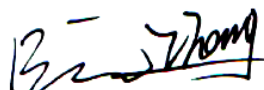




# EMC Test Report

**Project No.** : 1607C230  
**Equipment** : Gaming Mouse Mat  
**Test Model** : RZ02-0200  
**Series Model** : NA  
**Applicant** : Razer Inc.  
**Address** : 201 3rd Street, Suite 900, San Francisco, CA 94103

**Date of Receipt** : Jul. 21, 2016  
**Date of Test** : Jul. 21, 2016 ~ Jul. 27, 2016  
**Issued Date** : Jul. 28, 2016  
**Tested by** : BTL Inc.

**Testing Engineer** :   
(Bill Zhang)  
**Technical Manager** :   
(James Chiu)  
**Authorized Signatory** :   
(Steven Lu)

## B T L I N C .

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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.

<b>Table of Contents</b>	<b>Page</b>
<b>REPORT ISSUED HISTORY</b>	<b>6</b>
<b>1 . CERTIFICATION</b>	<b>7</b>
<b>2 . SUMMARY OF TEST RESULTS</b>	<b>8</b>
2.1 TEST FACILITY	9
2.2 MEASUREMENT UNCERTAINTY	9
<b>3 . GENERAL INFORMATION</b>	<b>10</b>
3.1 GENERAL DESCRIPTION OF EUT	10
3.2 DESCRIPTION OF TEST Modes	11
3.3 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED	12
3.4 DESCRIPTION OF SUPPORT UNITS	13
<b>4 . EMC EMISSION TEST</b>	<b>14</b>
4.1 CONDUCTED EMISSION TEST	14
4.1.1 LIMITS	14
4.1.2 MEASUREMENT INSTRUMENTS LIST	14
4.1.3 TEST PROCEDURE	15
4.1.4 DEVIATION FROM TEST STANDARD	15
4.1.5 TEST SETUP	15
4.1.6 EUT OPERATING CONDITIONS	15
4.1.7 TEST RESULTS	16
4.2 RADIATED EMISSION TEST	18
4.2.1 LIMITS	18
4.2.2 MEASUREMENT INSTRUMENTS LIST	19
4.2.3 TEST PROCEDURE	19
4.2.4 DEVIATION FROM TEST STANDARD	19
4.2.5 TEST SETUP	20
4.2.6 EUT OPERATING CONDITIONS	20
4.2.7 TEST RESULTS-BELOW 1 GHZ	21
<b>5 . EMC IMMUNITY TEST</b>	<b>23</b>
5.1 STANDARD COMPLIANCE/SERVIRITY LEVEL/CRITERIA	23
5.2 GENERAL PERFORMANCE CRITERIA	25
5.3 GENERAL PERFORMANCE CRITERIA TEST SETUP	25
5.4 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)	26
5.4.1 TEST SPECIFICATION	26
5.4.2 MEASUREMENT INSTRUMENTS	26
5.4.3 TEST PROCEDURE	26
5.4.4 DEVIATION FROM TEST STANDARD	27
5.4.5 TEST SETUP	27

<b>Table of Contents</b>	<b>Page</b>
5.4.6 TEST RESULTS	28
5.5 RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST (RS)	30
5.5.1 TEST SPECIFICATION	30
5.5.2 MEASUREMENT INSTRUMENTS	30
5.5.3 TEST PROCEDURE	30
5.5.4 DEVIATION FROM TEST STANDARD	30
5.5.5 TEST SETUP	31
5.5.6 TEST RESULTS	32
5.6 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT/BURST)	33
5.6.1 TEST SPECIFICATION	33
5.6.2 MEASUREMENT INSTRUMENTS	33
5.6.3 TEST PROCEDURE	33
5.6.4 DEVIATION FROM TEST STANDARD	33
5.6.5 TEST SETUP	34
5.6.6 TEST RESULTS	35
5.7 SURGE IMMUNITY TEST	36
5.7.1 TEST SPECIFICATION	36
5.7.2 MEASUREMENT INSTRUMENTS	36
5.7.3 TEST PROCEDURE	36
5.7.4 DEVIATION FROM TEST STANDARD	37
5.7.5 TEST SETUP	37
5.7.6 TEST RESULTS	38
5.8 IMMUNITY TO CONDUCTED DISTURBANCES, INDUCED BY RADIO-FREQUENCY FIELDS TEST (CS)	39
5.8.1 TEST SPECIFICATION	39
5.8.2 MEASUREMENT INSTRUMENTS	39
5.8.3 TEST PROCEDURE	39
5.8.4 DEVIATION FROM TEST STANDARD	39
5.8.5 TEST SETUP	40
5.8.6 TEST RESULTS	41
5.9 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST (PFMF)	42
5.9.1 TEST SPECIFICATION	42
5.9.2 MEASUREMENT INSTRUMENTS	42
5.9.3 TEST PROCEDURE	42
5.9.4 DEVIATION FROM TEST STANDARD	42
5.9.5 TEST SETUP	43
5.9.6 TEST RESULTS	44
5.10 VOLTAGE DIPS, SHORT INTERRUPTIONS AND VOLTAGE VARIATIONS IMMUNITY TEST	45
5.10.1 TEST SPECIFICATION	45
5.10.2 MEASUREMENT INSTRUMENTS	45

<b>Table of Contents</b>	<b>Page</b>
5.10.3 TEST PROCEDURE	45
5.10.4 DEVIATION FROM TEST STANDARD	45
5.10.5 TEST SETUP	46
5.10.6 TEST RESULTS	47
6 . EUT TEST PHOTO	48

## REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-EMC-1-1607C230	Original Issue.	Jul. 28, 2016

## 1. CERTIFICATION

Equipment : Gaming Mouse Mat  
Brand Name : RAZER  
Test Model : RZ02-0200  
Series Model : NA  
Applicant : Razer Inc.  
Manufacturer : Razer (Asia-Pacific) Pte.,Ltd.  
Address : 514 Chai Chee Lane #07-01 ~ 06 Singapore 469029  
Factory : RAZER TECHNOLOGY AND DEVELOPMENT (SHENZHEN) CO., LTD  
Address : East Wing, 3rd Floor, Block 2, Phase 1 of Vision Shenzhen Business Park Keji  
South Road, Hi-Tech Industrial Park, Shenzhen 518057, China  
Date of Test : Jul. 21, 2016 ~ Jul. 27, 2016  
Test Sample : Engineering Sample  
Standard(s) : EN 55022: 2010+AC:2011 Class B  
EN 55024: 2010+AC: 2015  
EN 61000-4-2: 2009  
EN 61000-4-3: 2006+A1:2008+A2:2010  
EN 61000-4-4: 2012  
EN 61000-4-5: 2014  
EN 61000-4-6: 2014  
EN 61000-4-8: 2010  
EN 61000-4-11: 2004

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-EMC-1-1607C230) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of 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:

Emission				
Standard(s)	Test Item	Limit	Judgment	Remark
EN 55022	Conducted disturbance at mains terminals	Class B	PASS	
	Conducted disturbance at telecommunication ports	-----	N/A	NOTE (1)
	Radiated disturbance below 1 GHz	Class B	PASS	
	Radiated disturbance above 1 GHz	-----	N/A	NOTE (1) NOTE (2)

Immunity EN 55024				
Section(s)	Test Item	Performance Criterion	Judgment	Remark
EN 61000-4-2	Electrostatic discharge immunity	B	PASS	
EN 61000-4-3	Radiated, radio-frequency, electromagnetic field immunity	A	PASS	
EN 61000-4-4	Electrical fast transient/burst immunity	B	PASS	
EN 61000-4-5	Surge immunity	B/C	PASS	NOTE (4)
EN 61000-4-6	Immunity to conducted disturbances, induced by radio-frequency fields	A	PASS	
EN 61000-4-8	Power frequency magnetic field immunity	A	PASS	
EN 61000-4-11	Voltage dips, short interruptions and voltage variations immunity	B / C / C	PASS	NOTE (5)

### NOTE:

- (1) "N/A" denotes test is not applicable to this device.
- (2) The EUT's max operating frequency is 12 MHz which does not exceed 108 MHz, so the test will not be performed.
- (3) If the power consumption is less than 75W, there is no limit applied.
- (4) Performance Criterion C for signal ports and telecommunication ports.  
Performance Criterion B for input d.c. power port and a.c. power ports.
- (5) Voltage Dips: >95% reduction – Performance Criterion B  
Voltage Dips: 30% reduction – Performance Criterion C  
Voltage Interruptions: >95% reduction – Performance Criterion C



## 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

## 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 BTL measurement uncertainty is less than the CISPR 16-4-2  $U_{\text{CISPR}}$  requirement.

The reported uncertainty of measurement  $y \pm U$ , where expanded 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 disturbance at mains terminals measurement:

Test Site	Method	Measurement Frequency Range	U,(dB)
DG-C02	CISPR	150 kHz ~ 30MHz	2.32

### B. Radiated disturbance below 1 GHz measurement:

Test Site	Method	Measurement Frequency Range	Ant. H / V	U,(dB)
DG-CB08 (10m)	CISPR	30MHz ~ 200MHz	V	4.66
		30MHz ~ 200MHz	H	4.64
		200MHz ~ 1,000MHz	V	4.88
		200MHz ~ 1,000MHz	H	4.86

### C. Immunity Measurement:

Test Site	Method	Test Item	U
SR02	EN 61000-4-2	Voltage (2kV/4kV/6kV/8kV/15kV/25kV/30kV)	1.0%
		Peak Current	6.0%
		30/60ns Current	6.0%
		Rise time	6.4%
CB05	EN 61000-4-3	80MHz~1GHz	2.175 dB
		1GHz~6GHz	2.175 dB
SR05	EN 61000-4-4	Impulse Voltage	4.0 %
		Impulse Rise Time	4.5 %
		Impulse duration Time	4.0 %
SR05	EN 61000-4-5	Impulse Voltage	4.0 %
		Impulse Rise Time	4.5 %
		Impulse duration Time	4.0 %
CB06	EN 61000-4-6	CDN: 150kHz~230MHz	2.509 dB
		EM Clamp: 150kHz~230MHz	3.094 dB
SR05	EN 61000-4-8	Magnetic Field Level	3 %
SR05	EN 61000-4-11	Impulse Amplitude	4 %
		Timing	3 %

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

Equipment	Gaming Mouse Mat
Brand Name	RAZER
Test Model	RZ02-0200
Series Model	NA
Model Difference	NA
Power Source	Supplied from USB Port
Power Rating	DC 5V

Note:

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

### 3.2 DESCRIPTION OF TEST Modes

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base 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.

