

RF TEST REPORT

Test item : Industrial PDA
Model No. : BIP-1500
Order No. : 1202-00288
Date of receipt : 2012-02-24
Test duration : 2012-03-13 ~ 2012-03-26
Date of issue : 2012-04-06
Use of report : FCC Original Grant

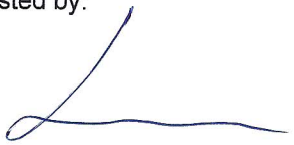
Applicant : Bluebird Soft Inc.
558-5, Sinsa-dong, Kangnam-gu, Seoul, Korea

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
Test environment : See appended test report
Test result : Pass Fail

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

Tested by:




Engineer
S.K.Ryu

Witnessed by:

N/A

Reviewed by:



Technical Director
Harvey Sung

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1. Equipment information

1.1 Equipment description

FCC Equipment Class	Part 15 Spread Spectrum Transmitter(DSS)
FCC ID	SS4BIP1500
Equipment type	Industrial PDA
Equipment model name	BIP-1500
Equipment add model name	N/A
Equipment serial no.	Identical prototype
Frequency band	2402 ~ 2480 MHz
Spread Spectrum	Frequency Hopping
Modulation type	GFSK, $\pi/4$ -DQPSK, 8DPSK
Transmission rate	1Mbps, 2Mbps, 3Mbps
Channel Spacing	1.0 MHz
Power	DC 7.4 V
Antenna type	Internal Type: (Max. Peak Gain: 1.4 dBi)

1.2 Ancillary equipment

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

2. Information about test items

2.1 Test cases

This device was tested in maximum duty mode at maximum power of hopping enable / disable mode.

Test Case 1 (Basic Test Case)	EUT + PINPAD (13.56MHz RFID)
Test Case 2 (Additional Test Case)	EUT + Finger scan
Test Case 3 (Additional Test Case)	EUT + Payment
Test Case 4 (Additional Test Case)	EUT + Battery Cover

This EUT has 4 optional external modules so above 4 test cases were tested for compliance.

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	: 22 ~ 24 °C
Relative humidity content	: 32 ~ 40 % R.H.
Details of power supply	: DC 7.4 V

2.5 EMI Suppression Device(s)/Modifications

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

3. Test Report

3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit (Using in 2400 ~ 2483.5MHz)	Test Condition	Status Note 1
I. Transmit mode (TX)				
15.247(a)	Carrier Frequency Separation	$\geq 20\text{dB BW}$ or \geq Two-Thirds of the 20dB BW	Conducted	C
	Number of Hopping Frequencies	≥ 15 hops		C
	20 dB Bandwidth	None		C
	Dwell Time	≤ 0.4 seconds		C
15.247(b)	Transmitter Output Power	$\leq 1\text{Watt}$, if CHs ≥ 75 Others $\leq 0.125\text{W}$		C
15.247(d)	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
	Conducted Spurious Emissions			C
15.205, 15.209	Radiated Spurious Emissions	FCC 15.209 Limits	Radiated	C Note.2
15.207	AC Conducted Emissions	EN 55022	AC Line Conducted	C
15.203	Antenna Requirements	FCC 15.203	-	C
<p>Note 1: C=Comply NC=Not Comply NT=Not Tested NA=Not Applicable</p> <p>Note 2: This test item was performed in each axis. And the worst case data were reported.</p>				

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

3.2 Transmitter requirements

3.2.1 Carrier Frequency Separation & Test Case 1

- 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 = \geq RBW

Detector function = peak

Trace = max hold

- Measurement Data: Comply

Hopping Mode	Test Mode	Peak of center channel (MHz)	Peak of adjacent Channel (MHz)	Test Result (MHz)
Enable	1Mbps	2439.986	2440.988	1.002
	2Mbps	2439.998	2441.000	1.002
	3Mbps	2441.000	2442.002	1.002

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

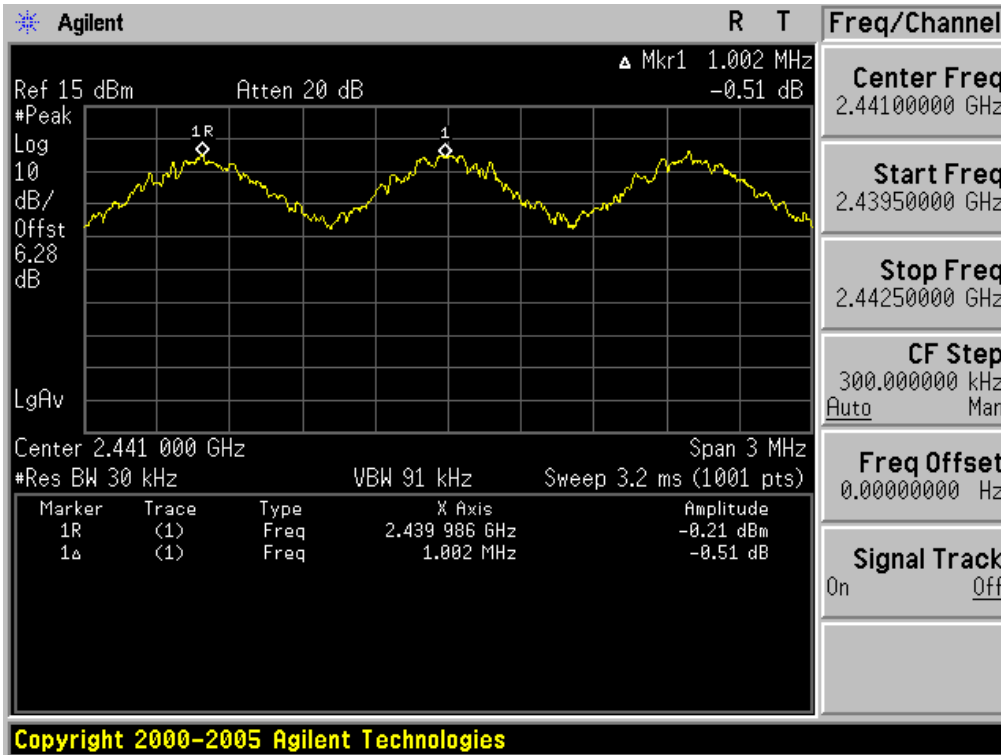
- Minimum Standard:

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

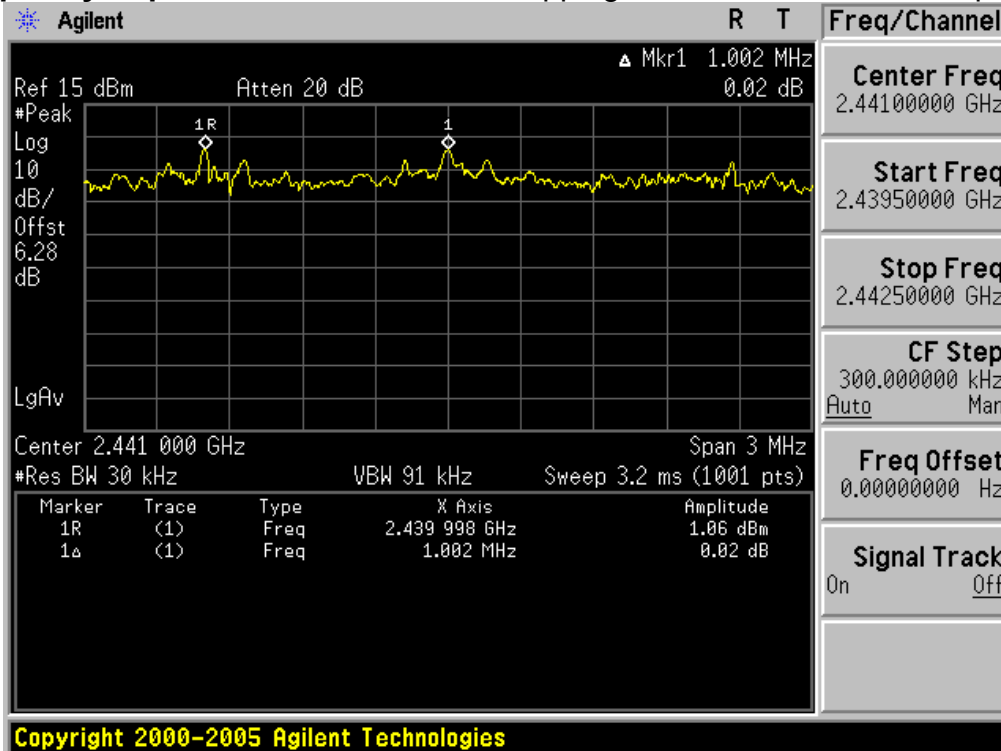
Carrier Frequency Separation

Hopping mode: Enable & 1Mbps



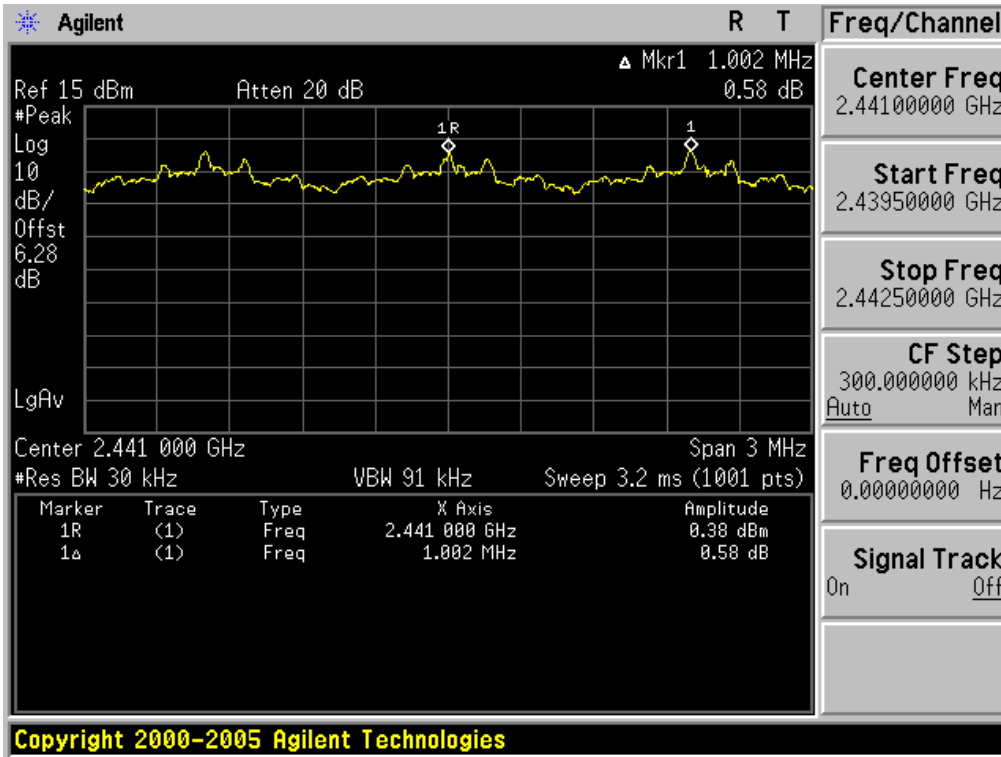
Carrier Frequency Separation

Hopping mode: Enable & 2Mbps



Carrier Frequency Separation

Hopping mode: Enable & 3Mbps



3.2.2 Number of Hopping Frequencies & Test Case 1

- 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 = \geq RBW

Detector function = peak

Trace = max hold

- Measurement Data: Comply

Hopping mode	Test mode	Test Result (Total Hops)
Enable	1Mbps	79
	2Mbps	79
	3Mbps	79

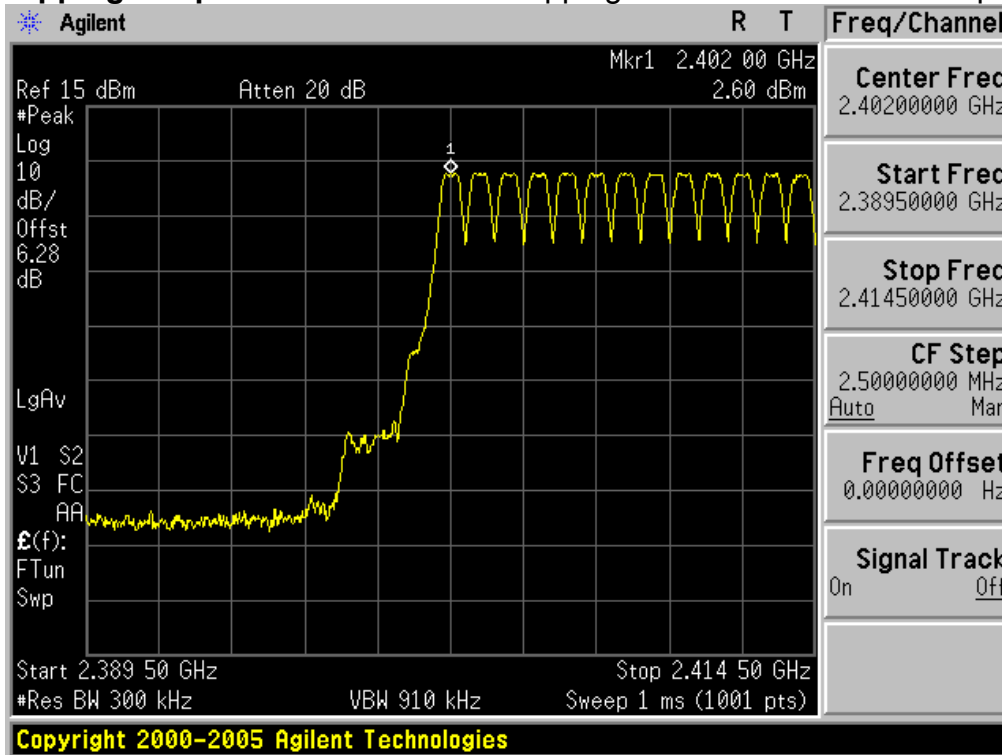
Note 1: See next pages for actual measured spectrum plots.

- Minimum Standard:

