

Applicant: Eastern Times Technology Co.,Ltd

Product: Mechanical Keyboard

Model No.: Z-94J, ET-8931, TR94J, TR95J

Trademark: E-YOOSO

Test Standards: FCC Part 15.249

Test result:

It is herewith confirmed and found to comply with the

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

Paragraph 15.249 regulations for the evaluation of

electromagnetic compatibility

Approved By

Terry Tang

Manager

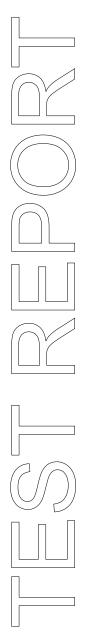
Dated: October 27, 2023

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

# SHENZHEN TIMEWAY TESTING LABORATORIES

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

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# **Special Statement:**

# FCC-Registration No.: 744189

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

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

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

# **A2LA** (Certification Number:5013.01)

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

**CAB identifier: CN0033** 

Date: 2023-10-27



# Test Report Conclusion

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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: Mechanical Keyboard

Manufacturer: Eastern Times Technology Co.,Ltd

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

Dongguan City, Guangdong, China.

Trademark: E-YOOSO

Model Number: Z-94J

Additional Model Name ET-8931, TR94J, TR95J

Rating: Input: DC5V, 8600mA or DC3.7V Battery: DC3.7V, 2500mAh Li-ion battery

Hardware Version: 8931-A TX V1

Software Version: 3116

Serial No.: 8931B230600275 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

Antenna Designation PCB antenna with gain -7.30dB maximum (Get from the antenna

specification)

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1.4 Submitted Sample: 2 Samples

1.5 Test Duration 2023-07-13 to 2023-10-27

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

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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	2023-07-14	2024-07-13	
LISN	R&S	EZH3-Z5	100294	2023-07-14	2024-07-13	
LISN	R&S	EZH3-Z5	100253	2023-07-14	2024-07-13	
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2023-07-14	2024-07-13	
Loop Antenna	EMCO	6507	00078608	2022-07-18	2025-07-17	
Spectrum	R&S	FSIQ26	100292	2023-07-14	2024-07-13	
Horn Antenna	A-INFO	LB-180400-KF	J211060660	2022-07-18	2025-07-17	
Horn Antenna	R&S	BBHA 9120D	9120D-631	2022-07-18	2024-07-17	
Power meter	Anritsu	ML2487A	6K00003613	2023-07-14	2024-07-13	
Power sensor	Anritsu	MA2491A	32263	2023-07-14	2024-07-13	
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2022-07-18	2025-07-17	
9*6*6 Anechoic			N/A	2022-07-26	2025-07-25	
EMI Test Receiver	RS	ESVB	826156/011	2023-07-14	2024-07-13	
EMI Test Receiver	RS	ESCS 30	834115/006	2023-07-14	2024-07-13	
Spectrum	HP/Agilent	E4407B	MY50441392	2023-07-14	2024-07-13	
Spectrum	RS	FSP	1164.4391.38	2023-07-14	2024-07-13	
RF Cable	Zhengdi	ZT26-NJ-NJ-8M/FA		2023-07-14	2024-07-13	
RF Cable	Zhengdi	7m		2023-07-14	2024-07-13	
Pre-Amplifier	Schwarebeck	BBV9743	#218	2023-07-14	2024-07-13	
Pre-Amplifier	HP/Agilent	8449B	3008A00160	2023-07-14	2024-07-13	
LISN	SCHAFFNER	NNB42	00012	2023-07-14	2024-07-13	
ESPI Test Receiver	R&S	ESPI 3	100379	2023-07-14	2024-07-13	
LISN	R&S	EZH3-Z5	100294	2023-07-14	2024-07-13	

# 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	n tested accordin	g to the following	specifications:
		A	, 50000

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.203	Antenna Requirement	Pass	Complies
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	Radiated Emission Test	Pass	Complies
FCC Part 15 Subpart C Paragraph 15.249(d) Limit	Band Edge Test	Pass	Complies
FCC Part 15.215(c)	20dB bandwidth	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

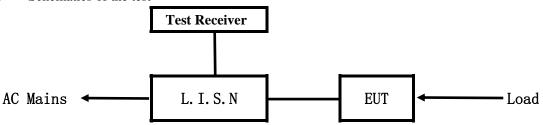
No modification by SHENZHEN TIMEWAY TESTING LABORATORIES

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#### **5.0** Power Line Conducted Emission Test

# 5.1 Schematics of the test

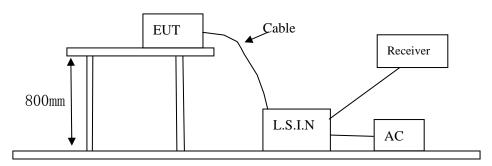


**EUT: Equipment Under Test** 

# 5.2 Test Method and test Procedure

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

Test Voltage: 120V~, 60Hz Block diagram of Test setup



# 5.3 Configuration of the EUT

The EUT was configured according to ANSI C63.10-2013. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below. 16 channels are provided to the EUT

