



DIGITAL EMC CO., LTD.

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CERTIFICATION OF COMPLIANCE

EpiValley Co., Ltd.

Lordland EZ Tower #511, 513, Gumi-dong, Bundang-Gu,
Sungnam-City, Kyunggi-Do, Korea

Dates of Tests: February 16 ~ 18, 2010

Test Report S/N: DR50111002Z

Test Site : DIGITAL EMC CO., LTD.

FCC ID

R2NSER-8189

APPLICANT

EpiValley Co., Ltd.

Purpose	:	Original Grant
FCC Equipment Class	:	Digital Transmission System (DTS)
Device name	:	CDMA 1x EV-DO USB Modem with WLAN
Manufacturer	:	EpiValley Co., Ltd.
FCC ID	:	R2NSER-8189
Model name	:	SER-8189
Test Device Serial number	:	Identical prototype
FCC Rule Part(s)	:	FCC Part 15.247 Subpart C ANSI C-63.4-2003
Frequency Range	:	2412 ~ 2462 MHz
Max. Output power	:	802.11b – 8.90 dBm Conducted 802.11g – 5.21 dBm Conducted
Data of issue	:	February 22, 2010

The Test results relate only to the tested sample. It is not allowed to copy this report even partly without the allowance of DIGITAL EMC CO., LTD.

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1. General information

This report contains the result of tests performed by:

DIGITAL EMC CO., LTD.

Address: 683-3, Yubang-Dong, Yongin-Si, Kyunggi-Do, Korea. 449-080

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Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the "General requirements for the competent of calibration and testing laboratory".

Tested by: *Engineer*

February 22, 2010 D.C. Cha



Date	Name	Signature
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Reviewed by: *Manager*

February 22, 2010 W.J. Lee



Date	Name	Signature
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Applicant:

Company name : EpiValley Co., Ltd.

Address : Lordland EZ Tower #511, 513, Gumi-dong, Bundang-Gu, Sungnam-City,
Kyunggi-Do, Korea

Date of order : November 24, 2009

2. Equipment information

R2NSER-8189

2.1 Equipment information

Equipment model no.	SER-8189
Equipment serial no.	Identical prototype
Type of equipment	CDMA 1x EV-DO USB Modem with WLAN
Frequency band	2412 ~ 2462 MHz
Type of Modulation	802.11b – CCK 802.11g – OFDM
Power	- Lithium Battery: DC 3.7V - AC/DC Adapter: 100 ~ 240V 50/60Hz
Type of antenna	☒ Internal Type: PIFA Antenna(-1.97dBi) ☐ External Type:



2.2 Ancillary equipment

Equipment	Model No.	Serial No.	Manufacturer	Note
Adapter	FJ-SW0502000U	N/A	SHENZHEN FU JIA APPLIANCE	DoC
-	-	-	-	-

3. Information about test items

R2NSER-8189

3.1 Tested frequency

Frequency	TX	RX
Lowest frequency	2412MHz	2412MHz
Middle frequency	2437MHz	2437MHz
Highest frequency	2462MHz	2462MHz

3.2 Tested environment

Temperature	:	22 ~ 23 (°C)
Relative humidity content	:	41 ~ 55 % R.H.
Details of power supply	:	3.7 V DC AC 120V 60Hz

3.3 Test mode

Test Case 1	Only EUT
Test Case 2	EUT + Adapter mode
Test Case 3	-

3.4 Auxiliary equipment

Equipment	Model No.	Serial No.	Manufacturer	Note
Notebook	HP520	CND73824M9	HP	DoC
Mouse	M-UK96A	HC714CA0004	Logitech	DoC

3.5 EMI Suppression Device(s)/Modifications

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

→ None

4. Test Report

4.1 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
Note 1: C=Comply NC=ot Comply NT=Not Tested NA=Not Applicable Note 2: Conducted test items were performed in test case 1 mode. Radiated test items were performed in all the test case modes. Note 3: The JBP(Computing device peripheral) portion was tested and approved by FCC DoC procedure.				

The sample was tested according to the following specification:

ANSI C-63.4-2003, DA00-705

4.2 Transmitter requirements

4.2.1 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

Sweep = auto

VBW = $\geq$ RBW

Detector function = peak

Trace = max hold

- Measurement Data: **Comply**

Test Mode	Frequency	Test Results (MHz)
802.11b	Lowest	11.80
	Middle	11.85
	Highest	11.95
802.11g	Lowest	16.55
	Middle	16.55
	Highest	16.55

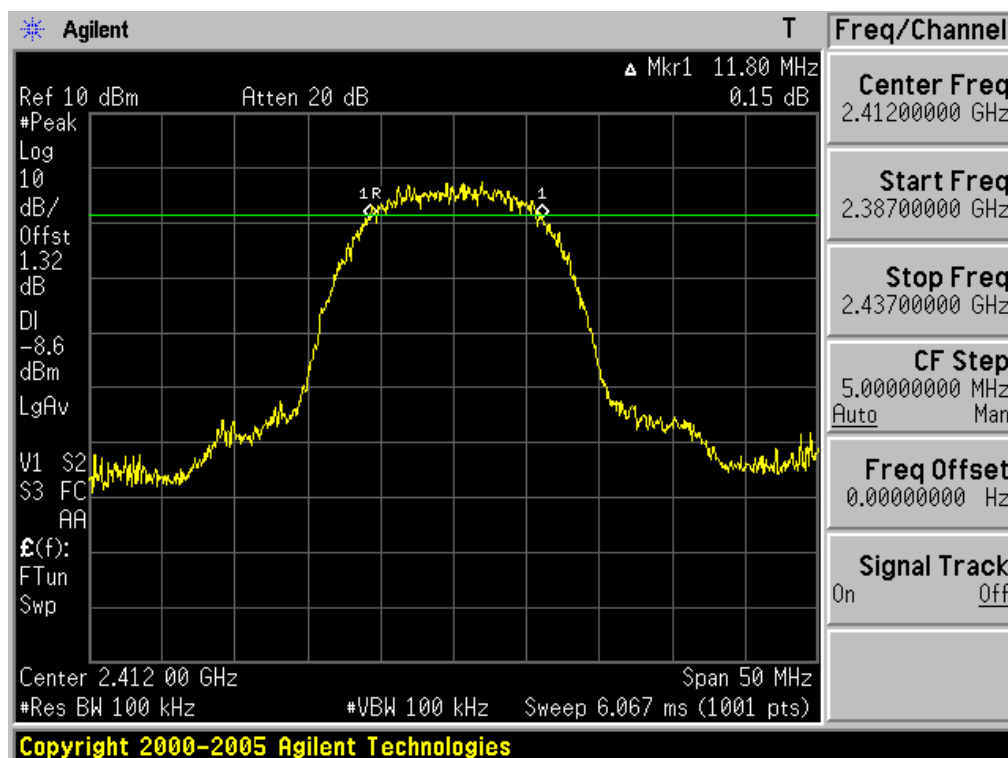
Note 1: See next pages for actual measured spectrum plots.

- Minimum Standard:

The minimum 6 dB bandwidth shall be at least 500 kHz

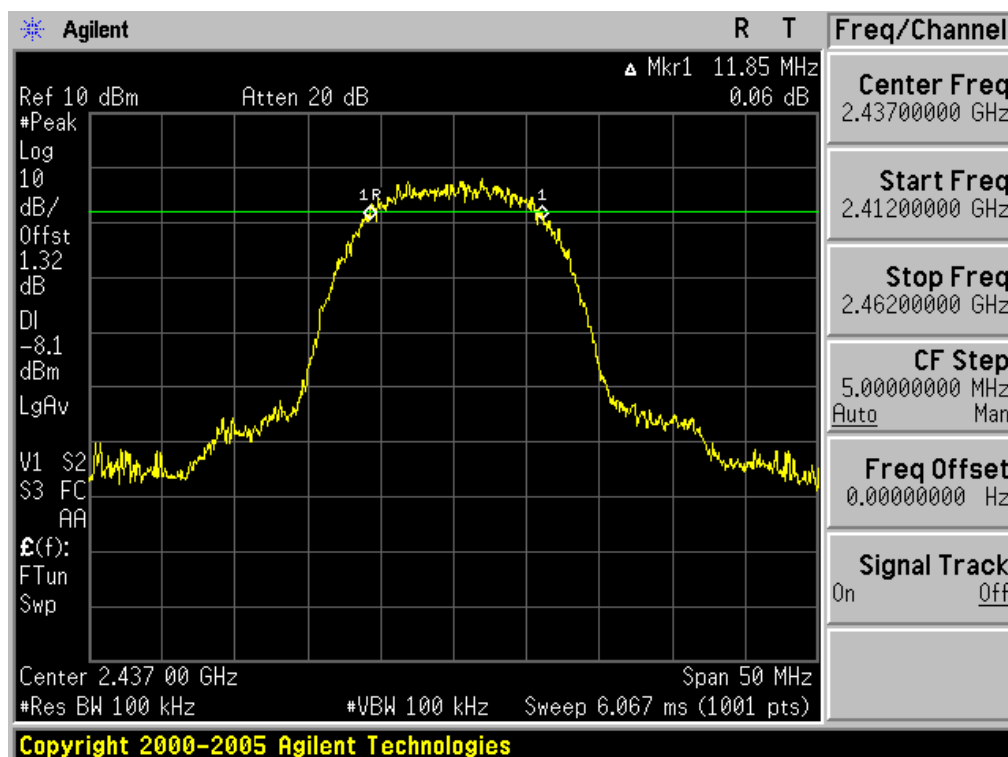
6 dB Bandwidth

Test Mode: 802.11b & Lowest Frequency



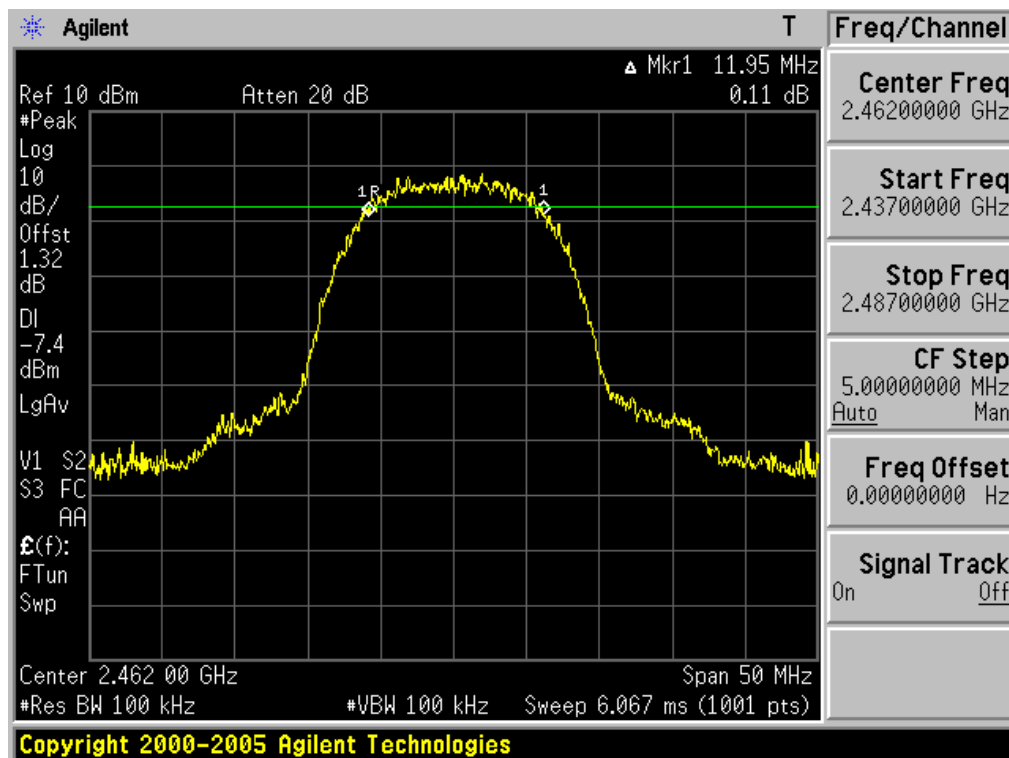
6 dB Bandwidth

Test Mode: 802.11b & Middle Frequency



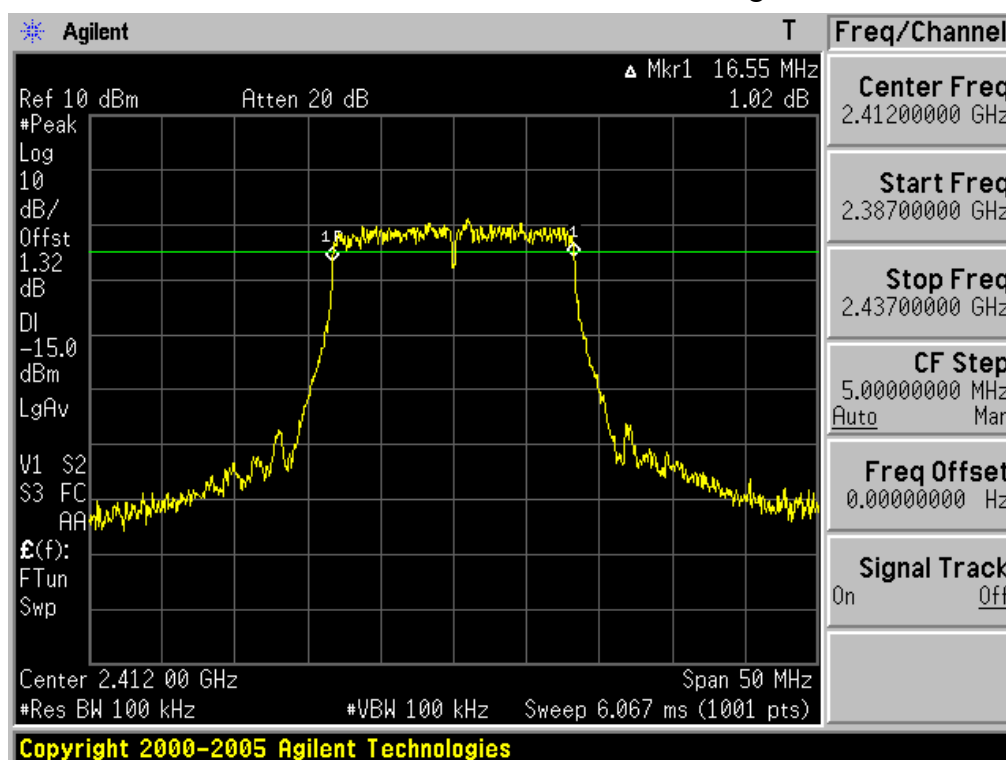
6 dB Bandwidth

Test Mode: 802.11b & Highest Frequency



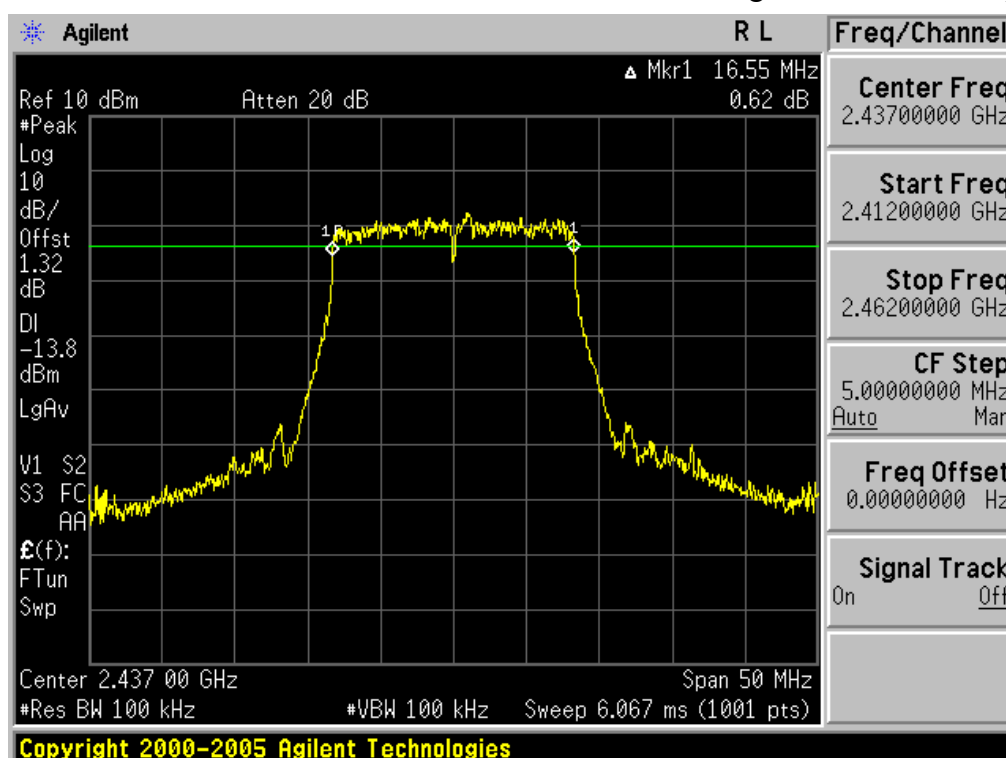
6 dB Bandwidth

Test Mode: 802.11g & Lowest Frequency



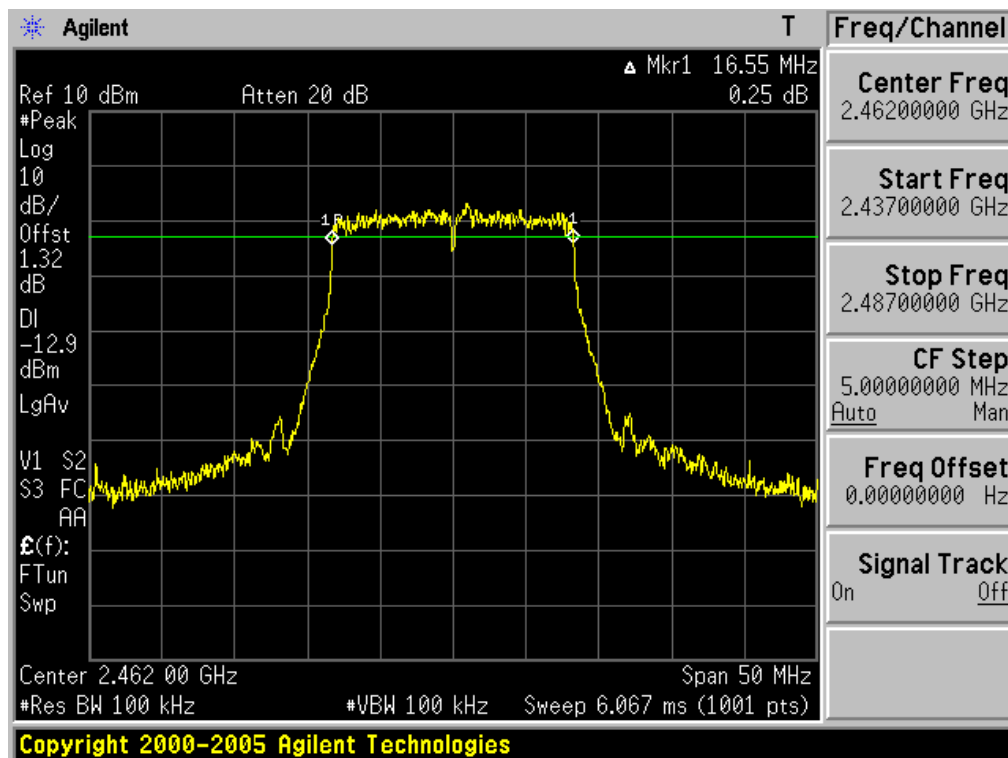
6 dB Bandwidth

Test Mode: 802.11g & Middle Frequency



6 dB Bandwidth

Test Mode: 802.11g & Highest Frequency



4.2.2 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**

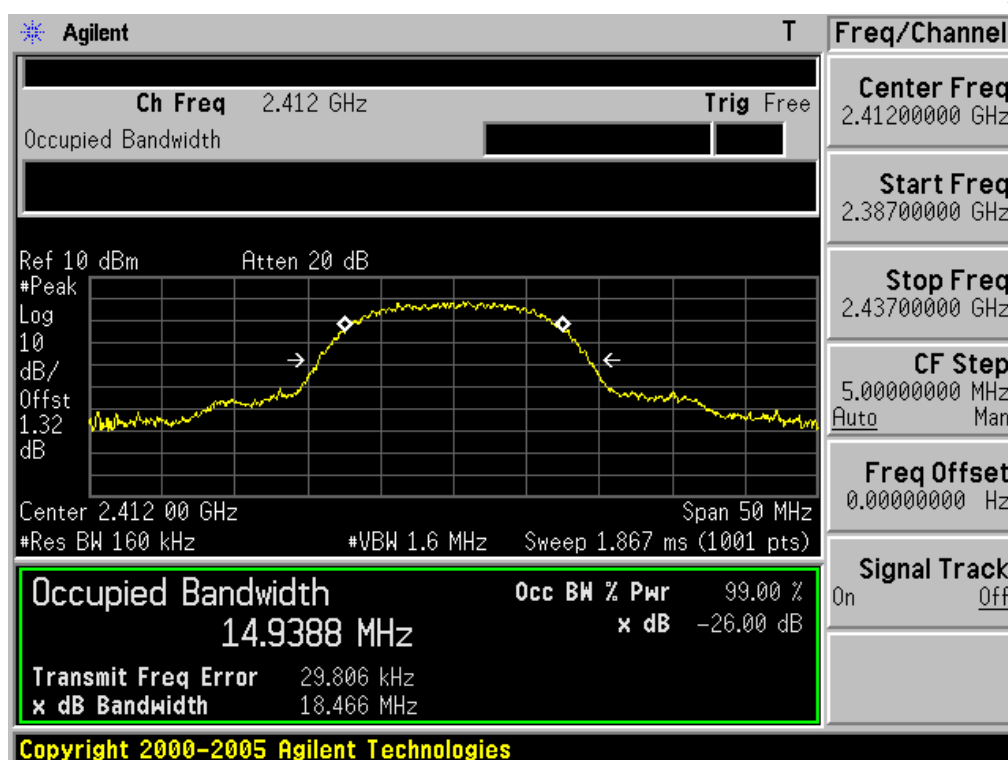
Test Mode	Frequency	Test Results	
		dBm	W
802.11b	Lowest	7.27	0.0053
	Middle	8.17	0.0066
	Highest	8.90	0.0078
802.11g	Lowest	3.16	0.0021
	Middle	4.31	0.0027
	Highest	5.21	0.0033

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

Minimum Standard:	< 1W
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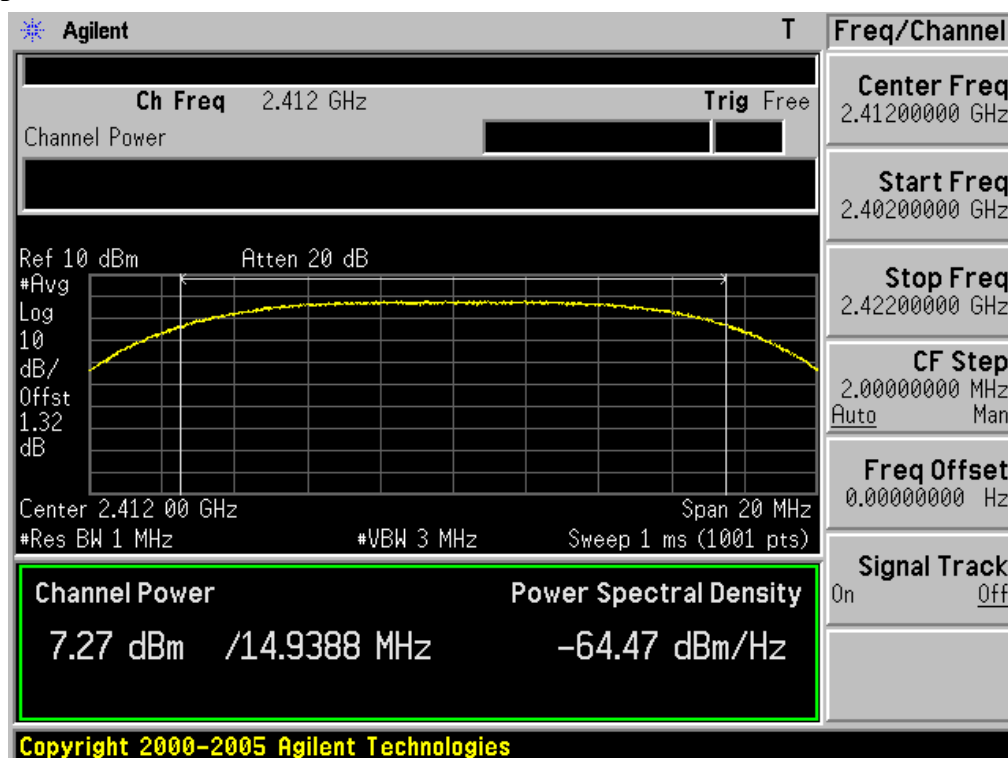
26 dB Bandwidth

