



# RF Exposure Evaluation Report

APPLICANT : Country Wireless, LLC  
EQUIPMENT : Outdoor LTE CPE  
BRAND NAME : country wireless  
MODEL NAME : CW5100  
FCC ID : 2AICPCW5100  
STANDARD : 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL (SHENZHEN) INC., would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091, and pass the limit. Without written approval of SPORTON INTERNATIONAL (SHENZHEN) INC., the test report shall not be reproduced except in full.

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Prepared by: Mark Qu / Manager

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**SPORTON INTERNATIONAL (SHENZHEN) INC.**

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**Revision History**

| REPORT NO. | VERSION | DESCRIPTION             | ISSUED DATE   |
|------------|---------|-------------------------|---------------|
| FA652611   | Rev. 01 | Initial issue of report | Aug. 01, 2016 |
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**1. Administration Data****1.1. Testing Laboratory**

| Testing Laboratory |                                                                                                                                                                                     |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Test Site          | SPORTON INTERNATIONAL (SHENZHEN) INC.                                                                                                                                               |
| Test Site Location | 1F & 2F, Building A, Morning Business Center, No. 4003 ShiGu Rd., Xili Town, Nanshan District, Shenzhen, Guangdong, P. R. China<br>TEL: +86-755-8637-9589<br>FAX: +86-755-8637-9595 |

| Applicant    |                                                     |
|--------------|-----------------------------------------------------|
| Company Name | Country Wireless, LLC                               |
| Address      | 1403 South Maple Avenue, Marshfield, WI, 54449, USA |

| Manufacturer |                                                                                                                            |
|--------------|----------------------------------------------------------------------------------------------------------------------------|
| Company Name | Jaton technology Limited                                                                                                   |
| Address      | Rm1505, Kuangu Building, 68#, Langrong Rd., Shi'ao Village, Dalang Sub-district, New Longhua District, Shenzhen City China |

**2. Description of Equipment Under Test (EUT)**

| Product Feature & Specification         |                                        |
|-----------------------------------------|----------------------------------------|
| EUT Type                                | Outdoor LTE CPE                        |
| Brand Name                              | country wireless                       |
| Model Name                              | CW5100                                 |
| FCC ID                                  | 2AICPCW5100                            |
| IMEI Code                               | 860524030016982                        |
| Wireless Technology and Frequency Range | LTE Band 43: 3652.5 MHz ~ 3697.5 MHz   |
| Mode                                    | LTE: QPSK, 16QAM                       |
| Antenna Type/Gain                       | WWAN: Planar antenna with gain 12.5dBi |
| HW Version                              | CW5100-V2.0                            |
| SW Version                              | MT-23425-1.2.3-R2-Standard             |
| EUT Stage                               | Identical Prototype                    |

**Remark:** The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

**3. Maximum RF average output power among production units**

| LTE Band 43        |          |         |            |              |
|--------------------|----------|---------|------------|--------------|
| average power(dBm) |          |         |            |              |
| Modulation         | BW (MHz) | RB size | Target MPR | Target Power |
| QPSK               | 20       | ≤ 18    | 0          | 17.5         |
| QPSK               | 20       | > 18    | 0          | 17.5         |
| 16QAM              | 20       | ≤ 18    | 0          | 17.5         |
| 16QAM              | 20       | > 18    | 0          | 17.5         |
| QPSK               | 15       | ≤ 16    | 0          | 17.5         |
| QPSK               | 15       | > 16    | 0          | 17.5         |
| 16QAM              | 15       | ≤ 16    | 0          | 17.5         |
| 16QAM              | 15       | > 16    | 0          | 17.5         |
| QPSK               | 10       | ≤ 12    | 0          | 17.5         |
| QPSK               | 10       | > 12    | 0          | 17.5         |
| 16QAM              | 10       | ≤ 12    | 0          | 17.5         |
| 16QAM              | 10       | > 12    | 0          | 17.5         |
| QPSK               | 5        | ≤ 8     | 0          | 17.5         |
| QPSK               | 5        | > 8     | 0          | 17.5         |
| 16QAM              | 5        | ≤ 8     | 0          | 17.5         |
| 16QAM              | 5        | > 8     | 0          | 17.5         |



#### **4. RF Exposure Limit Introduction**

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

| Frequency range (MHz)                                          | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm <sup>2</sup> ) | Averaging time (minutes) |
|----------------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| <b>(A) Limits for Occupational/Controlled Exposures</b>        |                               |                               |                                     |                          |
| 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>(B) Limits for General Population/Uncontrolled Exposure</b> |                               |                               |                                     |                          |
| 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                       |

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:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna



## **5. Radio Frequency Radiation Exposure Evaluation**

### **5.1. Standalone Power Density Calculation**

| Band        | Frequency (MHz) | Antenna Gain (dBi) | Maximum Power (dBm) | Maximum EIRP (dBm) | Maximum EIRP (W) | Average EIRP (mW) | Power Density at 20cm (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) |
|-------------|-----------------|--------------------|---------------------|--------------------|------------------|-------------------|---------------------------------------------|-----------------------------|
| LTE Band 43 | 3652.5          | 12.50              | 17.50               | 30.00              | 1.00             | 1000.00           | 0.199                                       | 1.00                        |

**Note:** For conservativeness, the lowest frequency of each band is used to determine the MPE limit of that band

### **Conclusion:**

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.