

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

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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**FCC Registration /
Designation Number:** 723255 / TW2022

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Table of Contents

Release Control Record	3
1 Certificate of Conformity	4
2 RF Exposure	5
2.1 Limits For Maximum Permissible Exposure (MPE)	5
2.2 MPE Calculation Formula	5
2.3 Classification	5
2.4 Antenna Gain	6
2.5 Calculation Result Of Maximum Conducted Power	7

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 : May Chen , **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

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 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/cm ²)	Limit (mW/cm ²)
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/cm ²)	Limit (mW/cm ²)
24GHz	24169	106.14	10.91	12.331	20	0.00245	1

Field strength is then converted to EIRP as follows:

- (i) $EIRP = ((E \cdot d)^2) / 30$
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:

- 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:

$$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$$

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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