Test Mode: 802.11b & Lowest Frequency



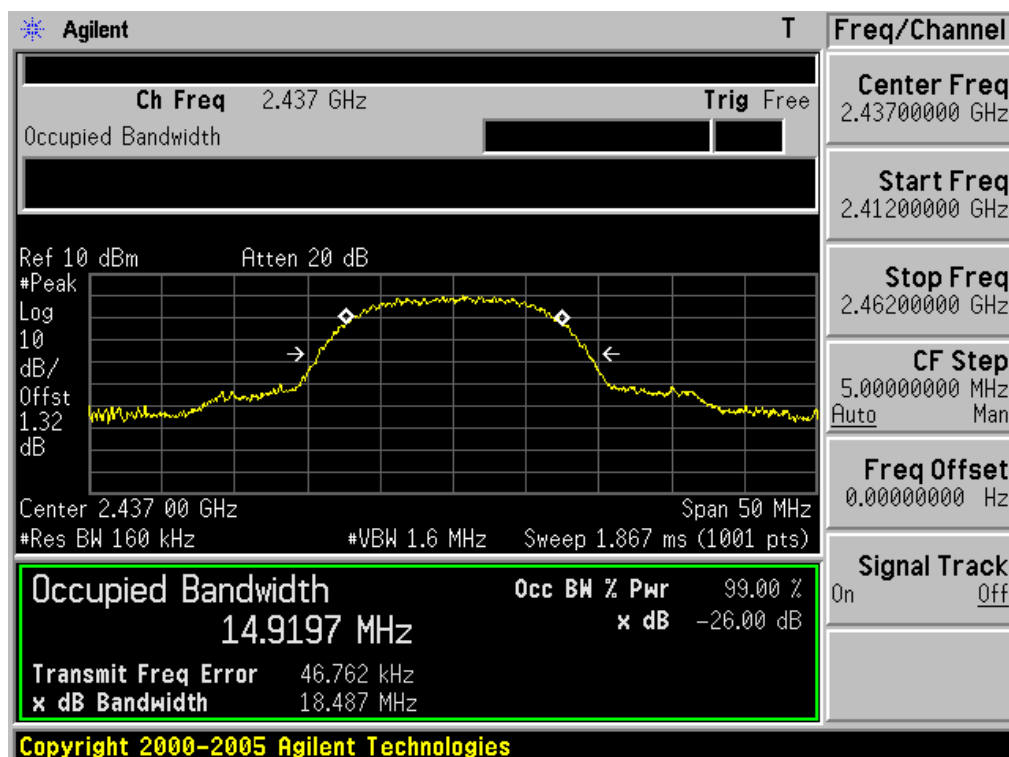
Peak Output Power

Test Mode: 802.11b & Lowest Frequency



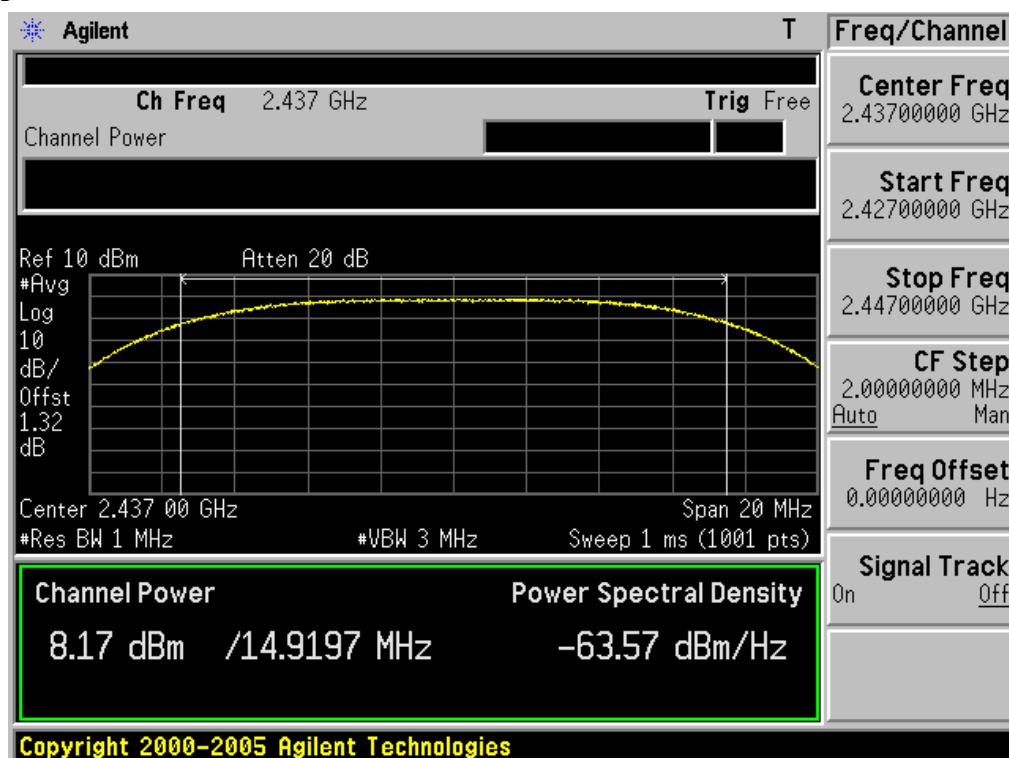
26 dB Bandwidth

Test Mode: 802.11b & Middle Frequency



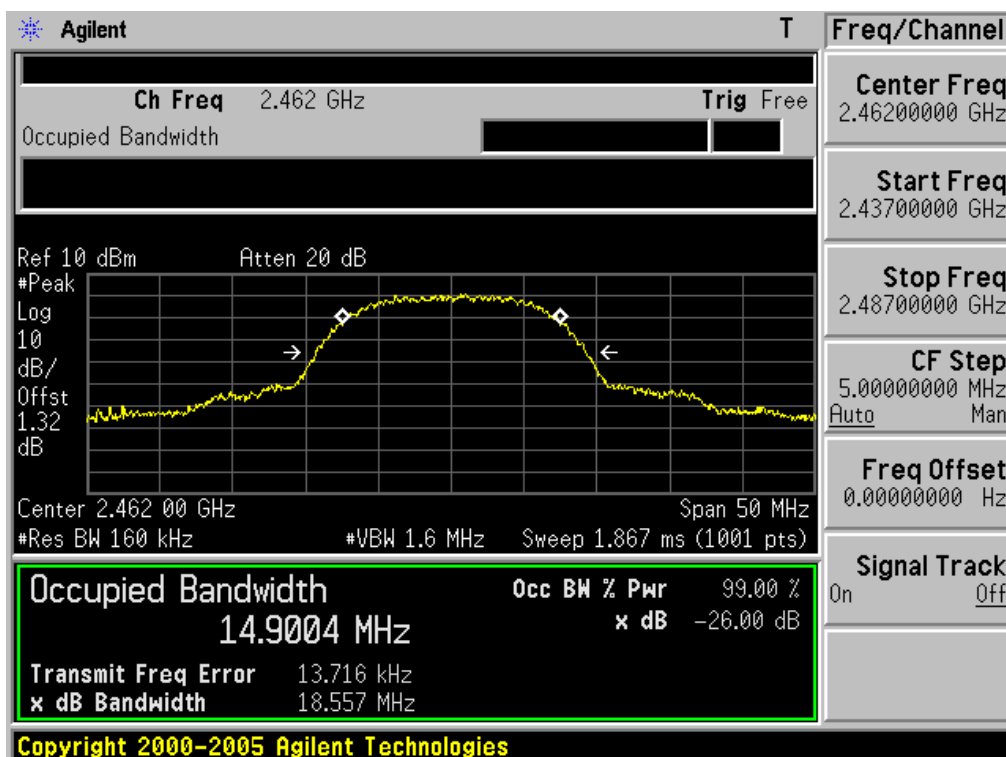
Peak Output Power

Test Mode: 802.11b & Middle Frequency



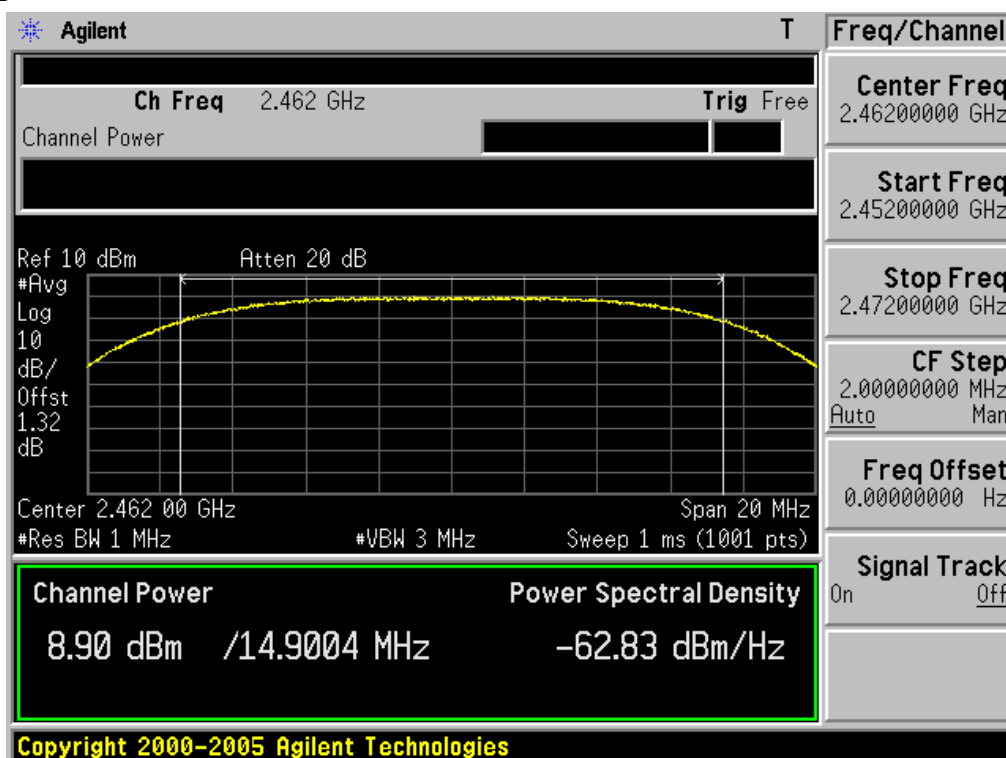
26 dB Bandwidth

Test Mode: 802.11b & Highest Frequency



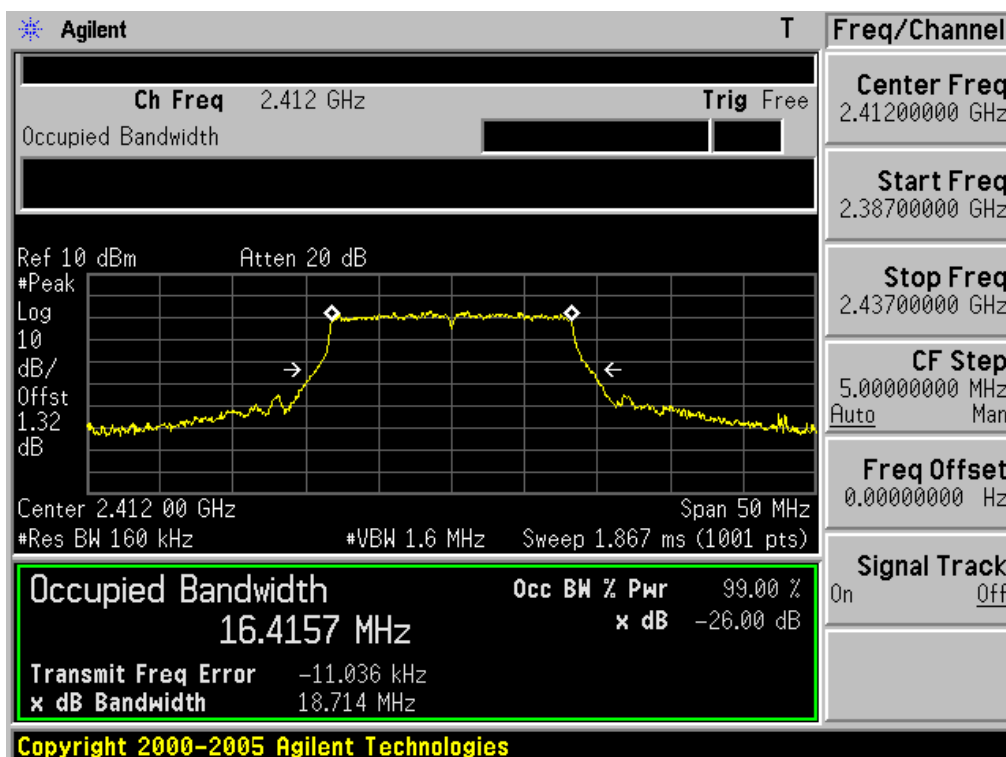
Peak Output Power

Test Mode: 802.11b & Highest Frequency



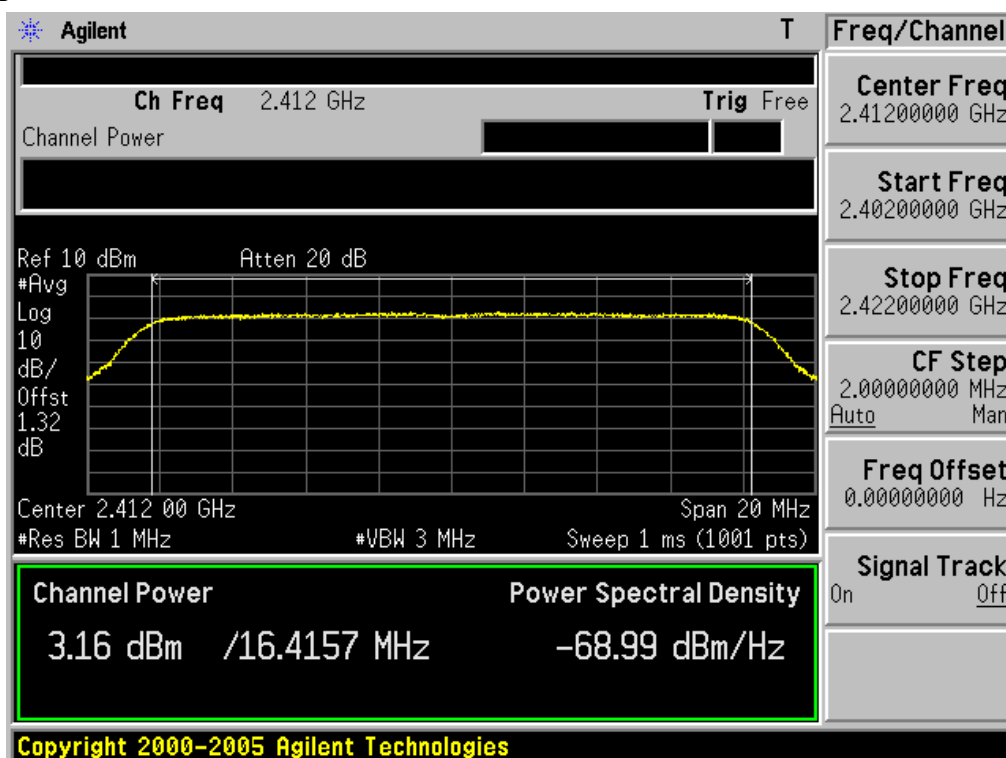
26 dB Bandwidth

Test Mode: 802.11g & Lowest Frequency



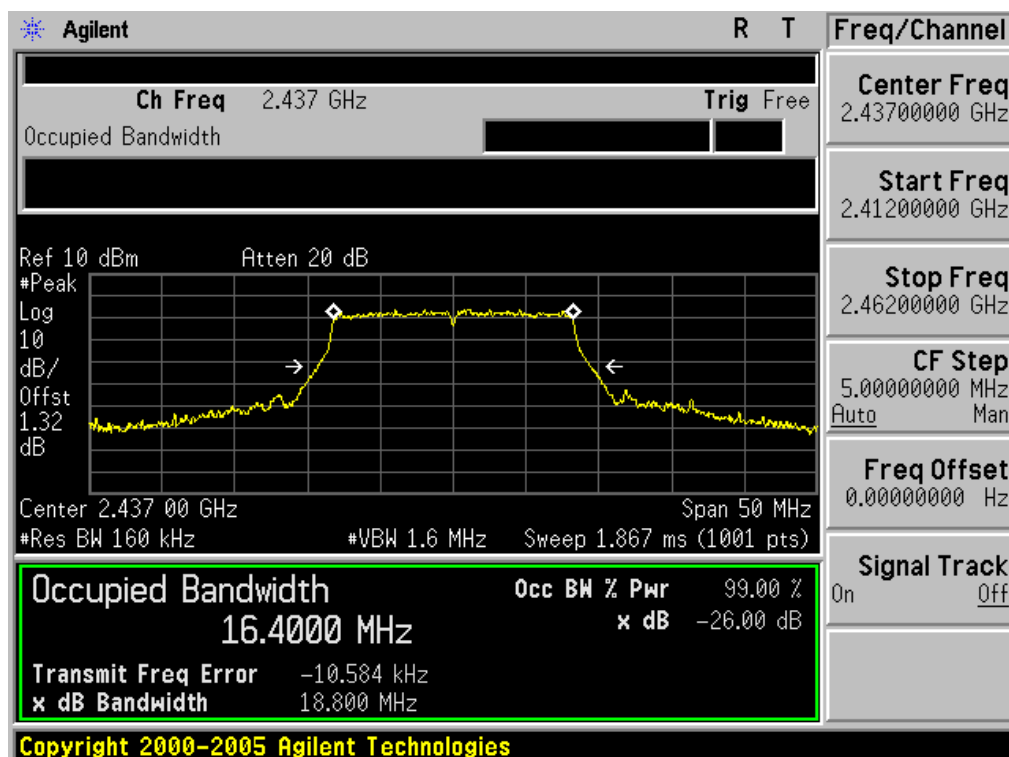
Peak Output Power

Test Mode: 802.11g & Lowest Frequency



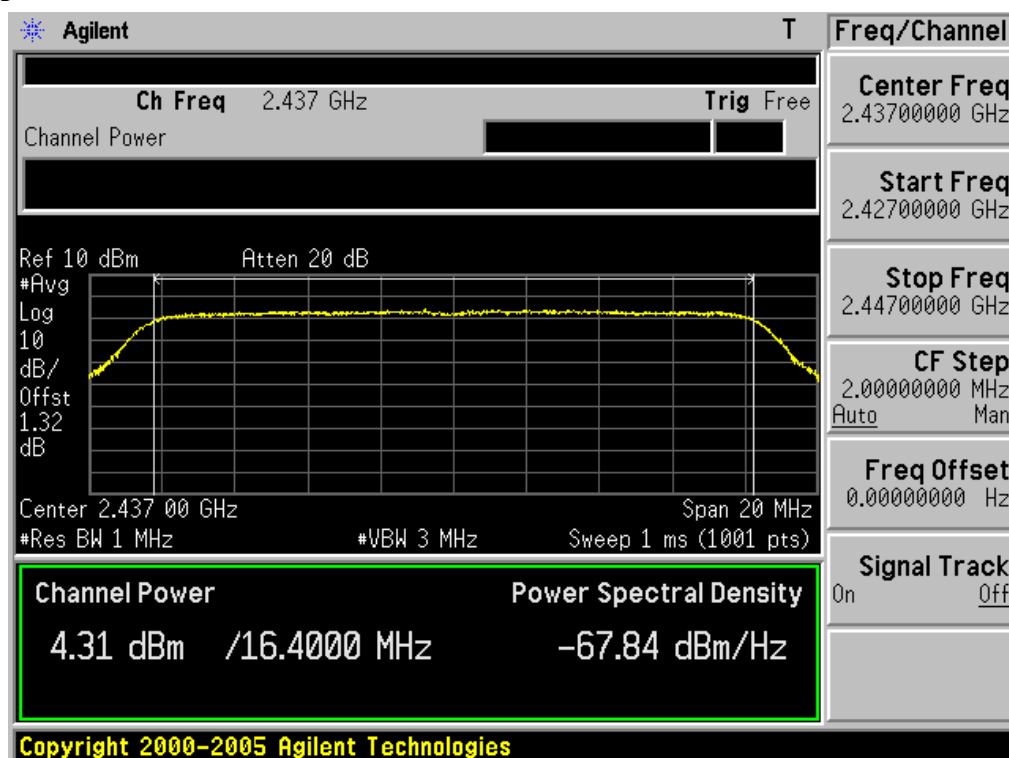
26 dB Bandwidth

Test Mode: 802.11g & Middle Frequency



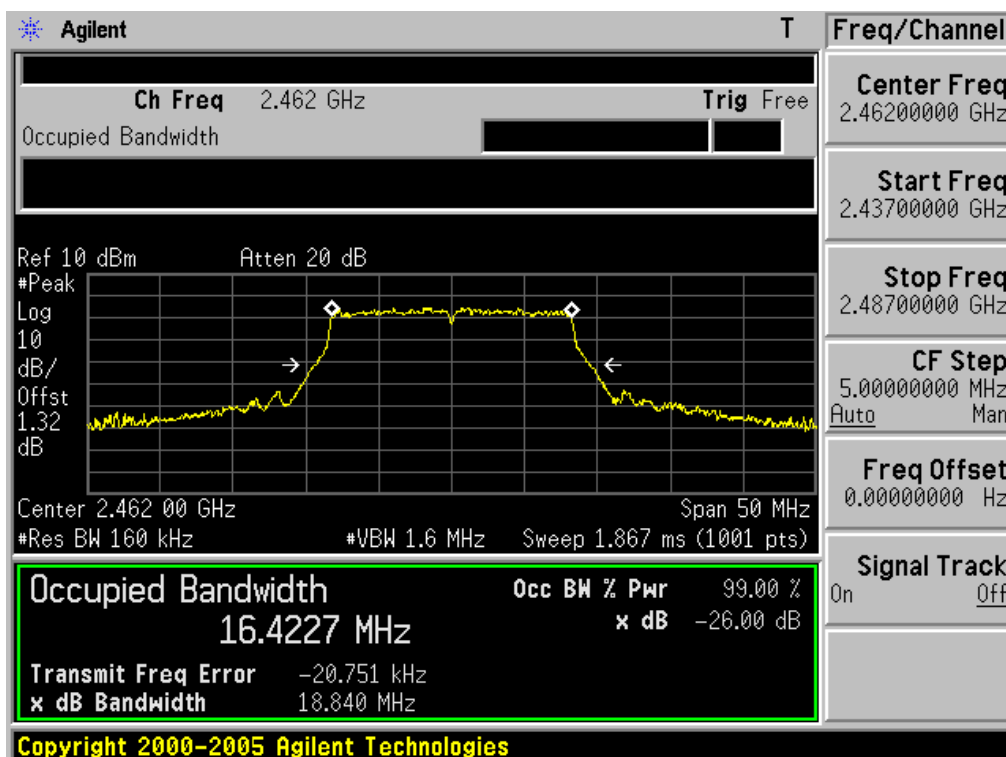
Peak Output Power

Test Mode: 802.11g & Middle Frequency



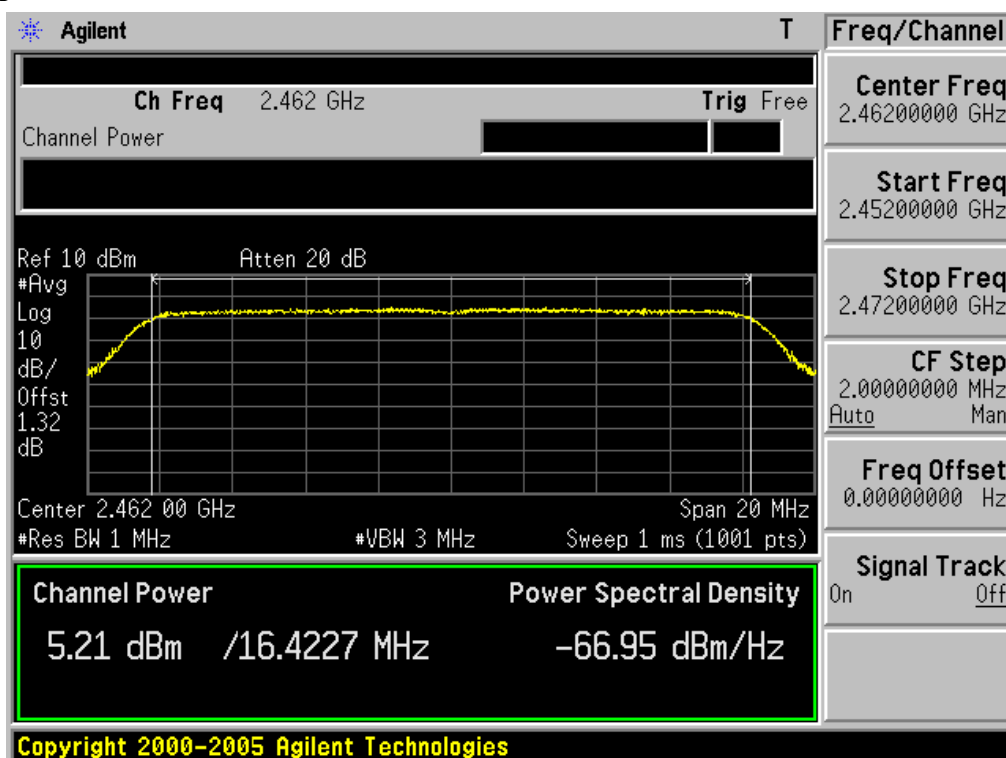
26 dB Bandwidth

Test Mode: 802.11g & Highest Frequency



Peak Output Power

Test Mode: 802.11g & Highest Frequency



4.2.3 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**

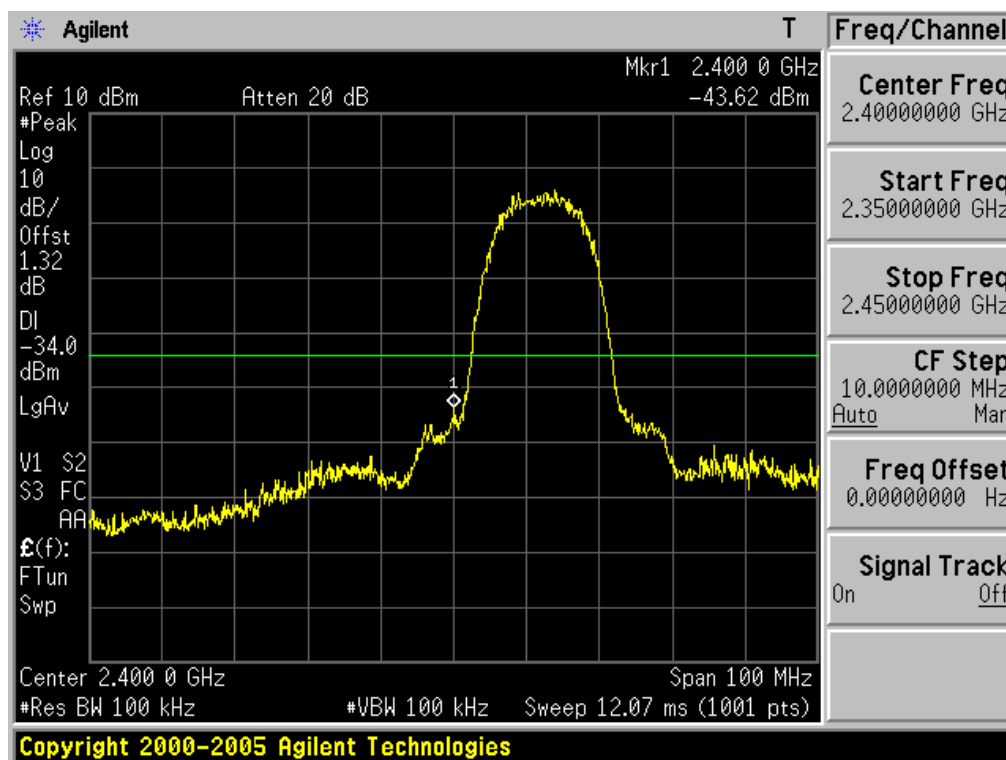
- All conducted emission in any 100 kHz bandwidth outside of the spread spectrum band was at least 30dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.

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

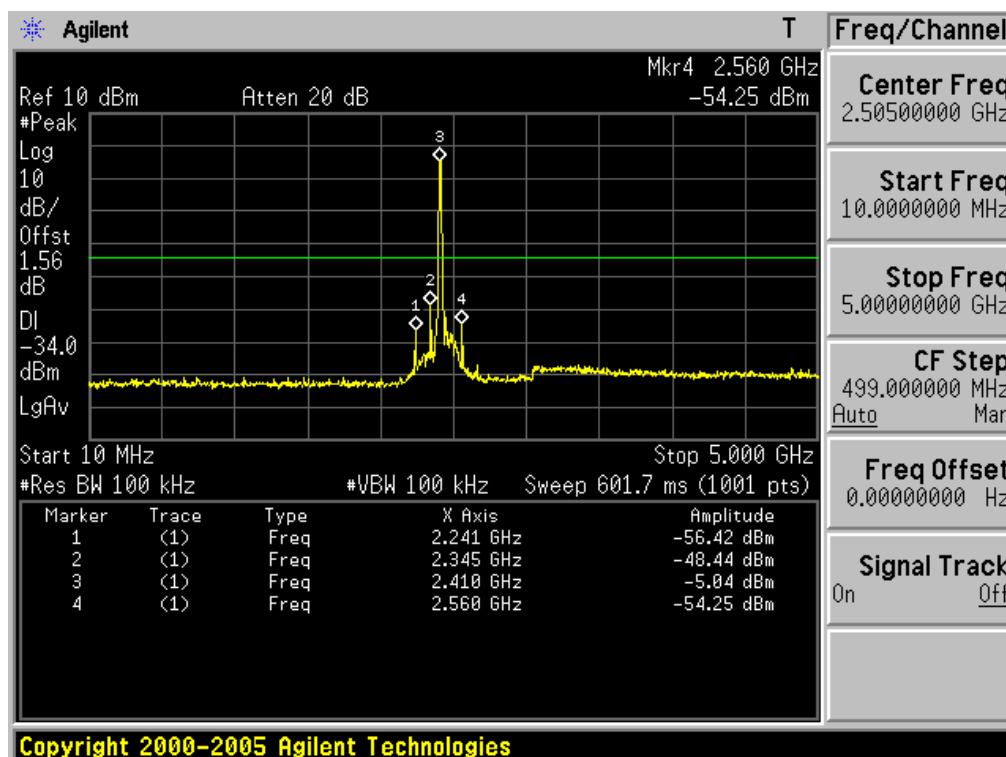
Minimum Standard:	> 30 dBc
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Low Band-edge at 30 dB blow

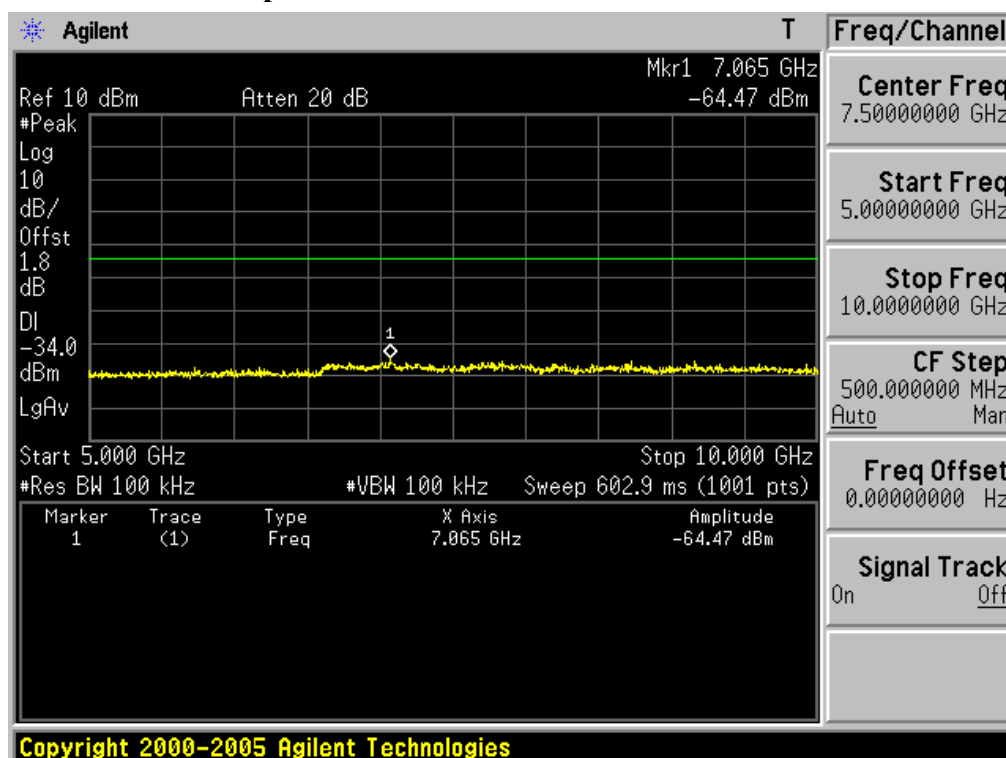
Test Mode: 802.11b & Lowest Frequency



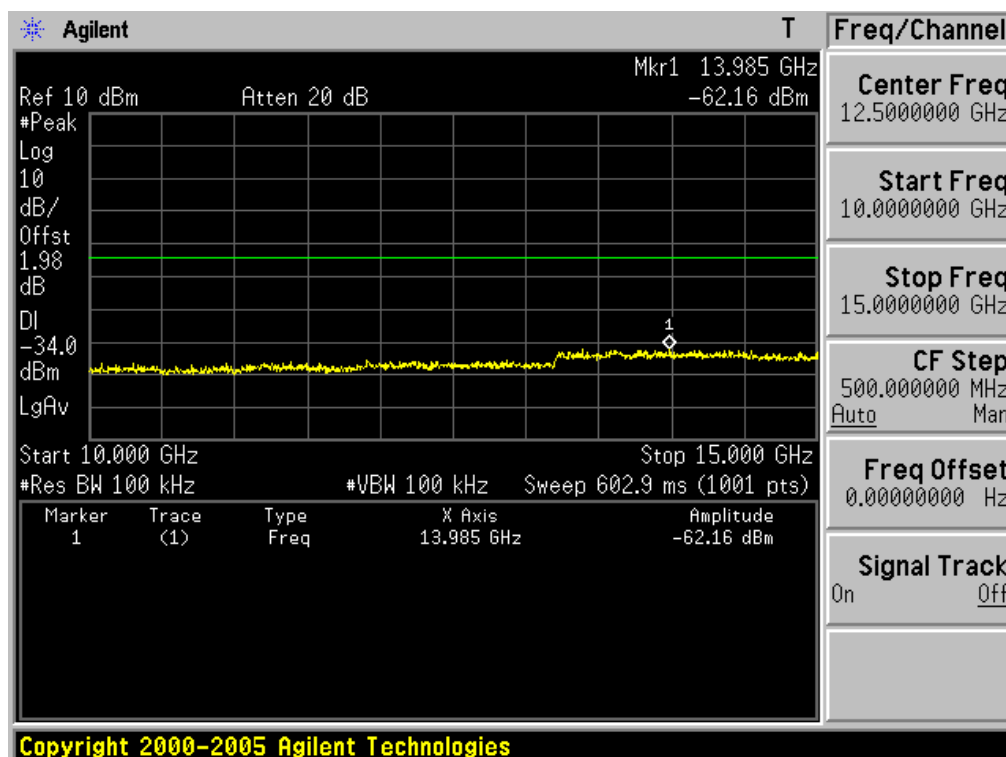
10MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11b & Lowest Frequency



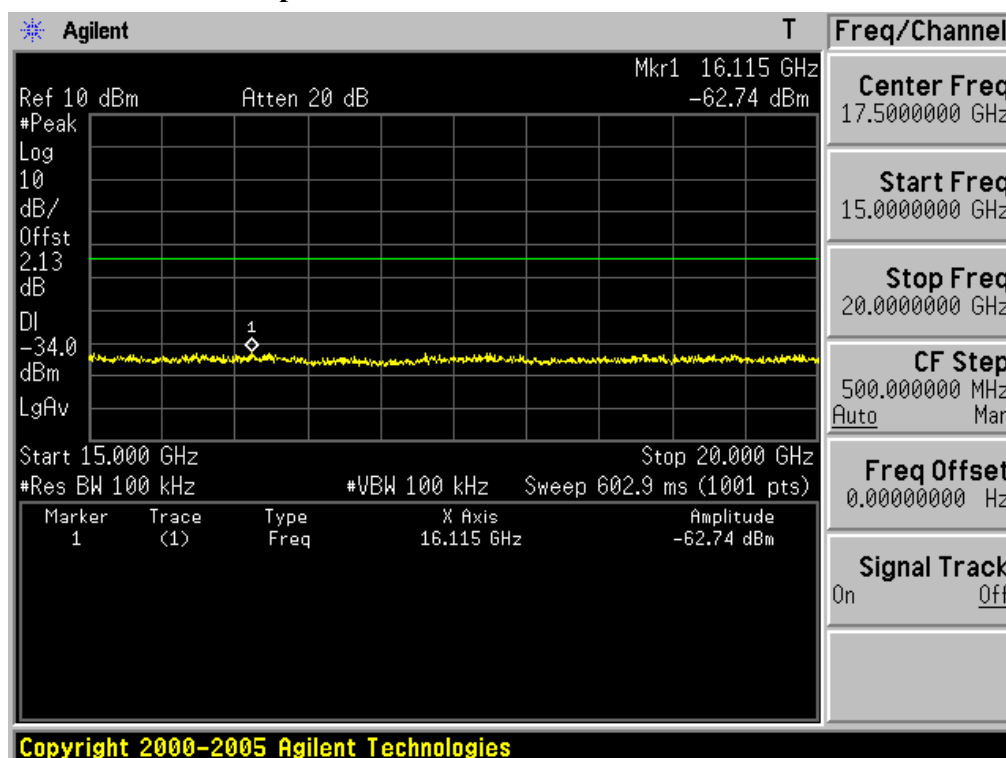
5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11b & Lowest Frequency



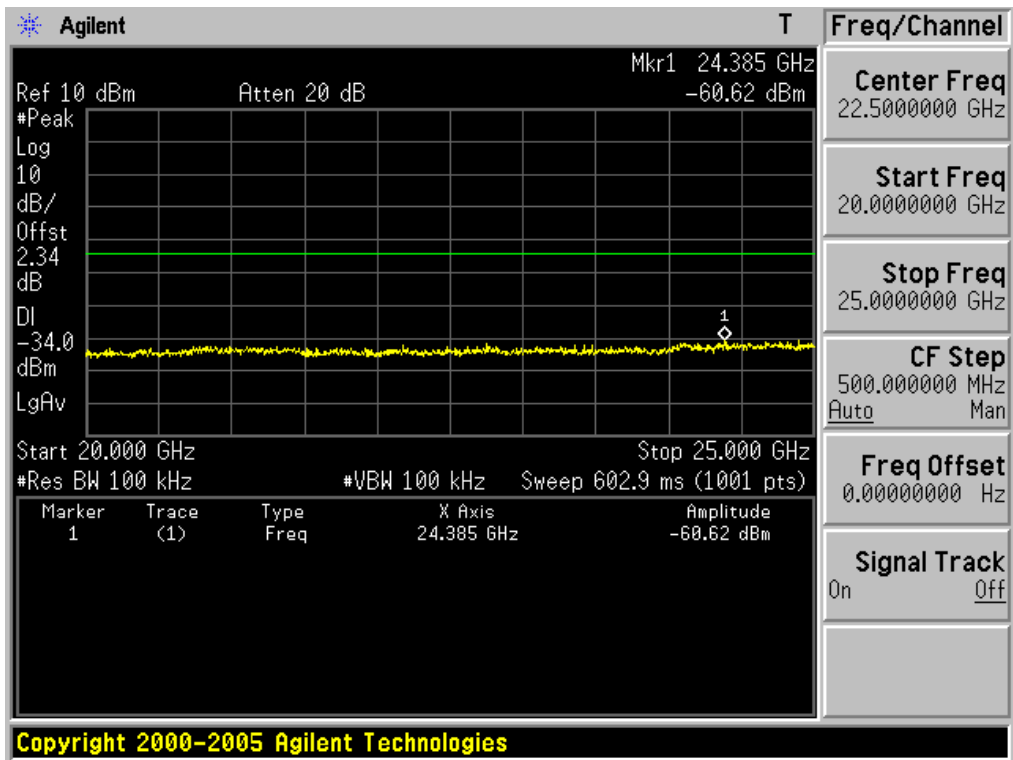
10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11b & Lowest Frequency



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

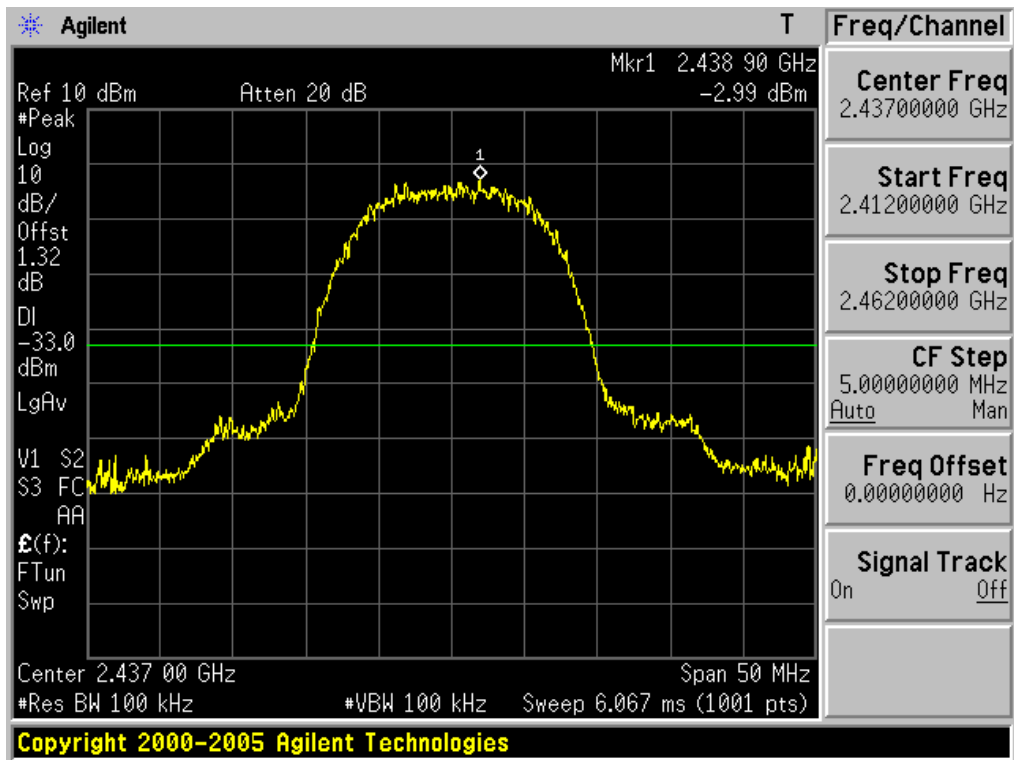


20GHz ~ 25GHz Conducted Spurious Emissions Test Mode: 802.11b & Lowest Frequency

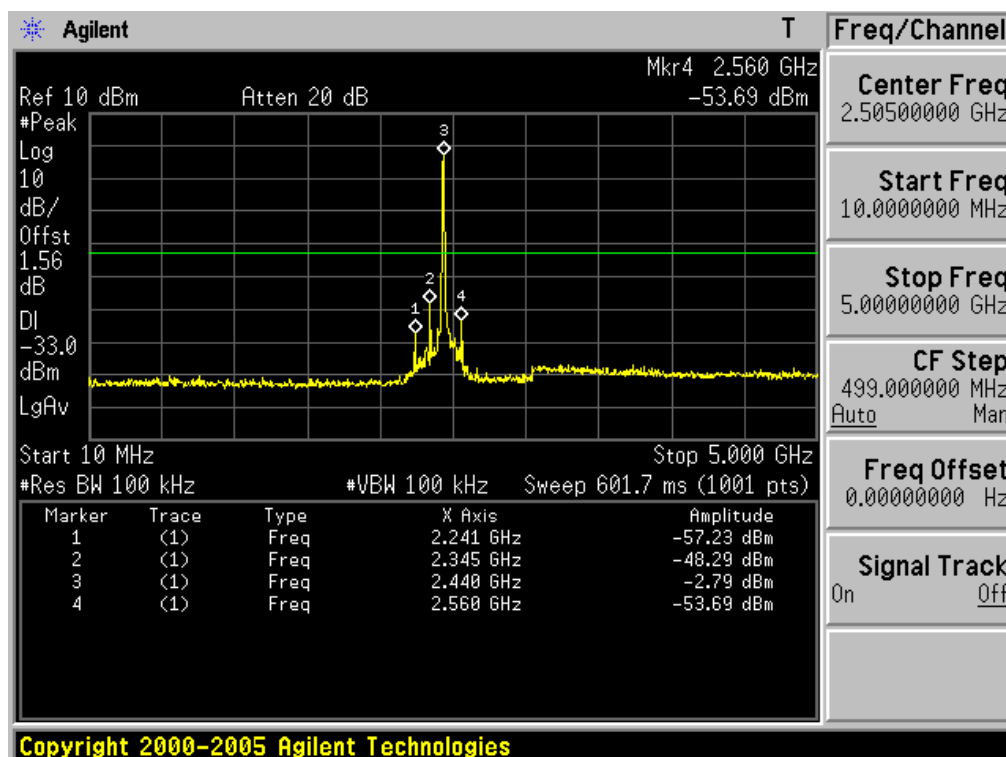


Reference for limit

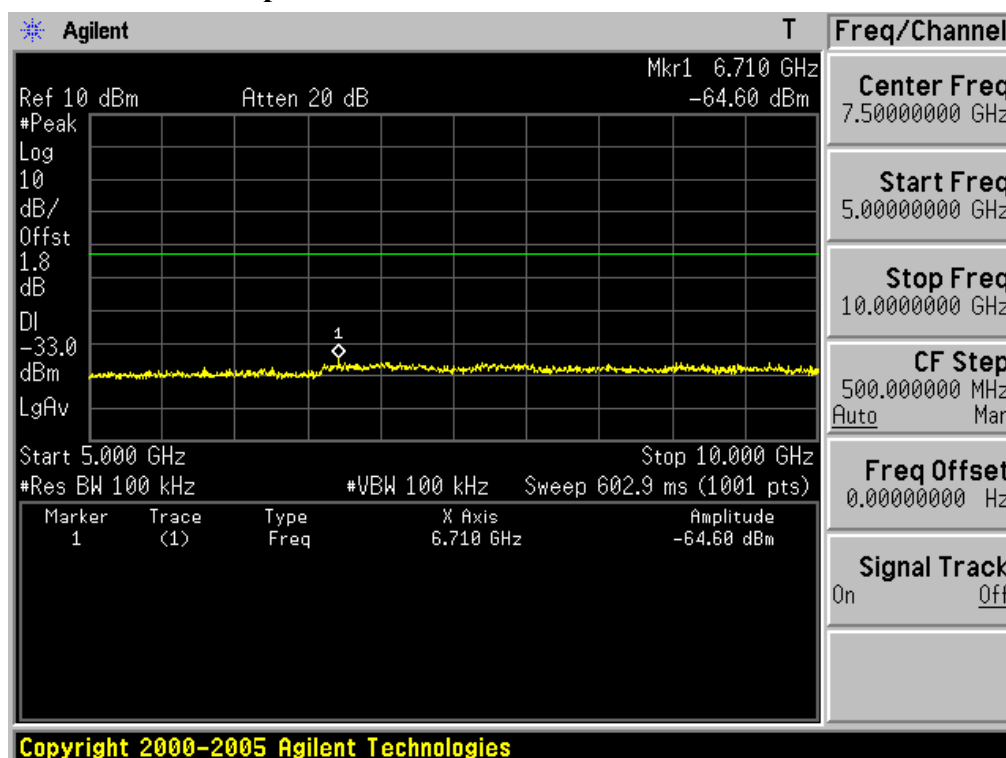
Test Mode: 802.11b & Middle Frequency



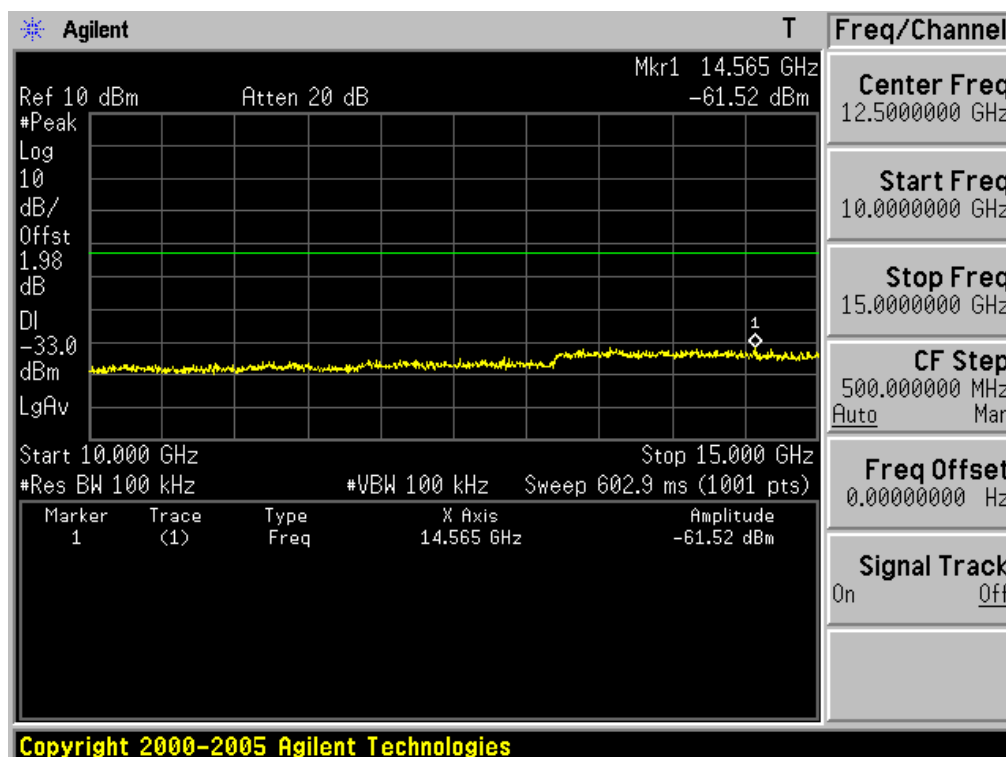
10MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11b & Middle Frequency



