



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: May 03 ~ 10, 2010

Test Report S/N:DRTFCC1005-0054

Test Site : DIGITAL EMC CO., LTD.

FCC ID

R2NSWR-8225

APPLICANT

EpiValley Co., Ltd.

Purpose	:	Original Grant
FCC Equipment Class	:	Digital Transmission System (DTS)
Device name	:	WiMAX Mobile Hostpot Router
Manufacturer	:	Epivalley Co., Ltd.
FCC ID	:	R2NSWR-8225
Model name	:	SWR-8225
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 – 15.81 dBm Conducted 802.11g – 12.34 dBm Conducted
Data of issue	:	May 17, 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*

May 17, 2010

D.C. Cha



Date

Name

Signature

Reviewed by: *Manager*

May 17, 2010

W.J. Lee



Date

Name

Signature

Applicant:

Company name : EpiValley Co., Ltd.

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

Date of order : April 16, 2010

2. Equipment information

R2NSWR-8225

2.1 Equipment information

Equipment model no.	SWR-8225
Equipment serial no.	Identical prototype
Type of equipment	WiMAX Mobile Hostpot Router
Frequency band	2412 ~ 2462 MHz
Type of Modulation	802.11b – CCK 802.11g – OFDM
Power	Li-ion polymer Battery: DC 3.7 V Adapter: AC 120V 60Hz
Type of antenna	☒ Internal Type: PIFA Antenna (Max. Peak Gain: -3.95 dBi) ☐ External Type:

2.2 Ancillary equipment

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

3. Information about test items

R2NSWR-8225

3.1 Tested frequency

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

3.2 Tested environment

Temperature	:	21 ~ 23 (°C)
Relative humidity content	:	35 ~ 55 % R.H.
Details of power supply	:	DC 3.7 V AC 120V 60Hz

3.3 Test mode

Test Case 1	Only EUT
Test Case 2	EUT + Adaptor
Test Case 3	-

3.4 Auxiliary equipment

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

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
				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				

The sample was tested according to the following specification:

ANSI C-63.4-2003

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	11.45
	Middle	11.90
	Highest	11.85
802.11g	Lowest	16.50
	Middle	16.55
	Highest	16.55

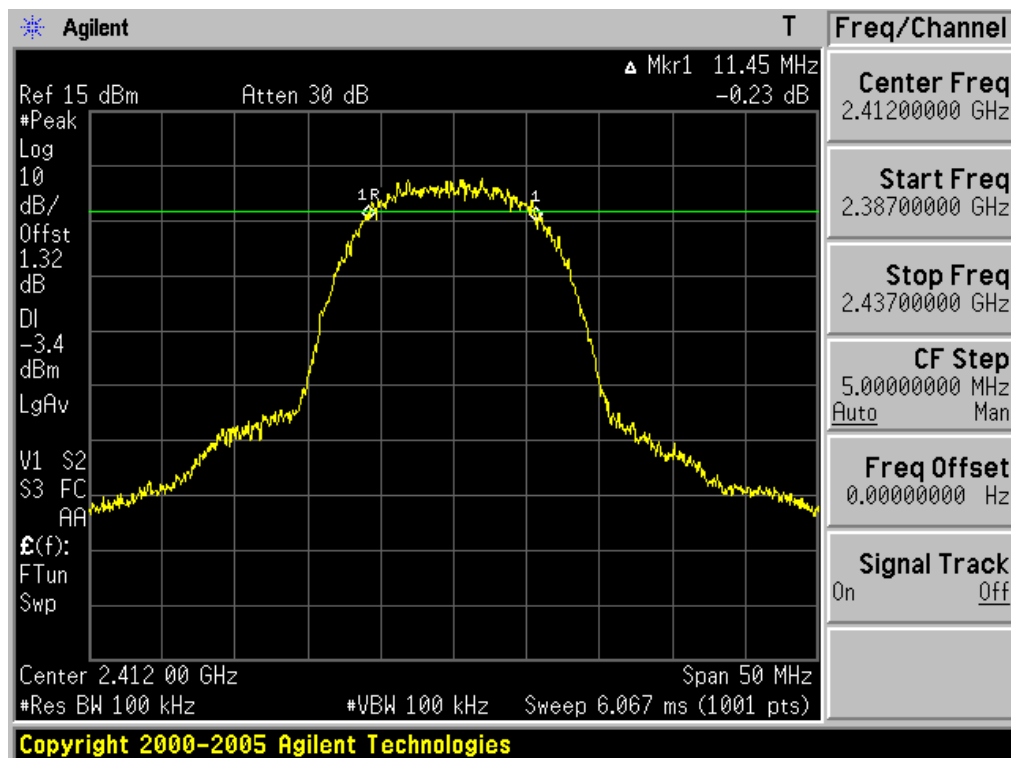
Note 1: See next pages for actual measured spectrum plots.

- Minimum Standard:

The minimum 6 dB bandwidth shall be at least 500 kHz

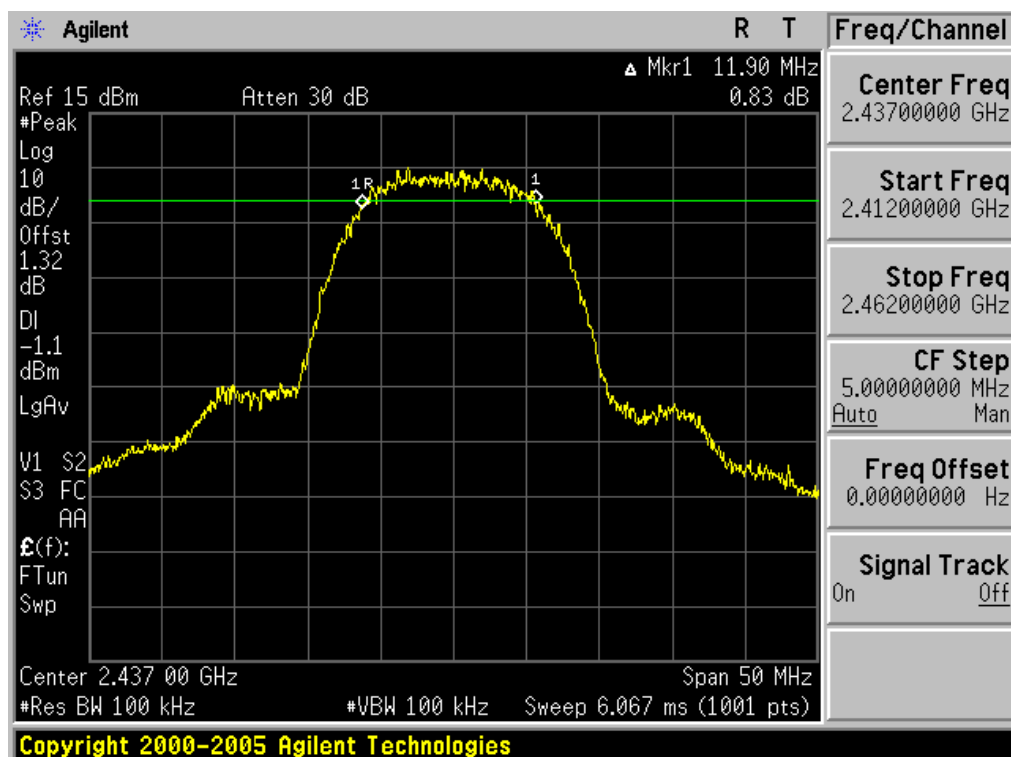
6 dB Bandwidth

Test Mode: 802.11b & Lowest Frequency



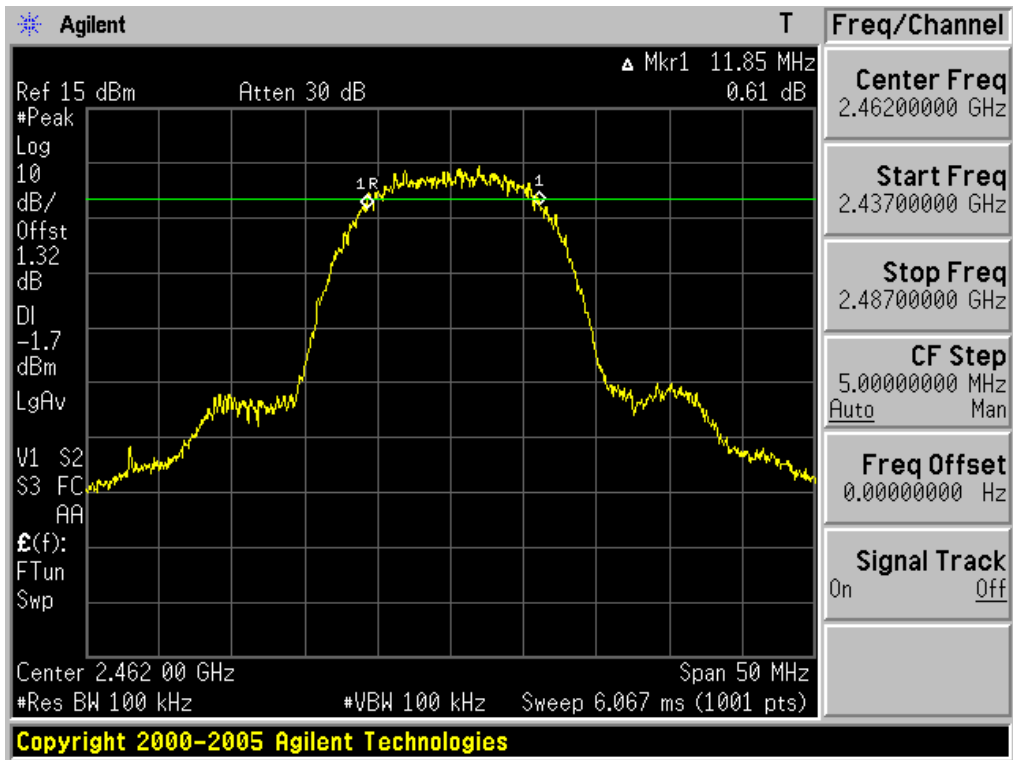
6 dB Bandwidth

Test Mode: 802.11b & Middle Frequency



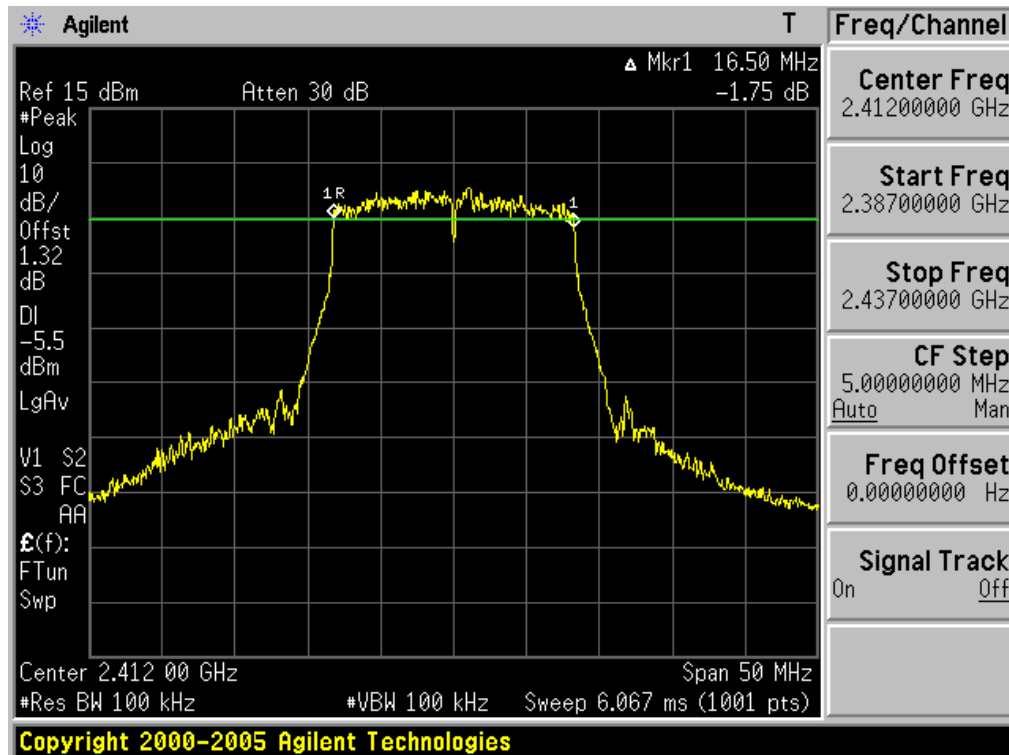
6 dB Bandwidth

Test Mode: 802.11b & Highest Frequency



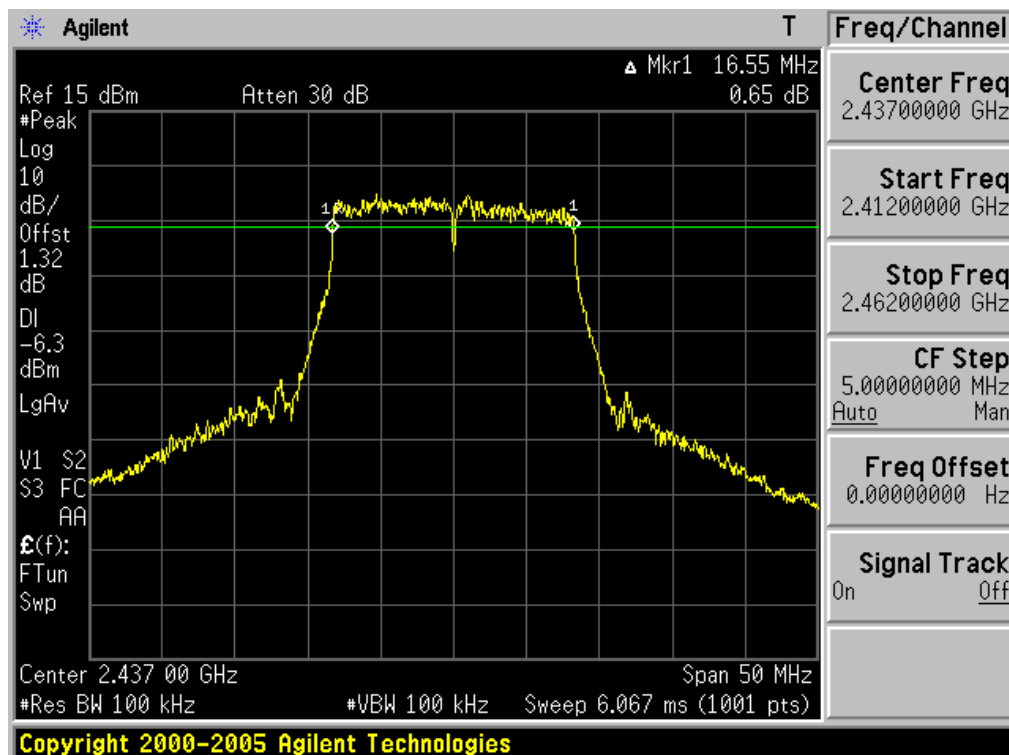
6 dB Bandwidth

Test Mode: 802.11g & Lowest Frequency



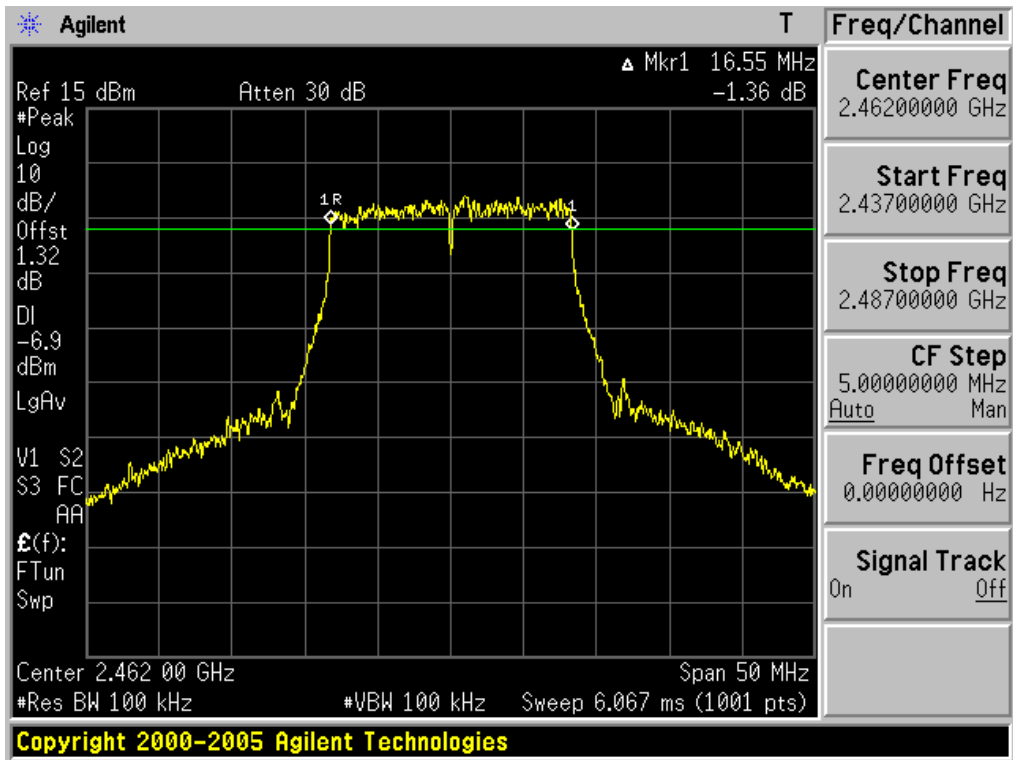
6 dB Bandwidth

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**

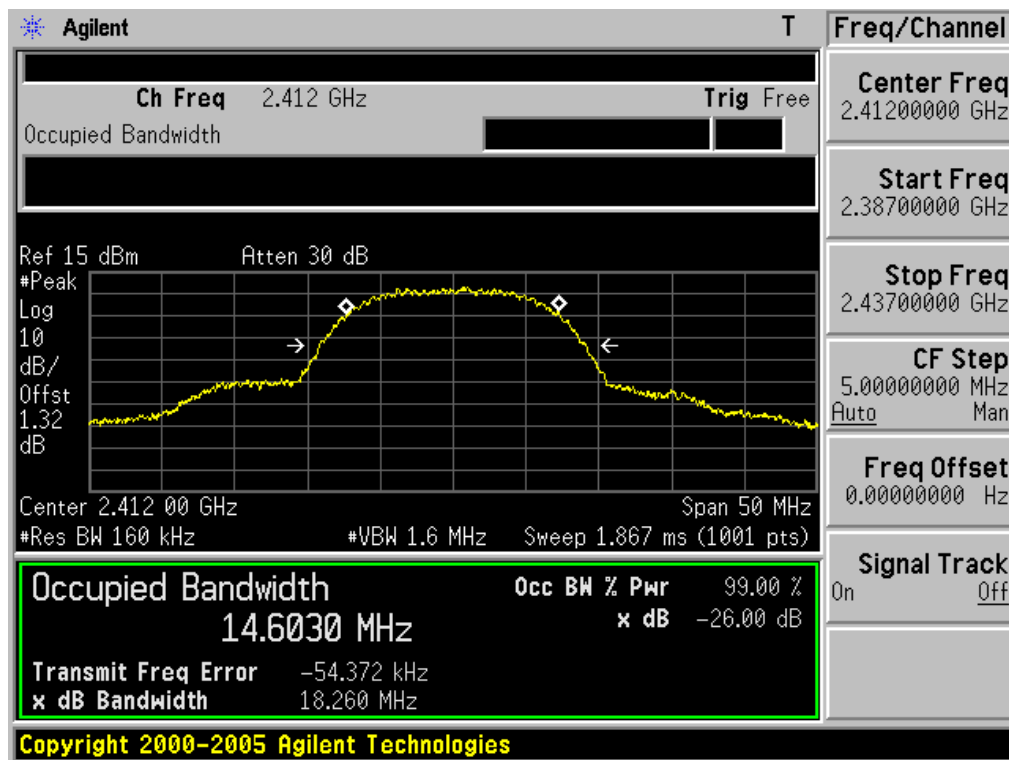
Test Mode	Frequency	Test Results	
		dBm	W
802.11b	Lowest	15.80	0.0380
	Middle	15.81	0.0381
	Highest	13.83	0.0242
802.11g	Lowest	12.12	0.0163
	Middle	12.34	0.0171
	Highest	11.58	0.0144

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

Minimum Standard:	< 1W
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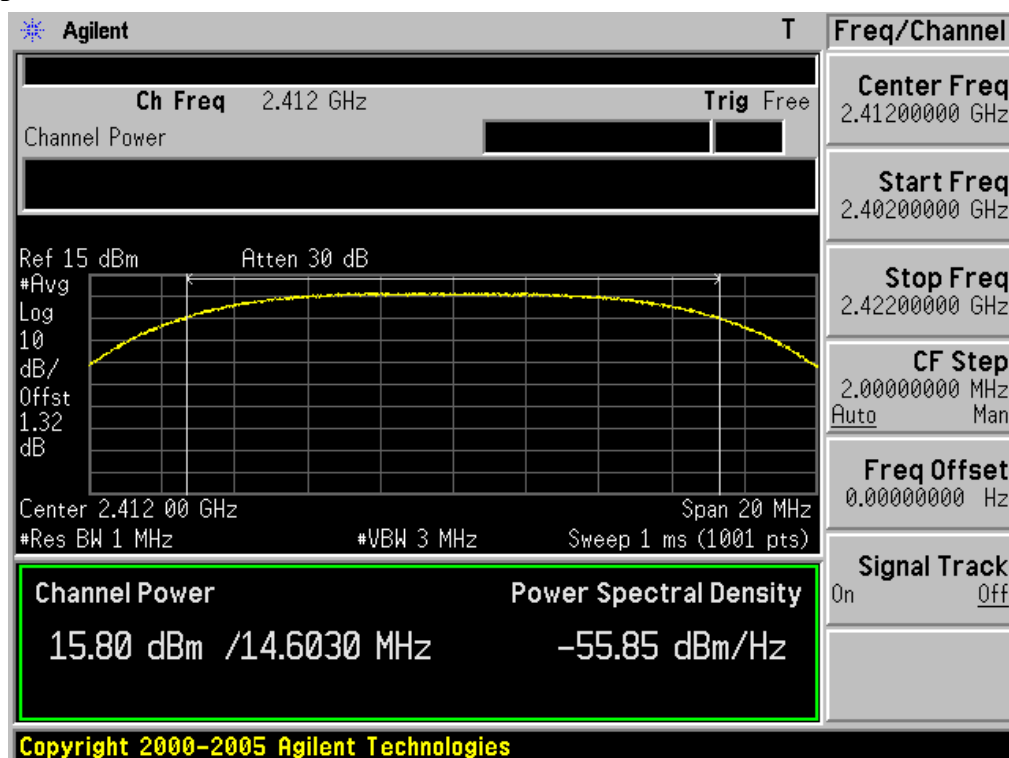
26 dB Bandwidth

