

BUREAU  
VERITAS

Test Report No.:FC110929N010-1

**TEST REPORT**

To:	<b>Camino International Limited</b>
Address:	Flat A, 3 <sup>rd</sup> Floor, Industrial Building, 501-503 Castle Peak Road, Cheung Sha Wan, Kowloon, Hong Kong

Manufacturer or Supplier	<b>Hoi Ming Plastic Products Factory</b>
Address	No. 10 Kai Ming Road, Niu Shi Po, Liu Yue, Heng Gang, Long Gang District, Shenzhen, China
Product	Wireless Optical Mouse(mouse)
Brand Name:	Camino
Model	760761(mouse)
Additional Model & Model Difference	760762 Different appearance only
Tested Sample	760761
Date of tests	Oct.12 ~ 17, 2011



The submitted sample of the above equipment has been tested for according with ANSI C63.4-2009 and the tests have been carried out according to the requirements of the following standards:

☒ **FCC Part 15, Subpart C (Section 15.249)**

**CONCLUSION: The submitted sample was found to COMPLY with the test requirement**

Prepared by Glyn He Project Engineer / EMC Department	Approved by Sam Tung Manager / EMC Department
	  Date: Oct.21, 2011

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification



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## **RELEASE CONTROL RECORD**

<b>ISSUE NO.</b>	<b>REASON FOR CHANGE</b>	<b>DATE ISSUED</b>
Original release	N/A	Oct. 16, 2011



## **1 SUMMARY OF TEST RESULTS**

The EUT has been tested according to the following specifications:

<b>APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)</b>			
<b>STANDARD SECTION</b>	<b>TEST TYPE AND LIMIT</b>	<b>RESULT</b>	<b>REMARK</b>
§15.203	Antenna Requirement	PASS	Compliant
§15.207 (a)	Conducted Emission	N/A	N/A
§15.205	Restricted Band of Operation	PASS	Compliant
§15.209 §15.249(a)	Radiated Emission	PASS	Compliant
§15.215(c)	20dB Bandwidth Test	PASS	Compliant
§15.249(d)	Out of Band Emission	PASS	Compliant

## **2. MEASUREMENT UNCERTAINTY**

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

<b>MEASUREMENT</b>	<b>FREQUENCY</b>	<b>UNCERTAINTY</b>
Conducted emissions	9kHz~30MHz	2.44dB
Radiated emissions	30MHz ~ 200MHz	3.19dB
	200MHz ~1000MHz	3.21dB
	1GHz ~ 18GHz	2.26dB
	18GHz ~ 40GHz	1.94dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k = 2$ .



### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless Optical Mouse(mouse)
MODEL NO.	760761/760762(mouse)
FCC ID	ZZX671M
NOMINAL VOLTAGE	3V DC (Battery)
MODULATION TYPE	GFSK
OPERATING FREQUENCY	2.4GHz: 2402.0 ~ 2480.0MHz
ANTENNA TYPE	Integral Antenna
ANTENNA CONNECTER	N/A
DATA CABLE	N/A
I/O PORTS	N/A
ACCESSORY DEVICES	N/A

#### 3.2 DESCRIPTION OF TEST MODES

CHANNEL	FREQUENCY
Low	2402MHz
Middle	2441MHz
High	2480MHz



### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC Part 15, Subpart C (15.249)**

**ANSI C63.4-2009**

All test items have been performed and recorded as per the above standards.

**NOTE:** The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

### 3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	N/A				

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A

**NOTE:**

1. All power cords of the above support units are non-shielded (1.8m).



## 4. TEST TYPES AND RESULTS

### 4.1 RADIATED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

According to §15.249(a), the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency	Field strength of fundamental (milli-volts/meter)	Field strength of harmonics (micro-volts/meter)
902-928 MHz	50	500
2400-2483.5 MHz	50	500
5725-5875 MHz	50	500
24.0-24.25 GHz	250	2500

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

## 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESVS10	841431/004	May 25,11	May 25,12
Bilog Antenna TESEQ	CBL 6111D	25758	Nov.22,10	Nov.22,11
10m Semi-anechoic Chamber ETS-LINDGREN	21.4m*12.1m*8.8m	NSEMC006	May 2,11	May 2,12
RF Cable IMRO	IMRO-400	10m Cable 1#10m	May 2,11	May 2,12
RF Cable IMRO	IMRO-400	10m Cable 2#3m	May 2,11	May 2,12
Signal Amplifier Agilent	8447D	2944A11174	May 2,11	May 2,12
Horn Antenna EMCO	3117	00062558	Nov.01,10	Nov.01,11
Horn Antenna (AUX) EMCO	3117	00085519	Nov.01,10	Nov.01,11
Spectrum Analyzer HP	8593E	3448U00806	May 25,11	May 25,12
Spectrum Analyzer Agilent	E4446A	MY46180622	Apr. 25,11	Apr. 25,12
RF Cable DRAKA	M06/25-RG102	10m Cable 2#	May 2,11	May 2,12

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA.
  2. The test was performed in Dongguan Chamber 10m.
  3. The horn antenna are used only for the measurement of emission frequency above 1GHz if tested.