#### A. EUT

Device Manufacturer		Model	FCC ID
Mechanical Keyboard	Eastern Times Technology	Z-94J, ET-8931, TR94J,	TIN/ET 9021 A
	Co.,Ltd	TR95J	TUVET-8931A

#### B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
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NT/A		
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 C63.10-2013

- A Setup the EUT and simulators as shown on follow
- B Enable AF signal and confirm EUT active to normal condition
- 5.5 Power line conducted Emission Limit according to Paragraph 15.207

Frequency	Limits (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:

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

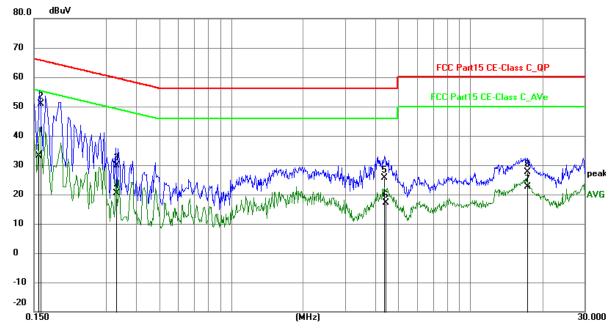
# **EUT Operating Environment**

Temperature: 25°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 (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1570	23.40	9.78	33.18	55.62	-22.44	AVG	Р
2	0.1600	41.04	9.78	50.82	65.46	-14.64	QP	Р
3	0.3310	20.02	9.76	29.78	59.43	-29.65	QP	Р
4	0.3310	10.65	9.76	20.41	49.43	-29.02	AVG	Р
5	4.3560	15.79	9.90	25.69	56.00	-30.31	QP	Р
6	4.4160	7.34	9.90	17.24	46.00	-28.76	AVG	Р
7	17.2830	12.21	10.52	22.73	50.00	-27.27	AVG	Р
8	17.3369	17.15	10.52	27.67	60.00	-32.33	QP	Р

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

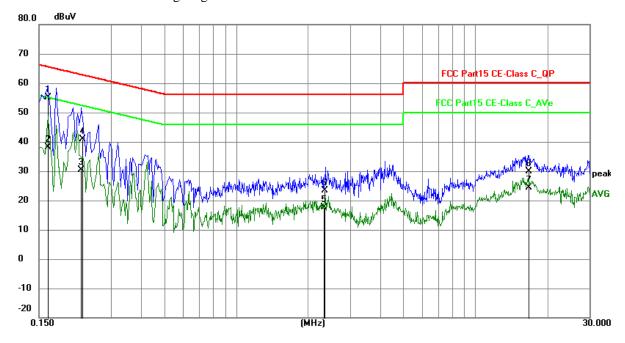
**EUT Operating Environment** 

Temperature: 25°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 (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.1630	45.36	9.78	55.14	65.31	-10.17	QP	Р
2	0.1630	28.26	9.78	38.04	55.31	-17.27	AVG	П
3	0.2250	20.67	9.75	30.42	52.63	-22.21	AVG	Р
4	0.2270	31.07	9.75	40.82	62.56	-21.74	QP	Р
5	2.3289	7.87	9.81	17.68	46.00	-28.32	AVG	Ч
6	2.3420	13.48	9.81	23.29	56.00	-32.71	QP	Р
7	16.6940	13.99	10.48	24.47	50.00	-25.53	AVG	Р
8	16.7350	19.32	10.48	29.80	60.00	-30.20	QP	Р

Date: 2023-10-27



#### **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 9kHz to 25 GHz was investigated. The frequency spectrum is set as follows:

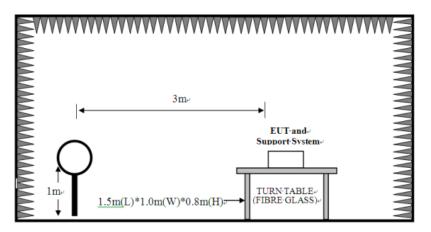
Frequency	Detector	RBW	VBW	Value
9KHz-150KHz	Quasi-peak	200Hz	600Hz	Quasi-peak
150KHz-30MHz	Quasi-peak	9KHz	30KHz	Quasi-peak
30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak
Above 1GHz	Peak	1MHz	3MHz	Peak
ADOVE IGHZ	Peak	1MHz	10Hz	Average

(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**

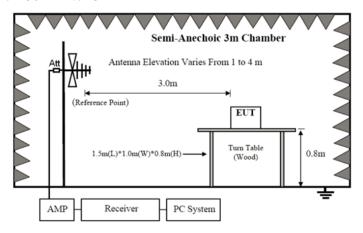
For radiated emissions from 9kHz to 30MHz



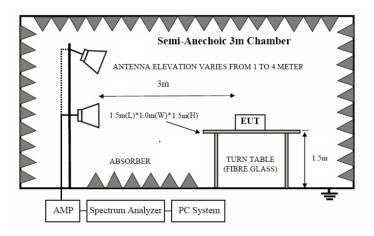
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For radiated emissions from 30MHz to1GHz



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	ength of Fundamental (3m)	Field Strength of Harmonics (3m)			
(MHz)	mV/m	dBuV/m	uV/m	dBuV/m		

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2400-2483.5 50	94 (Average)	114 (Peak)	500	54 (Average)	74 (Peak)
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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.

