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

Report No.: 10-03-MAS-176-02

Client:	OpenPeak Inc.
Product:	1) OpenFrame 7EZE 2) OpenFrame 7EZ
Model:	1) OPOF7E120E 2) OPOF7E120
FCC ID:	VGBOPOF7E120
Manufacturer/supplier:	Hon Hai Precision Industry Ltd.
Date test item received:	2010/03/19
Date test campaign completed:	2010/04/02
Date of issue:	2010/04/12

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Total number of pages of this test report: 48 pages
Total number of pages of photos: External photos 3 pages
Internal photos 13 pages
Setup photos 2 pages

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Client	: OpenPeak Inc.
Address	: 1750 Clint Moore Road, Boca Raton, FL 33487 USA
Manufacturer	: Hon Hai Precision Industry Ltd.
Address	: 2 Zihyou Street, Tucheng City, Taipei County 236 Taiwan
EUT	: 1) OpenFrame 7EZE 2) OpenFrame 7EZ
Trade name	: OPENPEAK
Model No.	: 1) OPOF7E120E 2) 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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② ISO/IEC 17025: BSMI, CNLA, NCC, NVLAP, CCIBLAC, UL, Compliance
③ Filing: FCC, Industry Canada, VCCI
④ MRA: Australia, Hong Kong, New Zealand, Singapore, USA, Japan, Korea, China, APLAC through TAF
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 : 1) OpenFrame 7EZE
2) OpenFrame 7EZ
b) Trade Name : OPENPEAK
c) Model No. : 1) OPOF7E120E
2) OPOF7E120
d) FCC ID : VGBOPOF7E120

※ The EUT changes some component, use different WiFi module and ERT module for option. This test report pretest some items to check the new EUT is still conform to the rule of FCC.

Model No. / Difference Item	Series Model	Series Mode (Worse for test)	Original Model	Series Model:
	OPOF7E120E with WiFi/BT	OPOF7E120E with WiFi	OPOF7E120 with WiFi/BT	OPOF7E120 with WiFi
PCB Layout and The Circuit Diagram	O	O	Remove ERT module	Remove ERT module
Components	ERT module WiFi/BT module	ERT module WiFi module	WiFi/BT module	WiFi module
Material	O	O	O	O
Function	O	without BT	without ERT	without ERT,BT
Shape & Color	O	O	O	O
Other	O	O	O	O

1.2 Characteristics of Device

The EUT is "OpenFrame 7EZE". 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) 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.

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.

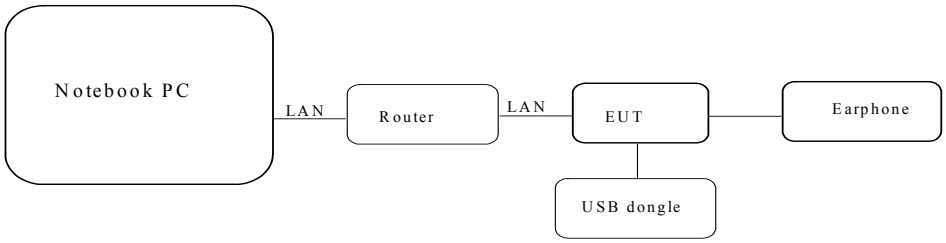
3. SYSTEM TEST CONFIGURATION

3.1 Devices for Tested System

Device	Manufacture	Model No.	Cable Description
OpenFrame 7EZE*	Hon Hai Precision Industry Ltd.	OPOF7E120E	1.8m*1, Unshielded Power Line
Router	N/A	N/A	1.8m Unshielded LAN Cable
Earphone	N/A	N/A	1.0m Unshielded Signal Line
USB Dongle	Transcend	JetFlash	N/A
Notebook PC	Dell	PP26L	1.0m Unshielded LAN Cable

Note:

Remark "*" means equipment under test.



4 CONDUCTED EMISSION MEASUREMENT

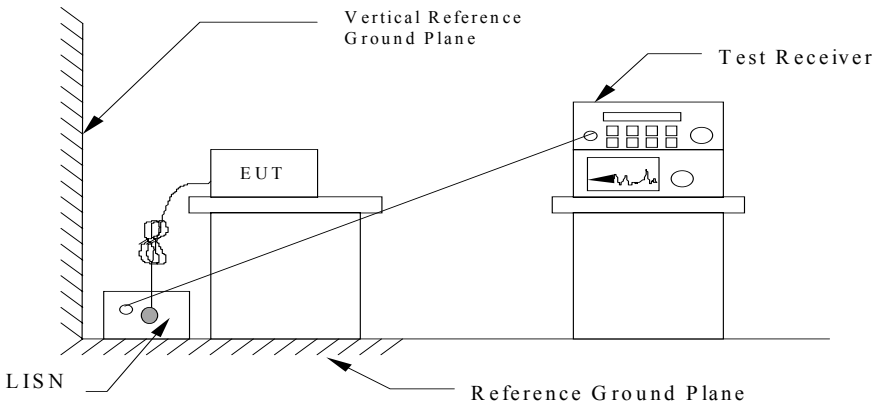
4.1 Standard Applicable

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.

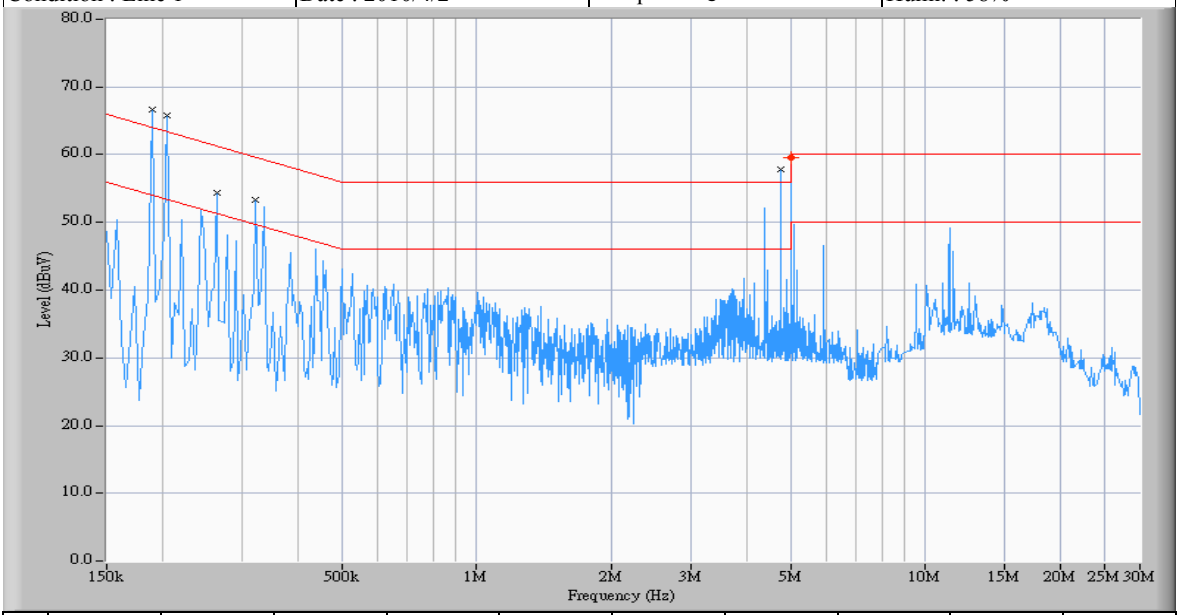
Figure 1 : Conducted emissions measurement configuration



4.3 Conducted Emission Data

4.3.1 Operation Mode: Channel Low

EUT : open peak	Model :	Status :	
Condition : Line 1	Date : 2010/4/2	Temp. : 19℃	Humi. : 58%

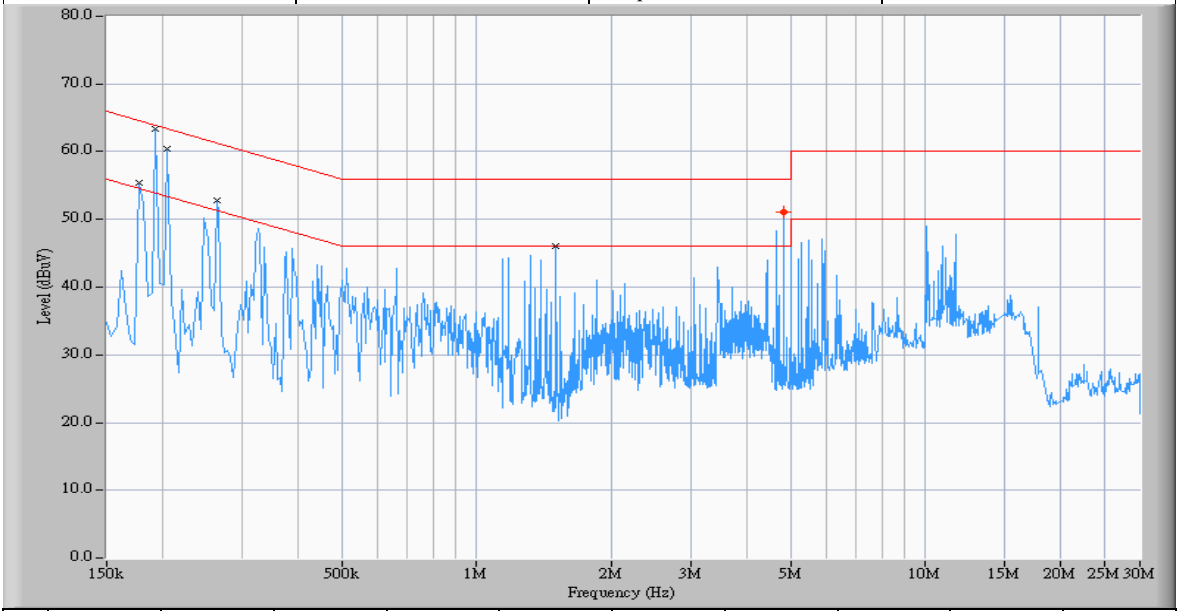


	Freq (MHz)	QP Level (dBuV)	AVG Level (dBuV)	Factor (dB)	QP Result (dBuV)	AVG Result (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	QP Margin (dB)	AVG Margin (dB)
1	0.150	56.5	33.2	0.2	56.7	33.4	66.0	56.0	-9.3	-22.6
2	0.189	63.3	49.8	0.2	63.5	50.0	64.1	54.1	-0.6	-4.1
3	0.205	60.3	40.2	0.2	60.5	40.4	63.4	53.4	-2.9	-13.0
4	0.263	55.3	42.2	0.2	55.5	42.4	61.3	51.3	-5.8	-8.9
5	0.322	51.4	37.6	0.2	51.6	37.8	59.7	49.7	-8.1	-11.9
6	5.021	46.5	25.5	0.2	46.7	25.7	60.0	50.0	-13.3	-24.3

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.

EUT : open peak	Model :	Status :	
Condition : Line 2	Date : 2010/4/2	Temp. : 19℃	Humi. : 58%



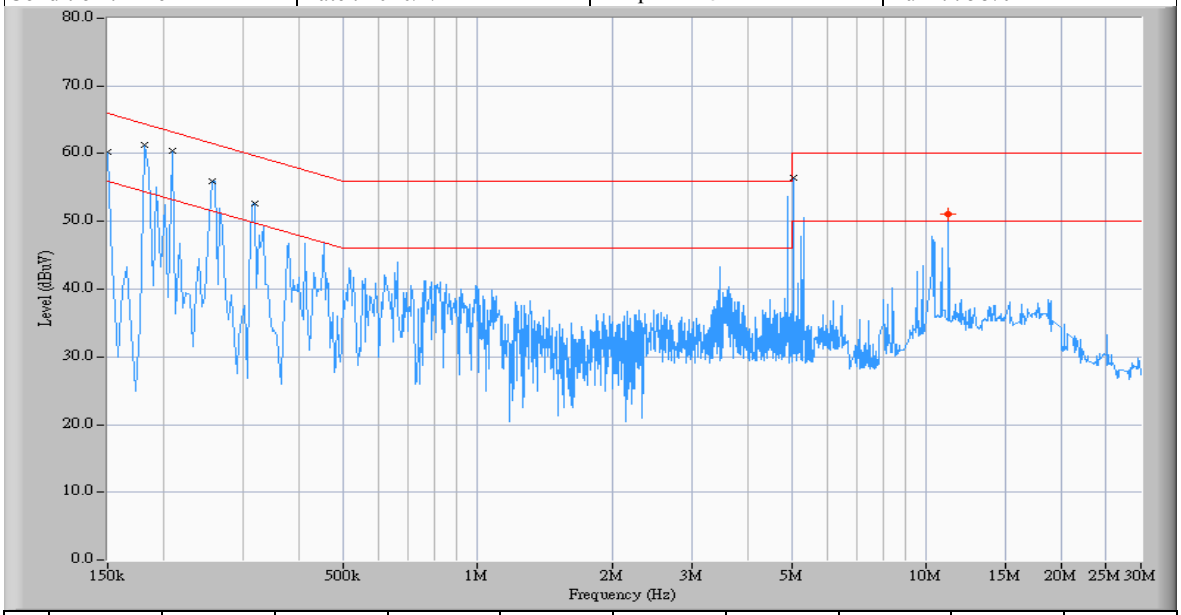
	Freq (MHz)	QP Level (dBuV)	AVG Level (dBuV)	Factor (dB)	QP Result (dBuV)	AVG Result (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	QP Margin (dB)	AVG Margin (dB)
1	0.177	55.4	27.2	0.2	55.6	27.4	64.6	54.6	-9.0	-27.2
2	0.193	63.4	48.7	0.2	63.6	48.9	63.9	53.9	-0.3	-5.0
3	0.205	60.4	42.8	0.2	60.6	43.0	63.4	53.4	-2.8	-10.4
4	0.263	52.9	40.5	0.2	53.1	40.7	61.3	51.3	-8.2	-10.6
5	1.502	46.0	17.4	0.2	46.2	17.6	56.0	46.0	-9.8	-28.4
6	4.834	51.1	18.6	0.2	51.3	18.8	56.0	46.0	-4.7	-27.2

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.