Test Mode: 802.11b & Lowest Frequency



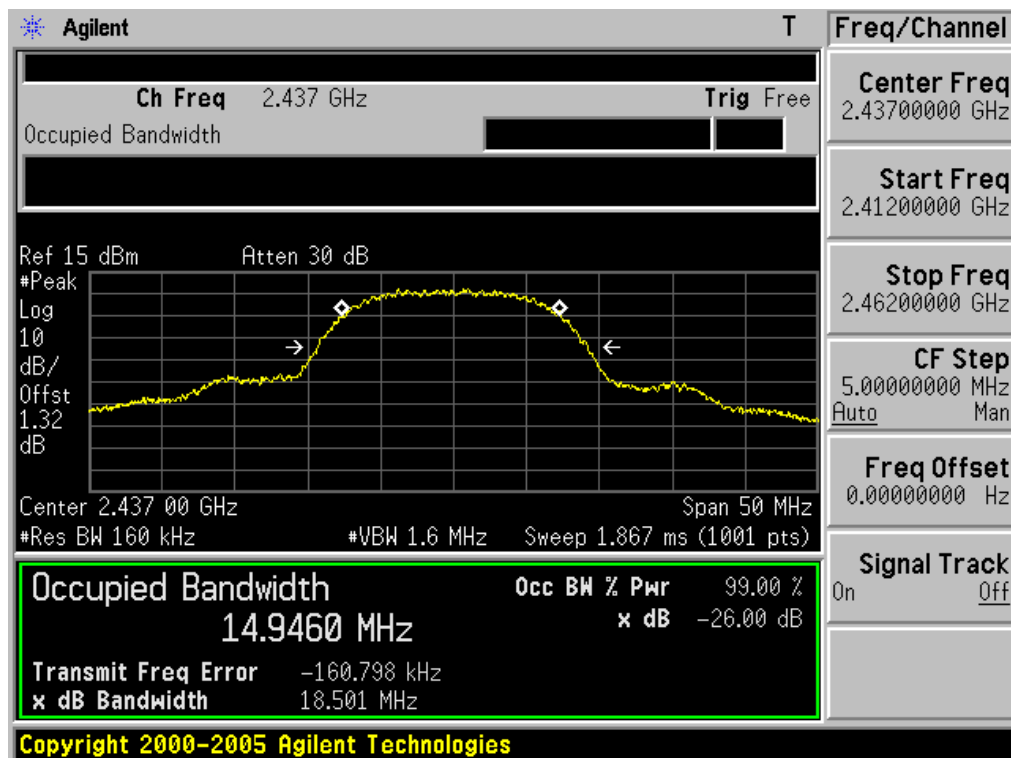
Peak Output Power

Test Mode: 802.11b & Lowest Frequency



26 dB Bandwidth

Test Mode: 802.11b & Middle Frequency



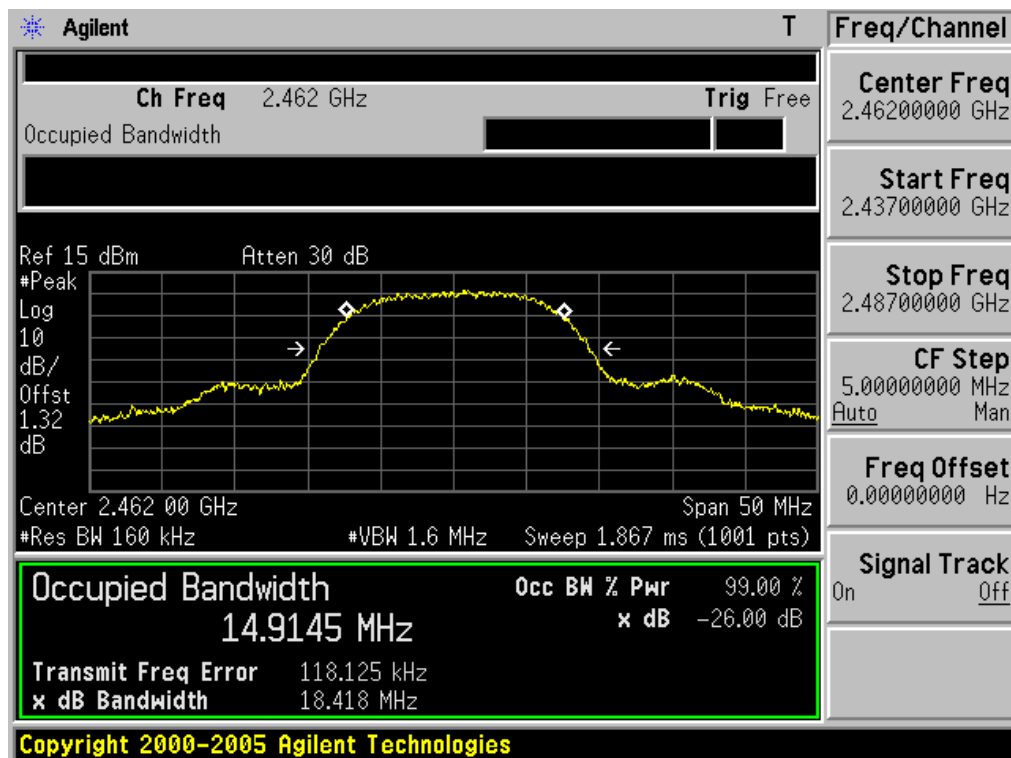
Peak Output Power

Test Mode: 802.11b & Middle Frequency



26 dB Bandwidth

Test Mode: 802.11b & Highest Frequency



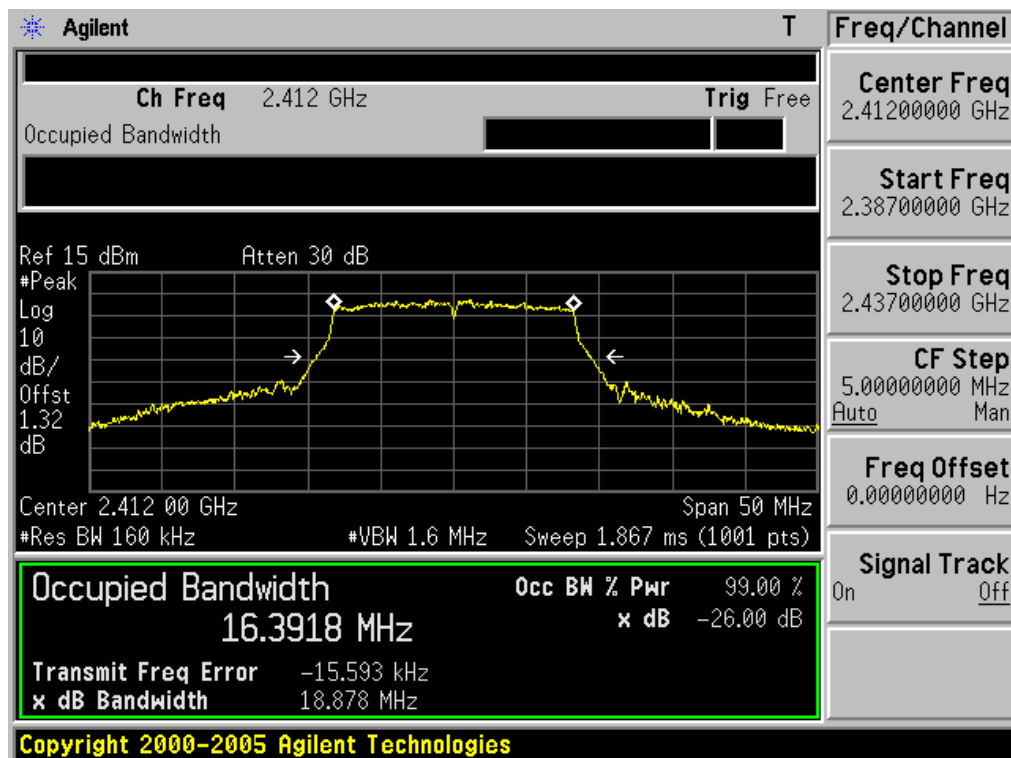
Peak Output Power

Test Mode: 802.11b & Highest Frequency



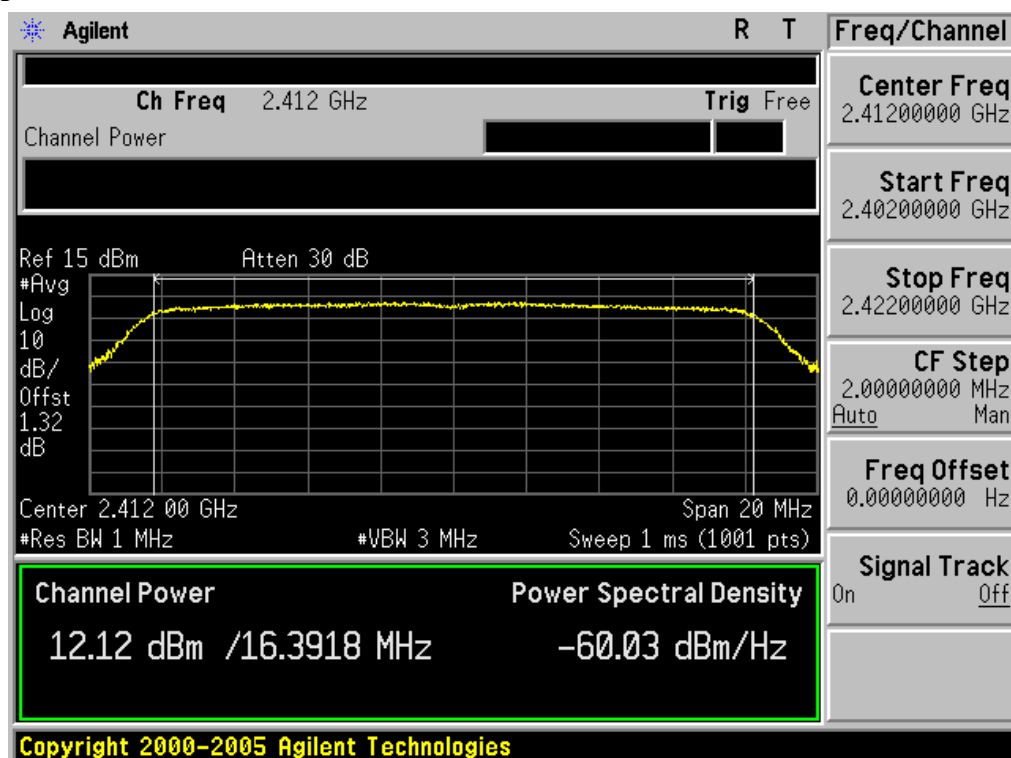
26 dB Bandwidth

Test Mode: 802.11g & Lowest Frequency



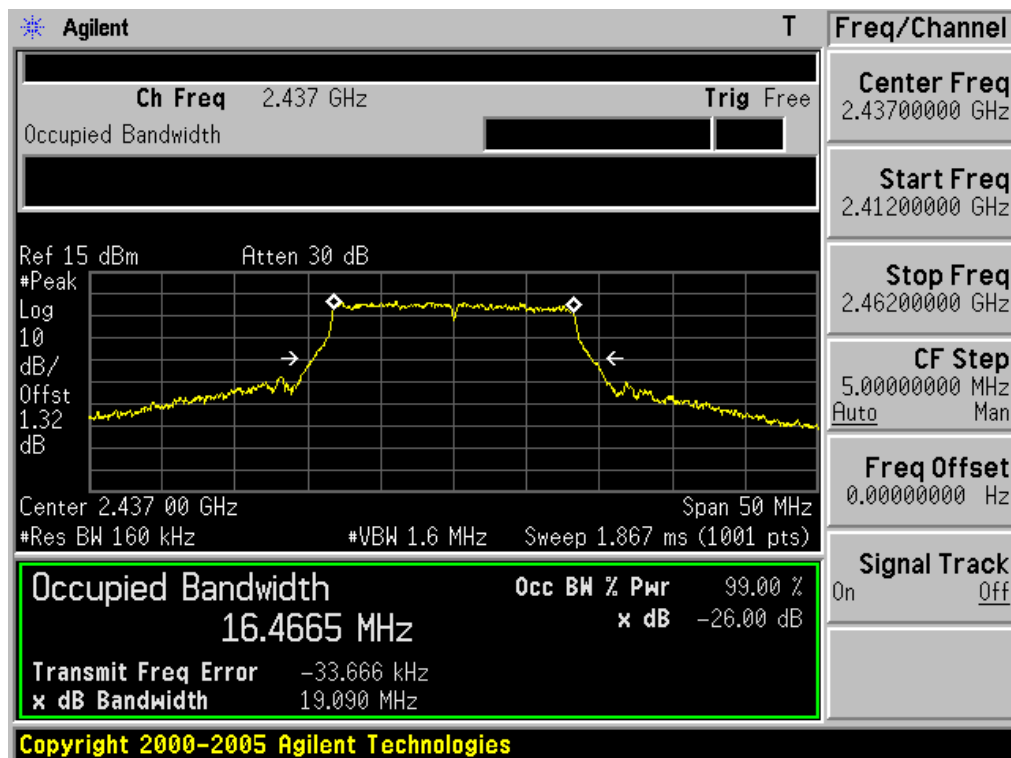
Peak Output Power

Test Mode: 802.11g & Lowest Frequency



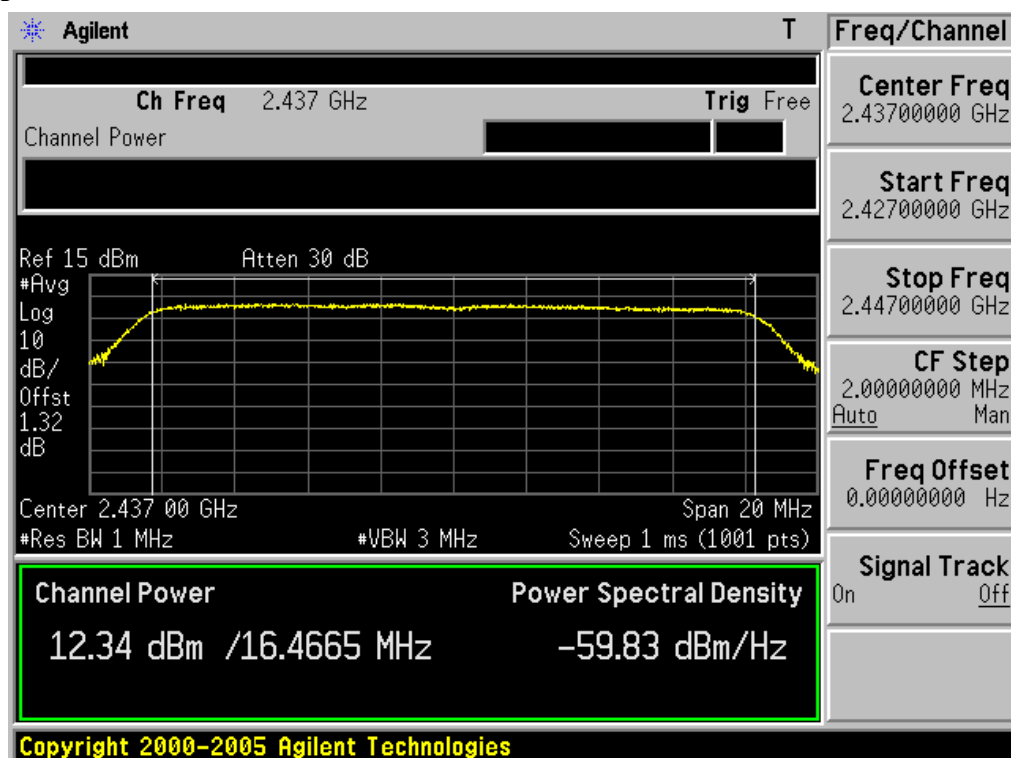
26 dB Bandwidth

Test Mode: 802.11g & Middle Frequency



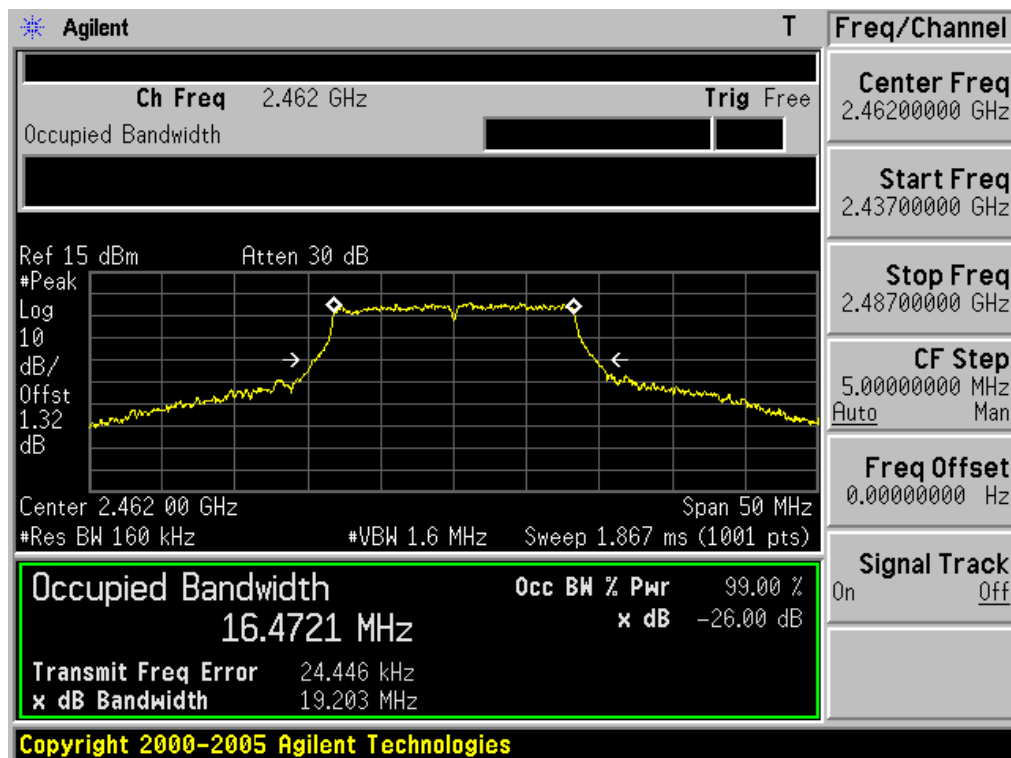
Peak Output Power

Test Mode: 802.11g & Middle Frequency



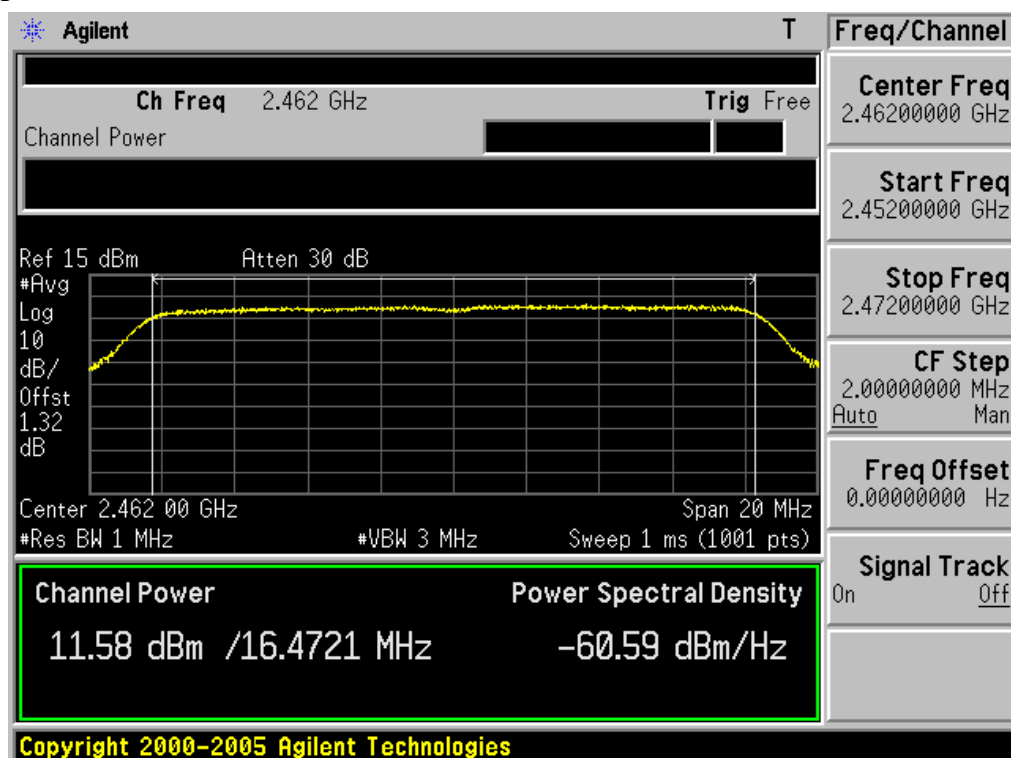
26 dB Bandwidth

Test Mode: 802.11g & Highest Frequency

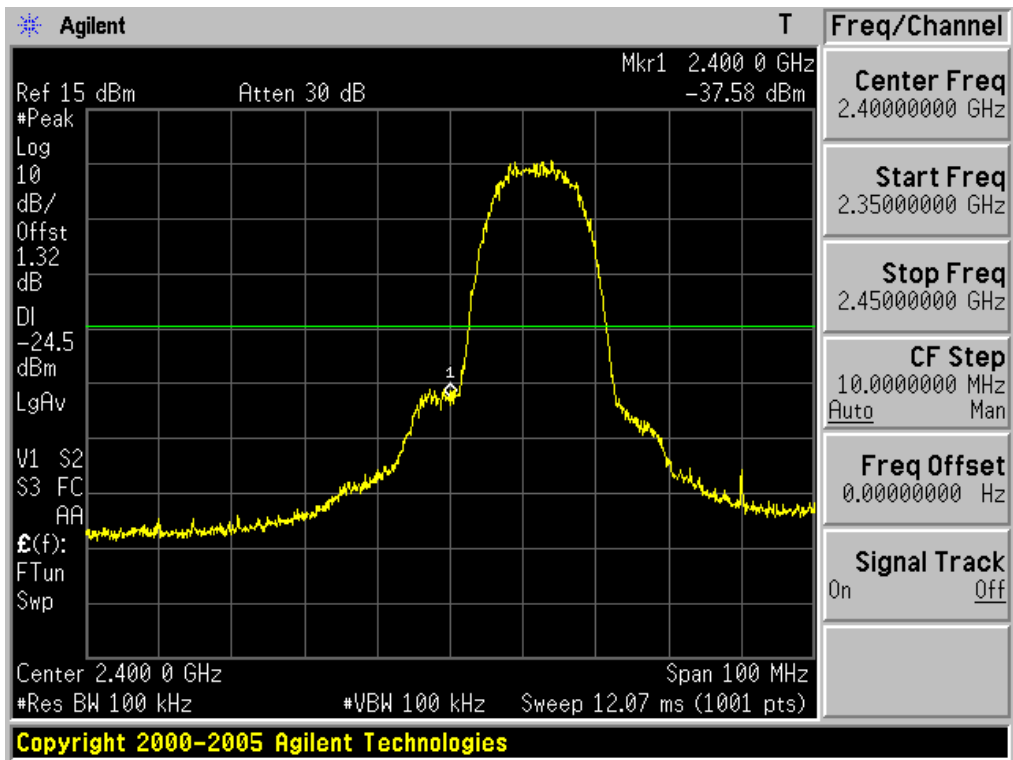


Peak Output Power

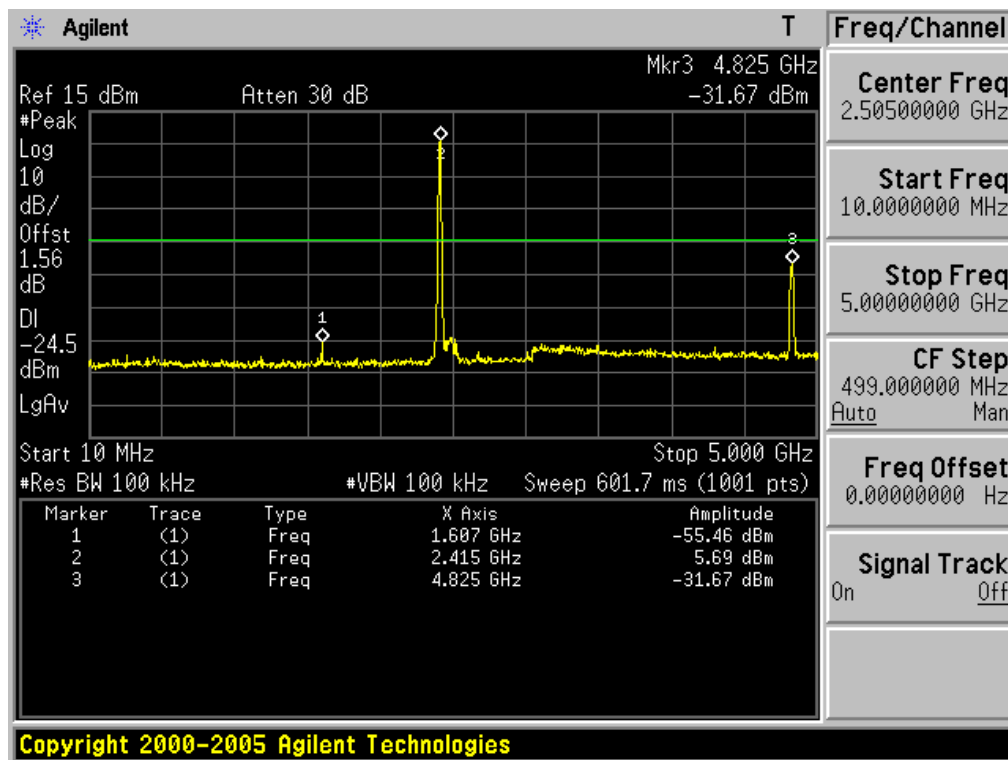
Test Mode: 802.11g & Highest Frequency



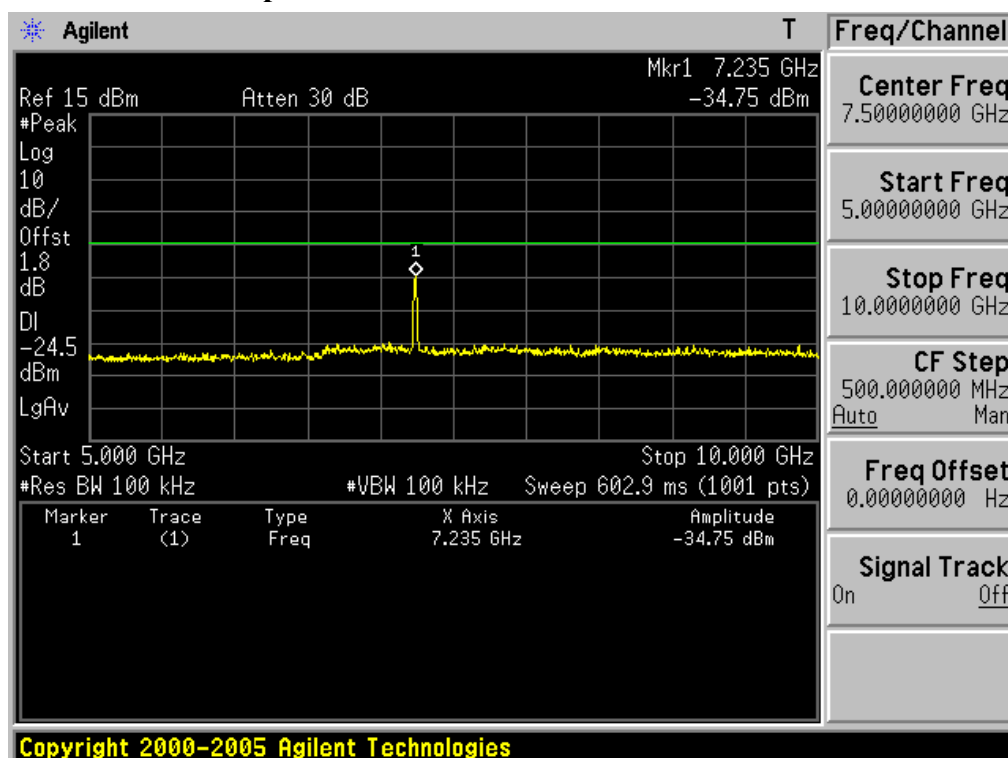
Low Band-edge at 30 dB blow Test Mode: 802.11b



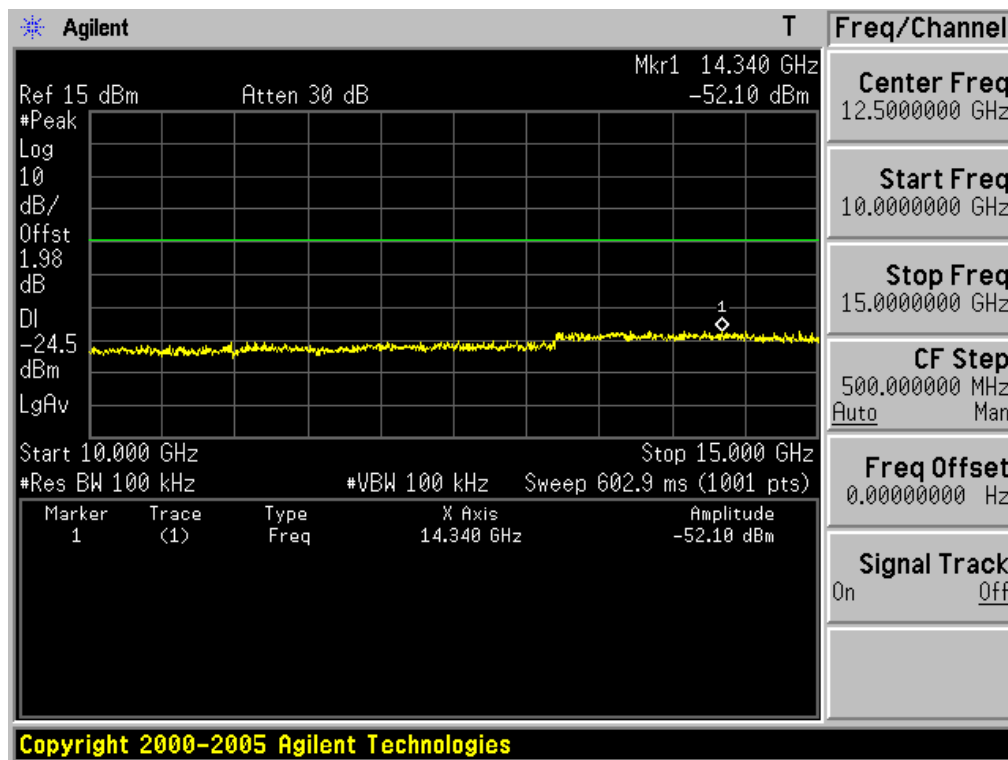
10MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11b & Lowest Frequency



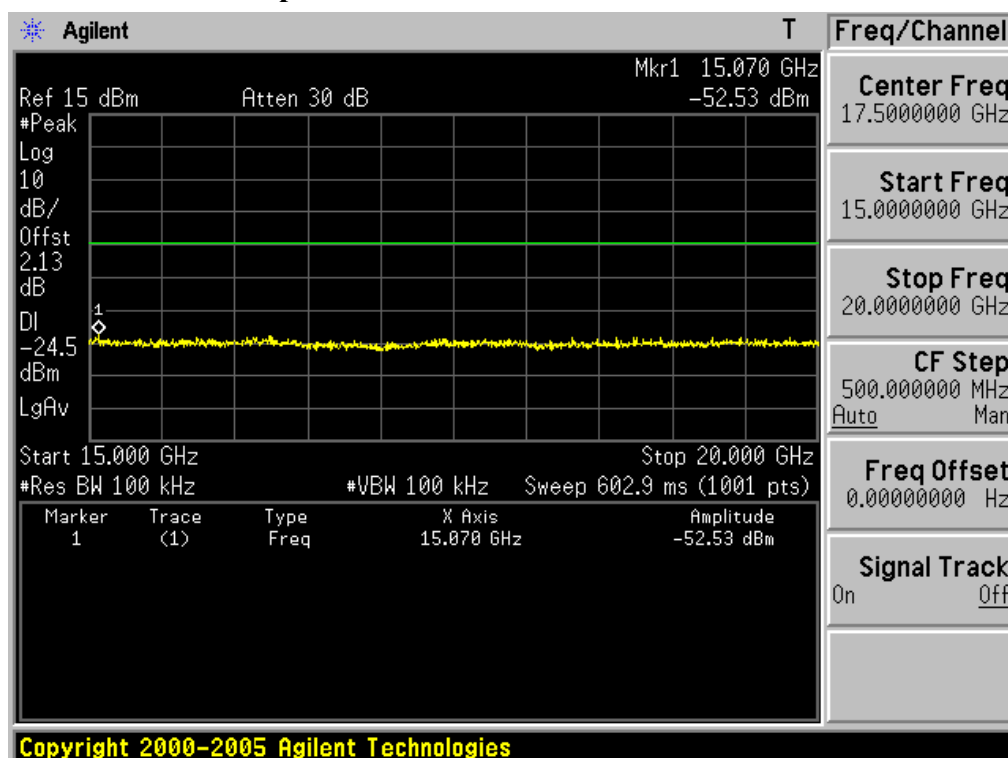
5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11b & Lowest Frequency



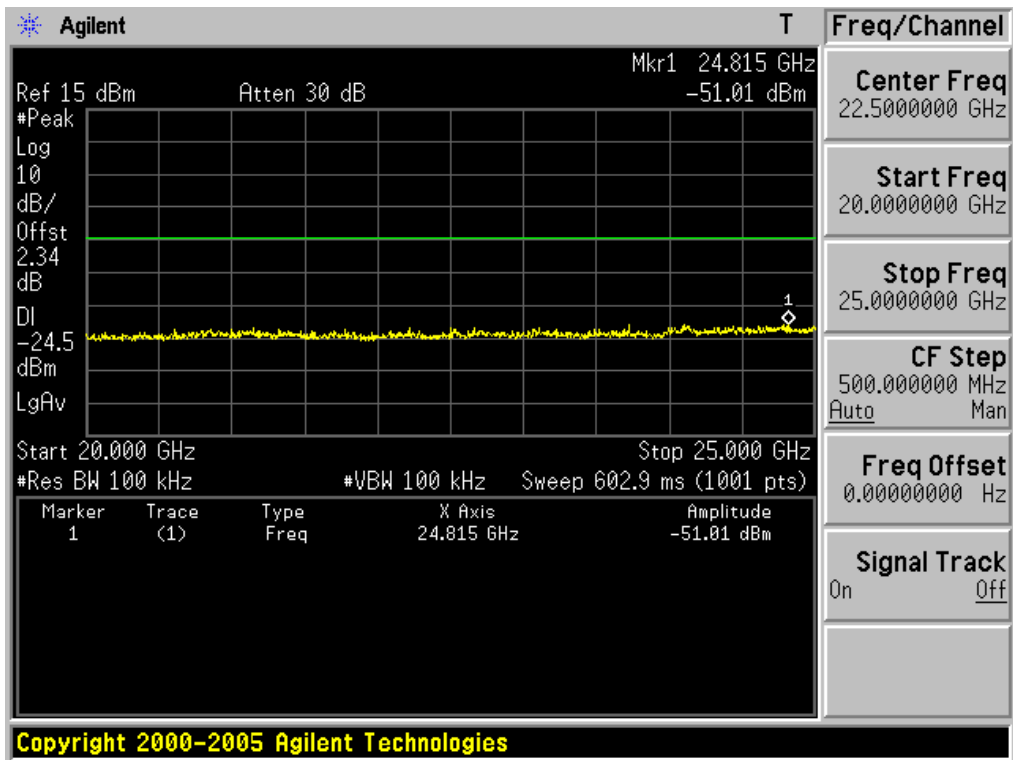
10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11b & Lowest Frequency



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

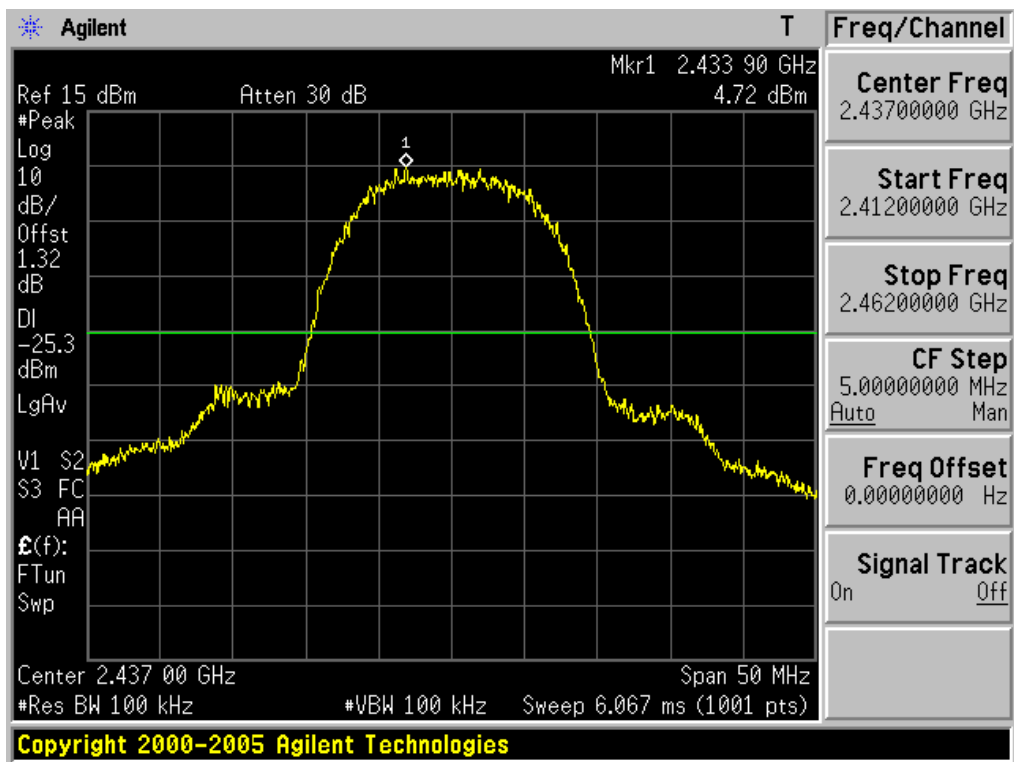


20GHz ~ 25GHz Conducted Spurious Emissions Test Mode: 802.11b & Lowest Frequency

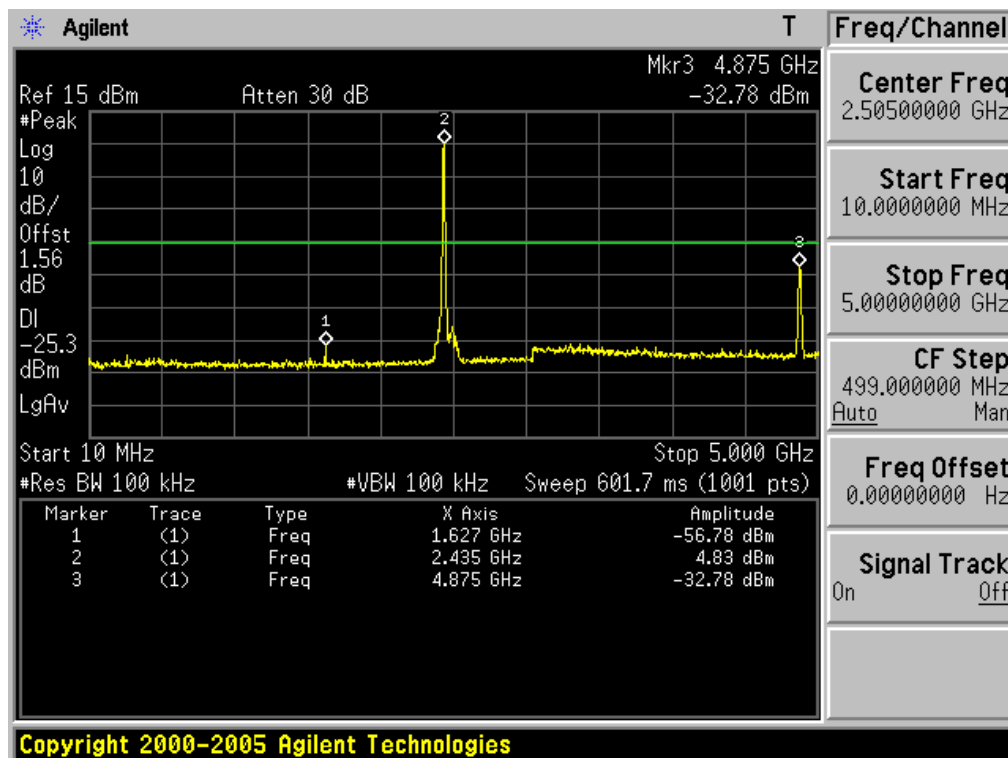


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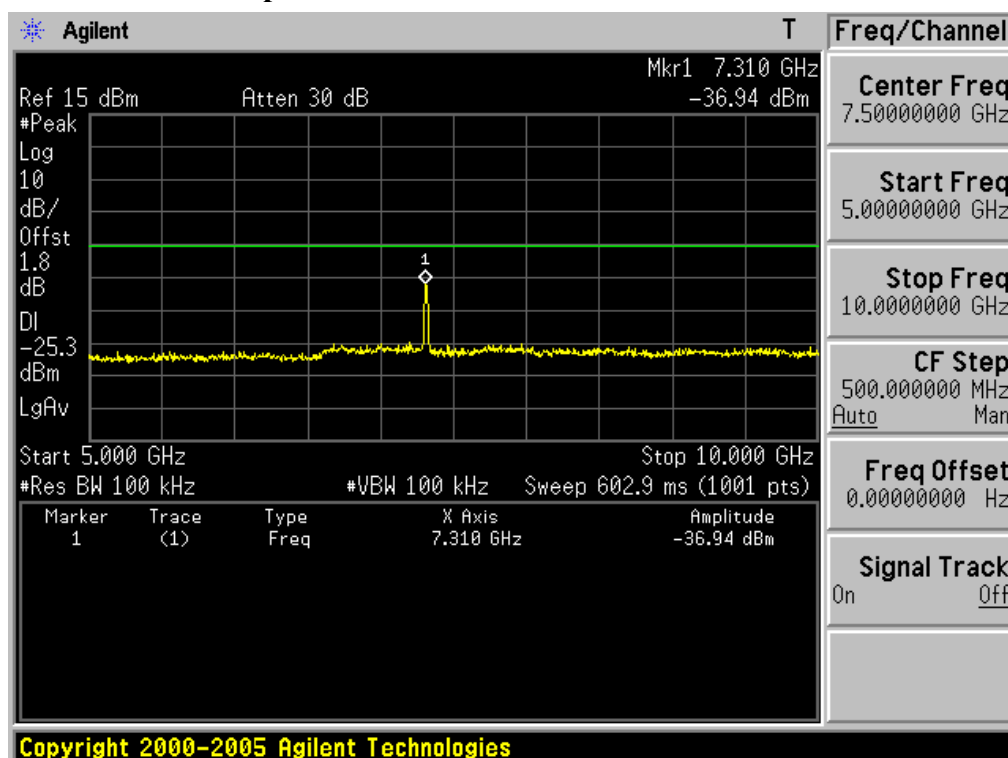
Test Mode: 802.11b & Middle Frequency

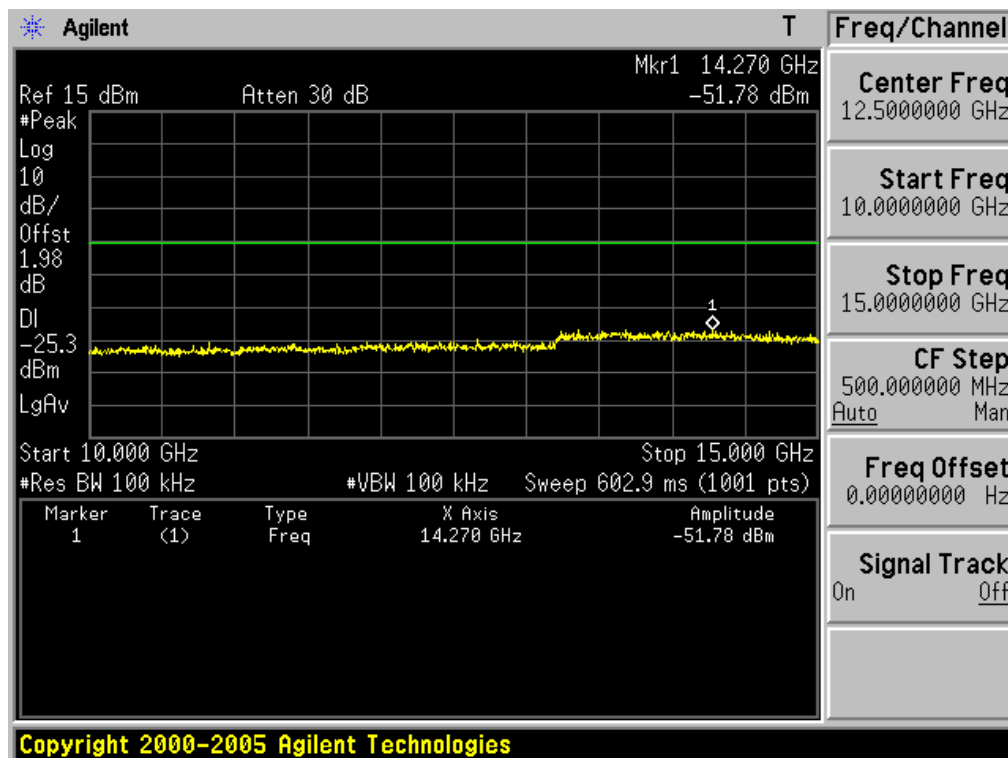
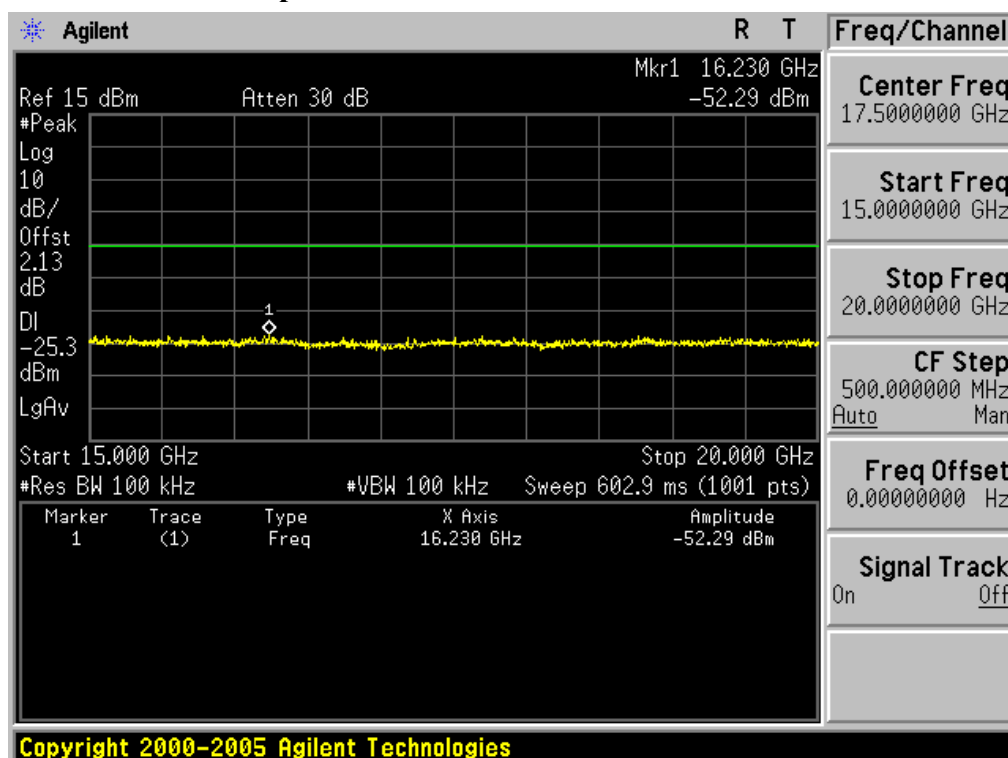


10MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11b & Middle Frequency

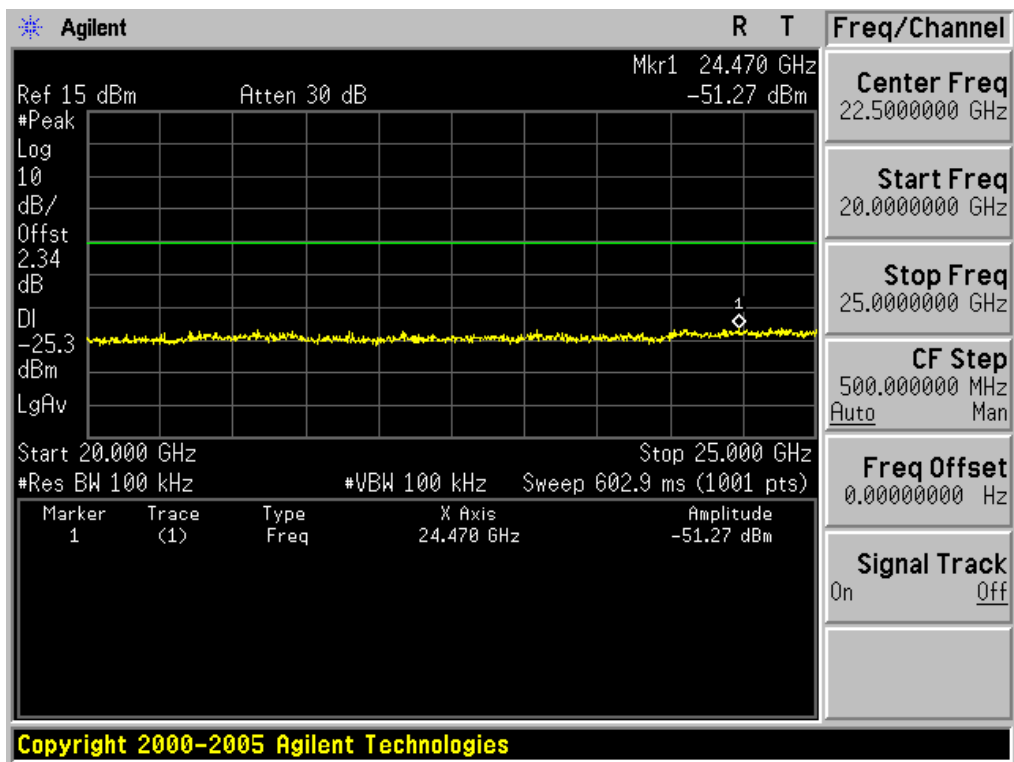


5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11b & Middle Frequency

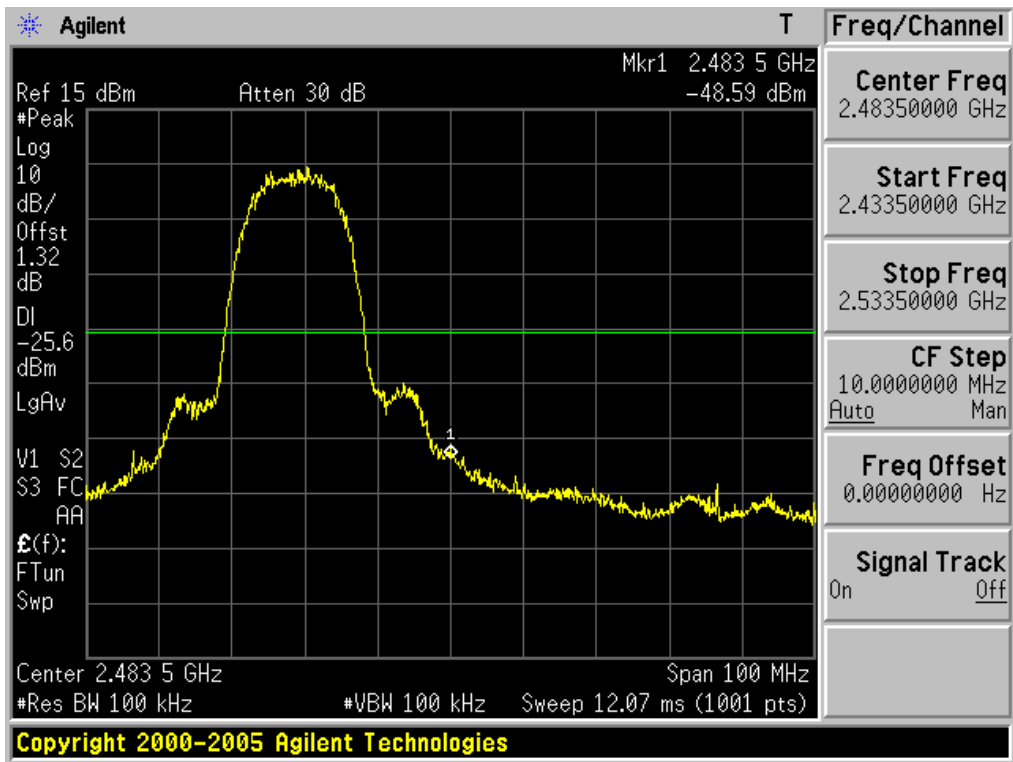


10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11b & Middle Frequency

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


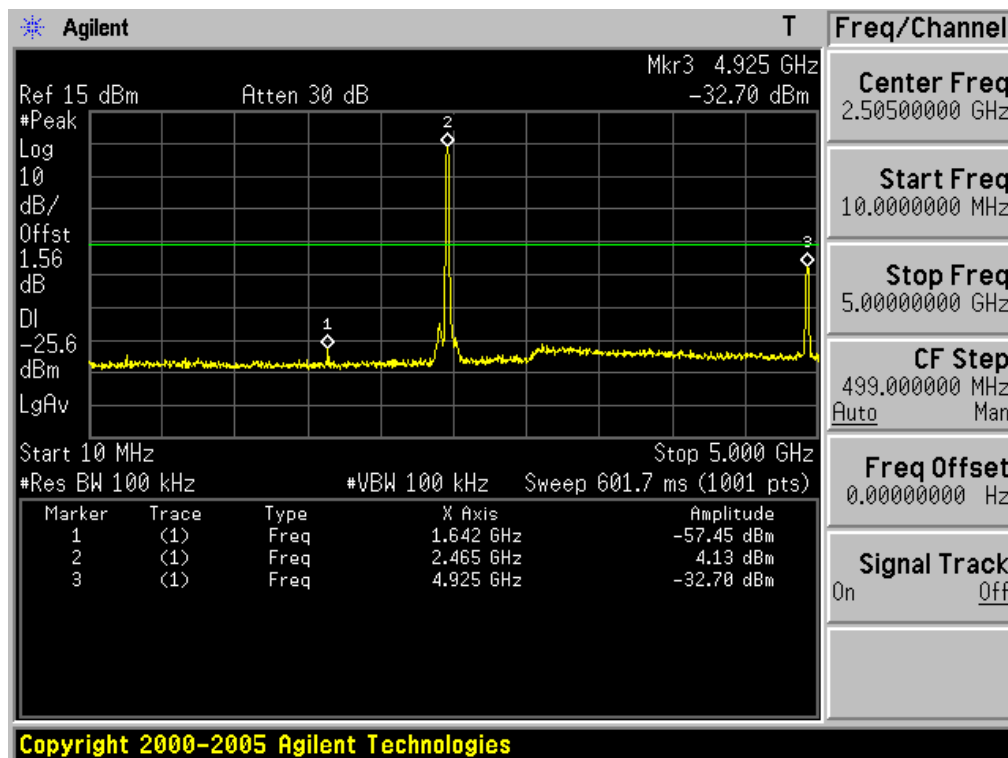
20GHz ~ 25GHz Conducted Spurious Emissions Test Mode: 802.11b & Middle Frequency



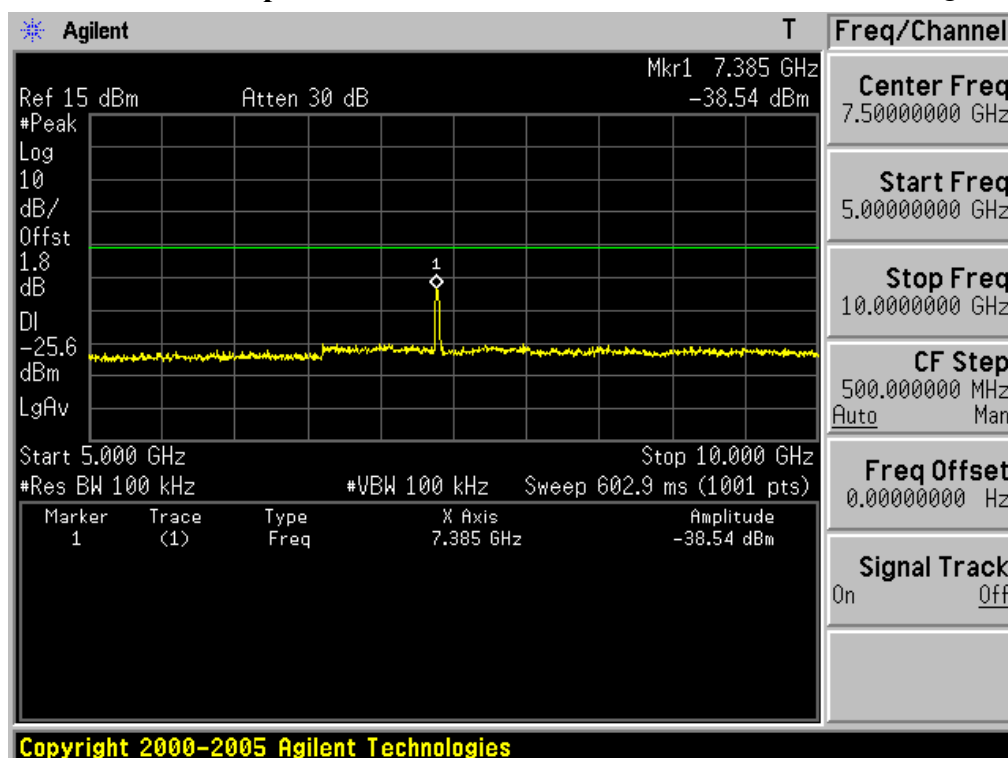
High Band-edge at 30 dB blow Test Mode: 802.11b & Highest Frequency



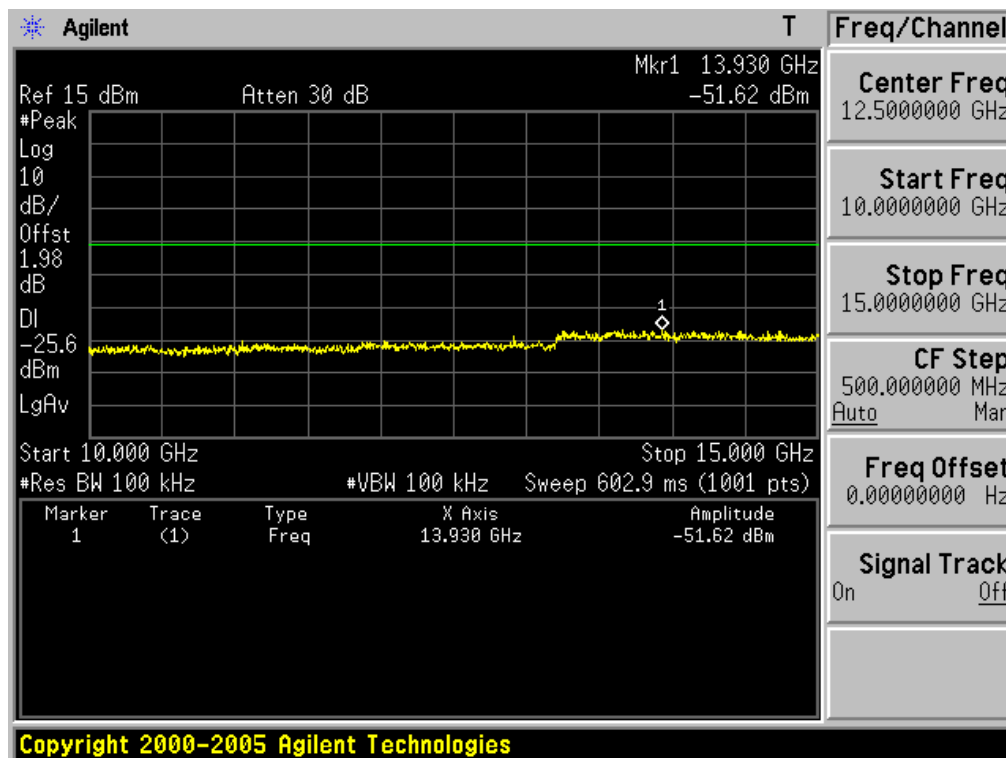
10MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11b & Highest Frequency



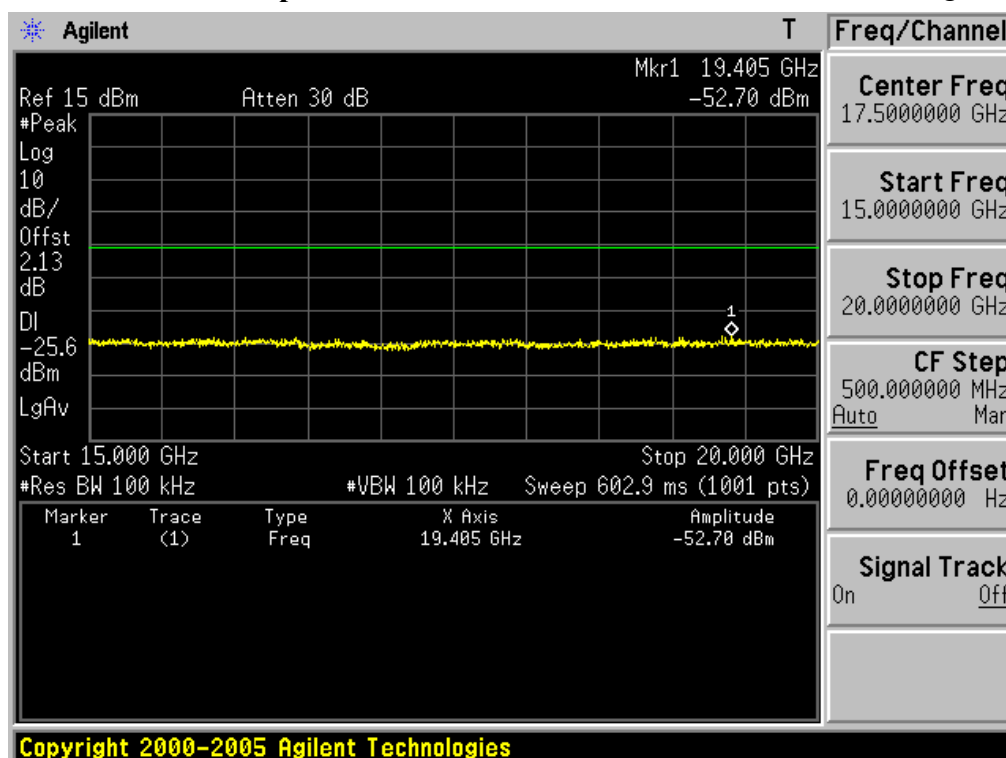
5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11b & Highest Frequency



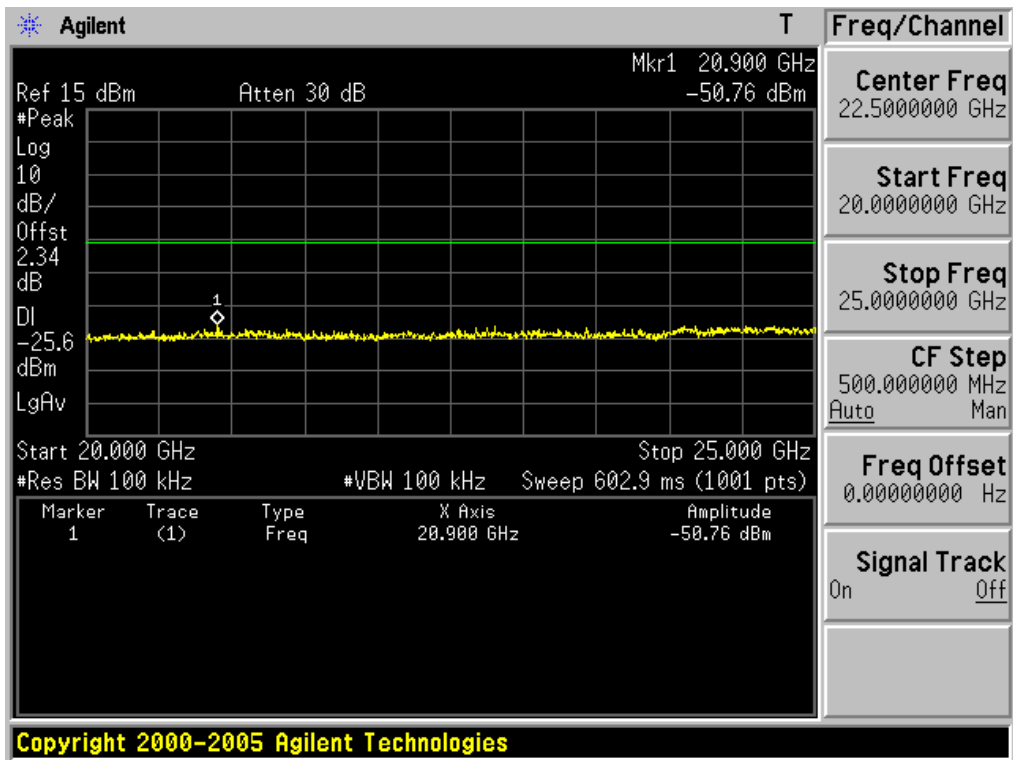
10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11b & Highest Frequency



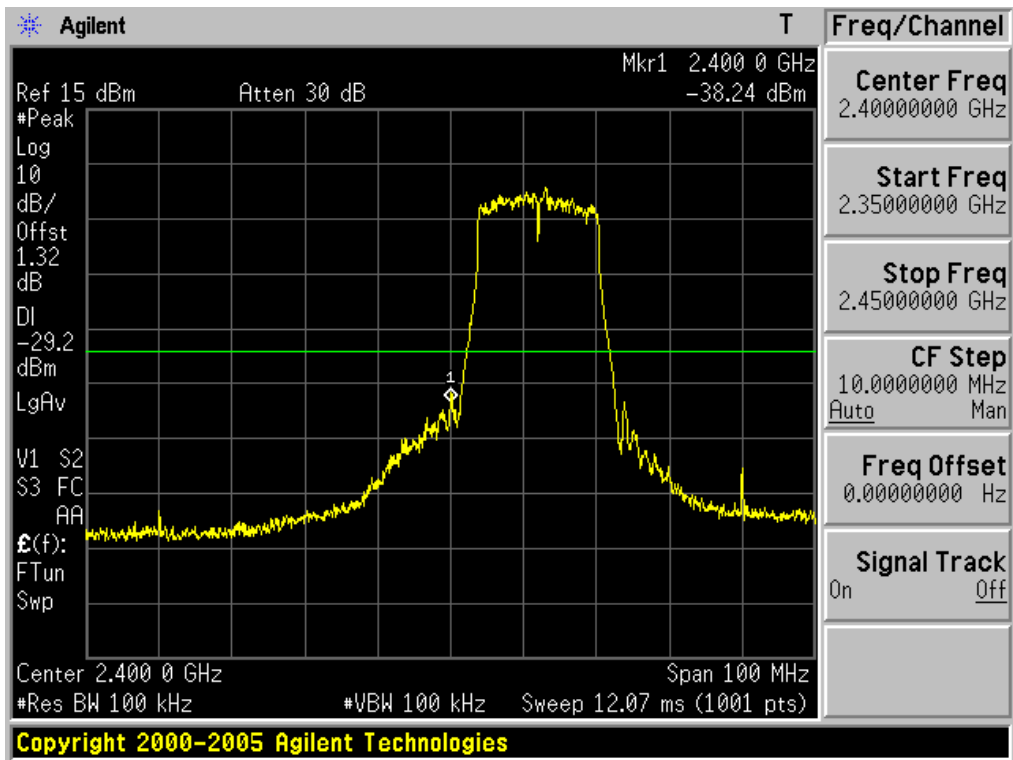
15GHz ~ 20GHz Conducted Spurious Emissions Test Mode: 802.11b & Highest Frequency



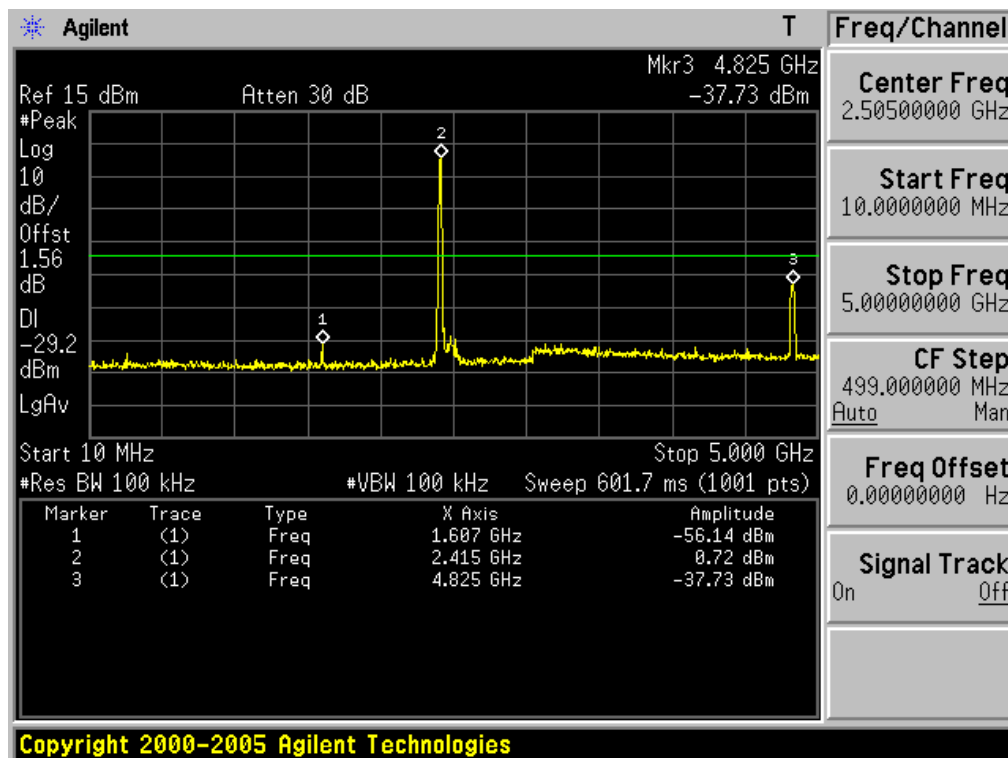
20GHz ~ 25GHz Conducted Spurious Emissions Test Mode: 802.11b & Highest Frequency



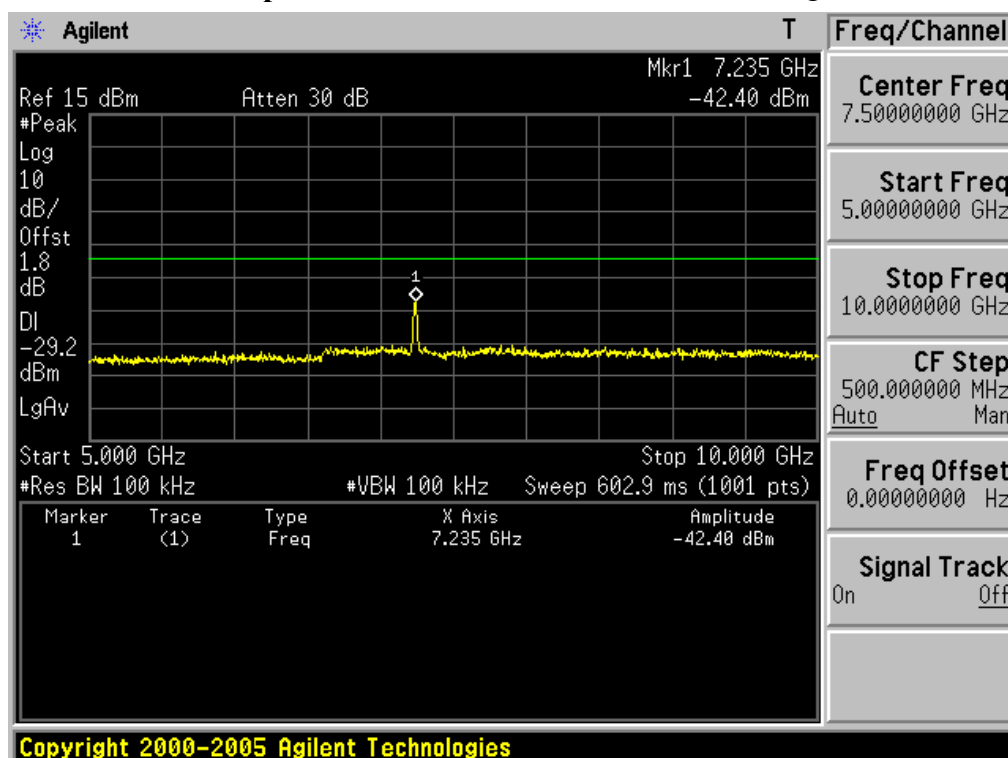
Low Band-edge at 30 dB blow Test Mode: 802.11g



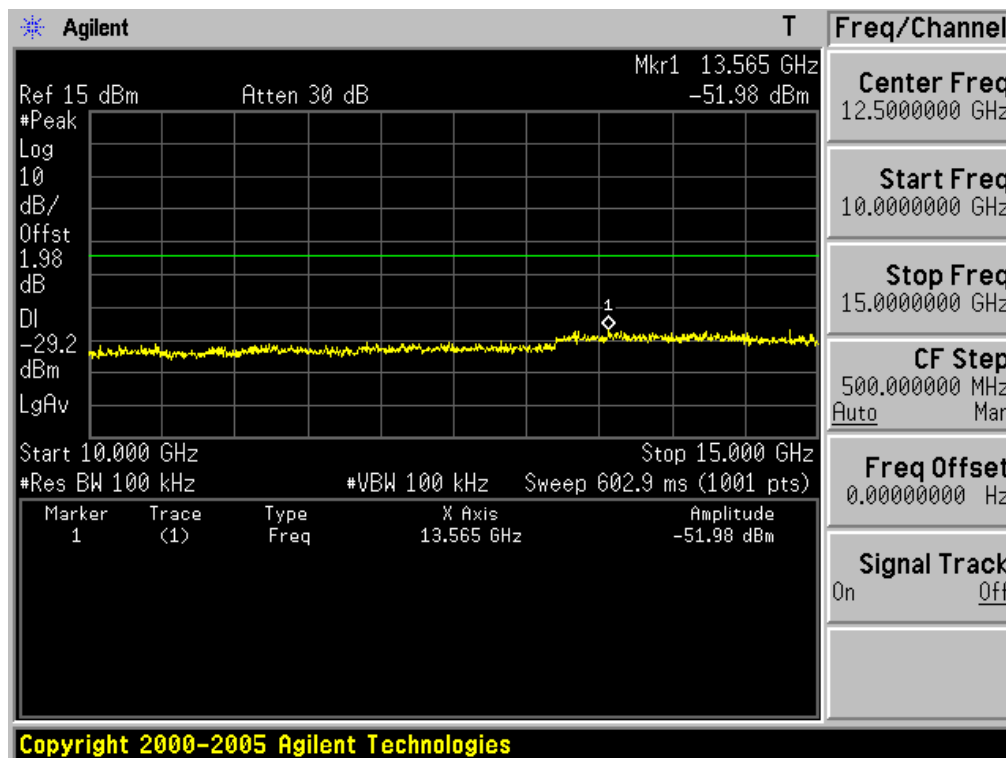
10MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11g & Lowest Frequency



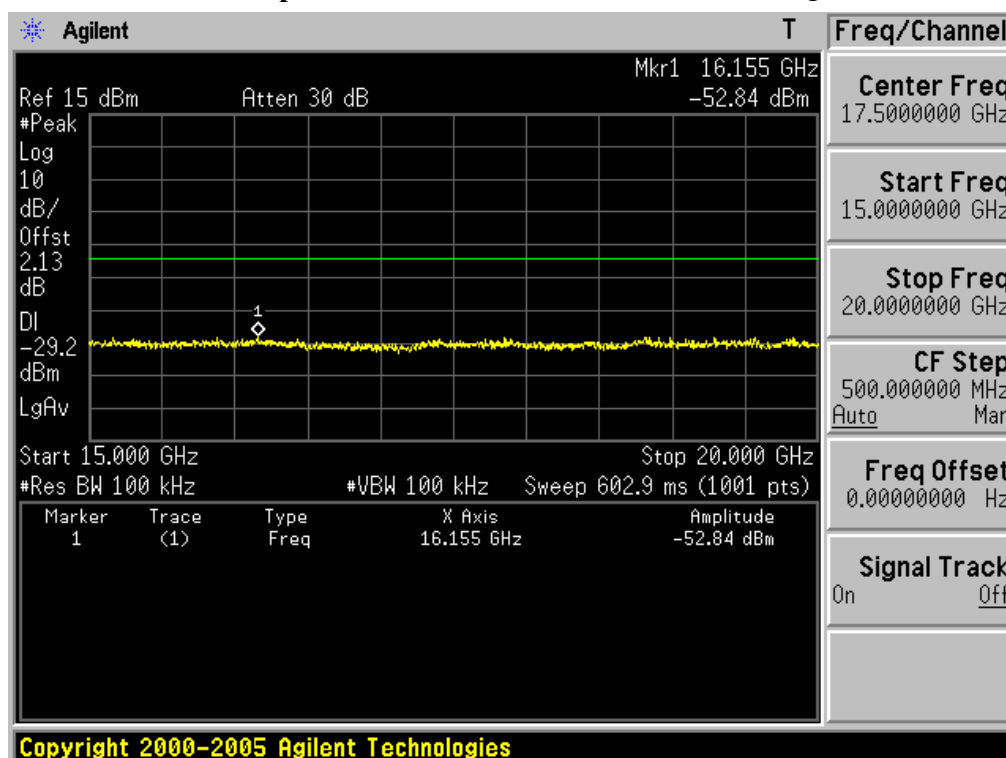
5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11g & Lowest Frequency



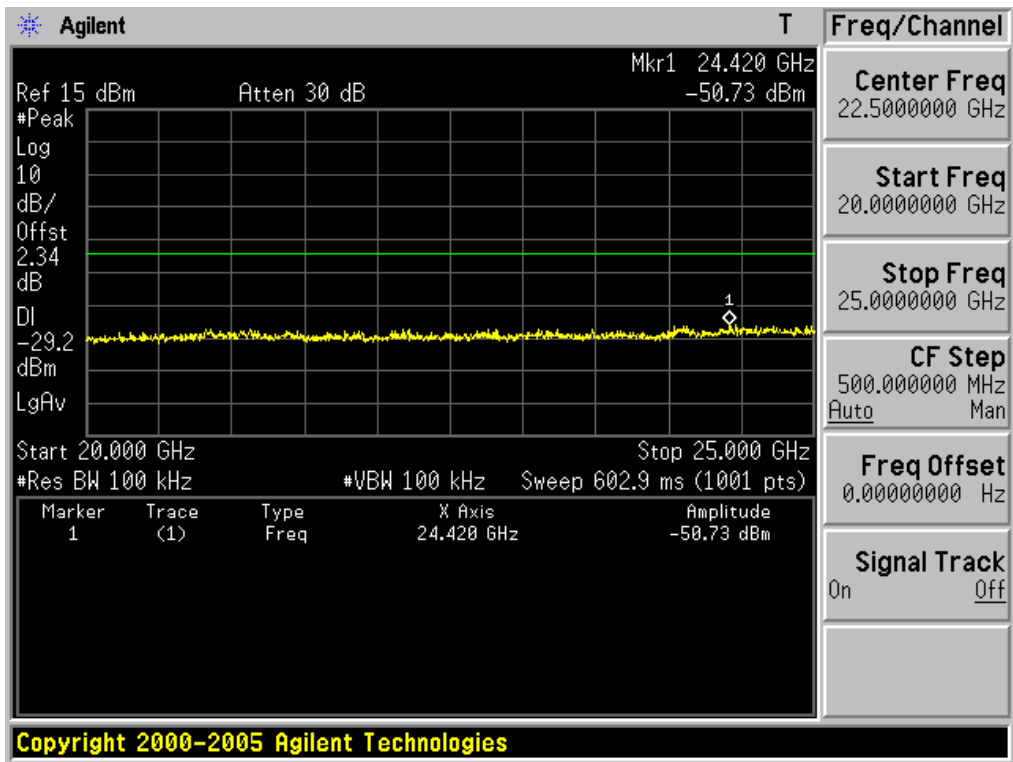
10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11g & Lowest Frequency