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

Frequency Range (MHz)	Distance (m)	Field strength (dB $\mu$ V/m)
0.009-0.490	3	20log(2400/F(kHz)) +40log (300/3)
0.490-1.705	3	20log(24000/F(kHz)) +40log (30/3)
1.705-30	3	69.5
30-80	3	40.0
88-216		43.5
21 -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. 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 was used during the test.

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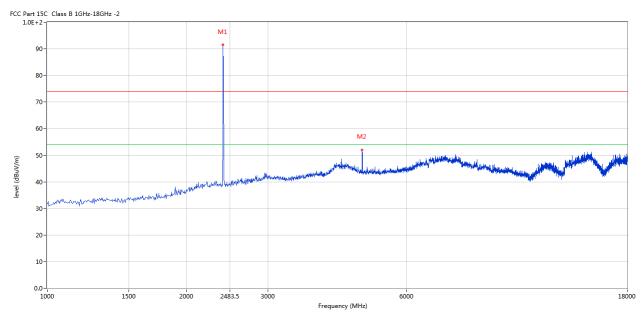


# 6.5 Test result

# A Fundamental & Harmonics Radiated Emission Data

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

#### Horizontal



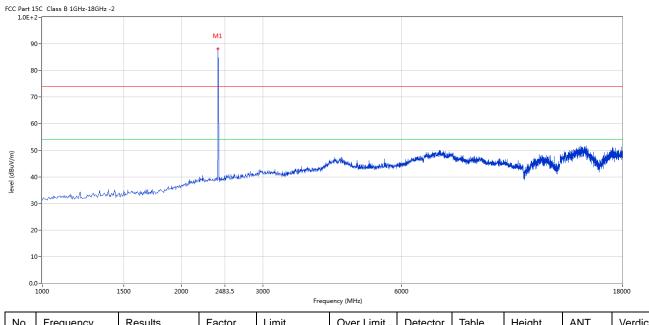
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2403	91.46	-3.57	114.0	-22.54	Peak	168.00	100	Horizontal	Pass
2	4802.799	52.06	3.12	74.0	-21.94	Peak	168.00	100	Horizontal	Pass

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# Vertical



	No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
		(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
Ī	1	2403	88.12	-3.57	114.0	-25.88	Peak	281.00	100	Vertical	Pass

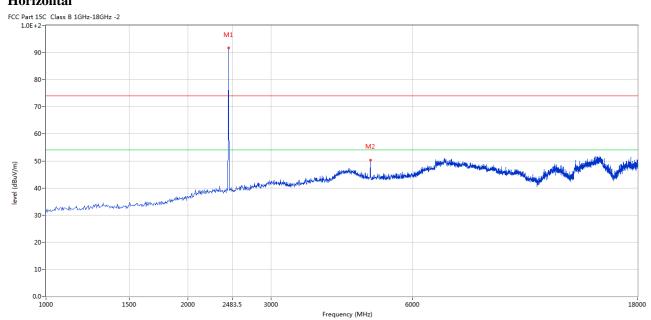
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# Please refer to the following test plots for details: Middle Channel-2441MHz

#### **Horizontal**



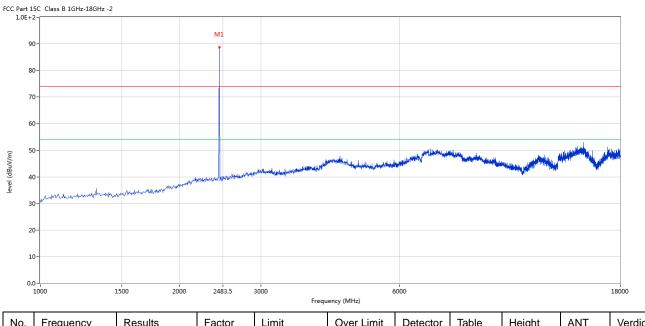
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2441	91.62	-3.57	114.0	-22.38	Peak	159.00	100	Horizontal	Pass
2	4879.280	50.28	3.20	74.0	-23.72	Peak	164.00	100	Horizontal	Pass

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#### Vertical



N	lo.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
		(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1		2441	88.64	-3.57	114.0	-25.36	Peak	285.00	100	Vertical	Pass

