RF TEST REPORT

Test item	:	Bluetooth Mono Headset
Model No.	:	HBM-810
Order No.	:	1005-00035
Date of receipt	:	2010-05-11
Test duration	:	2010-05-17 ~ 2010-06-04
Date of issue	:	2010-06-14
Use of report	:	FCC Original Grant

Applicant : LG Electronics USA.
1000 Sylvan Avenue Englewood Cliffs, New Jersey, 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 ANSI C63.4-2003
Test environment	:	See appended test report
Test result	:	☒ Pass ☐ Fail

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

Tested by:	Witnessed by:	Reviewed by:
Engineer B.G.HAN	N/A	Manager W.J. Lee

CONTENTS

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1. Equipment information

1.1 Equipment description

FCC Equipment Class	Part 15 Spread Spectrum Transmitter(DSS)
Equipment type	Bluetooth Mono Headset
Equipment model name	HBM-810
Equipment add model name	N/A
Equipment serial no.	Identical prototype
Frequency band	2402 ~ 2480 MHz
Spread Spectrum	Frequency Hopping
Modulation type	GFSK, π/4-DQPSK
Transmission rate	1Mbps, 2Mbps
Channel Spacing	1.0 MHz
Power	Li-ion polymer Battery: DC 3.7V AC-DC Adaptor: AC 120V 60Hz
Antenna type	Internal Type: FPCB Antenna (Max. Peak Gain: -0.5 dBi)

1.2 Ancillary equipment

Equipment	Model No.	Serial No.	Manufacturer	Note
Adaptor	STA-U34WDI	DB040633438	LG	-
Cradle	HBM-810	N/A	LG	-

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2. Information about test items

2.1 Test mode

This Device was tested in continuous transmitting mode(at maximum power) of hopping enable /disable mode.

Test Case 1	Only EUT mode
Test Case 2	EUT + Cradle mode
Test Case 3	EUT + Cradle + Adaptor mode

2.2 Auxiliary equipment

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

2.3 Tested frequency

- Hopping Function: Enable

	TX Frequency (MHz)	RX Frequency (MHz)
Hopping Band	2402 ~ 2480	2402 ~ 2480

- Hopping Function: Disable

	TX Frequency (MHz)	RX Frequency (MHz)
Lowest Channel	2402	2402
Middle Channel	2441	2441
Highest Channel	2480	2480

2.4 Tested environment

Temperature	:	20 ~ 24 °C
Relative humidity content	:	29 ~ 47 % R.H.
Details of power supply	:	Battery: DC 3.7 V AC 120V 60Hz

2.5 EMI Suppression Device(s)/Modifications

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

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3. Test Report

3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit (Using in 2400 ~ 483.5MHz)	Test Condition	Status Note 1
I. Test Items				
15.247(a)	Carrier Frequency Separation	>= 20dB BW or >= Two-Thirds of the 20dB BW	Conducted	**C** Note. 2
	Number of Hopping Frequencies	>= 15 hops		**C** Note. 2
	20 dB Bandwidth	None		**C** Note. 2
	Dwell Time	=< 0.4 seconds		**C** Note. 2
15.247(b)	Transmitter Output Power	=< 1Watt , if CHs >= 75 Others =<0.125W		**C** Note. 2
15.247(c)	Band-edge /Conducted	The radiated emission to any 100 kHz of out-band shall be at least 20dB below the highest in-band spectral density.		**C** Note. 2
	Conducted Spurious Emissions			**C** Note. 2
15.205 15.209	Radiated Spurious Emissions	FCC 15.209 Limits	Radiated	**C** Note. 3
15.207	AC Conducted Emissions	EN 55022	AC Line Conducted	**C** Note. 4
15.203	Antenna Requirements	FCC 15.203	-	**C**

Note 1: **C**=Comply **NC**=Not Comply **NT**=Not Tested **NA**=Not Applicable

Note 2: The test item was performed at only test case 1.

Note 3: The test item was performed in all the test cases. And the worst test results were reported.

Note 4: The test item was performed at only test case 3.

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

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3.2 Transmitter requirements

3.2.1 Carrier Frequency Separation

- Procedure:

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

After the trace being stable, the reading value between the peaks of the adjacent channels using the marker-delta function was recorded as the measurement results.

The spectrum analyzer is set to:

Span = wide enough to capture the peaks of two adjacent channels

RBW = 1% of the span

VBW = ≥ RBW

Trace = max hold

Sweep = auto

Detector function = peak

- Measurement Data: Comply

Hopping Mode	Data rate	Peak of center channel (MHz)	Peak of adjacent Channel (MHz)	Test Result (MHz)
Enable	1Mbps	2439.980	2441.009	1.029
	2Mbps	2439.971	2440.976	1.005

See next page for actual measured spectrum plot.

- **Minimum Standard:**

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.
Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW

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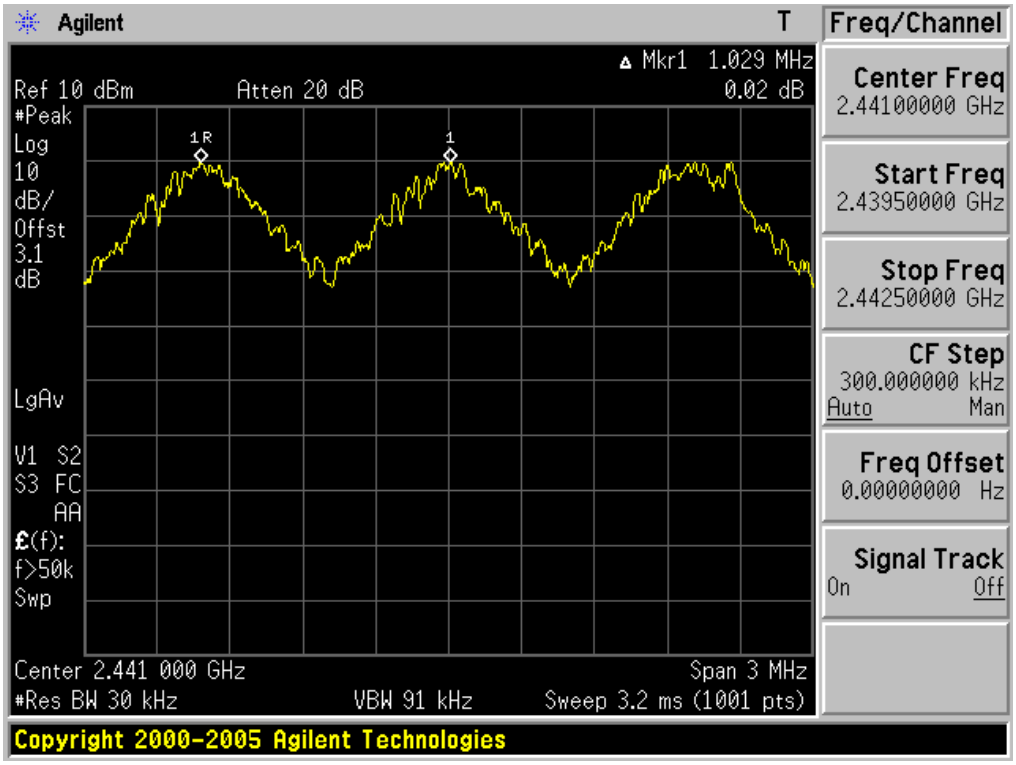
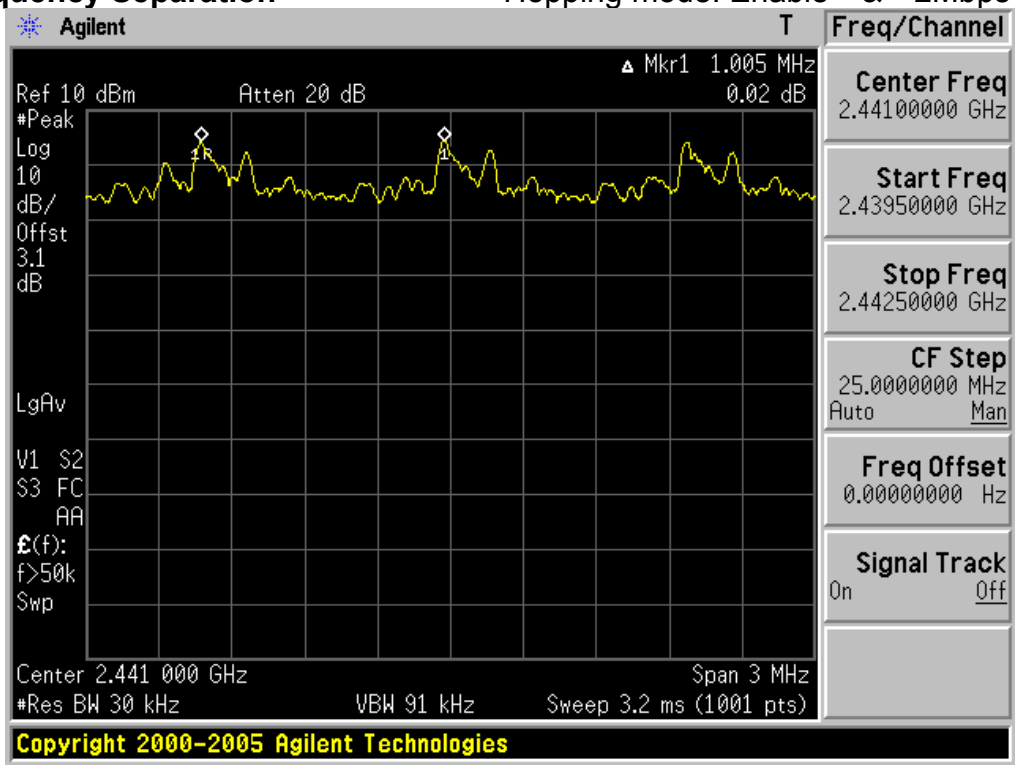
Carrier Frequency Separation Hopping mode: Enable & 1Mbps



Carrier Frequency Separation Hopping mode: Enable & 2Mbps



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3.2.2 Number of Hopping Frequencies

- Procedure:

The number of hopping frequencies was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.
To get higher resolution, four frequency ranges within the 2400 ~ 2483.5 MHz FH band were examined.

The spectrum analyzer is set to:

Span = 25MHz
Plot 1: Start Frequency = 2389.5MHz, Stop Frequency = 2414.5 MHz
Plot 2: Start Frequency = 2414.5MHz, Stop Frequency = 2439.5 MHz
Plot 3: Start Frequency = 2439.5MHz, Stop Frequency = 2464.5 MHz
Plot 4: Start Frequency = 2464.5MHz, Stop Frequency = 2489.5 MHz

RBW = 1% of the span or more
Sweep = auto
VBW = ≥ RBW
Detector function = peak
Trace = max hold

- **Measurement Data: Comply**

Hopping mode	Data rate	Test Result (Total Hops)
Enable	1Mbps	79
	2Mbps	79

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

- Minimum Standard:

At least 15 hopes

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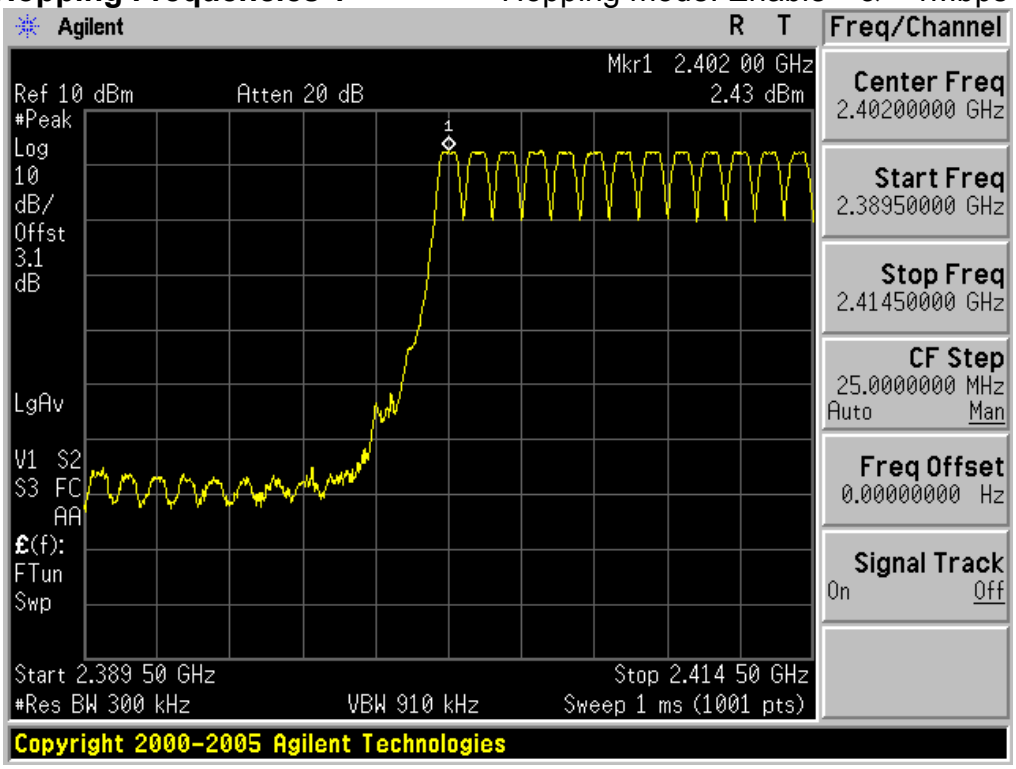
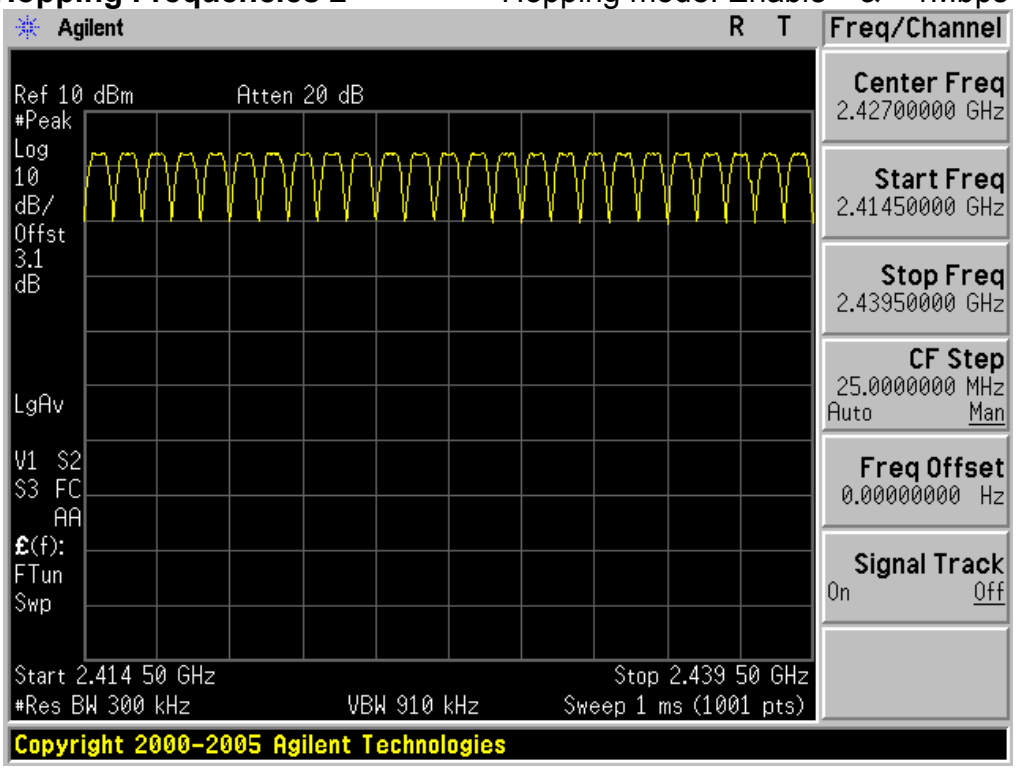
Number of Hopping Frequencies 1 Hopping mode: Enable & 1Mbps



Number of Hopping Frequencies 2 Hopping mode: Enable & 1Mbps



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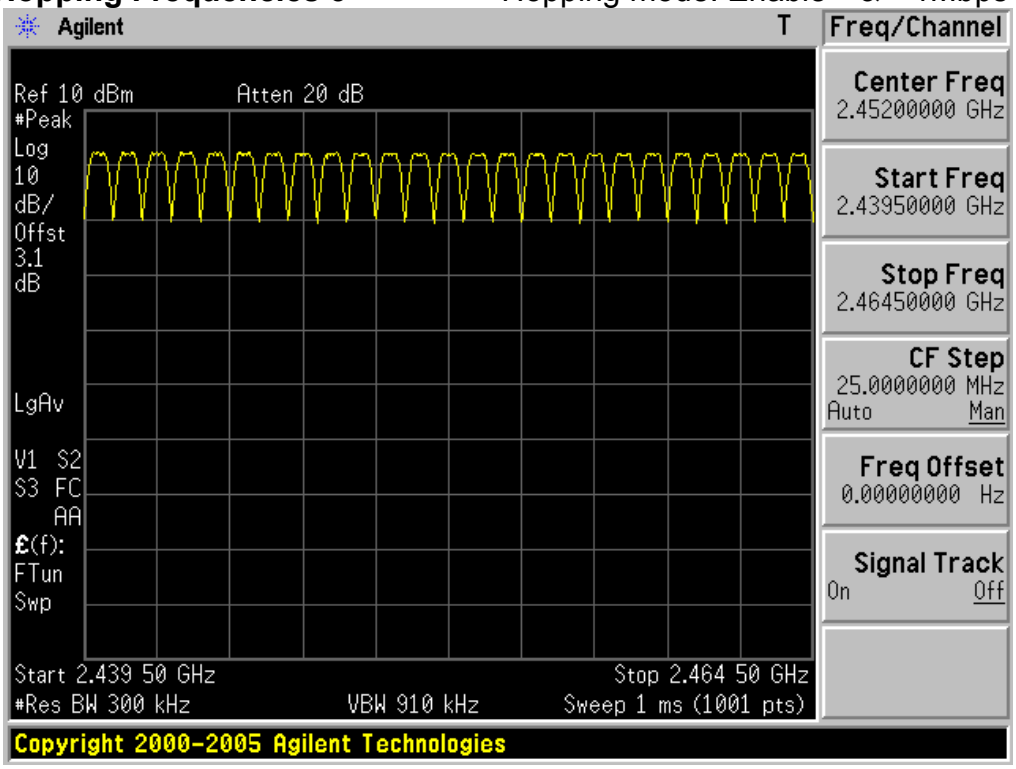
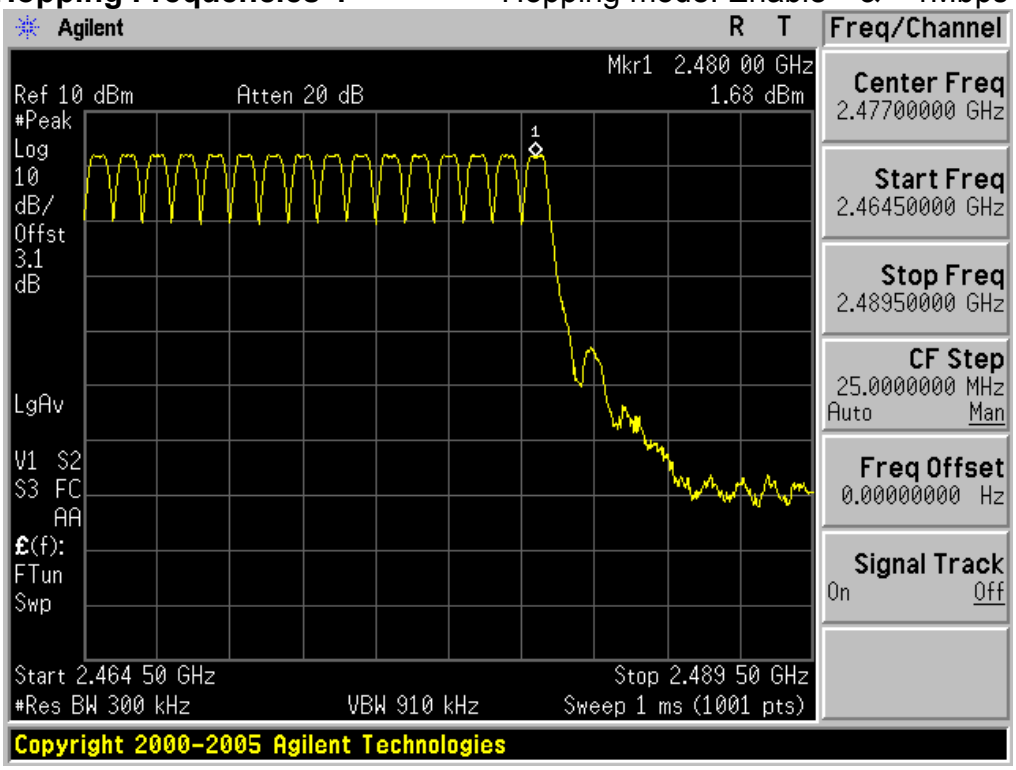
Number of Hopping Frequencies 3 Hopping mode: Enable & 1Mbps



Number of Hopping Frequencies 4 Hopping mode: Enable & 1Mbps



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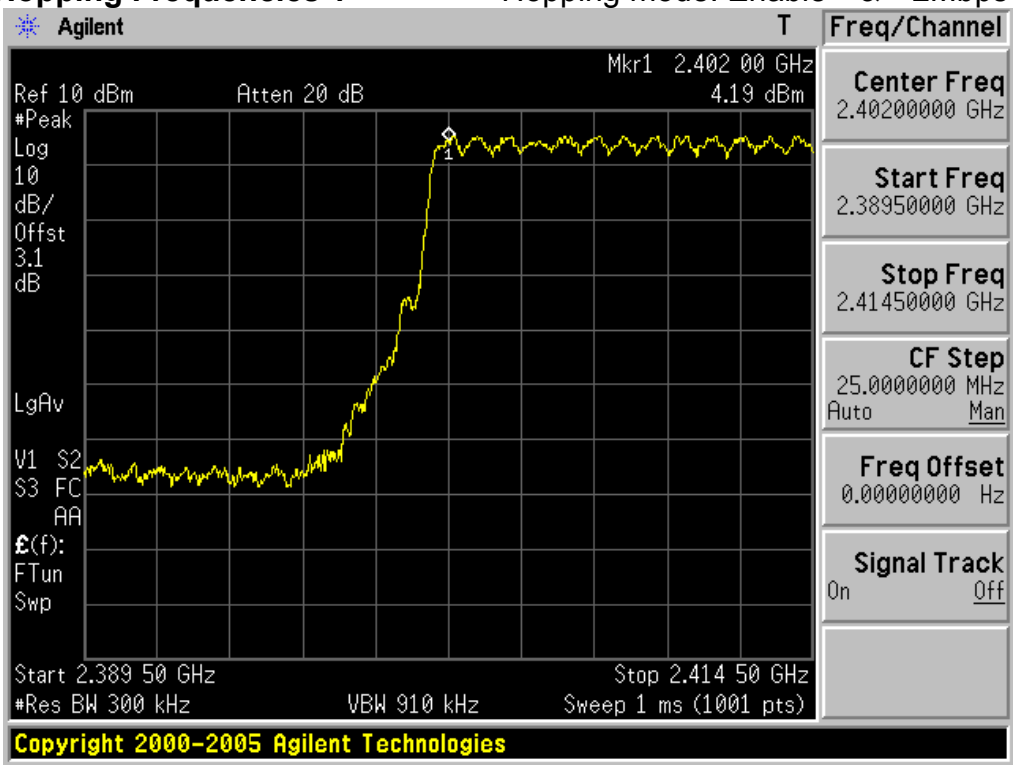
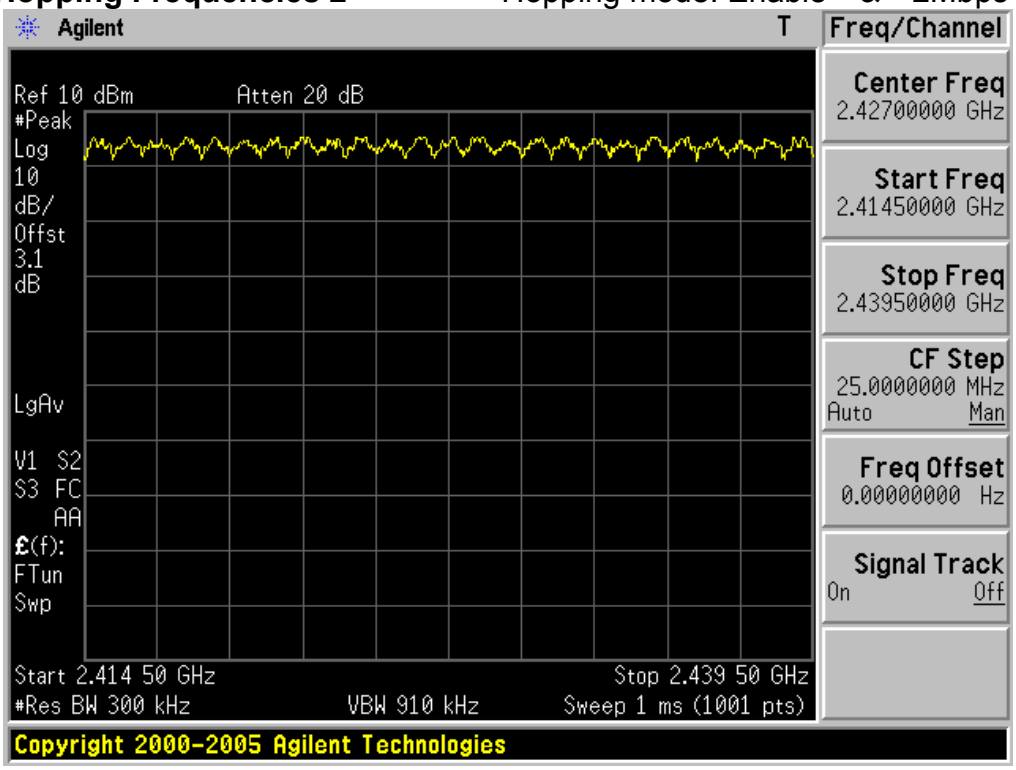
Number of Hopping Frequencies 1 Hopping mode: Enable & 2Mbps



Number of Hopping Frequencies 2 Hopping mode: Enable & 2Mbps



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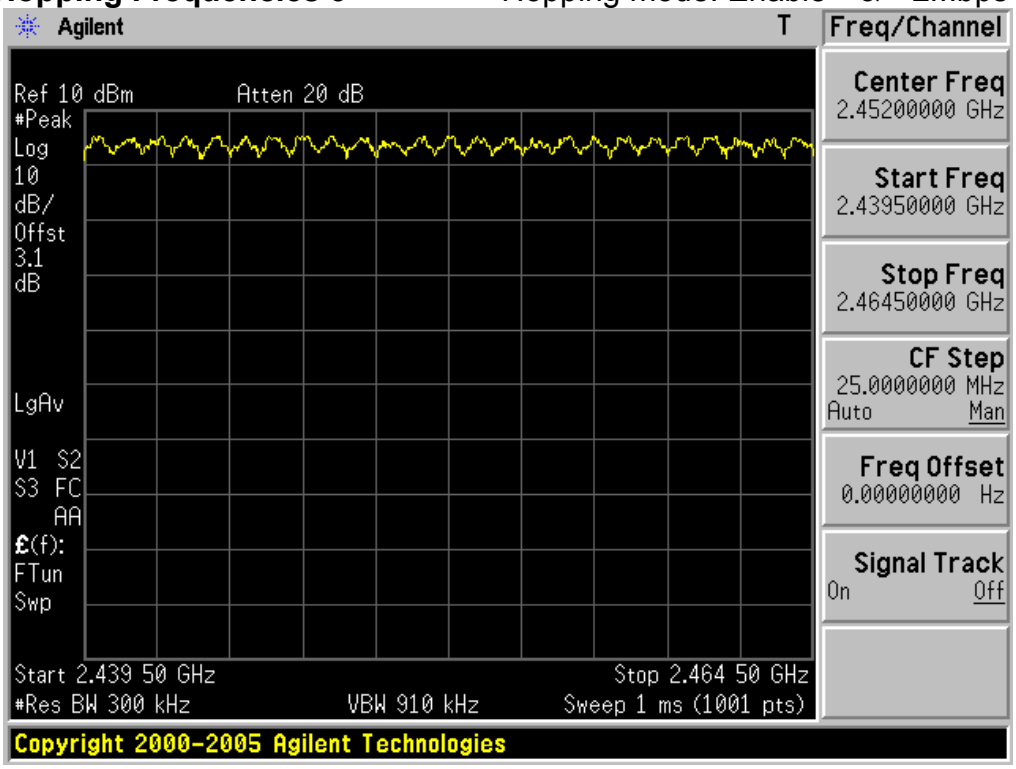
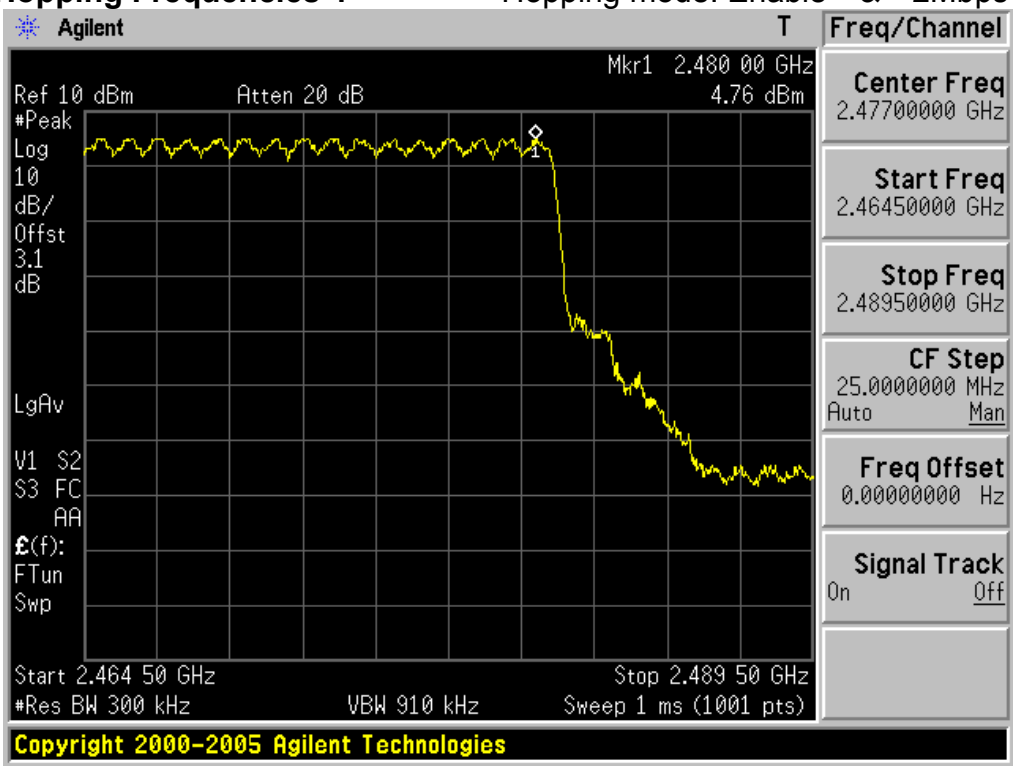
Number of Hopping Frequencies 3 Hopping mode: Enable & 2Mbps



Number of Hopping Frequencies 4 Hopping mode: Enable & 2Mbps



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3.2.3 20 dB Bandwidth

- Procedure:

The bandwidth at 20 dB below the highest inband spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled 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 20dB 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 20 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest Frequencies

Span = approximately 2 or 3 times of the 20 dB bandwidth

RBW = 1% of the 20dB bandwidth or more

VBW = ≥ RBW

Trace = max hold

Sweep = auto

Detector function = peak

- Measurement Data: Comply

Hopping mode	Date rate	Tested Channel	Test Results (MHz)
Disable	1Mbps	Lowest	0.930
		Middle	0.930
		Highest	0.930
	2Mbps	Lowest	1.300
		Middle	1.270
		Highest	1.290

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

- Minimum Standard:

