

RF Exposure Evaluation Report

Report No.: JYTSZ-R12-2400972G1

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 IoT-S

Trade mark: N/A

FCC ID: 2AT3M-GTWIOT

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

Date of sample receipt: 13 Aug., 2024

Date of Test: 14 Aug., to 08 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 8/9

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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 IoT-S		
Operation Frequency:	2.4G Wi-Fi: 2412MHz~2462MHz Bluetooth LE: 2402MHz~2480MHz		
Modulation technology:	802.11b: DSSS, 802.11g/n: OFDM Bluetooth LE: GFSK		
Antenna Type:	Internal Antenna		
Antenna gain:	Bluetooth LE: 3.48 dBi (declare by Applicant); Wi-Fi: 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:	☐ Voice(GMSK)	☒ GPRS(GMSK)	☒ EGPRS(GMSK, 8PSK)
Antenna Type:	Internal Antenna		
Antenna Gain:	GSM 850:	2.42 dBi (declare by Applicant)	
	PCS1900:	-2.67 dBi (declare by Applicant)	
LTE Specification			
Operation Frequency Range:	CAT-M/NB-IOT		
	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 25:	Tx: 1850 MHz - 1915 MHz	Rx: 1930 MHz - 1995 MHz
	LTE band 26:	Tx: 814 MHz - 849 MHz	Rx: 859 MHz - 894 MHz
	LTE band 66:	Tx: 1710 MHz - 1780 MHz	Rx: 2110 MHz - 2200 MHz
	LTE band 71:	Tx: 663 MHz - 698 MHz	Rx: 617 MHz - 652 MHz
LTE band 85:	Tx: 700.5 MHz - 711 MHz	Rx: 730.5 MHz - 741.0 MHz	
Modulation Type:	☒ QPSK	☒ 16QAM	
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 25:	-2.67 dBi (declare by Applicant)	

	LTE band 26:	3.79 dBi (declare by Applicant)
	LTE band 66:	-6.20 dBi (declare by Applicant)
	LTE band 71:	-0.36 dBi (declare by Applicant)
	LTE band 85:	0.05 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/PCS1900 mode
LTE CAT-M mode	Keep the EUT in continuously transmitting in LTE Band 2/4/5/12/13/25/26/66/85 mode
LTE NB-IOT mode	Keep the EUT in continuously transmitting in LTE Band 2/4/5/12/13/25/26/66/71/85 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 ²)	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 ²)	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 ²)	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 ²)	Limits for General Population/Uncontrolled Exposure (mW/cm ²)
GSM 850								
GPRS (1 slot)	33.5	-9.03	279.90	2.42	1.75	30.00	0.04	0.55
GPRS (2 slots)	33.5	-6.02	559.76	2.42	1.75	30.00	0.09	0.55
GPRS (3 slots)	30.0	-4.26	374.97	2.42	1.75	30.00	0.06	0.55
GPRS (4 slots)	28.0	-3.01	315.50	2.42	1.75	30.00	0.05	0.55
EGPRS (1 slot)	28.0	-9.03	78.89	2.42	1.75	30.00	0.01	0.55
EGPRS (2 slots)	28.0	-6.02	157.76	2.42	1.75	30.00	0.02	0.55
EGPRS (3 slots)	28.0	-4.26	236.59	2.42	1.75	30.00	0.04	0.55
EGPRS (4 slots)	27.0	-3.01	250.61	2.42	1.75	30.00	0.04	0.55
PCS 1900								
GPRS (1 slot)	30.5	-9.03	140.28	-2.67	0.54	30.00	0.01	1.0
GPRS (2 slots)	30.5	-6.02	280.54	-2.67	0.54	30.00	0.01	1.0
GPRS (3 slots)	30.0	-4.26	374.97	-2.67	0.54	30.00	0.02	1.0
GPRS (4 slots)	29.0	-3.01	397.19	-2.67	0.54	30.00	0.02	1.0
EGPRS (1 slot)	27.0	-9.03	62.66	-2.67	0.54	30.00	0.00	1.0
EGPRS (2 slots)	27.0	-6.02	125.31	-2.67	0.54	30.00	0.01	1.0
EGPRS (3 slots)	27.0	-4.26	187.93	-2.67	0.54	30.00	0.01	1.0
EGPRS (4 slots)	27.0	-3.01	250.61	-2.67	0.54	30.00	0.01	1.0
Remark:								
1. The frame-averaged power is linearly reported the maximum burst averaged power over 8 time slots. The calculated method are shown as below: The duty cycle "x" of different time slots as below: 1 TX slot is 1/8, 2 TX slots is 2/8, 3 TX slots is 3/8 and 4 TX slots is 4/8 Based on the calculation formula: So, Division factors 1 TX slot = -9.03 dB, 2 TX slots = -6.02 dB, 3 TX slots = -4.26 dB, 4 TX slots = -3.01 dB								