At least 15 hops

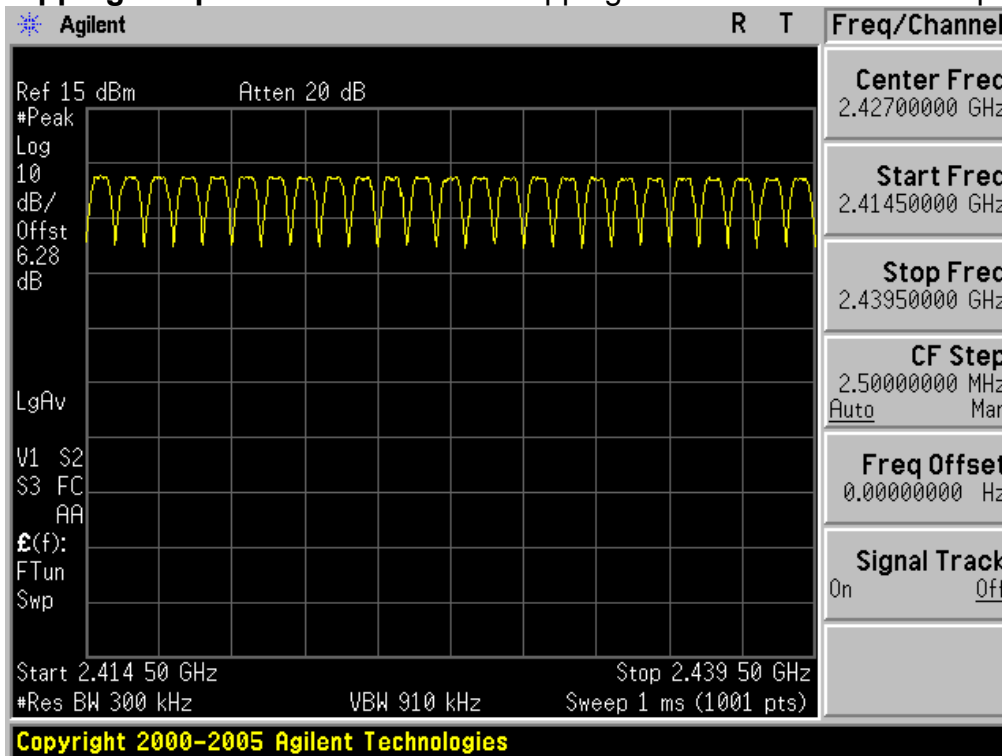
Number of Hopping Frequencies 1

Hopping mode: Enable & 1Mbps



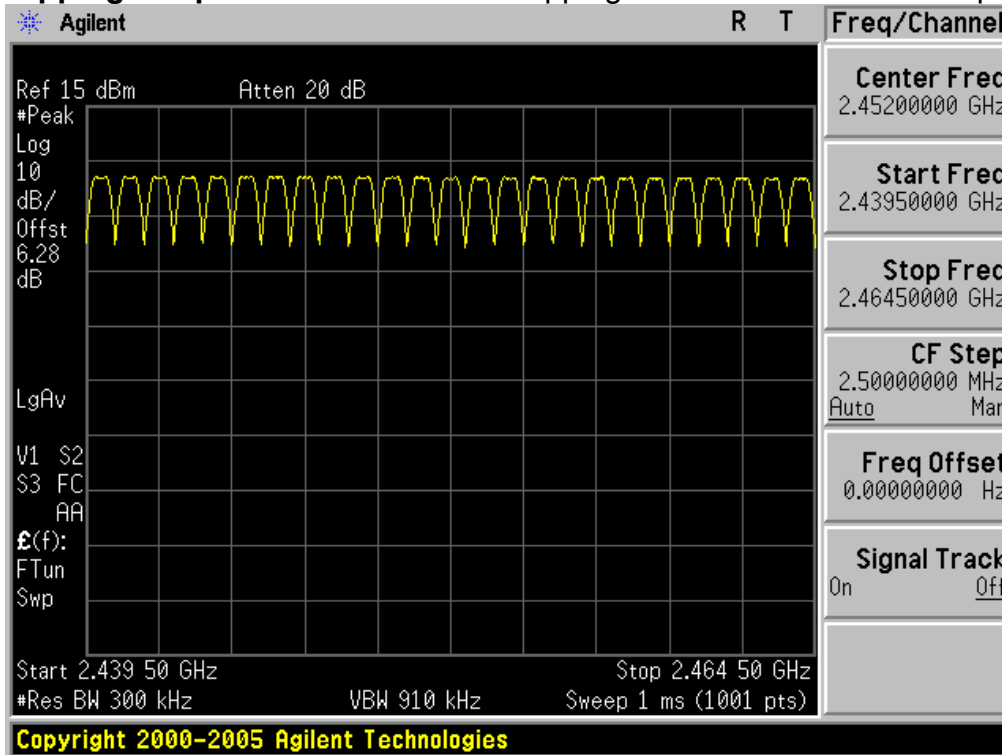
Number of Hopping Frequencies 2

Hopping mode: Enable & 1Mbps



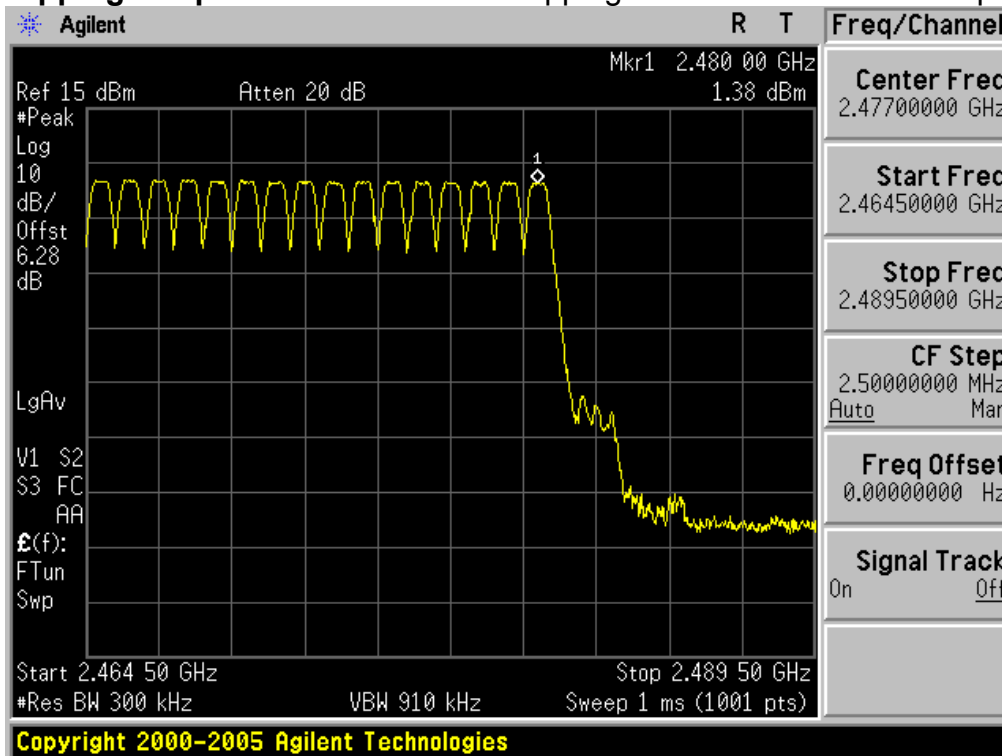
Number of Hopping Frequencies 3

Hopping mode: Enable & 1Mbps



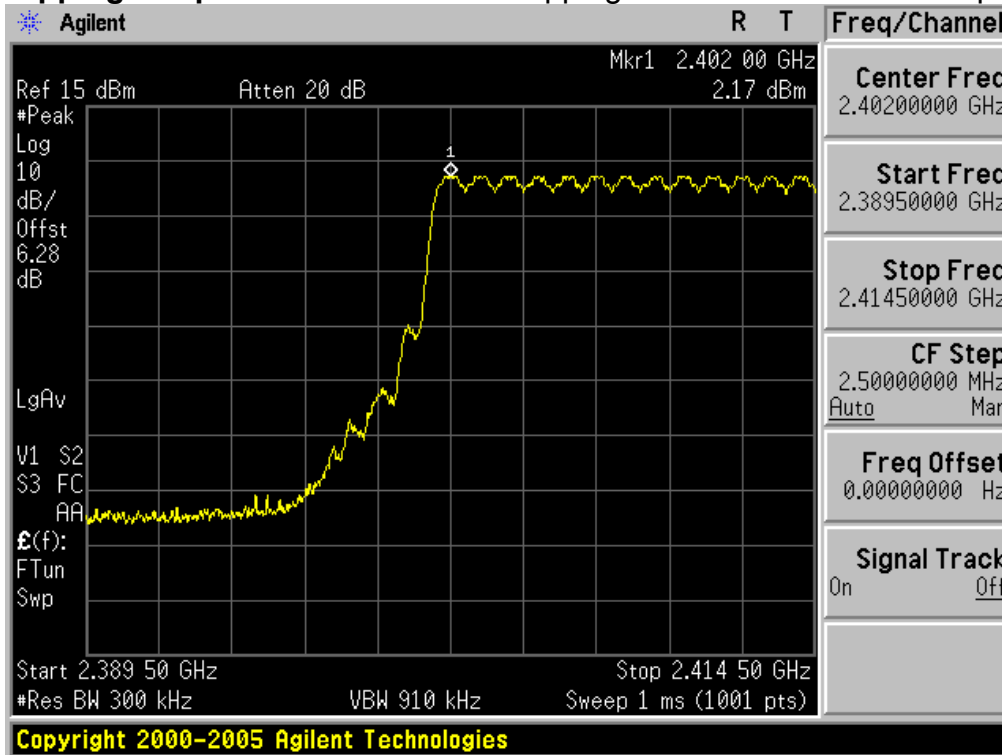
Number of Hopping Frequencies 4

Hopping mode: Enable & 1Mbps



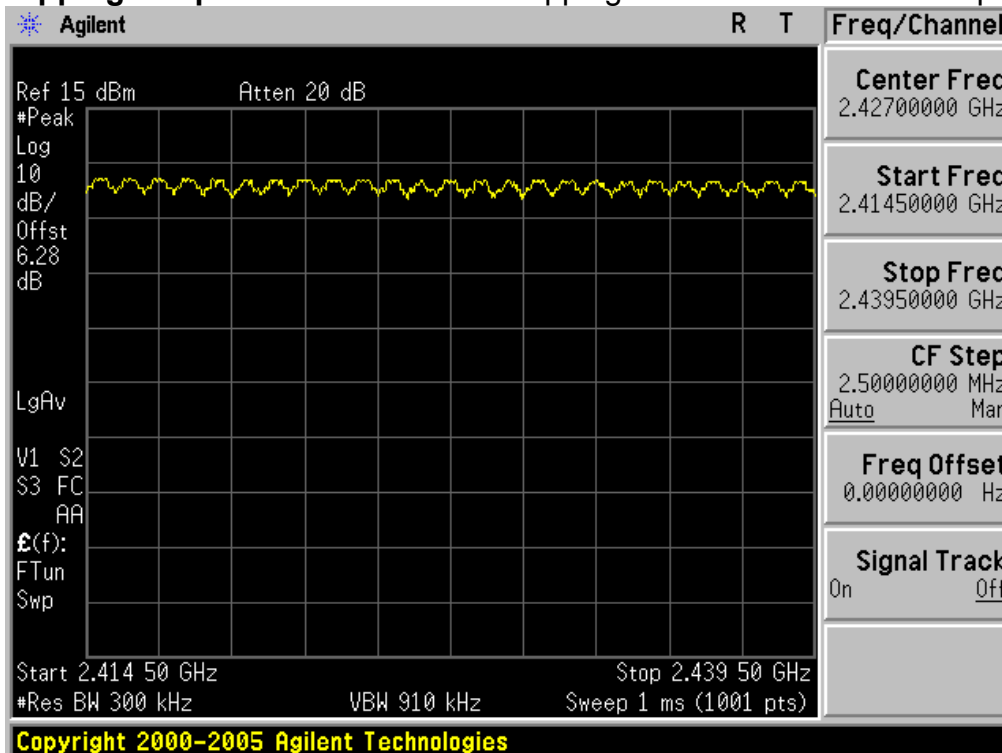
Number of Hopping Frequencies 1

Hopping mode: Enable & 2Mbps



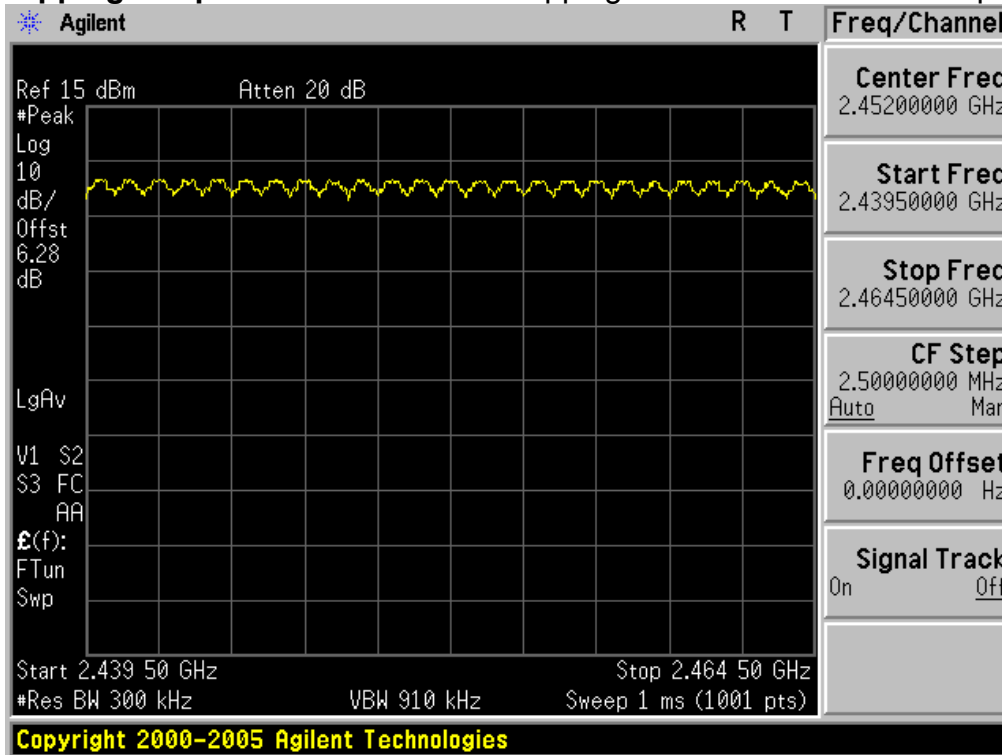
Number of Hopping Frequencies 2

Hopping mode: Enable & 2Mbps



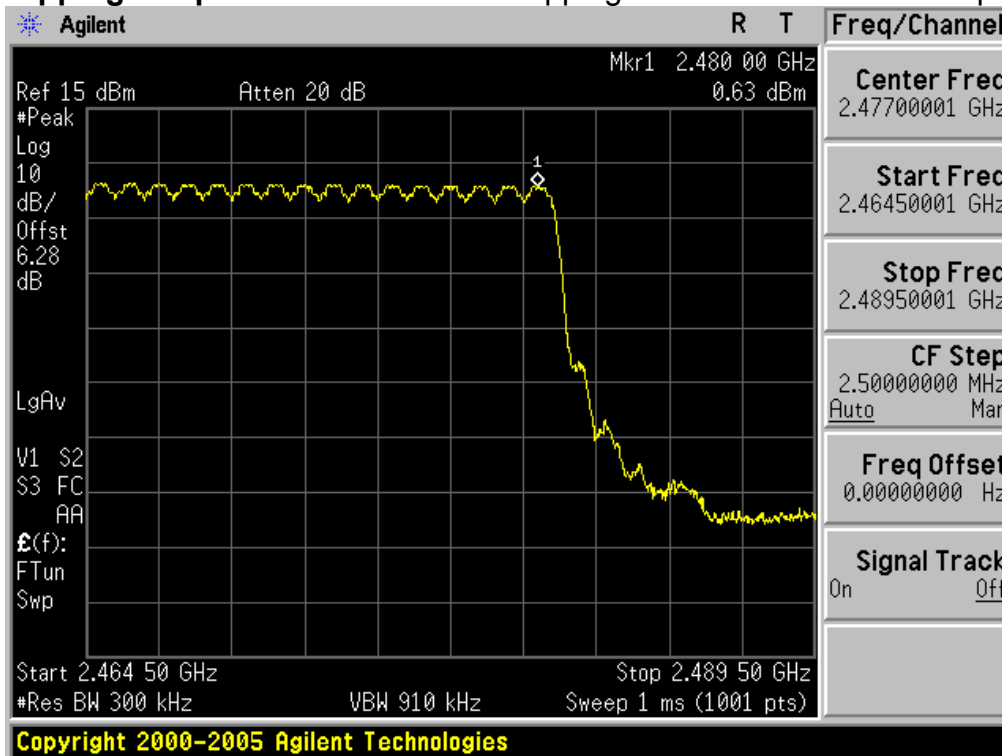
Number of Hopping Frequencies 3

Hopping mode: Enable & 2Mbps



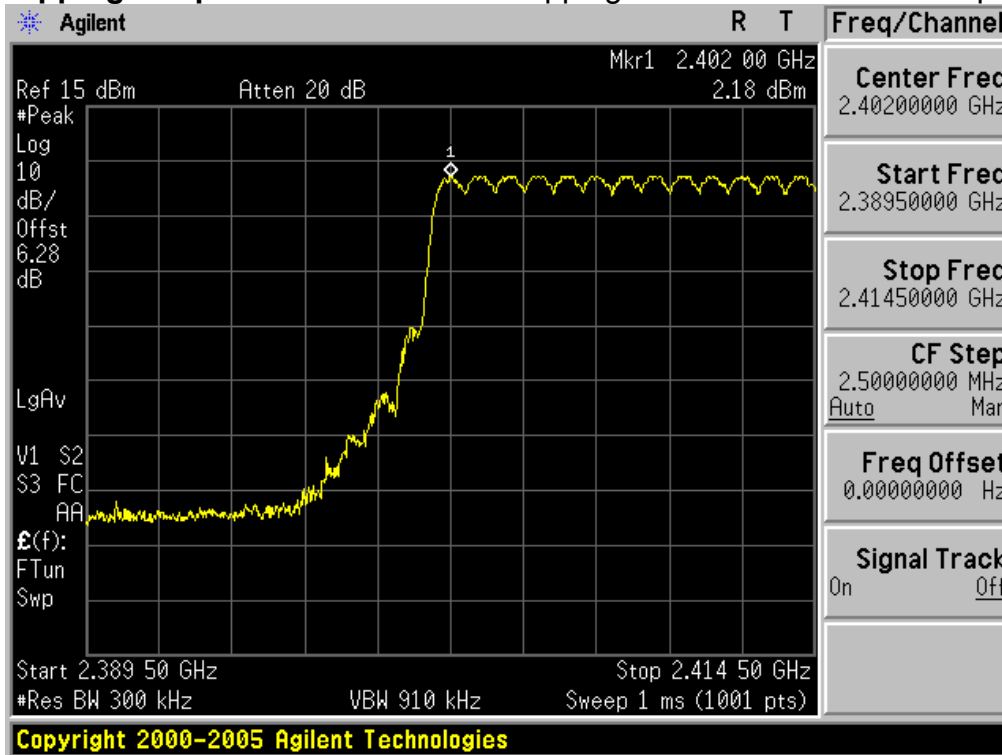
Number of Hopping Frequencies 4

Hopping mode: Enable & 2Mbps



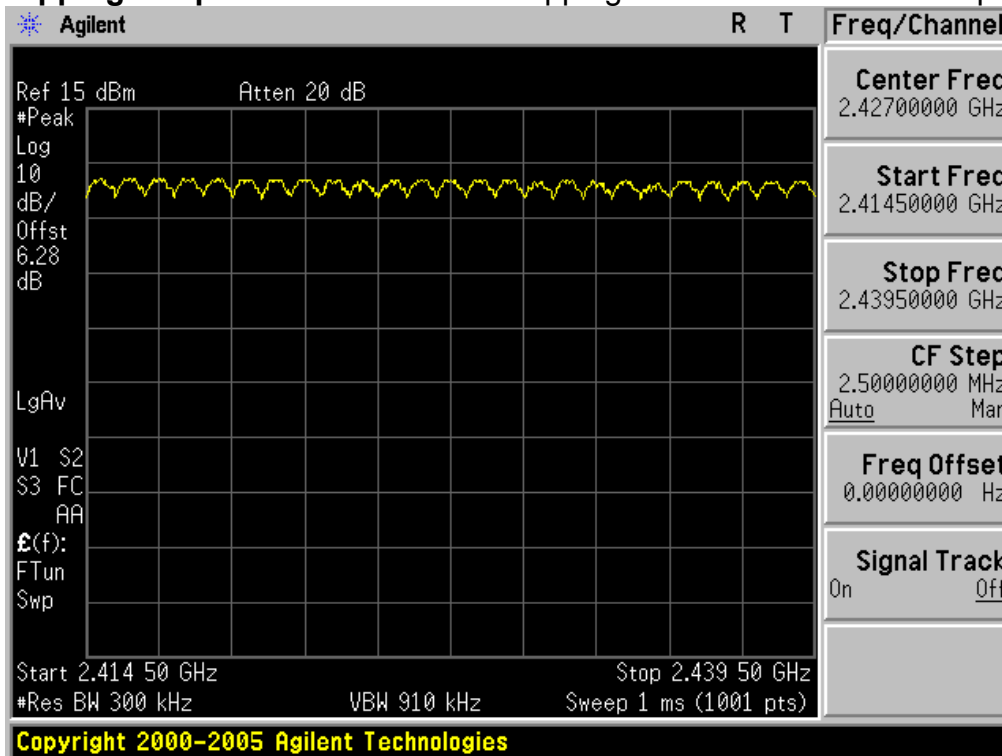
Number of Hopping Frequencies 1

Hopping mode: Enable & 3Mbps



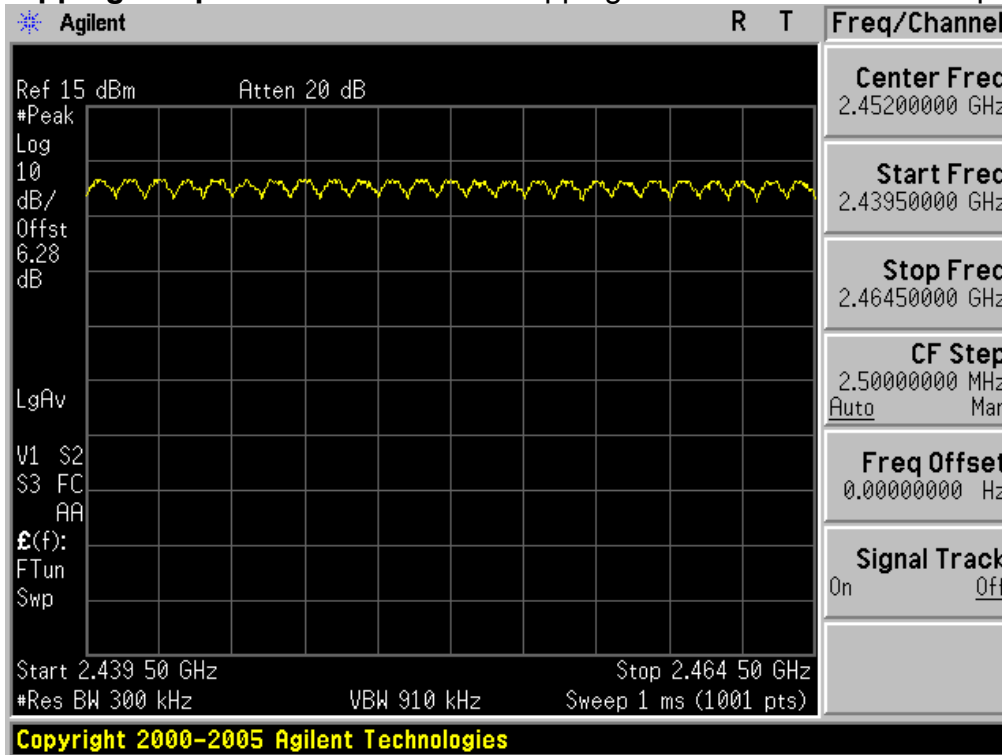
Number of Hopping Frequencies 2

Hopping mode: Enable & 3Mbps



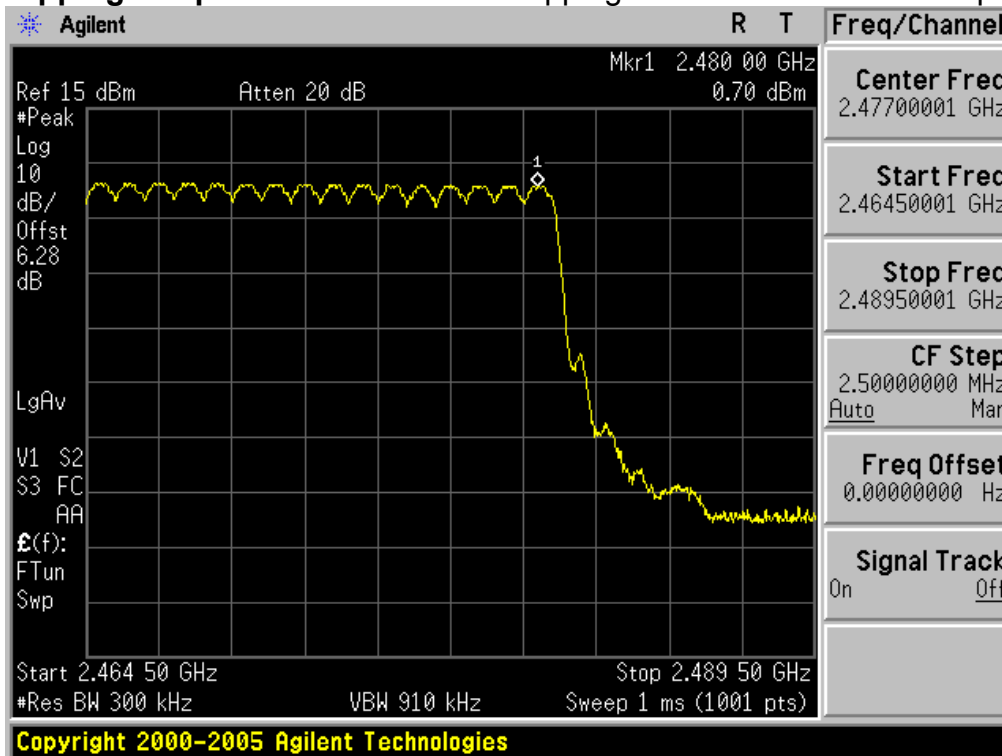
Number of Hopping Frequencies 3

Hopping mode: Enable & 3Mbps



Number of Hopping Frequencies 4

Hopping mode: Enable & 3Mbps



3.2.3 20 dB Bandwidth & Test Case 1

- 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 = \geq RBW

Detector function = peak

Trace = max hold

- Measurement Data: **Comply**

Hopping mode	Test mode	Tested Channel	Test Results(MHz)	
			20dB Bandwidth	Occupied Bandwidth(99%)
Disable	1Mbps	Lowest	0.952	0.897
		Middle	0.941	0.871
		Highest	0.937	0.871
	2Mbps	Lowest	1.274	1.201
		Middle	1.267	1.191
		Highest	1.281	1.187
	3Mbps	Lowest	1.297	1.218
		Middle	1.284	1.210
		Highest	1.290	1.199

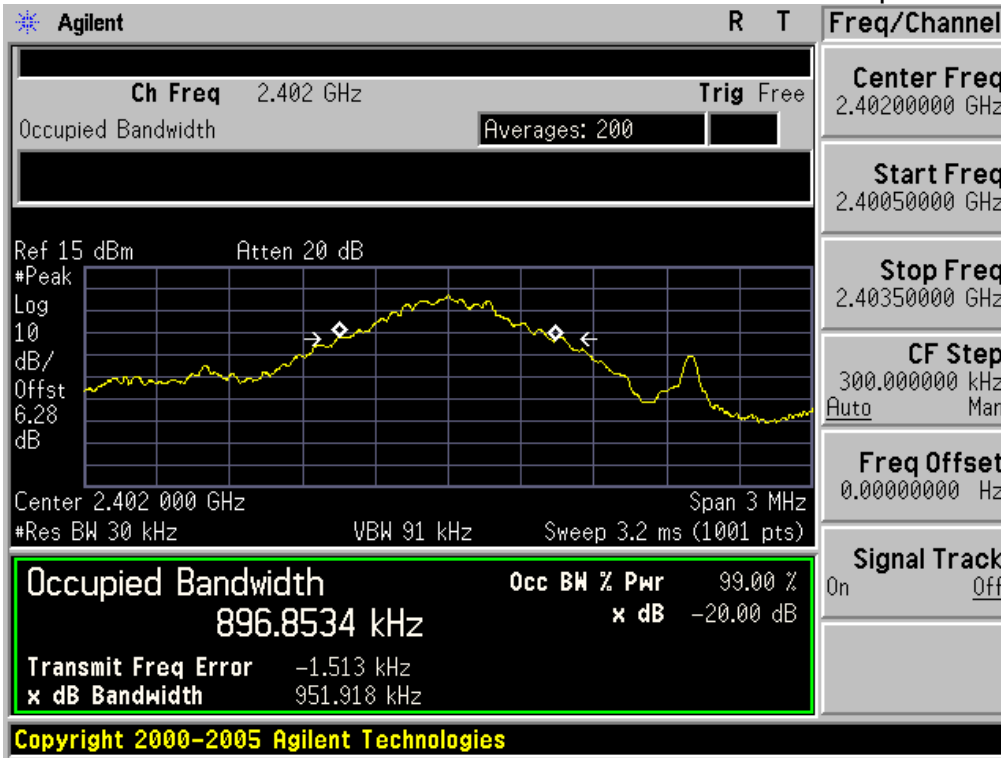
Note 1: See next pages for actual measured spectrum plots.

- Minimum Standard:

None

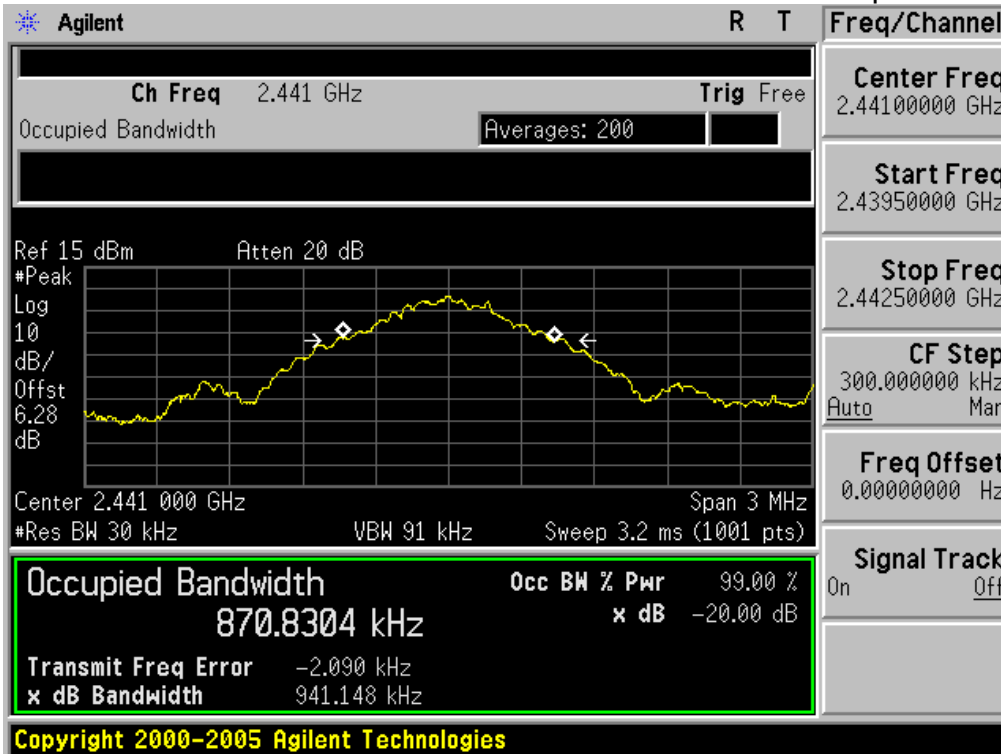
20dB Bandwidth

Lowest Channel & 1Mbps



20dB Bandwidth

Middle Channel & 1Mbps



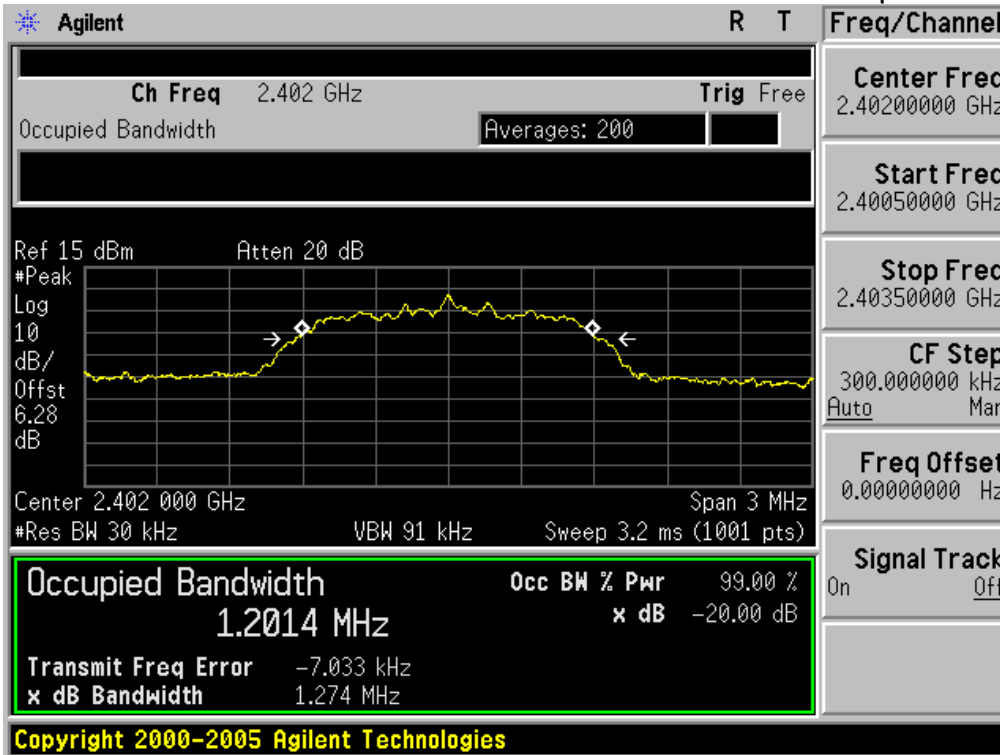
20dB Bandwidth

Highest Channel & 1Mbps

Agilent		R	T	Freq/Channel	
Ch Freq 2.48 GHz		Trig Free		Center Freq 2.48000000 GHz	
Occupied Bandwidth		Averages: 200		Start Freq 2.47850000 GHz	
Ref 15 dBm Atten 20 dB				Stop Freq 2.48150000 GHz	
				CF Step 300.000000 kHz Auto Man	
Center 2.480 000 GHz		Span 3 MHz		Freq Offset 0.00000000 Hz	
#Res BW 30 kHz		VBW 91 kHz		Sweep 3.2 ms (1001 pts)	
Occupied Bandwidth		Occ BW % Pwr		99.00 %	
871.0334 kHz		x dB		-20.00 dB	
Transmit Freq Error		-2.393 kHz		Signal Track On Off	
x dB Bandwidth		936.583 kHz			
Copyright 2000-2005 Agilent Technologies					

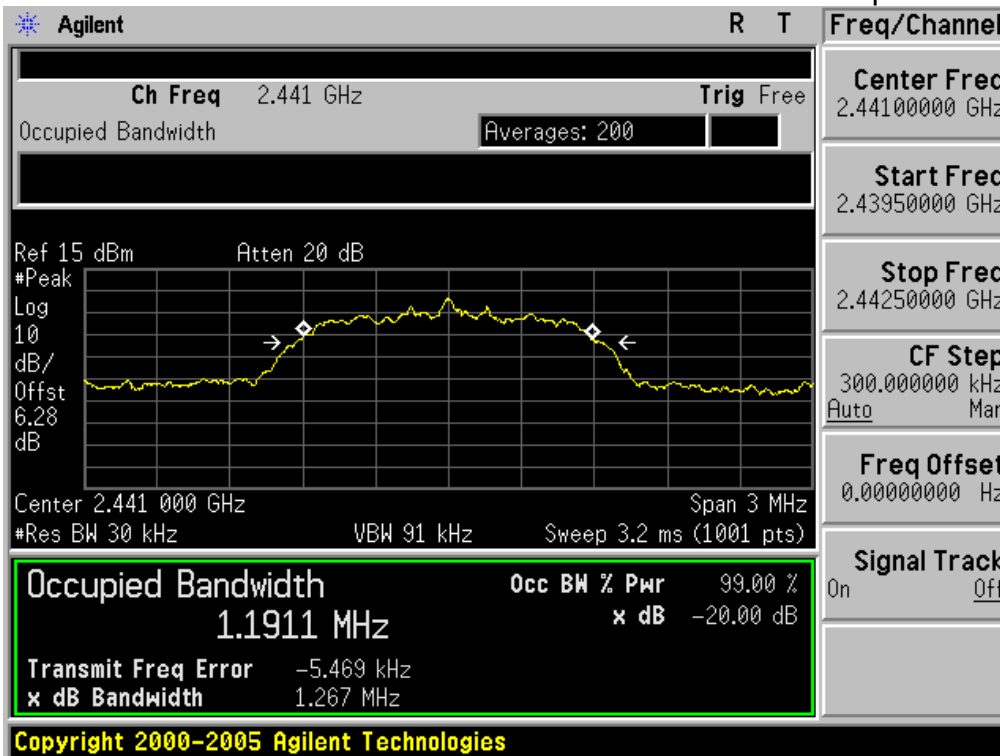
20dB Bandwidth

Lowest Channel & 2Mbps



20dB Bandwidth

Middle Channel & 2Mbps



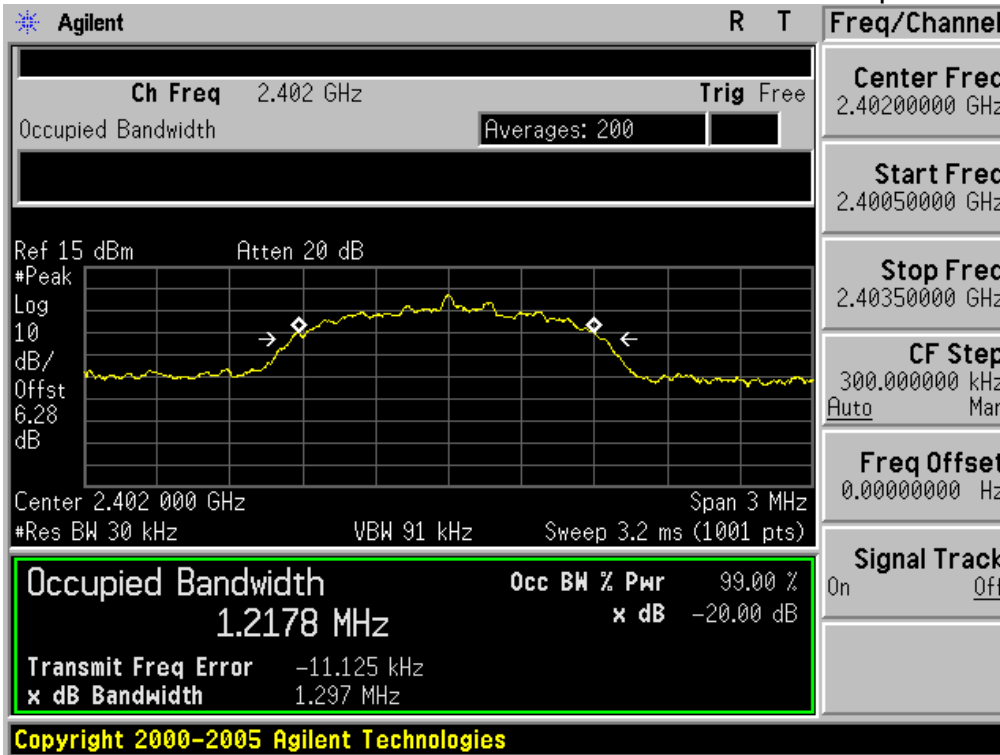
20dB Bandwidth

Highest Channel & 2Mbps

Agilent		R	T	Freq/Channel	
Ch Freq 2.48 GHz		Trig Free		Center Freq 2.48000000 GHz	
Occupied Bandwidth		Averages: 200		Start Freq 2.47850000 GHz	
Ref 15 dBm		Atten 20 dB		Stop Freq 2.48150000 GHz	
				CF Step 300.000000 kHz Auto Man	
Center 2.480 000 GHz		Span 3 MHz		Freq Offset 0.00000000 Hz	
#Res BW 30 kHz		VBW 91 kHz		Sweep 3.2 ms (1001 pts)	
Occupied Bandwidth 1.1872 MHz		Occ BW % Pwr 99.00 %		Signal Track On Off	
Transmit Freq Error -5.243 kHz		x dB -20.00 dB			
x dB Bandwidth 1.281 MHz					
Copyright 2000-2005 Agilent Technologies					

