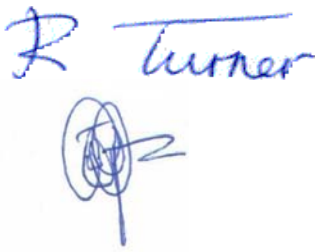
COMPLIANCE TESTING REPORT
FCC TITLE 47 PART 15
SUBPARTS A & C

Client:	Quest Retail Technology Pty Ltd
Address:	37-39 Walsh Street, Thebarton SA 5031, Australia
Report Number:	1217QUEVX640BMC_FCC15C
Date of Testing:	10 Nov to 8 Dec 2009
File Number:	QUEST080901

Equipment Name:	Versaterm (VX Series)
Equipment Model Number:	VX640BMC
Equipment Serial Number:	K24942
Equipment FCC ID:	WW4-VX2
Equipment Description:	Wireless Point Of Sale Terminal

Result:	**COMPLIES**
Tested by:	Richard Turner
Approved by:	Colin Gan
Date of Issue:	17 Dec 2009



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Report Revision History:

Date	Report Number	Changes
17 Dec 2009	1217QUEVX640BMC_FCC15C	Original Report.

1 TEST SUMMARY

Austest makes no claim regarding the consistency of production versions of the EUT.

The results in this report apply only to the tested EUT described in Section 3 of this report.

FCC Section	Test	Result	Notes
FCC Part 15, Subpart C – Intentional Radiators			
15.203	Antenna Requirement	Complies	
15.205	Restricted Bands of Operation	Complies	
15.207	Conducted Limits	Complies	
15.209	Radiated Emission Limits, General Requirements	Complies	
15.247	Operation within the Bands 902-928MHz, 2400-2483.5MHz, and 5725-5850MHz	Complies	

Notes (applicable only if referenced in "Notes" column of above summary table):
(i) EUT complies (the measurement results were below the applicable limits), but some emissions were within the range of measurement uncertainty of the limits.
(ii) EUT complies (when modified as described in Section 2 of this report).
(iii) There were deviations from the applied standard as described in Section 5.2 of this report.

2 MODIFICATIONS

None.

3 EQUIPMENT UNDER TEST (EUT) DESCRIPTION

EUT Name:	Versaterm (VX Series)
EUT Description:	Wireless Point Of Sale Terminal
EUT Model:	VX640BMC
EUT Serial Number:	K24942
EUT FCC ID:	WW4-VX2
Manufacturer:	Quest Retail Technology Pty Ltd
Power Supply & Rating:	115Vac, 60Hz
Highest Clock/Operating Frequency:	20MHz
Transmit Frequency Range:	802.11b and 802.11g
Transmit Power:	155mW
Number of Channels:	11 Channels
Antenna Specifications:	Gain: 2dBi External Stub Antenna (using reverse SM connector)

The EUT was housed in a painted metal case and contained the following:

1. Large keypad.
2. Raised LC display.
3. Magnetic stripe card reader.
4. Smaller rear customer LC display.
5. Thermal printer.
6. D-Link wireless LAN PBA, #DWL-G810C2G Rev: A1, operating in the 2.4GHz band.
7. Varta Lithium-Ion rechargeable battery, 8.8Ah 11.1V.
8. Internal battery charger.

The internal Varta Lithium-Ion battery powered the EUT. The battery was charged using the supplied EDACPOWER AC adaptor:

Model: EA1030CA
Input: 100-240VAC 1A 50-60Hz
Output: 13-20VDC 2.3A 30W max.

4 EUT TEST SETUP & CONFIGURATION

Refer to the photographs in Appendix C for the EUT test setup and physical configuration.

The unit was tested within its allowed temperature and humidity range.

Details of supporting equipment and cables used are listed as follows:

4.1 Supporting Equipment & Cables

S/No.	EUT Connection / Port	Connecting Cable	Source / Load
1	LAN Port	Short length unshielded CAT5 cable.	Permanently fitted to the internal D-Link wireless LAN PBA.
2	Port 1	Supplied 2m long unshielded DB9 to RJ45 cable, bundled.	
3	Port 2	Supplied 2m long unshielded DB9 to RJ45 cable, bundled.	
4	Cash Drawer	1.6m long unshielded RJ11 (6p6c) cable, bundled.	Permanently fitted to the supplied Quest cash drawer, model CD410MA
5	RF Reader	1.1m long unshielded RJ45 cable, p/n 220-2441-00 Rev A.	Permanently fitted to the supplied VIVOPAY 4500 reader (FCC ID Q55VIVOPAY4500)
6	Antenna Port		Supplied 6cm long stub antenna
7	Charger Port	1.8m long shielded power lead, bundled. Supplied with a fitted ferrite at the EUT connection.	Permanently fitted to the supplied AC adaptor.
8	Mains Connection	Power board with unshielded 1m long 3 core mains lead	AMN and 115AC 60Hz mains supply
9	Wireless Connection to EUT		Billion VoIP ADSL Router (Model BiPAC 7404VGP) remotely located outside test area.

4.2 Transmitter Test Channels

The transmitter test channels per Section 15.31(m) were:

Channel	Transmitter Frequency (MHz)
Low	CH1 (2.412GHz)
Mid	CH6 (2.437GHz)
High	CH11 (2.462GHz)

5 TEST SPECIFICATIONS

5.1 Accreditations & Listings

Austest Laboratories has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules and Test Site Criteria (ANSI C63.4-2003) by the FCC Laboratory Division for Certification testing under Parts 15 or 18 of the FCC Rules.

Austest Laboratories (NSW)'s Yarramalong test facilities are listed with the FCC under Registration Number 90455.

5.2 Deviations from Standards and/or Accreditations

None.

5.3 Test Facility

Testing was performed in New South Wales at Austest Laboratories (NSW)'s Yarramalong test facilities located at 46 Glenola Farm Lane in Yarramalong Valley, New South Wales, Australia.

Radiated emission testing is performed at an Open Area Test Site (OATS), where some ambient signals may exceed the continuous disturbance limit. The possibility of missing an emission during testing is removed by use of pre-scans, performed in a shielded enclosure, prior to the final OATS measurements.

5.4 Test Equipment

Test Equipment	Brand & Model	Cal. Due Date
EMI Receiver	HP 8574B	23 Feb 2010
Spectrum Analyser	HP 8593E	09 Oct 2010
Biconical Array Antenna	Emco 93110B	13 Jan 2010
Log-Periodic Array Antenna	Emco 93146	08 Jan 2010
DRG Horn Antenna	AH Systems SAS-571	28 Dec 2011
Pre-Amplifier	HP 8447E	24 Feb 2010
Pre-Amplifier	RE 518A	12 Oct 2010
LISN / AMN	COM-POWER LI-200	25 Feb 2010
10dB Attenuator	Microlab	10 Jan 2010
AC Source	Chroma 6512	NA

5.5 Measurement Uncertainties

The following uncertainties are for a 95% level of confidence, based on a coverage factor, k=2.

Test	Measurement Uncertainty
Conducted Emissions (Austest NSW)	±2.6dB
Radiated Emissions (Austest NSW)	±4.7dB

6 FCC Part 15C, Section 15.203 – ANTENNA REQUIREMENT

The EUT complies with the requirement of this Section since the client advised that the EUT will only be used with the supplied external stub antenna, using a reverse SM connector.

7 FCC Part 15C, Section 15.205 – RESTRICTED BANDS OF OPERATION

The EUT complies with the requirements of this Section since it does not operate within the listed Restricted Bands of Operation. The EUT is designed to operate in the band 2.400GHz to 2.4835GHz only.

8 FCC Part 15C, Section 15.207 - CONDUCTED LIMITS

8.1 EUT Operating Mode

a. EUT power supply voltage - 115Vac, 60Hz to the AC adapter.
b. The 2.4GHz transceiver could only be powered from the internal circuitry of the EUT.
c. Measurements were made with the 2.4GHz transceiver in transmit mode and then in non-transmit mode (i.e. D-Link PBA not powered).

8.2 Test Method

a. Measurements are performed in accordance with ANSI C63.4-2003.
b. Set the EMI Receiver BW to 9kHz for the test.
c. Set up the EUT on a non-conductive table, 0.8m above a conductive ground plane, with the rear of the whole EUT setup 0.4m away from a conductive vertical reference plane (in electrical contact with the ground plane), and 0.8m away from any other conductive surface.
d. The EUT power is supplied through the EUT LISN, which is grounded to the ground plane and kept 0.8m away from the EUT test setup.
e. Maintain the power cable length between the EUT and the EUT LISN between 0.8m to 1m. Bundle any excess power cable lengths together in the centre of the cable to form a bundle 30cm to 40cm long.
f. Drape all interconnection cables the table edge and keep them at least 40cm above the ground plane. Bundle any excess cables in the centre of the cable to form a bundle 30cm to 40cm long.

g. Conducted emission measurements are made on both Active and Neutral lines of the EUT.

8.3 Test Results

Tests were performed to the Class A limits specified in Subpart B, Section 15.107, since the EUT is a Class A device.

Unintentional conducted disturbances from the EUT comply with the Class A limits specified in Subpart B, Section 15.107, but exceed the Class B limits.

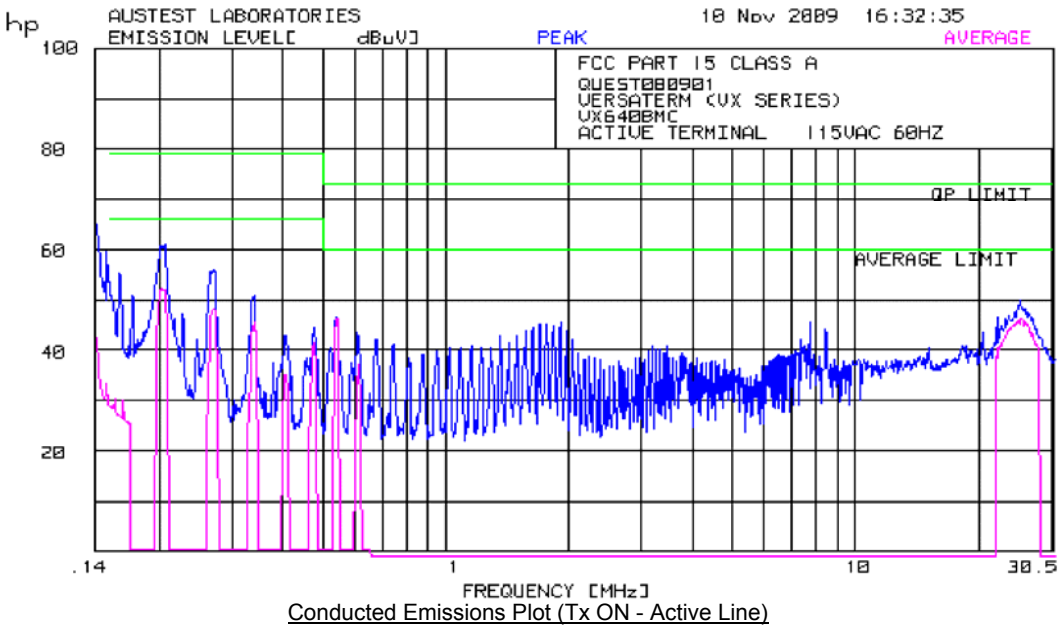
All disturbances from the 2.4GHz transceiver were below the unintentional disturbance level from the EUT. Disturbances were unaffected by the 802.11b or 802.11g modes or by RF channel selection.