#### 4.1.3 TEST PROCEDURES

The EUT was placed on a turn table which was 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on a antenna tower. At the frequency band of 30MHz to 1GHz, The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 to 4 m for horizontal and vertical polarizations. The broadband antenna (calibrated by dipole antenna) was used as a receiving antenna. At the frequency band of 1GHz to 10GHz, The measuring antenna moved from 1 to 4 m for horizontal and vertical polarization. The horn antenna was use das a receiving antenna.

The resolution bandwidth and video bandwidth of the test receiver was 120 kHz and 300kHz for Quasi-peak detection at frequency below 1GHz.

The resolution bandwidth and video bandwidth of the test receiver was1MHz and 1MHz for Peak detection at frequency above 1GHz.

For Average measurement at frequency above 1GHz.The resolution bandwidth of the test receiver was 1MHz ; due to the shortest pulse width T is 116us, according the video bandwidth should not smaller than 1/T,so the video bandwidth is 10Hz.

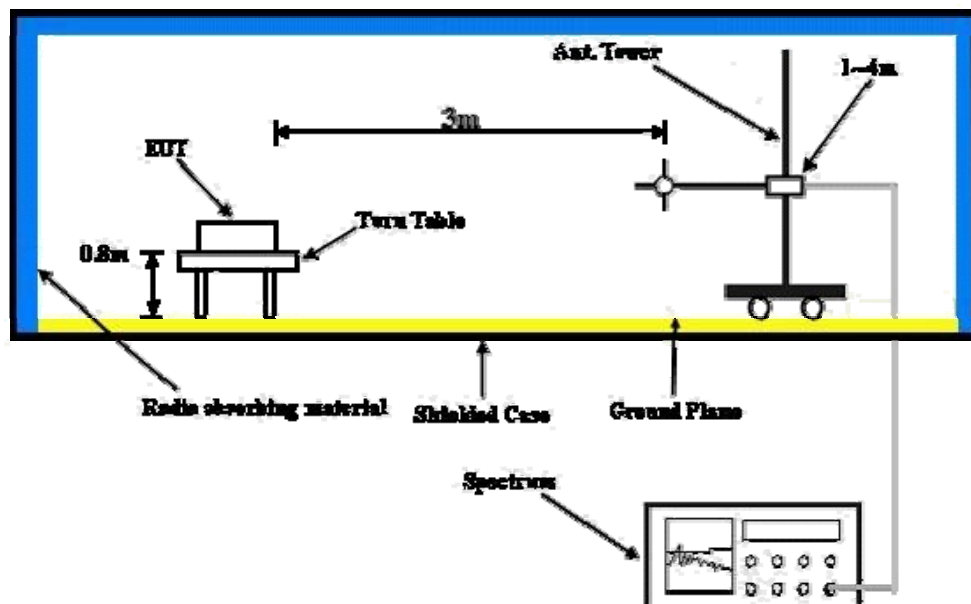
In 18GHz to 25GHz, The EUT was checked by Horn ANT . But the test result is background.

The EUT position(X. Y. Z) were checked and worse case was happened in Y position. So Y position was chose for find measurement. The EUT was tested in Chamber Site.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### 4.1.6 EUT OPERATING CONDITIONS

- Placed the EUT on the testing table.
- Trun on the EUT power by battery,
- Enable EUT under transmission condition continuously at specific channel frequency.



#### 4.1.7 TEST RESULTS

##### ABOVE 1GHz WORST-CASE DATA : Low channel

Frequency MHz	Detector	Raw Value dBuV	Direction Degree	Polar H / V	Correction factor dB/m	Emission level dBuV/m	Limit dBuV/m	Margin dB
4804.85	AV	-0.4	24	V	41.9	41.5	54	-12.5
4804.85	AV	-2.9	341	H	41.9	39.0	54	-15.0
4804.85	PK	12.8	177	V	41.9	54.7	74	-19.3
4804.85	PK	9.9	28	H	41.9	51.8	74	-22.2
7207.47	AV	-6.9	325	V	47.4	40.5	54	-13.5
7207.47	AV	-8.8	91	H	47.4	38.6	54	-15.4
7207.47	PK	6.3	77	V	47.4	53.7	74	-20.3
7207.47	PK	3.4	267	H	47.4	50.8	74	-23.2
2402.43	AV	11.5	33	V	34.1	45.6	94	-48.4
2402.43	AV	14.6	34	H	34.1	48.7	94	-45.3
2402.43	PK	27.8	164	V	34.1	61.9	114	-52.1
2402.43	PK	27.9	159	H	34.1	62.0	114	-52.0
2390.00	AV	4.5	230	V	33.9	38.4	54	-15.6
2390.00	AV	5.3	59	H	33.9	39.2	54	-14.8
2390.00	PK	17.2	230	V	33.9	51.1	74	-22.9
2390.00	PK	18.5	59	H	33.9	52.4	74	-21.6
2400.00	AV	7.1	215	V	34.0	41.1	54	-12.9
2400.00	AV	8.3	46	H	34.0	42.3	54	-11.7
2400.00	PK	19.4	215	V	34.0	53.4	74	-20.6
2400.00	PK	20.6	46	H	34.0	54.6	74	-19.4



