



Shenzhen CTA Testing Technology Co., Ltd.

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

**TEST REPORT**

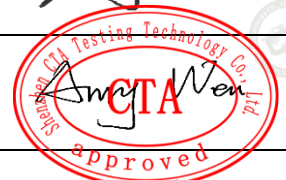
**EN 55032:2015+AC:2016+A1:2020+A11:2020/ EN 55035:2017+A11:2020  
EN IEC 61000-3-2:2019/A1:2021  
EN 61000-3-3:2013/A2:2021/AC:2022**

Report Reference No.....: CTA21122100901

Compiled by  
( position+printed name+signature)...: File administrators Zoey Cao

*Zoey Cao*

Supervised by  
( position+printed name+signature)...: Project Engineer Amy Wen



Approved by  
( position+printed name+signature)...: RF Manager Eric Wang

*Eric Wang*

Date of issue.....: Mar. 01, 2023

Testing Laboratory Name .....: **Shenzhen CTA Testing Technology Co., Ltd.**

Address .....: Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

Applicant's name.....: **Shenzhen Bainaohui Electronics Co.,Ltd.**

Address .....: 5F, E Building, HB Science Park, Citianpu, Gongming, Guangming New District, Shenzhen, China.

Test specification .....

Standard .....: **EN 55032:2015+AC:2016+A1:2020+A11:2020  
EN 55035:2017+A11:2020  
EN IEC 61000-3-2:2019/A1:2021  
EN 61000-3-3:2013/A2:2021/AC:2022**

**Shenzhen CTA Testing Technology Co., Ltd. . All rights reserved.**

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen CTA Testing Technology Co., Ltd. is acknowledged as copyright owner and source of the material. Shenzhen CTA Testing Technology Co., Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

Test item description .....: **Mouse**

Trade Mark .....: N/A

Manufacturer .....: Shenzhen Bainaohui Electronics Co.,Ltd.

Model/Type reference.....: 60

List Model .....: 49, 43, 56, 58, 65, 63

Ratings .....: DC 5.0V from PC

Result.....: **PASS**

**Shenzhen CTA Testing Technology Co., Ltd.**

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China  
Tel:+86-755 2322 5875 E-mail:cta@cta-test.cn Web:http://www.cta-test.cn

# TEST REPORT

Equipment under Test : Mouse

Model /Type : 60

Listed Models : 49, 43, 56, 58, 65, 63

**Applicant** : **Shenzhen Bainaohui Electronics Co.,Ltd.**

Address : 5F, E Building, HB Science Park, Citianpu, Gongming, Guangming New District, Shenzhen, China.

**Manufacturer** : **Shenzhen Bainaohui Electronics Co.,Ltd.**

Address : 5F, E Building, HB Science Park, Citianpu, Gongming, Guangming New District, Shenzhen, China.

<b>Test Result</b>	<b>PASS</b>
--------------------	-------------

The test report merely corresponds to the test sample.  
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

# Contents

<b>1.</b>	<b><u>TEST STANDARDS</u></b> .....	<b>4</b>
<b>2.</b>	<b><u>SUMMARY</u></b> .....	<b>5</b>
2.1.	General Remarks	5
2.2.	Product Description	5
2.3.	EUT operation mode	5
2.4.	EUT configuration	5
2.5.	Modifications	5
<b>3.</b>	<b><u>TEST ENVIRONMENT</u></b> .....	<b>6</b>
3.1.	Address of the test laboratory	6
3.2.	Test Facility	6
3.3.	Environmental conditions	6
3.4.	Test Description	6
3.5.	Statement of the measurement uncertainty	6
3.6.	Equipments Used during the Test	8
<b>4.</b>	<b><u>TEST CONDITIONS AND RESULTS</u></b> .....	<b>11</b>
<b>4.1.</b>	<b>EMISSION</b>	<b>11</b>
4.1.1.	Radiated Emission.....	11
4.1.2.	Conducted Emission.....	16
4.1.3.	Harmonic Current Emission.....	19
4.1.4.	Voltage Fluctuation and Flicker .....	20
<b>4.2.</b>	<b>IMMUNITY</b>	<b>21</b>
4.2.1.	Performance criteria .....	21
4.2.2.	Electrostatic Discharge .....	22
4.2.3.	RF Electromagnetic Field .....	24
4.2.4.	Surges .....	25
4.2.5.	RF- Common Mode 0.15MHz to 80MHz .....	26
4.2.6.	Fast Transients Common Mode .....	27
4.2.7.	Voltage Dips and Interruptions .....	28
4.2.8.	Power frequency magnetic field .....	29
<b>5.</b>	<b><u>TEST SET-UP PHOTOS OF THE EUT</u></b> .....	<b>30</b>
<b>6.</b>	<b><u>EXTERNAL AND INTERNAL PHOTOS OF THE EUT</u></b> .....	<b>31</b>

## **1. TEST STANDARDS**

The tests were performed according to following standards:

[EN 55032:2015+AC:2016+A1:2020+A11:2020](#)- Electromagnetic compatibility of multimedia equipment - Emission Requirements

[EN 55035:2017+A11:2020](#)- Electromagnetic compatibility of multimedia equipment - Immunity requirements

[EN IEC 61000-3-2:2019/A1:2021](#)-Electromagnetic compatibility (EMC) - Part 3-2: Limits - Limits for harmonic current emissions (equipment input current  $\leq 16$  A per phase)

[EN 61000-3-3:2013/A2:2021/AC:2022](#)- Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current  $\leq 16$  A per phase and not subject to conditional connection

## 2. SUMMARY

### 2.1. General Remarks

Date of receipt of test sample	:	Feb. 23, 2023
Testing commenced on	:	Feb. 23, 2023
Testing concluded on	:	Mar. 01, 2023

### 2.2. Product Description

Product Name:	Mouse
Model:	60
Power supply:	DC 5.0V from PC
PC information (Auxiliary test supplied by testing Lab)	Model: E470C Trade: thinkpad

### 2.3. EUT operation mode

As the function of the EUT, test mode selected to test as below to conform this standard:

Operation mode	Description
Mode 1	working

Test item	Test mode
Conducted emission	Mode 1
Radiated emission	Mode 1
EMS	Mode 1

### 2.4. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

Item	Name	Description	Model	Certificate	Note
1 <sup>Note1</sup>	/	/	/	/	/
2 <sup>Note1</sup>	/	/	/	/	/
3 <sup>Note1</sup>	/	/	/	/	/

Note1: This Auxiliary used during the test is provided by the manufacturer

### 2.5. Modifications

No modifications were implemented to meet testing criteria.

### 3. TEST ENVIRONMENT

#### 3.1. Address of the test laboratory

Shenzhen CTA Testing Technology Co., Ltd.

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

#### 3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

**FCC-Registration No.: 517856 Designation Number: CN1318**

Shenzhen CTA Testing Technology Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

**A2LA-Lab Cert. No.: 6534.01**

Shenzhen CTA Testing Technology Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.

#### 3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity	55 %
Air Pressure	989 hPa

#### 3.4. Test Description

Emission Measurement		
Radiated Emission	EN 55032:2015+AC:2016+A1:2020+A11:2020	PASS
Conducted Emission( AC Mains)	EN 55032:2015+AC:2016+A1:2020+A11:2020	PASS
Harmonic Current Emissions	EN IEC 61000-3-2:2019/A1:2021	N/A
Voltage Fluctuations and Flicker	EN 61000-3-3:2013/A2:2021/AC:2022	N/A
Immunity Measurement		
Electrostatic Discharge	EN 55035:2017+A11:2020	PASS
RF Electromagnetic Field	EN 55035:2017+A11:2020	PASS
Fast Transients Common Mode	EN 55035:2017+A11:2020	PASS
RF Common Mode 0,15 MHz to 80 MHz	EN 55035:2017+A11:2020	PASS
Voltage Dips and Interruptions	EN 55035:2017+A11:2020	PASS
Surges	EN 55035:2017+A11:2020	PASS
Power frequency magnetic field	EN 55035:2017+A11:2020	N/A

Remark:1. N/A means "not applicable".

2.The measurement uncertainty is not included in the test result.

