

RF TEST REPORT

Test item : Wireless LAN Module
Model No. : WizFi210
Order No. : 1103-00308
Date of receipt : 2011-03-11
Test duration : 2011-03-29 ~ 2011-04-18
Date of issue : 2011-04-21
Use of report : FCC Original Grant

Applicant : WIZNET Co., LTD.
4F Humax Village, 11-4 Sunae-dong, Bundang-gu, Seongnam-si
Gyeonggi-do, 463-825, Korea

Test laboratory : Digital EMC Co., Ltd.
683-3, Yubang-Dong, Cheoin-Gu, Yongin-Si, Kyunggi-Do, 449-080, Korea

Test specification : FCC Part 15.247 Subpart C
ANSI C63.4-2003

Test environment : See appended test report

Test result : Pass Fail

The test results presented in this test report are limited only to the sample supplied by applicant and the use of this test report is inhibited other than its purpose. This test report shall not be reproduced except in full, without the written approval of DIGITAL EMC CO., LTD.

Tested by:




Engineer
D.C. Cha

Witnessed by:

N/A

Reviewed by:



Manager
W.J. Lee

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1. Equipment information

1.1 Equipment description

FCC Equipment Class	Digital Transmission System (DTS)
Equipment type	Wireless LAN Module
Equipment model name	WizFi210
Equipment add model name	N/A
Equipment serial no.	Identical prototype
Frequency band	2412 ~ 2462 MHz
Modulation type	CCK
Channel Access Protocol	CSMA/CA
Channel Spacing	5.0 MHz
Antenna type	External Type: Dipole antenna (Max. Peak Gain: 3.377 dBi)
Power Supply	DC 3.3 V

1.2 Ancillary equipment

Equipment	Model No.	Serial No.	Manufacturer	Note
-	-	-	-	-
-	-	-	-	-

2. Information about test items

2.1 Test mode

This device was tested in continuous transmitting mode at maximum power.

Test Case 1	-
Test Case 2	-

2.2 Auxiliary equipment

Equipment	Model No.	Serial No.	Manufacturer	Note
AC-DC Adapter	DP05020DG	N/A	Green Power	-
-	-	-	-	-

2.3 Tested frequency

	TX Frequency (MHz)	RX Frequency (MHz)
Lowest Channel	2412	2412
Middle Channel	2437	2437
Highest Channel	2462	2462

2.4 Tested environment

Temperature	: 21 ~ 23 °C
Relative humidity content	: 32 ~ 52 % R.H.
Details of power supply	: DC 3.3 V AC-DC Adapter : 120 V 60 Hz

2.5 EMI Suppression Device(s)/Modifications

EMI suppression device(s) added and/or modifications made during testing

→ None

3. Test Report

3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit (Using in 2400 ~ 2483.5MHz)	Test Condition	Status Note 1
I. Test Items				
15.247(a)(2)	6 dB Bandwidth	> 500 kHz	Conducted	C
15.247(b)(3)	Transmitter Output Power	< 1Watt		C
15.247(c)	Out of Band Emissions / Band Edge	20dBc in any 100kHz BW		C
15.247(d)	Transmitter Power Spectral Density	< 8dBm / 3kHz		C
15.205 15.209	General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	<FCC 15.209 Limits	Radiated	C
15.207	AC Conducted Emissions	EN 55022	AC Line Conducted	C
15.203	Antenna Requirements	FCC 15.203	-	C
<p>Note 1: C=Comply NC=Not Comply NT=Not Tested NA=Not Applicable</p>				

The sample was tested according to the following specification:
ANSI C-63.4-2003, DA00-705

3.2 Transmitter requirements

3.2.1 6 dB Bandwidth

- Procedure:

The bandwidth at 6 dB below the highest inband spectral density was measured with a spectrum analyzer connected to the antenna terminal at the highest, middle and the lowest available channels.

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 6dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level.

The marker-delta reading at this point is the 6 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest Frequencies

Span = 50 MHz (Greater than EBW)

RBW = 100 kHz

VBW = \geq RBW

Trace = max hold

Sweep = auto

Detector function = peak

- Measurement Data: **Comply**

Test Mode	Frequency	Test Results (MHz)
802.11b	Lowest	10.00
	Middle	9.95
	Highest	10.00

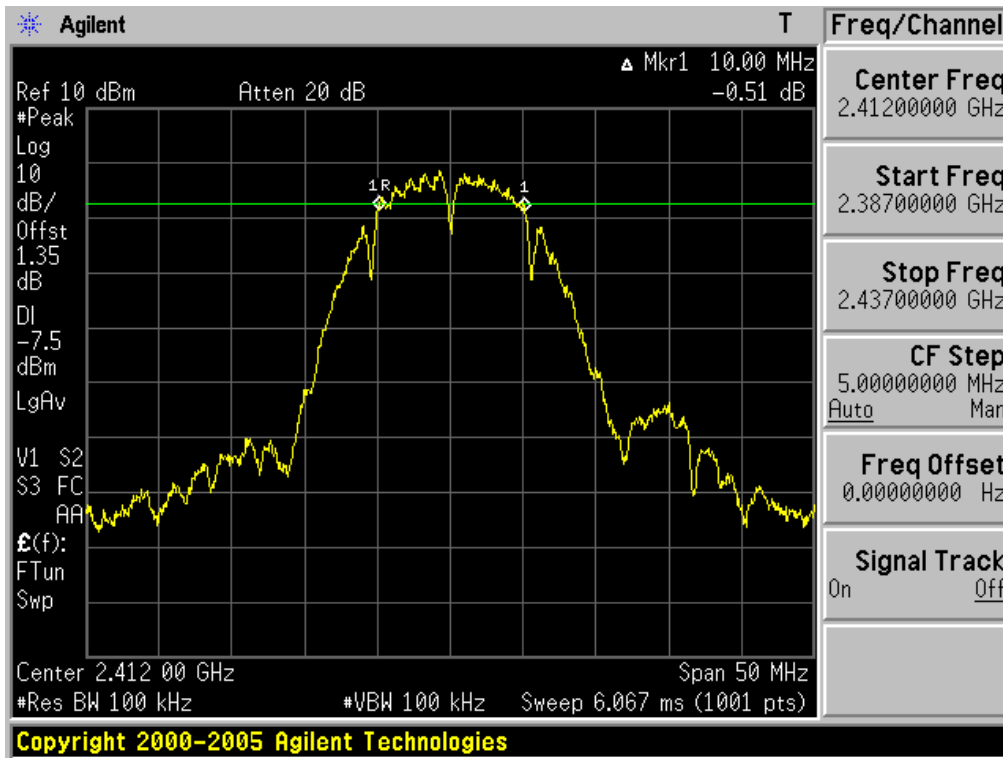
Note 1: See next pages for actual measured spectrum plots.

- Minimum Standard:

The minimum 6 dB bandwidth shall be at least 500 kHz

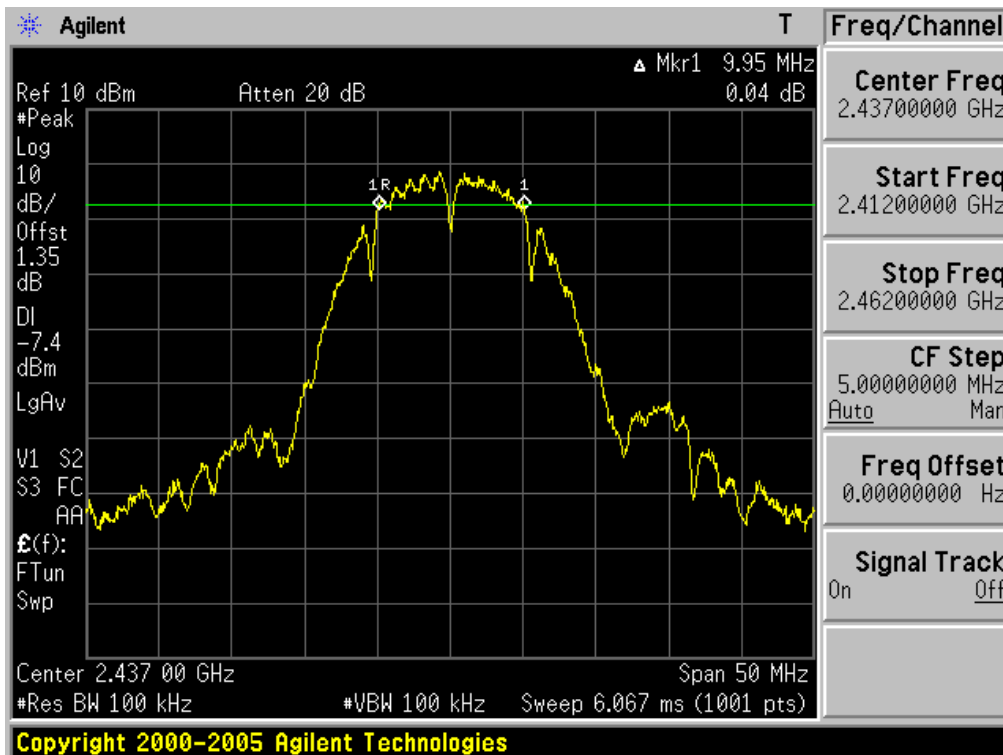
6 dB Bandwidth

Test Mode: 802.11b & Lowest Frequency



6 dB Bandwidth

Test Mode: 802.11b & Middle Frequency



6 dB Bandwidth

Test Mode: 802.11b & Highest Frequency



3.2.2 Peak Output Power

- Test Procedure and Spectrum Analyzer setting:

The peak output power was measured with a spectrum analyzer connected to the antenna terminal at the highest, middle and the lowest available channels.

The transmitter output is connected to a spectrum analyzer and the analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 26dB EBW.

The test is performed in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005. The transmitter operates continuously therefore Power Output Option 2, Method #1 is used.

- Measurement Data: **Comply**

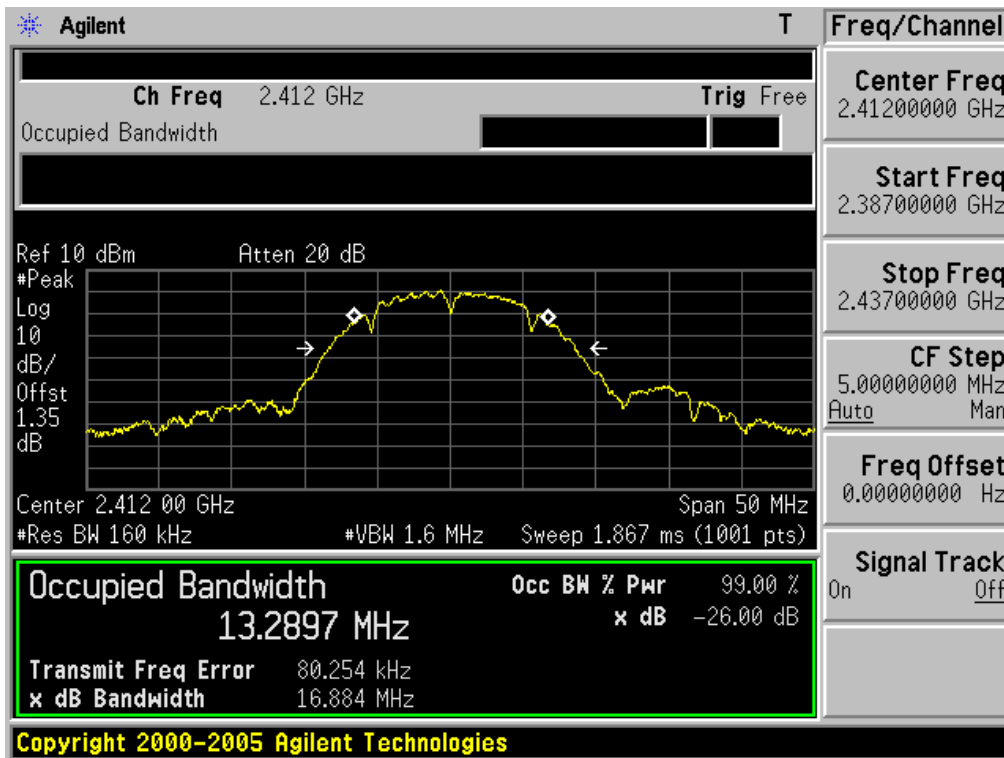
Test Mode	Frequency	Test Results	
		dBm	W
802.11b	Lowest	9.37	0.00865
	Middle	9.25	0.00841
	Highest	9.33	0.00857

Note 1: See next pages for actual measured spectrum plots.