None

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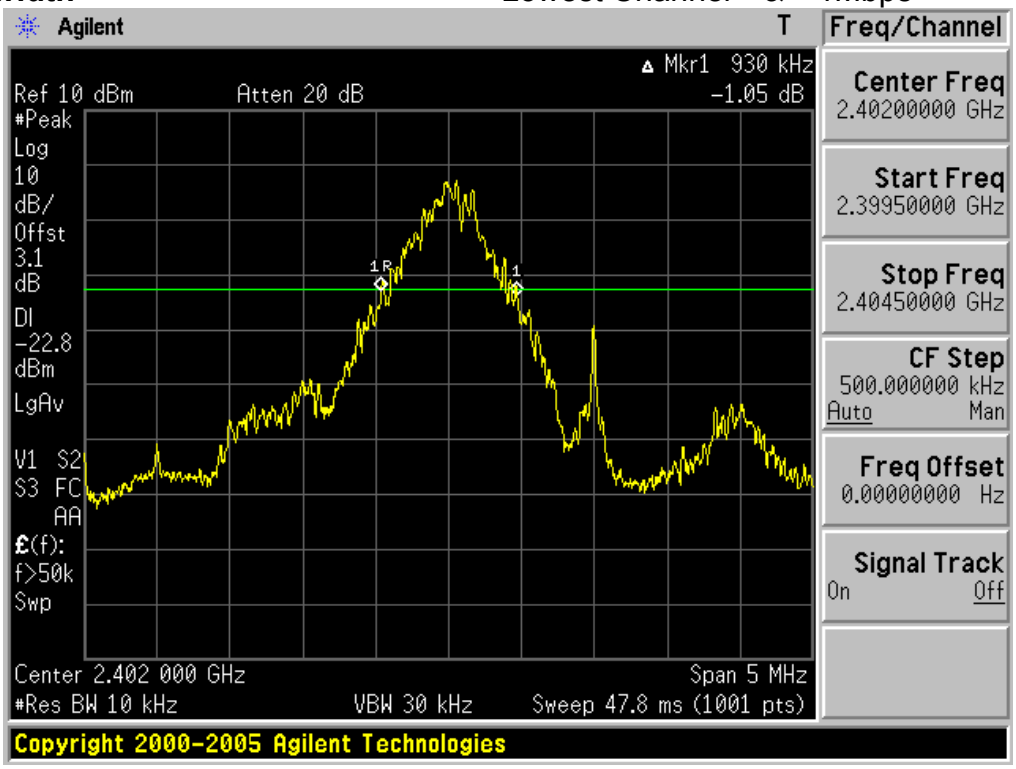
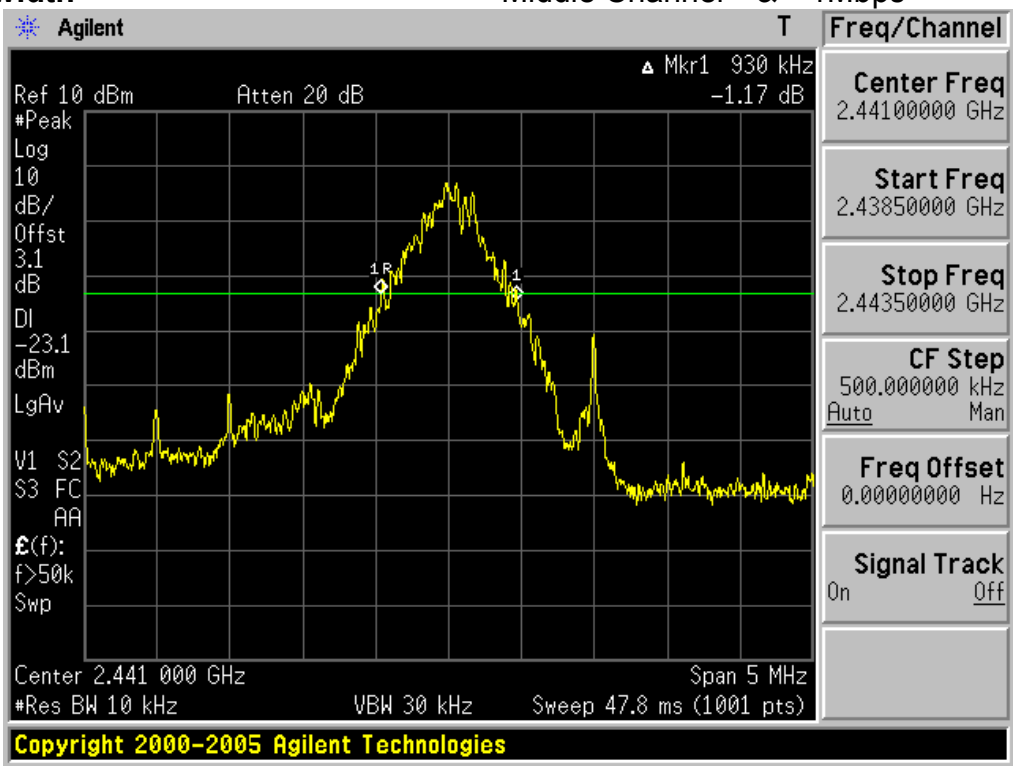
20dB Bandwidth Lowest Channel & 1Mbps



20dB Bandwidth Middle Channel & 1Mbps



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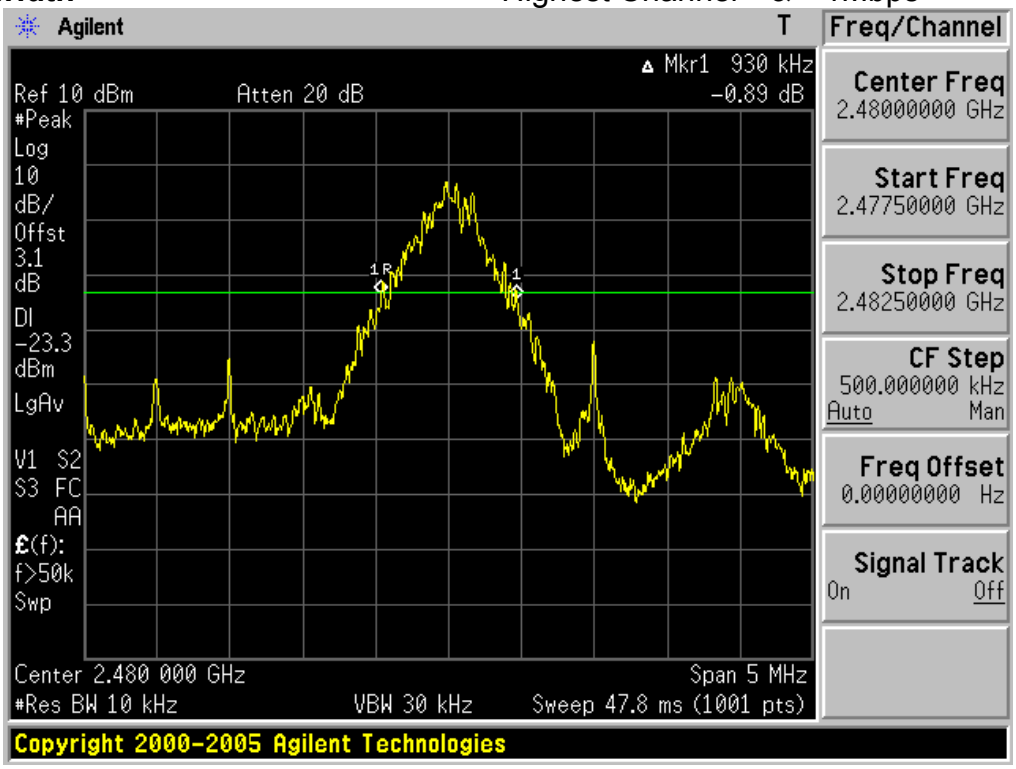
20dB Bandwidth Highest Channel & 1Mbps



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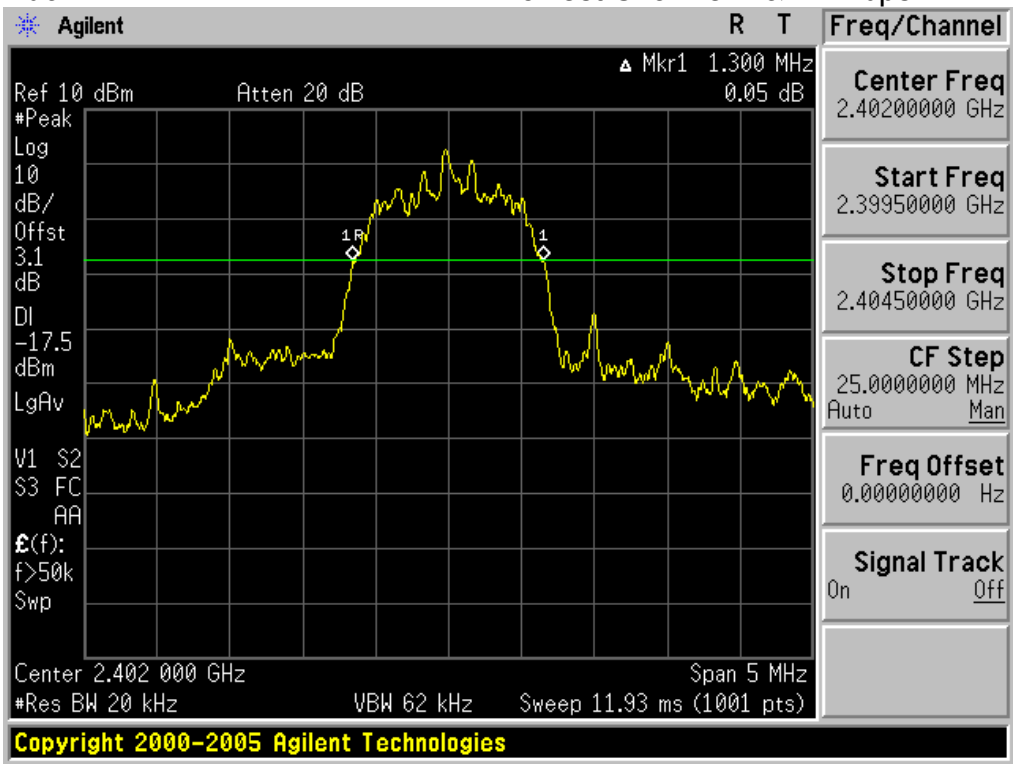
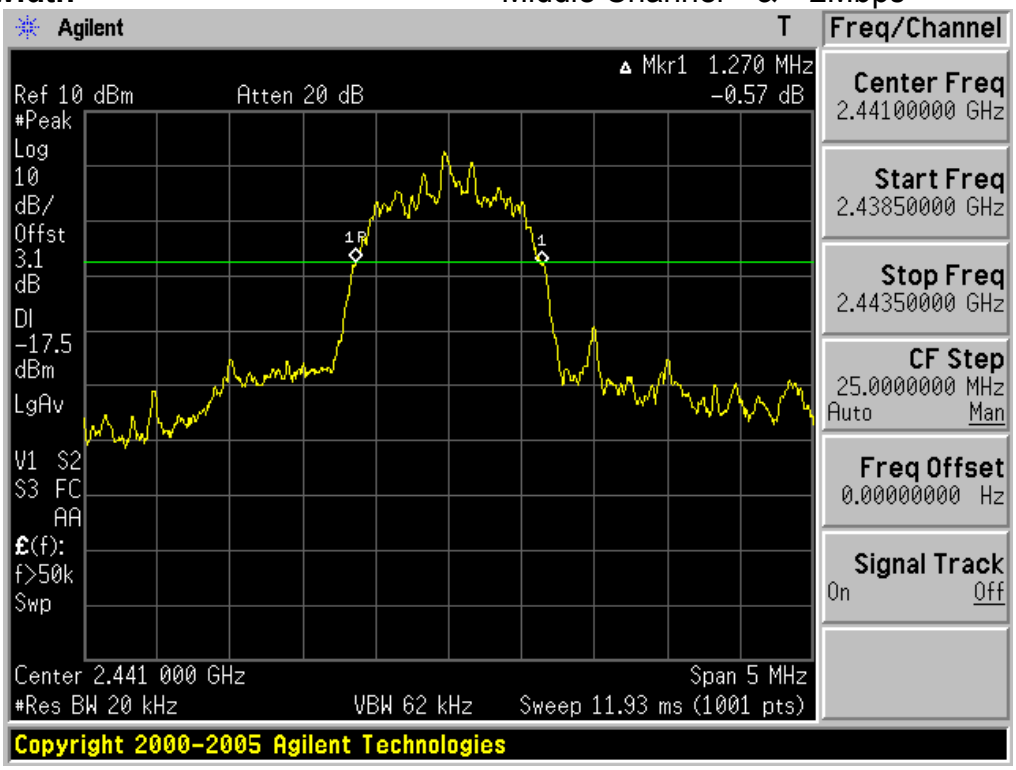
20dB Bandwidth Lowest Channel & 2Mbps



20dB Bandwidth Middle Channel & 2Mbps



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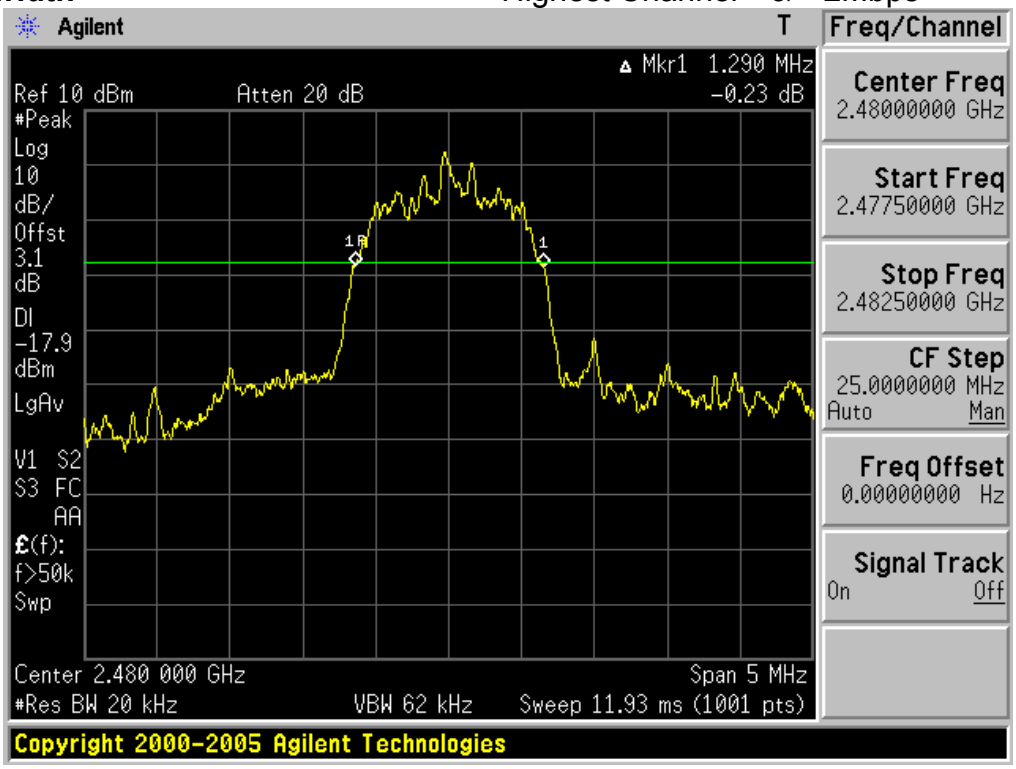
20dB Bandwidth Highest Channel & 2Mbps



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3.2.4 Time of Occupancy (Dwell Time)

- Procedure:

The dwell time was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

The spectrum analyzer is set to:

Center frequency = 2441 MHz	Span = zero
RBW = 1 MHz	VBW = ≥ RBW
Trace = max hold	Detector function = peak

- Measurement Data: Comply

Hopping mode	Data Rate	Packet Type	Burst On Time (ms)	Period (ms)	Number of hopping Channels	Test Result (s)
Enable	1Mbps	DH 5	2.895	3.750	79	0.309
	2Mbps	DH 5	2.925	3.765	79	0.311

Note 1: Each new transmission event begins on the next channel in the hopping sequence after the final channel used in the previous transmission event.

DWELL TIME=(0.4 x Number of hopping Channels) x Burst On time / (period x Number of hopping Channels)

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

- Minimum Standard:

No greater than 0.4 seconds

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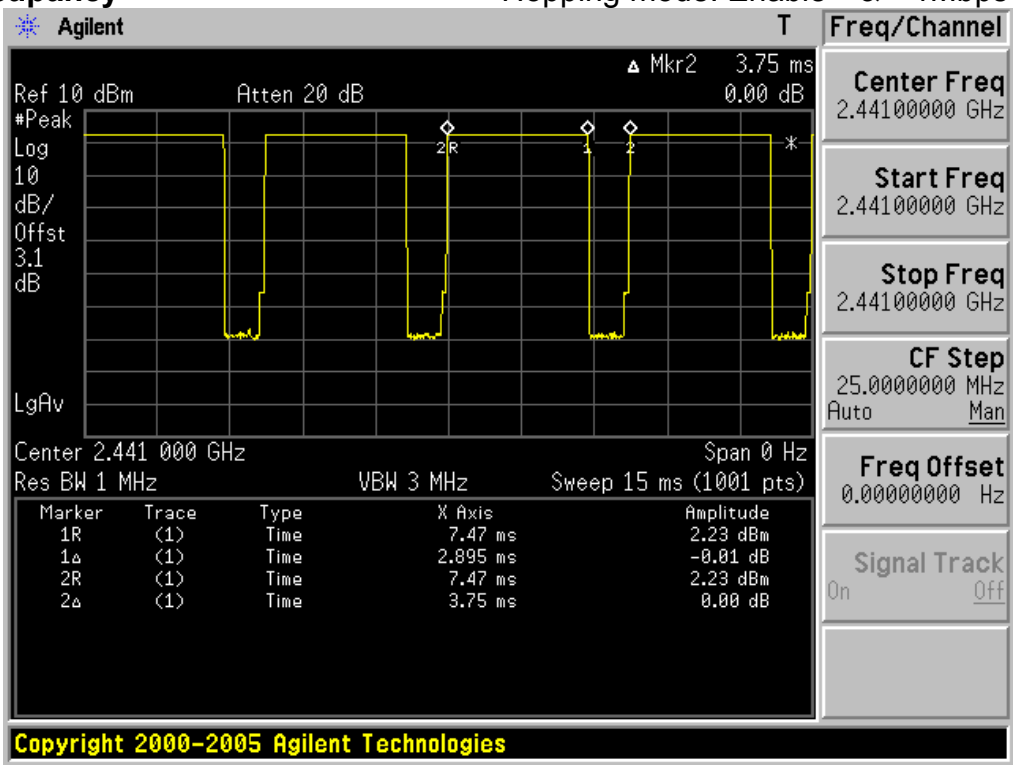
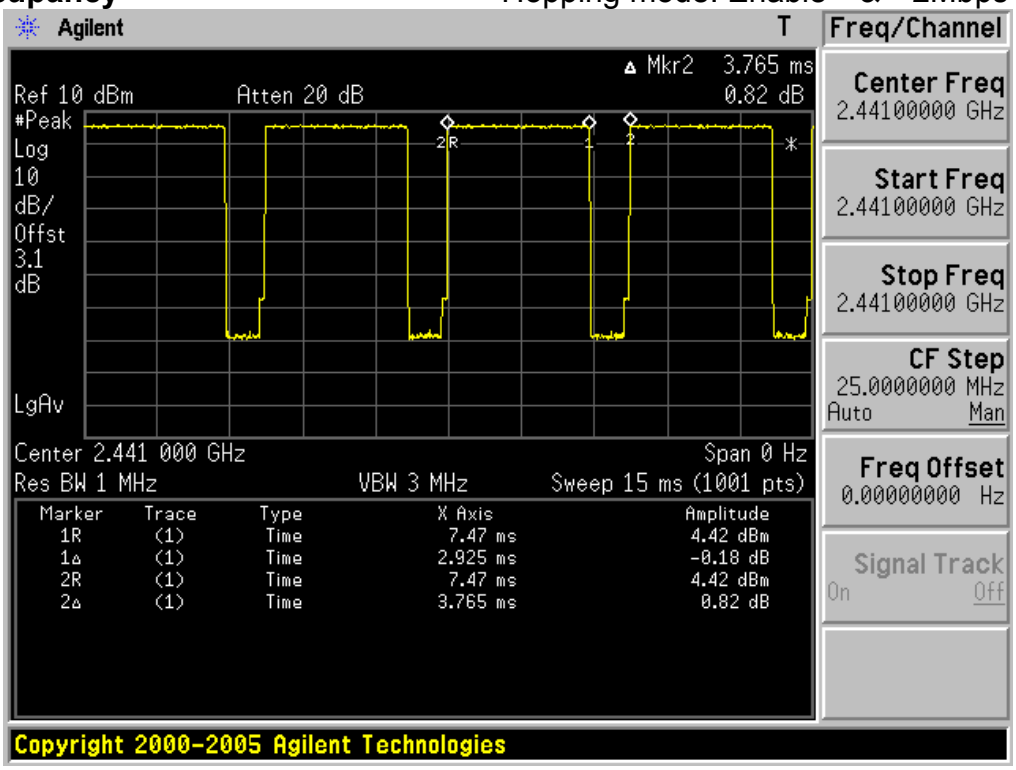
Time of Occupancy Hopping mode: Enable & 1Mbps



Time of Occupancy Hopping mode: Enable & 2Mbps



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3.2.5 Peak Output Power

- Procedure:

The peak output power was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled 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. The indicated level is the peak output power.

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 = ≥ RBW Detector function = peak
Trace = max hold Sweep = auto

- **Measurement Data: Comply**

Hopping mode	Data rate	Tested Channel	Test Results	
			dBm	mW
Disable	1Mbps	**Lowest**	**2.42**	**1.746**
		Middle	2.20	1.660
		Highest	1.89	1.545
	2Mbps	**Lowest**	5.78	3.784
		Middle	**5.88**	**3.873**
		Highest	5.57	3.606

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

- Minimum Standard:

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: **1 Watt**. For all other frequency hopping systems in the 2400-2483.5 MHz band: **0.125 Watts**

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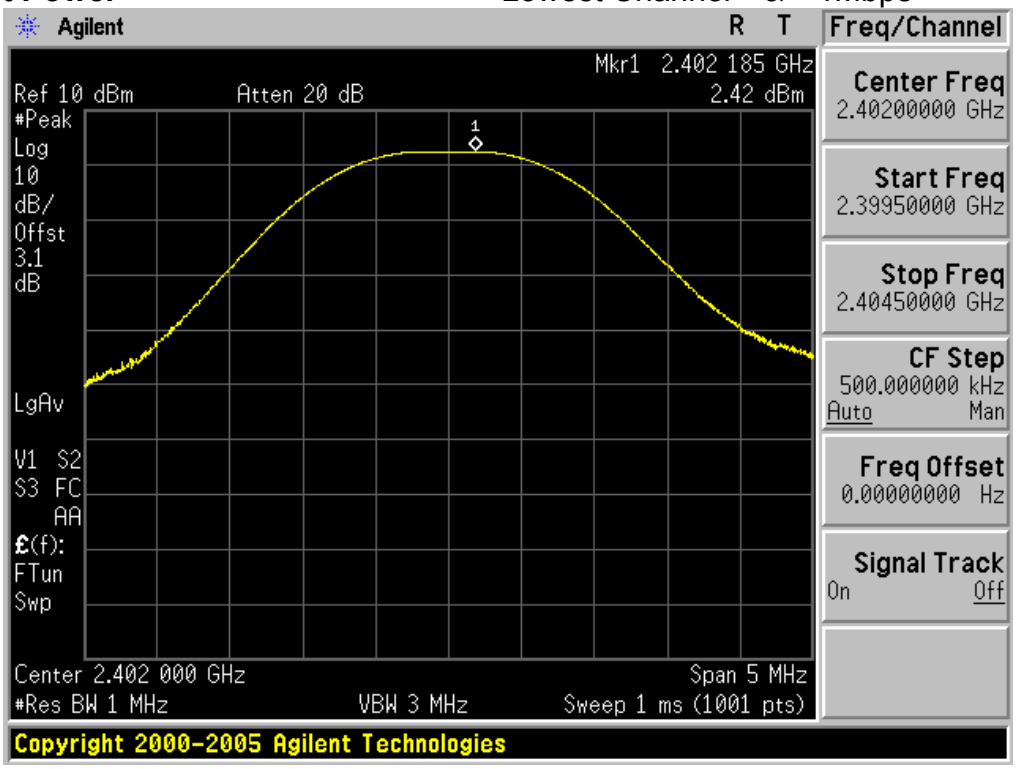
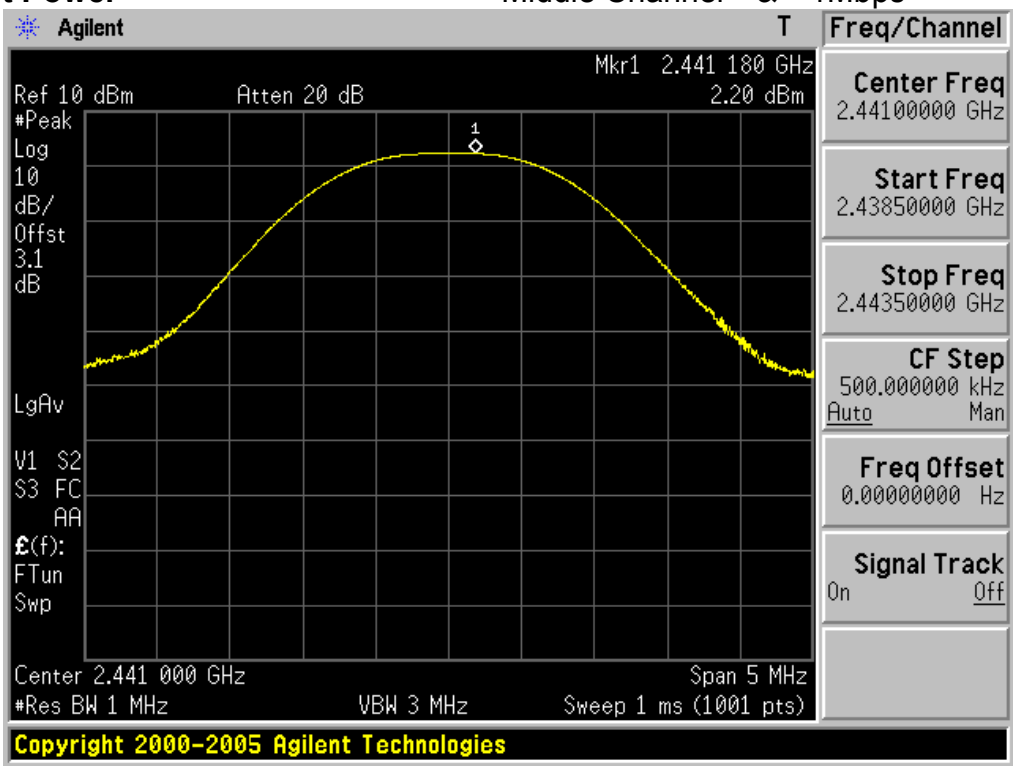
Peak Output Power Lowest Channel & 1Mbps



Peak Output Power Middle Channel & 1Mbps



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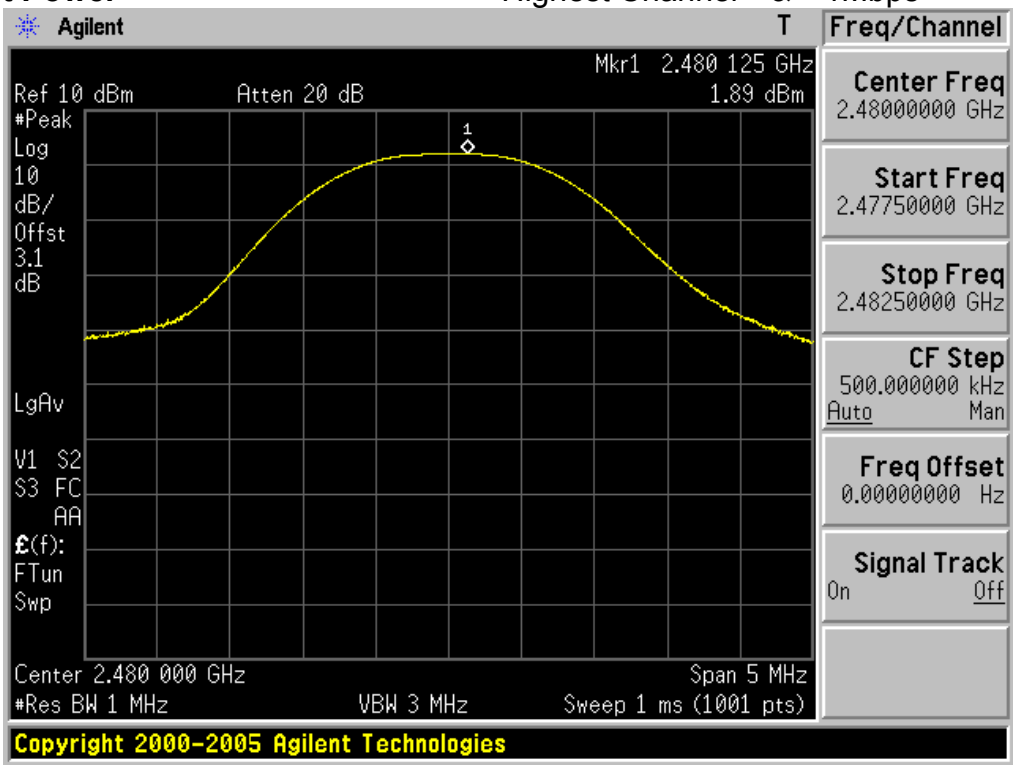
Peak Output Power Highest Channel & 1Mbps



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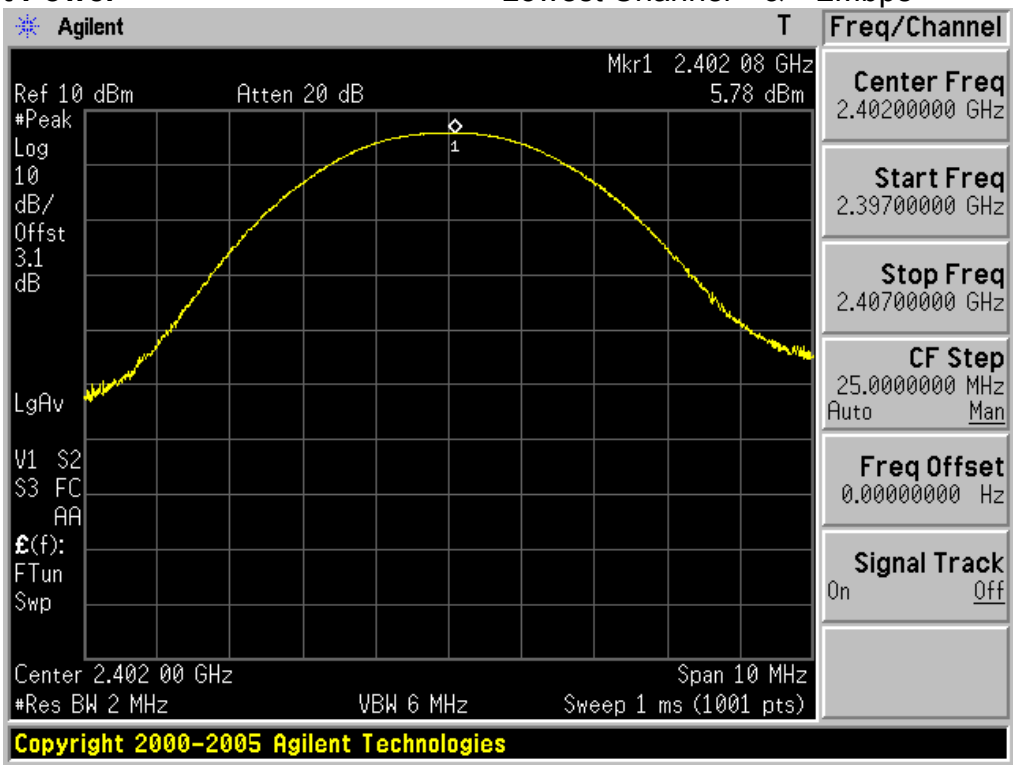
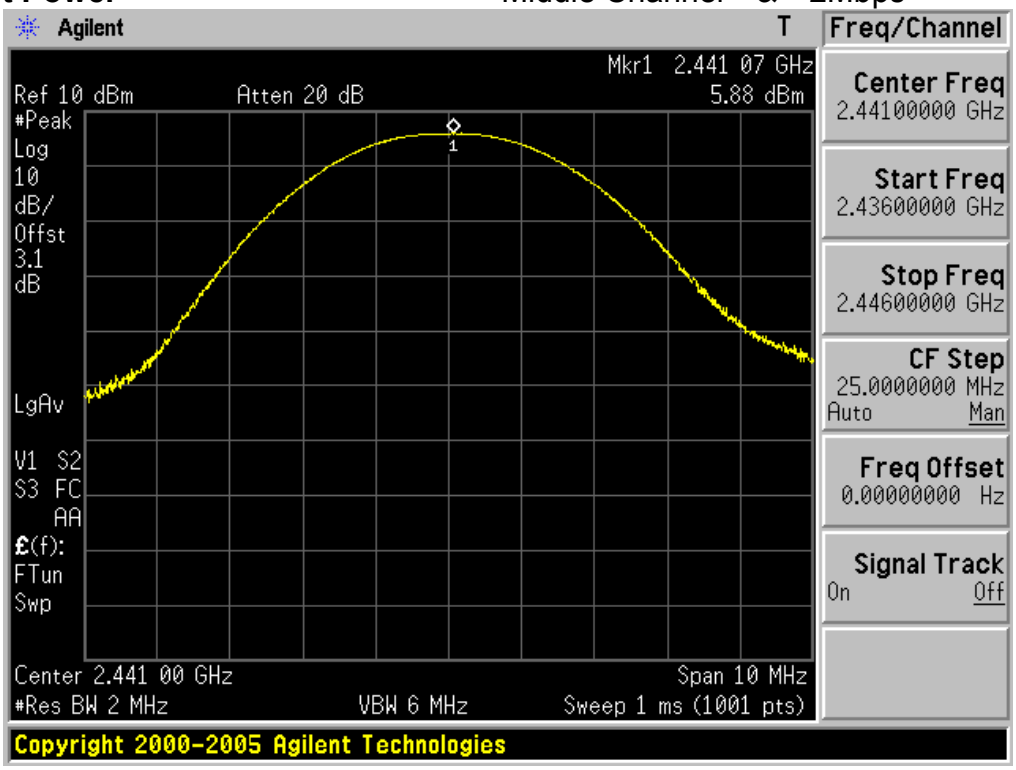
Peak Output Power Lowest Channel & 2Mbps



