CONFORMANCE TEST REPORT
FOR
FCC 47 CFR, Part 15 Subpart C

Report No.: 09-12-MAS-184-01

Client:	OpenPeak Inc.
Product:	Energy Frame 7
Model:	OPOF7E120
FCC ID:	VGBOPOF7E120
Manufacturer/supplier:	OpenPeak Inc.

Date test item received:	2009/12/17
Date test campaign completed:	2010/01/08
Date of issue:	2010/01/08

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Internal photos 14 pages

Setup photos 2 pages

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Client	: OpenPeak Inc.
Address	: 1750 Clint Moore Road, Boca Raton, FL 33487 USA
Manufacturer	: OpenPeak Inc.
Address	: 1750 Clint Moore Road, Boca Raton, FL 33487 USA
EUT	: Energy Frame 7
Trade name	: OPENPEAK
Model No.	: OPOF7E120
Power Source	: Adapter (LFS054000D-A8S) Input: 90-132VAC，60Hz，1.0A Output: 5V dc，4A
Regulations applied	: FCC 47 CFR, Part 15 Subpart C (2008)

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⑤ FCC Registration Number: 90588, 91094, 91095
⑥ Industry Canada Site Regisitation number: IC 2949A-1

NVLAP Lab Code 200133-0

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1 GENERAL INFORMATION

1.1 Product Description

a) Type of EUT : Energy Frame 7

b) Trade Name : OPENPEAK

c) Model No. : OPOF7E120

d) FCC ID : VGBOPOF7E120

1.2 Characteristics of Device

The EUT is "Energy Frame 7". The Zigbee function operates in the unlicensed ISM Band at 2.4 GHz.

Channel	Frequency (MHz)	Note	Channel	Frequency (MHz)	Note
11	2405	Channel Low	19	2445	-
12	2410	-	20	2450	-
13	2415	-	21	2455	-
14	2420	-	22	2460	-
15	2425	-	23	2465	-
16	2430	-	24	2470	-
17	2435	-	25	2475	-
18	2440	Channel Middle	26	2480	Channel High

1.3 Test Methodology

All testing were performed according to the procedures in ANSI C63.4 (2003) and FCC CFR 47 Part 2 and Part 15.

1.4 Test Facility

The semi-anechoic chamber and conducted measurement facility used to collect the radiated and conducted data are located inside the Building at No.8, Lane 29, Wen-ming Road, Lo-shan Tsun, Kweishan Hsiang, Taoyuan, Taiwan, R.O.C.
This site has been accreditation as a FCC filing site.

2 PROVISIONS APPLICABLE

2.1 Definition

Unintentional radiator:
A device that intentionally generates and radio frequency energy for use within the device, or that sends radio frequency signals by conduction to associated equipment via connecting wiring, but which is not intended to emit RF energy by radiation or induction.

Class A Digital Device:
A digital device which is marketed for use in commercial or business environment; exclusive of a device which is market for use by the general public, or which is intended to be used in the home.

Class B Digital Device :
A digital device which is marketed for use in a residential environment notwithstanding use in a commercial, business of industrial environment. Example of such devices that are marketed for the general public.

Note : A manufacturer may also qualify a device intended to be marketed in a commercial, business, or industrial environment as a Class B digital device, and in fact is encouraged to do so, provided the device complies with the technical specifications for a Class B Digital Device. In the event that a particular type of device has been found to repeatedly cause harmful interference to radio communications, the Commission may classify such a digital device as a Class B Digital Device, Regardless of its intended use.

Intentional radiator:
A device that intentionally generates and emits radio frequency energy by radiation or induction.

2.2 Requirement for Compliance

(1) Conducted Emission Requirement

For unintentional device, according to §15.107(a) Line Conducted Emission Limits is as following:

Frequency MHz	Quasi Peak dB μ V	Average dB μ V
0.15 - 0.5	66-56*	56-46*
0.5 - 5.0	56	46
5.0 - 30.0	60	50

*Decreases with the logarithm of the frequency.

For intentional device, according to §15.207(a) Line Conducted Emission Limits is same as above table.

(2) Radiated Emission Requirement

For unintentional device, according to §15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency MHz	Distance Meters	Radiated dB μ V/m	Radiated μ V/m
30 - 88	3	40.0	100
88 - 216	3	43.5	150
216 - 960	3	46.0	200
above 960	3	54.0	500

For intentional device, according to §15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

(3) Antenna Requirement

For intentional device, according to §15.203, 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.

(4) Bandwidth Requirement

According to 15.247 (a)(2), systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

(5) Output Power Requirement

For systems using digital modulation , according to 15.247(b), the maximum peak output power of the intentional radiator shall not exceed 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(6) Spurious Emissions Measurement

According to 15.247 (c) , in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

(7) Power Density Requirement

According to 15.247 (d) , for digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission..

2.3 Restricted Bands of Operation

Only spurious emissions are permitted in any of the frequency bands listed below :

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42-16.423	399.9-410	4.5-5.25
0.495 - 0.505 **	16.69475 - 16.69525	608-614	5.35-5.46
2.1735 - 2.1905	16.80425 - 16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475 - 156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41			

** : Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz

2.4 Labeling Requirement

The device shall bear the following statement in a conspicuous location on the device :

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

2.5 User Information

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual.

The Federal Communications Commission Radio Frequency Interference Statement includes the following paragraph.

This equipment has been tested and found to comply with the limits for a Class B Digital Device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction may cause harmful interference to radio communication. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-- Consult the dealer or an experienced radio / TV technician for help.

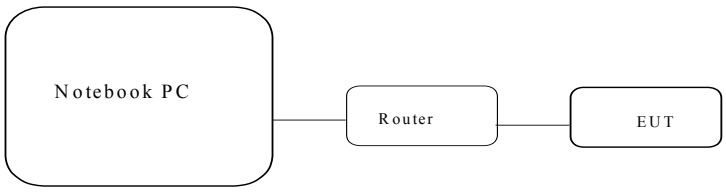
3. SYSTEM TEST CONFIGURATION

3.1 Devices for Tested System

Device	Manufacture	Model No.	Cable Description
Energy Frame 7*	OpenPeak Inc.	OPOF7E120	1.8m*1, Unshielded Power Line
Router	N/A	N/A	1.8m Unshielded LAN Cable
Notebook PC	Dell	PP26L	1.0m Unshielded LAN Cable

Note:

Remark "*" means equipment under test.



4 CONDUCTED EMISSION MEASUREMENT

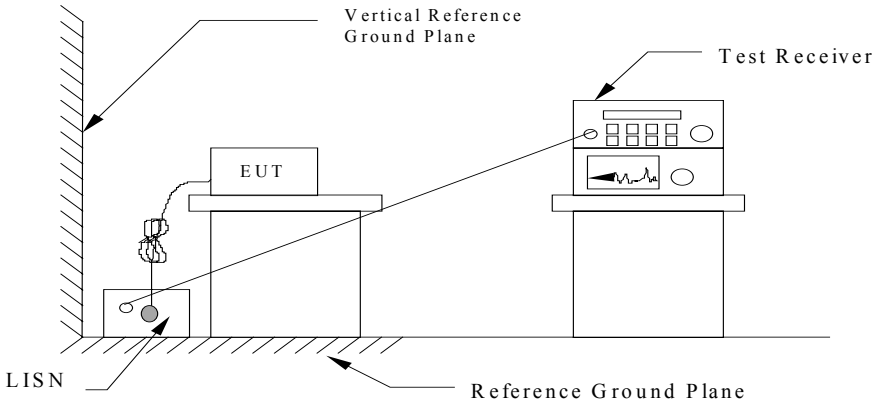
4.1 Standard Applicable

For unintentional and intentional device, Line Conducted Emission Limits are in accordance to § 15.107(a) and §15.207(a) respectively. Both Limits are identical specification.

4.2 Measurement Procedure

1. Setup the configuration per figure 1.
2. A preliminary scan with a spectrum monitor is performed to identify the frequency of emission that has the highest amplitude relative to the limit by operating the EUT in selected modes of operation, typical cable positions, and with a typical system configuration.
3. Record the 6 highest emissions relative to the limit.
4. Measure each frequency obtained from step 3 by a test receiver set on quasi peak detector function, and then record the accuracy frequency and emission level. If all emissions measured in the specified band are attenuated more than 20 dB from the limit, this step would be ignored, and the peak detector function would be used.
5. Confirm the highest three emissions with variation of the EUT cable configuration and record the final data.
6. Repeat all above procedures on measuring each operation mode of EUT.

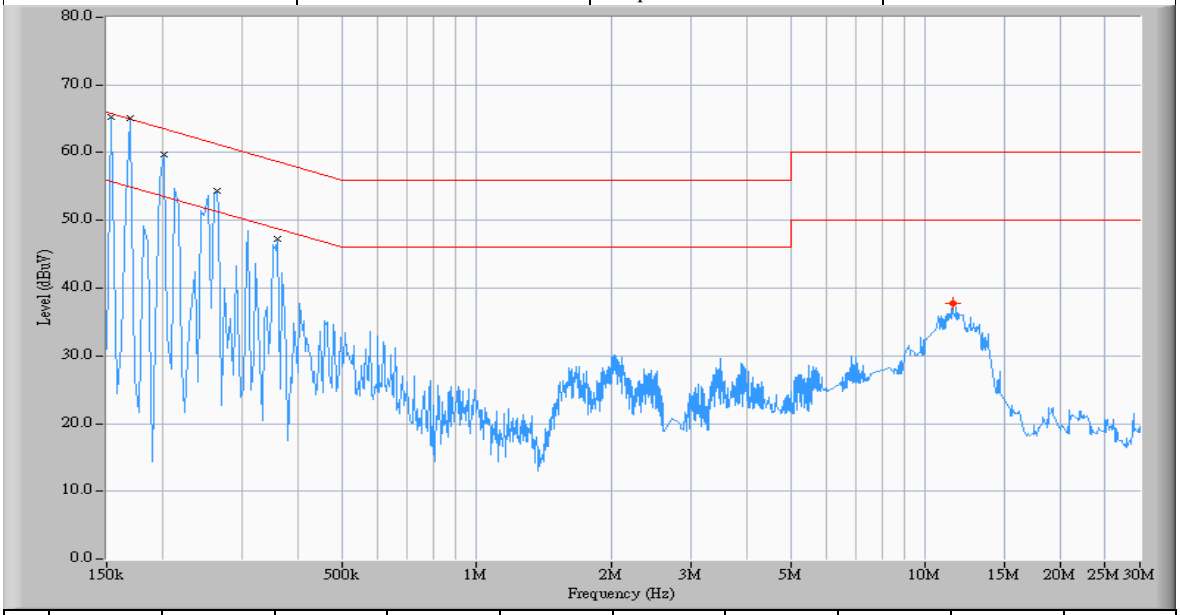
Figure 1 : Conducted emissions measurement configuration



4.3 Conducted Emission Data

4.3.1 Operation Mode: Channel Low

EUT :	Model :	Status : CH 11	
Condition : Line 1	Date : 2009/12/18	Temp. : 19℃	Humi. : 56%

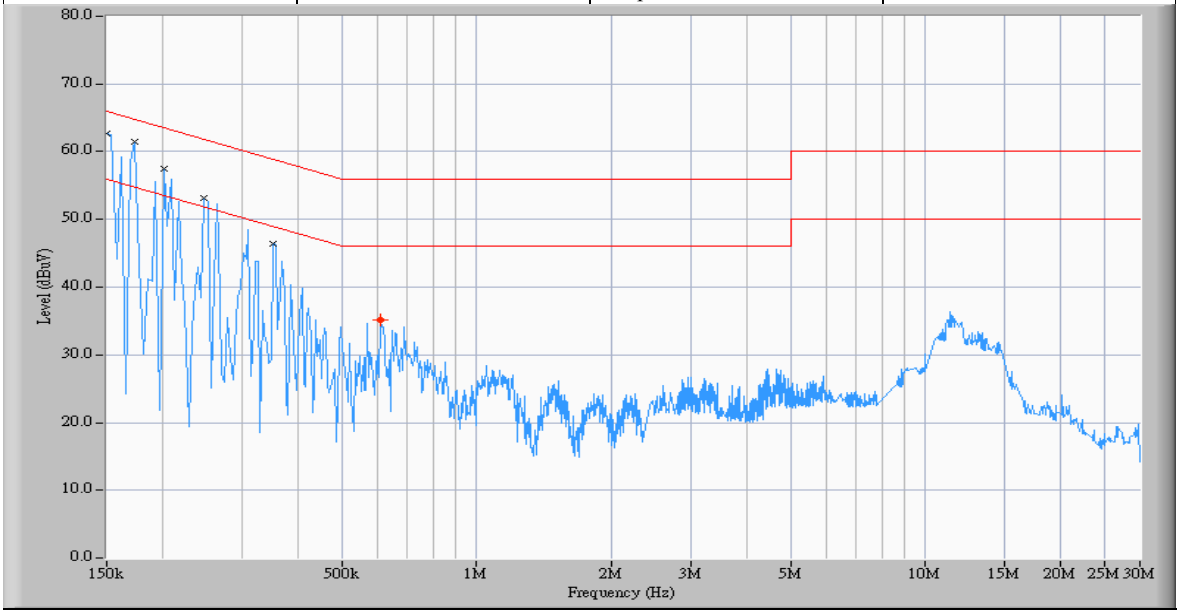


	Freq (MHz)	QP Level (dBuV)	AVG Level (dBuV)	Factor (dB)	QP Result (dBuV)	AVG Result (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	QP Margin (dB)	AVG Margin (dB)
1	0.154	65.3	47.2	0.1	65.4	47.3	65.8	55.8	-0.4	-8.5
2	0.170	54.1	28.6	0.1	54.2	28.7	65.0	55.0	-10.8	-26.3
3	0.201	59.8	41.6	0.1	59.9	41.7	63.6	53.6	-3.7	-11.9
4	0.263	54.4	33.3	0.1	54.5	33.4	61.3	51.3	-6.8	-17.9
5	0.361	47.3	----	0.1	47.4	----	58.7	48.7	-11.3	----
6	11.478	37.7	----	0.3	38.0	----	60.0	50.0	-22.0	----

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. “***” means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. “#” means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

EUT :	Model :	Status : CH 11	
Condition : Line 2	Date : 2009/12/18	Temp. : 19℃	Humi. : 56%



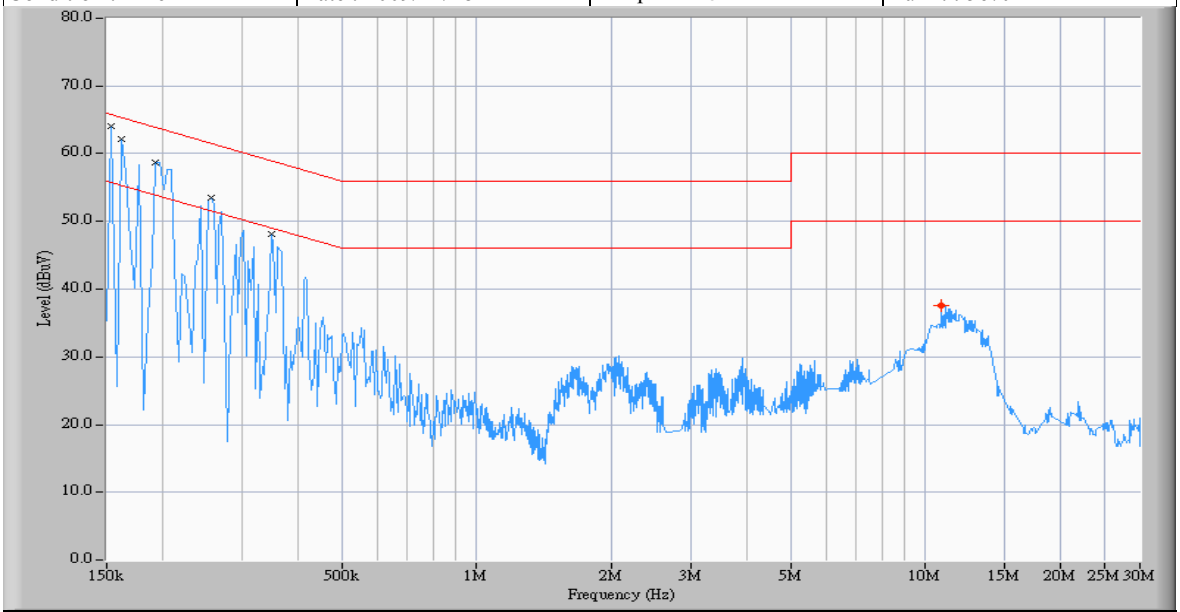
	Freq (MHz)	QP Level (dBuV)	AVG Level (dBuV)	Factor (dB)	QP Result (dBuV)	AVG Result (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	QP Margin (dB)	AVG Margin (dB)
1	0.150	62.7	44.0	0.1	62.8	44.1	66.0	56.0	-3.2	-11.9
2	0.173	61.5	19.7	0.1	61.6	19.8	64.8	54.8	-3.2	-35.0
3	0.201	57.4	38.6	0.1	57.5	38.7	63.6	53.6	-6.1	-14.9
4	0.248	53.1	29.6	0.1	53.2	29.7	61.8	51.8	-8.6	-22.1
5	0.353	46.4	----	0.1	46.5	----	58.9	48.9	-12.4	----
6	0.611	35.2	----	0.1	35.3	----	56.0	46.0	-20.7	----

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. "***" means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. "#" means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

4.3.2 Operation Mode: Channel Mid

EUT :	Model :	Status : CH 18	
Condition : Line 1	Date : 2009/12/18	Temp. : 19℃	Humi. : 56%

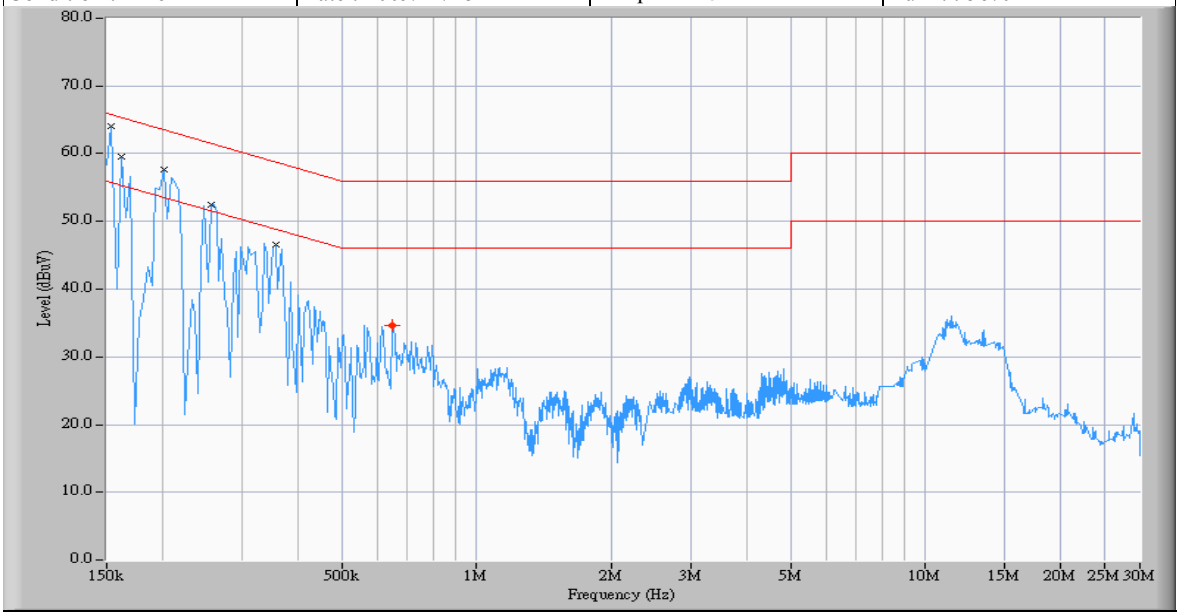


	Freq (MHz)	QP Level (dBuV)	AVG Level (dBuV)	Factor (dB)	QP Result (dBuV)	AVG Result (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	QP Margin (dB)	AVG Margin (dB)
1	0.154	64.0	44.6	0.1	64.1	44.7	65.8	55.8	-1.7	-11.1
2	0.162	62.2	36.7	0.1	62.3	36.8	65.4	55.4	-3.1	-18.6
3	0.193	58.7	28.6	0.1	58.8	28.7	63.9	53.9	-5.1	-25.2
4	0.255	53.5	35.8	0.1	53.6	35.9	61.6	51.6	-8.0	-15.7
5	0.349	48.2	----	0.1	48.3	----	59.0	49.0	-10.7	----
6	10.841	37.5	----	0.3	37.8	----	60.0	50.0	-22.2	----

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. "***" means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. "#" means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

EUT :	Model :	Status : CH 18	
Condition : Line 2	Date : 2009/12/18	Temp. : 19℃	Humi. : 56%