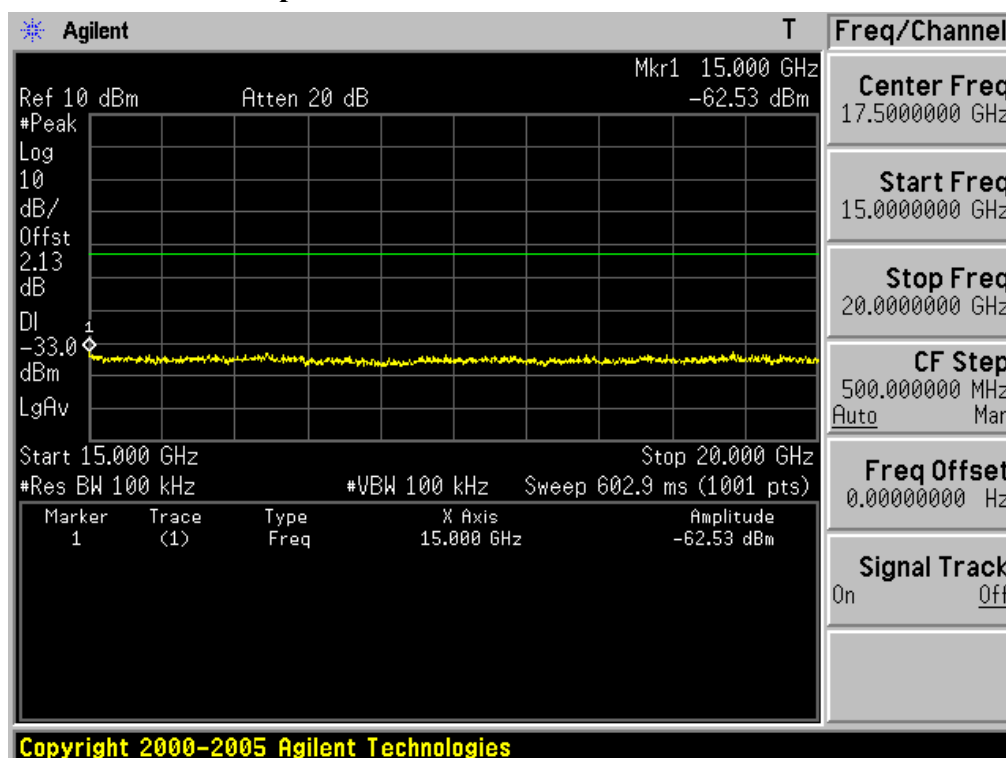
5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11b & Middle Frequency



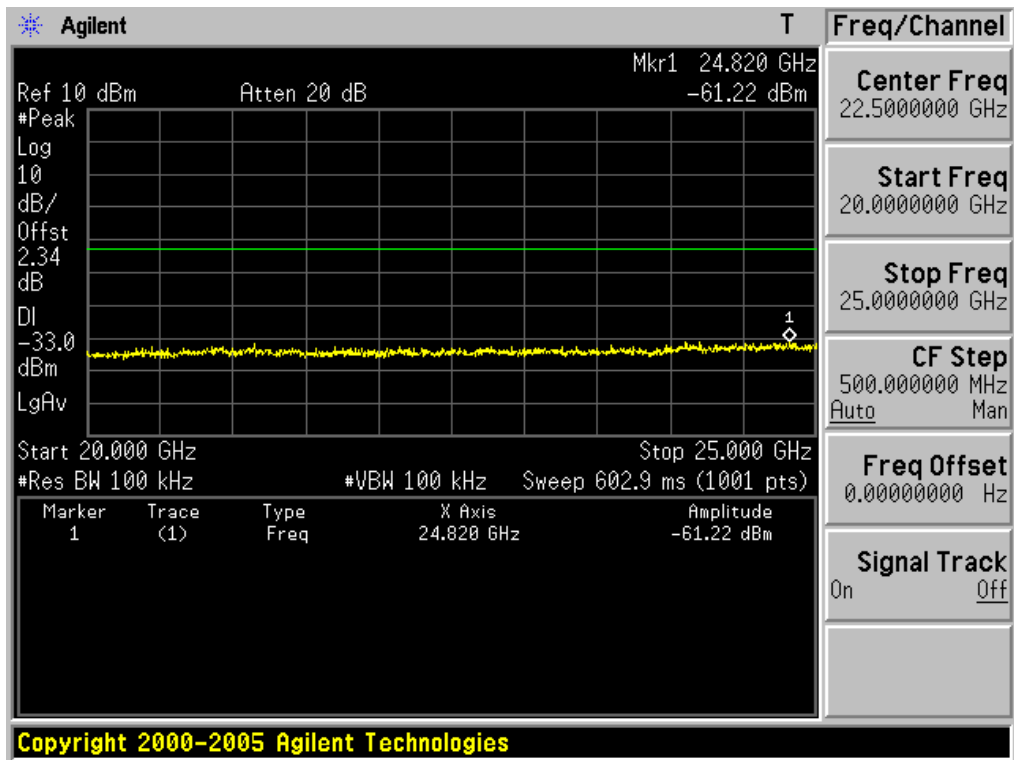
10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11b & Middle Frequency



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

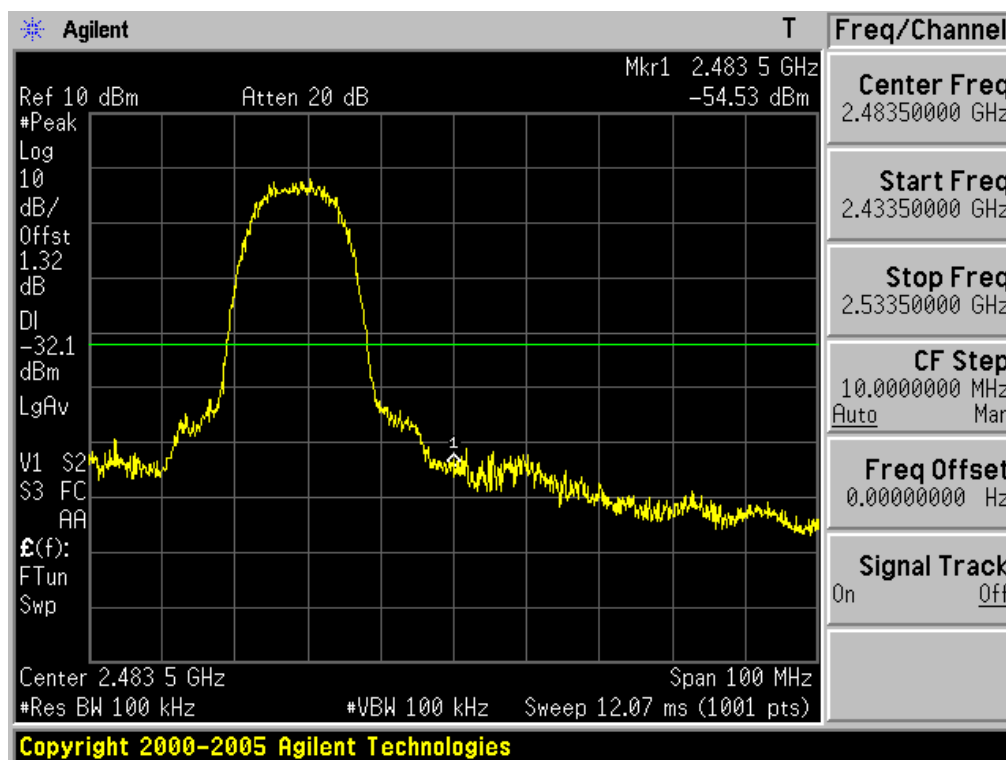


20GHz ~ 25GHz Conducted Spurious Emissions Test Mode: 802.11b & Middle Frequency

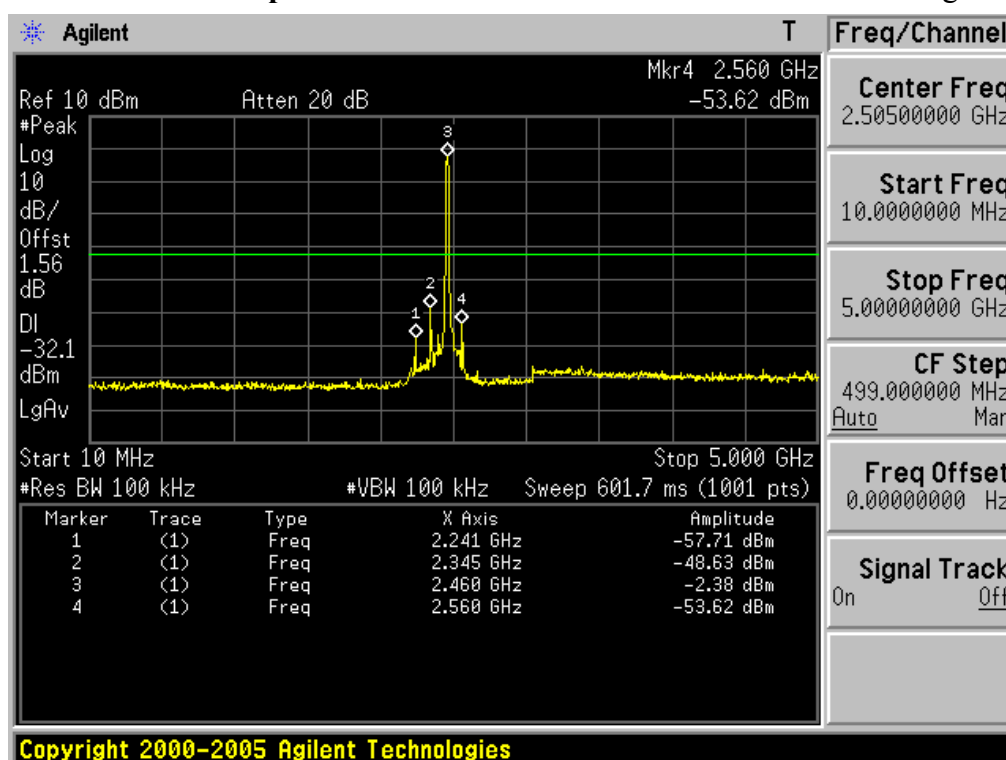


High Band-edge at 30 dB blow

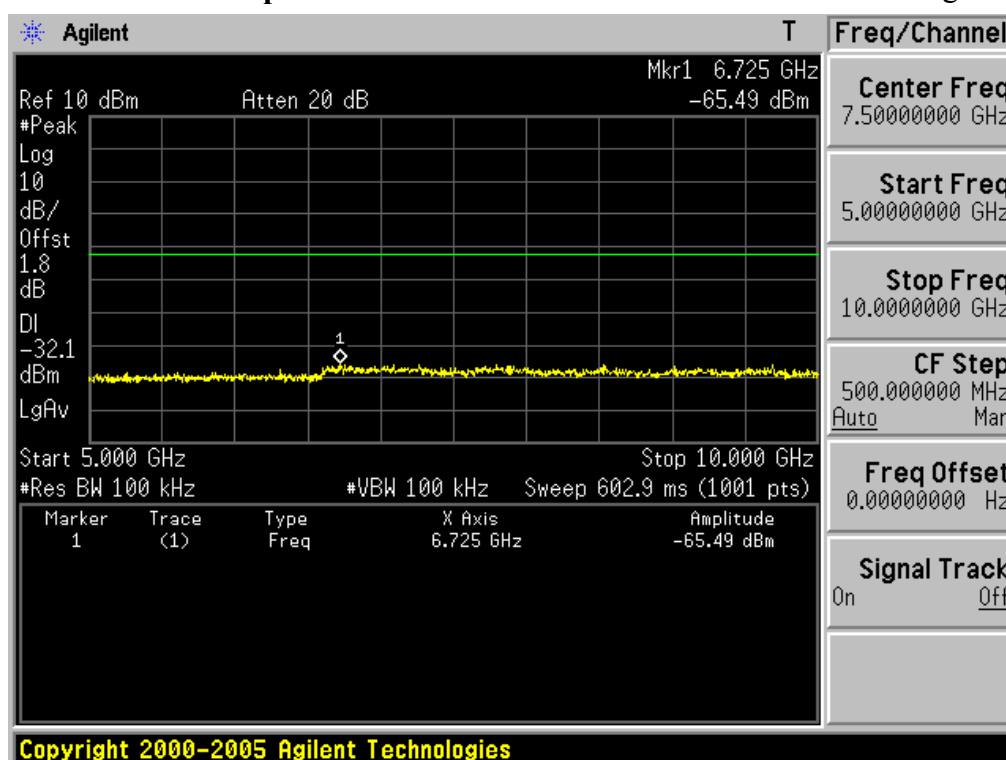
Test Mode: 802.11b & Highest Frequency



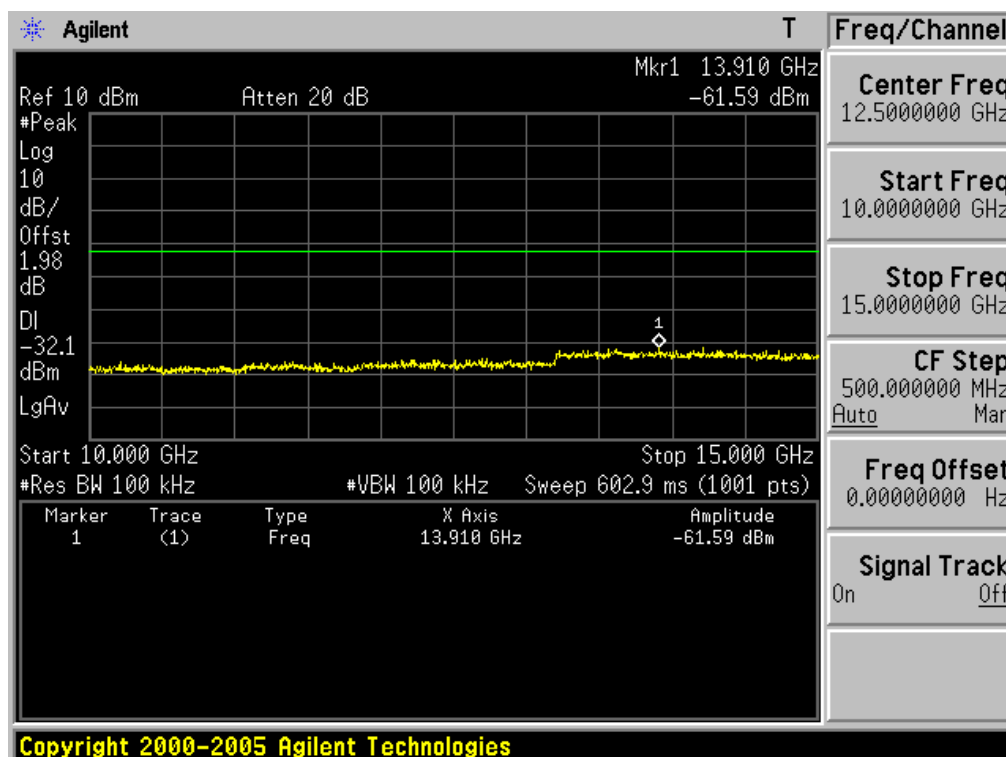
10MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11b & Highest Frequency



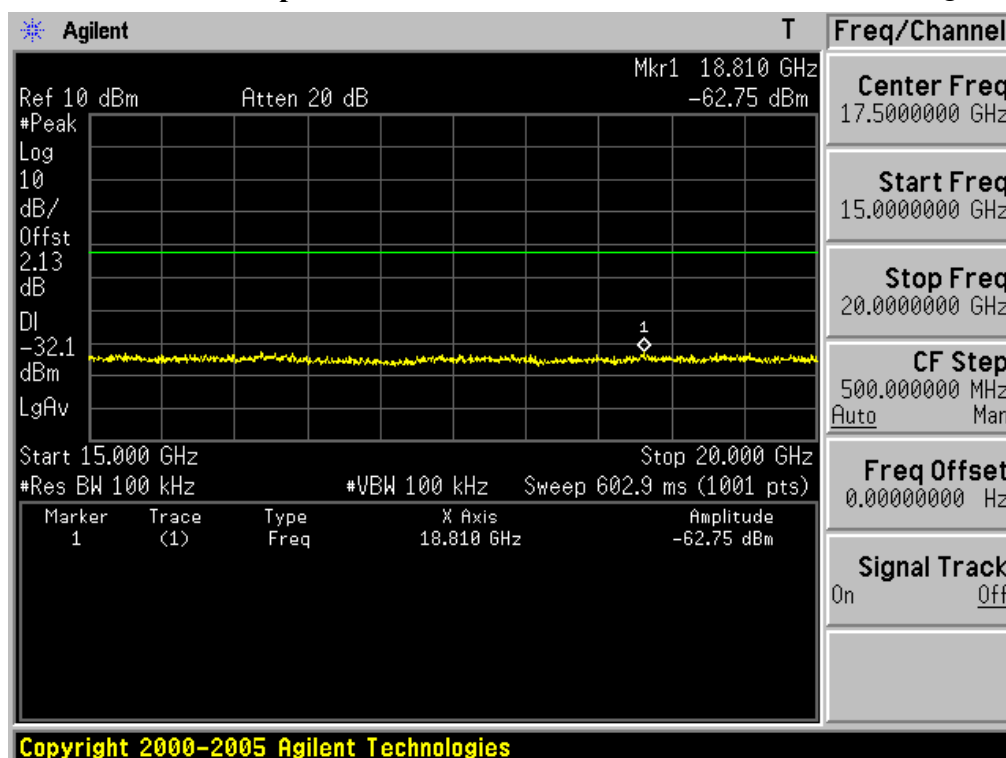
5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11b & Highest Frequency



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



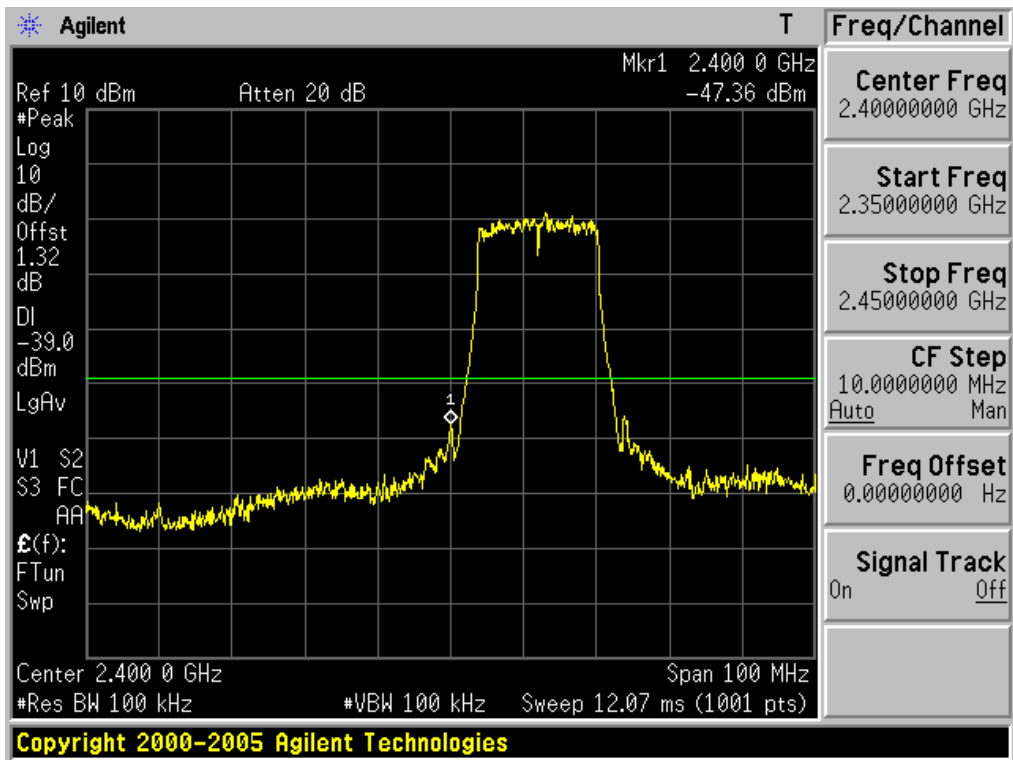
15GHz ~ 20GHz Conducted Spurious Emissions Test Mode: 802.11b & Highest Frequency



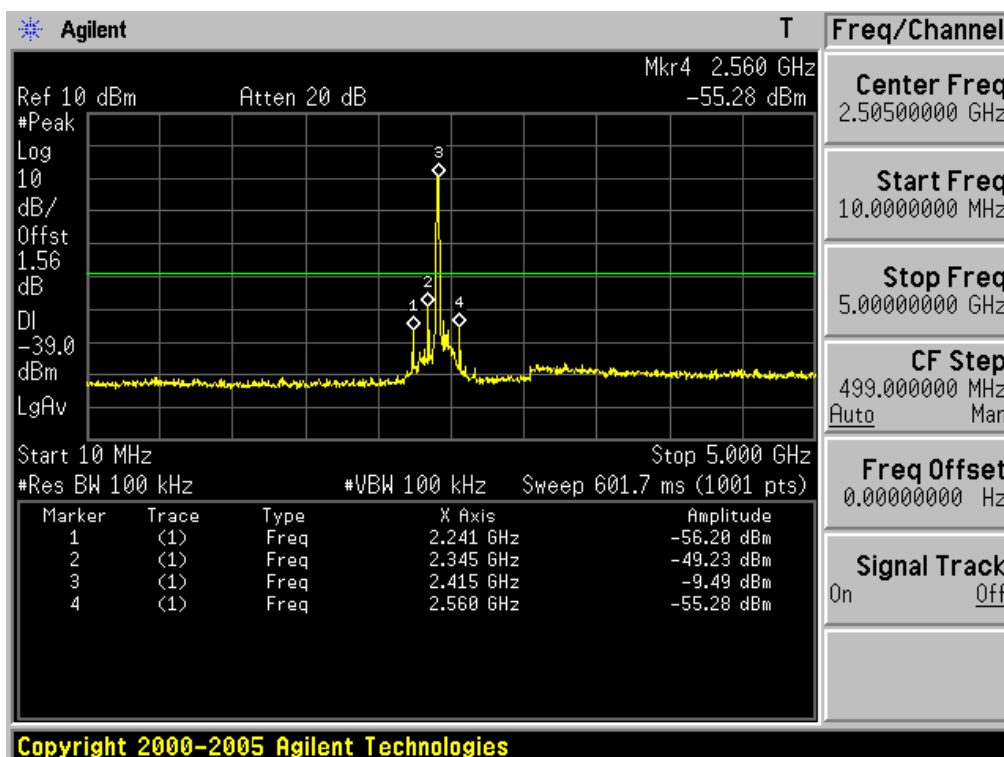
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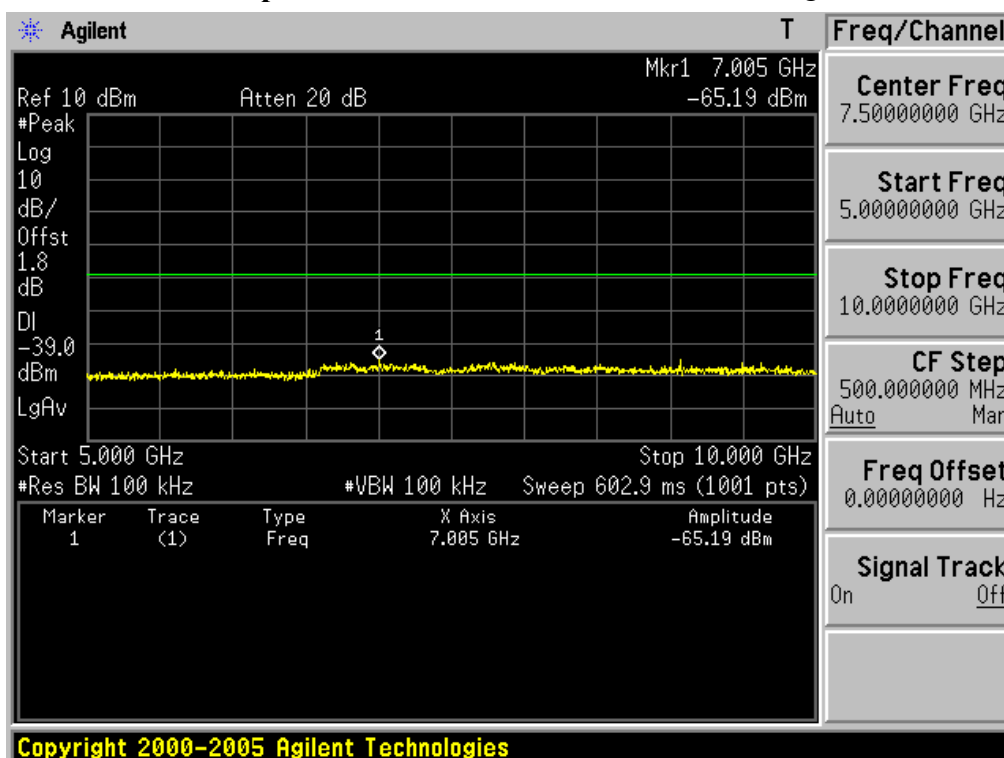
Low Band-edge at 30 dB blow Test Mode: 802.11g



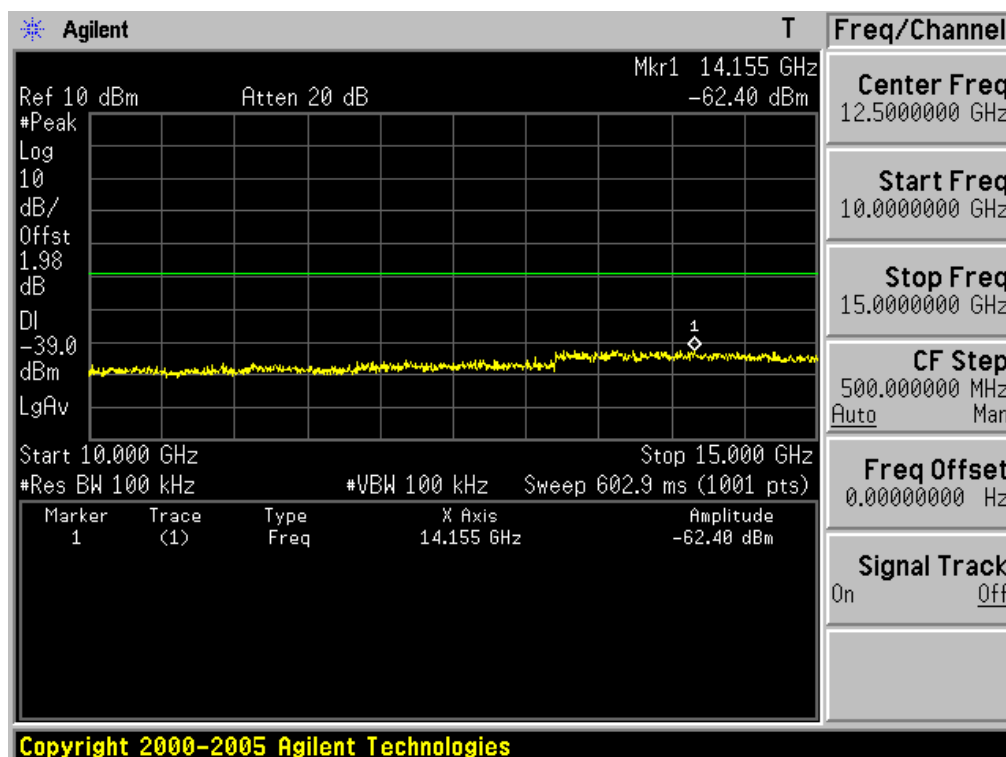
10MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11g & Lowest Frequency



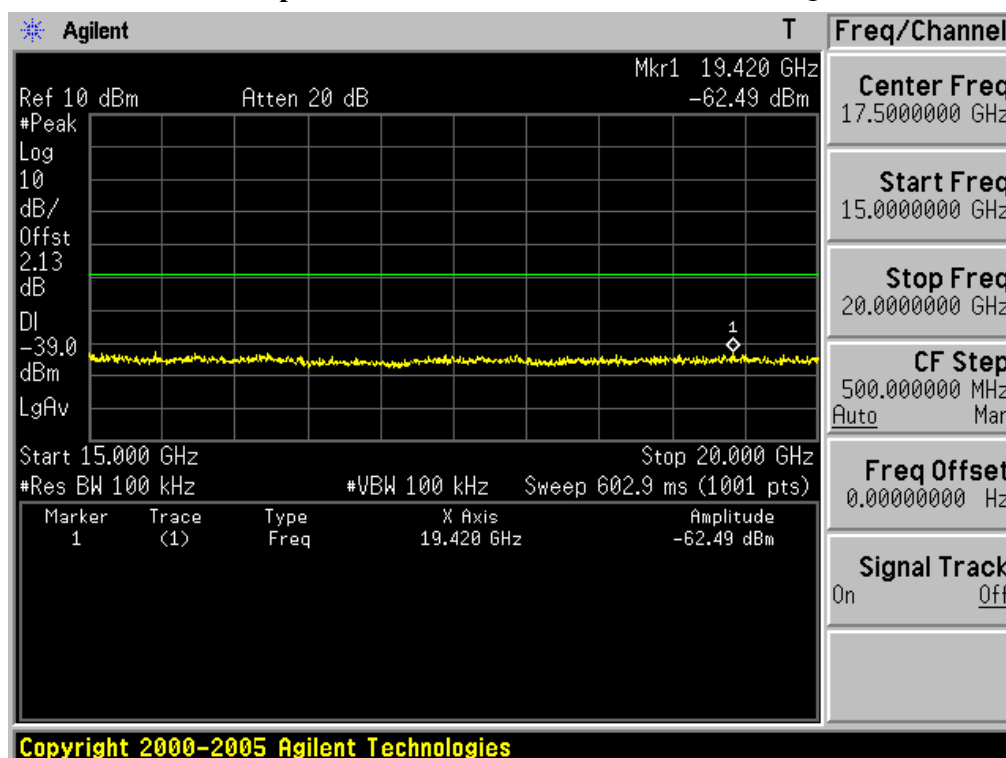
5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11g & Lowest Frequency



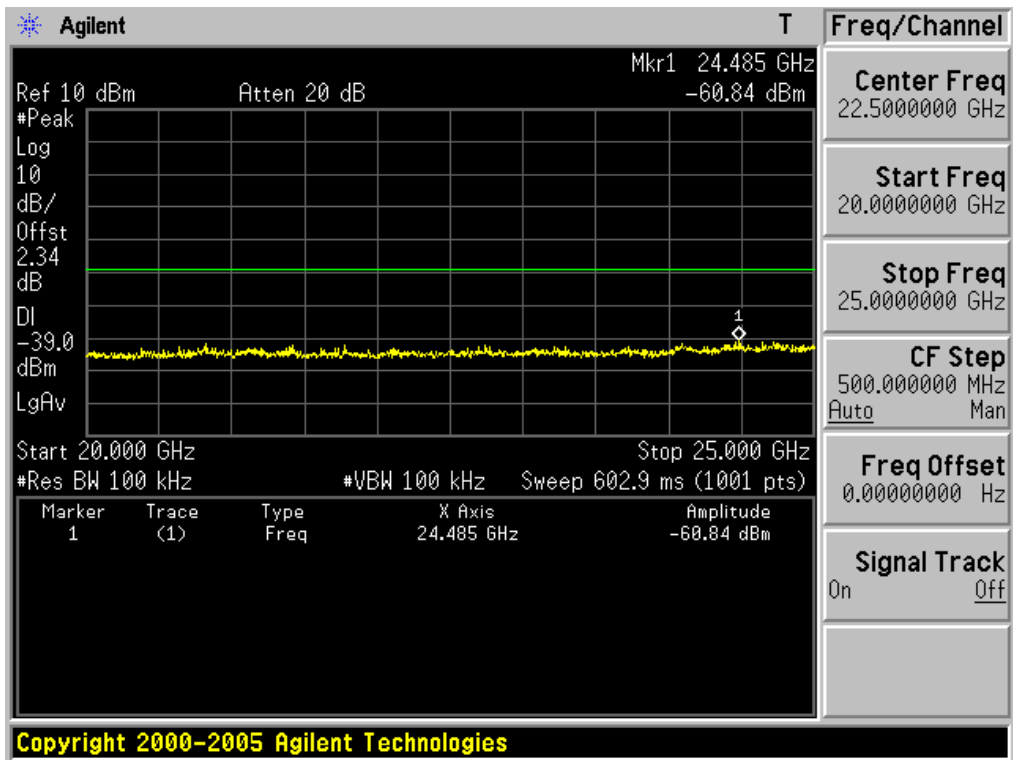
10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11g & Lowest Frequency



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

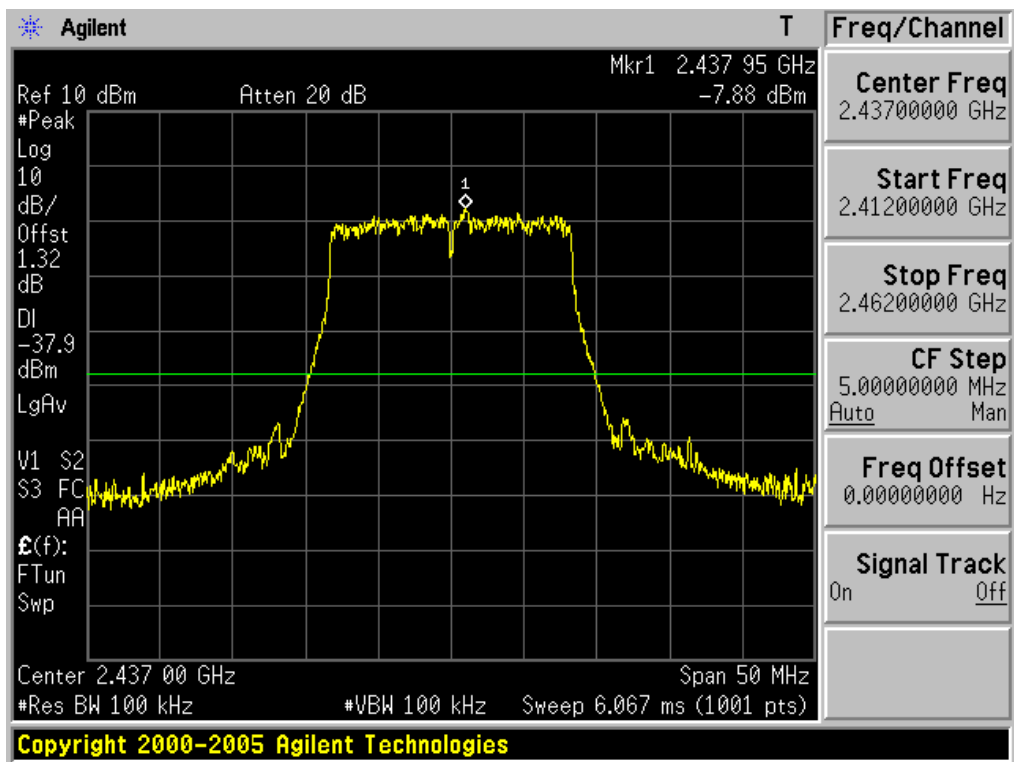


20GHz ~ 25GHz Conducted Spurious Emissions Test Mode: 802.11g & Lowest Frequency

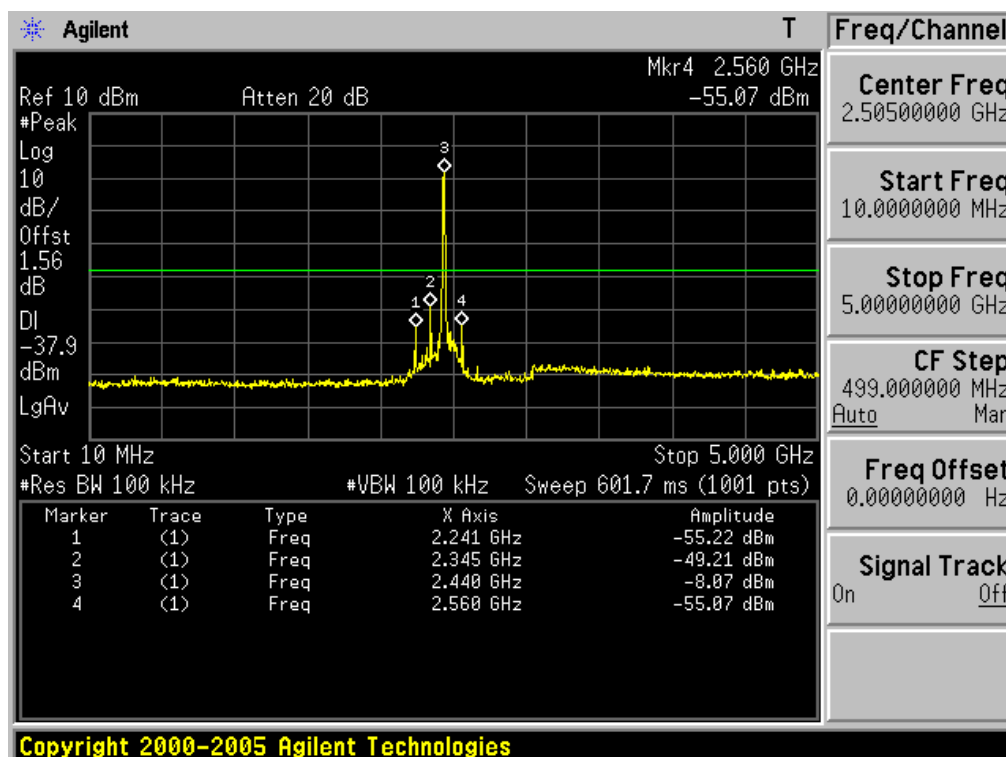


Reference for limit

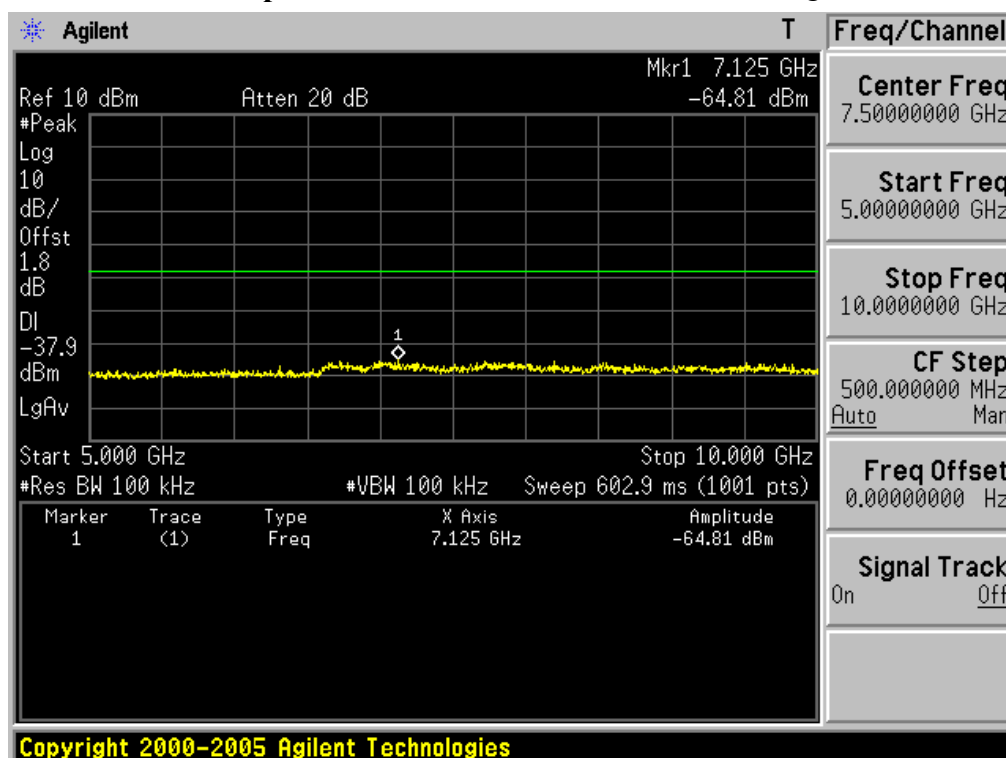
Test Mode: 802.11g & Middle Frequency



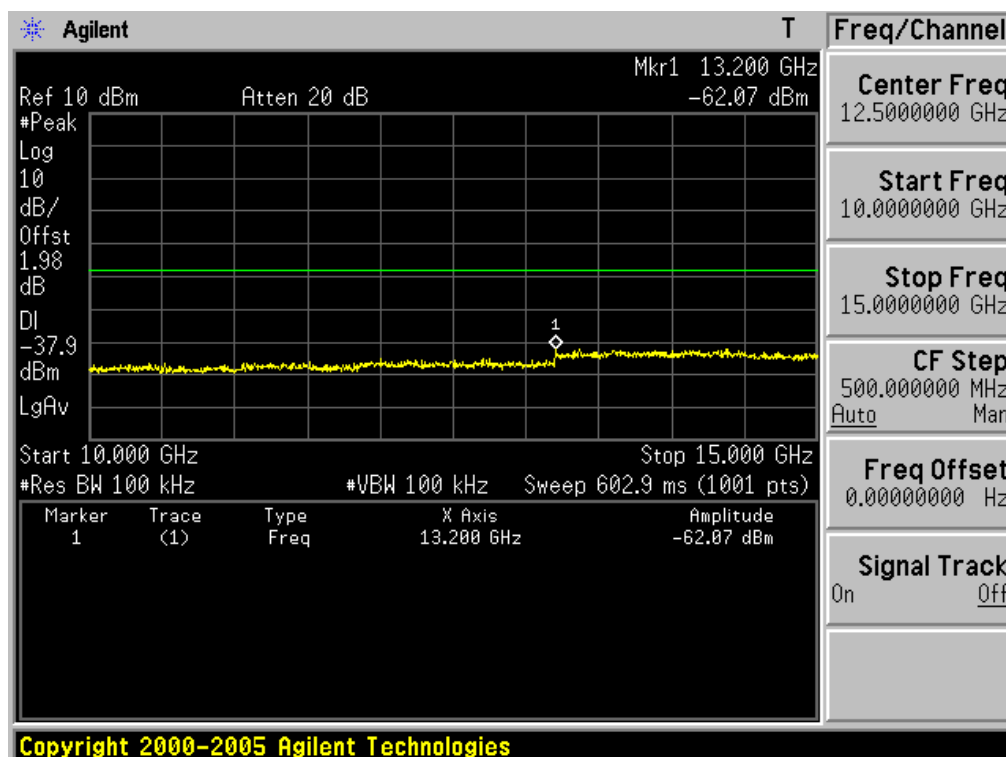
10MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11g & Middle Frequency



