

TEST REPORT

CERTIFICATE OF CONFORMITY

Standard: 47 CFR FCC Part 15, Subpart B, Class B
ANSI C63.4-2014
ANSI C63.4a-2017

Report No.: FDBDKG-WTW-P22040386B

Product: Wireless Keyboard

FCC ID.: JNZYR0067

Brand: Logitech

Model No.: Y-R0067

Received Date: 2023/9/6

Test Date: 2023/10/28

Issued Date: 2023/12/14

Applicant: Logitech Far East Ltd.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Hsin Chu Laboratory

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Test Location: No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan

FCC Registration /

Designation Number: 960022 / TW1058

Approved by: _____

Ken Lu / Manager

, Date: _____

2023/12/14

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Prepared by : Vito Lung / Specialist



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Release Control Record

Issue No.	Description	Date Issued
FDBDKG-WTW-P22040386B	Original release.	2023/12/14

1 Certificate

Product: Wireless Keyboard

Brand: Logitech

Test Model: Y-R0067

Sample Status: Engineering sample

Applicant: Logitech Far East Ltd.

Test Date: 2023/10/28

Standard: 47 CFR FCC Part 15, Subpart B, Class B
ANSI C63.4–2014
ANSI C63.4a–2017

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

2 Summary of Test Results

The test items that the EUT needs to perform according to its difference information (see section 3.1, Note 1) with the original report evaluation are as follows:

Standard / Clause	Test Item	Result	Remark
FCC Part 15.109	Radiated Emissions up to 1 GHz	Pass	Minimum passing Class B margin is -5.79 dB at 923.53 MHz

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Specification	Expanded Uncertainty (k=2) (±)	Maximum allowable uncertainty (±)
Radiated Emissions up to 1 GHz	30 MHz ~ 1 GHz	4.43 dB	6.3 dB (U_{CISPR})

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

2.2 Supplementary Information

There is not any deviation from the test standards for the test method, and no modifications required for compliance.

3 General Information

3.1 Description of EUT

Product	Wireless Keyboard
Brand	Logitech
Test Model	Y-R0067
Sample Status	Engineering sample
Operating Software	NA
Power Supply Rating	3 Vdc from battery
Accessory Device	NA
Data Cable Supplied	NA
Wireless Operating Frequency	2405MHz ~ 2474MHz

Note:

1. This is a supplementary report of Report No.: FC180115E03. The differences between them are as below information:
 - ◆ Inductors and capacitors will be changed from 0402 to 0201 size (include L1, L3, L2, C4, C5, C1, C2, C6, C7, C3, C10, C16)
 - ◆ Crystal XT1 package from PTH to SMD (mount method change): XT1, C12
2. According to above conditions and the applicant's requirement, only radiated emissions (up to 1GHz) test item needs to be performed. And all data are verified to meet the requirements.
3. The EUT may have a lot of colors for marketing requirement.
4. The product be supplied by primary alkaline batteries.

3.2 Primary Clock Frequencies of Internal Source

The highest frequency generated or used within the EUT or on which the EUT operates or tunes is 2474, provided by Logitech Far East Ltd., for detailed internal source, please refer to the manufacturer's specifications.

3.3 Features of EUT

The tests reported herein were performed according to the method specified by Logitech Far East Ltd., for detailed feature description, please refer to the manufacturer's specifications or user's manual.

3.4 Operating Modes of EUT and Determination of Worst Case Operating Mode

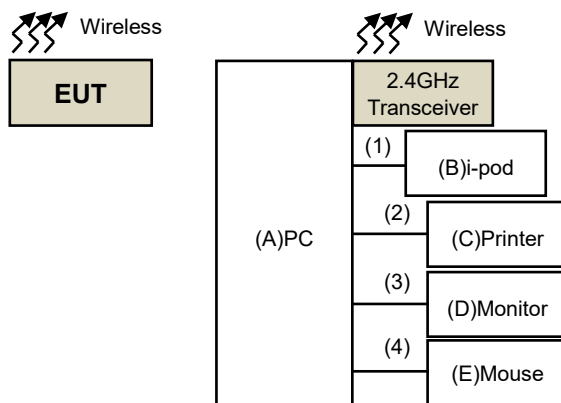
Test mode is presented in the report as below.

Test Condition	
Mode	Radiated Emissions up to 1 GHz
A	Typical Operation + Input Power(3 Vdc from battery) + Remark(Normal mode)

3.5 Test Program Used and Operation Descriptions

1. Turn on the power of all equipment.
2. EUT links with support unit A (PC) via wireless.
3. Support unit A (PC) runs "Note.exe" to check typical use condition of EUT via presses "H" key.
4. Support unit A (PC) runs "EMC test.exe" then sends "H" messages to support unit D (Monitor).