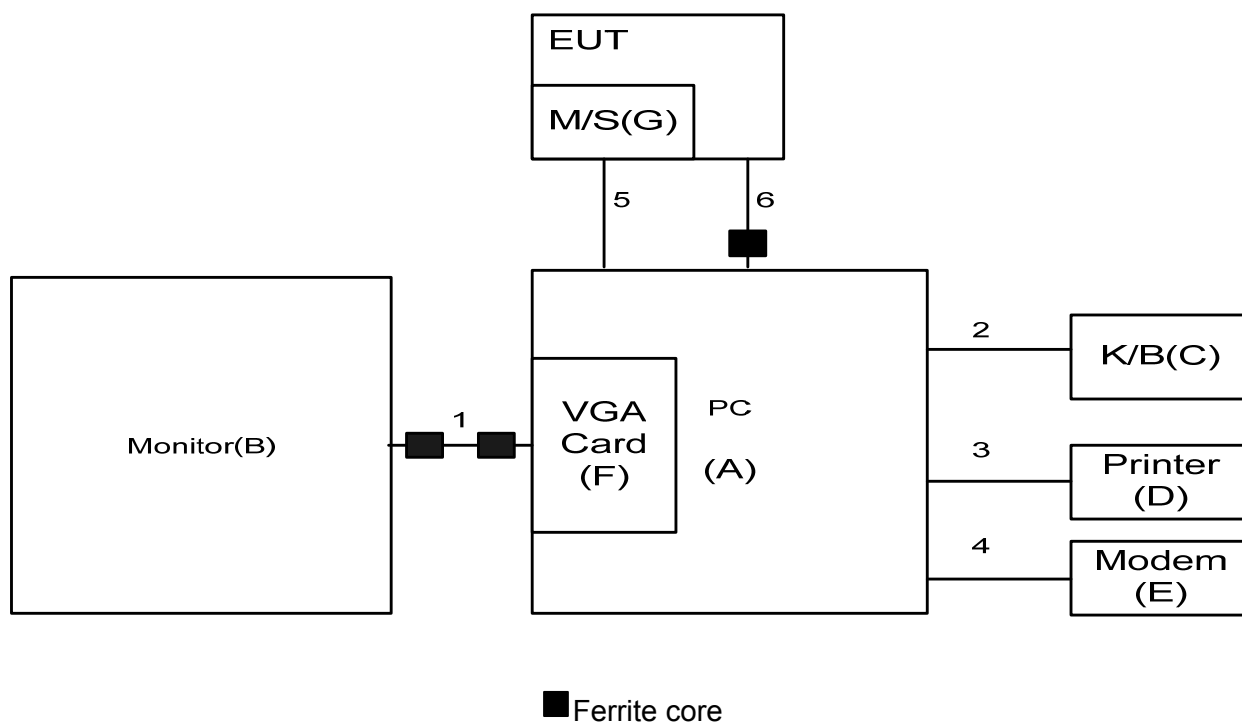
Pretest Mode	Description
Mode 1	Operating

For Conducted Test	
Final Test Mode	Description
Mode 1	Operating

For Radiated Test	
Final Test Mode	Description
Mode 1	Operating

For EMS Test	
Final Test Mode	Description
Mode 1	Operating

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



### 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.
A	PC	DELL	optiplex9020	DOC	17742771325
B	Monitor	DELL	E177FPC	DOC	CN-OFJ79-64180-763-0TKS
C	USB keyboard	DELL	KB212-B	DOC	CN0HTXH97158125004DXA01
D	Printer	SII	DPU-414	DOC	3018507 B
E	Modem	ACEEX	DM-1414V	IFAXDM1414	0603002131
F	VGA Card	LEADTEK	LR2A5F	DOC	ALF7100123952
G	USB Mouse	Dell	MO56UOA	DOC	FQJ000BS

Item	Shielded Type	Ferrite Core	Length	Note
1	YES	YES	1.8m	D-SUB Cable
2	YES	NO	1.5m	USB Cable
3	YES	NO	1.5m	Parallel Cable
4	YES	NO	1.5m	RS232 Cable
5	YES	NO	1.5m	USB Cable
6	YES	YES	2.1m	USB Cable

## 4. EMC EMISSION TEST

### 4.1 CONDUCTED EMISSION TEST

#### 4.1.1 LIMITS (FREQUENCY RANGE 150 KHZ-30MHZ)

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

**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.
- (3) The test result calculated as following:  
 Measurement Value = Reading Level + Correct Factor  
 Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)  
 Margin Level = Measurement Value – Limit Value

#### 4.1.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	LISN	EMCO	3816/2	0052765	Mar. 27, 2017
2	LISN	R&S	ENV216	101447	Mar. 27, 2017
3	Test Cable	emci	RG223(9KHz-30 MHz)	C_17	Mar. 10, 2017
4	EMI Test Receiver	R&S	ESCI	100382	Mar. 27, 2017
5	50Ω Terminator	SHX	TF2-3G-A	08122901	Mar. 27, 2017
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

Remark: "N/A" denotes no model name, no serial No. or no calibration specified.

All calibration period of equipment list is one year.

#### 4.1.3 TEST PROCEDURE

- 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.
- 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.
- 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.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

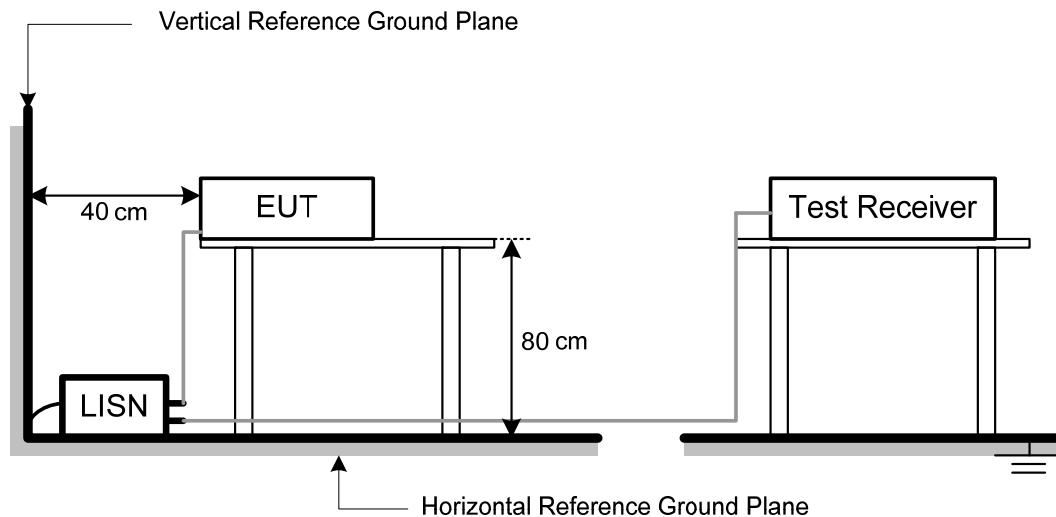
#### NOTE:

- Reading in which marked as Peak, QP or AVG means measurements by using are Quasi-Peak or Average Mode with Detector BW=9 kHz (6 dB Bandwidth).
- All readings are Peak Mode value unless otherwise stated QP or AVG in column of Note. If the Peak or 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 Peak or QP Mode was measured, but AVG Mode didn't perform.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP

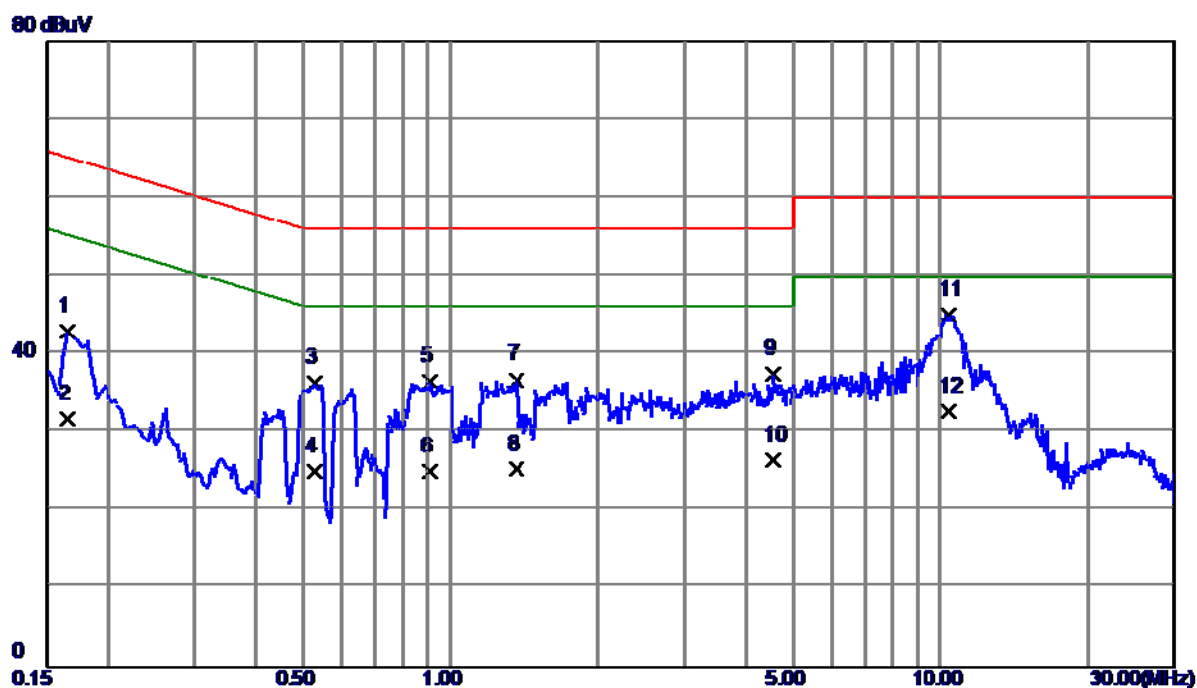


#### 4.1.6 EUT OPERATING CONDITIONS

The EUT exercise program used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use.

#### 4.1.7 TEST RESULTS

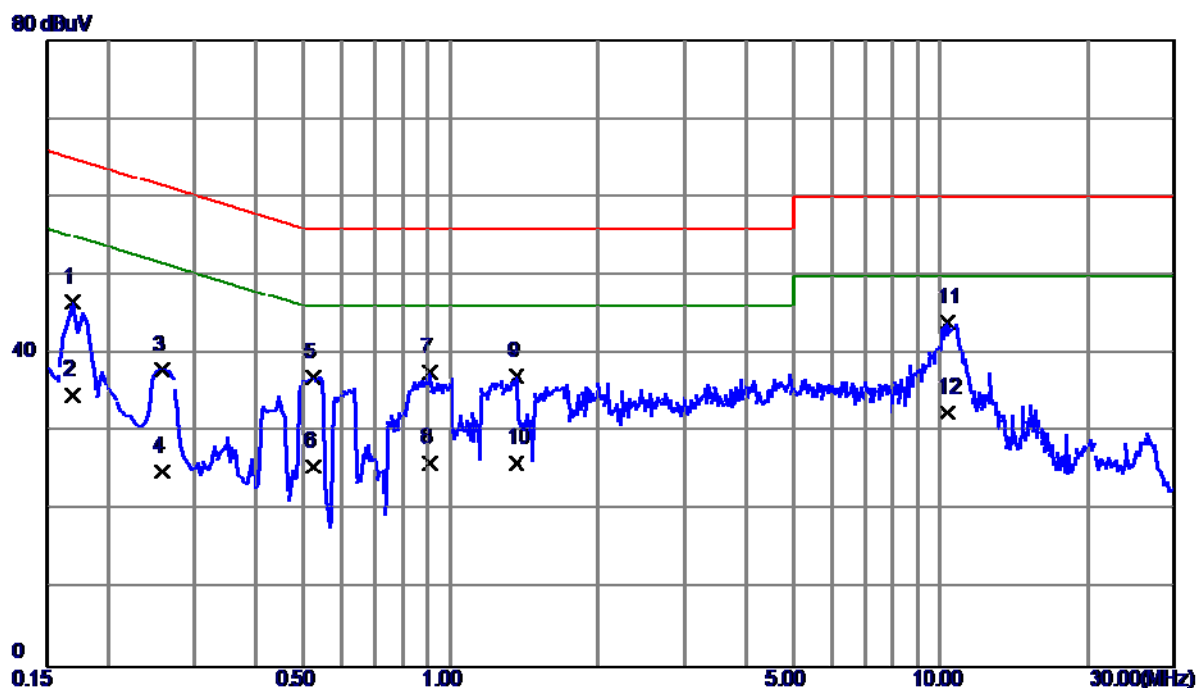
EUT	Gaming Mouse Mat	Model Name	RZ02-0200
Temperature	25°C	Relative Humidity	53%
Test Voltage	AC 230V/50Hz	Phase	Line
Test Mode	Operating		
Test Engineer	Lucky Mao		
Test Date	Jul. 25, 2016		