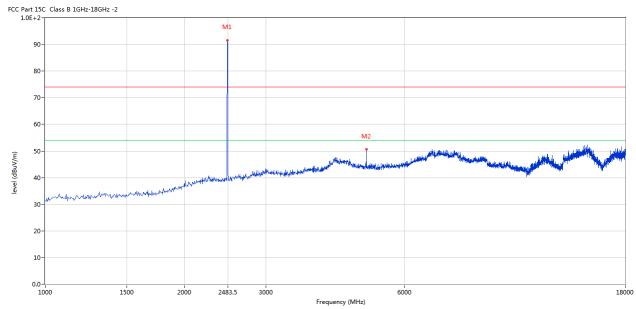
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Please refer to the following test plots for details: High Channel-2480MHz

#### Horizontal



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2480	91.61	-3.57	114.0	-22.39	Peak	168.00	100	Horizontal	Pass
2	4960.010	50.64	3.36	74.0	-23.36	Peak	216.00	100	Horizontal	Pass

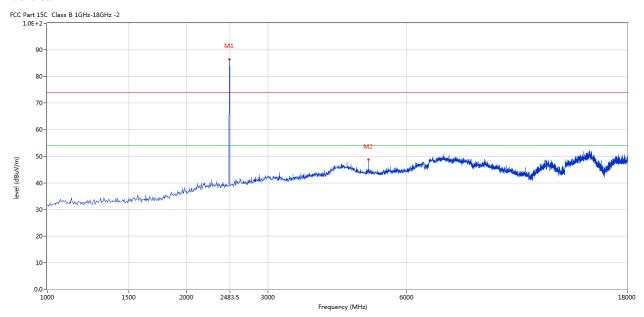
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#### Vertical



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2480	86.61	-3.57	114.0	-27.39	Peak	298.00	100	Vertical	Pass
2	4960.010	48.68	3.36	74.0	-25.32	Peak	298.00	100	Vertical	Pass

Note: (1) Emission Level = Reading Level + Antenna Factor + Cable Loss-Amplifier

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

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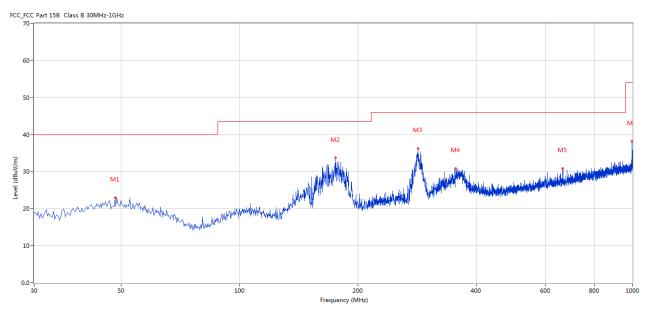


# B. General Radiated Emission Data Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

**Results:** Pass

Please refer to following diagram for individual



No.	Frequency	Results	Factor	Limit	Margin	Detector	Table	Height	Antenna	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(Degree)	(cm)		
1	48.183	22.96	-11.26	40.0	17.04	Peak	262.00	100	Horizontal	Pass
2	175.464	33.69	-15.57	43.5	9.81	Peak	296.00	100	Horizontal	Pass
3	284.319	36.29	-11.34	46.0	9.71	Peak	0.00	100	Horizontal	Pass
4	354.626	30.81	-9.43	46.0	15.19	Peak	1.00	100	Horizontal	Pass
5	664.949	30.84	-4.42	46.0	15.16	Peak	280.00	100	Horizontal	Pass
6	997.818	38.17	-1.23	54.0	15.83	Peak	283.00	100	Horizontal	Pass

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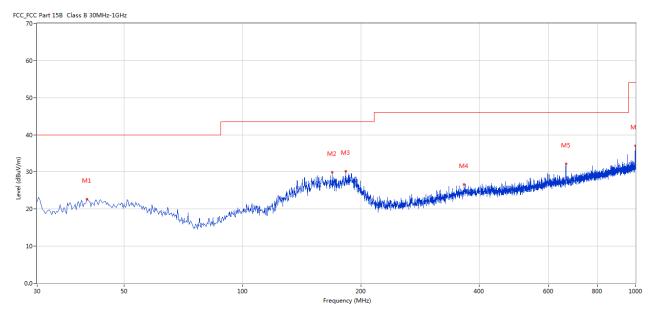


# Radiated Emission In Vertical (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

Results: Pass

Please refer to following diagram for individual



No.	Frequency	Results	Factor	Limit	Margin	Detector	Table	Height	Antenna	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(Degree)	(cm)		
1	40.182	22.74	-12.35	40.0	17.26	Peak	282.00	100	Vertical	Pass
2	169.160	29.98	-16.10	43.5	13.52	Peak	170.00	100	Vertical	Pass
3	182.979	30.23	-14.94	43.5	13.27	Peak	6.00	100	Vertical	Pass
4	366.506	26.63	-9.50	46.0	19.37	Peak	282.00	100	Vertical	Pass
5	665.919	32.13	-4.51	46.0	13.87	Peak	84.00	100	Vertical	Pass
6	998.788	37.08	-1.16	54.0	16.92	Peak	322.00	100	Vertical	Pass