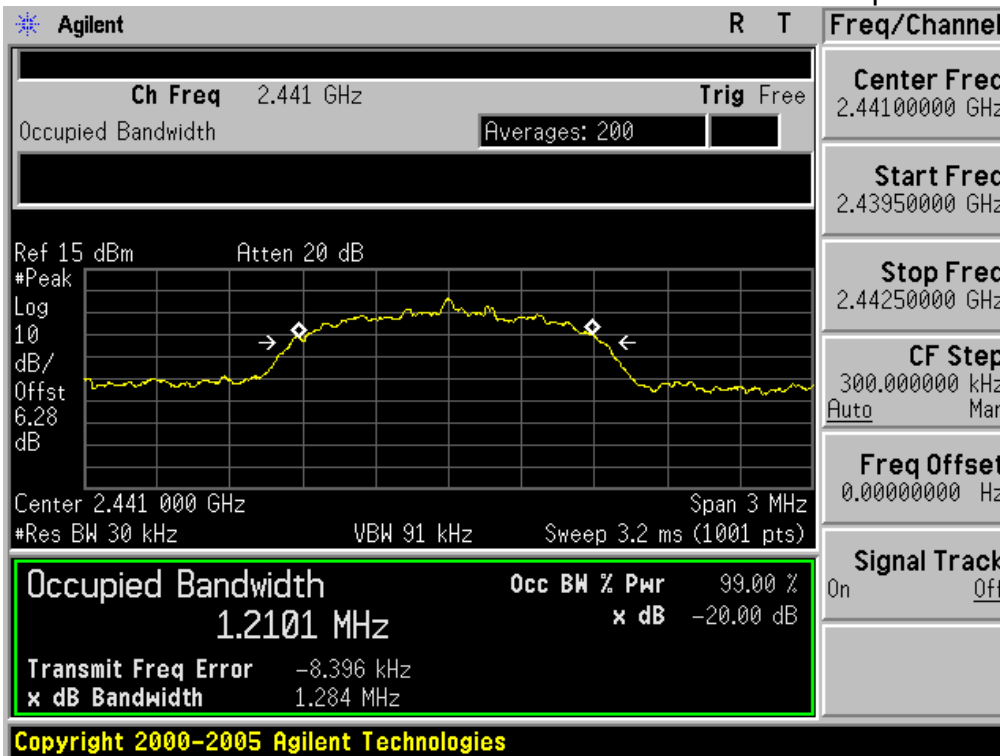
20dB Bandwidth

Lowest Channel & 3Mbps



20dB Bandwidth

Middle Channel & 3Mbps



20dB Bandwidth

Highest Channel & 3Mbps

Agilent R T		Freq/Channel	
Ch Freq 2.48 GHz Trig Free		Center Freq 2.48000000 GHz	
Occupied Bandwidth Averages: 200		Start Freq 2.47850000 GHz	
		Stop Freq 2.48150000 GHz	
Center 2.480 000 GHz Span 3 MHz #Res BW 30 kHz VBW 91 kHz Sweep 3.2 ms (1001 pts)		CF Step 300.000000 kHz Auto Man	
Occupied Bandwidth Occ BW % Pwr 99.00 % x dB -20.00 dB		Freq Offset 0.00000000 Hz	
Transmit Freq Error -7.081 kHz x dB Bandwidth 1.290 MHz		Signal Track On Off	
Copyright 2000-2005 Agilent Technologies			

3.2.4 Time of Occupancy (Dwell Time) & Test Case 1

- 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

RBW = 1 MHz

Trace = max hold

Span = zero

VBW = \geq RBW

Detector function = peak

- Measurement Data: **Comply**

Hopping mode	Test mode	Packet Type	Burst On Time (ms)	Period (ms)	Number of hopping Channels	Test Result (s)
Enable	1Mbps	DH 1	0.395	1.250	79	0.126
		DH 3	1.650	2.510		0.263
		DH 5	2.895	3.750		0.308
	2Mbps	2 DH 1	0.395	1.255	79	0.126
		2 DH 3	1.635	2.505		0.261
		2 DH 5	2.880	3.750		0.307
	3Mbps	3 DH 1	0.400	1.250	79	0.128
		3 DH 3	1.665	2.505		0.266
		3 DH 5	2.910	3.750		0.310

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.

$$\text{DWEELL TIME} = (0.4 \times \text{Number of hopping Channels}) \times \text{Burst On time} / (\text{period} \times \text{Number of hopping Channels})$$

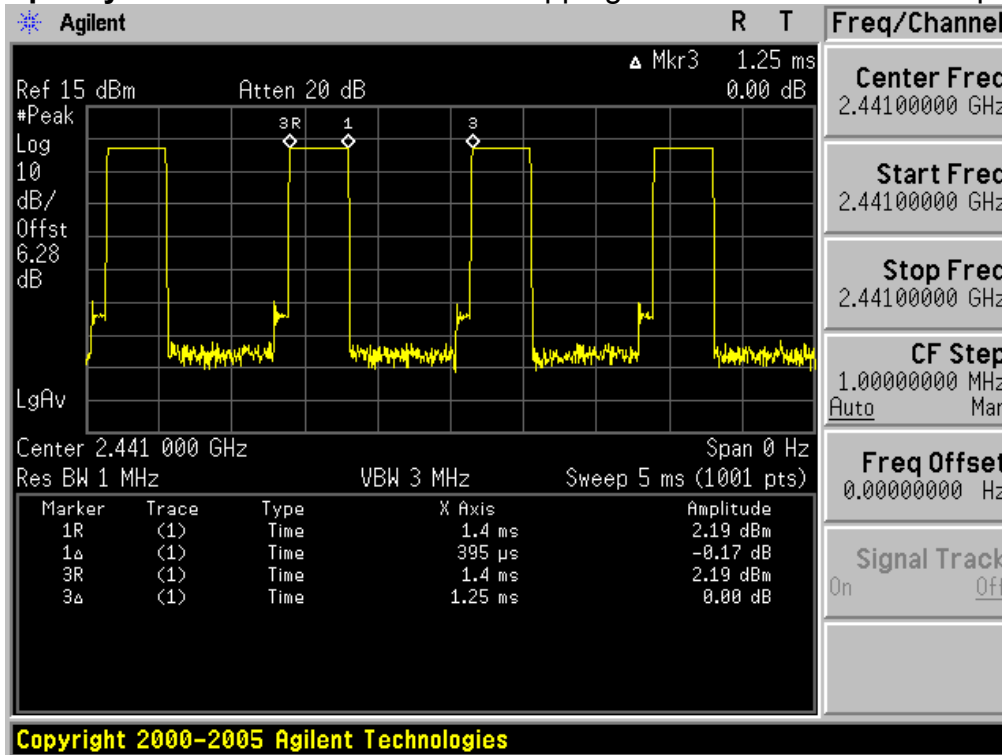
Note 2: See next pages for actual measured spectrum plots.

- Minimum Standard:

No greater than 0.4 seconds

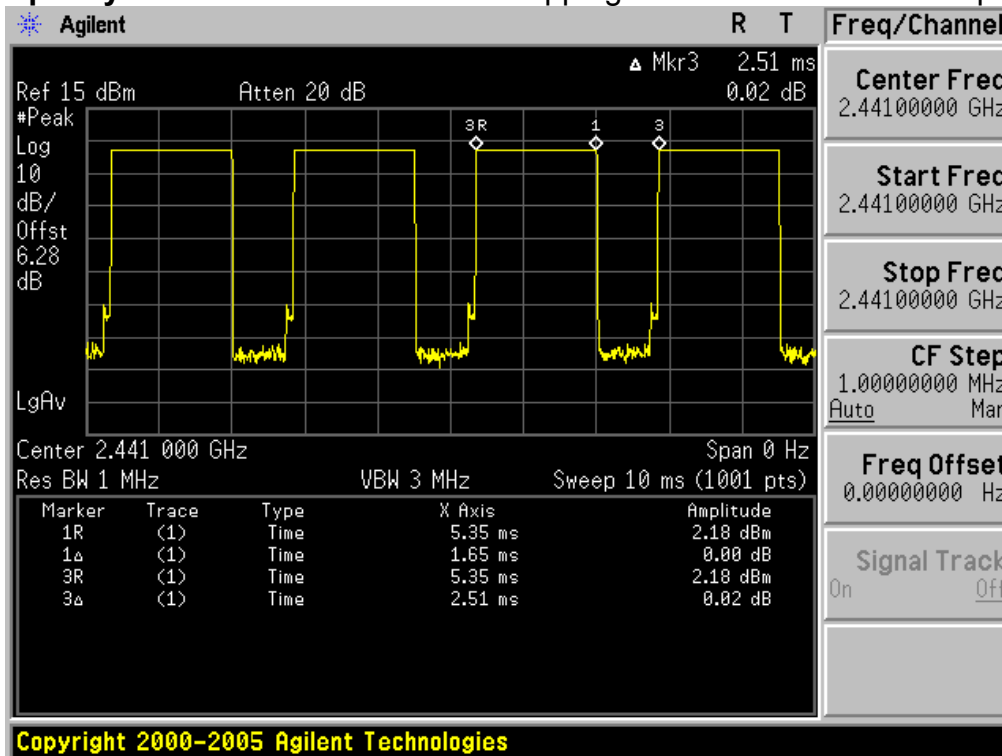
Time of Occupancy

Hopping mode: Enable & 1Mbps(DH1)



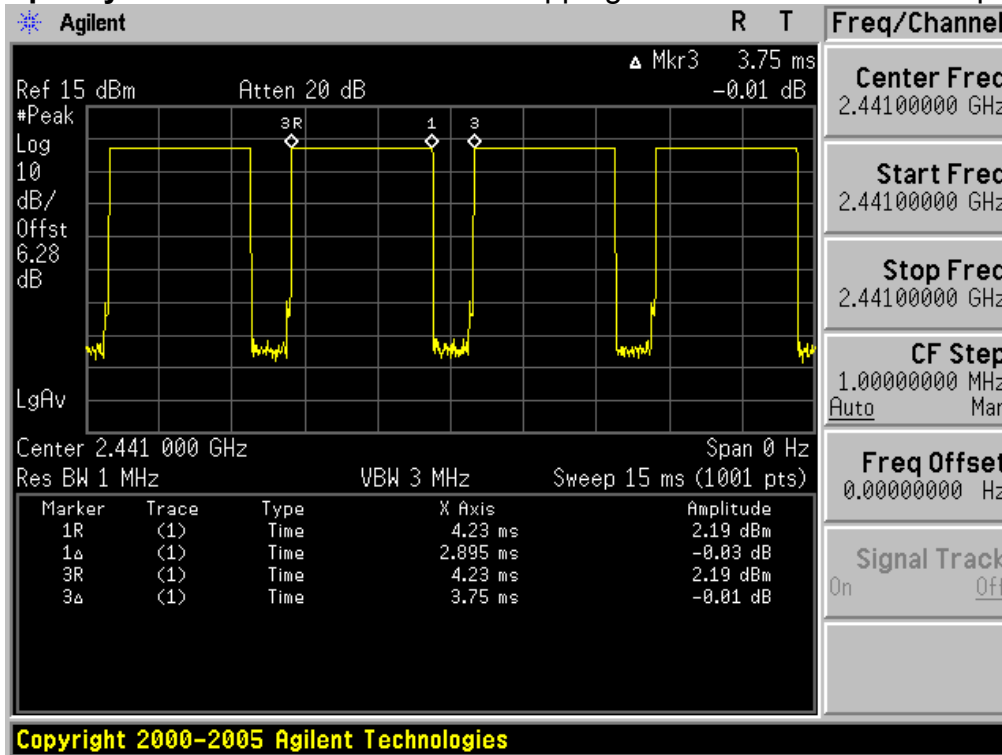
Time of Occupancy

Hopping mode: Enable & 1Mbps(DH3)



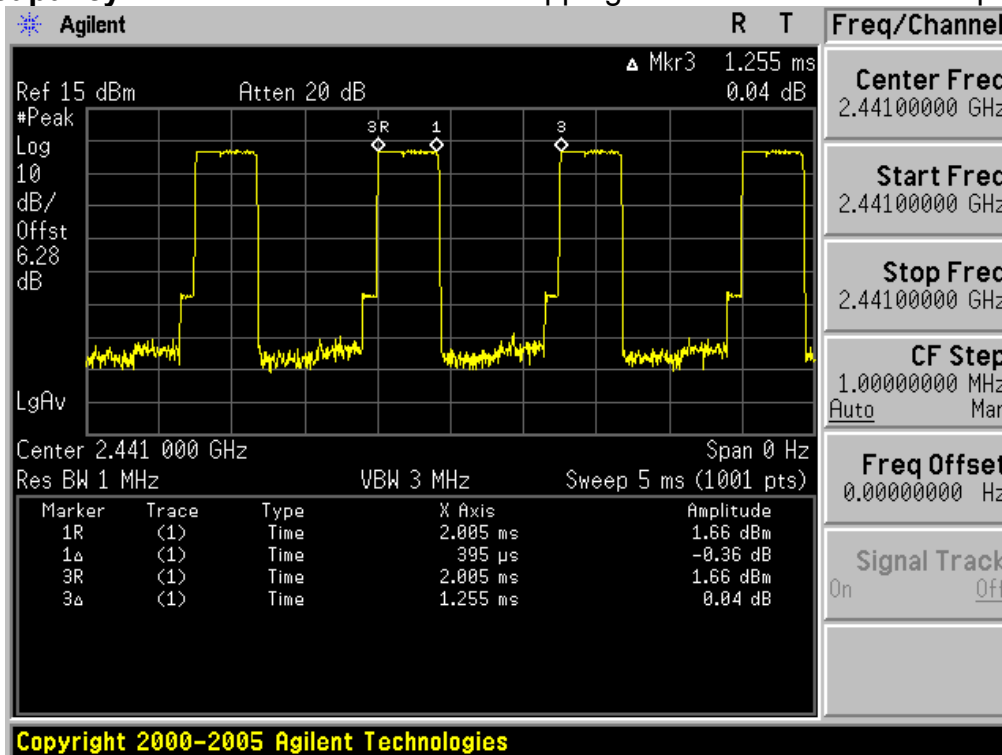
Time of Occupancy

Hopping mode: Enable & 1Mbps(DH5)



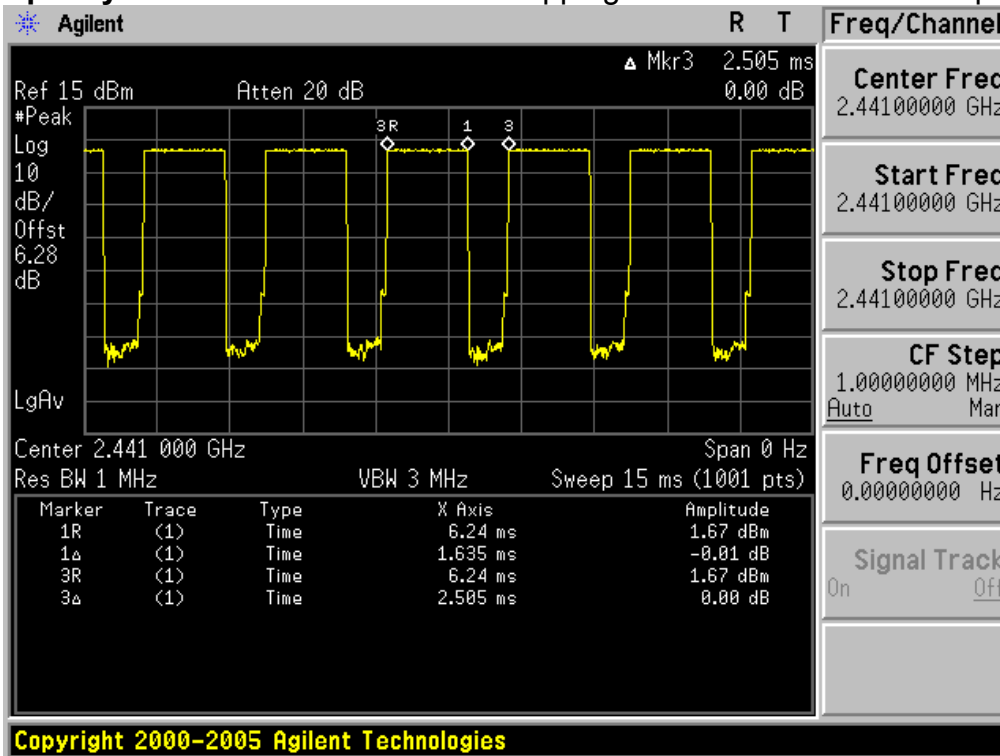
Time of Occupancy

Hopping mode: Enable & 2Mbps(DH1)



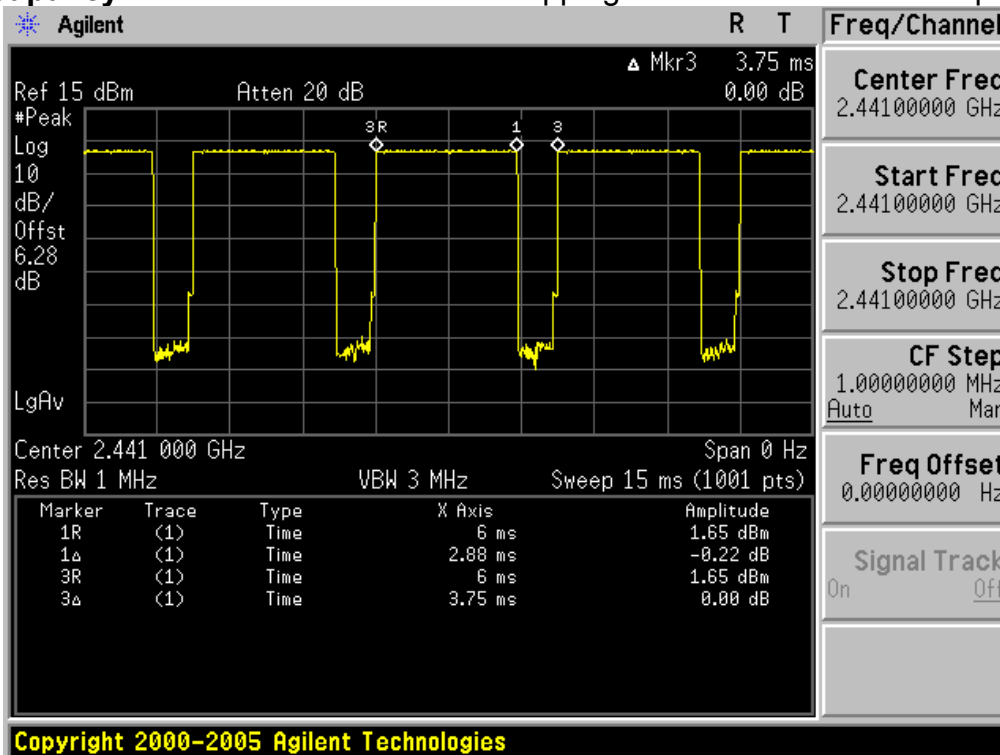
Time of Occupancy

Hopping mode: Enable & 2Mbps(DH3)



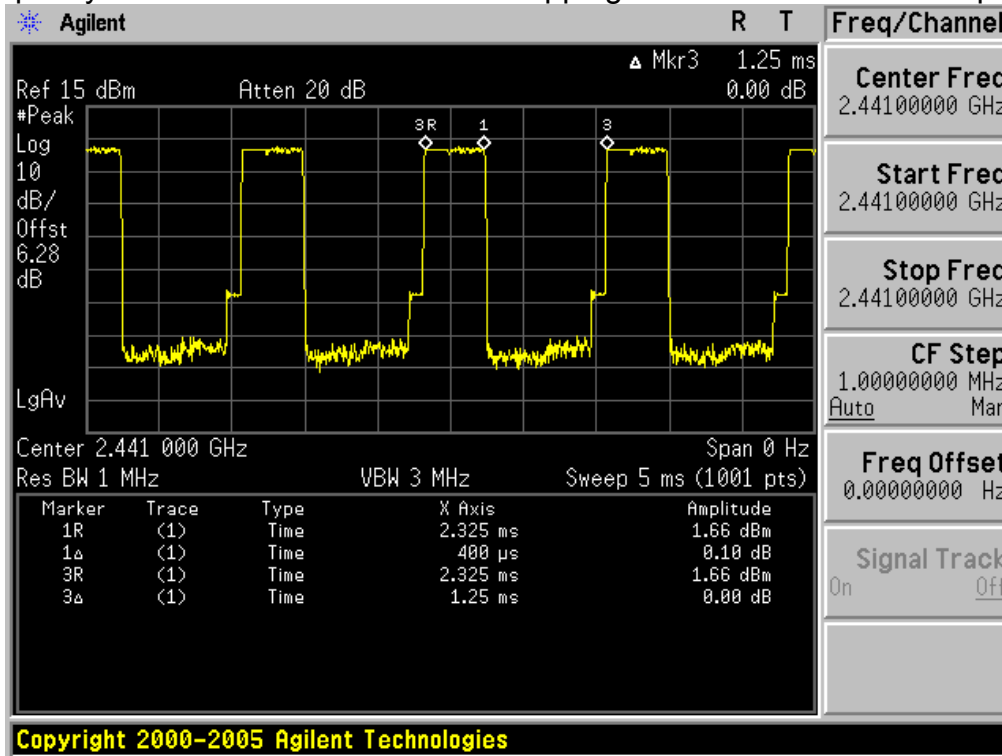
Time of Occupancy

Hopping mode: Enable & 2Mbps(DH5)



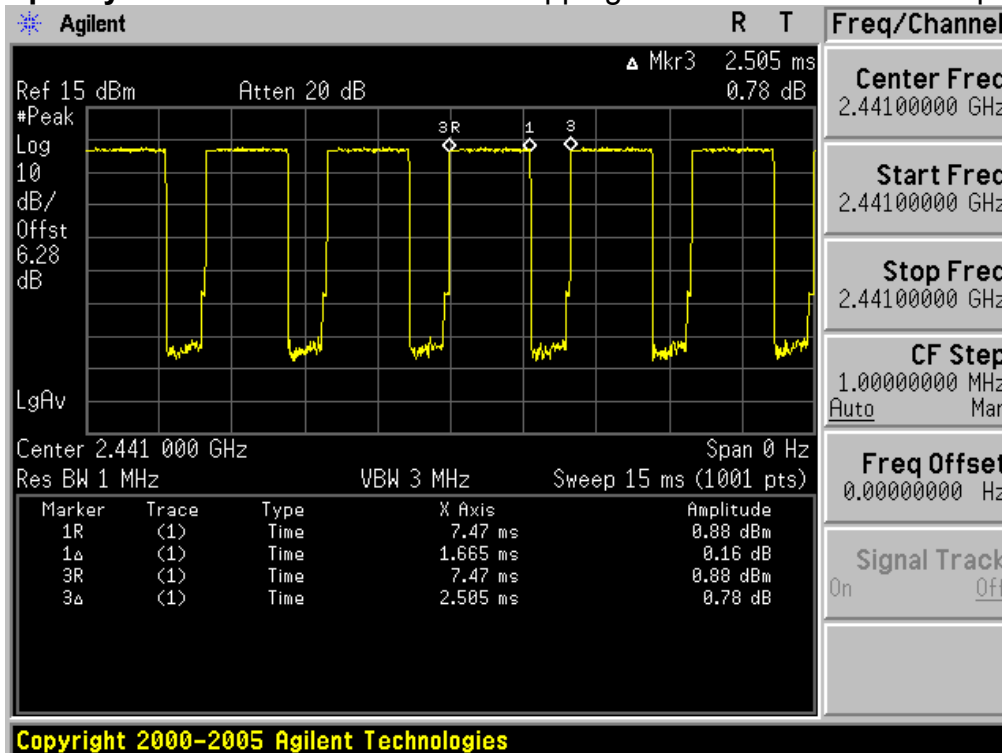
Time of Occupancy

Hopping mode: Enable & 3Mbps(DH1)



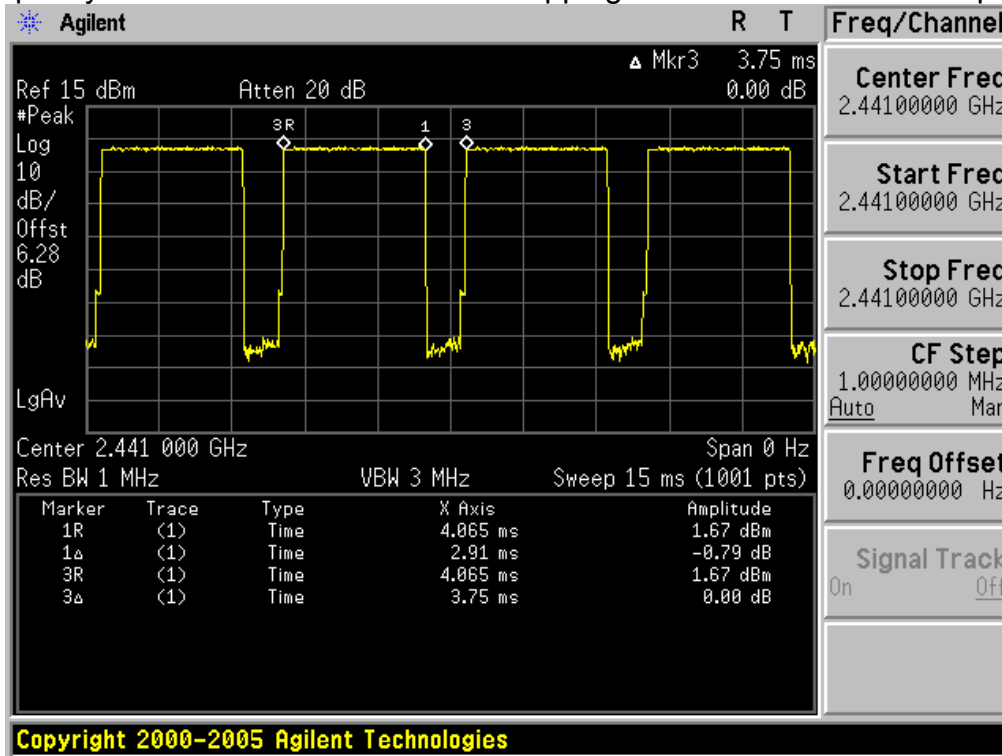
Time of Occupancy

Hopping mode: Enable & 3Mbps(DH3)



Time of Occupancy

Hopping mode: Enable & 3Mbps(DH5)



3.2.5 Peak Output Power & Test Case 1

- 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 10 times of the 20 dB bandwidth
 RBW = greater than the 20dB bandwidth of the emission being measured
 VBW = \geq RBW
 Trace = max hold
 Detector function = peak
 Sweep = auto

- Measurement Data: **Comply**

Hopping mode	Test mode	Tested Channel	Test Results	
			dBm	mW
Disable	1Mbps	Lowest	2.57	1.81
		Middle	2.15	1.64
		Highest	1.35	1.36
	2Mbps	Lowest	2.68	1.85
		Middle	2.16	1.64
		Highest	1.31	1.35
	3Mbps	Lowest	3.12	2.05
		Middle	2.56	1.80
		Highest	1.71	1.48

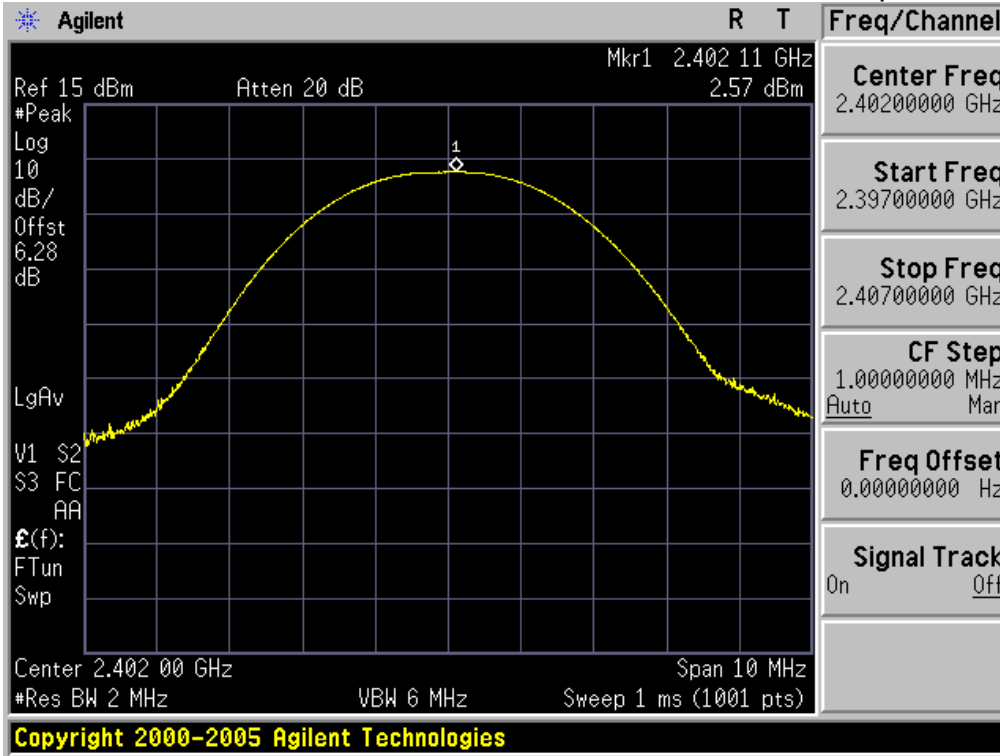
Note 1: See next pages for actual measured spectrum plots.

