



# FCC/IC Radio Test Report

FCC ID: WX9RC30001206

IC: 8092A-RC30001206

This report concerns (check one):  Original Grant  Class II Change

**Issued Date** : May. 09, 2011  
**Project No.** : 1105C003  
**Equipment** : Razer Mamba Elite Ergonomic Gaming Mouse  
**Model Name** : RC30-001206  
**Applicant** : Razer (Asia-Pacific) Pte Ltd  
**Address** : 514 Chai Chee Lane #07-01~06.Singapore 469029  
**Manufacturer** : Razer Technology Development (Shenzhen) Co.,Ltd  
**Address** : 302B room, East Wing,3F,Block 2,Phase 1 of Vision Business Park,Keji South Rd, Hi-Tech Industrial Park, Shenzhen 518057,China

**Tested by:**

Neutron Engineering Inc. EMC Laboratory

**Date of Receipt:** May. 03, 2011

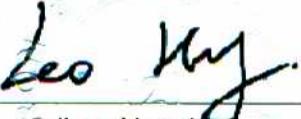
**Date of Test:**

May. 03, 2011 ~ May. 08, 2011

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## Declaration

**Neutron** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **R.O.C.**, or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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**Neutron**'s laboratory quality assurance procedures are in compliance with the **ISO Guide 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

## Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.



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## **1. CERTIFICATION**

**Equipment:** Razer Mamba Elite Ergonomic Gaming Mouse

**Brand Name :** RAZER

**Model Name.:** RC30-001206

**Applicant:** Razer (Asia-Pacific) Pte Ltd

**Date of Test:** May. 03, 2011 ~ May. 08, 2011

**Test Item:** ENGINEERING SAMPLE

**Standards:** FCC Part15, Subpart C(15.249)/ ANSI C63.4 : 2003 ; Canada RSS-210:2010

The above equipment has been tested and found compliance with the requirement of the relative standards by Neutron Engineering Inc. EMC Laboratory.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. NEI-FICP-1-1105C003) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of NVLAP and TAF according to the ISO-17025 quality assessment standard and technical standard(s).



## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

<b>FCC Part15, Subpart C (15.249)    Canada RSS-210:2010</b>				
StandardSection		Test Item	Judgment	Remark
FCC	RSS-210			
15.207		Conducted Emission	PASS	
15.209		Radiated Emission	PASS	
15.249	A2.9(a)	Radiated Spurious Emission	PASS	

**NOTE:**

- (1)" N/A" denotes test is not applicable in this Test Report
- (2) The EUT used rechargeable Li-ion battery.



## 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **DG-C02/DG-CB03** at the location of No.3,Jinshagang 1st Road, ShiXia, Dalang Town,Dong Guan, China.523792

Neutron's test firm number for FCC 319330

Neutron's test firm number for IC 4428B-1

## 2.2 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:

The reported uncertainty of measurement  $y \pm U$ , where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**, providing a level of confidence of approximately **95 %** .

### A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
DG-C02	CISPR	150 KHz ~ 30MHz	1.94	

### B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U , (dB)	NOTE
DG-CB03	CISPR	30MHz ~ 200MHz	V	2.48	
		30MHz ~ 200MHz	H	2.16	
		200MHz ~ 1,000MHz	V	2.50	
		200MHz ~ 1,000MHz	H	2.66	



### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

Equipment	Razer Mamba Elite Ergonomic Gaming Mouse																	
Brand Name	RAZER																	
Model Name.	RC30-001206																	
OEM Brand/Model Name	N/A																	
Model Difference	N/A																	
Product Description	<p>The EUT is a Razer Mamba Elite Ergonomic Gaming Mouse.</p> <table border="1"><tr><td>Product Type</td><td>Low Power Communication Device</td></tr><tr><td>Operation Frequency:</td><td>2402~2480 MHz</td></tr><tr><td>Modulation Type:</td><td>GFSK</td></tr><tr><td>Date rate:</td><td>1Mbps</td></tr><tr><td>Number of Channel</td><td>79CH .Please see Note 2.</td></tr><tr><td>Antenna Designation:</td><td>Printed antenna</td></tr><tr><td>Antenna Gain(Peak)</td><td>3.85 dBi</td></tr><tr><td>Output Power:</td><td>67.25 dBuV/m (AV Max.)</td></tr></table> <p>Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification. Please refer to the User's Manual.</p>		Product Type	Low Power Communication Device	Operation Frequency:	2402~2480 MHz	Modulation Type:	GFSK	Date rate:	1Mbps	Number of Channel	79CH .Please see Note 2.	Antenna Designation:	Printed antenna	Antenna Gain(Peak)	3.85 dBi	Output Power:	67.25 dBuV/m (AV Max.)
Product Type	Low Power Communication Device																	
Operation Frequency:	2402~2480 MHz																	
Modulation Type:	GFSK																	
Date rate:	1Mbps																	
Number of Channel	79CH .Please see Note 2.																	
Antenna Designation:	Printed antenna																	
Antenna Gain(Peak)	3.85 dBi																	
Output Power:	67.25 dBuV/m (AV Max.)																	
Channel List	Please refer to the Note 2.																	
Power Source	<p>DC Voltage supplied from Li-ion battery. Brand/Model name: RAZER/FT703437PP</p>																	
Power Rating	DC 3.7V 800mAh																	
Connecting I/O Port(s)	Please refer to the User's Manual																	

**Note:**

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



2.

<b>Channel List</b>					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2402	28	2429	55	2456
02	2403	29	2430	56	2457
03	2404	30	2431	57	2458
04	2405	31	2432	58	2459
05	2406	32	2433	59	2460
06	2407	33	2434	60	2461
07	2408	34	2435	61	2462
08	2409	35	2436	62	2463
09	2410	36	2437	63	2464
10	2411	37	2438	64	2465
11	2412	38	2439	65	2466
12	2413	39	2440	66	2467
13	2414	40	2441	67	2468
14	2415	41	2442	68	2469
15	2416	42	2443	69	2470
16	2417	43	2444	70	2471
17	2418	44	2445	71	2472
18	2419	45	2446	72	2473
19	2420	46	2447	73	2474
20	2421	47	2448	74	2475
21	2422	48	2449	75	2476
22	2423	49	2450	76	2477
23	2424	50	2451	77	2478
24	2425	51	2452	78	2479
25	2426	52	2453	79	2480
26	2427	53	2454		
27	2428	54	2455		

3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	N/A	N/A	Printed Antenna	N/A	3.85



## 3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Wireless Link
Mode 2	CH Lower – 2402MHz
Mode 3	CH Middle – 2441MHz
Mode 4	CH Highest -2480MHz

For Conducted Test	
Final Test Mode	Description
Mode 1	Wireless Link

For Radiated Test	
Final Test Mode	Description
Mode 2	CH Lower – 2402MHz
Mode 3	CH Middle – 2441MHz
Mode 4	CH Highest -2480MHz

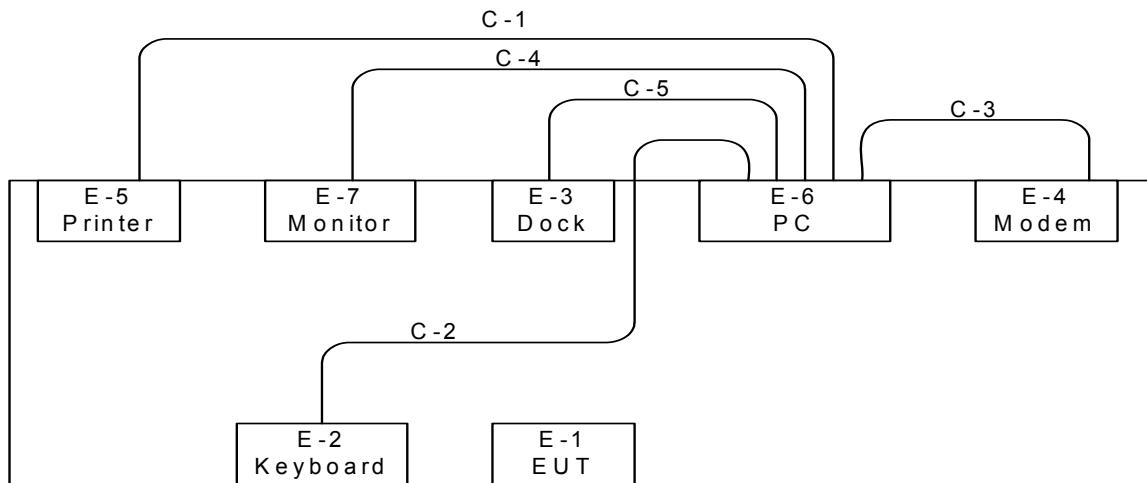
Note:

(1) The measurements are performed at the highest, middle, lowest available channels.



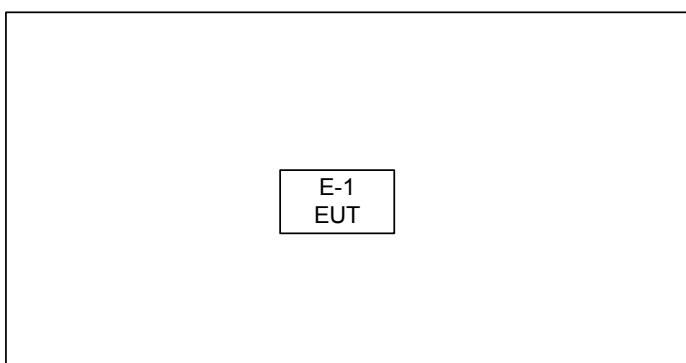
### 3.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

#### Conducted: Wireless Link



C -1: Parallel Cable  
C -2: USB Cable  
C -3: RS232 Cable  
C -4: D -Sub Cable  
C -5: USB Cable

#### Radiated: TX/RX Mode





### 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.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
E-1	Razer Mamba Elite Ergonomic Gaming Mouse	RAZER	RC30-001206	WX9RC30001206	N/A	EUT
E-2	USB Keyboard	Dell	L100	DOC	CNORH6596589071T08NE	
E-3	Razer Charging Dock	RAZER	RC30-001207	WX9RC30001207	CNORH6596589071T08NE	
E-4	Modem	ACEEX	DM-1414V	IFAXDm1414	0603002131	
E-5	Printer	SII	DPU-414	DOC	3018507 B	
E-6	PC	Dell 745	DCSM	DOC	G7K832X	
E-7	LCD monitor	Dell	E177FPc	DOC	CNOFJ179-64180-6AG-1WNS	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	YES	NO	1.5M	
C-2	YES	NO	1.5M	
C-3	YES	NO	1.5M	
C-4	YES	YES	1.2M	
C-5	YES	NO	2.2M	

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in m in 『Length』 column.



## 4. EMC EMISSION TEST

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 POWER LINE CONDUCTED EMISSION LIMITS (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)		Standard
	Quasi-peak	Average	Quasi-peak	Average	
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 -5.0	73.00	60.00	56.00	46.00	CISPR
5.0 -30.0	73.00	60.00	60.00	50.00	CISPR

0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *	FCC
0.50 -5.0	73.00	60.00	56.00	46.00	FCC
5.0 -30.0	73.00	60.00	60.00	50.00	FCC

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

### 4.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	00052765	May.26.2011
2	LISN	R&S	ENV216	100087	May.26.2011
3	Test Cable	N/A	C_17	N/A	Mar.30.2012
4	EMI TEST RECEIVER	R&S	ESCS30	8333641017	May.27.2011
5	50Ω Terminator	SHX	TF2-3G-A	08122902	May.26.2011

Remark: " N/A" denotes No Model Name. , Serial No. or No Calibration specified.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz



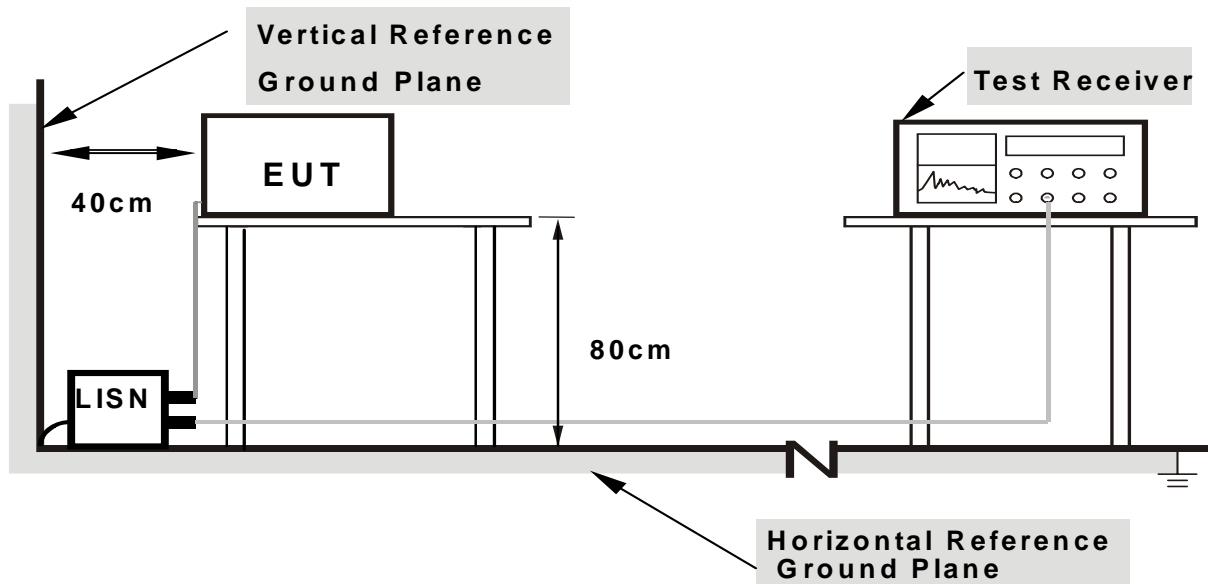
### 4.1.3 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.1.5 TEST SETUP



**Note: 1. Support units were connected to second LISN.**

**2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes**

### 4.1.6 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

The EUT was programmed to be in continuously transmitting mode.



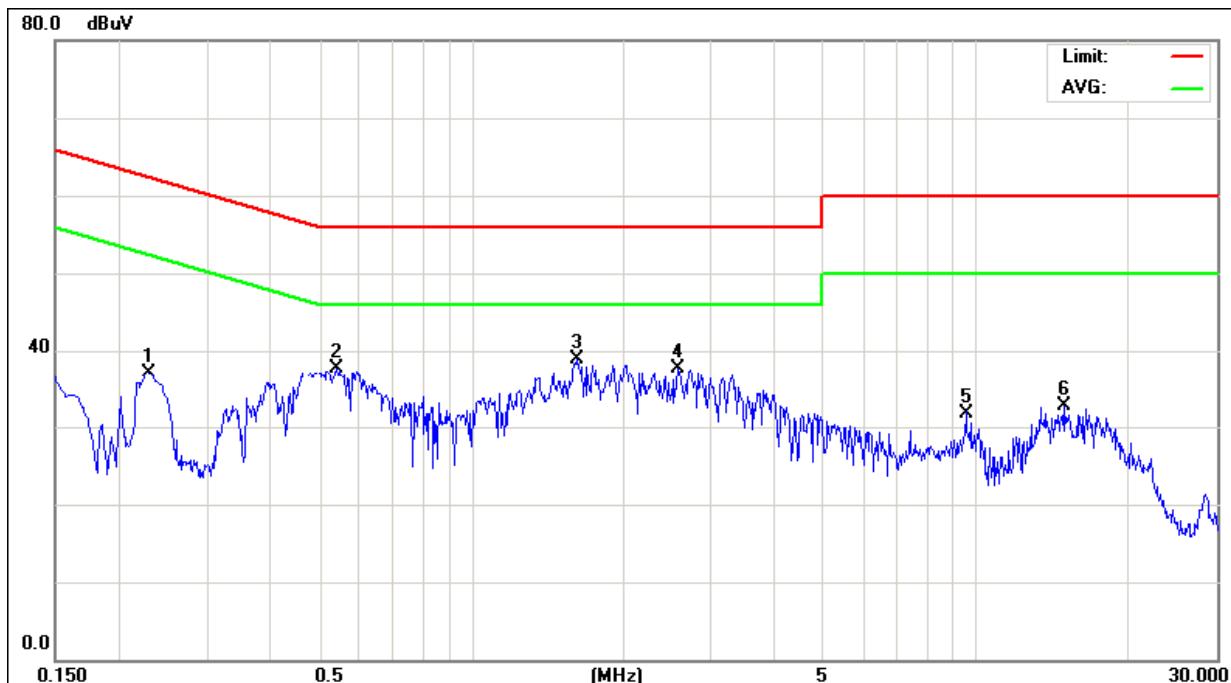
## 4.1.7 TEST RESULTS

EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	21 °C	Relative Humidity :	50 %
Pressure :	1009 hPa	Test Power :	AC 120V/60Hz
Test Mode :	Wireless Link		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.23	Line	37.12	*	62.49	52.49	-25.37	(QP)
0.54	Line	37.76	*	56.00	46.00	-18.24	(QP)
1.61	Line	38.84	*	56.00	46.00	-17.16	(QP)
2.58	Line	37.66	*	56.00	46.00	-18.34	(QP)
9.55	Line	31.80	*	60.00	50.00	-28.20	(QP)
14.91	Line	32.62	*	60.00	50.00	-27.38	(QP)

### Remark

- (1) All readings are QP Mode value unless otherwise stated AVG in column of "Note". If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a " \* " marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150KHz to 30MHz.
- (3) "N/A" denotes test is not applicable in this Test Report.



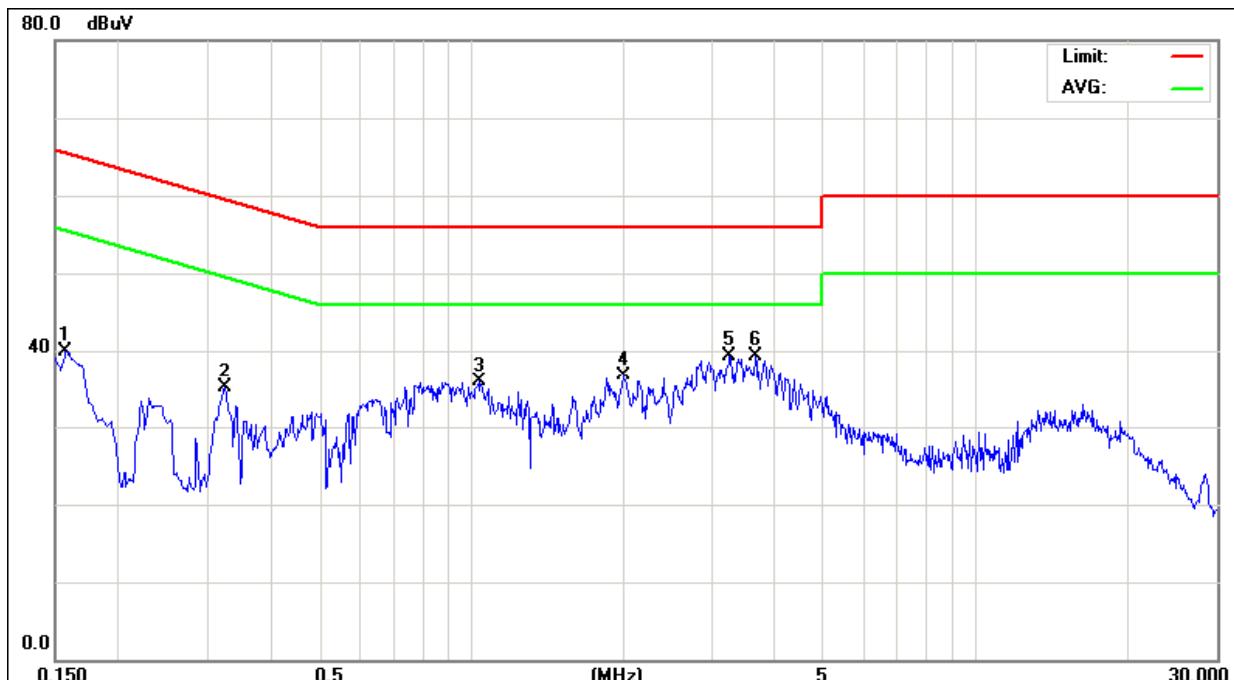


EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	21 °C	Relative Humidity :	50 %
Pressure :	1009 hPa	Test Power :	AC 120V/60Hz
Test Mode :	Wireless Link		

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Margin (dB)	Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.16	Neutral	39.83	*	65.61	55.61	-25.78	(QP)
0.33	Neutral	35.09	*	59.58	49.58	-24.49	(QP)
1.03	Neutral	35.83	*	56.00	46.00	-20.17	(QP)
2.00	Neutral	36.73	*	56.00	46.00	-19.27	(QP)
3.26	Neutral	39.25	*	56.00	46.00	-16.75	(QP)
3.66	Neutral	39.27	*	56.00	46.00	-16.73	(QP)

**Remark**

- (1) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform. In this case, a “\*” marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150KHz to 30MHz.
- (3) "N/A" denotes test is not applicable in this Test Report.





## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 RADIATED EMISSION LIMITS ( FCC 15.209 )

Frequencies (MHz)	Field Strength (micorvolts/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

Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other 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 comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission level (dBuV/m)=20log Emission level (uV/m).

### LIMITS OF RADIATED EMISSION MEASUREMENT ( FCC 15.209 )

FREQUENCY (MHz)	(dBuV/m) (at 3m)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

### LIMITS OF RADIATED EMISSION MEASUREMENT (FCC Part 15.249)

FCC Part15 (15.249) , Subpart C	
Limit	Frequency Range (MHz)
Field strength of fundamental 50000 $\mu$ V/m (94 dB $\mu$ V/m) @ 3 m	2400-2483.5
Field strength of harmonics 500 $\mu$ V/m (54 dB $\mu$ V/m) @ 3 m	Above 2483.5



#### 4.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Active Loop Antenna	R&S	HFH2-Z2	830749/020	May.27.2011
2	Bi-log Antenna	Schwarbeck	VULB9160	9160-3232	May.26.2011
3	Horn Antenna	ETS	3115	00075789	May.12.2011
4	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170340	Dec.15.2011
5	Amplifier	HP	8447D	2944A09673	May.26.2011
6	Amplifier	Agilent	8449B	3008A02274	May.26.2011
7	Amplifier	EMC	EMC2654045	980039	Aug.12.2011
8	Test Receiver	R&S	ESCI	100895	May.26.2011
9	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2011
10	Test Cable	N/A	C-01_CB03	N/A	Jul.05.2011
11	Test Cable	HUBER+SUHNER	SUCOFLEX_8 m	313794/4	Apr.11.2012
12	Controller	CT	SC100	N/A	N/A

Remark: " N/A" denotes No Model Name. / Serial No. and No Calibration specified.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP



#### **4.2.3 TEST PROCEDURE**

- a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3m meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

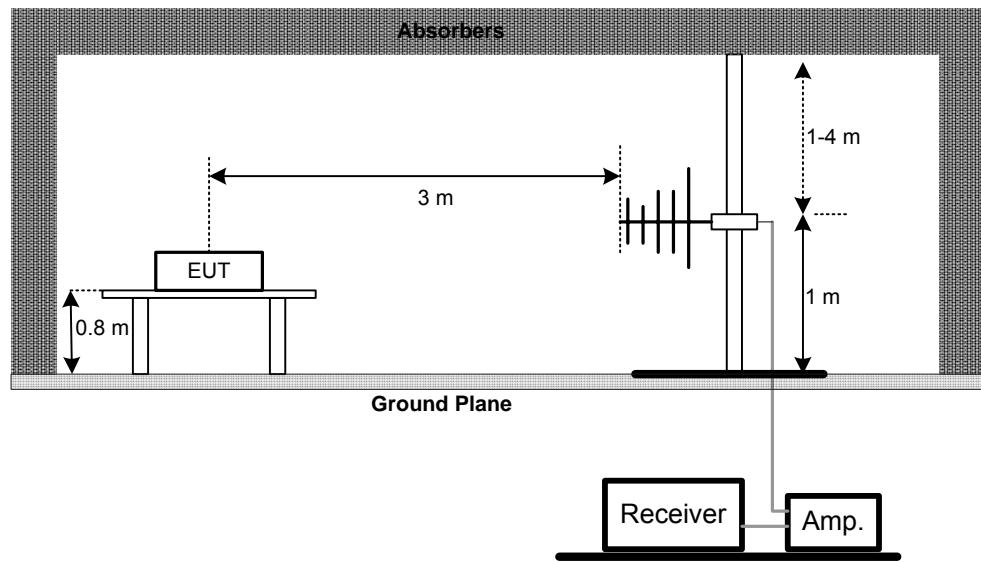
#### **4.2.4 DEVIATION FROM TEST STANDARD**

No deviation

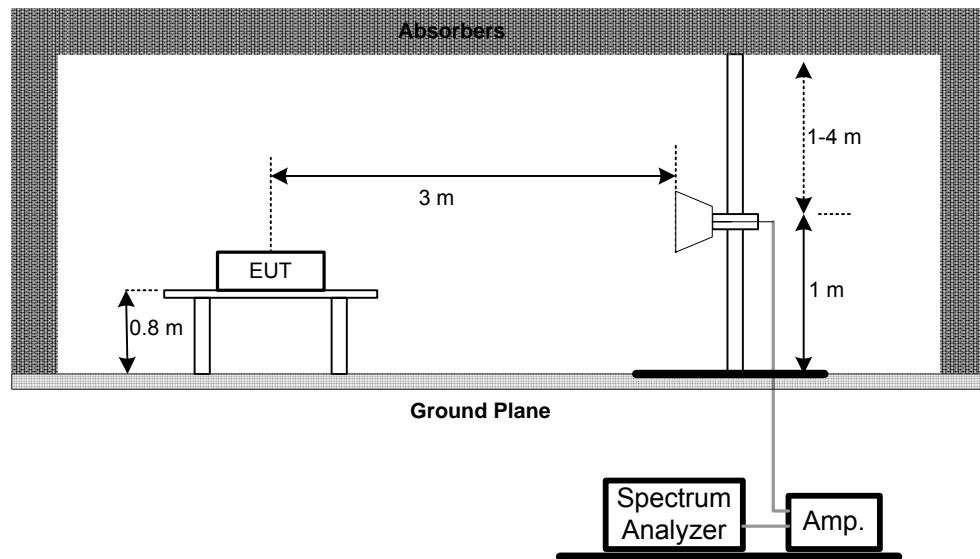


#### 4.2.5 TEST SETUP

##### (A) Radiated Emission Test Set-Up Frequency Below 1 GHz

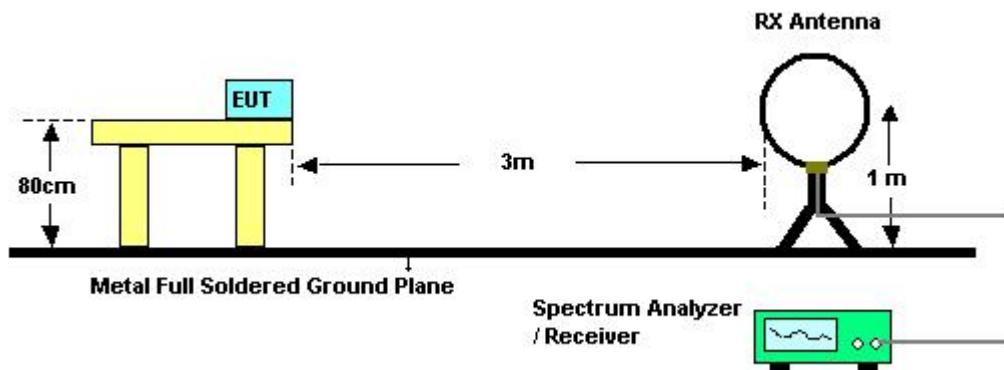


##### (B) Radiated Emission Test Set-Up Frequency Above 1 GHz





(C) For radiated emissions below 30MHz



#### 4.2.6 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

**4.2.7 TEST RESULTS (BELOW 30MHz)**

EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	25°C	Relative Humidity :	53 %
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	TX Mode		

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.02	0°	34.23	24.05	58.28	120.04	-61.75	PK
0.26	0°	27.45	20.38	47.82	99.34	-51.52	PK
1.98	0°	21.34	19.50	40.84	69.54	-28.70	PK
2.16	0°	19.43	19.41	38.84	69.54	-30.70	PK
5.49	0°	26.40	18.16	44.56	69.54	-24.98	PK
6.53	0°	27.54	18.08	45.62	69.54	-23.92	PK

Freq. (MHz)	Ant. 0°/90°	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
0.02	90°	34.57	24.05	58.62	120.04	-61.41	PK
0.26	90°	26.76	20.38	47.14	99.34	-52.20	PK
1.98	90°	28.34	19.50	47.84	69.54	-21.70	PK
2.16	90°	22.36	19.41	41.77	69.54	-27.77	PK
5.49	90°	25.54	18.16	43.70	69.54	-25.84	PK
6.53	90°	24.44	18.08	42.52	69.54	-27.02	PK

**Remark :**

- (1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported. °
- (2) Distance extrapolation factor =  $40 \log (\text{specific distance} / \text{test distance})$  (dB); °
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor. °

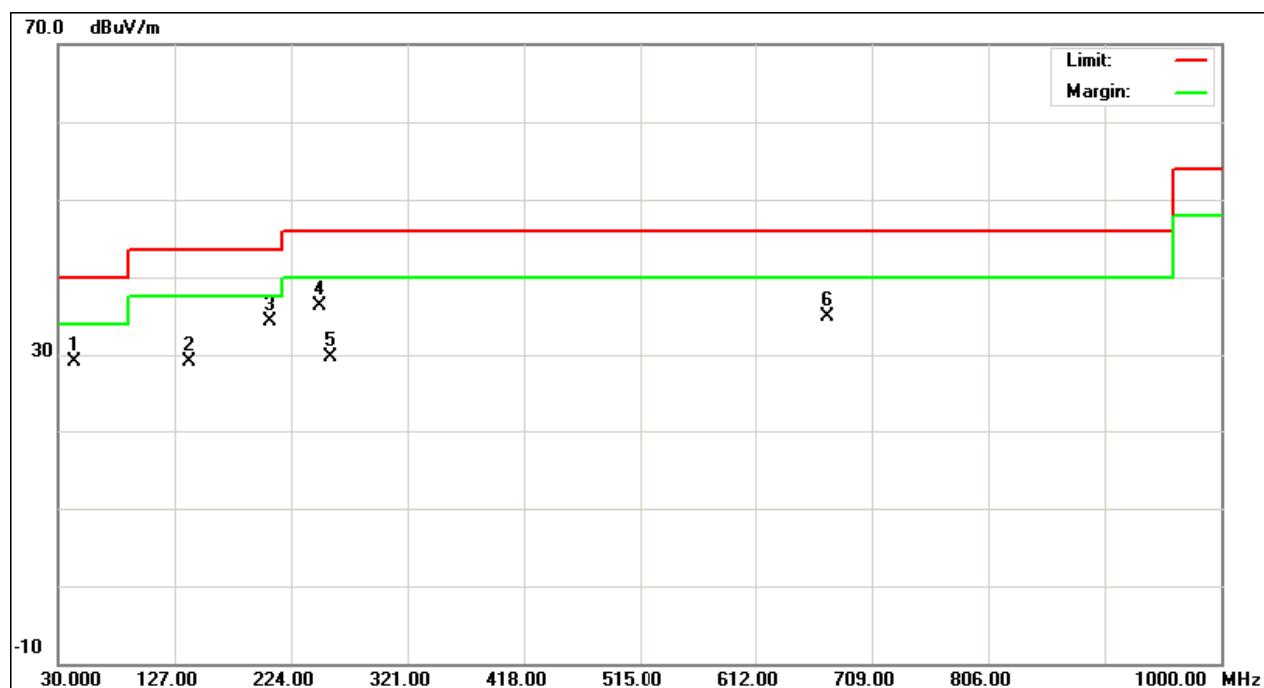
**4.2.8 TEST RESULTS (BETWEEN 30 – 1000 MHz)**

EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23°C	Relative Humidity :	51 %
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	TX Mode 2402MHz		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
43.50	V	46.01	-16.87	29.14	40.00	- 10.86	
137.81	V	46.94	-17.83	29.11	43.50	- 14.39	
205.68	V	50.68	-16.43	34.25	43.50	- 9.25	
248.02	V	51.03	-14.68	36.35	46.00	- 9.65	
256.98	V	43.79	-14.06	29.73	46.00	- 16.27	
672.13	V	38.14	-3.27	34.87	46.00	- 11.13	

**Remark :**

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency 。 "F" denotes fundamental frequency; " H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission 。
- (4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



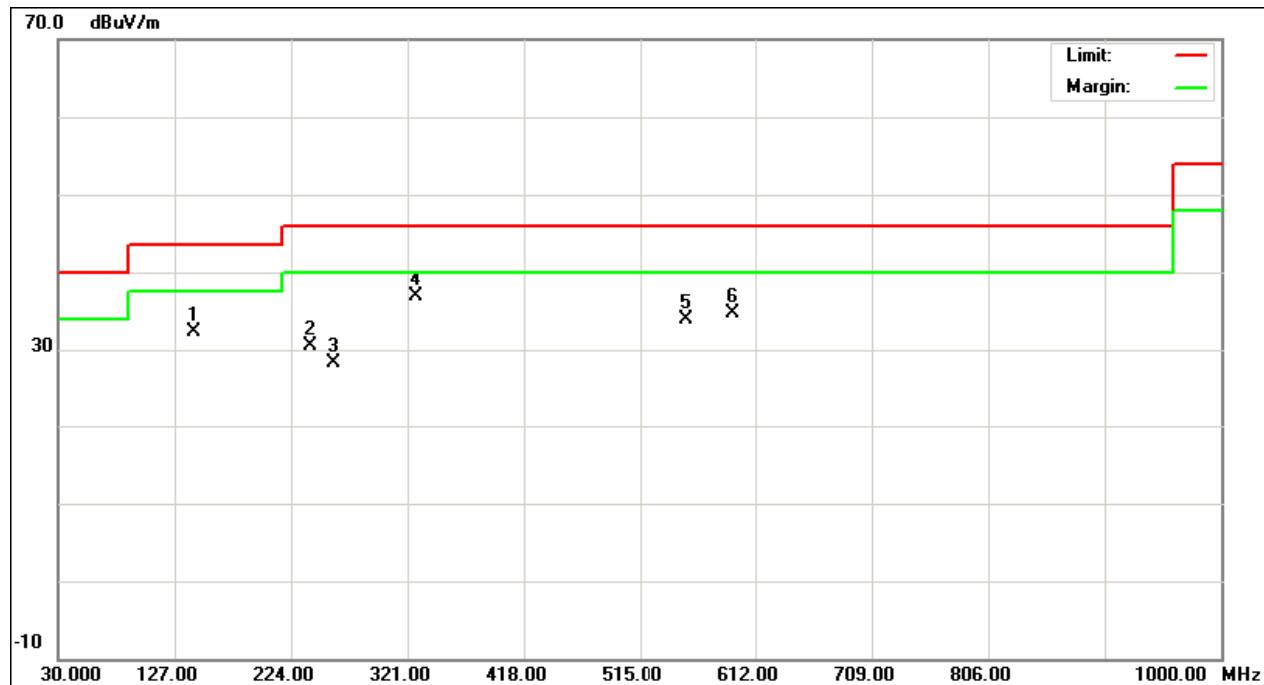


EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23°C	Relative Humidity :	51 %
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	TX Mode 2402MHz		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
143.01	H	50.01	-17.68	32.33	43.50	- 11.17	
239.01	H	45.62	-15.21	30.41	46.00	- 15.59	
259.54	H	42.24	-13.88	28.36	46.00	- 17.64	
327.70	H	48.35	-11.39	36.96	46.00	- 9.04	
556.65	H	39.23	-5.40	33.83	46.00	- 12.17	
591.83	H	39.22	-4.47	34.75	46.00	- 11.25	

## Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; " H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission .
- (4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



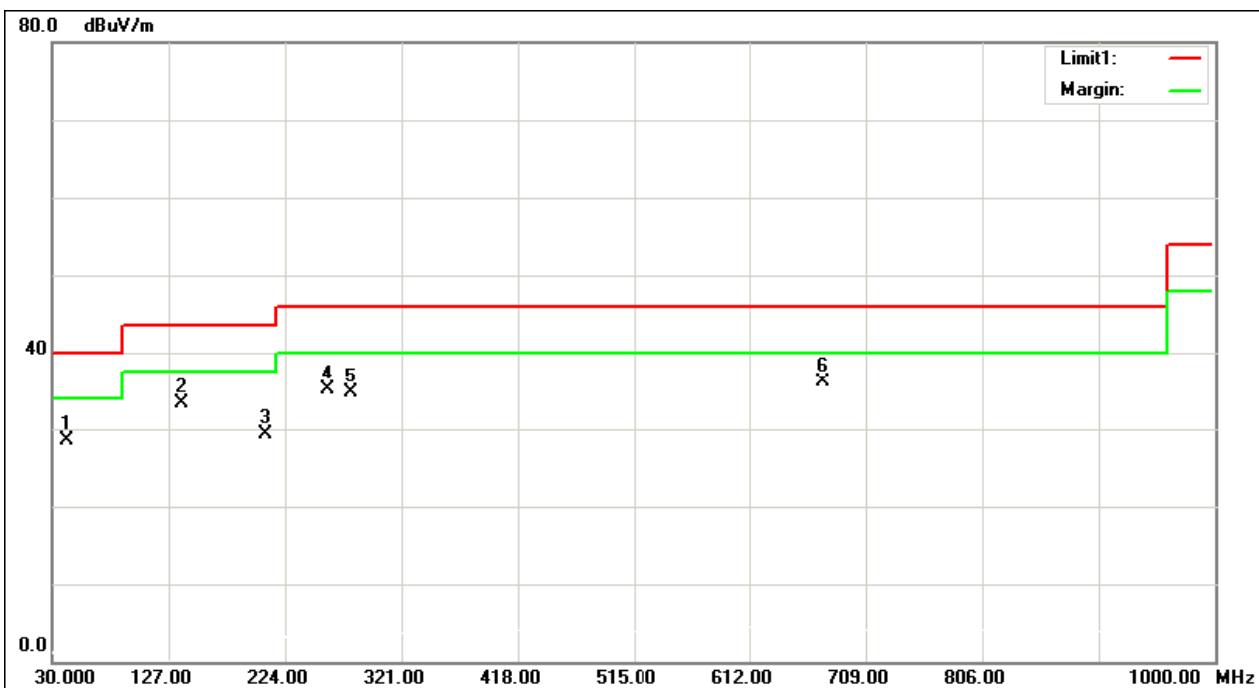


EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23°C	Relative Humidity :	51 %
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	TX Mode 2441MHz		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
43.49	V	45.42	-16.86	28.56	40.00	- 11.44	
137.76	V	51.04	-17.83	33.21	43.50	- 10.29	
207.51	V	45.73	-16.37	29.36	43.50	- 14.14	
259.89	V	48.90	-13.86	35.04	43.50	- 8.46	
278.50	V	47.51	-12.74	34.77	46.00	- 11.23	
672.67	V	39.34	-3.26	36.08	46.00	- 9.92	

## Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; " H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission .
- (4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



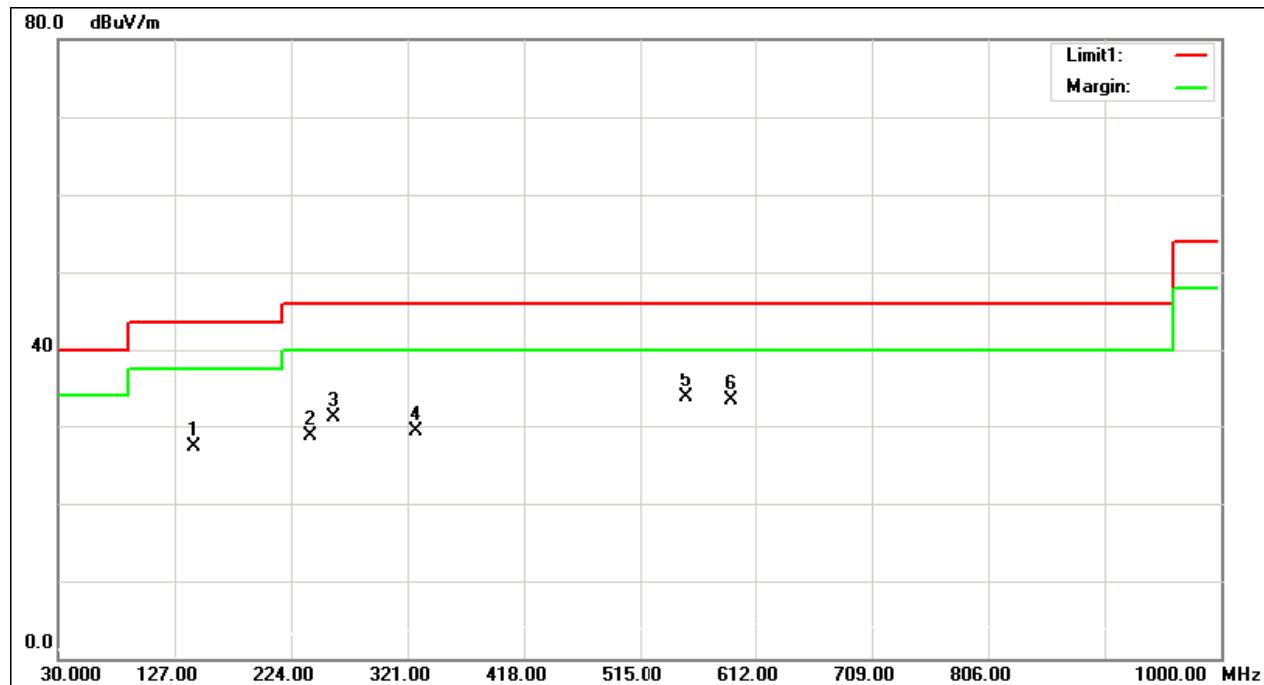


EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23°C	Relative Humidity :	51 %
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	TX Mode 2441MHz		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
143.49	H	45.00	-17.68	27.32	43.50	- 16.18	
239.52	H	43.92	-15.19	28.73	46.00	- 17.27	
259.89	H	44.97	-13.86	31.11	46.00	- 14.89	
327.76	H	40.73	-11.38	29.35	46.00	- 16.65	
553.80	H	39.07	-5.39	33.68	46.00	- 12.32	
591.54	H	37.88	-4.48	33.40	46.00	- 12.60	

## Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; " H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission .
- (4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



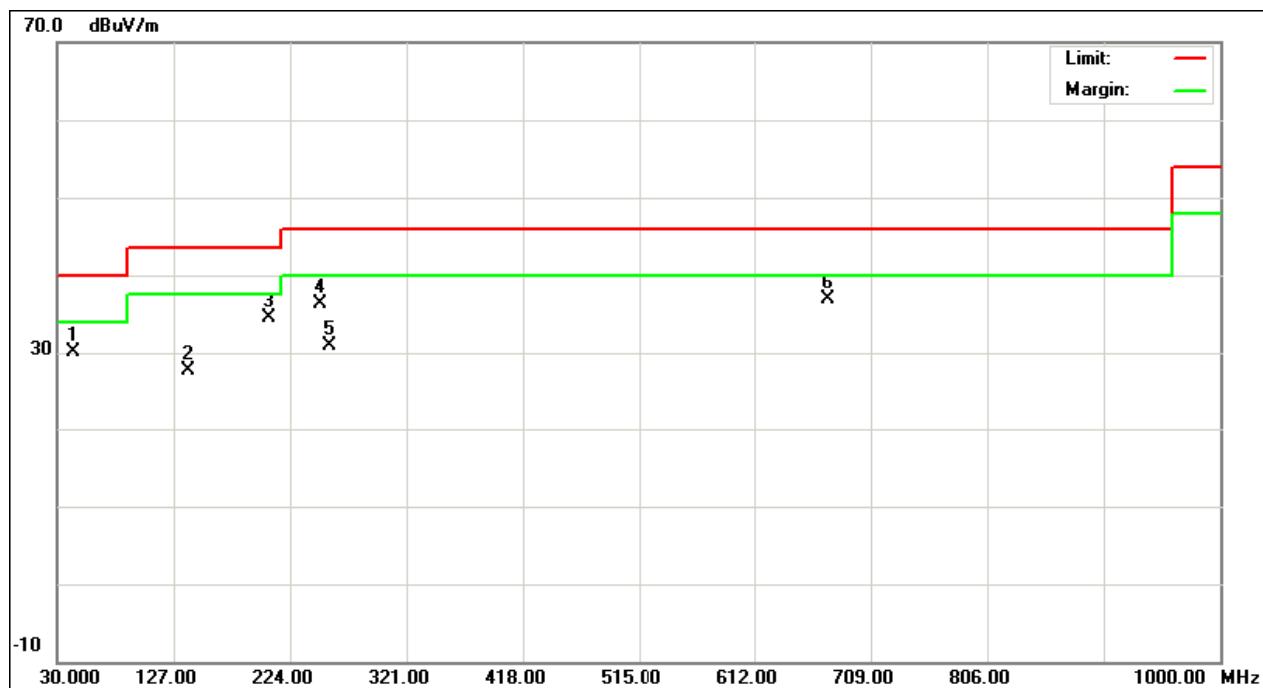


EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23°C	Relative Humidity :	51 %
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	TX Mode 2480MHz		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
43.52	V	47.02	-16.87	30.15	40.00	- 9.85	
138.25	V	45.56	-17.80	27.76	43.50	- 15.74	
206.52	V	50.87	-16.40	34.47	43.50	- 9.03	
248.80	V	50.99	-14.64	36.35	46.00	- 9.65	
256.60	V	44.90	-14.09	30.81	46.00	- 15.19	
672.53	V	40.12	-3.26	36.86	46.00	- 9.14	

## Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; " H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission .
- (4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



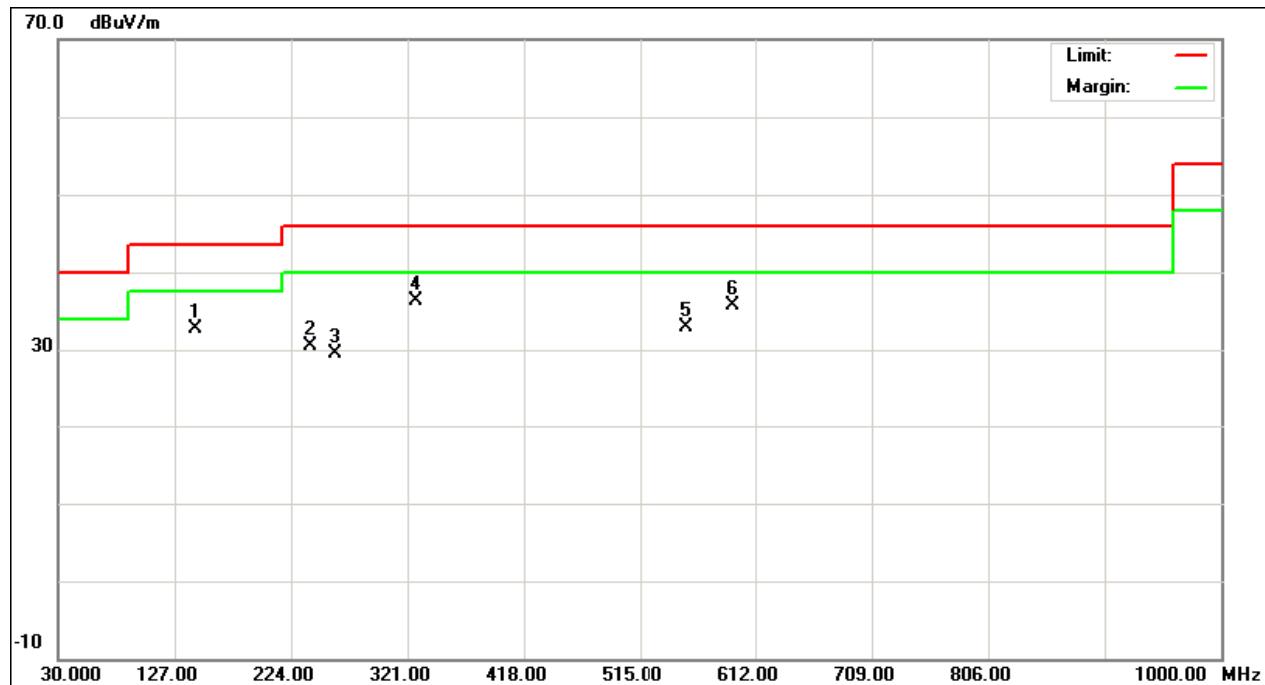


EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23°C	Relative Humidity :	51 %
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	TX Mode 2480MHz		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
144.02	H	50.35	-17.66	32.69	43.50	- 10.81	
239.14	H	45.62	-15.21	30.41	46.00	- 15.59	
260.04	H	43.28	-13.85	29.43	46.00	- 16.57	
327.08	H	47.75	-11.41	36.34	46.00	- 9.66	
554.74	H	38.25	-5.38	32.87	46.00	- 13.13	
592.02	H	40.12	-4.47	35.65	46.00	- 10.35	

### Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; " H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission .
- (4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



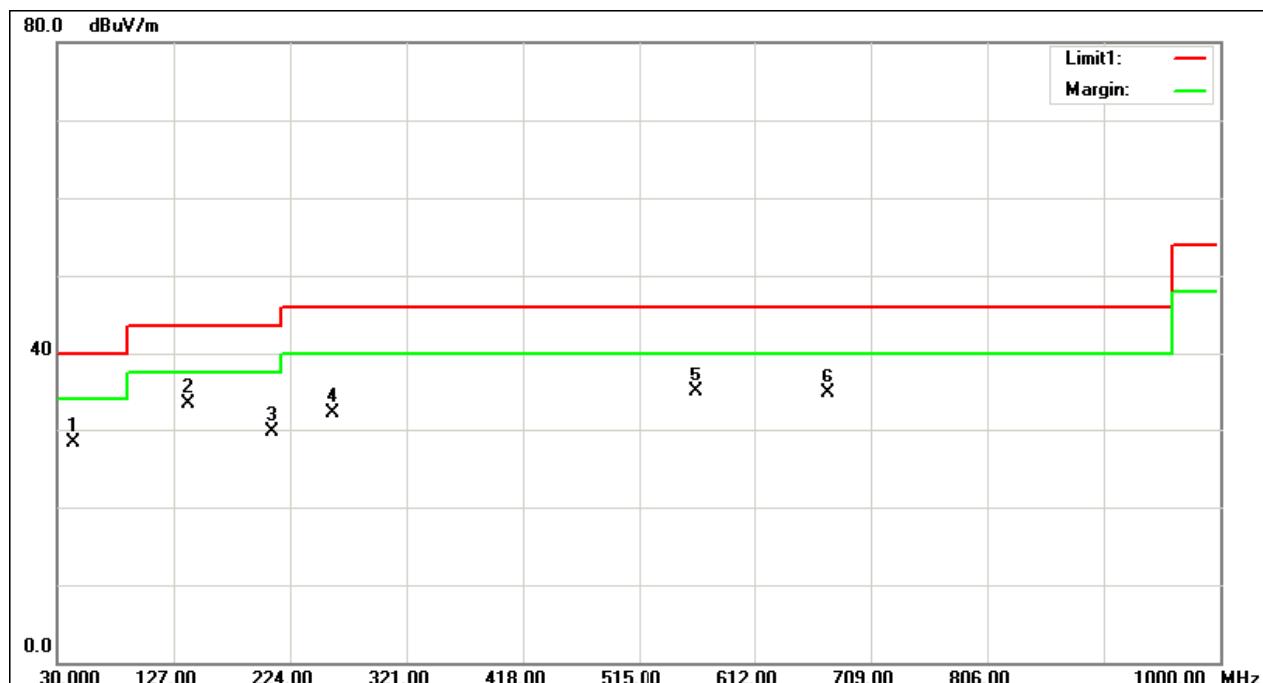


EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23°C	Relative Humidity :	51 %
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	RX Mode 2441MHz		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
43.49	V	39.73	-11.41	28.32	40.00	- 11.68	
137.86	V	46.53	-13.32	33.21	43.50	- 10.29	
207.54	V	45.90	-16.15	29.75	43.50	- 13.75	
259.65	V	45.69	-13.56	32.13	43.50	- 11.37	
563.23	V	39.62	-4.79	34.83	46.00	- 11.17	
672.55	V	38.64	-4.00	34.64	46.00	- 11.36	

## Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; " H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission .
- (4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.



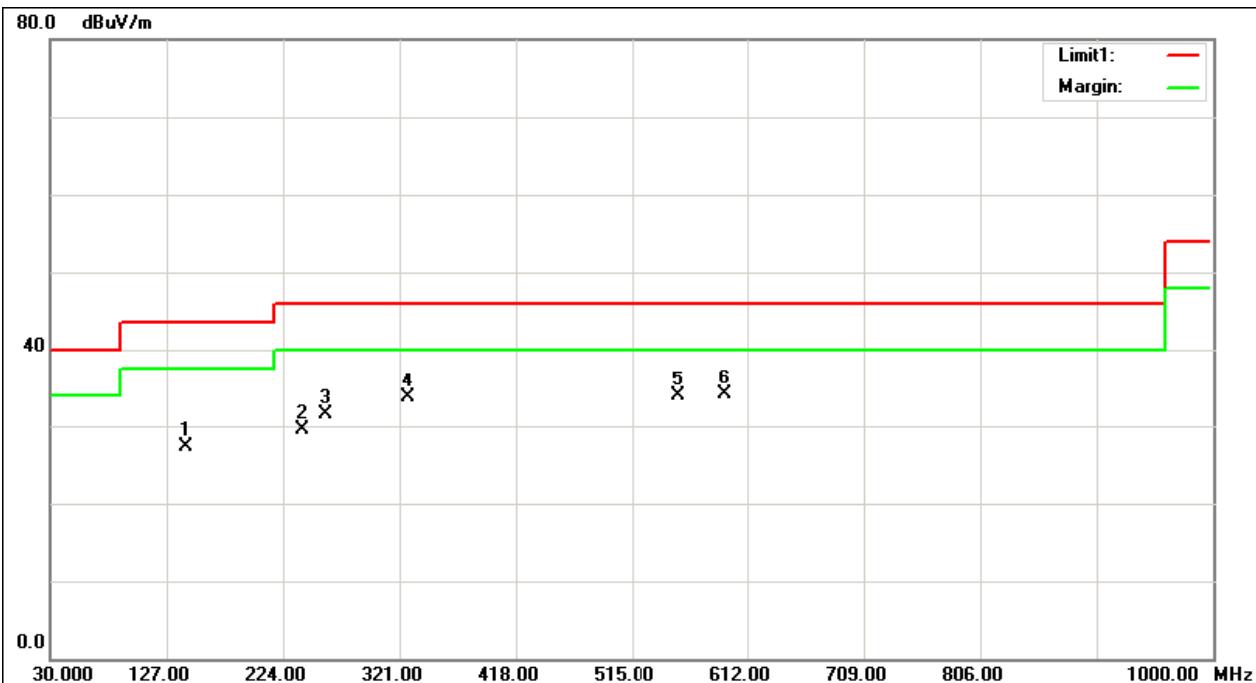


EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23°C	Relative Humidity :	51 %
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	RX Mode 2441MHz		

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Margin (dB)	Note
143.48	H	40.74	-13.38	27.36	43.50	- 16.14	
239.54	H	43.53	-13.99	29.54	46.00	- 16.46	
259.89	H	45.11	-13.55	31.56	46.00	- 14.44	
327.76	H	45.10	-11.46	33.64	46.00	- 12.36	
553.80	H	38.86	-5.00	33.86	46.00	- 12.14	
591.89	H	38.30	-4.16	34.14	46.00	- 11.86	

## Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; " H" denotes spurious frequency. "E" denotes band edge frequency.
- (3) Radiated emissions measured in frequency range from 30 MHz to 1000 MHz were made with an instrument using Peak detector mode or QP detector mode of the emission .
- (4) Data of measurement within this frequency range shown " - " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.





