RF Exposure Evaluation Report

Report No.:	JYTSZ-R12-2500113
Applicant:	ZillionSource Technologies (Shanghai) Co., Ltd.
Address of Applicant:	Room 2207A, No.28, Maii Road.Shanghai Free Trade Zone, Shanghai, China
Equipment Under Test (EUT)	
Product Name:	Environmental variable collector for logistics
Model No.:	ZT-28SE, ZT-28SE, ZT-28SE01, ZT-28SE02, ZT-28SE03, ZT-28E
Trade mark:	ZillionTrace, UBITracer
FCC ID:	2AJCRJ-ZT-28SE
Applicable standards:	FCC CFR Title 47 Part 2 (§2.1091)
Date of sample receipt:	09 Jan., 2025
Date of Test:	10 Jan., to 20 Jan., 2025
Date of report issue:	21 Jan., 2025
Test Result:	PASS

Project by:	Alan Chen	***Date:***	*21 Jan., 2025*
	Project Engineer		
Reviewed by:	Lwa Ping	***Date:***	*21 Jan., 2025*
	Senior Engineer		
Approved by:	James Wei	***Date:***	*21 Jan., 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.

1 Version

Version No.	Date	Description
00	*21 Jan., 2025*	*Original*

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3 General Information

3.1 Client Information

Applicant:	ZillionSource Technologies (Shanghai) Co., Ltd.
Address:	Room 2207A, No.28, Maii Road.Shanghai Free Trade Zone, Shanghai, China
Manufacturer:	ZillionSource Technologies (Shanghai) Co., Ltd.
Address:	Room 2207A, No.28, Maii Road.Shanghai Free Trade Zone, Shanghai, China

3.2 General Description of E.U.T.

Product Name:	Environmental variable collector for logistics	
Model No.:	ZT-28SE, ZT-28SE, ZT-28SE01, ZT-28SE02, ZT-28SE03, ZT-28E	
Operation Frequency Range:	LTE band 4:	Tx: 1710 MHz - 1755 MHz Rx: 2110 MHz - 2155 MHz
	LTE band 12:	Tx: 699 MHz - 716 MHz Rx: 729 MHz - 746 MHz
Modulation Type:	☒QPSK ☒16QAM	
LTE Category:	1bis	
Antenna Type:	Internal Antenna	
Antenna Gain:	LTE band 4:	-0.12 dBi (declare by Applicant)
	LTE band 12:	-6.39 dBi (declare by Applicant)
Remark:	Model No.: ZT-28SE, ZT-28SE, ZT-28SE01, ZT-28SE02, ZT-28SE03, ZT-28E were identical inside, the electrical circuit design, layout, components used and internal wiring, with only difference being model name.	
Test Sample Condition:	The test samples were provided in good working order with no visible defects.	

3.3 Operating Modes

Operating mode	Detail description
LTE mode	Keep the EUT in continuously transmitting in LTE Band 4/12 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

Frequency (MHz)	Maximum Output 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)
LTE							
Band 4	23.83	241.55	-0.12	0.97	20.00	0.05	1.0
Band 12	23.40	218.78	-6.39	0.23	20.00	0.01	0.47

Note: Just the worst case mode was shown in report.

4.4 Conclusion

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

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