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

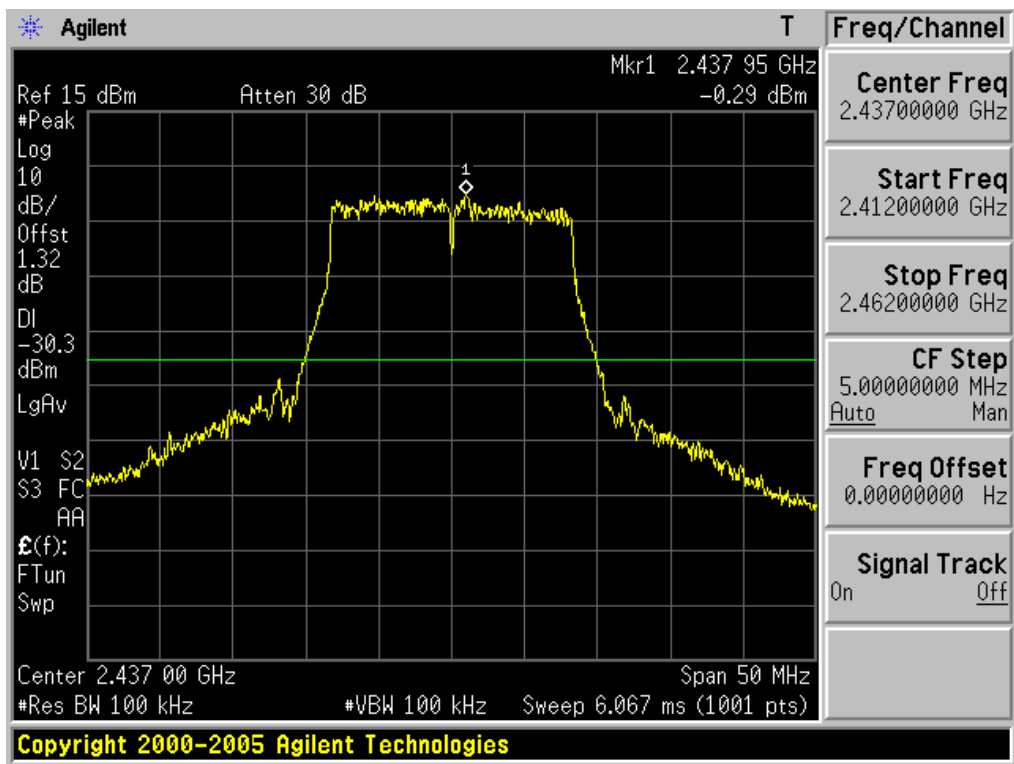


20GHz ~ 25GHz Conducted Spurious Emissions Test Mode: 802.11g & Lowest Frequency

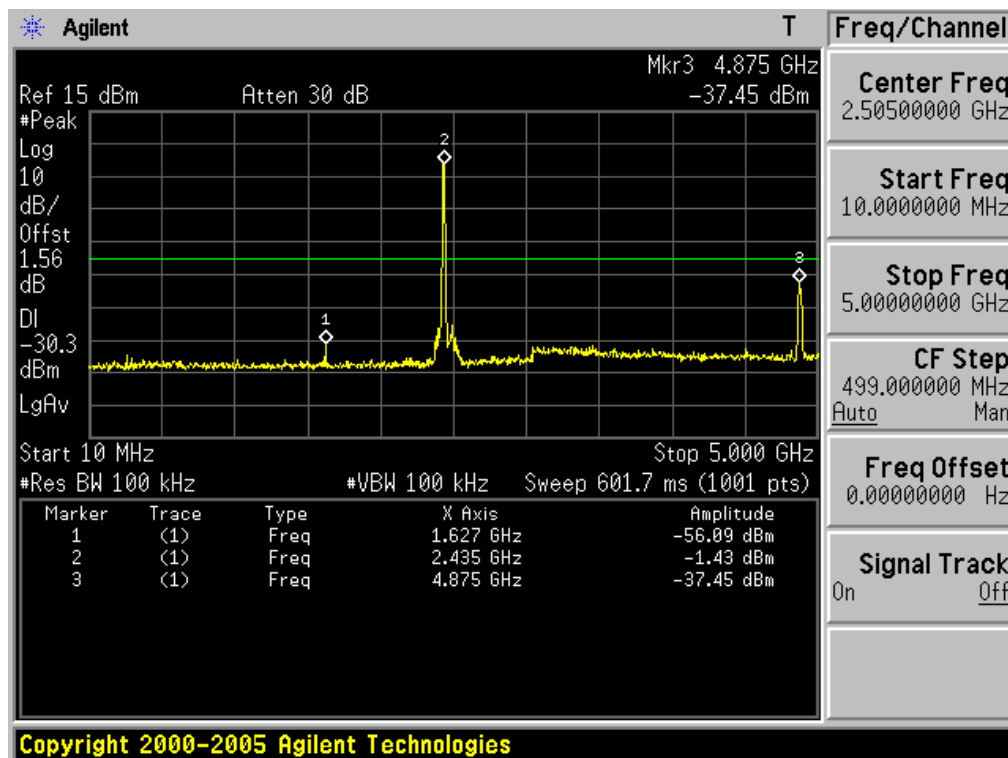


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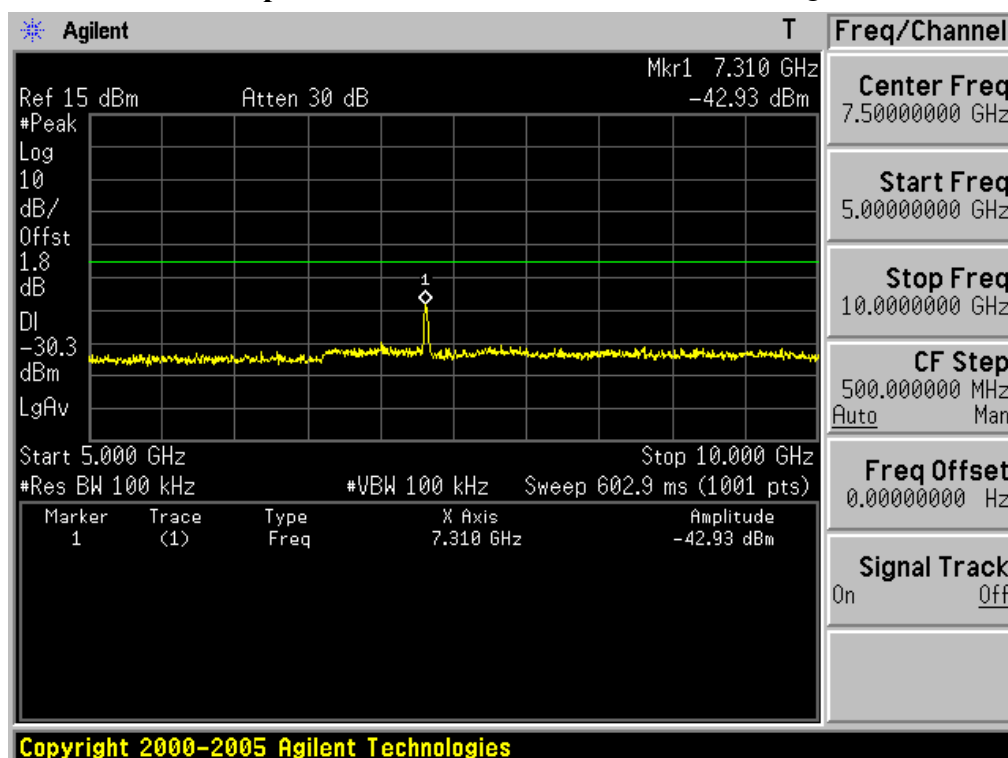
Test Mode: 802.11g & Middle Frequency

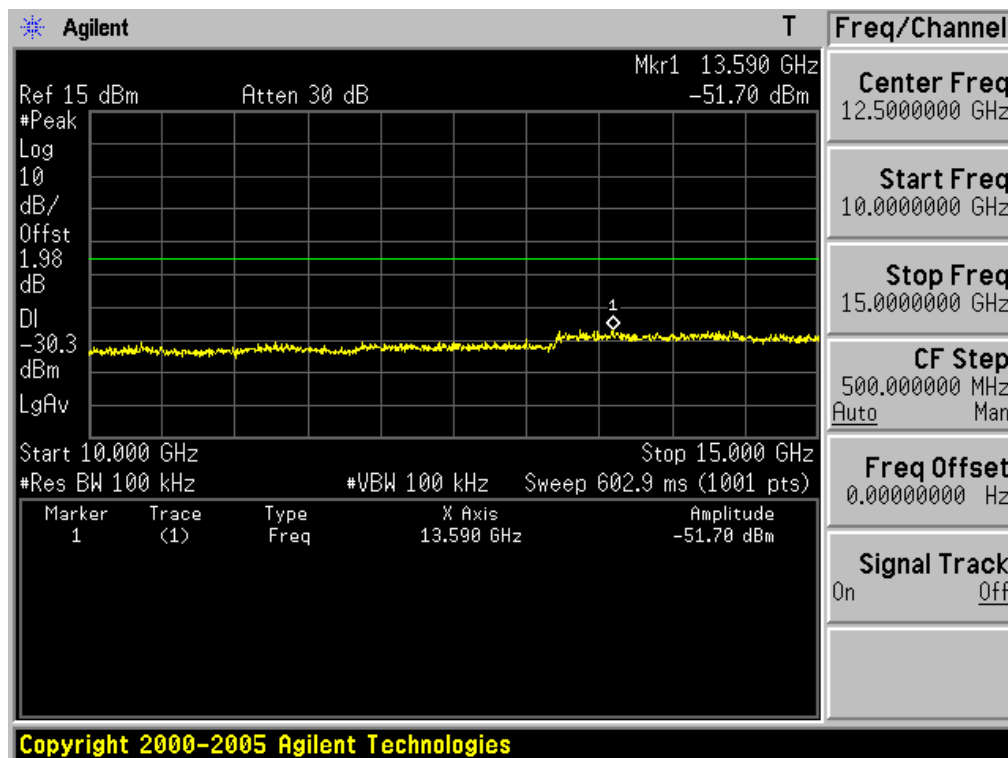
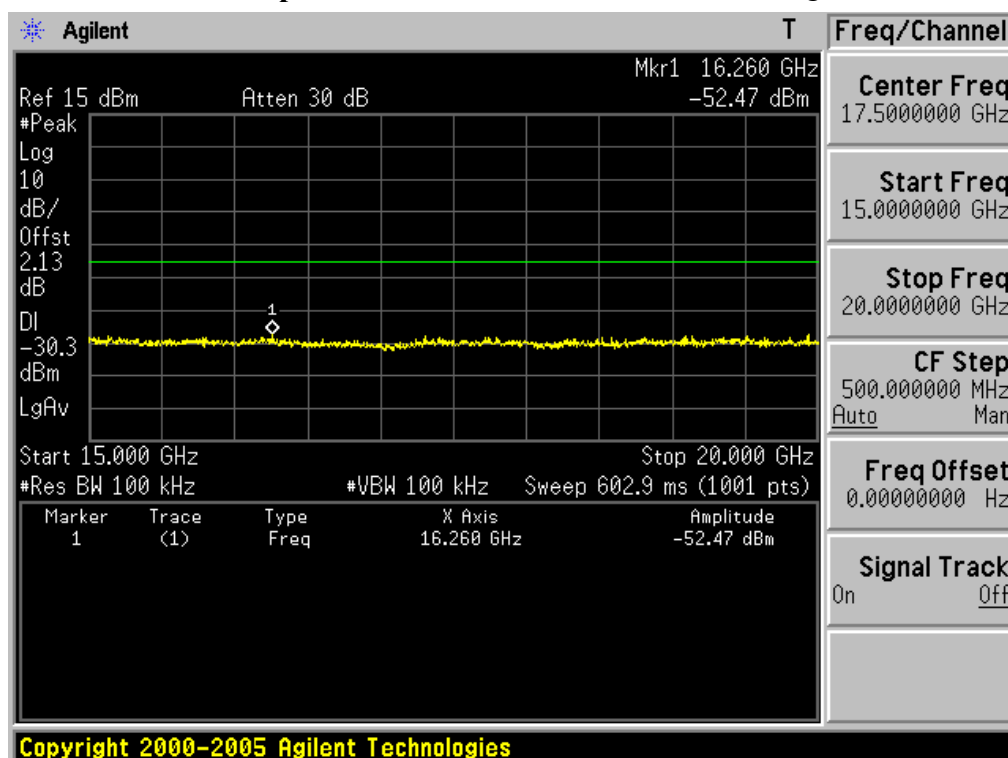


10MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11g & Middle Frequency

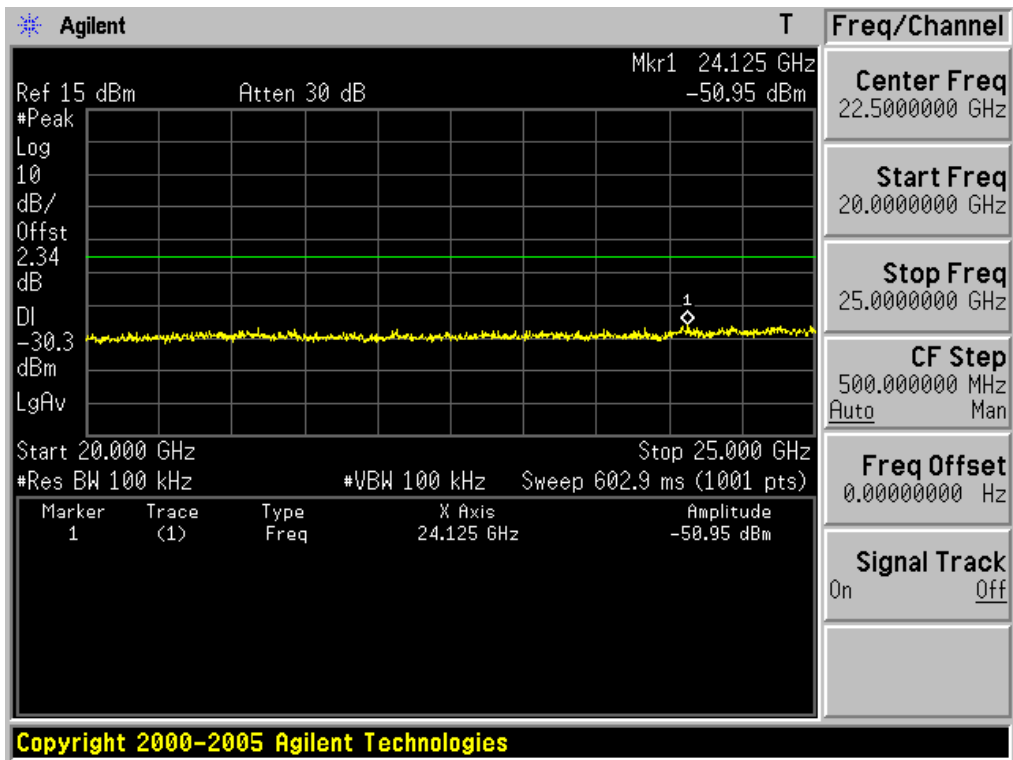


5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11g & Middle Frequency

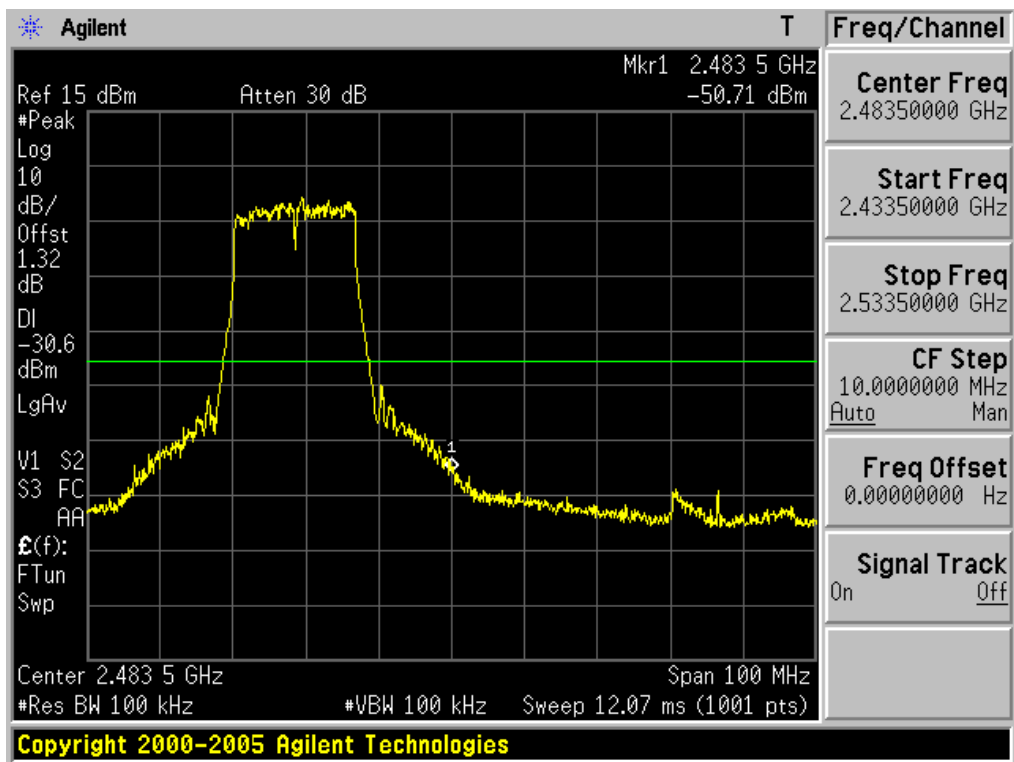


10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11g & Middle Frequency

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


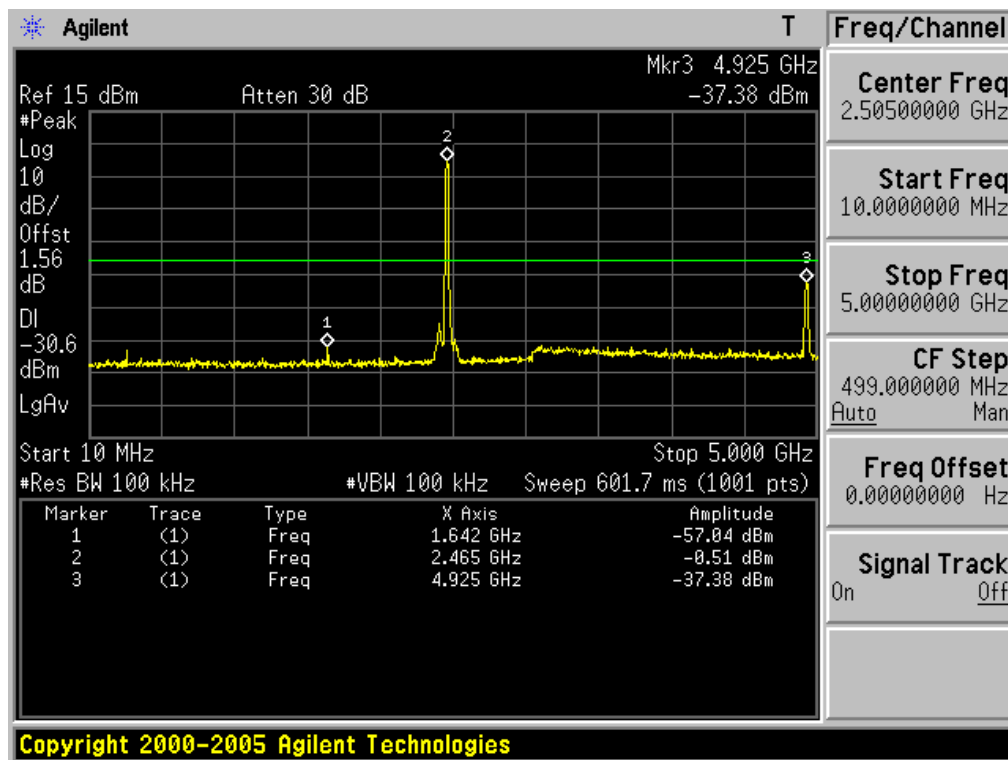
20GHz ~ 25GHz Conducted Spurious Emissions Test Mode: 802.11g & Middle Frequency



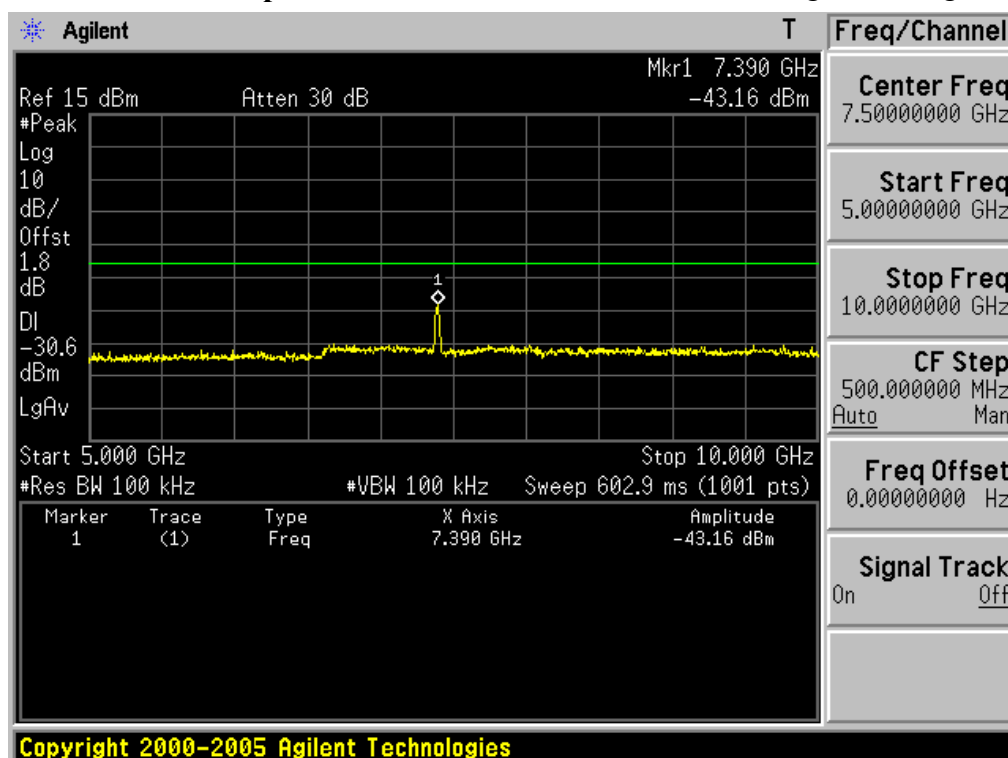
High Band-edge at 30 dB blow Test Mode: 802.11g & Highest Frequency



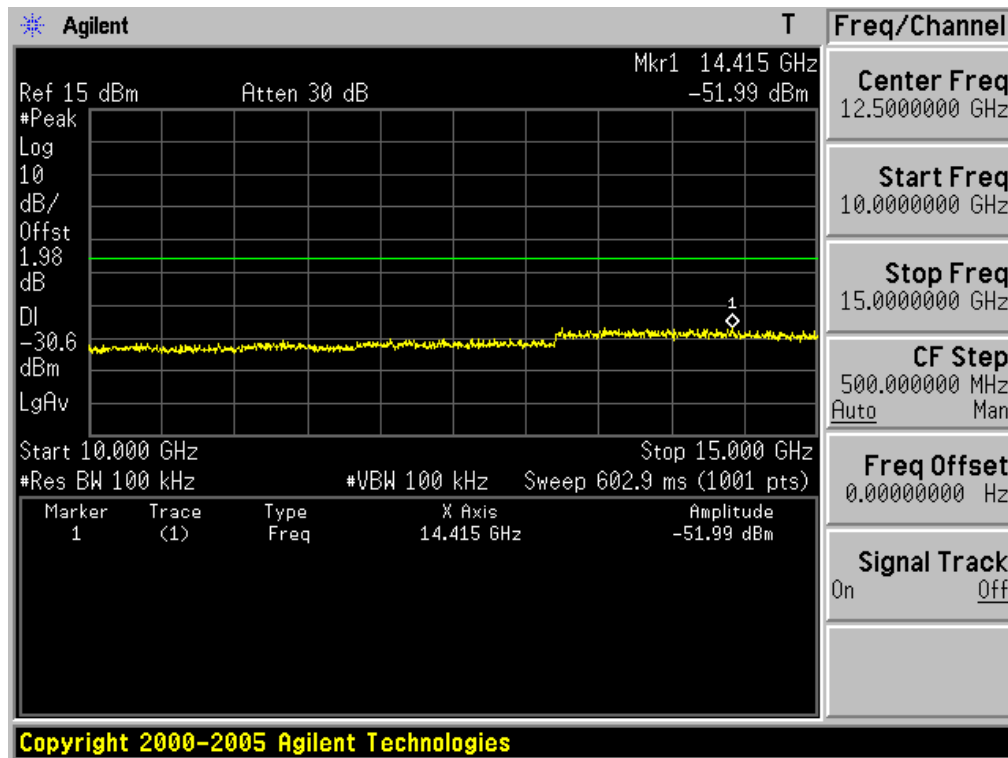
10MHz ~ 5GHz Conducted Spurious Emissions Test Mode: 802.11g & Highest Frequency



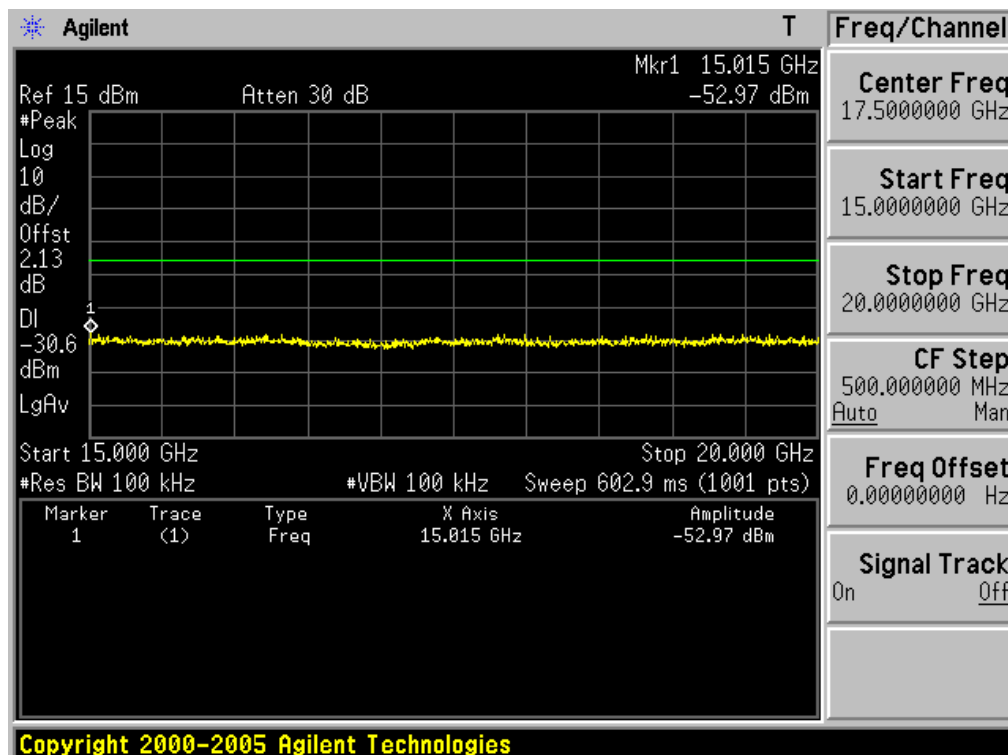
5GHz ~ 10GHz Conducted Spurious Emissions Test Mode: 802.11g & Highest Frequency



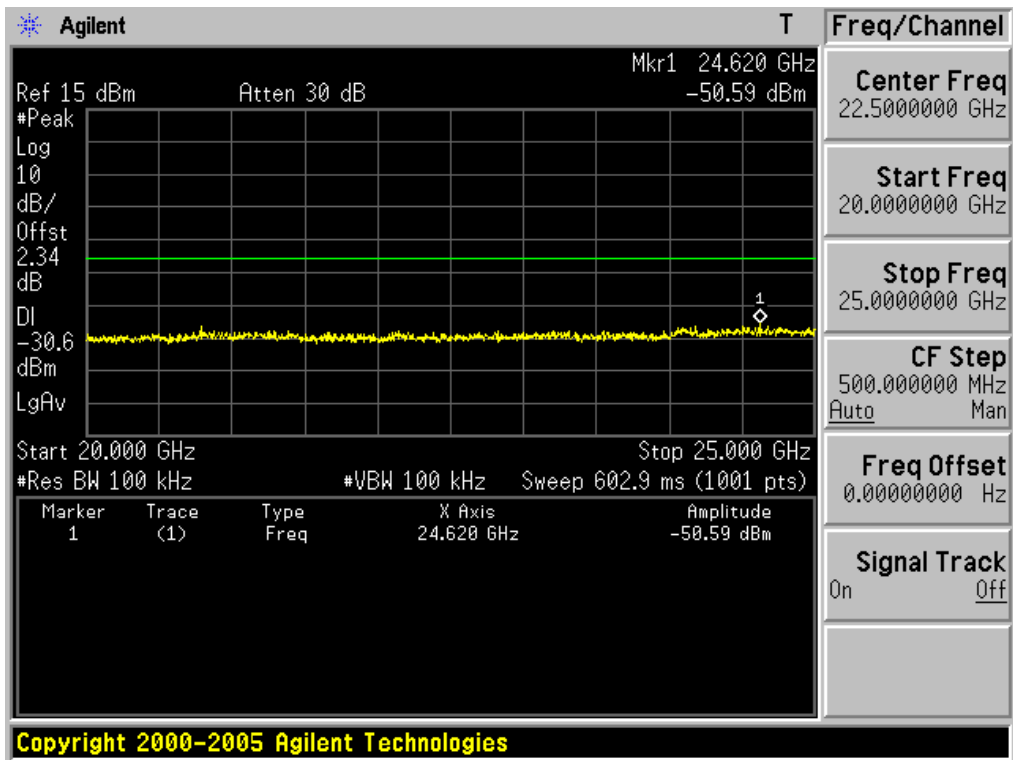
10GHz ~ 15GHz Conducted Spurious Emissions Test Mode: 802.11g & Highest Frequency



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

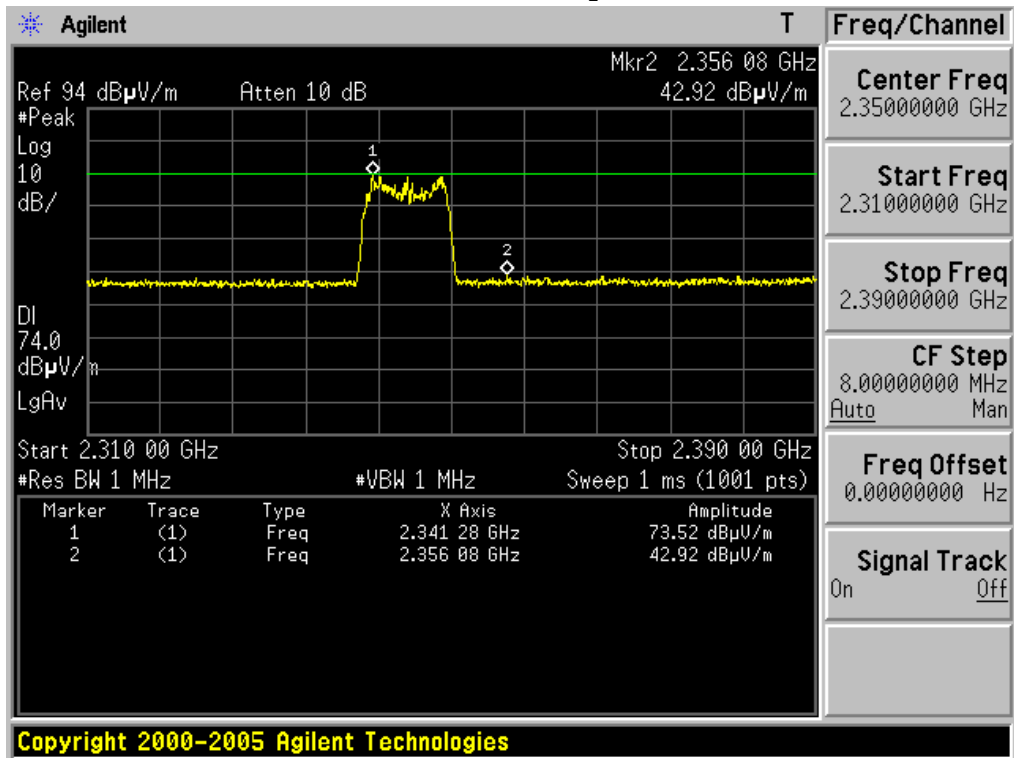
** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part,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

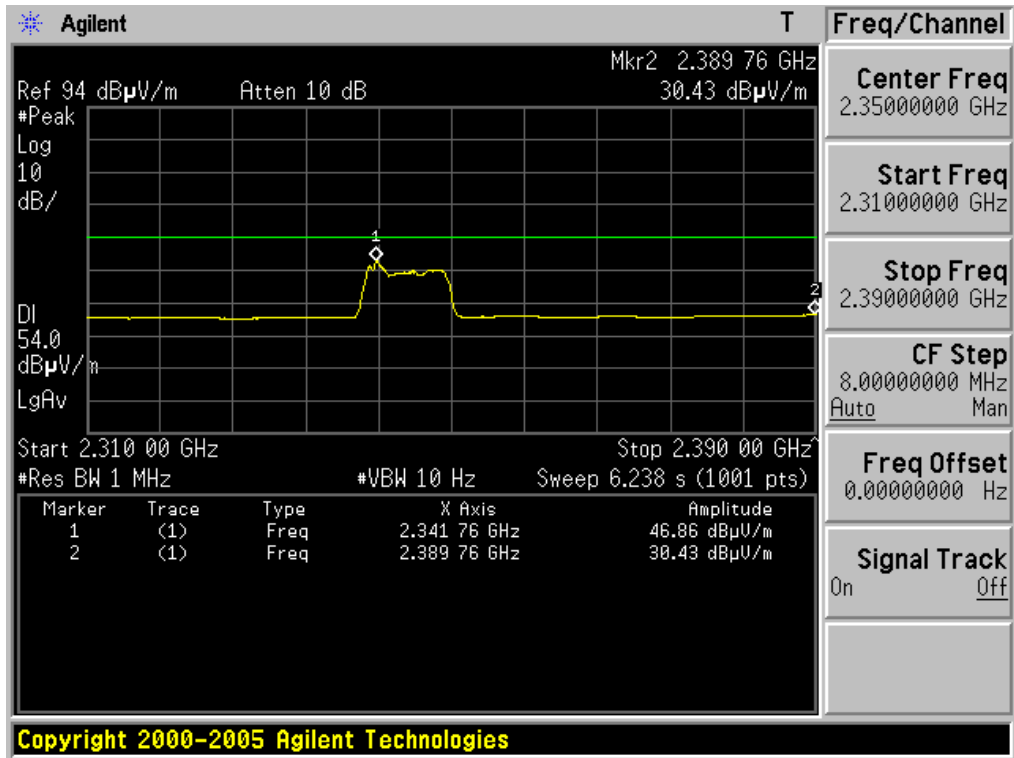
▪ **FCC Part 15.205(b):** The field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR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

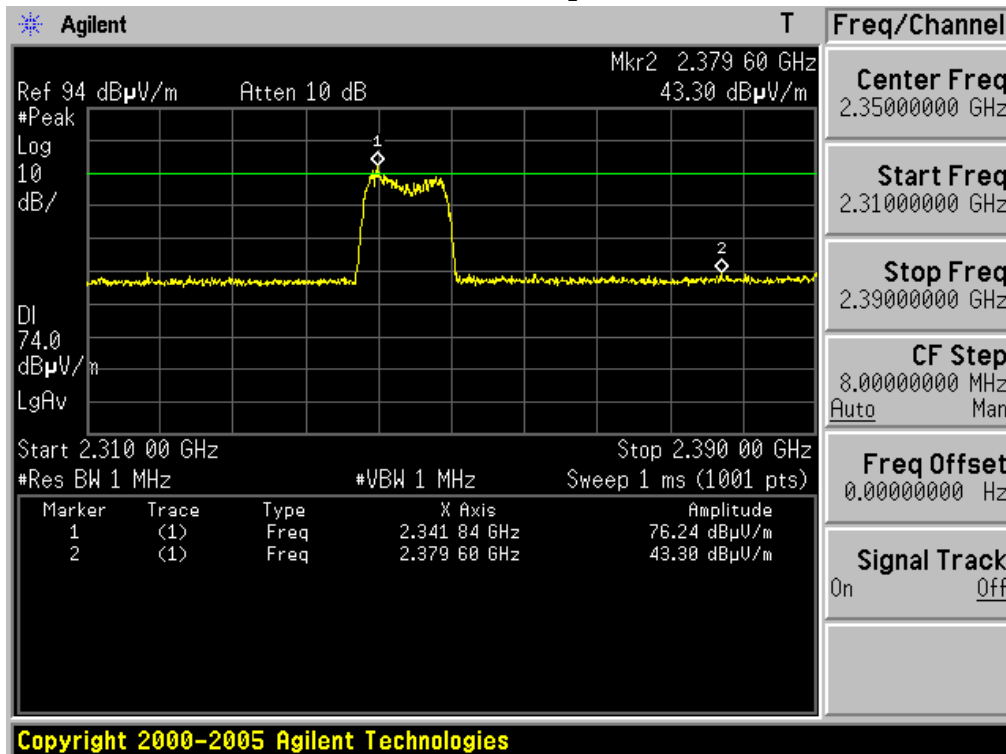
Restricted Band Edge Test Mode: 802.11b & Lowest Frequency & Test case 1
Average mode / Horizontal polarization