- 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**

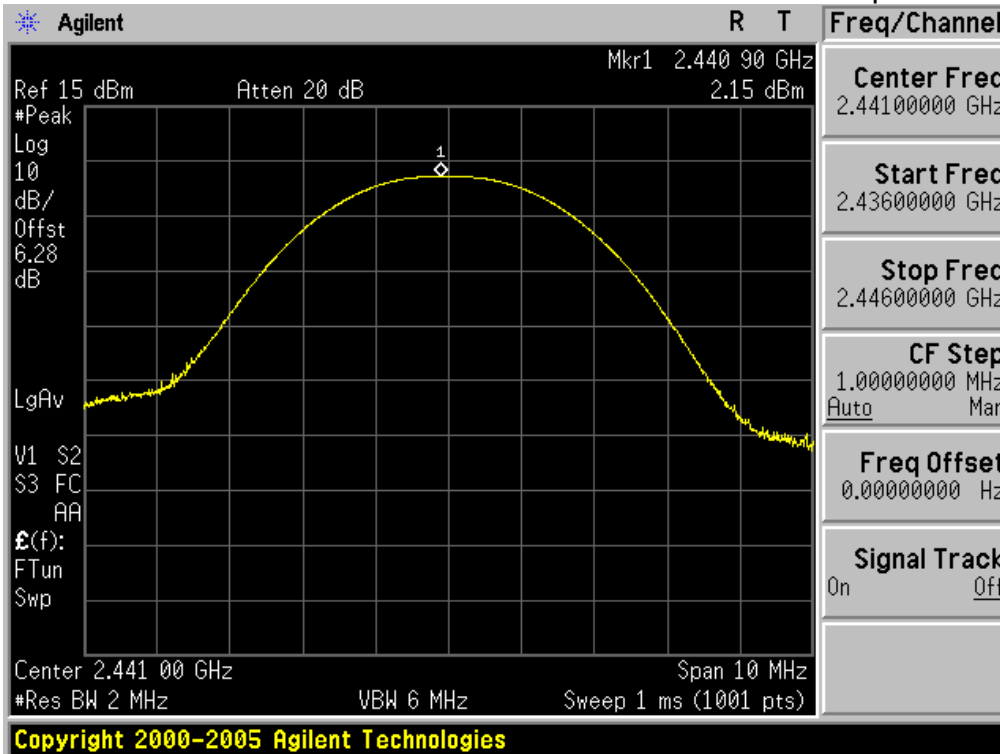
Peak Output Power

Lowest Channel & 1Mbps



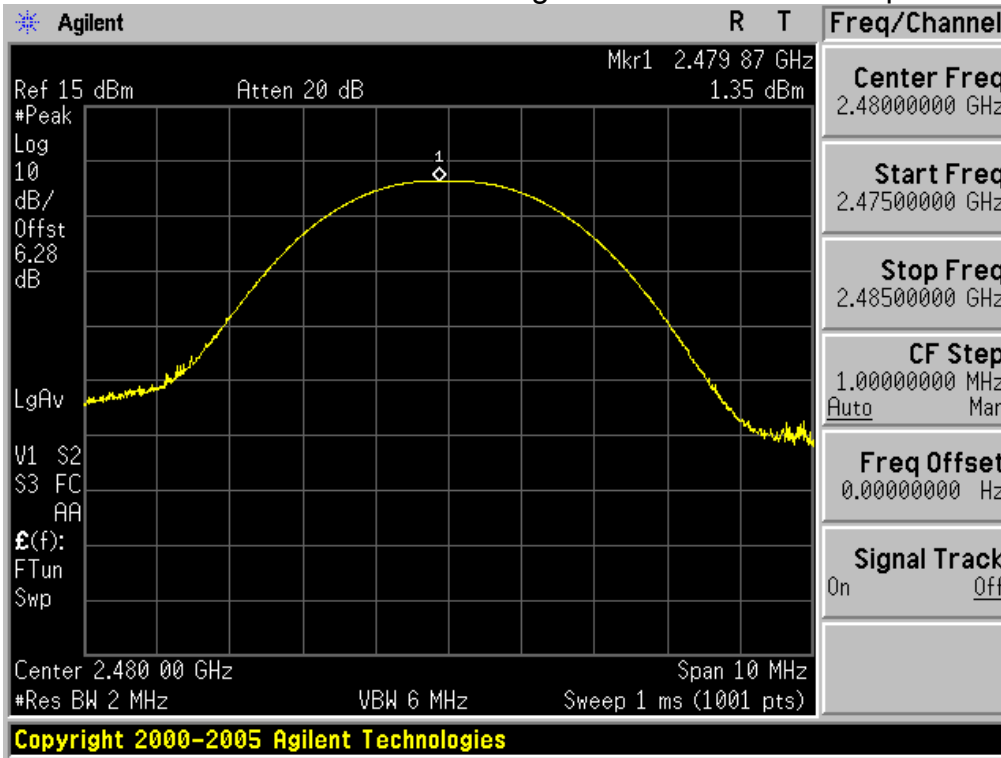
Peak Output Power

Middle Channel & 1Mbps



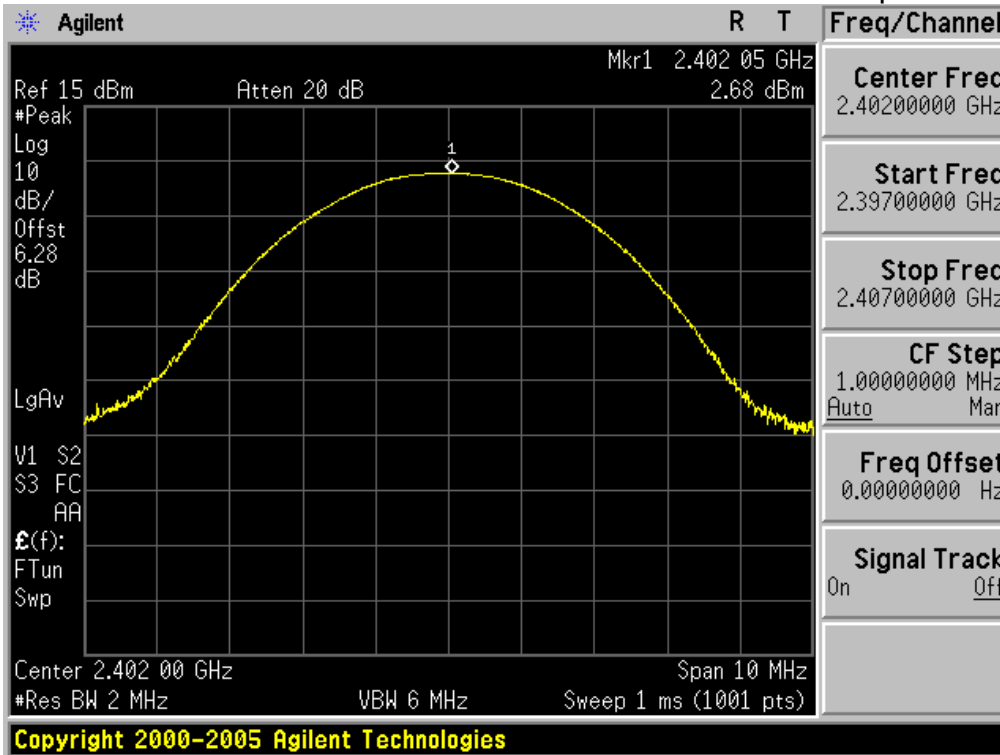
Peak Output Power

Highest Channel & 1Mbps



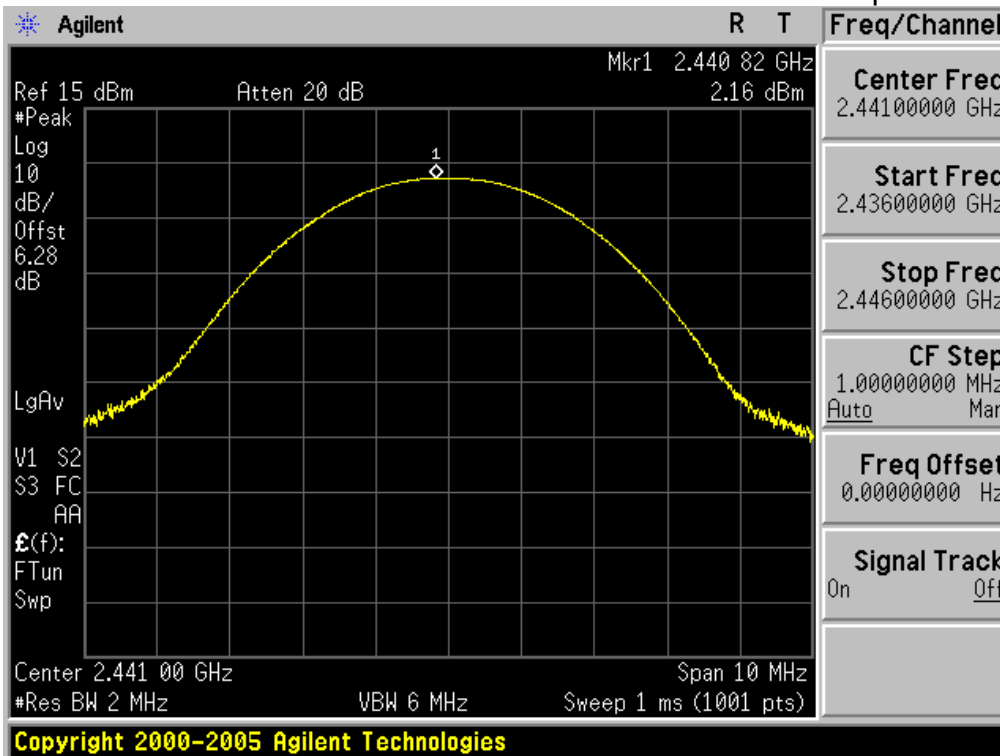
Peak Output Power

Lowest Channel & 2Mbps



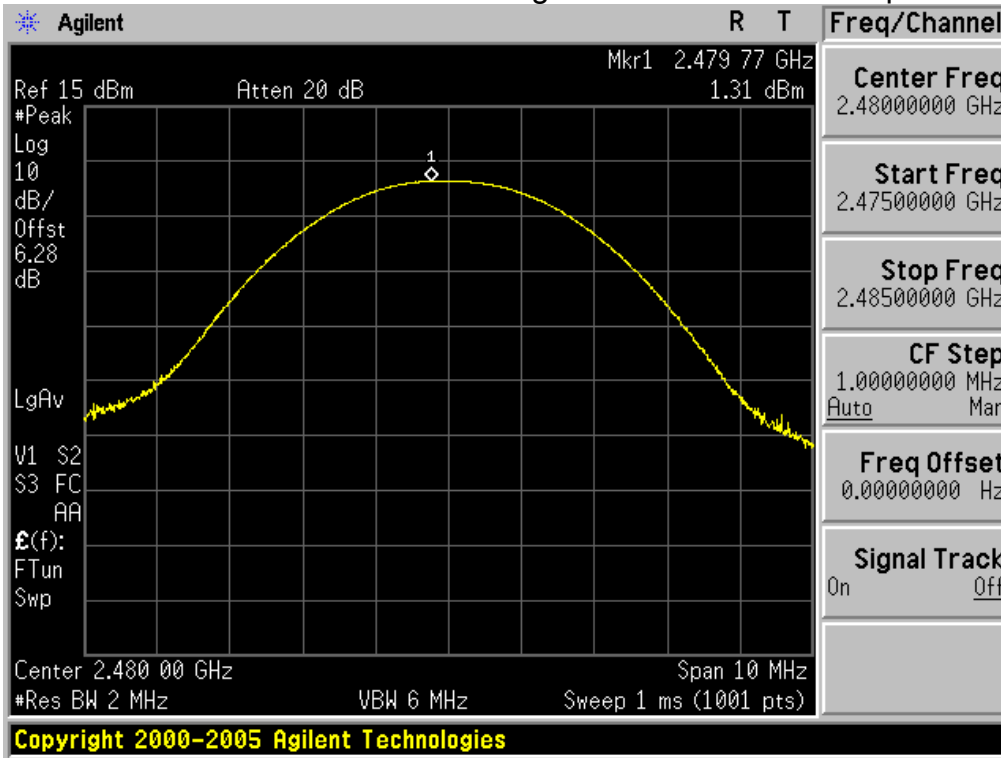
Peak Output Power

Middle Channel & 2Mbps



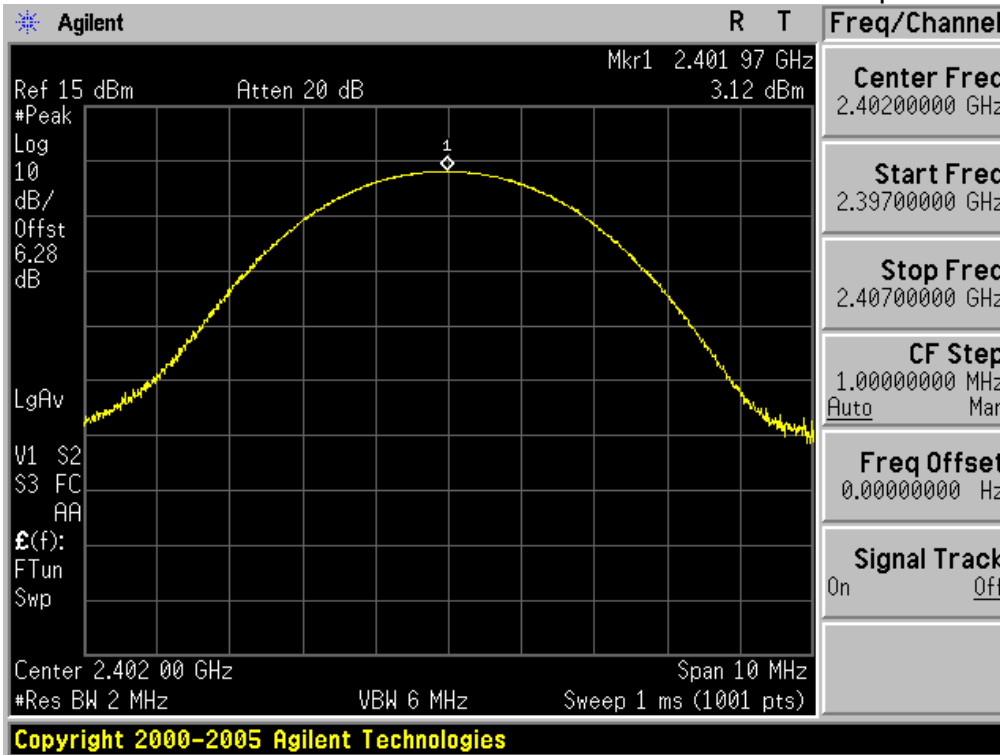
Peak Output Power

Highest Channel & 2Mbps



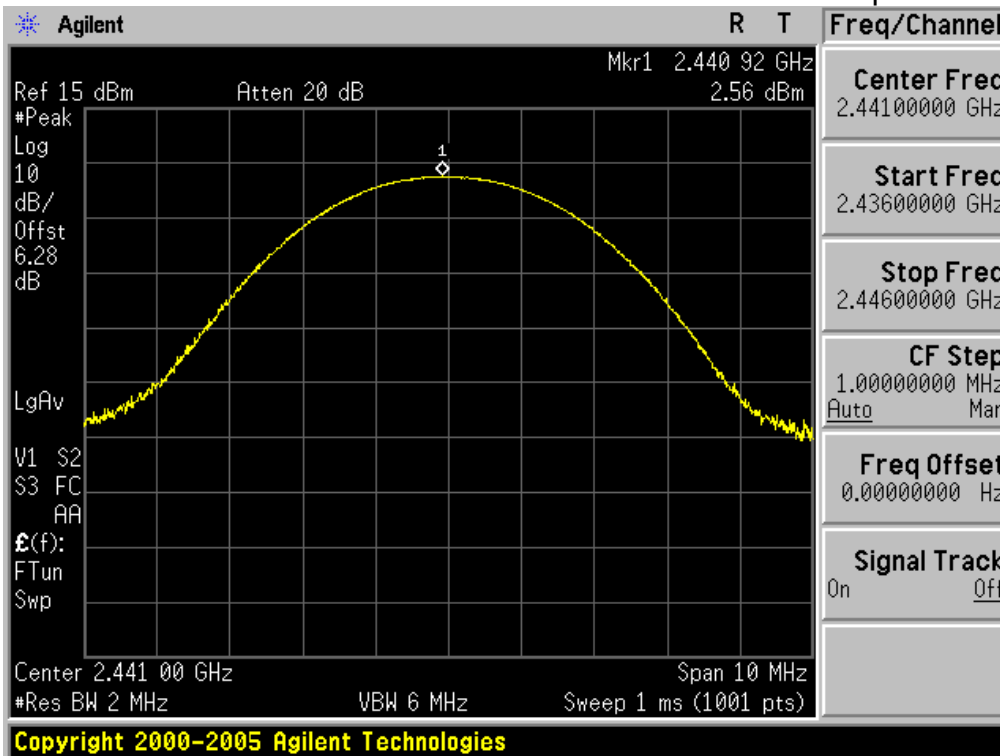
Peak Output Power

Lowest Channel & 3Mbps



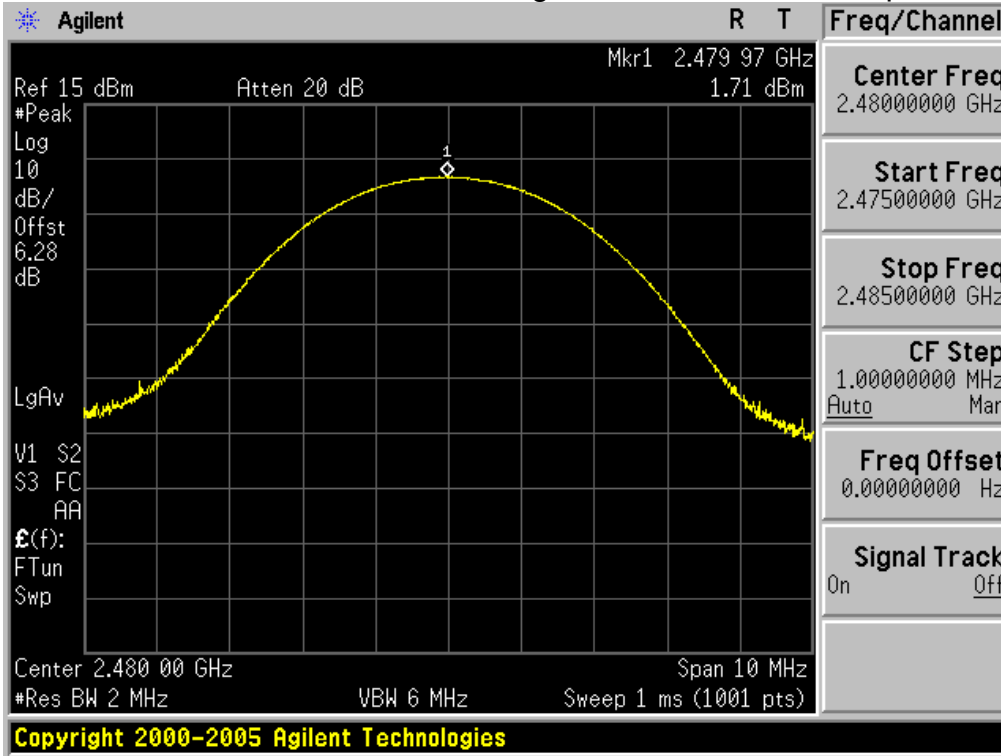
Peak Output Power

Middle Channel & 3Mbps



Peak Output Power

Highest Channel & 3Mbps



3.2.6 Conducted Spurious Emissions & Test Case 1

- 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 = \geq 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 = \geq RBW

Detector function = peak

Sweep = auto

Trace = max hold

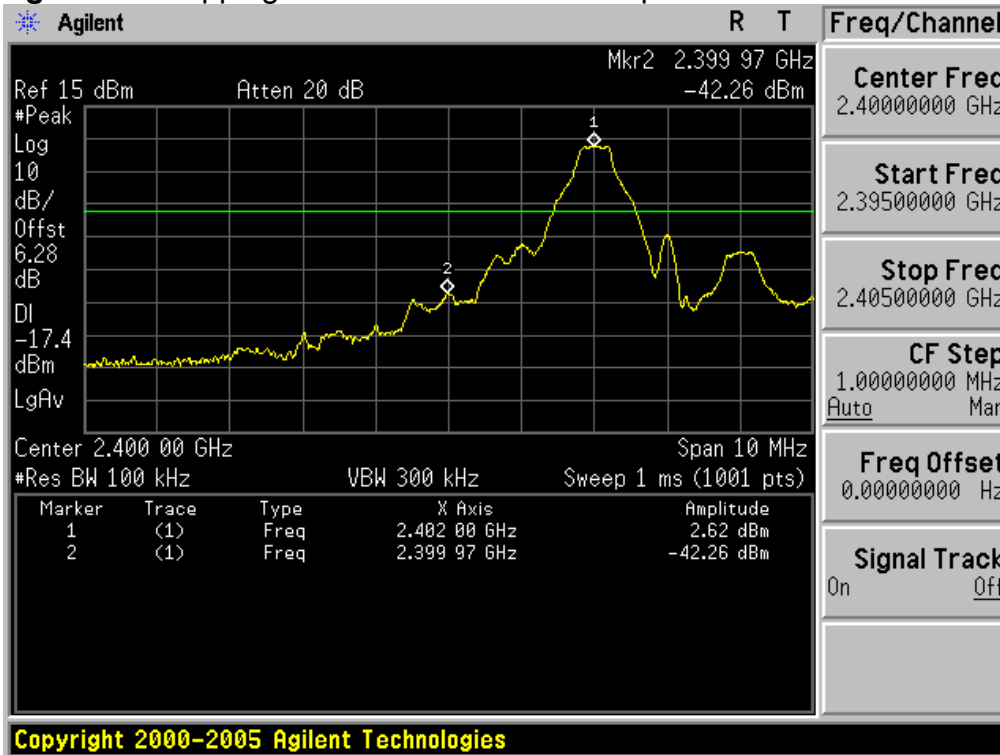
- Measurement Data: **Comply**

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

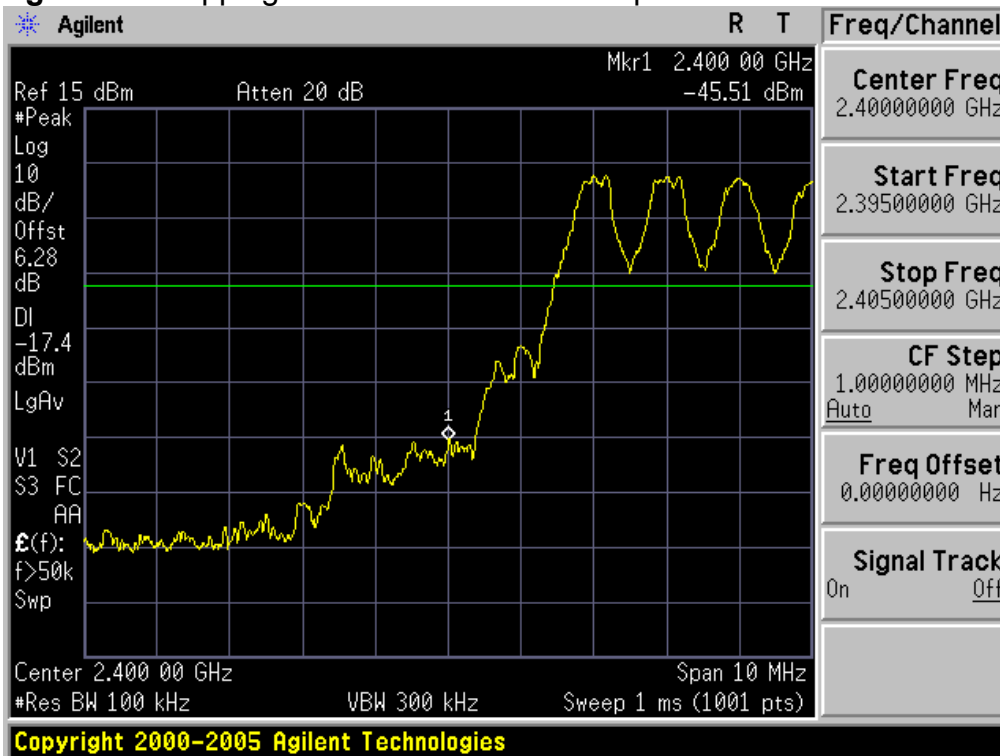
- Minimum Standard:

Minimum Standard:	> 20 dBc
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Low Band-edge Hopping mode: Disable & 1Mbps