4.3.2 Operation Mode: Channel Mid

EUT : open peak	Model :	Status :	
Condition : Line 1	Date : 2010/4/2	Temp. : 19℃	Humi. : 58%

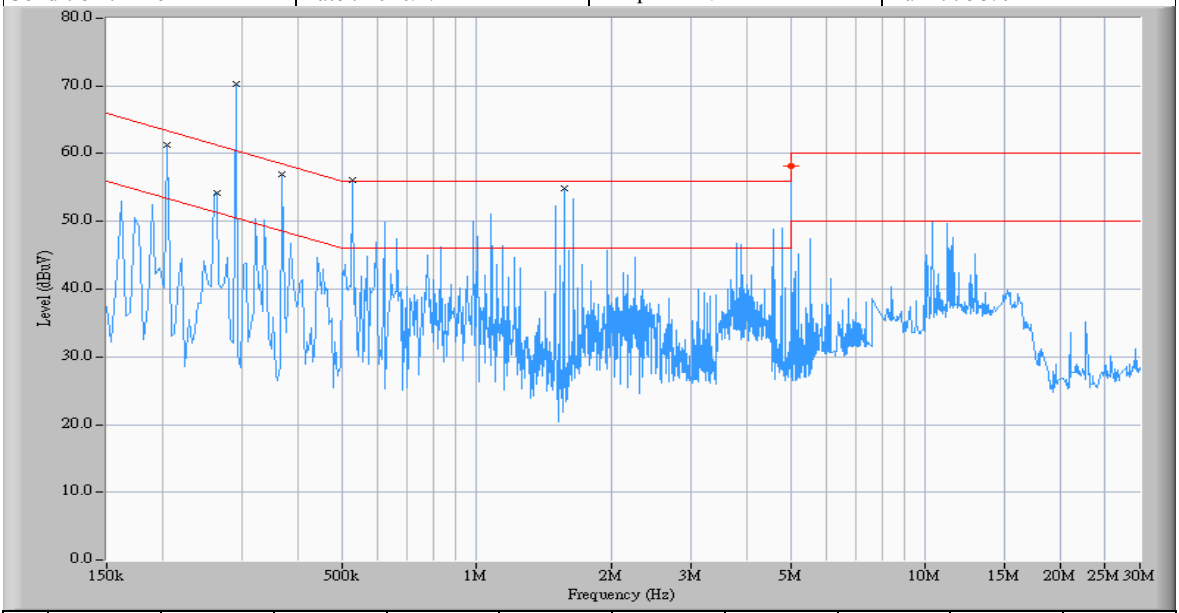


	Freq (MHz)	QP Level (dBuV)	AVG Level (dBuV)	Factor (dB)	QP Result (dBuV)	AVG Result (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	QP Margin (dB)	AVG Margin (dB)
1	0.150	60.3	34.5	0.2	60.5	34.7	66.0	56.0	-5.5	-21.3
2	0.181	61.3	30.9	0.2	61.5	31.1	64.4	54.4	-2.9	-23.3
3	0.209	60.5	35.2	0.2	60.7	35.4	63.2	53.2	-2.5	-17.8
4	0.255	56.0	39.3	0.2	56.2	39.5	61.6	51.6	-5.4	-12.1
5	0.318	52.6	33.5	0.2	52.8	33.7	59.8	49.8	-7.0	-16.1
6	5.052	56.4	26.1	0.2	56.6	26.3	60.0	50.0	-3.4	-23.7
7	11.158	51.1	21.8	0.3	51.4	22.1	60.0	50.0	-8.6	-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.

EUT : open peak	Model :	Status :	
Condition : Line 2	Date : 2010/4/2	Temp. : 19℃	Humi. : 58%



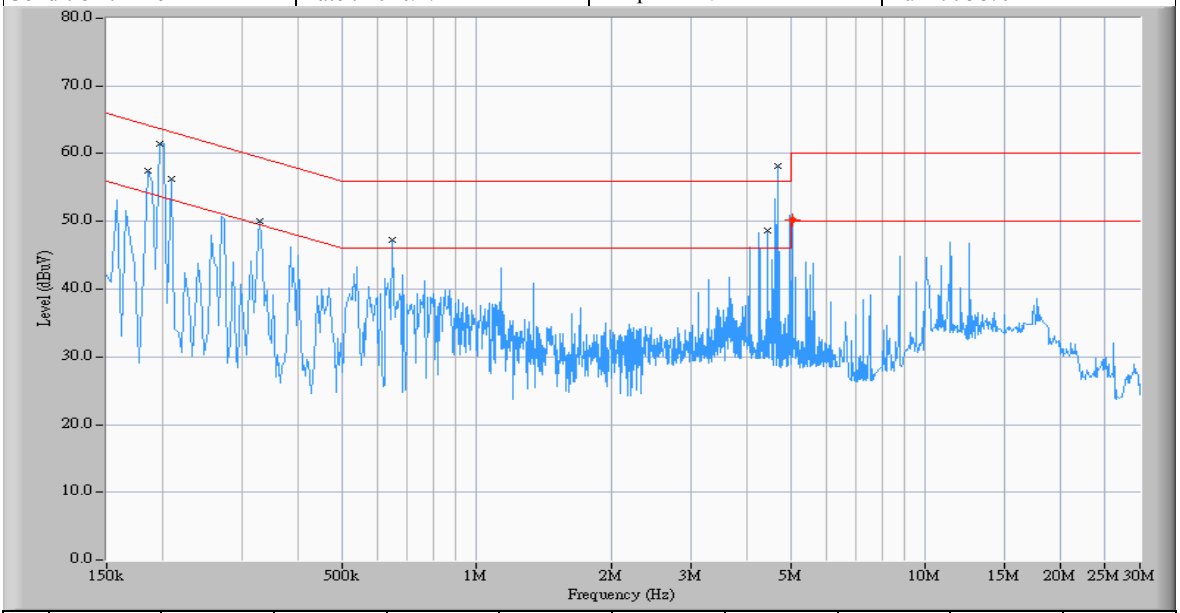
	Freq (MHz)	QP Level (dBuV)	AVG Level (dBuV)	Factor (dB)	QP Result (dBuV)	AVG Result (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	QP Margin (dB)	AVG Margin (dB)
1	0.205	60.0	42.1	0.2	60.2	42.3	63.4	53.4	-3.2	-11.1
2	0.263	53.0	43.3	0.2	53.2	43.5	61.3	51.3	-8.1	-7.8
3	0.291	45.0	28.7	0.2	45.2	28.9	60.5	50.5	-15.3	-21.6
4	0.369	39.9	31.0	0.2	40.1	31.2	58.5	48.5	-18.4	-17.3
5	0.529	40.4	31.5	0.2	40.6	31.7	56.0	46.0	-15.4	-14.3
6	1.568	33.9	17.5	0.2	34.1	17.7	56.0	46.0	-21.9	-28.3
7	5.029	44.2	17.2	0.2	44.4	17.4	60.0	50.0	-15.6	-32.6

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.

4.3.3 Operation Mode: Channel High

EUT : open peak	Model :	Status :	
Condition : Line 1	Date : 2010/4/2	Temp. : 19℃	Humi. : 58%

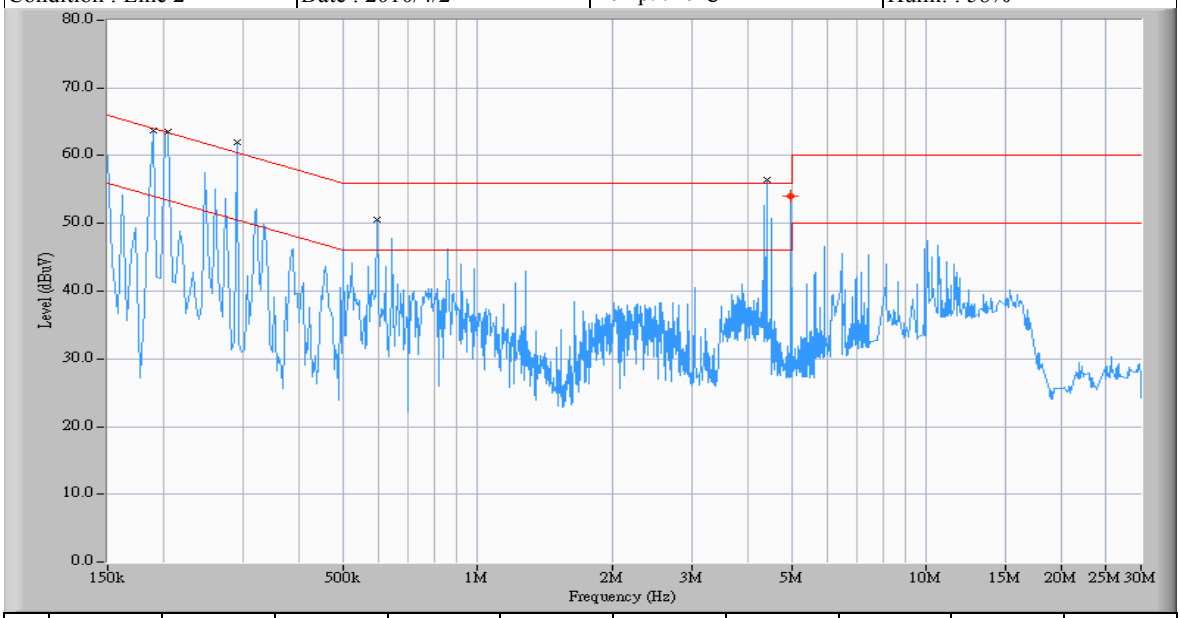


	Freq (MHz)	QP Level (dBuV)	AVG Level (dBuV)	Factor (dB)	QP Result (dBuV)	AVG Result (dBuV)	QP Limit (dBuV)	AVG Limit (dBuV)	QP Margin (dB)	AVG Margin (dB)
1	0.185	57.5	38.5	0.2	57.7	38.7	64.3	54.3	-6.6	-15.6
2	0.197	61.5	45.4	0.2	61.7	45.6	63.7	53.7	-2.0	-8.1
3	0.209	56.2	35.2	0.2	56.4	35.4	63.2	53.2	-6.8	-17.8
4	0.330	50.0	35.9	0.2	50.2	36.1	59.5	49.5	-9.3	-13.4
5	0.650	47.3	29.5	0.2	47.5	29.7	56.0	46.0	-8.5	-16.3
6	4.447	48.7	23.7	0.2	48.9	23.9	56.0	46.0	-7.1	-22.1
7	4.673	38.8	23.2	0.2	39.0	23.4	56.0	46.0	-17.0	-22.6
8	5.060	50.3	22.7	0.2	50.5	22.9	60.0	50.0	-9.5	-27.1

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 : open peak	Model :	Status :	
Condition : Line 2	Date : 2010/4/2	Temp. : 19℃	Humi. : 58%



	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	0.189	63.8	44.3	0.2	64.0	44.5	64.1	54.1	-0.1	-9.6
2	0.205	62.9	42.6	0.2	63.1	42.8	63.4	53.4	-0.3	-10.6
3	0.291	48.3	27.5	0.2	48.5	27.7	60.5	50.5	-12.0	-22.8
4	0.595	41.0	31.9	0.2	41.2	32.1	56.0	46.0	-14.8	-13.9
5	4.396	38.7	25.4	0.2	38.9	25.6	56.0	46.0	-17.1	-20.4
6	4.982	51.0	20.4	0.2	51.2	20.6	56.0	46.0	-4.8	-25.4

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	03/04/2011

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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 OUTPUT POWER MEASUREMENT

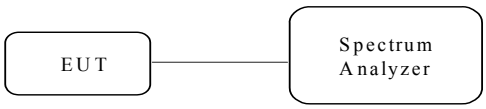
6.1 Standard Applicable

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.

