

Report No.: TW2304088-02E

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

Product: Wireless Keyboard

Model No.: ST-BK32

Trademark: N/A

Test Standards: FCC Part 15.249

Test result:

It is herewith confirmed and found to comply with the

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

electromagnetic compatibility

Approved By

Terry long

Terry Tang

Manager

Dated: May 09, 2023

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

# SHENZHEN TIMEWAY TESTING LABORATORIES

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

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

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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 17025:2017 General Requirements) for the Competence of testing Laboratories.

# FCC-Registration No.: 744189

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

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

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

# A2LA (Certification Number: 5013.01)

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

**CAB identifier: CN0033** 

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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.

11.0

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Photo of Test Setup and EUT View.

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

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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: Shenzhen Star Sources Electronic Technology Co., Ltd.

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

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

# 1.3 Description of EUT

Product: Wireless Keyboard

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

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

Shenzhen, China

Trademark: N/A
Additional Trademark: N/A
Model Number: ST-BK32
Additional Model Name N/A

Hardware Version: ZV1.1
Software Version: V03

Serial No.: 17657LW100001

Rating: DC3.0V

Battery: 2 pcs AAA batteries

Modulation Type: GFSK (Bluetooth Low Energy)

Operation Frequency: 2402-2480MHz

Channel Separate: 2MHz Channel Number: 40

Antenna Designation PCB antenna with gain -1.52dBi Max (Get from the antenna specification)

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1.4 Submitted Sample: 1 Sample

1.5 Test Duration

2023-04-08 to 2023-05-09

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: Terry Tang

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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	2022-07-15	2023-07-14
LISN	R&S	EZH3-Z5	100294	2022-07-18	2023-07-17
LISN	R&S	EZH3-Z5	100253	2022-07-18	2023-07-17
Impuls-Begrenzer	R&S	ESH3-Z2	100281	2022-07-18	2023-07-17
Loop Antenna	EMCO	6507	00078608	2022-07-18	2025-07-17
Spectrum	R&S	FSIQ26	100292	2022-07-15	2023-07-14
Horn Antenna	A-INFO	LB-180400-KF	J211060660	2022-07-18	2025-07-17
Horn Antenna	R&S	BBHA 9120D	9120D-631	2022-07-18	2024-07-17
Power meter	Anritsu	ML2487A	6K00003613	2022-07-18	2023-07-17
Power sensor	Anritsu	MA2491A	32263	2022-07-18	2023-07-17
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2022-07-18	2025-07-17
9*6*6 Anechoic			N/A	2022-07-26	2025-07-25
EMI Test Receiver	RS	ESVB	826156/011	2022-07-15	2023-07-14
EMI Test Receiver	EMI Test Receiver RS		834115/006	2022-07-15	2023-07-14
Spectrum	HP/Agilent	E4407B	MY50441392	2022-07-15	2023-07-14
Spectrum	RS	FSP	1164.4391.38	2022-07-15	2023-07-14
RF Cable	Zhengdi	ZT26-NJ-NJ-8M/FA		2022-07-15	2023-07-14
RF Cable	Zhengdi	7m		2022-07-15	2023-07-14
Pre-Amplifier	Schwarebeck	BBV9743	#218	2022-07-15	2023-07-14
Pre-Amplifier	HP/Agilent	8449B	3008A00160	2022-07-15	2023-07-14
LISN	SCHAFFNER	NNB42	00012	2022-08-18	2023-07-17
ESPI Test Receiver	R&S	ESPI 3	100379	2022-07-15	2023-07-14
LISN	R&S	EZH3-Z5	100294	2022-07-18	2023-07-17

# 2.2 Automation Test Software

#### For Conducted Emission Test

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

# For Radiated Emissions

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

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

#### 3.2 Test Standards

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

#### 4.0 EUT Modification

No modification by SHENZHEN TIMEWAY TESTING LABORATORIES

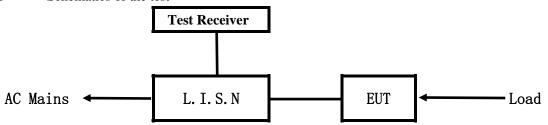
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#### 5. Power Line Conducted Emission Test

