

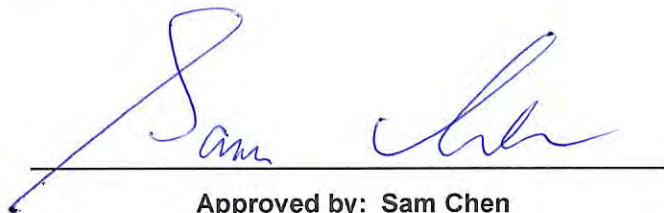


# RADIO EXPOSURE TEST REPORT

FCC ID : Z8H89FT0072  
Equipment : XE5-8  
Brand Name : Cambium Networks  
Model Name : XE5-8  
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. 07, 2021, and testing was started from Dec. 21, 2021 and completed on Nov. 22, 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.)



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### Photographs of EUT v01



## History of this test report

| Report No.  | Version | Description                                                                                                            | Issued Date   |
|-------------|---------|------------------------------------------------------------------------------------------------------------------------|---------------|
| FA142255-01 | 01      | Initial issue of report                                                                                                | Apr. 29, 2022 |
| FA142255-01 | 02      | Revising Maximum Permissible Exposure Simultaneous Transmission mode, because Radio 2 and 3 can't work simultaneously. | Jun. 16, 2022 |
| FA142255-01 | 03      | Revising Maximum Permissible Exposure Simultaneous Transmission mode, because Radio 2 and 3 can work simultaneously.   | Jul. 22, 2022 |
| FA142255-01 | 04      | Revising Results of Maximum Permissible Exposure.                                                                      | Aug. 02, 2022 |
| FA142255-01 | 05      | Adding Maximum Permissible Exposure from Radio 3 Pine 2                                                                | Dec. 13, 2022 |
|             |         |                                                                                                                        |               |
|             |         |                                                                                                                        |               |
|             |         |                                                                                                                        |               |
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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:**

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)<br>802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)<br>802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) |
| 5GHz WLAN              | 5150-5250<br>5725-5850 | 5180-5240<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)                                 |
| 6GHz WLAN              | 5925-7125              | 5955-7115                 | 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)                                                                                                                                    |
| Bluetooth              | 2400-2483.5            | 2402-2480                 | LE: GFSK                                                                                                                                                                                       |



## 1.2 Antenna Information

| Radio | Ant. | 2.4GHz port | 5GHz port        | 5GHz port        | 6E port | Bluetooth | Brand  | Model Name           | Antenna Type  | Connector | Gain (dBi) |
|-------|------|-------------|------------------|------------------|---------|-----------|--------|----------------------|---------------|-----------|------------|
| 1     | 1    | 4           | 4<br>(High band) | 4<br>(Full band) | -       | -         | ACCTON | EAP9819A-6E-1120-CAM | PCB antenna   | I-PEX     | Note 1     |
|       | 2    | 3           | 3<br>(High band) | 3<br>(Full band) | -       | -         | ACCTON | EAP9819A-6E-1120-CAM | PCB antenna   | I-PEX     |            |
|       | 3    | 2           | 2<br>(High band) | 2<br>(Full band) | -       | -         | ACCTON | EAP9819A-6E-1120-CAM | PCB antenna   | I-PEX     |            |
|       | 4    | 1           | 1<br>(High band) | 1<br>(Full band) | -       | -         | ACCTON | EAP9819A-6E-1120-CAM | PCB antenna   | I-PEX     |            |
| 1     | 5    | -           | 4<br>(Low band)  | 8<br>(Full band) | -       | -         | ACCTON | EAP9819A-6E-1120-CAM | PCB antenna   | I-PEX     |            |
|       | 6    | -           | 3<br>(Low band)  | 7<br>(Full band) | -       | -         | ACCTON | EAP9819A-6E-1120-CAM | PCB antenna   | I-PEX     |            |
|       | 7    | -           | 2<br>(Low band)  | 6<br>(Full band) | -       | -         | ACCTON | EAP9819A-6E-1120-CAM | PCB antenna   | I-PEX     |            |
|       | 8    | -           | 1<br>(Low band)  | 5<br>(Full band) | -       | -         | ACCTON | EAP9819A-6E-1120-CAM | PCB antenna   | I-PEX     |            |
| 2     | 9    | -           | 4                |                  | 4       | -         | ACCTON | EAP9819A-6E-1120-CAM | Metal antenna | I-PEX     |            |
|       | 10   | -           | 2                |                  | 2       | -         | ACCTON | EAP9819A-6E-1120-CAM | Metal antenna | I-PEX     |            |
|       | 11   | -           | 3                |                  | 3       | -         | ACCTON | EAP9819A-6E-1120-CAM | Metal antenna | I-PEX     |            |
|       | 12   | -           | 1                |                  | 1       | -         | ACCTON | EAP9819A-6E-1120-CAM | Metal antenna | I-PEX     |            |
| 3     | 13   | -           | 4                |                  | 4       | -         | ACCTON | EAP9819A-6E-1120-CAM | Metal antenna | I-PEX     |            |
|       | 14   | -           | 2                |                  | 2       | -         | ACCTON | EAP9819A-6E-1120-CAM | Metal antenna | I-PEX     |            |
|       | 15   | -           | 3                |                  | 3       | -         | ACCTON | EAP9819A-6E-1120-CAM | Metal antenna | I-PEX     |            |
|       | 16   | -           | 1                |                  | 1       | -         | ACCTON | EAP9819A-6E-1120-CAM | Metal antenna | I-PEX     |            |
| 4     | 17   | -           | -                | -                | -       | 1         | ACCTON | GT128V007S-001       | Chip antenna  | N/A       |            |

