



DIGITAL EMC CO., LTD.

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

Tel: +82-31-321-2664 Fax: +82-31-321-1664

<http://www.digitalemc.com>

CERTIFICATION OF COMPLIANCE

SEOWON INTECH., LTD.

689-47, Kumjung-Dong, Kunpo-City, Kyunggi-Do,
435-862 Korea

Dates of Tests: November 30 ~ December 04, 2009

Test Report S/N: DR50110912L-rev.1

Test Site : DIGITAL EMC CO., LTD.

FCC ID

V7MSWC-5100W

APPLICANT

SEOWON INTECH., LTD.

Purpose	: Original Grant
FCC Equipment Class	: Digital Transmission System (DTS)
Device name	: WIMAX CPE With 802.11b/g WLAN
Manufacturer	: SEOWON INTECH., LTD.
FCC ID	: V7MSWC-5100W
Model name	: SWC-5100W
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 – 11.97 dBm Conducted 802.11g – 11.13 dBm Conducted
Data of issue	: December 29, 2009

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

<http://www.digitalemc.com> E-mail: harveysung@digitalemc.com

Tel: +82-31-321-2664 Fax: +82-31-321-1664

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*

December 29, 2009

D.C. Cha



Date

Name

Signature

Reviewed by: *Manager*

December 29, 2009

W.J. Lee



Date

Name

Signature

Applicant:

Company name : SEOWON INTECH., LTD.

Address : 689-47, Kumjung-Dong, Kunpo-City, Kyunggi-Do, 435-862 Korea

Date of order : November 30, 2009

2. Equipment information

V7MSWC-5100W

2.1 Equipment information

Equipment model no.	SWC-5100W
Equipment serial no.	Identical prototype
Type of equipment	WIMAX CPE With 802.11b/g WLAN
Frequency band	2412 ~ 2462 MHz
Type of Modulation	802.11b – CCK 802.11g – OFDM
Power	AC 120V 60Hz
Type of antenna	<input type="checkbox"/> Internal Type: <input checked="" type="checkbox"/> External Type: Dipole Antenna



2.2 Ancillary equipment

Equipment	Model No.	Serial No.	Manufacturer	Note
Adaptor	KSAS0241200200D5	N/A	Kuantech Co., Ltd.	-
-	-	-	-	-

3. Information about test items

V7MSWC-5100W

3.1 Tested frequency

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

3.2 Tested environment

Temperature	: 15 ~ 35 (°C)
Relative humidity content	: 20 ~ 75 %
Air pressure	: 86 ~ 103 kPa
Details of power supply	: AC 120V & 60Hz

3.3 Auxiliary equipment

Equipment	Model No.	Serial No.	Manufacturer	Note
Notebook	M100	57271209K	TOSHIBA	-
Mouse	MOC5U0	HOFOOJYN	DELL	-
Phone	GS-460WA	612THDD045002	LG-Nortel	-
Keyboard	SK-8115	SN-0DJ321-71616-8C4-0GCZ	DELL	-
-	-	-	-	-

3.4 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
				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=Not Comply NT=Not Tested NA=Not Applicable Note 2: 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	12.50
	Highest	12.05
802.11g	Lowest	16.55
	Middle	16.55
	Highest	16.55

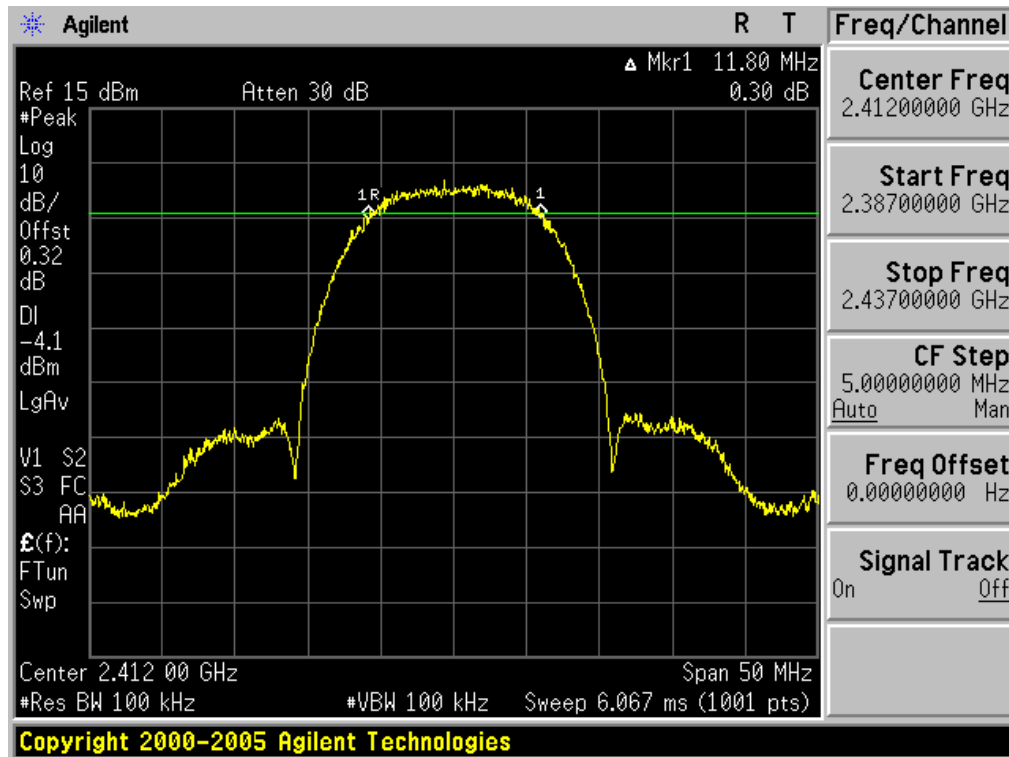
Note 1: See next pages for actual measured spectrum plots.

- Minimum Standard:

The minimum 6 dB bandwidth shall be at least 500 kHz

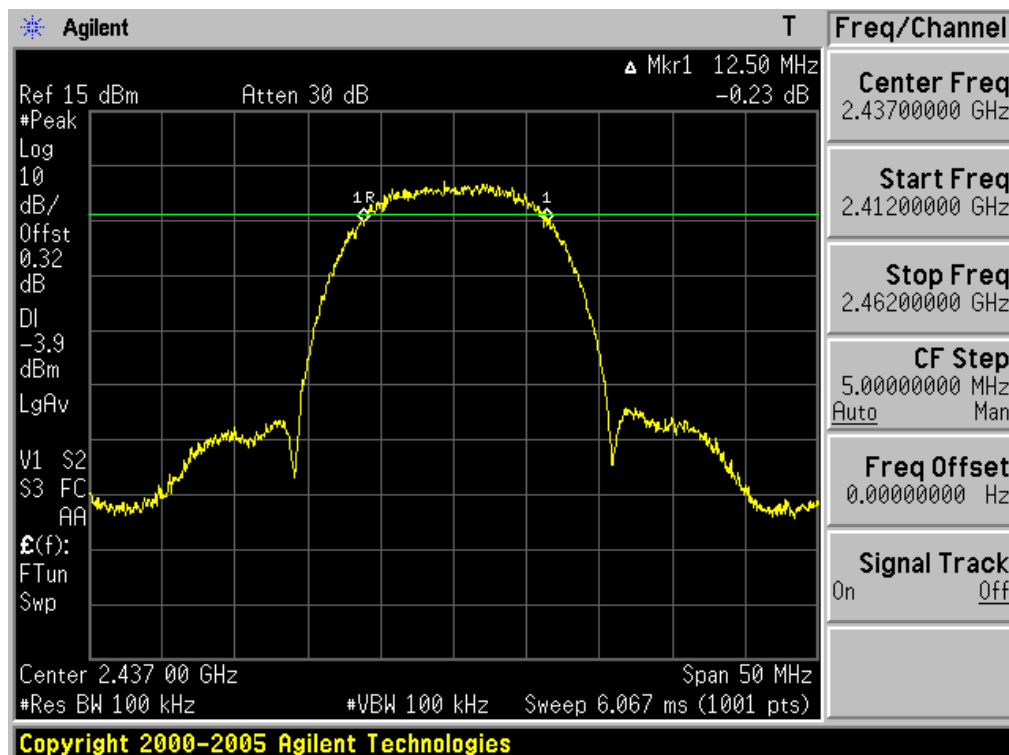
6 dB Bandwidth

Test Mode: 802.11b & Lowest Frequency



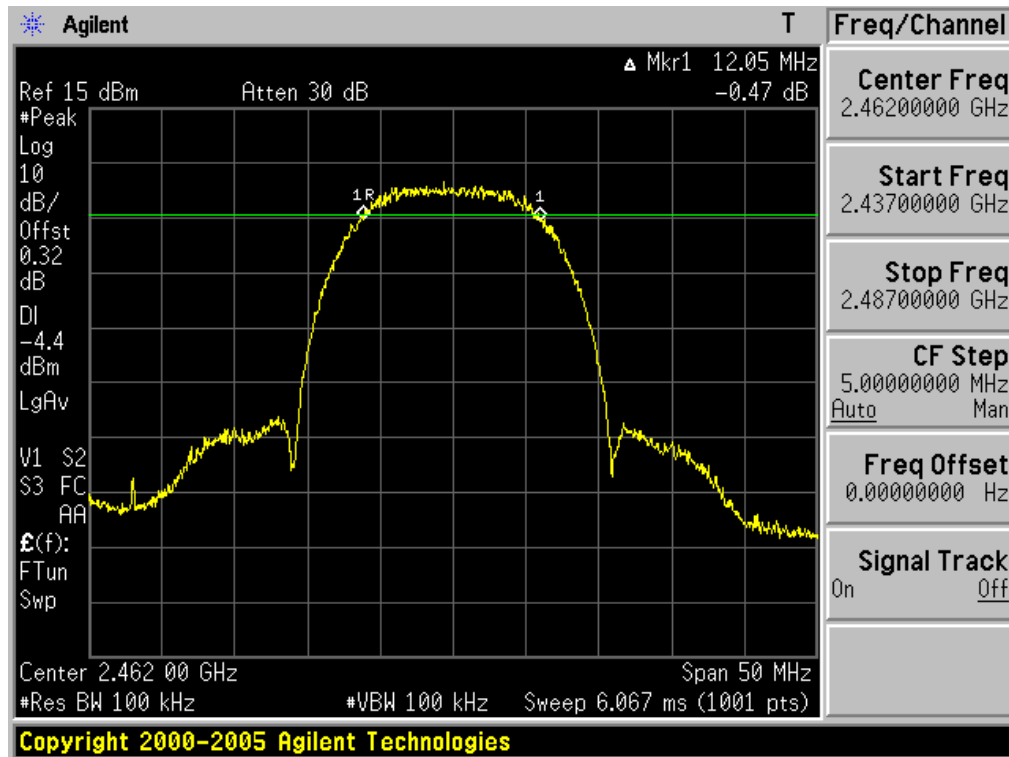
6 dB Bandwidth

Test Mode: 802.11b & Middle Frequency



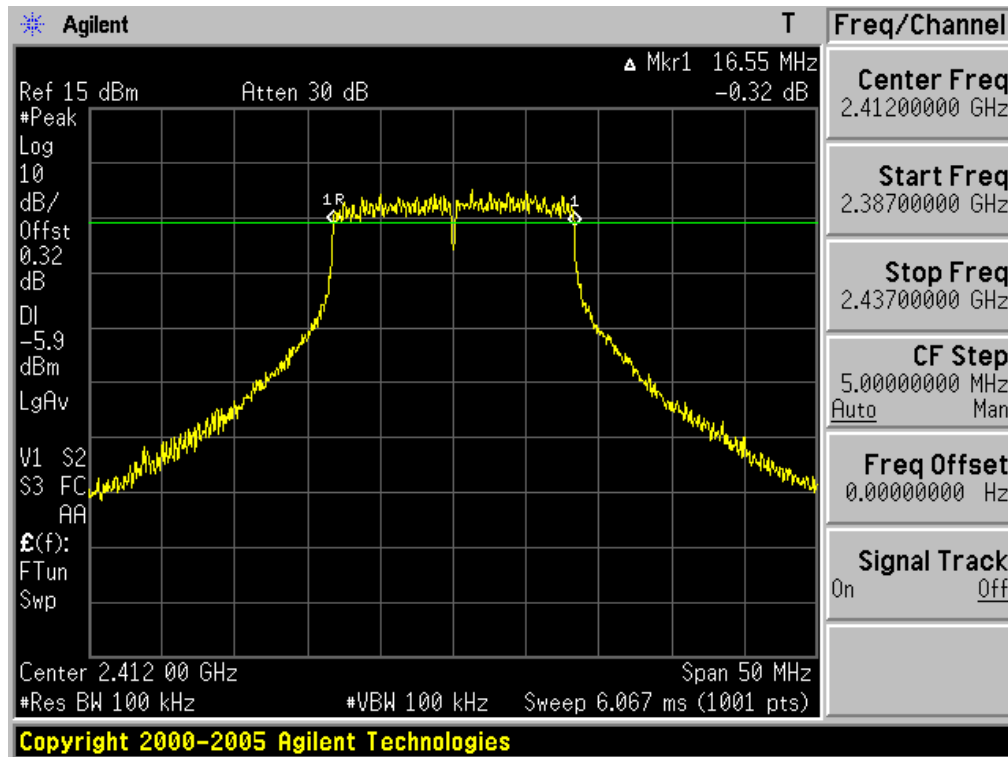
6 dB Bandwidth

Test Mode: 802.11b & Highest Frequency



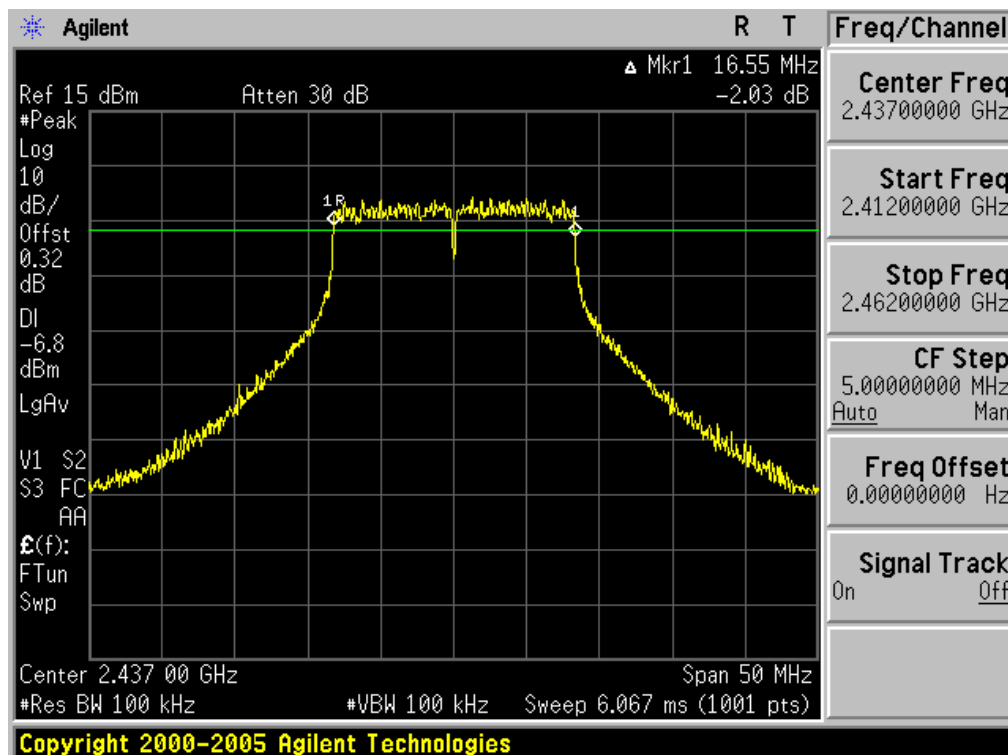
6 dB Bandwidth

Test Mode: 802.11g & Lowest Frequency



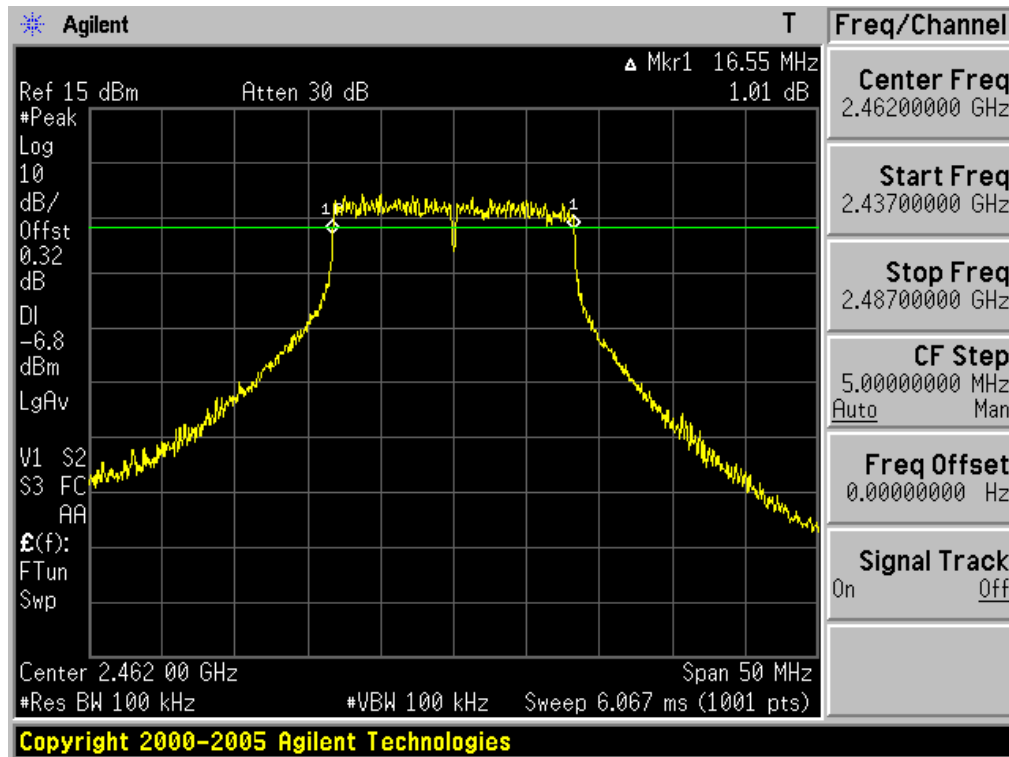
6 dB Bandwidth

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	11.67	0.01469
	Middle	11.97	0.01574
	Highest	11.21	0.01321
802.11g	Lowest	11.13	0.01297
	Middle	10.75	0.01189
	Highest	10.16	0.01038

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

Minimum Standard:	< 1W
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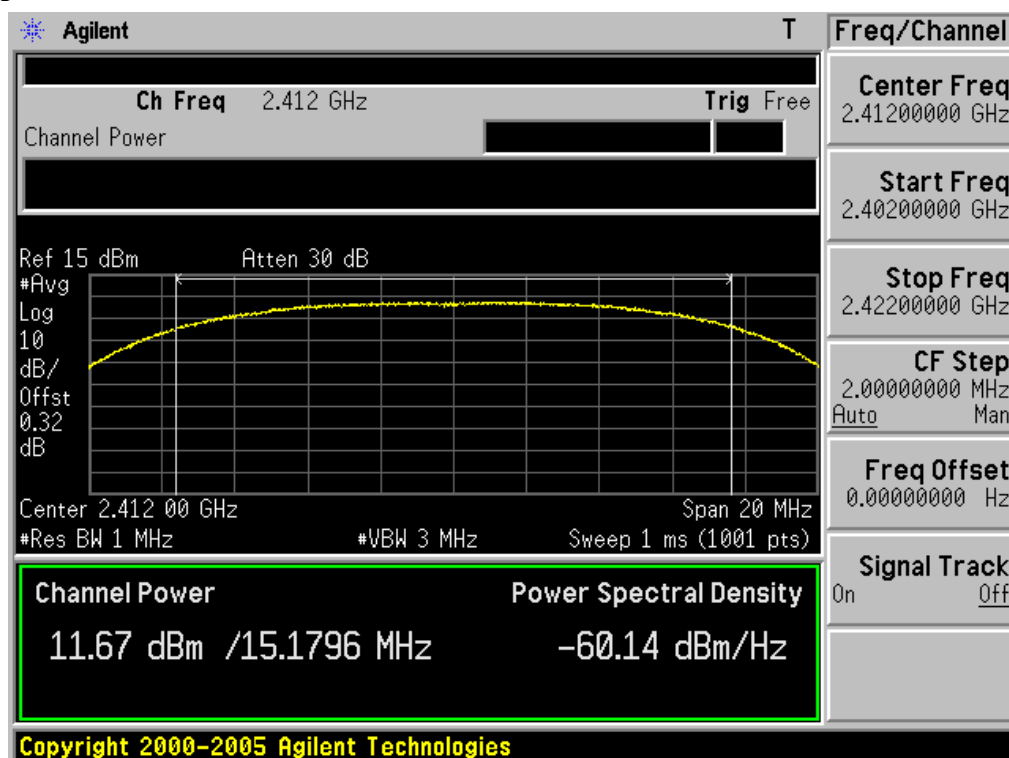
Occupied Bandwidth

Test Mode: 802.11b & Lowest Frequency



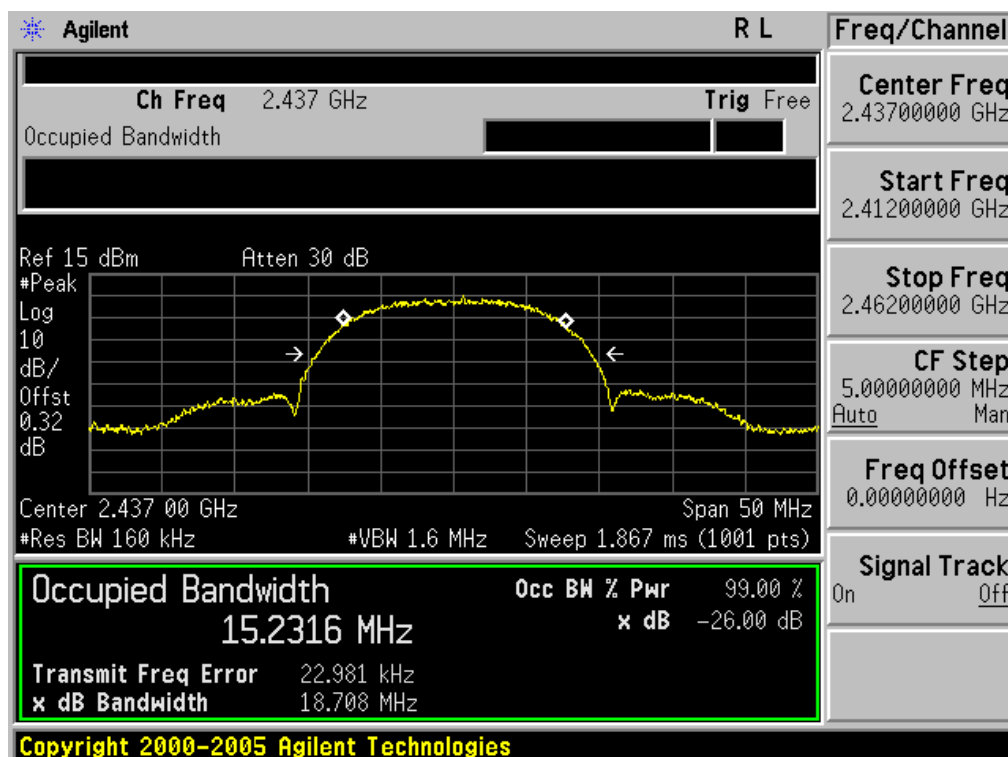
Peak Output Power

Test Mode: 802.11b & Lowest Frequency



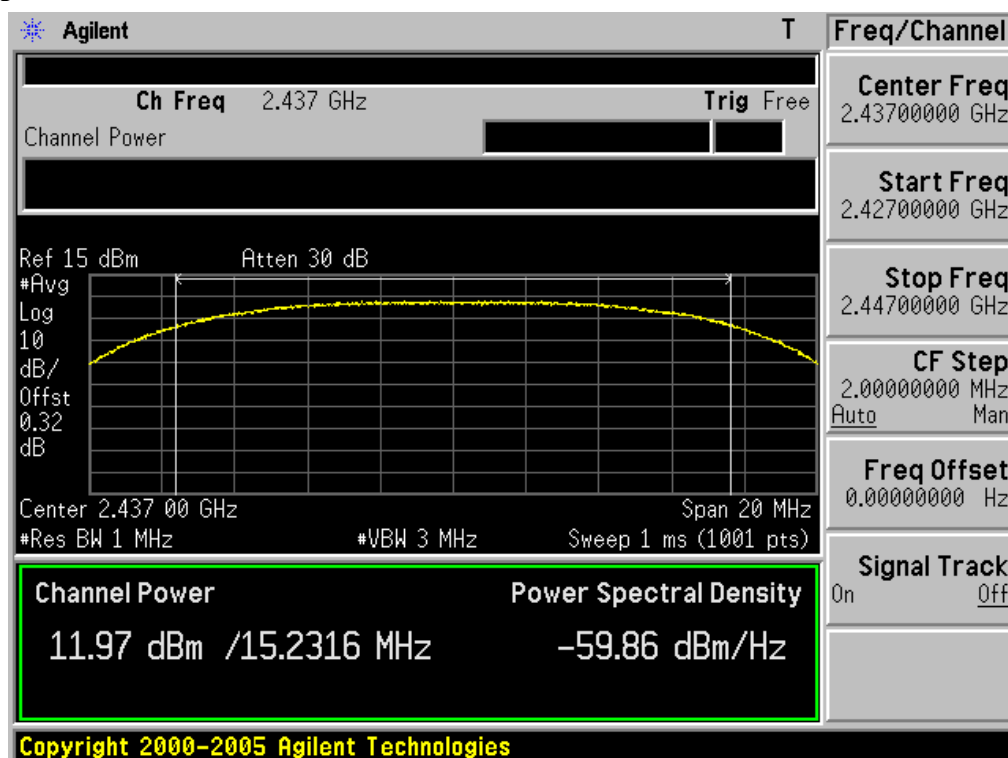
Occupied Bandwidth

Test Mode: 802.11b & Middle Frequency



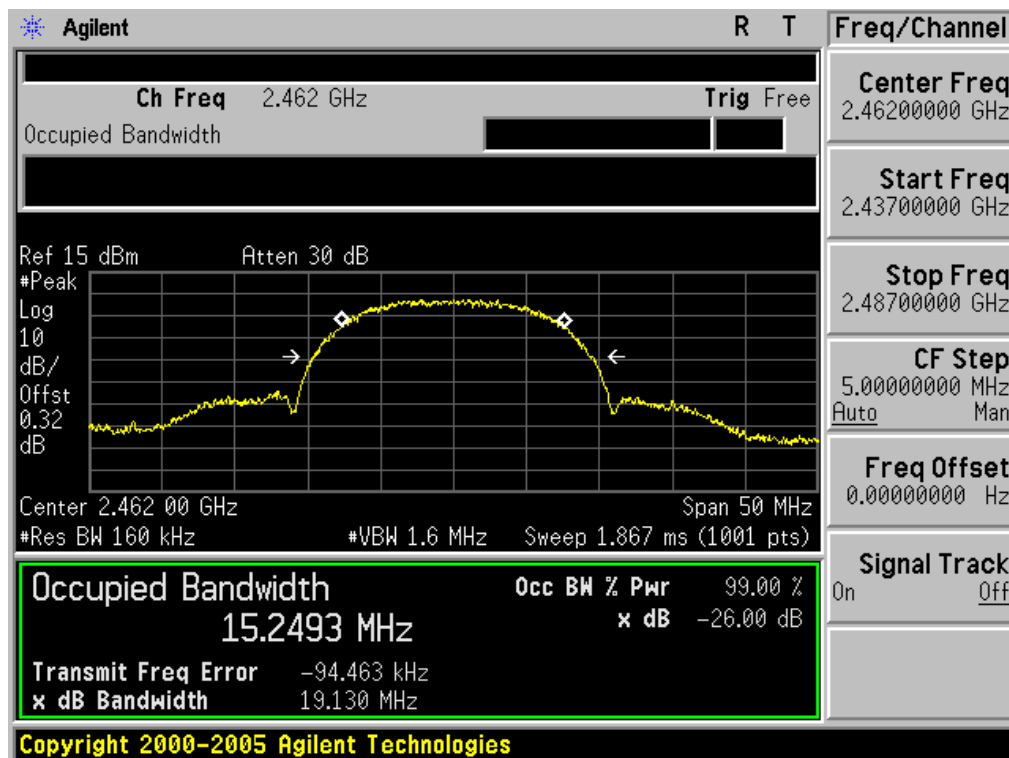
Peak Output Power

Test Mode: 802.11b & Middle Frequency



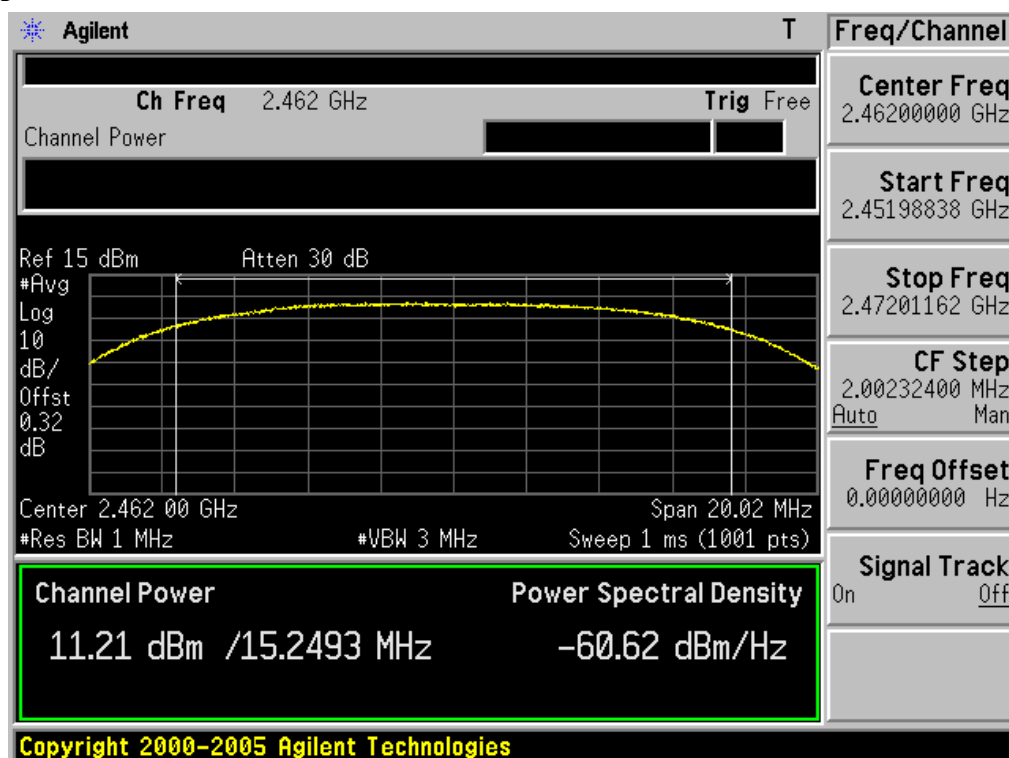
Occupied Bandwidth

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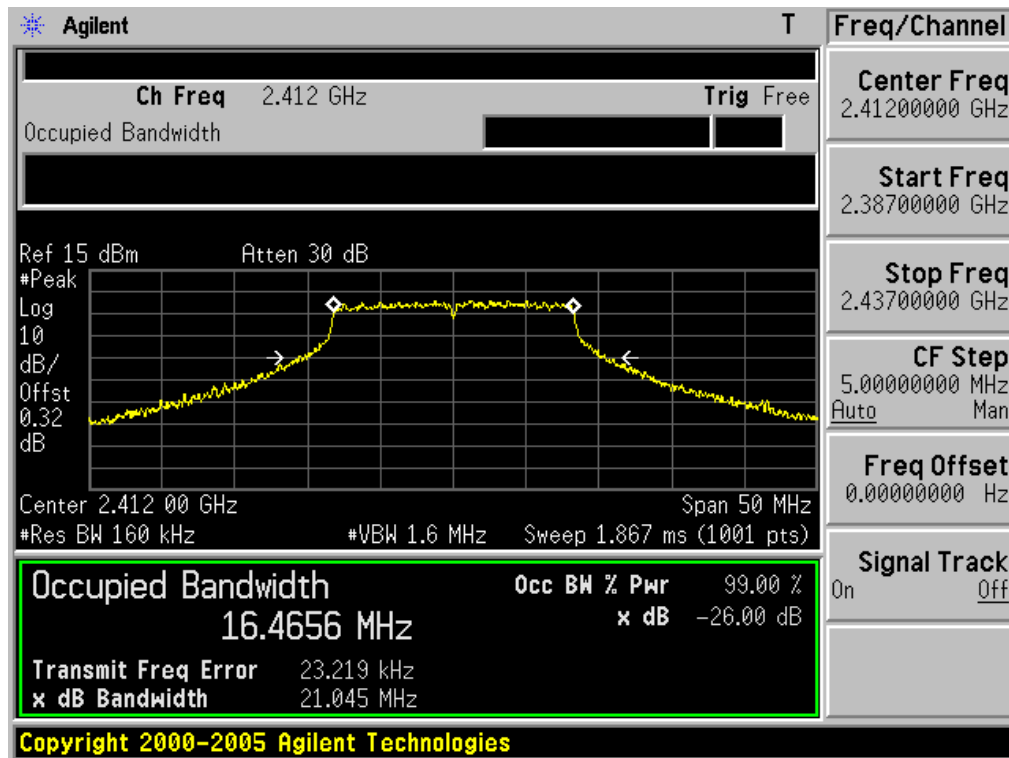
Peak Output Power