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector
1	0.1660	33.42	9.52	42.94	65.16	-22.22	QP
2	0.1660	22.14	9.52	31.66	55.16	-23.50	AVG
3	0.5299	26.61	9.64	36.25	56.00	-19.75	QP
4	0.5299	15.36	9.64	25.00	46.00	-21.00	AVG
5	0.9100	26.79	9.76	36.55	56.00	-19.45	QP
6	0.9100	15.17	9.76	24.93	46.00	-21.07	AVG
7	1.3660	26.89	9.83	36.72	56.00	-19.28	QP
8	1.3660	15.38	9.83	25.21	46.00	-20.79	AVG
9	4.5500	27.32	10.08	37.40	56.00	-18.60	QP
10	4.5500	16.38	10.08	26.46	46.00	-19.54	AVG
11 *	10.4180	34.71	10.22	44.93	60.00	-15.07	QP
12	10.4180	22.35	10.22	32.57	50.00	-17.43	AVG



EUT	Gaming Mouse Mat	Model Name	RZ02-0200
Temperature	25°C	Relative Humidity	53%
Test Voltage	AC 230V/50Hz	Phase	Neutral
Test Mode	Operating		
Test Engineer	Lucky Mao		
Test Date	Jul. 25, 2016		



No.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure ment dBuV	Limit dBuV	Margin dB	Detector
1	0.1700	37.15	9.42	46.57	64.96	-18.39	QP
2	0.1700	25.36	9.42	34.78	54.96	-20.18	AVG
3	0.2580	28.39	9.53	37.92	61.50	-23.58	QP
4	0.2580	15.38	9.53	24.91	51.50	-26.59	AVG
5	0.5260	27.55	9.44	36.99	56.00	-19.01	QP
6	0.5260	16.15	9.44	25.59	46.00	-20.41	AVG
7	0.9100	27.94	9.66	37.60	56.00	-18.40	QP
8	0.9100	16.35	9.66	26.01	46.00	-19.99	AVG
9	1.3660	27.51	9.67	37.18	56.00	-18.82	QP
10	1.3660	16.39	9.67	26.06	46.00	-19.94	AVG
11 *	10.3500	33.75	10.31	44.06	60.00	-15.94	QP
12	10.3500	22.15	10.31	32.46	50.00	-17.54	AVG

## 4.2 RADIATED EMISSION TEST

### 4.2.1 LIMITS

#### Below 1 GHz

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	dBuV/m	dBuV/m
30 - 230	40	30
230 - 1000	47	37

#### NOTE:

- (1) The limit for radiated test was performed according to as following:  
EN 55022.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m) =  $20\log$  Emission level (uV/m).
- (4) The test result calculated as following:  
 Measurement Value = Reading Level + Correct Factor  
 Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)  
 Margin Level = Measurement Value - Limit Value

#### FREQUENCY RANGE OF RADIATED MEASUREMENT (FOR UNINTENTIONAL RADIATORS)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	Range (MHz)
Below 108	1000
108 - 500	2000
500 - 1000	5000
Above 1000	5 <sup>th</sup> harmonic of the highest frequency or 6 GHz, whichever is lower

#### 4.2.2 MEASUREMENT INSTRUMENTS LIST

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	EMCO	3142C	00066462	Mar. 27, 2017
2	Antenna	EMCO	3142C	00066464	Mar. 27, 2017
3	Amplifier	Agilent	8447D	2944A11203	Oct. 11, 2016
4	Amplifier	Agilent	8447D	2944A11204	Oct. 11, 2016
5	Receiver	Agilent	N9038A	MY54450004	Nov. 20, 2016
6	Test Cable	emci	LMR-400 (30MHz-1GHz)	C-23	Dec.31, 2016
7	Test Cable	emci	LMR-400 (30MHz-1GHz)	C-22	Dec.31, 2016
8	Receiver	Agilent	N9038A	MY53220133	Jun. 23, 2017
9	Multi-Device Controller	ETS-Lindgren	2090	N/A	N/A
10	Measurement Software	Farad	EZ-EMC Ver.BTL-2ANT-1	N/A	N/A

Remark: "N/A" denotes no model name, no serial No. or no calibration specified.

All calibration period of equipment list is one year.

#### 4.2.3 TEST PROCEDURE

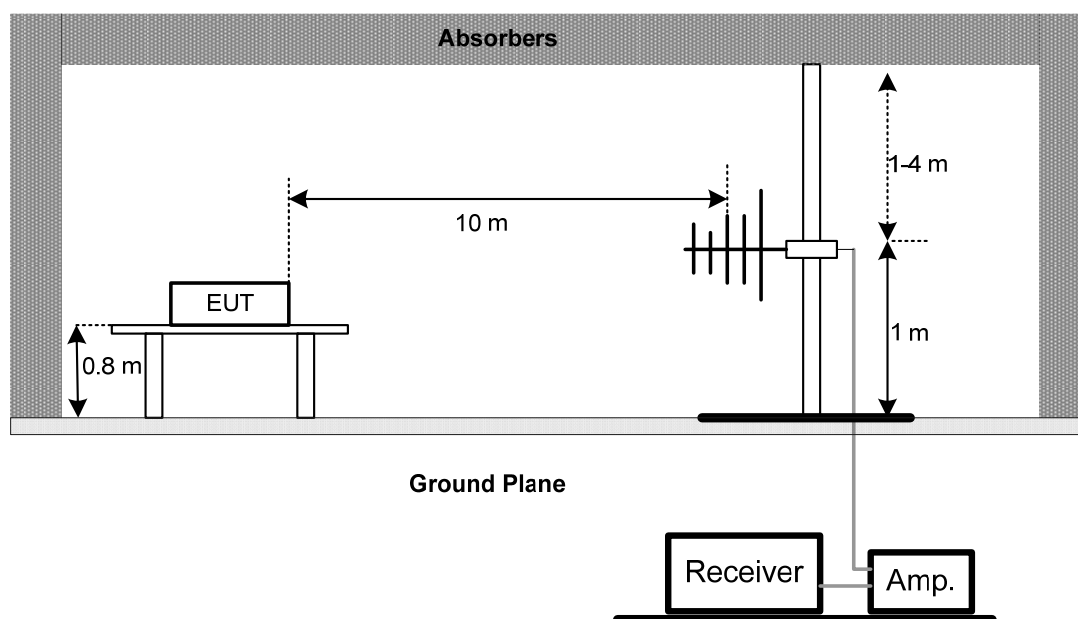
- The measuring distance of 10 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- The height of the equipment 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.
- The initial step in collecting radiated emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- 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. (below 1GHz)
- 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

Below 1 GHz

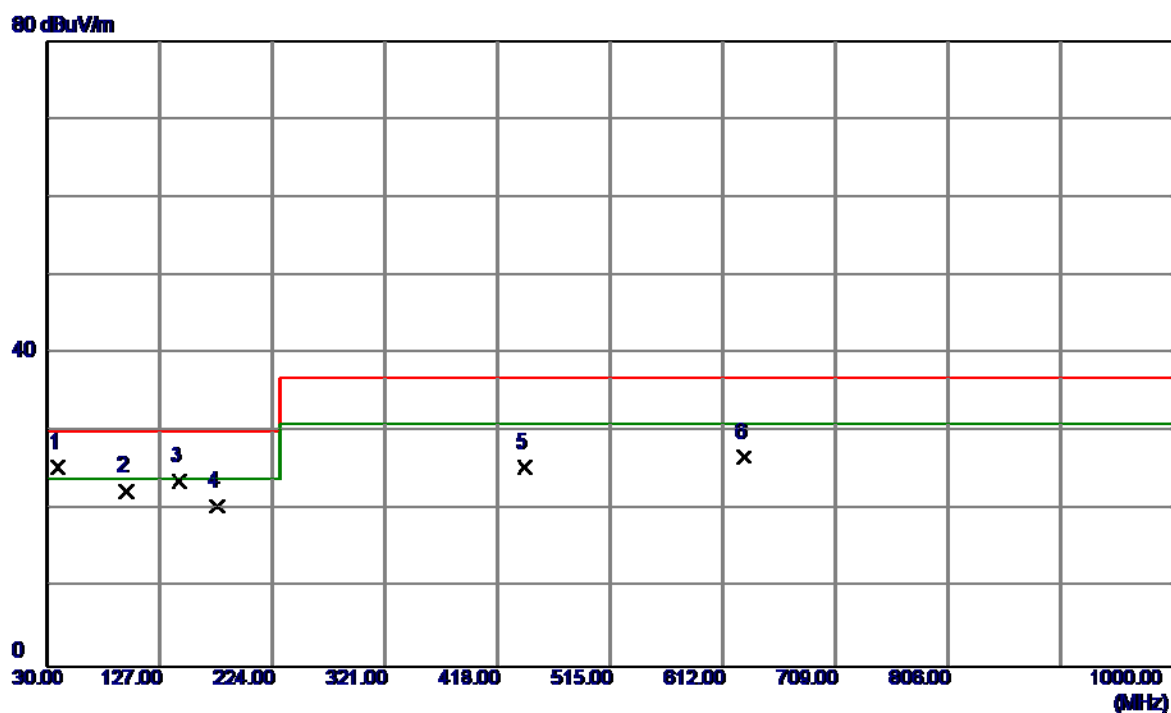


## 4.2.6 EUT OPERATING CONDITIONS

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 1 GHZ

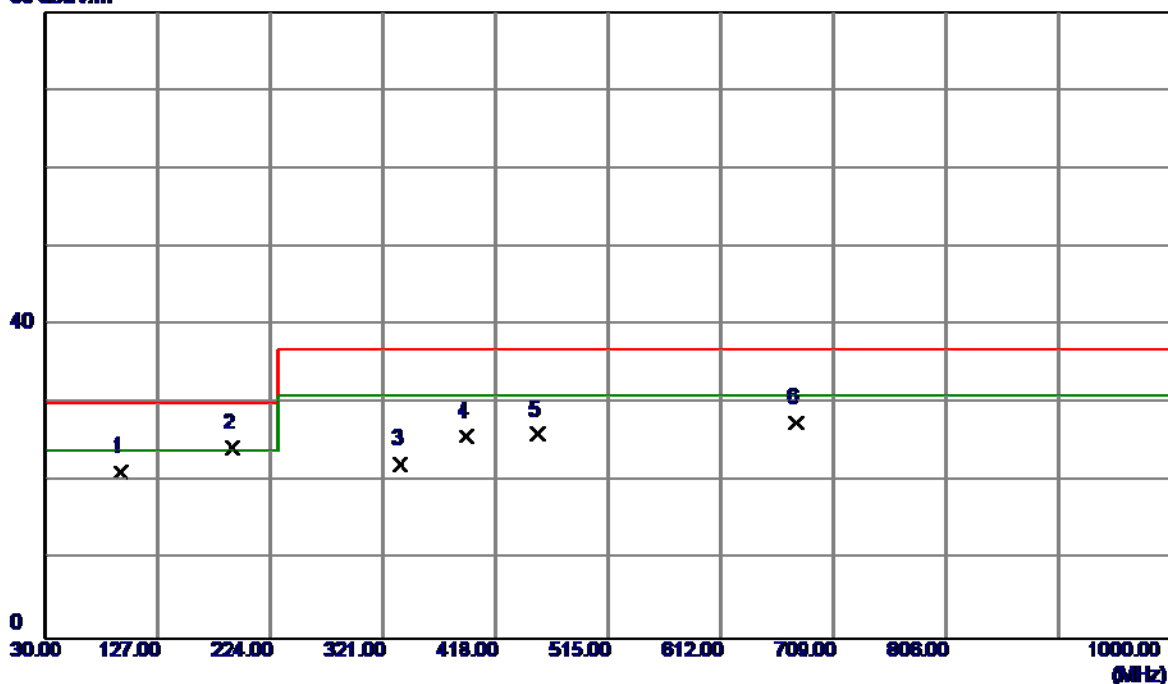
EUT	Gaming Mouse Mat	Model Name	RZ02-0200
Temperature	25°C	Relative Humidity	60%
Test Voltage	AC 230V/50Hz	Polarization	Vertical
Test Mode	Operating		
Test Engineer	Lucky Mao		
Test Date	Jul. 25, 2016		



