



# FCC TEST REPORT

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**MODEL NO.:** 62220-01  
**FCC ID:** ZHK-62220-01  
**RECEIVED:** Aug. 31, 2012  
**TESTED:** Sep. 04 ~ Sep. 05, 2012  
**ISSUED:** Sep. 14, 2012

**APPLICANT:** SteelSeries ApS

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IL. Chicago, IL 60661

**ISSUED BY:** Bureau Veritas Consumer Products Services  
(H.K.) Ltd., Taoyuan Branch

**LAB ADDRESS:** No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist.,  
New Taipei City, Taiwan, R.O.C.

**TEST LOCATION:** No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei  
Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF120831C16	Original release	Sep. 14, 2012



## 1. CERTIFICATION

**PRODUCT:** WORLD OF WARCRAFT WIRELESS MMO MOUSE

**MODEL NO.:** 62220-01

**BRAND:** STEELSERIES

**APPLICANT:** SteelSeries ApS

**TESTED:** Sep. 04 ~ Sep. 05, 2012

**TEST SAMPLE:** ENGINEERING SAMPLE

**STANDARDS:** FCC Part 15, Subpart C (Section 15.249)

ANSI C63.10-2009

The above equipment (model: 62220-01) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Jemma Yang , DATE : Sep. 14, 2012  
Jemma Yang / Specialist

APPROVED BY : Ken Liu , DATE : Sep. 14, 2012  
Ken Liu / Manager

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.249)			
STANDARD PARAGRAPH	TEST TYPE	RESULT	REMARK
15.207	Conducted Emission Test	NA	Power supply is 3.7Vdc from battery.
15.209 15.249 15.249 (d)	Radiated Emission Test Band Edge Measurement Limit: 50dB less than the peak value of fundamental frequency or meet radiated emission limit in section 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -12.9dB at 2440.00MHz.

### 2.1 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:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Radiated emission	30MHz ~ 200MHz	3.19 dB
	200MHz ~1000MHz	3.21 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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

<b>EUT</b>	WORLD OF WARCRAFT WIRELESS MMO MOUSE
<b>MODEL NO.</b>	62220-01
<b>POWER SUPPLY</b>	3.7Vdc (from battery)
<b>MODULATION TYPE</b>	GFSK
<b>DATA RATE</b>	2M bit /sec
<b>OPERATING FREQUENCY</b>	2404 ~ 2479MHz
<b>NUMBER OF CHANNEL</b>	26
<b>ANTENNA TYPE</b>	Printed antenna with 0.37dBi gain
<b>DATA CABLE</b>	2.0m shielded wire, USB connector, w/o core
<b>I/O PORT</b>	USB Port
<b>ACCESSORY DEVICES</b>	Cradle (Brand: STEELSERIES, Model: 62220-02)

**NOTE:**

1. The EUT consumes power from the following battery.

<b>Power Rating</b>	3.7Vdc, 0.1A, 0.37W
<b>Type</b>	Lithium

2. The EUT has transmitter and receiver functions.
3. The above EUT information is declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.



### 3.2 DESCRIPTION OF TEST MODES

26 channels are provided to this EUT:

CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)	CHANNEL	FREQ. (MHz)
1	2404	8	2425	15	2446	22	2467
2	2407	9	2428	16	2449	23	2770
3	2410	10	2431	17	2452	24	2473
4	2413	11	2434	18	2455	25	2476
5	2416	12	2437	19	2458	26	2479
6	2419	13	2440	20	2461		
7	2422	14	2443	21	2464		

#### 3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	BM	
A	√	√	-	√	TX Mode

Where **RE<1G**: Radiated Emission below 1GHz      **RE $\geq$ 1G**: Radiated Emission above 1GHz  
**PLC**: Power Line Conducted Emission      **BM**: Bandedge Measurement

**NOTE:**

1. No need to concern of Conducted Emission due to the EUT is powered by batteries.
2. "-" means no effect.

#### **RADIATED EMISSION TEST (ABOVE 1 GHz):**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations axis and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE
-	1 to 26	1, 13, 26	GFSK

#### **RADIATED EMISSION TEST (BELOW 1 GHz):**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations axis and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE
-	1 to 26	13	GFSK