**Note 1:**
**Radio 1 and Radio 4**

| Ant. | Antenna Gain (dBi) |           |         |         |        |           |
|------|--------------------|-----------|---------|---------|--------|-----------|
|      | WLAN 2.4GHz        | WLAN 5GHz |         |         |        | Bluetooth |
|      |                    | UNII 1    | UNII 2A | UNII 2C | UNII 3 |           |
| 1    | 4.51               | 4.09      | 3.06    | 3.82    | 3.60   | -         |
| 2    | 4.97               | 4.40      | 5.70    | 3.79    | 2.99   | -         |
| 3    | 4.66               | 5.17      | 5.99    | 4.38    | 3.52   | -         |
| 4    | 5.95               | 4.64      | 4.09    | 4.19    | 3.36   | -         |
| 5    | -                  | 3.39      | 3.58    | 3.34    | 2.01   | -         |
| 6    | -                  | 3.70      | 3.39    | 2.52    | 3.03   | -         |
| 7    | -                  | 3.10      | 3.68    | 2.83    | 2.84   | -         |
| 8    | -                  | 2.82      | 3.13    | 2.19    | 2.61   | -         |
| 17   | -                  | -         | -       | -       | -      | 3.24      |

**Mode 1: 2.4GHz 4TX and 5GHz UNII 1~UNII 3 8TX**

| Ant. | Directional Gain (dBi) |      |      |           |      |      |      |         |      |      |      |         |      |      |      |        |      |      |       |
|------|------------------------|------|------|-----------|------|------|------|---------|------|------|------|---------|------|------|------|--------|------|------|-------|
|      | WLAN 2.4GHz            |      |      | WLAN 5GHz |      |      |      |         |      |      |      |         |      |      |      |        |      |      |       |
|      |                        |      |      | UNII 1    |      |      |      | UNII 2A |      |      |      | UNII 2C |      |      |      | UNII 3 |      |      |       |
|      | 4T1S                   | 4T2S | 4T4S | 8T1S      | 8T2S | 8T4S | 8T8S | 8T1S    | 8T2S | 8T4S | 8T8S | 8T1S    | 8T2S | 8T4S | 8T8S | 8T1S   | 8T2S | 8T4S | 8T8S  |
| 1    | 9.91                   | 6.91 | 3.96 | 8.39      | 5.39 | 5.17 | 0.57 | 8.65    | 5.99 | 5.99 | 0.76 | 7.37    | 4.38 | 4.38 | 0.01 | 7.13   | 4.13 | 3.60 | -0.40 |
| 2    |                        |      |      |           |      |      |      |         |      |      |      |         |      |      |      |        |      |      |       |
| 3    |                        |      |      |           |      |      |      |         |      |      |      |         |      |      |      |        |      |      |       |
| 4    |                        |      |      |           |      |      |      |         |      |      |      |         |      |      |      |        |      |      |       |
| 5    | -                      | -    | -    |           |      |      |      |         |      |      |      |         |      |      |      |        |      |      |       |
| 6    | -                      | -    | -    |           |      |      |      |         |      |      |      |         |      |      |      |        |      |      |       |
| 7    | -                      | -    | -    |           |      |      |      |         |      |      |      |         |      |      |      |        |      |      |       |
| 8    | -                      | -    | -    |           |      |      |      |         |      |      |      |         |      |      |      |        |      |      |       |