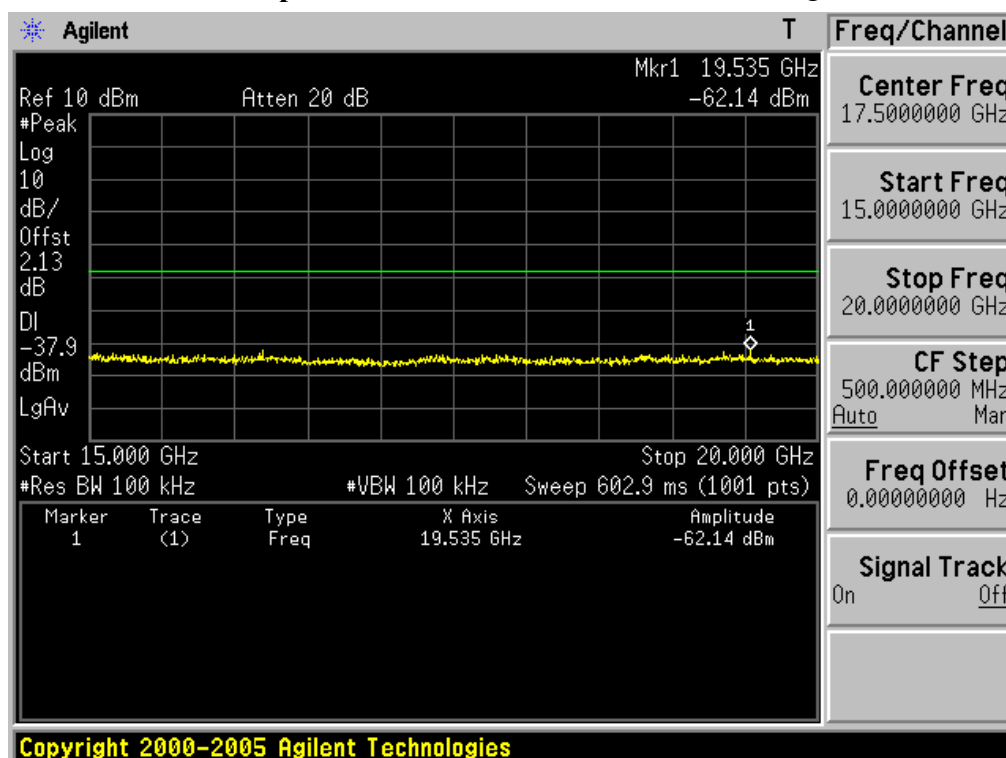
5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11g & Middle Frequency



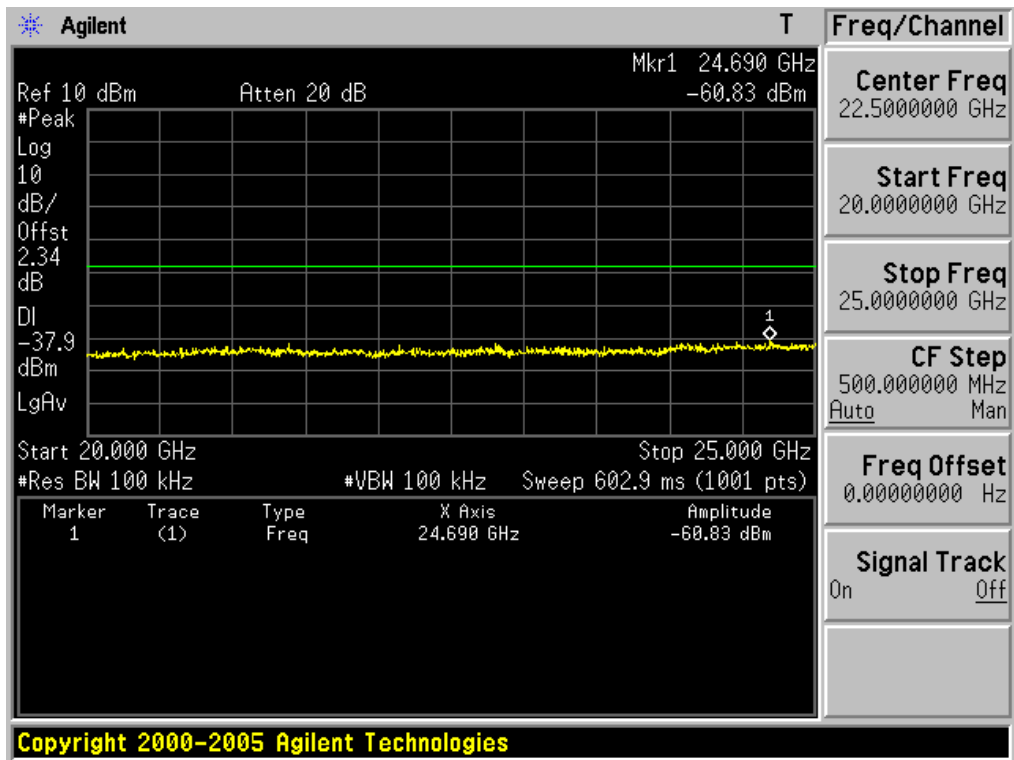
10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11g & Middle Frequency



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

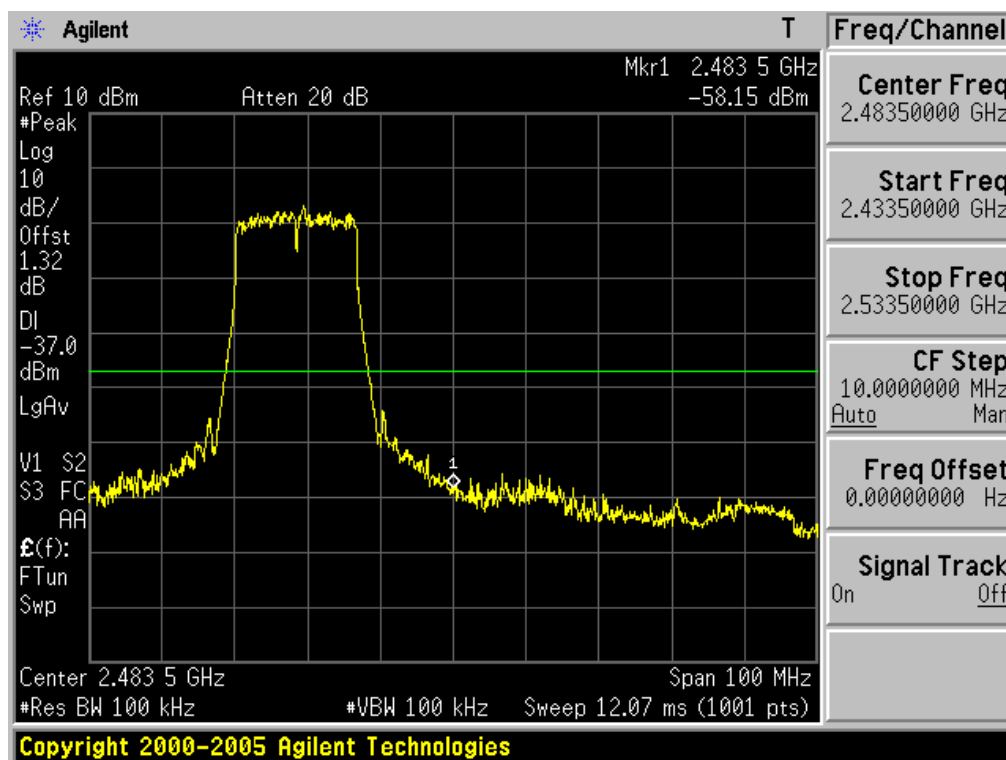


20GHz ~ 25GHz Conducted Spurious Emissions Test Mode: 802.11g & Middle Frequency

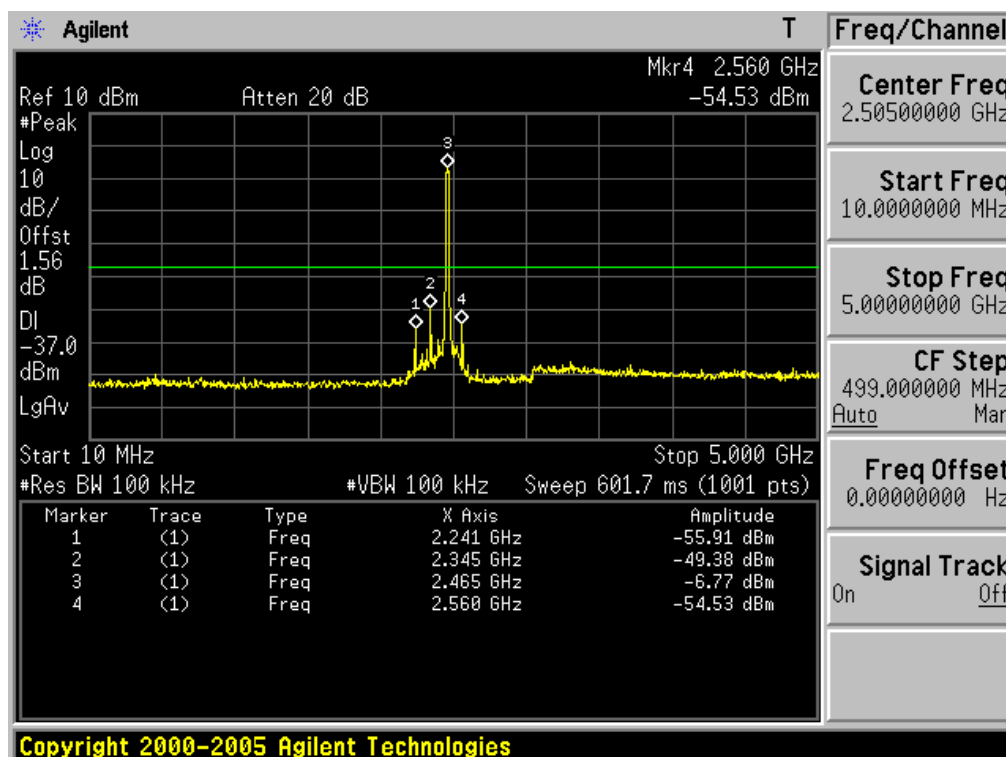


High Band-edge at 30 dB blow

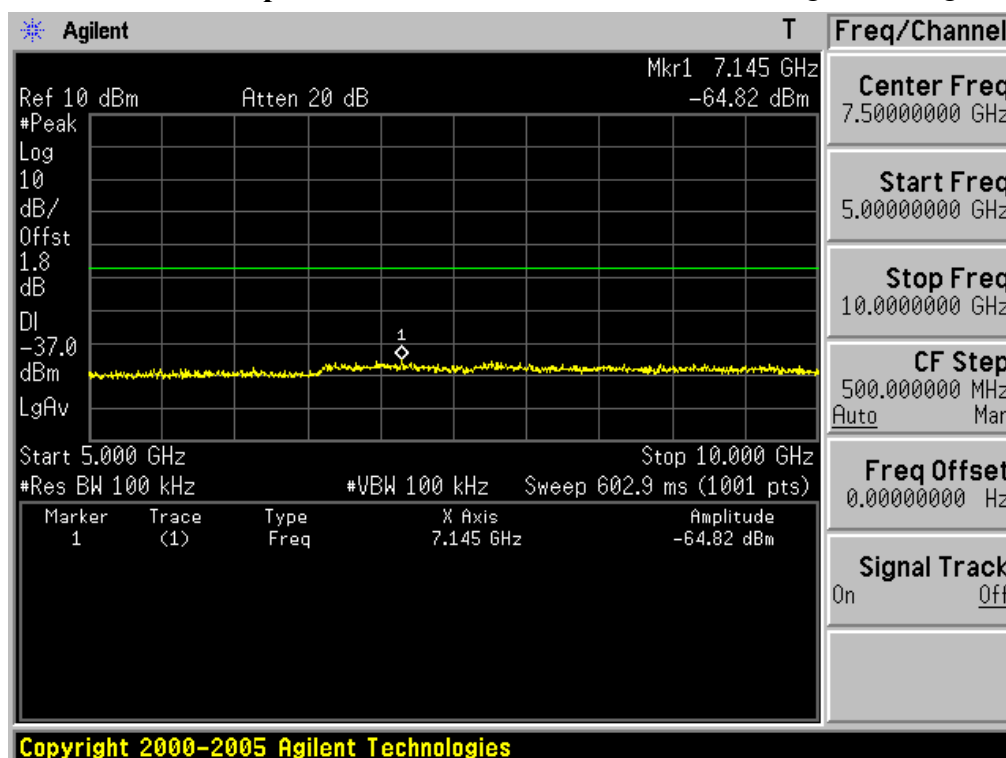
Test Mode: 802.11g & Highest Frequency



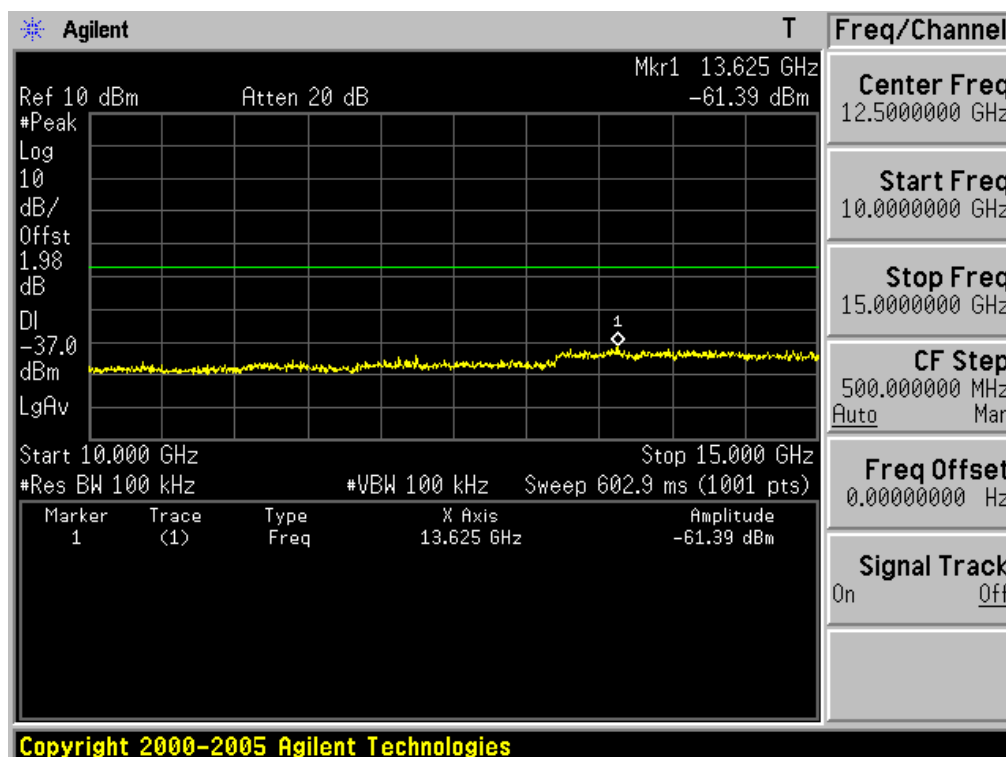
10MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11g & Highest Frequency



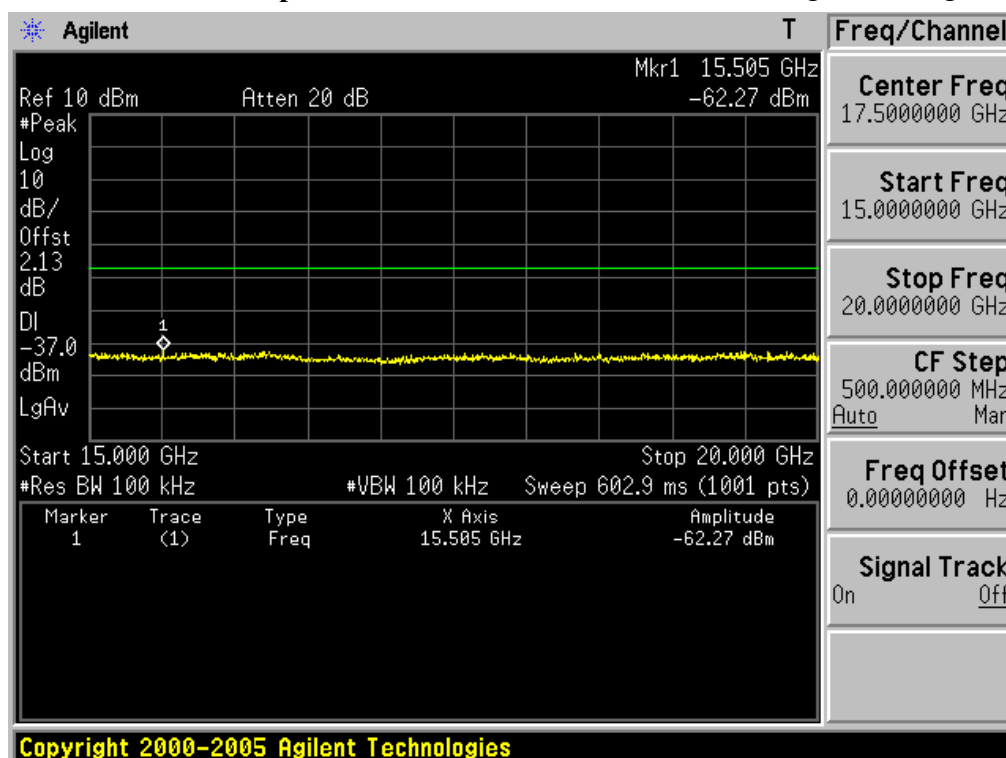
5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11g & Highest Frequency



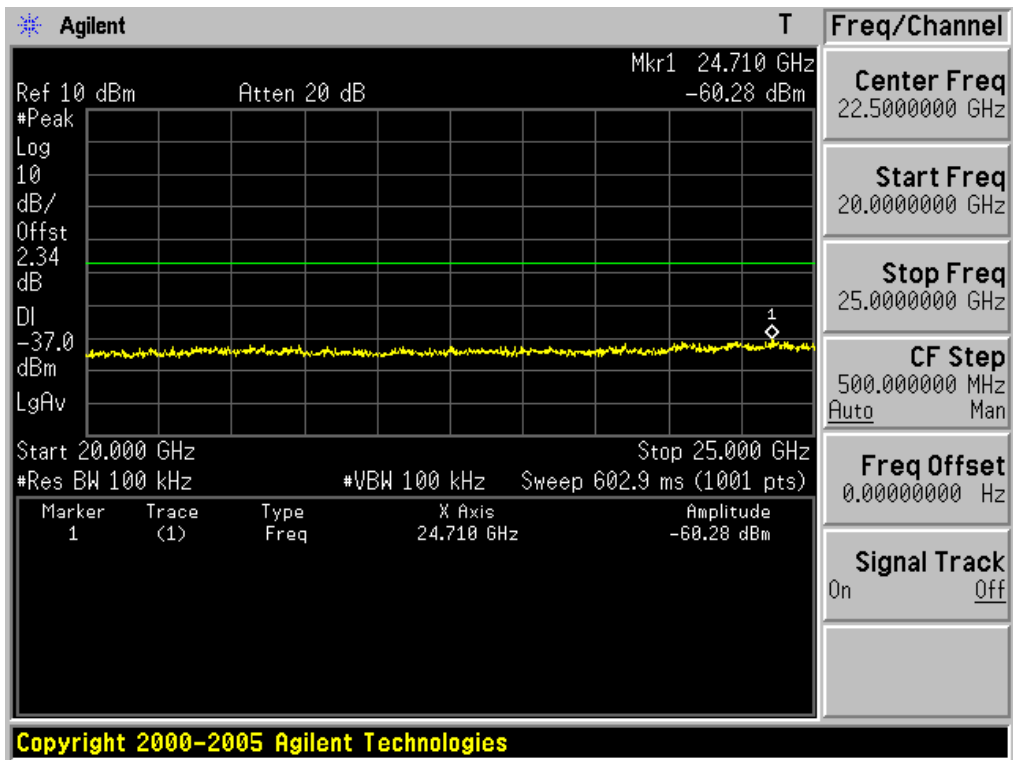
10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11g & Highest Frequency



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



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



4.2.4 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.

Note 2: This test item was performed in all the test cases.

- 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.

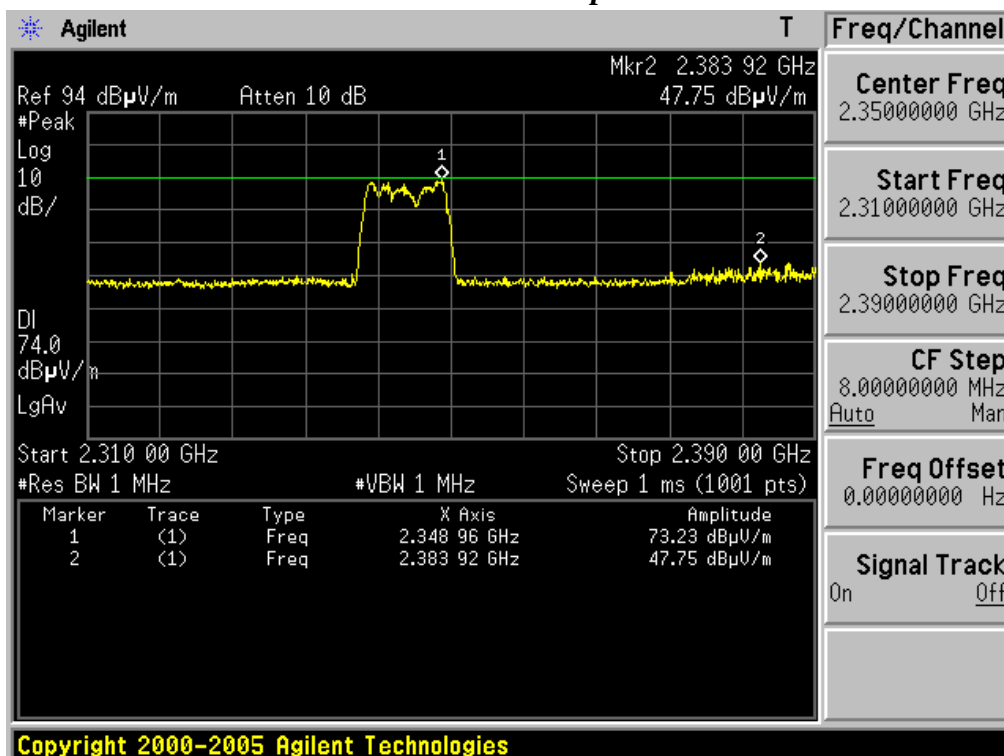
▪ FCC Part 15.205 (a): Only spurious emissions are permitted in any of the frequency bands listed below:

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 ~ 12.52025	149.9 ~ 150.05	1645.5 ~ 1646.5	5.35 ~ 5.46	17.7 ~ 21.4
4.125 ~ 4.128	12.57675 ~ 12.57725	156.52475 ~ 156.52525	1660 ~ 1710	7.25 ~ 7.75	22.01 ~ 23.12
4.17725 ~ 4.17775	13.36 ~ 13.41	156.7 ~ 156.9	1718.8 ~ 1722.2	8.025 ~ 8.5	23.6 ~ 24.0
4.20725 ~ 4.20775	16.42 ~ 16.423	162.0125 ~ 167.17	2200 ~ 2300	9.0 ~ 9.2	31.2 ~ 31.8
6.215 ~ 6.218	16.69475 ~ 16.69525	167.72 ~ 173.2	2310 ~ 2390	9.3 ~ 9.5	36.43 ~ 36.5
6.26775 ~ 6.26825	16.80425 ~ 16.80475	240 ~ 285	2483.5 ~ 2500	10.6 ~ 12.7	Above 38.6
6.31175 ~ 6.31225	25.5 ~ 25.67	322 ~ 335.4	2655 ~ 2900	13.25 ~ 13.4	
8.291 ~ 8.294	37.5 ~ 38.25	399.90 ~ 410	3260 ~ 3267		
8.362 ~ 8.366	73 ~ 74.6	608 ~ 614	3332 ~ 3339		
8.37625 ~ 8.38675	74.8 ~ 75.2	960 ~ 1240	3345.8 ~ 3358		

▪ **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.

Restricted Band Edge Test Mode: 802.11b & Lowest Frequency & Test case 1

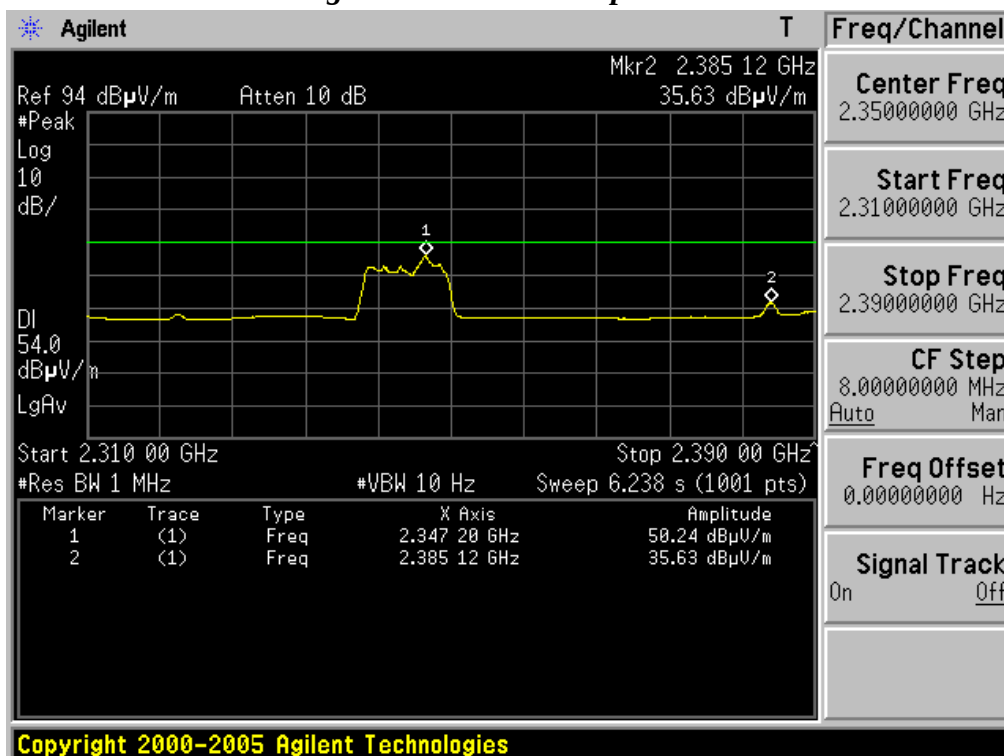
Peak mode / Horizontal polarization



Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

Restricted Band Edge Test Mode: 802.11b & Lowest Frequency & Test case 1

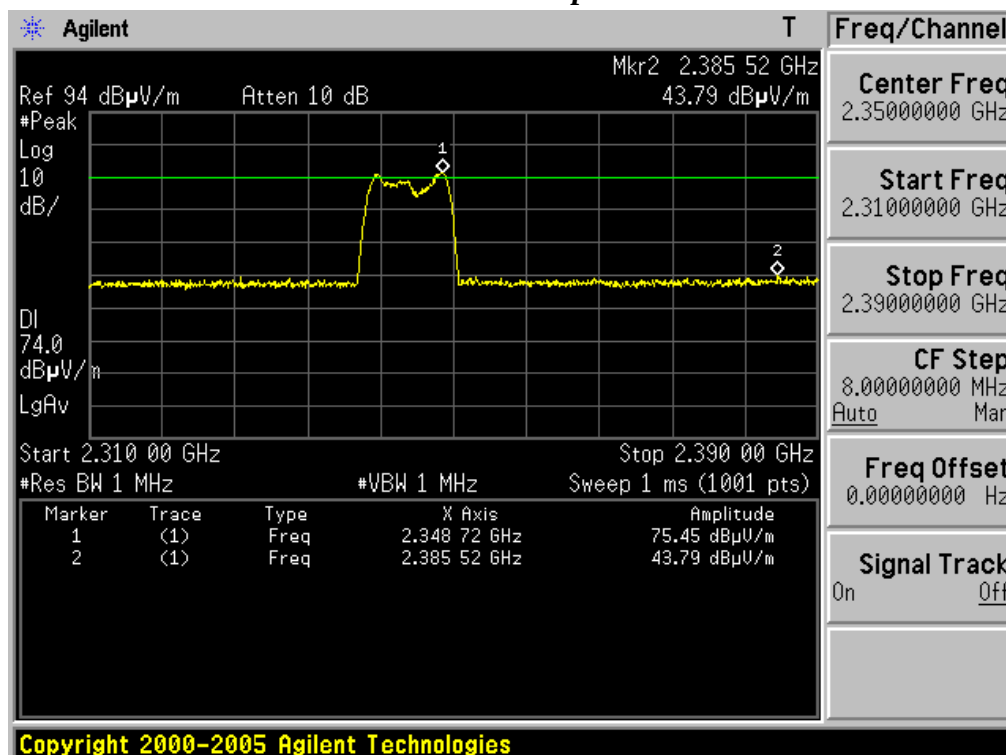
Average mode / Horizontal polarization



Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

Restricted Band Edge Test Mode: 802.11b & Lowest Frequency & Test case 1

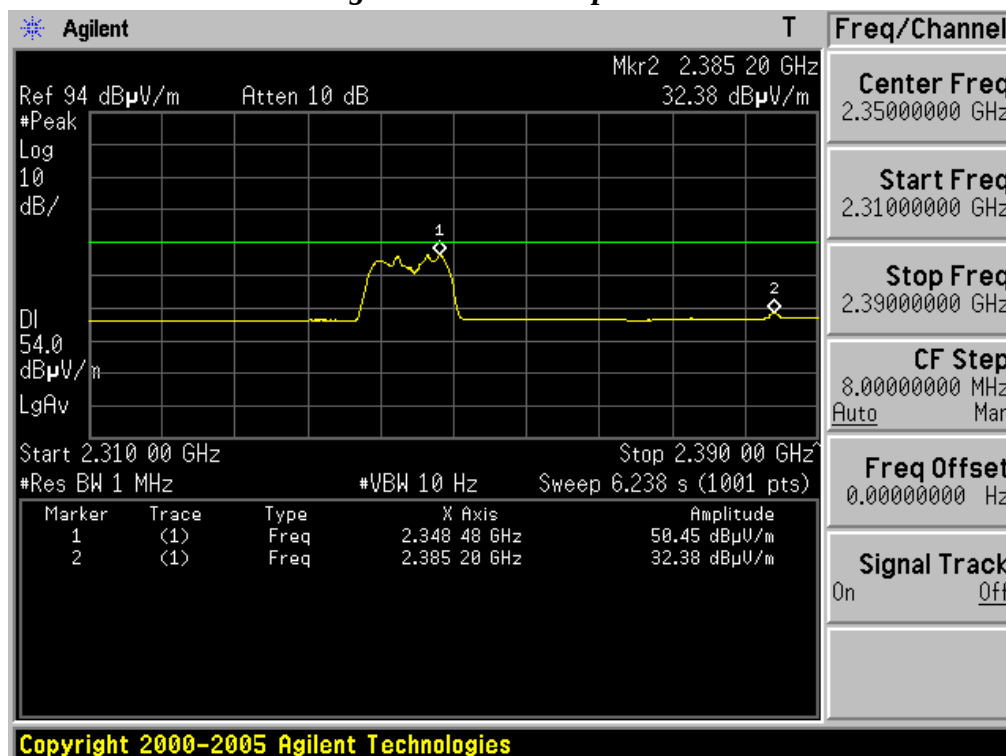
Peak mode / Vertical polarization



Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

Restricted Band Edge Test Mode: 802.11b & Lowest Frequency & Test case 1

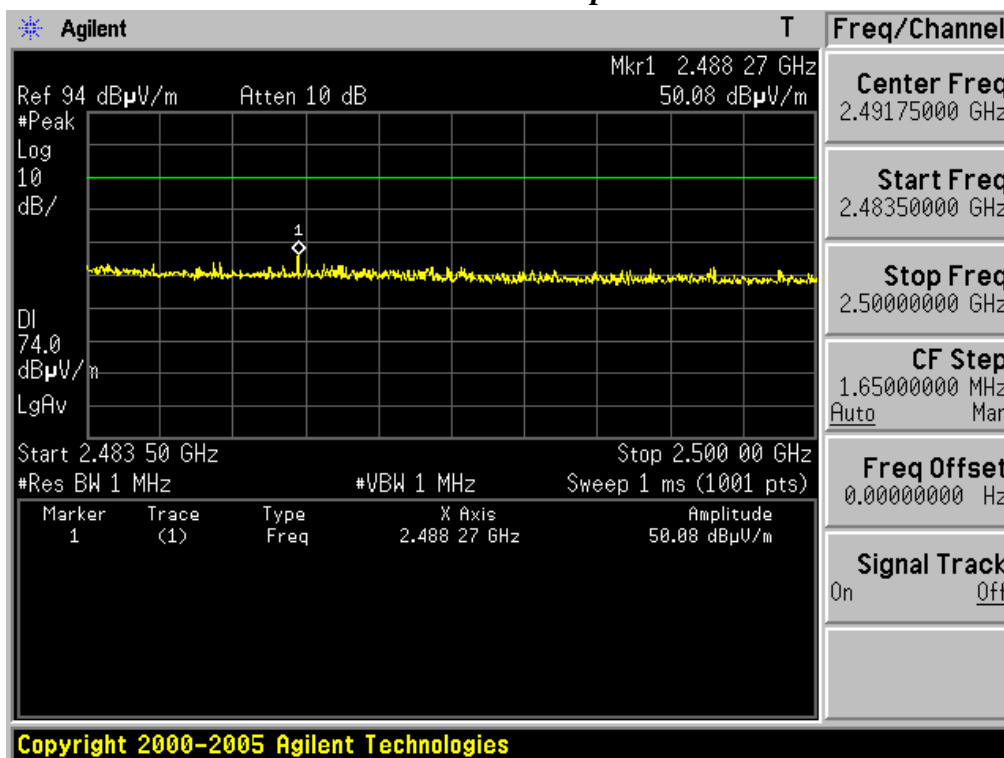
Average mode / Vertical polarization



Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

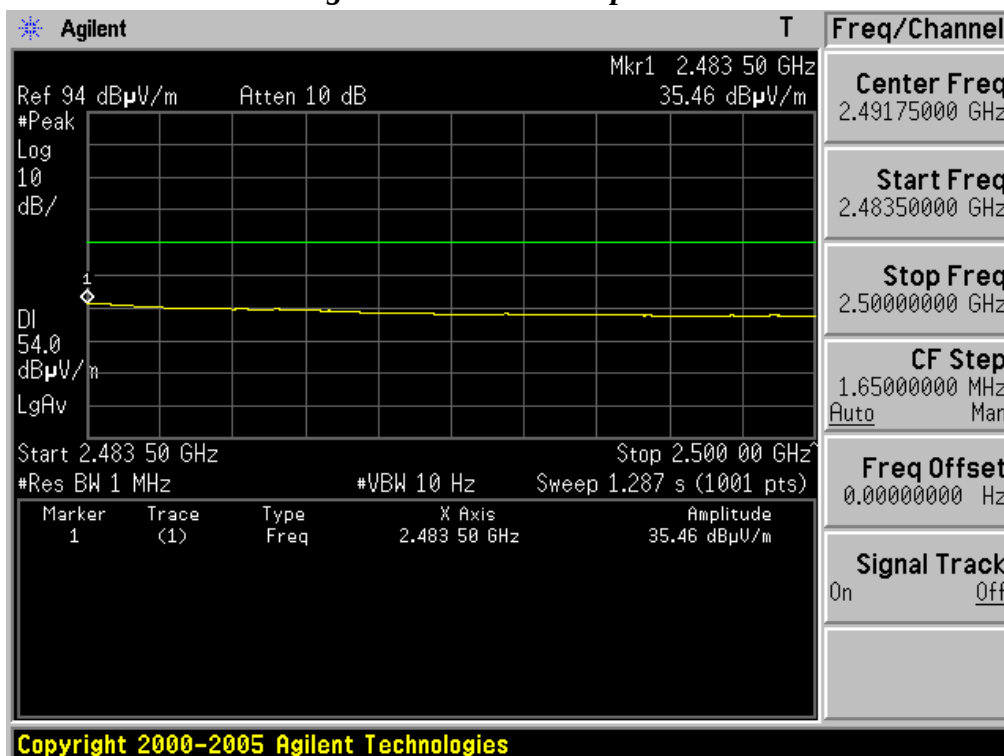
Restricted Band Edge Test Mode: 802.11b & Highest Frequency & Test case 1