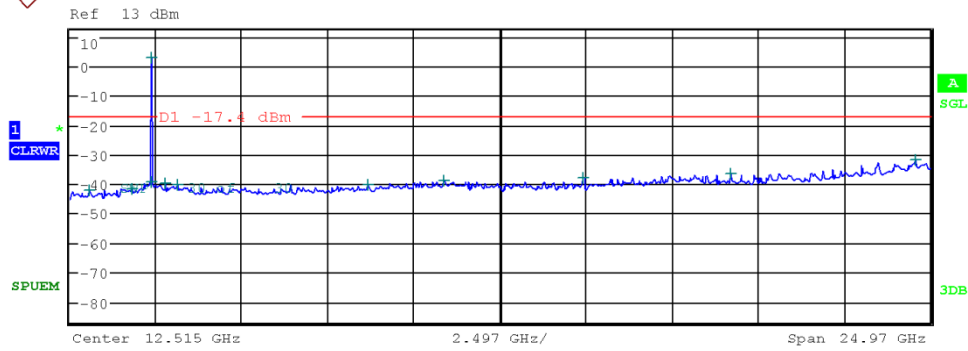


Low Band-edge Hopping mode: Enable & 1Mbps



Conducted Spurious Emissions

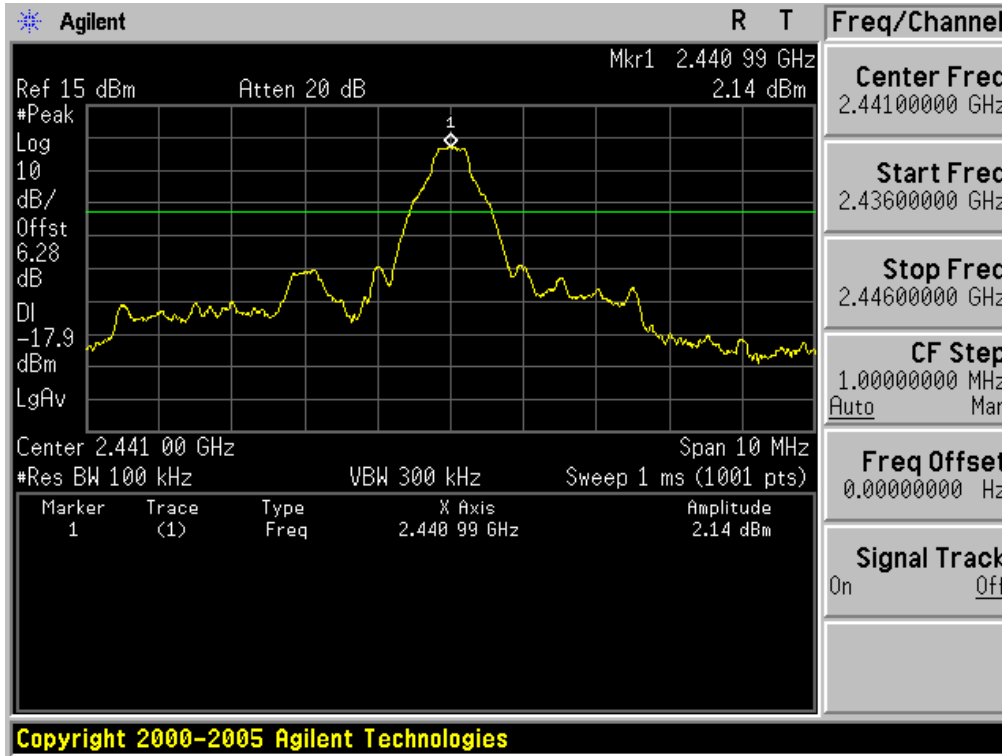
Lowest Frequency & 1Mbps



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
30.000 M	1.000 G	100.00 k	584.840000 M	-42.02	-200.00
1.000 G	2.000 G	100.00 k	1.812000 G	-41.68	-200.00
2.000 G	2.400 G	100.00 k	2.372600 G	-39.46	-200.00
2.400 G	2.483 G	100.00 k	2.401991 G	3.13	-200.00
2.483 G	3.000 G	100.00 k	2.796396 G	-39.77	-200.00
3.000 G	6.000 G	100.00 k	3.162000 G	-40.39	-200.00
6.000 G	9.000 G	100.00 k	8.653667 G	-40.22	-200.00
9.000 G	12.000 G	100.00 k	10.866667 G	-38.74	-200.00
12.000 G	15.000 G	100.00 k	14.924667 G	-38.12	-200.00
15.000 G	20.000 G	100.00 k	19.192778 G	-36.38	-200.00
20.000 G	25.000 G	100.00 k	24.543889 G	-31.81	-200.00

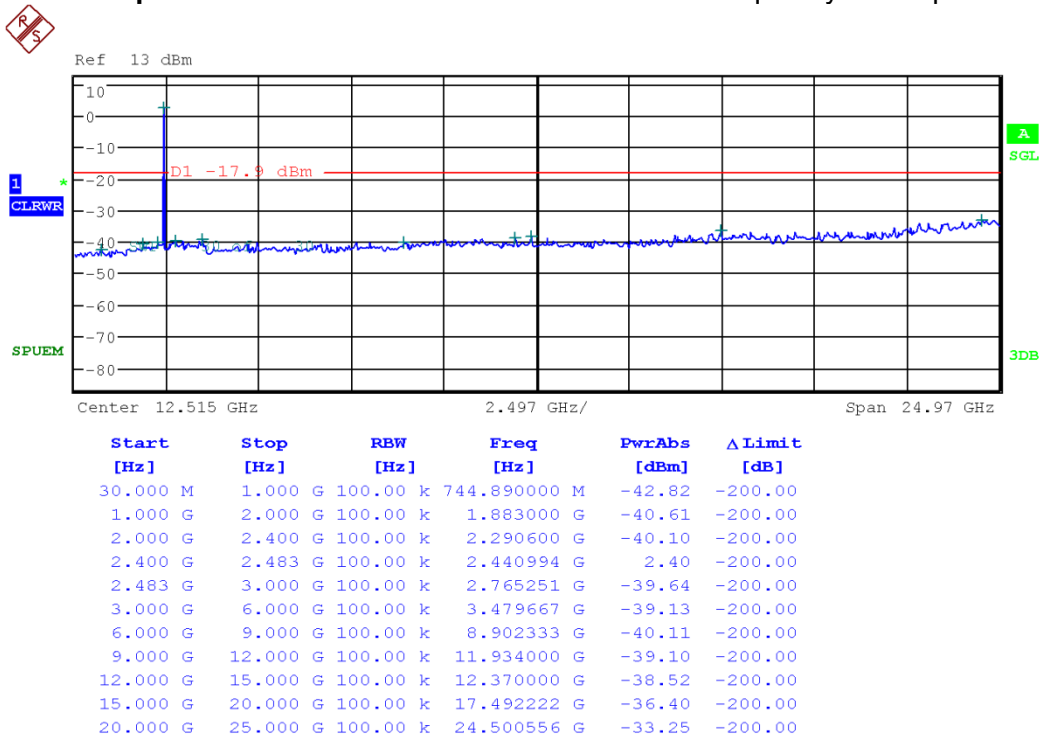
Reference for limit

Middle Frequency & 1Mbps

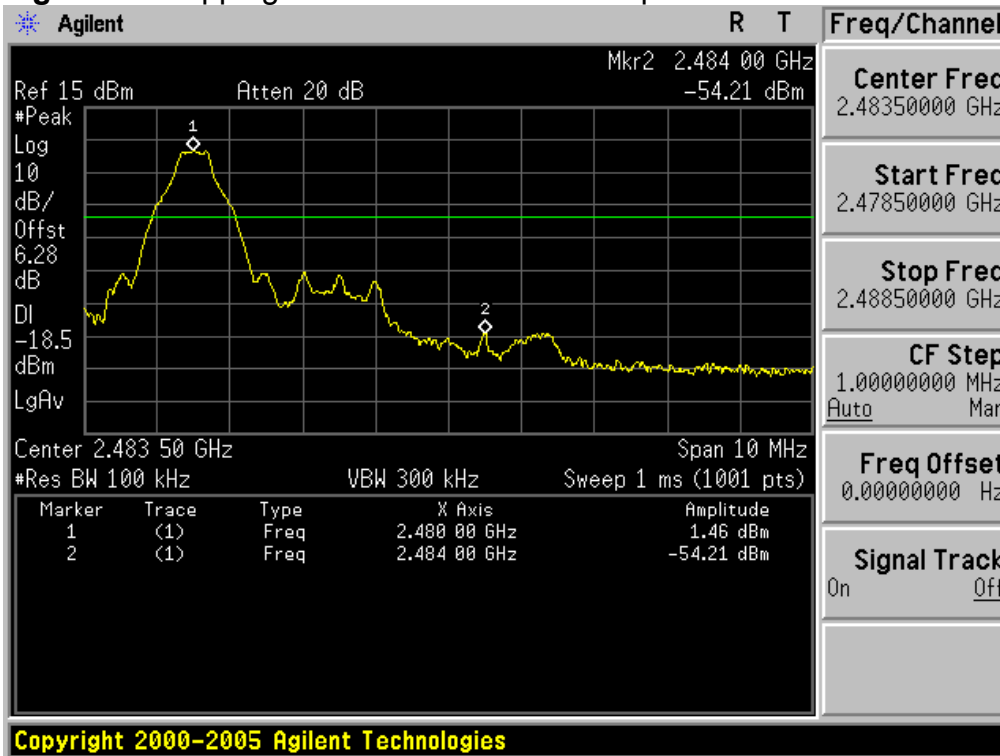


Conducted Spurious Emissions

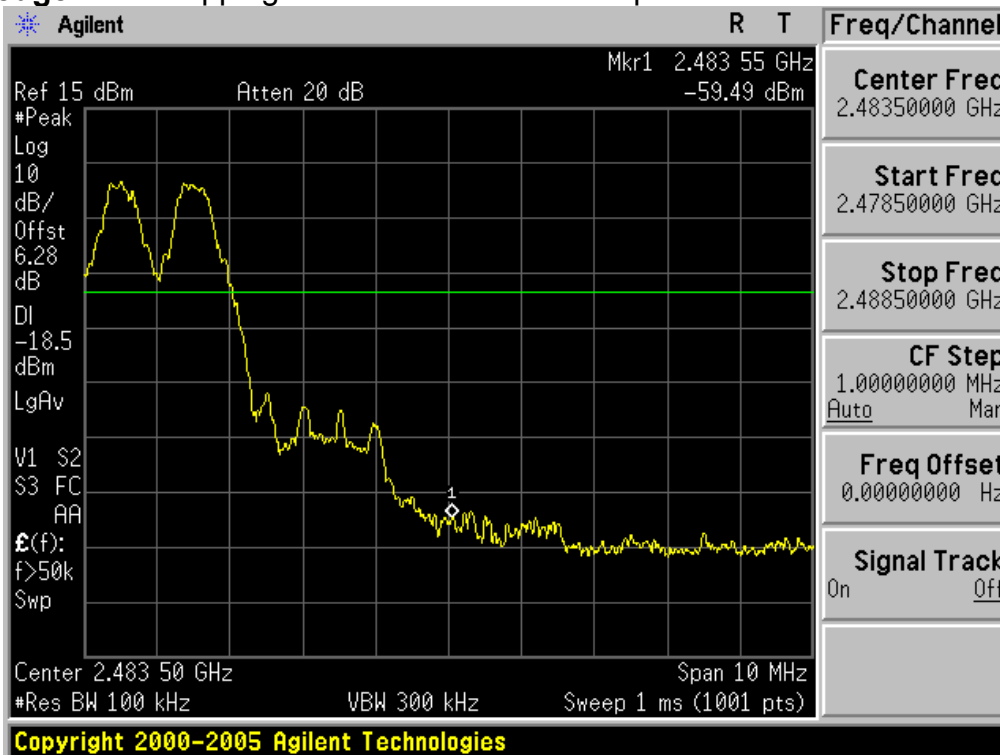
Middle Frequency & 1Mbps



High Band-edge Hopping mode: Disable & 1Mbps

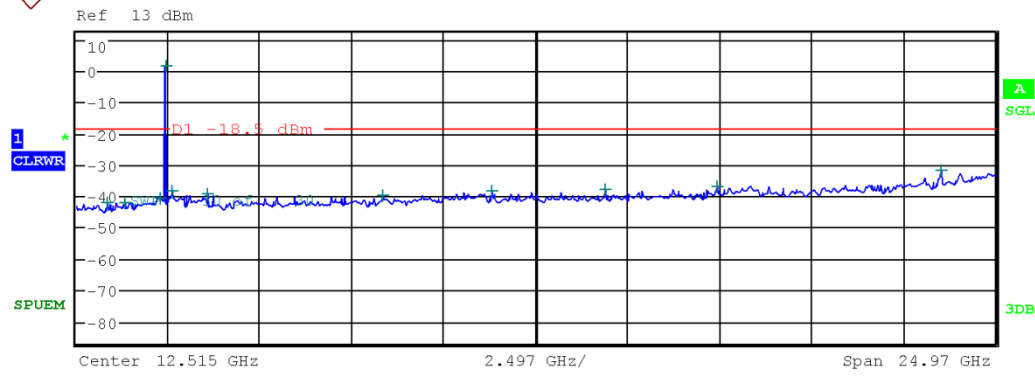


High Band-edge Hopping mode: Enable & 1Mbps



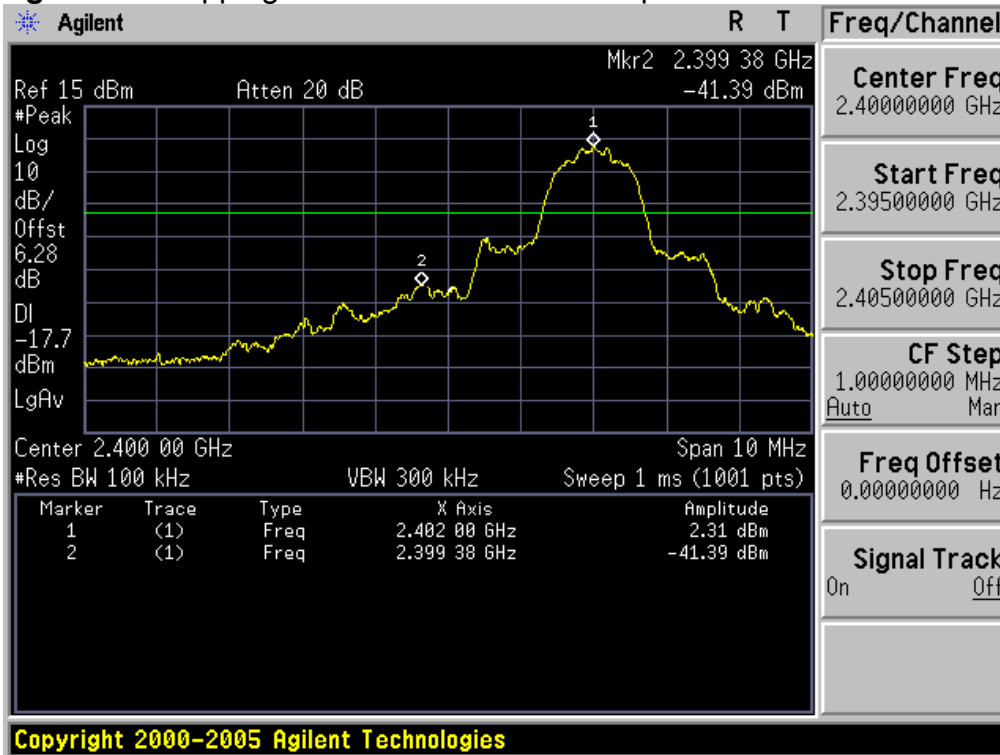
Conducted Spurious Emissions

Highest Frequency & 1Mbps

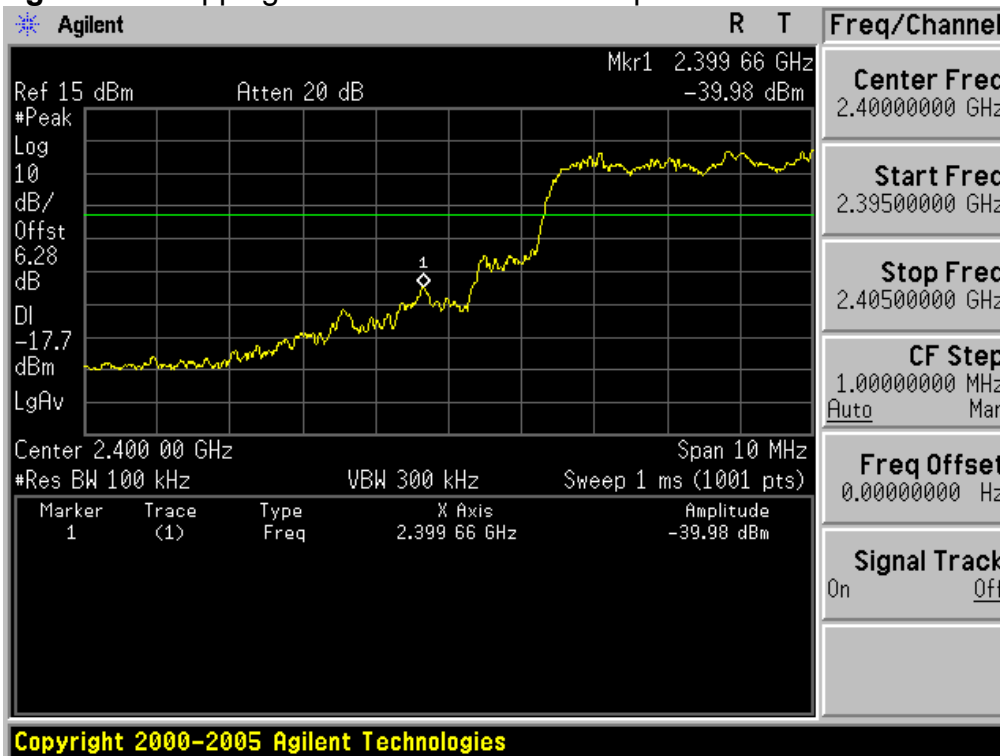


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
30.000 M	1.000 G	100.00 k	862.260000 M	-41.99	-200.00
1.000 G	2.000 G	100.00 k	1.361000 G	-42.02	-200.00
2.000 G	2.400 G	100.00 k	2.301120 G	-40.74	-200.00
2.400 G	2.483 G	100.00 k	2.479997 G	1.60	-200.00
2.483 G	3.000 G	100.00 k	2.637675 G	-38.63	-200.00
3.000 G	6.000 G	100.00 k	3.594333 G	-39.42	-200.00
6.000 G	9.000 G	100.00 k	8.370000 G	-39.96	-200.00
9.000 G	12.000 G	100.00 k	11.294667 G	-38.37	-200.00
12.000 G	15.000 G	100.00 k	14.390000 G	-37.96	-200.00
15.000 G	20.000 G	100.00 k	17.451111 G	-36.85	-200.00
20.000 G	25.000 G	100.00 k	23.512222 G	-31.95	-200.00

Low Band-edge Hopping mode: Disable & 2Mbps

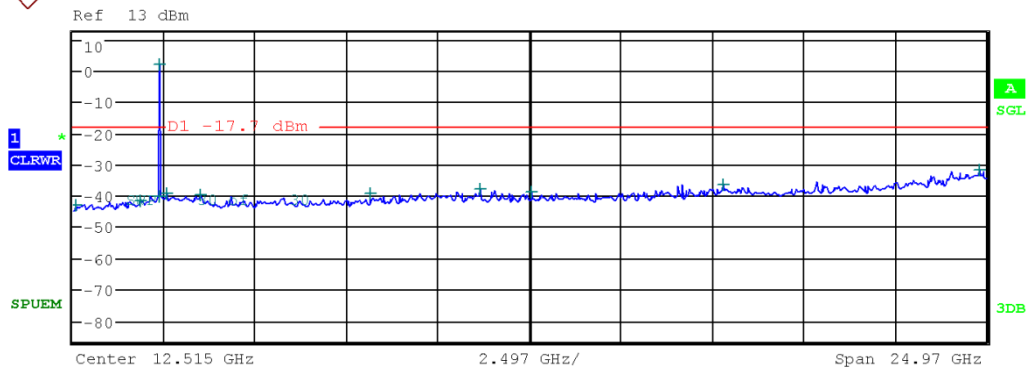


Low Band-edge Hopping mode: Enable & 2Mbps



Conducted Spurious Emissions

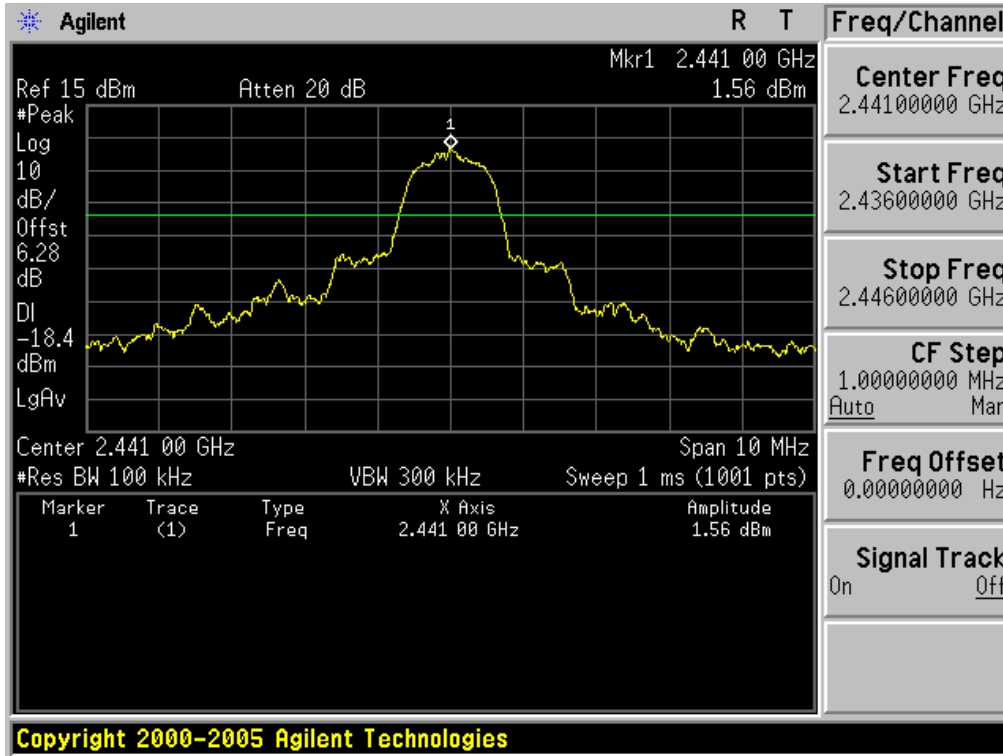
Lowest Frequency & 2Mbps



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
30.000 M	1.000 G	100.00 k	110.510000 M	-42.96	-200.00
1.000 G	2.000 G	100.00 k	1.851000 G	-41.69	-200.00
2.000 G	2.400 G	100.00 k	2.373400 G	-40.13	-200.00
2.400 G	2.483 G	100.00 k	2.401866 G	2.11	-200.00
2.483 G	3.000 G	100.00 k	2.590312 G	-39.49	-200.00
3.000 G	6.000 G	100.00 k	3.512667 G	-39.94	-200.00
6.000 G	9.000 G	100.00 k	8.148000 G	-39.21	-200.00
9.000 G	12.000 G	100.00 k	11.141000 G	-38.11	-200.00
12.000 G	15.000 G	100.00 k	12.564000 G	-39.01	-200.00
15.000 G	20.000 G	100.00 k	17.807222 G	-36.45	-200.00
20.000 G	25.000 G	100.00 k	24.818333 G	-31.96	-200.00

