DIGITAL EMC CO., LTD.

683-3, Yubang-Dong, Yongin-Si, Kyunggi-Do, Korea. 449-080
Tel: +82-31-321-2664 Fax: +82-31-321-1664
http://www.digitalemc.com

CERTIFICATION OF COMPLIANCE

D.O.Tel Co., Ltd.

#412, Kolon Science Valley II, 811 Guro-dong, Guro-gu, Seoul, Korea 152-878

Dates of Tests: October 12 ~ November 05, 2009
Test Report S/N: DR50110911F
Test Site : DIGITAL EMC CO., LTD.

FCC ID **QD5-DOTH-100**

APPLICANT **D.O.Tel Co., Ltd.**

Purpose	:	**Original Grant**
FCC Equipment Class	:	**Part 15 Spread Spectrum Transmitter(DSS)**
Device name	:	**Handheld Printer Terminal**
Manufacturer	:	**D.O.Tel Co., Ltd.**
FCC ID	:	**QD5-DOTH-100**
Model name	:	**DOTH-100**
Test Device Serial number	:	**Identical prototype**
FCC Rule Part(s)	:	**FCC Part 15.247 Subpart C**
		ANSI C63.4-2003
Frequency Range	:	**2402 ~ 2480 MHz**
Max. Output power	:	**-14.86 dBm Conducted**
Data of issue	:	**November 10, 2009**

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

TABLE OF CONTENTS

1. General information

This report contains the result of tests performed by:

DIGITAL EMC CO., LTD.
Address: 683-3, Yubang-Dong, Yongin-Si, Kyunggi-Do, Korea. 449-080
http://www.digitalemc.com E-mail: Harveysung@digitalemc.com
Tel: +82-31-321-2664 Fax: +82-31-321-1664

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

Tested by: ***Engineer***

Date	Name	Signature
November 10, 2009	D.C. Cha	

Reviewed by: ***Manager***

Date	Name	Signature
November 10, 2009	W.J. Lee	

Applicant:

Company name	:	D.O.Tel Co., Ltd.
Address	:	#412, Kolon Science Valley II, 811 Guro-dong, Guro-gu, Seoul, Korea 152-878
Date of order	:	May 08, 2009

2. Equipment information

QD5-DOTH-100

2.1 Equipment description

Equipment model no.	DOTH-100
Equipment serial no.	Identical prototype
Type of equipment	Handheld Printer Terminal
Frequency band	2402 ~ 2480 MHz
Type of Modulation	☒ GFSK for 1Mbps(BDR mode) ☐ π/4-DQPSK for 2Mbps(EDR mode) ☐ 8DPSK for 3Mbps(EDR mode)
Spread Spectrum	Frequency Hopping
Channel Spacing	1.0 MHz
Power	DC 7.4V (Lithium Battery)
Type of antenna	☒ Internal Type: Chip Antenna ☐ External Type:

2.2 Ancillary equipment

Equipment	Model No.	Serial No.	Manufacturer	Note
Cradle	Cradle for DOTH-100	AT10CIG09997	D.O.Tel CO.,LTD.	-
Adaptor	KSAH0950300T1M2	NA	Kuan Tech(Shenzhen) Co., Ltd.	-

3. Information about test items

QD5-DOTH-100

3.1 Tested frequency

- Hopping Function: Enable

Frequency	TX	RX
Frequency band of operation	2402MHz ~ 2480MHz	2402MHz ~ 2480MHz

- Hopping Function: Disable

Frequency	TX	RX
Lowest frequency	2402MHz	2402MHz
Middle frequency	2441MHz	2441MHz
Highest frequency	2480MHz	2480MHz

3.2 Tested environment

Temperature	:	15 ~ 35 (°C)
Relative humidity content	:	20 ~ 75 %
Air pressure	:	86 ~ 103 kPa
Details of power supply	:	DC 7.4 V AC 120V 50Hz

3.3 Test mode

Test Case 1	Only PDA
Test Case 2	PDA + Adaptor
Test Case 3	PDA + Cradle + Adaptor

3.4 Auxiliary equipment

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

3.5 EMI Suppression Device(s)/Modifications

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

→ None

4. Test Report

4.1 Summary of tests

FCC Part Section(s)	Parameter	Limit (Using in 2400 ~ 2483.5MHz)	Test Condition	Status Note 1
I. Test Items				
15.247(a)	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: This test item was tested in test case 1 supplying DC 7.4V.

Note 3: This test item was performed in all test cases.
And the worst data(Test case 2) were reported.

Note 4: This test item was performed in test case 2 and 3.
And the worst data(Test case 2) were reported.

Note 5: The JBP(Computing device peripheral) portion was tested and approved by FCC DoC procedure.

The sample was tested according to the following specification:
FCC Parts 15.247; ANSI C-63.4-2003, DA00-705

4.2 Transmitter requirements

4.2.1 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 Sweep = auto

VBW = ≥ RBW Detector function = peak

Trace = max hold

- Measurement Data: Comply

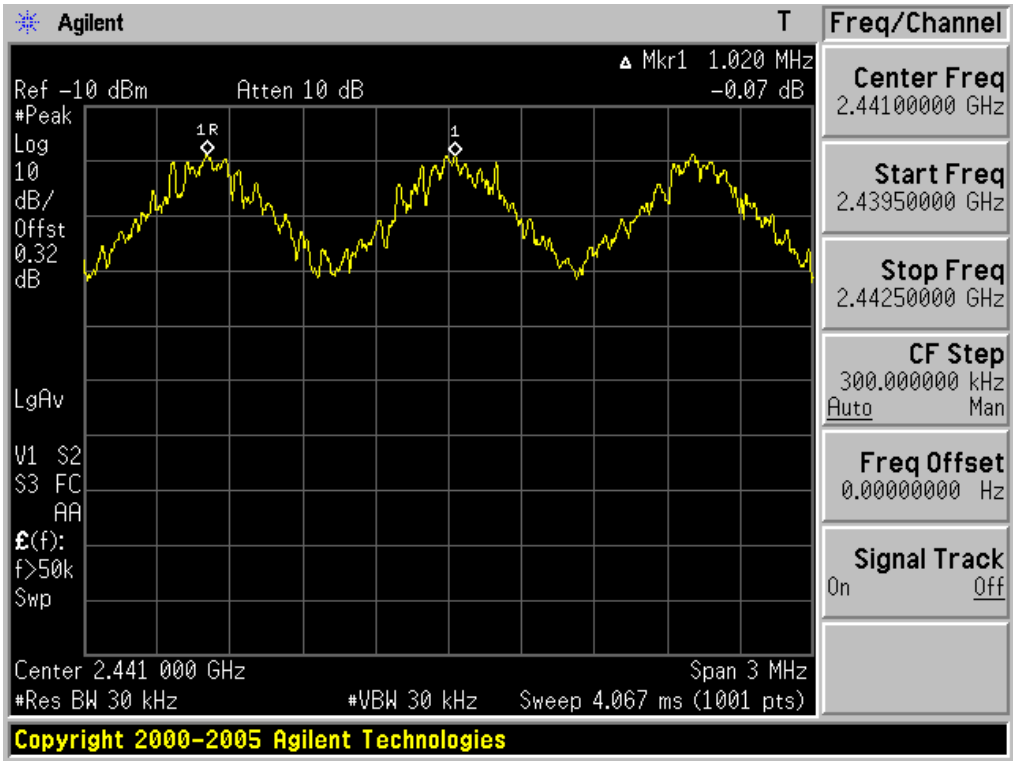
Hopping mode	Data rate	Peak of center channel (MHz)	Peak of adjacent Channel (MHz)	Test Result (MHz)
Enable	**1Mbps**	**2440.004000**	**2441.024000**	**1.020000**

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

Carrier Frequency Separation Hopping mode: Enable & Data rate: 1Mbps



4.2.2 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

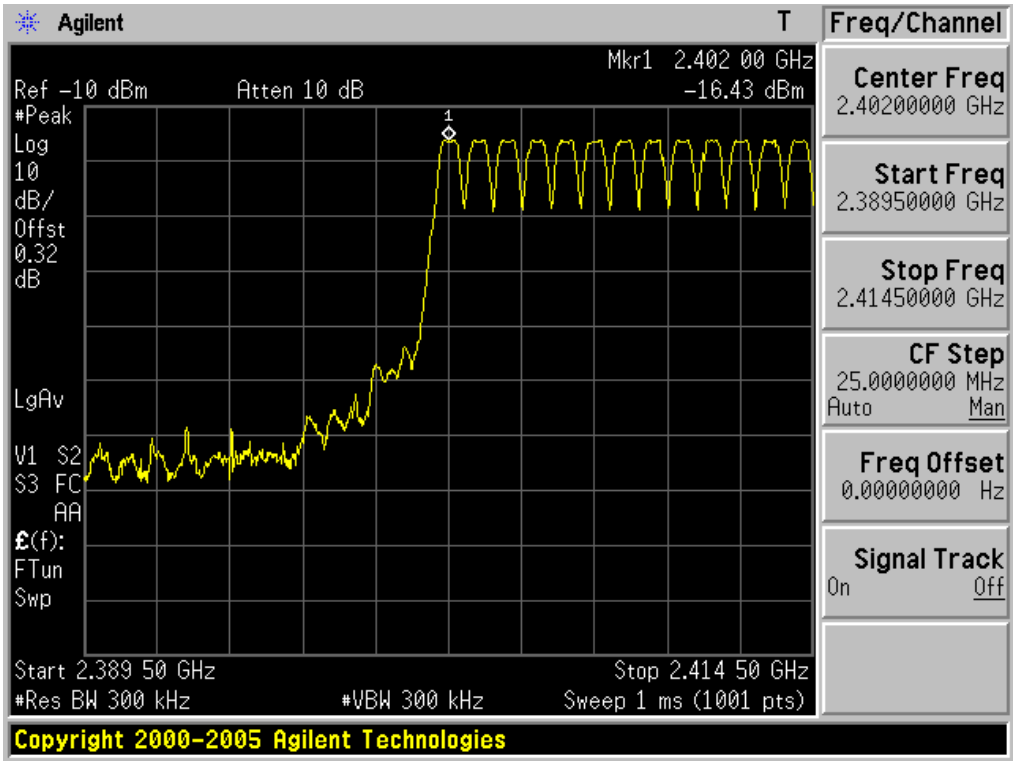
Hopping mode	Data rate	Test Result (Total Hops)
Enable	**1Mbps**	**79**

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

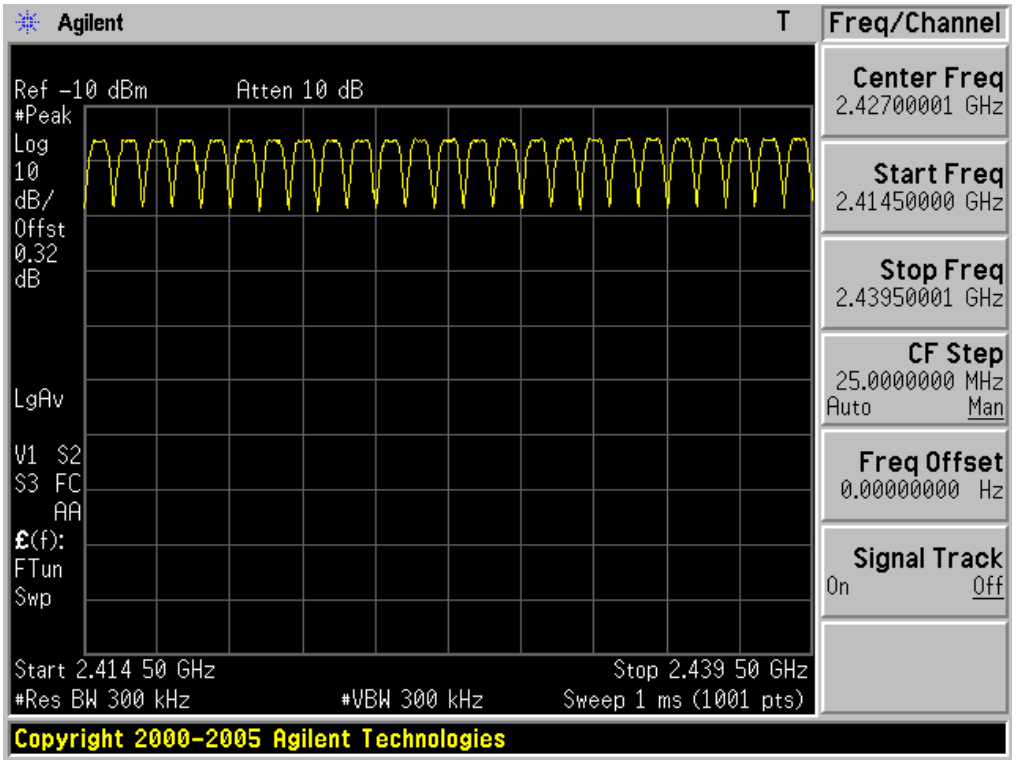
- Minimum Standard:

At least 15 hopes

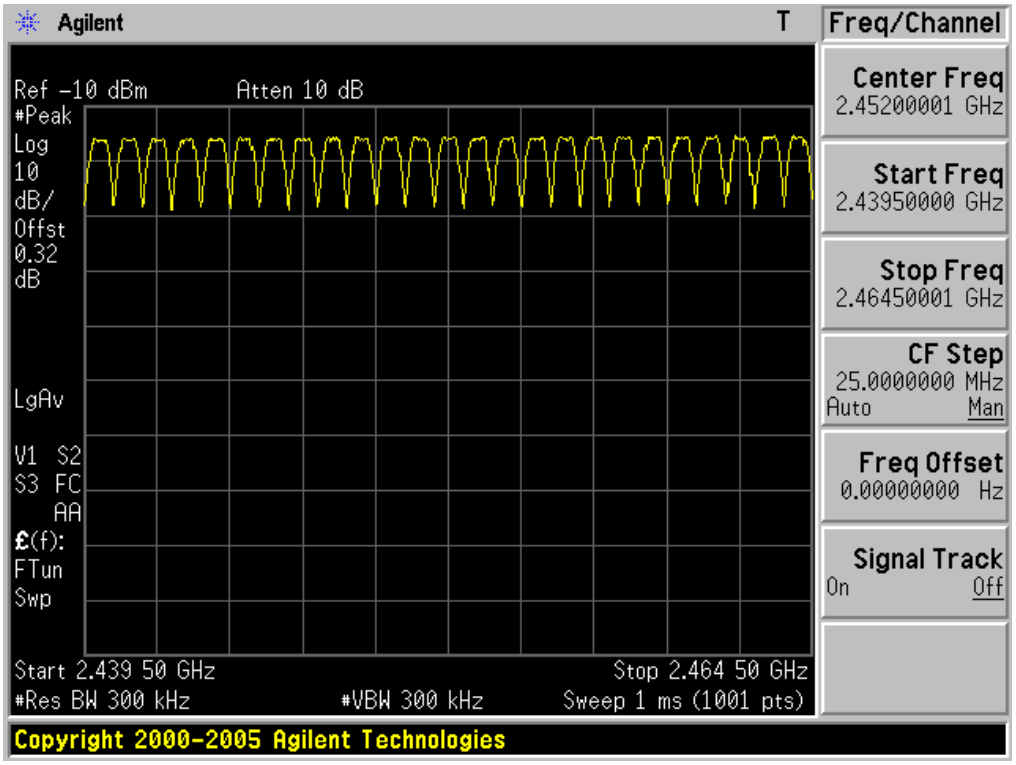
Number of Hopping Frequencies 1 Hopping mode: Enable & Data rate: 1Mbps



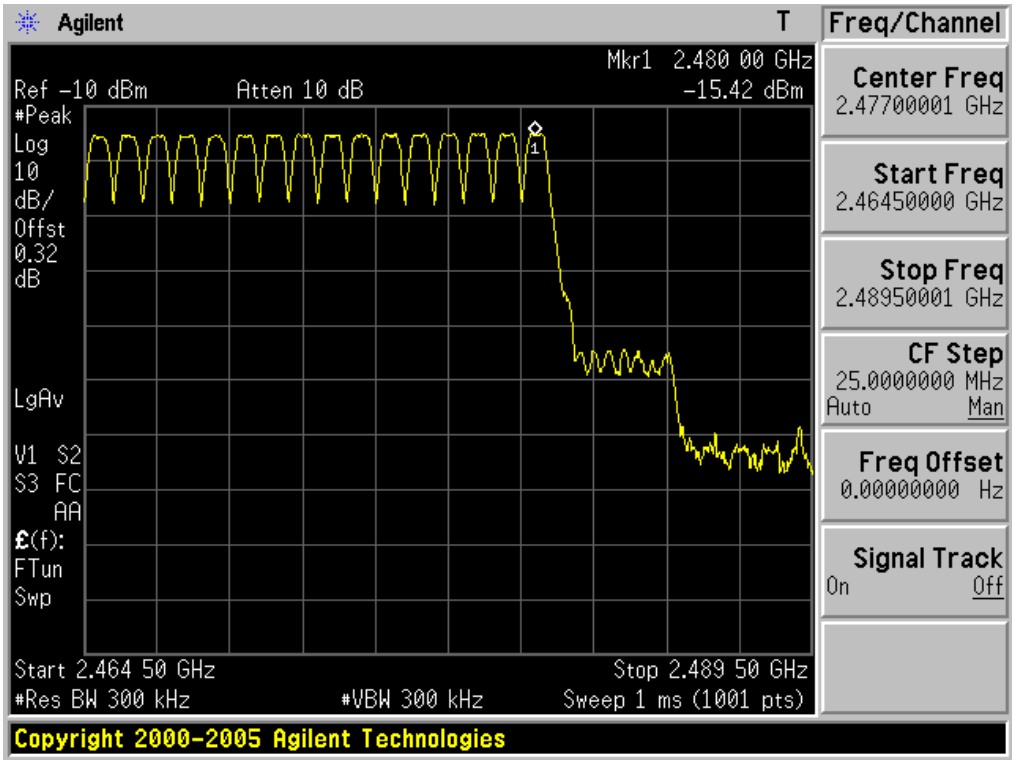
Number of Hopping Frequencies 2 Hopping mode: Enable & Data rate: 1Mbps



