

Report No.: TW2304225-01E

Applicant: Shenzhen Star Sources Electronic Technology Co., Ltd.

Product: Wireless Mouse

Model No.: ST-308

Trademark: N/A

Test Standards: FCC Part 15.249

Test result:

It is herewith confirmed and found to comply with the

requirements set up by ANSI C63.10 & FCC Part 15 Subpart C, Paragraph 15.249 regulations for the evaluation of

electromagnetic compatibility

Approved By

Terry Jane

Terry Tang

Manager

Dated: May 13, 2023

Results appearing herein relate only to the sample tested The technical reports is issued errors and omissions exempt and is subject to withdrawal at

## SHENZHEN TIMEWAY TESTING LABORATORIES

Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le Village, Nanshan District, Shenzhen, China

Tel (755) 83448688, Fax (755) 83442996, E-Mail:info@timeway-lab.com

Report No.: TW2304225-01E Page 2 of 38

Date: 2023-05-13



## **Special Statement:**

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAS. This approval result is accepted by MRA of APLAC.

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

## **CNAS-LAB Code: L2292**

The EMC Laboratory has been assessed and in compliance with CNAS-CL01 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:2017 General Requirements) for the Competence of testing Laboratories.

## FCC-Registration No.: 744189

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 744189.

## Industry Canada (IC) — Registration No.:5205A

The EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 5205A.

## A2LA (Certification Number: 5013.01)

The EMC Laboratory has been accredited by the American Association for Laboratory Accreditation (A2LA). Certification Number:5013.01

CAB identifier: CN0033

Report No.: TW2304225-01E

Date: 2023-05-13



## Test Report Conclusion

#### Content

1.0	General Details	4
1.1	Test Lab Details	4
1.2	Applicant Details	4
1.3	Description of EUT	4
1.4	Submitted Sample	4
1.5	Test Duration.	5
1.6	Test Uncertainty	5
1.7	Test By	5
2.0	List of Measurement Equipment	6
3.0	Technical Details	7
3.1	Summary of Test Results	7
3.2	Test Standards	7
4.0	EUT Modification	7
5.0	Power Line Conducted Emission Test	8
5.1	Schematics of the Test	8
5.2	Test Method and Test Procedure	8
5.3	Configuration of the EUT	8
5.4	EUT Operating Condition	9
5.5	Conducted Emission Limit.	9
5.6	Test Result	9
6.0	Radiated Emission test	10
6.1	Test Method and Test Procedure	10
6.2	Configuration of the EUT	11
6.3	EUT Operation Condition	11
6.4	Radiated Emission Limit	11
6.5	Test Result	13
7.0	Band Edge	21
7.1	Test Method and Test Procedure	21
7.2	Radiated Test Setup	21
7.3	Configuration of the EUT	21
7.4	EUT Operating Condition	21
7.5	Band Edge Limit.	21
7.6	Band Edge Test Result.	22
8.0	Antenna Requirement	26
9.0	20dB bandwidth measurement	27
10.0	FCC ID Label	30
11.0	Photo of Test Setup and EUT View	31

The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES. reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.

Date: 2023-05-13



#### 1.0 General Details

#### 1.1 Test Lab Details

Name: SHENZHEN TIMEWAY TESTING LABORATORIES.

Address: Zone C, 1st Floor, Block B, Jun Xiang Da Building, Zhongshan Park Road West, Tong Le

Village, Nanshan District, Shenzhen, China

Telephone: (755) 83448688 Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 744189 For 3m Anechoic Chamber

## 1.2 Applicant Details

Applicant: Shenzhen Star Sources Electronic Technology Co., Ltd.

Address: Room 2102, Block 1st, Yi Luan Building, Xixiang Road 230, BaoAn District, Shenzhen, China

Telephone: +86-755-86397260 Fax: +86-755-26609516

## 1.3 Description of EUT

Product: Wireless Mouse

Manufacturer: Shenzhen Star Sources Electronic Technology Co., Ltd.

Address: Room 2102, Block 1st, Yi Luan Building, Xixiang Road 230, BaoAn District,

Shenzhen, China

Trademark: N/A
Model Number: ST-308
Additional Model Name N/A
Rating: DC1.5V

Battery 1pc 1.5V AA battery

Modulation Type: GFSK

Operation Frequency: 2402-2480MHz

Channel Number: 40 Channel Separation: 2MHz

Hardware Version: BYKC-MM192-6621D-QFN-V1-A/B

Software Version: cfg 192MS61WB 122032 cv29 av045 v003

Serial No.: 17607LW100001

Antenna Designation PCB antenna with gain -4.62dBi Max (Get from the antenna test report)

The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES. reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.