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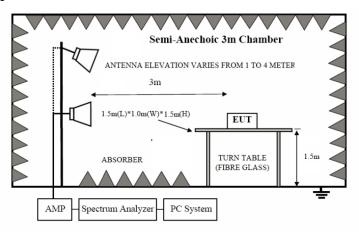


# 7. Band Edge

#### 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.

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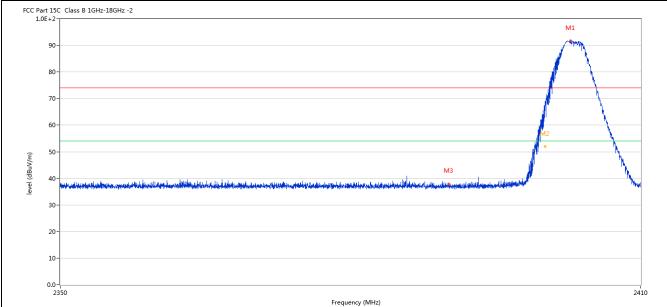
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# 7.6 Test Result

Product:	Mechanical 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	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2402.682	91.27	-3.57	74.0	17.68	Peak	163.00	100	Horizontal	N/A
2	2400.000	67.40	-3.57	74.0	-6.60	Peak	224.71	100	Horizontal	Pass
2**	2400.000	52.05	-3.57	54.0	-1.95	AV	224.71	100	Horizontal	Pass
3	2390.000	37.57	-3.53	74.0	-36.43	Peak	133.00	100	Horizontal	Pass

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]	Product: Mechani			Keyboard		Detect	or		Vertical	
	Mode	de Keeping Transmitting				Test Vol	tage	DC3.7V		
Te	mperature		24 de	g. C,		Humidity		56% RH		
Те	est Result:		Pas	ss						
	t 15C Class B 1GHz-18GH	z -2			•					
1.01	LTZ								M1	
	90-								∕~m⊾	
	80-									
	70-								1	
	60-									
	00									
(m//m)	50-							M2		
/el (dBuV/m)	50 -	<del>disambani sanka karaba diska</del> nsa diskansa diskansa diskansa diskansa diskansa diskansa diskansa diskansa diskansa	الباعدة المستواب شارة المتعان وأرأ المتعادة	lein ville og trekning de hiller for en og skaper om bes	a de la companya de l	M3	والمراجعة	M2 •		Muse
level (dBuV/m)	40-	Namentalisassi kasta	وه عليه المأرون والمرون المرون والمرون	hipmiline pripale algorithm de strange angele angele	i,han deployadi kilonadi elektronik da kilonadi elektronik da di kilonadi elektronik da di kilonadi elektronik		ent-perhaps over a physioper of the	M2 •		Mary
level (dBuV/m)	40-colonial hallonial immerioration	Newsonie lander der die des des des des conservations des des conservations de la conservation de la conserv	e appelike samilye sis ee see eele oord	الأسطاء ي المحافظية كالأوادة والمحافظة المحافظة المحافظة المحافظة المحافظة المحافظة المحافظة المحافظة المحافظة	الدورة والمراورة		and-optilyage.whereaph.georgis.ph	M2 •		Marie
level (dBuV/m)	40-	hikuwani tambin bari badika sahiri sasa mayad	دهی کارد دید اور در	kai milian pipula di pilipula di pina di	i kana da paga paga kata paga paga paga paga paga paga paga p		المراوسية المتاب مراحد جينة التاب المعط	M2 o		Marie
level (dBuV/m)	40-colonial hallonial immerioration	Newsquisembrahardistiskassiskovaanaaris	n aggebile seal for the everytheself	kel-milion is phenkedy blinker bereden der souph	ो सम्बंध अवशेषी करते हुं गई क्षिप्तक के हैं		and-yearlings with or a file-general signific	MAZ •		Marie
	30 - 10 - 0.	hiperatul samiya harqidd diribi ga alah isa san unun san	enga kilannin (n. 12-viral) e od	kakundan pipula di pilipi katungan pipula di pilipi katungan pipula di pilipi katungan pipula di pilipi katung	्रोत्याः सम्बंधक क्रमोत्तेष्यः क्रमोत्तेष्यः क्रमोत्तेष्यः क्रमोत्त्रः स्थापः क्रमोत्ताः क्रमोत्ताः क्रमोत्ता		ade-politique un resiliant de la politique	M12		M
	30 - 20 - 10 -	Managairan kan kan dini disik asi dan cara mara ka	n aggebild nearly to a server liberal		Frequency (MHz)		solvensky versky ve	MAZ •		2410
	30 - 10 - 0.	Results	Factor				Table	Height	ANT	2410 Verdid
	30 - 20 - 10 - 2350				Frequency (MHz)	ing caser in national published publ	Table (o)	Height (cm)	ANT	I
No.	30- 20- 10- 2350 Frequency	Results	Factor	Limit	Frequency (MHz)  Over Limit	ing caser in national published publ		_	ANT Vertical	I
No.	30- 20- 10- 0.0- 2350 Frequency (MHz)	Results (dBuV/m)	Factor (dB)	Limit (dBuV/m)	Frequency (MHz)  Over Limit (dB)	Detector	(o)	(cm)		Verdi
	20- 10- 2350 Frequency (MHz) 2402.382	Results (dBuV/m) 87.98	Factor (dB) -3.57	Limit (dBuV/m) 74.0	Frequency (MHz)  Over Limit (dB)  13.98	Detector Peak	(o) 283.00	(cm)	Vertical	Verdid