Transmit Mode

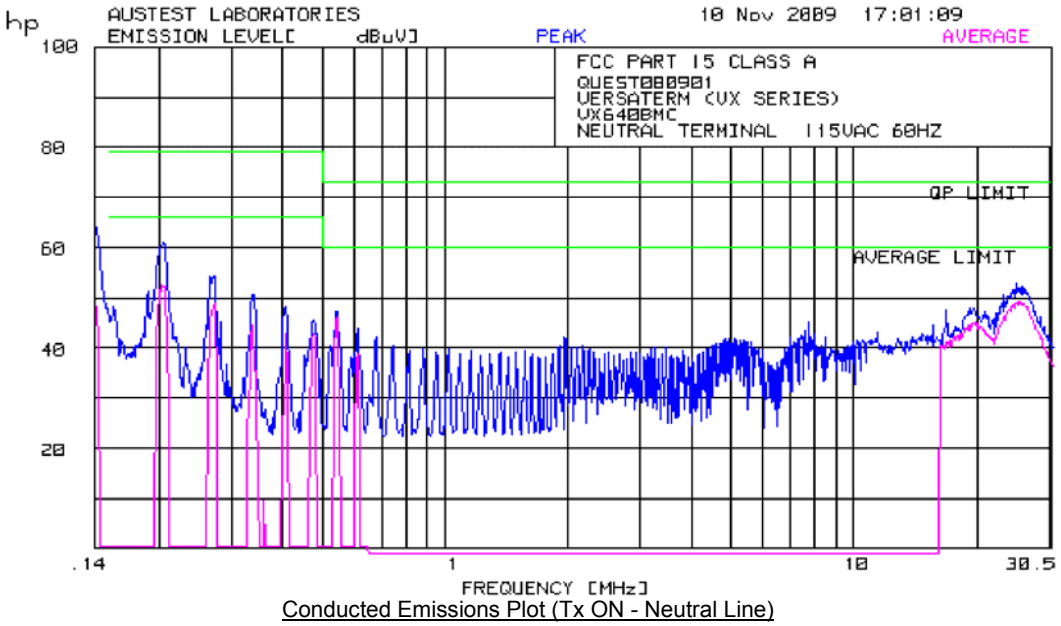
Highest measured disturbance was 10.7dB below the Class A Average limit at 25.4MHz, measured on the neutral line. All disturbances were greater than 10dB below the Class A Quasi-Peak limit.

Non-Transmit Mode

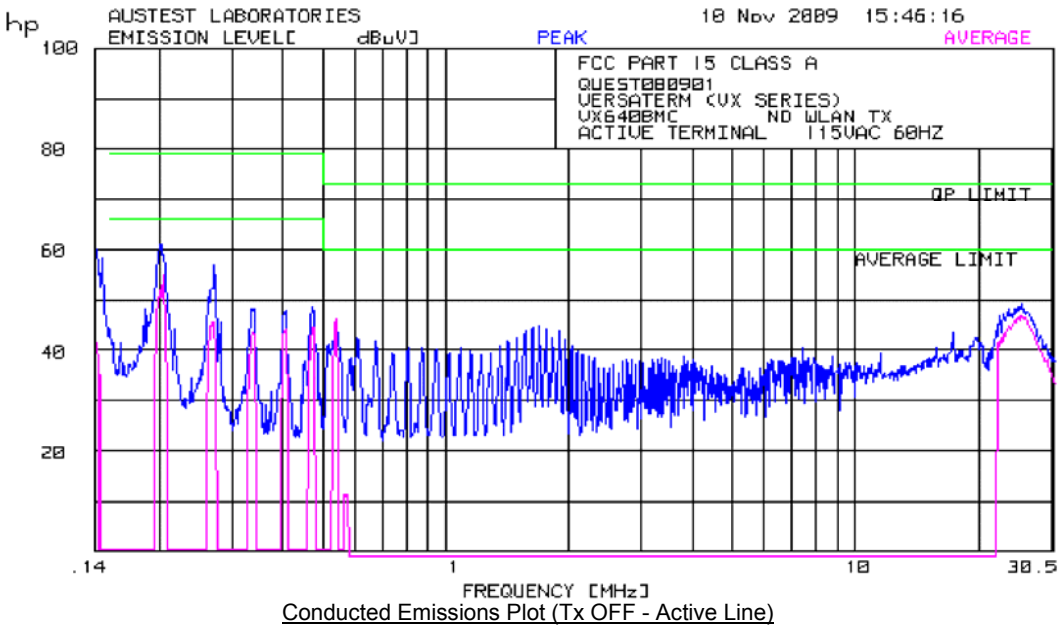
Highest measured disturbance was 9.5dB below the Class A Average limit at 25.3MHz, measured on the neutral line. All disturbances were greater than 10dB below the Class A Quasi-Peak limit.



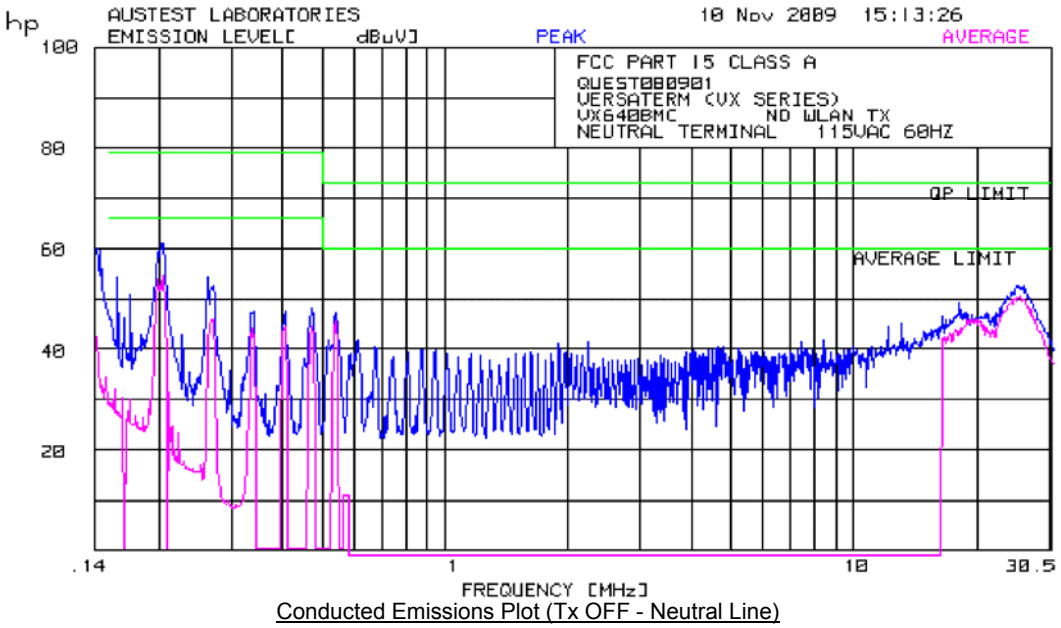
Conducted Emissions Plot (Tx ON - Active Line)



Conducted Emissions Plot (Tx ON - Neutral Line)



Conducted Emissions Plot (Tx OFF - Active Line)



Conducted Emissions Plot (Tx OFF - Neutral Line)

9 FCC Part 15C, Section 15.209 - RADIATED EMISSION LIMITS, GENERAL REQUIREMENTS

9.1 EUT Operating Mode

a. EUT power supply voltage - 115Vac, 60Hz to the AC adapter.
b. The EUT was continuously transmitting with modulation.
c. Battery voltage was monitored at 11.1V throughout the test.
d. The EUT was placed on top of a cash drawer, which is a typical configuration according to the client. No change in emissions was noted when the EUT was placed directly on the test table with the cash drawer removed.

9.2 Test Method

a. Measurements are performed in accordance with ANSI C63.4-2003.
b. Set the measuring receiver BW settings to:
   i. 120kHz (30MHz to 1GHz) EMI Receiver BW.
   ii. 1MHz (above 1GHz) RBW, 3MHz VBW, using a Spectrum Analyser for Peak measurements.
   iii. 1MHz (above 1GHz) RBW, 10Hz VBW, using a Spectrum Analyser for Average measurements.
c. Set up the EUT on a non-conductive turntable, 0.8m above the OATS conductive ground plane, and at the indicated test distance away from the measuring antenna.
d. To maximise emissions, rotate the EUT through 360^{o} and adjust the measuring antenna height between 1m to 4m in the following antenna orientations:
   i. Biconical and Log-Periodic antennas (30MHz to 1GHz) - Both vertical and horizontal polarizations.
   ii. Horn antenna (above 1GHz) - Both vertical and horizontal polarizations.
e. Measure the maximised emission and repeat the above for all measurement frequencies.
f. The intentional transmission signals are ignored for these measurements.

9.3 Test Results

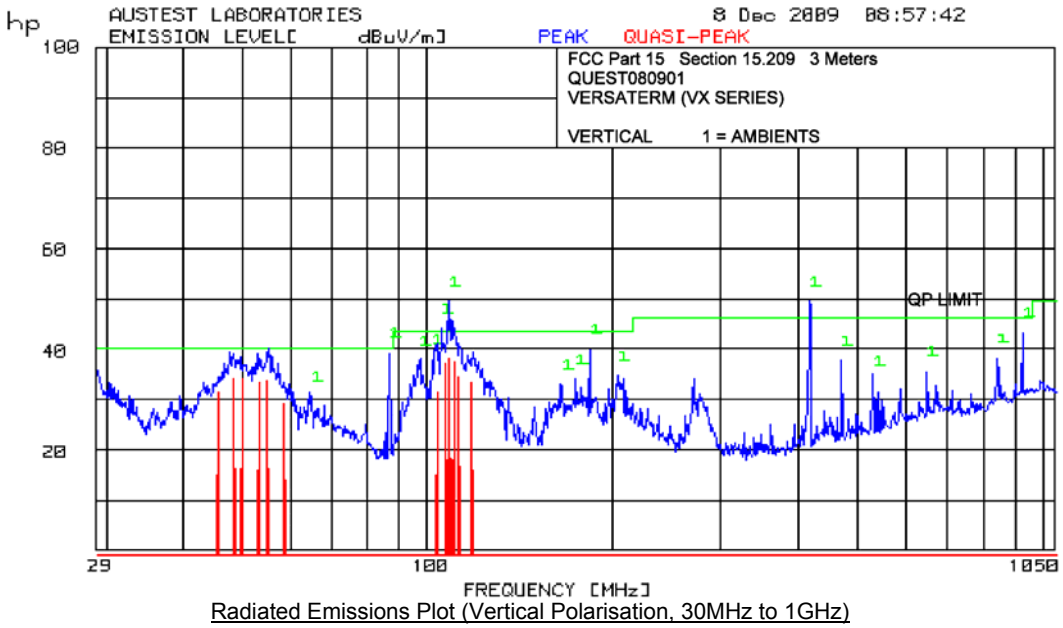
In accordance with section 15.247 (d), emissions that fall within the restricted bands of operation are to comply with the limits indicated in this section. All applicable restricted bands were assessed. Measurement made using the low, middle and high RF channels in both 802.11b and 802.11g modes.

The following results indicate frequencies where significant disturbance levels were observed. In other restricted bands, peak levels were greater than 10dB below the Average limit.

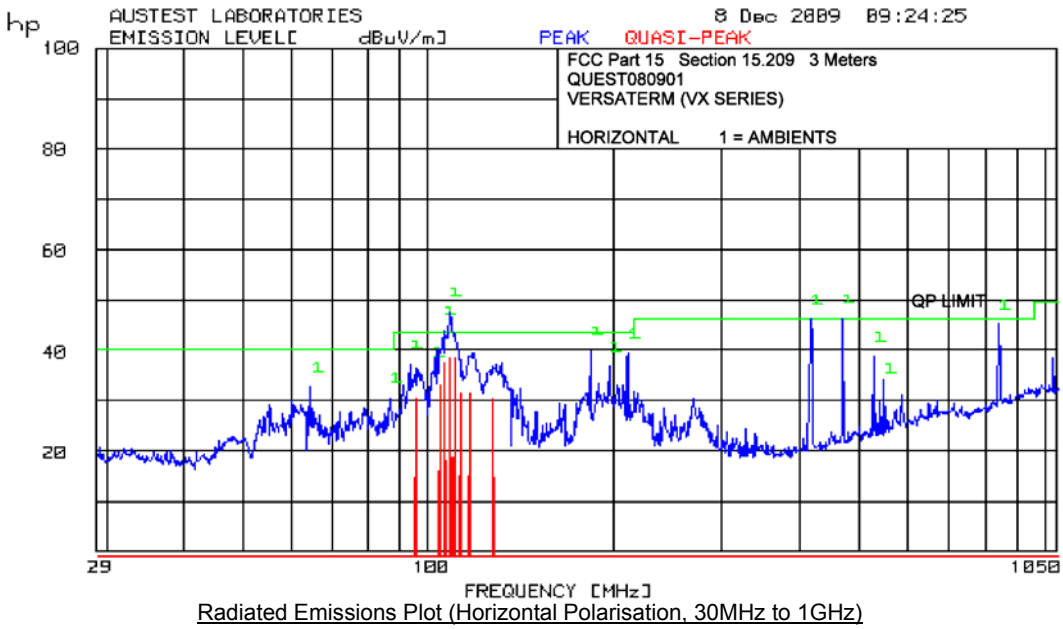
9.3.1 Band 30MHz-1GHz

The highest measured Quasi-Peak disturbance level was 5.2dB below the Quasi-Peak limit at 108.5MHz and 110.5MHz. Disturbance was broadband and was not generated from the intentional 2.4GHz transmission. Measurements were made to ensure that all disturbances met the limits specified in this section. Change of channel or 802.11 modes did not affect disturbances. Final measurements were made with Channel 11 selected using 802.11b mode.