**Mode 2: 2.4GHz, 5GHz UNII 1~UNII 2A and 5GHz UNII 2C~UNII 3 4TX**

| Ant. | Directional Gain (dBi) |      |      |           |      |      |         |      |      |         |      |      |        |      |      |
|------|------------------------|------|------|-----------|------|------|---------|------|------|---------|------|------|--------|------|------|
|      | WLAN 2.4GHz            |      |      | WLAN 5GHz |      |      |         |      |      |         |      |      |        |      |      |
|      |                        |      |      | UNII 1    |      |      | UNII 2A |      |      | UNII 2C |      |      | UNII 3 |      |      |
|      | 4T1S                   | 4T2S | 4T4S | 4T1S      | 4T2S | 4T4S | 4T1S    | 4T2S | 4T4S | 4T1S    | 4T2S | 4T4S | 4T1S   | 4T2S | 4T4S |
| 1    | 9.91                   | 6.91 | 3.96 | -         | -    | -    | -       | -    | -    | 8.67    | 5.67 | 2.75 | 8.15   | 5.15 | 2.27 |
| 2    |                        |      |      |           |      |      |         |      |      |         |      |      |        |      |      |
| 3    |                        |      |      |           |      |      |         |      |      |         |      |      |        |      |      |
| 4    |                        |      |      |           |      |      |         |      |      |         |      |      |        |      |      |
| 5    | -                      | -    | -    | 7.35      | 4.35 | 1.38 | 7.38    | 4.38 | 1.47 | -       | -    | -    | -      | -    | -    |
| 6    | -                      | -    | -    |           |      |      |         |      |      |         |      |      |        |      |      |
| 7    | -                      | -    | -    |           |      |      |         |      |      |         |      |      |        |      |      |
| 8    | -                      | -    | -    |           |      |      |         |      |      |         |      |      |        |      |      |

**For Radio 2~Radio 3**

| Ant. | Antenna Gain (dBi) |         |         |        |         |        |        |        |
|------|--------------------|---------|---------|--------|---------|--------|--------|--------|
|      | WLAN 5GHz          |         |         |        | WLAN 6E |        |        |        |
|      | UNII 1             | UNII 2A | UNII 2C | UNII 3 | UNII 5  | UNII 6 | UNII 7 | UNII 8 |
| 9    | 3.56               | 4.37    | 3.82    | 4.70   | 4.96    | 3.57   | 3.72   | 4.44   |
| 10   | 1.25               | 3.18    | 3.45    | 1.86   | 4.40    | 3.52   | 3.12   | 3.31   |
| 11   | 4.27               | 4.24    | 2.25    | 3.64   | 4.14    | 2.03   | 3.08   | 4.86   |
| 12   | 1.94               | 2.59    | 2.08    | 3.11   | 4.85    | 2.60   | 3.43   | 3.41   |
| 13   | 3.25               | 3.68    | 3.74    | 2.90   | 4.16    | 2.52   | 0.71   | 2.03   |
| 14   | 2.35               | 4.20    | 2.48    | 3.96   | 4.72    | 2.06   | 1.91   | 2.03   |
| 15   | 3.07               | 3.84    | 2.89    | 2.61   | 2.24    | 1.61   | 2.74   | 2.45   |
| 16   | 3.41               | 3.65    | 1.81    | 3.31   | 3.43    | 3.56   | 2.35   | 1.93   |