#### 3.5. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the Shenzhen CTA Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC

17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen CTA Testing Technology Co., Ltd. :

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.24 dB	(1)
Radiated Emission	1~18GHz	5.16 dB	(1)
Conducted Disturbance	0.15~30MHz	3.39 dB	(1)

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



### 3.6. Equipments Used during the Test

Radiated Emission						
Item	Test Equipment	Manufacturer	Model No.	Equipment No.	Last Cal.	Cal.Due
1	ULTRA-BROADBAND ANTENNA	Schwarzbeck	VULB9163	CTA-310	2021/08/07	2024/08/06
2	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	CTA-306	2022/08/03	2023/08/02
3	Horn Antenna	Schwarzbeck	BBHA 9120D	CTA-309	2021/08/07	2024/08/06
4	Universal Radio Communication	CMW500	R&S	CTA-302	2022/08/03	2023/08/02
5	Band-reject filter	Xi'an Xingbo Technology Co.,Ltd	XBLBQ-DZA66	CTA-410	2022/08/03	2023/08/02
6	Band-reject filter	Xi'an Xingbo Technology Co.,Ltd	XBLBQ-DZA64	CTA-411	2022/08/03	2023/08/02
7	Band-reject filter	Xi'an Xingbo Technology Co.,Ltd	XBLBQ-DZA63	CTA-411	2022/08/03	2023/08/02
8	High-pass filter	Xi'an Xingbo Technology Co.,Ltd	XBLBQ-GTA10	CTA-412	2022/08/03	2023/08/02
9	High-pass filter	Xi'an Xingbo Technology Co.,Ltd	XBLBQ-GTA18	CTA-402	2022/08/03	2023/08/02
10	EMI Test Software	Tonscend	TS@JS32-RE	N/A	N/A	N/A

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Equipment No.	Last Cal.	Cal.Due
1	EMI Test Receiver	R&S	ESPI	CTA-307	2022/08/03	2023/08/02
2	Artificial Mains	R&S	ENV-216	CTA-308	2022/08/03	2023/08/02
3	Artificial Mains	R&S	ENV-216	CTA-314	2022/08/03	2023/08/02
4	ISN	Schwarzbeck	NTFM8158	CTA-407	2022/08/03	2023/08/02
5	ISN	Schwarzbeck	CAT58158	CTA-408	2022/08/03	2023/08/02
6	ISN	Schwarzbeck	CAT38158	CTA-409	2022/08/03	2023/08/02
7	Universal Radio Communication	R&S	CMW500	CTA-302	2022/08/03	2023/08/02
8	EMI Test Software	Tonscend	TS@JS32-CE	N/A	N/A	N/A



Electrical Fast Transient						
Item	Test Equipment	Manufacturer	Model No.	Equipment No.	Last Cal.	Cal.Due
1	Fast Transient Burst Simulator	Prima	EFT61004TA	CTA-316	2022/08/03	2023/08/02
2	Coupling Clamp	Prima	EFT-CLAMP	CTA-317	2022/08/03	2023/08/02
3	Universal Radio Communication	R&S	CMW500	CTA-302	2022/08/03	2023/08/02

Harmonic Current/ Voltage Fluctuation and Flicker						
Item	Test Equipment	Manufacturer	Model No.	Equipment No.	Last Cal.	Cal.Due
1	Harmonic and Flicker Analyzer	Voltech	PM6000	CTA-339	2022/08/03	2023/08/02
2	Universal Radio Communication	R&S	CMW500	CTA-302	2022/08/03	2023/08/02

Electrostatic Discharge						
Item	Test Equipment	Manufacturer	Model No.	Equipment No.	Last Cal.	Cal.Due
1	ESD Simulators	NOISEKEN	ESS-100L(A)	CTA-315	2022/08/04	2023/08/03
2	Universal Radio Communication	R&S	CMW500	CTA-302	2022/08/03	2023/08/02

RF Field Strength Susceptibility						
Item	Test Equipment	Manufacturer	Model No.	Equipment No.	Last Cal.	Cal.Due
1	SIGNAL GENERATOR	Agilent	N5182A	CTA-305	2022/08/03	2023/08/02
2	POWER AMPLIFIER	AR	150W1000	CTA-413	2022/08/03	2023/08/02
3	POWER AMPLIFIER	Mictop	MPA-1000-6000-100	CTA-414	2022/08/03	2023/08/02
4	DUAL DIRECTIONAL COUPLER	AR	DC6080	CTA-415	2022/08/03	2023/08/02
5	POWER METER	Agilent	E4419B	CTA-416	2022/08/03	2023/08/02
6	Power sensor	Agilent	E9301A	CTA-417	2022/08/03	2023/08/02
7	Power sensor	Agilent	8483A	CTA-418	2022/08/03	2023/08/02
8	TRANSMITTING ANTENNA	AR	AT1080	CTA-419	2021/08/07	2024/08/06
9	TRANSMITTING ANTENNA	Schwarzbeck	STLP 9149	CTA-420	2021/08/07	2024/08/06
10	Radio Communication Tester	R&S	CMW500	CTA-302	2022/08/03	2023/08/02
11	Audio Analyzer	R&S	UPL	CTA-421	2022/08/03	2023/08/02

Conducted Susceptibility						
Item	Test Equipment	Manufacturer	Model No.	Equipment No.	Last Cal.	Cal.Due
1	CS Test system	Schloder	CDG 6000-75	CTA-322	2022/08/03	2023/08/02
2	CDN M2+M3	Zhinan	ZN3750	CTA-323	2022/08/03	2023/08/02
3	6dB Attenuator	Schloder	CDG60100	CTA-324	2022/08/03	2023/08/02
4	EM Clamp	Schloder	EMCL-20	CTA-325	2022/08/03	2023/08/02
5	Audio Analyzer	R&S	UPL	CTA-421	2022/08/03	2023/08/02
6	Universal Radio Communication	R&S	CMW500	CTA-302	2022/08/03	2023/08/02

Surge						
Item	Test Equipment	Manufacturer	Model No.	Equipment No.	Last Cal.	Cal.Due
1	Lightning Surge Generator	Prima	SUG61005TB	CTA-318	2022/08/03	2023/08/02
2	Lightning Surge Generator	Prima	SUG10/700TA	CTA-319	2022/08/03	2023/08/02
3	Universal Radio Communication	R&S	CMW500	CTA-302	2022/08/03	2023/08/02

Dips						
Item	Test Equipment	Manufacturer	Model No.	Equipment No.	Last Cal.	Cal.Due
1	Cycle Sag Simulator	Prima	DRP61011TA	CTA-321	2022/08/03	2023/08/02
2	Universal Radio Communication	R&S	CMW500	CTA-302	2022/08/03	2023/08/02

## 4. TEST CONDITIONS AND RESULTS

### 4.1. EMISSION

#### 4.1.1. Radiated Emission

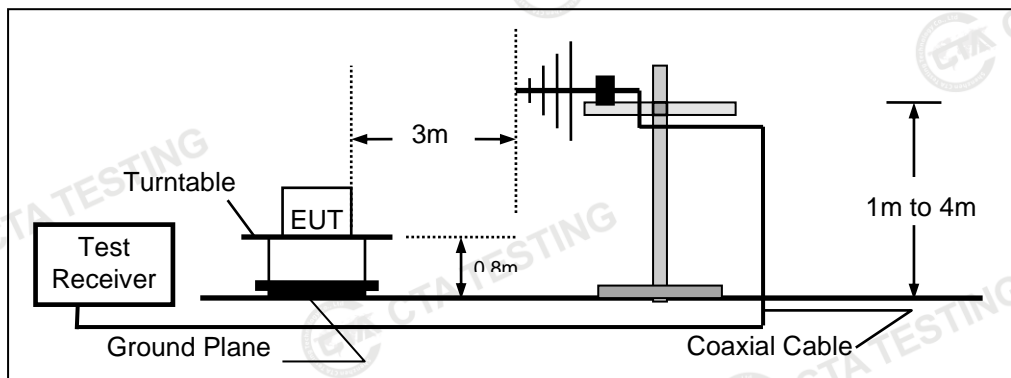
##### LIMIT

Please refer to EN 55032:2015+AC:2016+A1:2020+A11:2020

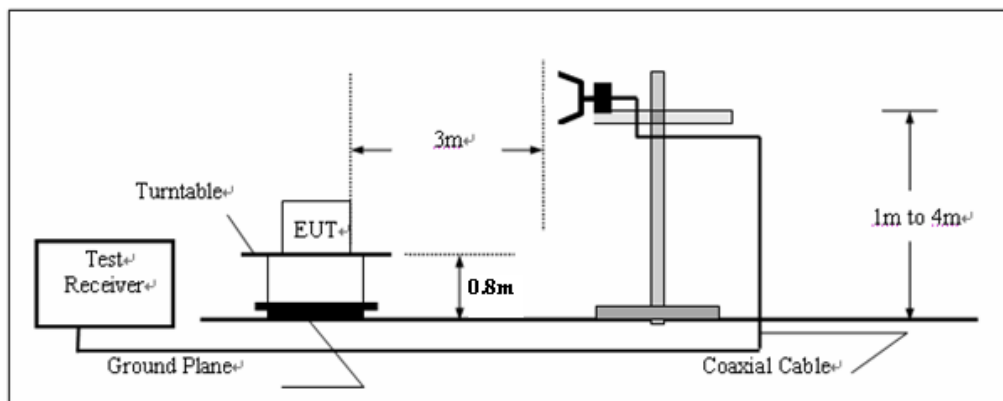
Frequency (MHz)	Distance (Meters)	Field Strengths Limits (dB $\mu$ V/m)
30 ~ 230	3	40
230~1000	3	47

##### TEST CONFIGURATION

- a) Radiated emission test set-up, frequency below 1000MHz:



- b) Radiated emission test set-up, frequency above 1000MHz



##### TEST PROCEDURE

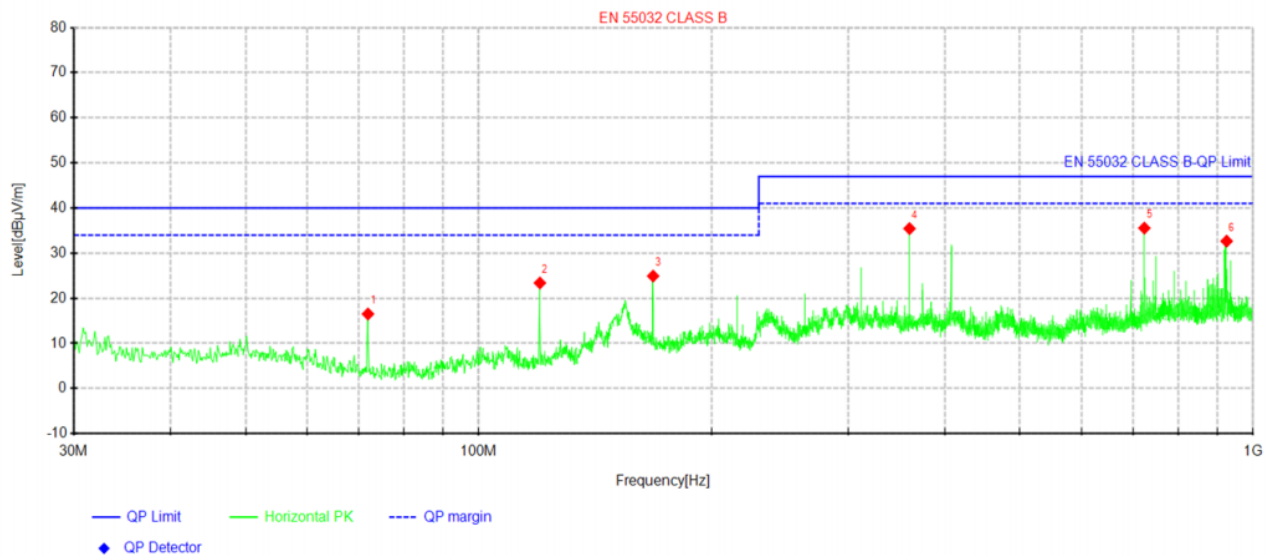
Please refer to EN 55032:2015+AC:2016+A1:2020+A11:2020 Annex A for the measurement methods

##### TEST RESULTS

**Passed**

Please refer to the below test data:

Test mode:	Mode 1	Polarization	Horizontal
------------	--------	--------------	------------

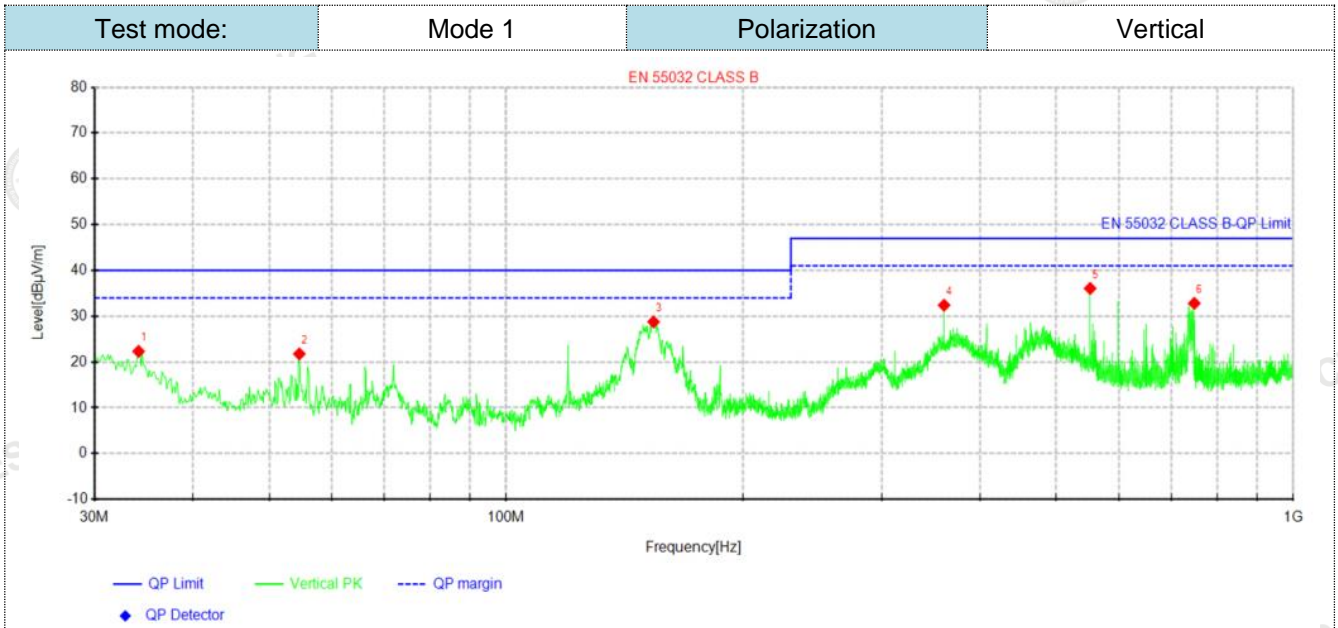


Suspected Data List									
NO.	Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	71.9525	37.49	16.52	-20.97	40.00	23.48	100	80	Horizontal
2	119.967	43.68	23.39	-20.29	40.00	16.61	100	70	Horizontal
3	167.982	46.08	24.92	-21.16	40.00	15.08	100	290	Horizontal
4	360.042	51.38	35.44	-15.94	47.00	11.56	100	210	Horizontal
5	723.792	46.81	35.55	-11.26	47.00	11.45	100	320	Horizontal
6	924.461	41.75	32.66	-9.09	47.00	14.34	100	90	Horizontal

Note: 1). Result (dBµV/m) = Reading (dBµV/m) + Factor (dB/m)

2). Factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin (dB) = Limit (dBµV/m) - Level (dBµV/m)

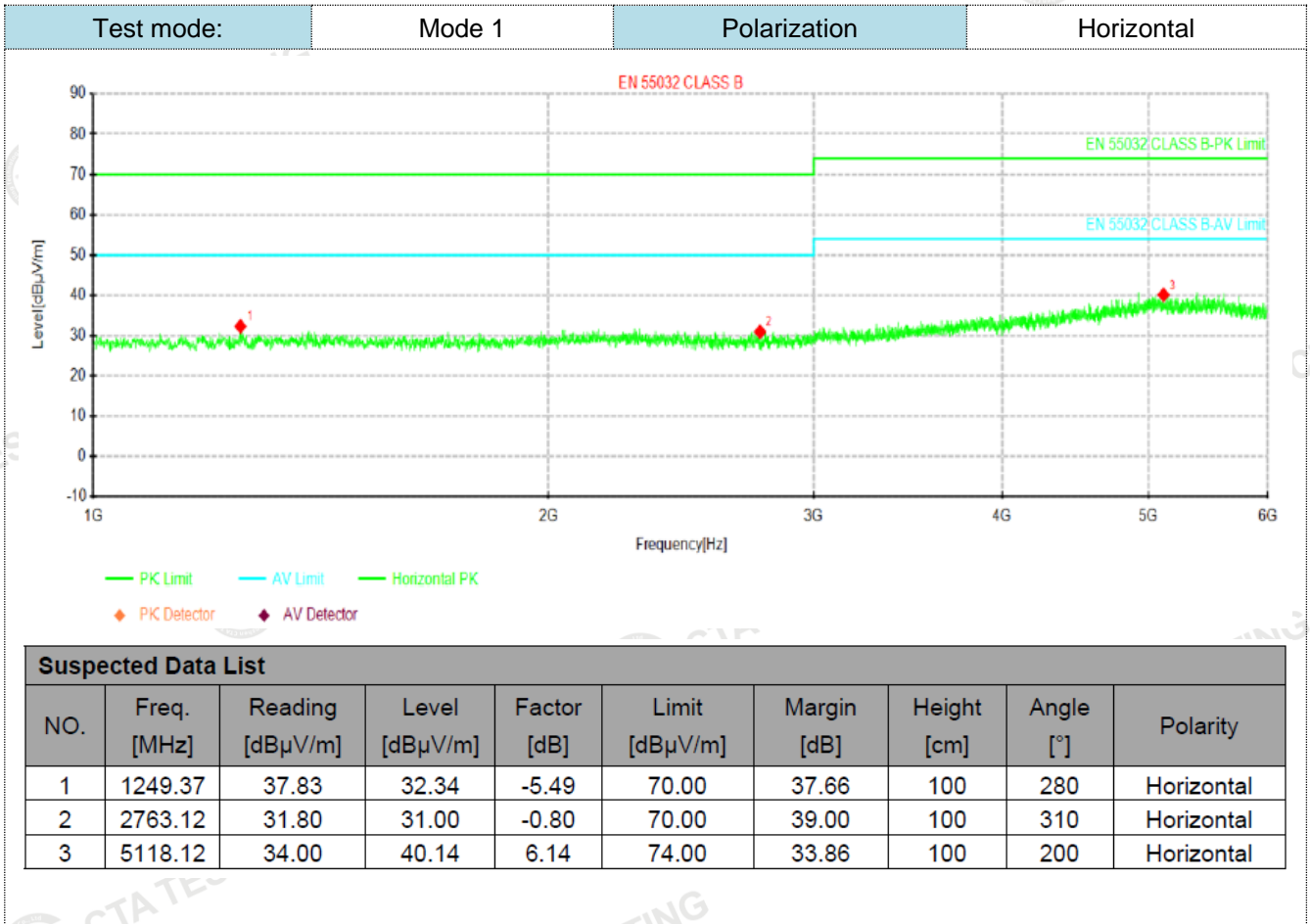


Suspected Data List									
NO.	Freq. [MHz]	Reading [dBµV]	Level [dBµV/m]	Factor [dB/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	34.1225	40.33	22.33	-18.00	40.00	17.67	100	230	Vertical
2	54.6138	38.82	21.77	-17.05	40.00	18.23	100	170	Vertical
3	153.917	50.47	28.76	-21.71	40.00	11.24	100	280	Vertical
4	360.042	48.34	32.40	-15.94	47.00	14.60	100	70	Vertical
5	551.981	49.68	36.07	-13.61	47.00	10.93	100	240	Vertical
6	748.648	43.52	32.81	-10.71	47.00	14.19	100	110	Vertical

