

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: (IEEE 802.11b)	DSSS-DBPSK, DQPSK, CCK	
Modulation Technology: (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:	☐ 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)

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:	☒ RMC(QPSK) ☒ HSUPA(QPSK) ☒ 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:	☒ QPSK ☒ 16QAM ☐ 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 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	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
PCS 1900								
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
Remark: 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 ²)	Limits for General Population/Uncontrolled Exposure (mW/cm ²)
2.4G Wi-Fi							
802.11g	18.0	63.10	3.14	2.06	20.00	0.01	1.0
BLE							
BLE 2Mbps	12.0	15.85	3.48	2.23	20.00	0.007	1.0
WCDMA							
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
LTE							
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-----