

# RF Exposure Evaluation Report

**Report No.:** JYTSZ-R12-2400995G1

**Applicant:** Dynamox SA

**Address of Applicant:** Rua Coronel Luiz Caldeira, n 67 Condominio Ybira, Itacorubi, Florianópolis-SC, Brazil, 88034-110

**Equipment Under Test (EUT)**

Product Name: DynaGateway

Model No.: DynaGateway LTE-S

Trade mark: N/A

**FCC ID:** 2AT3M-GTWLTE

**Applicable standards:** FCC CFR Title 47 Part 2 (§2.1091)

**Date of sample receipt:** 13 Aug., 2024

**Date of Test:** 14 Aug., to 11 Nov., 2024

**Date of report issue:** 11 Feb., 2025

**Test Result:** PASS

**Project by:** \_\_\_\_\_

**Date:** 11 Feb., 2025

**Reviewed by:** \_\_\_\_\_

**Date:** 11 Feb., 2025

**Approved by:** \_\_\_\_\_

**Date:** 11 Feb., 2025

**Manager**

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in above the application standard version. Test results reported herein relate only to the item(s) tested.

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1 Version

| Version No. | Date          | Description   |
|-------------|---------------|---------------|
| 00          | 11 Nov., 2024 | Original      |
| 01          | 11 Feb., 2025 | Update page 9 |
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### 3 General Information

#### 3.1 Client Information

|                       |                                                                                                  |
|-----------------------|--------------------------------------------------------------------------------------------------|
| Applicant:            | Dynamox SA                                                                                       |
| Address:              | Rua Coronel Luiz Caldeira, n 67 Condominio Ybira, Itacorubi, Florianópolis-SC, Brazil, 88034-110 |
| Manufacturer/Factory: | Dynamox SA                                                                                       |
| Address:              | Rua Coronel Luiz Caldeira, n 67 Condominio Ybira, Itacorubi, Florianópolis-SC, Brazil, 88034-110 |

#### 3.2 General Description of E.U.T.

|                                            |                                                                                                                                           |                                  |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Product Name:                              | DynaGateway                                                                                                                               |                                  |
| Model No.:                                 | DynaGateway LTE-S                                                                                                                         |                                  |
| BLE Specification                          |                                                                                                                                           |                                  |
| Operation Frequency:                       | 2402MHz-2480MHz                                                                                                                           |                                  |
| Channel number:                            | 40                                                                                                                                        |                                  |
| Channel separation:                        | 2MHz                                                                                                                                      |                                  |
| Modulation                                 | GFSK                                                                                                                                      |                                  |
| Antenna Type:                              | Internal Antenna                                                                                                                          |                                  |
| Antenna gain:                              | 3.48 dBi (declare by Applicant)                                                                                                           |                                  |
| 2.4GWi-Fi Specification                    |                                                                                                                                           |                                  |
| Operation Frequency:                       | 2412 MHz - 2462 MHz (802.11b, g, n-HT20)                                                                                                  |                                  |
|                                            | 2422 MHz - 2452 MHz (802.11n-HT40)                                                                                                        |                                  |
| Channel Numbers:                           | 11 (802.11b, g, n-HT20)                                                                                                                   |                                  |
|                                            | 7 (802.11n-HT40)                                                                                                                          |                                  |
| Channel Separation:                        | 5MHz                                                                                                                                      |                                  |
| Modulation Technology:<br>(IEEE 802.11b)   | DSSS-DBPSK, DQPSK, CCK                                                                                                                    |                                  |
| Modulation Technology:<br>(IEEE 802.11g/n) | OFDM-BPSK, QPSK, 16QAM, 64QAM                                                                                                             |                                  |
| Antenna Type:                              | Internal Antenna                                                                                                                          |                                  |
| Antenna Gain:                              | 3.14 dBi (declare by applicant)                                                                                                           |                                  |
| GSM Specification                          |                                                                                                                                           |                                  |
| Operation Frequency Range:                 | GSM850:                                                                                                                                   | 824.2 MHz - 848.8 MHz            |
|                                            | PCS1900:                                                                                                                                  | 1850.2 MHz - 1909.8 MHz          |
| Modulation Type:                           | <input type="checkbox"/> Voice(GMSK) <input checked="" type="checkbox"/> GPRS(GMSK) <input checked="" type="checkbox"/> EGPRS(GMSK, 8PSK) |                                  |
| Antenna Type:                              | Internal Antenna                                                                                                                          |                                  |
| Antenna Gain:                              | GSM 850:                                                                                                                                  | 2.42 dBi (declare by Applicant)  |
|                                            | PCS1900:                                                                                                                                  | -2.67 dBi (declare by Applicant) |

