



Report No.: TW2201285E File reference No.: 2022-02-28

Applicant: Eastern Times Technology Co.,Ltd

Product: WIRELESS GAMING KEYBOARD

Model No.: K509P-KS, ET-8668, ET-8493, K509P-WS

Trademark: REDRAGON

Test Standards: FCC Part 15.249

Test result:

It is herewith confirmed and found to comply with the

requirements set up by ANSI C63.10 & FCC Part 15 Subpart C,

Paragraph 15.249 regulations for the evaluation o

electromagnetic compatibility

Approved By

Terry Tong

Terry Tang Manager

Dated: February 28, 2022

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

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# **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

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# **Test Report Conclusion**

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

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### 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: -Fax: --

# 1.3 Description of EUT

Product: WIRELESS GAMING KEYBOARD

Manufacturer: Eastern Times Technology Co.,Ltd

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

Dongguan City, Guangdong, China.

Trademark: REDRAGON Model Number: K509P-KS

Additional Model Name ET-8668, ET-8493, K509P-WS Rating: DC5V, 500mA or DC3.7V, 350mA Battery DC3.7V, 2500mAh Li-ion battery

Modulation Type: GFSK

Operation Frequency: 2403-2480MHz

Channel Number: 16

Channel List (unit: MHz): 2403, 2424, 2441, 2461, 2414, 2435, 2450, 2470, 2409, 2429, 2455, 2475,

2419, 2445, 2465, 2480

Serial No.: RDK509P-KS21122500001

Antenna Designation PCB antenna with gain -1.85dBi Max (Declared by the Manufacturer)

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1.4 Submitted Sample: 1 Sample

1.5 Test Duration

2022-02-22 to 2022-02-28

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

Andy -xing

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| 2.0 Test Equipment |              |                  |              |              |            |
|--------------------|--------------|------------------|--------------|--------------|------------|
| Instrument Type    | Manufacturer | Model            | Serial No.   | Date of Cal. | Due Date   |
| ESPI Test Receiver | R&S          | ESPI 3           | 100379       | 2021-06-18   | 2022-06-17 |
| LISN               | R&S          | EZH3-Z5          | 100294       | 2021-06-18   | 2022-06-17 |
| LISN               | R&S          | EZH3-Z5          | 100253       | 2021-06-18   | 2022-06-17 |
| Impuls-Begrenzer   | R&S          | ESH3-Z2          | 100281       | 2021-06-18   | 2022-06-17 |
| Loop Antenna       | EMCO         | 6507             | 00078608     | 2021-06-18   | 2024-06-17 |
| Spectrum           | R&S          | FSIQ26           | 100292       | 2021-06-18   | 2022-06-17 |
| Horn Antenna       | A-INFO       | LB-180400-KF     | J211060660   | 2021-07-02   | 2024-07-01 |
| Horn Antenna       | R&S          | BBHA 9120D       | 9120D-631    | 2021-07-02   | 2024-07-01 |
| Power meter        | Anritsu      | ML2487A          | 6K00003613   | 2021-06-18   | 2022-06-17 |
| Power sensor       | Anritsu      | MA2491A          | 32263        | 2021-06-18   | 2022-06-17 |
| Bilog Antenna      | Schwarebeck  | VULB9163         | 9163/340     | 2021-07-02   | 2024-07-01 |
| 9*6*6 Anechoic     |              |                  | N/A          | 2021-07-02   | 2022-07-01 |
| EMI Test Receiver  | RS           | ESVB             | 826156/011   | 2021-06-18   | 2022-06-17 |
| EMI Test Receiver  | RS           | ESH3             | 860904/006   | 2021-06-18   | 2022-06-17 |
| Spectrum           | HP/Agilent   | ESA-L1500A       | US37451154   | 2021-06-18   | 2022-06-17 |
| Spectrum           | HP/Agilent   | E4407B           | MY50441392   | 2021-06-18   | 2022-06-17 |
| Spectrum           | RS           | FSP              | 1164.4391.38 | 2022-01-15   | 2023-01-14 |
| RF Cable           | Zhengdi      | ZT26-NJ-NJ-8M/FA |              | 2021-06-18   | 2022-06-17 |
| RF Cable           | Zhengdi      | 7m               |              | 2021-06-18   | 2022-06-17 |
| RF Switch          | EM           | EMSW18           | 060391       | 2021-06-18   | 2022-06-17 |
| Pre-Amplifier      | Schwarebeck  | BBV9743          | #218         | 2021-06-18   | 2022-06-17 |
| Pre-Amplifier      | HP/Agilent   | 8449B            | 3008A00160   | 2021-06-18   | 2022-06-17 |
| LISN               | SCHAFFNER    | NNB42            | 00012        | 2022-01-05   | 2023-01-04 |

# 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  |

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### 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<br>Requirement              | Pass   | Complies |
| FCC Part 15, Paragraph 15.207                               | Conducted<br>Emission Test          | Pass   | Complies |
| FCC Part 15 Subpart C Paragraph 15.249(a) & 15.249(b) Limit | Field Strength<br>of<br>Fundamental | Pass   | Complies |
| FCC Part 15, Paragraph 15.209 and RSS-210                   | Radiated<br>Emission Test           | Pass   | Complies |
| FCC Part 15 Subpart C Paragraph 15.249(d) Limit             | Band Edge<br>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

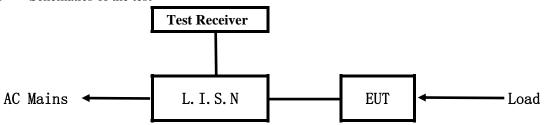
No modification by SHENZHEN TIMEWAY TESTING LABORATORIES

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### 5. Power Line Conducted Emission Test

### 5.1 Schematics of the test

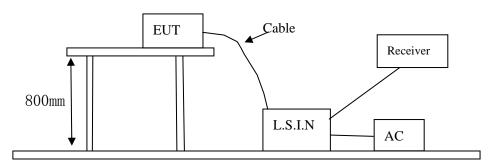


**EUT: Equipment Under Test** 

### 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.

16 channels are provided to the EUT

### A. EUT

| Device          | Manufacturer       | Model                       | FCC ID     |
|-----------------|--------------------|-----------------------------|------------|
| WIRELESS GAMING | Eastern Times      | K509P-KS, ET-8668, ET-8493, | TIMET 0660 |
| KEYBOARD        | Technology Co.,Ltd | K509P-WS                    | TUVET-8668 |