# 5.1 Schematics of the test



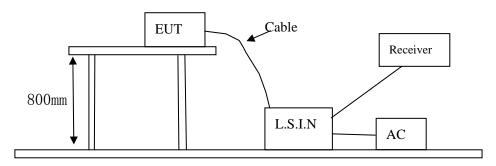
**EUT: Equipment Under Test** 

# 5.2 Test Method and test Procedure

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

Test Voltage: N/A

Block diagram of Test setup



# 5.3 Configuration of the EUT

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

40 channels are provided to the EUT

#### A. EUT

Device	Manufacturer	Model	FCC ID	
Wireless Keyboard	Shenzhen Star Sources Electronic		ZJEST-BK32	
	Technology Co., Ltd.	ST-BK32	ZJĽO I-DNOZ	

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#### B. Internal Device

Device	Manufacturer	Model	FCC ID/DOC
N/A			

#### C. Peripherals

Device	Manufacturer	Model	Rating
N/A			

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.10-2013

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

5.5 Power line conducted Emission Limit according to Paragraph 15.207

Frequency	Limits (dB µ V)			
(MHz)	Quasi-peak Level	Average Level		
$0.15 \sim 0.50$	66.0~ 6.0*	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:

N/A

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

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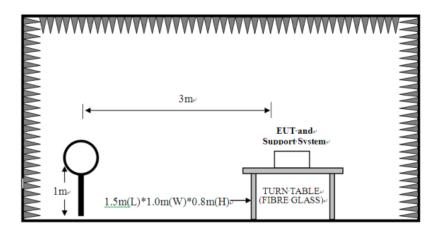


#### **6** Radiated Emission Test

- 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



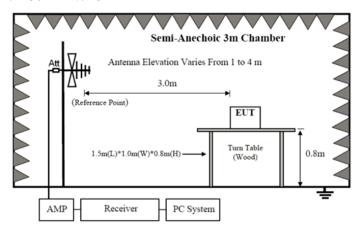
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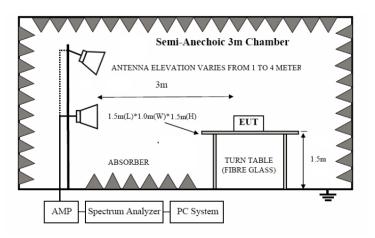
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For radiated emissions from 30MHz to1GHz



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.

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#### 6.4 Radiated Emission Limit

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

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

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

Note:

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

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

Frequency Range (MHz)	Distance (m)	Field strength (dB $\mu$ V/m)
0.009-0.490	3	20log(2400/F(kHz)) +40log (300/3)
0.490705	3	20log(24000/F(kHz)) +40log (30/3)
1.705-30	3	69.5
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note:

- 1. RF Voltage  $(dBuV) = 20 \log RF \text{ Voltage } (uV)$
- 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. For radiated emissions from 9kHz to 30MHz, the emission level is much less than the limit for more than 20dB. No necessary to take down the record.
- 6. New batteries were used during tests.

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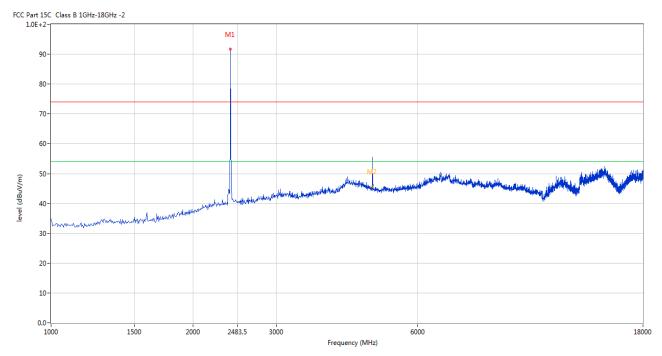


