

RF TEST REPORT

Test item : 2.4 GHz WLAN Module
Model No. : ML-NWA65L
Order No. : 1006-00229
Date of receipt : 2010-06-11
Test duration : 2010-07-10 ~ 2010-07-21
2010-08-02 ~ 2010-08-07
Date of issue : 2010-09-07
Use of report : FCC & IC Original Grant

Applicant : Samsung Electronics Co Ltd
18600 Broadwick St. Rancho Dominguez, CA 90220 United States

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

Test specification : FCC Part 15.247 Subpart C
RSS-210

Test environment : See appended test report

Test result : ☒ Pass ☐ Fail

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

Tested by:

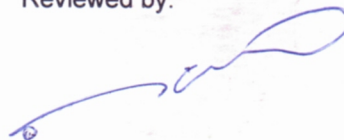


Engineer
B.G. Han

Witnessed by:

N/A

Reviewed by:



Technical director
W.J. Lee

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1. Equipment information

1.1 Equipment description

FCC Equipment Class	Digital Transmission System (DTS)
Equipment type	2.4 GHz WLAN Module
Equipment model name	ML-NWA65L
Equipment add model name	097N01880
Equipment serial no.	Identical prototype
Frequency band	2412 ~ 2462 MHz
Modulation type	CCK, OFDM
Channel Access Protocol	CSMA/CA
Channel Spacing	5.0 MHz
Power Supply	DC 5.0 V
Antenna type	Internal Type: PCB Antenna (Max. peak gain: 2.46 dBi)
Antenna Configuration	TX / RX Diversity: 1TX, 2RX

- TX Diversity: A transmitting antenna is selected by RX diversity. Simultaneous transmission is not supported.
- This device only supports a HT20 mode of 802.11n.

1.2 Ancillary equipment

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

2. Information about test items

2.1 Test mode

This device was tested in fixed duty cycle mode at maximum power.

2.2 Auxiliary equipment

Equipment	Model No.	Serial No.	Manufacturer	Note
Notebook	PSME4K-014001	19101993W	TOCHIBA	-
-	-	-	-	-

2.3 Tested frequency

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

2.4 Tested environment

Temperature	: 20 ~ 26 °C
Relative humidity content	: 33 ~ 47 % R.H.
Details of power supply	: DC 5.0 V

2.5 EMI Suppression Device(s)/Modifications

EMI suppression device(s) added and/or modifications made during testing
→ None

3. Test Report

3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit (Using in 2400 ~ 2483.5MHz)	Test Condition	Status Note 1
I. Transmit mode (Tx)				
15.247(a)(2) /RSS-210(A8.2(a))	6 dB Bandwidth	> 500 kHz	Conducted	C
15.247(b)(3) /RSS-210(A8.4)	Transmitter Output Power	< 1Watt		C
15.247(c) /RSS-210(A8.5)	Out of Band Emissions / Band Edge	20dBc in any 100kHz BW		C
15.247(d) /RSS-210(A8.2(b))	Transmitter Power Spectral Density	< 8dBm / 3kHz		C
15.205 15.209 /RSS-210(A8.5)	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/ A8.4	Antenna Requirements	FCC 15.203	-	C
II. Receive mode (Rx)				
15.107 / 7.2.2 /RSS-210(7.2.2)	AC Conducted Emissions	EN 55022	Line Conducted	C
15.109 / 7.2.3.2 /RSS-210(4.8)	Receiver Spurious Emissions	< FCC 15.109 limits	Radiated	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, RSS-210

3.2 Transmitter requirements

3.2.1 6 dB Bandwidth

- Procedure:

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

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

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

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest Frequencies

Span = 50 MHz (Greater than EBW)

RBW = 100 kHz

VBW = $\geq$ RBW

Trace = max hold

Sweep = auto

Detector function = peak

- Measurement Data: **Comply**

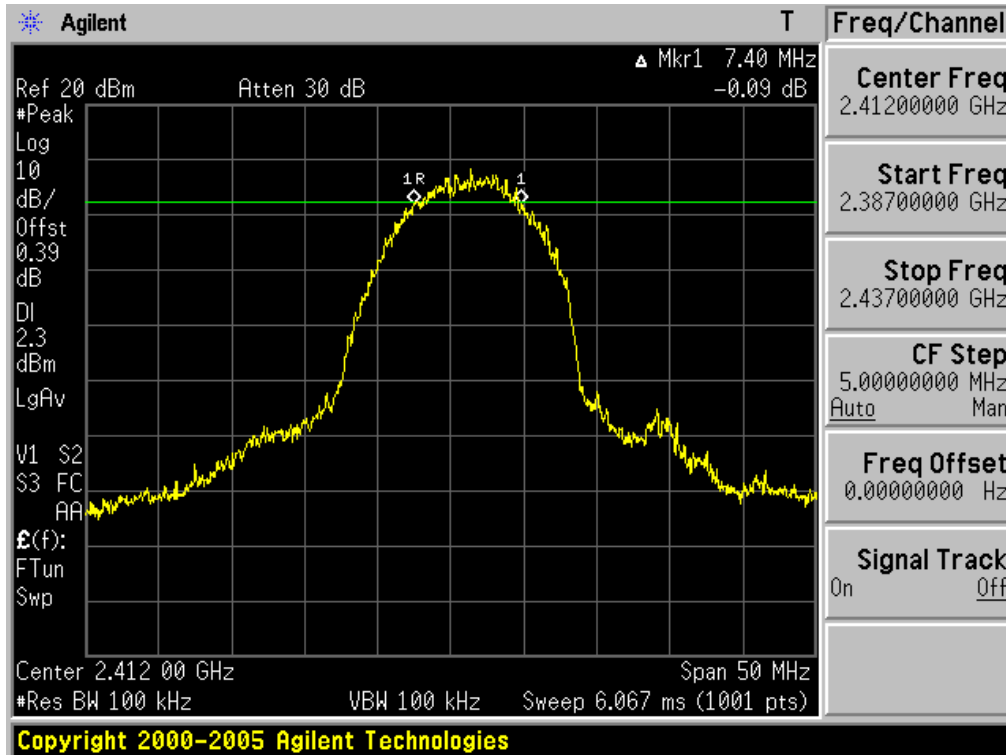
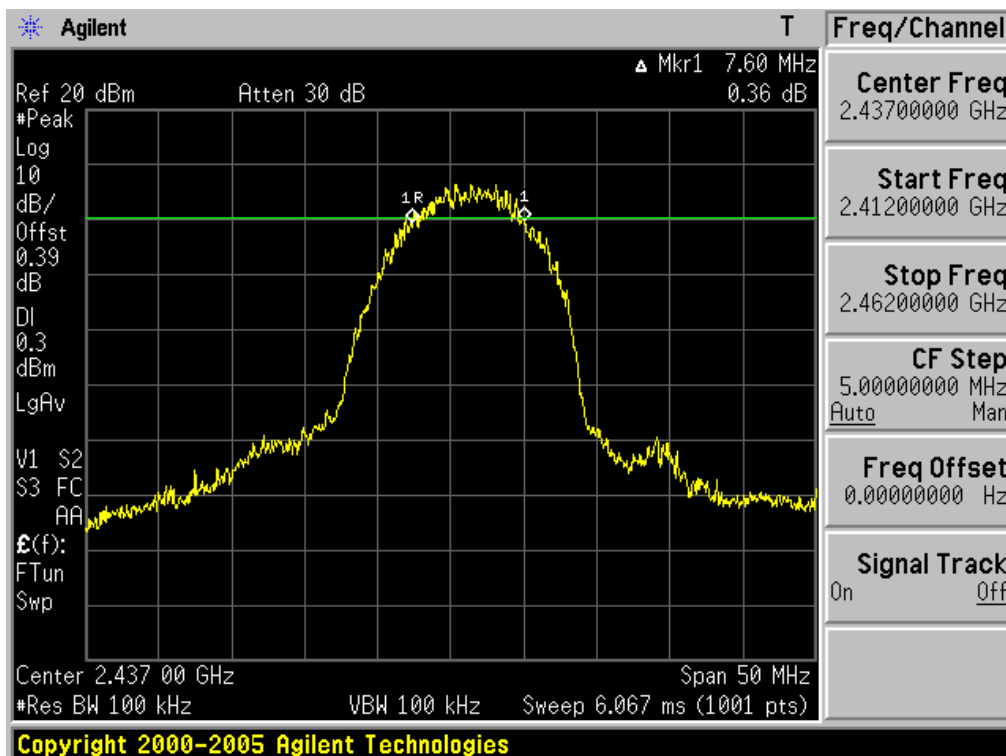
Test Mode	Frequency	Transmitting Antenna	Test Results (MHz)
802.11b	Lowest	Ant 2	7.40
	Middle	Ant 2	7.60
	Highest	Ant 2	8.20
802.11g	Lowest	Ant 1	15.80
	Middle	Ant 1	15.80
	Highest	Ant 1	15.80
802.11n HT20	Lowest	Ant 1	17.05
	Middle	Ant 1	15.80
	Highest	Ant 1	15.20

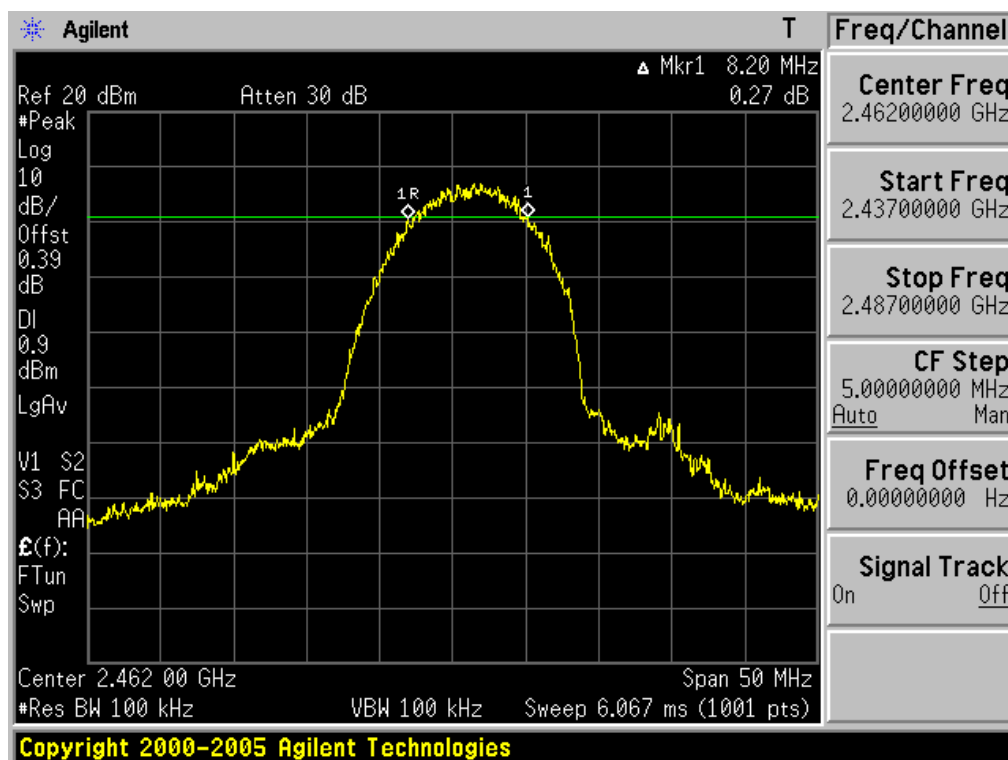
Note 1: This test item was tested at Ant 1 and at Ant 2. And the worst case data were reported.

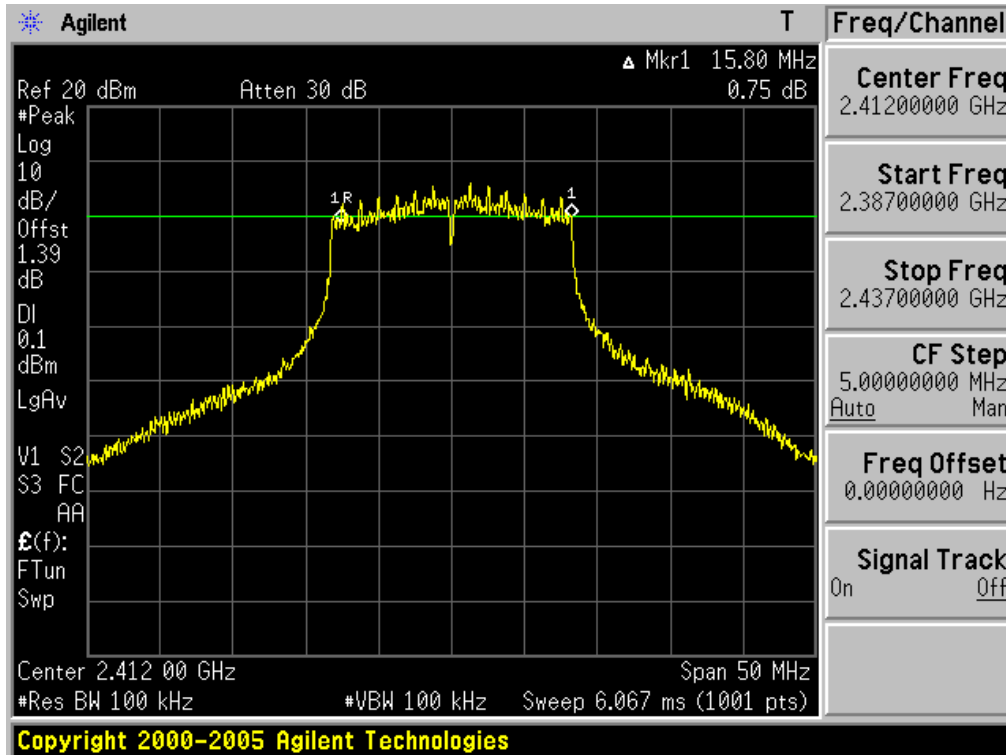
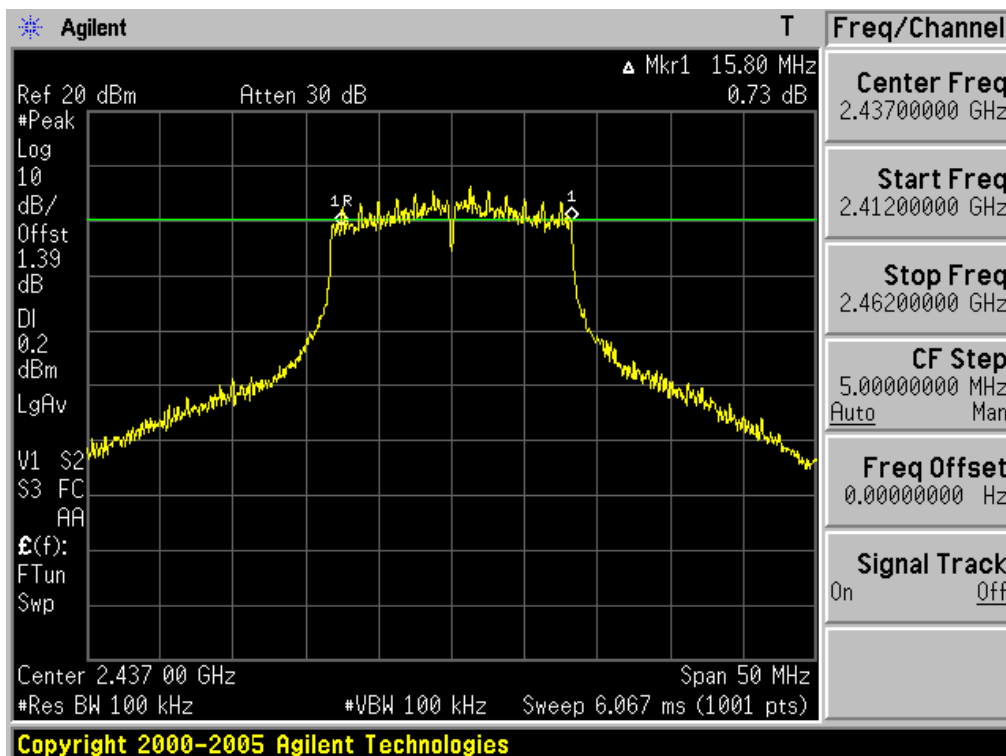
Note 2: See next pages for actual measured spectrum plots.

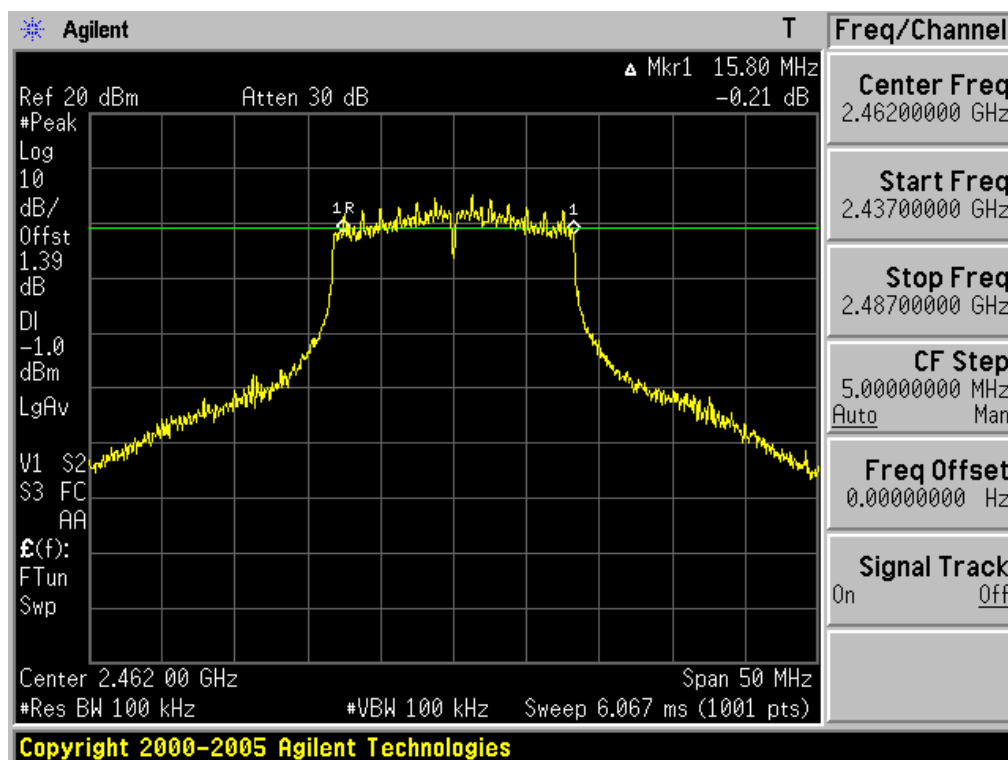
- Minimum Standard:

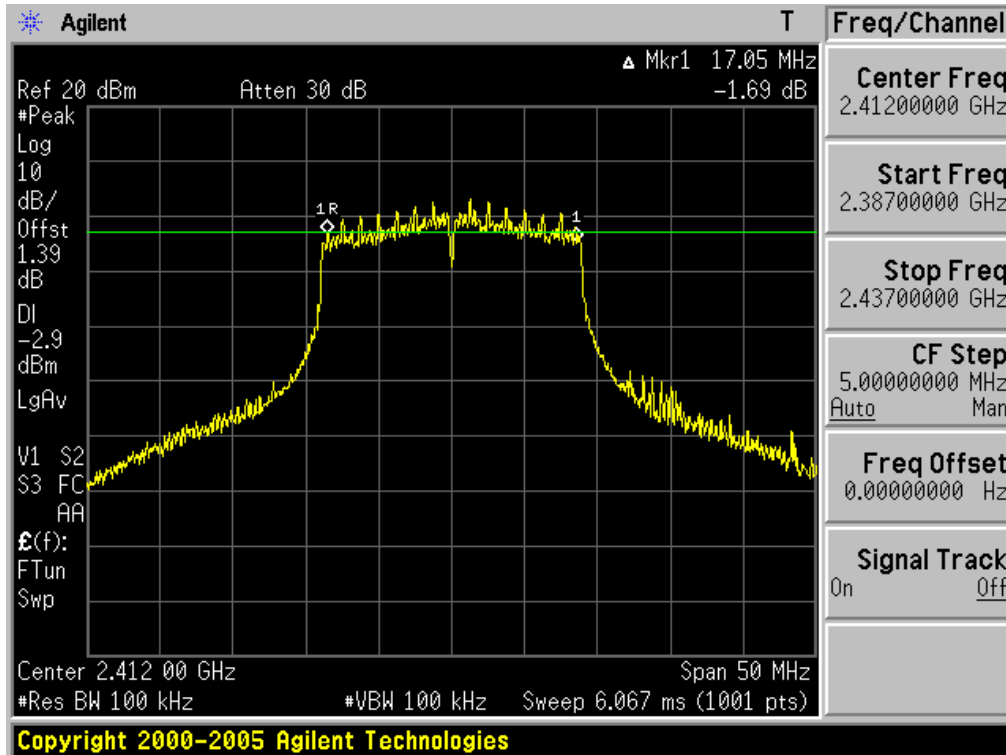
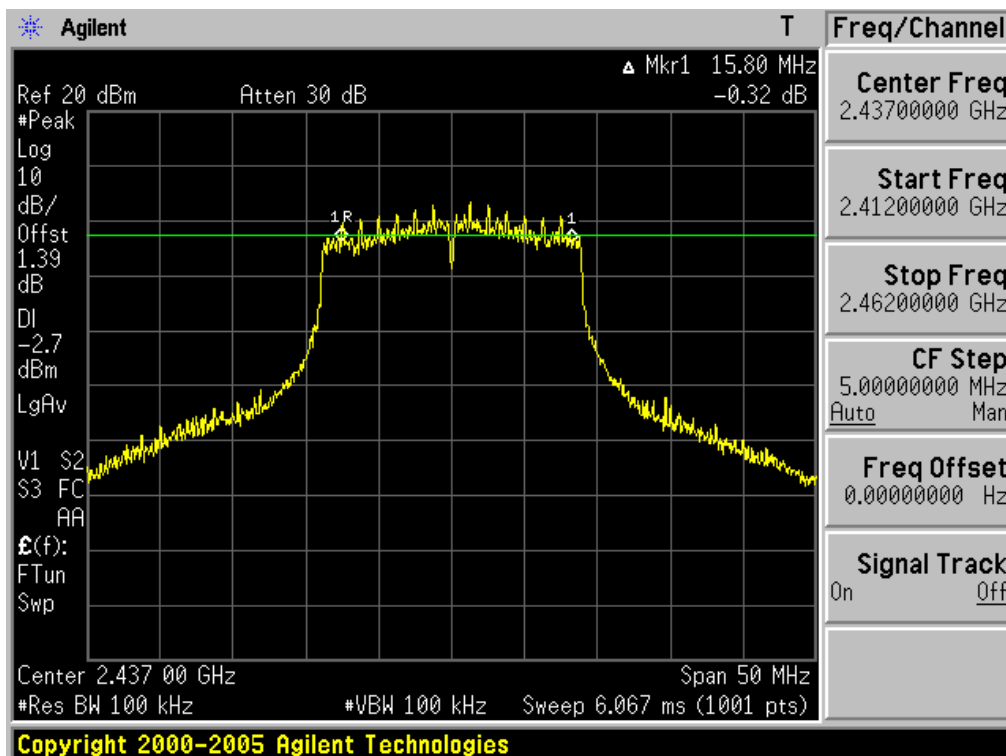
The minimum 6 dB bandwidth shall be at least 500 kHz

6 dB Bandwidth Ant 2 & Test Mode: 802.11b & Lowest Frequency

6 dB Bandwidth Ant 2 & Test Mode: 802.11b & Middle Frequency


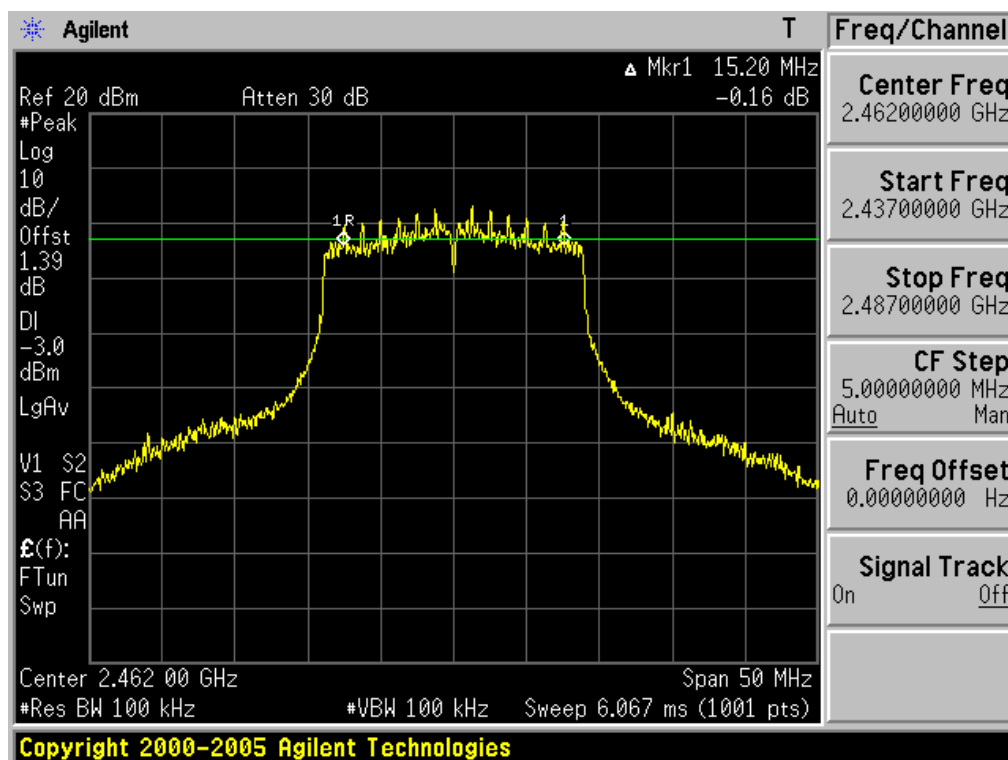
6 dB Bandwidth Ant 2 & Test Mode: 802.11b & Highest Frequency


6 dB Bandwidth Ant 1 & Test Mode: 802.11g & Lowest Frequency

6 dB Bandwidth Ant 1 & Test Mode: 802.11g & Middle Frequency


6 dB Bandwidth Ant 1 & Test Mode: 802.11b & Highest Frequency


6 dB Bandwidth Ant 1 & Test Mode: 802.11 HT20 & Lowest Frequency

6 dB Bandwidth Ant 1 & Test Mode: 802.11 HT20 & Middle Frequency


6 dB Bandwidth Ant 1 & Test Mode: 802.11n HT20 & Highest Frequency



3.2.2 Peak Output Power

- Test Procedure and Spectrum Analyzer setting:

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

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

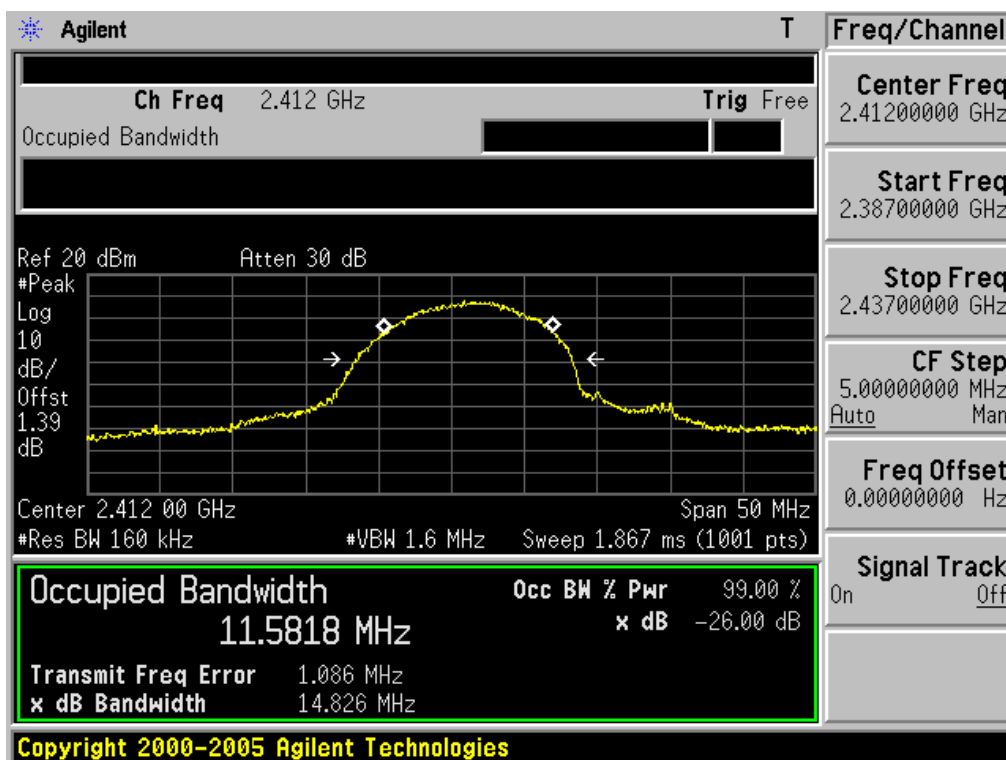
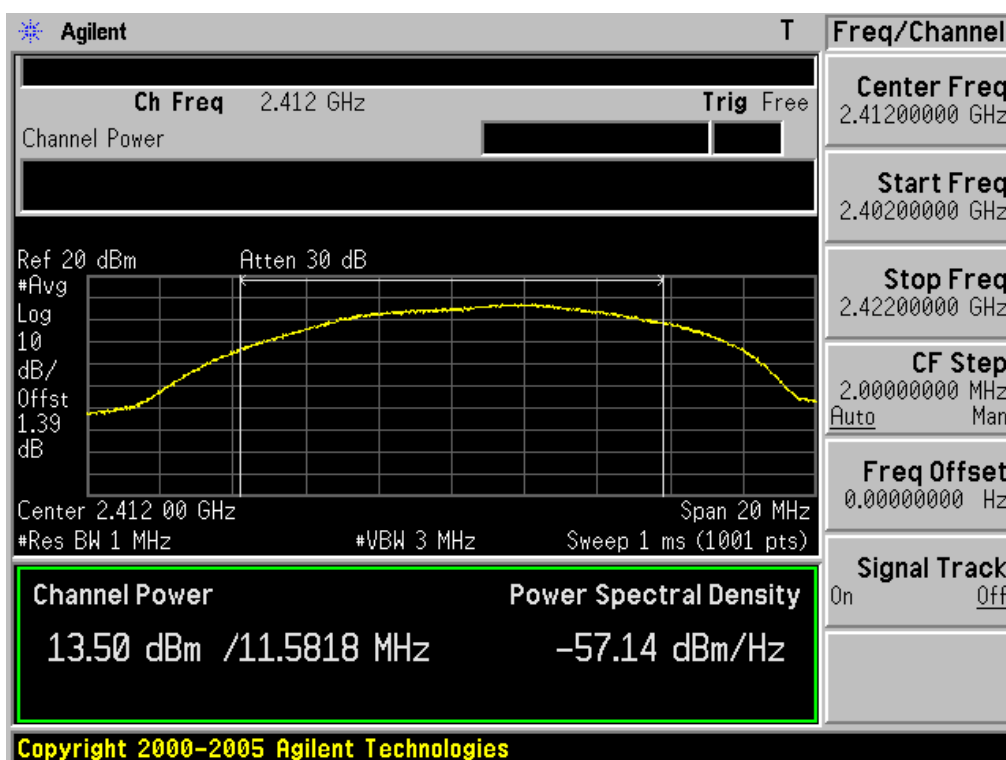
The test is performed in accordance with FCC document "Measurement of Digital Transmission Systems Operating under Section 15.247", March 23, 2005. The transmitter operates continuously therefore Power Output Option 2, Method #1 is used.

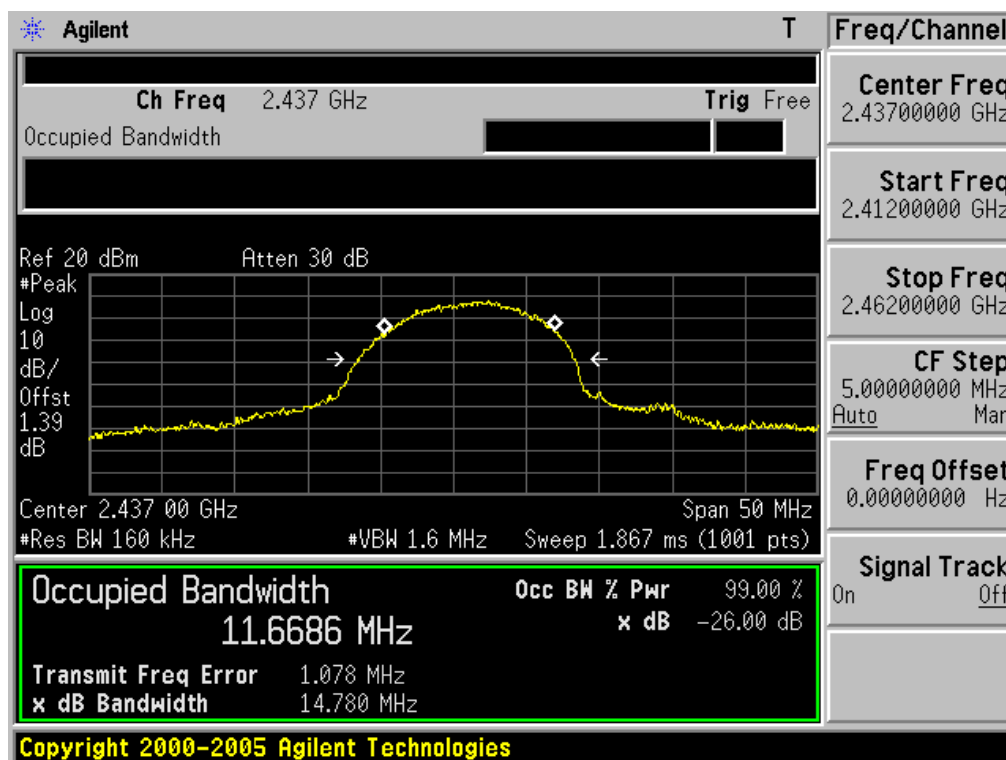
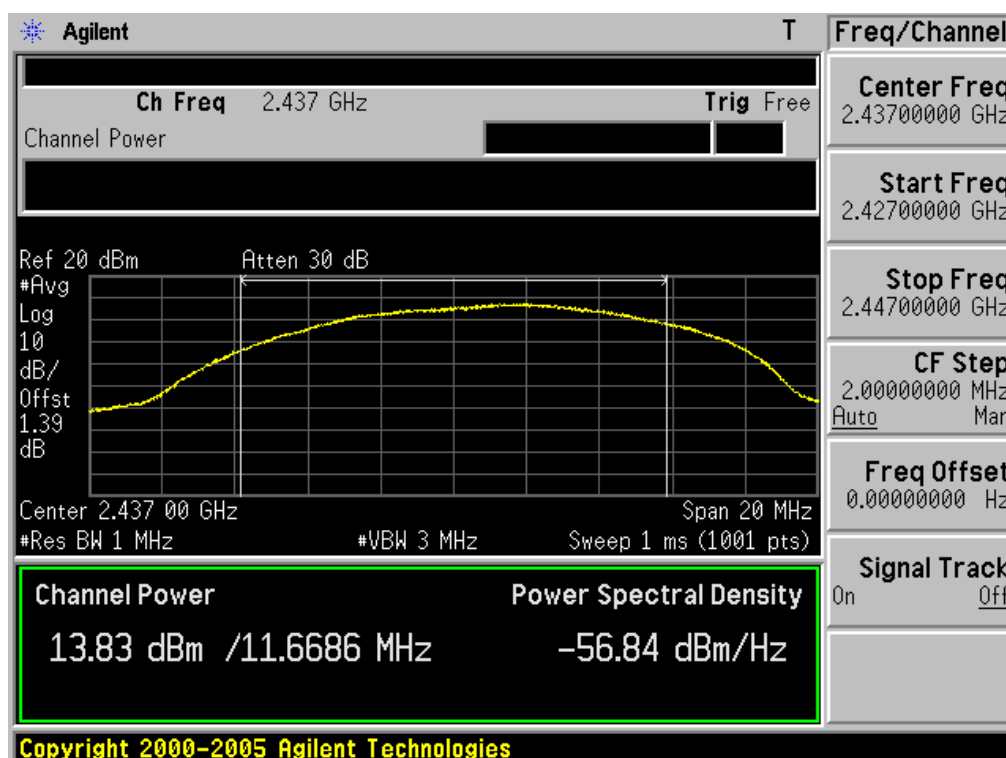
- Measurement Data: Comply

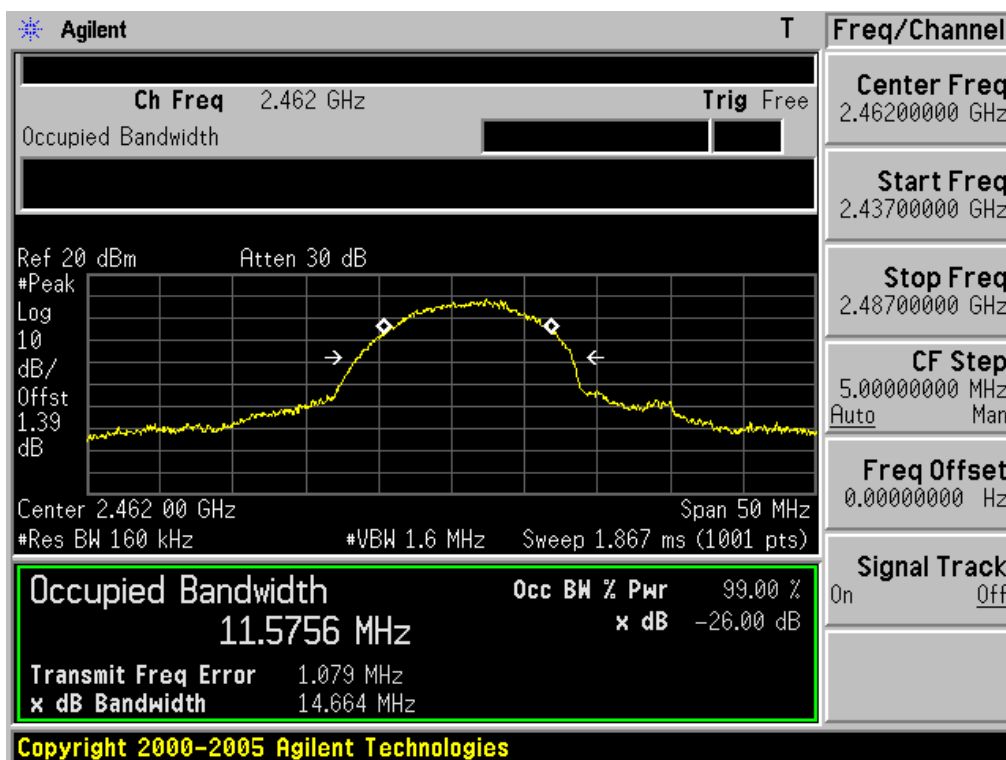
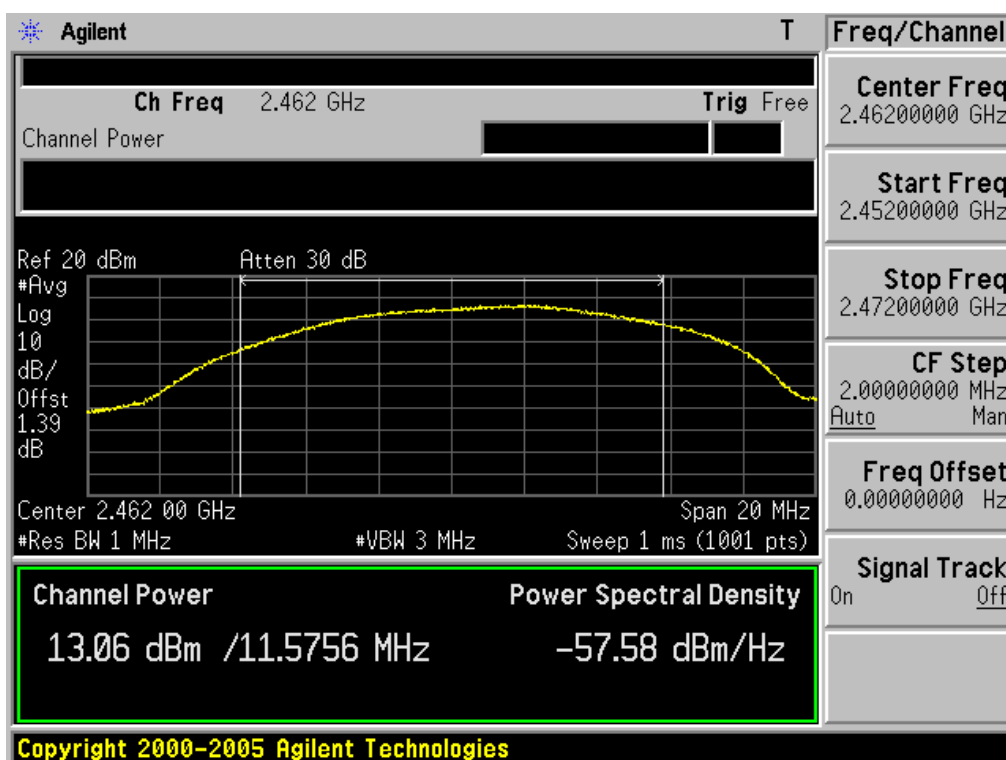
Test Mode	Frequency	Test Results			
		Ant 1		Ant 2	
		dBm	W	dBm	W
802.11b	Lowest	13.50	0.0224	14.08	0.0256
	Middle	13.83	0.0242	14.13	0.0259
	Highest	13.06	0.0202	15.15	0.0327
802.11g	Lowest	13.16	0.0207	13.47	0.0222
	Middle	13.74	0.0237	13.92	0.0247
	Highest	12.84	0.0192	13.11	0.0205
802.11n HT20	Lowest	10.11	0.0103	10.69	0.0117
	Middle	10.26	0.0106	10.44	0.0111
	Highest	10.66	0.0116	10.69	0.0117

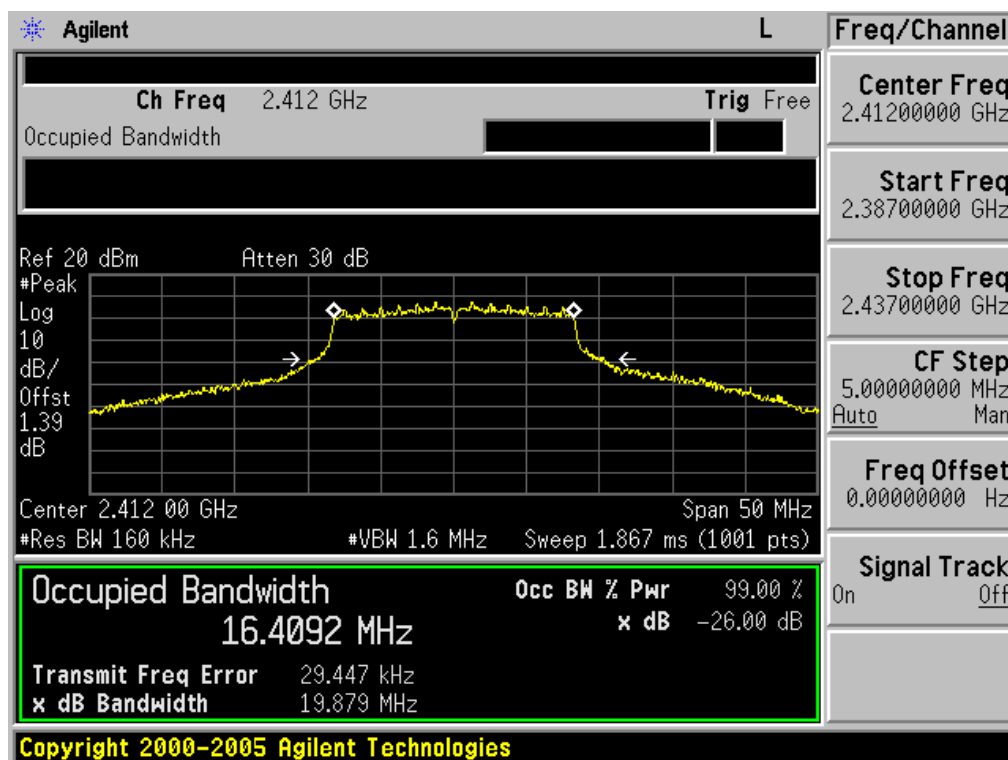
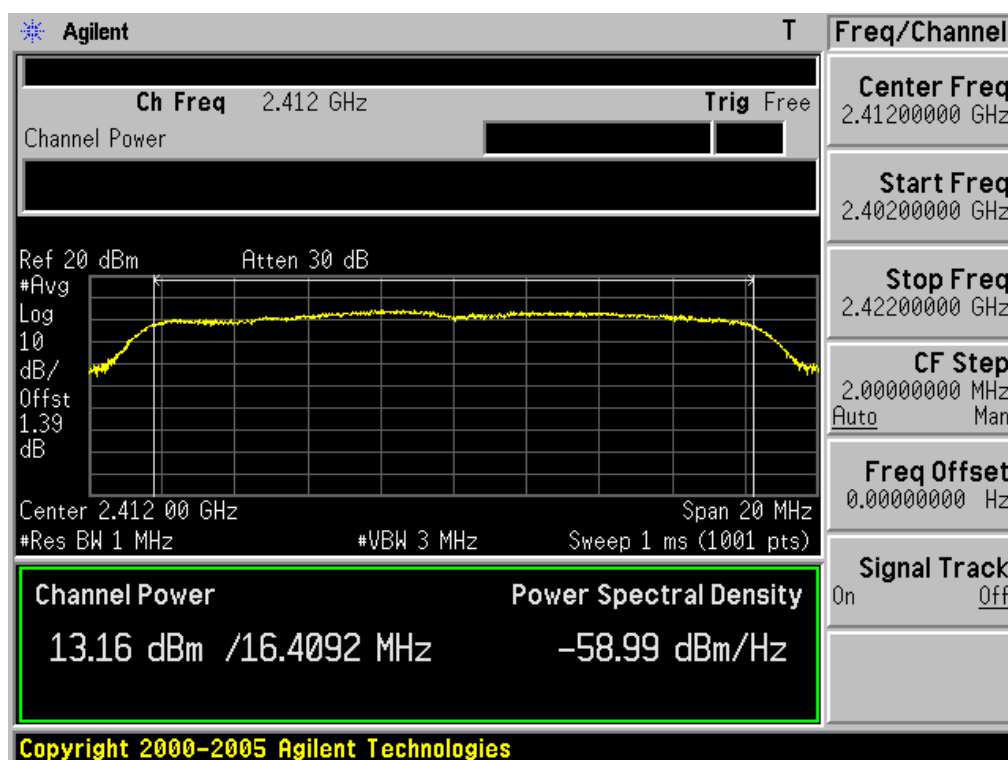
Note 1: See next pages for actual measured spectrum plots.