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### B. Internal Device

| Device | Manufacturer | Model | FCC ID/DOC |
|--------|--------------|-------|------------|
| N/A    |              |       |            |

### C. Peripherals

| Device       | Manufacturer | Model           | Rating                            |
|--------------|--------------|-----------------|-----------------------------------|
| Power Supply | KEYU         | KA23-0502000DEU | 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 15.207

| Frequency        | Limits (dB $\mu$ 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 ~ 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:

Pass

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

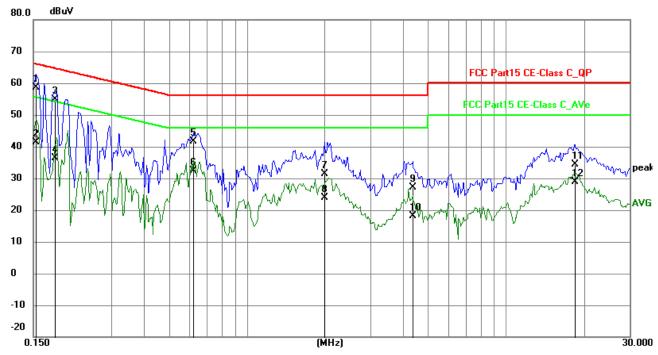
**EUT Operating Environment** 

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

**EUT set Condition: Charging and Keep Transmitting** 

**Results: Pass** 

Please refer to following diagram for individual



|     | Eroauooau          | Reading | Factor | Level  | Limit  | Margin |          |     |
|-----|--------------------|---------|--------|--------|--------|--------|----------|-----|
| No. | Frequency<br>(MHz) | (dBuV)  | (dB)   | (dBuV) | (dBuV) | (dB)   | Detector | P/F |
| 1   | 0.1539             | 48.86   | 9.78   | 58.64  | 65.79  | -7.15  | QP       | Р   |
| 2   | 0.1539             | 31.56   | 9.78   | 41.34  | 55.79  | -14.45 | AVG      | Р   |
| 3   | 0.1812             | 45.13   | 9.76   | 54.89  | 64.43  | -9.54  | QP       | Р   |
| 4   | 0.1812             | 26.58   | 9.76   | 36.34  | 54.43  | -18.09 | AVG      | Р   |
| 5   | 0.6219             | 31.73   | 9.78   | 41.51  | 56.00  | -14.49 | QP       | Р   |
| 6   | 0.6219             | 22.65   | 9.78   | 32.43  | 46.00  | -13.57 | AVG      | Р   |
| 7   | 1.9947             | 21.51   | 9.80   | 31.31  | 56.00  | -24.69 | QP       | Р   |
| 8   | 1.9947             | 13.99   | 9.80   | 23.79  | 46.00  | -22.21 | AVG      | Р   |
| 9   | 4.3611             | 17.16   | 9.90   | 27.06  | 56.00  | -28.94 | QP       | Р   |
| 10  | 4.3611             | 8.22    | 9.90   | 18.12  | 46.00  | -27.88 | AVG      | Р   |
| 11  | 18.3971            | 23.82   | 10.58  | 34.40  | 60.00  | -25.60 | QP       | Р   |
| 12  | 18.3971            | 18.35   | 10.58  | 28.93  | 50.00  | -21.07 | AVG      | Р   |

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

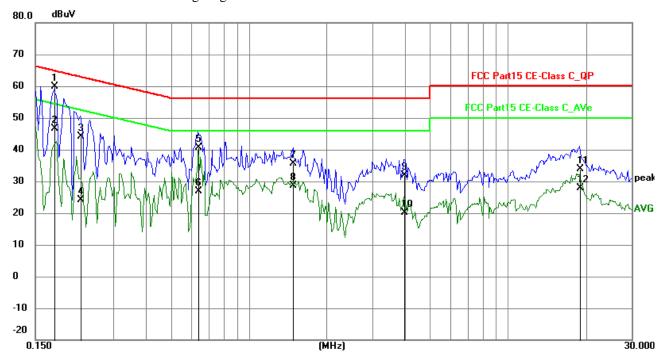
**EUT Operating Environment** 

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

**EUT set Condition: Charging and Keep Transmitting** 

**Results: Pass** 

Please refer to following diagram for individual



| No. | Frequency<br>(MHz) | Reading (dBuV) | Factor<br>(dB) | Level<br>(dBuV) | Limit<br>(dBuV) | Margin<br>(dB) | Detector | P/F |
|-----|--------------------|----------------|----------------|-----------------|-----------------|----------------|----------|-----|
| 1   | 0.1773             | 50.23          | 9.77           | 60.00           | 64.61           | -4.61          | QP       | Р   |
| 2   | 0.1773             | 36.77          | 9.77           | 46.54           | 54.61           | -8.07          | AVG      | Р   |
| 3   | 0.2241             | 34.47          | 9.75           | 44.22           | 62.67           | -18.45         | QP       | Р   |
| 4   | 0.2241             | 14.29          | 9.75           | 24.04           | 52.67           | -28.63         | AVG      | Р   |
| 5   | 0.6375             | 30.87          | 9.78           | 40.65           | 56.00           | -15.35         | QP       | Р   |
| 6   | 0.6375             | 17.05          | 9.78           | 26.83           | 46.00           | -19.17         | AVG      | Р   |
| 7   | 1.4799             | 25.86          | 9.79           | 35.65           | 56.00           | -20.35         | QP       | Р   |
| 8   | 1.4799             | 18.87          | 9.79           | 28.66           | 46.00           | -17.34         | AVG      | Р   |
| 9   | 3.9711             | 22.03          | 9.89           | 31.92           | 56.00           | -24.08         | QP       | Р   |
| 10  | 3.9711             | 10.15          | 9.89           | 20.04           | 46.00           | -25.96         | AVG      | Р   |
| 11  | 18.9393            | 23.27          | 10.62          | 33.89           | 60.00           | -26.11         | QP       | Р   |
| 12  | 18.9393            | 17.29          | 10.62          | 27.91           | 50.00           | -22.09         | AVG      | Р   |

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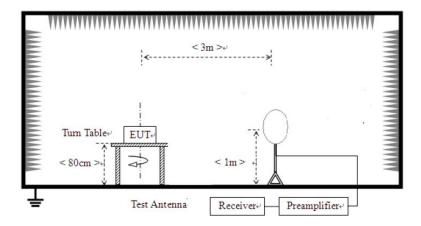