**BANDEDGE MEASUREMENT:**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE
-	1 to 26	1, 26	GFSK

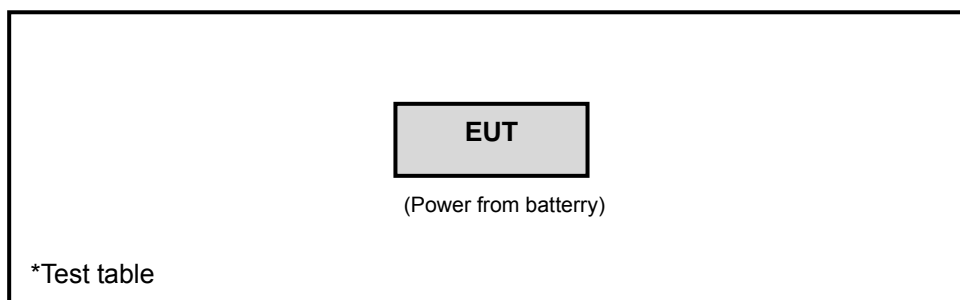
**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	25deg. C, 65%RH	3.7Vdc	Alan Wu
RE $<$ 1G	25deg. C, 65%RH	3.7Vdc	Brad Wu
BM	25deg. C, 65%RH	3.7Vdc	Alan Wu

**3.3 DESCRIPTION OF SUPPORT UNITS**

The EUT has been tested as an independent unit.

**3.3.1 CONFIGURATION OF SYSTEM UNDER TEST**







### 3.4 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 (Section 15.249)**

ANSI C63.10-2009

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.

## 4. TEST TYPES AND RESULTS

### 4.1 RADIATED EMISSION AND BAND EDGE MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION AND BAND EDGE MEASUREMENT

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902 ~ 928 MHz	50	500
2400 ~ 2483.5 MHz	50	500
5725 ~ 5875 MHz	50	500
24 ~ 24.25 GHz	250	2500

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 or to the general radiated emission limits as below table, whichever is the lesser attenuation

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

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. 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	ESI7	838496/016	Jan. 03, 2012	Jan. 02, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSP 40	100039	Feb. 03, 2012	Feb. 02, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Apr. 06, 2012	Apr. 05, 2013
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-408	Jan. 05, 2012	Jan. 04, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 11, 2012	Jul. 10, 2013
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier Agilent	8449B	3008A01961	Oct. 29, 2011	Oct. 28, 2012
Preamplifier Agilent	8447D	2944A10738	Oct. 29, 2011	Oct. 28, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Nov. 03, 2011	Nov. 02, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Nov. 03, 2011	Nov. 02, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Nov. 03, 2011	Nov. 02, 2012
Software ADT	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA	NA
Turn Table ADT	TT100.	TT93021704	NA	NA
Turn Table Controller ADT	SC100.	SC93021704	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  2. The calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
  3. The test was performed in HwaYa Chamber 4.
  4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  5. The FCC Site Registration No. is 460141.
  6. The IC Site Registration No. is IC7450F-4.

#### 4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

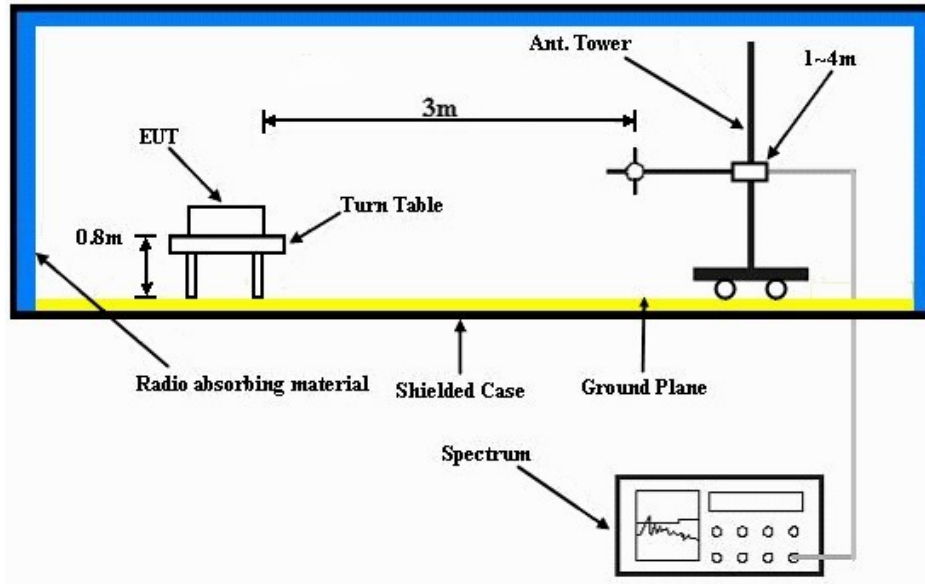
**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. All modes of operation were investigated and the worst-case emissions are reported.

