



# RADIO EXPOSURE TEST REPORT

**FCC ID** : Z8H89FT0084

**Equipment** : 6091HH

**Brand Name** : Cambium Networks

**Model Name** : 6091HH

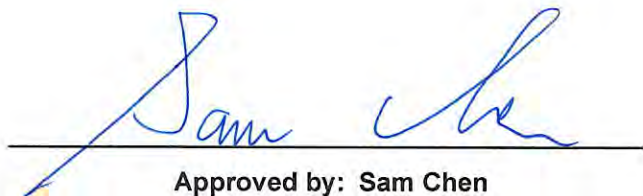
**Applicant** : Cambium Networks Inc.  
3800 Golf Road, Suite 360 Rolling Meadows, IL 60008, USA

**Manufacturer** : Cambium Networks, Ltd.  
Ashburton, TQ13 7UP, UK

**Standard** : 47 CFR Part 2.1091

The product was received on Dec. 20, 2023, and testing was started from Dec. 20, 2023 and completed on Feb. 28, 2024. 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**

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



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### Photographs of EUT v01





## Summary of Test Result

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

**Conformity Assessment Condition:**

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the chapter "Measurement Uncertainty".

**Disclaimer:**

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

**Reviewed by:** Sam Chen

**Report Producer:** Cathy Chiu



# 1 General Description

## 1.1 EUT General Information

| RF General Information |                     |                           |                 |
|------------------------|---------------------|---------------------------|-----------------|
| Frequency Range (MHz)  | Ch. Bandwidth (MHz) | Operating Frequency (MHz) | Modulation Type |
| 5725-5850              | 5                   | 5725.5-5847.5             | QPSK            |
|                        | 10                  | 5730-5845                 |                 |
|                        | 15                  | 5732.5-5842.5             |                 |
|                        | 20                  | 5735-5840                 |                 |
|                        | 30                  | 5740-5835                 |                 |
|                        | 40                  | 5745-5830                 |                 |
| 5925-6425              | 5                   | 5927.5-6297.5             | QPSK            |
|                        | 10                  | 5930-6295                 |                 |
|                        | 15                  | 5932.5-6292.5             |                 |
|                        | 20                  | 5935-6290                 |                 |
|                        | 30                  | 5940-6285                 |                 |
|                        | 40                  | 5945-6280                 |                 |

## 1.2 Antenna Information

| Ant. | Port | Brand   | Model Name | Antenna Type            | Connector | Gain (dBi) |
|------|------|---------|------------|-------------------------|-----------|------------|
| 1    | 1    | Cambium | 450B 6GHz  | Dish (Directional Ant.) | N/A       | 24         |
|      | 2    |         |            |                         |           |            |

Note 1: The above information was declared by manufacturer.

Note 2: The antenna is cross-polarization.

### For 5GHz function (2TX/2RX):

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

Port 1~2 could transmit/receive simultaneously.

### For 6GHz function (2TX/2RX):

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

Port 1~2 could transmit/receive simultaneously.



### 1.3 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FA3D2102

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

| Modifications                                                            | Performance Checking                           |
|--------------------------------------------------------------------------|------------------------------------------------|
| 1. Add UNII-5 for this device through SW change.                         | MPE for UNII-5                                 |
| 2. Revise the model name of the antenna to "450B 6GHz" from "450B 5GHz". | After evaluation, it does not need to re-test. |

Note: Other test results are based on original test report.

### 1.4 Accessories

N/A

### 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.                    |

Note: The tested sample of MPE for UNII-5 was received on Jan. 25, 2024.



## 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 183 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 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<sub>th</sub>.

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

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<br>(dBi) | Power<br>(dBm) | ERP<br>(dBm) | Tolerance<br>(dB) | Tune-up ERP<br>(mW) | Distance<br>(cm) | Option | TL ERP<br>(mW) |
|----------|-------------|----------------|--------------|-------------------|---------------------|------------------|--------|----------------|
| 5.8G;G7D | 24.00       | 25.71          | 47.56        | 0.50              | 63973.484           | 183              | C      | 64299.400      |
| 6.2G;G7D | 24.00       | -              | 33.81        | 0.03              | 2421.029            | 183              | C      | 64299.400      |

————THE END————