Minimum Standard:	< 1W
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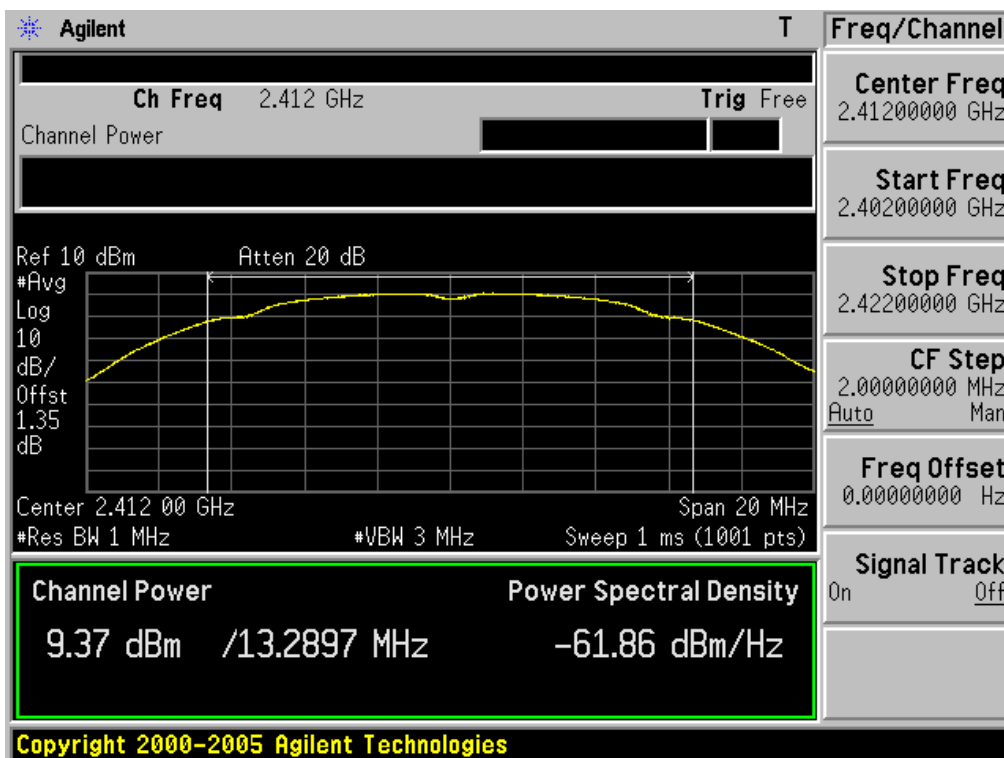
26 dB Bandwidth

Test Mode: 802.11b & Lowest Frequency



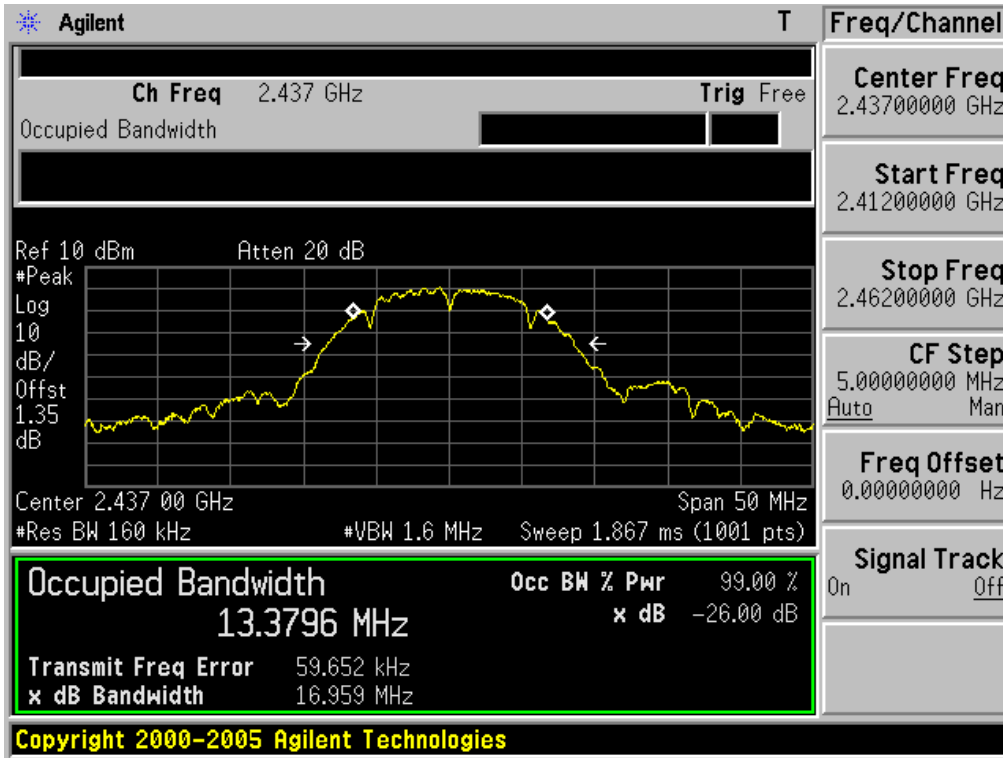
Peak Output Power

Test Mode: 802.11b & Lowest Frequency



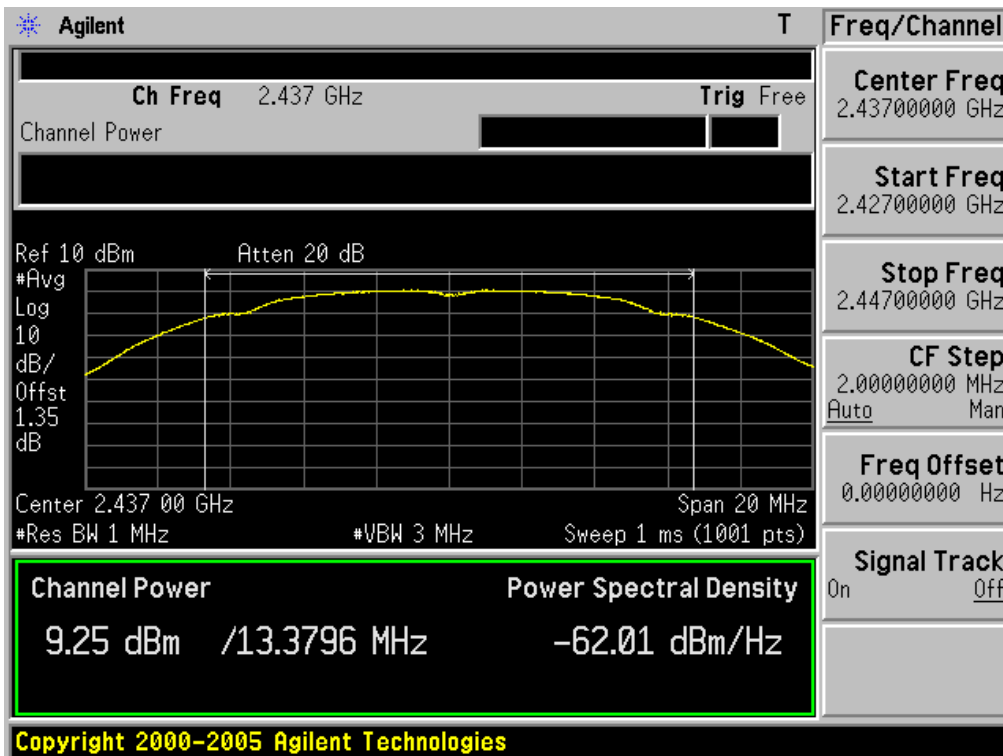
26 dB Bandwidth

Test Mode: 802.11b & Middle Frequency



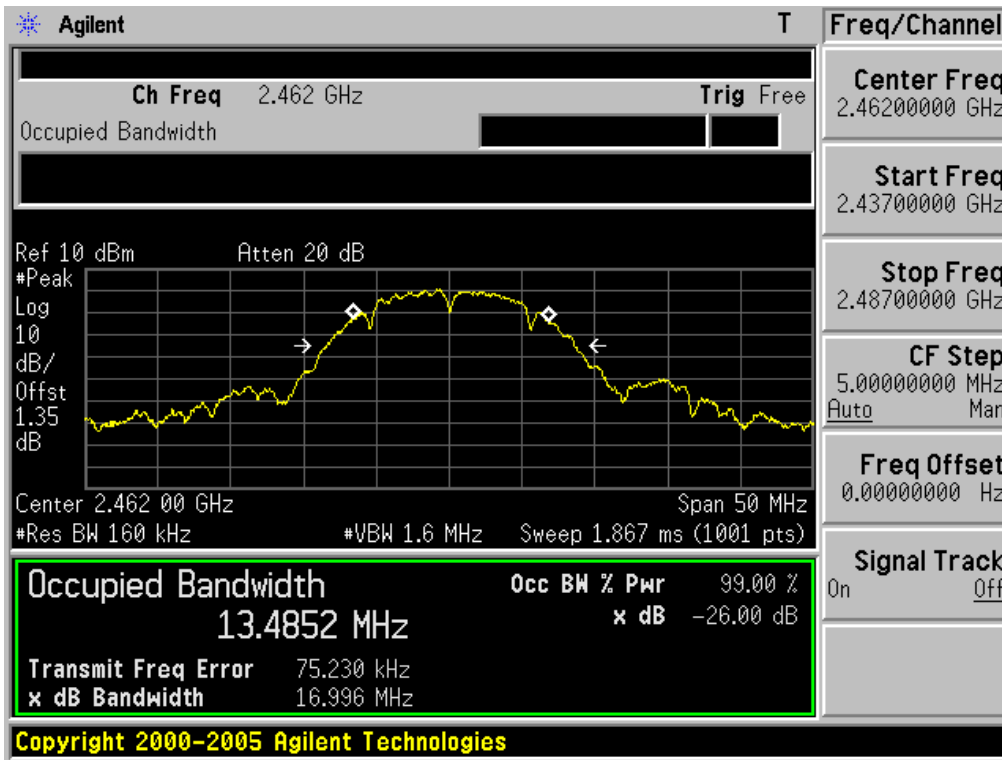
Peak Output Power

Test Mode: 802.11b & Middle Frequency



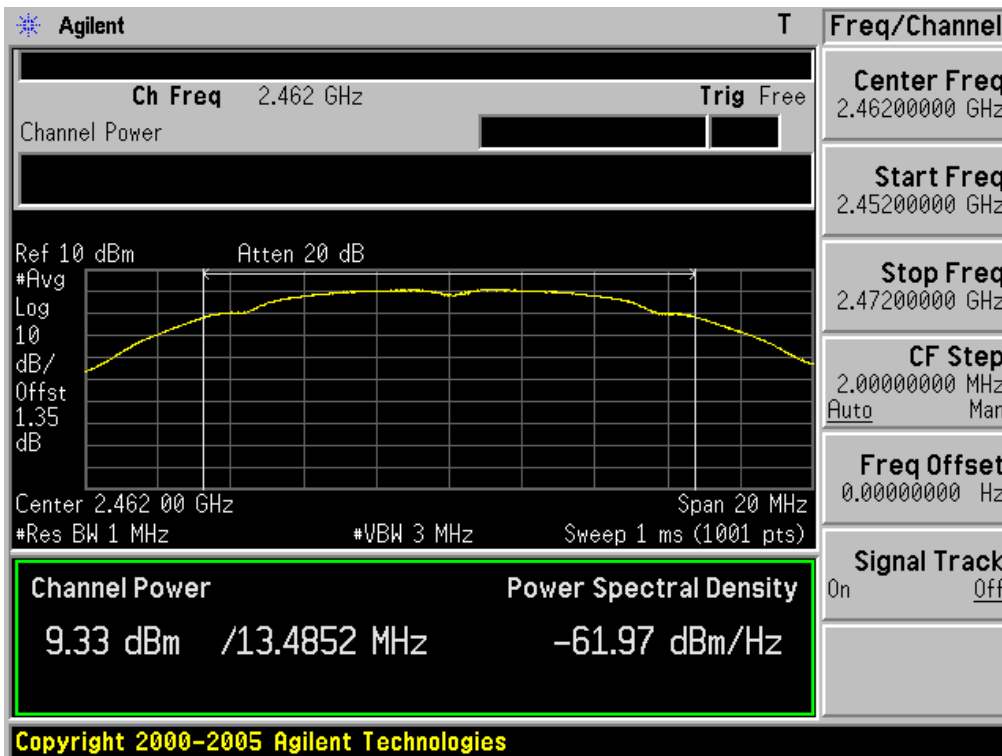
26 dB Bandwidth

Test Mode: 802.11b & Highest Frequency



Peak Output Power

Test Mode: 802.11b & Highest Frequency



3.2.3 Out of Band Emissions / Band Edge

- Procedure:

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal at the highest, middle and the lowest available channels.

After the trace being stable, Use the marker-to-peak function to measure 20 dB down both sides of the intentional emission.

This device complies with use of power option 2. The attenuation under this paragraph shall be 30dB instead of 20dB.