Report No.: TW2304225-01E Page 5 of 38

Date: 2023-05-13



1.4 Submitted Sample: 1 Sample

1.5 Test Duration

2023-04-18 to 2023-05-13

1.6 Test Uncertainty

Conducted Emissions Uncertainty = 3.6dB

Radiated Emissions below 1GHz Uncertainty =4.7dB

Radiated Emissions above 1GHz Uncertainty =6.0dB

Conducted Power Uncertainty = 6.0dB

Occupied Channel Bandwidth Uncertainty =5%

Conducted Emissions Uncertainty = 3.6dB

Note: The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

1.7 Test Engineer

The sample tested by

Print Name: Andy Xing

Page 6 of 38

Report No.: TW2304225-01E

Date: 2023-05-13



2.0 Test Equipment					
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	SPI Test Receiver R&S ESPI 3		100379	2022-07-15	2023-07-14
LISN	R&S	EZH3-Z5	100294	2022-07-18	2023-07-17
LISN	R&S	EZH3-Z5	100253	2022-07-18	2023-07-17
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2022-07-18	2023-07-17
Loop Antenna	EMCO	6507	00078608	2022-07-18	2025-07-17
Spectrum	R&S	FSIQ26	100292	2022-07-15	2023-07-14
Horn Antenna	A-INFO	LB-180400-KF	J211060660	2022-07-18	2025-07-17
Horn Antenna	R&S	BBHA 9120D	9120D-631	2022-07-18	2024-07-17
Power meter	Anritsu	ML2487A	6K00003613	2022-07-18	2023-07-17
Power sensor	Anritsu	MA2491A	32263	2022-07-18	2023-07-17
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2022-07-18	2025-07-17
9*6*6 Anechoic			N/A	2022-07-26	2025-07-25
EMI Test Receiver	RS	ESVB	826156/011	2022-07-15	2023-07-14
EMI Test Receiver	RS	ESCS 30	834115/006	2022-07-15	2023-07-14
Spectrum	HP/Agilent	E4407B	MY50441392	2022-07-15	2023-07-14
Spectrum	RS	FSP	1164.4391.38	2022-07-15	2023-07-14
RF Cable	Zhengdi	ZT26-NJ-NJ-8M/FA		2022-07-15	2023-07-14
RF Cable	Zhengdi	7m		2022-07-15	2023-07-14
Pre-Amplifier	Schwarebeck	BBV9743	#218	2022-07-15	2023-07-14
Pre-Amplifier	HP/Agilent	8449B	3008A00160	2022-07-15	2023-07-14
LISN	SCHAFFNER	NNB42	00012	2022-08-18	2023-07-17
ESPI Test Receiver	R&S	ESPI 3	100379	2022-07-15	2023-07-14
LISN	R&S	EZH3-Z5	100294	2022-07-18	2023-07-17

## 2.2 Automation Test Software

## For Conducted Emission Test

Name	Version	
EZ-EMC	Ver.EMC-CON 3A1.1	

## For Radiated Emissions

Name	Version
EMI Test Software BL410-EV18.91	V18.905
EMI Test Software BL410-EV18.806 High Frequency	V18.06

The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES. reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.

Page 7 of 38

Report No.: TW2304225-01E

Date: 2023-05-13



#### 3.0 Technical Details

## 3.1 Summary of test results

The EUT	has been	tested	according	to the	following	specifications:

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.203	Antenna Requirement	Pass	Complies
FCC Part 15, Paragraph 15.207	Conducted Emission Test	N/A	N/A
FCC Part 15 Subpart C Paragraph 15.249(a) & 15.249(b) Limit	Field Strength of Fundamental	Pass	Complies
FCC Part 15, Paragraph 15.209	Radiated Emission Test	Pass	Complies
FCC Part 15 Subpart C Paragraph 15.249(d) Limit	Band Edge Test	Pass	Complies

#### 3.2 Test Standards

FCC Part 15 Subpart C, Paragraph 15.249, ANSI C63.4:2014 and ANSI C63.10:2013

#### 4.0 EUT Modification

No modification by SHENZHEN TIMEWAY TESTING LABORATORIES

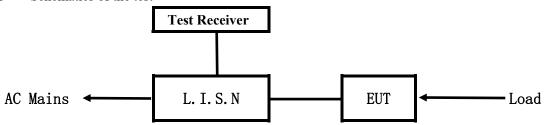
Report No.: TW2304225-01E

Date: 2023-05-13



#### 5. Power Line Conducted Emission Test

#### 5.1 Schematics of the test



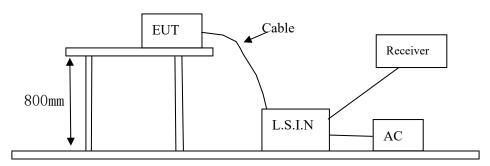
**EUT: Equipment Under Test** 

#### 5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.10-2013. The Frequency spectrum from 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.10-2013.

Test Voltage: N/A

Block diagram of Test setup



## 5.3 Configuration of the EUT

The EUT was configured according to ANSI C63.10-2013. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

40 channels are provided to the EUT

#### A. EUT

Device	Manufacturer	Model	FCC ID
	Shenzhen Star Sources		
Wireless Mouse	Electronic Technology Co.,	ST-308	ZJEST-308
	Ltd.		

The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

Page 9 of 38

Report No.: TW2304225-01E

Date: 2023-05-13



#### B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

## C. Peripherals

Device	Manufacturer	Model	Rating
N/A			

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.10-2013

- A Setup the EUT and simulators as shown on follow
- B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207

Frequency	Limits (d	lB μ V)
(MHz)	Quasi-peak Level	Average Level
$0.15 \sim 0.50$	66.0~56.0*	56.0~46.0*
$0.50 \sim 5.00$	56.0	46.0
$5.00 \sim 30.00$	60.0	50.0

Notes:

- 1. \*Decreasing linearly with logarithm of frequency.
- 2. The tighter limit shall apply at the transition frequencies

#### 5.6 Test Results:

N/A

Note: EUT powered by AA battery, this test item not applicable.