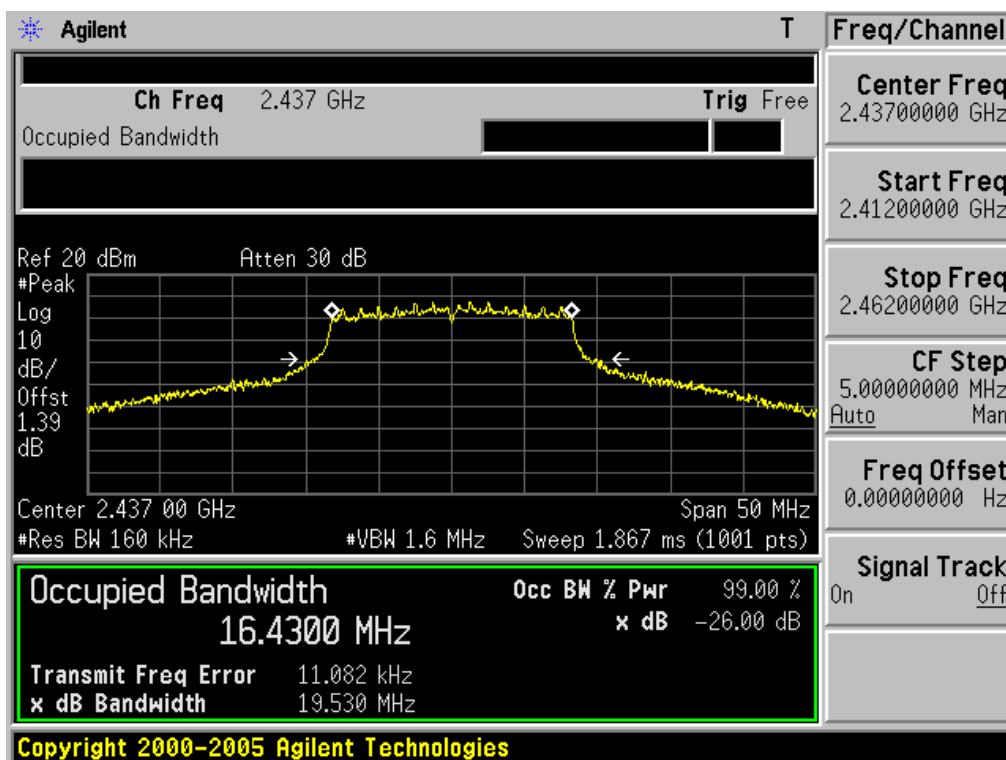
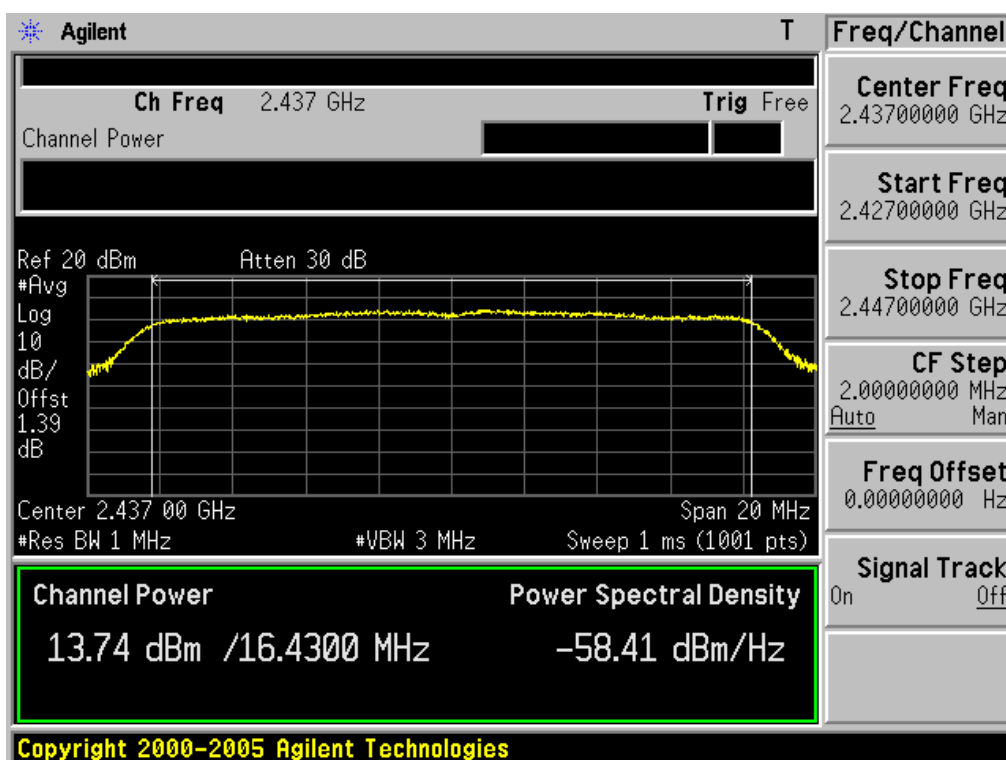
Minimum Standard:	< 1W
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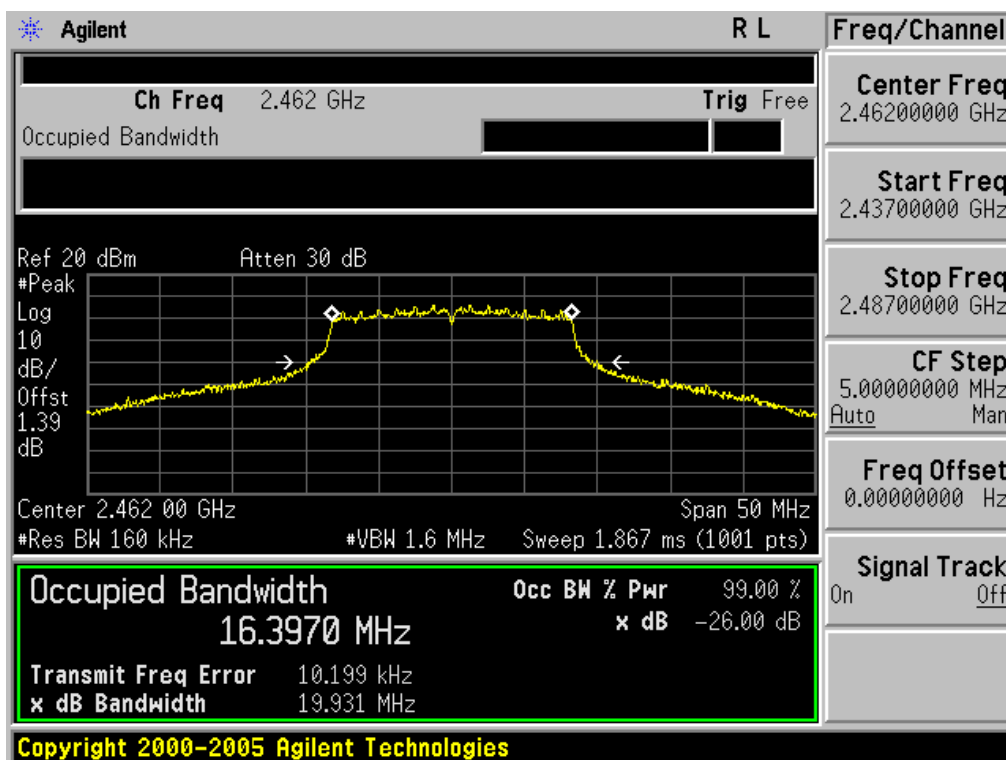
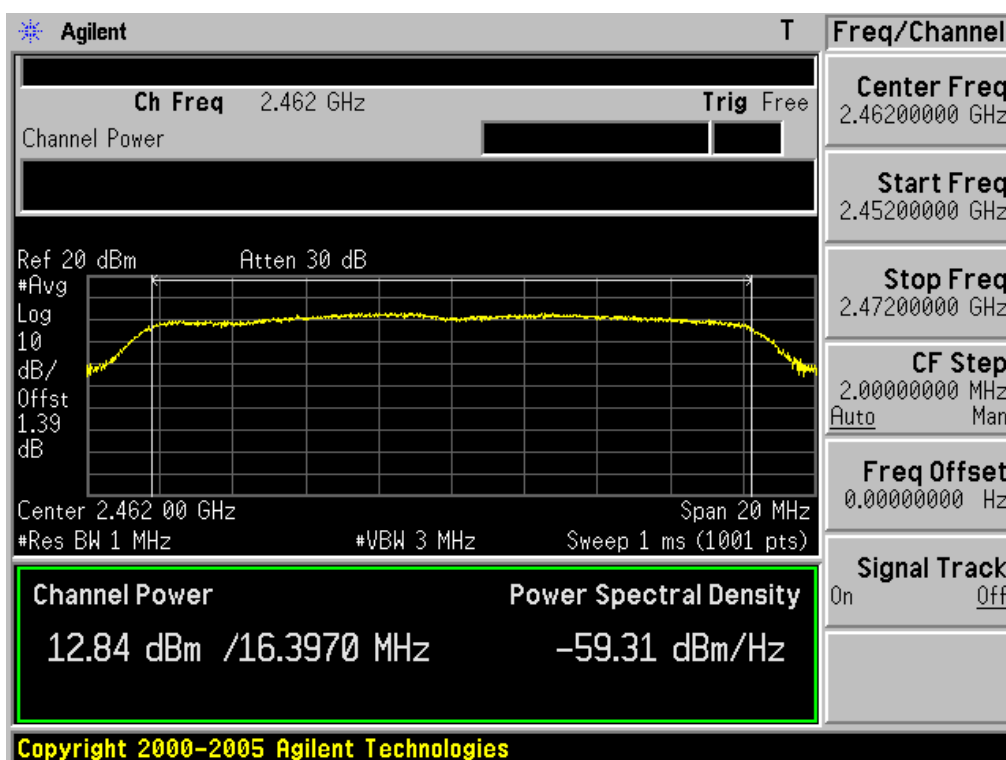
26 dB Bandwidth Ant 1 & Test Mode: 802.11b & Lowest Frequency

Peak Output Power Ant 1 & Test Mode: 802.11b & Lowest Frequency


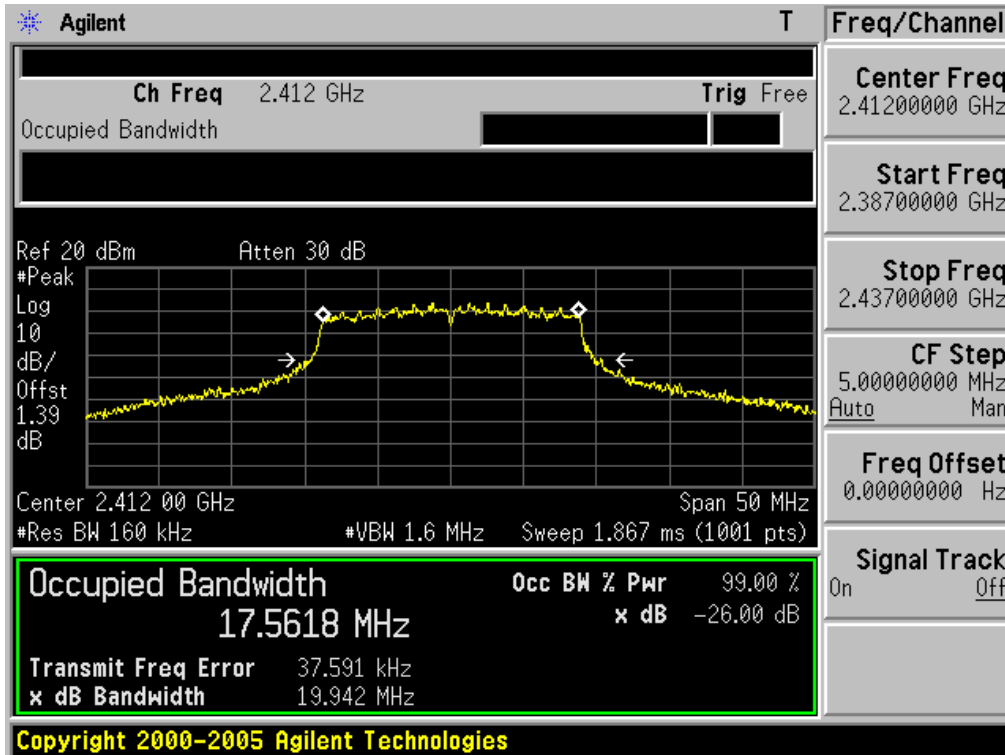
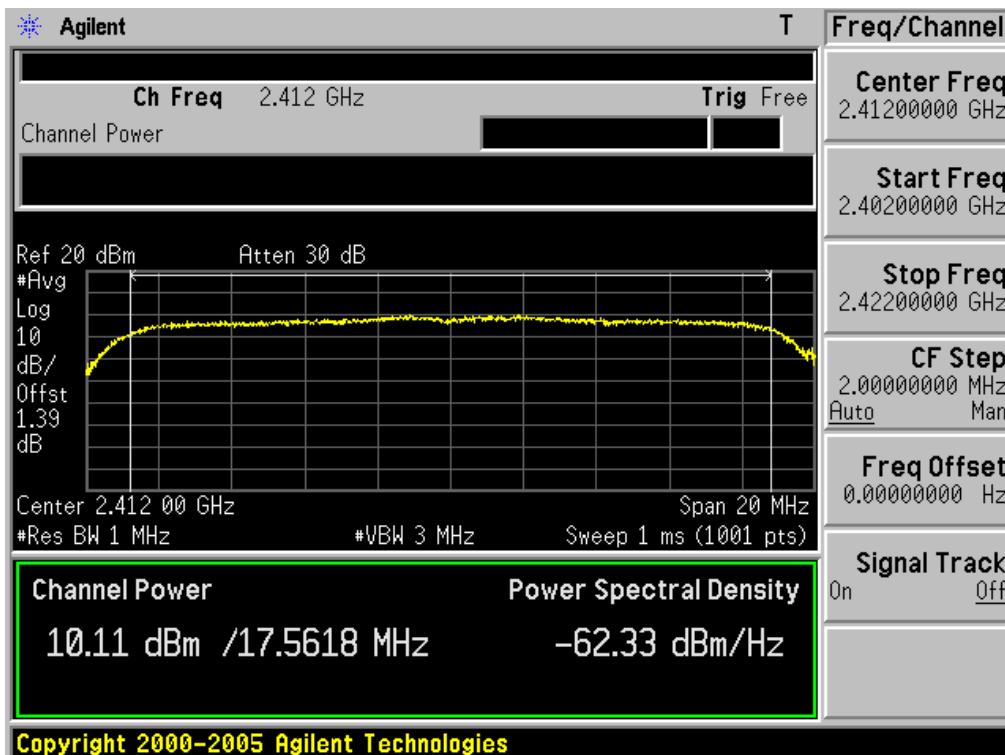
26 dB Bandwidth Ant 1 & Test Mode: 802.11b & Middle Frequency

Peak Output Power Ant 1 & Test Mode: 802.11b & Middle Frequency


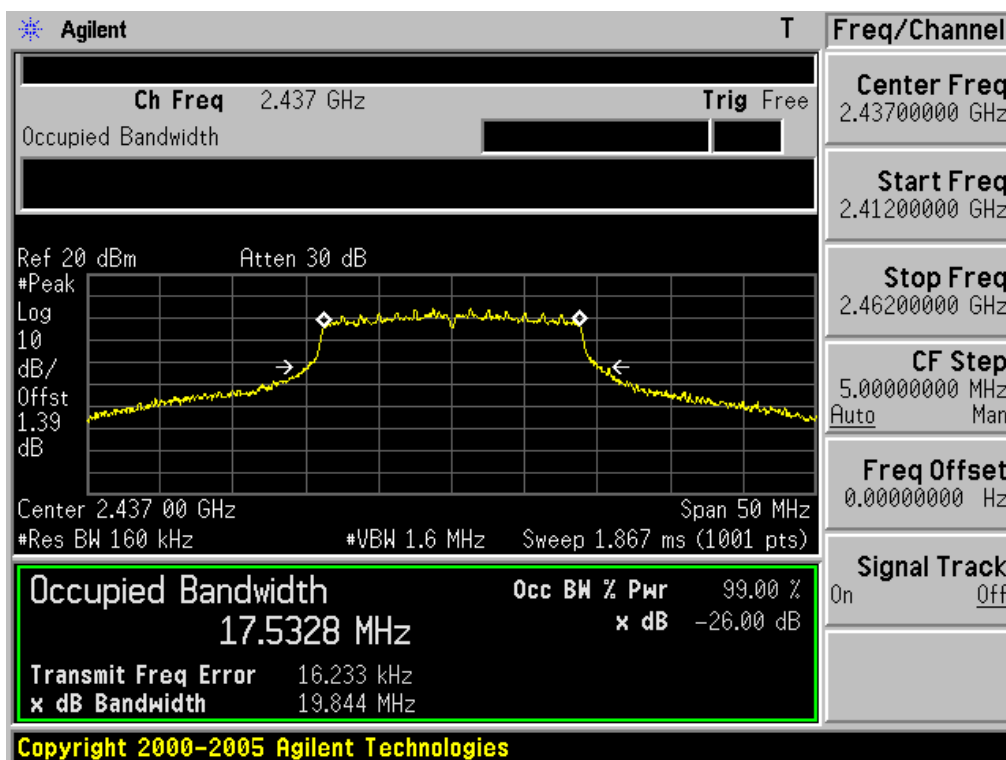
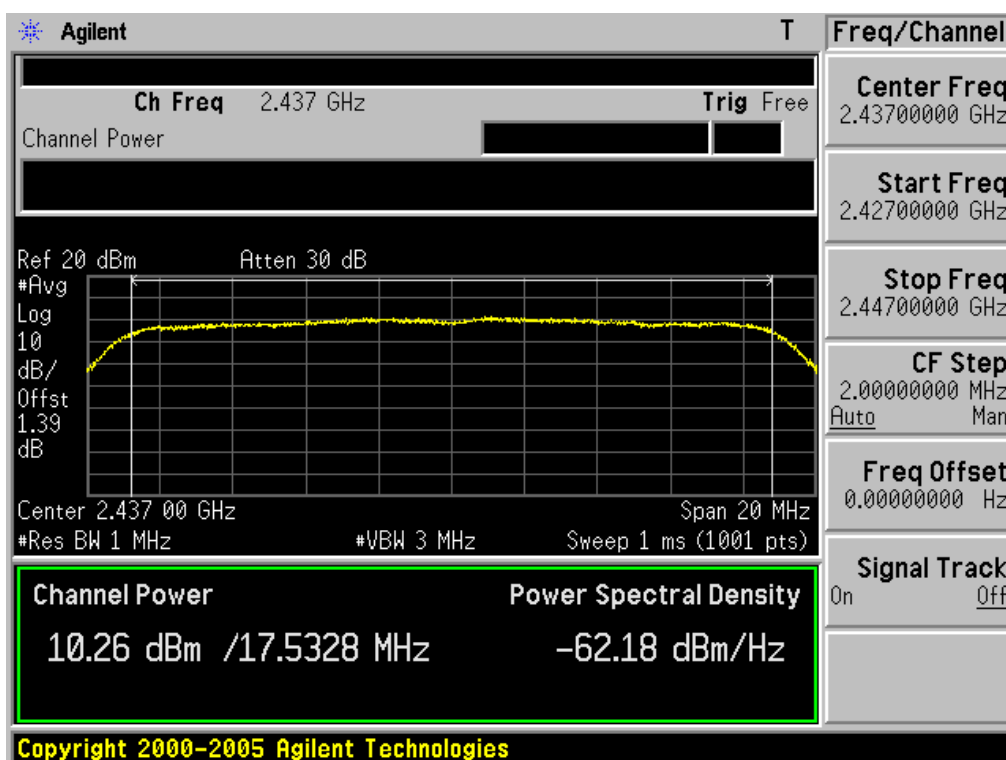
26 dB Bandwidth Ant 1 & Test Mode: 802.11b & Highest Frequency

Peak Output Power Ant 1 & Test Mode: 802.11b & Highest Frequency


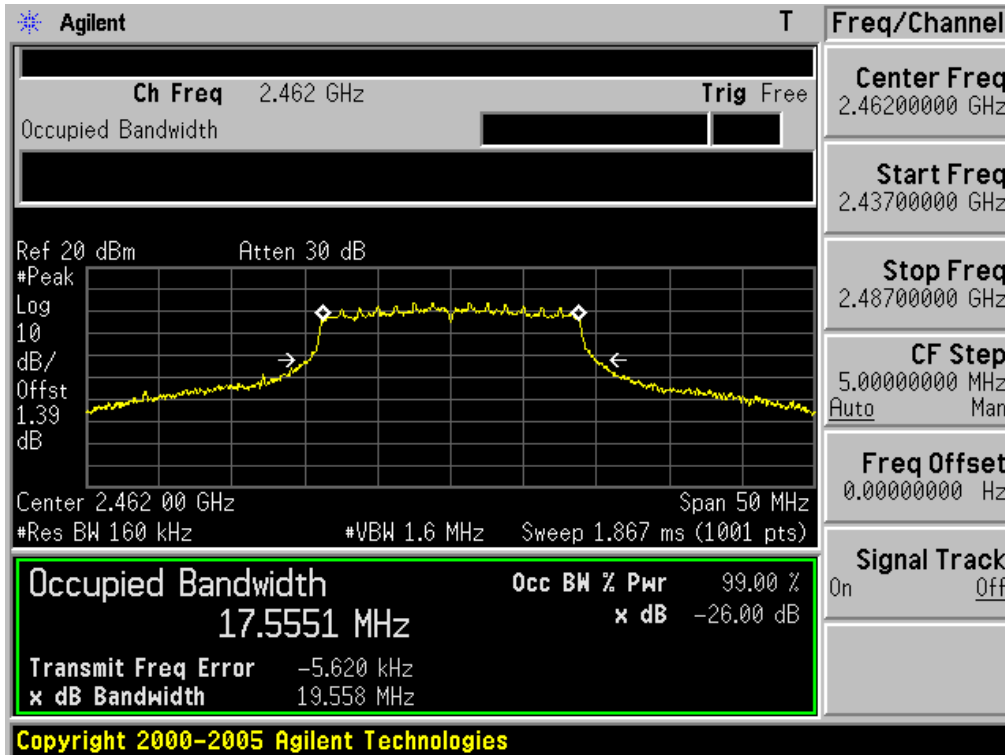
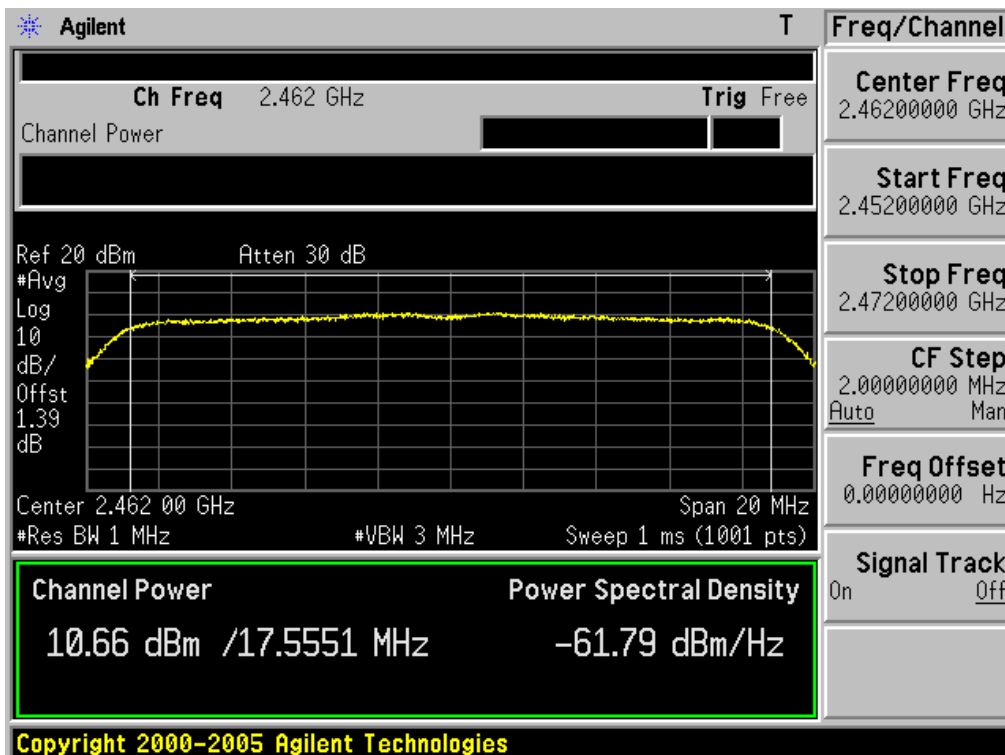
26 dB Bandwidth Ant 1 & Test Mode: 802.11g & Lowest Frequency

Peak Output Power Ant 1 & Test Mode: 802.11g & Lowest Frequency


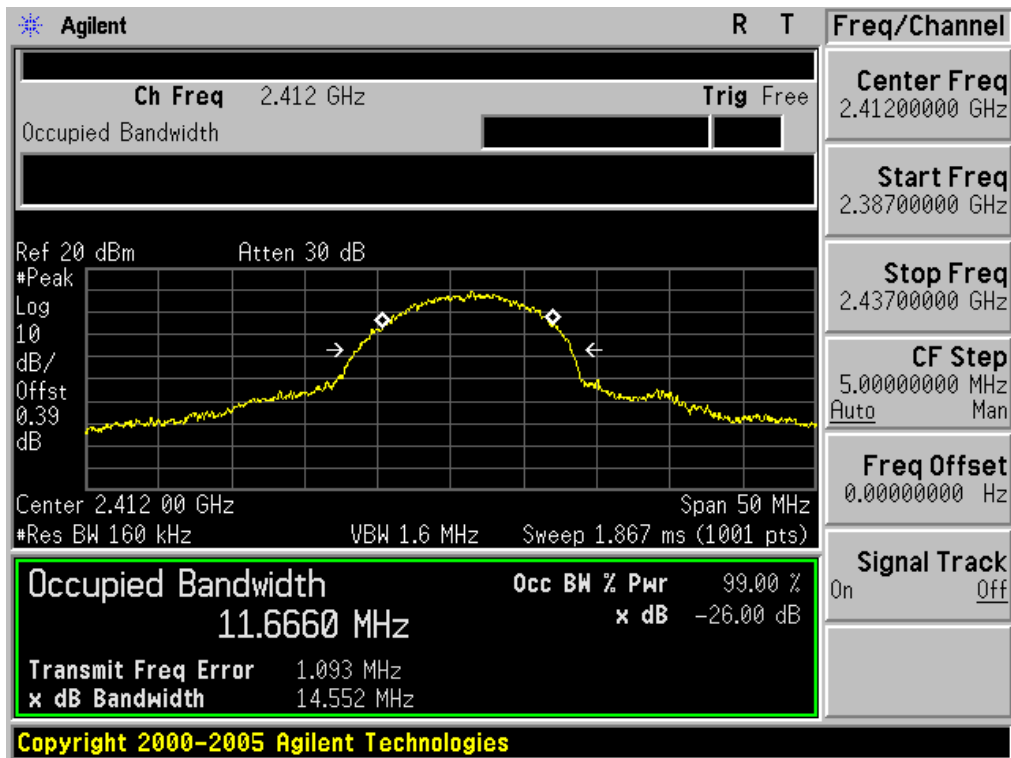
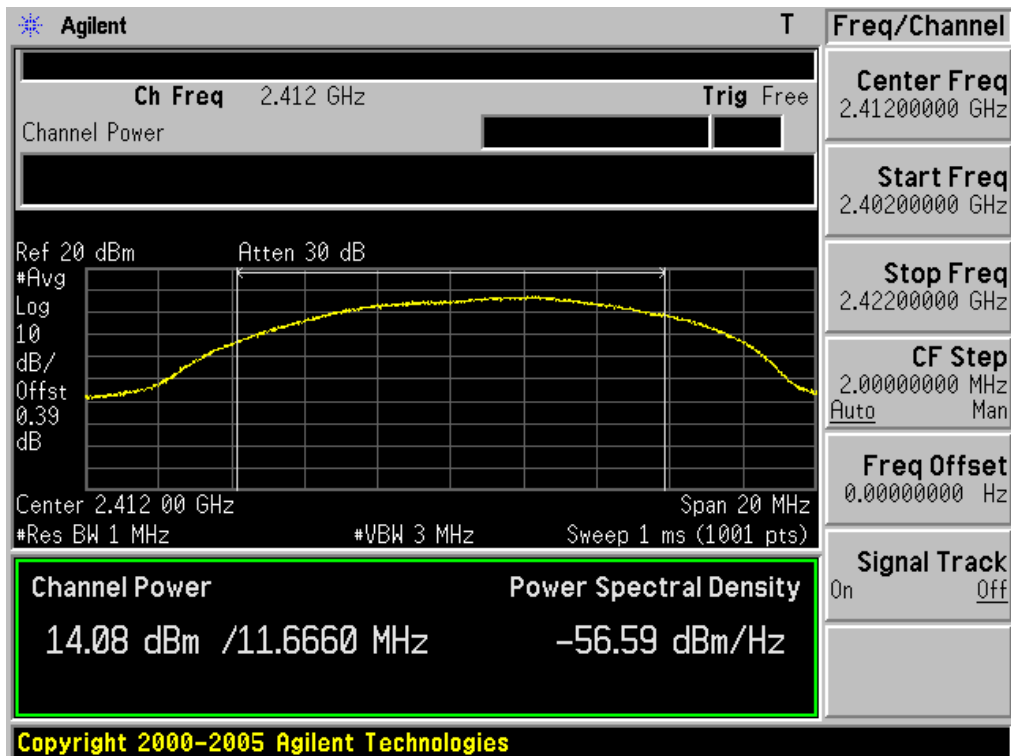
26 dB Bandwidth Ant 1 & Test Mode: 802.11g & Middle Frequency

Peak Output Power Ant 1 & Test Mode: 802.11g & Middle Frequency


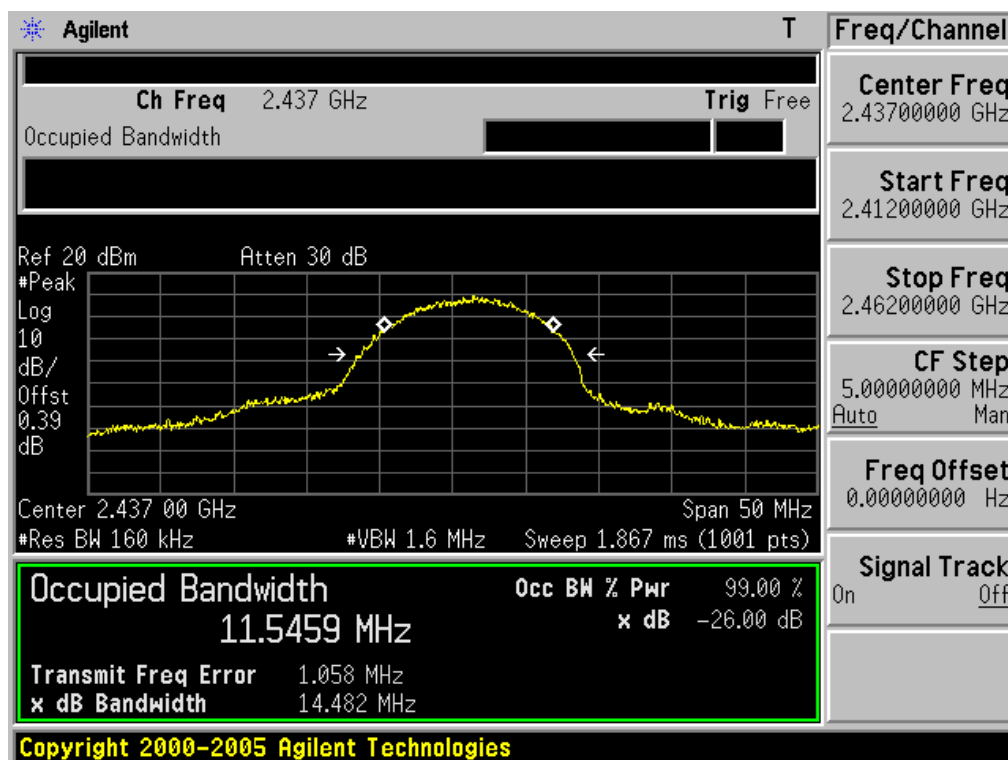
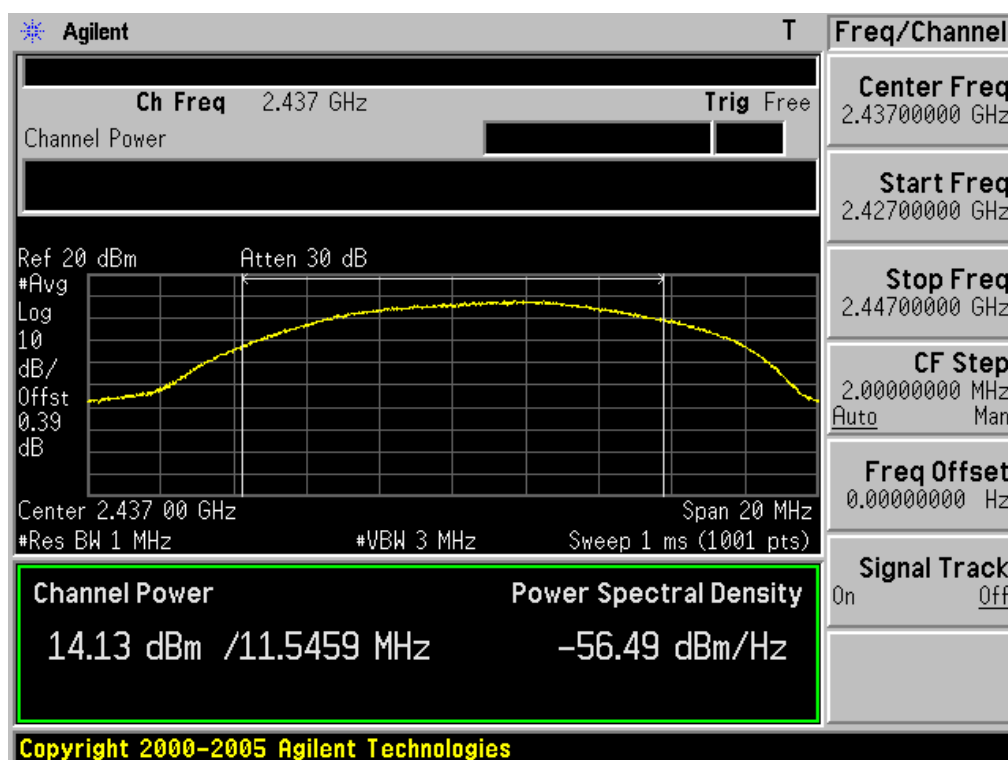
26 dB Bandwidth Ant 1 & Test Mode: 802.11g & Highest Frequency

Peak Output Power Ant 1 & Test Mode: 802.11g & Highest Frequency


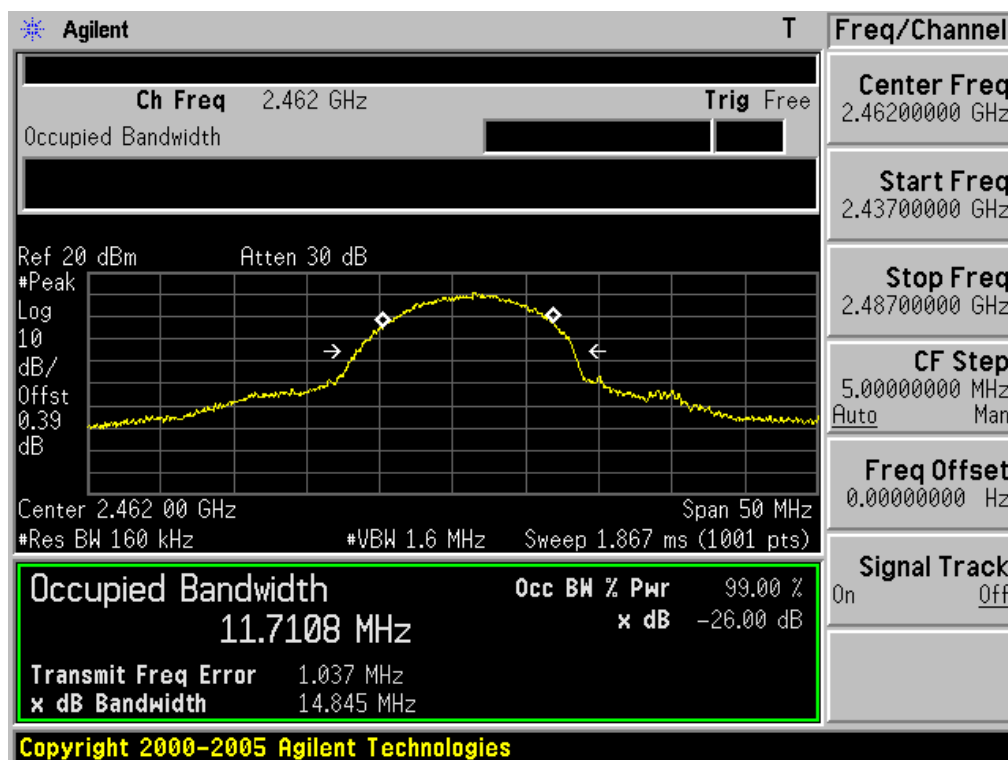
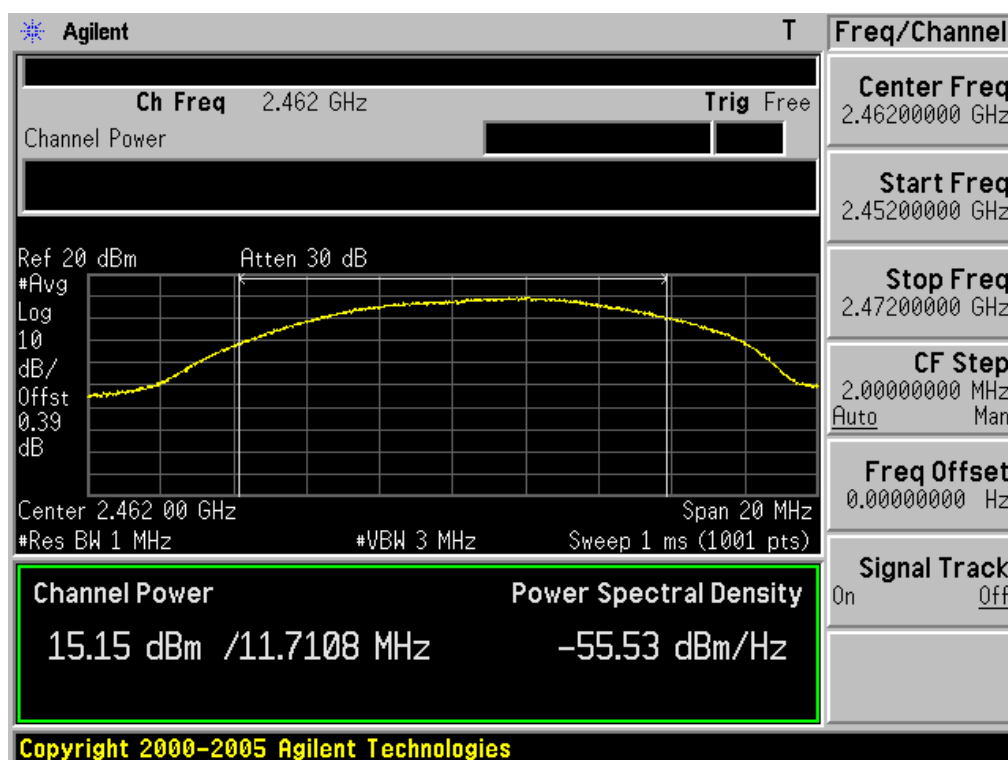
26 dB Bandwidth Ant 1 & Test Mode: 802.11n HT20 & Lowest Frequency

Peak Output Power Ant 1 & Test Mode: 802.11n HT20 & Lowest Frequency


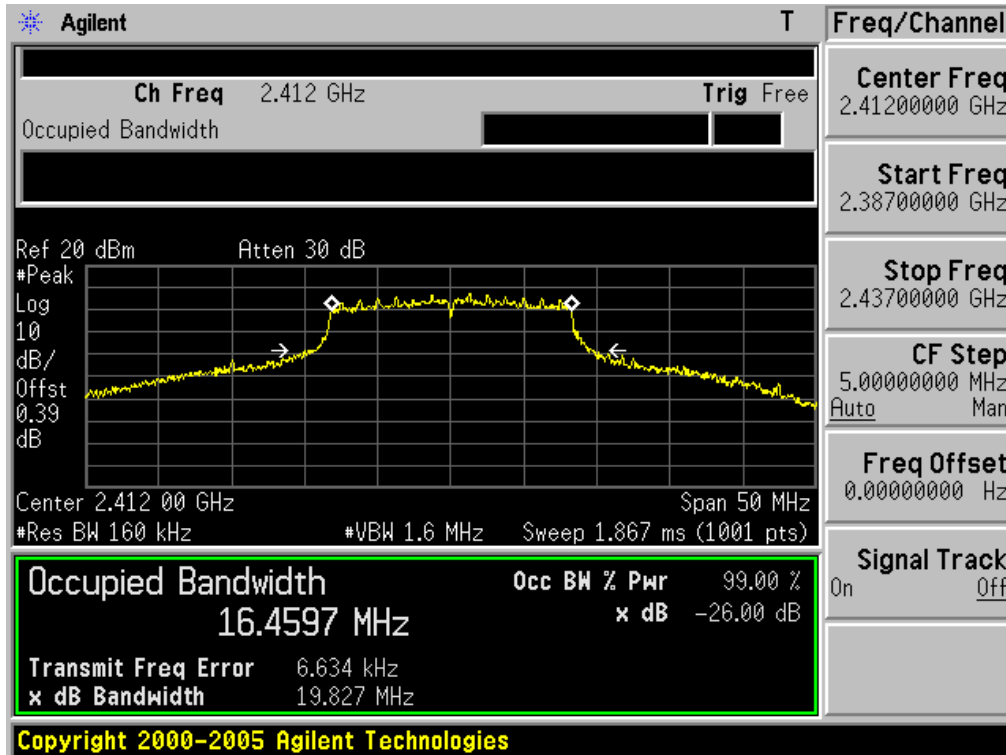
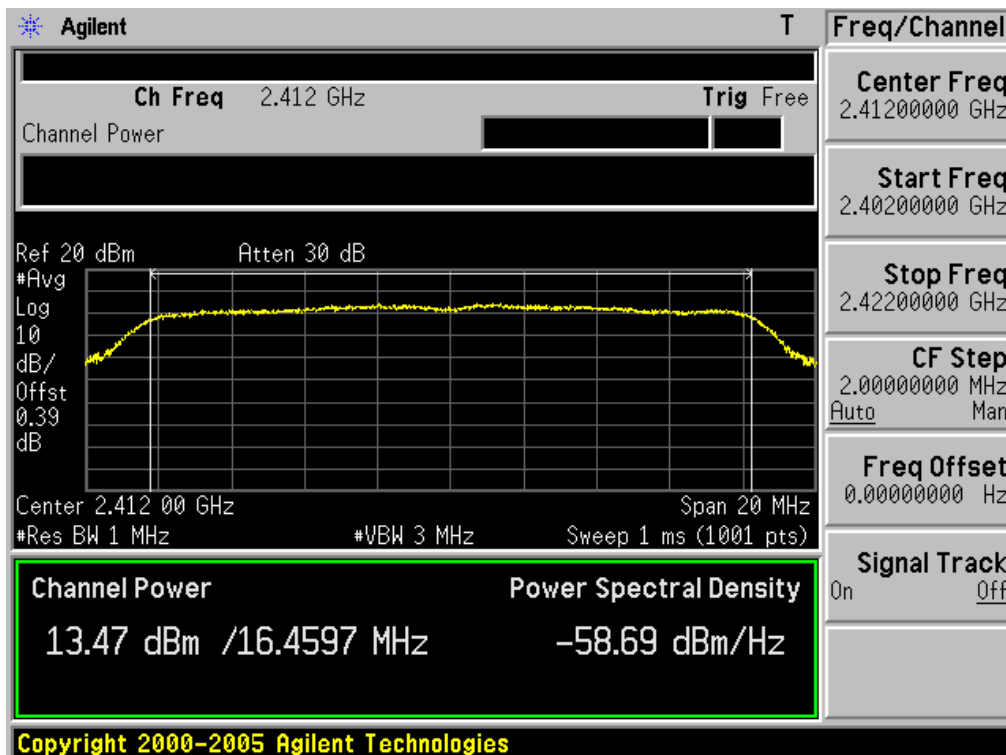
26 dB Bandwidth Ant 1 & Test Mode: 802.11n HT20 & Middle Frequency

Peak Output Power Ant 1 & Test Mode: 802.11n HT20 & Middle Frequency


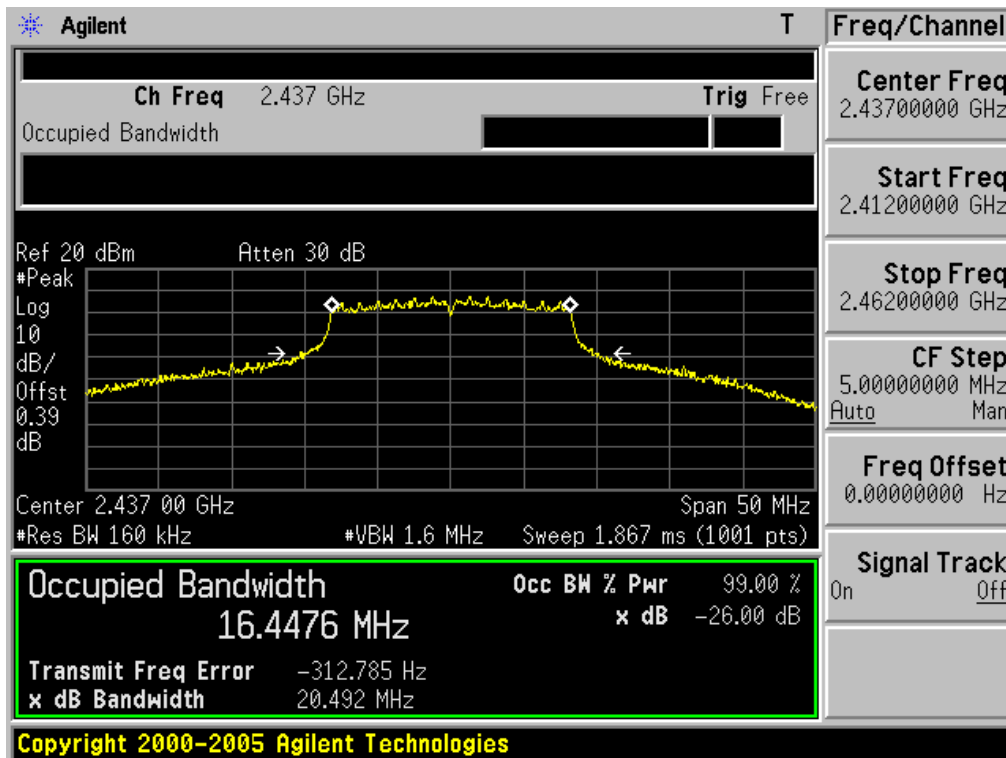
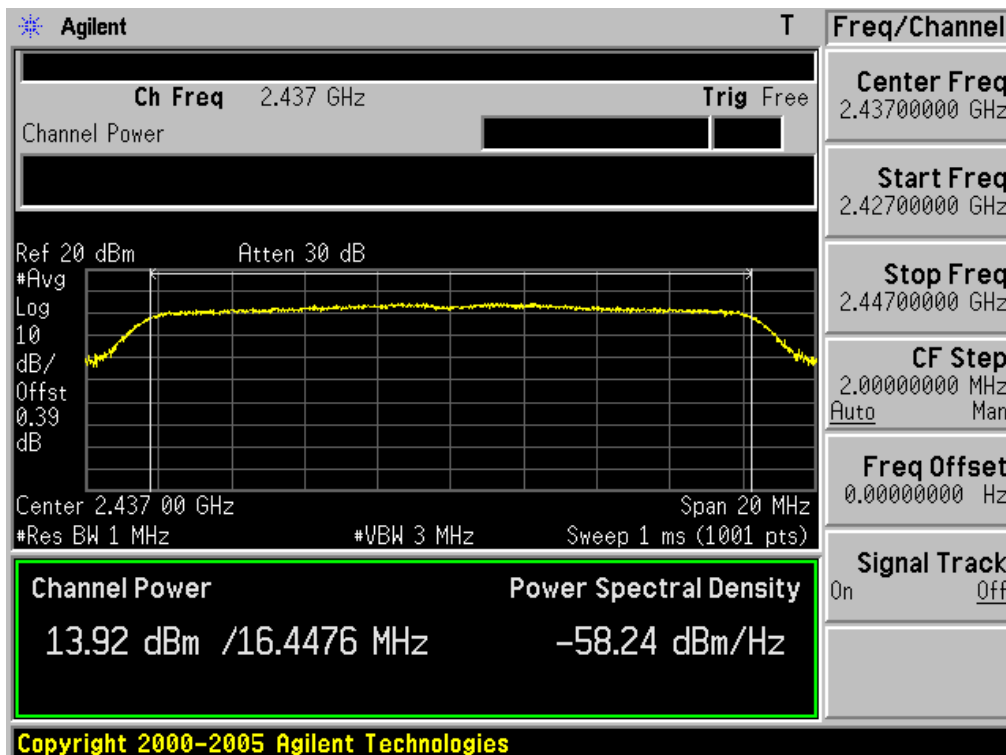
26 dB Bandwidth Ant 1 & Test Mode: 802.11n HT20 & Highest Frequency

Peak Output Power Ant 1 & Test Mode: 802.11n HT20 & Highest Frequency


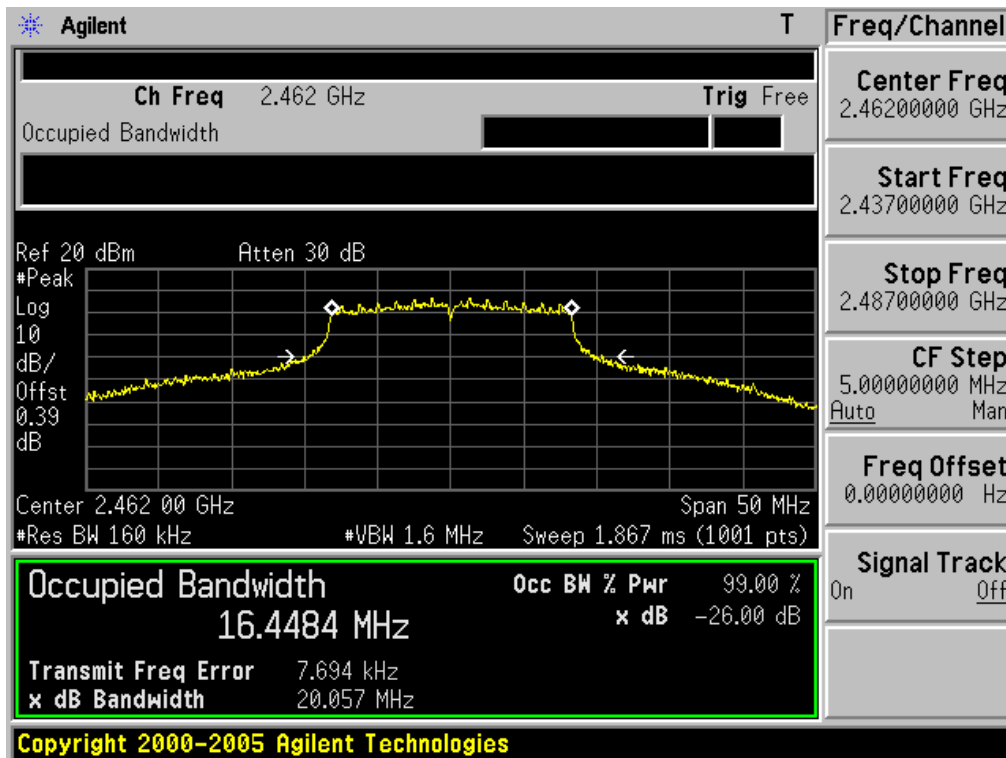
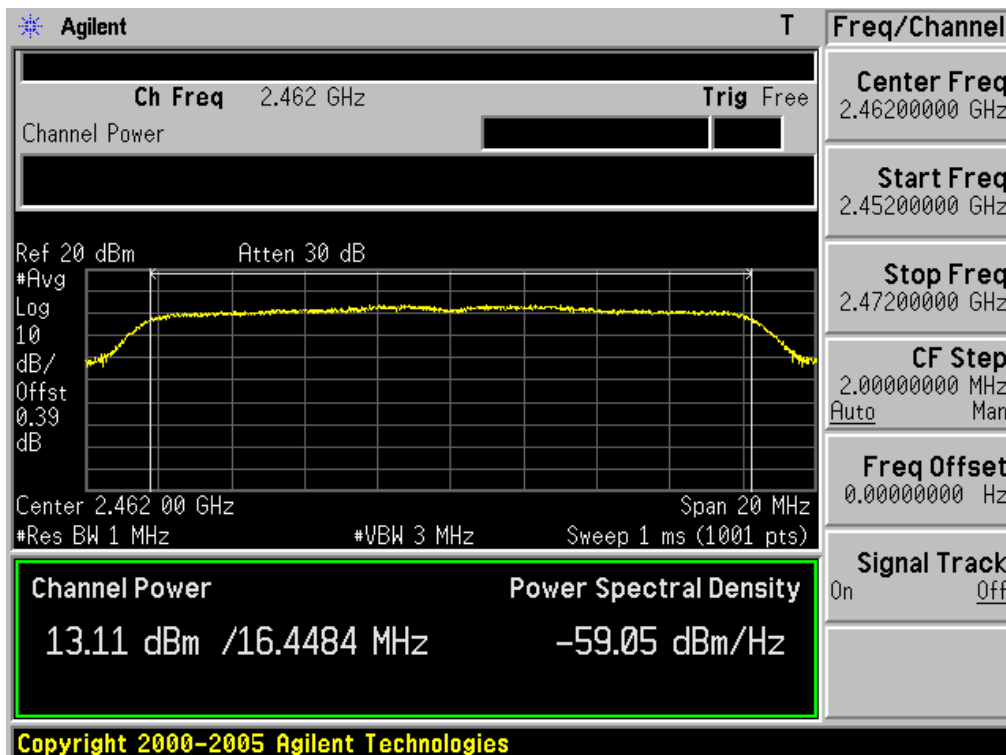
26 dB Bandwidth Ant 2 & Test Mode: 802.11b & Lowest Frequency