ABOVE 1GHz WORST-CASE DATA : Middle channel

Frequency MHz	Detector	Raw Value dBuV	Direction Degree	Polar H / V	Correction factor dB/m	Emission level dBuV/m	Limit dBuV/m	Margin dB
4882.65	AV	-1.4	24	V	41.8	40.4	54	-13.6
4882.65	AV	-3.7	341	H	41.8	38.1	54	-15.9
4882.65	PK	14.9	177	V	41.8	56.7	74	-17.3
4882.65	PK	10.6	28	H	41.8	52.4	74	-21.6
7323.85	AV	-6.0	325	V	47.9	41.9	54	-12.1
7323.85	AV	-7.3	91	H	47.9	40.6	54	-13.4
7323.85	PK	6.8	77	V	47.9	54.7	74	-19.3
7323.85	PK	3.9	267	H	47.9	51.8	74	-22.2
2441.32	AV	13.2	33	V	34.3	47.5	94	-46.5
2441.32	AV	16.1	34	H	34.3	50.4	94	-43.6
2441.32	PK	30.4	164	V	34.3	64.7	114	-49.3
2441.32	PK	31.5	159	H	34.3	65.8	114	-48.2



## ABOVE 1GHz WORST-CASE DATA : High channel

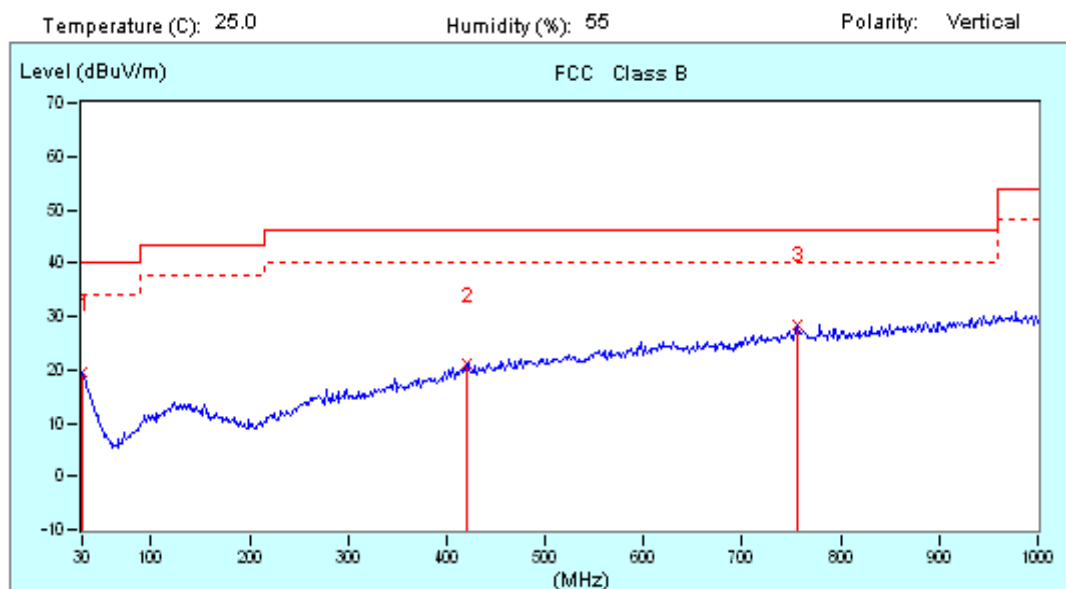
Frequency MHz	Detector	Raw Value dBuV	Direction Degree	Polar H / V	Correction factor dB/m	Emission level dBuV/m	Limit dBuV/m	Margin dB
4960.850	AV	-1.1	24	V	42.0	40.9	54	-13.1
4960.850	AV	-3.9	341	H	42.0	38.1	54	-15.9
4960.850	PK	15.3	177	V	42.0	57.3	74	-16.7
4960.850	PK	10.2	28	H	42.0	52.2	74	-21.8
7441.250	AV	-6.4	325	V	48.1	41.7	54	-12.3
7441.250	AV	-7.1	91	H	48.1	41.0	54	-13.0
7441.250	PK	6.5	77	V	48.1	54.6	74	-19.4
7441.250	PK	4.2	267	H	48.1	52.3	74	-21.7
2480.420	AV	13.6	33	V	34.5	48.1	94	-45.9
2480.420	AV	16.7	34	H	34.5	51.2	94	-42.8
2480.420	PK	30.9	164	V	34.5	65.4	114	-48.6
2480.420	PK	31.2	159	H	34.5	65.7	114	-48.3
2483.500	AV	5.9	52	V	34.6	40.5	54	-13.5
2483.500	AV	5.2	50	H	34.6	39.8	54	-14.2
2483.500	PK	16.8	150	V	34.6	51.4	74	-22.6
2483.500	PK	15.9	153	H	34.6	50.5	74	-23.5

- REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.  
5. “ \* “: Fundamental frequency.