### **6** Radiated Emission Test

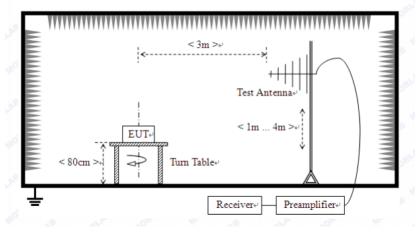
- 6.1 Test Method and test Procedure:
- (1) The EUT was tested according to ANSI C63.10-2013. The radiated test was performed at Timeway EMC Laboratory. This site is on file with the FCC laboratory division, Registration No. 744189
- (2) The EUT, peripherals were put on the turntable which table size 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



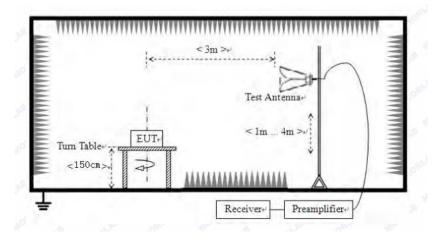
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For radiated emissions above 1GHz



- 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.
- 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 Stre | Field Strength of Fundamental (3m) |            |      | Field Strength of Harmonics (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  $(dBuV) = 20 \log RF \text{ Voltage } (uV)$
- 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.

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

| _                     |              |                                   |
|-----------------------|--------------|-----------------------------------|
| Frequency Range (MHz) | Distance (m) | Field strength (dB µ V/m)         |
| 0.009-0.049           | 3            | 20log(2400/F(kHz)) +40log (300/3) |
| 0.490-1.705           | 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  $(dBuV) = 20 \log RF \text{ Voltage } (uV)$
- 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. This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.
- 5. 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.
- 6. 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.
- 7. Battery full charged during tests.

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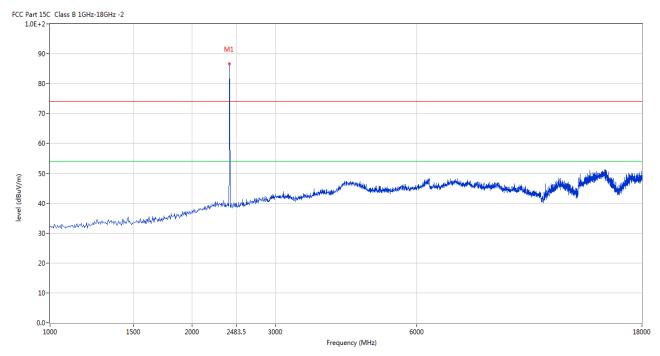


### 6.5 Test result

# A Fundamental & Harmonics Radiated Emission Data

Please refer to the following test plots for details: Low Channel-2403MHz

### Horizontal



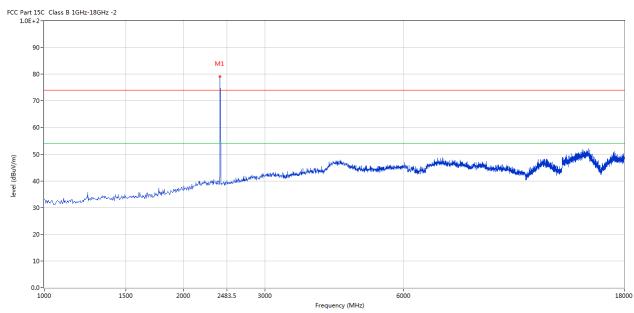
| No. | Frequency | Results  | Factor | Limit    | Over Limit | Detector | Table (o) | Height | ANT        | Verdict |
|-----|-----------|----------|--------|----------|------------|----------|-----------|--------|------------|---------|
|     | (MHz)     | (dBuV/m) | (dB)   | (dBuV/m) | (dB)       |          |           | (cm)   |            |         |
| 1   | 2402.149  | 86.57    | -3.57  | 114.0    | -27.43     | Peak     | 266.00    | 100    | Horizontal | Pass    |

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### Vertical



| No. | Frequency | Results  | Factor | Limit    | Over Limit | Detector | Table (o) | Height | ANT      | Verdict |
|-----|-----------|----------|--------|----------|------------|----------|-----------|--------|----------|---------|
|     | (MHz)     | (dBuV/m) | (dB)   | (dBuV/m) | (dB)       |          |           | (cm)   |          |         |
| 1   | 2402.149  | 79.05    | -3.57  | 114.0    | -34.95     | Peak     | 33.00     | 100    | Vertical | Pass    |

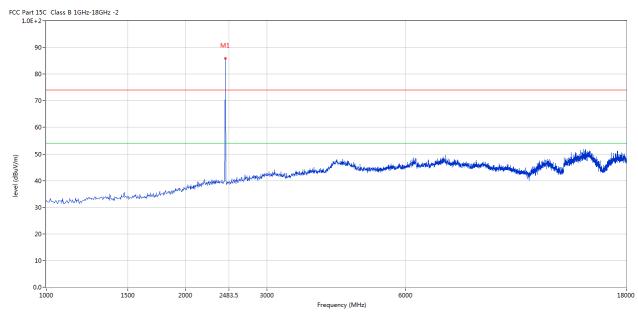
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Please refer to the following test plots for details: Middle Channel-2441MHz

### **Horizontal**



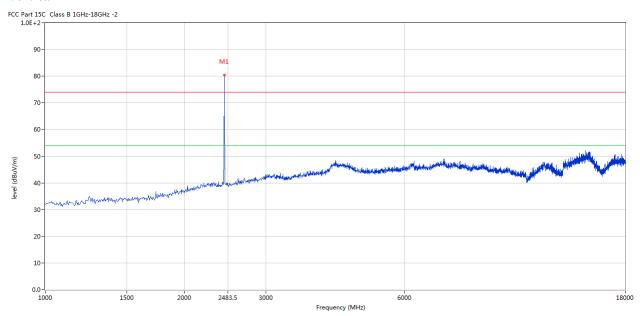
| No. | Frequency | Results  | Factor | Limit    | Over Limit | Detector | Table (o) | Height | ANT        | Verdict |
|-----|-----------|----------|--------|----------|------------|----------|-----------|--------|------------|---------|
|     | (MHz)     | (dBuV/m) | (dB)   | (dBuV/m) | (dB)       |          |           | (cm)   |            |         |
| 1   | 2440.390  | 85.87    | -3.57  | 114.0    | -28.13     | Peak     | 273.00    | 100    | Horizontal | Pass    |