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

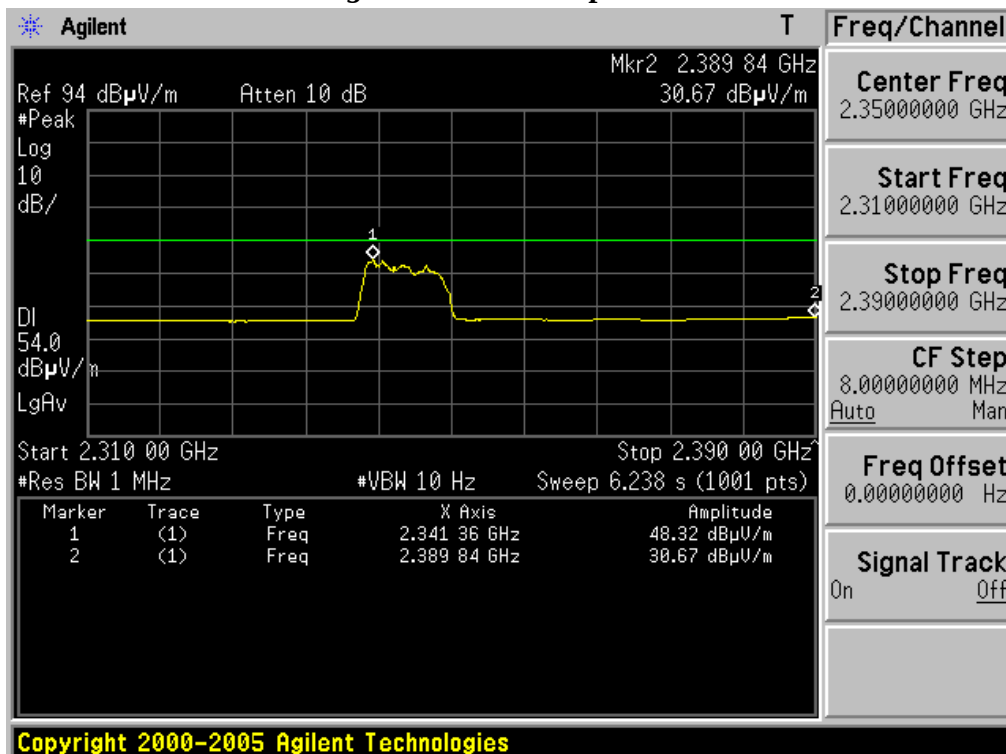
Peak mode / Vertical polarization



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

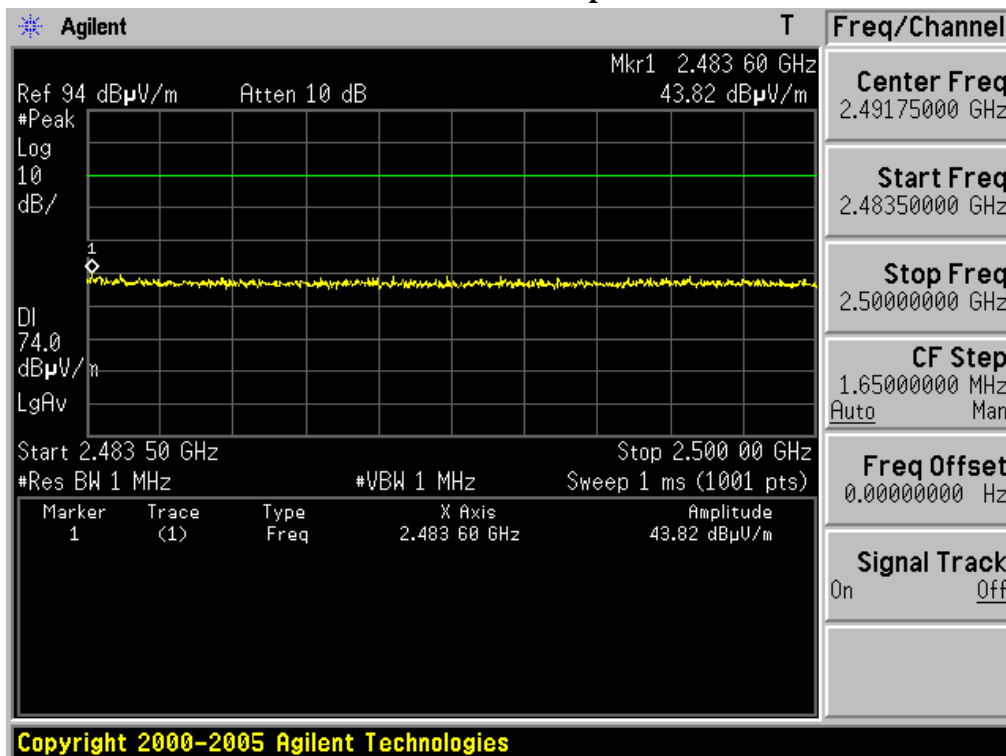
Average mode / Vertical polarization



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

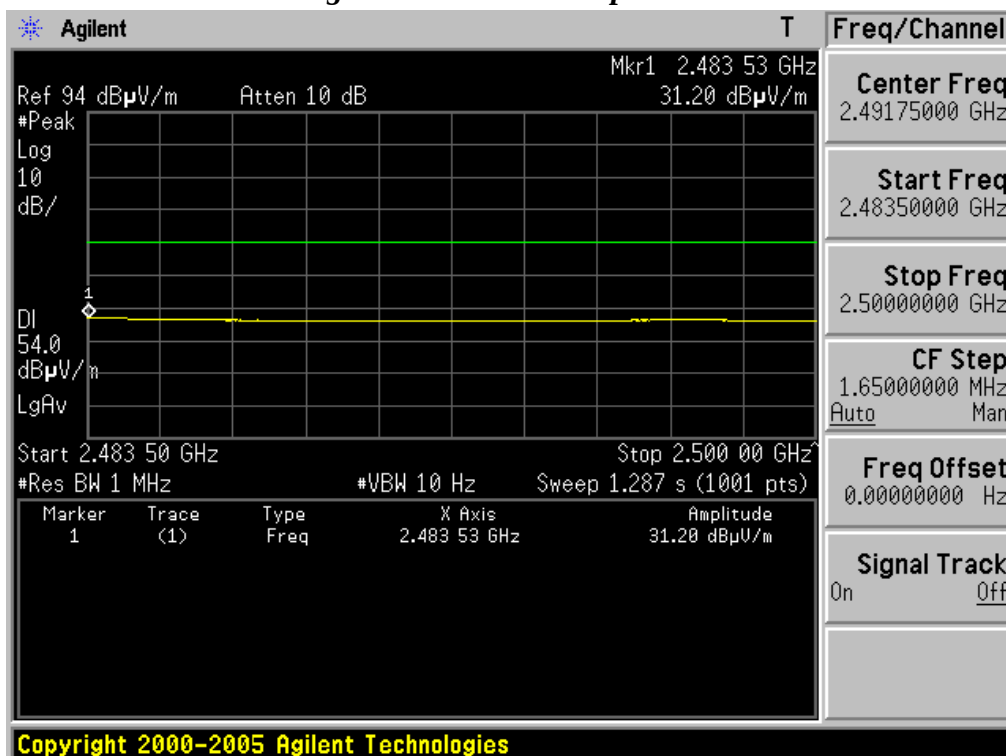
Restricted Band Edge Test Mode: 802.11b & Highest Frequency & Test case 1

Peak mode / Horizontal polarization



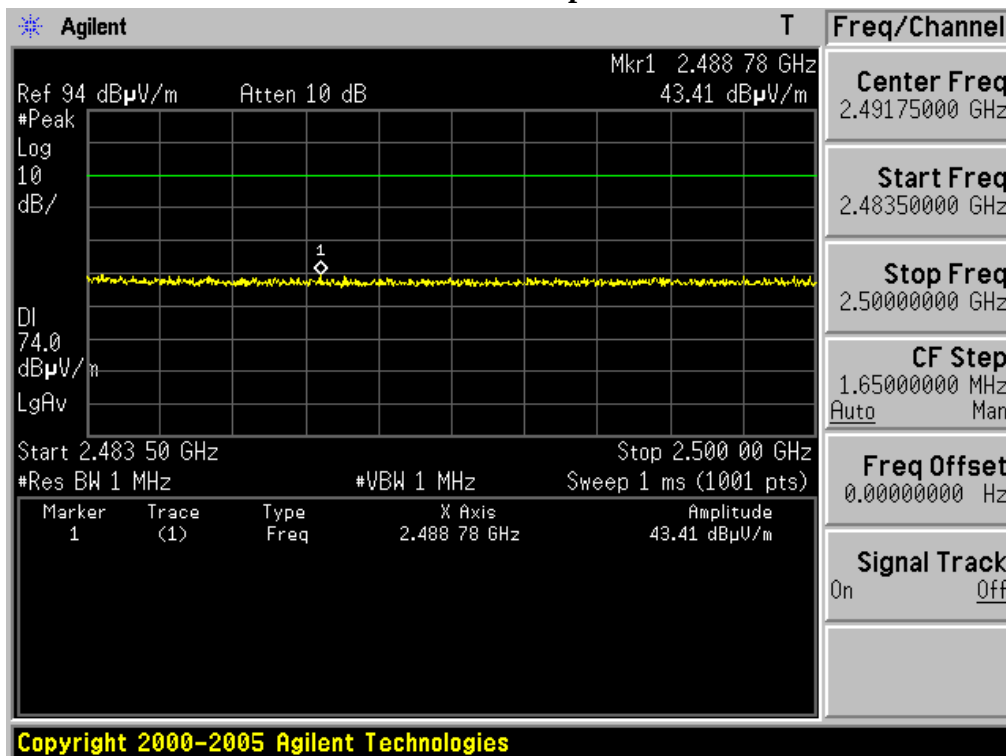
Restricted Band Edge Test Mode: 802.11b & Highest Frequency & Test case 1

Average mode / Horizontal polarization



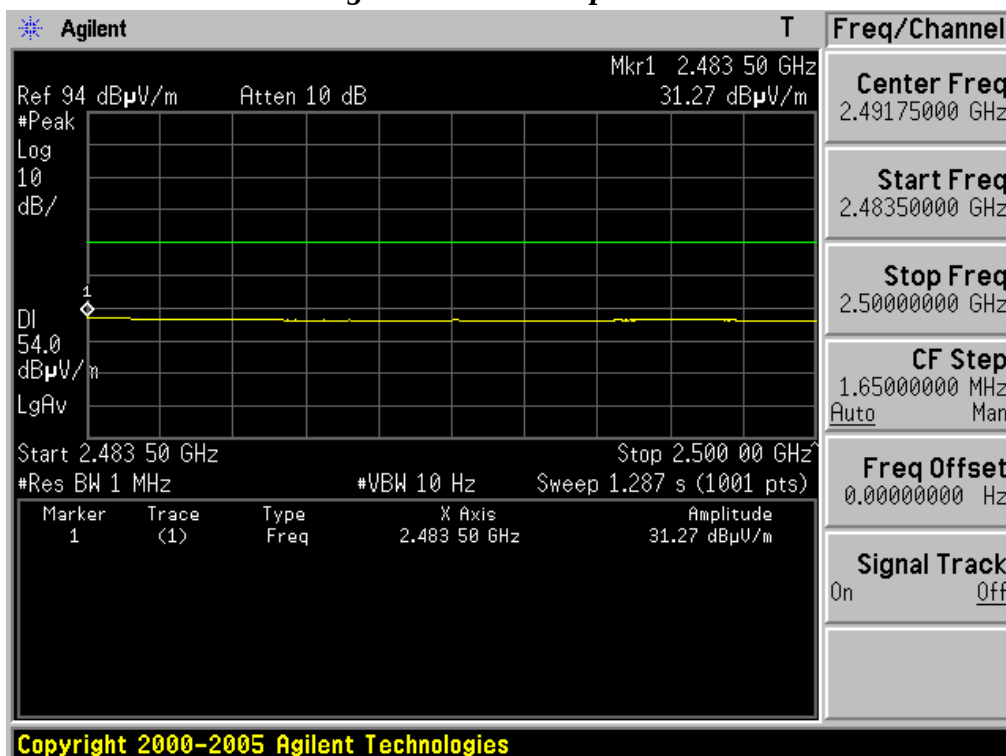
Restricted Band Edge Test Mode: 802.11b & Highest Frequency & Test case 1

Peak mode / Vertical polarization



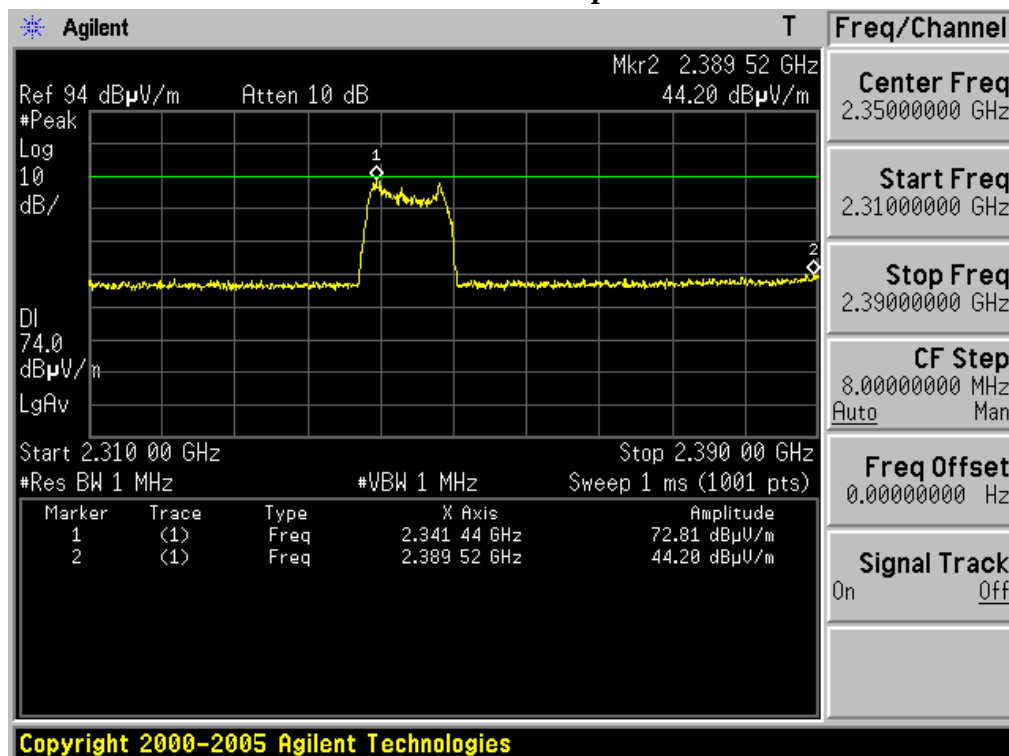
Restricted Band Edge Test Mode: 802.11b & Highest Frequency & Test case 1

Average mode / Vertical polarization



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

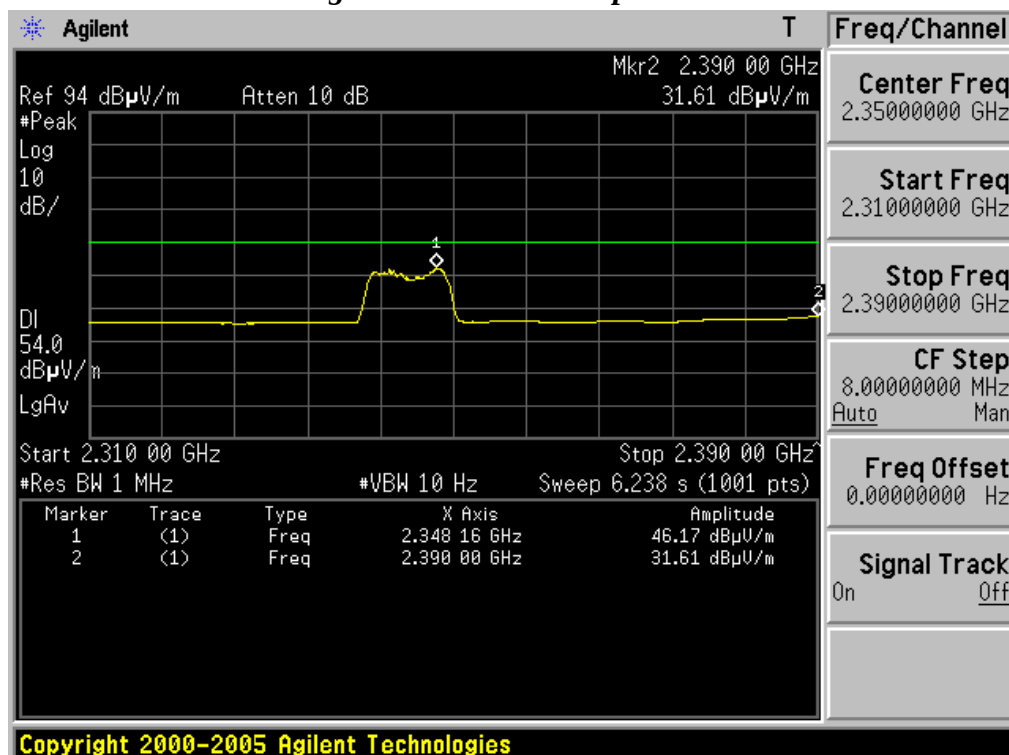
Peak mode / Horizontal polarization



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

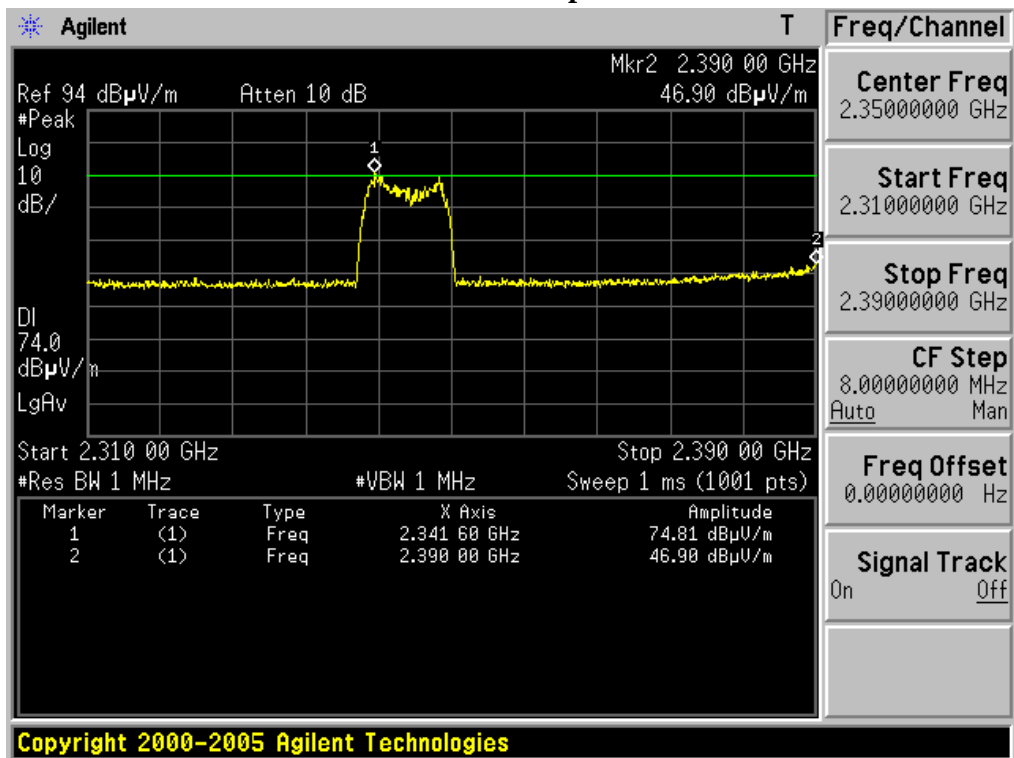
Restricted Band Edge Test Mode: 802.11g & Lowest Frequency & Test case 1

Average mode / Horizontal polarization



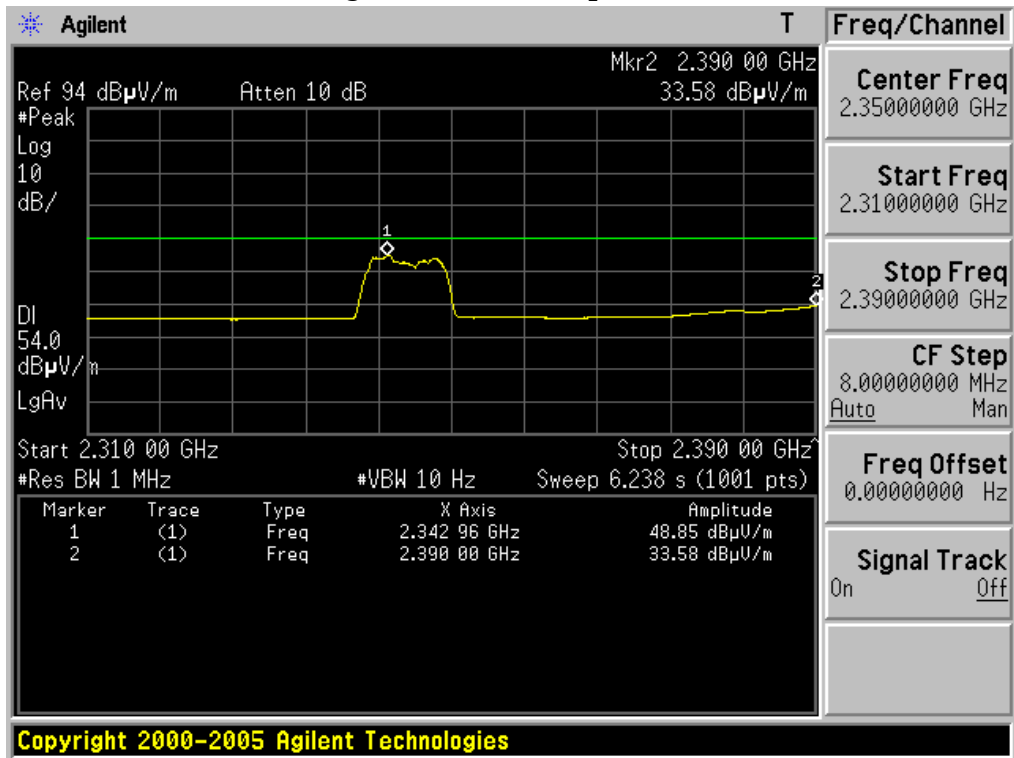
Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

Restricted Band Edge Test Mode: 802.11g & Lowest Frequency & Test case 1
Peak mode / Vertical polarization



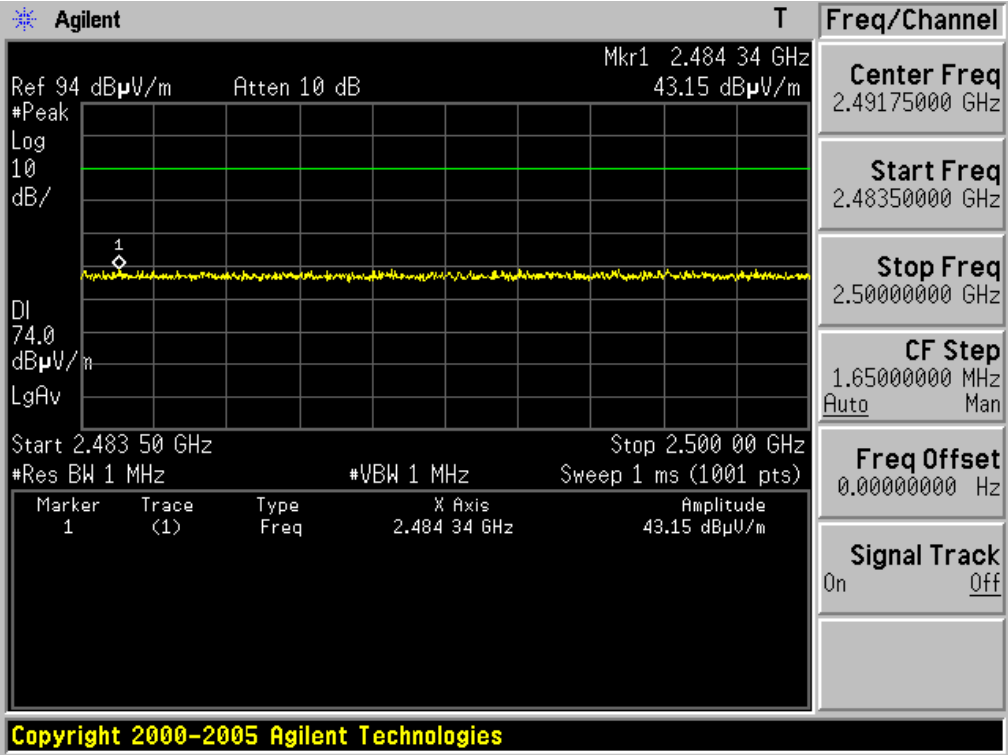
Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

Restricted Band Edge Test Mode: 802.11g & Lowest Frequency & Test case 1
Average mode / Vertical polarization

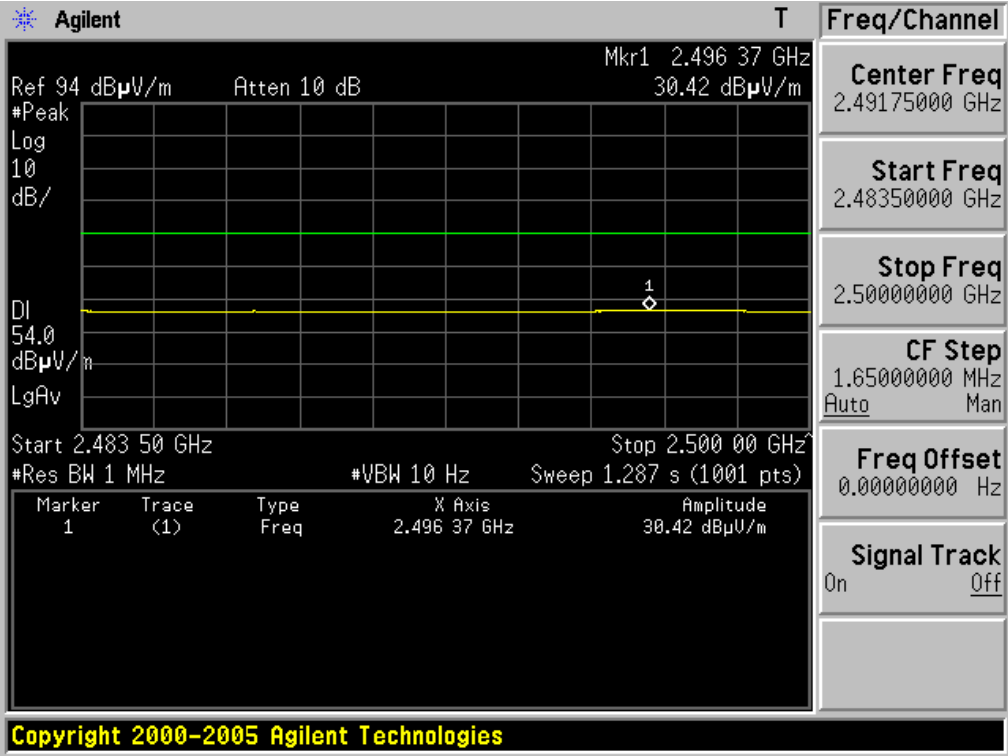


Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

Restricted Band Edge Test Mode: 802.11g & Highest Frequency & Test case 1
Peak mode / Horizontal polarization

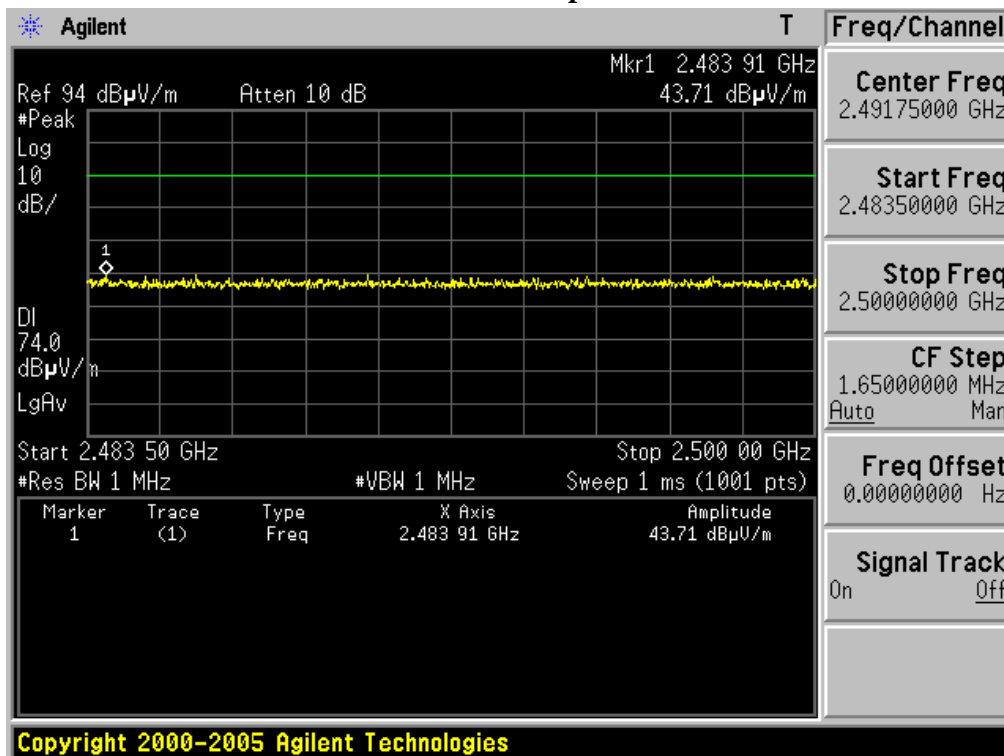


Restricted Band Edge Test Mode: 802.11g & Highest Frequency & Test case 1
Average mode / Horizontal polarization



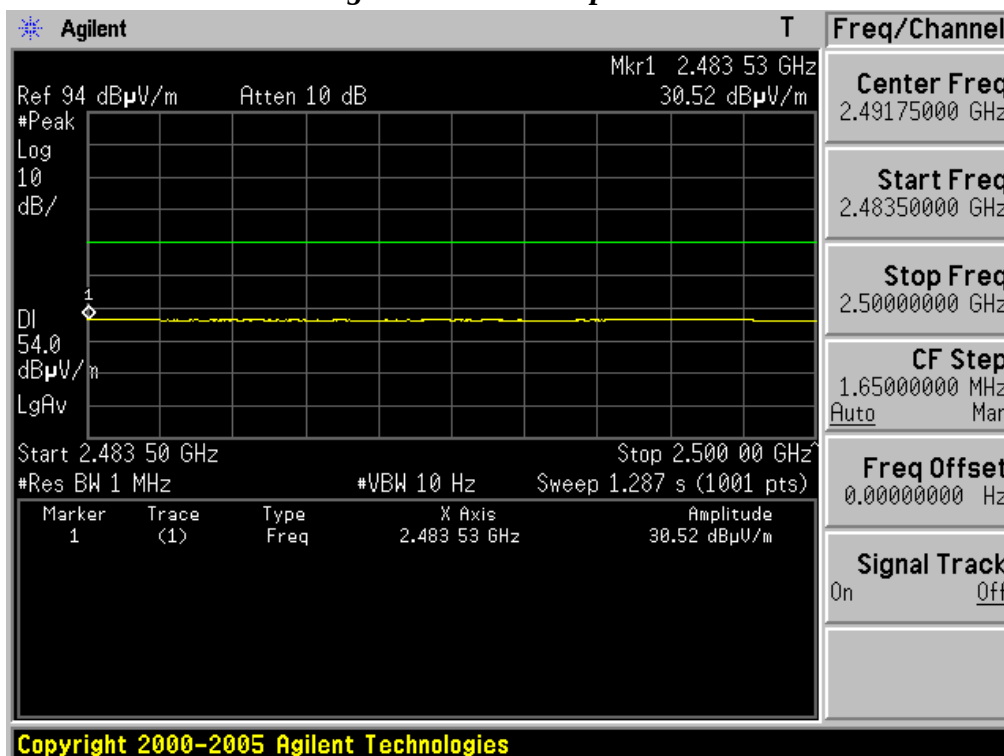
Restricted Band Edge Test Mode: 802.11g & Highest Frequency & Test case 1

Peak mode / Vertical polarization



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

Average mode / Vertical polarization



30MHz ~ 1GHz Radiated Spurious Emissions

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

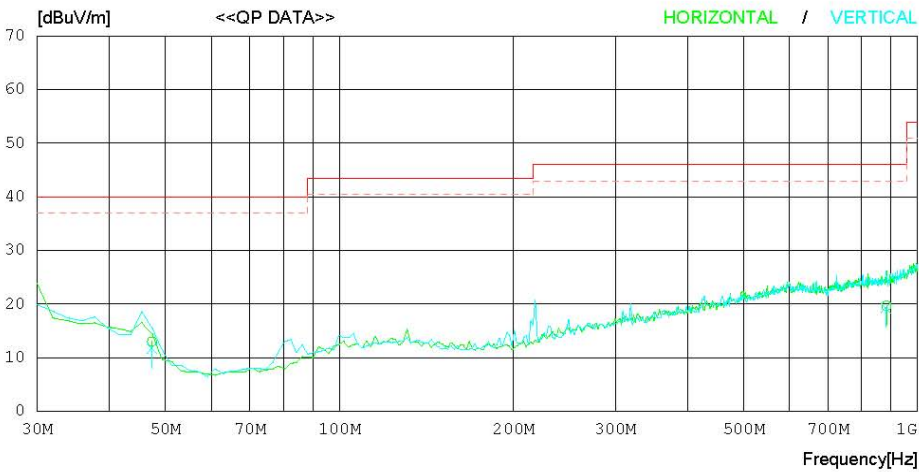


RADIATED EMISSION

Date : 2010-05-07

Model Name : SWR-8225
Model No. : #1
Serial No. : Identical prototype
Test Condition : TX : 2412 MHz (802.11b)
Reference No. :
Power Supply : DC 3.7 V
Temp/Humi : 21 'C 55 %
Operator : D.C.CHA

Memo : Test Case 1
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	47.405	24.3	10.4	1.0	22.7	13.0	40.0	27.0	134	135
2	883.557	18.4	19.7	4.9	23.3	19.7	46.0	26.3	112	97
----- Vertical -----										
3	47.375	23.0	10.4	1.0	22.7	11.7	40.0	28.3	110	138
4	881.585	18.0	19.7	4.9	23.3	19.3	46.0	26.7	112	195

30MHz ~ 1GHz Radiated Spurious Emissions

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

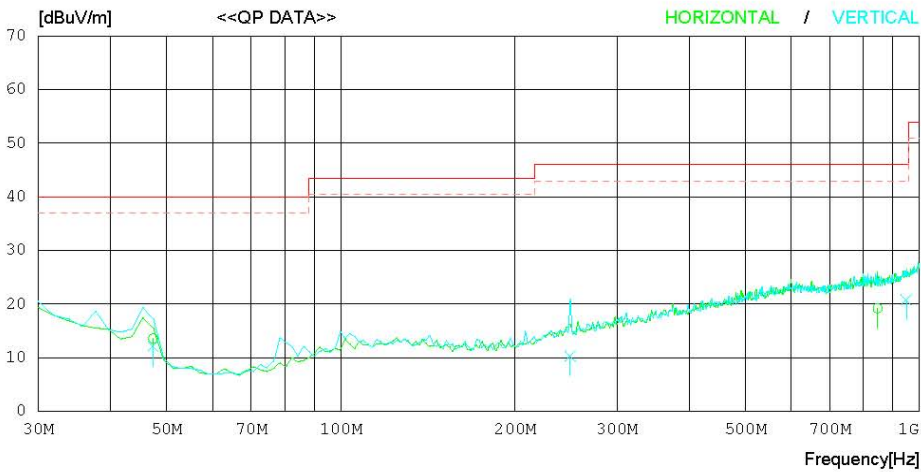


RADIATED EMISSION

Date : 2010-05-07

Model Name : SWR-8225
Model No. : #1
Serial No. : Identical prototype
Test Condition : TX : 2437 MHz (802.11b)
Reference No. :
Power Supply : DC 3.7 V
Temp/Humi : 21 'C 55 %
Operator : D.C.CHA

Memo : Test Case 1
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	47.380	24.9	10.4	1.0	22.7	13.6	40.0	26.4	145	130
2	846.755	18.2	19.7	4.8	23.5	19.2	46.0	26.8	100	254
----- Vertical -----										
3	47.380	23.4	10.4	1.0	22.7	12.1	40.0	27.9	100	254
4	249.112	18.4	13.2	2.2	23.5	10.3	46.0	35.7	105	49
5	949.496	18.2	20.5	5.1	23.0	20.8	46.0	25.2	110	276

