



Report No.: FCC1910055 File Reference No.: 2019-11-11

Applicant: Eastern Times Technology Co., Ltd.

Product: MECHANICAL GAMING KEYBOARD

Model No.: K596RGB, ET-8413

Brand Name: REDRAGON

Test Standards: FCC Part 15.249

Test Result:

It is herewith confirmed and found to comply with the

requirements set up by ANSI C63.4&FCC Part 15 Subpart C, Paragraph 15.249 regulations for the evaluation of

electromagnetic compatibility

Approved By

Jack Chung

Jack Chung

Manager

Dated: November 11, 2019

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.: FCC1910055 Page 2 of 40

Date: 2019-11-11



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 17025:2005 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

Date: 2019-11-11



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
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.	12
6.1	Test Method and Test Procedure.	12
6.2	Configuration of the EUT	12
6.3	EUT Operation Condition.	12
6.4	Radiated Emission Limit.	13
6.5	Test Result.	14
7.0	Band Edge	22
7.1	Test Method and Test Procedure.	22
7.2	Radiated Test Setup.	22
7.3	Configuration of the EUT.	22
7.4	EUT Operating Condition.	22
7.5	Band Edge Limit.	22
7.6	Band Edge Test Result.	23
8.0	Antenna Requirement.	27
9.0	20dB bandwidth measurement.	28
10.0	FCC ID Label	31
11.0	Photo of Test Setup and EUT View.	32

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.

Date: 2019-11-11



Page 4 of 40

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: Eastern Times Technology Co., Ltd.

Address: Building D, Nan An Industrial Area, Youganpu Village, Fenggang Town, Dongguan City,

Guangdong, China

Telephone: 13077806581/0769-86800511

Fax: --

1.3 Description of EUT

Product: MECHANICAL GAMING KEYBOARD

Manufacturer: Eastern Times Technology Co., Ltd

Address: Building D, Nan An Industrial Area, Youganpu Village, Fenggang Town,

Dongguan City, Guangdong, China

Brand Name: REDRAGON
Model Number: K596RGB
Additional Model Name ET-8413

Input Voltage: DC3.7V, Built-in 3.7V, 3000mAh Li-ion battery

Modulation Type: FSK

Operation Frequency: 2410-2468MHz

Channel Separation: 2MHz Channel Number: 30

Antenna Designation PCB antenna with gain 0dBi Max

1.4 Submitted Sample

1 Sample

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.: FCC1910055 Page 5 of 40

Date: 2019-11-11



1.5 Test Duration

2019-10-11 to 2019-11-08

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

Terry Tang

The sample tested by

Print Name: Terry Tang

Report No.: FCC1910055 Page 6 of 40



Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	R&S	ESPI 3	100379	2019-06-21	2020-06-20
LISN	R&S	EZH3-Z5	100294	2019-06-21	2020-06-20
LISN	R&S	EZH3-Z5	100253	2019-06-21	2020-06-20
Ultra Broadband ANT	R&S	HL562	100157	2019-06-21	2020-06-20
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2019-06-21	2020-06-20
Loop Antenna	EMCO	6507	00078608	2018-06-25	2021-06-24
Spectrum	R&S	FSIQ26	100292	2019-06-21	2020-06-20
Horn Antenna	A-INFO	LB-180400-KF	J211060660	2019-06-21	2021-06-20
Horn Antenna	R&S	BBHA 9120D	9120D-631	2018-07-09	2021-07-08
Power meter	Anritsu	ML2487A	6K00003613	2019-08-22	2020-08-21
Power sensor	Anritsu	MA2491A	32263	2019-08-22	2020-08-21
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2018-07-04	2021-07-03
9*6*6 Anechoic			N/A	2018-02-07	2021-02-06
EMI Test Receiver	RS	ESVB	826156/011	2019-06-21	2020-06-20
EMI Test Receiver	RS	ESH3	860904/006	2019-06-21	2020-06-20
Spectrum	HP/Agilent	ESA-L1500A	US37451154	2019-06-21	2020-06-20
Spectrum	HP/Agilent	E4407B	MY50441392	2019-06-21	2020-06-20
Spectrum	RS	FSP	1164.4391.38	2019-01-20	2020-01-19
RF Cable	Zhengdi	ZT26-NJ-NJ-8 M/FA		2019-06-21	2020-06-20
RF Cable	Zhengdi	7m		2019-06-21	2020-06-20
RF Switch	EM	EMSW18	060391	2019-06-21	2020-06-20
Pre-Amplifier	Schwarebeck	BBV9743	#218	2019-06-21	2020-06-20
Pre-Amplifier	HP/Agilent	8449B	3008A00160	2019-06-21	2020-06-20
LISN	SCHAFFNER	NNB42	00012	2019-01-08	2020-01-07