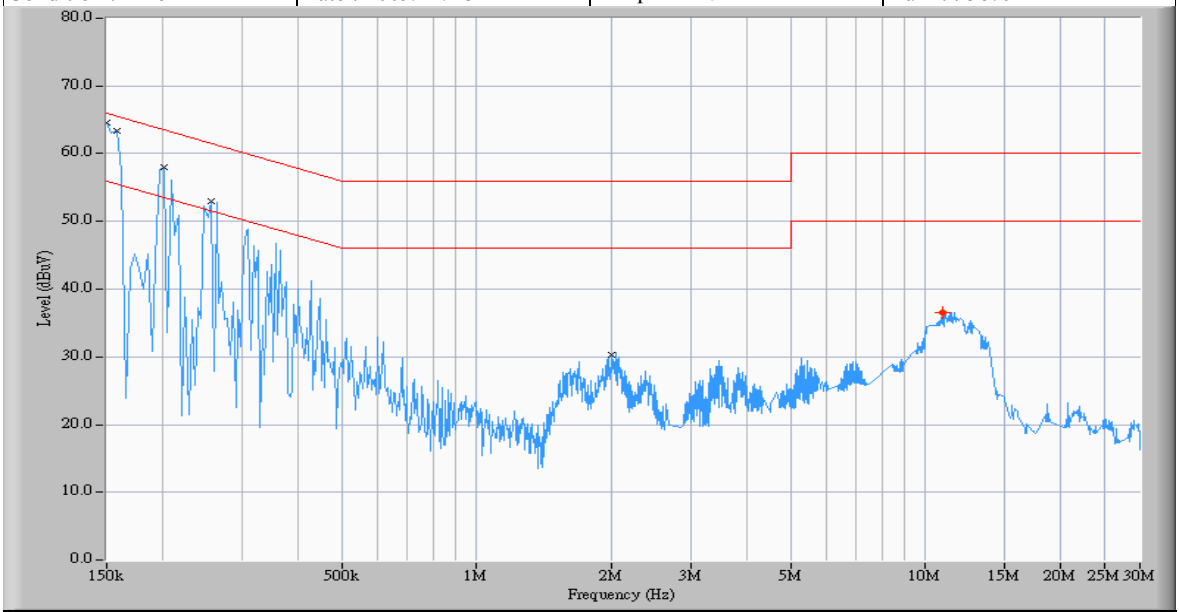
	Freq (MHz)	QP Level (dBuV)	AVG Level (dBuV)	Factor (dB)	QP Result (dBuV)	AVG Result (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	QP Margin (dB)	AVG Margin (dB)
1	0.154	64.0	44.6	0.1	64.1	44.7	65.8	55.8	-1.7	-11.1
2	0.162	59.6	36.8	0.1	59.7	36.9	65.4	55.4	-5.7	-18.5
3	0.201	57.7	38.1	0.1	57.8	38.2	63.6	53.6	-5.8	-15.4
4	0.255	52.5	35.7	0.1	52.6	35.8	61.6	51.6	-9.0	-15.8
5	0.357	46.6	----	0.1	46.7	----	58.8	48.8	-12.1	----
6	0.650	34.6	----	0.1	34.7	----	56.0	46.0	-21.3	----

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. "***" means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. "#" means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

4.3.3 Operation Mode: Channel High

EUT :	Model :	Status : CH 26	
Condition : Line 1	Date : 2009/12/18	Temp. : 19℃	Humi. : 56%

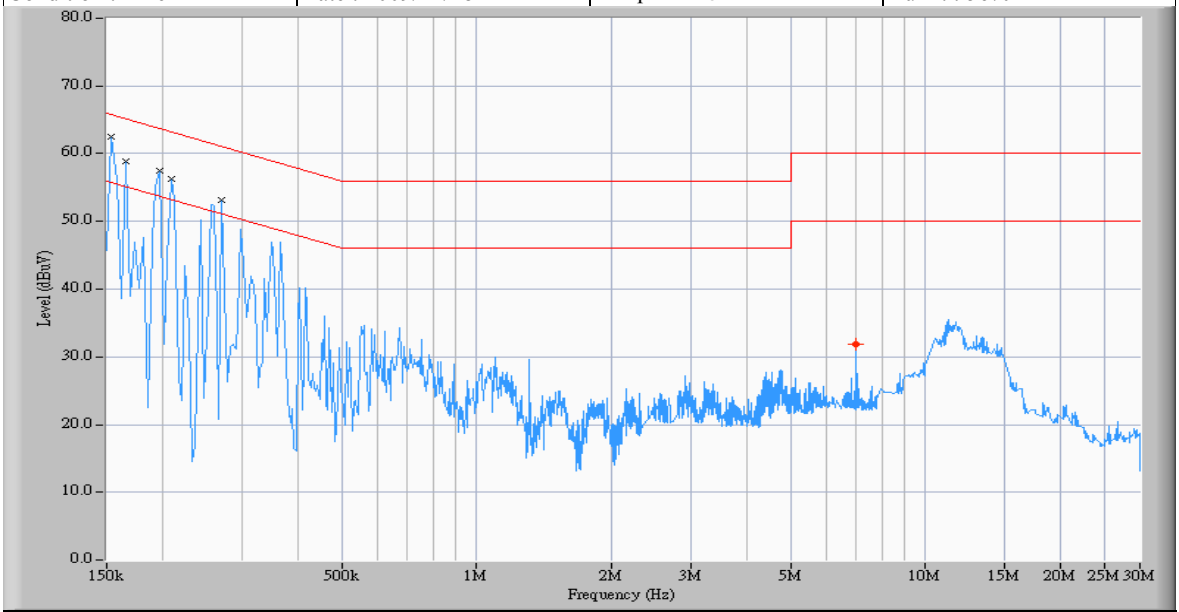


	Freq (MHz)	QP Level (dBuV)	AVG Level (dBuV)	Factor (dB)	QP Result (dBuV)	AVG Result (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	QP Margin (dB)	AVG Margin (dB)
1	0.150	64.6	42.8	0.1	64.7	42.9	66.0	56.0	-1.3	-13.1
2	0.158	63.4	41.9	0.1	63.5	42.0	65.6	55.6	-2.1	-13.6
3	0.201	58.0	37.0	0.1	58.1	37.1	63.6	53.6	-5.5	-16.5
4	0.255	52.9	34.8	0.1	53.0	34.9	61.6	51.6	-8.6	-16.7
5	1.994	30.3	----	0.1	30.4	----	56.0	46.0	-25.6	----
6	10.888	36.6	----	0.3	36.9	----	60.0	50.0	-23.1	----

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. "***" means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. "#" means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

EUT :	Model :	Status : CH 26	
Condition : Line 2	Date : 2009/12/18	Temp. : 19℃	Humi. : 56%



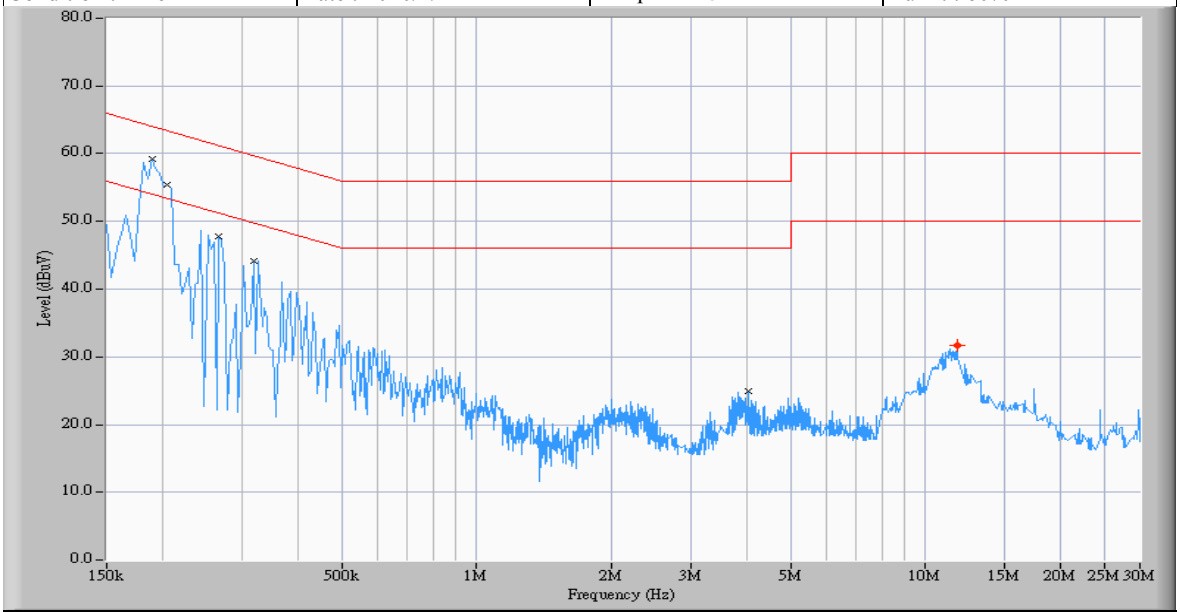
	Freq (MHz)	QP Level (dBuV)	AVG Level (dBuV)	Factor (dB)	QP Result (dBuV)	AVG Result (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	QP Margin (dB)	AVG Margin (dB)
1	0.154	62.5	44.6	0.1	62.6	44.7	65.8	55.8	-3.2	-11.1
2	0.166	58.8	30.8	0.1	58.9	30.9	65.2	55.2	-6.3	-24.3
3	0.197	57.5	33.4	0.1	57.6	33.5	63.7	53.7	-6.1	-20.2
4	0.209	56.3	35.9	0.1	56.4	36.0	63.2	53.2	-6.8	-17.2
5	0.271	53.2	23.1	0.1	53.3	23.2	61.1	51.1	-7.8	-27.9
6	7.005	31.9	----	0.2	32.1	----	60.0	50.0	-27.9	----

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. "***" means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. "#" means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

4.3.4 Operation Mode: Bluetooth Mode

EUT :	Model :	Status :	
Condition : Line 1	Date : 2010/1/4	Temp. : 21℃	Humi. : 60%



	Freq (MHz)	QP Level (dBuV)	AVG Level (dBuV)	Factor (dB)	QP Result (dBuV)	AVG Result (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	QP Margin (dB)	AVG Margin (dB)
1	0.150	55.5	33.1	0.2	55.6	33.3	66.0	56.0	-10.4	-22.7
2	0.189	59.2	43.0	0.1	59.3	43.1	64.1	54.1	-4.8	-11.0
3	0.267	47.9	----	0.1	48.0	----	61.2	51.2	-13.2	----
4	0.318	44.2	----	0.1	44.3	----	59.8	49.8	-15.5	----
5	4.029	25.0	----	0.2	25.2	----	56.0	46.0	-30.8	----
6	11.763	31.7	----	0.5	32.2	----	60.0	50.0	-27.8	----

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. "***" means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. "#" means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

EUT :	Model :	Status :	
Condition : Line 2	Date : 2010/1/4	Temp. : 21℃	Humi. : 60%

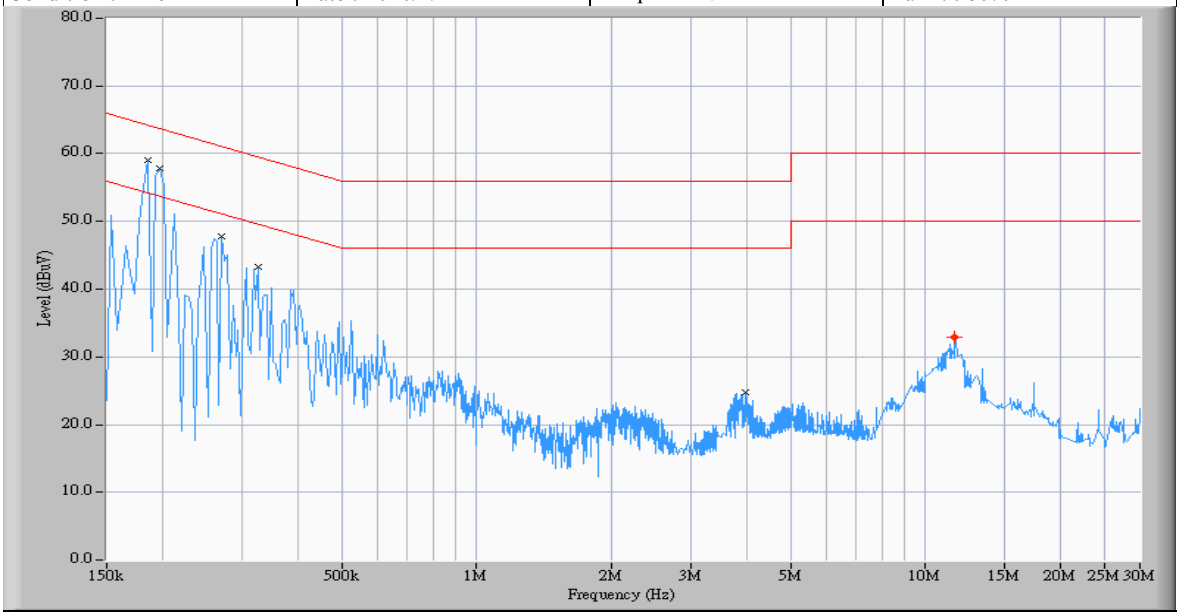
	Freq (MHz)	QP Level (dBuV)	AVG Level (dBuV)	Factor (dB)	QP Result (dBuV)	AVG Result (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	QP Margin (dB)	AVG Margin (dB)
1	0.193	57.7	42.0	0.1	57.8	42.1	63.9	53.9	-6.1	-11.8
2	0.205	54.9	36.7	0.1	55.0	36.8	63.4	53.4	-8.4	-16.6
3	0.252	48.3	----	0.1	48.4	----	61.7	51.7	-13.3	----
4	0.322	42.6	----	0.1	42.7	----	59.7	49.7	-17.0	----
5	0.857	26.1	----	0.1	26.2	----	56.0	46.0	-29.8	----
6	17.353	24.3	----	0.7	25.0	----	60.0	50.0	-35.0	----

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. "***" means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. "#" means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

4.3.5 Operation Mode: Wireless LAN mode

EUT :	Model :	Status :	
Condition : Line 1	Date : 2010/1/4	Temp. : 21℃	Humi. : 60%



	Freq (MHz)	QP Level (dBuV)	AVG Level (dBuV)	Factor (dB)	QP Result (dBuV)	AVG Result (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	QP Margin (dB)	AVG Margin (dB)
1	0.185	59.1	36.0	0.1	59.2	36.1	64.3	54.3	-5.1	-18.2
2	0.197	57.8	40.9	0.1	57.9	41.0	63.7	53.7	-5.8	-12.7
3	0.271	47.8	----	0.1	47.9	----	61.1	51.1	-13.2	----
4	0.326	43.3	----	0.1	43.4	----	59.6	49.6	-16.2	----
5	3.962	24.7	----	0.2	24.9	----	56.0	46.0	-31.1	----
6	11.580	32.9	----	0.5	33.4	----	60.0	50.0	-26.6	----

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. "***" means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. "#" means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

EUT :	Model :	Status :	
Condition : Line 2	Date : 2010/1/4	Temp. : 21℃	Humi. : 60%

	Freq (MHz)	QP Level (dBuV)	AVG Level (dBuV)	Factor (dB)	QP Result (dBuV)	AVG Result (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	QP Margin (dB)	AVG Margin (dB)
1	0.185	57.9	38.6	0.1	58.0	38.7	64.3	54.3	-6.3	-15.6
2	0.193	55.7	41.1	0.1	55.8	41.2	63.9	53.9	-8.1	-12.7
3	0.259	47.5	----	0.1	47.6	----	61.5	51.5	-13.9	----
4	0.334	41.5	----	0.1	41.6	----	59.4	49.4	-17.8	----
5	7.205	25.4	----	0.3	25.7	----	60.0	50.0	-34.3	----
6	11.166	31.8	----	0.4	32.2	----	60.0	50.0	-27.8	----

Note:

1. Place of measurement: EMC LAB. of the ETC.
2. "***" means the value was too low to be measured.
3. If the data table appeared symbol of "----" means the Q.P. value is under the limit of AVG. so, the AVG. value doesn't need to be measured.
4. "#" means the noise was too low, so record the peak value.
5. The estimated measurement uncertainty of the result measurement is ±2.5dB.

4.4 Result Data Calculation

The result data is calculated by adding the LISN Factor to the measured reading. The basic equation with a sample calculation is as follows:

RESULT = READING + LISN FACTOR (Included Cable Loss)

4.5 Conducted Measurement Equipment

The following test equipment are used during the conducted test.

Equipment	Manufacturer	Model No.	Next Cal. Due
RF Test Receiver	Rohde and Schwarz	ESCS30	08/22/2010
LISN	EMCO	37100/2M	02/11/2010

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5 ANTENNA REQUIREMENT

5.1 Standard Applicable

For intentional device, according to §15.203, 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.
And according to §15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.2 Antenna Construction and Directional Gain

Antenna name:	Airgain Profile 20
Antenna Gain:	3.8 dBi (peak)
Frequency Band:	2.4 to 2.49 GHz

The directional gain of antenna doesn't greater than 6 dBi, the power won't be reduced.

6 EMISSION BANDWIDTH MEASUREMENT

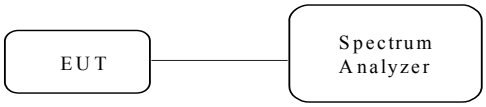
6.1 Standard Applicable

According to 15.247(a)(2), system using digital modulation techniques, the minimum 6dB bandwidth shall be at least 500 kHz.

6.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

Figure 2: Emission bandwidth measurement configuration.



6.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Agilent	E4446A	09/27/2010

6.4 Measurement Data

Test Date: Dec. 17, 2009 Temperature: 26℃ Humidity: 51 %

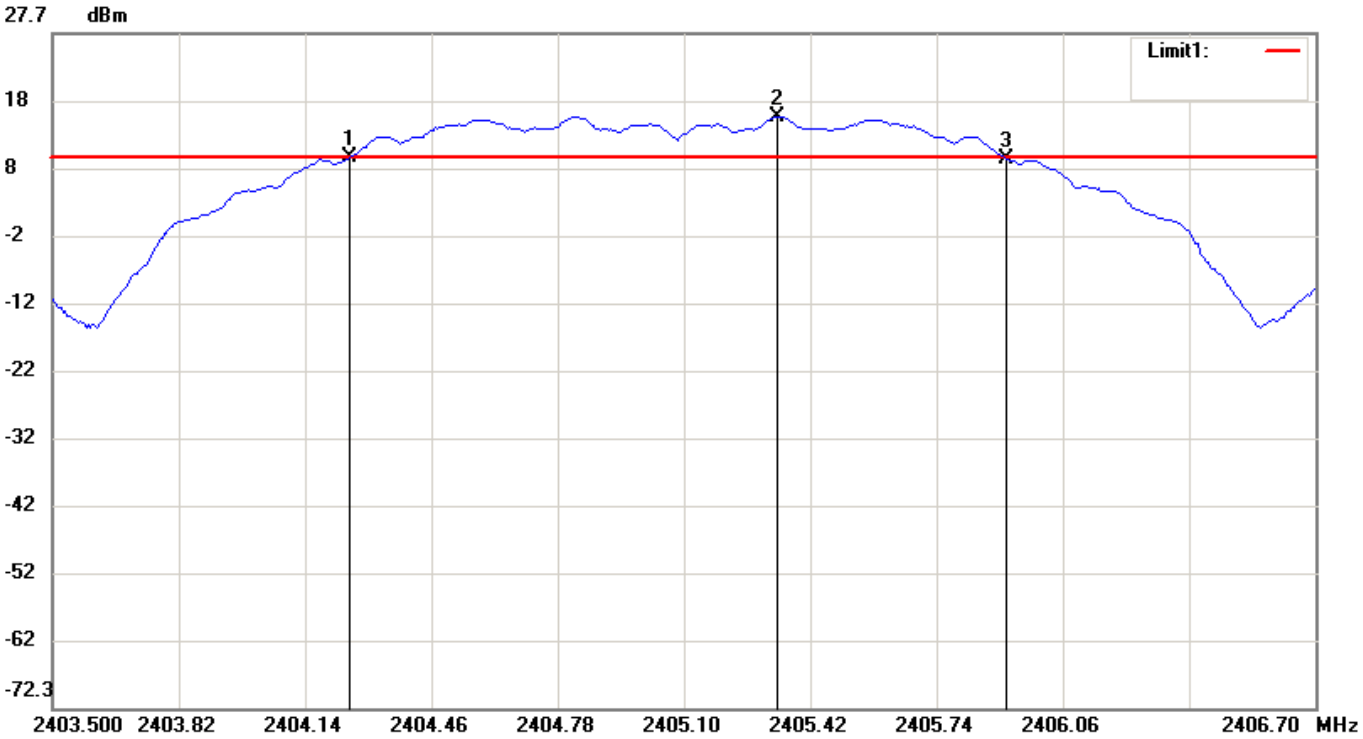
Channel	Frequency (MHz)	Data Transfer Rate (Mbps)	6dB Bandwidth (MHz)	FCC Limit (kHz)	Chart
11	2405	1	1.644	500	Page 27
18	2440	1	1.600	500	Page 28
26	2480	1	1.584	500	Page 29

Note:

1.Please refer to page 27 to page 29 for chart
2. The estimated measurement uncertainty of the result measurement is 8.25×10^{-7} *(1GHz* $\leqq f \leqq$ *18GHz)*

File: OPENPEAK **Data: #36** **Date: 2009/12/17** **Temperature: 26 ℃**

Time: AM 11:03:25 **Humidity: 51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 200ms Att.: 30dB**

Model: **RBW: 100 KHz VBW: 300 KHz**

Test Mode:

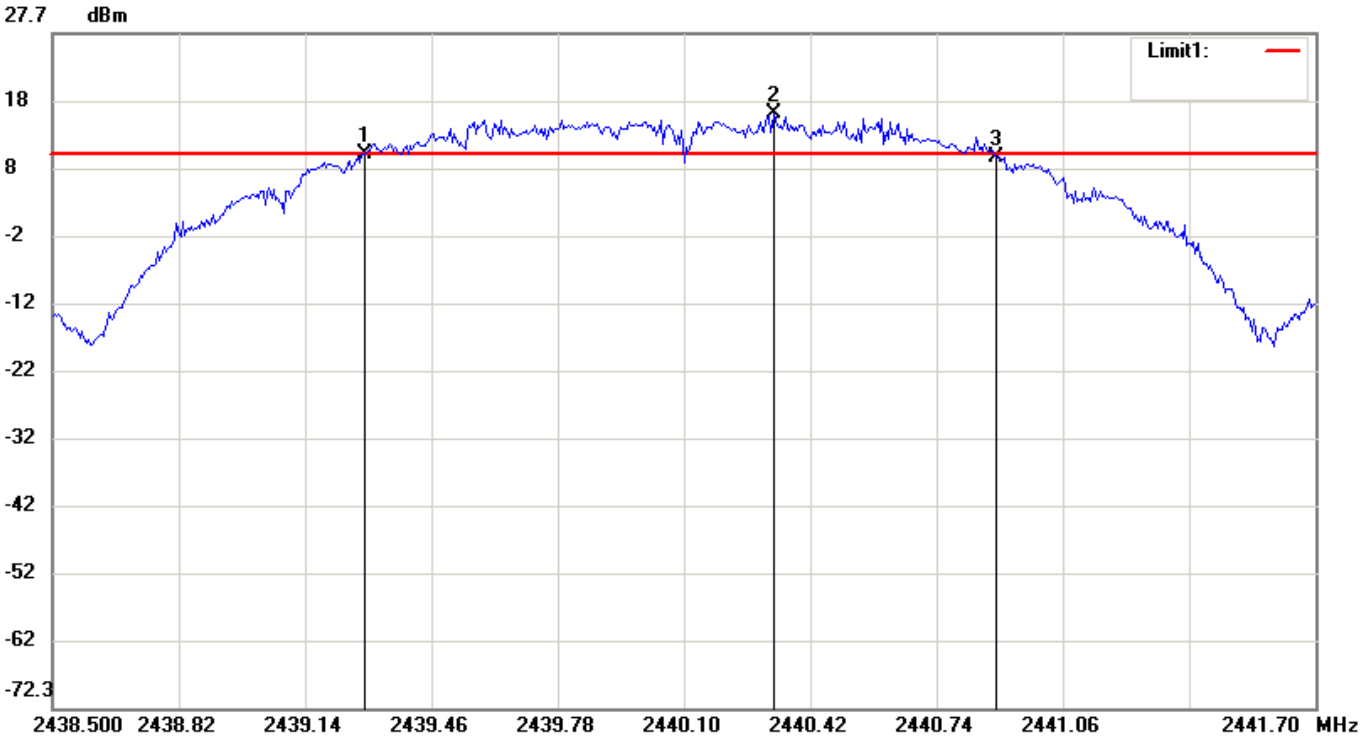
Note: **Channel 11-Conducted 6dB-BW**

No.	Frequency(MHz)	Level(dBm)
1	2405.2520	9.19
2	2405.3347	15.26
3	2405.9160	9.04

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	1.664	-0.15

File: OPENPEAK **Data: #34** **Date: 2009/12/17** **Temperature: 26 ℃**

Time: AM 10:57:16 **Humidity: 51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 200ms Att.: 30dB**

Model: **RBW: 100 KHz VBW: 300 KHz**

Test Mode:

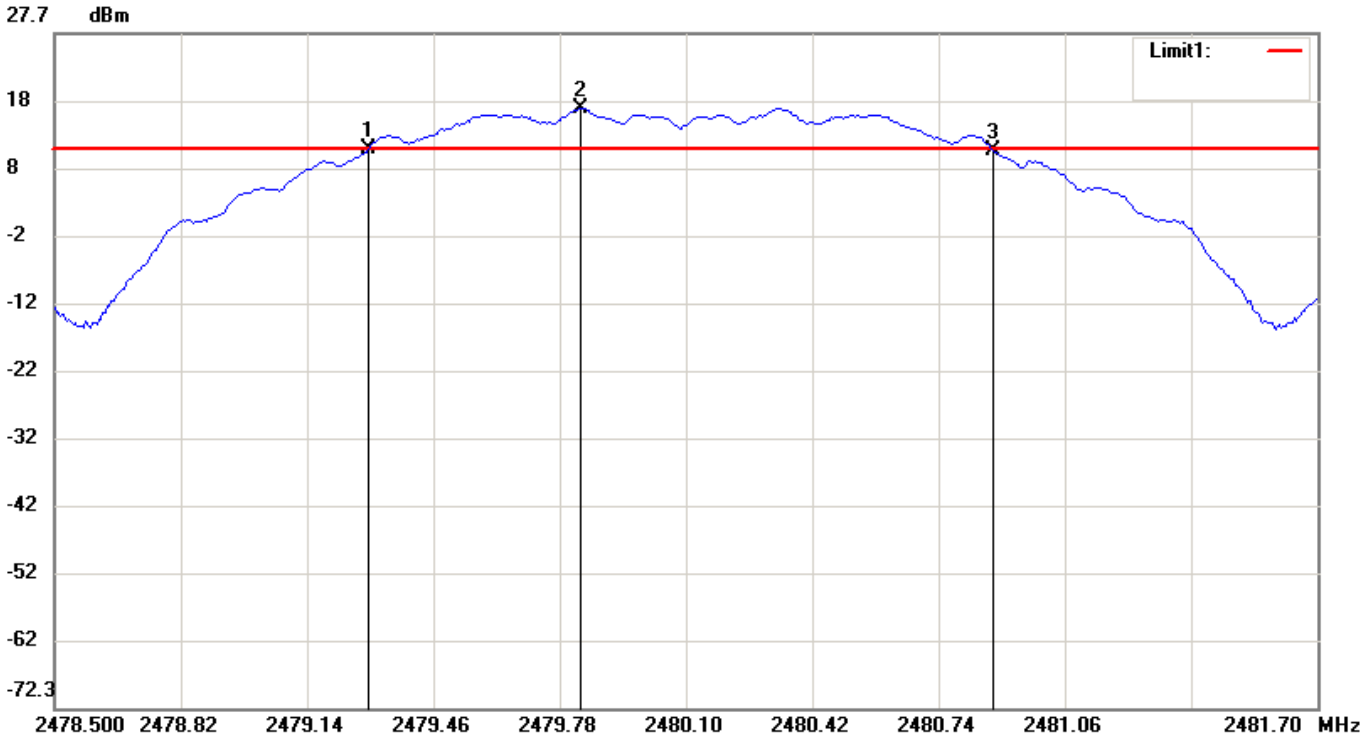
Note: **Channel 18-Conducted 6dB-BW**

No.	Frequency(MHz)	Level(dBm)
1	2439.2893	9.76
2	2440.3293	15.89
3	2440.8893	9.23

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	1.6	-0.53

File: OPENPEAK **Data: #38** **Date: 2009/12/17** **Temperature: 26 ℃**

Time: AM 11:06:44 **Humidity: 51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 200ms Att.: 30dB**

Model: **RBW: 100 KHz VBW: 300 KHz**

Test Mode:

Note: **Channel 26-Conducted 6dB-BW**

No.	Frequency(MHz)	Level(dBm)
1	2479.2947	10.53
2	2479.8333	16.56
3	2480.8787	10.40

No.		△Frequency(MHz)	△Level(dB)
1	mk3-mk1	1.584	-0.13

7 OUTPUT POWER MEASUREMENT

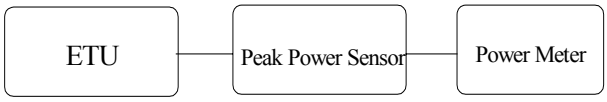
7.1 Standard Applicable

For direct sequence system, according to 15.247(b), the maximum peak output power of the transmitter shall not exceed 1 Watt. If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

7.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 3. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range.
3. Measure the highest value appearing on power meter and record the level to calculate result data.
4. Repeat above procedures until all frequencies measured were complete.

Figure 3: Output power measurement configuration.



7.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Power Meter	Agilent	N1922A	11/02/2010
Peak Power Sensor	Agilent	N1912A	11/02/2010

7.4 Measurement Data

Test Date: Dec. 17, 2009 Temperature: 26℃ Humidity: 51 %

Channel	Frequency (MHz)	Data Transfer Rate (Mbps)	Maximum Peak Output Power (dBm)	Maximum Peak Output Power (mW)	FCC Limit (mW)	Chart
11	2405	1	19.63	91.833	1000	-
18	2440	1	20.09	102.094	1000	-
26	2480	1	20.30	107.152	1000	-

Note:

The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)

7.5 Maximum Permissible Exposure

The devices are subject to the radio frequency radiation exposure requirements specified in FCC parts 1.1307 (b), 2.1091 and 2.1093, as appropriate. All equipment shall be considered to operate in a "general population / uncontrolled environment. For portable devices tests according to IEEE 1528 are requested, if applicable.

Measurement procedure

Consideration of radio frequency radiation exposure for EUT is done as

SAR test according OET65c (for PP)	☐
MPE calculation as below (for FP, Repeater)	☒

SAR test results: not applicable

MPE calculation:

The EUT is considered as a mobile device according to OET Bulletin 65, Edition -97-01. Therefore distance to human body of min. 20 cm is determined.

The limit of Power density for General Population / Umcontrolled Exposure is 1.0 mW/cm².
Formula:

$$S = EIRP / 4\pi R^2$$

Calculation:

EIRP	Radiated Power (dBm)	24.1
EIRP	Radiated Power (mW)	257.04
R	Distance (cm)	20
S	Power Density (mW/cm²)	0.051

8 POWER DENSITY MEASUREMENT

8.1 Standard Applicable

According to 15.247(d), for direct sequence systems, the transmitted power density averaged over any 1 second interval shall not be greater than 8 dBm in any 3 kHz bandwidth within these bands.

8.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 2. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set EUT to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of spectrum analyzer on highest level appearing on spectral display within a 300 kHz frequency span.
4. Set the spectrum analyzer on a 3 kHz resolution bandwidth and 10 kHz video bandwidth as well as max. hold function, then record the measurement result.
5. Repeat above procedures until all measured frequencies were complete.

8.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Agilent	E4446A	09/27/2010

8.4 Measurement Data

Test Date: Dec. 17, 2009 Temperature: 26℃ Humidity: 51 %

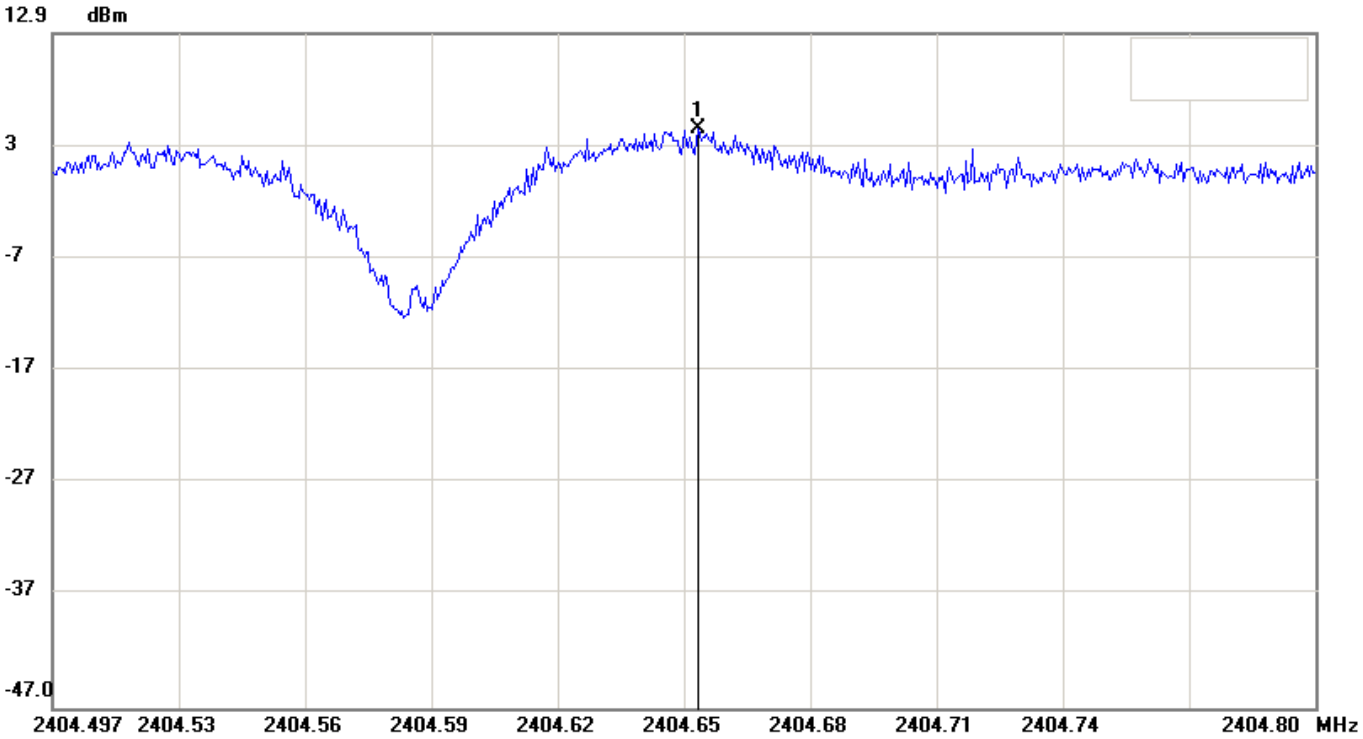
Channel	Frequency (MHz)	Data Transfer Rate (Mbps)	Peak Power Spectral Density (dBm)	FCC Limit (dBm)	Chart
11	2405	1	4.46	8	Page 35
18	2440	1	4.93	8	Page 36
26	2480	1	5.47	8	Page 37

Note:

1. *Please refer to page 35 to page 37 for chart*
2. *The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦ 18GHz)*

File: OPENPEAK **Data: #60** **Date: 2009/12/17** **Temperature: 26 ℃**

Time: PM 12:45:36 **Humidity: 51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 100000ms Att.: 20dB**

Model: **RBW: 3 KHz VBW: 10 KHz**

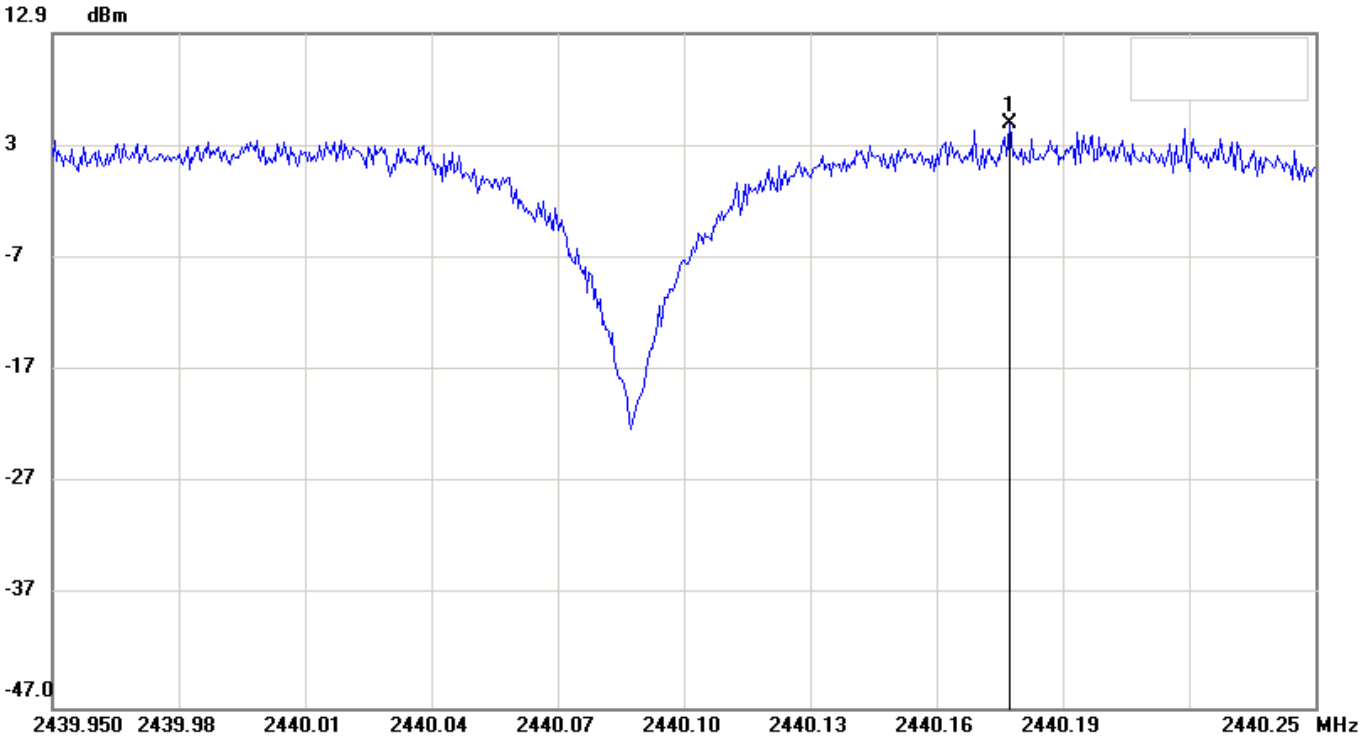
Test Mode:

Note: **Channel 11-Power Density (PK)**

No.	Frequency(MHz)	Level(dBm)
1	2405.6502	4.46

File: OPENPEAK **Data: #62** **Date: 2009/12/17** **Temperature: 26 ℃**

Time: PM 12:54:45 **Humidity: 51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 100000ms Att.: 20dB**

Model: **RBW: 3 KHz VBW: 10 KHz**

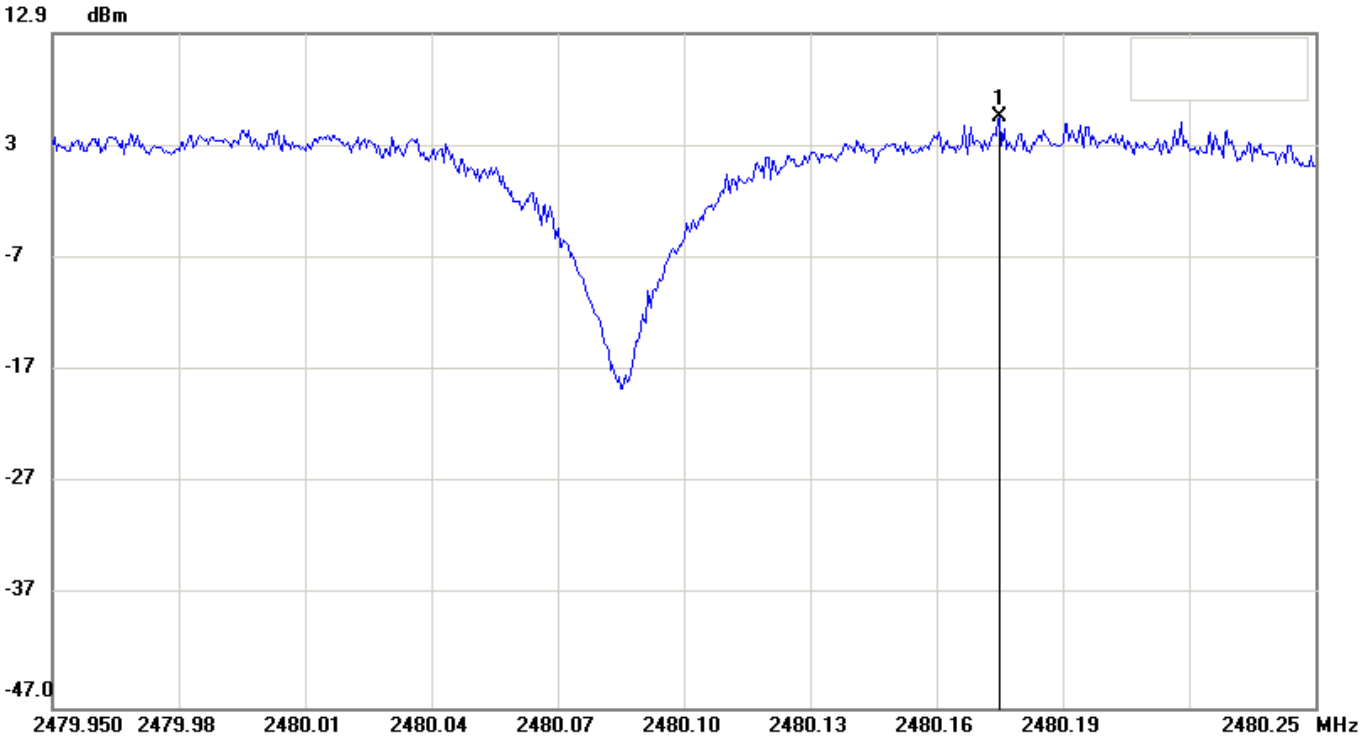
Test Mode:

Note: **Channel 18-Power Density (PK)**

No.	Frequency(MHz)	Level(dBm)
1	2440.1775	4.93

File: OPENPEAK **Data: #64** **Date: 2009/12/17** **Temperature: 26 ℃**

Time: PM 01:03:30 **Humidity: 51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 100000ms Att.: 20dB**

Model: **RBW: 3 KHz VBW: 10 KHz**

Test Mode:

Note: **Channel 26-Power Density (PK)**

No.	Frequency(MHz)	Level(dBm)
1	2480.1750	5.47

9 SPURIOUS EMISSION - RF CONDUCTED MEASUREMENT

9.1 Standard Applicable

According to 12.247 (c) , in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

9.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 2. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

9.3 Measurement Equipment

Equipment	Manufacturer	Model No.	Next Cal. Due
Spectrum Analyzer	Agilent	E4446A	09/27/2010

9.4 Measurement Data

Test Date: Dec. 17, 2009 Temperature: 26℃ Humidity: 51 %

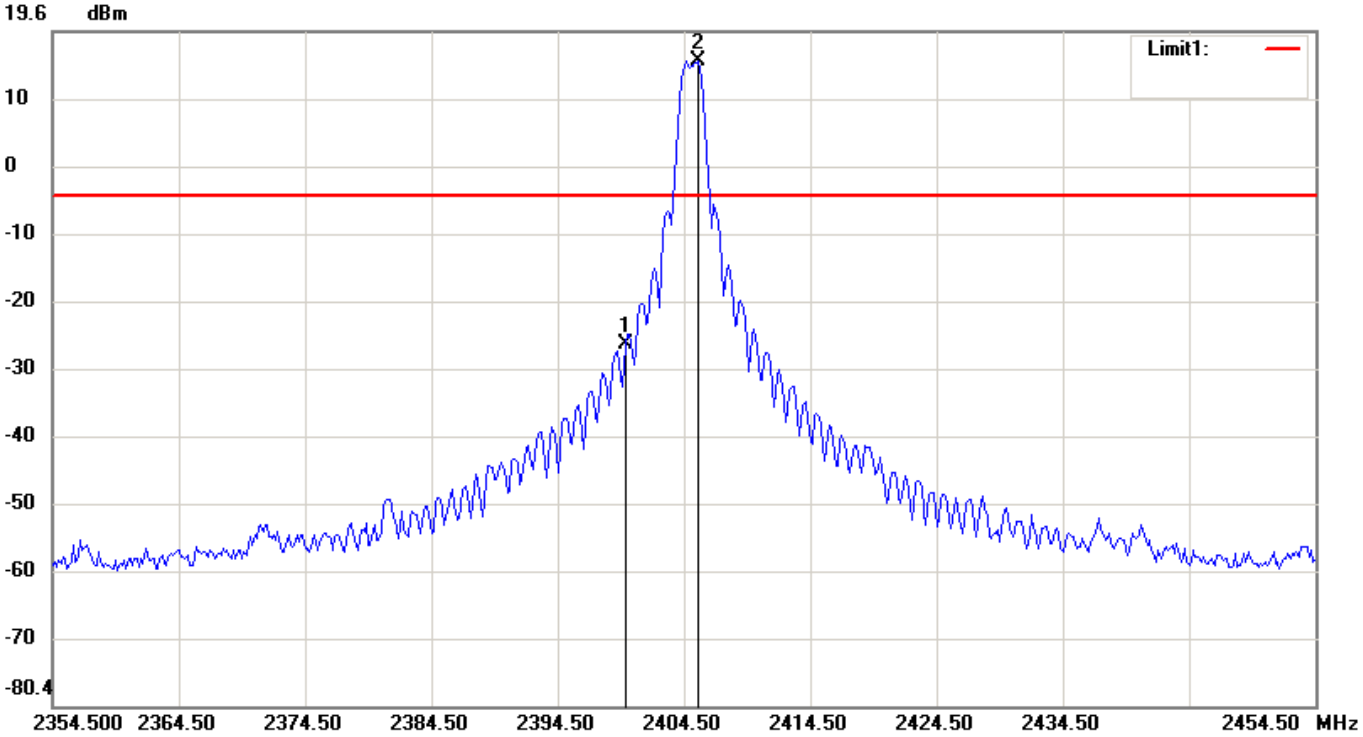
Channel	Frequency(MHz)	Chart
11	2405	Page 40, Page 42
18	2440	Page 43
26	2480	Page 41, Page 44

All out-of –band conducted emissions were more than 20dB below the carrier.

