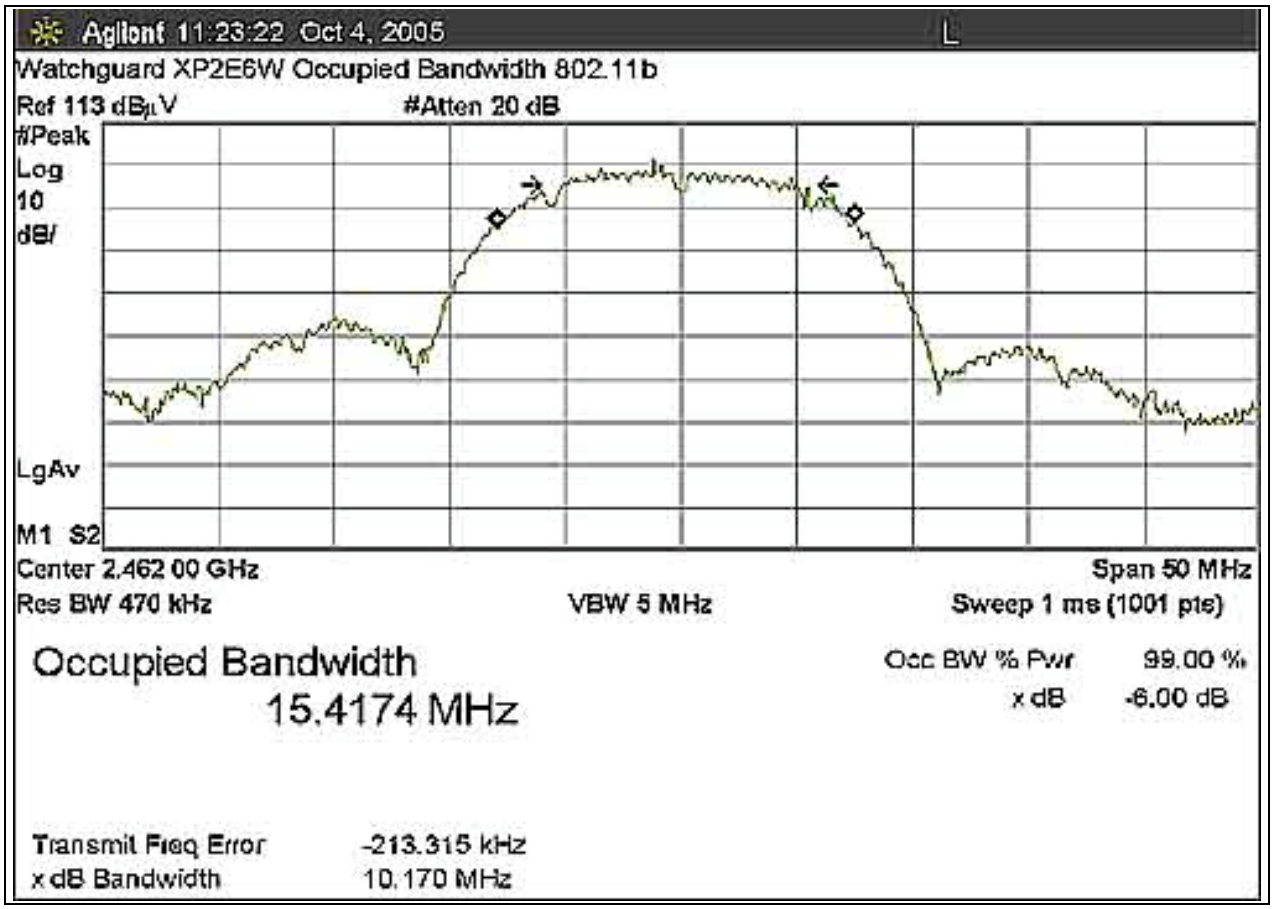
FCC 15.247(a)(2) OCCUPIED BANDWIDTH 6dB LOW 802.11b



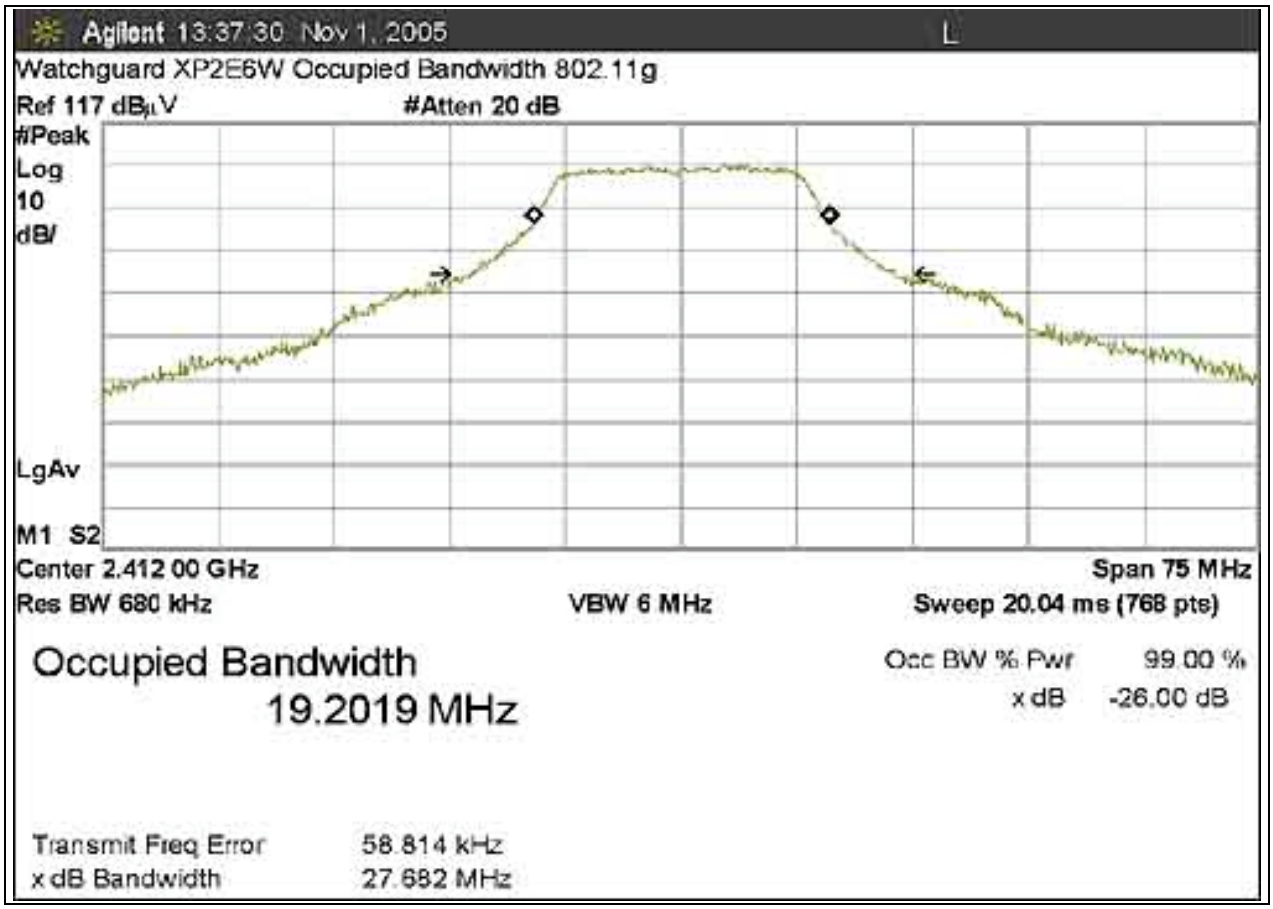
FCC 15.247(a)(2) OCCUPIED BANDWIDTH 6dB MID 802.11b



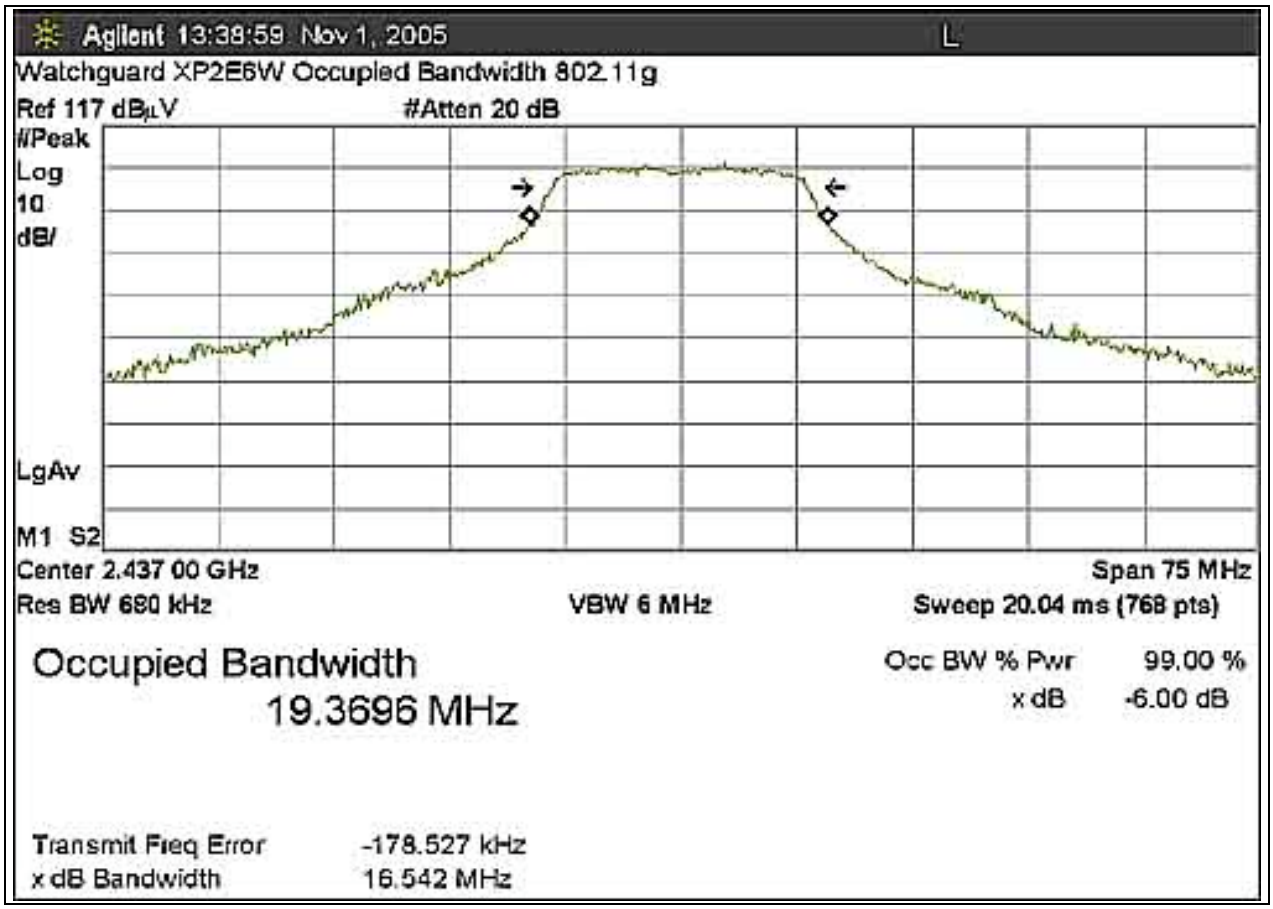
FCC 15.247(a)(2) OCCUPIED BANDWIDTH 6dB HIGH 802.11b



FCC 15.247(a)(2) OCCUPIED BANDWIDTH 6dB LOW 802.11g



FCC 15.247(a)(2) OCCUPIED BANDWIDTH 6dB MID 802.11g



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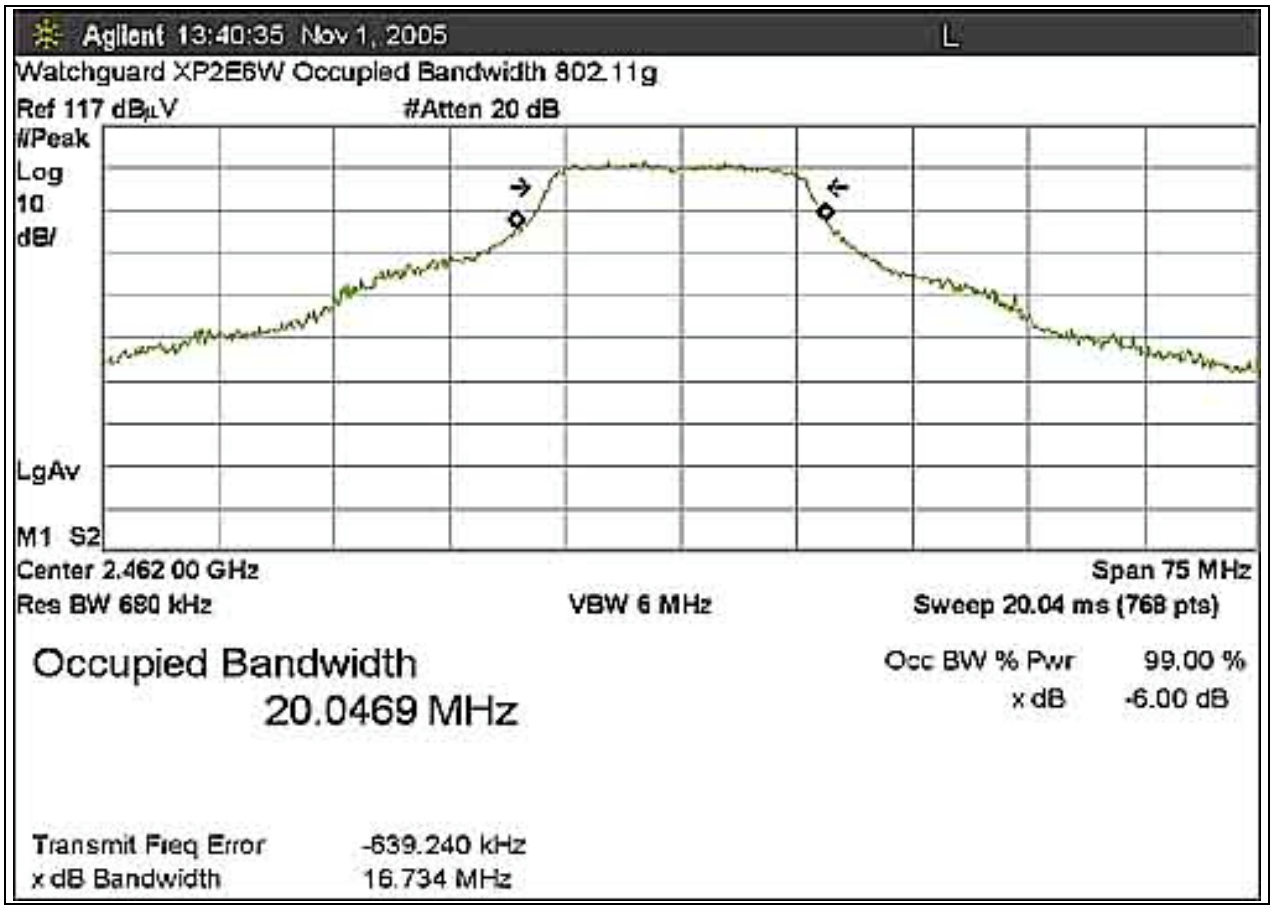

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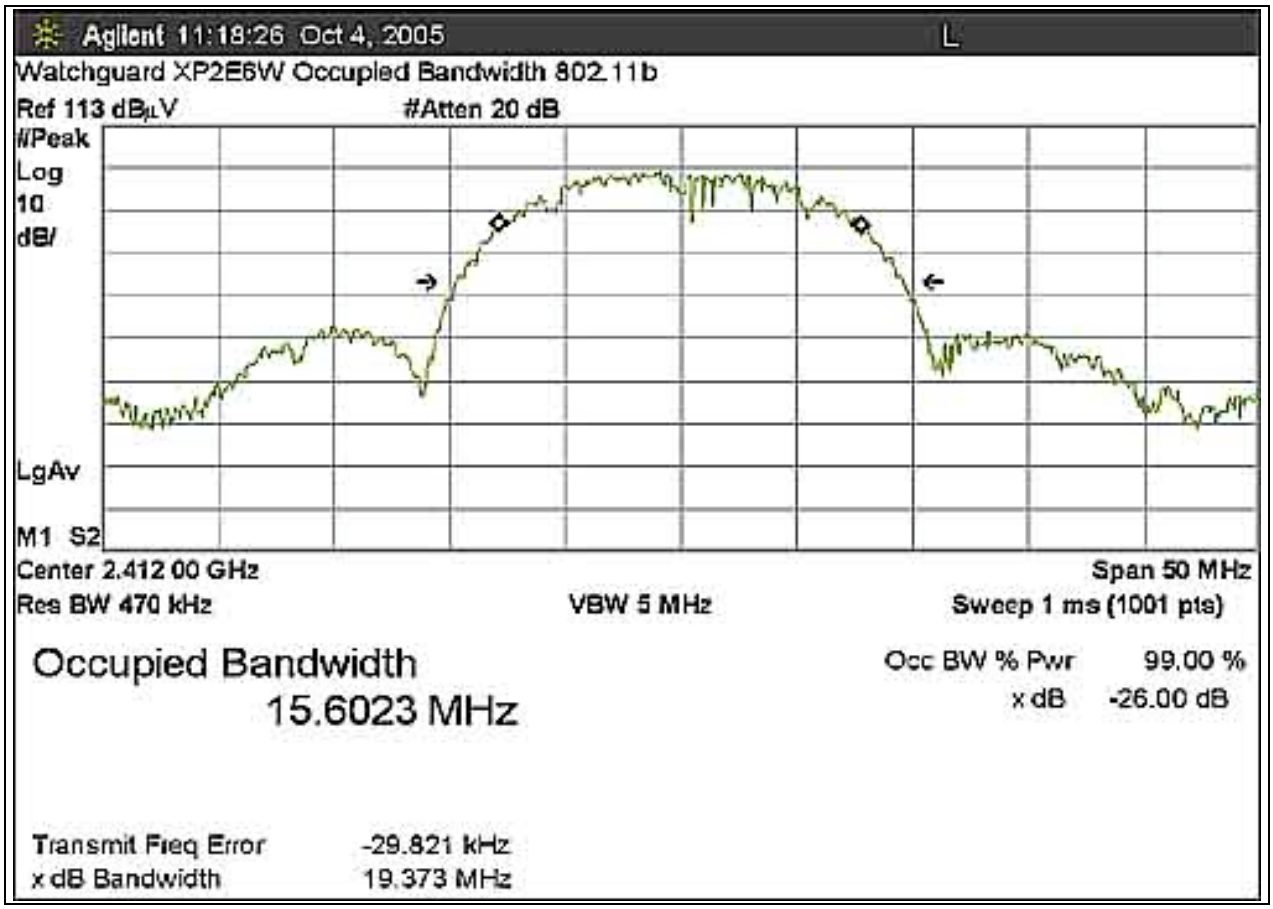
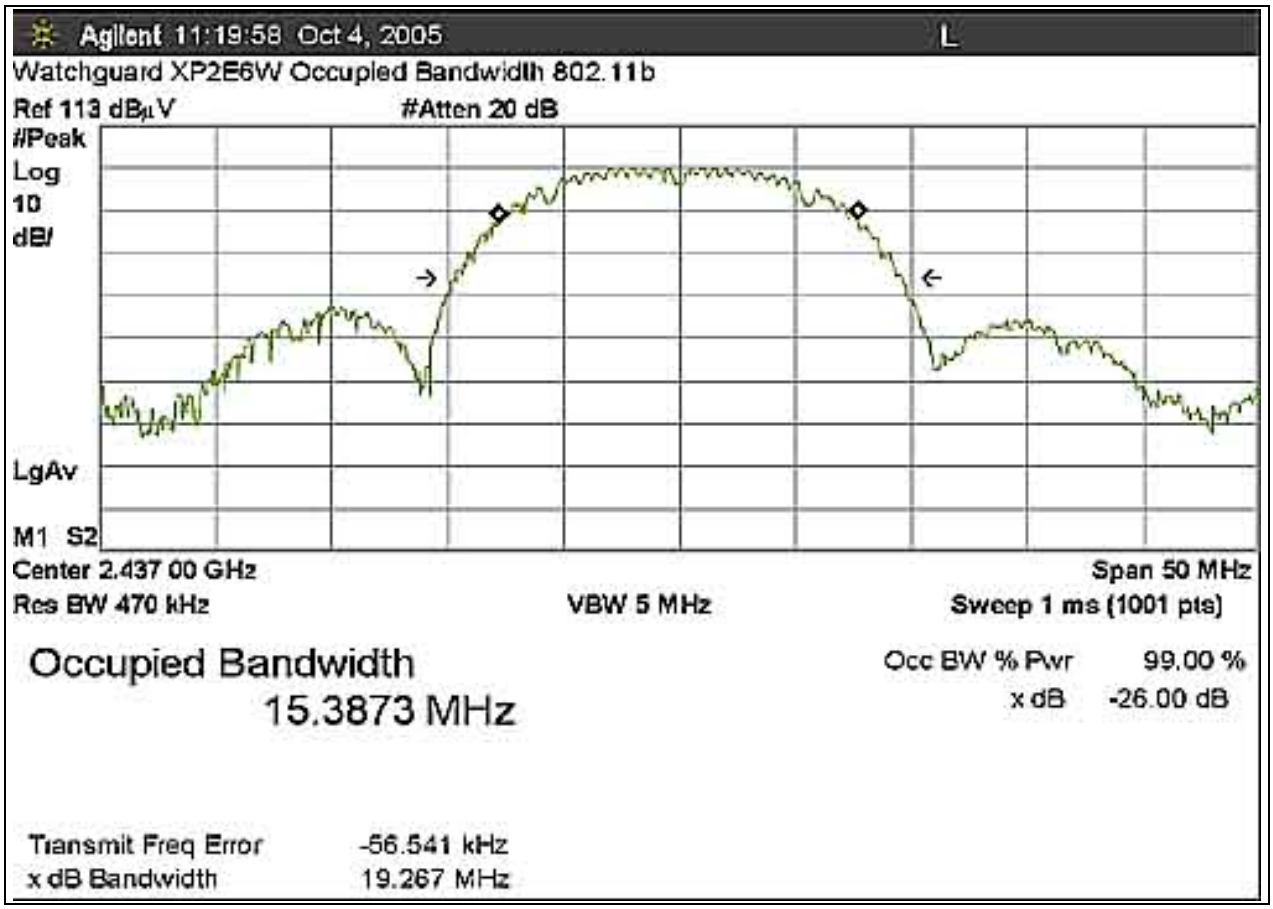
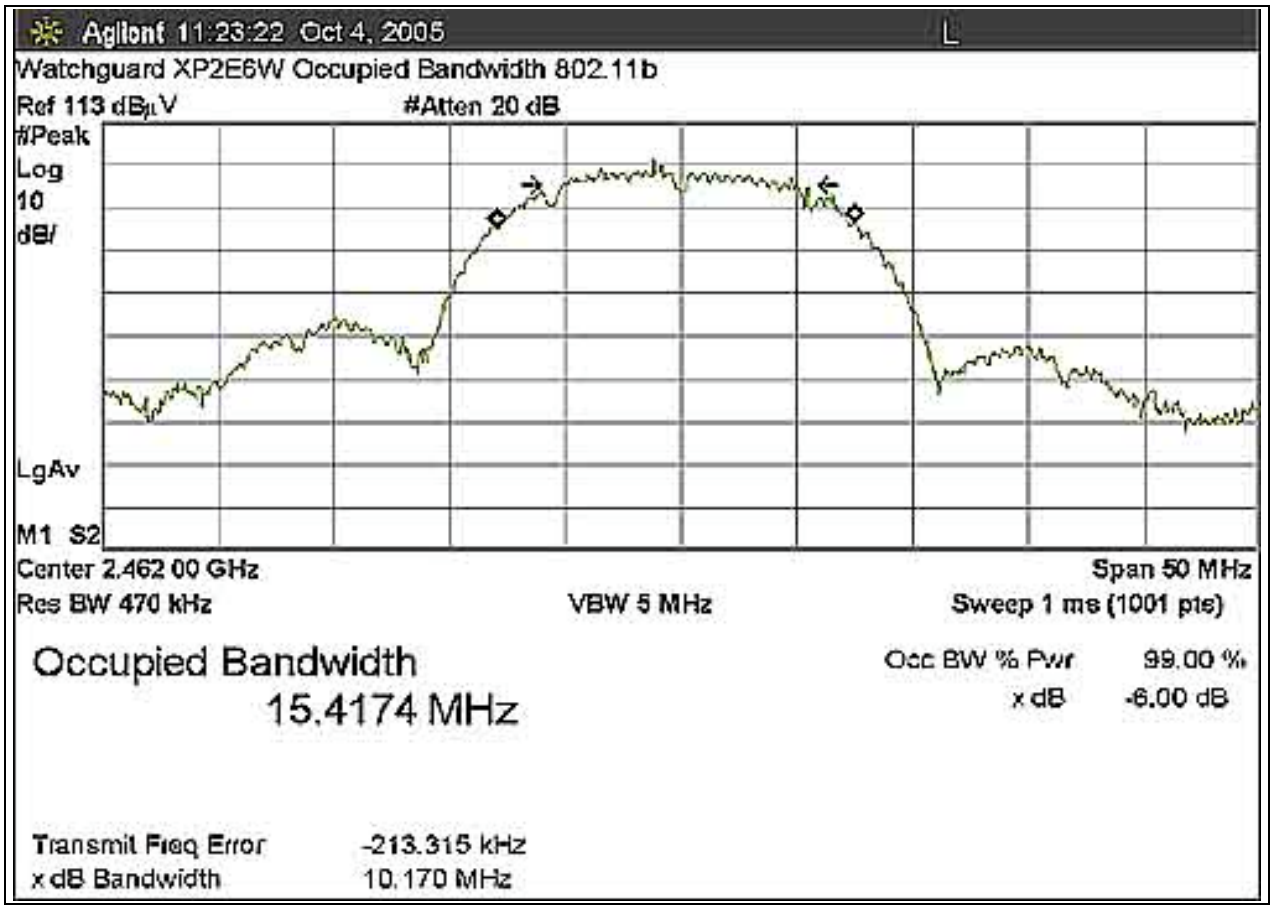


