



RADIO EXPOSURE TEST REPORT

FCC ID : 2AHKM-CODA5814Q1
Equipment : DOCIS 3.1 Wi-Fi 6 EMTA Gateway
Brand Name : Hitron
Model Name : CODA5814Q, CODA5810Q
Applicant : Hitron Technologies Inc.
No. 1-8, Li-Hsin 1st Rd. Hsinchu Science Park,
Hsinchu 30078, Taiwan
Manufacturer : Hitron Technologies Inc.
No. 1-8, Li-Hsin 1st Rd. Hsinchu Science Park,
Hsinchu 30078, Taiwan
Standard : 47 CFR Part 2.1091

The product was received on Jun. 28, 2022, and testing was started from Oct. 18, 2022 and completed on Nov. 04, 2022. We, Sporton International Inc. Hsinchu Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The test results in this 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	6
1.3 Table for Multiple Listing	7
1.4 Accessories	7
1.5 Applicable Standards	7
1.6 Testing Location	7
2 Maximum Permissible Exposure	8
2.1 Limit of Maximum Permissible Exposure	8
2.2 MPE Calculation Method	8
2.3 MPE Exemption	9
2.4 Calculated Result and Limit.....	10
Photographs of EUT v01	



History of this test report

Report No.	Version	Description	Issued Date
FA193028-02	01	Initial issue of report	Nov. 18, 2022



Summary of Test Result

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

Declaration of Conformity:

1. The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. It's means measurement values may risk exceeding the limit of regulation standards, if measurement uncertainty is include in test results.
2. The measurement uncertainty please refer to report "Measurement Uncertainty".

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: **Penny Kao**



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) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850 5725-5895	5180-5250 5250-5320 5500-5720 5745-5825 5815-5885	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)



1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	1	Airgain	N03HTAFE-PK1-LA1X80BUR2	PCB Antenna	I-PEX	Note 1
2	2	Airgain	N03HTAFF-PK1-LB1X90BU	PCB Antenna	I-PEX	
3	3	Airgain	N03HTAFG-PK1-LG1X130BUR2	PCB Antenna	I-PEX	
4	4	Airgain	N03HTAFH-PK1-LW1X150BU	PCB Antenna	I-PEX	

Note 1:

Ant.	Port	Antenna Gain (dBi)					
		2.4GHz	UNII 1	UNII 2A	UNII 2C	UNII 3	UNII 4
1	1	3.13	2.72	2.24	2.67	2.28	2.95
2	2	1.42	2.14	2.8	3.46	3.95	4.03
3	3	3.4	2.82	2.58	1.87	3.38	3.3
4	4	3.26	2.82	3.83	3.78	4.93	5.47
Directional Gain (dBi)							
		2.4GHz	UNII 1	UNII 2A	UNII 2C	UNII 3	UNII 4
4T1S		5.92	5.44	6.34	6.46	6.27	6.54
4T2S		3.4	2.82	3.83	3.78	4.93	5.47
4T4S		3.4	2.82	3.83	3.78	4.93	5.47

Note 2: The above information (brand / model name / antenna type) was declared by the manufacturer.

Note 3: WLAN 2.4GHz/5GHz(UNII 1~4): The directional gain is measured which follows the procedure of KDB 662911 D03.

Note 4: The EUT has four antennas.

For 2.4GHz function:

For IEEE 802.11 b/g/n/VHT/ax mode (4TX/4RX)

Port 1 and Port 2, Port 3 and Port 4 can be used as transmitting/receiving antenna.

Port 1 and Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11a/n/ac/ax mode (4TX/4RX)

Port 1 and Port 2, Port 3 and Port 4 can be used as transmitting/receiving antenna.

Port 1 and Port 2, Port 3 and Port 4 could transmit/receive simultaneously.



1.3 Table for Multiple Listing

Model Name	Voice Interface	Case color of EUT	Battery Port
CODA5814Q	V	Black	V
CODA5810Q	X	Black	X

Note1: From the above models, model: CODA5814Q was selected as representative model for the test and its data was recorded in this report.

Note2: The above information was declared by manufacturer.

1.4 Accessories

Accessories			
Equipment Name	Brand Name	Model Name	Rating
Adapter	MOSO	MS-V4000R120-050A0-US	Input: 100-240V~, 50/60Hz, 1.3A max. Output: 12.0V, 4.0A
Others			
RJ-45 cable*1: Non-shielded, 1.5m			

1.5 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR Part 2.1091
- ♦ KDB 447498 D04 Interim General RF Exposure Guidance v01

The following reference test guidance is not within the scope of accreditation of TAF.

- ♦ 47 CFR Part 1.1307
- ♦ 47 CFR Part 1.1310

1.6 Testing Location

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



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
3.0-30	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

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	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

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

2.2 MPE Calculation Method

The MPE was calculated at 51 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

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

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 MPE Exemption

Option (A): 1.1307(b)(3)(i)(A): Available maximum time-averaged power is < 1 mW

Option (B): 1.1307(b)(3)(i)(B): Device operates between 300 MHz and 6 GHz and the maximum time-averaged power or effective radiated power (ERP), whichever is greater, <= Pth.

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

d = the separation distance (cm);

Option (C): 1.1307(b)(3)(i)(C): ERP is below a threshold calculated based on the distance R between the person and the antenna / radiating structure, where $R > \lambda / 2 \pi$.

Single RF Sources Subject to Routine Environmental Evaluation	
RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1,920 R^2$.
1.34-30	$3,450 R^2/f^2$.
30-300	$3.83 R^2$.
300-1,500	$0.0128 R^2 f$.
1,500-100,000	$19.2 R^2$.

Note: R is in meters, f is in MHz.



2.4 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Option *1	TL EIRP (dBm) *2	TL Ratio *3
2.4G;D1D	5.92	29.99	35.91	0.08	35.99	51	0.12152	1.00000	C	39.133	0.4850
5.2G;D1D	5.44	29.50	34.94	0.50	35.44	51	0.10707	1.00000	C	39.133	0.4273
5.3G;D1D	6.34	23.62	29.96	0.03	29.99	51	0.03052	1.00000	C	39.133	0.1218
5.6G;D1D	6.46	23.51	29.97	0.02	29.99	51	0.03052	1.00000	C	39.133	0.1218
5.8G;D1D	6.27	29.61	35.88	0.11	35.99	51	0.12152	1.00000	C	39.133	0.4850
5.81G;D1D	6.54	29.31	35.85	0.14	35.99	51	0.12152	1.00000	C	39.133	0.4850

Note 1: Option A, B and C refer as clause 2.3

Note 2: For option B, Pth(mW) convert to TL EIRP(dBm); For option C, ERP(W) convert to TL EIRP(dBm)

Note 3: TL Ratio=Tune-up EIRP(mW)/TL EIRP(mW)

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz+WLAN 5GHz

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Distance (cm)	S (mW/cm ²)	Limit (mW/cm ²)	Option *1	TL EIRP (dBm)*2	TL Ratio *3
5.8G;D1D	6.27	29.61	35.88	0.11	35.99	51	0.12152	1.00000	C	39.133	0.4850
2.4G;D1D	5.92	29.99	35.91	0.08	35.99	51	0.12152	1.00000	C	39.133	0.4850
Sum TL Ratio_C	0.97										
Ratio Limit	1										

Note 1: Option A, B and C refer as clause 2.3

Note 2: For option B, Pth(mW) convert to TL EIRP(dBm); For option C, ERP(W) convert to TL EIRP(dBm)

Note 3: TL Ratio=Tune-up EIRP(mW)/TL EIRP(mW)

—————THE END—————