Mode	Max tune up power (dBm)	Maximum Output power (mW)	Antenna Gain (dBi)	Antenna Gain (numeric)	Distance (cm)	Result (mW/cm ²)	Limits for General Population/ Uncontrolled Exposure (mW/cm ²)
2.4G Wi-Fi							
802.11g	18.0	63.10	3.14	2.06	30.00	0.01	1.0
BLE							
BLE 2Mbps	12.0	15.85	3.48	2.23	30.00	0.003	1.0
GSM							
GSM 850	27.48	559.76	2.42	1.75	30.00	0.09	0.55
PCS 1900	25.99	397.19	-2.67	0.54	30.00	0.02	1.0
LTE NB-IOT							
Band 2	25.00	316.23	-2.67	0.54	30.00	0.02	1.0
Band 4	25.00	316.23	-6.20	0.24	30.00	0.01	1.0
Band 5	25.00	316.23	2.42	1.75	30.00	0.05	0.56
Band 12	25.00	316.23	-0.36	0.92	30.00	0.03	0.47
Band 13	25.00	316.23	0.05	1.01	30.00	0.03	0.52
Band 25	25.00	316.23	-2.67	0.54	30.00	0.02	1.0
Band26(L)	25.00	316.23	3.79	2.39	30.00	0.07	0.55
Band26(U)	25.00	316.23	3.79	2.39	30.00	0.07	0.55
Band66	25.00	316.23	-6.20	0.24	30.00	0.01	1.0
Band71	22.00	158.49	-0.36	0.92	30.00	0.03	0.45
Band85	25.00	316.23	0.05	1.01	30.00	0.03	0.47
LTE CAT-M							
Band 2	25.00	316.23	-2.67	0.54	30.00	0.02	1.0
Band 4	25.00	316.23	-6.20	0.24	30.00	0.01	1.0
Band 5	25.00	316.23	2.42	1.75	30.00	0.05	0.56
Band 12	25.00	316.23	-0.36	0.92	30.00	0.03	0.47
Band 13	25.00	316.23	0.05	1.01	30.00	0.03	0.52
Band 25	25.00	316.23	-2.67	0.54	30.00	0.02	1.0
Band26(L)	25.00	316.23	3.79	2.39	30.00	0.07	0.55
Band26(U)	25.00	316.23	3.79	2.39	30.00	0.07	0.55
Band66	25.00	316.23	-6.20	0.24	30.00	0.01	1.0
Band85	25.00	316.23	0.05	1.01	30.00	0.03	0.47

Note:

1. The GSM/LTE maximum output power reference report: STS1912245W04, FCC ID:RI7ME910G1WW, which is issued by Shenzhen STS Test Services Co., Ltd.
2. The WIFI/BLE maximum output power reference report: FR1D1609, FCC ID: 2AC7Z-ESPS3WROOM1U, which is issued by Sporton International Inc. (Kunshan)
3. Just the worst case mode was shown in report.

Simultaneous transmission(Worse mode):

Mode	Ratio	Total Ratio	Limit	Verdict
GSM 850	0.16	0.17	1.00	Pass
2.4G WIFI	0.01			

4.4 Conclusion

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

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