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### Vertical



| ſ | No. | Frequency | Results  | Factor | Limit    | Over       | Detector | Table (o) | Height | ANT      | Verdict |
|---|-----|-----------|----------|--------|----------|------------|----------|-----------|--------|----------|---------|
|   |     | (MHz)     | (dBuV/m) | (dB)   | (dBuV/m) | Limit (dB) |          |           | (cm)   |          |         |
|   | 1   | 2440.390  | 80.42    | -3.57  | 114.0    | -33.58     | Peak     | 30.00     | 100    | Vertical | Pass    |

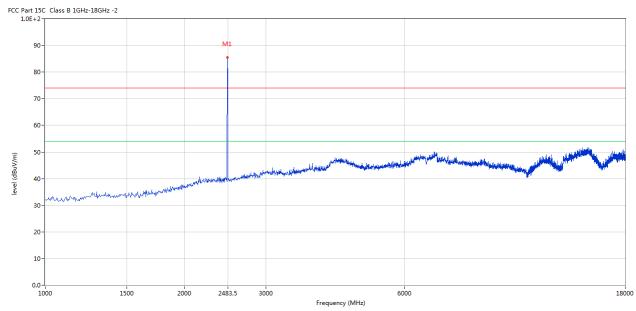
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Please refer to the following test plots for details: High Channel-2480MHz

### Horizontal



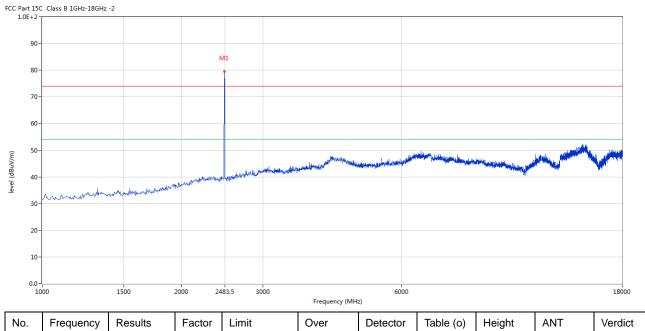
| No. | Frequency | Results  | Factor | Limit    | Over Limit | Detector | Table (o) | Height | ANT        | Verdict |
|-----|-----------|----------|--------|----------|------------|----------|-----------|--------|------------|---------|
|     | (MHz)     | (dBuV/m) | (dB)   | (dBuV/m) | (dB)       |          |           | (cm)   |            |         |
| 1   | 2478.630  | 85.58    | -3.57  | 114.0    | -28.42     | Peak     | 269.00    | 100    | Horizontal | Pass    |

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### Vertical



| No. | Frequency | Results  | Factor | Limit    | Over       | Detector | Table (o) | Height | ANT      | Verdict |
|-----|-----------|----------|--------|----------|------------|----------|-----------|--------|----------|---------|
|     | (MHz)     | (dBuV/m) | (dB)   | (dBuV/m) | Limit (dB) |          |           | (cm)   |          |         |
| 1   | 2478.630  | 79.48    | -3.57  | 114.0    | -34.52     | Peak     | 74.00     | 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.

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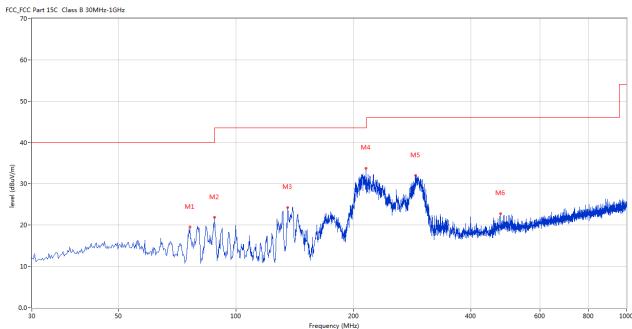


# B. General Radiated Emission Data Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

**Results:** Pass

Please refer to following diagram for individual



| No. | Frequency | Results  | Factor | Limit    | Over Limit | Detector | Table (o) | Height | ANT        | Verdict |
|-----|-----------|----------|--------|----------|------------|----------|-----------|--------|------------|---------|
|     | (MHz)     | (dBuV/m) | (dB)   | (dBuV/m) | (dB)       |          |           | (cm)   |            |         |
| 1   | 76.306    | 19.49    | -17.58 | 40.0     | -20.51     | Peak     | 350.00    | 200    | Horizontal | Pass    |
| 2   | 88.185    | 21.86    | -15.59 | 43.5     | -21.64     | Peak     | 360.00    | 200    | Horizontal | Pass    |
| 3   | 135.704   | 24.30    | -17.16 | 43.5     | -19.20     | Peak     | 172.00    | 200    | Horizontal | Pass    |
| 4   | 215.224   | 33.82    | -13.60 | 43.5     | -9.68      | Peak     | 360.00    | 200    | Horizontal | Pass    |
| 5   | 288.440   | 32.01    | -11.25 | 46.0     | -13.99     | Peak     | 336.00    | 100    | Horizontal | Pass    |
| 6   | 476.088   | 22.79    | -7.47  | 46.0     | -23.21     | Peak     | 250.00    | 200    | Horizontal | Pass    |

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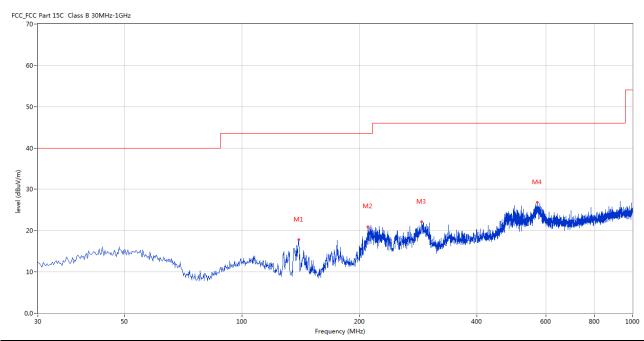