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



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



4.2.3 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

Sweep = auto

VBW = ≥ RBW

Detector function = peak

Trace = max hold

- Measurement Data: Comply

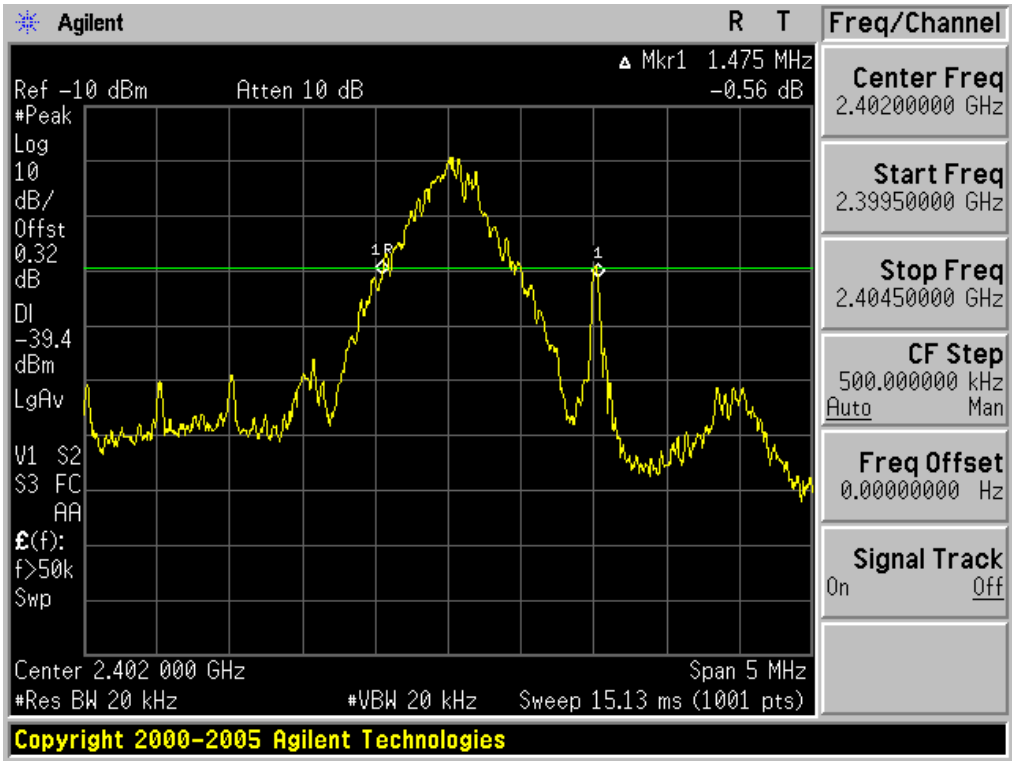
Hopping mode	Data rate	Tested Frequency	Test Results (MHz)
Disable	1Mbps	Lowest	1.475
		Middle	1.475
		Highest	1.465

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

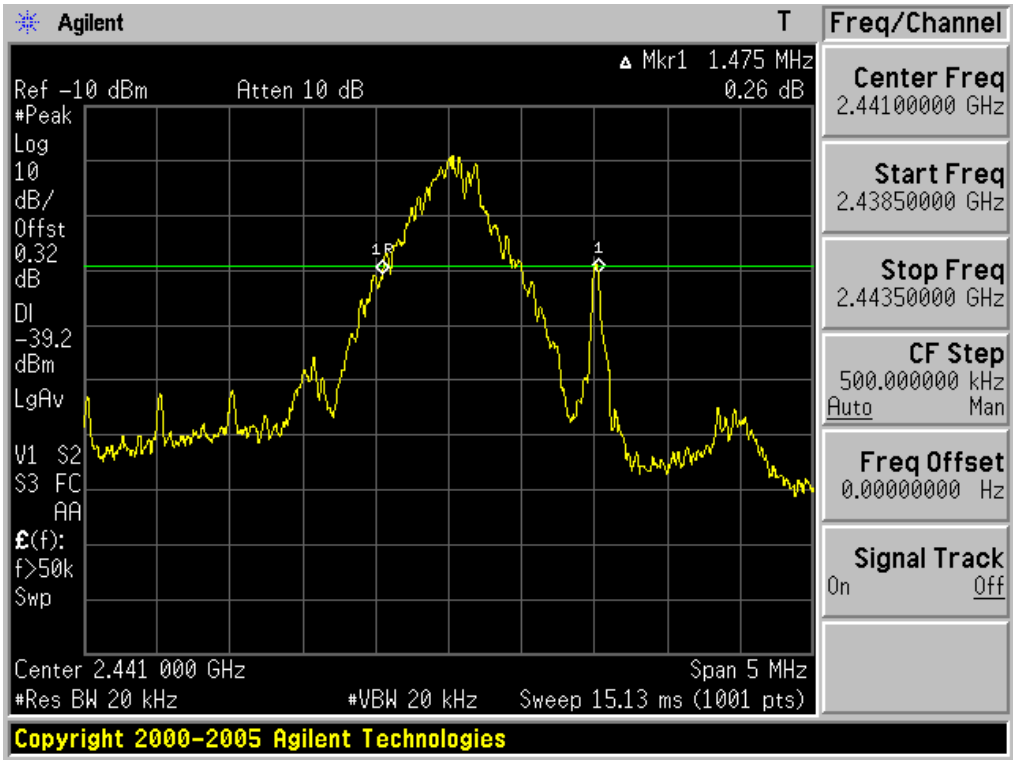
- Minimum Standard:

None

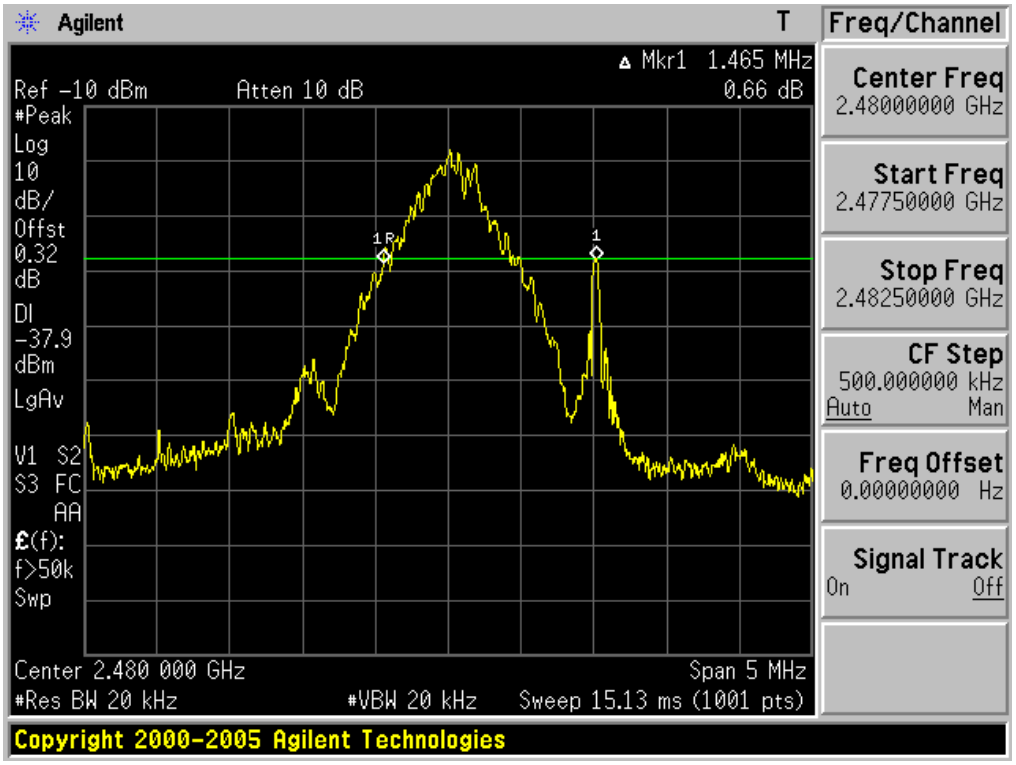
20dB Bandwidth Lowest Frequency & Data rate: 1Mbps



20dB Bandwidth Middle Frequency & Data rate: 1Mbps



20dB Bandwidth Highest Frequency & Data rate: 1Mbps



4.2.4 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

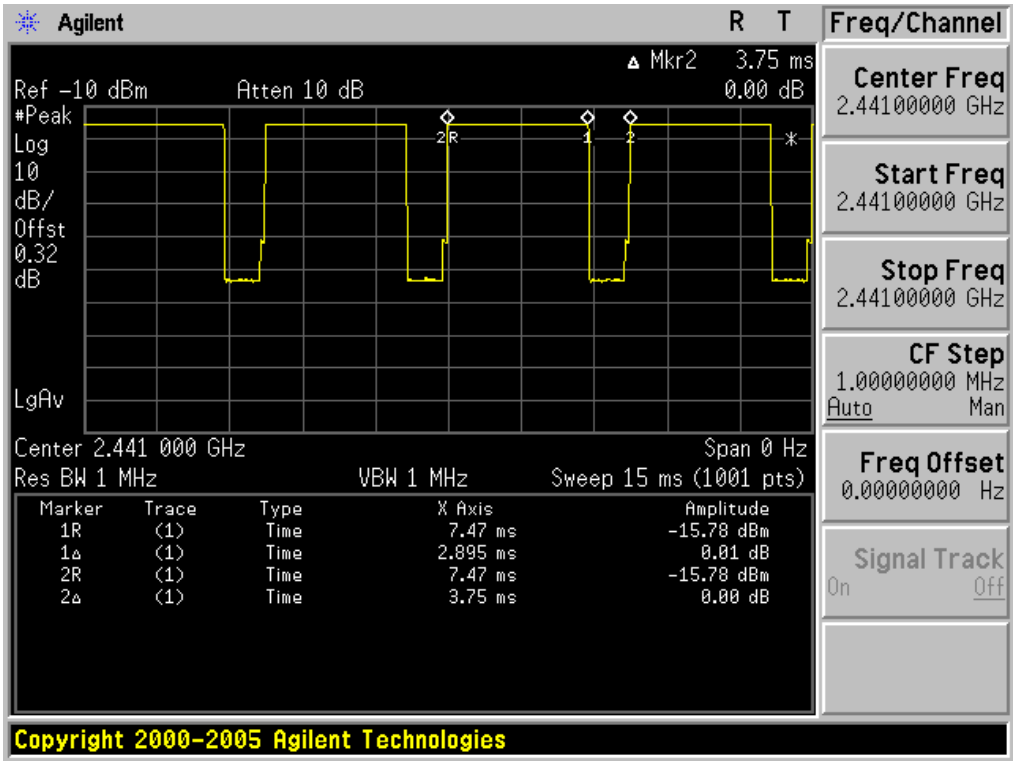
Hopping mode	Data rate	Packet Type	Burst On Time (ms)	Period (ms)	Number of hopping Channels	Test Result (s)
Enable	**1Mbps**	**DH 5**	**2.895**	**3.75**	**79**	**0.3088**

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

Time of Occupancy Hopping mode: Enable & Data rate: 1Mbps



4.2.5 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

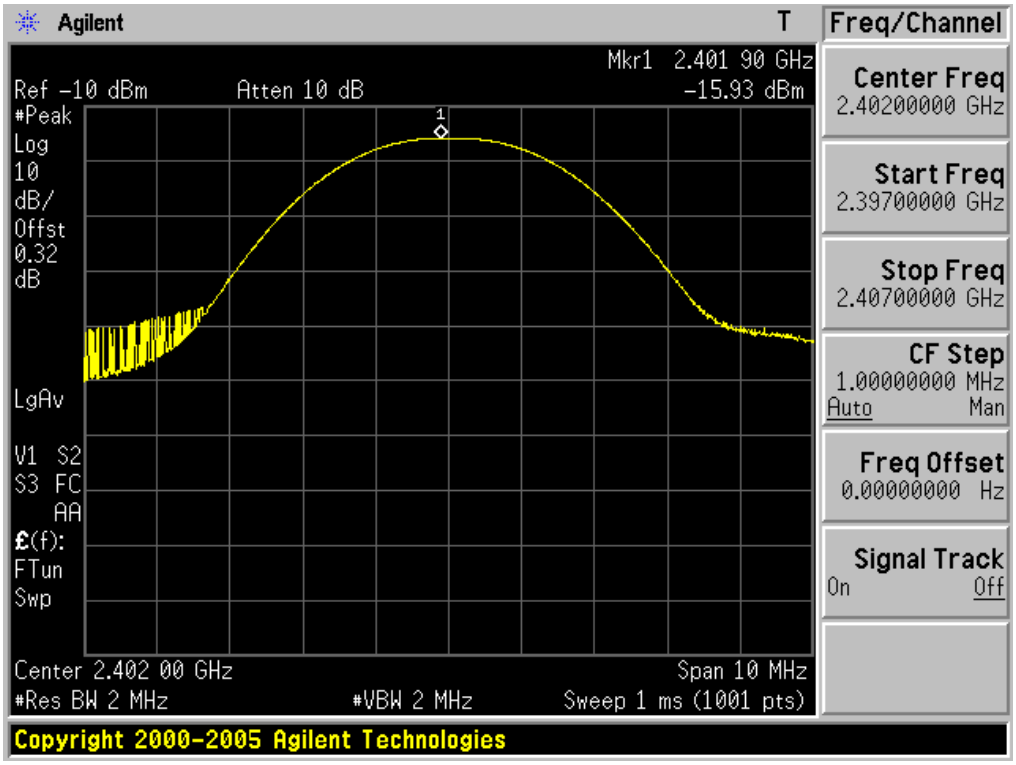
Hopping mode	Data rate	Tested Frequency	Test Results	
			dBm	mW
Disable	1Mbps	Lowest	-15.93	0.026
		Middle	-15.66	0.027
		Highest	**-14.86**	**0.033**

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

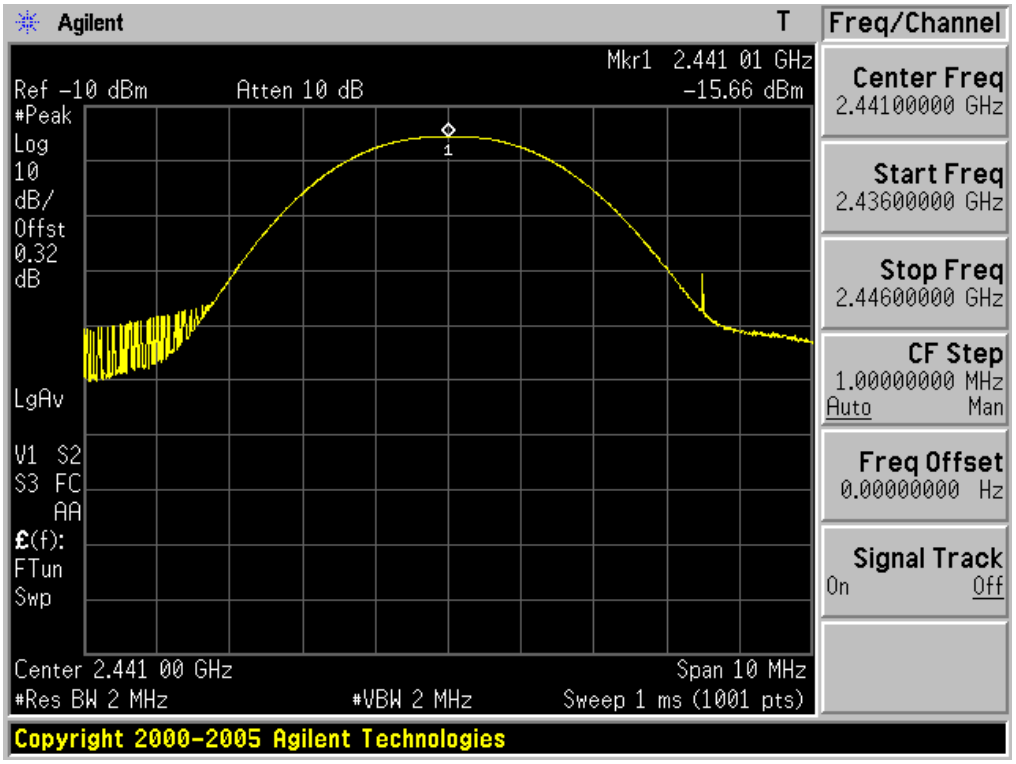
- Minimum Standard:

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**

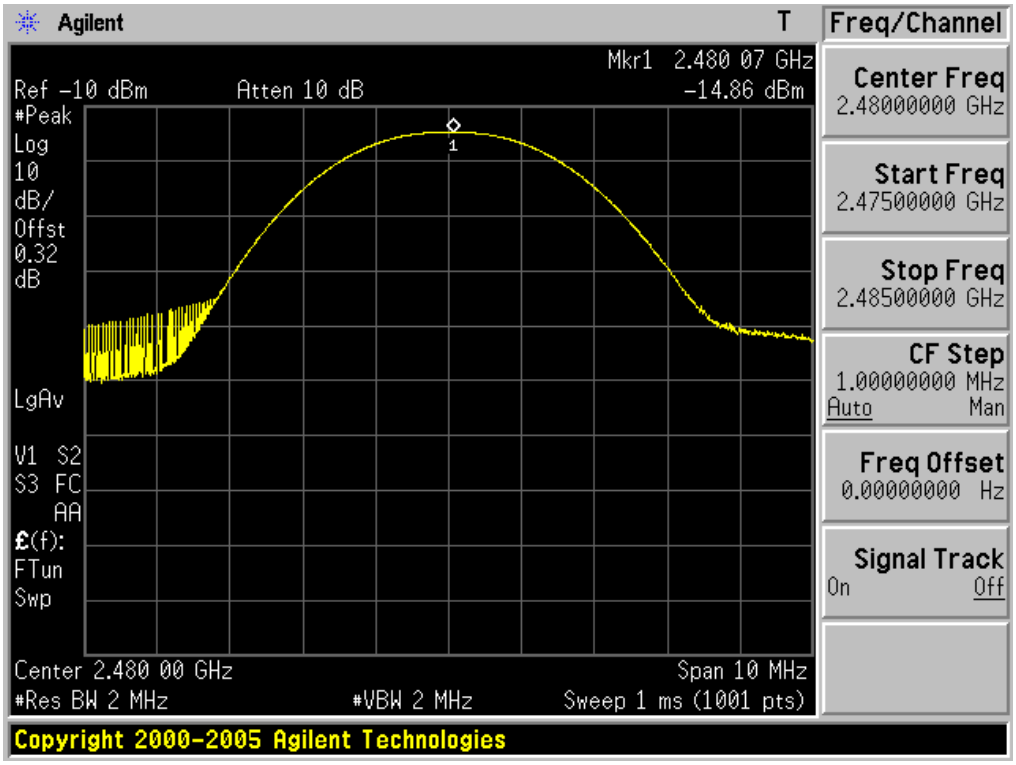
Peak Output Power Lowest Frequency & Data rate: 1Mbps



Peak Output Power Middle Frequency & Data rate: 1Mbps



Peak Output Power Highest Frequency & Data rate: 1Mbps



4.2.6 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 = 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

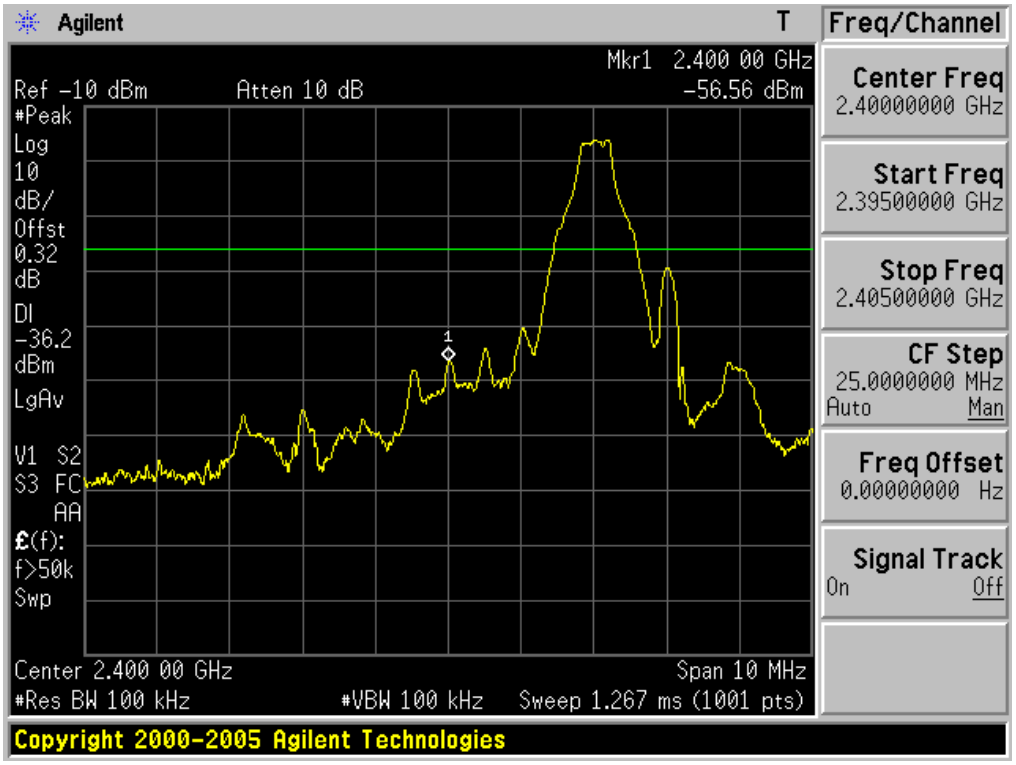
- Measurement Data: Comply

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

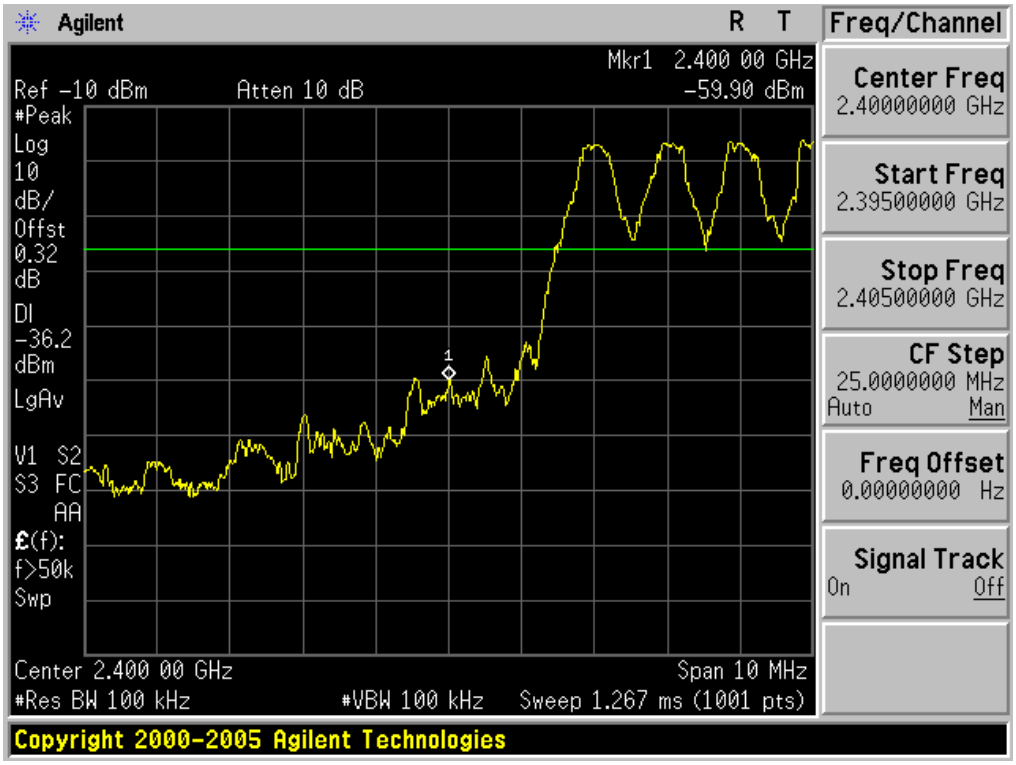
- Minimum Standard:

Minimum Standard:	> 20 dBc

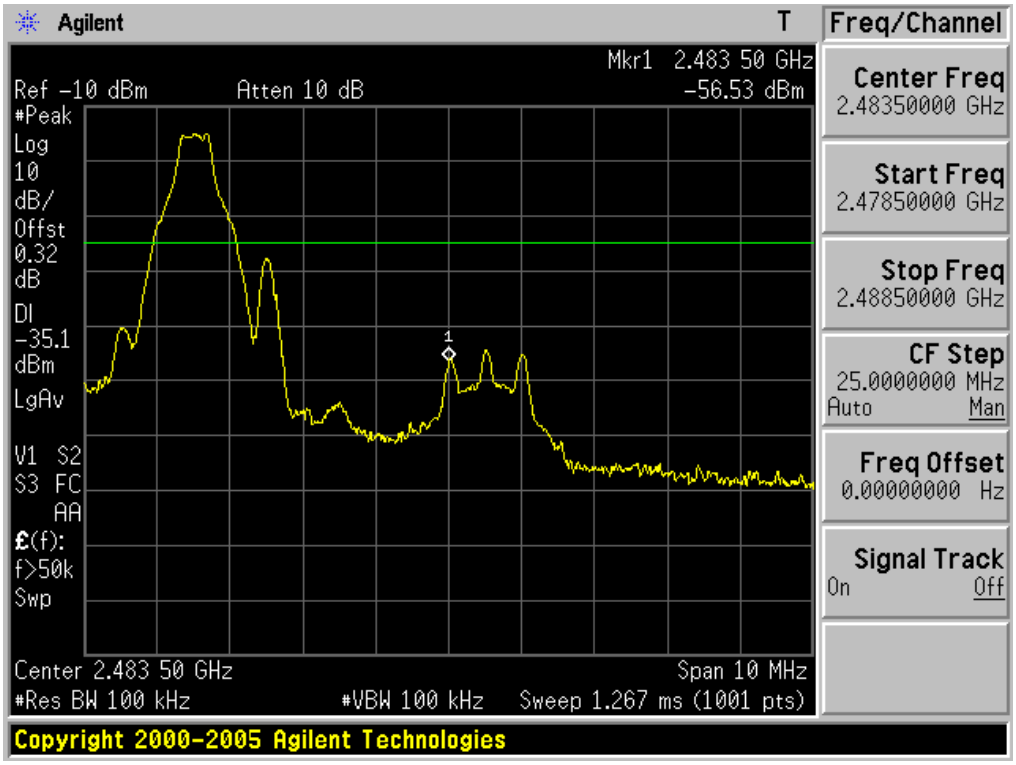
Low Band-edge Hopping mode: Disable & Data rate: 1Mbps



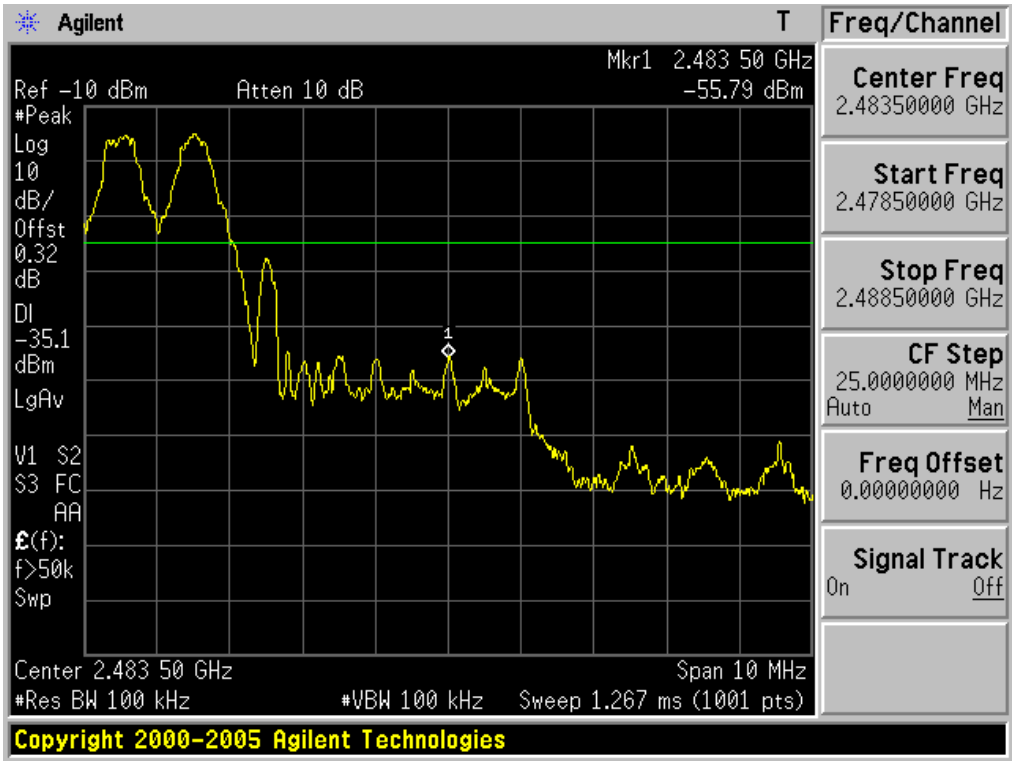
Low Band-edge Hopping mode: Enable & Data rate: 1Mbps



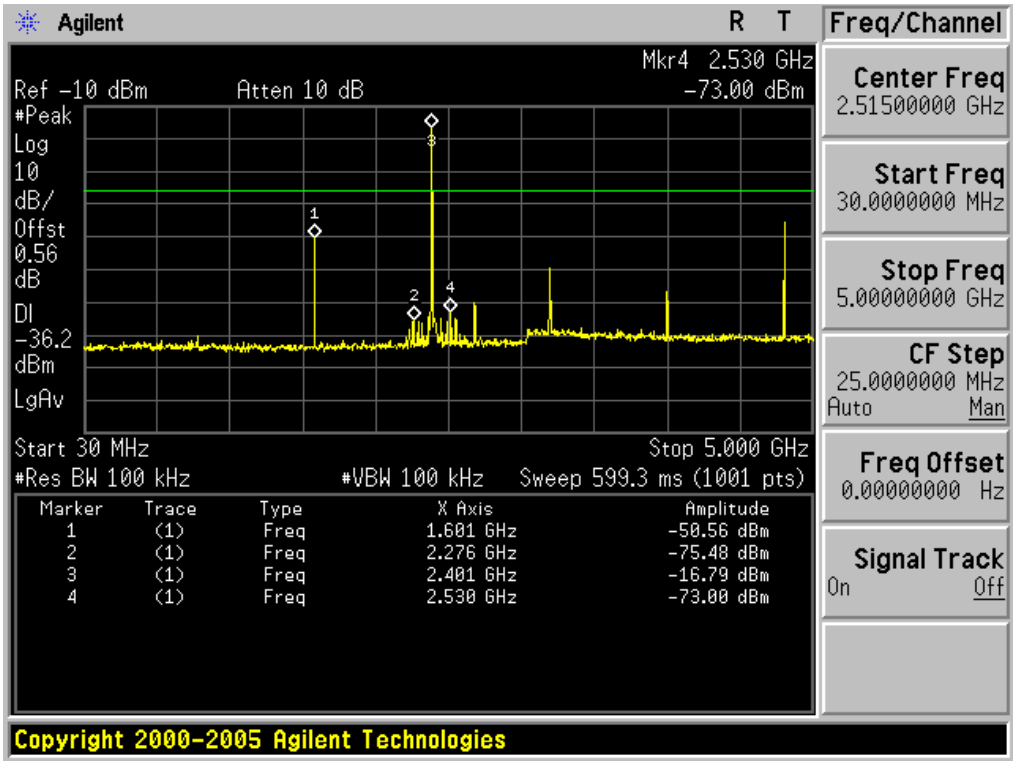
High Band-edge Hopping mode: Disable & Data rate: 1Mbps



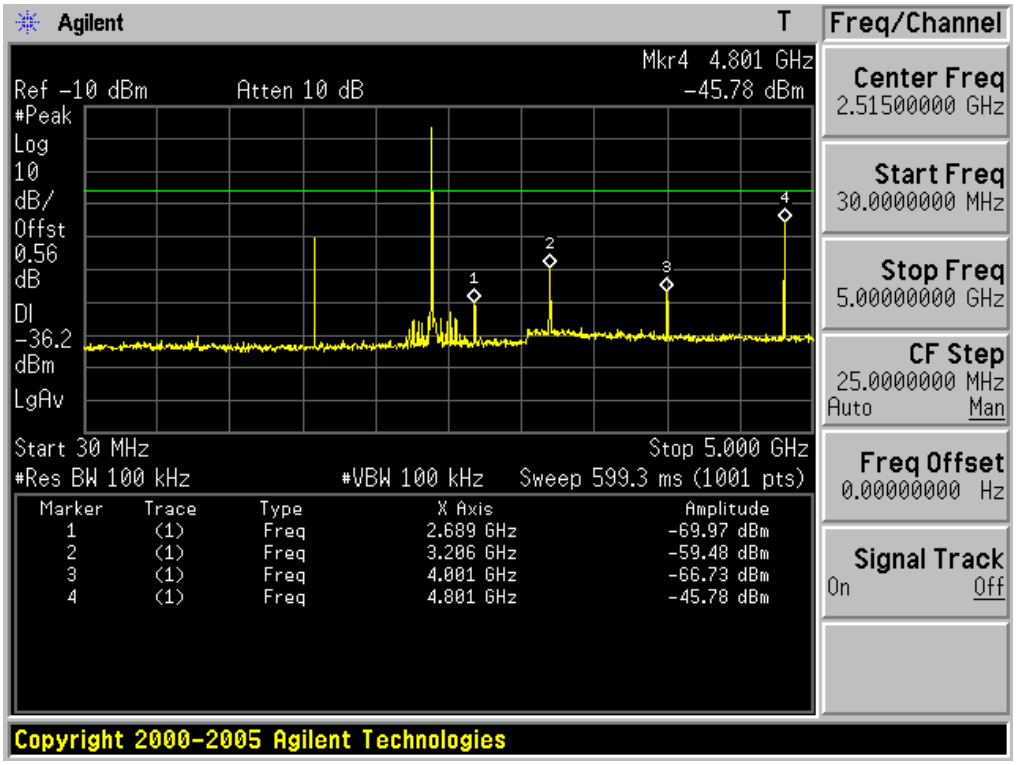
High Band-edge Hopping mode: Enable & Data rate: 1Mbps