Test Mode: 802.11b & Highest Frequency



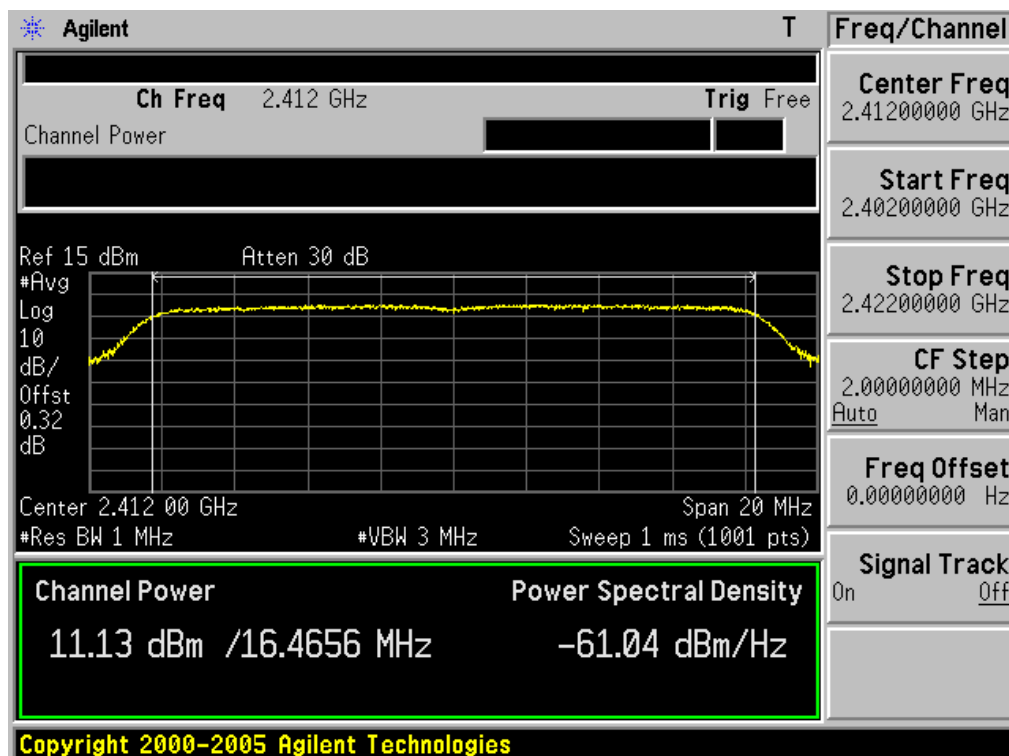
Occupied Bandwidth

Test Mode: 802.11g & Lowest Frequency



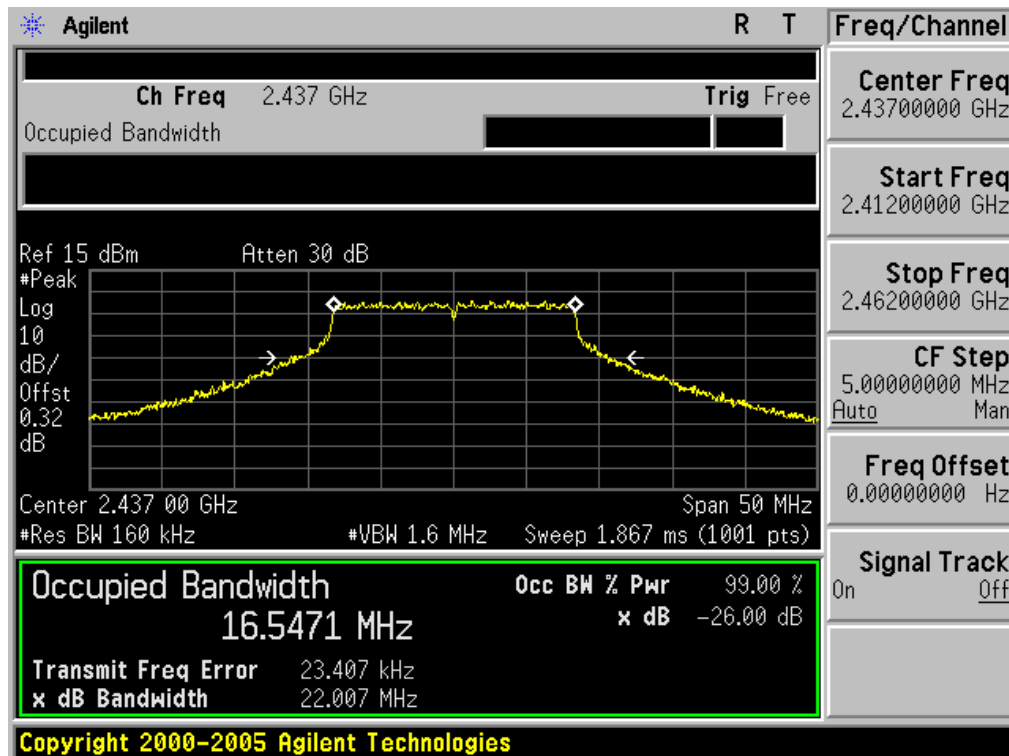
Peak Output Power

Test Mode: 802.11g & Lowest Frequency



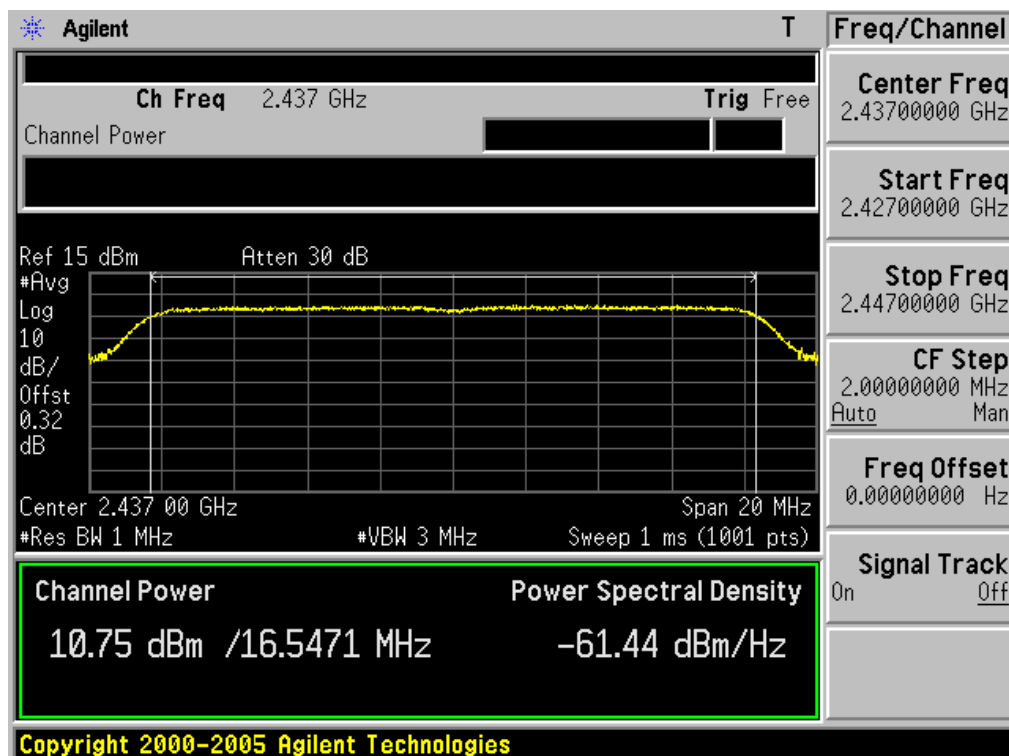
Occupied Bandwidth

Test Mode: 802.11g & Middle Frequency



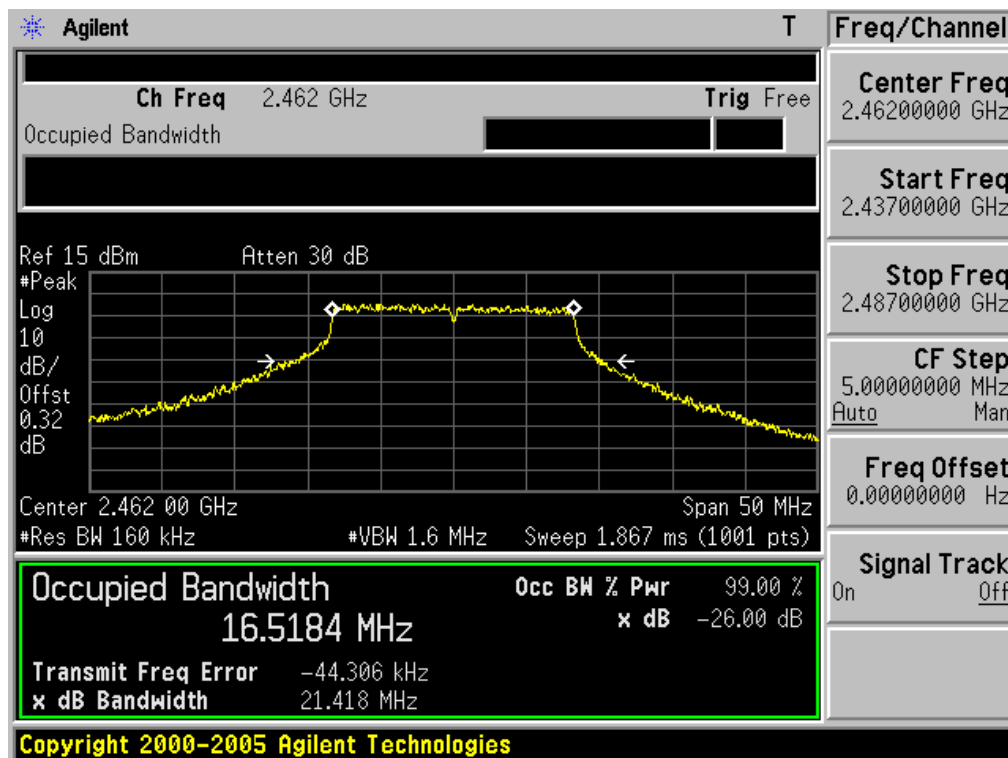
Peak Output Power

Test Mode: 802.11g & Middle Frequency



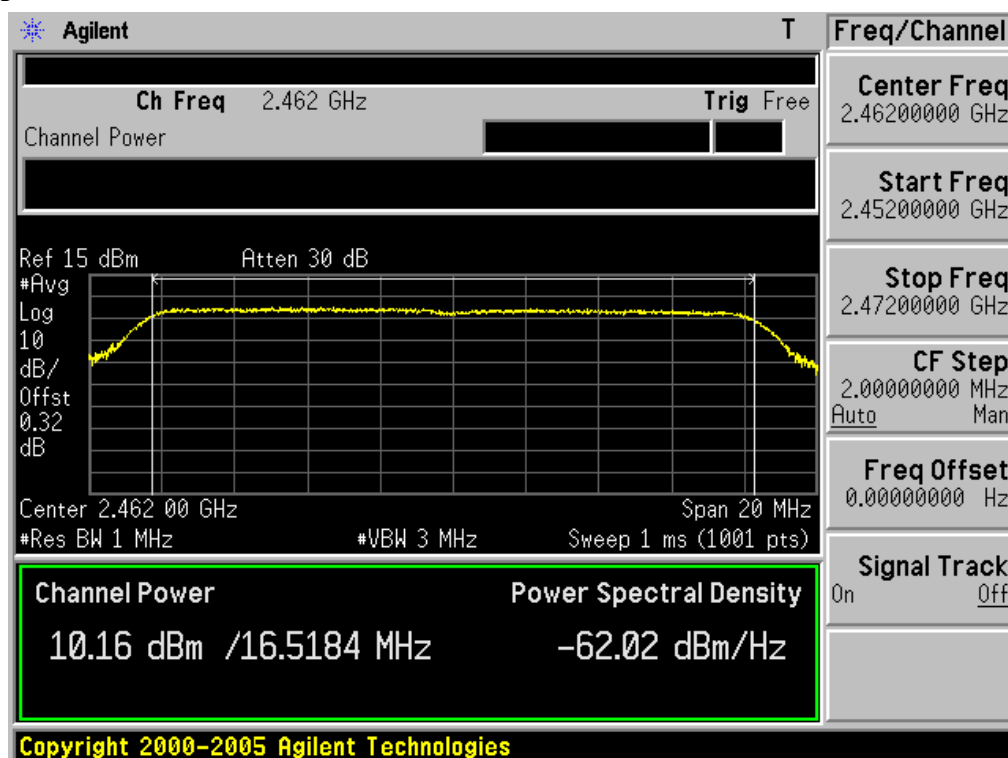
Occupied Bandwidth

Test Mode: 802.11g & Highest Frequency



Peak Output Power

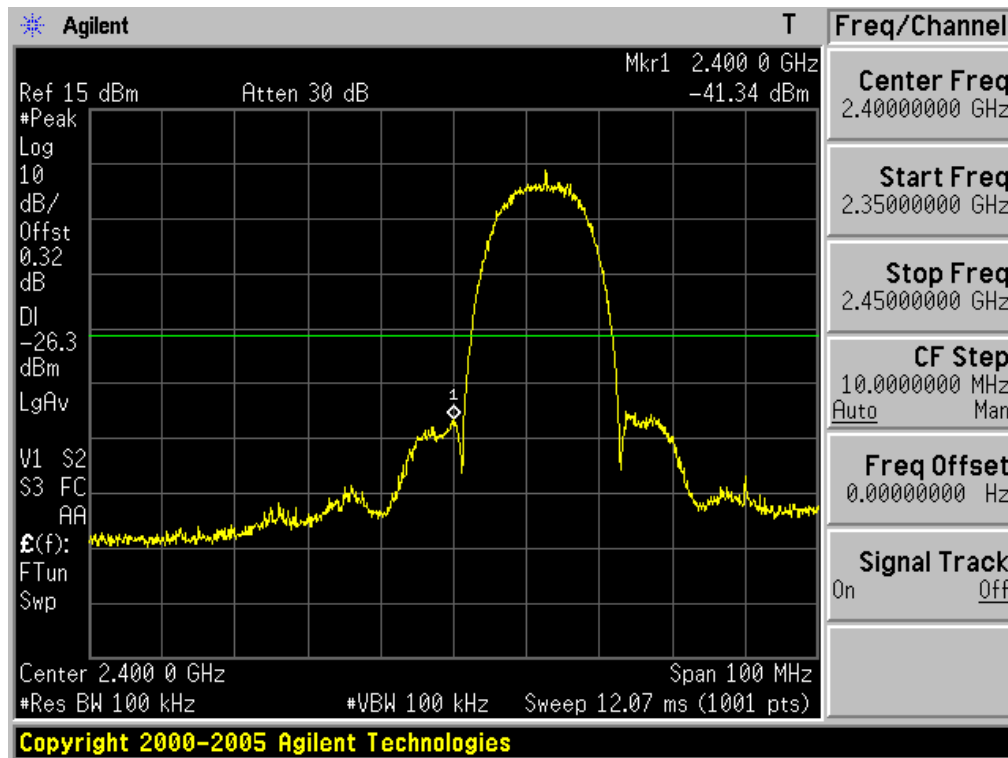
Test Mode: 802.11g & Highest Frequency



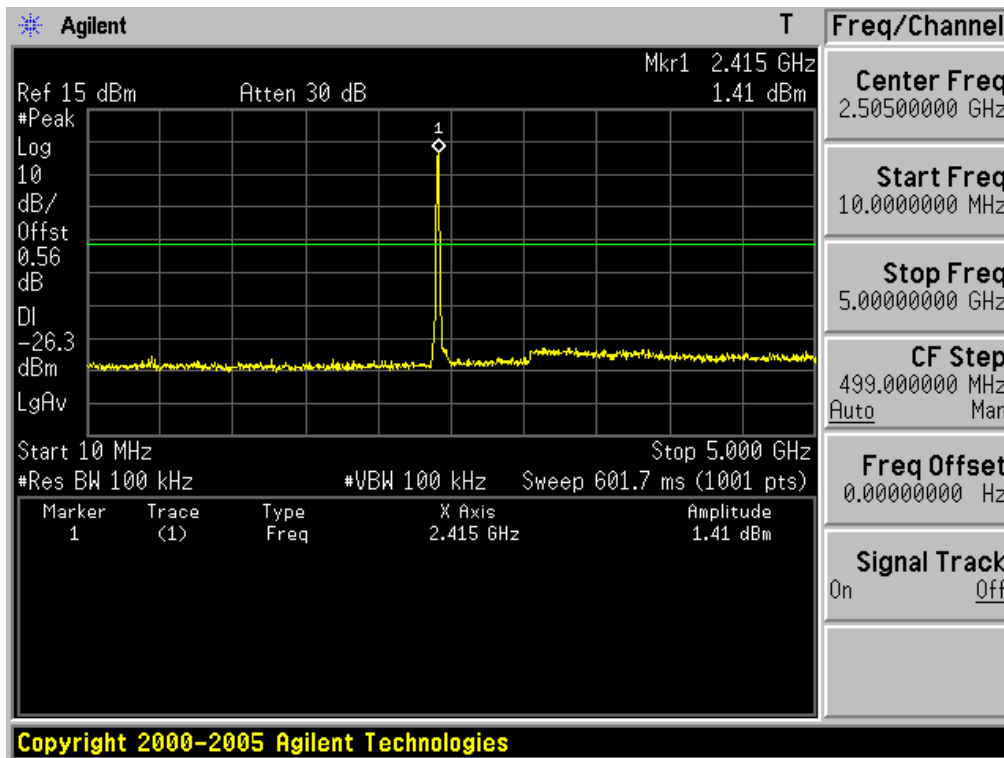
1. *Journal of Management Studies*, 1990, 27, 1, 1-14.

Low Band-edge at 30 dB blow

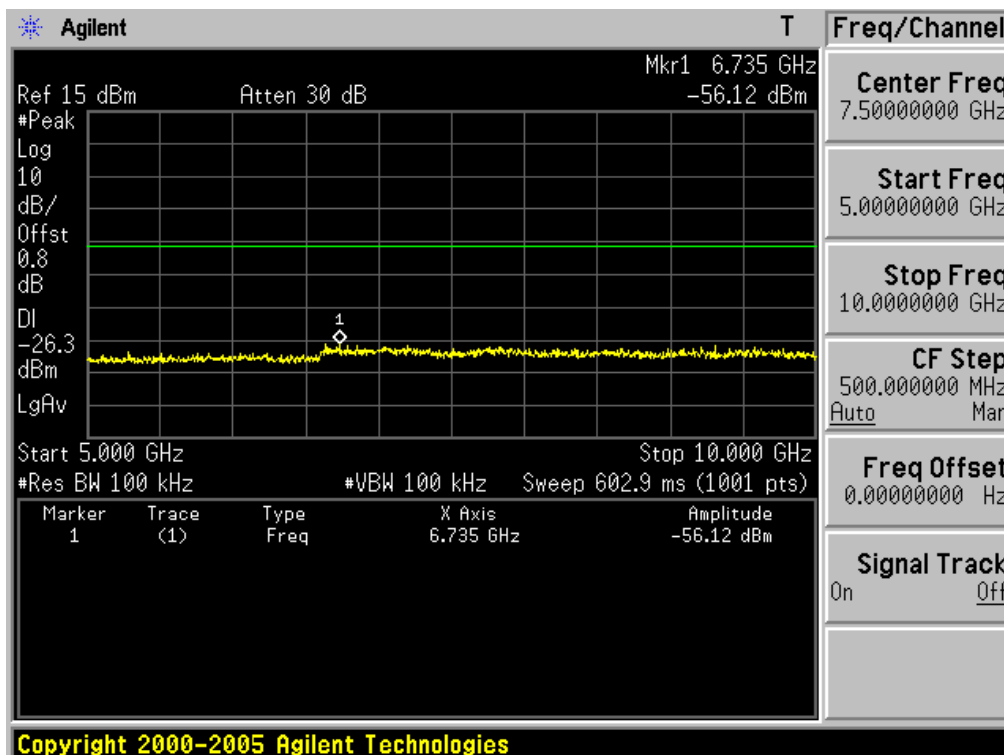
Test Mode: 802.11b & Lowest Frequency



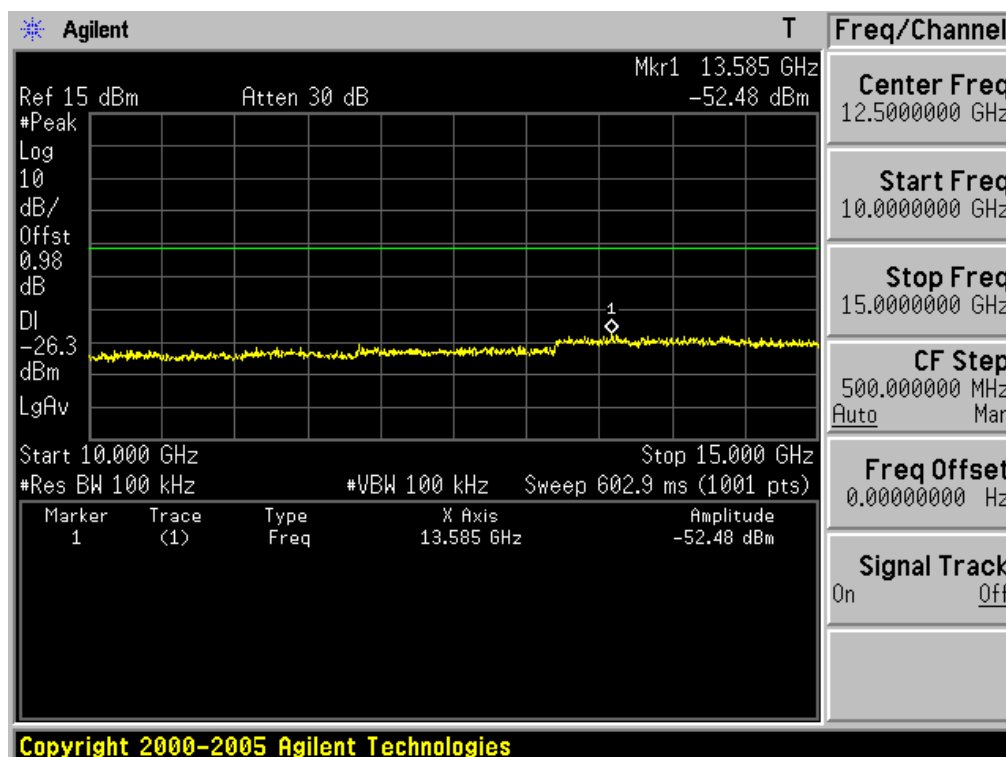
10MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11b & Lowest Frequency



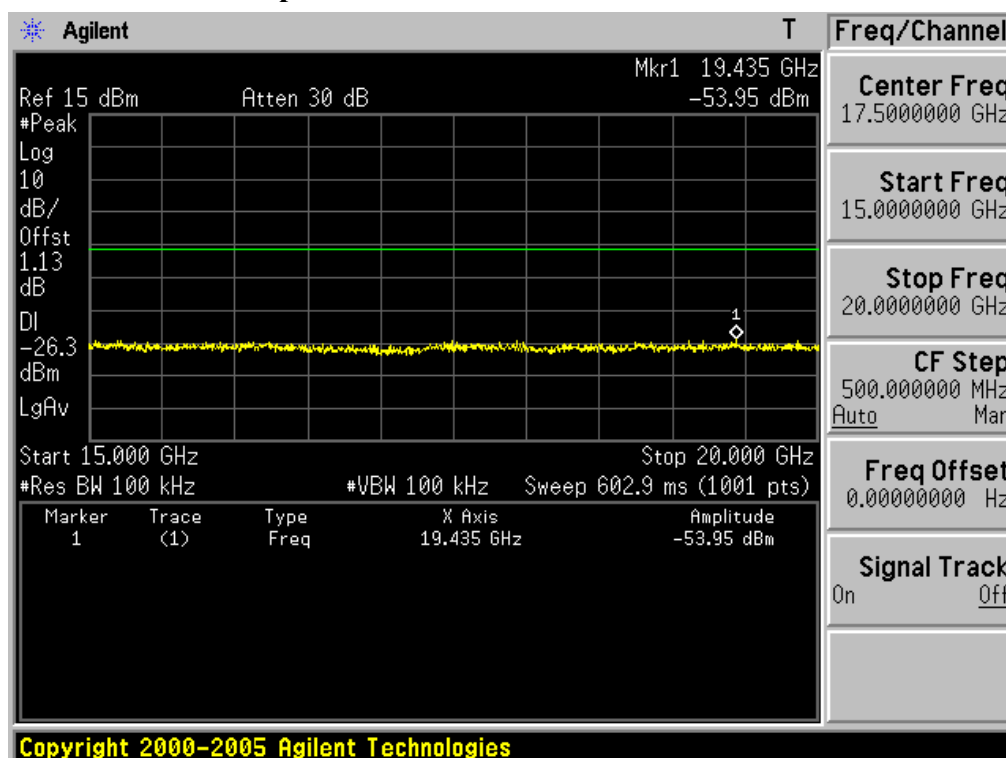
5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11b & Lowest Frequency