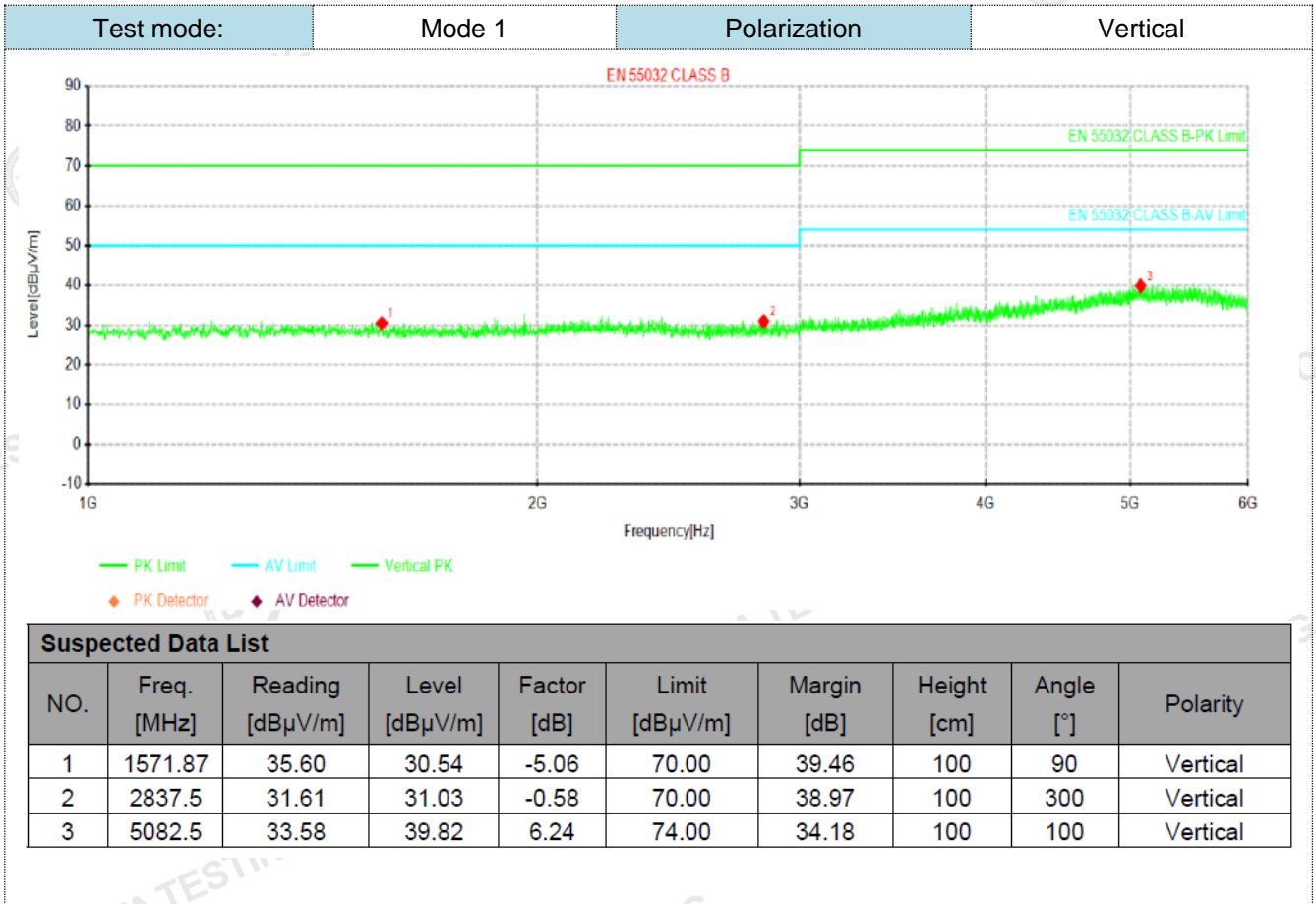
Note:1).Result (dBµV/m)= Reading (dBµV/m)+ Factor (dB/m)

2). Factor(dB/m)=Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin(dB) = Limit (dBµV/m) - Level (dBµV/m)







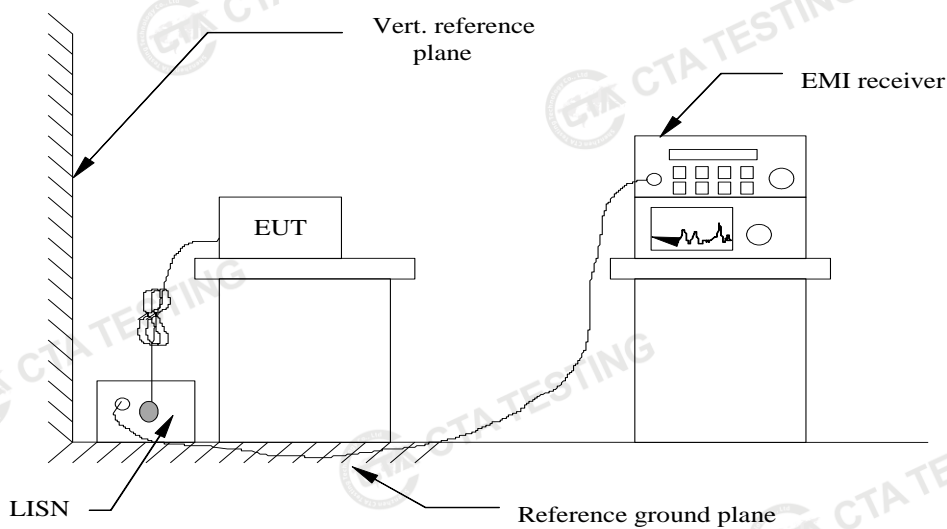
### 4.1.2. Conducted Emission

#### LIMIT

Please refer to EN 55032:2015+AC:2016+A1:2020+A11:2020

Frequency Range (MHz)	Limits (dBuV)	
	Quasi-Peak	Average
0.150~0.500	66~56	56~46
0.500~5.000	56	46
5.000~30.000	60	50

#### TEST CONFIGURATION



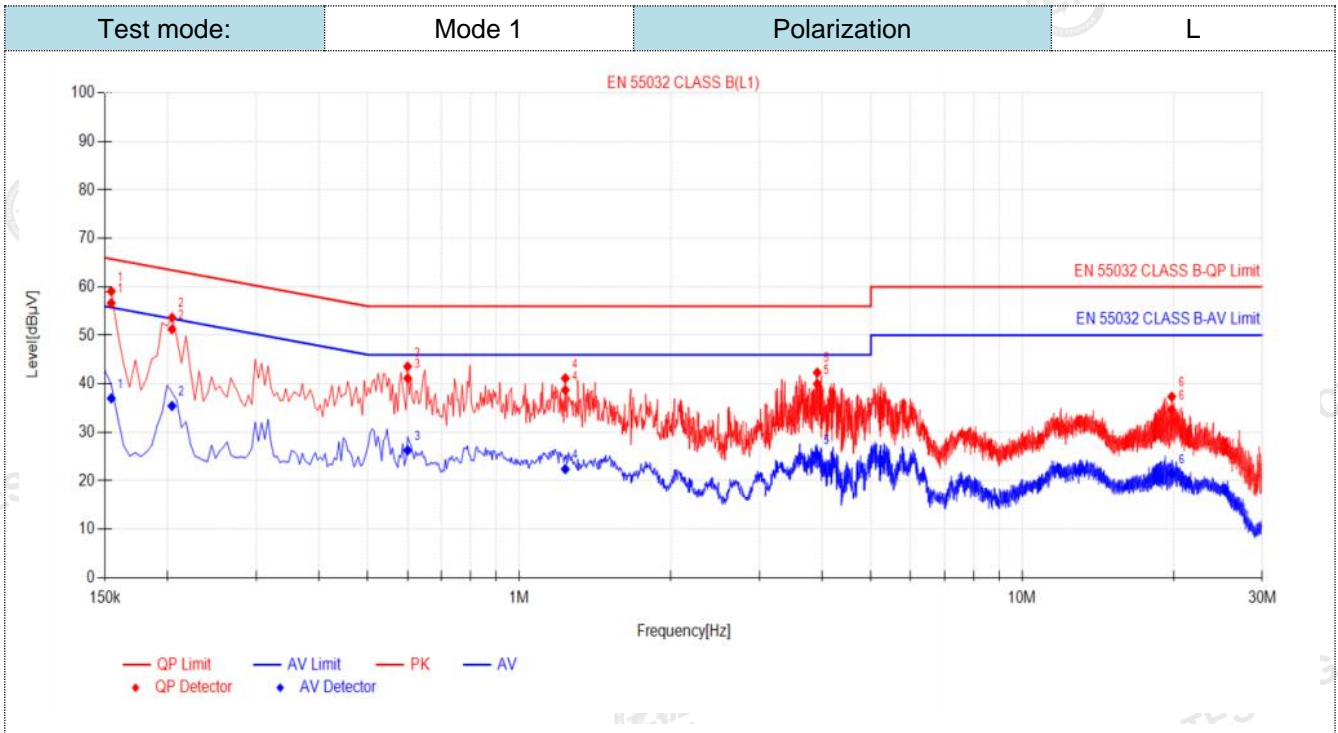
#### TEST PROCEDURE

Please refer to EN 55032:2015+AC:2016+A1:2020+A11:2020 Annex A for the measurement methods.

