



RADIO EXPOSURE TEST REPORT

Equipment : 無線感測器
Brand Name : Origin Wireless, Inc.
Model Name : Hex Command
Applicant : 元創電子股份有限公司
新竹科學工業園區新竹市力行一路 1 號 3 樓 A1-1
Manufacturer : 啟碁科技股份有限公司
308 新竹科學園區園區二路 20 號
Standard : NCC LP0002 (Jul. 01, 2020) Section 6.20 (6.20.2)

The product was received on May 06, 2020, and testing was started from May 11, 2020 and completed on Aug. 13, 2020. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in NCC LP0002 (Jul. 01, 2020) Section 6.20 (6.20.2) and shown compliance with the applicable technical standards.

The test results in this variant report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.



Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory
No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)



Table of Contents

History of this test report.....	3
Summary of Test Result.....	4
1 General Description	5
1.1 EUT General Information	5
1.2 Antenna Information	5
1.3 Table for EUT support function	6
1.4 Table for Permissive Change	6
1.5 Accessories	6
1.6 Testing Location	6
2 Maximum Permissible Exposure	7
2.1 Limit of Maximum Permissible Exposure	7
2.2 MPE Calculation Method	7
2.3 Calculated Result and Limit.....	8
Photographs of EUT v01	



History of this test report

TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB-A1_1 Ver1.1

Page Number : 3 of 8
Issued Date : Dec. 22, 2021
Report Version : 01



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	PASS	-

The test results of this report reference the results of Sporton Report No.: FA050538. After evaluating, the test results comply with the test standard LP0002 (2020-07-01).

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

Reviewed by: Sam Chen

Report Producer: Jessie Wei



1 General Description

1.1 EUT General Information

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)
5GHz WLAN	5150-5250 5725-5850	5180-5240 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)

1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
						2.4GHz	5GHz
1	1	WNC	OWS1200	PIFA	I-PEX	3.17	4.58
2	2	WNC	OWS1200	PIFA	I-PEX	3.06	5.07

Note: The above information was declared by manufacturer.

For 2.4GHz function:

For IEEE 802.11b/g/n/VHT (2TX/2RX):

Pot 1 and Port 2 can be used as transmitting/receiving antenna.

Pot 1 and Port 2 could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11a/n/ac (2TX/2RX):

Pot 1 and Port 2 can be used as transmitting/receiving antenna.

Pot 1 and Port 2 could transmit/receive simultaneously.



1.3 Table for EUT support function

Function
Master (AP)
Client without radar detection

1.4 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: TA050538-01

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
1. Adding Brand Name: Origin Wireless, Inc. / Model Name: Hex Command (The difference from the original brand/model is that the market strategy is different, different external, and their internal circuit boards are exactly identical).	The test results of this report reference the results of the original Sporton Report No.:TA050538-01. The modifications of this time do not affect the RF characteristic. Therefore, the content of the original test report is kept.
2. Updating test standard to "NCC LP0002 (Jul. 01, 2020) Section 6.20 (6.20.2)" from "NCC LP0002 (Jan. 10, 2018) Section 5.20 (5.20.2)"	

1.5 Accessories

Accessories			
Equipment Name	Brand Name	Model Name	Rating
Adapter	LEI	MU12B1120100-A1	INPUT: 100-240V ~ 600mA, 50/60Hz OUTPUT: 48V, 380mA

1.6 Testing Location

Testing Location Information	
Test Lab. : Sporton International Inc. Hsinchu Laboratory	
Hsinchu (TAF: 3787)	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.) TEL: 886-3-656-9065 FAX: 886-3-656-9085 Test site Designation No. TW3787 with FCC. Conformity Assessment Body Identifier (CABID) TW3787 with ISCED.

2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	*100	6
3-30	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	-	-	5.0	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	*100	30
1.34-30	842/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

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

2.2 MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
2.4G;D1D	3.17	27.77	30.94	0.50	31.44	1.39316	20	0.27716	1.00000
<Master>									
5.2G;D1D	5.07	26.09	31.16	0.50	31.66	1.46555	20	0.29156	1.00000
5.8G;D1D	5.07	23.83	28.90	0.50	29.40	0.87096	20	0.17327	1.00000
<Client without radar detection>									
5.2G;D1D	5.07	23.26	28.33	0.50	28.83	0.76384	20	0.15196	1.00000
5.8G;D1D	5.07	23.83	28.90	0.50	29.40	0.87096	20	0.17327	1.00000

————THE END————