Peak Output Power Ant 2 & Test Mode: 802.11b & Lowest Frequency


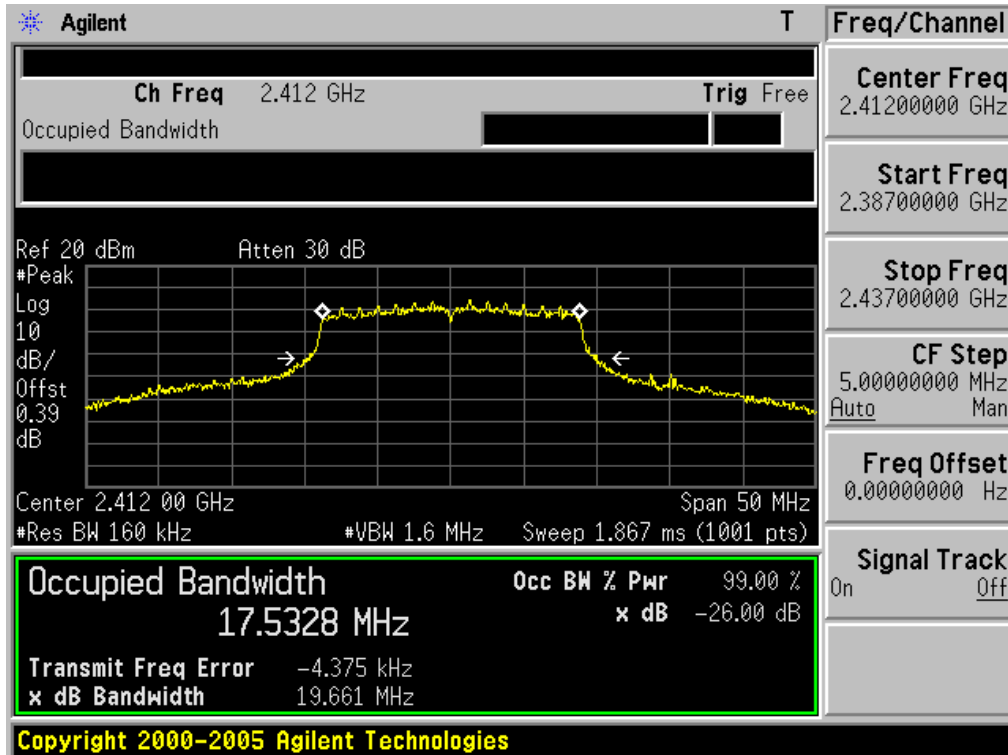
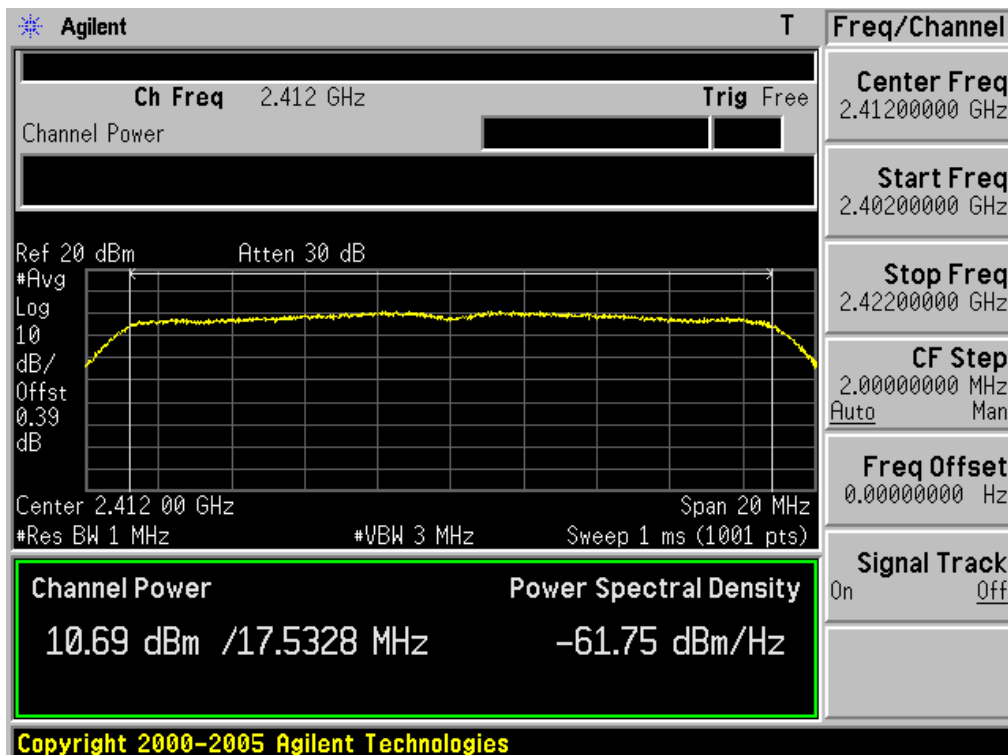
26 dB Bandwidth Ant 2 & Test Mode: 802.11b & Middle Frequency

Peak Output Power Ant 2 & Test Mode: 802.11b & Middle Frequency


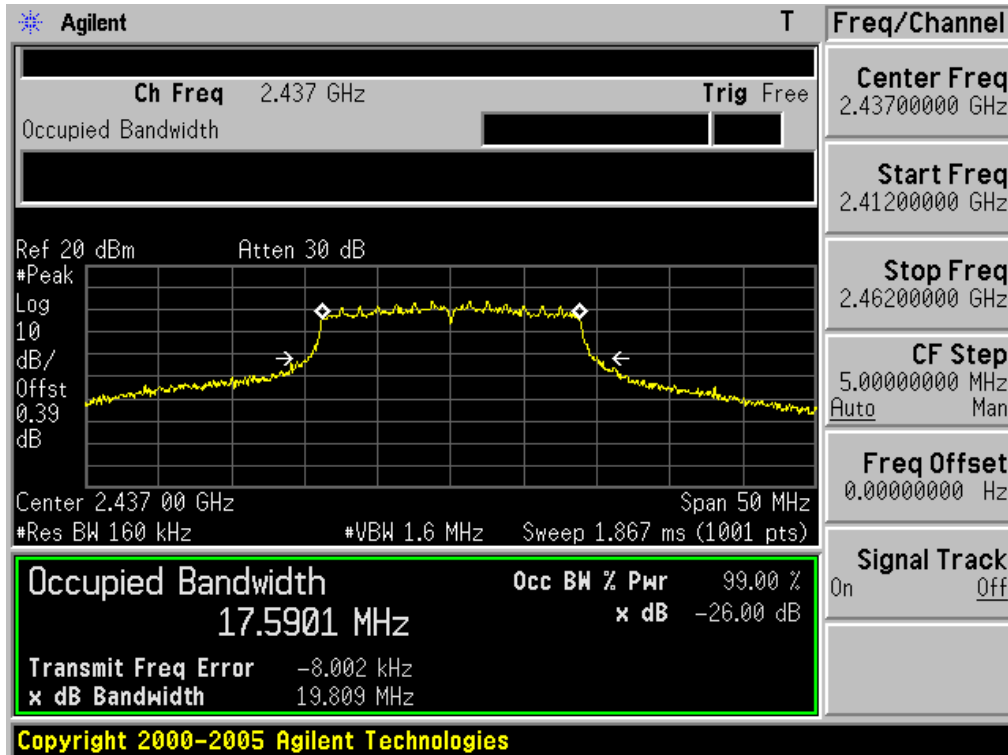
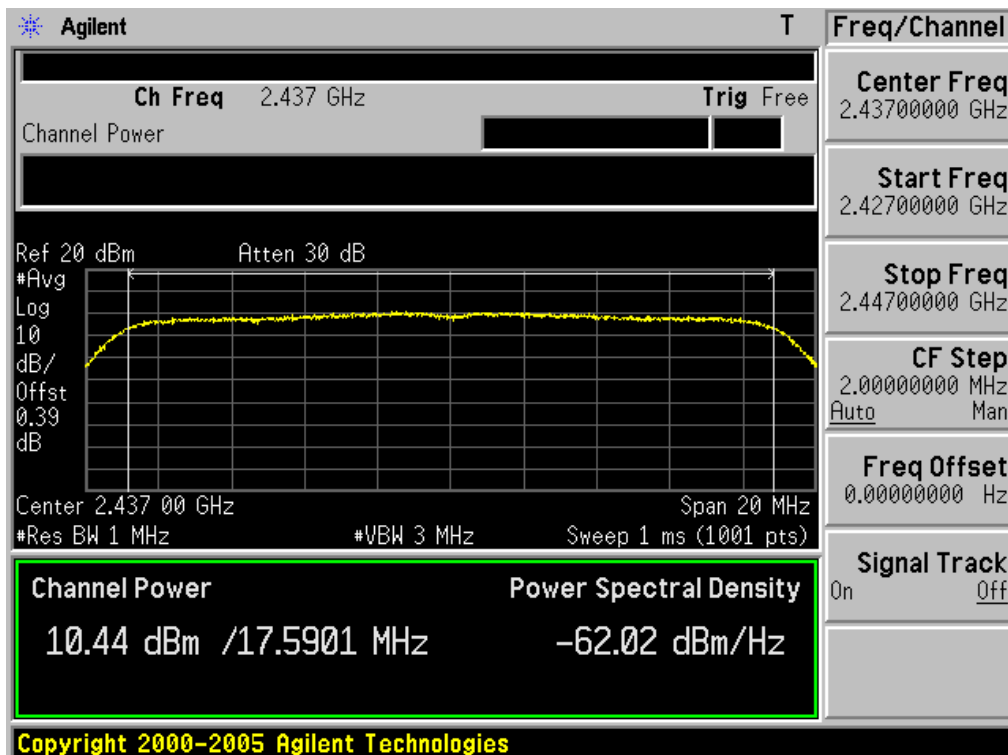
26 dB Bandwidth Ant 2 & Test Mode: 802.11b & Highest Frequency

Peak Output Power Ant 2 & Test Mode: 802.11b & Highest Frequency


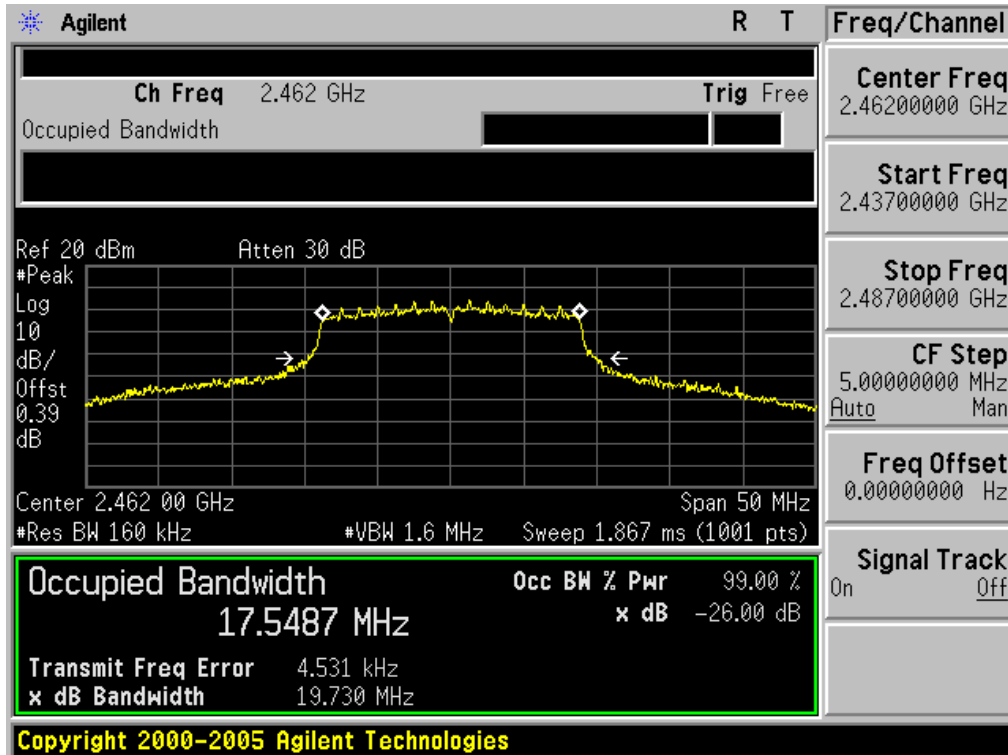
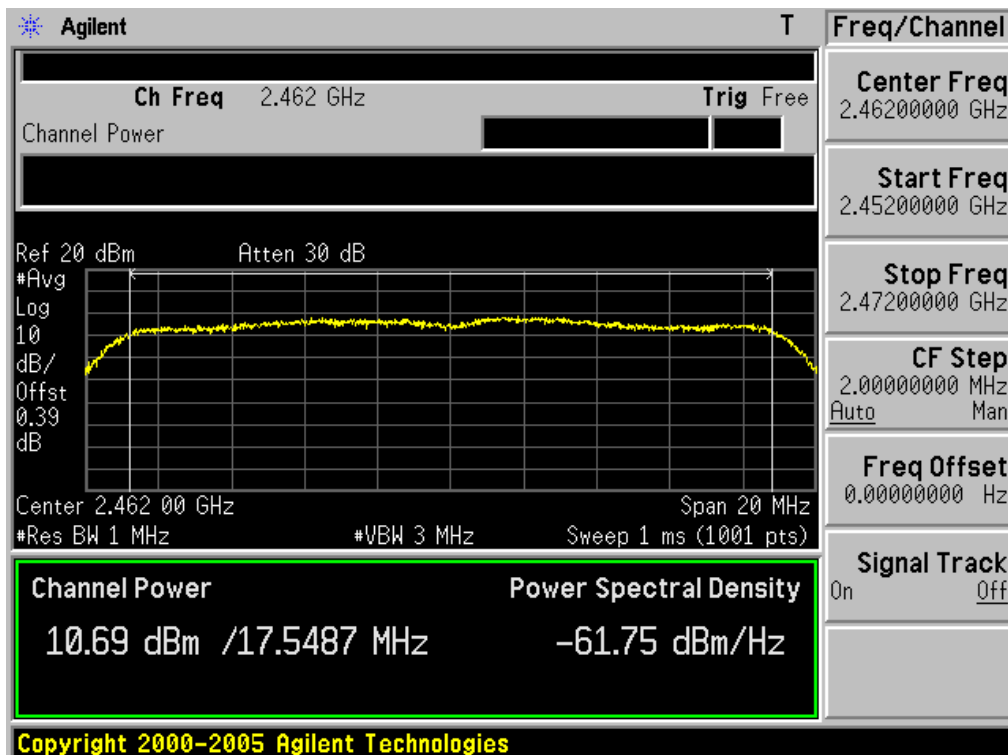
26 dB Bandwidth Ant 2 & Test Mode: 802.11g & Lowest Frequency

Peak Output Power Ant 2 & Test Mode: 802.11g & Lowest Frequency


26 dB Bandwidth Ant 2 & Test Mode: 802.11g & Middle Frequency

Peak Output Power Ant 2 & Test Mode: 802.11g & Middle Frequency


26 dB Bandwidth Ant 2 & Test Mode: 802.11g & Highest Frequency

Peak Output Power Ant 2 & Test Mode: 802.11g & Highest Frequency


26 dB Bandwidth Ant 2 & Test Mode: 802.11n HT20 & Lowest Frequency

Peak Output Power Ant 2 & Test Mode: 802.11n HT20 & Lowest Frequency


26 dB Bandwidth Ant 2 & Test Mode: 802.11n HT20 & Middle Frequency

Peak Output Power Ant 2 & Test Mode: 802.11n HT20 & Middle Frequency


26 dB Bandwidth Ant 2 & Test Mode: 802.11n HT20 & Highest Frequency

Peak Output Power Ant 2 & Test Mode: 802.11n HT20 & Highest Frequency


3.2.3 Out of Band Emissions / Band Edge

- Procedure:

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

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

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

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

Tested frequency = the highest and the lowest Frequencies

Center frequency = 2400MHz, 2483.5MHz

Span = 100MHz

Detector function = peak

RBW = 1% of the span

VBW = 100 kHz

Trace = max hold

Sweep = auto

For spurious testing the spectrum analyzer is set to:

Tested frequency = the highest, middle and the lowest Frequencies

RBW = 100 kHz

VBW = 100 kHz

Detector function = peak

Sweep = auto

Trace = max hold

- Measurement Data: Comply

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

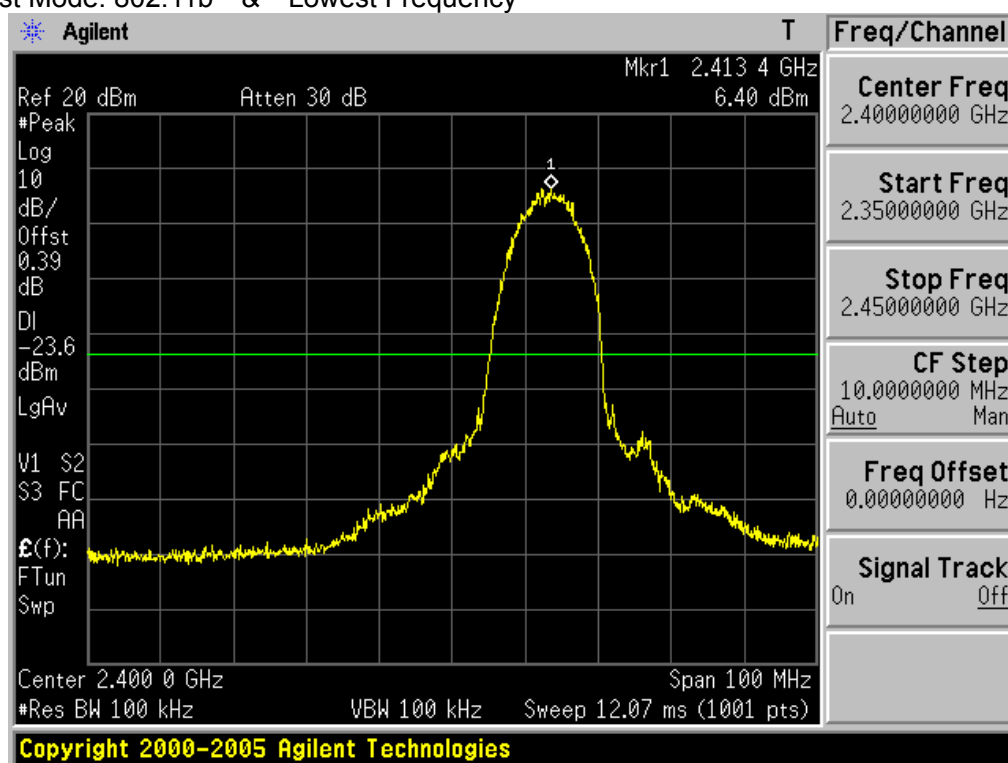
Note 1: This test item was tested at Ant 1 and at Ant 2. And the worst case data were reported.

Note 2: See next pages for actual measured spectrum plots.

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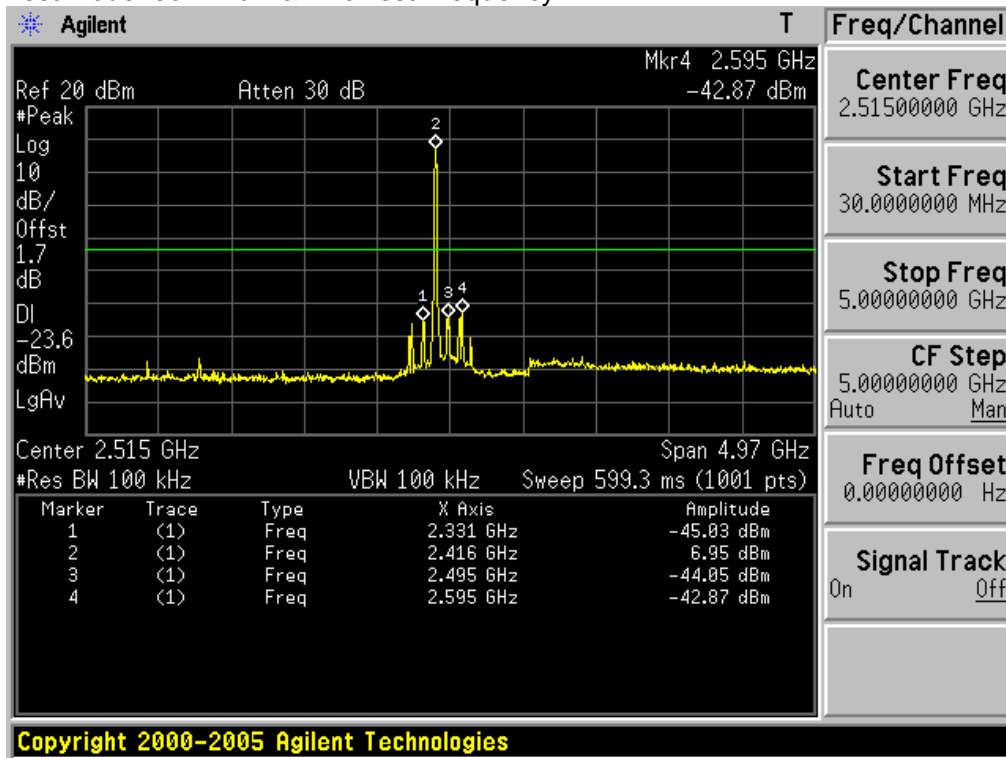
Low Band-edge at 30 dB blow

Ant 2 & Test Mode: 802.11b & Lowest Frequency



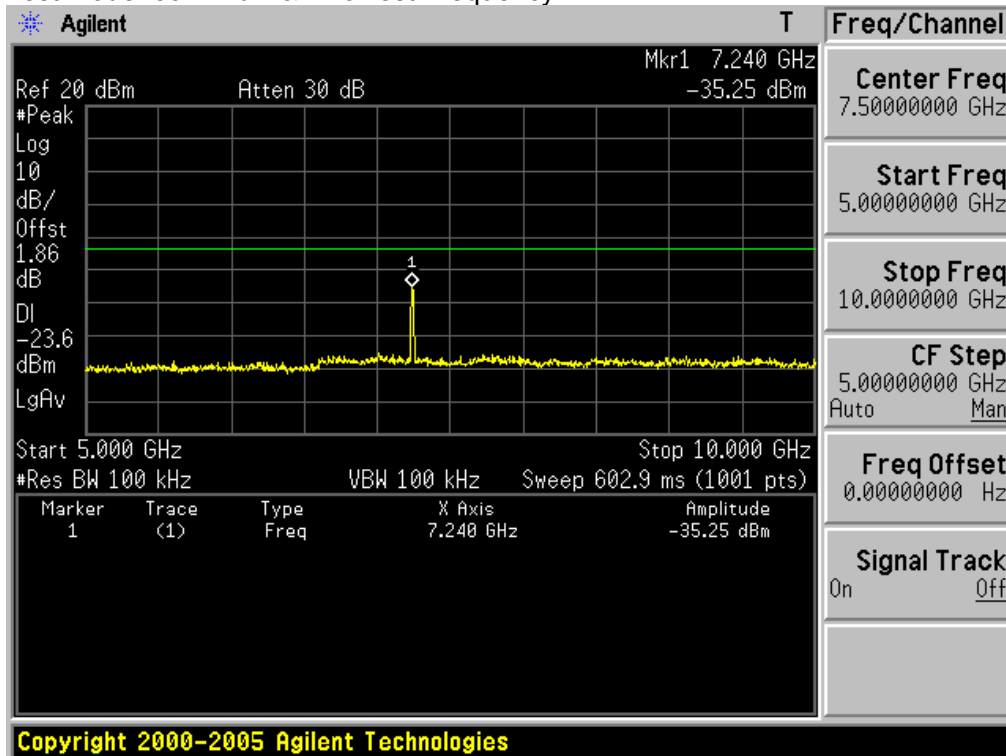
30MHz ~ 5GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11b & Lowest Frequency



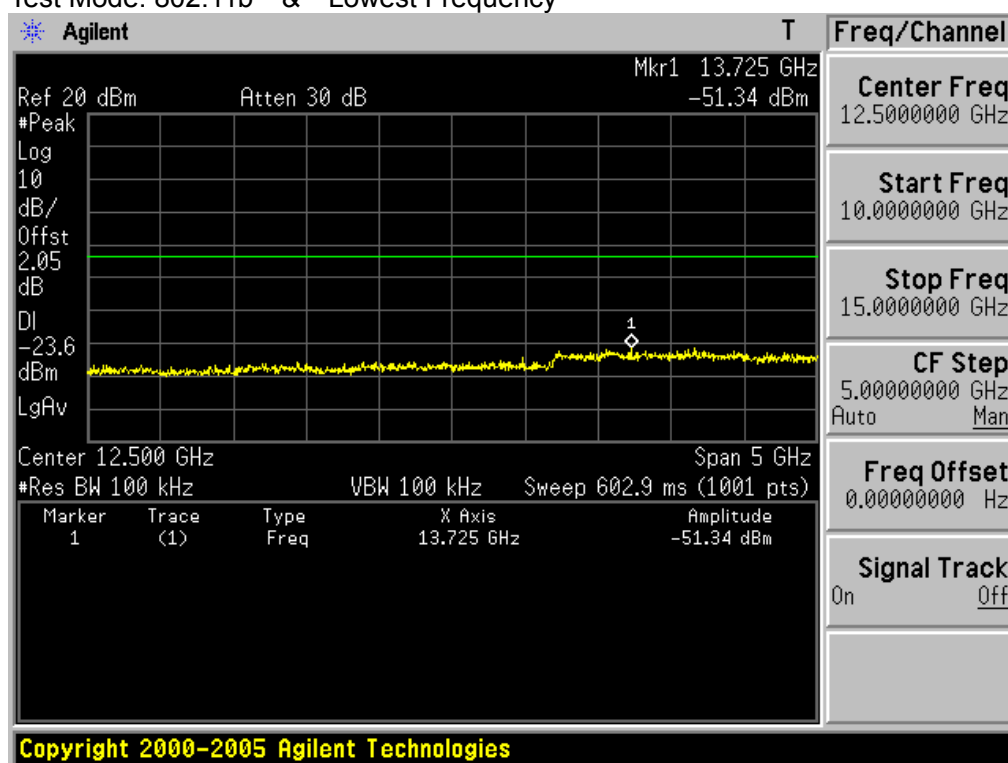
5GHz ~ 10GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11b & Lowest Frequency



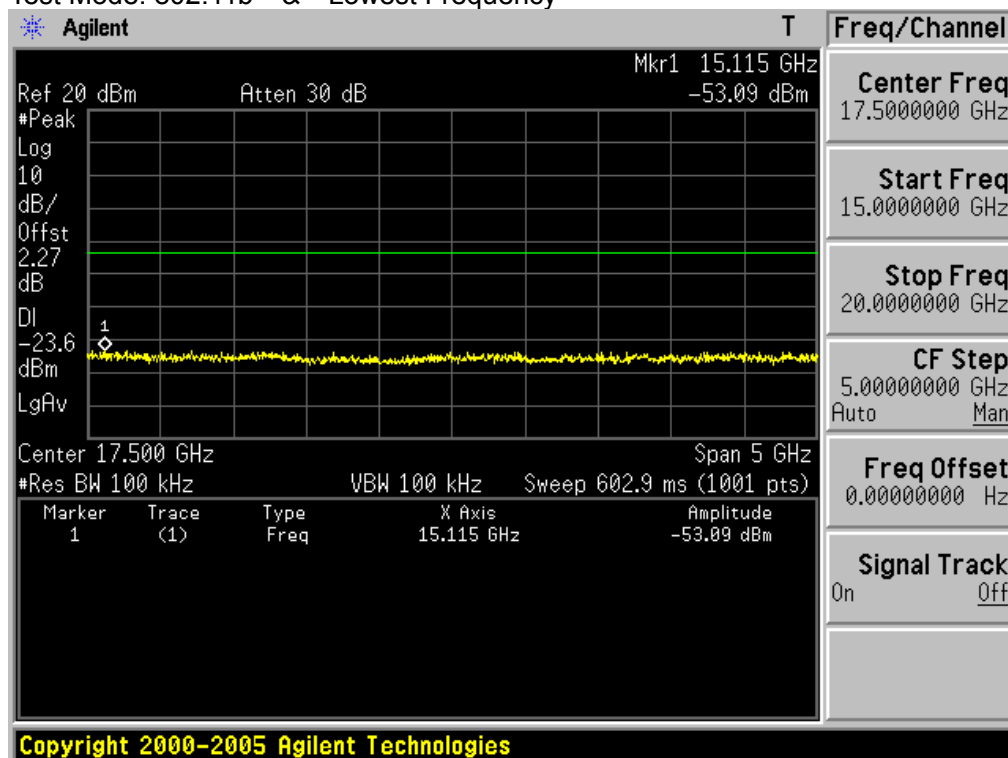
10GHz ~ 15GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11b & Lowest Frequency



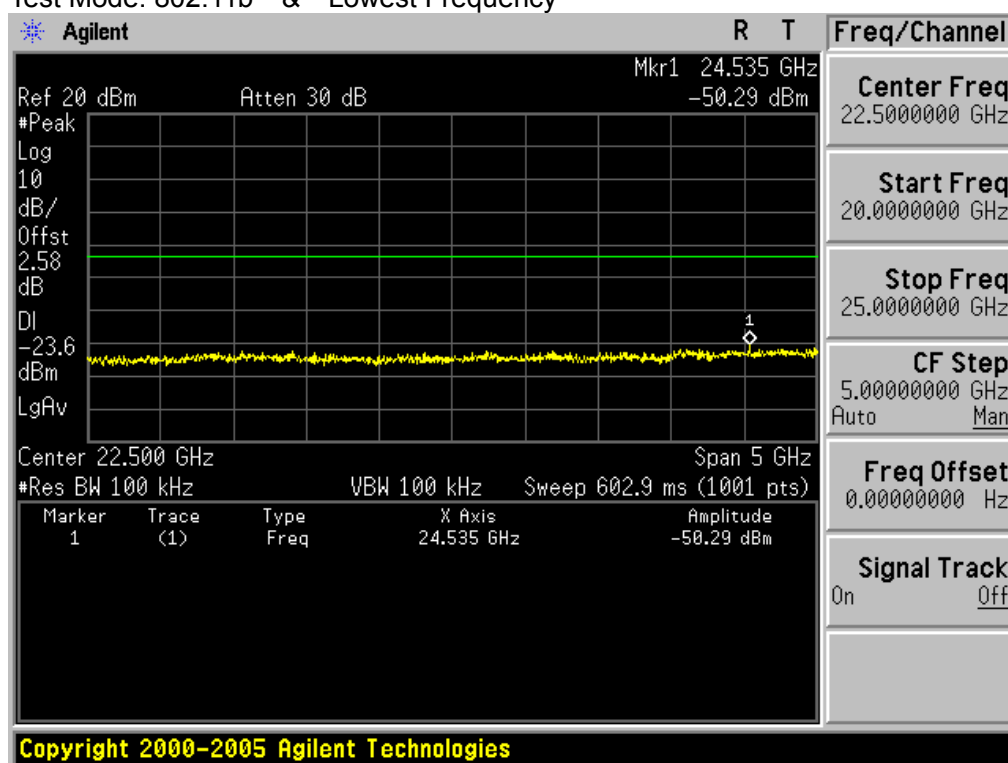
15GHz ~ 20GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11b & Lowest Frequency



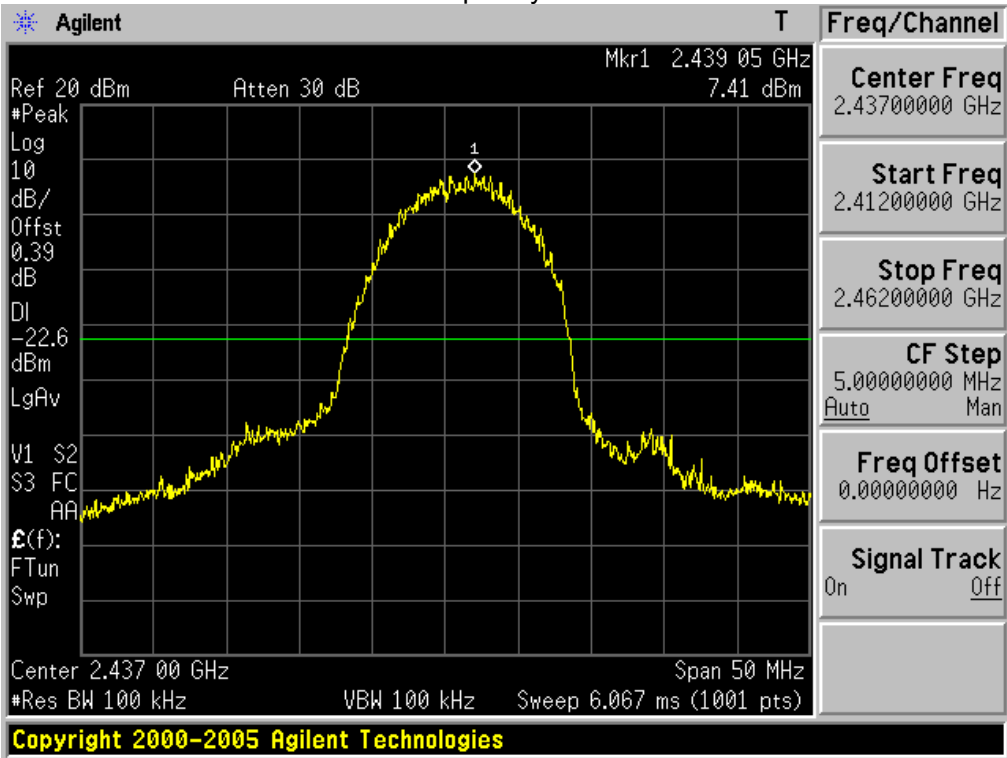
20GHz ~ 25GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11b & Lowest Frequency



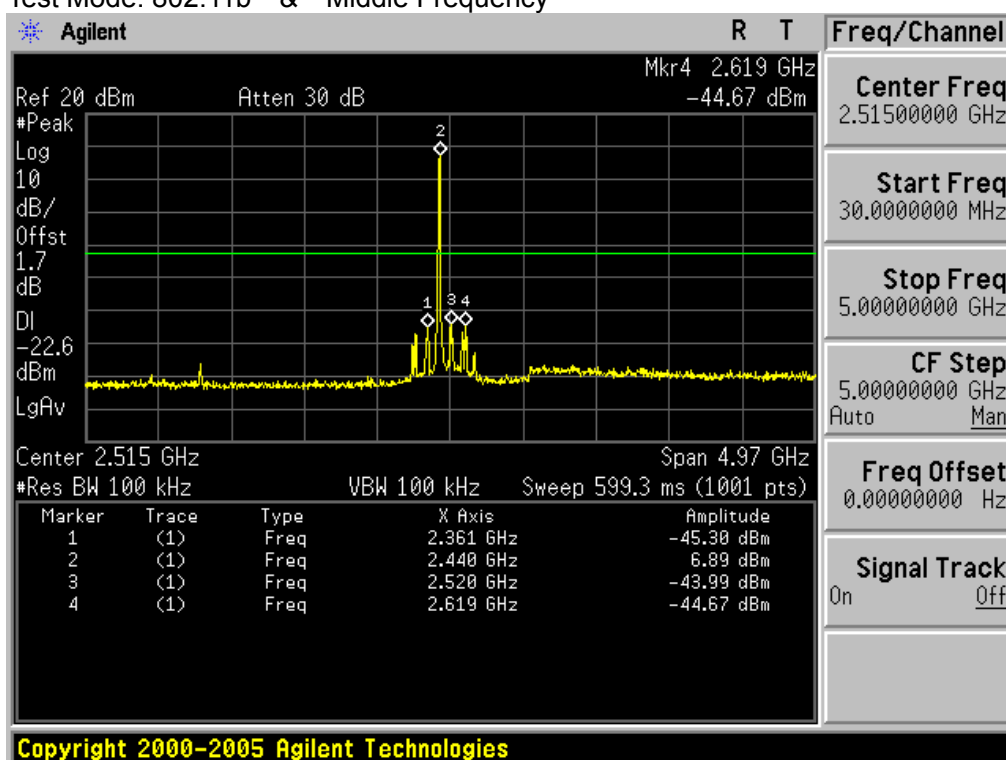
Reference for limit

Ant 2 & Test Mode: 802.11b & Middle Frequency



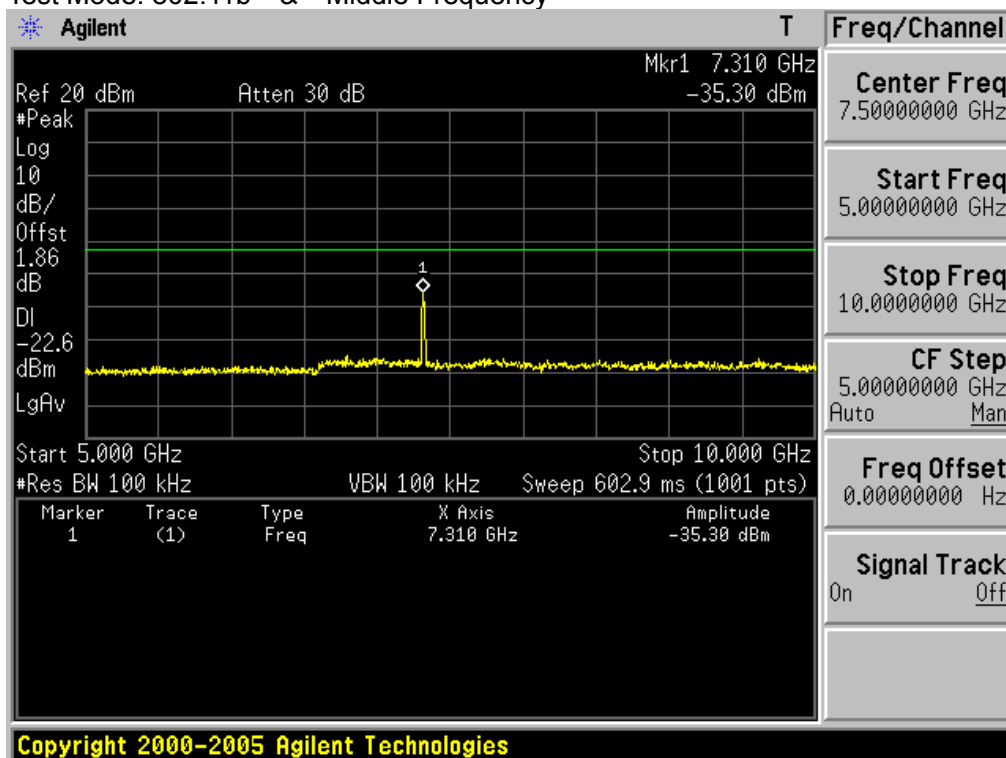
30MHz ~ 5GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11b & Middle Frequency



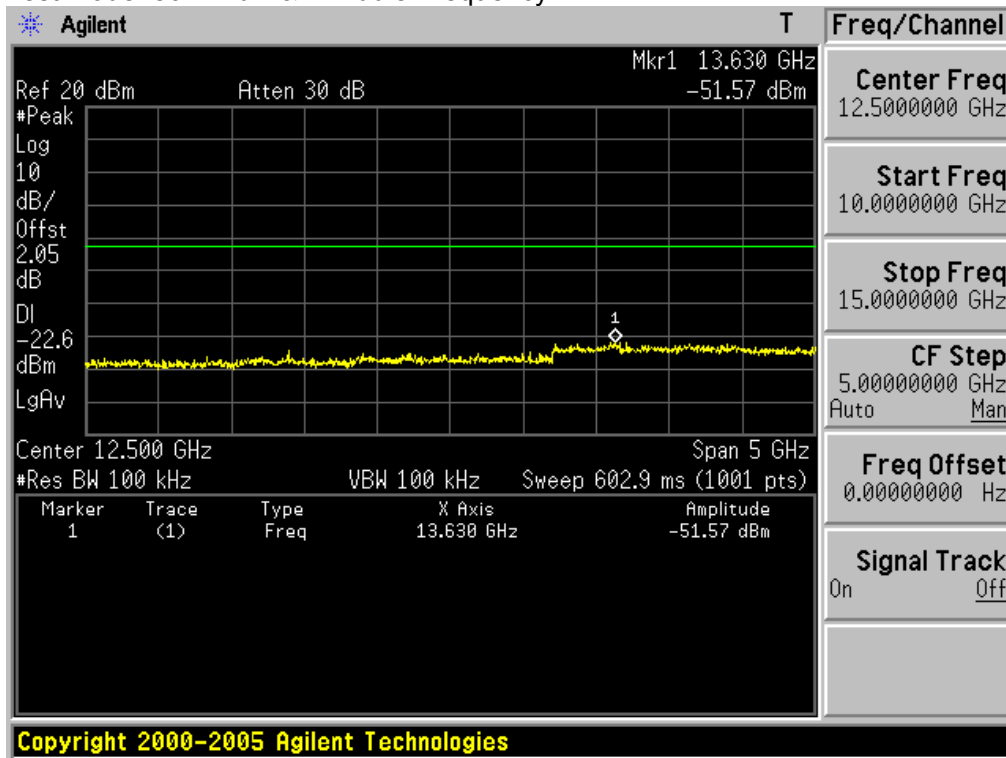
5GHz ~ 10GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11b & Middle Frequency



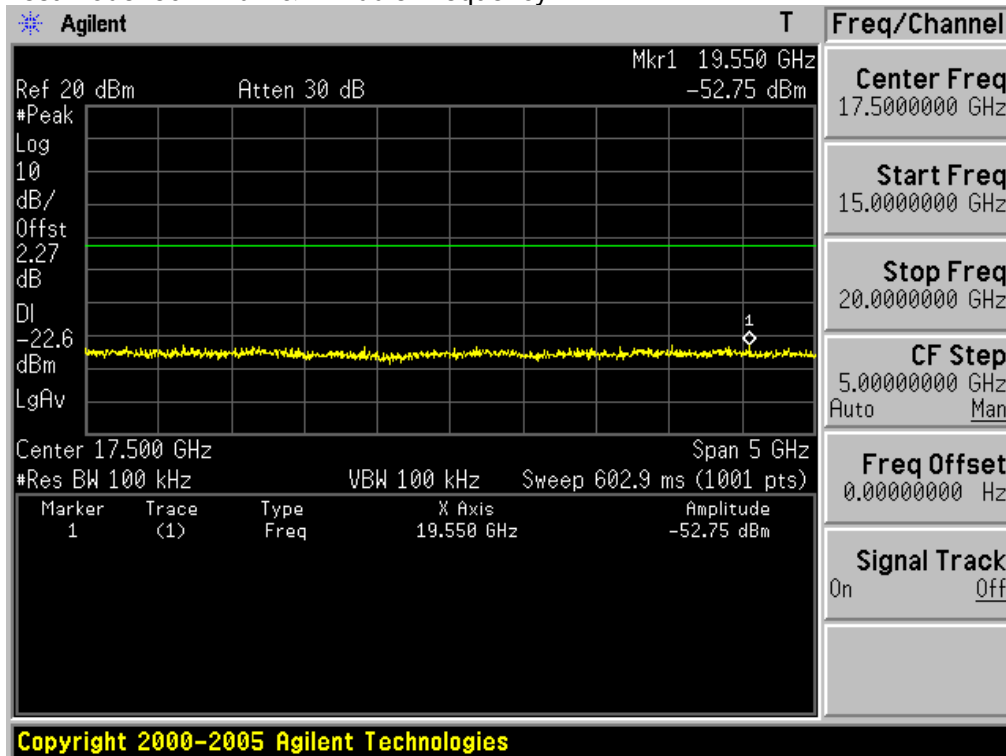
10GHz ~ 15GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11b & Middle Frequency



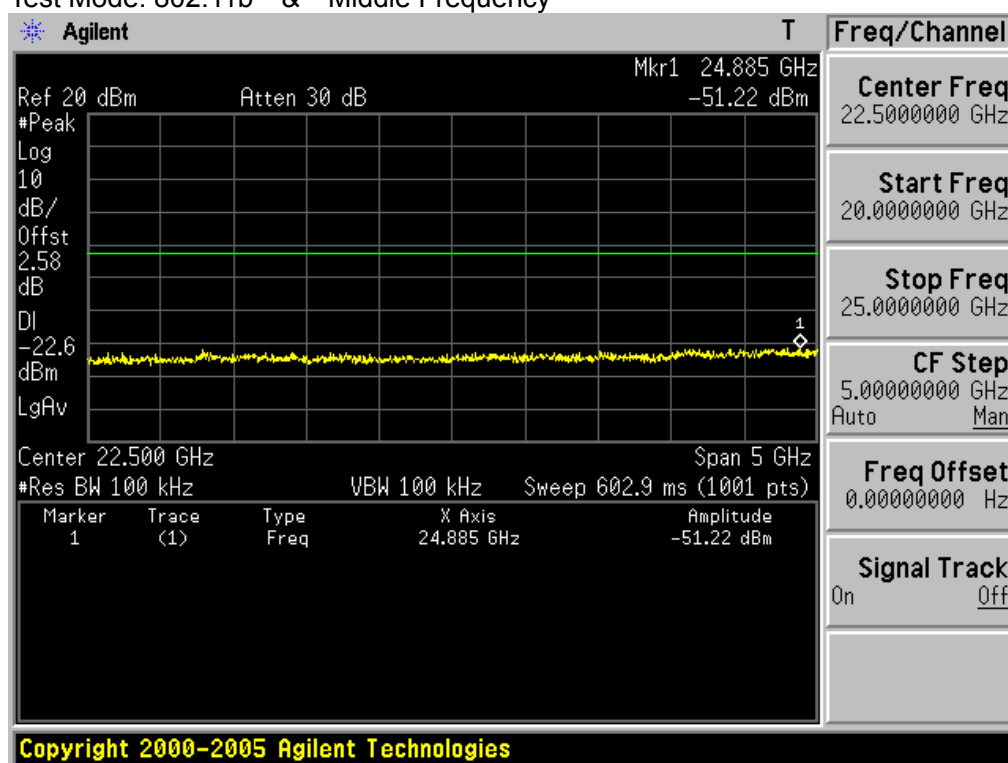
15GHz ~ 20GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11b & Middle Frequency



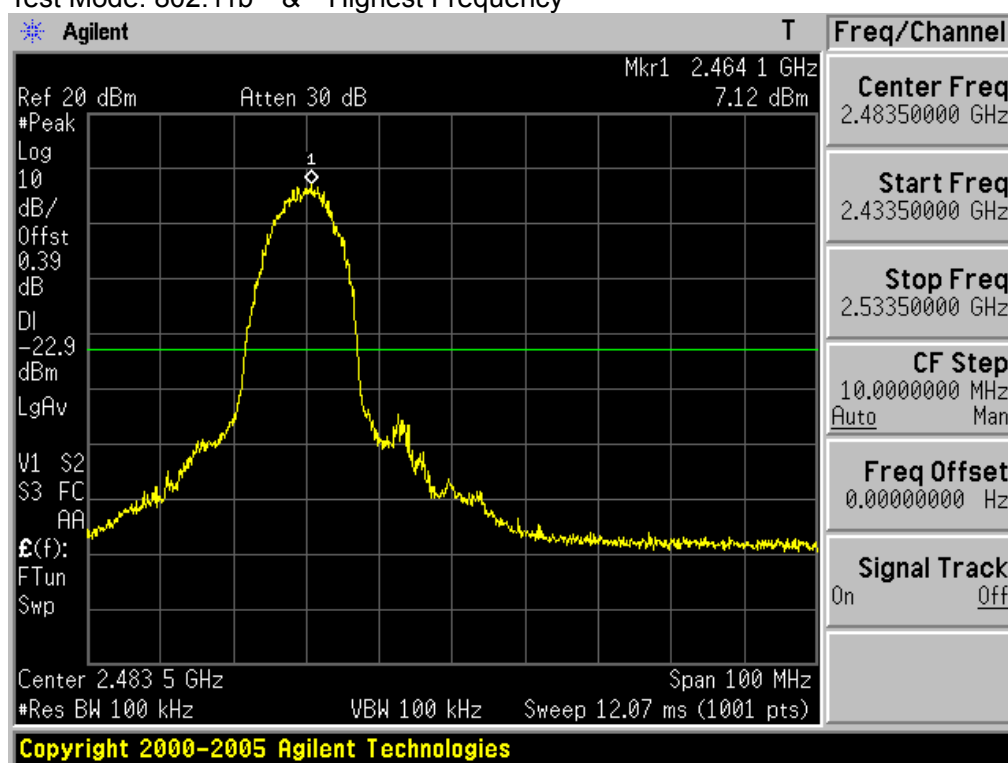
20GHz ~ 25GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11b & Middle Frequency



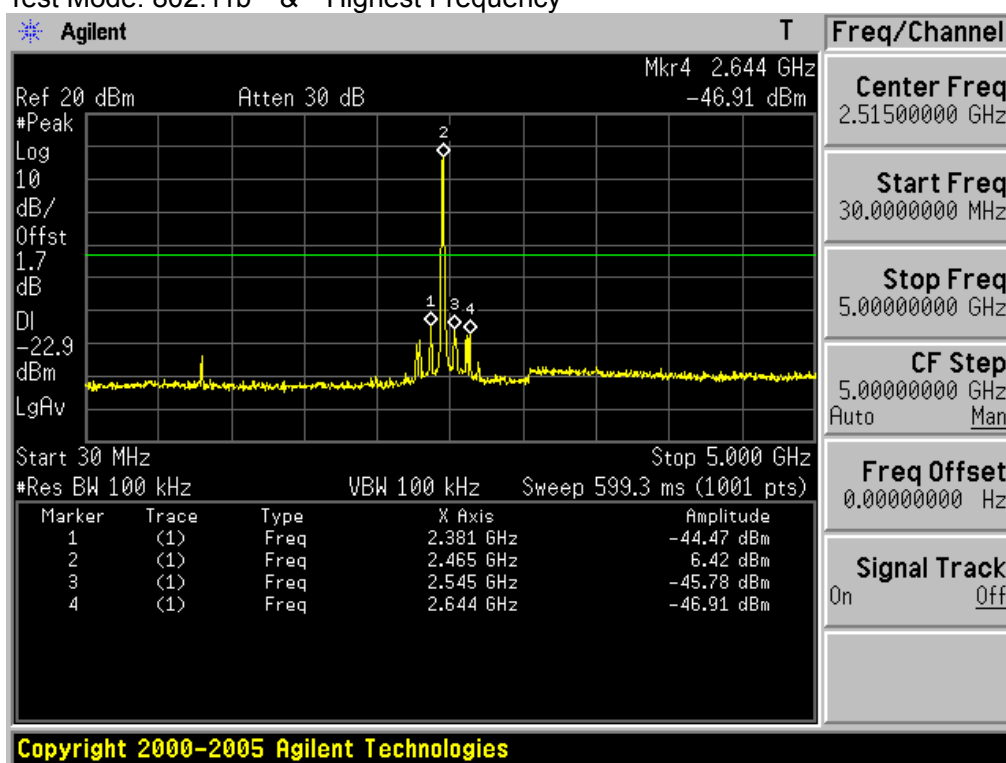
High Band-edge at 30 dB blow

Ant 2 & Test Mode: 802.11b & Highest Frequency



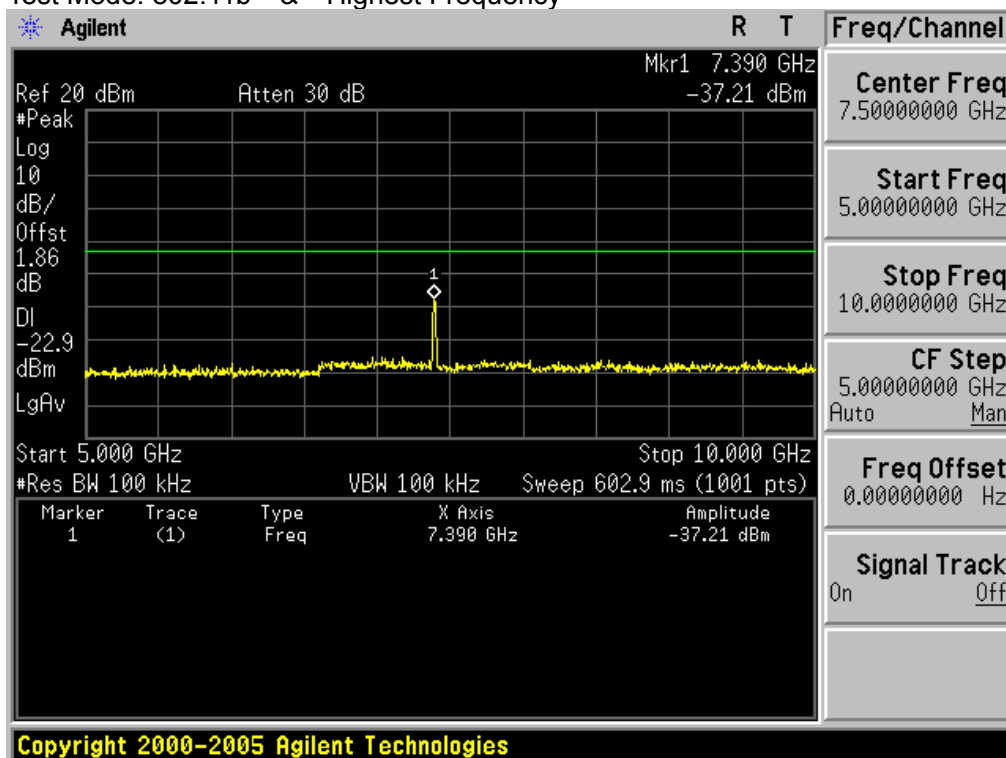
30MHz ~ 5GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11b & Highest Frequency



