RF Exposure Report

Report No.:	SABDKG-WTW-P20110147
FCC ID:	JNZVR0020
Test Model:	VR0020
Received Date:	Nov. 10, 2020
Test Date:	Mar. 09 to 19, 2021
Issued Date:	May 07, 2021
Applicant:	Logitech Far East Ltd
Address:	7700 Gateway Boulevard Newark California United States
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
SABDKG-WTW-P20110147	Original release.	May 07, 2021

1 Certificate of Conformity

Product:	Camera and Speakerphone
Brand:	Logitech
Test Model:	VR0020
Sample Status:	Engineering sample
Applicant:	Logitech Far East Ltd
Test Date:	Mar. 09 to 19, 2021
Standards:	FCC Part 2 (Section 2.1091)
References Test Guidance:	KDB 447498 D01 General RF Exposure Guidance v06

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.

Prepared by : Phoenix Huang , **Date:** May 07, 2021

Phoenix Huang / Specialist

Approved by : , **Date:** May 07, 2021

Clark Lin / Technical Manager

2 RF Exposure

2.1 Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (minutes)
Limits For General Population / Uncontrolled Exposure				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	…	…	f/1500	30
1500-100,000	…	…	1.0	30

f = Frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Formula

$Pd = (Pout*G) / (4*pi*r^2)$

where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

2.3 Classification

The antenna of this product, under normal use condition, is at least 20 cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

Antenna No.	RF Chain No.	Brand	Model	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type	Cable Length (mm)
ANT 0	Chain 0	FIH	PCB	7.35	2.4~2.4835	Monopole	i-pex(MHF)	85
				7.92	5.15~5.25			
				8.71	5.25~5.35			
				8.7	5.47~5.725			
				7.7	5.725~5.85			
ANT 1	Chain 1	FIH	PCB	5.06	2.4~2.4835	Monopole	i-pex(MHF)	100
				7.12	5.15~5.25			
				7.5	5.25~5.35			
				7.02	5.47~5.725			
				6.17	5.725~5.85			
Note: The Bluetooth technology will fix transmission on Chain (0)								

Note: The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

2.5 Calculation Result of Maximum Conducted Power

Operation Mode	Evaluation Frequency (MHz)	Max. Average Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
WLAN (2.4GHz)	2412~2462	232.256	9.29	20	0.39237	1
WLAN (U-NII-1)	5180~5240	69.047	10.54	20	0.15555	1
WLAN (U-NII-2A)	5260~5320	73.738	11.14	20	0.19073	1
WLAN (U-NII-2C)	5500~5720	82.227	10.91	20	0.20172	1
WLAN (U-NII-3)	5745~5825	214.244	9.98	20	0.42427	1
BT-LE	2402~2480	0.526	7.35	20	0.00057	1

Note:

1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. WLAN 2.4GHz: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 9.29 dBi
3. WLAN 5GHz:
   U-NII-1: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 10.54 dBi
   U-NII-2A: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 11.14 dBi
   U-NII-2C: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 10.91 dBi
   U-NII-3: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 9.98 dBi

Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

WLAN 2.4GHz + WLAN 5GHz = 0.39237 / 1 + 0.42427 / 1 = 0.81664

WLAN 2.4GHz + Bluetooth = 0.39237 / 1 + 0.00057 / 1 = 0.39294

WLAN 5GHz + Bluetooth = 0.42427 / 1 + 0.00057 / 1 = 0.42484

Therefore the maximum calculations of above situations are less than the "1" limit.

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