Frequency (MHz)	QP Level @ 3m (dBµV/m)	Antenna Pol	QP Limit @ 3m (dBµV/m)	QP Pass Margin (dB)
108.5	38.3	Horizontal	43.5	-5.2
110.5	38.3	Horizontal	43.5	-5.2
108.5	38.2	Vertical	43.5	-5.3
50.0	34.2	Vertical	40.0	-5.8
48.4	34.1	Vertical	40.0	-5.9
110.5	37.4	Vertical	43.5	-6.1



Radiated Emissions Plot (Vertical Polarisation, 30MHz to 1GHz)



Radiated Emissions Plot (Horizontal Polarisation, 30MHz to 1GHz)

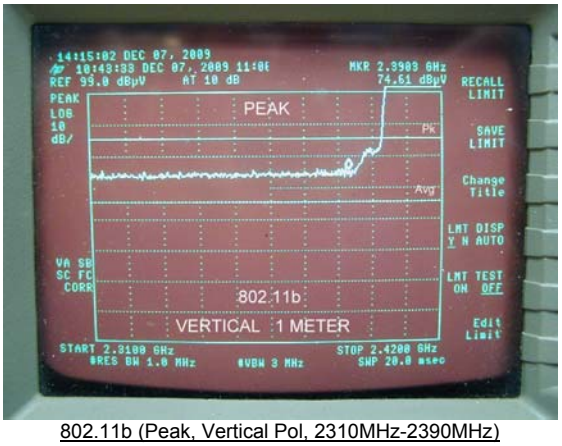
9.3.2 Band 2310MHz-2390MHz (**802.11b mode**)

Measurements were done at a 1m test distance, and then extrapolated to a 3m test distance using an extrapolation factor of 20dB/decade, as specified in Section 15.31(f)(1).

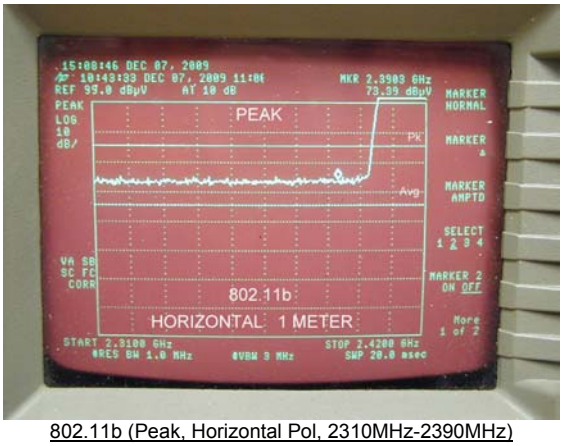
The highest measured Peak level was 1603µV/m (64.1dBµV/m) at 2390MHz (CH1).
The highest measured Average level was 191µV/m (45.6dBµV/m) at 2358MHz (CH1).
Average levels were measured when Peak levels exceeded the 500µV/m (54.0dBµV/m) Average limit.
Other channels were assessed and found to have lower disturbance levels.

Frequency (MHz)	Peak Level @ 3m (dBµV/m)	Antenna Pol	Peak Limit @ 3m (dBµV/m)	Peak Pass Margin (dB)	AV Limit @ 3m (dBµV/m)
2390	64.1	Vertical	74.0	-9.9	54.0
2358	64.0	Vertical	74.0	-10.0	54.0
2390	62.9	Horizontal	74.0	-11.1	54.0
2358	62.7	Horizontal	74.0	-11.3	54.0

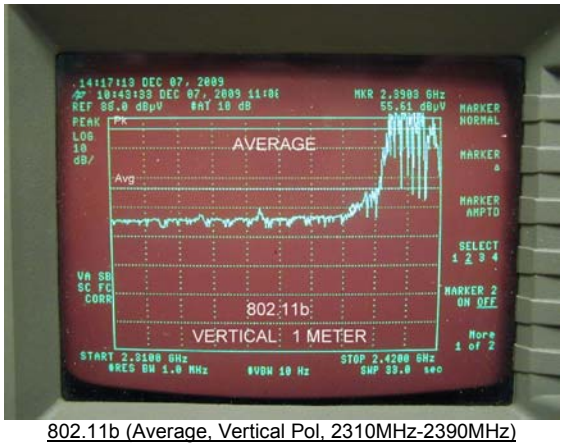
Frequency (MHz)	AV Level @ 3m (dBµV/m)	Antenna Pol	AV Limit @ 3m (dBµV/m)	AV Pass Margin (dB)
2358	45.6	Vertical	54.0	-8.4
2390	45.1	Vertical	54.0	-8.9
2358	42.6	Horizontal	54.0	-11.4
2390	42.0	Horizontal	54.0	-12.0



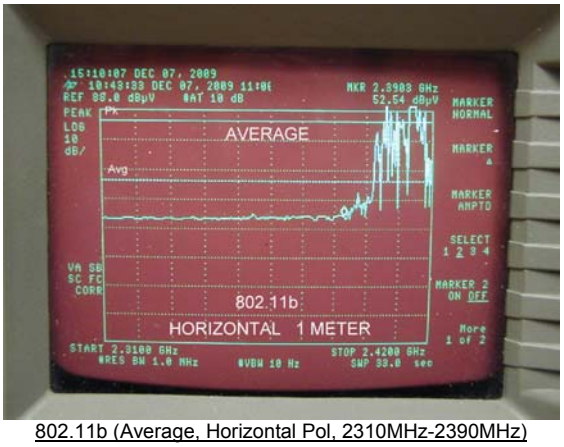
802.11b (Peak, Vertical Pol, 2310MHz-2390MHz)



802.11b (Peak, Horizontal Pol, 2310MHz-2390MHz)



802.11b (Average, Vertical Pol, 2310MHz-2390MHz)



802.11b (Average, Horizontal Pol, 2310MHz-2390MHz)

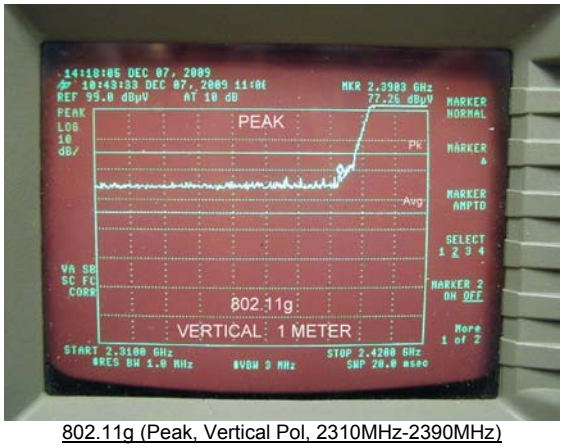
9.3.3 Band 2310MHz-2390MHz (**802.11g mode**)

Measurements were done at a 1m test distance, and then extrapolated to a 3m test distance using an extrapolation factor of 20dB/decade, as specified in Section 15.31(f)(1).

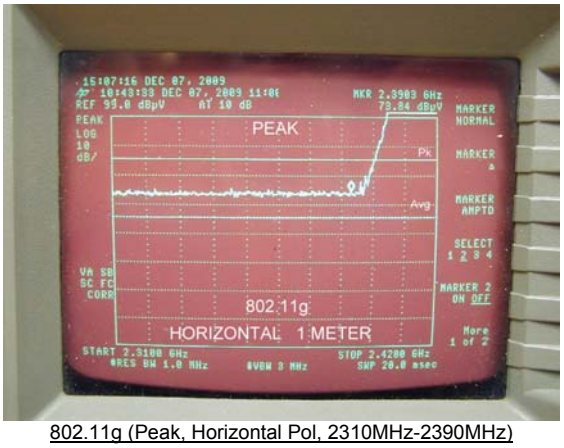
The highest measured Peak level was 2188µV/m (66.8dBµV/m) at 2390MHz (CH1).
The highest measured Average level was 141µV/m (43.0dBµV/m) at 2390MHz (CH1).
Average levels were measured when Peak levels exceeded the 500µV/m (54.0dBµV/m) Average limit.
Other channels were assessed and found to have lower disturbance levels.

Frequency (MHz)	Peak Level @ 3m (dBµV/m)	Antenna Pol	Peak Limit @ 3m (dBµV/m)	Peak Pass Margin (dB)	AV Limit @ 3m (dBµV/m)
2390	66.8	Vertical	74.0	-7.2	54.0
2390	63.3	Horizontal	74.0	-10.7	54.0

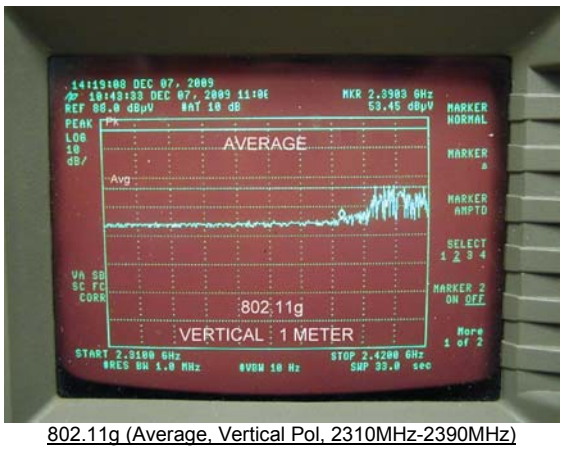
Frequency (MHz)	AV Level @ 3m (dBµV/m)	Antenna Pol	AV Limit @ 3m (dBµV/m)	AV Pass Margin (dB)
2390	43.0	Vertical	54.0	-11.0
2390	42.1	Horizontal	54.0	-11.9



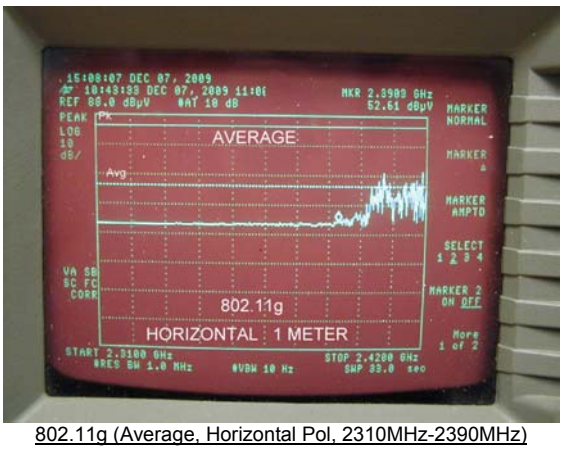
802.11g (Peak, Vertical Pol, 2310MHz-2390MHz)



802.11g (Peak, Horizontal Pol, 2310MHz-2390MHz)



802.11g (Average, Vertical Pol, 2310MHz-2390MHz)



802.11g (Average, Horizontal Pol, 2310MHz-2390MHz)

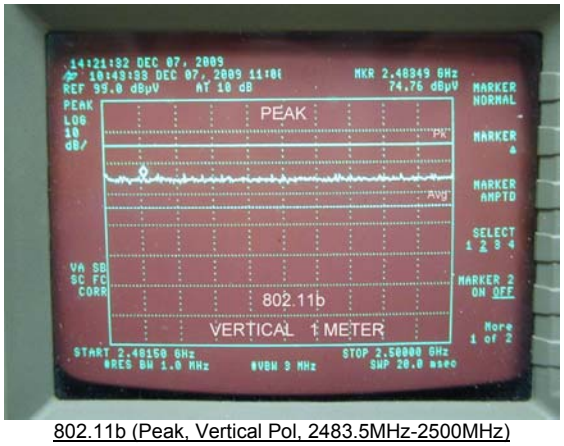
9.3.4 Band 2483.5MHz-2500MHz (**802.11b mode**)

Measurements were done at a 1m test distance, and then extrapolated to a 3m test distance using an extrapolation factor of 20dB/decade, as specified in Section 15.31(f)(1).