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector
1 *	39.4000	42.95	-17.52	25.43	30.00	-4.57	QP
2	98.8700	42.88	-20.47	22.41	30.00	-7.59	Peak
3	143.9750	39.47	-15.76	23.71	30.00	-6.29	Peak
4	176.4700	36.80	-16.38	20.42	30.00	-9.58	Peak
5	441.7650	35.36	-9.97	25.39	37.00	-11.61	Peak
6	630.4300	32.87	-6.16	26.71	37.00	-10.29	Peak

EUT	Gaming Mouse Mat	Model Name	RZ02-0200
Temperature	25°C	Relative Humidity	60%
Test Voltage	AC 230V/50Hz	Polarization	Horizontal
Test Mode	Operating		
Test Engineer	Kang		
Test Date	Jul. 25, 2016		

80 dBuV/m



No.	Freq. MHz	Reading Level dBuV/m	Correct Factor dB	Measure ment dBuV/m	Limit dBuV/m	Margin dB	Detector
1	95.9600	42.06	-20.82	21.24	30.00	-8.76	Peak
2 *	191.9900	42.10	-17.73	24.37	30.00	-5.63	Peak
3	336.0350	35.46	-13.20	22.26	37.00	-14.74	Peak
4	393.2650	37.48	-11.71	25.77	37.00	-11.23	Peak
5	454.8600	35.57	-9.57	26.00	37.00	-11.00	Peak
6	676.9900	33.07	-5.62	27.45	37.00	-9.55	Peak

## 5. EMC IMMUNITY TEST

### 5.1 STANDARD COMPLIANCE/SERVIRITY LEVEL/CRITERIA

Tests Standard No.	Test Specification Level / Test Mode	Test Ports	Criteria
Electrostatic discharge EN 61000-4-2 (ESD)	±8 kV air discharge ±4 kV contact discharge (Direct Mode)	Enclosure	B
	±4kV HCP discharge ±4kV VCP discharge (Indirect Mode)	Enclosure	B
Radiated, radio-frequency, electromagnetic field immunity EN 61000-4-3 (RS)	80 MHz to 1000 MHz 3V/m(unmodulated, r.m.s), 1 kHz, 80%, AM modulated	Enclosure	A
Electrical fast transient/burst immunity EN 61000-4-4 (EFT/Burst)	±0.5kV(peak) 5/50ns Tr/Th 5kHz Repetition Frequency (100kHz Repetition Frequency for xDSL equipment )	Signal ports and telecommunication ports (Only applicable to cable length>3 m)	B
	±0.5kV(peak) 5/50ns Tr/Th 5kHz Repetition Frequency	DC Power Ports	B
	±1 kV(peak) 5/50ns Tr/Th 5kHz Repetition Frequency	AC Power Ports	B
Surge immunity EN 61000-4-5 (Surges)	±1 kV(peak) 10/700 Tr/Th μs(NOTE) (without primary protection)	Signal ports and telecommunication ports (applicable only to ports connect directly to outdoor cables)	C
	±4 kV(peak) 10/700 Tr/Th μs(NOTE) (with primary protectors fitted)		C
	±0.5 kV(peak) 1.2/50(8/20) Tr/Th μs	DC Power Ports (applicable only to ports connect directly to outdoor cables)	B
	±1 kV(peak) 1.2/50(8/20) Tr/Th μs (line to line)	AC Power Ports	B
	±2 kV(peak) 1.2/50(8/20) Tr/Th μs (line to earth or ground)		B

Immunity to conducted disturbances, induced by radio-frequency fields EN 61000-4-6 (Injected Current)	0.15 MHz to 80 MHz 3V(unmodulated, r.m.s), 1kHz 80%, AM 150Ω source impedance	Signal ports and telecommunication ports (Only applicable to cable length>3 m)	A
	0.15 MHz to 80 MHz 3V(unmodulated, r.m.s), 1kHz 80%, AM 150Ω source impedance	DC Power Ports	A
	0.15 MHz to 80 MHz 3V(unmodulated, r.m.s), 1kHz 80%, AM 150Ω source impedance	AC Power Ports	A
Power frequency magnetic field immunity EN 61000-4-8 (PFMF)	50 Hz or 60Hz, 1A/m(r.m.s) μs	Enclosure	A
Voltage dips, short interruptions and voltage variations immunity EN 61000-4-11 (Voltage Interruption/Dips)	Voltage reduction > 95% 0.5 period Voltage reduction 30% 25 periods Voltage reduction > 95% 250 periods	AC Power Ports	B C C

**Note.**

Where the coupling network for the 10/700 μs waveform affects the functioning of high speed data ports, the test shall be carried out using a 1,2/50 (8/20) μs waveform and appropriate coupling network.



## 5.2 GENERAL PERFORMANCE CRITERIA

According to **EN55024** standard, the general performance criteria as following:

<b>Criterion A</b>	<p>The equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.</p> <p>If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.</p>
<b>Criterion B</b>	<p>After the test, the equipment shall continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomenon below a performance level specified by the manufacturer, when the equipment is used as intended. The performance level may be replaced by a permissible loss of performance.</p> <p>During the test, degradation of performance is allowed. However, no change of operating state if stored data allowed to persist after the test. If the minimum performance level (or the permissible performance loss ) is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended.</p>
<b>Criterion C</b>	<p>Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions.</p> <p>Functions, and/or information stored in non-volatile memory, or protected by a battery backup, shall not be lost.</p>

## 5.3 GENERAL PERFORMANCE CRITERIA TEST SETUP

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.

## 5.4 ELECTROSTATIC DISCHARGE IMMUNITY TEST (ESD)

### 5.4.1 TEST SPECIFICATION

Basic Standard	EN 61000-4-2
Discharge Impedance	330 ohm / 150 pF
Required Performance	B
Discharge Voltage	Air Discharge: $\pm 2$ kV, $\pm 4$ kV, $\pm 8$ kV (Direct) Contact Discharge: $\pm 2$ kV, $\pm 4$ kV (Direct/Indirect)
Polarity	Positive & Negative
Number of Discharge	Air Discharge: min. 20 times at each test point Contact Discharge: min. 200 times in total
Discharge Mode	Single Discharge
Discharge Period	1 second minimum

### 5.4.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	ESD Generator	TESEQ AG	NSG 437	450	Oct. 28, 2016

Remark: "N/A" denotes no model name, no serial No. or no calibration specified.

All calibration period of equipment list is one year.

### 5.4.3 TEST PROCEDURE

The test generator necessary to perform direct and indirect application of discharges to the EUT in the following manner:

- Contact discharge was applied to conductive surfaces (Direct) and coupling planes (Indirect) of the EUT.

During the test, it was performed with single discharges. For the single discharge time between successive single discharges was at least 1 second. The EUT shall be exposed to at least 200 discharges, 100 each at negative and positive polarity, at a minimum of four test points. One of the test points shall be subjected to at least 50 indirect discharges to the center of the front edge of the horizontal coupling plane. The remaining three test points shall each receive at least 50 direct contact discharges.

If no direct contact test points are available, then at least 200 indirect discharges shall be applied in the indirect mode. Test shall be performed at a maximum repetition rate of one discharge per second.

Vertical Coupling Plane (VCP):

The coupling plane, of dimensions 0.5m x 0.5m, is placed parallel to, and positioned at a distance 0.1m from, the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge.

Horizontal Coupling Plane (HCP):

The coupling plane is placed under to the EUT. The generator shall be positioned vertically at a distance of 0.1m from the EUT, with the Discharge Electrode touching the coupling plane.

The four faces of the EUT will be performed with electrostatic discharge.

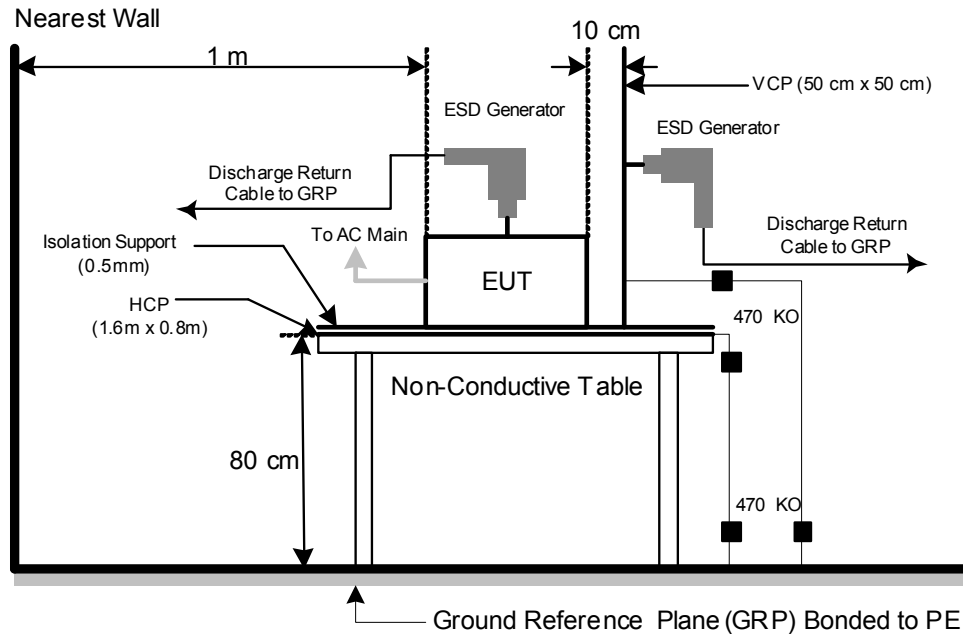
- Air discharges at insulation surfaces of the EUT.

It was at least ten single discharges with positive and negative at the same selected point.

#### 5.4.4 DEVIATION FROM TEST STANDARD

No deviation

#### 5.4.5 TEST SETUP



Note:

##### TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table 0.8 meters high standing on the Ground Reference Plane. The GRP consisted of a sheet of aluminum at least 0.25mm thick, and 2.5 meters square connected to the protective grounding system. A Horizontal Coupling Plane (1.6m x 0.8m) was placed on the table and attached to the GRP by means of a cable with 940k total impedance. The equipment under test was installed in a representative system as described in EN 61000-4-2, and its cables were placed on the HCP and isolated by an insulating support of 0.5mm thickness. A distance of 1-meter minimum was provided between the EUT and the walls of the laboratory and any other metallic structure.