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Date: 2023-10-27

2\*\*

2483.500

46.07

-3.57

54.0



F	Product: Mechanical Keyboard			luct: Mechanical Keyboard Polarity		olarity		Horizont	al	
	Mode Keeping Transmitting			-		t Voltage		DC3.7V		
Teı	mperature		24	deg. C,		Hı	umidity			
Te	st Result:		]	Pass						
CC Part 1.0E	: 15C Class B 1GHz-18GI	Hz -2			1			•		
level (dBuV/m)	90 - 80 - 70 - 60 - 50 - 40 - 14 - 14 - 14 - 14 - 14 - 14 - 1	anne de la sellación de sega de la sega de l	M1	N. S.	Dagana Maria da	lander skundervar i kalen	<del>hayda ah</del> lang an neo an haifi ne	Like many on the World agreed and	the continue of the latest and the continue of	of an defining a trade
	10-									
(	0.0- 2470			24	B3.5 Frequency (MHz)					250
No.	Frequency	Results	Factor	Limit	Over	Detector	Table	Height	ANT	Verdi
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	Limit (dB)		(o)	(cm)		
1	2479.388	91.50	-3.57	74.0	17.50	Peak	170.00	100	Horizontal	N/A
2	2483.500	61.01	-3.57	74.0	-12.99	Peak	170.00	100	Horizontal	Pass
			+		+		<b> </b>		+	

-7.93

ΑV

170.00

100

Horizontal

Pass

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I	Product: Mechanical Keyboard						Vertical			
	Mode Keeping Transmitting			ansmitting		Test Vo	ltage	DC3.7V		
Te	emperature 24 deg. C,			g. C,		Humio	lity	56% RH		
Te	est Result:		Pas	SS						
FCC Par	rt 15C Class B 1GHz-18GH E+2-r	lz -2			1			-1		
	90-		M1							
			Mh .	THIN.						
	80-									
	70-			7						
	60-		<i>[</i>							
		A <sup>l</sup>								
	50-	J.		1.1.1	IN.					
BuV/m)	50-			M2	n <sub>M</sub>					
evel (dBuV/m)	50- 40-	ndays actual and propher support and the support		W2	Manarathannananananananananananananananananan	hank alandayasin ya dagan da filona, da gabupa	ding garbang align hingban	harronistra from politica de l'addott	hand the state of	الديورا مرسط فيداطلوطان
level (dBuV/m)	40	nders seek and see seek as well as the seek as the		M2	Manny Manny and an annual property	hark din dispat undarra di ban da pinya	direct gallina in paint dissipate	harraidra frospylosaasitalahil	the second section is the second section of the second section of the second section is the second section of the second section of the second section is the second section of the second section of the sect	ingerlyn o <mark>ddioddiodd</mark>
level (dBuV/m)	40-	ndan sada and an and an		M2	Many	gath dividagis e catavor qilimo, distribuse	diring gathering about high ship	hann a differ for signific accept the debyth	<del>dels y a les disse que l</del> e vide d'Ar	in ferinandistalpa)
level (dBuV/m)	40	adapan kada ada ada ada ada ada ada ada ada ad		W2	Management of the second	ngik divologisi nadised si kuru deladusu	dunan gartening alped inglyddi	him alfra fragylvan erikalan	higher in the section of the section	in ferinandisistes
level (dBuV/m)	40-	ndaning and and an arrangement of the second		M2	Management of the second of th	aph dischages <sub>e</sub> differed er fern des playes	dang-gathaing dapid ingty dal	tarraipes propolescentratural	historia de la companio de la compa	ha fire la procedent de la pile.
	40	ndan salah sada sada sada sada sada sada sada sa		M2		agh dia diasana alban da faran dea dea pa	dang-girinah dipelak ingkadi	harvaides, perspriesses de Abril	hida ya akini ini maza ji siki dhe	
	30 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -	ndaning and and an arrangement of the second				an <sup>t</sup> disch gestes allend er fern des gespe	dang-girthadagadaid ingirad	hamusipa ja agajenaa-ikudam	hinker sekenting and profession	
	30 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -	Results	Factor		5	Detector	Table	Height	ANT	2500
	30 - 20 - 2470		Factor (dB)		; Frequency (MHz)					2500
No.	30- 20- 10- 2470 Frequency	Results		Limit	Frequency (MHz)  Over Limit		Table	Height		2500
	40- 30- 20- 10- 0.0- 2470 Frequency (MHz)	Results (dBuV/m)	(dB)	Limit (dBuV/m)	Frequency (MHz)  Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	2500

Note: 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 with gain -7.30dBi maximum. It fulfills the requirement of this section.