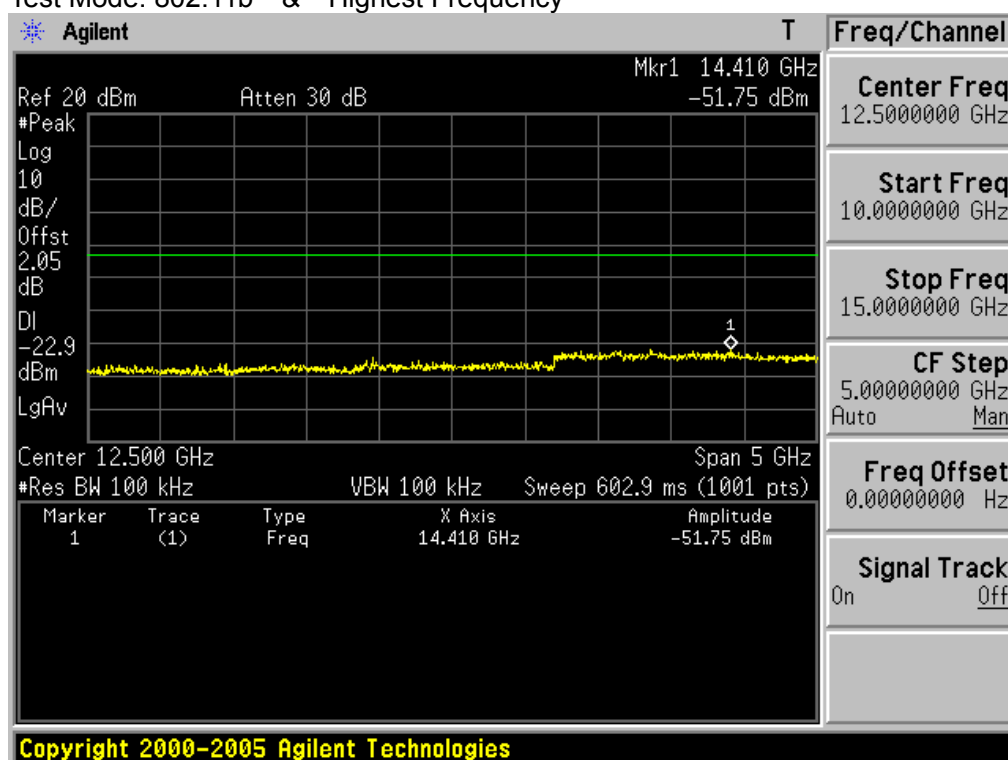
5GHz ~ 10GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11b & Highest Frequency



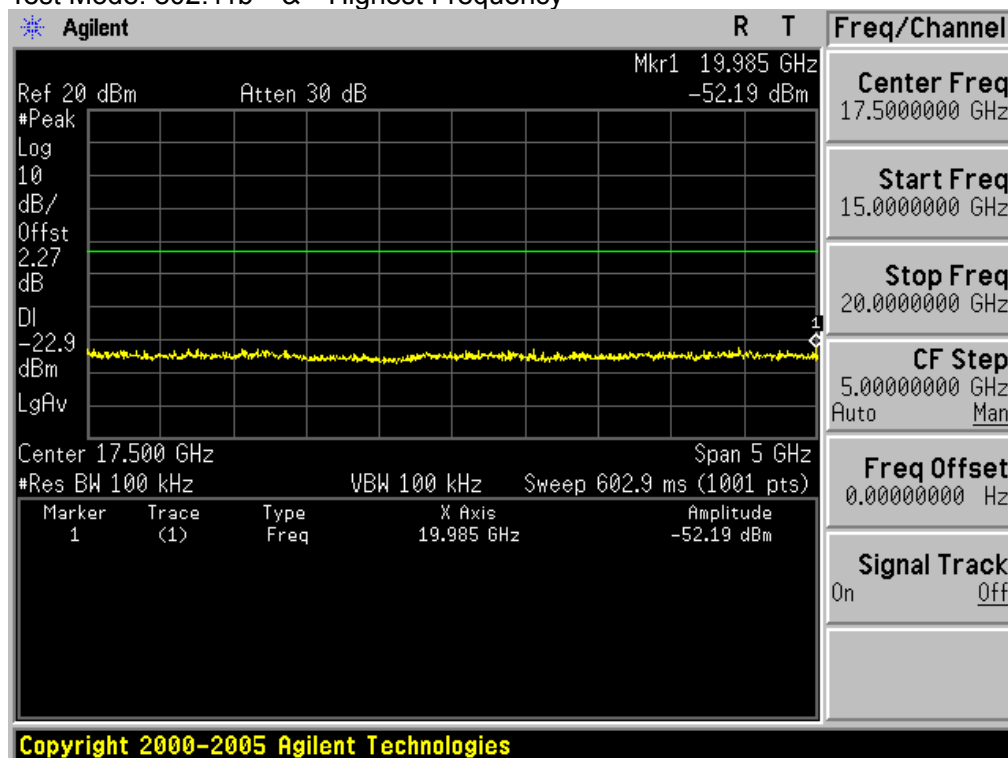
10GHz ~ 15GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11b & Highest Frequency



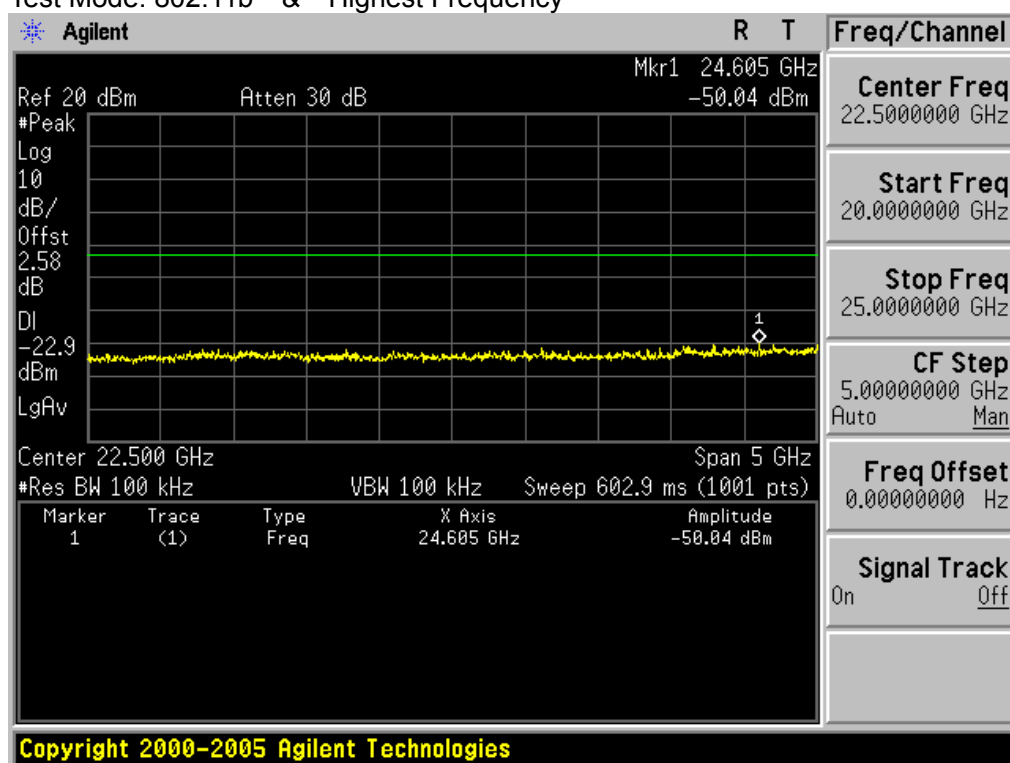
15GHz ~ 20GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11b & Highest Frequency



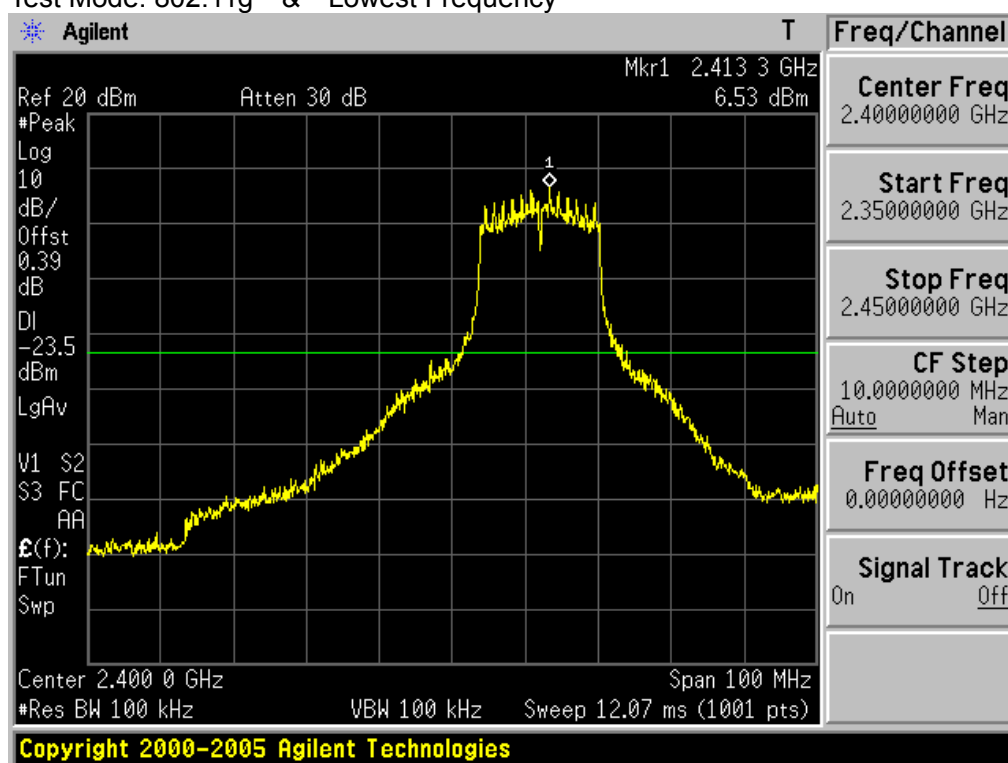
20GHz ~ 25GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11b & Highest Frequency



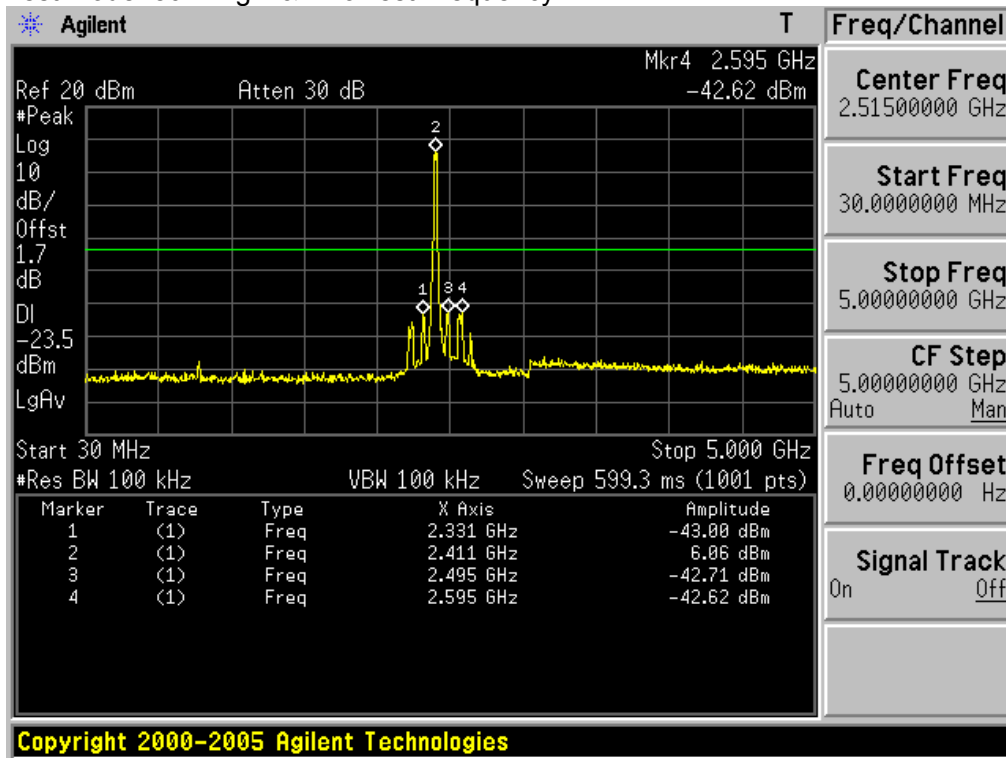
Low Band-edge at 30 dB blow

Ant 2 & Test Mode: 802.11g & Lowest Frequency



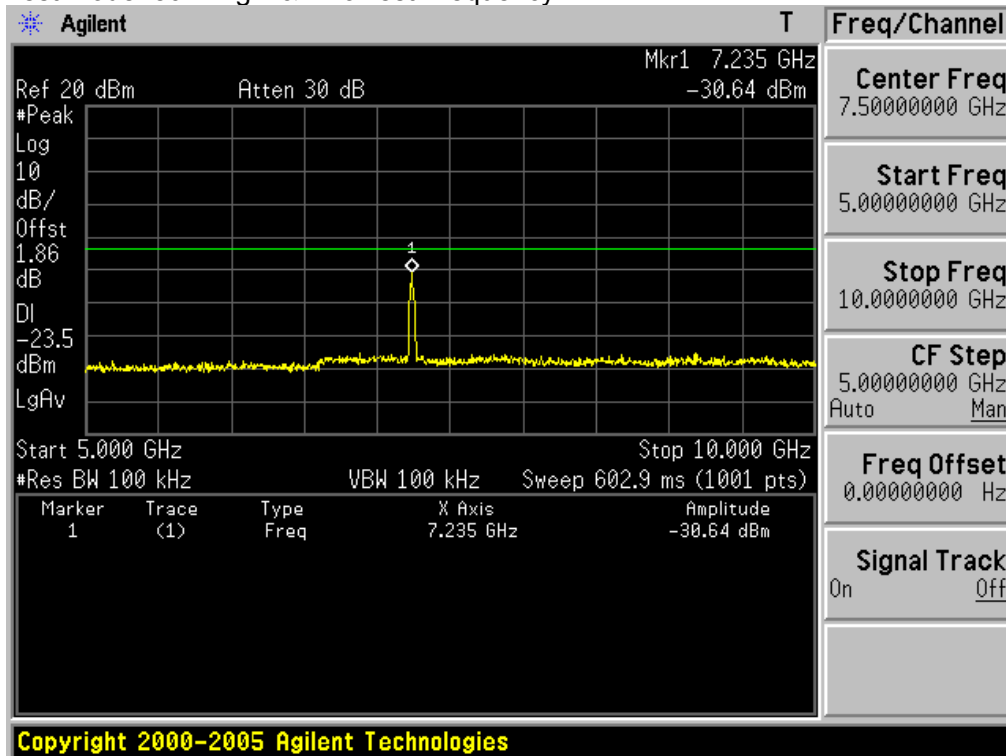
30MHz ~ 5GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11g & Lowest Frequency



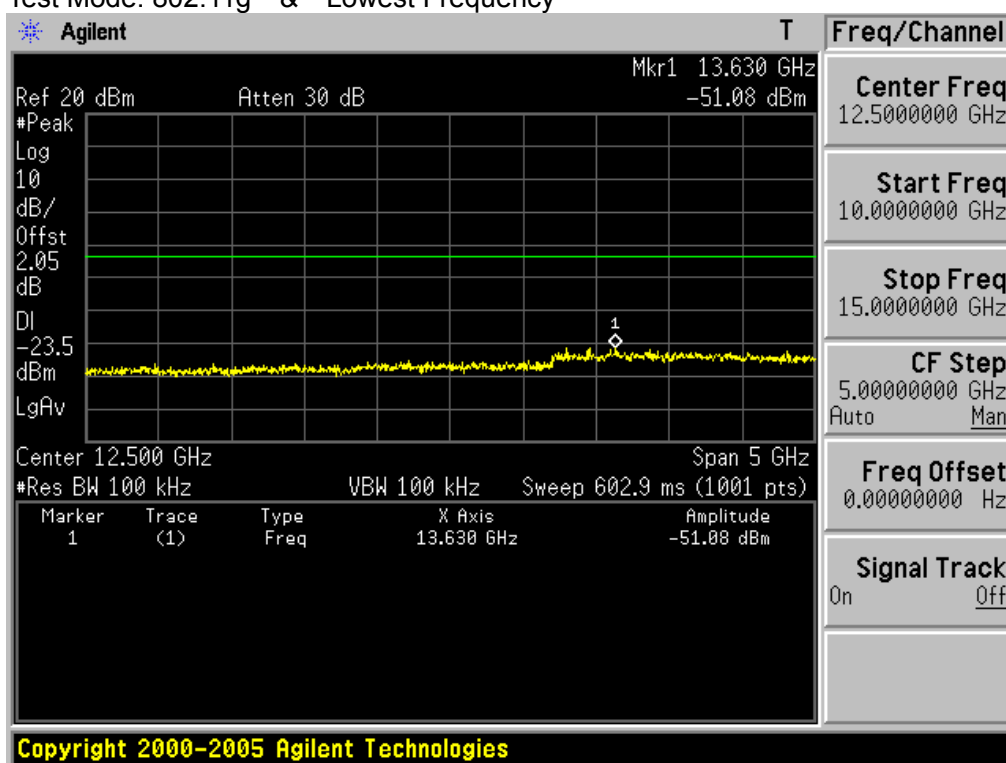
5GHz ~ 10GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11g & Lowest Frequency



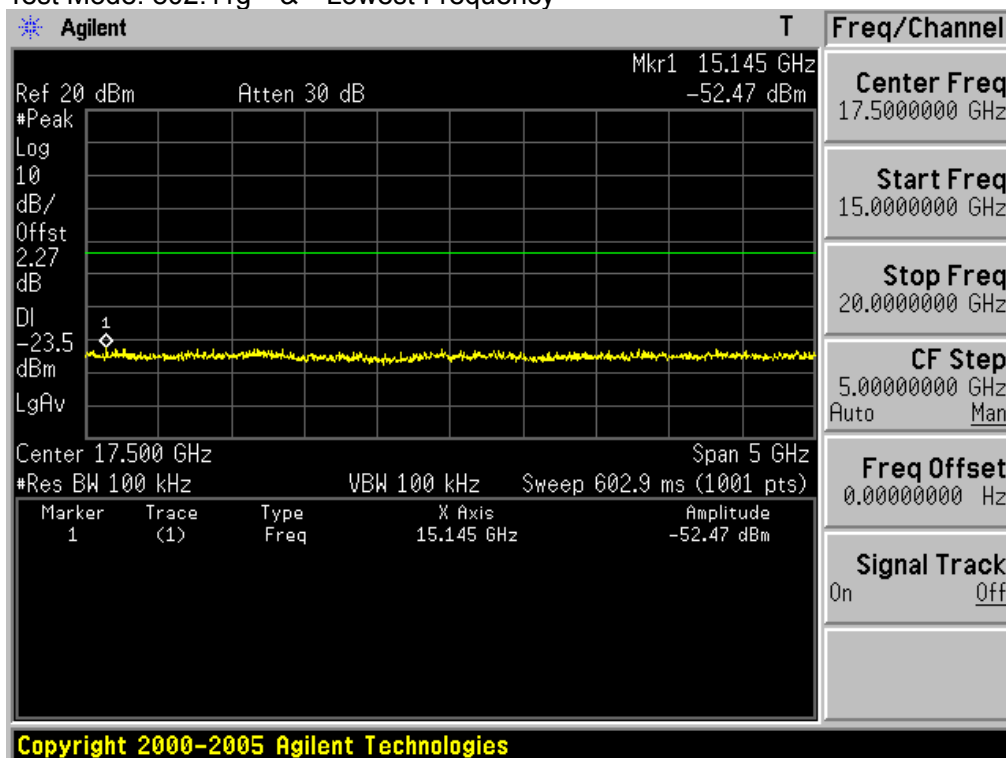
10GHz ~ 15GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11g & Lowest Frequency



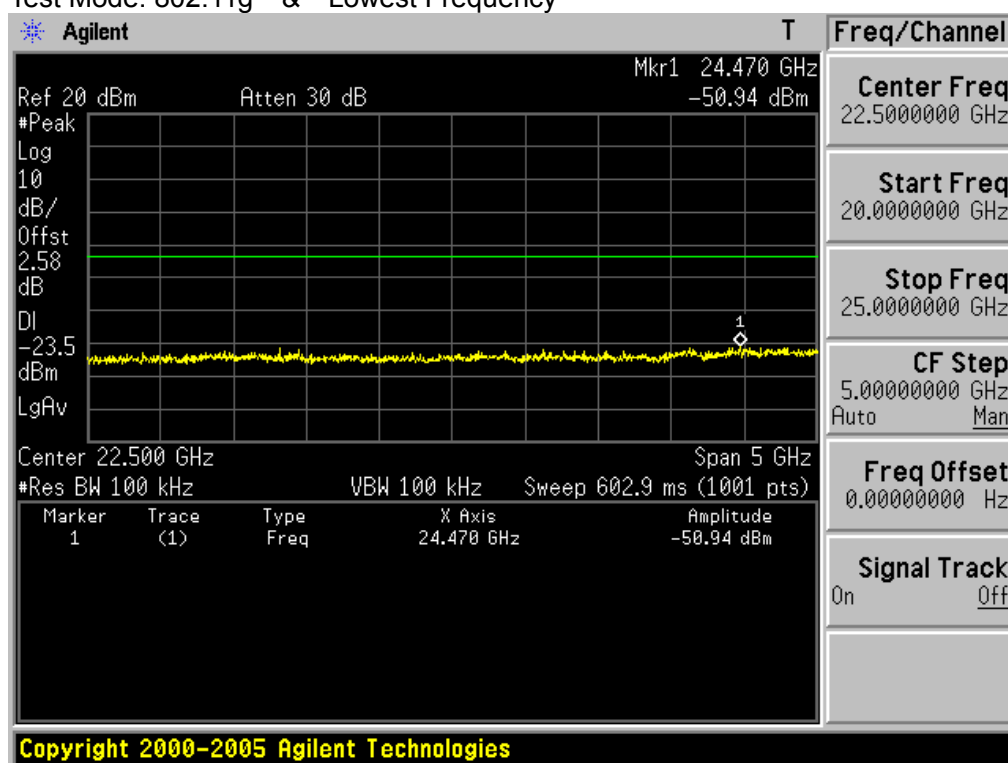
15GHz ~ 20GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11g & Lowest Frequency



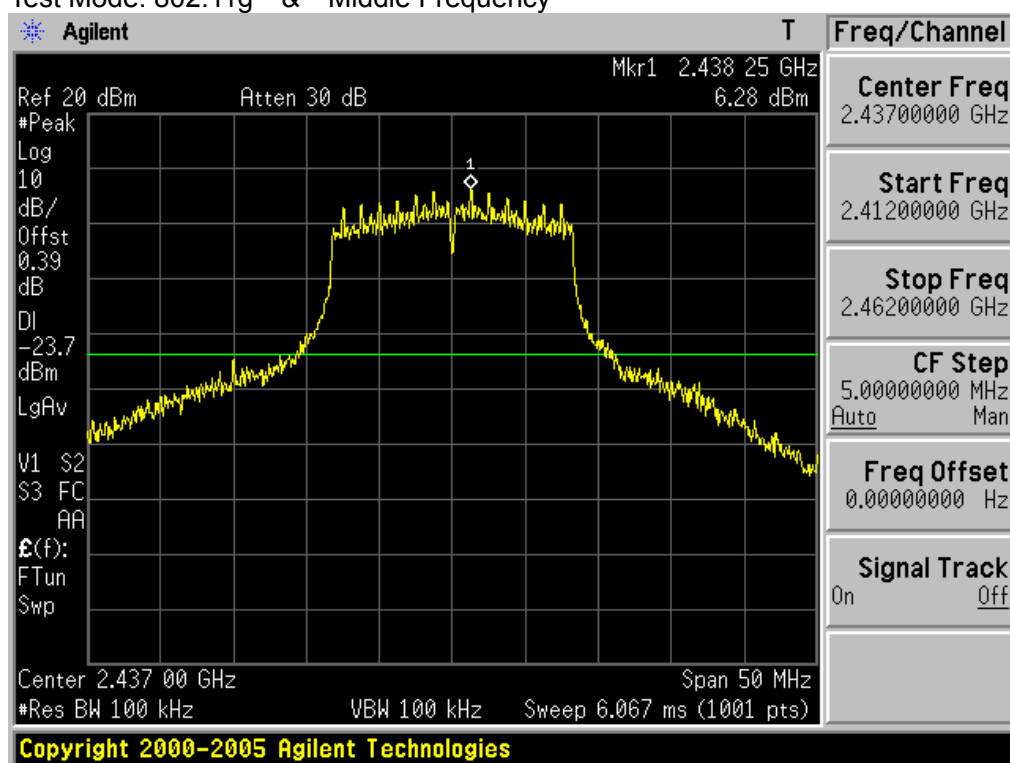
20GHz ~ 25GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11g & Lowest Frequency



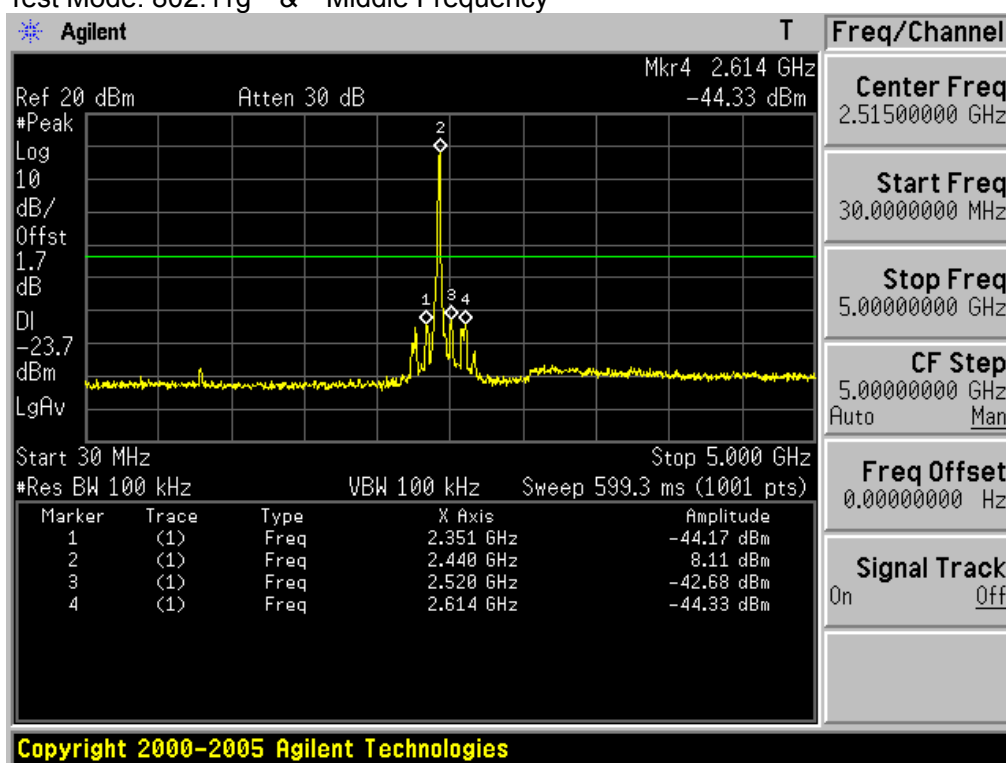
Reference for limit

Ant 2 & Test Mode: 802.11g & Middle Frequency



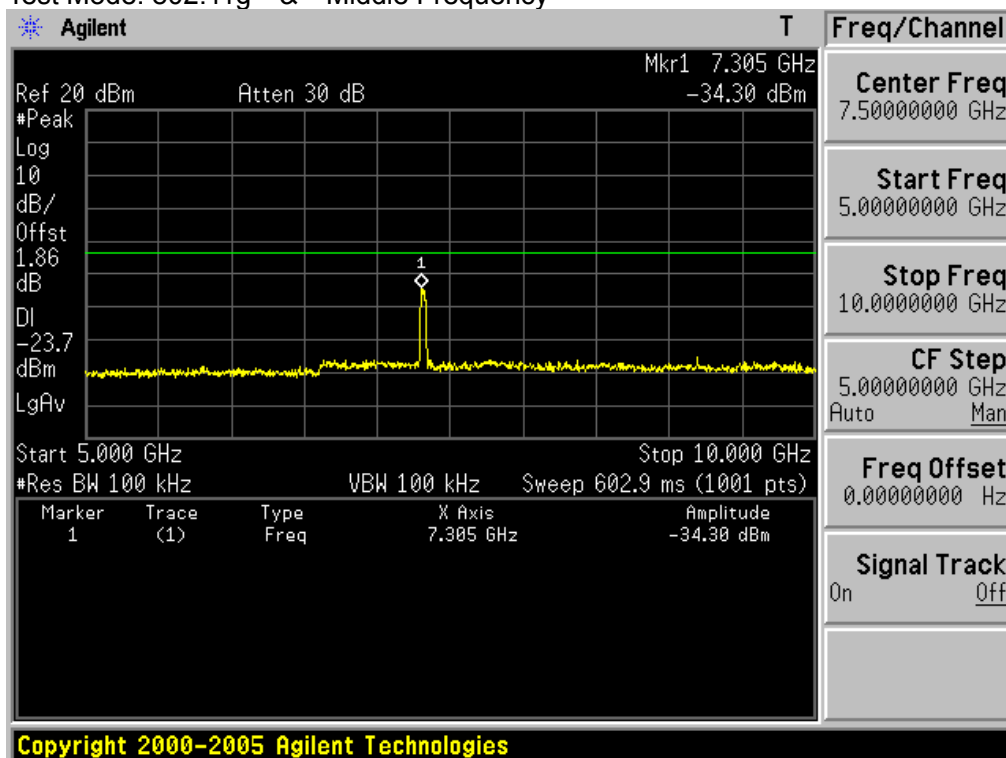
30MHz ~ 5GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11g & Middle Frequency



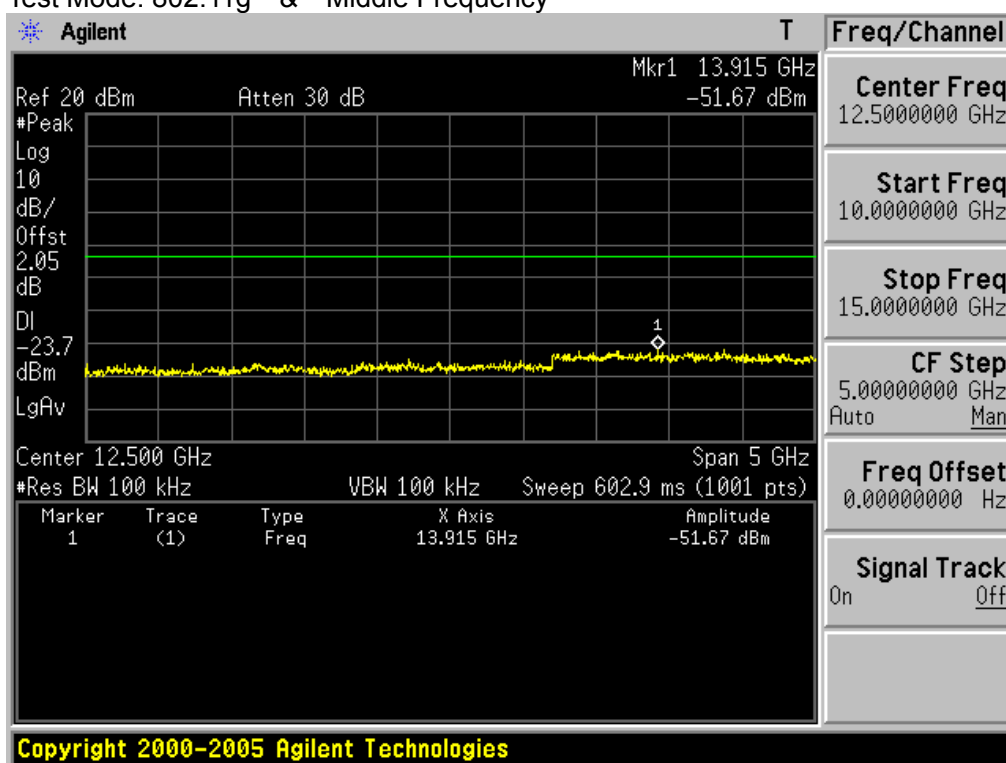
5GHz ~ 10GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11g & Middle Frequency



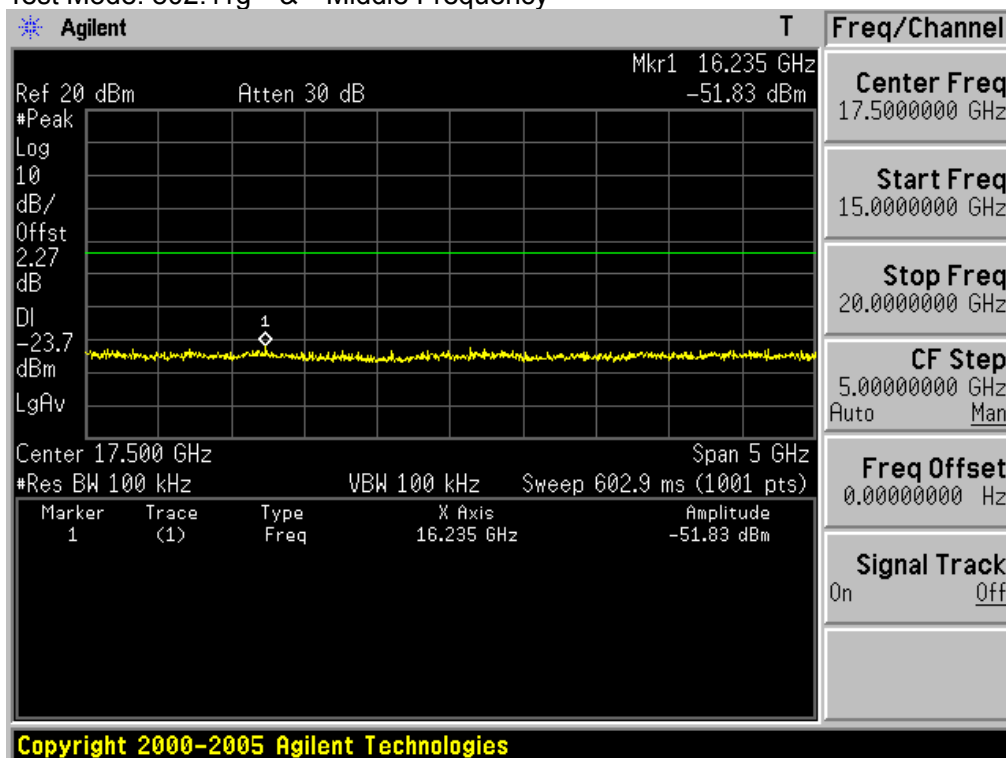
10GHz ~ 15GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11g & Middle Frequency



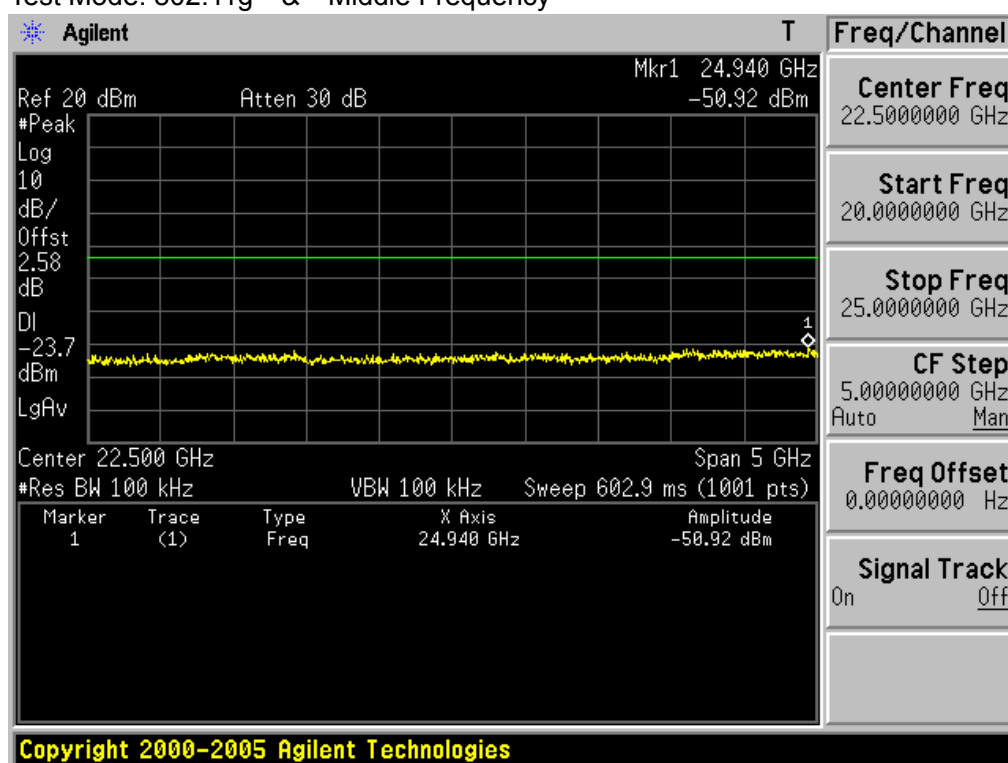
15GHz ~ 20GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11g & Middle Frequency



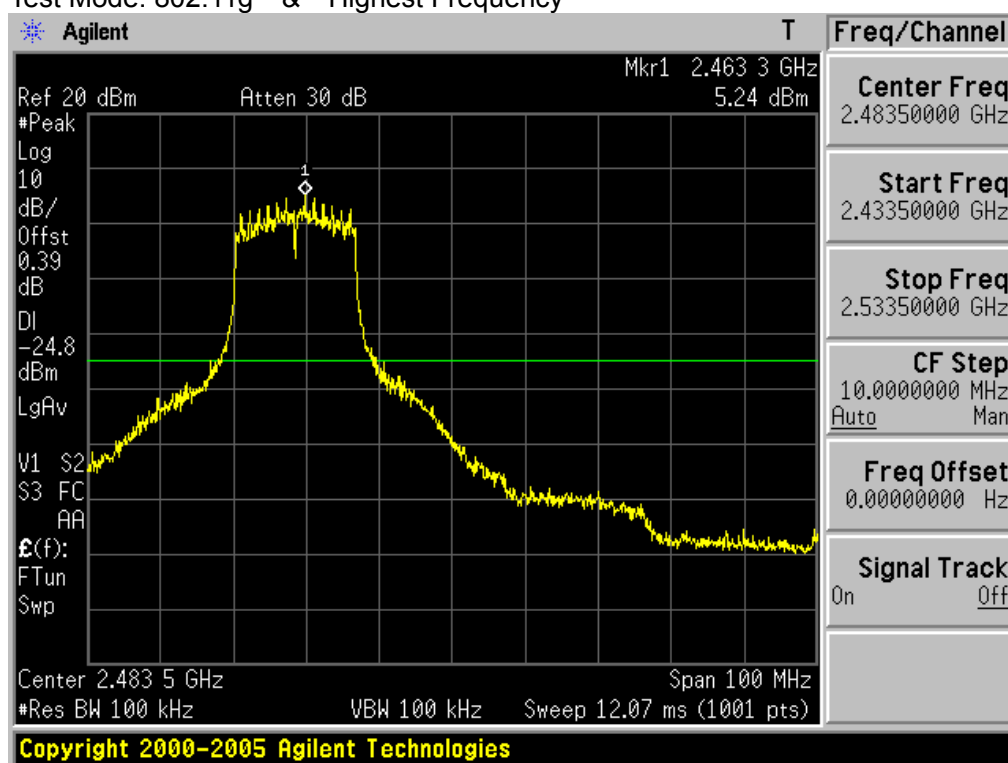
20GHz ~ 25GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11g & Middle Frequency



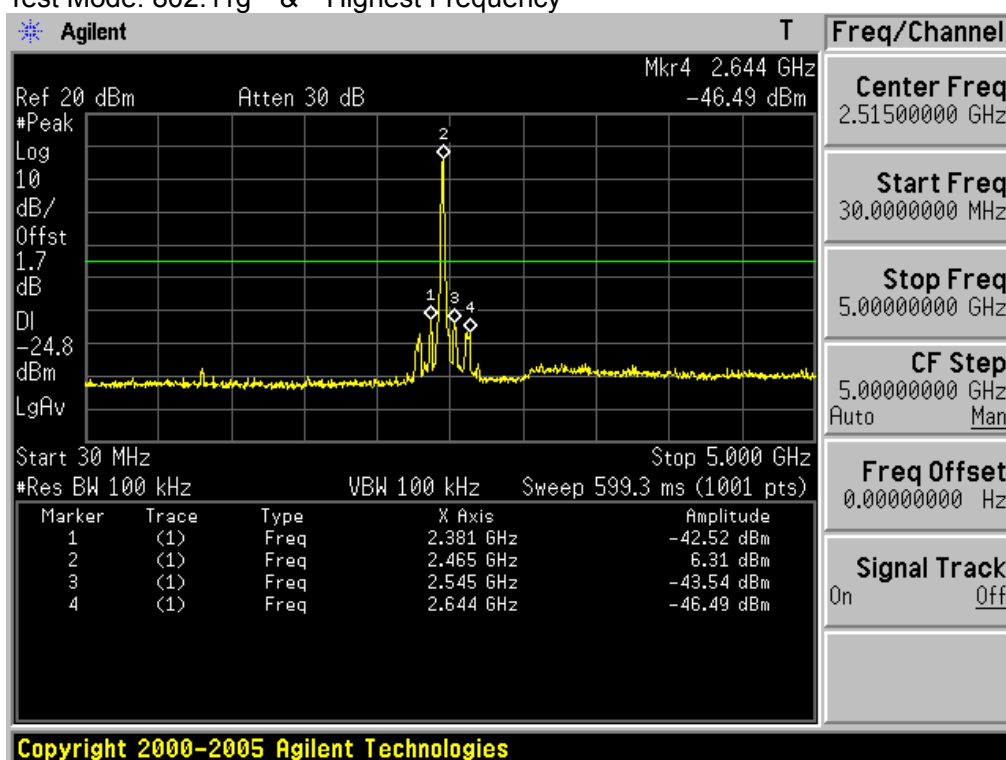
High Band-edge at 30 dB blow

Ant 2 & Test Mode: 802.11g & Highest Frequency



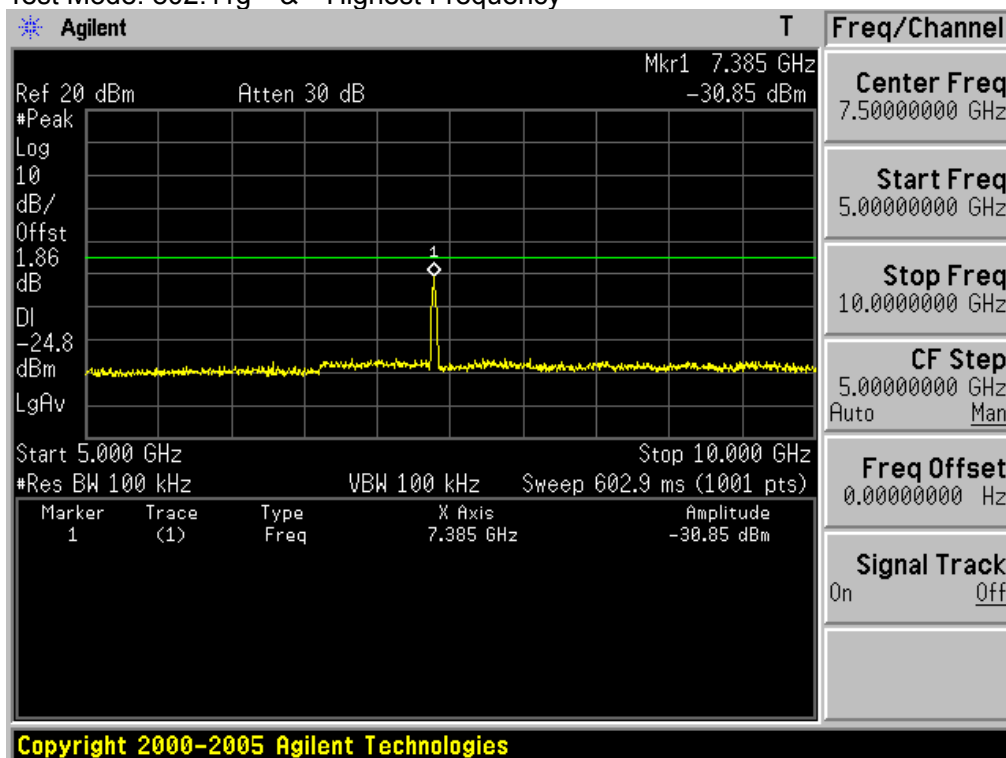
30MHz ~ 5GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11g & Highest Frequency



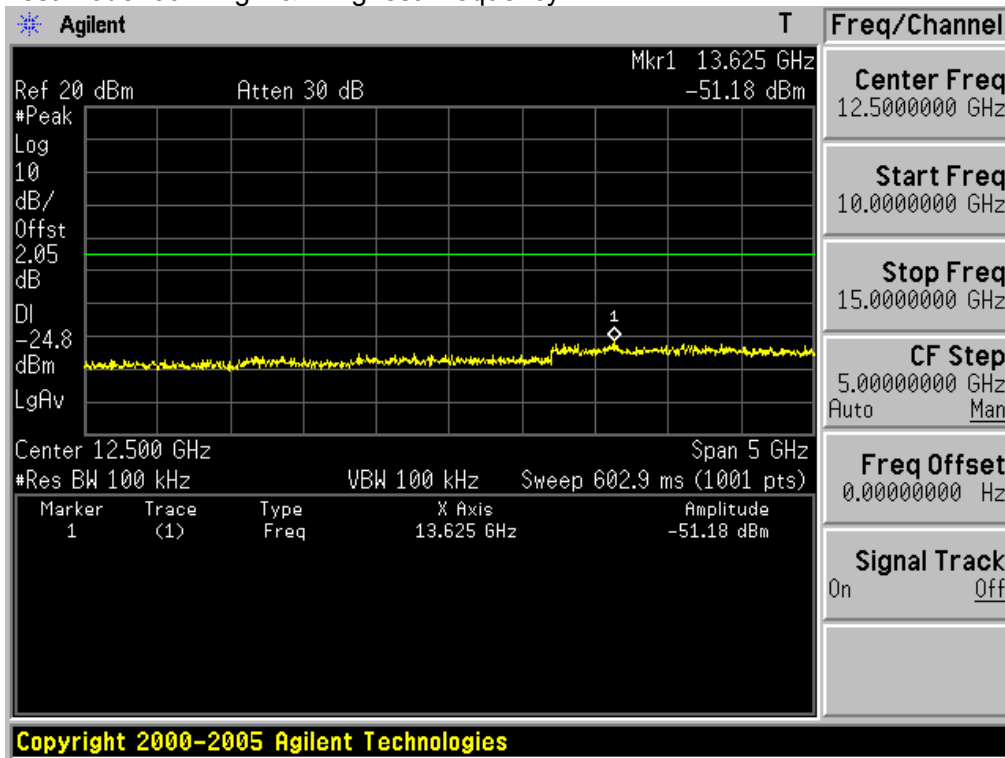
5GHz ~ 10GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11g & Highest Frequency