Page 7 of 40

Report No.: FCC1910055

Date: 2019-11-11



3.0 Technical Details

3.1 Summary of test results

The EUT has been tested according to the following sp	pecifications:
---	----------------

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.207	Conducted Emission Test	PASS	Complies
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 and RSS-210	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

Page 8 of 40

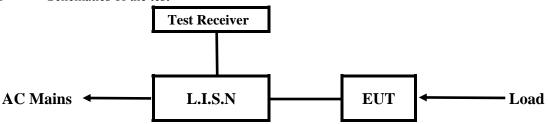
Report No.: FCC1910055

Date: 2019-11-11



5. Power Line Conducted Emission Test

5.1 Schematics of the test

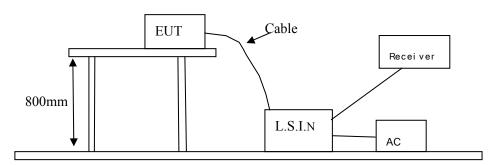


EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2014. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4-2014.

Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2014. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

One channels are provided to the EUT

A. EUT

	Device	Manufacturer	Model	FCC ID
Ī	MECHANICAL GAMING	Eastern Times Technology	K596RGB, ET-8413	TUVET-8413
	KEYBOARD	Co., Ltd	K390KOD, E1-0413	10 VE1-0413

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.: FCC1910055 Page 9 of 40

Date: 2019-11-11



B. Internal Device

Device	Manufacturer	Model	FCC ID/SDOC
N/A			

C. Peripherals

Device	Manufacturer	Model	Rating
Power Supply	Keyu	KA-23-0502000DEU	Input:100-240V~,
			50/60Hz,0.35A;
			Output: DC5V, 2A

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2014

- 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 15.107 and 15.207

Eraguanay (MHz)	Class A Li	mits (dBµV)	Class B Limits (dBµV)		
Frequency(MHz)	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level	
$0.15 \sim 0.50$	79.0	66.0	66.0~56.0*	56.0~46.0*	
$0.50 \sim 5.00$	73.0	60.0	56.0	46.0	
$5.00 \sim 30.00$	73.0	60.0	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: PASS

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

Date: 2019-11-11



A: Conducted Emission on Live Terminal (150kHz to 30MHz)

EUT Operating Environment

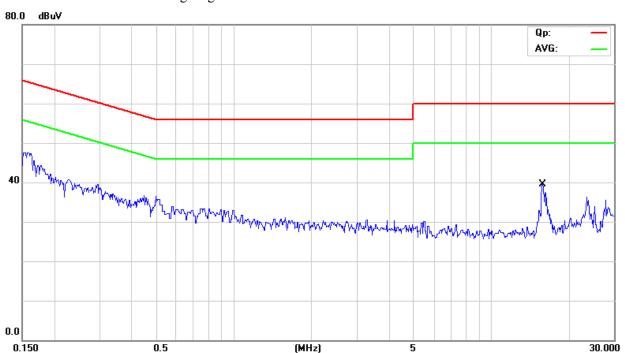
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Keep Transmitting

Equipment Level: Class B

Results: PASS

Please refer to following diagram for individual



No. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over		
	MHz	dBu∀	dB	dBu∀	dBu∀	dB	Detector	Comment
1 *	15.7860	22.00	10.43	32.43	60.00	-27.57	QP	
2	15.7860	3.70	10.43	14.13	50.00	-35.87	AVG	

Date: 2019-11-11



B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

EUT Operating Environment

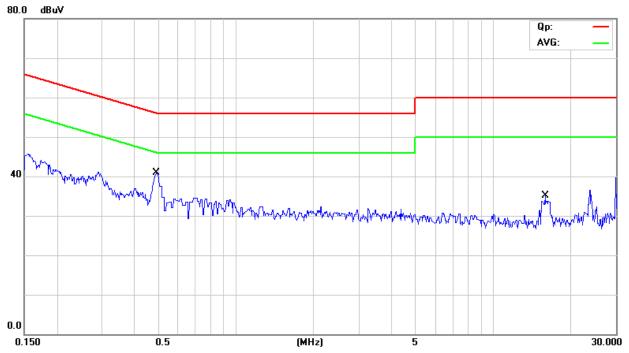
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Keep Transmitting

Equipment Level: Class B

Results: Pass

Please refer to following diagram for individual



No. Mk.	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over		
	MHz	dBu∀	dB	dBu∀	dBu∨	dB	Detector	Comment
1	0.4902	28.40	9.77	38.17	56.16	-17.99	QP	
2 *	0.4902	23.50	9.77	33.27	46.16	-12.89	AVG	
3	15.8632	19.70	10.43	30.13	60.00	-29.87	QP	
4	15.8632	5.10	10.43	15.53	50.00	-34.47	AVG	

Report No.: FCC1910055 Page 12 of 40

Date: 2019-11-11

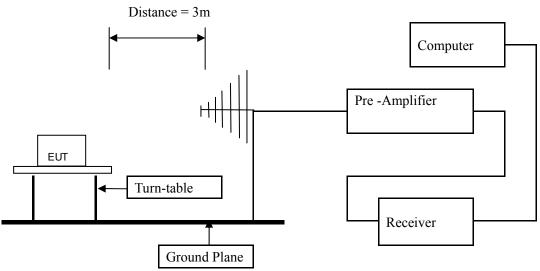


6 Radiated Emission Test

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



- 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.