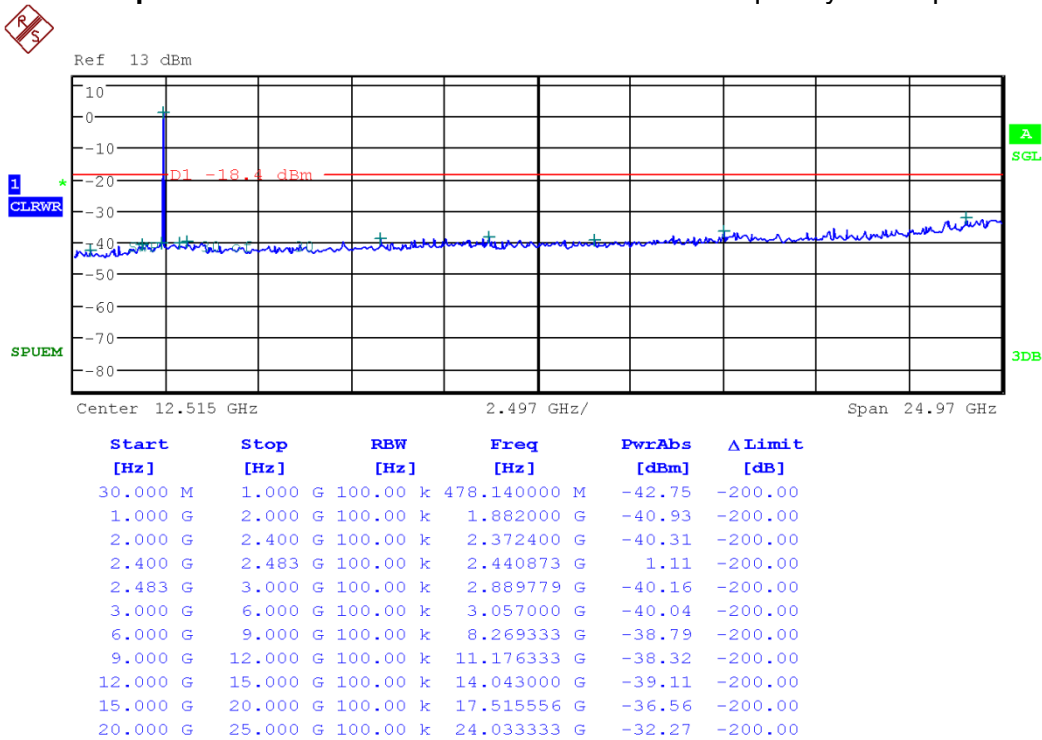
Reference for limit

Middle Frequency & 2Mbps

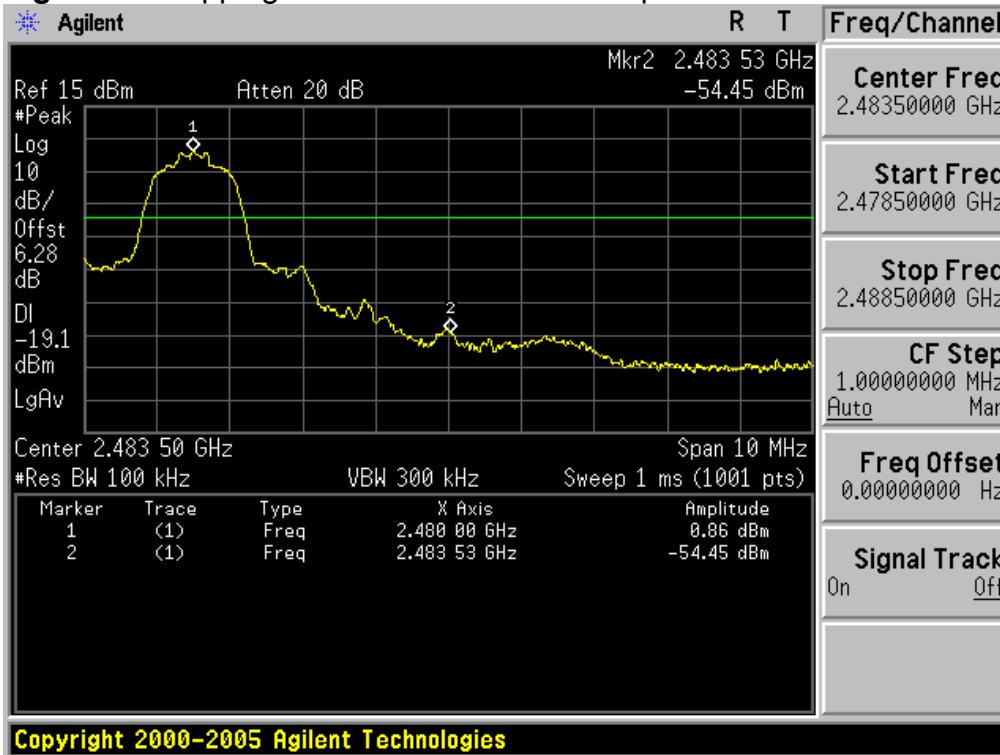


Conducted Spurious Emissions

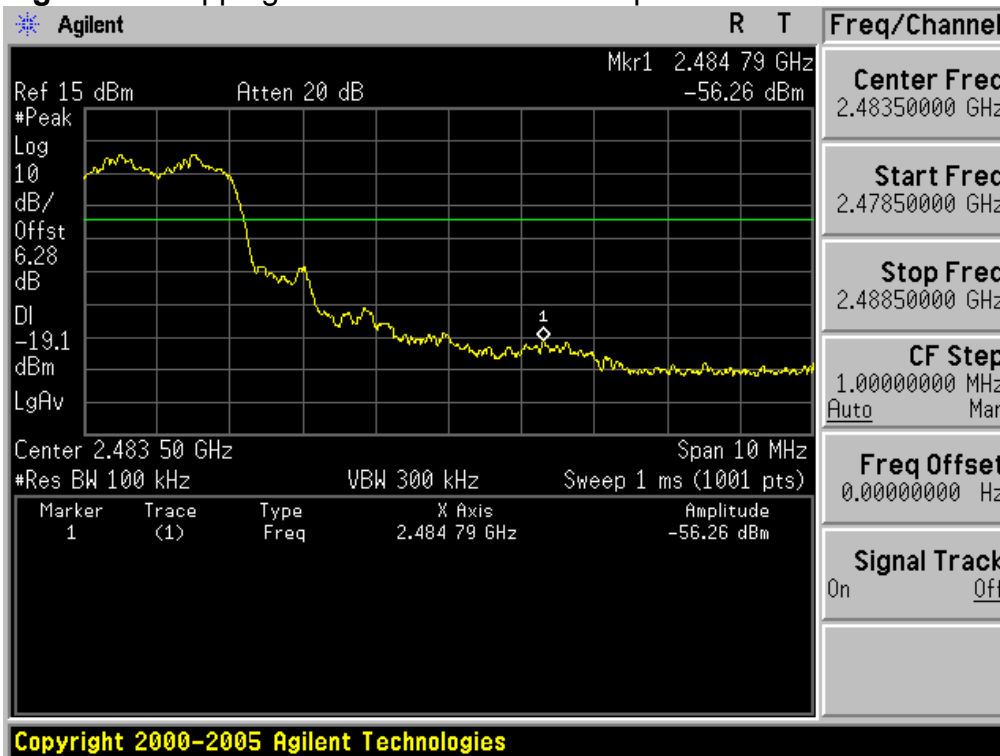
Middle Frequency & 2Mbps



High Band-edge Hopping mode: Disable & 2Mbps

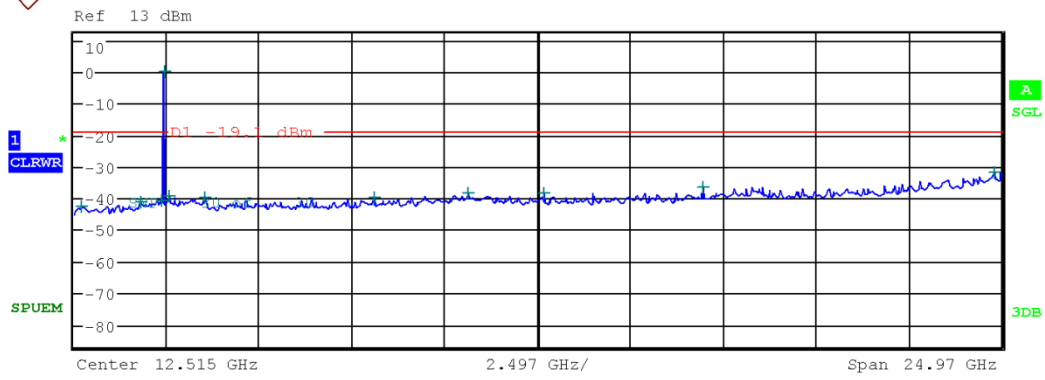


High Band-edge Hopping mode: Enable & 2Mbps



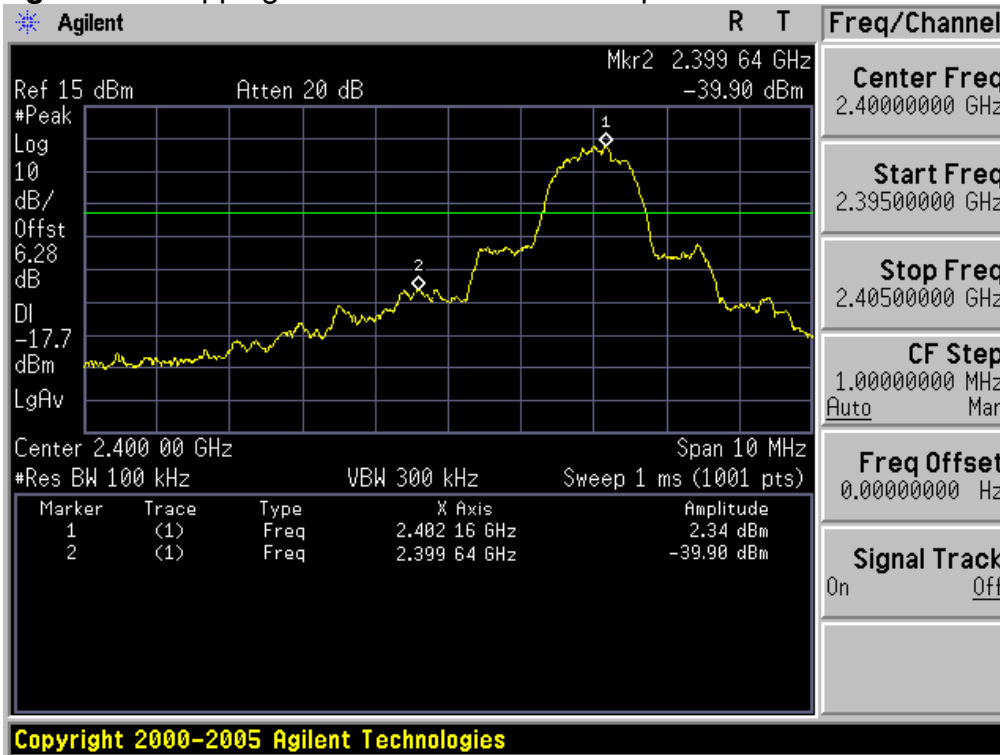
Conducted Spurious Emissions

Highest Frequency & 2Mbps

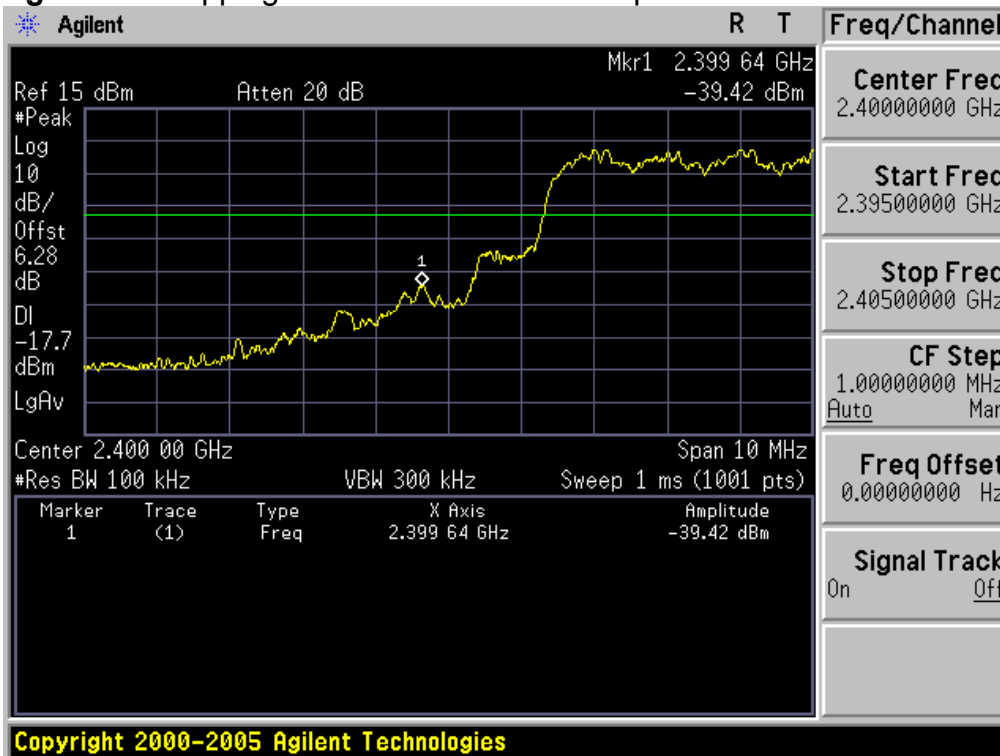


Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
30.000 M	1.000 G	100.00 k	248.250000 M	-42.52	-200.00
1.000 G	2.000 G	100.00 k	1.844000 G	-41.46	-200.00
2.000 G	2.400 G	100.00 k	2.395320 G	-40.55	-200.00
2.400 G	2.483 G	100.00 k	2.479872 G	0.23	-200.00
2.483 G	3.000 G	100.00 k	2.574042 G	-39.14	-200.00
3.000 G	6.000 G	100.00 k	3.568333 G	-40.00	-200.00
6.000 G	9.000 G	100.00 k	8.104000 G	-39.95	-200.00
9.000 G	12.000 G	100.00 k	10.623000 G	-38.34	-200.00
12.000 G	15.000 G	100.00 k	12.686333 G	-38.44	-200.00
15.000 G	20.000 G	100.00 k	16.960556 G	-36.51	-200.00
20.000 G	25.000 G	100.00 k	24.812222 G	-31.99	-200.00

Low Band-edge Hopping mode: Disable & 3Mbps

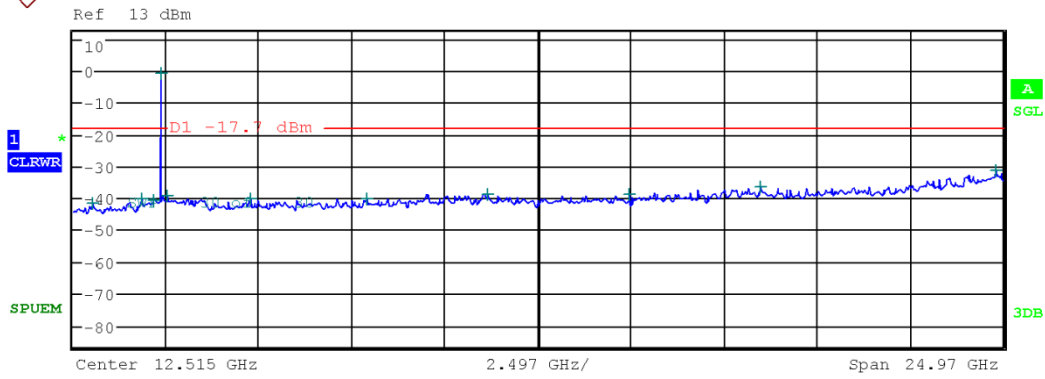


Low Band-edge Hopping mode: Enable & 3Mbps



Conducted Spurious Emissions

Lowest Frequency & 3Mbps

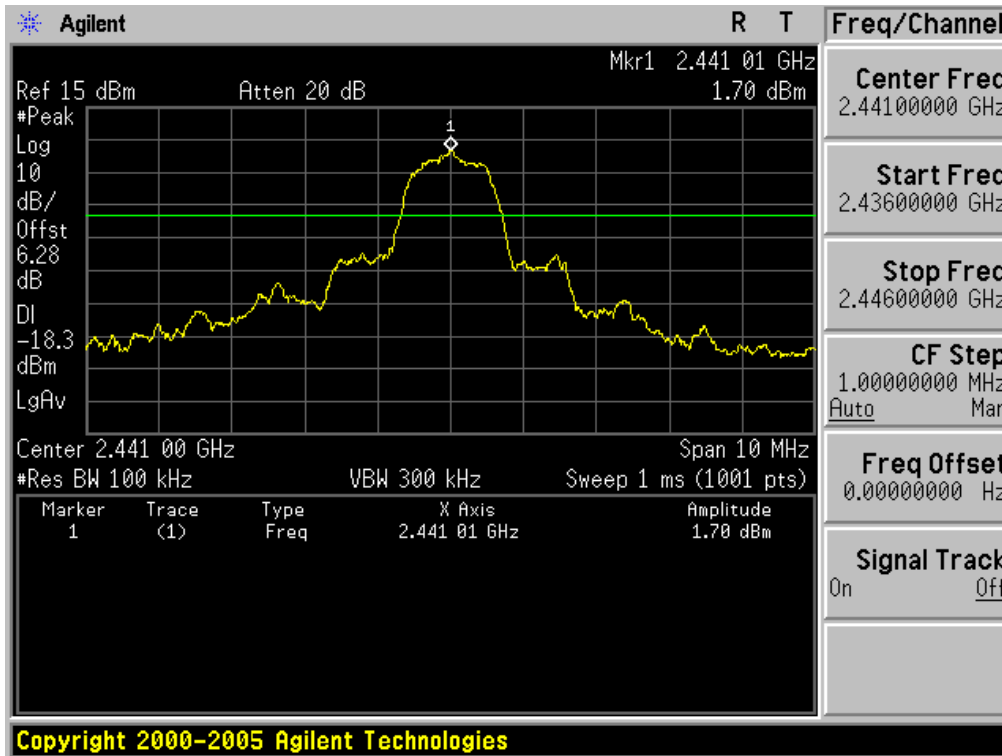


Center 12.515 GHz 2.497 GHz/ Span 24.97 GHz

Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
30.000 M	1.000 G	100.00 k	564.470000 M	-41.59	-200.00
1.000 G	2.000 G	100.00 k	1.879000 G	-40.41	-200.00
2.000 G	2.400 G	100.00 k	2.199040 G	-40.93	-200.00
2.400 G	2.483 G	100.00 k	2.401566 G	-1.05	-200.00
2.483 G	3.000 G	100.00 k	2.555448 G	-39.22	-200.00
3.000 G	6.000 G	100.00 k	4.804333 G	-40.38	-200.00
6.000 G	9.000 G	100.00 k	7.894000 G	-40.24	-200.00
9.000 G	12.000 G	100.00 k	11.157333 G	-38.67	-200.00
12.000 G	15.000 G	100.00 k	14.961333 G	-38.88	-200.00
15.000 G	20.000 G	100.00 k	18.463889 G	-36.54	-200.00
20.000 G	25.000 G	100.00 k	24.817222 G	-31.42	-200.00

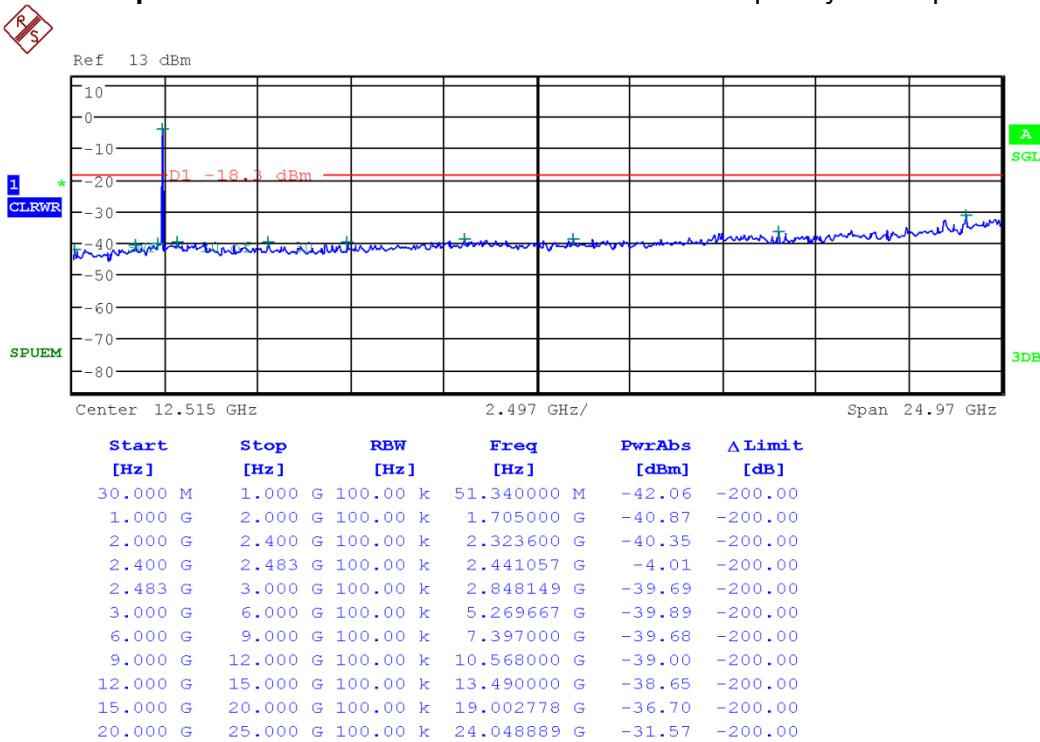
Reference for limit

Middle Frequency & 3Mbps

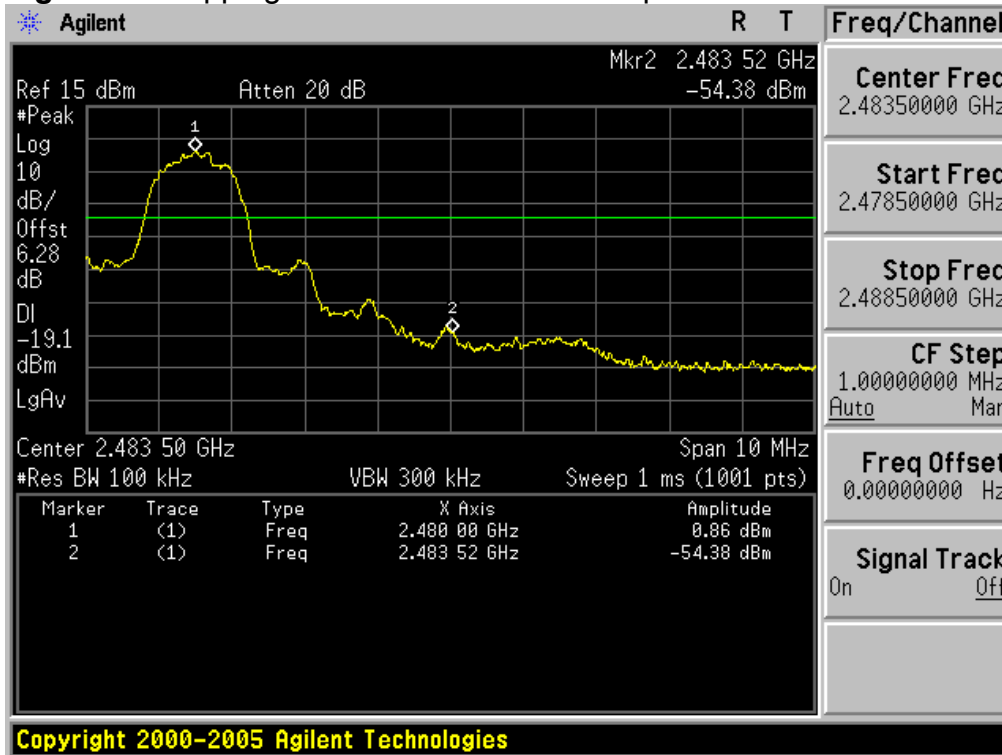


Conducted Spurious Emissions

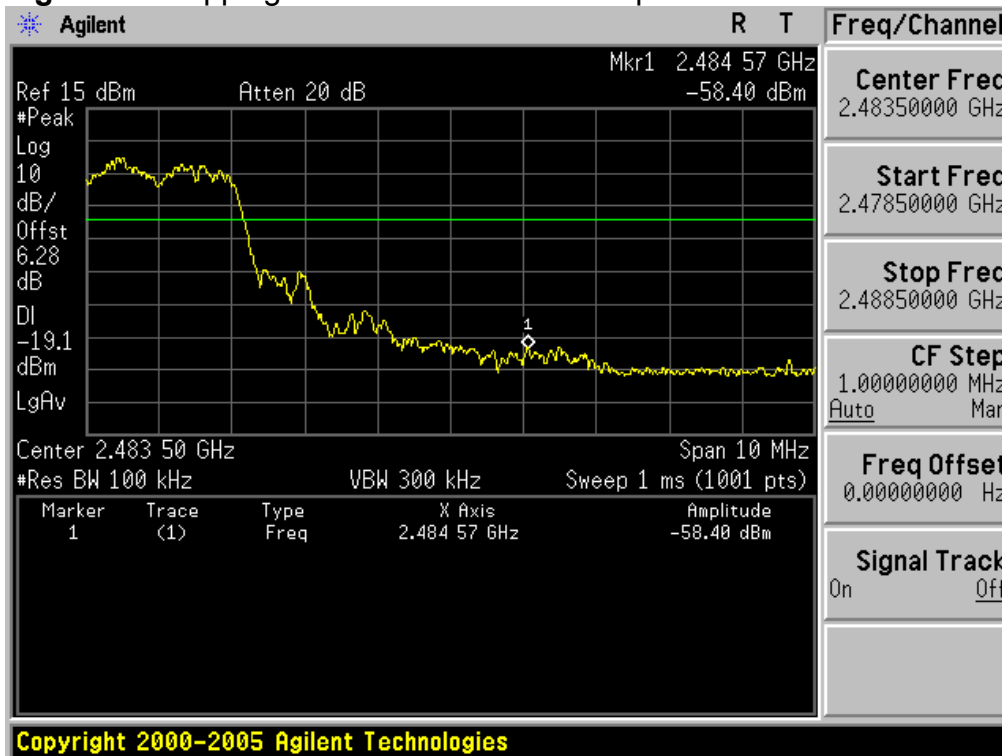
Middle Frequency & 3Mbps



High Band-edge Hopping mode: Disable & 3Mbps

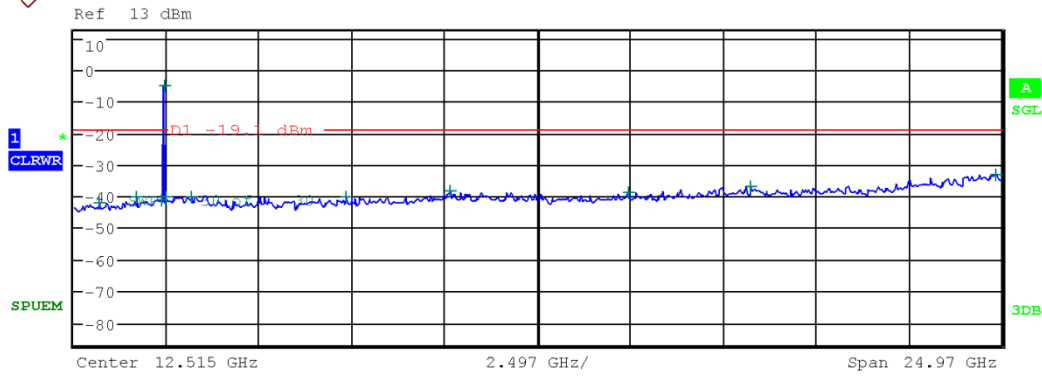


High Band-edge Hopping mode: Enable & 3Mbps



Conducted Spurious Emissions

Highest Frequency & 3Mbps



Start [Hz]	Stop [Hz]	RBW [Hz]	Freq [Hz]	PwrAbs [dBm]	Δ Limit [dB]
30.000 M	1.000 G	100.00 k	709.970000 M	-42.24	-200.00
1.000 G	2.000 G	100.00 k	1.707000 G	-40.24	-200.00
2.000 G	2.400 G	100.00 k	2.390880 G	-41.30	-200.00
2.400 G	2.483 G	100.00 k	2.480072 G	-4.97	-200.00
2.483 G	3.000 G	100.00 k	2.517382 G	-40.12	-200.00
3.000 G	6.000 G	100.00 k	3.183667 G	-40.10	-200.00
6.000 G	9.000 G	100.00 k	7.343333 G	-40.43	-200.00
9.000 G	12.000 G	100.00 k	10.135667 G	-38.23	-200.00
12.000 G	15.000 G	100.00 k	14.973000 G	-38.82	-200.00
15.000 G	20.000 G	100.00 k	18.229444 G	-37.02	-200.00
20.000 G	25.000 G	100.00 k	24.820556 G	-33.01	-200.00

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 = \geq RBW
2. Frequency range: 1GHz ~ 10th harmonics
Peak mode: RBW = 1MHz / VBW = \geq RBW
Average mode: RBW = 1MHz / VBW = 10Hz

Detector function = Peak

Sweep = auto

Trace = max hold

- Measurement Data: **Comply**

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

- Minimum Standard:

▪ FCC Part 15.209(a) and (b)

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

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

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

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

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

30MHz ~ 25GHz Radiated Spurious Emissions & Test Case 1 & 1Mbps

▪ Lowest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2399.850	H	Y axis	PK	40.30	-1.01	39.29	74.00	34.71
2399.850	H	Y axis	AV	31.14	-1.01	30.13	54.00	23.87
4804.520	H	Y axis	PK	49.84	8.34	58.18	74.00	15.82
4804.520	H	Y axis	AV	37.68	8.34	46.02	54.00	7.98

▪ Middle Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4882.340	H	Y axis	PK	50.17	8.51	58.68	74.00	15.32
4882.340	H	Y axis	AV	37.45	8.51	45.96	54.00	8.04

▪ Highest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2484.330	H	Y axis	PK	52.78	-1.06	51.72	74.00	22.28
2484.330	H	Y axis	AV	33.46	-1.06	32.40	54.00	21.60
4959.780	H	Y axis	PK	48.68	8.57	57.25	74.00	16.75
4959.780	H	Y axis	AV	36.54	8.57	45.11	54.00	8.89

Note.

- No other spurious and harmonic emissions were reported greater than listed emissions on above table.
- Sample Calculation.
 $\text{Margin} = \text{Limit} - \text{Result}$ / $\text{Result} = \text{Reading} + \text{T.F}$ / $\text{T.F} = \text{AF} + \text{CL} - \text{AG}$
 Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

30MHz ~ 25GHz Radiated Spurious Emissions & Test Case 1 & 2Mbps

▪ Lowest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2398.550	H	Y axis	PK	42.56	-1.01	41.55	74.00	32.45
2398.550	H	Y axis	AV	36.48	-1.01	35.47	54.00	18.53
4804.020	H	Y axis	PK	48.88	8.34	57.22	74.00	16.78
4804.020	H	Y axis	AV	36.28	8.34	44.62	54.00	9.38

▪ Middle Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4882.540	H	Y axis	PK	48.46	8.51	56.97	74.00	17.03
4882.540	H	Y axis	AV	37.89	8.51	46.40	54.00	7.60

▪ Highest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2484.500	H	Y axis	PK	53.86	-1.06	52.80	74.00	21.20
2484.500	H	Y axis	AV	40.25	-1.06	39.19	54.00	14.81
4960.010	H	Y axis	PK	47.69	8.57	56.26	74.00	17.74
4960.010	H	Y axis	AV	36.87	8.57	45.44	54.00	8.56

Note.