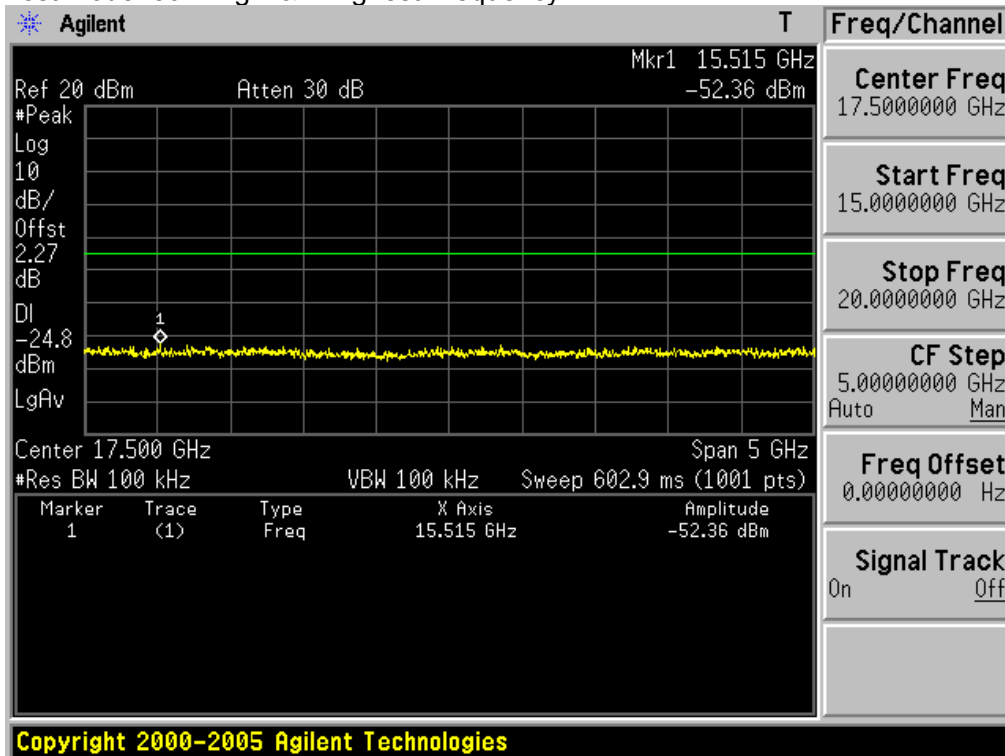
10GHz ~ 15GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11g & Highest Frequency



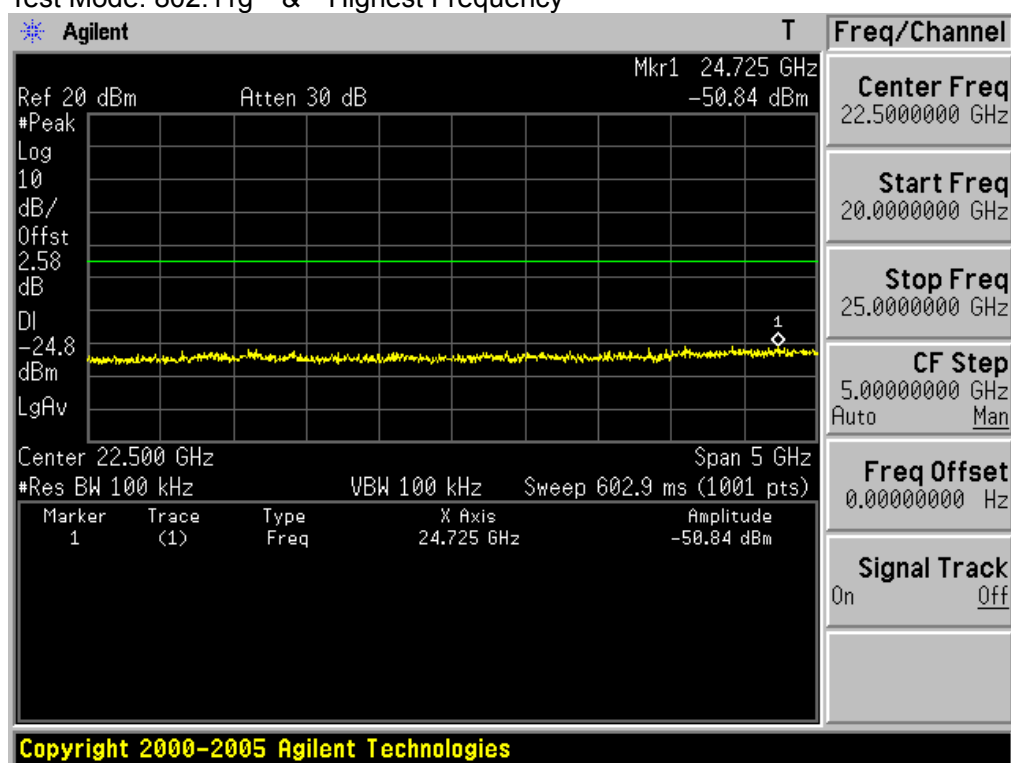
15GHz ~ 20GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11g & Highest Frequency



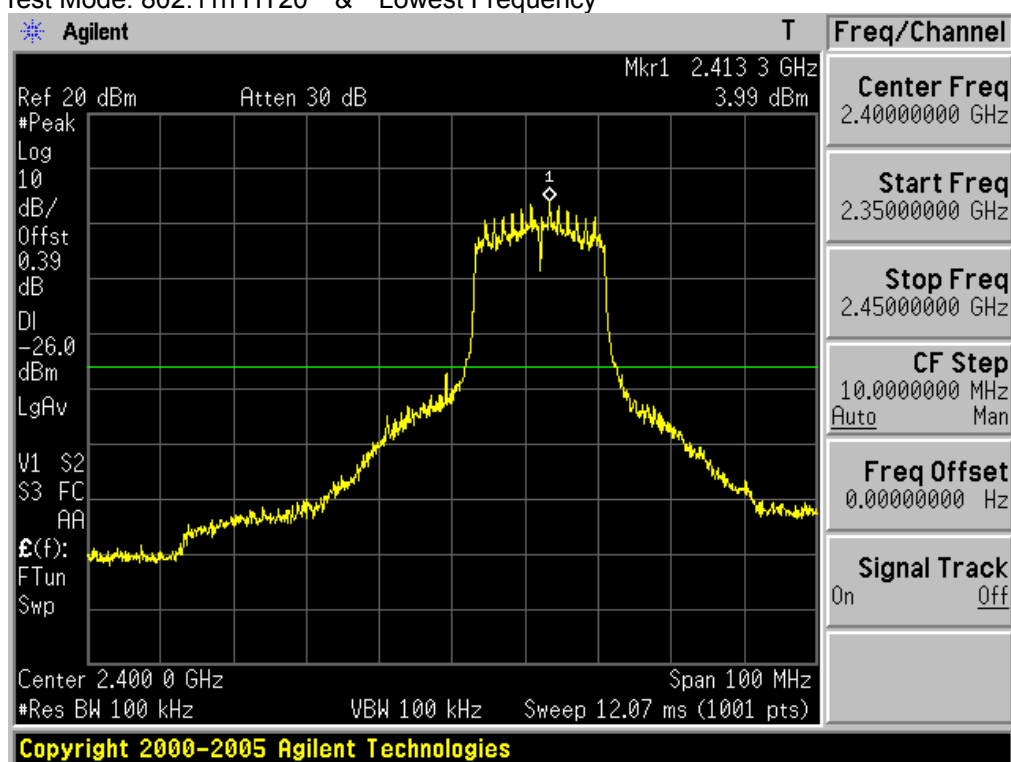
20GHz ~ 25GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11g & Highest Frequency



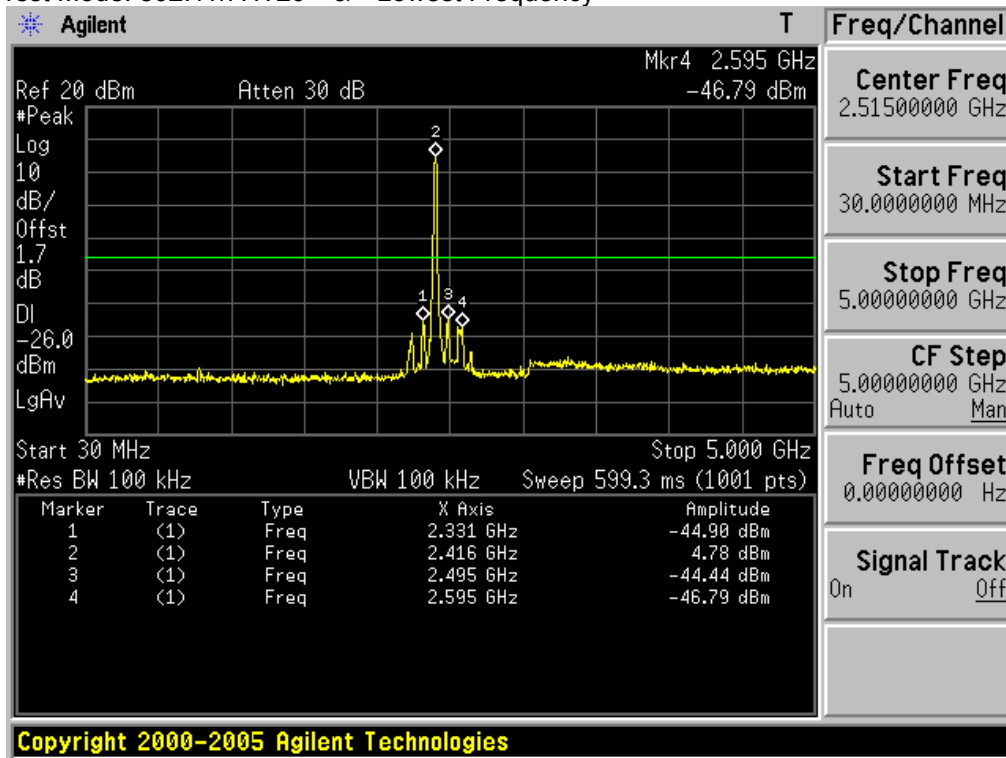
Low Band-edge at 30 dB blow

Ant 2 & Test Mode: 802.11n HT20 & Lowest Frequency



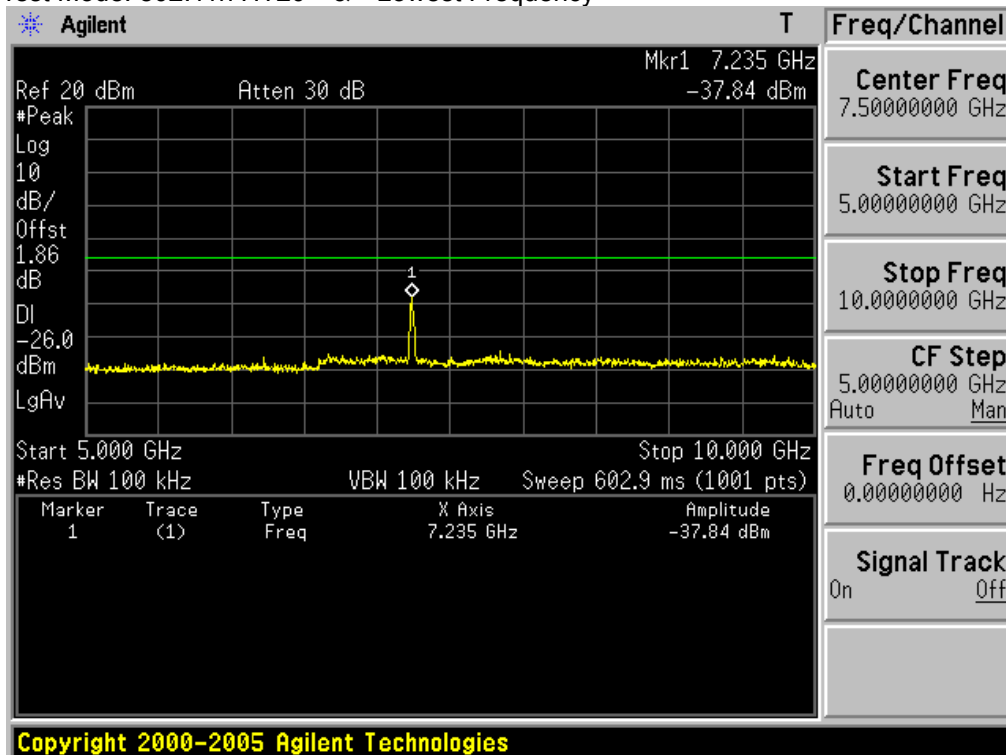
30MHz ~ 5GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11n HT20 & Lowest Frequency



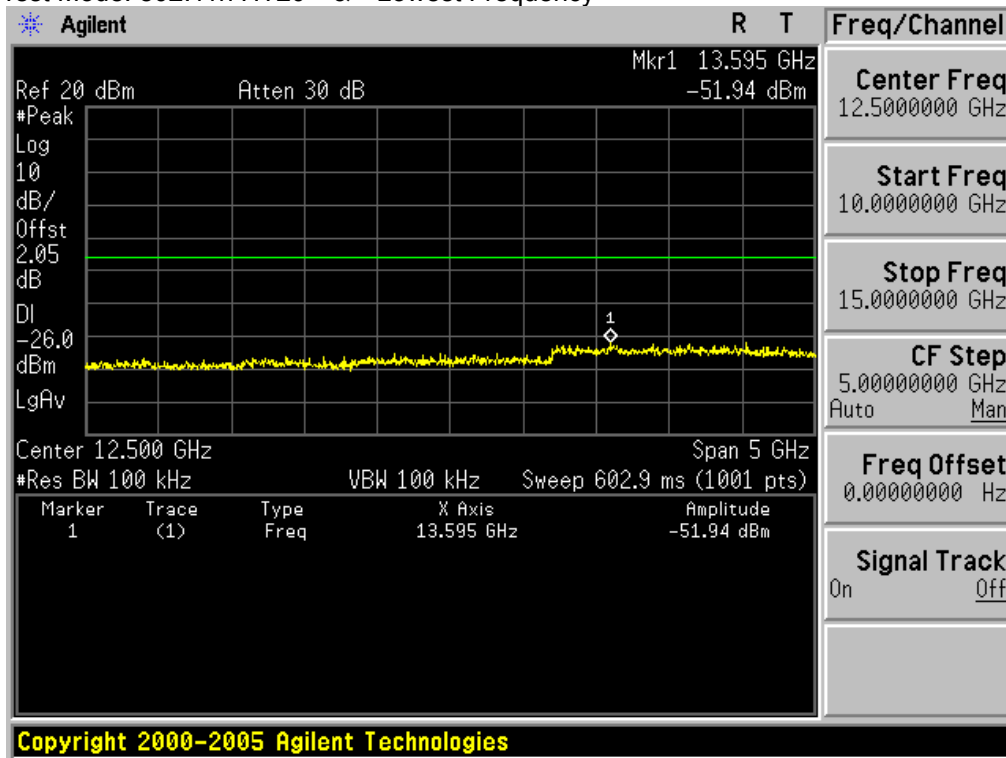
5GHz ~ 10GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11n HT20 & Lowest Frequency



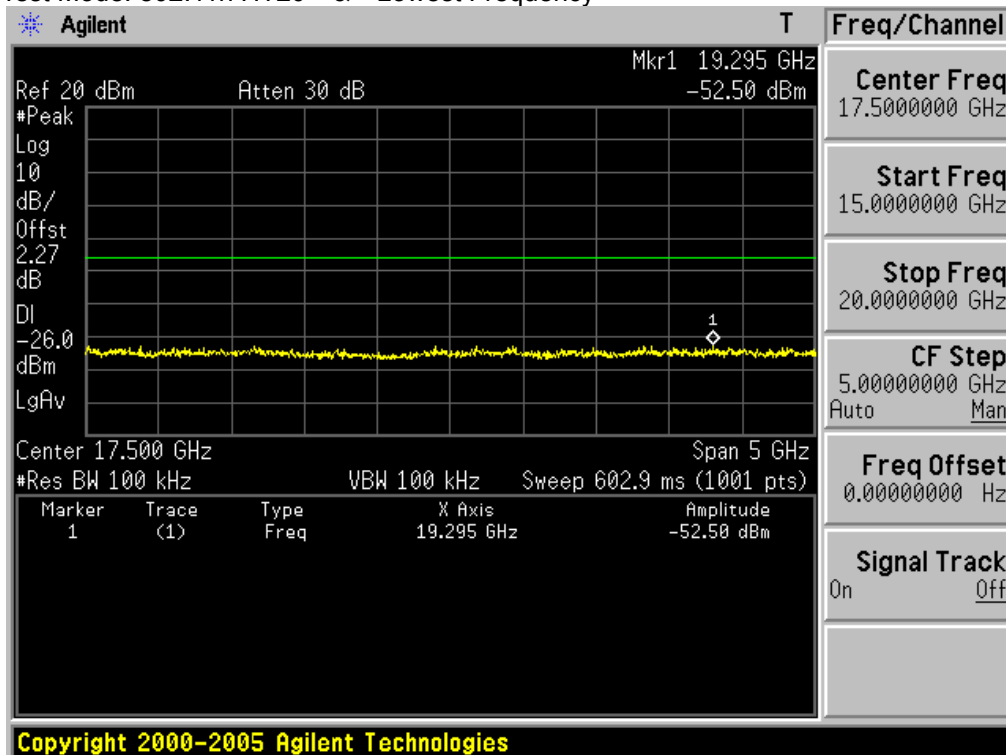
10GHz ~ 15GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11n HT20 & Lowest Frequency



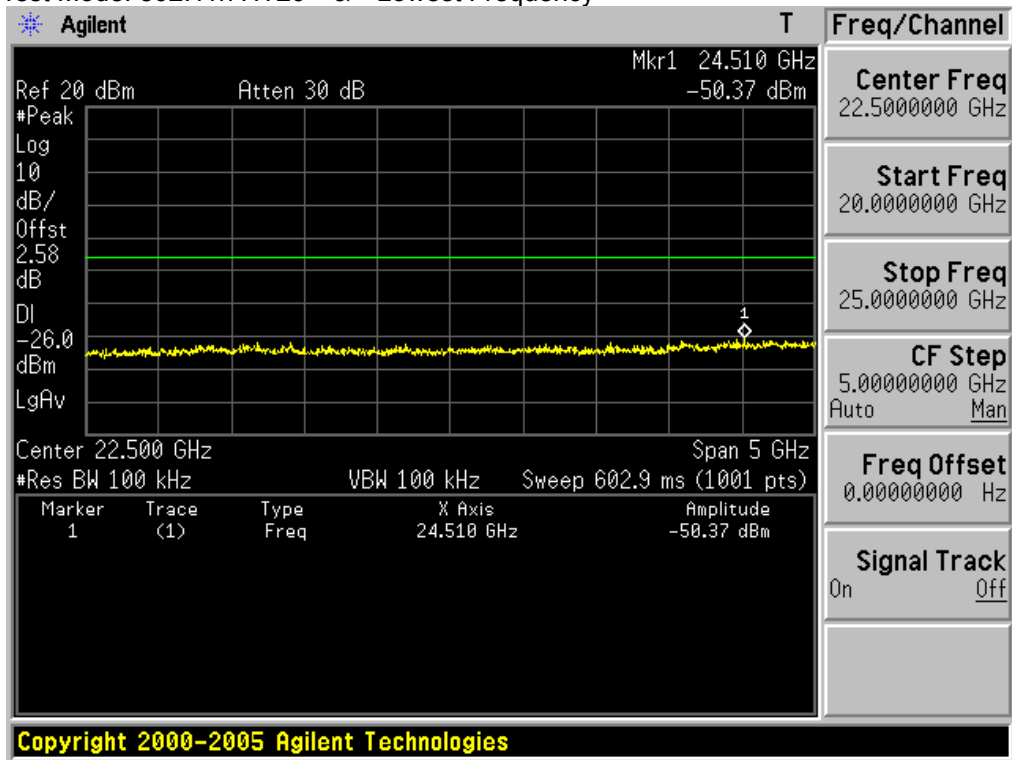
15GHz ~ 20GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11n HT20 & Lowest Frequency



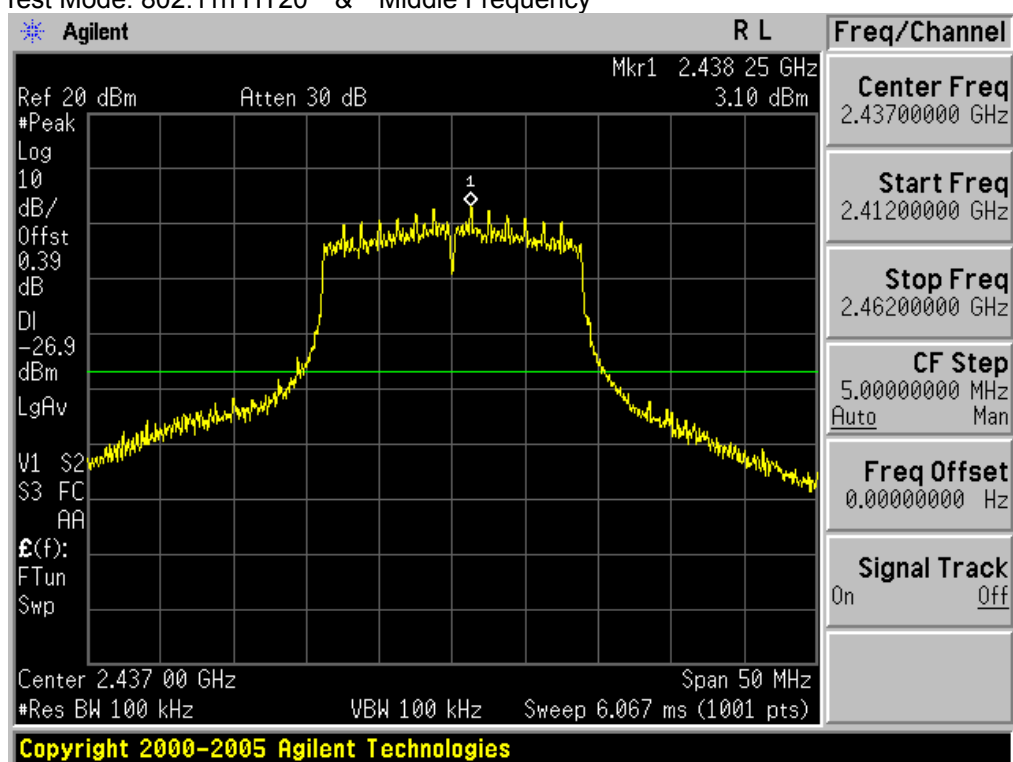
20GHz ~ 25GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11n HT20 & Lowest Frequency



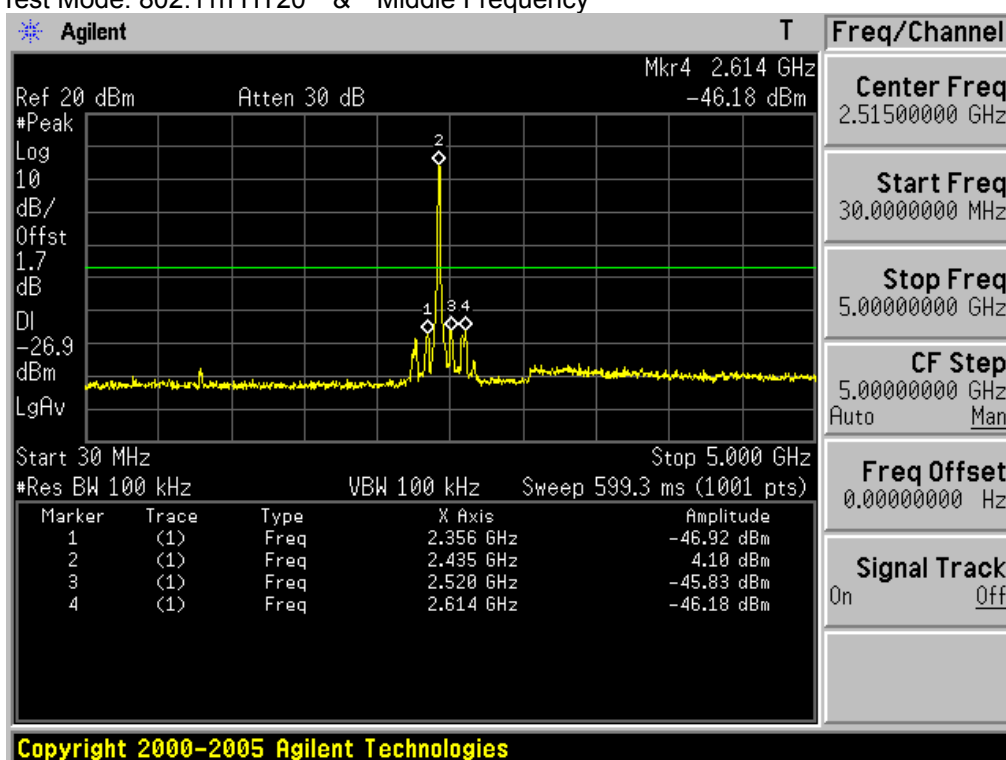
Reference for limit

Ant 2 & Test Mode: 802.11n HT20 & Middle Frequency



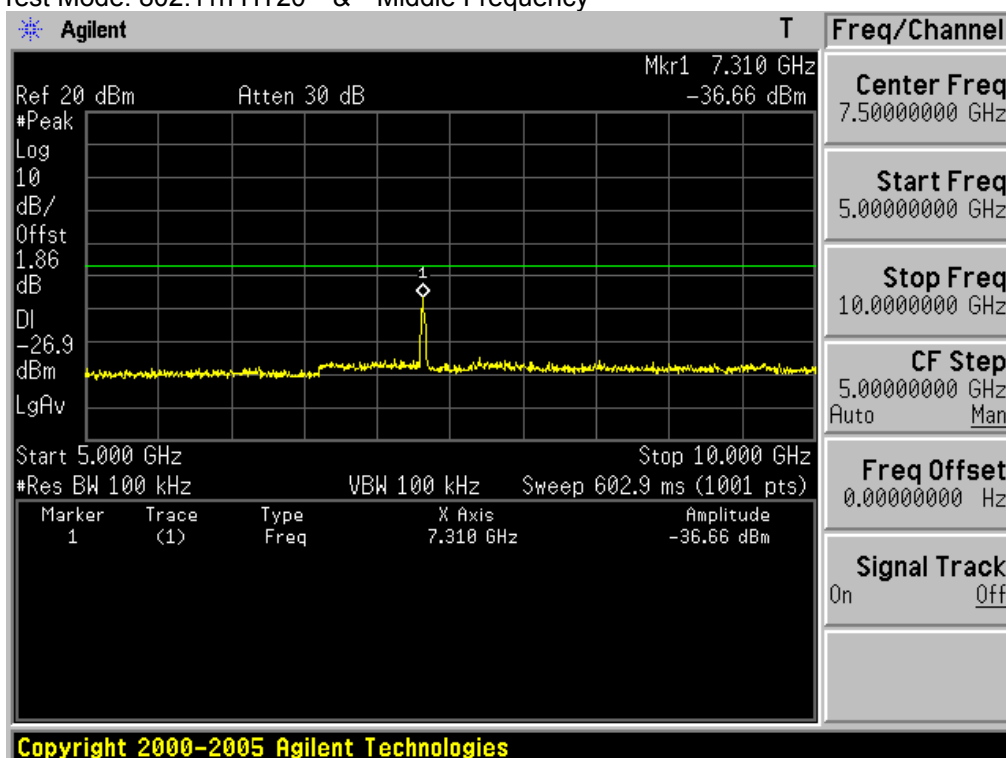
30MHz ~ 5GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11n HT20 & Middle Frequency



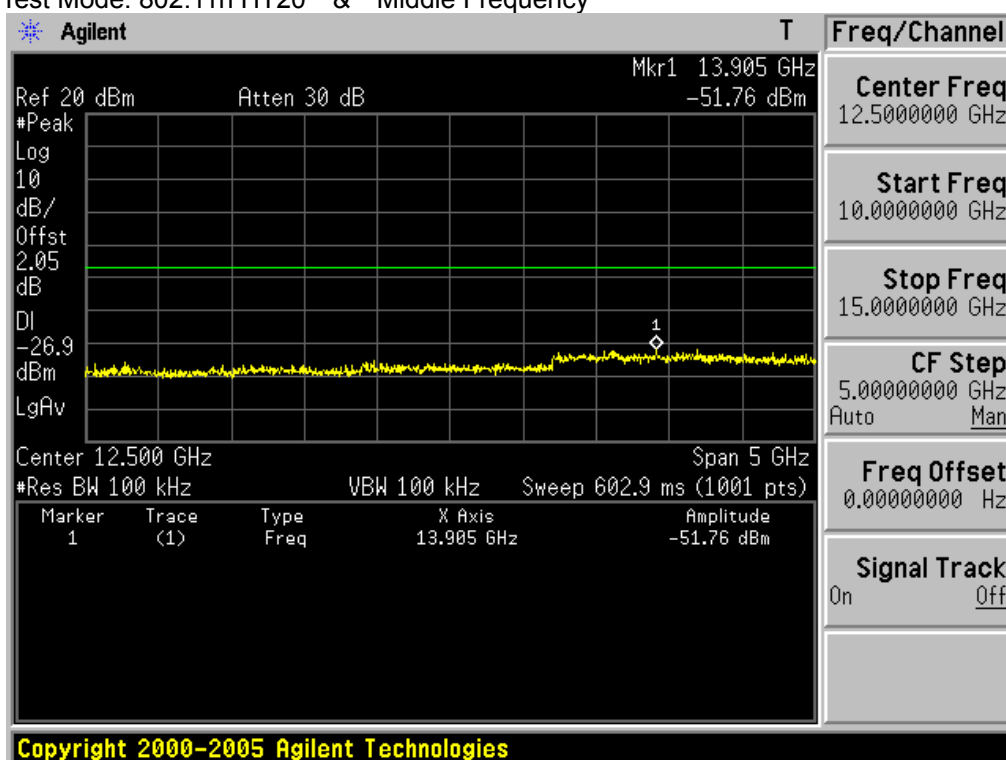
5GHz ~ 10GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11n HT20 & Middle Frequency



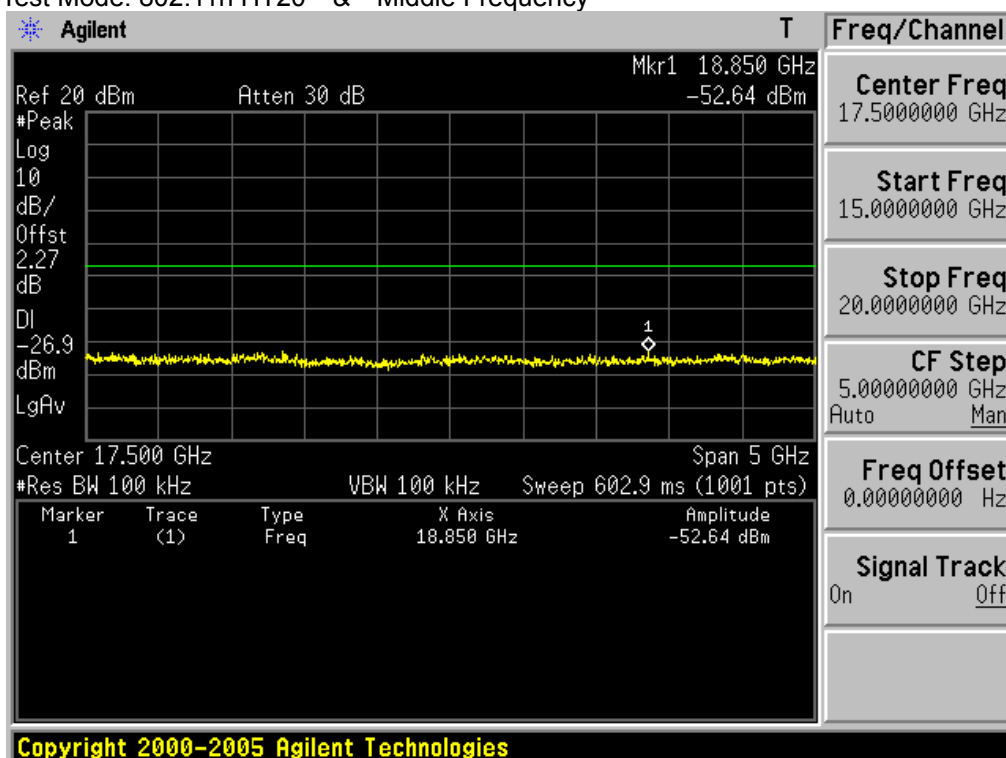
10GHz ~ 15GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11n HT20 & Middle Frequency



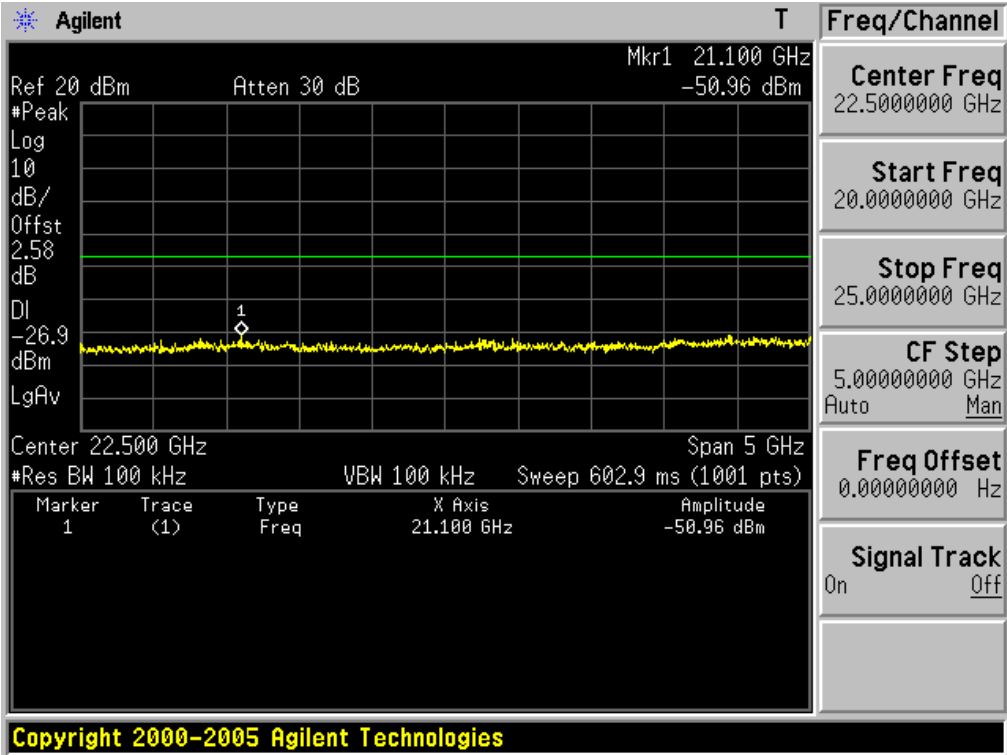
15GHz ~ 20GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11n HT20 & Middle Frequency



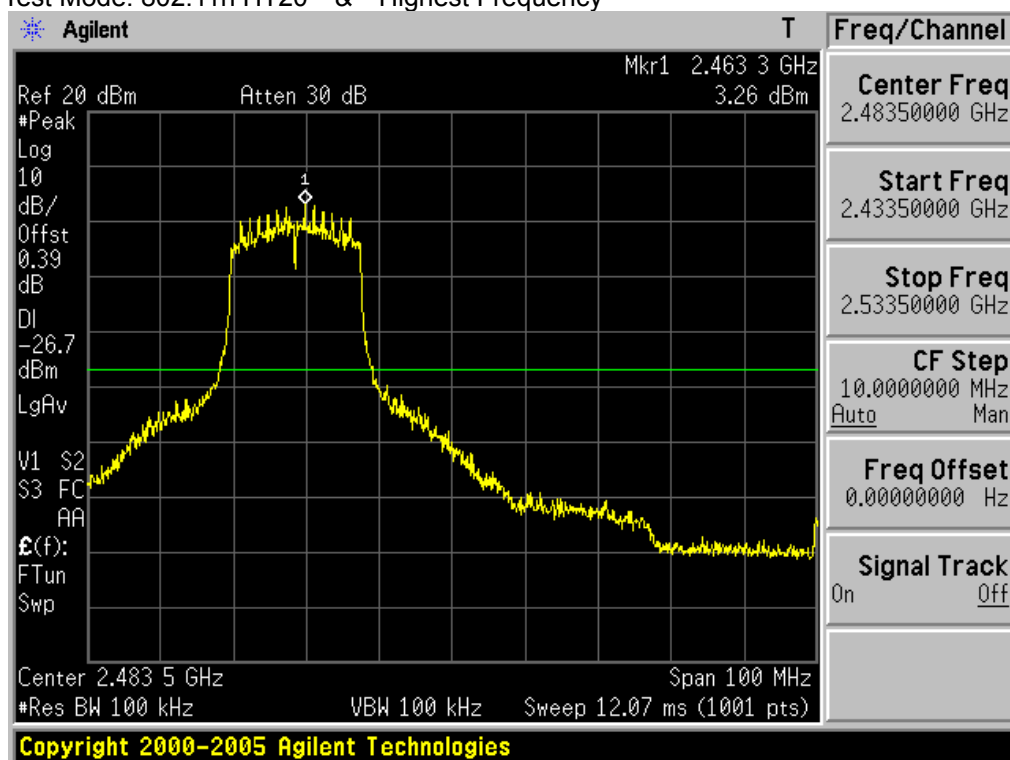
20GHz ~ 25GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11n HT20 & Middle Frequency



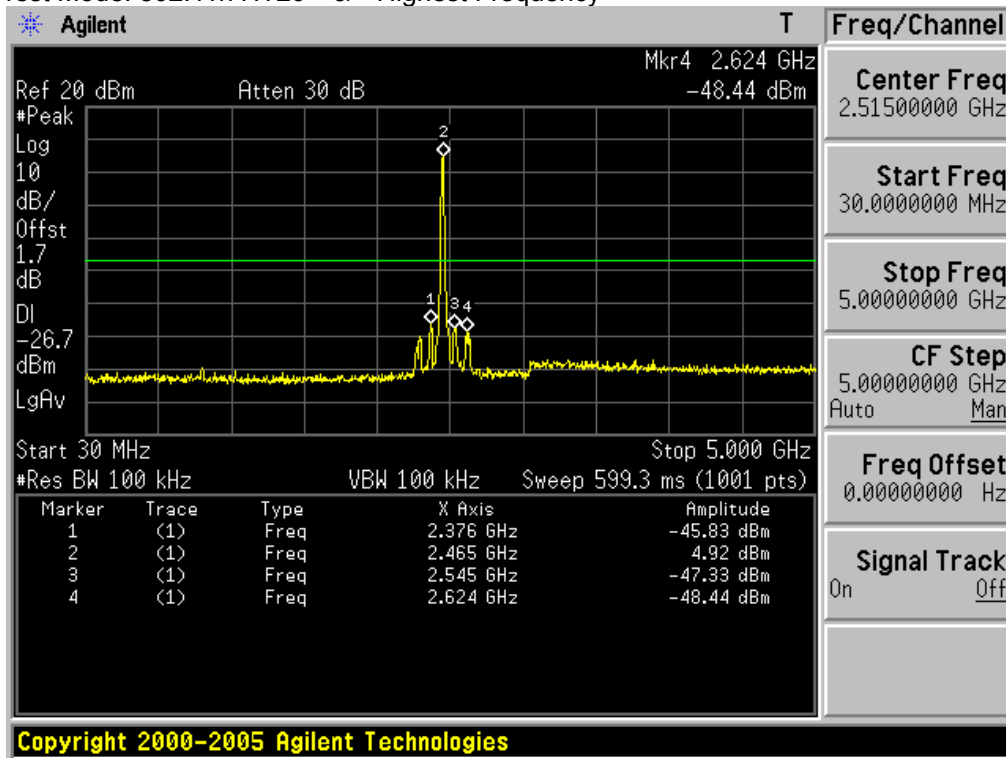
High Band-edge at 30 dB blow

Ant 2 & Test Mode: 802.11n HT20 & Highest Frequency



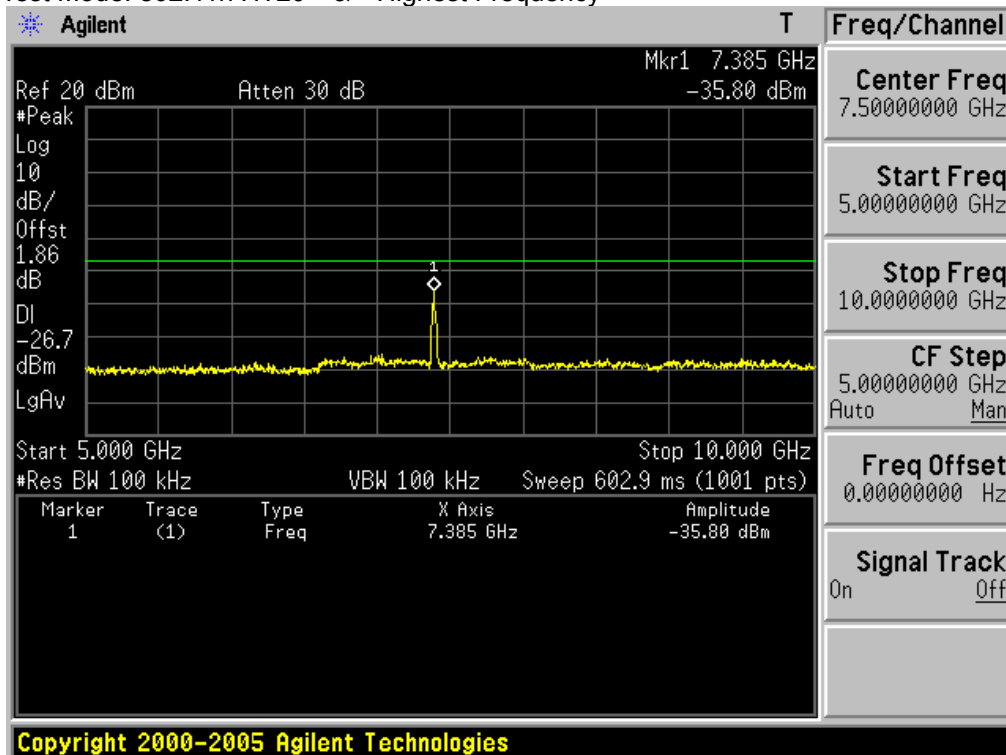
30MHz ~ 5GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11n HT20 & Highest Frequency



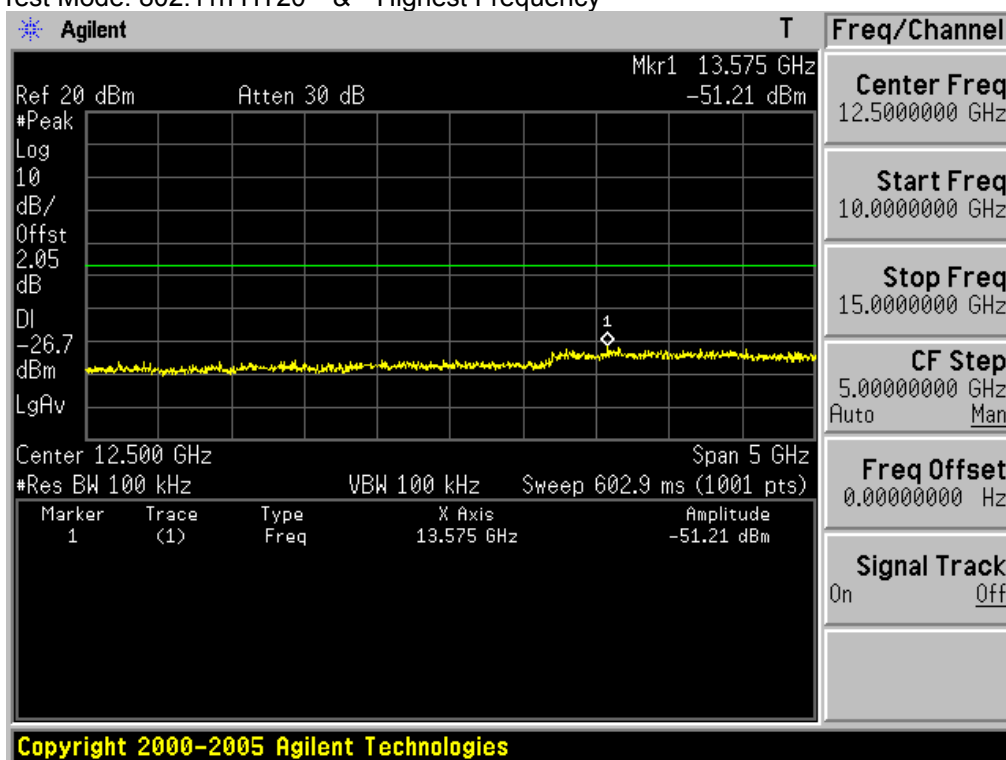
5GHz ~ 10GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11n HT20 & Highest Frequency



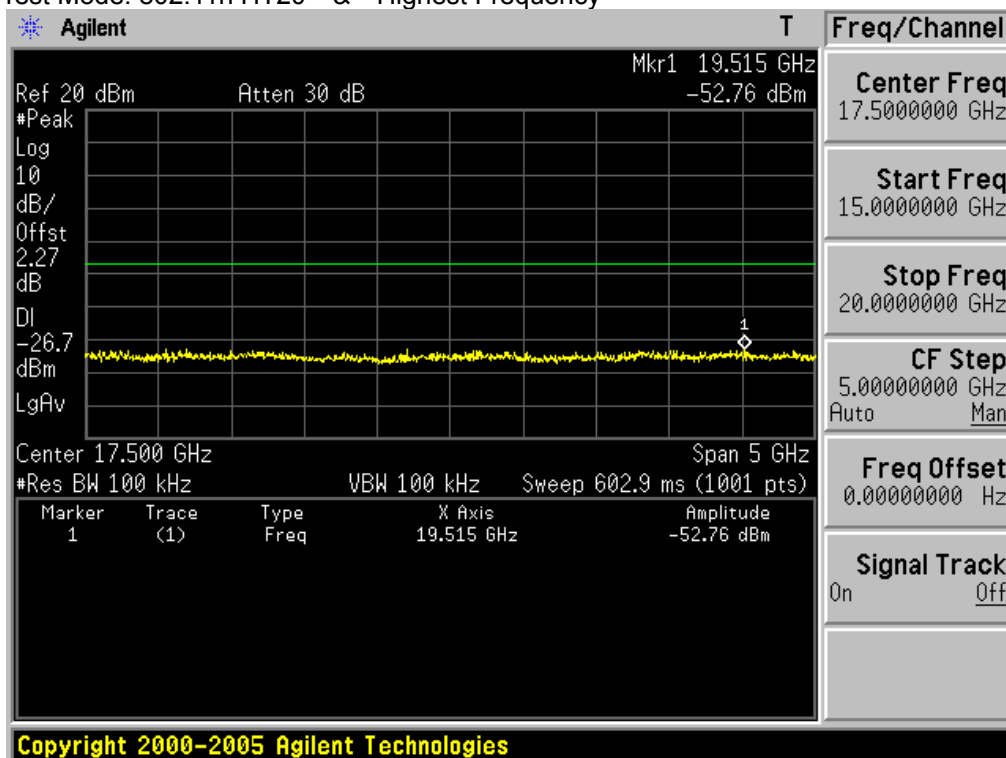
10GHz ~ 15GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11n HT20 & Highest Frequency



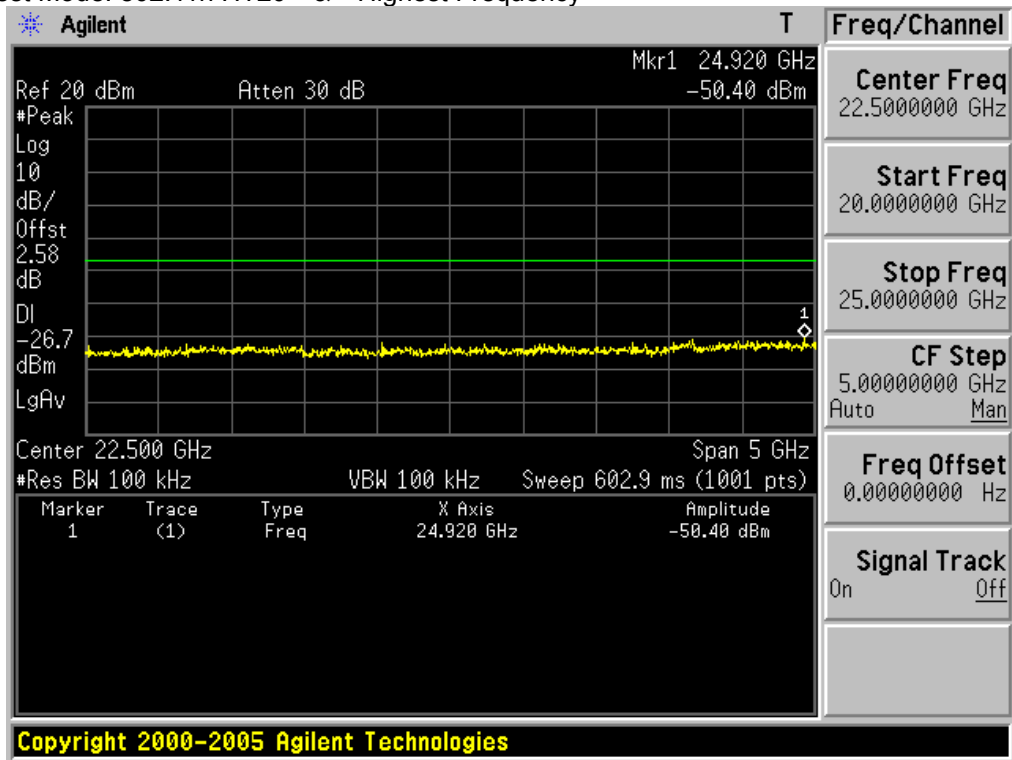
15GHz ~ 20GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11n HT20 & Highest Frequency



20GHz ~ 25GHz Conducted Spurious Emissions

Ant 2 & Test Mode: 802.11n HT20 & Highest Frequency



3.2.4 Out of band Emission – Radiated

- Procedure:

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

The spectrum analyzer is set to:

Tested frequency = Low, Middle, High Frequencies

Frequency Range = 30 MHz ~ 10th harmonic.

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

RBW = 120KHz / VBW = ≥ RBW

2. Frequency range: 1GHz ~ 10th harmonics

Peak mode: RBW = 1MHz / VBW = ≥ RBW

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

Detector function = Peak

Sweep = auto

Trace = max hold

- Measurement Data: **Comply**

Note 1: This test item was tested at Ant 1 and at Ant 2. And the worst case data were reported.

Note 2: See next pages for actual measured spectrum plots and data.

