

FCC RF EXPOSURE REPORT

FCC ID: 2A3BD-OSRDR02C1

Project No. : 2404C146
Equipment : AI Delivery Robot
Brand Name : ORIONSTAR
Test Model : OS-R-DR02-C
Series Model : OS-R-DR02-C1, OS-R-DR02-C2
Applicant : Beijing Orion Star Technology Co., Ltd
Address : Room A-2570, 2nd Floor, No. 30, Shixing Street, Shijingshan District, Beijing, P.R. China
Manufacturer : Beijing Orion Star Technology Co., Ltd
Address : Room A-2570, 2nd Floor, No. 30, Shixing Street, Shijingshan District, Beijing, P.R. China
Factory : Guangdong Mingji Hi-Tech Electronics Co., Ltd
Address : No.12 Changfu Road, Qinghutou, Tangxia Town, Dongguan, Guangdong, China
Date of Receipt : May 27, 2024
Date of Test : Jun. 18, 2024 ~ Jul. 16, 2024
Issued Date : Jul. 25, 2024
Report Version : R00
Test Sample : Engineering Sample No.: DG20240527177-3
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.

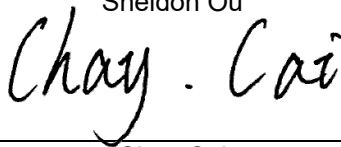
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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCCP-7-2404C146	R00	Original Report.	Jul. 25, 2024	Valid

1. MPE CALCULATION METHOD

Calculation Method of RF Safety Distance:

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

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

2. ANTENNA SPECIFICATION

For 2.4GHz:

Ant.	Manufacturer	P/N	Antenna Type	Connector	Gain (dBi)
1	HUIZHOU SPEED WIRELESS TECHNOLOGYCO., LTD	F-0A-5Q-0008-000-K0	FPC	N/A	0.37
2		F-0A-5Q-0009-000-K0	FPC	N/A	1.32

Note:

- This EUT supports CDD, and all antenna gains are not equal, so Directional gain=10log[(10^{G1/20}+10^{G2/20}+...10^{GN/20})²/N]dBi, that is Directional gain=10log[(10^{0.37/20}+10^{1.32/20})²/2]dBi =3.87.
- The antenna gain is provided by the manufacturer.

For 5GHz:

Ant.	Manufacturer	P/N	Antenna Type	Connector	Gain (dBi)
1	HUIZHOU SPEED WIRELESS TECHNOLOGYCO., LTD	F-0A-5Q-0008-000-K0	FPC	N/A	1.55
2		F-0A-5Q-0009-000-K0	FPC	N/A	2.88

Note:

- This EUT supports CDD, any transmit signals are correlated with each other, so Directional gain=10log[(10^{G1/20}+10^{G2/20}+...10^{GN/20})²/N]dBi, that is Directional gain=10log[(10^{1.55/20}+10^{2.88/20})²/2]dBi =5.25.
- The antenna gain is provided by the manufacturer.

For LTE:

Ant. P/N	Type	Ant. Manufacturer	Antenna Gain(dBi)	Note
F-0G-5Q-0014-000-K0	FPC	HUIZHOU SPEED WIRELESS TECHNOLOGYCO., LTD	3.79	LTE Band 2
			4.13	LTE Band 4
			-1.51	LTE Band 5
			2.72	LTE Band 7
			1.11	LTE Band 12
			1.11	LTE Band 13
			3.76	LTE Band 25
			-1.51	LTE Band 26
			3.82	LTE Band 38
			3.82	LTE Band 41

Note: The antenna gain is provided by the manufacturer.

3. CALCULATED RESULT

For 2.4GHz:

Directional gain (dBi)	Directional gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
3.87	2.4378	25.64	366.4376	0.17781	1	Complies

For 5GHz:

Directional gain (dBi)	Directional gain (numeric)	Max. Output Power (dBm)	Max. Output Power (mW)	Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
5.25	3.3497	25.83	382.8247	0.25524	1	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
Band 2	1850.7	25	3.79	2.3933	756.83	0.1506	1.0000	Complies
Band 4	1710.7	25	4.13	2.5882	818.46	0.1628	1.0000	Complies
Band 5	824.7	25	-1.51	0.7063	223.36	0.0444	0.5498	Complies
Band 7	2502.5	25	2.72	1.8707	591.56	0.1177	1.0000	Complies
Band 12	699.7	25	1.11	1.2912	408.32	0.0812	0.4665	Complies
Band 13	779.5	25	1.11	1.2912	408.32	0.0812	0.5197	Complies
Band 25	1850.7	25	3.76	2.3768	751.62	0.1495	1.0000	Complies
Band 26 (814-824)	814.7	25	-1.51	0.7063	223.36	0.0444	0.5431	Complies
Band 26 (824-849)	827.7	25	-1.51	0.7063	223.36	0.0444	0.5518	Complies
Band 38	2572.5	25	3.82	2.4099	762.08	0.1516	1.0000	Complies
Band 41	2498.5	25	3.82	2.4099	762.08	0.1516	1.0000	Complies

Note:

- (1) The calculated distance is 20 cm.
- (2) WLAN 2.4GHz, WLAN 5GHz and LTE can not simultaneous transmission.
- (3) The LTE Max. Tune up Power test results reference to module report which is provided by the manufacturer. (Report No.: HR/2019/1001602)

End of Test Report