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 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 2: Output power 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: Apr. 02, 2010 Temperature: 23℃ Humidity: 63 %

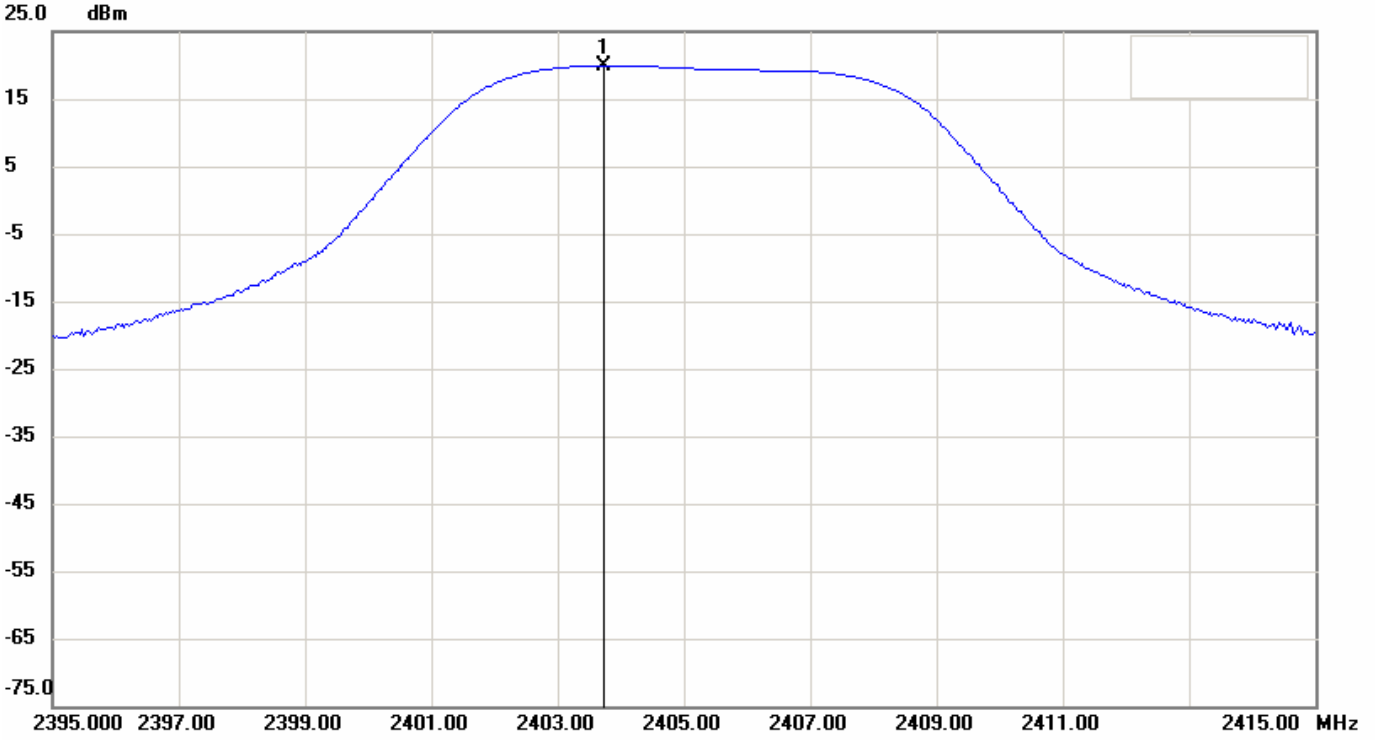
Channel	Frequency (MHz)	Maximum Peak Output Power (dBm)	Maximum Peak Output Power (mW)	FCC Limit (mW)	Chart
11	2405	19.97	99.312	1000	Page 23
18	2440	20.23	105.439	1000	Page 24
26	2480	20.30	107.152	1000	Page 25

Note:

1.Please refer to page 27 to page 29 for chart
2. The estimated measurement uncertainty of the result measurement is ±1.5dB(1GHz≦f≦18GHz)

File: OPENPEAK **Data: #22** **Date: 2010/4/2** **Temperature: 23 ℃**

Time: pm 04:56:09 **Humidity: 63 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 1ms Att.: 30dB**

Model: **RBW: 5000 KHz VBW: 2400 KHz**

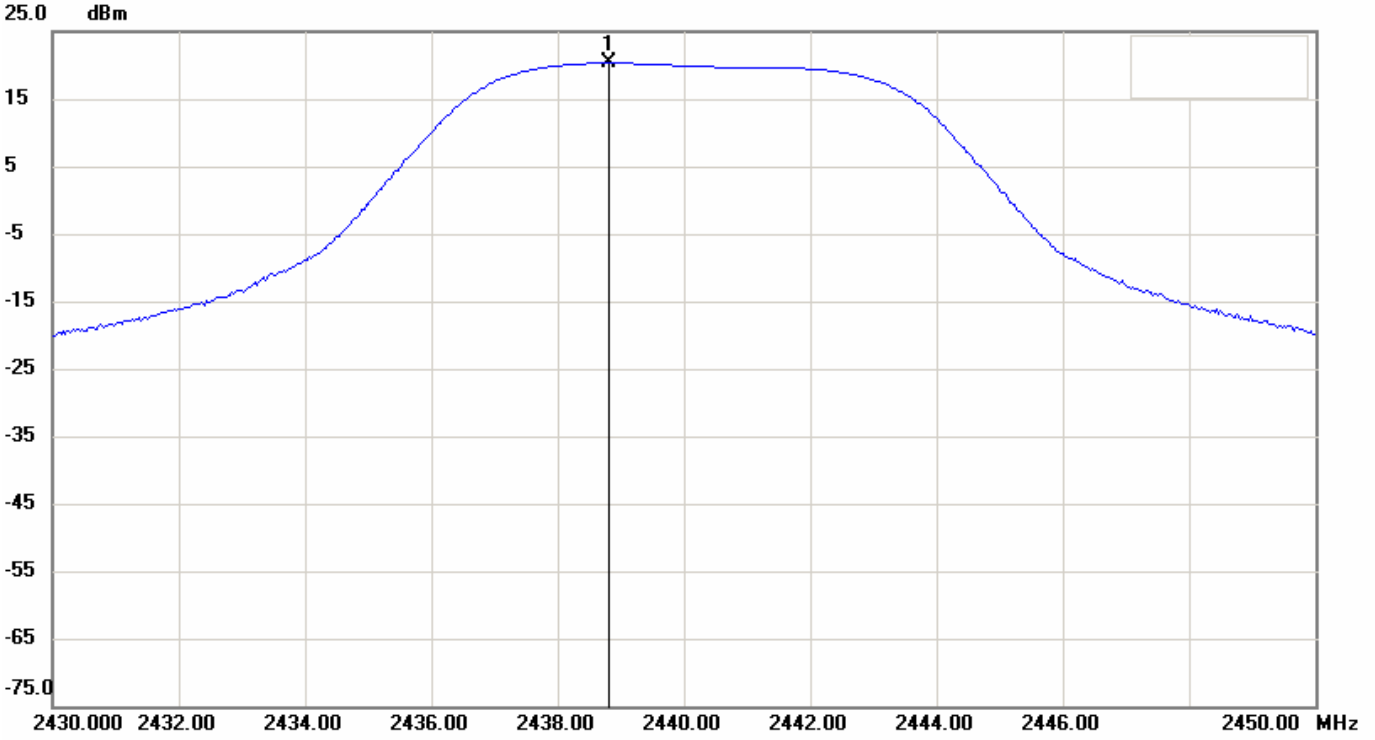
Test Mode:

Note: **CH11 Output Power**

No.	Frequency(MHz)	Level(dBm)
1	2403.7333	19.97

File: OPENPEAK **Data: #20** **Date: 2010/4/2** **Temperature: 23 ℃**

Time: pm 04:52:11 **Humidity: 63 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 1ms Att.: 30dB**

Model: **RBW: 5000 KHz VBW: 2400 KHz**

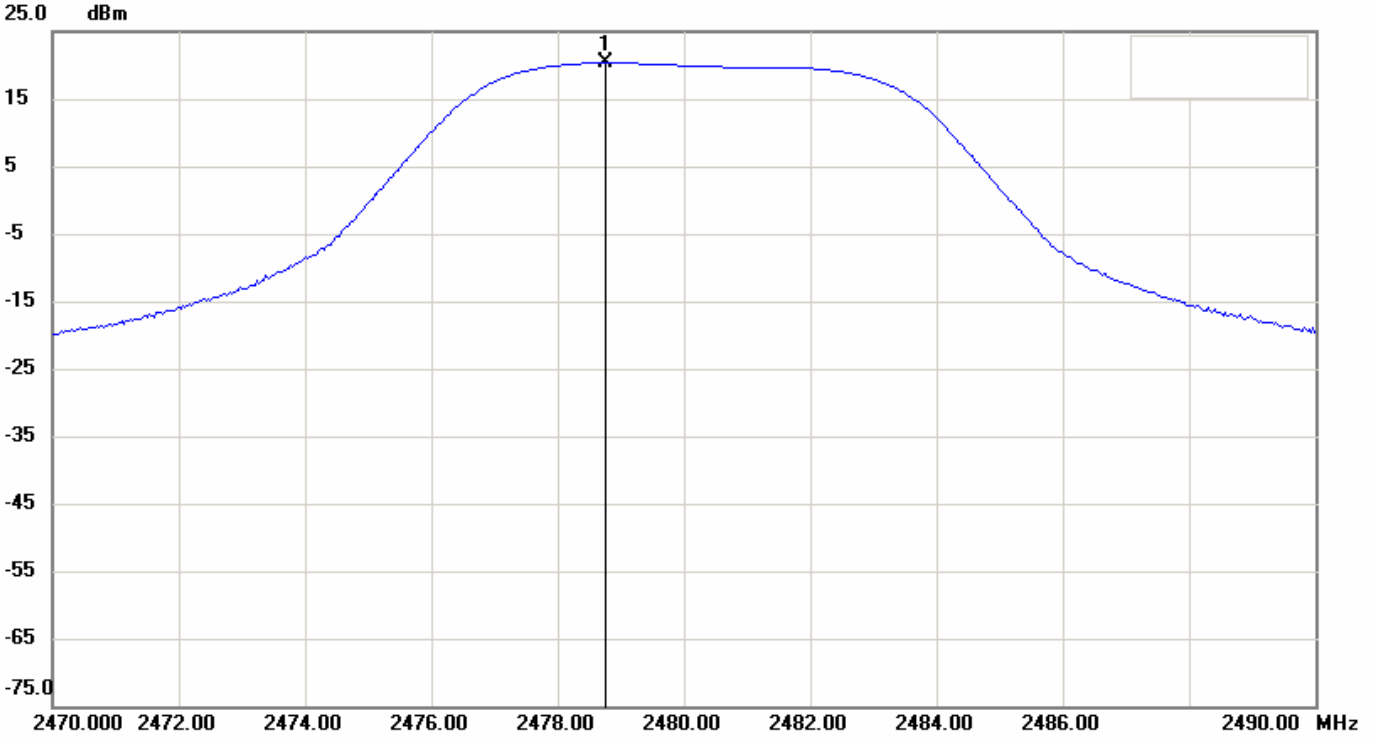
Test Mode:

Note: **CH18 Output Power**

No.	Frequency(MHz)	Level(dBm)
1	2438.8000	20.23

File: OPENPEAK **Data: #18** **Date: 2010/4/2** **Temperature: 23 ℃**

Time: pm 04:50:34 **Humidity: 63 %**



Condition: **RF Conducted**

EUT: **Sweep Time: 1ms Att.: 30dB**

Model: **RBW: 5000 KHz VBW: 2400 KHz**

Test Mode:

Note: **CH26 Output Power**

No.	Frequency(MHz)	Level(dBm)
1	2478.7667	20.30

6.5 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)	24.15
EIRP	Radiated Power (mW)	260.02
R	Distance (cm)	20
S	Power Density (mW/cm²)	0.052

7 RADIATED EMISSION MEASUREMENT

7.1 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)