3.6 Connection Diagram of EUT and Peripheral Devices



3.7 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	PC	Lenovo	M710s	PC0YD3ZY	N/A	Provided by Lab
B	i-pod	Apple	MD778TA/A	CC4JMCMXF4T1	N/A	Provided by Lab
C	Printer	EPSON	LQ-300+II	G88Y074085	DoC	Provided by Lab
D	Monitor	LG	24UD58	806NTSU6H462	DoC	Provided by Lab
E	Mouse	Logitech	M-U0026	810-002182_002	DoC	Provided by Lab

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	USB-A cable	1	0.1	Yes	0	Provided by Lab
2	USB-A to B cable	1	1.8	Yes	0	Provided by Lab
3	DP cable	1	1.8	Yes	0	Provided by Lab
4	USB-A cable	1	1.8	Yes	0	Provided by Lab

4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.1 Radiated Emissions up to 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Antenna Tower & Turn Table CT	N/A	N/A	N/A	N/A
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-358	2023/10/16	2024/10/15
		9168-359	2023/10/17	2024/10/16
Fixed Attenuator Mini-Circuits	UNAT-5+	CHF-001	2023/7/1	2024/6/30
Fixed attenuator Mini-Circuits	UNAT-5+	CHF-002	2023/7/1	2024/6/30
MXE EMI Receiver Agilent	N9038A	MY50010125	2023/3/24	2024/3/23
		MY50010132	2023/6/21	2024/6/20
Preamplifier Sonoma	310N	352925	2023/7/1	2024/6/30
		352926	2023/7/1	2024/6/30
RF Coaxial Cable PEWC	8D	8DCAB-001	2023/7/1	2024/6/30
	8D-FB	CHFCAB-001-1	2023/7/1	2024/6/30
		CHFCAB-001-3	2023/7/1	2024/6/30
		CHFCAB-001-4	2023/7/1	2024/6/30
		CHFCAB-002-1	2023/7/1	2024/6/30
		CHFCAB-002-3	2023/7/1	2024/6/30
		CHFCAB-002-4	2023/7/1	2024/6/30
		CHFCAB-003-1	2023/7/1	2024/6/30
		CHFCAB-003-3	2023/7/1	2024/6/30
Software BV	ADT_Radiated_V8.7.08	N/A	N/A	N/A

Notes:

1. The test was performed in HC - 10m Chamber 1. The test site validated date: 2023/6/29 (NSA)
2. The VCCI Site Registration No. is R-13252.
3. Tested Date: 2023/10/28

5 Limits of Test Items

5.1 Radiated Emissions up to 1 GHz

Emissions radiated outside of the specified bands, shall be according to the general radiated limits as following:

Radiated Emissions Limits at 10 meters (dBµV/m)				
Frequencies (MHz)	FCC 15B, Class A	FCC 15B, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	39.1	29.5	40	30
88-216	43.5	33.1		
216-230	46.4	35.6		
230-960				
960-1000	49.5	43.5	47	37

Radiated Emissions Limits at 3 meters (dBμV/m)				
Frequencies (MHz)	FCC 15B, Class A	FCC 15B, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	49.5	40.0	50.5	40.5
88-216	54.0	43.5		
216-230	56.9	46.0		
230-960				
960-1000	60.0	54.0	57.5	47.5

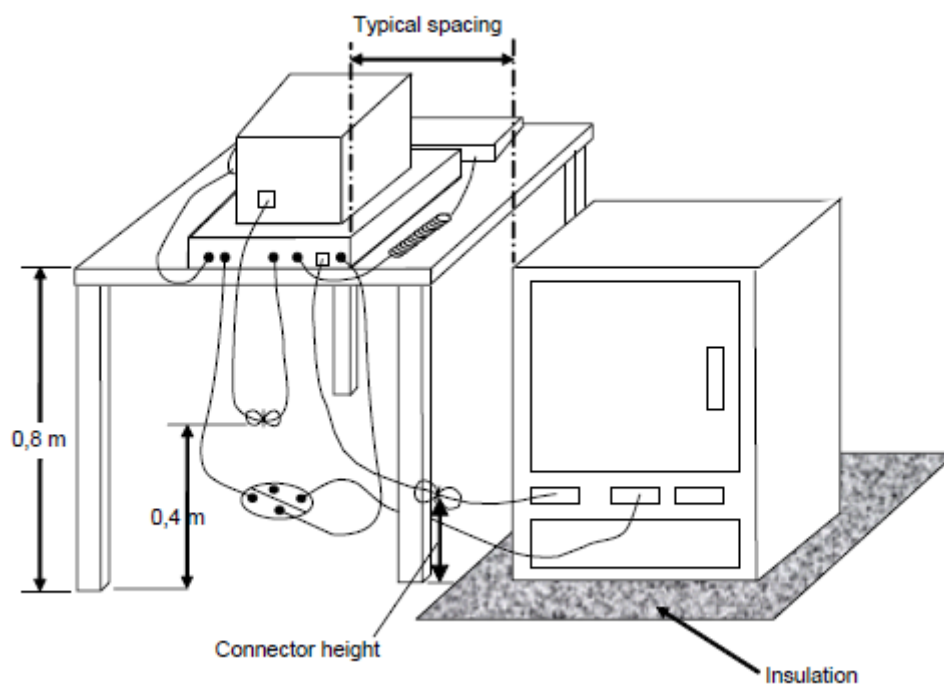
Notes: 1. The lower limit shall apply at the transition frequencies.