Page 10 of 38

Report No.: TW2304225-01E

Date: 2023-05-13

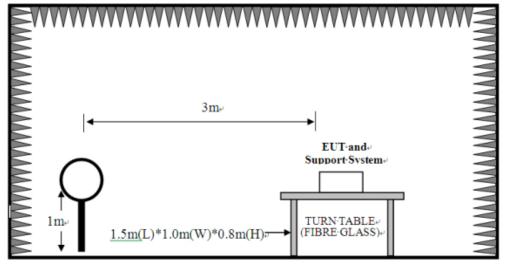


#### **6** Radiated Emission Test

- 6.1 Test Method and test Procedure:
- (1) The EUT was tested according to ANSI C63.10-2013. The radiated test was performed at Timeway EMC Laboratory. This site is on file with the FCC laboratory division, Registration No. 744189
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.10-2013.
- (3) The frequency spectrum from 30 MHz to 25 GHz was investigated. All readings from 30 MHz to 1 GHz are quasi-peak values with a resolution bandwidth of 120 kHz. All readings are above 1 GHz, peak values with a resolution bandwidth of 1 MHz (Note: for Fundamental frequency radiated emission measurement, RBW=3MHz, VBW=10MHz). Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) The antenna polarization: Vertical polarization and Horizontal polarization.

## **Block diagram of Test setup**

For radiated emissions from 9kHz to 30MHz

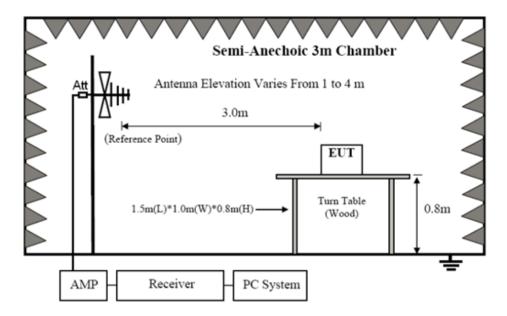


For radiated emissions from 30MHz to1GHz

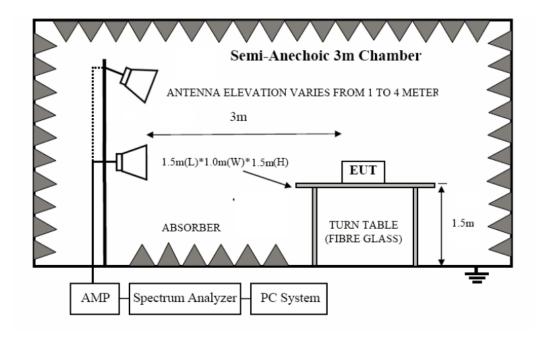
Report No.: TW2304225-01E

Date: 2023-05-13





For radiated emissions above 1GHz



- 6.2 Configuration of the EUT
  Same as section 5.3 of this report
- 6.3 EUT Operating Condition

  Same as section 5.4 of this report.

The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES. reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.

Report No.: TW2304225-01E Page 12 of 38

Date: 2023-05-13



#### 6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

## A FCC Part 15 Subpart C Paragraph 15.249(a) Limit

Fundamental Frequency	Field Strength of Fundamental (3m)			Field S	trength of Harmo	nics (3m)
(MHz)	mV/m	dBuV/m		uV/m	dBu	V/m
2400-2483.5	50	94 (Average)	114 (Peak)	500	54 (Average)	74 (Peak)

Note:

- 1. RF Field Strength (dBuV) = 20 log RF Voltage (uV)
- 2.Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.
- 3. The emission limit in this paragraph is based on measurement instrumentation employing an average detector.

## B. Frequencies in restricted band are complied to limit on Paragraph 15.209.

Frequency Range (MHz)	Distance (m)	Field strength (dB $\mu$ V/m)
0.009-0.490	3	20log(2400/F(kHz)) +40log (300/3)
0.490-1. 05	3	20log(24000/F(kHz)) +40log (30/3)
1.705-30	3	69.5
30-80	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note:

- 1. RF Voltage (dBuV) = 20 log RF Voltage (uV)
- 2. In the Above Table, the tighter limit applies at the band edges.
- 3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT
- 4. All scanning using PK detector. And the final emission level was get using QP detector for frequency range from 30-1000MHz.As to 1G-25G, the final emission level got using PK. For fundamental measurement, PK detector used.
- 5. For radiated emissions from 9kHz to 30MHz, the emission level is much less than the limit for more than 20dB. No necessary to take down the record.
- 6. New battery was used during tests.