Peak Output Power Middle Channel & 2Mbps



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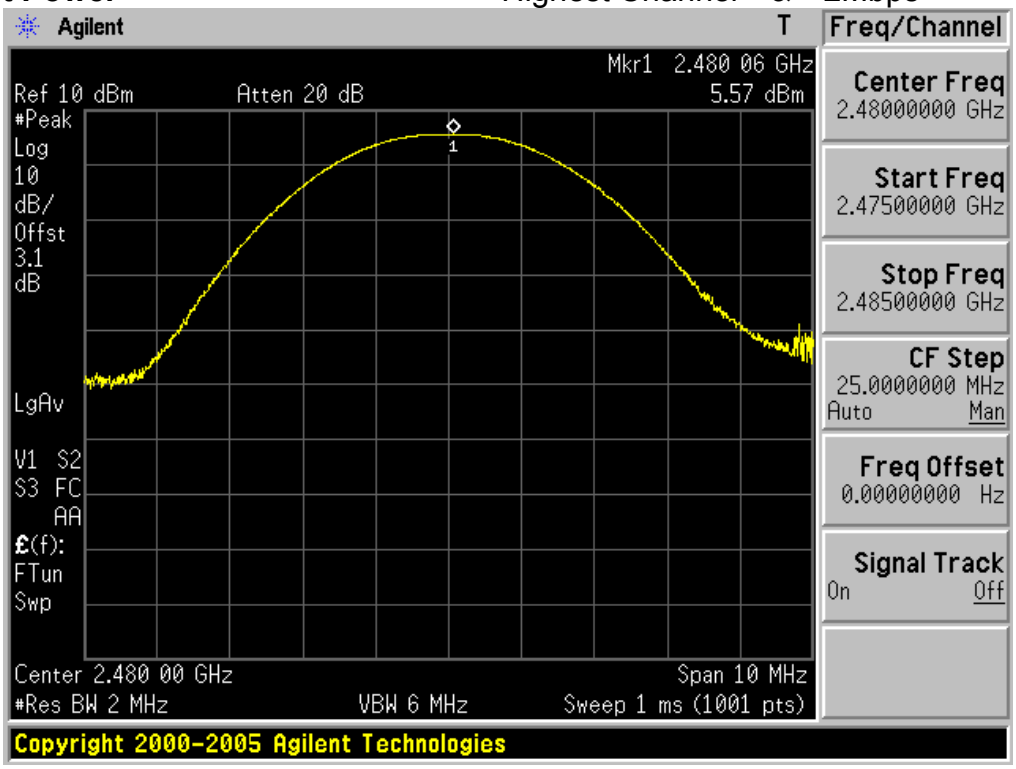
Peak Output Power Highest Channel & 2Mbps



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3.2.6 Conducted Spurious Emissions

- Procedure:

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled 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.

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

Tested frequency = the highest and the lowest Frequencies

Center frequency = 2400MHz, 2483.5MHz

Span = 10MHz	Detector function = peak
RBW = 1% of the span	VBW = ≥ RBW
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 = ≥ RBW
Detector function = peak	Sweep = auto
Trace = max hold	

- Measurement Data: Comply

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

- **Minimum Standard:**

Minimum Standard:	> 20 dBc

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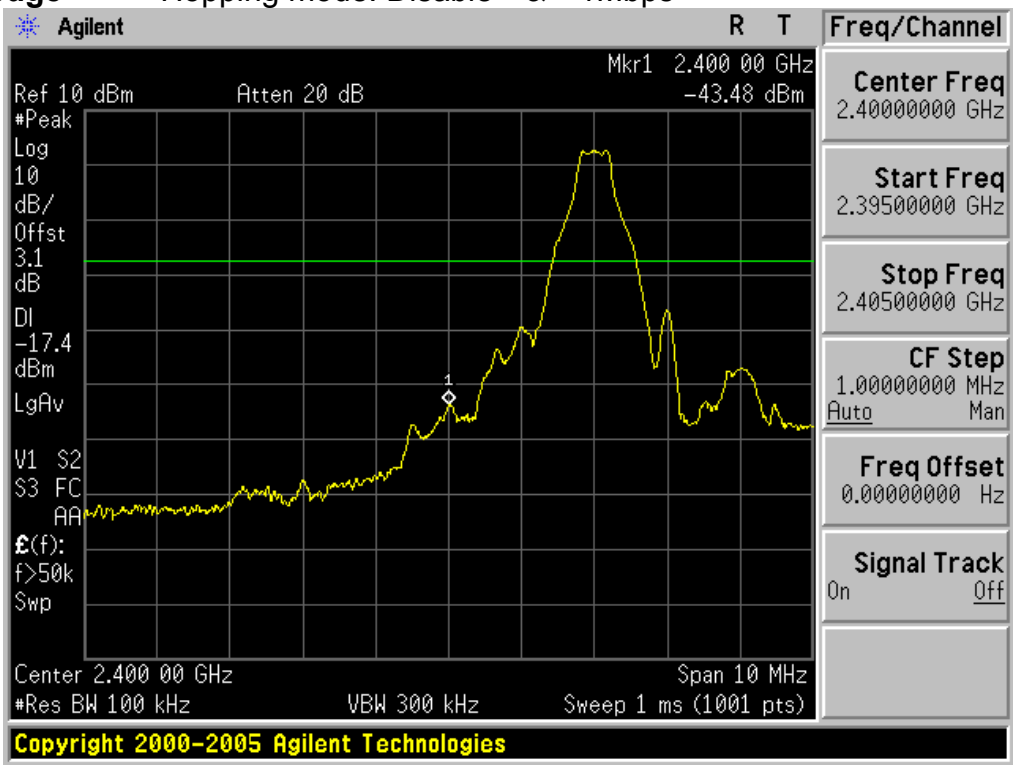
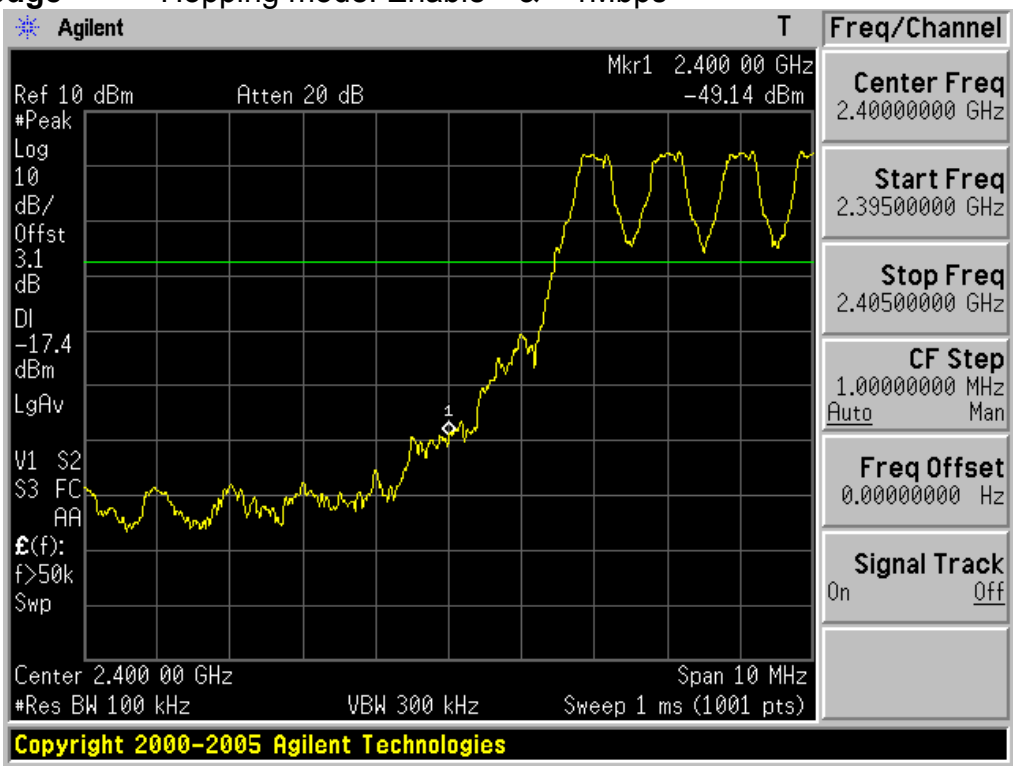
Low Band-edge Hopping mode: Disable & 1Mbps



Low Band-edge Hopping mode: Enable & 1Mbps



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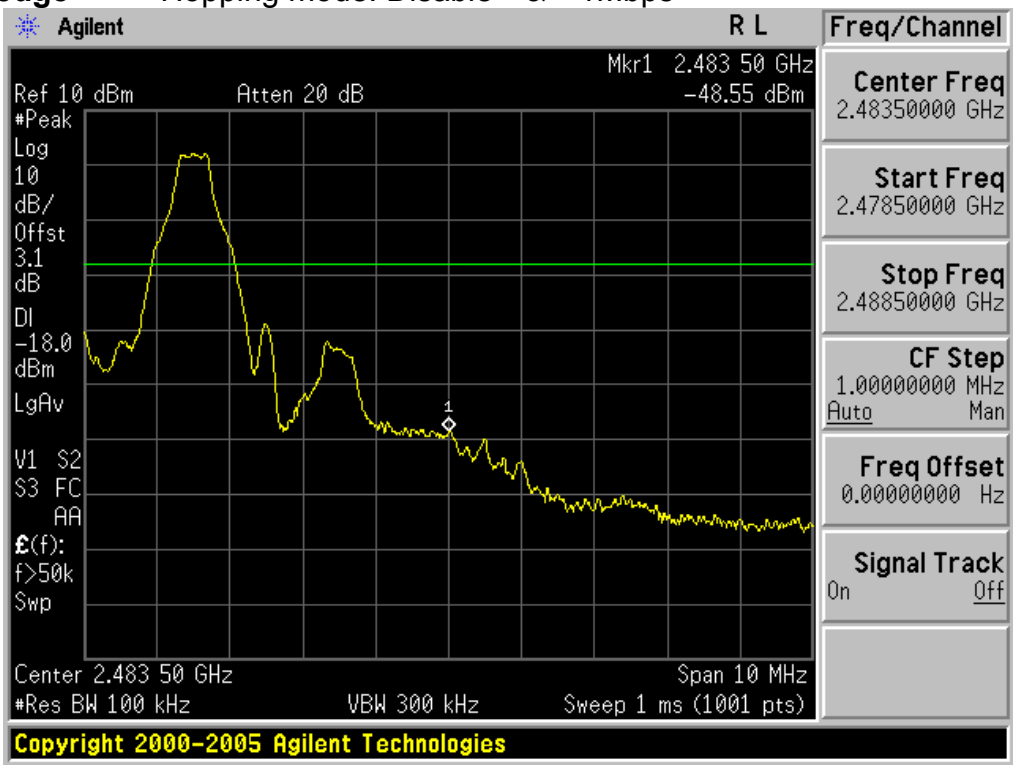
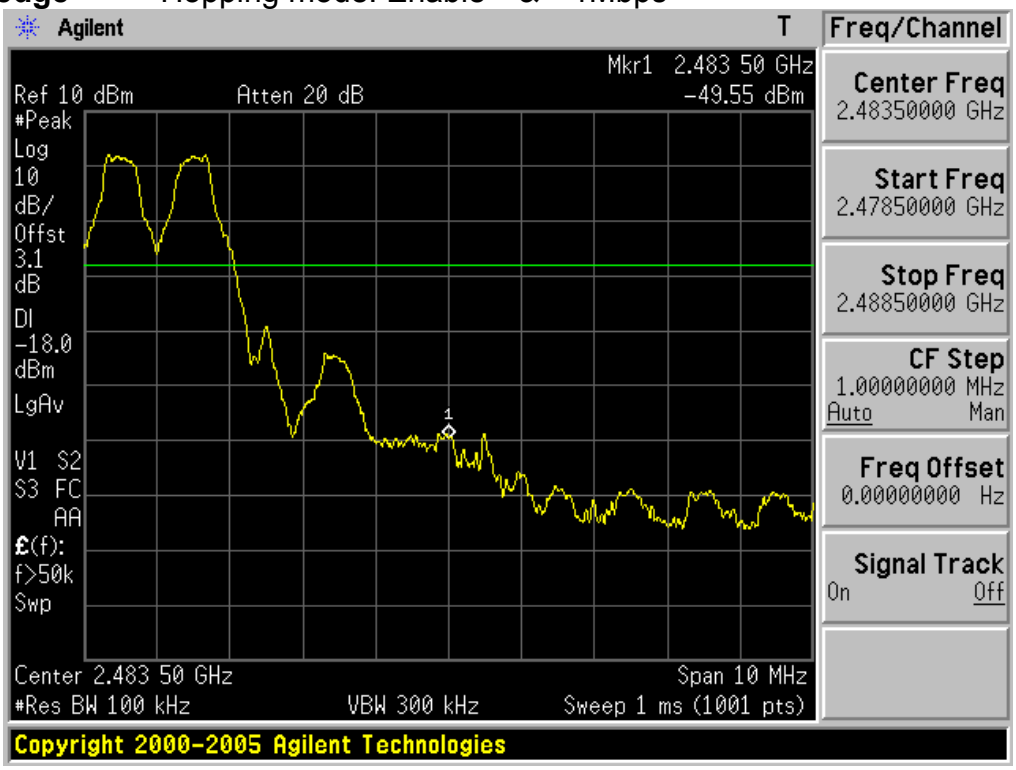
High Band-edge Hopping mode: Disable & 1Mbps



High Band-edge Hopping mode: Enable & 1Mbps



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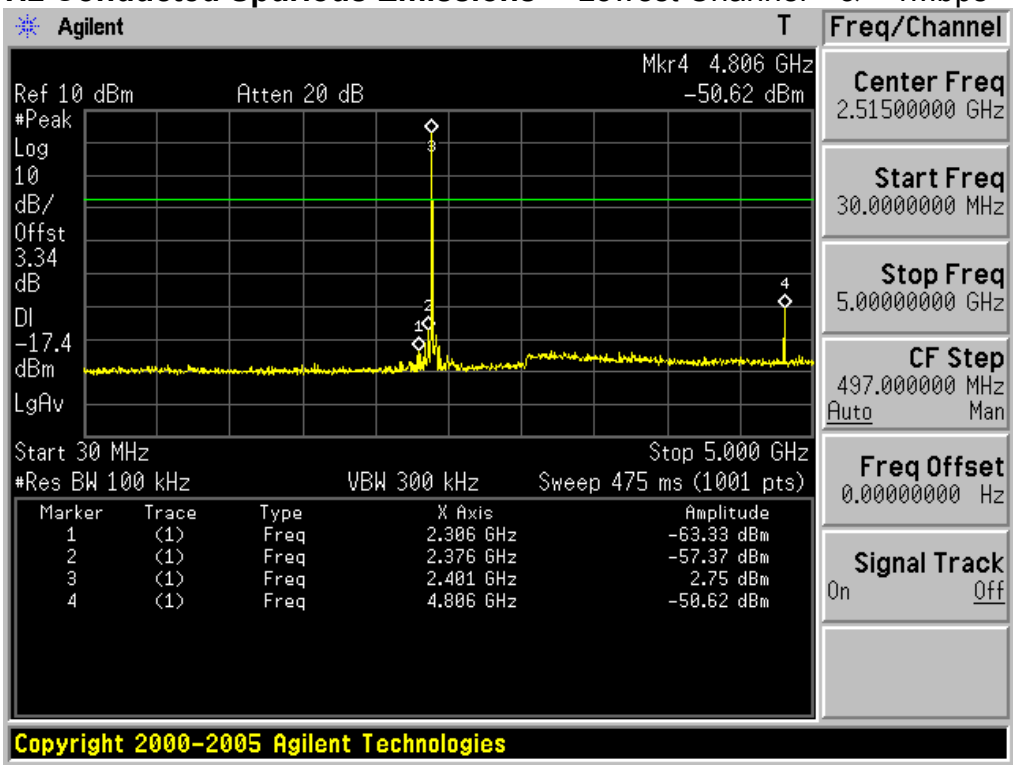
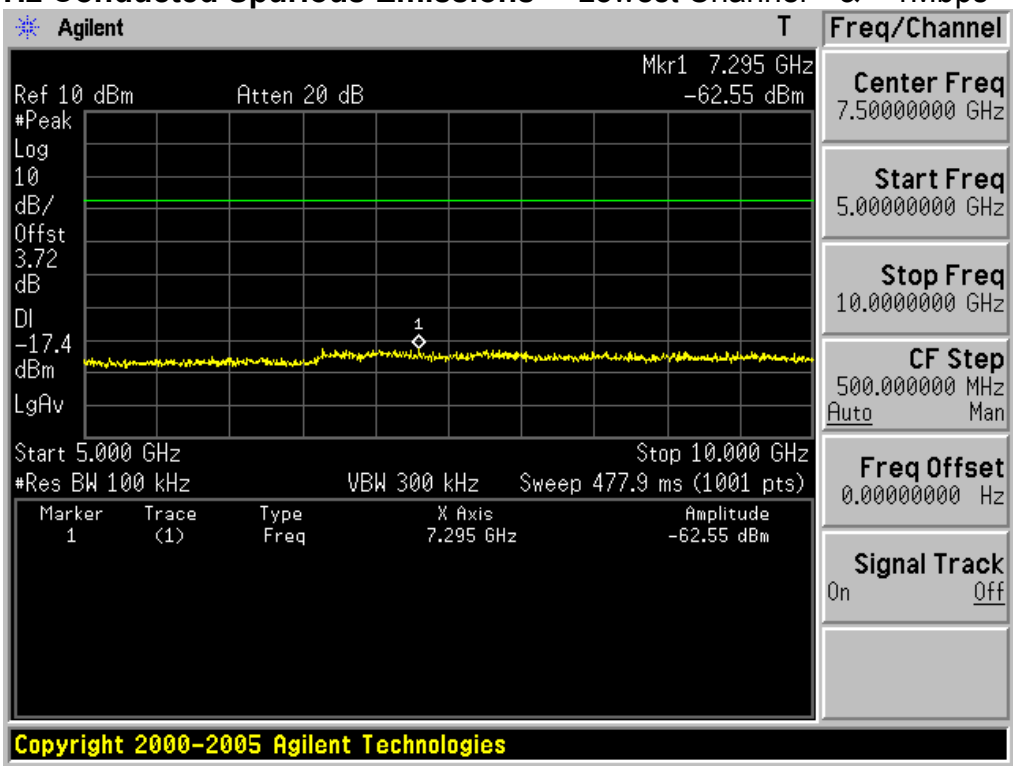
30MHz ~ 5GHz Conducted Spurious Emissions Lowest Channel & 1Mbps



5GHz ~ 10GHz Conducted Spurious Emissions Lowest Channel & 1Mbps



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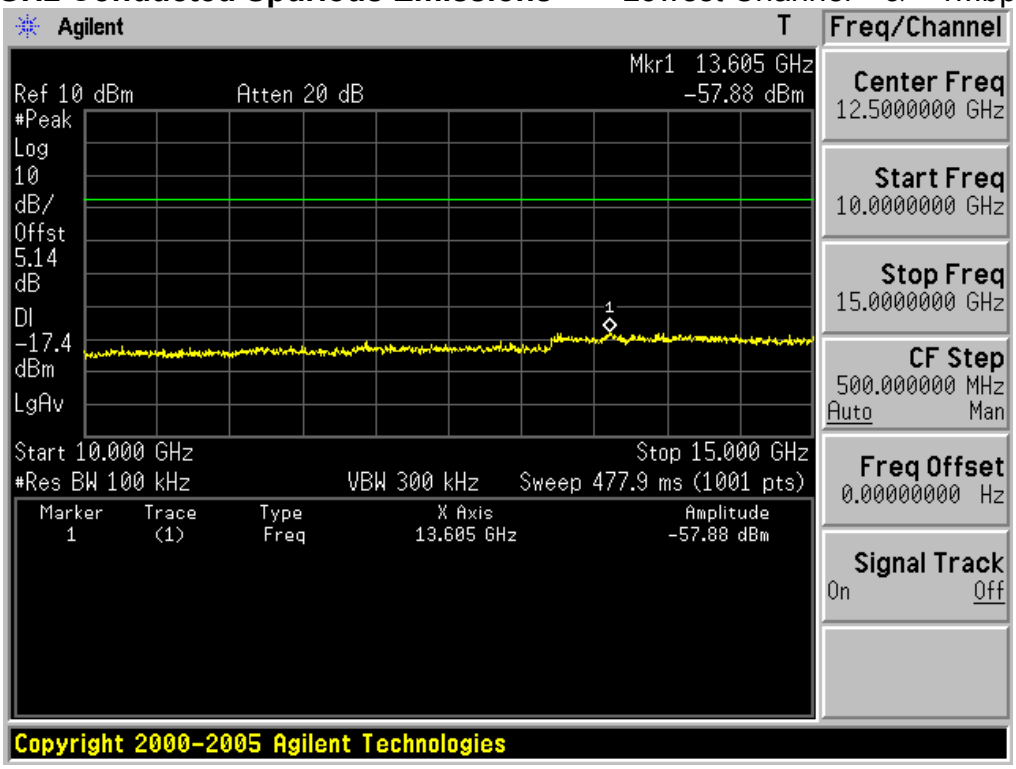
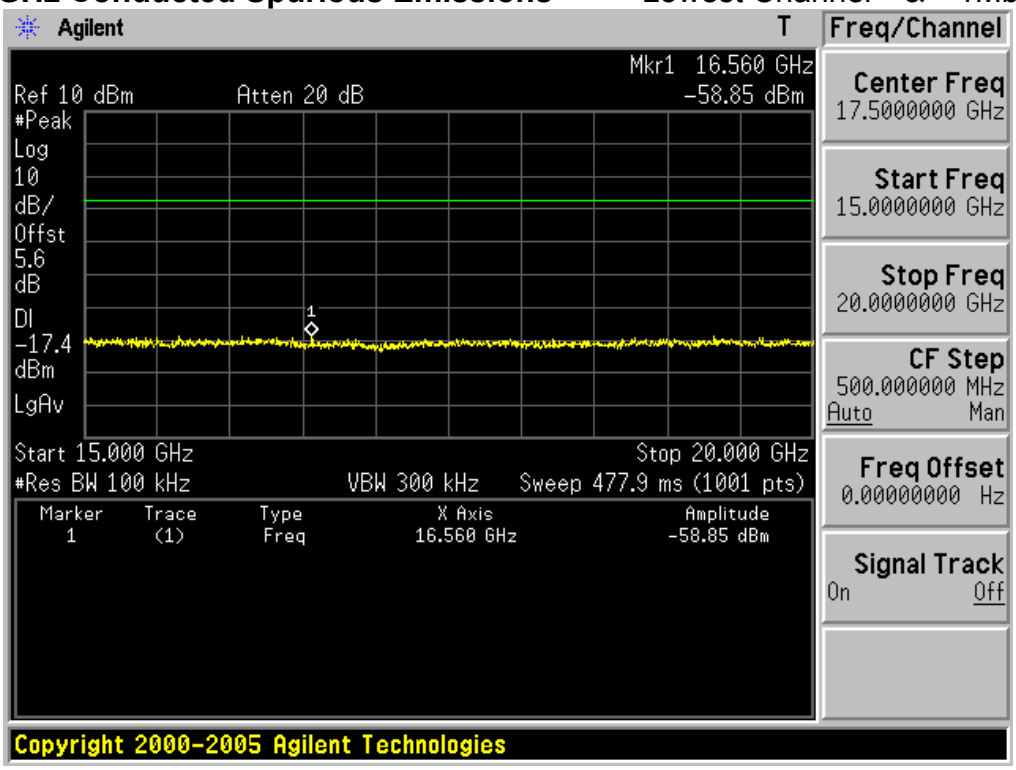
10GHz ~ 15GHz Conducted Spurious Emissions Lowest Channel & 1Mbps



15GHz ~ 20GHz Conducted Spurious Emissions Lowest Channel & 1Mbps



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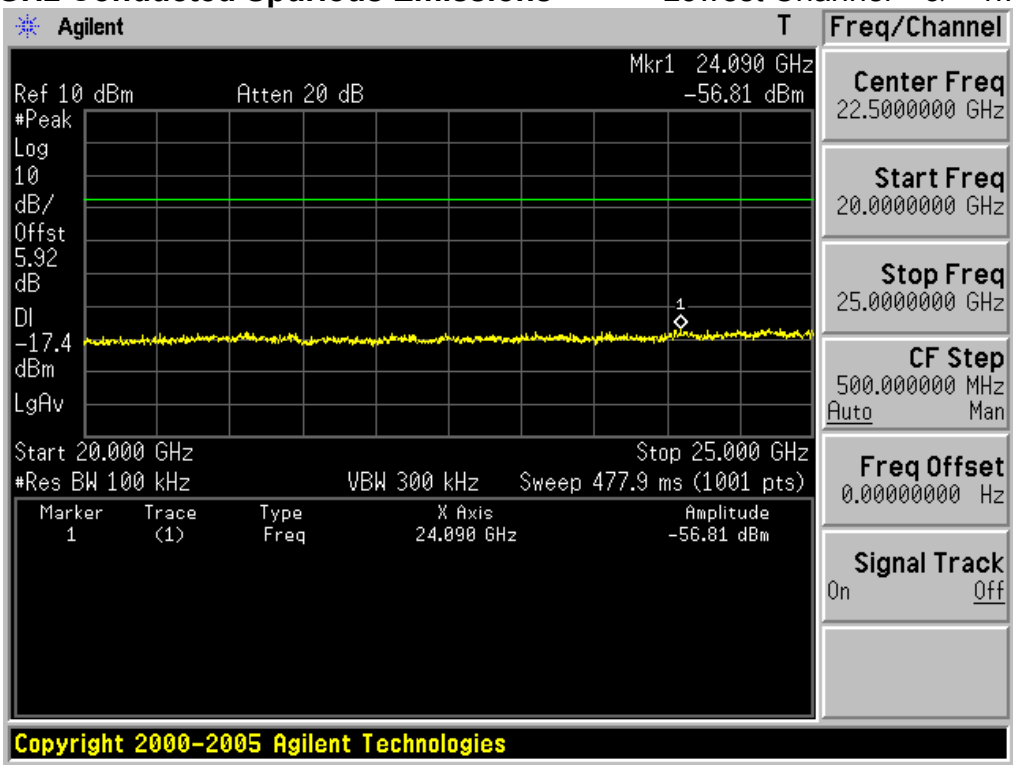
20GHz ~ 25GHz Conducted Spurious Emissions Lowest Channel & 1Mbps



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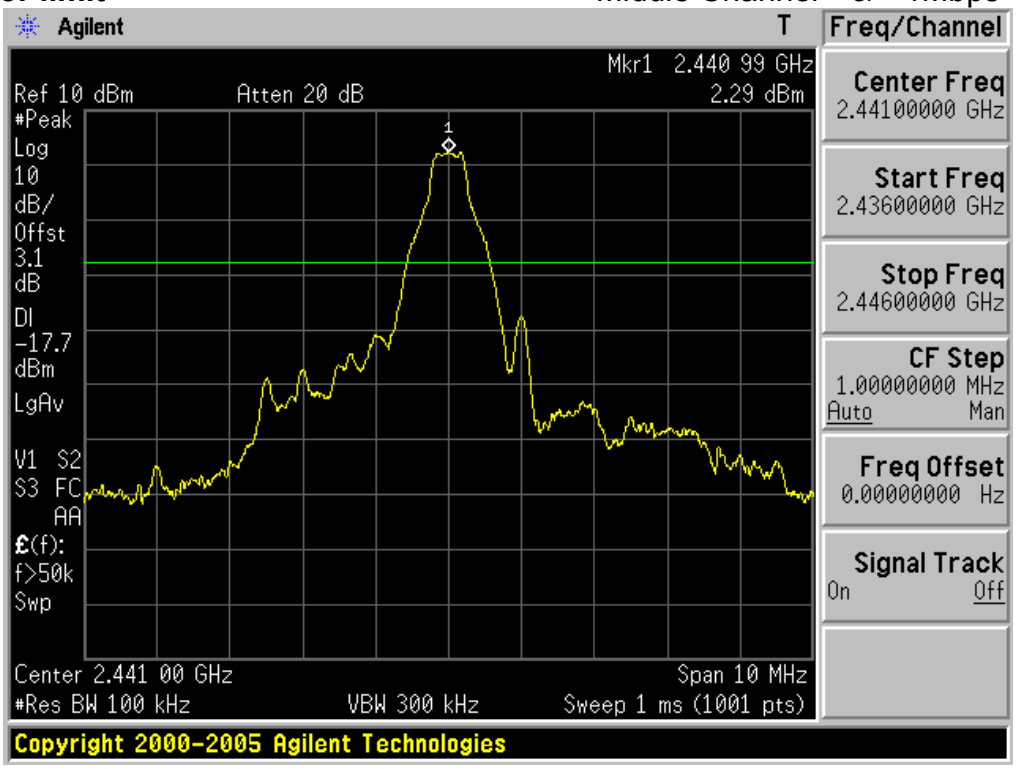
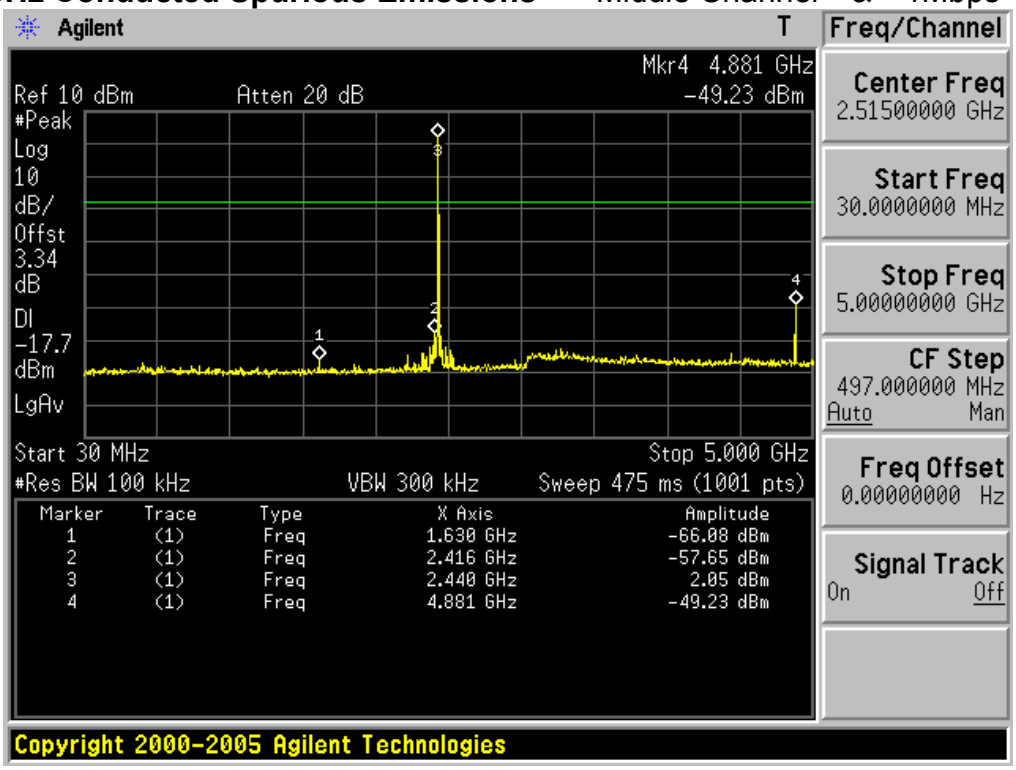
Reference for limit Middle Channel & 1Mbps