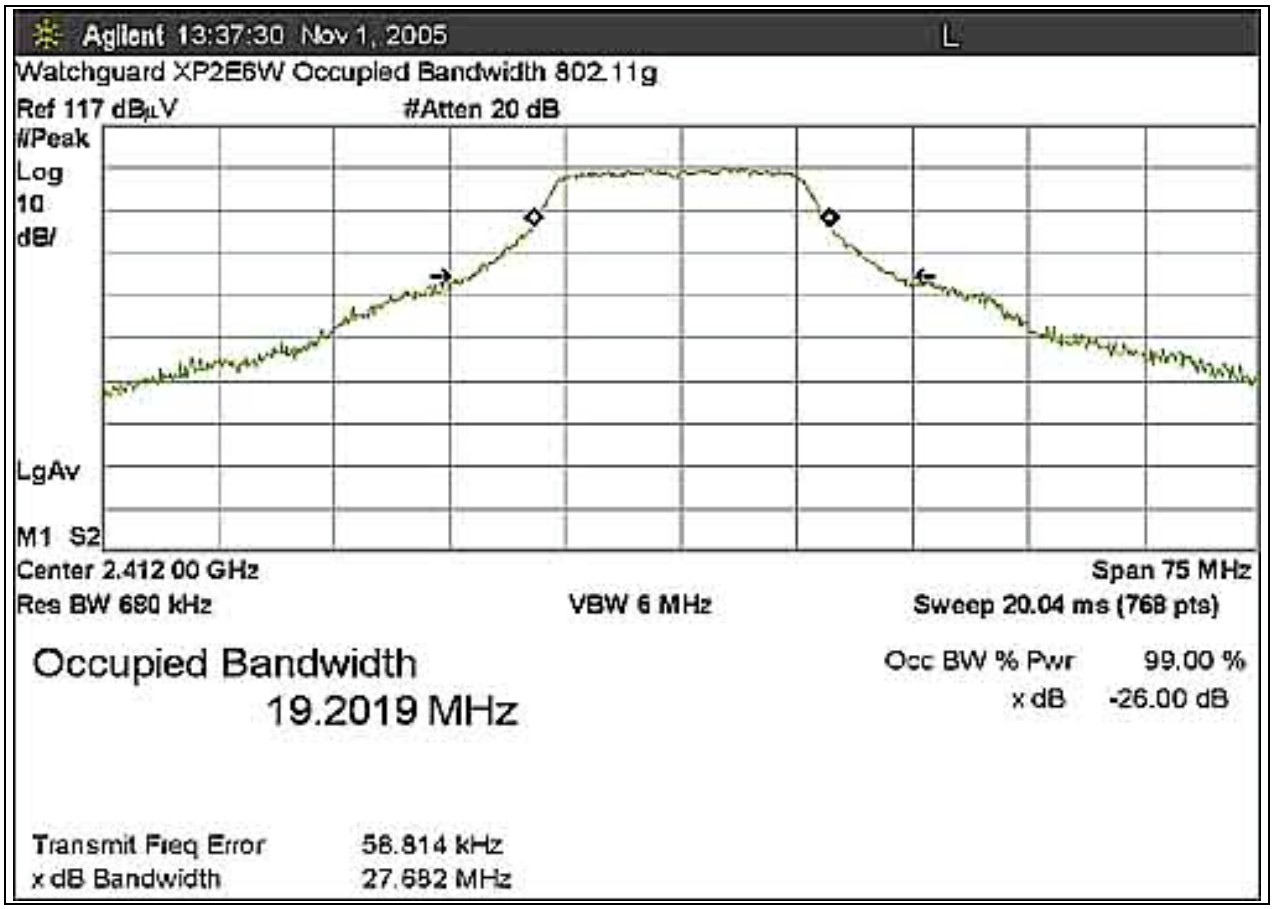
FCC 15.247(a)(2) OCCUPIED BANDWIDTH 26dB MID 802.11b



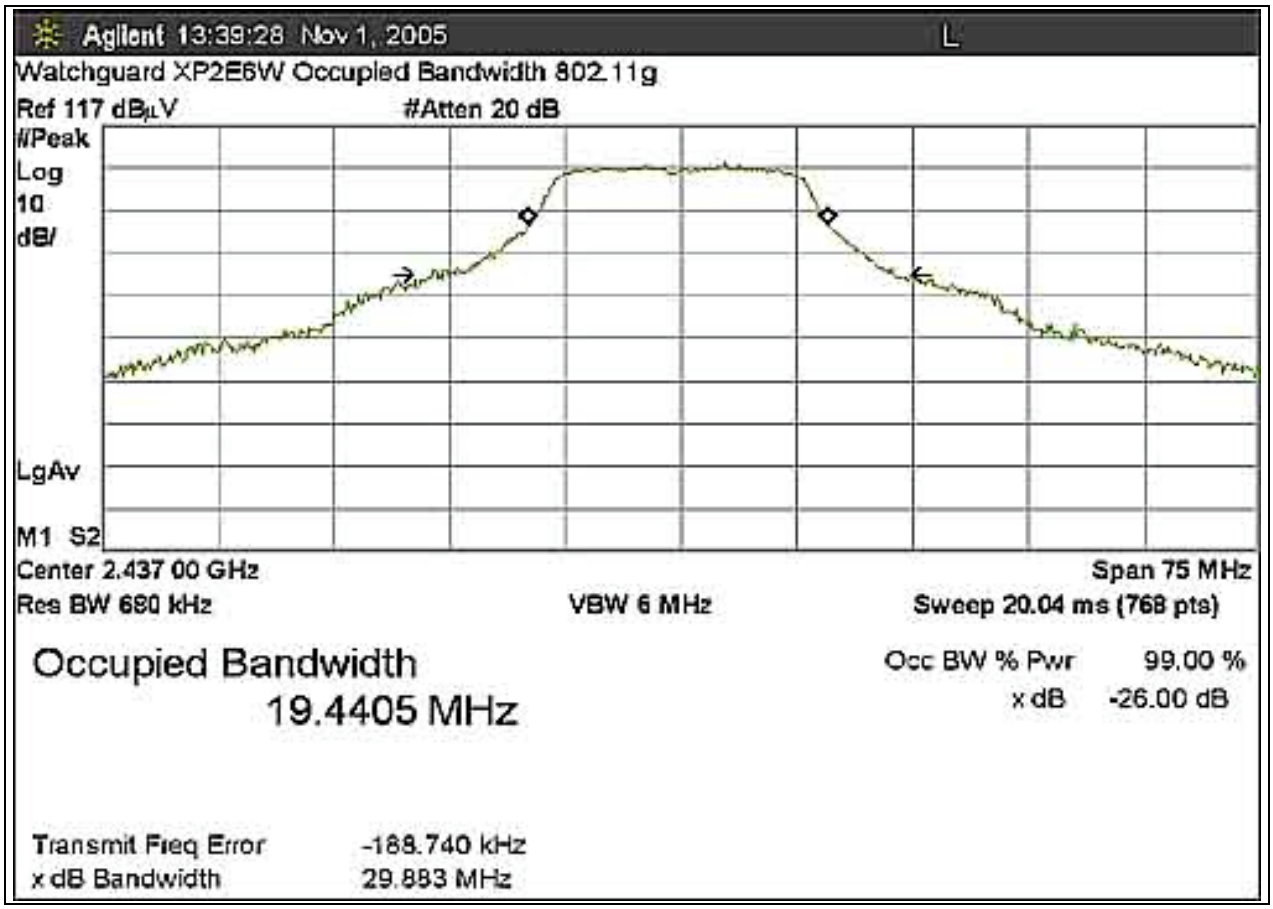
FCC 15.247(a)(2) OCCUPIED BANDWIDTH 26dB HIGH 802.11b



FCC 15.247(a)(2) OCCUPIED BANDWIDTH 26dB LOW 802.11g



FCC 15.247(a)(2) OCCUPIED BANDWIDTH 26dB MID 802.11g



FCC 15.247(a)(2) OCCUPIED BANDWIDTH 26dB HIGH 802.11g

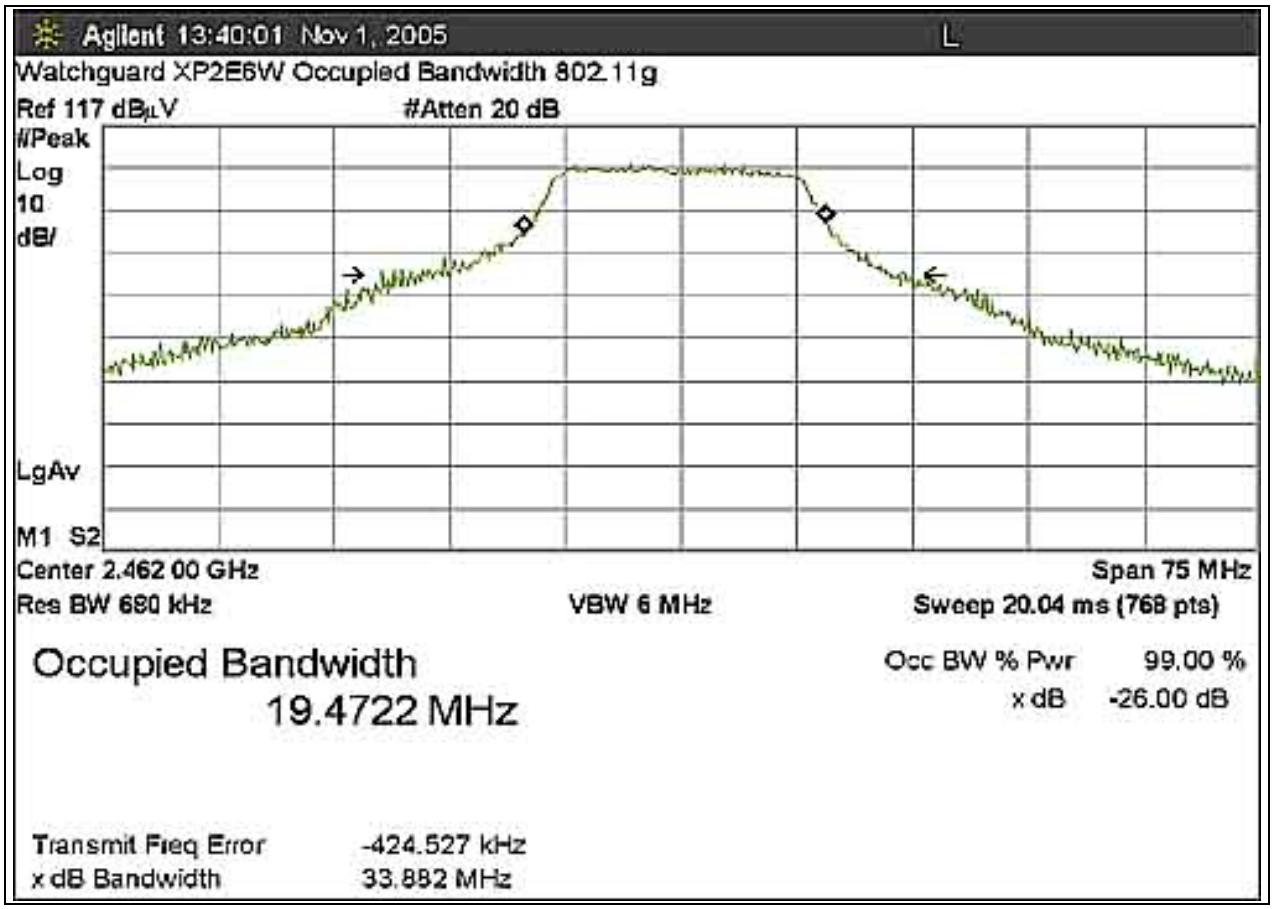


Table 5: FCC 15.247(b)(2) RF Power Output									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Att dB	Cable dB	Corr dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
2412.000	119.8	10.0	1.0	5.3		136.1	137.0	-0.9	R-g
2412.000	118.4	10.0	1.0	2.9		132.3	137.0	-4.7	R-b
2437.000	119.9	10.0	1.0	5.3		136.2	137.0	-0.8	R-g
2437.000	119.1	10.0	1.0	2.9		133.0	137.0	-4.0	R-b
2462.000	120.1	10.0	1.0	5.3		136.4	137.0	-0.6	R-g
2462.000	118.1	10.0	1.0	2.9		132.0	137.0	-5.0	R-b

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart C Sections 15.247(b)(3)

NOTES: R = RF Output
b = 802.11b
g = 802.11g

COMMENTS: EUT is a wireless Firewall with VPN support. EUT is communicating with support equipment. One EUT antenna is directly connected to spectrum analyzer. Transmit power test performed in accordance with KDB 558074. EUT Operational Mode: 802.11b @ 11MBs. Correction factor used 10*LOG(EBW/RBW) = 2.88 dB. Also tested in Operational Mode: 802.11g @ 54MBs. Correction factor used 10*LOG(EBW/RBW) = 5.31 dB. Frequency Range Investigated: Carrier. Temperature: 65°F, Relative Humidity: 32%.

Table 6: FCC 15.247(d) Six Highest Spurious Emission Levels									
FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Cable dB	Att dB	dB	dB	CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
2397.10000	72.7	1.0	10.0			83.7	98.0	-14.3	R-bL
2400.00000	84.0	1.0	10.0			95.0	100.0	-5.0	R-gL
2412.41700	104.3	1.0	10.0			115.3	118.0	-2.7	R-bL
2484.50000	72.6	1.0	10.0			83.6	100.0	-16.4	R-gH
2462.00000	105.9	1.0	10.0			116.9	118.0	-1.1	R-bH
2483.50000	74.4	1.0	10.0			85.4	100.0	-14.6	R-gH

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart C Sections 15.247(d)

NOTES: R = RF Output
b = 802.11b
g = 802.11g
L = Low
H = High

COMMENTS: EUT is a wireless Firewall with VPN support. EUT is communicating with support equipment. One EUT antenna is directly connected to spectrum analyzer. Transmit power test performed in accordance with KDB 558074. EUT Mode: 802.11b @ 11MBs and EUT Mode: 802.11g @ 54MBs. EUT Channel: Low. EUT Port: Left. Frequency Range Investigated: 9kHz to 26GHz. Temperature: 65ºF, Relative Humidity: 32%.

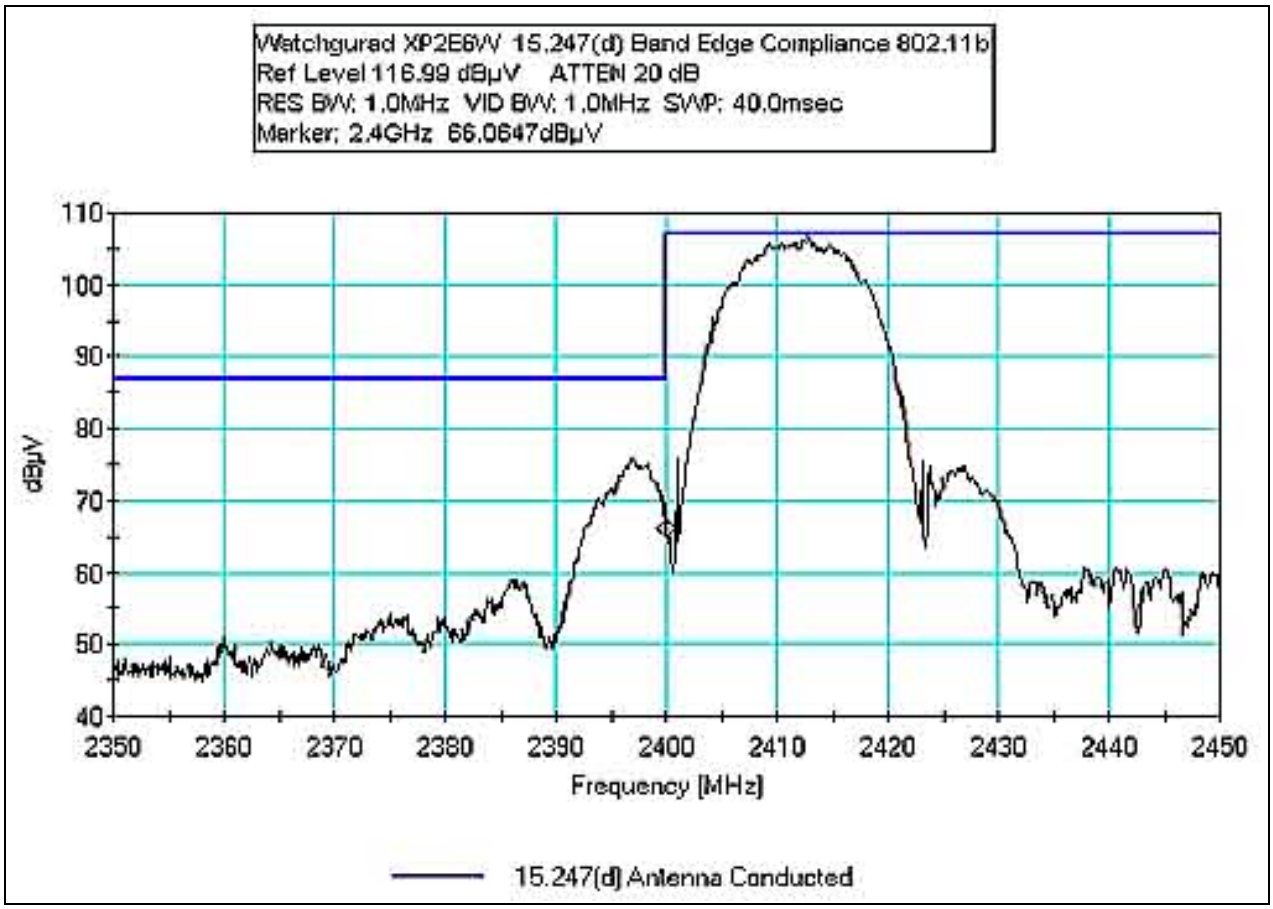
Table 7: FCC 15.247(d)/15.209 Six Highest Radiated Emission Levels									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Amp dB	Ant dB	Cable dB	dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
200.020	53.2	-26.5	8.3	3.3		38.3	43.5	-5.2	V-gM
200.424	52.8	0.0	0.0	0.0		37.9	43.5	-5.6	V-bH
200.443	52.9	0.0	0.0	0.0		38.0	43.5	-5/5	V-bM
324.898	49.1	0.0	0.0	0.0		40.5	46.0	-5.5	V-bL
2385.000	46.6	-34.6	29.1	10.1		51.2	54.0	-2.8	VA-gL
4924.000	34.2	-34.3	34.1	15.6		49.6	54.0	-4.4	VA-gH

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart C Sections 15.247(d)/15.209
Test Distance: 3 Meters

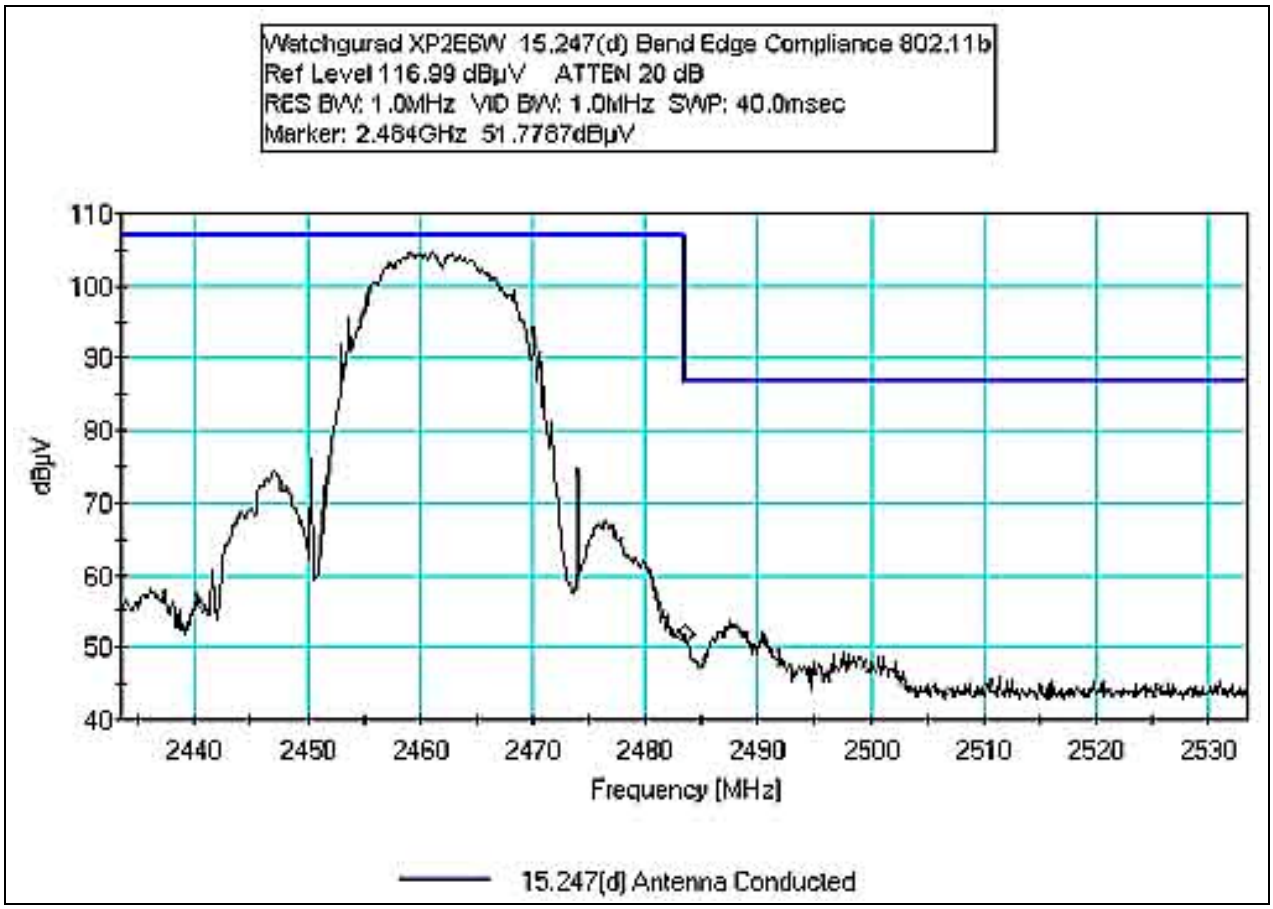
NOTES:
A = Average Reading
V = Vertical Polarization
b = 802.11b
g = 802.11g
L = Low
M = Mid
H = High

COMMENTS: EUT is a wireless Firewall with VPN support. The EUT is running Montavista Linux. A Toshiba 8100 is connected using shielded serial cable to the EUT serial port at 115k to initialize the unit as needed and monitor ping status. All 6 EUT wan/Lan ports are pinging bi-directionally to external support PC's via UTP Cat 5 ethernet cables. Three ethernet cables are going to three separate WatchGuard FB X Edge units, and three ethernet cables are going to a single WatchGuard X2 unit. EUT Operational Mode: 802.11bg. Low, Mid and High transmit channel investigated and noted for each reading. Data represents both operational modes of EUT. Low channel = 2412 MHz, Mid channel = 2437 MHz, High channel = 2462 MHz. Frequency Range Investigated: 30 MHz to 26 GHz. **No signals observed above 5 GHz**. Temperature: 65°F, Relative Humidity: 32%.