30MHz ~ 1GHz Radiated Spurious Emissions

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

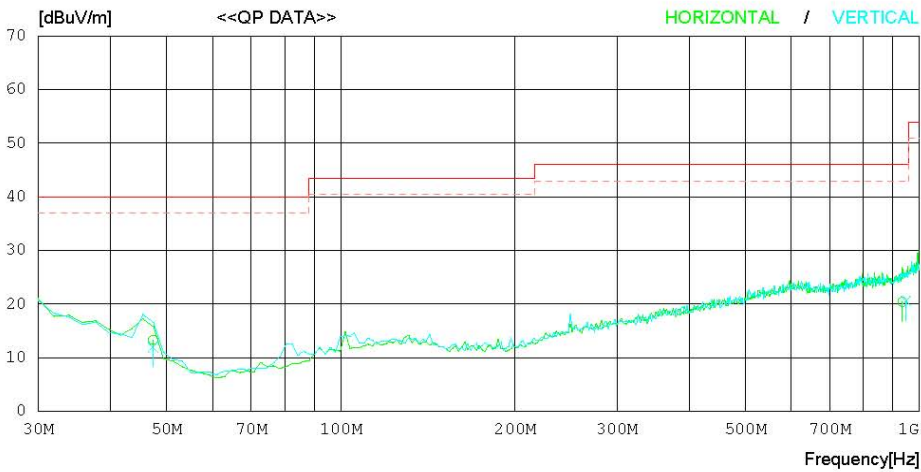


RADIATED EMISSION

Date : 2010-05-07

Model Name : SWR-8225
Model No. : #1
Serial No. : Identical prototype
Test Condition : TX : 2462 MHz (802.11b)
Reference No. :
Power Supply : DC 3.7 V
Temp/Humi : 21 'C 55 %
Operator : D.C.CHA

Memo : Test Case 1
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	47.370	24.6	10.4	1.0	22.7	13.3	40.0	26.7	167	230
2	934.005	18.1	20.3	5.1	23.1	20.4	46.0	25.6	100	174
----- Vertical -----										
3	47.385	23.3	10.4	1.0	22.7	12.0	40.0	28.0	115	268
4	947.670	18.0	20.5	5.1	23.0	20.6	46.0	25.4	100	345

30MHz ~ 1GHz Radiated Spurious Emissions

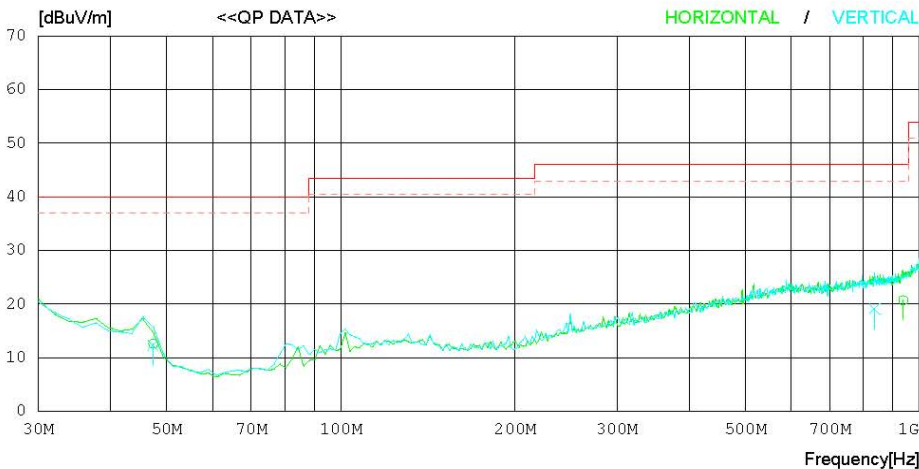
Test Mode: 802.11g & Lowest Frequency & Test case 1



RADIATED EMISSION

Date : 2010-05-07

Model Name : SWR-8225
Model No. : #1
Serial No. : Identical prototype
Test Condition : TX : 2412 MHz (802.11g)
Reference No. :
Power Supply : DC 3.7 V
Temp/Humi : 21'C 55 %
Operator : D.C.CHA
Memo : Test Case 1
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	47.384	23.9	10.4	1.0	22.7	12.6	40.0	27.4	130	250
2	937.875	18.3	20.4	5.1	23.1	20.7	46.0	25.3	105	125
----- Vertical -----										
3	47.370	23.6	10.4	1.0	22.7	12.3	40.0	27.7	115	220
4	837.131	18.2	19.7	4.7	23.5	19.1	46.0	26.9	100	125

30MHz ~ 1GHz Radiated Spurious Emissions

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

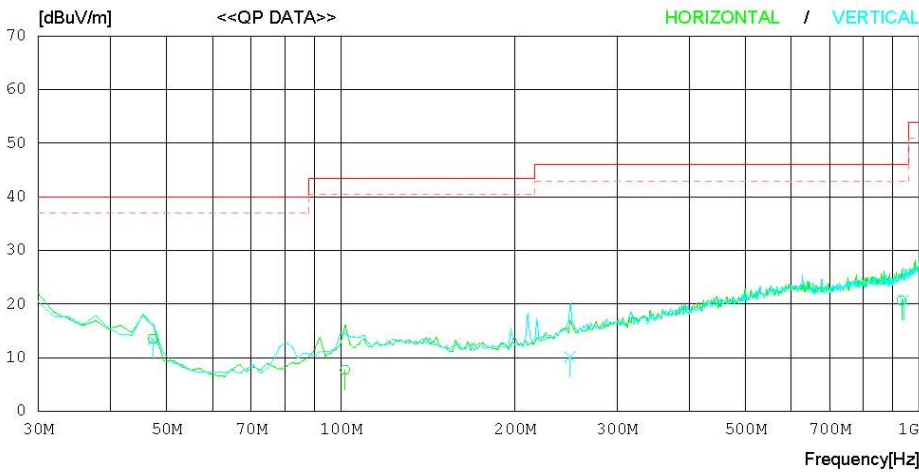


RADIATED EMISSION

Date : 2010-05-07

Model Name : SWR-8225
Model No. : #1
Serial No. : Identical prototype
Test Condition : TX : 2437 MHz (802.11g)
Reference No. :
Power Supply : DC 3.7 V
Temp/Humi : 21 °C 55 %
Operator : D.C.CHA

Memo : Test Case 1
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	47.360	24.8	10.4	1.0	22.7	13.5	40.0	26.5	155	321
2	101.611	18.2	10.8	1.4	22.7	7.7	43.5	35.8	100	88
3	932.001	18.4	20.3	5.1	23.1	20.7	46.0	25.3	100	168
----- Vertical -----										
4	47.380	24.7	10.4	1.0	22.7	13.4	40.0	26.6	134	158
5	249.110	18.2	13.2	2.2	23.5	10.1	46.0	35.9	105	241
6	939.521	18.3	20.4	5.1	23.1	20.7	46.0	25.3	100	100

30MHz ~ 1GHz Radiated Spurious Emissions

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

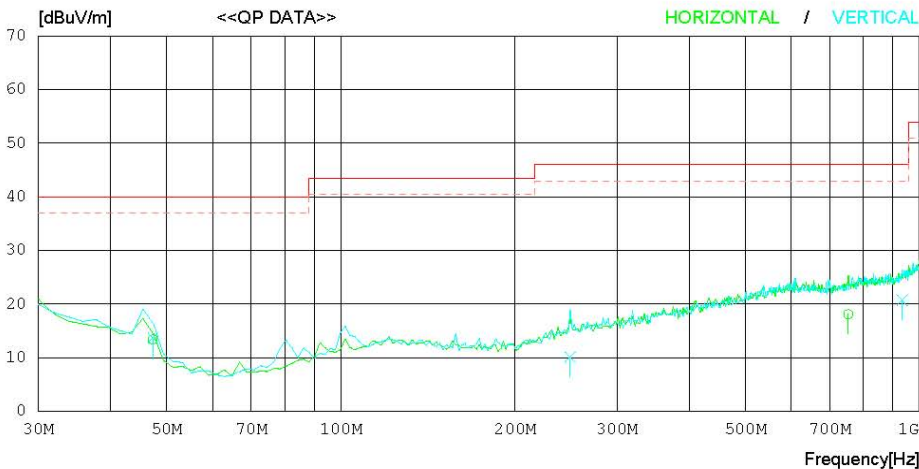


RADIATED EMISSION

Date : 2010-05-07

Model Name : SWR-8225
Model No. : #1
Serial No. : Identical prototype
Test Condition : TX : 2462 MHz (802.11g)
Reference No. :
Power Supply : DC 3.7 V
Temp/Humi : 21 'C 55 %
Operator : D.C.CHA

Memo : Test Case 1
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	47.320	24.6	10.5	1.0	22.7	13.4	40.0	26.6	123	250
2	753.550	18.2	19.3	4.5	23.9	18.1	46.0	27.9	100	136
----- Vertical -----										
3	47.350	24.9	10.5	1.0	22.7	13.7	40.0	26.3	152	115
4	249.100	18.2	13.2	2.2	23.5	10.1	46.0	35.9	105	325
5	934.120	18.4	20.3	5.1	23.1	20.7	46.0	25.3	102	310

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
4822.150	H	46.59	33.69	3.17	49.76	36.86	74.00	54.00	24.24	17.14
4822.400	V	46.64	33.75	3.17	49.81	36.92	74.00	54.00	24.19	17.08
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ 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
4873.850	H	45.57	33.38	3.18	48.75	36.56	74.00	54.00	25.25	17.44
4874.200	V	42.66	30.39	3.18	45.84	33.57	74.00	54.00	28.16	20.43
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ 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
4923.950	H	45.68	33.00	3.42	49.10	36.42	74.00	54.00	24.90	17.58
4923.746	V	43.27	31.50	3.42	46.69	34.92	74.00	54.00	27.31	19.08
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

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
4834.125	H	42.61	29.50	3.17	45.78	32.67	74.00	54.00	28.22	21.33
4811.250	V	42.94	29.88	3.17	46.11	33.05	74.00	54.00	27.89	20.95
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ 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
4872.124	H	43.03	30.39	3.18	46.21	33.57	74.00	54.00	27.79	20.43
4870.475	V	42.79	30.03	3.18	45.97	33.21	74.00	54.00	28.03	20.79
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ 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
4921.300	H	42.34	29.59	3.42	45.76	33.01	74.00	54.00	28.24	20.99
4933.750	V	42.52	29.72	3.42	45.94	33.14	74.00	54.00	28.06	20.86
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

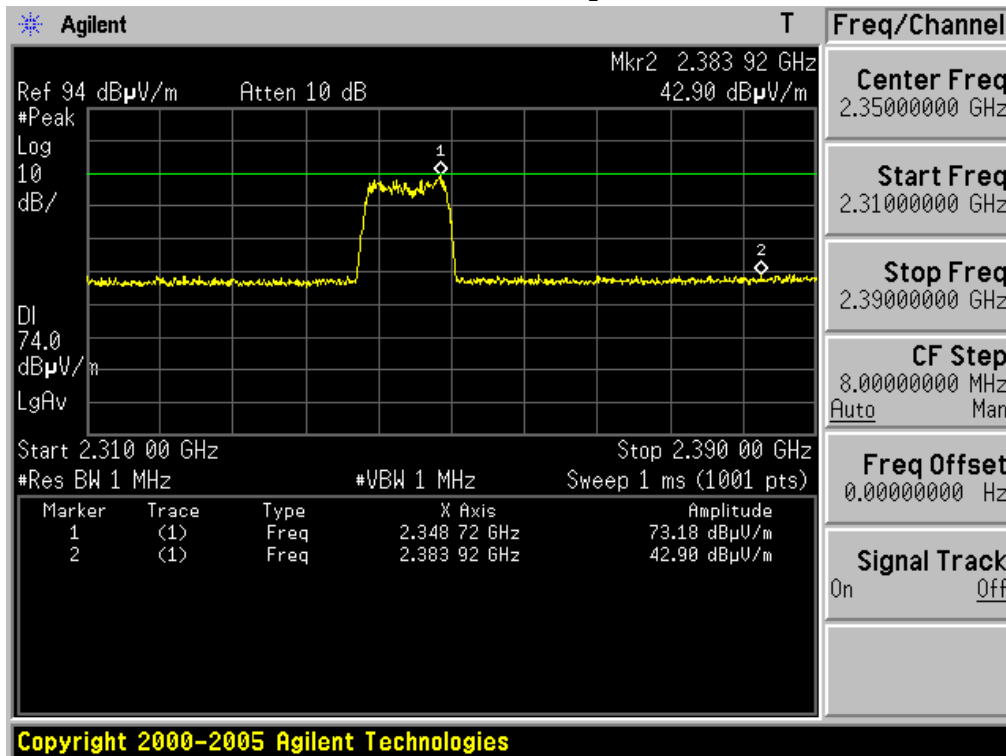
Note.

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

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

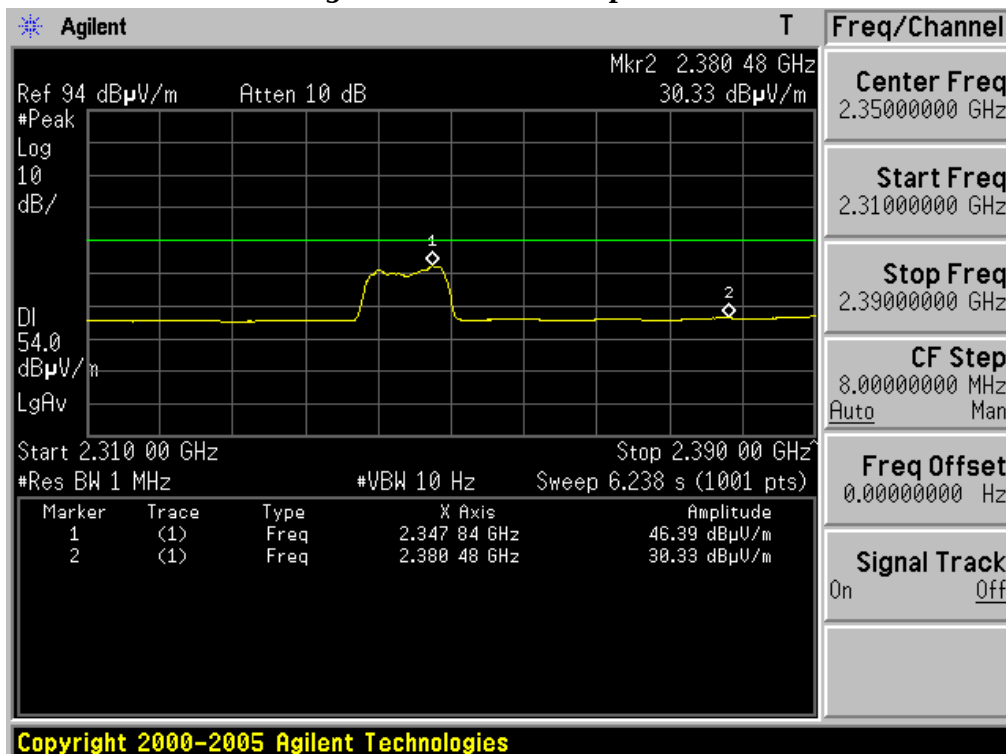
Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain

Restricted Band Edge Test Mode: 802.11b & Lowest Frequency & Test case 2
Peak mode / Horizontal polarization



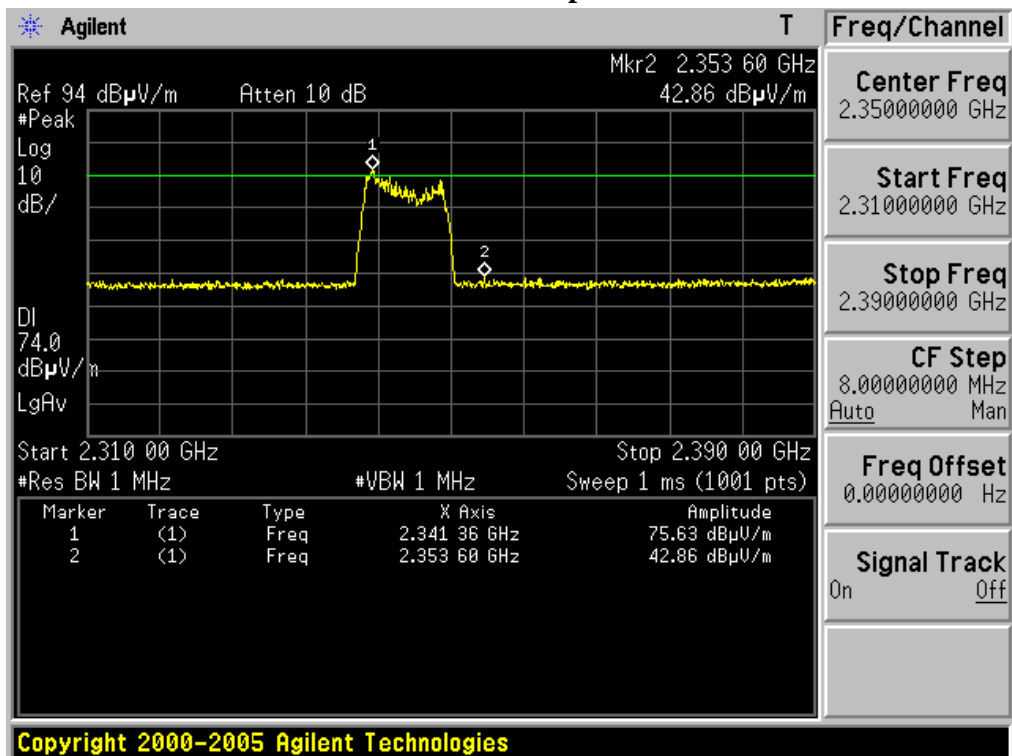
Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

Restricted Band Edge Test Mode: 802.11b & Lowest Frequency & Test case 2
Average mode / Horizontal polarization



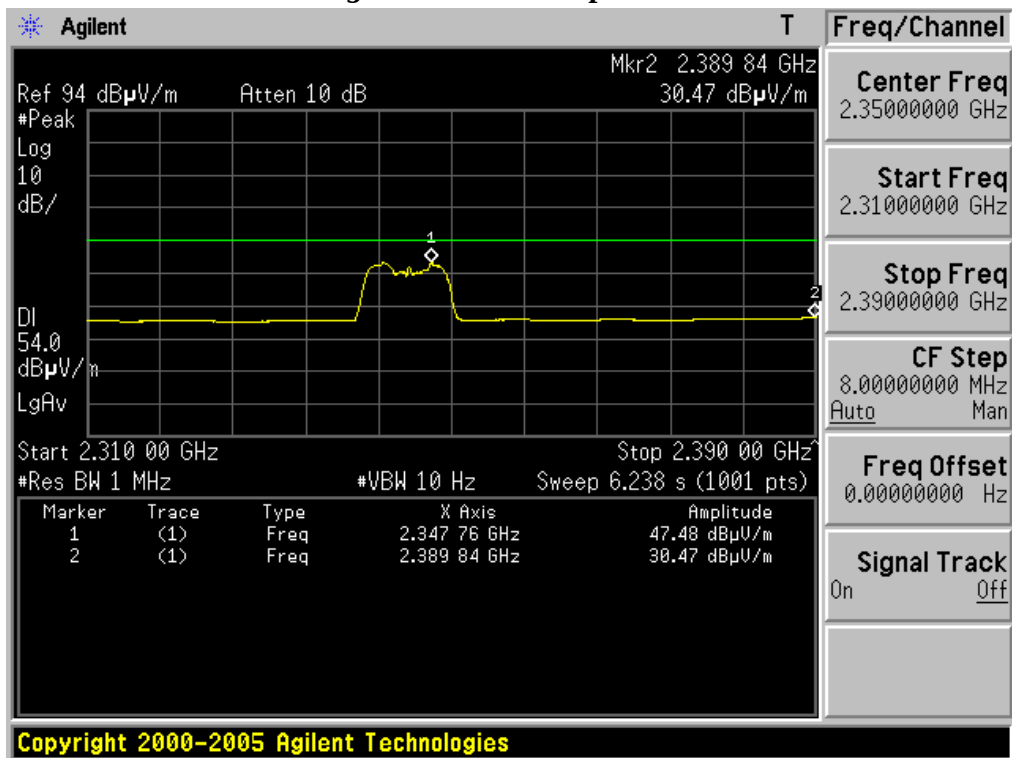
Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

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.

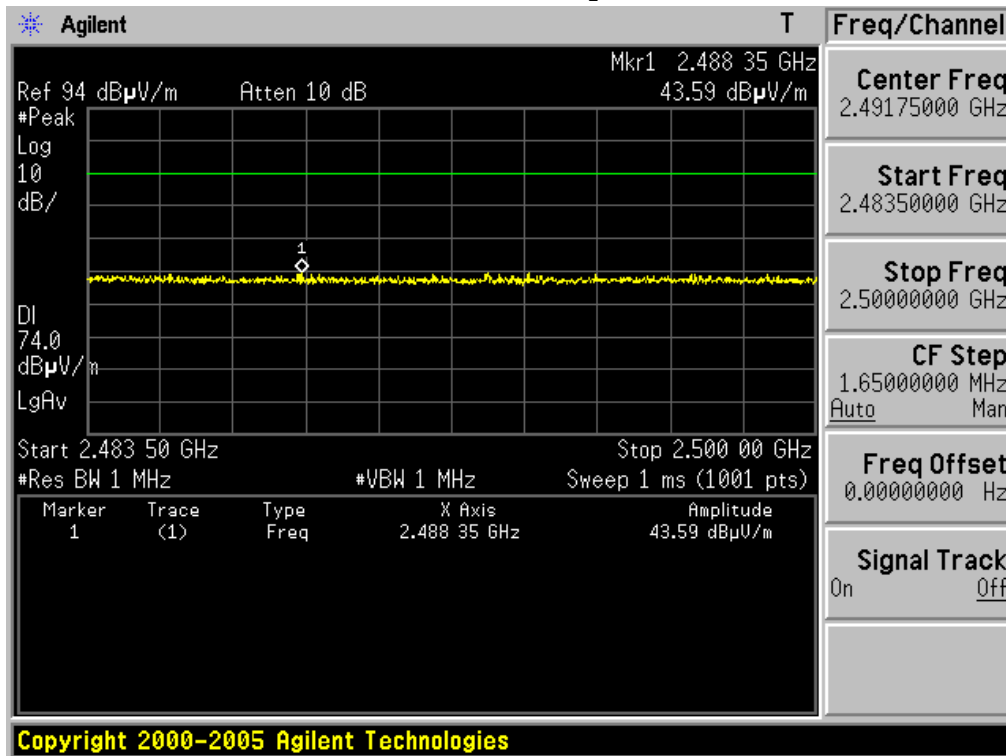
Restricted Band Edge Test Mode: 802.11b & Lowest Frequency & Test case 2
Average mode / Vertical polarization



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

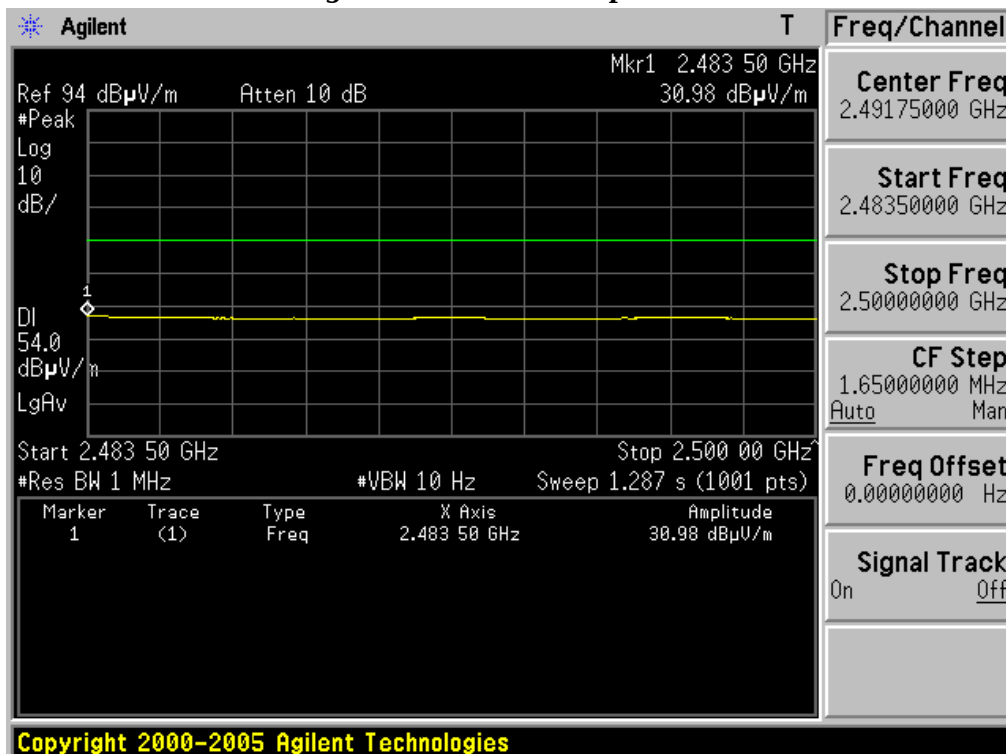
Restricted Band Edge Test Mode: 802.11b & Highest Frequency & Test case 2

Peak mode / Horizontal polarization



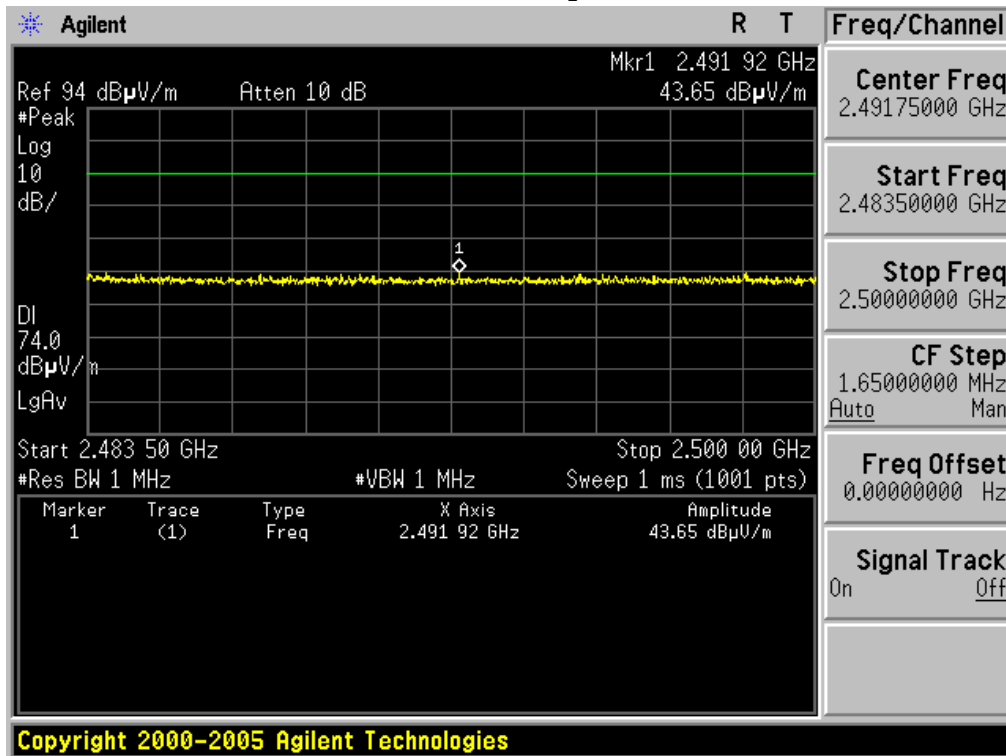
Restricted Band Edge Test Mode: 802.11b & Highest Frequency & Test case 2

Average mode / Horizontal polarization



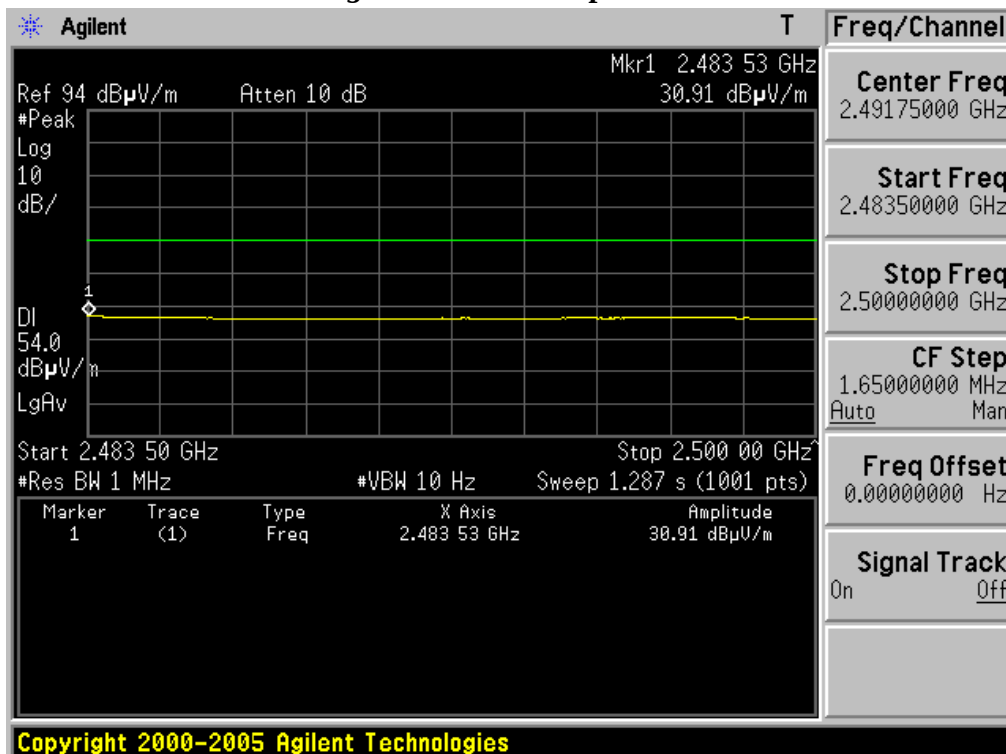
Restricted Band Edge Test Mode: 802.11b & Highest Frequency & Test case 2

Peak mode / Vertical polarization



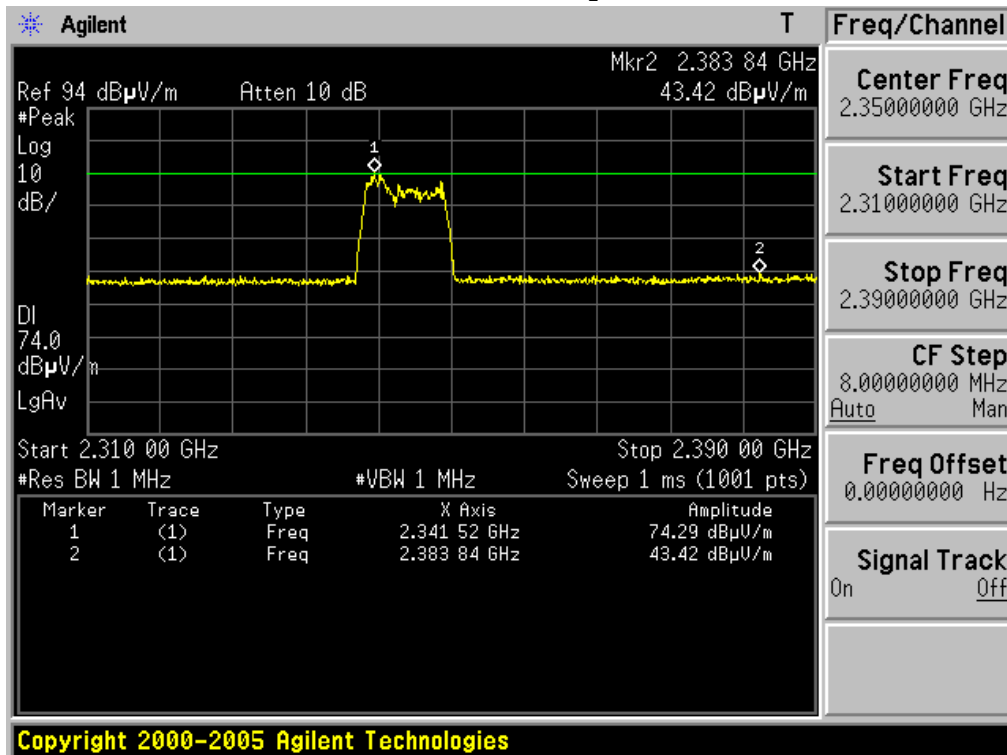
Restricted Band Edge Test Mode: 802.11b & Highest Frequency & Test case 2