30MHz ~ 5GHz Conducted Spurious Emissions Middle Channel & 1Mbps



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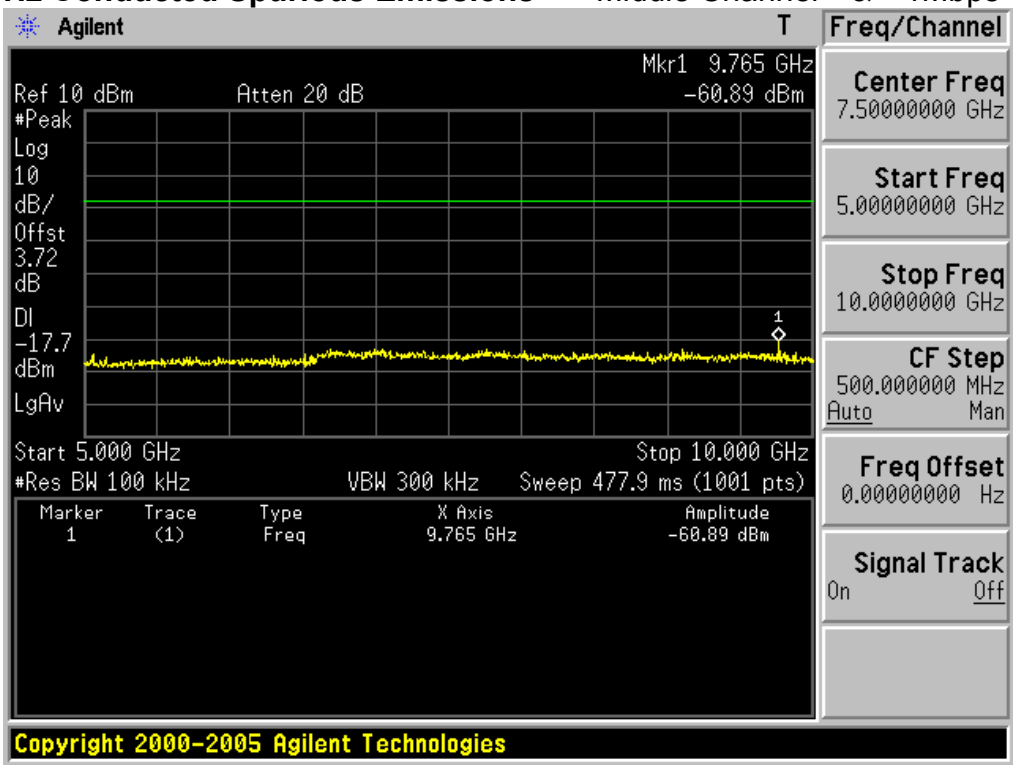
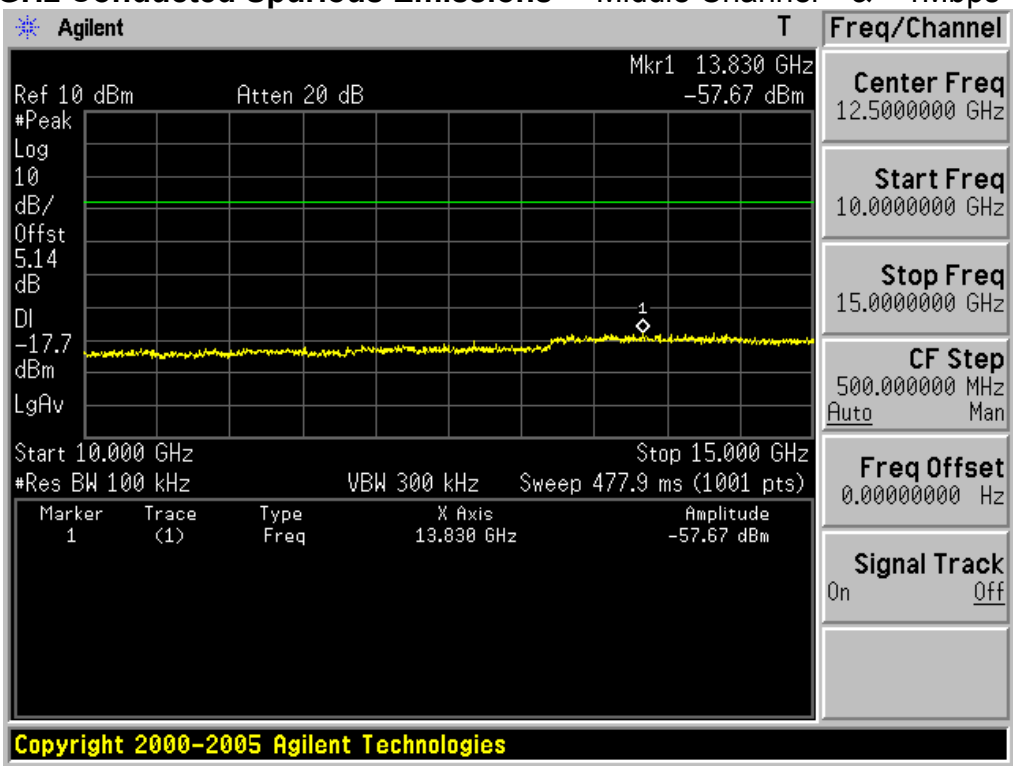
5GHz ~ 10GHz Conducted Spurious Emissions Middle Channel & 1Mbps



10GHz ~ 15GHz Conducted Spurious Emissions Middle Channel & 1Mbps



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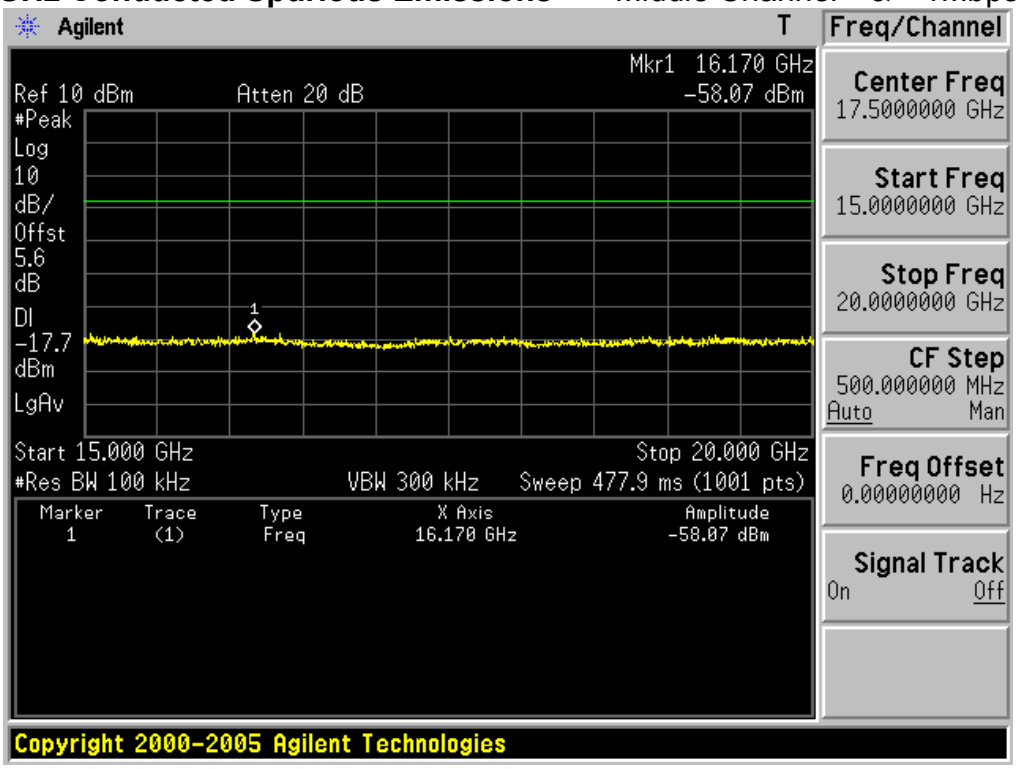
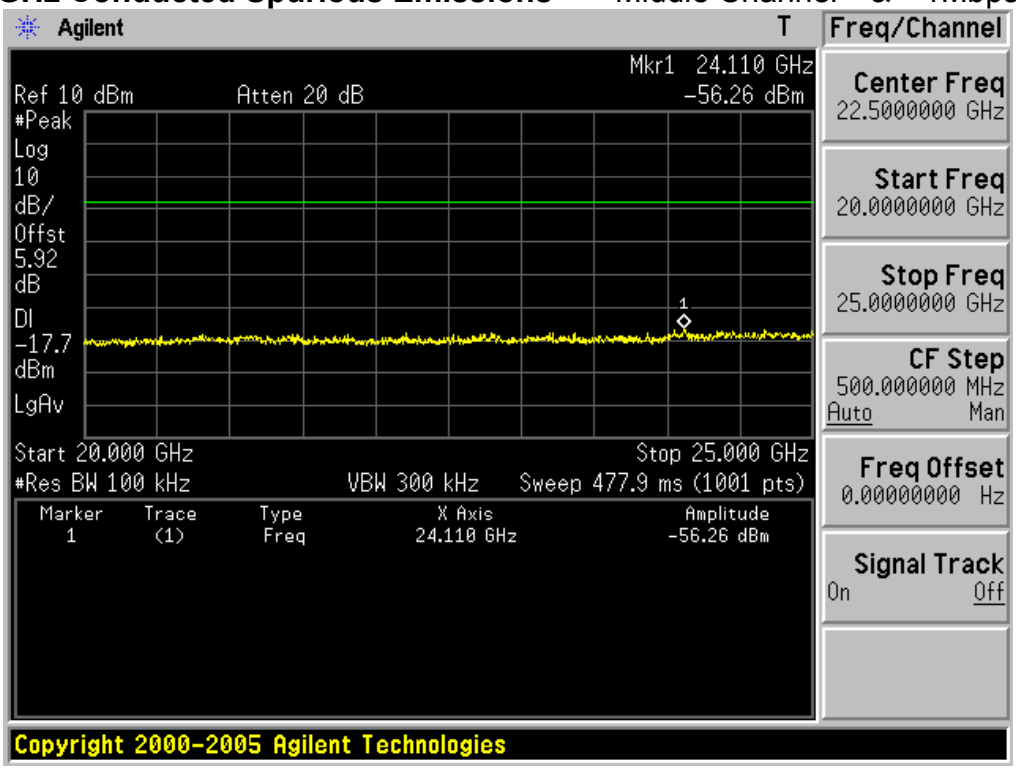
15GHz ~ 20GHz Conducted Spurious Emissions Middle Channel & 1Mbps



20GHz ~ 25GHz Conducted Spurious Emissions Middle Channel & 1Mbps



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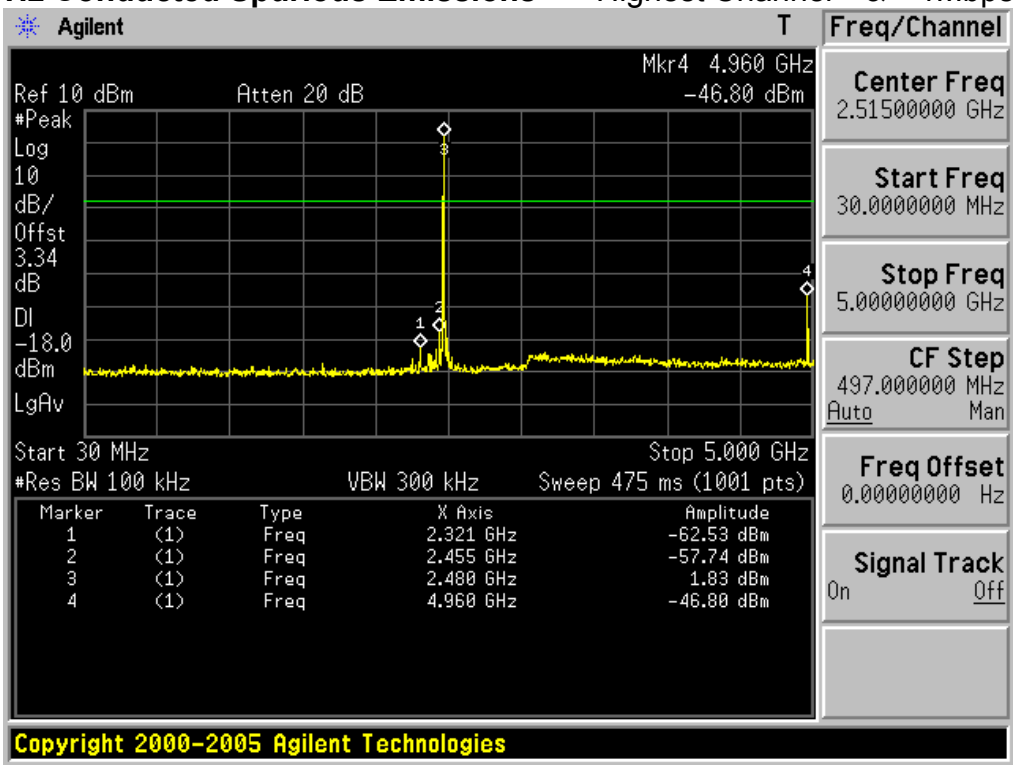
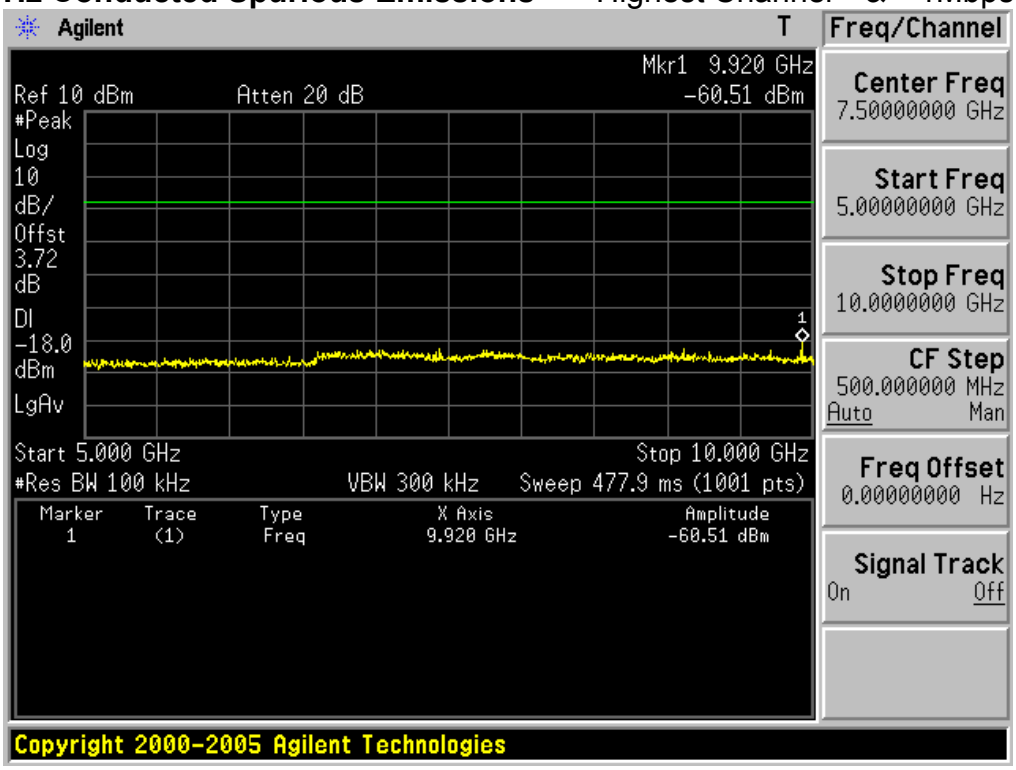
30MHz ~ 5GHz Conducted Spurious Emissions Highest Channel & 1Mbps



5GHz ~ 10GHz Conducted Spurious Emissions Highest Channel & 1Mbps



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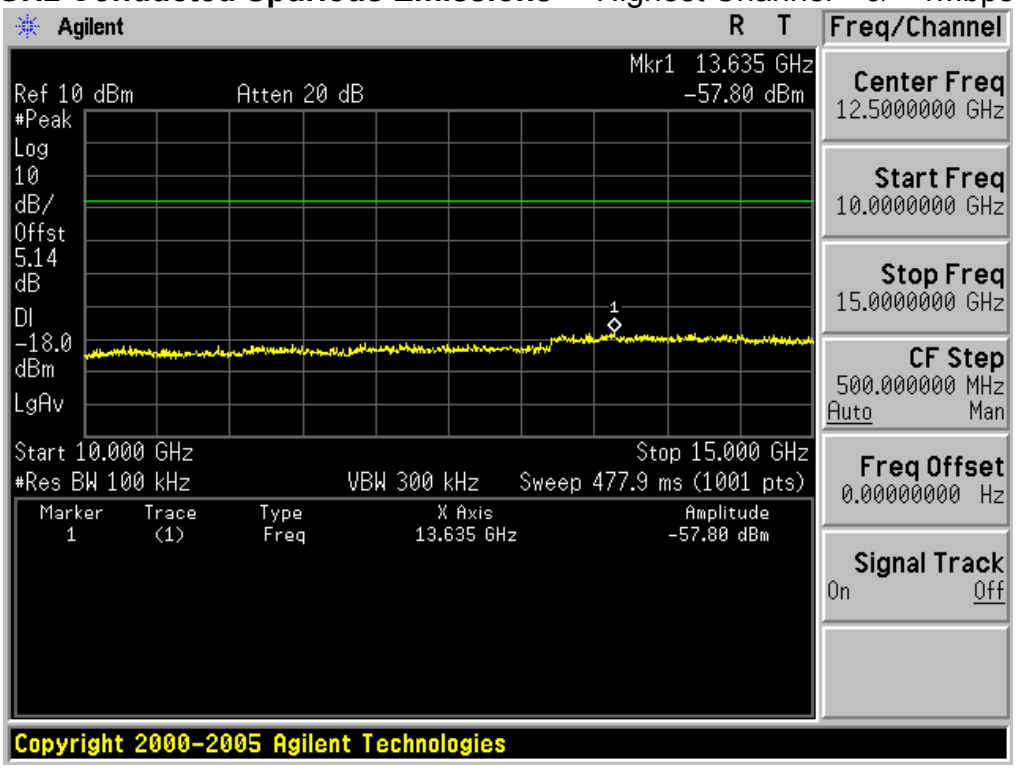
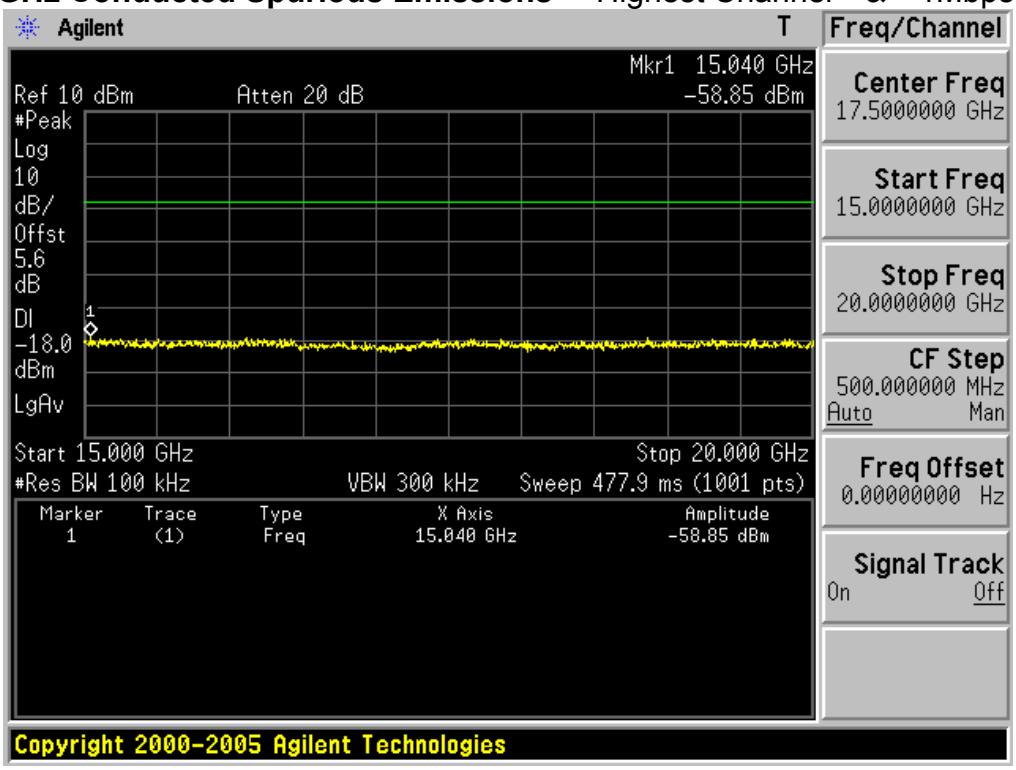
10GHz ~ 15GHz Conducted Spurious Emissions Highest Channel & 1Mbps



15GHz ~ 20GHz Conducted Spurious Emissions Highest Channel & 1Mbps



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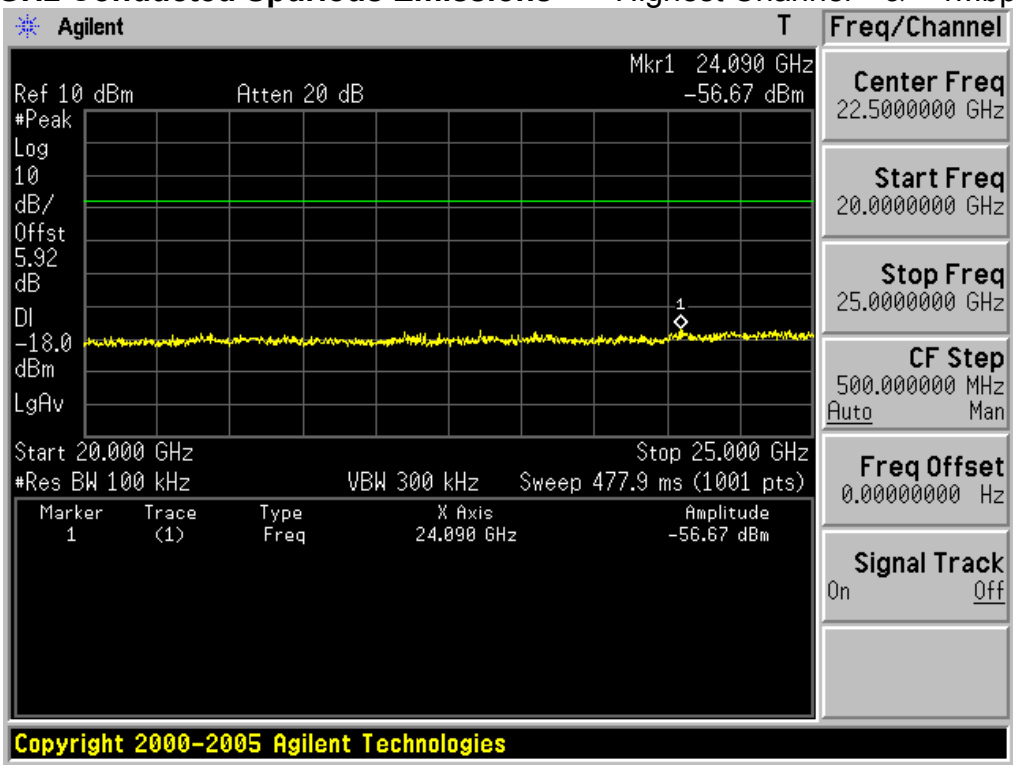
20GHz ~ 25GHz Conducted Spurious Emissions Highest Channel & 1Mbps



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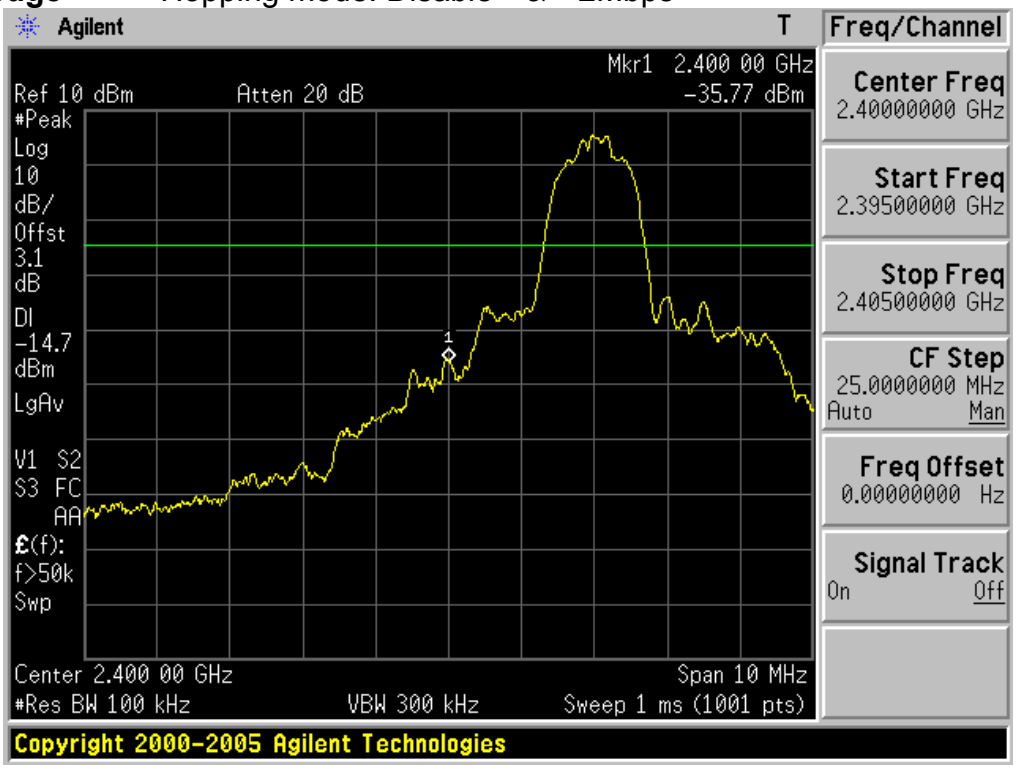
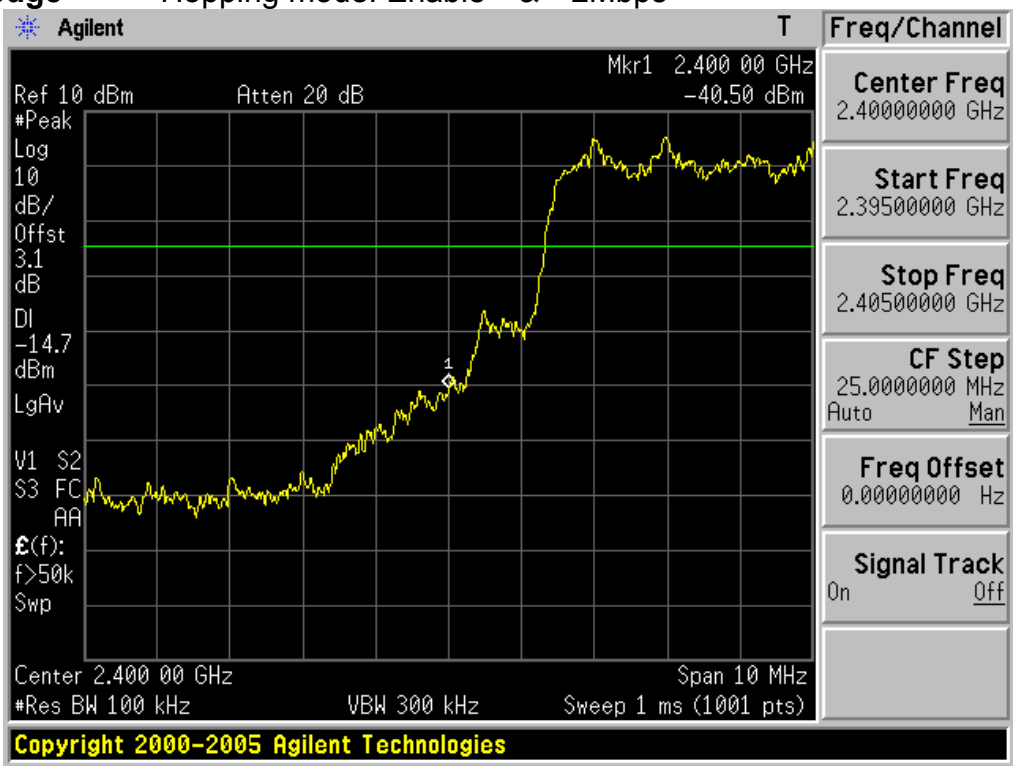
Low Band-edge Hopping mode: Disable & 2Mbps



Low Band-edge Hopping mode: Enable & 2Mbps



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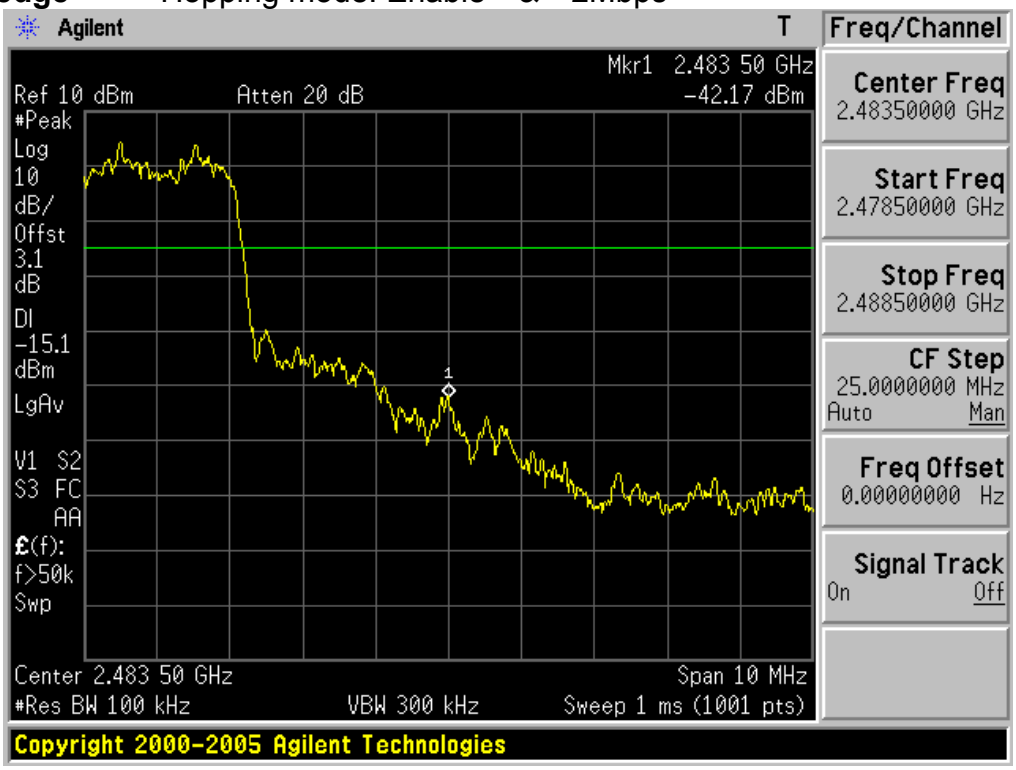
High Band-edge Hopping mode: Disable & 2Mbps