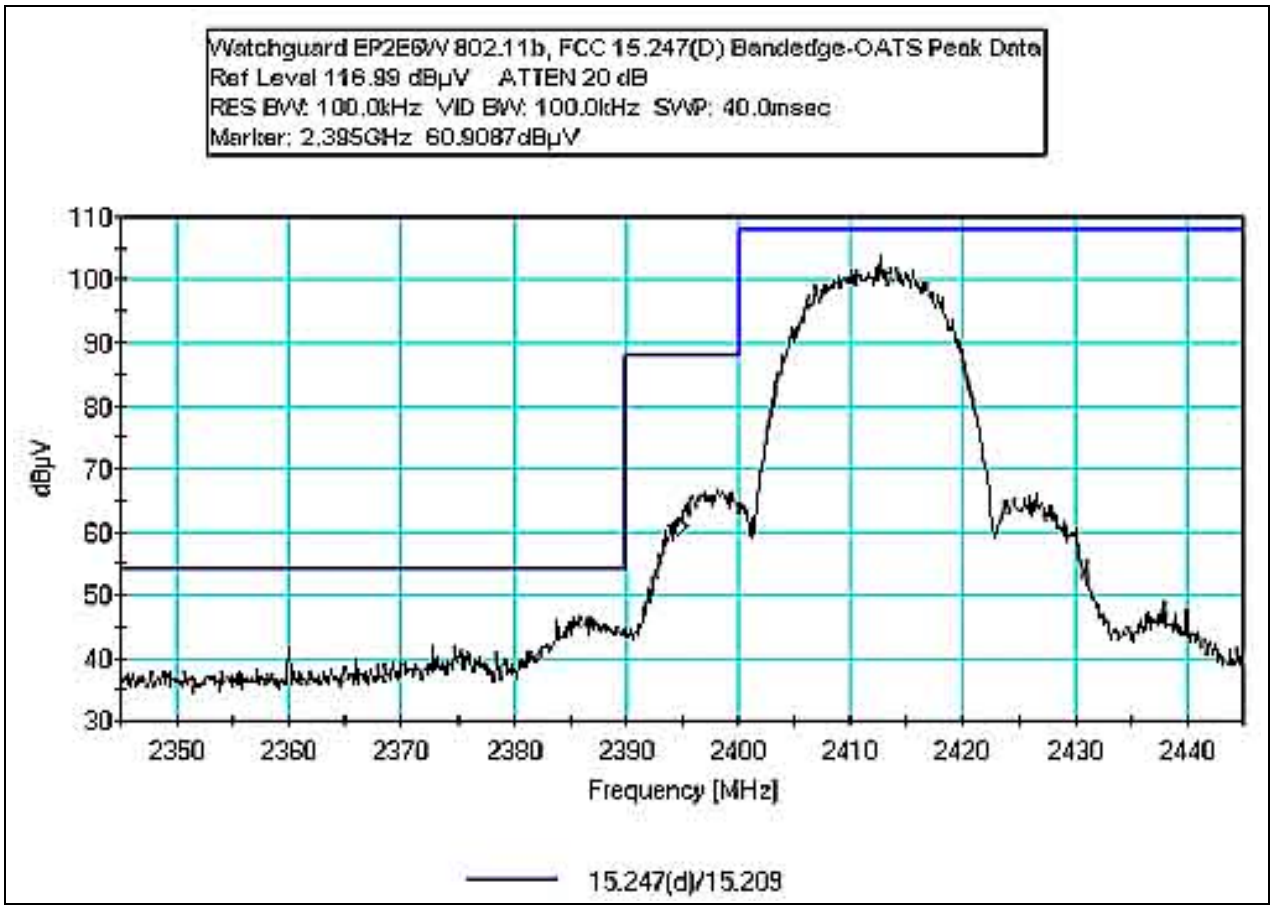
FCC 15.247(d) BANDEDGE LOW 802.11b



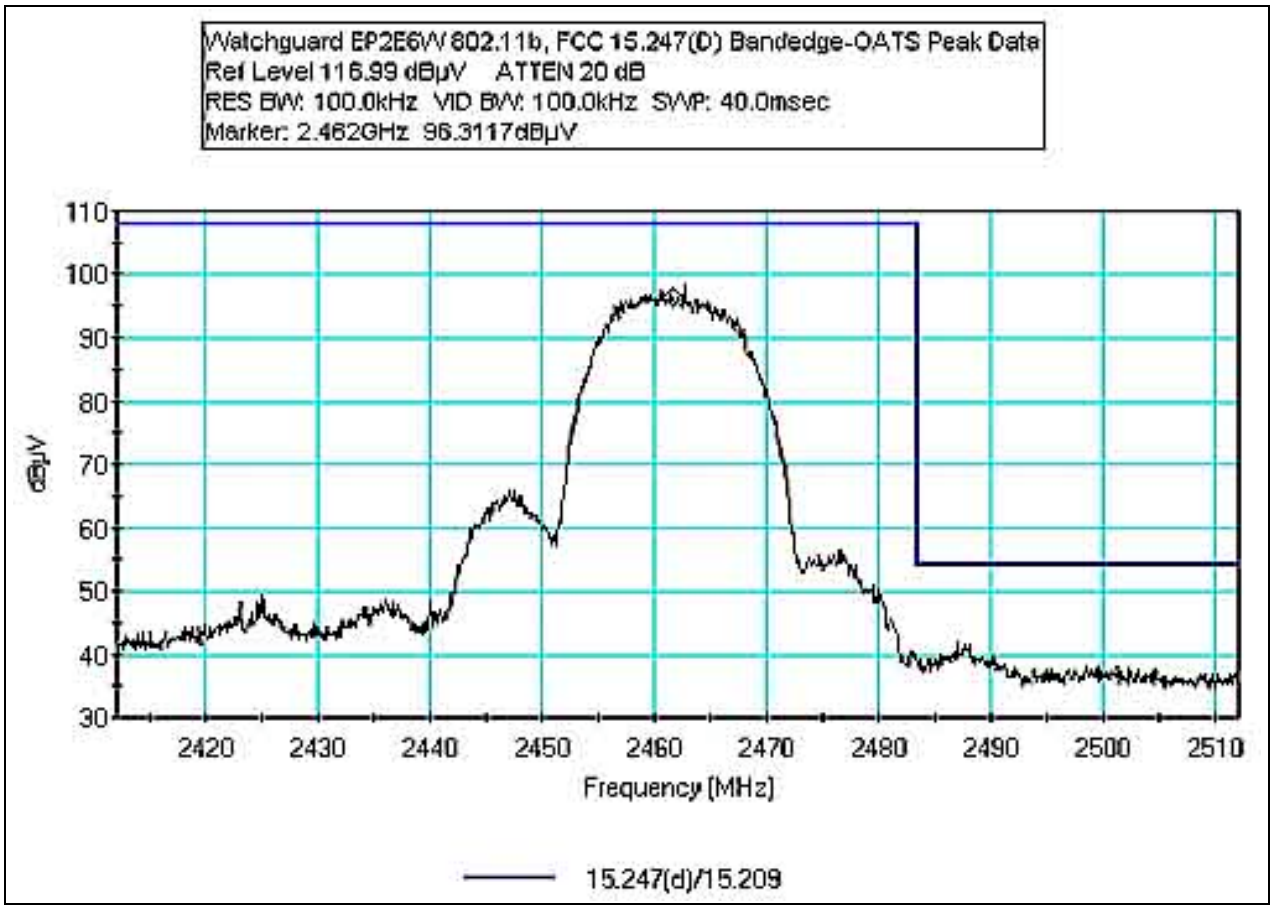
FCC 15.247(d) BANDEDGE HIGH 802.11b



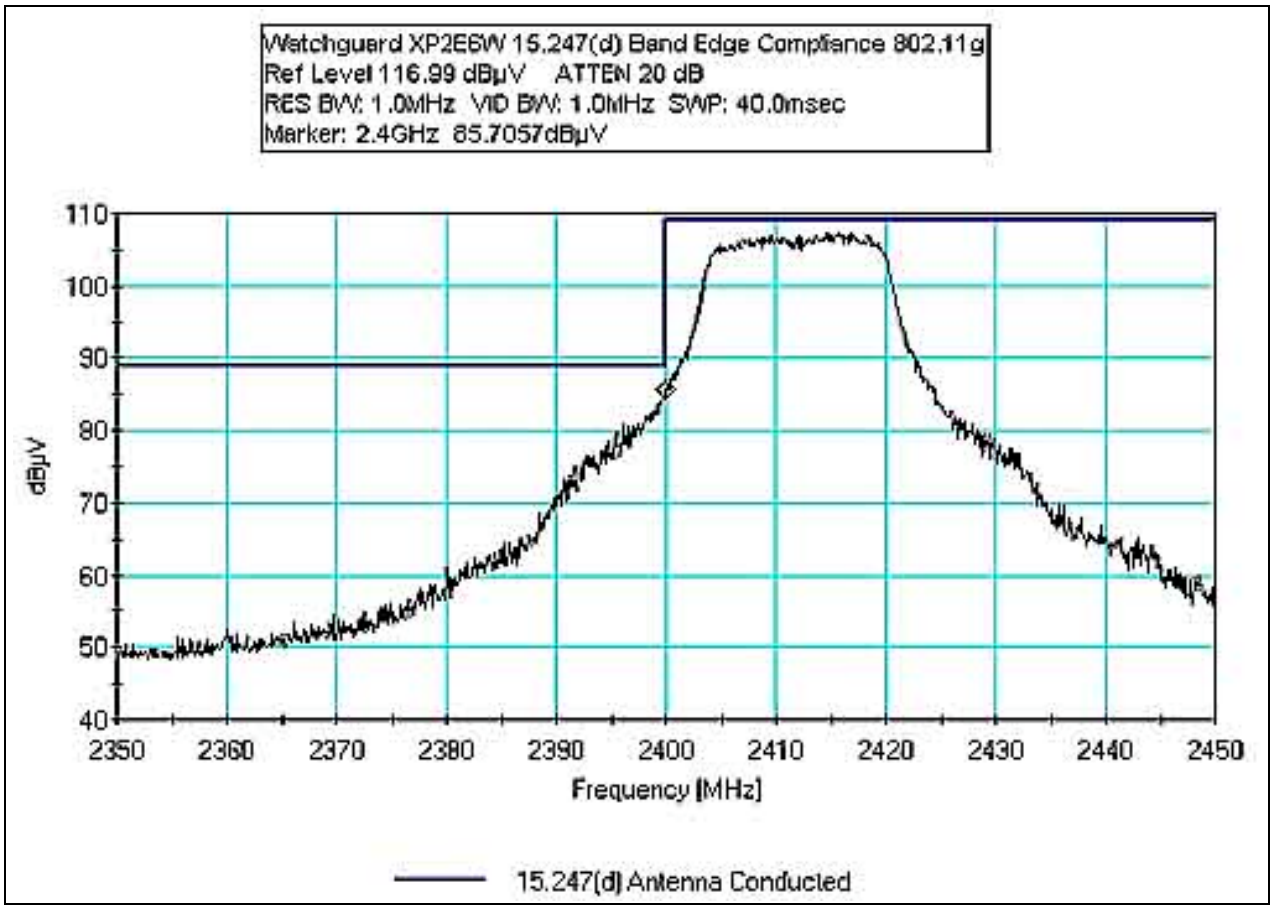
FCC 15.247(d) BANDEDGE LOW OATS 802.11b



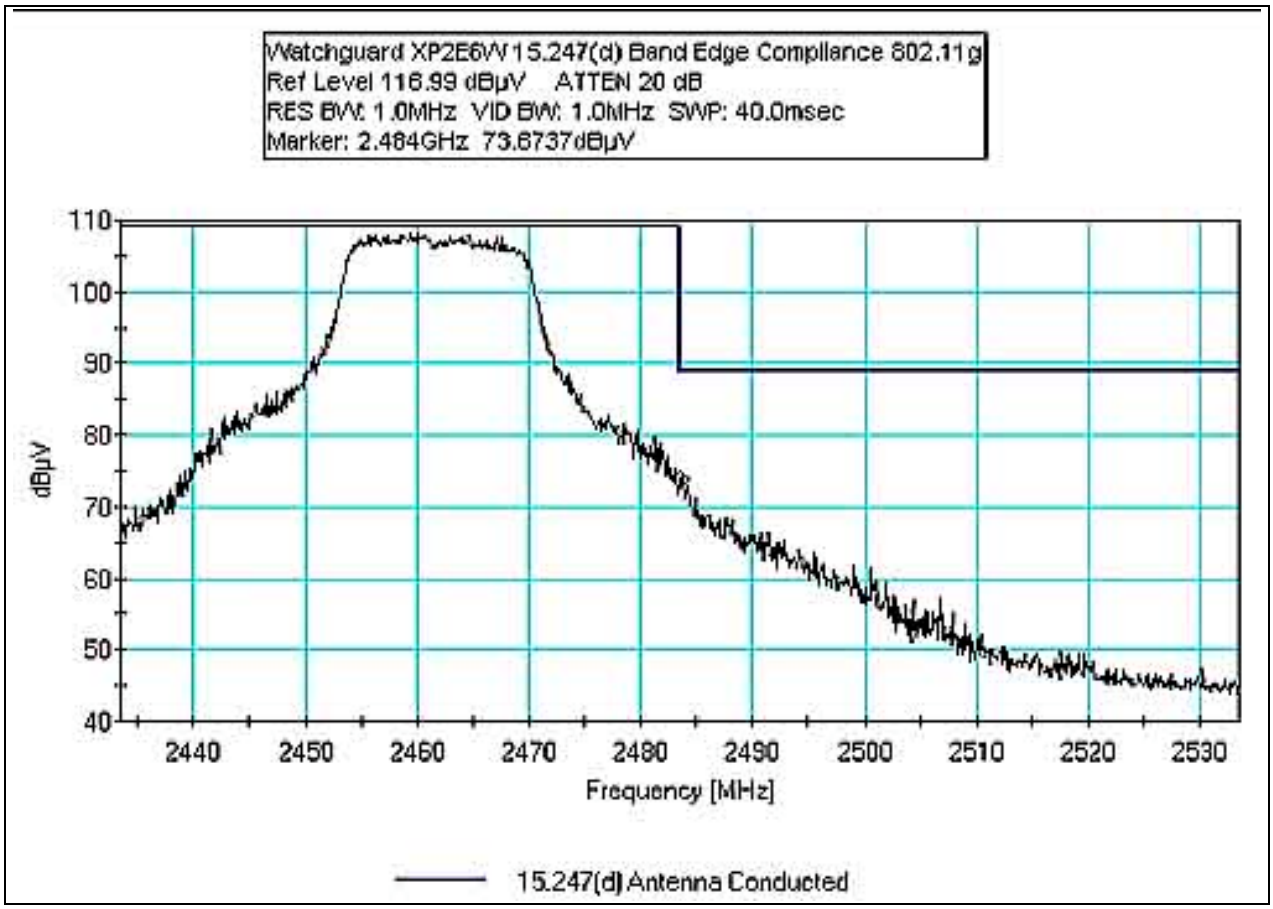
FCC 15.247(d) BANDEDGE HIGH OATS 802.11b



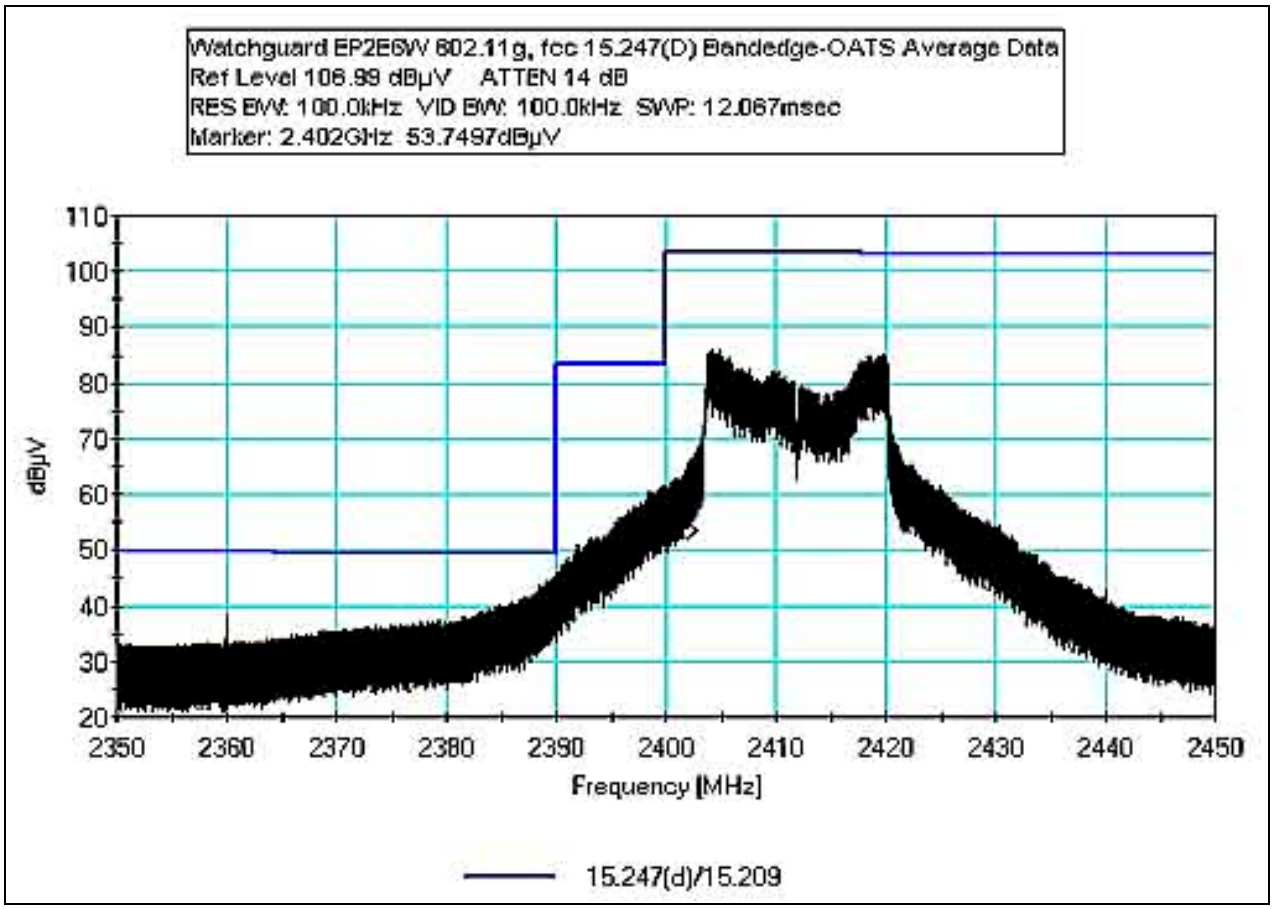
FCC 15.247(d) BANDEDGE LOW 802.11g



FCC 15.247(d) BANDEDGE HIGH 802.11g



FCC 15.247(d) BANDEDGE LOW OATS 802.11g



FCC 15.247(d) BANDEDGE HIGH OATS 802.11g

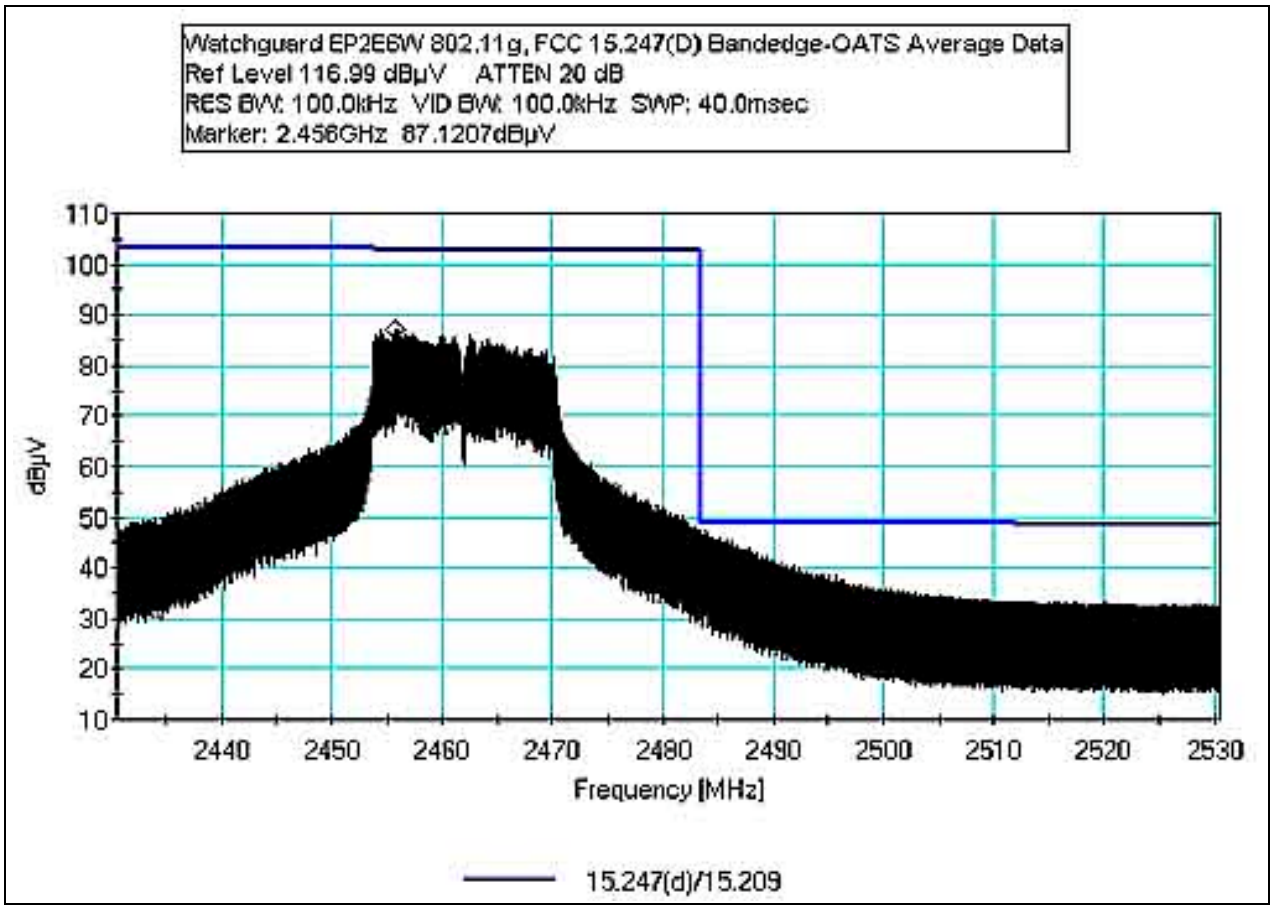


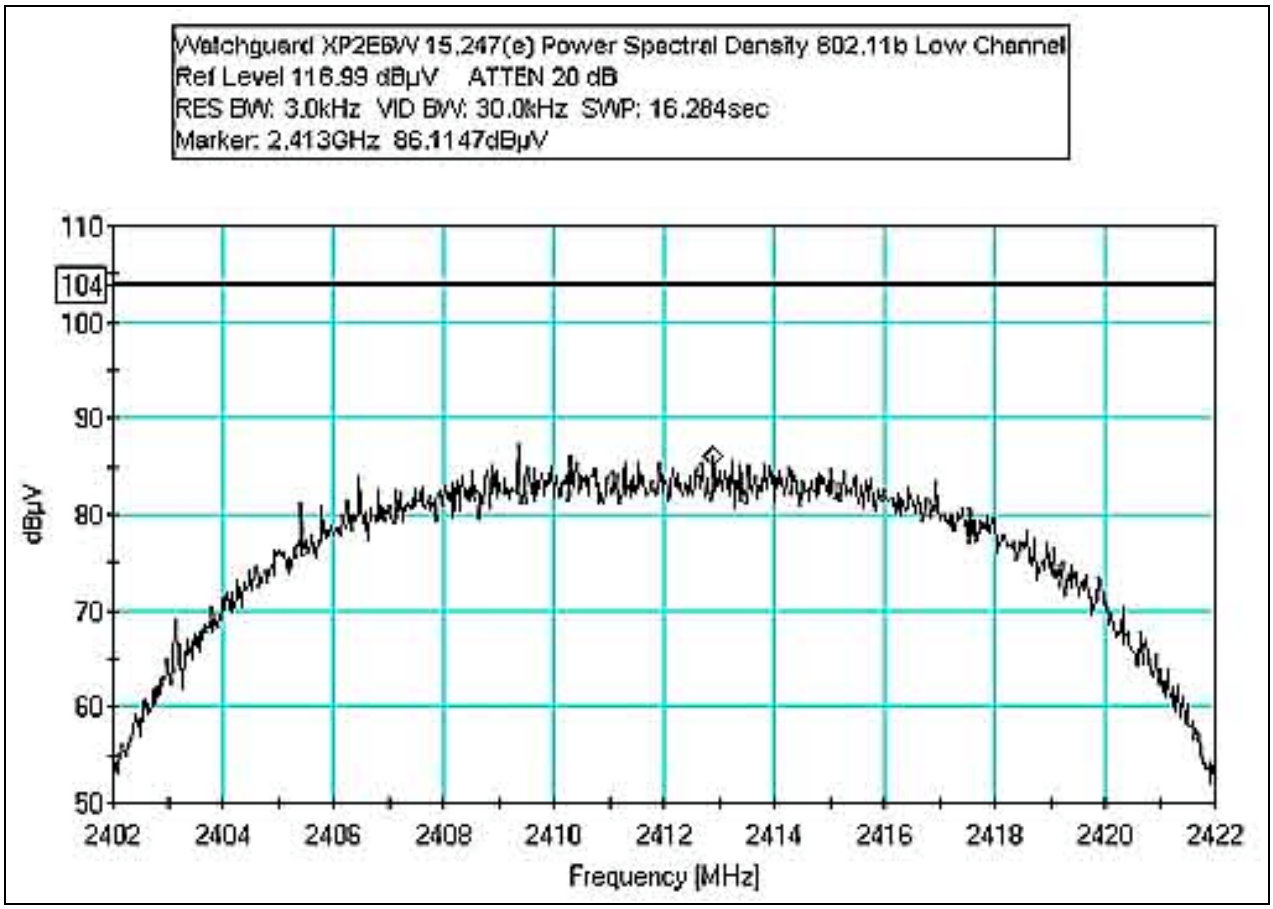
Table 8: FCC 15.247(e) Peak Power Spectral Density									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Cable dB	Corr dB	Att dB	dB	READING dBµV	LIMIT dBµV	MARGIN dB	NOTES
2410.47000	84.2	1.0	107.0	10.0		-11.8	8.0	-19.8	R-g
2412.90000	86.1	1.0	107.0	10.0		-9.9	8.0	-17.9	R-b
2437.27000	84.7	1.0	107.0	10.0		-11.3	8.0	-19.3	R-g
2439.88000	89.5	1.0	107.0	10.0		-6.5	8.0	-14.5	R-b
2463.84000	85.6	1.0	107.0	10.0		-10.4	8.0	-18.4	R-g
2465.40000	88.5	1.0	107.0	10.0		-7.5	8.0	-15.5	R-b

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart C Sections 15.247(e)

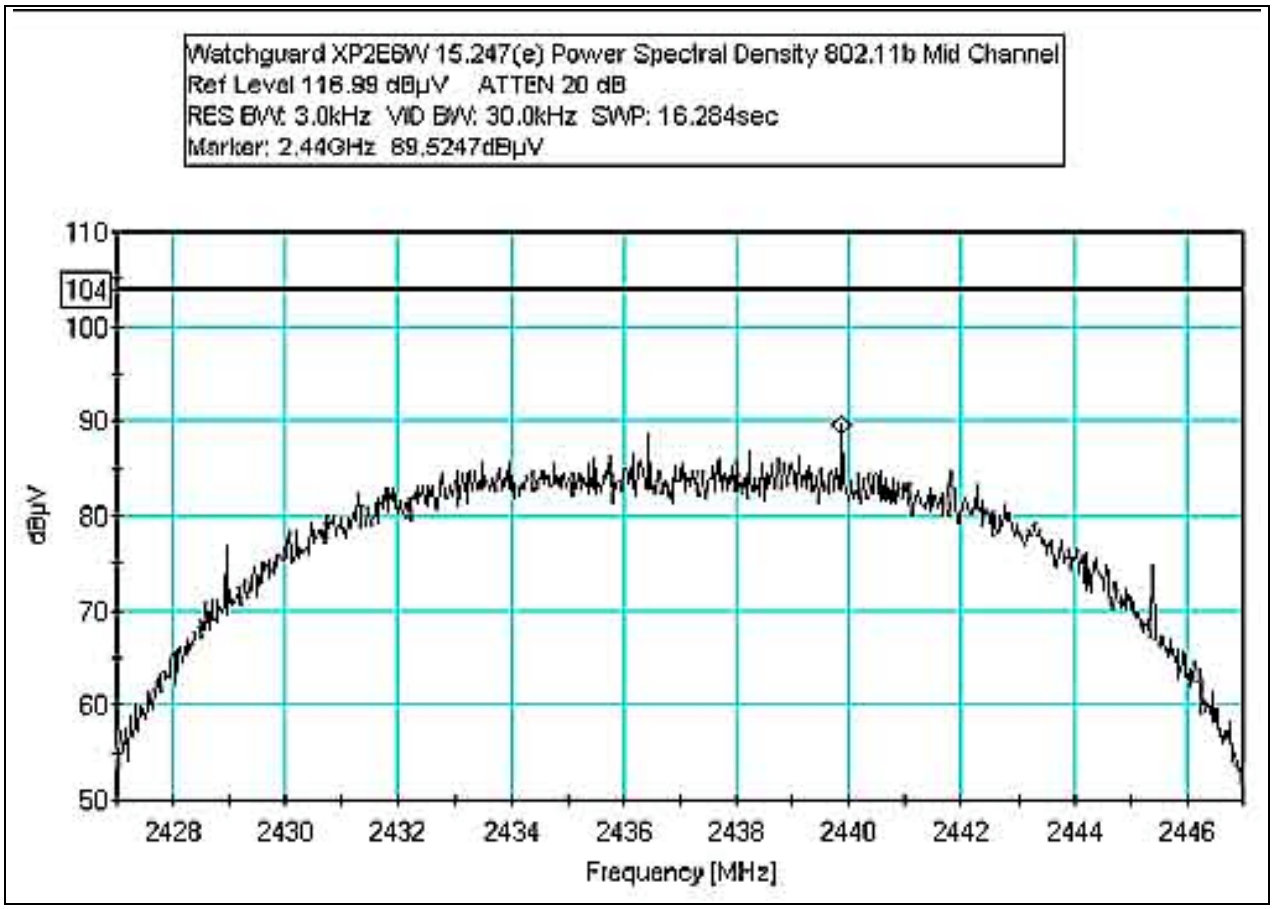
NOTES: R = RF Output
b = 802.11b
g = 802.11g

COMMENTS: EUT is a wireless Firewall with VPN support. EUT is communicating with support equipment. One EUT antenna is directly connected to spectrum analyzer. Transmit power test performed in accordance with KDB 558074. EUT Mode: 802.11b @ 11MBs and EUT Mode: 802.11g @ 54MBs EUT Port: Left. Frequency Range Investigated: Carrier. Temperature: 65ºF, Relative Humidity: 32%.