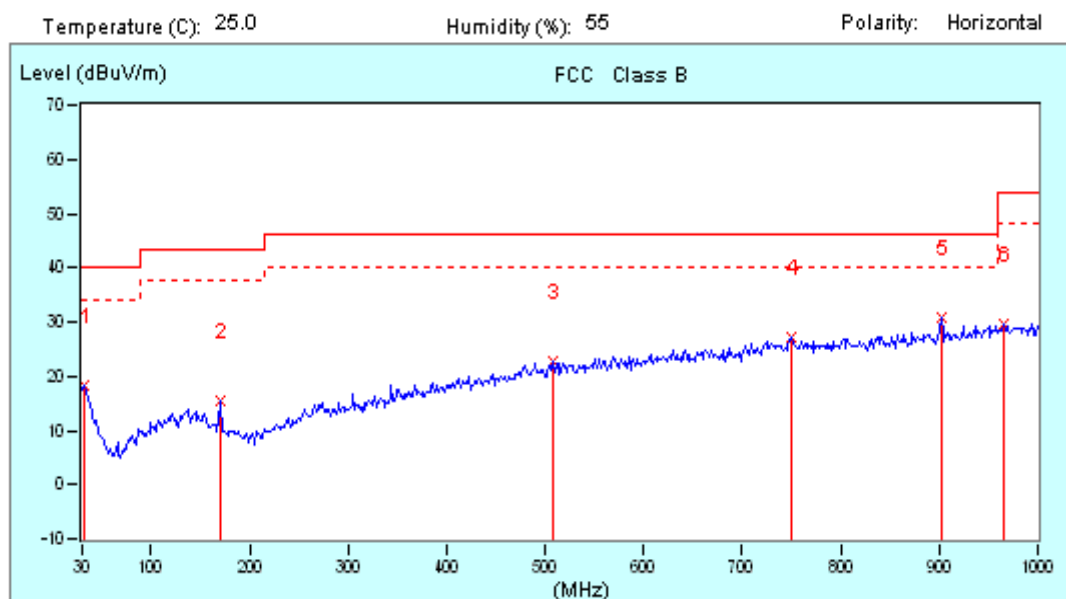
**Test Report No.:FC110929N010-1**

### BELOW 1GHz WORST-CASE DATA : Low channel

[illegible]



**Test Report No.:FC110929N010-1**

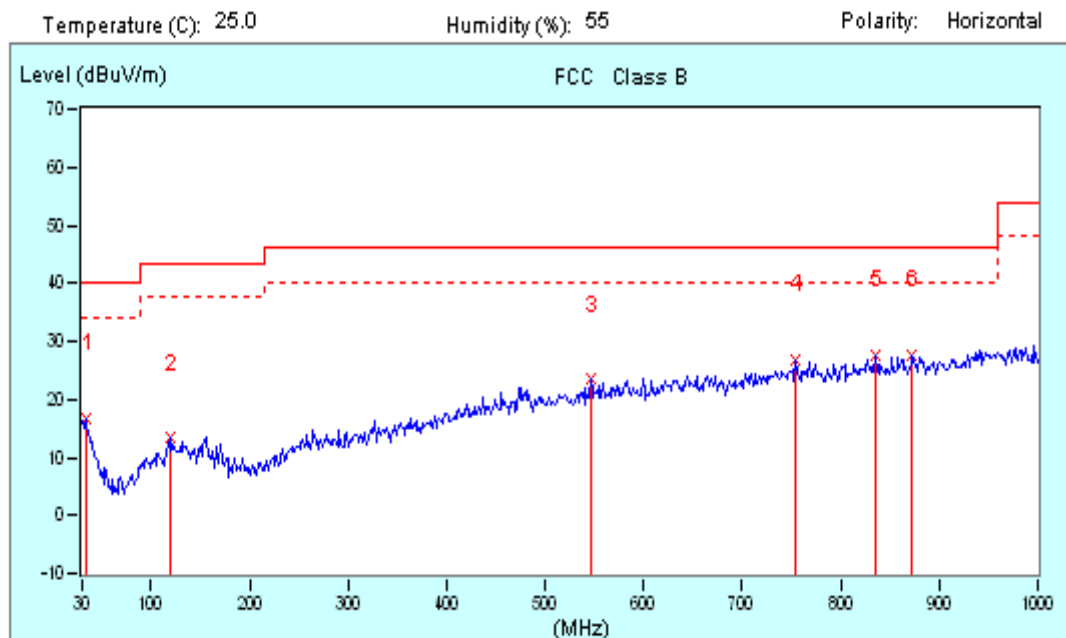
[illegible]