Report No.: TW2304225-01E Page 13 of 38

Date: 2023-05-13

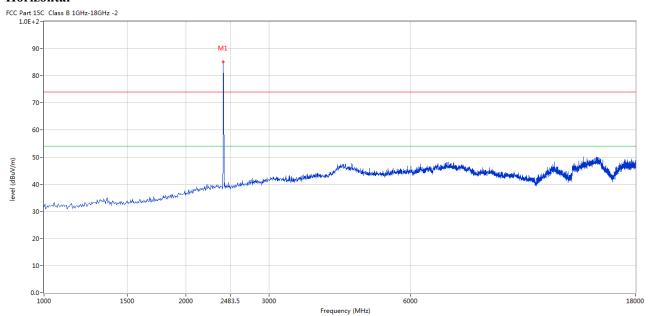


## 6.5 Test result

## A Fundamental & Harmonics Radiated Emission Data

Please refer to the following test plots for details: Low Channel-2402MHz

#### Horizontal



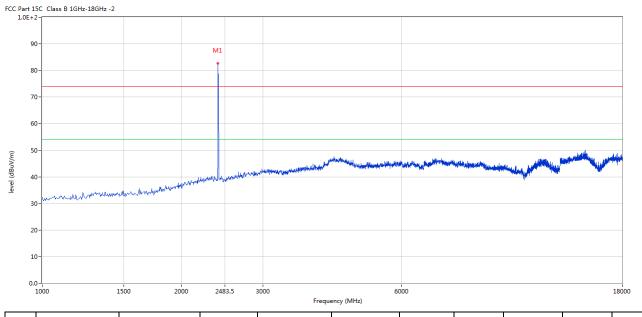
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2402	85.43	-3.57	114.0	-28.57	Peak	73.00	100	Horizontal	Pass

Report No.: TW2304225-01E Page 14 of 38

Date: 2023-05-13



## Vertical



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(0)	(cm)		
1	2402	82.74	-3.57	114.0	-31.26	Peak	31.00	100	Vertical	Pass

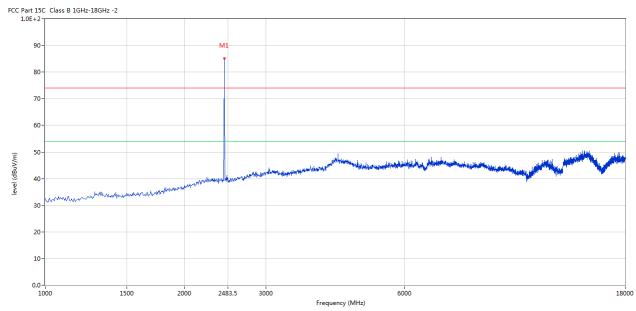
Report No.: TW2304225-01E Page 15 of 38

Date: 2023-05-13



Please refer to the following test plots for details: Middle Channel-2440MHz

#### Horizontal



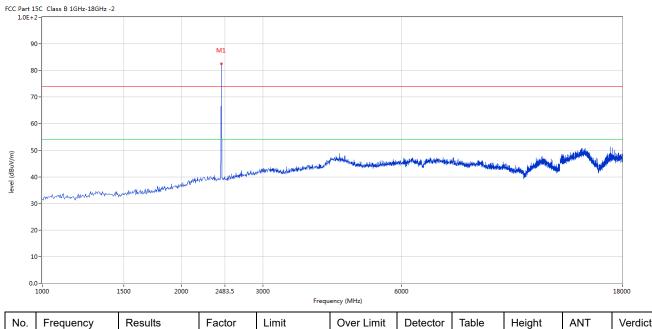
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2440	85.04	-3.57	114.0	-28.96	Peak	251.00	100	Horizontal	Pass

Report No.: TW2304225-01E Page 16 of 38

Date: 2023-05-13



## Vertical



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2440	82.46	-3.57	114.0	-31.54	Peak	168.00	100	Vertical	Pass

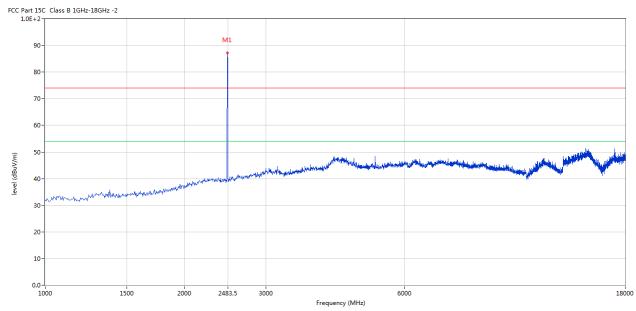
Report No.: TW2304225-01E Page 17 of 38

Date: 2023-05-13



Please refer to the following test plots for details: High Channel-2480MHz

#### Horizontal



Ī	No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
		(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
Ī	1	2480	84.85	-3.57	114.0	-29.15	Peak	243.00	100	Horizontal	Pass

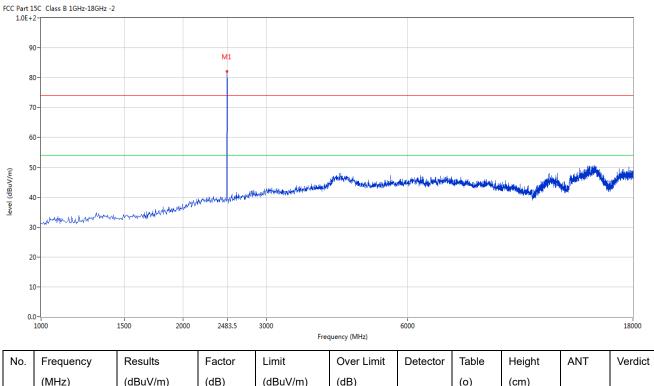
Page 18 of 38

Report No.: TW2304225-01E

Date: 2023-05-13



#### Vertical



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2480	82.20	-3.57	114.0	-31.80	Peak	36.00	100	Vertical	Pass

Note: (2) Emission Level = Reading Level + Antenna Factor + Cable Loss-Amplifier

- (3) Margin=Emission-Limits
- (4) According to section 15.35(b), the peak limit is 20dB higher than the average limit
- (5) For test purpose, keep EUT continuous transmitting
- (5) For emission above 18GHz and Below 30MHz, it is only the floor noise. No necessary to take down.
- (6) the measured PK value less than the AV limit.