# Radiated Emission In Vertical (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Results: Pass

Please refer to following diagram for individual



| No. | Frequency | Results  | Factor | Limit    | Over Limit | Detector | Table (o) | Height | ANT      | Verdict |
|-----|-----------|----------|--------|----------|------------|----------|-----------|--------|----------|---------|
|     | (MHz)     | (dBuV/m) | (dB)   | (dBuV/m) | (dB)       |          |           | (cm)   |          |         |
| 1   | 139.825   | 17.79    | -17.19 | 43.5     | -25.71     | Peak     | 62.00     | 200    | Vertical | Pass    |
| 2   | 210.132   | 20.92    | -13.59 | 43.5     | -22.58     | Peak     | 75.00     | 100    | Vertical | Pass    |
| 3   | 288.440   | 22.14    | -11.25 | 46.0     | -23.86     | Peak     | 264.00    | 100    | Vertical | Pass    |
| 4   | 570.155   | 26.78    | -5.81  | 46.0     | -19.22     | Peak     | 360.00    | 200    | Vertical | Pass    |

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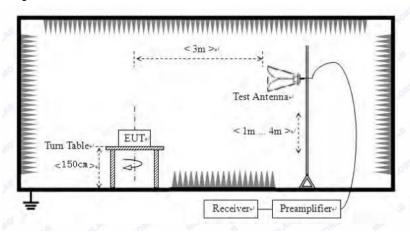


### 7. Band Edge

### 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.

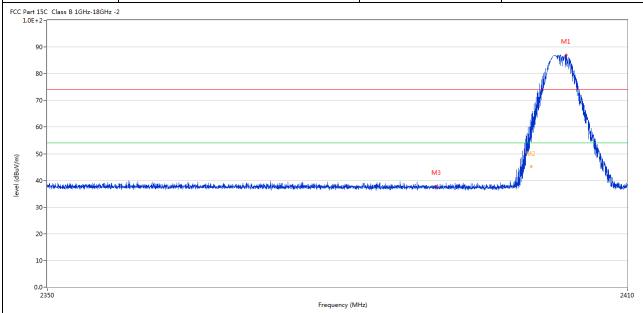
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### 7.6 Test Result

| Product:     | WIRELESS GAMING KEYBOARD | Polarity     | Horizontal |
|--------------|--------------------------|--------------|------------|
| Mode         | Keeping Transmitting     | Test Voltage | DC3.7V     |
| Temperature  | 24 deg. C,               | Humidity     | 56% RH     |
| Test Result: | Pass                     |              |            |



| No. | Frequency | Results  | Factor | Limit    | Over Limit | Detector | Table (o) | Height | ANT        | Verdict |
|-----|-----------|----------|--------|----------|------------|----------|-----------|--------|------------|---------|
|     | (MHz)     | (dBuV/m) | (dB)   | (dBuV/m) | (dB)       |          |           | (cm)   |            |         |
| 2   | 2399.938  | 56.47    | -3.57  | 74.0     | -17.53     | Peak     | 226.00    | 100    | Horizontal | Pass    |
| 2** | 2399.938  | 45.21    | -3.57  | 54.0     | -8.79      | AV       | 226.00    | 100    | Horizontal | Pass    |
| 3   | 2390.085  | 37.92    | -3.53  | 74.0     | -36.08     | Peak     | 220.00    | 100    | Horizontal | Pass    |

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| Pr                       | roduct:  | WIRE                                | LESS G                                       | AMING KI   | EYBOARD  | D  | etector  |                                   | Vertica         | 1               |
|--------------------------|--|-------------------------------------|--|--|--|--|--|-----------------------------------|-----------------|-----------------|
| 1                        | Mode   |                                     | Keepin                                       | g Transmitt  | ing  | Tes  | t Voltage  |                                   | DC3.7V          | V               |
| Tem                      | nperature  |                                     | 2  | 4 deg. C,  |  | H  | umidity  |                                   | 56% RI          | Н               |
| Test                     | t Result:  |                                     |  | Pass   |  |  |  |                                   |                 |                 |
| Part 15C<br>1.0E+2-      |  |                                     |  |  |  |  |  |                                   |                 |                 |
| 90-                      |  |                                     |  |  |  |  |  |                                   |                 |                 |
| 80-                      |  |                                     |  |  |  |  |  |                                   | M1              |                 |
| 70-                      |  |                                     |  |  |  |  |  |                                   |                 |                 |
| 60-                      |  |                                     |  |  |  |  |  | N                                 | $I \rightarrow$ |                 |
|                          | 0-   |                                     |  |  |  |  |  |                                   |                 |                 |
| 50-                      |  |                                     |  |  |  |  |  |                                   |                 |                 |
| 50 -<br>40 -             | denthal east where a simulation californ   | -                                   | بالمستخوف إحراف إمراق المعادة                | in the state of the parties of the p | more had printed to the processing the beginning to  | المسافية والمسافية والمساف | M3   | of an ability in a second second  |                 | Mune            |
| 50-<br>40-<br>30-        | dendade a september a septembe | خسيد معيد عبد المراجعة              | <u>ئەرىخىدە ئەرىخىدە ئەرىخىدە ئەرىخىدە ئ</u> | الموطاء ويقامون فالمناورة إليانية والمناورة أبرأته إ   | regrade belganises a difficult recognisis described in the constitution of the constit | المسافرة المتعارضة والمسافرة والمتعارضة والمتعارضات والمتعارضات والمتعارضات والمتعارضات والمتعارضات والمتعارضات والمتعارضات والمتعارضات والمتعارض والمتعارضات والمتعارض والمتعارضات والمتعارضات والمتعارض والمتعارض والمتعارض والمتعارضات والمتعار | M3   | and the second second             |                 | · ·             |
| 40-                      | dagh besspringente investigen as ben   | kangain, dalah aan menengan aya     | રે તેમાં માને સુધી હોય હોય કે તે ફો          | androughtippedistantisterist   | ng-na bahaping-dipting-projektohensikest   | المراجعة ال   | M3   | of weeklights in soft in the life |                 | · ·             |
| 40-<br>30-               | dentification in contract a similar temperature  | hampione placehous mentro angle i   | de.300年度,1986年,1986年                         | enderse glavingskrije, redelse, geskije p  | ng makin janung melipikan pencingkah pencingkah pencingkah pencingkah pencingkah pencingkah pencingkah pencing   | المساور والمساور والم  | M3   | aranisish.a.a.nda.abi             |                 | · ·             |
| 40-<br>30-<br>20-<br>10- |  | hampione flat hipszemin negot lögig | and physical state of the                    | kayah kana alah dipadagan jumah kanan di kanan  | mera kilaniara di Manjerinja dakatanih di  | المستأومة المستأومة والمستأومة والمستأومة والمستأومة والمستأومة والمستأومة والمستأومة والمستأومة والمستأومة وا   | M3   | derektisk in estimble             |                 |                 |
| 40-<br>30-<br>20-        |  | hampione flakking a menengen teggi  | 14.304 44.8.196.186.244 A                    | કર તૈયાલ ફાંકેમ્પ્લે <b>કહ્યાં</b> હતા હોય હતા   | Frequency (MF  |  | M3   | or which have not a bit           |                 | 2410            |
| 40-<br>30-<br>20-<br>10- |  | Results                             | Factor                                       | Limit  |  |  | M3 Table (o)   | Height                            | ANT             | 2410<br>Verdict |
| 40                       | 50   |                                     |  |  | Frequency (MI  | lz)  | Angele and the second s |                                   | ANT             |                 |
| 30<br>20<br>10<br>23:    | 50<br>Frequency  | Results                             | Factor                                       | Limit  | Frequency (MF  | lz)  | Angele and the second s | Height                            | ANT Vertical    |                 |