High Band-edge Hopping mode: Enable & 2Mbps



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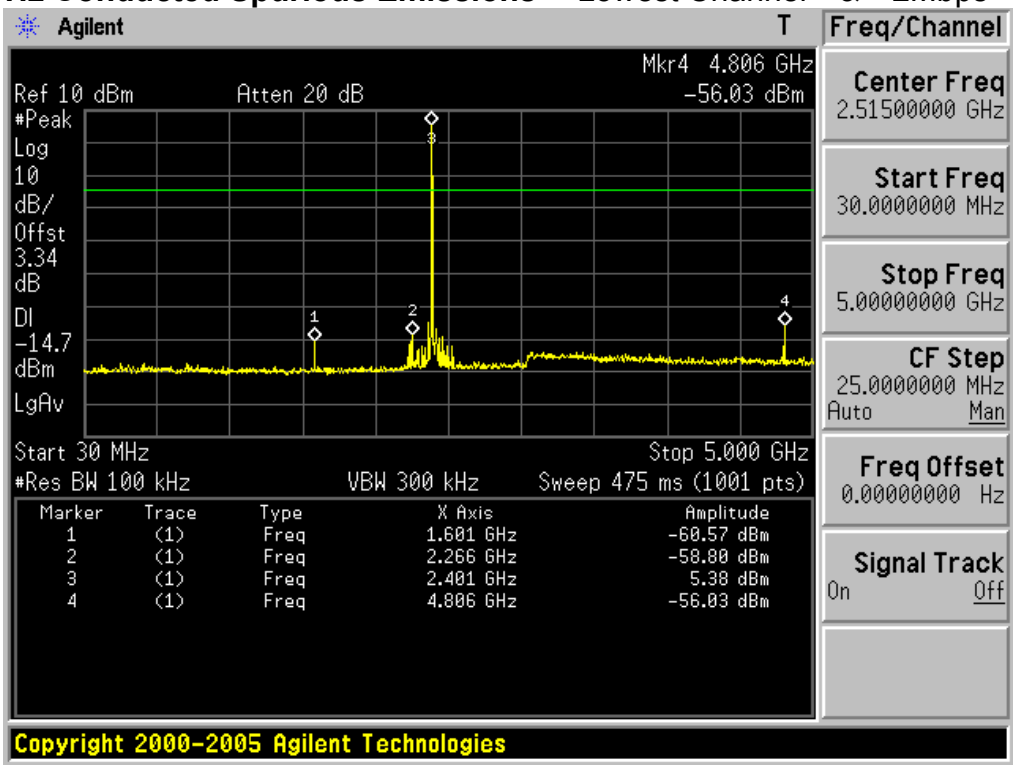
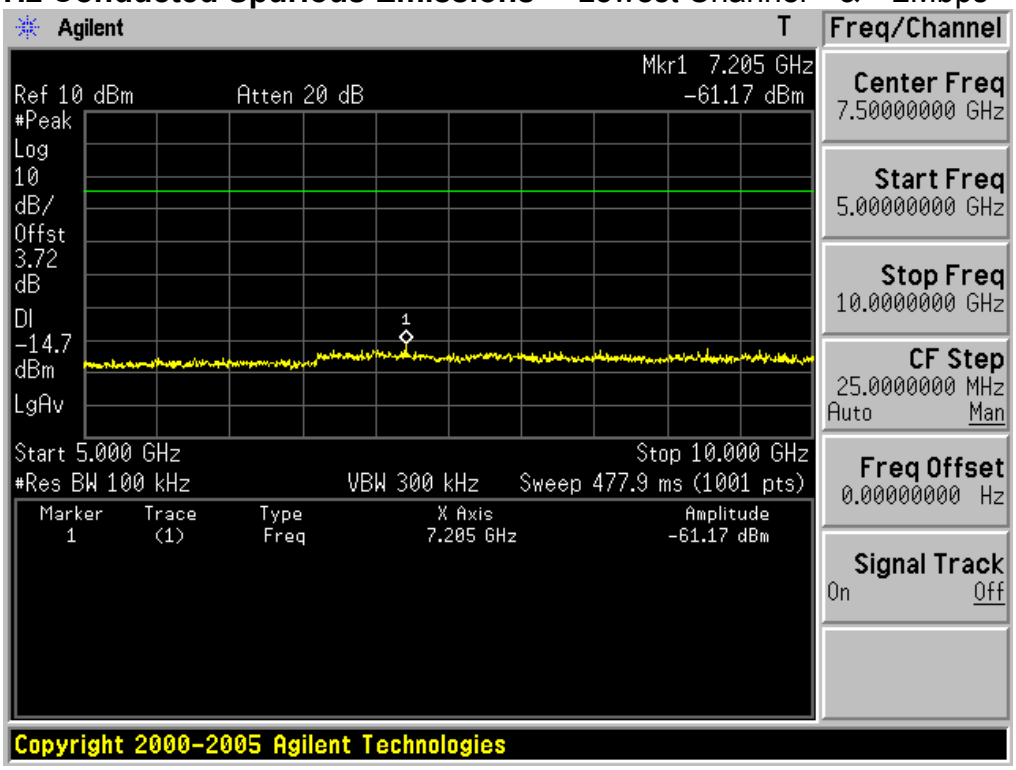
30MHz ~ 5GHz Conducted Spurious Emissions Lowest Channel & 2Mbps



5GHz ~ 10GHz Conducted Spurious Emissions Lowest Channel & 2Mbps



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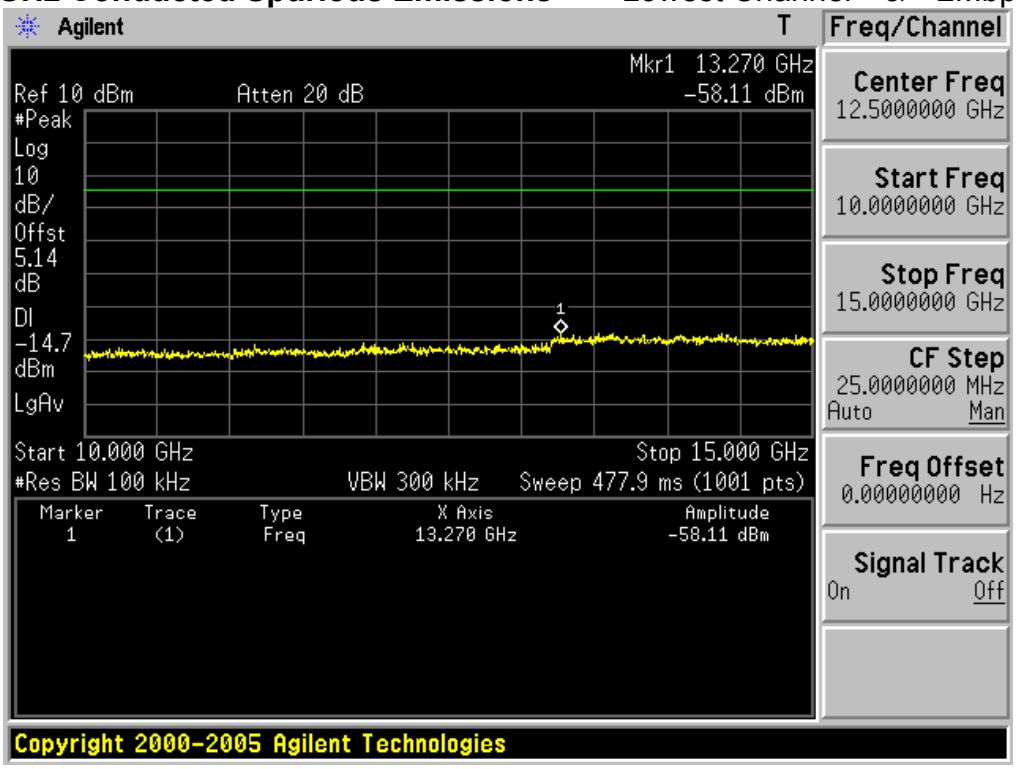
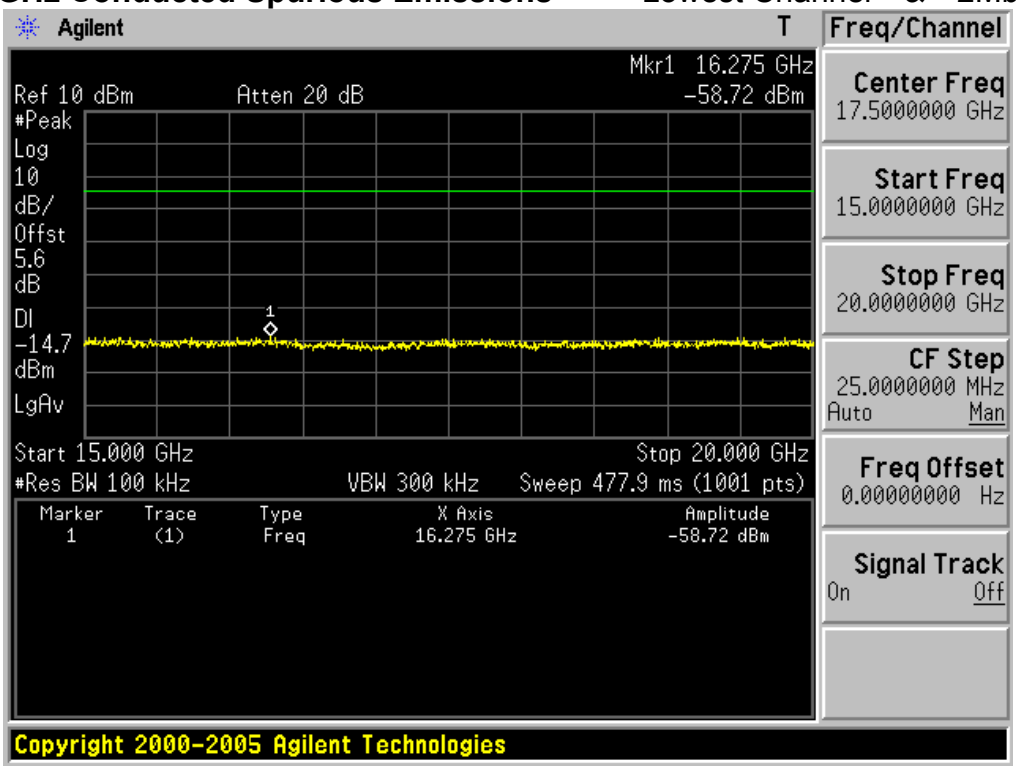
10GHz ~ 15GHz Conducted Spurious Emissions Lowest Channel & 2Mbps



15GHz ~ 20GHz Conducted Spurious Emissions Lowest Channel & 2Mbps



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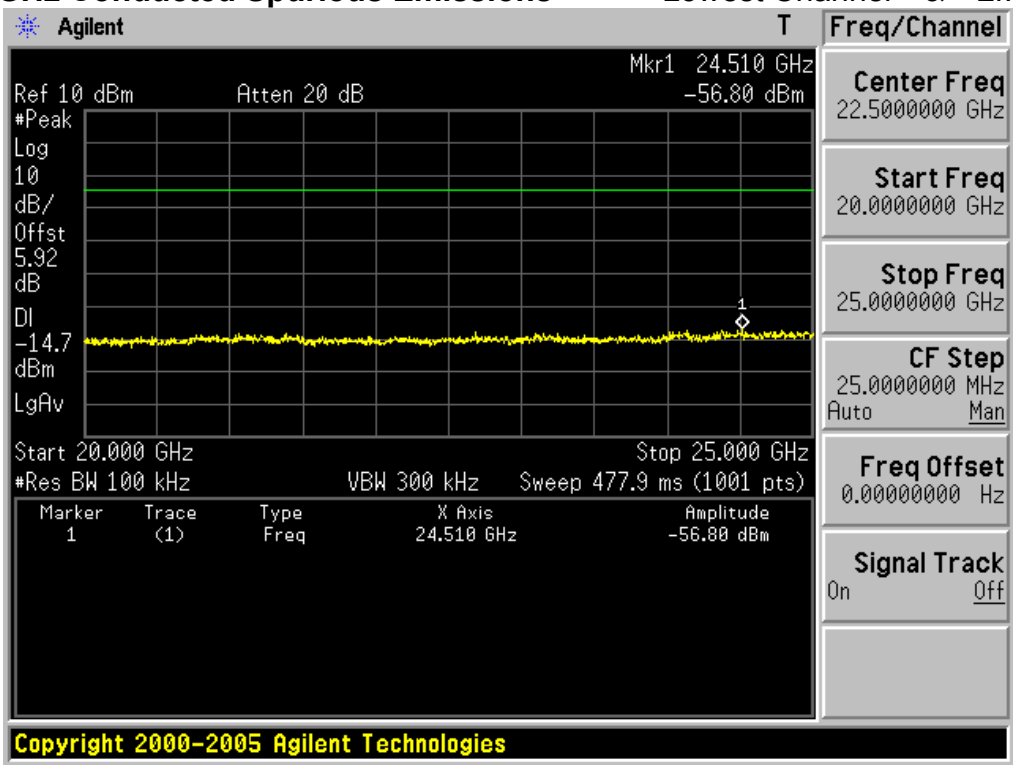
20GHz ~ 25GHz Conducted Spurious Emissions Lowest Channel & 2Mbps



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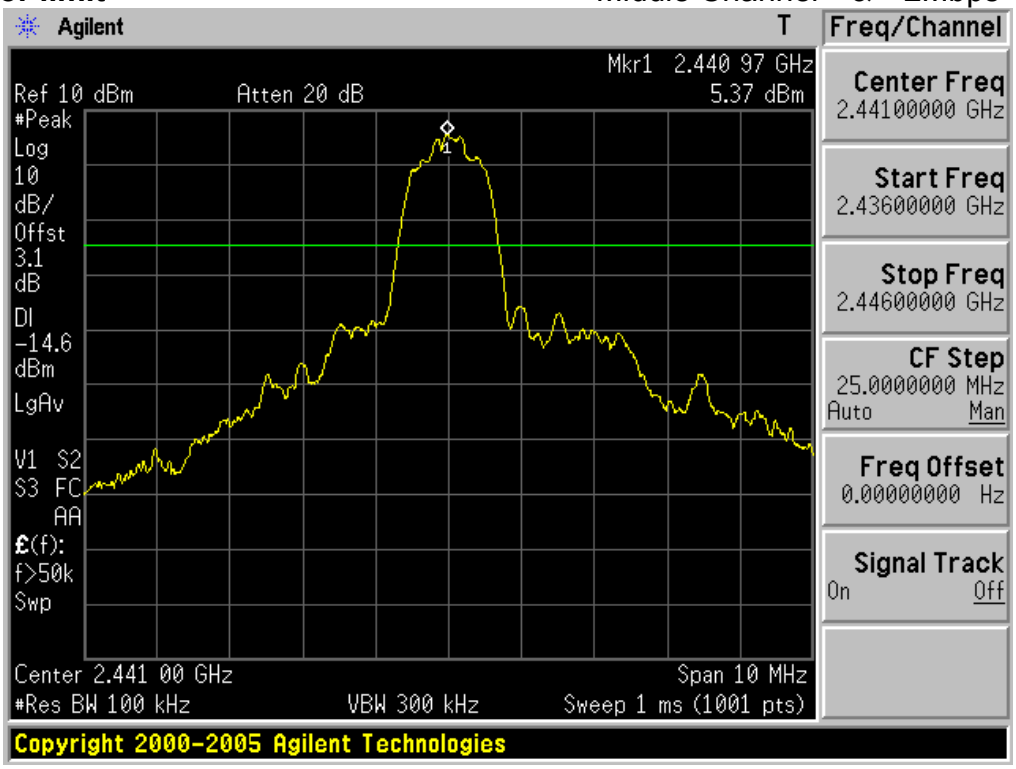
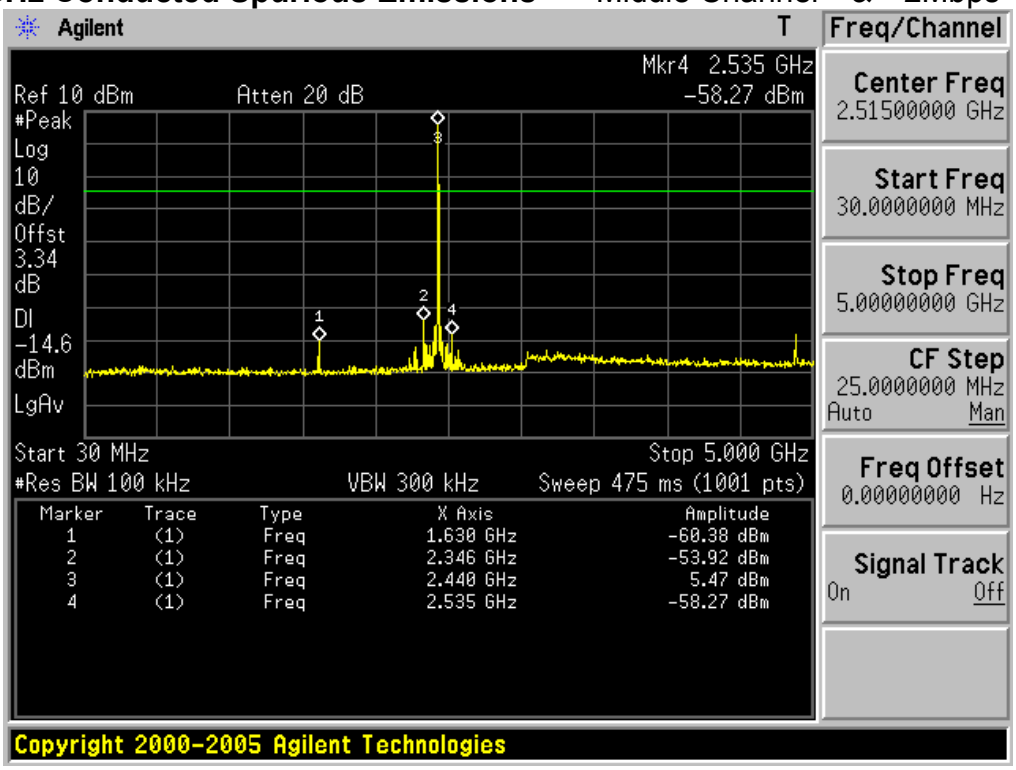
Reference for limit Middle Channel & 2Mbps



30MHz ~ 5GHz Conducted Spurious Emissions Middle Channel & 2Mbps



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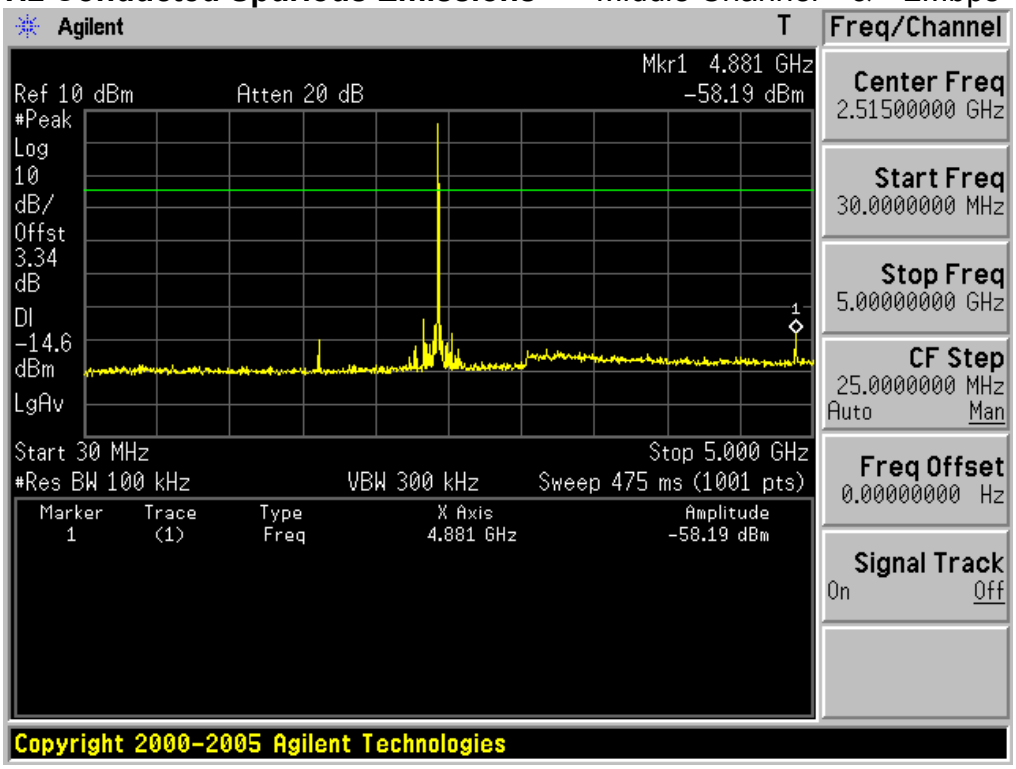
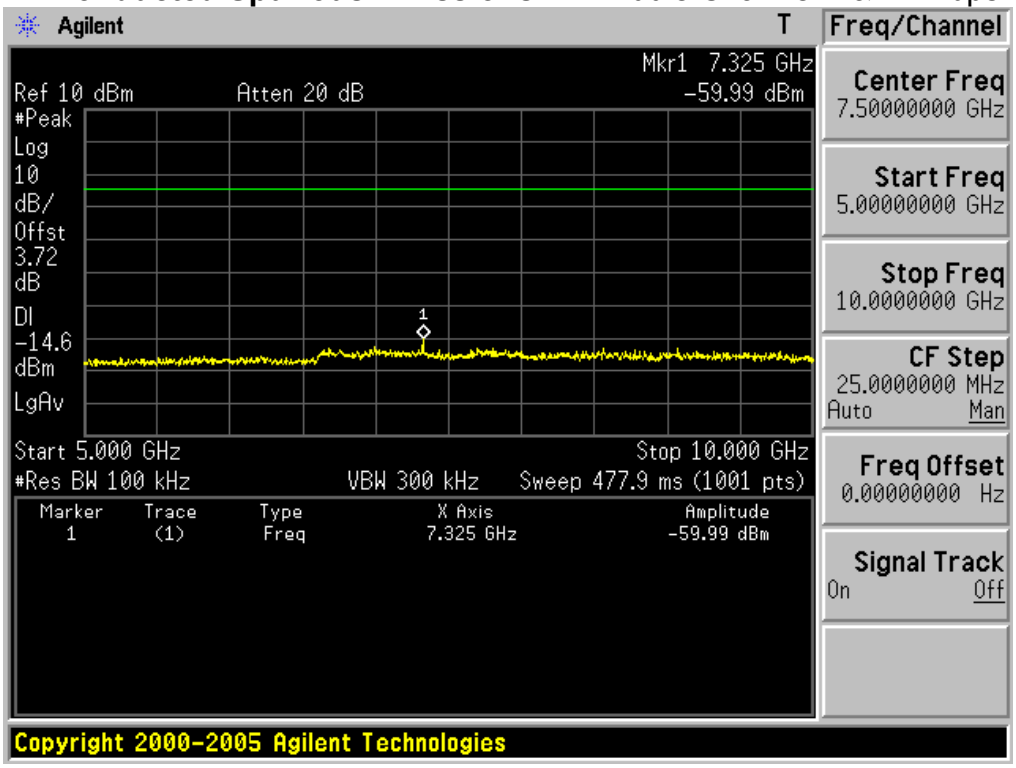
30MHz ~ 5GHz Conducted Spurious Emissions Middle Channel & 2Mbps



5GHz ~ 10GHz Conducted Spurious Emissions Middle Channel & 2Mbps



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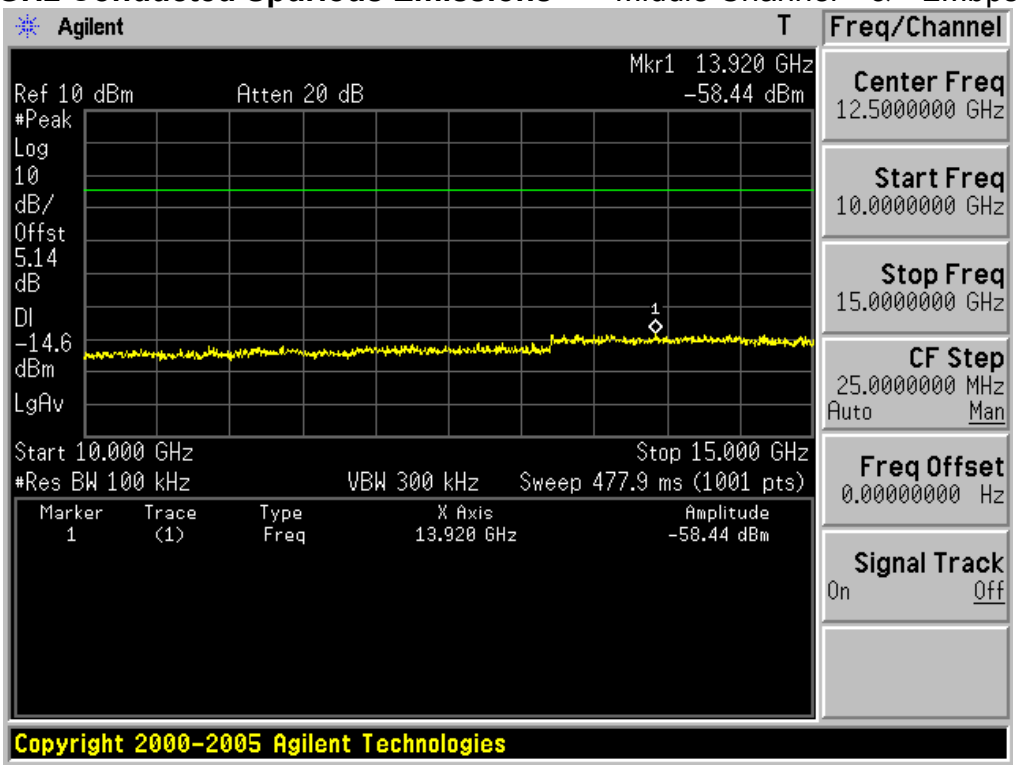
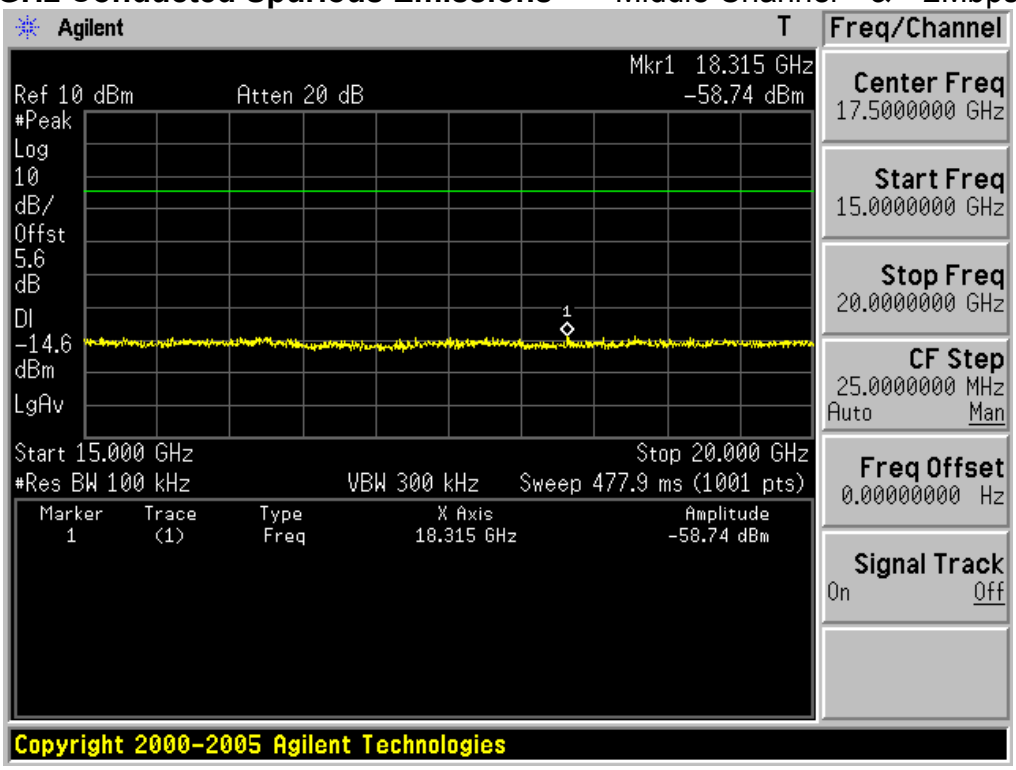
10GHz ~ 15GHz Conducted Spurious Emissions Middle Channel & 2Mbps



15GHz ~ 20GHz Conducted Spurious Emissions Middle Channel & 2Mbps



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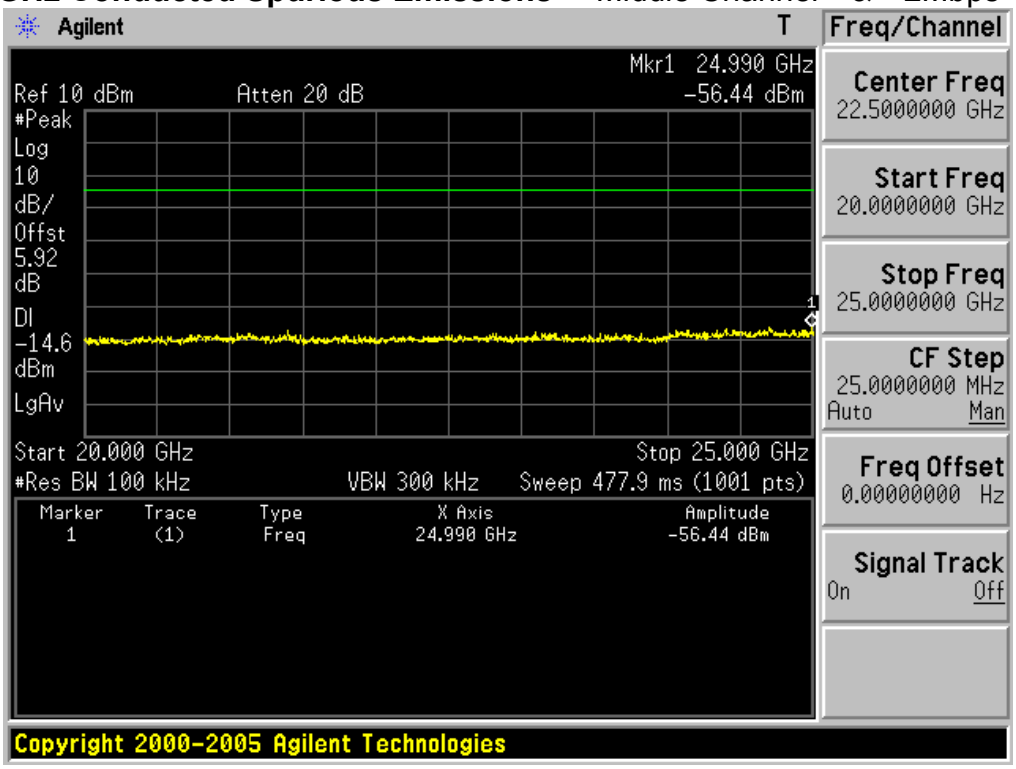
20GHz ~ 25GHz Conducted Spurious Emissions Middle Channel & 2Mbps