For Band-edge testing the spectrum analyzer is set to:

Tested frequency = the highest and the lowest Frequencies

Center frequency = 2400MHz, 2483.5MHz

Span = 100MHz

Detector function = peak

RBW = 1% of the span

VBW = 100 kHz

Trace = max hold

Sweep = auto

For spurious testing the spectrum analyzer is set to:

Tested frequency = the highest, middle and the lowest Frequencies

RBW = 100 kHz

VBW = 100 kHz

Detector function = peak

Sweep = auto

Trace = max hold

- Measurement Data: Comply

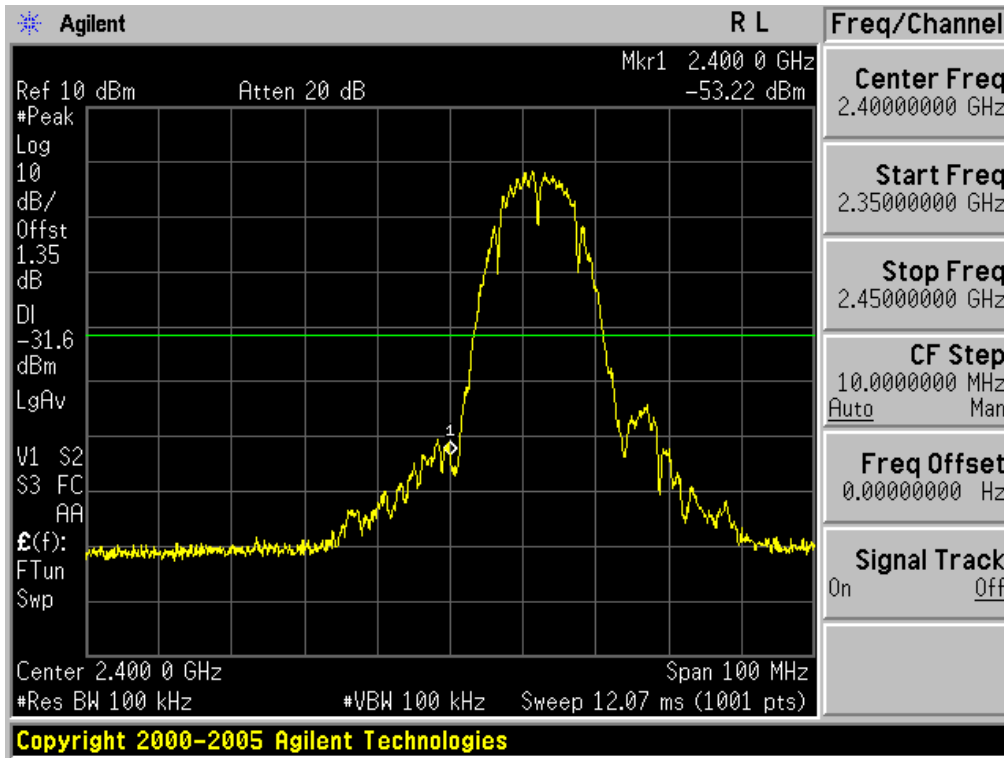
- All conducted emission in any 100 kHz bandwidth outside of the spread spectrum band was at least 30dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.

Note 1: See next pages for actual measured spectrum plots.

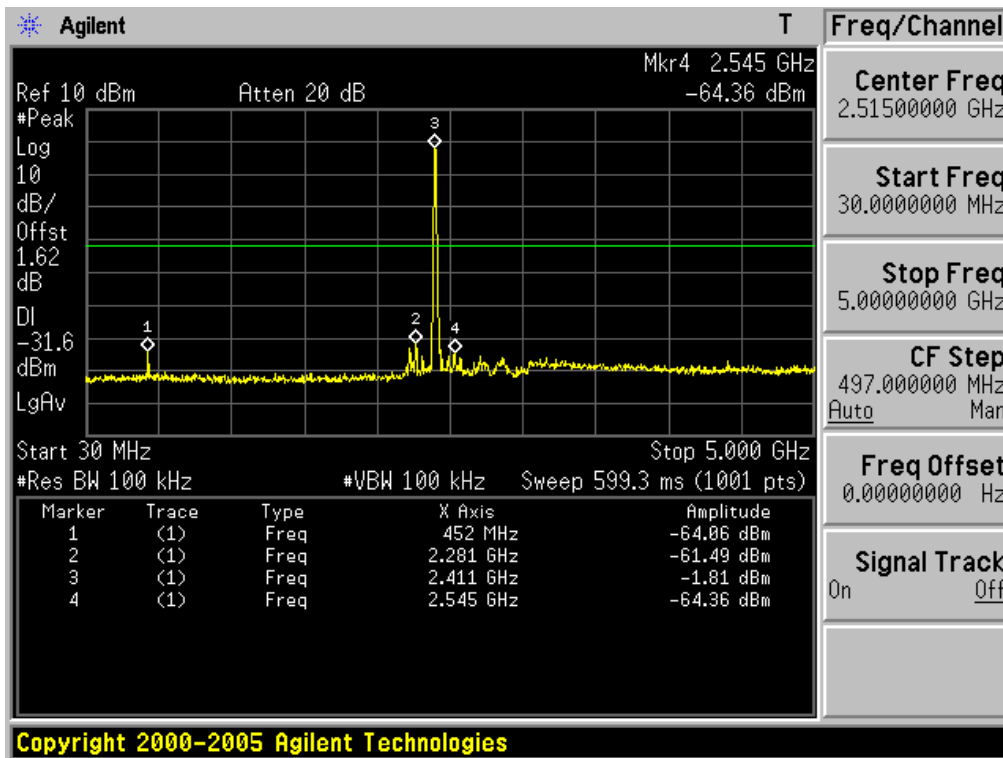
Minimum Standard:	> 30 dBc
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Low Band-edge at 30 dB blow

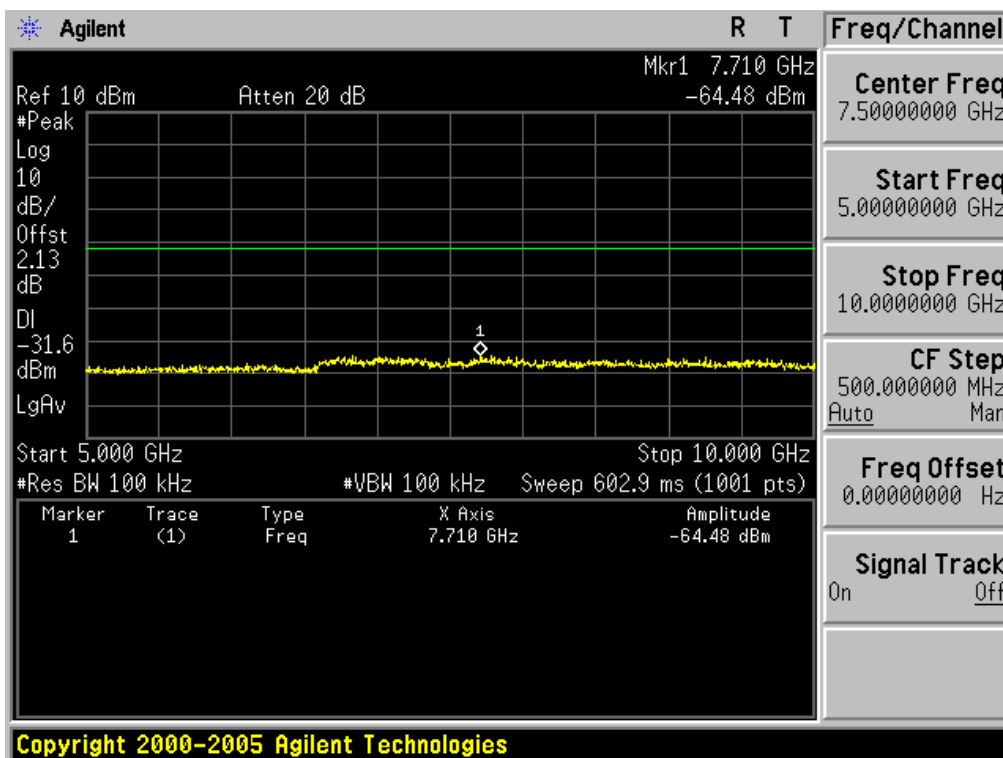
Test Mode: 802.11b



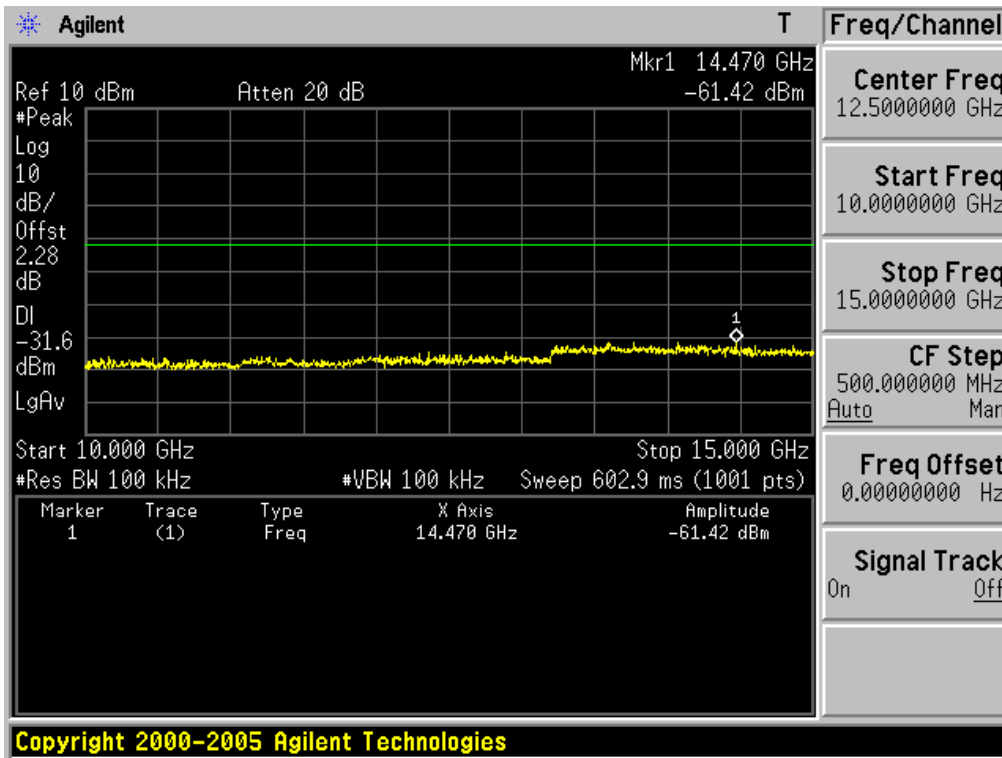
30MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11b & Lowest Frequency



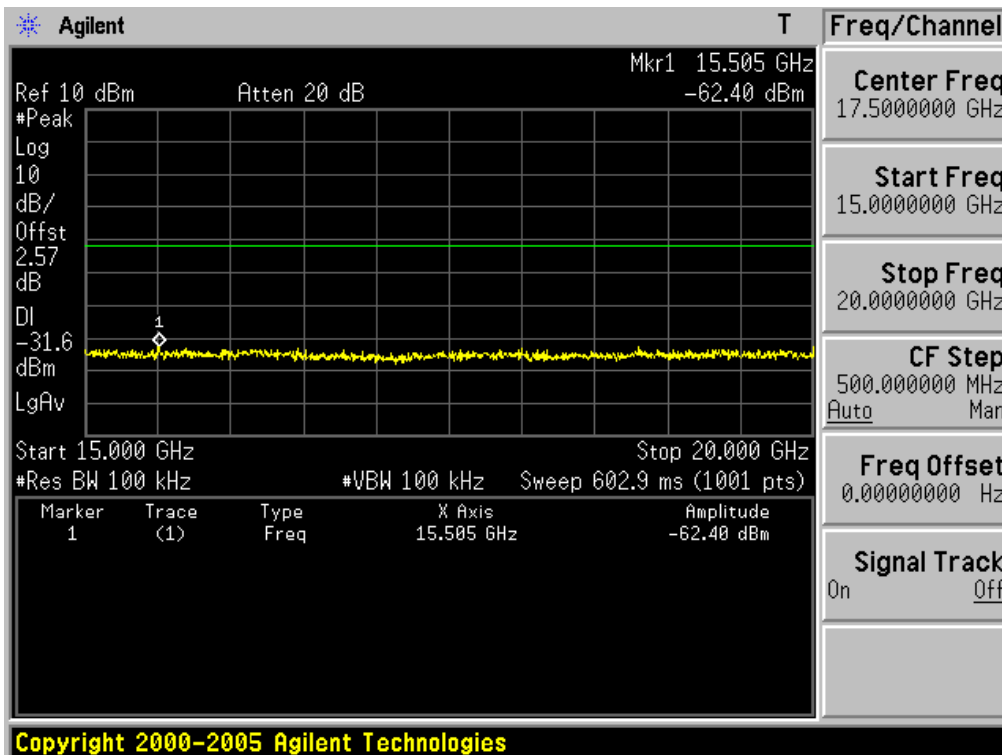
5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11b & Lowest Frequency



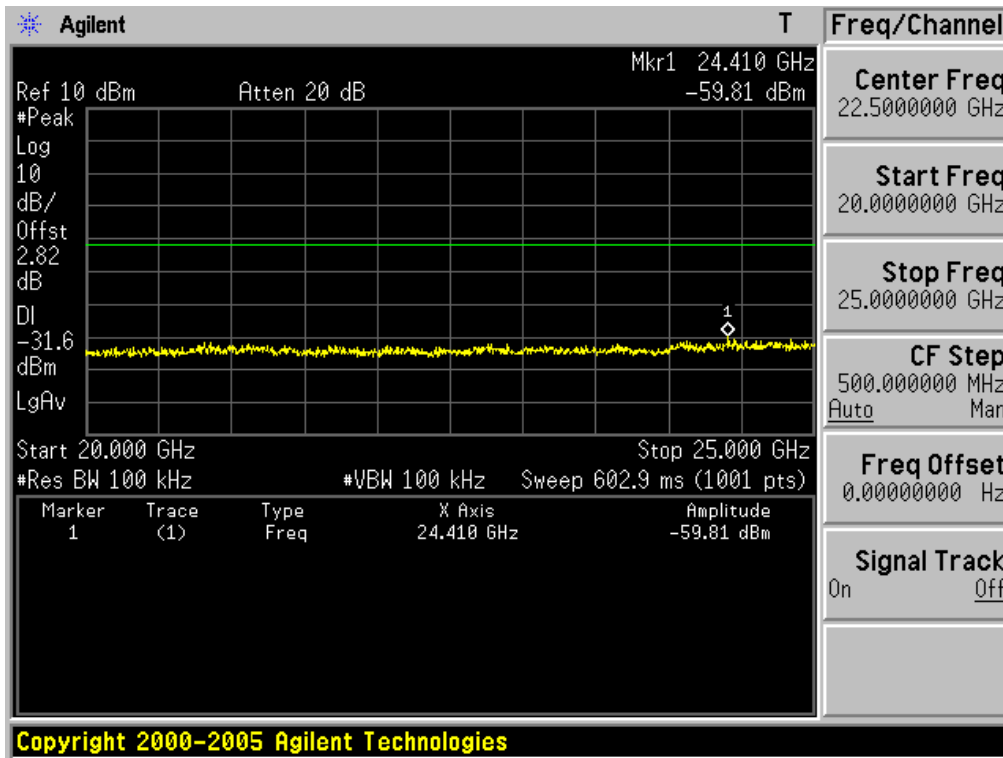
10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11b & Lowest Frequency