##### FLOOR-STANDING EQUIPMENT

The equipment under test was installed in a representative system as described in EN 61000-4-2, and its cables were isolated from the Ground Reference Plane by an insulating support of 0.1-meter thickness. The GRP consisted of a sheet of aluminum that is at least 0.25mm thick, and 2.5meters square connected to the protective grounding system and extended at least 0.5 meters from the EUT on all sides.

## 5.4.6 TEST RESULTS

EUT	Gaming Mouse Mat	Model Name	RZ02-0200
Temperature	24°C	Relative Humidity	48%
Test Voltage	AC 230V/50Hz	Pressure	1010hPa
Test Mode	Operating		
Test Date	Jul. 26, 2016		

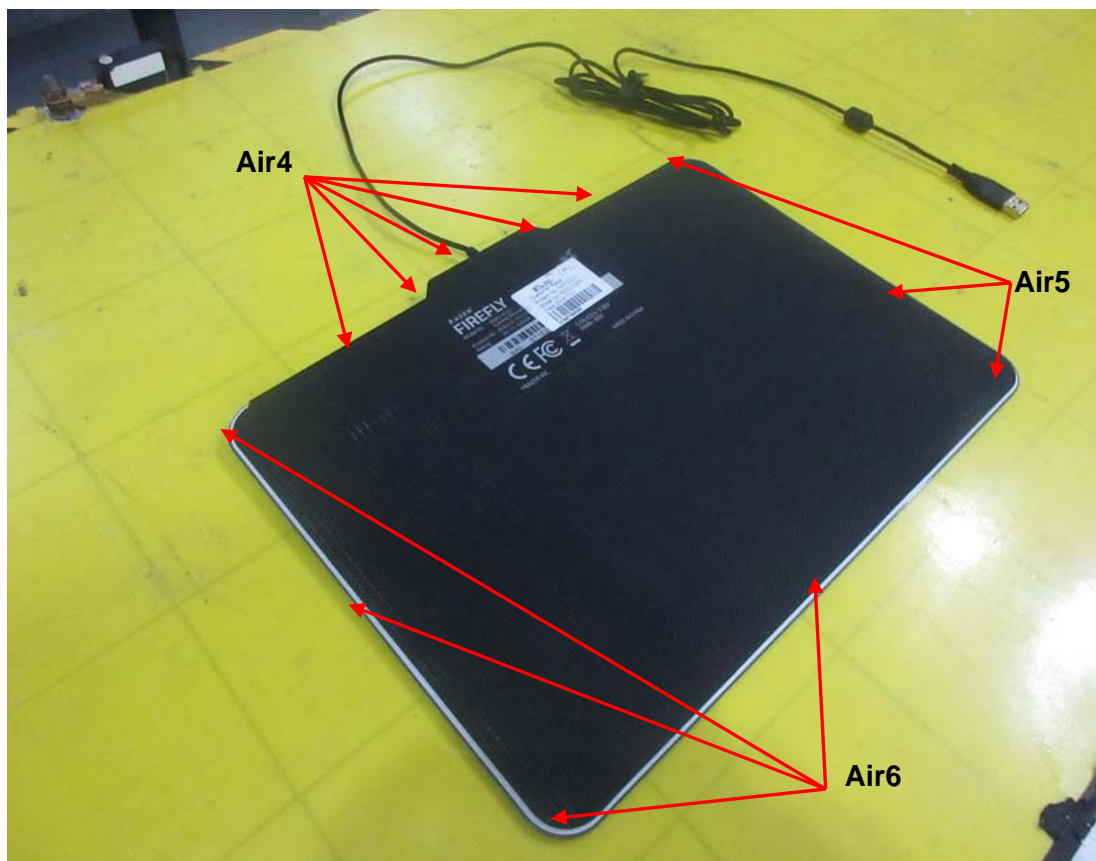
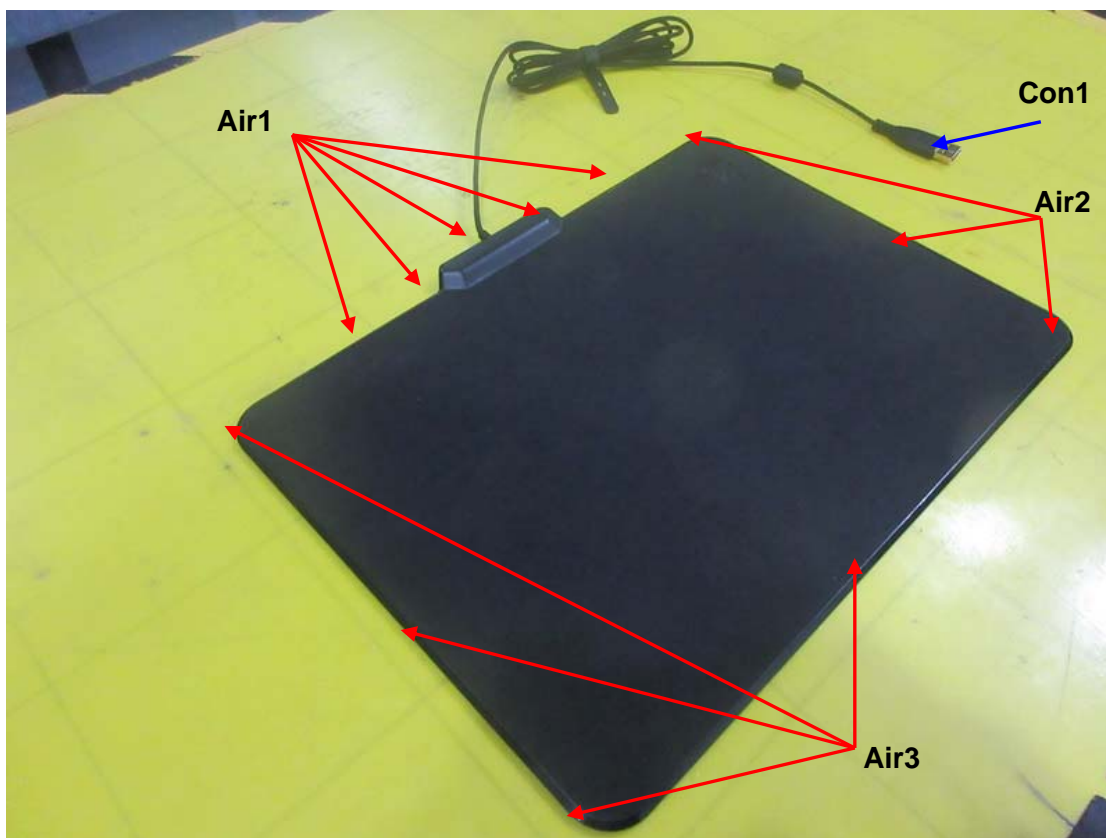
Mode	Air Discharge								Contact Discharge					
	2kV		4KV		8KV		- kV		2kV		4kV		-kV	
Location	P	N	P	N	P	N	P	N	P	N	P	N	P	N
1	A	A	A	A	A	B	-	-	A	A	B	B	-	-
2	A	A	A	A	A	A	-	-	-	-	-	-	-	-
3	A	A	A	A	A	A	-	-	-	-	-	-	-	-
4	A	A	A	A	A	B	-	-	-	-	-	-	-	-
5	A	A	A	A	A	A	-	-	-	-	-	-	-	-
6	A	A	A	A	A	A	-	-	-	-	-	-	-	-
Criteria	B						-		B				-	
Result	B						-		B				-	
Judgment	PASS						-		PASS				-	

Mode	HCP Contact Discharge						VCP Contact Discharge					
	2kV		4kV		kV		2kV		4kV		kV	
Location	P	N	P	N	P	N	P	N	P	N	P	N
1	A	A	B	B	-	-	A	A	B	B	-	-
2	A	A	B	B	-	-	A	A	B	B	-	-
3	A	A	B	B	-	-	A	A	B	B	-	-
4	A	A	B	B	-	-	A	A	B	B	-	-
Criteria	B				-		B				-	
Result	B				-		B				-	
Judgment	PASS				-		PASS				-	

Note:

- 1) P/N denotes the Positive/Negative polarity of the output voltage.
- 2) Test condition:  
Direct/Indirect(HCP/VCP) discharges: Minimum 50 times (Positive/Negative) at eachpoint.  
Air discharges: Minimum 20 times (Positive/Negative) at each point.
- 3) Test location(s) in which discharge (Air and contact discharge) to be applied illustrated by photos shown in next page(s)
- 4) The Indirect (HCP/VCP) discharges description of test point as following:  
1.left side; 2.right side; 3.front side; 4.rear side.
- 5) N/A - denotes test is not applicable in this test report
- 6) Criterion A: No observation of any performance degradation.
- 7) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 8) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

PHOTO(S) SHOWN THE LOCATION(S) OF ESD EVALUATED



## 5.5 RADIATED, RADIO-FREQUENCY, ELECTROMAGNETIC FIELD IMMUNITY TEST (RS)

### 5.5.1 TEST SPECIFICATION

Basic Standard	EN 61000-4-3
Required Performance	A
Frequency Range	80 MHz - 1000 MHz
Field Strength	3 V/m(unmodulated, r.m.s)
Modulation	1 kHz Sine Wave, 80%, AM Modulation
Frequency Step	1% of fundamental
Polarity of Antenna	Horizontal and Vertical
Test Distance	3 m
Antenna Height	1.5 m
Dwell Time	at least 3 seconds

### 5.5.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Digital Signal Generator	HP	ESG-D3000A	US36260188	Mar. 27, 2017
2	Antenna	ETS	3142C	00047662	Mar. 27, 2017
3	Power amplifier	MILMEGA	80RF1000-250	1064833	Nov. 02, 2016
4	Amplifier	AR	50S1G4A	326720	Mar. 28, 2017
5	Measurement Software	TOYO	IM5/R Ver 3.8.050	N/A	N/A

Remark: "N/A" denotes no model name, no serial No. or no calibration specified.

All calibration period of equipment list is one year.

### 5.5.3 TEST PROCEDURE

The EUT and support equipment, which are placed on a table that is 0.8 meter above ground and the testing was performed in a fully-anechoic chamber.

The testing distance from antenna to the EUT was 3 meters.