- Minimum Standard:

• FCC Part 15.209(a) and (b)

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

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

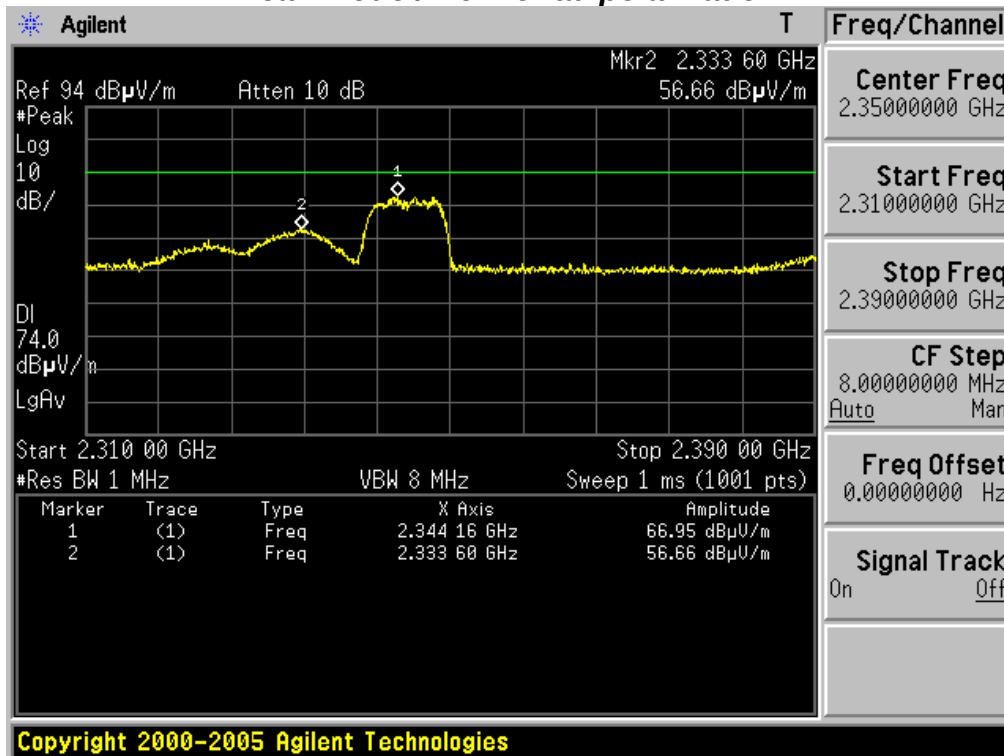
• FCC Part 15.205 (a): Only spurious emissions are permitted in any of the frequency bands listed below:

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

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

Restricted Band Edge

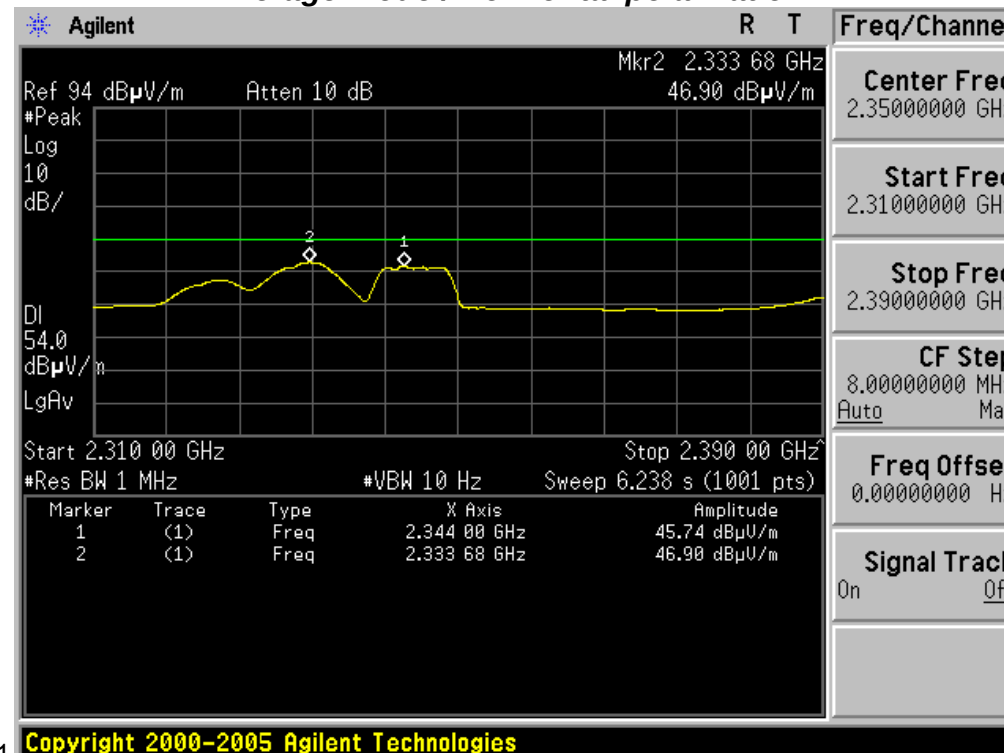
Ant 2 & Test Mode: 802.11b & Lowest Frequency

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

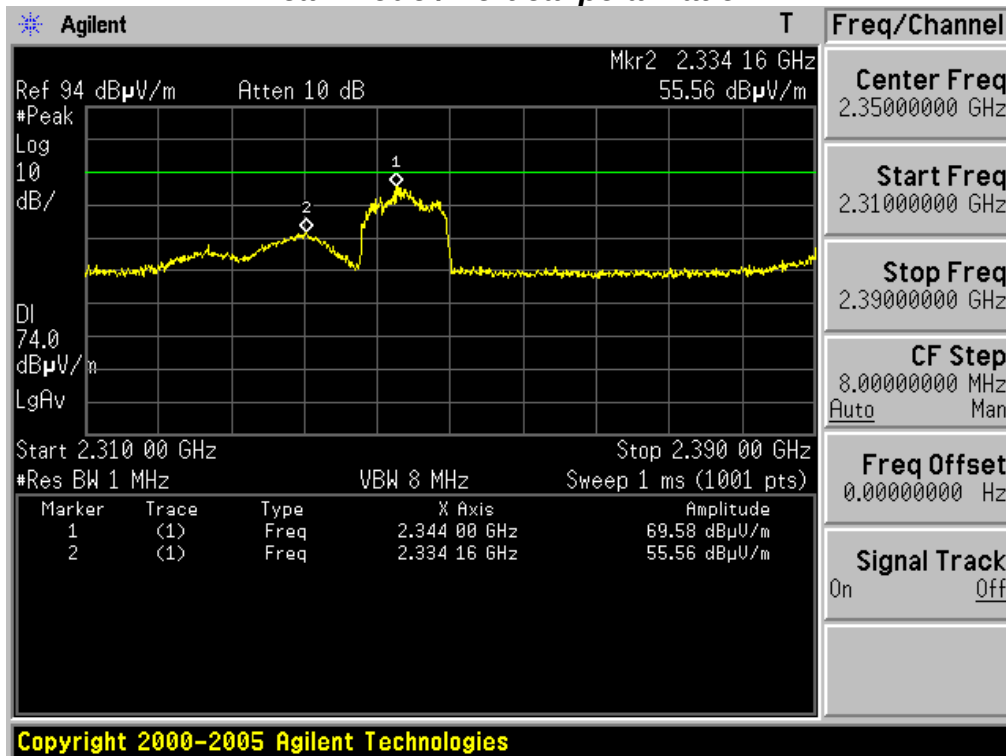
Ant 2 & Test Mode: 802.11b & Lowest Frequency

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 Ant 2 & Test Mode: 802.11b & Lowest Frequency

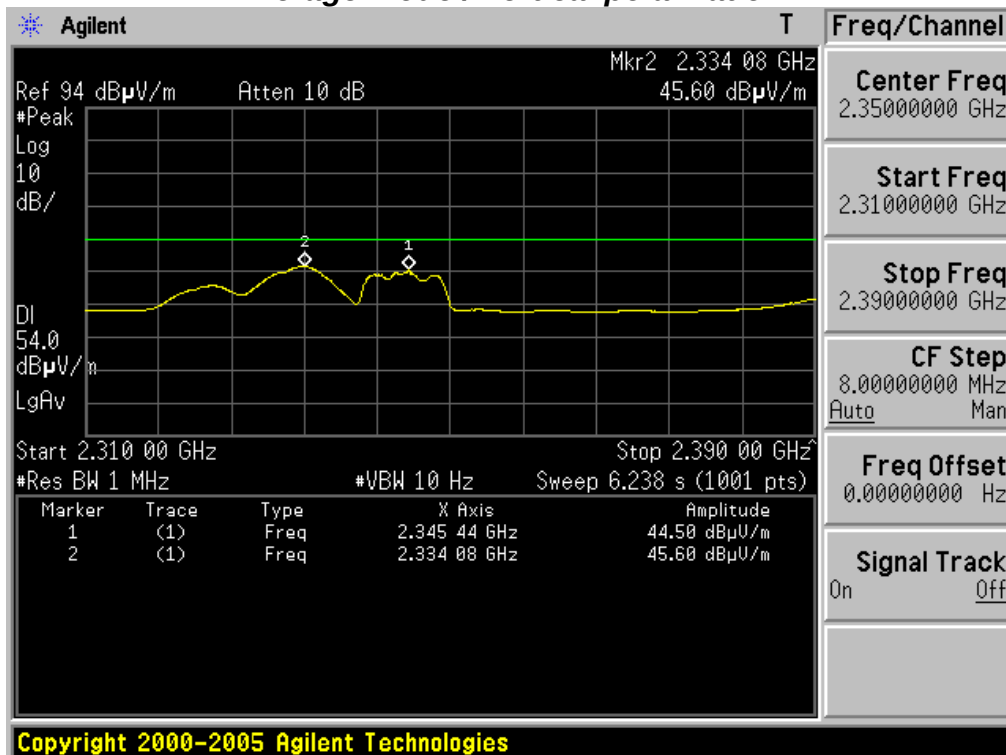
Peak mode / Vertical polarization



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

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

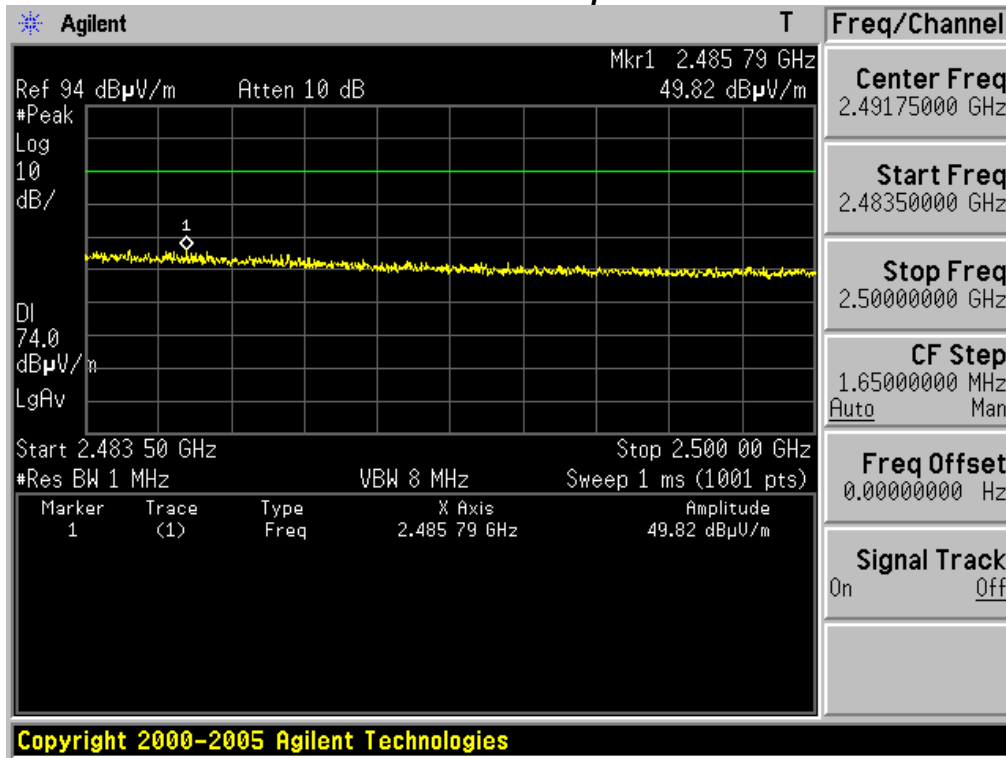
Average mode / Vertical polarization



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

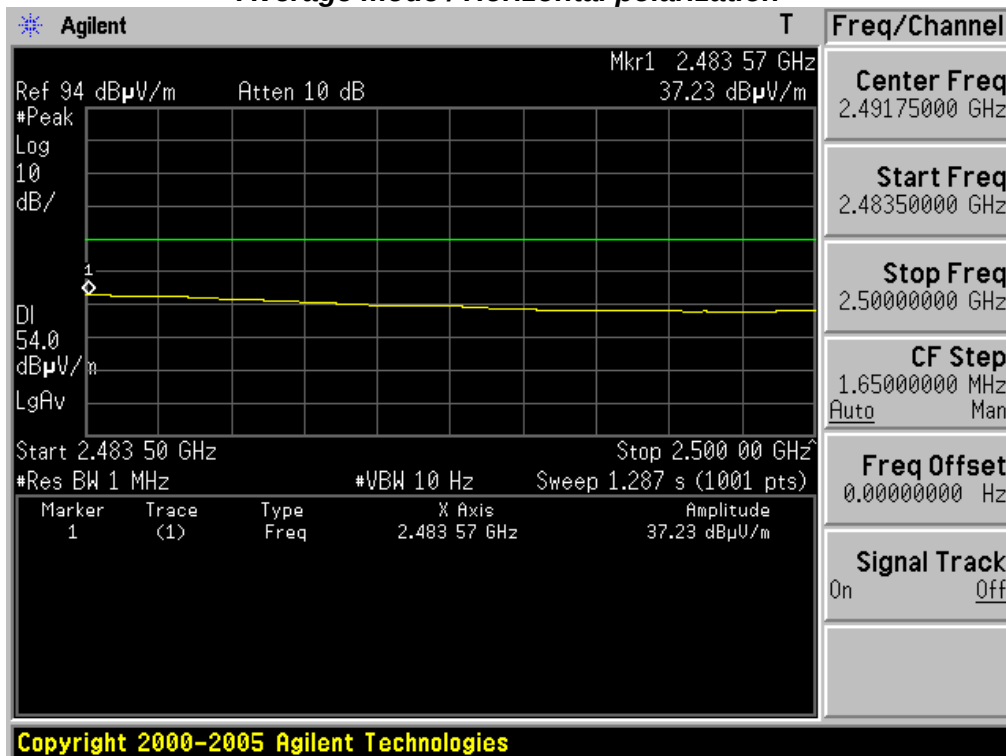
Restricted Band Edge Ant 1 & Test Mode: 802.11b & Highest Frequency

Peak mode / Horizontal polarization



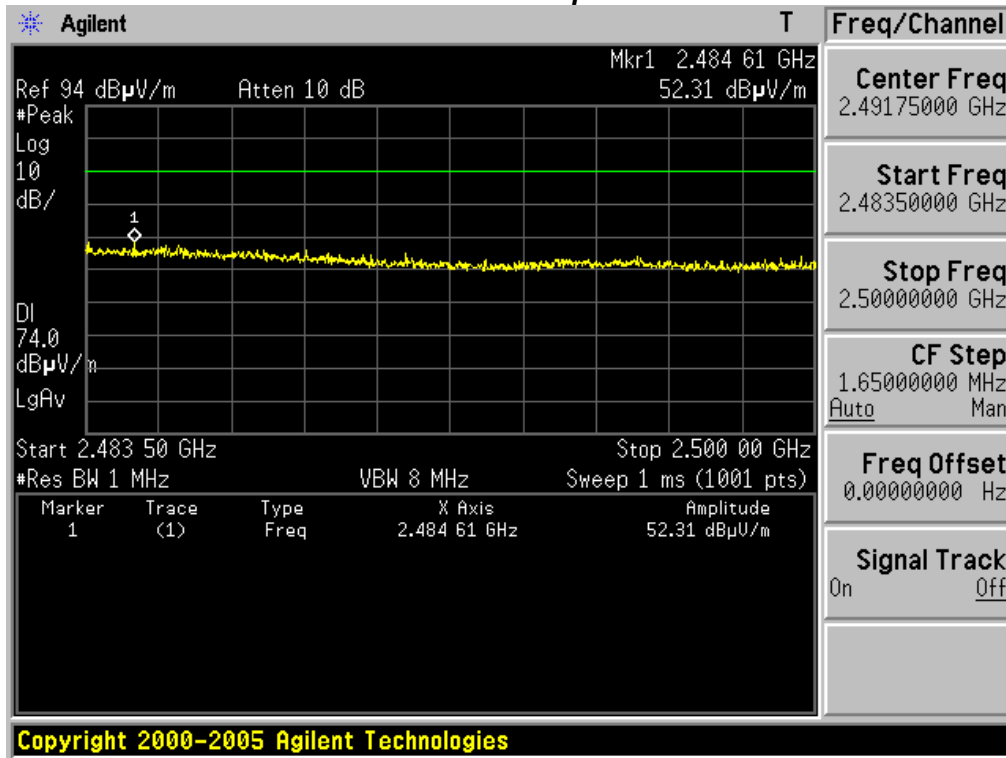
Restricted Band Edge Ant 1 & Test Mode: 802.11b & Highest Frequency

Average mode / Horizontal polarization



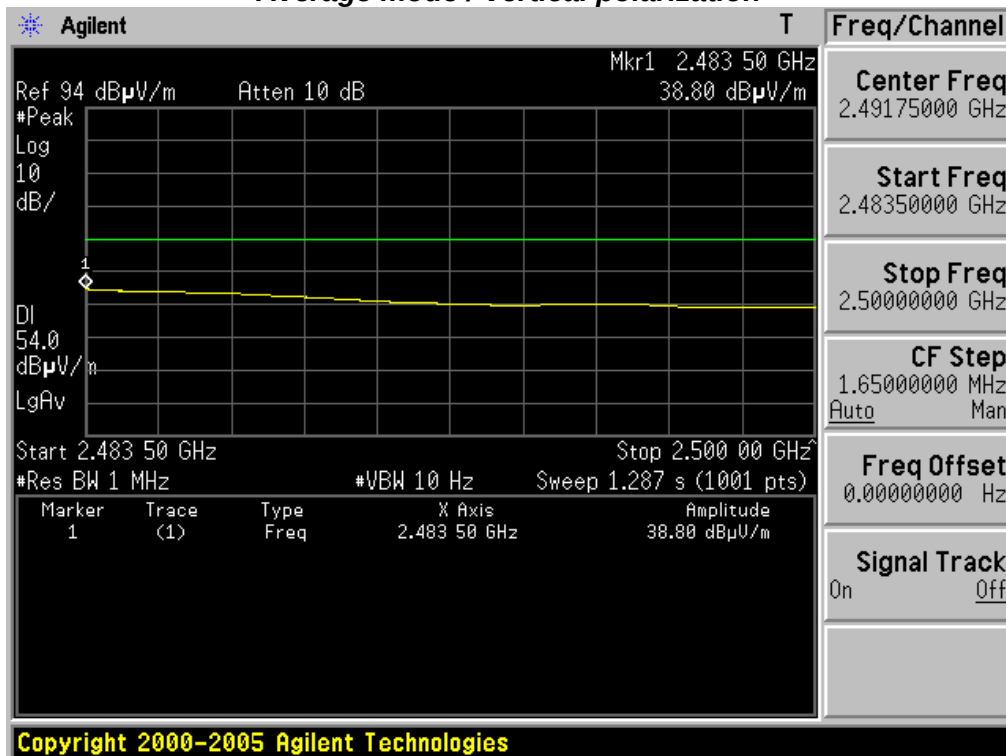
Restricted Band Edge Ant 1 & Test Mode: 802.11b & Highest Frequency

Peak mode / Vertical polarization

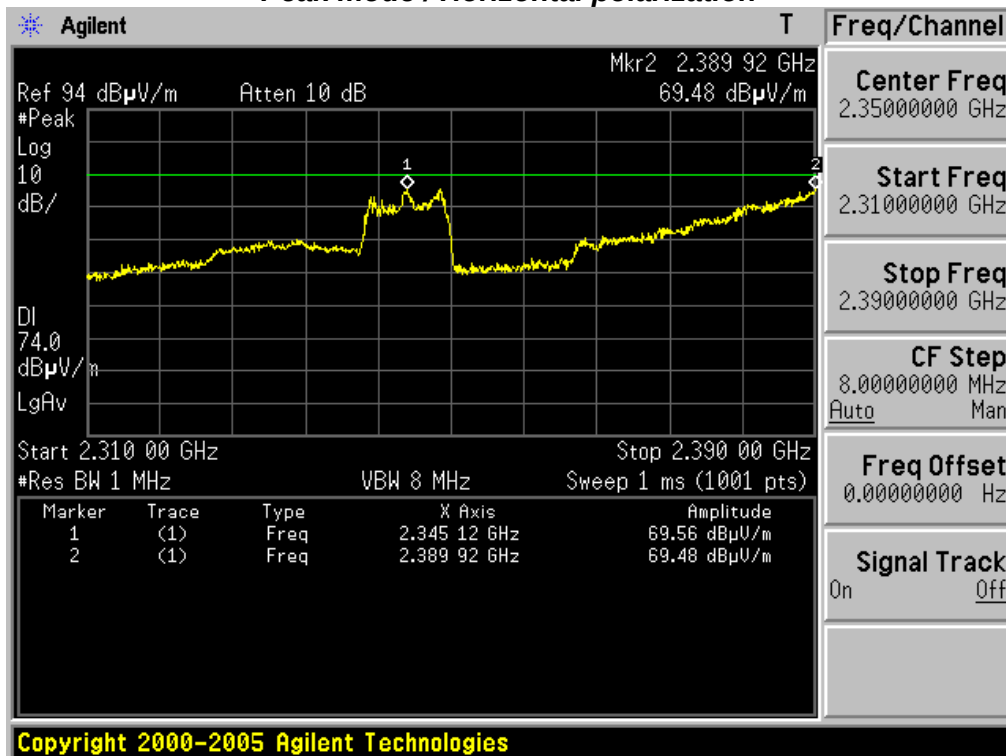


Restricted Band Edge Ant 1 & Test Mode: 802.11b & Highest Frequency

Average mode / Vertical polarization

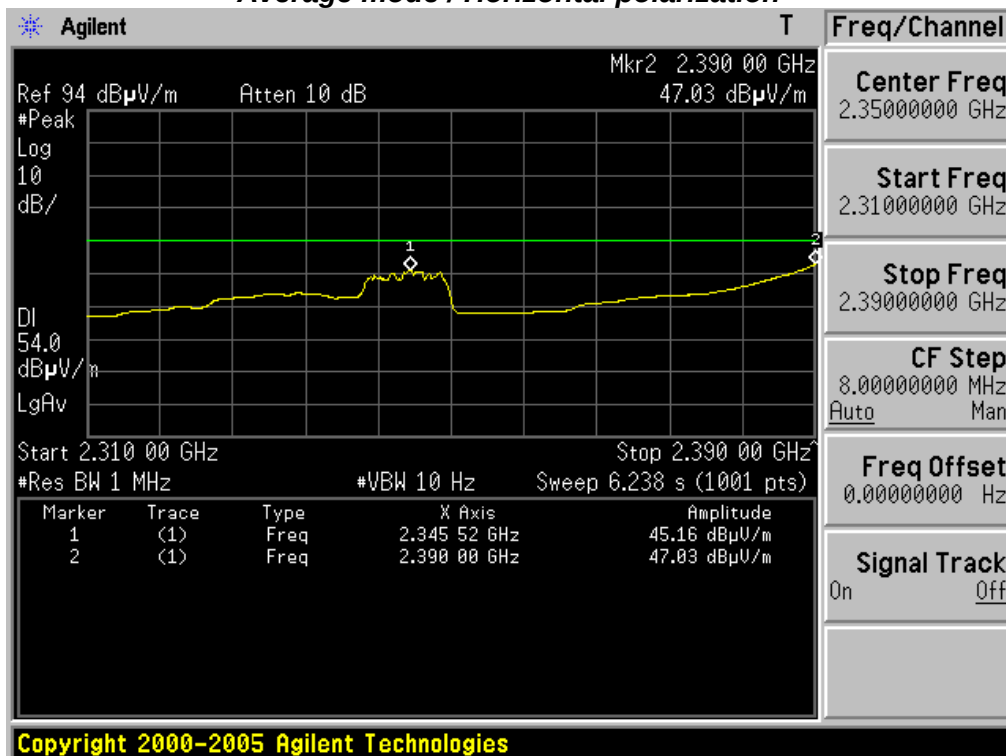


Restricted Band Edge Ant 2 & Test Mode: 802.11g & Lowest Frequency

Peak mode / Horizontal polarization


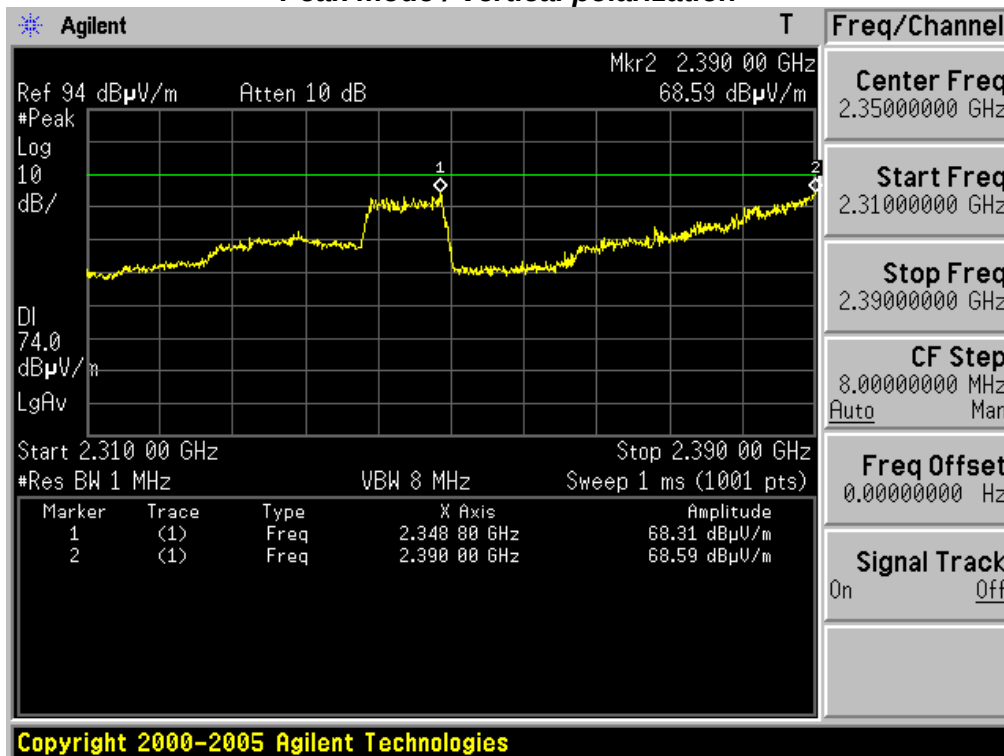
Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

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

Average mode / Horizontal polarization


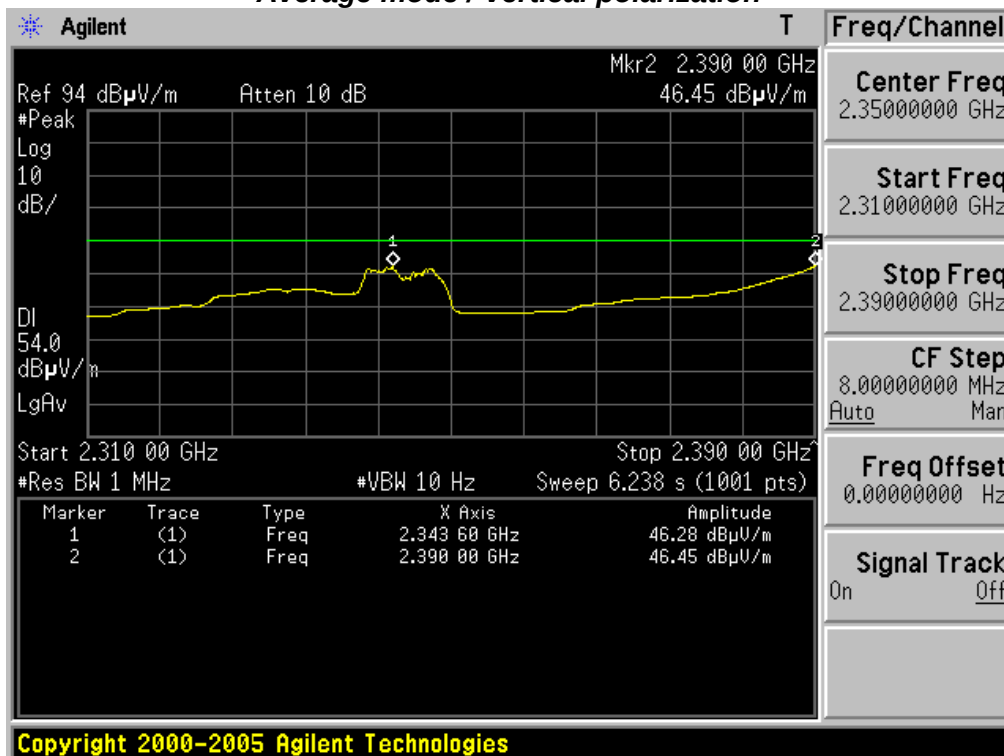
Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

Restricted Band Edge Ant 2 & 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.

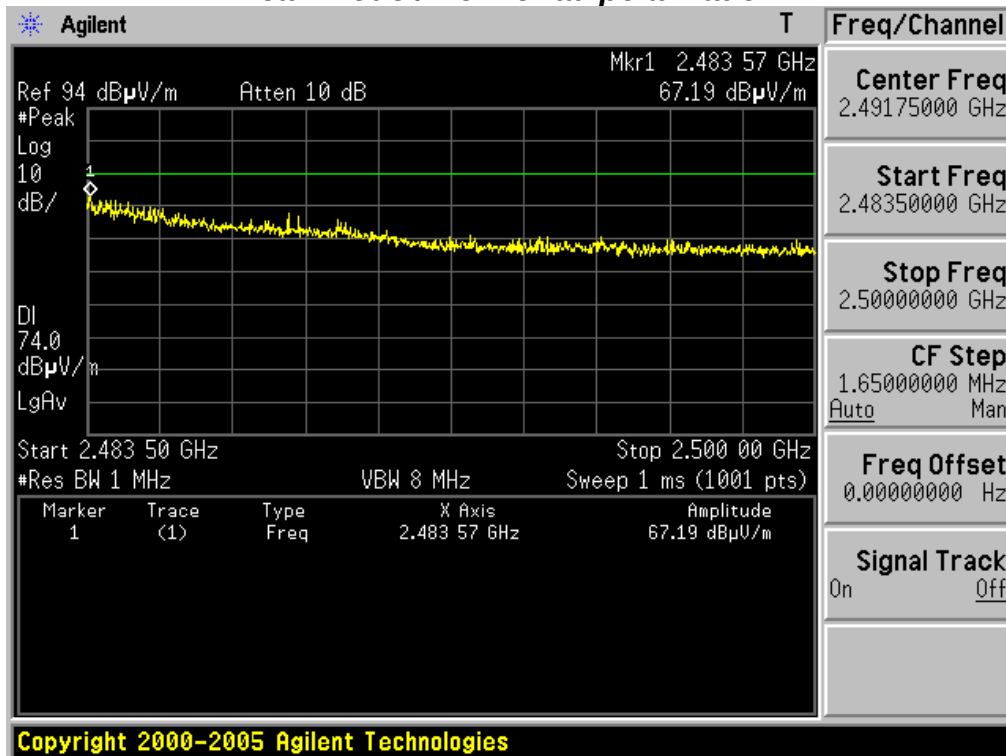
Restricted Band Edge Ant 2 & Test Mode: 802.11g & Lowest Frequency

Average mode / Vertical polarization


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

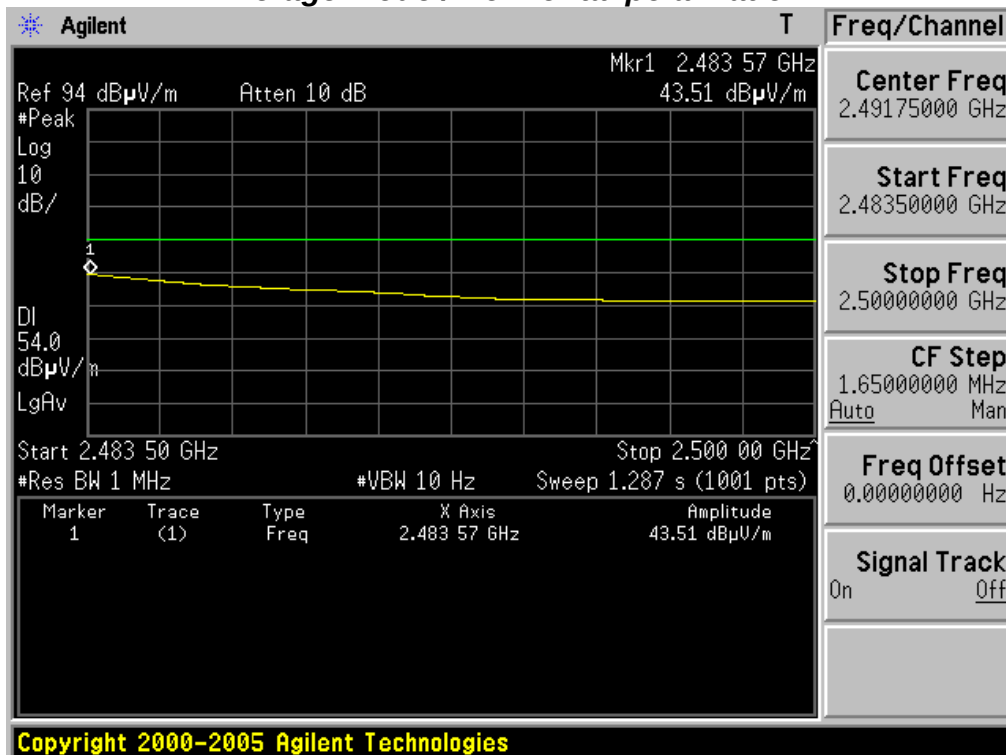
Restricted Band Edge Ant 1 & Test Mode: 802.11g & Highest Frequency

Peak mode / Horizontal polarization



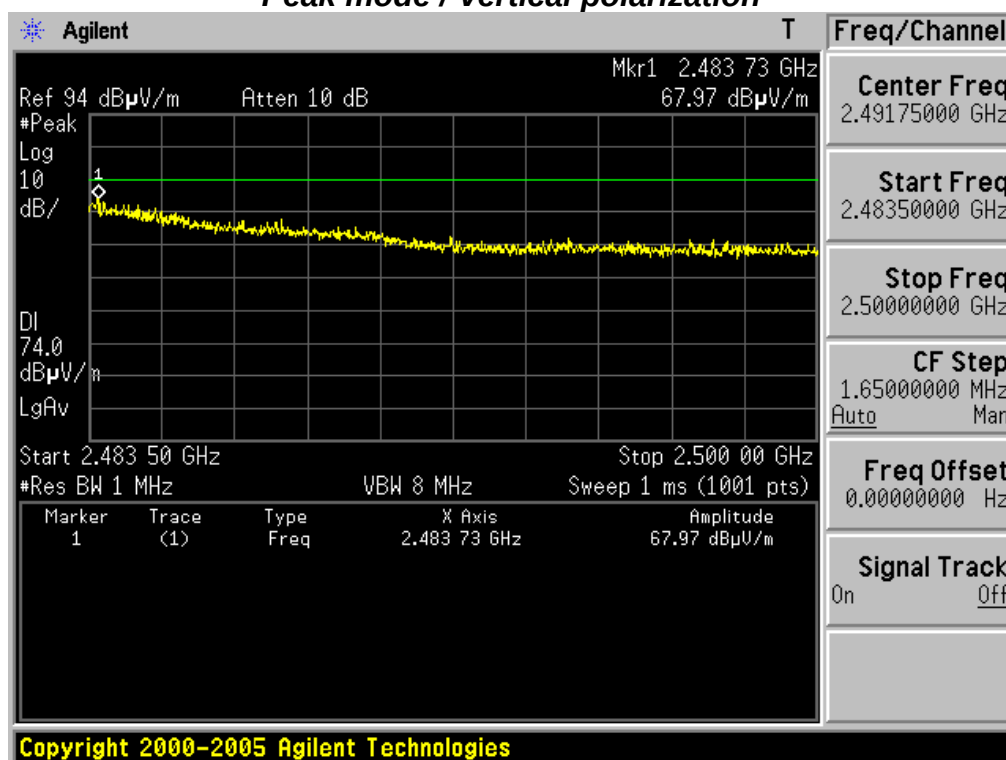
Restricted Band Edge Ant 1 & Test Mode: 802.11g & Highest Frequency

Average mode / Horizontal polarization



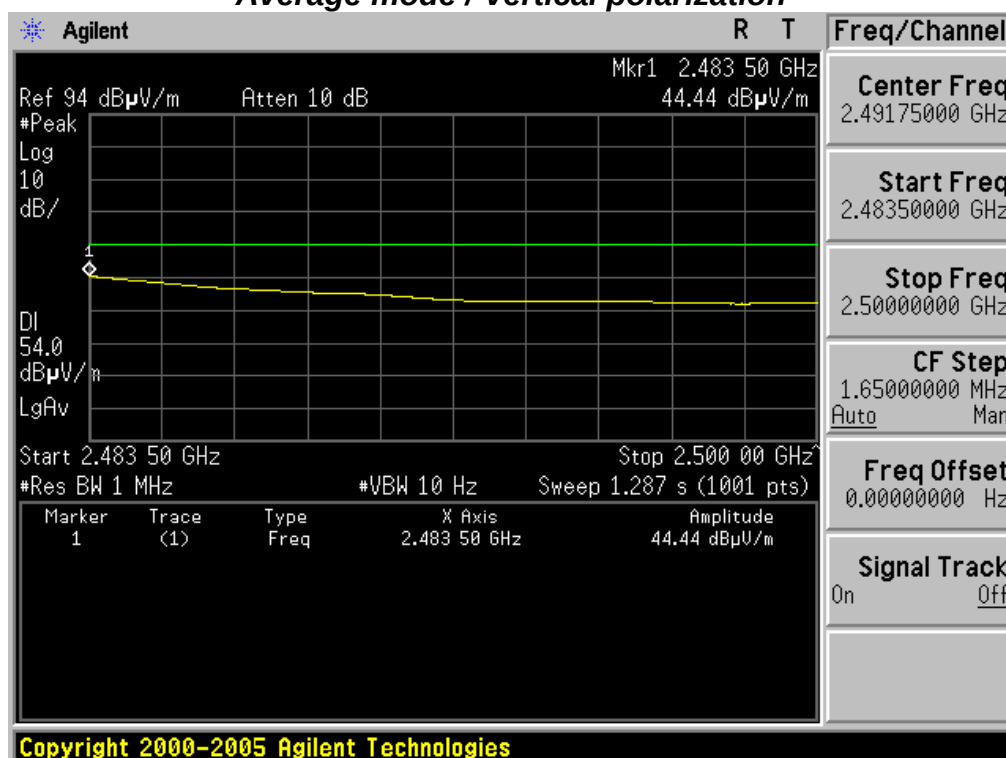
Restricted Band Edge Ant 1 & Test Mode: 802.11g & Highest Frequency

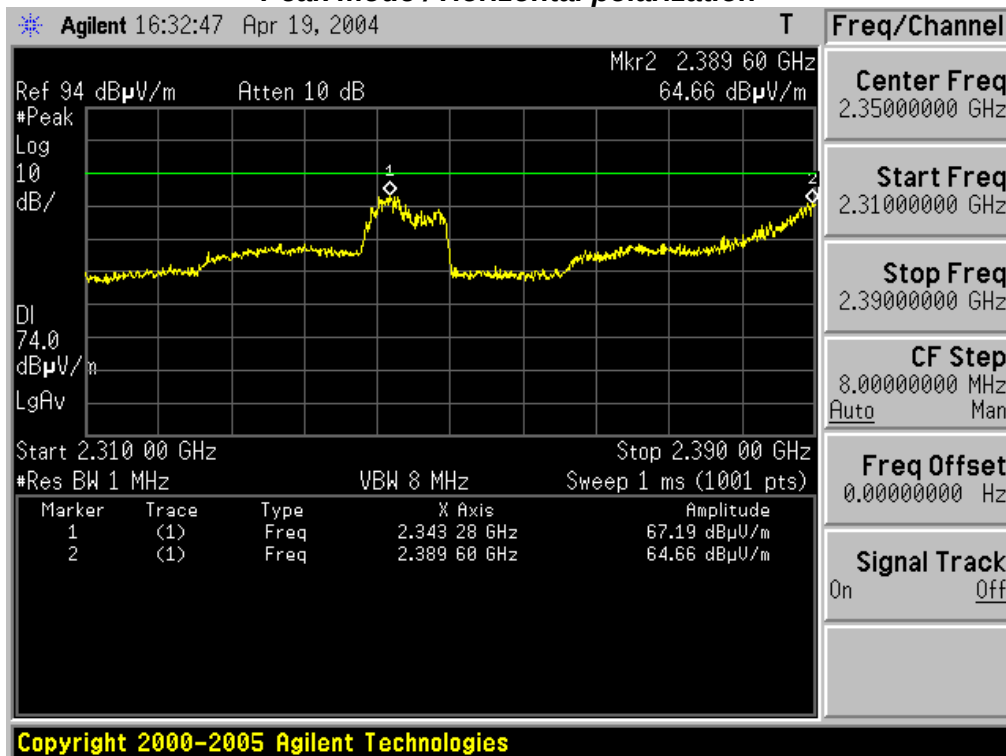
Peak mode / Vertical polarization



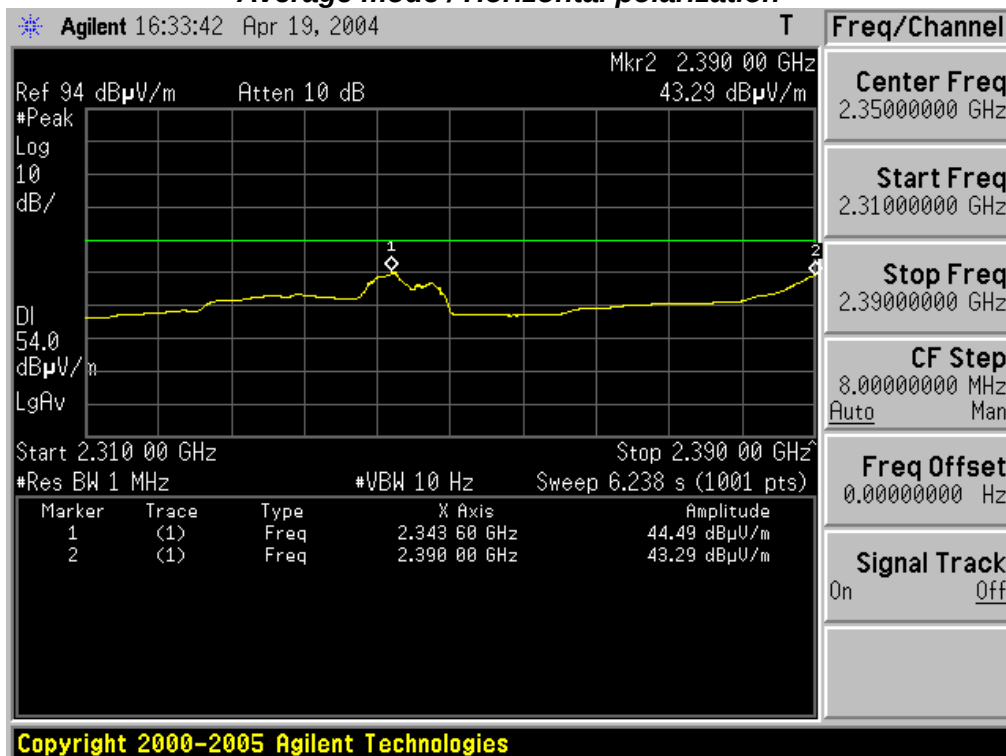
Restricted Band Edge Ant 1 & Test Mode: 802.11g & Highest Frequency

Average mode / Vertical polarization



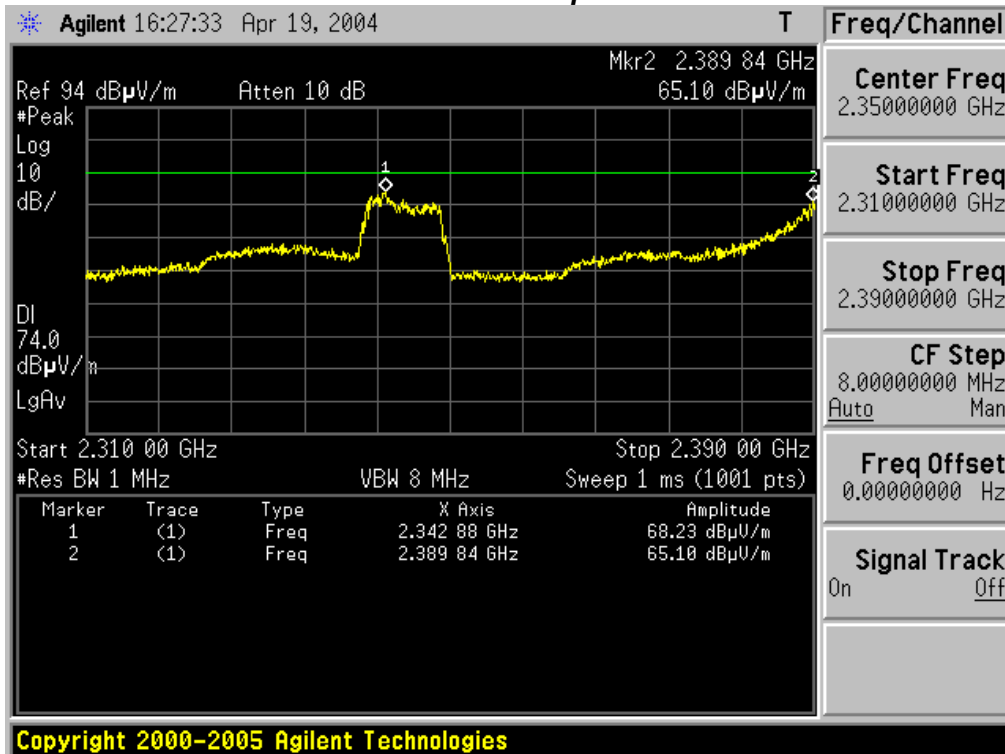
Restricted Band Edge Ant 2 & Test Mode: 802.11n HT20 & Lowest Frequency**Peak mode / Horizontal polarization**

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

Restricted Band Edge Ant 2 & Test Mode: 802.11 n HT20 & Lowest Frequency**Average mode / Horizontal polarization**

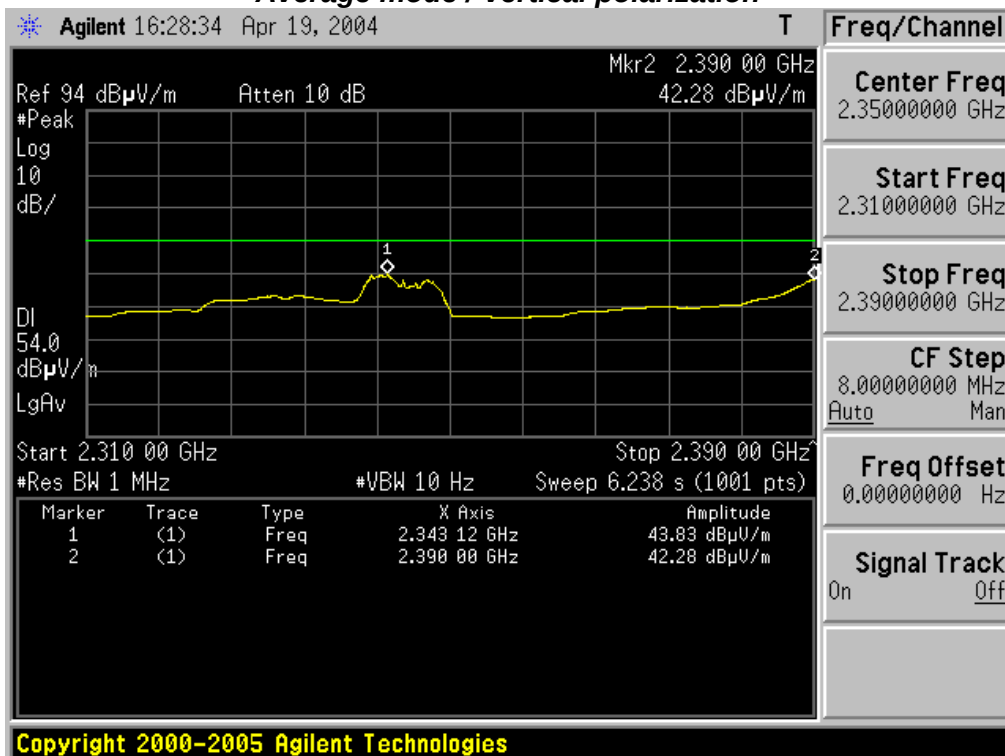
Marker 1's emissions of the low band edge test plots are emissions from WIMAX downlink signal in Korea.

Restricted Band Edge Ant 2 & Test Mode: 802.11n HT20 & 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.