Peak mode / Horizontal polarization



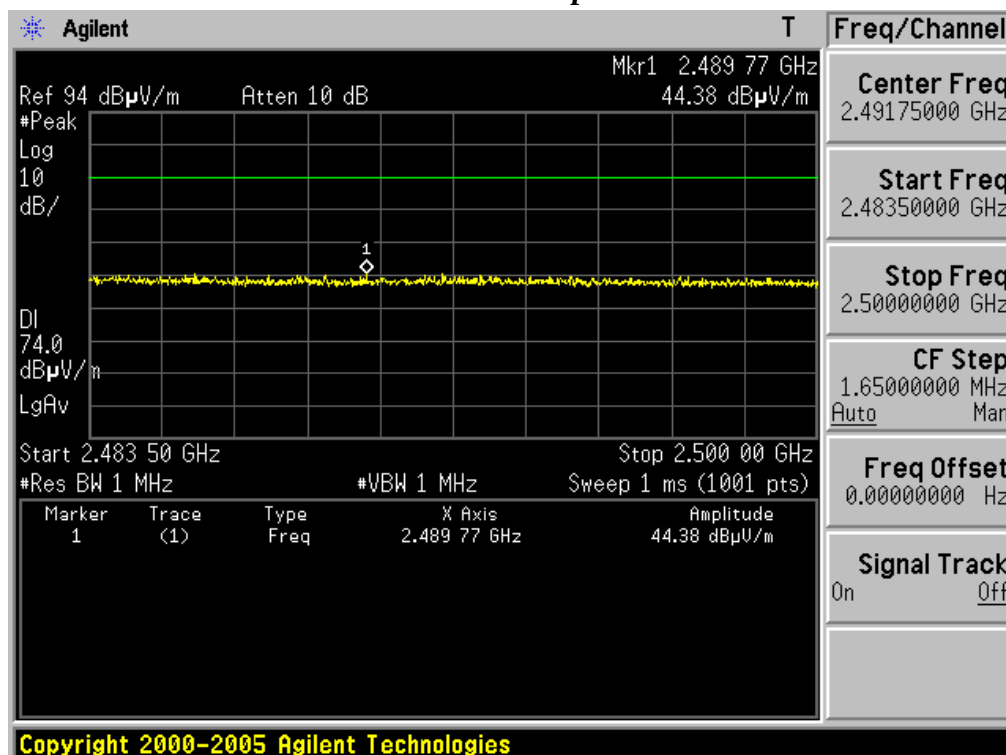
Restricted Band Edge Test Mode: 802.11b & Highest Frequency & Test case 1

Average mode / Horizontal polarization



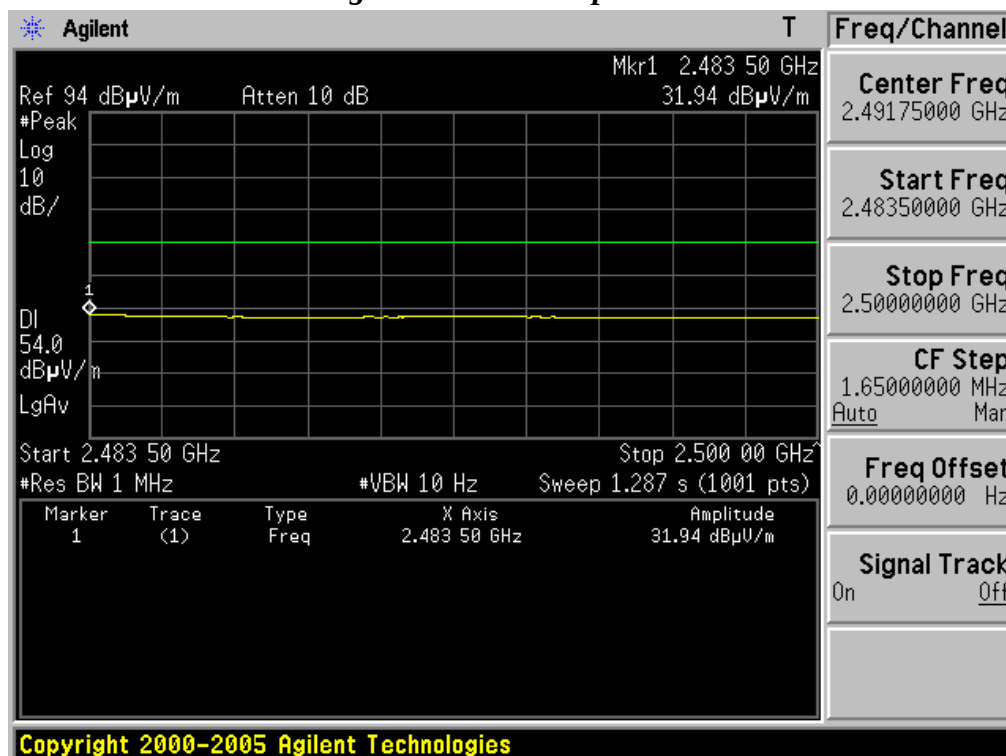
Restricted Band Edge Test Mode: 802.11b & Highest Frequency & Test case 1

Peak mode / Vertical polarization



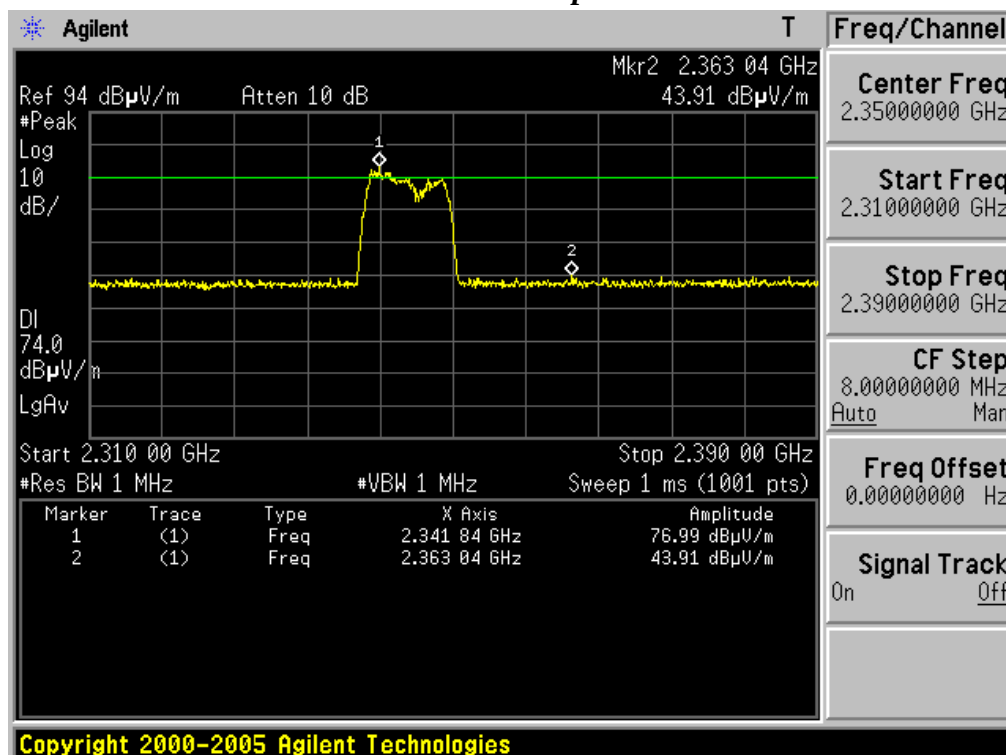
Restricted Band Edge Test Mode: 802.11b & Highest Frequency & Test case 1

Average mode / Vertical polarization



Restricted Band Edge Test Mode: 802.11g & Lowest Frequency & Test case 1

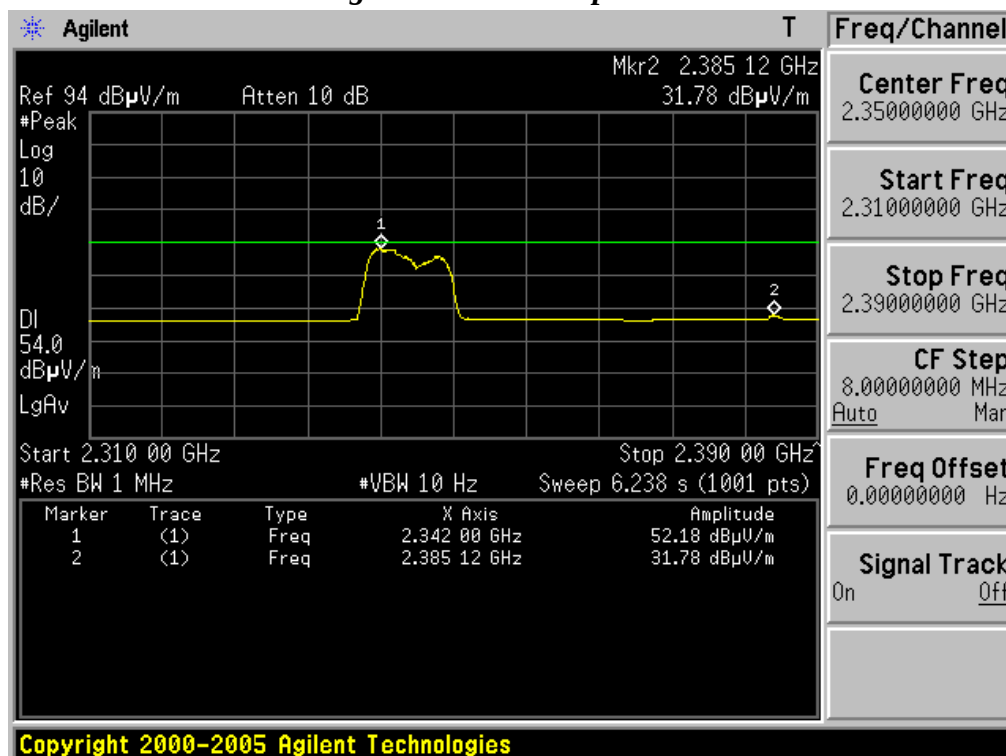
Peak mode / Vertical polarization



Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

Restricted Band Edge Test Mode: 802.11g & Lowest Frequency & Test case 1

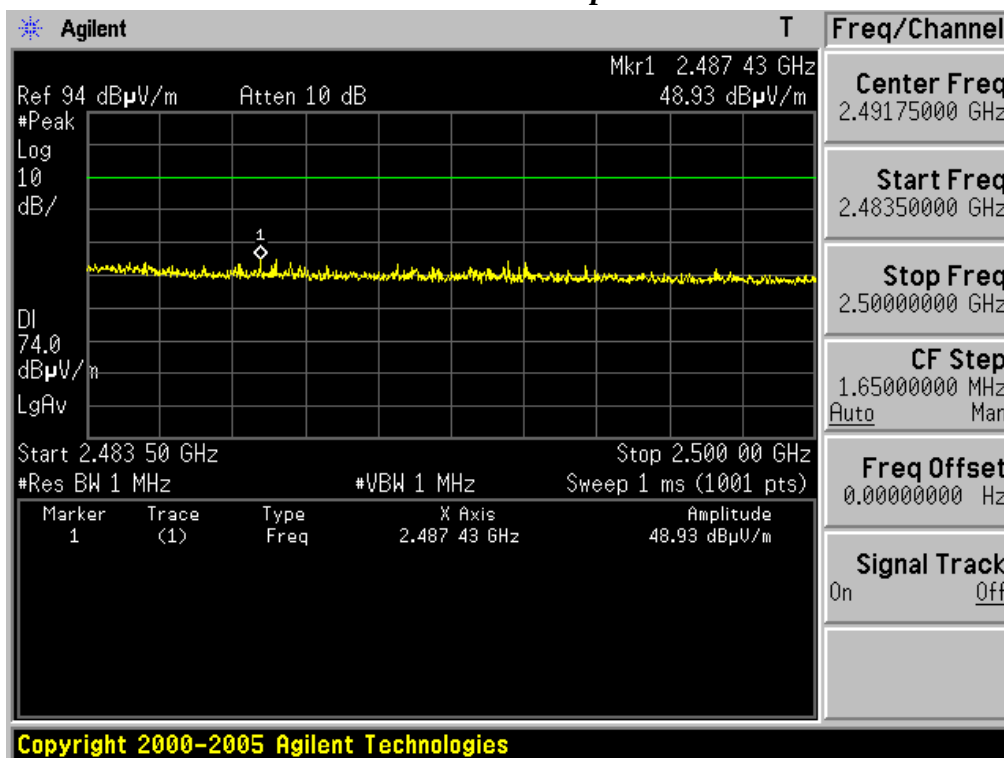
Average mode / Vertical polarization



Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

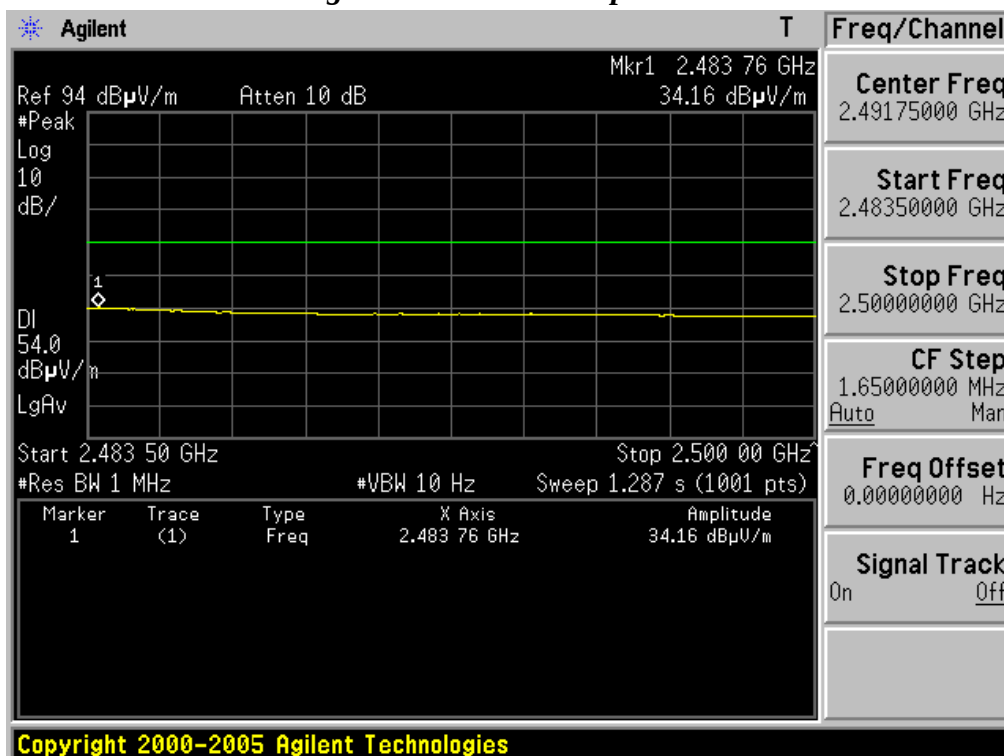
Restricted Band Edge Test Mode: 802.11g & Highest Frequency & Test case 1

Peak mode / Horizontal polarization



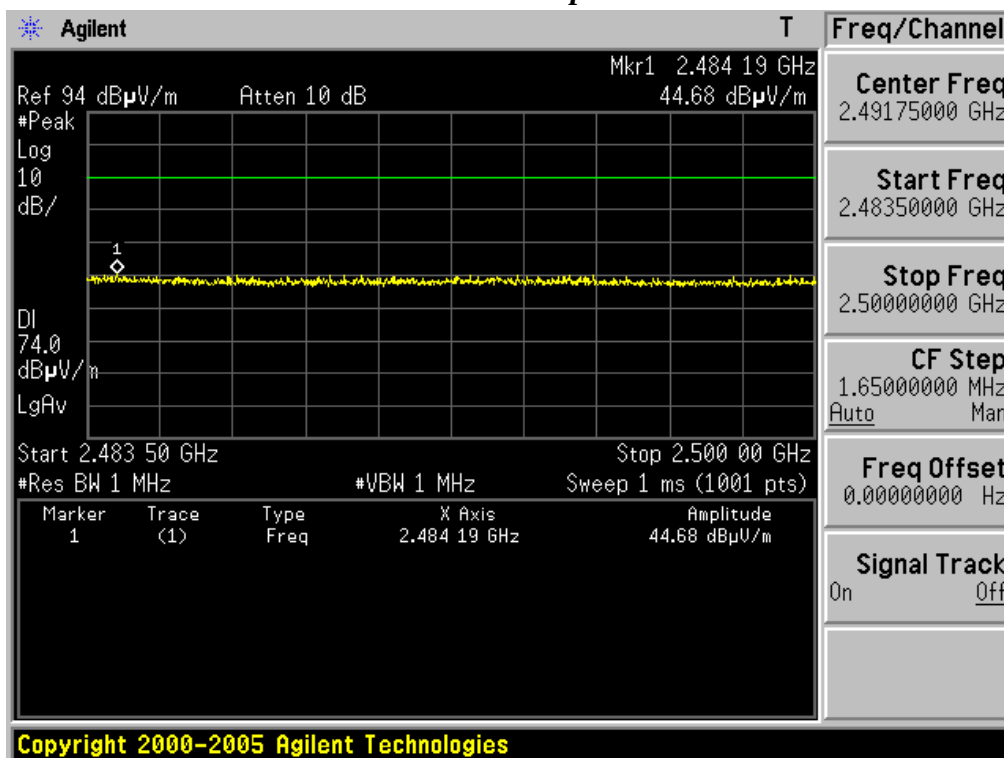
Restricted Band Edge Test Mode: 802.11g & Highest Frequency & Test case 1

Average mode / Horizontal polarization



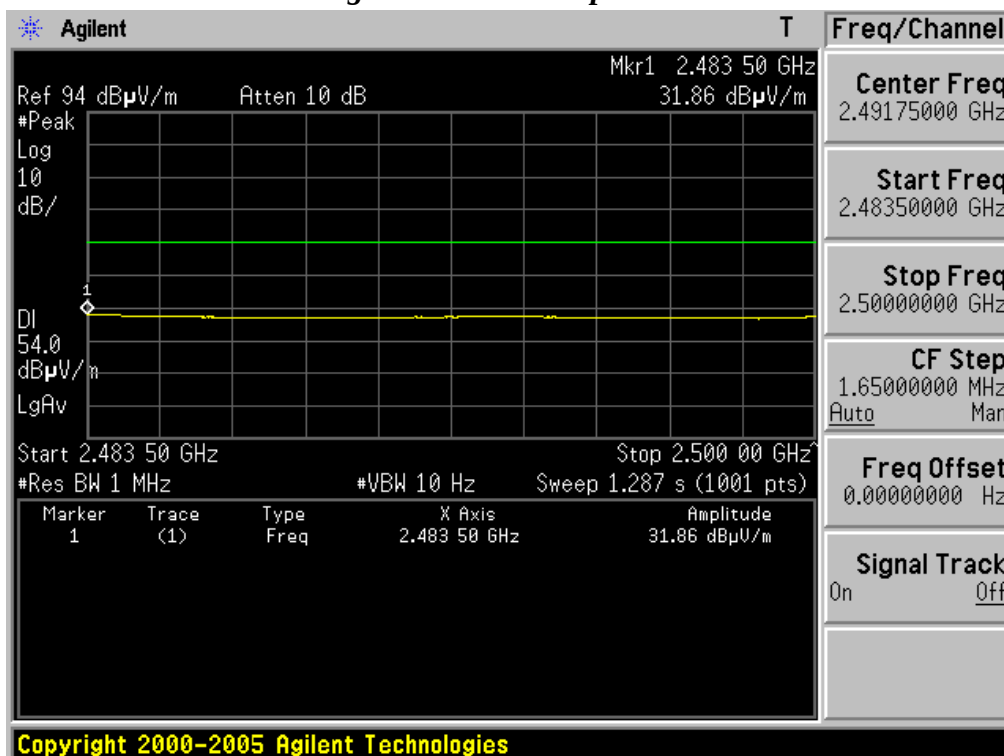
Restricted Band Edge Test Mode: 802.11g & Highest Frequency & Test case 1

Peak mode / Vertical polarization



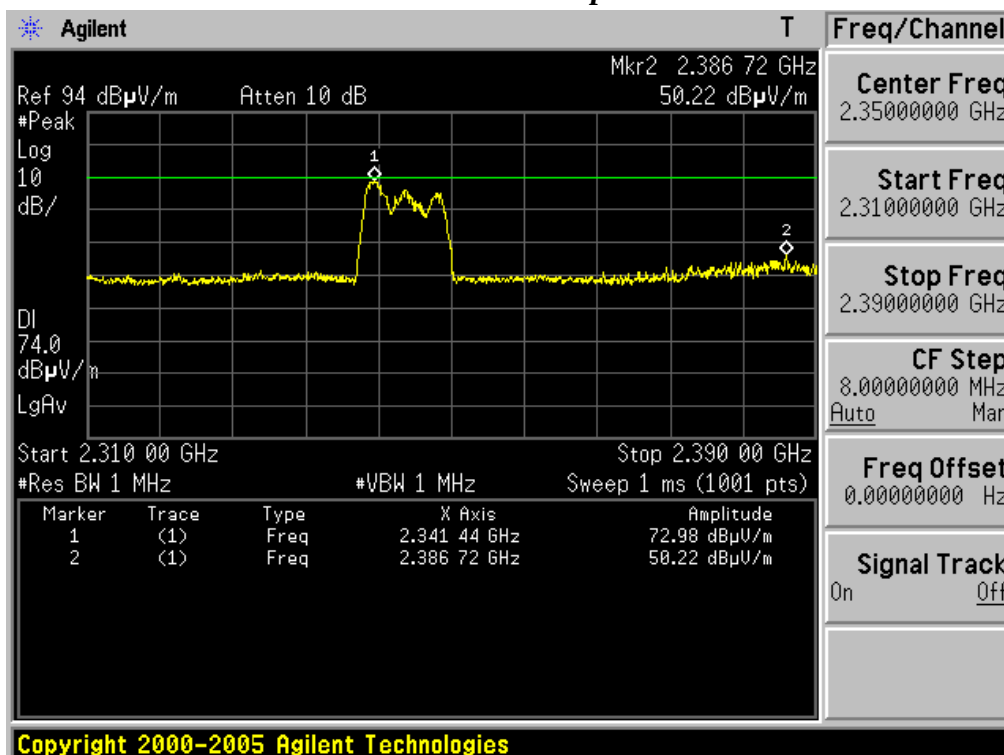
Restricted Band Edge Test Mode: 802.11g & Highest Frequency & Test case 1

Average mode / Vertical polarization



Restricted Band Edge Test Mode: 802.11b & Lowest Frequency & Test case 2

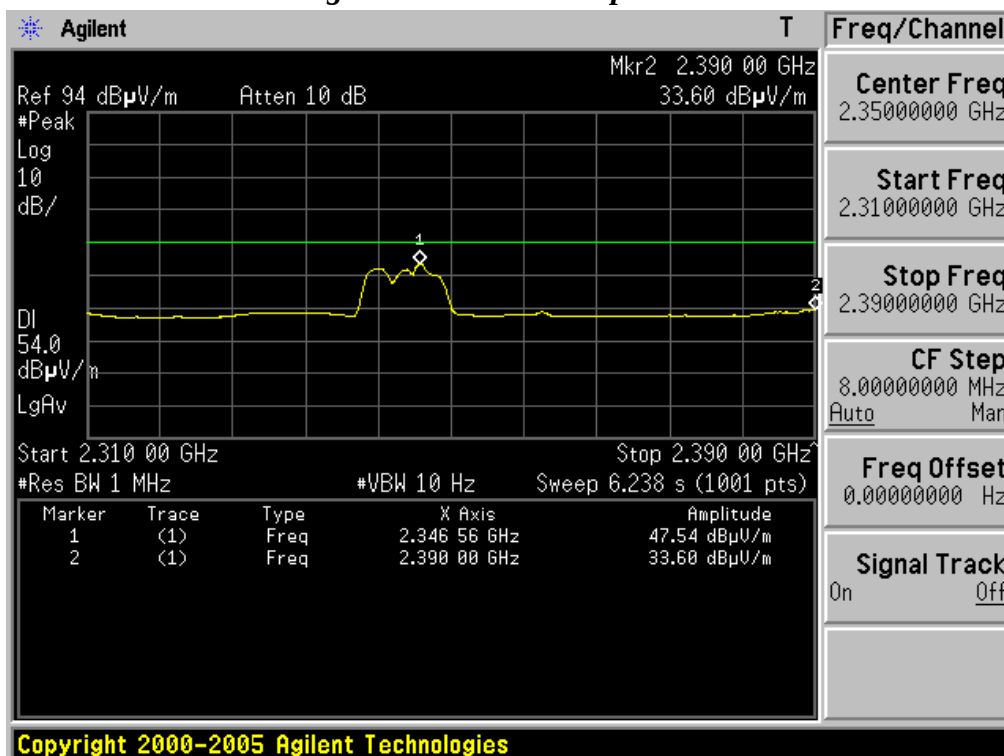
Peak mode / Horizontal polarization



Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

Restricted Band Edge Test Mode: 802.11b & Lowest Frequency & Test case 2

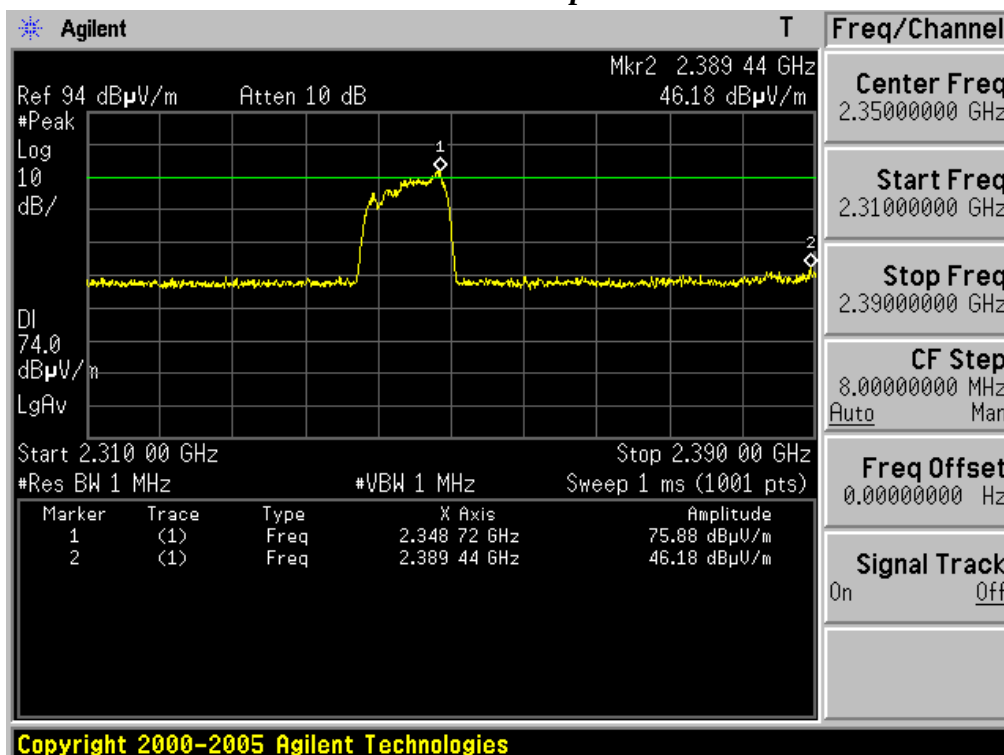
Average mode / Horizontal polarization



Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

Restricted Band Edge Test Mode: 802.11b & Lowest Frequency & Test case 2

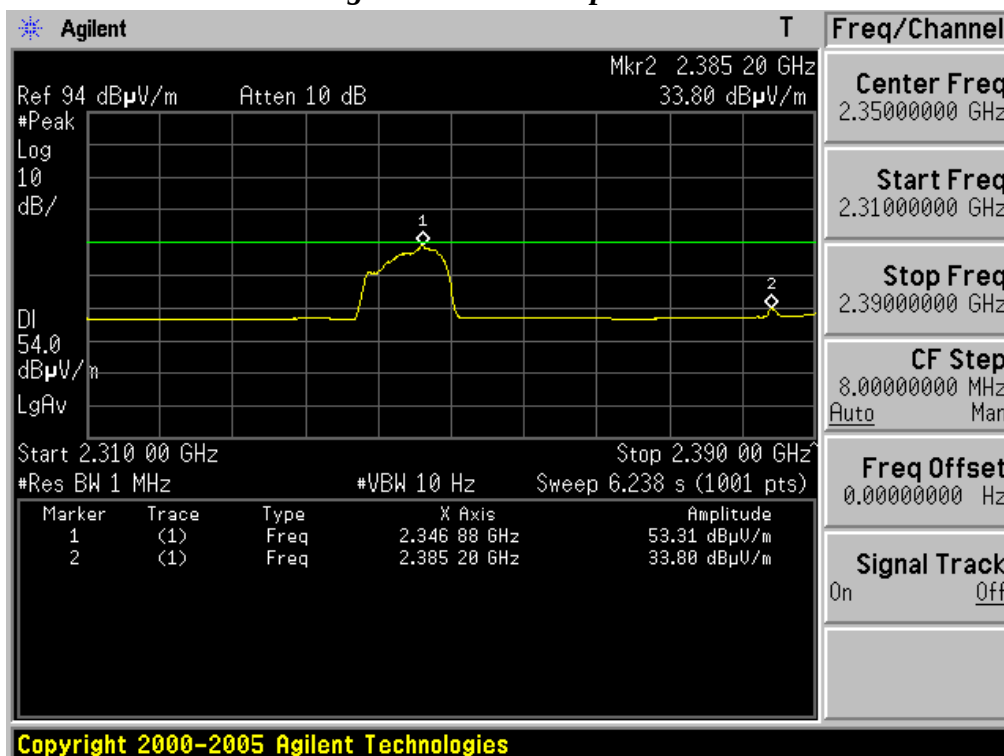
Peak mode / Vertical polarization



Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

Restricted Band Edge Test Mode: 802.11b & Lowest Frequency & Test case 2

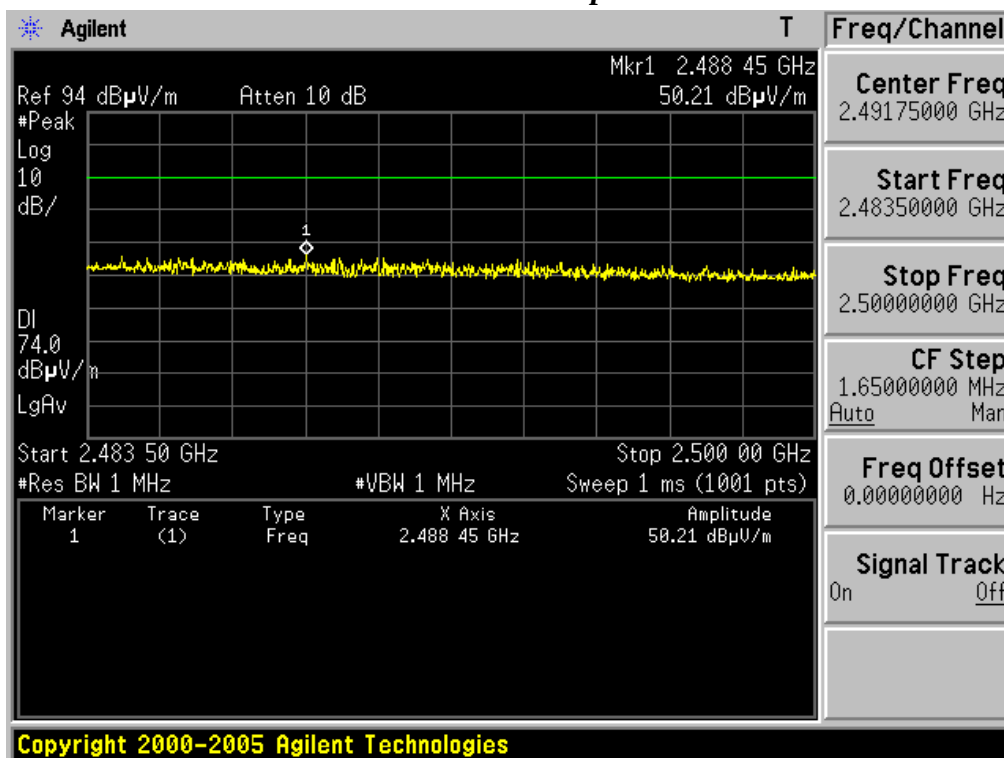
Average mode / Vertical polarization



Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

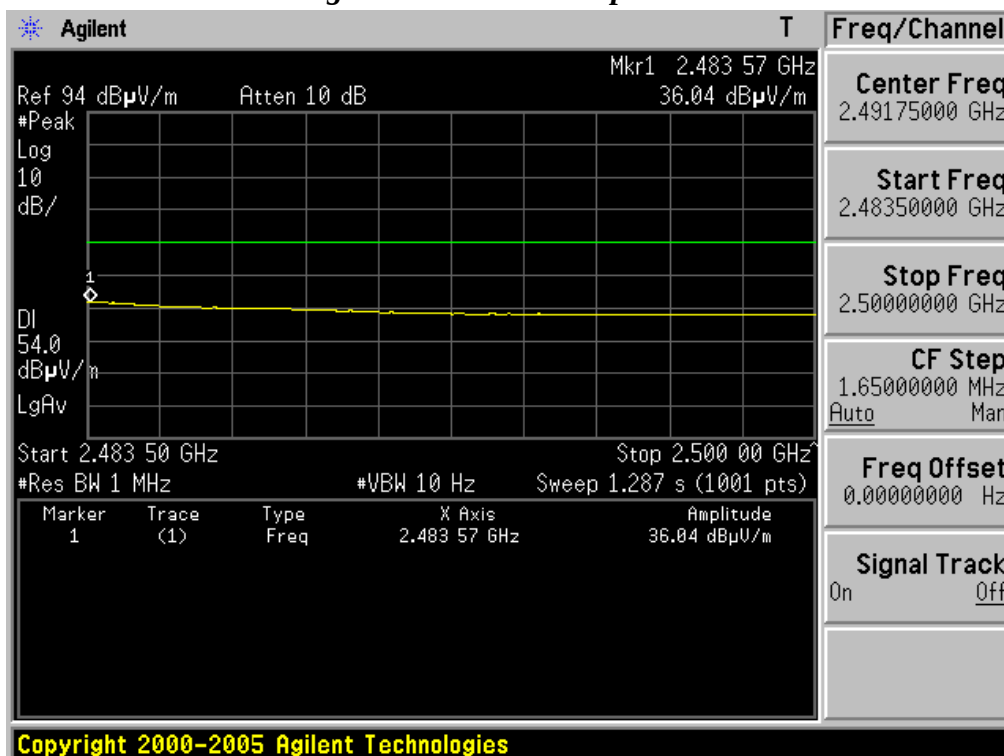
Restricted Band Edge Test Mode: 802.11b & Highest Frequency & Test case 2

Peak mode / Horizontal polarization



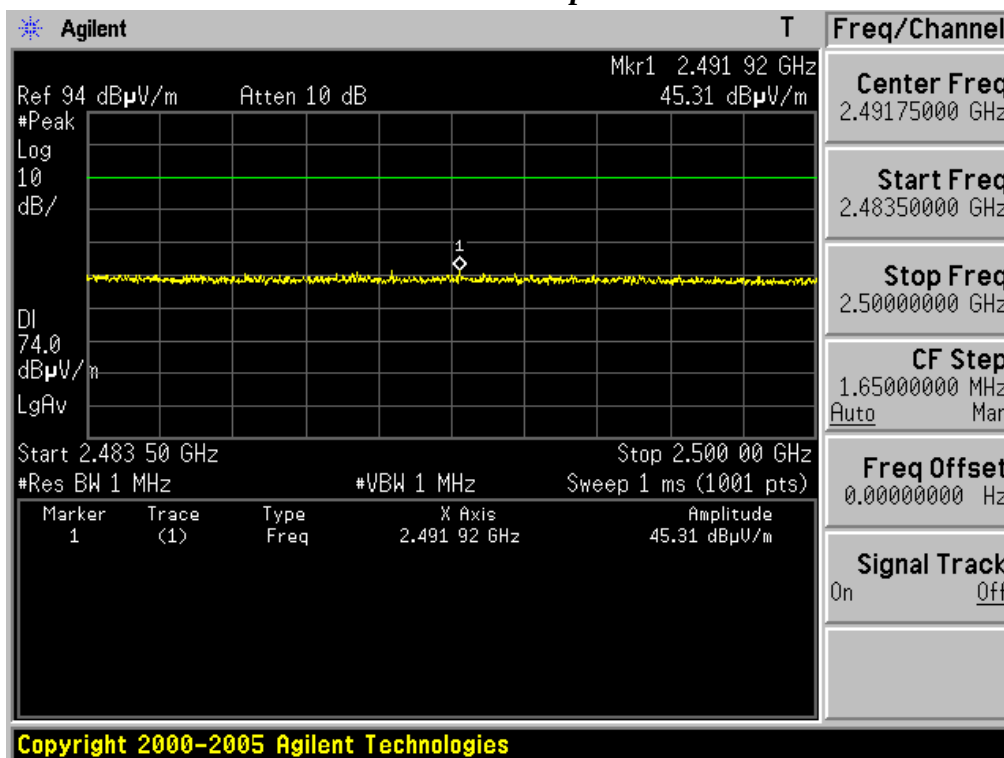
Restricted Band Edge Test Mode: 802.11b & Highest Frequency & Test case 2