Report No.: FCC1910055 Page 13 of 40

Date: 2019-11-11



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	onics (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 (dBμV/m)
30-88	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. Battery fully charged were used during tests.

Report No.: FCC1910055 Page 14 of 40

Date: 2019-11-11



6.5 Test result

A Fundamental & Harmonics Radiated Emission Data

Product:	MECHANICAL GAMING	Test Mode:	Keep transmitting-Low Channel
	KEYBOARD		
Test Item:	Fundamental Radiated Emission	Temperature:	25℃
	Data		
Test Voltage:	DC3.7V	Humidity:	56%
Test Result:	Pass		

Frequency	Emission PK/AV	Horiz /	Limits PK/AV	Margin
(MHz)	(dBuV/m)	Vert	(dBuV/m)	(dB)
2410	92.53 (PK)	Н	114/94	-1.48
2410	90.70 (PK)	V	114/94	-3.30
4820	51.40 (PK)	Н	74/54	-2.60
4820	48.79 (PK)	V	74/54	-5.21
7230		H/V	74/54	
9640		H/V	74/54	
12050		H/V	74/54	
14460		H/V	74/54	
16870		H/V	74/54	
19280		H/V	74/54	
21690		H/V	74/54	
24100		H/V	74/54	

Note: (1) PK= Peak, AV= Average

- (2) Emission Level = Reading Level + Antenna Factor + Cable Loss Pre-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
- (6) The PK emission level less than the AV limit. No necessary to record the AV emission level.

Report No.: FCC1910055 Page 15 of 40

Date: 2019-11-11



Product:	MECHANICAL GAMING	Test Mode:	Keep transmitting-Middle Channel
	KEYBOARD		
Test Item:	Fundamental Radiated Emission	Temperature:	25℃
	Data		
Test Voltage:	DC3.7V	Humidity:	56%
Test Result:	Pass		

Frequency	Emission PK/AV	Horiz /	Limits PK/AV	Margin
(MHz)	(dBuV/m)	Vert	(dBuV/m)	(dB)
2440	92.68 (PK)	Н	114/94	-1.32
2440	90.52 (PK)	V	114/94	-3.48
4880	49.24 (PK)	Н	74/54	-4.75
4880	47.42(PK)	V	74/54	-6.58
7320		H/V	74/54	
9760		H/V	74/54	
12200		H/V	74/54	
14640		H/V	74/54	
17080		H/V	74/54	
19520		H/V	74/54	
21960		H/V	74/54	
24400		H/V	74/54	

Note: (1) PK= Peak, AV= Average

- (2) Emission Level = Reading Level + Antenna Factor + Cable Loss Pre-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
- (6) The PK emission level less than the AV limit. No necessary to record the AV emission level.

Page 16 of 40

Report No.: FCC1910055

Date: 2019-11-11



Product:	MECHANICAL GAMING	Test Mode:	Keep transmitting-High Channel
	KEYBOARD		
Test Item:	Fundamental Radiated Emission	Temperature:	25℃
	Data		
Test Voltage:	DC3.7V	Humidity:	56%
Test Result:	Pass		

Frequency	Emission PK/AV	Horiz /	Limits PK/AV	Margin
(MHz)	(dBuV/m)	Vert	(dBuV/m)	(dB)
2468	92.91 (PK)	Н	114/94	-1.09
2468	88.15 (PK)	V	114/94	-5.85
4936	49.34 (PK)	Н	74/54	-4.66
4936	47.34(PK)	V	74/54	-6.66
7404		Н	74/54	
7404		V	74/54	
9872		H/V	74/54	
12340		H/V	74/54	
14808		H/V	74/54	
17276		H/V	74/54	
19744		H/V	74/54	
22212		H/V	74/54	
24680		H/V	74/54	

Note: (1) PK= Peak, AV= Average

- (2) Emission Level = Reading Level + Antenna Factor + Cable Loss Pre-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
- (6) The PK emission level less than the AV limit. No necessary to record the AV emission level.