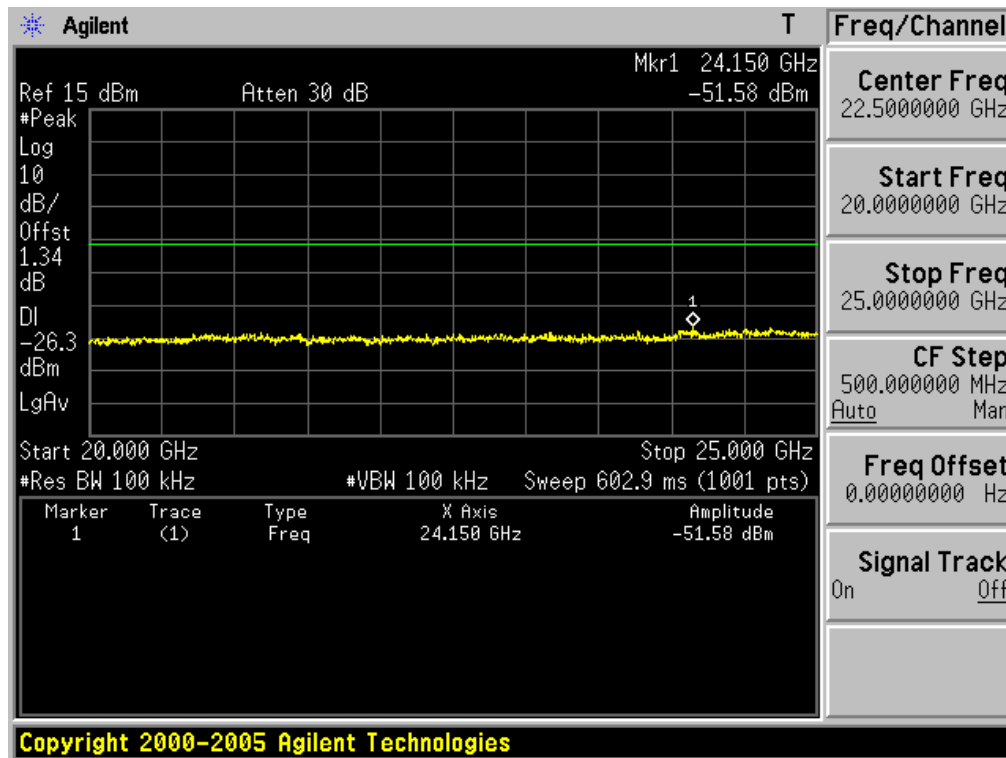
10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11b & Lowest Frequency



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

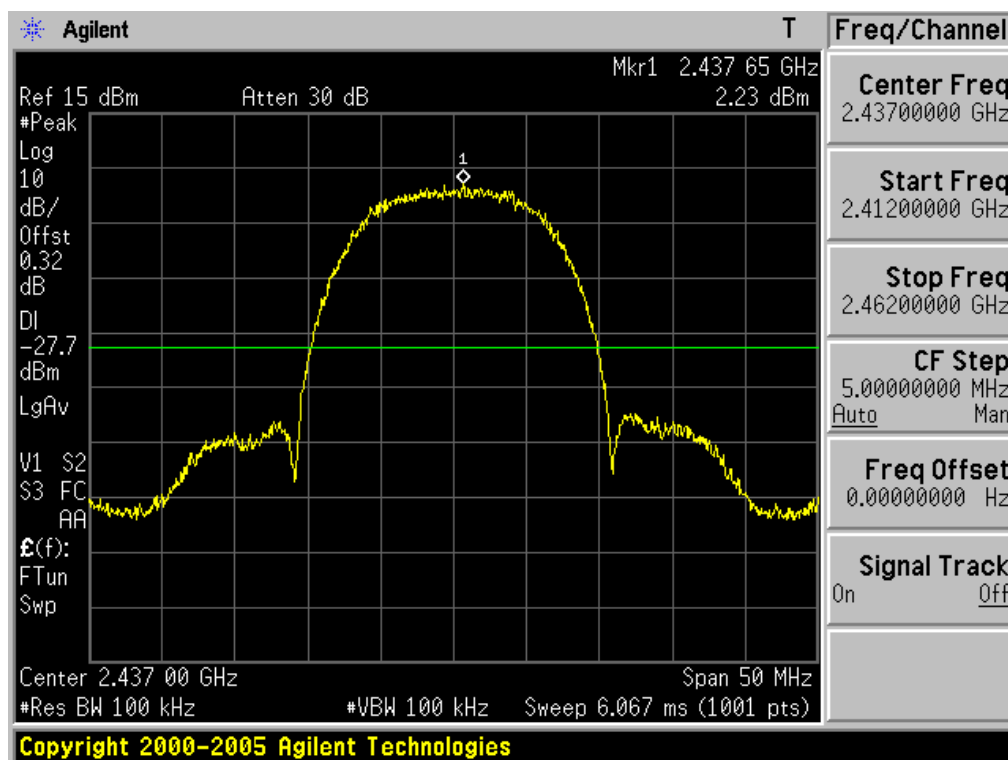


20GHz ~ 25GHz Conducted Spurious Emissions Test Mode: 802.11b & Lowest Frequency

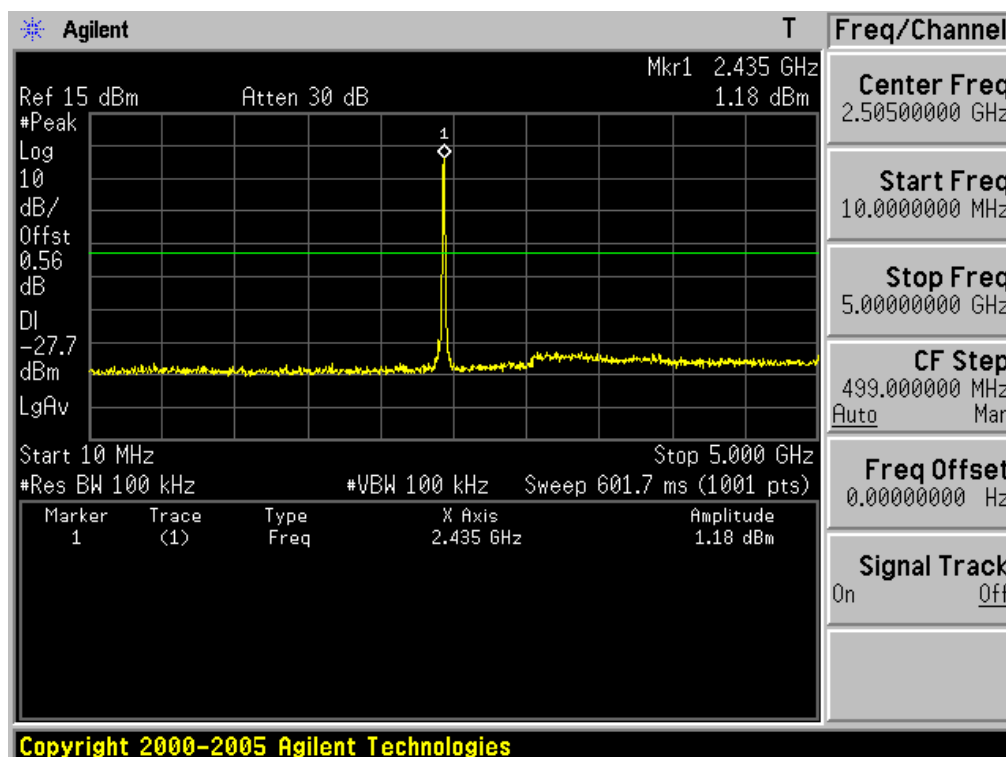


Reference for limit

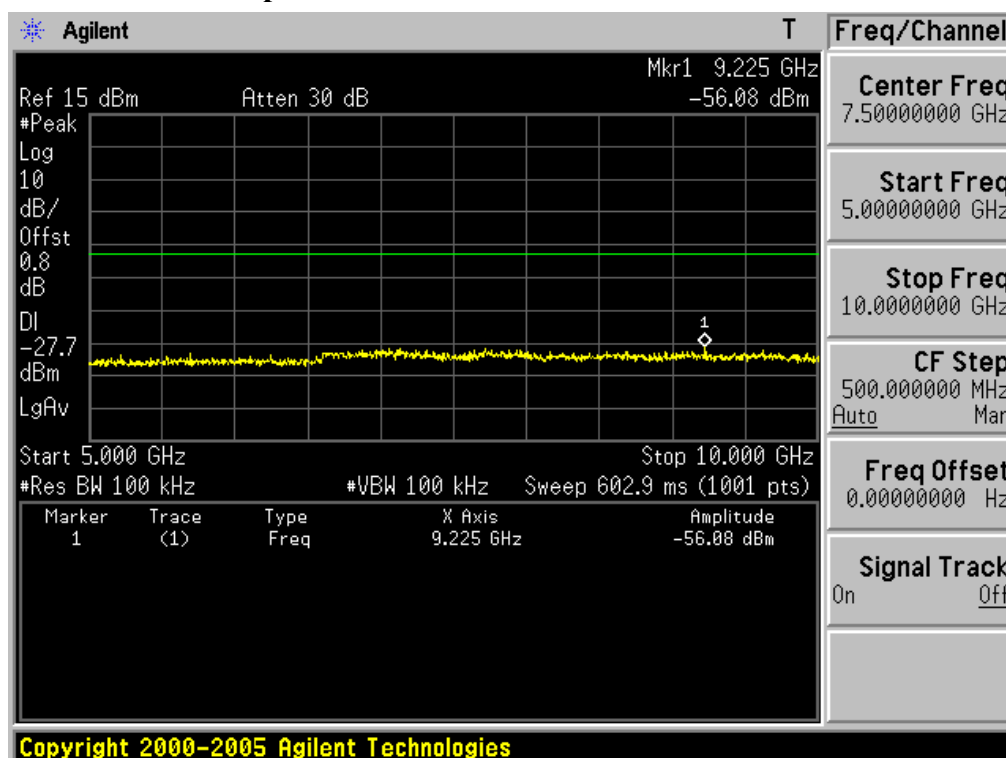
Test Mode: 802.11b & Middle Frequency



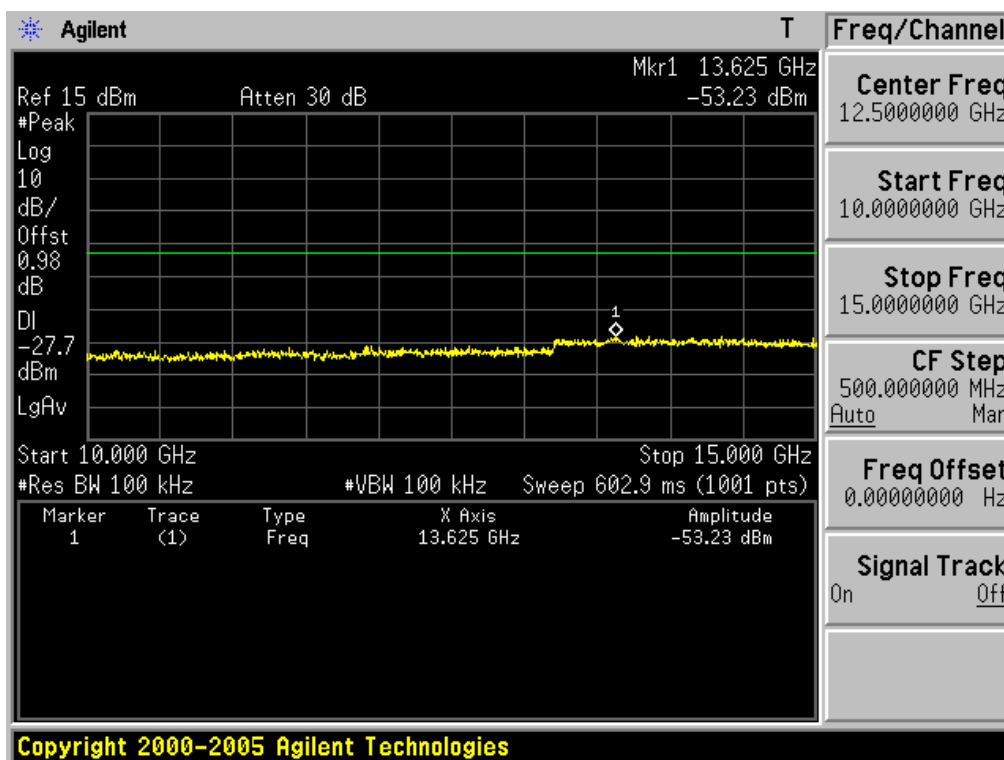
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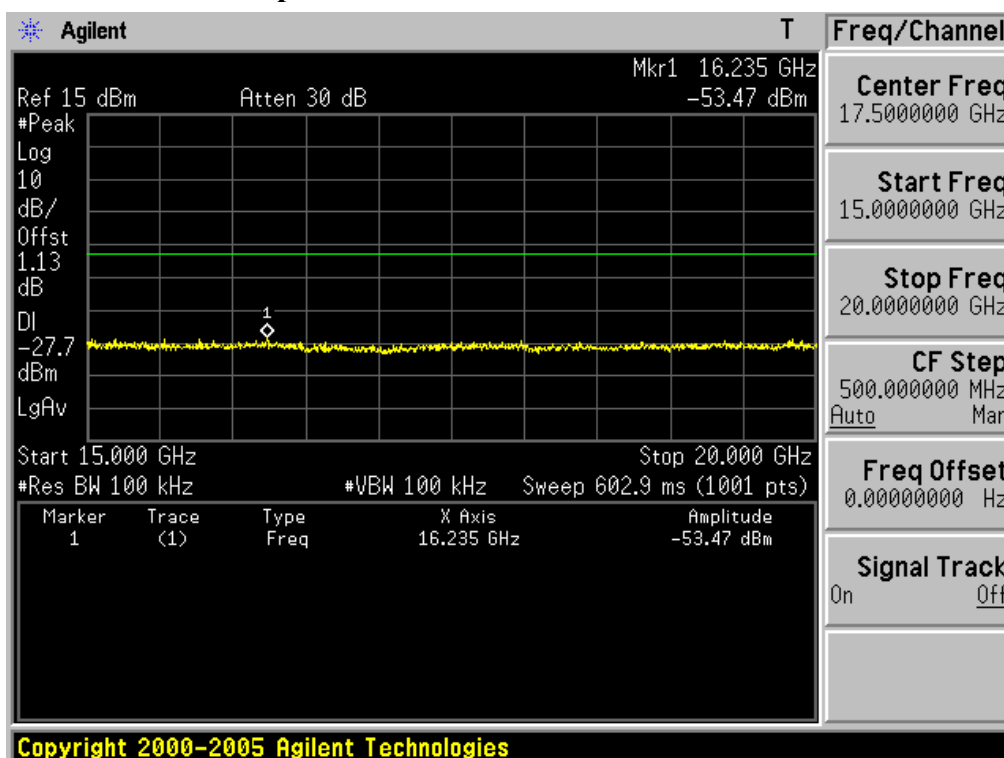
5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11b & Middle Frequency



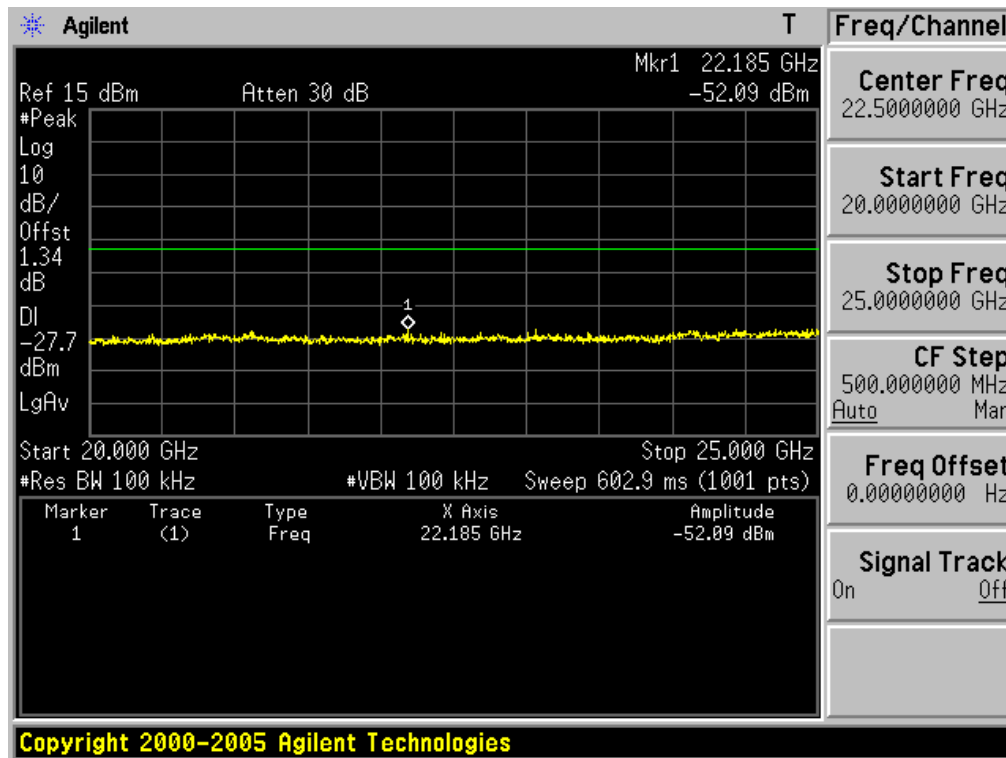
10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11b & Middle Frequency



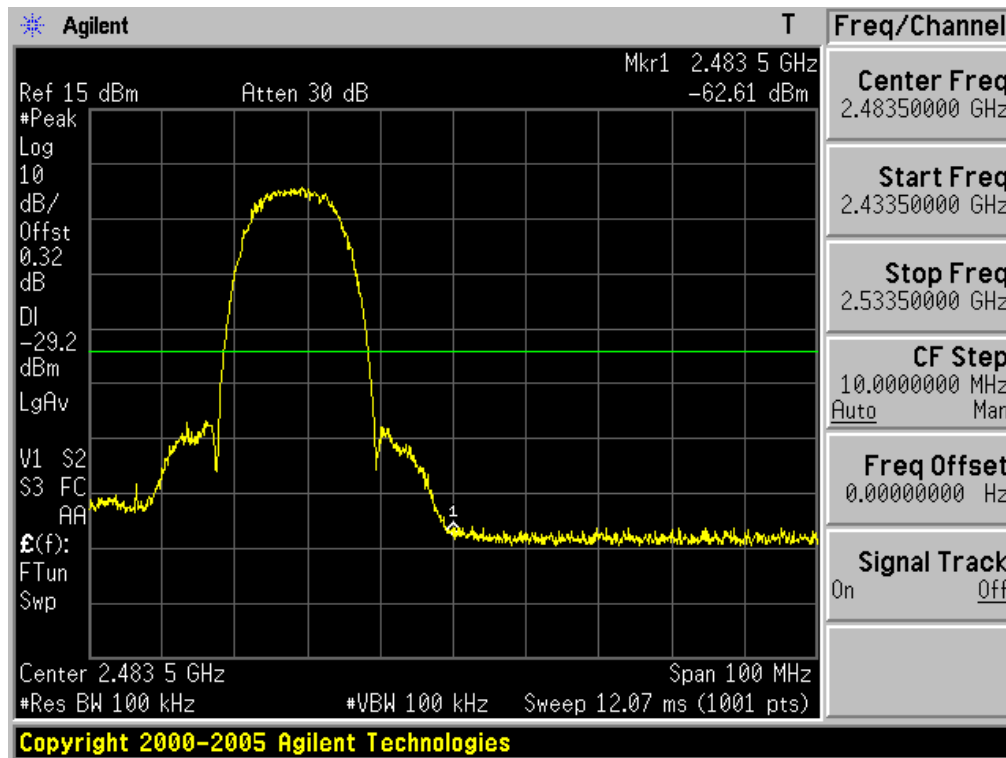
15GHz ~ 20GHz Conducted Spurious Emissions Test Mode: 802.11b & Middle Frequency



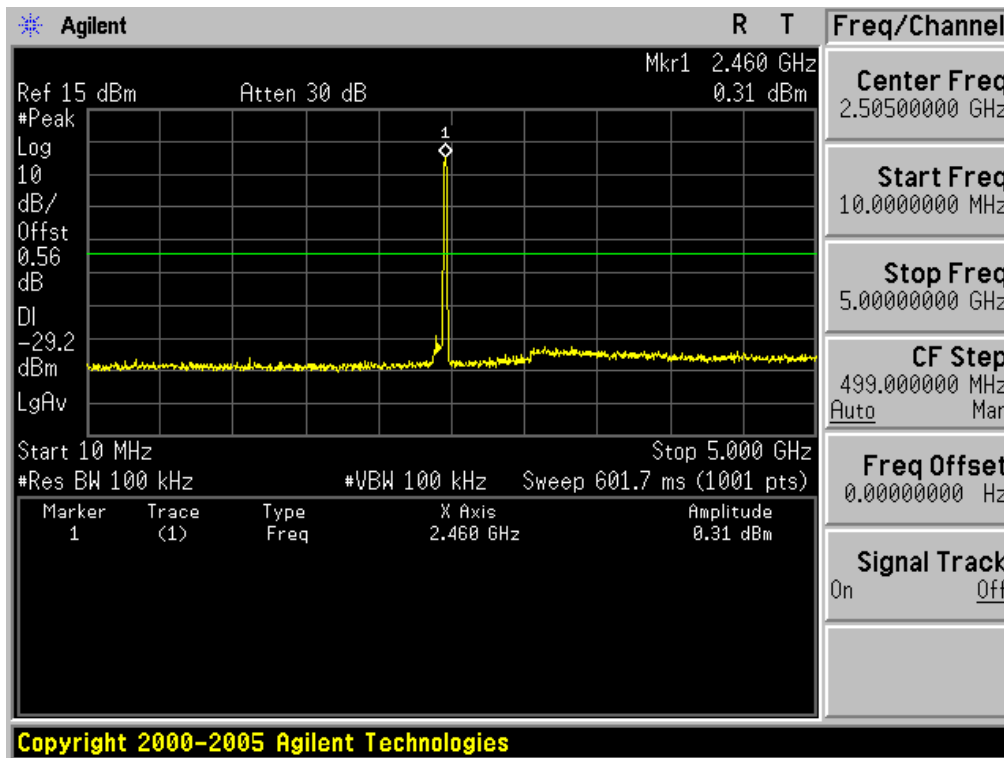
20GHz ~ 25GHz Conducted Spurious Emissions Test Mode: 802.11b & Middle Frequency



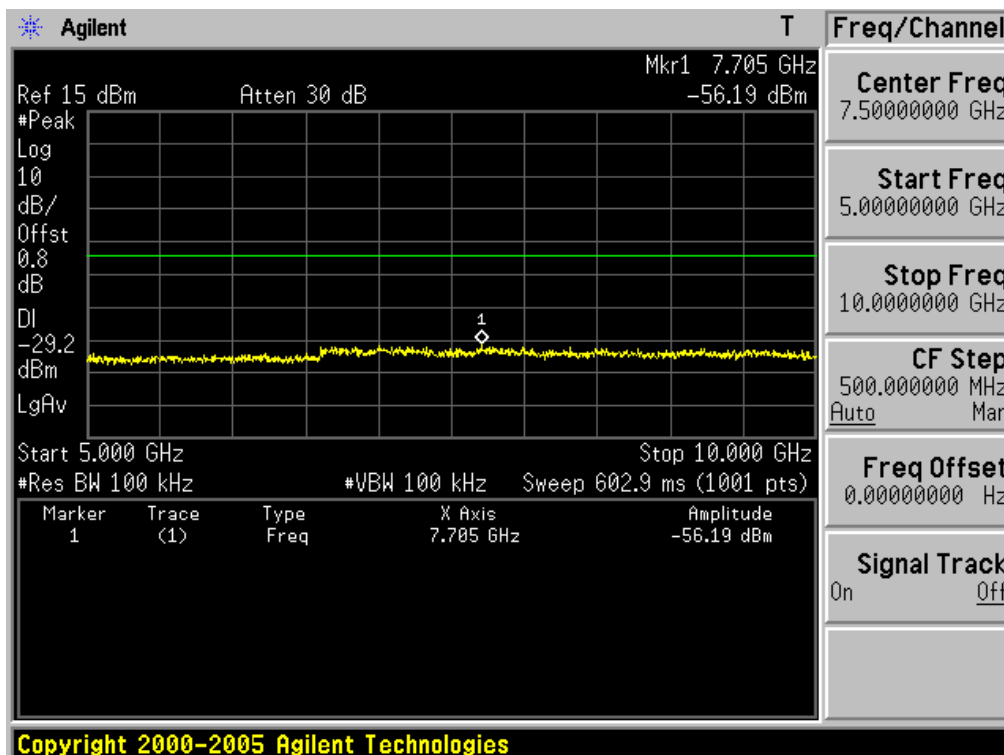
High Band-edge at 30 dB blow Test Mode: 802.11b & Highest Frequency



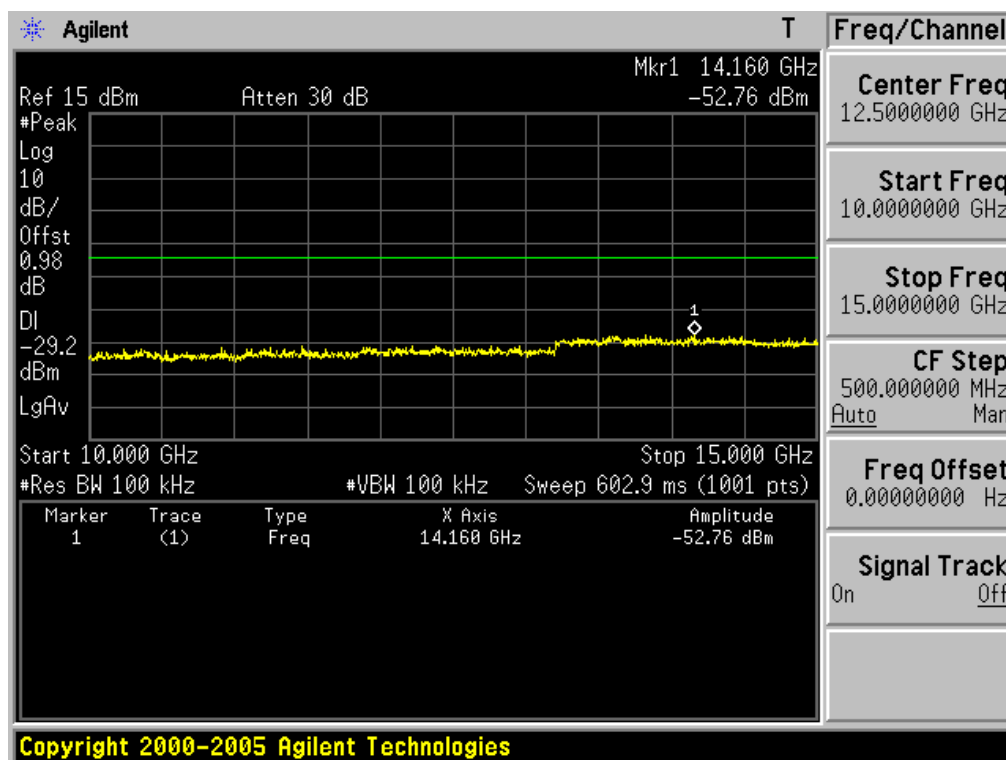
10MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11b & Highest Frequency



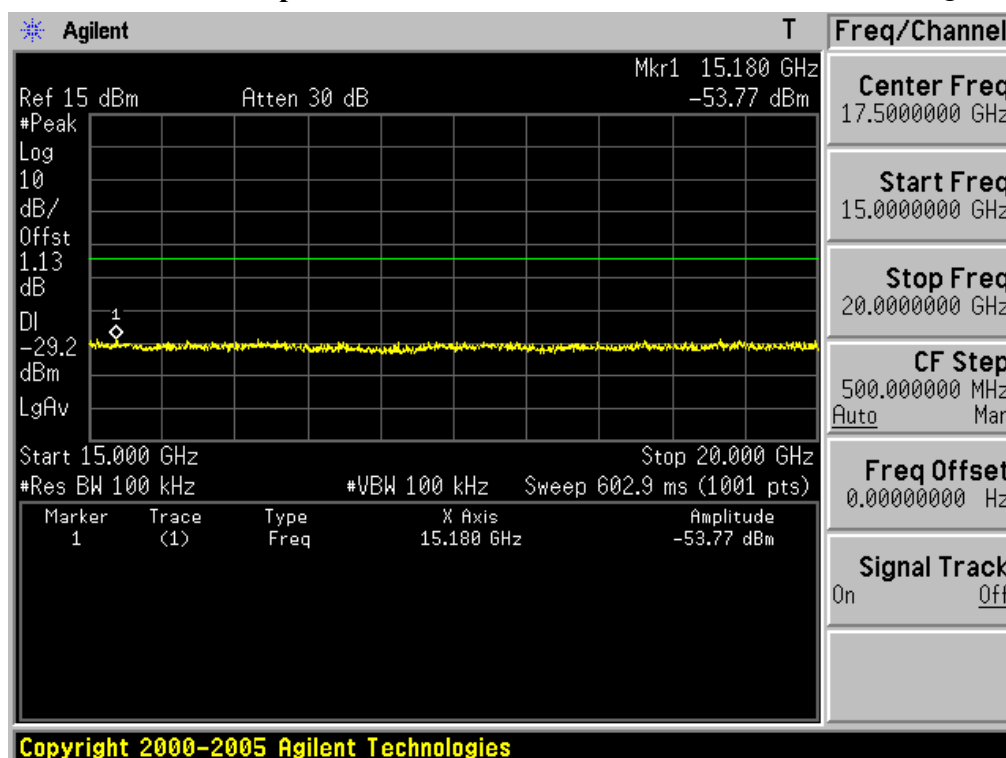
5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11b & Highest Frequency