Average mode / Horizontal polarization



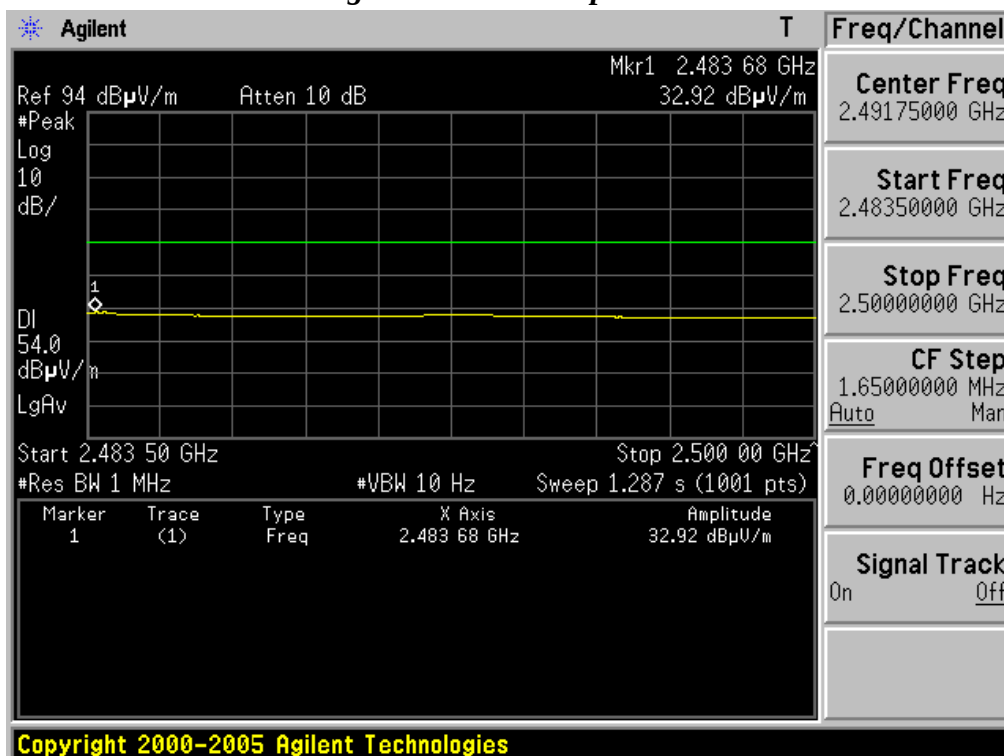
Restricted Band Edge Test Mode: 802.11b & Highest Frequency & Test case 2

Peak mode / Vertical polarization



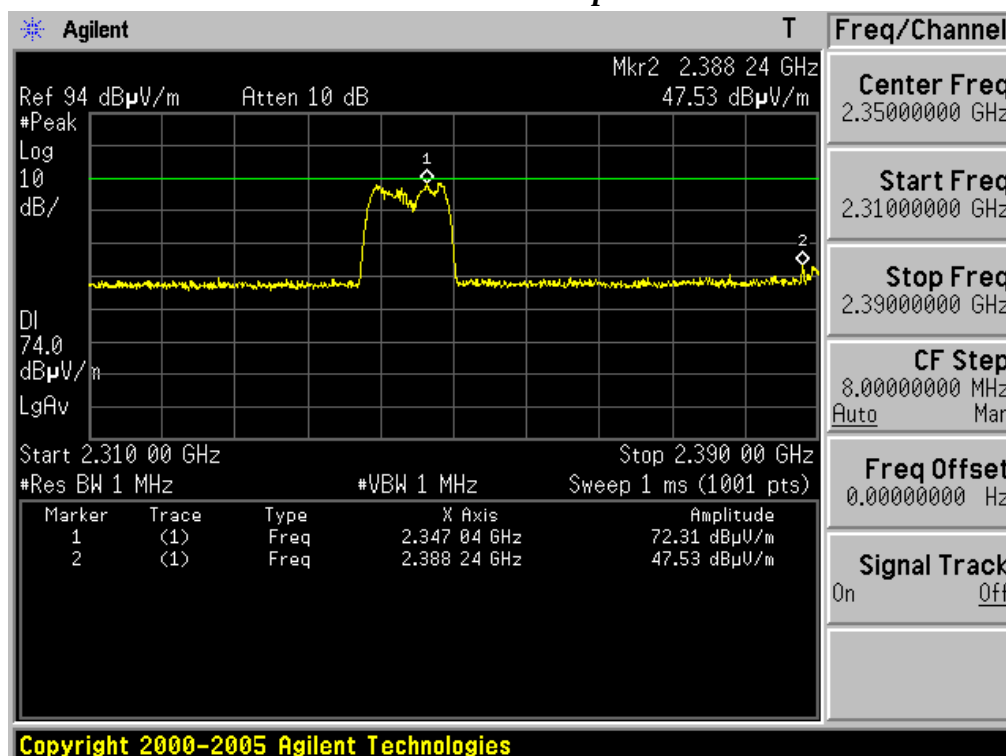
Restricted Band Edge Test Mode: 802.11b & Highest Frequency & Test case 2

Average mode / Vertical polarization



Restricted Band Edge Test Mode: 802.11g & Lowest Frequency & Test case 2

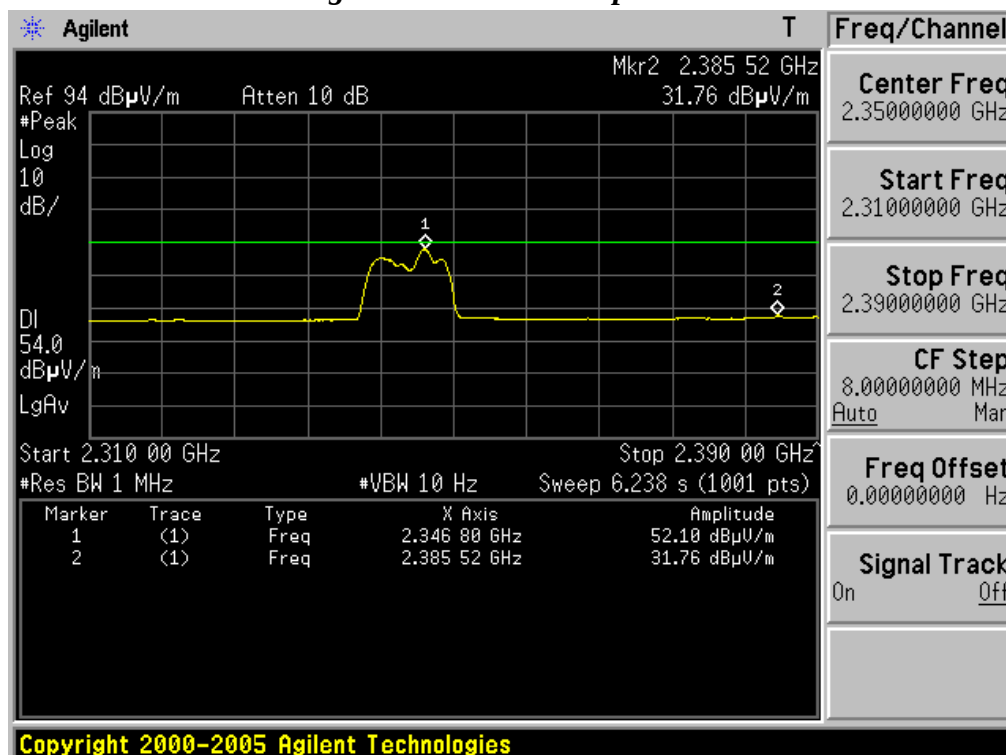
Peak mode / Horizontal polarization



Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

Restricted Band Edge Test Mode: 802.11g & Lowest Frequency & Test case 2

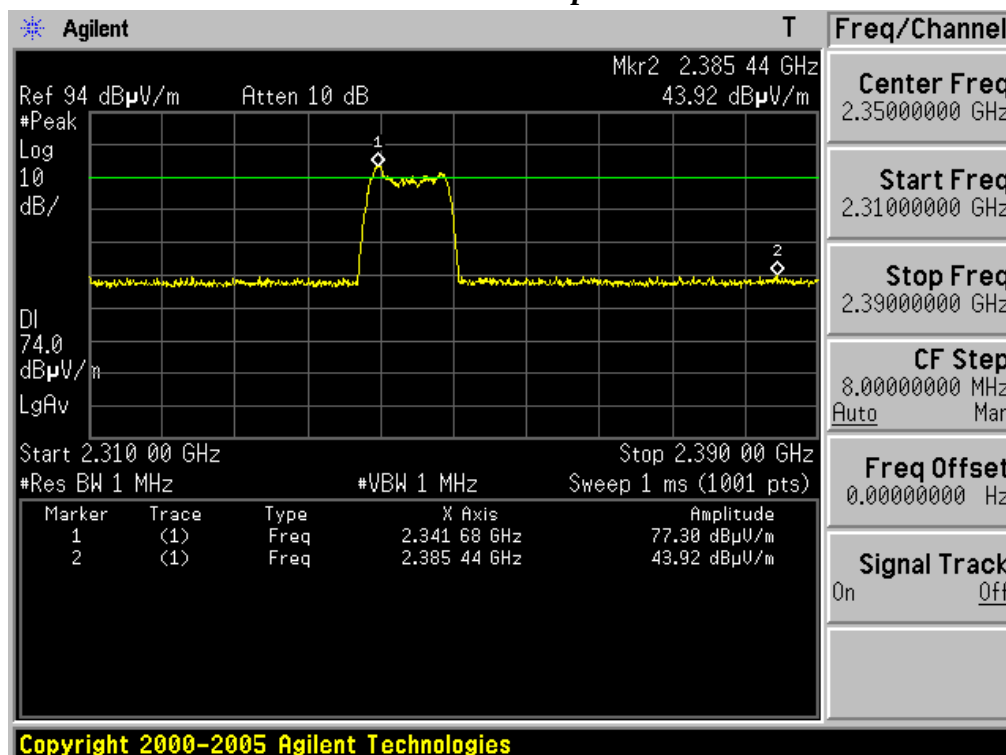
Average mode / Horizontal polarization



Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

Restricted Band Edge Test Mode: 802.11g & Lowest Frequency & Test case 2

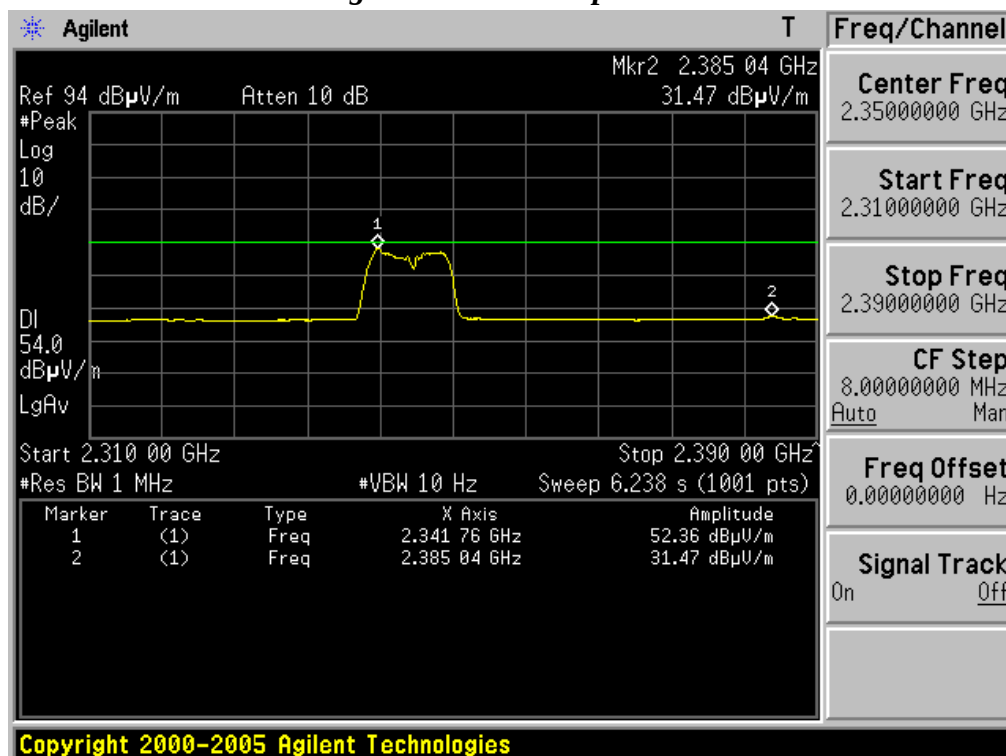
Peak mode / Vertical polarization



Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

Restricted Band Edge Test Mode: 802.11g & Lowest Frequency & Test case 2

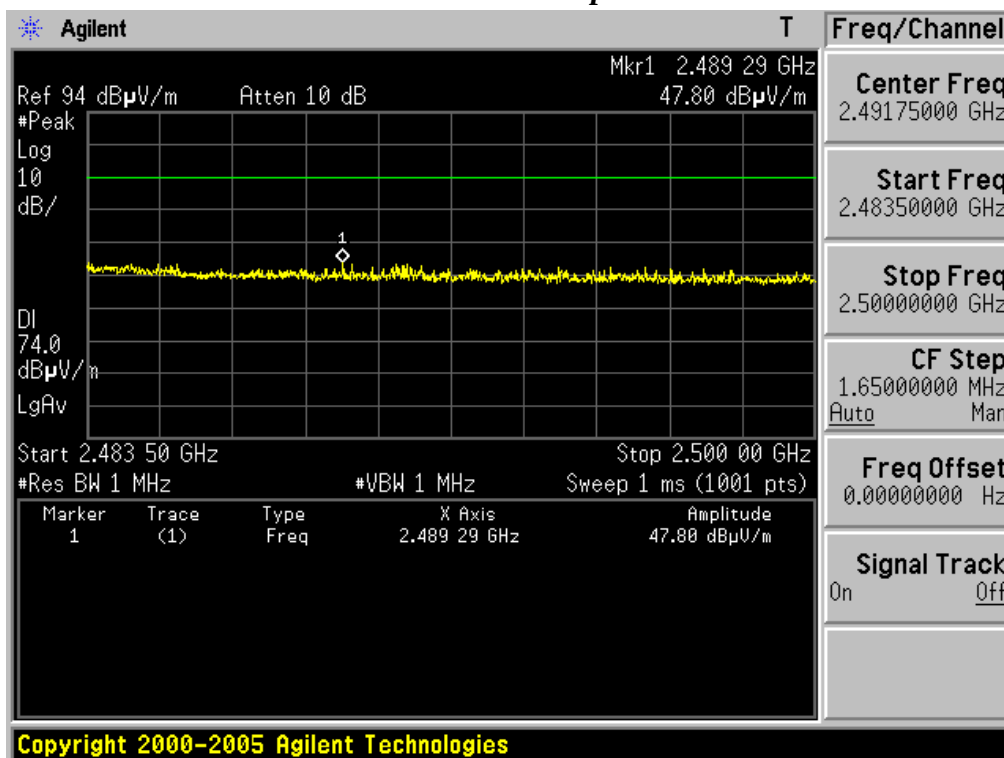
Average mode / Vertical polarization



Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

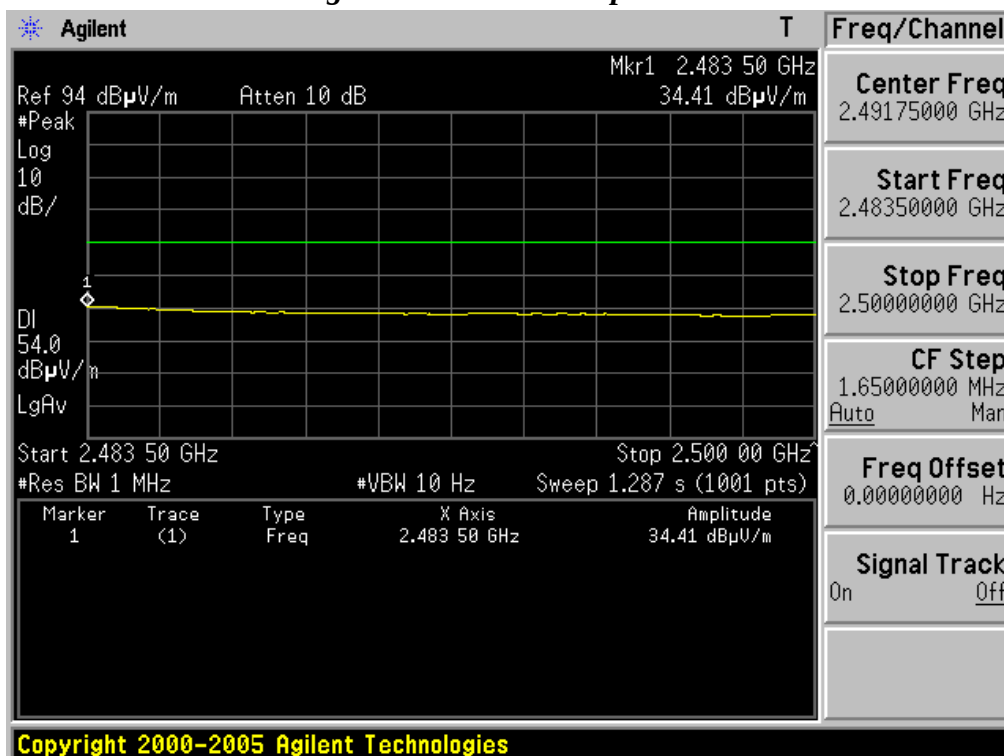
Restricted Band Edge Test Mode: 802.11g & Highest Frequency & Test case 2

Peak mode / Horizontal polarization



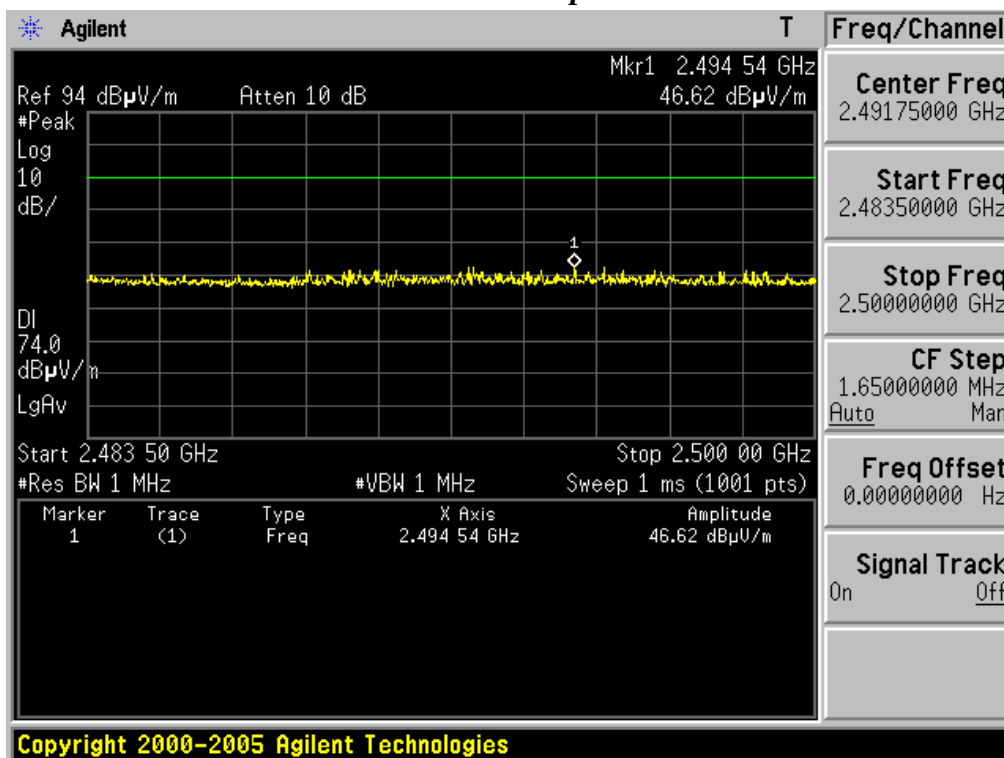
Restricted Band Edge Test Mode: 802.11g & Highest Frequency & Test case 2

Average mode / Horizontal polarization



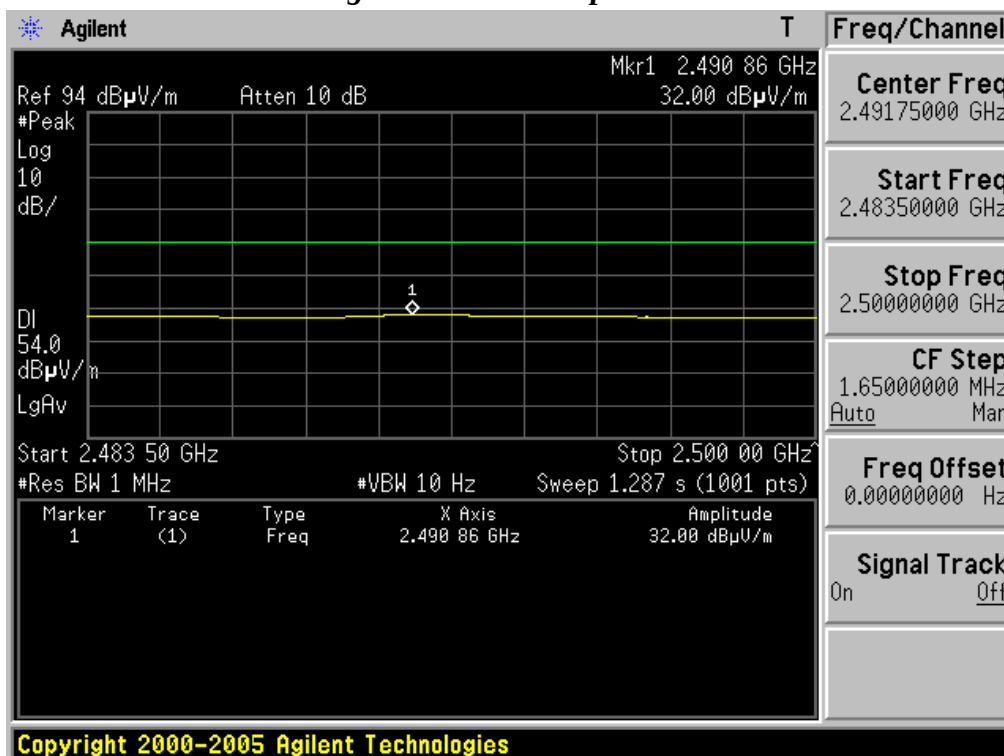
Restricted Band Edge Test Mode: 802.11g & Highest Frequency & Test case 2

Peak mode / Vertical polarization



Restricted Band Edge Test Mode: 802.11g & Highest Frequency & Test case 2

Average mode / Vertical polarization



30MHz ~ 1GHz Radiated Spurious Emissions

Test Mode: 802.11b & Lowest Frequency & Test case 1

RADIATED EMISSION

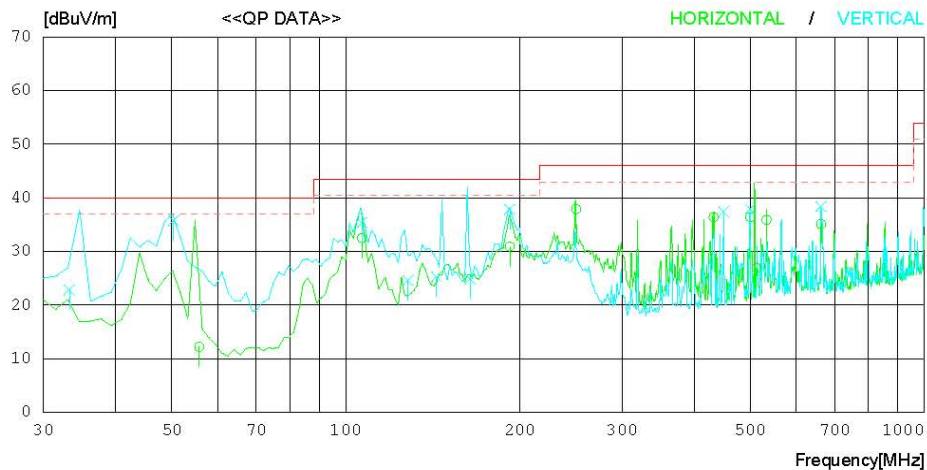
Date : 2010-02-17

Model Name : SER-8189
 Model No. : #1
 Serial No. : Identical prototype
 Test Condition : TX: 2412 MHz (802.11b)

Reference No.
 Power Supply : 120 V 60 Hz
 Temp/Humi : 21 'c 55 %
 Operator : D.C.CHA

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)
 MARGIN: 3 dB



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	55.811	27.1	6.8	1.0	22.7	12.2	40.0	27.8	201	79
2	106.682	42.7	11.0	1.5	22.7	32.5	43.5	11.0	201	153
3	192.083	41.5	10.7	2.0	23.3	30.9	43.5	12.6	100	1
4	249.988	46.0	13.2	2.2	23.5	37.9	46.0	8.1	100	118
5	432.002	40.6	17.0	3.2	24.4	36.4	46.0	9.6	100	1
6	499.990	39.4	18.0	3.5	24.5	36.4	46.0	9.6	100	1
7	512.497	29.7	18.1	3.6	24.5	26.9	46.0	19.1	400	20
8	533.309	38.3	18.4	3.7	24.5	35.9	46.0	10.1	100	1
9	662.515	36.3	18.9	4.1	24.2	35.1	46.0	10.9	201	0
----- Vertical -----										
10	33.278	28.3	16.3	0.8	22.6	22.8	40.0	17.2	400	237
11	50.416	49.4	8.0	1.0	22.7	35.7	40.0	4.3	100	114
12	106.682	45.6	11.0	1.5	22.7	35.4	43.5	8.1	100	358
13	128.124	34.2	11.7	1.6	22.9	24.6	43.5	18.9	199	1
14	143.301	35.5	11.0	1.7	22.9	25.3	43.5	18.2	299	358
15	163.974	35.7	10.5	1.8	23.1	24.9	43.5	18.6	299	61
16	191.987	48.4	10.7	2.0	23.3	37.8	43.5	5.7	100	358
17	449.993	41.5	17.2	3.2	24.5	37.4	46.0	8.6	100	358
18	499.989	41.0	18.0	3.5	24.5	38.0	46.0	8.0	100	358
19	662.499	39.6	18.9	4.1	24.2	38.4	46.0	7.6	100	48

30MHz ~ 1GHz Radiated Spurious Emissions

Test Mode: 802.11b & Middle Frequency & Test case 1



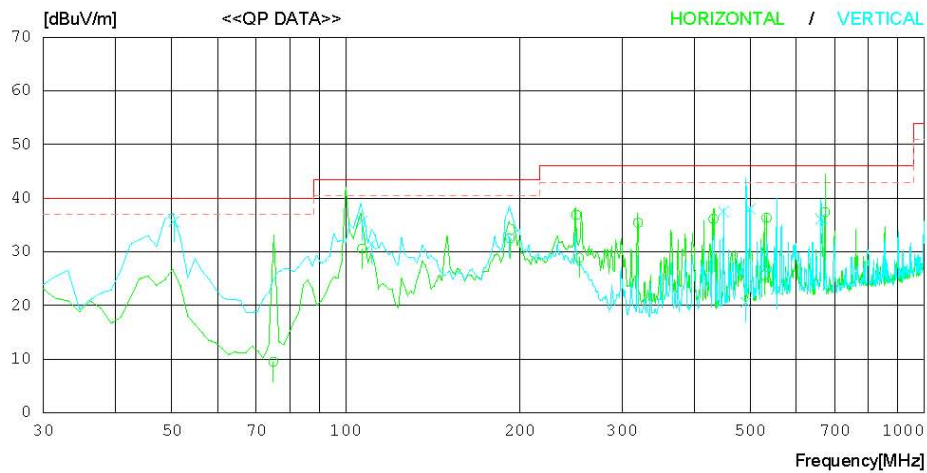
RADIATED EMISSION

Date : 2010-02-17

Model Name : SER-8189
 Model No. : #1
 Serial No. : Identical prototype
 Test Condition : TX: 2437 MHz (802.11b)
 Reference No. :
 Power Supply : 120 V 60 Hz
 Temp/Humi : 21 'c 55 %
 Operator : D.C.CHA

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)
 MARGIN: 3 dB



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	74.900	24.0	7.0	1.2	22.7	9.5	40.0	30.5	100	64
2	106.714	40.8	11.0	1.5	22.7	30.6	43.5	12.9	300	143
3	192.051	43.1	10.7	2.0	23.3	32.5	43.5	11.0	100	144
4	249.975	45.0	13.2	2.2	23.5	36.9	46.0	9.1	201	1
5	253.070	36.8	13.3	2.3	23.5	28.9	46.0	17.1	100	358
6	320.007	41.8	14.8	2.7	23.9	35.4	46.0	10.6	100	267
7	431.991	40.3	17.0	3.2	24.4	36.1	46.0	9.9	100	136
8	529.173	28.1	18.3	3.7	24.5	25.6	46.0	20.4	100	19
9	533.652	38.7	18.4	3.7	24.5	36.3	46.0	9.7	100	180
10	673.558	38.5	18.9	4.2	24.2	37.4	46.0	8.6	300	358
----- Vertical -----										
11	50.464	49.3	8.0	1.0	22.7	35.6	40.0	4.4	100	93
12	106.691	45.9	11.0	1.5	22.7	35.7	43.5	7.8	100	358
13	110.833	41.5	11.2	1.5	22.8	31.4	43.5	12.1	100	358
14	191.667	43.3	10.7	2.0	23.3	32.7	43.5	10.8	100	266
15	449.800	41.6	17.2	3.2	24.5	37.5	46.0	8.5	100	358
16	491.456	23.8	17.8	3.5	24.5	20.6	46.0	25.4	100	358
17	499.997	41.0	18.0	3.5	24.5	38.0	46.0	8.0	100	358
18	555.233	25.0	18.6	3.8	24.4	23.0	46.0	23.0	300	0
19	662.515	37.4	18.9	4.1	24.2	36.2	46.0	9.8	100	73

30MHz ~ 1GHz Radiated Spurious Emissions

Test Mode: 802.11b & Highest Frequency & Test case 1



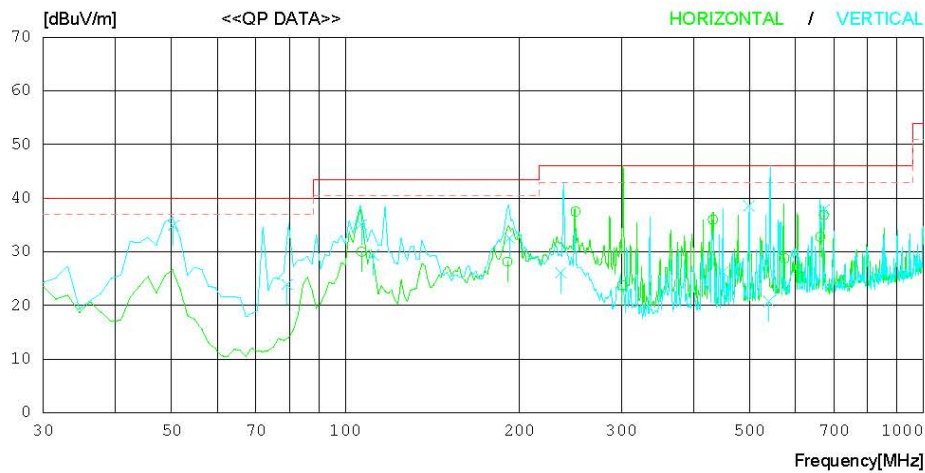
RADIATED EMISSION

Date : 2010-02-17

Model Name : SER-8189
 Model No. : #1
 Serial No. : Identical prototype
 Test Condition : TX: 2462 MHz (802.11b)
 Reference No. :
 Power Supply : 120 V 60 Hz
 Temp/Humi : 21 'c 55 %
 Operator : D.C.CHA

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)
 MARGIN: 3 dB



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	106.670	40.2	11.0	1.5	22.7	30.0	43.5	13.5	200	358
2	190.657	38.8	10.7	2.0	23.3	28.2	43.5	15.3	101	1
3	250.000	45.5	13.2	2.3	23.5	37.5	46.0	8.5	101	1
4	300.685	30.5	14.4	2.6	23.7	23.8	46.0	22.2	101	1
5	431.994	40.2	17.0	3.2	24.4	36.0	46.0	10.0	101	126
6	574.998	30.4	18.9	3.9	24.4	28.8	46.0	17.2	301	1
7	604.774	28.0	19.2	4.0	24.4	26.8	46.0	19.2	200	0
8	662.676	34.0	18.9	4.1	24.2	32.8	46.0	13.2	200	0
9	672.003	38.0	18.9	4.2	24.2	36.9	46.0	9.1	301	359
----- Vertical -----										
10	50.408	48.6	8.0	1.0	22.7	34.9	40.0	5.1	100	358
11	79.278	38.0	7.3	1.3	22.7	23.9	40.0	16.1	199	1
12	106.674	45.3	11.0	1.5	22.7	35.1	43.5	8.4	100	358
13	111.820	39.4	11.3	1.5	22.8	29.4	43.5	14.1	199	31
14	192.388	43.1	10.7	2.0	23.3	32.5	43.5	11.0	100	183
15	235.996	34.8	12.6	2.2	23.5	26.1	46.0	19.9	199	1
16	450.001	30.2	17.3	3.3	24.5	26.3	46.0	19.7	100	185
17	499.453	41.6	18.0	3.5	24.5	38.6	46.0	7.4	100	222
18	540.607	23.0	18.5	3.7	24.5	20.7	46.0	25.3	299	358
19	673.555	39.0	18.9	4.2	24.2	37.9	46.0	8.1	100	0

30MHz ~ 1GHz Radiated Spurious Emissions

Test Mode: 802.11g & Lowest Frequency & Test case 1



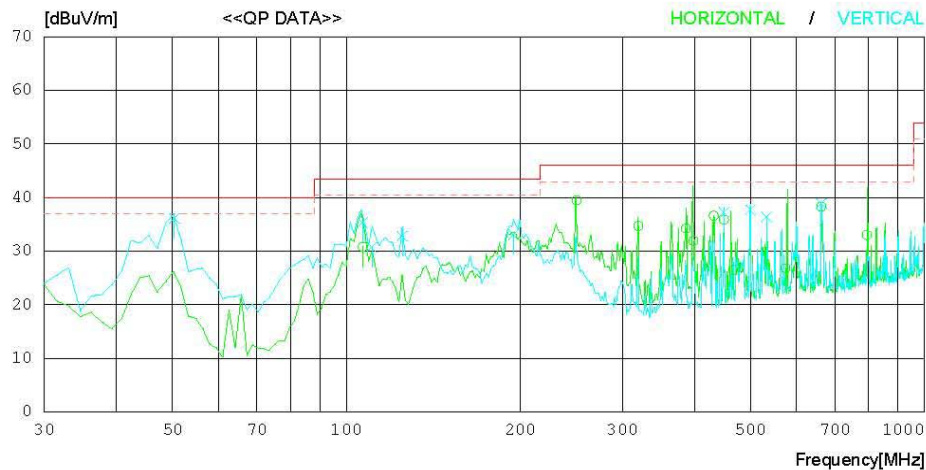
RADIATED EMISSION

Date : 2010-02-17

Model Name : SER-8189
 Model No. : #1
 Serial No. : Identical prototype
 Test Condition : TX: 2412 MHz (802.11g)
 Reference No. :
 Power Supply : 120 V 60 Hz
 Temp/Humi : 21 'c 55 %
 Operator : D.C.CHA

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)
 MARGIN: 3 dB



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	106.706	41.0	11.0	1.5	22.7	30.8	43.5	12.7	400	358
2	249.996	47.6	13.2	2.2	23.5	39.5	46.0	6.5	100	196
3	319.999	41.2	14.8	2.6	23.9	34.7	46.0	11.3	100	287
4	386.601	39.3	16.2	3.0	24.3	34.2	46.0	11.8	201	81
5	398.252	36.7	16.5	3.0	24.3	31.9	46.0	14.1	100	42
6	432.002	40.8	17.0	3.2	24.4	36.6	46.0	9.4	100	129
7	449.993	40.0	17.2	3.2	24.5	35.9	46.0	10.1	100	1
8	466.324	30.2	17.5	3.3	24.5	26.5	46.0	19.5	400	67
9	574.995	28.4	18.9	3.9	24.4	26.8	46.0	19.2	201	358
10	662.508	39.5	18.9	4.1	24.2	38.3	46.0	7.7	201	0
11	794.984	32.5	19.6	4.6	23.7	33.0	46.0	13.0	100	54
----- Vertical -----										
12	50.416	49.8	8.0	1.0	22.7	36.1	40.0	3.9	100	358
13	106.706	45.5	11.0	1.5	22.7	35.3	43.5	8.2	100	2
14	110.768	40.8	11.2	1.5	22.8	30.7	43.5	12.8	100	358
15	124.990	42.2	11.9	1.5	22.8	32.8	43.5	10.7	100	358
16	194.407	43.6	10.8	2.0	23.3	33.1	43.5	10.4	100	358
17	449.998	41.4	17.2	3.2	24.5	37.3	46.0	8.7	100	358
18	499.976	40.7	18.0	3.5	24.5	37.7	46.0	8.3	100	358
19	533.320	38.8	18.4	3.7	24.5	36.4	46.0	9.6	100	358
20	662.501	40.1	18.9	4.1	24.2	38.9	46.0	7.1	100	47