**For 5GHz UNII 1~UNII 3**

| Ant. | Directional Gain (dBi) |      |      |         |      |      |         |      |       |        |      |      |
|------|------------------------|------|------|---------|------|------|---------|------|-------|--------|------|------|
|      | WLAN 5GHz              |      |      |         |      |      |         |      |       |        |      |      |
|      | UNII 1                 |      |      | UNII 2A |      |      | UNII 2C |      |       | UNII 3 |      |      |
|      | 4T1S                   | 4T2S | 4T4S | 4T1S    | 4T2S | 4T4S | 4T1S    | 4T2S | 4T4S  | 4T1S   | 4T2S | 4T4S |
| 9    | 6.84                   | 4.27 | 0.94 | 7.38    | 4.38 | 1.63 | 5.12    | 3.82 | -0.67 | 5.70   | 4.70 | 0.08 |
| 10   |                        |      |      |         |      |      |         |      |       |        |      |      |
| 11   |                        |      |      |         |      |      |         |      |       |        |      |      |
| 12   |                        |      |      |         |      |      |         |      |       |        |      |      |
| 13   | 6.79                   | 3.79 | 0.92 | 6.16    | 4.20 | 0.76 | 4.51    | 3.74 | -0.79 | 5.60   | 3.96 | 0.29 |
| 14   |                        |      |      |         |      |      |         |      |       |        |      |      |
| 15   |                        |      |      |         |      |      |         |      |       |        |      |      |
| 16   |                        |      |      |         |      |      |         |      |       |        |      |      |

**For 6GHz UNII 5~8**

| Ant. | Directional Gain (dBi) |      |      |        |      |      |        |      |       |        |      |       |
|------|------------------------|------|------|--------|------|------|--------|------|-------|--------|------|-------|
|      | WLAN 6E                |      |      |        |      |      |        |      |       |        |      |       |
|      | UNII 5                 |      |      | UNII 6 |      |      | UNII 7 |      |       | UNII 8 |      |       |
|      | 4T1S                   | 4T2S | 4T4S | 4T1S   | 4T2S | 4T4S | 4T1S   | 4T2S | 4T4S  | 4T1S   | 4T2S | 4T4S  |
| 9    | 7.11                   | 4.96 | 1.27 | 6.27   | 3.57 | 0.39 | 6.05   | 3.72 | 0.36  | 7.06   | 4.86 | 1.54  |
| 10   |                        |      |      |        |      |      |        |      |       |        |      |       |
| 11   |                        |      |      |        |      |      |        |      |       |        |      |       |
| 12   |                        |      |      |        |      |      |        |      |       |        |      |       |
| 13   | 7.06                   | 4.72 | 1.39 | 6.25   | 3.56 | 0.34 | 4.86   | 2.74 | -0.72 | 5.56   | 2.56 | -0.38 |
| 14   |                        |      |      |        |      |      |        |      |       |        |      |       |
| 15   |                        |      |      |        |      |      |        |      |       |        |      |       |
| 16   |                        |      |      |        |      |      |        |      |       |        |      |       |

Note 2: The EUT has seventeen antennas.

Note 3: The brand/model/antenna type information was declared by manufacturer.

Note 4: Maximum Directional Gain following KDB662911 D03.

The antenna report is provided in the operational description for this application.

Note 5: Because radio 2 and radio 3 are the same radio, the Directional Gain of radio 2 is higher than radio 3. Thus, radio 2 was tested and recorded in the report.

Note 6: The EUT doesn't enable the DFS band.

**For Radio 1****For 2.4GHz:****For IEEE 802.11b/g/n/VHT/ax mode (4TX/4RX):**

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

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

**For 5GHz UNII 1 and UNII 3 (SBS Mode):****For IEEE 802.11a/n/ac/ax mode (4TX/4RX):**

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

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

**For 5GHz UNII 1 and UNII 3 (DBS Mode):****For IEEE 802.11a/n/ac/ax mode (8TX/8RX):**

Port 1, Port 2, Port 3, Port 4, Port 5, Port 6, Port 7, Port 8 can be used as transmitting/receiving antenna.

Port 1, Port 2, Port 3, Port 4, Port 5, Port 6, Port 7, Port 8 could transmit/receive simultaneously.



**For Radio 2 and Radio 3**

**For 5GHz UNII 1 and UNII 3:**

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

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

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

**For 6GHz UNII 5~8:**

**For IEEE 802.11ax mode (4TX/4RX):**

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

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

**For Radio 4**

**For Bluetooth:**

Only Port 1 can be used as transmitting/receiving antenna.