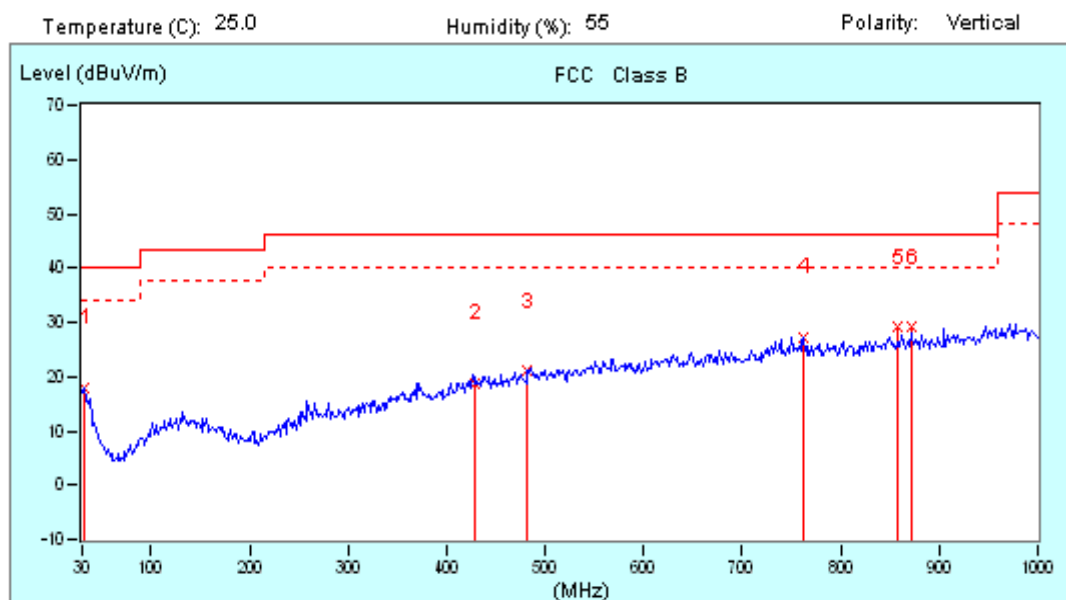
**Test Report No.:FC110929N010-1**

[illegible]



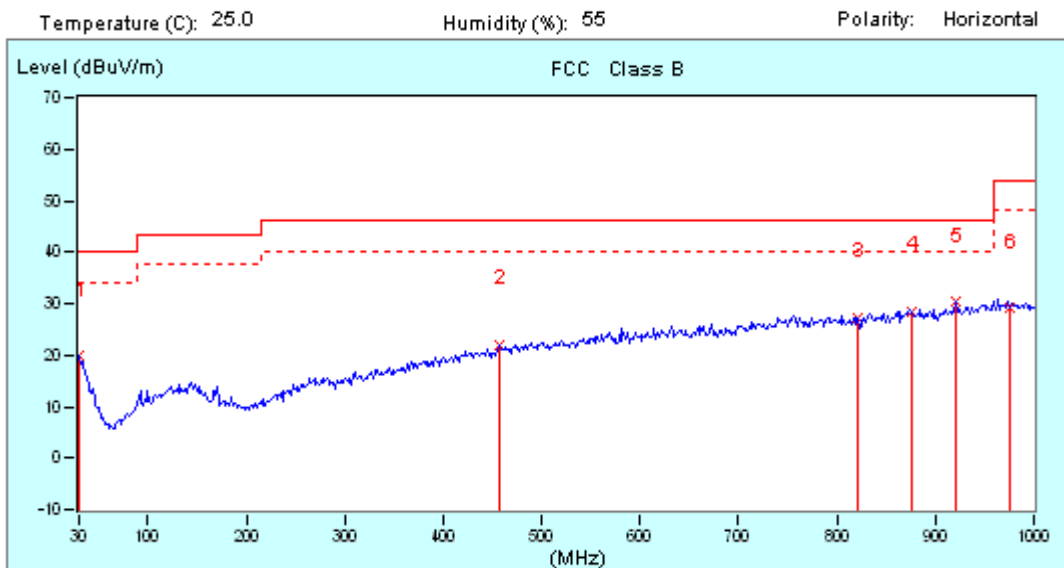
**Test Report No.:FC110929N010-1**

### BELOW 1GHz WORST-CASE DATA : High channel

[illegible]



**Test Report No.:FC110929N010-1**

[illegible]

**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.

## 4.2 20dB BANDWIDTH MEASUREMENT

### 4.2.1 LIMITS OF 20dB BANDWIDTH MEASUREMENT

According to FCC 15.215(c), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Spectrum Analyzer Agilent	E4446A	MY46180622	Apr. 25,11	Apr. 25,12

**NOTE:** The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA and NIM/CHINA

### 4.2.3 TEST PROCEDURE

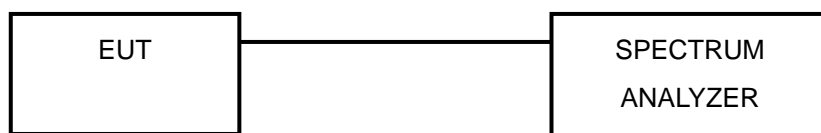
The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.