15GHz ~ 20GHz Conducted Spurious Emissions Test Mode: 802.11b & Lowest Frequency

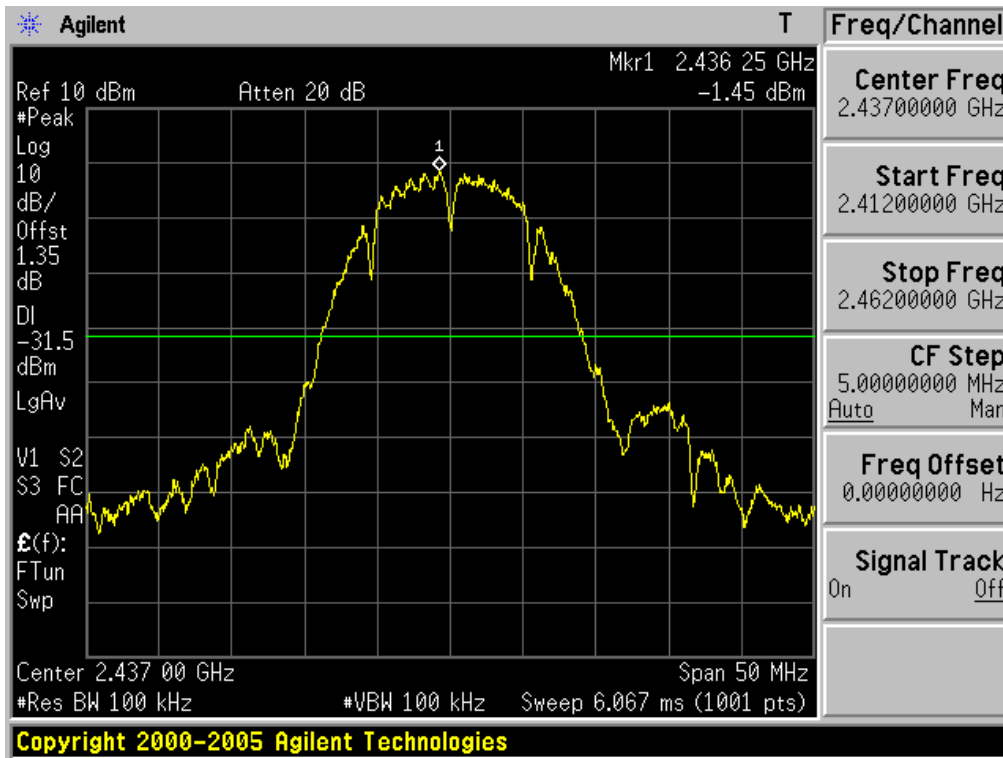


20GHz ~ 25GHz Conducted Spurious Emissions Test Mode: 802.11b & Lowest Frequency

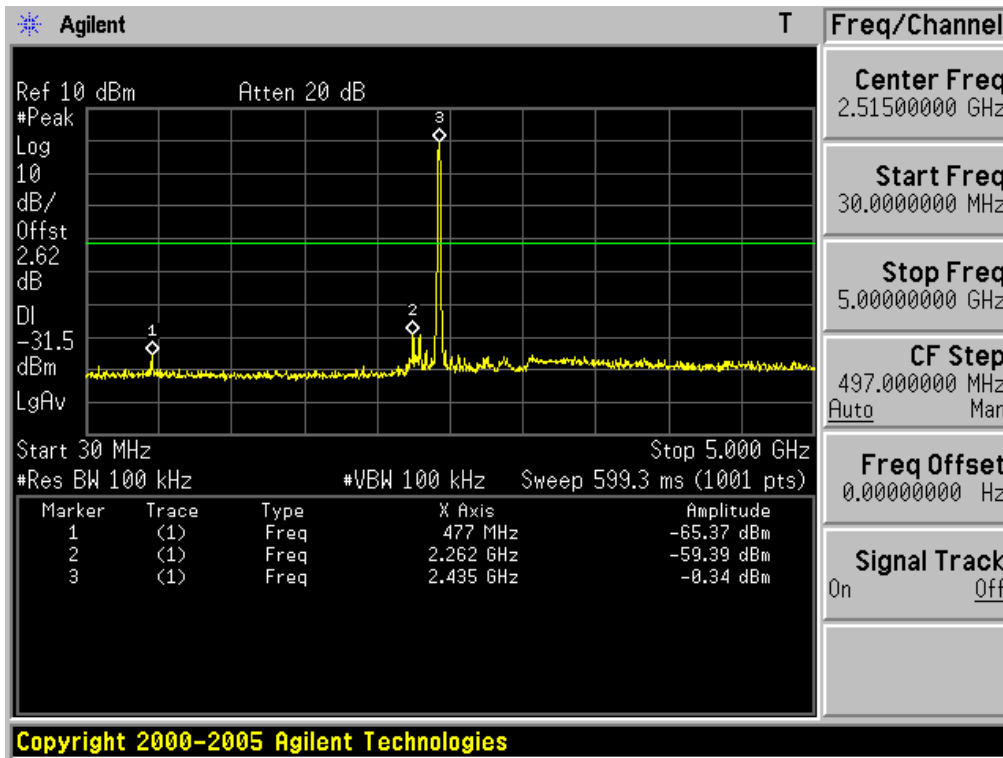


Reference for limit

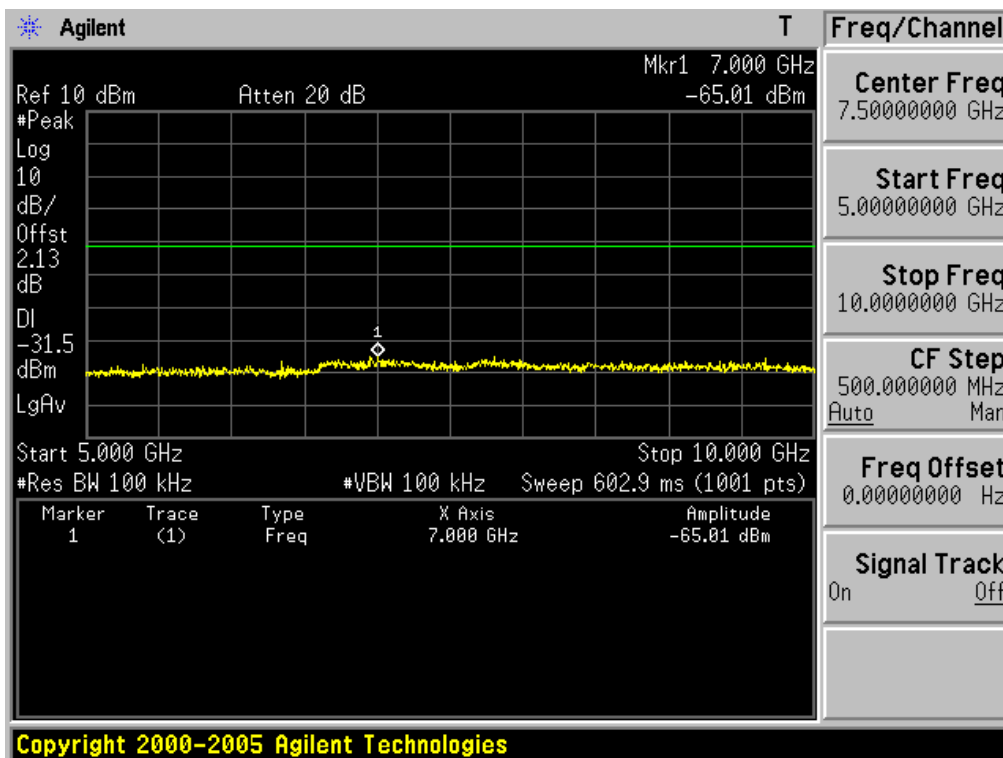
Test Mode: 802.11b & Middle Frequency



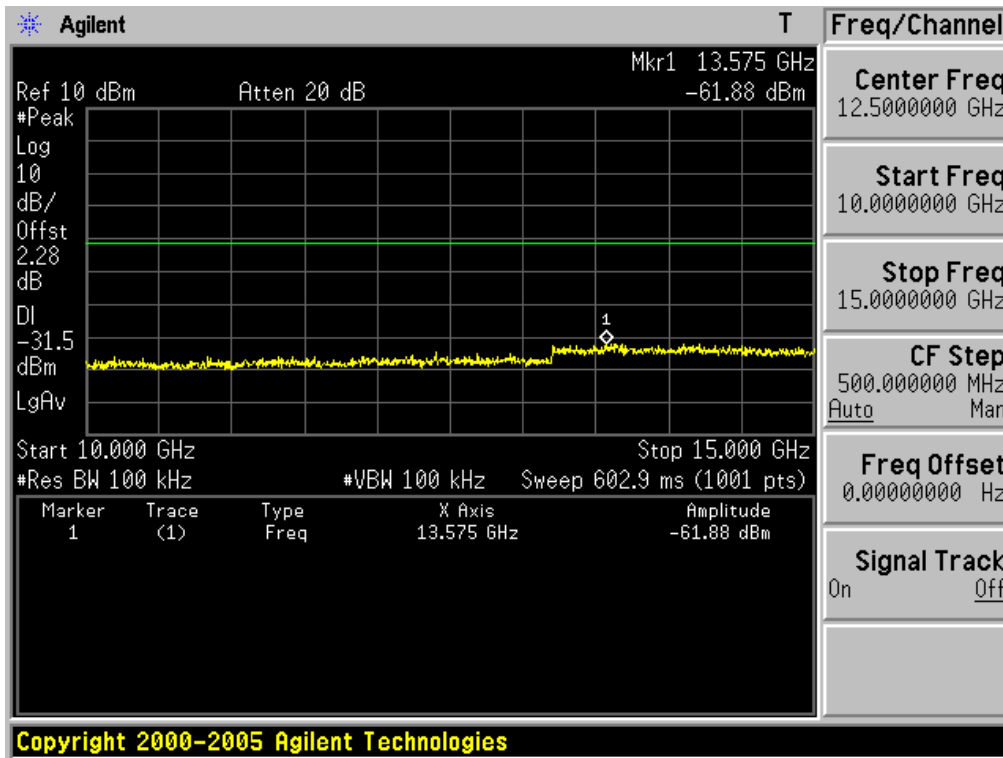
30MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11b & Middle Frequency



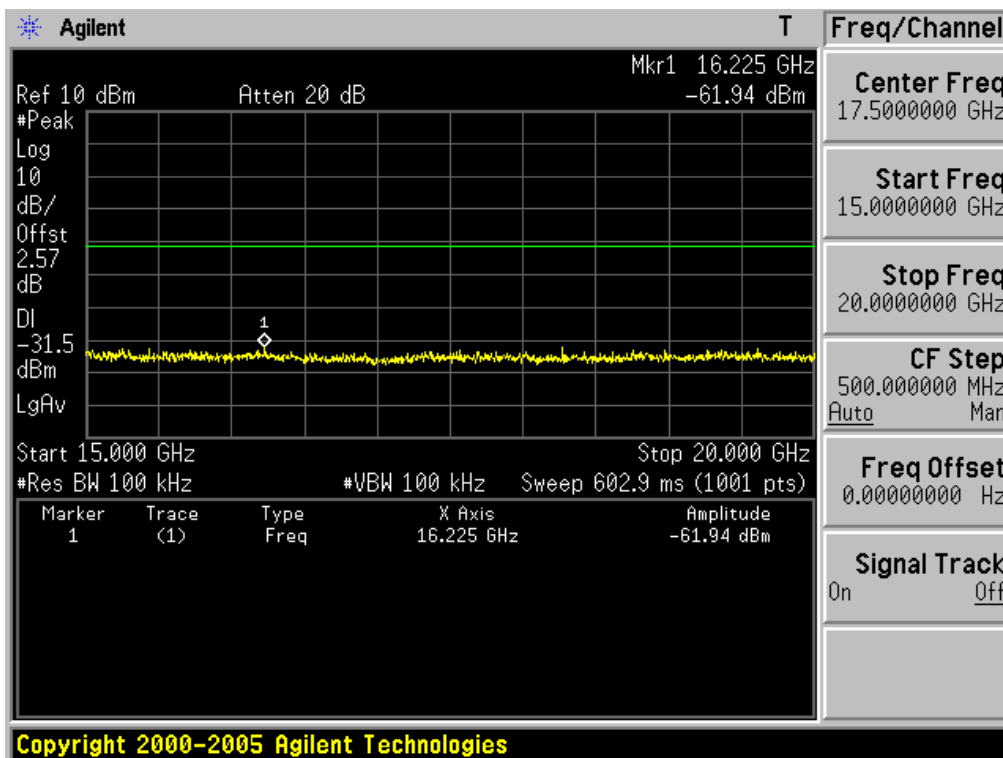
5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11b & Middle Frequency