### 1.3 Table of Radio Function

| Radio (R)     | 2.4GHz | 5GHz | 6E | Bluetooth |
|---------------|--------|------|----|-----------|
| 1             | V      | V    | -  | -         |
| 2<br>(Pine 1) | -      | V    | V  | -         |
| 3<br>(Pine 2) | -      | V    | V  | -         |
| 4             | -      | -    | -  | V         |

### 1.4 Table for EUT Operation Function

| Mode | Operation Function                                                                                             |
|------|----------------------------------------------------------------------------------------------------------------|
| 1    | DBS Mode: R1: 2.4GHz/5GHz UNII 1,UNII 3 in 8TX +R2: 5GHz UNII 1,UNII 3/6GHz+R3: 5GHz UNII 1,UNII 3/6GHz+R4: BT |
| 2    | SBS Mode: R1: 2.4GHz/5GHz UNII 1,UNII 3 in 4TX +R2: 5GHz UNII 1,UNII 3/6GHz+R3: 5GHz UNII 1,UNII 3/6GHz+R4: BT |

Note1: Only the 5GHz mode of radio 2, and 3 has been performed in the testing, because the output power is larger than 6GHz.

Note2: Radio 2 and Radio 3 can transmit simultaneously but they can't be configured to the same frequency.

### 1.5 Accessories

| Accessories |
|-------------|
| Cradle*1    |

### 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 <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 75 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<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

### For Radio 1

| 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        | 9.91     | 25.48       | 35.39      | 0.50           | 35.89              | 3.88150          | 75            | 0.05491                 | 1.00000                       |
| 5.2G;D1D<br>8TX | 8.17     | 27.68       | 35.85      | 0.14           | 35.99              | 3.97192          | 75            | 0.05619                 | 1.00000                       |
| 5.8G;D1D<br>8TX | 7.13     | 28.81       | 35.94      | 0.05           | 35.99              | 3.97192          | 75            | 0.05619                 | 1.00000                       |
| 5.2G;D1D<br>4TX | 7.35     | 26.54       | 33.89      | 0.50           | 34.39              | 2.74789          | 75            | 0.03887                 | 1.00000                       |
| 5.8G;D1D<br>4TX | 8.15     | 26.75       | 34.90      | 0.50           | 35.40              | 3.46737          | 75            | 0.04905                 | 1.00000                       |

### For Radio 2

| 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> ) |
|----------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|
| 5.2G;D1D | 6.84     | 28.06       | 34.90      | 0.50           | 35.40              | 3.46737          | 75            | 0.04905                 | 1.00000                       |
| 5.8G;D1D | 5.70     | 29.34       | 35.04      | 0.50           | 35.54              | 3.58096          | 75            | 0.05066                 | 1.00000                       |
| 6.2G;D1D | -        | 25.78       | 25.78      | 0.50           | 26.28              | 0.42462          | 75            | 0.00601                 | 1.00000                       |
| 6.4G;D1D | -        | 27.37       | 27.37      | 0.50           | 27.87              | 0.61235          | 75            | 0.00866                 | 1.00000                       |
| 6.7G;D1D | -        | 28.13       | 28.13      | 0.50           | 28.63              | 0.72946          | 75            | 0.01032                 | 1.00000                       |
| 7.0G;D1D | -        | 26.23       | 26.23      | 0.50           | 26.73              | 0.47098          | 75            | 0.00666                 | 1.00000                       |
| BT       | 3.24     | 10.09       | 13.33      | 0.50           | 13.83              | 0.02415          | 75            | 0.00034                 | 1.00000                       |

### For Radio 3

| 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> ) |
|----------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|
| 5.8G;D1D | 5.60     | 29.34       | 34.94      | 0.50           | 35.44              | 3.49945          | 75            | 0.04951                 | 1.00000                       |
| 6.2G;D1D | -        | 25.90       | 25.90      | 0.50           | 26.40              | 0.43652          | (cm)          | 0.00618                 | 1.00000                       |
| 6.4G;D1D | -        | 23.40       | 23.40      | 0.50           | 23.90              | 0.24547          | (cm)          | 0.00347                 | 1.00000                       |
| 6.7G;D1D | -        | 26.38       | 26.38      | 0.50           | 26.88              | 0.48753          | (cm)          | 0.00690                 | 1.00000                       |
| 7.0G;D1D | -        | 26.60       | 26.60      | 0.50           | 27.10              | 0.51286          | (cm)          | 0.00726                 | 1.00000                       |

