

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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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.

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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

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

where

Pd = power density in mW/cm²

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/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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