

FCC Radio Test Report

FCC ID: ZMONL668LA05

Project No. : 2111C171A
Equipment : LTE Module
Brand Name : Fibocom
Test Model : NL668-LA
Series Model : NL668-LA-05, NL668-LA-10, NL668-LA-30
Applicant : Fibocom Wireless Inc.
Address : 1101, Tower A, Building 6, Shenzhen International Innovation Valley,
Dashi 1st Rd, Nanshan, Shenzhen, China
Manufacturer : Fibocom Wireless Inc.
Address : 1101, Tower A, Building 6, Shenzhen International Innovation Valley,
Dashi 1st Rd, Nanshan, Shenzhen, China
Factory : Huizhou HYE Technology Co., Ltd.
Address : No. 237, Sanhe group, Sanhe village, Tonghu Town, Zhongkai hi tech
Zone, Huizhou
Date of Receipt : Nov. 29, 2021
Date of Test : Dec. 03, 2021 ~ Dec. 31, 2021
Issued Date : Mar. 04, 2025
Report Version : R00
Test Sample : Engineering Sample No.: DG20211201108
Standard(s) : FCC Guidelines for Human Exposure IEEE C95.1 & FCC Part 2.1091
FCC Title 47 Part 2.1091 & KDB 447498 D01 v06

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-4-2111C171A	R00	This is a supplementary report to the original test report (BTL-FCCP-4-2111C171). Added the antenna (ant.2~7) which maximum antenna gain are larger than the original so the synchronous transmission has been recalculated and recorded in the report. Other are kept the same.	Mar. 04, 2025	Valid

1. MPE CALCULATION METHOD

Calculation Method of RF Safety Distance:

$$S = \frac{PG}{4\pi R^2} = \frac{EIRP}{4\pi R^2}$$

where:

S = power density

P = power input to the antenna

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

R = distance to the center of radiation of the antenna

Table for Filed Antenna:

For GSM:

Ant.	Brand	Model Name or P/N	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	Dipole	SMA	-1.4 0.9	GSM 850 PCS 1900
2		F-0Y-31-0116-001 -K0	Dipole	N/A	-2.46 2.85	GSM 850 PCS 1900
3		F-0Y-31-0116-002 -K0	Dipole	N/A	-0.39 1.48	GSM 850 WCDMA Band II
4		TQX-071427HK2 2	Dipole	IPEX	1.97 5.41	GSM 850 PCS 1900
5	Kenbotong	KIT-HK23-PT24-4 G	Dipole	IPEX	2.76 4.57	GSM 850 PCS 1900
6		F-0Y-31-0166-001 -K0	Dipole	N/A	1.55 3.75	GSM 850 PCS 1900
7	Kenbotong	TQX-071427HK2 2-L	Dipole	IPEX	1.99 3.48	GSM 850 PCS 1900

Note: The antenna gain is provided by the manufacturer.

For WCDMA:

Ant.	Brand	Model Name or P/N	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	Dipole	SMA	0.9	WCDMA Band II
					1.4	WCDMA Band IV
					-1.4	WCDMA Band V
2		F-0Y-31-0116-001 -K0	Dipole	N/A	2.85	WCDMA Band II
					2.26	WCDMA Band IV
					-2.46	WCDMA Band V
3		F-0Y-31-0116-002 -K0	Dipole	N/A	1.48	WCDMA Band II
					3.51	WCDMA Band IV
					-0.39	WCDMA Band V
4		TQX-071427HK2 2	Dipole	IPEX	5.41	WCDMA Band II
					3.55	WCDMA Band IV
					1.97	WCDMA Band V
5	Kenbotong	KIT-HK23-PT24-4 G	Dipole	IPEX	4.57	WCDMA Band II
					2.68	WCDMA Band IV
					2.76	WCDMA Band V
6		F-0Y-31-0166-001 -K0	Dipole	N/A	3.75	WCDMA Band II
					3.6	WCDMA Band IV
					1.55	WCDMA Band V
7	Kenbotong	TQX-071427HK2 2-L	Dipole	IPEX	3.48	WCDMA Band II
					2.65	WCDMA Band IV
					1.99	WCDMA Band V

Note: The antenna gain is provided by the manufacturer.