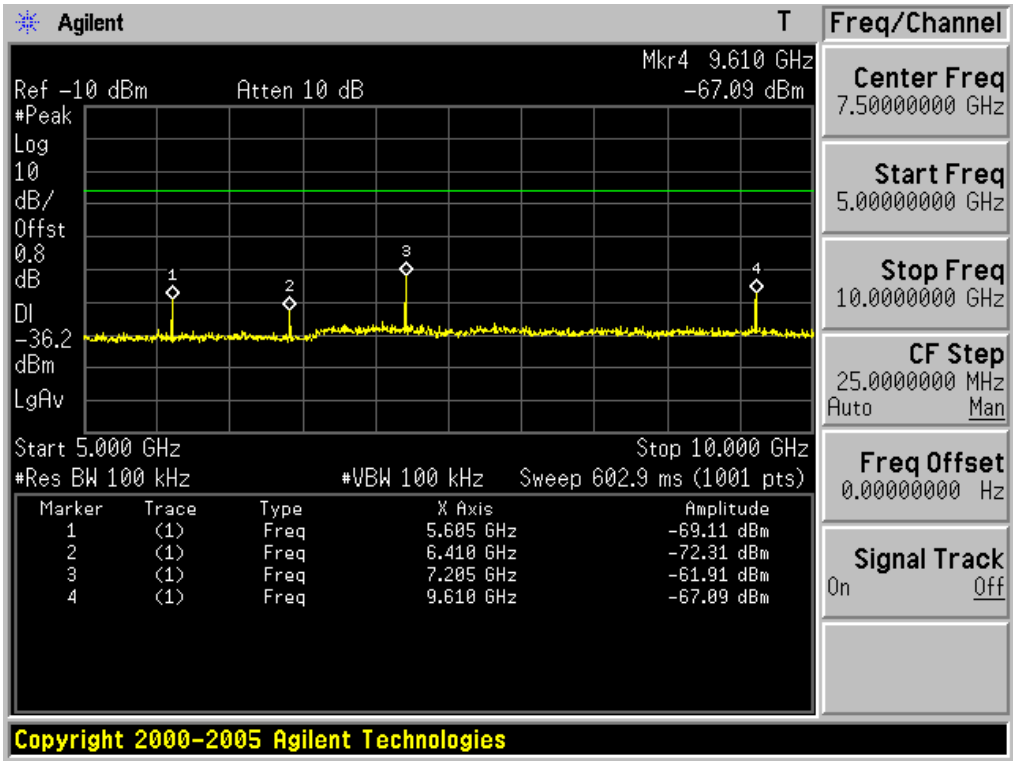
30MHz ~ 5GHz Conducted Spurious Emissions Lowest Frequency & Data rate: 1Mbps



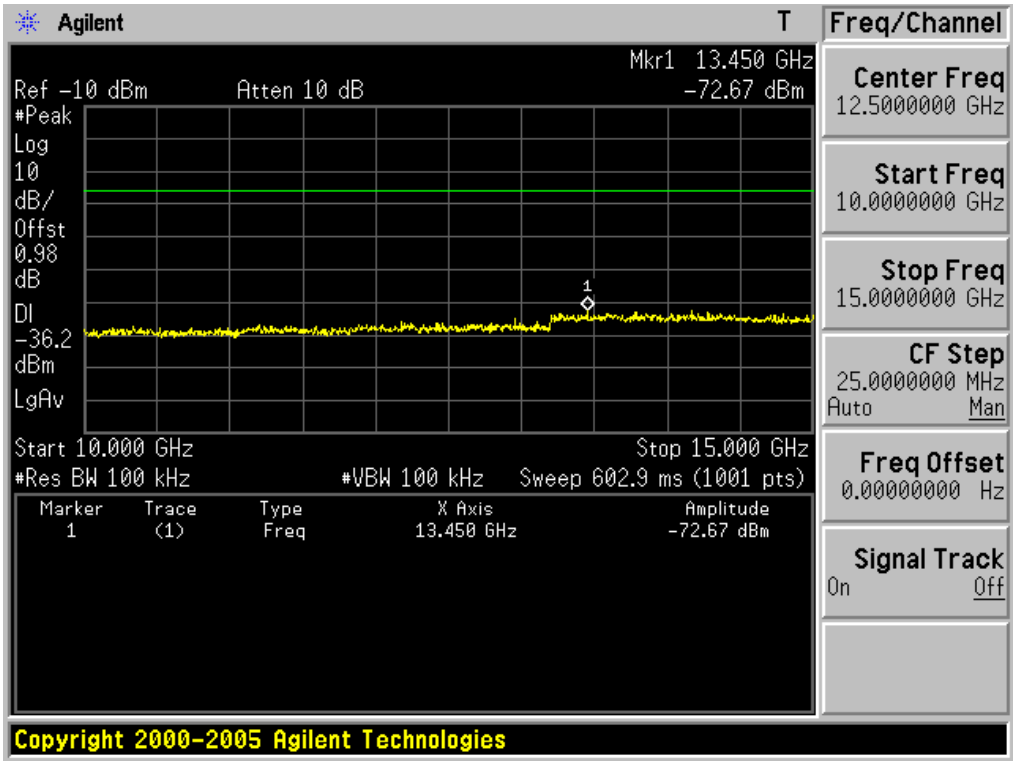
30MHz ~ 5GHz Conducted Spurious Emissions Lowest Frequency & Data rate: 1Mbps



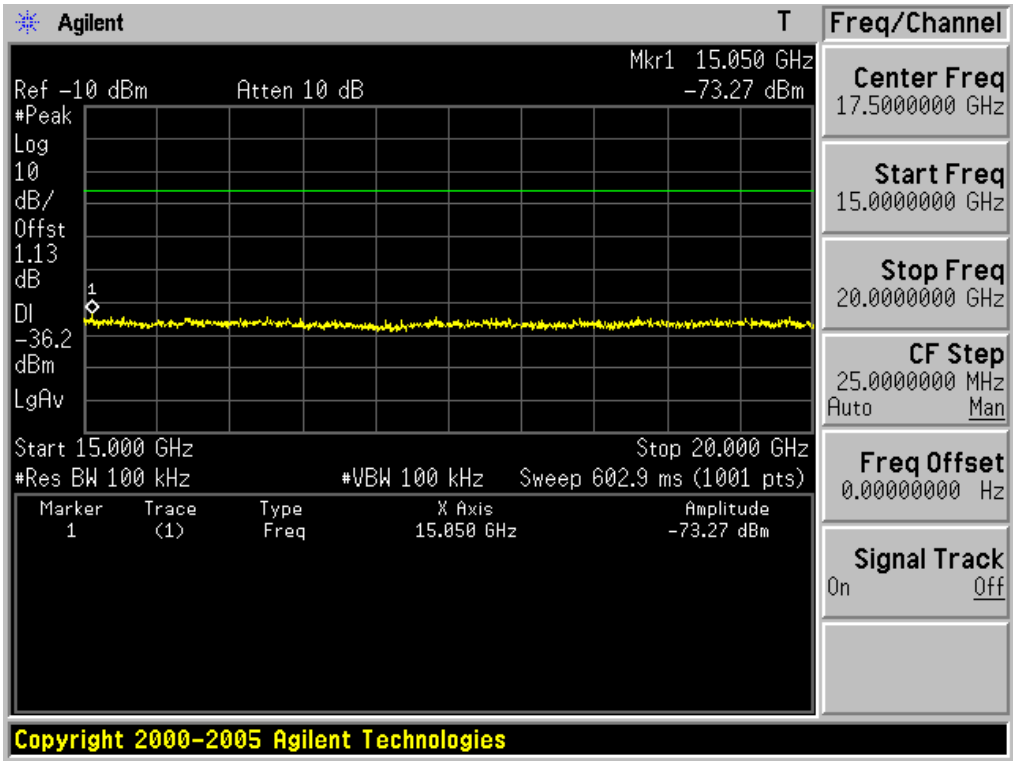
5GHz ~ 10GHz Conducted Spurious Emissions Lowest Frequency & Data rate: 1Mbps



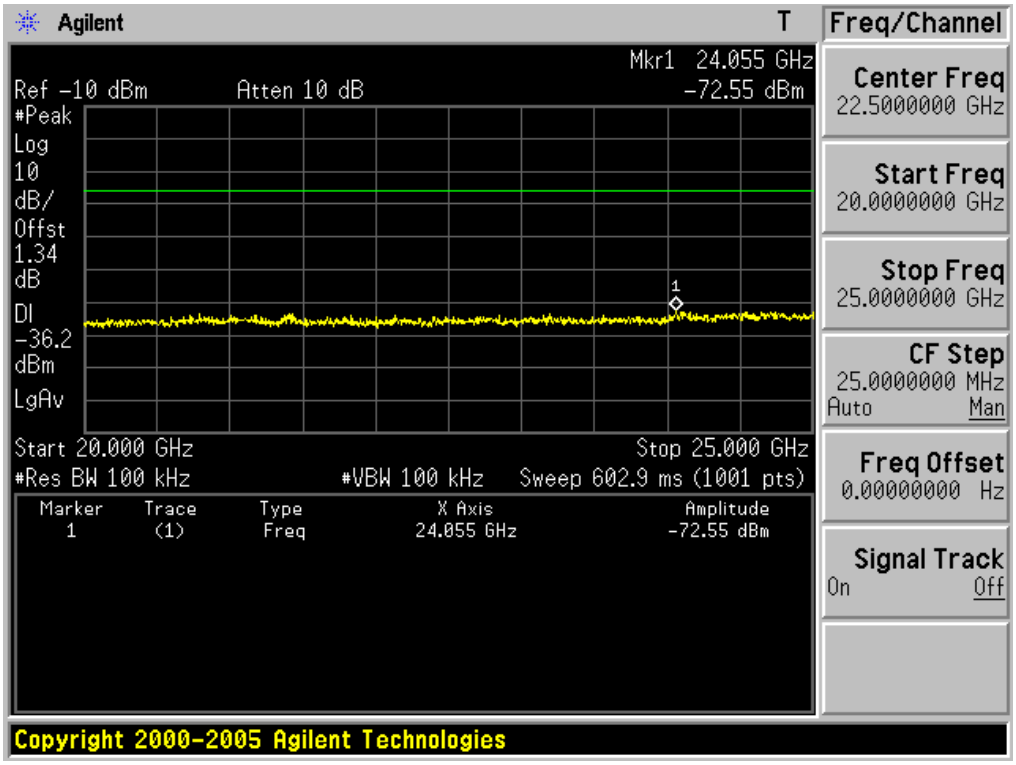
10GHz ~ 15GHz Conducted Spurious Emissions Lowest Frequency & Data rate: 1Mbps



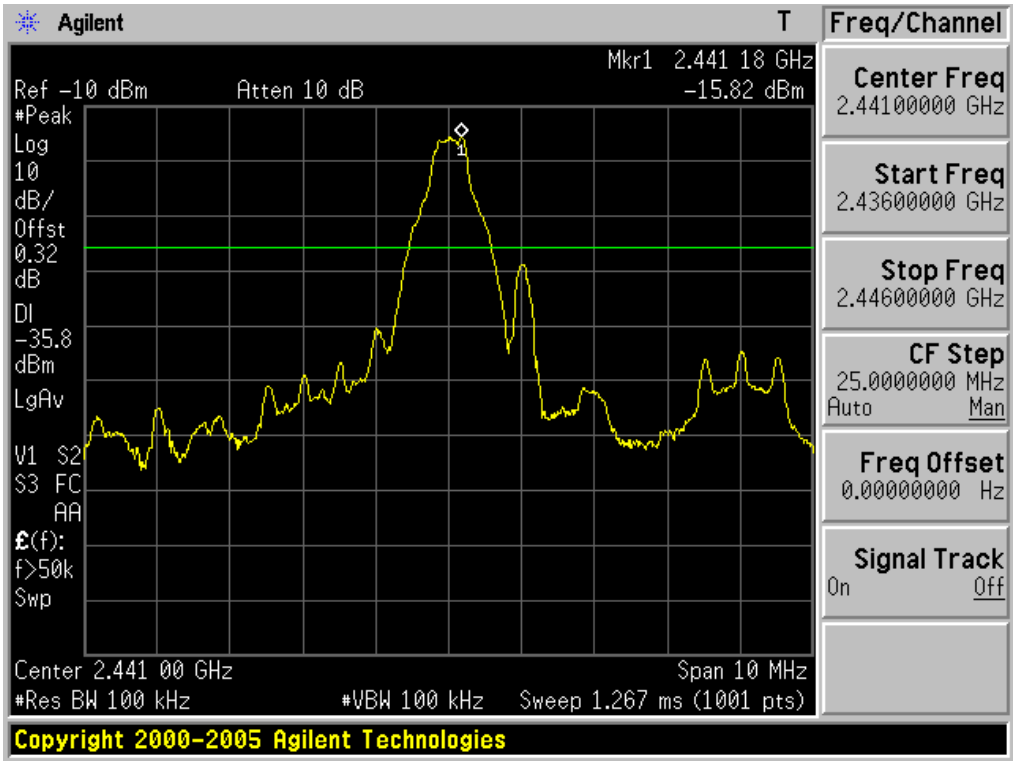
15GHz ~ 20GHz Conducted Spurious Emissions Lowest Frequency & Data rate: 1Mbps



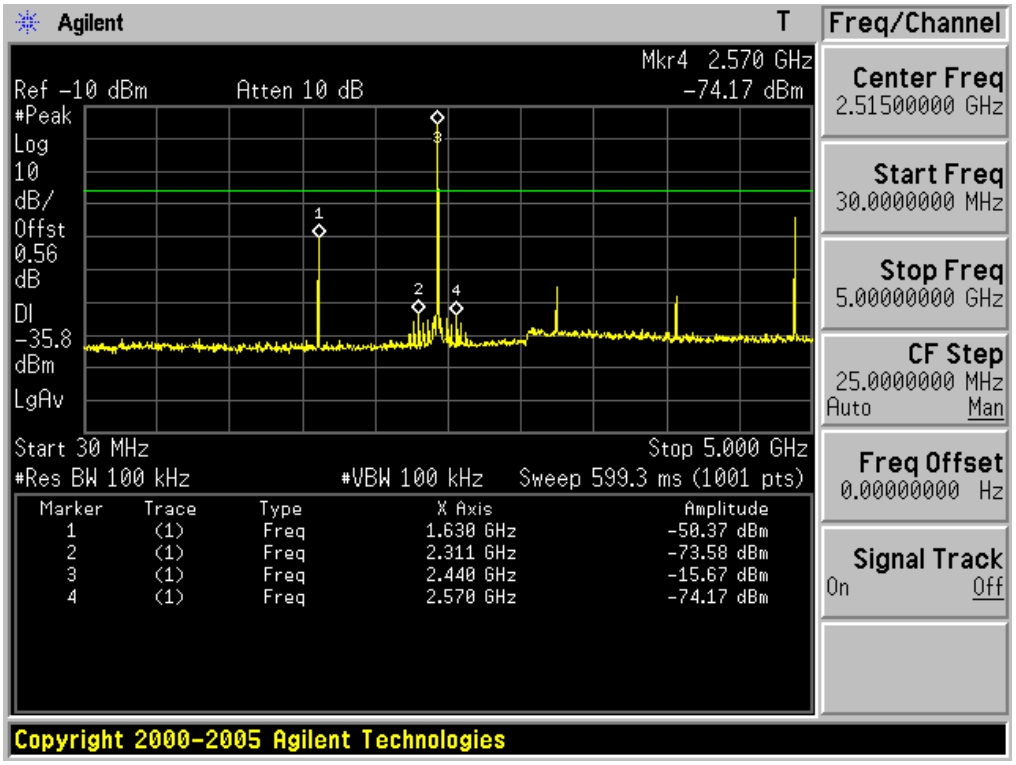
20GHz ~ 25GHz Conducted Spurious Emissions Lowest Frequency & Data rate: 1Mbps



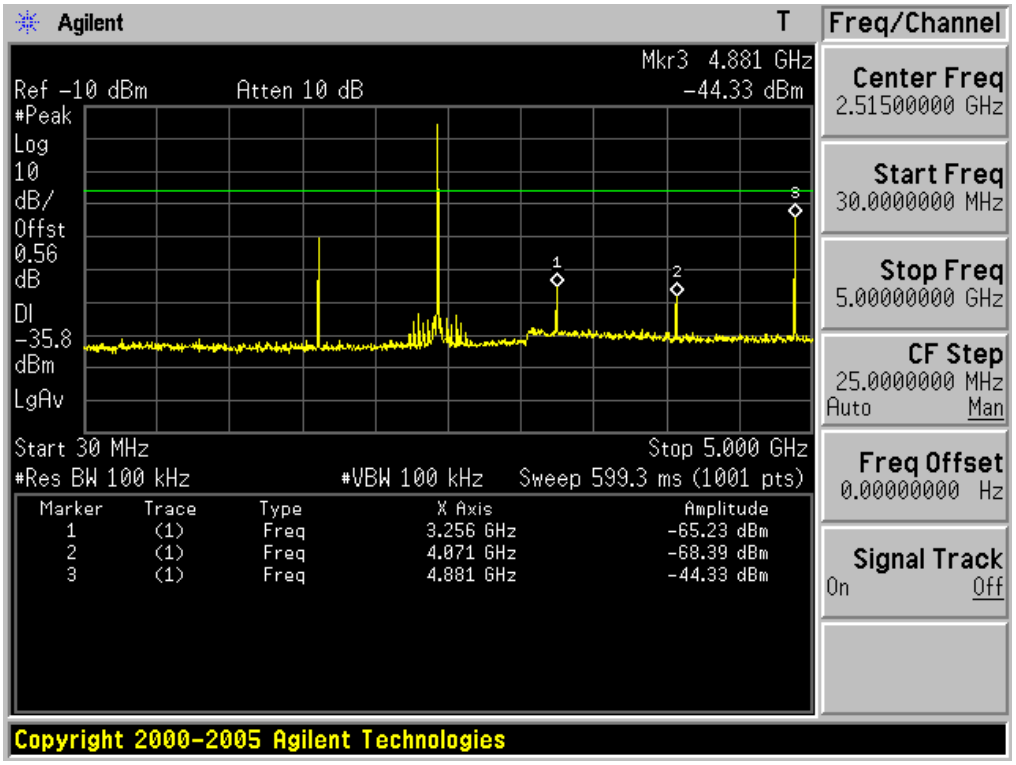
Reference for limit Middle Frequency & Data rate: 1Mbps