### For Radio 4

| 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> ) |
|------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|
| BT   | 3.24     | 10.09       | 13.33      | 0.50           | 13.83              | 0.02415          | 75            | 0.00034                 | 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             | 0.75  | 35.89              | 33.74             | 2.366           | 10.800            | Complies      |
| 5240                   | 0.0091             |       | 35.99              | 33.84             | 2.421           | 10.800            | Complies      |
| 5785                   | 0.0082             |       | 35.99              | 33.84             | 2.421           | 10.800            | Complies      |
| 5785                   | 0.0082             |       | 35.40              | 33.25             | 2.113           | 10.800            | Complies      |
| 5200                   | 0.0092             |       | 34.39              | 32.24             | 1.675           | 10.800            | Complies      |
| 5200                   | 0.0092             |       | 35.35              | 33.20             | 2.089           | 10.800            | Complies      |
| 5785                   | 0.0082             |       | 35.54              | 33.39             | 2.183           | 10.800            | Complies      |
| 5785                   | 0.0082             |       | 35.44              | 33.29             | 2.133           | 10.800            | Complies      |
| 6825                   | 0.0070             |       | 28.63              | 26.48             | 0.445           | 10.800            | Complies      |
| 6985                   | 0.0068             |       | 27.10              | 24.95             | 0.313           | 10.800            | Complies      |
| 2440                   | 0.0196             |       | 13.83              | 11.68             | 0.015           | 10.800            | Complies      |

**Simultaneous Transmission Analysis**

**Mode 1:DBS Mode:R1: 2.4GHz/5GHz UNII 1,UNII 3 in 8TX +R2: 5GHz UNII 1,UNII 3+R3: 5GHz UNII 1,UNII 3 +R4: BT**

| 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                                | 0.75  | 35.89              | 33.74             | 2.366           | 10.800            | 0.84                       | <= 1                             |
| 5785                                |       | 35.99              | 33.84             | 2.421           | 10.800            |                            |                                  |
| 5785                                |       | 35.54              | 33.39             | 2.183           | 10.800            |                            |                                  |
| 5785                                |       | 35.44              | 33.29             | 2.133           | 10.800            |                            |                                  |
| 2440                                |       | 13.83              | 11.68             | 0.015           | 10.800            |                            |                                  |



**Mode 2: DBS Mode:R1: 2.4GHz/5GHz UNII 1,UNII 3 in 8TX +R2: 5GHz UNII 1,UNII 3+R3: 6GHz UNII 5~UNII 8  
+R4: BT**

| 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                                | 0.75  | 35.89              | 33.74             | 2.366           | 10.800            | 0.68                       | <= 1                             |
| 5785                                |       | 35.99              | 33.84             | 2.421           | 10.800            |                            |                                  |
| 5785                                |       | 35.54              | 33.39             | 2.183           | 10.800            |                            |                                  |
| 6895                                |       | 27.10              | 24.95             | 0.313           | 10.800            |                            |                                  |
| 2440                                |       | 13.83              | 11.68             | 0.015           | 10.800            |                            |                                  |

**Mode 3: DBS Mode:R1: 2.4GHz/5GHz UNII 1,UNII 3 in 8TX +R2: 6GHz UNII 5~UNII 8+R3: 5GHz UNII 1,UNII 3  
+R4: BT**

| 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                                | 0.75  | 35.89              | 33.74             | 2.366           | 10.800            | 0.68                       | <= 1                             |
| 5785                                |       | 35.99              | 33.84             | 2.421           | 10.800            |                            |                                  |
| 6825                                |       | 28.63              | 26.48             | 0.445           | 10.800            |                            |                                  |
| 5785                                |       | 35.44              | 33.29             | 2.133           | 10.800            |                            |                                  |
| 2440                                |       | 13.83              | 11.68             | 0.015           | 10.800            |                            |                                  |