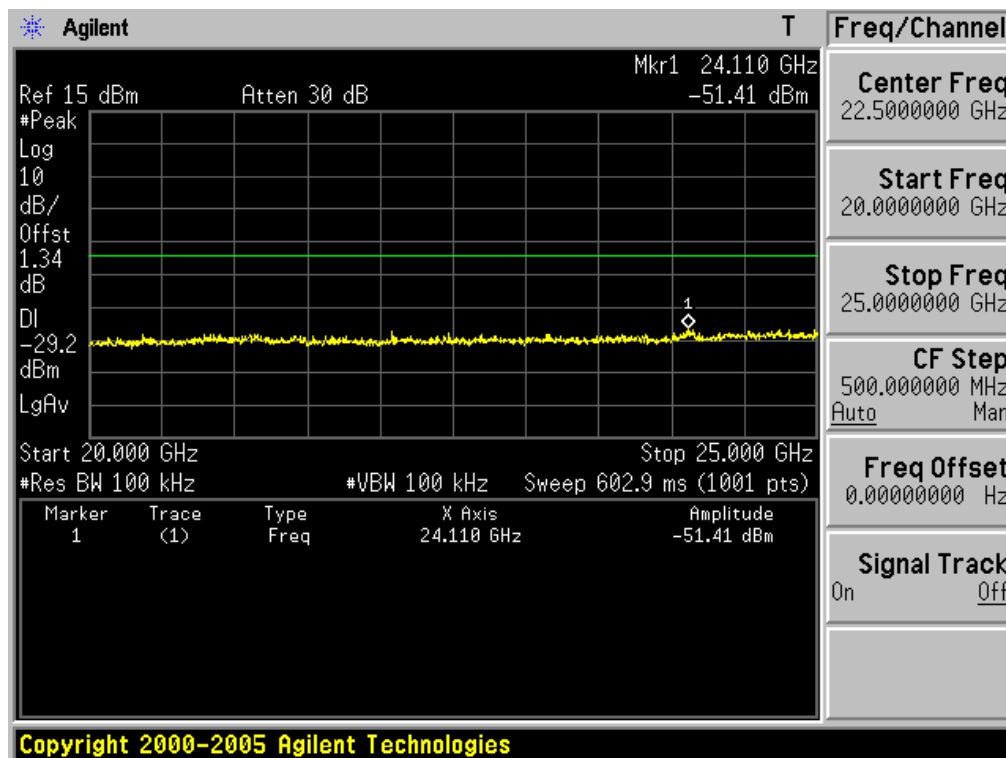
10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11b & Highest Frequency



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

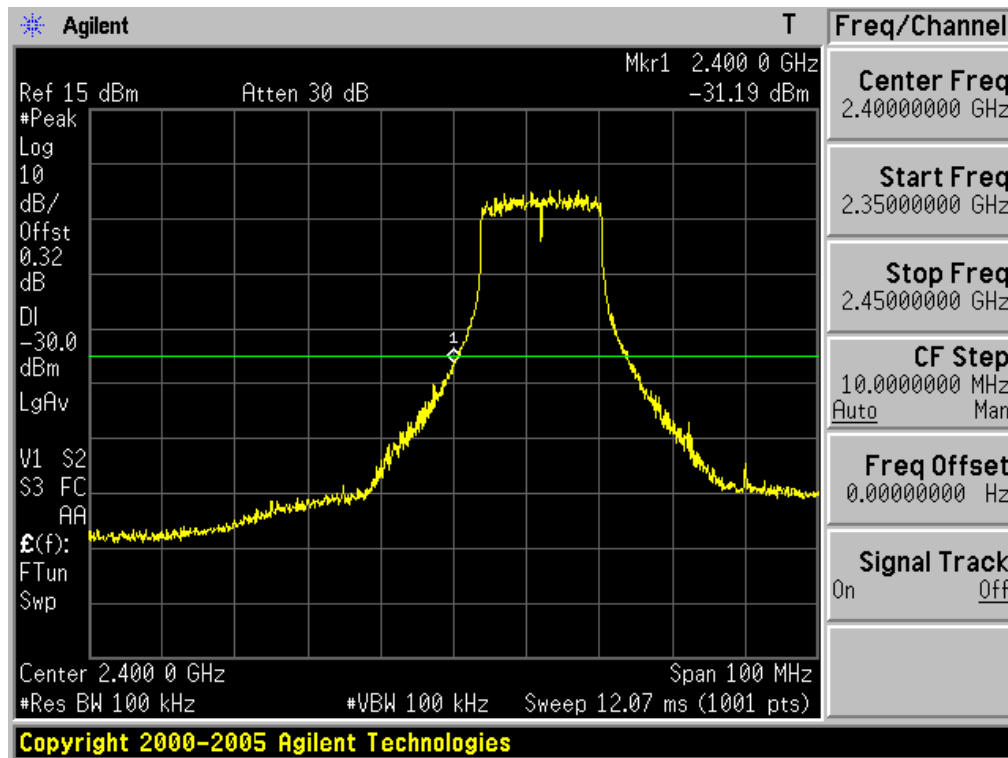


20GHz ~ 25GHz Conducted Spurious Emissions Test Mode: 802.11b & Highest Frequency

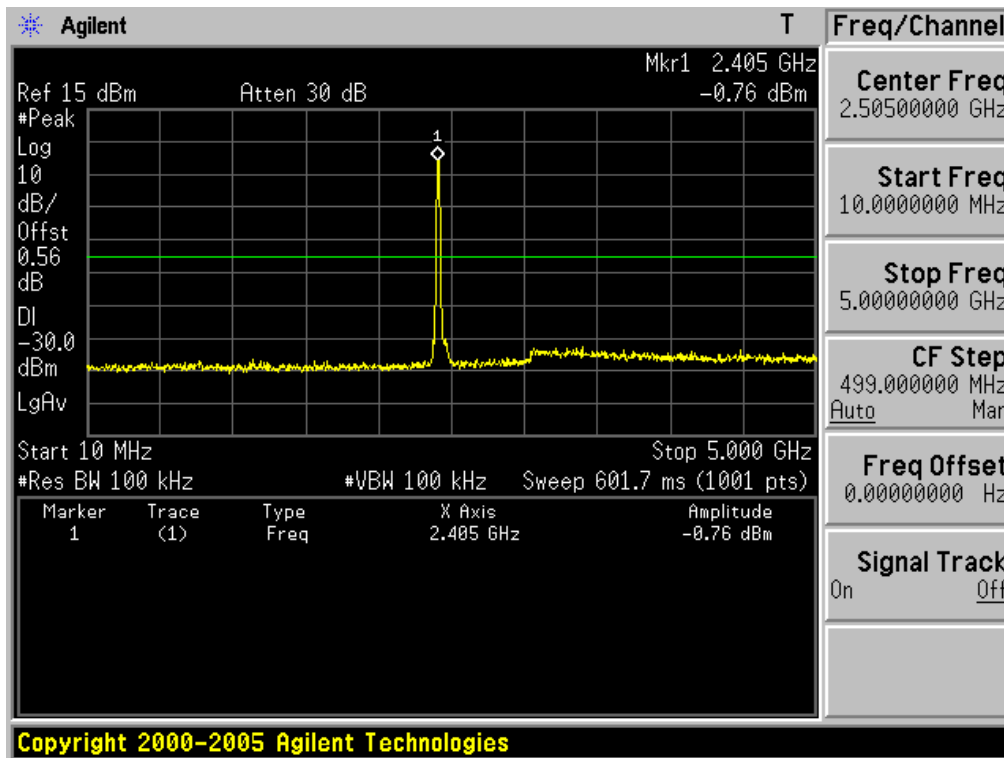


Low Band-edge at 30 dB blow

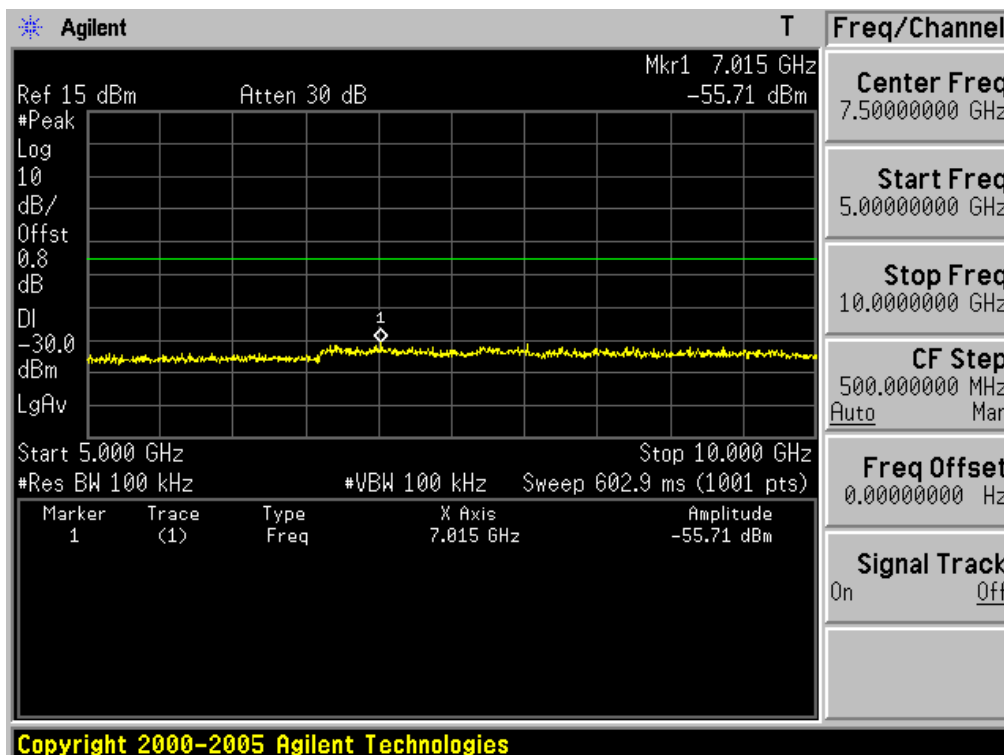
Test Mode: 802.11g & Lowest Frequency



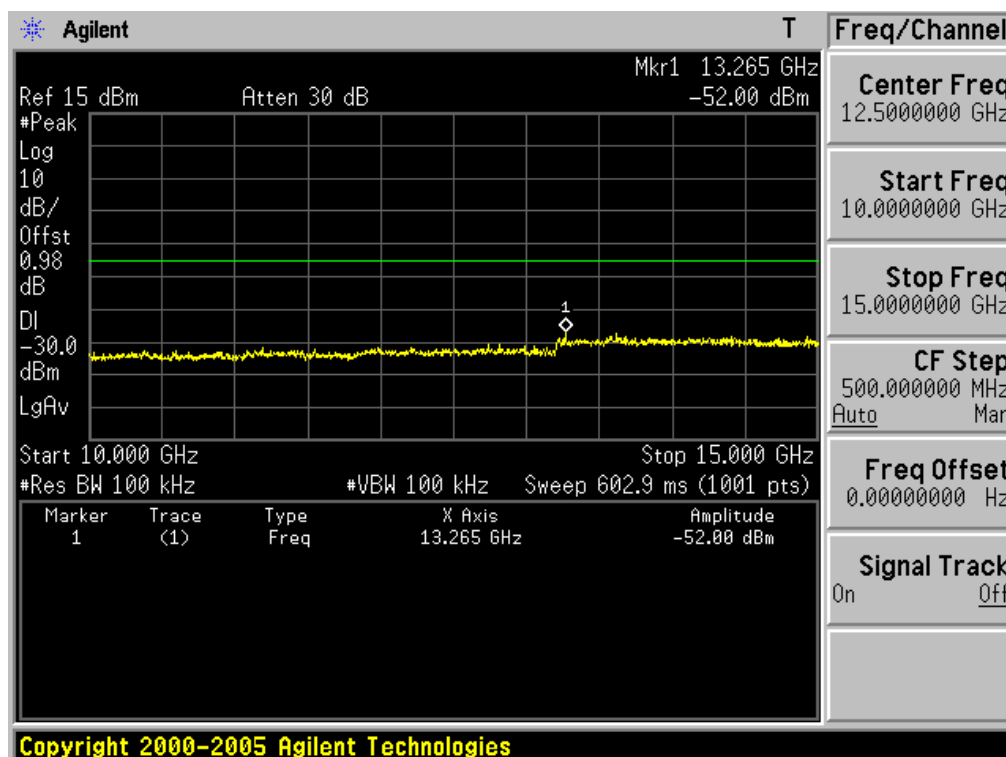
10MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11g & Lowest Frequency



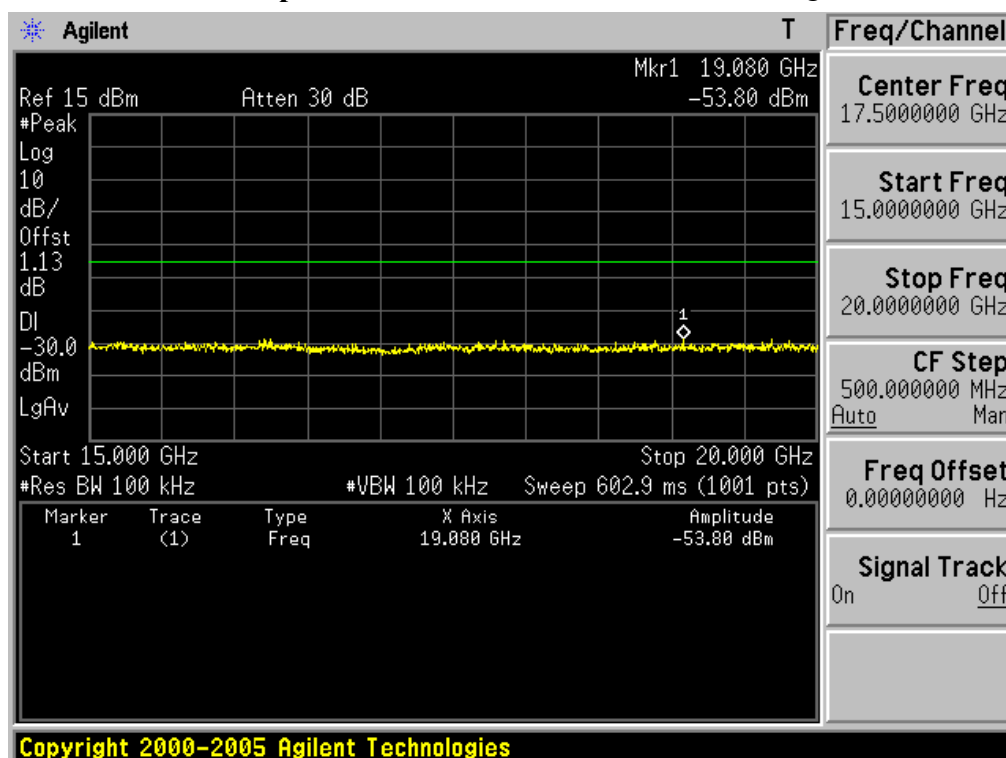
5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11g & Lowest Frequency



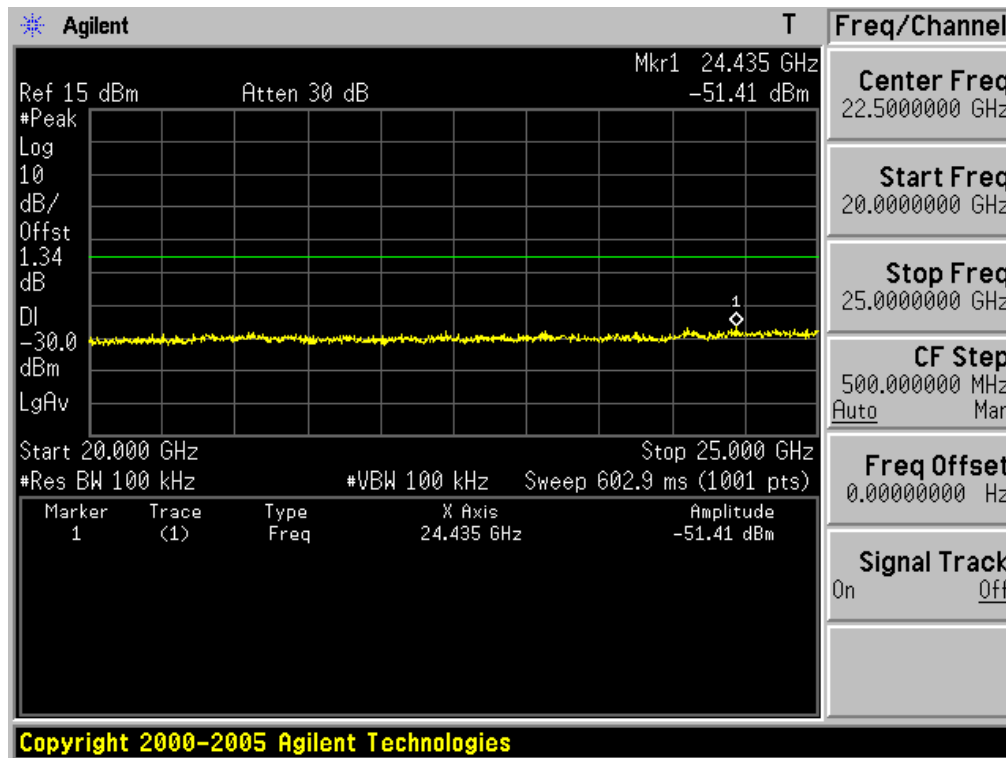
10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11g & Lowest Frequency



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

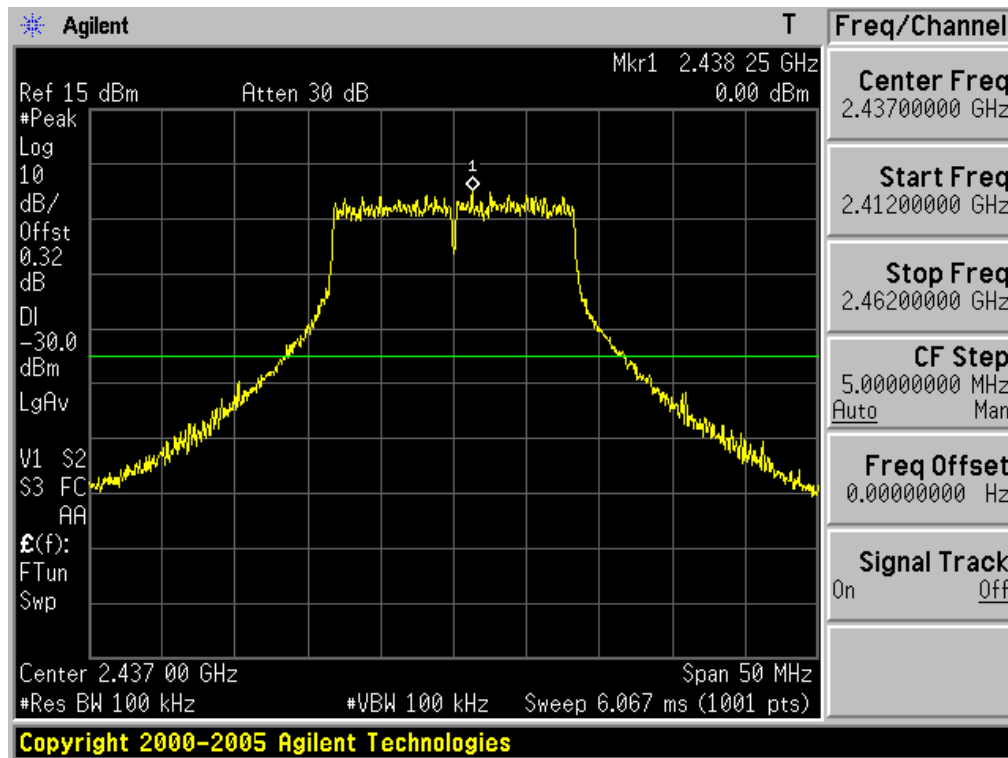


20GHz ~ 25GHz Conducted Spurious Emissions Test Mode: 802.11g & Lowest Frequency



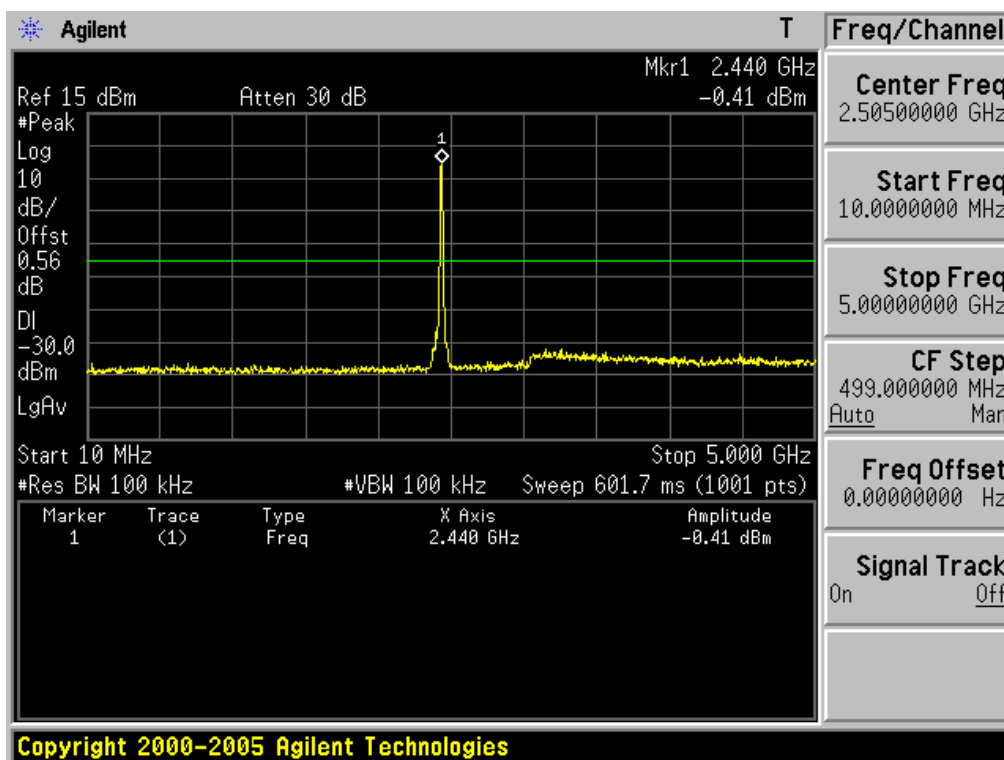
Reference for limit

Test Mode: 802.11g & Middle Frequency



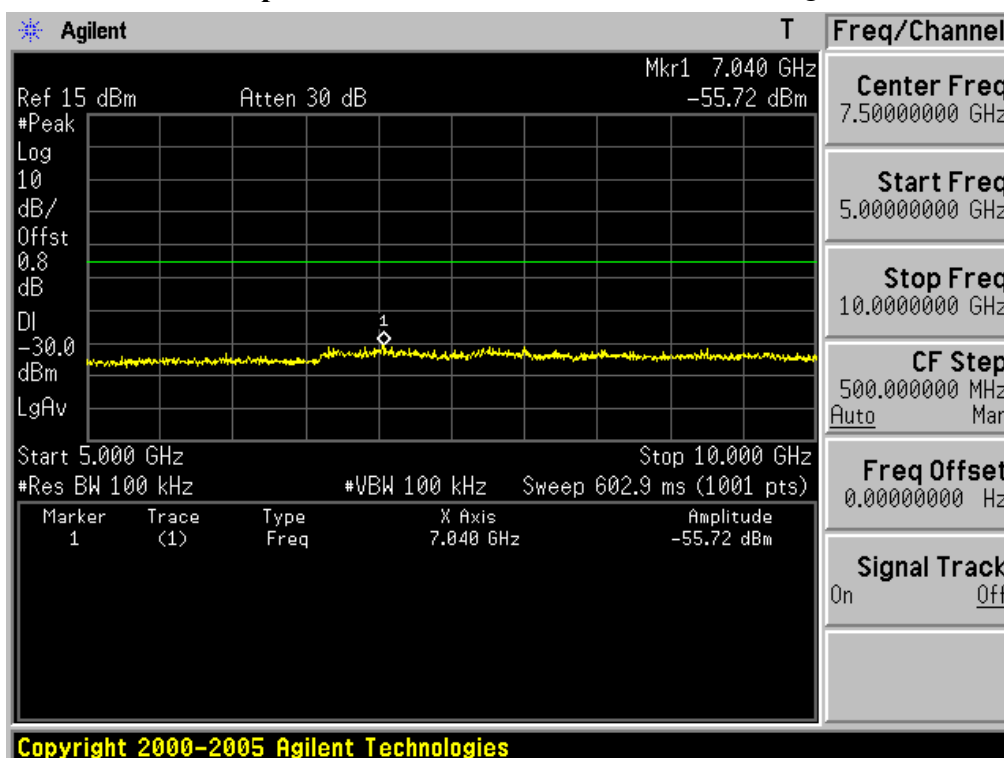
10MHz ~ 5GHz Conducted Spurious Emissions

Test Mode: 802.11g & Middle Frequency

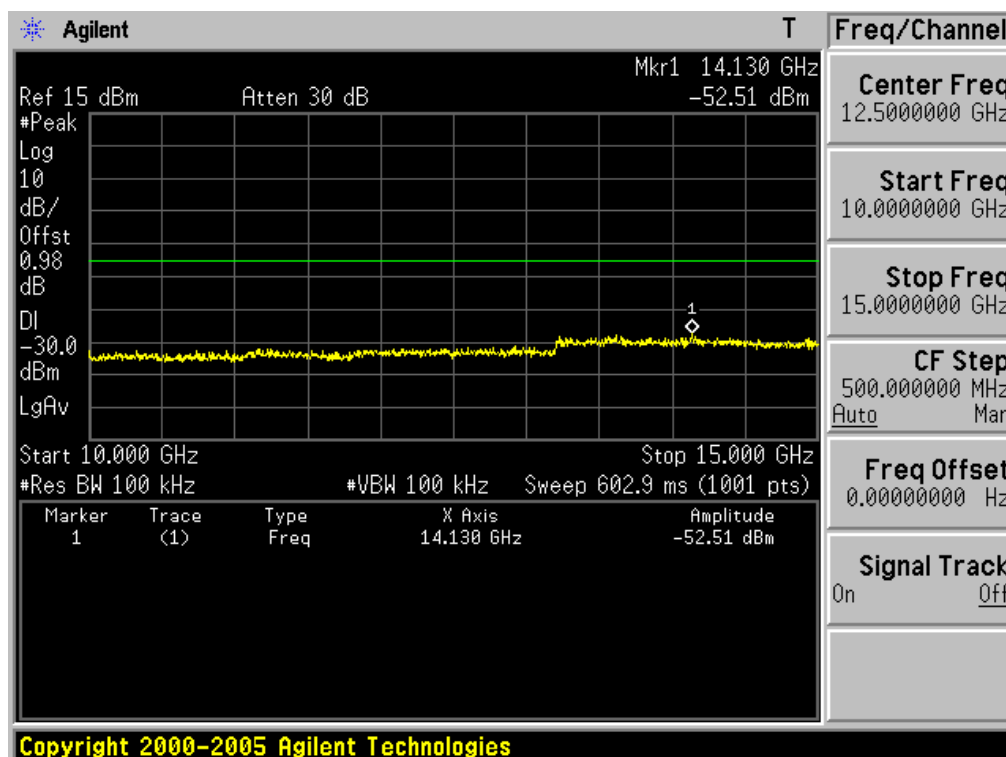


5GHz ~ 10GHz Conducted Spurious Emissions

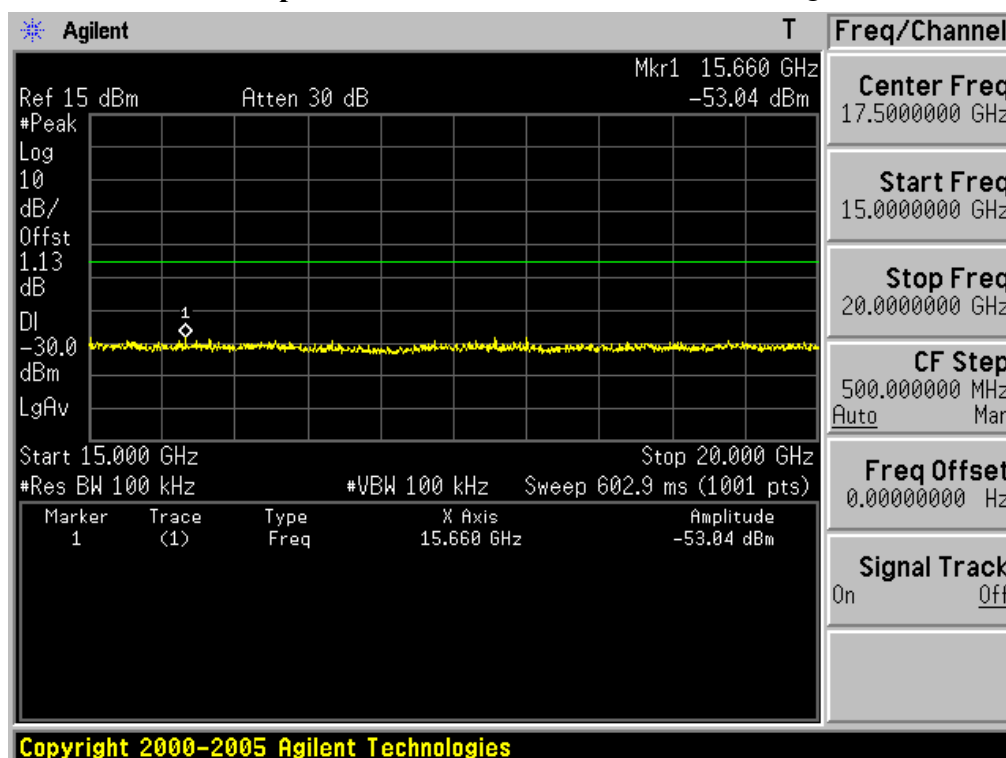
Test Mode: 802.11g & Middle Frequency



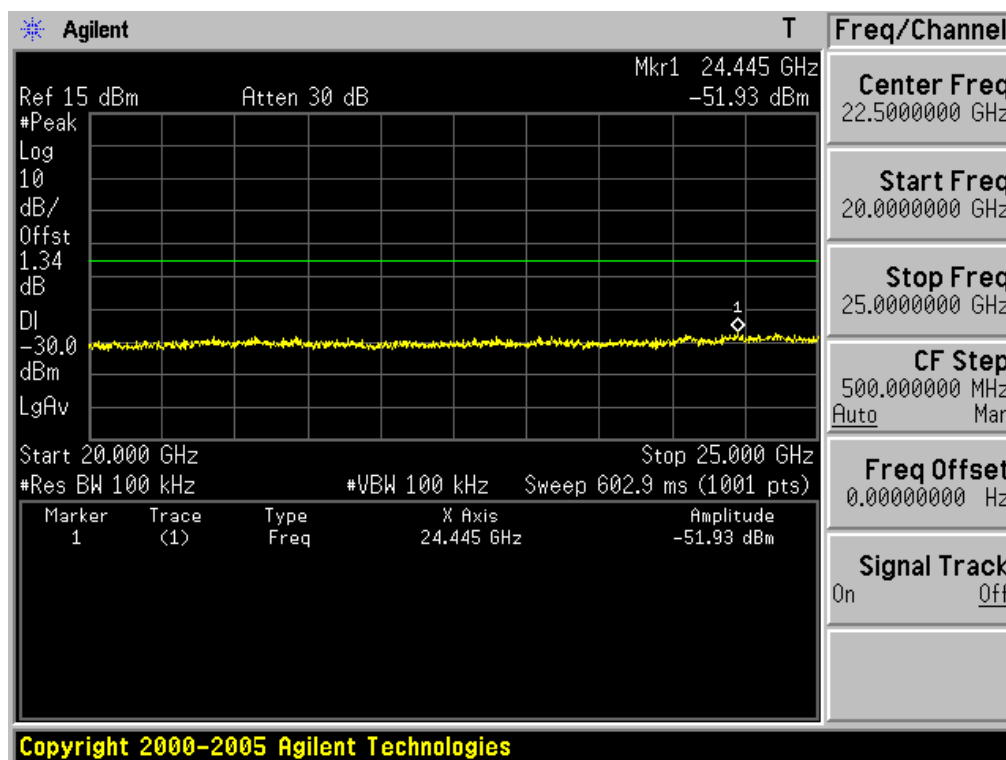
10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11g & Middle Frequency



