



SPORTON International Inc.

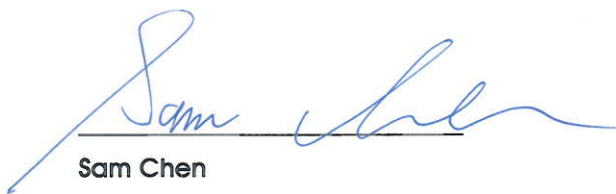
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Project No: CB10510084

Maximum Permissible Exposure Report

| | |
|------------------------|--------------------------------------------------|
| Applicant's company | Amped Wireless |
| Applicant Address | 13089 Peyton Dr. #C307 Chino Hills, CA 91709 USA |
| FCC ID | ZTT-ALLY00X19 |
| Manufacturer's company | Amped Wireless |
| Manufacturer Address | 13089 Peyton Dr. #C307 Chino Hills, CA 91709 USA |

| | |
|------------------|---------------------------------------------|
| Product Name | Whole Home Smart Wi-Fi Range Extender |
| Brand Name | amped wireless |
| Model Name | ALLY-00X19, ALLY-00X19K, ALLY-00X21K |
| Ref. Standard(s) | 47 CFR FCC Part 2 Subpart J, section 2.1091 |
| Received Date | Aug. 17, 2016 |
| Final Test Date | Sep. 30, 2016 |
| Submission Type | Original Equipment |


Sam Chen

SPORTON INTERNATIONAL INC.



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History of This Test Report

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|------------|---------|-------------------------|---------------|
| FA681934 | Rev. 01 | Initial issue of report | Oct. 19, 2016 |
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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) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) |
| 5GHz WLAN | 5150-5250 5725-5850 | 5180-5240 5745-5825 | 802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) |

1.2. Table for Multiple List

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

| Brand Name | Model Name | Description |
|----------------|-------------|-------------------------------------------------------------------------------------------------------|
| amped wireless | ALLY-00X19 | All the models are identical, the difference model for difference brand served as marketing strategy. |
| | ALLY-00X19K | |
| | ALLY-00X21K | |

From the above models, model: ALLY-00X19 was selected as representative model for the test and its data was recorded in this report.

1.3. Testing Location

| Testing Location | | |
|-------------------------------------|--------|-------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | HWA YA | ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL : 886-3-327-3456 FAX : 886-3-327-0973 |
| <input checked="" type="checkbox"/> | JHUBEI | ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C. TEL : 886-3-656-9065 FAX : 886-3-656-9085 |

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 ²) | Averaging Time E ² , H ² 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 ²) | Averaging Time E ² , H ² 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 23 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 = Peak 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 5GHz Band 1:

Antenna Type : Embedded Antenna

Conducted Power for IEEE 802.11ac MCS0/Nss1 (VHT20): 27.72dBm

| Distance (cm) | Test Freq. (MHz) | Directional Gain (dBi) | Antenna Gain (numeric) | The maximum combined Average Output Power | | Power Density (S) (mW/cm ²) | Limit of Power Density (S) (mW/cm ²) | Test Result |
|---------------|------------------|------------------------|------------------------|-------------------------------------------|----------|-----------------------------------------|--------------------------------------------------|-------------|
| | | | | (dBm) | (mW) | | | |
| 23 | 5200 | 7.82 | 6.0551 | 27.72 | 591.8004 | 0.5393 | 1 | Complies |

Note

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

For 5GHz Band B4:

Antenna Type : Embedded Antenna

Conducted Power for IEEE 802.11ac MCS0/Nss1 (VHT40): 27.01dBm

| Distance (cm) | Test Freq. (MHz) | Directional Gain (dBi) | Antenna Gain (numeric) | The maximum combined Average Output Power | | Power Density (S) (mW/cm ²) | Limit of Power Density (S) (mW/cm ²) | Test Result |
|---------------|------------------|------------------------|------------------------|-------------------------------------------|----------|-----------------------------------------|--------------------------------------------------|-------------|
| | | | | (dBm) | (mW) | | | |
| 23 | 5795 | 8.97 | 7.8908 | 27.01 | 502.7250 | 0.5970 | 1 | Complies |

Note

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

For 2.4GHz Band:

Antenna Type : Embedded Antenna

Conducted Power for IEEE 802.11g: 28.65 dBm

| Distance (cm) | Test Freq. (MHz) | Antenna Gain (dBi) | Antenna Gain (numeric) | The maximum combined Average Output Power | | Power Density (S) (mW/cm ²) | Limit of Power Density (S) (mW/cm ²) | Test Result |
|---------------|------------------|--------------------|------------------------|-------------------------------------------|----------|-----------------------------------------|--------------------------------------------------|-------------|
| | | | | (dBm) | (mW) | | | |
| 23 | 2437 | 2.71 | 1.8664 | 28.65 | 732.5974 | 0.2721 | 1 | Complies |

Conclusion:

Both of the WLAN 2.4GHz Band and WLAN 5GHz Band can transmit simultaneously, the formula of calculated the MPE is:

$$\text{CPD1} / \text{LPD1} + \text{CPD2} / \text{LPD2} + \dots \text{etc.} < 1$$

CPD = Calculation power density

LPD = Limit of power density

Therefore, the worst-case situation is $0.2721 / 1 + 0.5970 / 1 = 0.8027$, which is less than "1". This confirmed that the device complies.