



RADIO EXPOSURE TEST REPORT

FCC ID : 2AHKM-CODA5814Q

Equipment : DOCIS 3.1 Wi-Fi 6 EMTA Gateway

Brand Name : Hitron

Model Name : CODA5814Q, CODA5810Q, CODA5610Q

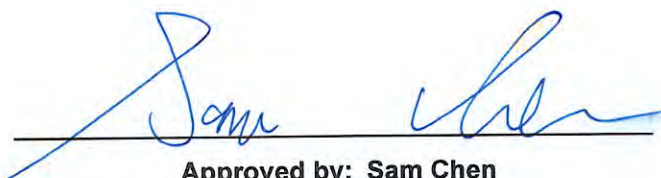
Applicant : Hitron Technologies Inc.
No. 1-8, Li-Hsin 1st Rd. Hsinchu Science Park,
Hsinchu 30078, Taiwan

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 Oct. 13, 2021, and testing was started from Oct. 13, 2021 and completed on Jun. 21, 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 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

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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 11
Issued Date : Jun. 30, 2022
Report Version : 01



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: Viola Huang



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	5180-5240 5260-5320 5500-5700 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	4.19	2.83	1.60	2.59	2.76	3.58
2	2	1.83	2.78	3.26	3.45	3.56	3.84
3	3	3.30	3.24	3.19	1.91	2.92	2.83
4	4	4.71	3.31	3.62	2.69	3.80	3.13
Directional Gain (dBi)							
		2.4GHz	UNII 1	UNII 2A	UNII 2C	UNII 3	UNII 4
4T1S		5.65	5.79	5.78	5.98	5.45	5.49
4T2S		4.71	3.31	3.62	3.45	3.80	3.84
4T4S		1.53	1.14	0.36	0.89	0.73	0.71

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

Note 3:

WLAN 2.4GHz/5GHz(UNII 1 ~ UNII 4): The directional gain is measured which follows the procedure of KDB 662911 D03. The antenna report is provided in the operational description for this application.

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
CODA5814Q	V	Black
CODA5810Q	X	Black
CODA5610Q	X	White

Note 1: From the above models, model: CODA5814Q were selected as representative model for the test and its data was recorded in this report.

Note 2: The above information was declared by manufacturer.

1.4 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FA193028

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

Modifications	Performance Checking
Adding UNII 4 (5725~5895 MHz) for this device.	Maximum Permissible Exposure

Note: RF Exposure Evaluation of 5GHz UNII 1, UNII 2A, UNII 2C, UNII 3 and 2.4GHz Band are based on original test report

1.5 Accessories

Power	Brand	Model	Rating
Adapter	MOSO	MS-V4000R120-050A0-US	Input: 100-240V~, 50/60Hz, 1.3A max. Output: 12.0V, 4.0A
Others			
Coaxial cable*1: Shielded 1.0m			
RJ-45 cable*1: Non-shielded, 1.5m			



1.6 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

1.7 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 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
3.0-30	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 48 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 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, <= P_{th}.

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

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)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)
2.4G;D1D	4.71	29.92	34.63	0.50	35.13	3.25837	48	0.11254	1.00000
5.2G;D1D	5.79	28.69	34.48	0.50	34.98	3.14775	48	0.10872	1.00000
5.3G;D1D	5.78	23.67	29.45	0.50	29.95	0.98855	48	0.03414	1.00000
5.6G;D1D	5.98	23.79	29.77	0.50	30.27	1.06414	48	0.03675	1.00000
5.8G;D1D (UNII 3)	5.45	29.68	35.13	0.50	35.63	3.65595	48	0.12627	1.00000
5.8G;D1D (UNII 4)	3.84	31.32	35.16	0.50	35.66	3.68129	48	0.12714	1.00000

MPE Exemption Option C							
Frequency (MHz)	$\lambda/2\pi$ (m)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	MPE Exemption
2437	0.0196	0.48	35.13	32.98	1.986	4.241	Complies
5835	0.0082		35.66	33.51	2.244	4.241	Complies

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

Simultaneous Transmissions Option C							
Frequency (MHz)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	Simultaneous Transmissions	Simultaneous Transmissions Limit
2437	0.48	35.13	32.98	1.986	4.424	0.96	<= 1
5835		35.66	33.51	2.244	4.424		

—THE END—