7.2 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

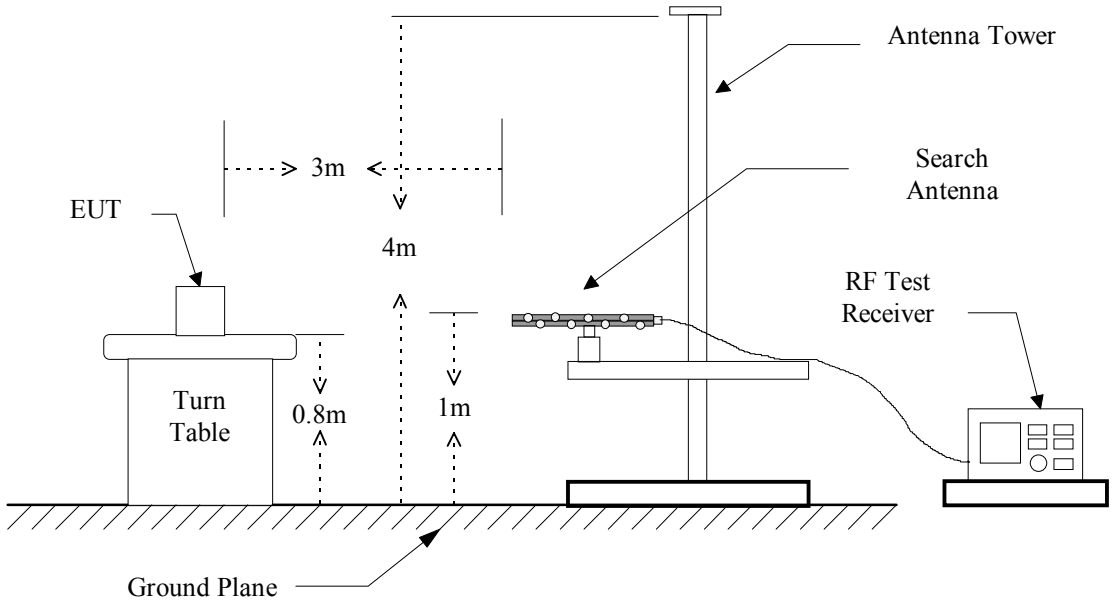
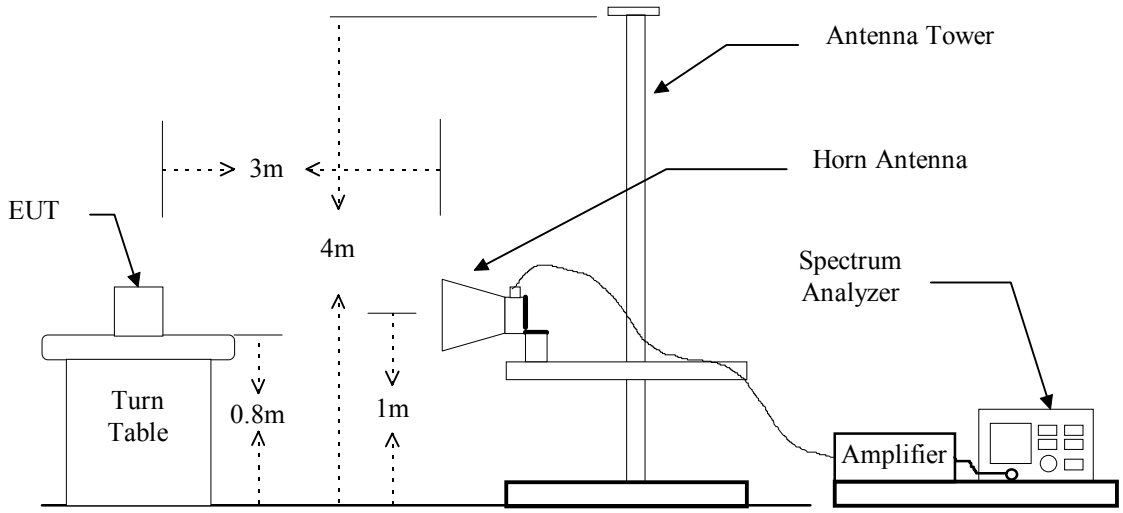


Figure 4 : Frequencies measured above 1 GHz configuration



7.3 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

7.4 Radiated Emission Data

7.4.1 Harmonic

Operation Mode: TX
Test Date: Mar. 22, 2010 Temperature: 23℃ Humidity: 63 %

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	---	---	71.1	52.3	-2.53	68.6	49.8	74.0	54.0
7215.000	---	---	58.1	46.1	0.35	58.5	46.5	74.0	54.0
12025.000	---	---	---	---	4.40	---	---	74.0	54.0
14430.000	---	---	---	---	9.08	---	---	74.0	54.0
19240.000	---	---	---	---	-3.56	---	---	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	---	---	63.0	45.1	-2.36	60.6	42.7	74.0	54.0
7320.000	---	---	52.0	38.5	0.61	52.6	39.1	74.0	54.0
12200.000	---	---	59.3	43.4	4.48	63.8	47.9	74.0	54.0
19520.000	---	---	---	---	-4.69	---	---	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	74.2	55.2	71.6	53.6	-2.19	72.0	53.0	74.0	54.0
7431.000	57.7	52.3	56.9	52.1	0.87	58.6	53.2	74.0	54.0
12385.000	---	---	---	---	4.56	---	---	74.0	54.0
19816.000	---	---	---	---	-4.63	---	---	74.0	54.0
22293.000	---	---	---	---	-3.29	---	---	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.

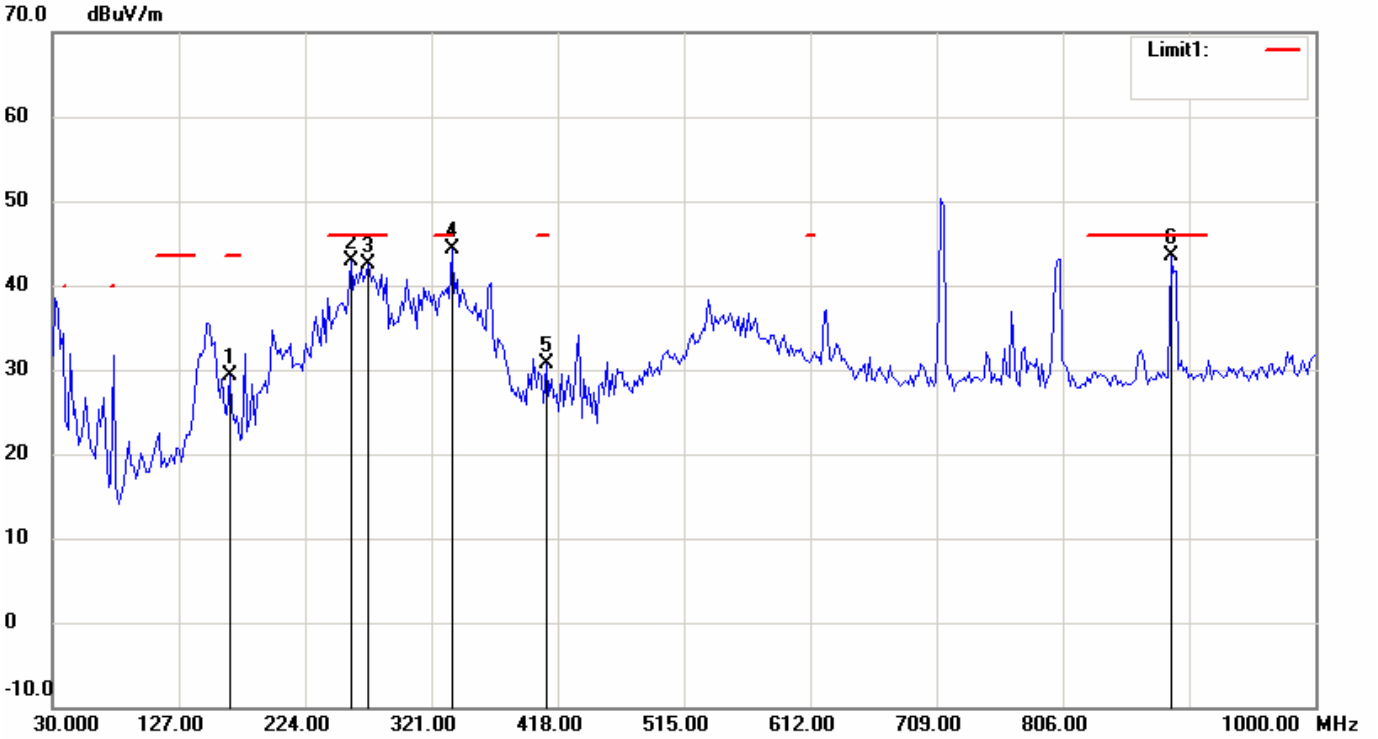
7.4.2 Spurious Emission

7.4.2.1 Operation Mode: Channel Low

7.4.2.1.1 Emission frequencies below 1 GHz

File: **OpenFrame** **Data:** **#1** **Date:** **2010/3/22** **Temperature:** **23 ℃**

Time: **PM 07:26:25** **Humidity:** **63 %**



Condition: **FCC_30-1000MHz** **Polarization:** **Horizontal**

EUT: **OpenFrame 7EZE** **Distance:**

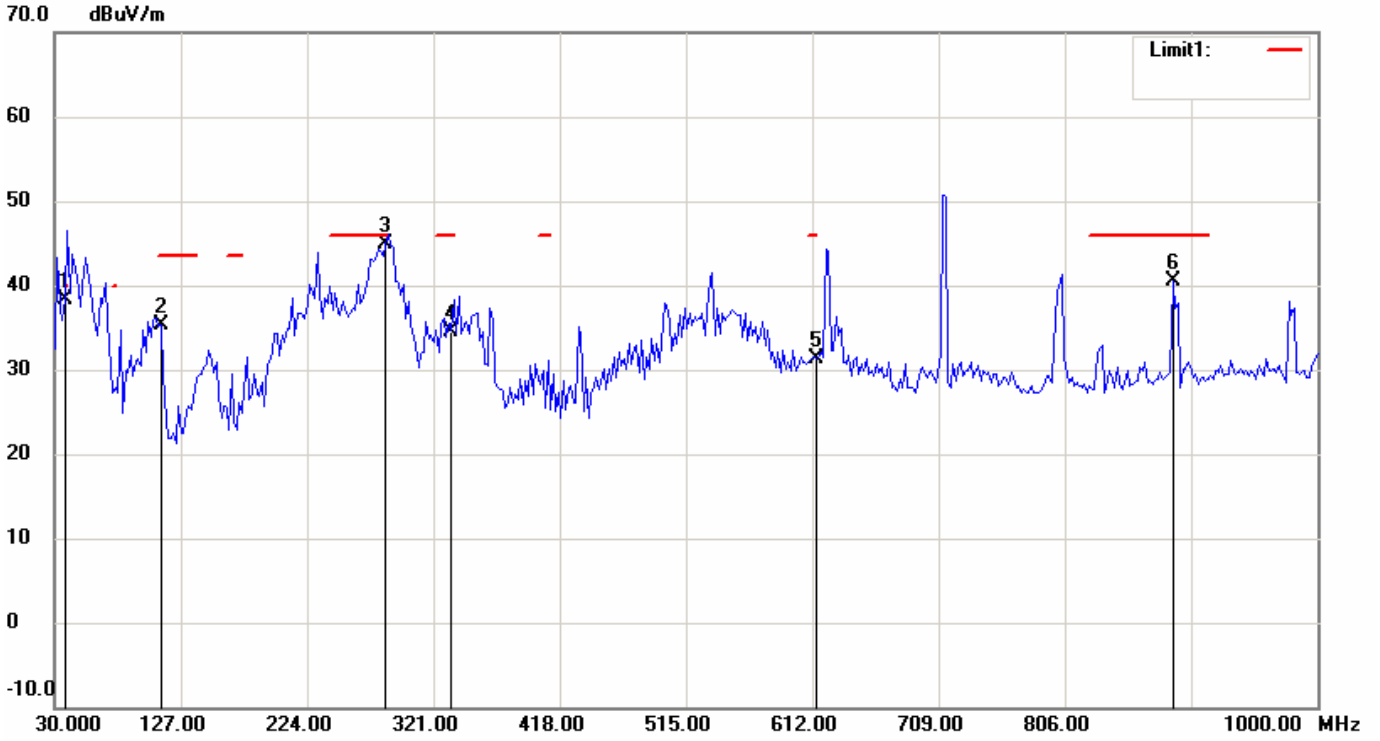
Model: **OPOF7E120E**

Test Mode: **LOW**

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	166.0721	17.37	peak	11.91	29.28	43.50	-14.22
2	259.3788	27.15	peak	15.76	42.91	46.00	-3.09
3	272.9860	26.92	peak	15.50	42.42	46.00	-3.58
4	337.1342	27.07	peak	17.21	44.28		
5	409.0581	11.48	peak	19.23	30.71	46.00	-15.29
6	889.1983	18.05	peak	25.48	43.53	46.00	-2.47