#### TEST RESULTS

**Passed**

Please refer to the below test data:



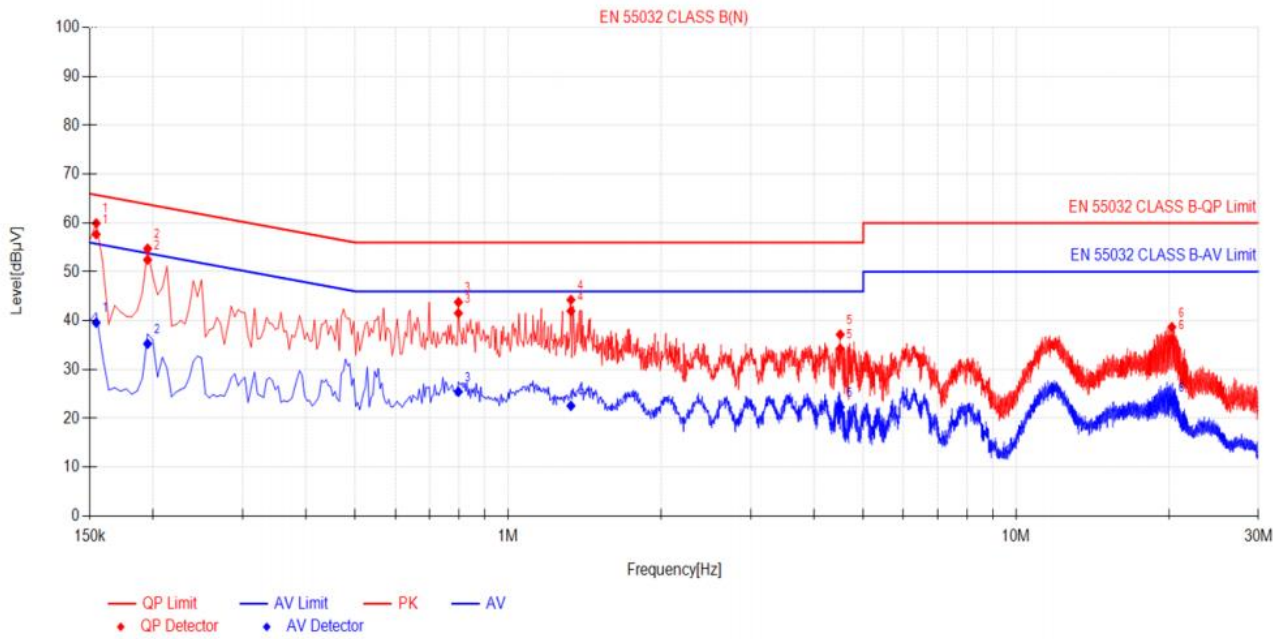
Final Data List

NO.	Freq. [MHz]	Factor [dB]	QP Reading [dBµV]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Reading [dBµV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.1545	10.50	46.16	56.66	65.75	9.09	26.50	37.00	55.75	18.75	PASS
2	0.204	10.50	40.75	51.25	63.45	12.20	24.93	35.43	53.45	18.02	PASS
3	0.6	10.50	30.65	41.15	56.00	14.85	15.77	26.27	46.00	19.73	PASS
4	1.2345	10.50	28.21	38.71	56.00	17.29	11.90	22.40	46.00	23.60	PASS
5	3.912	10.50	29.49	39.99	56.00	16.01	14.83	25.33	46.00	20.67	PASS
6	19.824	10.50	24.10	34.60	60.00	25.40	11.02	21.52	50.00	28.48	PASS

Note: 1). Level (dBµV/m) = Reading (dBµV/m) + Factor (dB/m)

2). Factor (dB/m) = Cable loss (dB) + LISN Factor (dB)

Test mode:	Mode 1	Polarization	N
------------	--------	--------------	---



Final Data List											
NO.	Freq. [MHz]	Factor [dB]	QP Reading[dB µV]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Reading [dBµV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.1545	10.50	47.18	57.68	65.75	8.07	29.09	39.59	55.75	16.16	PASS
2	0.195	10.50	41.97	52.47	63.82	11.35	24.76	35.26	53.82	18.56	PASS
3	0.798	10.50	31.02	41.52	56.00	14.48	14.94	25.44	46.00	20.56	PASS
4	1.329	10.50	31.48	41.98	56.00	14.02	12.06	22.56	46.00	23.44	PASS
5	4.506	10.50	23.77	34.27	56.00	21.73	11.79	22.29	46.00	23.71	PASS
6	20.2605	10.50	25.59	36.09	60.00	23.91	12.90	23.40	50.00	26.60	PASS

Note:1).Level (dBµV/m)= Reading (dBµV/m)+ Factor (dB/m)

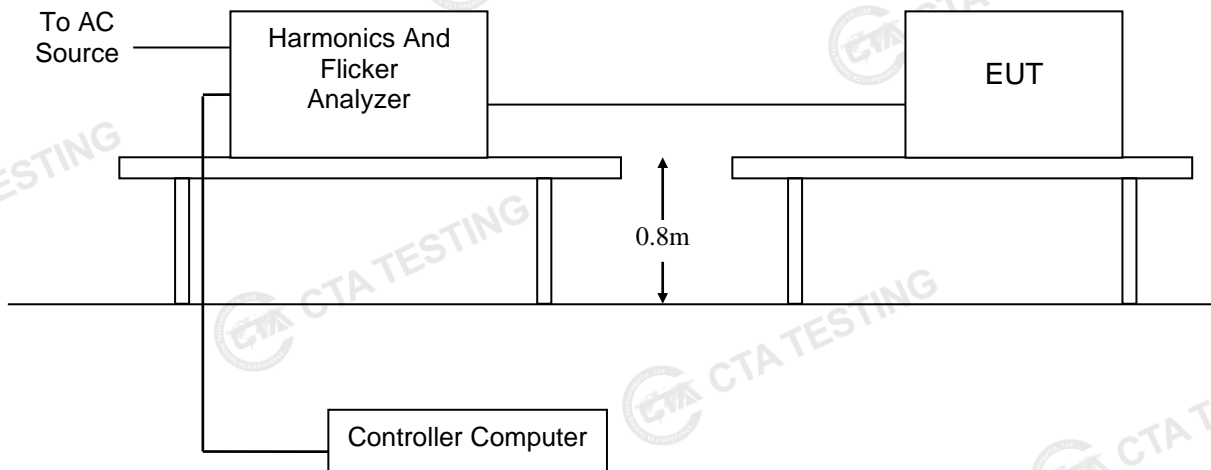
2). Factor(dB/m)=Cable loss (dB) + LISN Factor (dB)

### 4.1.3. Harmonic Current Emission

#### LIMIT

Please refer to EN 61000-3-2

#### TEST CONFIGURATION



#### TEST PROCEDURE

Please refer to EN 61000-3-2 for the measurement methods.

