



# FCC RADIO EXPOSURE TEST REPORT

**FCC ID** : 2AHKM-CODA5519

**Equipment** : DOCSIS 3.1 Wi-Fi 6 EMTA Gateway

**Brand Name** : hitron

**Model Name** : CODA-5519, CODA-5512, CODA-5719, CODA-5712,  
CODA-5610, CODA-5810, CODA-5814, CODA5610

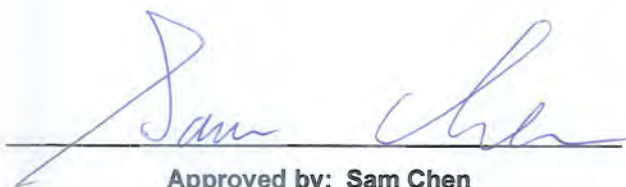
**Applicant** : Hitron Technologies Inc.  
No. 1-8, Li-Hsin 1st Rd. Hsinchu Science Park,  
Hsinchu 30078, Taiwan

**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 Nov. 28, 2019, and testing was started from Nov. 28, 2019 and completed on Jul. 23, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications 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. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Approved by: Sam Chen

**SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory**

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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## History of this test report

[illegible]



## Summary of Test Result

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

**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: Cindy Peng**



# 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)<br>802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)                 |
| 5GHz WLAN              | 5150-5250<br>5250-5350<br>5470-5725<br>5725-5850 | 5180-5250<br>5250-5320<br>5500-5720<br>5745-5825 | 802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)<br>802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) |



## 1.2 Table for Multiple Listing

The model names in the following table are all refer to the identical product.

| EUT                                                                                                          | Model Name | Frequency Configuration       | MoCA | Voice (SLIC) | LAN             | Wi-Fi   | BBU | USB |
|--------------------------------------------------------------------------------------------------------------|------------|-------------------------------|------|--------------|-----------------|---------|-----|-----|
| 1                                                                                                            | CODA-5519  | 5~85 US                       | Yes  | PEF42078     | PHY: GPY212     | WAV614+ | Yes | Yes |
|                                                                                                              |            | 108 ~ 1002 DS                 |      |              | Switch: PEF7085 | Wave624 |     |     |
| 2                                                                                                            | CODA-5512  | 5~85 US                       | Yes  | No           | PHY: GPY212     | WAV614+ | No  | Yes |
|                                                                                                              |            | 108 ~ 1002 DS                 |      |              | Switch: PEF7085 | Wave624 |     |     |
| 3                                                                                                            | CODA-5719  | 5-85/ 5~204MHz US             | Yes  | PEF42078     | PHY: GPY212     | WAV614+ | Yes | Yes |
|                                                                                                              |            | 108 ~ 1002 / 258 ~ 1002Mhz DS |      |              | Switch: PEF7085 | Wave624 |     |     |
| 4                                                                                                            | CODA-5712  | 5-85/ 5~204MHz US             | Yes  | No           | PHY: GPY212     | WAV614+ | No  | Yes |
|                                                                                                              |            | 108 ~ 1002 / 258 ~ 1002Mhz DS |      |              | Switch: PEF7085 | Wave624 |     |     |
| 5                                                                                                            | CODA-5610  | 5-42/ 5~85MHz US              | No   | No           | PHY: GPY212     | WAV614+ | No  | Yes |
|                                                                                                              |            | 108 ~ 1002 DS                 |      |              | Switch: PEF7085 | Wave624 |     |     |
| 6                                                                                                            | CODA-5810  | 5-85/ 5~204MHz US             | No   | No           | PHY: GPY212     | WAV614+ | No  | Yes |
|                                                                                                              |            | 108 ~ 1218 / 258 ~ 1218Mhz DS |      |              | Switch: PEF7085 | Wave624 |     |     |
| 7                                                                                                            | CODA-5814  | 5-85/ 5~204MHz US             | No   | PEF42078     | PHY: GPY212     | WAV614+ | Yes | Yes |
|                                                                                                              |            |                               |      |              | Switch: PEF7085 | Wave624 |     |     |
| -                                                                                                            | CODA5610   | 5-42/ 5~85MHz US              | No   | No           | PHY: GPY212     | WAV614+ | No  | Yes |
|                                                                                                              |            | 108 ~ 1002 DS                 |      |              | Switch: PEF7085 | Wave624 |     |     |
| Note: The model “CODA-5610” and “CODA5610” are identical, different model names serve as marketing strategy. |            |                               |      |              |                 |         |     |     |

From the above models, model: CODA-5519 was selected as representative model for the test and its data was recorded in this report.