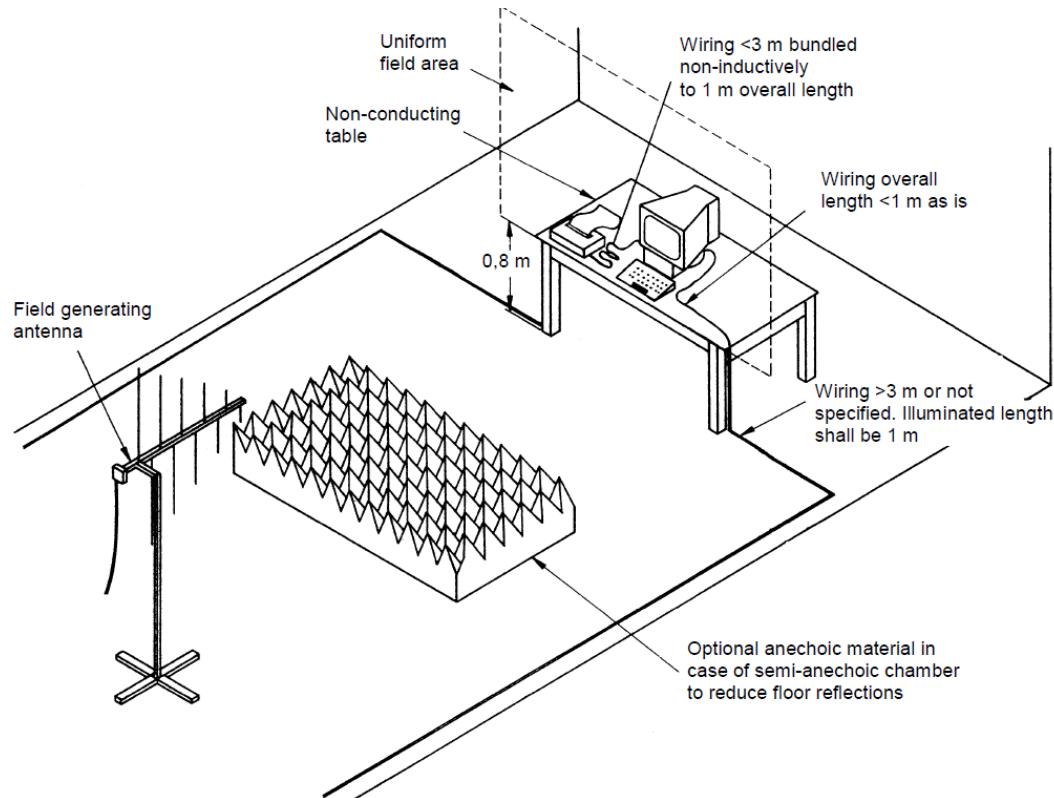
The other condition as following manner:

- The field strength level was 3 V/m(unmodulated, r.m.s).
- The frequency range is swept from 80 MHz to 1000 MHz, with the signal 80%amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed  $1.5 \times 10^{-3}$  decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.
- The test was performed with the EUT exposed to both vertically and horizontally polarized fields on each of the four sides.

### 5.5.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.5.5 TEST SETUP



Note:

#### TABLE-TOP EQUIPMENT

The EUT installed in a representative system as described in EN 61000-4-3 was placed on a non-conductive table 0.8 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.

#### FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in EN 61000-4-3 was placed on a non-conductive wood support 0.1 meters in height. The system under test was connected to the power and signal wire according to relevant installation instructions.



## 5.5.6 TEST RESULTS

EUT	Gaming Mouse Mat	Model Name	RZ02-0200
Temperature	25°C	Relative Humidity	65%
Test Voltage	AC 230V/50Hz		
Test Mode	Operating		
Test Date	Jul. 25, 2016		

Frequency Range (MHz)	RF Field Position	R.F. Field Strength	Azimuth	Criterion	Result	Judgment
80 - 1000	H / V	3V (unmodulated, r.m.s) AM Modulated 1000Hz, 80%	0	A	A	PASS
			90			
			180			
			270			

### Note:

- 1) P/N denotes the Positive/Negative polarity of the output voltage.
- 2) N/A - denotes test is not applicable in this test report.
- 3) Criterion A: No observation of any performance degradation.
- 4) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 5) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.



## 5.6 ELECTRICAL FAST TRANSIENT/BURST IMMUNITY TEST (EFT/BURST)

### 5.6.1 TEST SPECIFICATION

Basic Standard	EN 61000-4-4
Required Performance	B
Test Voltage	Power Line: $\pm 0.5$ kV, $\pm 1$ kV Signal/Control Line: $\pm 0.5$ kV
Polarity	Positive & Negative
Impulse Frequency	5 kHz: except for xDSL equipment 100 kHz: only for single lines of xDSL equipment.
Impulse Wave shape	5/50 ns
Burst Duration	15 ms
Burst Period	300 ms
Test Duration	Not less than 1 min.

### 5.6.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	THE MODULAR SOLUTION FOR 6 KV APPLICATIONS	Teseq	NSG 3060	1423	Oct. 11, 2016
2	Measurement Software	Teseq	Win 3000 Version 1.2.0	N/A	N/A

Remark: "N/A" denotes no model name, no serial No. or no calibration specified.

All calibration period of equipment list is one year.

### 5.6.3 TEST PROCEDURE

The EUT and support equipment(s) are placed on a table that is 0.8 meter high above a metal ground plane and should be located 0.1 m $\pm$  0.01m high above the Ground Reference Plane (1m\*1m min. and 0.65mm thick min).

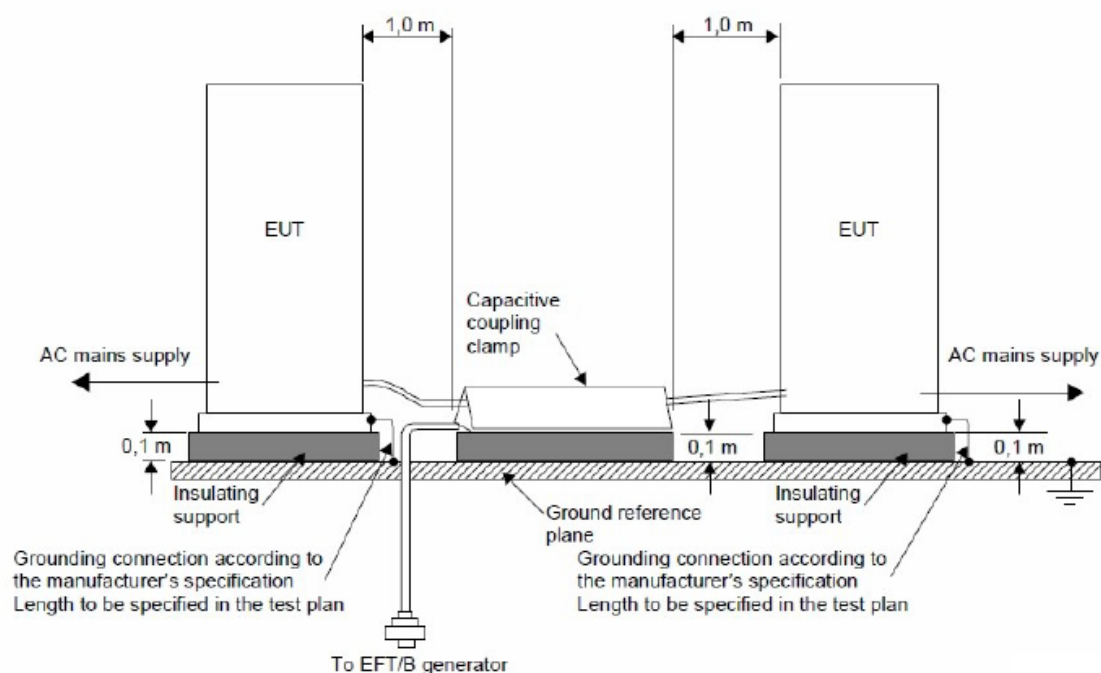
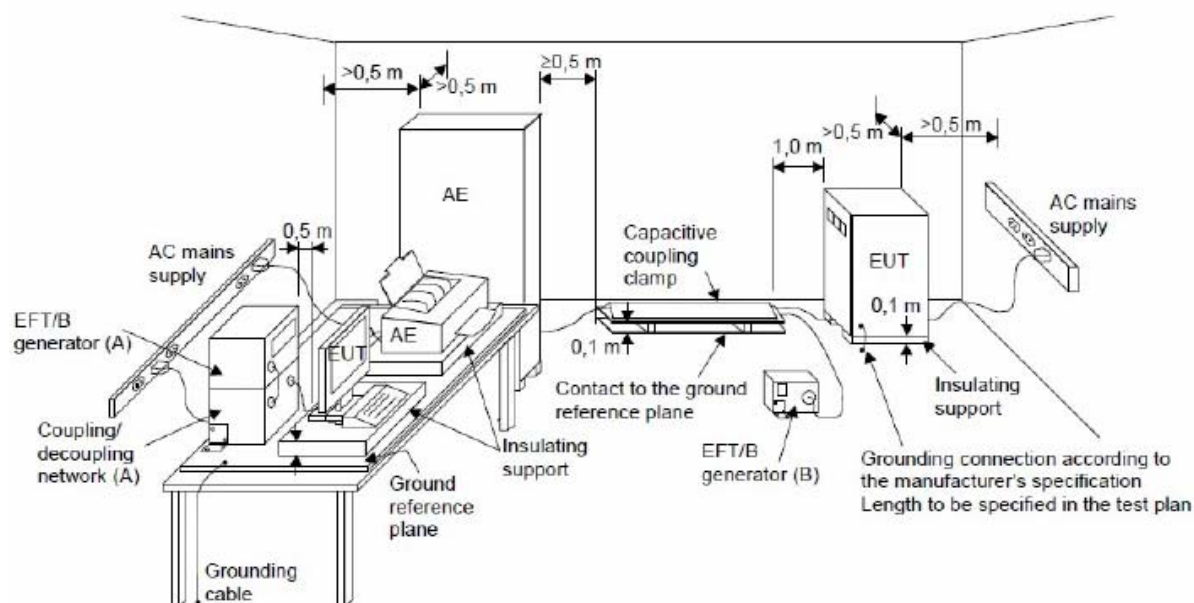
The other condition as following manner:

- The length of power cord between the coupling device and the EUT should not exceed 1 meter.
- Both positive and negative polarity discharges were applied.
- The duration time of each test sequential was 1 minute

### 5.6.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.6.5 TEST SETUP



Note:

## TABLE-TOP EQUIPMENT

The configuration consisted of a wooden table (0.8m high) standing on the Ground Reference Plane and should be located 0.1 m+/- 0.01m above the Ground Reference Plane. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system. A minimum distance of 0.5m was provided between the EUT and the walls of the laboratory or any other metallic structure.

## FLOOR-STANDING EQUIPMENT

The EUT installed in a representative system as described in EN 61000-4-4 and its cables were isolated from the Ground Reference Plane by an insulating support that is 0.1-meter thick. The GRP consisted of a sheet of aluminum (at least 0.25mm thick and 2.5m square) connected to the protective grounding system.

## 5.6.6 TEST RESULTS

EUT	Gaming Mouse Mat	Model Name	RZ02-0200
Temperature	25°C	Relative Humidity	65%
Test Voltage	AC 230V/50Hz		
Test Mode	Operating		
Test Date	Jul. 25, 2016		

EUT Ports Tested		Polarity	Repetition Frequency	Test Level	Criterion	Result	Judgment
				1kV			
AC Power Port	Line (L)	+	5 kHz	A	B	A	PASS
		-	5 kHz	A			
	Neutral (N)	+	5 kHz	A	B	A	PASS
		-	5 kHz	A			
	Ground (PE)	+	5 kHz	A	B	A	PASS
		-	5 kHz	A			

Note:

- 1) P/N denotes the Positive/Negative polarity of the output voltage.
- 2) N/A - denotes test is not applicable in this test report
- 3) Criterion A: No observation of any performance degradation.
- 4) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 5) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

## 5.7 SURGE IMMUNITY TEST

### 5.7.1 TEST SPECIFICATION

Basic Standard	EN 61000-4-5
Required Performance	B
Wave-Shape	Combination Wave for power lines 1.2/50 us Open Circuit Voltage 8 /20 us Short Circuit Current
Test Voltage	Power Line: $\pm 0.5$ kV, $\pm 1$ kV, $\pm 2$ kV
Surge Input/Output	L-N, L-PE, N-PE
Generator Source Impedance	2 ohm between networks 12 ohm between network and ground
Polarity	Positive/Negative
Phase Angle:	AC Port: $0^\circ/90^\circ/180^\circ/270^\circ$
Pulse Repetition Rate	1 time / min. (maximum)
Number of Tests	5 positive and 5 negative at selected points

### 5.7.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	THE MODULAR SOLUTION FOR 6 KV APPLICATIONS	Teseq	NSG 3060	1423	Oct. 11, 2016
2	Measurement Software	Teseq	Win 3000 Version 1.2.0	N/A	N/A

Remark: "N/A" denotes no model name, no serial No. or no calibration specified.