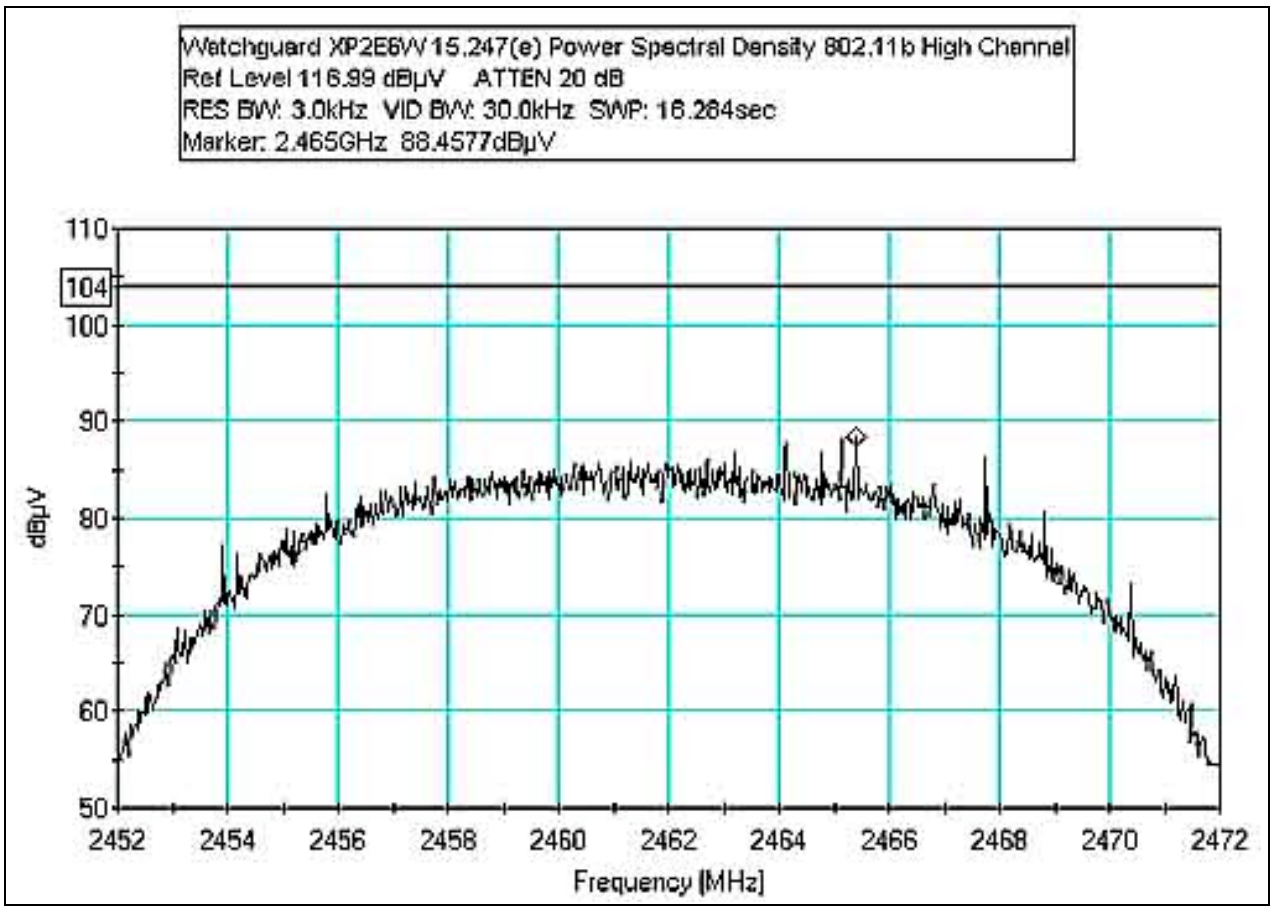
FCC 15.247(e) POWER SPECTRAL DENSITY LOW 802.11b



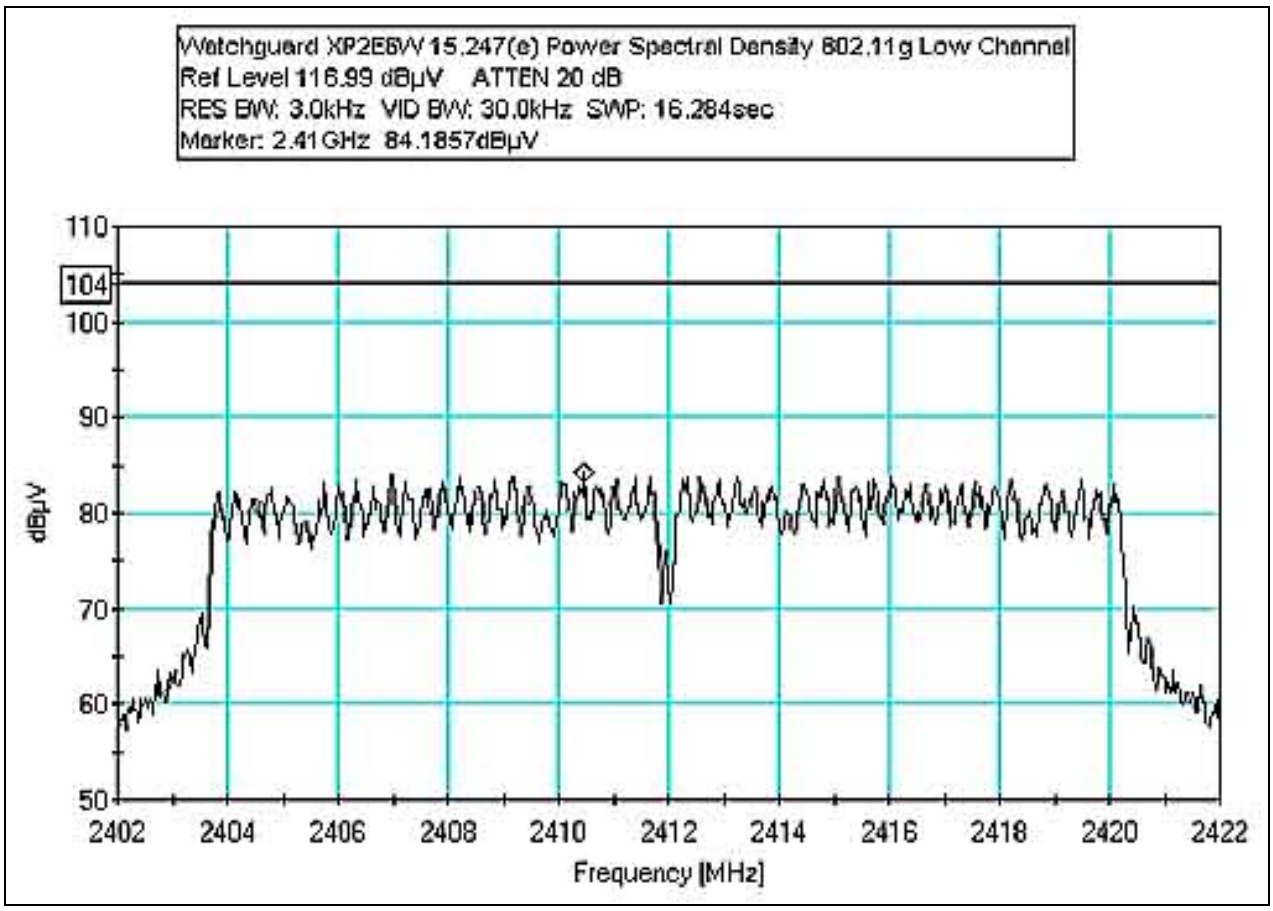
FCC 15.247(e) POWER SPECTRAL DENSITY MID 802.11b



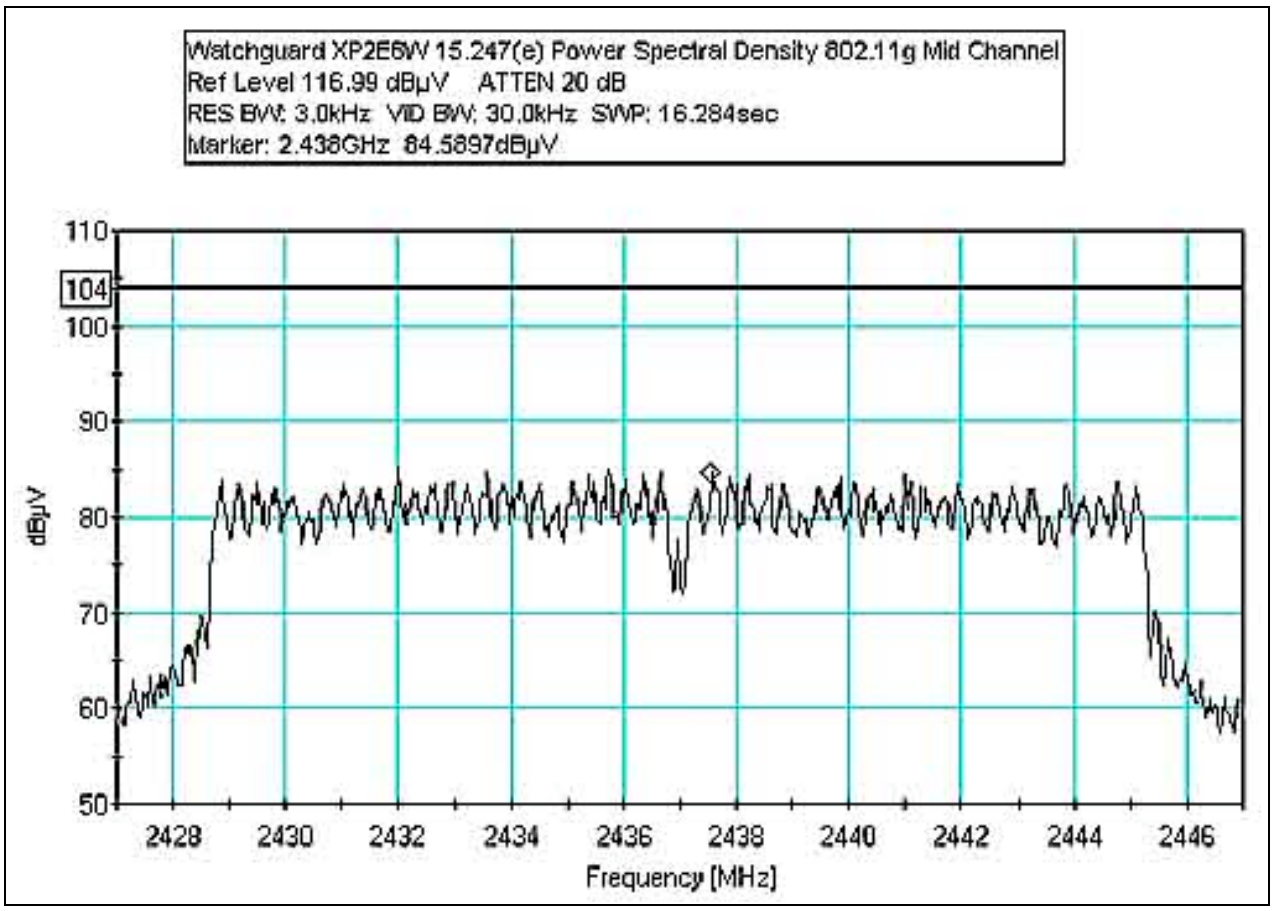
FCC 15.247(e) POWER SPECTRAL DENSITY HIGH 802.11b



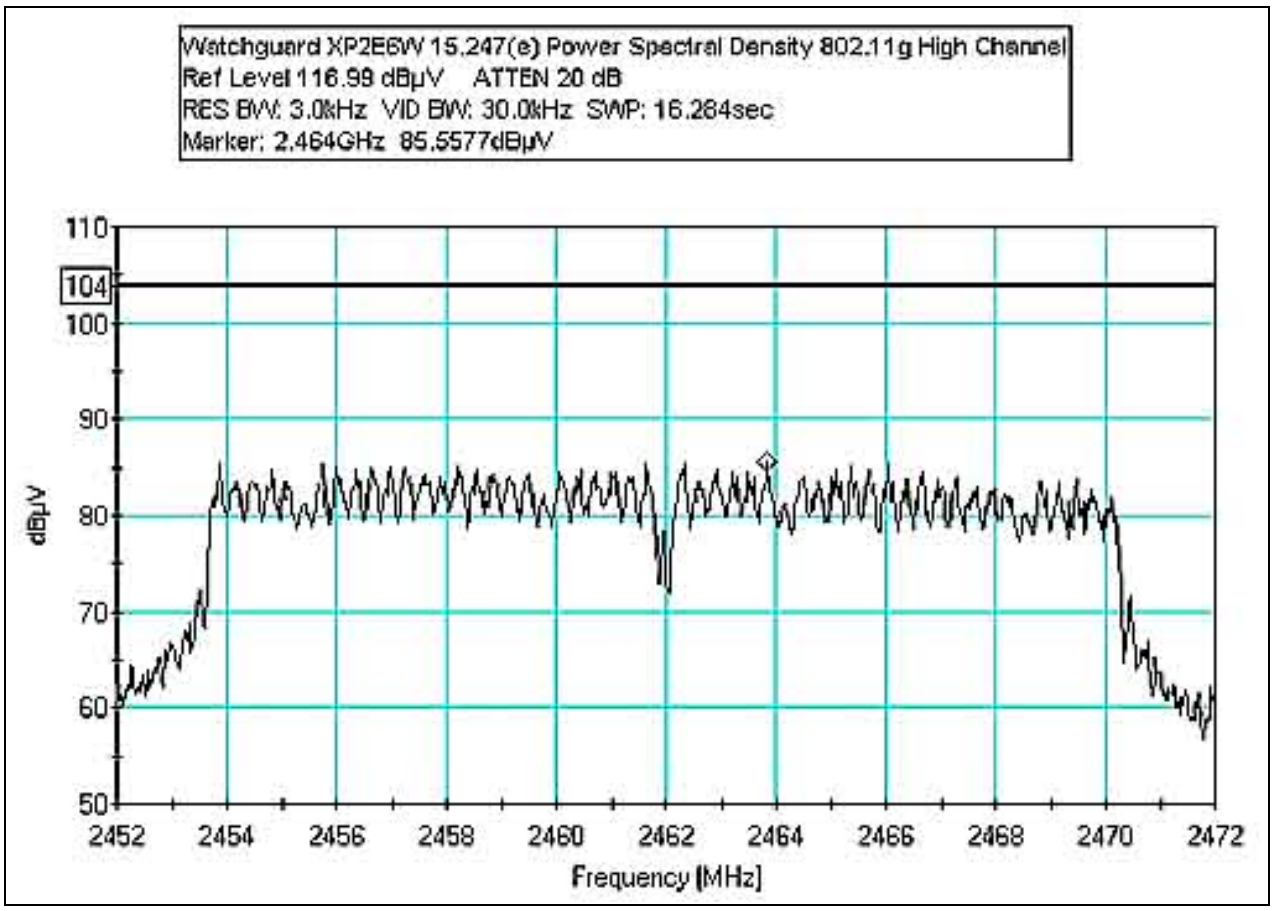
FCC 15.247(e) POWER SPECTRAL DENSITY LOW 802.11g



FCC 15.247(e) POWER SPECTRAL DENSITY MID 802.11g



FCC 15.247(e) POWER SPECTRAL DENSITY HIGH 802.11g



TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

EUT SETUP

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the photographs in Appendix A. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables. The corrected data was then compared to the applicable emission limits to determine compliance.

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available I/O ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. I/O cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The radiated and conducted emissions data of the EUT was taken with the HP Spectrum Analyzer. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in Table A.

Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula in Table A. This reading was then compared to the applicable specification limit to determine compliance.

TABLE A: SAMPLE CALCULATIONS

	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed in Table A were used to collect both the radiated and conducted emissions data for the EUT. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. For radiated measurements from 30 to 1000 MHz, the biconilog antenna was used. The horn antenna was used for frequencies above 1000 MHz. Conducted emissions tests required the use of the FCC type LISNs.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. For conducted emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used. A 10 dB external attenuator was also used during conducted tests, with internal offset correction in the analyzer. During radiated testing, the measurements were made with 0 dB of attenuation, a reference level of 97 dBµV, and a vertical scale of 10 dB per division.

SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the Tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the six highest readings, this is indicated as a "Q" or an "A" in the appropriate table. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the Spectrum Analyzer or test engineer recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the analyzer called "peak hold," the analyzer had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the analyzer made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the HP Quasi-Peak Adapter for the HP Spectrum Analyzer. The detailed procedure for making quasi peak measurements contained in the HP Quasi-Peak Adapter manual were followed.

Average

For certain frequencies, average measurements may be made using the spectrum analyzer. To make these measurements, the test engineer reduces the video bandwidth on the analyzer until the modulation of the signal is filtered out. At this point the analyzer is set into the linear mode and the scan time is reduced.

EUT TESTING

Mains Conducted Emissions

During conducted emissions testing, the EUT was located on a wooden table measuring approximately 80 cm high, 1 meter deep, and 1.5 meters in length. One wall of the room where the EUT was located has a minimum 2 meter by 2 meter conductive plane. The EUT was mounted on the wooden table 40 cm away from the conductive plane, and 80 cm from any other conductive surface.

The vertical metal plane used for conducted emissions was grounded to the earth. Power to the EUT was provided through a LISN. The LISN was grounded to the ground plane. All other objects were kept a minimum of 80 cm away from the EUT during the conducted test.

The LISNs used were 50 µH-/+50 ohms. A 30 to 50 second sweep time was used for automated measurements in the frequency bands of 150 kHz to 500 kHz, and 500 kHz to 30 MHz. All readings within 20 dB of the limit were recorded, and those within 6 dB of the limit were examined with additional measurements using a slower sweep time.

Antenna Conducted Emissions

For measuring the signal strength on the RF output port of the EUT, the spectrum analyzer was connected directly to the EUT. The sweep time of the analyzer was adjusted so that the spectrum analyzer readings were always in a calibrated range. All readings within 20 dB of the limit were recorded.

Radiated Emissions

The EUT was mounted on a nonconductive, rotating table 80 cm above the conductive grid. The nonconductive table dimensions were 1 meter by 1.5 meters.

During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. The frequency range of 30 MHz to 1000 MHz was scanned with the biconilog antenna located about 1.5 meter above the ground plane in the vertical polarity. During this scan, the turntable was rotated and all peaks at or near the limit were recorded. A scan of the FM band from 88 to 110 MHz was then made using a reduced resolution bandwidth and frequency span. The biconilog antenna was changed to the horizontal polarity and the above steps were repeated. For frequencies exceeding 1000 MHz, the horn antenna was used. Care was taken to ensure that no frequencies were missed within the FM and TV bands. An analysis was performed to determine if the signals that were at or near the limit were caused by an ambient transmission. If unable to determine by analysis, the equipment was powered down to make the final determination if the EUT was the source of the emission.

A thorough scan of all frequencies was made manually using a small frequency span, rotating the turntable and raising and lowering the antenna from one to four meters as needed. The test engineer maximized the readings with respect to the table rotation, antenna height and configuration of EUT. Maximizing of the EUT was achieved by monitoring the spectrum analyzer on a closed circuit television monitor.

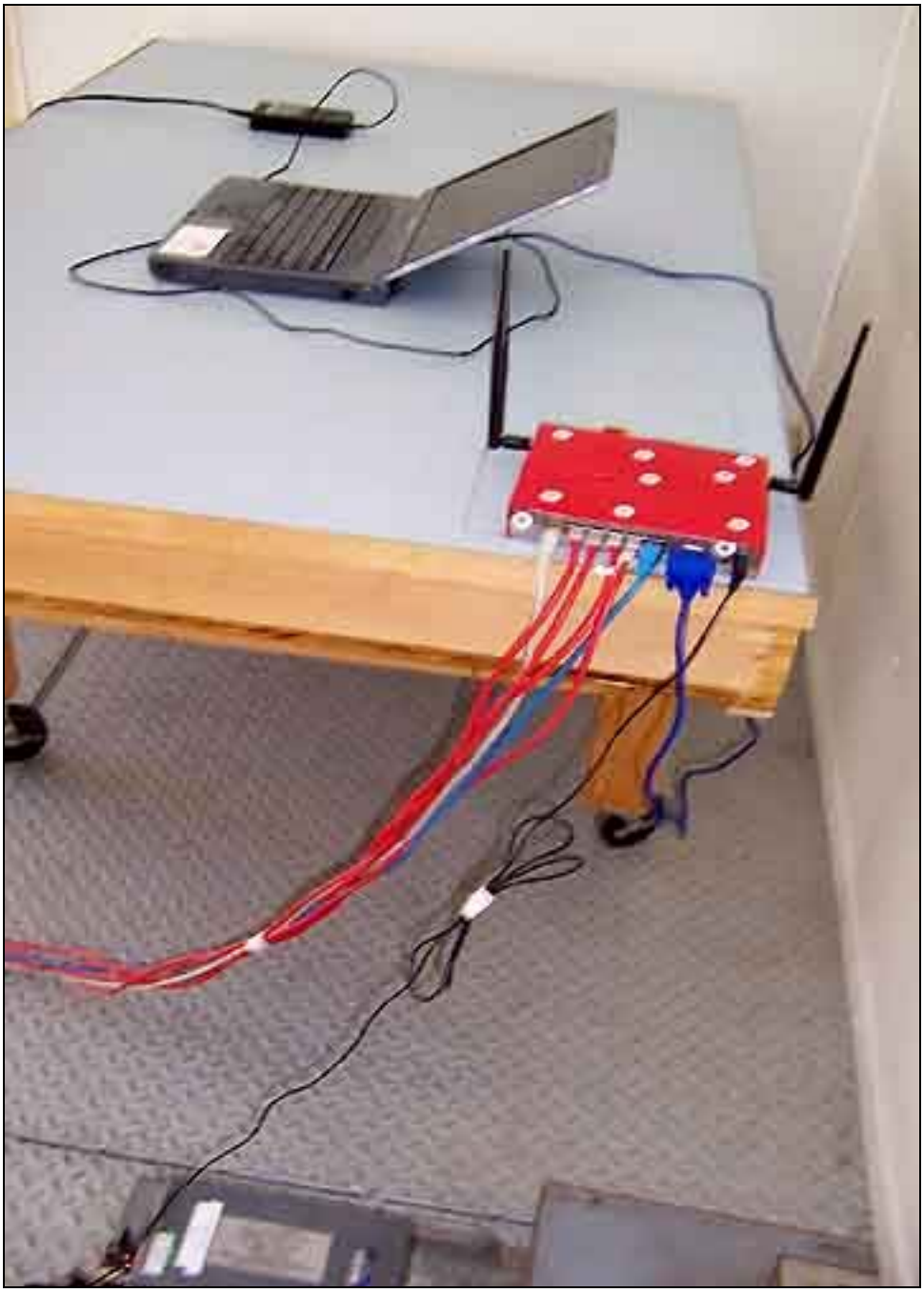
APPENDIX A

TEST SETUP PHOTOGRAPHS

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS

Mains Conducted Emissions - Front View

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



Mains Conducted Emissions - Side View

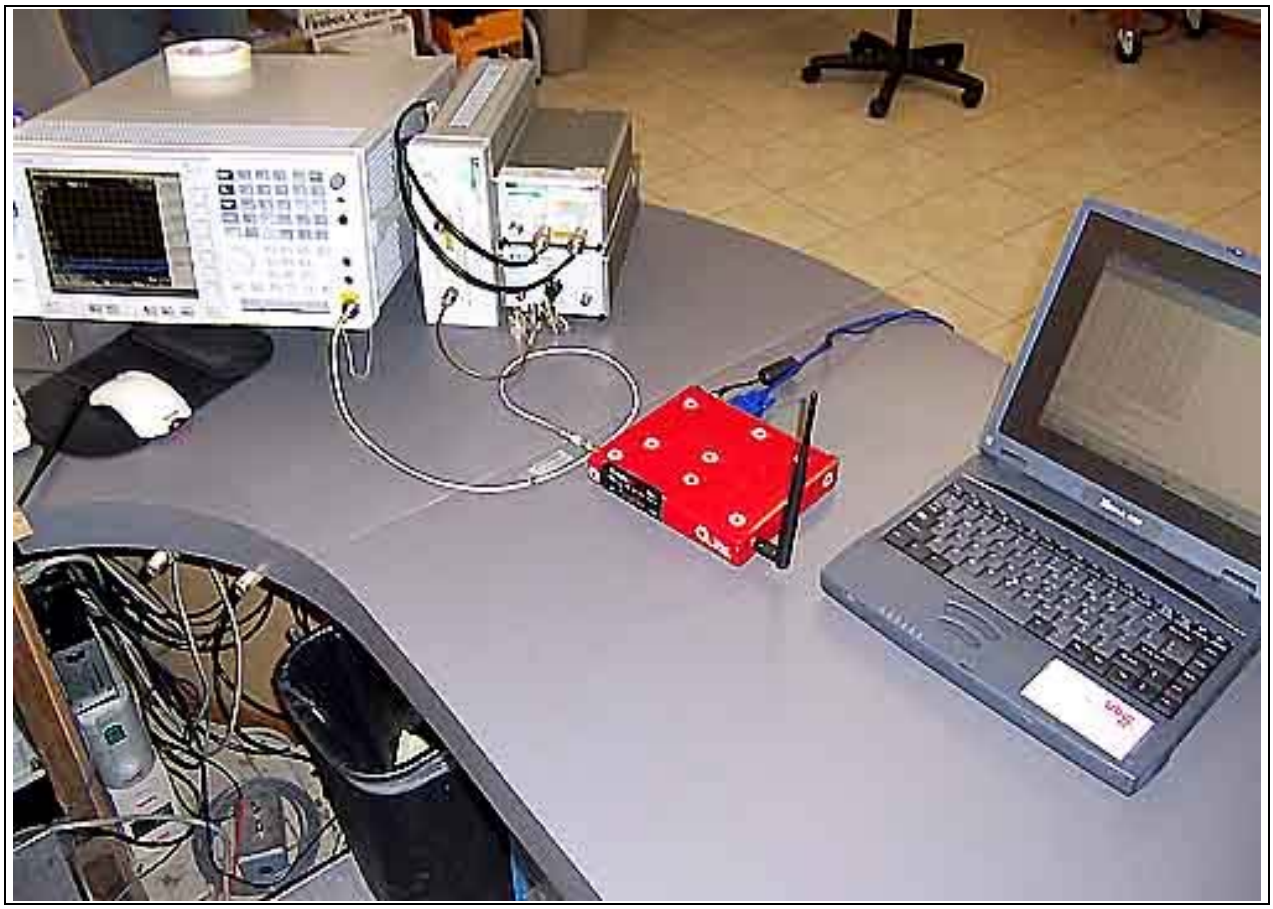
PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Front View

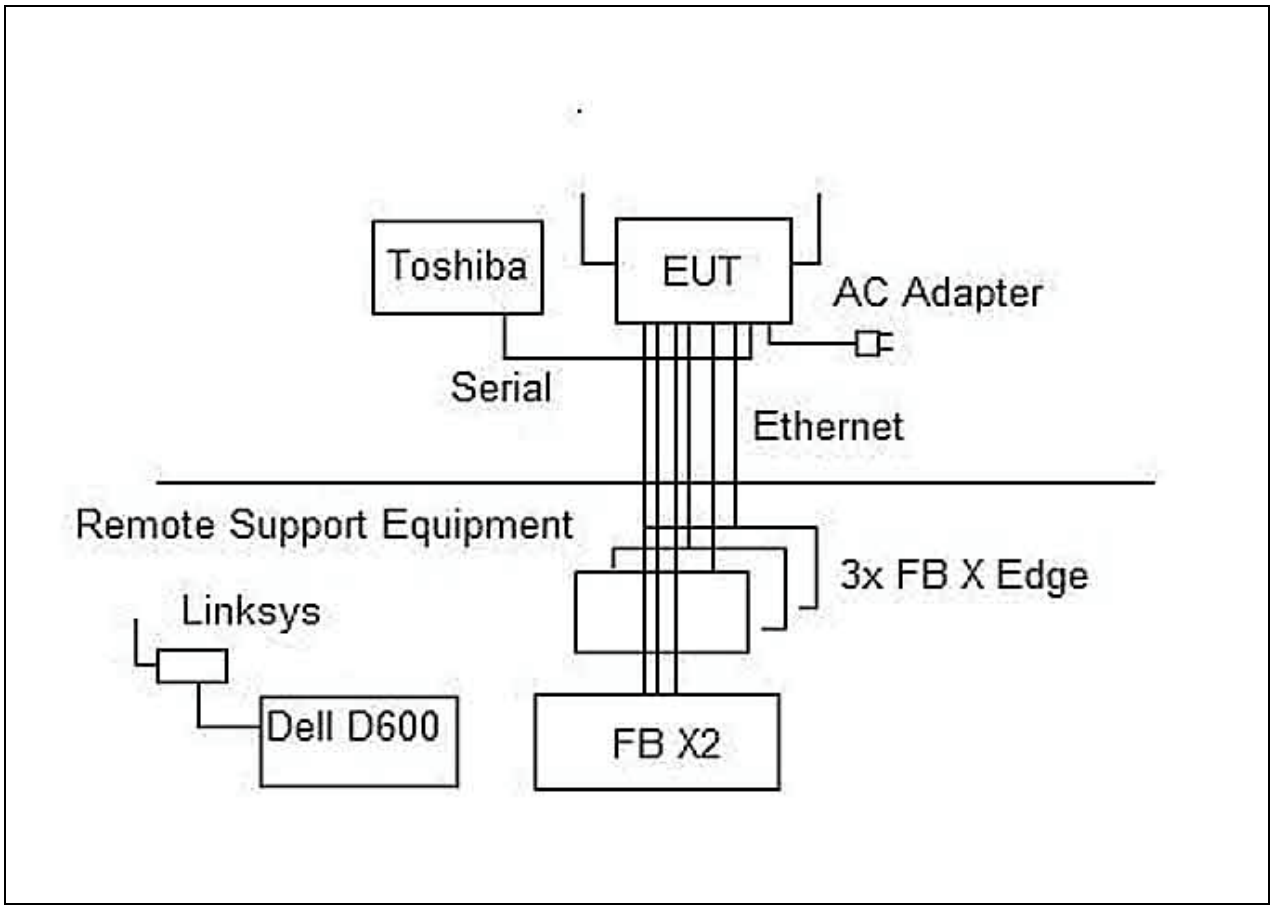
PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Back View

PHOTOGRAPH SHOWING DIRECT CONNECT TEST SETUP



EUT SETUP


Toshiba
EUT
AC Adapter
Serial
Ethernet
Remote Support Equipment
3x FB X Edge
Linksys
Dell D600
FB X2

APPENDIX B

TEST EQUIPMENT LIST

FCC 15.107 & 15.207

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/12/2005	01/12/2007	02660
150kHz HP Filter TTE	G7754	04/20/2004	04/20/2006	02608
LISN, 8028-50-TS-24-BNC	8379276, 280	06/03/2005	06/03/2007	1248 & 1249
10 dB Attenuator 10W	None	08/18/2005	08/18/2007	P04255

FCC 15.109

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/12/2005	01/12/2007	02660
Chase CBL6111C Bilog	2456	06/07/2005	06/07/2007	01991
EMCO 3115 Horn Antenna	9307-4085	04/29/2005	04/29/2007	00656
HP 8447D Preamp	1937A02604	03/11/2005	03/11/2007	00099
HP 8449B Preamp	3008A00301	12/14/2004	12/14/2006	2010

FCC 15.247(b)(3), 15.247(d) & 15.247(e)

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/12/2005	01/12/2007	02660
Cable, Pasternack 36"	NA	02/08/2005	02/08/2007	P05202
Weinchel 10dB attenuator	C8597	10/01/2004	10/01/2006	P02139

FCC 15.247(d) & 15.209

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/12/2005	01/12/2007	02660
Chase CBL6111C Bilog	2456	06/07/2005	06/07/2007	01991
EMCO 3115 Horn Antenna	9307-4085	04/29/2005	04/29/2007	00656
ARA MWH-1826/B Horn Antenna	1005	11/05/2004	11/05/2006	02046
HP 8447D Preamp	1937A02604	03/11/2005	03/11/2007	00099
HP 8449B Preamp	3008A00301	12/14/2004	12/14/2006	2010

APPENDIX C
MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **FCC 15.107(a) Class B - AVE**
Work Order #: **83764** Date: 10/6/2005
Test Type: **Conducted Emissions** Time: 10:53:05 AM
Equipment: **Internet Firewall** Sequence#: 8
Manufacturer: WatchGuard Technologies, Inc. Tested By: Mike Wilkinson
Model: XP2E6W 120V 60Hz
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
AC Adapter for EUT	Globtek	GT-41052-1512	none
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480
Internet Firewall	WatchGuard Technologies, Inc.	R6264S	808005596-6641
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600002-6EF8
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600207-AD99
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	110
Laptop PC	Toshiba	PA1230U XCD	02792218-3
Laptop PC	Dell	D600	79GSC51
USB/Wireless Network Adapter	Linksys	WUSB54GS	MI0004C09761

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. The EUT is running Montavista Linux The EUT wireless card is pinging uni-directionally via 802.11b (11 Mb/sec) to an external Dell D600 Support PC using a Linksys wireless usb adapter. A Toshiba 8100 is connected using shielded serial cable to the EUT serial port at 115k to initialize the unit as needed and monitor ping status. All 6 EUT wan/Lan ports are pinging bi-directionally to external support PC's via UTP Cat 5 ethernet cables. Three ethernet cables are going to three separate WatchGuard FB X Edge units, and three ethernet cables are going to a single WatchGuard X2 unit. EUT Operational Mode: 802.11b @ 11MBs. Frequency Range Investigated: 150 kHz to 30 MHz. Temperature: 65ºF, Relative Humidity: 32%.