Page 17 of 40

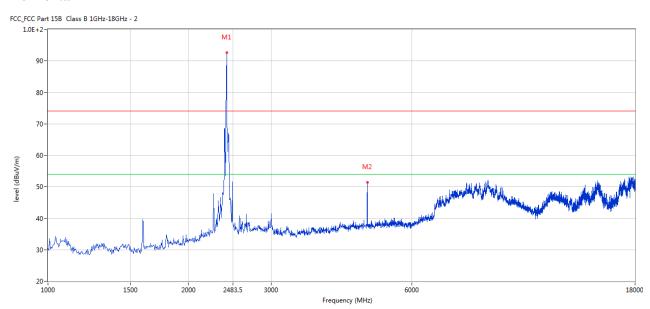
Report No.: FCC1910055

Date: 2019-11-11

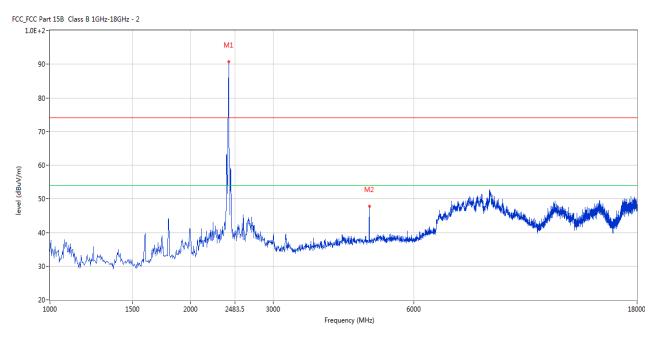


Please refer to the following test plots for details: Low Channel

Horizontal



Vertical



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

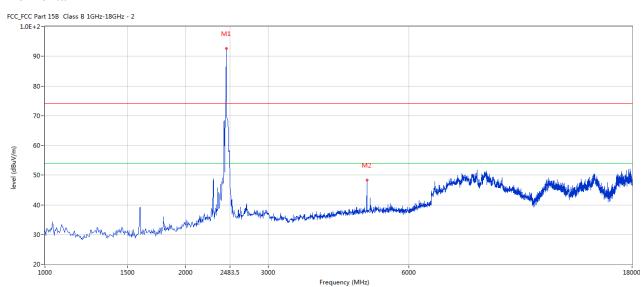
This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . 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.

Date: 2019-11-11

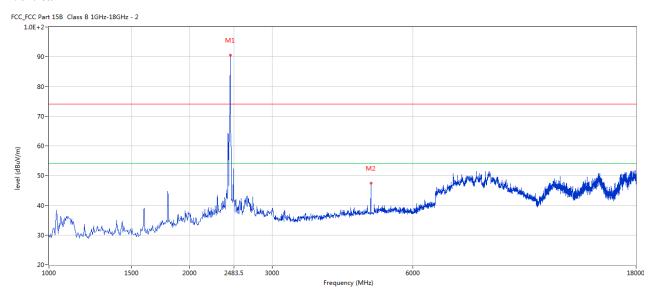


Please refer to the following test plots for details: Middle Channel

Horizontal



Vertical

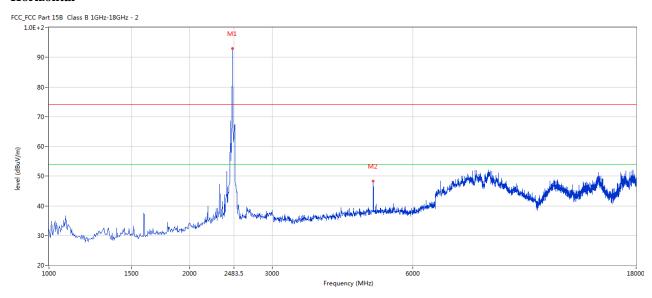


Date: 2019-11-11

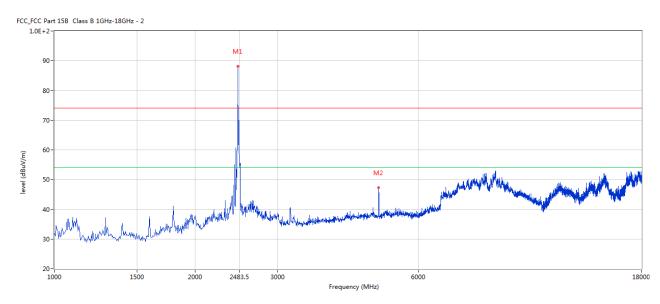


Please refer to the following test plots for details: High Channel

Horizontal



Vertical



For emission above 18GHz, It is only the floor noise. No necessary to take down.