| WCDMA Specification        |                                                                                                                                                     |                                                    |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| Operation Frequency Range: | WCDMA band II:                                                                                                                                      | 1852.4 MHz - 1907.6 MHz                            |
|                            | WCDMA band IV:                                                                                                                                      | 1712.4 MHz - 1752.6 MHz                            |
|                            | WCDMA band V:                                                                                                                                       | 826.4 MHz - 846.6 MHz                              |
| Modulation Type:           | <input checked="" type="checkbox"/> RMC(QPSK) <input checked="" type="checkbox"/> HSUPA(QPSK) <input checked="" type="checkbox"/> HSDPA(QPSK,16QAM) |                                                    |
| Antenna Type:              | Internal Antenna                                                                                                                                    |                                                    |
| Antenna Gain:              | WCDMA band II:                                                                                                                                      | -2.67 dBi (declare by Applicant)                   |
|                            | WCDMA band IV:                                                                                                                                      | -6.20 dBi (declare by Applicant)                   |
|                            | WCDMA band V:                                                                                                                                       | 2.42 dBi (declare by Applicant)                    |
| LTE Specification          |                                                                                                                                                     |                                                    |
| Operation Frequency Range: | LTE band 2:                                                                                                                                         | Tx: 1850 MHz - 1910 MHz    Rx: 1930 MHz - 1990 MHz |
|                            | LTE band 4:                                                                                                                                         | Tx: 1710 MHz - 1755 MHz    Rx: 2110 MHz - 2155 MHz |
|                            | LTE band 5:                                                                                                                                         | Tx: 824 MHz - 849 MHz      Rx: 869 MHz - 894 MHz   |
|                            | LTE band 12:                                                                                                                                        | Tx: 699 MHz - 716 MHz      Rx: 729 MHz - 746 MHz   |
|                            | LTE band 13:                                                                                                                                        | Tx: 777 MHz - 787 MHz      Rx: 746 MHz - 756 MHz   |
|                            | LTE band 14:                                                                                                                                        | Tx: 788 MHz - 798 MHz      Rx: 758 MHz - 768 MHz   |
|                            | LTE band 25:                                                                                                                                        | Tx: 1850 MHz - 1915 MHz    Rx: 1930 MHz - 1995 MHz |
|                            | LTE band 26:                                                                                                                                        | Tx: 814 MHz - 849 MHz      Rx: 859 MHz - 894 MHz   |
| Modulation Type:           | <input checked="" type="checkbox"/> QPSK <input checked="" type="checkbox"/> 16QAM <input type="checkbox"/> 64QAM                                   |                                                    |
| Antenna Type:              | Internal Antenna                                                                                                                                    |                                                    |
| Antenna Gain:              | LTE band 2:                                                                                                                                         | -2.67 dBi (declare by Applicant)                   |
|                            | LTE band 4:                                                                                                                                         | -6.20 dBi (declare by Applicant)                   |
|                            | LTE band 5:                                                                                                                                         | 2.42 dBi (declare by Applicant)                    |
|                            | LTE band 12:                                                                                                                                        | -0.36 dBi (declare by Applicant)                   |
|                            | LTE band 13:                                                                                                                                        | 0.05 dBi (declare by Applicant)                    |
|                            | LTE band 14:                                                                                                                                        | 2.42 dBi (declare by Applicant)                    |
|                            | LTE band 25:                                                                                                                                        | -2.67 dBi (declare by Applicant)                   |
|                            | LTE band 26:                                                                                                                                        | 2.42 dBi (declare by Applicant)                    |
| Test Sample Condition:     | The test samples were provided in good working order with no visible defects.                                                                       |                                                    |