Date: 2023-05-13

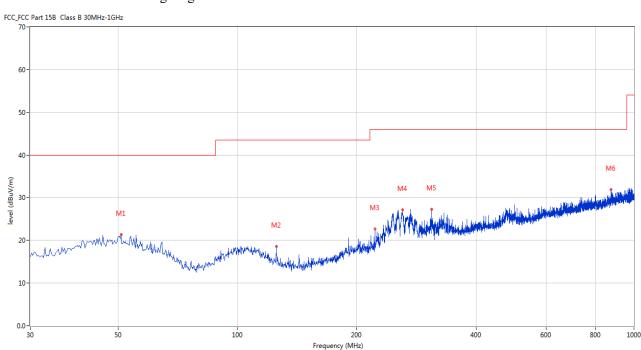


# B. General Radiated Emission Data Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

**Results:** Pass

Please refer to following diagram for individual



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	50.850	21.37	-11.40	40.0	-18.63	Peak	0.00	200	Horizontal	Pass
2	125.279	18.63	-16.36	43.5	-24.87	Peak	118.00	200	Horizontal	Pass
3	222.254	22.72	-13.21	46.0	-23.28	Peak	80.00	100	Horizontal	Pass
4	260.560	27.17	-11.84	46.0	-18.83	Peak	46.00	100	Horizontal	Pass
5	308.805	27.24	-10.85	46.0	-18.76	Peak	57.00	100	Horizontal	Pass
6	876.113	31.88	-2.13	46.0	-14.12	Peak	261.00	100	Horizontal	Pass

Report No.: TW2304225-01E Page 20 of 38

Date: 2023-05-13

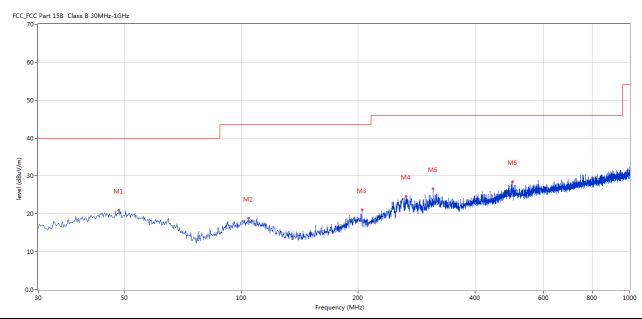


## Radiated Emission In Vertical (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Results: Pass

Please refer to following diagram for individual



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	48.425	20.92	-11.22	40.0	-19.08	Peak	0.00	200	Vertical	Pass
2	104.186	18.90	-13.30	43.5	-24.60	Peak	60.00	200	Vertical	Pass
3	204.314	21.15	-13.53	43.5	-22.35	Peak	226.00	100	Vertical	Pass
4	265.409	24.64	-11.85	46.0	-21.36	Peak	0.00	200	Vertical	Pass
5	311.715	26.63	-10.75	46.0	-19.37	Peak	183.00	100	Vertical	Pass
6	499.848	28.53	-6.90	46.0	-17.47	Peak	36.00	100	Vertical	Pass

Report No.: TW2304225-01E

Date: 2023-05-13

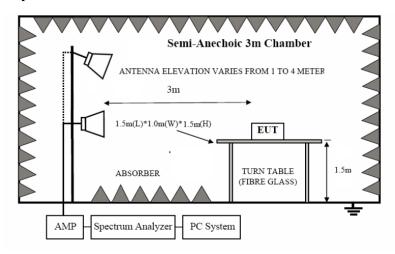


#### 7. Band Edge

#### 7.1 Test Method and test Procedure:

- (1) The EUT was tested according to ANSI C63.10–2013. The radiated test was performed at Timeway EMC Laboratory. This site is on file with the FCC laboratory division, Registration No. 744189
- (2) Set Spectrum as RBW=1MHz, VBW=3MHz and Peak detector used for PK value. RBW=1MHz, VBW=10Hz and Peak detector used for AV value.
- (3) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (4) The antenna polarization: Vertical polarization and Horizontal polarization.

## 7. 2 Radiated Test Setup



For the actual test configuration, please refer to the related items – Photos of Testing

#### 7.3 Configuration of the EUT

Same as section 5.3 of this report

## 7.4 EUT Operating Condition

Same as section 5.4 of this report.

## 7.5 Band Edge Limit

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

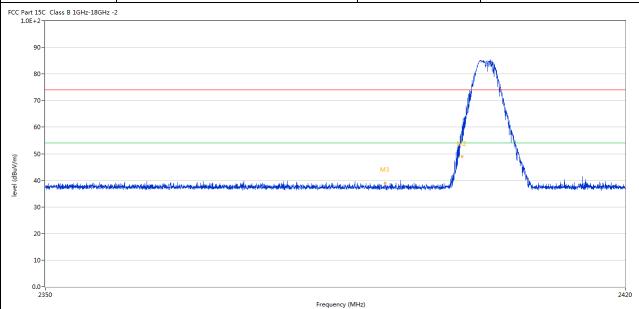
Report No.: TW2304225-01E Page 22 of 38

Date: 2023-05-13



#### 7.6 Test Result

Product:	Wireless Mouse	Polarity	Horizontal
Mode	Keeping Transmitting	Test Voltage	DC1.5V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass		