Note: Please refer to page 40 to page 44 for chart

File: OPENPEAK **Data: #53** **Date: 2009/12/17** **Temperature: 26 ℃**

Time: AM 11:48:36 **Humidity: 51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 10ms Att.: 20dB**

Model: **RBW: 100 KHz VBW: 300 KHz**

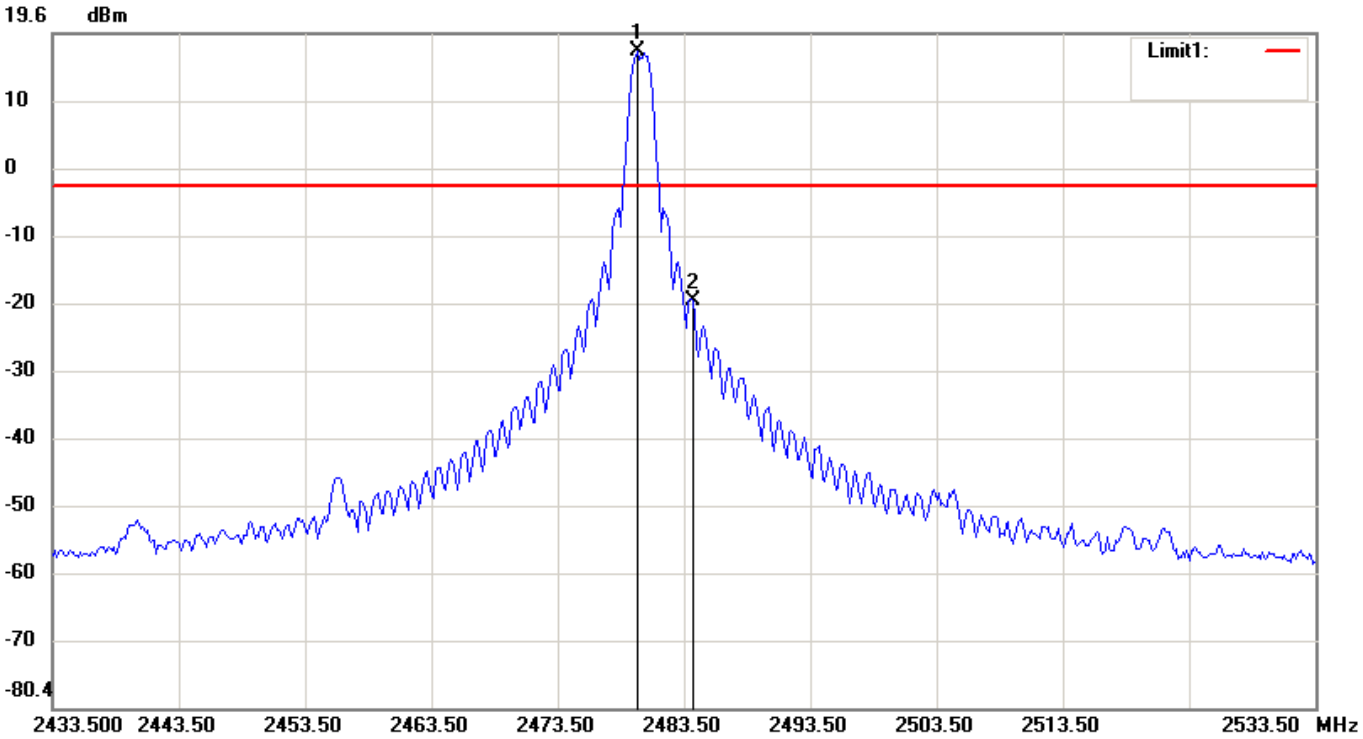
Test Mode:

Note: **Channel 11-Bandedge**

No.	Frequency(MHz)	Level(dBm)
1	2399.8332	-26.78
2	2405.6667	15.24

File: OPENPEAK **Data: #54** **Date: 2009/12/17** **Temperature: 26 ℃**

Time: AM 11:41:26 **Humidity: 51 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 10ms Att.: 20dB**

Model: **RBW: 100 KHz VBW: 300 KHz**

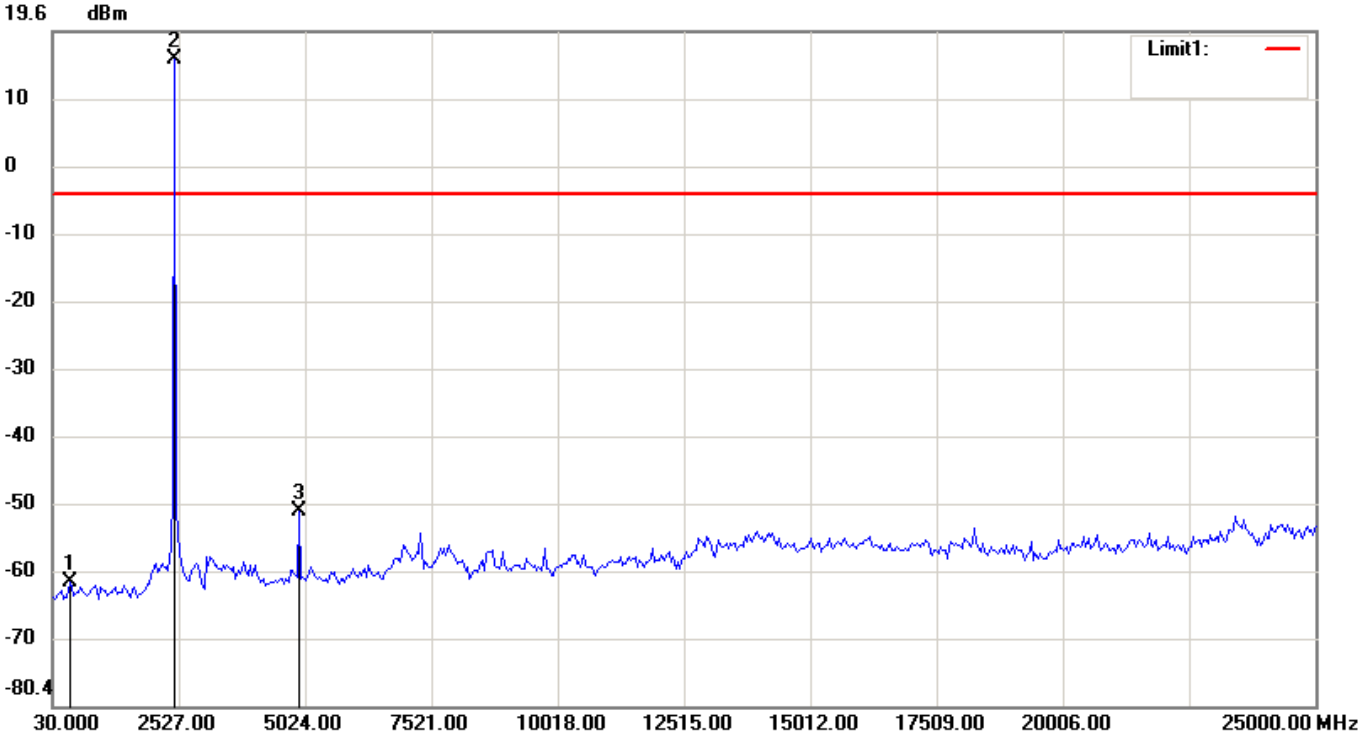
Test Mode:

Note: **Channel 26-Bandedge**

No.	Frequency(MHz)	Level(dBm)
1	2479.8332	16.91
2	2484.1667	-20.12

File: OPENPEAK **Data: #46** **Date: 2009/12/17** **Temperature: 26 ℃**

Time: AM 09:50:48 **Humidity: 51 %**



Condition: **-4.5dBm** **RF Conducted**

EUT: **Sweep Time: 2386ms** **Att.: 20dB**

Model: **RBW: 100 KHz** **VBW: 300 KHz**

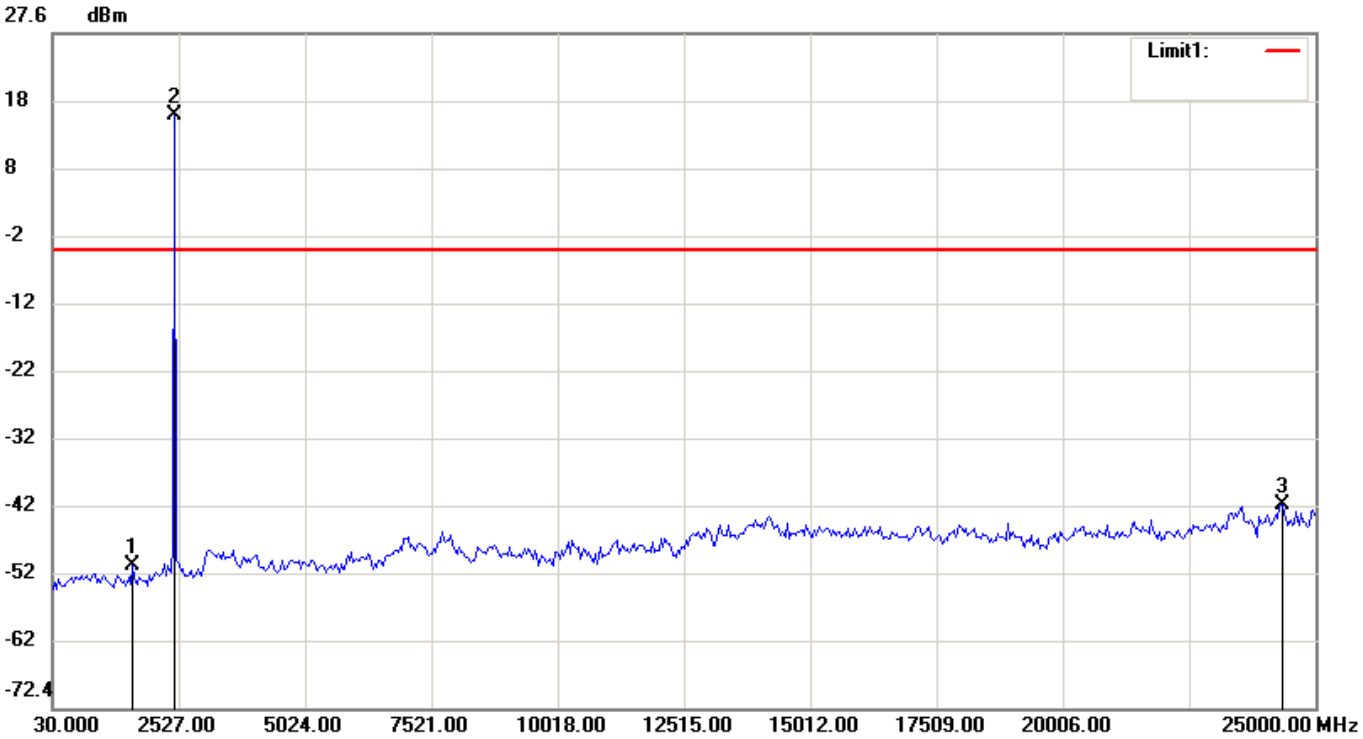
Test Mode:

Note: **Channel 11-Conducted Spurious**

No.	Frequency(MHz)	Level(dBm)
1	362.9333	-62.01
2	2443.7667	15.50
3	4899.1500	-51.44

File: OPENPEAK **Data: #47** **Date: 2009/12/17** **Temperature: 26 ℃**

Time: AM 10:28:55 **Humidity: 51 %**



Condition: **-4.43dBm** **RF Conducted**

EUT: **Sweep Time: 2386ms** **Att.: 30dB**

Model: **RBW: 100 KHz** **VBW: 300 KHz**

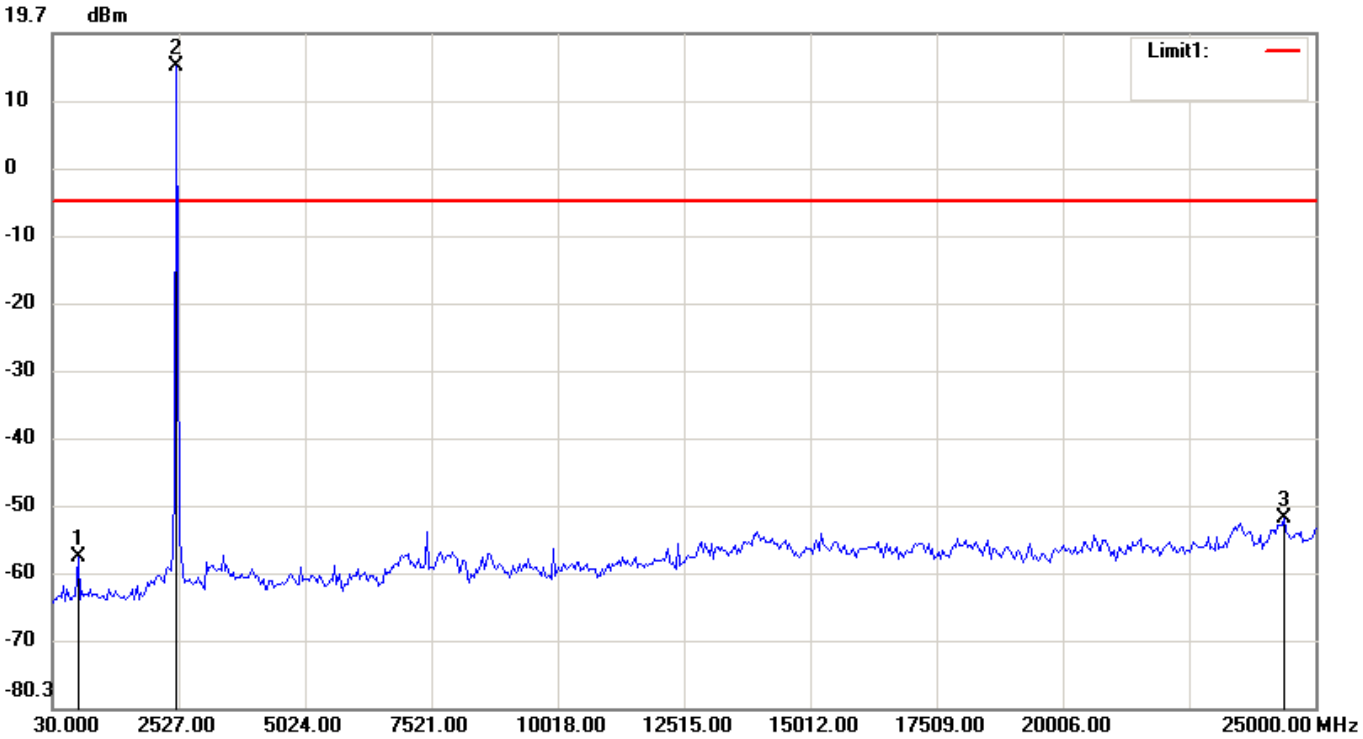
Test Mode:

Note: **Channel 18-Conducted Spurious**

No.	Frequency(MHz)	Level(dBm)
1	1611.4333	-51.30
2	2443.7667	15.57
3	24334.1333	-42.38

File: OPENPEAK **Data: #45** **Date: 2009/12/17** **Temperature: 26 ℃**

Time: AM 11:17:59 **Humidity: 51 %**



Condition: **-5.29dBm** **RF Conducted**

EUT: **Sweep Time: 2386ms** **Att.: 20dB**

Model: **RBW: 100 KHz** **VBW: 300 KHz**

Test Mode:

Note: **Channel 26-Conducted Spurious**

No.	Frequency(MHz)	Level(dBm)
1	529.4000	-58.01
2	2485.3833	14.71
3	24375.7500	-52.18

10 RADIATED EMISSION MEASUREMENT

10.1 Standard Applicable

For unintentional radiator, the radiated emission shall comply with §15.109(a).

For intentional radiators, according to §15.247 (a), operation under this provision is limited to frequency hopping and direct sequence spread spectrum, and the out band emission shall be comply with §15.247 (c)

10.2 Measurement Procedure

1. Setup the configuration per figure 3 and 4 for frequencies measured below and above 1 GHz respectively.
2. For emission frequencies measured below 1 GHz, it is performed in a semi-anechoic chamber to determine the accurate frequencies of higher emissions. For emission frequencies measured above 1 GHz, a pre-scan be performed with a 1 meter measuring distance before final test.
3. For emission frequencies measured below and above 1 GHz, set the spectrum analyzer on a 120 kHz and 1 MHz resolution bandwidth respectively for each frequency measured in step 2.
4. The search antenna is to be raised and lowered over a range from 1 to 4 meters in horizontally polarized orientation. Position the highness when the highest value is indicated on spectrum analyzer, then change the orientation of EUT on test table over a range from 0 ° to 360 ° with a speed as slow as possible, and keep the azimuth that highest emission is indicated on the spectrum analyzer. Vary the antenna position again and record the highest value as a final reading. A RF test receiver is also used to confirm emissions measured.

   Note : A filter was used to avoid pre-amplifier saturated when measure TX operation mode.
5. Repeat step 4 until all frequencies need to be measured were complete.
6. Repeat step 5 with search antenna in vertical polarized orientations.
7. Check the three frequencies of highest emission with varying the datarate, placement of ANT. cables associated with EUT to obtain the worse case and record the result.