File: **OpenFrame** **Data:** **#2** **Date:** **2010/3/22** **Temperature:** **23 ℃**

Time: **PM 07:28:19** **Humidity:** **63 %**



Condition: **FCC_30-1000MHz** **Polarization:** **Vertical**

EUT: **OpenFrame 7EZE** **Distance:**

Model: **OPOF7E120E**

Test Mode: **LOW**

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	37.7754	22.07	peak	16.17	38.24	40.00	-1.76
2	111.6431	21.52	peak	13.71	35.23	43.50	-8.27
3	284.6492	29.20	peak	15.67	44.87	46.00	-1.13
4	335.1904	17.44	peak	17.16	34.60	46.00	-11.40
5	615.1100	8.85	peak	22.46	31.31		
6	889.1983	15.08	peak	25.48	40.56	46.00	-5.44

7.4.2.1.2 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
4771.489	61.4	45.6	---	---	-2.60	58.8	43.0	74.0	54.0

Note:

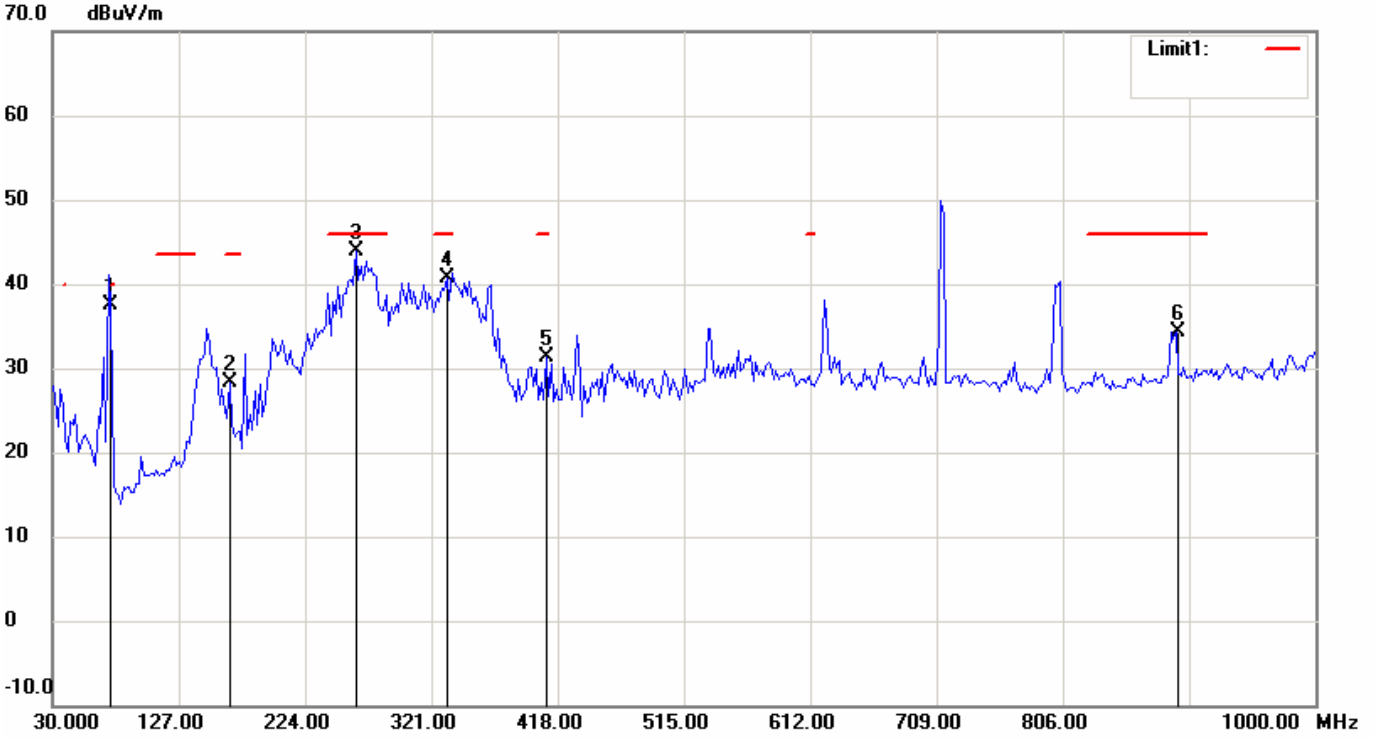
1. Place of Measurement: Measuring site of the ETC.
2. If the data table appeared symbol of "---" means the value was too low to be measured.
3. The estimated measurement uncertainty of the result measurement is
   ±4.6dB (30MHz≦f<300MHz).
   ±4.4dB (300MHz≦f≦1000MHz).
   ±2.9dB (1GHz≦f<18GHz).
   ±3.4dB (18GHz≦f≦40GHz).

7.4.2.2 Operation Mode: Channel Mid

7.4.2.2.1 Emission frequencies below 1 GHz

File: **OpenFrame** **Data:** **#4** **Date:** **2010/3/22** **Temperature:** **23 ℃**

Time: **PM 07:39:49** **Humidity:** **63 %**



Condition: **FCC_30-1000MHz** **Polarization:** **Horizontal**

EUT: **OpenFrame 7EZE** **Distance:**

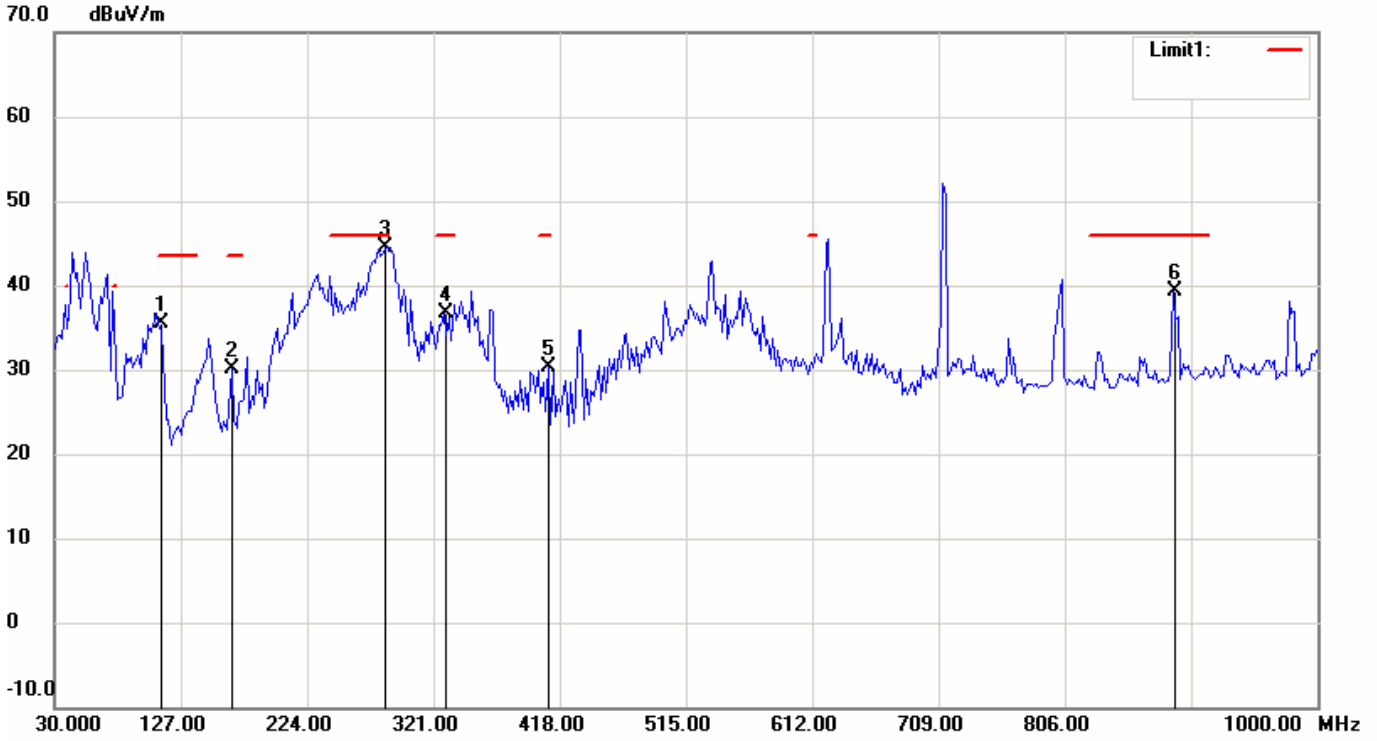
Model: **OPOF7E120E**

Test Mode: **MID**

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	74.7094	29.30	peak	8.18	37.48	40.00	-2.52
2	166.0721	17.47	peak	11.91	28.38	43.50	-15.12
3	263.2664	28.13	peak	15.70	43.83	46.00	-2.17
4	333.2465	23.53	peak	17.09	40.62	46.00	-5.38
5	409.0581	12.05	peak	19.23	31.28	46.00	-14.72
6	893.0862	8.80	peak	25.51	34.31	46.00	-11.69

File: **OpenFrame** **Data:** **#3** **Date:** **2010/3/22** **Temperature:** **23 ℃**

Time: **PM 07:38:25** **Humidity:** **63 %**



Condition: **FCC_30-1000MHz** **Polarization:** **Vertical**

EUT: **OpenFrame 7EZE** **Distance:**

Model: **OPOF7E120E**

Test Mode: **MID**

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	109.6994	21.90	peak	13.59	35.49	43.50	-8.01
2	166.0721	18.17	peak	11.91	30.08	43.50	-13.42
3	284.6492	28.75	peak	15.67	44.42	46.00	-1.58
4	329.3587	19.68	peak	16.96	36.64	46.00	-9.36
5	409.0581	11.13	peak	19.23	30.36	46.00	-15.64
6	889.1984	13.76	peak	25.48	39.24	46.00	-6.76

7.4.2.2.2 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 25 GHz were too low to be measured.							

Note:

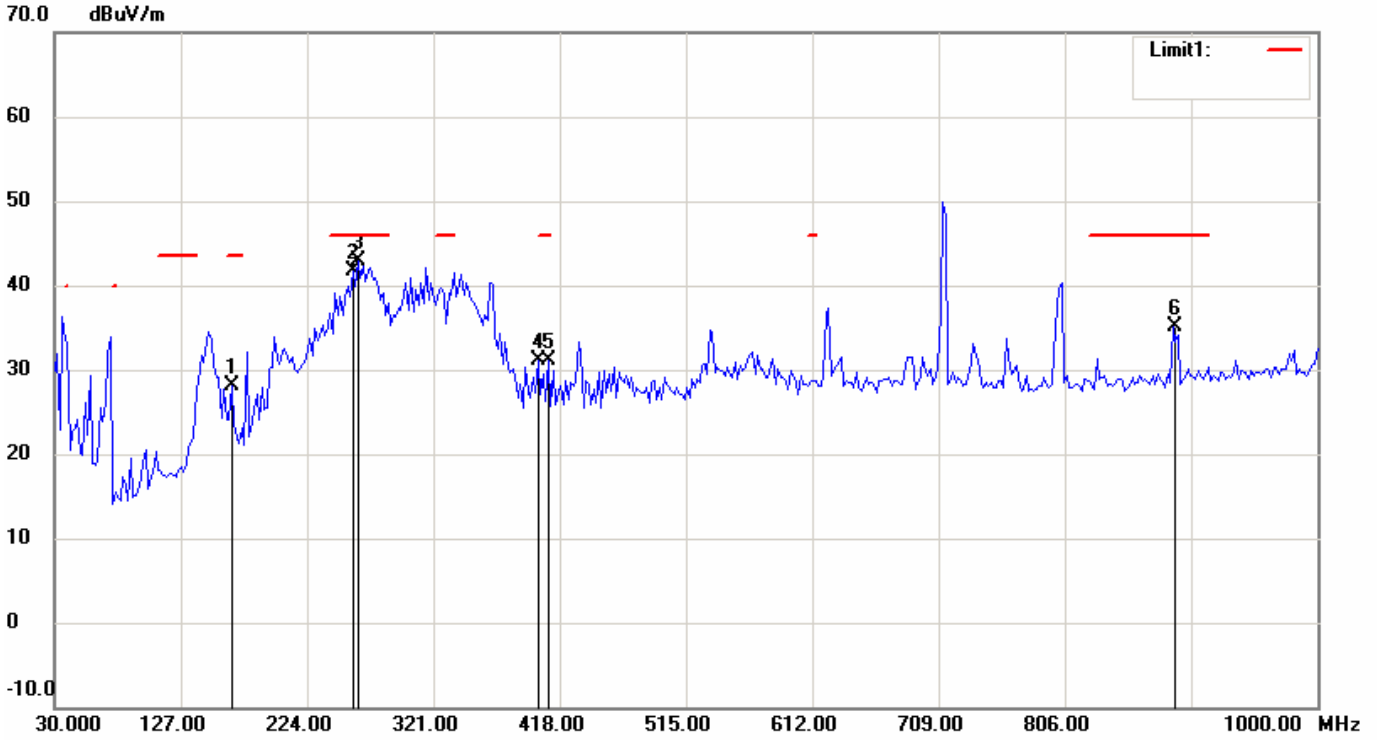
1. Place of Measurement: Measuring site of the ETC.
2. If the data table appeared symbol of "***" means the value was too low to be measured.
3. The estimated measurement uncertainty of the result measurement is
   ±4.6dB (30MHz≦f<300MHz).
   ±4.4dB (300MHz≦f≦1000MHz).
   ±2.9dB (1GHz≦f<18GHz).
   ±3.4dB (18GHz≦f≦40GHz).

