TEST REPORT

Applicant:	Fibocom Wireless Inc
Address:	1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China
Equipment Type:	LTE Module
Model Name:	MG661-LA
Brand Name:	Fibocom
FCC ID:	ZMOMG661LA
Test Standard:	47 CFR Part 2.1091 KDB 447498 D04 v01
Sample Arrival Date:	Jan. 24, 2025
Test Date:	Jan. 24, 2025 - Feb. 08, 2025
Date of Issue:	Mar. 12, 2025

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Xiong Lining	**Checked by:** Xu Rui	**Approved by:** Tolan Tu (Testing Director)
Xiong Li Ning	Xu Rui	Tolan Tu

Revision History

Version	Issue Date	Revisions Content
Rev. 01	Mar. 04, 2025	Initial Issue
Rev. 02	Mar. 12, 2025	Added Antenna Information in Section 2.4

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	☐ Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	☑ 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	Fibocom Wireless Inc
Address	1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China

2.2 Manufacturer Information

Manufacturer	Fibocom Wireless Inc
Address	1101, Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan, Shenzhen, China

2.3 General Description for Equipment under Test (EUT)

EUT Name	LTE Module
Model Name Under Test	MG661-LA
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	V1.2
Software Version	16009.1000.00.01.86.03
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.4 Antenna Information:

Model Name	Antenna Type	Antenna Gain (dBi)				
		LTE B2	LTE B4	LTE B5	LTE B7	LTE B66
F-0Y-31-0116-001	Dipole	3.13	2.26	-2.46	3.39	2.26
TQX-071427HK22		**5.41**	3.55	1.97	3.40	**3.96**
KIT-HK23-PT24-4G		4.57	2.68	**2.76**	3.64	2.79
F-0Y-31-0166-001-K0		3.75	**3.60**	1.55	**4.76**	3.60
TQX-071427HK22-L		3.48	2.65	1.99	2.27	2.65
GHT-019A	PIFA	1.93	2.86	1.32	1.07	3.53
Note 1: The report only shown the antenna which matches the antenna with the highest antenna gain. Note 2: The antenna information for GHT-019A is derived from the report BL-SZ2360790-701, which was issued by Shenzhen BALUN Technology Co., Ltd. on Jul. 31, 2023.						

2.5 Technical Information

Network and Wireless connectivity	4G Network LTE FDD Band 2/4/5/7/66

The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	LTE	
Frequency Range	LTE B2	TX: 1850 ~ 1910 MHz
	LTE B4	TX: 1710 ~ 1755 MHz
	LTE B5	TX: 824 ~ 849 MHz
	LTE B7	TX: 2500 ~ 2570 MHz
	LTE B66	TX: 1710 ~ 1780 MHz
Antenna Type	WWAN	Dipole Antenna
Exposure Category	General Population/Uncontrolled Exposure	
Product Type	Mobile Device	

3 SUMMARY OF TEST RESULT

3.1 Test Standards

No.	Identity	Document Title
1	KDB 447498 D04 v01	447498 D04 Interim General RF Exposure Guidance v01

3.2 Limit Standards

No.	Identity	Document Title
1	47 CFR Part 2.1091	Radiofrequency radiation exposure evaluation: mobile devices

4 DEVICE CATEGORY AND LEVELS LIMITS

Mobile Devices:

CFR Title 47 §2.1091(b)

For purposes of this section, a mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.

FCC KDB 447498 D04 General RF Exposure Guidance v01 Limit

Evaluation of compliance with the exposure limits in § 1.1310 is necessary if the ERP of the device is greater than ERP20cm in Formula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

$$P_{\text{th}}\ (\text{mW}) = ERP_{20\,\text{cm}}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases} \qquad (\text{B.1})$$

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i. e., without consideration of ERP only if the physical dimensions of the radiating structure(s) do not exceed the electrical length of λ/4 or if the antenna gain is less than that of a half-wave dipole.

SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold Pth (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). Pth is given by Formula (B.2).

$$P_{\text{th}}\,(\text{mW}) = \begin{cases} ERP_{20\,\text{cm}}(d/20\ \text{cm})^{x} & d \le 20\ \text{cm} \\ ERP_{20\,\text{cm}} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases} \qquad \text{(B.2)}$$

where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\,\text{cm}}\sqrt{f}}\right)$$

and f is in GHz, d is the separation distance (cm), and $ERP_{20\text{cm}}$ is per Formula (B.1).
The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)									
	5	10	15	20	25	30	35	40	45	50
300	39	65	88	110	129	148	166	184	201	217
450	22	44	67	89	112	135	158	180	203	226
835	9	25	44	66	90	116	145	175	207	240
1900	3	12	26	44	66	92	122	157	195	236
2450	3	10	22	38	59	83	111	143	179	219
3600	2	8	18	32	49	71	96	125	158	195
5800	1	6	14	25	40	58	80	106	136	169

5 ASSESSMENT RESULT

5.1 Output Power

LTE					
Mode	Band 2	Band 4	Band 5	Band 7	Band 66
Conducted Power (dBm)	23.08	23.07	22.48	22.69	23.18
Antenna Gain (dBi)	5.41	3.60	2.76	4.76	3.96
EIRP/ERP (dBm)	28.49	26.67	23.09	27.45	27.14
Note: This report listed the worst case power value, please refer to BL-SZ2511007-501 report for more details.					

5.2 Tune-up power

Mode		Conducted Power Range (dBm)	EIRP Range (dBm)	ERP Range (dBm)
LTE	Band 2	[22.00,24.00]	[27.00,29.00]	[24.85, 26.85]
	Band 4	[22.00,24.00]	[26.00,28.00]	[23.85, 25.85]
	Band 5	[21.00,23.00]	/	[21.85, 23.85]
	Band 7	[22.00,24.00]	[26.00,28.00]	[23.85, 25.85]
	Band 66	[22.00,24.00]	[26.00,28.00]	[23.85, 25.85]
Note1: ERP= EIRP -2.15dB. Note2: According KDB 447498 D04, used the greater of maximum conducted power and ERP to compare with the threshold value Pth.				

5.3 RF Exposure Evaluation Result

Evolution mode	Frequency (MHz)	Maximum power (dBm)	Maximum power (mw)	Distance (mm)	Threshold Power (mW)	Verdict
LTE B2	1910	26.85	484.17	200	3060.00	Pass
LTE B4	1755	25.85	384.59	200	3060.00	Pass
LTE B5	849	23.85	242.66	200	1731.96	Pass
LTE B7	2570	25.85	384.59	200	3060.00	Pass
LTE B66	1780	25.85	384.59	200	3060.00	Pass

5.4 Conclusion

This EUT is deemed to comply with the reference level limits, therefore the basic restrictions are compliant with human exposure limits.

Statement

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--END OF REPORT--