#### 4.2.5 TEST SETUP



#### 4.2.6 EUT OPERATING CONDITIONS

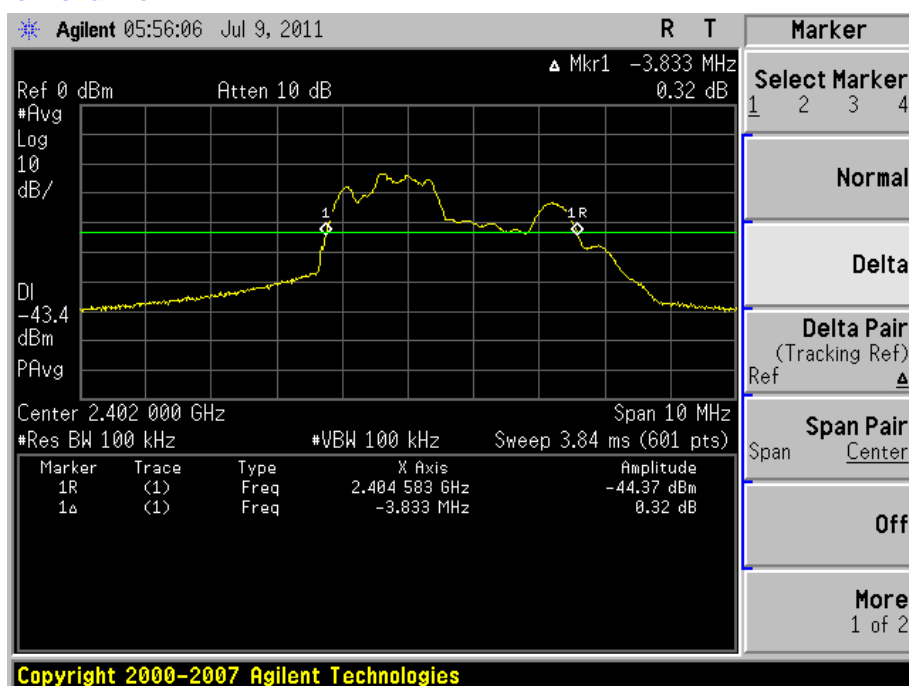
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



#### 4.2.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
Low	2402	3. 83
Middle	2441	3. 38
High	2480	2. 98

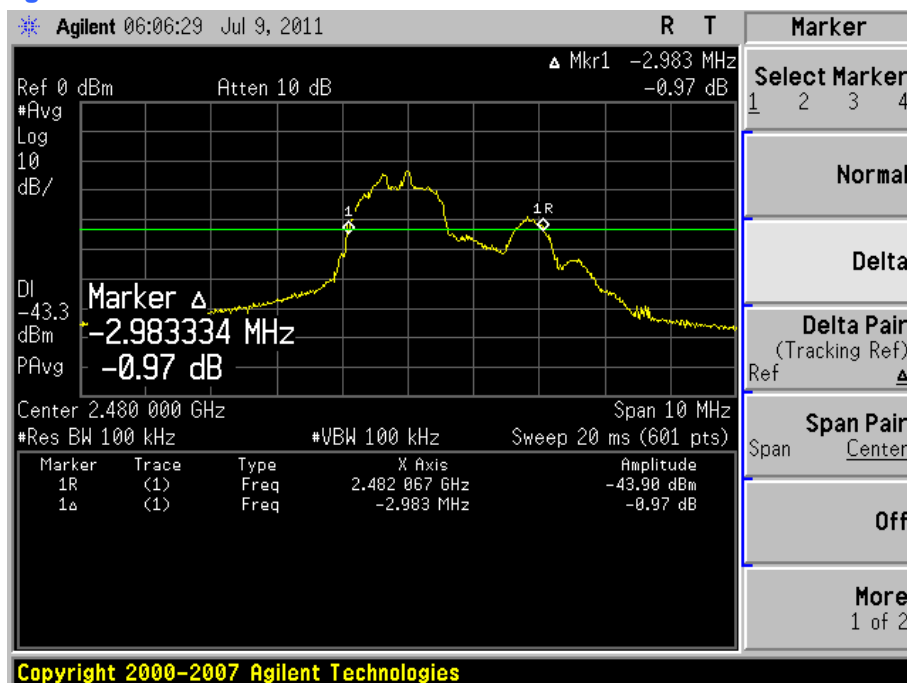
#### Test Data: Low channel



Test Data: Middle channel



Test Data: High channel



### 4.3 OUT OF BAND EMISSIONS

#### 4.3.1 STANDARD APPLICABLE

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental, whichever is the lesser attenuation.