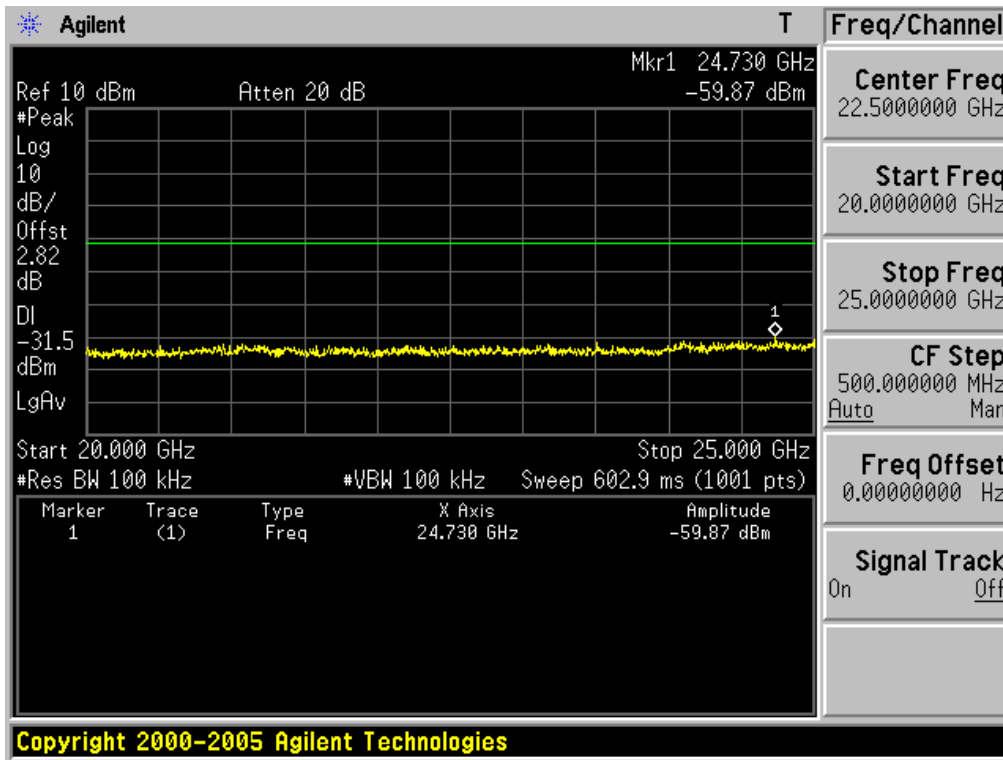
10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11b & Middle Frequency



15GHz ~ 20GHz Conducted Spurious Emissions Test Mode: 802.11b & Middle Frequency

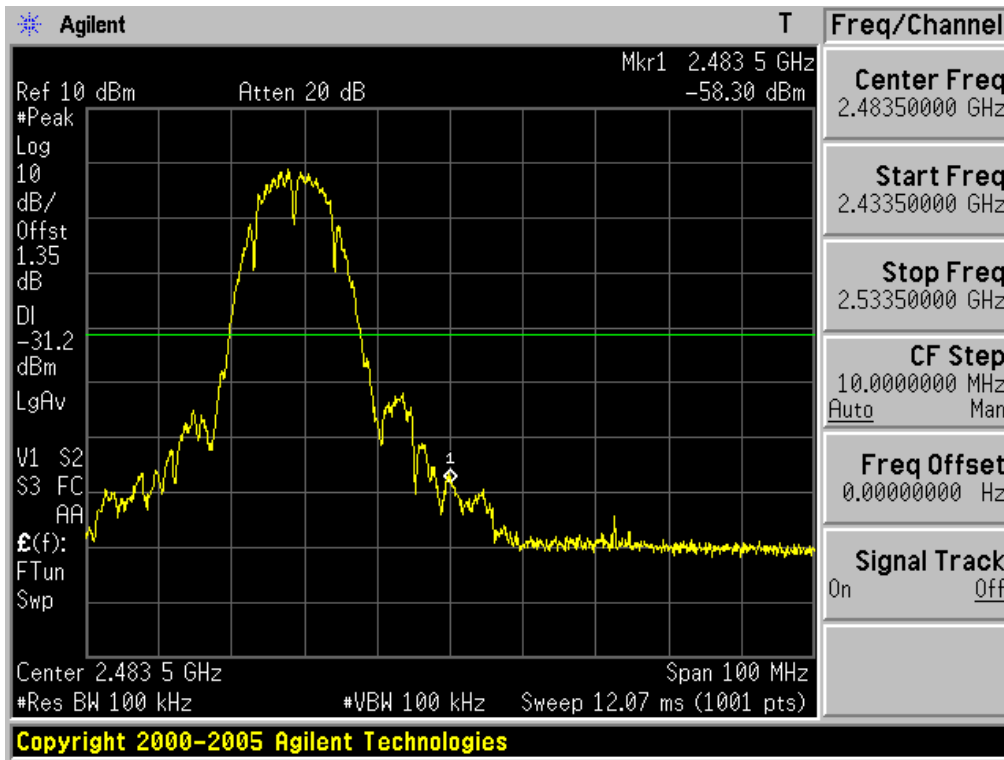


20GHz ~ 25GHz Conducted Spurious Emissions Test Mode: 802.11b & Middle Frequency

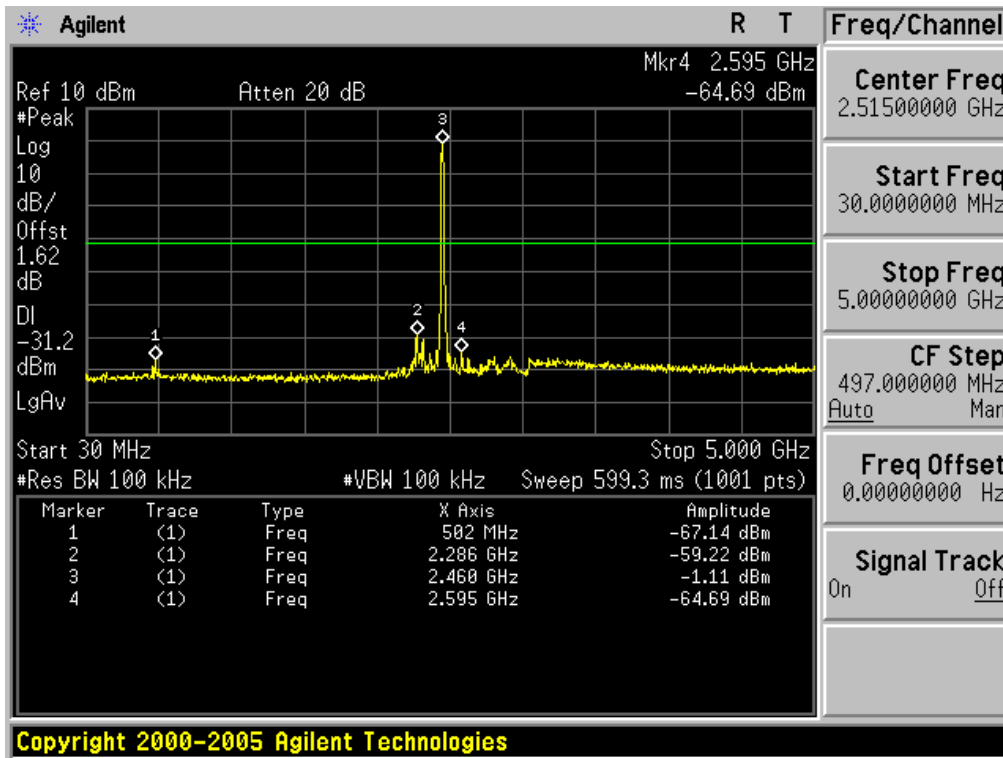


High Band-edge at 30 dB blow

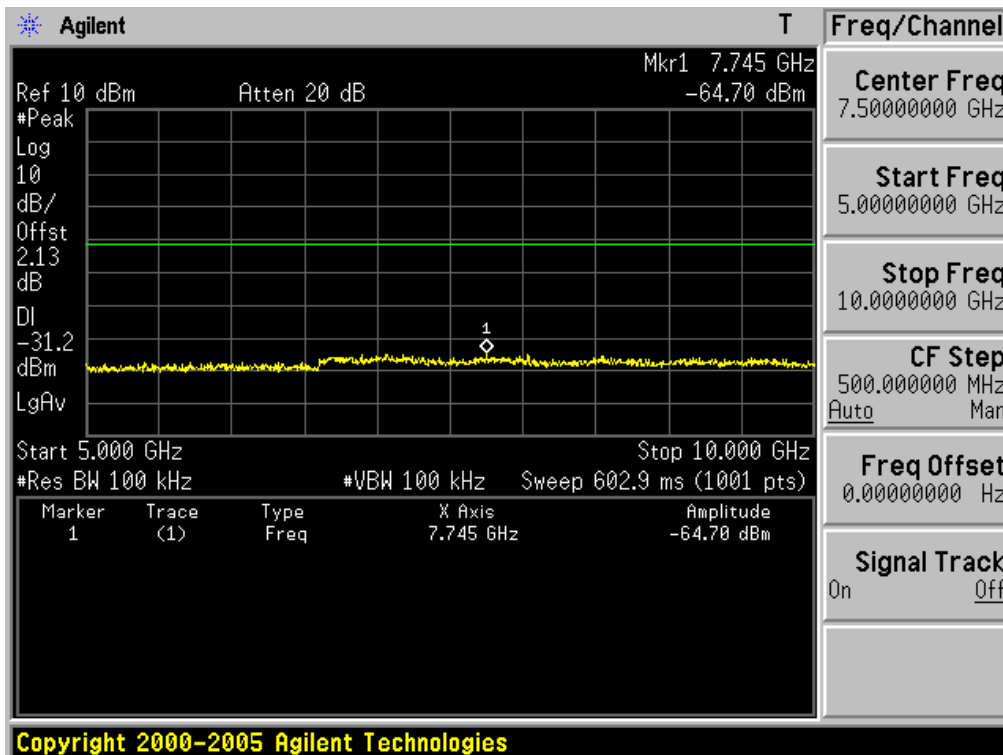
Test Mode: 802.11b & Highest Frequency



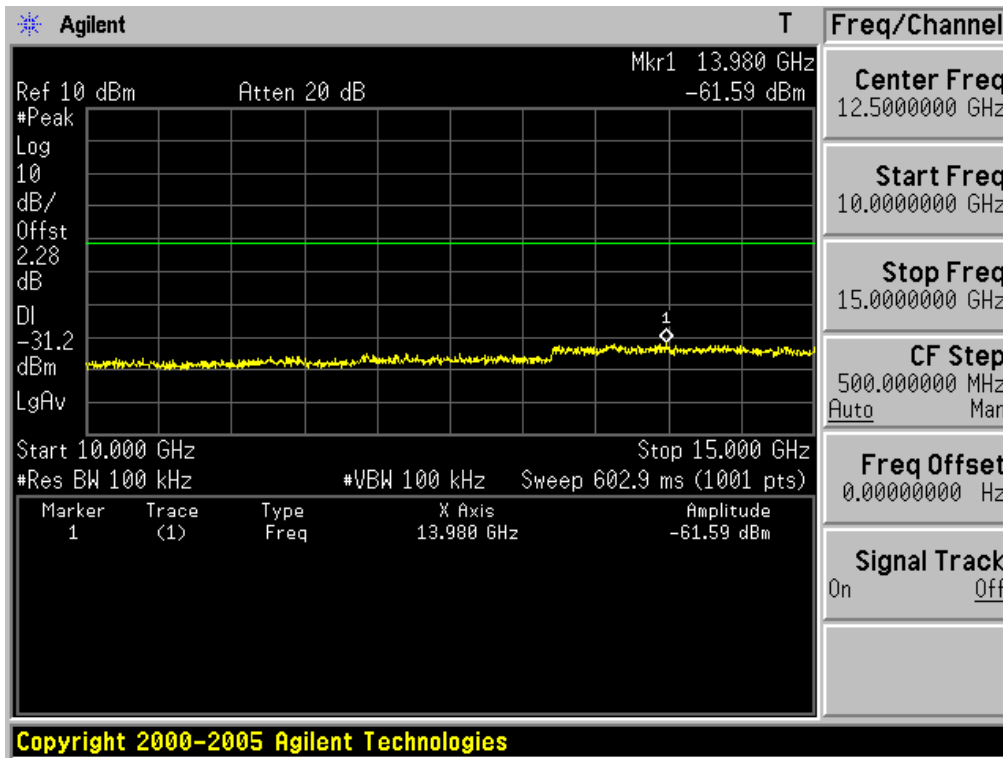
30MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11b & Highest Frequency