#### 6.5 Test result

# A Fundamental & Harmonics Radiated Emission Data

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

#### Horizontal



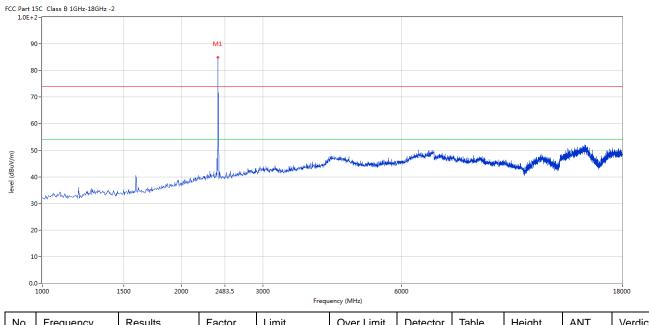
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table (o)	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)			(cm)		
1	2402	91.64	-3.57	114.0	-22.36	Peak	200.00	100	Horizontal	Pass
2	4802.799	55.63	3.12	74.0	-18.37	Peak	291.00	100	Horizontal	Pass
2**	4802.799	45.55	3.12	54.0	-8.45	AV	291.00	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	2402	85.01	-3.57	114.0	-28.99	Peak	314.00	100	Vertical	Pass

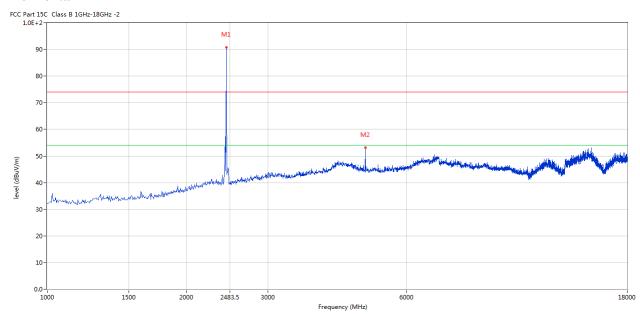
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Please refer to the following test plots for details: Middle Channel-2441MHz

#### **Horizontal**



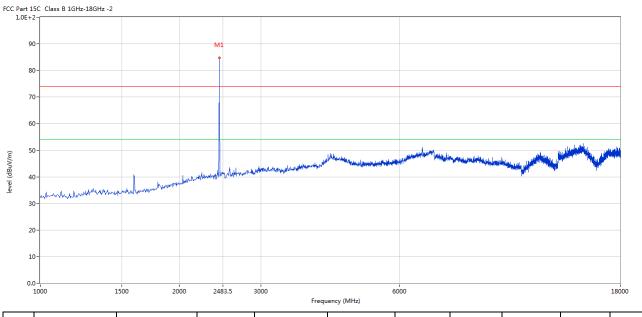
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2440	90.69	-3.57	114.0	-23.31	Peak	59.00	100	Horizontal	Pass
2	4879.280	53.01	3.20	74.0	-20.99	Peak	260.00	100	Horizontal	Pass

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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	2440	84.67	-3.57	114.0	-29.33	Peak	159.00	100	Vertical	Pass

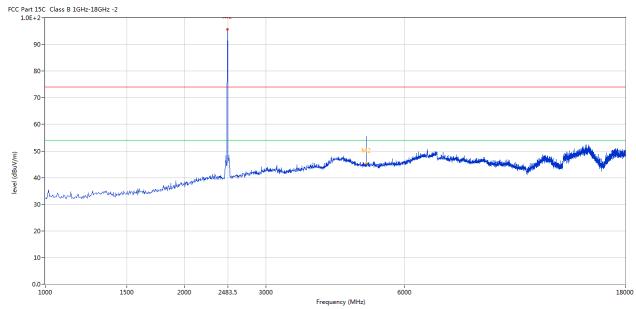
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Please refer to the following test plots for details: High Channel-2480MHz

#### Horizontal



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2480	95.65	-3.57	114.0	-18.35	Peak	245.00	100	Horizontal	Pass
1*	2480	86.37	-3.57	114.0	-7.63	AV	245.00	100	Horizontal	Pass
2	4960.010	55.50	3.36	74.0	-18.50	Peak	292.00	100	Horizontal	Pass
2**	4960.010	45.48	3.36	54.0	-8.52	AV	292.00	100	Horizontal	Pass

