RF Exposure Report

Report No.:	SA190311E06
FCC ID:	2AH3O-MLM10
Test Model:	LBCA2BZZFZ-710
Received Date:	Mar. 11, 2019
Test Date:	Mar. 28 to Apr. 08, 2019
Issued Date:	May 27, 2019
Applicant:	Rapsodo Pte Ltd
Address:	Blk 67, Ayer Rajah Crescent, #04-10, Singapore 139950
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 R.O.C.
Test Location :	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
SA190311E06	Original release.	May 27, 2019

1   Certificate of Conformity

Product:	Bluetooth Module
Brand:	Murata Electronics
Test Model:	LBCA2BZZFZ-710
Sample Status:	MASS-PRODUCTION
Applicant:	Rapsodo Pte Ltd
Test Date:	Mar. 28 to Apr. 08, 2019
Standards:	FCC Part 2 (Section 2.1091)
	KDB 447498 D01 General RF Exposure Guidance v06
	IEEE C95.1-1992

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 : _Wendy Wu_ , **Date:** May 27, 2019

Wendy Wu / Specialis

Approved by : _____ , **Date:** May 27, 2019

May Chen / 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 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 Antenna Gain

For BT used							
Antenna No	Transmitter Circuit	Brand	Model	Antenna Gain (dBi)	Frequency range(GHz)	Antenna Type	Connector Type
1	Chain (0)	Murata	LDA313G2613M-322	-3	2.4~2.4835	Monopole	NA

For 24GHz used						
Antenna No	Brand	Model	Antenna Gain (dBi)	Frequency range(GHz)	Antenna Type	Connector Type
1	InnoSent	SMR-333	7	24~24.25	Integrated Patch Antenna	NA

2.5   Calculation Result of Maximum Conducted Power

For BT-LE

Operation Mode	Frequency Band (MHz)	Max Power (mW)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm²)	Limit (mW/cm²)
Bluetooth-LE	2402	0.3155	-3	20	0.00003	1

For 24GHz (FCC ID: UXS-SMR3X3)

Operation Mode	Frequency Band (MHz)	Field Strength of Fundamental (dBuV/m)	Pout EIRP (dBm)	Pout EIRP (mW)	Distance (cm)	Power Density (mW/cm²)	Limit (mW/cm²)
24GHz	24169	106.14	10.91	12.331	20	0.00245	1

Field strength is then converted to EIRP as follows:

(i) $EIRP = ((E*d)^2) / 30$
    where:

    E is the field strength in V/m;
    d is the measurement distance in meters;
    EIRP is the equivalent isotropically radiated power in watts.

(ii) Working in dB units, the above equation is equivalent to:

    $EIRP[dBm] = E[dB\mu V/m] + 20\log(d[meters]) - 104.77$

(iii) Or, if d is 3 meters: $EIRP[dBm] = E[dB\mu V/m] – 95.23$

Note:

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

Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

BT-LE +24GHz = 0.00003 / 1 + 0.00245 / 1 = 0.00248

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

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