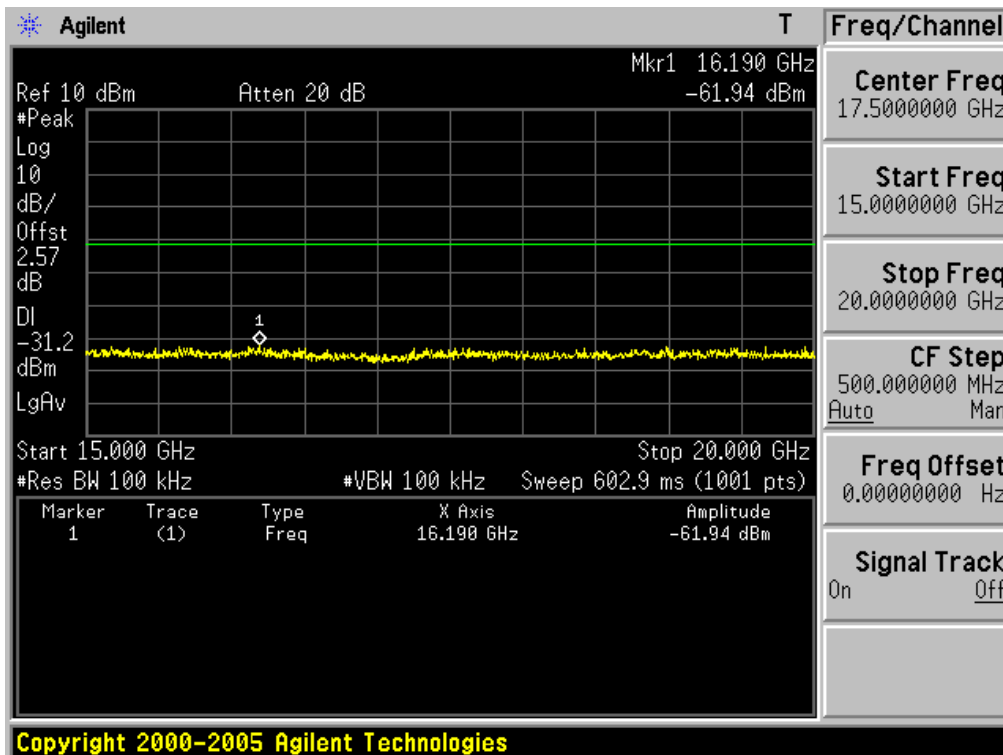
5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11b & Highest Frequency



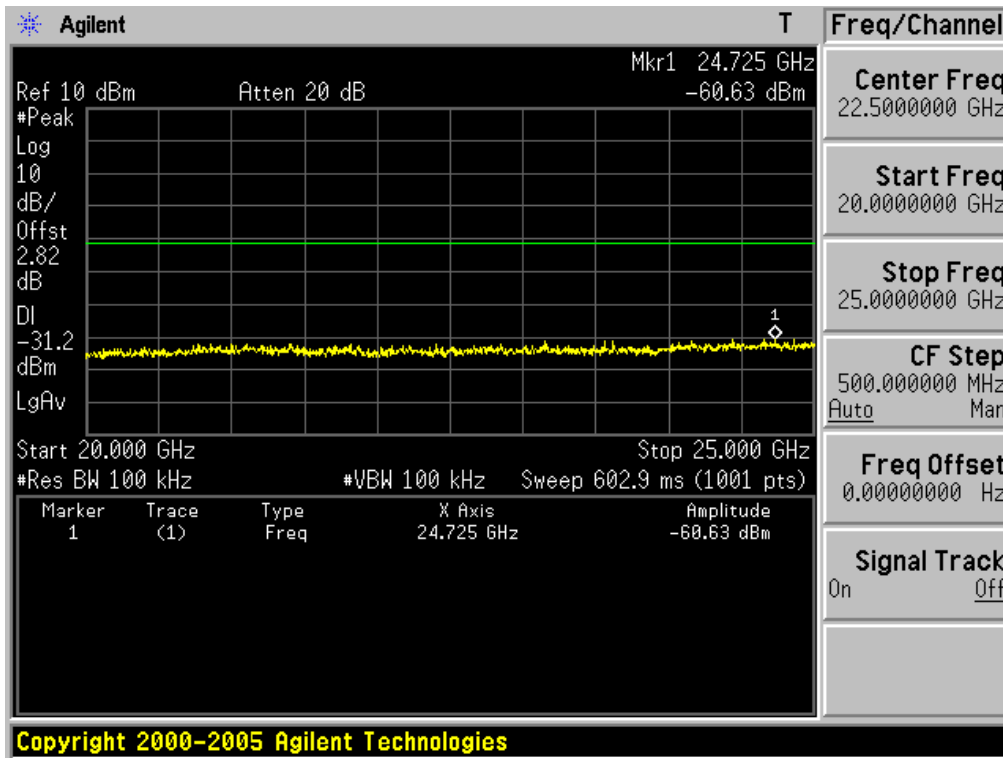
10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11b & Highest Frequency



15GHz ~ 20GHz Conducted Spurious Emissions Test Mode: 802.11b & Highest Frequency



20GHz ~ 25GHz Conducted Spurious Emissions Test Mode: 802.11b & Highest Frequency



3.2.4 Out of band Emission – Radiated

- Procedure:

The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

The spectrum analyzer is set to:

Tested frequency = Low, Middle, High Frequencies

Frequency Range = 30 MHz ~ 10th harmonic.

RBW and VBW = 1. Frequency range: 30MHz ~ 1GHz

RBW = 120KHz / VBW = \geq RBW

2. Frequency range: 1GHz ~ 10th harmonics

Peak mode: RBW = 1MHz / VBW = \geq RBW

Average mode: RBW = 1MHz / VBW = 10Hz

Detector function = Peak

Sweep = auto

Trace = max hold

- Measurement Data: **Comply**

Note 1: See next pages for actual measured spectrum plots and data.

- Minimum Standard:

• FCC Part 15.209(a) and (b)

Frequency (MHz)	Limit (uV/m) @ 3m
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

• FCC Part 15.205 (a): Only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	MHz	GHz	GHz
0.009 ~ 0.110	8.41425 ~ 8.41475	108 ~ 121.94	1300 ~ 1427	3600 ~ 4400	14.47 ~ 14.5
0.495 ~ 0.505	12.29 ~ 12.293	123 ~ 138	1435 ~ 1626.5	4.5 ~ 5.15	15.35 ~ 16.2
2.1735 ~ 2.1905	12.51975 ~	149.9 ~ 150.05	1645.5 ~ 1646.5	5.35 ~ 5.46	17.7 ~ 21.4
4.125 ~ 4.128	12.52025	156.52475 ~	1660 ~ 1710	7.25 ~ 7.75	22.01 ~ 23.12
4.17725 ~ 4.17775	12.57675 ~	156.52525	1718.8 ~ 1722.2	8.025 ~ 8.5	23.6 ~ 24.0
4.20725 ~ 4.20775	12.57725	156.7 ~ 156.9	2200 ~ 2300	9.0 ~ 9.2	31.2 ~ 31.8
6.215 ~ 6.218	13.36 ~ 13.41	162.0125 ~ 167.17	2310 ~ 2390	9.3 ~ 9.5	36.43 ~ 36.5
6.26775 ~ 6.26825	16.42 ~ 16.423	167.72 ~ 173.2	2483.5 ~ 2500	10.6 ~ 12.7	Above 38.6
6.31175 ~ 6.31225	16.69475 ~	240 ~ 285	2655 ~ 2900	13.25 ~ 13.4	
8.291 ~ 8.294	16.69525	322 ~ 335.4	3260 ~ 3267		
8.362 ~ 8.366	16.80425 ~	399.90 ~ 410	3332 ~ 3339		
8.37625 ~ 8.38675	16.80475	608 ~ 614	3345.8 ~ 3358		
	25.5 ~ 25.67	960 ~ 1240			
	37.5 ~ 38.25				
	73 ~ 74.6				
	74.8 ~ 75.2				

• **FCC Part 15.205(b):** The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

30MHz ~ 25GHz Radiated Spurious Emissions

▪ Lowest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
165.214	V	Z axis	QP	44.49	-8.99	35.50	43.50	8.00
2390.000	H	Z axis	PK	49.47	-2.81	46.66	74.00	27.34
2390.000	H	Z axis	AV	38.40	-2.81	35.59	54.00	18.41
2389.840	V	Z axis	PK	51.05	-2.81	48.24	74.00	25.76
2390.000	V	Z axis	AV	38.72	-2.81	35.91	54.00	18.09
4824.320	H	Z axis	PK	47.51	5.14	52.65	74.00	21.35
4824.120	H	Z axis	AV	38.25	5.14	43.39	54.00	10.61
4823.760	V	X axis	PK	48.19	5.14	53.33	74.00	20.67
4824.140	V	Y axis	AV	40.40	5.14	45.54	54.00	8.46

Note.

- No other spurious and harmonic emissions were detected greater than listed emissions on above table.
- Sample Calculation.

$$\text{Margin} = \text{Limit} - \text{Result} \quad / \quad \text{Result} = \text{Reading} + \text{T.F} \quad / \quad \text{T.F} = \text{AF} + \text{CL} - \text{AG}$$
 Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

30MHz ~ 25GHz Radiated Spurious Emissions

▪ Middle Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
165.341	V	Y axis	QP	43.88	-8.99	34.89	43.50	8.61
4874.360	H	Z axis	PK	45.89	5.32	51.21	74.00	22.79
4874.130	H	X axis	AV	36.27	5.32	41.59	54.00	12.41
4874.220	V	Z axis	PK	46.37	5.32	51.69	74.00	22.31
4874.140	V	Z axis	AV	38.50	5.32	43.82	54.00	10.18

Note.

1. No other spurious and harmonic emissions were detected greater than listed emissions on above table.

2. Sample Calculation.

$$\text{Margin} = \text{Limit} - \text{Result} \quad / \quad \text{Result} = \text{Reading} + \text{T.F} \quad / \quad \text{T.F} = \text{AF} + \text{CL} - \text{AG}$$

Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

30MHz ~ 25GHz Radiated Spurious Emissions

▪ Highest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
165.347	V	Z axis	QP	44.03	-8.99	35.04	43.50	8.46
2483.500	H	Z axis	PK	51.86	-2.47	49.39	74.00	24.61
2483.500	H	Z axis	AV	40.53	-2.47	38.06	54.00	15.94
2483.650	V	Y axis	PK	51.09	-2.47	48.62	74.00	25.38
2483.500	V	Y axis	AV	39.27	-2.47	36.80	54.00	17.20
4924.150	H	X axis	PK	45.53	5.90	51.43	74.00	22.57
4924.100	H	X axis	AV	36.78	5.90	42.68	54.00	11.32
4924.300	V	Z axis	PK	46.03	5.90	51.93	74.00	22.07
4924.150	V	Z axis	AV	37.48	5.90	43.38	54.00	10.62

Note.

1. No other spurious and harmonic emissions were detected greater than listed emissions on above table.
2. Sample Calculation.

$$\text{Margin} = \text{Limit} - \text{Result} \quad / \quad \text{Result} = \text{Reading} + \text{T.F} \quad / \quad \text{T.F} = \text{AF} + \text{CL} - \text{AG}$$
 Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

3.2.5 Transmitter Power Spectral Density

- Procedure:

The transmitter output is connected to a spectrum analyzer. Locate and zoom in on emission peak within the passband. The maximum level in a 3 kHz bandwidth is measured with the spectrum analyzer using RBW = 3kHz and VBW > 9kHz, sweep time= auto, video averaging is turned off. Trace average 100 traces in power averaging mode. The PPSD is the highest level found across the emission in any 3kHz band. The test is performed in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005. The transmitter output power was measured with power output option #2. Therefore, PSD was measured with PSD option #2.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest Frequencies

Span = approximately 5 times of the 20 dB bandwidth

RBW = greater than the 20dB bandwidth of the emission being measured

VBW = \geq RBW

Trace = max hold

Detector function = peak

Sweep = auto

- Measurement Data: **Comply**

Test Mode	Frequency	Test Results (dBm)
802.11b	Lowest	-13.405
	Middle	-13.187
	Highest	-12.938

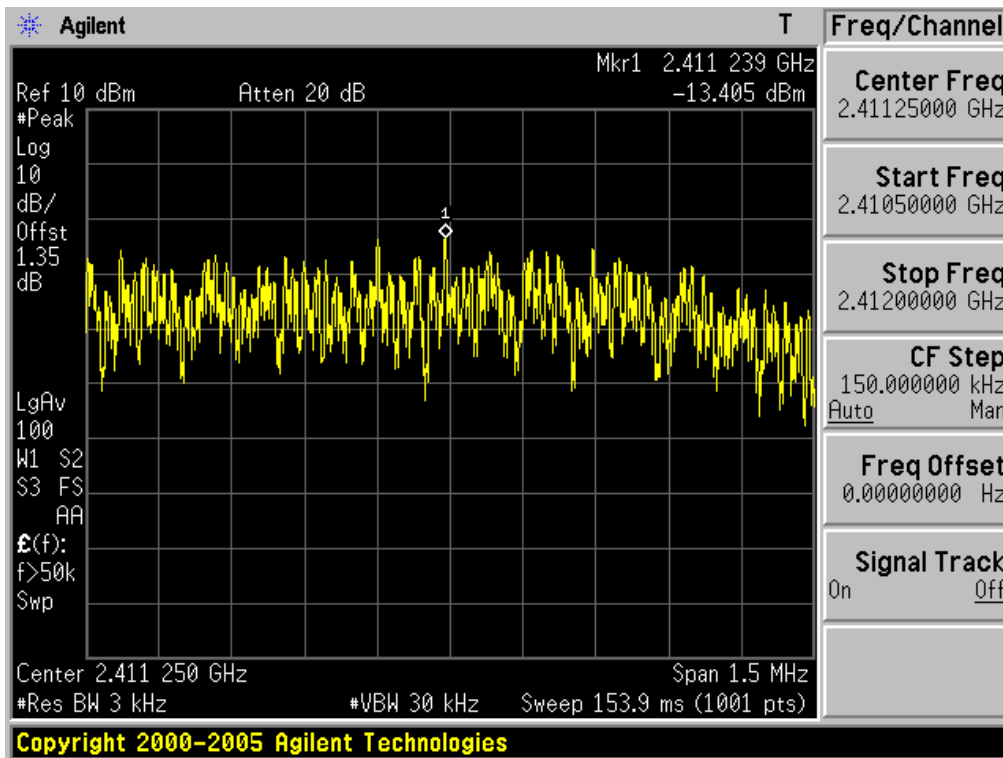
Note 1: See next pages for actual measured spectrum plots.