#### TEST RESULTS

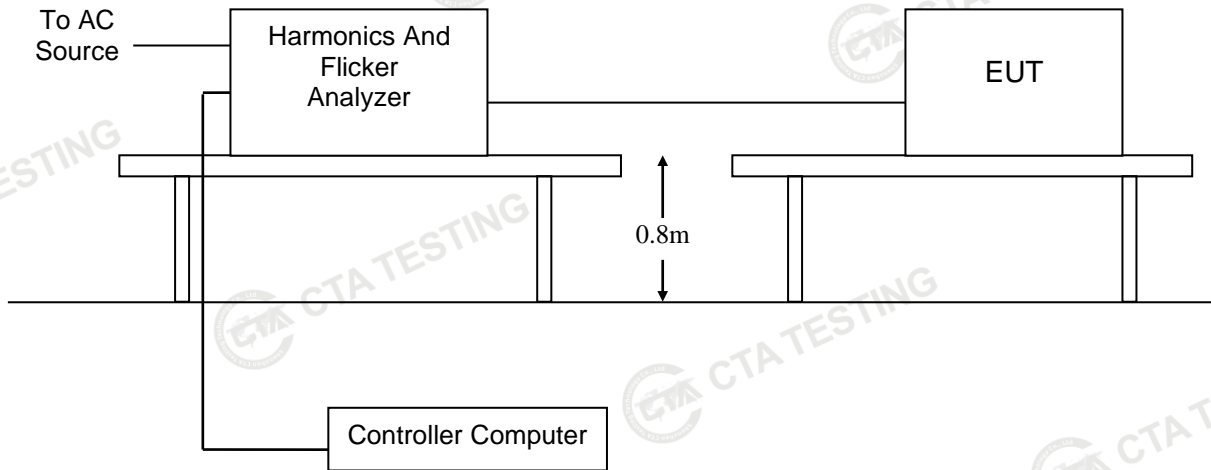
*The power of this product is less than 75W, So this test item is not applicable for the EUT.*

#### 4.1.4. Voltage Fluctuation and Flicker

##### LIMIT

Please refer to EN 61000-3-3

##### TEST CONFIGURATION



##### TEST PROCEDURE

Please refer to EN 61000-3-3 for the measurement methods.

##### TEST RESULTS

*The maximum input power of the EUT is less than 20W, which unlikely to produce significant voltage fluctuation. Therefore this test item is not applicable for the EUT.*

*See clause 6.1\*\*\* \*\*\* EN 61000-3-3, clause 6.1:" ... Tests need not be made on equipment which is unlikely to produce significant voltage fluctuations or flicker. ...".*



## 4.2. IMMUNITY

### 4.2.1. Performance criteria

#### ■ Performance Criterion of EN55035

Criterion A: 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.

Criterion B: 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 phenomena below a performance level specified by the manufacturer, when the equipment is used as intended.

Criterion C: 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.

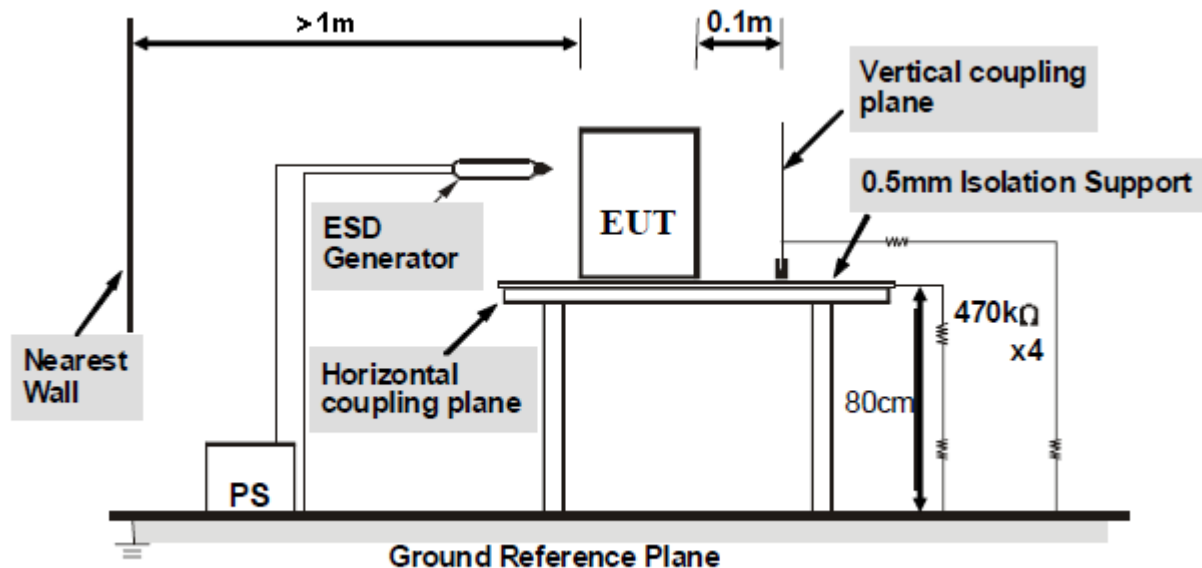
## 4.2.2. Electrostatic Discharge

### LIMIT

### SEVERITY LEVELS OF ELECTROSTATIC DISCHARGE

Test level: Contact Discharge at  $\pm 2\text{KV}$ ,  $\pm 4\text{KV}$  Air Discharge at  $\pm 2\text{KV}$ ,  $\pm 4\text{KV}$ ,  $\pm 8\text{KV}$

### TEST CONFIGURATION



### TEST PROCEDURE

Please refer to EN 55035 and EN 61000-4-2 for the measurement methods.

#### **Contact Discharge:**

The ESD generator is held perpendicular to the surface to which the discharge is applied and the tip of the discharge electrode touch the surface of EUT. Then turn the discharge switch. The generator is then re-triggered for a new single discharge and repeated at least 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

#### **Air Discharge:**

Air discharge is used where contact discharge can't be applied. The round discharge tip of the discharge electrode shall be approached as fast as possible to touch the EUT. After each discharge, the discharge electrode shall be removed from the EUT. The generator is then re-triggered for a new single discharge and repeated at least 10 times for each pre-selected test point. This procedure shall be repeated until all the air discharge completed.

#### **Indirect discharge for horizontal coupling plane:**

At least 10 single discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT.

#### **Indirect discharge for vertical coupling plane:**

At least 10 single discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated.

### TEST MODE

Please reference to the section 2.3

**TEST RESULTS**

Direct discharge				
Type of discharge	Discharge voltage (KV)	Observations Performance	Criteria Level	Result
Contact discharge	±2	No degradation in performance of the EUT was observed (A)	B	Pass
	±4	A	B	
Air discharge	±2	A	B	
	±4	A	B	
	±8	A	B	
Indirect discharge				
Type of discharge	Discharge voltage (KV)	Observations Performance	Criteria Level	Result
HCP (6 sides)	±2	A	B	Pass
	±4	A	B	
VCP (4 sides)	±2	A	B	
	±4	A	B	

Remark: The ancillary equipment's specification for an acceptable level of performance or degradation of performance during and/or after the ESD tests.

### 4.2.3. RF Electromagnetic Field

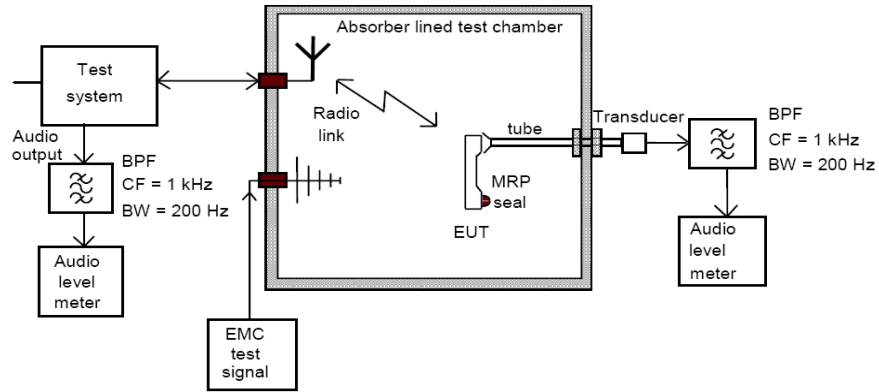
#### PERFORMANCE CRITERION

Criteria A

#### TEST LEVEL

3V/m (80%, 1kHz Amplitude Modulation)

#### TEST CONFIGURATION



#### TEST PROCEDURE

Please refer to EN 61000-4-3 for the measurement methods.

#### TEST MODE

Please reference to the section 2.3

#### TEST RESULTS

Frequency	Level	Modulation	Antenna Polarization	EUT Face	Observations (Performance Criterion)	Result
80MHz-1GHz 1800MHz 2600MHz 3500MHz 5000MHz	3 V/m	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=3seconds	V	Front	A	Pass
			H		A	Pass
			V	Rear	A	Pass
			H		A	Pass
			V	Left	A	Pass
			H		A	Pass
			V	Right	A	Pass
			H		A	Pass
			V	Top	A	Pass
			H		A	Pass
			V	Bottom	A	Pass
			H		A	Pass

### 4.2.4. Surges

#### PERFORMANCE CRITERION

Criteria B

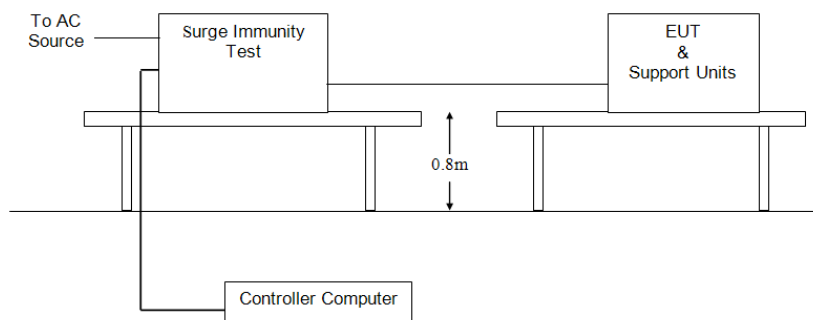
#### TEST LEVEL

1kV Line to Line: Differential mode

2kV Line to Ground: Common mode

(Voltage Waveform: 1.2/50 us; Current Waveform: 8/20 us)

#### TEST CONFIGURATION



#### TEST PROCEDURE

Please refer to EN 61000-4-5 for the measurement methods.