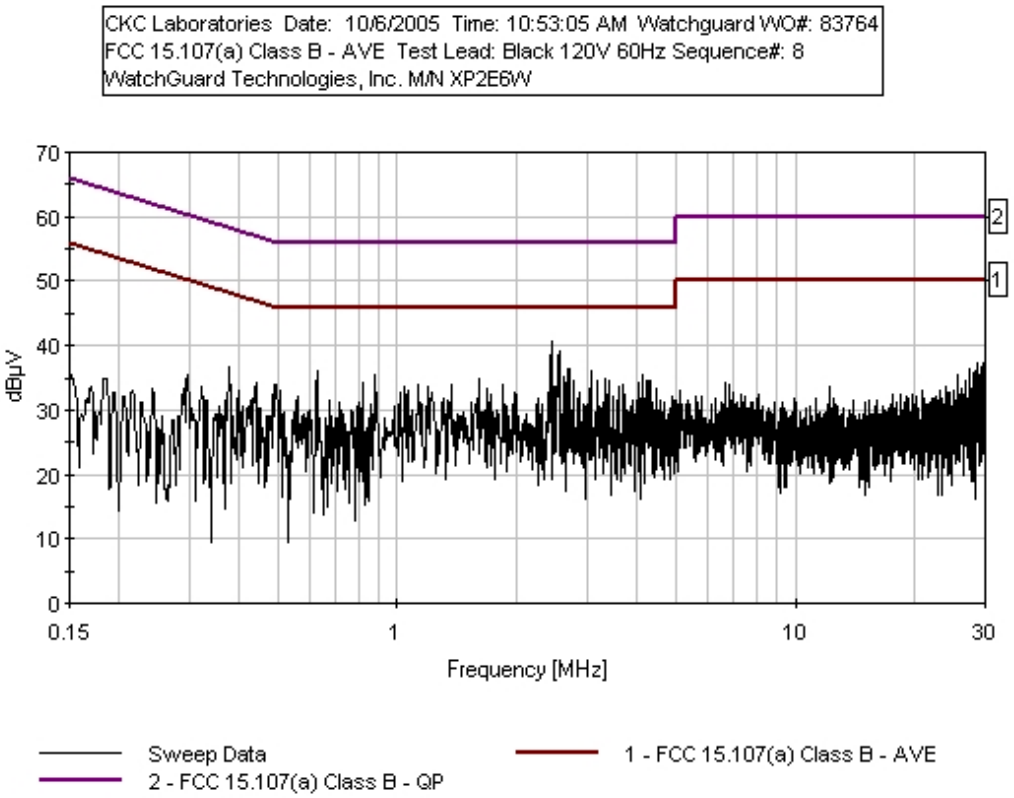
Transducer Legend:

T1=Cable - Internal + cab	T2=LISN Insertion Loss s/n276
T3=HP Filter AN02608	T4=ATT 10d B Site D Conducted

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2.451M	29.8	+0.3	+0.3	+0.1	+10.3	+0.0	40.8	46.0	-5.2	Black
2	2.553M	28.1	+0.3	+0.3	+0.1	+10.3	+0.0	39.1	46.0	-6.9	Black
3	2.417M	27.5	+0.3	+0.4	+0.1	+10.3	+0.0	38.6	46.0	-7.4	Black
4	2.685M	25.4	+0.3	+0.3	+0.1	+10.3	+0.0	36.4	46.0	-9.6	Black

5	2.697M	25.4	+0.3	+0.3	+0.1	+10.3	+0.0	36.4	46.0	-9.6	Black
6	3.059M	25.1	+0.3	+0.3	+0.1	+10.3	+0.0	36.1	46.0	-9.9	Black
7	627.774k	25.0	+0.1	+0.3	+0.3	+10.3	+0.0	36.0	46.0	-10.0	Black
8	881.457k	24.7	+0.1	+0.3	+0.2	+10.3	+0.0	35.6	46.0	-10.4	Black
9	4.126M	24.4	+0.3	+0.4	+0.1	+10.3	+0.0	35.5	46.0	-10.5	Black
10	2.621M	24.2	+0.3	+0.3	+0.1	+10.3	+0.0	35.2	46.0	-10.8	Black
11	3.072M	24.2	+0.3	+0.3	+0.1	+10.3	+0.0	35.2	46.0	-10.8	Black
12	1.604M	23.8	+0.2	+0.4	+0.1	+10.3	+0.0	34.8	46.0	-11.2	Black
13	3.327M	23.8	+0.3	+0.3	+0.1	+10.3	+0.0	34.8	46.0	-11.2	Black
14	2.770M	23.6	+0.3	+0.3	+0.1	+10.3	+0.0	34.6	46.0	-11.4	Black
15	3.386M	23.6	+0.3	+0.3	+0.1	+10.3	+0.0	34.6	46.0	-11.4	Black



Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **FCC 15.107(a) Class B - AVE**
Work Order #: **83764** Date: 10/6/2005
Test Type: **Conducted Emissions** Time: 11:03:17 AM
Equipment: **Internet Firewall** Sequence#: 9
Manufacturer: WatchGuard Technologies, Inc. Tested By: Mike Wilkinson
Model: XP2E6W 120V 60Hz
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
AC Adapter for EUT	Globtek	GT-41052-1512	none
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480
Internet Firewall	WatchGuard Technologies, Inc.	R6264S	808005596-6641
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600002-6EF8
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600207-AD99
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	110
Laptop PC	Toshiba	PA1230U XCD	02792218-3
Laptop PC	Dell	D600	79GSC51
USB/Wireless Network Adapter	Linksys	WUSB54GS	MI0004C09761

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. The EUT is running Montavista Linux The EUT wireless card is pinging uni-directionally via 802.11b (11 Mb/sec) to an external Dell D600 Support PC using a Linksys wireless usb adapter. A Toshiba 8100 is connected using shielded serial cable to the EUT serial port at 115k to initialize the unit as needed and monitor ping status. All 6 EUT wan/Lan ports are pinging bi-directionally to external support PC's via UTP Cat 5 ethernet cables. Three ethernet cables are going to three separate WatchGuard FB X Edge units, and three ethernet cables are going to a single WatchGuard X2 unit. EUT Operational Mode: 802.11b @ 11MBs. Rx. Frequency Range Investigated: 150 kHz to 30 MHz. Temperature: 65ºF, Relative Humidity: 32%.

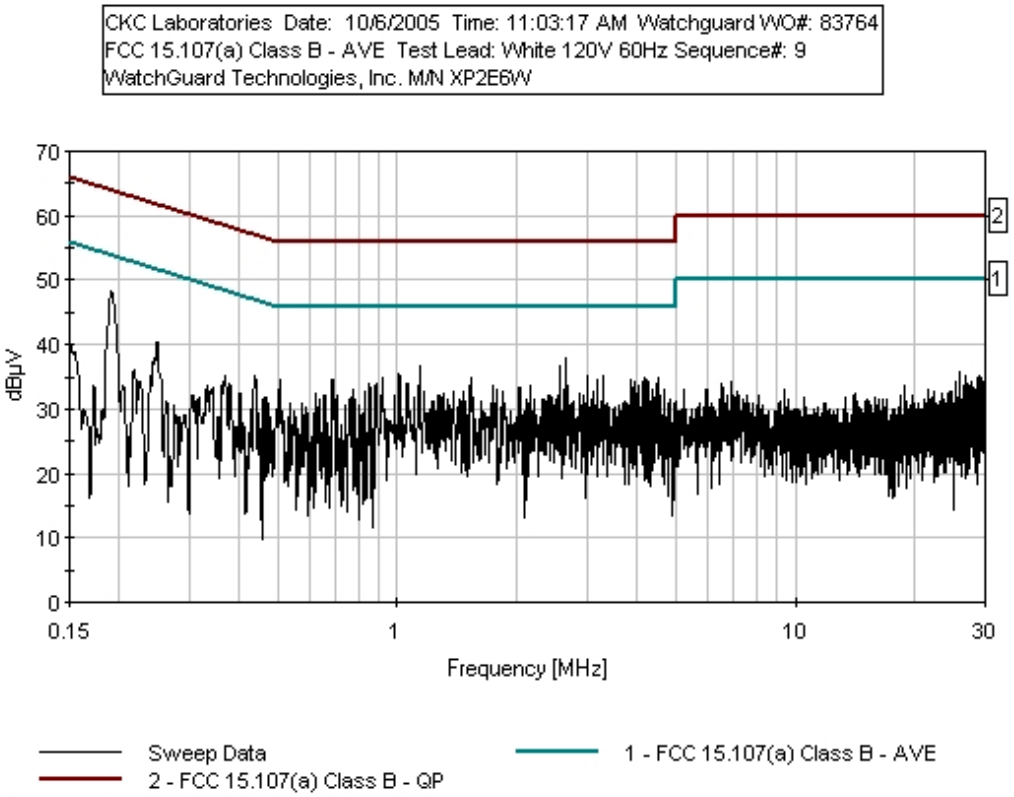
Transducer Legend:

T1=Cable - Internal + cab	T2=LISN Insertion Loss s/n280
T3=HP Filter AN02608	T4=ATT 10d B Site D Conducted

Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	190.724k	37.5	+0.1	+0.3	+0.2	+10.2	+0.0	48.3	54.0	-5.7	White
2	2.655M	27.0	+0.3	+0.3	+0.1	+10.3	+0.0	38.0	46.0	-8.0	White
3	2.557M	25.7	+0.3	+0.3	+0.1	+10.3	+0.0	36.7	46.0	-9.3	White
4	1.137M	25.6	+0.2	+0.3	+0.2	+10.3	+0.0	36.6	46.0	-9.4	White

5	1.009M	24.6	+0.2	+0.3	+0.2	+10.3	+0.0	35.6	46.0	-10.4	White
6	2.995M	24.3	+0.3	+0.3	+0.1	+10.3	+0.0	35.3	46.0	-10.7	White
7	3.301M	24.1	+0.3	+0.3	+0.1	+10.3	+0.0	35.1	46.0	-10.9	White
8	1.541M	24.1	+0.2	+0.3	+0.1	+10.3	+0.0	35.0	46.0	-11.0	White
9	915.479k	23.9	+0.2	+0.2	+0.2	+10.3	+0.0	34.8	46.0	-11.2	White
10	4.530M	23.8	+0.3	+0.3	+0.1	+10.3	+0.0	34.8	46.0	-11.2	White
11	248.900k	29.6	+0.1	+0.2	+0.3	+10.3	+0.0	40.5	51.8	-11.3	White
12	4.173M	23.6	+0.3	+0.4	+0.1	+10.3	+0.0	34.7	46.0	-11.3	White
13	686.678k	23.7	+0.1	+0.2	+0.3	+10.3	+0.0	34.6	46.0	-11.4	White
14	4.233M	23.5	+0.3	+0.4	+0.1	+10.3	+0.0	34.6	46.0	-11.4	White
15	506.331k	23.5	+0.1	+0.3	+0.2	+10.3	+0.0	34.4	46.0	-11.6	White
16	3.178M	23.4	+0.3	+0.3	+0.1	+10.3	+0.0	34.4	46.0	-11.6	White
17	3.871M	23.3	+0.3	+0.4	+0.1	+10.3	+0.0	34.4	46.0	-11.6	White
18	4.216M	23.1	+0.3	+0.4	+0.1	+10.3	+0.0	34.2	46.0	-11.8	White
19	4.279M	23.1	+0.3	+0.4	+0.1	+10.3	+0.0	34.2	46.0	-11.8	White
20	4.114M	23.0	+0.3	+0.4	+0.1	+10.3	+0.0	34.1	46.0	-11.9	White


CKC Laboratories Date: 10/6/2005 Time: 11:03:17 AM Watchguard WO#: 83764
FCC 15.107(a) Class B - AVE Test Lead: White 120V 60Hz Sequence#: 9
WatchGuard Technologies, Inc. M/N XP2E6W
70
60
50
40
30
20
10
0
dBµV
0.15
1
10
30
Frequency [MHz]
2
1
Sweep Data
2 - FCC 15.107(a) Class B - QP
1 - FCC 15.107(a) Class B - AVE

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **FCC 15.107(a) Class B - AVE**
Work Order #: **83764** Date: 10/6/2005
Test Type: **Conducted Emissions** Time: 11:39:15 AM
Equipment: **Internet Firewall** Sequence#: 15
Manufacturer: WatchGuard Technologies, Inc. Tested By: Mike Wilkinson
Model: XP2E6W 120V 60Hz
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001
AC Adapter for EUT	Leader Electronics Inc.	1415-2120125-WP	none

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480
Internet Firewall	WatchGuard Technologies, Inc.	R6264S	808005596-6641
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600002-6EF8
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600207-AD99
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	110
Laptop PC	Toshiba	PA1230U XCD	02792218-3
Laptop PC	Dell	D600	79GSC51
USB/Wireless Network Adapter	Linksys	WUSB54GS	MI0004C09761

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. The EUT is running Montavista Linux The EUT wireless card is pinging uni-directionally via 802.11b (11 Mb/sec) to an external Dell D600 Support PC using a Linksys wireless usb adapter. A Toshiba 8100 is connected using shielded serial cable to the EUT serial port at 115k to initialize the unit as needed and monitor ping status. All 6 EUT wan/Lan ports are pinging bi-directionally to external support PC's via UTP Cat 5 ethernet cables. Three ethernet cables are going to three separate WatchGuard FB X Edge units, and three ethernet cables are going to a single WatchGuard X2 unit. EUT Operational Mode: 802.11b @ 11MBs. Rx. Frequency Range Investigated: 150 kHz to 30 MHz. Temperature: 65ºF, Relative Humidity: 32%.

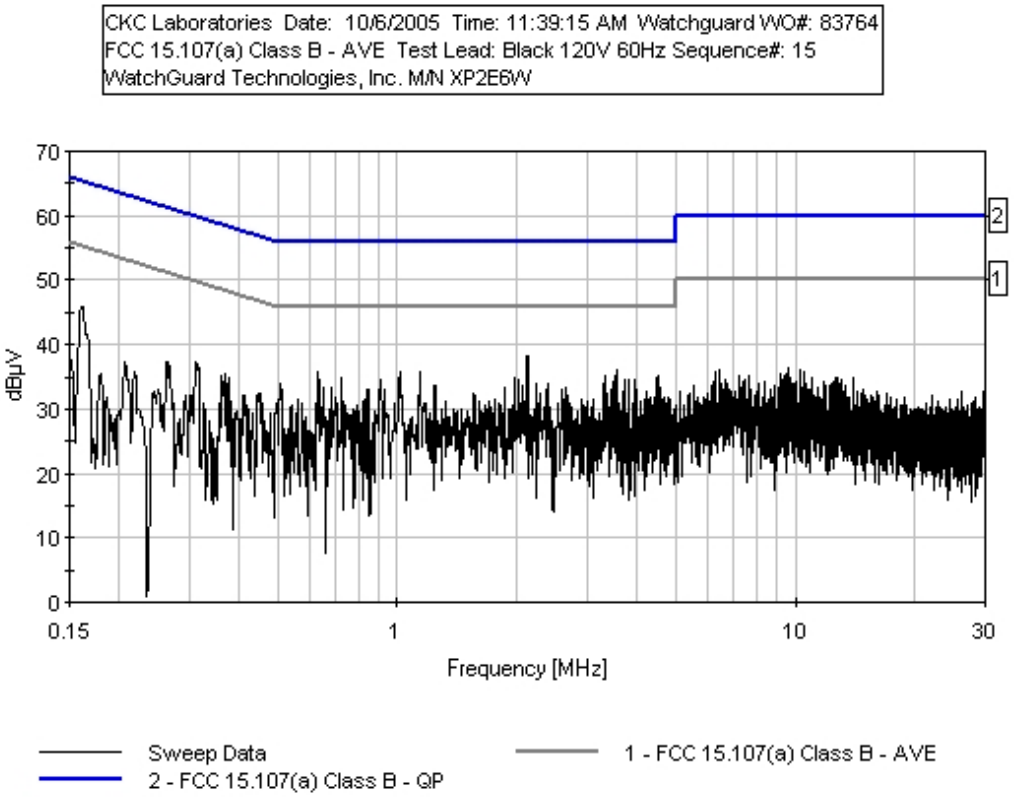
Transducer Legend:

T1=Cable - Internal + cab	T2=LISN Insertion Loss s/n276
T3=HP Filter AN02608	T4=ATT 10d B Site D Conducted

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2.119M	27.1	+0.2	+0.4	+0.1	+10.3	+0.0	38.1	46.0	-7.9	Black
2	160.908k	33.6	+0.1	+0.4	+1.7	+10.2	+0.0	46.0	55.4	-9.4	Black
3	3.569M	24.9	+0.3	+0.4	+0.1	+10.3	+0.0	36.0	46.0	-10.0	Black
4	1.137M	24.9	+0.2	+0.3	+0.2	+10.3	+0.0	35.9	46.0	-10.1	Black

5	631.410k	24.7	+0.1	+0.3	+0.3	+10.3	+0.0	35.7	46.0	-10.3	Black
6	1.013M	24.7	+0.2	+0.3	+0.2	+10.3	+0.0	35.7	46.0	-10.3	Black
7	3.518M	24.1	+0.3	+0.4	+0.1	+10.3	+0.0	35.2	46.0	-10.8	Black
8	3.310M	24.1	+0.3	+0.3	+0.1	+10.3	+0.0	35.1	46.0	-10.9	Black
9	4.501M	24.0	+0.3	+0.4	+0.1	+10.3	+0.0	35.1	46.0	-10.9	Black
10	722.311k	23.9	+0.1	+0.3	+0.3	+10.3	+0.0	34.9	46.0	-11.1	Black
11	1.966M	23.8	+0.2	+0.4	+0.1	+10.3	+0.0	34.8	46.0	-11.2	Black
12	911.226k	23.6	+0.2	+0.3	+0.2	+10.3	+0.0	34.6	46.0	-11.4	Black
13	2.021M	23.6	+0.2	+0.4	+0.1	+10.3	+0.0	34.6	46.0	-11.4	Black
14	3.727M	23.5	+0.3	+0.4	+0.1	+10.3	+0.0	34.6	46.0	-11.4	Black
15	3.829M	23.5	+0.3	+0.4	+0.1	+10.3	+0.0	34.6	46.0	-11.4	Black
16	3.926M	23.3	+0.3	+0.4	+0.1	+10.3	+0.0	34.4	46.0	-11.6	Black
17	3.467M	23.2	+0.3	+0.4	+0.1	+10.3	+0.0	34.3	46.0	-11.7	Black
18	509.240k	23.1	+0.1	+0.3	+0.2	+10.3	+0.0	34.0	46.0	-12.0	Black
19	2.221M	22.9	+0.2	+0.4	+0.1	+10.3	+0.0	33.9	46.0	-12.1	Black
20	2.383M	22.7	+0.3	+0.4	+0.1	+10.3	+0.0	33.8	46.0	-12.2	Black


CKC Laboratories Date: 10/6/2005 Time: 11:39:15 AM Watchguard WO#: 83764
FCC 15.107(a) Class B - AVE Test Lead: Black 120V 60Hz Sequence#: 15
WatchGuard Technologies, Inc. M/N XP2E6W
70
60
50
40
30
20
10
0
dBµV
0.15
1
10
30
Frequency [MHz]
2
1
Sweep Data
2 - FCC 15.107(a) Class B - QP
1 - FCC 15.107(a) Class B - AVE

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **FCC 15.107(a) Class B - AVE**
Work Order #: **83764** Date: 10/6/2005
Test Type: **Conducted Emissions** Time: 11:34:09 AM
Equipment: **Internet Firewall** Sequence#: 14
Manufacturer: WatchGuard Technologies, Inc. Tested By: Mike Wilkinson
Model: XP2E6W 120V 60Hz
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001
AC Adapter for EUT	Leader Electronics Inc.	1415-2120125-WP	none

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480
Internet Firewall	WatchGuard Technologies, Inc.	R6264S	808005596-6641
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600002-6EF8
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600207-AD99
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	110
Laptop PC	Toshiba	PA1230U XCD	02792218-3
Laptop PC	Dell	D600	79GSC51
USB/Wireless Network Adapter	Linksys	WUSB54GS	MI0004C09761

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. The EUT is running Montavista Linux The EUT wireless card is pinging uni-directionally via 802.11b (11 Mb/sec) to an external Dell D600 Support PC using a Linksys wireless usb adapter. A Toshiba 8100 is connected using shielded serial cable to the EUT serial port at 115k to initialize the unit as needed and monitor ping status. All 6 EUT wan/Lan ports are pinging bi-directionally to external support PC's via UTP Cat 5 ethernet cables. Three ethernet cables are going to three separate WatchGuard FB X Edge units, and three ethernet cables are going to a single WatchGuard X2 unit. EUT Operational Mode: 802.11b @ 11MBs. Rx. Frequency Range Investigated: 150 kHz to 30 MHz. Temperature: 65ºF, Relative Humidity: 32%.

