



Test report No.: 2330006R-RFUSV17S-A

## RF Exposure Report

|   |   |
|---|---|
| Product Name                              | 5G Enterprise Router  |
| Trademark                                 | BEC, Billion  |
| Model and /or type reference              | AirConnect® 8112, BEC AirConnect® 8112, BEC 8112  |
| FCC ID                                    | QI3BEC-8112   |
| Applicant's name / address                | Billion Electric Co., Ltd.<br>8F., No.192, Sec. 2, Zhongxing Rd., Xindian Dist., New Taipei City 231, Taiwan (R.O.C.)                                     |
| Manufacturer's name                       | Billion Electric Co., Ltd.  |
| Test method requested, standard           | KDB 447498 D01 v06<br><input checked="" type="checkbox"/> Minimum test separation distance $\geq 20$ cm<br><input type="checkbox"/> For low power devices |
| Verdict Summary                           | IN COMPLIANCE   |
| Documented By<br>(Supervisor / Jinn Chen) | Jinn Chen   |
| Tested By<br>(Senior Engineer / Jack Hsu) | Jack Hsu  |
| Approved By<br>(Manager / Tim Sung)       | Tim Sung  |
| Date of Receipt                           | 2023/03/01  |
| Date of Issue                             | 2023/06/21  |
| Report Version                            | V1.0  |

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## Competences and Guarantees

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DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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## General conditions

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1. The test results relate only to the samples tested.
2. The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
3. This report must not be used to claim product endorsement by TAF or any agency of the government.
4. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.
5. Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

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## Revision History

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| Report No.          | Version | Description              | Issued Date |
|---------------------|---------|--------------------------|-------------|
| 2330006R-RFUSV17S-A | V1.0    | Initial issue of report. | 2023/06/21  |

## 1. General Information

### 1.1. EUT Description

|                              |  |
|------------------------------|--|
| Product Name                 | 5G Enterprise Router                             |
| Trademark                    | BEC, Billion                                     |
| Model and /or type reference | AirConnect® 8112, BEC AirConnect® 8112, BEC 8112 |
| FCC ID                       | QI3BEC-8112                                      |

Note: For more detailed information please refer to report No.: 2330006R-RFUSV01S-A, 2330006R-RFUSV03S-A and 2330006R-RFUSV23S-A.

## 2. Test Facility

|        |   |
|--------|---|
| USA    | FCC Registration Number: TW0033                       |
| Canada | CAB Identifier Number: TW3023 / Company Number: 26930 |

|                  |                         |
|------------------|-------------------------|
| Site Description | Accredited by TAF       |
|                  | Accredited Number: 3023 |

|                    |  |
|--------------------|--|
| Test Laboratory    | DEKRA Testing and Certification Co., Ltd.                                  |
|                    | Linkou Laboratory  |
| Address            | No.5-22, Ruishukeng Linkou District, New Taipei City, 24451, Taiwan, R.O.C |
| Performed Location | No. 26, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan, R.O.C.  |
| Phone Number       | +886-3-275-7255  |
| Fax Number         | +886-3-327-8031  |

### 3. RF Exposure Evaluation

#### 3.1. Standard Applicable

According to KDB 447498 D01 (7.1), A minimum test separation distance  $\geq 20$  cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits.

#### 3.2. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

##### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

| Frequency Range (MHz)                                     | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | Average Time (Minutes) |
|---|-------------------------------|-------------------------------|-------------------------------------|------------------------|
| (A) Limits for Occupational/ Control Exposures            |                               |                               |                                     |                        |
| 0.3-3.0   | 614                           | 1.63                          | *(100)                              | 6                      |
| 3.0-30  | 1842/f                        | 4.89/f                        | *(900/f <sup>2</sup> )              | 6                      |
| 30-300  | 61.4                          | 0.163                         | 1.0                                 | 6                      |
| 300-1,500   |                               |                               | f/300                               | 6                      |
| 1,500-100,000   |                               |                               | 5                                   | 6                      |
| (B) Limits for General Population/ Uncontrolled Exposures |                               |                               |                                     |                        |
| 0.3-1.34  | 614                           | 1.63                          | *(100)                              | 30                     |
| 1.34-30   | 824/f                         | 2.19/f                        | *(180/f <sup>2</sup> )              | 30                     |
| 30-300  | 27.5                          | 0.073                         | 0.2                                 | 30                     |
| 300-1,500   |                               |                               | f/1500                              | 30                     |
| 1,500-100,000   |                               |                               | 1.0                                 | 30                     |

F= Frequency in MHz

Friis Formula

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

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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

Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is  $\leq 1.0$

## 3.3. Test Result of RF Exposure Evaluation

|           |                        |
|-----------|------------------------|
| Product   | 5G Enterprise Router   |
| Test Item | RF Exposure Evaluation |

| Band       | Frequency (MHz) | E.I.R.P (dBm) | E.I.R.P (mW) | Power Density at R = 20 cm (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|------------|-----------------|---------------|--------------|--|-----------------------------|
| 2.4 GHz    | 2417            | 32.640        | 1836.538     | 0.3654   | 1                           |
| 5 GHz      | 5795            | 34.290        | 2685.344     | 0.5342   | 1                           |
| LTE Band 2 | 1850 - 1910     | 26.900        | 489.779      | 0.0974   | 1                           |
| 5GNR n2    | 1850 - 1910     | 26.900        | 489.779      | 0.0974   | 1                           |

Note: The conducted output power is refer to report No.: 2330006R-RFUSV01S-A, 2330006R-RFUSV03S-A and 2330006R-RFUSV23S-A from the DEKRA. And refer to the tune-up procedure from the customer declaration.

## 3.4. Calculation for Multi-Transmitter

| Band    | Ratios | Result | Limit (mW/cm <sup>2</sup> ) |
|---------|--------|--------|-----------------------------|
| 2.4 GHz | 0.3654 | 0.9970 | 1                           |
| 5 GHz   | 0.5342 |        |                             |
| WWAN    | 0.0974 |        |                             |

Note: Ratios = Power Density / Power Density Limit

|         |      |
|---------|------|
| Results | PASS |
|---------|------|