7.4.2.3 Operation Mode: Channel High

7.4.2.3.1 Emission frequencies below 1 GHz

File: OpenFrame **Data: #5** **Date: 2010/3/22** **Temperature: 23 ℃**

Time: PM 07:42:49 **Humidity: 63 %**



Condition: **FCC_30-1000MHz** **Polarization:** **Horizontal**

EUT: **OpenFrame 7EZE** **Distance:**

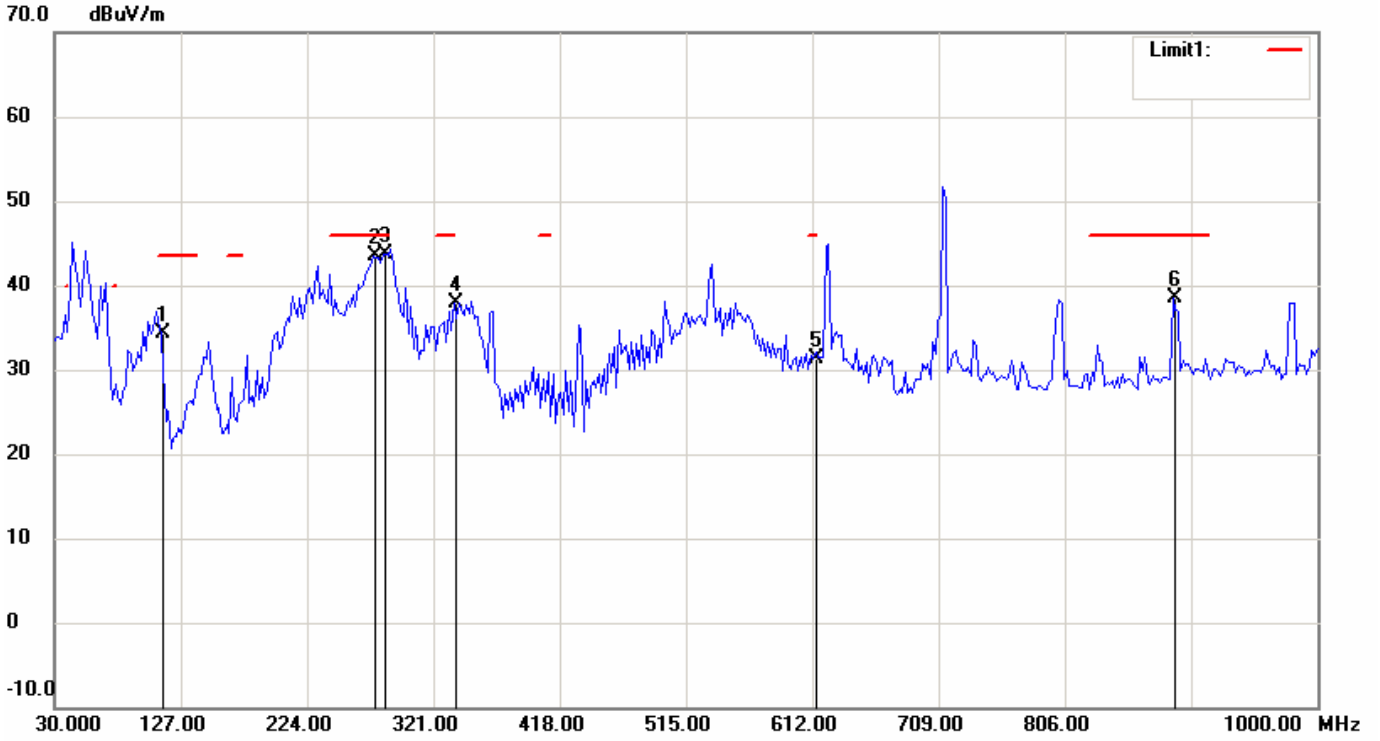
Model: **OPOF7E120E**

Test Mode: **HIGH**

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	166.0721	16.15	peak	11.91	28.06	43.50	-15.44
2	259.3788	25.86	peak	15.76	41.62	46.00	-4.38
3	263.2664	27.18	peak	15.70	42.88	46.00	-3.12
4	401.2826	12.05	peak	19.12	31.17	46.00	-14.83
5	409.0581	11.95	peak	19.23	31.18	46.00	-14.82
6	889.1984	9.57	peak	25.48	35.05	46.00	-10.95

File: **OpenFrame** **Data:** **#6** **Date:** **2010/3/22** **Temperature:** **23 ℃**

Time: **PM 07:44:00** **Humidity:** **63 %**



Condition: **FCC_30-1000MHz** **Polarization:** **Vertical**

EUT: **OpenFrame 7EZE** **Distance:**

Model: **OPOF7E120E**

Test Mode: **HIGH**

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	111.6433	20.55	peak	13.71	34.26	43.50	-9.24
2	274.9300	28.00	peak	15.53	43.53	46.00	-2.47
3	284.6492	28.11	peak	15.67	43.78	46.00	-2.22
4	337.1343	20.70	peak	17.21	37.91		
5	613.1663	8.95	peak	22.43	31.38	46.00	-14.62
6	889.1984	13.01	peak	25.48	38.49	46.00	-7.51

7.4.2.3.2 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 25 GHz were too low to be measured.							

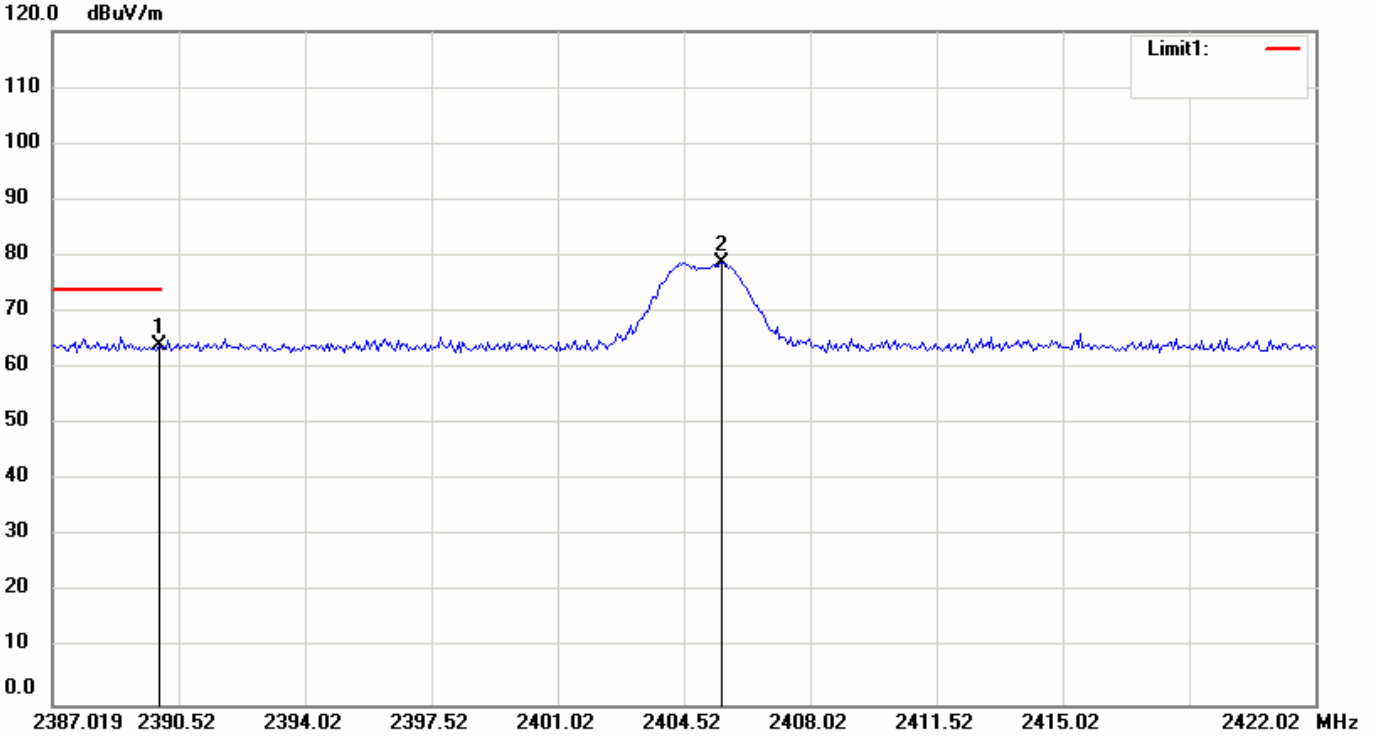
Note:

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).
   ±3.4dB (18GHz≦f≦40GHz).

7.4.3 Radiated Measurement at Bandedge with Fundamental Frequencies

File: OpenFrame **Data:** #11 **Date:** 2010/3/22 **Temperature:** 23 ℃

Time: PM 08:36:44 **Humidity:** 63 %



Condition: NCC__Above1GHz PK **Polarization:** Horizontal

EUT: OpenFrame 7EZE **Distance:**

Model: OPOF7E120E

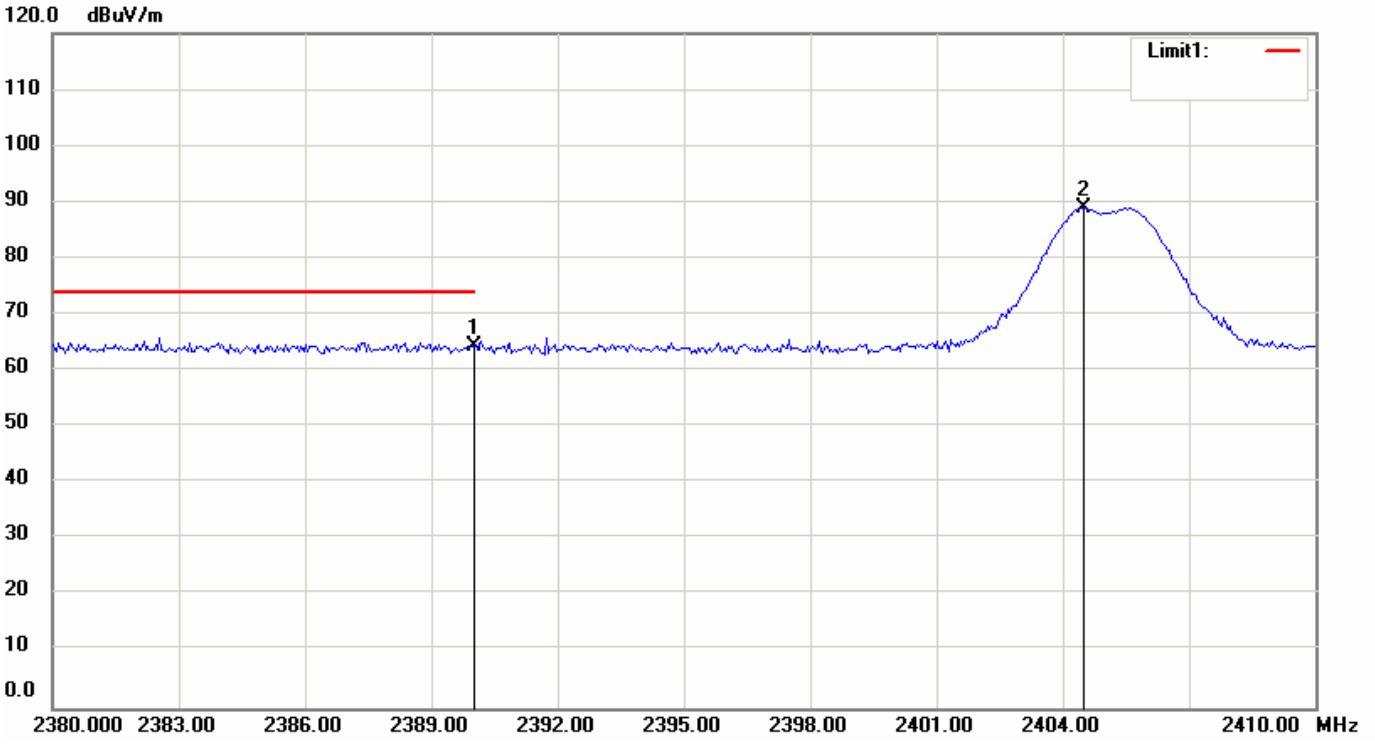
Test Mode: LOW

Note:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	2390.0000	34.81	peak	29.23	64.04	74.00	-9.96	---	---
2	2405.5848	49.62	peak	29.21	78.83	---	---	---	---

