



Test report No: 6170721.52

TEST REPORT

Radio Spectrum Matters (RF)

Identification of item tested	Wireless Module
Trademark	
Model and /or type reference	HRN71_BSNS
Features	3.3V DC
FCC ID	2BC2T-HRN71
ISED Number	31630-HRN71
Applicant's name / address	HooRii Technology Co., Ltd. Building H, Aicheng Road 198, Yuhang District, Hangzhou, Zhejiang, 311300, China
Test method requested, standard	FCC CFR Title 47 Part 2 Subpart J Section 2.1091 RSS-102 Issue 5 IEEE Std C95.3:2002
Verdict Summary	IN COMPLIANCE
Prepared by (name / position & signature)	Lei Chen Senior Project Manager 
Approved by (name / position & signature)	Adrian Shi Technical Supervisor 
Date of issue	2023-11-21
Report template No	TRF_MPE_RF01 V1.0

INDEX

	page
Competences and Guarantees.....	3
General conditions.....	3
Environmental conditions.....	3
Possible test case verdicts	4
Definition of symbols used in this test report	4
Abbreviations	4
Document History	4
Remarks and Comments	5
1 General Information.....	6
1.1 General Description of the Item(s)	6
1.2 Test date	7
1.3 Test Facility	7
2 Maximum Permissible Exposure (MPE).....	8
2.1 Limit.....	8
2.2 MPE Calculation Method.....	9
2.3 Result of MPE	9
2.4 Conclusion.....	9

COMPETENCES AND GUARANTEES

DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

DEKRA is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA.

GENERAL CONDITIONS

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or Competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA.
5. This report will not be used for social proof function in China market.

ENVIRONMENTAL CONDITIONS

The climatic conditions during the tests are within the limits specified by the manufacturer for the operation of the EUT and the test equipment. The climatic conditions during the tests were within the following limits:

Ambient temperature	15 °C – 35 °C
Relative Humidity air	30% - 60%
Atmospheric pressure	86 kPa – 106 kPa

If explicitly required in the basic standard or applied product / product family standard the climatic values are recorded and documented separately in this test report.

POSSIBLE TEST CASE VERDICTS

Test case does not apply to test object	N/A
Test object does meet requirement	P (Pass) / PASS
Test object does not meet requirement	F (Fail) / FAIL
Not measured	N/M

DEFINITION OF SYMBOLS USED IN THIS TEST REPORT

<input checked="" type="checkbox"/> Indicates that the listed condition, standard or equipment is applicable for this report/test/EUT.			
<input type="checkbox"/> Indicates that the listed condition, standard or equipment is not applicable for this report/test/EUT.			
Decimal separator used in this report	<input checked="" type="checkbox"/>	Comma (,)	<input type="checkbox"/> Point (.)

ABBREVIATIONS

For the purposes of the present document, the following abbreviations apply:

EUT	: Equipment Under Test
QP	: Quasi-Peak
CAV	: CISPR Average
AV	: Average
CDN	: Coupling Decoupling Network
SAC	: Semi-Anechoic Chamber
OATS	: Open Area Test Site
BW	: Bandwidth
AM	: Amplitude Modulation
PM	: Pulse Modulation
HCP	: Horizontal Coupling Plane
VCP	: Vertical Coupling Plane
U_N	: Nominal voltage
T_x	: Transmitter
R_x	: Receiver
N/A	: Not Applicable
N/M	: Not Measured

DOCUMENT HISTORY

Report nr.	Date	Description
6170721.52	2023-11-21	First release.

REMARKS AND COMMENTS


The equipment under test (EUT) does meet the essential requirements of the stated standard(s)/test(s).

The test results relate only to the samples tested.

This report shall not be reproduced, except in full, without the written approval.

1 GENERAL INFORMATION

1.1 General Description of the Item(s)

Description of the item	Wireless Module
Model / Type number	HRN71_BSNS
Trademark.....	
FCC ID	2BC2T-HRN71
ISED Number	31630-HRN71
Manufacturer	HooRii Technology Co., Ltd. Building H, Aicheng Road 198, Yuhang District, Hangzhou, Zhejiang, 311300, China

Mode of Operation	Bluetooth BLE
Operating frequency range(s)	2402~2480 MHz
Type of Modulation	GFSK
Antenna type	Omni Antenna
Antenna gain	0.5 dBi

Mode of Operation	Thread 802.15.4
Operating frequency range(s)	2405~2480 MHz
Type of Modulation	DSSS-OQPSK
Antenna type	Omni Antenna
Antenna gain	0.5 dBi

Note:

1. The antenna gain is provided by the manufacturer

Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input checked="" type="checkbox"/>	DC: 3.34V					
	<input type="checkbox"/>	Battery:					
Mounting position.....	<input type="checkbox"/>	Table top equipment					
	<input type="checkbox"/>	Wall/Ceiling mounted equipment					
	<input type="checkbox"/>	Floor standing equipment					
	<input type="checkbox"/>	Hand-held equipment					
	<input checked="" type="checkbox"/>	Other					

Intended use of the Equipment Under Test (EUT)
The product is Wireless Module which supports BLE & Thread function.

1.2 Test date

Test Location	DEKRA Testing and Certification (Shanghai) Ltd. No.250, Jiangchangsan Road, Shanghai, 200436 P.R. China
Date of receipt of test item	2023-09-18
Date (s) of performance of tests	2023-09-27 to 2023-11-13

1.3 Test Facility

FCC Designation Number	:	CN1358
ISED CAB identifier Number	:	CN0155

2 Maximum Permissible Exposure (MPE)

2.1 Limit

According to FCC Part 1.1310, 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).

Table 1 – Limits for Maximum Permissible Exposure (MPE)

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 Exposure				
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
300-1,500			f/300	6
1,500-100,000			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
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

According to RSS-102 Issue 5 clause 2.5.2, Exemption Limits for Routine Evaluation – RF Exposure Evaluation as below:

RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

- below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1W (adjusted for tune-up tolerance);
- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}W$ (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}W$ (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

2.2 MPE Calculation Method

Calculation Formula from FCC OET 65:

$$S = \frac{P * G}{4 * \pi * R^2}$$

Where:

S = Power Density (mW/cm²)

P = output power of the antenna (mW)

G = antenna gain relative to an isotropic antenna

R = distance from the antenna to the point of investigation (cm)

2.3 Result of MPE

For FCC

Mode	Frequency Range (MHz)	Max Tune-up Power (dBm)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	FCC Limit (mW/cm ²)
BLE	2402 ~ 2480	8	0.5	0.00141	1.0
Thread	2405 ~ 2480	8	0.5	0.00141	1.0

For ISSED

Mode	Frequency Range (MHz)	Max Tune-up E.I.R.P (dBm)	Max Tune-up E.I.R.P (W)	Exemption Limit (W)
BLE	2402 ~ 2480	8.5	0.00708	2.676
Thread	2405 ~ 2480	8.5	0.00708	2.679

2.4 Conclusion

The result at the position which is 20 cm far from the EUT is comply with the FCC Limit per 47 CFR 2.1091 for the uncontrolled RF Exposure of mobile device & ISSED Exemption Limits for Routine Evaluation.

--- END ---