



# FCC RADIO EXPOSURE TEST REPORT

**FCC ID** : NKR-ATTC71KW  
**Equipment** : Wireless STB  
**Brand Name** : AT&T  
**Model Name** : C71KW-400, C71KWBP-400  
**Applicant** : Wistron NeWeb Corporation  
20 Park Avenue II Hsinchu Science Park Hsinchu, 308 Taiwan  
**Manufacturer** : Wistron NeWeb Corporation  
20 Park Avenue II Hsinchu Science Park Hsinchu, 308 Taiwan  
**Standard** : 47 CFR Part 2.1091

The product was received on May 09, 2019, and testing was started from Nov. 08, 2019 and completed on Nov. 23, 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 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 government.

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**

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### Photographs of EUT v01



TEL : 886-3-656-9065  
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Report Template No.: CB-A1\_1 Ver1.0



## 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: 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>802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) |
| 5GHz WLAN              | 5150-5250<br>5250-5350<br>5470-5725<br>5725-5850 | 5180-5240<br>5260-5320<br>5500-5720<br>5745-5825 | 802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)                                      |
| Bluetooth              | 2400-2483.5                                      | 2402-2480                                        | BR / EDR: FHSS (GFSK / $\pi/4$ -DQPSK / 8DPSK)<br>LE: DSSS (GFSK)                                                                    |

## 1.2 Table for Multiple Listing

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

| Brand Name | Model Name  | Description                                                                 |
|------------|-------------|-----------------------------------------------------------------------------|
| AT&T       | C71KW-400   | There is nothing different of two models, just for different marketing use. |
|            | C71KWBP-400 |                                                                             |

From the above models, model: C71KW-400 was selected as representative model for the test and its data was recorded in this report.

## 1.3 Table for FEM Information

| FEM      | Brand name | Model Name |
|----------|------------|------------|
| Original | SKYWORKS   | SKY85809   |
| New      | SKYWORKS   | SKY85818   |
| New      | QORVO      | QPF4800    |



## 1.4 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FA791514

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

| Modifications                                                                                                         | Performance Checking |
|-----------------------------------------------------------------------------------------------------------------------|----------------------|
| Changing FEM (Front-end Module) of WLAN for this device.<br>(Please refer to section 1.3 for detail FEM information.) | MPE                  |

Note: The Bluetooth MPE results were based on original report.

## 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 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \quad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

**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

For Mode 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       | 6.30     | 28.09       | 34.39      | 0.50           | 34.89              | 3.08319          | 20            | 0.61338                 | 1.00000                       |
| 5.2G;D1D       | 7.60     | 27.98       | 35.58      | 0.41           | 35.99              | 3.97192          | 20            | 0.79017                 | 1.00000                       |
| 5.3G;D1D       | 7.50     | 22.03       | 29.53      | 0.46           | 29.99              | 0.99770          | 20            | 0.19849                 | 1.00000                       |
| 5.6G;D1D       | 7.00     | 22.69       | 29.69      | 0.30           | 29.99              | 0.99770          | 20            | 0.19849                 | 1.00000                       |
| 5.8G;D1D       | 7.10     | 27.89       | 34.99      | 0.50           | 35.49              | 3.53997          | 20            | 0.70425                 | 1.00000                       |
| 2.4G;<br>BT-BR | 1.11     | 10.98       | 12.09      | 0.50           | 12.59              | 0.01816          | 20            | 0.00361                 | 1.00000                       |

Simultaneous Transmission Analysis Mode: WLAN 2.4GHz + Bluetooth

| 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;<br>BT-BR | 1.11     | 10.98       | 12.09      | 0.50           | 12.59              | 0.01816          | 20            | 0.00361                 | 1                             | 0.00361         |
| 2.4G;D1D       | 6.30     | 28.09       | 34.39      | 0.50           | 34.89              | 3.08319          | 20            | 0.61337                 | 1                             | 0.61337         |
|                |          |             |            |                |                    |                  |               |                         | Sum Ratio                     | 0.61698         |
|                |          |             |            |                |                    |                  |               |                         | Ratio Limit                   | 1               |

Simultaneous Transmission Analysis Mode: WLAN 5GHz + Bluetooth

| 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;<br>BT-BR | 1.11     | 10.98       | 12.09      | 0.50           | 12.59              | 0.01816          | 20            | 0.00361                 | 1                             | 0.00361         |
| 5.2G;D1D       | 7.60     | 27.98       | 35.58      | 0.41           | 35.99              | 3.97192          | 20            | 0.79017                 | 1                             | 0.79017         |
|                |          |             |            |                |                    |                  |               |                         | Sum Ratio                     | 0.79378         |
|                |          |             |            |                |                    |                  |               |                         | Ratio Limit                   | 1               |

**For Mode 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> ) |
|----------------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|
| 2.4G;D1D       | 6.30     | 29.21       | 35.51      | 0.48           | 35.99              | 3.97192          | 20            | 0.79017                 | 1.00000                       |
| 5.2G;D1D       | 7.60     | 28.03       | 35.63      | 0.36           | 35.99              | 3.97192          | 20            | 0.79017                 | 1.00000                       |
| 5.3G;D1D       | 7.50     | 22.44       | 29.94      | 0.05           | 29.99              | 0.99770          | 20            | 0.19849                 | 1.00000                       |
| 5.6G;D1D       | 7.00     | 22.75       | 29.75      | 0.24           | 29.99              | 0.99770          | 20            | 0.19849                 | 1.00000                       |
| 5.8G;D1D       | 7.10     | 27.61       | 34.71      | 0.50           | 35.21              | 3.31894          | 20            | 0.66028                 | 1.00000                       |
| 2.4G;<br>BT-BR | 1.11     | 10.98       | 12.09      | 0.50           | 12.59              | 0.01816          | 20            | 0.00361                 | 1.00000                       |

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

| 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;<br>BT-BR | 1.11     | 10.98       | 12.09      | 0.50           | 12.59              | 0.01816          | 20            | 0.00361                 | 1                             | 0.00361         |
| 2.4G;D1D       | 6.30     | 29.21       | 35.51      | 0.48           | 35.99              | 3.97192          | 20            | 0.79017                 | 1                             | 0.79017         |
|                |          |             |            |                |                    |                  |               |                         | Sum Ratio                     | 0.79378         |
|                |          |             |            |                |                    |                  |               |                         | Ratio Limit                   | 1               |

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

| 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;<br>BT-BR | 1.11     | 10.98       | 12.09      | 0.50           | 12.59              | 0.01816          | 20            | 0.00361                 | 1                             | 0.00361         |
| 5.2G;D1D       | 7.60     | 28.03       | 35.63      | 0.36           | 35.99              | 3.97192          | 20            | 0.79017                 | 1                             | 0.79017         |
|                |          |             |            |                |                    |                  |               |                         | Sum Ratio                     | 0.79378         |
|                |          |             |            |                |                    |                  |               |                         | Ratio Limit                   | 1               |

Note: The above antenna gain was declared by manufacturer.

————THE END————