## 4.2.9 TEST RESULTS (ABOVE 1000 MHz)

EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23	Relative Humidity :	51%
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	TX 2402MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	V	28.44	10.75	31.91	60.35	42.66	74.00	54.00	X/E
<b>2402.00</b>	<b>V</b>	<b>62.99</b>	<b>32.37</b>	<b>31.90</b>	<b>94.89</b>	<b>64.27</b>	<b>114.00</b>	<b>94.00</b>	<b>X/F</b>
4803.86	V	52.23	41.55	5.21	57.44	46.76	74.00	54.00	X/H

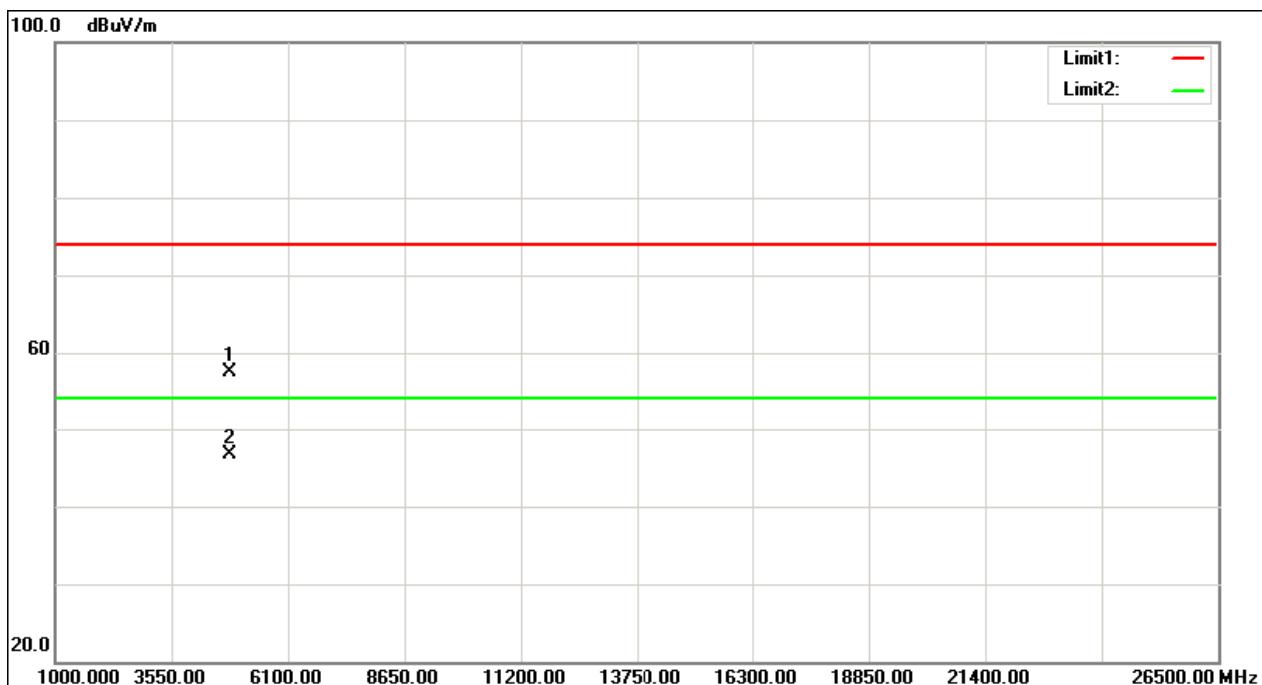
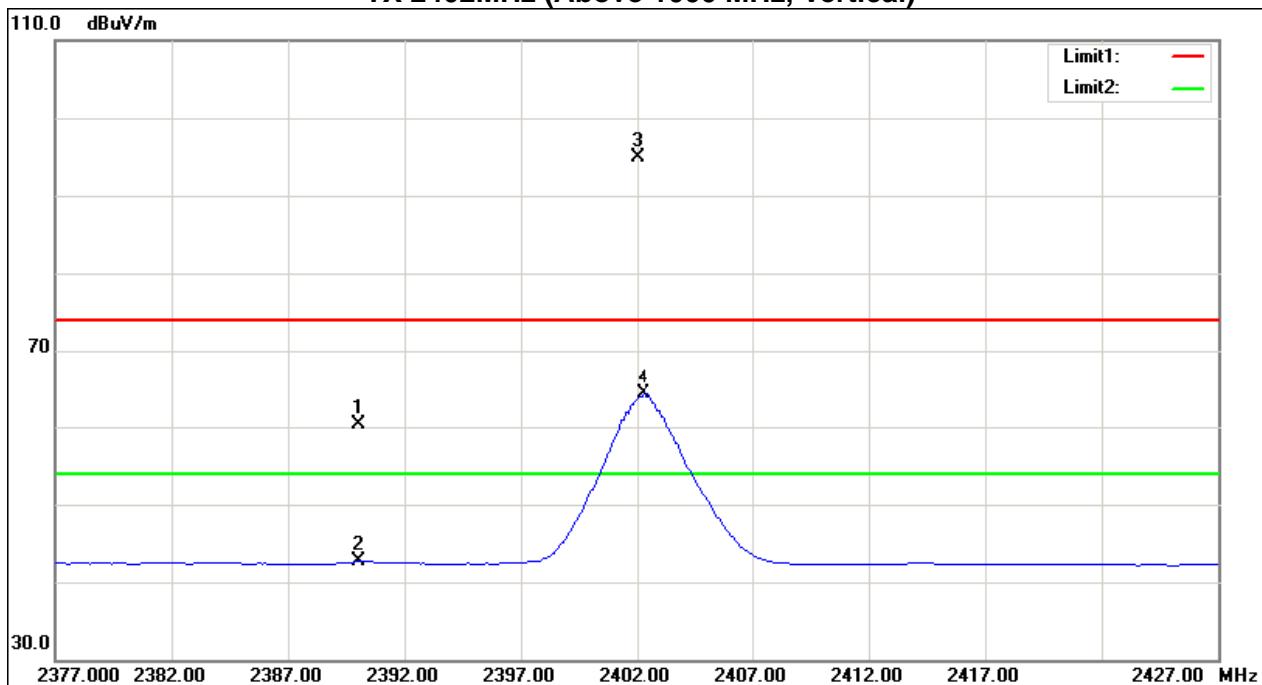
### Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



**Orthogonal Axis : X**

**TX 2402MHz (Above 1000 MHz, Vertical)**





EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23	Relative Humidity :	51%
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	TX 2402MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2390.00	H	30.35	10.84	31.91	62.26	42.75	74.00	54.00	X/E
<b>2401.90</b>	<b>H</b>	<b>65.62</b>	<b>33.70</b>	<b>31.90</b>	<b>97.52</b>	<b>65.60</b>	<b>114.00</b>	<b>94.00</b>	<b>X/F</b>
4803.96	H	46.90	38.55	5.21	52.11	43.76	74.00	54.00	X/H

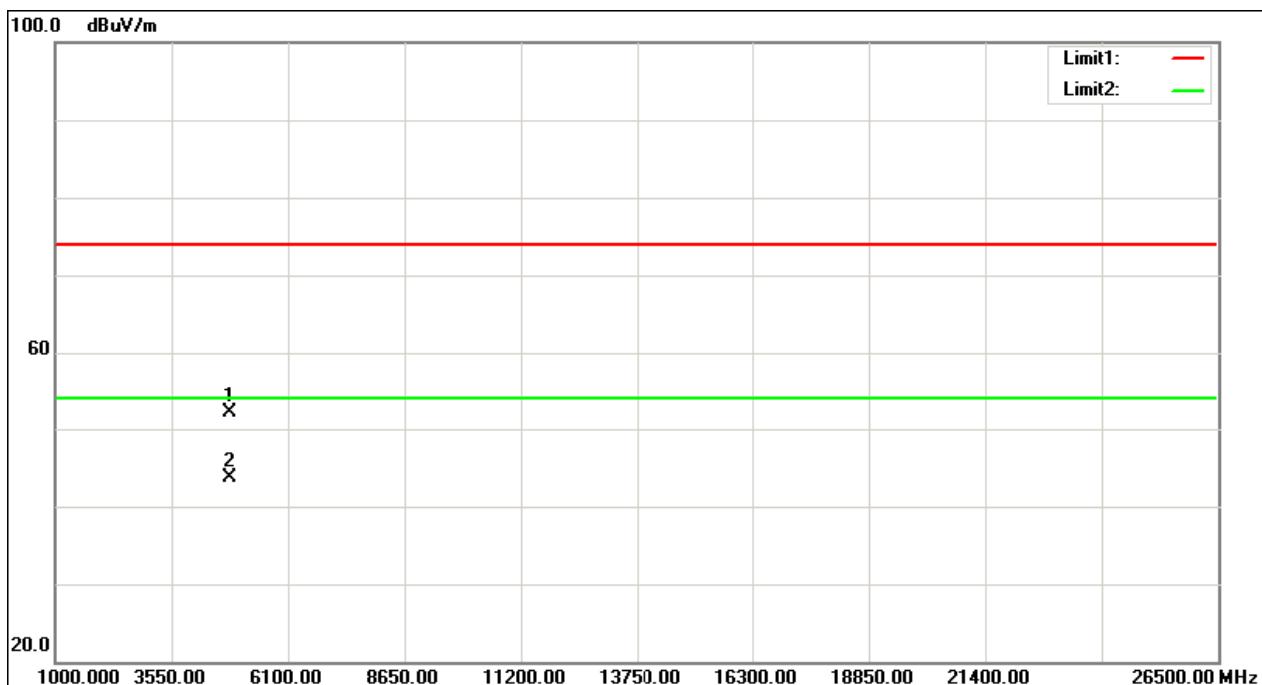
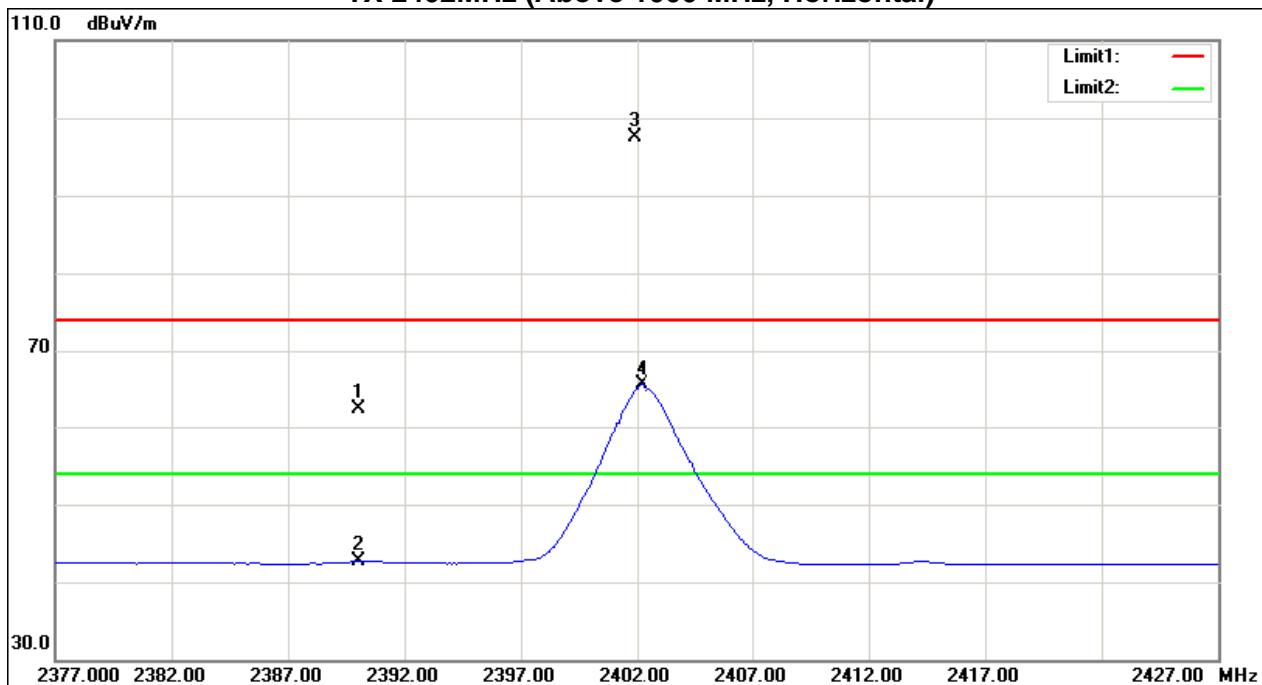
Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



**Orthogonal Axis : X**

**TX 2402MHz (Above 1000 MHz, Horizontal)**





EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23	Relative Humidity :	51%
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	TX 2441MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2440.90	V	62.46	33.51	31.85	94.31	65.36	114.00	94.00	X/F
4881.80	V	51.92	42.26	5.50	57.42	47.76	74.00	54.00	X/H

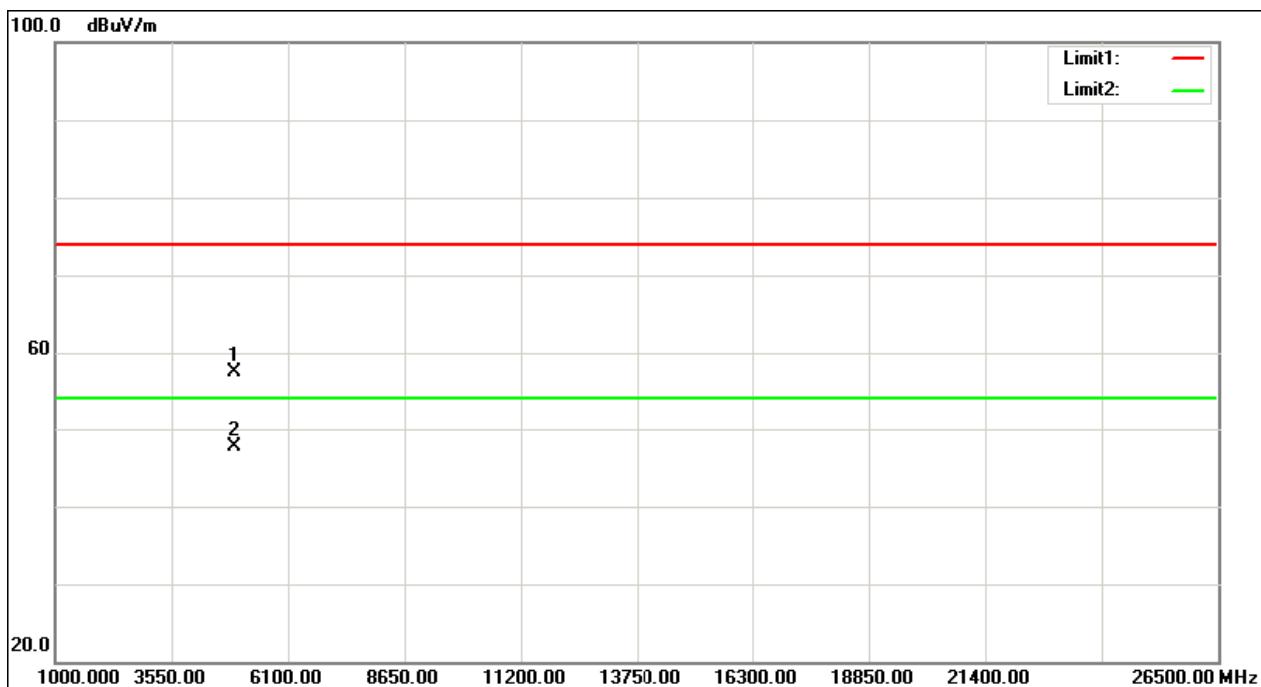
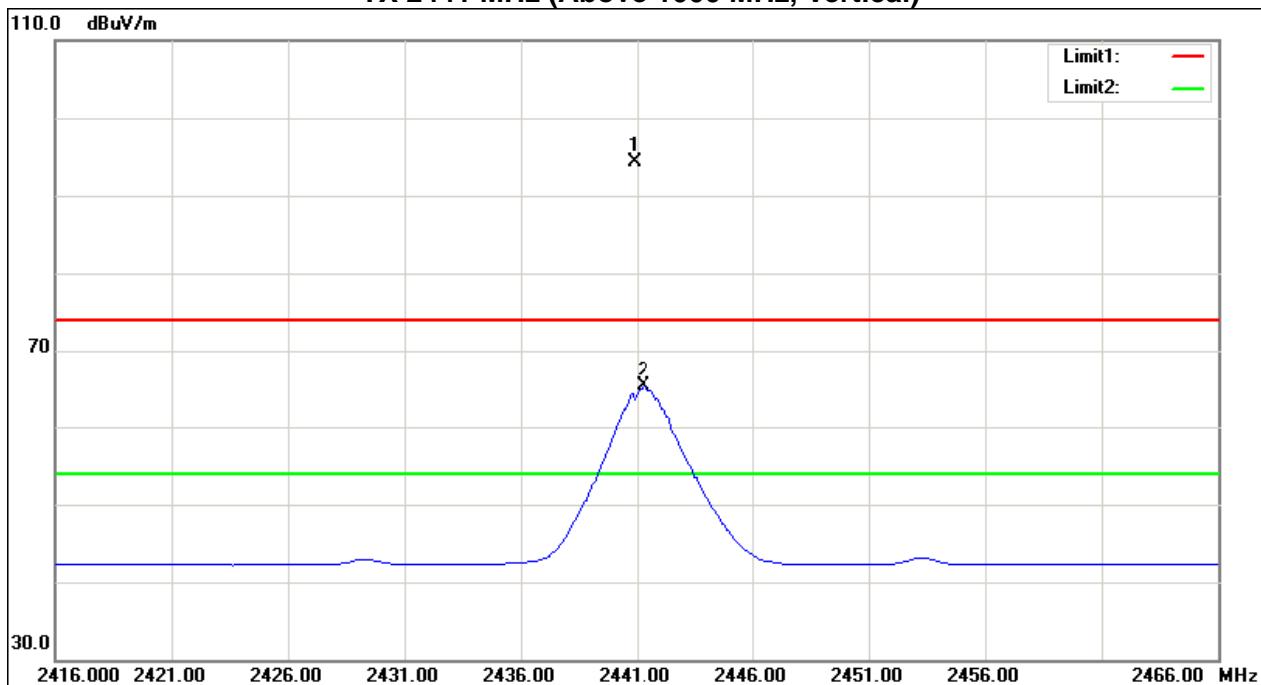
**Remark :**

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency◦“F” denotes fundamental frequency; “H” denotes spurious frequency. “E” denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission ◦
- (4) Data of measurement within this frequency range shown “ \* ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
“X” - denotes Laid on Table ; “Y” - denotes Vertical Stand ; “Z” - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



**Orthogonal Axis : X**

**TX 2441 MHz (Above 1000 MHz, Vertical)**





EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23	Relative Humidity :	51%
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	TX 2441MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2441.00	H	66.13	35.40	31.85	97.98	67.25	114.00	94.00	X/F
4881.80	H	46.74	38.26	5.50	52.24	43.76	74.00	54.00	X/H

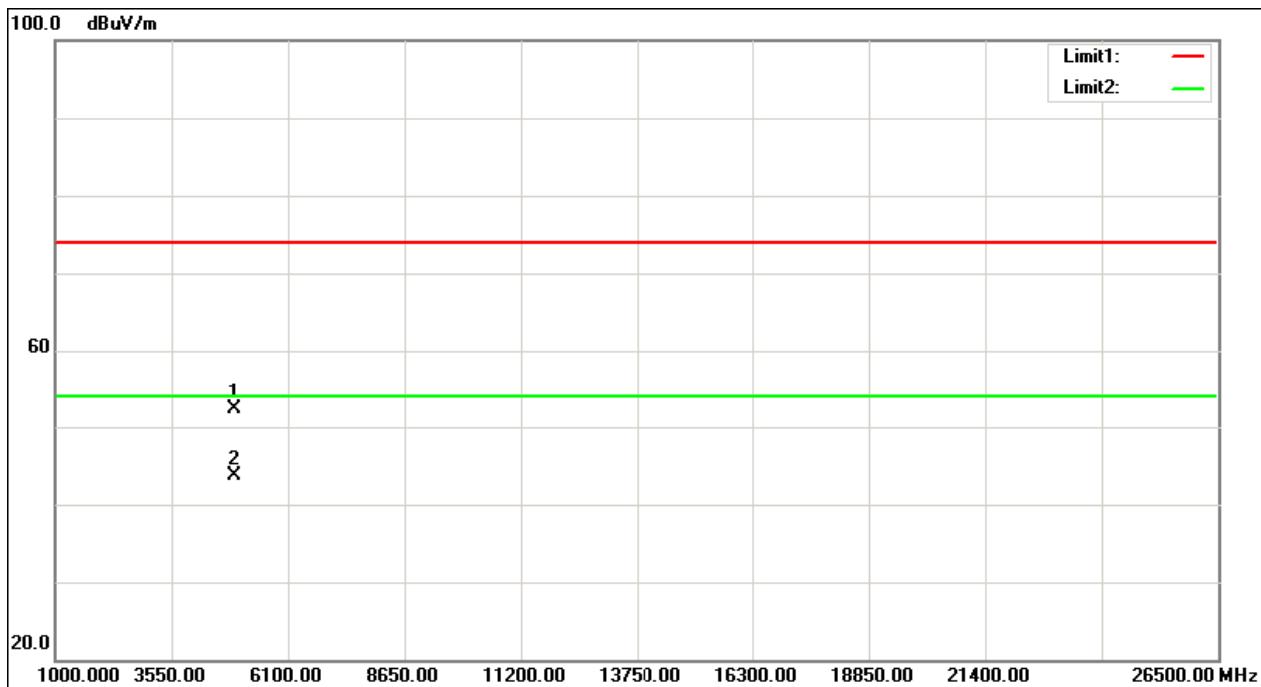
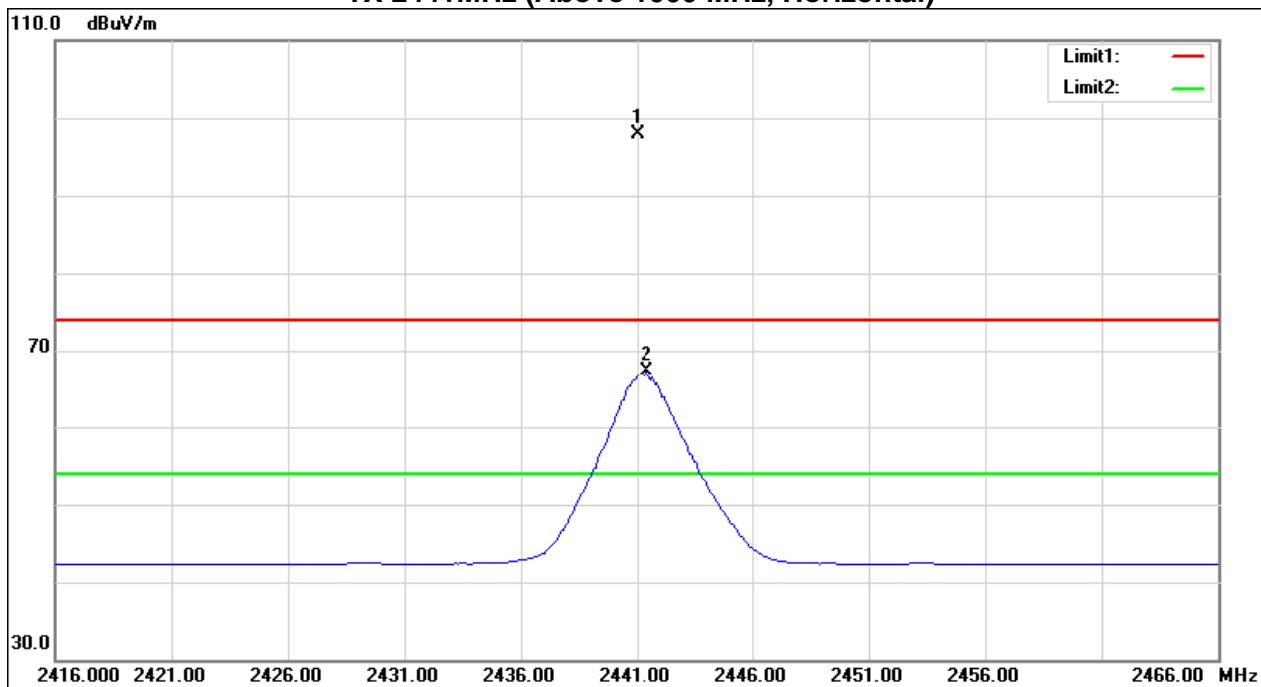
**Remark :**