- No other spurious and harmonic emissions were reported greater than listed emissions on above table.
- Sample Calculation.
 $\text{Margin} = \text{Limit} - \text{Result}$ / $\text{Result} = \text{Reading} + \text{T.F}$ / $\text{T.F} = \text{AF} + \text{CL} - \text{AG}$
 Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

30MHz ~ 25GHz Radiated Spurious Emissions & Test Case 1 & 3Mbps

▪ Lowest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2388.650	H	Y axis	PK	51.98	-1.01	50.97	74.00	23.03
2388.650	H	Y axis	AV	34.59	-1.01	33.58	54.00	20.42
4804.000	H	Y axis	PK	47.56	8.34	55.90	74.00	18.10
4804.000	H	Y axis	AV	35.45	8.34	43.79	54.00	10.21

▪ Middle Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4882.060	H	Y axis	PK	49.87	8.51	58.38	74.00	15.62
4882.060	H	Y axis	AV	35.44	8.51	43.95	54.00	10.05

▪ Highest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.880	H	Y axis	PK	53.44	-1.06	52.38	74.00	21.62
2483.880	H	Y axis	AV	34.92	-1.06	33.86	54.00	20.14
4960.020	H	Y axis	PK	46.86	8.57	55.43	74.00	18.57
4960.020	H	Y axis	AV	34.25	8.57	42.82	54.00	11.18

Note.

- No other spurious and harmonic emissions were reported greater than listed emissions on above table.
- Sample Calculation.

$$\text{Margin} = \text{Limit} - \text{Result} \quad / \quad \text{Result} = \text{Reading} + \text{T.F} \quad / \quad \text{T.F} = \text{AF} + \text{CL} - \text{AG}$$
 Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

30MHz ~ 25GHz Radiated Spurious Emissions & Test Case 2 & 1Mbps

▪ Lowest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2399.860	H	Y axis	PK	39.48	-1.01	38.47	74.00	35.53
2399.860	H	Y axis	AV	31.11	-1.01	30.10	54.00	23.90
4804.200	H	Y axis	PK	48.97	8.34	57.31	74.00	16.69
4804.200	H	Y axis	AV	37.54	8.34	45.88	54.00	8.12

▪ Middle Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4882.050	H	Y	PK	49.58	8.51	58.09	74.00	15.91
4882.050	H	Y	AV	37.15	8.51	45.66	54.00	8.34

▪ Highest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2484.260	H	Y	PK	51.74	-1.06	50.68	74.00	23.32
2484.260	H	Y	AV	33.06	-1.06	32.00	54.00	22.00
4959.860	H	Y	PK	48.68	8.57	57.25	74.00	16.75
4959.860	H	Y	AV	36.24	8.57	44.81	54.00	9.19

Note.

- No other spurious and harmonic emissions were reported greater than listed emissions on above table.
- Sample Calculation.
 $\text{Margin} = \text{Limit} - \text{Result}$ / $\text{Result} = \text{Reading} + \text{T.F}$ / $\text{T.F} = \text{AF} + \text{CL} - \text{AG}$
 Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

30MHz ~ 25GHz Radiated Spurious Emissions & Test Case 2 & 2Mbps

▪ Lowest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2398.520	H	Y	PK	42.31	-1.01	41.30	74.00	32.70
2398.520	H	Y	AV	36.54	-1.01	35.53	54.00	18.47
4804.030	H	Y	PK	48.57	8.34	56.91	74.00	17.09
4804.030	H	Y	AV	36.22	8.34	44.56	54.00	9.44

▪ Middle Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4882.420	H	Y	PK	48.45	8.51	56.96	74.00	17.04
4882.420	H	Y	AV	37.98	8.51	46.49	54.00	7.51

▪ Highest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2484.480	H	Y	PK	53.56	-1.06	52.50	74.00	21.50
2484.480	H	Y	AV	40.18	-1.06	39.12	54.00	14.88
4960.120	H	Y	PK	47.55	8.57	56.12	74.00	17.88
4960.120	H	Y	AV	36.87	8.57	45.44	54.00	8.56

Note.

- No other spurious and harmonic emissions were reported greater than listed emissions on above table.
- Sample Calculation.

$$\text{Margin} = \text{Limit} - \text{Result} \quad / \quad \text{Result} = \text{Reading} + \text{T.F} \quad / \quad \text{T.F} = \text{AF} + \text{CL} - \text{AG}$$
 Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

30MHz ~ 25GHz Radiated Spurious Emissions & Test Case 2 & 3Mbps

▪ Lowest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2388.450	H	Y	PK	51.26	-1.01	50.25	74.00	23.75
2388.450	H	Y	AV	34.44	-1.01	33.43	54.00	20.57
4804.000	H	Y	PK	47.21	8.34	55.55	74.00	18.45
4804.000	H	Y	AV	35.44	8.34	43.78	54.00	10.22

▪ Middle Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4882.030	H	Y	PK	49.75	8.51	58.26	74.00	15.74
4882.030	H	Y	AV	34.98	8.51	43.49	54.00	10.51

▪ Highest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2483.890	H	Y	PK	52.86	-1.06	51.80	74.00	22.20
2483.890	H	Y	AV	34.68	-1.06	33.62	54.00	20.38
4960.000	H	Y	PK	46.78	8.57	55.35	74.00	18.65
4960.000	H	Y	AV	34.55	8.57	43.12	54.00	10.88

Note.

- No other spurious and harmonic emissions were reported greater than listed emissions on above table.
- Sample Calculation.
 $\text{Margin} = \text{Limit} - \text{Result}$ / $\text{Result} = \text{Reading} + \text{T.F}$ / $\text{T.F} = \text{AF} + \text{CL} - \text{AG}$
 Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

30MHz ~ 25GHz Radiated Spurious Emissions & Test Case 3 & 1Mbps

▪ Lowest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2398.680	H	Y	PK	41.01	-1.01	40.00	74.00	34.00
2398.680	H	Y	AV	31.69	-1.01	30.68	54.00	23.32
4804.000	H	Y	PK	48.67	8.34	57.01	74.00	16.99
4804.000	H	Y	AV	37.92	8.34	46.26	54.00	7.74

▪ Middle Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4882.000	H	Y	PK	49.66	8.51	58.17	74.00	15.83
4882.000	H	Y	AV	38.25	8.51	46.76	54.00	7.24

▪ Highest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2484.030	H	Y	PK	50.98	-1.06	49.92	74.00	24.08
2484.030	H	Y	AV	34.65	-1.06	33.59	54.00	20.41
4960.000	H	Y	PK	49.08	8.57	57.65	74.00	16.35
4960.000	H	Y	AV	37.01	8.57	45.58	54.00	8.42

Note.

- No other spurious and harmonic emissions were reported greater than listed emissions on above table.
- Sample Calculation.
 $\text{Margin} = \text{Limit} - \text{Result}$ / $\text{Result} = \text{Reading} + \text{T.F}$ / $\text{T.F} = \text{AF} + \text{CL} - \text{AG}$
 Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

30MHz ~ 25GHz Radiated Spurious Emissions & Test Case 3 & 2Mbps

▪ Lowest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2398.920	H	Y	PK	42.15	-1.01	41.14	74.00	32.86
2398.920	H	Y	AV	37.35	-1.01	36.34	54.00	17.66
4804.000	H	Y	PK	47.69	8.34	56.03	74.00	17.97
4804.000	H	Y	AV	36.52	8.34	44.86	54.00	9.14

▪ Middle Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4882.000	H	Y	PK	46.79	8.51	55.30	74.00	18.70
4882.000	H	Y	AV	37.68	8.51	46.19	54.00	7.81

▪ Highest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2485.030	H	Y	PK	53.82	-1.06	52.76	74.00	21.24
2485.030	H	Y	AV	41.03	-1.06	39.97	54.00	14.03
4960.000	H	Y	PK	48.35	8.57	56.92	74.00	17.08
4960.000	H	Y	AV	37.24	8.57	45.81	54.00	8.19

Note.

- No other spurious and harmonic emissions were reported greater than listed emissions on above table.
- Sample Calculation.
 $\text{Margin} = \text{Limit} - \text{Result}$ / $\text{Result} = \text{Reading} + \text{T.F}$ / $\text{T.F} = \text{AF} + \text{CL} - \text{AG}$
 Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

30MHz ~ 25GHz Radiated Spurious Emissions & Test Case 3 & 3Mbps

▪ Lowest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2394.980	H	Y	PK	52.67	-1.01	51.66	74.00	22.34
2394.980	H	Y	AV	35.61	-1.01	34.60	54.00	19.40
4804.000	H	Y	PK	48.22	8.34	56.56	74.00	17.44
4804.000	H	Y	AV	35.46	8.34	43.80	54.00	10.20

▪ Middle Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4882.000	H	Y	PK	47.56	8.51	56.07	74.00	17.93
4882.000	H	Y	AV	35.87	8.51	44.38	54.00	9.62

▪ Highest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2484.250	H	Y	PK	51.85	-1.06	50.79	74.00	23.21
2484.250	H	Y	AV	35.88	-1.06	34.82	54.00	19.18
4960.000	H	Y	PK	47.68	8.57	56.25	74.00	17.75
4960.000	H	Y	AV	34.88	8.57	43.45	54.00	10.55

Note.

- No other spurious and harmonic emissions were reported greater than listed emissions on above table.
- Sample Calculation.
 $\text{Margin} = \text{Limit} - \text{Result}$ / $\text{Result} = \text{Reading} + \text{T.F}$ / $\text{T.F} = \text{AF} + \text{CL} - \text{AG}$
 Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

30MHz ~ 25GHz Radiated Spurious Emissions & Test Case 4 & 1Mbps

▪ Lowest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2399.570	H	Y	PK	40.02	-1.01	39.01	74.00	34.99
2399.570	H	Y	AV	31.54	-1.01	30.53	54.00	23.47
4804.060	H	Y	PK	48.67	8.34	57.01	74.00	16.99
4804.060	H	Y	AV	37.64	8.34	45.98	54.00	8.02

▪ Middle Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4882.000	H	Y	PK	49.57	8.51	58.08	74.00	15.92
4882.000	H	Y	AV	37.25	8.51	45.76	54.00	8.24

▪ Highest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2484.360	H	Y	PK	51.23	-1.06	50.17	74.00	23.83
2484.360	H	Y	AV	33.24	-1.06	32.18	54.00	21.82
4960.000	H	Y	PK	48.55	8.57	57.12	74.00	16.88
4960.000	H	Y	AV	36.33	8.57	44.90	54.00	9.10

Note.

- No other spurious and harmonic emissions were reported greater than listed emissions on above table.
- Sample Calculation.
 $\text{Margin} = \text{Limit} - \text{Result}$ / $\text{Result} = \text{Reading} + \text{T.F}$ / $\text{T.F} = \text{AF} + \text{CL} - \text{AG}$
 Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

30MHz ~ 25GHz Radiated Spurious Emissions & Test Case 4 & 2Mbps

▪ Lowest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2399.020	H	Y	PK	41.68	-1.01	40.67	74.00	33.33
2399.020	H	Y	AV	36.45	-1.01	35.44	54.00	18.56
4804.000	H	Y	PK	48.51	8.34	56.85	74.00	17.15
4804.000	H	Y	AV	36.34	8.34	44.68	54.00	9.32

▪ Middle Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4882.000	H	Y	PK	47.68	8.51	56.19	74.00	17.81
4882.000	H	Y	AV	37.25	8.51	45.76	54.00	8.24

▪ Highest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2484.350	H	Y	PK	54.01	-1.06	52.95	74.00	21.05
2484.350	H	Y	AV	41.25	-1.06	40.19	54.00	13.81
4960.050	H	Y	PK	48.05	8.57	56.62	74.00	17.38
4960.050	H	Y	AV	37.02	8.57	45.59	54.00	8.41

Note.

1. No other spurious and harmonic emissions were reported greater than listed emissions on above table.
2. Sample Calculation.
 $\text{Margin} = \text{Limit} - \text{Result} \quad / \quad \text{Result} = \text{Reading} + \text{T.F} \quad / \quad \text{T.F} = \text{AF} + \text{CL} - \text{AG}$
 Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

30MHz ~ 25GHz Radiated Spurious Emissions & Test Case 4 & 3Mbps

▪ Lowest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2391.540	H	Y	PK	52.15	-1.01	51.14	74.00	22.86
2391.540	H	Y	AV	34.88	-1.01	33.87	54.00	20.13
4804.000	H	Y	PK	47.52	8.34	55.86	74.00	18.14
4804.000	H	Y	AV	35.49	8.34	43.83	54.00	10.17

▪ Middle Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
4882.000	H	Y	PK	48.67	8.51	57.18	74.00	16.82
4882.000	H	Y	AV	35.20	8.51	43.71	54.00	10.29

▪ Highest Channel

Freq. (MHz)	ANT Pol	The worst case EUT Position	Detector Mode	Reading (dBuV)	T.F (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2484.020	H	Y	PK	51.29	-1.06	50.23	74.00	23.78
2484.020	H	Y	AV	35.24	-1.06	34.18	54.00	19.82
4960.000	H	Y	PK	47.65	8.57	56.22	74.00	17.78
4960.000	H	Y	AV	35.25	8.57	43.82	54.00	10.18

Note.

- No other spurious and harmonic emissions were reported greater than listed emissions on above table.
- Sample Calculation.
 $\text{Margin} = \text{Limit} - \text{Result}$ / $\text{Result} = \text{Reading} + \text{T.F}$ / $\text{T.F} = \text{AF} + \text{CL} - \text{AG}$
 Where, T.F = Total Factor, AF = Antenna Factor, CL = Cable Loss, AG = Amplifier Gain,

3.2.8 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.

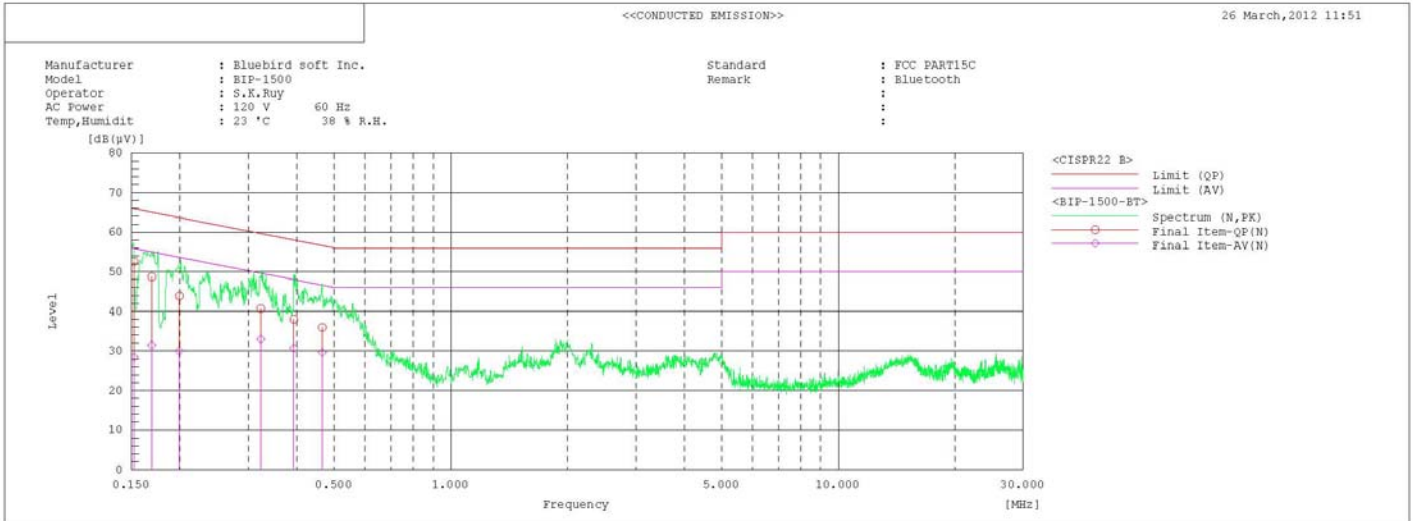
- Measurement Data: Comply

- 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 Test Case 1 & Modulation: **GFSK**

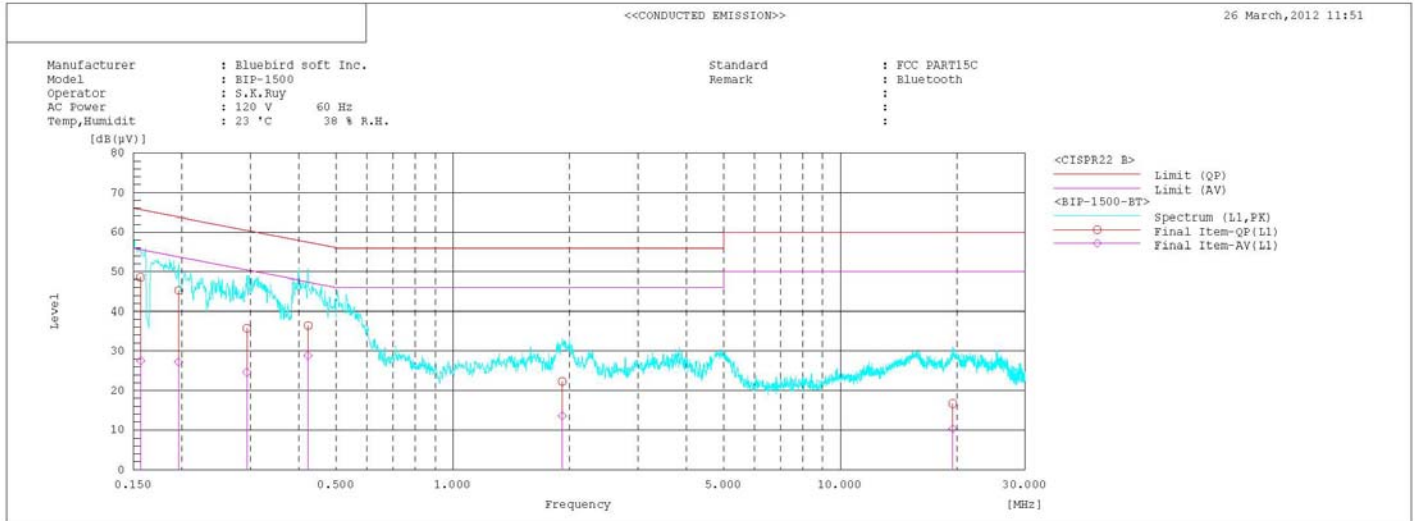


Final Result

--- L1 Phase ---

No.	Frequency [MHz]	Reading		c.f [dB]	Result		Limit		Margin		Remark
		QP [dB(µV)]	AV [dB(µV)]		QP [dB(µV)]	AV [dB(µV)]	QP [dB(µV)]	AV [dB(µV)]	QP [dB]	AV [dB]	
1	0.152	52.4	28.3	0.2	52.6	28.5	65.9	55.9	13.3	27.4	
2	0.169	48.5	31.3	0.2	48.7	31.5	65.0	55.0	16.3	23.5	
3	0.199	43.7	29.8	0.2	43.9	30.0	63.7	53.7	19.8	23.7	
4	0.323	40.5	32.8	0.2	40.7	33.0	59.6	49.6	18.9	16.6	
5	0.393	37.8	30.5	0.2	38.0	30.7	58.0	48.0	20.0	17.3	
6	0.465	35.7	29.5	0.2	35.9	29.7	56.6	46.6	20.7	16.9	

AC Line Conducted Emissions Test Case 1 & Modulation: **GFSK**

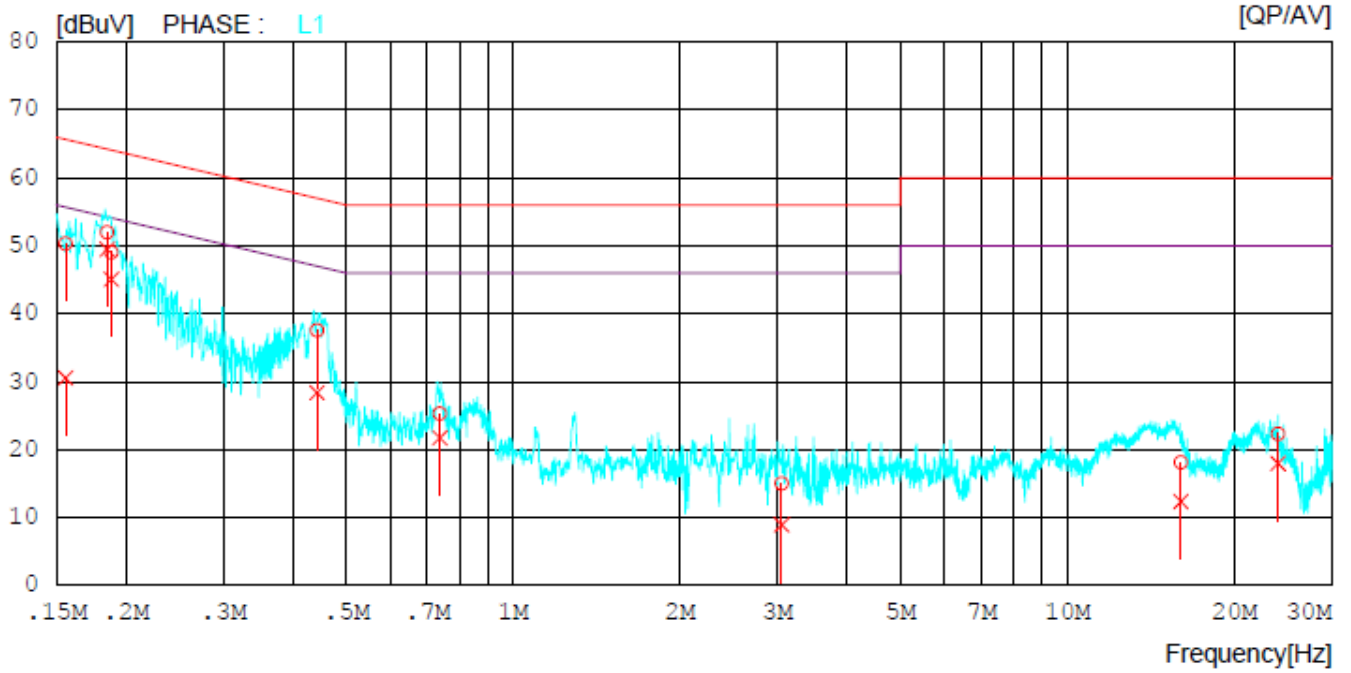
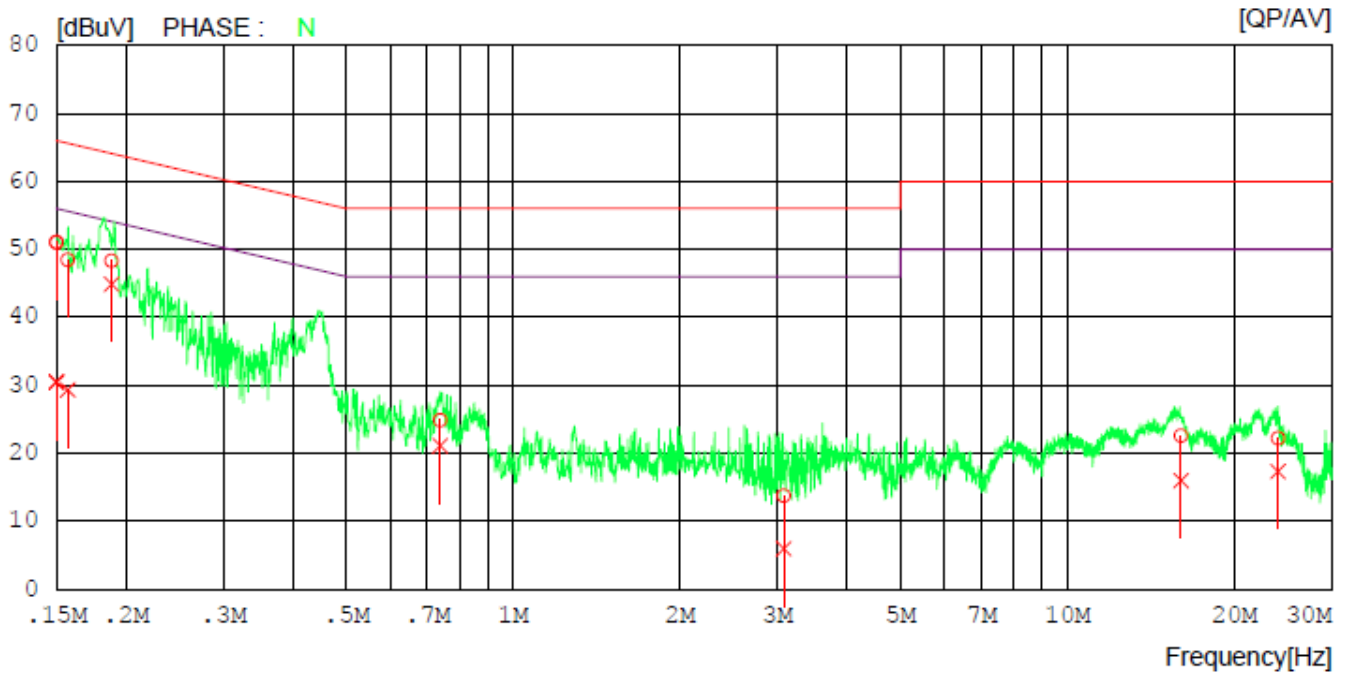


Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading		c.f	Result		Limit		Margin		Remark
		QP [dB(µV)]	AV [dB(µV)]		QP [dB(µV)]	AV [dB(µV)]	QP [dB(µV)]	AV [dB(µV)]	QP [dB]	AV [dB]	
1	0.156	48.5	27.4	0.1	48.6	27.5	65.7	55.7	17.1	28.2	
2	0.196	45.2	27.1	0.1	45.3	27.2	63.8	53.8	18.5	26.6	
3	0.294	35.6	24.5	0.1	35.7	24.6	60.4	50.4	24.7	25.8	
4	0.423	36.3	28.7	0.1	36.4	28.8	57.4	47.4	21.0	18.6	
5	1.915	22.1	13.4	0.2	22.3	13.6	56.0	46.0	33.7	32.4	
6	19.490	15.6	9.2	1.1	16.7	10.3	60.0	50.0	43.3	39.7	