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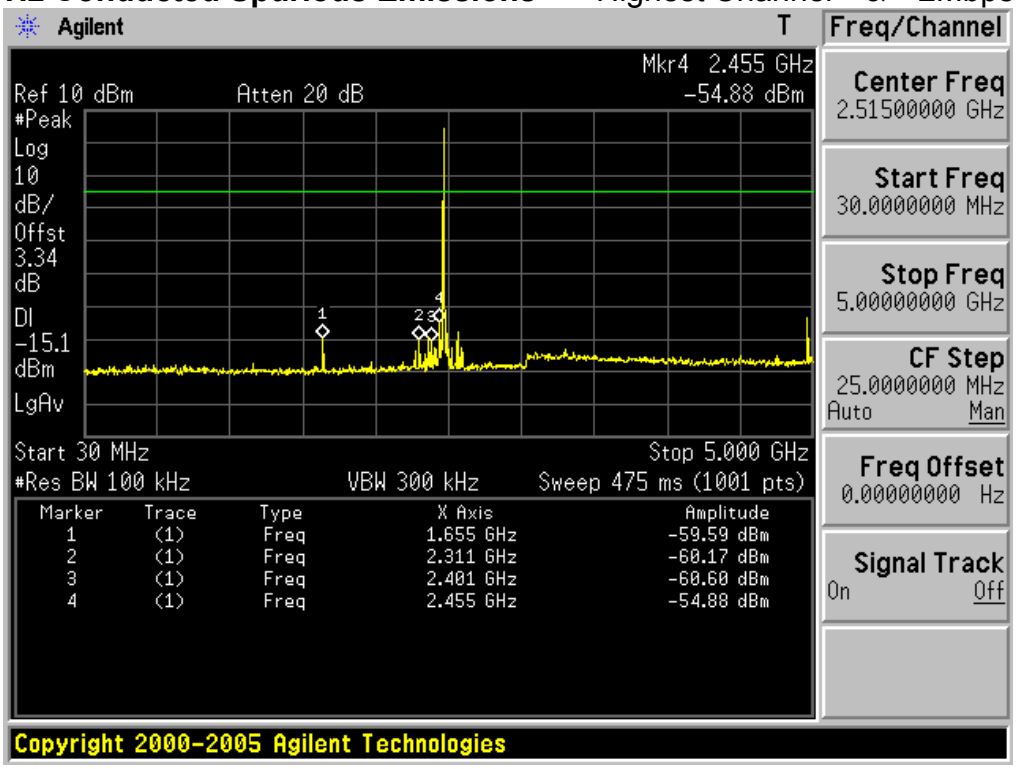
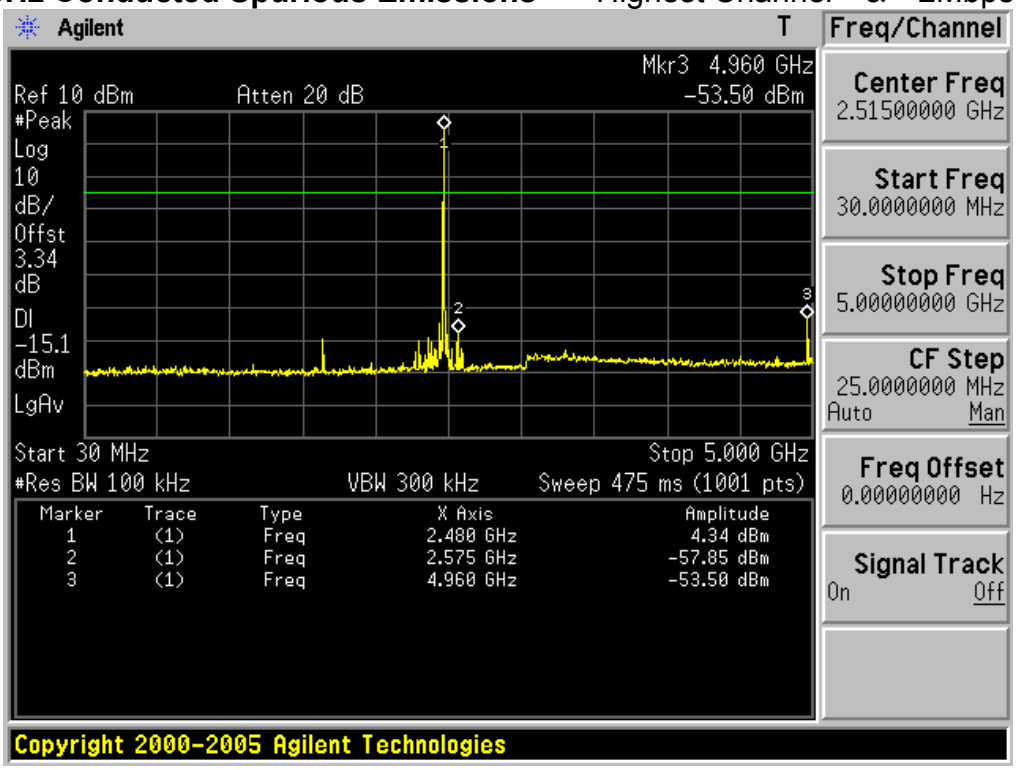
30MHz ~ 5GHz Conducted Spurious Emissions Highest Channel & 2Mbps



30MHz ~ 5GHz Conducted Spurious Emissions Highest Channel & 2Mbps



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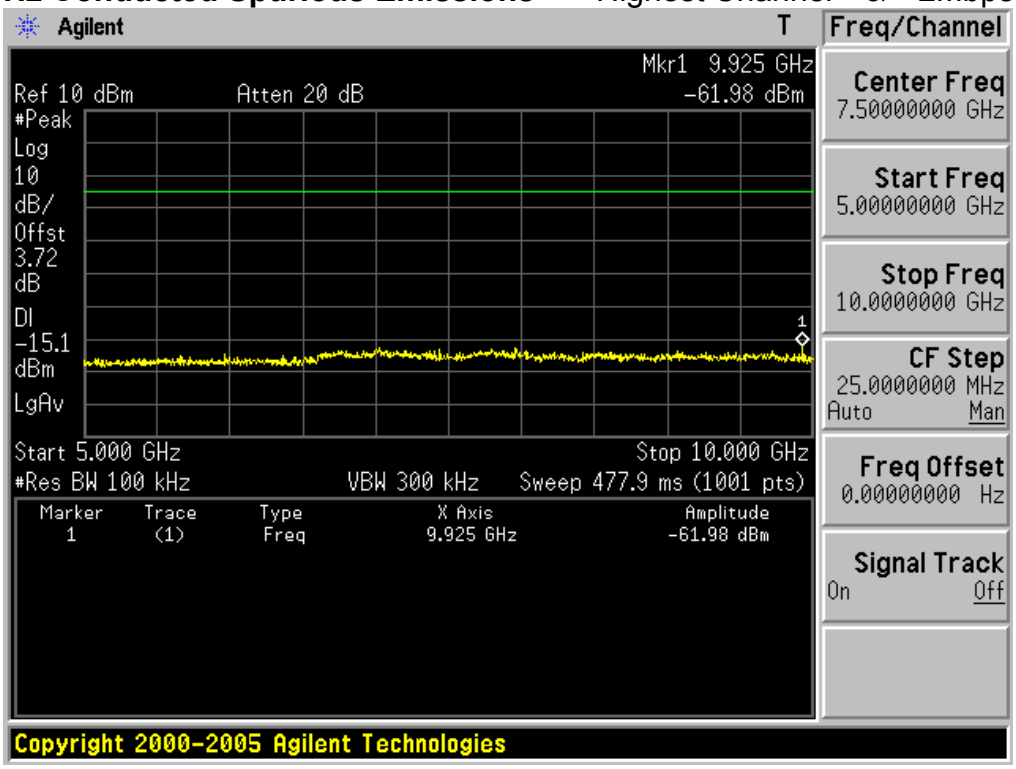
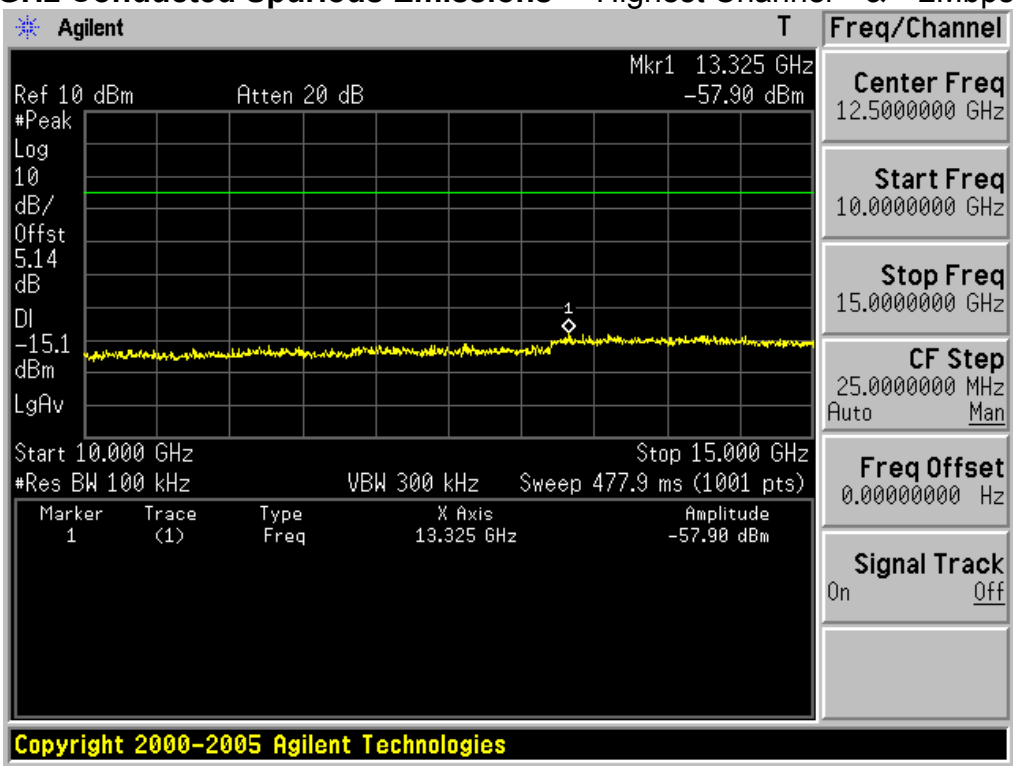
5GHz ~ 10GHz Conducted Spurious Emissions Highest Channel & 2Mbps



10GHz ~ 15GHz Conducted Spurious Emissions Highest Channel & 2Mbps



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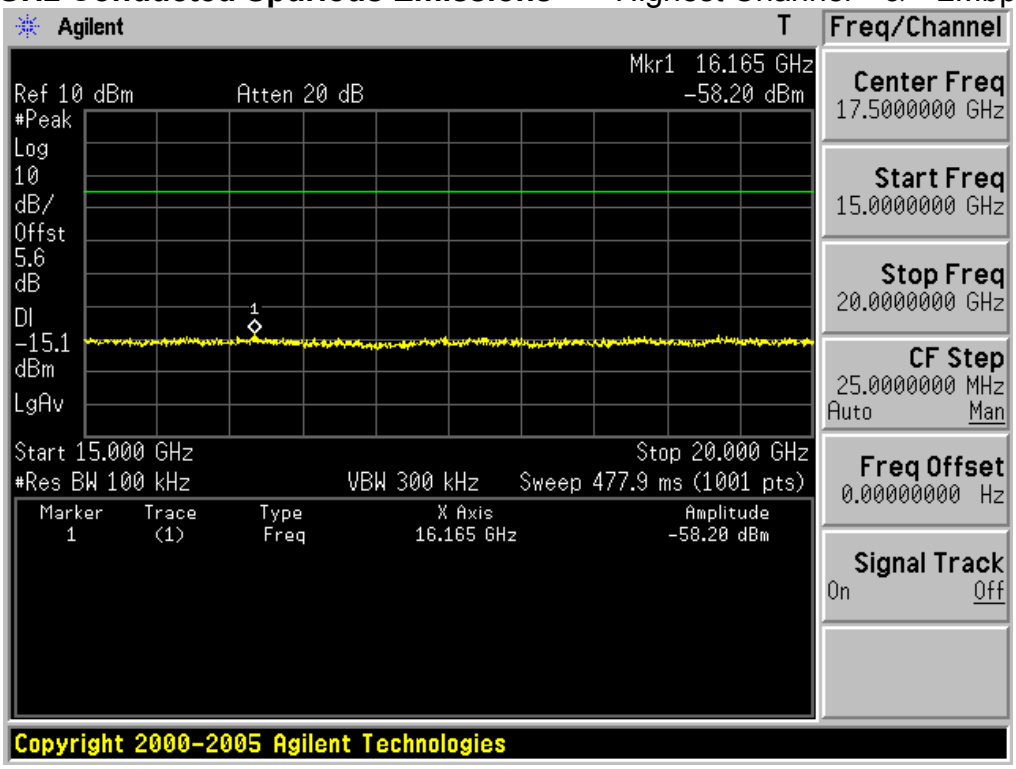
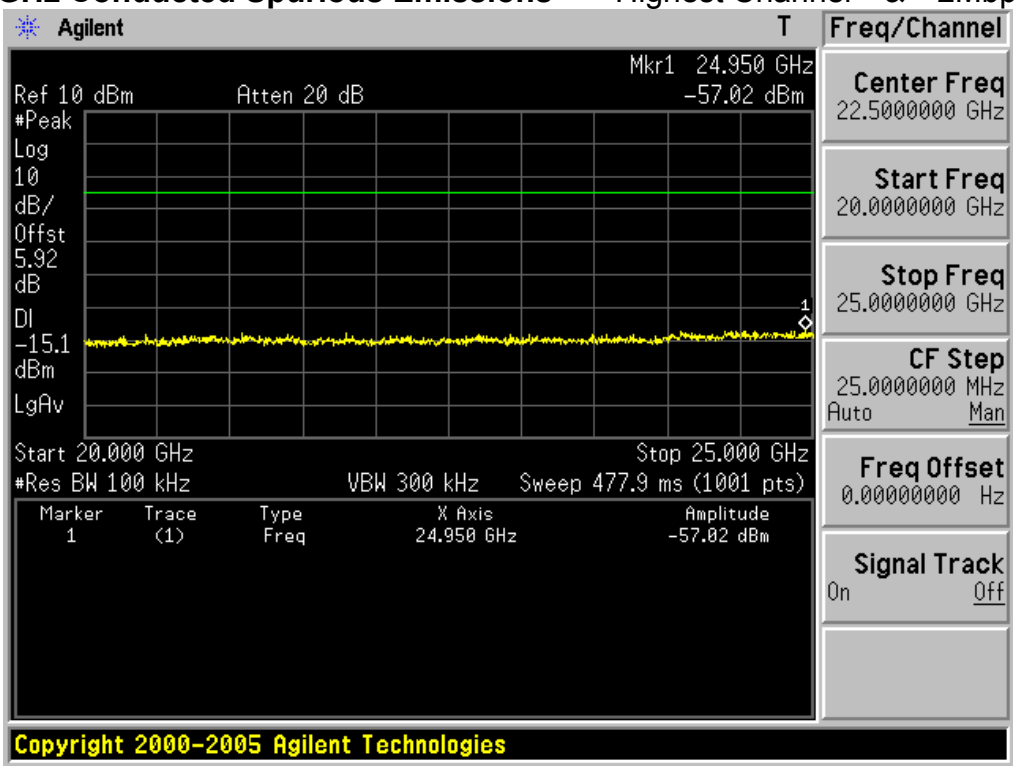
15GHz ~ 20GHz Conducted Spurious Emissions Highest Channel & 2Mbps



20GHz ~ 25GHz Conducted Spurious Emissions Highest Channel & 2Mbps



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3.2.7 Radiated Spurious Emissions

- 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: The test item was performed in all the test cases. And the worst test results 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 ~ 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.

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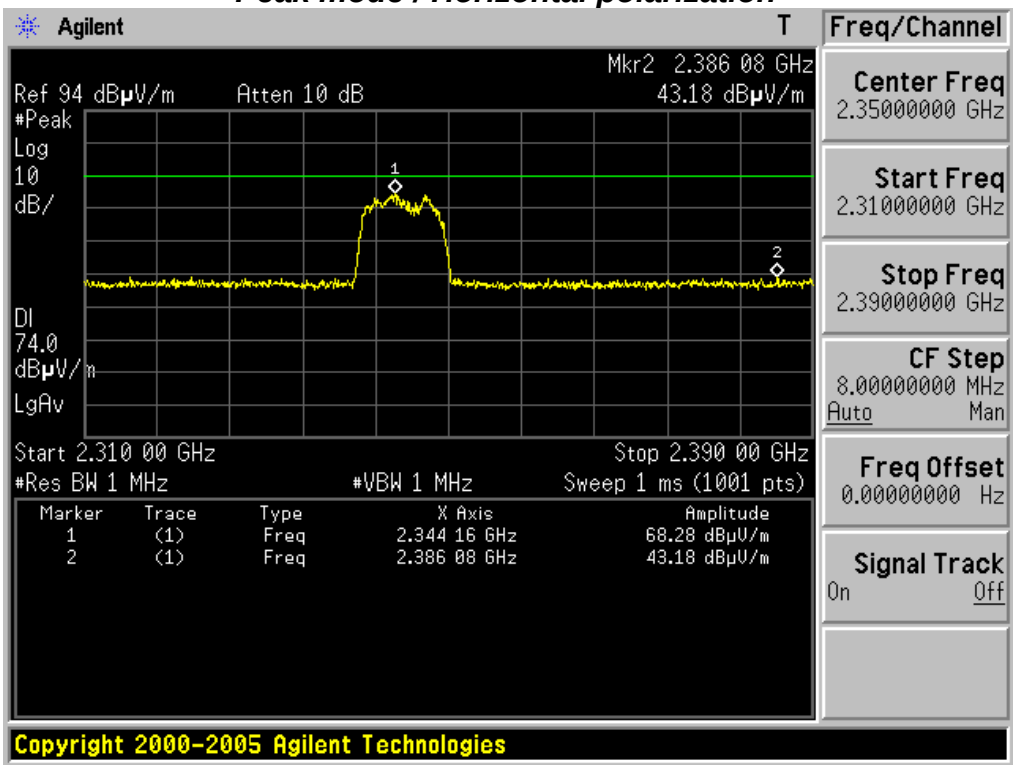
Restricted Band Edge Lowest Channel & 1Mbps & Test Case 3

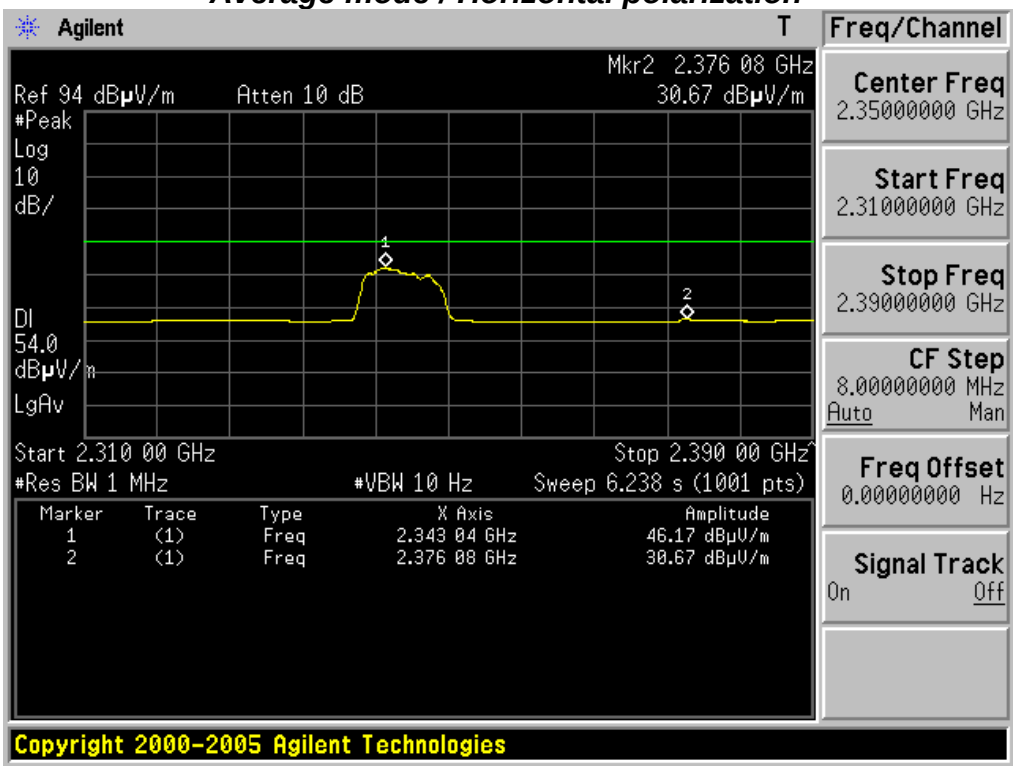
Peak mode / Horizontal polarization



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

Restricted Band Edge Lowest Channel & 1Mbps & Test Case 3

Average mode / Horizontal polarization



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

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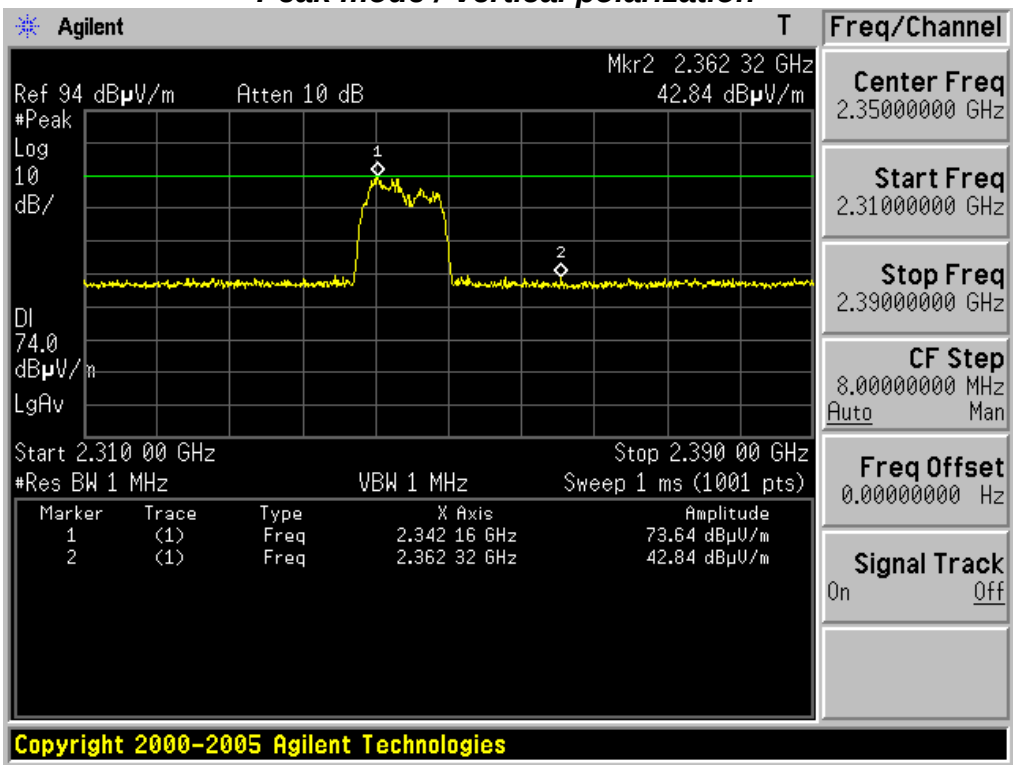
Restricted Band Edge Lowest Channel & 1Mbps & Test Case 3

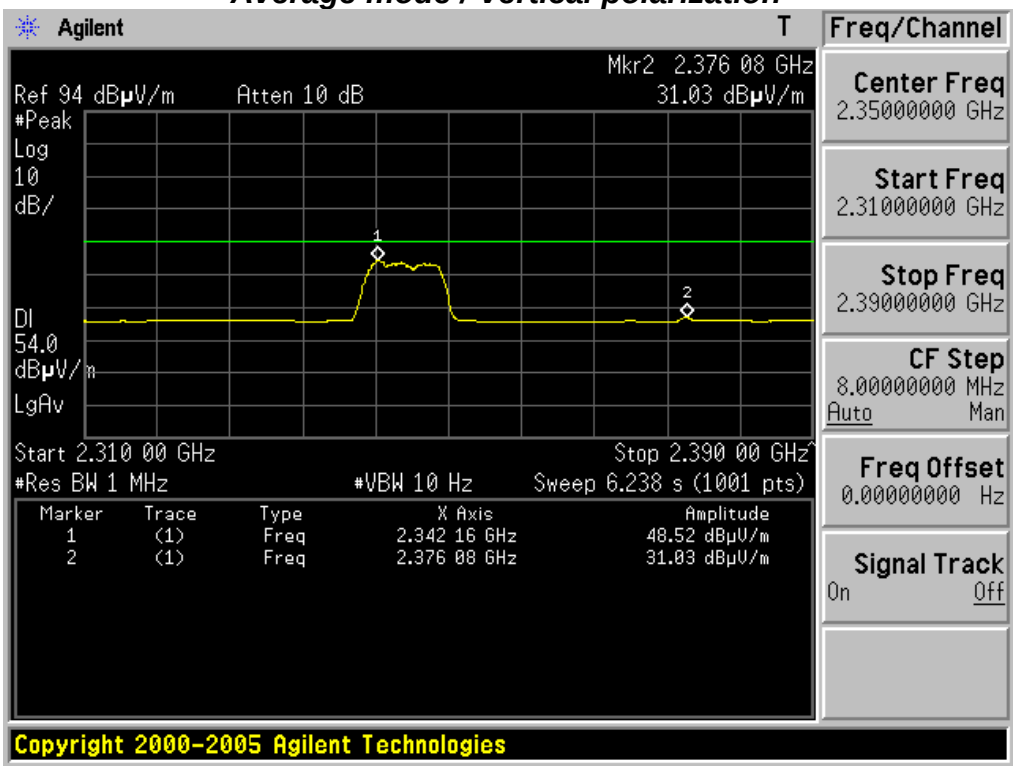
Peak mode / Vertical polarization



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

Restricted Band Edge Lowest Channel & 1Mbps & Test Case 3

Average mode / Vertical polarization



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

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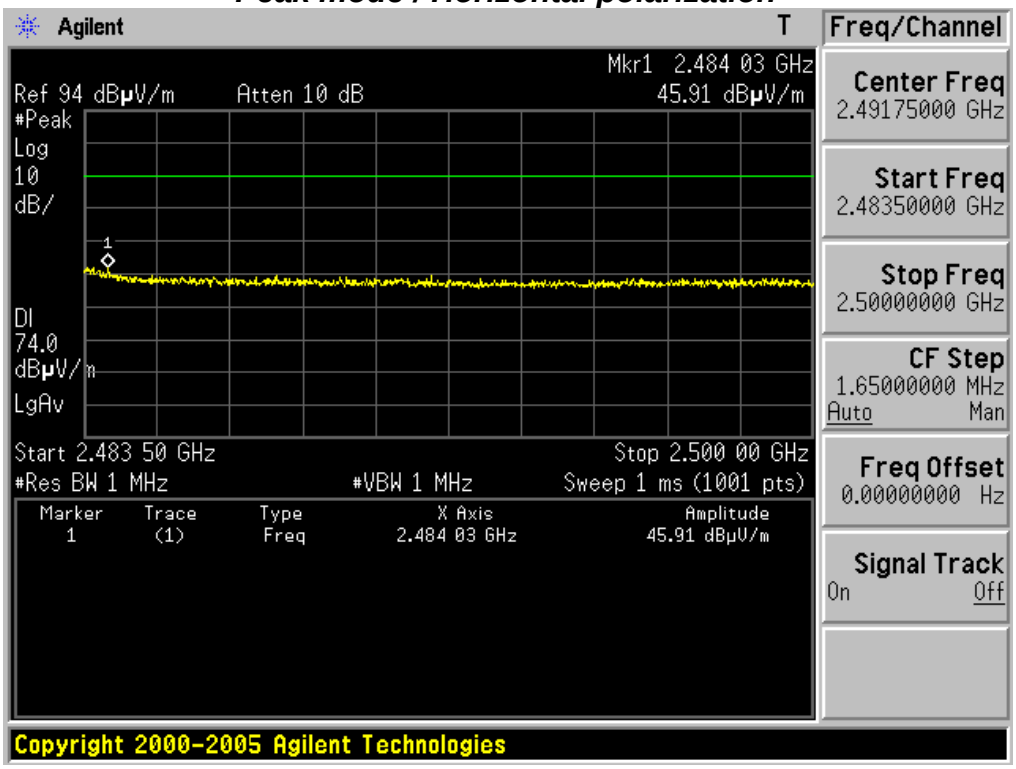
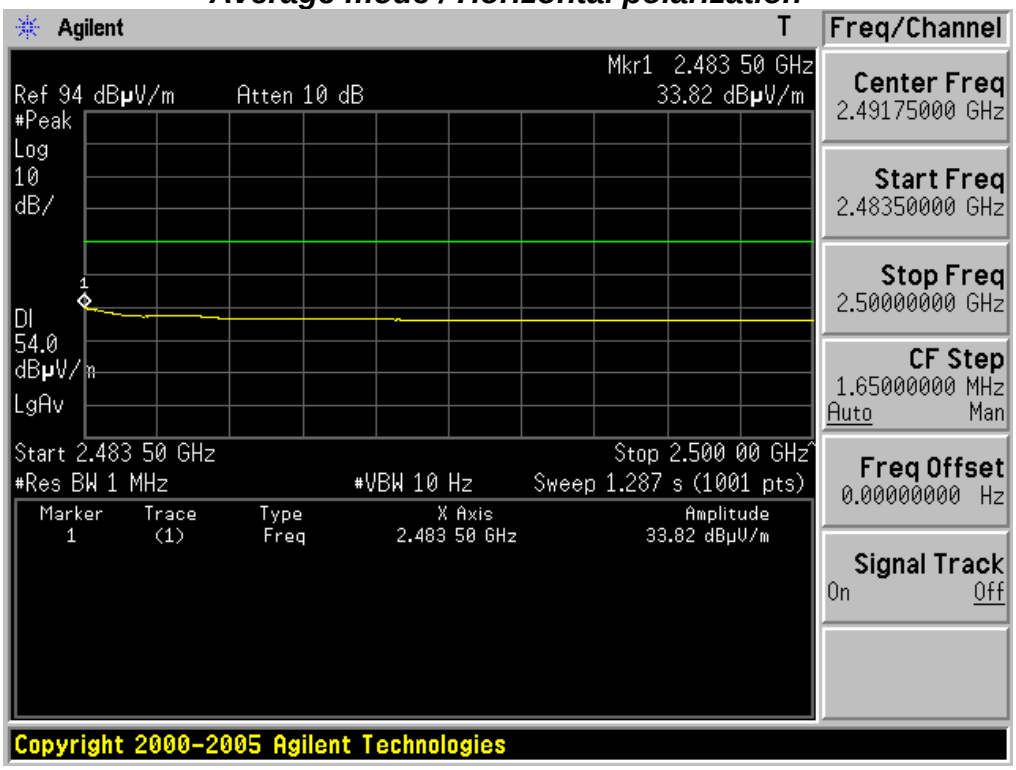
Restricted Band Edge Highest Channel & 1Mbps & Test Case 3