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| Product:                                      | W  | IRELES                                  | S GAMING          | KEYBOAR                 | 2D   | Polar  | ity                                 | Horiz  | ontal             |
|---|--|---|-------------------|-------------------------|--|--|-------------------------------------|--|-------------------|
| Mode  |  | Kee                                     | eping Trans       | mitting                 |  | Test Vo  | ltage                               | DC3  | 3.7V              |
| Temperatur                                    | 2  |   | 24 deg. C         |                         |  | Humio  |                                     | 56%  | RH                |
| Test Result                                   |  |   | Pass              |                         |  |  |                                     | -  | -                 |
| Part 15C Class B 1GHz                         | Class B 1GHz-18GHz -2  |   |                   |                         | •  |  |                                     | •  |                   |
| 90-<br>80-<br>70-<br>60-<br>50-<br>40-<br>30- | vooring in the subsequence of the law of the | AND |                   | Marine Marine           | da da ili birdiga di katan di Manada a a akta a di | ng Mangala salpas, nje na jepan kjenang njeropin | dazida artik deli pisarek erkela ar | بالشعر ألفاد واليعادي فرودال لاجوا طباط برمه | material analysis |
|   |  |   |                   |                         |  |  |                                     |  |                   |
| 0.0-  |  |   |                   | 2483.5<br>Frequency (Mi | Hz)  |  |                                     |  | 2500              |
| 0.0-<br>2470                                  | ncy Results  | Factor                                  | Limit             |                         | Detector   | Table (o)  | Height                              | ANT  | ı                 |
| 0.0-<br>2470                                  | Results (dBuV/m)   | Factor (dB)                             | Limit<br>(dBuV/m) | Frequency (Mi           | I  | Table (o)  | Height (cm)                         | ANT  | 2500<br>Verdic    |
| No. Frequer                                   | (dBuV/m)   |   |                   | Over Limit              | I  | Table (o) 270.00                                 | _                                   | ANT Horizontal                               | ı                 |

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| Pr   | roduct:   | V  | WIRELESS GAMING KEYBOARD |                       |                                       |  |  | Detector   |   | tical  |
|--|---|--|--------------------------|-----------------------|---------------------------------------|--|--|--|---|--|
| N  | Mode  |  | Keeping Transmitting     |                       |                                       |  | Test V   | Voltage  | DC  | 3.7V   |
| Tem  | perature  |  | 24 deg. C,               |                       |                                       |  | Humidity 56%   |  |   | RH   |
| Test   | t Result:   |  | Pass                     |                       |                                       |  |  |  |   |  |
| 2 Part 15C<br>1.0E+2-                          | Class B 1GHz-18GHz  | : -2   |                          |                       |                                       |  |  |  |   |  |
| 00   |   |  |                          |                       |                                       |  |  |  |   |  |
| 90-  |   |  |                          |                       |                                       |  |  |  |   |  |
| 80-  |   |  | S                        | - Water Market Market |                                       |  |  |  |   |  |
| 70-  |   |  |                          |                       |                                       |  |  |  |   |  |
| 60-  |   |  | _/_                      |                       |                                       |  |  |  |   |  |
|  |   |  | 4                        |                       |                                       |  |  |  |   |  |
|  |   |  | /                        |                       |                                       |  |  |  |   |  |
|  | and the second second second  |  |                          |                       |                                       | A Black and A Landau                           |  | line comme di  | . I.a I.a. is   |  |
| 50-<br>40-                                     | والمعاولة والمدرور والمراجع والمراجع والمعاولة والمعاولة والمعاولة والمعاولة والمعاولة والمعاولة والمعاولة والم | idanakan di dinakan di   |                          |                       | A Comment                             | أمطأ فالبيطر بنتابتها ومنابدتك المبابا الإرجاء | tanish kushpolosid Alfricipanilish   | dalimet announce i the thomas is and fed   | harahistla orak olaya da da p                         | to the side as the constitution of the constit |
| 50 -<br>40 -<br>30 -                           | inaritista di propinsi di p | itteesiinaa aasta ka ja  |                          |                       | A decision of                         | indikingal-ii ja orija kun kiliki ja orij      | العربية الإيرانية الإيرانية الإيرانية الإيرانية الإيرانية الإيرانية الإيرانية الإيرانية الإيرانية ا  | kin menangan kendidan dan bid  | h, e, ad hi jit liga ar qui to algazin algo, qiliy ti | n depleto an employer per  |
| 50-<br>40-                                     | inarikisan-kupupupun dipun subupun dibabins   | والمستعدد والمستعد والمستعدد والمستعد والمستعدد والمستعد | /                        |                       | A second                              | haldenselville evilen i ville (sevil           | tangs dengan negativan di kanan di kan   | h de service de la company | harakis tilise anaşlı silgeşir dir. İstifici          | a distribute and the same  |
| 50 -<br>40 -<br>30 -                           | insertitivista nelimpian kalego est est esperimente de la constitución de la constitución de la constitución d  | Mary transport and the second of the second  | /                        |                       | A A A A A A A A A A A A A A A A A A A | halilatenduskipa uniperioriksista kond         | taryja bir velyydrogod "Higherdon alberki  | hili-metanasiga tagika-misa-hid  | heerakeistika eerok nipuguda eilikei                  | h heite ann agailteáirí  |
| 50<br>40<br>30<br>20<br>10                     |   | ritanian industrial padr   |                          |                       |                                       | haddanadusiya quraqoon hasala qoraq            | المنطقة المتوادية المتوادي | h de marine i talik marine i kal   | ken nederist line anne i velenin dete sidiri          | A SOO  |
| 50-<br>40-<br>30-<br>20-                       |   | Mingrish and Mingr |                          |                       | 2483.5<br>Frequency (MHz              |  | taryja bir velyydrogod "Higherdon alberki  | hilimatanasiga talika misia hid  | heersaheistikse verselvalsprojekte sidyte             | 2500   |
| 50-<br>40-<br>30-<br>20-<br>10-<br>0.0-<br>247 |   | Results  | Factor                   | Limit                 | 2483.5                                |  | Table (o)  | Height   | ANT   | 2500<br>Verdict  |
| 50<br>40<br>30<br>20<br>10                     | 70  |  | Factor (dB)              | Limit<br>(dBuV/m)     | 2483.5<br>Frequency (MHz              | z)   |  |  |   | Т  |