#### 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

Set the EUT under transmitting mode.



### 4.1.7 TEST RESULTS

#### ABOVE 1GHz DATA

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	3.7Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH	TESTED BY	Alan Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	41.2 PK	74.0	-32.8	1.12 H	353	9.20	32.00
2	2390.00	28.7 AV	54.0	-25.3	1.12 H	353	-3.30	32.00
3	2398.00	43.8 PK	74.0	-30.2	1.12 H	353	11.80	32.00
4	2398.00	31.3 AV	54.0	-22.7	1.12 H	353	-0.70	32.00
5	2400.00	40.3 PK	74.0	-33.7	1.12 H	353	8.30	32.00
6	2400.00	17.4 AV	54.0	-36.6	1.12 H	353	-14.60	32.00
7	*2404.00	100.0 PK	114.0	-14.0	1.12 H	353	68.00	32.00
8	*2404.00	77.1 AV	94.0	-16.9	1.12 H	353	45.10	32.00
9	4808.00	51.8 PK	74.0	-22.2	1.06 H	50	13.50	38.30
10	4808.00	28.9 AV	54.0	-25.1	1.06 H	50	-9.40	38.30

#### REMARKS:

- Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
- Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
- The other emission levels were very low against the limit.
- Margin value = Emission level – Limit value.
- “ \* “ : Fundamental frequency
- The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle) Where the duty factor is calculated from following formula:  
 $20 \log (\text{Duty cycle}) = 20 \log (7.15 \text{ ms} / 100 \text{ ms}) = -22.91 \text{ dB}$   
 Please see page 18 for plotted duty.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	3.7Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH	TESTED BY	Alan Wu

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	40.0 PK	74.0	-34.0	1.72 V	23	8.00	32.00
2	2390.00	28.1 AV	54.0	-25.9	1.72 V	23	-3.90	32.00
3	2398.00	40.6 PK	74.0	-33.4	1.72 V	23	8.60	32.00
4	2398.00	29.0 AV	54.0	-25.0	1.72 V	23	-3.00	32.00
5	2400.00	38.1 PK	74.0	-35.9	1.72 V	23	6.10	32.00
6	2400.00	15.2 AV	54.0	-38.8	1.72 V	23	-16.80	32.00
7	*2404.00	92.5 PK	114.0	-21.5	1.72 V	23	60.50	32.00
8	*2404.00	69.6 AV	94.0	-24.4	1.72 V	23	37.60	32.00
9	4808.00	50.4 PK	74.0	-23.6	1.31 V	307	12.10	38.30
10	4808.00	27.5 AV	54.0	-26.5	1.31 V	307	-10.80	38.30

**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
6. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle) Where the duty factor is calculated from following formula:  
 $20 \log (\text{Duty cycle}) = 20 \log (7.15 \text{ ms} / 100 \text{ ms}) = -22.91 \text{ dB}$   
Please see page 18 for plotted duty.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 13	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	3.7Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH	TESTED BY	Alan Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	101.1 PK	114.0	-12.9	1.10 H	349	69.00	32.10
2	*2440.00	78.2 AV	94.0	-15.8	1.10 H	349	46.10	32.10
3	4880.00	51.6 PK	74.0	-22.4	1.05 H	206	13.10	38.50
4	4880.00	28.7 AV	54.0	-25.3	1.05 H	206	-9.80	38.50
5	7320.00	56.6 PK	74.0	-17.4	1.03 H	185	12.20	44.40
6	7320.00	33.7 AV	54.0	-20.3	1.03 H	185	-10.70	44.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2440.00	93.5 PK	114.0	-20.5	1.36 V	276	61.40	32.10
2	*2440.00	70.6 AV	94.0	-23.4	1.36 V	276	38.50	32.10
3	4880.00	50.7 PK	74.0	-23.3	1.00 V	160	12.20	38.50
4	4880.00	27.8 AV	54.0	-26.2	1.00 V	160	-10.70	38.50
5	7320.00	55.2 PK	74.0	-18.8	1.00 V	58	10.80	44.40
6	7320.00	32.0 AV	54.0	-22.0	1.00 V	58	-12.40	44.40

**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
6. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle) Where the duty factor is calculated from following formula:  
 $20 \log (\text{Duty cycle}) = 20 \log (7.15 \text{ ms} / 100 \text{ ms}) = -22.91 \text{ dB}$   
 Please see page 18 for plotted duty.





EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 26	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	3.7Vdc	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH	TESTED BY	Alan Wu

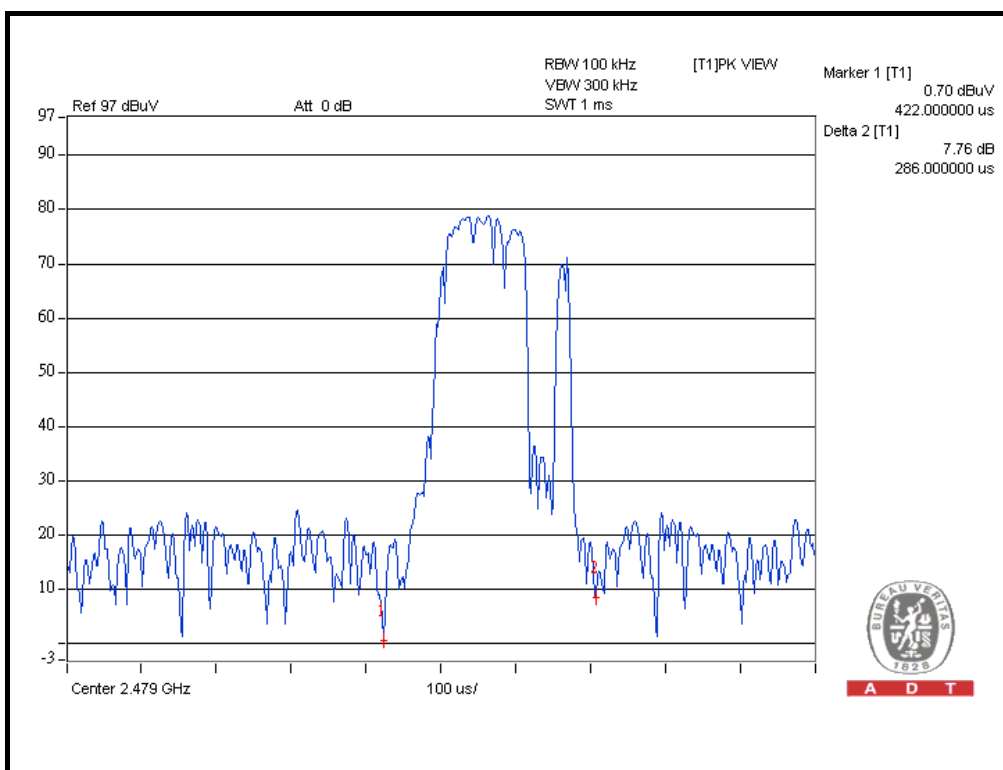
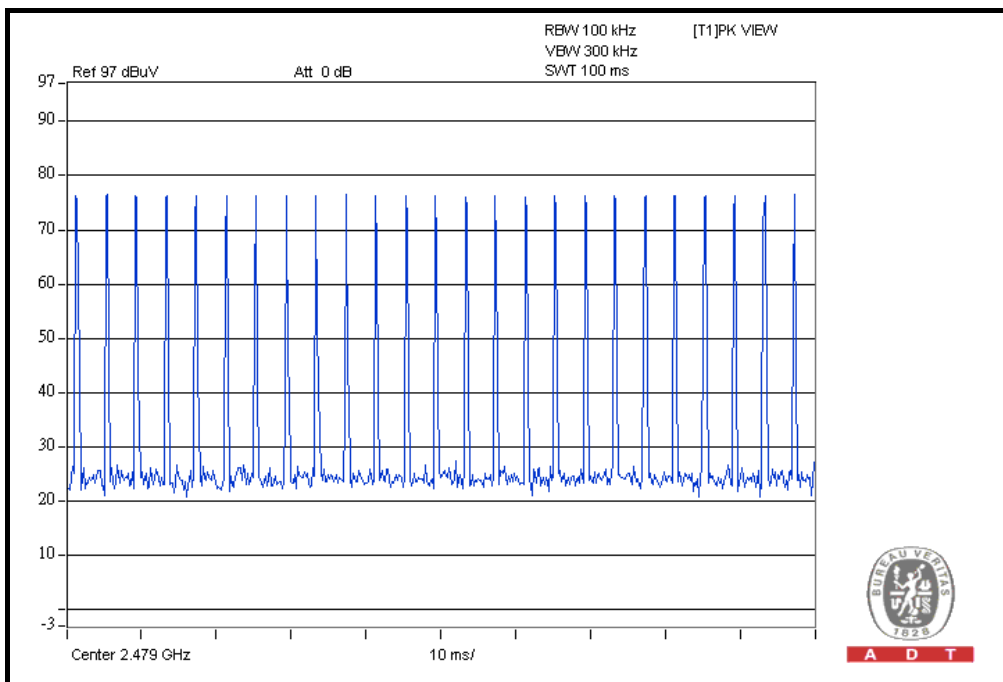
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2479.00	100.4 PK	114.0	-13.6	1.06 H	187	68.10	32.30
2	*2479.00	77.5 AV	94.0	-16.5	1.06 H	187	45.20	32.30
3	2483.50	40.2 PK	74.0	-33.8	1.06 H	187	7.90	32.30
4	2483.50	17.3 AV	54.0	-36.7	1.06 H	187	-15.00	32.30
5	2485.50	44.5 PK	74.0	-29.5	1.06 H	187	12.20	32.30
6	2485.50	31.3 AV	54.0	-22.7	1.06 H	187	-1.00	32.30
7	4958.00	52.3 PK	74.0	-21.7	1.03 H	181	13.90	38.40
8	4958.00	29.4 AV	54.0	-24.6	1.03 H	181	-9.00	38.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2479.00	93.3 PK	114.0	-20.7	1.69 V	276	61.00	32.30
2	*2479.00	70.4 AV	94.0	-23.6	1.69 V	276	38.10	32.30
3	2483.50	36.4 PK	74.0	-37.6	1.69 V	276	4.10	32.30
4	2483.50	13.5 AV	54.0	-40.5	1.69 V	276	-18.80	32.30
5	2485.50	41.3 PK	74.0	-32.7	1.69 V	276	9.00	32.30
6	2485.50	29.1 AV	54.0	-24.9	1.69 V	276	-3.20	32.30
7	4958.00	51.5 PK	74.0	-22.5	1.00 V	18	13.10	38.40
8	4958.00	28.6 AV	54.0	-25.4	1.00 V	18	-9.80	38.40