30MHz ~ 1GHz Radiated Spurious Emissions

Test Mode: 802.11g & Middle Frequency & Test case 1

RADIATED EMISSION

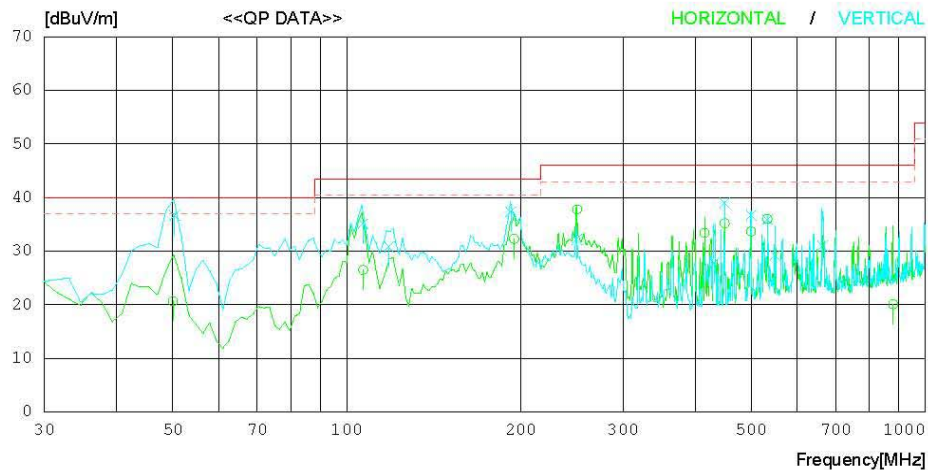
Date : 2010-02-17

Model Name : SER-8189
 Model No. : #1
 Serial No. : Identical prototype
 Test Condition : TX: 2437 MHz (802.11g)

Reference No. :
 Power Supply : 120 V 60 Hz
 Temp/Humi : 21 'c 55 %
 Operator : D.C.CHA

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)
 MARGIN: 3 dB



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	50.031	34.3	8.1	1.0	22.7	20.7	40.0	19.3	301	1
2	106.714	36.7	11.0	1.5	22.7	26.5	43.5	17.0	201	358
3	194.545	42.8	10.8	2.0	23.3	32.3	43.5	11.2	100	1
4	249.996	45.9	13.2	2.2	23.5	37.8	46.0	8.2	100	1
5	415.228	37.9	16.8	3.1	24.4	33.4	46.0	12.6	100	160
6	449.993	39.3	17.2	3.2	24.5	35.2	46.0	10.8	100	1
7	499.974	36.7	18.0	3.5	24.5	33.7	46.0	12.3	100	1
8	533.337	38.4	18.4	3.7	24.5	36.0	46.0	10.0	100	174
9	879.425	18.8	19.7	4.9	23.3	20.1	46.0	25.9	201	302
----- Vertical -----										
10	50.400	50.4	8.0	1.0	22.7	36.7	40.0	3.3	100	110
11	106.682	45.3	11.0	1.5	22.7	35.1	43.5	8.4	100	1
12	118.349	40.5	11.6	1.5	22.8	30.8	43.5	12.7	100	217
13	192.019	47.9	10.7	2.0	23.3	37.3	43.5	6.2	100	1
14	250.016	40.2	13.2	2.3	23.5	32.2	46.0	13.8	100	1
15	431.986	32.0	17.0	3.2	24.4	27.8	46.0	18.2	100	1
16	449.992	43.1	17.2	3.2	24.5	39.0	46.0	7.0	100	189
17	499.985	39.7	18.0	3.5	24.5	36.7	46.0	9.3	100	1
18	533.313	38.3	18.4	3.7	24.5	35.9	46.0	10.1	100	1
19	549.991	31.3	18.6	3.8	24.5	29.2	46.0	16.8	199	358
20	664.442	32.2	18.9	4.1	24.2	31.0	46.0	15.0	100	1

30MHz ~ 1GHz Radiated Spurious Emissions

Test Mode: 802.11g & Highest Frequency & Test case 1



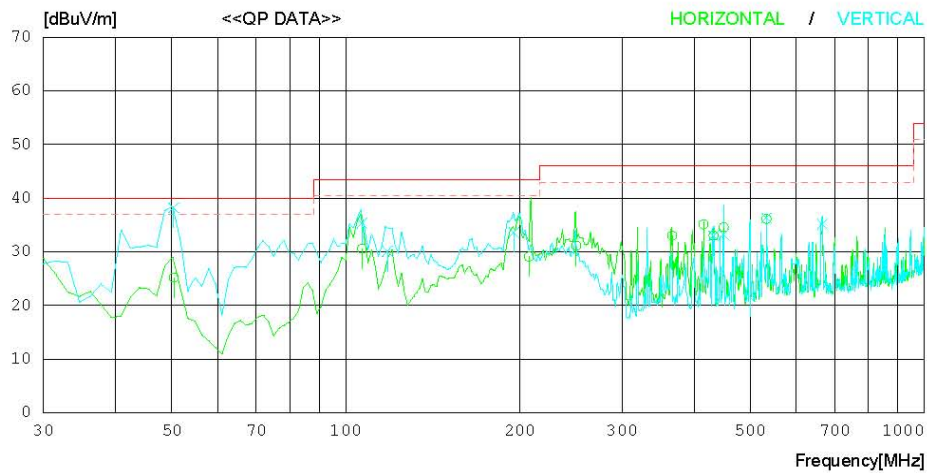
RADIATED EMISSION

Date : 2010-02-17

Model Name : SER-8189
 Model No. : #1
 Serial No. : Identical prototype
 Test Condition : TX: 2462 MHz (802.11g)
 Reference No. :
 Power Supply : 120 V 60 Hz
 Temp/Humi : 21 'c 55 %
 Operator : D.C.CHA

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)
 MARGIN: 3 dB



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	50.432	38.9	8.0	1.0	22.7	25.2	40.0	14.8	300	319
2	106.714	40.8	11.0	1.5	22.7	30.6	43.5	12.9	201	1
3	207.251	39.1	11.2	2.1	23.3	29.1	43.5	14.4	300	72
4	249.990	39.2	13.2	2.2	23.5	31.1	46.0	14.9	100	358
5	366.426	38.4	15.8	2.9	24.1	33.0	46.0	13.0	100	276
6	415.241	39.6	16.8	3.1	24.4	35.1	46.0	10.9	100	168
7	431.994	37.2	17.0	3.2	24.4	33.0	46.0	13.0	100	358
8	449.993	38.7	17.2	3.2	24.5	34.6	46.0	11.4	100	218
9	533.326	38.5	18.4	3.7	24.5	36.1	46.0	9.9	100	358
----- Vertical -----										
10	50.416	51.9	8.0	1.0	22.7	38.2	40.0	1.8	100	109
11	106.714	45.5	11.0	1.5	22.7	35.3	43.5	8.2	100	358
12	117.964	39.9	11.5	1.5	22.8	30.1	43.5	13.4	100	226
13	195.272	44.1	10.8	2.0	23.3	33.6	43.5	9.9	100	203
14	432.018	37.2	17.0	3.2	24.4	33.0	46.0	13.0	100	141
15	449.992	37.3	17.2	3.2	24.5	33.2	46.0	12.8	100	185
16	499.453	24.7	18.0	3.5	24.5	21.7	46.0	24.3	100	358
17	533.334	38.7	18.4	3.7	24.5	36.3	46.0	9.7	100	358
18	666.306	36.4	18.9	4.1	24.2	35.2	46.0	10.8	100	107

30MHz ~ 1GHz Radiated Spurious Emissions

Test Mode: 802.11b & Lowest Frequency & Test case 2

RADIATED EMISSION

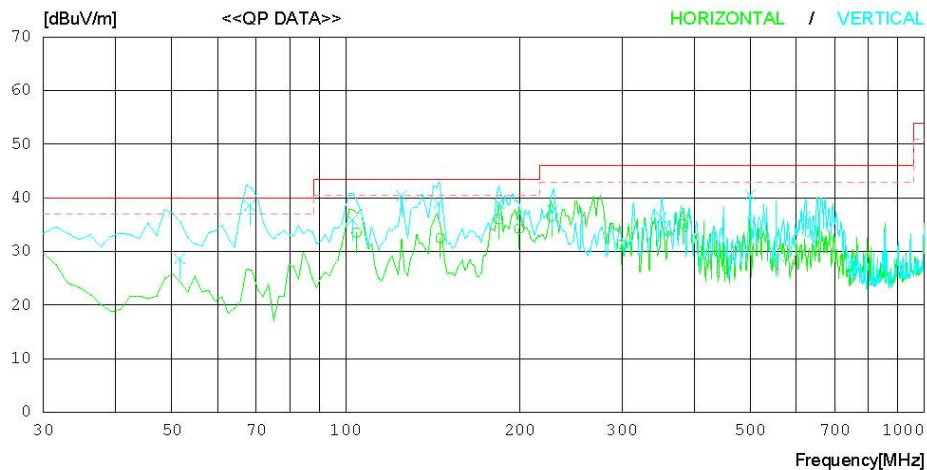
Date : 2010-02-16

Model Name : SER-8189
 Model No. : #1
 Serial No. : Identical prototype
 Test Condition : TX: 2412 MHz (802.11b)

Reference No. :
 Power Supply : 120 V 60 Hz
 Temp/Humi : 22 'c 55 %
 Operator : D.C.CHA

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)
 MARGIN: 3 dB



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	104.327	43.9	10.9	1.4	22.7	33.5	43.5	10.0	201	1
2	145.657	42.9	10.9	1.7	23.0	32.5	43.5	11.0	201	1
3	183.702	46.8	10.5	1.9	23.2	36.0	43.5	7.5	100	163
4	199.239	44.6	10.9	2.0	23.3	34.2	43.5	9.3	100	358
5	226.827	45.6	12.1	2.2	23.4	36.5	46.0	9.5	100	197
6	299.757	38.1	14.3	2.6	23.7	31.3	46.0	14.7	100	183
7	381.961	40.3	16.1	2.9	24.2	35.1	46.0	10.9	100	183
----- Vertical -----										
8	51.644	42.5	7.8	1.0	22.7	28.6	40.0	11.4	100	339
9	68.189	53.7	6.4	1.2	22.7	38.6	40.0	1.4	100	153
10	102.708	46.3	10.8	1.4	22.7	35.8	43.5	7.7	100	1
11	125.000	49.8	11.9	1.5	22.8	40.4	43.5	3.1	100	220
12	144.839	49.3	11.0	1.7	23.0	39.0	43.5	4.5	100	250
13	184.054	49.7	10.5	1.9	23.2	38.9	43.5	4.6	100	181
14	227.468	46.7	12.2	2.2	23.4	37.7	46.0	8.3	100	181
15	351.060	42.1	15.5	2.8	24.1	36.3	46.0	9.7	100	1
16	499.997	43.6	18.0	3.5	24.5	40.6	46.0	5.4	100	1
17	559.277	31.0	18.7	3.8	24.4	29.1	46.0	16.9	199	358
18	622.194	37.6	19.1	4.1	24.3	36.5	46.0	9.5	100	296
19	641.089	34.9	19.0	4.1	24.3	33.7	46.0	12.3	100	1

30MHz ~ 1GHz Radiated Spurious Emissions

Test Mode: 802.11b & Middle Frequency & Test case 2



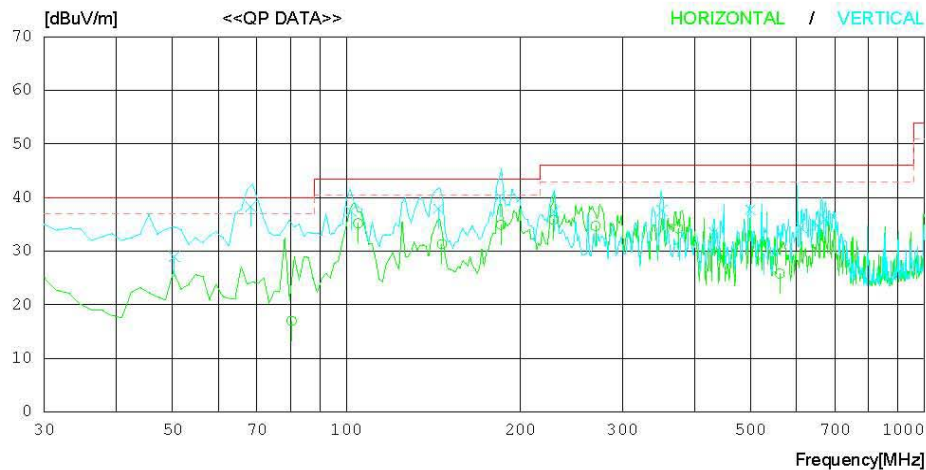
RADIATED EMISSION

Date : 2010-02-16

Model Name : SER-8189
 Model No. : #1
 Serial No. : Identical prototype
 Test Condition : TX: 2437 MHz (802.11b)
 Reference No. :
 Power Supply : 120 V 60 Hz
 Temp/Humi : 22 'c 55 %
 Operator : D.C.CHA

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)
 MARGIN: 3 dB



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	80.400	31.0	7.4	1.3	22.7	17.0	40.0	23.0	201	358
2	104.754	45.6	10.9	1.4	22.7	35.2	43.5	8.3	300	139
3	146.249	41.7	10.9	1.7	23.0	31.3	43.5	12.2	201	358
4	185.112	45.7	10.5	1.9	23.2	34.9	43.5	8.6	100	147
5	228.398	44.9	12.2	2.2	23.4	35.9	46.0	10.1	100	1
6	269.792	42.2	13.7	2.4	23.6	34.7	46.0	11.3	100	180
7	374.993	39.5	16.0	2.9	24.2	34.2	46.0	11.8	100	1
8	561.760	27.7	18.7	3.8	24.4	25.8	46.0	20.2	100	1
----- Vertical -----										
9	50.420	42.7	8.0	1.0	22.7	29.0	40.0	11.0	201	353
10	68.445	53.4	6.4	1.2	22.7	38.3	40.0	1.7	100	119
11	101.907	48.0	10.8	1.4	22.7	37.5	43.5	6.0	100	1
12	144.407	48.2	11.0	1.7	23.0	37.9	43.5	5.6	100	1
13	184.503	51.0	10.5	1.9	23.2	40.2	43.5	3.3	100	1
14	228.654	46.4	12.2	2.2	23.4	37.4	46.0	8.6	100	1
15	351.544	43.4	15.5	2.8	24.1	37.6	46.0	8.4	100	1
16	432.001	37.7	17.0	3.2	24.4	33.5	46.0	12.5	201	130
17	499.965	40.7	18.0	3.5	24.5	37.7	46.0	8.3	100	228
18	527.354	32.0	18.3	3.6	24.5	29.4	46.0	16.6	201	140
19	612.050	35.6	19.1	4.0	24.3	34.4	46.0	11.7	201	136
20	654.711	36.0	19.0	4.1	24.3	34.8	46.0	11.2	201	0
21	674.936	37.1	18.9	4.2	24.2	36.0	46.0	10.0	100	141

30MHz ~ 1GHz Radiated Spurious Emissions

Test Mode: 802.11b & Highest Frequency & Test case 2



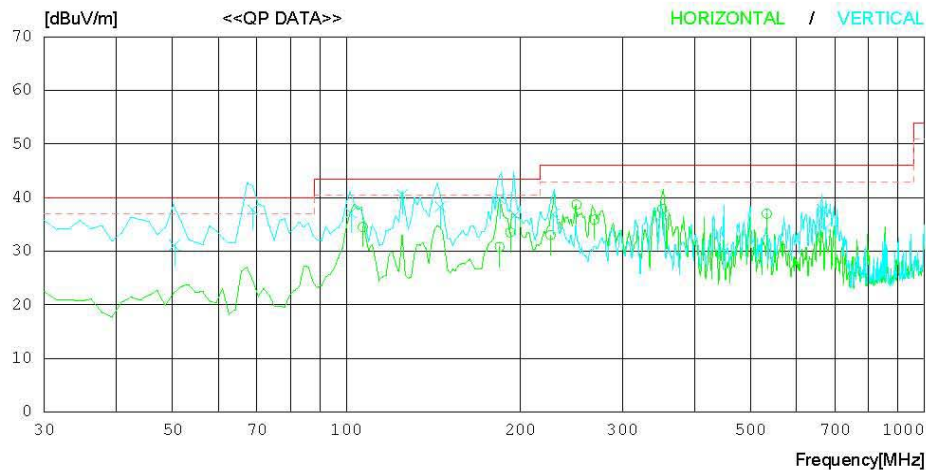
RADIATED EMISSION

Date : 2010-02-16

Model Name : SER-8189
 Model No. : #1
 Serial No. : Identical prototype
 Test Condition : TX: 2462 MHz (802.11b)
 Reference No. :
 Power Supply : 120 V 60 Hz
 Temp/Humi : 22 'c 55 %
 Operator : D.C.CHA

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)
 MARGIN: 3 dB



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	106.698	44.7	11.0	1.5	22.7	34.5	43.5	9.0	301	148
2	183.958	41.6	10.5	1.9	23.2	30.8	43.5	12.7	100	166
3	192.019	44.1	10.7	2.0	23.3	33.5	43.5	10.0	100	142
4	225.545	42.1	12.1	2.2	23.4	33.0	46.0	13.0	100	1
5	249.988	46.8	13.2	2.2	23.5	38.7	46.0	7.3	100	205
6	268.717	43.5	13.6	2.4	23.6	35.9	46.0	10.1	100	1
7	351.778	43.7	15.5	2.8	24.1	37.9	46.0	8.1	100	267
8	533.325	39.4	18.4	3.7	24.5	37.0	46.0	9.0	201	292
----- Vertical -----										
9	50.432	44.8	8.0	1.0	22.7	31.1	40.0	8.9	100	1
10	68.846	52.7	6.5	1.2	22.7	37.7	40.0	2.3	100	177
11	101.859	47.7	10.8	1.4	22.7	37.2	43.5	6.3	100	163
12	124.984	50.0	11.9	1.5	22.8	40.6	43.5	2.9	100	1
13	145.353	48.7	10.9	1.7	23.0	38.3	43.5	5.2	100	1
14	184.231	50.6	10.5	1.9	23.2	39.8	43.5	3.7	100	191
15	196.106	47.2	10.8	2.0	23.3	36.7	43.5	6.8	200	358
16	228.382	45.9	12.2	2.2	23.4	36.9	46.0	9.1	100	1
17	353.028	42.5	15.5	2.8	24.1	36.7	46.0	9.3	100	229
18	448.234	34.5	17.2	3.2	24.5	30.4	46.0	15.6	100	1
19	664.695	39.1	18.9	4.1	24.2	37.9	46.0	8.1	100	145
20	675.288	35.5	18.9	4.2	24.2	34.4	46.0	11.6	100	135

30MHz ~ 1GHz Radiated Spurious Emissions

Test Mode: 802.11g & Lowest Frequency & Test case 2



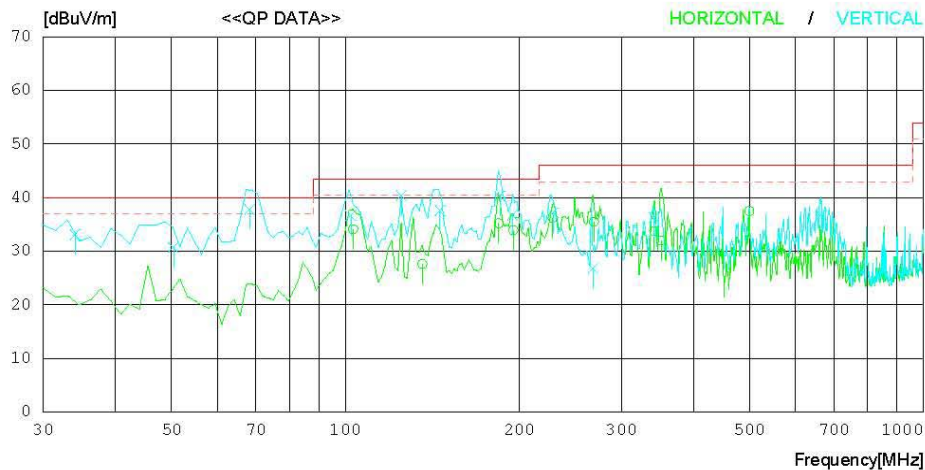
RADIATED EMISSION

Date : 2010-02-16

Model Name : SER-8189
 Model No. : #1
 Serial No. : Identical prototype
 Test Condition : TX: 2412 MHz (802.11g)
 Reference No. :
 Power Supply : 120 V 60 Hz
 Temp/Humi : 22 'c 55 %
 Operator : D.C.CHA

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)
 MARGIN: 3 dB



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	103.141	44.6	10.8	1.4	22.7	34.1	43.5	9.4	301	1
2	135.817	37.5	11.4	1.6	22.9	27.6	43.5	15.9	200	358
3	184.182	46.0	10.5	1.9	23.2	35.2	43.5	8.3	100	1
4	195.224	44.4	10.8	2.0	23.3	33.9	43.5	9.6	100	156
5	228.173	45.2	12.2	2.2	23.4	36.2	46.0	9.8	100	214
6	269.231	43.1	13.6	2.4	23.6	35.5	46.0	10.5	100	1
7	341.986	39.8	15.3	2.7	24.0	33.8	46.0	12.2	100	291
8	351.457	37.8	15.5	2.8	24.1	32.0	46.0	14.0	100	297
9	499.997	40.5	18.0	3.5	24.5	37.5	46.0	8.5	100	204
----- Vertical -----										
10	34.054	38.9	15.9	0.9	22.6	33.1	40.0	6.9	100	358
11	50.448	44.4	8.0	1.0	22.7	30.7	40.0	9.3	100	358
12	68.301	52.9	6.4	1.2	22.7	37.8	40.0	2.2	100	103
13	102.196	47.2	10.8	1.4	22.7	36.7	43.5	6.8	100	358
14	124.989	49.8	11.9	1.5	22.8	40.4	43.5	3.1	100	358
15	145.705	48.0	10.9	1.7	23.0	37.6	43.5	5.9	100	358
16	185.111	51.1	10.5	1.9	23.2	40.3	43.5	3.2	100	358
17	194.487	47.2	10.8	2.0	23.3	36.7	43.5	6.8	100	358
18	228.637	46.2	12.2	2.2	23.4	37.2	46.0	8.8	100	192
19	268.525	34.4	13.6	2.4	23.6	26.8	46.0	19.2	199	1
20	341.826	42.3	15.3	2.7	24.0	36.3	46.0	9.7	100	358
21	665.336	38.0	18.9	4.1	24.2	36.8	46.0	9.2	100	358

30MHz ~ 1GHz Radiated Spurious Emissions

Test Mode: 802.11g & Middle Frequency & Test case 2



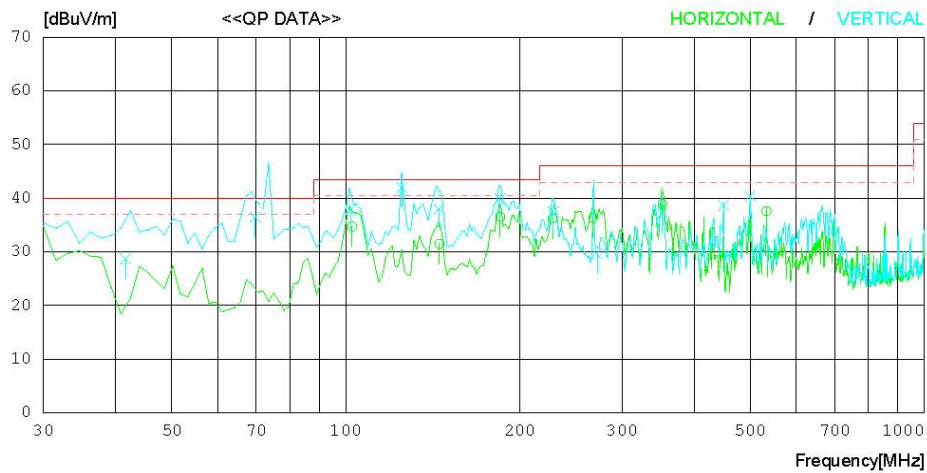
RADIATED EMISSION

Date : 2010-02-16

Model Name : SER-8189
 Model No. : #1
 Serial No. : Identical prototype
 Test Condition : TX: 2437 MHz (802.11g)
 Reference No. :
 Power Supply : 120 V 60 Hz
 Temp/Humi : 22 'c 55 %
 Operator : D.C.CHA

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)
 MARGIN: 3 dB



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	102.500	45.2	10.8	1.4	22.7	34.7	43.5	8.8	201	358
2	145.144	41.9	10.9	1.7	23.0	31.5	43.5	12.0	201	358
3	184.935	47.3	10.5	1.9	23.2	36.5	43.5	7.0	201	358
4	227.628	45.2	12.2	2.2	23.4	36.2	46.0	9.8	100	196
5	267.516	43.9	13.6	2.4	23.6	36.3	46.0	9.7	100	1
6	352.322	44.7	15.5	2.8	24.1	38.9	46.0	7.1	100	297
7	533.331	40.0	18.4	3.7	24.5	37.6	46.0	8.4	201	358
----- Vertical -----										
8	41.600	37.0	13.4	0.9	22.6	28.7	40.0	11.3	100	202
9	69.743	51.5	6.5	1.2	22.7	36.5	40.0	3.5	201	65
10	101.907	48.4	10.8	1.4	22.7	37.9	43.5	5.6	100	146
11	124.997	51.3	11.9	1.5	22.8	41.9	43.5	1.6	100	1
12	144.944	48.2	11.0	1.7	23.0	37.9	43.5	5.6	100	1
13	184.759	50.8	10.5	1.9	23.2	40.0	43.5	3.5	100	1
14	228.317	46.5	12.2	2.2	23.4	37.5	46.0	8.5	100	1
15	272.003	37.2	13.7	2.4	23.6	29.7	46.0	16.3	400	52
16	352.050	42.9	15.5	2.8	24.1	37.1	46.0	8.9	100	1
17	449.985	42.8	17.2	3.2	24.5	38.7	46.0	7.3	100	1
18	500.003	43.4	18.0	3.5	24.5	40.4	46.0	5.6	100	1

30MHz ~ 1GHz Radiated Spurious Emissions

Test Mode: 802.11g & Highest Frequency & Test case 2



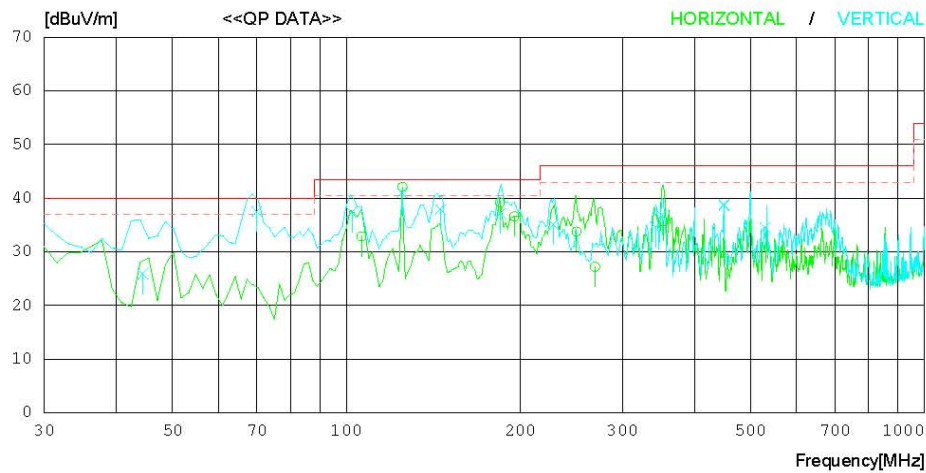
RADIATED EMISSION

Date : 2010-02-17

Model Name : SER-8189
 Model No. : #1
 Serial No. : Identical prototype
 Test Condition : TX: 2462 MHz (802.11g)
 Reference No. :
 Power Supply : 120 V 60 Hz
 Temp/Humi : 22 'c 55 %
 Operator : D.C.CHA

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)
 MARGIN: 3 dB



No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	106.111	43.1	11.0	1.5	22.7	32.9	43.5	10.6	201	358
2	124.992	51.5	11.9	1.5	22.8	42.1	43.5	1.4	301	1
3	184.342	50.0	10.5	1.9	23.2	39.2	43.5	4.3	100	1
4	195.240	47.1	10.8	2.0	23.3	36.6	43.5	6.9	100	1
5	249.994	41.9	13.2	2.2	23.5	33.8	46.0	12.2	100	1
6	269.143	34.8	13.6	2.4	23.6	27.2	46.0	18.8	100	190
7	353.044	41.5	15.5	2.8	24.1	35.7	46.0	10.3	100	1
----- Vertical -----										
8	44.478	34.9	12.6	1.0	22.6	25.9	40.0	14.1	200	346
9	69.926	52.5	6.5	1.2	22.7	37.5	40.0	2.5	100	149
10	102.132	47.9	10.8	1.4	22.7	37.4	43.5	6.1	100	157
11	125.000	50.4	11.9	1.5	22.8	41.0	43.5	2.5	100	264
12	145.465	48.3	10.9	1.7	23.0	37.9	43.5	5.6	100	201
13	184.807	47.9	10.5	1.9	23.2	37.1	43.5	6.4	100	170
14	228.125	44.1	12.2	2.2	23.4	35.1	46.0	10.9	100	1
15	342.451	40.6	15.3	2.7	24.0	34.6	46.0	11.4	100	1
16	351.874	42.6	15.5	2.8	24.1	36.8	46.0	9.2	100	218
17	449.985	42.8	17.2	3.2	24.5	38.7	46.0	7.3	100	1
18	450.013	42.7	17.3	3.3	24.5	38.8	46.0	7.2	100	224
19	530.863	37.0	18.3	3.7	24.5	34.5	46.0	11.5	100	199

1GHz ~ 25GHz Radiated Spurious Emissions

▪ Test Mode: 802.11b & Lowest Frequency & Test case 1

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4824.000	H	43.63	30.88	7.27	50.90	38.15	74.00	54.00	23.10	15.85
4824.000	V	44.02	30.82	7.27	51.29	38.09	74.00	54.00	22.71	15.91
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ Test Mode: 802.11b & Middle Frequency & Test case 1

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4874.000	H	43.68	31.12	7.65	51.33	38.77	74.00	54.00	22.67	15.23
4874.000	V	43.62	31.31	7.65	51.27	38.96	74.00	54.00	22.73	15.04
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ Test Mode: 802.11b & Highest Frequency & Test case 1

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4924.000	H	43.27	31.09	7.96	51.23	39.05	74.00	54.00	22.77	14.95
4924.000	V	43.44	31.22	7.96	51.40	39.18	74.00	54.00	22.60	14.82
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were detected at a level greater than 20dB below limit.
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

1GHz ~ 25GHz Radiated Spurious Emissions

▪ Test Mode: 802.11g & Lowest Frequency & Test case 1

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4824.000	H	44.59	31.09	7.27	51.86	38.36	74.00	54.00	22.14	15.64
4824.000	V	44.07	30.94	7.27	51.34	38.21	74.00	54.00	22.66	15.79
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ Test Mode: 802.11g & Middle Frequency & Test case 1

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4874.000	H	43.80	30.60	7.65	51.45	38.25	74.00	54.00	22.55	15.75
4874.000	V	43.90	30.77	7.65	51.55	38.42	74.00	54.00	22.45	15.58
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ Test Mode: 802.11g & Highest Frequency & Test case 1

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4924.000	H	43.70	30.50	7.96	51.66	38.46	74.00	54.00	22.34	15.54
4924.000	V	43.91	30.48	7.96	51.87	38.44	74.00	54.00	22.13	15.56
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were detected at a level greater than 20dB below limit.
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

1GHz ~ 25GHz Radiated Spurious Emissions

▪ Test Mode: 802.11b & Lowest Frequency & Test case 2

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4824.000	H	44.43	30.91	7.27	51.70	38.18	74.00	54.00	22.30	15.82
4824.000	V	44.09	30.93	7.27	51.36	38.20	74.00	54.00	22.64	15.80
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ Test Mode: 802.11b & Middle Frequency & Test case 2

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4874.000	H	43.90	30.91	7.65	51.55	38.56	74.00	54.00	22.45	15.44
4874.000	V	43.67	30.79	7.65	51.32	38.44	74.00	54.00	22.68	15.56
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ Test Mode: 802.11b & Highest Frequency & Test case 2

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4924.000	H	43.43	31.03	7.96	51.39	38.99	74.00	54.00	22.61	15.01
4924.000	V	43.52	30.99	7.96	51.48	38.95	74.00	54.00	22.52	15.05
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were detected at a level greater than 20dB below limit.
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

1GHz ~ 25GHz Radiated Spurious Emissions

▪ Test Mode: 802.11g & Lowest Frequency & Test case 2

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4824.000	H	44.83	31.22	7.27	52.10	38.49	74.00	54.00	21.90	15.51
4824.000	V	43.95	31.19	7.27	51.22	38.46	74.00	54.00	22.78	15.54
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ Test Mode: 802.11g & Middle Frequency & Test case 2

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4874.000	H	44.12	30.69	7.65	51.77	38.34	74.00	54.00	22.23	15.66
4874.000	V	43.84	30.62	7.65	51.49	38.27	74.00	54.00	22.51	15.73
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ Test Mode: 802.11g & Highest Frequency & Test case 2

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4924.000	H	43.59	30.72	7.96	51.55	38.68	74.00	54.00	22.45	15.32
4924.000	V	44.09	30.66	7.96	52.05	38.62	74.00	54.00	21.95	15.38
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were detected at a level greater than 20dB below limit.
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

4.2.5 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.

- Measurement Data: **Comply**

Test Mode	Frequency	Test Results (dBm)
802.11b	Lowest	-18.823
	Middle	-17.770
	Highest	-16.902
802.11g	Lowest	-23.576
	Middle	-22.527
	Highest	-21.607

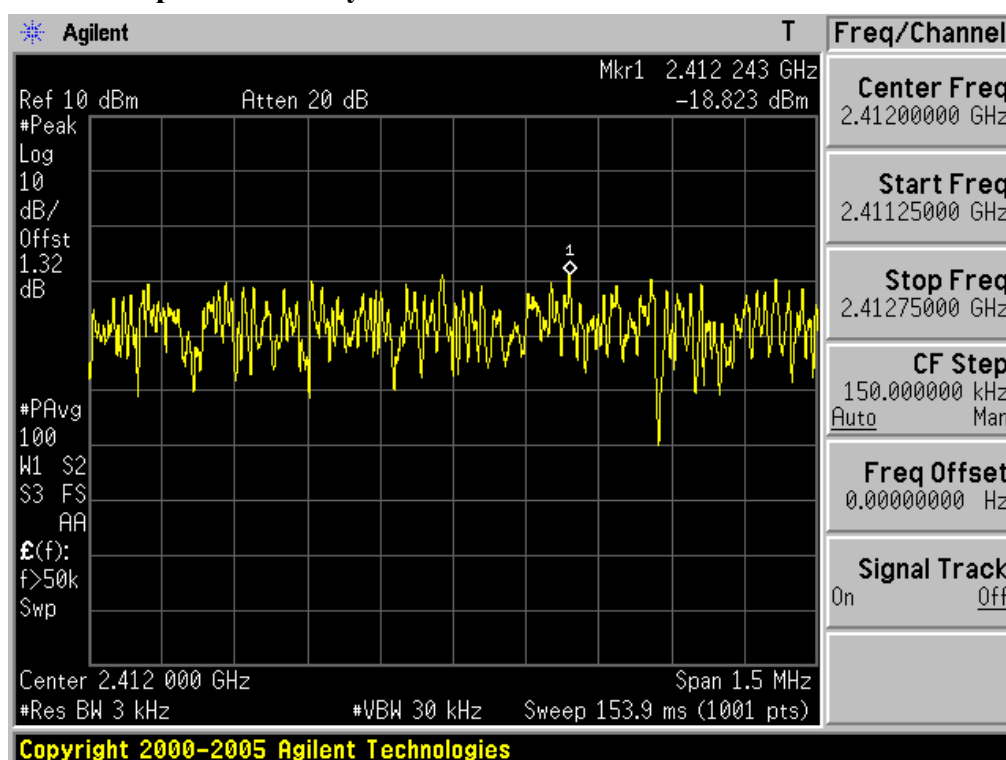
Note 1: See next pages for actual measured spectrum plots.