For LTE:

Ant.	Brand	Model Name or P/N	Antenna Type	Connector	Gain (dBi)	Note
1	N/A	N/A	Dipole	SMA	0.9	LTE Band 2
					1.4	LTE Band 4
					-1.4	LTE Band 5
					2.6	LTE Band 7
					-1.4	LTE Band 12
					-0.7	LTE Band 17
					1.8	LTE Band 38
					1.6	LTE Band 66
2		F-0Y-31-0116-001 -K0	Dipole	N/A	2.85	LTE Band 2
					2.26	LTE Band 4
					-2.46	LTE Band 5
					3.39	LTE Band 7
					0.54	LTE Band 12
					0.54	LTE Band 17
					3.39	LTE Band 38
					2.26	LTE Band 66
3		F-0Y-31-0116-002 -K0	Dipole	N/A	1.48	LTE Band 2
					3.51	LTE Band 4
					-0.39	LTE Band 5
					2.53	LTE Band 7
					2.5	LTE Band 12
					2.5	LTE Band 17
					2.27	LTE Band 38
					3.51	LTE Band 66

Ant.	Brand	Model Name or P/N	Antenna Type	Connector	Gain (dBi)	Note
4		TQX-071427HK2 2	Dipole	IPEX	5.41	LTE Band 2
					3.55	LTE Band 4
					1.97	LTE Band 5
					3.4	LTE Band 7
					5.1	LTE Band 12
					5.1	LTE Band 17
					3.4	LTE Band 38
					3.96	LTE Band 66
5	Kenbotong	KIT-HK23-PT24-4 G	Dipole	IPEX	4.57	LTE Band 2
					2.68	LTE Band 4
					2.76	LTE Band 5
					3.35	LTE Band 7
					3.85	LTE Band 12
					3.85	LTE Band 17
					3.18	LTE Band 38
					2.68	LTE Band 66
6		F-0Y-31-0166-001 -K0	Dipole	N/A	3.75	LTE Band 2
					3.6	LTE Band 4
					1.55	LTE Band 5
					4.71	LTE Band 7
					-0.02	LTE Band 12
					-0.02	LTE Band 17
					4.71	LTE Band 38
					3.6	LTE Band 66
7	Kenbotong	TQX-071427HK2 2-L	Dipole	IPEX	3.48	LTE Band 2
					2.65	LTE Band 4
					1.99	LTE Band 5
					2.27	LTE Band 7
					3.26	LTE Band 12
					3.26	LTE Band 17
					2.49	LTE Band 38
					2.65	LTE Band 66

Note: The antenna gain is provided by the manufacturer.

2. TEST RESULTS

For GSM:

EGSM900	Max Burst Average Power (dBm)	Max Frame Average Power (dBm)
	Channel/Frequency(MHz)	Channel/Frequency(MHz)
	251/848.8	251/848.8
GSM (CS)	34.5	25.31
GSM1800	Max Burst Average Power (dBm)	Max Frame Average Power (dBm)
	Channel/Frequency(MHz)	Channel/Frequency(MHz)
	512/1850.2	512/1850.2
GSM (CS)	31.5	22.31

Band	Frequency (MHz)	Max.Tune Up Power (dBm)	Antenna Gain (dBi)	Antenna Gain (linear)	Output Power to Antenna	Power Density (mW/cm ²)	Power Density Limit (mW/cm ²)	Test Result
GSM 850	848.8	25.31	2.76	1.89	641.21	0.1276	0.5659	Complies
PCS 1900	1850.2	22.31	5.41	3.48	591.56	0.1177	1.0000	Complies

For WCDMA:

Band	Frequency (MHz)	Max.Tune Up Power (dBm)	Antenna Gain (dBi)	Antenna Gain (linear)	Output Power to Antenna	Power Density (mW/cm ²)	Power Density Limit (mW/cm ²)	Test Result
WCDMA II	1907.6	25.5	5.41	3.48	1233.10	0.2453	1.0000	Complies
WCDMA IV	1712.4	25.5	3.6	2.29	812.83	0.1617	1.0000	Complies
WCDMA V	846.6	25.5	2.76	1.89	669.88	0.1333	0.5644	Complies

For LTE:

Band	Frequency (MHz)	Max. Tune Up Power (dBm)	Antenna Gain (dBi)	Antenna Gain (linear)	Output Power to Antenna	Power Density (mW/cm ²)	Power Density Limit (mW/cm ²)	Test Result
LTE Band 2	1855	25	5.41	3.48	1099.01	0.2186	1.0000	Complies
LTE Band 4	1717.5	25	3.6	2.29	724.44	0.1441	1.0000	Complies
LTE Band 5	825.5	25	2.76	1.89	597.04	0.1188	0.5503	Complies
LTE Band 7	2505	25	4.71	2.96	935.41	0.1861	1.0000	Complies
LTE Band 12	714.5	25	5.1	3.24	1023.29	0.2036	0.4763	Complies
LTE Band 17	709	25	5.1	3.24	1023.29	0.2036	0.4727	Complies
LTE Band 38	2595	25	4.71	2.96	935.41	0.1861	1.0000	Complies
LTE Band 66	1717.5	25	3.96	2.49	787.05	0.1566	1.0000	Complies

Note: The calculated distance is 20 cm.
Output power including tune up tolerance

End of Test Report