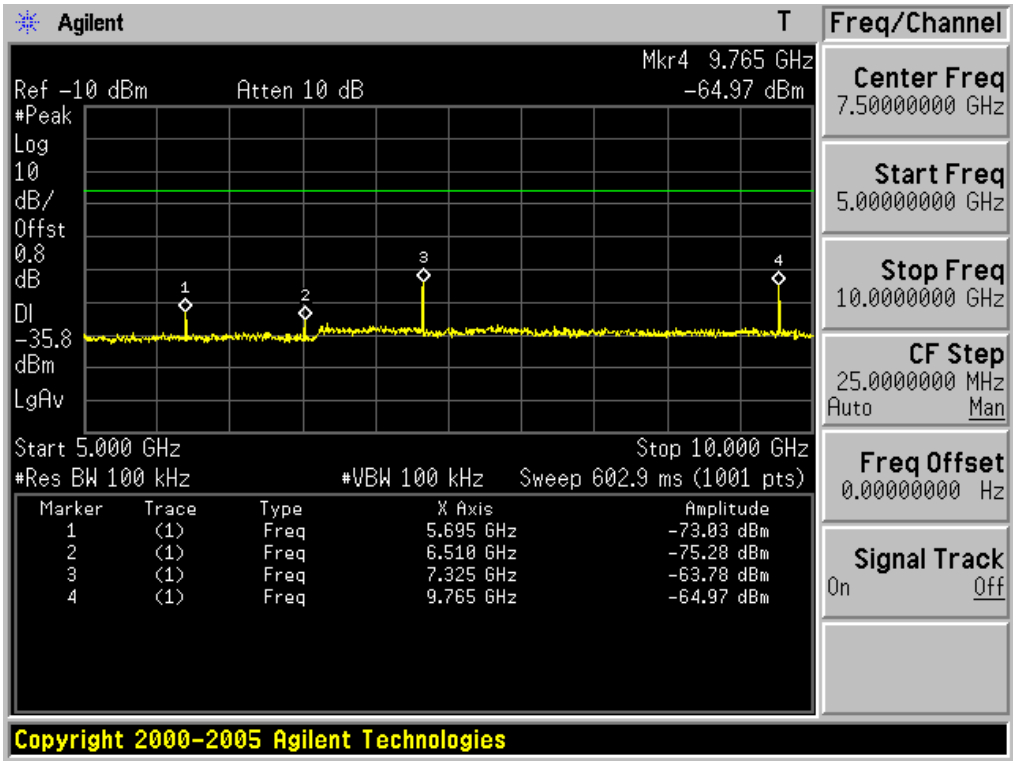
30MHz ~ 5GHz Conducted Spurious Emissions Middle Frequency & Data rate: 1Mbps



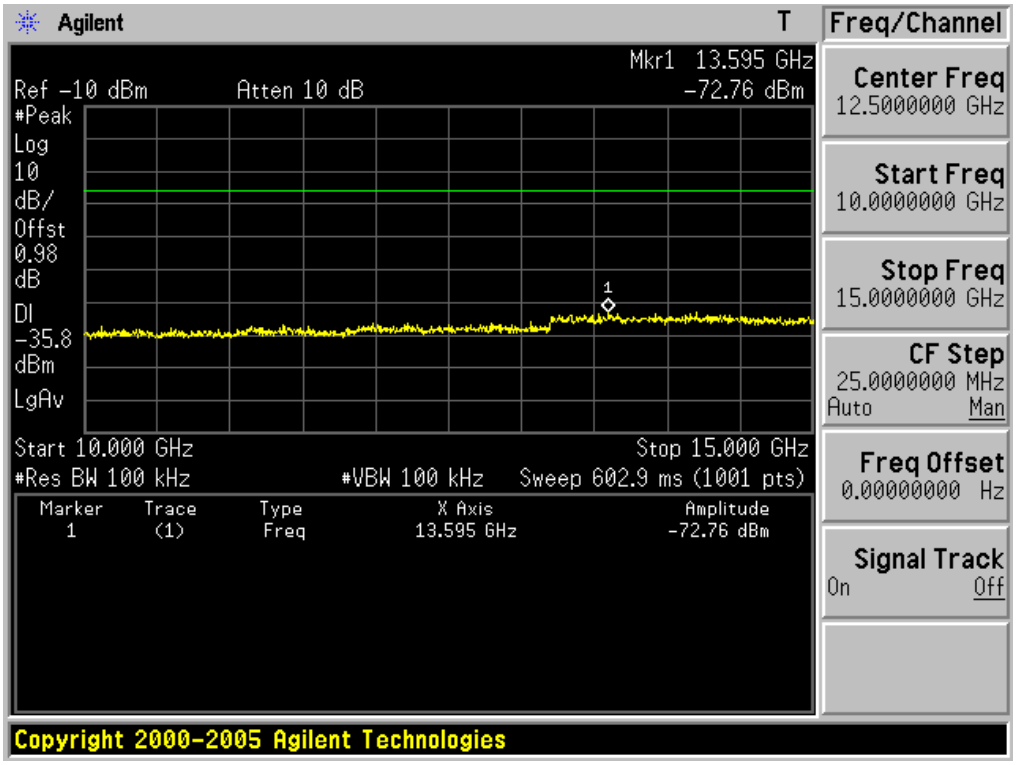
30MHz ~ 5GHz Conducted Spurious Emissions Middle Frequency & Data rate: 1Mbps



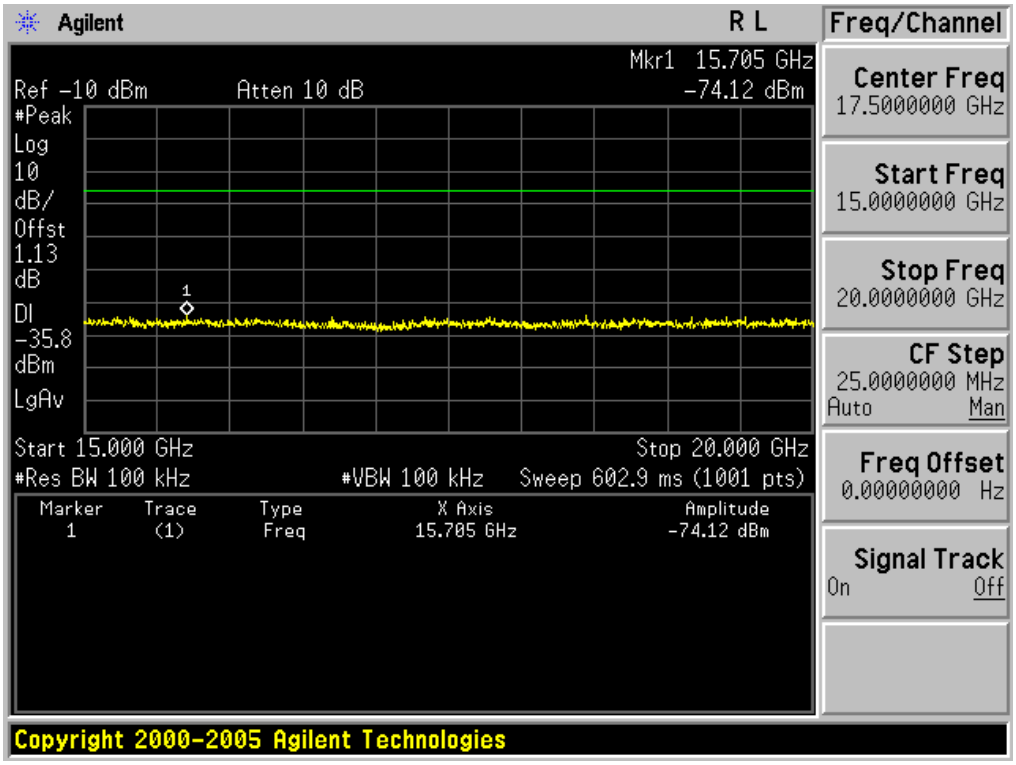
5GHz ~ 10GHz Conducted Spurious Emissions Middle Frequency & Data rate: 1Mbps



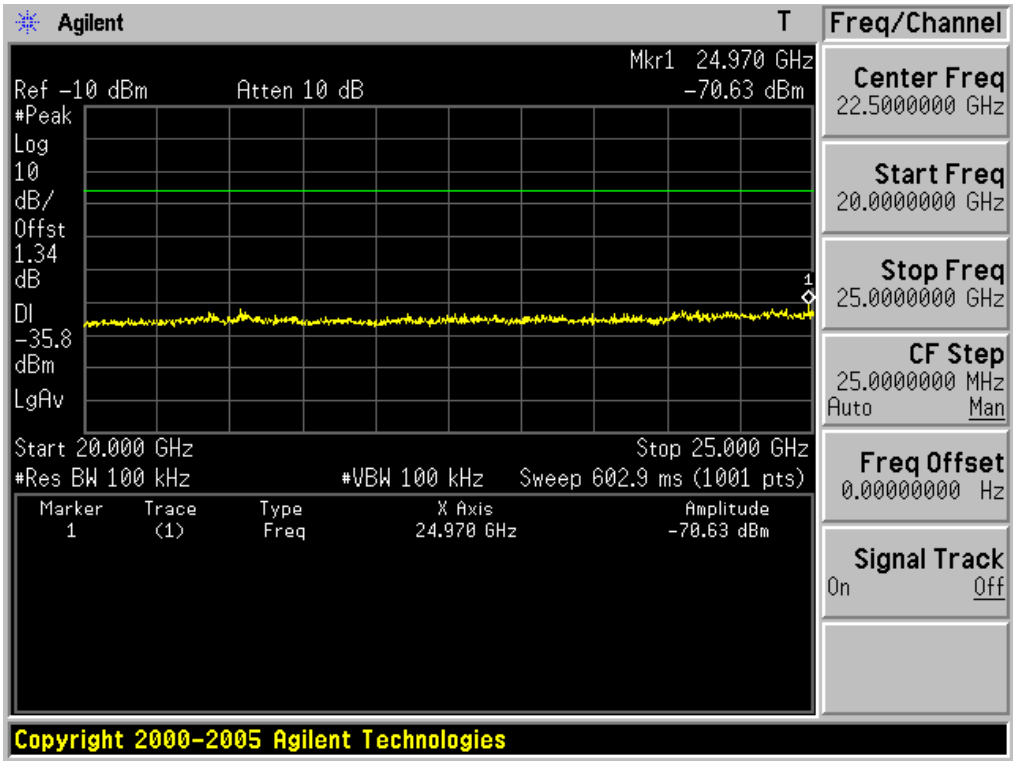
10GHz ~ 15GHz Conducted Spurious Emissions Middle Frequency & Data rate: 1Mbps



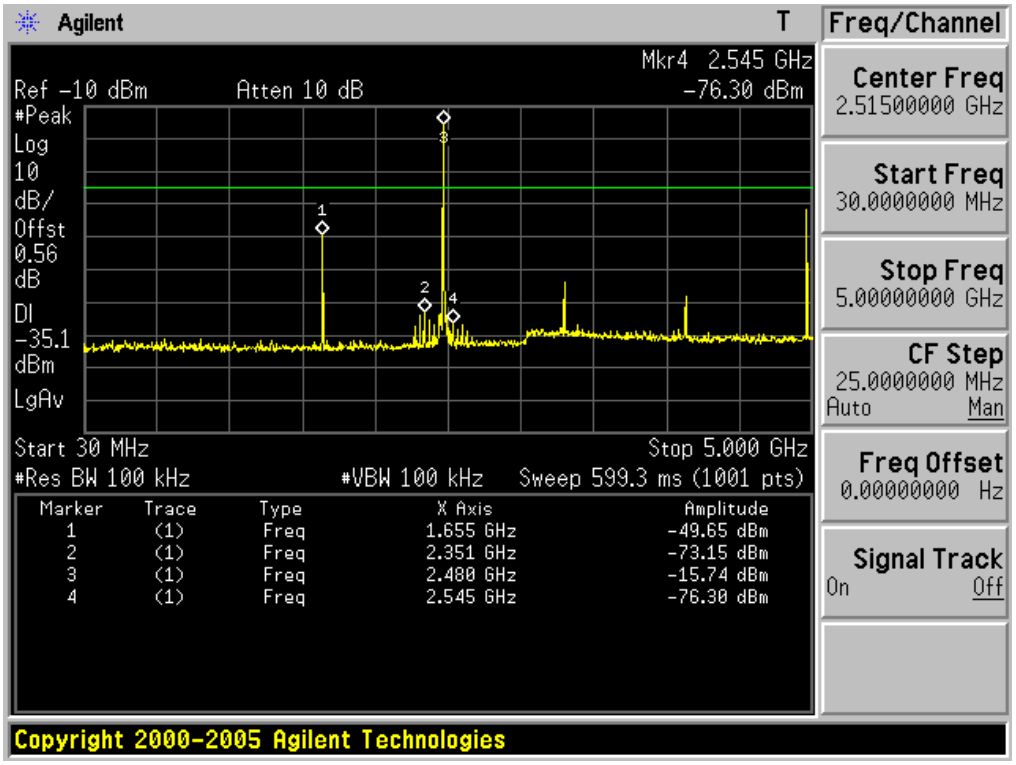
15GHz ~ 20GHz Conducted Spurious Emissions Middle Frequency & Data rate: 1Mbps



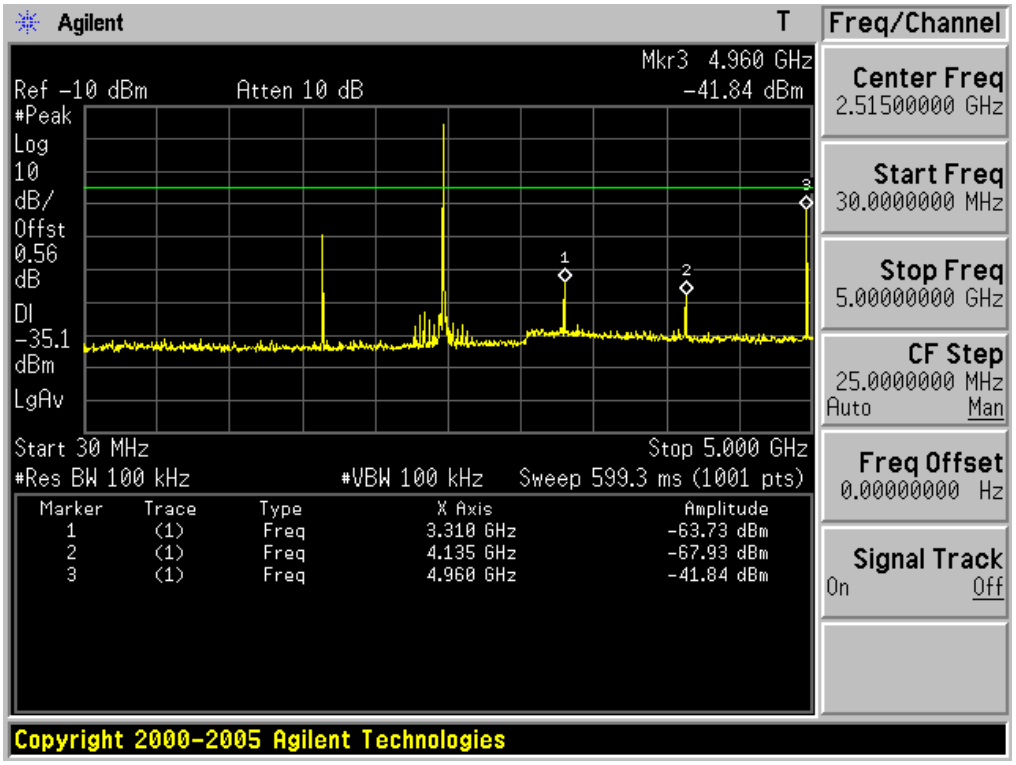
20GHz ~ 25GHz Conducted Spurious Emissions Middle Frequency & Data rate: 1Mbps



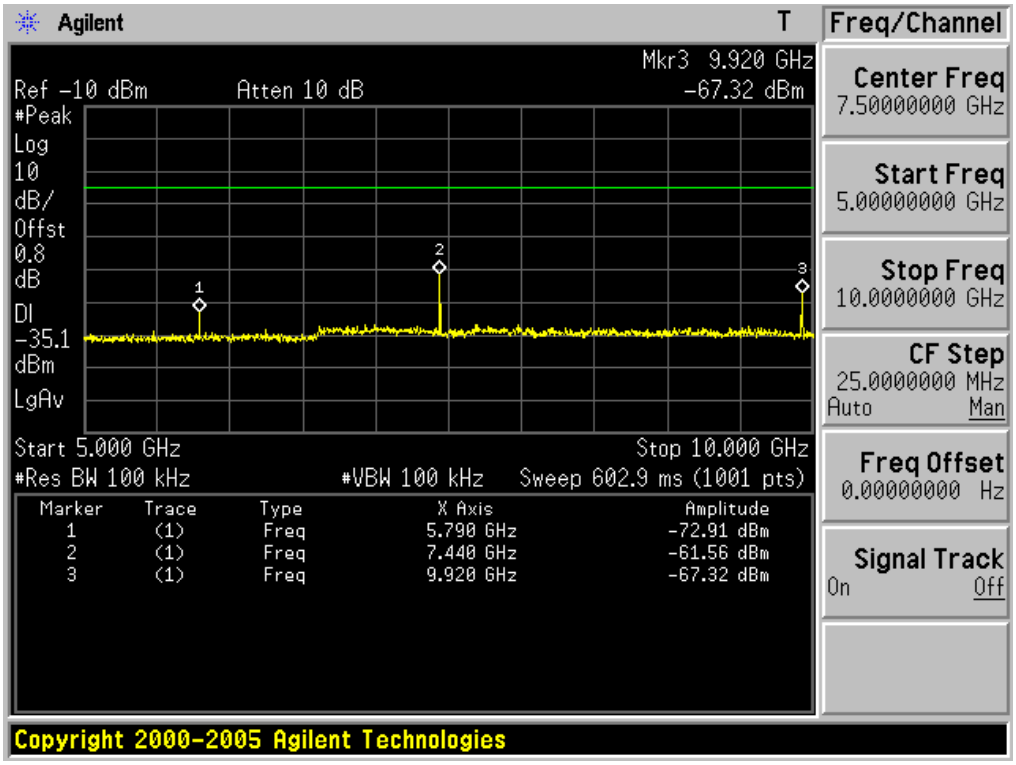
30MHz ~ 5GHz Conducted Spurious Emissions Highest Frequency & Data rate: 1Mbps