Report No.: FCC1910055 Page 20 of 40

Date: 2019-11-11



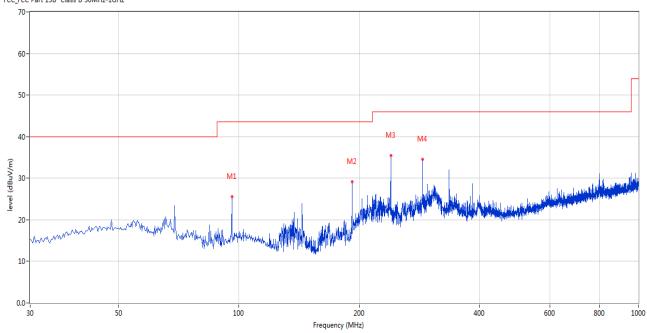
B. General Radiated Emission Data Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Results: Pass

Please refer to following diagram for individual

FCC_FCC Part 15B Class B 30MHz-1GHz



No.	Frequency	Results	Factor (dB)	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)		(dBuV/m)	(dB)		(o)	(cm)		
1	95.944	25.49	-14.16	43.5	-18.01	Peak	63.00	200	Н	Pass
2	191.950	29.15	-14.07	43.5	-14.35	Peak	170.00	200	Н	Pass
3	239.953	35.42	-12.33	46.0	-10.58	Peak	360.00	200	Н	Pass
4	287.956	34.52	-11.27	46.0	-11.48	Peak	197.00	100	Н	Pass

Report No.: FCC1910055 Page 21 of 40

Date: 2019-11-11



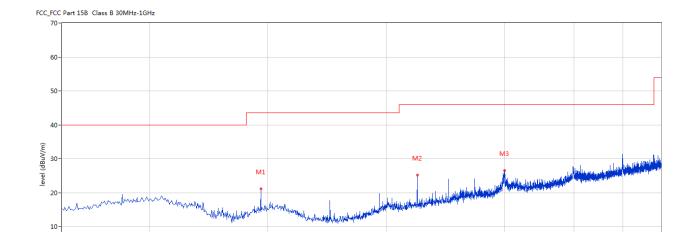
Radiated Emission In Vertical (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Results: Pass

0.0

Please refer to following diagram for individual



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	95.944	21.13	-14.16	43.5	-22.37	Peak	40.00	100	V	Pass
2	239.953	25.18	-12.33	46.0	-20.82	Peak	297.00	150	V	Pass
3	400.447	26.58	-8.58	46.0	-19.42	Peak	6.00	150	V	Pass

Frequency (MHz)

600

1000

100

Date: 2019-11-11

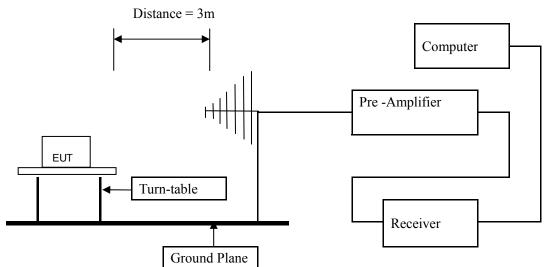


7. Band Edge

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
- (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.

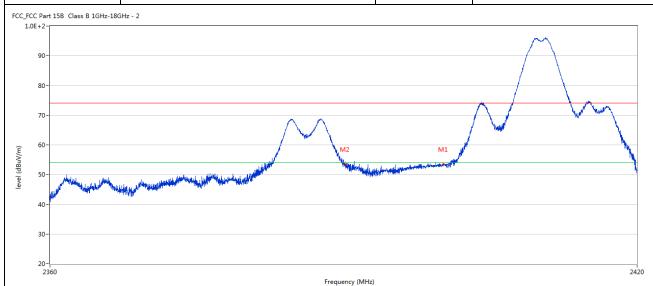
Report No.: FCC1910055 Page 23 of 40

Date: 2019-11-11



7.6 Test Result

Product:	MECHANICAL GAMING KEYBOARD	Polarity	Horizontal
Mode	Low Channel	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass		



No.	Frequenc	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	y (MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	2400	53.85	-3.57	74.0	-20.15	Peak	275.00	100	Н	Pass
1*	2400	33.19	-3.57	54.0	-20.81	AV	275.00	100	Н	Pass
2	2390	53.86	-3.53	74.0	-20.14	Peak	0.00	100	Н	Pass
2*	2390	33.25	-3.53	54.0	-20.75	AV	0.00	100	Н	Pass
3**	2387.518	48.42	-3.52	54.0	-5.58	AV	275.00	100	Н	Pass
3	2387.518	68.78	-3.52	74.0	-5.22	Peak	275.00	100	Н	Pass
4**	2384.474	45.75	-3.51	54.0	-8.25	AV	275.00	100	Н	Pass
4	2384.474	68.74	-3.51	74.0	-5.26	Peak	275.00	100	Н	Pass

Page 24 of 40

Report No.: FCC1910055



Pre	oduct:	M		IICAL GAN YBOARD	MING	Detector Vertic			Vertical		
N	Mode		Lov	w Channel		Test Volt	tage		DC3.7V	-	
Tem	perature		24	4 deg. C,		Humid	ity	56% RH			
Test	est Result:		Pass								
1.0E+2		يتناط بالإنجار العالماء بالمائة الطبيدية	inno alexandria	i. waa daadda khaala ka	M2		M1				
20- 236	50				Frequency (MI	Hz)				24	
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdict	
1	2400	49.49	-3.57	54.0	-4.51	Peak	280.00	100	V	Pass	
2	2390	50.65	-3.53	54.0	-3.35	Peak	119.00	100	V	Pass	
1											