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



**Orthogonal Axis : X**

**TX 2441MHz (Above 1000 MHz, Horizontal)**





EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23	Relative Humidity :	51%
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	TX 2480MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2480.00	V	62.31	31.84	31.80	94.11	63.64	114.00	94.00	X/F
2483.50	V	38.17	16.34	31.80	69.97	48.14	74.00	54.00	X/E
4959.98	V	49.45	40.20	5.78	55.23	45.98	74.00	54.00	X/H

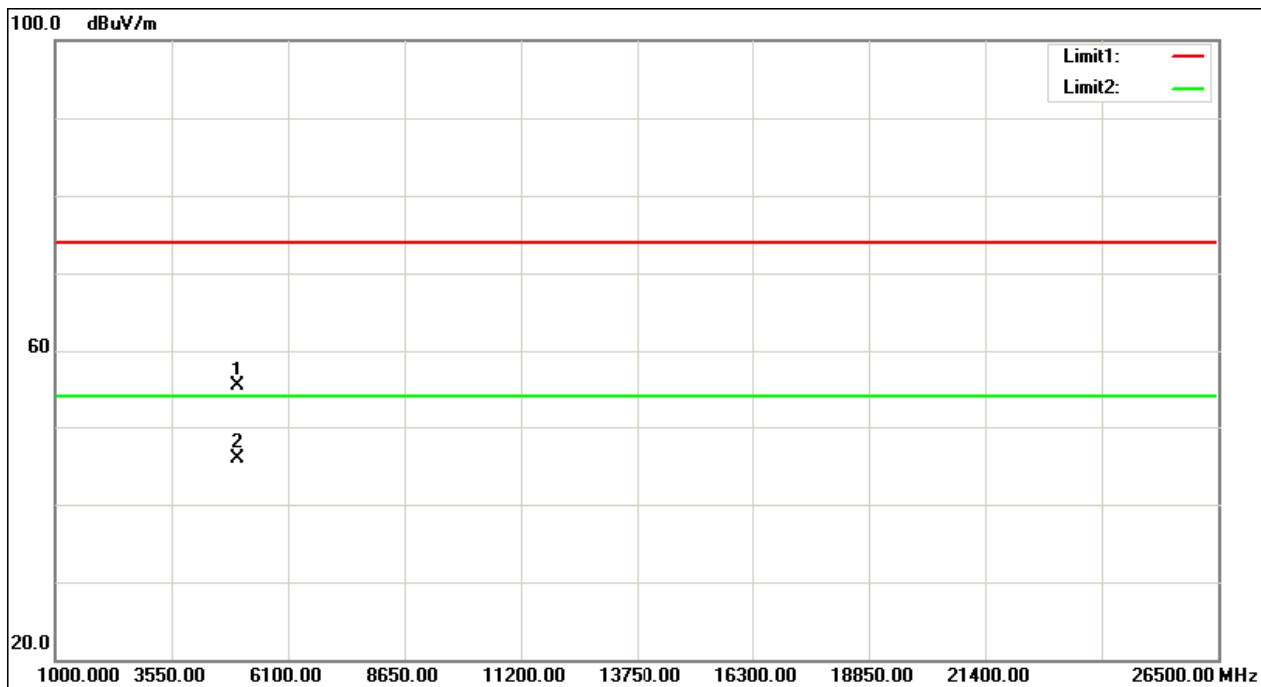
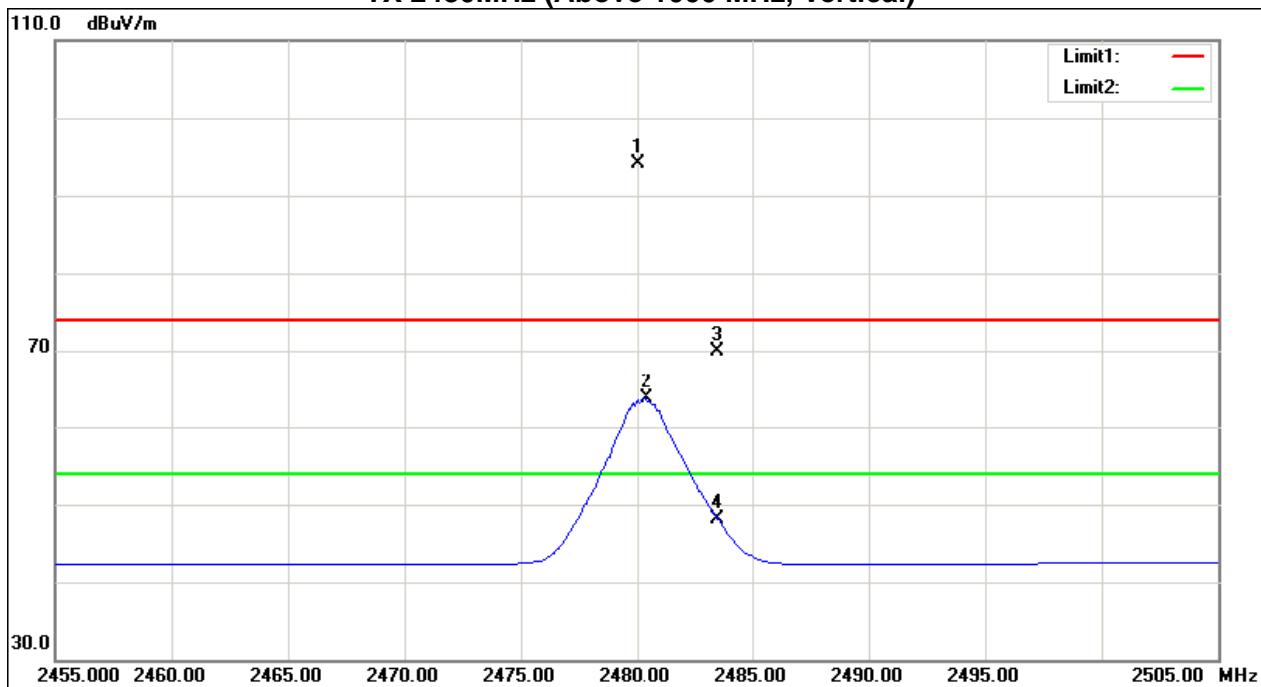
Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



**Orthogonal Axis : X**

**TX 2480MHz (Above 1000 MHz, Vertical)**





EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23	Relative Humidity :	51%
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	TX 2480MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
2479.90	H	<b>65.59</b>	<b>33.58</b>	<b>31.80</b>	<b>97.39</b>	<b>65.38</b>	<b>114.00</b>	<b>94.00</b>	X/F
2483.50	H	40.73	17.57	31.80	72.53	49.37	74.00	54.00	X/E
4959.82	H	44.26	34.54	5.78	50.04	40.32	74.00	54.00	X/H

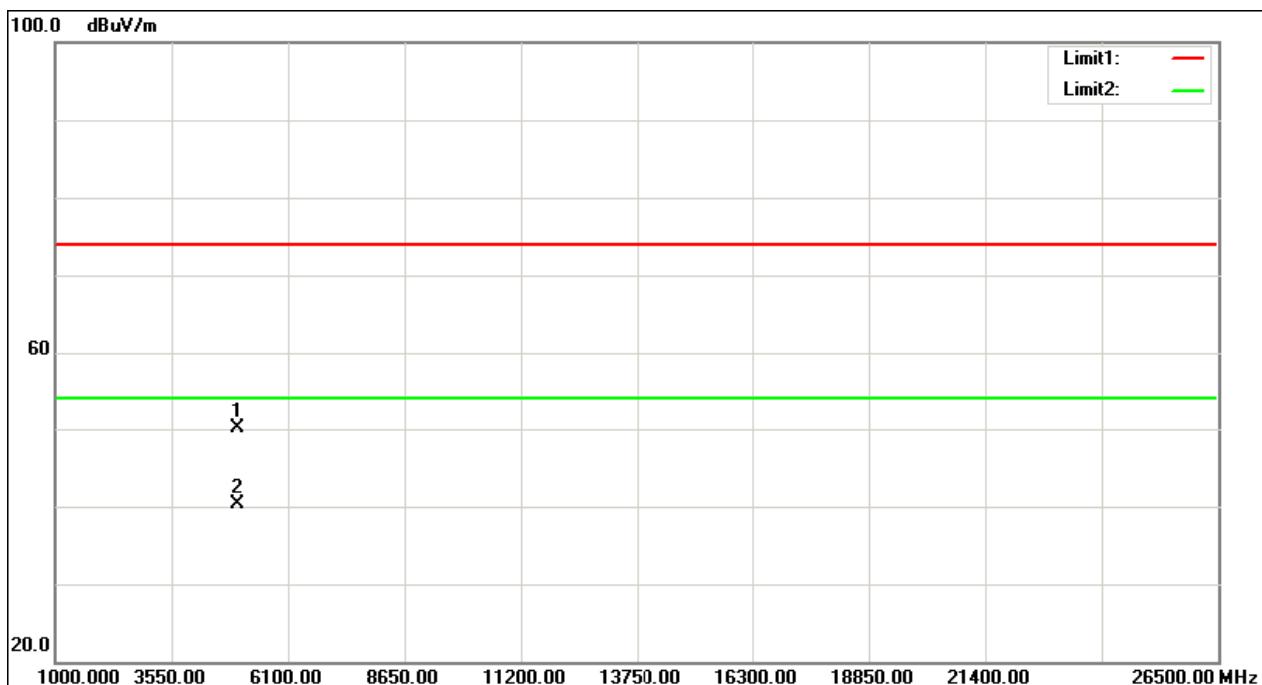
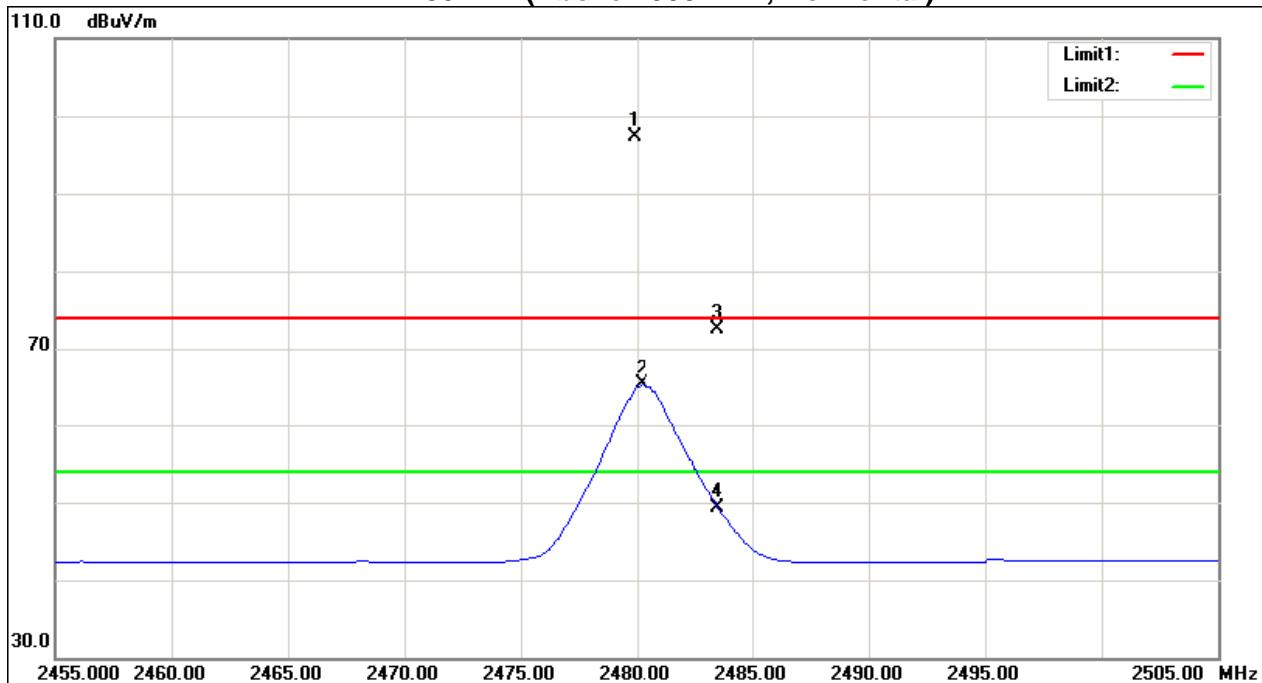
**Remark :**

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 30MHz to 1000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand
- (7) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna



**Orthogonal Axis : X**

**TX 2480MHz (Above 1000 MHz, Horizontal)**



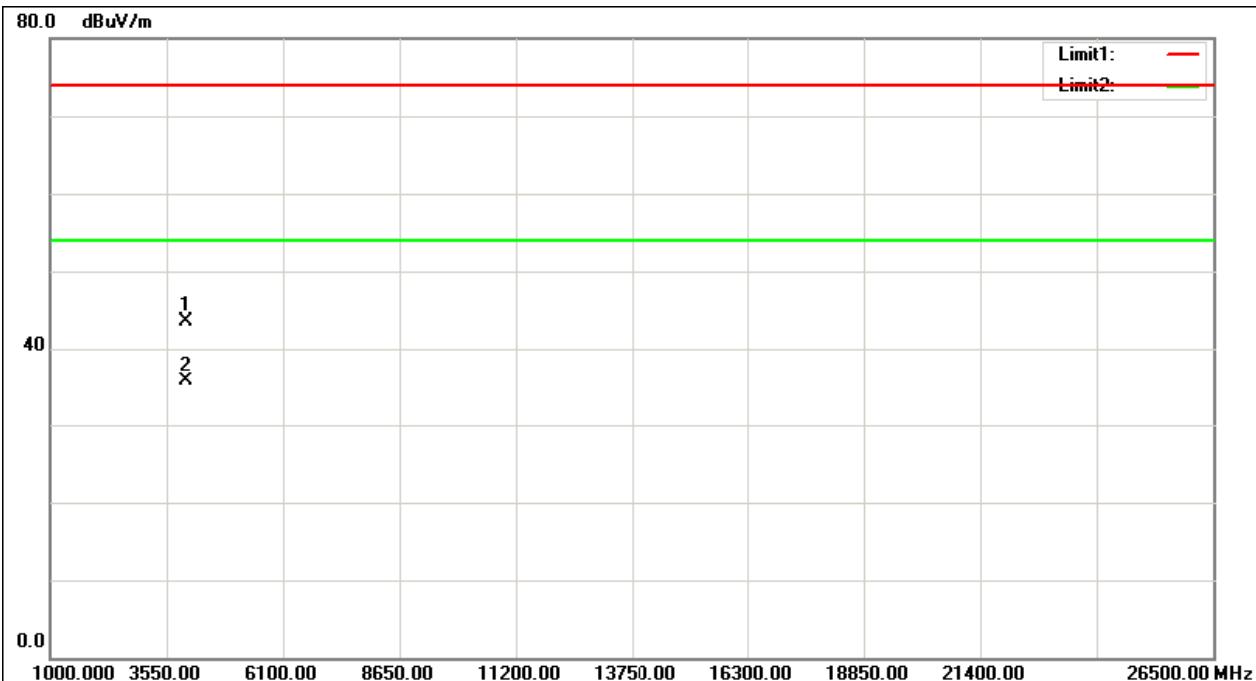


EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23	Relative Humidity :	51%
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	RX Mode 2402MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
3968.12	V	39.13	31.29	4.32	43.45	35.61	74.00	54.00	X/E

Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 1000MHz to 6000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand



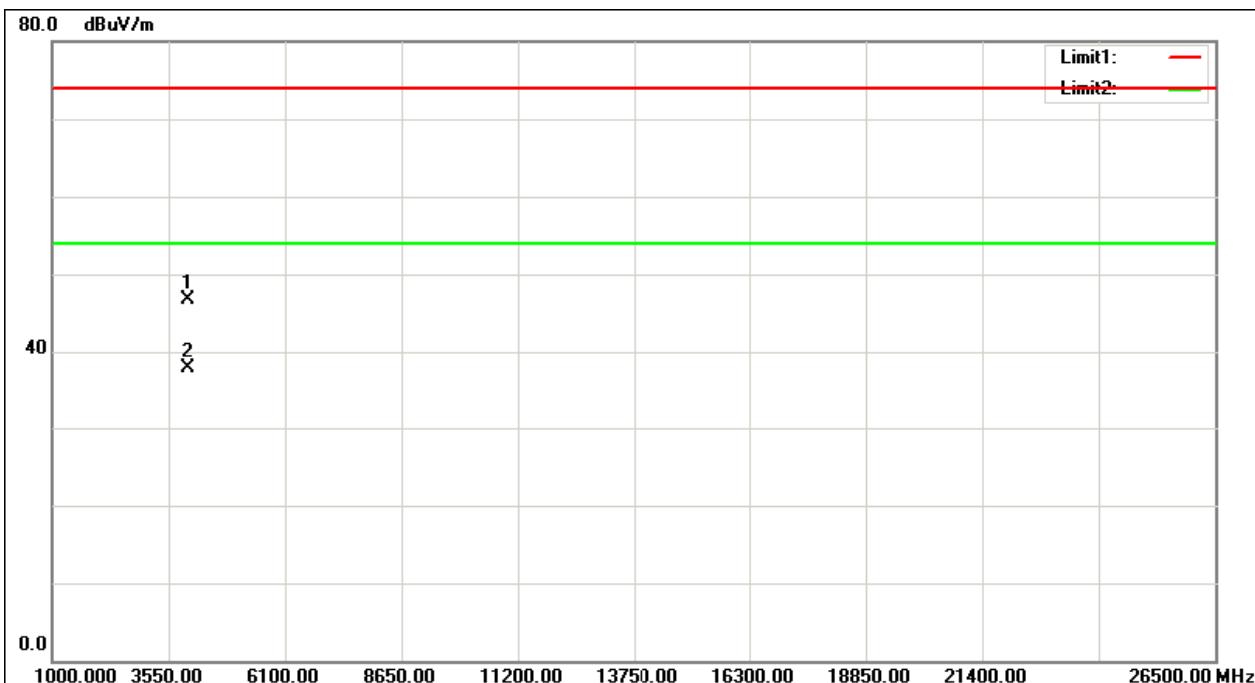


EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23	Relative Humidity :	51%
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	RX Mode 2402MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
3968.12	H	42.33	33.54	4.32	46.65	37.86	74.00	54.00	X/E