Peak mode / Horizontal polarization



Restricted Band Edge Highest Channel & 1Mbps & Test Case 3

Average mode / Horizontal polarization



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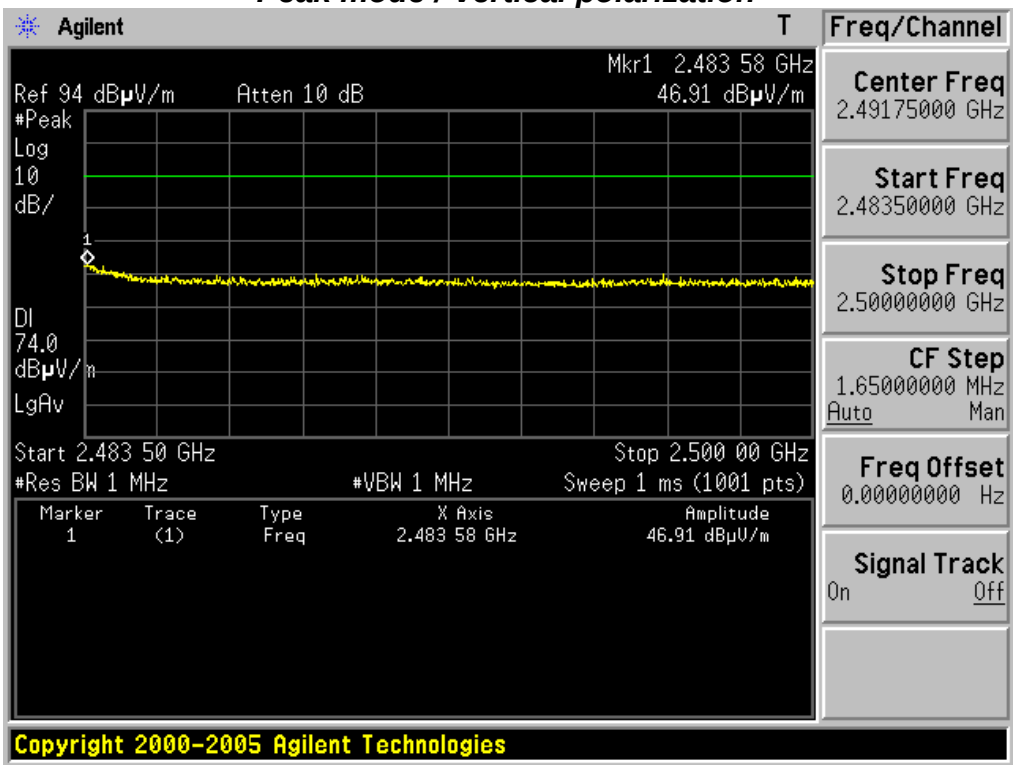
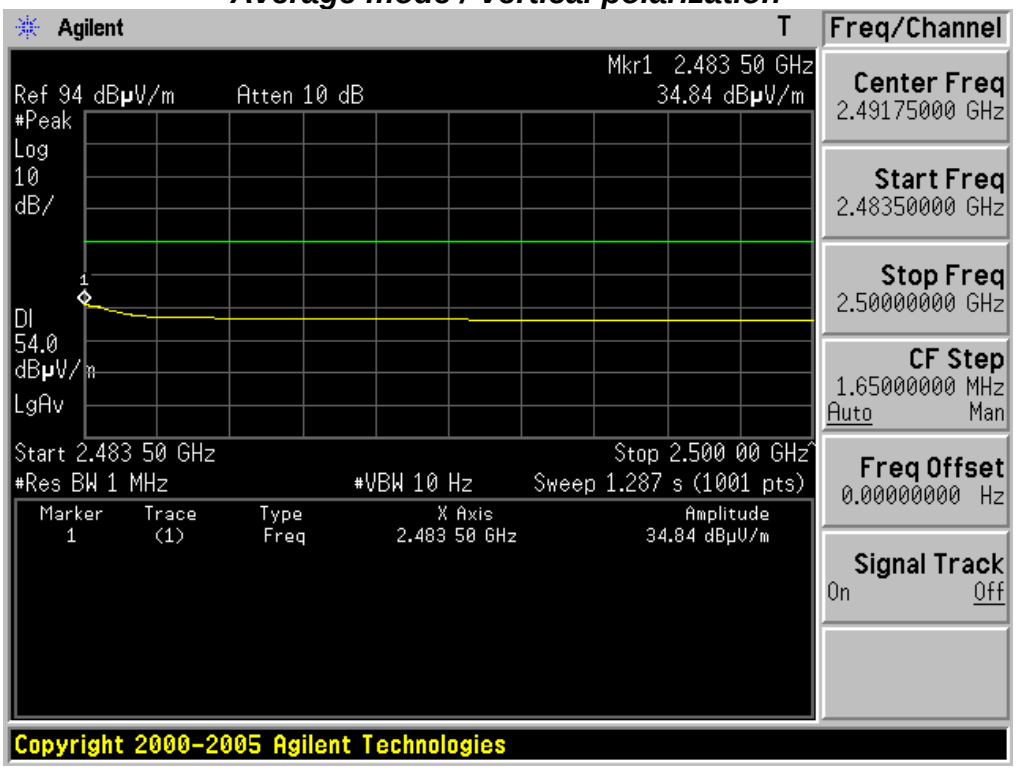
Restricted Band Edge Highest Channel & 1Mbps & Test Case 3

Peak mode / Vertical polarization



Restricted Band Edge Highest Channel & 1Mbps & Test Case 3

Average mode / Vertical polarization



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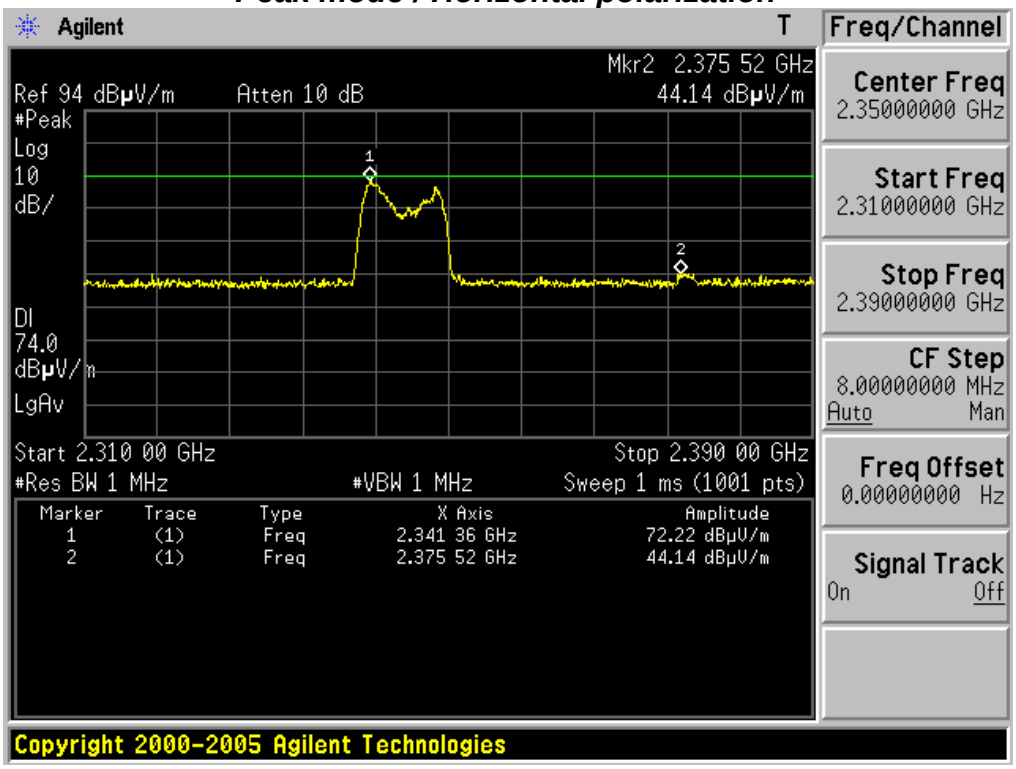
Restricted Band Edge Lowest Channel & 2Mbps & Test Case 3

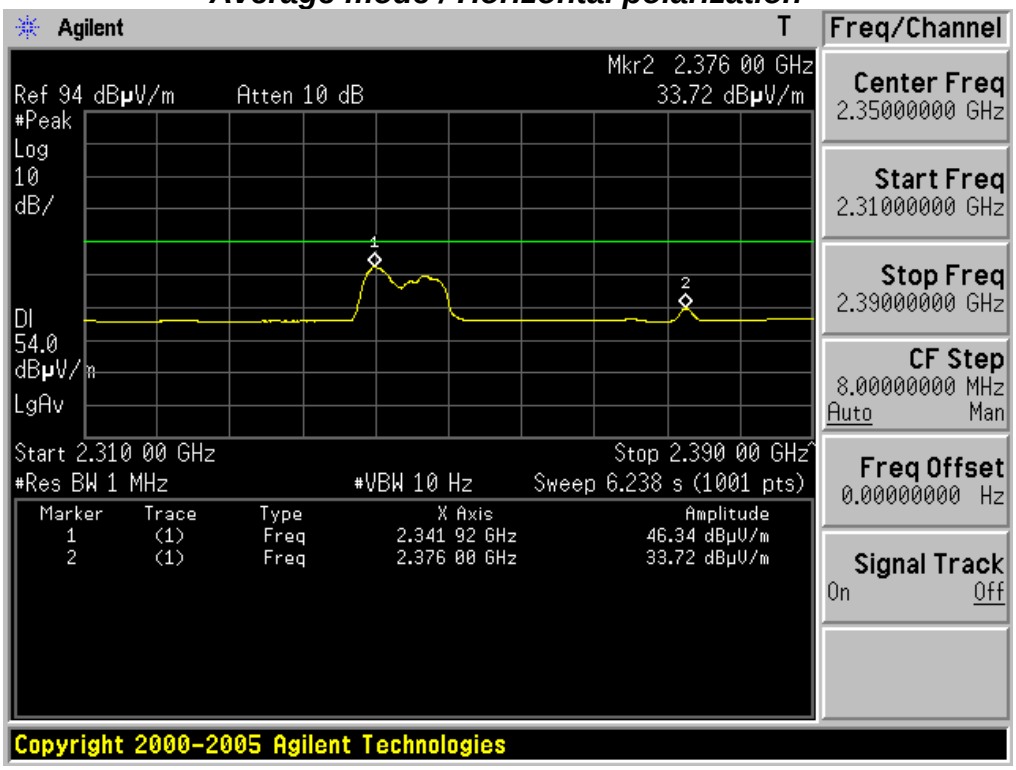
Peak mode / Horizontal polarization



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

Restricted Band Edge Lowest Channel & 2Mbps & Test Case 3

Average mode / Horizontal polarization



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

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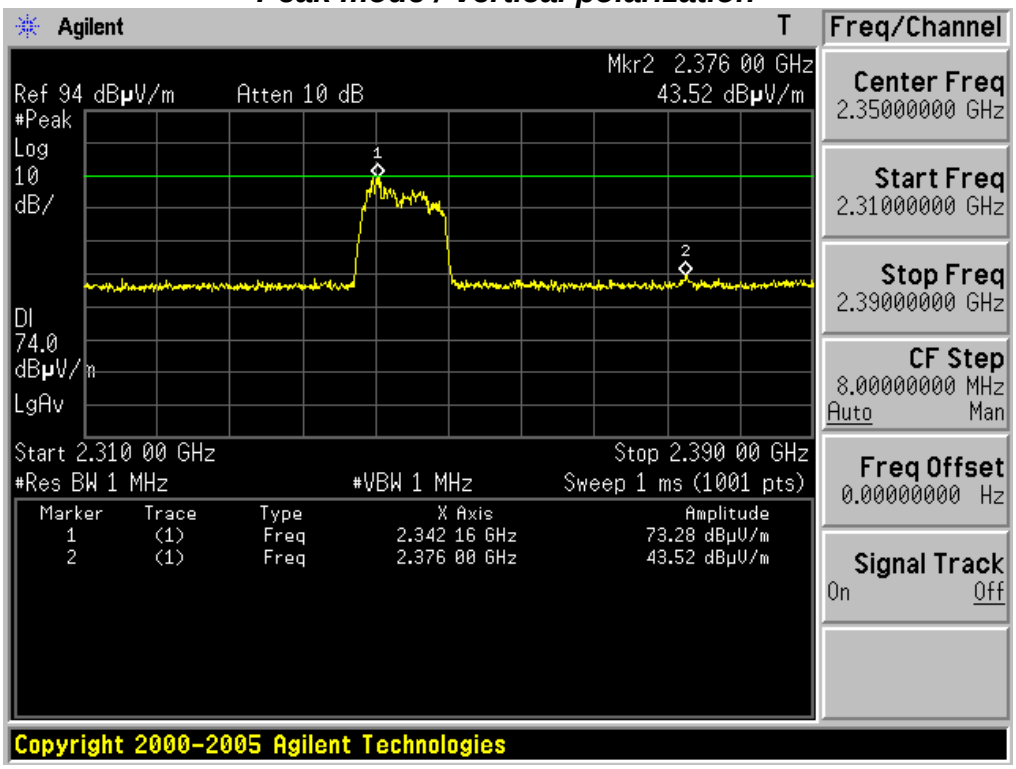
Restricted Band Edge Lowest Channel & 2Mbps & Test Case 3

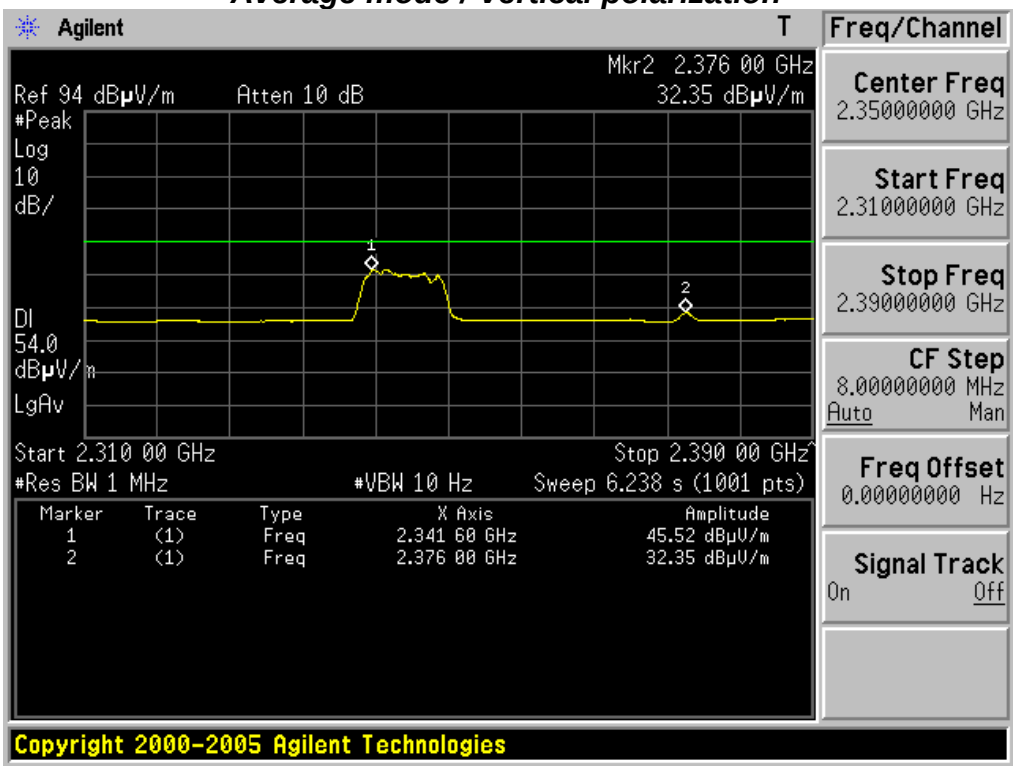
Peak mode / Vertical polarization



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

Restricted Band Edge Lowest Channel & 2Mbps & Test Case 3

Average mode / Vertical polarization



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

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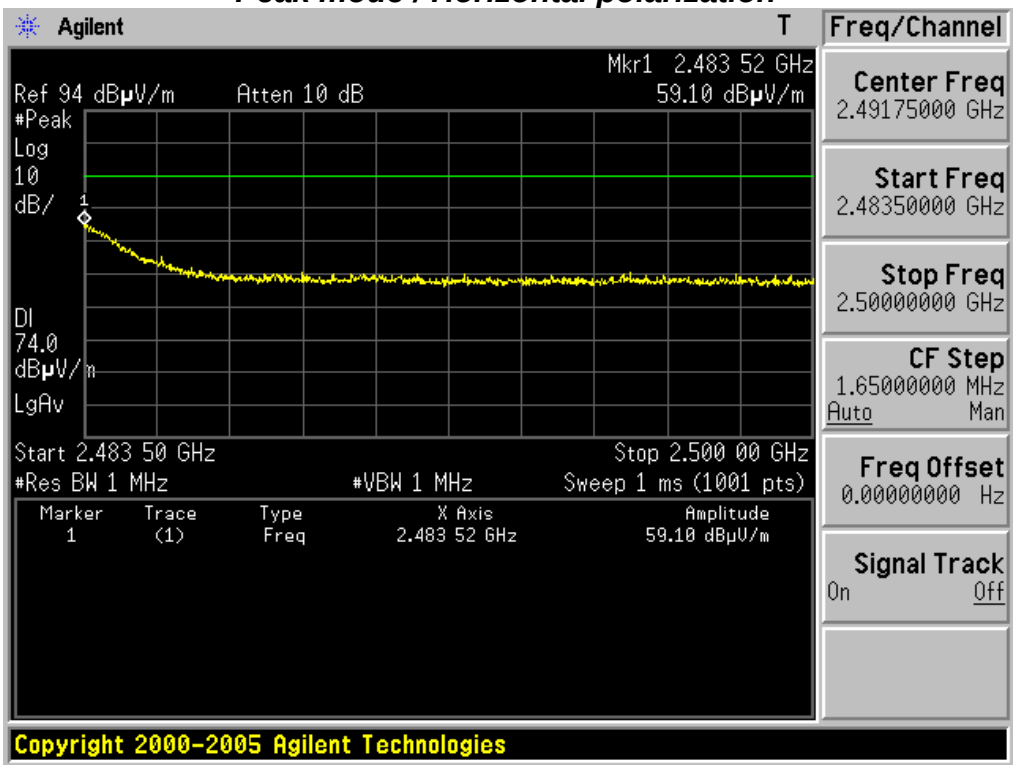
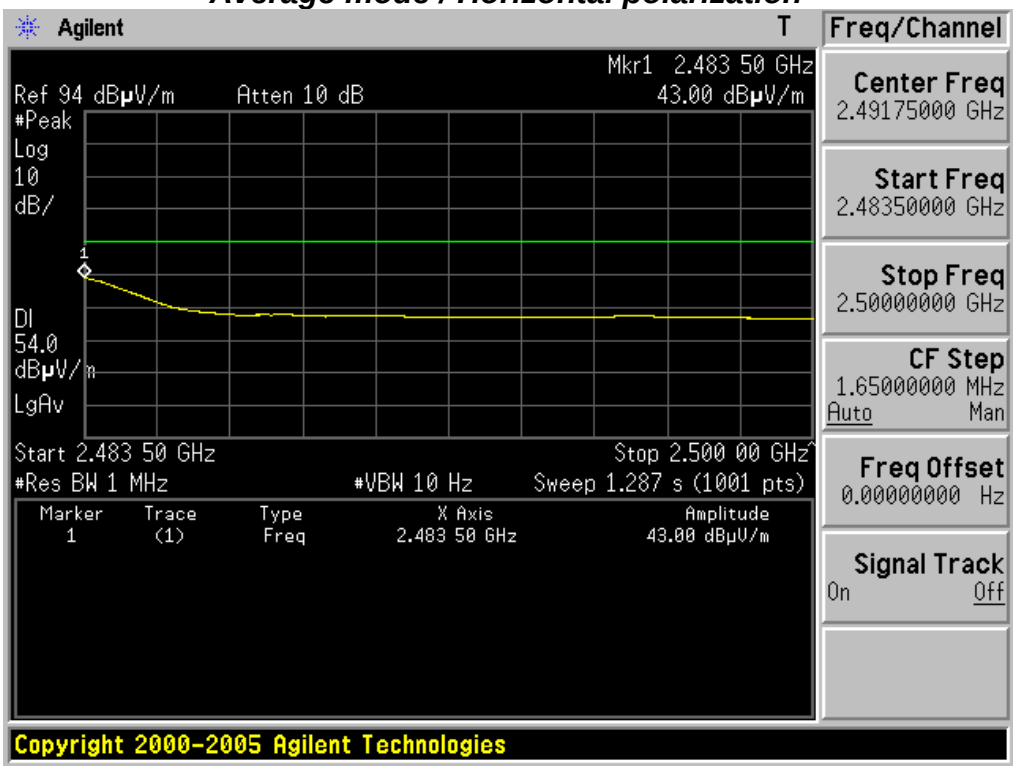
Restricted Band Edge Highest Channel & 2Mbps & Test Case 3

Peak mode / Horizontal polarization



Restricted Band Edge Highest Channel & 2Mbps & Test Case 3

Average mode / Horizontal polarization



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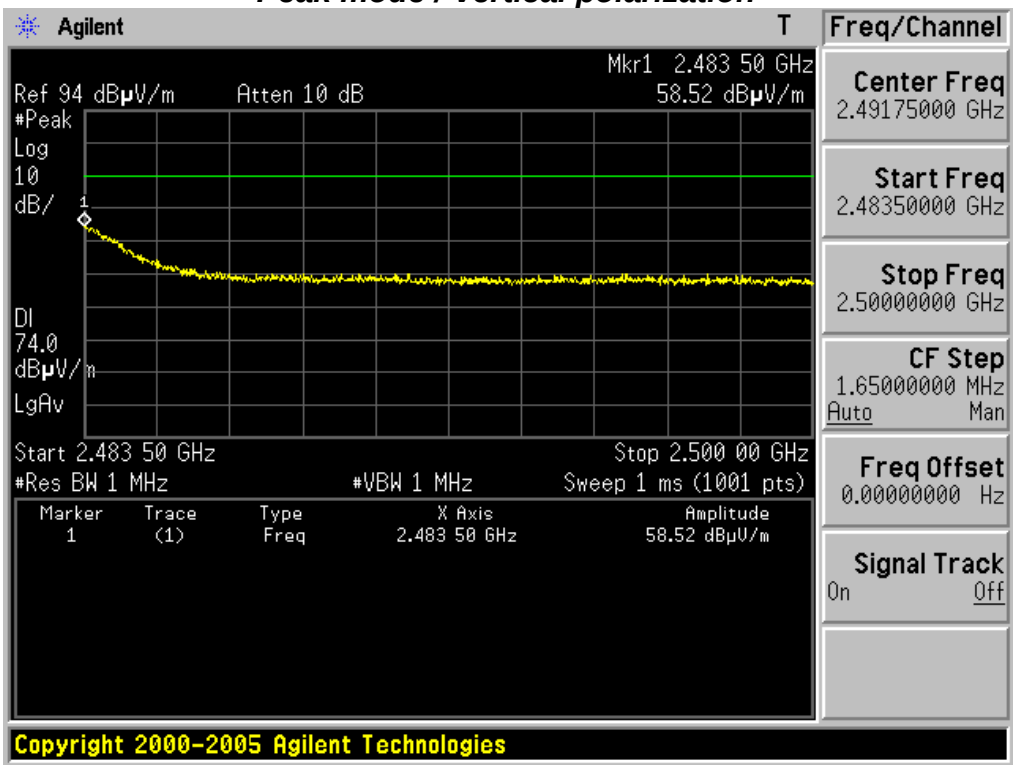
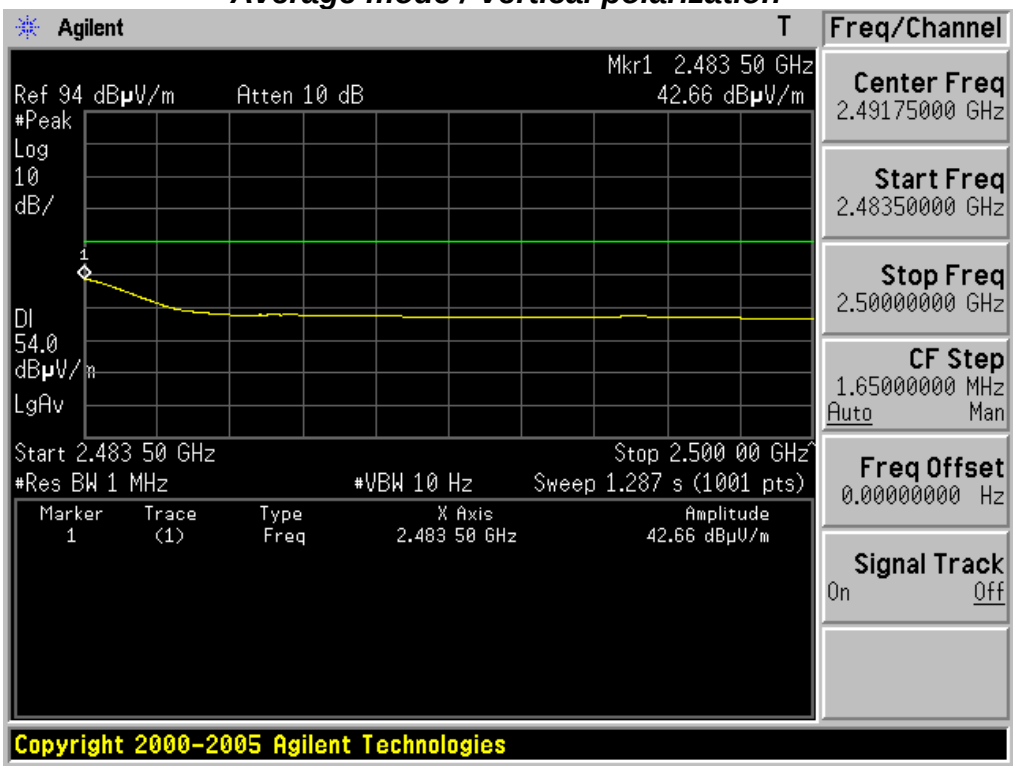
Restricted Band Edge Highest Channel & 2Mbps & Test Case 3

Peak mode / Vertical polarization



Restricted Band Edge Highest Channel & 2Mbps & Test Case 3

Average mode / Vertical polarization



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30MHz ~ 1GHz Radiated Spurious Emissions Lowest Channel & 1Mbps & Test Case 3

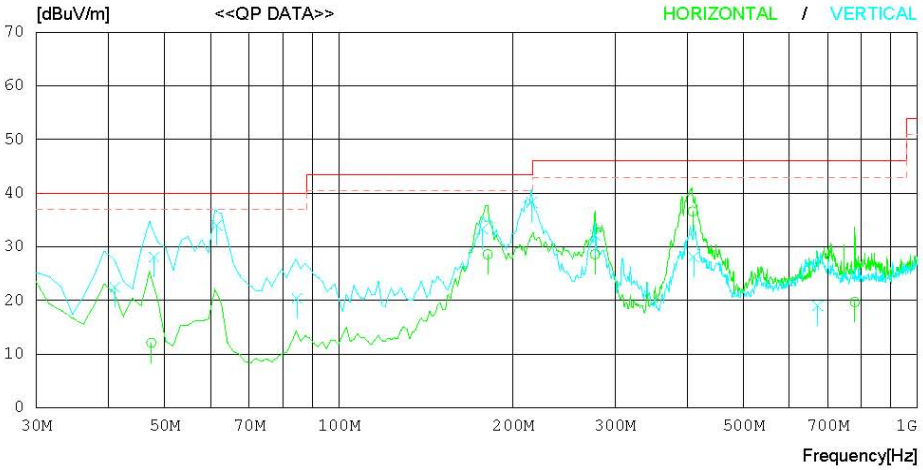
Digital EMC

RADIATED EMISSION

Date : 2010-05-17

Model Name	:	HBM-810	Reference No.	:	
Model No.	:		Power Supply	:	120 V 60 Hz
Serial No.	:	Identical prototype	Temp/Humi	:	21 'C 40 % R.H.
Test Condition	:	TX : 2402 MHz(1Mbps)	Operator	:	B.G.HAN
Memo	:	Test Case 3			

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	47.390	23.4	10.4	1.0	22.7	12.1	40.0	27.9	116	150
2	180.800	39.5	10.4	1.9	23.2	28.6	43.5	14.9	201	358
3	277.200	36.0	13.8	2.4	23.6	28.6	46.0	17.4	100	155
4	408.701	41.2	16.7	3.1	24.4	36.6	46.0	9.4	121	106
5	779.302	19.5	19.5	4.5	23.8	19.7	46.0	26.3	201	0
----- Vertical ------										
6	41.033	30.6	13.6	0.9	22.6	22.5	40.0	17.5	170	258
7	47.908	39.8	10.0	1.0	22.7	28.1	40.0	11.9	100	135
8	61.520	49.7	5.9	1.1	22.7	34.0	40.0	6.0	125	110
9	84.683	33.6	8.2	1.3	22.7	20.4	40.0	19.6	120	140
10	177.323	44.4	10.3	1.9	23.2	33.4	43.5	10.1	110	99
11	215.791	48.0	11.6	2.1	23.4	38.3	43.5	5.2	100	355
12	277.360	39.6	13.8	2.4	23.6	32.2	46.0	13.8	116	255
13	410.668	32.7	16.7	3.1	24.4	28.1	46.0	17.9	100	119
14	672.293	20.1	18.9	4.2	24.2	19.0	46.0	27.0	100	268

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30MHz ~ 1GHz Radiated Spurious Emissions Middle Channel & 1Mbps & Test Case 3

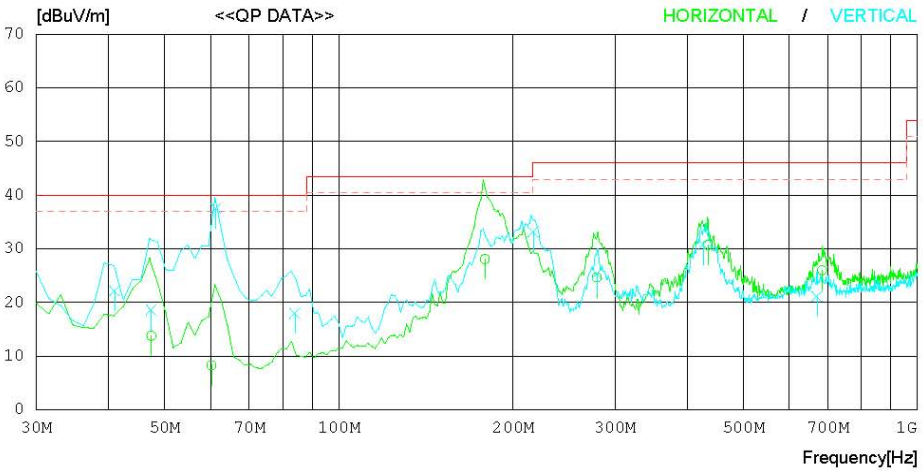
Digital EMC

RADIATED EMISSION

Date : 2010-05-24

Model Name	:	HBM-810	Reference No.	:	
Model No.	:		Power Supply	:	120 V 60 Hz
Serial No.	:	Identical prototype	Temp/Humi	:	20 'C 45 % R.H.
Test Condition	:	TX : 2441 MHz(1Mbps)	Operator	:	B.G.HAN
Memo	:	Test Case 3			

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	47.399	25.2	10.4	0.9	22.7	13.8	40.0	26.2	100	35
2	60.203	24.3	5.8	0.9	22.7	8.3	40.0	31.7	103	156
3	178.979	39.3	10.4	1.6	23.2	28.1	43.5	15.4	115	223
4	279.112	32.5	13.9	1.9	23.6	24.7	46.0	21.3	102	134
5	434.230	35.7	17.0	2.4	24.4	30.7	46.0	15.3	100	112
6	684.345	28.3	18.8	3.1	24.2	26.0	46.0	20.0	103	163
----- Vertical ------										
7	40.965	30.4	13.6	0.8	22.6	22.2	40.0	17.8	105	320
8	47.400	30.0	10.4	0.9	22.7	18.6	40.0	21.4	100	100
9	61.266	53.4	5.9	0.9	22.7	37.5	40.0	2.5	102	220
10	83.944	31.5	8.0	1.1	22.7	17.9	40.0	22.1	100	150
11	216.801	43.2	11.7	1.7	23.4	33.2	46.0	12.8	100	55
12	279.631	33.2	13.9	1.9	23.6	25.4	46.0	20.6	111	256
13	426.938	35.9	16.9	2.4	24.4	30.8	46.0	15.2	102	247
14	670.500	23.3	18.9	3.1	24.2	21.1	46.0	24.9	100	185

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30MHz ~ 1GHz Radiated Spurious Emissions Highest Channel & 1Mbps & Test Case 3

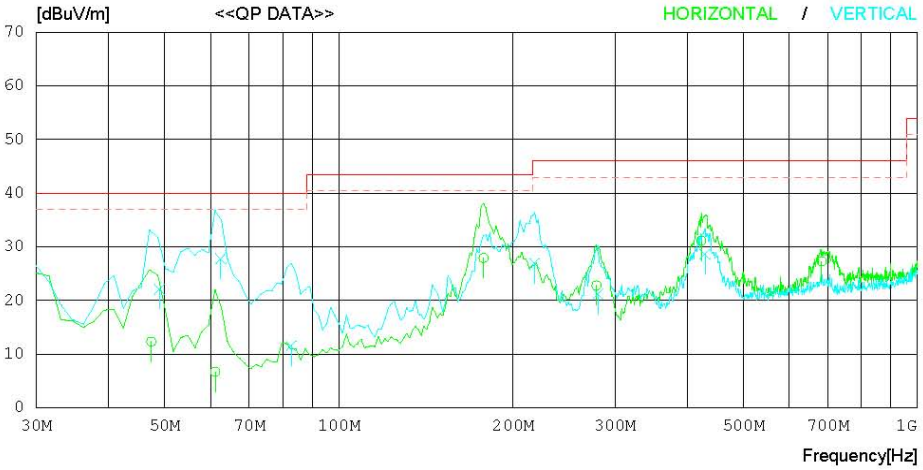
Digital EMC

RADIATED EMISSION

Date : 2010-05-24

Model Name	:	HBM-810	Reference No.	:	
Model No.	:		Power Supply	:	120 V 60 Hz
Serial No.	:	Identical prototype	Temp/Humi	:	20 'C 45 % R.H.
Test Condition	:	TX : 2480 MHz(1Mbps)	Operator	:	B.G.HAN
Memo	:	Test Case 3			