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

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# 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 -1.85dBi Max. It fulfills the requirement of this section. Test Result: Pass

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| Product:      | WIRELESS GAMING KEYBOARD |            |          | Test Mode:   |              |  | Keep transmitting |         |                    |    |
|---------------|--------------------------|------------|----------|--------------|--------------|--|-------------------|---------|--------------------|----|
| Mode          | Keeping Transmitting     |            |          |              | Test Voltage |  |                   | DC3     | .7V                |    |
| Temperature   |                          | 24 deg. C, |          |              | Humidity     |  | 56% RH            |         |                    |    |
| Test Result:  |                          | Pass       |          |              | Ι            | Detector                               | PK                |         |                    |    |
| OdB Bandwidth | Bandwidth 2.645MHz       |            |          |              |              |  |                   |         |                    |    |
| <b>&gt;</b>   | Marker 1 [T1 ndB]        |            |          | RI           | BW           | 100 k                                  | Iz RF Att         |         | 30 dB              |    |
| Ref Lvl       | ndB                      | 20         | .00 dB   | V            | BW           | 300 k                                  | Hz                |         |                    |    |
| 10 dBm        | BW                       | 2.645290   | 058 MHz  | SI           | TW           | 5 m                                    | s Ui              | nit     | dBm                | ı  |
| 10            |                          |            |          |              |              | <b>v</b> <sub>1</sub>                  | [T1]              | - 4     | .87 dBm            |    |
|               |                          |            |          |              |              |  |                   | 2.40240 | 381 GHz            |    |
| 0             |                          | 1          |          |              |              | ndB                                    |                   | 20      | .00 dB             |    |
|               |                          |            | المسيد 🗸 | $\setminus$  |              | ightharpoonup BW                       | [ TT ]            | 2.64529 | 058 MHz            |    |
| -10           |                          |            | V ~-     | <del>\</del> | ~~           | \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 1.1.1             | 2.40155 | .93 dBm<br>210 GHz |    |
|               |                          | $\sim$     |          | $\sim$       |              | ∇ <sub>T</sub>                         | [T1]              | -25     |                    |    |
| -20           | r1 ~                     | Now        |          |              |              |  | T2                | 2.40419 | 739 GHz            |    |
| 1MAX          | Amma Jama                |            |          |              |              |  | Ÿ                 |         |                    | 11 |
| -30           | ~W*                      |            |          |              |              |  | $\overline{}$     |         | 1                  |    |
| July          |                          |            |          |              |              |  | hay               |         | M                  |    |
| -40           |                          |            |          |              |              |  |                   |         | hum                | l  |
|               |                          |            |          |              |              |  |                   |         |                    |    |
| -50           |                          |            |          |              |              |  |                   |         |                    |    |
|               |                          |            |          |              |              |  |                   |         |                    |    |
| -60           |                          |            |          |              | _            |  |                   |         |                    |    |
|               |                          |            |          |              |              |  |                   |         |                    |    |
| -70           |                          |            |          |              |              |  |                   |         |                    |    |
|               |                          |            |          |              |              |  |                   |         |                    |    |
| -80           |                          |            |          |              |              |  |                   |         |                    |    |
|               |                          |            |          |              |              |  |                   |         |                    |    |
| -90           |                          |            |          |              |              |  |                   |         |                    |    |
| Center 2.     | 403 GHz                  |            | 500 }    | KHz/         |              |  |                   | Spa     | ın 5 MHz           | -  |

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| Product:       | WIRELESS GAMING KEYBOARD |                |      |          | Test Mode:                                 |       | Keep transmitting |          |     |
|----------------|--------------------------|----------------|------|----------|--|-------|-------------------|----------|-----|
| Mode           | Keeping Transmitting     |                |      |          | Test Voltage                               |       | DC3.7V            |          |     |
| Temperature    | 24 deg. C,               |                |      | Humidity |  |       | 56% RH            |          |     |
| Test Result:   | Pass                     |                |      |          | Detector                                   |       | PK                |          |     |
| 20dB Bandwidth | 2.645MHz                 |                |      |          |  |       |                   |          |     |
| Ŕ              | Marker                   | 1 [T1 ndB]     | F    | RBW      | 100 k                                      | Hz Ri | F Att             | 30 dB    |     |
| Ref Lvl        | ndB 20.00 dB             |                |      | /BW      | 300 k                                      |       |                   |          |     |
| 10 dBm         | BW 2                     | 2.64529058 MHz | 5    | TWE      | 5 m  | s Ui  | nit               | dBm      | l   |
| 10             |                          |                |      |          | <b>v</b> <sub>1</sub>                      | [T1]  | -3                | .80 dBm  | A   |
|                |                          |                |      |          |  |       | 2.44040           | 381 GHz  | -   |
| 0              |                          | 1              | _    |          | ndB  |       | 20                |          |     |
|                |                          |                |      |          | $\bigwedge_{\bullet}$ $\nabla_{\text{T1}}$ | [T1]  | 2.64529           |          |     |
| -10            |                          |                |      | /        |  |       |                   | 210 GHz  |     |
|                |                          |                |      |          | $\nabla_{\mathrm{T}}$                      | [T1]  | -24               | .00 dBm  |     |
| -20            | T1                       |                |      |          |  | T2    | 2.44219           | 739 GHz  |     |
| 1MAX           | and the same             |                |      |          |  | Y.    |                   |          | 1MA |
| -30            | N                        |                |      |          |  | -     |                   |          |     |
| -40            |                          |                |      |          |  | w     | Mym               | Mylym    |     |
| -40            |                          |                |      |          |  |       |                   | 30034    |     |
|                |                          |                |      |          |  |       |                   |          |     |
| -50            |                          |                |      |          |  |       |                   |          |     |
|                |                          |                |      |          |  |       |                   |          |     |
| -60            |                          |                |      |          |  |       |                   |          |     |
|                |                          |                |      |          |  |       |                   |          |     |
| -70            |                          |                |      |          |  |       |                   |          |     |
|                |                          |                |      |          |  |       |                   |          |     |
| -80            |                          |                |      |          |  |       |                   |          |     |
|                |                          |                |      |          |  |       |                   |          |     |
| -90            |                          |                |      |          |  |       |                   |          |     |
| Center 2.      | .441 GHz                 | 500            | kHz/ | ,        |  |       | Spa               | ın 5 MHz |     |
| Date: 25       | .FEB.2022 14             | :05:34         |      |          |  |       |                   |          |     |