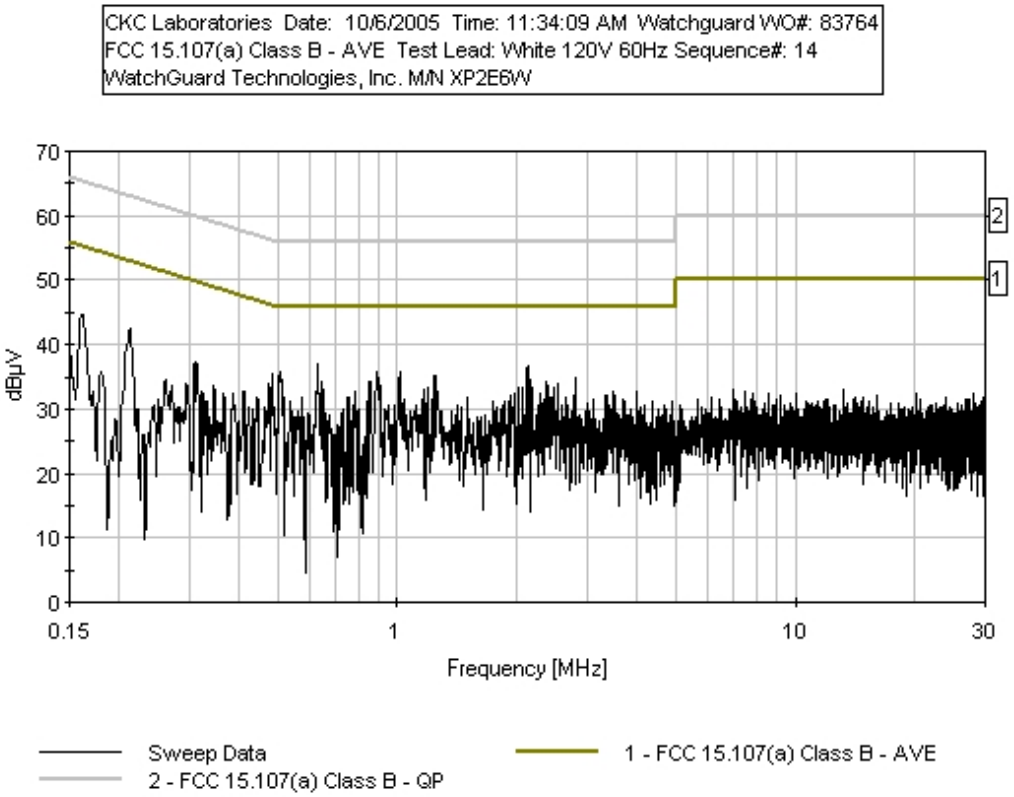
Transducer Legend:

T1=Cable - Internal + cab	T2=LISN Insertion Loss s/n280
T3=HP Filter AN02608	T4=ATT 10d B Site D Conducted

Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	629.956k	26.2	+0.1	+0.2	+0.3	+10.3	+0.0	37.1	46.0	-8.9	White
2	2.123M	25.8	+0.2	+0.3	+0.1	+10.3	+0.0	36.7	46.0	-9.3	White
3	505.604k	24.9	+0.1	+0.3	+0.2	+10.3	+0.0	35.8	46.0	-10.2	White
4	889.962k	25.0	+0.1	+0.2	+0.2	+10.3	+0.0	35.8	46.0	-10.2	White

5	1.013M	24.8	+0.2	+0.3	+0.2	+10.3	+0.0	35.8	46.0	-10.2	White
6	212.540k	31.7	+0.1	+0.3	+0.1	+10.2	+0.0	42.4	53.1	-10.7	White
7	1.239M	24.3	+0.2	+0.3	+0.2	+10.3	+0.0	35.3	46.0	-10.7	White
8	160.908k	32.3	+0.1	+0.3	+1.7	+10.2	+0.0	44.6	55.4	-10.8	White
9	485.242k	24.5	+0.1	+0.3	+0.2	+10.3	+0.0	35.4	46.2	-10.8	White
10	2.795M	23.9	+0.3	+0.3	+0.1	+10.3	+0.0	34.9	46.0	-11.1	White
11	2.170M	23.6	+0.2	+0.3	+0.1	+10.3	+0.0	34.5	46.0	-11.5	White
12	646.682k	23.4	+0.1	+0.2	+0.3	+10.3	+0.0	34.3	46.0	-11.7	White
13	852.481k	23.4	+0.1	+0.2	+0.3	+10.3	+0.0	34.3	46.0	-11.7	White
14	2.374M	23.2	+0.3	+0.3	+0.1	+10.3	+0.0	34.2	46.0	-11.8	White
15	2.536M	22.9	+0.3	+0.3	+0.1	+10.3	+0.0	33.9	46.0	-12.1	White
16	475.788k	23.0	+0.1	+0.3	+0.2	+10.3	+0.0	33.9	46.4	-12.5	White
17	1.188M	22.4	+0.2	+0.3	+0.2	+10.3	+0.0	33.4	46.0	-12.6	White
18	2.072M	22.5	+0.2	+0.3	+0.1	+10.3	+0.0	33.4	46.0	-12.6	White
19	2.017M	22.4	+0.2	+0.3	+0.1	+10.3	+0.0	33.3	46.0	-12.7	White
20	2.463M	22.3	+0.3	+0.3	+0.1	+10.3	+0.0	33.3	46.0	-12.7	White


CKC Laboratories Date: 10/6/2005 Time: 11:34:09 AM Watchguard WO#: 83764
FCC 15.107(a) Class B - AVE Test Lead: White 120V 60Hz Sequence#: 14
WatchGuard Technologies, Inc. M/N XP2E6W
70
60
50
40
30
20
10
0
dBµV
0.15
1
10
30
Frequency [MHz]
2
1
Sweep Data
2 - FCC 15.107(a) Class B - QP
1 - FCC 15.107(a) Class B - AVE

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **15.109 CLASS B**
Work Order #: **83764** Date: 10/5/2005
Test Type: **Radiated Scan** Time: 15:35:35
Equipment: **Internet Firewall** Sequence#: 6
Manufacturer: WatchGuard Technologies, Inc. Tested By: Mike Wilkinson
Model: XP2E6W
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
AC Adapter for EUT	Globtek	GT-41052-1512	none
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480
Internet Firewall	WatchGuard Technologies, Inc.	R6264S	808005596-6641
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600002-6EF8
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600207-AD99
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	110
Laptop PC	Toshiba	PA1230U XCD	02792218-3
Laptop PC	Dell	D600	79GSC51
USB/Wireless Network Adapter	Linksys	WUSB54GS	MI0004C09761

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. The EUT is running Montavista Linux The EUT wireless card is pinging uni-directionally via 802.11b (11 Mb/sec) to an external Dell D600 Support PC using a Linksys wireless usb adapter. A Toshiba 8100 is connected using shielded serial cable to the EUT serial port at 115k to initialize the unit as needed and monitor ping status. All 6 EUT wan/Lan ports are pinging bi-directionally to external support PC's via UTP Cat 5 ethernet cables. Three ethernet cables are going to three separate WatchGuard FB X Edge units, and three ethernet cables are going to a single WatchGuard X2 unit. EUT Operational Mode: 802.11b Rx. Frequency Range Investigated: 30 MHz to 12.5 GHz. Temperature: 65ºF, Relative Humidity: 32%.

Transducer Legend:

T1=Amp - S/N 604	T2=Bilog Site D
T3=Cable - 10 Meter	T4=Amp - S/N 301
T5=Horn AN 00656 1-18 GHz (Mariposa)	T6=Cable - 3 Meter to bulkhead
T7=Cable 35' Blue SMA CKC P1352	

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2 T6	T3 T7	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	324.898M	49.1	-26.4	+13.5	+4.3		+0.0	40.5	46.0	-5.5	Vert
2	200.443M	52.9	-26.5	+8.3	+3.3		+0.0	38.0	43.5	-5.5	Vert
3	1320.005M	51.1	+0.0 +25.2	+0.0 +3.6	+0.0 +3.7	-35.5	+0.0	48.1	54.0	-5.9	Vert

4	375.044M	46.5	-26.7	+14.8	+4.8		+0.0	39.4	46.0	-6.6	Horiz
5	1170.050M	50.7	+0.0 +24.7	+0.0 +3.4	+0.0 +3.4	-35.7	+0.0	46.5	54.0	-7.5	Vert
6	125.018M	48.3	-26.7	+11.2	+2.5		+0.0	35.3	43.5	-8.2	Vert
7	500.037M	40.7	-27.3	+17.4	+5.5		+0.0	36.3	46.0	-9.7	Vert
8	250.025M	46.4	-26.0	+12.0	+3.6		+0.0	36.0	46.0	-10.0	Vert
9	400.897M	41.6	-26.8	+15.4	+5.1		+0.0	35.3	46.0	-10.7	Vert
10	500.044M	39.2	-27.3	+17.4	+5.5		+0.0	34.8	46.0	-11.2	Horiz
11	1187.750M	46.2	+0.0 +24.8	+0.0 +3.4	+0.0 +3.5	-35.7	+0.0	42.2	54.0	-11.8	Vert
12	250.040M	42.2	-26.0	+12.0	+3.6		+0.0	31.8	46.0	-14.2	Horiz
13	399.980M	36.9	-26.8	+15.4	+5.1		+0.0	30.6	46.0	-15.4	Horiz
14	200.452M	42.7	-26.5	+8.3	+3.3		+0.0	27.8	43.5	-15.7	Horiz
15	625.029M	31.8	-27.6	+19.4	+6.2		+0.0	29.8	46.0	-16.2	Vert
16	350.031M	37.6	-26.5	+14.2	+4.5		+0.0	29.8	46.0	-16.2	Horiz
17	350.038M	36.8	-26.5	+14.2	+4.5		+0.0	29.0	46.0	-17.0	Vert

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **15.109 CLASS A (Digital)**
Work Order #: **83764** Date: 10/5/2005
Test Type: **Radiated Scan** Time: 14:51:29
Equipment: **Internet Firewall** Sequence#: 7
Manufacturer: WatchGuard Technologies, Inc. Tested By: Mike Wilkinson
Model: XP2E6W
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
AC Adapter for EUT	Globtek	GT-41052-1512	none
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001
AC Adapter for EUT	Leader Electronics Inc.	1415-2120125-WP	none

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480
Internet Firewall	WatchGuard Technologies, Inc.	R6264S	808005596-6641
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600002-6EF8
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600207-AD99
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	110
Laptop PC	Toshiba	PA1230U XCD	02792218-3
Laptop PC	Dell	D600	79GSC51
USB/Wireless Network Adapter	Linksys	WUSB54GS	MI0004C09761

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. The EUT is running Montavista Linux The EUT wireless card is pinging uni-directionally via 802.11b (11 Mb/sec) to an external Dell D600 Support PC using a Linksys wireless usb adapter. A Toshiba 8100 is connected using shielded serial cable to the EUT serial port at 115k to initialize the unit as needed and monitor ping status. All 6 EUT wan/Lan ports are pinging bi-directionally to external support PC's via UTP Cat 5 ethernet cables. Three ethernet cables are going to three separate WatchGuard FB X Edge units, and three ethernet cables are going to a single WatchGuard X2 unit. EUT Operational Mode: 802.11b @ 11MBs. Rx. Frequency Range Investigated: 30 MHz to 2.0 GHz. Highest frequency used or generated is 266 MHz. Temperature: 65ºF, Relative Humidity: 32%. All readings are with Globtek supply - Verified that the Globtek was worst case over the Leader supply

Transducer Legend:

T1=Amp - S/N 604	T2=Bilog Site D
T3=Cable - 10 Meter	T4=Amp - S/N 301
T5=Horn AN 00656 1-18 GHz (Mariposa)	T6=Cable 35' Blue SMA CKC P1352
T7=Cable - 3 Meter to bulkhead	

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7						
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	47.817M	57.1	-26.8	+8.9	+1.6		-10.0	30.8	39.1	-8.3	Vert

2	1319.950M	52.7	+0.0 +25.2	+0.0 +3.7	+0.0 +3.6	-35.5	-10.0	39.7	49.5	-9.8	Vert
3	55.325M	57.0	-26.8	+7.1	+1.7		-10.0	29.0	39.1	-10.1	Vert
4	1584.022M	48.4	+0.0 +26.2	+0.0 +4.1	+0.0 +3.9	-35.2	-10.0	37.4	49.5	-12.1	Vert
5	200.443M	52.9	-26.5	+8.3	+3.3		-10.0	28.0	43.5	-15.5	Vert
6	324.898M	49.1	-26.4	+13.5	+4.3		-10.0	30.5	46.4	-15.9	Vert
7	375.044M	46.5	-26.7	+14.8	+4.8		-10.0	29.4	46.4	-17.0	Horiz
8	1319.970M	44.3	+0.0 +25.2	+0.0 +3.7	+0.0 +3.6	-35.5	-10.0	31.3	49.5	-18.2	Horiz
9	125.018M	48.3	-26.7	+11.2	+2.5		-10.0	25.3	43.5	-18.2	Vert
10	1056.186M	49.5	+0.0 +24.3	+0.0 +3.2	+0.0	-35.9	-10.0	31.1	49.5	-18.4	Vert
11	1056.010M	45.4	+0.0 +24.3	+0.0 +3.2	+0.0 +3.2	-35.9	-10.0	30.2	49.5	-19.3	Horiz
12	500.037M	40.7	-27.3	+17.4	+5.5		-10.0	26.3	46.4	-20.1	Vert
13	250.025M	46.4	-26.0	+12.0	+3.6		-10.0	26.0	46.4	-20.4	Vert
14	400.897M	41.6	-26.8	+15.4	+5.1		-10.0	25.3	46.4	-21.1	Vert
15	500.044M	39.2	-27.3	+17.4	+5.5		-10.0	24.8	46.4	-21.6	Horiz
16	250.040M	42.2	-26.0	+12.0	+3.6		-10.0	21.8	46.4	-24.6	Horiz
17	200.452M	42.7	-26.5	+8.3	+3.3		-10.0	17.8	43.5	-25.7	Horiz
18	399.980M	36.9	-26.8	+15.4	+5.1		-10.0	20.6	46.4	-25.8	Horiz
19	625.029M	31.8	-27.6	+19.4	+6.2		-10.0	19.8	46.4	-26.6	Vert
20	350.031M	37.6	-26.5	+14.2	+4.5		-10.0	19.8	46.4	-26.6	Horiz
21	350.038M	36.8	-26.5	+14.2	+4.5		-10.0	19.0	46.4	-27.4	Vert

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **FCC 15.207 - AVE**
Work Order #: **83764** Date: 10/6/2005
Test Type: **Conducted Emissions** Time: 10:53:05 AM
Equipment: **Internet Firewall** Sequence#: 8
Manufacturer: WatchGuard Technologies, Inc. Tested By: Mike Wilkinson
Model: XP2E6W 120V 60Hz
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
AC Adapter for EUT	Globtek	GT-41052-1512	none
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480
Internet Firewall	WatchGuard Technologies, Inc.	R6264S	808005596-6641
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600002-6EF8
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600207-AD99
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	110
Laptop PC	Toshiba	PA1230U XCD	02792218-3
Laptop PC	Dell	D600	79GSC51
USB/Wireless Network Adapter	Linksys	WUSB54GS	MI0004C09761

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. The EUT is running Montavista Linux The EUT wireless card is pinging uni-directionally via 802.11b (11 Mb/sec) to an external Dell D600 Support PC using a Linksys wireless usb adapter. A Toshiba 8100 is connected using shielded serial cable to the EUT serial port at 115k to initialize the unit as needed and monitor ping status. All 6 EUT wan/Lan ports are pinging bi-directionally to external support PC's via UTP Cat 5 ethernet cables. Three ethernet cables are going to three separate WatchGuard FB X Edge units, and three ethernet cables are going to a single WatchGuard X2 unit. EUT Operational Mode: 802.11b @ 11MBs. Low Channel = 2412 MHz. Frequency Range Investigated: 150 kHz to 30 MHz. Temperature: 65ºF, Relative Humidity: 32%.

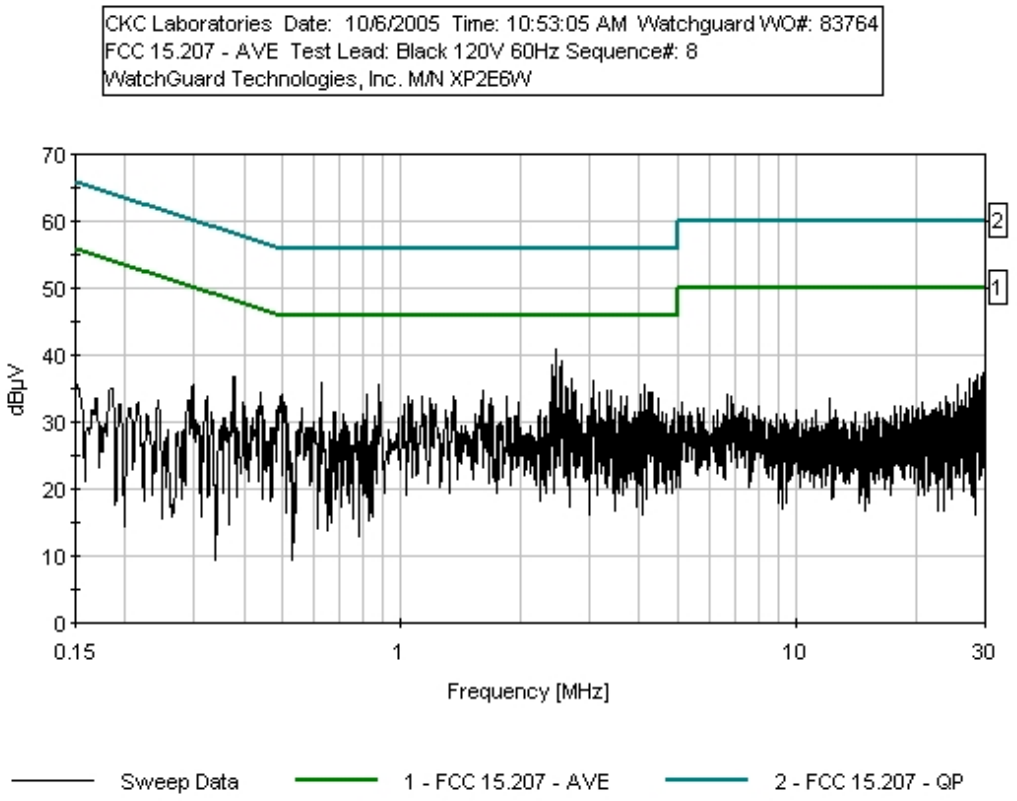
Transducer Legend:

T1=Cable - Internal + cab	T2=LISN Insertion Loss s/n276
T3=HP Filter AN02608	T4=ATT 10d B Site D Conducted

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2.451M	29.8	+0.3	+0.3	+0.1	+10.3	+0.0	40.8	46.0	-5.2	Black
2	2.553M	28.1	+0.3	+0.3	+0.1	+10.3	+0.0	39.1	46.0	-6.9	Black
3	2.417M	27.5	+0.3	+0.4	+0.1	+10.3	+0.0	38.6	46.0	-7.4	Black
4	2.685M	25.4	+0.3	+0.3	+0.1	+10.3	+0.0	36.4	46.0	-9.6	Black

5	2.697M	25.4	+0.3	+0.3	+0.1	+10.3	+0.0	36.4	46.0	-9.6	Black
6	3.059M	25.1	+0.3	+0.3	+0.1	+10.3	+0.0	36.1	46.0	-9.9	Black
7	627.774k	25.0	+0.1	+0.3	+0.3	+10.3	+0.0	36.0	46.0	-10.0	Black
8	881.457k	24.7	+0.1	+0.3	+0.2	+10.3	+0.0	35.6	46.0	-10.4	Black
9	4.126M	24.4	+0.3	+0.4	+0.1	+10.3	+0.0	35.5	46.0	-10.5	Black
10	2.621M	24.2	+0.3	+0.3	+0.1	+10.3	+0.0	35.2	46.0	-10.8	Black
11	3.072M	24.2	+0.3	+0.3	+0.1	+10.3	+0.0	35.2	46.0	-10.8	Black
12	1.604M	23.8	+0.2	+0.4	+0.1	+10.3	+0.0	34.8	46.0	-11.2	Black
13	3.327M	23.8	+0.3	+0.3	+0.1	+10.3	+0.0	34.8	46.0	-11.2	Black
14	2.770M	23.6	+0.3	+0.3	+0.1	+10.3	+0.0	34.6	46.0	-11.4	Black
15	3.386M	23.6	+0.3	+0.3	+0.1	+10.3	+0.0	34.6	46.0	-11.4	Black



Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **FCC 15.207 - AVE**
Work Order #: **83764** Date: 10/6/2005
Test Type: **Conducted Emissions** Time: 11:03:17 AM
Equipment: **Internet Firewall** Sequence#: 9
Manufacturer: WatchGuard Technologies, Inc. Tested By: Mike Wilkinson
Model: XP2E6W 120V 60Hz
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
AC Adapter for EUT	Globtek	GT-41052-1512	none
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480
Internet Firewall	WatchGuard Technologies, Inc.	R6264S	808005596-6641
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600002-6EF8
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600207-AD99
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	110
Laptop PC	Toshiba	PA1230U XCD	02792218-3
Laptop PC	Dell	D600	79GSC51
USB/Wireless Network Adapter	Linksys	WUSB54GS	MI0004C09761

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. The EUT is running Montavista Linux The EUT wireless card is pinging uni-directionally via 802.11b (11 Mb/sec) to an external Dell D600 Support PC using a Linksys wireless usb adapter. A Toshiba 8100 is connected using shielded serial cable to the EUT serial port at 115k to initialize the unit as needed and monitor ping status. All 6 EUT wan/Lan ports are pinging bi-directionally to external support PC's via UTP Cat 5 ethernet cables. Three ethernet cables are going to three separate WatchGuard FB X Edge units, and three ethernet cables are going to a single WatchGuard X2 unit. EUT Operational Mode: 802.11b @ 11MBs. Low Channel = 2412 MHz. Frequency Range Investigated: 150 kHz to 30 MHz. Temperature: 65ºF, Relative Humidity: 32%.

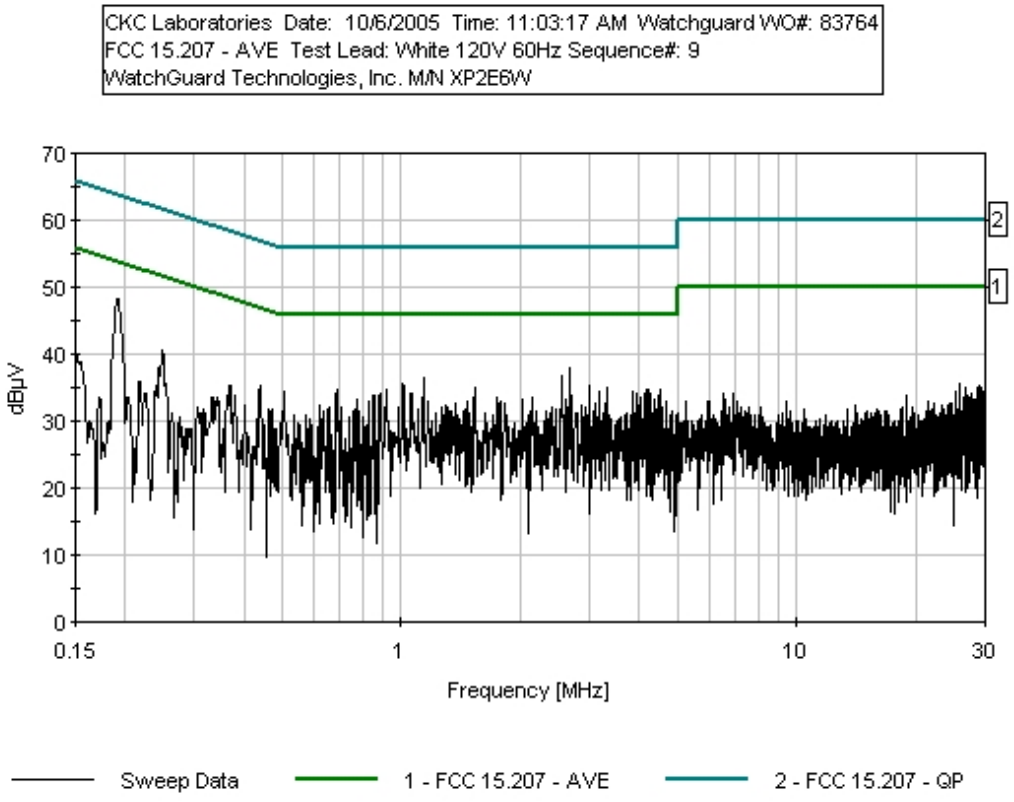
Transducer Legend:

T1=Cable - Internal + cab	T2=LISN Insertion Loss s/n280
T3=HP Filter AN02608	T4=ATT 10d B Site D Conducted

Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	190.724k	37.5	+0.1	+0.3	+0.2	+10.2	+0.0	48.3	54.0	-5.7	White
2	2.655M	27.0	+0.3	+0.3	+0.1	+10.3	+0.0	38.0	46.0	-8.0	White
3	2.557M	25.7	+0.3	+0.3	+0.1	+10.3	+0.0	36.7	46.0	-9.3	White
4	1.137M	25.6	+0.2	+0.3	+0.2	+10.3	+0.0	36.6	46.0	-9.4	White

5	1.009M	24.6	+0.2	+0.3	+0.2	+10.3	+0.0	35.6	46.0	-10.4	White
6	2.995M	24.3	+0.3	+0.3	+0.1	+10.3	+0.0	35.3	46.0	-10.7	White
7	3.301M	24.1	+0.3	+0.3	+0.1	+10.3	+0.0	35.1	46.0	-10.9	White
8	1.541M	24.1	+0.2	+0.3	+0.1	+10.3	+0.0	35.0	46.0	-11.0	White
9	915.479k	23.9	+0.2	+0.2	+0.2	+10.3	+0.0	34.8	46.0	-11.2	White
10	4.530M	23.8	+0.3	+0.3	+0.1	+10.3	+0.0	34.8	46.0	-11.2	White
11	248.900k	29.6	+0.1	+0.2	+0.3	+10.3	+0.0	40.5	51.8	-11.3	White
12	4.173M	23.6	+0.3	+0.4	+0.1	+10.3	+0.0	34.7	46.0	-11.3	White
13	686.678k	23.7	+0.1	+0.2	+0.3	+10.3	+0.0	34.6	46.0	-11.4	White
14	4.233M	23.5	+0.3	+0.4	+0.1	+10.3	+0.0	34.6	46.0	-11.4	White
15	506.331k	23.5	+0.1	+0.3	+0.2	+10.3	+0.0	34.4	46.0	-11.6	White
16	3.178M	23.4	+0.3	+0.3	+0.1	+10.3	+0.0	34.4	46.0	-11.6	White
17	3.871M	23.3	+0.3	+0.4	+0.1	+10.3	+0.0	34.4	46.0	-11.6	White
18	4.216M	23.1	+0.3	+0.4	+0.1	+10.3	+0.0	34.2	46.0	-11.8	White
19	4.279M	23.1	+0.3	+0.4	+0.1	+10.3	+0.0	34.2	46.0	-11.8	White
20	4.114M	23.0	+0.3	+0.4	+0.1	+10.3	+0.0	34.1	46.0	-11.9	White


CKC Laboratories Date: 10/6/2005 Time: 11:03:17 AM Watchguard WO#: 83764
FCC 15.207 - AVE Test Lead: White 120V 60Hz Sequence#: 9
WatchGuard Technologies, Inc. M/N XP2E6W
70
60
50
40
30
20
10
0
dBµV
0.15
1
10
30
Frequency [MHz]
2
1
Sweep Data
1 - FCC 15.207 - AVE
2 - FCC 15.207 - QP

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **FCC 15.207 - AVE**
Work Order #: **83764** Date: 10/6/2005
Test Type: **Conducted Emissions** Time: 11:39:15 AM
Equipment: **Internet Firewall** Sequence#: 15
Manufacturer: WatchGuard Technologies, Inc. Tested By: Mike Wilkinson
Model: XP2E6W 120V 60Hz
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001
AC Adapter for EUT	Leader Electronics Inc.	1415-2120125-WP	none

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480
Internet Firewall	WatchGuard Technologies, Inc.	R6264S	808005596-6641
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600002-6EF8
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600207-AD99
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	110
Laptop PC	Toshiba	PA1230U XCD	02792218-3
Laptop PC	Dell	D600	79GSC51
USB/Wireless Network Adapter	Linksys	WUSB54GS	MI0004C09761

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. The EUT is running Montavista Linux The EUT wireless card is pinging uni-directionally via 802.11b (11 Mb/sec) to an external Dell D600 Support PC using a Linksys wireless usb adapter. A Toshiba 8100 is connected using shielded serial cable to the EUT serial port at 115k to initialize the unit as needed and monitor ping status. All 6 EUT wan/Lan ports are pinging bi-directionally to external support PC's via UTP Cat 5 ethernet cables. Three ethernet cables are going to three separate WatchGuard FB X Edge units, and three ethernet cables are going to a single WatchGuard X2 unit. EUT Operational Mode: 802.11b @ 11MBs. Low Channel = 2412 MHz. Frequency Range Investigated: 150 kHz to 30 MHz. Temperature: 65ºF, Relative Humidity: 32%.