#### TEST MODE

Please reference to the section 2.3

#### TEST RESULTS

Location	Level(kV)	Pulse No	Surge Interval	Phase(deg)	Observations (Performance Criterion)	Result
L-N	± 1	5	60s	0°	A	Pass
				90°	A	Pass
				180°	A	Pass
				270°	A	Pass
L-PE	± 2	5	60s	0°	A	Pass
				90°	A	Pass
				180°	A	Pass
				270°	A	Pass
N-PE	± 2	5	60s	0°	A	Pass
				90°	A	Pass
				180°	A	Pass
				270°	A	Pass

Remark: A: No degradation in performance of the EUT was observed.

### 4.2.5. RF- Common Mode 0.15MHz to 80MHz

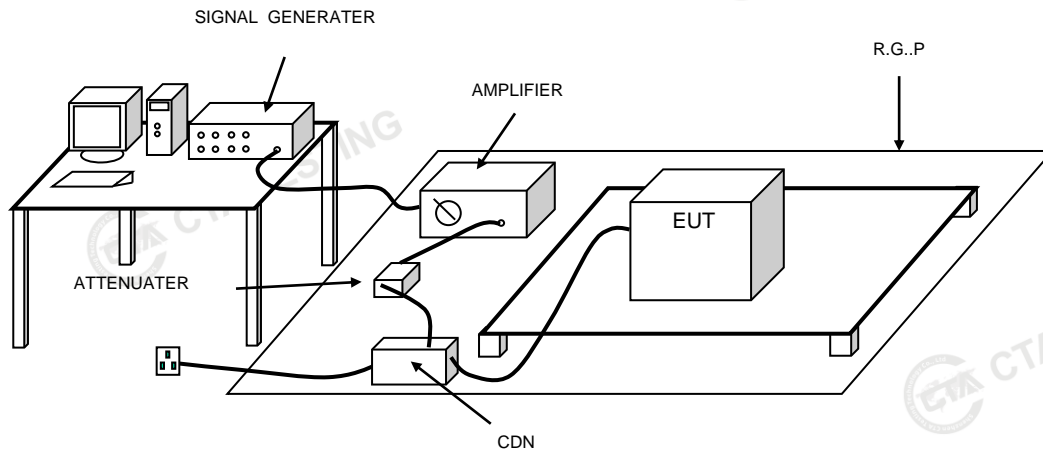
#### PERFORMANCE CRITERION

Criteria A

#### TEST LEVEL

3Vrms on AC main port (80%, 1kHz Amplitude Modulation)

#### TEST CONFIGURATION



#### TEST PROCEDURE

Please refer to EN 61000-4-6 for the measurement methods.

#### TEST MODE

Please reference to the section 2.3

#### TEST RESULTS

Frequency	Injected Position	Level	Modulation	Observations (Performance Criterion)	Result
150kHz to 10MHz	AC Mains	3Vrms	1 kHz, 80 % Amp. Mod, 1 % increment, dwell time=3seconds	A	Pass
10MHz to 30MHz		3 Vrms to 1 Vrms			
30MHz to 80MHz		1 Vrms			



### 4.2.6. Fast Transients Common Mode

#### PERFORMANCE CRITERION

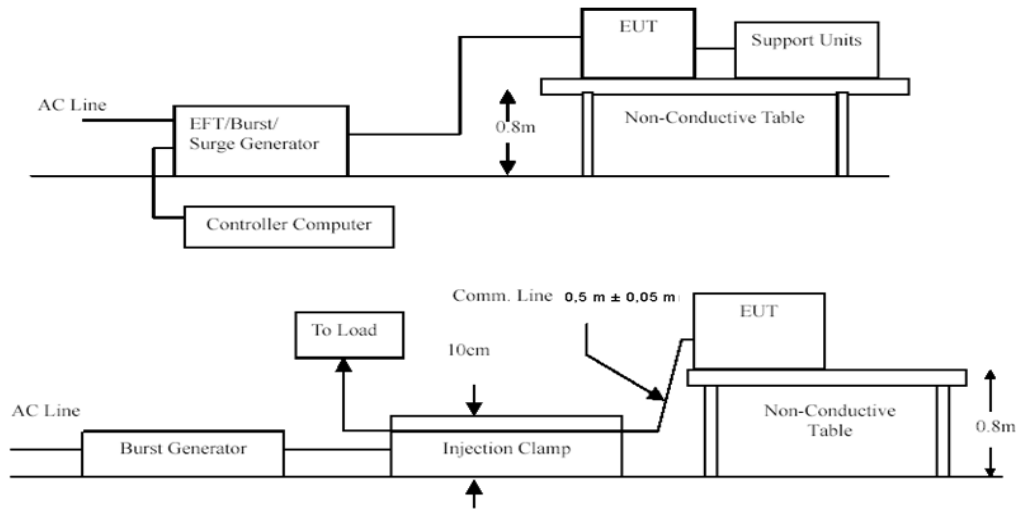
Criteria B

#### TEST LEVEL

1KV for AC main port

(Impulse Frequency: 5 kHz; Tr/Th: 5/50ns; Burst Duration: 15ms; Burst Period: 3Hz)

#### TEST CONFIGURATION



#### TEST PROCEDURE

Please refer to EN55035 and EN 61000-4-4 for the measurement methods.

#### TEST MODE

Please reference to the section 2.3

#### TEST RESULTS

Lead under Test	Level ( $\pm$ kV)	Coupling Direct/Clamp	Observations (Performance Criterion)	Result
L	$\pm 1$	Direct	A	Pass
N	$\pm 1$	Direct	A	Pass
PE	$\pm 1$	Direct	A	Pass
L-PE	$\pm 1$	Direct	A	Pass
N-PE	$\pm 1$	Direct	A	Pass
L-N	$\pm 1$	Direct	A	Pass
L-N-PE	$\pm 1$	Direct	A	Pass

Remark: A: No degradation in performance of the EUT was observed.

### 4.2.7. Voltage Dips and Interruptions

#### PERFORMANCE CRITERION

>95% VD, 0.5 period----Performance criterion: B

>95% VD, 1.0 period----Performance criterion: B

30% VD, 25 period----Performance criterion: C

>95% VI, 250 period----Performance criterion: C

#### TEST LEVEL

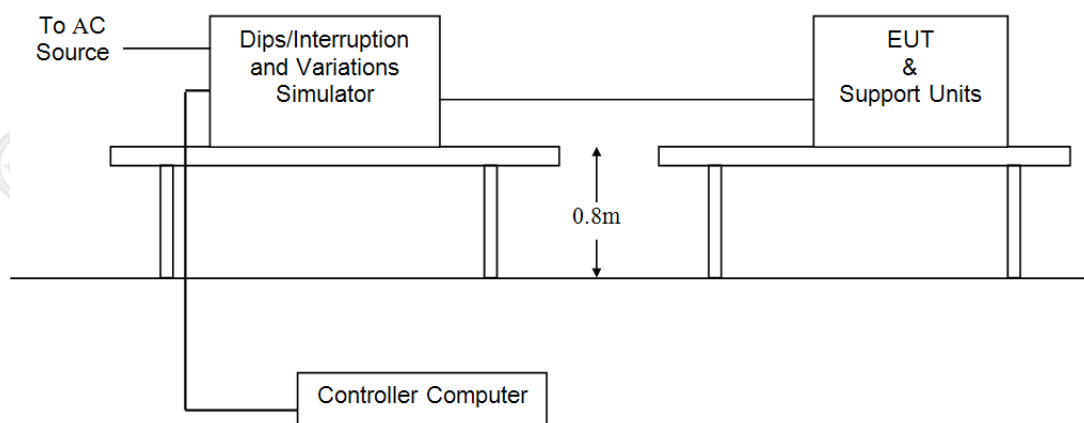
0% of VT(Supply Voltage) for 0.5 period

0% of VT(Supply Voltage) for 1.0 period

70% of VT(Supply Voltage) for 25 period

0% of VT(Supply Voltage) for 250 period

#### TEST CONFIGURATION



#### TEST PROCEDURE

Please refer to EN 61000-4-11 for the measurement methods.

#### TEST MODE

Please reference to the section 2.3

#### TEST RESULTS

Test Level % UT	Duration (Periods)	Phase angle	No. of drop out	Time between dropout	Observations (Performance Criterion)	Result
0	0.5	0°, 90°, 180°, 270°	3	10s	A	Pass
0	1.0	0°, 90°, 180°, 270°	3	10s	A	Pass
70	25	0°, 90°, 180°, 270°	3	10s	A	Pass
0	250	0°, 90°, 180°, 270°	3	10s	B	Pass

Remark :

A: No degradation in performance of the EUT was observed.

B: During the test, the power shut down, after the experiment, the function can automatically return to normal.

