


# Radio Exposure Evaluation Report

**FCC ID** : Z8H89FT0041

**Equipment** : cnPilot e425H Indoor

**Brand Name** :  Cambium Networks

**Model Name** : REG-PL-E425H

**Applicant** : Cambium Networks Inc.  
3800 Golf Road, Suite 360 Rolling Meadows, IL  
60008, USA

**Manufacturer** : Cambium Networks Ltd.  
Unit B2 Linhay Business Park Eastern Rd  
Ashburton, Devon TQ13 7UP United Kingdom

**Standard** : 47 CFR Part 2.1091

The product was received on Jan. 07, 2019, and testing was started from Feb. 01, 2019 and completed on Mar. 28, 2019. 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, KDB447498 D01 General RF Exposure Guidance v06 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of United States government.

The test results in this 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: Allen Lin

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

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



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## 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:

None.

**Reviewed by: Jackson Tsai**

**Report Producer: Debby Hung**

# 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)                 |
| 5GHz WLAN              | 5150-5250<br>5250-5350<br>5470-5725<br>5725-5850 | 5180-5240<br>5260-5320<br>5500-5700<br>5745-5825 | 802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) |

## 1.2 Testing Location

| Testing Location                           |        |  |                      |
|--|--------|--|----------------------|
| <input checked="" type="checkbox"/>        | HWA YA | ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)    |                      |
|  |        | TEL : 886-3-327-3456   | FAX : 886-3-327-0973 |
| Test site Designation No. TW1190 with FCC. |        |  |                      |
| <input type="checkbox"/>                   | JHUBEI | ADD : No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.) |                      |
|  |        | TEL : 886-3-656-9065   | FAX : 886-3-656-9085 |
| Test site Designation No. TW0006 with FCC. |        |  |                      |

## 1.3 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FA8D2017

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

| Modifications                 | Performance Checking |
|-------------------------------|----------------------|
| UNII-2A and UNII-2C was added | NA                   |

## 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 <sup>2</sup> )*                 | 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 <sup>2</sup> )*                   | 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:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d}$$

$$\text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

**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

WLAN 2.4G Function:

| Mode     | DG<br>(dBi) | Power<br>(dBm) | EIRP<br>(dBm) | Tolerance<br>(dB) | Tune-up<br>EIRP<br>(dBm) | Tune-up<br>EIRP<br>(W) | Distance<br>(cm) | S<br>(mW/cm <sup>2</sup> ) | S Limit<br>(mW/cm <sup>2</sup> ) |
|----------|-------------|----------------|---------------|-------------------|--------------------------|------------------------|------------------|----------------------------|----------------------------------|
| 2.4G;G1D | 4.04        | 24.94          | 28.98         | 0.50              | 29.48                    | 0.88716                | 20               | 0.17649                    | 1.00000                          |
| 2.4G;D1D | 4.04        | 24.52          | 28.56         | 0.50              | 29.06                    | 0.80538                | 20               | 0.16023                    | 1.00000                          |

WLAN 5G Function:

<Non-Beamforming>

| Mode     | DG<br>(dBi) | Power<br>(dBm) | EIRP<br>(dBm) | Tolerance<br>(dB) | Tune-up<br>EIRP<br>(dBm) | Tune-up<br>EIRP<br>(W) | Distance<br>(cm) | S<br>(mW/cm <sup>2</sup> ) | S Limit<br>(mW/cm <sup>2</sup> ) |
|----------|-------------|----------------|---------------|-------------------|--------------------------|------------------------|------------------|----------------------------|----------------------------------|
| 5.2G;D1D | 4.29        | 26.77          | 31.06         | 0.50              | 31.56                    | 1.43219                | 20               | 0.28493                    | 1.00000                          |
| 5.3G;D1D | 4.29        | 23.94          | 28.23         | 0.50              | 28.73                    | 0.74645                | 20               | 0.14850                    | 1.00000                          |
| 5.6G;D1D | 4.29        | 23.99          | 28.28         | 0.50              | 28.78                    | 0.75509                | 20               | 0.15022                    | 1.00000                          |
| 5.8G;D1D | 4.29        | 25.40          | 29.69         | 0.50              | 30.19                    | 1.04472                | 20               | 0.20784                    | 1.00000                          |

< Beamforming>

| Mode     | DG<br>(dBi) | Power<br>(dBm) | EIRP<br>(dBm) | Tolerance<br>(dB) | Tune-up<br>EIRP<br>(dBm) | Tune-up<br>EIRP<br>(W) | Distance<br>(cm) | S<br>(mW/cm <sup>2</sup> ) | S Limit<br>(mW/cm <sup>2</sup> ) |
|----------|-------------|----------------|---------------|-------------------|--------------------------|------------------------|------------------|----------------------------|----------------------------------|
| 5.2G;D1D | 7.26        | 22.15          | 29.41         | 0.50              | 29.91                    | 0.97949                | 20               | 0.19486                    | 1.00000                          |
| 5.3G;D1D | 7.26        | 21.40          | 28.66         | 0.50              | 29.16                    | 0.82414                | 20               | 0.16396                    | 1.00000                          |
| 5.6G;D1D | 7.26        | 21.70          | 28.96         | 0.50              | 29.46                    | 0.88308                | 20               | 0.17568                    | 1.00000                          |
| 5.8G;D1D | 7.26        | 21.31          | 28.57         | 0.50              | 29.07                    | 0.80724                | 20               | 0.16060                    | 1.00000                          |



**Co-location**

**WLAN 2.4G +WLAN 5G Function:**

| 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;G1D | 4.04     | 24.94       | 28.98      | 0.50           | 29.48              | 0.88716          | 20            | 0.17649                 | 1.00000                       | 0.17649         |
| 5.2G;D1D | 4.29     | 26.77       | 31.06      | 0.50           | 31.56              | 1.43219          | 20            | 0.28493                 | 1.00000                       | 0.28492         |
|          |          |             |            |                |                    |                  |               |                         | Sum Ratio                     | 0.46141         |
|          |          |             |            |                |                    |                  |               |                         | Ratio Limit                   | 1               |

————THE END————