### 3.3 Operating Modes

| Operating mode | Detail description                                                              |
|----------------|---------------------------------------------------------------------------------|
| BLE mode       | Keep the EUT in continuously transmitting in BLE mode                           |
| 2.4G WIFI mode | Keep the EUT in continuously transmitting in 2.4G WIFI mode                     |
| GSM mode       | Keep the EUT in continuously transmitting in GSM850/1900 mode                   |
| WCDMA mode     | Keep the EUT in continuously transmitting in WCDMA Band 2/4/5 mode              |
| LTE mode       | Keep the EUT in continuously transmitting in LTE Band 2/4/5/12/13/14/25/26 mode |

### 3.4 Additions to, deviations, or exclusions from the method

|    |
|----|
| No |
|----|

### 3.5 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC - Designation No.: CN1211**

JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.

● **ISED – CAB identifier.: CN0021**

The 3m Semi-anechoic chamber and 10m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

● **CNAS - Registration No.: CNAS L15527**

JianYan Testing Group Shenzhen Co., Ltd. is accredited to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L15527.

● **A2LA - Registration No.: 4346.01**

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <https://portal.a2la.org/scopepdf/4346-01.pdf>

### 3.6 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.

Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.

Tel: +86-755-23118282, Fax: +86-755-23116366

Email: info-JYTee@lets.com, Website: <http://jyt.lets.com>

## 4 Technical Requirements Specification

### 4.1 Limits

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)

| Frequency range (MHz)                                   | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm <sup>2</sup> ) | Averaging time (minutes) |
|---------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| (A) Limits for Occupational/Controlled 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                        |
| 300–1500                                                |                               |                               | f/300                               | 6                        |
| 1500–100,000                                            |                               |                               | 5                                   | 6                        |
| (B) 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 <sup>2</sup> )              | 30                       |
| 30–300                                                  | 27.5                          | 0.073                         | 0.2                                 | 30                       |
| 300–1500                                                |                               |                               | f/1500                              | 30                       |
| 1500–100,000                                            |                               |                               | 1.0                                 | 30                       |

### 4.2 Test Procedure

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = \frac{P \times G}{4 \times \pi \times R^2}$$

Where:

S = power density

P = power input to the antenna

G = numeric gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the centre of radiation of the antenna

## 4.3 Result

| Mode                                                                                                                                                                                    | Maximum Output power (dBm) | Division factors (dB) | Maximum frame-averaged power (mW) | Antenna Gain (dBi) | Antenna Gain (numeric) | Distance (cm) | Result (mW/cm <sup>2</sup> ) | Limits for General Population/Uncontrolled Exposure (mW/cm <sup>2</sup> ) |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|-----------------------|-----------------------------------|--------------------|------------------------|---------------|------------------------------|---------------------------------------------------------------------------|
| <b>GSM 850</b>                                                                                                                                                                          |                            |                       |                                   |                    |                        |               |                              |                                                                           |
| GPRS                                                                                                                                                                                    | 33.5                       | -6.02                 | 559.79                            | 2.42               | 1.75                   | 20.00         | 0.19                         | 0.55                                                                      |
| EGPRS                                                                                                                                                                                   | 28.0                       | -6.02                 | 157.76                            | 2.42               | 1.75                   | 20.00         | 0.05                         | 0.55                                                                      |
| <b>PCS 1900</b>                                                                                                                                                                         |                            |                       |                                   |                    |                        |               |                              |                                                                           |
| GPRS                                                                                                                                                                                    | 30.5                       | -6.02                 | 280.54                            | -2.67              | 0.54                   | 20.00         | 0.03                         | 1.0                                                                       |
| EGPRS                                                                                                                                                                                   | 27.0                       | -6.02                 | 125.31                            | -2.67              | 0.54                   | 20.00         | 0.01                         | 1.0                                                                       |
| <b>Remark:</b><br>Division factors: (Max number of uplink slots for GSM mode: 2 slots) Correction factor $10\log(\text{max number of uplink slots}/8) = 10\log(2/8) = -6.02 \text{ dB}$ |                            |                       |                                   |                    |                        |               |                              |                                                                           |