#### 4.3.2 TEST EQUIPMENT LIST AND DETAILS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Spectrum Analyzer Agilent	E4446A	MY46180622	Apr. 25,11	Apr. 25,12

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

#### 4.3.3 TEST PROCEDURE

As the radiation test, set the Lowest and Highest Transmitting Channel, observed the outside band of 2400MHz to 2438.5MHz, than mark the higher-level emission for comparing with the FCC rules.

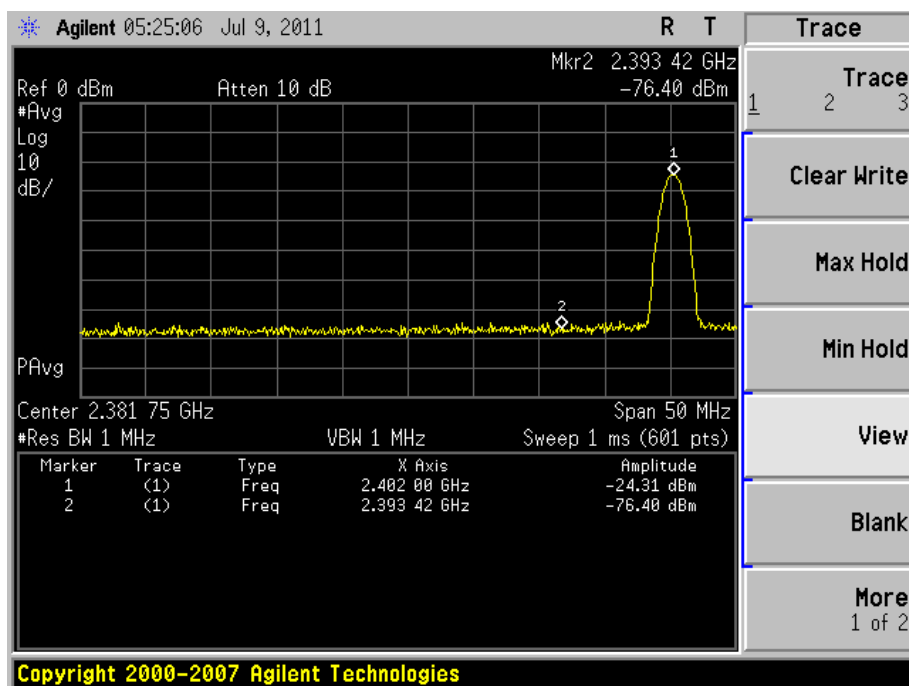
#### 4.3.4 SUMMARY OF TEST RESULTS/PLOTS

Frequency MHz	Limit dBuV	Result
Low Edge	<54	Pass
High Edge	<54	Pass

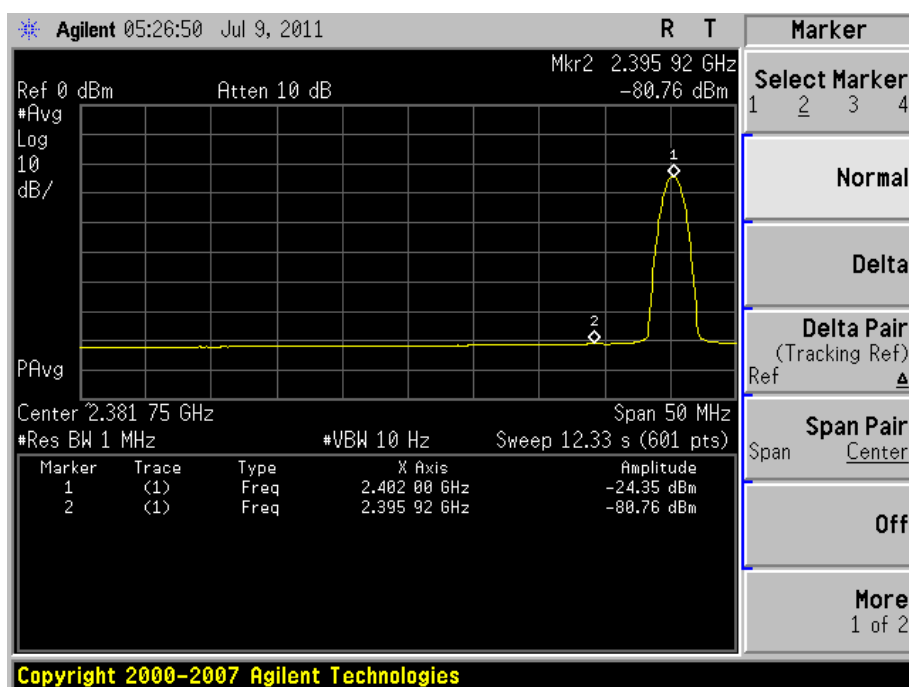
The edge emissions are shall be attenuated by at least 50 dB below the level of the fundamental.  
Please refer to the test plots below.