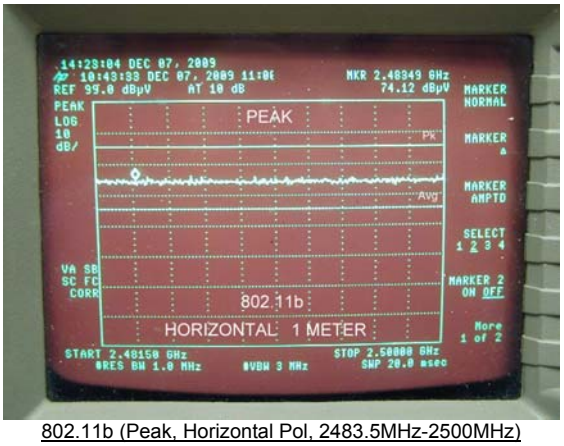
The highest measured Peak level was 1641µV/m (64.3dBµV/m) at 2483.5MHz (CH11).
The highest measured Average level was 158µV/m (44.0dBµV/m) at 2483.5MHz CH11).
Average levels were measured when Peak levels exceeded the 500µV/m (54.0dBµV/m) Average limit.
Other channels were assessed and found to have lower disturbance levels.

Frequency (MHz)	Peak Level @ 3m (dBµV/m)	Antenna Pol	Peak Limit @ 3m (dBµV/m)	Peak Pass Margin (dB)	AV Limit @ 3m (dBµV/m)
2483.5	64.3	Vertical	74.0	-9.7	54.0
2483.5	63.6	Horizontal	74.0	-10.4	54.0

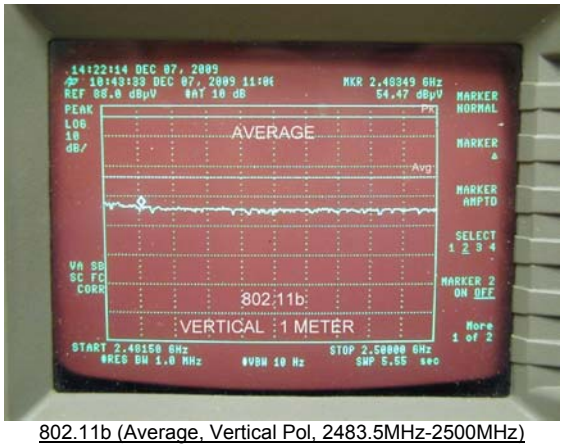
Frequency (MHz)	AV Level @ 3m (dBµV/m)	Antenna Pol	AV Limit @ 3m (dBµV/m)	AV Pass Margin (dB)
2483.5	44.0	Vertical	54.0	-10.0
2483.5	41.7	Horizontal	54.0	-12.3



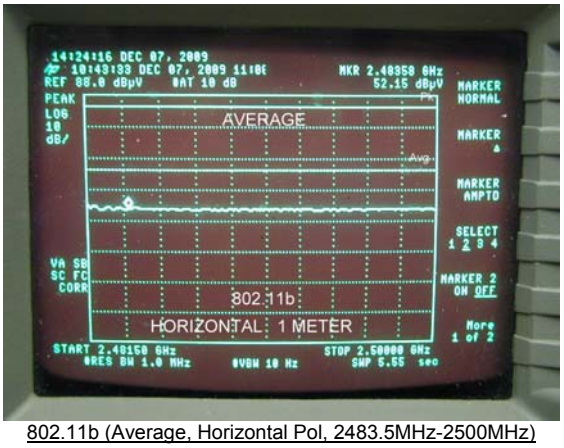
802.11b (Peak, Vertical Pol, 2483.5MHz-2500MHz)



802.11b (Peak, Horizontal Pol, 2483.5MHz-2500MHz)



802.11b (Average, Vertical Pol, 2483.5MHz-2500MHz)



802.11b (Average, Horizontal Pol, 2483.5MHz-2500MHz)

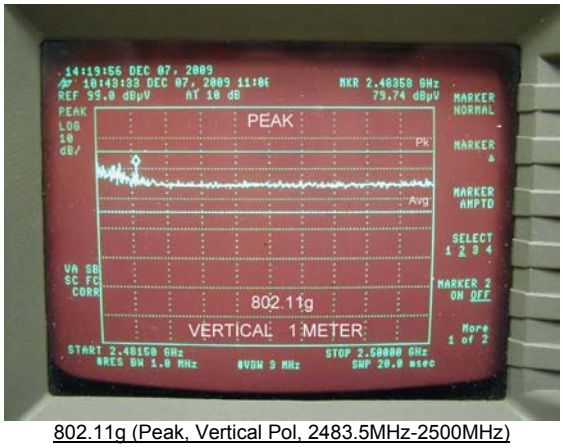
9.3.5 Band 2483.5MHz-2500MHz (**802.11g mode**)

Measurements were done at a 1m test distance, and then extrapolated to a 3m test distance using an extrapolation factor of 20dB/decade, as specified in Section 15.31(f)(1).

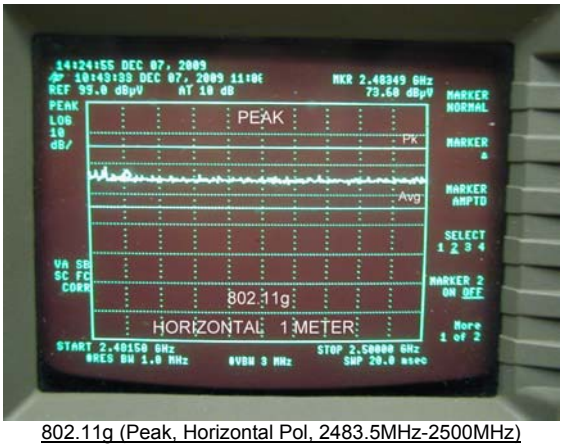
The highest measured Peak level was 2884µV/m (69.2dBµV/m) at 2483.6MHz (CH11).
The highest measured Average level was 129µV/m (42.2dBµV/m) at 2483.6MHz (CH11).
Average levels were measured when Peak levels exceeded the 500µV/m (54.0dBµV/m) Average limit.
Other channels were assessed and found to have lower disturbance levels.

Frequency (MHz)	Peak Level @ 3m (dBµV/m)	Antenna Pol	Peak Limit @ 3m (dBµV/m)	Peak Pass Margin (dB)	AV Limit @ 3m (dBµV/m)
2483.6	69.2	Vertical	74.0	-4.8	54.0
2483.6	63.1	Horizontal	74.0	-10.9	54.0

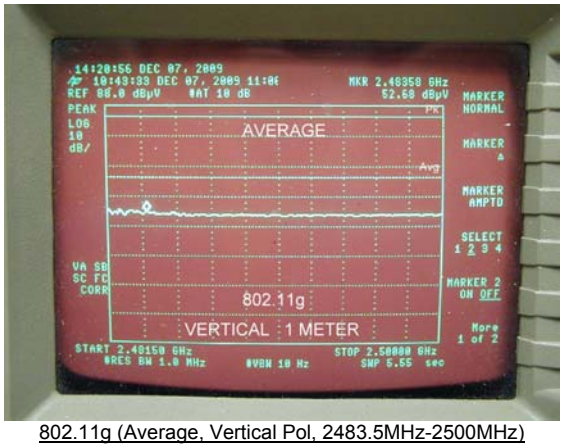
Frequency (MHz)	AV Level @ 3m (dBµV/m)	Antenna Pol	AV Limit @ 3m (dBµV/m)	AV Pass Margin (dB)
2483.6	42.2	Vertical	54.0	-11.8
2483.6	41.5	Horizontal	54.0	-12.5



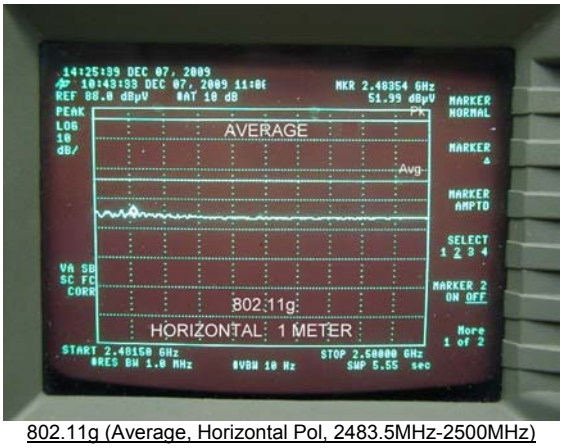
802.11g (Peak, Vertical Pol, 2483.5MHz-2500MHz)



802.11g (Peak, Horizontal Pol, 2483.5MHz-2500MHz)



802.11g (Average, Vertical Pol, 2483.5MHz-2500MHz)



802.11g (Average, Horizontal Pol, 2483.5MHz-2500MHz)

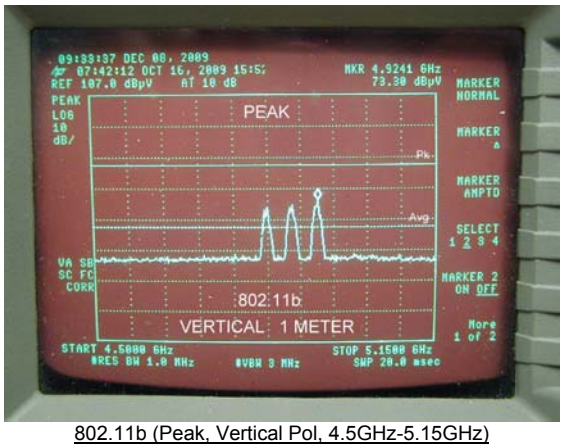
9.3.6 Band 4.5GHz-5.15GHz (**802.11b mode**)

Measurements were done at a 1m test distance, and then extrapolated to a 3m test distance using an extrapolation factor of 20dB/decade, as specified in Section 15.31(f)(1).

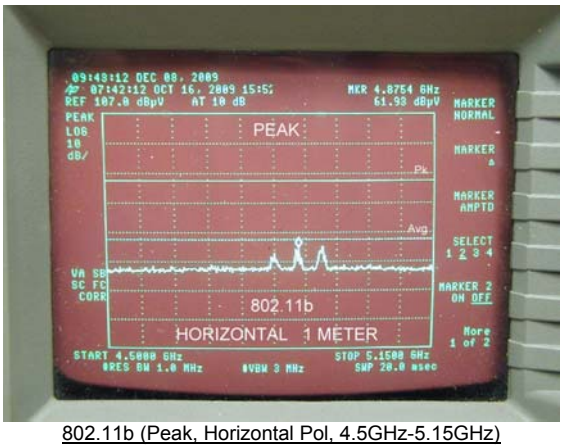
The highest measured Peak level was 1445µV/m (63.2dBµV/m) at 4924MHz (CH11).
The highest measured Average level was 166µV/m (44.4dBµV/m) at 4914MHz (CH11).
Average levels were measured when Peak levels exceeded the 500µV/m (54.0dBµV/m) Average limit.