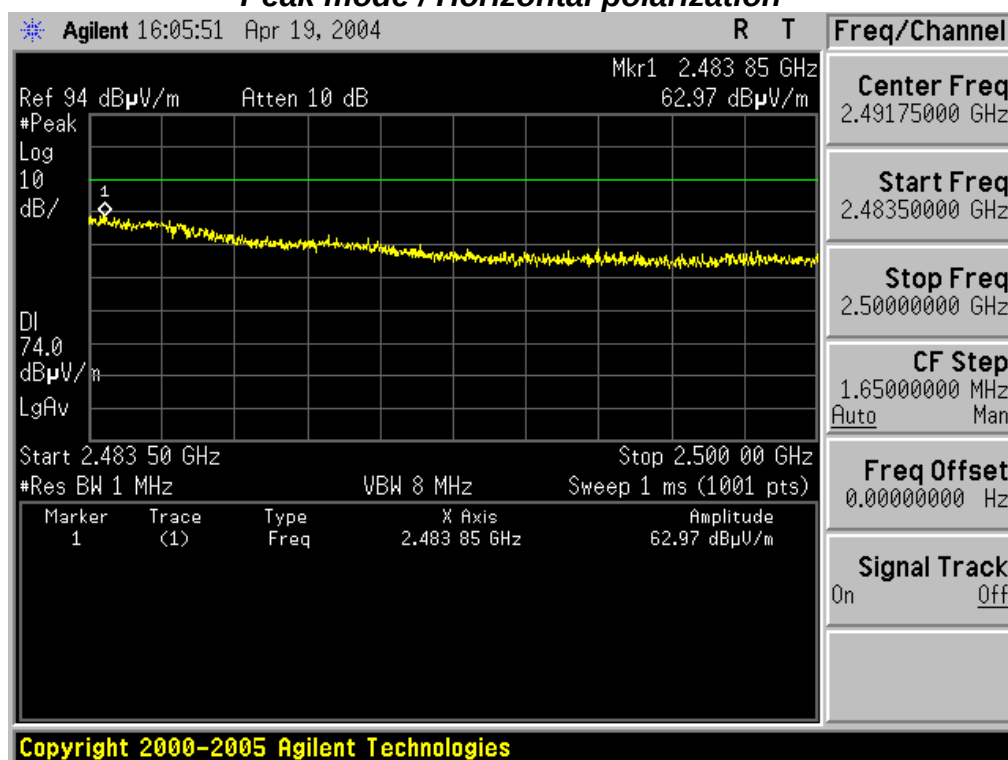
Restricted Band Edge Ant 2 & Test Mode: 802.11n HT20 & Lowest Frequency

Average mode / Vertical polarization


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

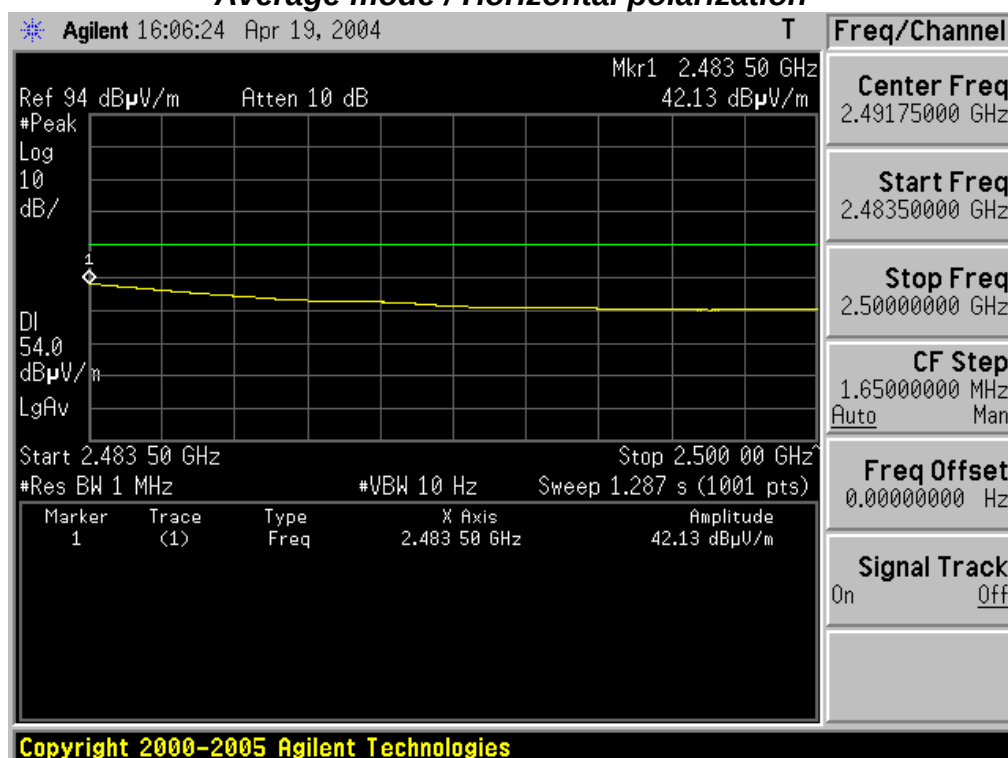
Restricted Band Edge Ant 1 & Test Mode: 802.11n HT20 & Highest Frequency

Peak mode / Horizontal polarization



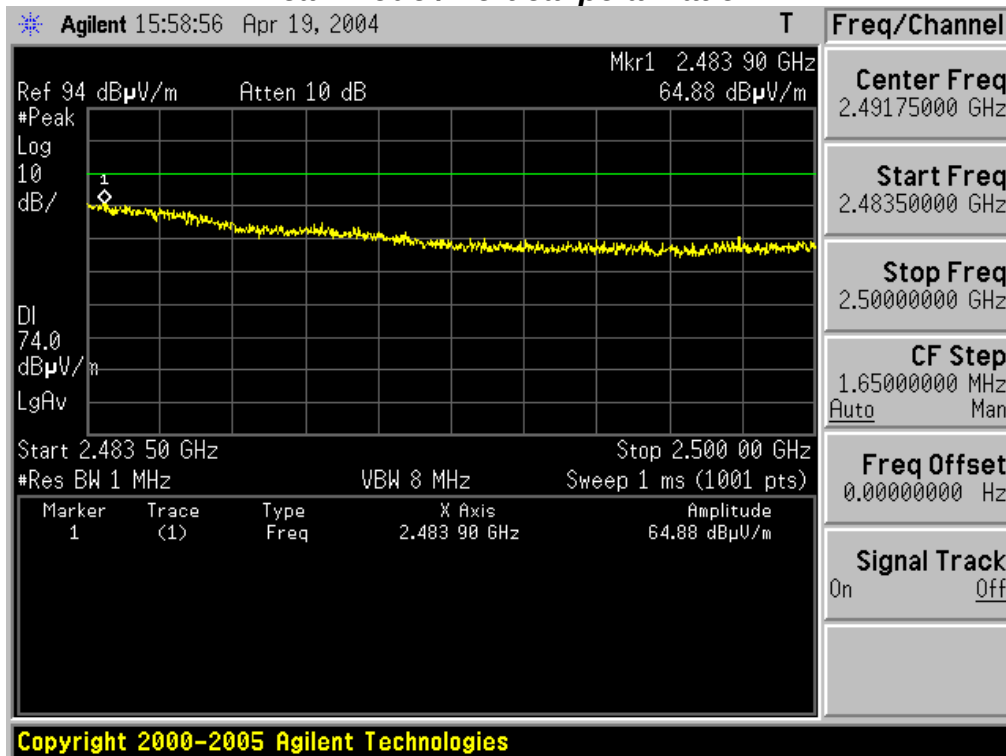
Restricted Band Edge Ant 1 & Test Mode: 802.11n HT20 & Highest Frequency

Average mode / Horizontal polarization



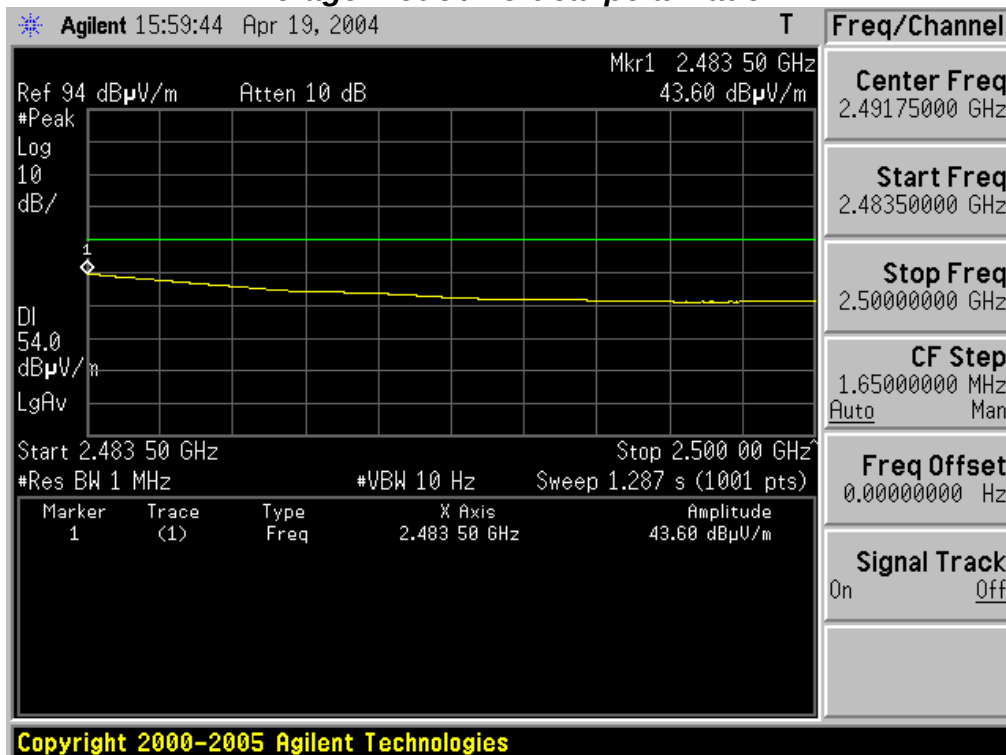
Restricted Band Edge Ant 1 & Test Mode: 802.11n HT20 & Highest Frequency

Peak mode / Vertical polarization



Restricted Band Edge Ant 1 & Test Mode: 802.11n HT20 & Highest Frequency

Average mode / Vertical polarization



30MHz ~ 25GHz Radiated Spurious Emissions

▪ Test Mode: 802.11b & Lowest Frequency

Frequency (MHz)	ANT Pol	Transmitting Antenna	Reading(dBuV)			T.F (dB/m)	Result(dBuV/m)			Limit(dBuV/m)			Margin(dB)		
			QP	PK	AV		QP	PK	AV	QP	PK	AV	QP	PK	AV
100.330	Ver	Ant 2	46.04	-	-	-15.04	31.00	-	-	43.50	-	-	12.50	-	-
100.330	Hor	Ant 2	48.04	-	-	-15.04	33.00	-	-	43.50	-	-	10.50	-	-
216.730	Hor	Ant 2	41.53	-	-	-7.03	34.50	-	-	46.00	-	-	11.50	-	-
287.050	Ver	Ant 2	36.29	-	-	-4.29	32.00	-	-	46.00	-	-	14.00	-	-
289.475	Hor	Ant 2	37.21	-	-	-4.21	33.00	-	-	46.00	-	-	13.00	-	-
4821.480	Hor	Ant 2	-	44.65	32.51	5.41	-	50.06	37.92	-	74.00	54.00	-	23.94	16.08
4823.330	Ver	Ant 2	-	44.98	32.27	5.41	-	50.39	37.68	-	74.00	54.00	-	23.61	16.32

▪ Test Mode: 802.11b & Middle Frequency

Frequency (MHz)	ANT Pol	Transmitting Antenna	Reading(dBuV)			T.F (dB/m)	Result(dBuV/m)			Limit(dBuV/m)			Margin(dB)		
			QP	PK	AV		QP	PK	AV	QP	PK	AV	QP	PK	AV
100.330	Ver	Ant 2	46.54	-	-	-15.04	31.50	-	-	43.50	-	-	12.00	-	-
100.330	Hor	Ant 2	47.54	-	-	-15.04	32.50	-	-	43.50	-	-	11.00	-	-
216.730	Hor	Ant 2	41.03	-	-	-7.03	34.00	-	-	46.00	-	-	12.00	-	-
287.050	Ver	Ant 2	36.79	-	-	-4.29	32.50	-	-	46.00	-	-	13.50	-	-
289.475	Hor	Ant 2	37.71	-	-	-4.21	33.50	-	-	46.00	-	-	12.50	-	-
4875.250	Hor	Ant 2	-	45.93	32.30	5.47	-	51.40	37.77	-	74.00	54.00	-	22.60	16.23
4872.790	Ver	Ant 2	-	45.87	32.67	5.47	-	51.34	38.14	-	74.00	54.00	-	22.66	15.86

▪ Test Mode: 802.11b & Highest Frequency

Frequency (MHz)	ANT Pol	Transmitting Antenna	Reading(dBuV)			T.F (dB/m)	Result(dBuV/m)			Limit(dBuV/m)			Margin(dB)		
			QP	PK	AV		QP	PK	AV	QP	PK	AV	QP	PK	AV
100.330	Ver	Ant 2	46.64	-	-	-15.04	31.60	-	-	43.50	-	-	11.90	-	-
100.330	Hor	Ant 2	47.74	-	-	-15.04	32.70	-	-	43.50	-	-	10.80	-	-
216.730	Hor	Ant 2	40.03	-	-	-7.03	33.00	-	-	46.00	-	-	13.00	-	-
287.050	Ver	Ant 2	37.09	-	-	-4.29	32.80	-	-	46.00	-	-	13.20	-	-
289.475	Hor	Ant 2	36.51	-	-	-4.21	32.30	-	-	46.00	-	-	13.70	-	-
4924.910	Hor	Ant 2	-	45.21	32.58	5.81	-	51.02	38.39	-	74.00	54.00	-	22.98	15.61
4923.580	Ver	Ant 2	-	45.67	31.98	5.81	-	51.48	37.79	-	74.00	54.00	-	22.52	16.21

Note.

1. Except for the above table: All other spurious emissions were less than 20dB for the 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

30MHz ~ 25GHz Radiated Spurious Emissions

▪ Test Mode: 802.11g & Lowest Frequency

Frequency (MHz)	ANT Pol	Transmitting Antenna	Reading(dBuV)			T.F (dB/m)	Result(dBuV/m)			Limit(dBuV/m)			Margin(dB)		
			QP	PK	AV		QP	PK	AV	QP	PK	AV	QP	PK	AV
100.325	Hor	Ant 2	46.54	-	-	-15.04	31.50	-	-	43.50	-	-	12.00	-	-
100.330	Ver	Ant 2	46.04	-	-	-15.04	31.00	-	-	43.50	-	-	12.50	-	-
287.050	Hor	Ant 2	38.29	-	-	-4.29	34.00	-	-	46.00	-	-	12.00	-	-
287.050	Ver	Ant 2	35.79	-	-	-4.29	31.50	-	-	46.00	-	-	14.50	-	-
359.800	Ver	Ant 2	39.55	-	-	-7.05	32.50	-	-	46.00	-	-	13.50	-	-
4827.350	Hor	Ant 2	-	45.45	32.02	5.41	-	50.86	37.43	-	74.00	54.00	-	23.14	16.57
4823.970	Ver	Ant 2	-	45.37	31.95	5.41	-	50.78	37.36	-	74.00	54.00	-	23.22	16.64

▪ Test Mode: 802.11g & Middle Frequency

Frequency (MHz)	ANT Pol	Transmitting Antenna	Reading(dBuV)			T.F (dB/m)	Result(dBuV/m)			Limit(dBuV/m)			Margin(dB)		
			QP	PK	AV		QP	PK	AV	QP	PK	AV	QP	PK	AV
100.325	Hor	Ant 2	46.84	-	-	-15.04	31.80	-	-	43.50	-	-	11.70	-	-
100.330	Ver	Ant 2	45.94	-	-	-15.04	30.90	-	-	43.50	-	-	12.60	-	-
287.050	Hor	Ant 2	38.89	-	-	-4.29	34.60	-	-	46.00	-	-	11.40	-	-
287.050	Ver	Ant 2	36.59	-	-	-4.29	32.30	-	-	46.00	-	-	13.70	-	-
359.800	Ver	Ant 2	38.75	-	-	-7.05	31.70	-	-	46.00	-	-	14.30	-	-
4875.580	Hor	Ant 2	-	45.07	32.15	5.47	-	50.54	37.62	-	74.00	54.00	-	23.46	16.38
4876.270	Ver	Ant 2	-	44.95	32.05	5.47	-	50.42	37.52	-	74.00	54.00	-	23.58	16.48

▪ Test Mode: 802.11g & Highest Frequency

Frequency (MHz)	ANT Pol	Transmitting Antenna	Reading(dBuV)			T.F (dB/m)	Result(dBuV/m)			Limit(dBuV/m)			Margin(dB)		
			QP	PK	AV		QP	PK	AV	QP	PK	AV	QP	PK	AV
100.325	Hor	Ant 2	47.94	-	-	-15.04	32.90	-	-	43.50	-	-	10.60	-	-
100.330	Ver	Ant 2	46.94	-	-	-15.04	31.90	-	-	43.50	-	-	11.60	-	-
287.050	Hor	Ant 2	37.39	-	-	-4.29	33.10	-	-	46.00	-	-	12.90	-	-
287.050	Ver	Ant 2	38.09	-	-	-4.29	33.80	-	-	46.00	-	-	12.20	-	-
359.800	Ver	Ant 2	39.65	-	-	-7.05	32.60	-	-	46.00	-	-	13.40	-	-
4924.180	Hor	Ant 2	-	44.86	31.91	5.81	-	50.67	37.72	-	74.00	54.00	-	23.33	16.28
4924.730	Ver	Ant 2	-	44.91	31.68	5.81	-	50.72	37.49	-	74.00	54.00	-	23.28	16.51

Note.

1. Except for the above table: All other spurious emissions were less than 20dB for the 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

30MHz ~ 25GHz Radiated Spurious Emissions

▪ Test Mode: 802.11n & Lowest Frequency

Frequency (MHz)	ANT Pol	Transmitting Antenna	Reading(dBuV)			T.F (dB/m)	Result(dBuV/m)			Limit(dBuV/m)			Margin(dB)		
			QP	PK	AV		QP	PK	AV	QP	PK	AV	QP	PK	AV
100.380	Hor	Ant 2	49.54	-	-	-15.04	34.50	-	-	43.50	-	-	9.00	-	-
100.360	Ver	Ant 2	47.54	-	-	-15.04	32.50	-	-	43.50	-	-	11.00	-	-
216.730	Hor	Ant 2	39.03	-	-	-7.03	32.00	-	-	46.00	-	-	14.00	-	-
287.050	Ver	Ant 2	38.03	-	-	-7.03	31.00	-	-	46.00	-	-	15.00	-	-
4826.530	Hor	Ant 2	-	44.79	32.21	5.41	-	50.20	37.62	-	74.00	54.00	-	23.80	16.38
4823.370	Ver	Ant 2	-	44.51	31.95	5.41	-	49.92	37.36	-	74.00	54.00	-	24.08	16.64

▪ Test Mode: 802.11n & Middle Frequency

Frequency (MHz)	ANT Pol	Transmitting Antenna	Reading(dBuV)			T.F (dB/m)	Result(dBuV/m)			Limit(dBuV/m)			Margin(dB)		
			QP	PK	AV		QP	PK	AV	QP	PK	AV	QP	PK	AV
100.380	Hor	Ant 2	49.94	-	-	-15.04	34.90	-	-	43.50	-	-	8.60	-	-
100.360	Ver	Ant 2	47.84	-	-	-15.04	32.80	-	-	43.50	-	-	10.70	-	-
216.730	Hor	Ant 2	38.73	-	-	-7.03	31.70	-	-	46.00	-	-	14.30	-	-
287.050	Ver	Ant 2	39.43	-	-	-7.03	32.40	-	-	46.00	-	-	13.60	-	-
4873.940	Hor	Ant 2	-	44.92	31.92	5.47	-	50.39	37.39	-	74.00	54.00	-	23.61	16.61
4876.170	Ver	Ant 2	-	45.01	32.27	5.47	-	50.48	37.74	-	74.00	54.00	-	23.52	16.26

▪ Test Mode: 802.11n & Highest Frequency

Frequency (MHz)	ANT Pol	Transmitting Antenna	Reading(dBuV)			T.F (dB/m)	Result(dBuV/m)			Limit(dBuV/m)			Margin(dB)		
			QP	PK	AV		QP	PK	AV	QP	PK	AV	QP	PK	AV
100.380	Hor	Ant 2	49.14	-	-	-15.04	34.10	-	-	43.50	-	-	9.40	-	-
100.360	Ver	Ant 2	48.24	-	-	-15.04	33.20	-	-	43.50	-	-	10.30	-	-
216.730	Hor	Ant 2	39.73	-	-	-7.03	32.70	-	-	46.00	-	-	13.30	-	-
287.050	Ver	Ant 2	39.83	-	-	-7.03	32.80	-	-	46.00	-	-	13.20	-	-
4921.450	Hor	Ant 2	-	44.83	31.75	5.81	-	50.64	37.56	-	74.00	54.00	-	23.36	16.44
4929.370	Ver	Ant 2	-	44.97	32.01	5.81	-	50.78	37.82	-	74.00	54.00	-	23.22	16.18

Note.

1. Except for the above table: All other spurious emissions were less than 20dB for the limit.
2. Sample Calculation.
 $\text{Margin} = \text{Limit} - \text{Result}$ / $\text{Result} = \text{Reading} + \text{T.F}$ / $\text{T.F} = \text{AF} + \text{CL} - \text{AG}$
 Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain

3.2.5 Transmitter Power Spectral Density

- Procedure:

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

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest Frequencies

Span = approximately 5 times of the 20 dB bandwidth

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

VBW = $\geq$ RBW

Trace = max hold

Detector function = peak

Sweep = auto

- Measurement Data: **Comply**

Test Mode	Frequency	Transmitting Antenna	Test Results (dBm)
802.11b	Lowest	Ant 2	-13.614
	Middle	Ant 2	-12.644
	Highest	Ant 2	-13.727
802.11g	Lowest	Ant 2	-14.898
	Middle	Ant 2	-15.193
	Highest	Ant 2	-15.872
802.11n HT20	Lowest	Ant 2	-19.148
	Middle	Ant 2	-19.755
	Highest	Ant 2	-19.517

Note 1: This test item was performed at Ant 1 and at Ant 2. And the worst case data were reported.

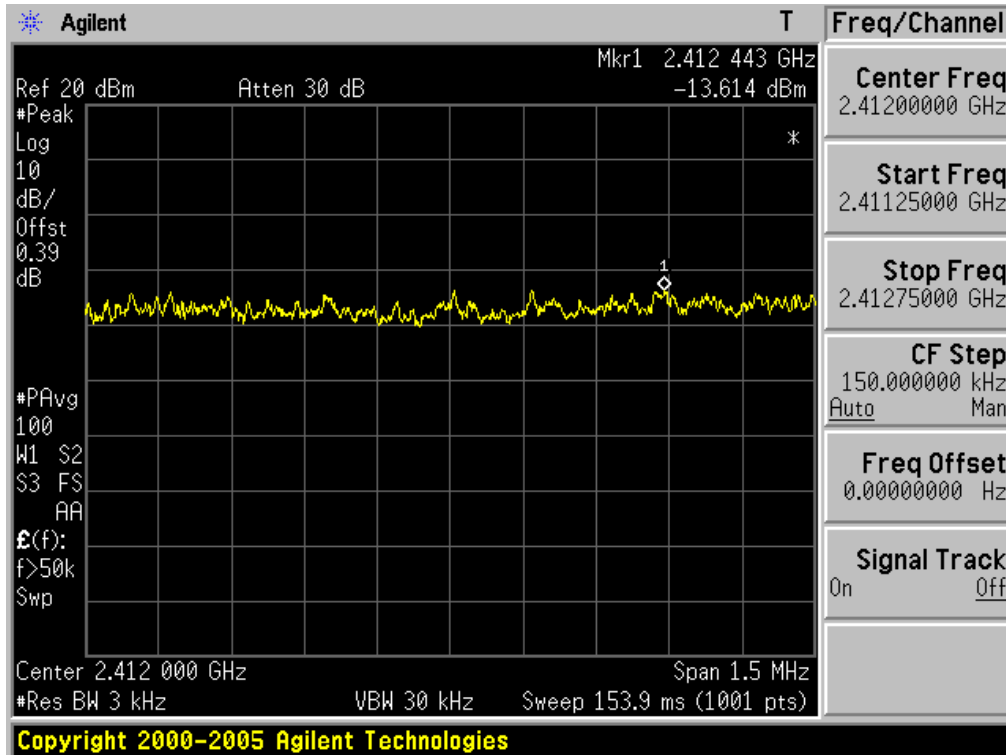
Note 2: See next pages for actual measured spectrum plots.

- Minimum Standard:

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

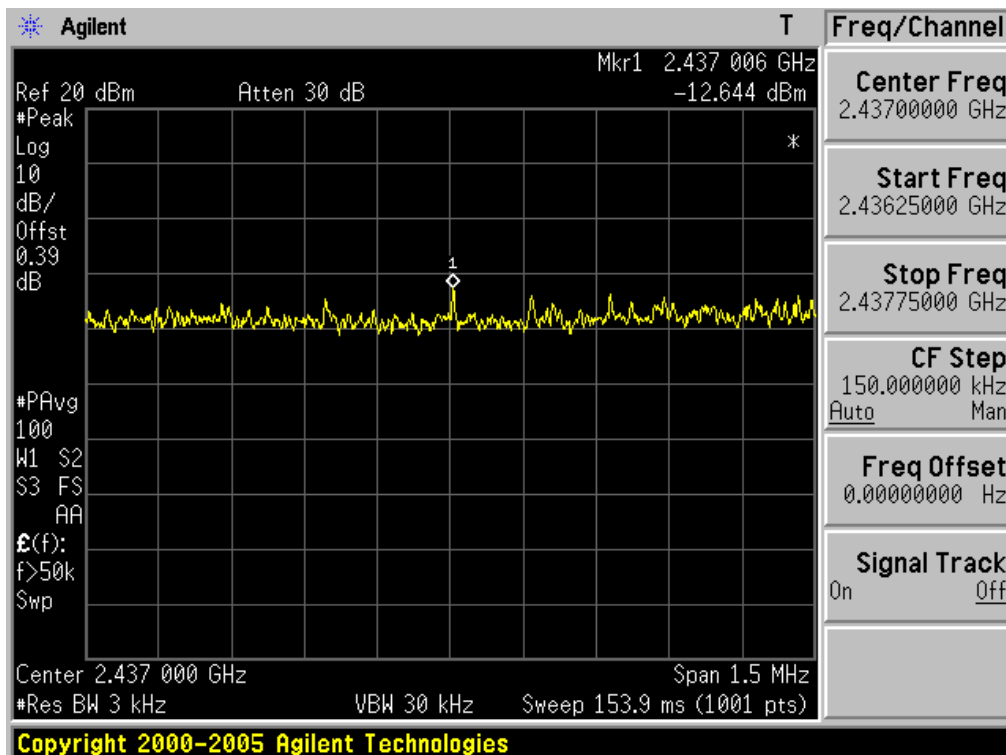
Transmitter Power Spectral Density

Ant 2 & Test Mode: 802.11b & Lowest Frequency



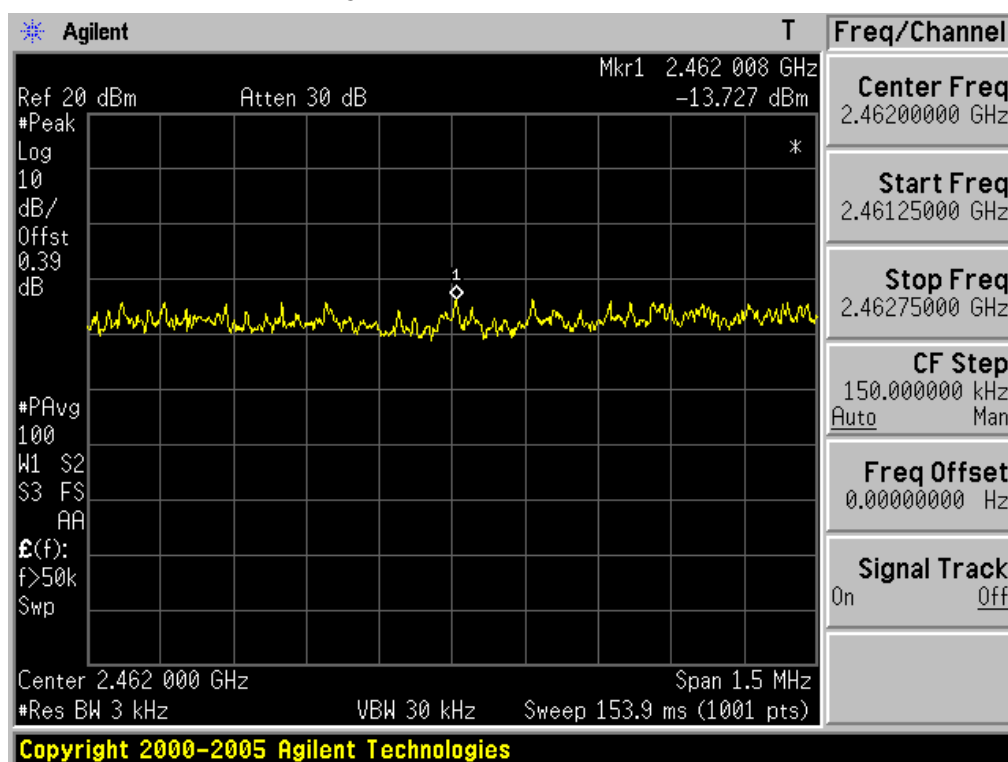
Transmitter Power Spectral Density

Ant 2 & Test Mode: 802.11b & Middle Frequency



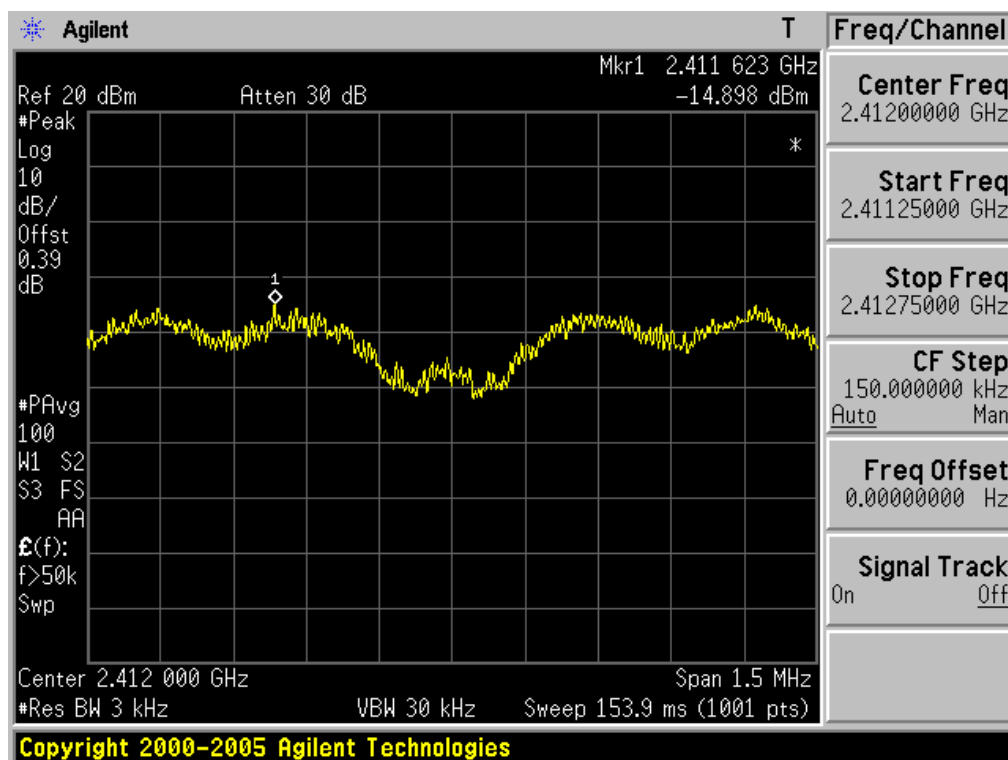
Transmitter Power Spectral Density

Ant 2 & Test Mode: 802.11b & Highest Frequency



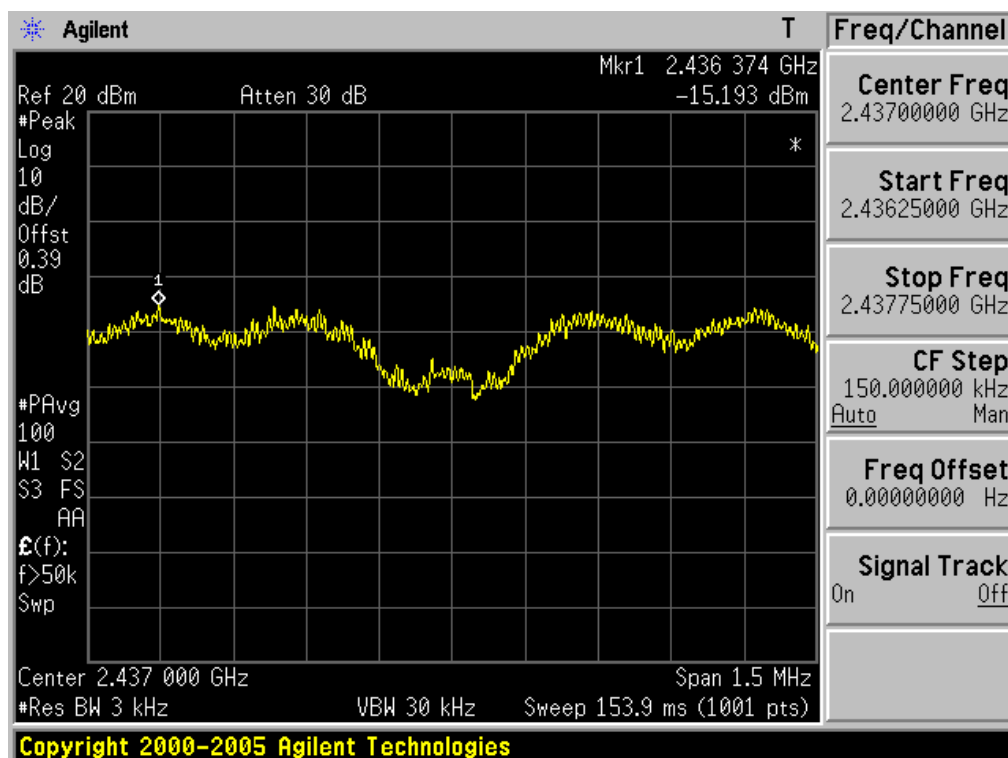
Transmitter Power Spectral Density

Ant 2 & Test Mode: 802.11g & Lowest Frequency



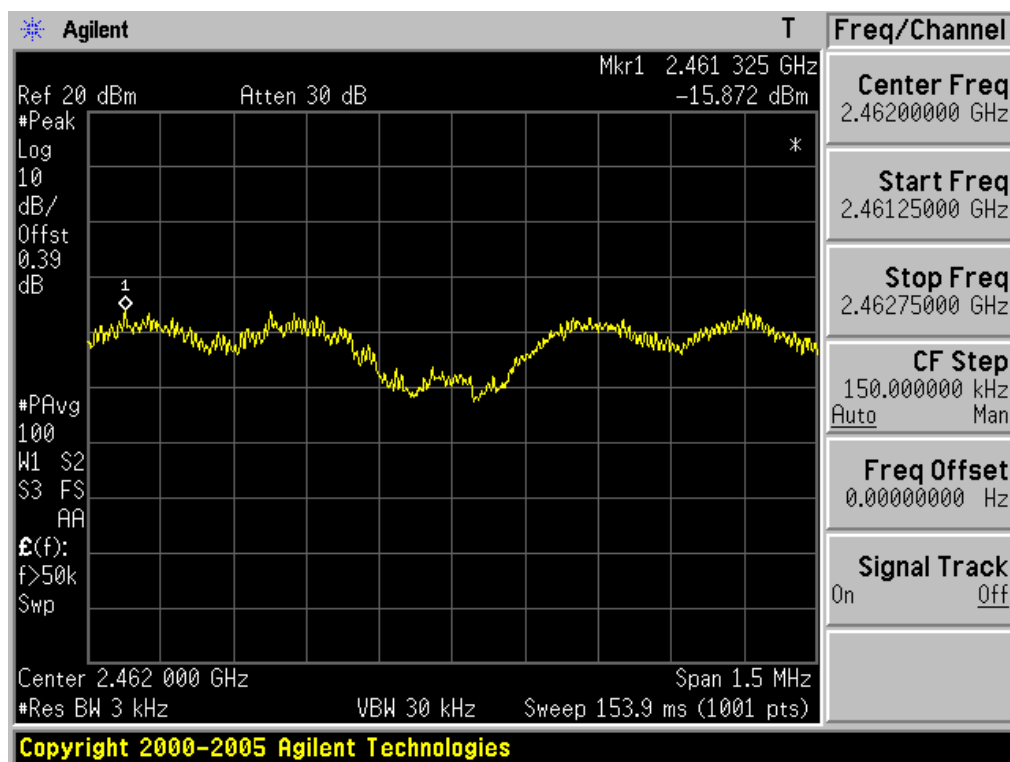
Transmitter Power Spectral Density

Ant 2 & Test Mode: 802.11g & Middle Frequency



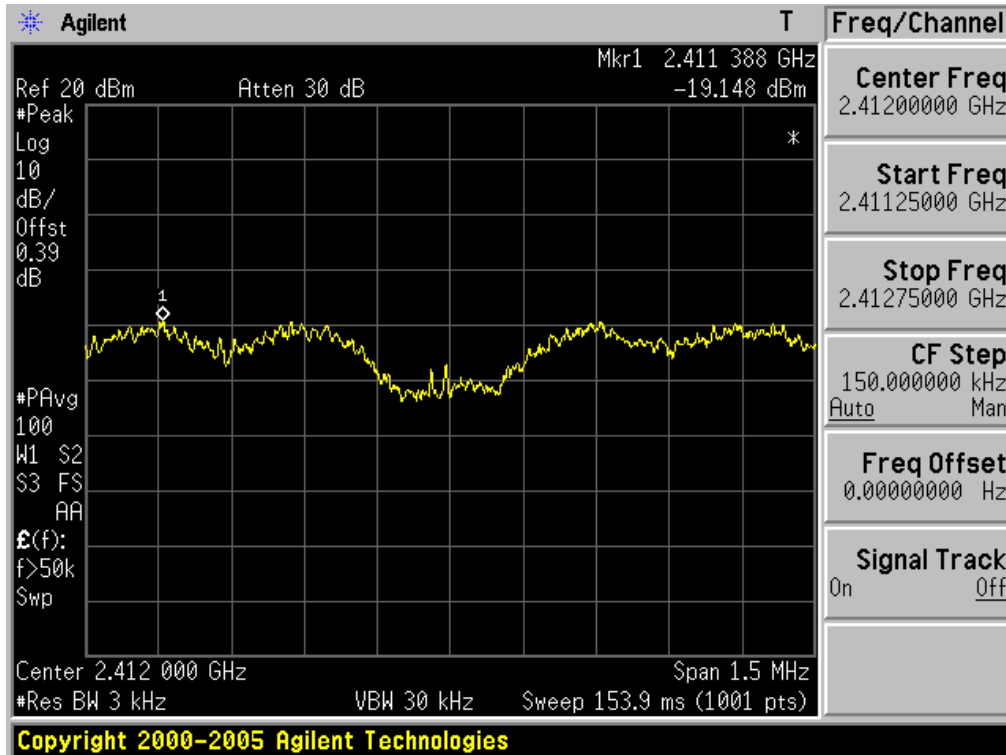
Transmitter Power Spectral Density

Ant 2 & Test Mode: 802.11g & Highest Frequency



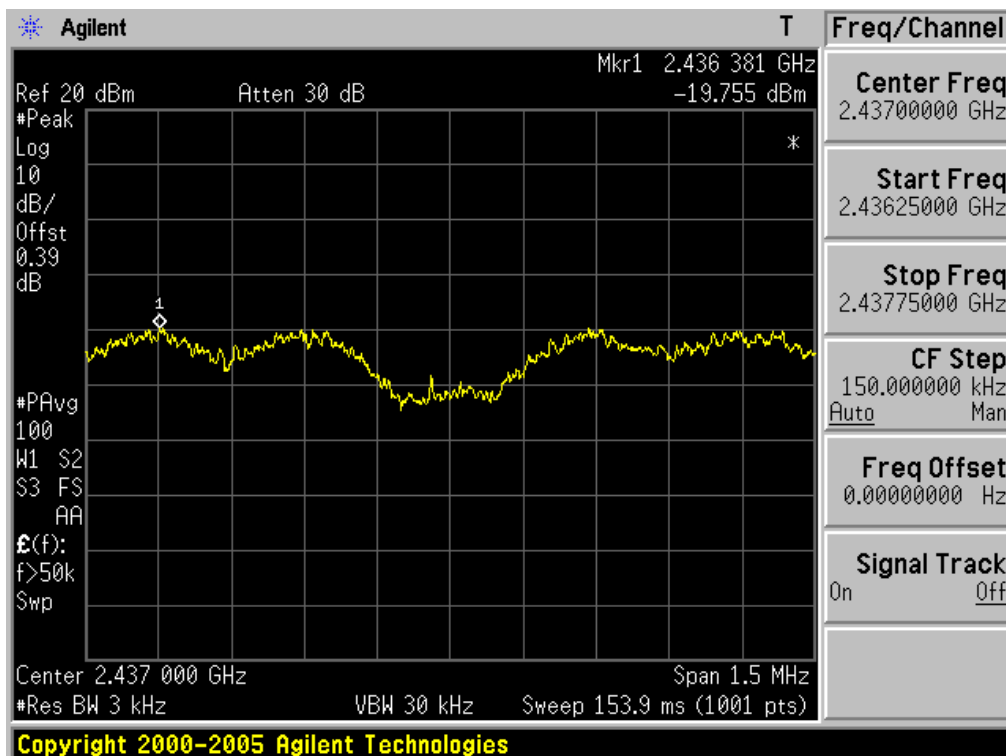
Transmitter Power Spectral Density

Ant 2 & Test Mode: 802.11n HT20 & Lowest Frequency



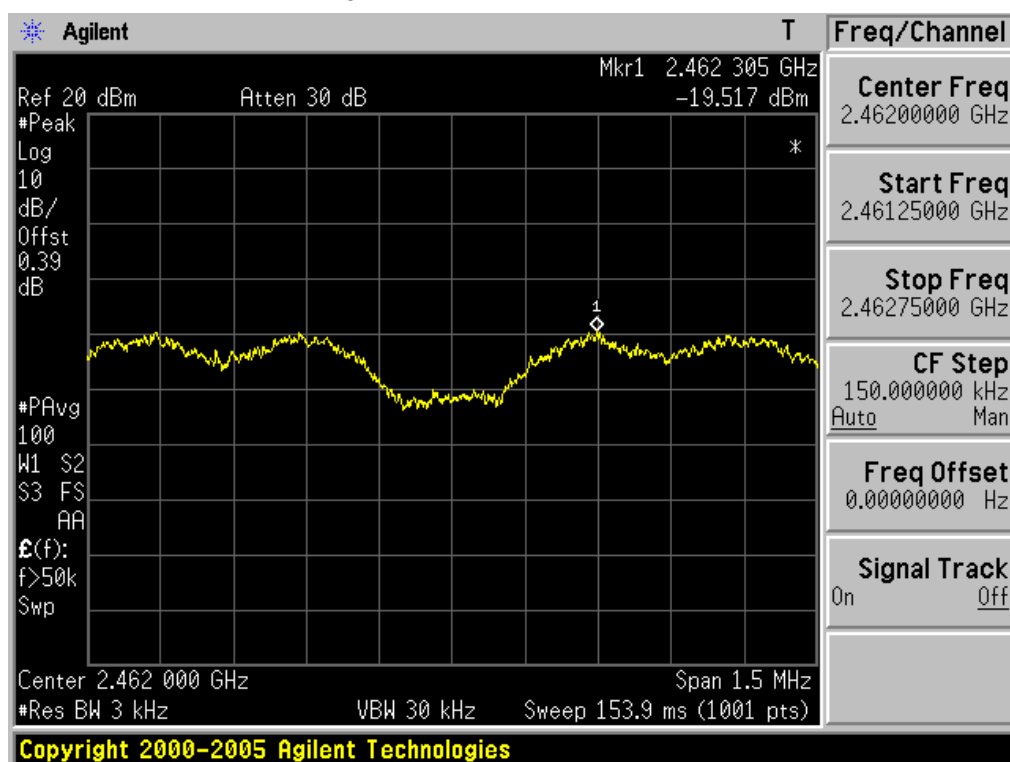
Transmitter Power Spectral Density

Ant 2 & Test Mode: 802.11n HT20 & Middle Frequency



Transmitter Power Spectral Density

Ant 2 & Test Mode: 802.11n HT20 & Highest Frequency



3.2.6 AC Conducted Emissions

- Procedure:

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

- Measurement Data: Comply

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

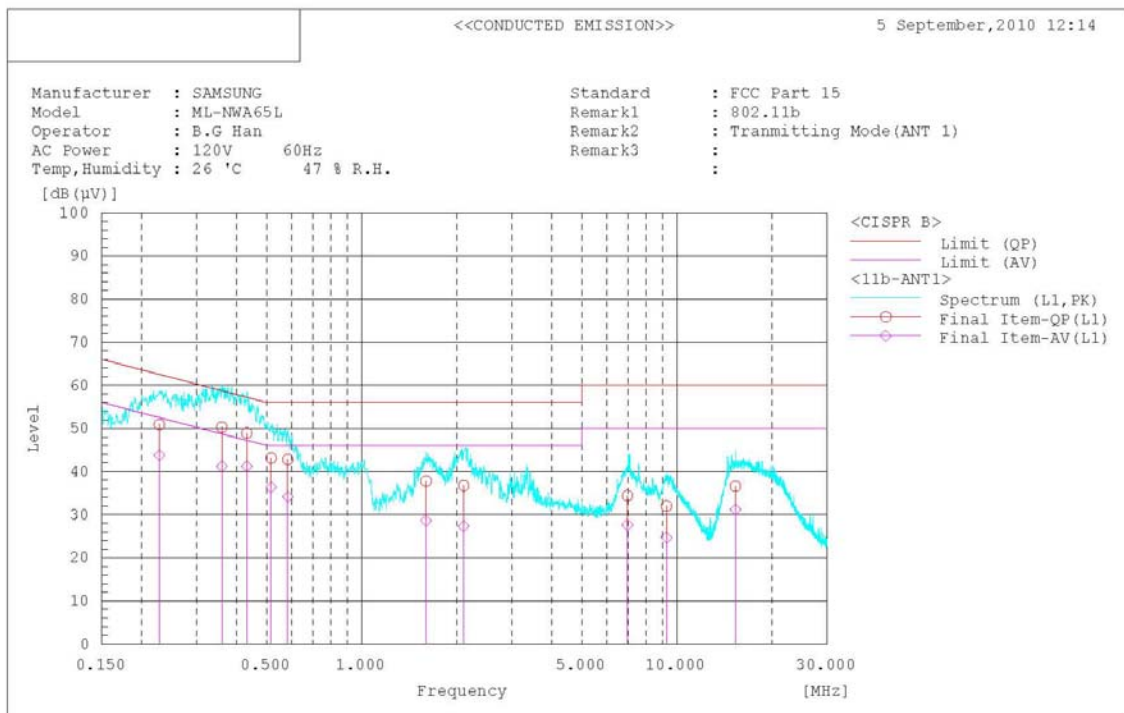
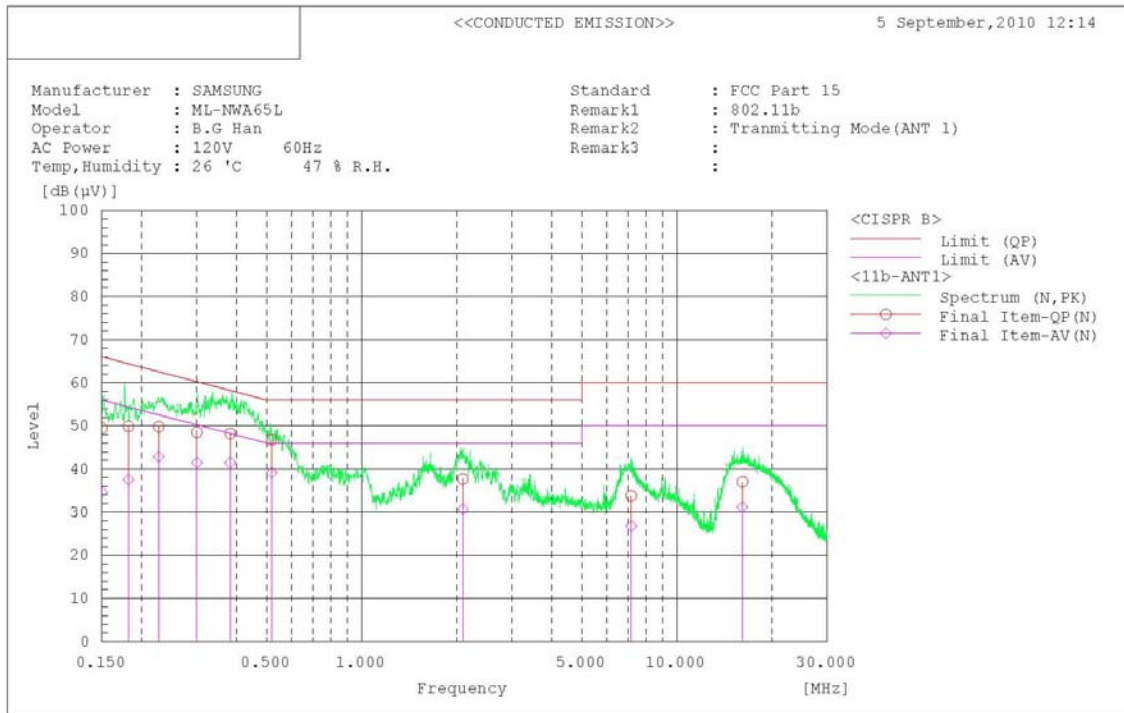
- Minimum Standard: FCC Part 15.207(a)/EN 55022

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

* Decreases with the logarithm of the frequency

AC Line Conducted Emissions (Graph)

Ant 1 & Test Mode: 802.11b



AC Line Conducted Emissions (Data List)

Ant 1 & Test Mode: 802.11b

<<CONDUCTED EMISSION>>

5 September, 2010 12:14

Standard : FCC Part 15

Manufacturer : SAMSUNG

Model : ML-NWA65L

Operator : B.G Han

AC Power : 120V 60Hz

Temp, Humidity : 26 °C 47 % R.H.