Test Result: Pass

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#### 9.0 20dB Bandwidth Measurement

# **Test Configuration**



# **Test Procedure**

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30kHz RBW and 100kHz VBW.

The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

# Limit

N/A

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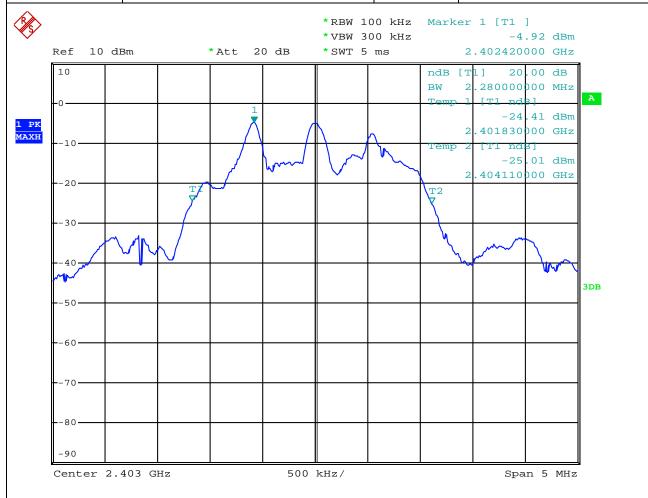
Report No.: TW2307232-01E

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#### **Test Result**

Product:	Mechanical 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	2.280MHz		



Date: 11.OCT.2023 16:59:51

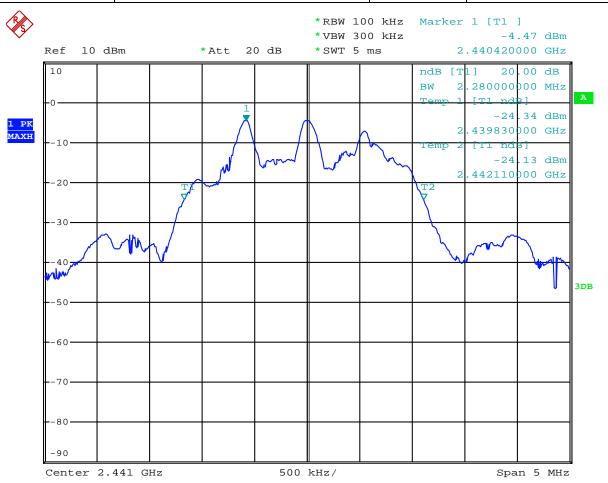
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Product:	Mechanical Keyboard	Test Mode:	Keep transmitting
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	2.280MHz		



Date: 11.0CT.2023 17:07:18

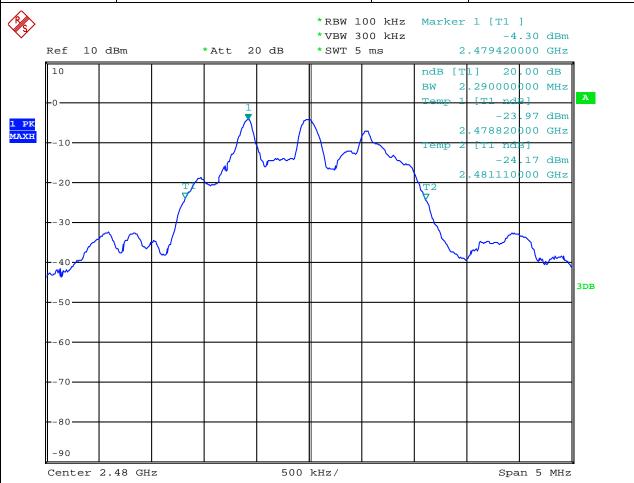
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Product:	Mechanical Keyboard	Test Mode:	Keep transmitting
Mode	Keeping Transmitting	Test Voltage	DC3.7V
Temperature	24 deg. C,	Humidity	56% RH
Test Result:	Pass	Detector	PK
20dB Bandwidth	2.290MHz		