| Mode               | Max tune up power (dBm) | Maximum Output power (mW) | Antenna Gain (dBi) | Antenna Gain (numeric) | Distance (cm) | Result (mW/cm <sup>2</sup> ) | Limits for General Population/Uncontrolled Exposure (mW/cm <sup>2</sup> ) |
|--------------------|-------------------------|---------------------------|--------------------|------------------------|---------------|------------------------------|---------------------------------------------------------------------------|
| <b>2.4G Wi-Fi</b>  |                         |                           |                    |                        |               |                              |                                                                           |
| 802.11g            | 18.0                    | 63.10                     | 3.14               | 2.06                   | 20.00         | 0.01                         | 1.0                                                                       |
| <b>BLE</b>         |                         |                           |                    |                        |               |                              |                                                                           |
| BLE 2Mbps          | 12.0                    | 15.85                     | 3.48               | 2.23                   | 20.00         | 0.007                        | 1.0                                                                       |
| <b>WCDMA</b>       |                         |                           |                    |                        |               |                              |                                                                           |
| WCDMA II           | 24.50                   | 281.84                    | -2.67              | 0.54                   | 20.00         | 0.03                         | 1.0                                                                       |
| WCDMA IV           | 24.50                   | 281.84                    | -6.20              | 0.24                   | 20.00         | 0.01                         | 1.0                                                                       |
| WCDMA V            | 24.50                   | 281.84                    | 2.42               | 1.75                   | 20.00         | 0.10                         | 0.5493                                                                    |
| <b>LTE</b>         |                         |                           |                    |                        |               |                              |                                                                           |
| Band 2             | 24.00                   | 251.19                    | -2.67              | 0.54                   | 20.00         | 0.03                         | 1.0                                                                       |
| Band 4             | 24.00                   | 251.19                    | -6.20              | 0.24                   | 20.00         | 0.01                         | 1.0                                                                       |
| Band 5             | 24.00                   | 251.19                    | 2.42               | 1.75                   | 20.00         | 0.09                         | 0.5493                                                                    |
| Band 12            | 24.00                   | 251.19                    | -0.36              | 0.92                   | 20.00         | 0.05                         | 0.4660                                                                    |
| Band 13            | 24.00                   | 251.19                    | 0.05               | 1.01                   | 20.00         | 0.05                         | 0.5180                                                                    |
| Band 14            | 24.00                   | 251.19                    | 2.42               | 1.75                   | 20.00         | 0.09                         | 0.5253                                                                    |
| Band 25            | 24.00                   | 251.19                    | -2.67              | 0.54                   | 20.00         | 0.03                         | 1.0                                                                       |
| Band 26 (Part 22H) | 24.00                   | 251.19                    | 2.42               | 1.75                   | 20.00         | 0.09                         | 0.5427                                                                    |
| Band 26 (90S)      | 24.00                   | 251.19                    | 2.42               | 1.75                   | 20.00         | 0.09                         | 0.5427                                                                    |

**Simultaneous transmission(Worse mode):**

| ANT No.           | Mode      | Ratio | Total Ratio | Limit |
|-------------------|-----------|-------|-------------|-------|
| Wi-Fi/BLE ANT     | 2.4GWi-Fi | 0.01  | 0.36        | 1.0   |
| GSM/WCDMA/LTE ANT | GSM 850   | 0.35  |             |       |

Note:

1. Just the worst case mode was shown in report.
2. BLE/2.4G WiFi Maximum Output power please refer to FCC ID: 2AC7Z-ESPS3WROOM1U, report No.:FR1D1609 issue by Sporton International Inc.(Kunshan).
3. GSM/WCDMA/LTE Maximum Output power please refer to FCC ID: R17LE910CXWWX, MPE report. Reports was issued by PCTEST Lab. Columbia, MD, USA.

## 4.4 Conclusion

The device is exempt from the SAR test and satisfies RF exposure evaluation.

-----End of report-----