

RF Exposure Report

Report No.: SABCLD-WTW-P21060790

FCC ID: QI3BEC-MX241NP

Test Model: BEC MX-241NP

Received Date: Jun. 24, 2021

Test Date: Jul. 07 ~ Jul. 09, 2021

Issued Date: Sep. 11, 2021

Applicant: BILLION ELECTRIC CO., LTD.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lin Kou Laboratories

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Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City
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**FCC Registration /
Designation Number:** 788550 / TW0003



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Release Control Record

Issue No.	Description	Date Issued
SABCLD-WTW-P21060790	Original release	Sep. 11, 2021

1 Certificate of Conformity

Product: 4G LTE CBRS Wi-Fi Router

Brand: BEC, BILLION

Test Model: BEC MX-241NP

Sample Status: Engineering sample

Applicant: BILLION ELECTRIC CO., LTD.

Test Date: Jul. 07 ~ Jul. 09, 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 RF characteristics under the conditions specified in this report.

Prepared by : Celine Chou , **Date:** Sep. 11, 2021
Celine Chou / Senior Specialist

Approved by : Bruce Chen , **Date:** Sep. 11, 2021
Bruce Chen / Senior Engineer

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				
300-1500	F/1500	30
1500-100,000	1.0	30

F = Frequency in MHz

2.2 MPE Calculation Formula

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

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**.

3 Calculation Result of Maximum Conducted Power

Function	Frequency Band (MHz)	Max AV Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
WLAN	2412-2462	24.70	5.82	20	0.224	1.00

Function	Frequency Band (MHz)	Max EIRP Power (dBm)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
LTE B48	3550-3700	22.81	20	0.038	1.00

Note:

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

$$2.4\text{GHz: Directional gain} = 10 \log[(10^{G^1/20} + 10^{G^2/20} + \dots + 10^{G^N/20})^2/2] = 5.82\text{dBi}$$

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

$$\text{WLAN } 2.4\text{GHz} + \text{WWAN} = 0.224 / 1 + 0.038 / 1 = 0.262 < 1$$

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