Date: 11.0CT.2023 16:52:53

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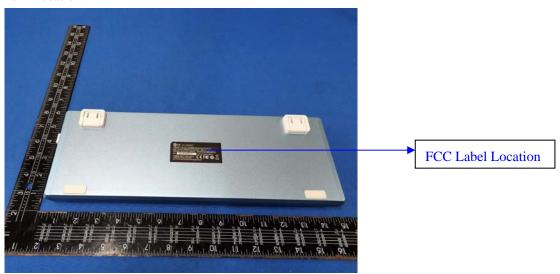
# 10.0 FCC ID Label

#### FCC ID: TUVET-8931A

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



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#### 11.2 Photographs – EUT

#### Outside View





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Outside View



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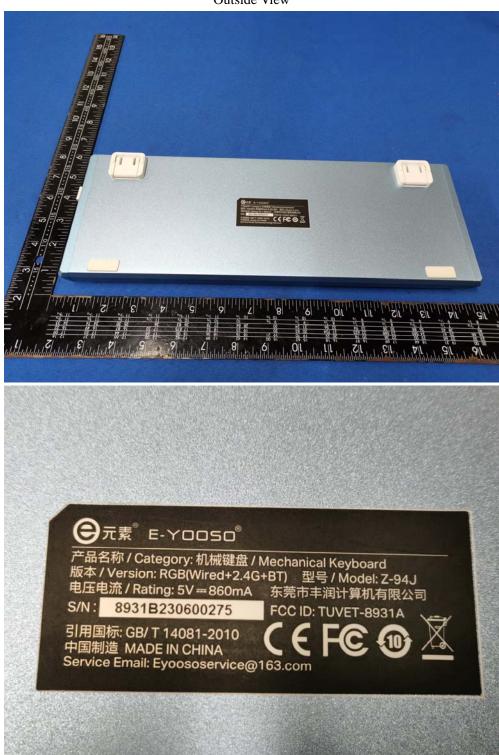
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Outside View



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Outside View





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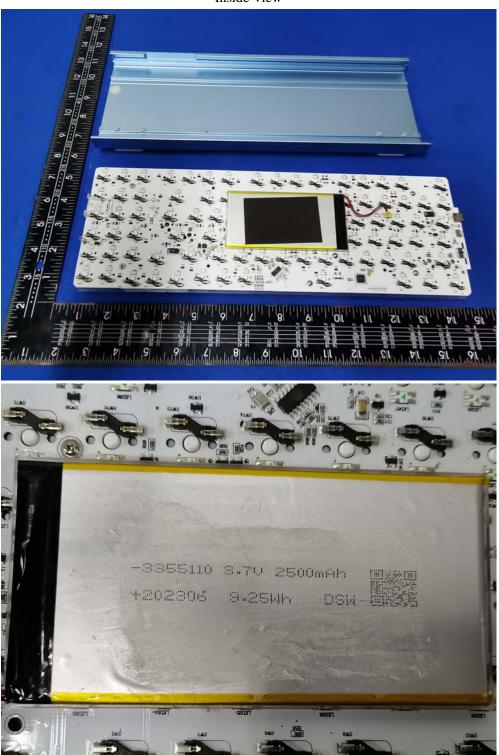
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Inside View



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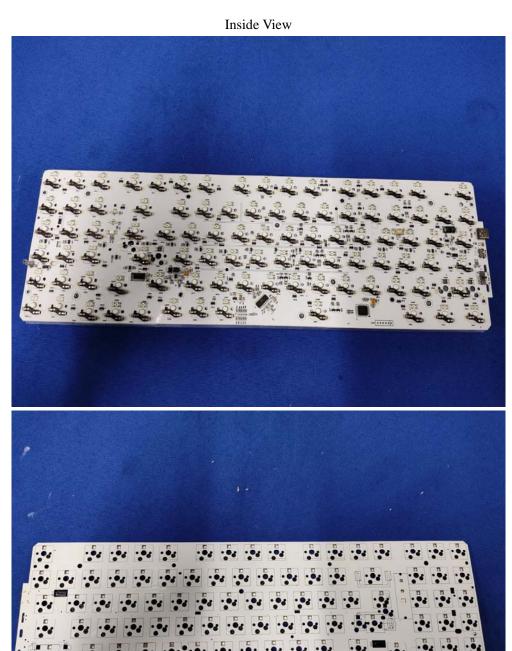
adopt any other remedies which may be appropriate.

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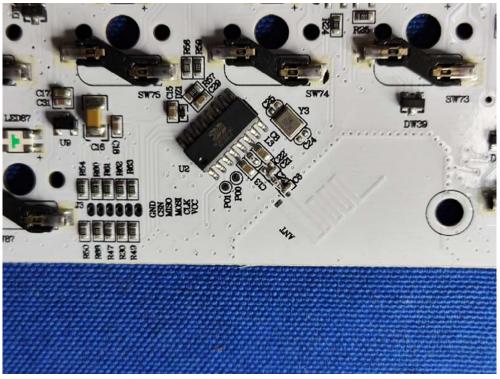


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# Inside View



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