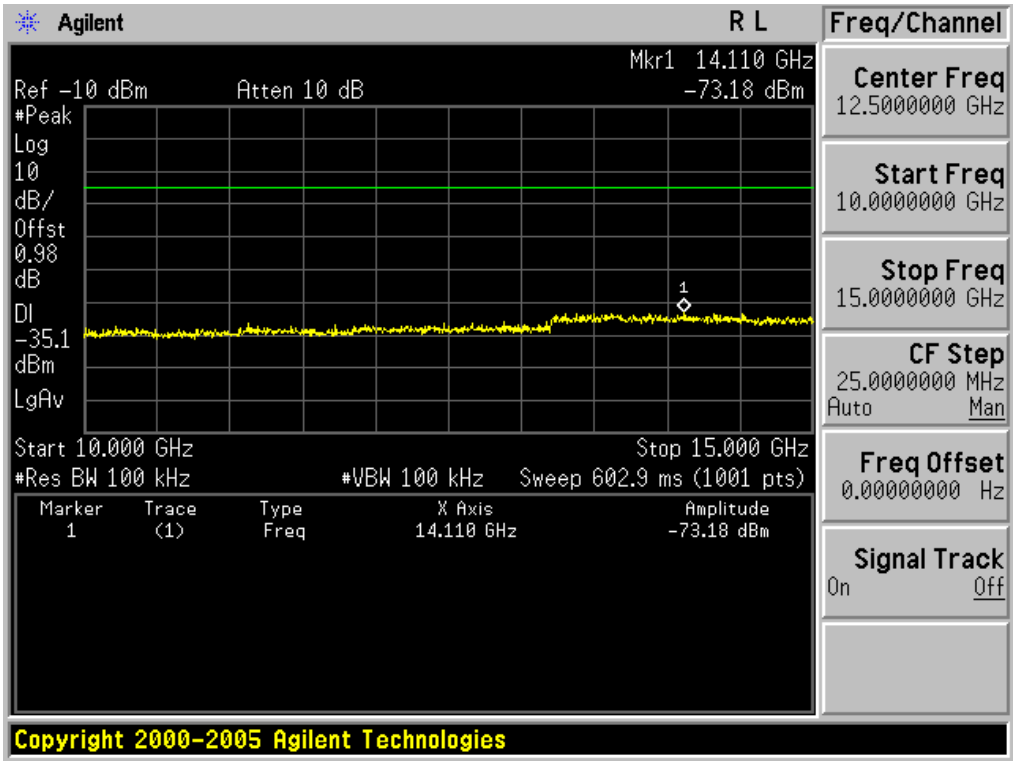
30MHz ~ 5GHz Conducted Spurious Emissions Highest Frequency & Data rate: 1Mbps



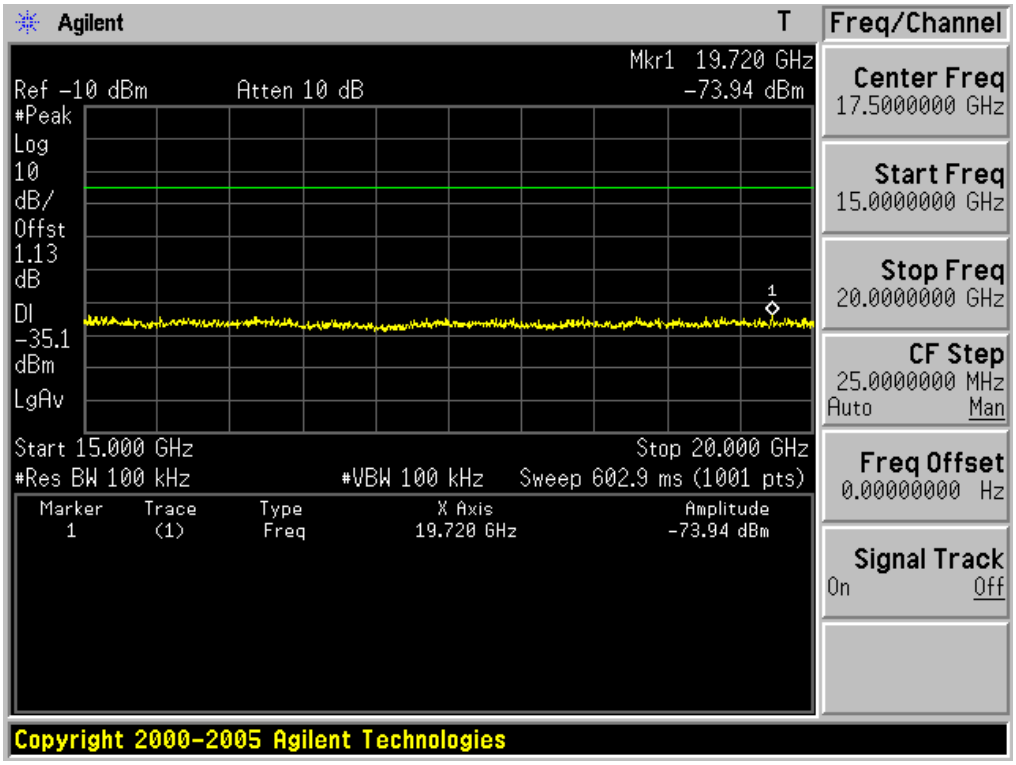
5GHz ~ 10GHz Conducted Spurious Emissions Highest Frequency & Data rate: 1Mbps



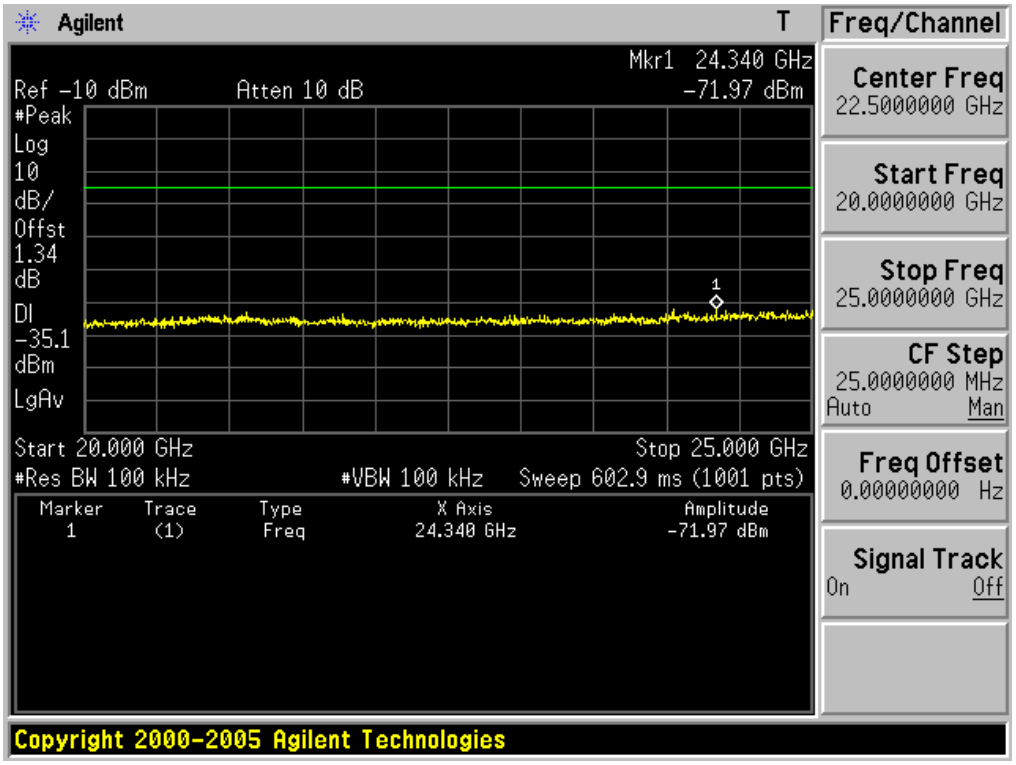
10GHz ~ 15GHz Conducted Spurious Emissions Highest Frequency & Data rate: 1Mbps



15GHz ~ 20GHz Conducted Spurious Emissions Highest Frequency & Data rate: 1Mbps



20GHz ~ 25GHz Conducted Spurious Emissions Highest Frequency & Data rate: 1Mbps



4.2.7 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: See next pages for actual measured spectrum plots and data.
Note 2: This test item was performed in all test cases.
And the worst data(Test case 2) were reported.

- Minimum Standard:

▪ FCC Part 15.209(a) and (b)

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

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

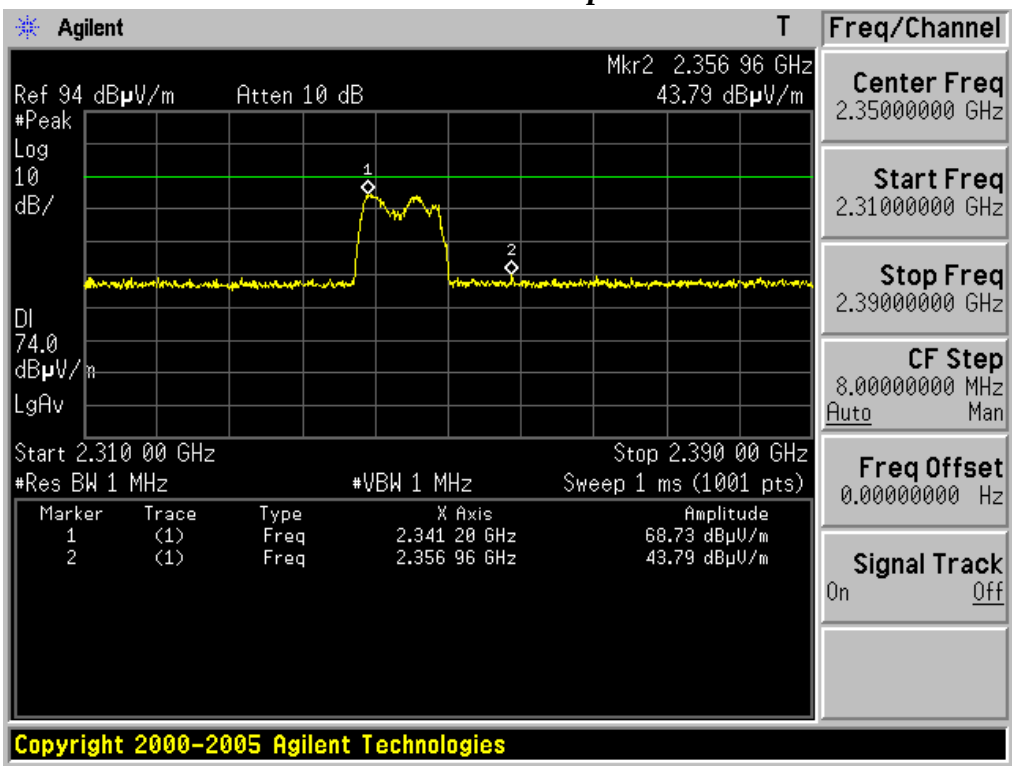
▪ FCC Part 15.205 (a): Only spurious emissions are permitted in any of the frequency bands listed below:

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

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

Restricted Band Edge Lowest Frequency & Data rate: 1Mbps & Test case 2

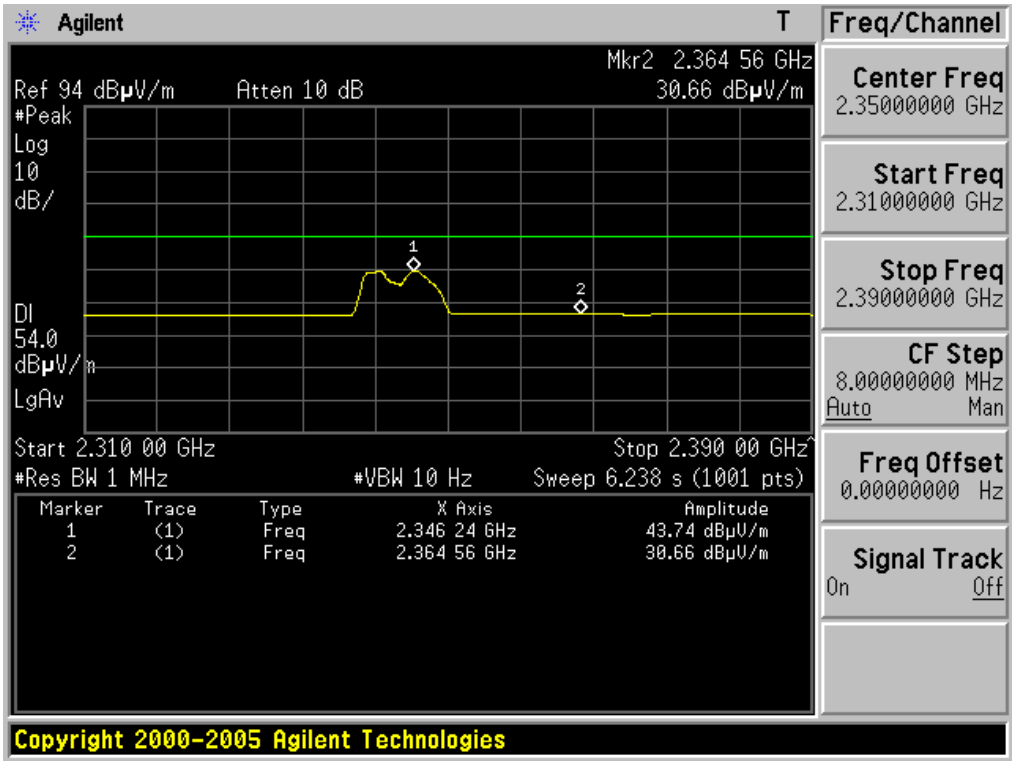
Peak mode / Horizontal polarization



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

Restricted Band Edge Lowest Frequency & Data rate: 1Mbps & Test case 2

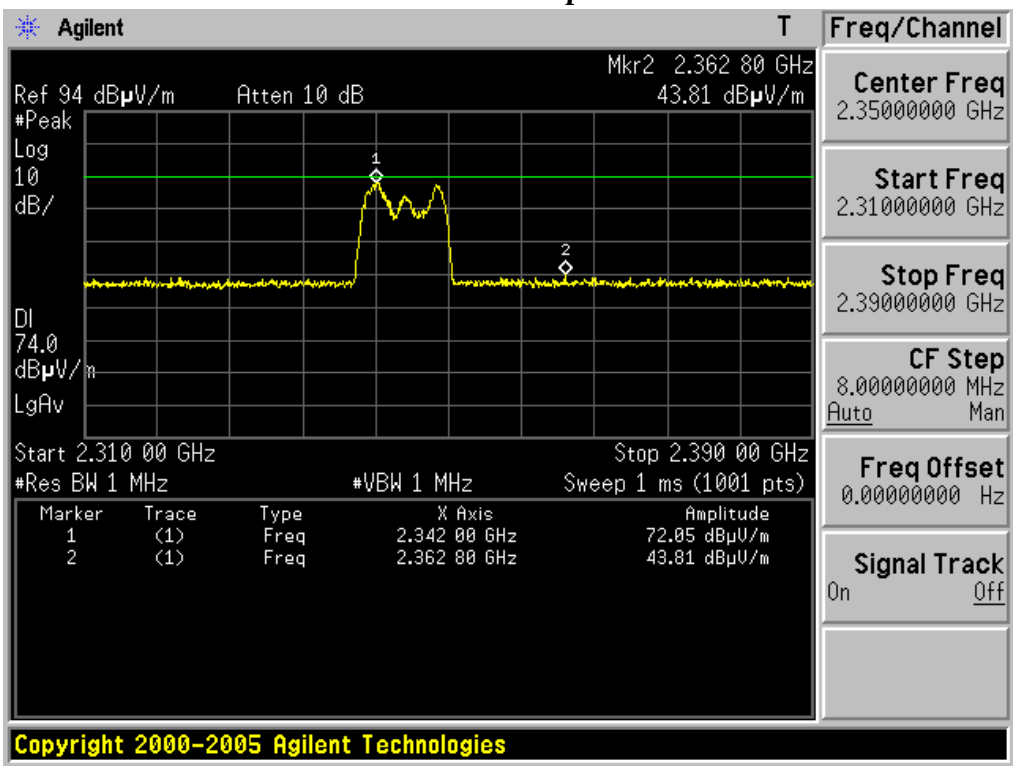
Average mode / Horizontal polarization



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

Restricted Band Edge Lowest Frequency & Data rate: 1Mbps & Test case 2

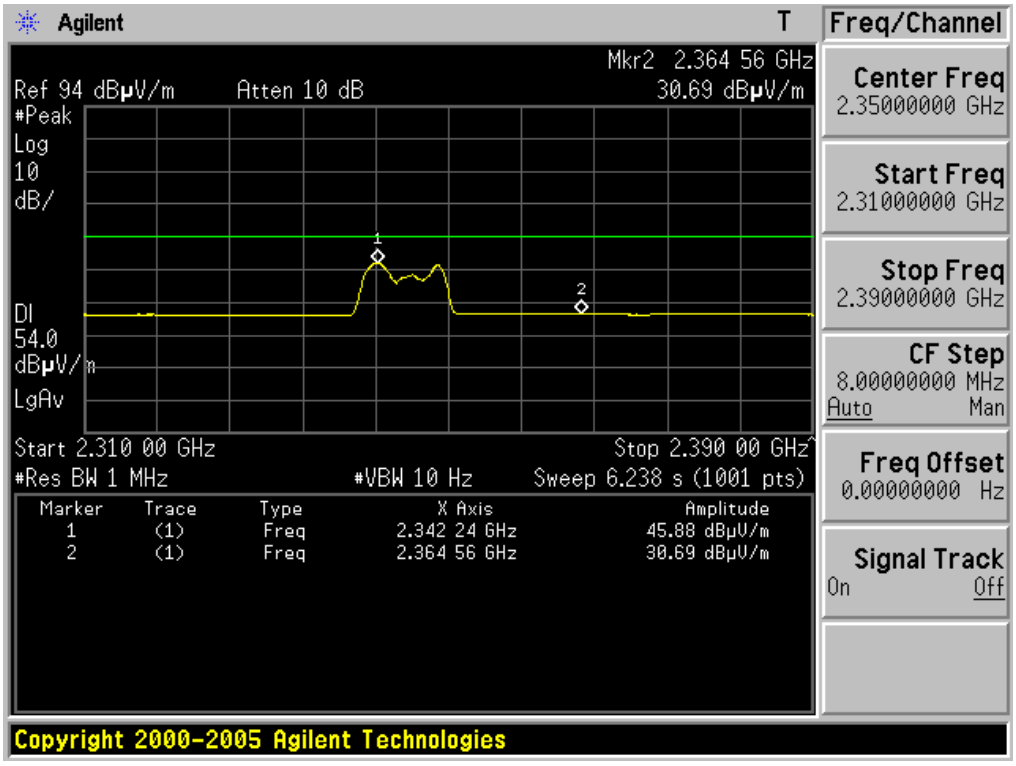
Peak mode / Vertical polarization



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

Restricted Band Edge Lowest Frequency & Data rate: 1Mbps & Test case 2

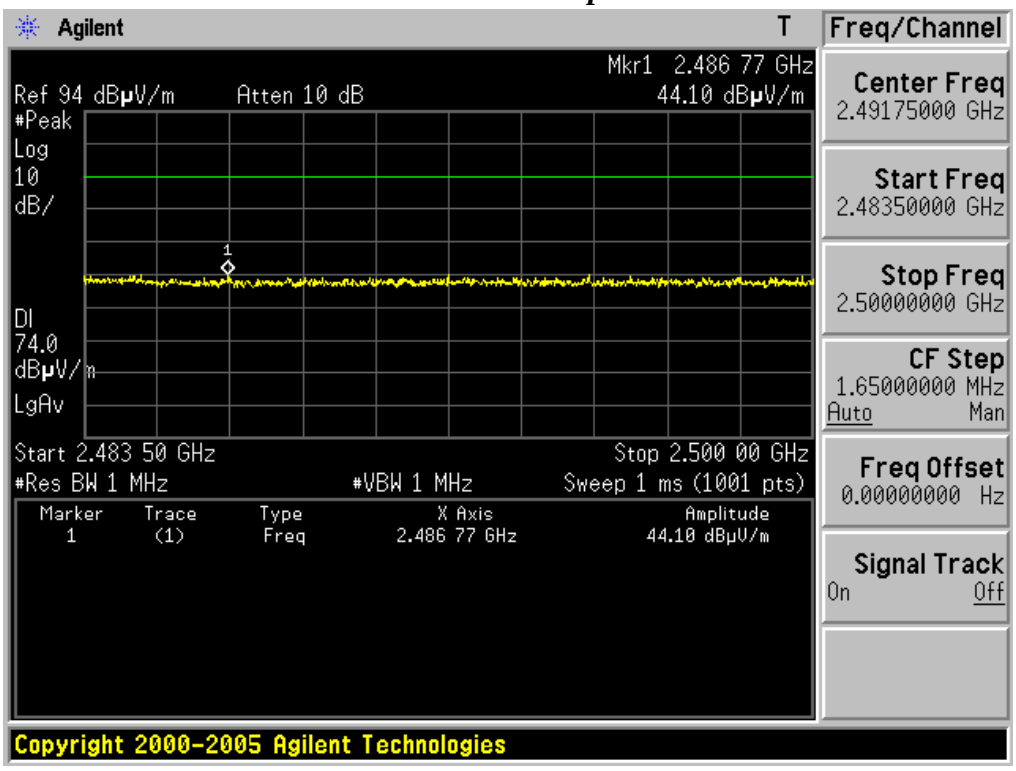
Average mode / Vertical polarization



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

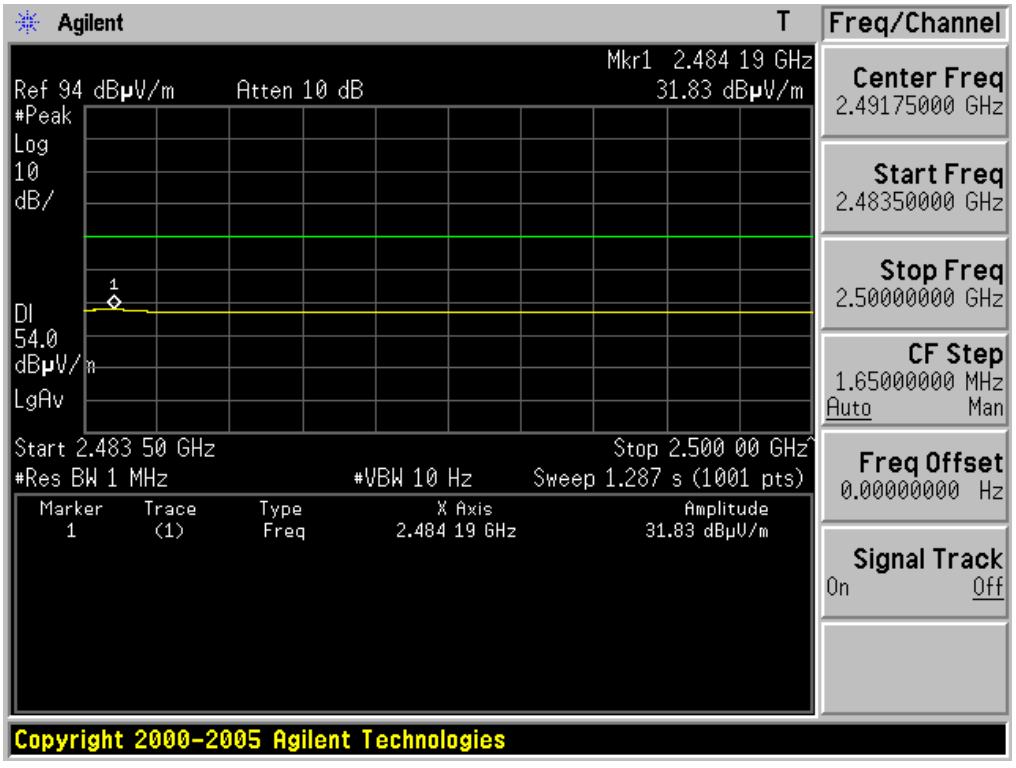
Restricted Band Edge Highest Frequency & Data rate: 1Mbps & Test case 2

Peak mode / Horizontal polarization



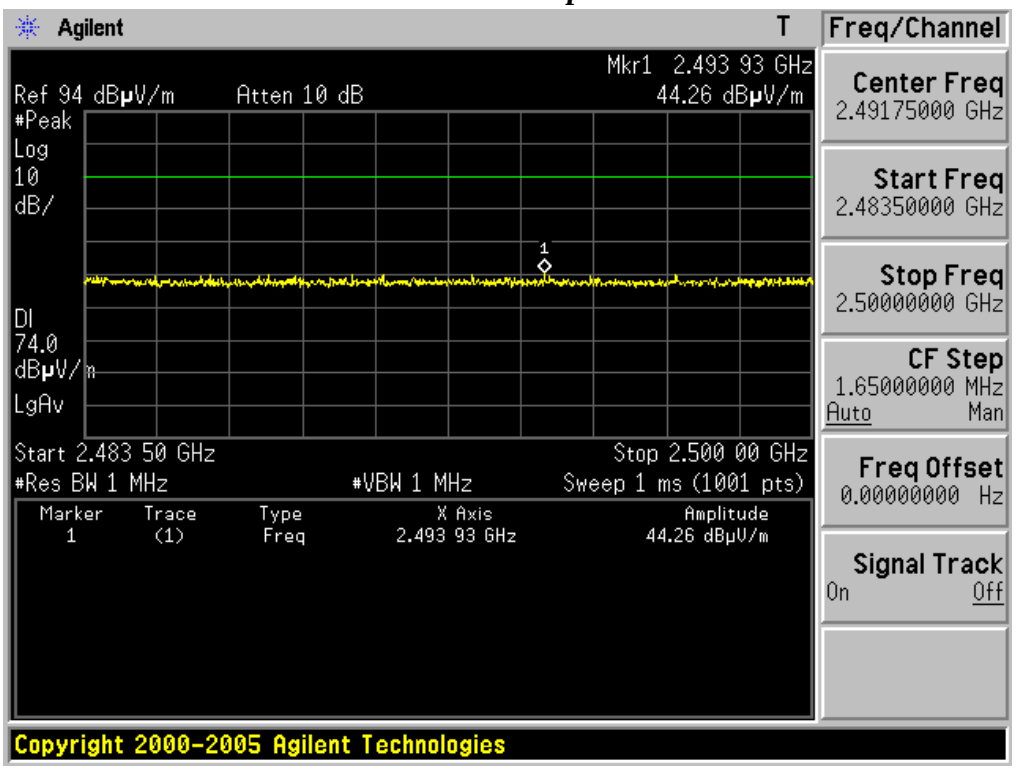
Restricted Band Edge Highest Frequency & Data rate: 1Mbps & Test case 2

Average mode / Horizontal polarization



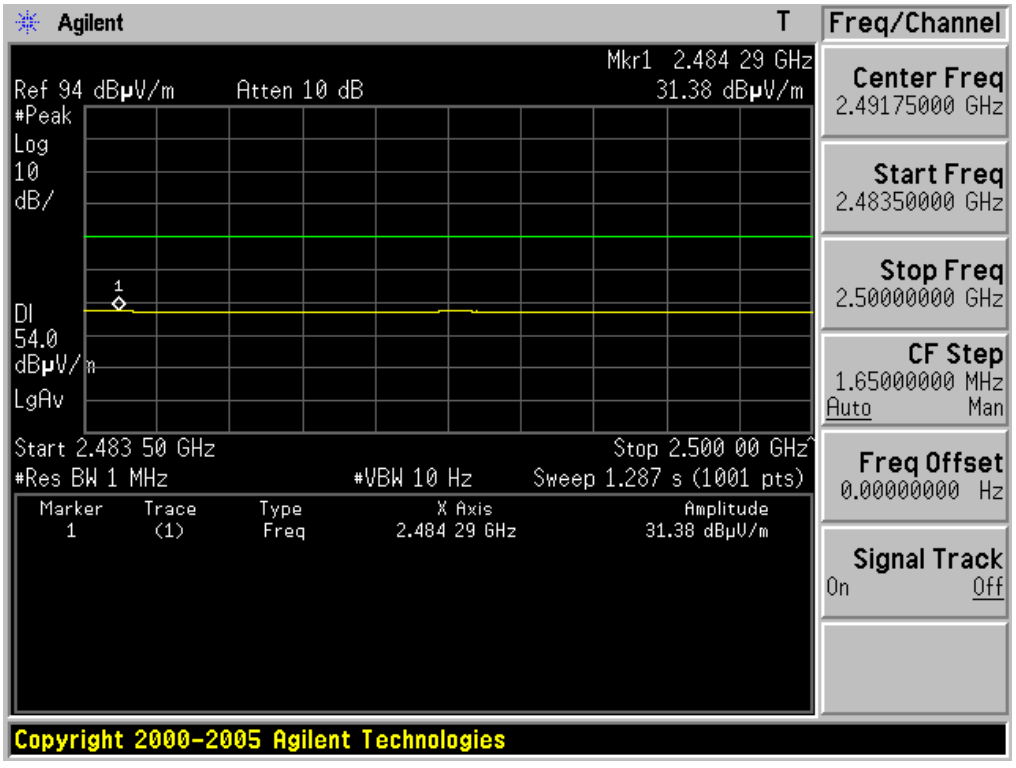
Restricted Band Edge Highest Frequency & Data rate: 1Mbps & Test case 2

Peak mode / Vertical polarization



Restricted Band Edge Highest Frequency & Data rate: 1Mbps & Test case 2

Average mode / Vertical polarization



30MHz ~ 1GHz Radiated Spurious Emissions

▪ Lowest Frequency & Data rate: 1Mbps

Frequency (MHz)	ANT Pol	Reading(dBuV)	T.F (dB)	Result(dBuV/m)	Limit(dBuV/m)	Margin(dB)
		QP		QP	QP	QP
199.594	V	47.0	-10.0	37.0	43.5	6.5
211.564	H	40.3	-9.4	30.9	43.5	12.6
214.858	V	44.9	-9.3	35.6	43.5	7.9
224.678	V	42.5	-8.9	33.6	46.0	12.4
239.936	V	38.8	-8.1	30.7	46.0	15.3
301.010	H	37.3	-6.4	30.9	46.0	15.1
354.422	H	46.7	-5.5	41.2	46.0	4.8
356.623	V	41.1	-5.4	35.7	46.0	10.3
371.907	H	42.7	-5.0	37.7	46.0	8.3
372.455	V	34.6	-5.0	29.6	46.0	16.4

▪ Middle Frequency & Data rate: 1Mbps

Frequency (MHz)	ANT Pol	Reading(dBuV)	T.F (dB)	Result(dBuV/m)	Limit(dBuV/m)	Margin(dB)
		QP		QP	QP	QP
199.605	V	47.5	-10.0	37.5	43.5	6.0
211.558	H	40.8	-9.4	31.4	43.5	12.1
214.886	V	44.8	-9.3	35.5	43.5	8.0
224.597	V	42.8	-8.9	33.9	46.0	12.1
239.945	V	40.0	-8.1	31.9	46.0	14.1
301.116	H	37.1	-6.4	30.7	46.0	15.3
354.382	H	46.4	-5.5	40.9	46.0	5.1
356.658	V	41.6	-5.4	36.2	46.0	9.8
371.850	H	42.9	-5.0	37.9	46.0	8.1
372.554	V	34.9	-5.0	29.9	46.0	16.1

▪ Highest Frequency & Data rate: 1Mbps

Frequency (MHz)	ANT Pol	Reading(dBuV)	T.F (dB)	Result(dBuV/m)	Limit(dBuV/m)	Margin(dB)
		QP		QP	QP	QP
198.987	V	47.9	-10.0	37.9	43.5	5.6
211.610	H	41.0	-9.4	31.6	43.5	11.9
214.377	V	44.0	-9.3	34.7	43.5	8.8
223.887	V	42.5	-8.9	33.6	46.0	12.4
240.005	V	39.7	-8.1	31.6	46.0	14.4
301.016	H	36.9	-6.4	30.5	46.0	15.5
355.015	H	46.1	-5.4	40.7	46.0	5.3
356.658	V	41.9	-5.4	36.5	46.0	9.5
371.344	H	43.0	-5.0	38.0	46.0	8.0
372.651	V	35.0	-5.0	30.0	46.0	16.0

Note.

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

   Margin = Limit – Result / Result = Reading + T.F / T.F = AF + CL - AG

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

1GHz ~ 25GHz Radiated Spurious Emissions

▪ Lowest Frequency & Data rate: 1Mbps

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4804	H	48.54	41.99	7.27	55.81	49.26	74.00	54.00	18.19	4.74
4804	V	49.63	41.72	7.27	56.90	48.99	74.00	54.00	17.10	5.01
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ Middle Frequency & Data rate: 1Mbps

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4882	H	50.64	42.57	7.65	58.29	50.22	74.00	54.00	15.71	3.78
4882	V	52.43	45.15	7.65	60.08	52.80	74.00	54.00	13.92	1.20
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

▪ Highest Frequency & Data rate: 1Mbps

Frequency (MHz)	ANT Pol	Reading(dBuV)		T.F (dB)	Result(dBuV/m)		Limit(dBuV/m)		Margin(dB)	
		PK	AV		PK	AV	PK	AV	PK	AV
4960	H	47.44	38.76	7.96	55.40	46.72	74.00	54.00	18.60	7.28
4960	V	46.82	39.06	7.96	54.78	47.02	74.00	54.00	19.22	6.98
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

Note.

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

   Margin = Limit – Result / Result = Reading + T.F / T.F = AF + CL - AG

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

4.2.8 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.
Note 2: This test item was performed in test case 2 and 3.
And the worst data(Test case 2) were reported.