Figure 3 : Frequencies measured below 1 GHz configuration

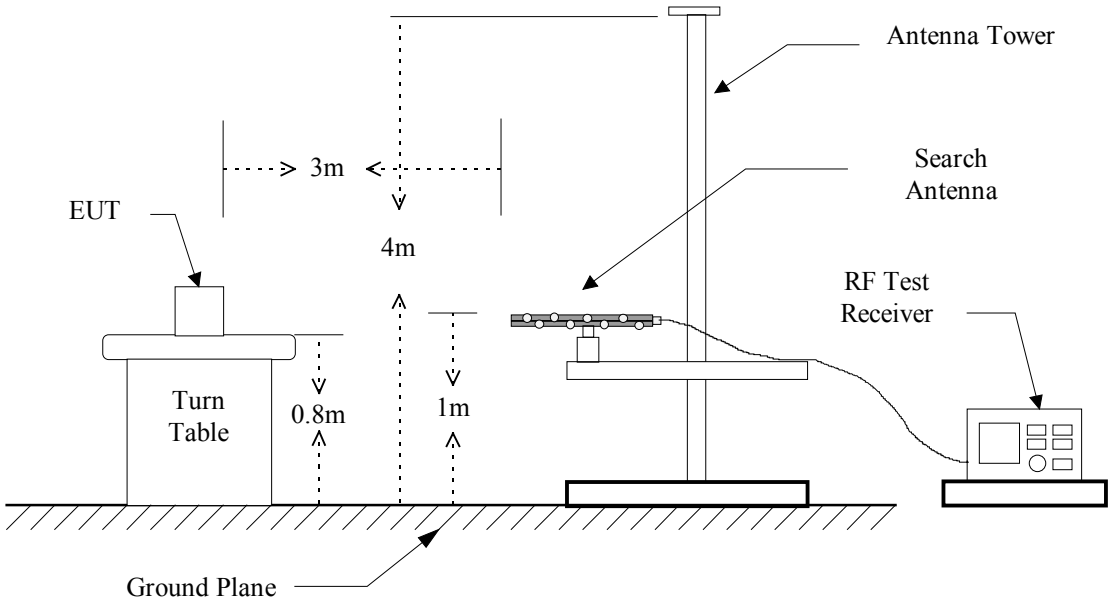
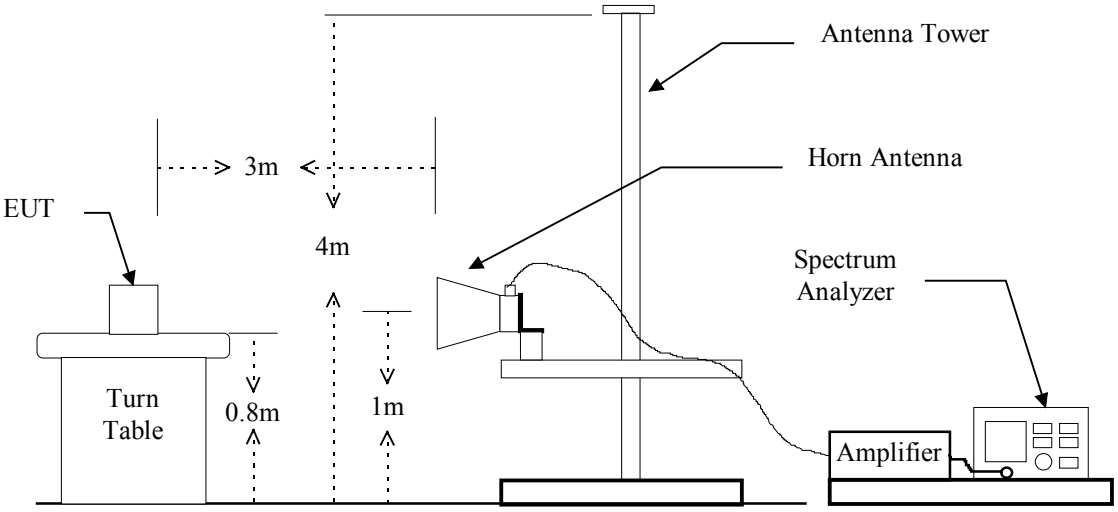


Figure 4 : Frequencies measured above 1 GHz configuration



10.3 Measuring Instrument

The following instrument are used for radiated emissions measurement :

Equipment	Manufacturer	Model No.	Serial No.	Calibrated until
EMI Receiver	R&S	ESIB7	13054414-001	07/19/2010
BiLog Antenna	Schaffner	CBL 6112B	2927	08/18/2010
Horn Antenna	EMCO	3115	9107-3729	12/10/2010
PRE-Amplifier	Agilent	8449B	3008A01648	10/11/2010
Spectrum Analyzer	R&S	FSU46	13040904-001	11/18/2010

Measuring instrument setup in measured frequency band when specified detector function is used :

Frequency Band (MHz)	Instrument	Function	Resolution Bandwidth	Video Bandwidth
30 to 1000	RF Test Receiver	Quasi-Peak	120 kHz	300 kHz
	Spectrum Analyzer	Peak	120 kHz	300 kHz
Above 1000	Spectrum Analyzer	Peak	1 MHz	1 MHz
	Spectrum Analyzer	Average	1 MHz	10 Hz

10.4 Radiated Emission Data

10.4.1 Harmonic

Operation Mode: TX
Test Date: Dec. 16, 2009 Temperature: 21℃ Humidity: 57 %

a) Channel Low
Fundamental Frequency: 2405 MHz

Frequency	Reading (dBuV)				Factor	Result @3m		Limit @3m	
	H		V		(dB)	(dBuV/m)		(dBuV/m)	
(MHz)	Peak	Ave	Peak	Ave	Corr.	Peak	Ave	Peak	Ave.
4810.000	---	---	---	---	0.7	---	---	74.0	54.0
12025.000	---	---	---	---	1.6	---	---	74.0	54.0
14430.000	---	---	---	---	6.5	---	---	74.0	54.0
19240.000	---	---	---	---	10.9	---	---	74.0	54.0

b) Channel Middle
Fundamental Frequency: 2440 MHz

Frequency	Reading (dBuV)				Factor	Result @3m		Limit @3m	
	H		V		(dB)	(dBuV/m)		(dBuV/m)	
(MHz)	Peak	Ave	Peak	Ave	Corr.	Peak	Ave	Peak	Ave.
4880.000	---	---	---	---	0.6	---	---	74.0	54.0
7320.000	---	---	---	---	2.8	---	---	74.0	54.0
12200.000	---	---	---	---	1.6	---	---	74.0	54.0
19520.000	---	---	---	---	10.9	---	---	74.0	54.0

c) Channel High
Fundamental Frequency: 2480 MHz

Frequency	Reading (dBuV)				Factor	Result @3m		Limit @3m	
	H		V		(dB)	(dBuV/m)		(dBuV/m)	
(MHz)	Peak	Ave	Peak	Ave	Corr.	Peak	Ave	Peak	Ave.
4954.000	---	---	---	---	0.6	---	---	74.0	54.0
7431.000	---	---	---	---	2.8	---	---	74.0	54.0
12385.000	---	---	---	---	1.0	---	---	74.0	54.0
19816.000	---	---	---	---	10.9	---	---	74.0	54.0
22293.000	---	---	---	---	10.9	---	---	74.0	54.0

Note :

1. Item of margin shown in above table refer to average limit.
2. Remark "---" means that the emissions level is too low to be measured.

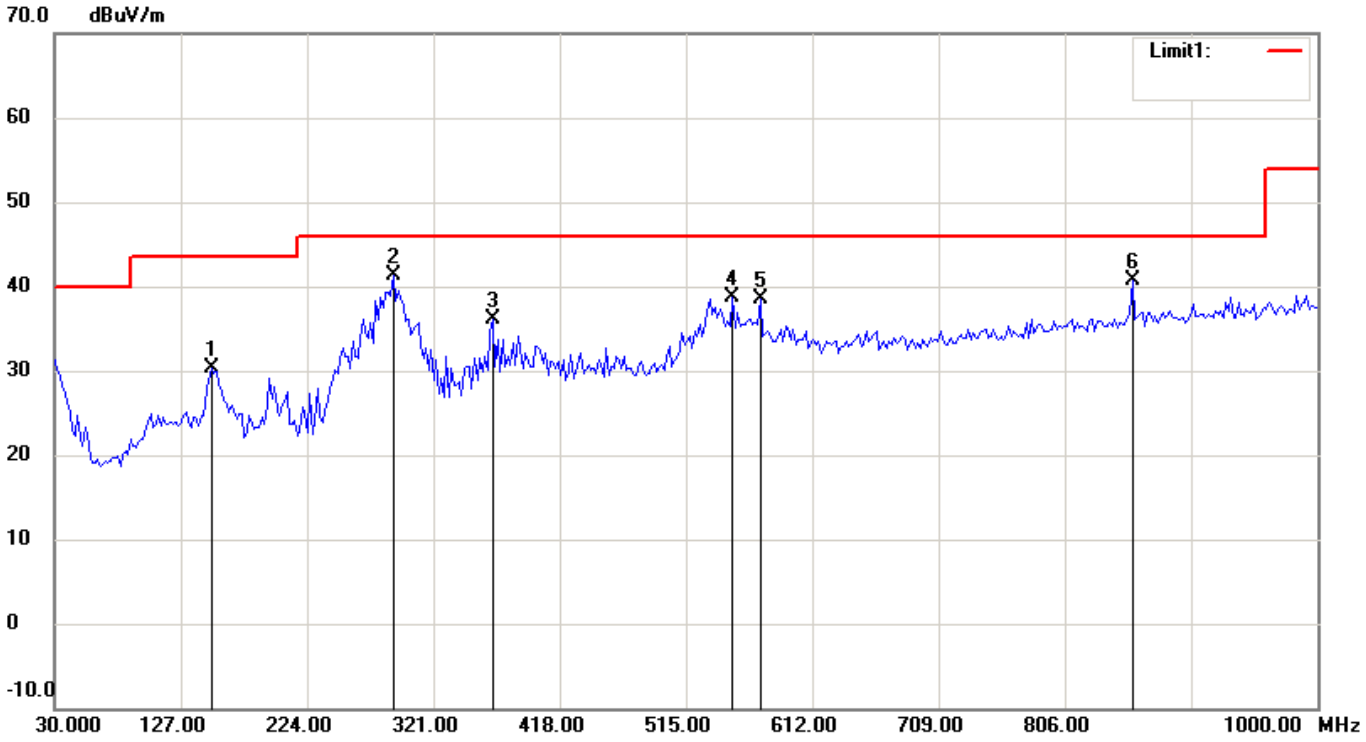
10.4.2 Spurious Emission

10.4.2.1 Operation Mode: Channel Low

10.4.2.1.1 Emission frequencies below 1 GHz

File: OPENPEAK **Data: #9** **Date: 2009/12/16** **Temperature: 21 ℃**

Time: PM 05:10:01 **Humidity: 57 %**



Condition: **FCC Part15 RE-Class B_30-1000MHz** **Polarization:** **Horizontal**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

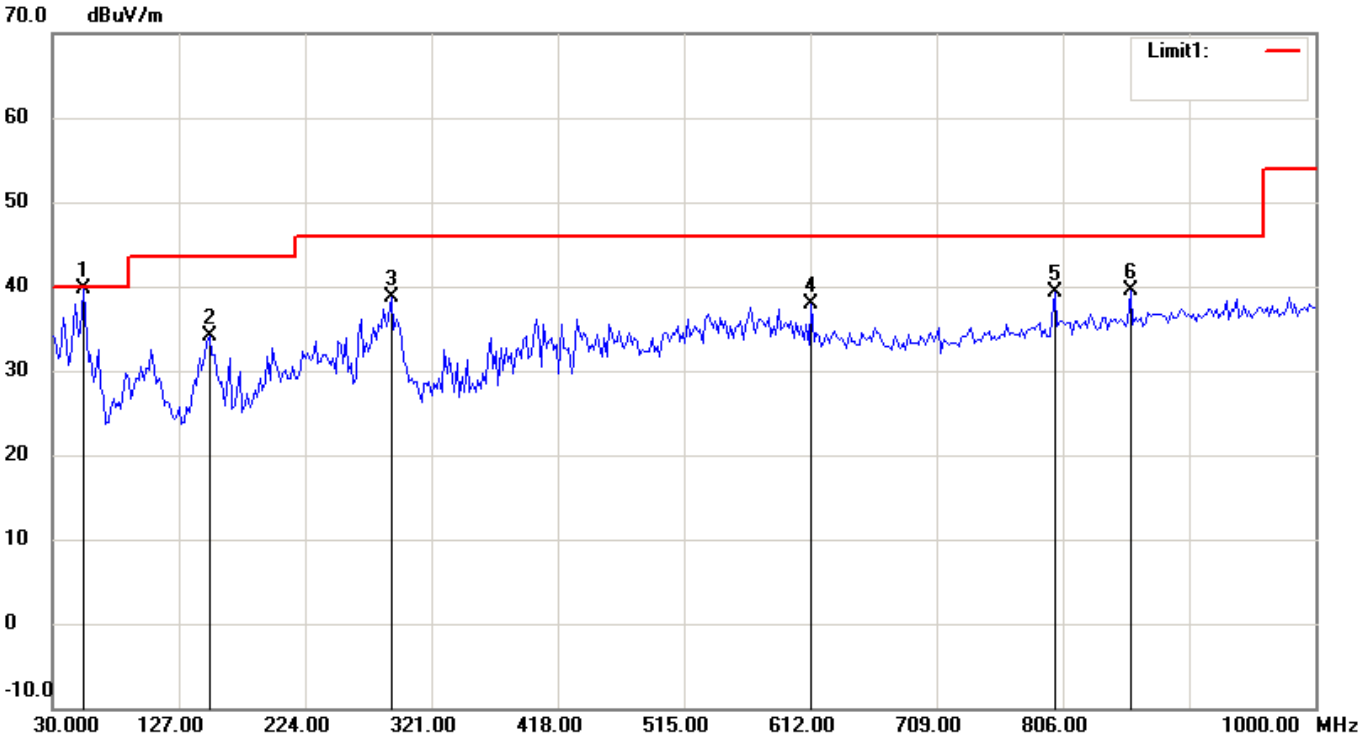
Model:

Test Mode: **LOW**

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	150.5210	17.55	peak	12.70	30.25	43.50	-13.25
2	290.4810	25.51	peak	15.75	41.26	46.00	-4.74
3	366.2926	17.98	peak	18.13	36.11	46.00	-9.89
4	550.9619	16.85	peak	21.80	38.65	46.00	-7.35
5	572.3447	16.47	peak	21.99	38.46	46.00	-7.54
6	858.0962	15.52	peak	25.21	40.73	46.00	-5.27

File: **OPENPEAK** **Data:** **#7** **Date:** **2009/12/16** **Temperature:** **21 ℃**

Time: **PM 05:08:20** **Humidity:** **57 %**



Condition: **FCC Part15 RE-Class B_30-1000MHz** **Polarization:** **Vertical**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

Model:

Test Mode: **LOW**

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	53.3267	30.58	peak	9.16	39.74	40.00	-0.26
2	150.5210	21.37	peak	12.70	34.07	43.50	-9.43
3	290.4810	23.02	peak	15.75	38.77	46.00	-7.23
4	613.1663	15.46	peak	22.43	37.89	46.00	-8.11
5	799.7796	15.01	peak	24.32	39.33	46.00	-6.67
6	858.0962	14.26	peak	25.21	39.47	46.00	-6.53

10.4.2.1.2 Emission frequencies above 1 GHz

Frequency (MHz)	Reading (dBuV)				Correct Factor (dB/m)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)	
	H		V						
	Peak	AVG	Peak	AVG		Peak	AVG	Peak	AVG
1175.000	58.1	43.8	54.4	50.2	-14.6	43.5	35.6	74.0	54.0
1473.397	---	---	55.8	43.3	-12.1	43.7	31.2	74.0	54.0

Note:

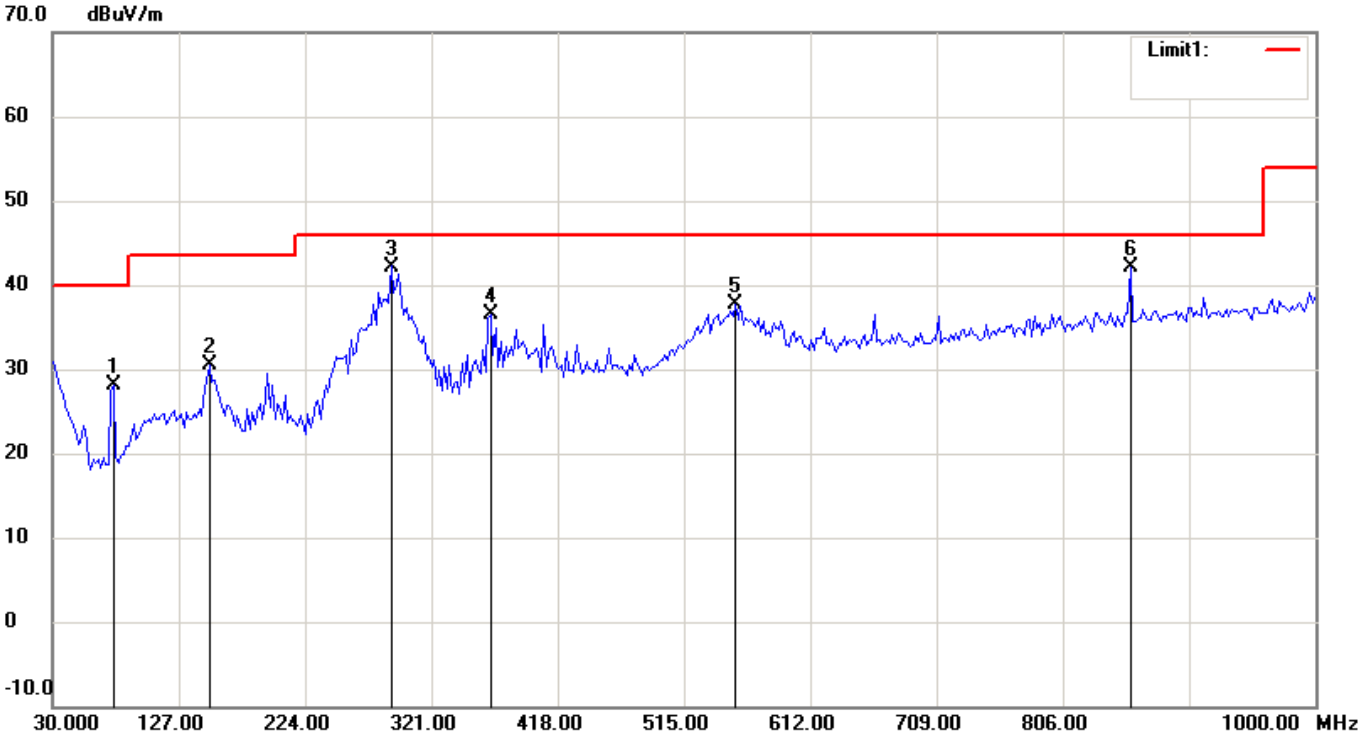
1. Place of Measurement: Measuring site of the ETC.
2. If the data table appeared symbol of "***" means the value was too low to be measured.
3. The estimated measurement uncertainty of the result measurement is
   ±4.6dB (30MHz≦f<300MHz).
   ±4.4dB (300MHz≦f≦1000MHz).
   ±2.9dB (1GHz≦f<18GHz).

10.4.2.2 Operation Mode: Channel Mid

10.4.2.2.1 Emission frequencies below 1 GHz

File: **OPENPEAK** **Data:** **#2** **Date:** **2009/12/16** **Temperature:** **21 ℃**

Time: **PM 03:56:52** **Humidity:** **57 %**



Condition: **FCC Part15 RE-Class B_30-1000MHz** **Polarization:** **Horizontal**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

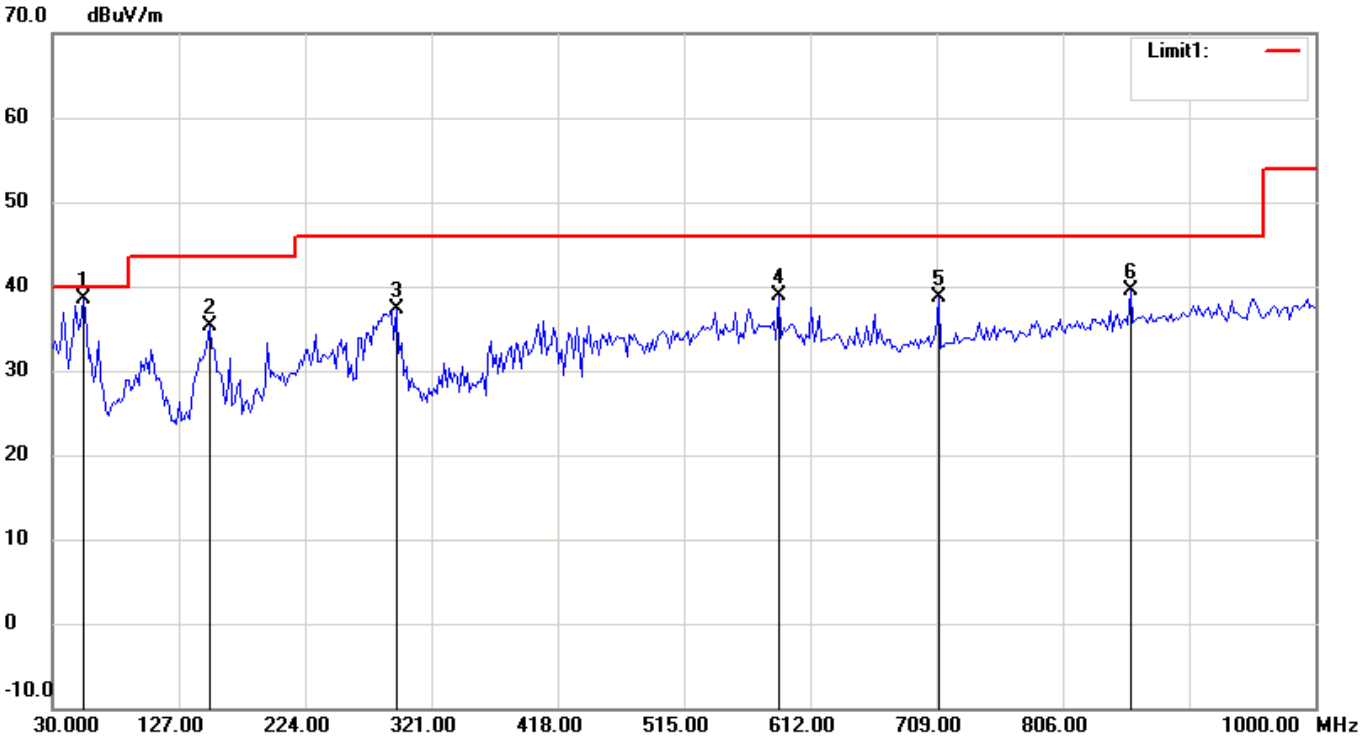
Model:

Test Mode: **MID**

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	76.6533	19.67	peak	8.39	28.06	40.00	-11.94
2	150.5210	17.83	peak	12.70	30.53	43.50	-12.97
3	290.4810	26.45	peak	15.75	42.20	46.00	-3.80
4	366.2926	18.36	peak	18.13	36.49	46.00	-9.51
5	554.8497	15.79	peak	21.83	37.62	46.00	-8.38
6	858.0962	16.83	peak	25.21	42.04	46.00	-3.96

File: **OPENPEAK** **Data:** **#4** **Date:** **2009/12/16** **Temperature:** **21 ℃**

Time: **PM 03:59:13** **Humidity:** **57 %**



Condition: **FCC Part15 RE-Class B_30-1000MHz** **Polarization:** **Vertical**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

Model:

Test Mode: **MID**

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	53.3267	29.32	peak	9.16	38.48	40.00	-1.52
2	150.5210	22.57	peak	12.70	35.27	43.50	-8.23
3	294.3687	21.45	peak	15.85	37.30	46.00	-8.70
4	587.8958	16.83	peak	22.13	38.96	46.00	-7.04
5	710.3607	15.56	peak	23.21	38.77	46.00	-7.23
6	858.0962	14.33	peak	25.21	39.54	46.00	-6.46

10.4.2.2.2 Emission frequencies above 1 GHz

Frequency (MHz)	Reading (dBuV)				Correct Factor (dB/m)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)	
	H		V						
	Peak	AVG	Peak	AVG		Peak	AVG	Peak	AVG
1175.000	57.5	50.3	54.2	49.9	-14.6	42.9	35.7	74.0	54.0
1473.397	---	---	55.8	43.3	-12.1	43.0	30.8	74.0	54.0

Note:

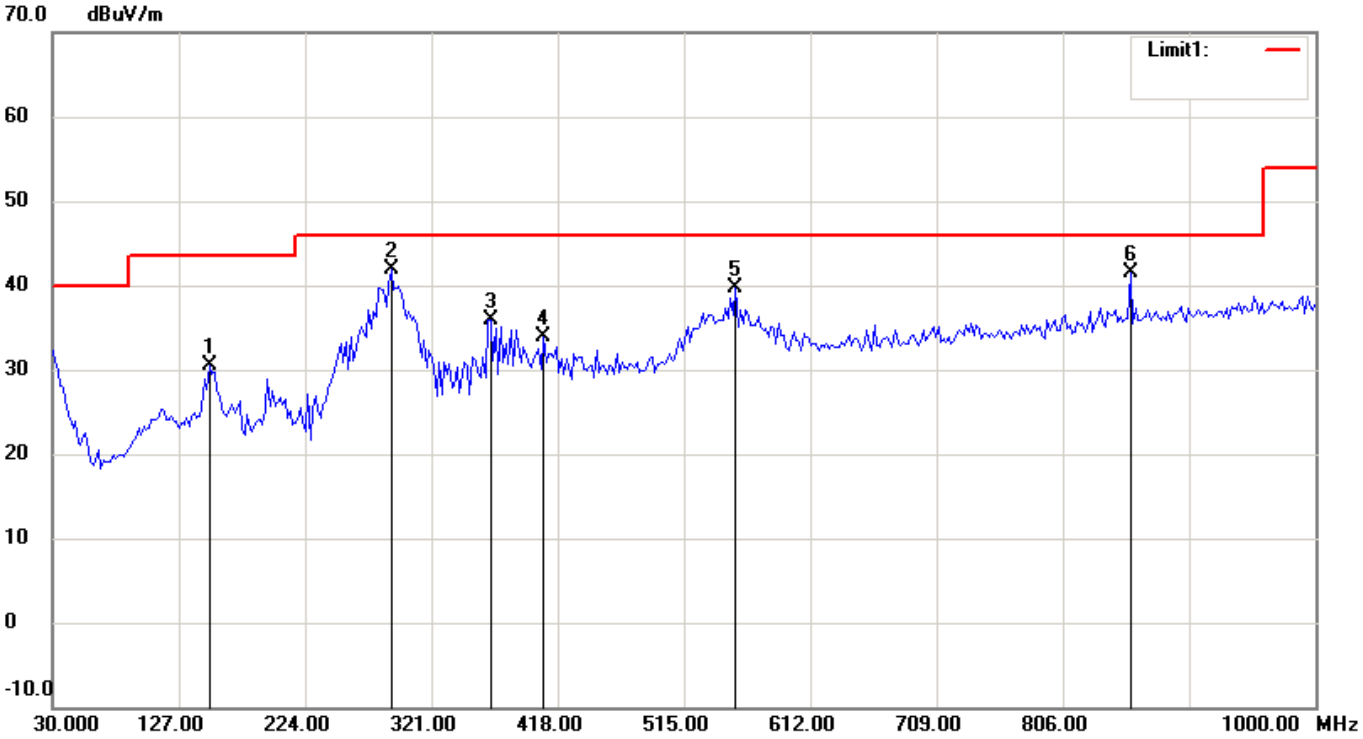
1. Place of Measurement: Measuring site of the ETC.
2. If the data table appeared symbol of "***" means the value was too low to be measured.
3. The estimated measurement uncertainty of the result measurement is
   ±4.6dB (30MHz≦f<300MHz).
   ±4.4dB (300MHz≦f≦1000MHz).
   ±2.9dB (1GHz≦f<18GHz).

10.4.2.3 Operation Mode: Channel High

10.4.2.3.1 Emission frequencies below 1 GHz

File: **OPENPEAK** **Data:** **#11** **Date:** **2009/12/16** **Temperature:** **21 ℃**

Time: **PM 05:12:54** **Humidity:** **57 %**



Condition: **FCC Part15 RE-Class B_30-1000MHz** **Polarization:** **Horizontal**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

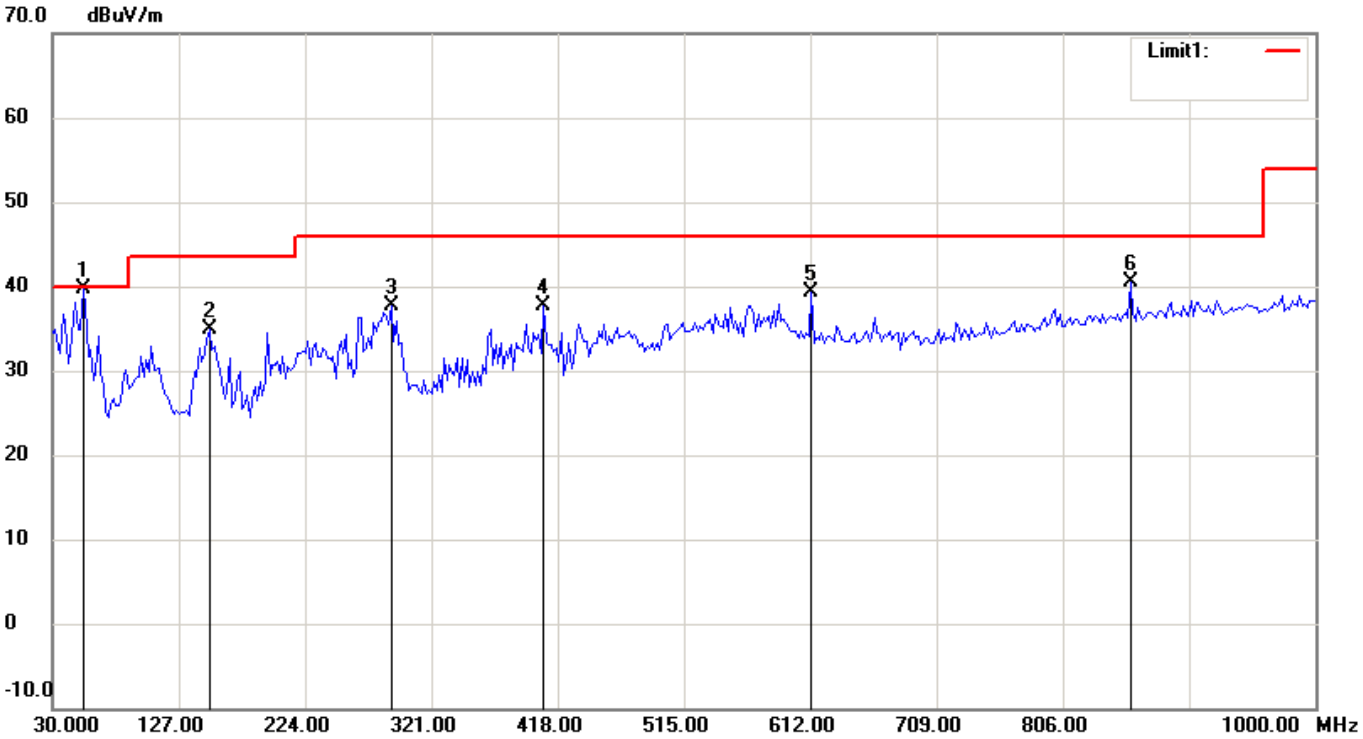
Model:

Test Mode: **HIGH**

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	150.5210	17.71	peak	12.70	30.41	43.50	-13.09
2	290.4810	26.06	peak	15.75	41.81	46.00	-4.19
3	366.2926	17.82	peak	18.13	35.95	46.00	-10.05
4	407.1142	14.68	peak	19.20	33.88	46.00	-12.12
5	554.8497	17.87	peak	21.83	39.70	46.00	-6.30
6	858.0962	16.30	peak	25.21	41.51	46.00	-4.49

File: **OPENPEAK** **Data:** **#13** **Date:** **2009/12/16** **Temperature:** **21 ℃**

Time: **PM 05:16:36** **Humidity:** **57 %**



Condition: **FCC Part15 RE-Class B_30-1000MHz** **Polarization:** **Vertical**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

Model:

Test Mode: **HIGH**

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	53.3267	30.54	peak	9.16	39.70	40.00	-0.30
2	150.5210	22.19	peak	12.70	34.89	43.50	-8.61
3	290.4810	21.98	peak	15.75	37.73	46.00	-8.27
4	407.1142	18.41	peak	19.20	37.61	46.00	-8.39
5	613.1663	16.97	peak	22.43	39.40	46.00	-6.60
6	858.0962	15.32	peak	25.21	40.53	46.00	-5.47

10.4.2.3.2 Emission frequencies above 1 GHz

Frequency (MHz)	Reading (dBuV)				Correct Factor (dB/m)	Result @3m (dBuV/m)		Limit @3m (dBuV/m)	
	H		V						
	Peak	AVG	Peak	AVG		Peak	AVG	Peak	AVG
1750.000	58.6	41.0	56.2	50.0	-9.6	49.0	40.4	74.0	54.0
1473.397	53.2	41.2	55.1	43.2	-12.1	43.0	31.1	74.0	54.0

Note:

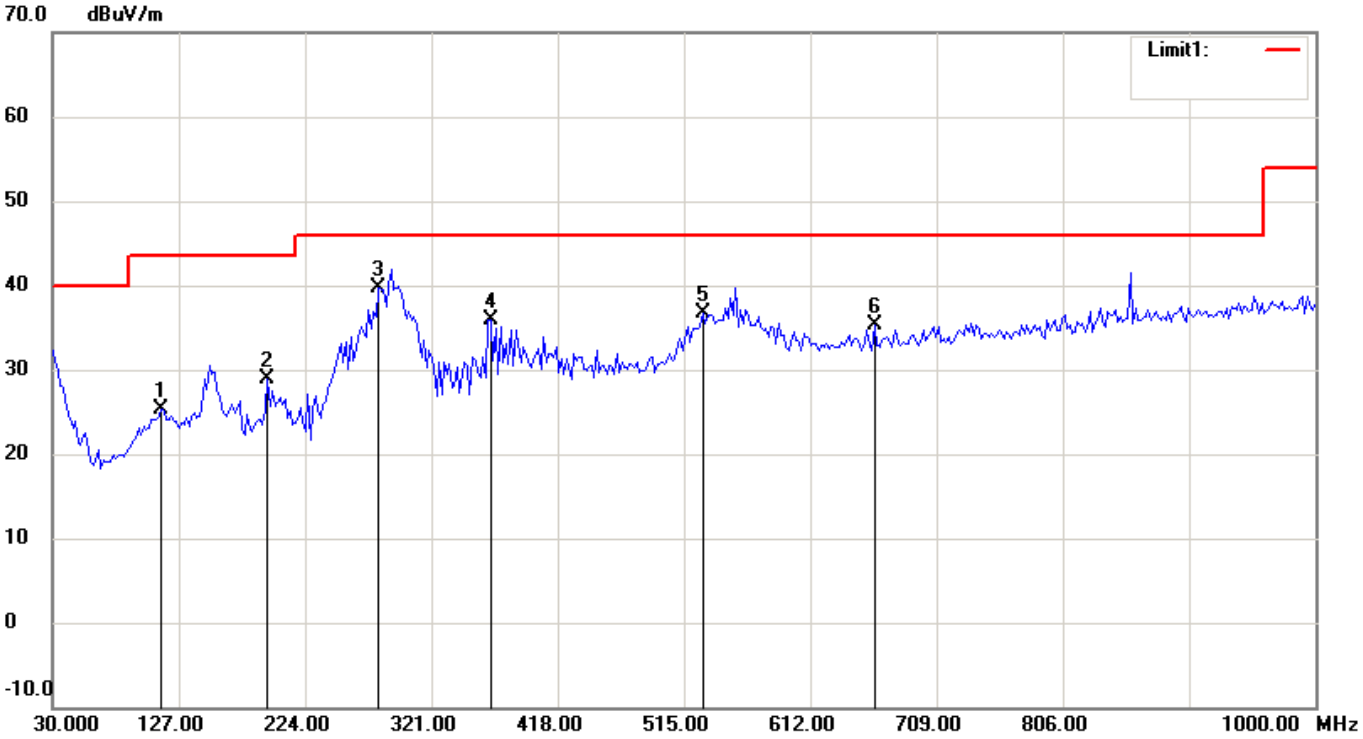
1. Place of Measurement: Measuring site of the ETC.
2. If the data table appeared symbol of "***" means the value was too low to be measured.
3. The estimated measurement uncertainty of the result measurement is
   ±4.6dB (30MHz≦f<300MHz).
   ±4.4dB (300MHz≦f≦1000MHz).
   ±2.9dB (1GHz≦f<18GHz).

10.4.2.4 Operation Mode: Bluetooth mode

10.4.2.4.1 Emission frequencies below 1 GHz

File: **OPENPEAK** **Data:** **#22** **Date:** **2009/12/16** **Temperature:** **21 ℃**

Time: **PM 05:12:54** **Humidity:** **57 %**



Condition: **FCC Part15 RE-Class B_30-1000MHz** **Polarization:** **Horizontal**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

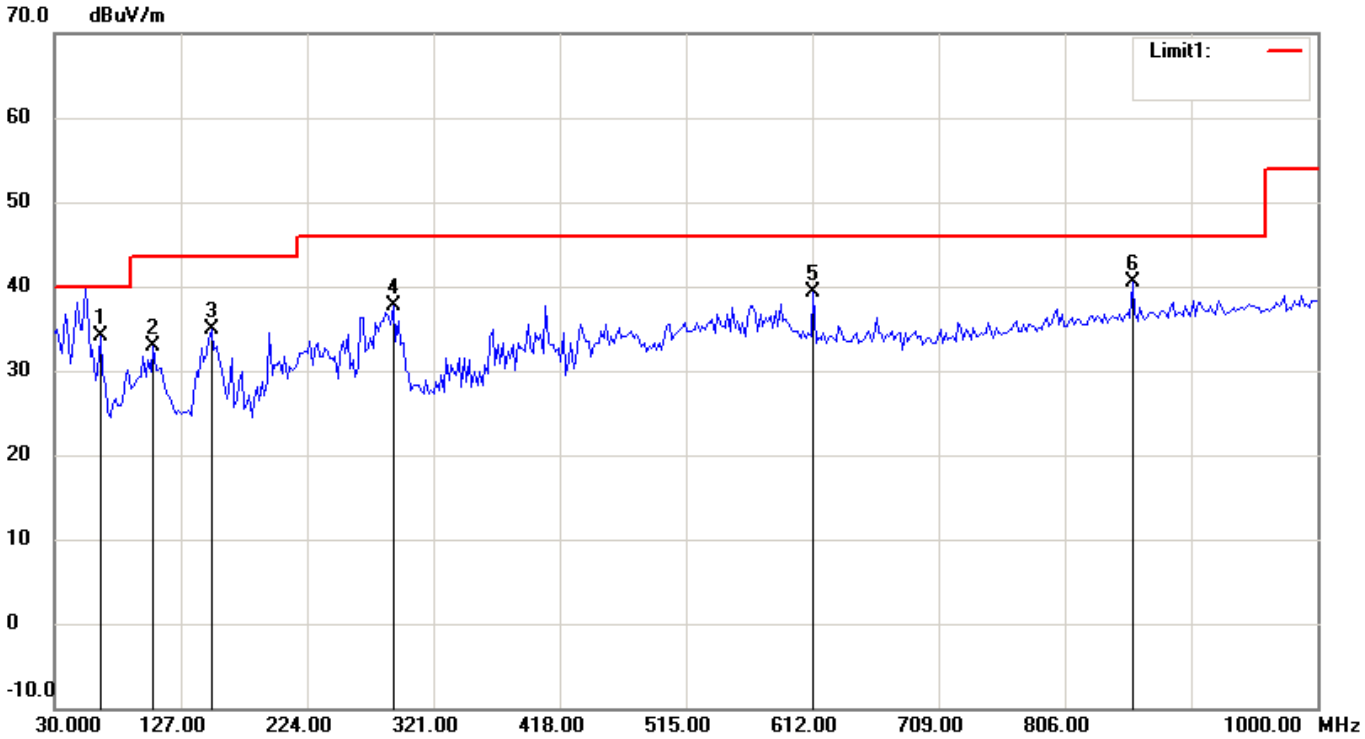
Model:

Test Mode:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	113.5871	11.57	peak	13.79	25.36	43.50	-18.14
2	195.2305	15.17	peak	13.73	28.90	43.50	-14.60
3	280.7615	24.09	peak	15.61	39.70	46.00	-6.30
4	366.2925	17.82	peak	18.13	35.95	46.00	-10.05
5	529.5792	15.32	peak	21.36	36.68	46.00	-9.32
6	661.7635	12.33	peak	22.99	35.32	46.00	-10.68

File: OPENPEAK **Data: #24** **Date: 2009/12/16** **Temperature: 21 ℃**

Time: PM 05:16:36 **Humidity: 57 %**



Condition: **FCC Part15 RE-Class B_30-1000MHz** **Polarization:** **Vertical**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

Model:

Test Mode:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	64.9900	26.35	peak	7.75	34.10	40.00	-5.90
2	105.8115	19.80	peak	13.07	32.87	43.50	-10.63
3	150.5210	22.19	peak	12.70	34.89	43.50	-8.61
4	290.4810	21.98	peak	15.75	37.73	46.00	-8.27
5	613.1662	16.97	peak	22.43	39.40	46.00	-6.60
6	858.0961	15.32	peak	25.21	40.53	46.00	-5.47

10.4.2.4.2 Emission frequencies above 1 GHz

Frequency (MHz)	Ant Pol H / V	Reading (dBuV) Peak	Correct Factor (dB)	Duty Factor (dB)	Result @3m (dBuV/m) Peak AVG	Limit @3m (dBuV/m) Peak AVG	Margins (dB)
Radiated emission frequencies above 1 GHz to 12.5 GHz were too low to be measured.							

Note:

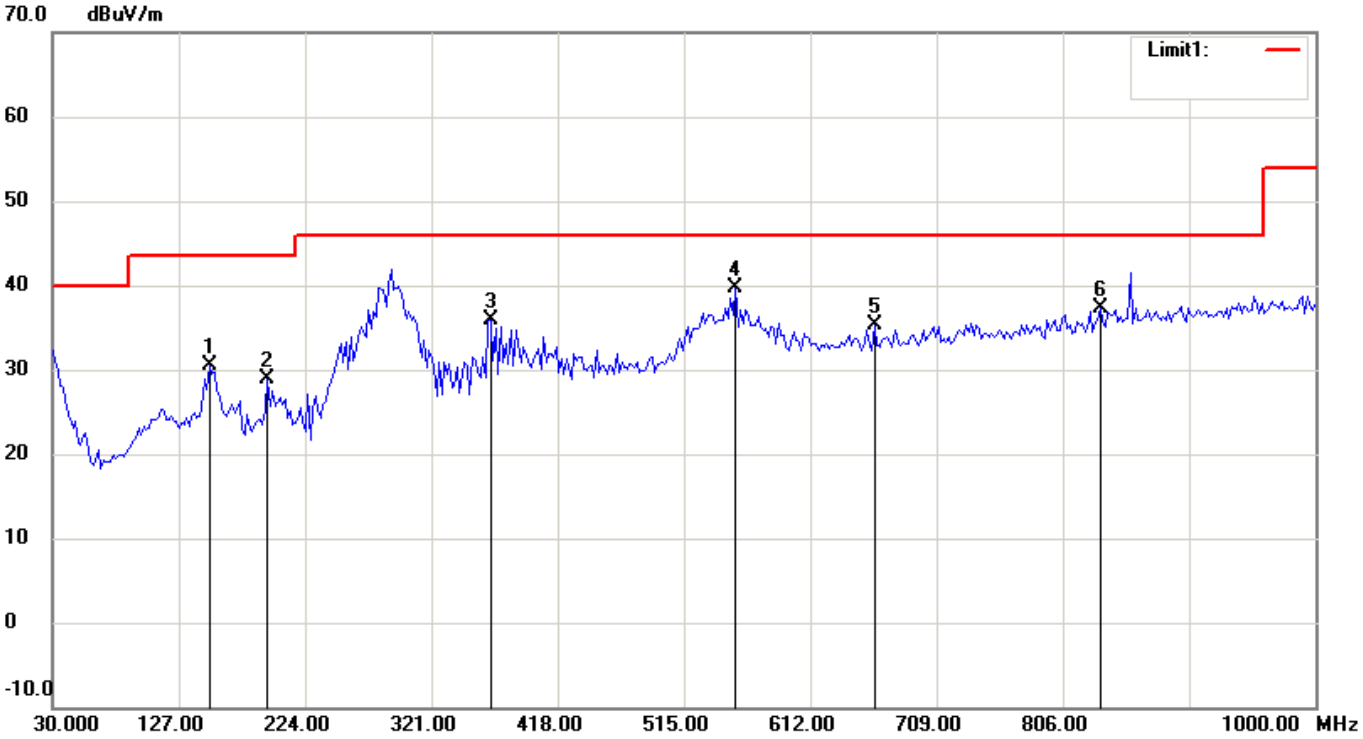
1. Place of Measurement: Measuring site of the ETC.
2. If the data table appeared symbol of "***" means the value was too low to be measured.
3. The estimated measurement uncertainty of the result measurement is
   ±4.6dB (30MHz≦f<300MHz).
   ±4.4dB (300MHz≦f≦1000MHz).
   ±2.9dB (1GHz≦f<18GHz).