- Minimum Standard:

The transmitter power density average over 1-second interval shall not be greater than 8 dBm in any 3kHz BW.

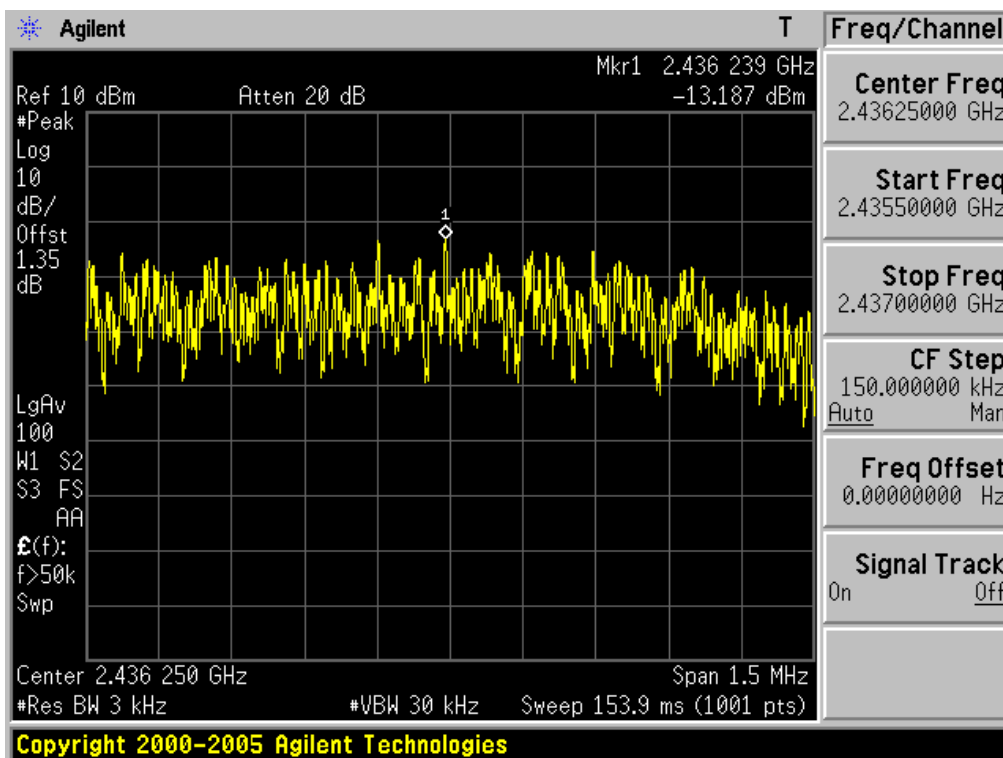
Transmitter Power Spectral Density

Test Mode: 802.11b & Lowest Frequency



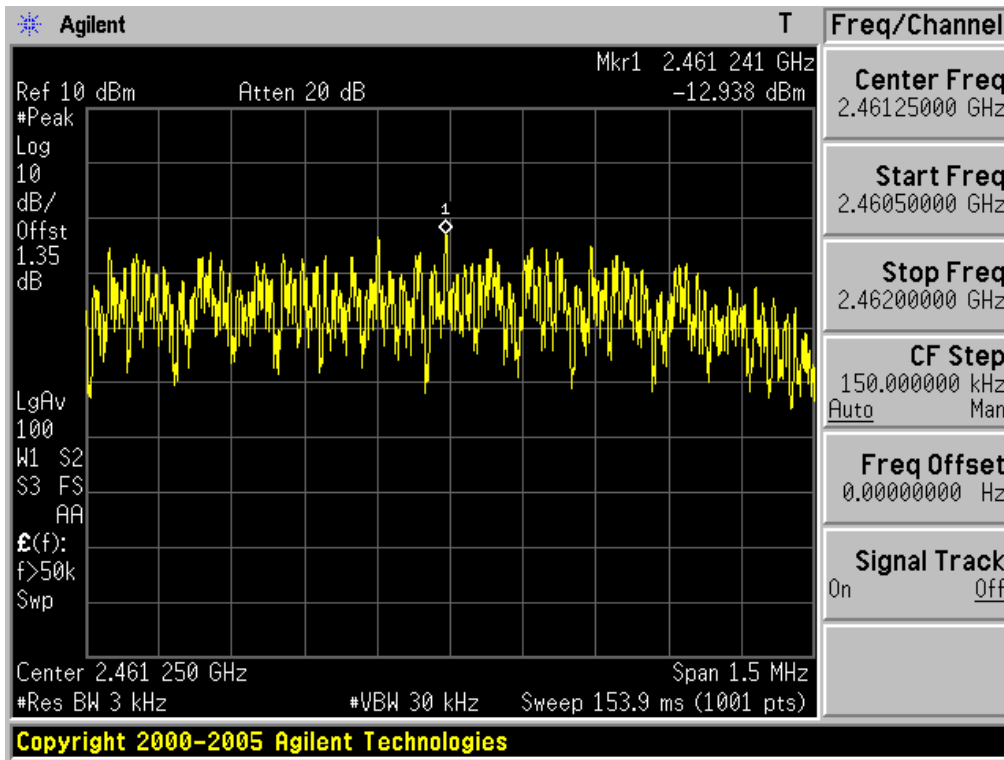
Transmitter Power Spectral Density

Test Mode: 802.11b & Middle Frequency



Transmitter Power Spectral Density

Test Mode: 802.11b & Highest Frequency



3.2.6 AC Conducted Emissions

- Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. Emissions closest to the limit are measured in the quasi-peak mode (QP) and average mode (AV) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

- Measurement Data: Comply

Note 1: See next pages for actual measured spectrum plots and data.

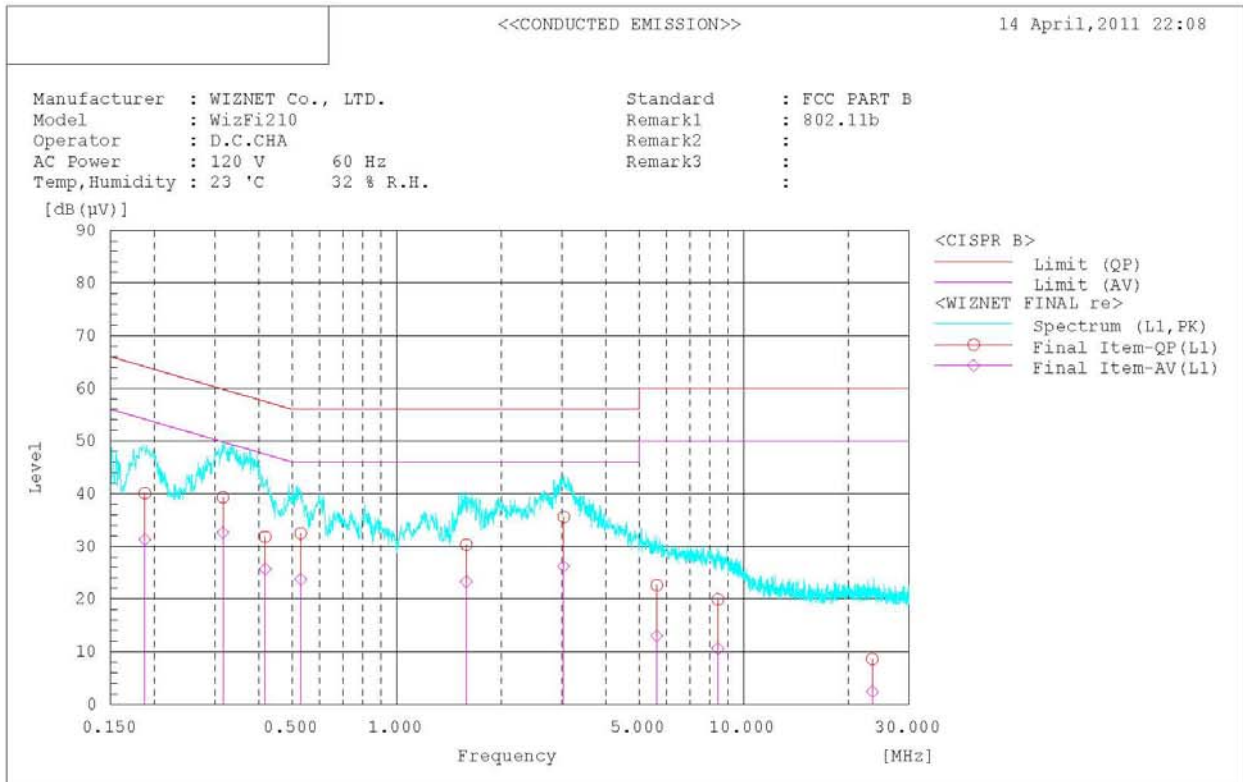
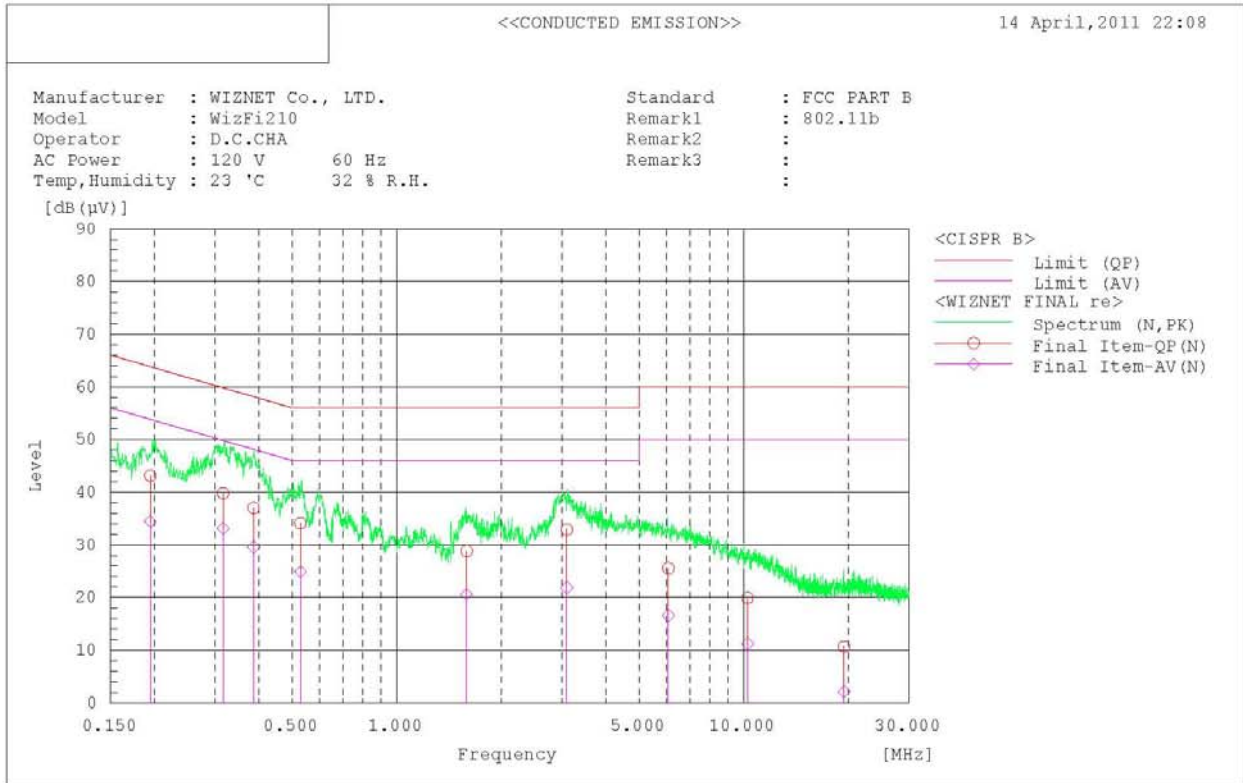
- Minimum Standard: FCC Part 15.207(a)/EN 55022

Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

* Decreases with the logarithm of the frequency

AC Line Conducted Emissions (Graph)

Test Mode: 802.11b



AC Line Conducted Emissions (Data List)

Test Mode: 802.11b

<<CONDUCTED EMISSION>>

14 April, 2011 22:08

Standard : FCC PART B
 Manufacturer : WIZNET Co., LTD.
 Model : WIZFI210
 Operator : D.C.CHA
 AC Power : 120 V 60 Hz
 Temp, Humidity : 23 °C 32 % R.H.
 Remark1 : 802.11b
 Remark2 :
 Remark3 :

Final Result

--- N Phase ---

No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
	[MHz]	[dB (µV)]	[dB (µV)]	[dB]	[dB (µV)]	[dB (µV)]	[dB (µV)]	[dB (µV)]	[dB]	[dB]	
1	0.195	43.0	34.3	0.1	43.1	34.4	63.8	53.8	20.7	19.4	
2	0.316	39.7	33.0	0.1	39.8	33.1	59.8	49.8	20.0	16.7	
3	0.387	36.9	29.5	0.1	37.0	29.6	58.1	48.1	21.1	18.5	
4	0.528	34.0	24.8	0.1	34.1	24.9	56.0	46.0	21.9	21.1	
5	1.590	28.6	20.4	0.2	28.8	20.6	56.0	46.0	27.2	25.4	
6	3.094	32.7	21.7	0.2	32.9	21.9	56.0	46.0	23.1	24.1	
7	6.066	25.1	16.2	0.4	25.5	16.6	60.0	50.0	34.5	33.4	
8	10.261	19.3	10.6	0.6	19.9	11.2	60.0	50.0	40.1	38.8	
9	19.457	9.6	1.0	1.1	10.7	2.1	60.0	50.0	49.3	47.9	

--- L1 Phase ---

No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
	[MHz]	[dB (µV)]	[dB (µV)]	[dB]	[dB (µV)]	[dB (µV)]	[dB (µV)]	[dB (µV)]	[dB]	[dB]	
1	0.188	39.8	31.0	0.3	40.1	31.3	64.1	54.1	24.0	22.8	
2	0.316	39.0	32.3	0.3	39.3	32.6	59.8	49.8	20.5	17.2	
3	0.418	31.5	25.4	0.3	31.8	25.7	57.5	47.5	25.7	21.8	
4	0.529	32.2	23.4	0.3	32.5	23.7	56.0	46.0	23.5	22.3	
5	1.588	30.0	23.0	0.3	30.3	23.3	56.0	46.0	25.7	22.7	
6	3.029	35.2	25.8	0.4	35.6	26.2	56.0	46.0	20.4	19.8	
7	5.619	22.1	12.5	0.5	22.6	13.0	60.0	50.0	37.4	37.0	
8	8.422	19.3	10.0	0.6	19.9	10.6	60.0	50.0	40.1	39.4	
9	23.464	7.2	1.0	1.4	8.6	2.4	60.0	50.0	51.4	47.6	

3.2.7 Antenna Requirements

- Procedure:

Describe how the EUT complies with the requirement that either its antenna is permanently attached, or that it employs a unique antenna connector, for every antenna proposed for use with the EUT.