Average mode / Vertical polarization



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

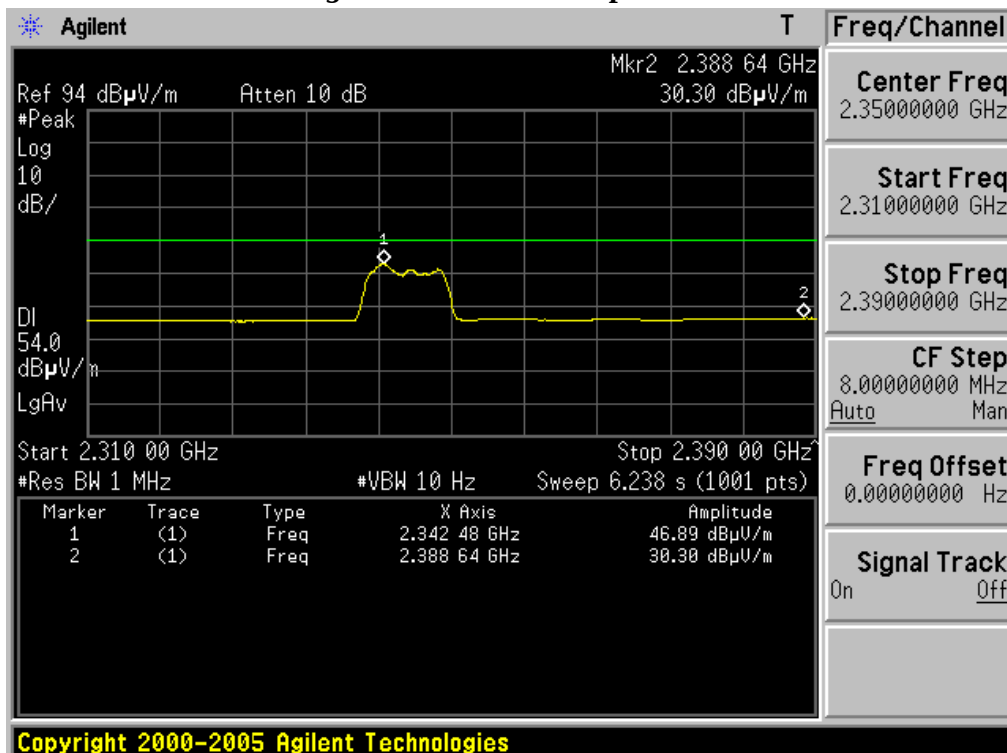
Peak mode / Horizontal polarization



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

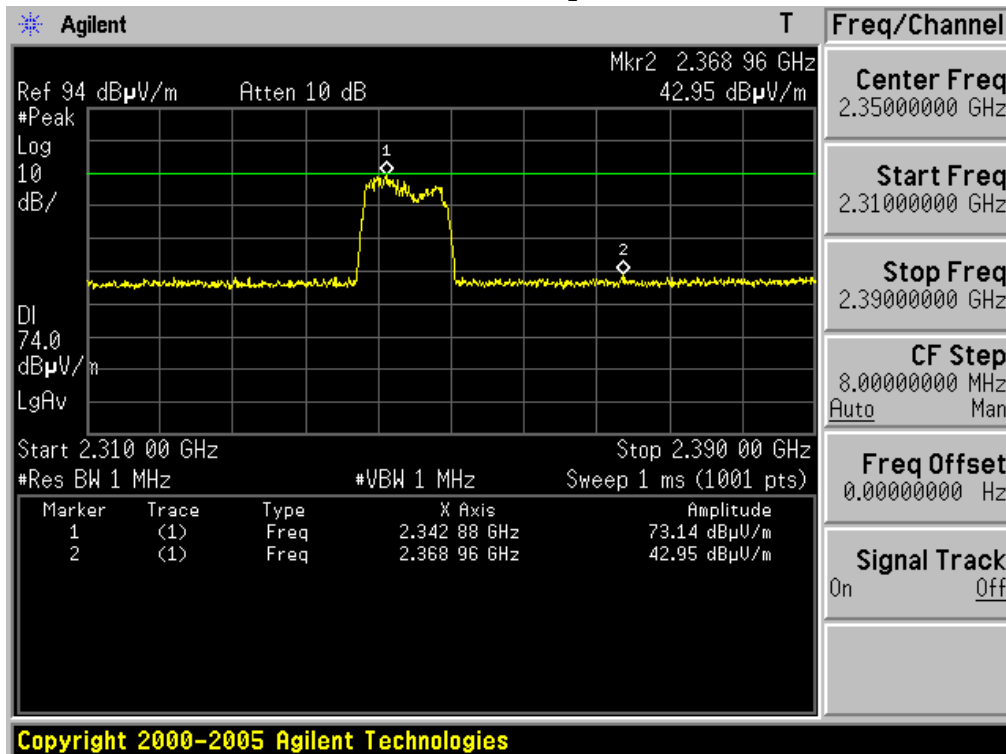
Average mode / Horizontal polarization



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

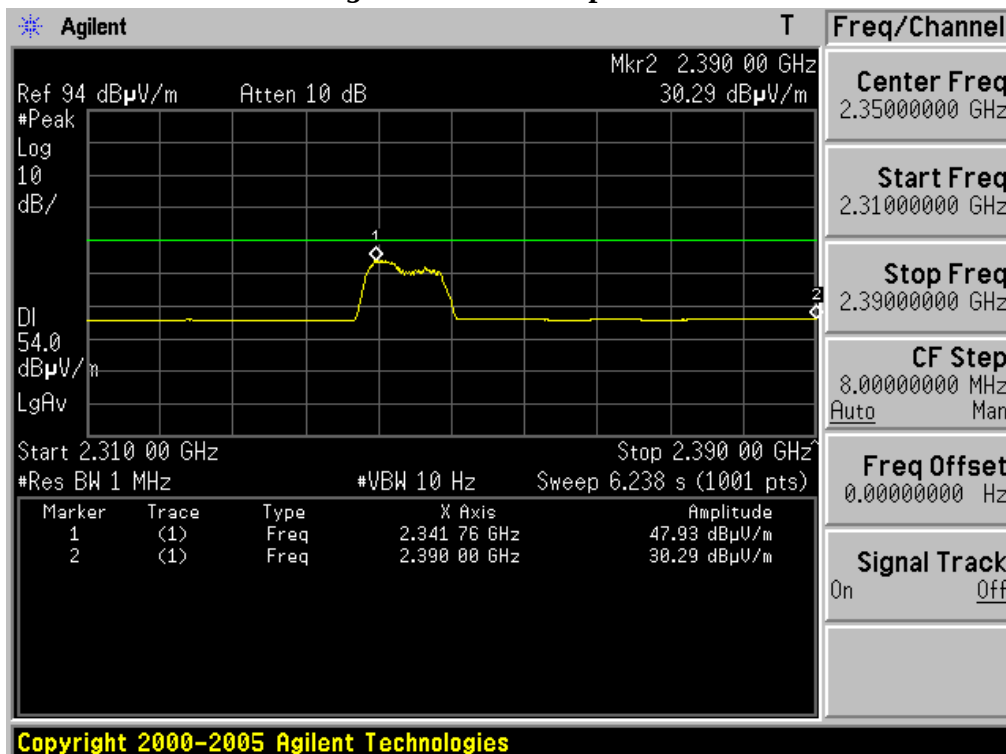
Peak mode / Vertical polarization



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

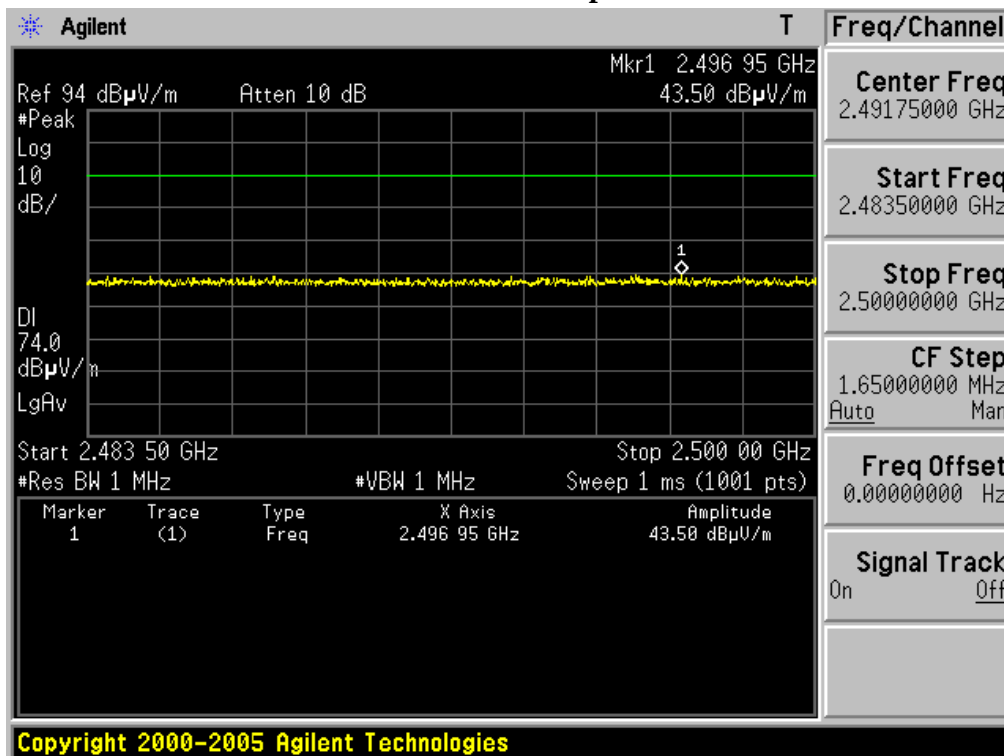
Average mode / Vertical polarization



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

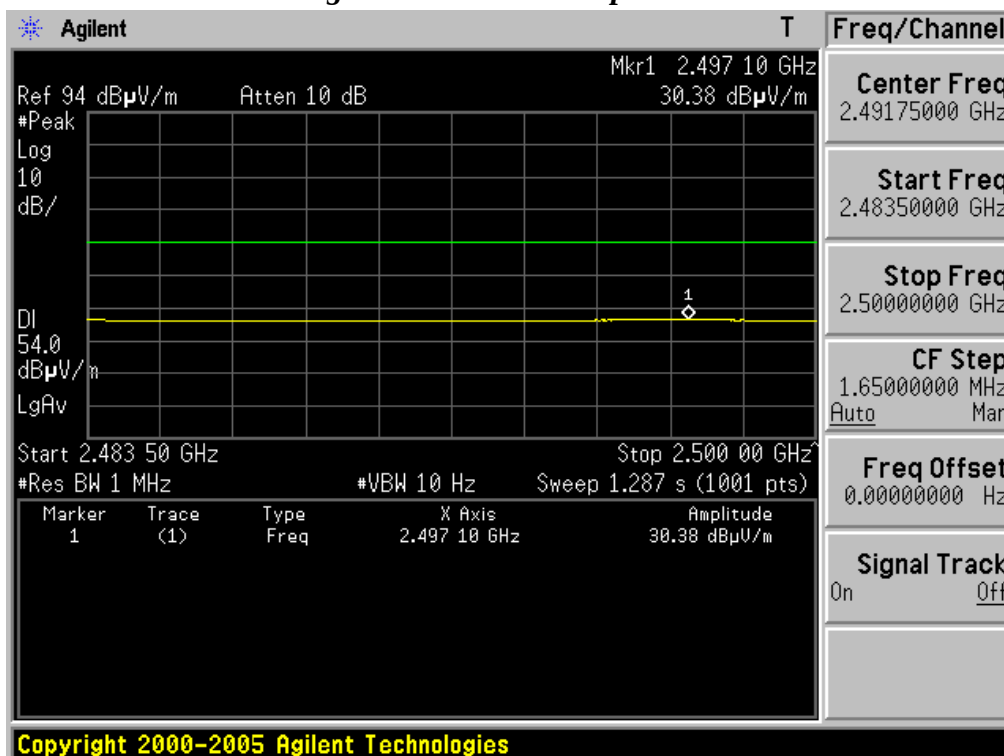
Restricted Band Edge Test Mode: 802.11g & Highest Frequency & Test case 2

Peak mode / Horizontal polarization



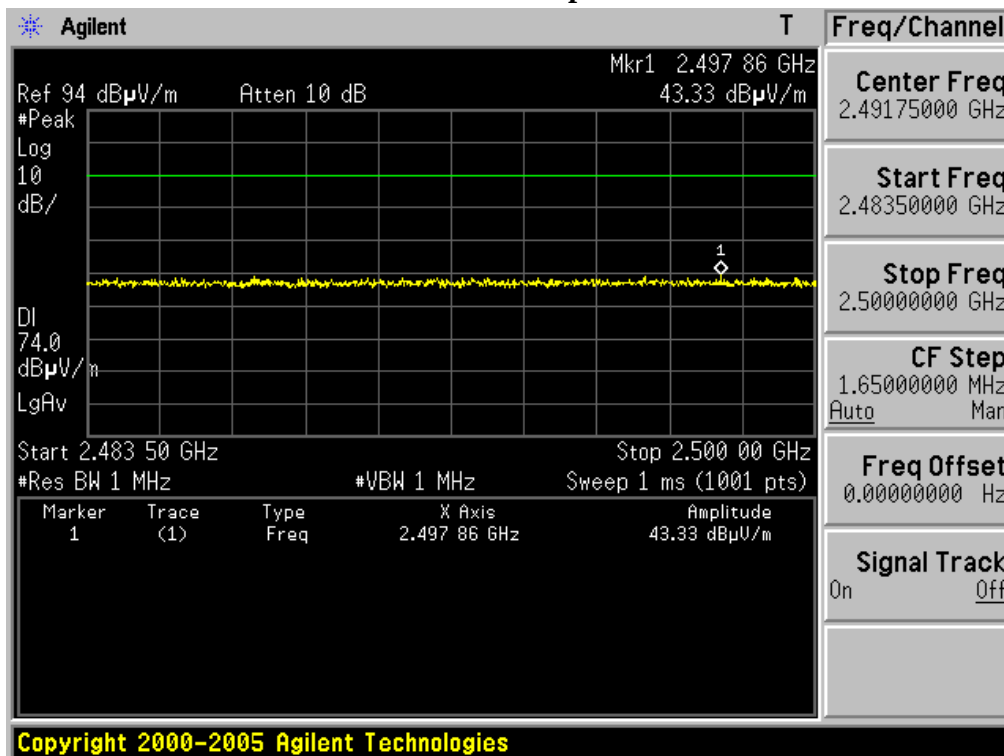
Restricted Band Edge Test Mode: 802.11g & Highest Frequency & Test case 2

Average mode / Horizontal polarization



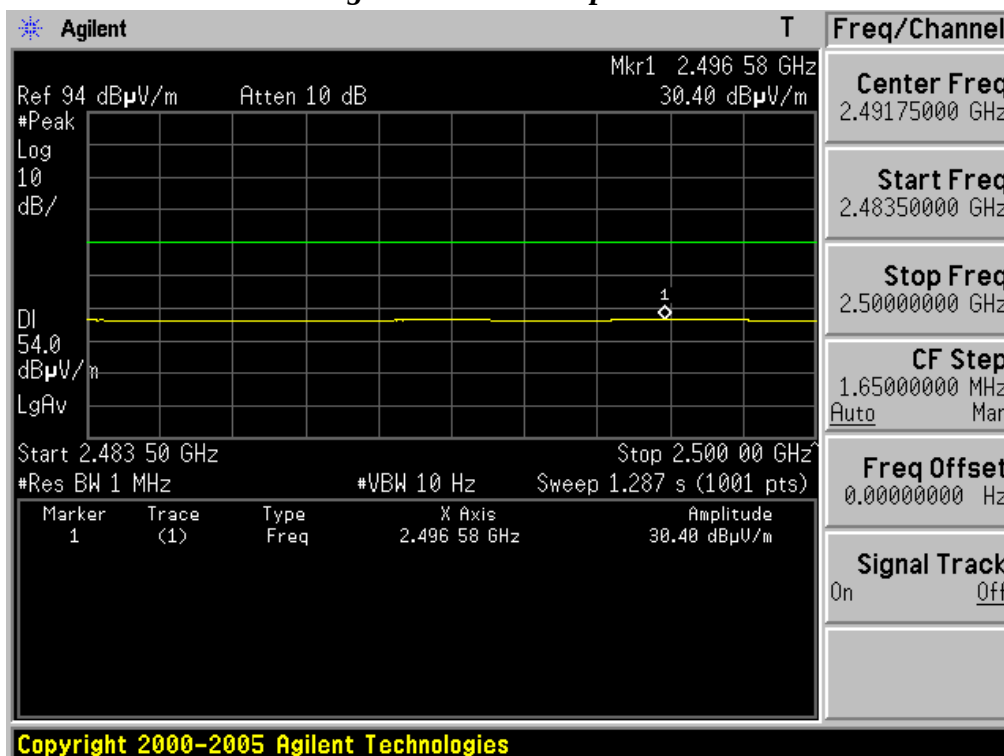
Restricted Band Edge Test Mode: 802.11g & Highest Frequency & Test case 2

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 2



RADIATED EMISSION

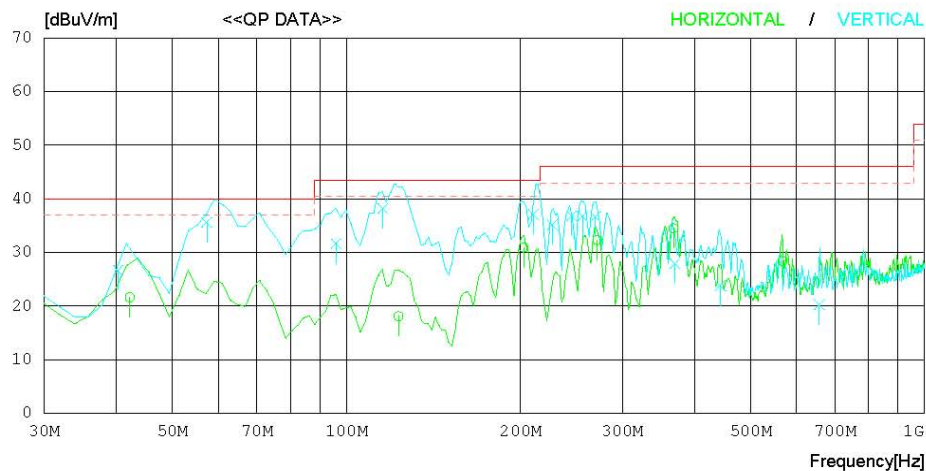
Date : 2010-05-10

Model Name : SWR-8225
Model No. : #1
Serial No. : Identical prototype
Test Condition : TX : 2412 MHz (802.11b)

Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 20 °C 42 %
Operator : D.C.CHA

Memo : Test Case 2

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	42.169	30.0	13.3	0.9	22.6	21.6	40.0	18.4	106	150
2	123.080	27.6	11.8	1.5	22.8	18.1	43.5	25.4	301	164
3	202.500	41.1	11.0	2.1	23.3	30.9	43.5	12.6	201	91
4	271.651	39.8	13.7	2.4	23.6	32.3	46.0	13.7	102	110
5	367.894	40.0	15.8	2.9	24.2	34.5	46.0	11.5	105	141
6	568.280	30.1	18.8	3.9	24.4	28.4	46.0	17.6	201	236
----- Vertical -----										
7	40.261	34.6	13.8	0.9	22.6	26.7	40.0	13.3	100	246
8	57.309	50.8	6.4	1.1	22.7	35.6	40.0	4.4	100	358
9	95.971	42.9	10.0	1.4	22.7	31.6	43.5	11.9	105	146
10	115.597	48.1	11.4	1.5	22.8	38.2	43.5	5.3	100	26
11	210.512	47.0	11.4	2.1	23.4	37.1	43.5	6.4	100	45
12	227.229	44.2	12.2	2.2	23.4	35.2	46.0	10.8	100	60
13	245.223	45.1	13.0	2.2	23.5	36.8	46.0	9.2	100	105
14	256.221	44.6	13.4	2.3	23.6	36.7	46.0	9.3	100	243
15	269.673	44.1	13.7	2.4	23.6	36.6	46.0	9.4	100	110
16	369.981	33.3	15.9	2.9	24.2	27.9	46.0	18.1	107	243
17	443.722	27.8	17.2	3.2	24.4	23.8	46.0	22.2	156	350
18	657.714	21.6	18.9	4.1	24.3	20.3	46.0	25.7	100	358

30MHz ~ 1GHz Radiated Spurious Emissions

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



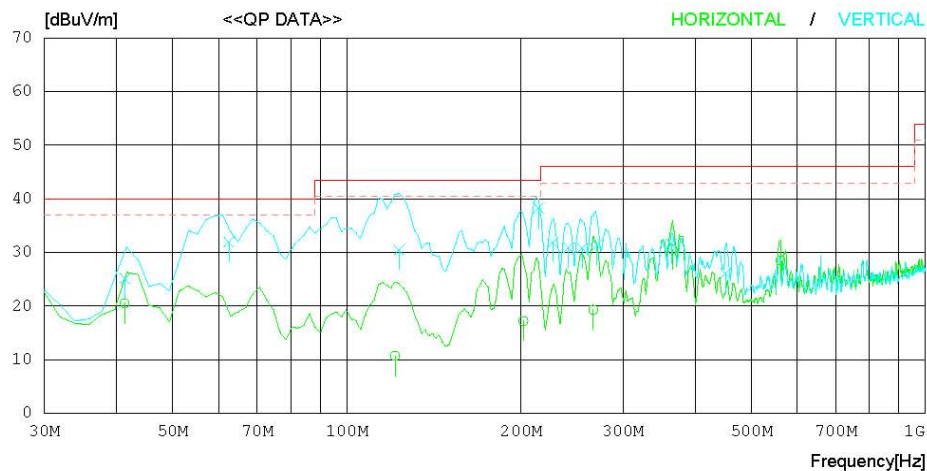
RADIATED EMISSION

Date : 2010-05-10

Model Name : SWR-8225
 Model No. : #1
 Serial No. : Identical prototype
 Test Condition : TX : 2437 MHz (802.11b)
 Reference No. :
 Power Supply : 120 V 60 Hz
 Temp/Humi : 20 'C 42 %
 Operator : D.C.CHA

Memo : Test Case 2

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	41.303	28.7	13.5	0.9	22.6	20.5	40.0	19.5	100	111
2	121.172	20.3	11.7	1.5	22.8	10.7	43.5	32.8	301	358
3	201.969	27.4	11.0	2.1	23.3	17.2	43.5	26.3	201	100
4	266.733	26.9	13.6	2.4	23.6	19.3	46.0	26.7	100	65
5	365.581	36.0	15.8	2.9	24.1	30.6	46.0	15.4	100	358
6	562.084	30.4	18.7	3.8	24.4	28.5	46.0	17.5	201	83
----- Vertical -----										
7	41.351	33.3	13.5	0.9	22.6	25.1	40.0	14.9	100	100
8	62.562	47.5	6.0	1.1	22.7	31.9	40.0	8.1	103	22
9	123.141	40.0	11.8	1.5	22.8	30.5	43.5	13.0	100	36
10	214.222	48.1	11.5	2.1	23.4	38.3	43.5	5.2	100	336
11	227.120	41.0	12.1	2.2	23.4	31.9	46.0	14.1	100	74
12	241.675	39.4	12.8	2.2	23.5	30.9	46.0	15.1	100	90
13	255.291	38.7	13.3	2.3	23.5	30.8	46.0	15.2	100	131
14	270.660	38.9	13.7	2.4	23.6	31.4	46.0	14.6	100	150
15	363.680	37.2	15.7	2.8	24.1	31.6	46.0	14.4	100	141
16	451.428	30.0	17.3	3.3	24.5	26.1	46.0	19.9	100	320

30MHz ~ 1GHz Radiated Spurious Emissions

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



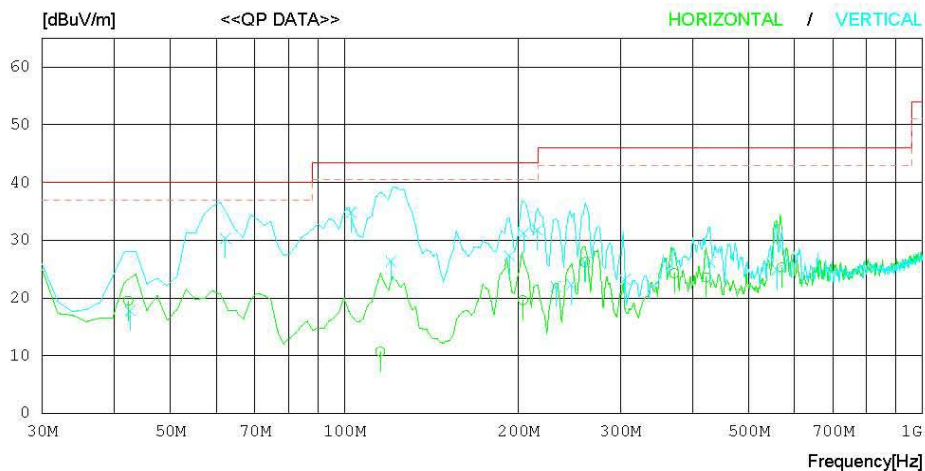
RADIATED EMISSION

Date : 2010-05-10

Model Name : SWR-8225
 Model No. : #1
 Serial No. : Identical prototype
 Test Condition : TX : 2462 MHz (802.11b)
 Reference No. :
 Power Supply : 120 V 60 Hz
 Temp/Humi : 20 °C 42 %
 Operator : D.C. CHA

Memo : Test Case 2

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	42.272	28.0	13.2	0.9	22.6	19.5	40.0	20.5	100	8
2	115.320	20.6	11.4	1.5	22.8	10.7	43.5	32.8	301	294
3	203.539	29.7	11.1	2.1	23.3	19.6	43.5	23.9	201	358
4	260.580	34.1	13.4	2.3	23.6	26.2	46.0	19.8	100	1
5	371.952	29.7	15.9	2.9	24.2	24.3	46.0	21.7	100	62
6	422.693	28.0	16.9	3.1	24.4	23.6	46.0	22.4	100	48
7	570.360	27.0	18.8	3.9	24.4	25.3	46.0	20.7	201	87
----- Vertical -----										
8	42.605	26.4	13.1	0.9	22.6	17.8	40.0	22.2	102	135
9	62.241	45.9	6.0	1.1	22.7	30.3	40.0	9.7	120	340
10	102.660	45.3	10.8	1.4	22.7	34.8	43.5	8.7	100	142
11	120.362	35.9	11.7	1.5	22.8	26.3	43.5	17.2	102	67
12	192.992	37.9	10.7	2.0	23.3	27.3	43.5	16.2	100	358
13	204.284	41.3	11.1	2.1	23.3	31.2	43.5	12.3	100	358
14	215.793	41.5	11.6	2.1	23.4	31.8	43.5	11.7	100	300
15	232.154	30.9	12.4	2.2	23.5	22.0	46.0	24.0	110	152
16	247.032	30.5	13.1	2.2	23.5	22.3	46.0	23.7	106	66
17	260.860	34.0	13.5	2.3	23.6	26.2	46.0	19.8	100	262
18	305.346	29.9	14.5	2.6	23.8	23.2	46.0	22.8	200	168
19	428.916	30.4	17.0	3.2	24.4	26.2	46.0	19.8	108	125
20	560.034	26.7	18.7	3.8	24.4	24.8	46.0	21.2	120	226

30MHz ~ 1GHz Radiated Spurious Emissions

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



RADIATED EMISSION

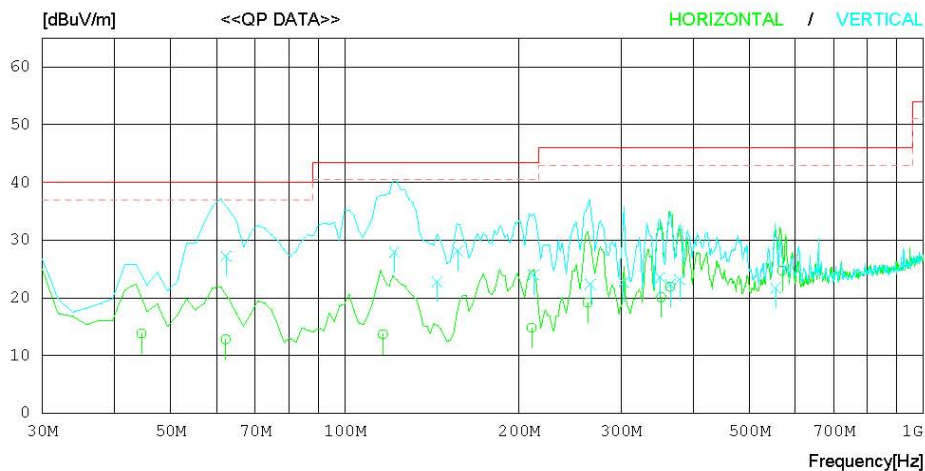
Date : 2010-05-10

Model Name : SWR-8225
 Model No. : #1
 Serial No. : Identical prototype
 Test Condition : TX : 2412 MHz (802.11g)

Reference No. :
 Power Supply : 120 V 60 Hz
 Temp/Humi : 20 °C 42 %
 Operator : D.C. CHA

Memo : Test Case 2

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	44.509	22.8	12.6	1.0	22.6	13.8	40.0	26.2	101	78
2	62.225	28.4	6.0	1.1	22.7	12.8	40.0	27.2	301	358
3	116.374	23.5	11.5	1.5	22.8	13.7	43.5	29.8	301	358
4	210.344	24.7	11.4	2.1	23.4	14.8	43.5	28.7	101	358
5	262.864	27.0	13.5	2.3	23.6	19.2	46.0	26.8	101	285
6	352.112	25.9	15.5	2.8	24.1	20.1	46.0	25.9	101	52
7	365.216	27.4	15.8	2.8	24.1	21.9	46.0	24.1	101	358
8	570.360	26.4	18.8	3.9	24.4	24.7	46.0	21.3	201	1
----- Vertical -----										
9	62.370	42.8	6.0	1.1	22.7	27.2	40.0	12.8	110	332
10	121.901	37.5	11.7	1.5	22.8	27.9	43.5	15.6	102	158
11	144.474	33.1	11.0	1.7	23.0	22.8	43.5	20.7	100	123
12	157.029	38.8	10.6	1.7	23.0	28.1	43.5	15.4	100	257
13	211.887	33.9	11.4	2.1	23.4	24.0	43.5	19.5	100	327
14	265.760	29.9	13.6	2.4	23.6	22.3	46.0	23.7	113	68
15	303.574	29.5	14.4	2.6	23.8	22.7	46.0	23.3	199	358
16	350.827	29.3	15.5	2.8	24.1	23.5	46.0	22.5	103	267
17	365.118	27.8	15.8	2.8	24.1	22.3	46.0	23.7	100	147
18	379.100	28.4	16.1	2.9	24.2	23.2	46.0	22.8	199	358
19	555.956	23.7	18.6	3.8	24.4	21.7	46.0	24.3	112	220

30MHz ~ 1GHz Radiated Spurious Emissions

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



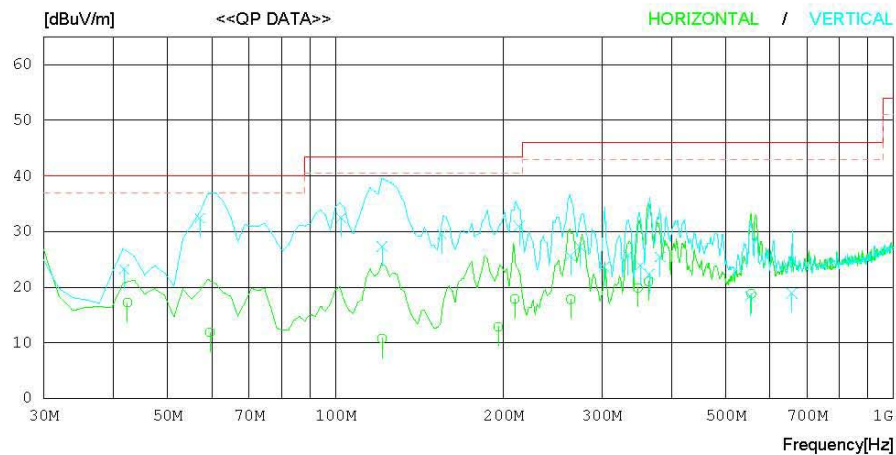
RADIATED EMISSION

Date : 2010-05-10

Model Name : SWR-8225
 Model No. : #1
 Serial No. : Identical prototype
 Test Condition : TX : 2437 MHz (802.11g)
 Reference No. :
 Power Supply : 120 V 60 Hz
 Temp/Humi : 20 °C 42 %
 Operator : D.C.CHA

Memo : Test Case 2

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	42.352	25.7	13.2	0.9	22.6	17.2	40.0	22.8	100	6
2	59.518	27.6	5.9	1.1	22.7	11.9	40.0	28.1	400	358
3	121.195	20.4	11.7	1.5	22.8	10.8	43.5	32.7	301	211
4	195.770	23.4	10.8	2.0	23.3	12.9	43.5	30.6	200	358
5	209.577	27.9	11.3	2.1	23.4	17.9	43.5	25.6	100	44
6	263.825	25.6	13.5	2.3	23.6	17.8	46.0	28.2	100	71
7	348.273	25.7	15.4	2.8	24.0	19.9	46.0	26.1	100	48
8	363.883	26.6	15.7	2.8	24.1	21.0	46.0	25.0	100	62
9	555.956	20.8	18.6	3.8	24.4	18.8	46.0	27.2	200	91
----- Vertical -----										
10	41.790	31.5	13.4	0.9	22.6	23.2	40.0	16.8	100	135
11	57.153	47.5	6.5	1.1	22.7	32.4	40.0	7.6	112	235
12	102.403	43.0	10.8	1.4	22.7	32.5	43.5	11.0	100	358
13	121.146	36.9	11.7	1.5	22.8	27.3	43.5	16.2	100	358
14	155.243	40.2	10.6	1.7	23.0	29.5	43.5	14.0	100	358
15	213.413	40.8	11.5	2.1	23.4	31.0	43.5	12.5	100	358
16	263.825	33.4	13.5	2.3	23.6	25.6	46.0	20.4	105	62
17	274.470	34.7	13.8	2.4	23.6	27.3	46.0	18.7	199	300
18	303.460	30.4	14.4	2.6	23.8	23.6	46.0	22.4	299	253
19	334.552	31.8	15.1	2.7	23.9	25.7	46.0	20.3	100	358
20	352.112	29.7	15.5	2.8	24.1	23.9	46.0	22.1	100	119
21	365.216	27.8	15.8	2.8	24.1	22.3	46.0	23.7	100	358
22	381.585	30.6	16.1	2.9	24.2	25.4	46.0	20.6	100	358
23	553.929	20.4	18.6	3.8	24.4	18.4	46.0	27.6	100	358
24	657.714	20.2	18.9	4.1	24.3	18.9	46.0	27.1	100	358

30MHz ~ 1GHz Radiated Spurious Emissions

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

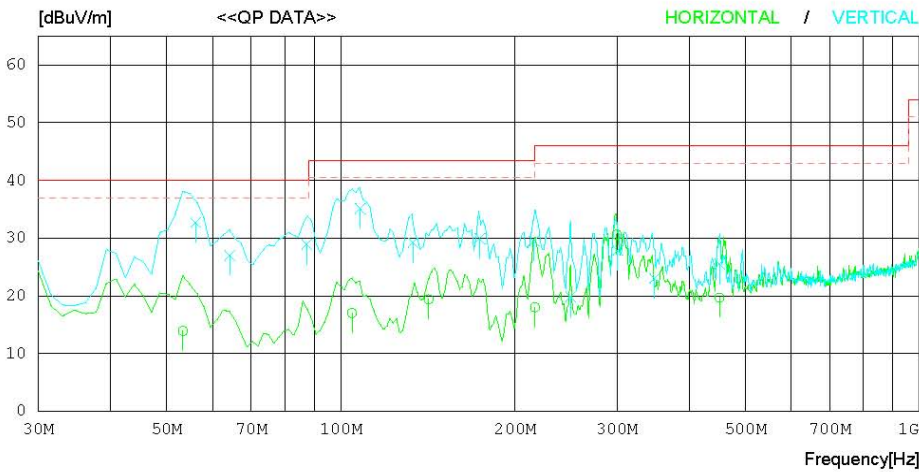


RADIATED EMISSION

Date : 2010-05-10

Model Name : SWR-8225
Model No. : #1
Serial No. : Identical prototype
Test Condition : TX : 2462 MHz (802.11g)
Reference No. :
Power Supply : 120 V 60 Hz
Temp/Humi : 20 °C 42 %
Operator : D.C. CHA
Memo : Test Case 2

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	53.331	28.2	7.4	1.0	22.7	13.9	40.0	26.1	301	61
2	104.500	27.4	10.9	1.4	22.7	17.0	43.5	26.5	301	1
3	141.900	29.5	11.1	1.7	22.9	19.4	43.5	24.1	201	359
4	216.555	27.6	11.7	2.1	23.4	18.0	46.0	28.0	100	1
5	299.818	37.4	14.3	2.6	23.7	30.6	46.0	15.4	100	92
6	451.265	23.6	17.3	3.3	24.5	19.7	46.0	26.3	201	359
----- Vertical -----										
7	56.153	47.7	6.7	1.0	22.7	32.7	40.0	7.3	104	124
8	64.250	42.5	6.1	1.1	22.7	27.0	40.0	13.0	101	247
9	87.395	41.7	8.6	1.3	22.7	28.9	40.0	11.1	100	329
10	108.044	45.2	11.1	1.5	22.7	35.1	43.5	8.4	100	358
11	133.220	39.0	11.5	1.6	22.9	29.2	43.5	14.3	115	147
12	173.945	40.9	10.3	1.8	23.1	29.9	43.5	13.6	110	126
13	215.793	39.2	11.6	2.1	23.4	29.5	43.5	14.0	106	268
14	249.765	27.9	13.2	2.2	23.5	19.8	46.0	26.2	199	244
15	300.915	34.6	14.4	2.6	23.7	27.9	46.0	18.1	120	115
16	348.273	28.8	15.4	2.8	24.0	23.0	46.0	23.0	106	255
17	451.428	29.4	17.3	3.3	24.5	25.5	46.0	20.5	110	136

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
4823.800	Hor	46.40	33.79	3.17	49.57	36.96	74.00	54.00	24.43	17.04
4822.400	Ver	46.66	33.77	3.17	49.83	36.94	74.00	54.00	24.17	17.06
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ 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
4874.335	Hor	49.71	36.69	3.18	52.89	39.87	74.00	54.00	21.11	14.13
4874.885	Ver	46.80	34.82	3.18	49.98	38.00	74.00	54.00	24.02	16.00
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ 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
4929.150	Hor	49.23	37.06	3.42	52.65	40.48	74.00	54.00	21.35	13.52
4924.000	Ver	46.92	36.09	3.42	50.34	39.51	74.00	54.00	23.66	14.49
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were detected at a level greater than 25dB 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
4835.000	Hor	46.28	33.85	3.17	49.45	37.02	74.00	54.00	24.55	16.98
4816.100	Ver	46.86	33.89	3.17	50.03	37.06	74.00	54.00	23.97	16.94
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ 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
4871.275	Hor	48.06	35.36	3.18	51.24	38.54	74.00	54.00	22.76	15.46
4875.144	Ver	47.46	34.20	3.18	50.64	37.38	74.00	54.00	23.36	16.62
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ 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
4921.750	Hor	47.36	34.41	3.42	50.78	37.83	74.00	54.00	23.22	16.17
4927.800	Ver	47.04	34.14	3.42	50.46	37.56	74.00	54.00	23.54	16.44
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were detected at a level greater than 25dB 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	-8.837
	Middle	-9.763
	Highest	-10.402
802.11g	Lowest	-15.464
	Middle	-16.598
	Highest	17.253

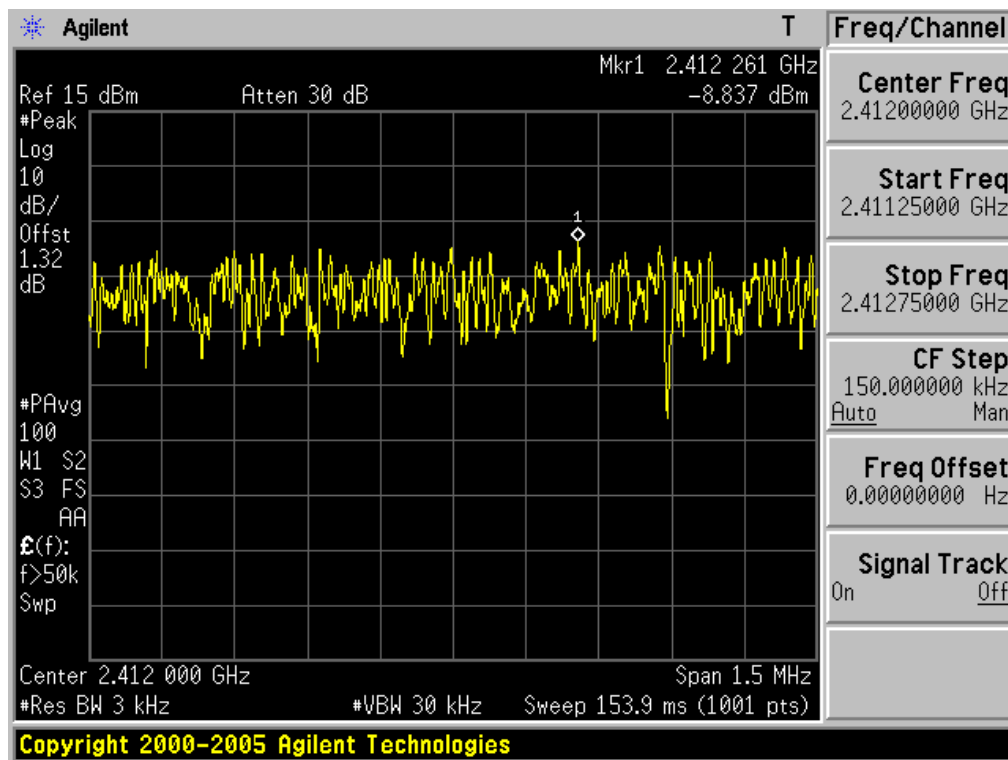
Note 1: See next pages for actual measured spectrum plots.

