Report No.: CST2022050017E03

RF Exposure Report

Applicant:	Shenzhen Dragino technology development Co., LTD.
Address of Applicant:	Room 202, Block B, BaoChengTai industrial park, No.8 CaiYunRoad , LongCheng Street, LongGang District, Shenzhen 518116, China
Manufacturer/Factory:	Shenzhen Dragino technology development Co., LTD.
Address of Manufacturer/Factory:	Room 202, Block B, BaoChengTai industrial park, No.8 CaiYunRoad , LongCheng Street, LongGang District, Shenzhen 518116, China

Equipment Under Test (EUT)

Product Name:	LoRaWAN Sensor Node
Model No.:	LSN50v2, LSN50v2-D20, LSN50v2-D22, LSN50v2-D23, CPL01, LDS03A, SW3L
Trade Mark:	Dragino
Applicable standards:	EN IEC 62311: 2020
Date of sample receipt:	Jun. 11, 2022
Date of Test:	Jun. 12, 2022 –Jun. 24, 2022
Date of report issue:	Jun. 27, 2022
Test Result :	PASS *

* In the configuration tested, the EUT complied with the standards specified above.

The CE mark as shown below can be used, under the responsibility of the manufacturer, after completion of an EC Declaration of Conformity and compliance with all relevant EC Directives. The protection requirements with respect to electromagnetic compatibility contained in Directive 2014/53/EU are considered.

Shenzhen CST Testing Co., Ltd.

David Zhong
Laboratory Manager

2 Version

Version No.	Date	Description
00	*Jun. 27, 2022*	*Original*

Prepared By: kyle Wang ***Date:*** *Jun. 27, 2022*

Project Engineer

Check By: ***Date:*** *Jun. 27, 2022*

Reviewer

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4 General Information

4.1 General Description of EUT

Product Name:	LoRaWAN Sensor Node
Model No.:	LSN50v2, LSN50v2-D20, LSN50v2-D22, LSN50v2-D23, CPL01, LDS03A, SW3L
Test Model:	LSN50v2 for all test, and all models for radiated emission test
Model difference:	Only the temperature probe configuration, sensor type is not the same, the internal motherboard, structure, circuit is completely the same.
Trademark:	Dragino
Power supply:	Powered by one 3.6VDC, 3.8Ah non-rechargeable 18505 battery
Operation Frequency:	867.1MHz ~868.8MHz
Modulation type:	FSK
Antenna Type:	Integral antenna
Antenna Gain:	2dBi
Power Supply:	Powered by one 3.6VDC, 3.8Ah non-rechargeable 18505 battery

4.2 Test Location

All tests were performed at:
Shenzhen CST Testing Co., Ltd Address: Room 202-203, Floor 2st, Building B, Baoan Zhigu Technology Park, Xixiang Street, Baoan District, Shenzhen, China. 518101 Tel: 0755-27907627 Fax: 0755-27907627

4.3 Description of Support Units

None.

4.4 Deviation from Standards

None.

4.5 Abnormalities from Standard Conditions

None.

4.6 Other Information Requested by the Customer

None.

5 Technical Requirements Specification in EN 62311

Test Requirement:	EN 62311
Test Method:	EN 62311
General Description of Applied Standards	EN 62311 Generic standard to demonstrate the compliance of electronic and electrical apparatus with the basic restrictions related to human exposure to electromagnetic fields (0 Hz–300 GHz) is to demonstrate the compliance of apparatus with the basic restrictions or reference levels on exposure of the general public related to electric, magnetic, electromagnetic fields as well as induced and contact current.
Limit:	According to EN 62311, the criteria listed in the below table shall be used to evalouate the environmental inpact of human exposure to radio-frequency (RF) radiation as specified table 2 of Council Recommendation 1999/519/EC.
Test method:	According to the Far field calculation formula:
Result:	Pass

Reference levels for electric, magnetic and electromagnetic fields (0 Hz to 300 GHz, unperturbed rms values)

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (μT)	Equivalent plane wave power density S_{eq} (W/m²)
0-1 Hz	—	$3,2 \times 10^4$	4×10^4	—
1-8 Hz	10 000	$3,2 \times 10^4/f^2$	$4 \times 10^4/f^2$	—
8-25 Hz	10 000	4 000/f	5 000/f	—
0,025-0,8 kHz	250/f	4/f	5/f	—
0,8-3 kHz	250/f	5	6,25	—
3-150 kHz	87	5	6,25	—
0,15-1 MHz	87	0,73/f	0,92/f	—
1-10 MHz	$87/f^{1/2}$	0,73/f	0,92/f	—
10-400 MHz	28	0,073	0,092	2
400-2 000 MHz	$1,375\ f^{1/2}$	$0,0037\ f^{1/2}$	$0,0046\ f^{1/2}$	f/200
2-300 GHz	61	0,16	0,20	10

Notes:

1. f as indicated in the frequency range column.

Far Field Calculation Formula

$$E = \frac{\sqrt{30PG(\theta,\phi)}}{r}$$

G = antenna gain relative to an isotropic antenna

θ, ϕ = elevation and azimuth angles to point of investigation

r = distance from observation point to the antenna

The antenna of the product, under normal use condition is at least 20cm away from the body of the user. Warning statement ot the user for keeing 20cm separation distance and the prohibition of operating to a person has been printed on the user manual. So, this product under normal use is located on electromagnetic far field between the human body.

Measurement Data:
Distance to human body: 20cm

Frequency (MHz)	ERP (dBm)	Output Power (mW)	E Field Strength (V/m)	Limit (V/m)	Result
867.9	11.67	14.689	3.319	61.0	Pass

------End------