



SPORTON International Inc.

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Project No: CB10408188

Maximum Permissible Exposure

Applicant's company	Hewlett-Packard Company
Applicant Address	8000 Foothills Blvd. Roseville, CA 95747
FCC ID	RTPMRLBB1403
Manufacturer's company	Joy Technology (ShenZhen) Corporation
Manufacturer Address	Building A,B,C,D, HengKeng Ind., Shangpai, Shangwu,Aiqun Rd., Shiyan Town,Shenzhen 518135 China

Product Name	802.11ac WLAN Radio
Brand Name	HP
Model No.	MRLBB-1403
Product No.	5066-3786
Ref. Standard(s)	47 CFR FCC Part 2 Subpart J, section 2.1091
EUT Freq. Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	May 28, 2014
Final Test Date	Aug. 17, 2015
Submission Type	Class II Change

Sam Chen

SPORTON INTERNATIONAL INC.



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History of This Assessment Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA410910-05	Rev. 01	Initial issue of report	Aug. 20, 2015

1. MAXIMUM PERMISSIBLE EXPOSURE

1.1. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FA410910-01

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

Modifications
1. Adding Band 2 and Band 3 (5250~5350 MHz, 5470~5725 MHz) for this device, and it evaluated for Maximum Permissible Exposure.
2. Change Applicant address to "8000 Foothills Blvd. Roseville, CA 95747" from "3000 Hanover Street Palo Alto, California 94304 U.S.A."
3. Change FCC ID to "RTPMRLBB1403" from "B94MRLBB1403"

1.2. Applicable Standard

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2 m normally can be maintained between the user and the device.

(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

1.3. MPE Calculation Method

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

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

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$

From the EUT RF output power, the minimum mobile separation distance, $d=0.2\text{m}$, as well as the gain of the used antenna, the RF power density can be obtained.

1.4. Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

For 5GHz UNII Band:

Antenna Type : PCB Antenna

Conducted Power for IEEE 802.11ac VHT 80: 23.31dBm

Distance (m)	Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain (numeric)	Average Output Power		Power Density (S) (mW/cm ²)	Limit of Power Density (S) (mW/cm ²)	Test Result
				(dBm)	(mW)			
0.2	5610	6.50	4.4668	23.3065	214.1171	0.190371	1	Complies