	INO.	riequency	Results	racioi	LIIIII	Over Limit	Detector	Table (0)	rieigni	AINI	verdict
		(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
	1	2400	49.49	-3.57	54.0	-4.51	Peak	280.00	100	٧	Pass
	2	2390	50.65	-3.53	54.0	-3.35	Peak	119.00	100	V	Pass
	3**	2387.623	47.12	-3.52	54.0	-6.88	AV	284.00	100	V	Pass
	3	2387.623	63.31	-3.52	74.0	-10.69	Peak	284.00	100	V	Pass
	4**	2384.489	46.37	-3.51	54.0	-7.63	AV	284.00	100	V	Pass
	4	2384.489	63.40	-3.51	74.0	-10.60	Peak	284.00	100	V	Pass
Г											

Page 25 of 40

Report No.: FCC1910055



P	Product:		MECHANICAL GAMING KEYBOARD			Polar	rity	Horizontal			
	Mode		Н	igh Channe	1	Test Vo	ltage	DC3.7V			
Ten	nperature		24	4 deg. C,		Humi	dity		56% RH	[
Tes	st Result:			Pass							
90· 80· 70·		in GHz-2	^_								
50	- markethylas y park high high	A STATE OF THE STA	/)	halle the same			Name of the last o	Name and Association of the Control	
40	- Company to the property of t	And the second			Frequency	(MHz)	2483.5			And Annual Market Market	
40	orangelysis parkited per	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Frequency Over Limit (dB)	(MHz) Detector	म अस्तुता	Height (cm)	ANT	Verdict	
50· 40· 30· 2	450 Frequency				Over Limit		2483.5	_	ANT	Verdict	
30·2	450 Frequency (MHz)	(dBuV/m)	(dB)	(dBuV/m)	Over Limit (dB)	Detector	2483.5 Table (o)	(cm)			
30. 2 No.	Frequency (MHz) 2483.5	(dBuV/m) 52.74	(dB) -3.57	(dBuV/m) 54.0	Over Limit (dB) -1.26	Detector Peak	2483.5 Table (o) 204.00	(cm)	Н	Pass	
30° 2 No.	450 Frequency (MHz) 2483.5 2489.465	(dBuV/m) 52.74 43.24	(dB) -3.57 -3.57	(dBuV/m) 54.0 54.0	Over Limit (dB) -1.26 -10.76	Detector Peak AV	2483.5 Table (o) 204.00 250.00	(cm) 100 100	H	Pass Pass	

Page 26 of 40

Report No.: FCC1910055



	Product:		ICAL GAMING YBOARD	Detector	Vertical
	Mode	Hig	gh Channel	Test Voltage	DC3.7V
-	Гетрегаture	24	deg. C,	Humidity	56% RH
,	Test Result:		Pass		
,	2483.5MHz	PK (dBμV/m)		Limit	$74~dB\mu V/m$
Ź	2483.5MHz	AV (dBμV/m)		Limit	$54 \; dB\mu V/m$
	90- 80- 50-	SHz-2			
	30- 2450		Frequency (N	2483. /IHz)	5 2500

No.	Frequency	Results	Factor (dB)	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)		(dBuV/m)	(dB)		(o)	(cm)		
1	2483.5	44.96	-3.57	54.0	-9.04	Peak	87.00	100	V	Pass

Report No.: FCC1910055 Page 27 of 40

Date: 2019-11-11



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 0dBi Max. It fulfills the requirement of this section. Test Result: Pass

Page 28 of 40

Report No.: FCC1910055



Product:	MECHANICAL GAMING KEYBOARD Keeping Transmitting				de:	Keep transmitting DC3.7V		
Mode					age			
Temperature	24 deg. C, Humid		Humidi	ty	56%	6 RH		
Test Result:		Pass 2.335MHz		Detecto	or	PK		
0dB Bandwidth								
Ref Lvl	ndB	1 [T1 ndB] 20.00	dB V	BW 300) kHz) kHz	RF Att	20 dB	
10 dBm	BW	2.33466934	MHZ S	WT 5	ms	Unit	dBm	
				1	1 [T1		1.16 dBm 2605 GHz	
0				J \ 1	ndB BW 7 _{Tl [T]}		0.00 dB 6934 MHz 9.39 dBm	
-10	±ã.ºº	a and the second		M	7 _{T2} [2:	2.4088	9.39 dBm 3267 GHz 8.85 dBm	
-20 1MAX	No. of the last of					2.4111	6733 GHz	
-30								
-40								
-50								
-60								
-70								
-80								
-90								
Center 2.41	GHz		500 kHz/			Spa	an 5 MHz	