All calibration period of equipment list is one year.

### 5.7.3 TEST PROCEDURE

#### a. For EUT power supply:

The surge is to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks are required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines, and to provide sufficient decoupling impedance to the surge wave. The power cord between the EUT and the coupling/decoupling networks shall be 2meters in length (or shorter).

#### b. For test applied to unshielded unsymmetrically operated interconnection lines of EUT :

The surge is applied to the lines via the capacitive coupling. The coupling /decoupling networks shall not influence the specified functional conditions of the EUT. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

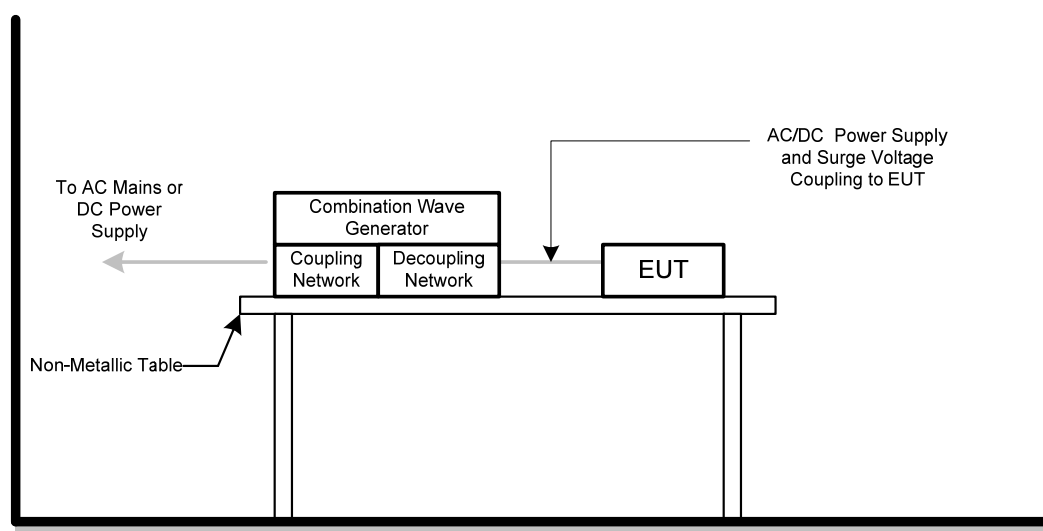
#### c. For test applied to unshielded symmetrically operated interconnection /telecommunication lines of EUT :

The surge is applied to the lines via gas arrestors coupling. Test levels below the ignition point of the coupling arrestor cannot be specified. The interconnection line between the EUT and the coupling/decoupling networks shall be 2 meters in length (or shorter).

#### 5.7.4 DEVIATION FROM TEST STANDARD

No deviation

#### 5.7.5 TEST SETUP



## 5.7.6 TEST RESULTS

EUT	Gaming Mouse Mat	Model Name	RZ02-0200
Temperature	25°C	Relative Humidity	65%
Test Voltage	AC 230V/50Hz		
Test Mode	Operating		
Test Date	Jul. 25, 2016		

Wave Form EUT Ports Tested		1.2/50(8/20)Tr/Thµs						Criterion	Result	Judgment
		Polarity	Phase	Voltage						
				0.5kV	1kV	-- kV	-- kV			
AC	L – N (2 ohm)	+/-	0°	A	A	-	-	B	A	PASS
		+/-	90°	A	A	-	-			
		+/-	180°	A	A	-	-			
		+/-	270°	A	A	-	-			

Wave Form EUT Ports Tested		1.2/50(8/20)Tr/Thµs						Criterion	Result	Judgment
		Polarity	Phase	Voltage						
				0.5kV	1kV	1.5kV	2kV			
AC	L – PE (12 ohm)	+/-	0°	A	A	A	A	B	A	PASS
		+/-	90°	A	A	A	A			
		+/-	180°	A	A	A	A			
		+/-	270°	A	A	A	A			
	N – PE (12 ohm)	+/-	0°	A	A	A	A	B	A	PASS
		+/-	90°	A	A	A	A			
		+/-	180°	A	A	A	A			
		+/-	270°	A	A	A	A			

Note:

- 1) Polarity and Numbers of Impulses: 5 Pst / Ngst at each tested mode
- 2) N/A - denotes test is not applicable in this Test Report
- 3) Criterion A: No observation of any performance degradation.
- 4) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 5) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

## 5.8 IMMUNITY TO CONDUCTED DISTURBANCES, INDUCED BY RADIO-FREQUENCY FIELDS TEST (CS)

### 5.8.1 TEST SPECIFICATION

Basic Standard	EN 61000-4-6
Required Performance	A
Frequency Range	0.15 MHz - 80 MHz
Field Strength	3 V (unmodulated, r.m.s.)
Modulation	1 kHz Sine Wave, 80%, AM Modulation
Frequency Step	1% of fundamental
Dwell Time	at least 3 seconds

### 5.8.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Signal Generator	HP	8648A	3636A02964	Mar. 27, 2017
2	Power Amplifier	Teseq	CBA230M-080	T43748	Mar. 27, 2017
3	Power CDN	FCC	FCC-801-M2/M3-16A	100271	Mar. 27, 2017
4	Measurement Software	TOYO	IM5/C Ver 3.7.028	N/A	N/A

Remark: "N/A" denotes no model name, no serial No. or no calibration specified.

All calibration period of equipment list is one year.

### 5.8.3 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m\*1m min. and 0.65mm thick min.

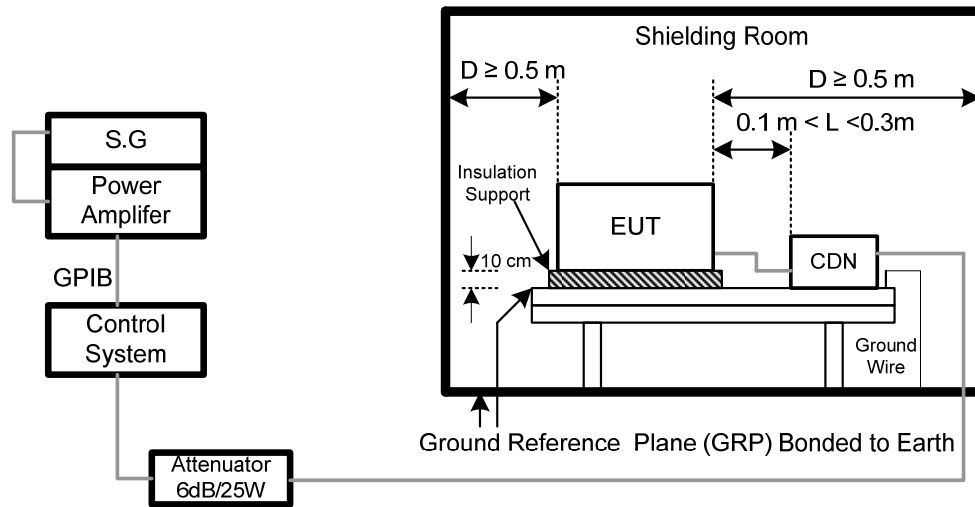
The other condition as following manner:

- The field strength level was 3 V (unmodulated, r.m.s.)
- The frequency range is swept from 150 kHz to 80 MHz, with the signal 80%amplitude modulated with a 1 kHz sine wave. The rate of sweep did not exceed  $1.5 \times 10^{-3}$  decade/s. Where the frequency range is swept incrementally, the step size was 1% of fundamental.
- The dwell time at each frequency shall be not less than the time necessary for the EUT to be able to respond.

### 5.8.4 DEVIATION FROM TEST STANDARD

No deviation

## 5.8.5 TEST SETUP



### NOTE:

#### FLOOR-STANDING EQUIPMENT

The equipment to be tested is placed on an insulating support of 0.1 meters height above a ground reference plane. All relevant cables shall be provided with the appropriate coupling and decoupling devices at a distance between 0.1 meters and 0.3 meters from the projected geometry of the EUT on the ground reference plane.



## 5.8.6 TEST RESULTS

EUT	Gaming Mouse Mat	Model Name	RZ02-0200
Temperature	25°C	Relative Humidity	65%
Test Voltage	AC 230V/50Hz		
Test Mode	Operating		
Test Date	Jul. 25, 2016		

Test Ports (Mode)	Freq.Range (MHz)	Field Strength	Criteria	Results	Judgment
Input/ Output AC.PowerPort	0.15 ---80	3V(unmodulated, r.m.s) AM Modulated 1000Hz, 80%	A	A	PASS

### Note:

- 1). N/A - denotes test is not applicable in this test report.
- 2) Criterion A: No observation of any performance degradation.
- 3) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 4) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

## 5.9 POWER FREQUENCY MAGNETIC FIELD IMMUNITY TEST (PFMF)

### 5.9.1 TEST SPECIFICATION

Basic Standard	EN 61000-4-8
Required Performance	A
Frequency Range	50/60 Hz
Field Strength	1 A/m
Observation Time	1 minute
Inductance Coil	Rectangular type, 1mx1m

### 5.9.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Magnetic Field Test Generator	FCC	F-1000-4-8-G-125A	04032	Mar. 27, 2017
2	Magnetic Field immunity loop	Thermo KeyTek	F-1000-4-8/9/10-L-1M	04024	Mar. 27, 2017

Remark: "N/A" denotes no model name, no serial No. or no calibration specified.  
All calibration period of equipment list is one year.

### 5.9.3 TEST PROCEDURE

The EUT and support equipment, are placed on a table that is 0.8 meter above a metal ground plane measured 1m\*1m min. and 0.65mm thick min.

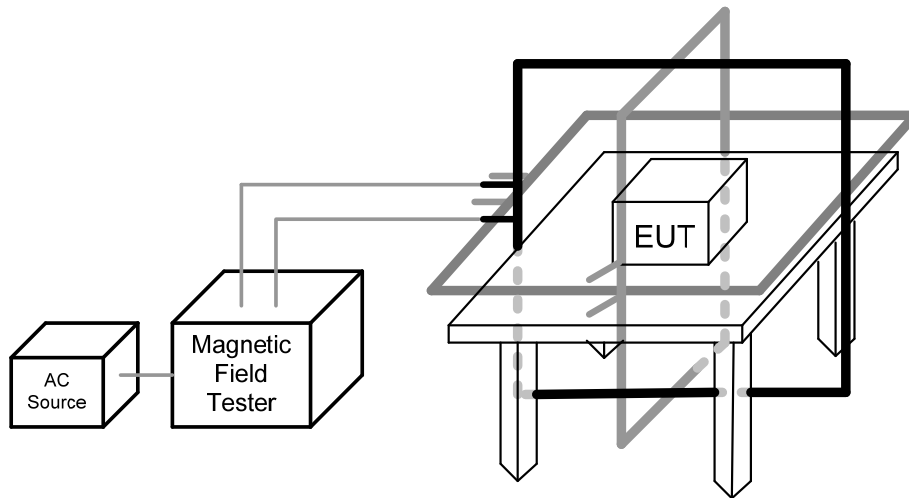
The other condition as following manner:

- The equipment cabinets shall be connected to the safety earth directly on the GRP via the earth terminal of the EUT.
- The cables supplied or recommended by the equipment manufacturer shall be used. 1 meter of all cables used shall be exposed to the magnetic field.