Remark1 : 802.11b

Remark2 : Transmitting Mode (ANT 1)

Remark3 :

Final Result

--- N Phase ---

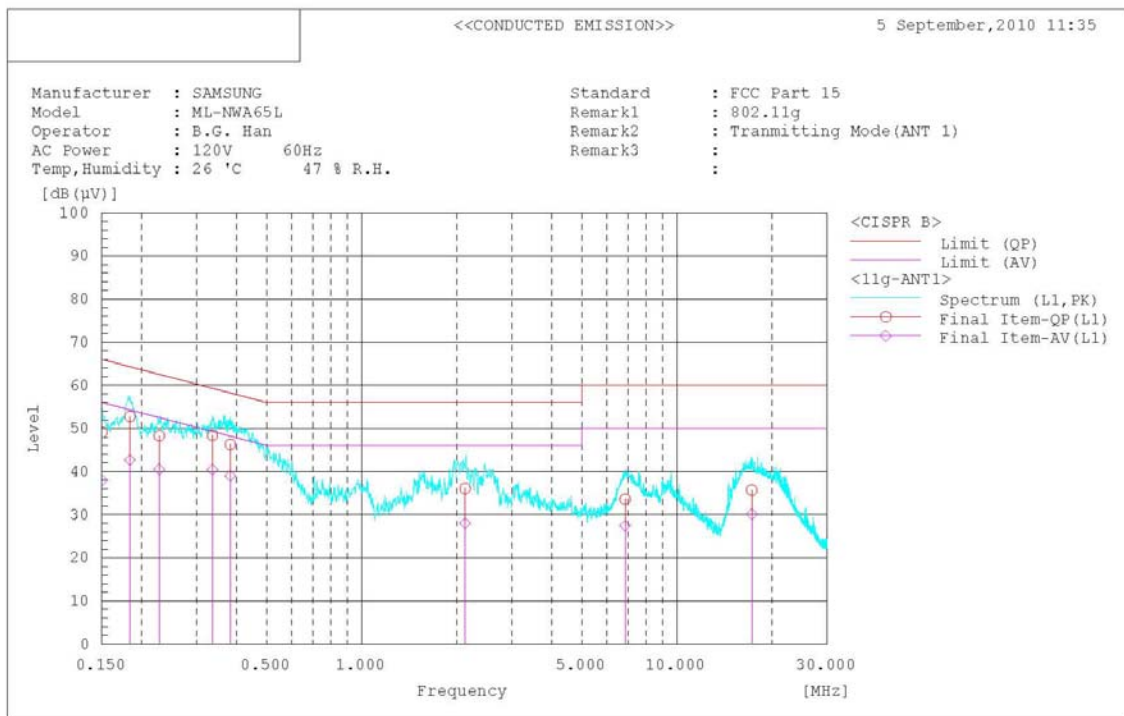
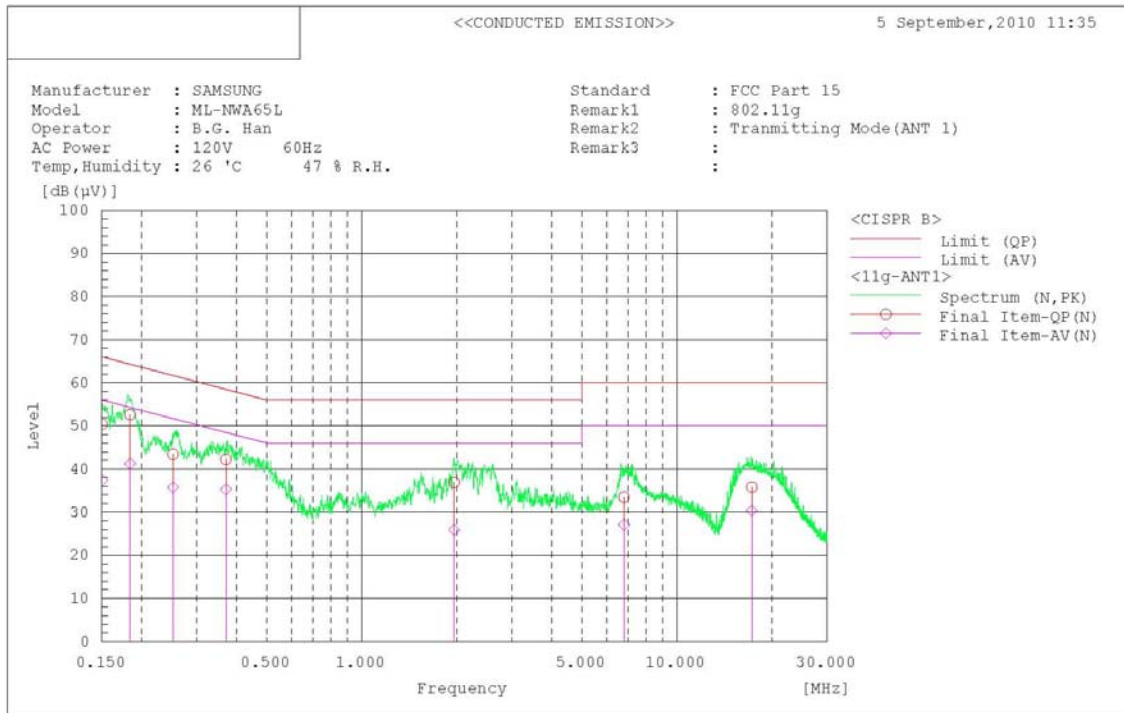
No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
	[MHz]	[dB (μV)]	[dB (μV)]	[dB]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB]	[dB]	
1	0.150	49.1	34.2	0.4	49.5	34.6	66.0	56.0	16.5	21.4	
2	0.182	49.6	37.3	0.3	49.9	37.6	64.4	54.4	14.5	16.8	
3	0.227	49.5	42.5	0.3	49.8	42.8	62.6	52.6	12.8	9.8	
4	0.383	48.0	41.3	0.2	48.2	41.5	58.2	48.2	10.0	6.7	
5	0.518	46.6	39.0	0.2	46.8	39.2	56.0	46.0	9.2	6.8	
6	2.093	37.4	30.4	0.3	37.7	30.7	56.0	46.0	18.3	15.3	
7	0.300	48.3	41.3	0.2	48.5	41.5	60.2	50.2	11.7	8.7	
8	7.153	33.4	26.4	0.4	33.8	26.8	60.0	50.0	26.2	23.2	
9	16.133	36.4	30.6	0.6	37.0	31.2	60.0	50.0	23.0	18.8	

--- 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	0.228	50.8	43.7	0.1	50.9	43.8	62.5	52.5	11.6	8.7	
2	0.360	50.2	41.1	0.1	50.3	41.2	58.7	48.7	8.4	7.5	
3	0.432	48.8	41.1	0.1	48.9	41.2	57.2	47.2	8.3	6.0	
4	0.516	43.0	36.2	0.1	43.1	36.3	56.0	46.0	12.9	9.7	
5	0.583	42.7	34.0	0.1	42.8	34.1	56.0	46.0	13.2	11.9	
6	1.599	37.7	28.5	0.1	37.8	28.6	56.0	46.0	18.2	17.4	
7	2.106	36.6	27.2	0.1	36.7	27.3	56.0	46.0	19.3	18.7	
8	6.963	34.2	27.4	0.2	34.4	27.6	60.0	50.0	25.6	22.4	
9	9.266	31.8	24.5	0.2	32.0	24.7	60.0	50.0	28.0	25.3	
10	15.330	36.3	30.9	0.3	36.6	31.2	60.0	50.0	23.4	18.8	

AC Line Conducted Emissions (Graph)

Ant 1 & Test Mode: 802.11g



AC Line Conducted Emissions (Data List)

Ant 1 & Test Mode: 802.11g

<<CONDUCTED EMISSION>>

5 September, 2010 11:35

Standard : FCC Part 15

Manufacturer : SAMSUNG

Model : ML-NWA65L

Operator : B.G. Han

AC Power : 120V 60Hz

Temp, Humidity : 26 °C 47 % R.H.

Remark1 : 802.11g

Remark2 : Transmitting Mode (ANT 1)

Remark3 :

Final Result

--- N Phase ---

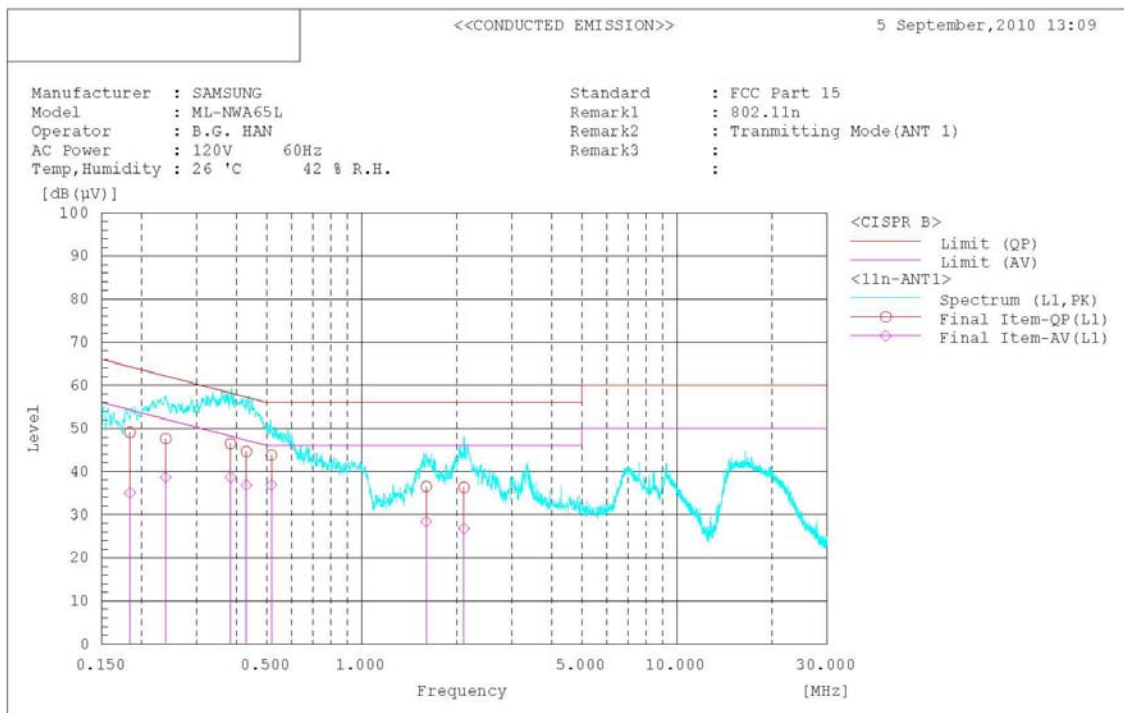
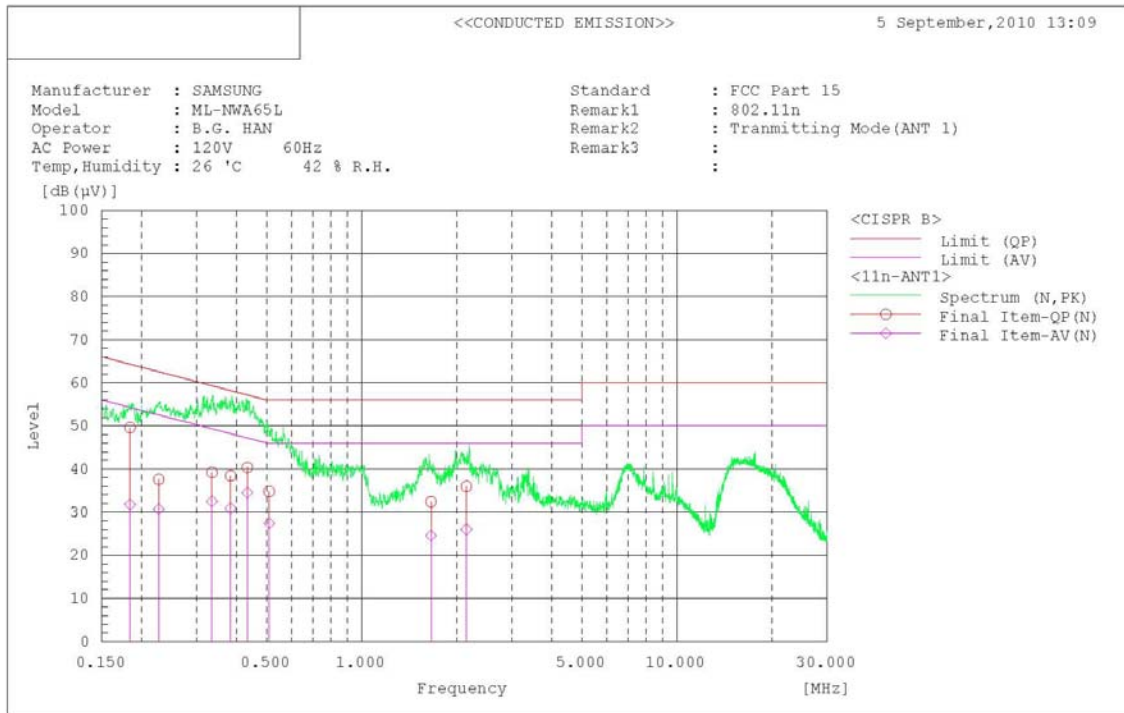
No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
	[MHz]	[dB (μV)]	[dB (μV)]	[dB]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB]	[dB]	
1	0.150	50.0	37.0	0.4	50.4	37.4	66.0	56.0	15.6	18.6	
2	0.184	52.3	41.0	0.3	52.6	41.3	64.3	54.3	11.7	13.0	
3	0.252	43.1	35.5	0.3	43.4	35.8	61.7	51.7	18.3	15.9	
4	0.371	42.1	35.1	0.2	42.3	35.3	58.5	48.5	16.2	13.2	
5	1.966	36.6	25.6	0.3	36.9	25.9	56.0	46.0	19.1	20.1	
6	6.792	33.1	26.7	0.4	33.5	27.1	60.0	50.0	26.5	22.9	
7	17.272	35.2	29.7	0.6	35.8	30.3	60.0	50.0	24.2	19.7	

--- 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]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB]	[dB]	
1	0.150	49.0	37.9	0.1	49.1	38.0	66.0	56.0	16.9	18.0	
2	0.184	52.7	42.6	0.1	52.8	42.7	64.3	54.3	11.5	11.6	
3	0.228	48.2	40.4	0.1	48.3	40.5	62.5	52.5	14.2	12.0	
4	0.336	48.3	40.3	0.1	48.4	40.4	59.3	49.3	10.9	8.9	
5	0.383	46.2	38.9	0.1	46.3	39.0	58.2	48.2	11.9	9.2	
6	2.128	36.0	27.9	0.1	36.1	28.0	56.0	46.0	19.9	18.0	
7	6.851	33.4	27.2	0.2	33.6	27.4	60.0	50.0	26.4	22.6	
8	17.268	35.4	29.8	0.3	35.7	30.1	60.0	50.0	24.3	19.9	

AC Line Conducted Emissions (Graph)

Ant 1 & Test Mode: 802.11n



AC Line Conducted Emissions (Data List)

Ant 1 & Test Mode: 802.11n

<<CONDUCTED EMISSION>>

5 September, 2010 13:09

Standard : FCC Part 15

Manufacturer : SAMSUNG

Model : ML-NWA65L

Operator : B.G. HAN

AC Power : 120V 60Hz

Temp, Humidity : 26 °C 42 % R.H.

Remark1 : 802.11n

Remark2 : Transmitting Mode (ANT 1)

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	0.184	49.3	31.5	0.3	49.6	31.8	64.3	54.3	14.7	22.5	
2	0.227	37.3	30.4	0.3	37.6	30.7	62.6	52.6	25.0	21.9	
3	0.335	39.0	32.3	0.2	39.2	32.5	59.3	49.3	20.1	16.8	
4	0.384	38.2	30.7	0.2	38.4	30.9	58.2	48.2	19.8	17.3	
5	0.434	40.2	34.3	0.2	40.4	34.5	57.2	47.2	16.8	12.7	
6	0.509	34.6	27.2	0.2	34.8	27.4	56.0	46.0	21.2	18.6	
7	1.660	32.2	24.4	0.2	32.4	24.6	56.0	46.0	23.6	21.4	
8	2.148	35.7	25.7	0.3	36.0	26.0	56.0	46.0	20.0	20.0	

--- 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]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB (μV)]	[dB]	[dB]	
1	0.184	49.0	35.0	0.1	49.1	35.1	64.3	54.3	15.2	19.2	
2	0.239	47.5	38.6	0.1	47.6	38.7	62.1	52.1	14.5	13.4	
3	0.384	46.4	38.6	0.1	46.5	38.7	58.2	48.2	11.7	9.5	
4	0.431	44.5	36.8	0.1	44.6	36.9	57.2	47.2	12.6	10.3	
5	0.517	43.7	36.8	0.1	43.8	36.9	56.0	46.0	12.2	9.1	
6	1.604	36.4	28.3	0.1	36.5	28.4	56.0	46.0	19.5	17.6	
7	2.111	36.2	26.7	0.1	36.3	26.8	56.0	46.0	19.7	19.2	

3.2.7 Antenna Requirements

- Procedure:

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

- Conclusion: Comply

The DUT antenna is pattern antenna on the module's PCB. (Refer to Internal photo file.)

- Minimum Standard:

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

3.3 Receiver requirements

3.3.1 AC Conducted Emissions (Receiver Mode)

- Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. While the measurement, EUT had its receiving function. 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.

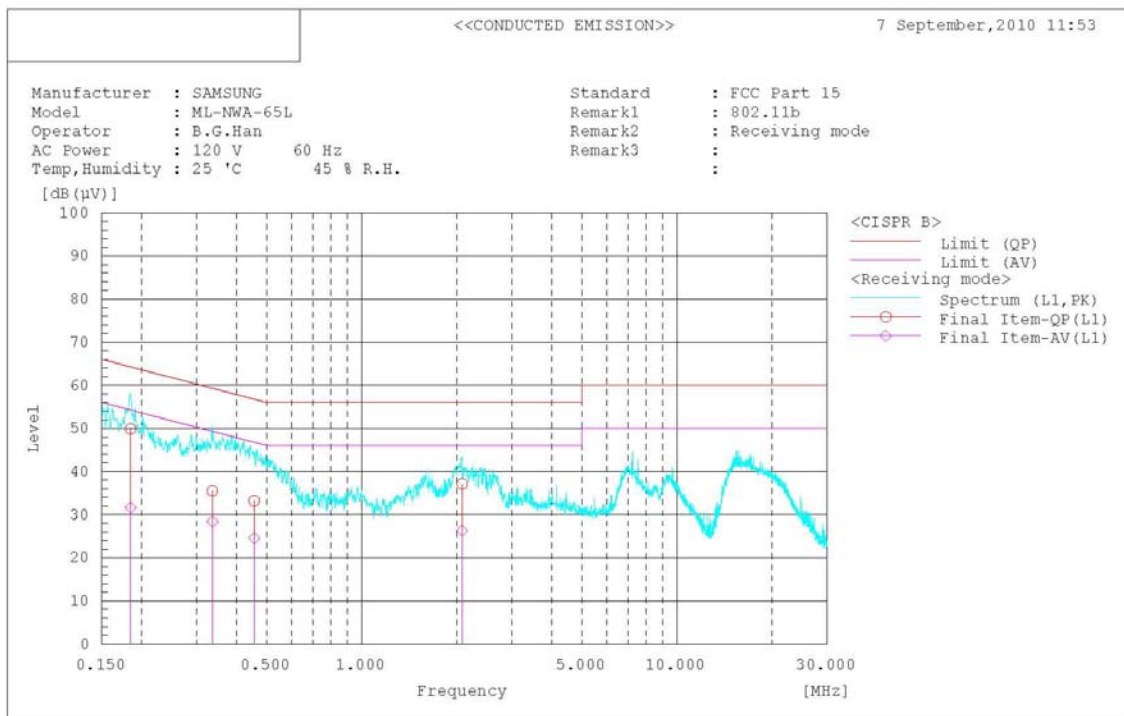
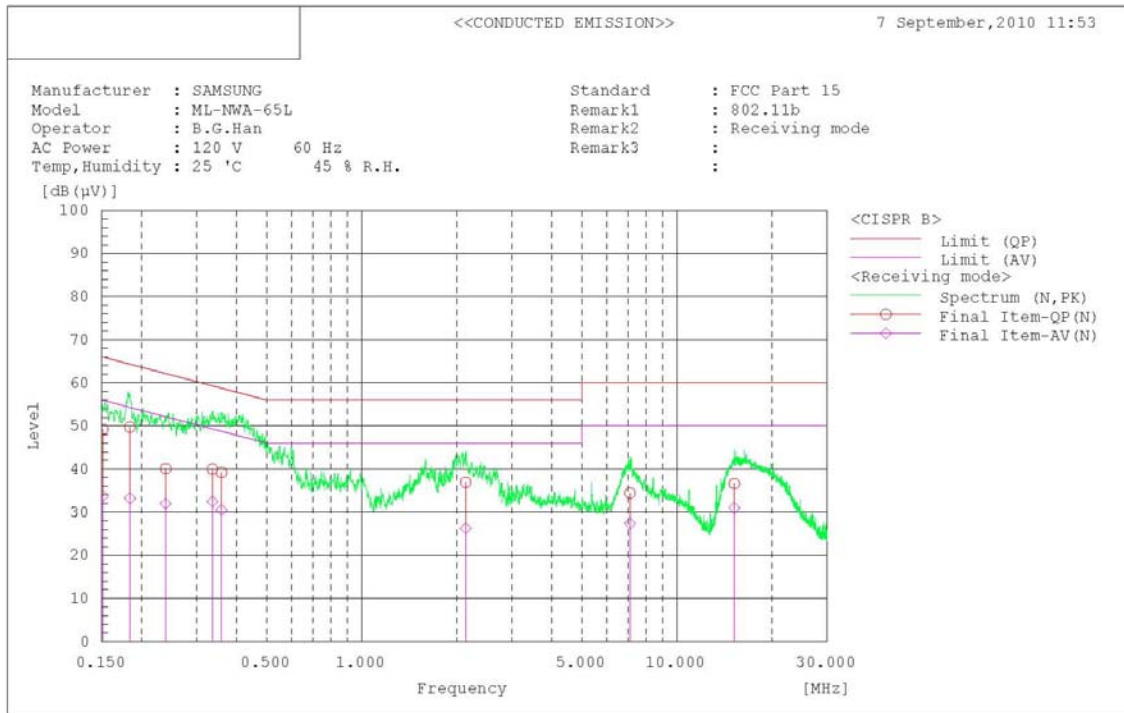
- Minimum Standard: FCC Part 15.207(a)/EN 55022

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>>
7 September, 2010 11:53

Standard      : FCC Part 15
Manufacturer  : SAMSUNG
Model         : ML-NWA-65L
Operator      : B.G.Han
AC Power      : 120 V      60 Hz
Temp, Humidity : 25 °C      45 % R.H.
Remark1       : 802.11b
Remark2       : Receiving mode
Remark3       :
*****

Final Result

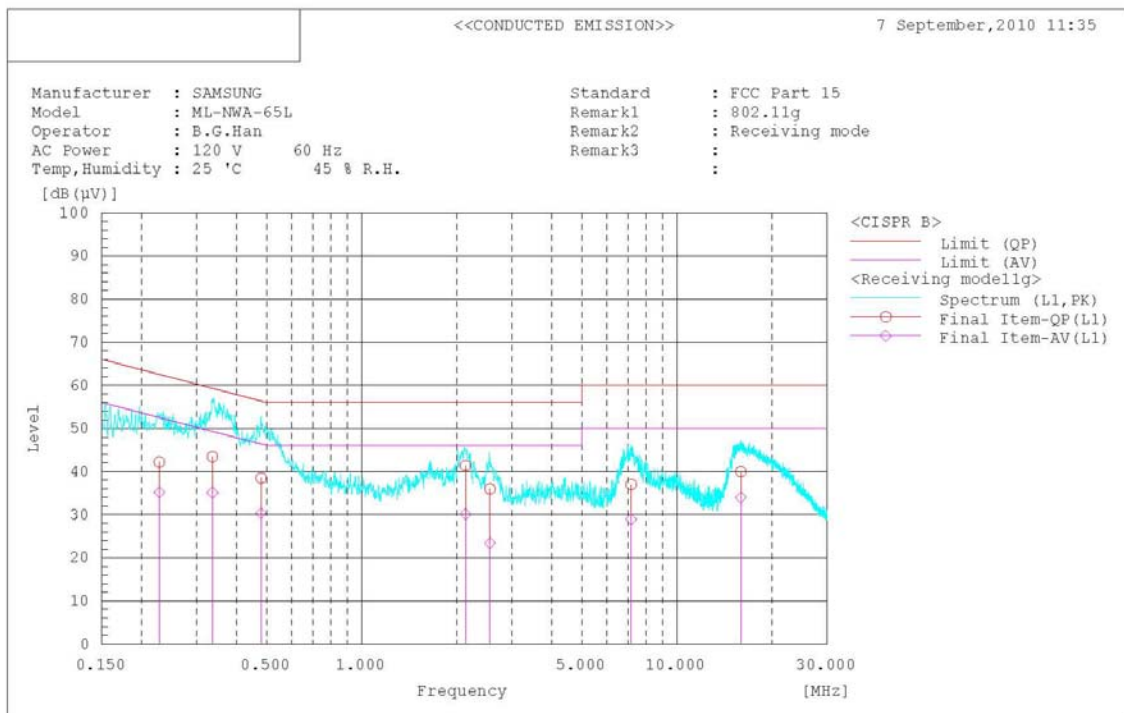
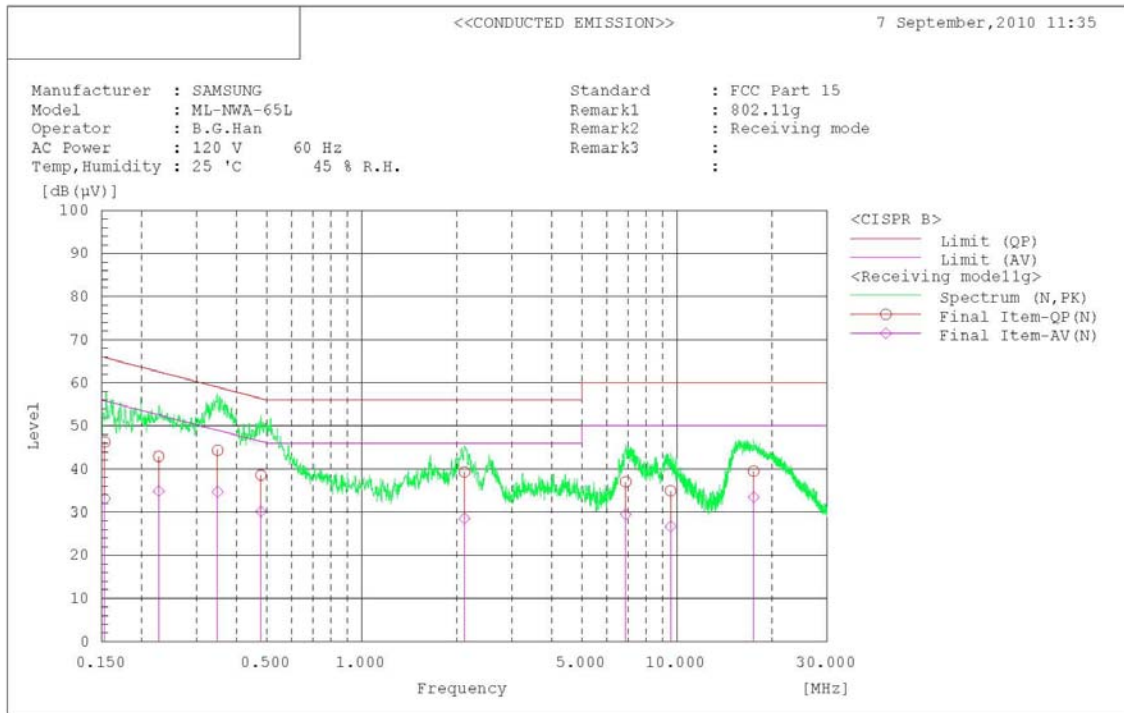
--- N Phase ---
No.  Frequency  Reading  Reading  c.f.  Result  Result  Limit  Limit  Margin  Margin  Remark
      [MHz]      QP      AV      [dB]  [dB(μV)] [dB(μV)] [dB(μV)] [dB(μV)] [dB]    [dB]
1     0.151     48.8     33.4    0.4    49.2     33.8    65.9    55.9    16.7    22.1
2     0.184     49.4     32.9    0.3    49.7     33.2    64.3    54.3    14.6    21.1
3     0.239     39.8     31.7    0.3    40.1     32.0    62.1    52.1    22.0    20.1
4     0.336     39.8     32.3    0.2    40.0     32.5    59.3    49.3    19.3    16.8
5     0.359     39.0     30.3    0.2    39.2     30.5    58.8    48.8    19.6    18.3
6     2.137     36.6     25.9    0.3    36.9     26.2    56.0    46.0    19.1    19.8
7     7.097     34.0     27.0    0.4    34.4     27.4    60.0    50.0    25.6    22.6
8    15.212     36.0     30.4    0.6    36.6     31.0    60.0    50.0    23.4    19.0

--- L1 Phase ---
No.  Frequency  Reading  Reading  c.f.  Result  Result  Limit  Limit  Margin  Margin  Remark
      [MHz]      QP      AV      [dB]  [dB(μV)] [dB(μV)] [dB(μV)] [dB(μV)] [dB]    [dB]
1     0.185     49.8     31.5    0.1    49.9     31.6    64.3    54.3    14.4    22.7
2     0.336     35.4     28.3    0.1    35.5     28.4    59.3    49.3    23.8    20.9
3     0.456     33.1     24.4    0.1    33.2     24.5    56.8    46.8    23.6    22.3
4     2.082     37.0     26.2    0.1    37.1     26.3    56.0    46.0    18.9    19.7

```

AC Line Conducted Emissions (Graph)

Test Mode: 802.11g



AC Line Conducted Emissions (Data List)

Test Mode: 802.11g

<<CONDUCTED EMISSION>>

7 September, 2010 11:35

Standard : FCC Part 15
 Manufacturer : SAMSUNG
 Model : ML-NWA-65L
 Operator : B.G.Han
 AC Power : 120 V 60 Hz
 Temp, Humidity : 25 °C 45 % R.H.
 Remark1 : 802.11g
 Remark2 : Receiving mode
 Remark3 :

Final Result

--- N Phase ---

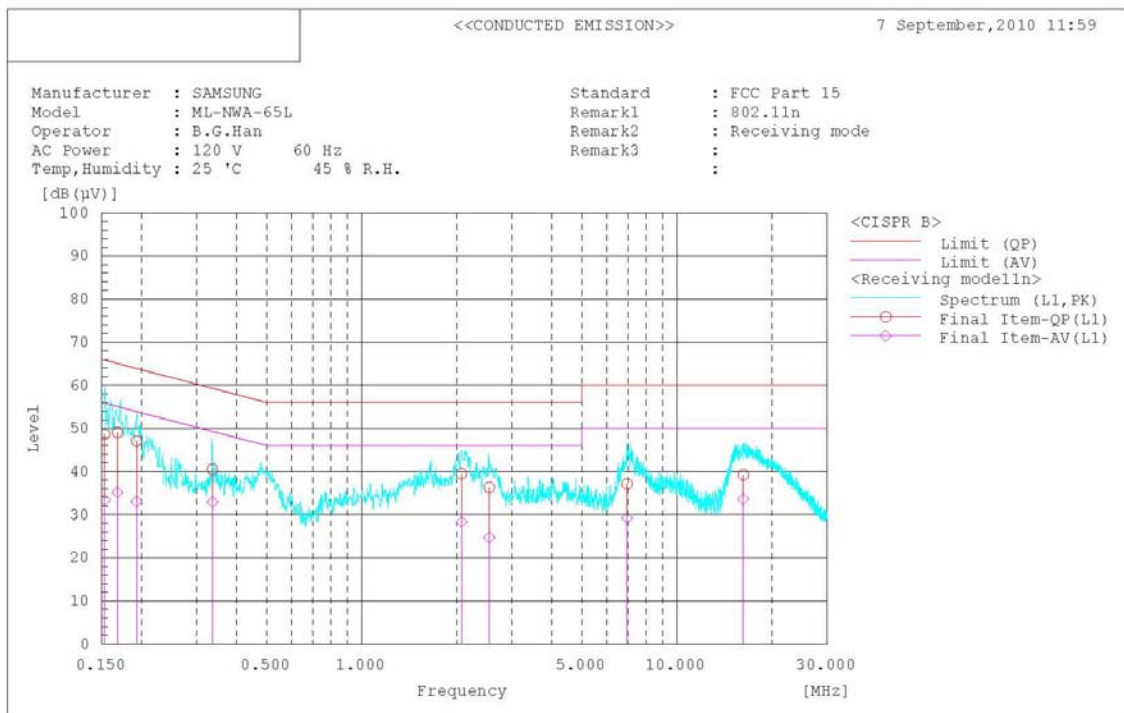
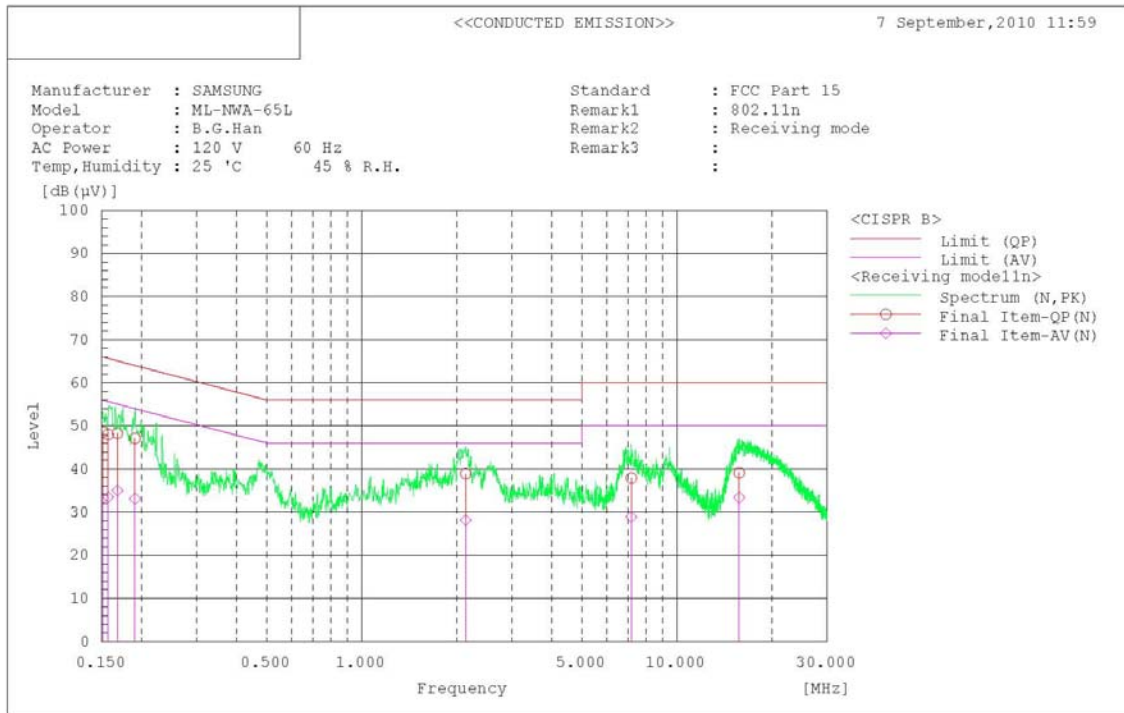
No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]	
1	9.546	34.4	26.2	0.5	34.9	26.7	60.0	50.0	25.1	23.3	
2	6.872	36.6	29.1	0.4	37.0	29.5	60.0	50.0	23.0	20.5	
3	2.119	39.1	28.3	0.2	39.3	28.5	56.0	46.0	16.7	17.5	
4	0.479	38.5	30.1	0.1	38.6	30.2	56.4	46.4	17.8	16.2	
5	0.349	44.3	34.6	0.1	44.4	34.7	59.0	49.0	14.6	14.3	
6	0.227	42.8	34.8	0.1	42.9	34.9	62.6	52.6	19.7	17.7	
7	0.153	46.2	33.0	0.1	46.3	33.1	65.8	55.8	19.5	22.7	
8	17.507	38.5	32.5	1.0	39.5	33.5	60.0	50.0	20.5	16.5	

--- 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	15.944	39.0	33.0	1.0	40.0	34.0	60.0	50.0	20.0	16.0	
2	7.157	36.4	28.3	0.6	37.0	28.9	60.0	50.0	23.0	21.1	
3	2.552	35.7	23.1	0.3	36.0	23.4	56.0	46.0	20.0	22.6	
4	2.134	41.1	29.8	0.3	41.4	30.1	56.0	46.0	14.6	15.9	
5	0.480	38.2	30.0	0.3	38.5	30.3	56.3	46.3	17.8	16.0	
6	0.336	43.1	34.8	0.3	43.4	35.1	59.3	49.3	15.9	14.2	
7	0.228	41.9	34.9	0.3	42.2	35.2	62.5	52.5	20.3	17.3	

AC Line Conducted Emissions (Graph)

Test Mode: 802.11n



AC Line Conducted Emissions (Data List)

Test Mode: 802.11n

<<CONDUCTED EMISSION>>

7 September, 2010 11:59

Standard : FCC Part 15
 Manufacturer : SAMSUNG
 Model : ML-NWA-65L
 Operator : B.G.Han
 AC Power : 120 V 60 Hz
 Temp, Humidity : 25 °C 45 % R.H.
 Remark1 : 802.11n
 Remark2 : Receiving mode
 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	0.151	48.5	33.1	0.1	48.6	33.2	65.9	55.9	17.3	22.7	
2	0.157	47.9	33.4	0.1	48.0	33.5	65.6	55.6	17.6	22.1	
3	0.168	48.2	34.9	0.1	48.3	35.0	65.1	55.1	16.8	20.1	
4	0.191	47.0	33.0	0.1	47.1	33.1	64.0	54.0	16.9	20.9	
5	2.137	38.7	28.0	0.2	38.9	28.2	56.0	46.0	17.1	17.8	
6	7.165	37.5	28.5	0.4	37.9	28.9	60.0	50.0	22.1	21.1	
7	15.771	38.2	32.5	0.9	39.1	33.4	60.0	50.0	20.9	16.6	

--- 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	0.153	48.3	33.1	0.3	48.6	33.4	65.8	55.8	17.2	22.4	
2	0.168	48.8	34.9	0.3	49.1	35.2	65.1	55.1	16.0	19.9	
3	0.193	46.8	32.8	0.3	47.1	33.1	63.9	53.9	16.8	20.8	
4	0.336	40.2	32.6	0.3	40.5	32.9	59.3	49.3	18.8	16.4	
5	2.074	39.2	28.0	0.3	39.5	28.3	56.0	46.0	16.5	17.7	
6	2.537	36.0	24.4	0.3	36.3	24.7	56.0	46.0	19.7	21.3	
7	6.946	36.6	28.7	0.5	37.1	29.2	60.0	50.0	22.9	20.8	
8	16.250	38.2	32.6	1.0	39.2	33.6	60.0	50.0	20.8	16.4	

3.3.2 Out of Band Emissions – Radiated (Receiver Mode)

- 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 a 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:

Frequency Range = 30 MHz ~ 10th harmonic.

RBW = 120 kHz (30MHz ~ 1 GHz)

= 1 MHz (1 GHz ~ 10th harmonic)

Trace = max hold

Sweep = auto

VBW = 10Hz (Average), VBW ≥ RBW (Peak)

Detector function = peak

- Measurement Data: Comply (Refer to the Next page)

Note 1: This test item was performed at Ant 1 and at Ant 2. And the worst case data were reported.

Note 2: See next pages for measured data.

- Minimum Standard: FCC Part 15.109(a)

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.

30MHz ~ 25GHz Radiated Spurious Emissions

▪ Test Mode: 802.11b & Lowest Frequency

Frequency (MHz)	ANT Pol	Transmitting Antenna	Reading(dBuV)			T.F (dB/m)	Result(dBuV/m)			Limit(dBuV/m)			Margin(dB)		
			QP	PK	AV		QP	PK	AV	QP	PK	AV	QP	PK	AV
100.325	Hor	Ant 1	48.54	-	-	-15.04	33.50	-	-	43.50	-	-	10.00	-	-
100.330	Ver	Ant 1	46.54	-	-	-15.04	31.50	-	-	43.50	-	-	12.00	-	-
287.050	Hor	Ant 1	39.53	-	-	-7.03	32.50	-	-	46.00	-	-	13.50	-	-
287.050	Ver	Ant 1	38.53	-	-	-7.03	31.50	-	-	46.00	-	-	14.50	-	-
5358.985	Hor	Ant 1	-	45.20	31.20	3.60	-	48.80	34.80	-	74.00	54.00	-	25.20	19.20
-	-	-	-	-	-	-	-	--	-	-	-	-	-	-	-

▪ Test Mode: 802.11b & Middle Frequency

Frequency (MHz)	ANT Pol	Transmitting Antenna	Reading(dBuV)			T.F (dB/m)	Result(dBuV/m)			Limit(dBuV/m)			Margin(dB)		
			QP	PK	AV		QP	PK	AV	QP	PK	AV	QP	PK	AV
100.325	Hor	Ant 1	47.84	-	-	-15.04	32.80	-	-	43.50	-	-	10.70	-	-
100.330	Ver	Ant 1	46.34	-	-	-15.04	31.30	-	-	43.50	-	-	12.20	-	-
287.050	Hor	Ant 1	39.93	-	-	-7.03	32.90	-	-	46.00	-	-	13.10	-	-
287.050	Ver	Ant 1	39.03	-	-	-7.03	32.00	-	-	46.00	-	-	14.00	-	-
5391.036	Hor	Ant 1	-	44.60	33.40	3.70	-	48.30	37.10	-	74.00	54.00	-	25.70	16.90
5567.315	Ver	Ant 1	-	44.70	30.00	4.30	-	49.00	34.30	-	74.00	54.00	-	25.00	19.70
-	-	-	-	-	-	-	-	--	-	-	-	-	-	-	-

▪ Test Mode: 802.11b & Highest Frequency

Frequency (MHz)	ANT Pol	Transmitting Antenna	Reading(dBuV)			T.F (dB/m)	Result(dBuV/m)			Limit(dBuV/m)			Margin(dB)		
			QP	PK	AV		QP	PK	AV	QP	PK	AV	QP	PK	AV
100.325	Hor	Ant 1	47.84	-	-	-15.04	32.80	-	-	43.50	-	-	10.70	-	-
100.330	Ver	Ant 1	46.34	-	-	-15.04	31.30	-	-	43.50	-	-	12.20	-	-
287.050	Hor	Ant 1	39.93	-	-	-7.03	32.90	-	-	46.00	-	-	13.10	-	-
287.050	Ver	Ant 1	39.03	-	-	-7.03	32.00	-	-	46.00	-	-	14.00	-	-
5895.835	Hor	Ant 1	-	44.10	31.90	4.20	-	48.30	36.10	-	74.00	54.00	-	25.70	17.90
-	-	-	-	-	-	-	-	--	-	-	-	-	-	-	-

Note.

1. Except for the above table: All other spurious emissions were less than 20dB for the 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

30MHz ~ 25GHz Radiated Spurious Emissions

▪ Test Mode: 802.11g & Lowest Frequency

Frequency (MHz)	ANT Pol	Transmitting Antenna	Reading(dBuV)			T.F (dB/m)	Result(dBuV/m)			Limit(dBuV/m)			Margin(dB)		
			QP	PK	AV		QP	PK	AV	QP	PK	AV	QP	PK	AV
100.325	Hor	Ant 1	48.04	-	-	-15.04	33.00	-	-	43.50	-	-	10.50	-	-
100.330	Ver	Ant 1	47.04	-	-	-15.04	32.00	-	-	43.50	-	-	11.50	-	-
287.050	Hor	Ant 1	39.03	-	-	-7.03	32.00	-	-	46.00	-	-	14.00	-	-
287.050	Ver	Ant 1	39.03	-	-	-7.03	32.00	-	-	46.00	-	-	14.00	-	-
5783.658	Ver	Ant 1	-	44.13	31.00	4.20	-	48.33	35.20	-	74.00	54.00	-	25.67	18.80
5943.912	Hor	Ant 1	-	44.90	30.50	4.20	-	49.10	34.70	-	74.00	54.00	-	24.90	19.30
-	-	-	-	-	-	-	-	--	-	-	-	-	-	-	-

▪ Test Mode: 802.11g & Middle Frequency

Frequency (MHz)	ANT Pol	Transmitting Antenna	Reading(dBuV)			T.F (dB/m)	Result(dBuV/m)			Limit(dBuV/m)			Margin(dB)		
			QP	PK	AV		QP	PK	AV	QP	PK	AV	QP	PK	AV
100.325	Hor	Ant 1	47.64	-	-	-15.04	32.60	-	-	43.50	-	-	10.90	-	-
100.330	Ver	Ant 1	47.44	-	-	-15.04	32.40	-	-	43.50	-	-	11.10	-	-
287.050	Hor	Ant 1	39.93	-	-	-7.03	32.90	-	-	46.00	-	-	13.10	-	-
287.050	Ver	Ant 1	38.53	-	-	-7.03	31.50	-	-	46.00	-	-	14.50	-	-
5447.086	Hor	Ant 1	-	43.00	31.80	4.00	-	47.00	35.80	-	74.00	54.00	-	27.00	18.20
5815.708	Ver	Ant 1	-	43.80	31.80	4.20	-	48.00	36.00	-	74.00	54.00	-	26.00	18.00
-	-	-	-	-	-	-	-	--	-	-	-	-	-	-	-

▪ Test Mode: 802.11g & Highest Frequency

Frequency (MHz)	ANT Pol	Transmitting Antenna	Reading(dBuV)			T.F (dB/m)	Result(dBuV/m)			Limit(dBuV/m)			Margin(dB)		
			QP	PK	AV		QP	PK	AV	QP	PK	AV	QP	PK	AV
100.325	Hor	Ant 1	46.84	-	-	-15.04	31.80	-	-	43.50	-	-	11.70	-	-
100.330	Ver	Ant 1	47.24	-	-	-15.04	32.20	-	-	43.50	-	-	11.30	-	-
287.050	Hor	Ant 1	40.53	-	-	-7.03	33.50	-	-	46.00	-	-	12.50	-	-
287.050	Ver	Ant 1	39.73	-	-	-7.03	32.70	-	-	46.00	-	-	13.30	-	-
5519.239	Ver	Ant 1	-	43.80	31.40	4.40	-	48.20	35.80	-	74.00	54.00	-	25.80	18.20
5855.772	Hor	Ant 1	-	44.10	31.40	4.20	-	48.30	35.60	-	74.00	54.00	-	25.70	18.40
-	-	-	-	-	-	-	-	--	-	-	-	-	-	-	-

Note.

1. Except for the above table: All other spurious emissions were less than 20dB for the 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

30MHz ~ 25GHz Radiated Spurious Emissions

▪ Test Mode: 802.11n & Lowest Frequency

Frequency (MHz)	ANT Pol	Transmitting Antenna	Reading(dBuV)			T.F (dB/m)	Result(dBuV/m)			Limit(dBuV/m)			Margin(dB)		
			QP	PK	AV		QP	PK	AV	QP	PK	AV	QP	PK	AV
100.325	Hor	Ant 1	46.84	-	-	-15.04	31.80	-	-	43.50	-	-	11.70	-	-
100.330	Ver	Ant 1	48.64	-	-	-15.04	33.60	-	-	43.50	-	-	9.90	-	-
287.050	Hor	Ant 1	39.43	-	-	-7.03	32.40	-	-	46.00	-	-	13.60	-	-
287.050	Ver	Ant 1	38.93	-	-	-7.03	31.90	-	-	46.00	-	-	14.10	-	-
5615.391	Hor	Ant 1	-	44.00	33.40	4.30	-	48.30	37.70	-	74.00	54.00	-	25.70	16.30
5943.912	Ver	Ant 1	-	44.70	30.60	4.20	-	48.90	34.80	-	74.00	54.00	-	25.10	19.20
-	-	-	-	-	-	-	-	--	-	-	-	-	-	-	-

▪ Test Mode: 802.11n & Middle Frequency

Frequency (MHz)	ANT Pol	Transmitting Antenna	Reading(dBuV)			T.F (dB/m)	Result(dBuV/m)			Limit(dBuV/m)			Margin(dB)		
			QP	PK	AV		QP	PK	AV	QP	PK	AV	QP	PK	AV
100.325	Hor	Ant 1	47.74	-	-	-15.04	32.70	-	-	43.50	-	-	10.80	-	-
100.330	Ver	Ant 1	47.44	-	-	-15.04	32.40	-	-	43.50	-	-	11.10	-	-
287.050	Hor	Ant 1	40.23	-	-	-7.03	33.20	-	-	46.00	-	-	12.80	-	-
287.050	Ver	Ant 1	40.83	-	-	-7.03	33.80	-	-	46.00	-	-	12.20	-	-
5479.175	Ver	Ant 1	-	44.60	31.90	4.10	-	48.70	36.00	-	74.00	54.00	-	25.30	18.00
5783.658	Hor	Ant 1	-	44.60	33.60	4.20	-	48.80	37.80	-	74.00	54.00	-	25.20	16.20
-	-	-	-	-	-	-	-	--	-	-	-	-	-	-	-

▪ Test Mode: 802.11n & Highest Frequency

Frequency (MHz)	ANT Pol	Transmitting Antenna	Reading(dBuV)			T.F (dB/m)	Result(dBuV/m)			Limit(dBuV/m)			Margin(dB)		
			QP	PK	AV		QP	PK	AV	QP	PK	AV	QP	PK	AV
100.325	Hor	Ant 1	48.54	-	-	-15.04	33.50	-	-	43.50	-	-	10.00	-	-
100.330	Ver	Ant 1	46.54	-	-	-15.04	31.50	-	-	43.50	-	-	12.00	-	-
287.050	Hor	Ant 1	39.53	-	-	-7.03	32.50	-	-	46.00	-	-	13.50	-	-
287.050	Ver	Ant 1	39.53	-	-	-7.03	32.50	-	-	46.00	-	-	13.50	-	-
5687.505	Hor	Ant 1	-	44.60	33.70	4.30	-	48.90	38.00	-	74.00	54.00	-	25.10	16.00
5751.607	Ver	Ant 1	-	43.60	33.40	4.20	-	47.80	37.60	-	74.00	54.00	-	26.20	16.40
-	-	-	-	-	-	-	-	--	-	-	-	-	-	-	-

Note.

1. Except for the above table: All other spurious emissions were less than 20dB for the 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

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	EPM-442A	01/07/10	01/07/11	GB37170413
☐	Power Sensor	H.P	8481A	01/07/10	01/07/11	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	01/07/10	01/07/11	017060
☐	Frequency Counter	H.P	5342A	01/07/10	01/07/11	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	01/07/10	01/07/11	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	02/07/10	02/07/11	3011A09448
☐	Modulation Analyzer	H.P	8901B	01/07/10	01/07/11	3028A03029
☐	8960 Series 10 Wireless Comms. Test Set	Agilent	E5515C	02/07/10	02/07/11	GB43461134
☐	Universal Radio communication Tester	Rohde Schwarz	CMU 200	12/03/10	12/03/11	106760
☐	Bluetooth Tester	TESCOM	TC-3000B	01/07/10	01/07/11	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
☐	DC Power Supply	Protek	PWS-3010D	13/10/09	13/10/10	4072702
☐	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	SCHWARZBECK	BBHA9120A	13/04/10	13/04/11	322
☒	HORN ANT	ETS	3115	23/09/09	23/09/10	21097
☐	HORN ANT	ETS	3115	14/07/10	14/07/11	6419
☐	HORN ANT	A.H.Systems	SAS-574	10/06/09	10/06/11	154
☐	HORN ANT	A.H.Systems	SAS-574	10/06/09	10/06/11	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	01/07/10	01/07/11	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
☐	Termination	H.P	HP-909D	02/07/10	02/07/11	02750
☐	Termination	H.P	HP-909D	02/07/10	02/07/11	02702
☐	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0088CAN	01/07/10	01/07/11	788
☐	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0185CAN	01/07/10	01/07/11	790
☐	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0215CAN	01/07/10	01/07/11	112
☒	Amplifier (30dB)	Agilent	8449B	23/04/10	23/04/11	3008A01590
☐	Amplifier (30dB)	H.P	8449B	13/05/10	13/05/11	3008A00370
☐	Amplifier	EMPOWER	BBS3Q7ELU	02/11/09	02/11/10	1020
☐	RF Power Amplifier	OPHIRRF	5069F	01/07/10	01/07/11	1006
☒	EMI TEST RECEIVER	R&S	ESU	29/01/10	29/01/11	100014
☒	BILOG ANTENNA	SCHAFFNER	CBL 6112D	28/10/09	28/10/10	22609
☒	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	UHALP 9108 A-1	07/10/09	07/10/10	1098
☒	BICONICAL ANT.	Schwarzbeck	VHA 9103	06/10/09	06/10/10	91031946
☒	LOG-PERIODIC ANT.	Schwarzbeck	UHALP9108A	07/07/10	07/07/11	590
☐	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	01/07/10	01/07/11	2648A04922
☒	LOW NOISE PREAMPLIFIER	TSJ	MLA-00108-B02-36	08/02/10	08/02/11	1518831
☒	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	02/07/10	02/07/11	4N-170-3