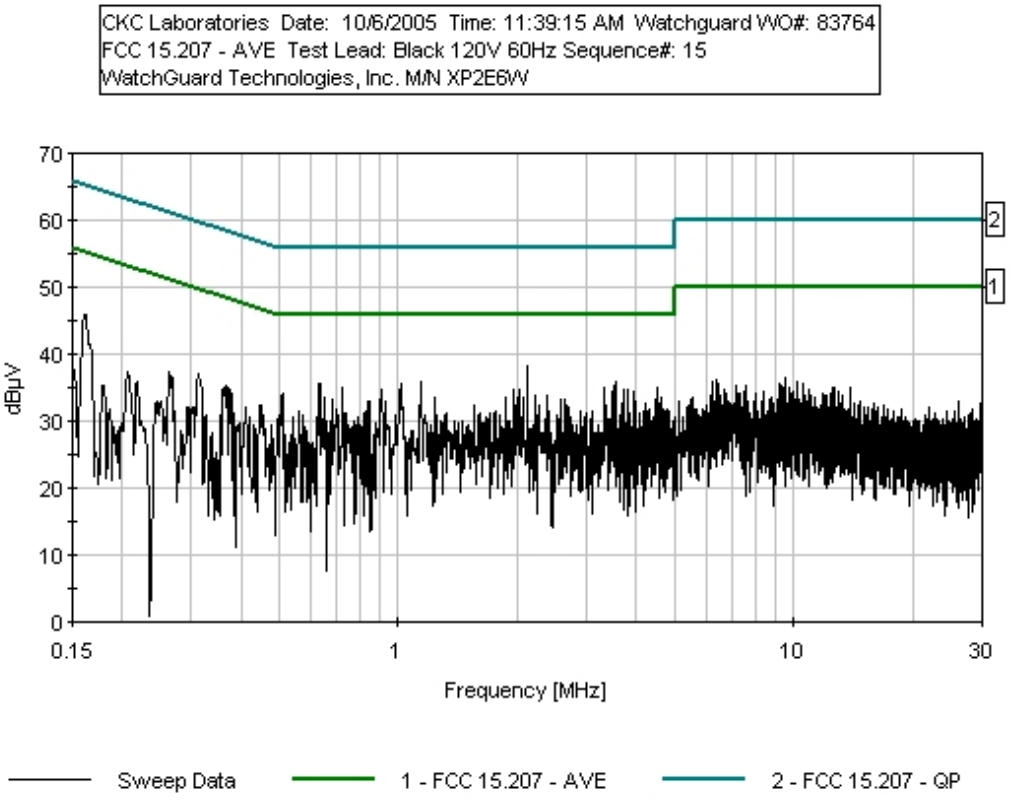
Transducer Legend:

T1=Cable - Internal + cab	T2=LISN Insertion Loss s/n276
T3=HP Filter AN02608	T4=ATT 10d B Site D Conducted

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2.119M	27.1	+0.2	+0.4	+0.1	+10.3	+0.0	38.1	46.0	-7.9	Black
2	160.908k	33.6	+0.1	+0.4	+1.7	+10.2	+0.0	46.0	55.4	-9.4	Black
3	3.569M	24.9	+0.3	+0.4	+0.1	+10.3	+0.0	36.0	46.0	-10.0	Black
4	1.137M	24.9	+0.2	+0.3	+0.2	+10.3	+0.0	35.9	46.0	-10.1	Black

5	631.410k	24.7	+0.1	+0.3	+0.3	+10.3	+0.0	35.7	46.0	-10.3	Black
6	1.013M	24.7	+0.2	+0.3	+0.2	+10.3	+0.0	35.7	46.0	-10.3	Black
7	3.518M	24.1	+0.3	+0.4	+0.1	+10.3	+0.0	35.2	46.0	-10.8	Black
8	3.310M	24.1	+0.3	+0.3	+0.1	+10.3	+0.0	35.1	46.0	-10.9	Black
9	4.501M	24.0	+0.3	+0.4	+0.1	+10.3	+0.0	35.1	46.0	-10.9	Black
10	722.311k	23.9	+0.1	+0.3	+0.3	+10.3	+0.0	34.9	46.0	-11.1	Black
11	1.966M	23.8	+0.2	+0.4	+0.1	+10.3	+0.0	34.8	46.0	-11.2	Black
12	911.226k	23.6	+0.2	+0.3	+0.2	+10.3	+0.0	34.6	46.0	-11.4	Black
13	2.021M	23.6	+0.2	+0.4	+0.1	+10.3	+0.0	34.6	46.0	-11.4	Black
14	3.727M	23.5	+0.3	+0.4	+0.1	+10.3	+0.0	34.6	46.0	-11.4	Black
15	3.829M	23.5	+0.3	+0.4	+0.1	+10.3	+0.0	34.6	46.0	-11.4	Black
16	3.926M	23.3	+0.3	+0.4	+0.1	+10.3	+0.0	34.4	46.0	-11.6	Black
17	3.467M	23.2	+0.3	+0.4	+0.1	+10.3	+0.0	34.3	46.0	-11.7	Black
18	509.240k	23.1	+0.1	+0.3	+0.2	+10.3	+0.0	34.0	46.0	-12.0	Black
19	2.221M	22.9	+0.2	+0.4	+0.1	+10.3	+0.0	33.9	46.0	-12.1	Black
20	2.383M	22.7	+0.3	+0.4	+0.1	+10.3	+0.0	33.8	46.0	-12.2	Black


CKC Laboratories Date: 10/6/2005 Time: 11:39:15 AM Watchguard WO#: 83764
FCC 15.207 - AVE Test Lead: Black 120V 60Hz Sequence#: 15
WatchGuard Technologies, Inc. M/N XP2E6W
70
60
50
40
30
20
10
0
dBµV
0.15
1
10
30
Frequency [MHz]
2
1
Sweep Data
1 - FCC 15.207 - AVE
2 - FCC 15.207 - QP

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **FCC 15.207 - AVE**
Work Order #: **83764** Date: 10/6/2005
Test Type: **Conducted Emissions** Time: 11:34:09 AM
Equipment: **Internet Firewall** Sequence#: 14
Manufacturer: WatchGuard Technologies, Inc. Tested By: Mike Wilkinson
Model: XP2E6W 120V 60Hz
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001
AC Adapter for EUT	Leader Electronics Inc.	1415-2120125-WP	none

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480
Internet Firewall	WatchGuard Technologies, Inc.	R6264S	808005596-6641
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600002-6EF8
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600207-AD99
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	110
Laptop PC	Toshiba	PA1230U XCD	02792218-3
Laptop PC	Dell	D600	79GSC51
USB/Wireless Network Adapter	Linksys	WUSB54GS	MI0004C09761

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. The EUT is running Montavista Linux The EUT wireless card is pinging uni-directionally via 802.11b (11 Mb/sec) to an external Dell D600 Support PC using a Linksys wireless usb adapter. A Toshiba 8100 is connected using shielded serial cable to the EUT serial port at 115k to initialize the unit as needed and monitor ping status. All 6 EUT wan/Lan ports are pinging bi-directionally to external support PC's via UTP Cat 5 ethernet cables. Three ethernet cables are going to three separate WatchGuard FB X Edge units, and three ethernet cables are going to a single WatchGuard X2 unit. EUT Operational Mode: 802.11b @ 11MBs. Low Channel = 2412 MHz. Frequency Range Investigated: 150 kHz to 30 MHz. Temperature: 65ºF, Relative Humidity: 32%.

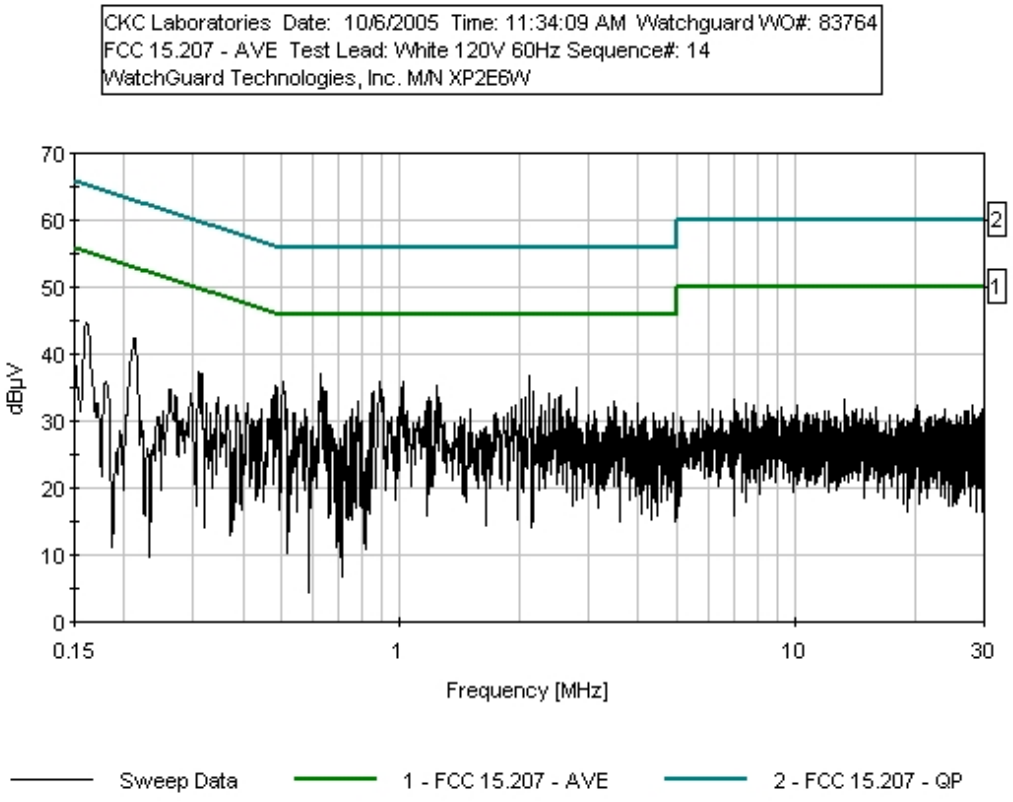
Transducer Legend:

T1=Cable - Internal + cab	T2=LISN Insertion Loss s/n280
T3=HP Filter AN02608	T4=ATT 10d B Site D Conducted

Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	629.956k	26.2	+0.1	+0.2	+0.3	+10.3	+0.0	37.1	46.0	-8.9	White
2	2.123M	25.8	+0.2	+0.3	+0.1	+10.3	+0.0	36.7	46.0	-9.3	White
3	505.604k	24.9	+0.1	+0.3	+0.2	+10.3	+0.0	35.8	46.0	-10.2	White
4	889.962k	25.0	+0.1	+0.2	+0.2	+10.3	+0.0	35.8	46.0	-10.2	White

5	1.013M	24.8	+0.2	+0.3	+0.2	+10.3	+0.0	35.8	46.0	-10.2	White
6	212.540k	31.7	+0.1	+0.3	+0.1	+10.2	+0.0	42.4	53.1	-10.7	White
7	1.239M	24.3	+0.2	+0.3	+0.2	+10.3	+0.0	35.3	46.0	-10.7	White
8	160.908k	32.3	+0.1	+0.3	+1.7	+10.2	+0.0	44.6	55.4	-10.8	White
9	485.242k	24.5	+0.1	+0.3	+0.2	+10.3	+0.0	35.4	46.2	-10.8	White
10	2.795M	23.9	+0.3	+0.3	+0.1	+10.3	+0.0	34.9	46.0	-11.1	White
11	2.170M	23.6	+0.2	+0.3	+0.1	+10.3	+0.0	34.5	46.0	-11.5	White
12	646.682k	23.4	+0.1	+0.2	+0.3	+10.3	+0.0	34.3	46.0	-11.7	White
13	852.481k	23.4	+0.1	+0.2	+0.3	+10.3	+0.0	34.3	46.0	-11.7	White
14	2.374M	23.2	+0.3	+0.3	+0.1	+10.3	+0.0	34.2	46.0	-11.8	White
15	2.536M	22.9	+0.3	+0.3	+0.1	+10.3	+0.0	33.9	46.0	-12.1	White
16	475.788k	23.0	+0.1	+0.3	+0.2	+10.3	+0.0	33.9	46.4	-12.5	White
17	1.188M	22.4	+0.2	+0.3	+0.2	+10.3	+0.0	33.4	46.0	-12.6	White
18	2.072M	22.5	+0.2	+0.3	+0.1	+10.3	+0.0	33.4	46.0	-12.6	White
19	2.017M	22.4	+0.2	+0.3	+0.1	+10.3	+0.0	33.3	46.0	-12.7	White
20	2.463M	22.3	+0.3	+0.3	+0.1	+10.3	+0.0	33.3	46.0	-12.7	White


CKC Laboratories Date: 10/6/2005 Time: 11:34:09 AM Watchguard WO#: 83764
FCC 15.207 - AVE Test Lead: White 120V 60Hz Sequence#: 14
WatchGuard Technologies, Inc. M/N XP2E6W
70
60
50
40
30
20
10
0
dBµV
0.15
1
10
30
Frequency [MHz]
2
1
Sweep Data
1 - FCC 15.207 - AVE
2 - FCC 15.207 - QP

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer:	**Watchguard**		
Specification:	**15.247(b)(3)**		
Work Order #:	**83764**	Date:	11/1/2005
Test Type:	**Conducted Emissions**	Time:	12:28:57
Equipment:	**Internet Firewall**	Sequence#:	1
Manufacturer:	WatchGuard Technologies, Inc.	Tested By:	Randal Clark
Model:	XP2E6W		120V 60Hz
S/N:	100405-001		

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
AC Adapter for EUT	Globtek	GT-41052-1512	none
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. EUT is communicating with support equipment. One EUT antenna is directly connected to spectrum analyzer. Transmit power test performed in accordance with KDB 558074. EUT Operational Mode: 802.11b @ 11MBs. Correction factor used 10*LOG(EBW/RBW) = 2.88 dB. Frequency Range Investigated: Carrier. Temperature: 65ºF, Relative Humidity: 32%.

Transducer Legend:

T1=Att 10dB AN02139	T2=Cable 40 GHz 36"
T3=Corr BW Correction	

Measurement Data: Reading listed by margin. Test Lead: RF Output

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2437.000M	119.1	+10.0	+1.0	+2.9		+0.0	133.0	137.0	-4.0	RF Ou
2	2412.000M	118.4	+10.0	+1.0	+2.9		+0.0	132.3	137.0	-4.7	RF Ou
3	2462.000M	118.1	+10.0	+1.0	+2.9		+0.0	132.0	137.0	-5.0	RF Ou

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **15.247(b)(3)**
Work Order #: **83764** Date: 11/1/2005
Test Type: **Conducted Emissions** Time: 14:16:50
Equipment: **Internet Firewall** Sequence#: 1
Manufacturer: WatchGuard Technologies, Inc. Tested By: Randal Clark
Model: XP2E6W 120V 60Hz
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
AC Adapter for EUT	Globtek	GT-41052-1512	none
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. EUT is communicating with support equipment. One EUT antenna is directly connected to spectrum analyzer. Transmit power test performed in accordance with KDB 558074 EUT Operational Mode: 802.11g @ 54MBs Correction factor used 10*LOG(EBW/RBW) = 5.31 dB Frequency Range Investigated: Carrier Temperature: 65ºF, Relative Humidity: 32%

Transducer Legend:

T1=Att 10dB AN02139	T2=Cable 40 GHz 36"
T3=Corr BW Correction	

Measurement Data: Reading listed by margin. Test Lead: RF Output

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2462.000M	120.1	+10.0	+1.0	+5.3		+0.0	136.4	137.0	-0.6	RF Ou
2	2437.000M	119.9	+10.0	+1.0	+5.3		+0.0	136.2	137.0	-0.8	RF Ou
3	2412.000M	119.8	+10.0	+1.0	+5.3		+0.0	136.1	137.0	-0.9	RF Ou

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **15.247(d) Antenna Conducted**
Work Order #: **83764** Date: 11/1/2005
Test Type: **Conducted Emissions** Time: 14:25:45
Equipment: **Internet Firewall** Sequence#: 3
Manufacturer: WatchGuard Technologies, Inc. Tested By: Randal Clark
Model: XP2E6W 120V 60Hz
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
AC Adapter for EUT	Globtek	GT-41052-1512	none
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. EUT is communicating with support equipment. One EUT antenna is directly connected to spectrum analyzer. Transmit power test performed in accordance with KDB 558074. EUT Mode: 802.11b @ 11MBs EUT Channel: Low. EUT Port: Left. Frequency Range Investigated: 9kHz to 26GHz. Temperature: 65ºF, Relative Humidity: 32%.

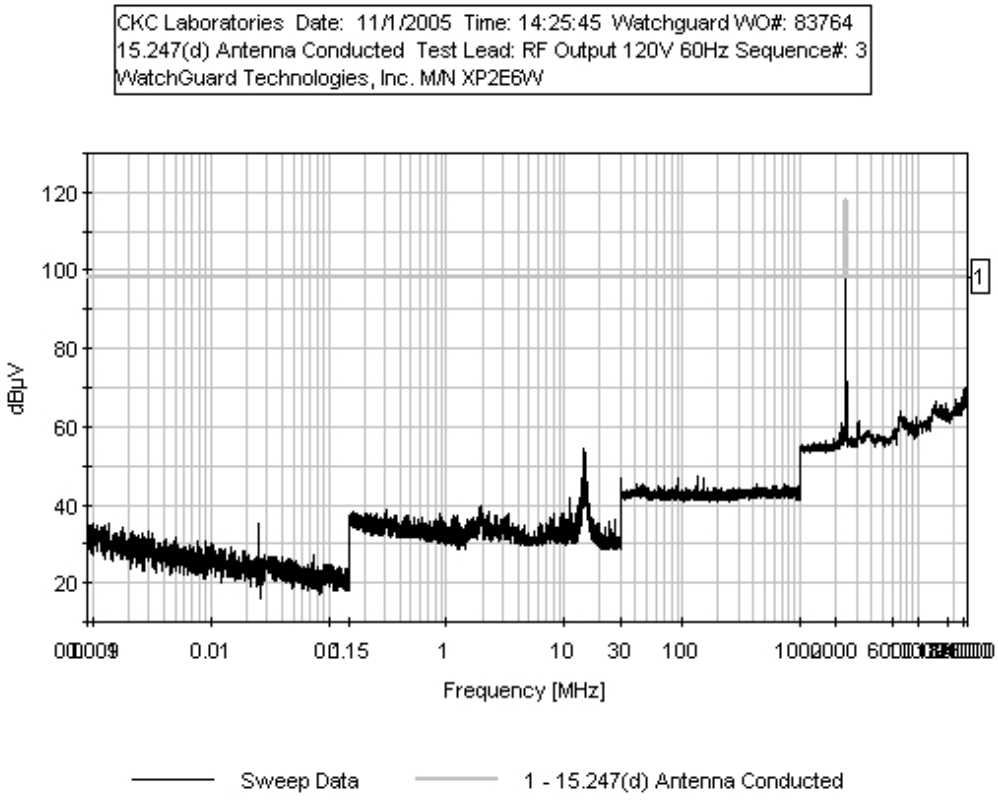
Transducer Legend:

T1=Cable 40 GHz 36" T2=Att 10dB AN02139

Measurement Data: Reading listed by margin. Test Lead: RF Output

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2412.417M	104.3	+1.0	+10.0			+0.0	115.3	118.0	-2.7	RF Ou
2	2397.100M	72.7	+1.0	+10.0			+0.0	83.7	98.0	-14.3	RF Ou
3	2397.100M	72.4	+1.0	+10.0			+0.0	83.4	98.0	-14.6	RF Ou
4	24124.170M	51.7	+3.8	+10.6			+0.0	66.1	98.0	-31.9	RF Ou
5	2487.900M	55.1	+1.0	+10.0			+0.0	66.1	98.0	-31.9	RF Ou
6	14474.500M	51.0	+2.7	+10.4			+0.0	64.1	98.0	-33.9	RF Ou
7	19299.330M	49.0	+3.3	+10.5			+0.0	62.8	98.0	-35.2	RF Ou
8	21711.750M	47.6	+3.3	+10.6			+0.0	61.5	98.0	-36.5	RF Ou
9	16886.920M	48.1	+2.9	+10.4			+0.0	61.4	98.0	-36.6	RF Ou

10	7237.250M	47.8	+1.9	+10.1	+0.0	59.8	98.0	-38.2	RF Ou
11	12062.080M	47.1	+2.4	+10.3	+0.0	59.8	98.0	-38.2	RF Ou
12	9649.667M	46.9	+2.2	+10.2	+0.0	59.3	98.0	-38.7	RF Ou
13	4824.833M	43.7	+1.5	+10.0	+0.0	55.2	98.0	-42.8	RF Ou



Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **15.247(d) Antenna Conducted**
Work Order #: **83764** Date: 10/4/2005
Test Type: **Conducted Emissions** Time: 14:45:00
Equipment: **Internet Firewall** Sequence#: 2
Manufacturer: WatchGuard Technologies, Inc. Tested By: Randal Clark
Model: XP2E6W 120V 60Hz
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
AC Adapter for EUT	Globtek	GT-41052-1512	none
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480

Test Conditions / Notes:

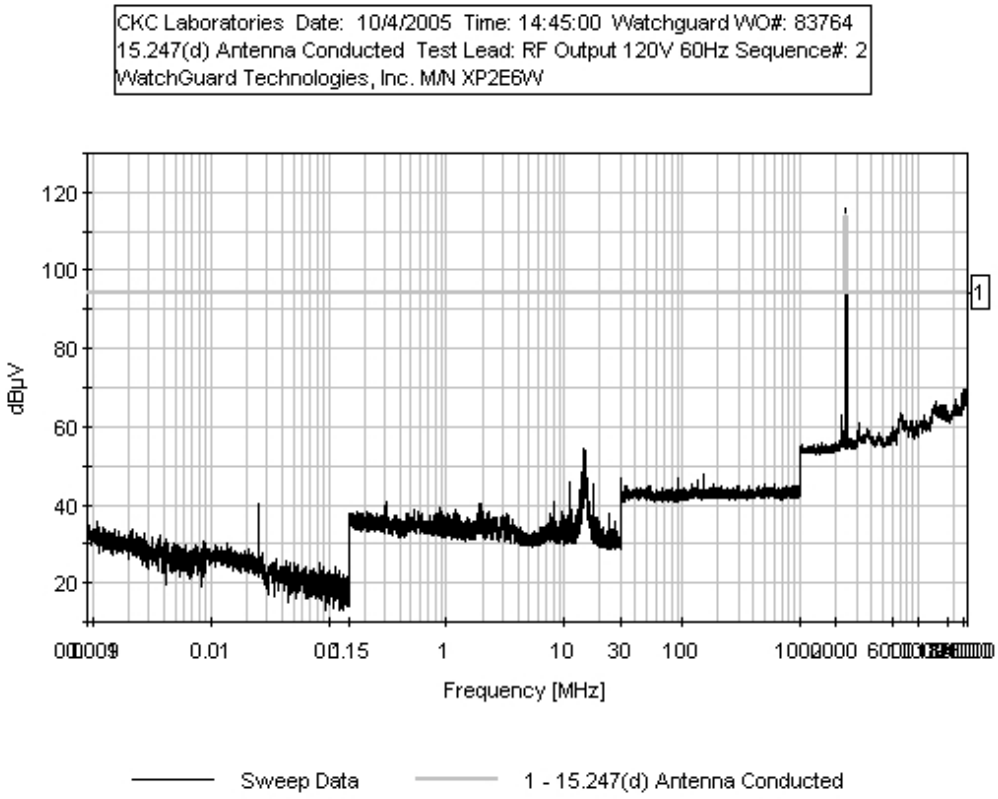
EUT is a wireless Firewall with VPN support. EUT is communicating with support equipment. One EUT antenna is directly connected to spectrum analyzer. Transmit power test performed in accordance with KDB 558074. EUT Mode: 802.11b @ 11MBs. EUT Channel: Mid. EUT Port: Left. Frequency Range Investigated: 9kHz to 26GHz. Temperature: 65ºF, Relative Humidity: 32%.

Transducer Legend:

T1=Cable 40 GHz 36"	T2=Att 10dB AN02139

Measurement Data: Reading listed by margin. Test Lead: RF Output

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2435.880M	104.7	+1.0	+10.0			+0.0	115.7	114.0 Carrier	+1.7	RF Ou
2	9747.870M	58.4	+2.2	+10.1			+0.0	70.7	94.0	-23.3	RF Ou
3	24178.460M	54.9	+3.8	+10.6			+0.0	69.3	94.0	-24.7	RF Ou
4	9747.870M	54.5	+2.2	+10.1			+0.0	66.8	94.0	-27.2	RF Ou
5	17327.530M	52.0	+3.0	+10.5			+0.0	65.5	94.0	-28.5	RF Ou
6	21567.040M	51.6	+3.3	+10.6			+0.0	65.5	94.0	-28.5	RF Ou
7	19987.300M	51.4	+3.3	+10.6			+0.0	65.3	94.0	-28.7	RF Ou
8	7307.640M	46.9	+1.9	+10.1			+0.0	58.9	94.0	-35.1	RF Ou
9	4871.760M	43.2	+1.5	+10.0			+0.0	54.7	94.0	-39.3	RF Ou


CKC Laboratories Date: 10/4/2005 Time: 14:45:00 Watchguard WO#: 83764
15.247(d) Antenna Conducted Test Lead: RF Output 120V 60Hz Sequence#: 2
WatchGuard Technologies, Inc. M/N XP2E6W
120
100
80
60
40
20
dBµV
1
0.01
0.15
1
10
30
100
Frequency [MHz]
Sweep Data
1 - 15.247(d) Antenna Conducted

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **15.247(d) Antenna Conducted**
Work Order #: **83764** Date: 11/1/2005
Test Type: **Conducted Emissions** Time: 14:26:33
Equipment: **Internet Firewall** Sequence#: 4
Manufacturer: WatchGuard Technologies, Inc. Tested By: Randal Clark
Model: XP2E6W 120V 60Hz
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
AC Adapter for EUT	Globtek	GT-41052-1512	none
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. EUT is communicating with support equipment. One EUT antenna is directly connected to spectrum analyzer. Transmit power test performed in accordance with KDB 558074. EUT Mode: 802.11b @ 11MBs. EUT Channel: High. EUT Port: Left. Frequency Range Investigated: 9kHz to 26GHz. Temperature: 65ºF, Relative Humidity: 32%.

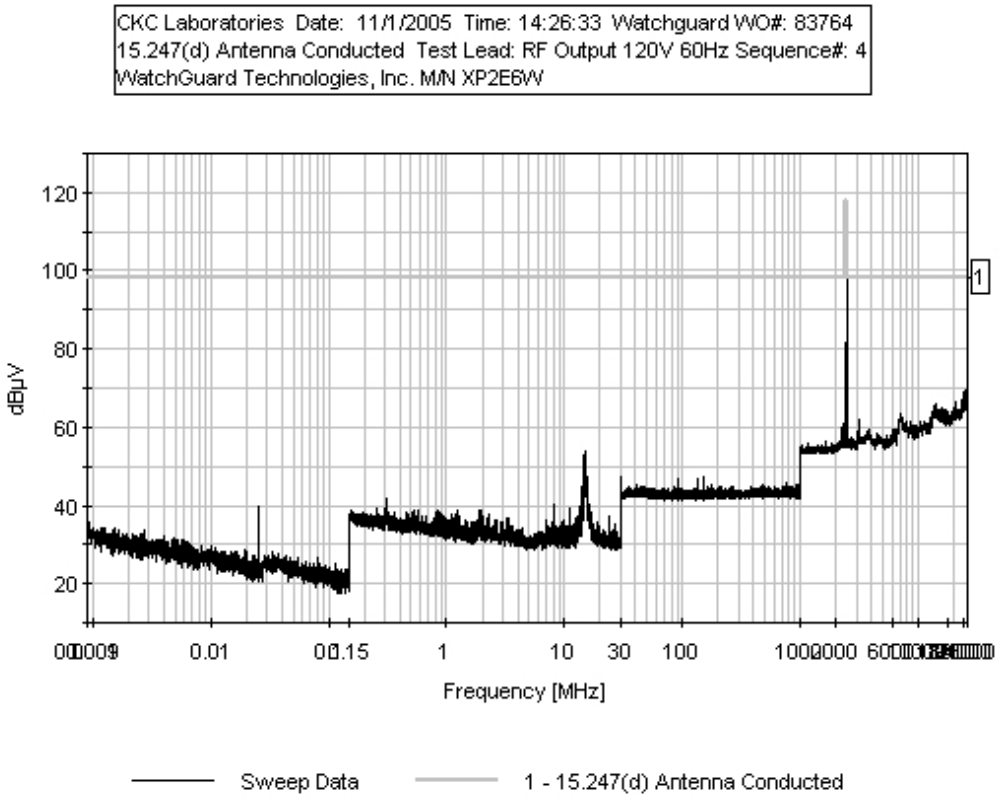
Transducer Legend:

T1=Cable 40 GHz 36" T2=Att 10dB AN02139

Measurement Data: Reading listed by margin. Test Lead: RF Output

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2462.000M	105.9	+1.0	+10.0			+0.0	116.9	118.0	-1.1	RF Ou
2	9847.965M	56.4	+2.2	+10.2			+0.0	68.8	98.0	-29.2	RF Ou
3	2487.900M	55.5	+1.0	+10.0			+0.0	66.5	98.0	-31.5	RF Ou
4	24619.960M	50.7	+3.9	+10.6			+0.0	65.2	98.0	-32.8	RF Ou
5	14771.760M	51.8	+2.8	+10.3			+0.0	64.9	98.0	-33.1	RF Ou
6	22157.960M	49.6	+3.4	+10.6			+0.0	63.6	98.0	-34.4	RF Ou
7	19695.770M	49.5	+3.4	+10.5			+0.0	63.4	98.0	-34.6	RF Ou
8	17233.770M	49.2	+2.9	+10.5			+0.0	62.6	98.0	-35.4	RF Ou

9	7385.930M	48.1	+1.9	+10.1	+0.0	60.1	98.0	-37.9	RF Ou
10	12309.960M	44.8	+2.5	+10.3	+0.0	57.6	98.0	-40.4	RF Ou
11	4923.930M	43.4	+1.5	+10.0	+0.0	54.9	98.0	-43.1	RF Ou



Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **15.247(d) Antenna Conducted**
Work Order #: **83764** Date: 11/1/2005
Test Type: **Conducted Emissions** Time: 14:59:09
Equipment: **Internet Firewall** Sequence#: 20
Manufacturer: WatchGuard Technologies, Inc. Tested By: Randal Clark
Model: XP2E6W 120V 60Hz
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
AC Adapter for EUT	Globtek	GT-41052-1512	none
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. EUT is communicating with support equipment. One EUT antenna is directly connected to spectrum analyzer. Transmit power test performed in accordance with KDB 558074. EUT Mode: 802.11g @ 54MBs. EUT Channel: Low. EUT Port: Left. Frequency Range Investigated: 9kHz to 26GHz. Temperature: 65ºF, Relative Humidity: 32%.