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

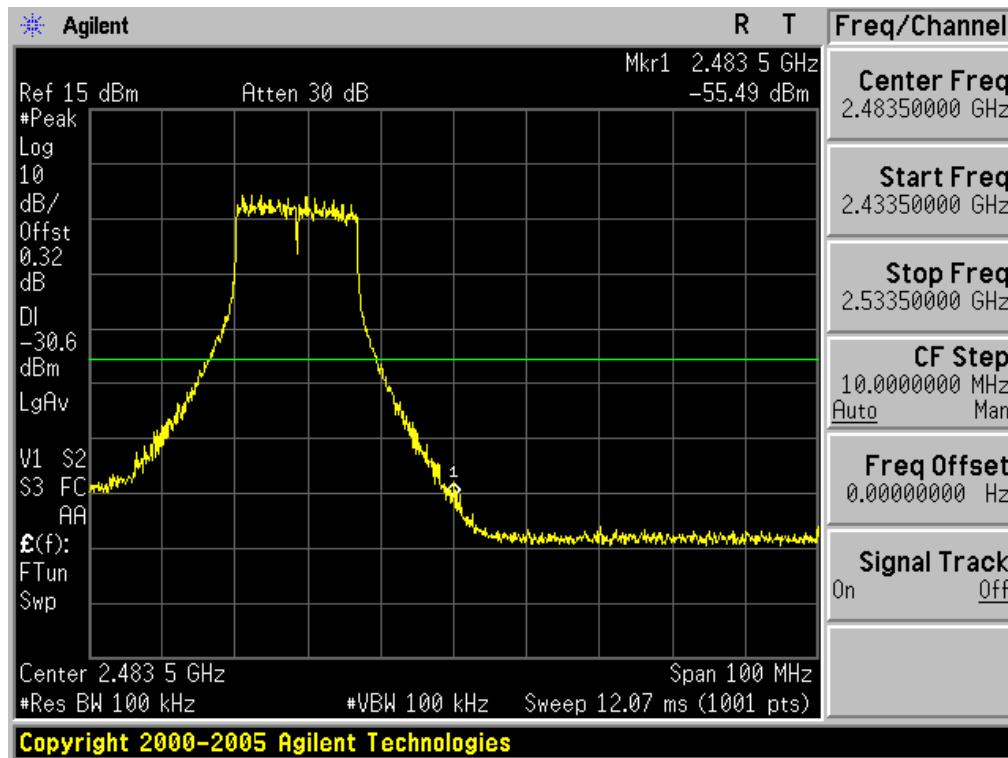


20GHz ~ 25GHz Conducted Spurious Emissions Test Mode: 802.11g & Middle Frequency

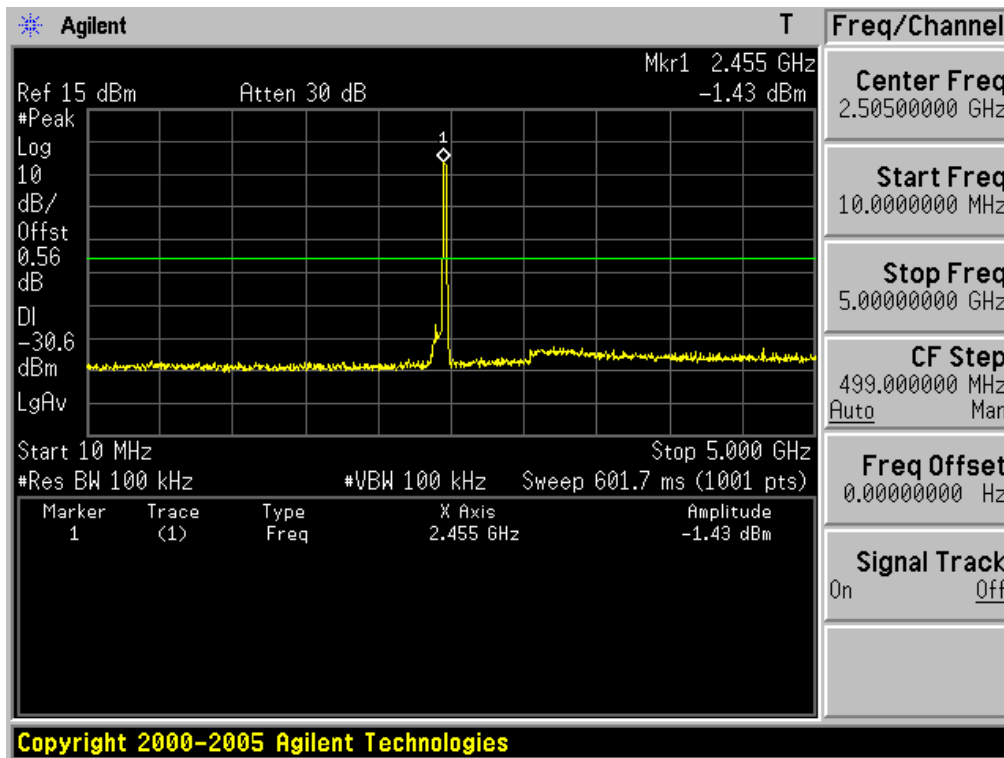


High Band-edge at 30 dB blow

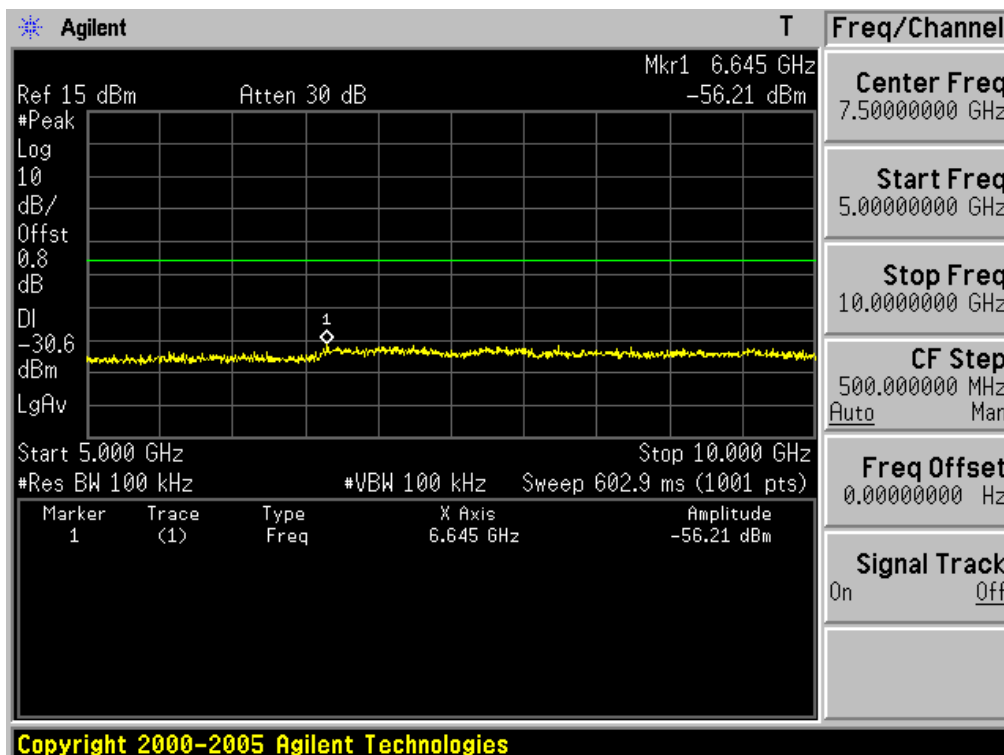
Test Mode: 802.11g & Highest Frequency



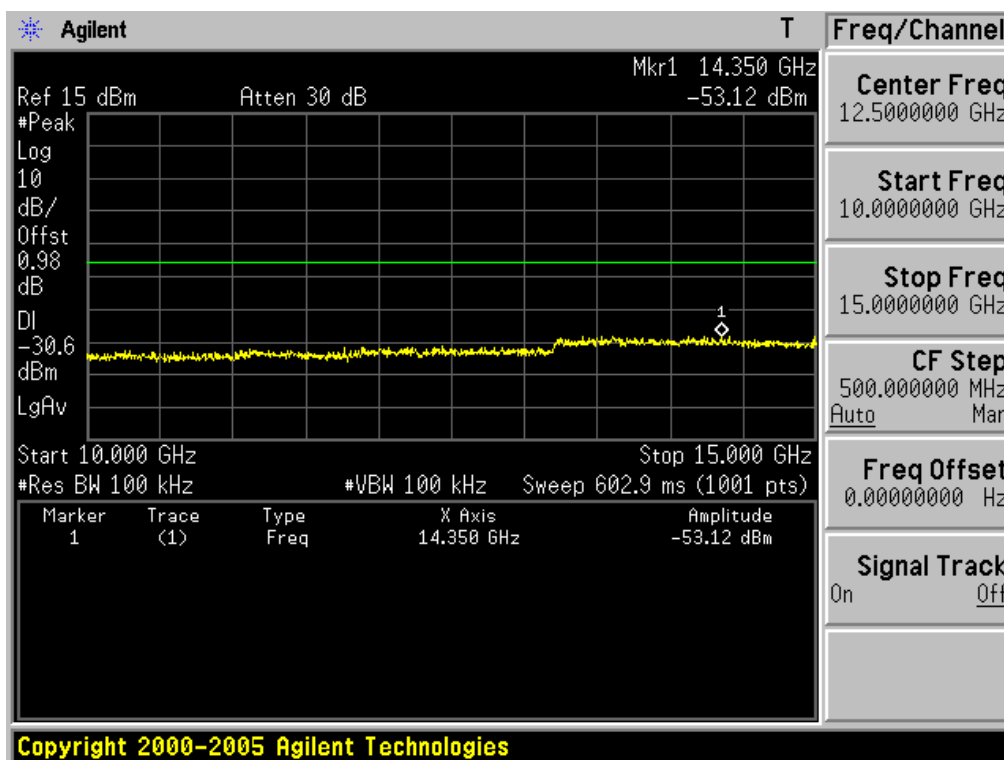
10MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11g & Highest Frequency



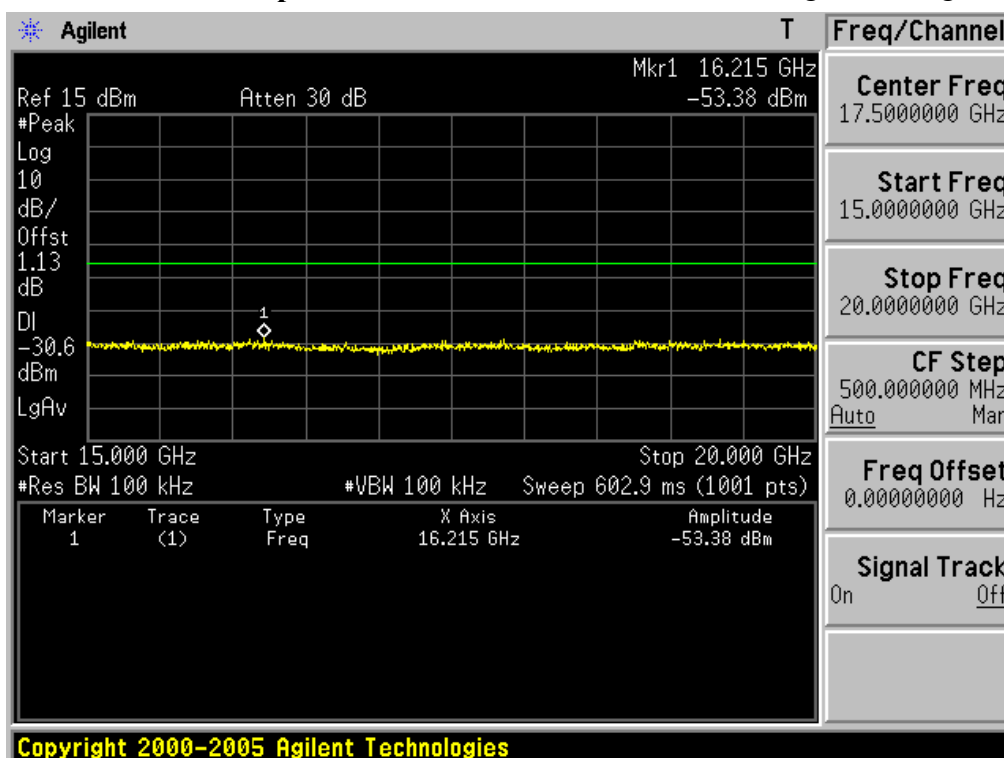
5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11g & Highest Frequency



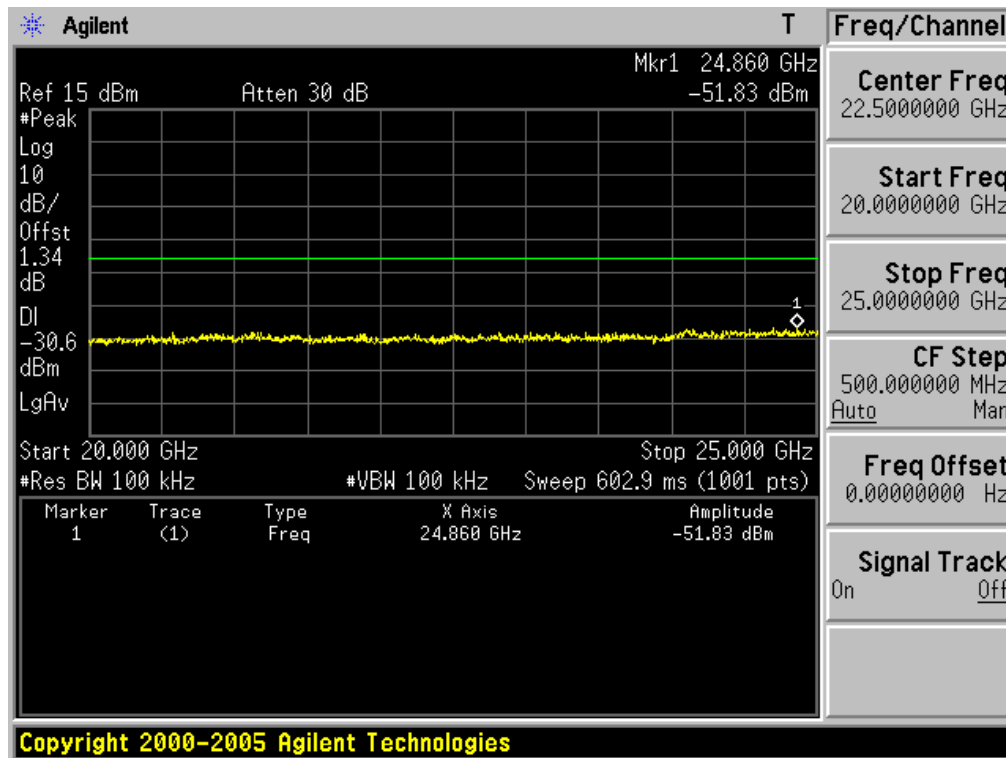
10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11g & Highest Frequency



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.

- 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

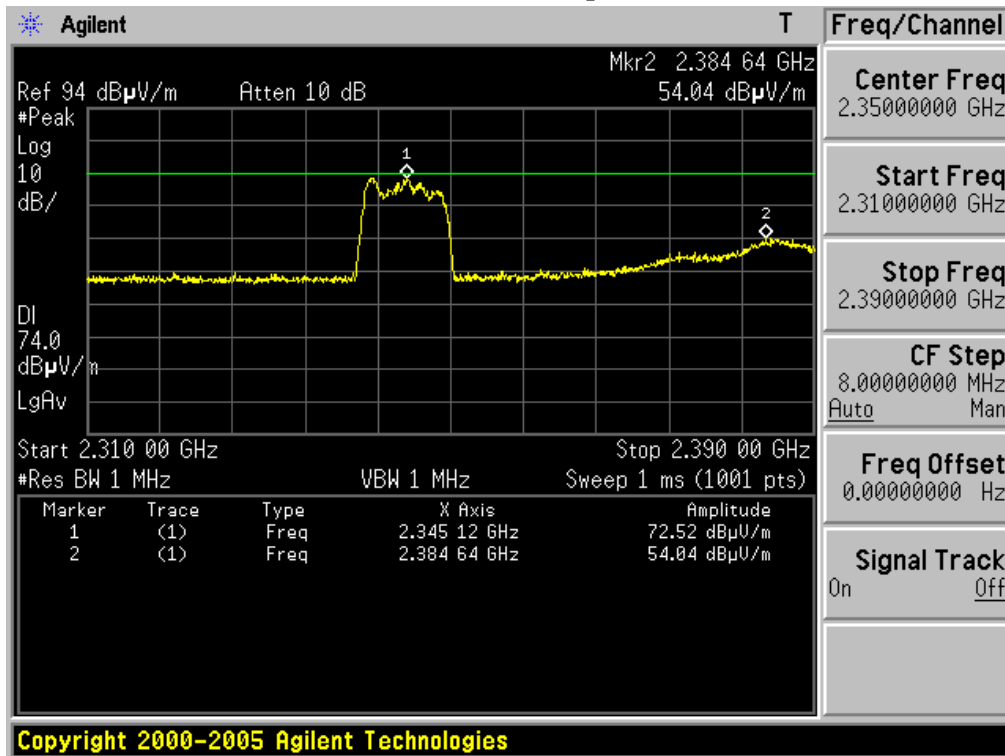
** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part,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

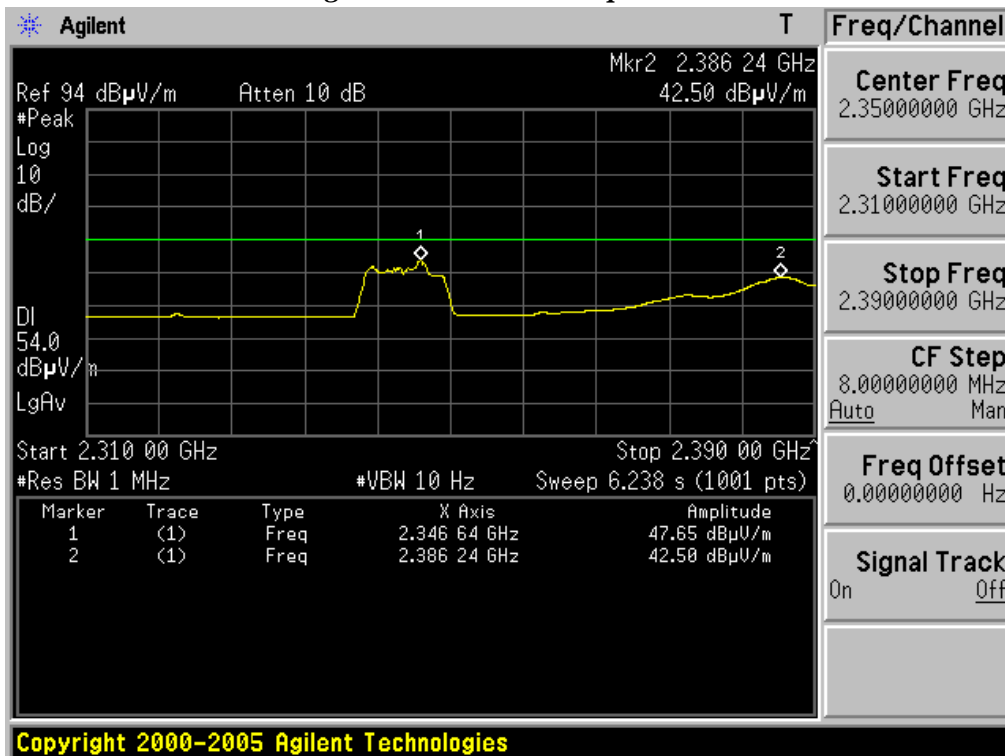
▪ **FCC Part 15.205(b):** The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR 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
Peak mode / Horizontal polarization



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

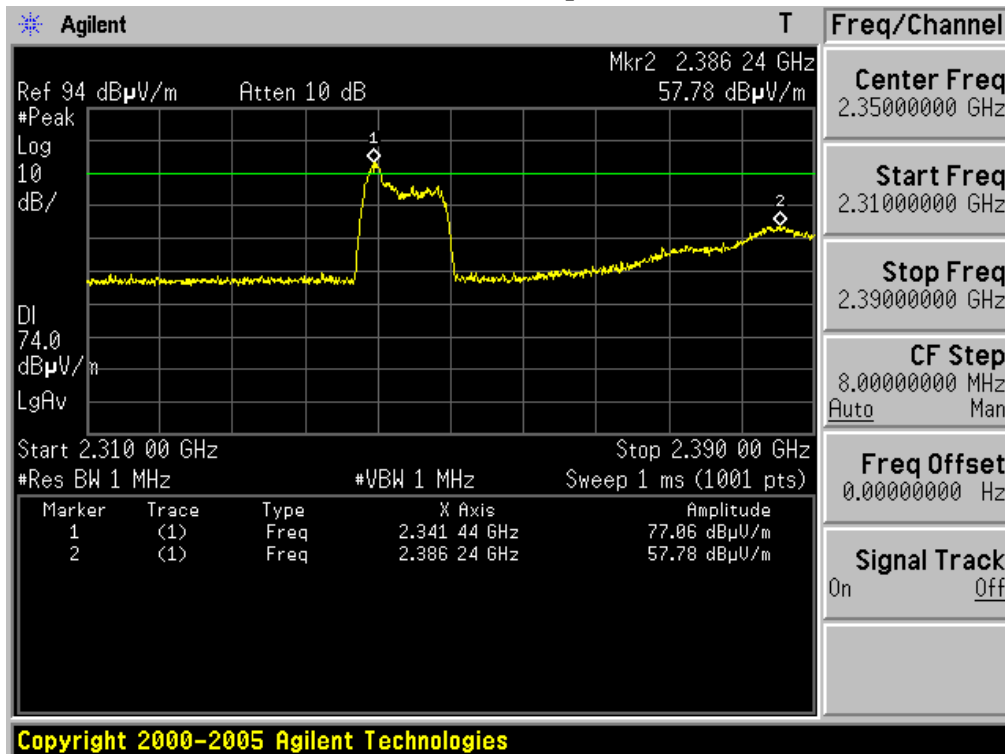
Restricted Band Edge Test Mode: 802.11b & Lowest Frequency
Average mode / Horizontal polarization



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

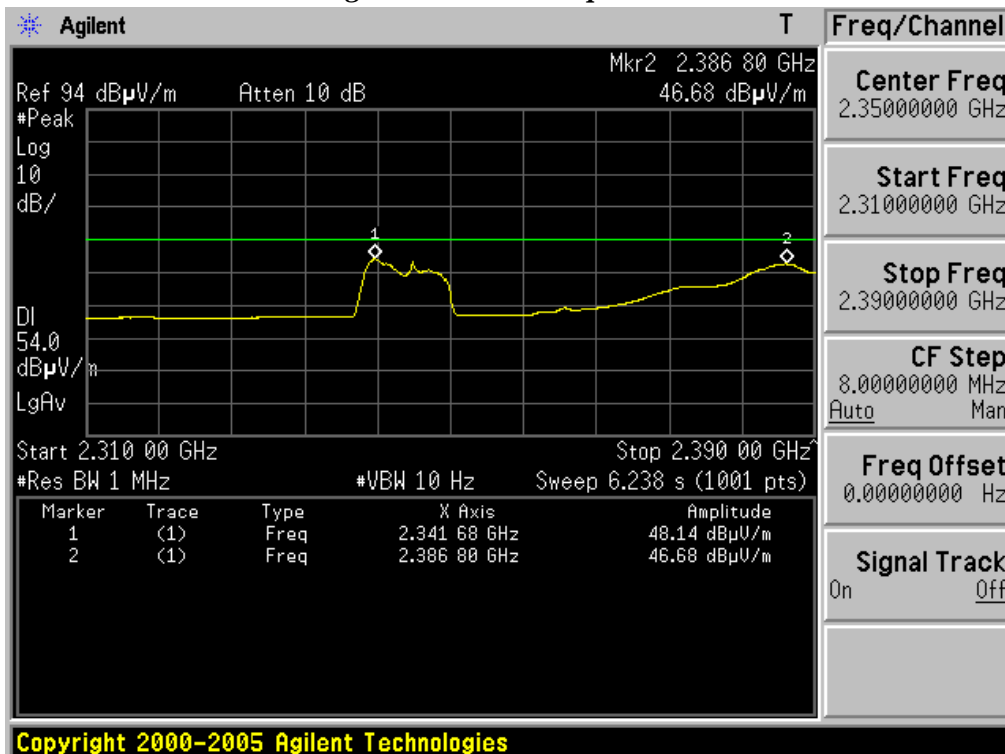
Peak mode / Vertical polarization



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

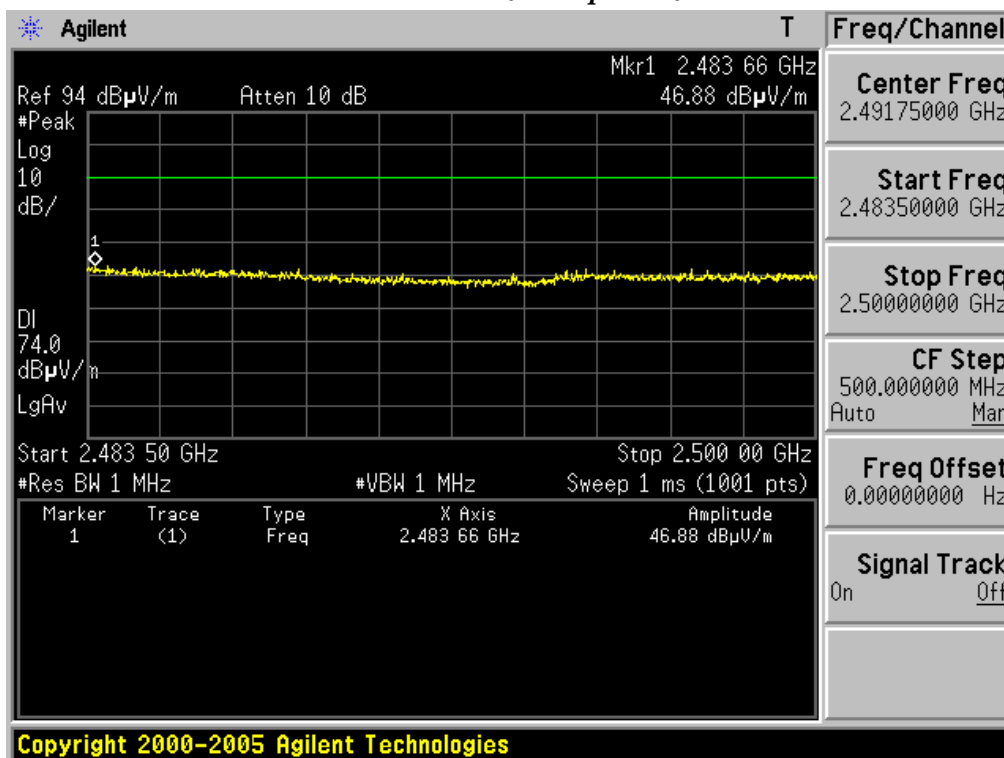
Average mode / Vertical polarization



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

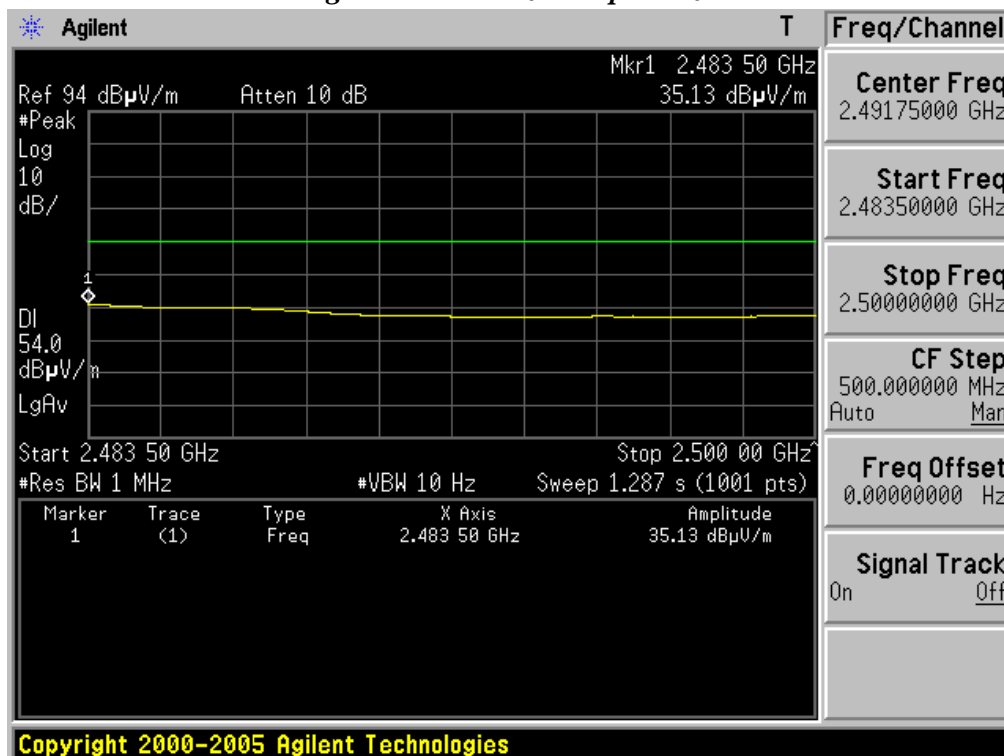
Restricted Band Edge Test Mode: 802.11b & Highest Frequency