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| Product:       | WIRELESS GAMIN    | NG KEYBOARD  | Test Mode:            | Keep transmitting   |          |  |
|----------------|-------------------|--------------|-----------------------|---------------------|----------|--|
| Mode           | Keeping Tra       | nsmitting    | Test Voltage          | DC:                 | 3.7V     |  |
| Temperature    | 24 deg            | . C,         | Humidity              | 56% RH              |          |  |
| Test Result:   | Pass              | S            | Detector              | PK                  |          |  |
| 20dB Bandwidth | 2.385N            | ИНz          |                       | -                   |          |  |
| R)             | Marker 1 [        | [I ndB]      | RBW 100 kHz           | z RF Att            | 30 dB    |  |
| Ref Lvl        | ndB               |              | 7BW 300 kHz           |                     |          |  |
| 10 dBm         | BW 2.384          | 476954 MHz S | SWT 5 ms              | Unit                | dBm      |  |
| 10             |                   |              | ▼1 [                  | г1] –4              | .24 dBm  |  |
| 0              |                   |              |                       | 2.47941             | 383 GHz  |  |
|                |                   | 1            | ndB                   | 20                  | .00 dB   |  |
|                |                   |              | BW VT1                | 2.38476<br>[T1] -24 | 954 MHz  |  |
| -10            | /                 |              | W                     | 2.47878             | 257 GHz  |  |
|                |                   |              | $ abla_{\mathrm{T2}}$ | [T1] -23            | .29 dBm  |  |
| -20            | T1                |              |                       | 2.48116             | 733 GHz  |  |
| IMAX           |                   |              |                       | \                   | IMA      |  |
| -30            | n 150M            |              |                       | 4                   |          |  |
| 10 Wall-wall   | Amoun.            |              |                       | John Marin          | Whitewar |  |
| -40            |                   |              |                       |                     |          |  |
|                |                   |              |                       |                     |          |  |
| -50            |                   |              |                       |                     |          |  |
|                |                   |              |                       |                     |          |  |
| -60            |                   |              |                       |                     |          |  |
|                |                   |              |                       |                     |          |  |
| -70            |                   |              |                       |                     |          |  |
|                |                   |              |                       |                     |          |  |
| -80            |                   |              |                       |                     |          |  |
|                |                   |              |                       |                     |          |  |
| -90            |                   |              |                       |                     |          |  |
| Center 2       | .48 GHz           | 500 kHz/     | ,                     | Spa                 | n 5 MHz  |  |
| Date: 25       | 5.FEB.2022 14:06: | : 22         |                       |                     |          |  |

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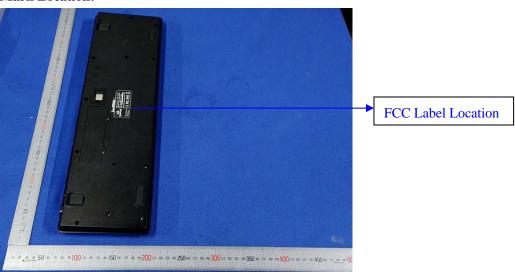
### 10.0 FCC ID Label

### FCC ID: TUVET-8668

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:**



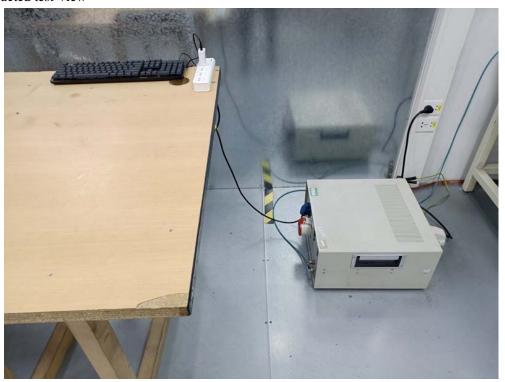
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### 11.0 Photo of testing

#### 11.1 Conducted test View--



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### Radiated emission test view



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

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# 11.2 Photographs – EUT

### Outside View



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# Photographs - EUT

### Outside View





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Outside View





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Inside view



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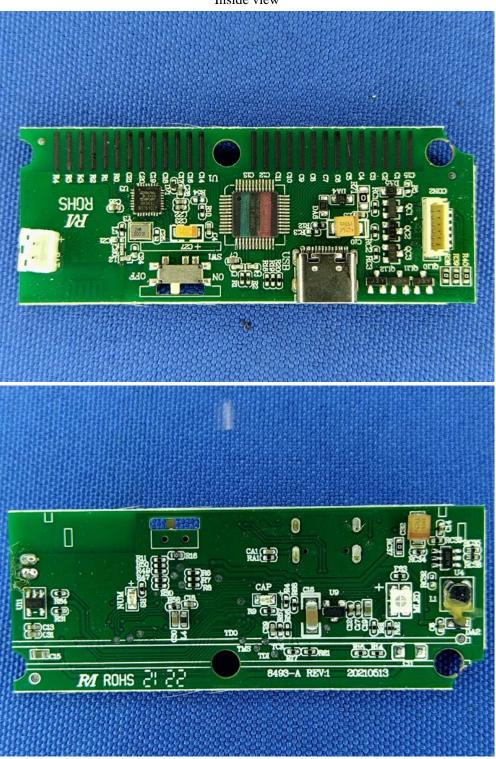
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Inside view



# --End of the report--

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