- Conclusion: Comply

→ This device employs a SMA plug reverse type(left-hand thread) for the unique connector.
(Refer to External photo file.)

- Minimum Standard:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions.

APPENDIX

TEST EQUIPMENT FOR TESTS

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment.

	Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
<input checked="" type="checkbox"/>	Spectrum Analyzer	Agilent	E4440A	10/09/30	11/09/30	MY45304199
<input type="checkbox"/>	Spectrum Analyzer	Rohde Schwarz	FSQ26	11/01/11	12/01/11	200445
<input type="checkbox"/>	Spectrum analyzer	Agilent	E4404B	11/03/08	12/03/08	US41061134
<input type="checkbox"/>	Spectrum Analyzer(RE)	H.P	8563E	10/10/04	11/10/04	3551A04634
<input type="checkbox"/>	MXA Signal Analyzer	Agilent Technologies, Inc	N9020A	11/01/07	12/01/07	MY49100833
<input type="checkbox"/>	Power Meter	H.P	EPM-442A	10/07/01	11/07/01	GB37170413
<input type="checkbox"/>	Power Sensor	H.P	8481A	10/07/01	11/07/01	3318A96332
<input type="checkbox"/>	Power Divider	Agilent	11636B	10/10/05	11/10/05	56471
<input type="checkbox"/>	4-Way Power Divider	ET Industries	D-0526-4	10/12/24	11/12/24	210195001
<input type="checkbox"/>	Power Splitter	Anritsu	K241B	10/10/05	11/10/05	020611
<input type="checkbox"/>	Power Splitter	Anritsu	K241B	10/07/01	11/07/01	017060
<input type="checkbox"/>	Power Splitters & Dividers	Aeroflex/Weinschel	1594	11/02/21	12/02/21	1177
<input type="checkbox"/>	Frequency Counter	H.P	5342A	10/07/01	11/07/01	2119A04450
<input type="checkbox"/>	TEMP & HUMIDITY Chamber	JISCO	KR-100/J-RHC2	10/10/04	11/10/04	30604493/021031
<input checked="" type="checkbox"/>	Digital Multimeter	H.P	34401A	11/03/07	12/03/07	3146A13475, US36122178
<input type="checkbox"/>	Multifunction Synthesizer	HP	8904A	10/10/11	11/10/11	3633A08404
<input checked="" type="checkbox"/>	Signal Generator	Rohde Schwarz	SMR20	11/03/08	12/03/08	101251
<input type="checkbox"/>	Signal Generator	H.P	ESG-3000A	10/07/01	11/07/01	US37230529
<input type="checkbox"/>	Vector Signal Generator	Rohde Schwarz	SMJ100A	11/01/11	12/01/11	100148
<input type="checkbox"/>	Vector Signal Generator	Rohde Schwarz	SMBV100A	11/01/11	12/01/11	255571
<input type="checkbox"/>	Audio Analyzer	H.P	8903B	10/07/02	11/07/02	3011A09448
<input type="checkbox"/>	Modulation Analyzer	H.P	8901B	10/07/01	11/07/01	3028A03029
<input type="checkbox"/>	8960 Series 10 Wireless Comms. Test Set	Agilent	E5515C	11/03/07	12/03/07	GB43461134
<input type="checkbox"/>	Universal Radio communication Tester	Rohde Schwarz	CMU200	11/03/07	12/03/07	106760
<input type="checkbox"/>	Bluetooth Tester	TESCOM	TC-3000B	10/07/01	11/07/01	3000B000268
<input type="checkbox"/>	Thermo hygrometer	BODYCOM	BJ5478	11/01/13	12/01/13	090205-3
<input type="checkbox"/>	Thermo hygrometer	BODYCOM	BJ5478	11/01/13	12/01/13	090205-2
<input checked="" type="checkbox"/>	Thermo hygrometer	BODYCOM	BJ5478	11/01/13	12/01/13	090205-4
<input type="checkbox"/>	AC Power supply	DAEKWANG	5KVA	11/03/08	12/03/08	20060321-1
<input checked="" type="checkbox"/>	DC Power Supply	HP	6622A	11/03/07	12/03/07	3448A03760
<input type="checkbox"/>	DC Power Supply	HP	6633A	11/03/07	12/03/07	3524A06634
<input type="checkbox"/>	DC Power Supply	Protek	PWS-3010D	10/10/04	11/10/04	4072702
<input type="checkbox"/>	BAND Reject Filter	Microwave Circuits	N0308372	10/10/05	11/10/05	3125-01DC0352
<input type="checkbox"/>	BAND Reject Filter	Wainwright	WRCG1750	10/10/05	11/10/05	2
<input type="checkbox"/>	High-Pass Filter	ANRITSU	MP526D	10/10/04	11/10/04	M27756
<input type="checkbox"/>	High-pass filter	Wainwright	WHNX2.1	N/A	N/A	1
<input checked="" type="checkbox"/>	High-pass filter	Wainwright	WHNX3.0	N/A	N/A	9
<input type="checkbox"/>	High-pass filter	Wainwright	WHNX5.0	N/A	N/A	8

	Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
<input type="checkbox"/>	High-Pass Filter	Wainwright	WHKX8.5	N/A	N/A	1
<input type="checkbox"/>	High-Pass Filter	Wainwright	D82346	N/A	N/A	9
<input type="checkbox"/>	Tunable Notch Filter	Wainwright	WRCT800.0 /960.0-0.2/40-8SSK	N/A	N/A	32
<input type="checkbox"/>	Tunable Notch Filter	Wainwright	WRCD1700.0 /2000.0-0.2/40-10SSK	N/A	N/A	53
<input type="checkbox"/>	Tunable Notch Filter	Wainwright	WRCT1900.0/ 2200.0-5/40-10SSK	N/A	N/A	30
<input checked="" type="checkbox"/>	HORN ANT	ETS	3115	10/10/04	11/10/04	21097
<input type="checkbox"/>	HORN ANT	ETS	3115	11/03/22	12/03/22	6419
<input checked="" type="checkbox"/>	HORN ANT	A.H.Systems	SAS-574	11/03/25	13/03/25	154
<input type="checkbox"/>	HORN ANT	A.H.Systems	SAS-574	11/03/25	13/03/25	155
<input type="checkbox"/>	HORN ANT	SCHWARZBECK	BBHA9120A	10/04/13	12/04/13	322
<input type="checkbox"/>	Dipole Antenna	Schwarzbeck	VHA9103	10/11/29	11/11/29	2116
<input type="checkbox"/>	Dipole Antenna	Schwarzbeck	VHA9103	10/11/29	11/11/29	2117
<input type="checkbox"/>	Dipole Antenna	Schwarzbeck	UHA9105	10/11/29	11/11/29	2261
<input type="checkbox"/>	Dipole Antenna	Schwarzbeck	UHA9105	10/11/29	11/11/29	2262
<input type="checkbox"/>	LOOP Antenna	ETS	6502	10/11/29	11/11/29	3471
<input type="checkbox"/>	Coaxial Fixed Attenuators	Agilent	8491B	10/07/01	11/07/01	MY39260700
<input type="checkbox"/>	Attenuator (3dB)	WEINSCHERL	56-3	10/10/05	11/10/05	Y2342
<input type="checkbox"/>	Attenuator (3dB)	WEINSCHERL	56-3	10/10/05	11/10/05	Y2370
<input type="checkbox"/>	Attenuator (10dB)	WEINSCHERL	23-10-34	10/10/01	11/10/01	BP4386
<input type="checkbox"/>	Attenuator (10dB)	WEINSCHERL	23-10-34	11/01/11	12/01/11	BP4387
<input type="checkbox"/>	Attenuator (10dB)	WEINSCHERL	86-10-11	10/10/05	11/10/05	446
<input type="checkbox"/>	Attenuator (10dB)	WEINSCHERL	86-10-11	10/10/05	11/10/05	408
<input type="checkbox"/>	Attenuator (20dB)	WEINSCHERL	86-20-11	10/10/05	11/10/05	432
<input type="checkbox"/>	Attenuator (30dB)	JFW	50FH-030-300	11/03/07	12/03/07	060320-1
<input type="checkbox"/>	Attenuator (40dB)	WEINSCHERL	57-40-33	10/10/01	11/10/01	NN837
<input type="checkbox"/>	Termination	H.P	HP-909D	10/07/02	11/07/02	02750
<input type="checkbox"/>	Termination	H.P	HP-909D	10/07/02	11/07/02	02702
<input type="checkbox"/>	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0088CAN	10/07/01	11/07/01	788
<input type="checkbox"/>	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0185CAN	10/07/01	11/07/01	790
<input type="checkbox"/>	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0215CAN	10/07/01	11/07/01	112
<input type="checkbox"/>	Amplifier (30dB)	Agilent	8449B	11/03/07	12/03/07	3008A01590
<input checked="" type="checkbox"/>	Amplifier (30dB)	H.P	8449B	11/03/07	12/03/07	3008A00370
<input type="checkbox"/>	Amplifier	EMPOWER	BBS3Q7ELU	10/10/04	11/10/04	1020
<input type="checkbox"/>	RF Power Amplifier	OPHIRRF	5069F	10/07/01	11/07/01	1006
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	R&S	ESU	11/01/20	12/01/20	100014
<input type="checkbox"/>	BILOG ANTENNA	SCHAFFNER	CBL6112B	10/07/14	11/07/14	2737
<input type="checkbox"/>	Amplifier (22dB)	H.P	8447E	11/01/11	12/01/11	2945A02865
<input type="checkbox"/>	EMI TEST RECEIVER	R&S	ESCI	11/03/08	12/03/08	100364

	Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
<input checked="" type="checkbox"/>	BICONICAL ANT.	Schwarzbeck	VHA 9103	10/11/29	11/11/29	91032789
<input checked="" type="checkbox"/>	LOG-PERIODIC ANT.	Schwarzbeck	UHALP9108A1	10/11/29	12/11/29	1098
<input type="checkbox"/>	BICONICAL ANT.	Schwarzbeck	VHA 9103	10/12/21	12/12/21	91031946
<input type="checkbox"/>	LOG-PERIODIC ANT.	Schwarzbeck	UHALP9108A1	10/07/07	11/07/07	0590
<input checked="" type="checkbox"/>	Low Noise Pre Amplifier	TSJ	MLA-100K01-B01-2	11/03/07	12/03/07	1252741
<input type="checkbox"/>	Low Noise Pre Amplifier	TSJ	MLA-00108-B02-36	11/01/11	12/01/11	1518831
<input type="checkbox"/>	Amplifier (25dB)	Agilent	8447D	11/03/07	12/03/07	2944A10144
<input type="checkbox"/>	Amplifier (25dB)	Agilent	8447D	10/07/01	11/07/01	2648A04922
<input checked="" type="checkbox"/>	Spectrum Analyzer(CE)	H.P	8591E	11/03/07	12/03/07	3649A05889
<input type="checkbox"/>	LISN	Kyoritsu	KNW-407	11/01/11	12/01/11	8-317-8
<input checked="" type="checkbox"/>	LISN	Kyoritsu	KNW-242	10/07/02	11/07/02	8-654-15
<input checked="" type="checkbox"/>	CVCF	NF Electronic	4420	11/03/08	12/03/08	304935/337980
<input checked="" type="checkbox"/>	50 ohm Terminator	HME	CT-01	11/01/11	12/01/11	N/A
<input checked="" type="checkbox"/>	RFI/FIELD Intensity Meter	Kyoritsu	KNM-2402	10/07/02	11/07/02	4N-170-3
<input checked="" type="checkbox"/>	Wideband Radio Communication Tester	R&S	CMW500	10/10/21	11/10/21	100988