### 1.3 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FA020705

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

| Modifications                                                                                                                                                                                                                                                                                                                           | Performance Checking                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| 1. Changing the color of RJ-45 cable to "orange" from "yellow".<br>2. Removing one adapter (Brand Name: APD, Model Name: DA-60Y12).<br>3. Changing the hardware of model names: CODA-5512, CODA-5719, CODA-5712, CODA-5610, the detail please refer to the section 1.2.<br>4. Adding three model names: CODA-5810, CODA-5814, CODA5610. | It does not affect the test result. |
| 5. Adding 5GHz band 2 and band 3 (5250~5350 MHz, 5470~5725 MHz).<br>6. Adding the 160MHz bandwidth.                                                                                                                                                                                                                                     | Maximum Permissible Exposure.       |

Note: Maximum Permissible Exposure of 5GHz band 1, 4 and 2.4GHz band are based on original test report.

### 1.4 Testing Location

| Testing Location                    |        |                                                                                                                               |
|-------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/>            | HWA YA | ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.<br>TEL : 886-3-327-3456 FAX : 886-3-327-0973   |
| <input checked="" type="checkbox"/> | JHUBEI | ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.<br>TEL : 886-3-656-9065 FAX : 886-3-656-9085 |

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.



## 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 <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|------------------------------------------|------------------------------------------------------------------|
| 0.3-3.0               | 614                               | 1.63                              | (100)*                                   | 6                                                                |
| 3.0-30                | 1842 / f                          | 4.89 / f                          | (900 / f)*                               | 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 <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|------------------------------------------|------------------------------------------------------------------|
| 0.3-1.34              | 614                               | 1.63                              | (100)*                                   | 30                                                               |
| 1.34-30               | 824/f                             | 2.19/f                            | (180/f)*                                 | 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 22 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 <sup>2</sup> ) | S Limit (mW/cm <sup>2</sup> ) |
|----------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|
| 2.4G;D1D | 2.80     | 29.88       | 32.68      | 0.50           | 33.18              | 2.07970          | 22            | 0.34194                 | 1.00000                       |
| 5.2G;D1D | 8.62     | 27.28       | 35.90      | 0.09           | 35.99              | 3.97192          | 22            | 0.65305                 | 1.00000                       |
| 5.3G;D1D | 9.02     | 20.94       | 29.96      | 0.03           | 29.99              | 0.99770          | 22            | 0.16404                 | 1.00000                       |
| 5.6G;D1D | 9.42     | 20.45       | 29.87      | 0.12           | 29.99              | 0.99770          | 22            | 0.16404                 | 1.00000                       |
| 5.8G;D1D | 9.02     | 26.96       | 35.98      | 0.01           | 35.99              | 3.97192          | 22            | 0.65305                 | 1.00000                       |

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

| Mode     | DG (dBi) | Power (dBm) | EIRP (dBm) | Tolerance (dB) | Tune-up EIRP (dBm) | Tune-up EIRP (W) | Distance (cm) | S (mW/cm <sup>2</sup> ) | S Limit (mW/cm <sup>2</sup> ) | Ratio (S/Limit) |
|----------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|-----------------|
| 2.4G;D1D | 2.80     | 29.88       | 32.68      | 0.50           | 33.18              | 2.07970          | 22            | 0.34194                 | 1.00000                       | 0.34194         |
| 5.8G;D1D | 9.02     | 26.96       | 35.98      | 0.01           | 35.99              | 3.97192          | 22            | 0.65305                 | 1.00000                       | 0.65305         |
|          |          |             |            |                |                    |                  |               |                         | Sum Ratio                     | 0.99499         |
|          |          |             |            |                |                    |                  |               |                         | Ratio Limit                   | 1               |

Note: The above antenna gain was declared by manufacturer.

————THE END————