**Remark :**

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (2) Measuring frequency range from 1000MHz to 6000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission.
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand



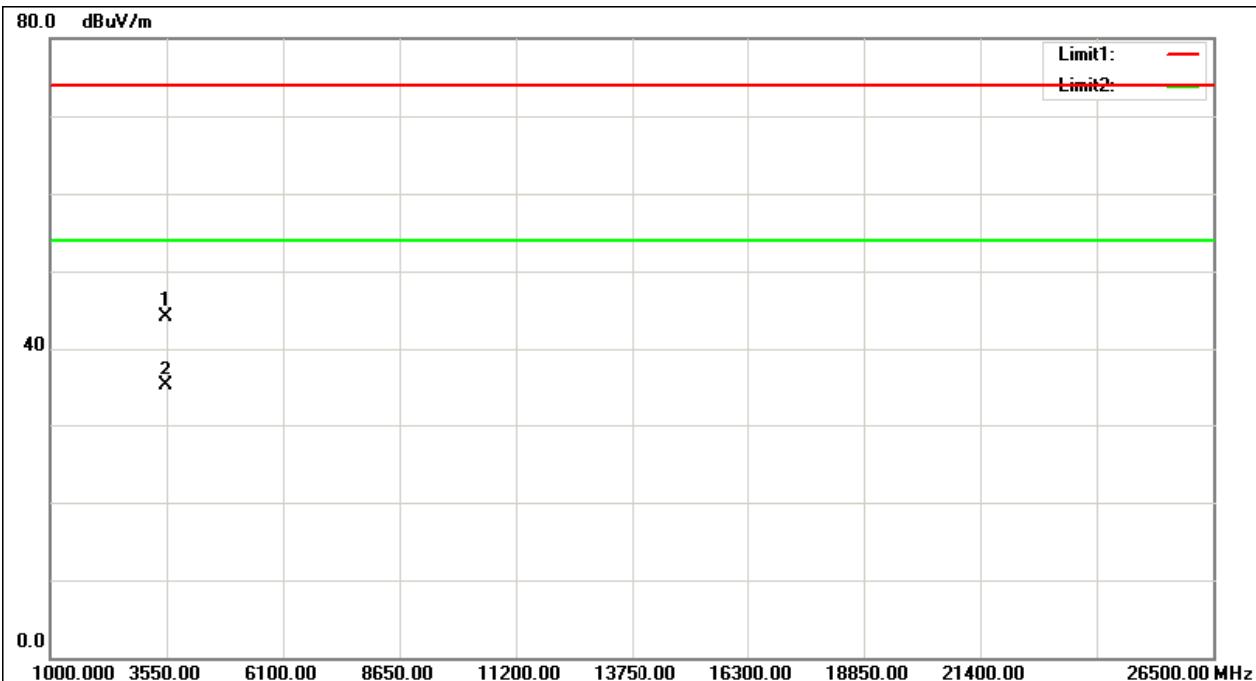


EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23	Relative Humidity :	51%
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	RX Mode 2441MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
3521.22	V	41.34	32.27	2.82	44.16	35.09	74.00	54.00	X/E

**Remark :**

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 1000MHz to 6000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand



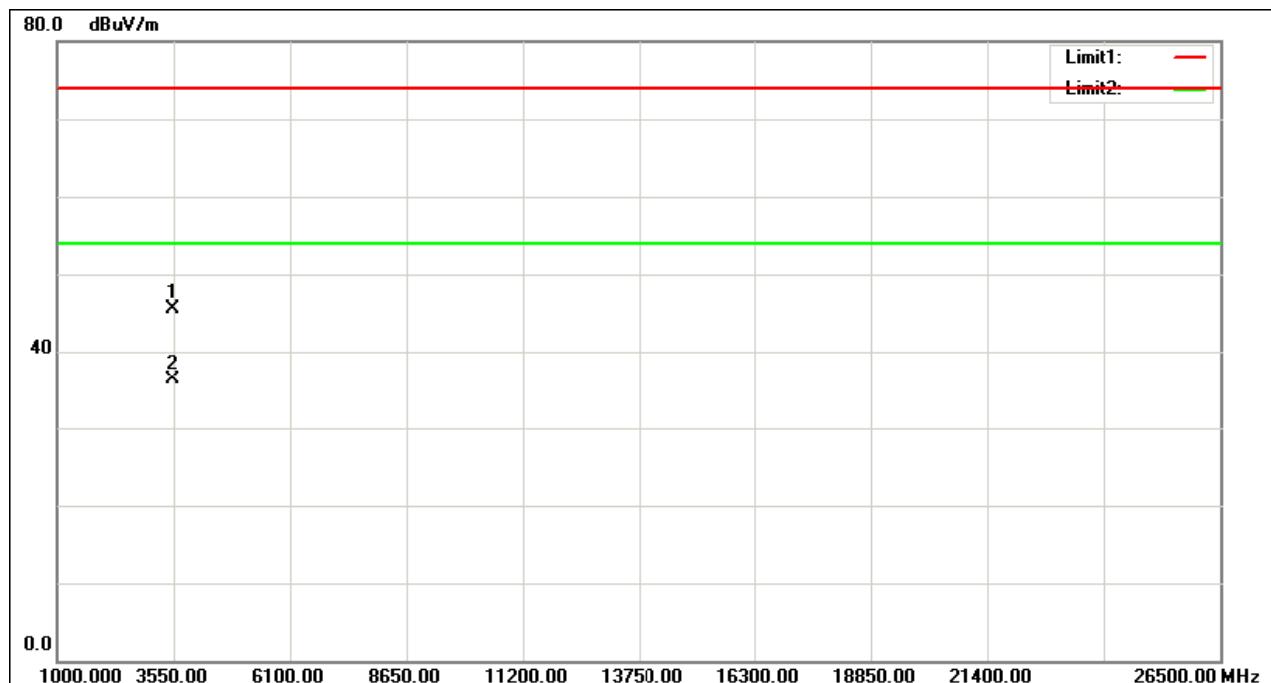


EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23	Relative Humidity :	51%
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	RX Mode 2441MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
3521.22	H	42.72	33.39	2.82	45.54	36.21	74.00	54.00	X/E

**Remark :**

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (2) Measuring frequency range from 1000MHz to 6000MHz or the 10th harmonic of highest fundamental frequency. "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission.
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand



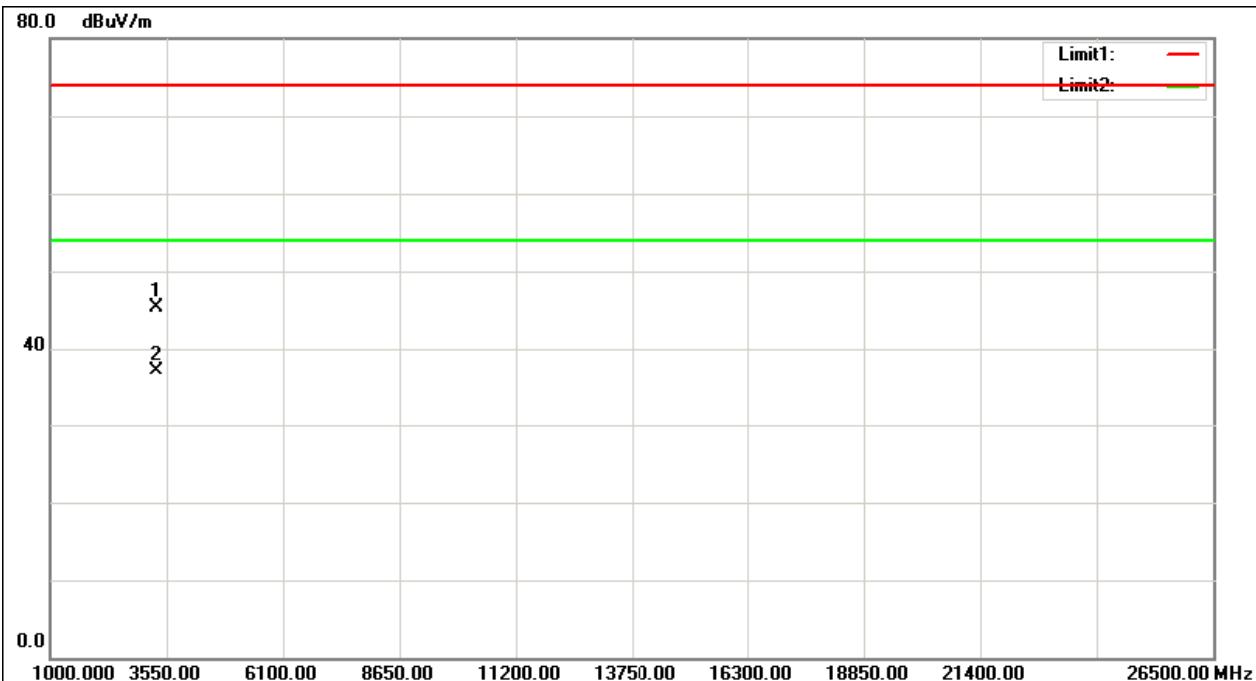


EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23	Relative Humidity :	51%
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	RX Mode 2480MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
3296.23	V	43.11	35.02	2.12	45.23	37.14	74.00	54.00	X/E

## Remark :

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 1000MHz to 6000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand



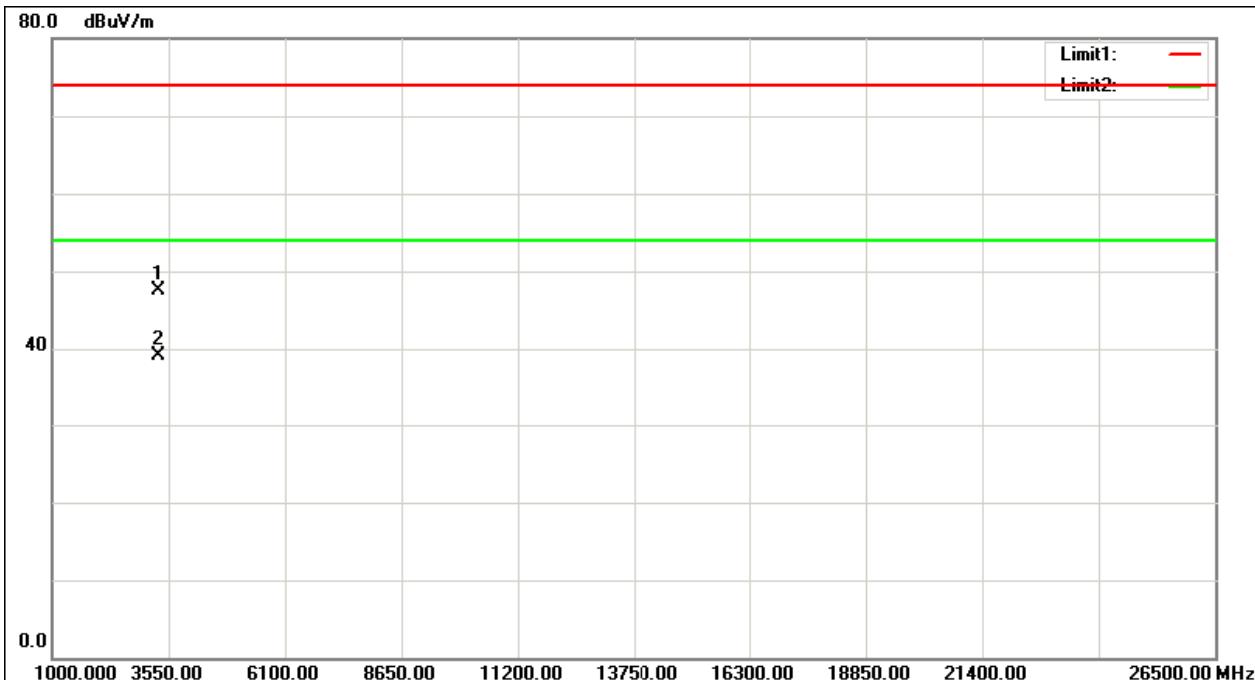


EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	23	Relative Humidity :	51%
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	RX Mode 2480MHz		

Freq. (MHz)	Ant.Pol. H/V	Reading		Ant./CF CF(dB)	Act.		Limit		Note
		Peak (dBuV)	AV (dBuV)		Peak (dBuV/m)	AV (dBuV/m)	Peak (dBuV/m)	AV (dBuV/m)	
3296.23	H	45.39	5.00	2.12	47.51	39.17	74.00	54.00	X/E

**Remark :**

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Measuring frequency range from 1000MHz to 6000MHz or the 10th harmonic of highest fundamental frequency . "F" denotes fundamental frequency; "H" denotes spurious frequency. "E" denotes band edge frequency. (This judgment method includes the Band Edge Requirement.)
- (3) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (4) Data of measurement within this frequency range shown " \* " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (5) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (6) EUT Orthogonal Axis :  
"X" - denotes Laid on Table ; "Y" - denotes Vertical Stand ; "Z" - denotes Side Stand



**4.2.10 TEST RESULTS (2400 – 2483.5 MHz)**

EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	20°C	Relative Humidity :	55 %
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	TX CH 2402MHz/2441MHz/2480MHz		

Freq. (MHz)	Ant.Pol. (H/V)	Peak		AV		Peak		AV		Limit3m	NOTE
		Reading (dBuV)	Ant./CL/ CF(dB)	Actual FS (dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)		
2402.00	V	62.99	32.37	31.90	94.89	64.27	114.00	94.00	94.00	CH01	
2401.90	H	65.62	33.70	31.90	97.52	65.60	114.00	94.00	94.00	CH01	
2440.90	V	62.46	33.51	31.85	94.31	65.36	114.00	94.00	94.00	CH40	
2441.00	H	66.13	35.40	31.85	97.98	67.25	114.00	94.00	94.00	CH40	
2480.00	V	62.31	31.84	31.80	94.11	63.64	114.00	94.00	94.00	CH79	
2479.90	H	65.59	33.58	31.80	97.39	65.38	114.00	94.00	94.00	CH79	

**Remark :**

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』 . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform .
- (2) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission .
- (3) Data of measurement within this frequency range shown “ \* ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- (4) EUT Orthogonal Axis :  
“X” - denotes Laid on Table ; “Y” - denotes Vertical Stand ; “Z” - denotes Side Stand



## 5. BANDWIDTH TEST

### 5.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2011

Remark: " N/A " denotes No Model Name. , Serial No. or No Calibration specified.

### 5.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = 2.5 ms.

### 5.3 DEVIATION FROM STANDARD

No deviation.

### 5.4 TEST SETUP



### 5.5 EUT OPERATION CONDITIONS

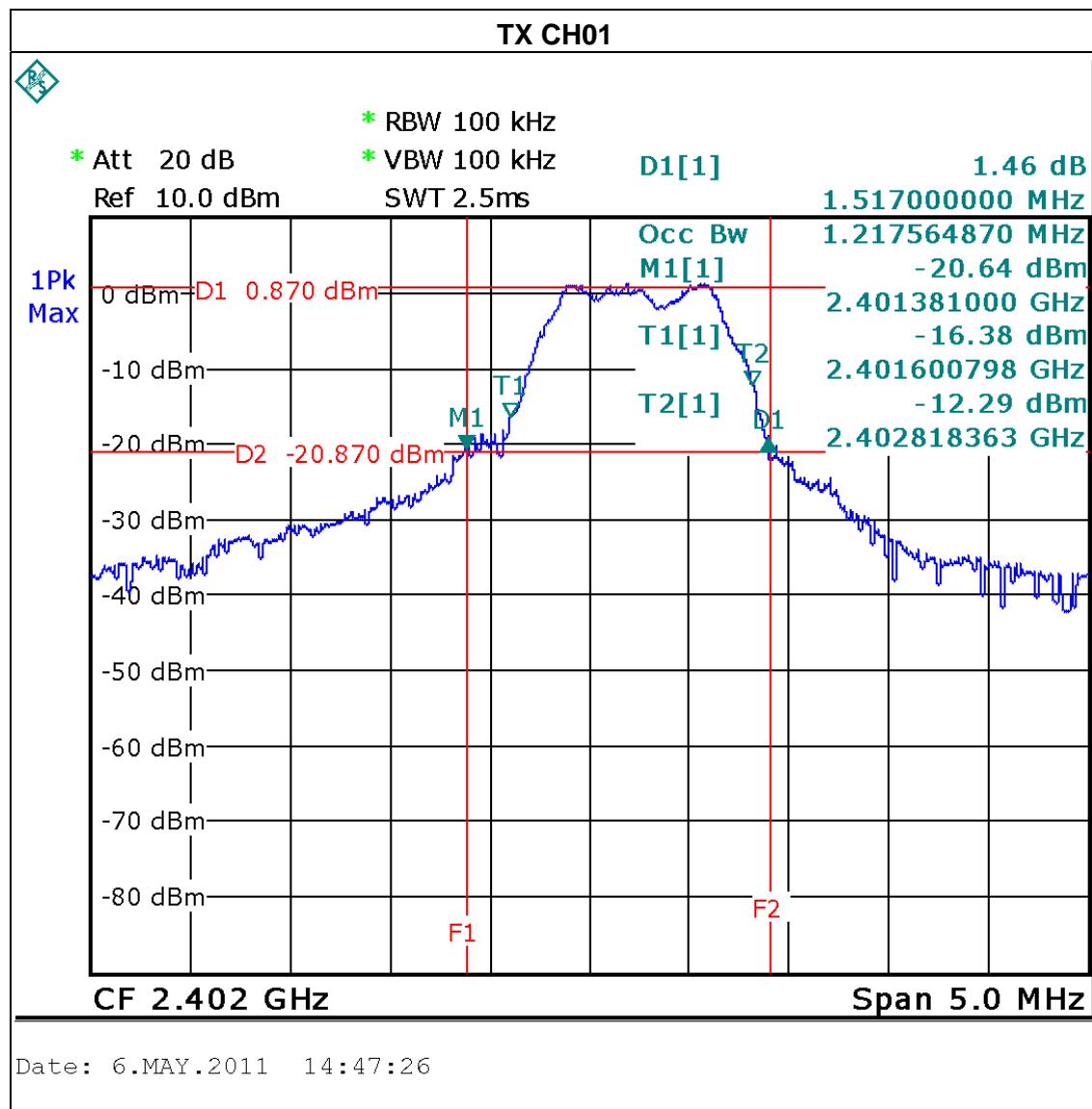
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