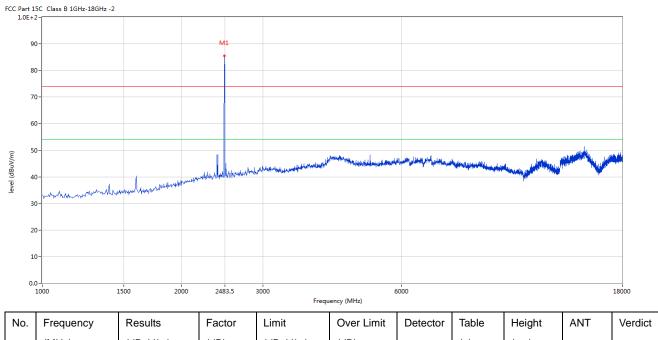
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#### Vertical



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2480	85.47	-3.57	114.0	-28.53	Peak	322.00	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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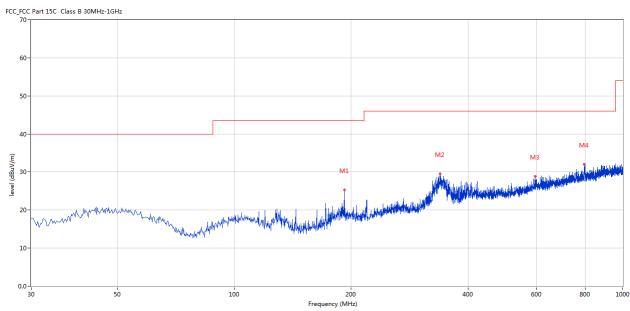


# B. General Radiated Emission Data Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

**Results:** Pass

Please refer to following diagram for individual



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	191.950	25.31	-14.07	43.5	-18.19	Peak	97.00	200	Horizontal	Pass
2	338.868	29.52	-9.77	46.0	-16.48	Peak	201.00	100	Horizontal	Pass
3	595.611	28.93	-5.20	46.0	-17.07	Peak	0.00	200	Horizontal	Pass
4	796.836	32.10	-3.06	46.0	-13.90	Peak	316.00	100	Horizontal	Pass

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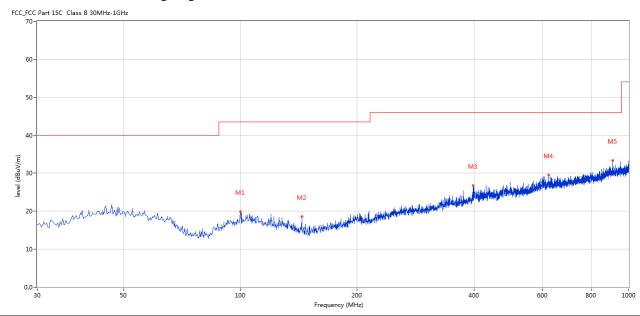


# Radiated Emission In Vertical (30MHz----1000MHz)

EUT set Condition: Keep Tx transmitting

**Results:** Pass

Please refer to following diagram for individual



No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	100.065	19.85	-13.52	43.5	-23.65	Peak	94.00	200	Vertical	Pass
2	143.947	18.59	-17.10	43.5	-24.91	Peak	105.00	100	Vertical	Pass
3	397.538	26.74	-8.71	46.0	-19.26	Peak	193.00	100	Vertical	Pass
4	621.552	29.57	-4.85	46.0	-16.43	Peak	257.00	200	Vertical	Pass
5	908.600	33.39	-1.76	46.0	-12.61	Peak	348.00	100	Vertical	Pass

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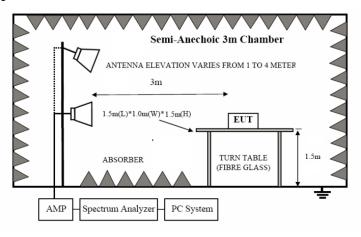


#### 7. Band Edge

#### 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

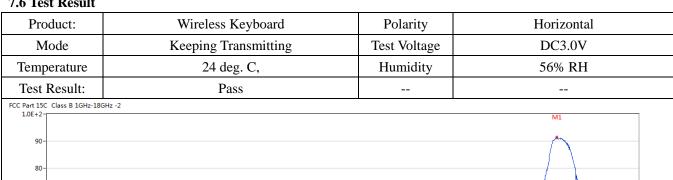
Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