**Mode 4: DBS Mode:R1: 2.4GHz/5GHz UNII 1,UNII 3 in 8TX +R2: 6GHz UNII 5~UNII 8+R3: 6GHz UNII 5~UNII 8  
+R4: BT**

| 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                                | 0.75  | 35.89              | 33.74             | 2.366           | 10.800            | 0.51                       | <= 1                             |
| 5785                                |       | 35.99              | 33.84             | 2.421           | 10.800            |                            |                                  |
| 6825                                |       | 28.63              | 26.48             | 0.445           | 10.800            |                            |                                  |
| 6985                                |       | 27.10              | 24.95             | 0.313           | 10.800            |                            |                                  |
| 2440                                |       | 13.83              | 11.68             | 0.015           | 10.800            |                            |                                  |



**Mode 5: DBS Mode:R1: 2.4GHz/ SBS Mode:5GHz UNII 1+UNII 3 in 4TX +R2: 5GHz UNII 1,UNII 3+R3: 5GHz UNII 1,UNII 3 +R4: BT**

| 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                                | 0.75  | 35.89              | 33.74             | 2.366           | 10.800            | 0.971                      | <= 1                             |
| 5200                                |       | 34.39              | 32.24             | 1.675           | 10.800            |                            |                                  |
| 5745                                |       | 35.40              | 33.25             | 2.113           | 10.800            |                            |                                  |
| 5785                                |       | 35.54              | 33.39             | 2.183           | 10.800            |                            |                                  |
| 5785                                |       | 35.44              | 33.29             | 2.133           | 10.800            |                            |                                  |
| 2440                                |       | 13.83              | 11.68             | 0.015           | 10.800            |                            |                                  |

**Mode 6: DBS Mode:R1: 2.4GHz/ SBS Mode:5GHz UNII 1+UNII 3 in 4TX +R2: 5GHz UNII 1,UNII 3+R3: 6GHz UNII 5~UNII 8 +R4: BT**

| 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                                | 0.75  | 35.89              | 33.74             | 2.366           | 10.800            | 0.80                       | <= 1                             |
| 5200                                |       | 34.39              | 32.24             | 1.675           | 10.800            |                            |                                  |
| 5745                                |       | 35.40              | 33.25             | 2.113           | 10.800            |                            |                                  |
| 5785                                |       | 35.54              | 33.39             | 2.183           | 10.800            |                            |                                  |
| 6985                                |       | 27.10              | 24.95             | 0.313           | 10.800            |                            |                                  |
| 2440                                |       | 13.83              | 11.68             | 0.015           | 10.800            |                            |                                  |

**Mode 7: DBS Mode:R1: 2.4GHz/ SBS Mode:5GHz UNII 1+UNII 3 in 4TX +R2: 6GHz UNII 5~UNII 8+R3: 5GHz UNII 1, UNII 3 +R4: BT**

| 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                                | 0.75  | 35.89              | 33.74             | 2.366           | 10.800            | 0.81                       | <= 1                             |
| 5200                                |       | 34.39              | 32.24             | 1.675           | 10.800            |                            |                                  |
| 5745                                |       | 35.40              | 33.25             | 2.113           | 10.800            |                            |                                  |
| 6825                                |       | 28.63              | 26.48             | 0.445           | 10.800            |                            |                                  |
| 5785                                |       | 35.44              | 33.29             | 2.133           | 10.800            |                            |                                  |
| 2440                                |       | 13.83              | 11.68             | 0.015           | 10.800            |                            |                                  |



Mode 8: DBS Mode:R1: 2.4GHz/ SBS Mode:5GHz UNII 1+UNII 3 in 4TX +R2: 6GHz UNII 5~UNII 8+R3: 6GHz UNII 5~UNII 8 +R4: BT

| 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                                | 0.75  | 35.89              | 33.74             | 2.366           | 10.800            | 0.64                       | <= 1                             |
| 5200                                |       | 34.39              | 32.24             | 1.675           | 10.800            |                            |                                  |
| 5745                                |       | 35.40              | 33.25             | 2.113           | 10.800            |                            |                                  |
| 6825                                |       | 28.63              | 26.48             | 0.445           | 10.800            |                            |                                  |
| 6895                                |       | 27.10              | 24.95             | 0.313           | 10.800            |                            |                                  |
| 2440                                |       | 13.83              | 11.68             | 0.015           | 10.800            |                            |                                  |

————THE END————