





TEST REPORT

Product Name: LoRa Module

Trademark:  

Model Number: Ra-01S-P

Prepared For: Shenzhen Ai-Thinker Technology Co., Ltd

Address: 410, Block C, Huafeng Smart Innovation Port. Gushu 2nd Road, Gushu Community, Xixiang Street, Baoan District, Shenzhen, China

Manufacturer: Shenzhen Ai-Thinker Technology Co., Ltd

Address: 410, Block C, Huafeng Smart Innovation Port. Gushu 2nd Road, Gushu Community, Xixiang Street, Baoan District, Shenzhen, China

Prepared By: Shenzhen CTB Testing Technology Co., Ltd.

Address: 1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China

Sample Received Date: Oct. 29, 2024

Sample tested Date: Oct. 29, 2024 to Nov. 15, 2024

Issue Date: Nov. 15, 2024

Report No.: CTB24102904802RH01

Test Standards: EN IEC 62311:2020
EN 50665:2017

Test Results: PASS

Compiled by:

Zhou Kui

Zhou Kui

Reviewed by:

Arron Liu

Arron Liu

Approved by:

Bin Mei / Director

Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

TABLE OF CONTENT

Test Report Declaration	Page
1. VERSION	3
2. PRODUCT INFORMATION AND TEST SETUP	4
2.1 Product Information	4
3. HEALTH REQUIREMENTS	5
3.1 Limits	5
3.2 Exposure Evaluation	6
4. EUT PHOTOGRAPHS	7

(Note: N/A means not applicable)

1. VERSION

Report No.	Issue Date	Description	Approved
CTB24102904802RH01	Nov. 15, 2024	Original	Valid

2. PRODUCT INFORMATION AND TEST SETUP

2.1 Product Information

Model(s):	Ra-01S-P
Model Description:	N/A
SRD:	433.050MHz-434.790MHz
Receiver Category:	2
Hardware Version:	V1.0
Software Version:	V1.0
Max. RF output power:	9.194dBm
Type of Modulation:	FSK
Antenna installation:	Internal antenna
Ratings:	DC 3.3V powering from PC

3. HEALTH REQUIREMENTS

3.1 Limits

According to Council Recommendation: the criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation.

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

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (μT)	Equivalent plane wave power density Seq (W/m ²)
0-1 Hz	-	3.2×10^4	4×10^4	-
1-8 Hz	10000	$3.2 \times 10^4 / f^2$	$4 \times 10^4 / f^2$	-
8-25 Hz	10000	4000/f	5000/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	0.095	2
400-2000 MHz	$1.375 f^{1/2}$	$0.0037 f^{1/2}$	$0.0046 f^{1/2}$	f/200
2-300 GHz	61	0.16	0.2	10

Note:

1. f as indicated in the frequency range column.
2. For frequencies between 100 kHz and 10 GHz, Seq, E², H² and B² are to be averaged over any six-minute period.
3. For frequencies exceeding 10 GHz, Seq, E², H² and B² are to be averaged over any $68 / f^{1.05}$ minute period (f in GHz).

3.2 Exposure Evaluation

From Council Recommendation 1999/519/EC table 2, the maximum power density is 10 W/m².

Power density (S) is calculated by the following formula:

$$S = PG * \text{Duty factor} / 4\pi R^2$$

P = Peak Power Input to antenna (Watts)

G = Antenna Gain (numeric)

R = distance to the center of radiation of antenna (in meter) = 0.2 m

Note:

1) $P \text{ (Watts)} = (10^{(dBm/10)})/1000$

2) $G \text{ (Antenna gain in numeric)} = 10^{(\text{Antenna gain in dBi} / 10)}$

3) Duty factor=1.0

4) $\pi = 3.142$

SRD:

Antenna Gain (dBi)	Antenna Gain (numeric)	Max. Output Power (dBm)	Max. Output Power (W)	Duty factor	Calculated RF Exposure (W/ m ²)	Limit (W/ m ²)
1	1.25892541	9.194	0.0083062	1	0.0208	10

4. EUT PHOTOGRAPHS

Refer to Report No.: CTB24102904802RE02 for EUT external and internal photos.

.***** END OF REPORT *****