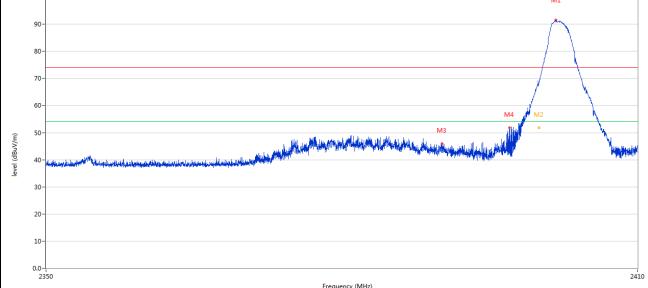
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# 7.6 Test Result





	l	l	ı	l		l		l		
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	Verdict
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dB)		(o)	(cm)		
1	2401.662	93.84	-3.57	74.0	19.84	Peak	300.00	100	Horizontal	N/A
2	2400.042	68.78	-3.57	74.0	-5.22	Peak	300.00	100	Horizontal	Pass
2**	2400.042	52.65	-3.57	54.0	-1.35	AV	300.00	100	Horizontal	Pass
3	2390.025	45.93	-3.53	74.0	-28.07	Peak	107.00	100	Horizontal	Pass
4	2396.863	51.83	-3.56	74.0	-22.17	Peak	300.00	100	Horizontal	Pass
		•		•			_	_		

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4

5

2395.079

2396.623

50.59

50.82

-3.55

-3.56

74.0

74.0

-23.41

-23.18

Peak

Peak

280.00

280.00

100

100

Vertical

Vertical

Pass

Pass



P	roduct:	W	ireless Key	board	De	etector		Vert	tical	
	Mode	Kee	ping Trans	mitting	Test	Voltage		DC3	3.0V	
Ten	nperature		24 deg. C, Humidity			56% RH				
Tes	t Result:		Pass					-		
	art 15C Class B 1GHz-18GHz -2 0E+2- 90-									
	90-							M1		
									$\wedge$	
8	70-									
7										
6	70-						- H			
. 5	60-						M4	M5 M2		
. 5	حالا جالا على المالية	dhe de constant	الديديات الدين		والجراب أبقا والخفاف وأطاع والمادية	and the same of th				Maluamb
	when their rational states in reality attentions		A STATE OF THE PARTY OF THE PAR		dag lijeda sassi "Aber-eksak teleti pilasy	and and any of the state of the	ing all the market in the black	grade ( bis )		ANTHONY
3	10-									
2	10-									
1	.0-									
0	.0-									
	2350									
					Frequency (MHz)					:
No.	Frequency	Results	Factor	Limit	Over Limit	Detector	Table	Height	ANT	ı
No.	Frequency (MHz)	Results (dBuV/m)	Factor (dB)	1	1	Detector	Table (o)	Height (cm)	ANT	ı
	, ,			Limit	Over Limit	Detector Peak			ANT Vertical	ı
No. 1	(MHz)	(dBuV/m)	(dB)	Limit (dBuV/m)	Over Limit (dB)		(0)	(cm)		Verdi N/A Pass
1	(MHz) 2401.812	(dBuV/m) 85.91	(dB) -3.57	Limit (dBuV/m) 74.0	Over Limit (dB) 11.91	Peak	(o) 157.00	(cm)	Vertical	Verdi