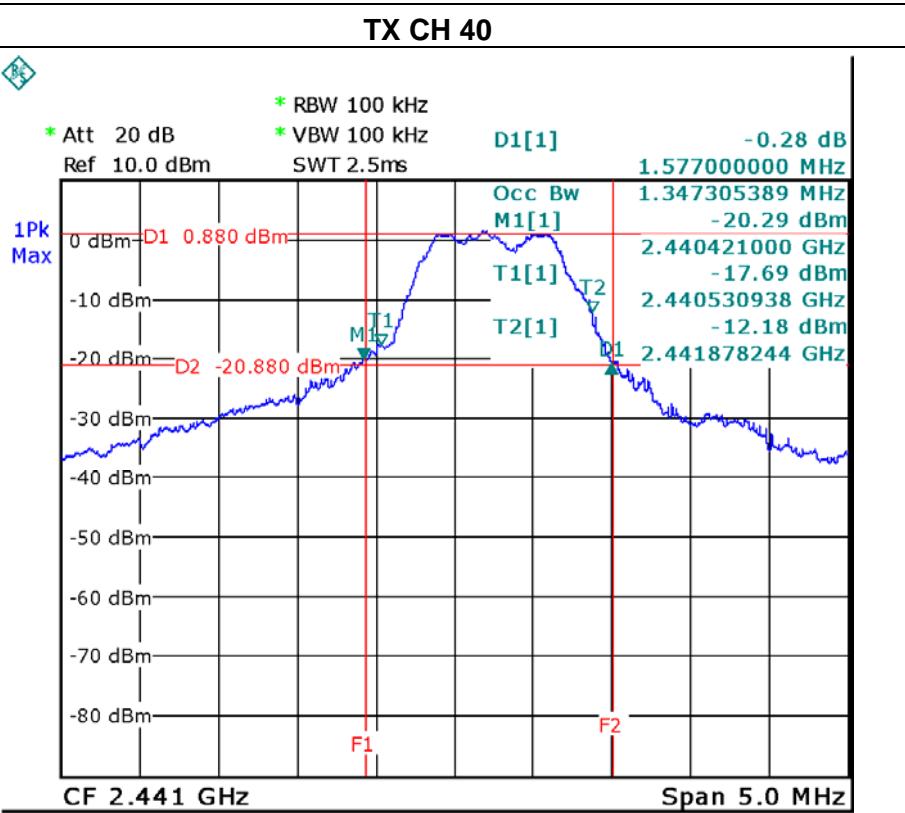


## 5.6 TEST RESULTS

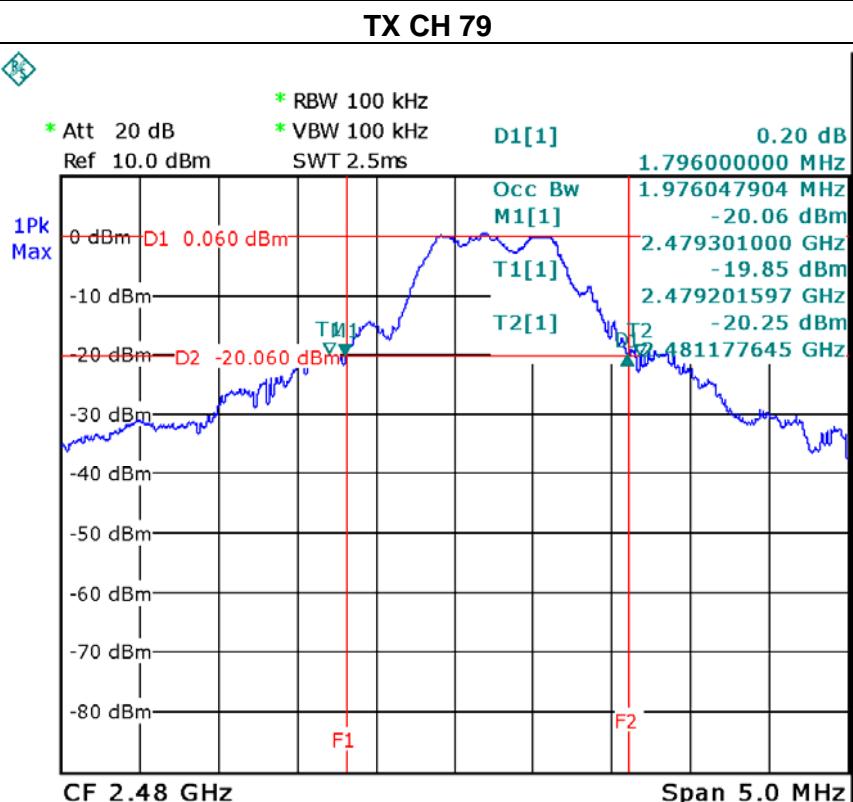
EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	20°C	Relative Humidity :	55 %
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	TX CH 01/40/79		

Test Channel	Frequency (MHz)	20 dBC Bandwidth (MHz)	99% occupied Bandwidth(MHz)
CH01	2402	1.517	1.218
CH40	2441	1.577	1.347
CH79	2480	1.796	1.976





Date: 6.MAY.2011 14:45:49



Date: 6.MAY.2011 14:44:38



## 6. ANTENNA CONDUCTED SPURIOUS EMISSION

### 6.1 APPLIED PROCEDURES / LIMIT

20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/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

#### 6.1.1 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov.26.2011

Remark: " N/A " denotes No Model Name. , Serial No. or No Calibration specified.

#### 6.1.2 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- Spectrum Setting : RBW= 100KHz, VBW=100KHz, Sweep time = 200 ms.

#### 6.1.3 DEVIATION FROM STANDARD

No deviation.

#### 6.1.4 TEST SETUP



#### 6.1.5 EUT OPERATION CONDITIONS

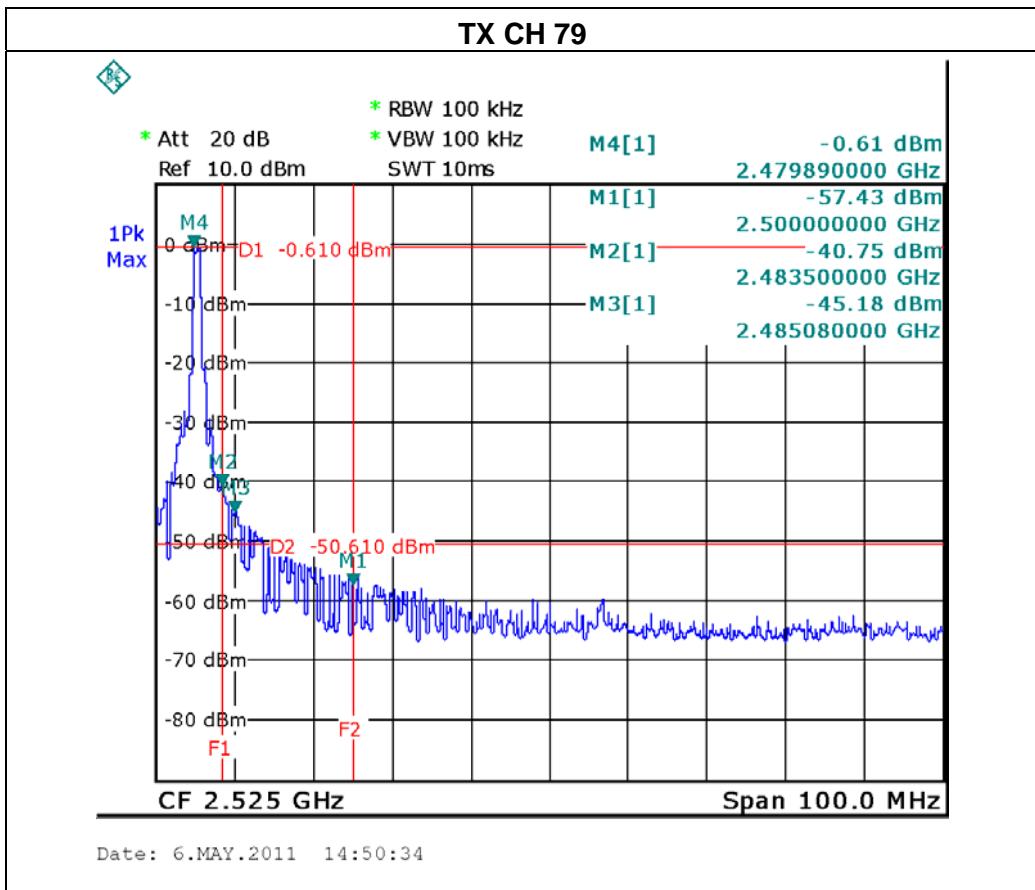
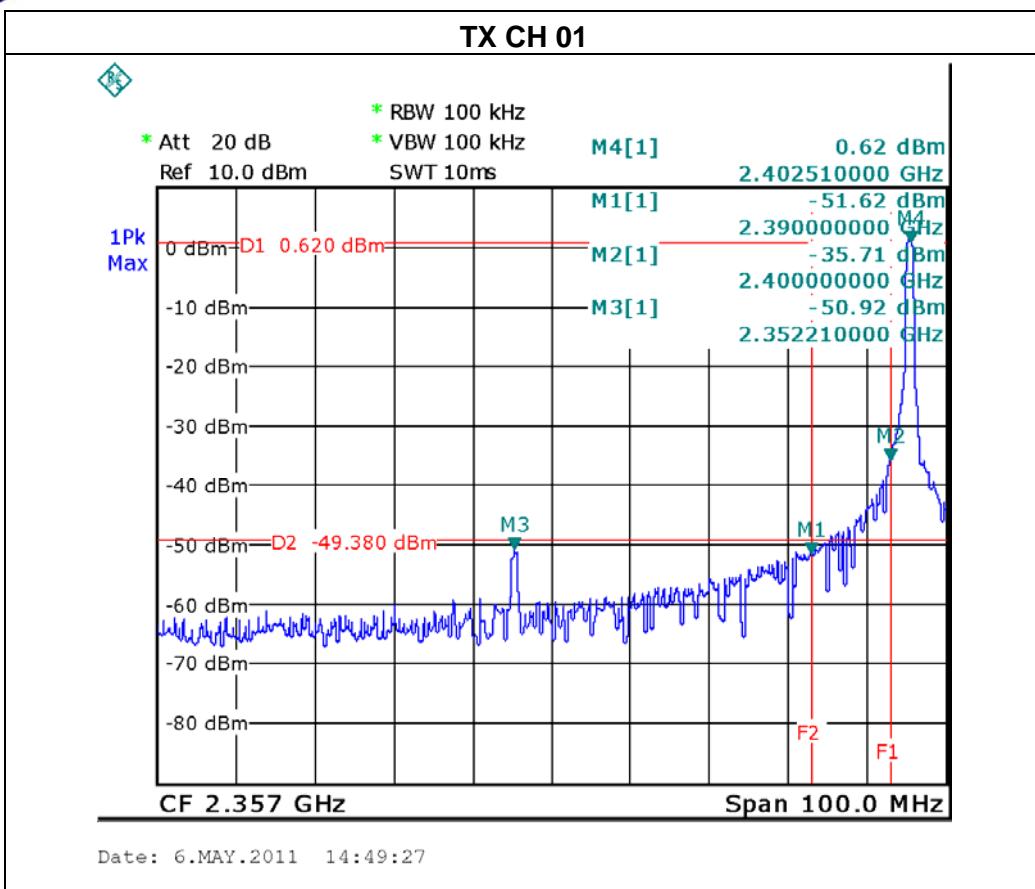
The EUT tested system was configured as the statements of 4.1.6 Unless otherwise a special operating condition is specified in the follows during the testing.

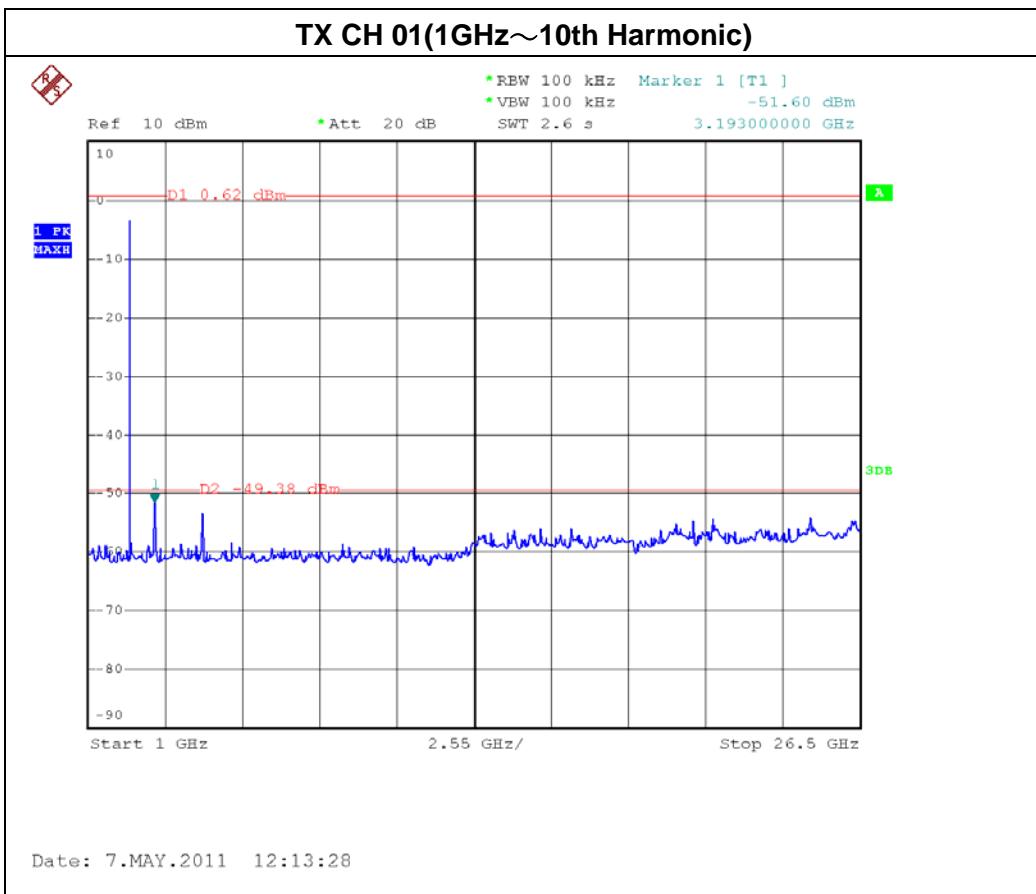
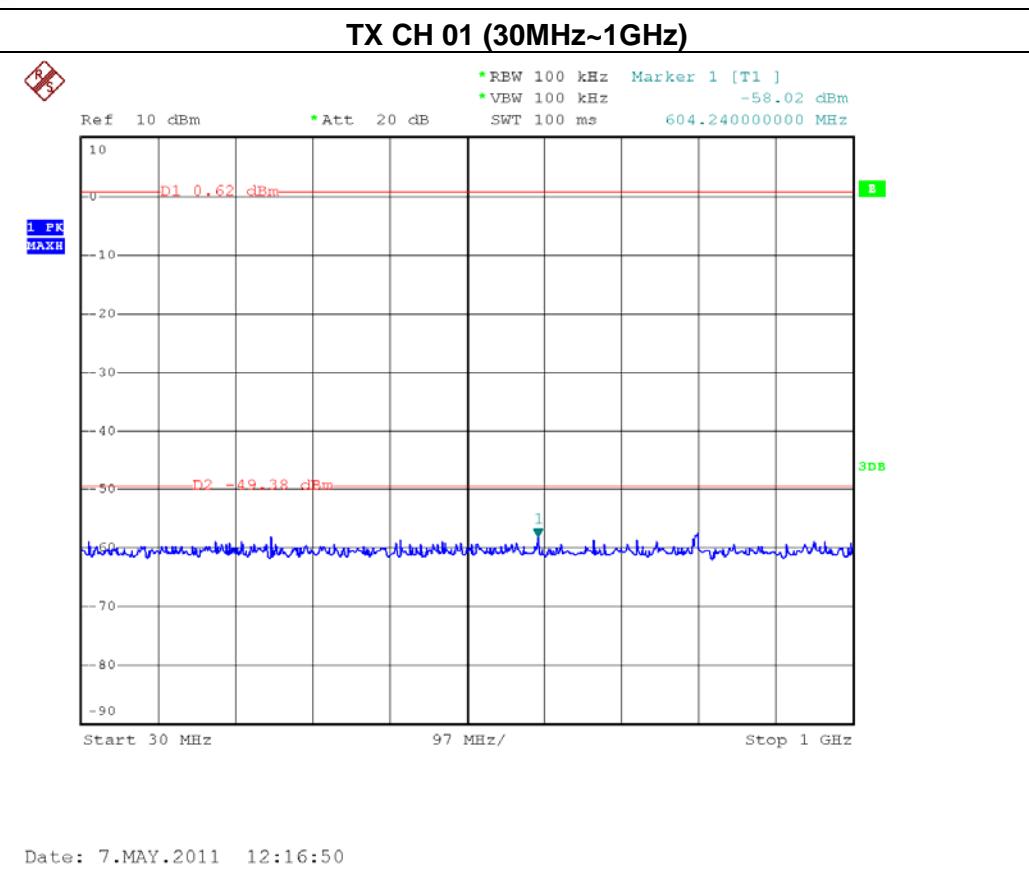