File: **OpenFrame** **Data:** **#13** **Date:** **2010/3/22** **Temperature:** **23 ℃**

Time: **PM 08:41:19** **Humidity:** **63 %**



Condition: **NCC__Above1GHz PK** **Polarization:** **Vertical**

EUT: **OpenFrame 7EZE** **Distance:**

Model: **OPOF7E120E**

Test Mode: **LOW**

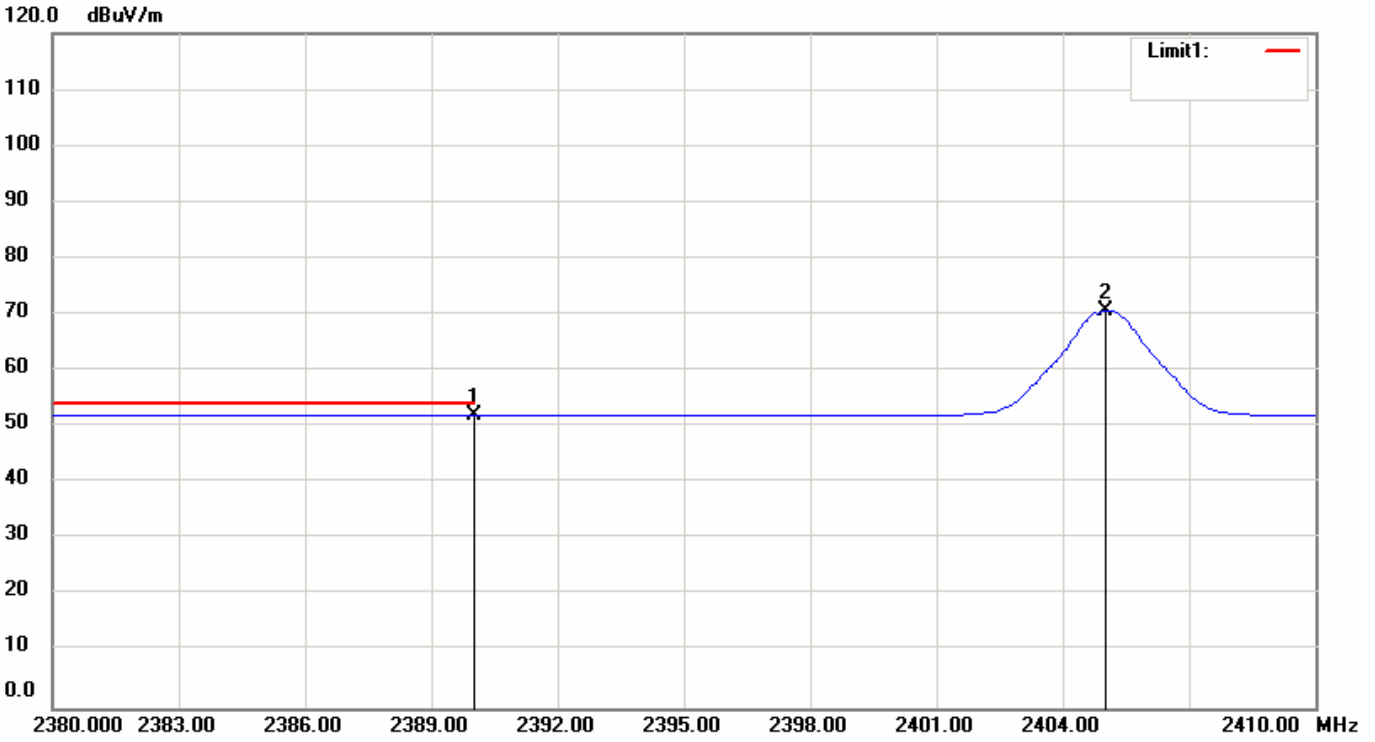
Note:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	2390.0000	35.25	peak	29.23	64.48	74.00	-9.52	---	---
2	2404.4712	59.66	peak	29.21	88.87	---	---	---	---

No.		△Frequency(MHz)	△Level(dB)
1	mk2-mk1	14.4712	24.39

File: **OpenFrame** **Data:** **#12** **Date:** **2010/3/22** **Temperature:** **23 ℃**

Time: **PM 08:37:55** **Humidity:** **63 %**



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

EUT: **OpenFrame 7EZE** **Distance:**

Model: **OPOF7E120E**

Test Mode: **LOW**

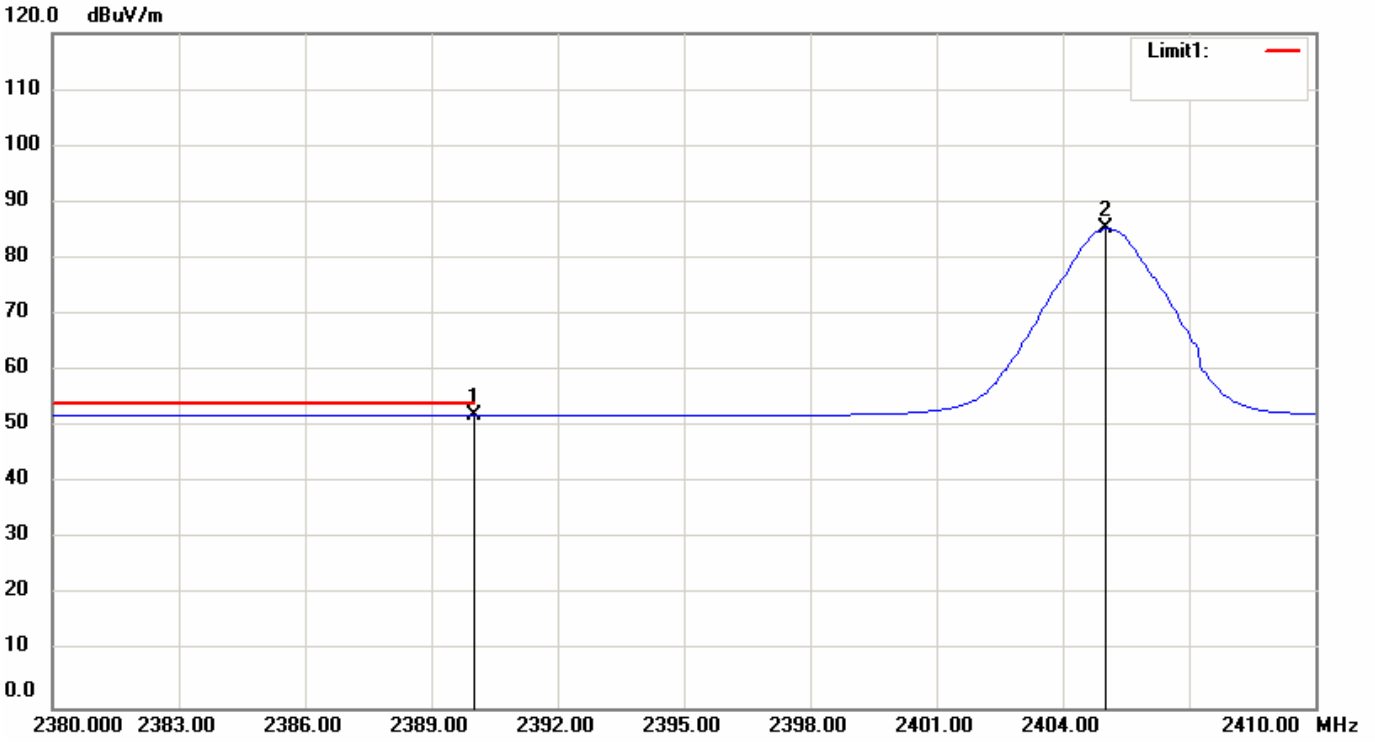
Note:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	2390.0000	22.77	peak	29.23	52.00	54.00	-2.00	---	---
2	2405.0000	41.41	peak	29.21	70.62	---	---	---	---

No.		△Frequency(MHz)	△Level(dB)
1	mk2-mk1	15	18.62

File: **OpenFrame** **Data:** **#14** **Date:** **2010/3/22** **Temperature:** **23 ℃**

Time: **PM 08:42:30** **Humidity:** **63 %**



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

EUT: **OpenFrame 7EZE** **Distance:**

Model: **OPOF7E120E**

Test Mode: **LOW**

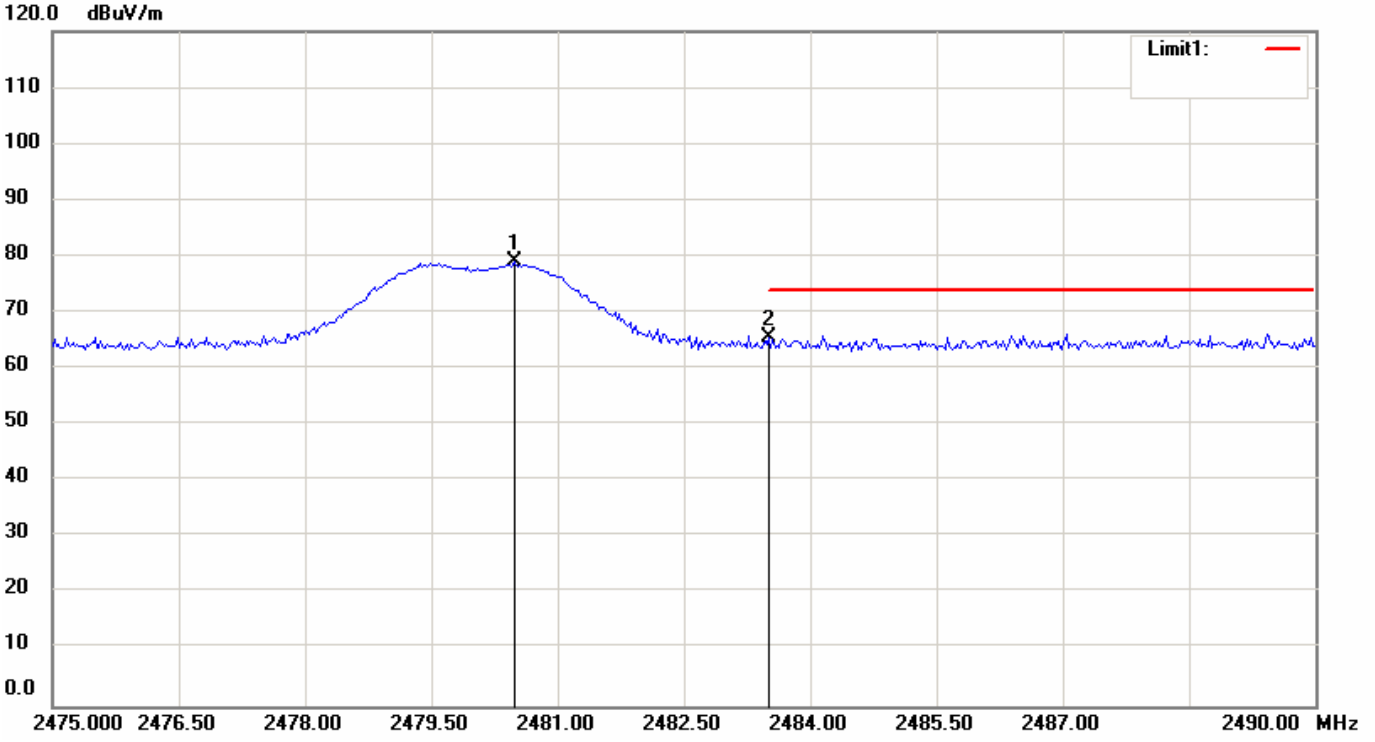
Note:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	2390.0000	22.76	peak	29.23	51.99	54.00	-2.01	---	---
2	2405.0000	56.06	peak	29.21	85.27	---	---	---	---