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	47.399	23.7	10.4	0.9	22.7	12.3	40.0	27.7	201	72
2	61.110	22.6	5.9	0.9	22.7	6.7	40.0	33.3	201	240
3	177.837	39.2	10.3	1.6	23.2	27.9	43.5	15.6	201	88
4	278.725	30.6	13.9	1.9	23.6	22.8	46.0	23.2	103	225
5	423.300	36.2	16.9	2.4	24.4	31.1	46.0	14.9	100	115
6	682.915	29.6	18.8	3.1	24.2	27.3	46.0	18.7	101	91
----- Vertical ------										
7	49.022	34.9	9.0	0.9	22.7	22.1	40.0	17.9	103	138
8	62.476	43.5	6.0	1.0	22.7	27.8	40.0	12.2	100	259
9	82.763	25.3	7.8	1.1	22.7	11.5	40.0	28.5	100	255
10	217.888	36.9	11.7	1.7	23.4	26.9	46.0	19.1	110	135
11	280.733	29.1	13.9	1.9	23.7	21.2	46.0	24.8	100	198
12	429.479	33.6	17.0	2.4	24.4	28.6	46.0	17.4	102	321

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30MHz ~ 1GHz Radiated Spurious Emissions Lowest Channel & 2Mbps & Test Case 3

Digital EMC

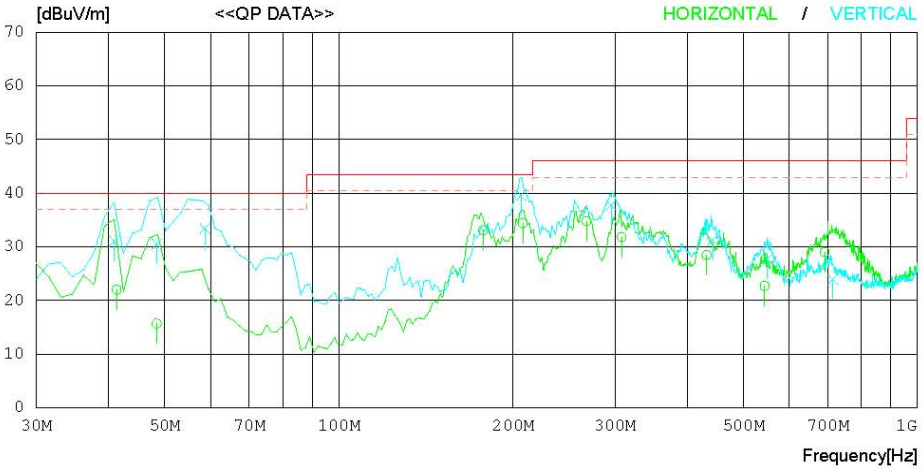
RADIATED EMISSION

Date : 2010-05-25

Model Name	:	HBM-810	Reference No.	:	
Model No.	:		Power Supply	:	120 V 60 Hz
Serial No.	:	Identical prototype	Temp/Humi	:	21 'C 39 % R.H.
Test Condition	:	TX : 2402 MHz (2Mbps)	Operator	:	B.G.HAN

Memo : Test Case 3

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	41.305	30.3	13.5	0.8	22.6	22.0	40.0	18.0	101	150
2	48.448	28.0	9.5	0.9	22.7	15.7	40.0	24.3	140	100
3	177.692	44.4	10.3	1.6	23.2	33.1	43.5	10.4	142	55
4	207.925	44.8	11.3	1.7	23.4	34.4	43.5	9.1	120	320
5	268.013	42.9	13.6	1.9	23.6	34.8	46.0	11.2	101	190
6	308.253	39.0	14.5	2.1	23.8	31.8	46.0	14.2	101	110
7	432.014	33.5	17.0	2.4	24.4	28.5	46.0	17.5	141	330
8	544.475	25.9	18.5	2.8	24.5	22.7	46.0	23.3	103	110
9	691.746	31.3	18.8	3.1	24.2	29.0	46.0	17.0	100	119
----- Vertical ------										
10	40.945	39.2	13.6	0.8	22.6	31.0	40.0	9.0	100	345
11	48.511	42.9	9.4	0.9	22.7	30.5	40.0	9.5	100	220
12	58.750	49.1	6.1	0.9	22.7	33.4	40.0	6.6	105	192
13	206.644	50.0	11.2	1.7	23.3	39.6	43.5	3.9	100	115
14	295.865	45.3	14.2	2.0	23.7	37.8	46.0	8.2	202	250
15	442.544	36.1	17.1	2.5	24.4	31.3	46.0	14.7	100	117
16	550.754	30.8	18.6	2.8	24.5	27.7	46.0	18.3	100	171
17	714.307	25.9	18.9	3.2	24.1	23.9	46.0	22.1	100	290

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30MHz ~ 1GHz Radiated Spurious Emissions Middle Channel & 2Mbps & Test Case 3

Digital EMC

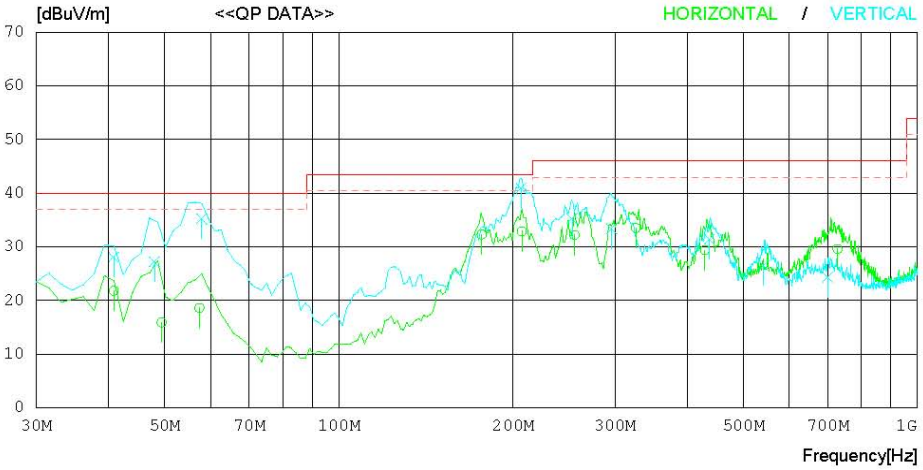
RADIATED EMISSION

Date : 2010-05-26

Model Name	:	HBM-810	Reference No.	:	
Model No.	:		Power Supply	:	120 V 60 Hz
Serial No.	:	Identical prototype	Temp/Humi	:	21 'C 39 % R.H.
Test Condition	:	TX : 2441 MHz (2Mbps)	Operator	:	B.G.HAN

Memo : Test Case 3

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	40.850	30.0	13.6	0.8	22.6	21.8	40.0	18.2	101	358
2	49.396	29.0	8.7	0.9	22.7	15.9	40.0	24.1	110	235
3	57.426	34.0	6.4	0.9	22.7	18.6	40.0	21.4	105	115
4	176.487	43.6	10.3	1.6	23.2	32.3	43.5	11.2	140	212
5	207.075	43.3	11.2	1.7	23.3	32.9	43.5	10.6	101	55
6	255.404	40.6	13.3	1.8	23.5	32.2	46.0	13.8	110	250
7	325.830	40.4	14.9	2.1	23.9	33.5	46.0	12.5	110	150
8	428.989	34.4	17.0	2.4	24.4	29.4	46.0	16.6	120	115
9	727.419	31.3	19.0	3.3	24.0	29.6	46.0	16.4	105	198
----- Vertical ------										
10	40.845	36.3	13.6	0.8	22.6	28.1	40.0	11.9	100	141
11	48.015	39.1	9.9	0.9	22.7	27.2	40.0	12.8	103	150
12	57.932	50.7	6.3	0.9	22.7	35.2	40.0	4.8	100	110
13	206.778	51.3	11.2	1.7	23.3	40.9	43.5	2.6	105	259
14	252.997	43.7	13.3	1.8	23.5	35.3	46.0	10.7	100	238
15	296.377	40.8	14.3	2.0	23.7	33.4	46.0	12.6	110	330
16	436.825	36.2	17.1	2.5	24.4	31.4	46.0	14.6	102	100
17	542.162	29.7	18.5	2.8	24.5	26.5	46.0	19.5	100	310
18	699.976	26.5	18.8	3.2	24.2	24.3	46.0	21.7	103	120

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30MHz ~ 1GHz Radiated Spurious Emissions Highest Channel & 2Mbps & Test Case 3

Digital EMC

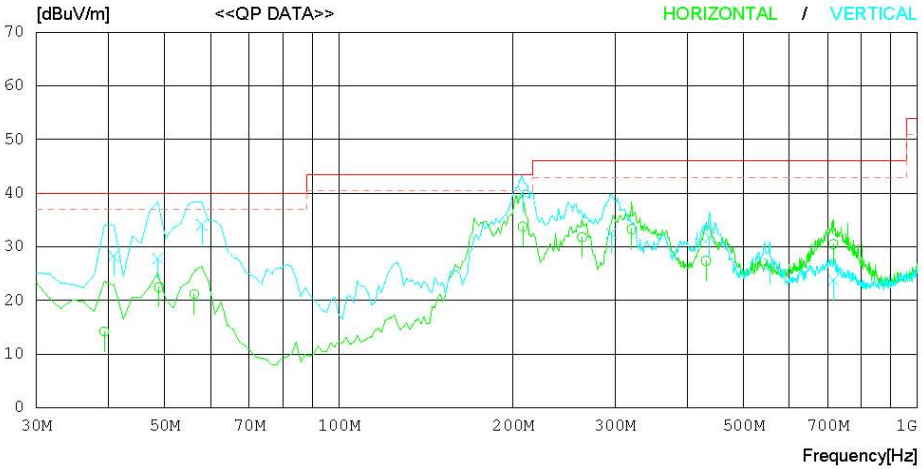
RADIATED EMISSION

Date : 2010-05-26

Model Name	:	HBM-810	Reference No.	:	
Model No.	:		Power Supply	:	120 V 60 Hz
Serial No.	:	Identical prototype	Temp/Humi	:	21 'C 39 % R.H.
Test Condition	:	TX : 2480 MHz (2Mbps)	Operator	:	B.G.HAN

Memo : Test Case 3

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	39.327	21.9	14.1	0.8	22.6	14.2	40.0	25.8	100	358
2	48.902	35.2	9.1	0.9	22.7	22.5	40.0	17.5	249	278
3	56.218	36.3	6.7	0.9	22.7	21.2	40.0	18.8	298	200
4	207.949	44.2	11.3	1.7	23.4	33.8	43.5	9.7	100	358
5	263.200	40.0	13.5	1.9	23.6	31.8	46.0	14.2	100	320
6	320.689	40.3	14.8	2.1	23.9	33.3	46.0	12.7	105	258
7	431.057	32.4	17.0	2.4	24.4	27.4	46.0	18.6	166	168
8	715.510	32.5	18.9	3.2	24.1	30.5	46.0	15.5	100	232
----- Vertical ------										
9	40.832	36.5	13.6	0.8	22.6	28.3	40.0	11.7	100	216
10	48.669	40.3	9.3	0.9	22.7	27.8	40.0	12.2	103	220
11	57.984	49.6	6.3	0.9	22.7	34.1	40.0	5.9	100	150
12	207.893	50.6	11.3	1.7	23.4	40.2	43.5	3.3	108	121
13	296.172	39.9	14.3	2.0	23.7	32.5	46.0	13.5	115	281
14	437.255	36.6	17.1	2.5	24.4	31.8	46.0	14.2	100	102
15	555.430	29.8	18.6	2.8	24.4	26.8	46.0	19.2	100	288
16	715.496	25.8	18.9	3.2	24.1	23.8	46.0	22.2	109	247

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1GHz ~ 25GHz Radiated Spurious Emissions & 1Mbps & Test Case 3

▪ Lowest Channel

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB/m)	D.C.F	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV			PK	AV	PK	AV	PK	AV
4804.435	Hor	58.55	51.42	5.36	-30.77	33.14	26.01	74.00	54.00	40.86	27.99
4803.910	Ver	62.79	55.68	5.36	-30.77	37.38	30.27	74.00	54.00	36.62	23.73
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

▪ Middle Channel

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB/m)	D.C.F	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV			PK	AV	PK	AV	PK	AV
4881.900	Hor	57.91	50.47	5.66	-30.77	32.80	25.36	74.00	54.00	41.20	28.64
4882.245	Ver	60.81	53.77	5.66	-30.77	35.70	28.66	74.00	54.00	38.30	25.34
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

▪ Highest Channel

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB/m)	D.C.F	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV			PK	AV	PK	AV	PK	AV
4959.885	Hor	54.52	46.32	6.09	-30.77	29.84	21.64	74.00	54.00	44.16	32.36
4959.720	Ver	58.48	50.87	6.09	-30.77	33.80	26.19	74.00	54.00	40.20	27.81
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were detected at a level greater than 35dB below limit.
2. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F + D.C.F / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
   D.C.F (Duty Cycle Correction Factor) = 20log(The worst Case DWELL Time/100ms)
   = 20log(2.895ms / 100ms) = -30.77dB

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1GHz ~ 25GHz Radiated Spurious Emissions & 2Mbps & Test Case 3

▪ Lowest Channel

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB/m)	D.C.F	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV			PK	AV	PK	AV	PK	AV
4804.020	Hor	49.00	37.34	5.36	-30.68	23.68	12.02	74.00	54.00	50.32	41.98
4804.040	Ver	55.44	42.94	5.36	-30.68	30.12	17.62	74.00	54.00	43.88	36.38
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

▪ Middle Channel

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB/m)	D.C.F	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV			PK	AV	PK	AV	PK	AV
4882.060	Hor	52.89	42.22	5.66	-30.68	27.87	17.20	74.00	54.00	46.13	36.80
4882.060	Ver	63.82	52.80	5.66	-30.68	38.80	27.78	74.00	54.00	35.20	26.22
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

▪ Highest Channel

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB/m)	D.C.F	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV			PK	AV	PK	AV	PK	AV
4960.070	Hor	56.57	45.95	6.09	-30.68	31.98	21.36	74.00	54.00	42.02	32.64
4960.030	Ver	59.59	48.47	6.09	-30.68	35.00	23.88	74.00	54.00	39.00	30.12
-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

Note.

1. No other spurious and harmonic emissions were detected at a level greater than 45dB below limit.
2. Sample Calculation.
   Margin = Limit – Result / Result = Reading + T.F + D.C.F / T.F = AF + CL – AG
   Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,
   D.C.F (Duty Cycle Correction Factor) = 20log(The worst Case DWELL Time/100ms)
   = 20log(2.925ms / 100ms) = -30.68dB

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3.2.8 AC Line Conducted Emissions

- Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. While the measurement, EUT had its hopping function disabled at the middle channels in line with Section 15.31(m). Emissions closest to the limit are measured in the quasi-peak and average detector mode 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

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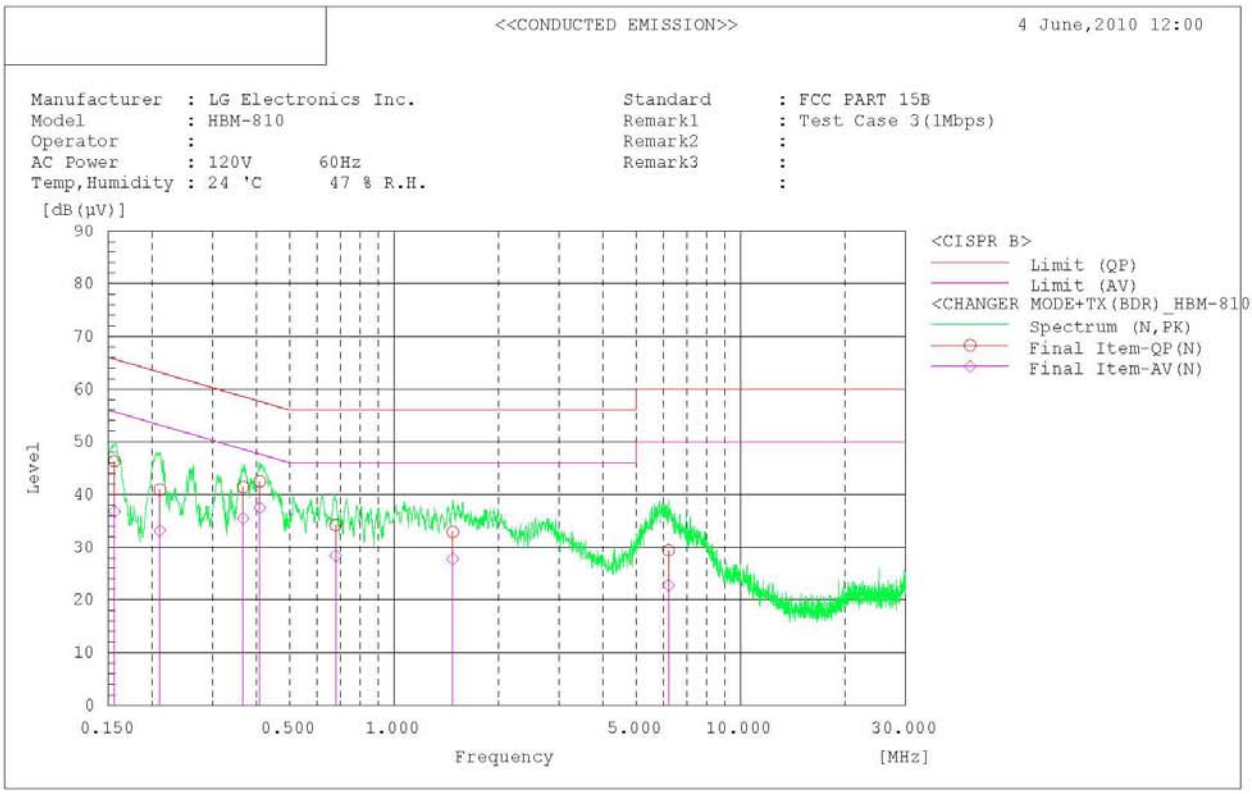
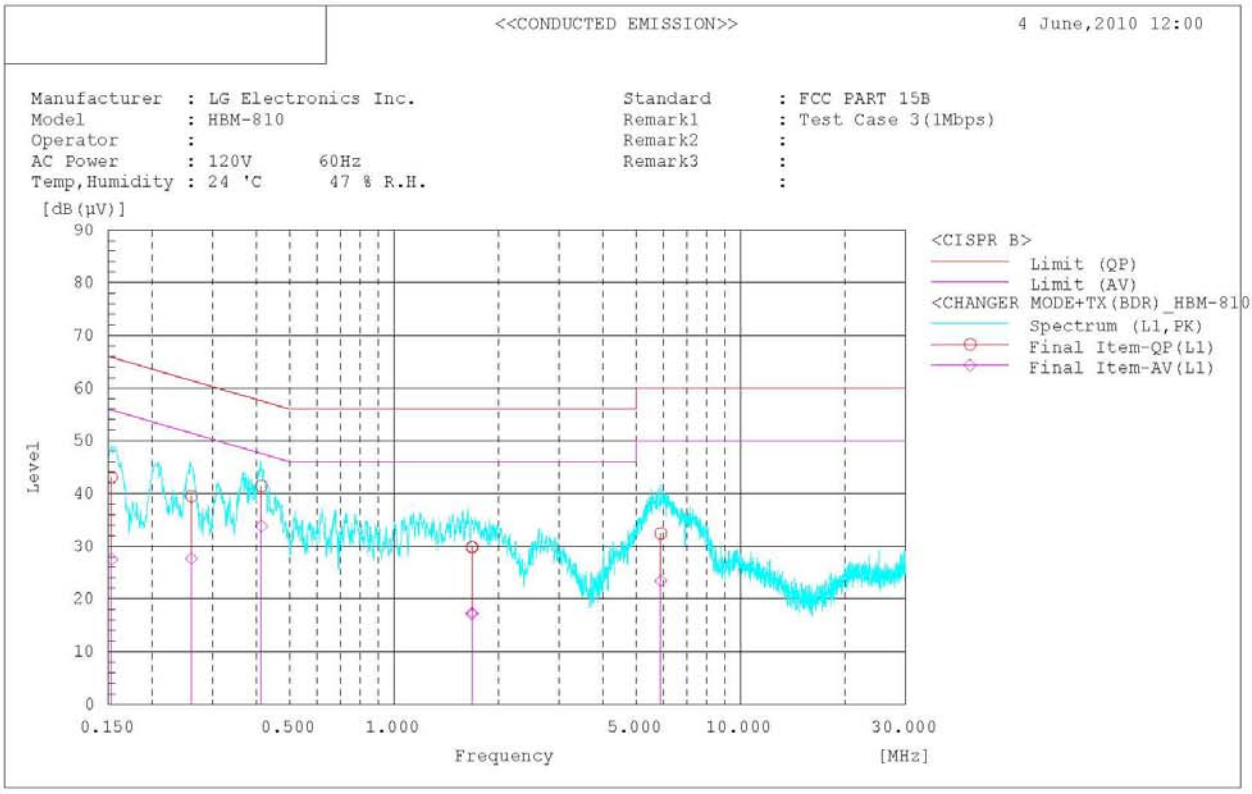
AC Line Conducted Emissions (Graph) 1Mbps & Test Case 3





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AC Line Conducted Emissions (Data List) 1Mbps & Test Case 3

<<CONDUCTED EMISSION>>

4 June,2010 12:00

Standard : FCC PART 15B
Manufacturer : LG Electronics Inc.
Model : HBM-810
Operator :
AC Power : 120V 60Hz
Temp,Humidity : 24 'C 47 % R.H.
Remark1 : Test Case 3(1Mbps)
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	0.156	46.1	36.6	0.2	46.3	36.8	65.7	55.7	19.4	18.9	
2	0.211	40.6	32.8	0.3	40.9	33.1	63.2	53.2	22.3	20.1	
3	0.367	41.1	35.2	0.3	41.4	35.5	58.6	48.6	17.2	13.1	
4	0.410	42.2	37.2	0.3	42.5	37.5	57.6	47.6	15.1	10.1	
5	0.678	33.8	28.0	0.4	34.2	28.4	56.0	46.0	21.8	17.6	
6	1.477	32.6	27.5	0.3	32.9	27.8	56.0	46.0	23.1	18.2	
7	6.197	29.0	22.4	0.4	29.4	22.8	60.0	50.0	30.6	27.2	

--- 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	43.0	27.4	0.1	43.1	27.5	65.8	55.8	22.7	28.3	
2	0.260	39.3	27.4	0.2	39.5	27.6	61.4	51.4	21.9	23.8	
3	0.414	41.0	33.4	0.4	41.4	33.8	57.6	47.6	16.2	13.8	
4	1.681	29.3	16.8	0.5	29.8	17.3	56.0	46.0	26.2	28.7	
5	1.679	29.3	16.6	0.5	29.8	17.1	56.0	46.0	26.2	28.9	
6	5.885	31.7	22.7	0.7	32.4	23.4	60.0	50.0	27.6	26.6	

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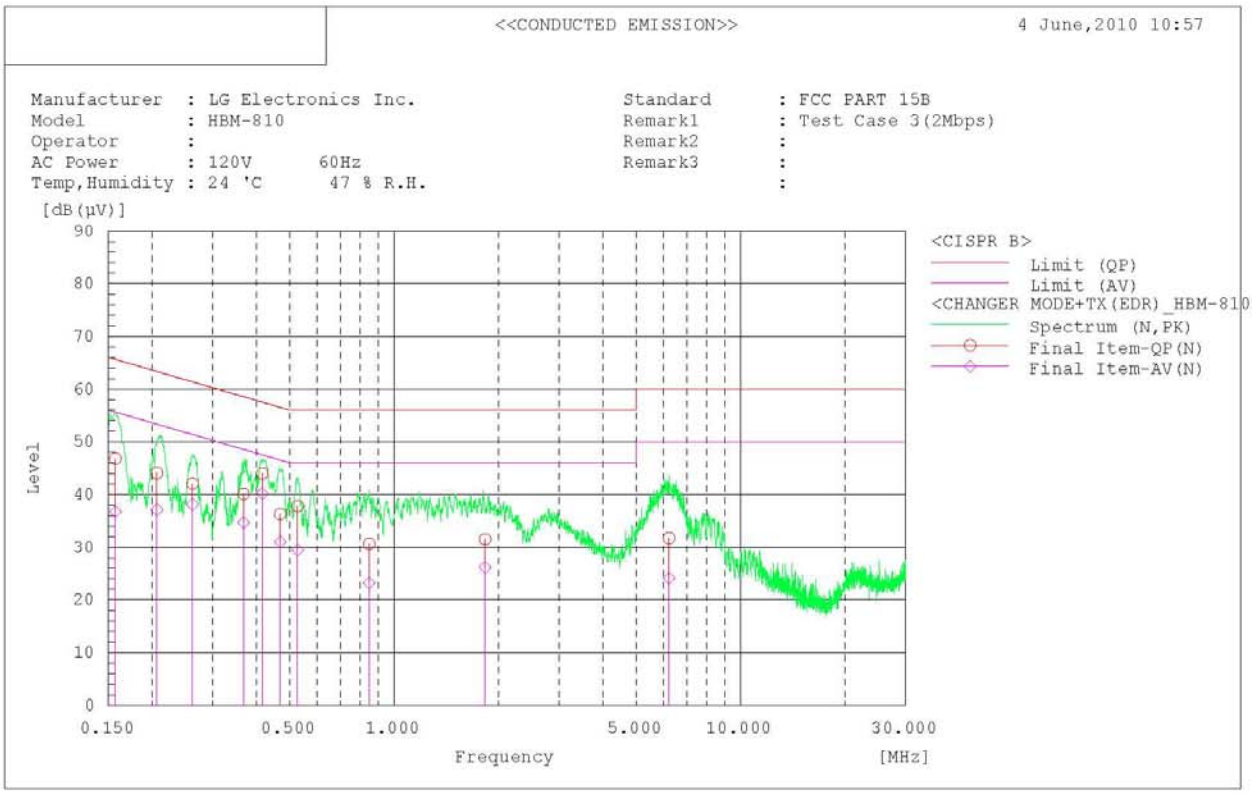
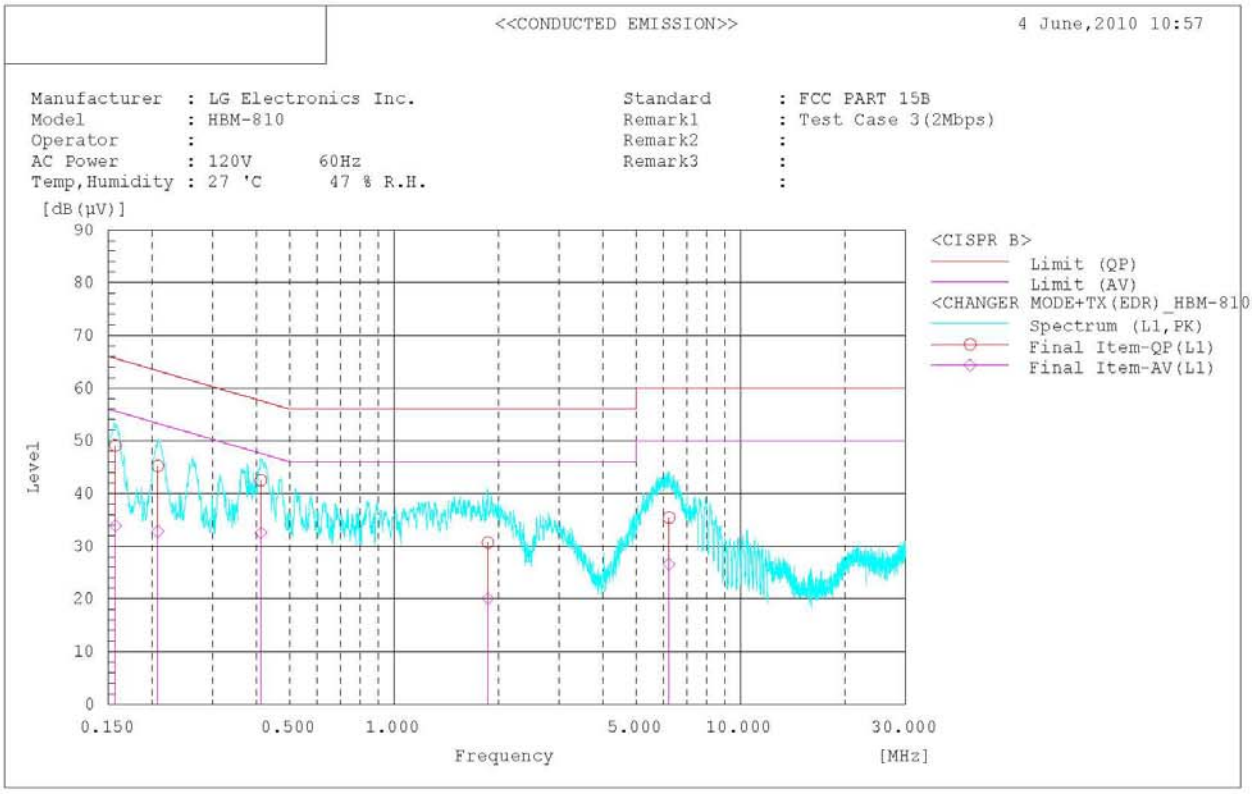
AC Line Conducted Emissions (Graph) 2Mbps & Test Case 3





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AC Line Conducted Emissions (Data List) 2Mbps & Test Case 3

<<CONDUCTED EMISSION>>

4 June,2010 10:57

Standard : FCC PART 15B
Manufacturer : LG Electronics Inc.
Model : HBM-810
Operator :
AC Power : 120V 60Hz
Temp,Humidity : 24 'C 47 % R.H.
Remark1 : Test Case 3(2Mbps)
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	0.157	46.6	36.6	0.2	46.8	36.8	65.6	55.6	18.8	18.8	
2	0.207	43.8	36.8	0.3	44.1	37.1	63.3	53.3	19.2	16.2	
3	0.262	41.7	37.8	0.3	42.0	38.1	61.4	51.4	19.4	13.3	
4	0.368	39.8	34.4	0.3	40.1	34.7	58.5	48.5	18.4	13.8	
5	0.417	43.7	39.9	0.3	44.0	40.2	57.5	47.5	13.5	7.3	
6	0.469	35.9	30.6	0.4	36.3	31.0	56.5	46.5	20.2	15.5	
7	0.527	37.4	29.0	0.4	37.8	29.4	56.0	46.0	18.2	16.6	
8	0.848	30.2	22.8	0.4	30.6	23.2	56.0	46.0	25.4	22.8	
9	1.832	31.2	25.9	0.3	31.5	26.2	56.0	46.0	24.5	19.8	
10	6.220	31.3	23.7	0.4	31.7	24.1	60.0	50.0	28.3	25.9	

--- L1 Phase ---

No.	Frequency	Reading QP	Reading AV	c.f	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV	Remark
	[MHz]	[dB(μV)]	[dB(μV)]	[dB]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB]	[dB]	
1	0.157	49.0	33.8	0.1	49.1	33.9	65.6	55.6	16.5	21.7	
2	0.208	45.0	32.6	0.2	45.2	32.8	63.3	53.3	18.1	20.5	
3	0.413	42.1	32.1	0.4	42.5	32.5	57.6	47.6	15.1	15.1	
4	1.866	30.2	19.5	0.5	30.7	20.0	56.0	46.0	25.3	26.0	
5	6.222	34.7	25.9	0.7	35.4	26.6	60.0	50.0	24.6	23.4	

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3.2.9 Antenna Requirements

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

- Conclusion: Comply
The antenna is permanently attached by soldering. (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.

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APPENDIX

TEST EQUIPMENT FOR TESTS

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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	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	23/09/09	23/09/10	21097

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	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)	WEINSCHEL	56-3	16/12/09	16/12/10	Y2342
☐	Attenuator (3dB)	WEINSCHEL	56-3	16/12/09	16/12/10	Y2370
☐	Attenuator (10dB)	WEINSCHEL	23-10-34	01/10/09	01/10/10	BP4386
☐	Attenuator (10dB)	WEINSCHEL	23-10-34	11/01/10	11/01/11	BP4387
☐	Attenuator (10dB)	WEINSCHEL	31696	06/10/09	06/10/10	446
☐	Attenuator (10dB)	WEINSCHEL	31696	06/10/09	06/10/10	408
☐	Attenuator (20dB)	WEINSCHEL	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)	WEINSCHEL	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 (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	02/07/09	02/07/10	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
☐	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

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