## 4.2.8. Power frequency magnetic field

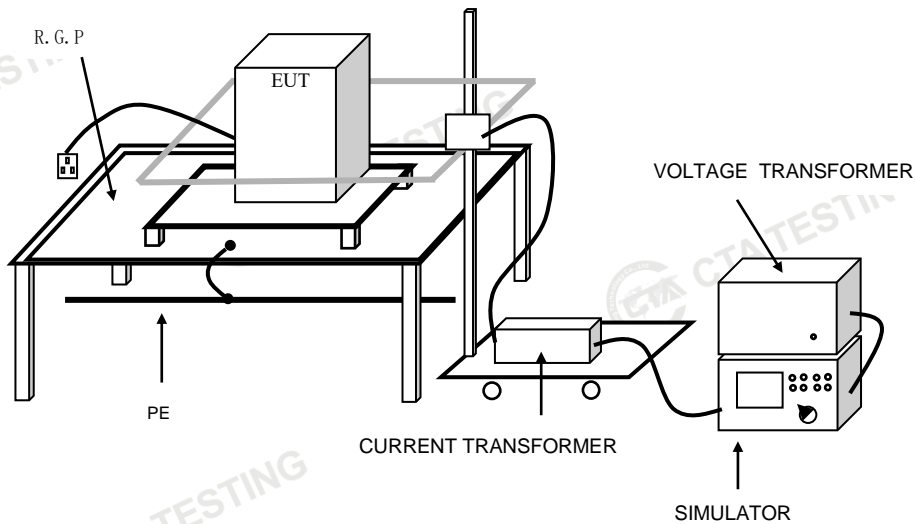
### PERFORMANCE CRITERION

Criteria A

### TEST LEVEL

30A /m ( X-axis, Y-axis, Z-axis)

### TEST CONFIGURATION



### TEST PROCEDURE

Please refer to EN 61000-4-8 for the measurement methods.

### TEST MODE

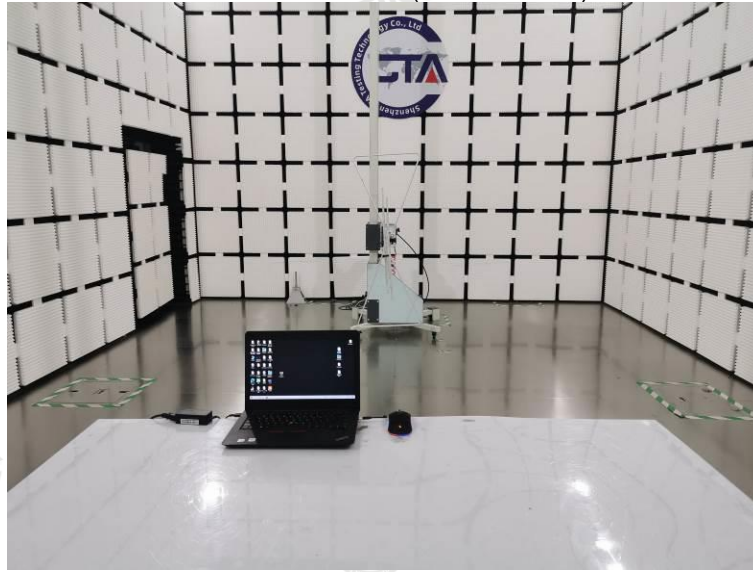
Please reference to the section 2.3

### TEST RESULTS

Not applicable

## 5. Test Set-up Photos of the EUT

Radiated Emission (30MHz-1GHz)



Conducted Emission



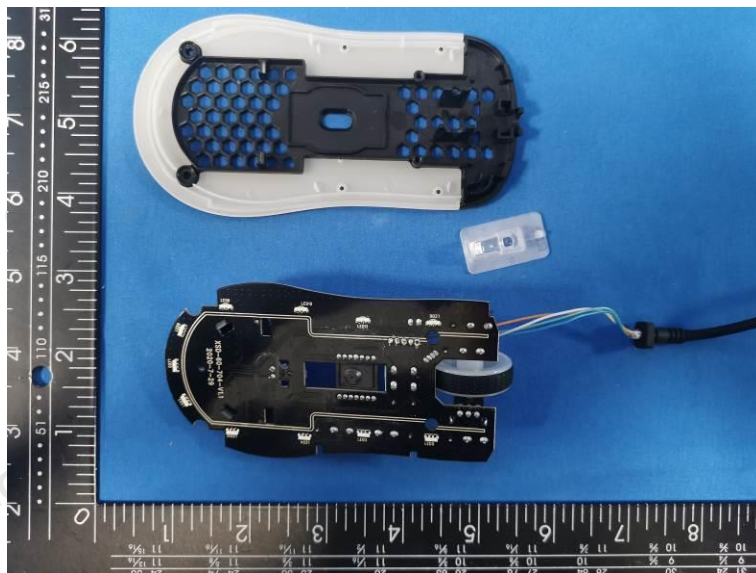
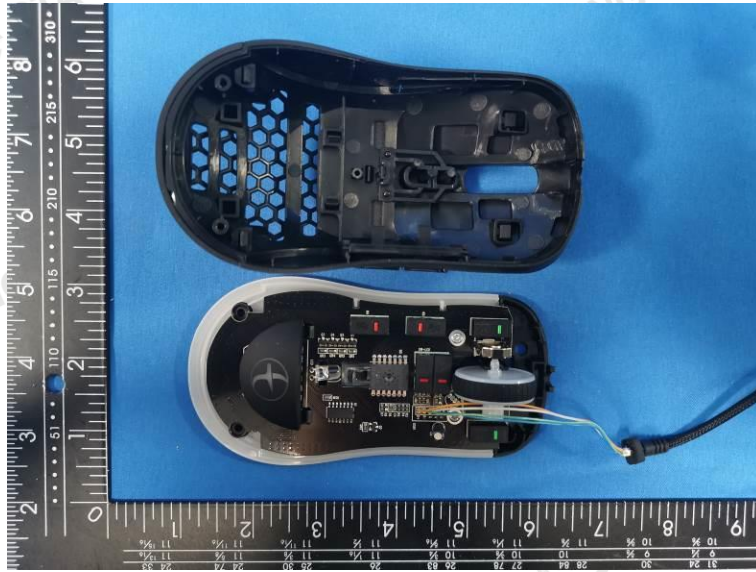
### 6. External and Internal Photos of the EUT

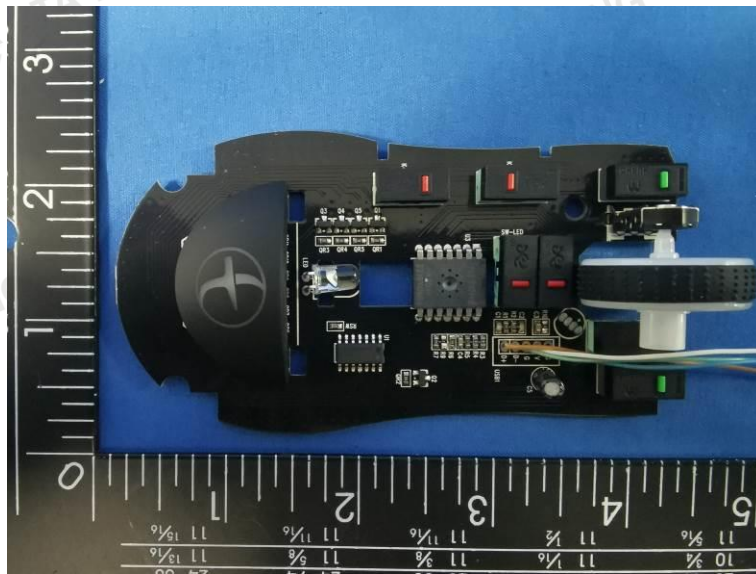
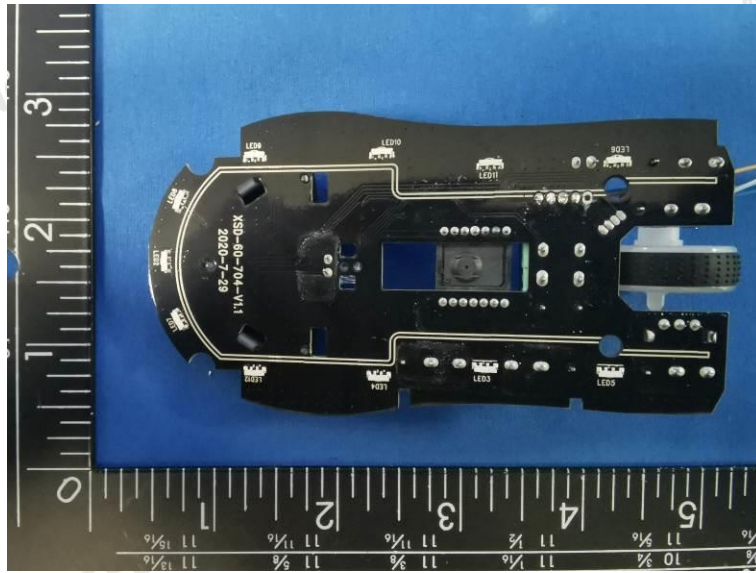












.....End of Report.....