Frequency (MHz)	Peak Level @ 3m (dBµV/m)	Antenna Pol	Peak Limit @ 3m (dBµV/m)	Peak Pass Margin (dB)	AV Limit @ 3m (dBµV/m)
4924 (CH11)	63.2	Vertical	74.0	-10.8	54.0
4874 (CH6)	62.9	Vertical	74.0	-11.1	54.0
4824 (CH1	61.3	Vertical	74.0	-12.7	54.0
4924 (CH11)	53.2	Horizontal	74.0	-20.8	54.0
4874 (CH6)	52.5	Horizontal	74.0	-21.5	54.0
4824 (CH1)	50.3	Horizontal	74.0	-23.7	54.0

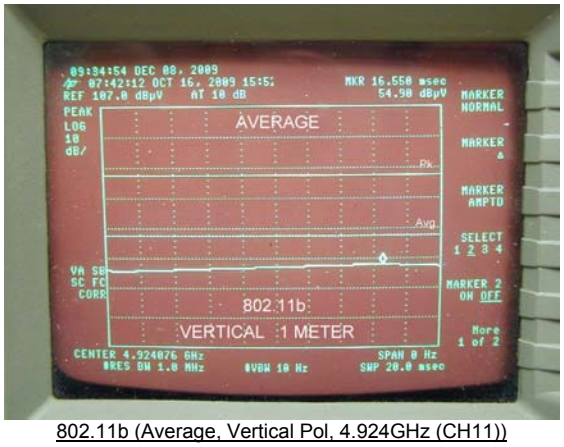
Frequency (MHz)	AV Level @ 3m (dBµV/m)	Antenna Pol	AV Limit @ 3m (dBµV/m)	AV Pass Margin (dB)
4924 (CH11)	44.4	Vertical	54.0	-9.6
4874 (CH6)	43.5	Vertical	54.0	-10.5
4824 (CH1	43.3	Vertical	54.0	-10.7



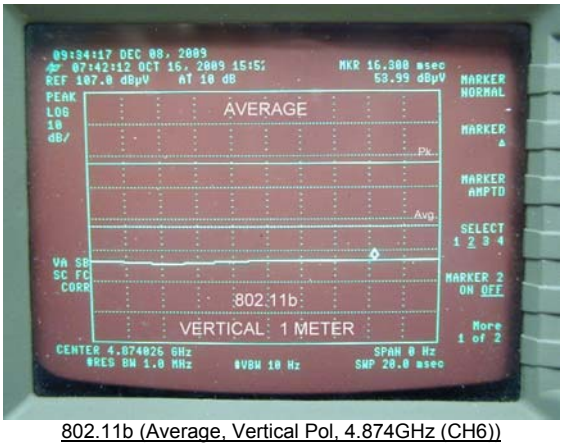
802.11b (Peak, Vertical Pol, 4.5GHz-5.15GHz)



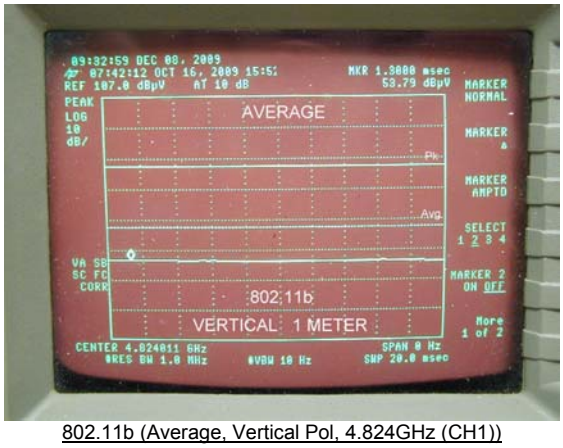
802.11b (Peak, Horizontal Pol, 4.5GHz-5.15GHz)



802.11b (Average, Vertical Pol, 4.924GHz (CH11))



802.11b (Average, Vertical Pol, 4.874GHz (CH6))



802.11b (Average, Vertical Pol, 4.824GHz (CH1))

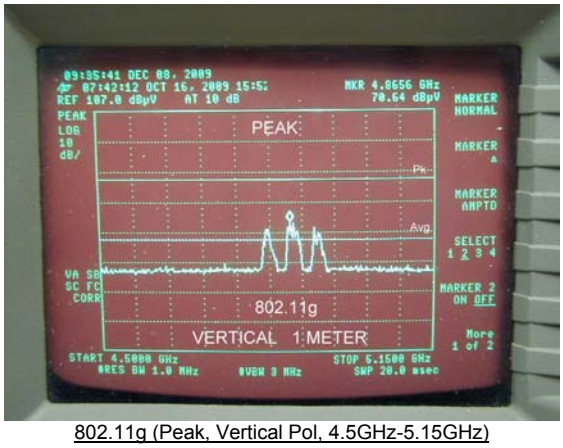
9.3.7 Band 4.5GHz-5.15GHz (**802.11g mode**)

Measurements were done at a 1m test distance, and then extrapolated to a 3m test distance using an extrapolation factor of 20dB/decade, as specified in Section 15.31(f)(1).

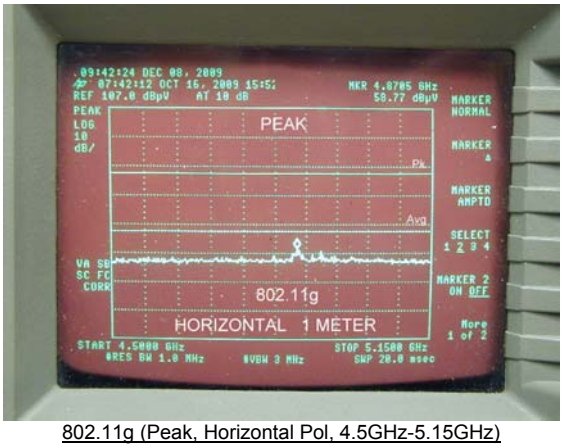
The highest measured Peak level was 1318µV/m (62.4dBµV/m) at 4866MHz.
The highest measured Average level was 57µV/m (35.1dBµV/m) at 4821MHz.
Average levels were measured when Peak levels exceeded the 500µV/m (54.0dBµV/m) Average limit.

Frequency (MHz)	Peak Level @ 3m (dBµV/m)	Antenna Pol	Peak Limit @ 3m (dBµV/m)	Peak Pass Margin (dB)	AV Limit @ 3m (dBµV/m)
4866 (CH6)	62.4	Vertical	74.0	-11.6	54.0
4821 (CH1)	60.5	Vertical	74.0	-13.5	54.0
4917 (CH11)	59.3	Vertical	74.0	-14.7	54.0
4869 (CH6)	51.1	Horizontal	74.0	-22.9	54.0
4920 (CH11)	49.7	Horizontal	74.0	-24.3	54.0
4824 (CH1)	47.2	Horizontal	74.0	-26.8	54.0

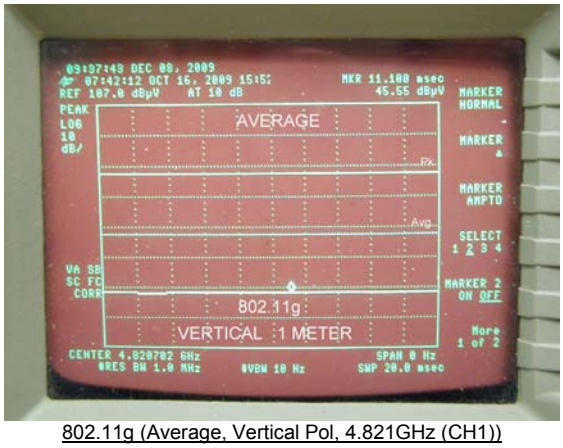
Frequency (MHz)	AV Level @ 3m (dBµV/m)	Antenna Pol	AV Limit @ 3m (dBµV/m)	AV Pass Margin (dB)
4821 (CH1)	35.1	Vertical	54.0	-18.9
4866 (CH6)	34.9	Vertical	54.0	-19.1
4917 (CH11)	34.3	Vertical	54.0	-19.7



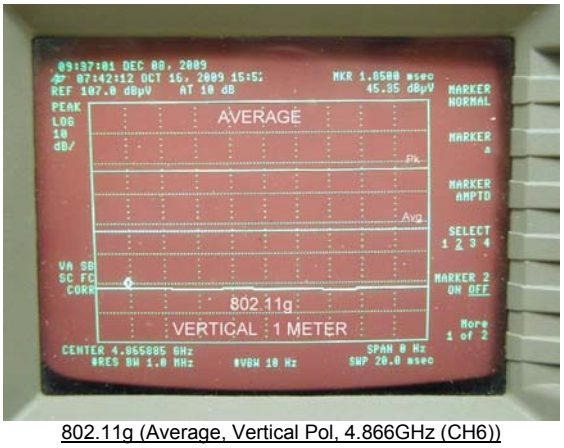
802.11g (Peak, Vertical Pol, 4.5GHz-5.15GHz)



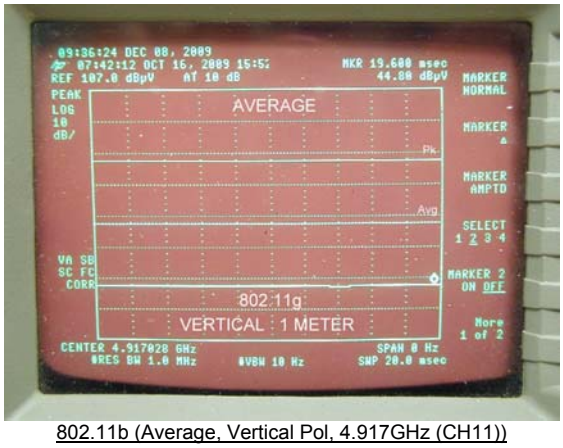
802.11g (Peak, Horizontal Pol, 4.5GHz-5.15GHz)



802.11g (Average, Vertical Pol, 4.821GHz (CH1))



802.11g (Average, Vertical Pol, 4.866GHz (CH6))



802.11b (Average, Vertical Pol, 4.917GHz (CH11))

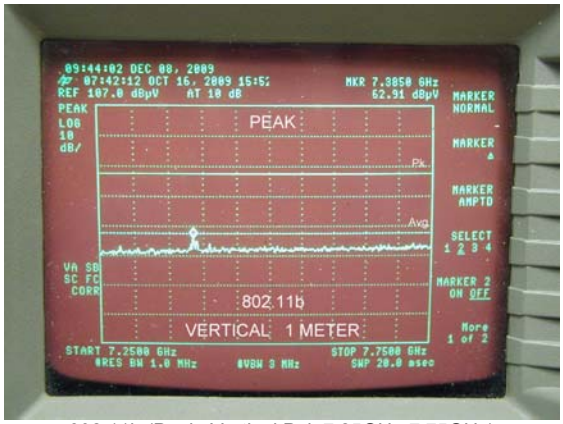
9.3.8 Band 7.25GHz-7.75GHz (**802.11b mode**)

Measurements were done at a 1m test distance, and then extrapolated to a 3m test distance using an extrapolation factor of 20dB/decade, as specified in Section 15.31(f)(1).

The highest measured Peak level was 537µV/m (54.6dBµV/m) at 7388MHz (CH11).
The highest measured Average level was 79µV/m (38.0dBµV/m) at 7388MHz (CH11).
Average levels were measured when Peak levels exceeded the 500µV/m (54.0dBµV/m) Average limit.

Frequency (MHz)	Peak Level @ 3m (dBµV/m)	Antenna Pol	Peak Limit @ 3m (dBµV/m)	Peak Pass Margin (dB)	AV Limit @ 3m (dBµV/m)
7388 (CH11)	54.6	Vertical	74.0	-19.4	54.0
7313 (CH6)	50.0	Vertical	74.0	-24.0	54.0

Frequency (MHz)	AV Level @ 3m (dBµV/m)	Antenna Pol	AV Limit @ 3m (dBµV/m)	AV Pass Margin (dB)
7388 (CH11)	38.0	Vertical	54.0	-16.0



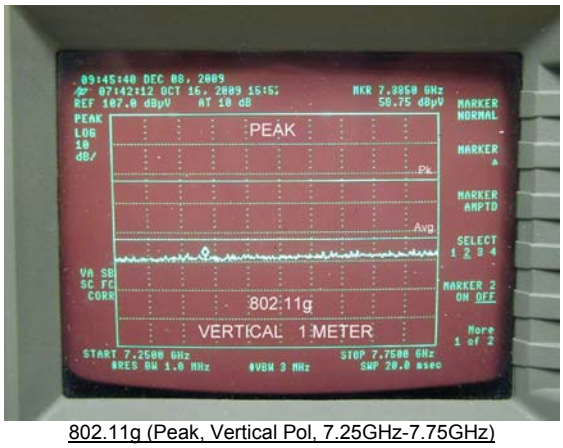
802.11b (Peak, Vertical Pol, 7.25GHz-7.75GHz)

802.11b (Peak, Horizontal Pol, 7.25GHz-7.75GHz)

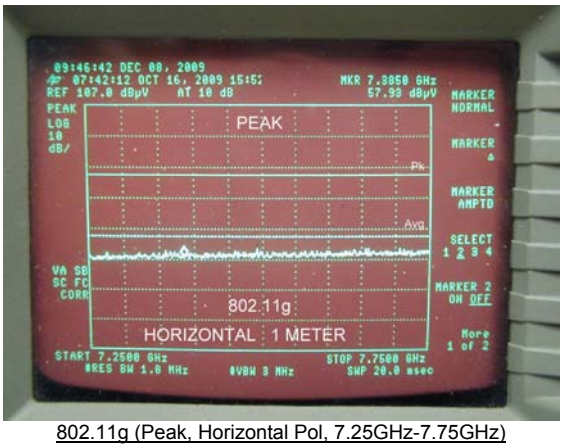
802.11b (Average, Vertical Pol, 7388MHz (CH11))

9.3.9 Band 7.25GHz-7.75GHz (**802.11g mode**)

All measured Peak levels were greater than 10dB below the Average limit.



