



# SPORTON International Inc.

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Project No: CB10505162

## Maximum Permissible Exposure Report

Applicant's company	Belkin International, Inc.
Applicant Address	12045 East Waterfront Drive, Playa Vista, CA 90094
FCC ID	K7SF9K1116V1

Product Name	AC750 DB Wi-Fi Dual-Band AC+ Router
Equipment Marketing Name	1. AC750 DB Wi-Fi Dual-Band AC+ Router 2. AC1200 DB Wi-Fi Dual-Band AC+ Router
Brand Name	belkin
Model Name	1. F9K1116V2 2. F9K1123V2
Ref. Standard(s)	47 CFR FCC Part 2 Subpart J, section 2.1091
Received Date	Feb. 29, 2016
Final Test Date	May 13, 2016
Submission Type	Class II Change



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SPORTON INTERNATIONAL INC.





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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.

Equipment Marketing Name	Model No.	Name of F/W version
AC750 DB Wi-Fi Dual-Band AC+ Router	F9K1116V2	F9K1116V2
AC1200 DB Wi-Fi Dual-Band AC+ Router	F9K1123V2	F9K1123V2

Note: The difference between these models is only the name of F/W version. Model No.: F9K1116V2 was selected as representative model for the test and its data was recorded in this report.

### 1.3. Table for Class II Change

This product is an extension of original one reported under Sporton project number: 2N1310

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

Modifications	Performance Checking
1. Updating model name to "F9K1116V2" from "F9K1116V1". 2. Adding a new power adapter (Model Name: MU12AR120100-A1). 3. Adding a new model number. (Model No. F9K1123V2). 4. Adding two equipment marketing name (AC750 DB Wi-Fi Dual-Band AC+ Router and AC1200 DB Wi-Fi Dual-Band AC+ Router) 5. Changing the second source DDR2. 6. Removing two adapters (Model No.: DSA-18PFG-12 FUS 120150 and Model No.: DSA-12PFE-12 BUS 120100). 7. Updating address to "12045 East Waterfront Drive, Playa Vista, CA 90094" from "12045 E. Waterfront Drive Playa Vista, CA 90094, USA". 8. Updating brand name to "belkin" from "Belkin".	it's not necessary to re-evaluate MPE.
9. Updating Band 1 to "New Rules " from "Old Rules". 10. Updating 5GHz band 4 to "15.407 (b)(4)(i) of New Rules (ET Docket No. 13-49; FCC 16-24)" from "Old Rules".	MPE

Note: Maximum Permissible Exposure of 2.4GHz Band is based on original test report.

### 1.4. 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 <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** = 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:

Antenna Type : Printed Antenna

Conducted Power for IEEE 802.11ac MCS0/Nss2 (VHT20): 24.55dBm

Distance (cm)	Test Freq. (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	The maximum combined average Output Power		Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
				(dBm)	(mW)			
20	5825	4.56	2.8576	24.55	285.0519	0.162100	1	Complies

For 2.4GHz Band:

Antenna Type : Printed Antenna

Conducted Power for IEEE 802.11n MCS8 HT20: 24.49 dBm

Distance (cm)	Test Freq. (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	The maximum combined Average Output Power		Power Density (S) (mW/cm <sup>2</sup> )	Limit of Power Density (S) (mW/cm <sup>2</sup> )	Test Result
				(dBm)	(mW)			
20	2437	4.97	3.1405	24.4906	281.2302	0.175797	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  $0.162100 / 1 + 0.175797 / 1 = 0.337897$ , which is less than "1". This confirmed that the device complies.