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_										
	Product: Wireless Keyboard  Mode Keeping Transmittin  mperature 24 deg C					Polarity			orizontal	
]	Mode	Kee	ping Tran	smitting	T	est Voltag	e	D	C3.0V	
Ten	nperature		24 deg.	C,		Humidity		5	6% RH	
Tes										
C Part 1 1.0E+	rt 15C Class B 1GHz-18GHz -2									
	10-									
7	70-	da								
6	50-	المستمهم بمنطق المال			<b>A</b>					
	:0	principal de la		M	2		Jiring ang palagan dalah d	ianderjadikananikadek	didden and selected by the selected by	
. 5	:0	A STANDARD BY A		M	2		Jiring papaga pangan dalah	ikadelijas dalemanis goldisla	diadeli, addining pit ili tugo an	Malter de la constitución de la
. 5	10 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -	A STANDARD BERTHAMAN STANDARD		M	2 months of the second	nder gerand to be desired the little of	lingupha Albhi	ikadalah padak	diadinative principles	Hallman a hard gar
5 4 3		riting the light of the state o		M	2 months of the second	nggi kanayan ing Angiri dan	Diagraphic Addition	the afternoon of the state of t	diddin minimi y wydd y y ddin y y ddin y	
5 4 3 2		A STANDARD BARBARAN STANDARD S		M	2 month daily		iliangerija prince distribu	the first property and the	didd galaight gall gall ag dha	Make the body
3 2 1 0.		A STANDARD BANK BANK BANK BANK BANK BANK BANK BANK		248:	and the same of th		iliangerija prince distribut	the specific property and specific property	diad in the second se	2
5 4 3 2 1	0-	Results	Factor	•	3.5	Detector	Table	Height	ANT	ı
3 3 2 1 0.	0-2470	Results (dBuV/m)	Factor (dB)	248:	S.5 Frequency (MHz)					ı
3 2 1 0.	00- 00- 00- 00- 00- 00- 00- 00- 00- 00-			248:	S.5 Frequency (MHz)		Table	Height		ı
5 4 3 2	Frequency (MHz)	(dBuV/m)	(dB)	Limit (dBuV/m)	0.5 Frequency (MHz) Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	verdi N/A Pass

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P	roduct:	W	Wireless Keyboard Keeping Transmitting			etector		Ve	rtical	
]	Mode	Kee	ping Trans	smitting	Test	t Voltage		DC	3.0V	
Ten	nperature		24 deg. (	C,	Нι	ımidity		569	% RH	
Tes	st Result:		Pass							
C Part 1	15C Class B 1GHz-18GHz	-2			 		1			
			M1							
g	90-		A-01							
8	80-									
7	70-									
6	50 -									
		· ·	<u> </u>	4						
		the state of the s								
5	50-	1 10 10 10 10 10 10 10 10 10 10 10 10 10		M2	1					
5	50 - 40 -	Market Hall Ball Barrer		M2	And the Later of t					Mary Market
4		- Line of the state of the stat		M2	deligible		A Maria	A CONTRACTOR OF THE PARTY OF TH		
4	30-	A STANSON AND A		M2	dulph beginner	and the state of t	And the broad till conjust	the light was the light of the	erik kasili ya palitan alah bi	
4	10-	marka a shirth a shir		M2	April de la companya	ne glade plane i telebrate, glas per	aga khan ir straft bilindagidd	ak landing and high		
3	30-	A STANSON OF THE STAN		M2	Antilya hakijinkan		aadkaduushillusajar	helipensi internet distribution di second	en he hijire a primari da kanada k	Margarett Mayor Lang
3 2 2	10	A STATE OF THE STA			e mag v over tre v over	ng pingkalang pilabang persepa	ng dipake an hillimenjar	aphronaising a shaight		
3 2 2	10 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -			2483.5	e mag v over tre v over		ng hidipa dirasa fi Milira anja M	de la companie de la	the state of the s	250
3 2 2 0	10	Results	Factor	2483.5	i and a second	Detector	Table	Height	ANT	П
4 3 2 1	10		Factor (dB)	2483.5	; Frequency (MHz)					250 Verdid
4 3 2 1	20- 10- 2470 Frequency	Results		2483.5 Limit	Frequency (MHz)  Over Limit		Table	Height		П
4 2 1 1 0 No.	20- 10- 2470 Frequency (MHz)	Results (dBuV/m)	(dB)	Limit (dBuV/m)	Frequency (MHz)  Over Limit (dB)	Detector	Table (o)	Height (cm)	ANT	Verdio

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 -1.52 dBi maximum. It fulfills the requirement of this section.