802.11g (Peak, Vertical Pol, 7.25GHz-7.75GHz)



802.11g (Peak, Horizontal Pol, 7.25GHz-7.75GHz)

10 FCC Part 15C, Section 15.247 – OPERATION WITHIN THE BANDS 902-928MHz, 2400-2483.5MHz, AND 5725-5850MHz

10.1 6dB Bandwidth - Section 15.247(a)(2)

10.1.1 EUT Operating Mode

a. EUT power supply voltage - 115Vac, 60Hz to the AC adapter.
b. The EUT was set in transmitting mode.

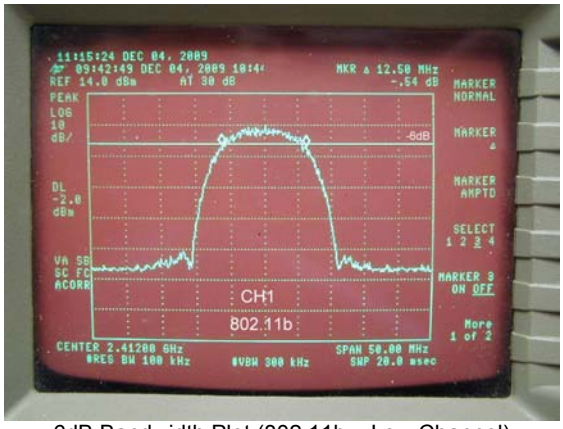
10.1.2 Test Method

a. Measurements performed in accordance with FCC document, “Measurement of Digital Transmission Systems Operating under Section 15.247”, dated March 23, 2005.
b. Connect the EUT antenna port directly to a spectrum analyser via a low loss RF cable, and attenuator.
c. Set the spectrum analyser RBW to 100kHz RBW, and the VBW to 300kHz.
d. Mark the peak frequency level and note the -6dB (lower and upper) frequencies.
e. Repeat the above for all measurement frequencies.

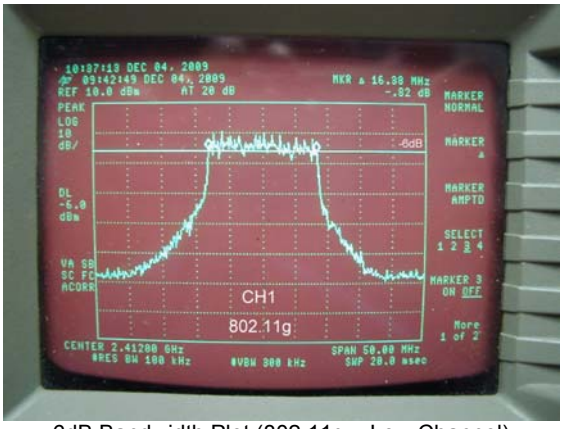
10.1.3 Test Results

The EUT transceiver satisfies the criteria for operation under this section as a digitally modulated transmitter.

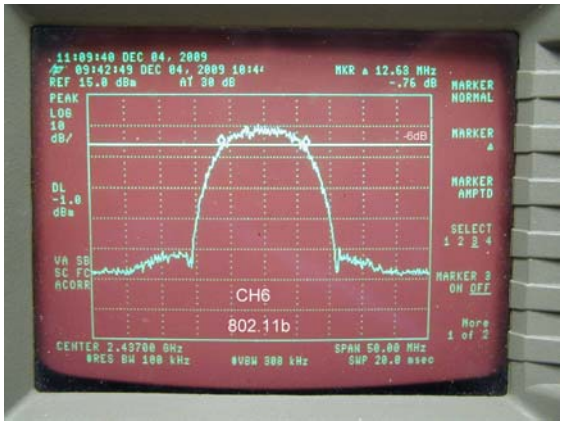
Channel	Wireless Mode	6dB Bandwidth (MHz)	6dB BW Limit (kHz)	Result
Low (CH1)	802.11b	12.50	>500kHz	Pass
Mid (CH6)	802.11b	12.63	>500kHz	Pass
High (CH11)	802.11b	12.50	>500kHz	Pass
Low (CH1)	802.11g	16.38	>500kHz	Pass
Mid (CH6)	802.11g	15.88	>500kHz	Pass
High (CH11)	802.11g	16.13	>500kHz	Pass



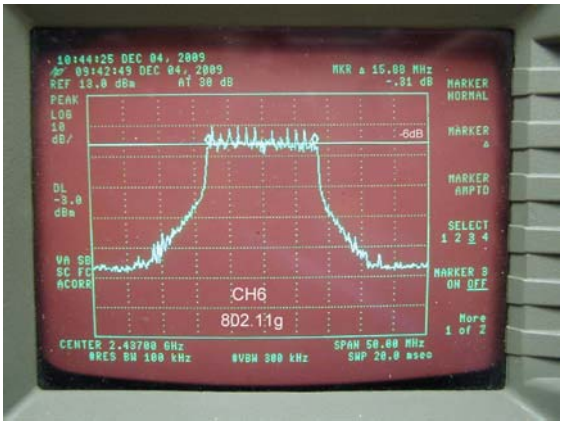
6dB Bandwidth Plot (802.11b – Low Channel)



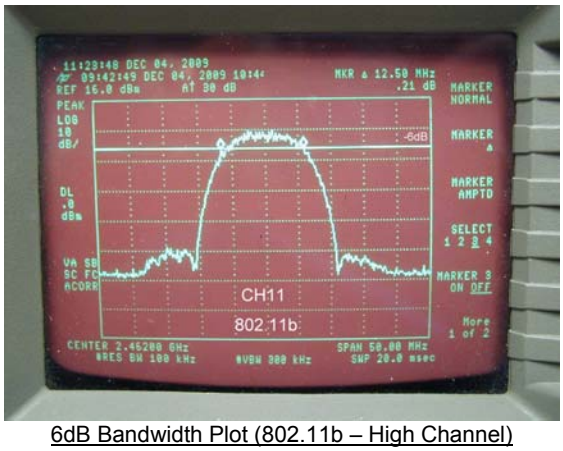
6dB Bandwidth Plot (802.11g – Low Channel)



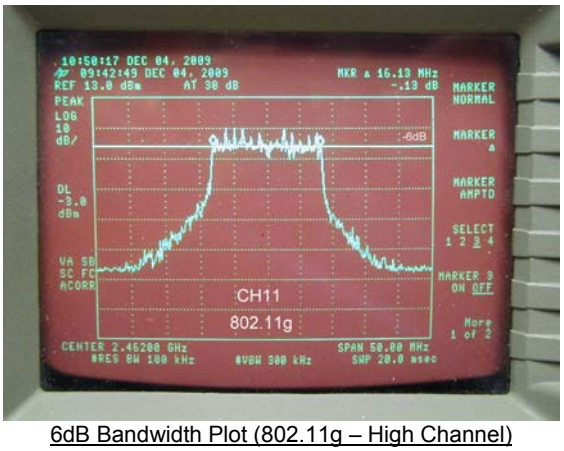
6dB Bandwidth Plot (802.11b – Mid Channel)



6dB Bandwidth Plot (802.11g – Mid Channel)



6dB Bandwidth Plot (802.11b – High Channel)



6dB Bandwidth Plot (802.11g – High Channel)

10.2 Peak Conducted Output Power – Section 15.247(b)(3)

10.2.1 EUT Operating Mode

a. EUT power supply voltage - 115Vac, 60Hz to the AC adapter.
b. The EUT was set in transmitting mode.

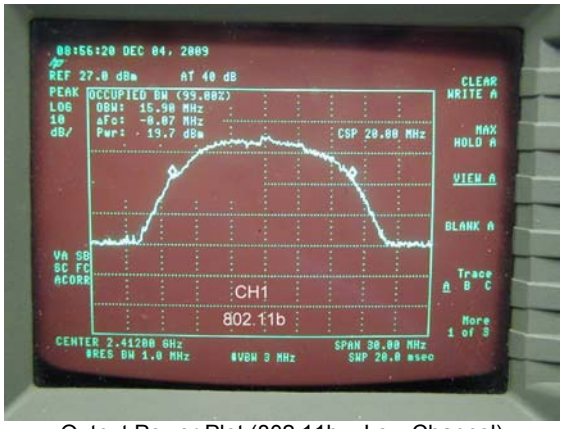
10.2.2 Test Method

a. Measurements performed in accordance with FCC document, "Measurement of Digital Transmission Systems Operating under Section 15.247", dated March 23, 2005, using the Spectrum Analyser's 99% power bandwidth function.
b. Connect the EUT antenna port directly to a spectrum analyser via a low loss RF cable, and attenuator.
c. Set the spectrum analyser RBW to 1MHz, and the VBW to 3MHz.
d. Record the maximum reading (corrected for losses).
e. Repeat the above for all measurement frequencies.

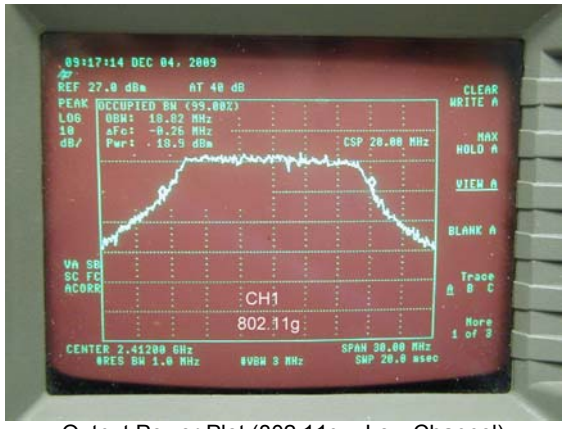
10.2.3 Test Results

Channel	Wireless Mode	Output Power (dBm)	Output Power (W)	Power Limit (W)	Result
Low (CH1)	802.11b	19.7	0.093	1.0	Pass
Mid (CH6)	802.11b	21.2	0.132	1.0	Pass
High (CH11)	802.11b	21.9	0.155	1.0	Pass
Low (CH1)	802.11g	18.9	0.078	1.0	Pass
Mid (CH6)	802.11g	20.2	0.105	1.0	Pass
High (CH11)	802.11g	19.8	0.095	1.0	Pass

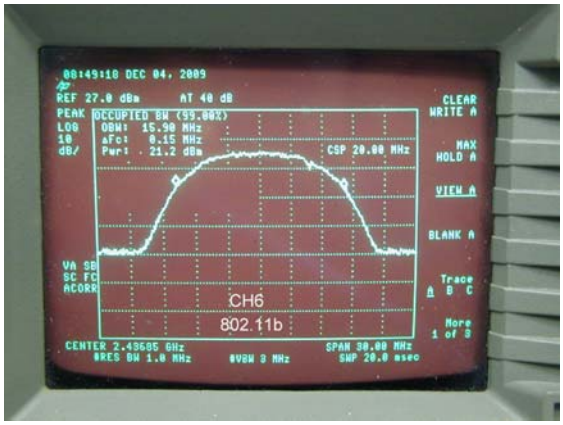
The maximum Peak Conducted Output Power was 155mW (21.9dBm) at 2462MHz (CH11) in 802.11b mode.



Output Power Plot (802.11b – Low Channel)

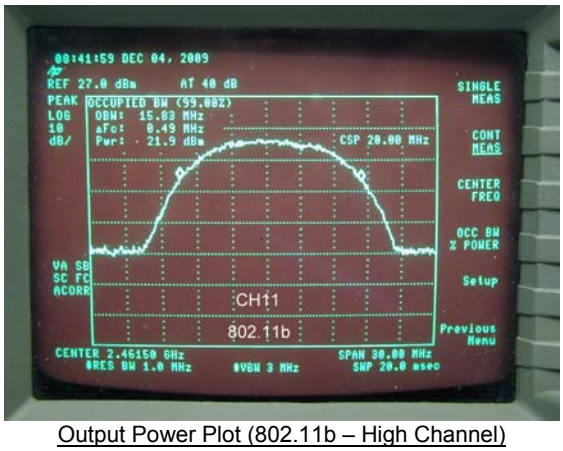


Output Power Plot (802.11g – Low Channel)

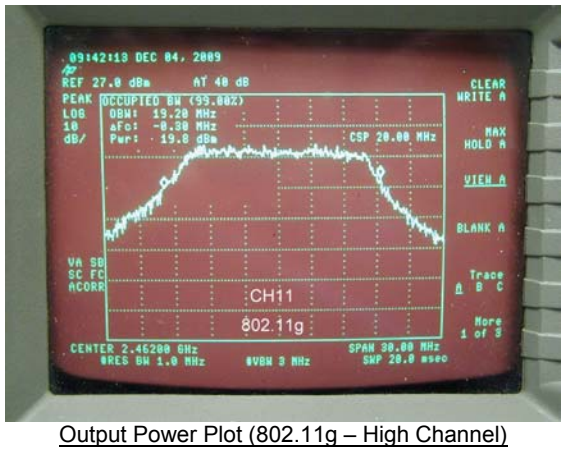


Output Power Plot (802.11b – Mid Channel)

Output Power Plot (802.11g – Mid Channel)



Output Power Plot (802.11b – High Channel)



Output Power Plot (802.11g – High Channel)

10.3 RF Conducted Measurement of Out-of-Band Emissions at the Antenna Port – Section 15.247(d)

10.3.1 EUT Operating Mode

a. EUT power supply voltage - 115Vac, 60Hz to the AC adapter.
b. The EUT was set in transmitting mode.