Page 29 of 40

Report No.: FCC1910055

Date: 2019-11-11



	Product:		MECHANICAL GAMING KEYBOARD				Test Mode:			Keep transmitting		
]	Mode		Keeping Transmitting				Test Voltage		;	DC3.7V		
Ten	nperature		24 deg. C, Humidity 56% RH		6 RH							
Tes	t Result:			Pass]	Detector		P	PΚ	
20dB	Bandwidt	h	2	2.355MHz								
Ŕ		•	Marker	1 [T1 r	ndB]	R	BW	100 k	Hz	RF Att	20 dB	
4 5/3	Ref Lvl	-	ndB	20.	00 dB	V	BW	300 k	Hz			
	10 dBm	n	BW 2	2.354709	42 MHz	S	WТ	5 m	າຣ	Unit	dBm	ı
10								.				Ī
								v ₁	[T1]	0 4405	0.81 dBm	A
0				<i>K</i>				1		2.44051		
				الر.	\		/	ndi	В	2.35470	0.00 dB	
				ľ		~~~	'	BW ▼T	[[T1]	2.35470	942 MHz $9.22 dBm$	
-10				, M				1		2.43882		
			TA					$\nabla_{\mathbf{T}_{2}^{2}}$	2 F #1]	-19		
-20			7					12	, A + 1	2.44117	7735 GHz	
	1MAX		Non I							2.4411	7733 G112	1MA
	لهما		/						\		$\overline{}$	
-30	مم مم	7	Á							Value 1		
-40	T ⁽⁰⁾										1	
	y											
-50												
-60												
-70												
2 -												
-80												
-90												<u> </u>
	Center	2.44 GH	z		500	kHz/				Spa	an 5 MHz	
Date:	:	29.OCT.2	2019 12	2:58:50								

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 30 of 40

Report No.: FCC1910055

Date: 2019-11-11



Product:		NICAL GAMING EYBOARD	Tes	st Mode:	Keep transmitting		
Mode	Keeping Transmitting 24 deg. C,			t Voltage	DC3.7V 56% RH		
Temperature				umidity			
Test Result:		Pass	D	Detector PK			
20dB Bandwidth	2	2.365MHz			-	-	
Ŕ	Marker	1 [T1 ndB]	RBW	100 kHz	z RF Att	20 dB	
Ref Lvl	ndB	20.00 dB	VBW	300 kHz	Z		
10 dBm	BW	2.36472946 MHz	SWT	5 ms	Unit	dBm	
10				V 1 [45 35	
			1	, T [T1] (1.45 dBm A	
0			Ţ	77		607 GHz	
		\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	/	ndB BW	2.36472	.00 dB 2946 MHz	
			\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	Ч	[T1] -20	946 MHz	
-10		. Moh.		1	2.46682	7.17 abii	
	TIAM	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		∇_{T2}	T211 -19		
-20					2.46918	737 GHz	
1MAX						1MA	
-30					سر. ا		
March 1						and the second	
-40						<u></u>	
-50							
-60							
-70						-	
-80							
-90	460 GH	F00	1-11- /				
Center 2.4	±08 GHZ	500	kHz/		Spa	an 5 MHz	
Date: 29.	OCT.2019 13	3:01:13					

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.

Report No.: FCC1910055 Page 31 of 40

Date: 2019-11-11



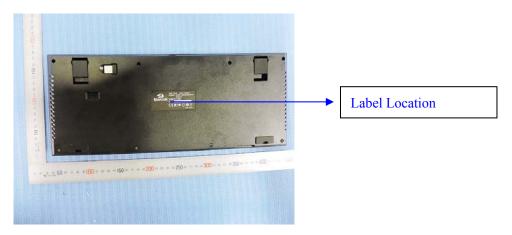
10.0 FCC ID Label

FCC ID: TUVET-8413

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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:



Page 32 of 40

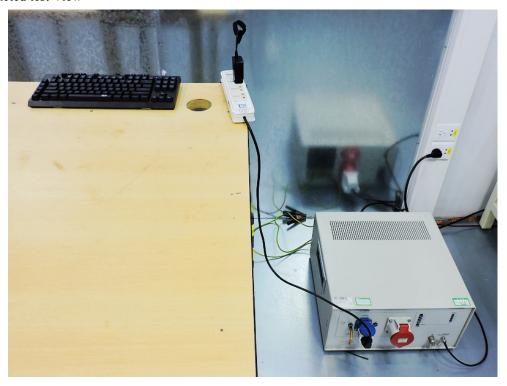
Report No.: FCC1910055

Date: 2019-11-11



11.0 Photo of testing

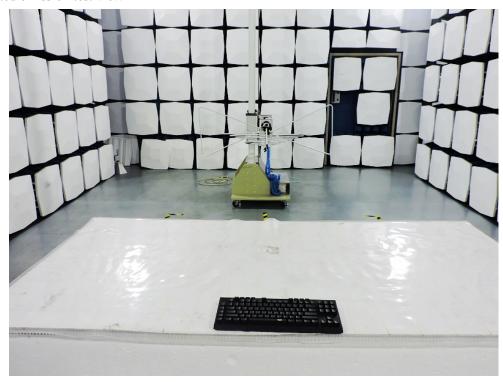
11.1 Conducted test View

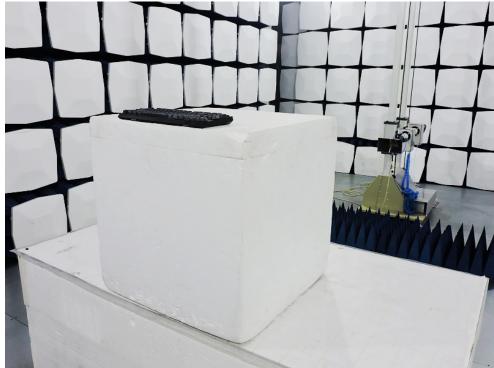


Date: 2019-11-11



11.2 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.

Date: 2019-11-11



11.3 Photographs – EUT

Outside View-Keyboard





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.

Date: 2019-11-11



Outside View-Keyboard





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.

Date: 2019-11-11



Outside View-Keyboard





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 37 of 40

Report No.: FCC1910055

Date: 2019-11-11



Outside View-Keyboard





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.

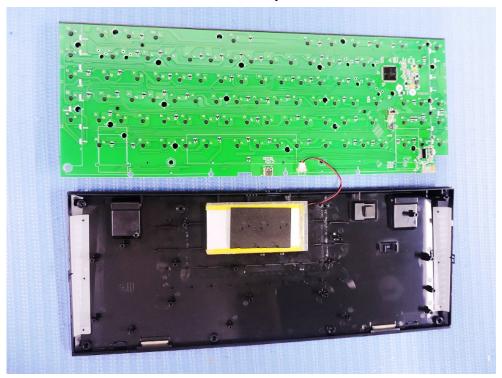
Page 38 of 40

Report No.: FCC1910055

Date: 2019-11-11



Inside view-Keyboard





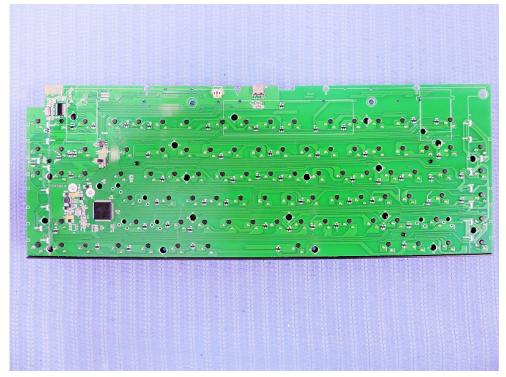
The report refers only to the sample tested and does not apply to the bulk.

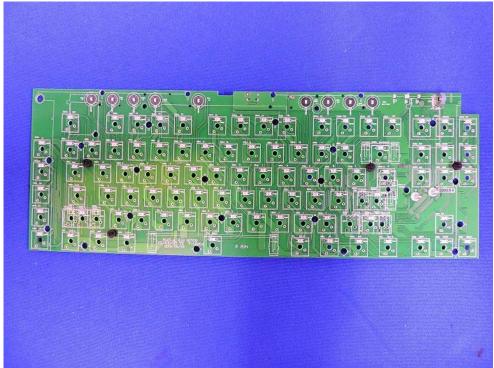
This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . 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.

Date: 2019-11-11



Inside view-Keyboard





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

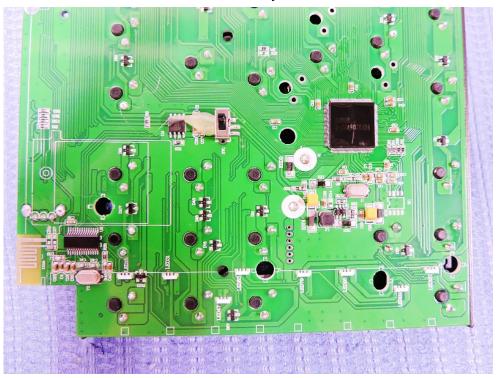
This report is issued in confidence to the client and it will be strictly treated as such by the SHENZHEN TIMEWAY TESTING LABORATORIES. It may not be reproduced rather in its entirety or in part and it may not be used for adverting. The client to whom the report is issued may, however, show or send it . 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.: FCC1910055 Page 40 of 40

Date: 2019-11-11



Inside view-Keyboard



-- End of the report--