Test Result: Pass

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FSK Modulation						
Product:	W	ireless Keyboard		Test Mode:	Keep t	transmitting
Mode	Kee	eping Transmitting		Test Voltage	D	C3.0V
Temperature		24 deg. C,		Humidity	50	5% RH
Test Result:		Pass		Detector		PK
0dB Bandwidth		1.208MHz		-		
	Marker	1 [T1 ndB]	RBW	100 kHz	RF Att	20 dB
Ref Lvl	ndB	20.00 dB	VBW	300 kHz		
10 dBm	BW	1.20841683 MHz	SWT	5 ms	Unit	dBm
10				<b>▼</b> 1 [T	1] -	-1.03 dBm
		1				'4449 GHz
0				ndB	2	20.00 dB
				BW		1683 MHz
-10				V <sub>T1</sub>	<u>[1] -2</u>	
				VT'2 ['	2.4013 [1] -2	88377 GHz 21.15 dBm
-20		<u>/</u>		TI2 ·	2.4025	
-30						11
	~~~			\		
-40						Y.
-50						Land
-60						
-70						
-80						
-90						
Center 2.402	2 GHz	300	kHz/		Sp	an 3 MHz

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Product: Wireless			ess Keybo	ss Keyboard		Test Mode:			Keep transmitting		
Mode		Keeping Transmitting 24 deg. C,				Test Voltage			DC3.0V		
Temperature						Humidity			56% RH		
Test Result:	Pass 1.208MHz				Detector			PK			
0dB Bandwidth											
Ŕ	ľ	Marker	1 [T1 n	ndB]	R	BW	100 ki	łz R	F Att	20 dB	
Ref Lvl	r	ndB	20.	00 dB	V	BW	300 ki	łz			
10 dBm	F	BW 1	1.208416	83 MHz	S	WT	5 ms	s U	nit	dBm	l
10							$\mathbf{v}_1$	[T1]	- (	0.61 dBm	A
				1					2.43974	449 GHz	
0			/	<b>\</b>	1		ndB		20	0.00 dB	
						<u></u>	lacksquare BW $lacksquare$ $lacksquare$ $lacksquare$ $lacksquare$	[T1]	1.20841	.683 MHz J.78 dBm	
-10							1		2.43938		
		T					<del></del>	[T1]	-20	.75 dBm	
-20		7					Ţ,		2.44059	218 GHz	1M2
IMAX											IMA
-30	m							<del>\</del> .	my		
		<b>V</b> • •						~~~			
-40									V		
-50										The housing	
										0.000	
-60											
-70	+										
-80											
-90 Center 2	44 CII-			300	bu≂ /				Con	an 3 MHz	
Center 2	. TT GNZ			300 .	кп2/				Syc	אחויו כ יוי	

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Product: Win		reless Keyboard		est Mode:	Keep transmitting		
Mode	Keepir	ng Transmitting	Te	est Voltage	DC3.0V 56% RH PK 		
Temperature	2	24 deg. C,	I	Humidity			
Test Result:		Pass	]	Detector			
0dB Bandwidth	1	.208MHz					
<b>F</b>	Marker	1 [T1 ndB]	RBW	100 kHz	RF Att	20 dB	
Ref Lvl	ndB	20.00 dB	VBW	300 kHz		_	
10 dBm	BW	1.20841683 MHz	SWT	5 ms	Unit	dBm	
				<b>▼</b> 1 [T	1] -	0.18 dBm	
0		1			2.4797	4449 GHz	
				ndB BW	1.2084	0.00 dB 1683 MHz	
-10				_	T1] -2		
					2.4793	8377 GHz	
-20	T	<u>/</u>		<b>△</b> #5 [	T1] -2		
1MAX					2.4805	9218 GHz <b>1M</b> 2	
-30					my		
-40						<b>V</b>	
-50						- Wh	
-60							
-70							
-80							
-90							
Center 2.	48 GHz	300	kHz/		Sp	an 3 MHz	

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#### 10.0 FCC ID Label

#### FCC ID: ZJEST-BK32

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

Radiated emission test view



Photographs – EUT

Please refer test report TW2304088-01E

-- End of the report--

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

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