6 Test Arrangements

6.1 Radiated Emissions up to 1 GHz

- For the table-top EUT is placed on a 0.8 meter to the top of rotating table; for the floor standing EUT shall be insulated (by insulation of 12 mm) from the horizontal reference ground plane. The rotating table is rotated 360 degrees to determine the position of the highest radiation. If the equipment requires a dedicated ground connection, this shall be provided and bonded to the RGP.
- The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is up to 1 GHz.

Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for quasi-peak detection (QP) at frequency up to 1GHz.



For the actual test configuration, please refer to the related Item – Photographs of the Test Configuration.

7 Test Results of Test Item

7.1 Radiated Emissions up to 1 GHz

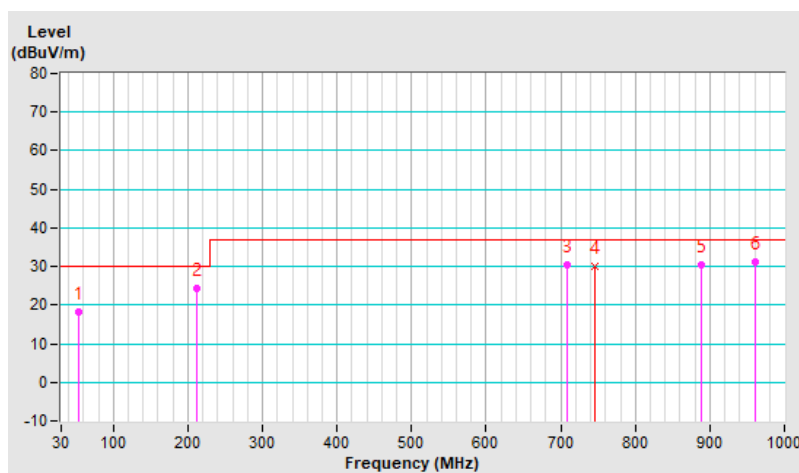
Mode A

Frequency Range	30 MHz ~ 1 GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120 kHz
Input Power	3 Vdc from battery	Environmental Conditions	25°C, 63% RH
Tested By	Richard Huang		

Antenna Polarity & Test Distance : Horizontal at 10 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	52.57	18.15 QP	30.00	-11.85	4.00 H	74	30.85	-12.70
2	212.55	24.14 QP	30.00	-5.86	3.00 H	71	38.61	-14.47
3	708.03	30.38 QP	37.00	-6.62	2.00 H	34	31.77	-1.39
4	746.08	30.11 QP	37.00	-6.89	1.00 H	317	30.20	-0.09
5	887.90	30.44 QP	37.00	-6.56	1.00 H	270	28.25	2.19
6	960.62	31.11 QP	37.00	-5.89	4.00 H	126	27.46	3.65

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
– Pre-Amplifier Factor (dB)
3. Margin value = Emission level – Limit value
4. The other emission levels were very low against the limit.

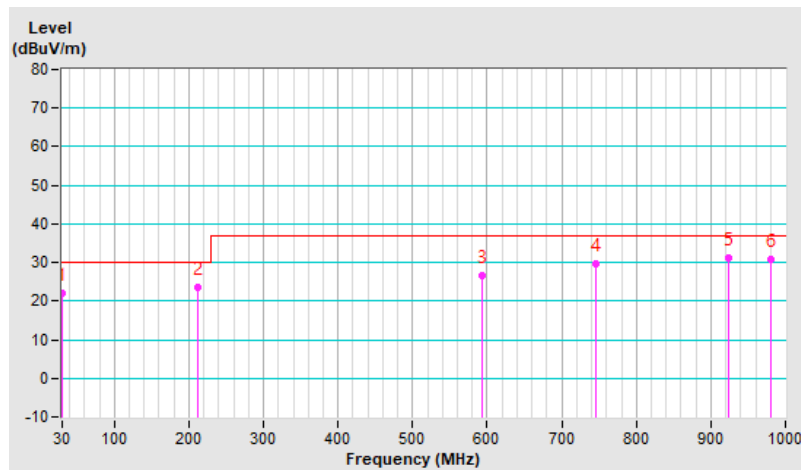


Frequency Range	30 MHz ~ 1 GHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP), 120 kHz
Input Power	3 Vdc from battery	Environmental Conditions	25°C, 63% RH
Tested By	Richard Huang		

Antenna Polarity & Test Distance : Vertical at 10 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	30.29	22.16 QP	30.00	-7.84	1.00 V	76	36.54	-14.38
2	212.07	23.61 QP	30.00	-6.39	2.00 V	353	38.76	-15.15
3	593.99	26.72 QP	37.00	-10.28	1.00 V	343	29.73	-3.01
4	746.05	29.59 QP	37.00	-7.41	2.00 V	99	29.75	-0.16
5	923.53	31.21 QP	37.00	-5.79	1.00 V	264	27.76	3.45
6	979.79	30.76 QP	37.00	-6.24	3.00 V	193	26.19	4.57

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
– Pre-Amplifier Factor (dB)
3. Margin value = Emission level – Limit value
4. The other emission levels were very low against the limit.



8 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo)

9 Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

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