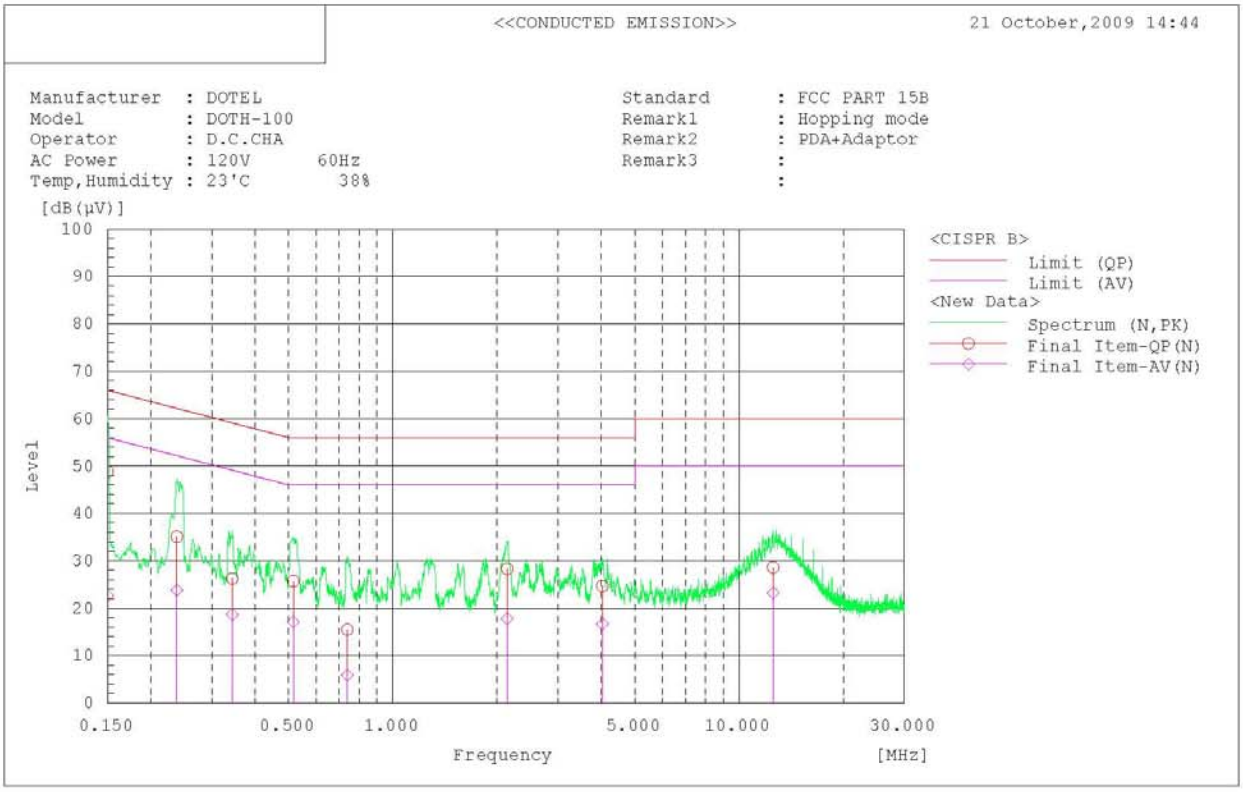
- Minimum Standard: FCC Part 15.207(a)/EN 55022

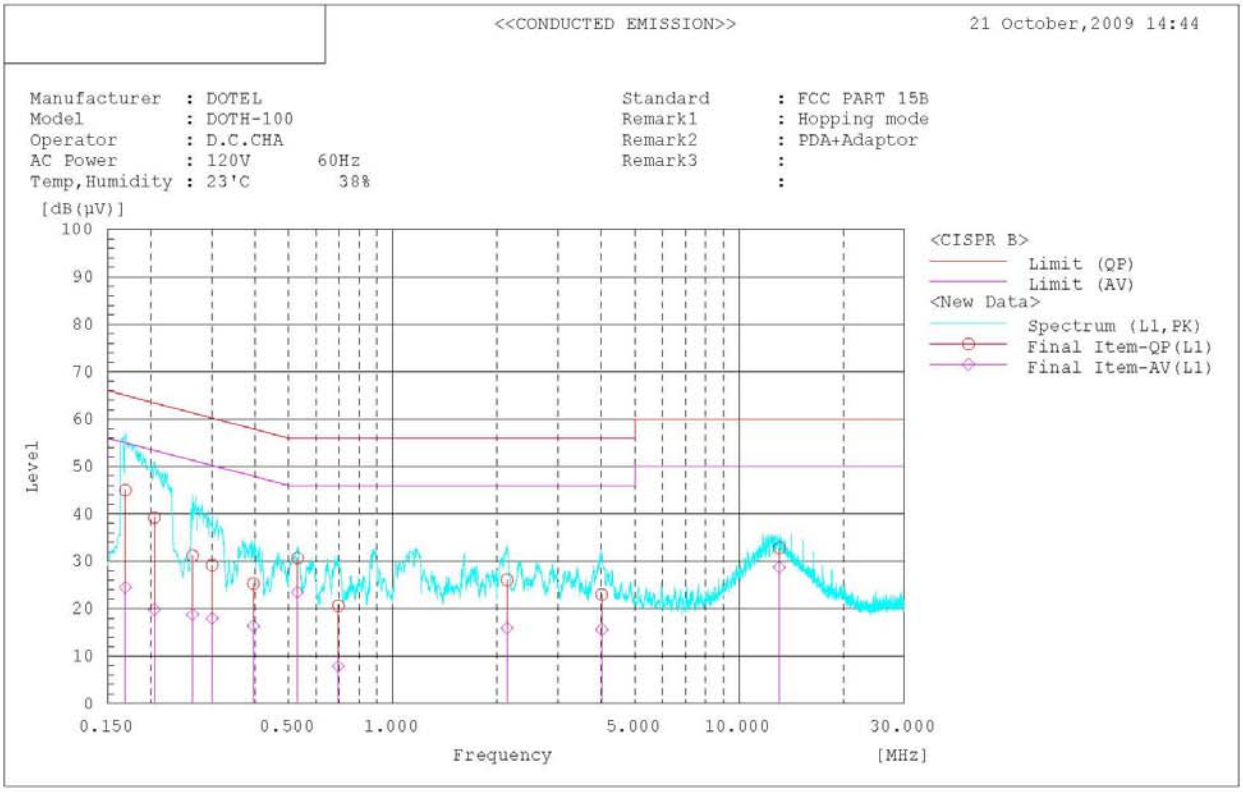
Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 ~ 0.5	66 to 56 *	56 to 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50

* Decreases with the logarithm of the frequency

AC Line Conducted Emissions (Graph)

Hopping mode: Enable & Data rate: 1Mbps & Test case 2





AC Line Conducted Emissions (Data List)

Hopping mode: Enable & Data rate: 1Mbps & Test case 2

<<CONDUCTED EMISSION>>

21 October,2009 14:44

Standard : FCC PART 15B
Manufacturer : DOTEL
Model : DOTH-100
Operator : D.C.CHA
AC Power : 120V 60Hz
Temp,Humidity : 23'C 38%
Remark1 : Hopping mode
Remark2 : PDA+Adaptor
Remark3 :
:

Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]	Remark
1	0.150	48.7	22.5	0.1	48.8	22.6	66.0	56.0	17.2	33.4	
2	0.238	35.0	23.7	0.1	35.1	23.8	62.2	52.2	27.1	28.4	
3	0.344	26.2	18.6	0.1	26.3	18.7	59.1	49.1	32.8	30.4	
4	0.516	25.6	17.0	0.1	25.7	17.1	56.0	46.0	30.3	28.9	
5	0.739	15.4	5.8	0.1	15.5	5.9	56.0	46.0	40.5	40.1	
6	2.141	28.1	17.6	0.2	28.3	17.8	56.0	46.0	27.7	28.2	
7	4.029	24.4	16.4	0.3	24.7	16.7	56.0	46.0	31.3	29.3	
8	12.552	27.9	22.5	0.7	28.6	23.2	60.0	50.0	31.4	26.8	

--- L1 Phase ---

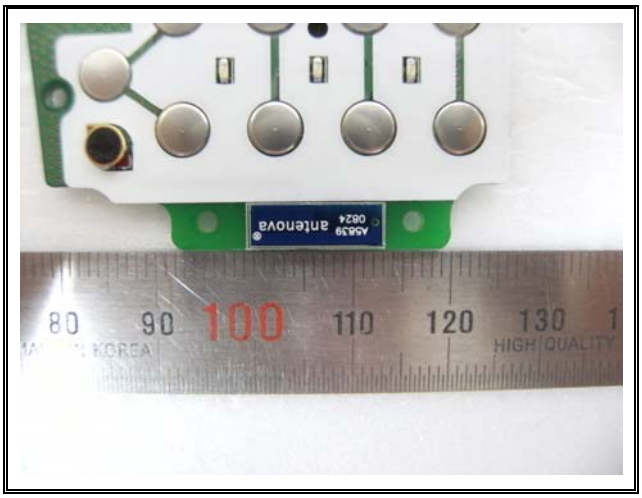
No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading AV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result AV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin AV [dB]	Remark
1	0.169	44.7	24.2	0.3	45.0	24.5	65.0	55.0	20.0	30.5	
2	0.205	38.9	19.5	0.3	39.2	19.8	63.4	53.4	24.2	33.6	
3	0.264	30.9	18.5	0.3	31.2	18.8	61.3	51.3	30.1	32.5	
4	0.301	28.8	17.6	0.4	29.2	18.0	60.2	50.2	31.0	32.2	
5	0.396	24.9	16.0	0.4	25.3	16.4	57.9	47.9	32.6	31.5	
6	0.531	30.2	23.0	0.5	30.7	23.5	56.0	46.0	25.3	22.5	
7	0.696	20.1	7.4	0.5	20.6	7.9	56.0	46.0	35.4	38.1	
8	4.017	22.3	14.9	0.7	23.0	15.6	56.0	46.0	33.0	30.4	
9	2.140	25.5	15.3	0.6	26.1	15.9	56.0	46.0	29.9	30.1	
10	13.093	31.7	27.7	1.1	32.8	28.8	60.0	50.0	27.2	21.2	

4.2.9 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



- Minimum Standard:

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

APPENDIX

TEST EQUIPMENT FOR TESTS

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment.

	Type	Manufacturer	Model	Cal.Due.Date (dd/mm/yy)	Next.Due.Date (dd/mm/yy)	S/N
☒	Spectrum Analyzer	Agilent	E4440A	25/09/09	25/09/10	MY45304199
☐	Spectrum Analyzer	Rohde Schwarz	FSQ26	05/06/09	05/06/10	200445
☐	Spectrum Analyzer(RE)	H.P	8563E	13/10/09	13/10/10	3551A04634
☐	Power Meter	H.P	EMP-442A	02/07/09	02/07/10	GB37170413
☐	Power Sensor	H.P	8481A	02/07/09	02/07/10	3318A96332
☐	Power Divider	Agilent	11636B	13/10/09	13/10/10	56471
☐	Power Splitter	Anritsu	K241B	13/10/09	13/10/10	20611
☐	Power Splitter	Anritsu	K241B	02/07/09	02/07/10	017060
☐	Frequency Counter	H.P	5342A	13/07/09	13/07/10	2119A04450
☐	TEMP & HUMIDITY Chamber	JISCO	KR-100/J-RHC2	10/10/09	10/10/10	30604493/021031
☒	Digital Multimeter	H.P	34401A	13/03/09	13/03/10	3146A13475, US36122178
☐	Multifuction Synthesizer	HP	8904A	06/10/09	06/10/10	3633A08404
☒	Signal Generator	Rohde Schwarz	SMR20	13/03/09	13/03/10	101251
☒	Signal Generator	H.P	ESG-3000A	02/07/09	02/07/10	US37230529
☐	Vector Signal Generator	Rohde Schwarz	SMJ100A	02/02/09	02/02/10	100148
☐	Audio Analyzer	H.P	8903B	02/07/09	02/07/10	3011A09448
☐	Modulation Analyzer	H.P	8901B	02/07/09	02/07/10	3028A03029
☐	8960 Series 10 Wireless Comms. Test Set	Agilent	E5515C	02/07/09	02/07/10	GB43461134
☐	Universal Radio communication Tester	Rohde Schwarz	CMU 200	19/05/09	19/05/10	106760
☐	Bluetooth Tester	TESCOM	TC-3000B	02/07/09	02/07/10	3000B000268
☐	Thermo hygrometer	BODYCOM	BJ5478	06/02/09	06/02/10	090205-3
☐	Thermo hygrometer	BODYCOM	BJ5478	06/02/09	06/02/10	090205-2
☒	Thermo hygrometer	BODYCOM	BJ5478	06/02/09	06/02/10	090205-4
☐	AC Power supply	DAEKWANG	5KVA	13/03/09	13/03/10	20060321-1
☒	DC Power Supply	HP	6622A	13/03/09	13/03/10	3448A03760
☐	DC Power Supply	HP	6633A	13/03/09	13/03/10	3524A06634
☐	BAND Reject Filter	Microwave Circuits	N0308372	06/10/09	06/10/10	3125-01DC0352
☐	BAND Reject Filter	Wainwright	WRCG1750	06/10/09	06/10/10	2
☐	High-Pass Filter	ANRITSU	MP526D	06/10/09	06/10/10	M27756
☐	High-pass filter	Wainwright	WHKX2.1	N/A	N/A	1
☒	High-Pass Filter	Wainwright	WHKX3.0	N/A	N/A	9
☐	Tunable Notch Filter	Wainwright	WRCT800.0 /960.0-0.2/40-8SSK	N/A	N/A	10
☐	Tunable Notch Filter	Wainwright	WRCD1700.0 /2000.0-0.2/40-10SSK	N/A	N/A	27
☐	Tunable Notch Filter	Wainwright	WRCT1900.0/ 2200.0-5/40-10SSK	N/A	N/A	7
☒	HORN ANT	ETS	3115	17/06/09	17/06/10	6419
☐	HORN ANT	ETS	3115	23/09/09	23/09/10	21097
☐	HORN ANT	A.H.Systems	SAS-574	10/06/09	10/06/10	154
☐	HORN ANT	A.H.Systems	SAS-574	10/06/09	10/06/10	155

	Type	Manufacturer	Model	Cal.Due.Date (dd/mm/yy)	Next.Due.Date (dd/mm/yy)	S/N
☐	Dipole Antenna	Schwarzbeck	VHA9103	06/10/09	06/10/10	2116
☐	Dipole Antenna	Schwarzbeck	VHA9103	06/10/09	06/10/10	2117
☐	Dipole Antenna	Schwarzbeck	UHA9105	05/10/09	05/10/10	2261
☐	Dipole Antenna	Schwarzbeck	UHA9105	05/10/09	05/10/10	2262
☐	LOOP Antenna	ETS	6502	14/09/09	14/09/10	3471
☐	Coaxial Fixed Attenuators	Agilent	8491B	02/07/09	02/07/10	MY39260700
☐	Coaxial Fixed Attenuators	Agilent	8491B	02/07/09	02/07/10	MY39260699
☐	Attenuator (10dB)	WEINSCHEL	23-10-34	01/10/09	01/10/10	BP4386
☐	Attenuator (10dB)	WEINSCHEL	23-10-34	19/01/09	19/01/10	BP4387
☐	Attenuator (20dB)	WEINSCHEL	86-20-11	06/10/09	06/10/10	432
☐	Attenuator (10dB)	WEINSCHEL	31696	06/10/09	06/10/10	446
☐	Attenuator (10dB)	WEINSCHEL	31696	06/10/09	06/10/10	408
☐	Attenuator (40dB)	WEINSCHEL	57-40-33	01/10/09	01/10/10	NN837
☐	Attenuator (30dB)	JFW	50FH-030-300	13/03/09	13/03/10	060320-1
☐	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0088CAN	02/07/09	02/07/10	788
☐	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0185CAN	02/07/09	02/07/10	790
☐	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0215CAN	02/07/09	02/07/10	112
☒	Amplifier (30dB)	Agilent	8449B	10/10/09	10/10/10	3008A01590
☐	Amplifier	EMPOWER	BBS3Q7ELU	02/02/09	02/02/10	1020
☐	RF Power Amplifier	OPHIRRF	5069F	02/07/09	02/07/10	1006
☒	EMI TEST RECEIVER	R&S	ESU	02/02/09	02/02/10	100014
☒	BILOG ANTENNA	SCHAFFNER	CBL6112B	02/06/09	02/06/10	2737
☒	Amplifier (22dB)	H.P	8447E	05/02/09	05/02/10	2945A02865
☐	EMI TEST RECEIVER	R&S	ESCI	12/05/09	12/05/10	100364
☐	LOG-PERIODIC ANT.	Schwarzbeck	UHALP9108A	30/05/09	30/05/10	590
☐	BICONICAL ANT.	Schwarzbeck	VHA 9103	02/06/09	02/06/10	2233
☐	LOG-PERIODIC ANT.	Schwarzbeck	UHALP9108A1	07/10/09	07/10/10	1098
☐	BICONICAL ANT.	Schwarzbeck	VHA 9103	06/10/09	06/10/10	91031946
☐	Low Noise Pre Amplifier	TSJ	MLA-100K01-B01-2	13/03/09	13/03/10	1252741
☐	Amplifier (25dB)	Agilent	8447D	12/05/09	12/05/10	2944A10144
☐	Amplifier (25dB)	Agilent	8447D	03/07/09	03/07/10	2648A04922
☒	Spectrum Analyzer(CE)	H.P	8591E	26/04/09	26/04/10	3649A05889
☐	LISN	Kyoritsu	KNW-407	03/07/09	03/07/10	8-317-8
☒	LISN	Kyoritsu	KNW-242	13/10/09	13/10/10	8-654-15
☒	CVCF	NF Electronic	4420	13/03/09	13/03/10	304935/337980
☒	DC BLOCK	Hyuplip	KEL-007	N/A	N/A	7-1581-5
☐	50 ohm Terminator	HME	CT-01	22/01/09	22/01/10	N/A
☒	RFI/FIELD Intensity Meter	Kyoritsu	KNM-2402	03/07/09	03/07/10	4N-170-3