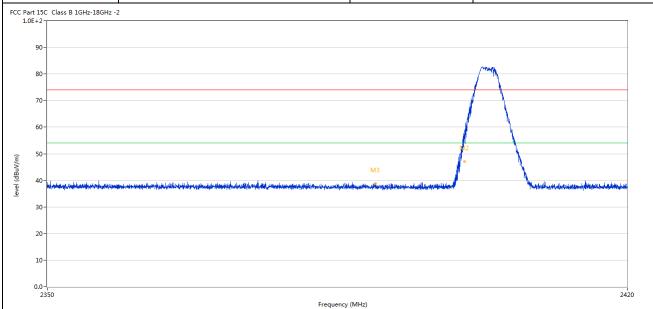


No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2403.572	85.23	-3.57	74.0	11.23	Peak	71.00	100	Horizontal	N/A
2	2400.090	60.99	-3.57	74.0	-13.01	Peak	71.00	100	Horizontal	Pass
2**	2400.090	48.76	-3.57	54.0	-5.24	AV	71.00	100	Horizontal	Pass
3	2390.082	39.07	-3.53	74.0	-34.93	Peak	26.00	100	Horizontal	Pass

Report No.: TW2304225-01E Page 23 of 38



Product:	Wireless Mouse	Detector	Vertical
Mode	Keeping Transmitting	Test Voltage	DC1.5V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass		

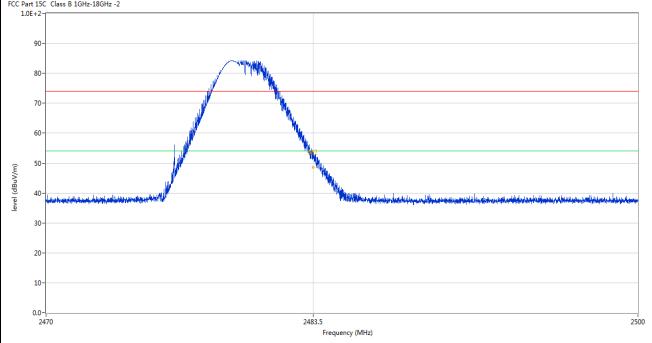


No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2402.732	82.71	-3.57	74.0	8.71	Peak	30.00	100	Vertical	N/A
2	2400.142	58.81	-3.57	74.0	-15.19	Peak	30.00	100	Vertical	Pass
2**	2400.142	47.00	-3.57	54.0	-7.00	AV	30.00	100	Vertical	Pass
3	2389.998	38.85	-3.53	74.0	-35.15	Peak	182.00	100	Vertical	Pass

Report No.: TW2304225-01E Page 24 of 38



Product:	Wireless Mouse	Polarity	Horizontal	
Mode	Keeping Transmitting	Test Voltage	DC1.5V	
Temperature	24 deg. C,	Humidity	56% RH	
Test Result:	Pass			



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2479.785	84.21	-3.57	74.0	10.21	Peak	76.00	100	Horizontal	N/A
2	2483.497	54.00	-3.57	74.0	-20.00	Peak	71.00	100	Horizontal	Pass
2**	2483.497	48.52	-3.57	54.0	-5.48	AV	71.00	100	Horizontal	Pass

Page 25 of 38

Report No.: TW2304225-01E



Product:		Wireless Mouse				Detector		Vertical		
	Mode	Tode Keeping Transmitting			Tes	st Voltage		DC1.5V		
Te	mperature		24 deg.	С,	Н	lumidity		56% RH		
Te	est Result:		Pass							
CC Part 1 1.0E+	15C Class B 1GHz-18GHz	-2			<b>"</b>					
9	90-									
8	30-		- Variable	Mr.						
7	70-			***************************************						
6	50-	<u> </u>								
				N <sub>1</sub>						
Œ// 5	50-	- Jr		M <sub>k</sub>						
(m/\ngp) lava	10 - with the production of the contract of	Market Hard Company of the State of the Stat		3/1/4	Markan markatan in	i iki da Jama ka kidi da jama ya dan	الله الأوليا إلى المارود و ع <b>ينة الانت</b> ارا المارود المارود المارود المارود المارود المارود المارود المارود المارود	aumericalle forescoppe a extende designed d	hhdrephaltanonneamhraidh	wholesive
W/nngp) level	10-	- And the second of the second second		3/1/1	Marianananananana	kişdir daş dişeniyi baş diki İsadikması ya diker	inicpeddophyddiaeppeeriaetheiddiaeth	عسيست والمطاب ورسياس والمتابي فالمتاب والمتاب والمتاب والمتاب والمتاب والمتاب والمتاب والمتاب والمتاب والمتاب	khistorya lakkamanna samiyyada.	cyhadadio
m/\ngp (dpn\)	10-	and the second s		3/4	Make at the second control of the second	ting of the state	and the second second second	مساحة خالم إسور بسيده الإيار لهن يمايا أ	bhistogad dikina canno campo yakada	i, de la constante de la const
E/\nngp)   44	10- torophi-be-desk-pijkkede-kridere-klik 10-	manadami ilikus asaptayada di kadada		***************************************	Marinemanication	ting to the standard and design and a standard and the st	ining add photographic debut i	aumerskikfurgymynne krisk das skyk is	bhistogyi dikina namenanyayahda	tubalenina
#/(ngpn) 4  3  2  1		marikan ika sasiya ayada da kabada da ka		***************************************	Marie and the second	t is do the special reference special	ina adi pangan pendadi pangan	umrashipangan spikasaphi	histogradhumenverminseld	
E/(nngp) avail 4	10 - turkin ku kili kili ku ki	manadan i kanadan kanada da ka		2483.5 Fre	equency (MHz)	tich in few bradel vijewy den	ing pakipathap residuktual	n-merakkipanyan epik dasapi k	bhilangi alkanowenin pada	2500
#/(ngpn) 4  3  2  1		Results	Factor			Detector	Table	Height	ANT	2500
E/(Angp)   44   3   3   3   3   3   3   3   3	10 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -		Factor (dB)	Fre	equency (MHz)					2500
W/(Appp) Java 3 3 2 2 1 0.	10 - White the standard of the	Results		Limit	equency (MHz)  Over Limit		Table	Height		
W/(nngp) Javail 3 2 1 1 0.	Frequency (MHz)	Results (dBuV/m)	(dB)	Limit (dBuV/m)	equency (MHz)  Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	2500 Verdic