- Minimum Standard:

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

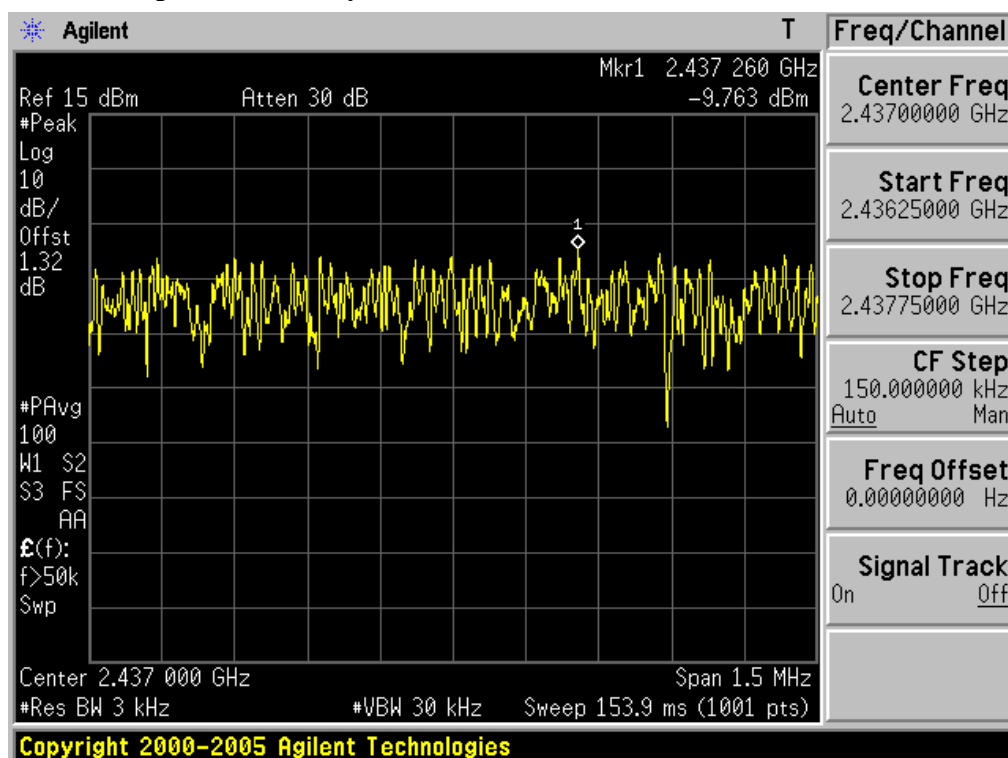
Transmitter Power Spectral Density

Test Mode: 802.11b & Lowest Frequency



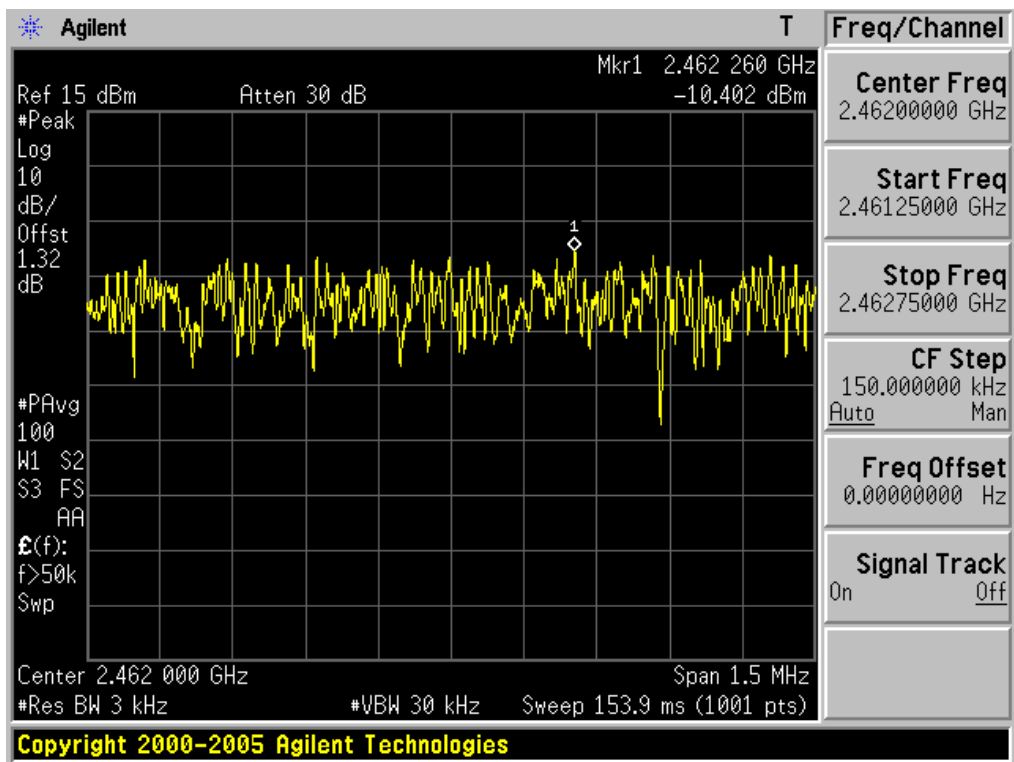
Transmitter Power Spectral Density

Test Mode: 802.11b & Middle Frequency



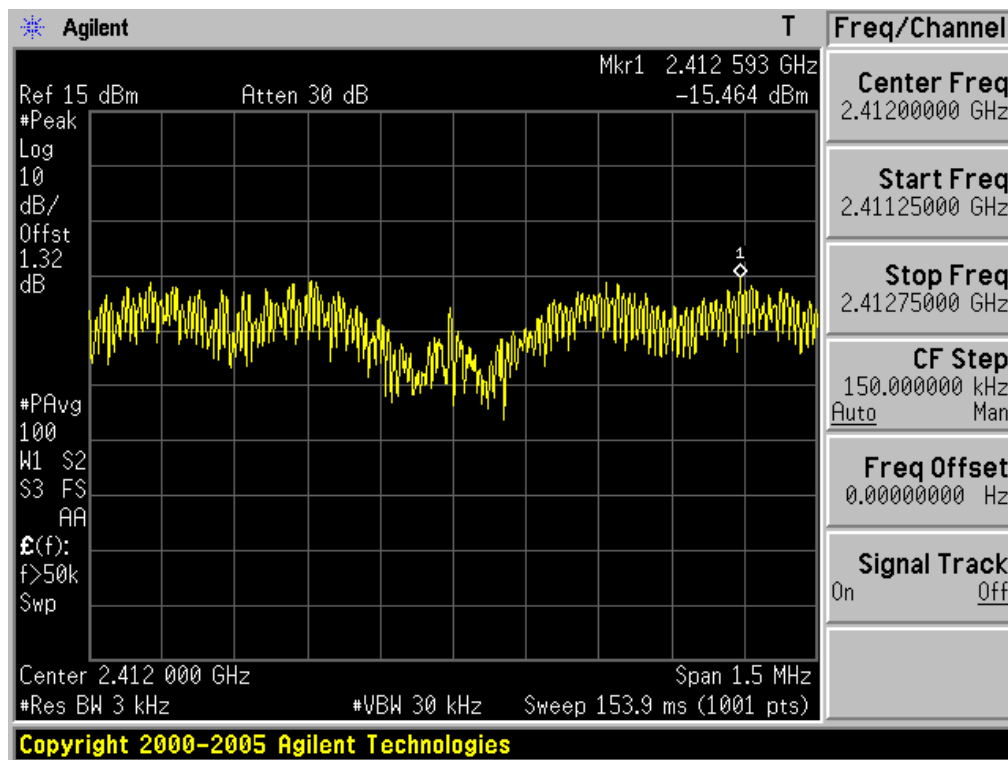
Transmitter Power Spectral Density

Test Mode: 802.11b & Highest Frequency



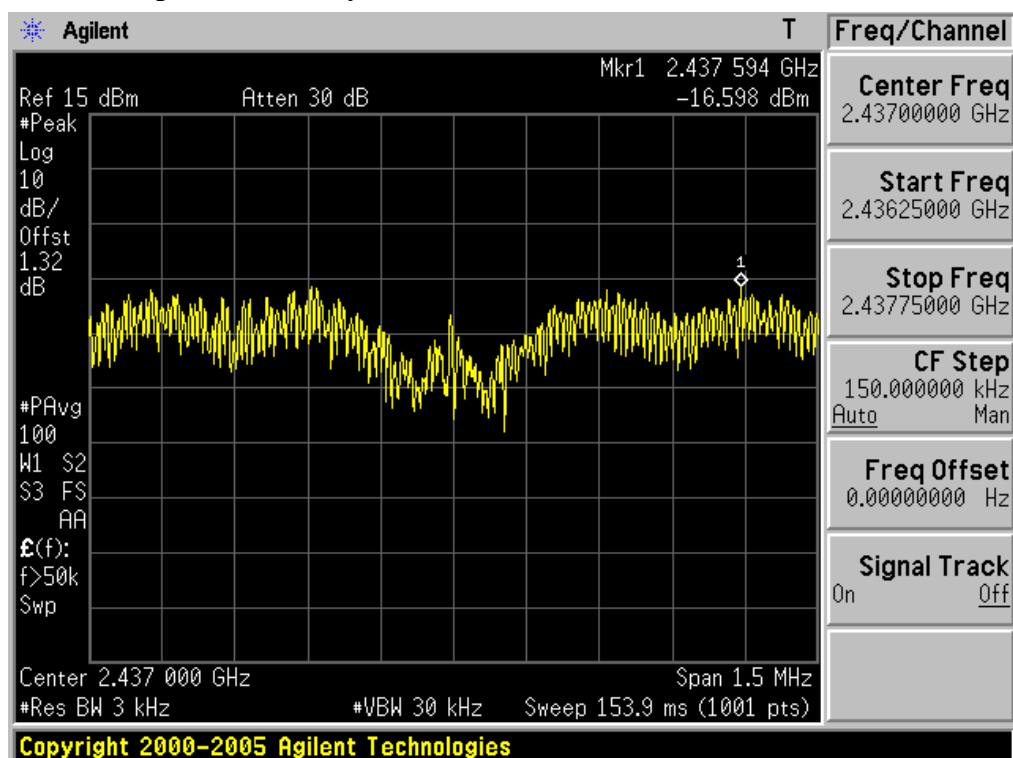
Transmitter Power Spectral Density

Test Mode: 802.11g & Lowest Frequency



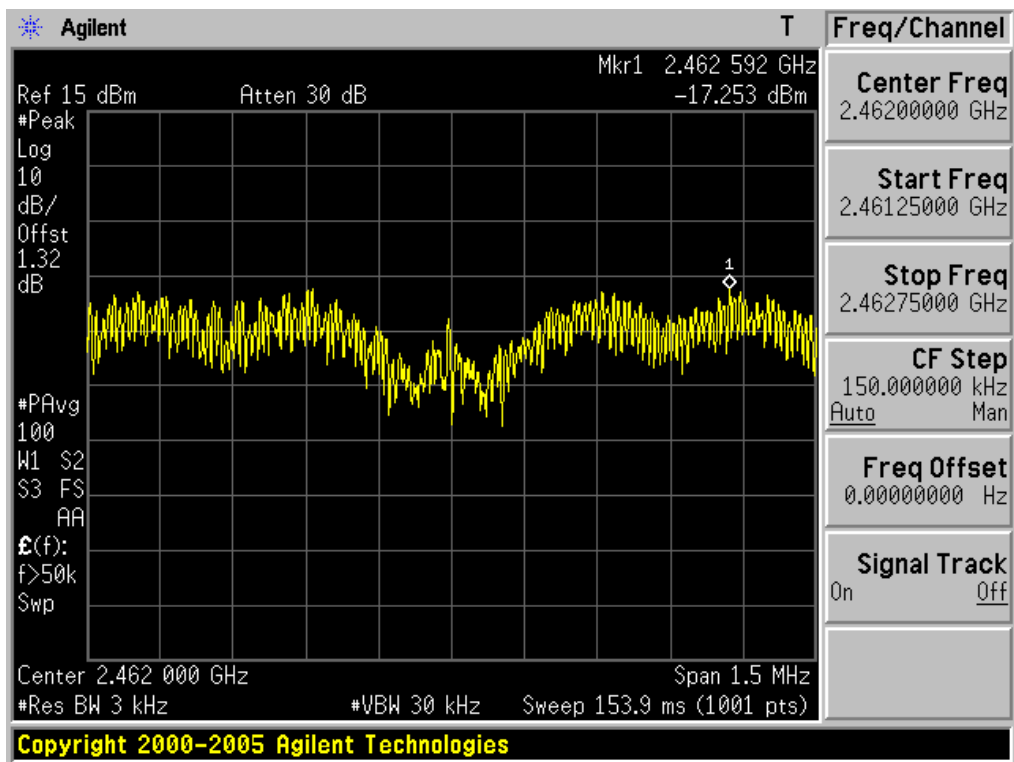
Transmitter Power Spectral Density

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.

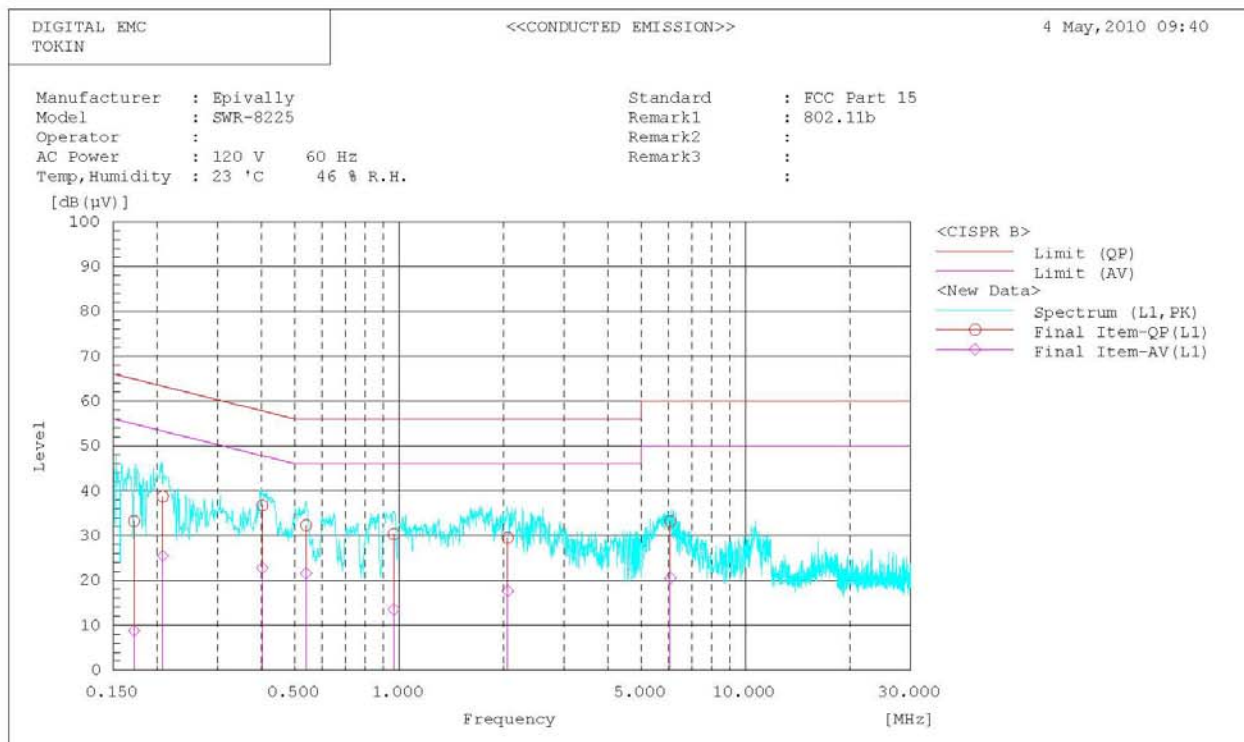
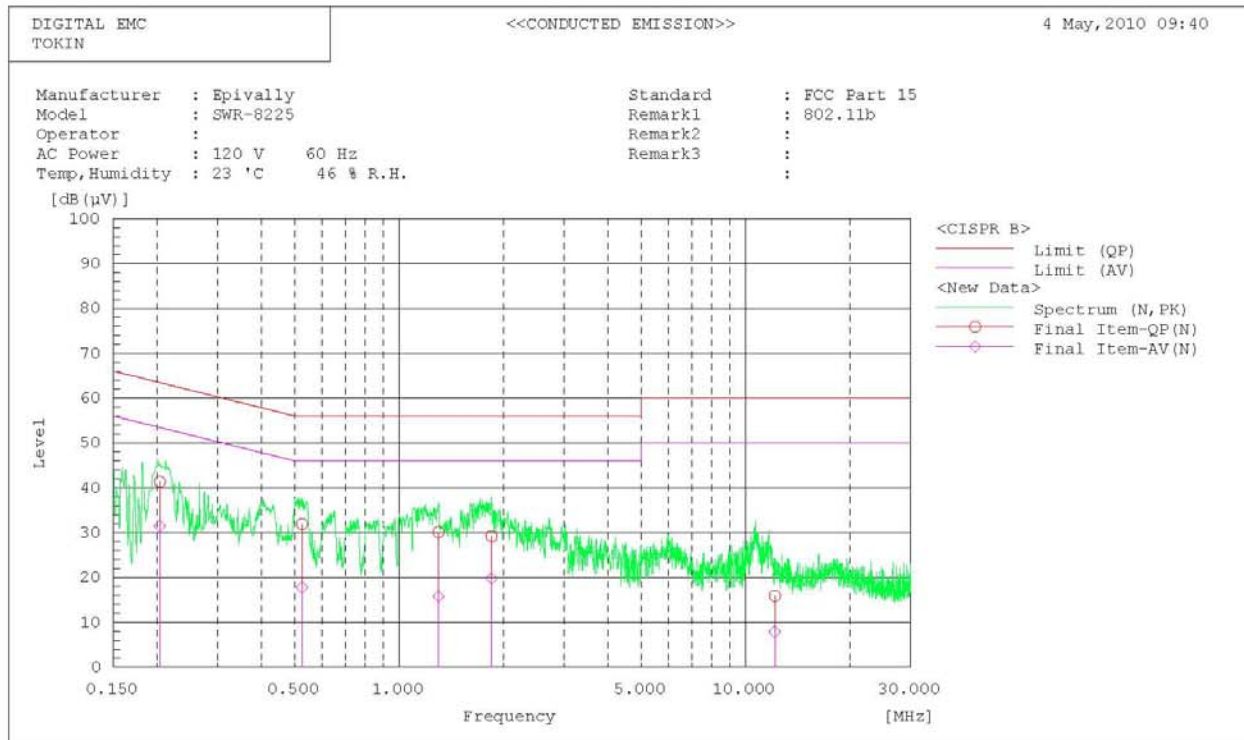
- Minimum Standard: FCC Part 15.207(a)/EN 55022

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 & Test case 2



AC Line Conducted Emissions (Data List)

Test Mode: 802.11b & Test case 2

```

***** DIGITAL EMC *****
<<CONDUCTED EMISSION>>
4 May, 2010 09:40

Standard      : FCC Part 15
Manufacturer  : Epivally
Model         : SWR-8225
Operator      :
AC Power       : 120 V    60 Hz
Temp, Humidity : 23 'C    46 % R.H.
Remark1       : 802.11b
Remark2       :
Remark3       :
*****

Final Result

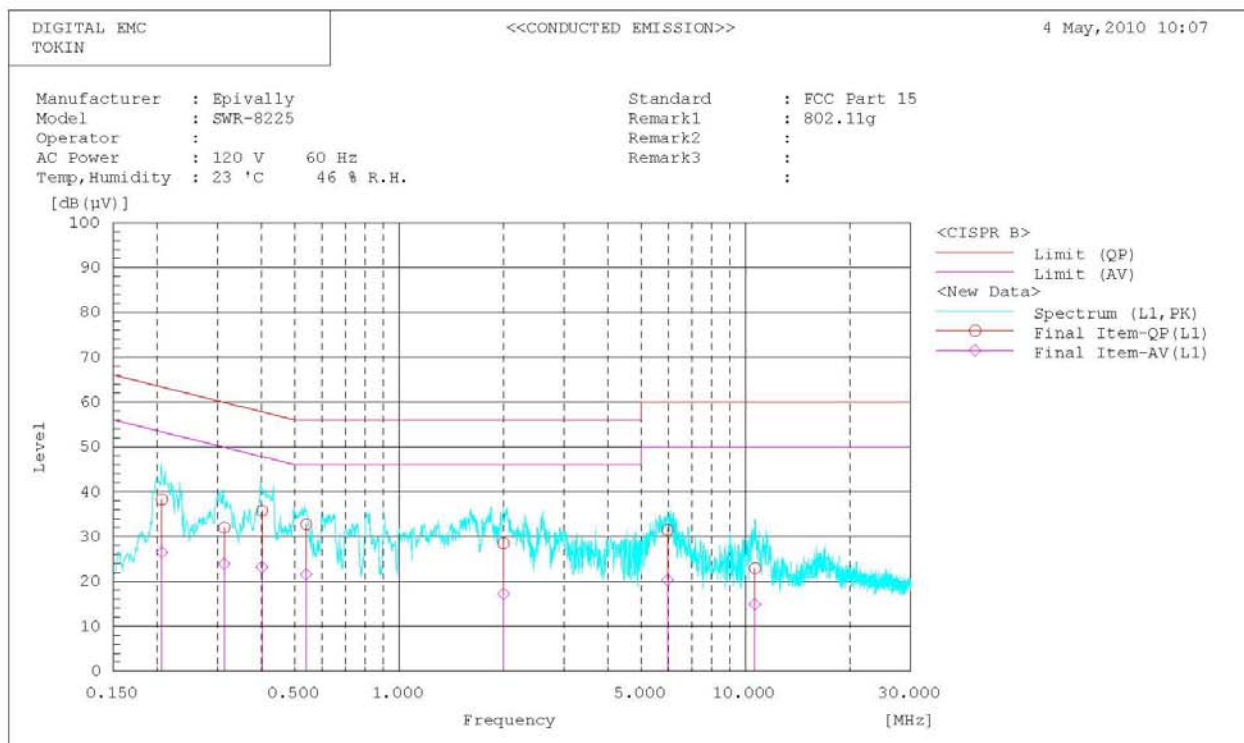
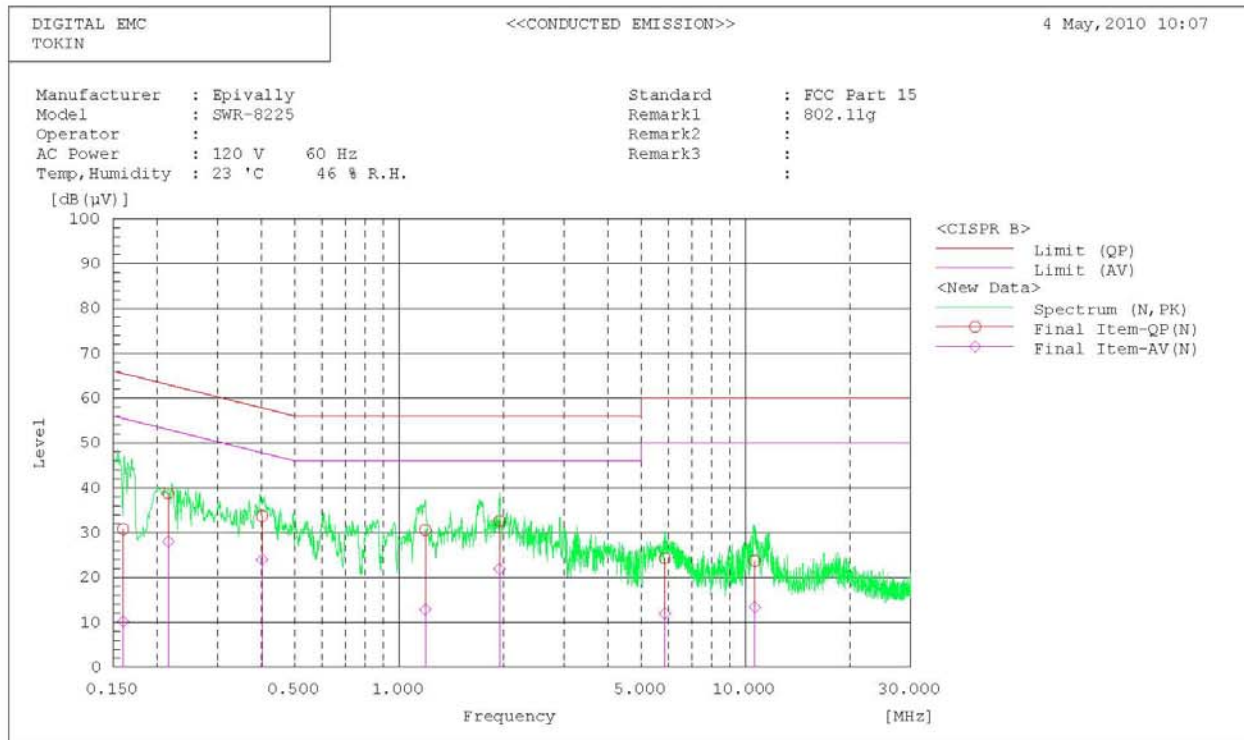
--- N Phase ---
No.  Frequency  Reading  Reading  c.f  Result  Result  Limit  Limit  Margin  Margin  Remark
      [MHz]     [dB(μV)] [dB(μV)] [dB]  [dB(μV)] [dB(μV)] [dB(μV)] [dB(μV)] [dB]  [dB]
1    0.204      41.1     31.3   0.2   41.3     31.5   63.4   53.4   22.1   21.9
2    0.525      31.5     17.4   0.4   31.9     17.8   56.0   46.0   24.1   28.2
3    1.299      29.7     15.4   0.4   30.1     15.8   56.0   46.0   25.9   30.2
4    1.849      28.8     19.4   0.4   29.2     19.8   56.0   46.0   26.8   26.2
5   12.152      15.4      7.4   0.5   15.9      7.9   60.0   50.0   44.1   42.1

--- L1 Phase ---
No.  Frequency  Reading  Reading  c.f  Result  Result  Limit  Limit  Margin  Margin  Remark
      [MHz]     [dB(μV)] [dB(μV)] [dB]  [dB(μV)] [dB(μV)] [dB(μV)] [dB(μV)] [dB]  [dB]
1    0.172      33.1      8.7   0.1   33.2      8.8   64.9   54.9   31.7   46.1
2    0.208      38.6     25.4   0.1   38.7     25.5   63.3   53.3   24.6   27.8
3    0.403      36.4     22.5   0.3   36.7     22.8   57.8   47.8   21.1   25.0
4    0.540      31.8     21.1   0.5   32.3     21.6   56.0   46.0   23.7   24.4
5    0.966      29.8     13.0   0.5   30.3     13.5   56.0   46.0   25.7   32.5
6    2.059      28.9     17.0   0.6   29.5     17.6   56.0   46.0   26.5   28.4
7    6.067      32.5     19.8   0.7   33.2     20.5   60.0   50.0   26.8   29.5

```

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

***** DIGITAL EMC *****

<<CONDUCTED EMISSION>>

4 May, 2010 10:07

Standard : FCC Part 15

Manufacturer : Epivally

Model : SWR-8225

Operator :

AC Power : 120 V 60 Hz

Temp, Humidity : 23 °C 46 % R.H.

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]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB]	[dB]	
1	0.160	30.6	10.0	0.2	30.8	10.2	65.5	55.5	34.7	45.3	
2	0.216	38.6	27.8	0.2	38.8	28.0	63.0	53.0	24.2	25.0	
3	0.402	33.4	23.7	0.3	33.7	24.0	57.8	47.8	24.1	23.8	
4	1.191	30.2	12.5	0.4	30.6	12.9	56.0	46.0	25.4	33.1	
5	1.950	32.2	21.5	0.4	32.6	21.9	56.0	46.0	23.4	24.1	
6	5.853	24.0	11.7	0.3	24.3	12.0	60.0	50.0	35.7	38.0	
7	10.638	23.2	12.9	0.5	23.7	13.4	60.0	50.0	36.3	36.6	

--- 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]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB]	[dB]	
1	0.207	38.2	26.4	0.1	38.3	26.5	63.3	53.3	25.0	26.8	
2	0.313	31.8	23.7	0.2	32.0	23.9	59.9	49.9	27.9	26.0	
3	0.402	35.4	22.9	0.3	35.7	23.2	57.8	47.8	22.1	24.6	
4	0.540	32.2	21.1	0.5	32.7	21.6	56.0	46.0	23.3	24.4	
5	2.002	27.9	16.6	0.6	28.5	17.2	56.0	46.0	27.5	28.8	
6	5.959	30.8	19.6	0.7	31.5	20.3	60.0	50.0	28.5	29.7	
7	10.655	21.9	13.9	1.0	22.9	14.9	60.0	50.0	37.1	35.1	

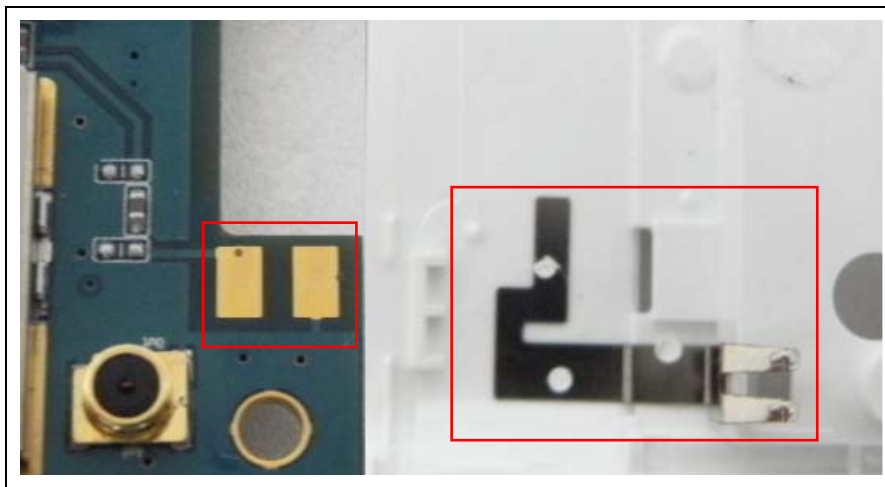
4.2.7 Antenna Requirements

- 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.

- **Description** : The EUT antenna is connected to the main PCB using the spring contactor which is manufacturer's unique method.

- **Conclusion:** **Comply**



- 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	25/02/10	25/02/11	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	12/03/10	12/03/11	3146A13475, US36122178
☐	Multifunction Synthesizer	HP	8904A	06/10/09	06/10/10	3633A08404
☒	Signal Generator	Rohde Schwarz	SMR20	12/03/10	12/03/11	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
☐	Vector Signal Generator	Rohde Schwarz	SMBV100A	23/02/10	23/02/11	255571
☐	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	12/03/10	12/03/11	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	12/03/10	12/03/11	20060321-1
☐	DC Power Supply	HP	6622A	12/03/10	12/03/11	3448A03760
☒	DC Power Supply	HP	6633A	12/03/10	12/03/11	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	WHNX2.1	N/A	N/A	1
☒	High-pass filter	Wainwright	WHNX3.0	N/A	N/A	9
☐	High-pass filter	Wainwright	WHNX5.0	N/A	N/A	8
☐	High-Pass Filter	Wainwright	WHKX8.5	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 (10dB)	WEINSCHTEL	31696	06/10/09	06/10/10	446
☐	Attenuator (10dB)	WEINSCHTEL	31696	06/10/09	06/10/10	408
☐	Attenuator (20dB)	WEINSCHTEL	86-20-11	06/10/09	06/10/10	432
☐	Attenuator (30dB)	JFW	50FH-030-300	12/03/10	12/03/11	060320-1
☐	Attenuator (40dB)	WEINSCHTEL	57-40-33	01/10/09	01/10/10	NN837
☐	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	23/04/10	23/04/11	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	12/05/10	12/05/11	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	12/03/10	12/03/11	1252741
☐	Amplifier (25dB)	Agilent	8447D	12/03/10	12/03/11	2944A10144
☐	Amplifier (25dB)	Agilent	8447D	03/07/09	03/07/10	2648A04922
☒	Spectrum Analyzer(CE)	H.P	8591E	12/03/10	12/03/11	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	12/03/10	12/03/11	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