10.4.2.5 Operation Mode: Wireless LAN mode

10.4.2.5.1 Emission frequencies below 1 GHz

File: **OPENPEAK** **Data:** **#23** **Date:** **2009/12/16** **Temperature:** **21 ℃**

Time: **PM 05:12:54** **Humidity:** **57 %**



Condition: **FCC Part15 RE-Class B_30-1000MHz** **Polarization:** **Horizontal**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

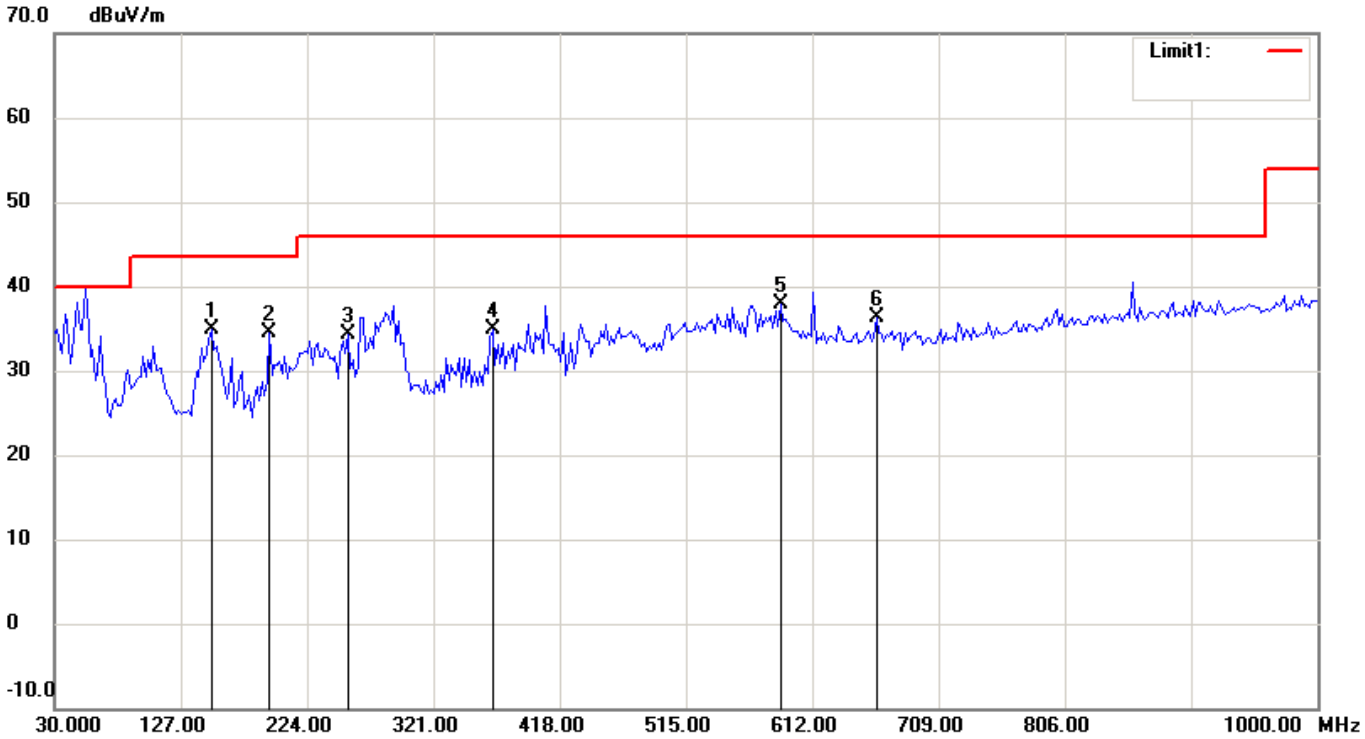
Model:

Test Mode:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	150.5210	17.71	peak	12.70	30.41	43.50	-13.09
2	195.2305	15.17	peak	13.73	28.90	43.50	-14.60
3	366.2925	17.82	peak	18.13	35.95	46.00	-10.05
4	554.8496	17.87	peak	21.83	39.70	46.00	-6.30
5	661.7635	12.33	peak	22.99	35.32	46.00	-10.68
6	834.7694	12.42	peak	24.89	37.31	46.00	-8.69

File: **OPENPEAK** **Data:** **#25** **Date:** **2009/12/16** **Temperature:** **21 ℃**

Time: **PM 05:16:36** **Humidity:** **57 %**



Condition: **FCC Part15 RE-Class B_30-1000MHz** **Polarization:** **Vertical**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

Model:

Test Mode:

No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBuV/m)		Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)
1	150.5210	22.19	peak	12.70	34.89	43.50	-8.61
2	195.2305	20.74	peak	13.73	34.47	43.50	-9.03
3	255.4910	18.94	peak	15.39	34.33	46.00	-11.67
4	366.2925	16.71	peak	18.13	34.84	46.00	-11.16
5	587.8958	15.74	peak	22.13	37.87	46.00	-8.13
6	661.7635	13.28	peak	22.99	36.27	46.00	-9.73

10.4.2.5.2 Emission frequencies above 1 GHz

Frequency (MHz)	Ant Pol H / V	Reading (dBuV) Peak	Correct Factor (dB)	Duty Factor (dB)	Result @3m (dBuV/m) Peak AVG	Limit @3m (dBuV/m) Peak AVG	Margins (dB)
Radiated emission frequencies above 1 GHz to 12.5 GHz were too low to be measured.							

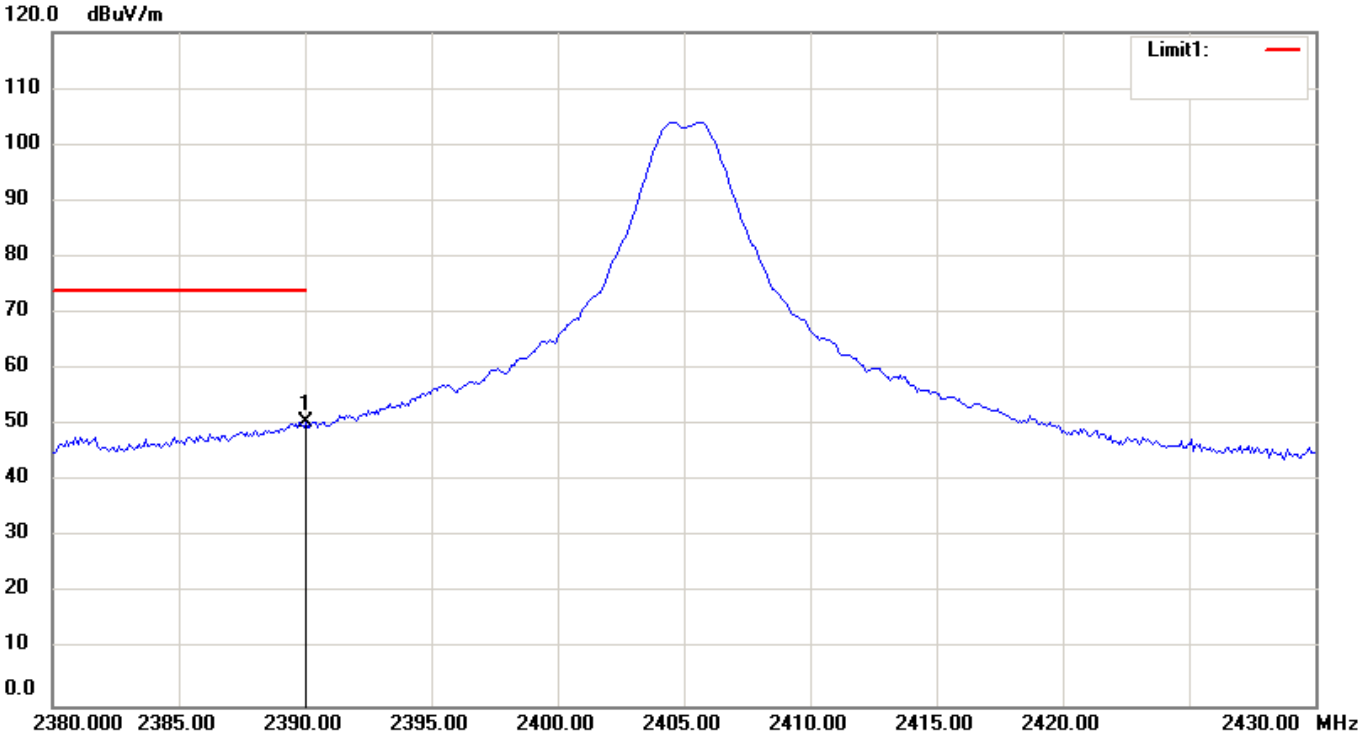
Note:

1. Place of Measurement: Measuring site of the ETC.
2. If the data table appeared symbol of "***" means the value was too low to be measured.
3. The estimated measurement uncertainty of the result measurement is
   ±4.6dB (30MHz≦f<300MHz).
   ±4.4dB (300MHz≦f≦1000MHz).
   ±2.9dB (1GHz≦f<18GHz).

10.4.3 Radiated Measurement at Bandedge with Fundamental Frequencies

File: **OPENPEAK** **Data:** **#48** **Date:** **2010/1/7** **Temperature:** **18 ℃**

Time: **PM 06:20:02** **Humidity:** **67 %**



Condition: **FCC Part15 RE-Class B_Above 1GHz PK** **Polarization:** **Horizontal**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

Model:

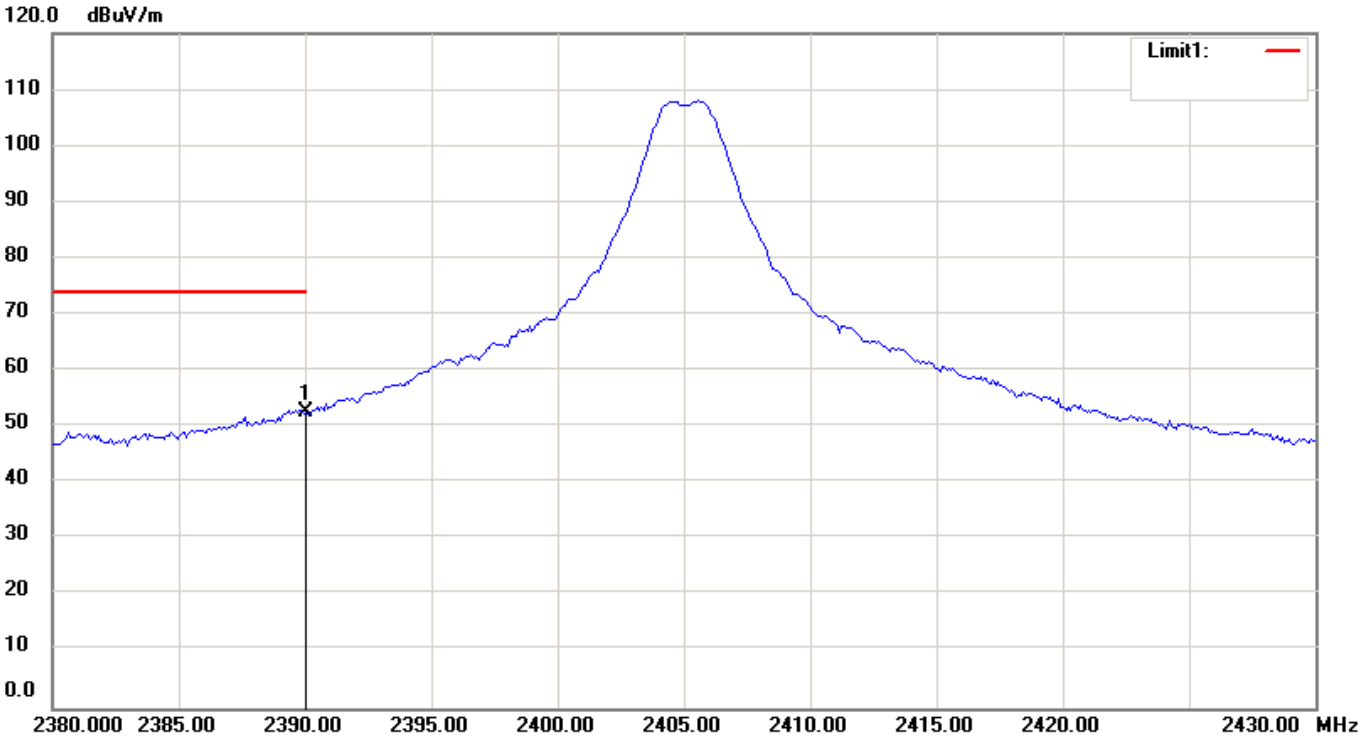
Test Mode:

Note:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2390.0000	59.22	peak	-8.69	50.53	74.00	-23.47

File: OPENPEAK **Data: #49** **Date: 2010/1/7** **Temperature: 18 ℃**

Time: PM 06:30:12 **Humidity: 67 %**



Condition: **FCC Part15 RE-Class B_Above 1GHz PK** **Polarization:** **Vertical**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

Model:

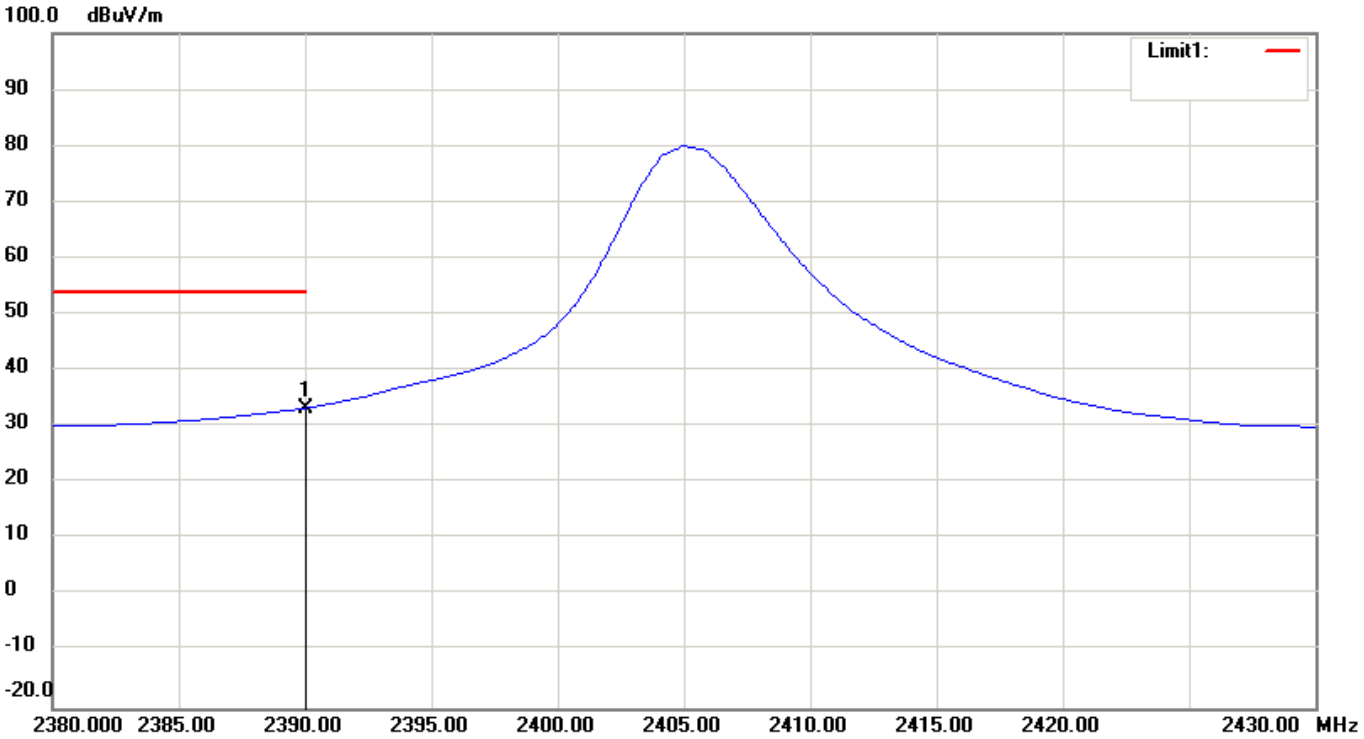
Test Mode:

Note:

No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBuV/m)		Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)
1	2390.0000	61.42	peak	-8.69	52.73	74.00	-21.27

File: OPENPEAK **Data: #62** **Date: 2010/1/8** **Temperature: 18 ℃**

Time: PM 02:07:56 **Humidity: 67 %**



Condition: **FCC Part15 RE-Class B_Above 1GHz_AVG** **Polarization:** **Horizontal**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

Model:

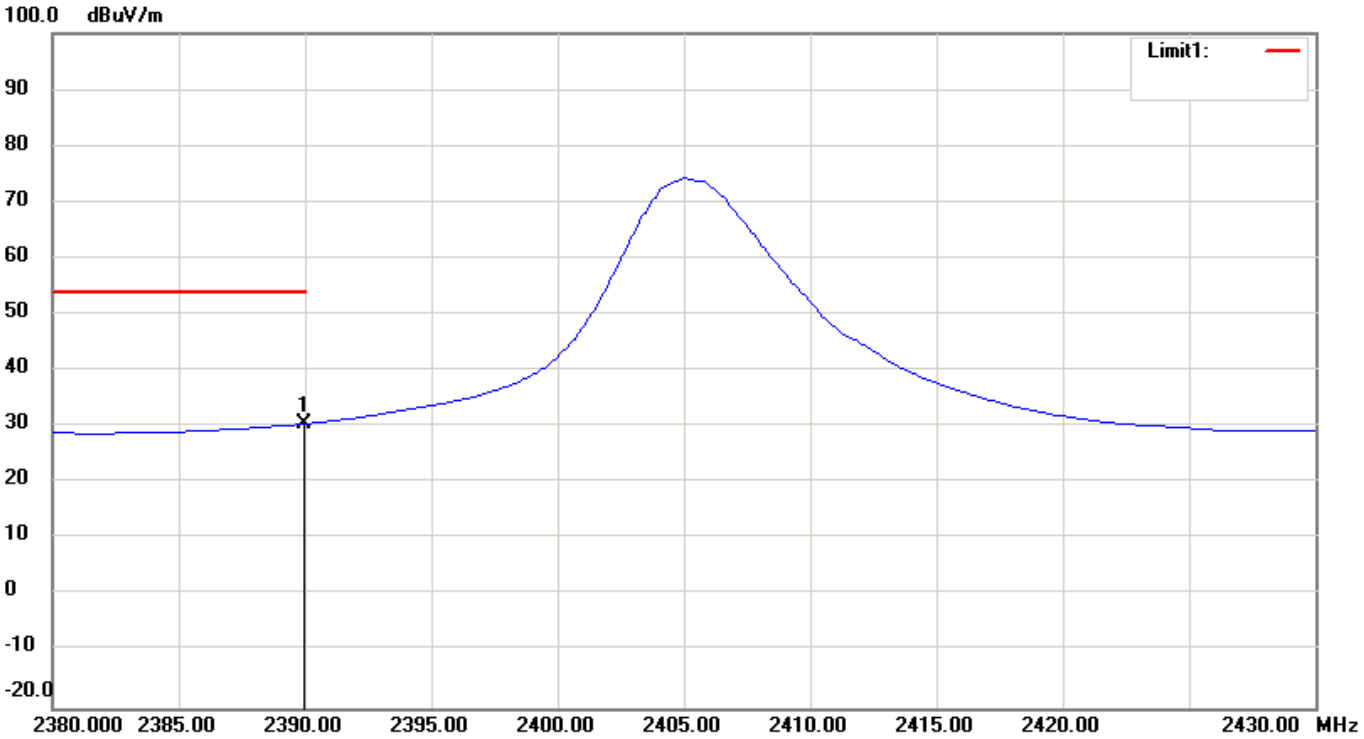
Test Mode:

Note:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2390.0000	42.09	AVG	-8.69	33.40	54.00	-20.60

File: OPENPEAK **Data: #61** **Date: 2010/1/8** **Temperature: 18 ℃**

Time: PM 02:06:53 **Humidity: 67 %**



Condition: **FCC Part15 RE-Class B_Above 1GHz_AVG** **Polarization:** **Vertical**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

Model:

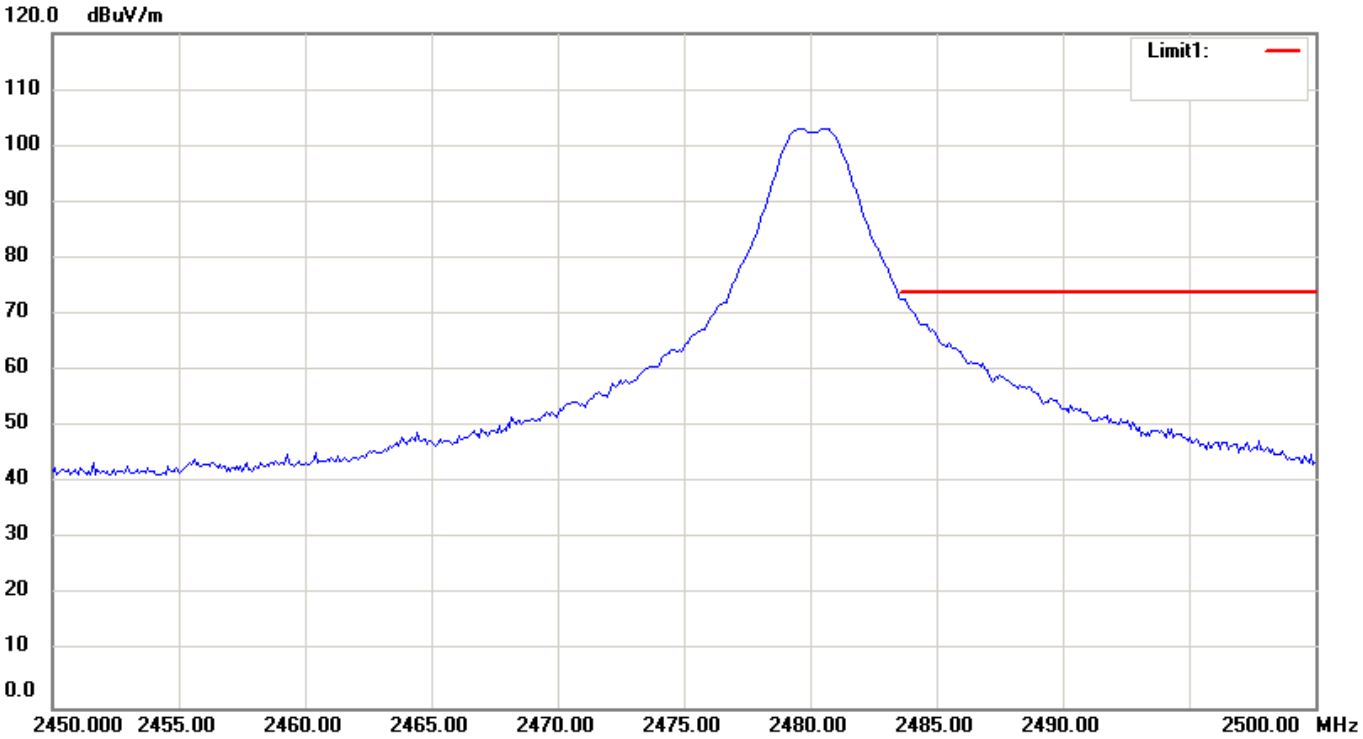
Test Mode:

Note:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2389.9358	39.23	AVG	-8.69	30.54	54.00	-23.46

File: OPENPEAK **Data: #45** **Date: 2010/1/7** **Temperature: 18 ℃**

Time: PM 06:10:45 **Humidity: 67 %**



Condition: **FCC Part15 RE-Class B_Above 1GHz PK** **Polarization:** **Horizontal**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

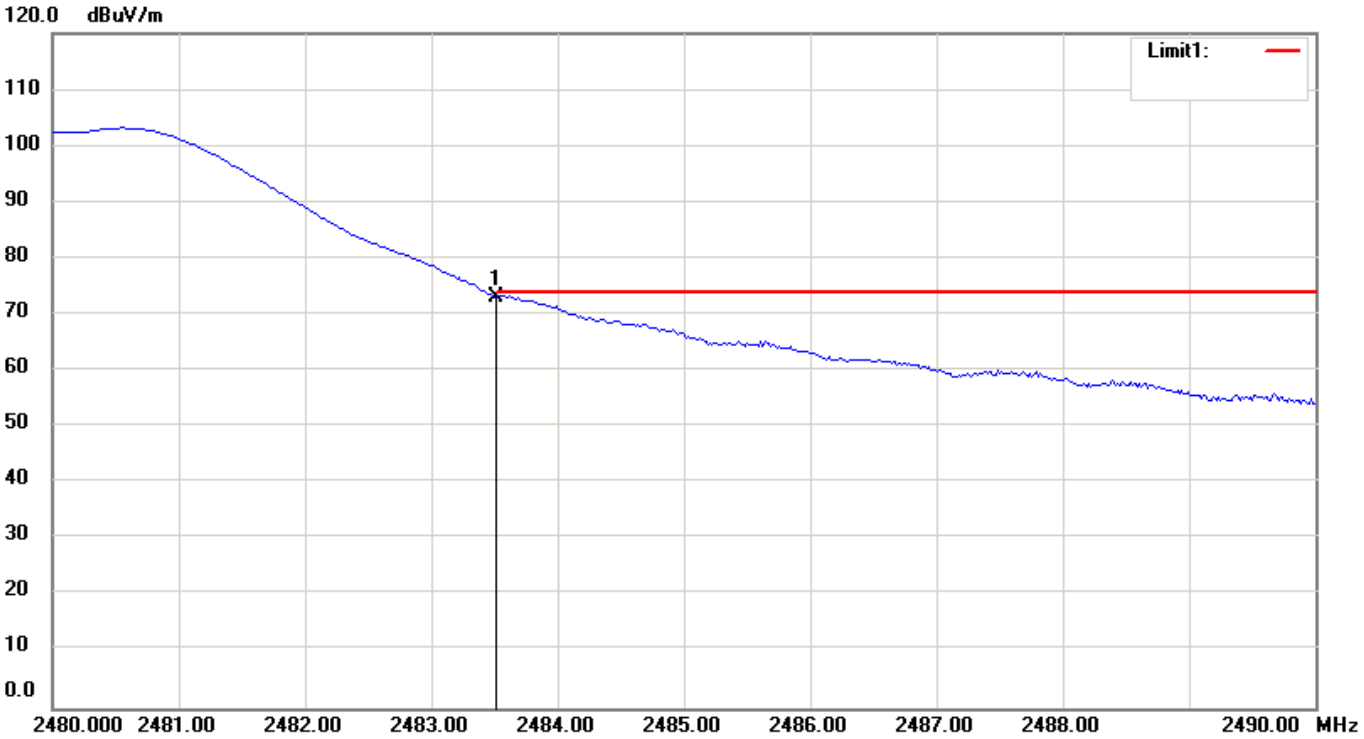
Model:

Test Mode:

Note:

File: OPENPEAK **Data: #46** **Date: 2010/1/7** **Temperature: 18 ℃**

Time: PM 06:13:11 **Humidity: 67 %**



Condition: **FCC Part15 RE-Class B_Above 1GHz PK** **Polarization:** **Horizontal**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

Model:

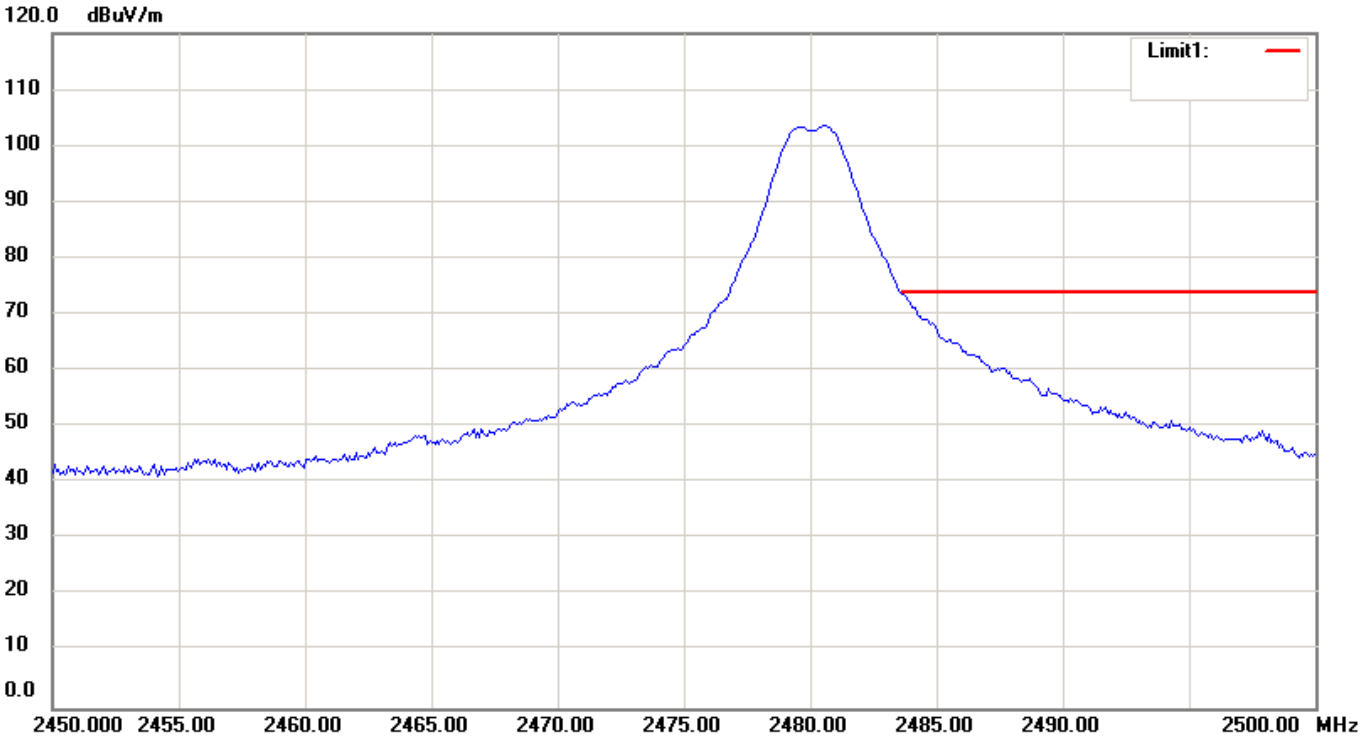
Test Mode:

Note:

No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBuV/m)		Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)
1	2483.5000	81.90	peak	-8.78	73.12	74.00	-0.88

File: OPENPEAK **Data: #43** **Date: 2010/1/7** **Temperature: 18 ℃**

Time: PM 05:59:55 **Humidity: 67 %**



Condition: **FCC Part15 RE-Class B_Above 1GHz PK** **Polarization:** **Vertical**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

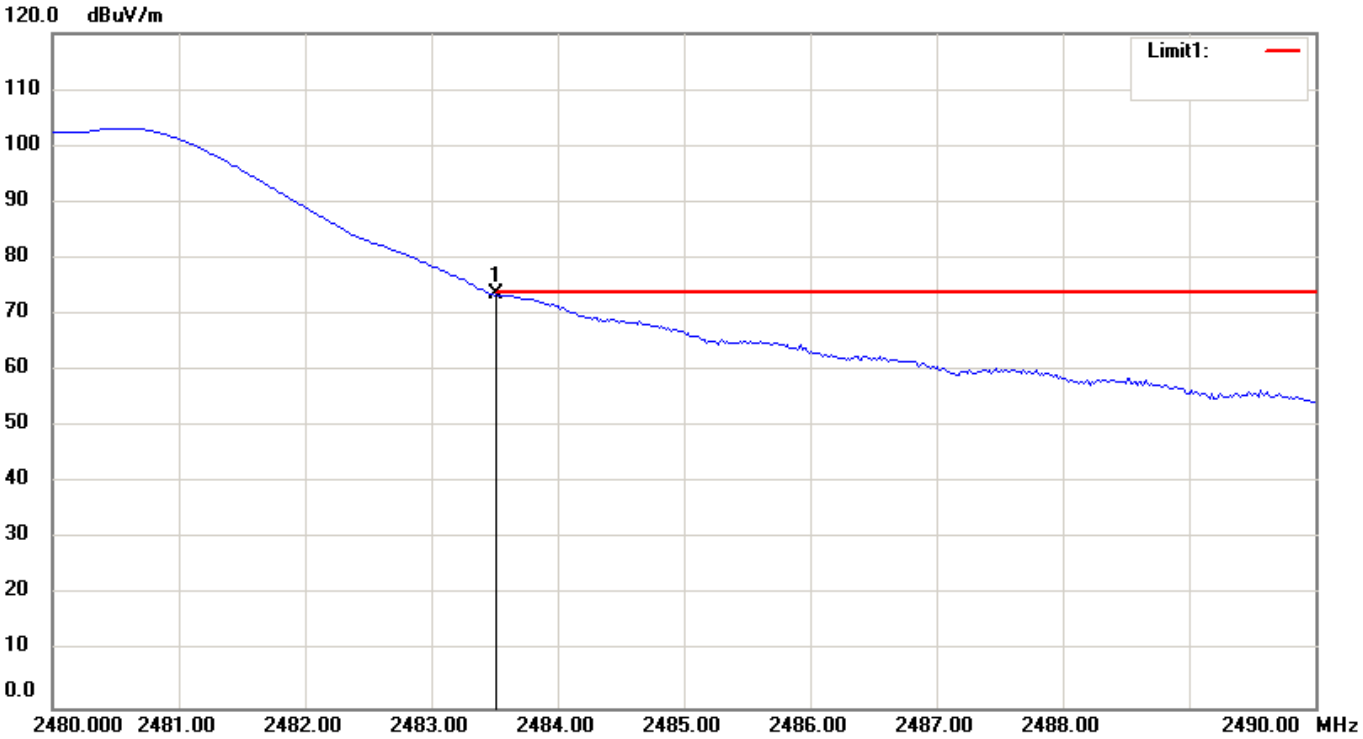
Model:

Test Mode:

Note:

File: OPENPEAK **Data: #44** **Date: 2010/1/7** **Temperature: 18 ℃**

Time: PM 06:03:52 **Humidity: 67 %**



Condition: **FCC Part15 RE-Class B_Above 1GHz PK** **Polarization:** **Vertical**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

Model:

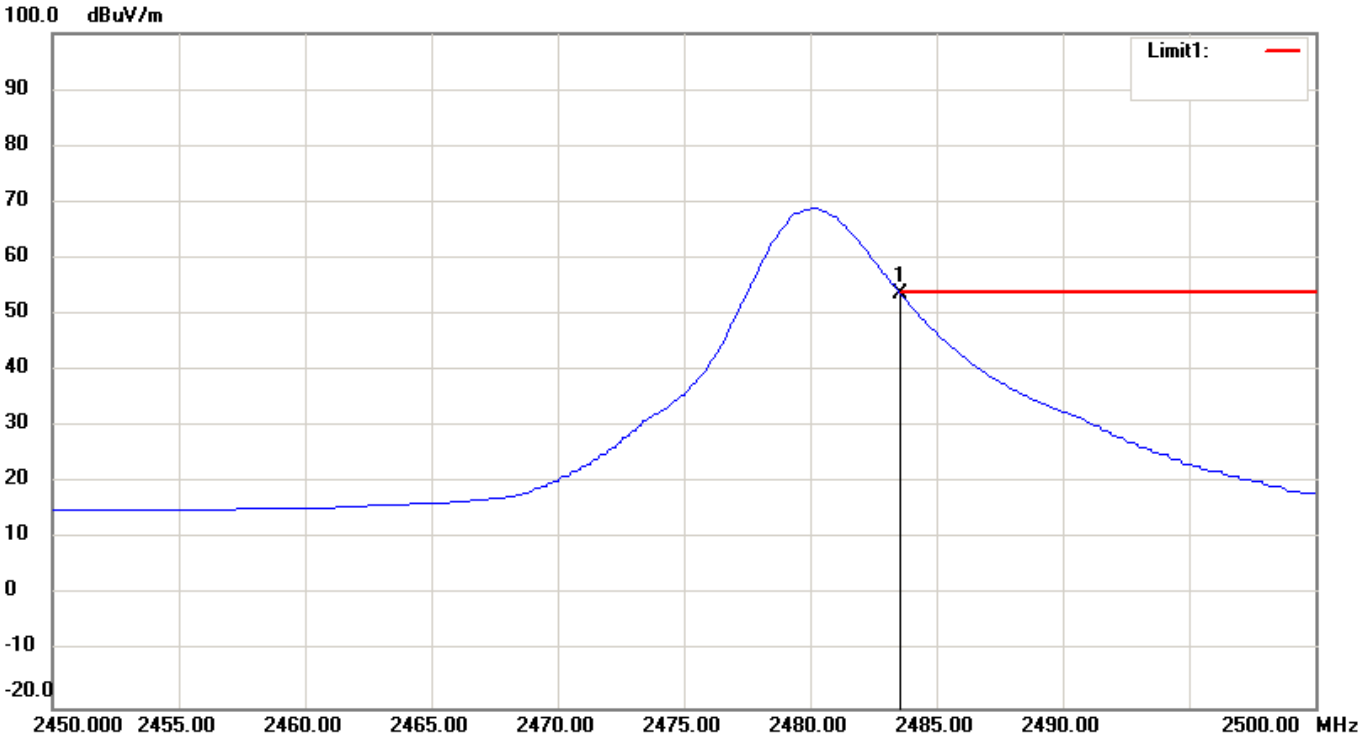
Test Mode:

Note:

No.	Frequency	Reading	Detector	Corrected	Result	Limit	Margin
	(MHz)	(dBuV/m)		Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)
1	2483.5000	82.36	peak	-8.78	73.58	74.00	-0.42

File: **OPENPEAK** **Data:** **#60** **Date:** **2010/1/8** **Temperature:** **18 ℃**

Time: **PM 02:02:21** **Humidity:** **67 %**



Condition: **FCC Part15 RE-Class B_Above 1GHz_AVG** **Polarization:** **Horizontal**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

Model:

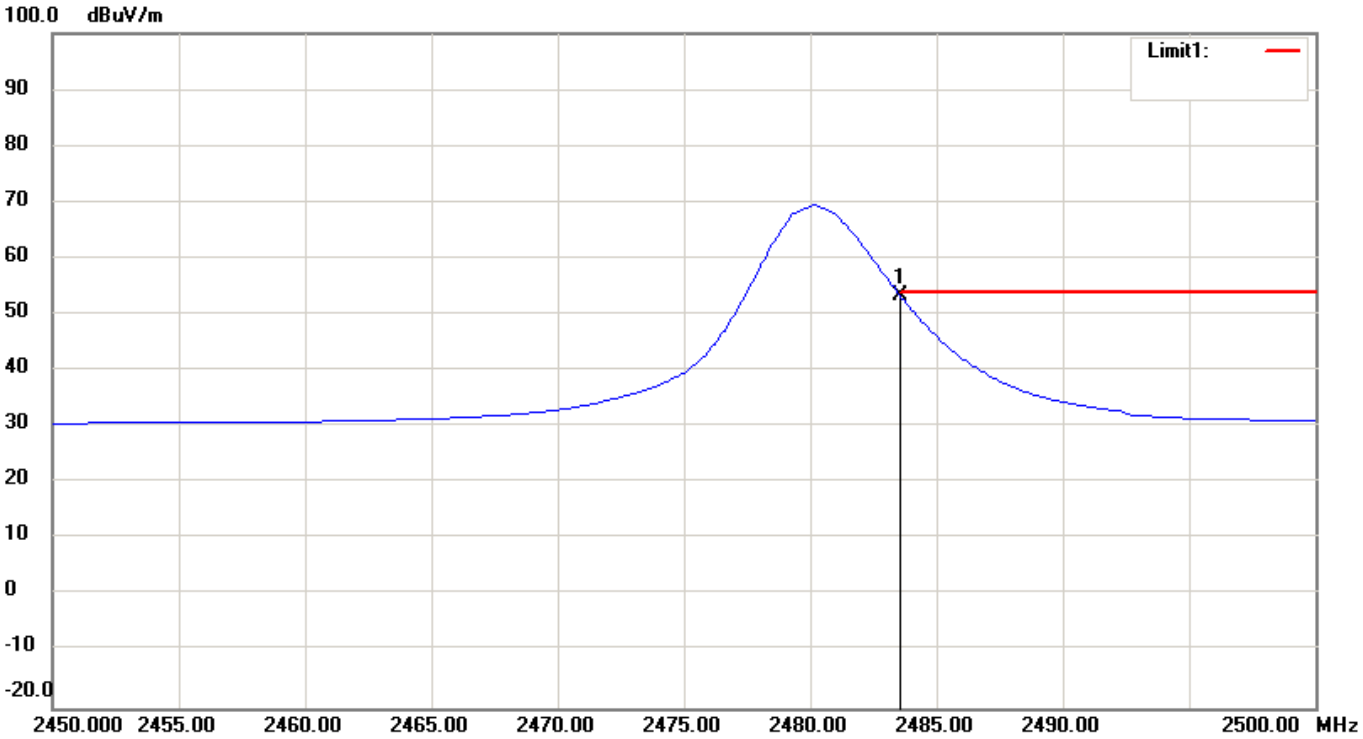
Test Mode:

Note:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2483.5736	62.48	AVG	-8.78	53.70	54.00	-0.30

File: OPENPEAK **Data: #59** **Date: 2010/1/8** **Temperature: 18 ℃**

Time: PM 02:04:05 **Humidity: 67 %**



Condition: **FCC Part15 RE-Class B_Above 1GHz_AVG** **Polarization:** **Vertical**

EUT: **OPENPEAK ZigBee** **Distance:** **3m**

Model:

Test Mode:

Note:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2483.5736	62.08	AVG	-8.78	53.30	54.00	-0.70

Note :

1. Remark "---" means that the emissions level is too low to be measured.
2. The result is the highest value of radiated emission from restrict band of 2310 ~ 2390 MHz and 2483.5 ~ 2500 MHz.

10.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor, High Pass Filter Loss(if used) and Cable Loss, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

where

Corrected Factor = Antenna Factor + Cable Loss + High Pass Filter Loss - Amplifier Gain