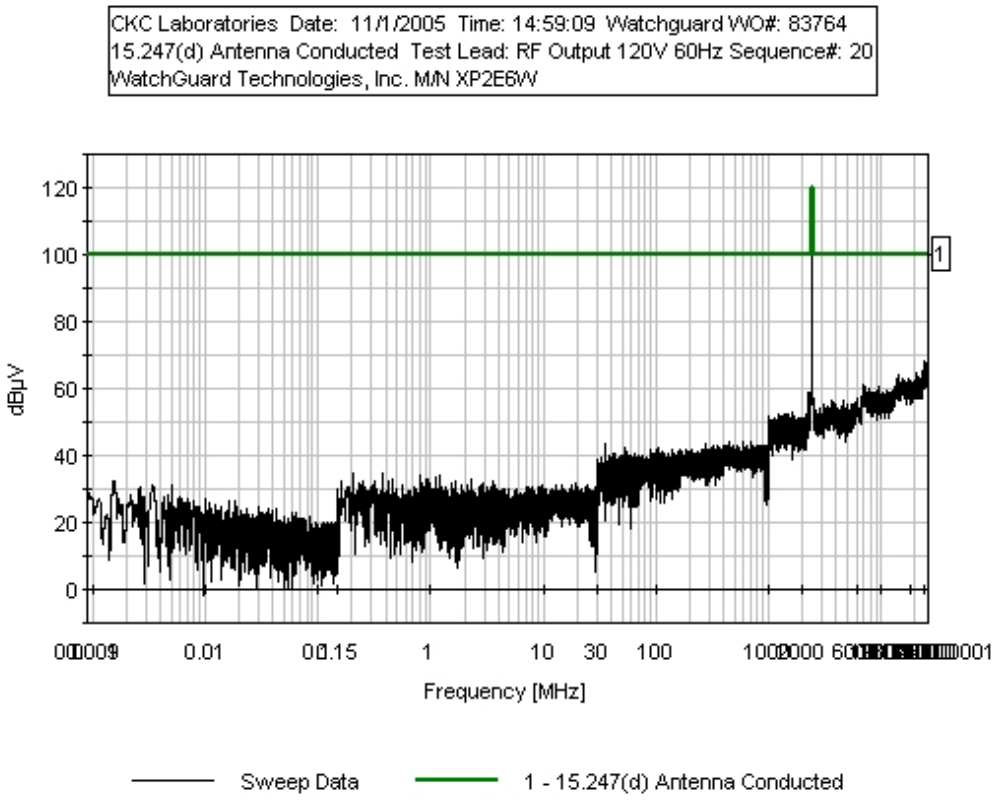
Transducer Legend:

T1=Cable 40 GHz 36" T2=Att 10dB AN02139

Measurement Data: Reading listed by margin. Test Lead: RF Output

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2412.000M	107.4	+1.0	+10.0			+0.0	118.4	120.0 Carrier	-1.6	RF Ou
2	2400.000M	84.0	+1.0	+10.0			+0.0	95.0	100.0	-5.0	RF Ou
3	24123.600M	53.3	+3.8	+10.6			+0.0	67.7	100.0	-32.3	RF Ou
4	13977.610M	51.3	+2.7	+10.3			+0.0	64.3	100.0	-35.7	RF Ou
5	9650.900M	51.2	+2.2	+10.2			+0.0	63.6	100.0	-36.4	RF Ou
6	13759.260M	49.7	+2.7	+10.4			+0.0	62.8	100.0	-37.2	RF Ou
7	14475.300M	48.4	+2.7	+10.4			+0.0	61.5	100.0	-38.5	RF Ou
8	21711.900M	46.4	+3.3	+10.6			+0.0	60.3	100.0	-39.7	RF Ou
9	7236.600M	48.1	+1.9	+10.1			+0.0	60.1	100.0	-39.9	RF Ou

10	19299.700M	46.2	+3.3	+10.5	+0.0	60.0	100.0	-40.0	RF Ou
11	16887.500M	46.3	+2.9	+10.4	+0.0	59.6	100.0	-40.4	RF Ou
12	12063.100M	45.3	+2.4	+10.3	+0.0	58.0	100.0	-42.0	RF Ou
13	4824.400M	42.7	+1.5	+10.0	+0.0	54.2	100.0	-45.8	RF Ou



Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **15.247(d) Antenna Conducted**
Work Order #: **83764** Date: 11/1/2005
Test Type: **Conducted Emissions** Time: 15:07:31
Equipment: **Internet Firewall** Sequence#: 21
Manufacturer: WatchGuard Technologies, Inc. Tested By: Randal Clark
Model: XP2E6W 120V 60Hz
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
AC Adapter for EUT	Globtek	GT-41052-1512	none
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. EUT is communicating with support equipment. One EUT antenna is directly connected to spectrum analyzer. Transmit power test performed in accordance with KDB 558074. EUT Mode: 802.11g @ 54MBs. EUT Channel: Mid. EUT Port: Left. Frequency Range Investigated: 9kHz to 26GHz. Temperature: 65ºF, Relative Humidity: 32%.

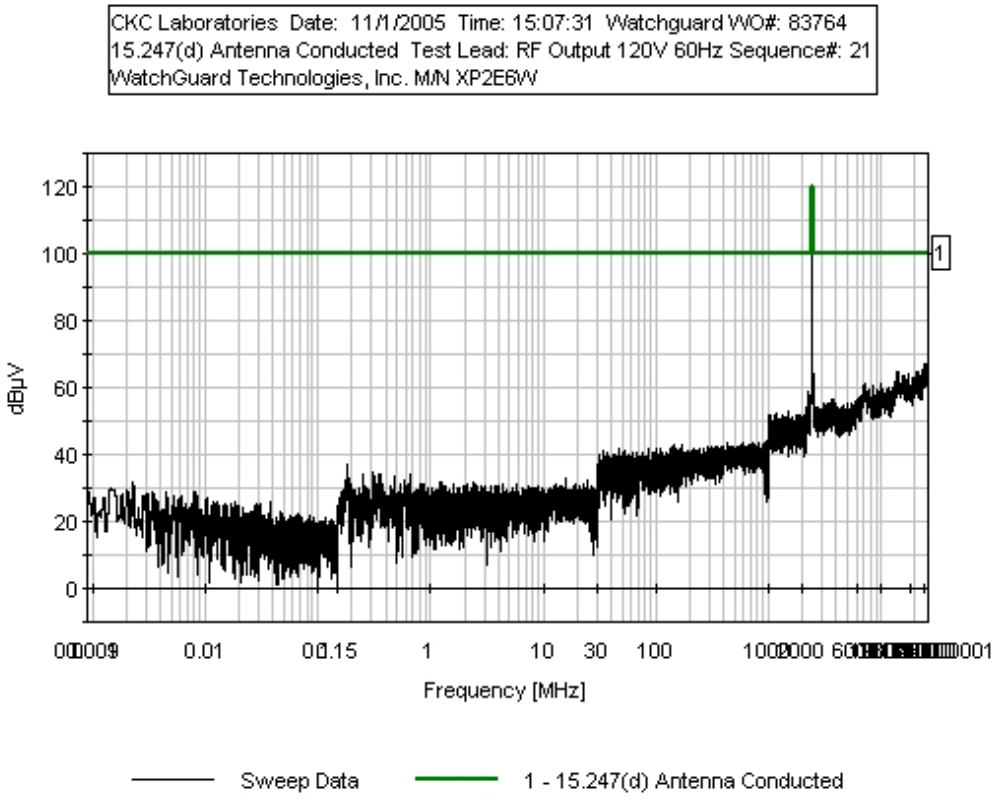
Transducer Legend:

T1=Cable 40 GHz 36"	T2=Att 10dB AN02139

Measurement Data: Reading listed by margin. Test Lead: RF Output

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2437.000M	107.4	+1.0	+10.0			+0.0	118.4	120.0 Carrier	-1.6	RF Ou
2	24367.600M	51.0	+3.9	+10.6			+0.0	65.5	100.0	-34.5	RF Ou
3	9747.600M	51.3	+2.2	+10.1			+0.0	63.6	100.0	-36.4	RF Ou
4	2240.000M	52.4	+1.0	+10.0			+0.0	63.4	100.0	-36.6	RF Ou
5	2233.400M	52.1	+1.0	+10.0			+0.0	63.1	100.0	-36.9	RF Ou
6	19494.200M	48.8	+3.4	+10.5			+0.0	62.7	100.0	-37.3	RF Ou
7	17057.600M	49.2	+2.9	+10.4			+0.0	62.5	100.0	-37.5	RF Ou
8	21930.900M	48.0	+3.3	+10.6			+0.0	61.9	100.0	-38.1	RF Ou

9	14620.900M	47.2	+2.7	+10.3	+0.0	60.2	100.0	-39.8	RF Ou
10	7310.000M	46.0	+1.9	+10.1	+0.0	58.0	100.0	-42.0	RF Ou
11	12184.200M	44.3	+2.5	+10.3	+0.0	57.1	100.0	-42.9	RF Ou
12	4873.300M	42.3	+1.5	+10.0	+0.0	53.8	100.0	-46.2	RF Ou



Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **15.247(d) Antenna Conducted**
Work Order #: **83764** Date: 11/1/2005
Test Type: **Conducted Emissions** Time: 14:53:52
Equipment: **Internet Firewall** Sequence#: 19
Manufacturer: WatchGuard Technologies, Inc. Tested By: Randal Clark
Model: XP2E6W 120V 60Hz
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
AC Adapter for EUT	Globtek	GT-41052-1512	none
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. EUT is communicating with support equipment. One EUT antenna is directly connected to spectrum analyzer. Transmit power test performed in accordance with KDB 558074. EUT Mode: 802.11g @ 54MBs EUT Channel: High. EUT Port: Left. Frequency Range Investigated: 9kHz to 26GHz. Temperature: 65ºF, Relative Humidity: 32%.

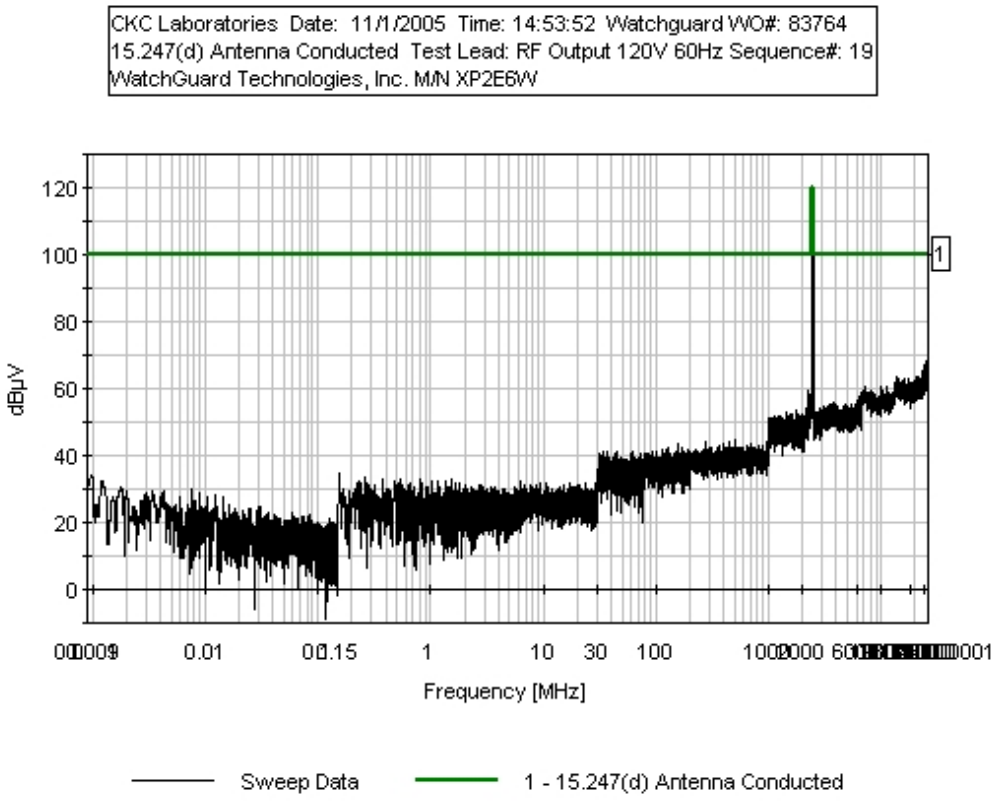
Transducer Legend:

T1=Cable 40 GHz 36" T2=Att 10dB AN02139

Measurement Data: Reading listed by margin. Test Lead: RF Output

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2462.000M	107.7	+1.0	+10.0			+0.0	118.7	120.0 Carrier	-1.3	RF Ou
2	2483.500M	74.4	+1.0	+10.0			+0.0	85.4	100.0	-14.6	RF Ou
3	2484.500M	72.6	+1.0	+10.0			+0.0	83.6	100.0	-16.4	RF Ou
4	2483.686M	66.2	+1.0	+10.0			+0.0	77.2	100.0	-22.8	RF Ou
5	2450.147M	81.0	+1.0	+10.0			+0.0	92.0	120.0	-28.0	RF Ou
6	9848.800M	56.0	+2.2	+10.2			+0.0	68.4	100.0	-31.6	RF Ou
7	24637.600M	48.8	+3.9	+10.6			+0.0	63.3	100.0	-36.7	RF Ou
8	22172.800M	47.8	+3.4	+10.6			+0.0	61.8	100.0	-38.2	RF Ou
9	17243.200M	48.2	+2.9	+10.5			+0.0	61.6	100.0	-38.4	RF Ou

10	19708.000M	47.1	+3.4	+10.5	+0.0	61.0	100.0	-39.0	RF Ou
11	14778.400M	47.4	+2.8	+10.3	+0.0	60.5	100.0	-39.5	RF Ou
12	12313.600M	46.0	+2.5	+10.2	+0.0	58.7	100.0	-41.3	RF Ou
13	7394.400M	46.1	+1.9	+10.1	+0.0	58.1	100.0	-41.9	RF Ou
14	4929.600M	42.9	+1.5	+10.0	+0.0	54.4	100.0	-45.6	RF Ou



Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **15.247(d)/15.209**
Work Order #: **83764** Date: 11/2/2005
Test Type: **Radiated Scan** Time: 14:47:08
Equipment: **Internet Firewall** Sequence#: 6
Manufacturer: WatchGuard Technologies, Inc. Tested By: Mike Wilkinson
Model: XP2E6W
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
AC Adapter for EUT	Globtek	GT-41052-1512	none
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480
Internet Firewall	WatchGuard Technologies, Inc.	R6264S	808005596-6641
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600002-6EF8
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	706600207-AD99
Internet Firewall	WatchGuard Technologies, Inc.	MF16S32E10	110
Laptop PC	Toshiba	PA1230U XCD	02792218-3
Laptop PC	Dell	D600	79GSC51
USB/Wireless Network Adapter	Linksys	WUSB54GS	MI0004C09761

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. The EUT is running Montavista Linux A Toshiba 8100 is connected using shielded serial cable to the EUT serial port at 115k to initialize the unit as needed and monitor ping status. All 6 EUT wan/Lan ports are pinging bi-directionally to external support PC's via UTP Cat 5 ethernet cables. Three ethernet cables are going to three separate WatchGuard FB X Edge units, and three ethernet cables are going to a single WatchGuard X2 unit. EUT Operational Mode: 802.11bg. Low, Mid and High transmit channel investigated and noted for each reading. Data represents both operational modes of EUT Low channel = 2412 MHz, Mid channel = 2437 MHz, High channel = 2462 MHz. Frequency Range Investigated: 30 MHz to 26 GHz. **No signals observed above 5 GHz**. Temperature: 65ºF, Relative Humidity: 32%.

Transducer Legend:

T1=Amp - S/N 604	T2=Bilog Site D
T3=Cable - 10 Meter	T4=Horn AN 00656 1-18 GHz (Mariposa)
T5=Amp - S/N 301	T6=Cable 35' Blue SMA CKC P1352
T7=Cable - 3 Meter to bulkhead	

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7						
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	2385.000M	46.6	+0.0	+0.0	+0.0	+29.1	+0.0	51.2	54.0	-2.8	Vert
	Ave		-34.6	+5.2	+4.9				Low Channel-g		
2	4924.000M	34.2	+0.0	+0.0	+0.0	+34.1	+0.0	49.6	54.0	-4.4	Vert
	Ave		-34.3	+8.2	+7.4				High Channel-g		

3	200.020M	53.2	-26.5	+8.3	+3.3	+0.0	+0.0	38.3	43.5	-5.2	Vert
			+0.0	+0.0	+0.0				Mid Channel-g		
4	200.443M	52.9	+0.0	+0.0	+0.0		+0.0	38.0	43.5	-5.5	Vert
									Mid Channel-b		
5	324.898M	49.1	+0.0	+0.0	+0.0		+0.0	40.5	46.0	-5.5	Vert
									Low Channel-b		
6	200.424M	52.8	+0.0	+0.0	+0.0		+0.0	37.9	43.5	-5.6	Vert
									High Channel-b		
7	200.450M	52.2	+0.0	+0.0	+0.0		+0.0	37.3	43.5	-6.2	Vert
									Low Channel-b		
8	324.991M	48.3	-26.4	+13.5	+4.3	+0.0	+0.0	39.7	46.0	-6.3	Vert
			+0.0	+0.0	+0.0				Low Channel-g		
9	199.991M	52.0	-26.5	+8.3	+3.3	+0.0	+0.0	37.1	43.5	-6.4	Vert
			+0.0	+0.0	+0.0				Low Channel-g		
10	4823.000M	32.6	+0.0	+0.0	+0.0	+34.0	+0.0	47.6	54.0	-6.4	Vert
	Ave		-34.4	+8.1	+7.3				Low Channel-g		
11	4874.040M	32.2	+0.0	+0.0	+0.0	+34.1	+0.0	47.5	54.0	-6.5	Vert
	Ave		-34.3	+8.2	+7.3				Mid Channel-g		
12	199.600M	51.9	-26.5	+8.3	+3.3	+0.0	+0.0	37.0	43.5	-6.5	Vert
			+0.0	+0.0	+0.0				High Channel-g		
13	375.044M	46.5	+0.0	+0.0	+0.0		+0.0	39.4	46.0	-6.6	Horiz
									Mid Channel-b		
14	4874.000M	32.0	+0.0	+0.0	+0.0	+34.1	+0.0	47.3	54.0	-6.7	Vert
	Ave		-34.3	+8.2	+7.3				Mid Channel-b		
15	4924.000M	31.9	+0.0	+0.0	+0.0	+34.1	+0.0	47.3	54.0	-6.7	Vert
	Ave		-34.3	+8.2	+7.4				High Channel-b		
16	325.035M	47.2	-26.4	+13.5	+4.3	+0.0	+0.0	38.6	46.0	-7.4	Vert
			+0.0	+0.0	+0.0				Mid Channel-g		
17	4824.000M	31.1	+0.0	+0.0	+0.0	+34.0	+0.0	46.1	54.0	-7.9	Vert
	Ave		-34.4	+8.1	+7.3				Low Channel-b		
18	125.018M	48.3	+0.0	+0.0	+0.0		+0.0	35.3	43.5	-8.2	Vert
									Low Channel-b		
19	375.020M	43.5	+0.0	+0.0	+0.0		+0.0	36.4	46.0	-9.6	Horiz
									Low Channel-b		
20	500.037M	40.7	+0.0	+0.0	+0.0		+0.0	36.3	46.0	-9.7	Vert
									Low Channel-b		
21	324.930M	44.8	+0.0	+0.0	+0.0		+0.0	36.2	46.0	-9.8	Vert
									Mid Channel-b		
22	250.025M	46.4	+0.0	+0.0	+0.0		+0.0	36.0	46.0	-10.0	Vert
									Low Channel-b		
23	125.024M	46.1	+0.0	+0.0	+0.0		+0.0	33.1	43.5	-10.4	Vert
									Mid Channel-b		
24	324.910M	44.0	+0.0	+0.0	+0.0		+0.0	35.4	46.0	-10.6	Vert
									High Channel-b		
25	400.897M	41.6	+0.0	+0.0	+0.0		+0.0	35.3	46.0	-10.7	Vert
									Low Channel-b		
26	124.984M	45.5	-26.7	+11.2	+2.5	+0.0	+0.0	32.5	43.5	-11.0	Vert
			+0.0	+0.0	+0.0				Mid Channel-g		
27	500.044M	39.2	+0.0	+0.0	+0.0		+0.0	34.8	46.0	-11.2	Horiz
									Mid Channel-b		

28	375.045M	41.6	+0.0	+0.0	+0.0		+0.0	34.5	46.0	-11.5	Vert	Low Channel-b
29	250.021M	44.8	+0.0	+0.0	+0.0		+0.0	34.4	46.0	-11.6	Vert	Mid Channel-b
30	250.020M	44.8	+0.0	+0.0	+0.0		+0.0	34.4	46.0	-11.6	Horiz	Low Channel-b
31	125.018M	43.7	+0.0	+0.0	+0.0		+0.0	30.7	43.5	-12.8	Vert	High Channel-b
32	124.600M	43.6	-26.7 +0.0	+11.2 +0.0	+2.5 +0.0	+0.0	+0.0	30.6	43.5	-12.9	Vert	High Channel-g
33	400.754M	39.1	+0.0	+0.0	+0.0		+0.0	32.8	46.0	-13.2	Vert	High Channel-b
34	250.006M	42.9	+0.0	+0.0	+0.0		+0.0	32.5	46.0	-13.5	Vert	High Channel-b
35	250.040M	42.2	+0.0	+0.0	+0.0		+0.0	31.8	46.0	-14.2	Horiz	Mid Channel-b
36	400.855M	37.0	+0.0	+0.0	+0.0		+0.0	30.7	46.0	-15.3	Vert	Mid Channel-b
37	399.980M	36.9	+0.0	+0.0	+0.0		+0.0	30.6	46.0	-15.4	Horiz	High Channel-b
38	200.452M	42.7	+0.0	+0.0	+0.0		+0.0	27.8	43.5	-15.7	Horiz	High Channel-b
39	350.031M	37.6	+0.0	+0.0	+0.0		+0.0	29.8	46.0	-16.2	Horiz	Mid Channel-b
40	625.029M	31.8	+0.0	+0.0	+0.0		+0.0	29.8	46.0	-16.2	Vert	Low Channel-b
41	124.991M	40.0	-26.7 +0.0	+11.2 +0.0	+2.5 +0.0	+0.0	+0.0	27.0	43.5	-16.5	Vert	Low Channel-g
42	375.036M	36.6	+0.0	+0.0	+0.0		+0.0	29.5	46.0	-16.5	Horiz	High Channel-b
43	350.038M	36.8	+0.0	+0.0	+0.0		+0.0	29.0	46.0	-17.0	Vert	Low Channel-b
44	2488.041M Ave	31.4	+0.0 -34.5	+0.0 +5.4	+0.0 +5.0	+29.3	+0.0	36.6	54.0	-17.4	Vert	High Channel-b
^	2488.040M	48.4	+0.0 -34.5	+0.0 +5.4	+0.0 +5.0	+29.3	+0.0	53.6	54.0	-0.4	Vert	High Channel-b
46	2385.800M Ave	31.4	+0.0 -34.6	+0.0 +5.2	+0.0 +4.9	+29.1	+0.0	36.0	54.0	-18.0	Vert	Low Channel-b
^	2385.800M	50.2	+0.0 -34.6	+0.0 +5.2	+0.0 +4.9	+29.1	+0.0	54.8	54.0	+0.8	Vert	Low Channel-b

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Watchguard**
Specification: **15.247(e) Peak Power Spectral Density**
Work Order #: **83764** Date: 10/4/2005
Test Type: **Conducted Emissions** Time: 16:51:05
Equipment: **Internet Firewall** Sequence#: 5
Manufacturer: WatchGuard Technologies, Inc. Tested By: Randal Clark
Model: XP2E6W 120V 60Hz
S/N: 100405-001

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
AC Adapter for EUT	Globtek	GT-41052-1512	none
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. EUT is communicating with support equipment. One EUT antenna is directly connected to spectrum analyzer. Transmit power test performed in accordance with KDB 558074. EUT Mode: 802.11b @ 11MBs. EUT Port: Left. Frequency Range Investigated: Carrier. Temperature: 65ºF, Relative Humidity: 32%.

Transducer Legend:

T1=Cable 40 GHz 36" T2=dBm to dBuV
T3=Att 10dB AN02139

Measurement Data: Reading listed by margin. Test Lead: RF Output

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2439.880M	89.5	+1.0	+107.0	+10.0		+0.0	-6.5	8.0	-14.5	RF Ou
2	2465.400M	88.5	+1.0	+107.0	+10.0		+0.0	-7.5	8.0	-15.5	RF Ou
3	2412.900M	86.1	+1.0	+107.0	+10.0		+0.0	-9.9	8.0	-17.9	RF Ou

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer:	**Watchguard**		
Specification:	**15.247(e) Peak Power Spectral Density**		
Work Order #:	**83764**	Date:	11/1/2005
Test Type:	**Conducted Emissions**	Time:	13:40:21
Equipment:	**Internet Firewall**	Sequence#:	5
Manufacturer:	WatchGuard Technologies, Inc.	Tested By:	Randal Clark
Model:	XP2E6W		120V 60Hz
S/N:	100405-001		

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
AC Adapter for EUT	Globtek	GT-41052-1512	none
Internet Firewall*	WatchGuard Technologies, Inc.	XP2E6W	100405-001

Support Devices:

Function	Manufacturer	Model #	S/N
Host PC	Toshiba	PT810U	60748626U
AC Adapter for Host PC	Toshiba	PA2444U	1359480

Test Conditions / Notes:

EUT is a wireless Firewall with VPN support. EUT is communicating with support equipment. One EUT antenna is directly connected to spectrum analyzer. Transmit power test performed in accordance with KDB 558074. EUT Mode: 802.11g @ 54MBs. EUT Port: Left. Frequency Range Investigated: Carrier. Temperature: 65ºF, Relative Humidity: 32%.

Transducer Legend:

T1=Cable 40 GHz 36"	T2=dBm to dBuV
T3=Att 10dB AN02139	

Measurement Data: Reading listed by margin. Test Lead: RF Output

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	2463.840M	85.6	+1.0	+107.0	+10.0		+0.0	-10.4	8.0	-18.4	RF Ou
2	2437.270M	84.7	+1.0	+107.0	+10.0		+0.0	-11.3	8.0	-19.3	RF Ou
3	2410.470M	84.2	+1.0	+107.0	+10.0		+0.0	-11.8	8.0	-19.8	RF Ou