Note: 1. The PK emission level less than the AV limit. No necessary to record the AV emission level.

Report No.: TW2304225-01E

Date: 2023-05-13



Page 26 of 38

## 8.0 Antenna Requirement

## **Applicable Standard**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

This product has a PCB antenna. The antenna gain is -4.62dBi Max. It fulfills the requirement of this section. Test Result: Pass

Page 27 of 38

Report No.: TW2304225-01E



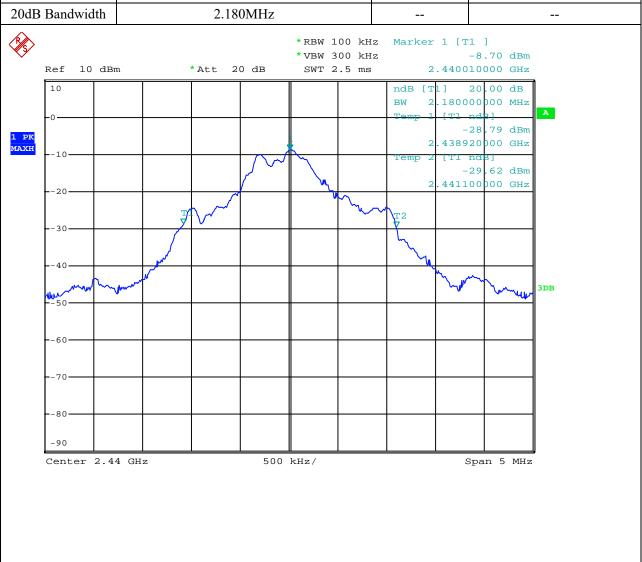
Product:		Wireless Mou	Test Mode:	Keep tr	ansmitting	
Mode	de Keeping Transmitting				DC1.5V	
Temperature		24 deg. C, Humidity 56% RF				
Test Result:	Result: Pass			Detector	PK	
20dB Bandwidth		1.970MHz				
Ref 10 dB	n *	Att 20 dB	*RBW 100 } *VBW 300 } SWT 2.5 n	ns 2.40 ndB [T1] BW 1.9	-8.69 dBm 02010000 GHz 20.00 dB 70000000 MHz	
PK10				2.4	71 nd3  -28.53 dBm 01120000 GHz F1 nd3  -28.67 dBm	A
30		T1	<b>W</b>	T2	03090000 GHz	
-40 -50	~~~~			- Van	m	3DB
60						
70						
-90 -90						
Center 2.4	02 GHz	50	0 kHz/		Span 5 MHz	

Page 28 of 38

Report No.: TW2304225-01E



Product:	Wireless Mouse	Test Mode:	Keep transmitting
Mode	Keeping Transmitting	Test Voltage	DC1.5V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	2.180MHz		

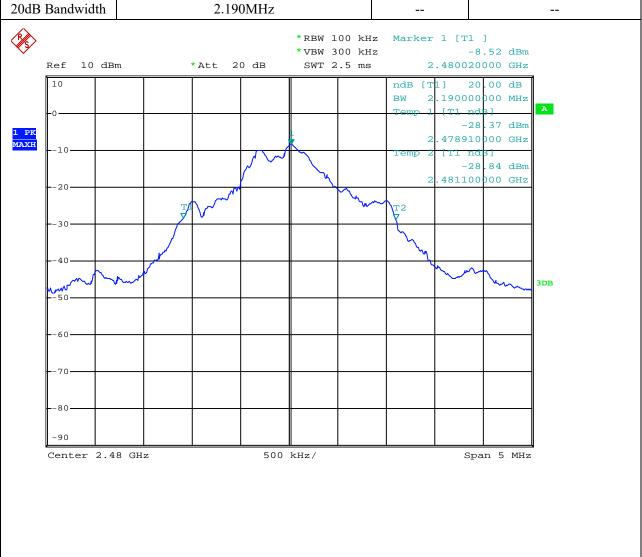


Page 29 of 38

Report No.: TW2304225-01E



Product:	Wireless Mouse	Test Mode:	Keep transmitting
Mode	Keeping Transmitting	Test Voltage	DC1.5V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	2.190MHz		