10.3.2 Test Method

a. Since the client was unable to specify the lowest frequency used by the intentional radiator, measurements were made from 9kHz to 25GHz.
b. Measurements performed in accordance with FCC document, "Measurement of Digital Transmission Systems Operating under Section 15.247", dated March 23, 2005.
c. Connect the EUT antenna port directly to a spectrum analyser via a low loss RF cable, and attenuator.
d. Set the spectrum analyser bandwidth as follows:
   - RBW to 100Hz, and VBW to 300Hz (9kHz to 150kHz).
   - RBW to 10kHz, and VBW to 30kHz (150kHz to 30MHz).
   - RBW to 100kHz, and VBW to 300kHz (above 30MHz).
e. Mark the peak frequency level (corrected for losses), and measure the highest emission level observed in any 100kHz bandwidth below the 100kHz bandwidth of the Low Channel.
f. Mark the peak frequency level (corrected for losses), and measure the highest emission level observed in any 100kHz bandwidth above the 100kHz bandwidth of the High Channel.

10.3.3 Test Results

Out-of-Band limit is set 20dB lower than the Peak In-Band level:

Channel	Wireless Mode	In-Band Peak Level (dBm)	Out-of-Band Limit (dBm)
CH1	802.11b	3.9	-16.1
CH6	802.11b	4.3	-15.7
CH11	802.11b	5.0	-15.0
CH1	802.11g	0.5	-19.5
CH6	802.11g	1.9	-18.1
CH11	802.11g	2.7	-17.3

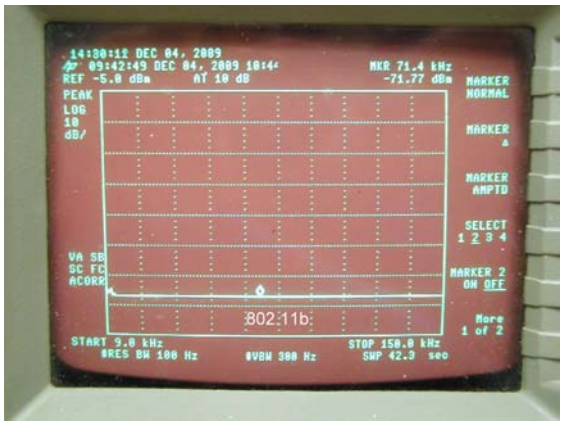
Measured Out-of-Band Emissions (**802.11b**):

Frequency (MHz)	Channel	Peak Level (dBm)	Limit (dBm)	Pass Margin (dB)
2400.0	1	-37.0	-16.1	-20.9
2483.5	11	-41.1	-15.0	-26.1
4824.0	1	-49.7	-16.1	-33.6
4873.4	6	-50.3	-15.7	-34.6
4924.0	11	-49.2	-15.0	-34.2

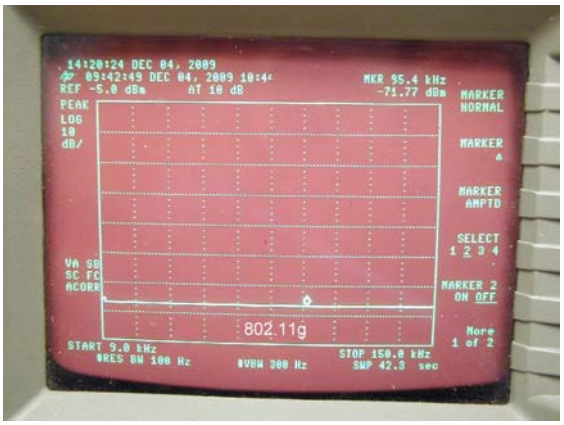
Measured Out-of-Band Emissions (**802.11g**):

Frequency (MHz)	Channel	Peak Level (dBm)	Limit (dBm)	Pass Margin (dB)
2400.0	1	-29.0	-19.5	-9.5
2483.5	11	-41.0	-17.3	-23.7

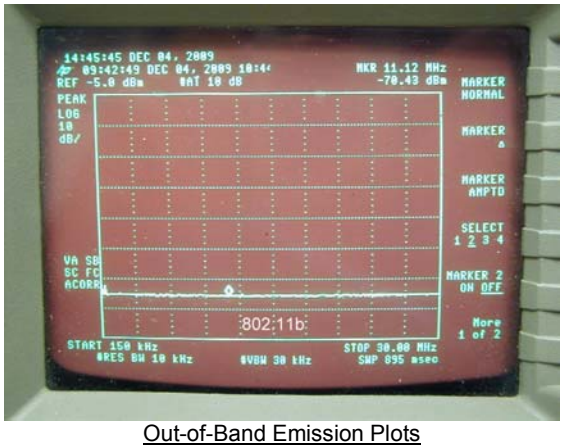
Highest Out-of-Band Emission was -29.0dBm (1.3µW) at 2400.0MHz (CH1) in 802.11g mode.



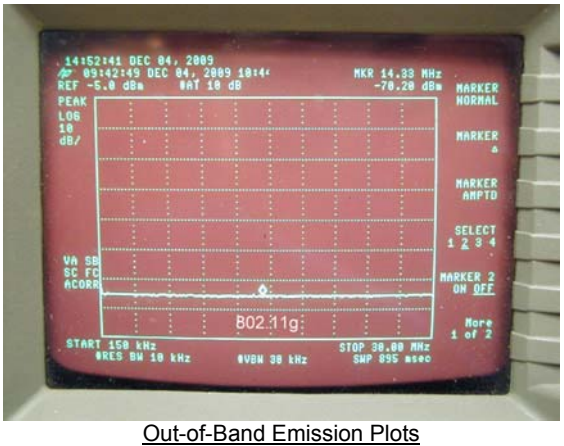
Out-of-Band Emission Plots
(802.11b – 9kHz-150kHz)



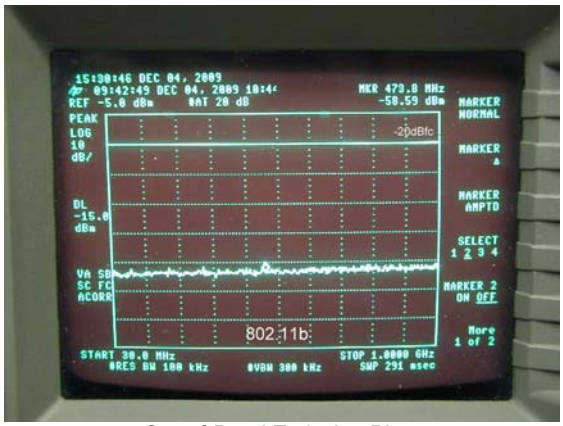
Out-of-Band Emission Plots
(802.11g – 9kHz-150kHz)



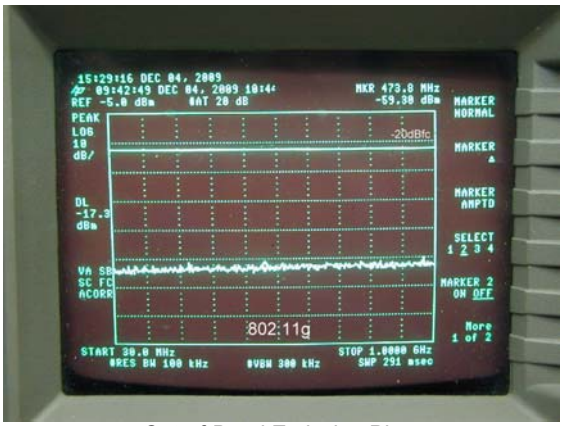
Out-of-Band Emission Plots
(802.11b – 150kHz-30MHz)



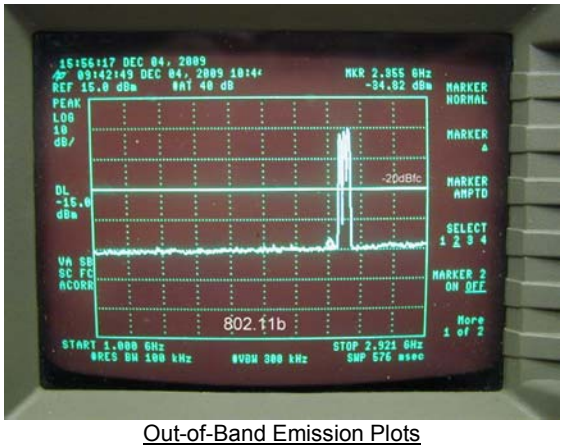
Out-of-Band Emission Plots
(802.11g – 150kHz-30MHz)



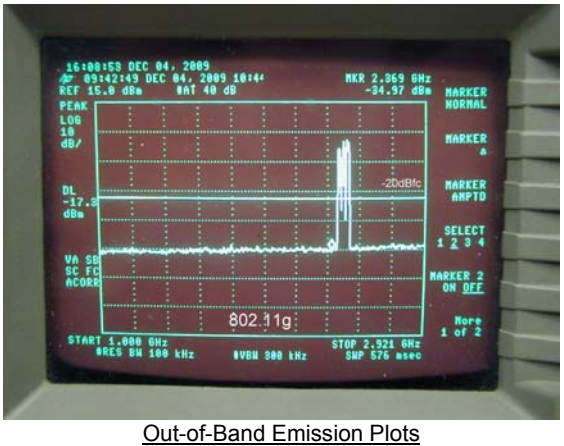
Out-of-Band Emission Plots
(802.11b – 30MHz-1GHz)



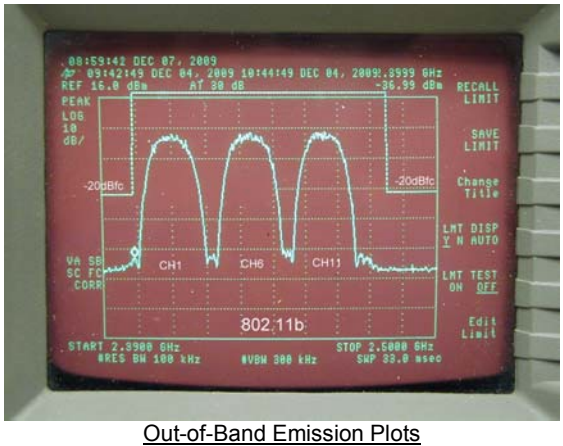
Out-of-Band Emission Plots
(802.11g – 30MHz-1GHz)



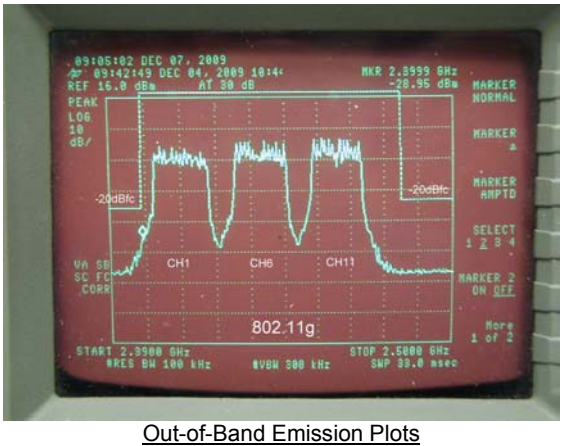
Out-of-Band Emission Plots
(802.11b – 1GHz-2.9GHz)