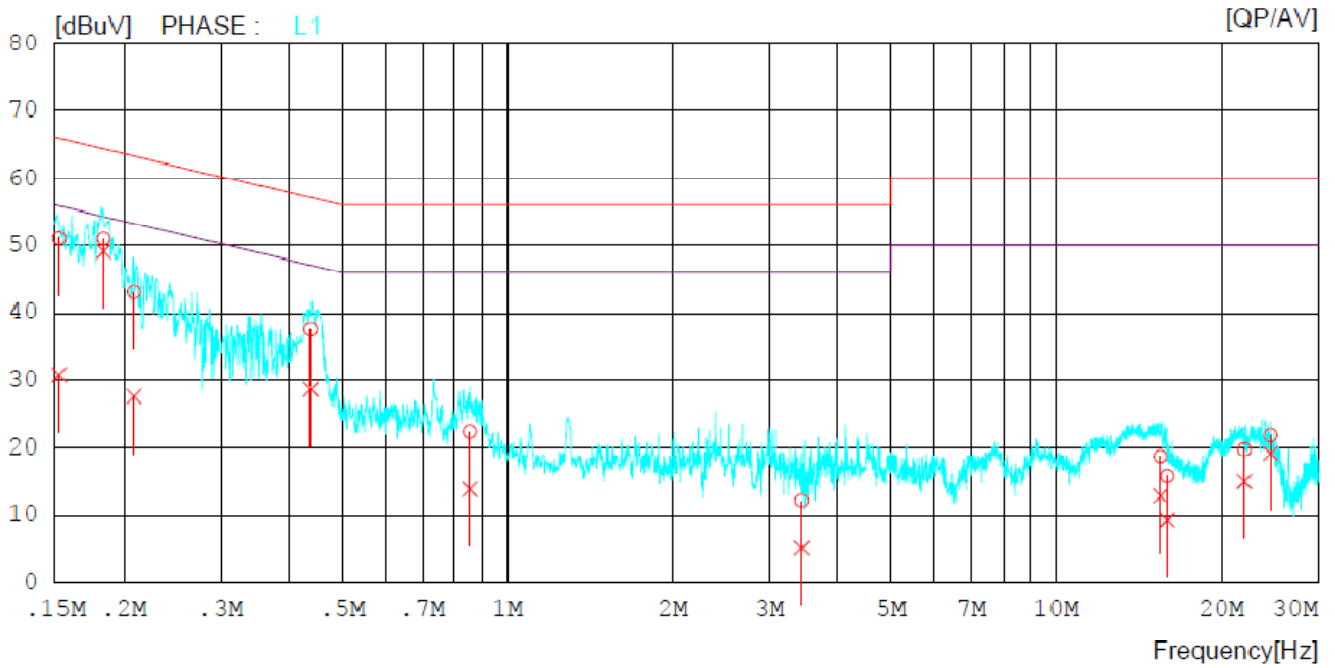
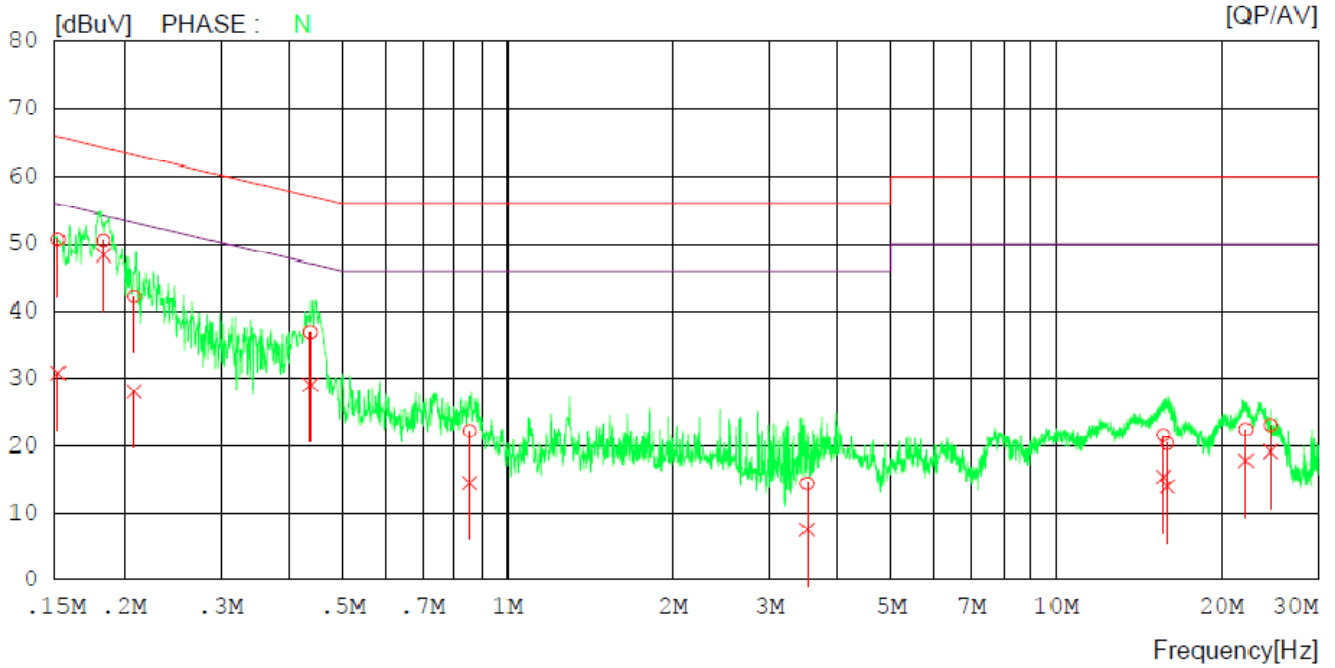
AC Line Conducted Emissions Test Case 2 & Modulation: **GFSK**



AC Line Conducted Emissions Test Case 2 & Modulation: **GFSK**

NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.15001	50.7	30.1	0.3	51.0	30.4	66.0	56.0	15.0	25.6	N
2	0.15001	50.8	30.2	0.3	51.1	30.5	66.0	56.0	14.9	25.5	N
3	0.15724	48.1	29.0	0.3	48.4	29.3	65.6	55.6	17.2	26.3	N
4	0.18861	48.1	44.7	0.2	48.3	44.9	64.1	54.1	15.8	9.2	N
5	0.73859	24.6	20.9	0.2	24.8	21.1	56.0	46.0	31.2	24.9	N
6	3.07850	13.3	5.5	0.4	13.7	5.9	56.0	46.0	42.3	40.1	N
7	16.04350	21.6	15.0	1.0	22.6	16.0	60.0	50.0	37.4	34.0	N
8	24.00050	21.0	16.1	1.2	22.2	17.3	60.0	50.0	37.8	32.7	N
9	0.15585	50.0	30.3	0.3	50.3	30.6	65.7	55.7	15.4	25.1	L1
10	0.18515	51.8	49.3	0.2	52.0	49.5	64.3	54.3	12.3	4.8	L1
11	0.18850	48.8	44.9	0.2	49.0	45.1	64.1	54.1	15.1	9.0	L1
12	0.44291	37.4	28.2	0.2	37.6	28.4	57.0	47.0	19.4	18.6	L1
13	0.73795	25.1	21.5	0.2	25.3	21.7	56.0	46.0	30.7	24.3	L1
14	3.05250	14.6	8.5	0.4	15.0	8.9	56.0	46.0	41.0	37.1	L1
15	16.03500	17.2	11.3	1.0	18.2	12.3	60.0	50.0	41.8	37.7	L1
16	24.00250	21.1	16.8	1.2	22.3	18.0	60.0	50.0	37.7	32.0	L1

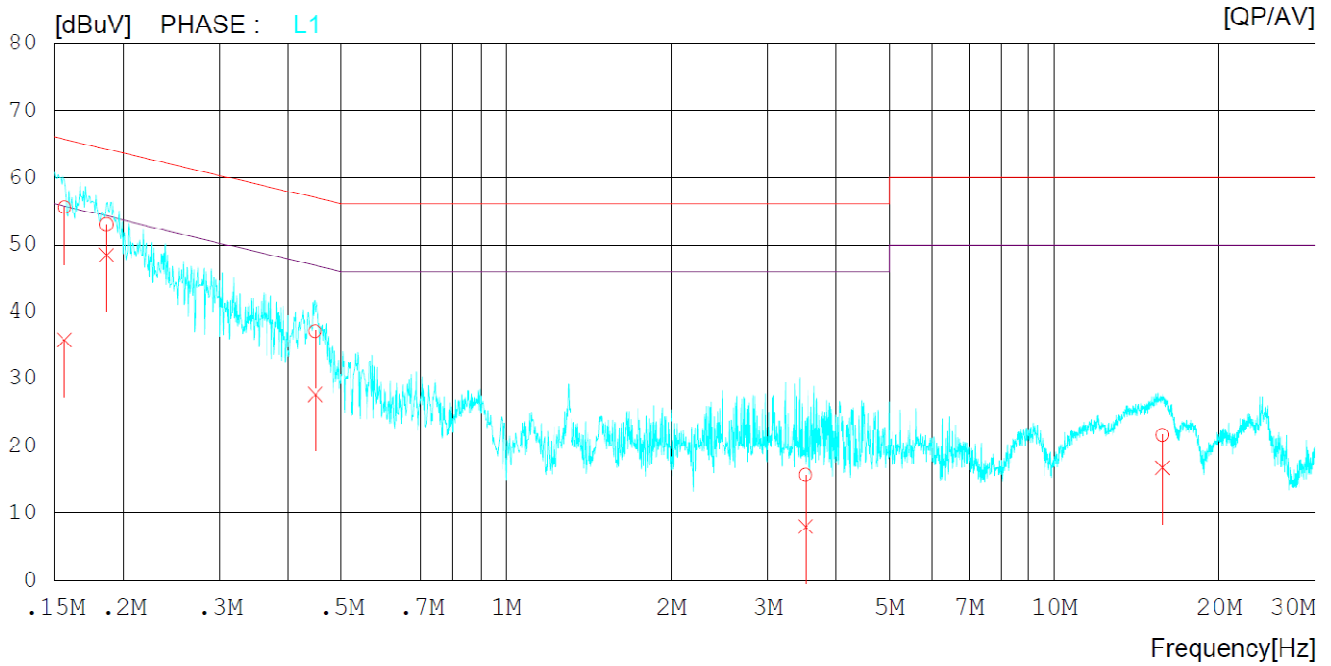
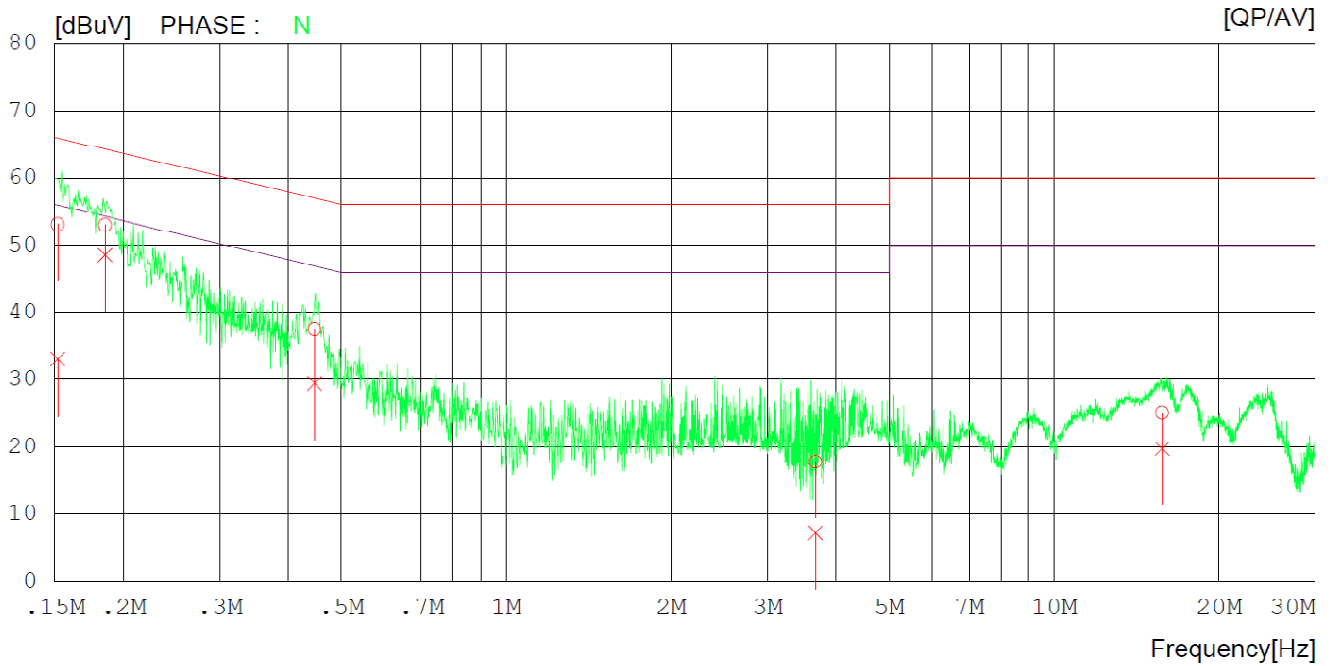
AC Line Conducted Emissions Test Case 3 & Modulation: **GFSK**



AC Line Conducted Emissions Test Case 3 & Modulation: GFSK

NO	FREQ [MHz]	READING		C. FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.15178	50.4	30.5	0.3	50.7	30.8	65.9	55.9	15.2	25.1	N
2	0.18398	50.4	48.1	0.2	50.6	48.3	64.3	54.3	13.7	6.0	N
3	0.20856	42.0	27.8	0.2	42.2	28.0	63.3	53.3	21.1	25.3	N
4	0.43744	36.7	28.8	0.2	36.9	29.0	57.1	47.1	20.2	18.1	N
5	0.85185	21.9	14.1	0.3	22.2	14.4	56.0	46.0	33.8	31.6	N
6	3.51550	13.9	7.1	0.4	14.3	7.5	56.0	46.0	41.7	38.5	N
7	15.66300	20.6	14.3	1.0	21.6	15.3	60.0	50.0	38.4	34.7	N
8	15.92350	19.3	12.9	1.0	20.3	13.9	60.0	50.0	39.7	36.1	N
9	22.16000	21.2	16.6	1.2	22.4	17.8	60.0	50.0	37.6	32.2	N
10	24.57650	21.9	17.9	1.2	23.1	19.1	60.0	50.0	36.9	30.9	N
11	0.15240	50.7	30.4	0.3	51.0	30.7	65.9	55.9	14.9	25.2	L1
12	0.18380	50.8	48.9	0.2	51.0	49.1	64.3	54.3	13.3	5.2	L1
13	0.20856	42.9	27.4	0.2	43.1	27.6	63.3	53.3	20.2	25.7	L1
14	0.43795	37.3	28.4	0.2	37.5	28.6	57.1	47.1	19.6	18.5	L1
15	0.85359	22.0	13.6	0.3	22.3	13.9	56.0	46.0	33.7	32.1	L1
16	3.43700	11.8	4.7	0.4	12.2	5.1	56.0	46.0	43.8	40.9	L1
17	15.47950	17.8	11.9	1.0	18.8	12.9	60.0	50.0	41.2	37.1	L1
18	15.92450	14.8	8.3	1.0	15.8	9.3	60.0	50.0	44.2	40.7	L1
19	22.03550	18.6	13.8	1.2	19.8	15.0	60.0	50.0	40.2	35.0	L1
20	24.57650	20.6	18.0	1.2	21.8	19.2	60.0	50.0	38.2	30.8	L1

AC Line Conducted Emissions Test Case 4 & Modulation: **GFSK**



AC Line Conducted Emissions Test Case 4 & Modulation: GFSK

NO	FREQ [MHz]	READING		C.FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.15185	52.8	32.7	0.3	53.1	33.0	65.9	55.9	12.8	22.9	N
2	0.18531	52.8	48.3	0.2	53.0	48.5	64.2	54.2	11.2	5.7	N
3	0.44698	37.3	29.2	0.2	37.5	29.4	56.9	46.9	19.4	17.5	N
4	3.66950	17.3	6.6	0.4	17.7	7.0	56.0	46.0	38.3	39.0	N
5	15.75850	24.1	18.7	1.0	25.1	19.7	60.0	50.0	34.9	30.3	N
6	0.15621	55.2	35.4	0.3	55.5	35.7	65.7	55.7	10.2	20.0	L1
7	0.18636	52.8	48.2	0.2	53.0	48.4	64.2	54.2	11.2	5.8	L1
8	0.44836	36.9	27.5	0.2	37.1	27.7	56.9	46.9	19.8	19.2	L1
9	3.52050	15.3	7.5	0.4	15.7	7.9	56.0	46.0	40.3	38.1	L1
10	15.78150	20.7	15.8	1.0	21.7	16.8	60.0	50.0	38.3	33.2	L1

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 type is a Chip antenna. The antenna is attached permanently using 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.

APPENDIX I

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.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
<input checked="" type="checkbox"/>	Spectrum Analyzer	Agilent	E4440A	11/09/30	12/09/30	MY45304199
<input checked="" type="checkbox"/>	Spectrum Analyzer	Rohde Schwarz	FSQ26	12/01/09	13/01/09	200445
<input type="checkbox"/>	Spectrum analyzer	Agilent	E4404B	12/03/05	13/03/05	US41061134
<input type="checkbox"/>	Spectrum Analyzer(RE)	H.P	8563E	11/10/04	12/10/04	3551A04634
<input type="checkbox"/>	MXA Signal Analyzer	Agilent Technologies, Inc	N9020A	12/01/09	13/01/09	MY49100833
<input type="checkbox"/>	Power Meter	H.P	EPM-442A	11/07/01	12/07/01	GB37170413
<input type="checkbox"/>	Power Sensor	H.P	8481A	11/07/01	12/07/01	3318A96332
<input type="checkbox"/>	Wideband Power Sensor	Rohde Schwarz	NRP-Z81	11/06/04	12/06/04	1137.9009.02-101001
<input type="checkbox"/>	Virtual Power Meter(S/W)	Rohde Schwarz	R&S Power Viewer Plus	-	-	V 4.1.0
<input type="checkbox"/>	Power Divider	Agilent	11636B	11/09/30	12/09/30	56471
<input type="checkbox"/>	4-Way Power Divider	ET Industries	D-0526-4	11/12/01	12/12/01	210195001
<input checked="" type="checkbox"/>	Power Splitter	Anritsu	K241B	11/09/30	12/09/30	020611
<input type="checkbox"/>	Power Splitter	Anritsu	K241B	11/07/01	12/07/01	017060
<input type="checkbox"/>	Power Splitters & Dividers	Aeroflex/Weinschel	1594	12/02/07	13/02/07	1177
<input type="checkbox"/>	Frequency Counter	H.P	5342A	11/07/01	12/07/01	2119A04450
<input type="checkbox"/>	TEMP & HUMIDITY Chamber	JISCO	KR-100/J-RHC2	11/09/30	12/09/30	30604493/021031
<input type="checkbox"/>	TEMP & HUMIDITY Chamber	SJ SCIENCE	TEM1850-10	12/03/06	13/03/06	S7400LE267 1226
<input checked="" type="checkbox"/>	Digital Multimeter	H.P	34401A	12/03/05	13/03/05	3146A13475, US36122178
<input type="checkbox"/>	Multifunction Synthesizer	HP	8904A	11/10/06	12/10/06	3633A08404
<input checked="" type="checkbox"/>	Signal Generator	Rohde Schwarz	SMR20	12/03/05	13/03/05	101251
<input type="checkbox"/>	Signal Generator	H.P	ESG-3000A	11/07/01	12/07/01	US37230529
<input checked="" type="checkbox"/>	Vector Signal Generator	Rohde Schwarz	SMJ100A	12/01/09	13/01/09	100148
<input type="checkbox"/>	Vector Signal Generator	Rohde Schwarz	SMBV100A	12/01/09	13/01/09	255571
<input type="checkbox"/>	Audio Analyzer	H.P	8903B	11/07/02	12/07/02	3011A09448
<input type="checkbox"/>	Modulation Analyzer	H.P	8901B	11/07/01	12/07/01	3028A03029
<input type="checkbox"/>	8960 Series 10 Wireless Comms. Test Set	Agilent	E5515C	12/03/05	13/03/05	GB43461134
<input type="checkbox"/>	Universal Radio communication Tester	Rohde Schwarz	CMU200	12/03/06	13/03/06	106760
<input checked="" type="checkbox"/>	Bluetooth Tester	TESCOM	TC-3000B	11/07/01	12/07/01	3000B000268
<input checked="" type="checkbox"/>	Thermo hygrometer	BODYCOM	BJ5478	12/01/13	13/01/13	090205-3
<input type="checkbox"/>	Thermo hygrometer	BODYCOM	BJ5478	12/01/13	13/01/13	090205-2
<input type="checkbox"/>	Thermo hygrometer	BODYCOM	BJ5478	12/01/13	13/01/13	090205-4
<input type="checkbox"/>	AC Power supply	DAEKWANG	5KVA	12/03/05	13/03/05	20060321-1
<input checked="" type="checkbox"/>	DC Power Supply	HP	6622A	12/03/05	13/03/05	3448A03760
<input type="checkbox"/>	DC Power Supply	HP	6633A	12/03/05	13/03/05	3524A06634
<input type="checkbox"/>	DC Power Supply	Protek	PWS-3010D	11/09/30	12/09/30	4072702
<input type="checkbox"/>	DC Power Supply	SM techno	SDP30-5D	11/05/20	12/05/20	305DKA013
<input type="checkbox"/>	BAND Reject Filter	Microwave Circuits	N0308372	11/09/30	12/09/30	3125-01DC0352
<input type="checkbox"/>	BAND Reject Filter	Wainwright	WRCG1750	11/09/30	12/09/30	2

	Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
<input type="checkbox"/>	High-Pass Filter	ANRITSU	MP526D	11/09/30	12/09/30	M27756
<input type="checkbox"/>	High-pass filter	Wainwright	WHNX2.1	11/09/30	12/09/30	1
<input checked="" type="checkbox"/>	High-pass filter	Wainwright	WHNX3.0	11/09/30	12/09/30	9
<input type="checkbox"/>	High-pass filter	Wainwright	WHNX5.0	11/09/19	12/09/19	8
<input type="checkbox"/>	High-Pass Filter	Wainwright	WHKX8.5	11/09/19	12/09/19	1
<input type="checkbox"/>	High-Pass Filter	Wainwright	WHKX1.0	11/09/30	12/09/30	9
<input type="checkbox"/>	Tunable Notch Filter	Wainwright	WRCT800.0 /960.0-0.2/40-8SSK	N/A	N/A	32
<input type="checkbox"/>	Tunable Notch Filter	Wainwright	WRCD1700.0 /2000.0-0.2/40-10SSK	N/A	N/A	53
<input type="checkbox"/>	Tunable Notch Filter	Wainwright	WRCT1900.0/ 2200.0-5/40-10SSK	N/A	N/A	30
<input checked="" type="checkbox"/>	HORN ANT	ETS	3115	11/09/06	12/09/06	21097
<input type="checkbox"/>	HORN ANT	ETS	3115	12/02/20	13/02/20	6419
<input checked="" type="checkbox"/>	HORN ANT	A.H.Systems	SAS-574	11/03/25	13/03/25	154
<input type="checkbox"/>	HORN ANT	A.H.Systems	SAS-574	11/03/25	13/03/25	155
<input type="checkbox"/>	HORN ANT	SCHWARZBECK	BBHA9120A	10/04/13	12/04/13	322
<input type="checkbox"/>	Dipole Antenna	Schwarzbeck	VHA9103	12/03/12	13/03/12	2116
<input type="checkbox"/>	Dipole Antenna	Schwarzbeck	VHA9103	11/11/22	12/11/22	2117
<input type="checkbox"/>	Dipole Antenna	Schwarzbeck	UHA9105	12/03/12	13/03/12	2261
<input type="checkbox"/>	Dipole Antenna	Schwarzbeck	UHA9105	11/11/22	12/11/22	2262
<input type="checkbox"/>	LOOP Antenna	ETS	6502	10/10/29	12/10/29	3471
<input type="checkbox"/>	Coaxial Fixed Attenuators	Agilent	8491B	11/07/02	12/07/02	MY39260700
<input checked="" type="checkbox"/>	Attenuator (3dB)	WEINSCHHEL	56-3	11/09/30	12/09/30	Y2342
<input type="checkbox"/>	Attenuator (3dB)	WEINSCHHEL	56-3	11/09/30	12/09/30	Y2370
<input type="checkbox"/>	Attenuator (10dB)	WEINSCHHEL	23-10-34	11/09/30	12/09/30	BP4386
<input type="checkbox"/>	Attenuator (10dB)	WEINSCHHEL	23-10-34	12/01/09	13/01/09	BP4387
<input type="checkbox"/>	Attenuator (10dB)	WEINSCHHEL	86-10-11	11/09/30	12/09/30	446
<input type="checkbox"/>	Attenuator (10dB)	WEINSCHHEL	86-10-11	11/09/30	12/09/30	408
<input type="checkbox"/>	Attenuator (20dB)	WEINSCHHEL	86-20-11	11/09/30	12/09/30	432
<input type="checkbox"/>	Attenuator (30dB)	JFW	50FH-030-300	12/03/05	13/03/05	060320-1
<input type="checkbox"/>	Attenuator (40dB)	WEINSCHHEL	57-40-33	11/09/30	12/09/30	NN837
<input type="checkbox"/>	Termination	H.P	HP-909D	11/07/02	12/07/02	02750
<input type="checkbox"/>	Termination	H.P	HP-909D	11/07/02	12/07/02	02702
<input type="checkbox"/>	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0088CAN	11/07/01	12/07/01	788
<input type="checkbox"/>	Type N Coaxial CIRCULATOR	NOVA MICROWAVE	0185CAN	11/07/01	12/07/01	790
<input checked="" type="checkbox"/>	Amplifier (30dB)	Agilent	8449B	12/03/05	13/03/05	3008A01590
<input type="checkbox"/>	Amplifier (30dB)	H.P	8449B	12/03/05	13/03/05	3008A00370
<input type="checkbox"/>	Amplifier	EMPOWER	BBS3Q7ELU	11/09/30	12/09/30	1020
<input type="checkbox"/>	RF Power Amplifier	OPHIRRF	5069F	11/07/01	12/07/01	1006
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	R&S	ESU	12/01/09	13/01/09	100014

	Type	Manufacturer	Model	Cal.Date (yy/mm/dd)	Next.Cal.Date (yy/mm/dd)	S/N
<input checked="" type="checkbox"/>	BILOG ANTENNA	SCHAFFNER	CBL6112B	10/07/14	12/07/14	2737
<input checked="" type="checkbox"/>	Amplifier (22dB)	H.P	8447E	12/01/09	13/01/09	2945A02865
<input type="checkbox"/>	EMI TEST RECEIVER	R&S	ESCI	12/03/06	13/03/06	100364
<input type="checkbox"/>	BICONICAL ANT.	Schwarzbeck	VHA 9103	10/11/29	12/11/29	91032789
<input type="checkbox"/>	LOG-PERIODIC ANT.	Schwarzbeck	UHALP9108A1	10/11/29	12/11/29	1098
<input type="checkbox"/>	BICONICAL ANT.	Schwarzbeck	VHA 9103	10/12/21	12/12/21	91031946
<input type="checkbox"/>	LOG-PERIODIC ANT.	Schwarzbeck	UHALP9108A1	10/07/07	12/07/07	0590
<input type="checkbox"/>	Low Noise Pre Amplifier	TSJ	MLA-100K01-B01-2	12/03/05	13/03/05	1252741
<input type="checkbox"/>	Low Noise Pre Amplifier	TSJ	MLA-00108-B02-36	12/01/09	13/01/09	1518831
<input type="checkbox"/>	Amplifier (25dB)	Agilent	8447D	12/03/05	13/03/05	2944A10700
<input type="checkbox"/>	Amplifier (25dB)	Agilent	8447D	11/07/01	12/07/01	2648A04922
<input checked="" type="checkbox"/>	Spectrum Analyzer(CE)	H.P	8591E	12/03/05	13/03/05	3649A05889
<input checked="" type="checkbox"/>	LISN	Kyoritsu	KNW-407	12/01/09	13/01/09	8-317-8
<input checked="" type="checkbox"/>	LISN	Kyoritsu	KNW-242	11/07/02	12/07/02	8-654-15
<input checked="" type="checkbox"/>	CVCF	NF Electronic	4420	11/09/15	12/09/15	304935/4420023
<input checked="" type="checkbox"/>	50 ohm Terminator	HME	CT-01	12/01/09	13/01/09	N/A
<input checked="" type="checkbox"/>	RFI/FIELD Intensity Meter	Kyoritsu	KNM-2402	11/07/02	12/07/02	4N-170-3
<input checked="" type="checkbox"/>	EMI Test Receiver	R&S	ECSI	12/03/05	13/03/05	100364
<input checked="" type="checkbox"/>	LISN	R&S	ESH2-Z5	11/09/30	12/09/30	8287391006
<input checked="" type="checkbox"/>	CVCF	NF Electronic	4420	12/03/05	13/03/05	304935/337980
<input checked="" type="checkbox"/>	RFI/FIELD Intensity Meter	ES4152	424059	11/09/30	12/09/30	424059
<input type="checkbox"/>	Wideband Radio Communication Tester	R&S	CMW500	11/09/30	12/09/30	100989