



SPORTON International Inc.

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Project No: CB10505257

Maximum Permissible Exposure Report

| | |
|---------------------|--|
| Applicant's company | Belkin International, Inc. |
| Applicant Address | 12045 East Waterfront Drive, Playa Vista, CA 90094 |
| FCC ID | K7SF9K1117V2 |

| | |
|------------------|---|
| Product Name | AC1200 DB Wi-Fi Dual-Band AC + Gigabit Router |
| Brand Name | belkin |
| Model Name | F9K1113v5 |
| Ref. Standard(s) | 47 CFR FCC Part 2 Subpart J, section 2.1091 |
| Received Date | Feb. 29, 2016 |
| Final Test Date | May 18, 2016 |
| Submission Type | Class II Change |

Sam Chen

SPORTON INTERNATIONAL INC.





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History of This Test Report

| REPORT NO. | VERSION | DESCRIPTION | ISSUED DATE |
|-------------|---------|-------------------------|---------------|
| FA4N1172-27 | Rev. 01 | Initial issue of report | Jun. 08, 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 Class II Change

This product is an extension of original one reported under Sporton project number: 202519-03

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

| Modifications | Performance Checking |
|---|--|
| 1. Updating product information as below: a. Brand Name from "Belkin" to "belkin". b. Model No. from "F9K1113v4" to "F9K1113v5". c. Address from "12045 East Waterfront Drive Playa Vista California 90094 United States" to "12045 East Waterfront Drive, Playa Vista, CA 90094". 2. Remove an accessories is RJ-45 Cable*1, Non-Shielded, 1.2m. | Do not effect the test results. |
| 3. Adding an adapter (Model No.: MU18A2120150-A1) 4. Changing the flash memory. | After evaluating, it is not necessary to re-test Maximum Permissible Exposure. |
| 5. Updating test rule of 5GHz band 4 to "15.407 (b)(4)(i) of New Rules (ET Docket No. 13-49; FCC 16-24)" from New Rules (ET Docket No.13-49; FCC 14-30). | Maximum Permissible Exposure. |

Note: Maximum Permissible Exposure of 2.4GHz and 5GHz Band1 is based on original 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 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

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

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 : PCB Antenna

Conducted Power for IEEE 802.11ac VHT 20 MCS0/Nss1: 22.74dBm

| 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) | | | |
| 20 | 5240 | 4.11 | 2.5763 | 22.7410 | 187.9765 | 0.0964 | 1 | Complies |

For 5GHz Band 4:

Antenna Type : PCB Antenna

Conducted Power for IEEE 802.11ac VHT 20 MCS0/Nss1: 24.81dBm

| 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) | | | |
| 20 | 5825 | 4.11 | 2.5763 | 24.81 | 302.4219 | 0.1550 | 1 | Complies |

For 2.4GHz Band:

Antenna Type : PCB Antenna

Conducted Power for IEEE 802.11b: 22.50 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) | | | |
| 20 | 2437 | 3.71 | 2.3496 | 22.5000 | 177.8279 | 0.0831 | 1 | Complies |

Conclusion:

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

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

CPD = Calculation power density

LPD = Limit of power density

Therefore, the worst-case situation is $0.0831/1 + 0.1550/1 = 0.2381$, which is less than "1". This confirmed that the device complies.