Peak mode / Horizontal polarization



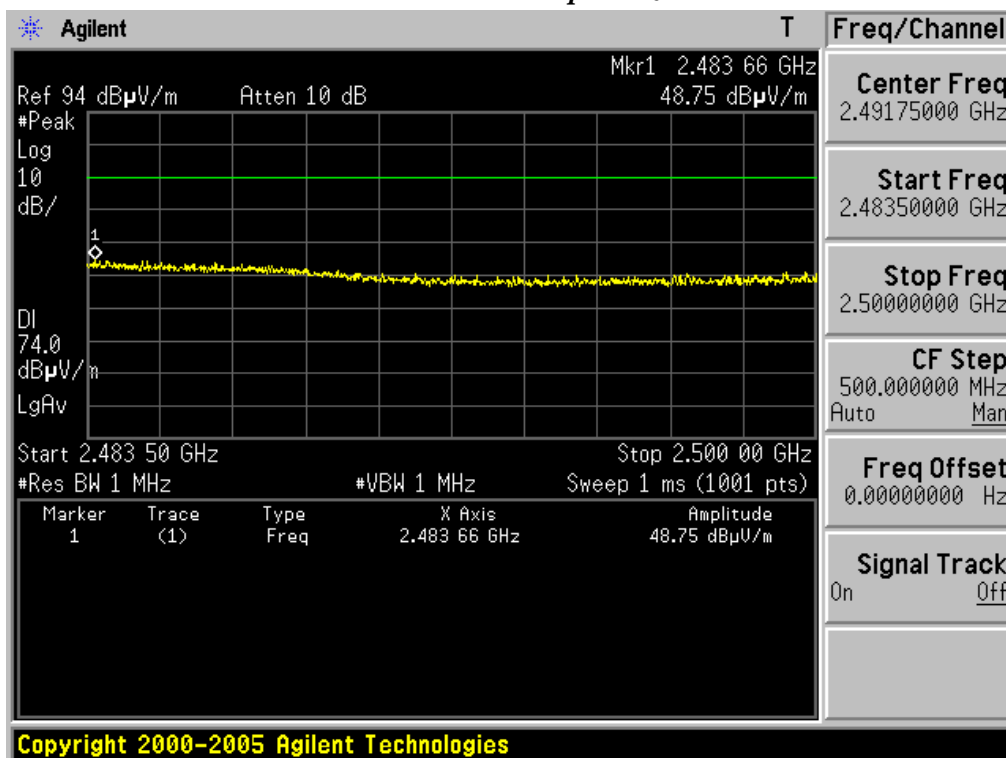
Restricted Band Edge Test Mode: 802.11b & Highest Frequency

Average mode / Horizontal polarization



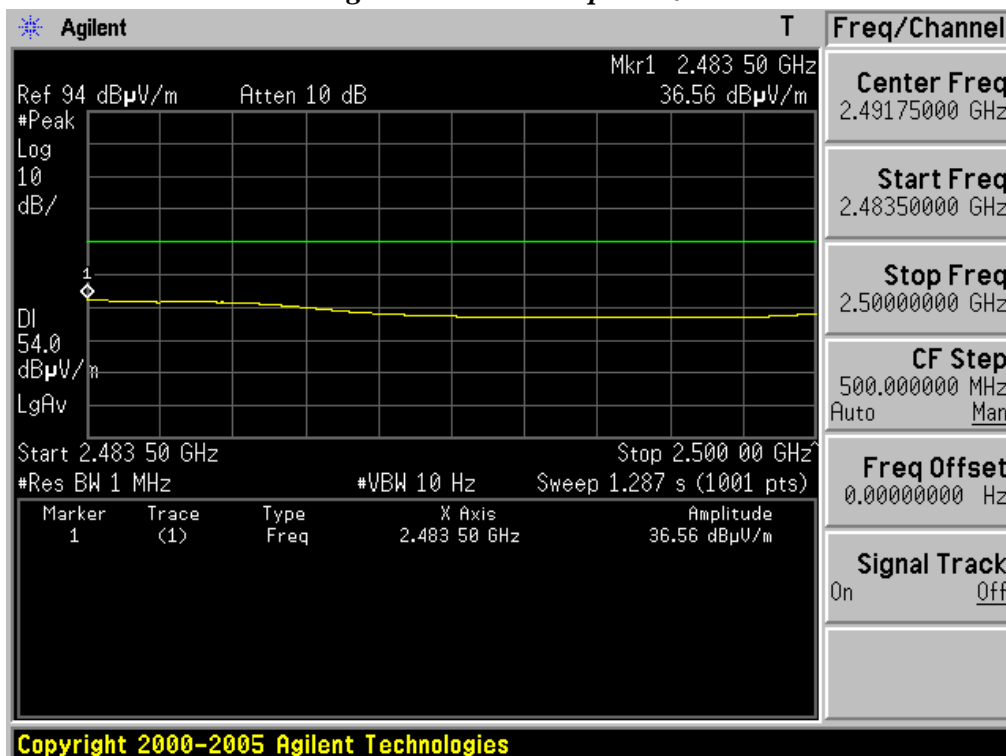
Restricted Band Edge Test Mode: 802.11b & Highest Frequency

Peak mode / Vertical polarization



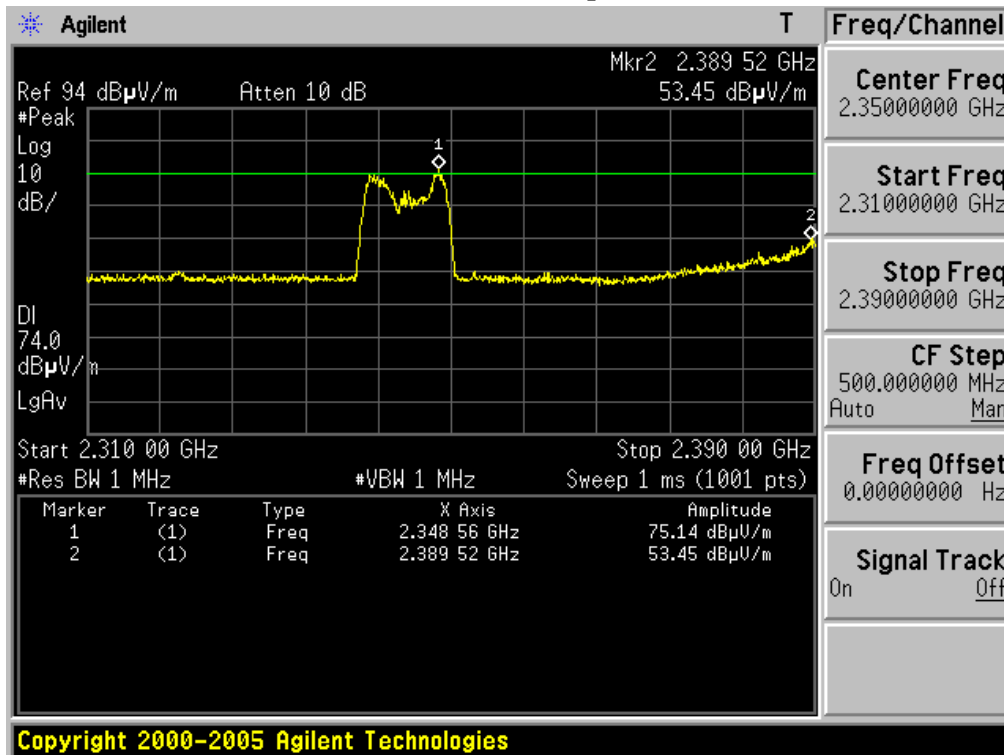
Restricted Band Edge Test Mode: 802.11b & Highest Frequency

Average mode / Vertical polarization



Restricted Band Edge Test Mode: 802.11g & Lowest Frequency

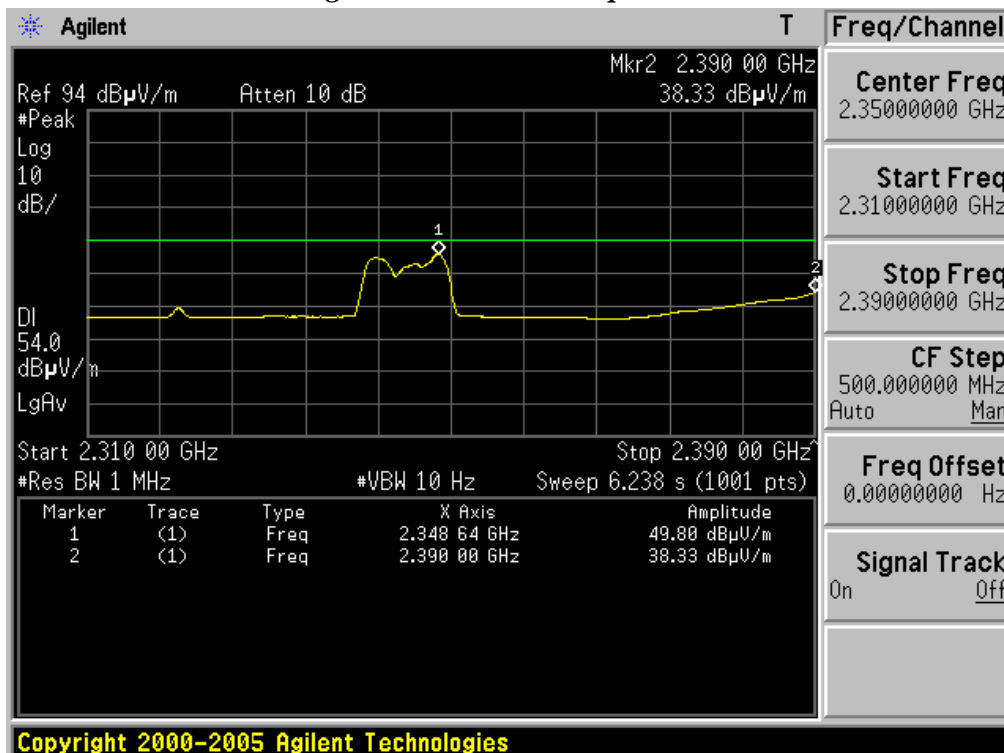
Peak mode / Horizontal polarization



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

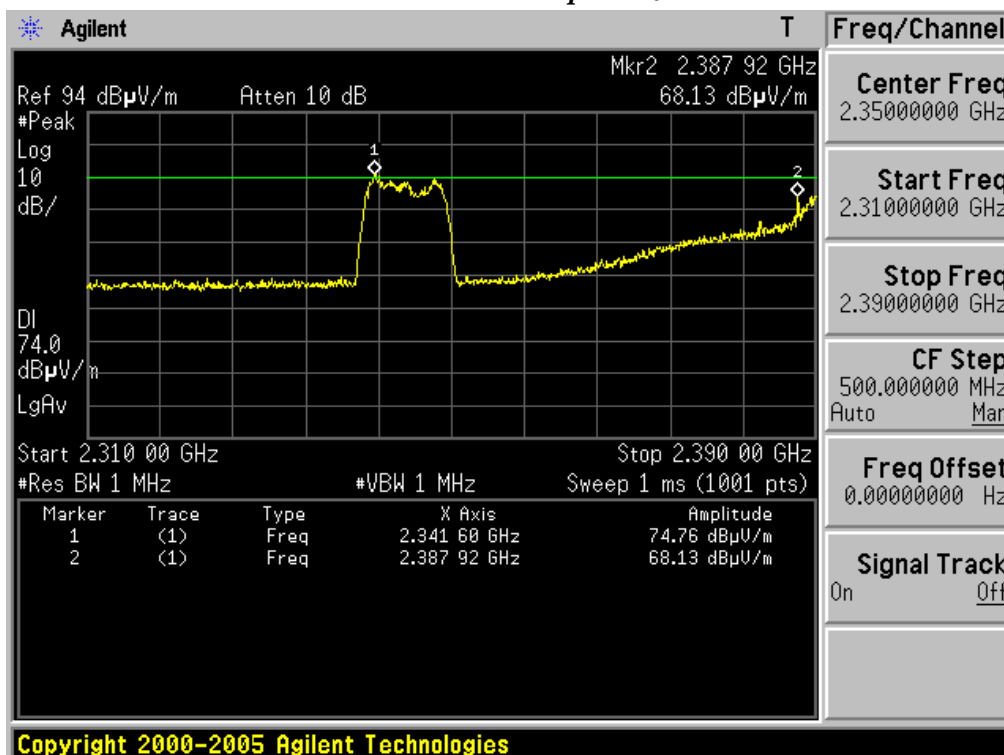
Average mode / Horizontal polarization



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

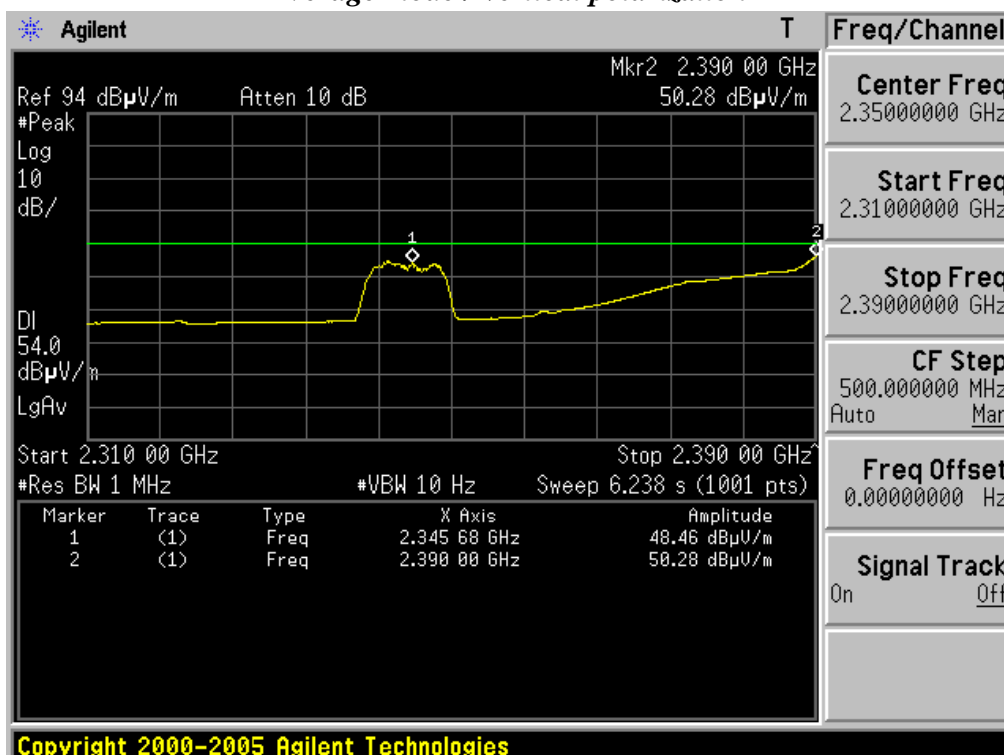
Peak mode / Vertical polarization



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

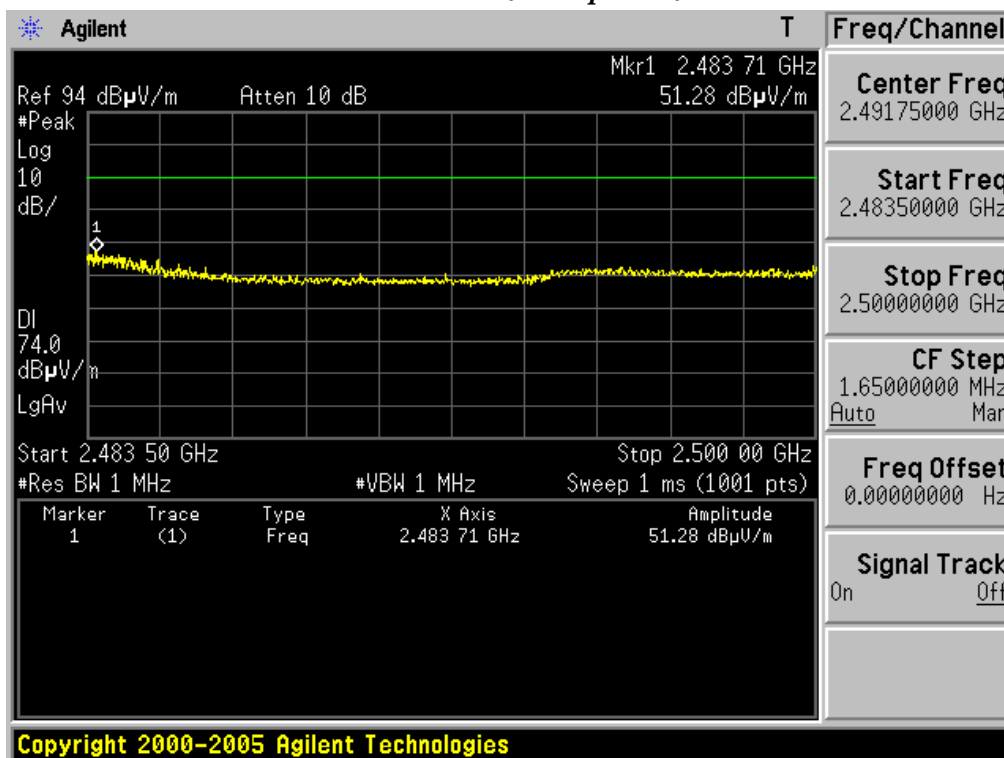
Average mode / Vertical polarization



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

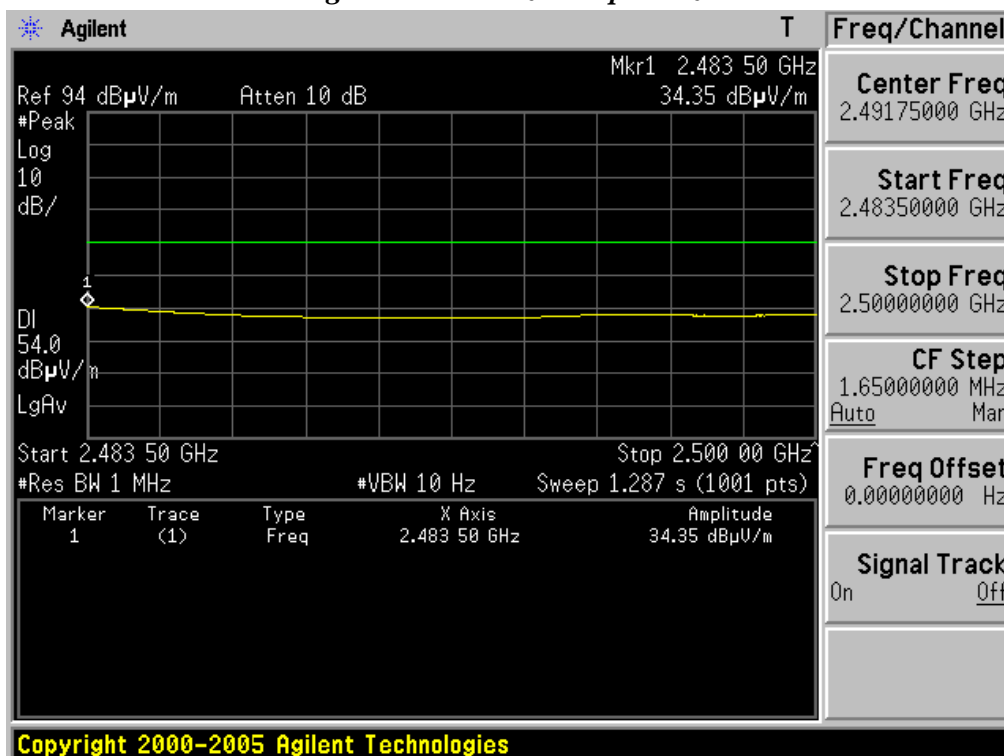
Restricted Band Edge Test Mode: 802.11g & Highest Frequency

Peak mode / Horizontal polarization



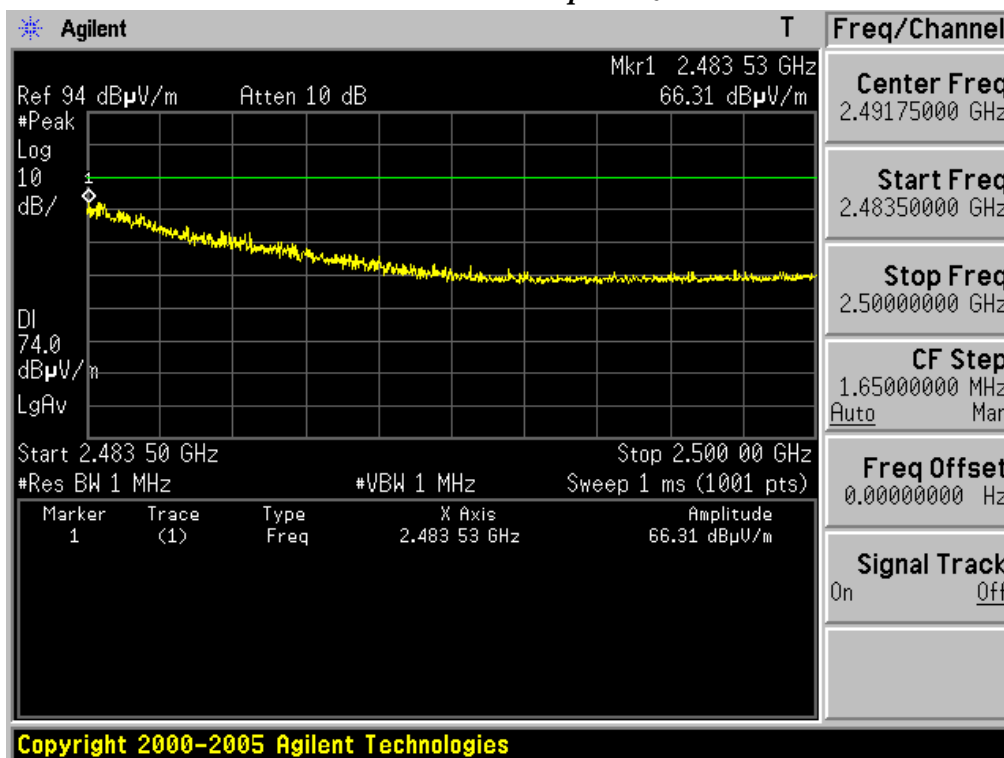
Restricted Band Edge Test Mode: 802.11g & Highest Frequency

Average mode / Horizontal polarization



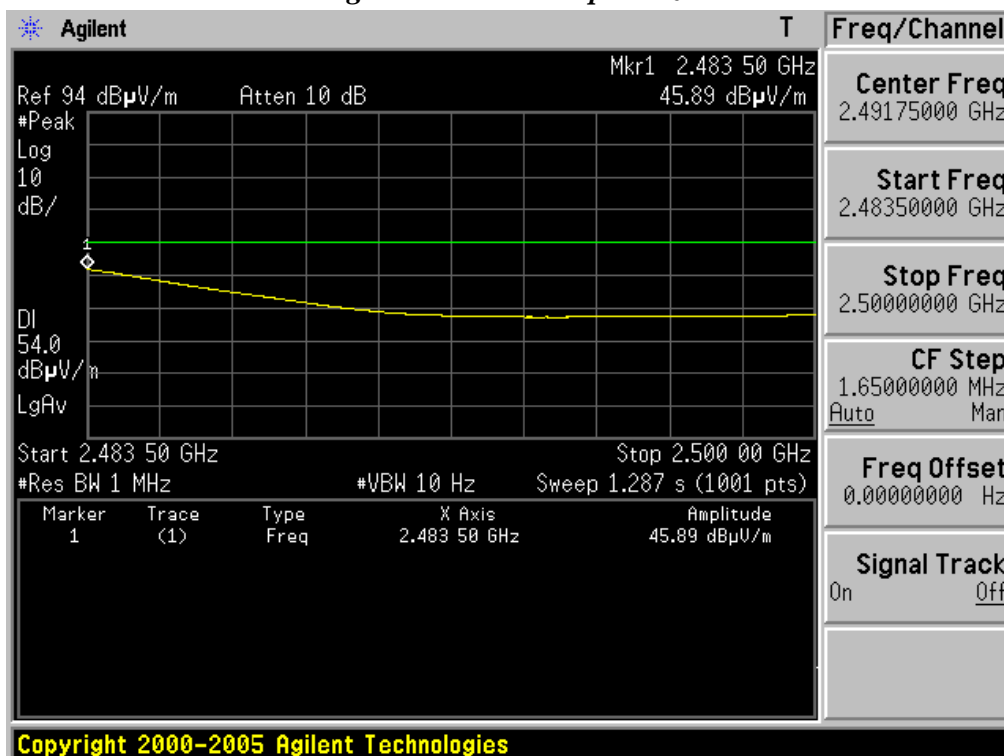
Restricted Band Edge Test Mode: 802.11g & Highest Frequency

Peak mode / Vertical polarization



Restricted Band Edge Test Mode: 802.11g & Highest Frequency

Average mode / Vertical polarization



30MHz ~ 1GHz Radiated Spurious Emissions

Test Mode: 802.11b & Lowest Frequency



RADIATED EMISSION

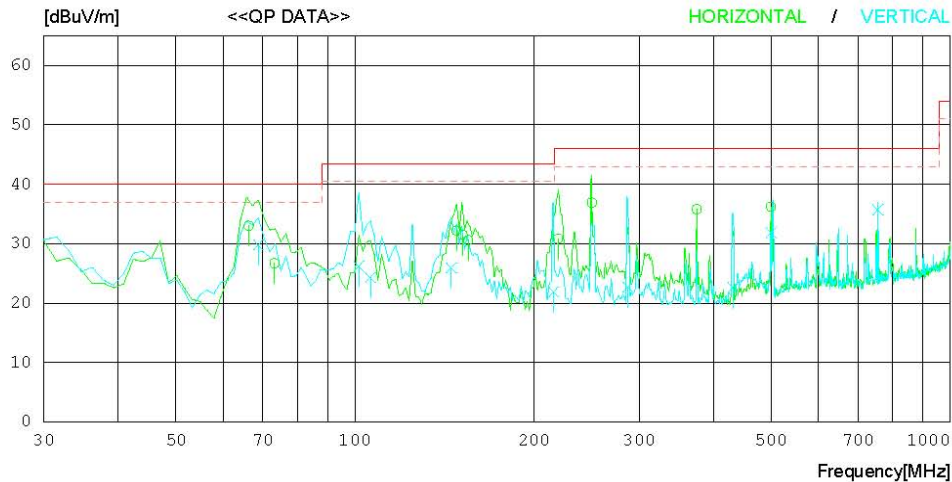
Date : 2009-12-02

Model Name : SWC-5100W
Model No. :
Serial No. : Identical prototype
Test Condition : TX: 2412MHz(802.11b)

Reference No. :
Power Supply : 120V 60Hz
Temp/Humi : 20°C 46%
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	66.291	48.0	6.3	1.1	22.4	33.0	40.0	7.0	301	167
2	73.191	41.2	6.8	1.2	22.5	26.7	40.0	13.3	400	1
3	148.107	42.3	10.8	1.7	22.6	32.2	43.5	11.3	201	1
4	151.543	41.7	10.7	1.7	22.6	31.5	43.5	12.0	201	196
5	154.791	40.9	10.6	1.7	22.6	30.6	43.5	12.9	101	358
6	219.300	39.9	11.8	2.1	23.0	30.8	46.0	15.2	101	358
7	250.003	44.5	13.2	2.3	23.1	36.9	46.0	9.1	101	358
8	374.996	40.7	16.0	2.9	23.8	35.8	46.0	10.2	101	155
9	500.007	39.0	18.0	3.5	24.3	36.2	46.0	9.8	101	356
----- Vertical -----										
10	68.843	44.5	6.5	1.2	22.4	29.8	40.0	10.2	198	358
11	101.492	36.5	10.8	1.4	22.5	26.2	43.5	17.3	100	143
12	106.155	34.3	11.0	1.5	22.5	24.3	43.5	19.2	100	137
13	145.111	35.9	10.9	1.7	22.6	25.9	43.5	17.6	100	1
14	215.633	31.2	11.6	2.1	23.0	21.9	43.5	21.6	100	1
15	287.323	29.5	14.1	2.5	23.4	22.7	46.0	23.3	198	358
16	432.010	26.5	17.0	3.2	24.1	22.6	46.0	23.4	100	1
17	499.982	34.5	18.0	3.5	24.2	31.8	46.0	14.2	100	44
18	755.946	35.6	19.3	4.5	23.7	35.7	46.0	10.3	100	212