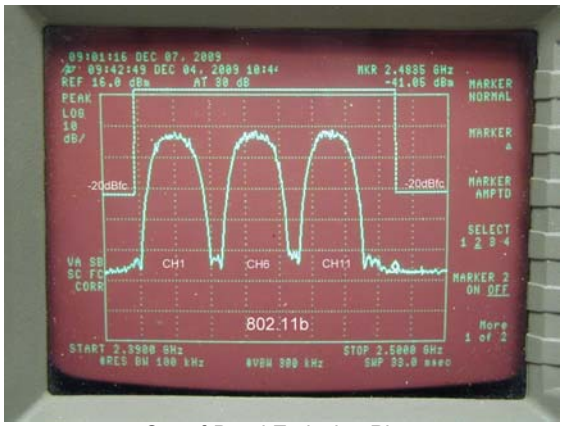
Out-of-Band Emission Plots
(802.11g – 1GHz-2.9GHz)



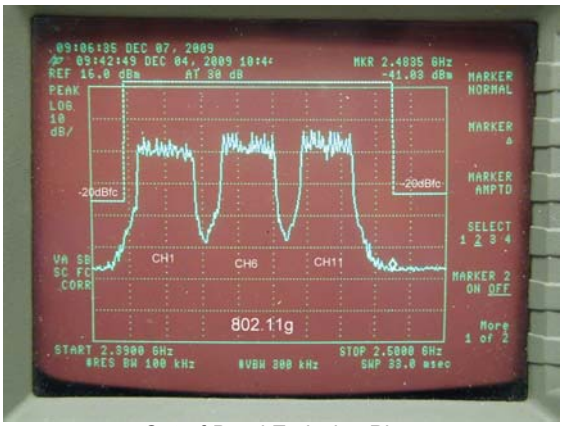
Out-of-Band Emission Plots
(802.11b – 2.4GHz)



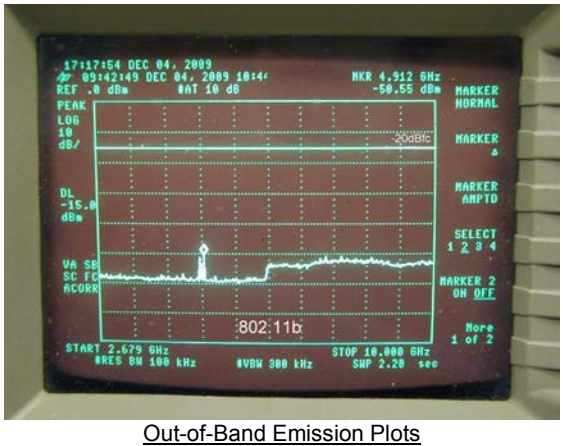
Out-of-Band Emission Plots
(802.11g – 2.4GHz)



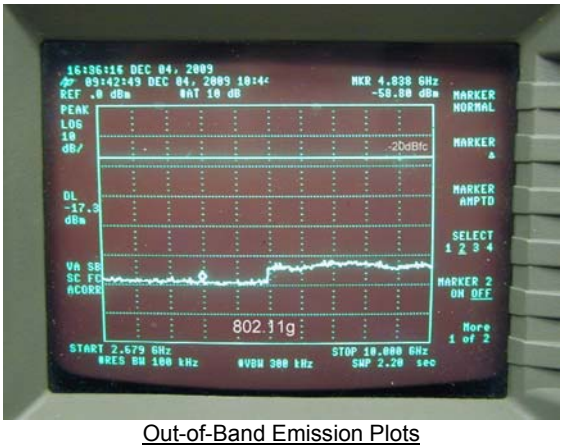
Out-of-Band Emission Plots
(802.11b – 2.4835GHz)



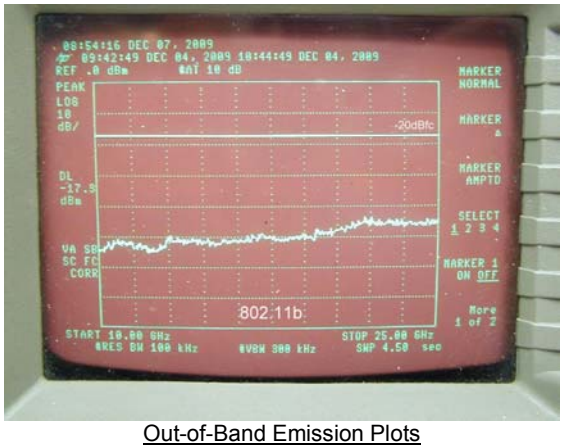
Out-of-Band Emission Plots
(802.11g – 2.4835GHz)



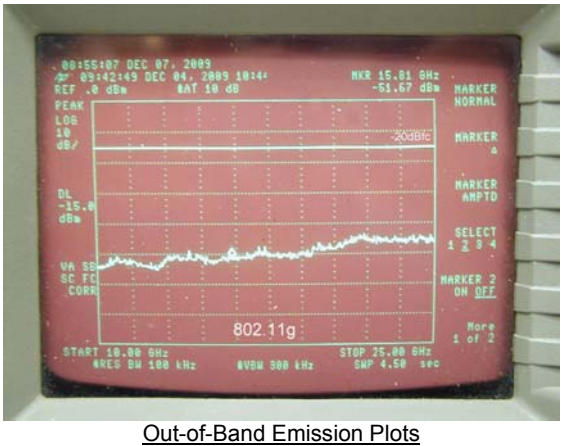
Out-of-Band Emission Plots
(802.11b – 2.6GHz-10GHz)



Out-of-Band Emission Plots
(802.11g – 2.6GHz-10GHz)



Out-of-Band Emission Plots
(802.11b – 10GHz-25GHz)



Out-of-Band Emission Plots
(802.11g – 10GHz-25GHz)

10.4 Peak Power Spectral Density – Section 15.247(e)

10.4.1 EUT Operating Mode

a. EUT power supply voltage - 115Vac, 60Hz to the AC adapter.
b. The EUT was set in transmitting mode.

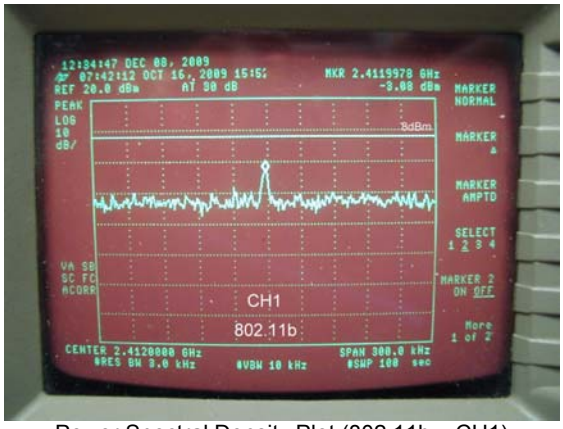
10.4.2 Test Method

a. Measurements performed in accordance with FCC document, “Measurement of Digital Transmission Systems Operating under Section 15.247”, dated March 23, 2005.
b. Connect the EUT antenna port directly to a spectrum analyser via a low loss RF cable, and attenuator.
c. Set the spectrum analyser RBW to 3kHz, and the VBW to 10kHz.
d. Record the maximum reading (corrected for losses).
e. Repeat the above for all measurement frequencies.

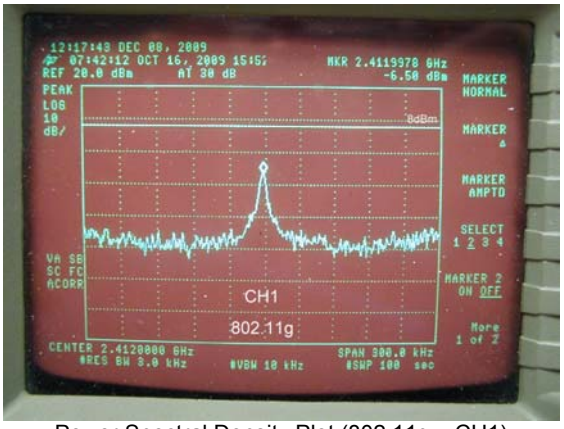
10.4.3 Test Results

Channel	Frequency (MHz)	Wireless Mode	Power Density Level (dBm)	Power Density Limit (dBm)	Pass Margin (dB)
Low (CH1)	2412.0	802.11b	-3.1	8.0	-11.1
Mid (CH6)	2437.0	802.11b	-2.0	8.0	-10.0
High (CH11)	2462.0	802.11b	-2.8	8.0	-10.8
Low (CH1)	2412.0	802.11g	-6.5	8.0	-14.5
Mid (CH6)	2437.0	802.11g	-7.2	8.0	-15.2
High (CH11)	2462.0	802.11g	-8.9	8.0	-16.9

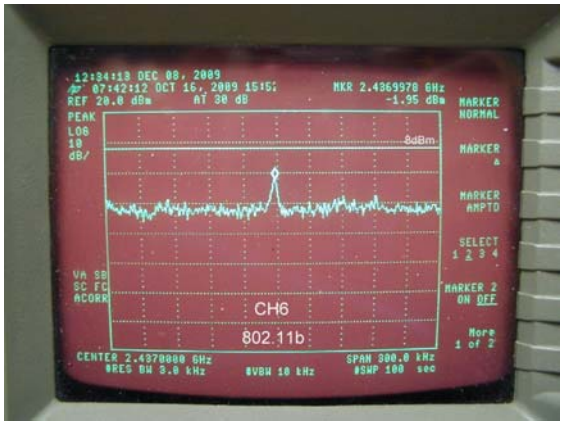
Maximum Peak Power Spectral Density was -2.0dBm per 3kHz at 2437.0MHz (CH6) in 802.11b mode.



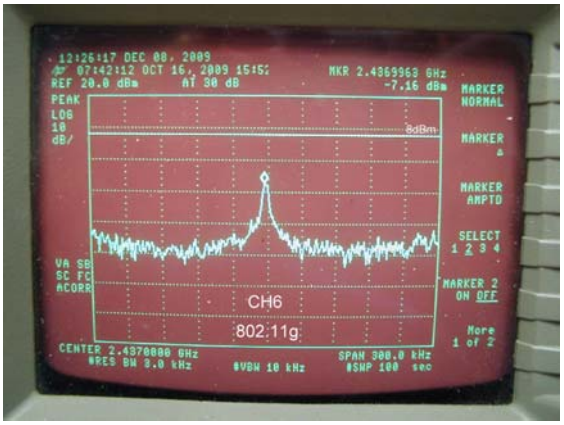
Power Spectral Density Plot (802.11b – CH1)



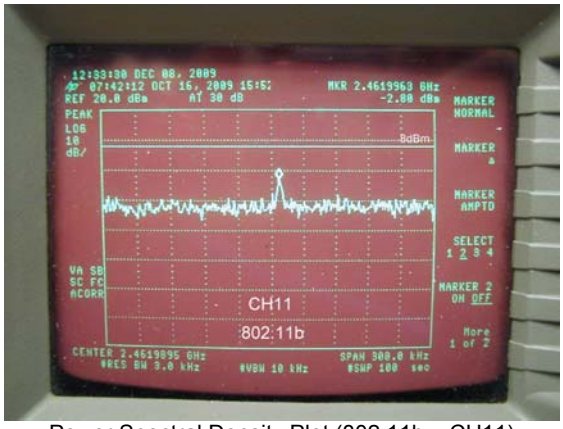
Power Spectral Density Plot (802.11g – CH1)



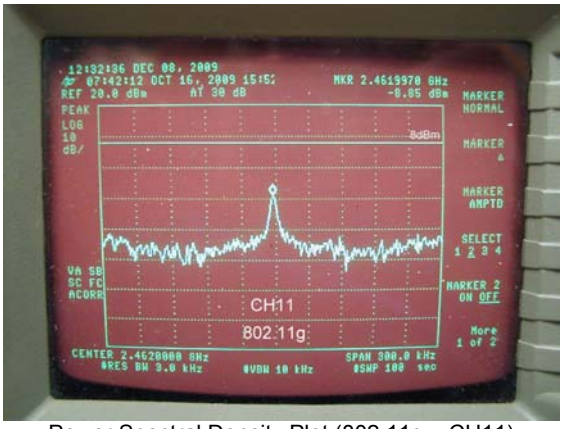
Power Spectral Density Plot (802.11b – CH6)



Power Spectral Density Plot (802.11g – CH6)



Power Spectral Density Plot (802.11b – CH11)



Power Spectral Density Plot (802.11g – CH11)