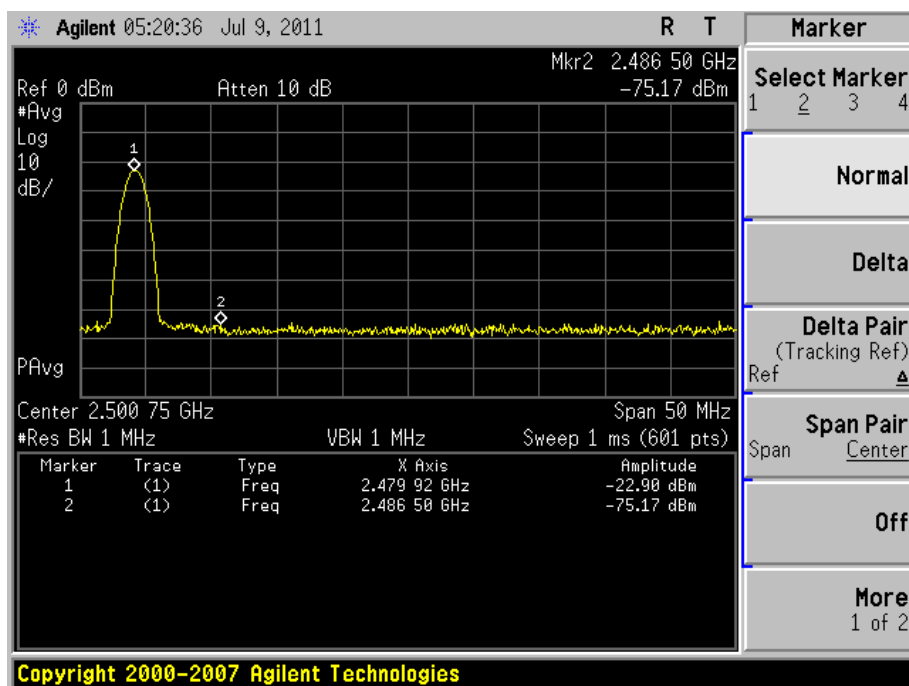
Lowest Bandedge: PK



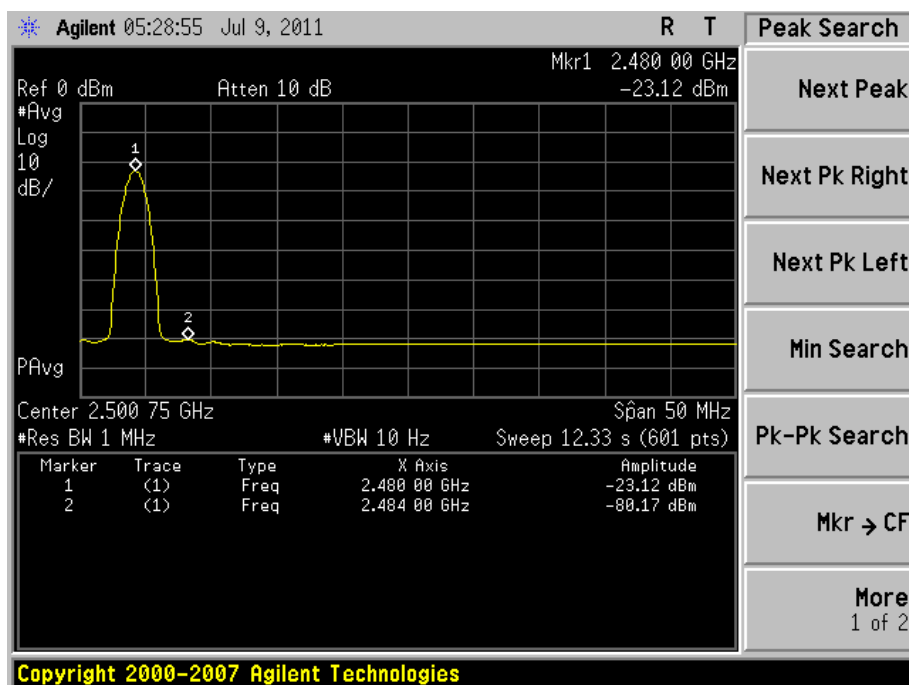
Lowest Bandedge: AV



Highest Bandedge: PK



Highest Bandedge: AV





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## **5 PHOTOGRAPHS OF THE TEST CONFIGURATION**

Please refer to the attached file (Test Setup Photo).



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## **6 APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB**

No any modifications are made to the EUT by the lab during the test.

**---END---**