Report No.: TW2304225-01E Page 30 of 38

Date: 2023-05-13



#### 10.0 FCC ID Label

#### FCC ID: ZJEST-308

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

#### **Mark Location:**



Report No.: TW2304225-01E

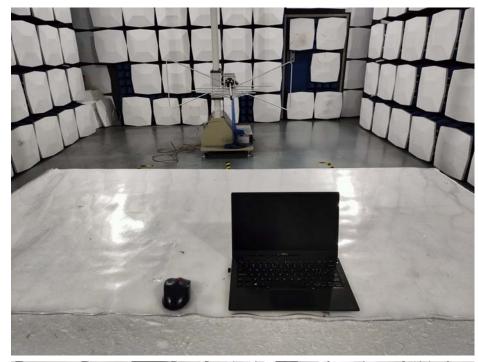
Date: 2023-05-13



11.0 Photo of testing

#### 11.1 Conducted test View—N/A

#### Radiated emission test view





The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES. reserves the rights to withdraw it and to

adopt any other remedies which may be appropriate.

Page 32 of 38

Report No.: TW2304225-01E

Date: 2023-05-13



11.2 Outside View





The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES. reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.

Page 33 of 38

Report No.: TW2304225-01E

Date: 2023-05-13



Outside View



The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES. reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.

Page 34 of 38

Report No.: TW2304225-01E

Date: 2023-05-13





The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES. reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.

Report No.: TW2304225-01E Page 35 of 38



Outside View



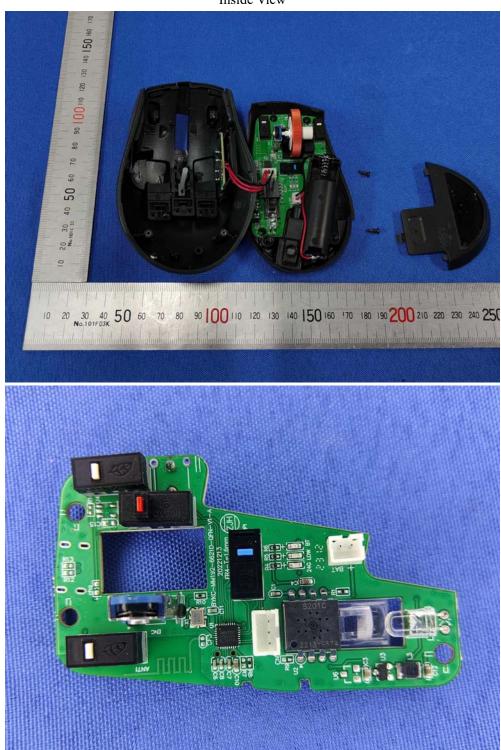
Page 36 of 38

Report No.: TW2304225-01E

Date: 2023-05-13



Inside View



The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES. will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES. reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.

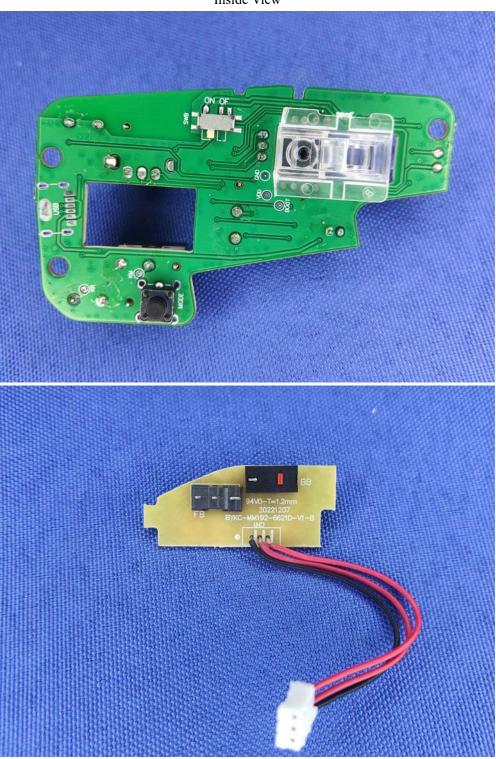
Page 37 of 38

Report No.: TW2304225-01E

Date: 2023-05-13



Inside View



The report refers only to the sample tested and does not apply to the bulk.

This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . or a certified copy there of prepared by the SHENZHEN TIMEWAY TESTING LABORATORIES. to his customer. Supplier or others persons directly concerned. SHENZHEN TIMEWAY TESTING LABORATORIES.

will not, without the consent of the client enter into any discussion of correspondence with any third party concerning the contents of the report.

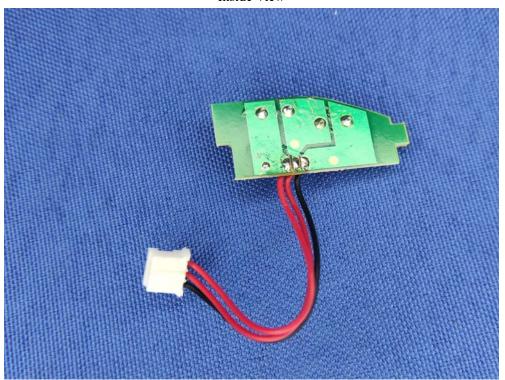
In the event of the improper use of the report. The SHENZHEN TIMEWAY TESTING LABORATORIES. reserves the rights to withdraw it and to

adopt any other remedies which may be appropriate.

Report No.: TW2304225-01E Page 38 of 38



Inside View



-- End of the Report--