- Minimum Standard:

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

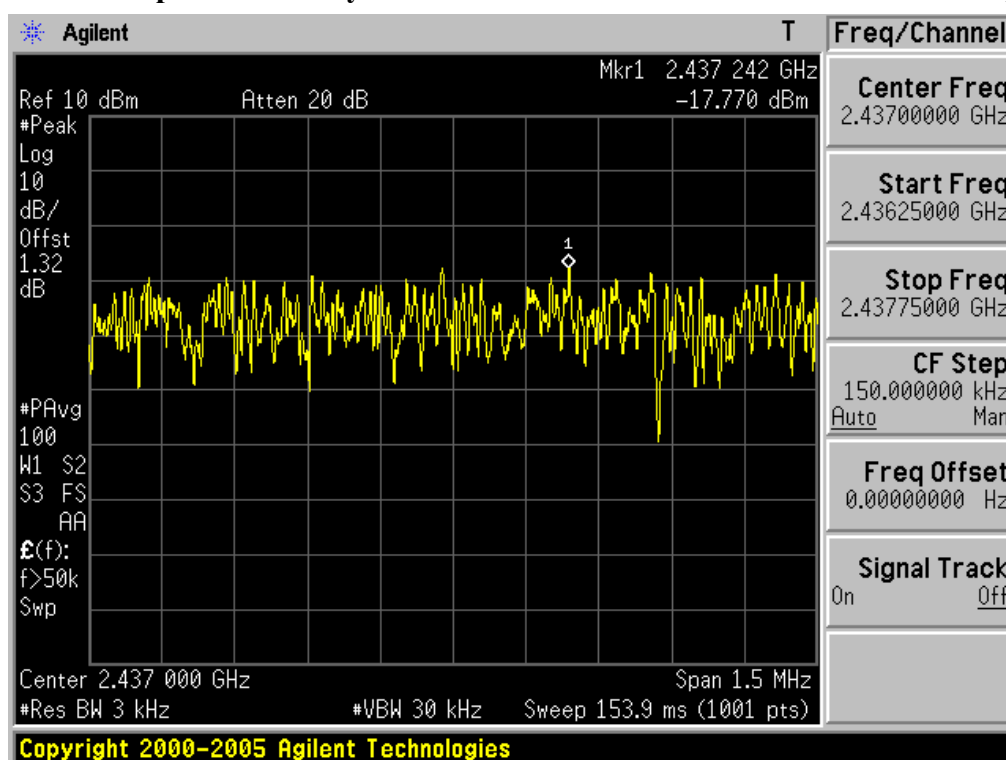
Transmitter Power Spectral Density

Test Mode: 802.11b & Lowest Frequency



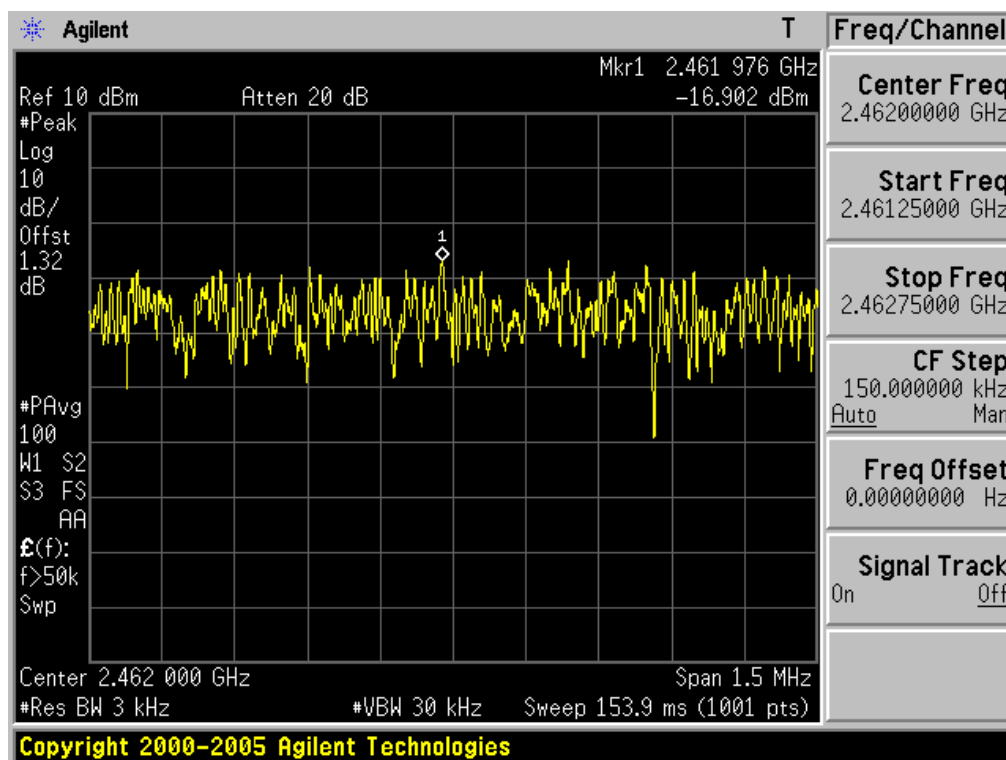
Transmitter Power Spectral Density

Test Mode: 802.11b & Middle Frequency



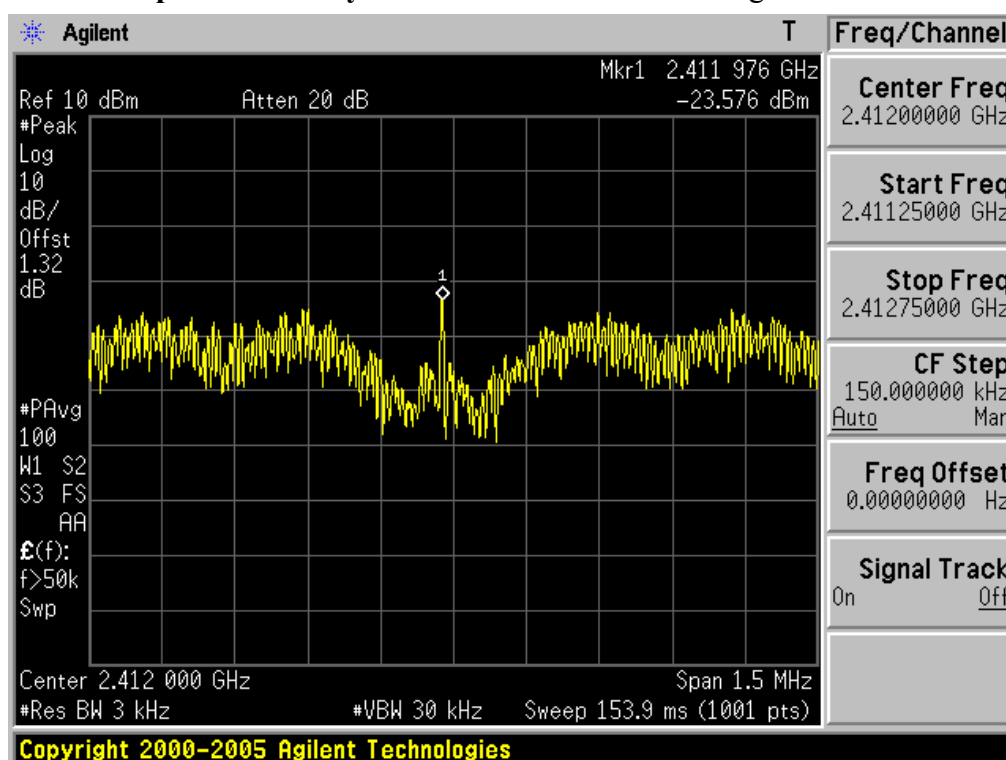
Transmitter Power Spectral Density

Test Mode: 802.11b & Highest Frequency



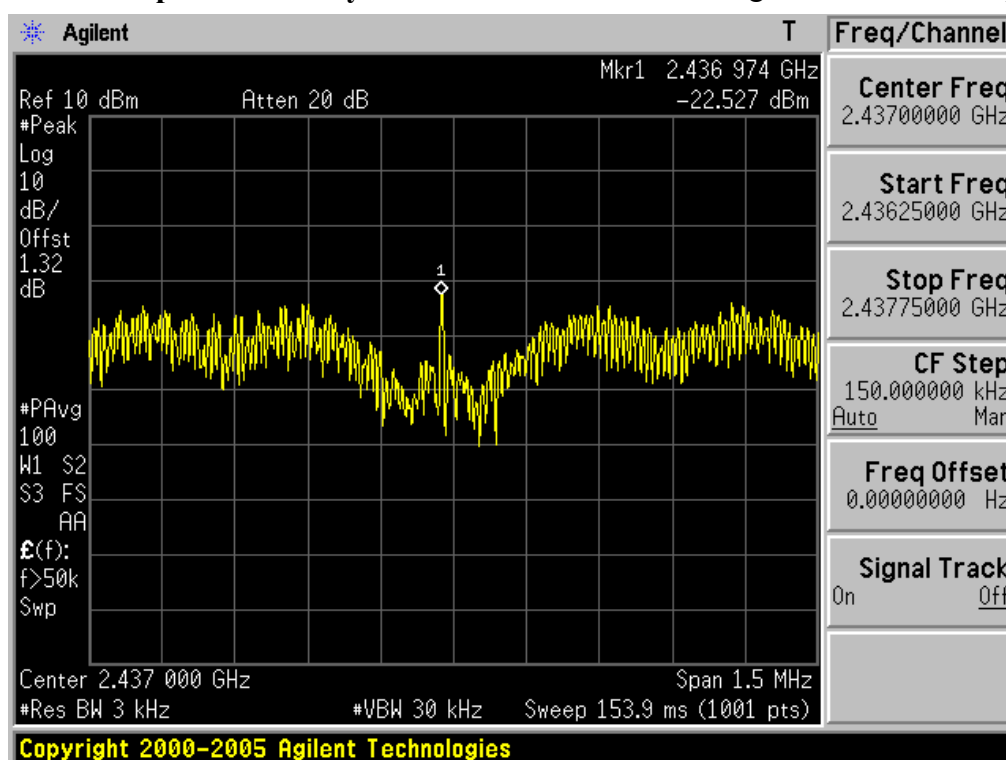
Transmitter Power Spectral Density

Test Mode: 802.11g & Lowest Frequency



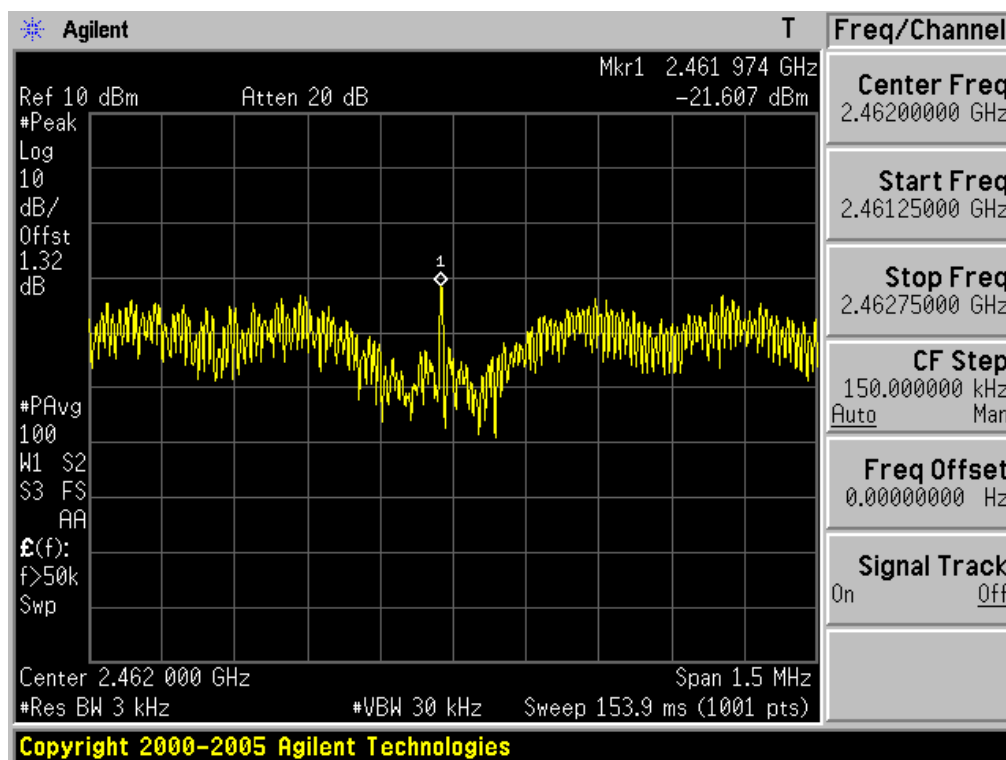
Transmitter Power Spectral Density

Test Mode: 802.11g & Middle Frequency



Transmitter Power Spectral Density

Test Mode: 802.11g & Highest Frequency



4.2.6 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.

Note 2: This test item was performed only in the test case 2.

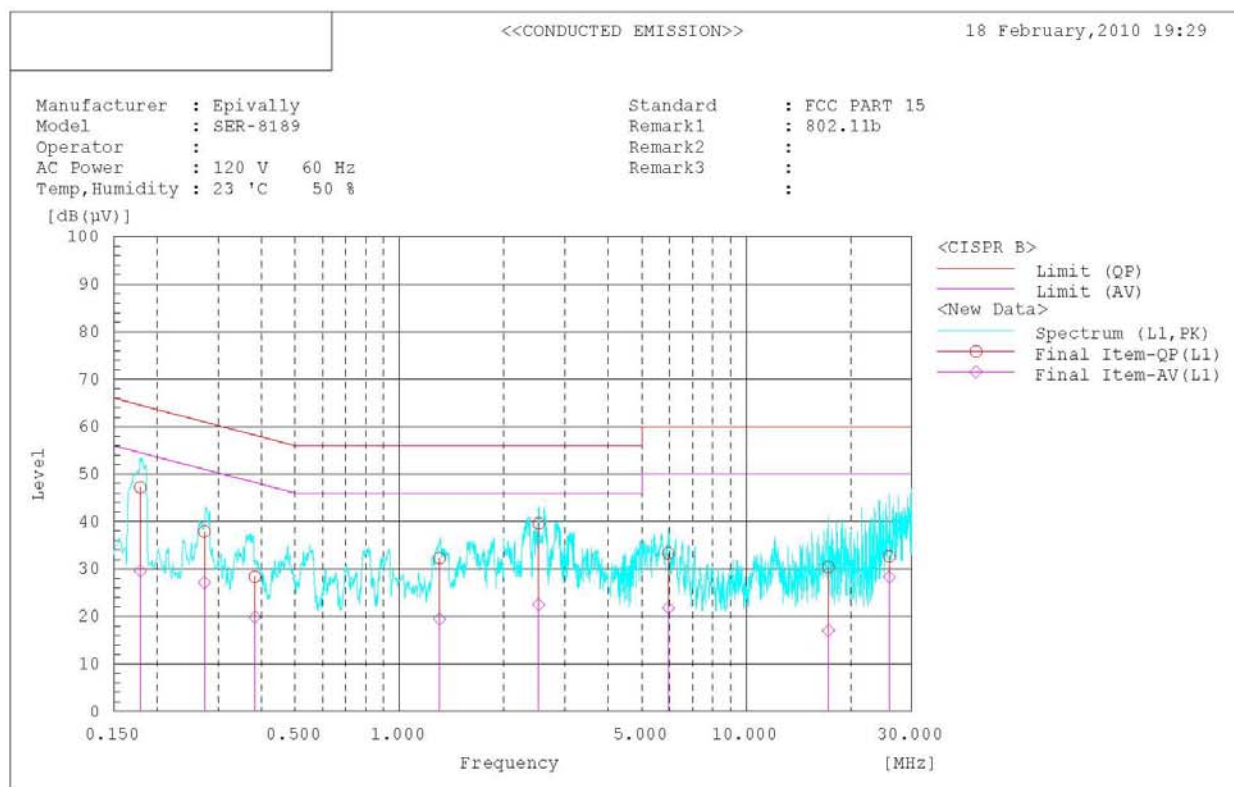
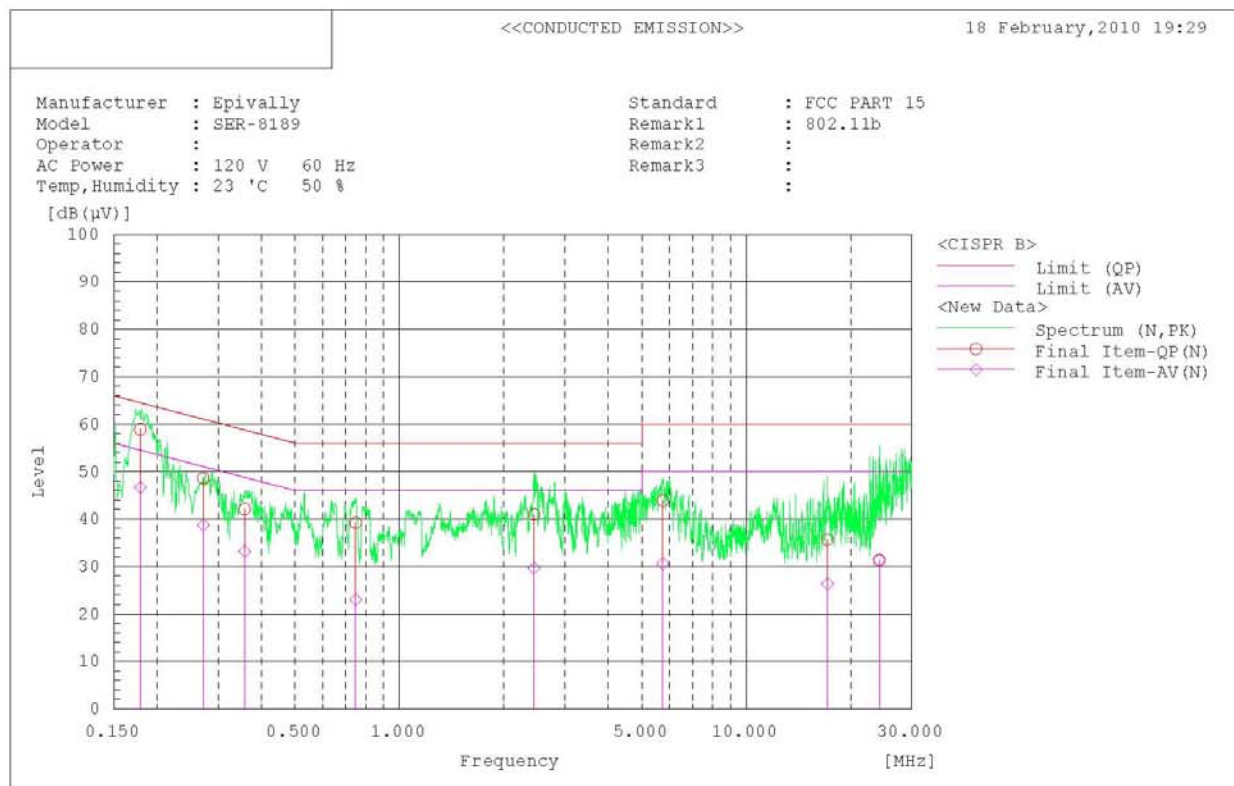
- Minimum Standard: FCC Part 15.207(a)/EN 55022

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 & Test Case 2



AC Line Conducted Emissions (Data List)

Test Mode: 802.11b & Test Case 2

<<CONDUCTED EMISSION>>

18 February, 2010 19:29

Standard : FCC PART 15

Manufacturer : Epivally

Model : SER-8189

Operator :

AC Power : 120 V 60 Hz

Temp, Humidity : 23 °C 50 %

Remark1 : 802.11b

Remark2 :

Remark3 :

Final Result

--- N Phase ---

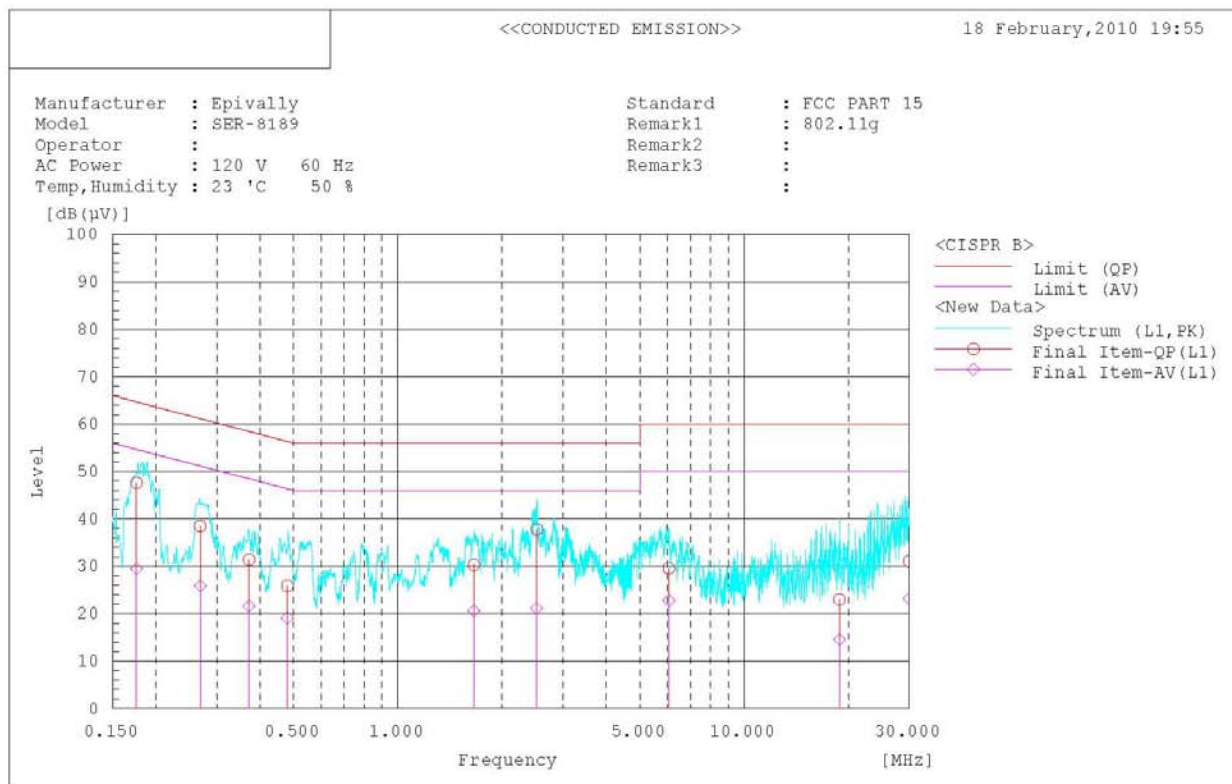
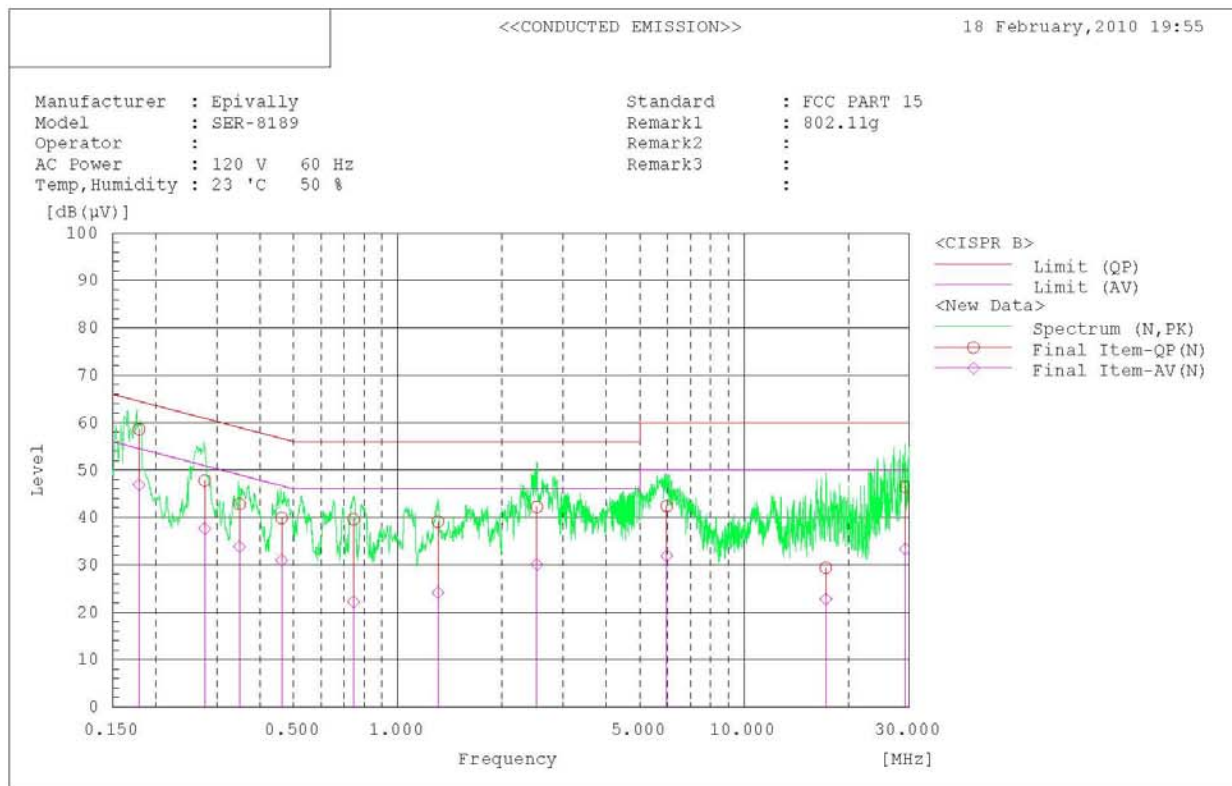
No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
	[MHz]	[dB (μV)]	[dB (μV)]		[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB]	[dB]	
1	0.179	48.8	36.6	10.1	58.9	46.7	64.5	54.5	5.6	7.8	
2	0.272	39.5	29.6	9.1	48.6	38.7	61.1	51.1	12.5	12.4	
3	0.358	32.9	24.0	9.2	42.1	33.2	58.8	48.8	16.7	15.6	
4	0.748	30.0	13.8	9.2	39.2	23.0	56.0	46.0	16.8	23.0	
5	2.443	31.5	20.2	9.5	41.0	29.7	56.0	46.0	15.0	16.3	
6	5.748	34.1	20.8	9.8	43.9	30.6	60.0	50.0	16.1	19.4	
7	17.158	25.7	16.4	10.0	35.7	26.4	60.0	50.0	24.3	23.6	
8	24.211	21.1	21.2	10.2	31.3	31.4	60.0	50.0	28.7	18.6	

--- 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 (μV)]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB]	[dB]	
1	0.179	47.2	29.6	0.0	47.2	29.6	64.5	54.5	17.3	24.9	
2	0.274	37.9	27.2	0.0	37.9	27.2	61.0	51.0	23.1	23.8	
3	0.383	28.3	19.8	0.1	28.4	19.9	58.2	48.2	29.8	28.3	
4	1.306	32.2	19.4	0.1	32.3	19.5	56.0	46.0	23.7	26.5	
5	2.520	39.5	22.4	0.1	39.6	22.5	56.0	46.0	16.4	23.5	
6	5.972	33.1	21.6	0.2	33.3	21.8	60.0	50.0	26.7	28.2	
7	25.875	32.2	27.8	0.5	32.7	28.3	60.0	50.0	27.3	21.7	
8	17.251	30.0	16.6	0.4	30.4	17.0	60.0	50.0	29.6	33.0	

AC Line Conducted Emissions (Graph)

Test Mode: 802.11g & Test Case 2



AC Line Conducted Emissions (Data List)

Test Mode: 802.11g & Test Case 2

<<CONDUCTED EMISSION>>

18 February, 2010 19:55

Standard : FCC PART 15
Manufacturer : Epivally
Model : SER-8189
Operator :
AC Power : 120 V 60 Hz
Temp, Humidity : 23 °C 50 %
Remark1 : 802.11g
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 (μV)]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB]	[dB]	
1	0.179	48.5	36.8	10.1	58.6	46.9	64.5	54.5	5.9	7.6	
2	0.277	38.7	28.5	9.1	47.8	37.6	60.9	50.9	13.1	13.3	
3	0.349	33.6	24.6	9.2	42.8	33.8	59.0	49.0	16.2	15.2	
4	0.462	30.6	21.7	9.3	39.9	31.0	56.7	46.7	16.8	15.7	
5	0.746	30.4	13.0	9.2	39.6	22.2	56.0	46.0	16.4	23.8	
6	1.307	29.8	14.9	9.3	39.1	24.2	56.0	46.0	16.9	21.8	
7	2.524	32.6	20.5	9.6	42.2	30.1	56.0	46.0	13.8	15.9	
8	5.986	32.6	22.1	9.8	42.4	31.9	60.0	50.0	17.6	18.1	
9	17.238	19.4	12.8	10.0	29.4	22.8	60.0	50.0	30.6	27.2	
10	29.248	36.2	23.0	10.3	46.5	33.3	60.0	50.0	13.5	16.7	

--- 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 (μV)]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB]	[dB]	
1	0.176	47.6	29.5	0.0	47.6	29.5	64.7	54.7	17.1	25.2	
2	0.269	38.5	25.9	0.0	38.5	25.9	61.1	51.1	22.6	25.2	
3	0.372	31.3	21.5	0.1	31.4	21.6	58.5	48.5	27.1	26.9	
4	0.480	25.8	19.0	0.1	25.9	19.1	56.3	46.3	30.4	27.2	
5	1.660	30.2	20.5	0.1	30.3	20.6	56.0	46.0	25.7	25.4	
6	2.520	37.7	21.0	0.1	37.8	21.1	56.0	46.0	18.2	24.9	
7	6.066	29.4	22.6	0.2	29.6	22.8	60.0	50.0	30.4	27.2	
8	18.855	22.6	14.2	0.4	23.0	14.6	60.0	50.0	37.0	35.4	
9	29.995	30.6	22.7	0.5	31.1	23.2	60.0	50.0	28.9	26.8	

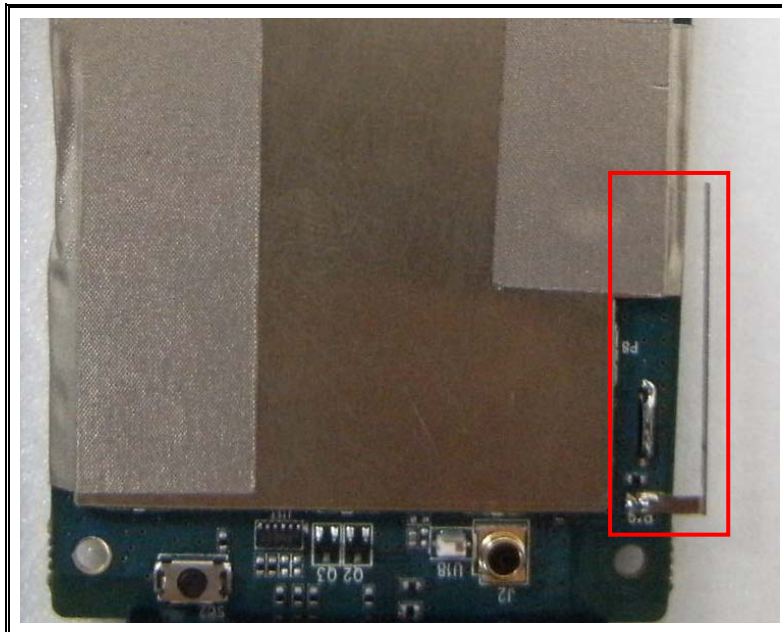
4.2.7 Antenna Requirements

- 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

The PIFA Antenna is permanently attached on this device by soldering.



- 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.Due.Date (dd/mm/yy)	Next.Due.Date (dd/mm/yy)	S/N
☒	Spectrum Analyzer	Agilent	E4440A	25/09/09	25/09/10	MY45304199
☐	Spectrum Analyzer	Rohde Schwarz	FSQ26	05/06/09	05/06/10	200445
☐	Spectrum Analyzer(RE)	H.P	8563E	13/10/09	13/10/10	3551A04634
☐	Power Meter	H.P	EMP-442A	02/07/09	02/07/10	GB37170413
☐	Power Sensor	H.P	8481A	02/07/09	02/07/10	3318A96332
☐	Power Divider	Agilent	11636B	13/10/09	13/10/10	56471
☐	Power Splitter	Anritsu	K241B	13/10/09	13/10/10	20611
☐	Power Splitter	Anritsu	K241B	02/07/09	02/07/10	017060
☐	Frequency Counter	H.P	5342A	13/07/09	13/07/10	2119A04450
☐	TEMP & HUMIDITY Chamber	JISCO	KR-100/J-RHC2	10/10/09	10/10/10	30604493/021031
☒	Digital Multimeter	H.P	34401A	13/03/09	13/03/10	3146A13475, US36122178
☐	Multifunction Synthesizer	HP	8904A	06/10/09	06/10/10	3633A08404
☒	Signal Generator	Rohde Schwarz	SMR20	13/03/09	13/03/10	101251
☒	Signal Generator	H.P	ESG-3000A	02/07/09	02/07/10	US37230529
☐	Vector Signal Generator	Rohde Schwarz	SMJ100A	11/01/10	11/01/11	100148
☐	Audio Analyzer	H.P	8903B	02/07/09	02/07/10	3011A09448
☐	Modulation Analyzer	H.P	8901B	02/07/09	02/07/10	3028A03029
☐	8960 Series 10 Wireless Comms. Test Set	Agilent	E5515C	02/07/09	02/07/10	GB43461134
☐	Universal Radio communication Tester	Rohde Schwarz	CMU 200	19/05/09	19/05/10	106760
☐	Bluetooth Tester	TESCOM	TC-3000B	02/07/09	02/07/10	3000B000268
☐	Thermo hygrometer	BODYCOM	BJ5478	28/01/10	28/01/11	090205-3
☒	Thermo hygrometer	BODYCOM	BJ5478	28/01/10	28/01/11	090205-2
☐	Thermo hygrometer	BODYCOM	BJ5478	28/01/10	28/01/11	090205-4
☒	AC Power supply	DAEKWANG	5KVA	13/03/09	13/03/10	20060321-1
☒	DC Power Supply	HP	6622A	13/03/09	13/03/10	3448A03760
☐	DC Power Supply	HP	6633A	13/03/09	13/03/10	3524A06634
☐	BAND Reject Filter	Microwave Circuits	N0308372	06/10/09	06/10/10	3125-01DC0352
☐	BAND Reject Filter	Wainwright	WRCG1750	06/10/09	06/10/10	2
☐	High-Pass Filter	ANRITSU	MP526D	06/10/09	06/10/10	M27756
☐	High-pass filter	Wainwright	WHKX2.1	N/A	N/A	1
☒	High-Pass Filter	Wainwright	WHKX3.0	N/A	N/A	9
☐	High-Pass Filter	Wainwright	WHNX5.0	N/A	N/A	8
☐	High-Pass Filter	Wainwright	WHNX8.5	N/A	N/A	1
☐	Tunable Notch Filter	Wainwright	WRCT800.0 /960.0-0.2/40-8SSK	N/A	N/A	32
☐	Tunable Notch Filter	Wainwright	WRCD1700.0 /2000.0-0.2/40-10SSK	N/A	N/A	53
☐	Tunable Notch Filter	Wainwright	WRCT1900.0/ 2200.0-5/40-10SSK	N/A	N/A	30
☒	HORN ANT	ETS	3115	17/06/09	17/06/10	6419
☐	HORN ANT	ETS	3115	23/09/09	23/09/10	21097
☐	HORN ANT	A.H.Systems	SAS-574	10/06/09	10/06/10	154
☐	HORN ANT	A.H.Systems	SAS-574	10/06/09	10/06/10	155

	Type	Manufacturer	Model	Cal.Due.Date (dd/mm/yy)	Next.Due.Date (dd/mm/yy)	S/N
☐	Dipole Antenna	Schwarzbeck	VHA9103	06/10/09	06/10/10	2116
☐	Dipole Antenna	Schwarzbeck	VHA9103	06/10/09	06/10/10	2117
☐	Dipole Antenna	Schwarzbeck	UHA9105	05/10/09	05/10/10	2261
☐	Dipole Antenna	Schwarzbeck	UHA9105	05/10/09	05/10/10	2262
☐	LOOP Antenna	ETS	6502	14/09/09	14/09/10	3471
☐	Coaxial Fixed Attenuators	Agilent	8491B	02/07/09	02/07/10	MY39260700
☐	Attenuator (3dB)	WEINSCHTEL	56-3	16/12/09	16/12/10	Y2342
☐	Attenuator (3dB)	WEINSCHTEL	56-3	16/12/09	16/12/10	Y2370
☐	Attenuator (10dB)	WEINSCHTEL	23-10-34	01/10/09	01/10/10	BP4386
☐	Attenuator (10dB)	WEINSCHTEL	23-10-34	11/01/10	11/01/11	BP4387
☐	Attenuator (20dB)	WEINSCHTEL	86-20-11	06/10/09	06/10/10	432
☐	Attenuator (10dB)	WEINSCHTEL	31696	06/10/09	06/10/10	446
☐	Attenuator (10dB)	WEINSCHTEL	31696	06/10/09	06/10/10	408
☐	Attenuator (40dB)	WEINSCHTEL	57-40-33	01/10/09	01/10/10	NN837
☐	Attenuator (30dB)	JFW	50FH-030-300	13/03/09	13/03/10	060320-1
☐	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0088CAN	02/07/09	02/07/10	788
☐	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0185CAN	02/07/09	02/07/10	790
☐	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0215CAN	02/07/09	02/07/10	112
☒	Amplifier (30dB)	Agilent	8449B	10/10/09	10/10/10	3008A01590
☐	Amplifier	EMPOWER	BBS3Q7ELU	02/11/09	02/11/10	1020
☐	RF Power Amplifier	OPHIRRF	5069F	02/07/09	02/07/10	1006
☒	EMI TEST RECEIVER	R&S	ESU	29/01/10	29/01/11	100014
☒	BILOG ANTENNA	SCHAFFNER	CBL6112B	02/06/09	02/06/10	2737
☒	Amplifier (22dB)	H.P	8447E	29/01/10	29/01/11	2945A02865
☐	EMI TEST RECEIVER	R&S	ESCI	12/05/09	12/05/10	100364
☐	LOG-PERIODIC ANT.	Schwarzbeck	UHALP9108A	30/05/09	30/05/10	590
☐	BICONICAL ANT.	Schwarzbeck	VHA 9103	02/06/09	02/06/10	2233
☐	LOG-PERIODIC ANT.	Schwarzbeck	UHALP 9108 A-1	07/10/09	07/10/10	1098
☐	BICONICAL ANT.	Schwarzbeck	VHA 9103	06/10/09	06/10/10	91031946
☐	Low Noise Pre Amplifier	TSJ	MLA-100K01-B01-2	13/03/09	13/03/10	1252741
☐	Amplifier (25dB)	Agilent	8447D	12/05/09	12/05/10	2944A10144
☐	Amplifier (25dB)	Agilent	8447D	03/07/09	03/07/10	2648A04922
☒	Spectrum Analyzer(CE)	H.P	8591E	26/04/09	26/04/10	3649A05889
☒	LISN	Kyoritsu	KNW-407	29/01/10	29/01/11	8-317-8
☒	LISN	Kyoritsu	KNW-242	29/01/10	29/01/11	8-654-15
☒	CVCF	NF Electronic	4420	13/03/09	13/03/10	304935/337980
☒	50 ohm Terminator	HME	CT-01	12/01/10	12/01/11	N/A
☒	RFI/FIELD Intensity Meter	Kyoritsu	KNM-2402	03/07/09	03/07/10	4N-170-3