**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
6. The average value of fundamental frequency is: Average = Peak value + 20log(Duty cycle) Where the duty factor is calculated from following formula:  
 $20 \log (\text{Duty cycle}) = 20 \log (7.15 \text{ ms} / 100 \text{ ms}) = -22.91 \text{ dB}$   
 Please see page 18 for plotted duty.



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$$20 \log (\text{Duty cycle}) = 20 \log (25 \times 0.286 \text{ ms} / 100 \text{ ms}) = -22.91 \text{ dB}$$



### BELOW 1GHz WORST-CASE DATA

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 13	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	3.7Vdc	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH	TESTED BY	Brad Wu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	64.83	17.3 QP	40.0	-22.7	1.50 H	252	4.40	12.90
2	377.23	17.8 QP	46.0	-28.2	1.00 H	224	1.20	16.60
3	460.67	18.5 QP	46.0	-27.5	1.25 H	87	-0.10	18.60
4	582.91	21.1 QP	46.0	-24.9	1.74 H	80	-0.10	21.20
5	769.19	24.8 QP	46.0	-21.2	2.00 H	318	1.00	23.80
6	908.90	27.5 QP	46.0	-18.5	1.50 H	177	1.70	25.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	99.75	24.1 QP	43.5	-19.4	1.49 V	6	14.70	9.40
2	272.45	14.5 QP	46.0	-31.5	1.00 V	150	0.80	13.70
3	468.43	19.1 QP	46.0	-26.9	1.74 V	13	0.40	18.70
4	643.07	22.3 QP	46.0	-23.7	1.00 V	95	0.50	21.80
5	815.76	25.4 QP	46.0	-20.6	1.00 V	221	0.60	24.80
6	885.62	27.1 QP	46.0	-18.9	1.74 V	13	1.50	25.60

#### 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. PHOTOGRAPHS OF THE TEST CONFIGURATION

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



## 6. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

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The address and road map of all our labs can be found in our web site also.

## **7. APPENDIX A – MODIFICATION 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---**