30MHz ~ 1GHz Radiated Spurious Emissions

Test Mode: 802.11b & Middle Frequency

RADIATED EMISSION

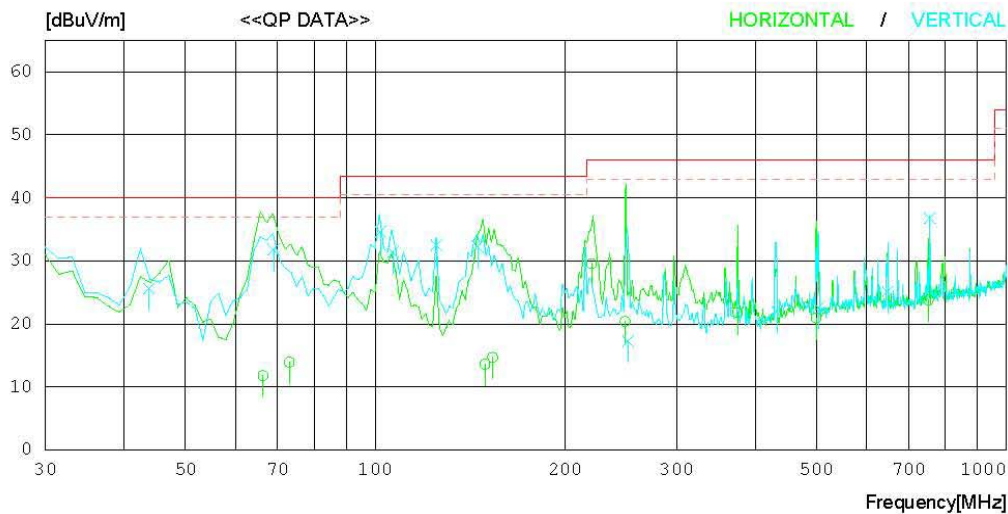
Date : 2009-12-02

Model Name : SWC-5100W
 Model No. :
 Serial No. : Identical prototype
 Test Condition : TX: 2437MHz(802.11b)

Reference No. :
 Power Supply : 120V 60Hz
 Temp/Humi : 20°C 46%
 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	66.365	26.8	6.3	1.1	22.4	11.8	40.0	28.2	301	178
2	73.080	28.4	6.8	1.2	22.5	13.9	40.0	26.1	201	172
3	149.174	23.7	10.8	1.7	22.6	13.6	43.5	29.9	201	196
4	153.445	24.9	10.7	1.7	22.6	14.7	43.5	28.8	301	1
5	220.080	38.7	11.8	2.1	23.0	29.6	46.0	16.4	101	1
6	248.769	28.1	13.2	2.2	23.1	20.4	46.0	25.6	101	1
7	375.123	26.7	16.0	2.9	23.8	21.8	46.0	24.2	101	1
8	499.328	23.6	18.0	3.5	24.2	20.9	46.0	25.1	101	1
9	752.577	23.8	19.2	4.5	23.7	23.8	46.0	22.2	201	130
----- Vertical -----										
10	43.782	34.3	12.8	0.9	22.4	25.6	40.0	14.4	100	73
11	69.014	46.5	6.5	1.2	22.4	31.8	40.0	8.2	198	229
12	101.840	44.9	10.8	1.4	22.5	34.6	43.5	8.9	100	129
13	106.705	41.4	11.0	1.5	22.5	31.4	43.5	12.1	100	143
14	124.992	41.7	11.9	1.5	22.6	32.5	43.5	11.0	100	267
15	145.253	42.3	10.9	1.7	22.6	32.3	43.5	11.2	100	358
16	755.938	36.7	19.3	4.5	23.7	36.8	46.0	9.2	100	358
17	251.618	24.9	13.2	2.3	23.1	17.3	46.0	28.7	198	160
18	433.060	25.8	17.0	3.2	24.1	21.9	46.0	24.1	100	175
19	504.136	25.4	18.0	3.5	24.3	22.6	46.0	23.4	100	125
20	648.546	26.1	19.0	4.1	24.1	25.1	46.0	20.9	100	93

30MHz ~ 1GHz Radiated Spurious Emissions

Test Mode: 802.11b & Highest Frequency



RADIATED EMISSION

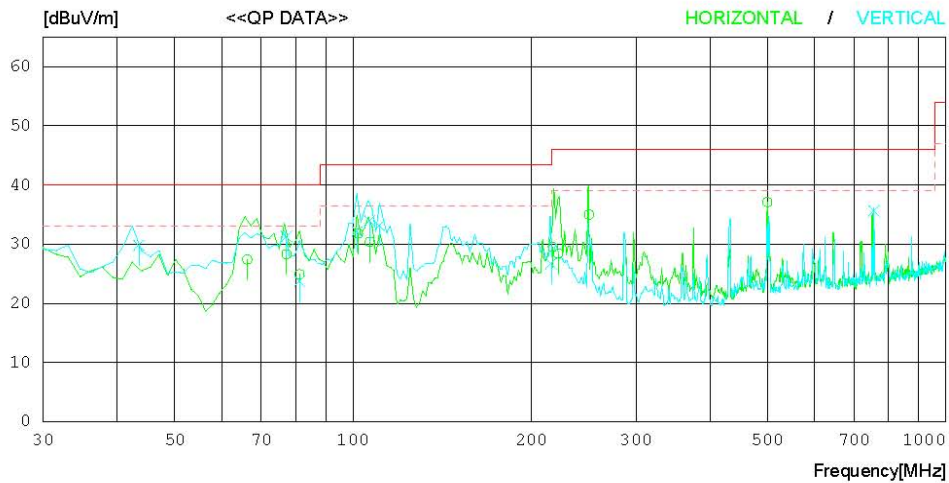
Date : 2009-12-02

Model Name : SWC-5100W
Model No. :
Serial No. : Identical prototype
Test Condition : TX: 2462MHz(802.11b)

Reference No. :
Power Supply : 120V 60Hz
Temp/Humi : 20°C 46%
Operator : D.C.CHA

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)
MARGIN: 7 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	66.317	42.4	6.3	1.1	22.4	27.4	40.0	12.6	299	167
2	77.189	42.4	7.1	1.3	22.5	28.3	40.0	11.7	199	1
3	81.205	38.5	7.6	1.3	22.5	24.9	40.0	15.1	199	1
4	101.907	42.1	10.8	1.4	22.5	31.8	43.5	11.7	299	358
5	106.718	40.4	11.0	1.5	22.5	30.4	43.5	13.1	199	190
6	217.234	38.7	11.7	2.1	23.0	29.5	46.0	16.5	199	39
7	221.779	37.4	11.9	2.1	23.0	28.4	46.0	17.6	199	39
8	250.014	42.6	13.2	2.3	23.1	35.0	46.0	11.0	100	358
9	499.988	39.8	18.0	3.5	24.2	37.1	46.0	8.9	100	146
----- Vertical -----										
10	43.532	38.4	12.9	0.9	22.4	29.8	40.0	10.2	100	1
11	77.202	45.4	7.1	1.3	22.5	31.3	40.0	8.7	100	1
12	81.288	37.3	7.6	1.3	22.5	23.7	40.0	16.3	100	1
13	101.578	42.4	10.8	1.4	22.5	32.1	43.5	11.4	100	1
14	106.676	43.9	11.0	1.5	22.5	33.9	43.5	9.6	100	1
15	110.810	43.1	11.2	1.5	22.6	33.2	43.5	10.3	100	113
16	215.964	36.0	11.6	2.1	23.0	26.7	43.5	16.8	100	199
17	755.948	35.5	19.3	4.5	23.7	35.6	46.0	10.4	100	213

30MHz ~ 1GHz Radiated Spurious Emissions

Test Mode: 802.11g & Lowest Frequency



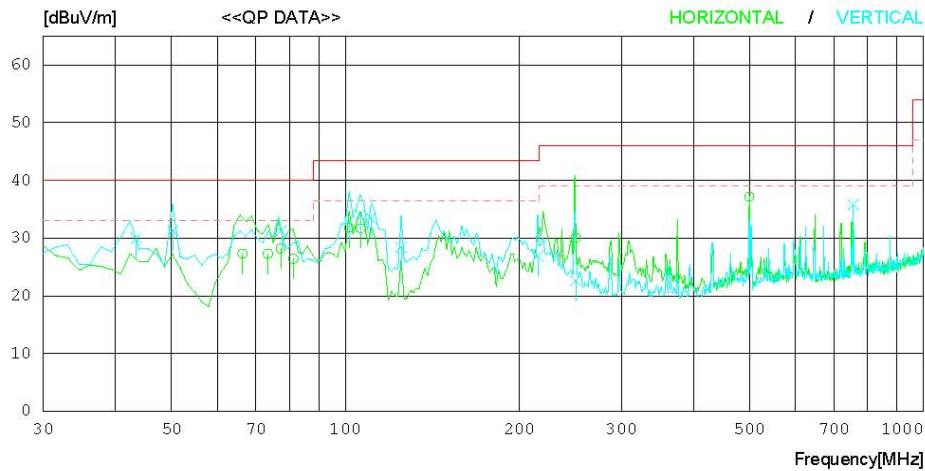
RADIATED EMISSION

Date : 2009-12-02

Model Name : SWC-5100W
 Model No. :
 Serial No. : Identical prototype
 Test Condition : TX: 2412MHz(802.11g)
 Reference No. :
 Power Supply : 120V 60Hz
 Temp/Humi : 20°C 46%
 Operator : D.C.CHA

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)
 MARGIN: 7 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	66.324	42.3	6.3	1.1	22.4	27.3	40.0	12.7	301	154
2	73.436	41.8	6.8	1.2	22.5	27.3	40.0	12.7	400	162
3	77.246	42.3	7.1	1.3	22.5	28.2	40.0	11.8	400	1
4	81.298	40.0	7.6	1.3	22.5	26.4	40.0	13.6	201	172
5	101.507	42.1	10.8	1.4	22.5	31.8	43.5	11.7	301	358
6	106.284	41.7	11.0	1.5	22.5	31.7	43.5	11.8	201	1
7	250.128	37.6	13.2	2.3	23.1	30.0	46.0	16.0	101	72
8	499.453	39.9	18.0	3.5	24.2	37.2	46.0	8.8	101	146
----- Vertical -----										
9	43.485	38.6	12.9	0.9	22.4	30.0	40.0	10.0	100	4
10	50.360	44.6	8.1	1.0	22.4	31.3	40.0	8.7	400	358
11	77.608	45.3	7.2	1.3	22.5	31.3	40.0	8.7	100	169
12	101.507	43.2	10.8	1.4	22.5	32.9	43.5	10.6	100	83
13	106.170	44.0	11.0	1.5	22.5	34.0	43.5	9.5	100	123
14	110.833	43.3	11.2	1.5	22.6	33.4	43.5	10.1	100	1
15	124.824	37.6	11.9	1.5	22.6	28.4	43.5	15.1	100	1
16	250.314	30.2	13.2	2.3	23.1	22.6	46.0	23.4	100	1
17	215.329	36.2	11.6	2.1	23.0	26.9	43.5	16.6	100	210
18	755.946	35.7	19.3	4.5	23.7	35.8	46.0	10.2	100	359

30MHz ~ 1GHz Radiated Spurious Emissions

Test Mode: 802.11g & Middle Frequency



RADIATED EMISSION

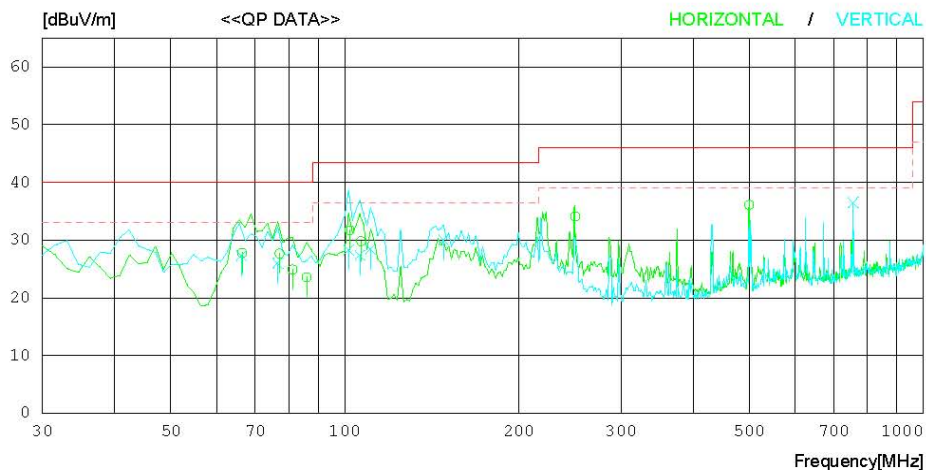
Date : 2009-12-02

Model Name : SWC-5100W
Model No. :
Serial No. : Identical prototype
Test Condition : TX: 2437MHz(802.11g)

Reference No. :
Power Supply : 120V 60Hz
Temp/Humi : 20°C 46%
Operator : D.C. CHA

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)
MARGIN: 7 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	66.421	42.8	6.3	1.1	22.4	27.8	40.0	12.2	301	171
2	77.148	41.8	7.1	1.3	22.5	27.7	40.0	12.3	400	358
3	81.224	38.5	7.6	1.3	22.5	24.9	40.0	15.1	201	158
4	85.887	36.4	8.4	1.3	22.5	23.6	40.0	16.4	201	164
5	101.912	42.0	10.8	1.4	22.5	31.7	43.5	11.8	301	1
6	106.709	39.8	11.0	1.5	22.5	29.8	43.5	13.7	201	174
7	250.004	41.7	13.2	2.3	23.1	34.1	46.0	11.9	100	91
8	499.978	38.8	18.0	3.5	24.2	36.1	46.0	9.9	100	1
----- Vertical -----										
9	66.241	42.3	6.3	1.1	22.4	27.3	40.0	12.7	100	174
10	76.622	40.2	7.1	1.2	22.5	26.0	40.0	14.0	100	66
11	101.487	38.6	10.8	1.4	22.5	28.3	43.5	15.2	100	358
12	106.174	37.4	11.0	1.5	22.5	27.4	43.5	16.1	100	109
13	110.788	38.3	11.2	1.5	22.6	28.4	43.5	15.1	100	106
14	148.241	40.1	10.8	1.7	22.6	30.0	43.5	13.5	100	358
15	755.945	36.4	19.3	4.5	23.7	36.5	46.0	9.5	100	205

30MHz ~ 1GHz Radiated Spurious Emissions

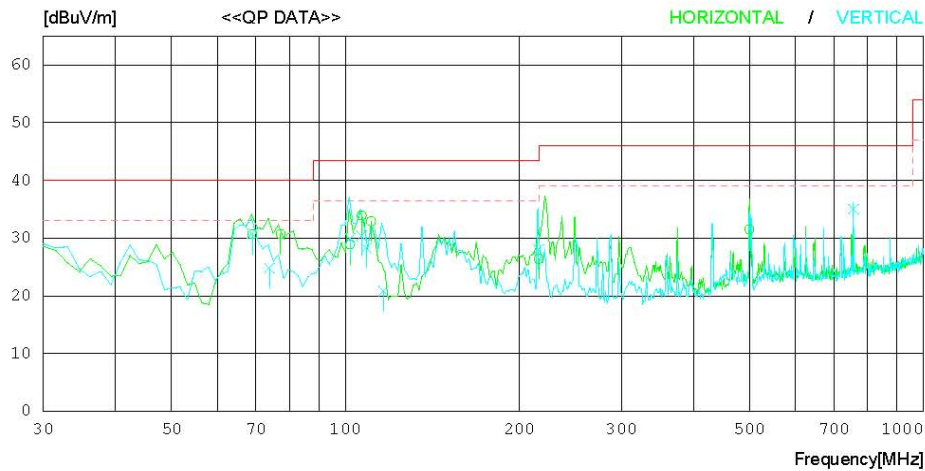
Test Mode: 802.11g & Highest Frequency



RADIATED EMISSION

Date : 2009-12-02

Model Name : SWC-5100W
 Model No. :
 Serial No. : Identical prototype
 Test Condition : TX: 2462MHz(802.11g)
 Reference No. :
 Power Supply : 120V 60Hz
 Temp/Humi : 20°C 46%
 Operator : D.C.CHA
 Memo :
 LIMIT : FCC Part15 Subpart.B Class B (3m)
 MARGIN: 7 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	68.974	45.4	6.5	1.2	22.4	30.7	40.0	9.3	301	163
2	77.198	44.8	7.1	1.3	22.5	30.7	40.0	9.3	201	1
3	101.907	39.2	10.8	1.4	22.5	28.9	43.5	14.6	301	187
4	106.647	43.9	11.0	1.5	22.5	33.9	43.5	9.6	201	197
5	110.789	42.8	11.2	1.5	22.6	32.9	43.5	10.6	201	177
6	215.964	35.7	11.6	2.1	23.0	26.4	43.5	17.1	201	1
7	499.957	34.2	18.0	3.5	24.2	31.5	46.0	14.5	100	358
----- Vertical -----										
8	69.001	45.5	6.5	1.2	22.4	30.8	40.0	9.2	201	198
9	73.909	39.2	6.9	1.2	22.5	24.8	40.0	15.2	201	231
10	101.865	40.2	10.8	1.4	22.5	29.9	43.5	13.6	100	358
11	106.657	40.4	11.0	1.5	22.5	30.4	43.5	13.1	100	150
12	108.829	38.3	11.1	1.5	22.6	28.3	43.5	15.2	100	358
13	116.477	30.4	11.5	1.5	22.6	20.8	43.5	22.7	100	358
14	215.701	37.3	11.6	2.1	23.0	28.0	43.5	15.5	100	358
15	755.948	34.9	19.3	4.5	23.7	35.0	46.0	11.0	100	215

1GHz ~ 25GHz Radiated Spurious Emissions

▪ Test Mode: 802.11b & Lowest Frequency

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	H	44.15	31.49	7.27	51.42	38.76	74.00	54.00	22.58	15.24
4824	V	43.54	30.42	7.27	50.81	37.69	74.00	54.00	23.19	16.31
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ Test Mode: 802.11b & Middle Frequency

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	H	42.85	29.63	7.65	50.50	37.28	74.00	54.00	23.50	16.72
4874	V	42.03	30.25	7.65	49.68	37.90	74.00	54.00	24.32	16.10
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ Test Mode: 802.11b & Highest Frequency

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	H	42.10	29.40	7.96	50.06	37.36	74.00	54.00	23.94	16.64
4924	V	42.69	29.63	7.96	50.65	37.59	74.00	54.00	23.35	16.41
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

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

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	H	44.21	30.46	7.27	51.48	37.73	74.00	54.00	22.52	16.27
4824	V	43.52	30.50	7.27	50.79	37.77	74.00	54.00	23.21	16.23
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ Test Mode: 802.11g & Middle Frequency

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	H	43.45	30.40	7.65	51.10	38.05	74.00	54.00	22.90	15.95
4874	V	42.91	30.62	7.65	50.56	38.27	74.00	54.00	23.44	15.73
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ Test Mode: 802.11g & Highest Frequency

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	H	43.33	30.15	7.96	51.29	38.11	74.00	54.00	22.71	15.89
4924	V	42.47	30.38	7.96	50.43	38.34	74.00	54.00	23.57	15.66
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

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	-18.740
	Middle	-18.498
	Highest	-21.003
802.11g	Lowest	-21.172
	Middle	-21.689
	Highest	-22.189

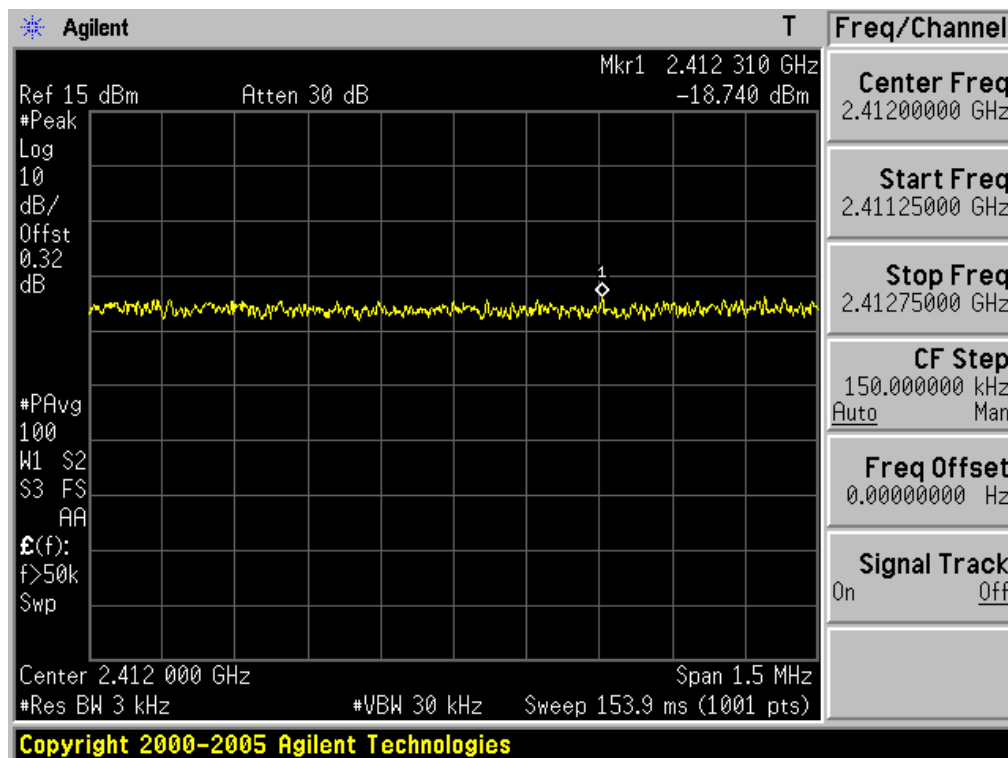
Note 1: See next pages for actual measured spectrum plots.

- Minimum Standard:

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

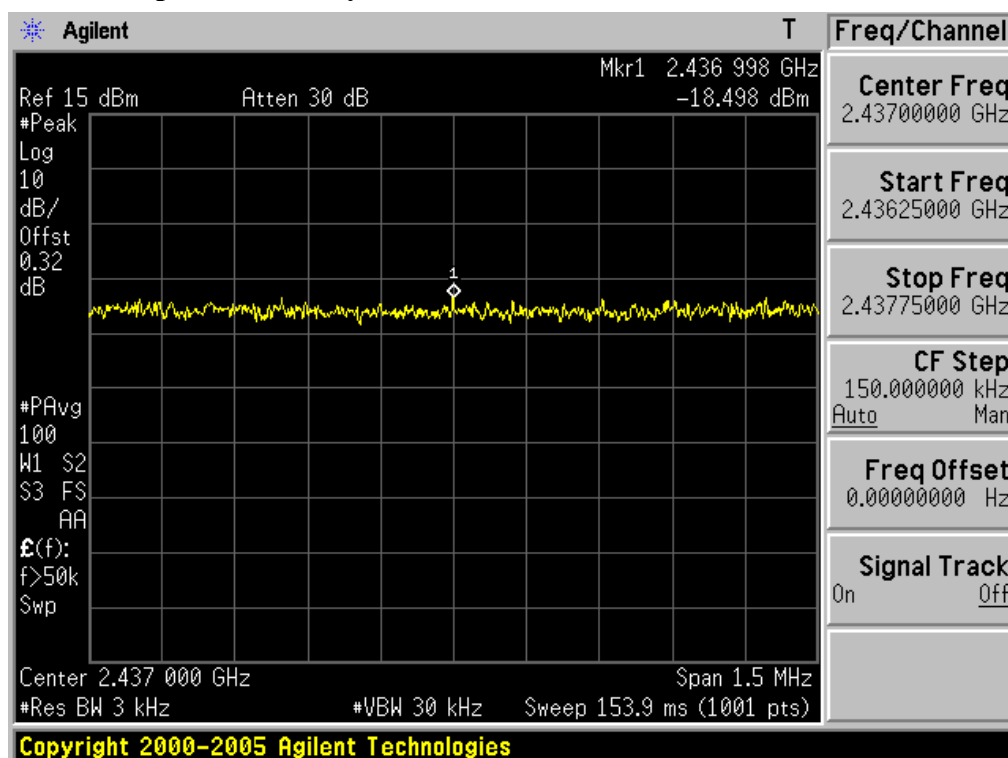
Transmitter Power Spectral Density

Test Mode: 802.11b & Lowest Frequency



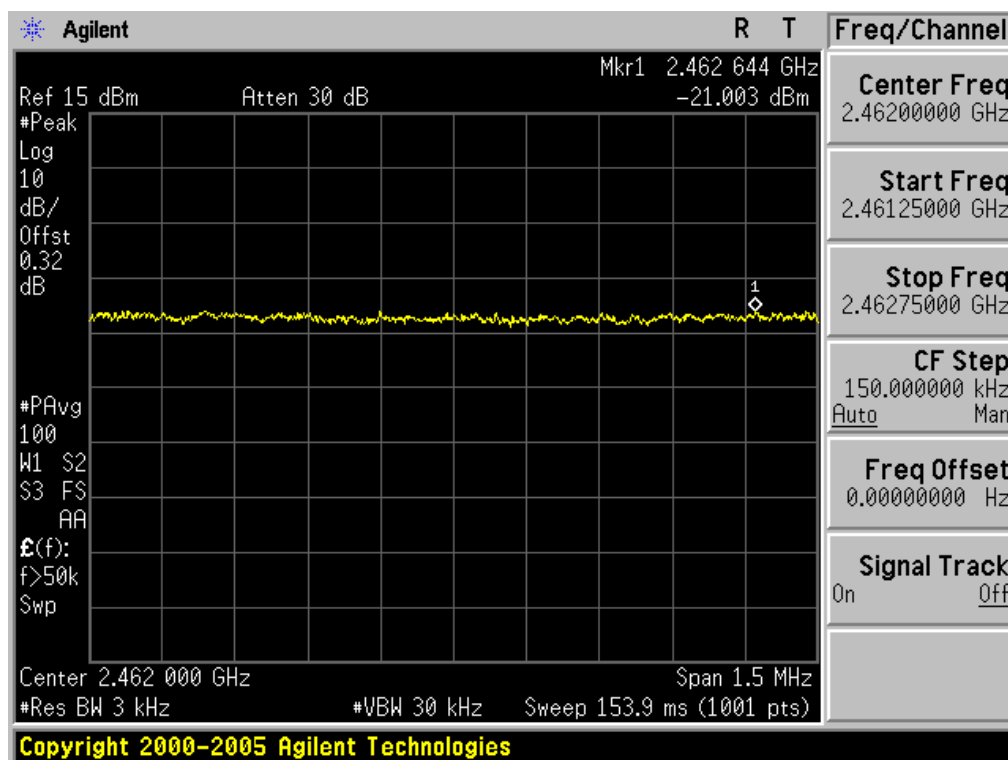
Transmitter Power Spectral Density

Test Mode: 802.11b & Middle Frequency



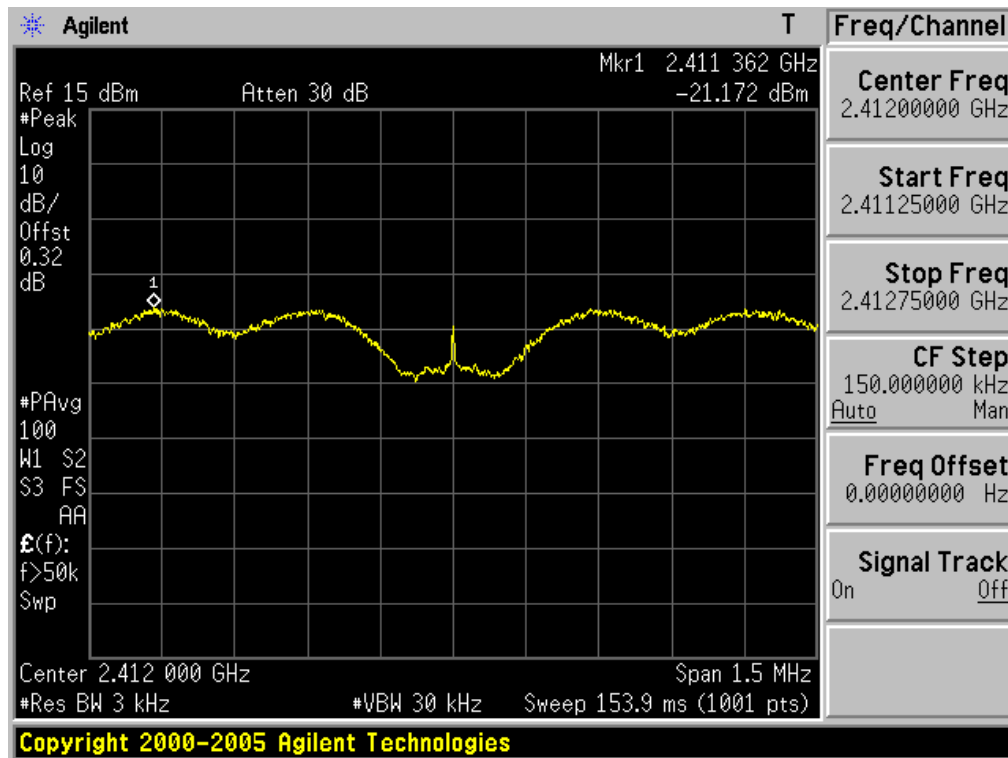
Transmitter Power Spectral Density

Test Mode: 802.11b & Highest Frequency



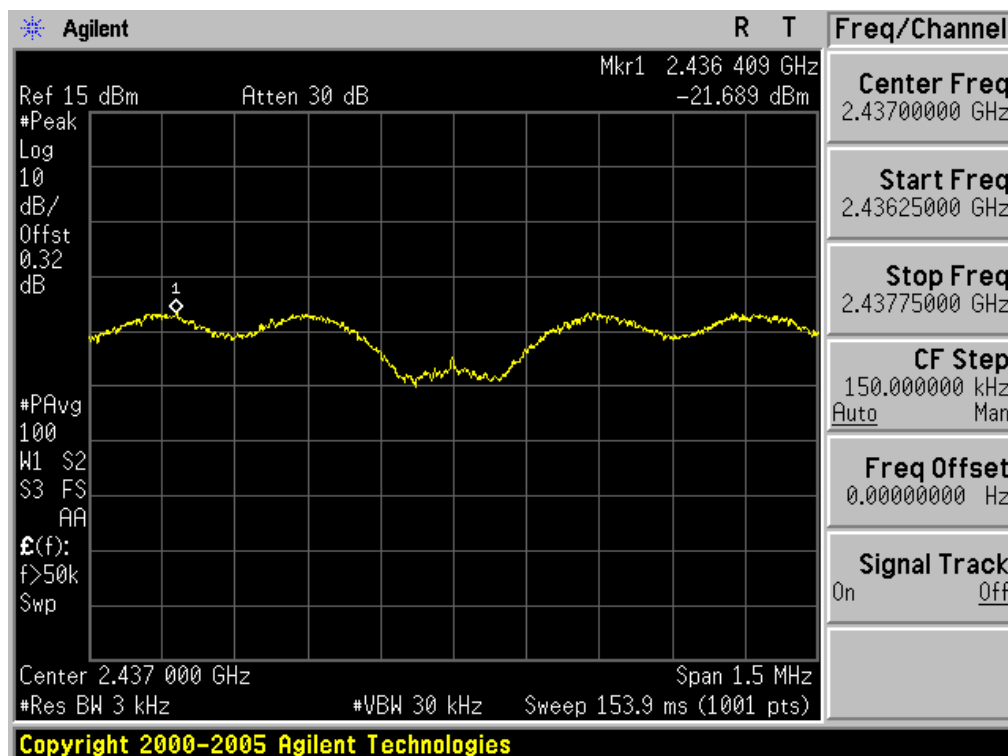
Transmitter Power Spectral Density

Test Mode: 802.11g & Lowest Frequency



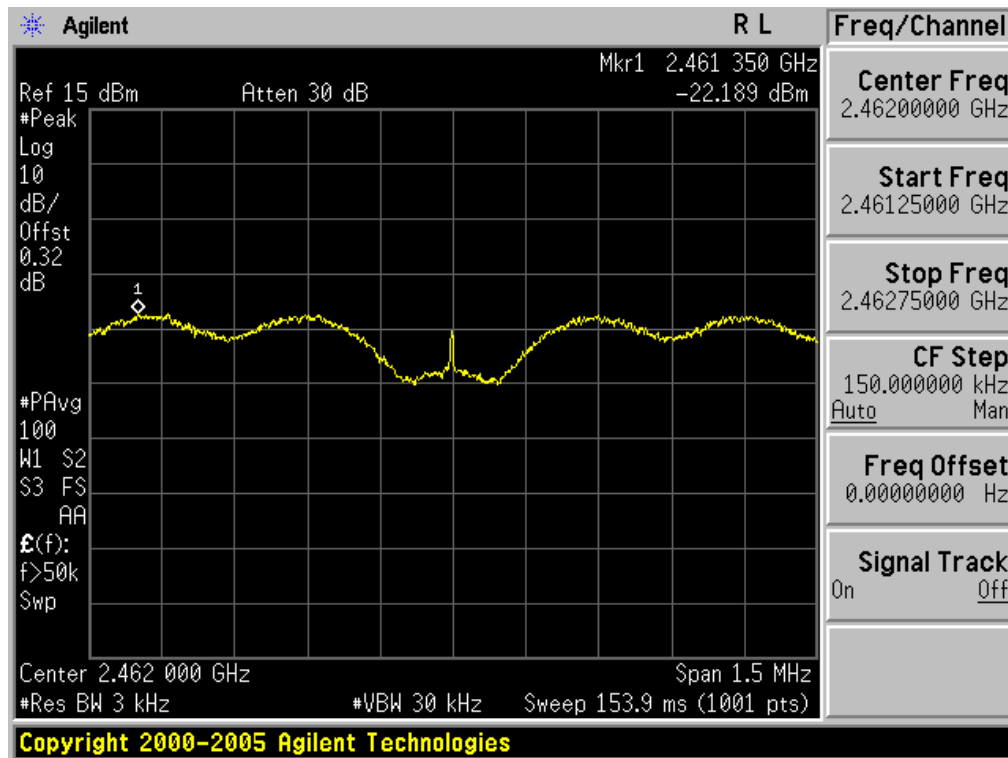
Transmitter Power Spectral Density

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.

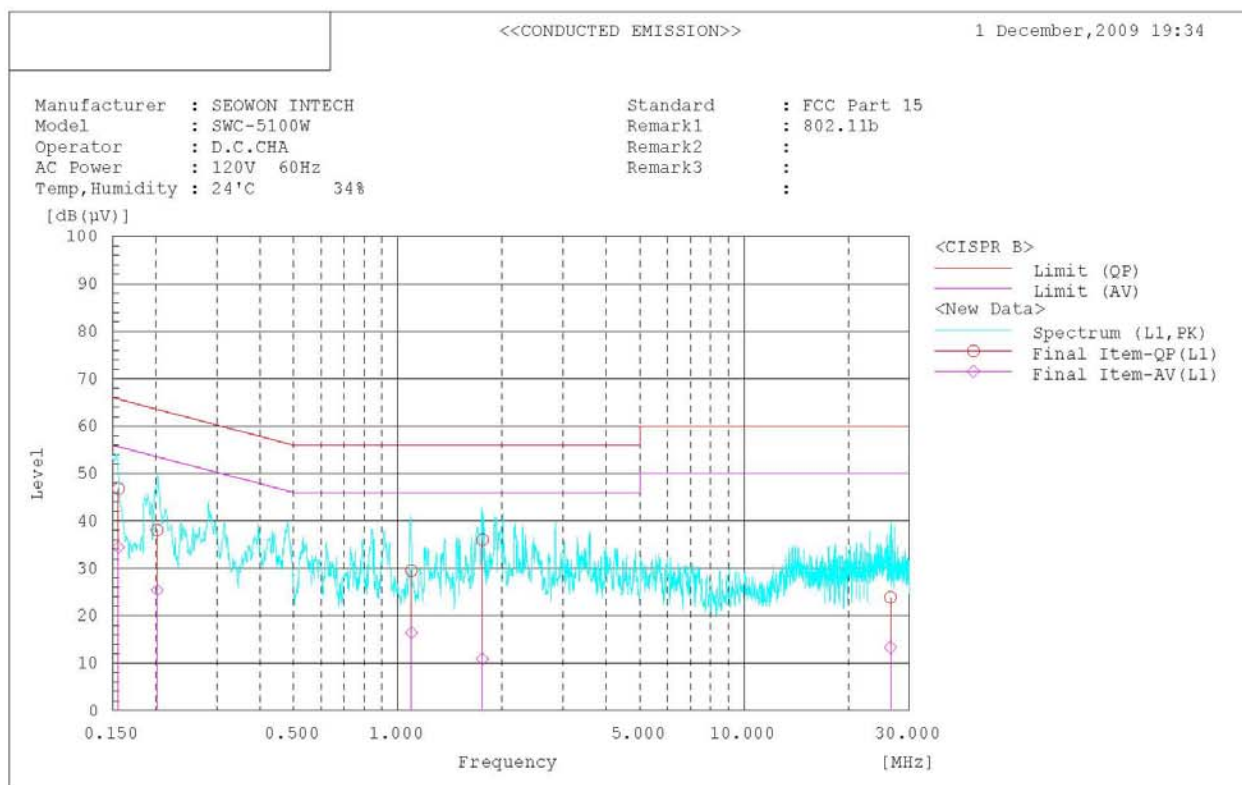
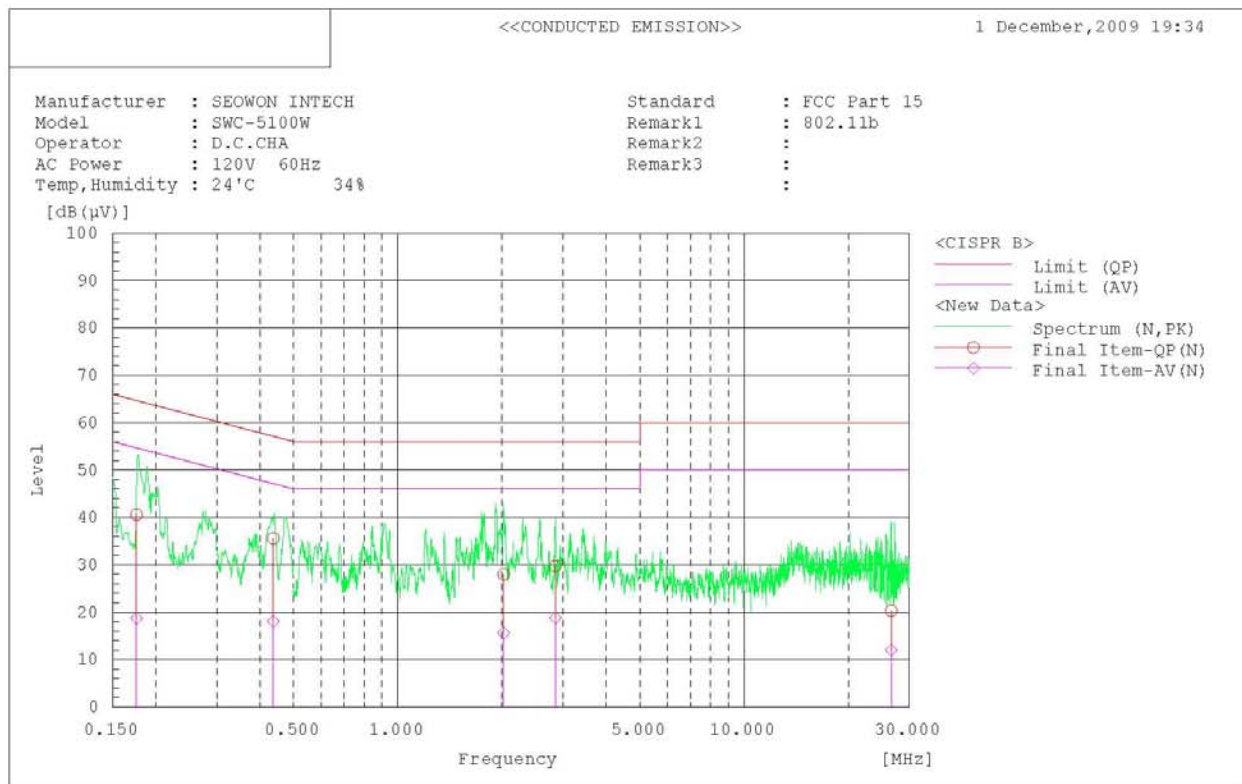
- Minimum Standard: FCC Part 15.207(a)/EN 55022

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>>

1 December, 2009 19:34

Standard : FCC Part 15
Manufacturer : SEOWON INTECH
Model : SWC-5100W
Operator : D.C.CHA
AC Power : 120V 60Hz
Temp, Humidity : 24°C 34%
Remark1 : 802.11b
Remark2 :
Remark3 :
:

Final Result

--- N Phase ---

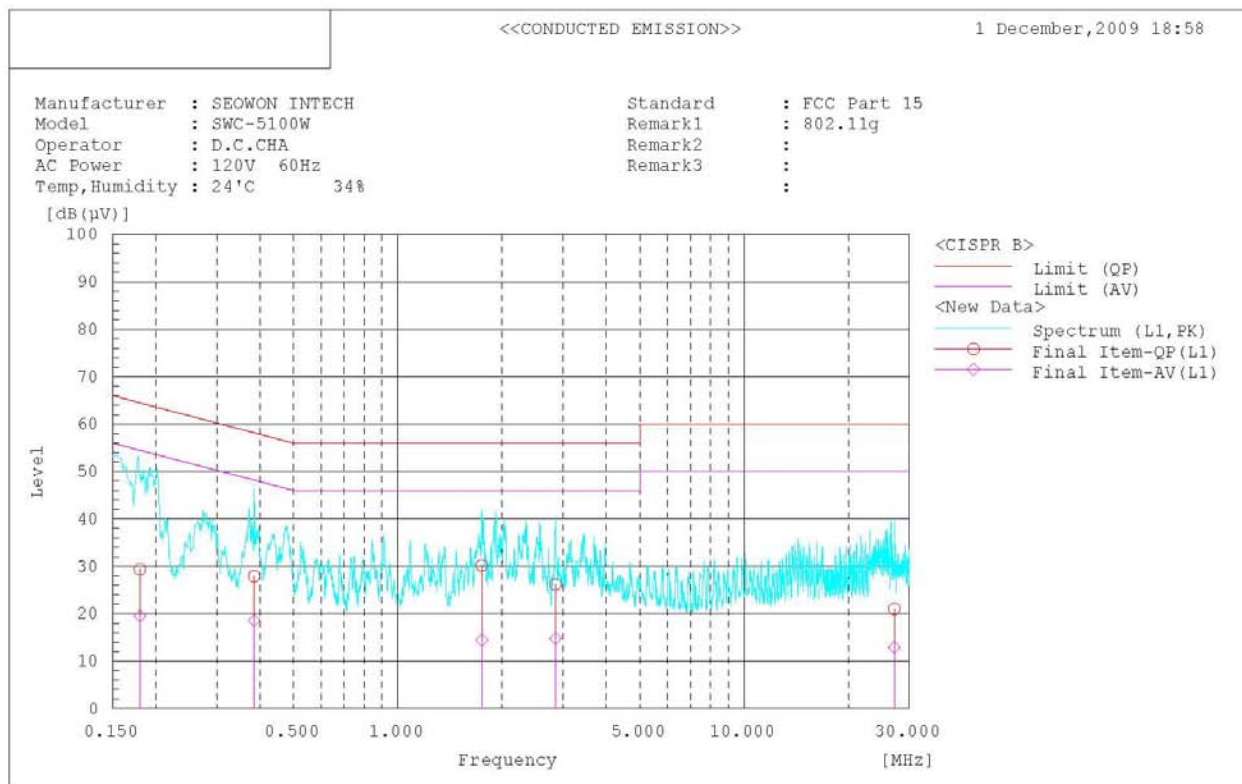
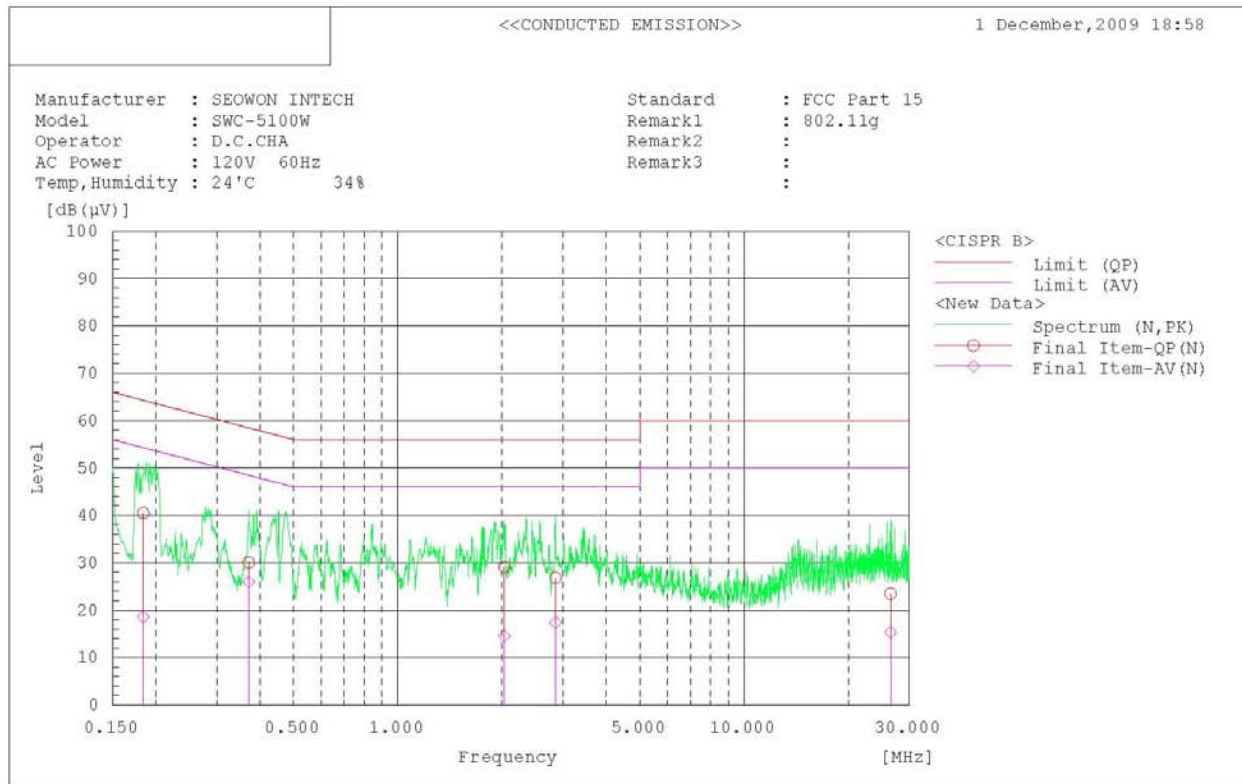
No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
	[MHz]	[dB(μV)]	[dB(μV)]		[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]	
1	0.176	40.5	18.6	0.1	40.6	18.7	64.7	54.7	24.1	36.0	
2	0.437	35.4	17.9	0.2	35.6	18.1	57.1	47.1	21.5	29.0	
3	2.023	27.8	15.4	0.2	28.0	15.6	56.0	46.0	28.0	30.4	
4	2.853	29.6	18.6	0.2	29.8	18.8	56.0	46.0	26.2	27.2	
5	26.633	18.6	10.3	1.7	20.3	12.0	60.0	50.0	39.7	38.0	

--- 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	0.156	46.6	34.2	0.2	46.8	34.4	65.7	55.7	18.9	21.3	
2	0.202	37.8	25.1	0.3	38.1	25.4	63.5	53.5	25.4	28.1	
3	1.757	35.4	10.3	0.6	36.0	10.9	56.0	46.0	20.0	35.1	
4	1.095	29.0	15.9	0.5	29.5	16.4	56.0	46.0	26.5	29.6	
5	26.512	21.9	11.3	2.0	23.9	13.3	60.0	50.0	36.1	36.7	

AC Line Conducted Emissions (Graph)

Test Mode: 802.11g



AC Line Conducted Emissions (Data List)

Test Mode: 802.11g

<<CONDUCTED EMISSION>>

1 December, 2009 18:58

Standard : FCC Part 15

Manufacturer : SEOWON INTECH

Model : SWC-5100W

Operator : D.C.CHA

AC Power : 120V 60Hz

Temp, Humidity : 24°C 34%

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	0.184	40.4	18.5	0.1	40.5	18.6	64.3	54.3	23.8	35.7	
2	0.371	30.0	25.9	0.1	30.1	26.0	58.5	48.5	28.4	22.5	
3	2.031	28.9	14.4	0.2	29.1	14.6	56.0	46.0	26.9	31.4	
4	2.855	26.6	17.2	0.2	26.8	17.4	56.0	46.0	29.2	28.6	
5	26.516	21.8	13.6	1.7	23.5	15.3	60.0	50.0	36.5	34.7	

--- 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	0.180	29.1	19.2	0.3	29.4	19.5	64.5	54.5	35.1	35.0	
2	0.385	27.5	18.2	0.4	27.9	18.6	58.2	48.2	30.3	29.6	
3	1.750	29.6	13.8	0.6	30.2	14.4	56.0	46.0	25.8	31.6	
4	2.857	25.6	14.2	0.6	26.2	14.8	56.0	46.0	29.8	31.2	
5	27.180	19.0	10.9	2.0	21.0	12.9	60.0	50.0	39.0	37.1	

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 antenna connector of this device is an inverted male SMA connector which is unique connector type.



- 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
<input checked="" type="checkbox"/>	Spectrum Analyzer	Agilent	E4440A	25/09/09	25/09/10	MY45304199
<input type="checkbox"/>	Spectrum Analyzer	Rohde Schwarz	FSQ26	05/06/09	05/06/10	200445
<input type="checkbox"/>	Spectrum Analyzer(RE)	H.P	8563E	13/10/09	13/10/10	3551A04634
<input type="checkbox"/>	Power Meter	H.P	EMP-442A	02/07/09	02/07/10	GB37170413
<input type="checkbox"/>	Power Sensor	H.P	8481A	02/07/09	02/07/10	3318A96332
<input type="checkbox"/>	Power Divider	Agilent	11636B	13/10/09	13/10/10	56471
<input type="checkbox"/>	Power Splitter	Anritsu	K241B	13/10/09	13/10/10	20611
<input type="checkbox"/>	Power Splitter	Anritsu	K241B	02/07/09	02/07/10	017060
<input type="checkbox"/>	Frequency Counter	H.P	5342A	13/07/09	13/07/10	2119A04450
<input type="checkbox"/>	TEMP & HUMIDITY Chamber	JISCO	KR-100/J-RHC2	10/10/09	10/10/10	30604493/021031
<input checked="" type="checkbox"/>	Digital Multimeter	H.P	34401A	13/03/09	13/03/10	3146A13475, US36122178
<input type="checkbox"/>	Multifunction Synthesizer	HP	8904A	06/10/09	06/10/10	3633A08404
<input checked="" type="checkbox"/>	Signal Generator	Rohde Schwarz	SMR20	13/03/09	13/03/10	101251
<input checked="" type="checkbox"/>	Signal Generator	H.P	ESG-3000A	02/07/09	02/07/10	US37230529
<input type="checkbox"/>	Vector Signal Generator	Rohde Schwarz	SMJ100A	02/02/09	02/02/10	100148
<input type="checkbox"/>	Audio Analyzer	H.P	8903B	02/07/09	02/07/10	3011A09448
<input type="checkbox"/>	Modulation Analyzer	H.P	8901B	02/07/09	02/07/10	3028A03029
<input type="checkbox"/>	8960 Series 10 Wireless Comms. Test Set	Agilent	E5515C	02/07/09	02/07/10	GB43461134
<input type="checkbox"/>	Universal Radio communication Tester	Rohde Schwarz	CMU 200	19/05/09	19/05/10	106760
<input type="checkbox"/>	Bluetooth Tester	TESCOM	TC-3000B	02/07/09	02/07/10	3000B000268
<input type="checkbox"/>	Thermo hygrometer	BODYCOM	BJ5478	06/02/09	06/02/10	090205-3
<input checked="" type="checkbox"/>	Thermo hygrometer	BODYCOM	BJ5478	06/02/09	06/02/10	090205-2
<input type="checkbox"/>	Thermo hygrometer	BODYCOM	BJ5478	06/02/09	06/02/10	090205-4
<input type="checkbox"/>	AC Power supply	DAEKWANG	5KVA	13/03/09	13/03/10	20060321-1
<input checked="" type="checkbox"/>	DC Power Supply	HP	6622A	13/03/09	13/03/10	3448A03760
<input type="checkbox"/>	DC Power Supply	HP	6633A	13/03/09	13/03/10	3524A06634
<input type="checkbox"/>	BAND Reject Filter	Microwave Circuits	N0308372	06/10/09	06/10/10	3125-01DC0352
<input type="checkbox"/>	BAND Reject Filter	Wainwright	WRCG1750	06/10/09	06/10/10	2
<input type="checkbox"/>	High-Pass Filter	ANRITSU	MP526D	06/10/09	06/10/10	M27756
<input type="checkbox"/>	High-pass filter	Wainwright	WHKX2.1	N/A	N/A	1
<input checked="" type="checkbox"/>	High-Pass Filter	Wainwright	WHKX3.0	N/A	N/A	9
<input type="checkbox"/>	Tunable Notch Filter	Wainwright	WRCT800.0/960.0-0.2/40-8SSK	N/A	N/A	10
<input type="checkbox"/>	Tunable Notch Filter	Wainwright	WRCD1700.0/2000.0-0.2/40-10SSK	N/A	N/A	27
<input type="checkbox"/>	Tunable Notch Filter	Wainwright	WRCT1900.0/2200.0-5/40-10SSK	N/A	N/A	7
<input checked="" type="checkbox"/>	HORN ANT	ETS	3115	17/06/09	17/06/10	6419
<input type="checkbox"/>	HORN ANT	ETS	3115	23/09/09	23/09/10	21097
<input type="checkbox"/>	HORN ANT	A.H.Systems	SAS-574	10/06/09	10/06/10	154
<input type="checkbox"/>	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
<input type="checkbox"/>	Dipole Antenna	Schwarzbeck	VHA9103	06/10/09	06/10/10	2116
<input type="checkbox"/>	Dipole Antenna	Schwarzbeck	VHA9103	06/10/09	06/10/10	2117
<input type="checkbox"/>	Dipole Antenna	Schwarzbeck	UHA9105	05/10/09	05/10/10	2261
<input type="checkbox"/>	Dipole Antenna	Schwarzbeck	UHA9105	05/10/09	05/10/10	2262
<input type="checkbox"/>	LOOP Antenna	ETS	6502	14/09/09	14/09/10	3471
<input type="checkbox"/>	Coaxial Fixed Attenuators	Agilent	8491B	02/07/09	02/07/10	MY39260700
<input type="checkbox"/>	Coaxial Fixed Attenuators	Agilent	8491B	02/07/09	02/07/10	MY39260699
<input type="checkbox"/>	Attenuator (10dB)	WEINSCHEL	23-10-34	01/10/09	01/10/10	BP4386
<input type="checkbox"/>	Attenuator (10dB)	WEINSCHEL	23-10-34	19/01/09	19/01/10	BP4387
<input type="checkbox"/>	Attenuator (20dB)	WEINSCHEL	86-20-11	06/10/09	06/10/10	432
<input type="checkbox"/>	Attenuator (10dB)	WEINSCHEL	31696	06/10/09	06/10/10	446
<input type="checkbox"/>	Attenuator (10dB)	WEINSCHEL	31696	06/10/09	06/10/10	408
<input type="checkbox"/>	Attenuator (40dB)	WEINSCHEL	57-40-33	01/10/09	01/10/10	NN837
<input type="checkbox"/>	Attenuator (30dB)	JFW	50FH-030-300	13/03/09	13/03/10	060320-1
<input type="checkbox"/>	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0088CAN	02/07/09	02/07/10	788
<input type="checkbox"/>	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0185CAN	02/07/09	02/07/10	790
<input type="checkbox"/>	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0215CAN	02/07/09	02/07/10	112
<input checked="" type="checkbox"/>	Amplifier (30dB)	Agilent	8449B	10/10/09	10/10/10	3008A01590
<input type="checkbox"/>	Amplifier	EMPOWER	BBS3Q7ELU	02/02/09	02/02/10	1020
<input type="checkbox"/>	RF Power Amplifier	OPHIRRF	5069F	02/07/09	02/07/10	1006
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	R&S	ESU	02/02/09	02/02/10	100014
<input checked="" type="checkbox"/>	BILOG ANTENNA	SCHAFFNER	CBL6112B	02/06/09	02/06/10	2737
<input checked="" type="checkbox"/>	Amplifier (22dB)	H.P	8447E	05/02/09	05/02/10	2945A02865
<input type="checkbox"/>	EMI TEST RECEIVER	R&S	ESCI	12/05/09	12/05/10	100364
<input type="checkbox"/>	LOG-PERIODIC ANT.	Schwarzbeck	UHLP9108A	30/05/09	30/05/10	590
<input type="checkbox"/>	BICONICAL ANT.	Schwarzbeck	VHA 9103	02/06/09	02/06/10	2233
<input type="checkbox"/>	LOG-PERIODIC ANT.	Schwarzbeck	UHLP9108A1	07/10/09	07/10/10	1098
<input type="checkbox"/>	BICONICAL ANT.	Schwarzbeck	VHA 9103	06/10/09	06/10/10	91031946
<input type="checkbox"/>	Low Noise Pre Amplifier	TSJ	MLA-100K01-B01-2	13/03/09	13/03/10	1252741
<input type="checkbox"/>	Amplifier (25dB)	Agilent	8447D	12/05/09	12/05/10	2944A10144
<input type="checkbox"/>	Amplifier (25dB)	Agilent	8447D	03/07/09	03/07/10	2648A04922
<input checked="" type="checkbox"/>	Spectrum Analyzer(CE)	H.P	8591E	26/04/09	26/04/10	3649A05889
<input checked="" type="checkbox"/>	LISN	Kyoritsu	KNW-407	03/07/09	03/07/10	8-317-8
<input checked="" type="checkbox"/>	LISN	Kyoritsu	KNW-242	13/10/09	13/10/10	8-654-15
<input checked="" type="checkbox"/>	CVCF	NF Electronic	4420	13/03/09	13/03/10	304935/337980
<input checked="" type="checkbox"/>	DC BLOCK	Hyuplip	KEL-007	N/A	N/A	7-1581-5
<input checked="" type="checkbox"/>	50 ohm Terminator	HME	CT-01	22/01/09	22/01/10	N/A
<input checked="" type="checkbox"/>	RFI/FIELD Intensity Meter	Kyoritsu	KNM-2402	03/07/09	03/07/10	4N-170-3