### 5.9.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.9.5 TEST SETUP



Note:

#### TABLE-TOP EQUIPMENT

The equipment shall be subjected to the test magnetic field by using the induction coil of standard dimension (1 m x 1 m). The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

#### FLOOR-STANDING EQUIPMENT

The equipment shall be subjected to the test magnetic field by using induction coils of suitable dimensions. The test shall be repeated by moving and shifting the induction coils, in order to test the whole volume of the EUT for each orthogonal direction. The test shall be repeated with the coil shifted to different positions along the side of the EUT, in steps corresponding to 50 percent of the shortest side of the coil. The induction coil shall then be rotated by 90 degrees in order to expose the EUT to the test field with different orientations.

## 5.9.6 TEST RESULTS

EUT	Gaming Mouse Mat	Model Name	RZ02-0200
Temperature	25°C	Relative Humidity	65%
Test Voltage	AC 230V/50Hz		
Test Mode	Operating		
Test Date	Jul. 25, 2016		

### 50Hz

Test Mode	Test Level	Antenna aspect	Duration (s)	Criteria	Results	Judgment
Enclosure	1 A/m	X	60	A	A	PASS
Enclosure	1 A/m	Y	60	A	A	PASS
Enclosure	1 A/m	Z	60	A	A	PASS

### 60Hz

Test Mode	Test Level	Antenna aspect	Duration (s)	Criteria	Results	Judgment
Enclosure	1 A/m	X	60	A	A	PASS
Enclosure	1 A/m	Y	60	A	A	PASS
Enclosure	1 A/m	Z	60	A	A	PASS

#### Note:

- 1). N/A - denotes test is not applicable in this test report.
- 2) Criterion A: No observation of any performance degradation.
- 3) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 4) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

## 5.10 VOLTAGE DIPS, SHORT INTERRUPTIONS AND VOLTAGE VARIATIONS IMMUNITY TEST

### 5.10.1 TEST SPECIFICATION

Basic Standard	EN 61000-4-11
Required Performance	B (For >95% Voltage Dips) C (For 30% Voltage Dips) C (For >95% Voltage Interruptions)
Test Duration Time	Minimum three test events in sequence
Interval between Event	Minimum ten seconds
Phase Angle	0°/180°
Test Cycle	3 times

### 5.10.2 MEASUREMENT INSTRUMENTS

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	THE MODULAR SOLUTION FOR 6 KV APPLICATIONS	Teseq	NSG 3060	1423	Oct. 11, 2016
2	Measurement Software	Teseq	Win 3000 Version 1.2.0	N/A	N/A

Remark: "N/A" denotes no model name, no serial No. or no calibration specified.  
All calibration period of equipment list is one year.

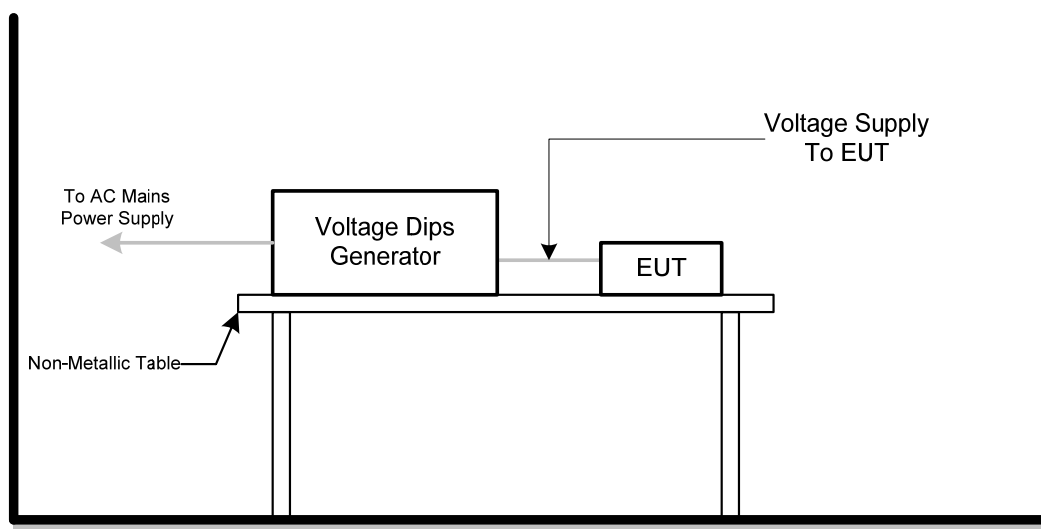
### 5.10.3 TEST PROCEDURE

The EUT shall be tested for each selected combination of test levels and duration with a sequence of three dips/interruptions with intervals of 10 s minimum (between each test event). Each representative mode of operation shall be tested. Abrupt changes in supply voltage shall occur at zero crossings of the voltage waveform.

### 5.10.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.10.5 TEST SETUP



## 5.10.6 TEST RESULTS

EUT	Gaming Mouse Mat	Model Name	RZ02-0200
Temperature	25°C	Relative Humidity	65%
Test Voltage	AC 230V/50Hz		
Test Mode	Operating		
Test Date	Jul. 25, 2016		

AC 100V/50Hz				
VoltageReduction	Periods	Criteria	Results	Judgment
Voltage dip > 95%	0.5	B	A	PASS
Voltage dip 30%	25	C	C	PASS
Interruption > 95%	250	C	C	PASS

AC 230V/50Hz				
VoltageReduction	Periods	Criteria	Results	Judgment
Voltage dip > 95%	0.5	B	A	PASS
Voltage dip 30%	25	C	A	PASS
Interruption > 95%	250	C	C	PASS

AC 240V/50Hz				
VoltageReduction	Periods	Criteria	Results	Judgment
Voltage dip > 95%	0.5	B	A	PASS
Voltage dip 30%	25	C	A	PASS
Interruption > 95%	250	C	C	PASS

### Note:

- 1). N/A - denotes test is not applicable in this test report.
- 2) Criterion A: No observation of any performance degradation.
- 3) Criterion B: Some degradation of performance is observed but the equipment continues to operate as intended.
- 4) Criterion C: Loss of functionality, but self-recoverable by user, without loss of information or settings.

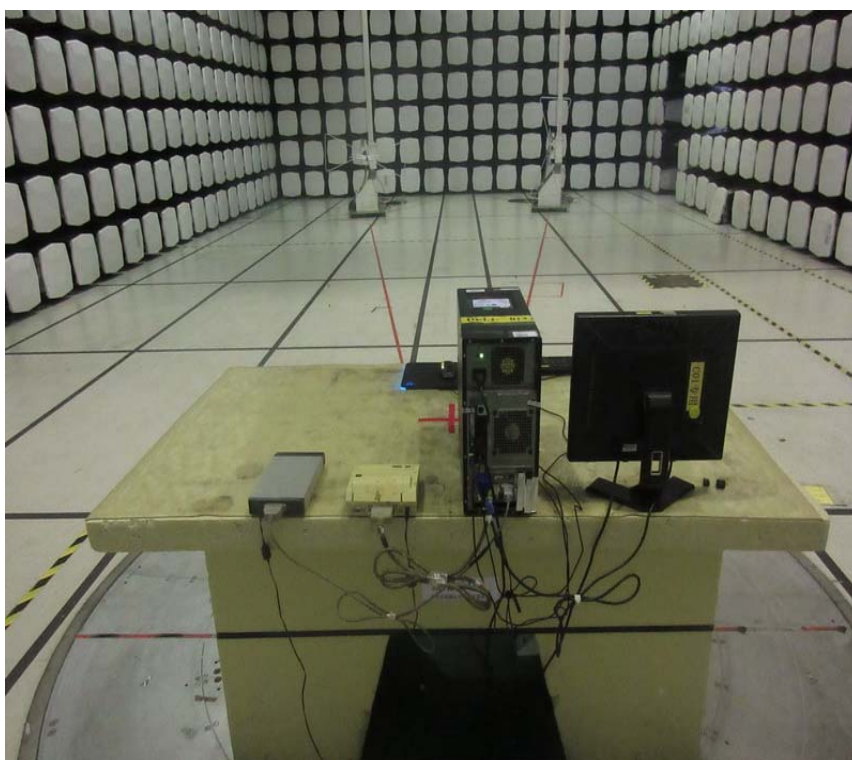
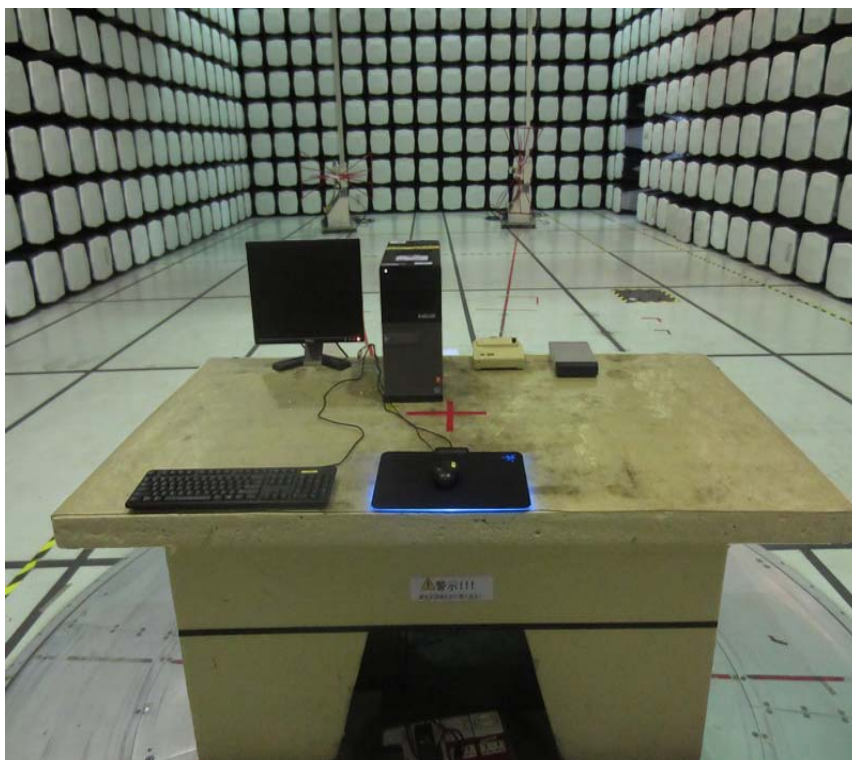
## 6. EUT TEST PHOTO

Conducted disturbance at mains terminals





# Radiated disturbance below 1 GHz



## Electrostatic discharge immunity



Conducted disturbance at mains terminals Sample Name 2 Radiated,  
radio-frequency, electromagnetic field immunity



# Electrical fast transient/burst immunity



## Conducted disturbance at mains terminals Sample Name 2 Surge immunity





Immunity to conducted disturbances, induced by radio-frequency fields



Conducted disturbance at mains terminals Sample Name 2 Power frequency magnetic field immunity



## Voltage dips, short interruptions and voltage variations immunity