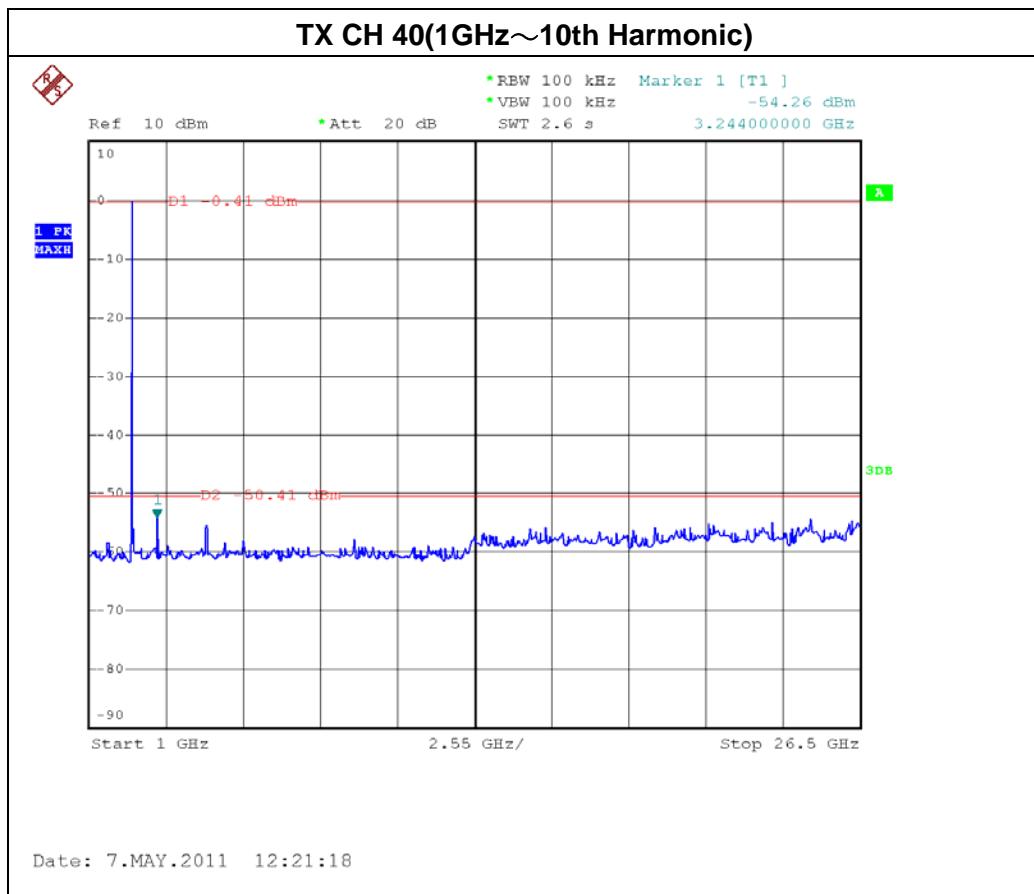
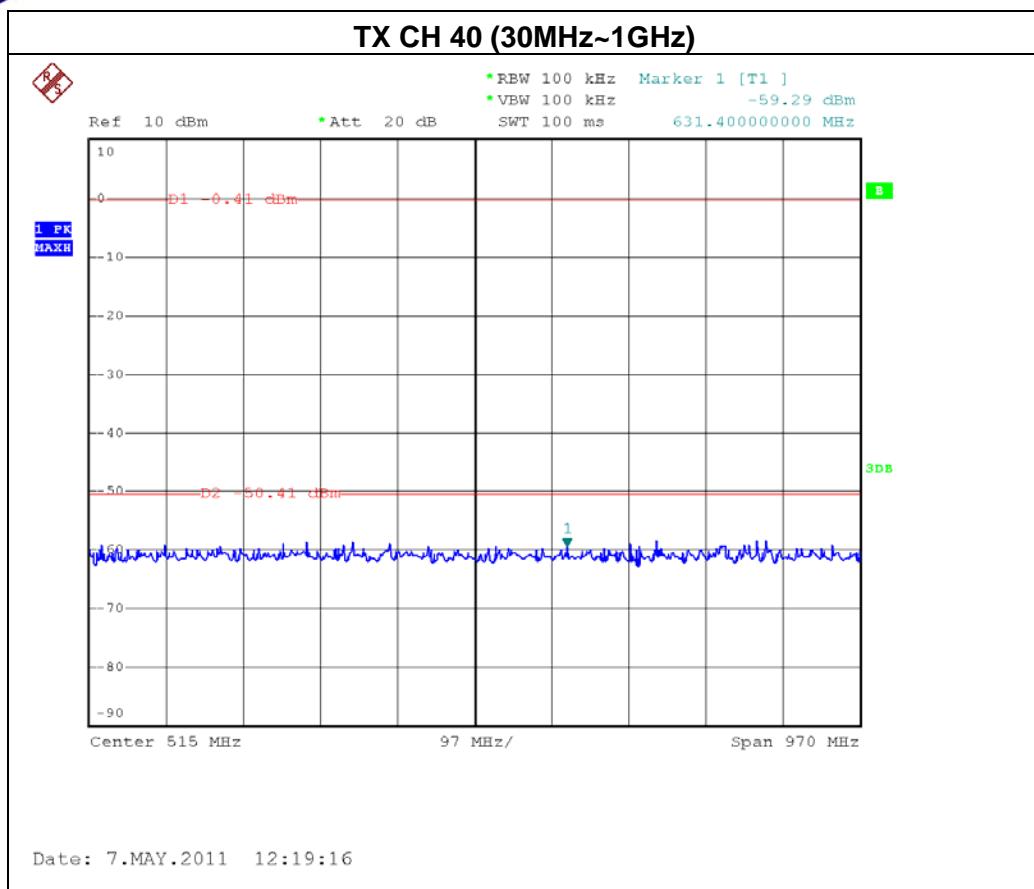
#### 6.1.6 TEST RESULTS

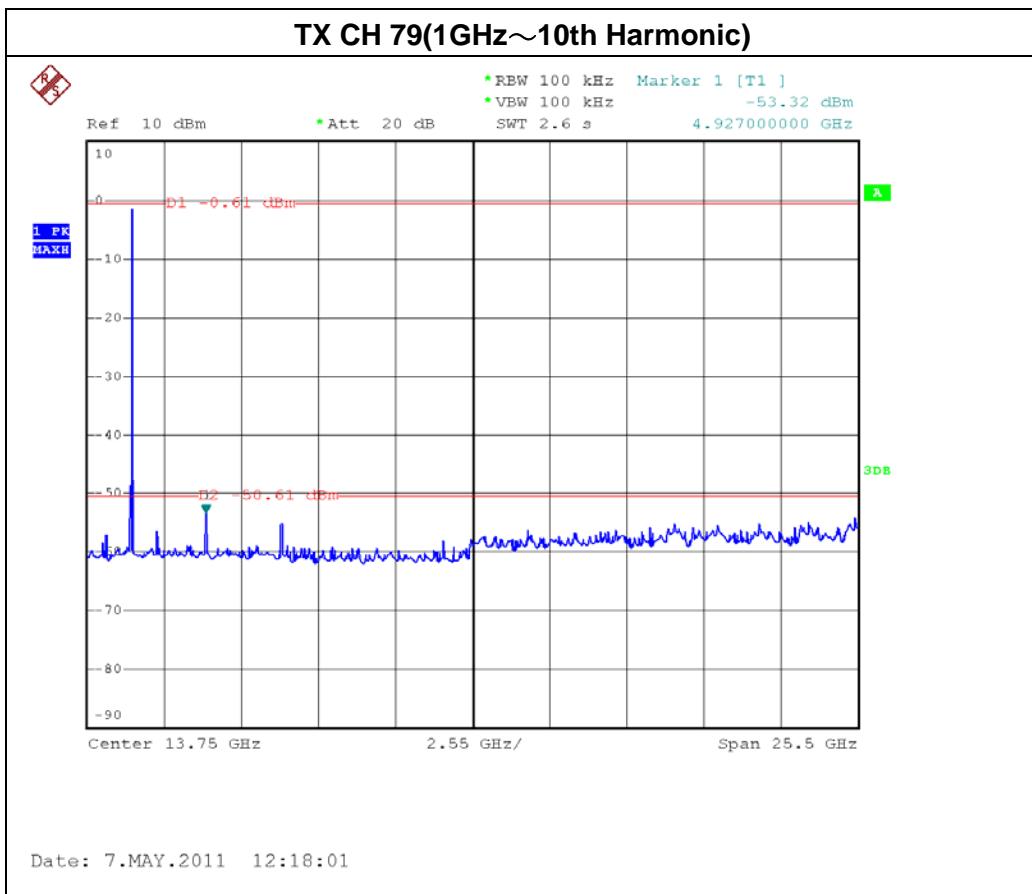
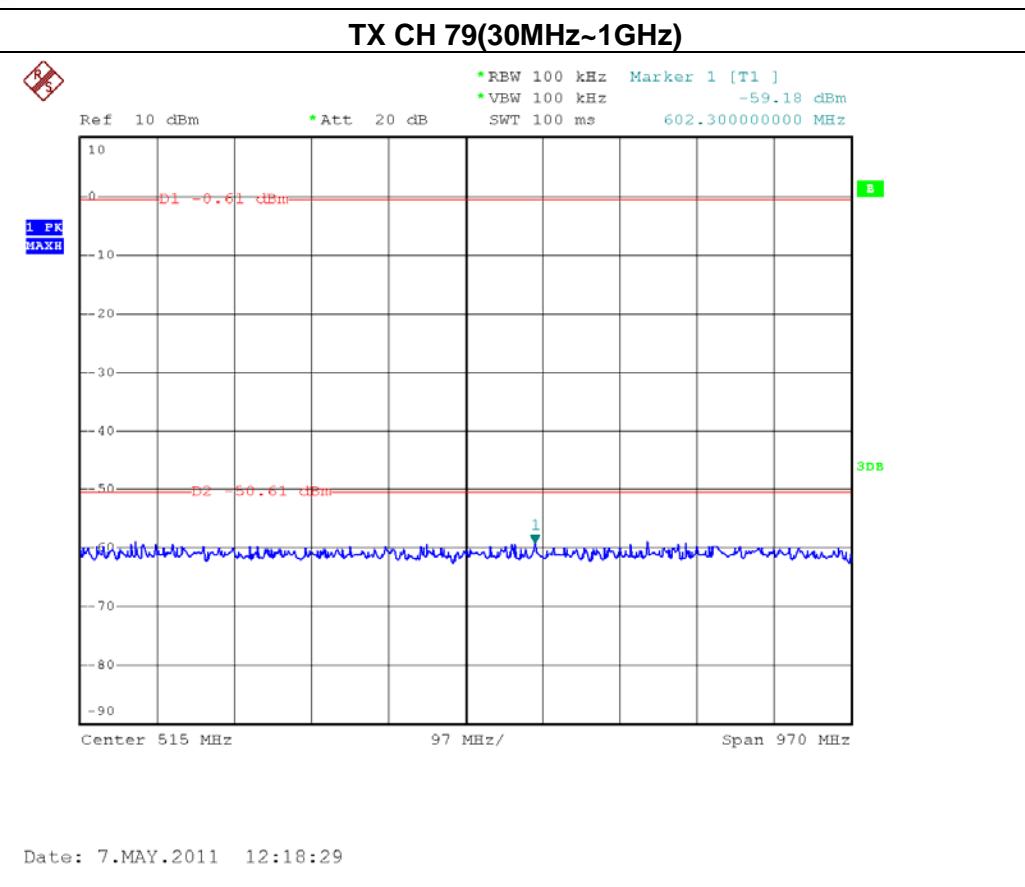
EUT :	Razer Mamba Elite Ergonomic Gaming Mouse	Model Name. :	RC30-001206
Temperature :	20°C	Relative Humidity :	55 %
Pressure :	1009 hPa	Test Power :	DC 3.7V
Test Mode :	TX CH01, CH40, CH79		

Channel of Worst Data: CH79			
The max. radio frequency power in any 100kHz bandwidth outside the frequency band		The max. radio frequency power in any 100 kHz bandwidth within the frequency band.	
FREQUENCY(MHz)	POWER(dBm)	FREQUENCY(MHz)	POWER(dBm)
2352.21	-50.92	2483.50	-40.75
Result			
In any 100kHz bandwidth outside the frequency band, the radio frequency power is at least 50dB below that in the 100kHz bandwidth within the band that contains the highest lever of the desired power.			











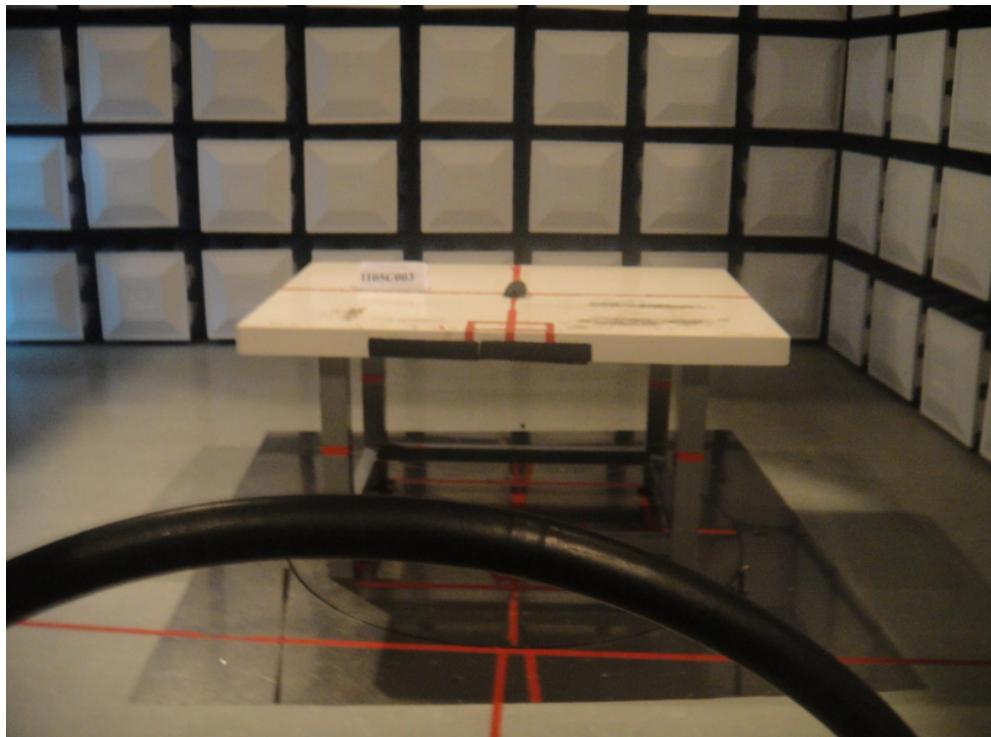
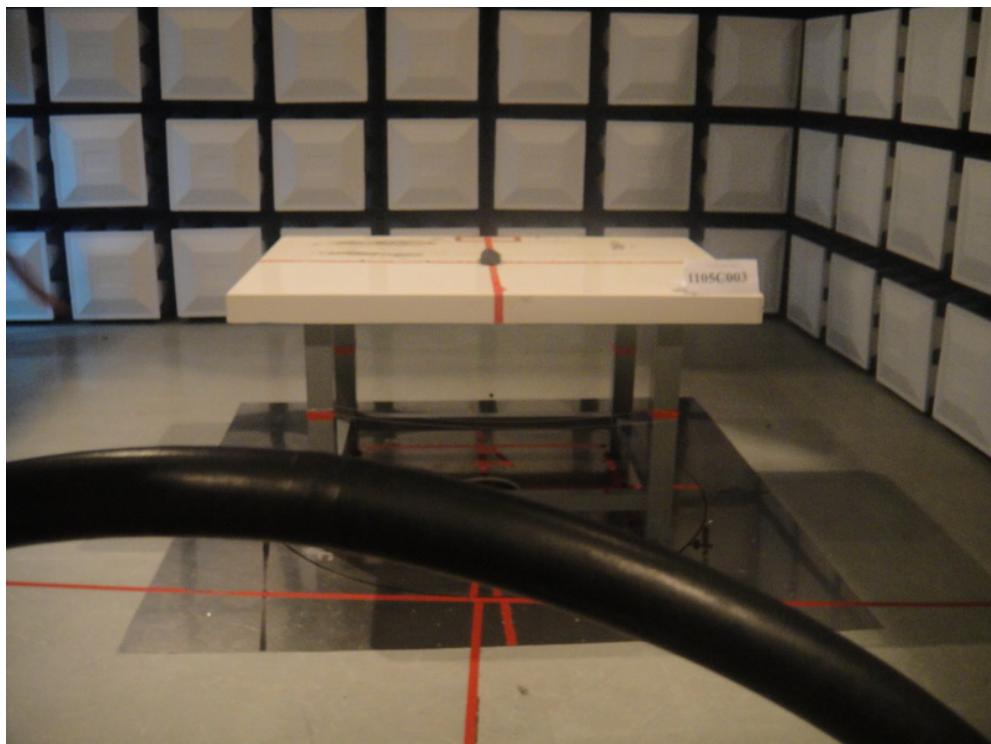
**7. EUT TEST PHOTO**

**Conducted Measurement Photos  
Charge Mode**



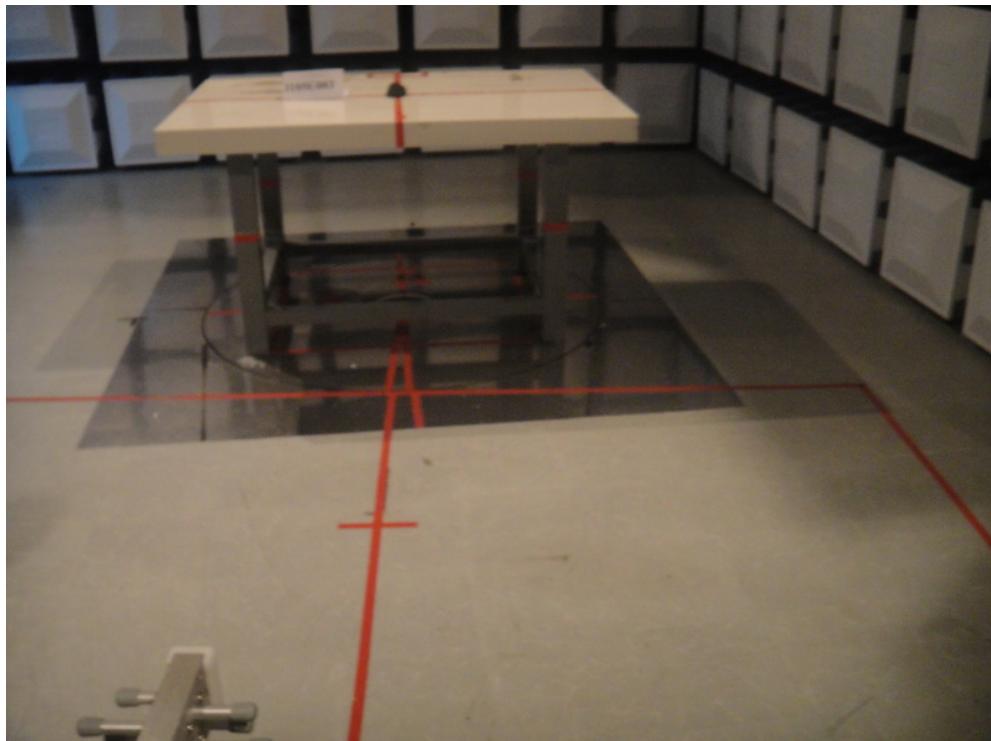
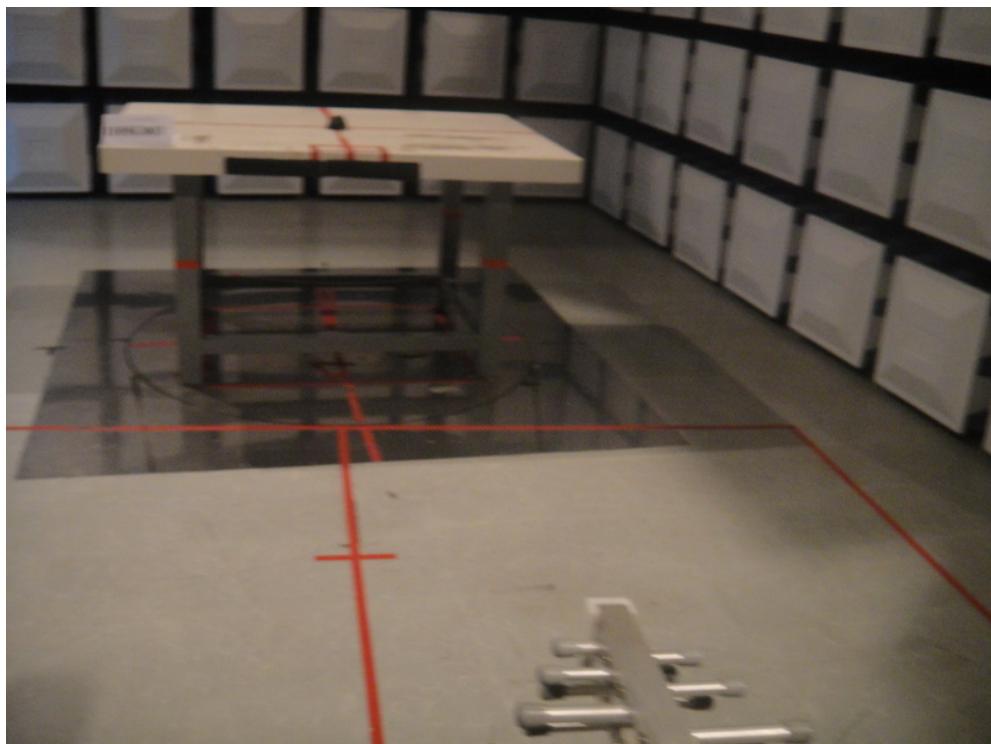


**Radiated Measurement Photos**  
**9K~30MHz**





**Radiated Measurement Photos**  
**30M~1000MHz**





**Radiated Measurement Photos  
Above 1000MHz**