No.		△Frequency(MHz)	△Level(dB)
1	mk2-mk1	15	33.28

File: **OpenFrame** **Data:** **#9** **Date:** **2010/3/22** **Temperature:** **23 ℃**

Time: **PM 08:27:53** **Humidity:** **63 %**



Condition: **NCC__Above1GHz PK** **Polarization:** **Horizontal**

EUT: **OpenFrame 7EZE** **Distance:**

Model: **OPOF7E120E**

Test Mode: **HIGH**

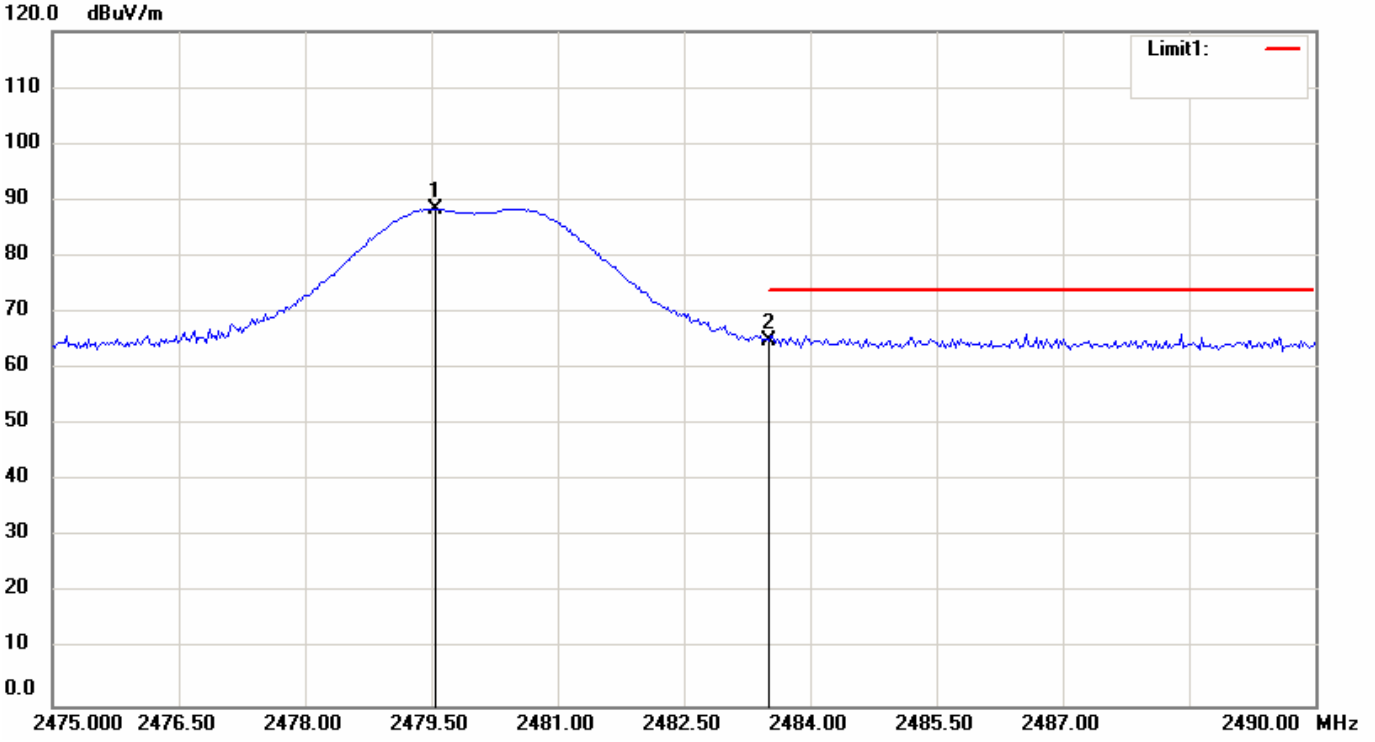
Note:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	2480.4806	49.79	peak	29.13	78.92	---	---	---	---
2	2483.5000	36.39	peak	29.12	65.51	74.00	-8.49	---	---

No.		△Frequency(MHz)	△Level(dB)
1	mk2-mk1	3.0194	-13.41

File: **OpenFrame** **Data:** **#7** **Date:** **2010/3/22** **Temperature:** **23 ℃**

Time: **PM 08:19:04** **Humidity:** **63 %**



Condition: **NCC__Above1GHz PK** **Polarization:** **Vertical**

EUT: **OpenFrame 7EZE** **Distance:**

Model: **OPOF7E120E**

Test Mode: **HIGH**

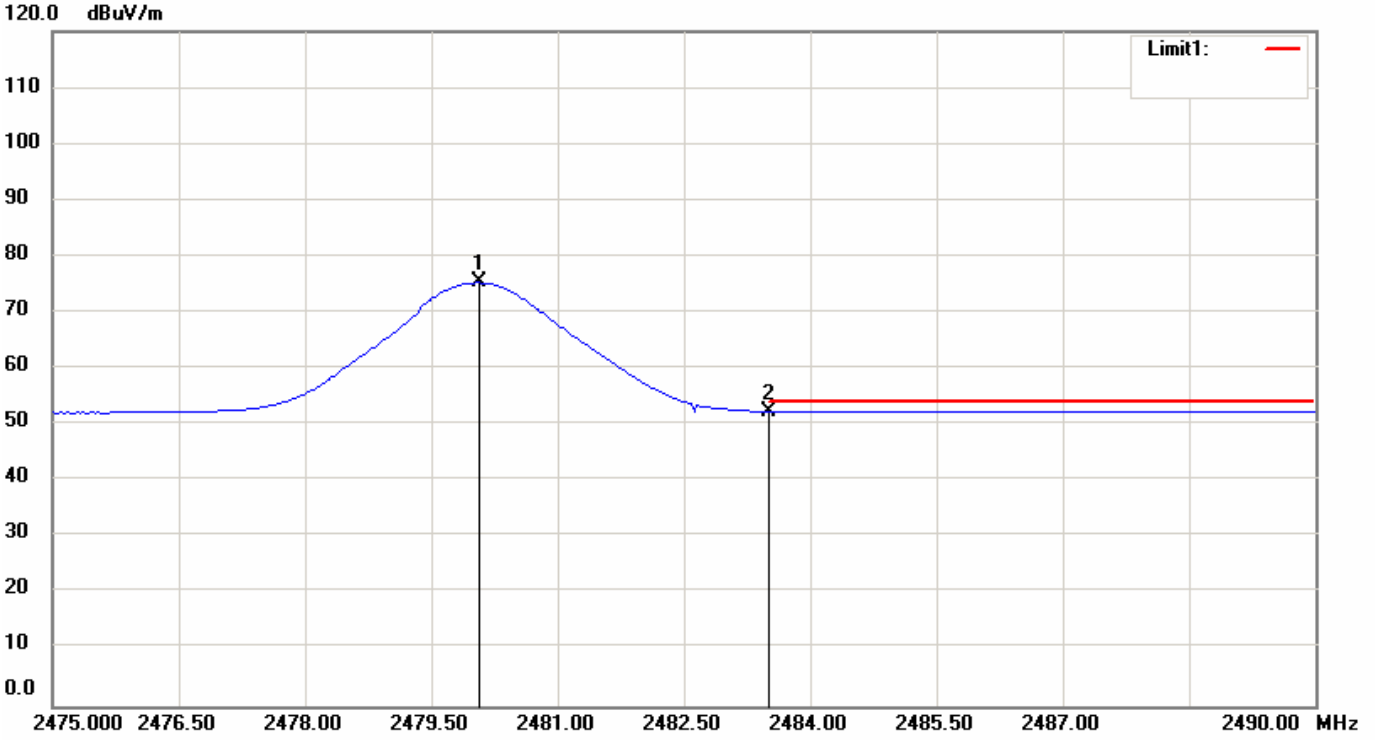
Note:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	2479.5431	59.37	peak	29.13	88.50	---	---	---	---
2	2483.5000	35.78	peak	29.12	64.90	74.00	-9.10	---	---

No.		△Frequency(MHz)	△Level(dB)
1	mk2-mk1	3.9569	-23.6

File: **OpenFrame** **Data:** **#10** **Date:** **2010/3/22** **Temperature:** **23 ℃**

Time: **PM 08:29:04** **Humidity:** **63 %**



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

EUT: **OpenFrame 7EZE** **Distance:**

Model: **OPOF7E120E**

Test Mode: **HIGH**

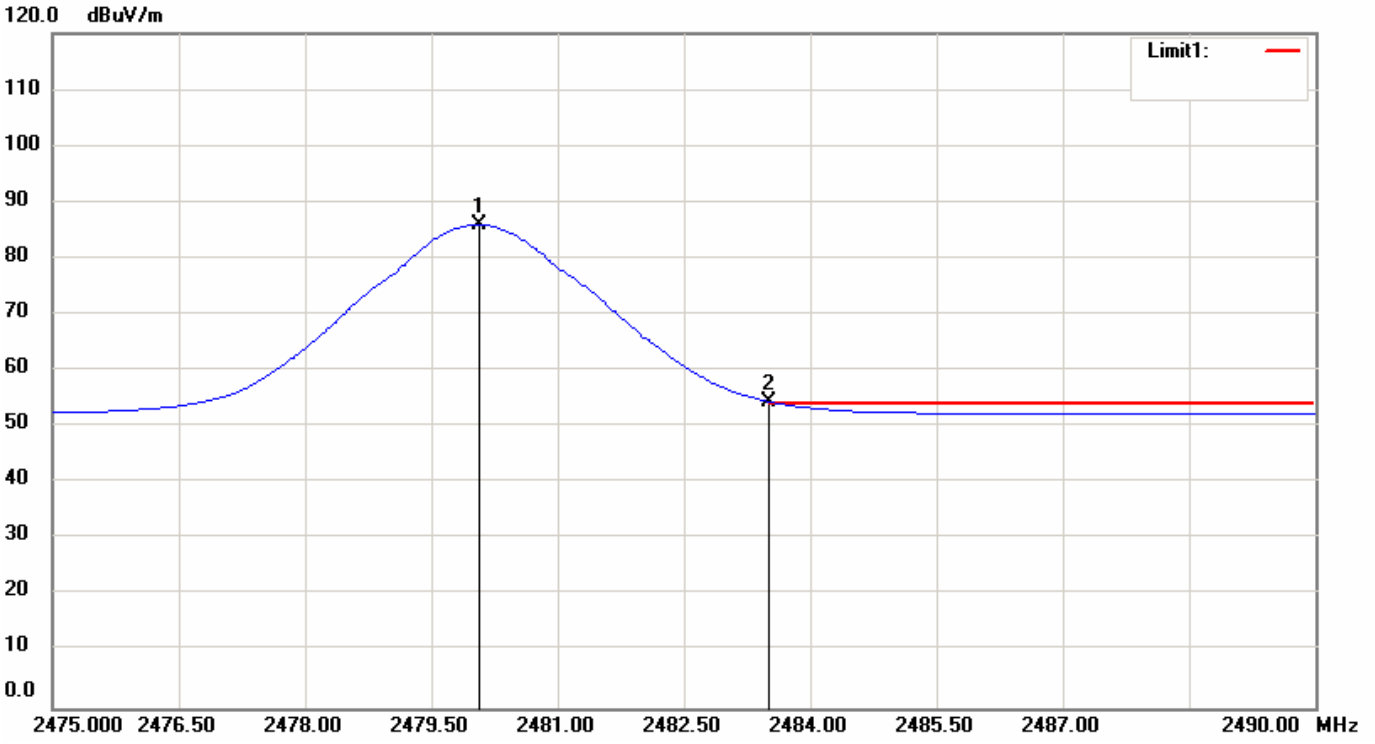
Note:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	2480.0481	46.18	peak	29.13	75.31	---	---	---	---
2	2483.5000	23.28	peak	29.12	52.40	54.00	-1.60	---	---

No.		△Frequency(MHz)	△Level(dB)
1	mk2-mk1	3.4519	-22.91

File: **OpenFrame** **Data:** **#8** **Date:** **2010/3/22** **Temperature:** **23 ℃**

Time: **PM 08:23:40** **Humidity:** **63 %**



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

EUT: **OpenFrame 7EZE** **Distance:**

Model: **OPOF7E120E**

Test Mode: **HIGH**

Note:

No.	Frequency (MHz)	Reading (dBuV/m)	Detector	Corrected Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)
1	2480.0481	56.85	peak	29.13	85.98	---	---	---	---
2	2483.5000	24.86	peak	29.12	53.98	54.00	-0.2	---	---

No.		△Frequency(MHz)	△Level(dB)
1	mk2-mk1	3.4519	-31.44

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.

7.5 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